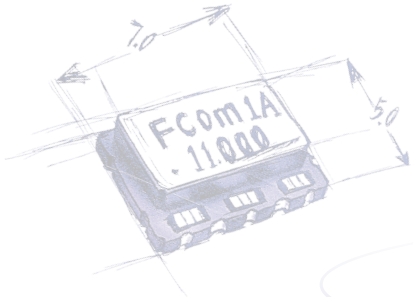
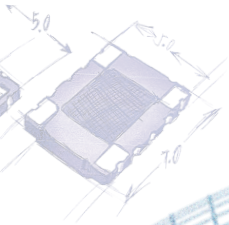
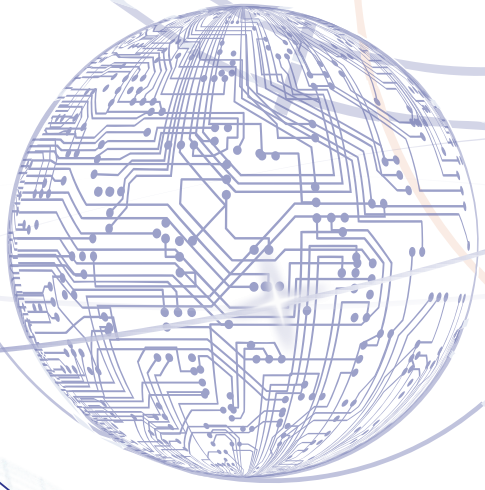
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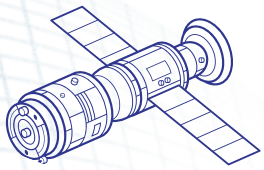
FUJI CRYSTAL

Product Catalogue

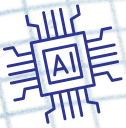






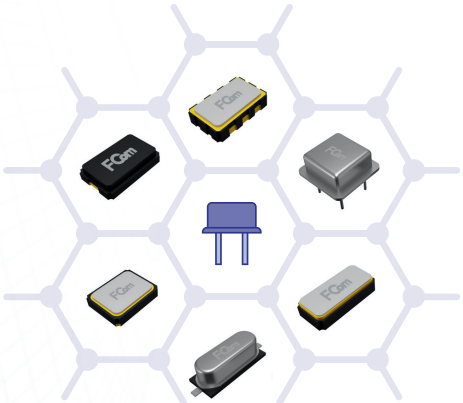






PRECISELY ACCURATE







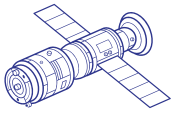
Company Introduction

Fuji Crystal (Hong Kong) Electronics Co., Ltd. was established in 2007, and established Shenzhen Huihao Electronic Technology Development Co., Ltd. in Shenzhen, mainly focusing on the research and development, production and sales of frequency components.

Product brand: FCom, FCom comes from the first letter of each word of the sentence Frequency Components Outstanding Manufacturer, which represents the company's commitment to becoming an outstanding frequency component manufacturer worldwide.

Fuji Crystal upholds the core value of Precisely Accurate and implements it in the four dimensions of product, technic, service, and after-sales attitude.

We care about every single vibration.
Product categories include quartz crystals, crystal oscillators, and SAW components.



- **Quartz crystal**: MHz crystal, kHz crystal, thermal crystal.
- **Crystal oscillator**: kHz oscillator, MHz oscillator, programmable oscillator, differential output oscillator, VCXO, TCXO, VCTCXO, OCXO.
- **SAW components**: SAW filter, SAW resonator.

Our products are widely used in telecommunications, enterprise networks, automotive electronics, consumer electronics and mobile communications.

- **Telecommunications, enterprise network**: radio frequency unit, distributed unit, centralized unit, small base station, optical transceiver module, server, switch, smart network card
- **Automotive electronics**: electric vehicles, advanced assisted intelligent driving systems, vehicle entertainment systems, vehicle communications, tire pressure monitors
- **Consumer Electronics**:
  - Smart home, mobile networking technology upgrade, comprehensive integration of home intelligent systems, such as network systems, home lighting control, security monitoring, intercoms, home environment control, energy management, etc.
  - Mobile computing devices, due to the increasingly mature development of AI in various fields, contain an inestimable amount of data that needs to be collected, processed (computed) and transmitted in real time, which continues to promote the multi-faceted development of cloud/edge/high-speed computing.
- **Mobile communications**: smartphones, smart wearables, connection and network technology

Fuji crystal strictly control the production process, from raw materials to finished product inspection, and features of our products mainly are high precision, industrial grade, automotive grade, military grade, reliability, durability, low power consumption, low jitter/low phase noise.

As a manufacturer, Fuji Crystal is committed to providing high-reliability frequency components to customers around the world and actively meeting the needs of different application fields. We are committed to continuously improving our products to make them smaller and more precise, and always maintain competitive price advantages to provide more cost-effective products.

At the same time, we attach great importance to environmental responsibility and strictly control harmful ingredients in the product production process to ensure that our products comply with international standards and specifications, such as REACH, RoHS, etc., and have obtained ISO14001, ISO9001 and IATF16949 certifications.





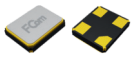
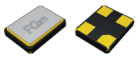
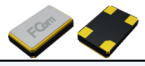
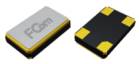
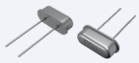
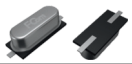




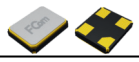
Email: FCom@fujicrystal.com
Web: www.fujicrystal.com

FUJI CRYSTAL
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Quartz Crystal

No.	Series	Package	Frequency	Feature	Application
01	FCX-1S	1.2 x 1.0 mm 	24 ~ 76.8 MHz	• Ultra-small size • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Wi-Fi and BT, other wireless module • IoT devices, Wearable devices • Space limited application, Smartphone
02	FCX-1M	1.6 x 1.2 mm 	24 ~ 60 MHz	• Package: 1.6*1.2*0.33 mm • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Wi-Fi and BT, other wireless module • IoT devices, Wearable devices • Space limited application, Smartphone
03	FCX-2S	2.0 x 1.6 mm 	16 ~ 96 MHz	• Package: 2.0*1.6*0.5 mm • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Wireless Communication, CPE, Router • Ethernet Switch, Gateway, Set-Top Box • Notebook, Tablet, Server, Cloud, Industry
04	FCX-2M	2.5 x 2.0 mm 	12 ~ 66 MHz	• Package: 2.5*2.0*0.55 mm • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Wireless Communication, CPE, Router • Ethernet Switch, Gateway, Set-Top Box • Notebook, Tablet, Server, Cloud, Industry
05	FCX-3M	3.2 x 2.5 mm 	8 ~ 80 MHz	• Package: 3.2*2.5*0.7 mm • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Wireless Communication, CPE, Router • Ethernet Switch, Gateway, Set-Top Box • Notebook, Tablet, Server, Cloud, Industry
06	FCX-3G	3.2 x 2.5 mm 	8 ~ 55.4 MHz	• Package: 3.2*2.5*0.8 mm • 4 pads glass sealed crystal • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Desktop computer, Notebook, Printer • Set-Top Box, Server, Monitor, TV • USB-Hub, Game Console
07	FCX-5M	5.0 x 3.2 mm 	8 ~ 54 MHz	• Package: 5.0*3.2*0.9 mm • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Communication • Test equipment, IoT devices • PCMCIA, Wireless applications
08	FCX-5G	5.0 x 3.2 mm 	8 ~ 54 MHz	• Package: 5.0*3.2*1.3 mm • 2 pads glass sealed crystal • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Desktop computer, Notebook, Printer • Set-Top Box , Server • Monitor, TV, USB-Hub, Game Console
09	FCX-6M	6.0 x 3.5 mm 	6 ~ 48 MHz	• Package: 6.0*3.5*1.0 mm • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Communication • Test equipment, IoT devices • PCMCIA, Wireless applications
10	FCX-6G	6.0 x 3.5 mm 	8 ~ 30 MHz	• 2 pads glass sealed crystal • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Desktop computer, Notebook, Printer • Set-Top Box, Server • Monitor, TV, USB-Hub, Game Console
11	FCX-7M	7.0 x 5.0 mm 	6 ~ 48 MHz	• Package: 7.0*5.0*1.1 mm • ±10 ppm @ 25℃ available • -40 ~ 125℃ available	• Communication • Wireless applications • Test equipment, IoT devices
12	FCX-9S	HC-49S 	3.2 ~ 64 MHz	• Many standard frequencies • Lower cost and highly mass production capability	• TV, STB, LCDM • Cable Modem
13	FCX-9M	HC-49 SMD 	3.2 ~ 64 MHz	• Many standard frequencies • Lower cost and highly mass production capability	• Bluetooth • WLAN • IoT, MPU
14	FCX-4U	HC-49U 	1.8 ~ 64 MHz	• Higher frequency pullibility and lower equivalent series resistance	• Consumer Electronics • Test and Measurement • Computer Peripherals, FPGA/Microcontrollers
15	FCX-5U	HC-50U 	0.85 ~ 4 MHz	• Resistance welded type crystal units • Low frequency as 850kHz	• Consumer Electronics • Test and Measurement • Computer Peripherals, FPGA/Microcontrollers
16	FCX-M1	UM-1 	7 ~ 200 MHz	• Low Cost, High precision, High frequency stability • Excellent aging characteristics	• Communication Electronics • Measurement Instrument
17	FCX-M5	UM-5 	4 ~ 200 MHz	• Excellent shock resistance • Excellent aging characteristics	• Communication Electronics • Measurement Instrument

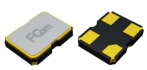
Thermal Quartz Crystal

No.	Series	Package	Frequency	Feature	Application
18	FCX-1R	1.6 x 1.2 mm 	26 ~ 54 MHz	• Built-in thermistor, support 26~54MHz • High precision, high reliability	• Mobile phones • GPS/GNSS • Wearable devices
19	FCX-6R	2.0 x 1.6 mm 	19.2 ~ 54 MHz	• Built-in thermistor, support 19.2~54MHz • High precision, high reliability	• Mobile phones • GPS/GNSS • Wearable devices
20	FCX-2R	2.5 x 2.0 mm 	12 ~ 54 MHz	• Built-in thermistor, support 19.2~54MHz • High precision, high reliability	• Mobile phones • GPS/GNSS • Wearable devices

Tuning Fork Crystal

No.	Series	Package	Frequency	Feature	Application
21	FCT-1S	1.2 x 1.0 mm 	32.768kHz	• Package: 1.2*1.0*0.5 mm • ±5 ppm @ 25℃ available • -40 ~ 125℃ available	• Consumer products • Real Time Clock
22	FCT-1M	1.6 x 1.0 mm 	32.768kHz	• Package: 1.6*1.0*0.5 mm • ±5 ppm @ 25℃ available • -40 ~ 125℃ available	• Real Time Clock • System in sleep mode or low energy mode Timekeeping
23	FCT-2M	2.0 x 1.2 mm 	32.768kHz	• Package: 2.0*1.2*0.6 mm • ±5 ppm @ 25℃ available • -40 ~ 125℃ available	• Consumer products • Small mobile devices • Industrial electronic equipment • Communication devices
24	FCT-3M	3.2 x 1.5 mm 	32.768kHz	• Package: 3.2*1.5*0.75 mm • ±5 ppm @ 25℃ available • -40 ~ 125℃ available	• Consumer products • System in sleep mode or low energy mode Timekeeping • Communication devices
25	FCT-6M	6.9 x 1.4 mm 	32.768kHz	• Package: 6.9*1.4*1.3 mm • ±5 ppm @ 25℃ available • -40 ~ 85℃ available	• Consumer products • Small mobile telecommunicationgs devices
26	FCT-8M	3.0 x 8.0 mm 	32.768kHz	• Package: 3.8*8.0 mm • ±5 ppm @ 25℃ available • -40 ~ 85℃ available	• Consumer products • Microprocessors • Clocks
27	FCT-2T	ϕ2×6 mm 	32.768kHz	• Package: ϕ 2*6 mm • ±5 ppm @ 25℃ available • -40 ~ 85℃ available	• Consumer products reference clocks
28	FCT-3T	ϕ3×8 mm 	32.768kHz	• Package: ϕ 3*8 mm • ±5 ppm @ 25℃ available • -40 ~ 85℃ available	• PC • Consumer products reference clocks

Oscillator 32.768kHz

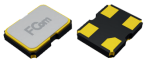
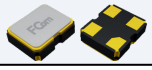
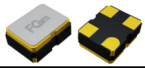
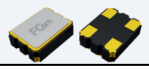
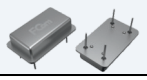
No.	Series	Package	Frequency	Feature	Application
29	FCO-1K	1.6 x 1.2 mm 	32.768kHz	• Wide temperature range from -40 to +125°C • Ultra lowcurrent consumption	• Real Time Clock, Health, Wellness Monitors • Wearable device, Sport Video Cams • Ultra-small Notebook PC, Mobile Phones
30	FCO-6K	2.0 x 1.6 mm 	32.768kHz	• Operation supply voltage: 1.5V, 1.8V • Ultra lowcurrent consumption	• Real Time Clock, Health, Wellness Monitors • Wearable device, Sport Video Cams • Ultra-small Notebook PC, Mobile Phones
31	FCO-2K	2.5 x 2.0 mm 	32.768kHz	• Low Power Supply Voltage: 3.3, 2.5, 1.8 Supply Options	• RTC Module, IoT • Smartphone, Wearable Device • Watch, Medical
32	FCO-3K	3.2 x 2.5 mm 	32.768kHz	• Low Power Supply Voltage: 3.3, 2.5, 1.8 Supply Options	• RTC Module • Smartphone • IoT, Wearable Device

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Web: www.fujicrystal.com

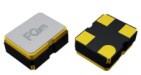
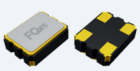
Low Current OSC 32.768kHz

No.	Series	Package	Frequency	Feature	Application
33	FCO-6K-UC	2.0 x 1.6 mm 	32.768kHz	• Operation supply voltage: 1.5V, 1.8V • Ultra-Low current: 1.4uA typical	• RTC Reference Clock • Wearable device, Sport Video Cams • Ultra-small Notebook PC • Mobile Phones, Health, Wellness Monitors
34	FCO-2K-UC	2.5 x 2.0 mm 	32.768kHz	• Operation supply voltage: 1.5V, 1.8V • Ultra-Low current: 1.4uA typical	• RTC Reference Clock • Wearable device, Sport Video Cams • Ultra-small Notebook PC • Mobile Phones, Health, Wellness Monitors

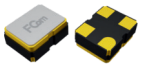
Crystal Oscillator

No.	Series	Package	Frequency	Feature	Application
35	FCO-1C	1.6 x 1.2 mm 	3 ~ 60 MHz	• Wide temperature range from -40 to +125°C • Tri-state enable/disable mode	• WLAN • Mobile Phone, Health, Wellness Monitors • DSC, Set-top Box, HDTV
36	FCO-6C	2.0 x 1.6 mm 	1.5 ~ 50 MHz	• Operation voltage: 1.8V, 2.5V, 3.3V • -40 to +125°C available	• WLAN/WiMax • Mobile Phone • DSC, Set-top Box, HDTV
37	FCO-2C	2.5 x 2.0 mm 	1.25 ~ 125 MHz	• Operation voltage: 1.8V, 2.5V, 3.3V • -40 to +125°C available	• WLAN/WiMax • Mobile Phone • DSC, Set-top Box, HDTV
38	FCO-3C	3.2 x 2.5 mm 	1.25 ~ 125 MHz	• Operation voltage: 1.8V, 2.5V, 3.3V • -40 to +125°C available	• WLAN/WiMax • Mobile Phone • DSC, Set-top Box, HDTV
39	FCO-5C	5.0 x 3.2 mm 	0.0137 ~ 160 MHz	• Operation voltage: 1.8V, 2.5V, 3.3V • -40 to +125°C available	• GPS, Mobile Phone • WLAN, Wireless, Fiber/10Gbit Ethernet • Netbook, PDA, DSC
40	FCO-7C	7.0 x 5.0 mm 	0.0137 ~ 166 MHz	• Low Power Supply Voltage: 3.3, 2.5, 1.8 Supply Options • -40 to +125°C available	• PC, VGA Card • Netbook, PDA • xDSL, WLAN, Fiber/10Gbit Ethernet
41	FCO-HL	12.46×12.46 mm 	0.25 ~ 180 MHz	• Tight symmetry (45 to 55%) available • Operation voltage:5V, 3.3V	• Communication, wireless communication • Test instruments, industrial equipment • Frequency converter
42	FCO-FL	20.4 × 12.8 mm 	0.25 ~ 180 MHz	• Tight symmetry (45 to 55%) available • Operation voltage:5V, 3.3V	• Communication, wireless communication • Test instruments, industrial equipment • Frequency converter

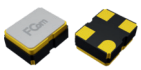
High Precision OSC

No.	Series	Package	Frequency	Feature	Application
43	FCO-2C-HP	2.5 x 2.0 mm 	2.5 ~ 60 MHz	• Tight frequency stability: ±10 ppm over -40°C to 85°C ±15 ppm over -40°C to 95°C	• Wireless Connectivity • Mobile device • Smart meter
44	FCO-3C-HP	3.2 x 2.5 mm 	2.5 ~ 60 MHz	• Tight frequency stability: ±10 ppm over -40°C to 85°C ±15 ppm over -40°C to 95°C	• Wireless Connectivity • Mobile device • Smart meter

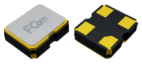
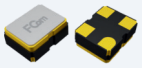
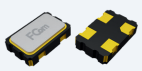
Ultra-low Power OSC

No.	Series	Package	Frequency	Feature	Application
45	FCO-2C-UP	2.5 x 2.0 mm 	1 ~ 50 MHz	• 0.9V, 1.2V, 1.5V ultra-low power supply • Low Noise, 0.3ps at 12kHz~20MHz offsets	• IoT, Game Console, Smartphone • Wearable Device • Digital Camera • Digital Consumer Electronics
46	FCO-3C-HP	3.2 x 2.5 mm 	2.5 ~ 60 MHz	• 0.9V, 1.2V, 1.5V ultra-low power supply • Low Noise, 0.3ps at 12kHz~20MHz offsets	• Wireless Connectivity • Mobile device • Smart meter

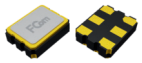
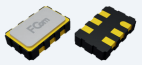
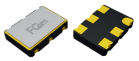
Extended Temp. OSC

No.	Series	Package	Frequency	Feature	Application
47	FCO-2C-WT	2.5 x 2.0 mm 	1.25 ~ 100 MHz	• Operating Temp. Range -55°C to 125°C available • Low jitter and phase noise • Operation voltage: 1.8V, 2.5V, 3.3V	• Extreme environment applications • Oil drilling, geothermal • Commercial space, car/aircraft engine, aerospace & military • Industrial instrumentation
48	FCO-3C-WT	3.2 x 2.5 mm 	1.25 ~ 100 MHz	• Operating Temp. Range -55°C to 125°C available • Low jitter and phase noise • Operation voltage: 1.8V, 2.5V, 3.3V	• Extreme environment applications • Oil drilling, geothermal • Commercial space, car/aircraft engine, aerospace & military • Industrial instrumentation

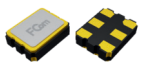
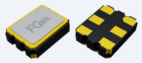
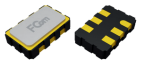
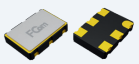
Low Power & Jitter FASTXO

No.	Series	Package	Frequency	Feature	Application
49	FCO-6P-PJ	2.0 x 1.6 mm 	1 ~ 200 MHz	• Operation supply voltage: 1.8V, 2.5V and 3.3V • Programable series, Fast delivery at any frequency	• IoT, Smartphone • Game console • Mobile device • Wearable device
50	FCO-2P-PJ	2.5 x 2.0 mm 	1 ~ 200 MHz	• Operation supply voltage: 1.8V, 2.5V and 3.3V • Programable series, Fast delivery at any frequency	• Computer Peripherals • Set-top Box , HDTV • DSC, PDA • Wearable device
51	FCO-3P-PJ	3.2 x 2.5 mm 	1 ~ 200 MHz	• Operation supply voltage: 1.8V, 2.5V and 3.3V • Programable series, Fast delivery at any frequency	• Computer Peripherals • Set-top Box , HDTV • DSC, PDA • Wearable device
52	FCO-5P-PJ	5.0 x 3.2 mm 	1 ~ 200 MHz	• Operation supply voltage: 1.8V, 2.5V and 3.3V • Programable series, Fast delivery at any frequency	• Mobile Phone • WLAN, Wireless • Fiber/10G-bit Ethernet • Notebook, PDA, DSC
53	FCO-7P-PJ	7.0 × 5.0 mm 	1 ~ 200 MHz	• Operation supply voltage: 1.8V, 2.5V and 3.3V • Programable series, Fast delivery at any frequency	• PC main board, VGA card • xDSL, WLAN • Fiber/10G-bit Ethernet • Notebook, PDA, DSC

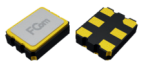
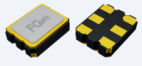
Ultra-Low Jitter FASTXO

No.	Series	Package	Frequency	Feature	Application
54	FCO-3P-UJ	3.2 x 2.5 mm 	10 ~ 250 MHz	• Very low phase jitter: <1 pS(0.8 pS, typ.) RMS • Singled-end output : CMOS	• High-Speed Gigabite Ethernet • Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access/Smart Grid
55	FCO-5P-UJ	5.0 x 3.2 mm 	10 ~ 250 MHz	• Very low phase jitter: <1 pS(0.6 pS, typ.) RMS • Singled-end output : CMOS	• Fiber Channel, Storage • Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access/Smart Grid
56	FCO-7P-UJ	7.0 × 5.0 mm 	10 ~ 250 MHz	• Very low phase jitter: <1 pS(0.6 pS, typ.) RMS • Singled-end output : CMOS	• High-Speed Gigabite Ethernet • Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access/Smart Grid • Fiber Channel, Storage Area Network

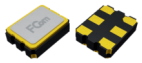
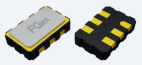
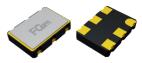
Differential Output OSC

No.	Series	Package	Frequency	Feature	Application
57	FCO-2L	2.5 x 2.0 mm 	13.5 ~ 220 MHz	• Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz	• 10Gbit Ethernet, Fiber Channel • Storage Area Network, SONET • Enterprise Servers, Telecom • Reference Clocks for ADC and DAC
58	FCO-3L	3.2 x 2.5 mm 	13.5 ~ 220 MHz	• Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz	• 10Gbit Ethernet, Fiber Channel • Storage Area Network, SONET • Enterprise Servers, Telecom • Reference Clocks for ADC and DAC
59	FCO-5L	5.0 x 3.2 mm 	13.5 ~ 220 MHz	• Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz	• 10Gbit Ethernet, Fiber Channel • Storage Area Network, SONET • Enterprise Servers, Telecom • Reference Clocks for ADC and DAC
60	FCO-7L	7.0 × 5.0 mm 	13.5 ~ 220 MHz	• Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz	• 10Gbit Ethernet, Fiber Channel • Storage Area Network, SONET • Enterprise Servers, Telecom • Reference Clocks for ADC and DAC

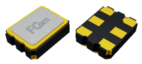
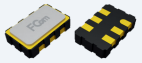
Ultra-Low Jitter Differential OSC

No.	Series	Package	Frequency	Feature	Application
61	FCO-2L-UJ	2.5 x 2.0 mm 	100 ~ 220 MHz	• Very low phase jitter: 50 fs, typ. RMS from 12kHz - 20MHz	• 40Gbit/100Gbit Ethernet, MAN • SONET, Fiber Channel • Test Instrumentation
62	FCO-3L-UJ	3.2 x 2.5 mm 	100 ~ 220 MHz	• Very low phase jitter: 0.05pS, typ. RMS from 12kHz - 20MHz	• 40Gbit/100Gbit Ethernet, MAN • SONET, Fiber Channel • Test Instrumentation
63	FCO-5L-UJ	5.0 x 3.2 mm 	100 ~ 220 MHz	• Very low phase jitter: 0.05pS, typ. RMS from 12kHz - 20MHz	• 40Gbit/100Gbit Ethernet, MAN • SONET, Fiber Channel • Test Instrumentation
64	FCO-7L-UJ	7.0 × 5.0 mm 	70 ~ 170 MHz	• Very low phase jitter: < 100 fs RMS from 12kHz - 20MHz	• 40Gbit/100Gbit Ethernet, MAN • SONET, Fiber Channel • WLAN/WiMAX, xDSL • Test Instrumentation

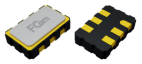
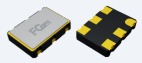
Differential Output FASTXO

No.	Series	Package	Frequency	Feature	Application
65	FCO-3L-PG	3.2 x 2.5 mm 	10 ~ 1500 MHz	• Frequency support up to 1.5GHz • Low phase jitter: 0.6 pS, typ. RMS from 12kHz - 20MHz	• Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access, Smart Grid • High-Speed Gigabite Ethernet • Storages Area Network, SONET
66	FCO-5L-PG	5.0 x 3.2 mm 	10 ~ 1500 MHz	• Very low phase jitter: 0.6 pS, typ. RMS from 12kHz - 20MHz • Fast delivery	• Storage Area Network, SONET • High-Speed Gigabit Ethernet, Fiber Channel • Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access, Smart Grid
67	FCO-7L-PG	7.0 × 5.0 mm 	10 ~ 1500 MHz	• Frequency support up to 1.5GHz • Low phase jitter: 0.6 pS, typ. RMS from 12kHz - 20MHz	• Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access, Smart Grid • High-Speed Gigabite Ethernet • Storages Area Network, SONET

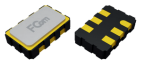
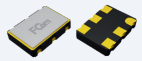
CMOS Output SMD VCXO

No.	Series	Package	Frequency	Feature	Application
68	FVC-3X	3.2 x 2.5 mm 	2 ~ 66 MHz	• Low power supply voltage: 3.3, 2.8 supply options • Frequency support from 2MHz to 66MHz	• High-Speed Gigabite Ethernet, SONET • Fiber Channel, Storages Area Network • Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access, Smart Grid
69	FVC-5X	5.0 x 3.2 mm 	1.5 ~ 170 MHz	• Tight symmetry (45 to 55%) available • Output frequency up to 170MHz	• Set-top Box, HDTV • WiMAX/WLAN • xDSL/ VoIP • Cable modem

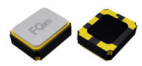
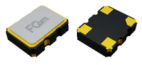
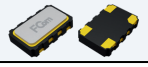
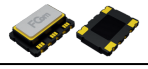
Low Jitter FASTVCXO

No.	Series	Package	Frequency	Feature	Application
70	FVC-3P-LJ	3.2 x 2.5 mm 	10 ~ 250 MHz	• Frequency support from 10MHz to 250MHz • Low phase jitter typical: 0.6 ps RMS from 12kHz to 20MHz	• High-Speed Gigabite Ethernet, SONET • Fiber Channel, Storages Area Network • Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access, Smart Grid
71	FVC-5P-LJ	5.0 x 3.2 mm 	10 ~ 250 MHz	• Frequency support from 10MHz to 250MHz • Low phase jitter typical: 0.6 ps RMS from 12kHz to 20MHz	• Set-top Box, HDTV • WiMAX/WLAN • xDSL/ VoIP • Cable modem
72	FVC-7P-LJ	7.0 × 5.0 mm 	10 ~ 250 MHz	• Frequency support from 10MHz to 250MHz • Low phase jitter typical: 0.6 ps RMS from 12kHz to 20MHz	• Set-top Box, HDTV • WiMAX/WLAN • xDSL/ VoIP • Cable modem

Differential Output FASTVCXO

No.	Series	Package	Frequency	Feature	Application
73	FVC-3L-PG	3.2 x 2.5 mm 	10 ~ 1500 MHz	• Differential output : LVPECL, LVDS • Low phase jitter typical: 0.6 ps RMS from 12kHz to 20MHz	• High-Speed Gigabite Ethernet, SONET • Fiber Channel, Storages Area Network • Enterprise Server, SAS/SATA • Microprocessors/DSP/FPGA • Broadband Access, Smart Grid
74	FVC-5L-PG	5.0 x 3.2 mm 	10 ~ 1500 MHz	• LVPECL / LVDS output • Low jitter performance: < 1 ps RMS from 12k-20MHz	• Set-top Box, HDTV • WiMAX/WLAN • Jitter Attenuator, ADC • xDSL/ VoIP, Cable modem
75	FVC-7L-PG	7.0 × 5.0 mm 	10 ~ 1500 MHz	• LVPECL / LVDS output • Low jitter performance: < 1 ps RMS from 12k-20MHz	• Set-top Box, HDTV • WiMAX/WLAN • Jitter Attenuator, ADC • xDSL/ VoIP, Cable modem

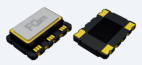
Standard SMD VCTCXO

No.	Series	Package	Frequency	Feature	Application
76	FVT-6S	2.0 x 1.6 mm 	10 ~ 52 MHz	• Compactness and lightweight • Miniature size and low profile • ±0.5ppm @-40°C~+85°C	• GPS • WiMAX, WLAN, Mobile Phone • IoT, wearable Electronics
77	FVT-2S	2.5 x 2.0 mm 	10 ~ 52 MHz	• Compactness and lightweight • Miniature size, low thickness • ±0.5ppm @-40°C~+85°C	• GPS • WiMAX, WLAN, Mobile Phone • IoT, wearable Electronics
78	FVT-3S	3.2 x 2.5 mm 	10 ~ 52 MHz	• Low power consumption • Compactness and lightweight • ±0.5ppm @-40°C~+85°C	• GPS • WiMAX, WLAN • Mobile Phone, IoT
79	FVT-5S	5.0 x 3.2 mm 	10 ~ 52 MHz	• Low power consumption • Compactness and lightweight • ±0.5ppm @-40°C~+85°C	• GPS • WiMAX, WLAN • Mobile Phone, Telecommunication
80	FVT-7S	7.0 × 5.0 mm 	5 ~ 52 MHz	• Compactness and lightweight • Low power consumption • ±0.5ppm @-40°C~+85°C	• Femtocell , Base Stations • WiMAX, WLAN, WIFI • Wireless Communications, Mobile Phone

Extended Temp. VCTCXO

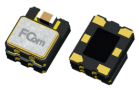
No.	Series	Package	Frequency	Feature	Application
81	FVT-7S	7.0 × 5.0 mm 	10 ~ 52 MHz	• High Precision @ High Temperature range • ±0.1ppm @ -40°C~+95°C • ±0.2ppm @ -40°C~+105°C	• Femtocell , Base Stations • WiMAX, WLAN, WIFI • Wireless Communications

High Precision VCTCXO

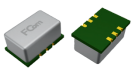
No.	Series	Package	Frequency	Feature	Application
82	FVT-5S-HP	5.0 x 3.2 mm 	10 ~ 52 MHz	• CMOS and Clipped Sine wave output optional • ±0.28ppm @-40°C~+85°C • ±0.05ppm @-10°C~+70°C	• Base Stations • Stratum 3 • Femtocell
83	FVT-7S-HP	7.0 × 5.0 mm 	10 ~ 52 MHz	• CMOS and Clipped Sine wave output optional • ±0.28ppm @-40°C~+85°C • ±2.0ppm @-40°C~+105°C	• Femtocell , Base Stations • WiMAX, WLAN, WIFI • Wireless Communications

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Web: www.fujicrystal.com

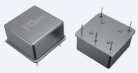
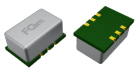
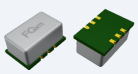
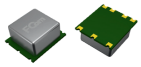
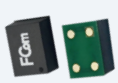
Low Jitter SMD TCXO

No.	Series	Package	Frequency	Feature	Application
84	FVT-3S-LJ	3.2×2.5 mm 	10 ~ 1500 MHz	• Low power supply voltage: 3.3V and 2.5V options • Low Phase Jitter typical 0.6 pS RMS at 12kHz to 20MHz frequency offsets	• High-Speed Gigabit Ethernet, SONET • Fiber Channel, Strorages Area Network • Enterprise Server, SAS/SATA, Smart Grid • Microprocessors/DSP/FPGA, Broadband Access

Low Phase Noise TCXO

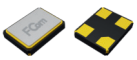
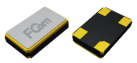
No.	Series	Package	Frequency	Feature	Application
85	FVT-9S-LN	14 × 9 mm 	40 ~ 150 MHz	• Low Phase Noise • High Stability for Stratum 3 • Small SMD Package	• Time Synchronization • Microwave Communication • Test & Measurement • Telecom Systems, Satellite Communication

OCXO

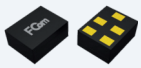
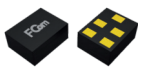
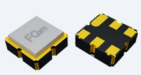
No.	Series	Package	Frequency	Feature	Application
86	FOC-1D	20.3 x 12.7 mm 	5 ~ 40 MHz	• Stratum 3 (Overall ± 4.6 ppm including 10 years aging.)	• SDH/SONET, Telecommunication base station • Test and measurement equipment • Synthesizer, Digital switch, Reference Timing Circuit
87	FOC-2D	20.6 x 20.6 mm 	5 ~ 40 MHz	• Dimension 20.6 x 20.6 x 11.0 mm typical • SC Cut Crystal	• SDH/SONET, Telecommunication base station • Test and measurement equipment • Synthesizer, Digital switch, Reference Timing Circuit
88	FOC-3D	25.4 x 25.4 mm 	5 ~ 40 MHz	• Dimension 25.4 x 25.4 x 12.7 mm typical • SC Cut Crystal	• SDH/SONET, Telecommunication base station • Test and measurement equipment • Synthesizer, Digital switch, Reference Timing Circuit
89	FOC-4D	36.3 x 27.2 mm 	5 ~ 40 MHz	• Dimension 36.3 x 27.2 x 12.7 mm typical • SC Cut Crystal	• SDH/SONET, Telecommunication base station • Test and measurement equipment • Synthesizer, Digital switch, Reference Timing Circuit
90	FOC-5S	14.7 x 9.6 mm 	10 ~ 40 MHz	• ±30 ppb stability over -40 to 85°C • Stratum 3 (Overall ±4.6 ppm including 20 years aging.)	• SDH/SONET, Telecommunication base station • Test and measurement equipment • Synthesizer, Digital switch, Reference Timing Circuit • Packet Timing Protocol (e.g. 1588)
91	FOC-5S-LN	14.7 x 9.6 mm 	10 ~ 40 MHz	• ±10 ppb Stability over -40 to 85°C • Very Low Phase Noise	• SDH/SONET, Telecommunication base station • Test and measurement equipment • Synthesizer, Digital switch, Reference Timing Circuit • Packet Timing Protocol (e.g. 1588)
92	FOC-6S	25.4 x 22.1 mm 	10 ~ 40 MHz	• ±30 ppb stability over -40 to 85°C • Stratum 3 (Overall ±4.6 ppm including 20 years aging.)	• SDH/SONET, Telecommunication base station • Test and measurement equipment • Synthesizer, Digital switch, Reference Timing Circuit • Packet Timing Protocol (e.g. 1588)
93	FOC-7S	9.7 x 7.5 mm 	10 ~ 40 MHz	• Low Power Consumption • ±20 ppb stability over -40 to 85°C • Stratum 3 (Overall ±4.6 ppm including 20 years aging.)	• Small Cell, Portable Telecommunication Device • Test and Instrumentation • Synthesizer, Digital switch, Reference Timing Circuit • Packet Timing Protocol (e.g. IEEE-1588)

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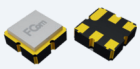
Automotive Crystal

No.	Series	Package	Frequency	Feature	Application
94	FCX-2S-A	2.0 x 1.6 mm 	16 ~ 52 MHz	• Size 2.0×1.6, Ultra thin, thickness 0.5mm • High precision, high frequency stability • AEC-Q200 Compliant	• Automotive Wireless Communication • In-Vehicle Infotainment system • Camera, Radar, Lidar, TPMS, Smart Key • Battery Management System, Body Control • Power steering, Breaking System, Engine Control
95	FCX-2M-A	2.5 x 2.0 mm 	12 ~ 54 MHz	• Industry Standard Package: 2.5*2.0*0.55mm • AEC-Q200 Compliant • High precision, high reliability	• Automotive Wireless Communication • In-Vehicle Infotainment system • Camera, Radar, Lidar, TPMS, Smart Key • Battery Management System, Body Control • Power steering, Breaking System, Engine Control
96	FCX-3M-A	3.2 x 2.5 mm 	8 ~ 50 MHz	• Size 3.2×2.5, Ultra thin, thickness 0.70mm • AEC-Q200 Compliant • High precision, high reliability	• Automotive Wireless Communication • In-Vehicle Infotainment system • Camera, Radar, Lidar, TPMS, Smart Key • Battery Management System, Body Control • Power steering, Breaking System, Engine Control
97	FCX-3G-A	3.2 x 2.5 mm 	8 ~ 54 MHz	• Industry Standard Package: 3.2*2.5*0.8mm • AEC-Q200 Compliant • High precision, high reliability	• Automotive Ethernet • In-Vehicle Infotainment system • Battery Management System, Body Control • Instrument clusters • Power steering, Breaking System, Engine Control
98	FCX-5M-A	5.0 x 3.2 mm 	8 ~ 54 MHz	• Size 5.0×3.2, thickness 0.90mm • High precision and high frequency stability • AEC-Q200 Compliant	• Automotive Wireless Communication • In-Vehicle Infotainment system • Camera, Radar, Lidar, TPMS, Smart Key • Battery Management System, Body Control • Power steering, Breaking System, Engine Control
99	FCX-5G-A	5.0 x 3.2 mm 	8 ~ 54 MHz	• Industry Standard Package: 5.0*3.2*1.3mm • High precision and high frequency stability • AEC-Q200 Compliant	• Automotive Wireless Communication • In-Vehicle Infotainment system • Camera, Radar, Lidar, TPMS, Smart Key • Battery Management System, Body Control • Power steering, Breaking System, Engine Control
100	FCT-3M-A	3.2 x 1.5 mm 	32.768kHz	• Ultra small size 3.2*1.5*0.75mm • High frequency stability and high precision • AEC-Q200 Compliant	• Real Time Clock for automotive • System in sleep mode or low energy mode Timekeeping

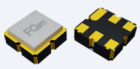
SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
101	FSF-0907-1197M420-62M4	0.9 x 0.7 mm 	1197.420 MHz	62.4 MHz	-
102	FSF-0907-1582M470-46M84		1582.470 MHz	46.84	-
103	FSF-1109-1176M000-20M46	1.1 x 0.9 mm 	1176.000 MHz	20.46 MHz	-
104	FSF-1109-1176M450-50M		1176.450 MHz	50 (3dB) MHz	1.2 dB
105	FSF-1109-1189M000-50M		1189.000 MHz	50 (3dB) MHz	2.5 dB
106	FSF-1109-1189M000-50M		1189.000 MHz	50 MHz	1.9 dB
107	FSF-1109-1197M420-62M4		1197.420 MHz	62.4 MHz	-
108	FSF-1109-1575M420-54M		1575.420 MHz	54 (3dB) MHz	1.3 dB
109	FSF-1109-1582M000-46M8		1582.000 MHz	46.8 MHz	-
110	FSF-1109-1582M400-70M		1582.400 MHz	70 (3dB) MHz	1.6 dB
111	FSF-1109-1582M470-46M84		1582.470 MHz	46.84 MHz	-
112	FSF-1411-1237M000-80M	1.4 x 1.1 mm 	1237.000 MHz	80 MHz	-
113	FSF-1411-1568M000-44M		1568.000 MHz	44 (3dB) MHz	2.2 dB
114	FSF-1411-1575M420-64M		1575.420 MHz	64(3dB) MHz	0.9 dB
115	FSF-1411-1575M420-44M		1575.420 MHz	44 (3dB) MHz	1.3 dB
116	FSF-1411-1575M420-2M		1575.420 MHz	2 MHz	-
117	FSF-1411-1582M000-46M8		1582.000 MHz	46.8 MHz	-
118	FSF-1411-1582M400-70M		1582.400 MHz	70 (3dB) MHz	1.8 dB
119	FSF-1411-1615M680-8M16		1615.680 MHz	8.16 MHz	-
120	FSF-1411-2491M750-16M		2491.750 MHz	16 MHz	-
121	FSF-3030-876M000-10M	3.0 x 3.0 mm 	876.000 MHz	10 MHz	2.5 dB
122	FSF-3030-1176M000-20M		1176.000 MHz	20 MHz	2 dB
123	FSF-3030-1176M450-20M44		1176.450 MHz	20.44 MHz	1.9 dB
124	FSF-3030-1176M450-20M46		1176.450 MHz	20.46 MHz	1 dB
125	FSF-3030-1176M450-56M		1176.450 MHz	56 (3dB) MHz	2.0 dB
126	FSF-3030-1176M500-20M		1176.500 MHz	20 MHz	-
127	FSF-3030-1191M000-51M		1191.000 MHz	51 MHz	-
128	FSF-3030-1191M795-32M		1191.795 MHz	32 MHz	2.4 dB
129	FSF-3030-1191M500-51M		1191.500 MHz	51 MHz	3.8 dB

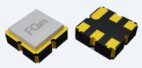
SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
130	FSF-3030-1199M000-108M	3.0 x 3.0 mm 	1199.000 MHz	108 MHz	5.0 dB
131	FSF-3030-1207M000-20M		1207.000 MHz	20 MHz	2 dB
132	FSF-3030-1207M000-25M8		1207.000 MHz	25.8 MHz	-
133	FSF-3030-1207M000-35M		1207.000 MHz	35 (3dB) MHz	2.5 dB
134	FSF-3030-1207M000-36M		1207.000 MHz	36(3dB) MHz	2.5 dB
135	FSF-3030-1207M140-10M23		1207.140 MHz	10.23 MHz	3.2 dB
136	FSF-3030-1218M000-40M		1218.000 MHz	40 MHz	2.9 dB
137	FSF-3030-1222M000-80M		1222.000 MHz	80 MHz	1.2 dB
138	FSF-3030-1222M000-112M		1222.000 MHz	112 MHz	4.8 dB
139	FSF-3030-1224M000-108M		1224.000 MHz	108 MHz	-
140	FSF-3030-1224M000-130M		1224.000 MHz	130 (3dB) MHz	4.8 dB
141	FSF-3030-1227M000-57M4		1227.000 MHz	57.4 MHz	2 dB
142	FSF-3030-1227M000-75M5		1227.000 MHz	75.5 MHz	-
143	FSF-3030-1227M000-35M		1227.000 MHz	35(3dB) MHz	2.5 dB
144	FSF-3030-1227M000-57M		1227.000 MHz	57 (3dB) MHz	1.8 dB
145	FSF-3030-1228M000-20M		1228.000 MHz	20 MHz	2 dB
146	FSF-3030-1228M000-62M		1228.000 MHz	62 MHz	3.8 dB
147	FSF-3030-1237M000-80M		1237.000 MHz	80 MHz	3.0 dB
148	FSF-3030-1240M000-8M		1240.000 MHz	8 MHz	3.5 dB
149	FSF-3030-1240M000-20M		1240.000 MHz	20 MHz	1.9 dB
150	FSF-3030-1245M000-96M		1245.000 MHz	96 (3dB) MHz	2.9 dB
151	FSF-3030-1246M000-8M		1246.000 MHz	8 MHz	3.5 dB
152	FSF-3030-1247M500-61M		1247.500 MHz	61 MHz	3.8 dB
153	FSF-3030-1252M000-25M		1252.000 MHz	25 MHz	2.5 dB
154	FSF-3030-1268M000-20M		1268.000 MHz	20 MHz	1.8 dB
155	FSF-3030-1268M000-20M5		1268.000 MHz	20.5 MHz	-
156	FSF-3030-1268M520-36M6		1268.520 MHz	36.6 (3dB) MHz	3 dB
157	FSF-3030-1268M520-20M46		1268.520 MHz	20.46 MHz	1.4 dB
158	FSF-3030-1268M520-36M		1268.520 MHz	36 (3dB) MHz	2.5 dB

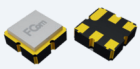
SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
159	FSF-3030-1268M520-64M	3.0 x 3.0 mm 	1268.520 MHz	64 (3dB) MHz	1.0 dB
160	FSF-3030-1268M520-20M		1268.520 MHz	20 (1dB) MHz	3.0 dB
161	FSF-3030-1268M520-27M		1268.520 MHz	27 (3dB) MHz	3.5 dB
162	FSF-3030-1268M520-50M		1268.520 MHz	50 (1dB) MHz	0.9 dB
163	FSF-3030-1268M520-40M		1268.520 MHz	40 (3dB) MHz	2.0 dB
164	FSF-3030-1268M520-57M		1268.520 MHz	57 (3dB) MHz	1.8 dB
165	FSF-3030-1278M000-20M		1278.000 MHz	20 MHz	2 dB
166	FSF-3030-1542M000-34M		1542.000 MHz	34 MHz	1.3 dB
167	FSF-3030-1550M000-20M		1550.000 MHz	20 MHz	4 dB
168	FSF-3030-1561M000-12M		1561.000 MHz	12 (3dB) MHz	4 dB
169	FSF-3030-1561M000-20M		1561.000 MHz	20 (3dB) MHz	4.3 dB
170	FSF-3030-1561M000-21M		1561.000 MHz	21 MHz	4 dB Good rectangle coefficient
171	FSF-3030-1561M000-21M		1561.000 MHz	21 MHz	2.3 dB Low insertion loss
172	FSF-3030-1561M000-31M		1561.000 MHz	31 (3dB) MHz	3.0 dB
173	FSF-3030-1561M000-39M5		1561.000 MHz	39.5 MHz	-
174	FSF-3030-1561M100-4M092		1561.100 MHz	4.092 MHz	7.5 dB
175	FSF-3030-1562M000-55M		1562.000 MHz	55 (3dB) MHz	1.8 dB
176	FSF-3030-1566M000-28M		1566.000 MHz	28 (3dB) MHz	4.0 dB
177	FSF-3030-1567M000-27M		1567.000 MHz	27 (1dB) MHz	1.8 dB
178	FSF-3030-1568M000-18M		1568.000 MHz	18 MHz	1.8 dB
179	FSF-3030-1568M000-59M		1568.000 MHz	59 (3dB) MHz	1.0 dB
180	FSF-3030-1568M000-30M		1568.000 MHz	30 (1dB) MHz	1.5 dB
181	FSF-3030-1568M000-52M		1568.000 MHz	52 (3dB) MHz	2.1 dB
182	FSF-3030-1568M000-43M		1568.000 MHz	43 (3dB) MHz	1.5 dB
183	FSF-3030-1570M000-20M		1570.000 MHz	20 MHz	4 dB
184	FSF-3030-1572M000-30M		1572.000 MHz	30 MHz	2 dB
185	FSF-3030-1572M500-30M		1572.500 MHz	30 MHz	-
186	FSF-3030-1573M000-62M		1573.000 MHz	62 (3dB) MHz	0.75 dB
187	FSF-3030-1573M000-80M		1573.000 MHz	80 (3dB) MHz	2.8 dB

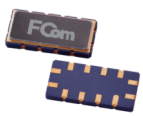
SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
188	FSF-3030-1575M420-47M		1575.420 MHz	47 (3dB) MHz	1.5 dB
189	FSF-3030-1575M420-64M		1575.420 MHz	64 (3dB) MHz	1.0 dB
190	FSF-3030-1575M420-26M		1575.420 MHz	26 (3dB) MHz	3.2 dB
191	FSF-3030-1575M420-27M		1575.420 MHz	27 (3dB) MHz	3.5 dB
192	FSF-3030-1575M420-20M		1575.420 MHz	20 (3dB) MHz	3.2 dB
193	FSF-3030-1575M420-74M		1575.420 MHz	74 (3dB) MHz	0.9 dB
194	FSF-3030-1575M420-35M		1575.420 MHz	35 (3dB) MHz	1.5 dB
195	FSF-3030-1575M420-27M		1575.420 MHz	27 (1dB) MHz	1.8 dB
196	FSF-3030-1575M420-32M736		1575.420 MHz	32.736 MHz	1.4 dB
197	FSF-3030-1575M420-2M		1575.420 MHz	2 MHz	2 dB
198	FSF-3030-1575M420-20M46		1575.420 MHz	20.46 MHz	-
199	FSF-3030-1576M000-34M	3.0 x 3.0 mm 	1576.000 MHz	34 MHz	1.2 dB
200	FSF-3030-1584M000-50M		1584.000 MHz	50 MHz	1.0dB-1.2dB small insertion loss
201	FSF-3030-1584M000-50M		1584.000 MHz	50 MHz	2.0-2.5 dB
202	FSF-3030-1585M000-59M		1585.000 MHz	59 MHz	2.6 dB
203	FSF-3030-1586M000-42M		1586.000 MHz	42 MHz	1.2 dB
204	FSF-3030-1588M000-20M		1588.000 MHz	20 MHz	4 dB
205	FSF-3030-1588M000-82M		1588.000 MHz	82 (3dB) MHz	2.0 dB
206	FSF-3030-1590M000-52M		1590.000 MHz	52 (3dB) MHz	3.0 dB
207	FSF-3030-1602M000-64M		1602.000 MHz	64 (3dB) MHz	1.0 dB
208	FSF-3030-1602M000-21M		1602.000 MHz	21 (1dB) MHz	3.2 dB
209	FSF-3030-1602M000-30M		1602.000 MHz	30 (3dB) MHz	3.5 dB
210	FSF-3030-1602M000-27M		1602.000 MHz	27 (1dB) MHz	1.8 dB
211	FSF-3030-1602M000-20M		1602.000 MHz	20 MHz	4 dB High rectangularity
212	FSF-3030-1602M000-35M		1602.000 MHz	35 (3dB) MHz	3.3 dB
213	FSF-3030-1602M000-20M		1602.000 MHz	20 MHz	2 dB Low insertion loss
214	FSF-3030-1602M000-37M2		1602.000 MHz	37.2 MHz	-
215	FSF-3030-1610M000-20M		1610.000 MHz	20 MHz	4 dB
216	FSF-3030-1615M000-20M		1615.000 MHz	20 MHz	4.5 dB Good rectangle coefficient

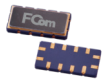
SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
217	FSF-3030-1575M420-47M	3.0 x 3.0 mm 	1575.420 MHz	47 (3dB) MHz	1.5 dB
218	FSF-3030-1575M420-64M		1575.420 MHz	64 (3dB) MHz	1.0 dB
219	FSF-3030-1575M420-26M		1575.420 MHz	26 (3dB) MHz	3.2 dB
220	FSF-3030-1575M420-27M		1575.420 MHz	27 (3dB) MHz	3.5 dB
221	FSF-3030-1575M420-20M		1575.420 MHz	20 (3dB) MHz	3.2 dB
222	FSF-3030-1575M420-74M		1575.420 MHz	74 (3dB) MHz	0.9 dB
223	FSF-3030-1575M420-35M		1575.420 MHz	35 (3dB) MHz	1.5 dB
224	FSF-3030-1575M420-27M		1575.420 MHz	27 (1dB) MHz	1.8 dB
225	FSF-3030-1575M420-32M736		1575.420 MHz	32.736 MHz	1.4 dB
226	FSF-3030-1575M420-2M		1575.420 MHz	2 MHz	2 dB
227	FSF-3030-1575M420-20M46		1575.420 MHz	20.46 MHz	-
228	FSF-3030-1576M000-34M		1576.000 MHz	34 MHz	1.2 dB
229	FSF-3030-1584M000-50M		1584.000 MHz	50 MHz	1.0dB-1.2dB small insertion loss
230	FSF-3030-1584M000-50M		1584.000 MHz	50 MHz	2.0-2.5 dB
231	FSF-3030-1585M000-59M		1585.000 MHz	59 MHz	2.6 dB
232	FSF-3030-1586M000-42M		1586.000 MHz	42 MHz	1.2 dB
233	FSF-3030-1588M000-20M		1588.000 MHz	20 MHz	4 dB
234	FSF-3030-1588M000-82M		1588.000 MHz	82 (3dB) MHz	2.0 dB
235	FSF-3030-1590M000-52M		1590.000 MHz	52 (3dB) MHz	3.0 dB
236	FSF-3030-1602M000-64M		1602.000 MHz	64 (3dB) MHz	1.0 dB
237	FSF-3030-1602M000-21M		1602.000 MHz	21 (1dB) MHz	3.2 dB
238	FSF-3030-1602M000-30M		1602.000 MHz	30 (3dB) MHz	3.5 dB
239	FSF-3030-1602M000-27M		1602.000 MHz	27 (1dB) MHz	1.8 dB
240	FSF-3030-1602M000-20M		1602.000 MHz	20 MHz	4 dB High rectangularity
241	FSF-3030-1602M000-35M		1602.000 MHz	35 (3dB) MHz	3.3 dB
242	FSF-3030-1602M000-20M		1602.000 MHz	20 MHz	2 dB low insertion loss
243	FSF-3030-1602M000-37M2		1602.000 MHz	37.2 MHz	-
244	FSF-3030-1610M000-20M		1610.000 MHz	20 MHz	4 dB
245	FSF-3030-1615M000-20M		1615.000 MHz	20 MHz	4.5 dB Good rectangle coefficient

SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
246	FSF-7050-135M000-7M	7.0 x 5.0 mm 	135.000 MHz	7 (3dB) MHz	22 dB
247	FSF-7050-140M000-0.24M		140.000 MHz	0.24 (3dB) MHz	5 dB
248	FSF-7050-159M000-30M		159.000 MHz	30 (1dB) MHz	15(max) dB
249	FSF-7050-162M000-0.14M		162.000 MHz	0.14 (3dB) MHz	5 （max） dB
250	FSF-7050-164M180-0.1M		164.180 MHz	0.1 (1dB) MHz	2.2 dB
251	FSF-7050-178M500-9M8		178.500 MHz	9.8 (3dB) MHz	15 （max） dB
252	FSF-7050-200M000-25M		200.000 MHz	25 (1dB) MHz	15 （max） dB
253	FSF-7050-243M000-0.13M		243.000 MHz	0.13 (1dB) MHz	5.5 dB
254	FSF-7050-294M200-4M5		294.200 MHz	4.5 (1dB) MHz	15 （max） dB
255	FSF-7050-294M200-20M		294.200 MHz	20 (1.2dB) MHz	23 （max） dB
256	FSF-7050-274M200-11M5		294.200 MHz	11.5 (1dB) MHz	15 （max） dB
257	FSF-7050-294M200-12M5		294.200 MHz	12.5 (1dB) MHz	15 （max） dB
258	FSF-7050-294M520-21M		294.520 MHz	21 (3dB) MHz	20 （max） dB
259	FSF-1145-164M180-0.075M	11.0 x 4.5 mm	164.180 MHz	0.075(1dB) MHz	4 (max) dB
260	FSF-1145-169M200-0.12M		169.200 MHz	0.12 (3dB) MHz	4 (max) dB
261	FSF-1145-173M080-0.12M		173.080 MHz	0.12 (3dB) MHz	4 (max) dB
262	FSF-1145-173M130-0.12M		173.130 MHz	0.12 (3dB) MHz	4 (max) dB
263	FSF-1145-900M000-7M		900.000 MHz	7 (3dB) MHz	4 dB
264	FSF-1145-900M000-8M5		900.000 MHz	8.5 (3dB) MHz	7 dB
265	FSF-1365-35M420-2M	13.3 x 6.5 mm 	35.420 MHz	2 MHz	19 dB
266	FSF-1365-60M000-15M		60.000 MHz	15 (1dB) MHz	15 (max) dB
267	FSF-1365-70M000-0.09M		70.000 MHz	0.09 (1dB) MHz	4 dB
268	FSF-1365-70M000-27M4		70.000 MHz	27.4 (3dB) MHz	20 dB
269	FSF-1365-76M800-0.21M		76.800 MHz	0.21 (3dB) MHz	7 dB
270	FSF-1365-108M050-50M		108.050 MHz	50 (1dB) MHz	4 dB
271	FSF-1365-115M000-11M18		115.000 MHz	11.18(1dB) MHz	13.5 dB
272	FSF-1365-117M960-50M		117.960 MHz	50 (1dB) MHz	4 dB
273	FSF-1365-121M500-50M		121.500 MHz	50 (1dB) MHz	4 dB
274	FSF-1365-138M000-0.06M		138.000 MHz	0.06 (1dB) MHz	5 (max) dB

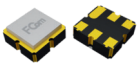
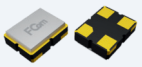
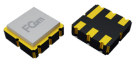
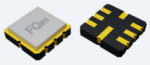
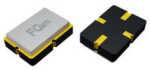
SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
275	FSF-1365-140M000-0.24M	13.3 x 6.5 mm 	140.000 MHz	0.24 (3dB) MHz	5 dB
276	FSF-1365-156M800-0.07M		156.800 MHz	0.07 (1dB) MHz	3 dB
277	FSF-39-480M000-27M	TO-39 	480.000 MHz	27 (3dB) MHz	20 dB
278	FSF-39-479M500-27M		479.500 MHz	27 (3dB) MHz	21 dB
279	FSF-39-479M500-16M		479.500 MHz	16 (3dB) MHz	23.5 dB
280	FSF-39-480M000-18M		480.000 MHz	18 (3dB) MHz	21 dB
281	FSF-1272-135M000-7M	12.0 x 7.2	135.000 MHz	7 (3dB) MHz	16.5 dB
282	FSF-1365-36M170-0.3M	13.0 x 6.5	36.170 MHz	0.3 (1dB) MHz	16 dB
283	FSF-1365-46M000-4M3		46.000 MHz	4.3 (3dB) MHz	9 dB
284	FSF-1367-35M420-1M	13.7 x 6.7	35.420 MHz	1 (3dB) MHz	19 dB
285	FSF-1606-50M500-0.7M	16.0 x 6.0	50.500 MHz	0.7 (3dB) MHz	12.3 dB
286	FSF-1606-57M000-0.85M		57.000 MHz	0.85 (2dB) MHz	12.5 dB
287	FSF-1885-44M000-4M7	18.6 x 8.5	44.000 MHz	4.7 (1dB) MHz	25 dB
288	FSF-2212-62M500-0.36M	22.2 x 12.8	62.500 MHz	0.36 (3dB) MHz	6.5 dB
289	FSF-2212-70M000-41M		70.000 MHz	41 (3dB) MHz	24.7 dB
290	FSF-2212-70M000-31M		70.000 MHz	31 (3dB) MHz	22.3 dB
291	FSF-2212-70M000-20M55		70.000 MHz	20.55(3dB) MHz	26.2 dB
292	FSF-2212-70M000-16M7		70.000 MHz	16.7 (3dB) MHz	23 dB
293	FSF-2212-70M000-12M7		70.000 MHz	12.7 (3dB) MHz	23.3 dB
294	FSF-2212-70M000-13M		70.000 MHz	13 (3dB) MHz	23 dB
295	FSF-2212-70M000-4M2		70.000 MHz	4.2 (3dB) MHz	21.5 dB
296	FSF-2212-70M000-3M6		70.000 MHz	3.6 (3dB) MHz	24 dB
297	FSF-2212-140M000-28M35		140.000 MHz	28.35(3dB) MHz	24.8 dB
298	FSF-2212-140M000-25M8		140.000 MHz	25.8 (3dB) MHz	21.7 dB
299	FSF-2212-140M000-6M3		140.000 MHz	6.3 (3dB) MHz	28 dB
300	FSF-2212-186M000-4M		186.000 MHz	4 (1dB) MHz	17 dB
301	FSF-2712-70M000-1M24	27.0 x 12.8	70.000 MHz	1.24 (3dB) MHz	20.8 dB
302	FSF-2712-140M000-1M82		140.000 MHz	1.82(1.5dB)MHz	28 dB

SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
303	FSF-3512-70M000-6M32	35.0 x 12.8	70.000 MHz	6.32 (3dB) MHz	25 dB
304	FSF-3512-70M000-19M28		70.000 MHz	19.28(3dB) MHz	34.5 dB
305	FSF-3512-70M000-5M24		70.000 MHz	5.24 (3dB) MHz	20 dB
306	FSF-3512-140M000-10M		140.000 MHz	10 MHz	29 (max) dB
307	FSF-3512-140M000-10M2		140.000 MHz	10.2 (3dB) MHz	26 (max) dB
308	FSF-3512-140M000-15M2		140.000 MHz	15.2 (3dB) MHz	28 dB
309	FSF-3512-140M000-20M05		140.000 MHz	20.05(1.5dB)MHz	27 dB
310	FSF-3512-140M000-19M3		140.000 MHz	19.3(1.5dB)MHz	28 dB
311	FSF-3512-140M000-25M04		140.000 MHz	25.04(1.5dB)MHz	28.8 dB
312	FSF-3513-90M000-14M2	35.0 x 13.0	90.000 MHz	14.2 (1dB) MHz	25.5 dB
313	FSF-3616-21M400-0.25M	36.0 x 16.0	21.400 MHz	0.25 (1dB) MHz	10 dB

SAW Resonator

No.	Series	Package	Frequency - Center	Insertion Loss
314	FSR-3030-315M000	3.0 x 3.0 mm 	315.000 MHz	1.0 dB
315	FSR-3030-433M920		433.920 MHz	1.2 dB
316	FSR-3225-315M000	3.2 x 2.5 mm 	315.000 MHz	1.0 dB
317	FSR-3225-433M920		433.920 MHz	1.3 dB
318	FSR-3838-315M000	3.8 x 3.8 mm 	315.000 MHz	1.7 dB
319	FSR-3838-315M500		315.500 MHz	1.9 dB
320	FSR-3838-433M920		433.920 MHz	1.7 dB
321	FSR-5050-311M063	5.0 x 5.0 mm 	311.063 MHz	1.3 dB
322	FSR-5050-315M000		315.000 MHz	0.8 dB
323	FSR-5050-433M000		433.000 MHz	1.5 dB
324	FSR-5050-433M920		433.920 MHz	1.6 dB
325	FSR-5050-433M920		433.920 MHz	1.1 dB
326	FSR-5035-163M735	5.0 x 3.5 mm 	163.735 MHz	2.2 dB
327	FSR-5035-168M760		168.760 MHz	2.5 dB
328	FSR-5035-172M635		172.635 MHz	2.5 dB
329	FSR-5035-172M690		172.690 MHz	2.6 dB
330	FSR-5035-172M785		172.785 MHz	2.5 dB
331	FSR-5035-315M000		315.000	0.8 dB
332	FSR-5035-318M000		318.000 MHz	1.3 dB
333	FSR-5035-340M000		340.000 MHz	1.5 dB
334	FSR-5035-423M220		423.220 MHz	1.1 dB
335	FSR-5035-433M920		433.920 MHz	1.5 dB
336	FSR-8334-315M000	8.36 x 3.45	315.000 MHz	1.1 dB
337	FSR-8334-346M500		346.500 MHz	2 dB
338	FSR-1146-433M920	11.9 x 4.6	433.920 MHz	2.5 dB

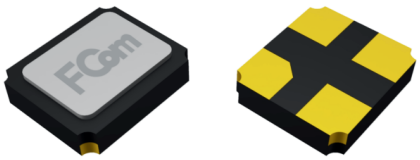
SAW Resonator

No.	Series	Package	Frequency - Center	Insertion Loss
339	FSR-1145-315M500	11.0*4.5	315.500 MHz	1.5 dB
340	FSR-1145-300M000		300.000 MHz	1.2 dB
341	FSR-1145-303M000		303.000 MHz	1.3 dB
342	FSR-1145-303M825		303.825 MHz	1.3 dB
343	FSR-1145-303M875		303.875 MHz	1.2 dB
344	FSR-1145-310M000		310.000 MHz	1.7 dB
345	FSR-1145-315M500		315.500 MHz	1.5 dB
346	FSR-1145-315M000		315.000 MHz	1.3 dB
347	FSR-1145-318M000		318.000 MHz	1.6 dB
348	FSR-1145-345M000		345.000 MHz	1.5 dB
349	FSR-1145-360M000		360.000 MHz	1.6 dB
350	FSR-1145-370M000		370.000 MHz	1.6 dB
351	FSR-1145-380M000		380.000 MHz	1.1 dB
352	FSR-1145-390M000		390.000 MHz	1.1 dB
353	FSR-1145-433M920		433.920 MHz	1.7 dB
354	FSR-1145-433M920		433.920 MHz	2 dB
355	FSR-1145-433M920		433.920 MHz	1 dB

FCom Quartz Crystal

Series FCX-1S

SMD Seam Sealed Crystals 1.2x1.0 mm



Feature

- Industry Standard Package: 1.2*1.0*0.33mm
- Seam with vacuum Sealed for Ultra-small size
- High precision and high reliability
- RoHS and REACH Compliant , Pb-free

Application

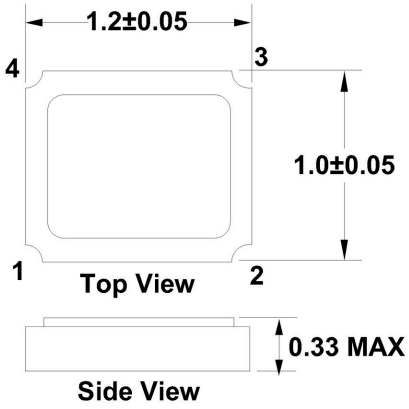
- Wearable devices
- Wi-Fi and BT or other wireless module
- IoT devices
- Smart phone
- Space limited application

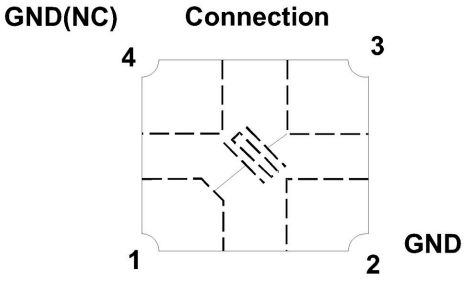
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	24 ~ 76.8			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 15			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	100	Ohm	24~32MHz	
		-	-	80		37.4~48MHz	
		-	-	60		>48MHz	
Aging	-	± 3			ppm	1st Year	

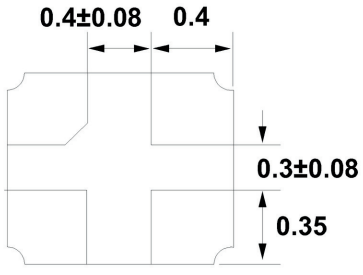
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

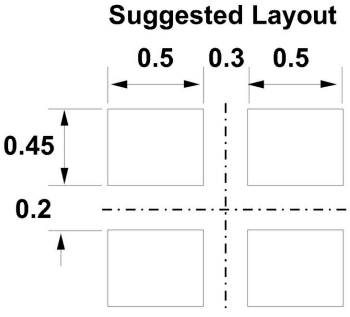
DIMENSION(mm)





4pin connect to GND.NC is Open



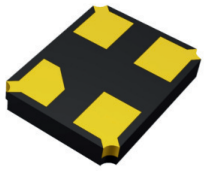


FCom Quartz Crystal

Series FCX-1M

SMD Seam Sealed Crystals 1.6x1.2 mm





Feature

- Industry Standard Package: 1.6*1.2*0.33mm
- High reliable environmental performance
- High precision and high reliability
- RoHS and REACH Compliant , Pb-free

Application

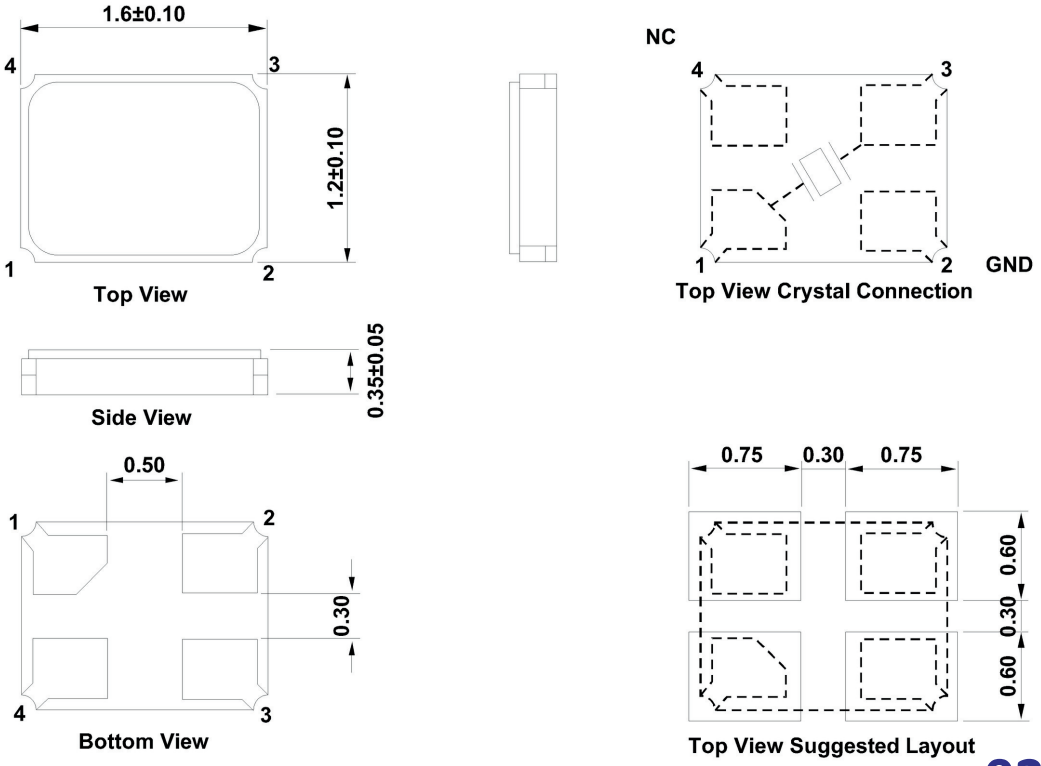
- Wearable devices
- Wi-Fi and BT or other wireless module
- IoT devices
- Smart phone
- Space limited application

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	24 ~ 60			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 15			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	200	uW		
Equivalent Series Resistance	ESR	-	-	60	Ohm	24~38.4MHz	
		-	-	40		38.4~48MHz	
		-	-	30		>48MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

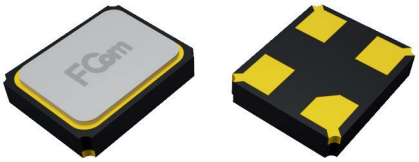
DIMENSION(mm)



FCom Quartz Crystal

Series FCX-2S

SMD Seam Sealed Crystals 2.0x1.6 mm



Feature

- Size 2.0×1.6, Ultra thin, thickness 0.5mm
- High precision and high frequency stability
- Extremely good for reducing EMI effect
- RoHS and REACH Compliant , Pb-free

Application

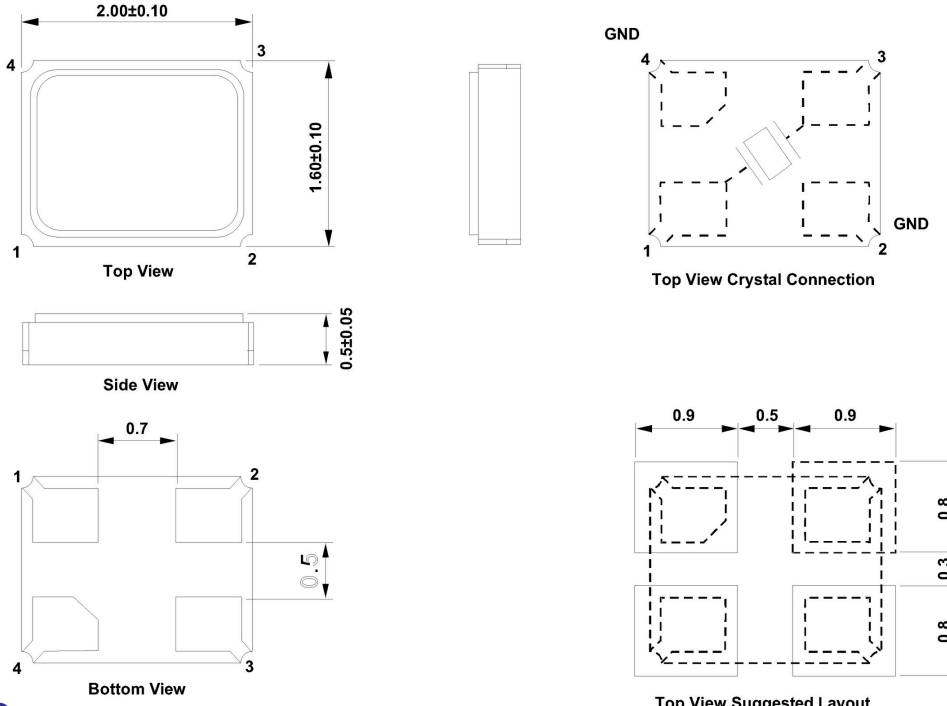
- Wireless Communication
- CPE, Router, Ethernet Switch
- Gateway, Set-Top Box
- Notebook, Tablet, Server, Cloud
- Industry

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	16 ~ 96			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	16~60MHz	
		± 15				>60MHz	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 20			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	200	uW		
Equivalent Series Resistance	ESR	-	-	100	Ohm	16~20MHz	
		-	-	80		20~60MHz	
		-	-	30		60~96MHz	
Aging	-	± 3, ± 5			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

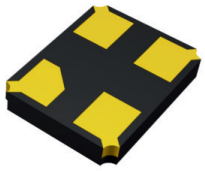


FCom Quartz Crystal

Series FCX-2M

SMD Seam Sealed Crystals 2.5x2.0 mm





Feature

- Industry Standard Package: 2.5*2.0*0.55mm
- Extremely good for reducing EMI effect
- High precision and high reliability
- RoHS and REACH Compliant , Pb-free

Application

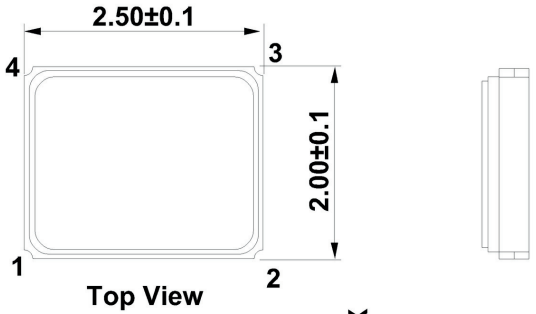
- Wireless Communication
- CPE , Router , Ethernet Switch , Gateway , Set-Top Box
- Notebook , Tablet , Server , Cloud
- Industry

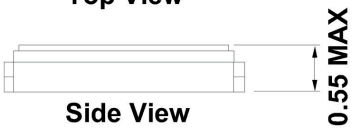
ELECTRICAL SPECIFICATIONS

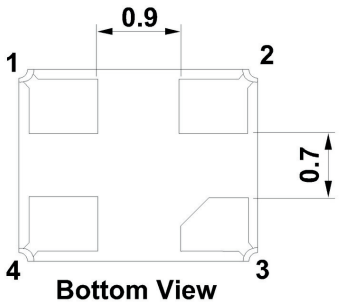
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	12 ~ 66			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 20			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	300	uW		
Equivalent Series Resistance	ESR	-	-	180	Ohm	12~16MHz	
		-	-	100		16~20MHz	
		-	-	60		20~66MHz	
Aging	-	± 3			ppm	1st Year	

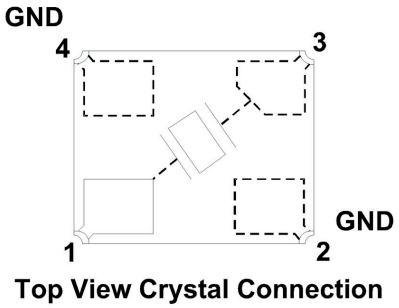
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

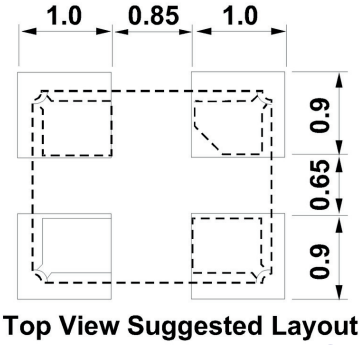
DIMENSION(mm)







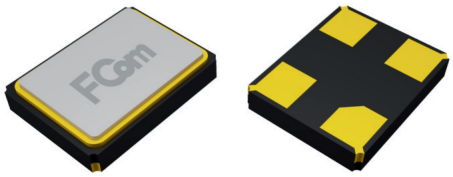




FCom Quartz Crystal

Series FCX-3M

SMD Seam Sealed Crystals 3.2x2.5 mm



Feature

- Size 3.2×2.5, Ultra thin, thickness 0.70mm
- Excellent heat resistance and environmental characteristics
- High precision and high frequency stability
- RoHS and REACH Compliant , Pb-free

Application

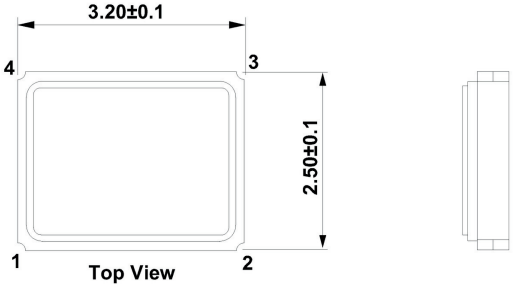
- Wireless Communication
- CPE , Router , Ethernet Switch
- Gateway , Set-Top Box
- Notebook , Tablet , Server , Cloud
- Industry

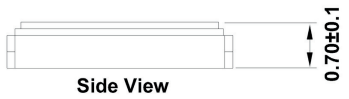
ELECTRICAL SPECIFICATIONS

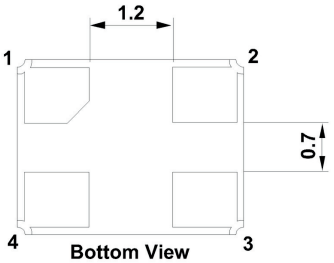
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~80			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 20			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	200	uW		
Equivalent Series Resistance	ESR	-	-	300	Ohm	8~12MHz	
		-	-	80		12~16MHz	
		-	-	50		16~40MHz	
		-	-	30		>40MHz	
Aging	-	± 3			ppm	1st Year	

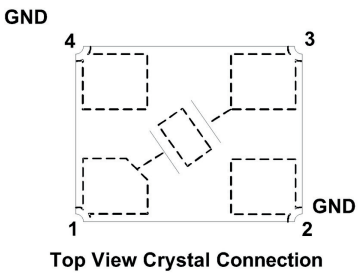
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

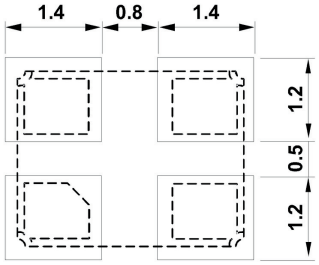
DIMENSION(mm)









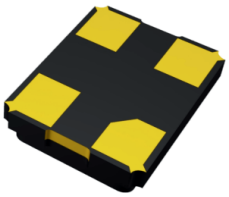


FCom Quartz Crystal

Series FCX-3G

SMD Glass Sealed Ceramic 3.2x2.5 mm





Feature

- Industry Standard Package: 3.2*2.5*0.8mm
- Excellent heat resistance and environmental characteristic
- High precision and high reliability
- Contain Pb exempted by RoHS directive

Application

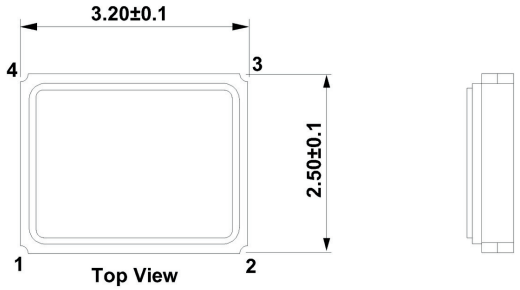
- Desktop computer , Notebook , Printer
- Set-Top Box , Server
- Monitor , TV
- USB-Hub
- Game Console

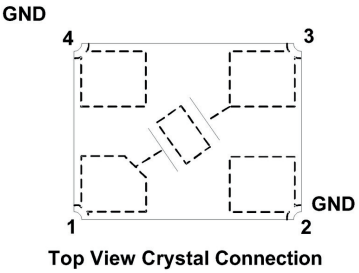
ELECTRICAL SPECIFICATIONS

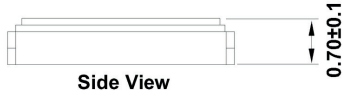
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~ 55.4			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 20 , ± 30			ppm	@-40~85°C	
		± 30 , ± 50			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	300	uW		
Equivalent Series Resistance	ESR	-	-	300	Ohm	8~10MHz	
		-	-	150		10~16MHz	
				50		16~40MHz	
		-	-	40		>40MHz	
Aging	-	± 3			ppm	1st Year	

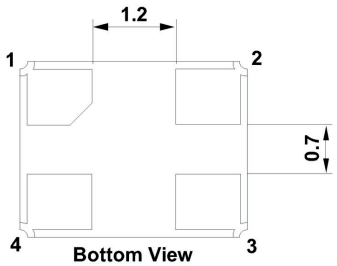
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

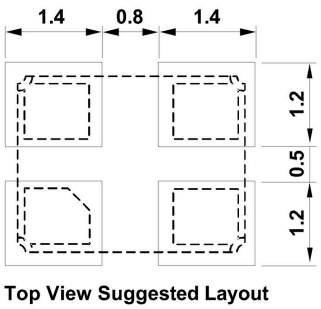
DIMENSION(mm)







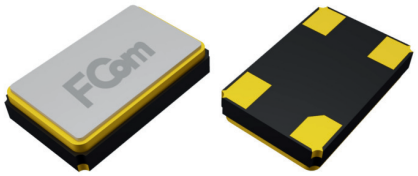




FCom Quartz Crystal

Series FCX-5M

SMD Seam Sealed Crystals 5.0x3.2 mm



Feature

- Size 5.0×3.2, thickness 0.90mm
- High precision and high frequency stability
- Excellent heat resistance and environmental characteristics
- RoHS and REACH Compliant , Pb-free

Application

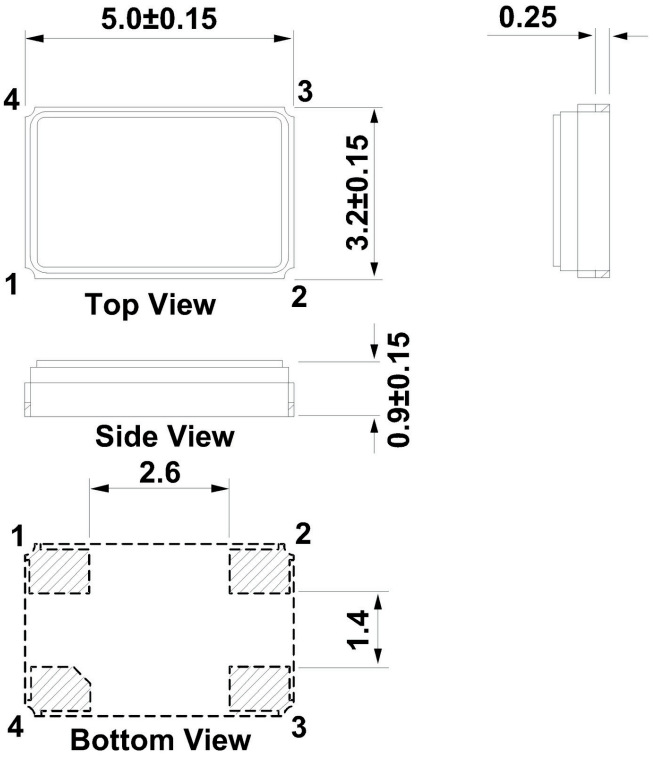
- Communication
- Test equipmentIoT devices
- PCMCIA
- Wireless applications

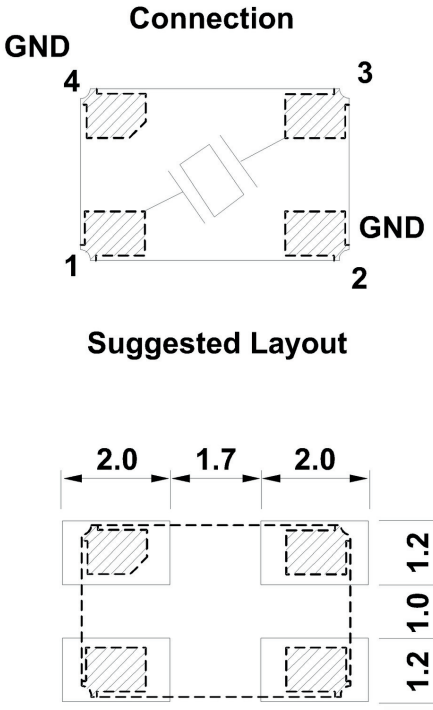
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~ 54			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 15			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	200	uW		
Equivalent Series Resistance	ESR	-	-	80	Ohm	8~19.999MHz	
		-	-	60		20~25.999MHz	
		-	-	40		>26MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

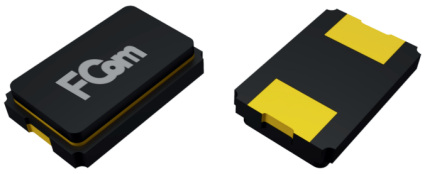




FCom Quartz Crystal

Series FCX-5G

SMD Glass Sealed Ceramic 5.0×3.2 mm



Feature

- Industry Standard Package: 5.0*3.2*1.3mm
- Excellent heat resistance and environmental characteristic
- High precision and high reliability
- Contain Pb exempted by RoHS directive

Application

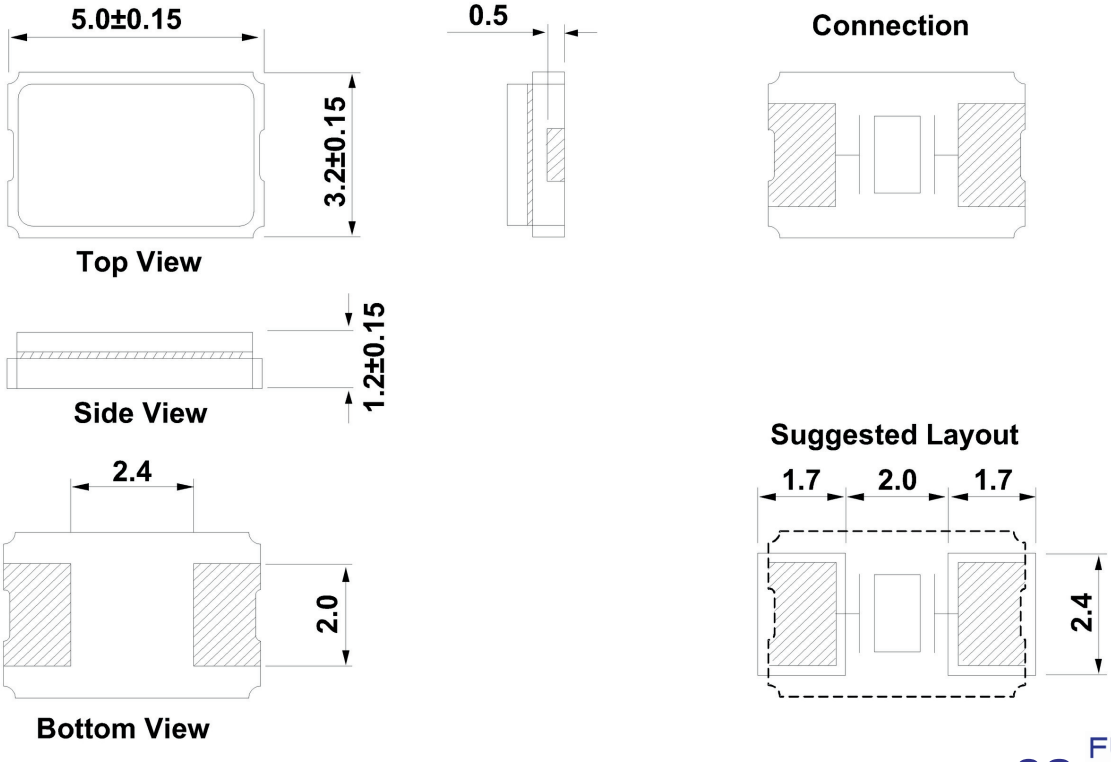
- Desktop computer , Notebook , Printer
- Set-Top Box , Server
- Monitor , TV
- USB-Hub
- Game Console

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~ 54			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 15			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	50	200	uW		
Equivalent Series Resistance	ESR	-	-	120	Ohm	8~20MHz	
		-	-	60		20~26MHz	
		-	-	40		26~54MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

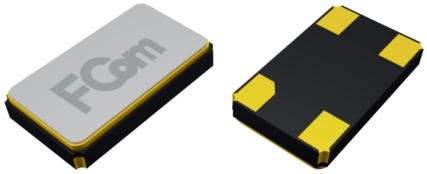
DIMENSION(mm)



FCom Quartz Crystal

Series FCX-6M

SMD Seam Sealed Crystals 6.0×3.5 mm



Feature

- Industry Standard Package: 6.0*3.5*1.0mm
- Excellent heat resistance and environmental characteristic
- High precision and high reliability
- RoHS Compliant / Pb Free

Application

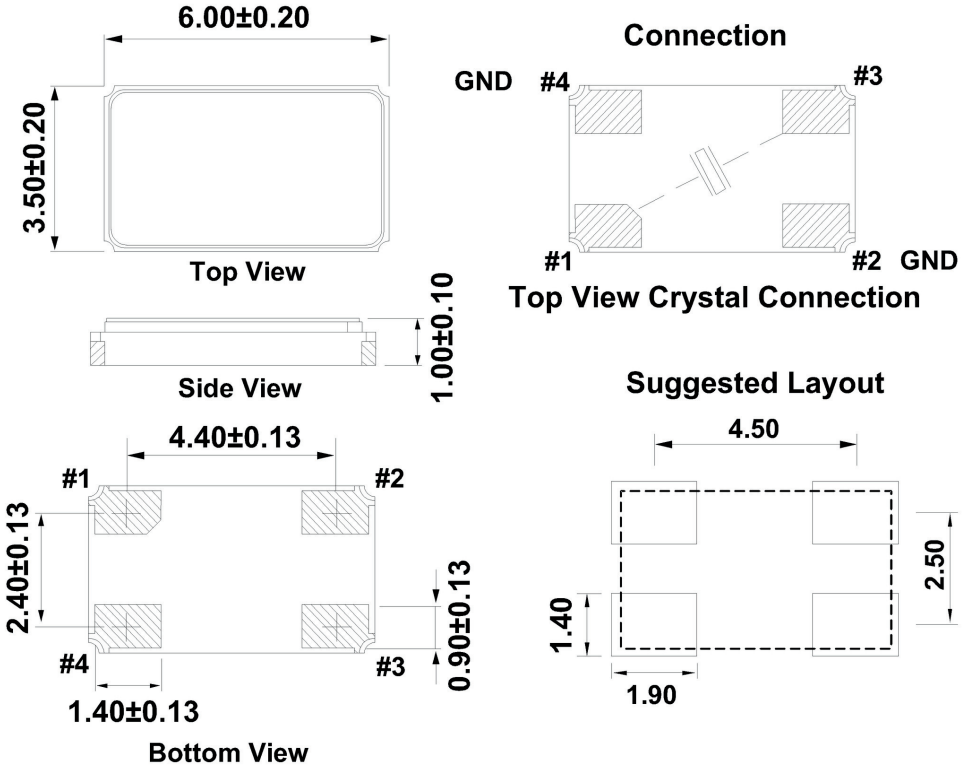
- Communication
- Test equipmentIoT devices
- PCMCIA
- Wireless applications

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	6 ~ 48			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 15			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	70	Ohm	6~10MHz	
		-	-	40		10~48MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

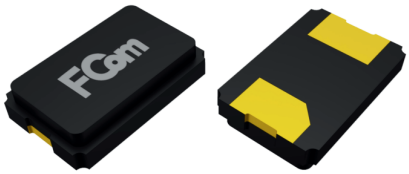
DIMENSION(mm)



FCom Quartz Crystal

Series FCX-6G

SMD Glass Sealed Ceramic 6.0×3.5 mm



Feature

- 2 pads SMD glass sealed pads led crystal units
- Tight tolerance and stability parts are available
- Designed for automatic mounting and reflow soldering
- Contain Pb exempted by RoHS directive

Application

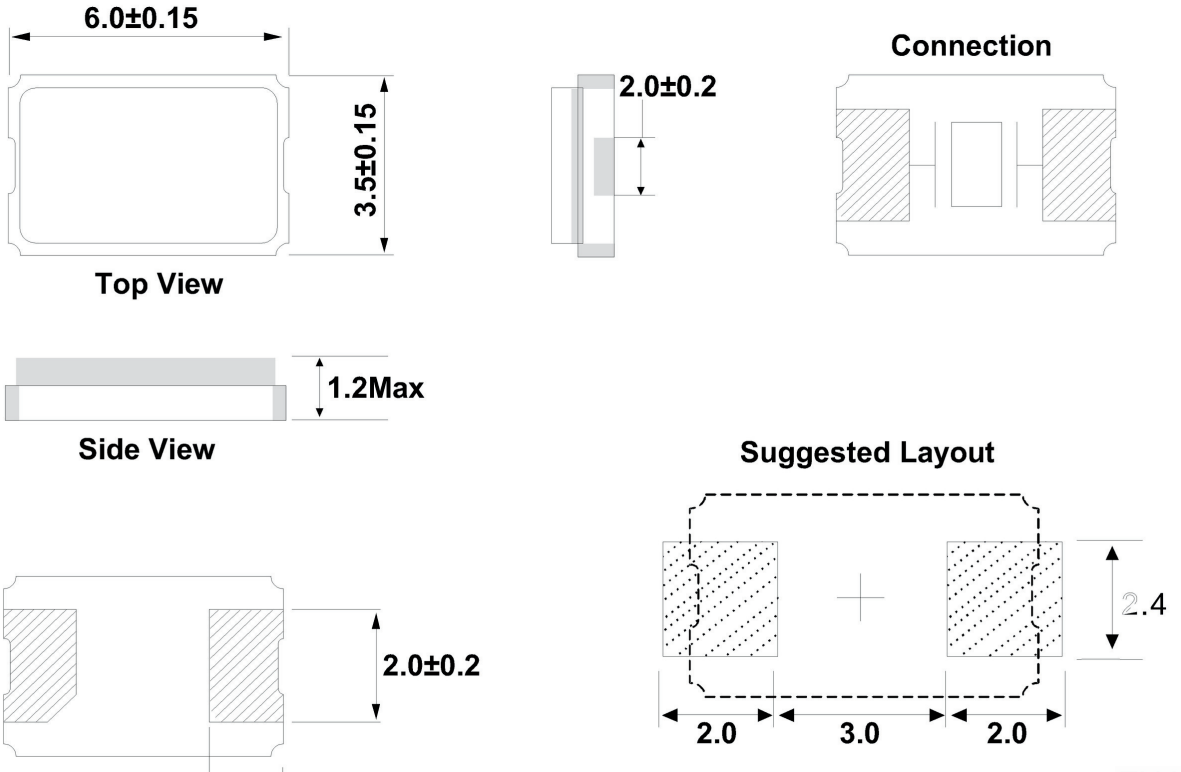
- Desktop computer , Notebook , Printer
- Set-Top Box , Server
- Monitor , TV
- USB-Hub
- Game Console

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~ 30			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 15			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10 , 18 or specify			pF		
Drive Level	DL	-	100	200	uW		
Equivalent Series Resistance	ESR	-	-	60	Ohm	8~10MHz	
		-	-	40		10~30MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

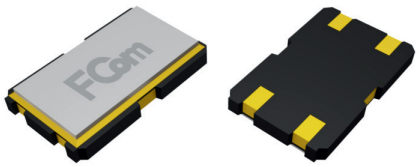
DIMENSION(mm)



FCom Quartz Crystal

Series FCX-7M

SMD Seam Sealed Crystals 7.0x5.0 mm



Feature

- Extremely small SMD type crystal units
- High precision and high frequency stability
- Excellent heat resistance and environmental characteristics
- RoHS and REACH Compliant , Pb-free

Application

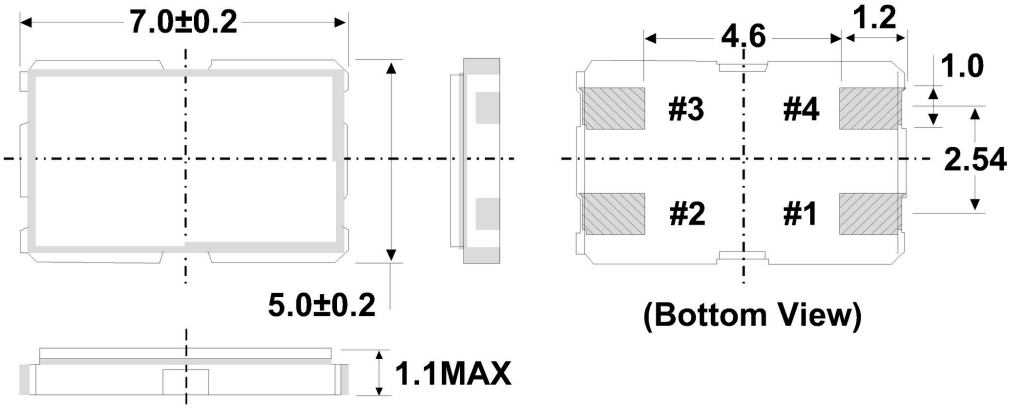
- Designed for automatic mounting and reflow soldering
- Communication
- Test equipmentIoT devices
- Wireless applications

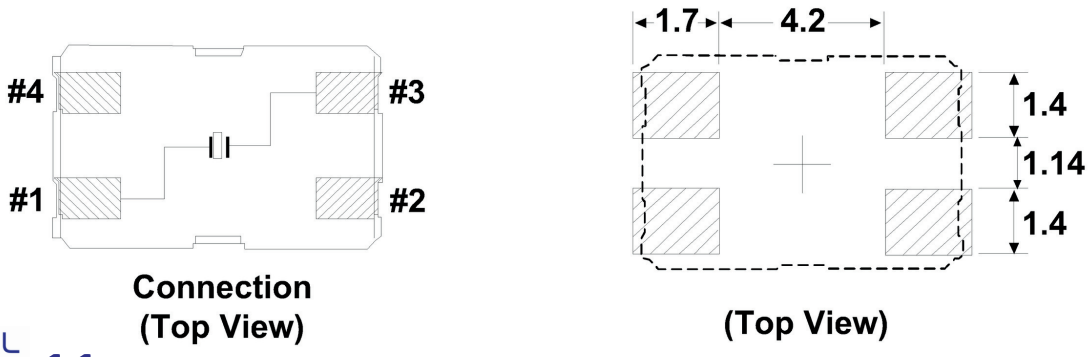
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	6 ~ 48			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 15			ppm	@-40~85°C	
		± 30			ppm	@-40~105°C	
		± 80			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	8 , 12 , 18 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	100	Ohm	6~8MHz	
		-	-	80		8~48MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

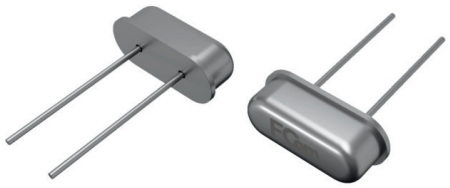




FCom Quartz Crystal

Series FCX-9S

Resistance Welded HC-49S



Feature

- Resistance welded type crystal units
- A great number of standard frequencies
- Lower cost and highly mass production capability
- RoHS and REACH Compliant , Pb-free

Application

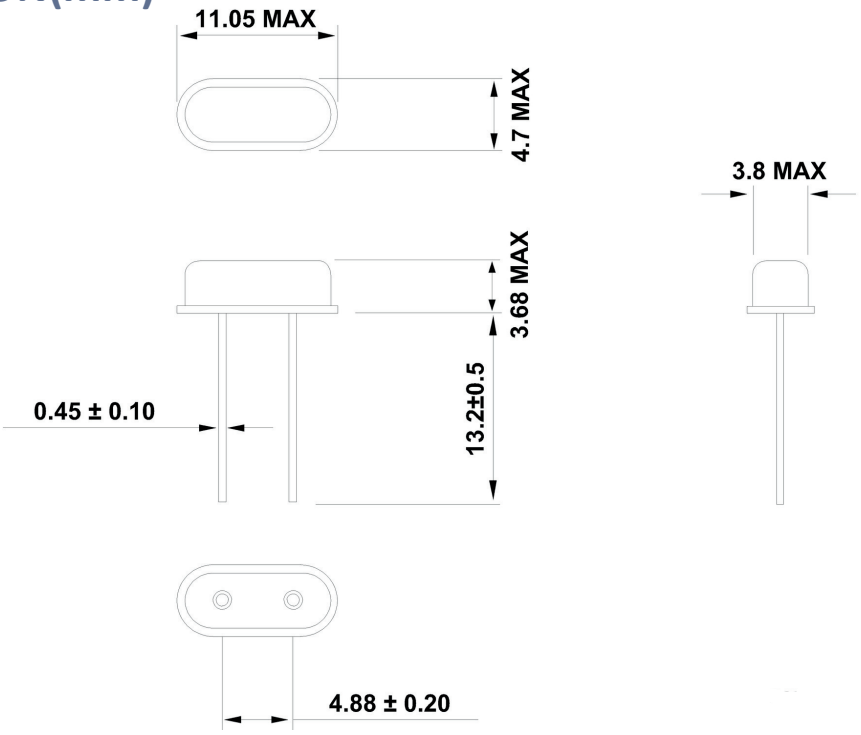
- TV, STB, LCDM
- Cable Modem

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	3.2 ~ 64			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 50			ppm	@-40~85°C	
		± 80			ppm	@-40~105°C	
Operating Temperature	Topr	-40	25	105	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	100	500	uW		
Equivalent Series Resistance	ESR	-	-	120	Ohm	3.2~5.999MHz	
		-	-	90		6~7.999MHz	
				40		8~15.999MHz	
				30		16~40MHz	
		-	-	100		>40MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

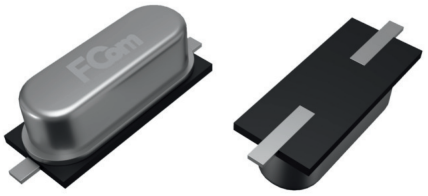
DIMENSION(mm)



FCom Quartz Crystal

Series FCX-9M

Resistance Welded HC-49 SMD



Feature

- Surface mount type crystal units
- A great number of standard frequencies
- Lower cost and highly mass production capability
- RoHS and REACH Compliant , Pb-free

Application

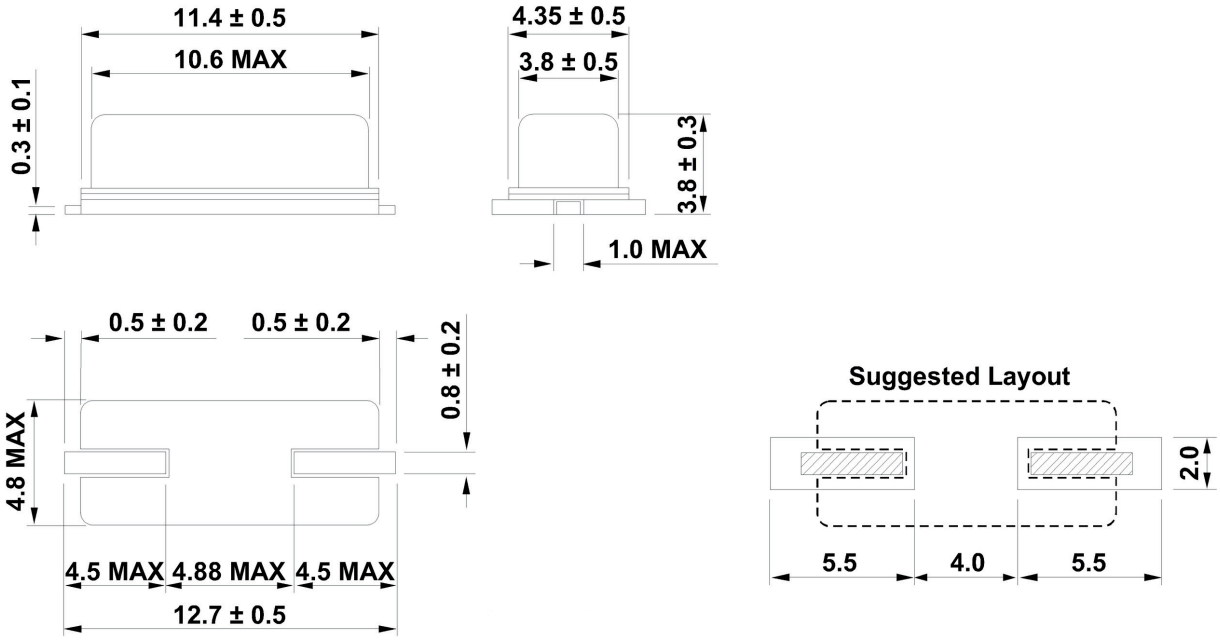
- Bluetooth
- WLAN
- IoT, MPU

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	3.2 ~ 64			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 50			ppm	@-40~85°C	
		± 80			ppm	@-40~105°C	
Operating Temperature	Topr	-40	25	105	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	100	500	uW		
Equivalent Series Resistance	ESR	-	-	120	Ohm	3.2~5.999MHz	
		-	-	90		6~7.999MHz	
		-	-	40		8~15.999MHz	
		-	-	30		16~40MHz	
		-	-	100		>40MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



FCom Quartz Crystal

Series FCX-4U

Resistance Welded HC-49U



Feature

- Resistance welded type crystal units
- Higher frequency pullibility and lower equivalent series resistance
- RoHS and REACH Compliant , Pb-free

Application

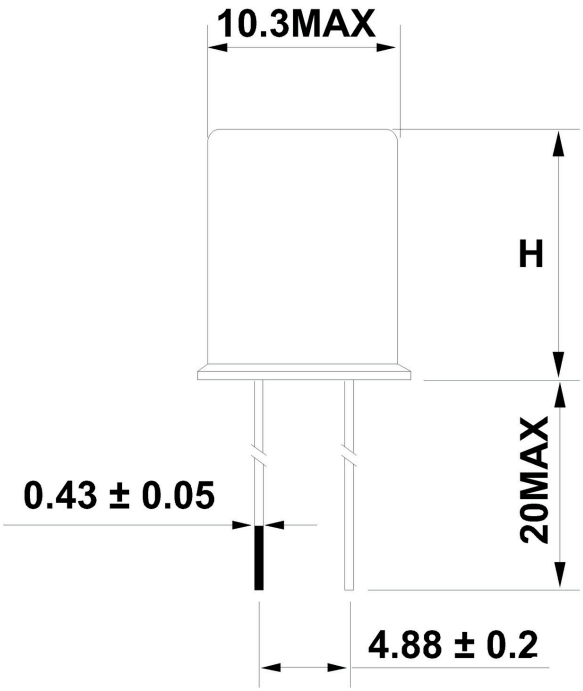
- Consumer Electronics
- Test and Measurement
- Computer Peripherals
- FPGA/Microcontrollers

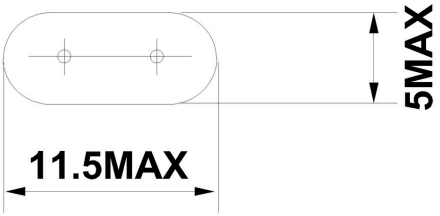
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	1.8 ~ 64			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 30			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 50			ppm	@-20~70°C	
		± 50			ppm	@-40~85°C	
Operating Temperature	Topr	-40	25	85	°C		
Load Capacitance	CL	10, 18, 20 or specify			pF		
Drive Level	DL	-	100	500	uW		
Equivalent Series Resistance	ESR	-	-	300	Ohm	1.8~2.4MHz	
		-	-	200		2.4~3.5MHz	
		-	-	80		3.5~7MHz	
		-	-	40		7~54MHz	
		-	-	80		>54MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)





Type	H(mm)
HC-49U	13.50 Max
HC-49T	11.05 Max

FCom Quartz Crystal

Series FCX-5U

Resistance Welded 50U



Feature

- Resistance welded type crystal units
- Low frequency as 850kHz is available
- AT-Cut
- RoHS and REACH Compliant , Pb-free

Application

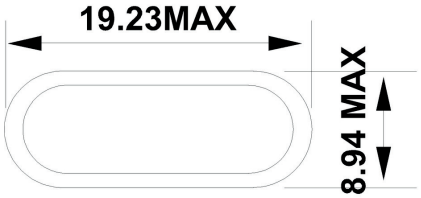
- Consumer Electronics
- Test and Measurement
- Computer Peripherals
- FPGA/Microcontrollers

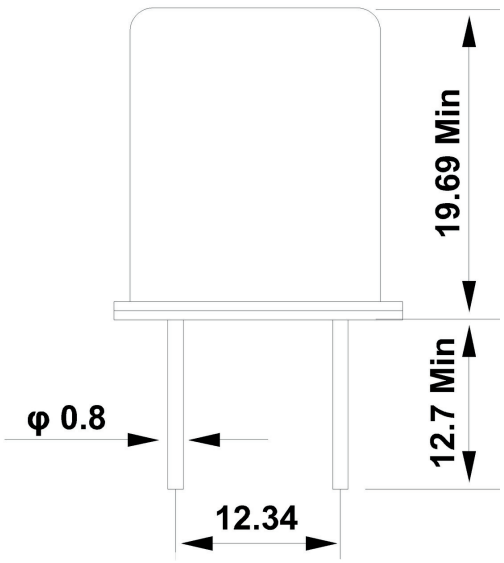
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	0.85 ~ 4			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 30			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 50			ppm	@-20~70°C	
		± 50			ppm	@-40~85°C	
Operating Temperature	Topr	-40	25	85	°C		
Load Capacitance	CL	10, 18, 20 or specify			pF		
Drive Level	DL	-	-	2	mW		
Equivalent Series Resistance	ESR	-	-	1000	Ohm	0.85~1MHz	
		-	-	600		1~1.5MHz	
		-	-	300		1.5~2.5MHz	
		-	-	150		2.5~3MHz	
		-	-	100		>3MHz	
Aging	-	± 5			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)





FCom Quartz Crystal

Series FCX-M1

Resistance Welded UM-1



Feature

- MHz DIP Crystal, UM-1 Type
- Low Cost, High precision, High frequency stability
- Excellent aging characteristics
- RoHS and REACH Compliant , Pb-free

Application

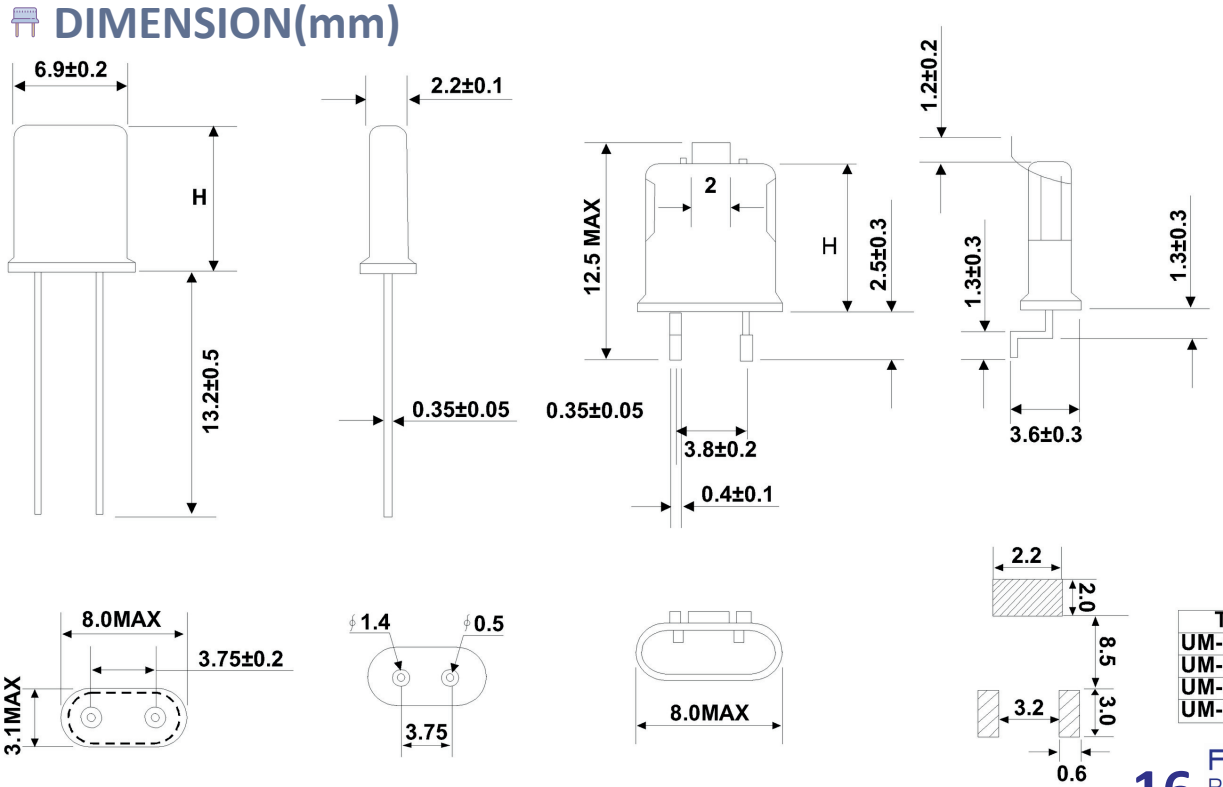
- Communication Electronics
- Measurement Instrument

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	7 ~ 200			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 10			ppm	@-20~70°C	
		± 30			ppm	@-40~85°C	
Operating Temperature	Topr	-40	25	85	°C		
Load Capacitance	CL	10, 18, 20 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	30	Ohm	7~20MHz	
		-	-	25		20~50MHz	
		-	-	40		40~120MHz, 3rd	
		-	-	100		80~200MHz, 5th	
Aging	-	± 5			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



Type	H(mm)
UM-1	7.8±0.2
UM-1/SMD	7.8±0.2
UM-5	6.0±0.2
UM-5/SMD	6.0±0.2

FCom Quartz Crystal

Series FCX-M5

Resistance Welded C



Feature

- MHz DIP Crystal, UM-5 Type
- Excellent shock resistance
- Excellent aging characteristics
- RoHS and REACH Compliant , Pb-free

Application

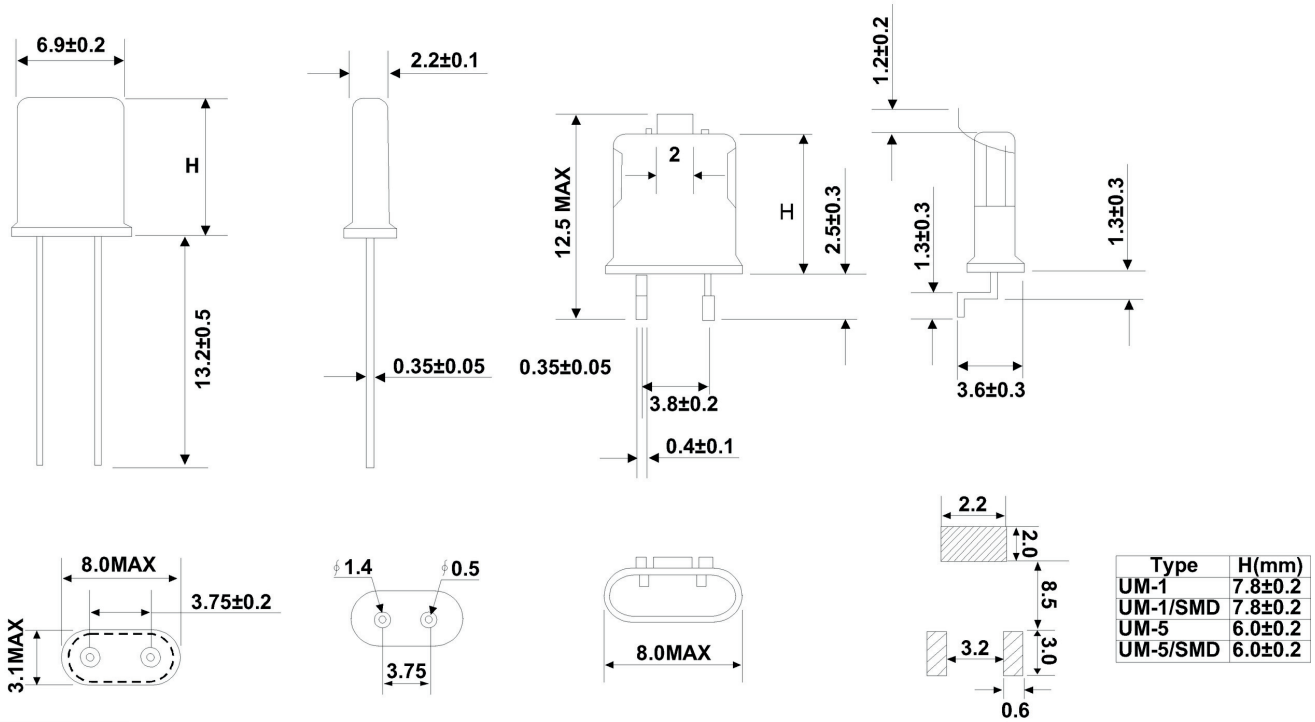
- Communication Electronics
- Measurement Instrument

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	4 ~ 200			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 10			ppm	@-20~70°C	
		± 30			ppm	@-40~85°C	
Operating Temperature	Topr	-40	25	85	°C		
Load Capacitance	CL	10, 18, 20 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	80	Ohm	4~20MHz	
		-	-	30		20~48MHz	
		-	-	80		24~100MHz, 3rd	
		-	-	100		100~200MHz, 5th	
Aging	-	± 5			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



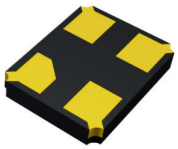
Type	H(mm)
UM-1	7.8±0.2
UM-1/SMD	7.8±0.2
UM-5	6.0±0.2
UM-5/SMD	6.0±0.2

FCom Thermal Quartz Crystal

Series FCX-1R

SMD Crystals with built-in temp. sensor 1.6x1.2 mm





Feature

- **Ultra small package: 1.6*1.2*0.65mm**
- **Built-in thermistor, support 26~54MHz**
- **High precision and high reliability**
- **RoHS and REACH Compliant , Pb-free**

Application

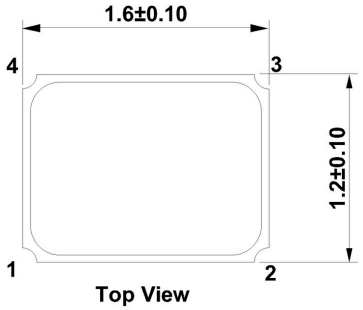
- **Mobile phones**
- **GPS/GNSS**
- **Wearable devices**

ELECTRICAL SPECIFICATIONS

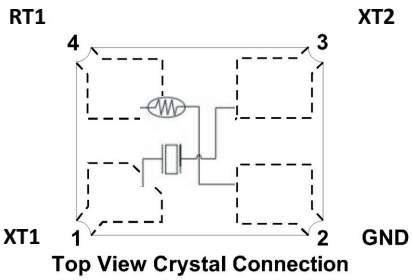
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		26 ~ 54		MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT		± 10		ppm	@25°C±3°C	
Frequency Stability	ST		± 12		ppm	@-30~85°C	
Operating Temperature	Topr	-30	25	85	°C		
Load Capacitance	CL		6, 7, 8 or specify		pF		
Drive Level	DL	10	100		uW		
Equivalent Series Resistance	ESR	-	-	100	Ohm		
Thermistor Resistance	/		22 / 100 (@ 25℃)		kΩ		
Thermistor B-constant	/		3380 / 4250 (@ 25℃ ~ 50℃)		K		
Storage Temp. Range	Tstr		−40 ~ 125 ℃		℃		
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



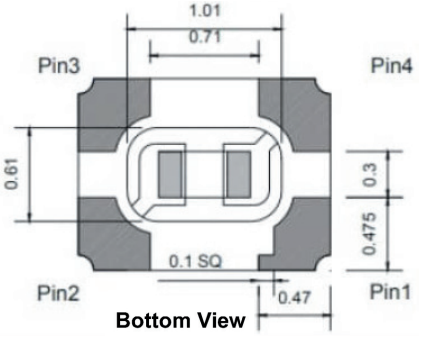
Top View



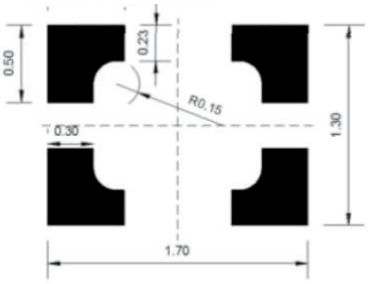
Top View Crystal Connection



Side View



Bottom View

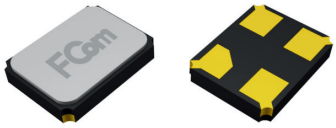


Top View Suggested Layout

FCom Thermal Quartz Crystal

Series FCX-6R

SMD Crystals with built-in temp. sensor 2.0x1.6 mm



Feature

- Ultra small package: 2.0*1.6*0.65mm
- Built-in thermistor, support 19.2~54MHz
- High precision and high reliability
- RoHS and REACH Compliant , Pb-free

Application

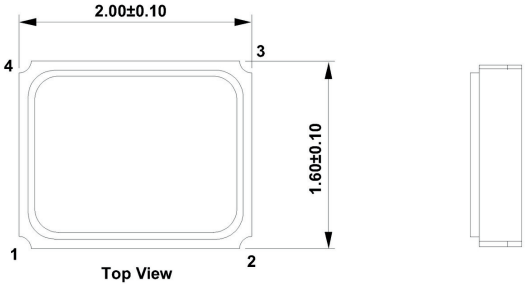
- Mobile phones
- GPS/GNSS
- Wearable devices

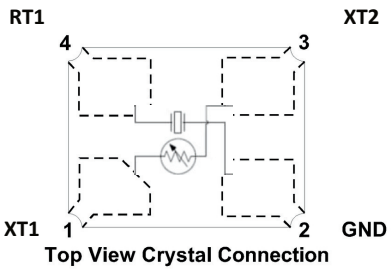
ELECTRICAL SPECIFICATIONS

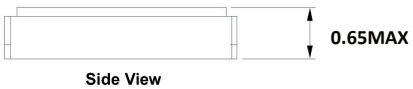
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		19.2 ~ 54		MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT		± 10		ppm	@25°C±3°C	
Frequency Stability	ST		± 12		ppm	@-30~85°C	
Operating Temperature	Topr	-30	25	85	°C		
Load Capacitance	CL		6, 7, 8 or specify		pF		
Drive Level	DL	10	100		uW		
Equivalent Series Resistance	ESR	-	-	100	Ohm	19.2~30MHz	
	ESR	-	-	80	Ohm	30~54MHz	
Thermistor Resistance	/		22 / 100 (@ 25℃)		kΩ		
Thermistor B-constant	/		3380 / 4250 (@ 25℃ ~ 50℃)		K		
Storage Temp. Range	Tstr		–40 ~ 125 ℃		°C		
Aging	-		± 3		ppm	1st Year	

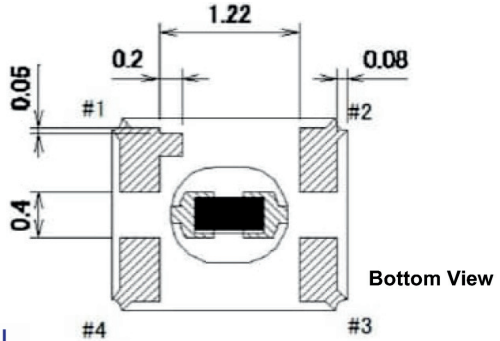
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

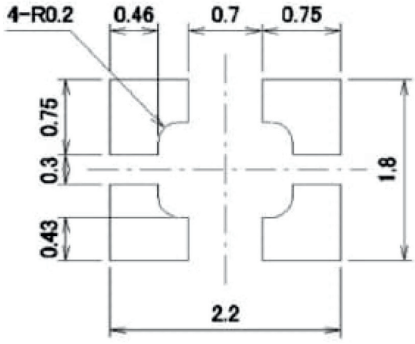
DIMENSION(mm)







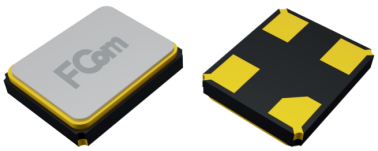




FCom Thermal Quartz Crystal

Series FCX-2R

SMD Crystals with built-in temp. sensor 2.5x2.0 mm



Feature

- Ultra small package: 2.5*2.0*1.0mm
- Built-in thermistor, support 19.2~54MHz
- High precision and high reliability
- RoHS and REACH Compliant , Pb-free

Application

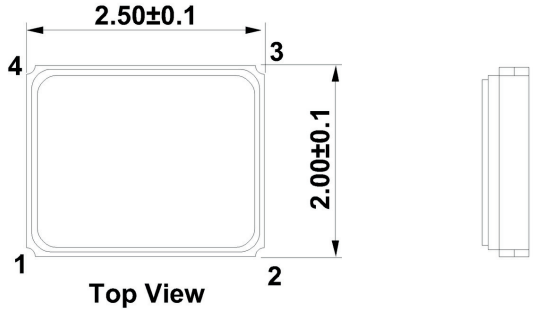
- Mobile phones
- GPS/GNSS
- Wearable devices

ELECTRICAL SPECIFICATIONS

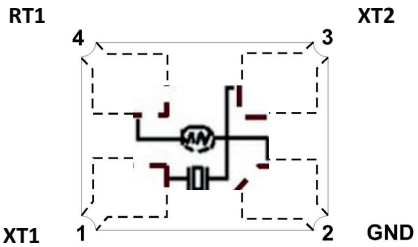
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		12 ~ 54		MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT		± 10		ppm	@25°C±3°C	
Frequency Stability	ST		± 10		ppm	@-30~85°C	
Operating Temperature	Topr	-25	25	85	°C		
Load Capacitance	CL		6, 7, 8 or specify		pF		
Drive Level	DL	-	30	100	uW		
Equivalent Series Resistance	ESR	-	-	50	Ohm		
Thermistor Resistance	/		22 / 100 (@ 25℃)		kΩ		
Thermistor B-constant	/		3380 / 4250 (@ 25℃ ~ 50℃)		K		
Storage Temp. Range	Tstr		−40 ~ 125 ℃		°C		
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



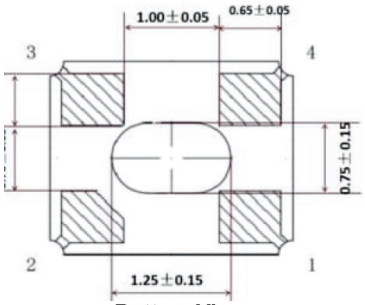
Top View



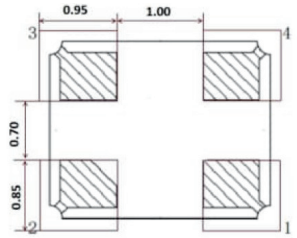
Top View Crystal Connection



Side View



Bottom View

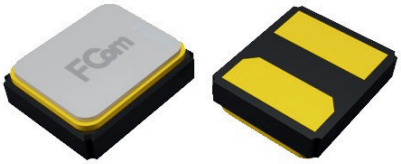


Top View Suggested Layout

FCom Tuning Fork Crystal

Series FCT-1S

SMD Package 1.2×1.0 mm 32.768kHz



Feature

- Ultra small size 1.2×1.0×0.5mm
- High reliability environmental performance
- High frequency stability and high precision
- RoHS and REACH Compliant , Pb-free

Application

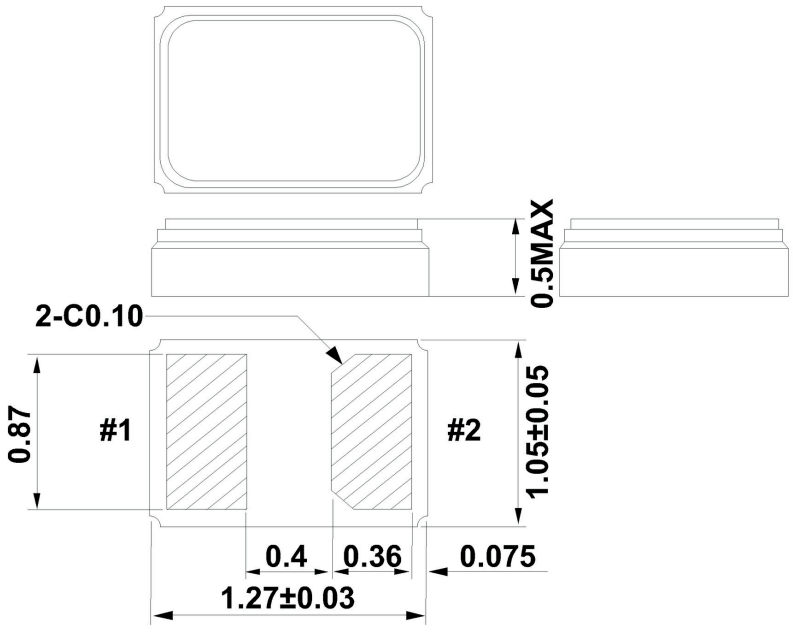
- Consumer products
- Real Time Clock

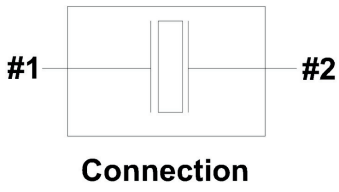
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-40~85°C	
			± 10, ± 20, ± 30		ppm	@-40~105°C	
			± 10, ± 20, ± 30		ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	0.1	0.5	uW		
Equivalent Series Resistance	ESR	-	-	90	Kohm		
Shunt Capacitance	C0		1.5		pF		
Temperature Coefficient	-		-0.034	-0.039	ppm/T²		
Insulation Resistance	-	500	-	-	Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

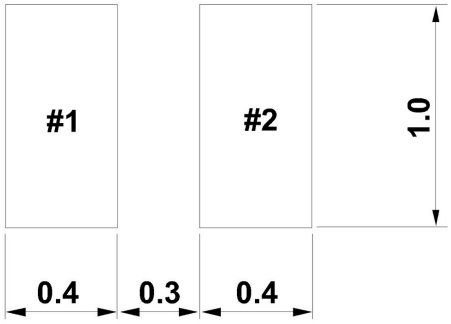
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)





Connection



Suggested Layout

FCom Tuning Fork Crystal

Series FCT-1M

SMD Package 1.6×1.0 mm 32.768kHz





Feature

- Industry Standard Package 1.6×1.0×0.5mm
- High reliability environmental performance
- High frequency stability and high precision
- RoHS and REACH Compliant , Pb-free

Application

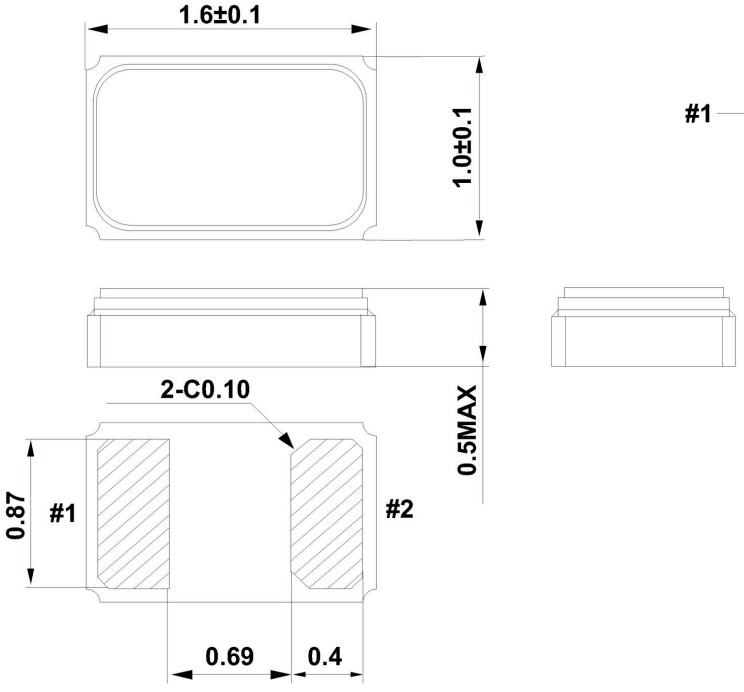
- Real Time Clock
- System in sleep mode or low energy mode Timekeeping

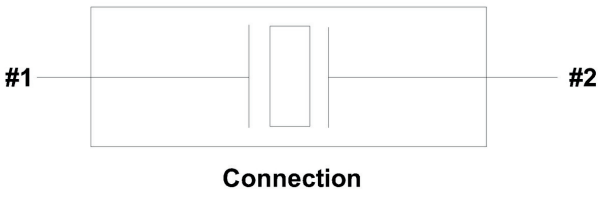
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-40~85°C	
			± 10, ± 20, ± 30		ppm	@-40~105°C	
			± 10, ± 20, ± 30		ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	0.5	0.5	uW		
Equivalent Series Resistance	ESR	-	-	90	Kohm		
Shunt Capacitance	C0		1.3		pF		
Temperature Coefficient	-			-0.04	ppm/T²		
Insulation Resistance	-	500	-	-	Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

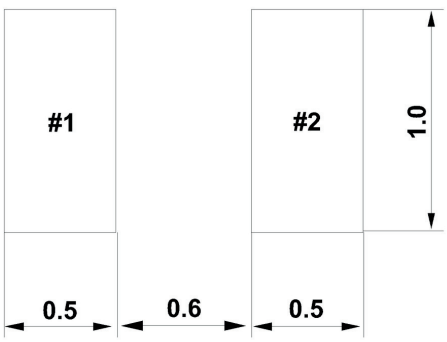
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)





Connection



Suggested Layout

FCom Tuning Fork Crystal

Series FCT-2M

SMD Package 2.0×1.2 mm 32.768kHz





Feature

- Ultra small size 2.0×1.2×0.6 mm
- High reliability environmental performance
- High frequency stability and high precision
- RoHS and REACH Compliant , Pb-free

Application

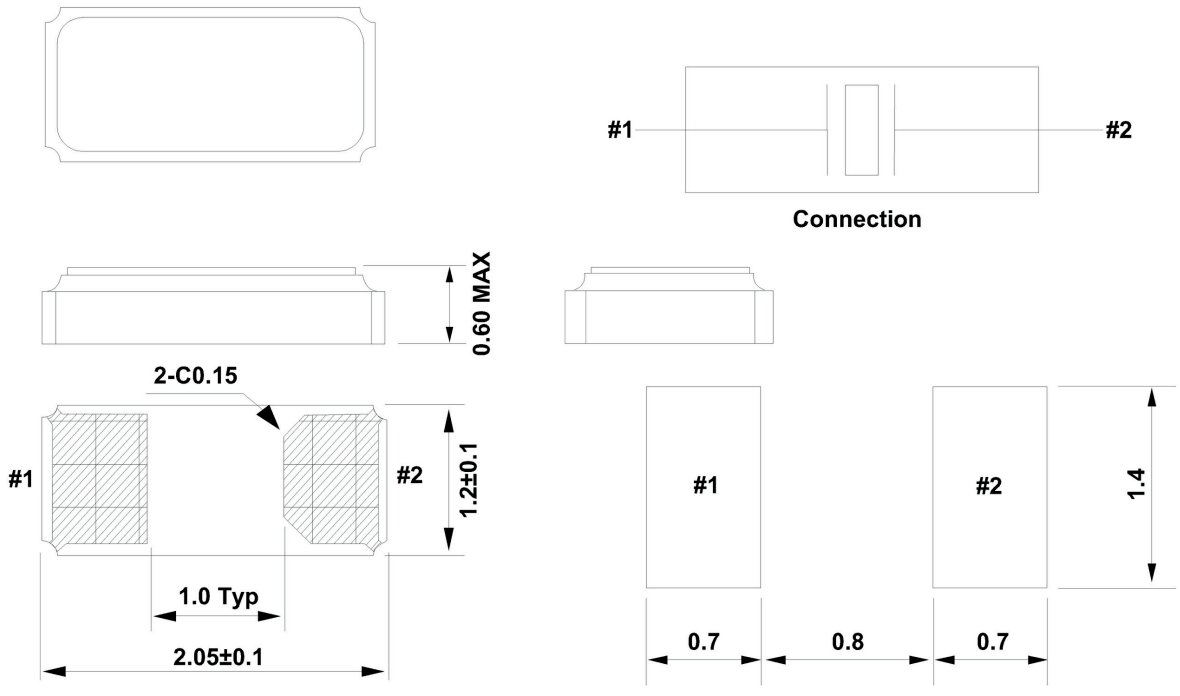
- Consumer products
- Small mobile devices
- Industrial electronic equipment
- Communication devices

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-40~85°C	
			± 10, ± 20, ± 30		ppm	@-40~105°C	
			± 10, ± 20, ± 30		ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	0.1	0.5	uW		
Equivalent Series Resistance	ESR	-	-	70	Kohm		
Shunt Capacitance	C0		1.5		pF		
Temperature Coefficient	-		-0.036±0.005		ppm/T²		
Insulation Resistance	-	500	-	-	Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

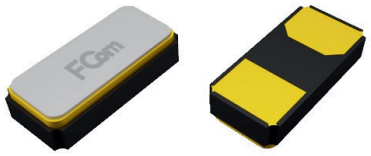
DIMENSION(mm)



FCom Tuning Fork Crystal

Series FCT-3M

SMD Package 3.2×1.5 mm 32.768kHz



Feature

- Ultra small size 3.2×1.5×0.75mm
- High reliability environmental performance
- High frequency stability and high precision
- RoHS and REACH Compliant , Pb-free

Application

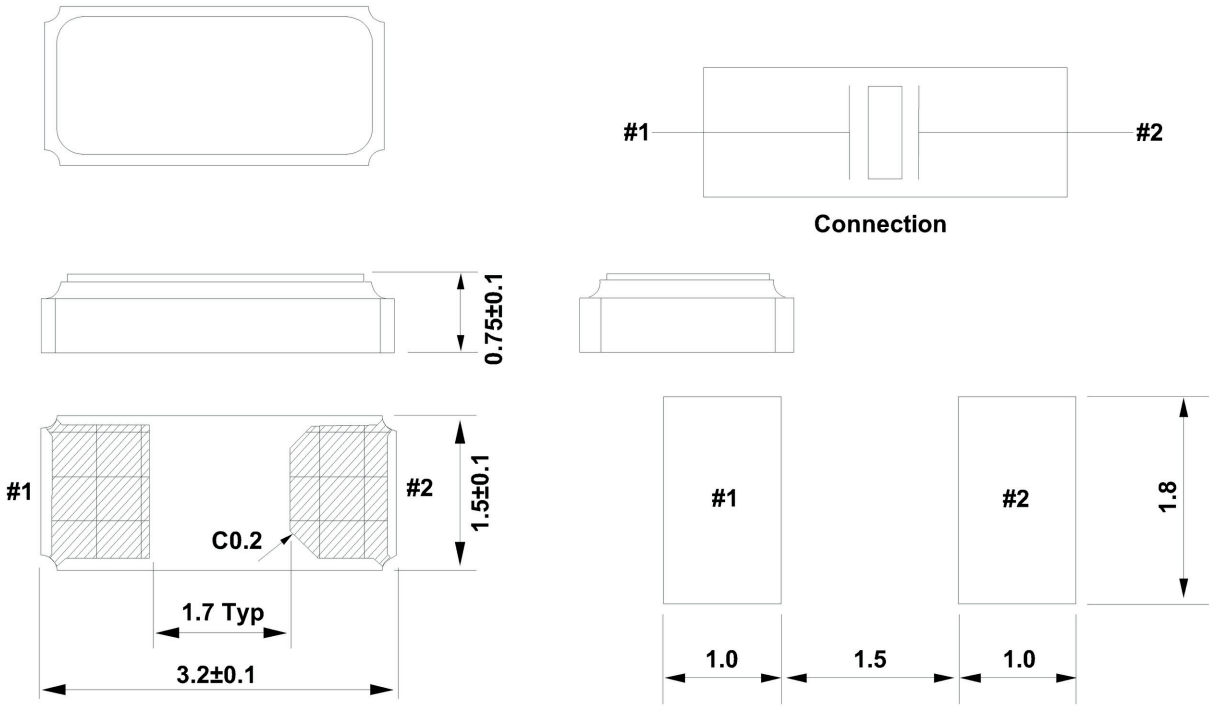
- Consumer products
- System in sleep mode or
- low energy mode Timekeeping
- Communication devices

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-40~85°C	
			± 10, ± 20, ± 30		ppm	@-40~105°C	
			± 10, ± 20, ± 30		ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	0.1	0.5	uW		
Equivalent Series Resistance	ESR	-	-	70	Kohm		
Shunt Capacitance	C0		1.6		pF		
Temperature Coefficient	-		-0.036±0.005		ppm/T²		
Insulation Resistance	-	500	-	-	Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



FCom Tuning Fork Crystal

Series FCT-6M

SMD Package 6.9×1.4 mm 32.768kHz



Feature

- Ultra small size 6.9×1.4×1.3 mm
- High reliability environmental performance
- High frequency stability and high precision

Application

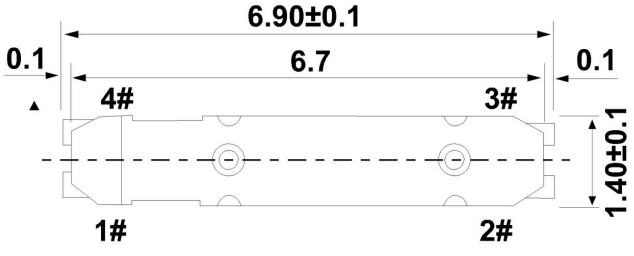
- Consumer products
- Small mobile telecommunicationgs devices

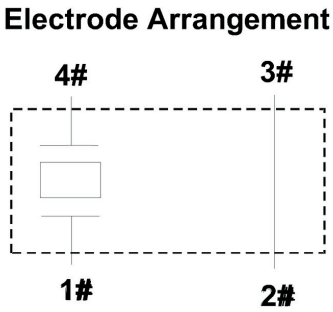
ELECTRICAL SPECIFICATIONS

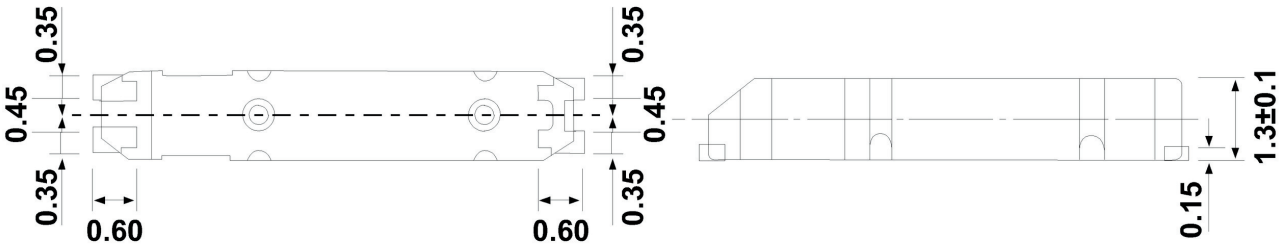
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-20~70°C	
			± 5, ± 10, ± 20		ppm	@-40~85°C	
Operating Temperature	Topr	-40	25	85	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	-	1.0	uW		
Equivalent Series Resistance	ESR	-	-	65	Kohm		
Shunt Capacitance	C0		0.8		pF		
Temperature Coefficient	-		-0.035+0.01		ppm/T²		
Insulation Resistance	-	500	-	-	Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)







FCom Tuning Fork Crystal

Series FCT-8M

SMD Package 3.8 x 8.0mm 32.768kHz



Feature

- Industry Standard Package: 3.8 x 8.0mm
- Designed for automatic mounting and reflow soldering

Application

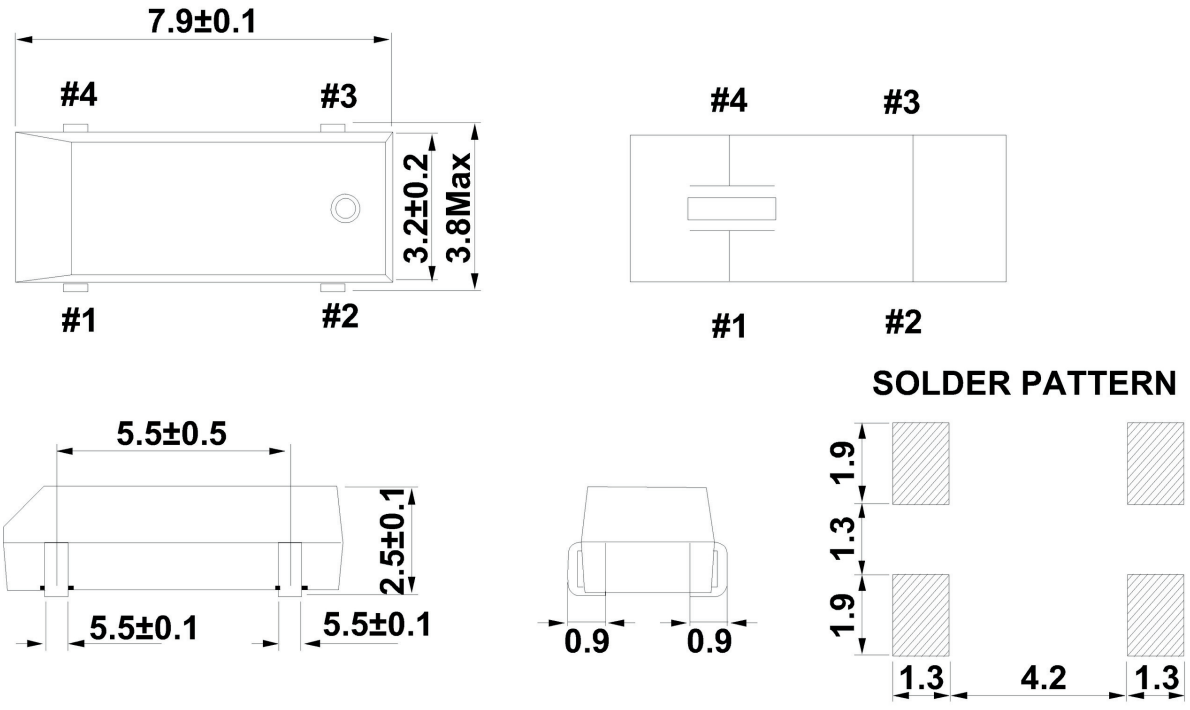
- Consumer products
- Microprocessors
- Clocks

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-20~70°C	
			± 5, ± 10, ± 20		ppm	@-40~85°C	
Operating Temperature	Topr	-40	25	85	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	-	1.0	uW		
Equivalent Series Resistance	ESR	-	-	50	Kohm		
Shunt Capacitance	C0		1.6		pF		
Temperature Coefficient	-		-0.035+0.01		ppm/T²		
Insulation Resistance	-	500	-	-	Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

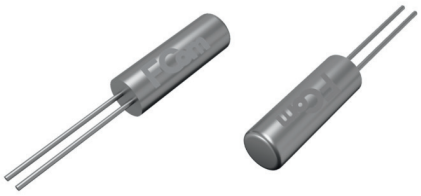
DIMENSION(mm)



FCom Tuning Fork Crystal

Series FCT-2T

Cylinder Type Crystal ϕ2×6 mm 32.768kHz



Feature

- Small size ϕ2×6mm
- Wide frequency range
- Excellent frequency stability
- RoHS and REACH Compliant , Pb-free

Application

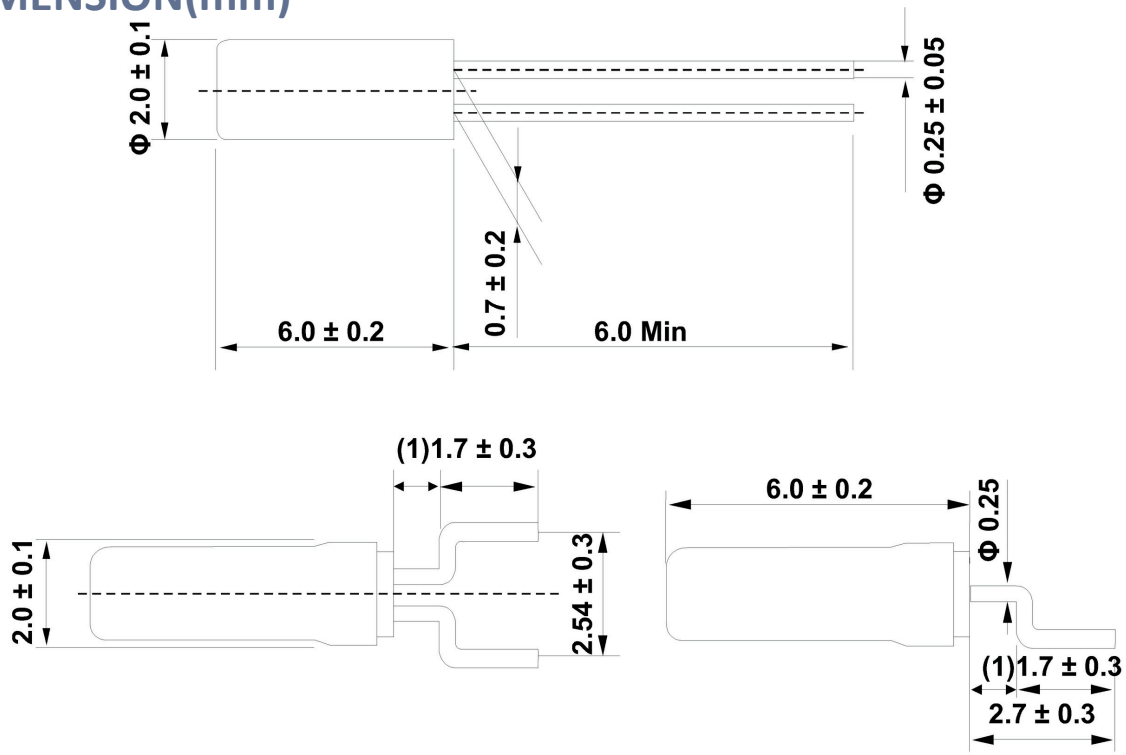
- Consumer products reference clocks

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-20~70°C	
			± 5, ± 10, ± 20		ppm	@-40~85°C	
Operating Temperature	Topr	-40	25	85	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	-	1.0	uW		
Equivalent Series Resistance	ESR	-	-	40	Kohm		
Shunt Capacitance	C0		1.5-0.85		pF		
Temperature Coefficient	-		-0.035+0.01		ppm/T²		
Insulation Resistance	-	500	-	-	Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



FCom Tuning Fork Crystal

Series FCT-3T

Cylinder Type Crystal ϕ3×8 mm 32.768kHz



Feature

- Small size ϕ3×8mm
- A great number of standard frequencies
- Lower cost and highly mass production capability
- RoHS and REACH Compliant , Pb-free

Application

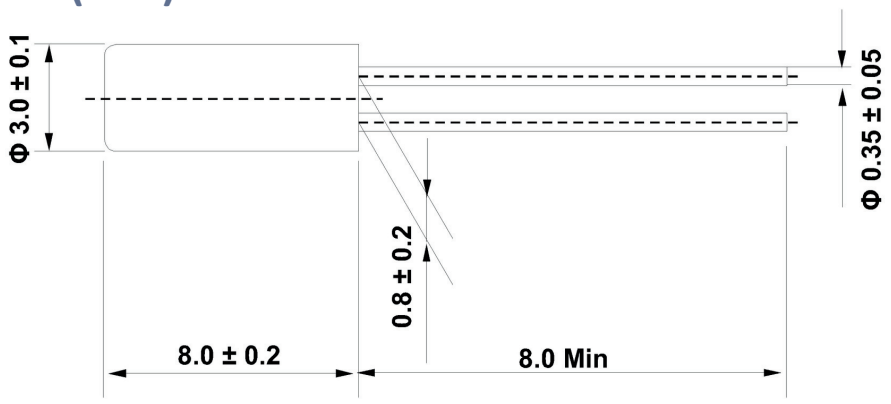
- PC
- Consumer products reference clocks

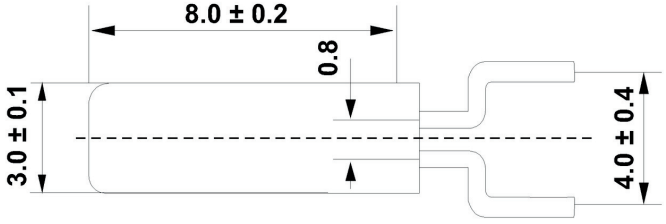
ELECTRICAL SPECIFICATIONS

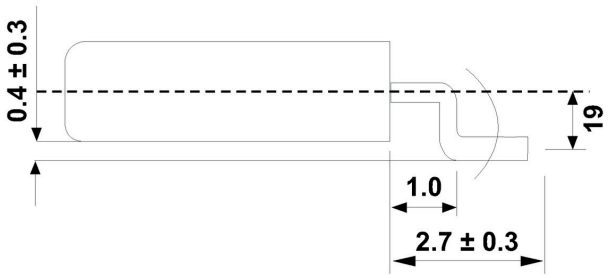
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-20~70°C	
			± 5, ± 10, ± 20		ppm	@-40~85°C	
Operating Temperature	Topr	-40	25	85	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	-	1.0	uW		
Equivalent Series Resistance	ESR	-	-	30	Kohm		
Shunt Capacitance	C0		1.75-1.65		pF		
Temperature Coefficient	-		-0.035+0.01		ppm/T²		
Insulation Resistance	-	500			Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



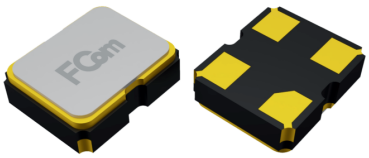




FCom Oscillator 32.768kHz

Series FCO-1K

SMD Crystal Oscillator 1.6×1.2 mm 32.768kHz



Feature

- Typical 1.6×1.2mm SMD package
- Wide temperature range from -40 to +125°C
- Ultra low current consumption
- RoHS and REACH Compliant , Pb-free

Application

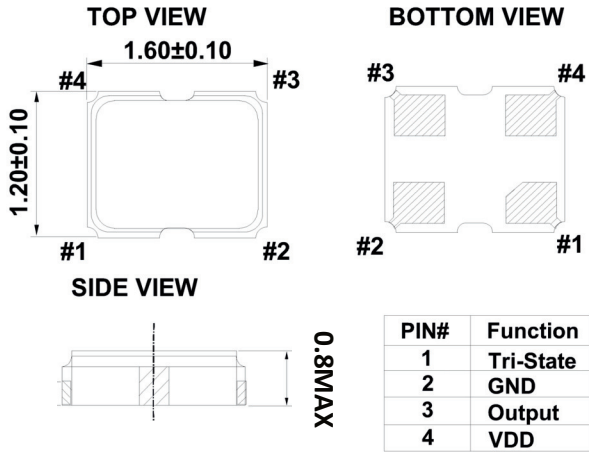
- Real Time Clock
- Wearable device, Sport Video Cams
- Ultra-small Notebook PC, Mobile Phones
- Health and Wellness Monitors

ELECTRICAL SPECIFICATIONS

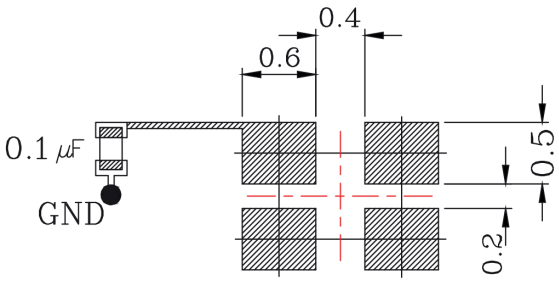
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT		± 10		ppm	@25°C±3°C	
Supply Voltage	Vdd		1.8V, 2.5V, 3.3V		V	@No load	
Current Consumption	Icc	-		32	uA	@No load	
Stand by Current	Icc(ST)	-	-	5	uA		
Output Load (CMOS)	CL		15		pF		
Output Level	VoH	90% Vdd	-	-	V	Output High	
	VoL	-	-	10% Vdd	V	Output Low	
Rise Time / Fall Time	Tr / Tf	-	-	15	nSec	@10%-90%	
Tri-State Mode (Input to Pin 1)	VIH	70% Vdd	-	-	V	Enable	
	VIL	-	-	30% Vdd	V	Disable	
Duty Cycle	TH/T	45	~	55	%		
Start-up Time	Tosc	-	-	30	mSec		
Aging	ppm/yr		±5		ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

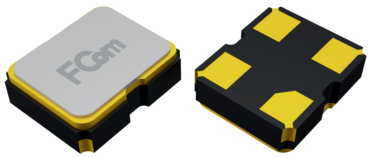
Temp.(°C) \ ppm	± 30	± 50	± 100
@-40~85°C	○	○	○
@-40~105°C	△	○	○
@-40~125°C	△	△	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Oscillator 32.768kHz

Series FCO-6K

SMD Crystal Oscillator 2.0×1.6 mm 32.768kHz



Feature

- Typical 2.0×1.6mm SMD package
- Operation supply voltage: 1.5V, 1.8V
- Ultra low current consumption
- RoHS and REACH Compliant , Pb-free

Application

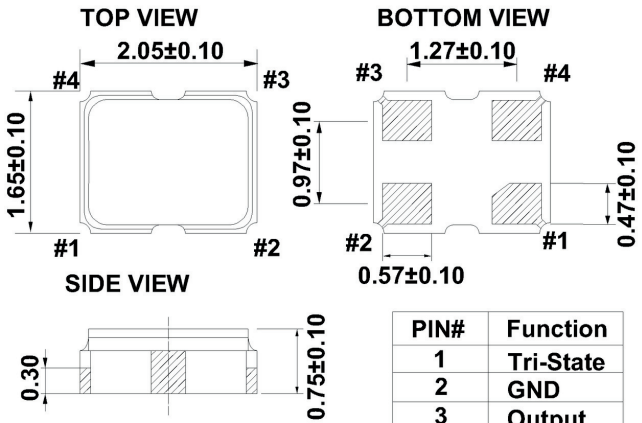
- Real Time Clock
- Wearable device, Sport Video Cams
- Ultra-small Notebook PC, Mobile Phones
- Health and Wellness Monitors

ELECTRICAL SPECIFICATIONS

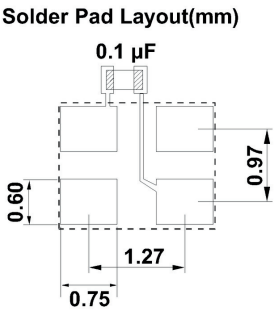
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT		± 10		ppm	@25°C±3°C	
Supply Voltage	Vdd		1.8V, 2.5V, 3.3V		V	@No load	
Current Consumption	Icc	-		35	uA	@No load	
Stand by Current	Icc(ST)	-	-	3	uA		
Output Load (CMOS)	CL		15		pF		
Output Level	VoH	90% Vdd	-	-	V	Output High	
	VoL	-	-	10% Vdd	V	Output Low	
Rise Time / Fall Time	Tr / Tf	-	-	15	nSec	@10%-90%	
Tri-State Mode (Input to Pin 1)	VIH	70% Vdd	-	-	V	Enable	
	VIL	-	-	30% Vdd	V	Disable	
Duty Cycle	TH/T	45	~	55	%		
Start-up Time	Tosc	-	-	20	mSec		
Aging	ppm/yr		±3		ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

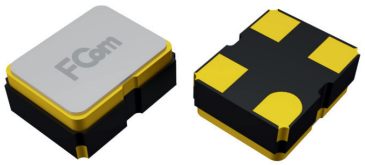
Temp.(°C) \ ppm	± 25	± 30	± 50
@-40~85°C	○	○	○
@-40~105°C	△	○	○
@-40~125°C	×	△	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Oscillator 32.768kHz

Series FCO-2K

SMD Crystal Oscillator 2.5×2.0 mm 32.768kHz



Feature

- Typical 2.5×2.0×0.81mm SMD package
- Low Power Supply Voltage: 3.3, 2.5, 1.8 Supply Options
- RoHS and REACH Compliant , Pb-free

Application

- RTC Module
- Smartphone
- IoT
- Wearable Device
- Watch, Medical

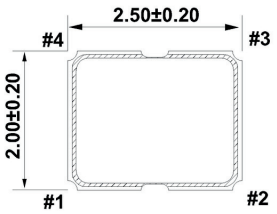
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	32.768			kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C±3°C	
Supply Voltage	Vdd	1.8V, 2.5V, 3.3V			V	@No load	
Current Consumption	Icc	-		35	uA	@No load	
Stand by Current	Icc(ST)	-	-	3	uA		
Output Load (CMOS)	CL	15			pF		
Output Level	VoH	90% Vdd	-	-	V	Output High	
	VoL	-	-	10% Vdd	V	Output Low	
Rise Time / Fall Time	Tr / Tf	-	-	15	nSec	@10%-90%	
Tri-State Mode (Input to Pin 1)	VIH	70% Vdd	-	-	V	Enable	
	VIL	-	-	30% Vdd	V	Disable	
Duty Cycle	TH/T	45	~	55	%		
Start-up Time	Tosc	-	-	20	mSec		
Aging	ppm/yr	±3			ppm/yr	1st. Year at 25°C	

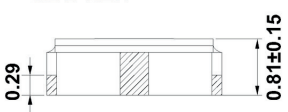
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

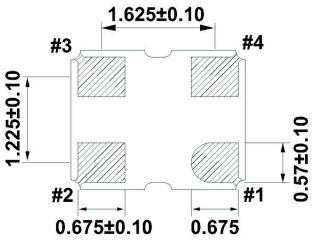
TOP VIEW



SIDE VIEW

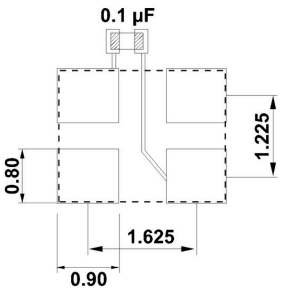


BOTTOM VIEW



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD

Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

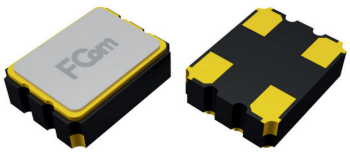
Temp.(°C) \ ppm	± 25	± 30	± 50
@-40~85°C	○	○	○
@-40~105°C	△	○	○
@-40~125°C	×	△	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Oscillator 32.768kHz

Series FCO-3K

SMD Crystal Oscillator 3.2×2.5 mm 32.768kHz



Feature

- Typical 3.2×2.5×0.95mm SMD package
- Low Power Supply Voltage: 1.8V, 2.5V and 3.3V Supply Options
- RoHS and REACH Compliant , Pb-free

Application

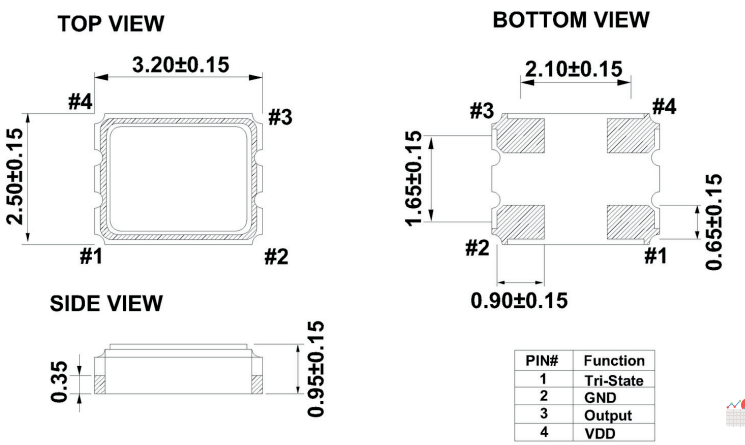
- RTC Module
- Smartphone
- IoT
- Wearable Device

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT		± 10		ppm	@25°C±3°C	
Supply Voltage	Vdd		1.8V, 2.5V, 3.3V		V	@No load	
Current Consumption	Icc	-		35	uA	@No load	
Stand by Current	Icc(ST)	-	-	3	uA		
Output Load (CMOS)	CL		15		pF		
Output Level	VoH	90% Vdd	-	-	V	Output High	
	VoL	-	-	10% Vdd	V	Output Low	
Rise Time / Fall Time	Tr / Tf	-	-	15	nSec	@10%-90%	
Tri-State Mode (Input to Pin 1)	VIH	70% Vdd	-	-	V	Enable	
	VIL	-	-	30% Vdd	V	Disable	
Duty Cycle	TH/T	45	~	55	%		
Start-up Time	Tosc	-	-	20	mSec		
Aging	ppm/yr		±3		ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

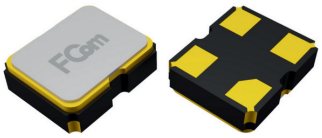
Temp.(°C) \ ppm	± 25	± 30	± 50
@-40~85°C	△	○	○
@-40~105°C	△	○	○
@-40~125°C	×	△	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Current OSC 32.768kHz

Series FCO-6K-UC

Ultra-Low Current SMD 2.0×1.6 mm 32.768kHz



Feature

- Typical 2.0×1.6×0.75mm SMD package
- Operation supply voltage: 1.5V, 1.8V
- Ultra-Low current: 1.4uA typical
- RoHS and REACH Compliant , Pb-free
- Frequency Stability ±25ppm over -40~85℃ @3days Average

Application

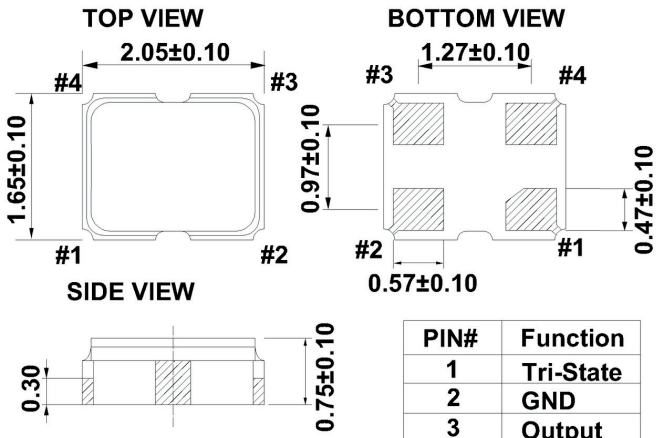
- RTC Reference Clock
- Wearable device, Sport Video Cams
- Ultra-small Notebook PC
- Mobile Phones
- Health and Wellness Monitors

ELECTRICAL SPECIFICATIONS

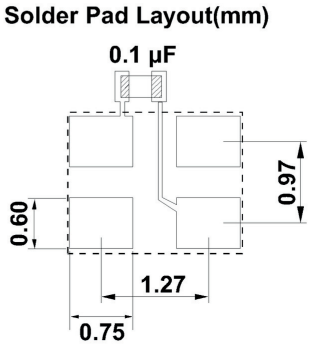
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT		± 10		ppm	@25°C±3°C	
Supply Voltage	Vdd		1.5V, 1.8V		V	Typ.	
Frequency vs Temperature	FS		± 25		ppm	@-40~85℃	
Current Consumption	Icc	-	1.4	1.8	uA	@No load	
Output Level	VoH	90% Vdd	-	-	V	Output High	
	VoL	-	-	10% Vdd	V	Output Low	
Rise Time / Fall Time	Tr / Tf	-	-	10	nSec	@10%-90%	
Duty Cycle	TH/T	45	~	55	%		
Start-up Time	Tosc	-	-	8	mSec		
Aging	ppm/yr		±3		ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

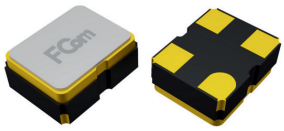
Temp.(°C) \ ppm	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	×	○	○
@-40~105°C	×	△	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Current OSC 32.768kHz

Series FCO-2K-UC

Ultra-Low Current SMD 2.5×2.0 mm 32.768kHz



Feature

- Typical 2.5×2.0×0.81mm SMD package
- Operation supply voltage: 1.5V, 1.8V
- Ultra-Low current: 1.4uA typical
- RoHS and REACH Compliant , Pb-free
- Frequency Stability ±25ppm over -40~85℃ @3days Average

Application

- RTC Reference Clock
- Wearable device, Sport Video Cams
- Ultra-small Notebook PC
- Mobile Phones
- Health and Wellness Monitors

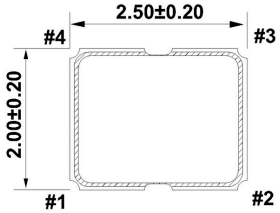
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT		± 10		ppm	@25°C±3°C	
Supply Voltage	Vdd		1.5V, 1.8V		V	Typ.	
Frequency vs Temperature	FS		± 25		ppm	@-40~85℃	
Current Consumption	Icc	-	1.4	1.8	uA	@No load	
Output Level	VoH	90% Vdd	-	-	V	Output High	
	VoL	-	-	10% Vdd	V	Output Low	
Rise Time / Fall Time	Tr / Tf	-	-	10	nSec	@10%-90%	
Duty Cycle	TH/T	45	~	55	%		
Start-up Time	Tosc	-	-	8	mSec		
Aging	ppm/yr		±3		ppm/yr	1st. Year at 25°C	

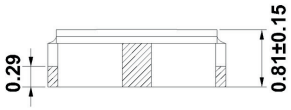
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

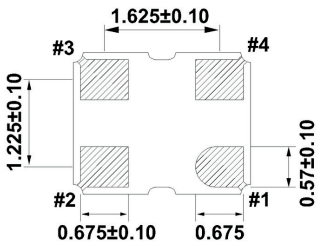
TOP VIEW



SIDE VIEW

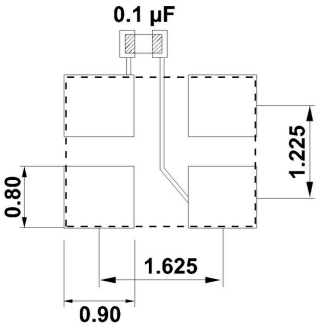


BOTTOM VIEW



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD

Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

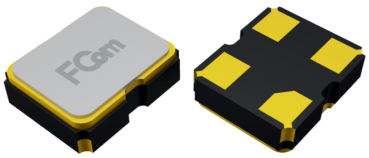
Temp.(°C) \ ppm	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	×	○	○
@-40~105°C	×	△	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Crystal Oscillator

Series FCO-1C

SMD Crystal Oscillator 1.6×1.2 mm



Feature

- Typical 1.6×1.2mm SMD package
- Wide temperature range from -40 to +125°C
- Tri-state enable / disable mode
- RoHS and REACH Compliant , Pb-free

Application

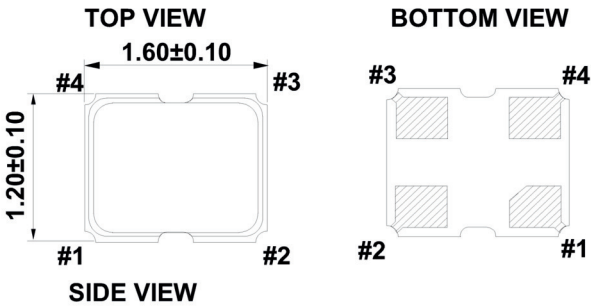
- WLAN
- Mobile Phone
- DSC, Set-top Box, HDTV
- Health and Wellness Monitors

ELECTRICAL SPECIFICATIONS

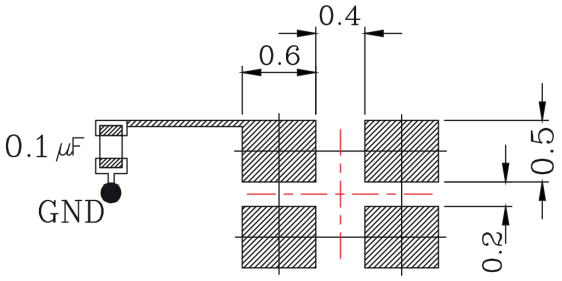
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range	F	3~60			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	10,12,12.288,19.2,20,24,25,40,50			MHz		
Supply Voltage	Vdd	1.8V	2.5V	3.3V	V	Typ.	
Current Consumption	Icc	-		15	mA		
Stand by Current	Icc(ST)	-	-	10	uA		
Output Load (CMOS)	CL	15			pF		
Output Level	VoH	90% Vdd	-	-	V	Output High	
	VoL	-	-	10% Vdd	V	Output Low	
Rise Time / Fall Time	Tr / Tf	-	-	10	nSec	@20% - 80%	
Tri-State Mode (Input to Pin 1)	VIH	70% Vdd	-	-	V	Enable	
	VIL	-	-	30% Vdd	V	Disable	
Period Jitter	Pk	-	-	40	ps		
RMS Phase Jitter	PJ	-	-	1.0	ps	Integrated 12kHz~20MHz	
Duty Cycle	TH/T	45	~	55	%		
Start-up Time	Tosc	-	-	2	mSec		
Aging	ppm/yr	±5			ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

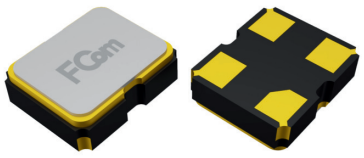
FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 20	± 25	± 50	± 100
@-20~70°C	○	○	○	○
@-40~85°C	△	○	○	○
@-40~105°C	△	○	○	○
@-40~125°C	×	×	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Crystal Oscillator

Series FCO-6C



SMD Crystal Oscillator 2.0×1.6 mm

Feature

- Typical 2.05 x 1.65 x 0.75 mm package
- Tight symmetry (45 to 55%) available
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tri-state enable/disable

Application

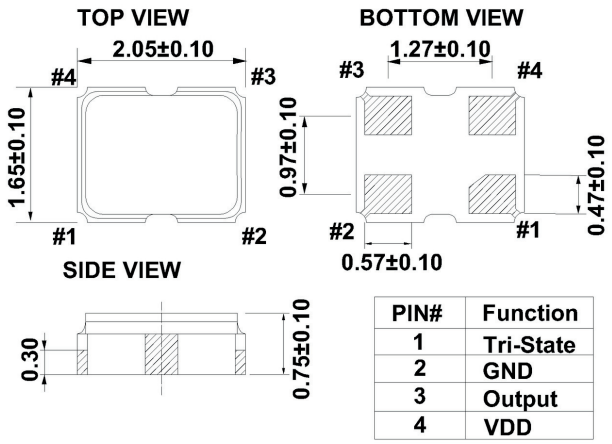
- WLAN/WiMax
- Mobile Phone
- DSC, Set-top Box, HDTV

ELECTRICAL SPECIFICATIONS

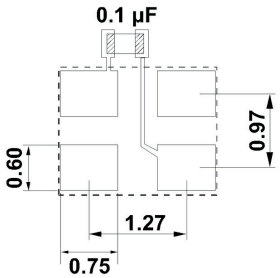
Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	1.5~50			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	24, 26			MHz		
Supply Voltage		Vdd	**1.8V**	**2.5V**	**3.3V**	V	Typ.	
Current Consumption @15pF Load		Icc	7	10	15	mA	Max.	
Rise Time /Fall Time	1.5 MHz ≦ Fo < 20 MHz	Tr/Tf	5	4	4	nSec	Max. @10% ~ 90% @ load 15pF	
	20 MHz ≦ Fo < 50 MHz		4	3	3			
Stand by Current		Icc(ST)	-	-	10	uA		
Output Load (CMOS)		CL	15			pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
Period Jitter		Pk	-	-	40	pSec		
RMS Phase Jitter		PJ	-	-	1.0	pSec	Integrated 12KHz~20MHz	
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	2	mSec		
Aging		ppm/yr	±3			ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

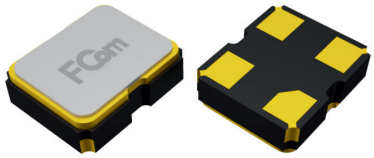
FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	△	△	○
@-40~105°C	×	△	○
@-40~125°C	×	×	△

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Crystal Oscillator

Series FCO-2C



SMD Crystal Oscillator 2.5×2.0 mm

Feature

- Typical 2.5×2.0×0.81mm SMD package
- Tight symmetry (45 to 55%) available
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tri-state enable/disable

Application

- WLAN/WiMax
- Mobile Phone
- DSC, Set-top Box, HDTV

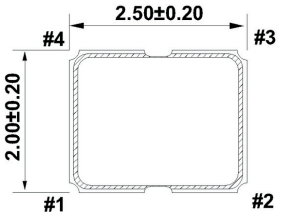
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	1.25~125			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	24, 26, 30, 40			MHz		
Supply Voltage		Vdd	1.8V	2.5V	3.3V	V	Typ.	
Current Consumption	@15pF Load	Icc	7	10	15	mA	Max.	
	1.25 MHz ≦ Fo < 10 MHz		1.2	1.5	1.5			
	10 MHz ≦ Fo < 20 MHz		1.5	2	2			
	20 MHz ≦ Fo < 80 MHz		1.5	2.5	3			
	80 MHz ≦ Fo < 125 MHz		5	7	8			
Transition Time: Rise/Fall Time	1.25 MHz ≦ Fo < 10 MHz	Tr/Tf	5	4	3	nSec	Max. @10% ~ 90% @ load 15pF	
	10 MHz ≦ Fo < 20 MHz		4	3	3			
	20 MHz ≦ Fo < 80 MHz		4	3	3			
	80 MHz ≦ Fo < 125 MHz		4	3	3			
Stand by Current	@-40°C to 85°C	Icc(ST)	-	-	10	uA		
	@-40°C to 125°C		-	-	20			
Output Load (CMOS)		CL	15			pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
Period Jitter		Pk	-	-	40	pSec		
RMS Phase Jitter		PJ	-	-	1.0	pSec	Integrated 12 KHz~20 MHz	
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	2	mSec		
Aging		ppm/yr	±3			ppm/yr	1st. Year at 25°C	

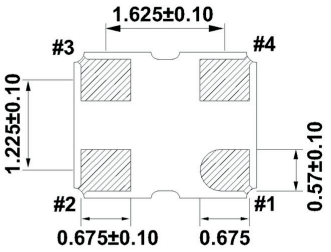
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

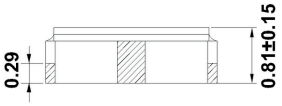
DIMENSION(mm)

TOP VIEW

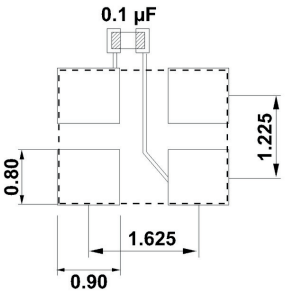


BOTTOM VIEW





PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

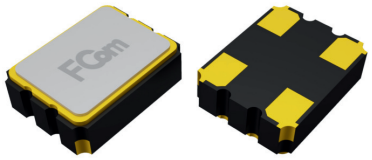
FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	△	△	○
@-40~105°C	×	△	○
@-40~125°C	×	×	△

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Crystal Oscillator

Series FCO-3C



SMD Crystal Oscillator 3.2×2.5 mm

Feature

- Typical 3.2 x 2.5 x 0.95 mm package
- Tight symmetry (45 to 55%) available
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tri-state enable/disable

Application

- WLAN/WiMax
- Mobile Phone
- DSC, Set-top Box, HDTV

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency Range		F		1.25~125		MHz	
Standard Frequency		F(ST)		24, 26, 30, 40		MHz	
Supply Voltage		Vdd	1.8V	2.5V	3.3V	V	Typ.
Current Consumption	@15pF Load	Icc	7	10	15	mA	Max.
	1.25 MHz ≦ Fo < 10 MHz		1.2	1.5	1.5		
	10 MHz ≦ Fo < 20 MHz		1.5	2	2		
	20 MHz ≦ Fo < 80 MHz		1.5	2.5	3		
	80 MHz ≦ Fo < 125 MHz		5	7	8		
Transition Time: Rise/Fall Time	1.25 MHz ≦ Fo < 10 MHz	Tr/Tf	5	4	3	nSec	Max. @10% ~ 90% @ load 15pF
	10 MHz ≦ Fo < 20 MHz		4	3	3		
	20 MHz ≦ Fo < 80 MHz		4	3	3		
	80 MHz ≦ Fo < 125 MHz		4	3	3		
Stand by Current	@-40°C to 85°C	Icc(ST)	-	-	10	uA	
	@-40°C to 125°C		-	-	20		
Output Load (CMOS)		CL		15		pF	
Output Level		VoH	90% Vdd	-	-	V	Output High
		VoL	-	-	10% Vdd	V	Output Low
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable
		VIL	-	-	30% Vdd	V	Disable
Period Jitter		Pk	-	-	40	pSec	
RMS Phase Jitter		PJ	-	-	1.0	pSec	Integrated 12 KHz~20 MHz
Duty Cycle		TH/T	45	~	55	%	
Start-up Time		Tosc	-	-	2	mSec	
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C

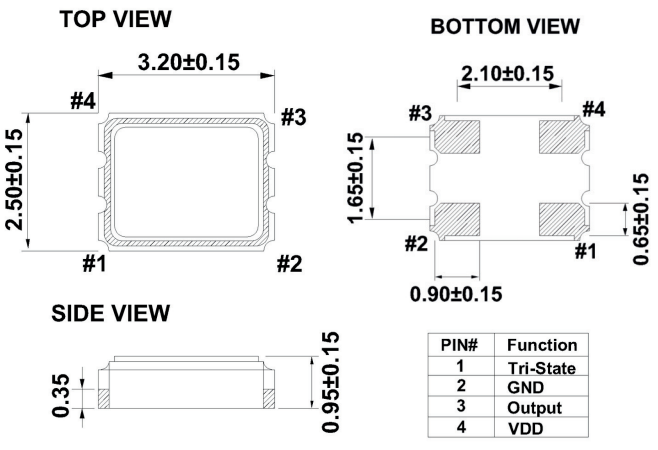
Test condition

Ambient temperature: 25 ± 5°C

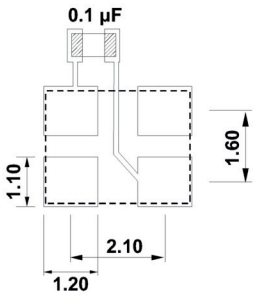
Relative humidity: 40% ~ 70%

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(°C)	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	△	△	○
@-40~105°C	×	△	○
@-40~125°C	×	×	△

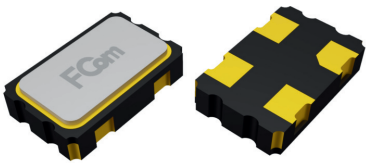
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Crystal Oscillator

Series FCO-5C

SMD Crystal Oscillator 5.0×3.2 mm



Feature

- Typical 5.0×3.2×1.2mm ceramic SMD package
- Tight symmetry (45 to 55%) available
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tri-state enable/disable

Application

- GPS, Mobile Phone
- WLAN, Wireless, Fiber/10Gbit Ethernet
- Netbook, PDA, DSC

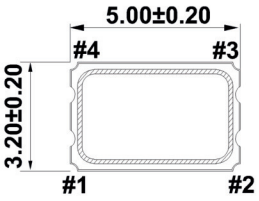
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	0.0137~160			MHz		
Standard Frequency		F(ST)	2.048, 25, 26, 27, 50, 66.667, 100, 125			MHz		
Supply Voltage		Vdd	1.8V	2.5V	3.3V	V	Typ.	
Current Consumption	13.7 kHz ≦ Fo ≦ 93 kHz	Icc	1	1	1	mA	Max.	
	0.3125 MHz ≦ Fo < 40 MHz		7	8	10			
	40 MHz ≦ Fo < 75 MHz		15	18	20			
	75 MHz ≦ Fo < 135 MHz		25	30	35			
	135 MHz ≦ Fo < 160 MHz		-	40	45			
Transition Time: Rise/Fall Time	13.7 kHz ≦ Fo ≦ 93 kHz	Tr/Tf	50	50	50	nSec	Max. @10% ~ 90% @ load 15pF	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
	0.3125 MHz ≦ Fo < 100 MHz		5	5	5			
	100 MHz ≦ Fo < 160 MHz		3	3	3			
Stand by Current		Icc(ST)	-	-	10	uA		
Output Load (CMOS)		CL	15			pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
Period Jitter		Pk	-	-	40	pSec		
RMS Phase Jitter		PJ	-	-	1.0	pSec	Integrated 12 KHz~20 MHz	
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	5	mSec		
Aging		ppm/yr	±3			ppm/yr	1st. Year at 25°C	

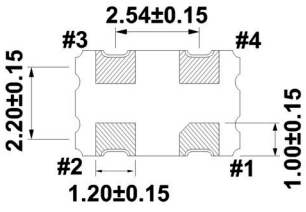
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

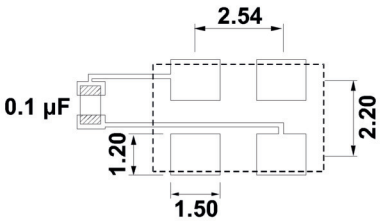
DIMENSION(mm)

TOP VIEW



BOTTOM VIEW

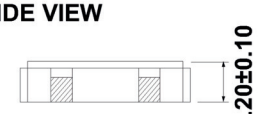




Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

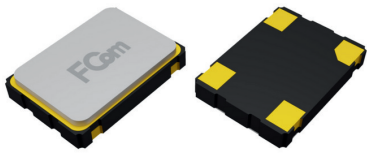
ppm / Temp.(°C)	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	△	△	○
@-40~105°C	×	△	○
@-40~125°C	×	×	△

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Crystal Oscillator

Series FCO-7C

SMD Crystal Oscillator 7.0×5.0 mm



Feature

- Typical 7.0×5.0×1.3 mm SMD package
- Output Frequency up to 166MHz
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tri-state enable/disable

Application

- PC, VGA Card
- Netbook, PDA
- xDSL, WLAN, Fiber/10Gbit Ethernet

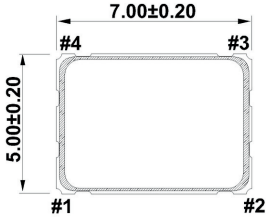
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	0.0137~166			MHz		
Standard Frequency		F(ST)	2.048, 25, 26, 27, 50, 66.667, 100, 125			MHz		
Supply Voltage		Vdd	1.8V	2.5V	3.3V	V	Typ.	
Current Consumption	13.7 kHz ≦ Fo ≦ 70 kHz	Icc	1	1	1	mA	Max.	
	0.3125 MHz≦Fo<30 MHz		7	8	10			
	30 MHz ≦ Fo < 75 MHz		15	18	20			
	75 MHz ≦ Fo < 133 MHz		25	30	35			
	133 MHz ≦ Fo < 166 MHz		-	40	45			
Transition Time: Rise/Fall Time	13.7 kHz ≦ Fo ≦ 70 kHz	Tr/Tf	50	50	50	nSec	Max. @10% ~ 90% @ load 15pF	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
	0.3125 MHz ≦ Fo < 100 MHz		5	5	5			
	100 MHz ≦ Fo < 166 MHz		3	3	3			
Stand by Current		Icc(ST)	-	-	10	uA		
Output Load (CMOS)		CL	15			pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
Period Jitter		Pk	-	-	40	pSec		
RMS Phase Jitter		PJ	-	-	1.0	pSec	Integrated 12 KHz~20 MHz	
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	5	mSec		
Aging		ppm/yr	±3			ppm/yr	1st. Year at 25°C	

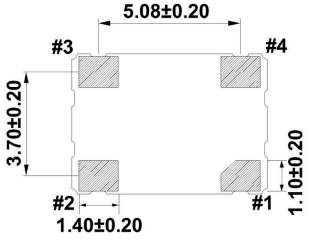
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

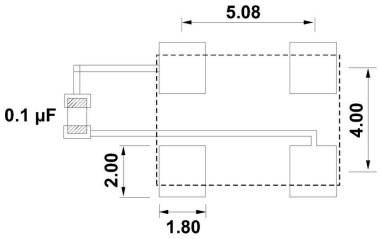
DIMENSION(mm)

TOP VIEW



BOTTOM VIEW

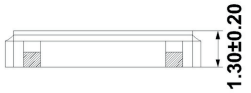




Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD

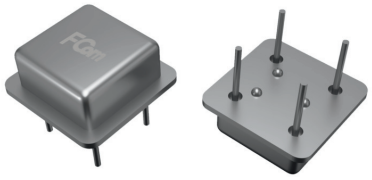
FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(°C)	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	△	△	○
@-40~105°C	×	△	○
@-40~125°C	×	×	△

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Crystal Oscillator

Series FCO-HL



Crystal Oscillator 12.46×12.46 DIP HALF Size

Feature

- Typical 12.46×12.46×5mm
- Tight symmetry (45 to 55%) available
- Operation voltage:5V, 3.3V
- Tri-state enable / disable

Application

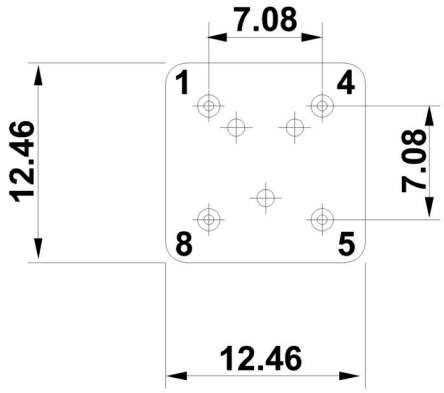
- Communication, wireless communication
- Test instruments, industrial equipment
- Frequency converter

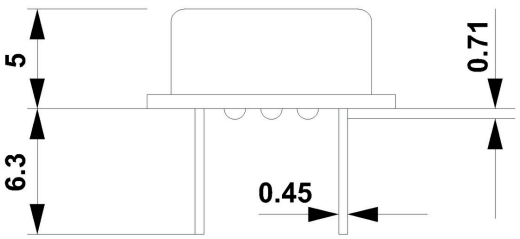
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	0.25~180			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Stability		Fs	±25, ±50, ±100			ppm		
Operating Temperature			0~70, -20~70, -40~85			℃		
Supply Voltage		Vdd	-	3.3V	5.0V	V	Typ.	
Fan out Type			-	CMOS	TTL/CMOS			
Current Consumption	0.25MHz ≦ FO < 20MHz	Icc	-	10	15	mA	Max.	
	20MHz ≦ FO < 50MHz		-	30	40			
	50MHz ≦ FO < 180MHz		-	40	50			
Transition Time: Rise/Fall Time	0.25MHz ≦ FO < 20MHz	Tr/Tf	-	10	8	nSec	@10% ~ 90% @ load 15pF	
	20MHz ≦ FO < 50MHz		-	6	5			
	50MHz ≦ FO < 180MHz		-	5	4			
Input Voltage	Vol	Vdd	-	0.33	0.4/0.5	V	Max.	
	2.4V/4.5V		-	2.4/2.5	3.0		Min.	
Driving Ability	CMOS			15	15/50	pF	Load Max	
	TTL				10TTL			
Stand by Current		Icc(ST)	-	-	15	uA		
E/D Function	#1 OPEN		Pin#5 Open					
	#1 ≧ 2.2V		Pin#5 Open					
	#1 ≦ 0.8V		Pin#5 High					
Duty Cycle		TH/T	45	~	55	%		
Start-up Time	@ load 15pF	Tosc	-	-	5	mSec		
	@ load 50pF		-	-	50			
Aging		ppm/yr	±3, ±5			ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

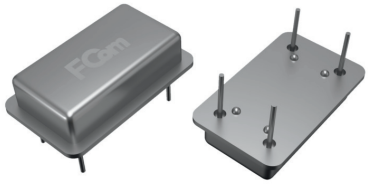




Pin	Function
1	Tri-State/NC
4	GND
5	Output
8	Vdd

FCom Crystal Oscillator

Series FCO-FL



Crystal Oscillator 20.4×12.8 DIP FULL Size

Feature

- Typical 20.4×12.8×5mm
- Tight symmetry (45 to 55%) available
- Operation voltage:5V, 3.3V
- Tri-state enable / disable

Application

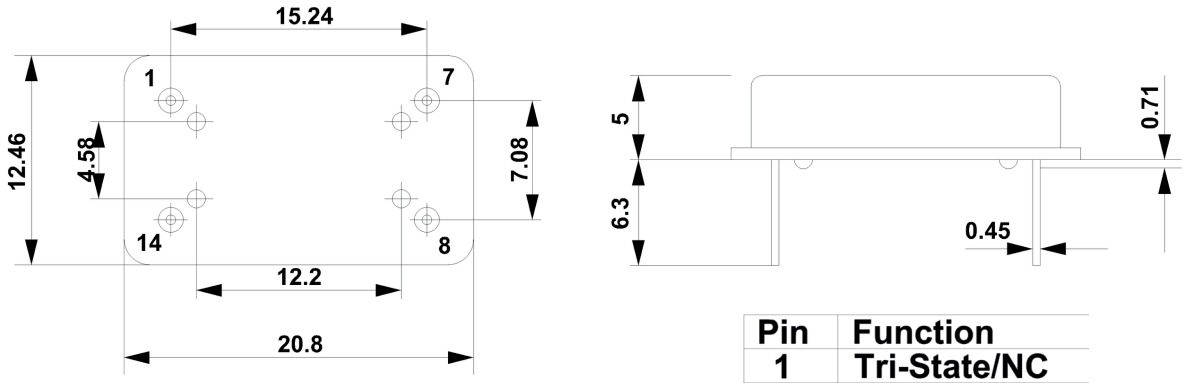
- Communication, wireless communication
- Test instruments, industrial equipment
- Frequency converter

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	0.25~180			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Stability		Fs	±25, ±50, ±100			ppm		
Operating Temperature			0~70, -20~70, -40~85			℃		
Supply Voltage		Vdd	-	3.3V	5.0V	V	Typ.	
Fan out Type			-	CMOS	TTL/CMOS			
Current Consumption	0.25MHz ≦ FO < 20MHz	Icc	-	10	15	mA	Max.	
	20MHz ≦ FO < 50MHz		-	30	40			
	50MHz ≦ FO < 180MHz		-	40	50			
Transition Time: Rise/Fall Time	0.25MHz ≦ FO < 20MHz	Tr/Tf	-	10	8	nSec	@10% ~ 90% @ load 15pF	
	20MHz ≦ FO < 50MHz		-	6	5			
	50MHz ≦ FO < 180MHz		-	5	4			
Input Voltage	Vol	Vdd	-	0.33	0.4/0.5	V	Max.	
	2.4V/4.5V		-	2.4/2.5	3.0		Min.	
Driving Ability	CMOS			15	15/50	pF	Load Max	
	TTL				10TTL			
Stand by Current		Icc(ST)	-	-	15	uA		
E/D Function	#1 OPEN		Pin#8 Open					
	#1 ≧ 2.2V		Pin#8 Open					
	#1 ≦ 0.8V		Pin#8 High					
Duty Cycle		TH/T	45	~	55	%		
Start-up Time	@ load 15pF	Tosc	-	-	5	mSec		
	@ load 50pF		-	-	50			
Aging		ppm/yr	±3, ±5			ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

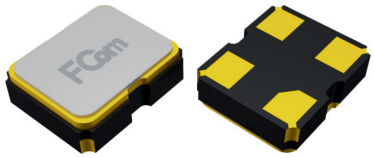


Pin	Function
1	Tri-State/NC
7	GND
8	Output
14	Vdd

FCom High Precision OSC

Series FCO-2C-HP

High Precision SMD Crystal Oscillator 2.5×2.0 mm



Feature

- Tight frequency stability:
  - ±10 ppm over -40°C to 85°C
  - ±15 ppm over -40°C to 95°C
- LVCOMS Output Logic
- Operation voltage: 1.8V, 2.5V, 3.3V
- Wide frequency range : 2.5MHz~60MHz

Application

- Wireless Connectivity
- Mobile device
- Smart meter

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency Range		F		2.5~60		MHz	
Standard Frequency		F(ST)		24, 25, 32		MHz	
Supply Voltage		Vdd	1.8V	2.5V	3.3V	V	Typ.
Current Consumption	@15pF Load	Icc	4	5	6	mA	Max.
Duty Cycle		TH/T	40/60	45/55	45/55	%	
Transition Time	Rise Time	Tr/Tf	-	-	6	nSec	Max. @10% ~ 90%, load 15pF
	Fall Time		-	-	6		
Stand by Current		Icc(ST)	-	-	10	uA	
Output Load (CMOS)		CL		15		pF	
Output Level		VoH	90% Vdd	-	-	V	Output High
		VoL	-	-	10% Vdd	V	Output Low
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable
		VIL	-	-	30% Vdd	V	Disable
RMS Phase Jitter		PJ	-	-	0.5	pSec	Integrated 12 KHz~20 MHz
Start-up Time		Tosc	-	-	2	mSec	
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C

Test condition

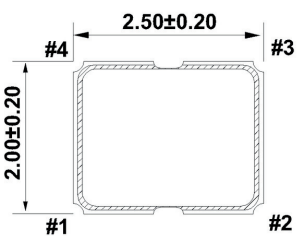
Ambient temperature: 25 ± 5°C

Relative humidity: 40% ~ 70%

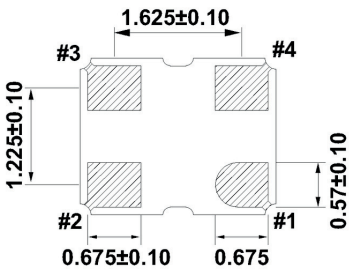
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

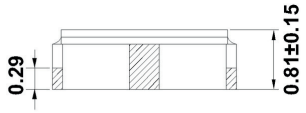
DIMENSION(mm)

TOP VIEW

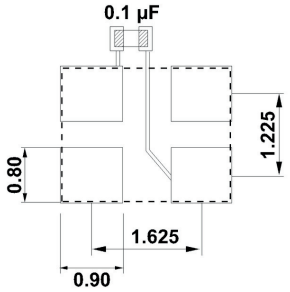


BOTTOM VIEW





PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

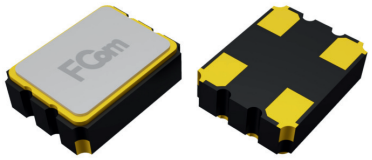
Temp.(°C) \ ppm	± 10	± 15	± 20
@-20~70°C	○	○	○
@-30~85°C	○	○	○
@-40~85°C	○	○	○
@-40~95°C	×	○	○

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom High Precision OSC

Series FCO-3C-HP



High Precision SMD Crystal Oscillator 3.2×2.5 mm

Feature

- Tight frequency stability:
  - ±10 ppm over -40°C to 85°C
  - ±15 ppm over -40°C to 95°C
- LVCOMS Output Logic
- Operation voltage: 1.8V, 2.5V, 3.3V
- Wide frequency range : 2.5MHz~60MHz

Application

- Wireless Connectivity
- Mobile device
- Smart meter

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency Range		F		2.5~60		MHz	
Standard Frequency		F(ST)		24, 25, 32		MHz	
Supply Voltage		Vdd	1.8V	2.5V	3.3V	V	Typ.
Current Consumption	@15pF Load	Icc	4	5	6	mA	Max.
Duty Cycle		TH/T	40/60	45/55	45/55	%	
Transition Time	Rise Time	Tr/Tf	-	-	6	nSec	Max. @10% ~ 90%, load 15pF
	Fall Time		-	-	6		
Stand by Current		Icc(ST)	-	-	10	uA	
Output Load (CMOS)		CL		15		pF	
Output Level		VoH	90% Vdd	-	-	V	Output High
		VoL	-	-	10% Vdd	V	Output Low
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable
		VIL	-	-	30% Vdd	V	Disable
RMS Phase Jitter		PJ	-	-	0.5	pSec	Integrated 12 KHz~20 MHz
Start-up Time		Tosc	-	-	2	mSec	
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C

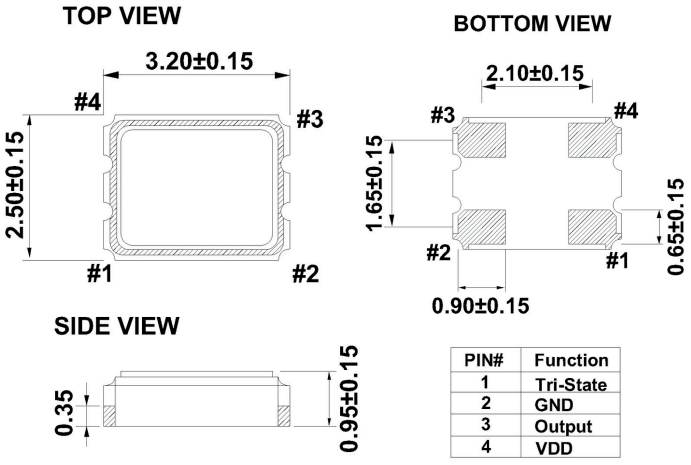
Test condition

Ambient temperature: 25 ± 5°C

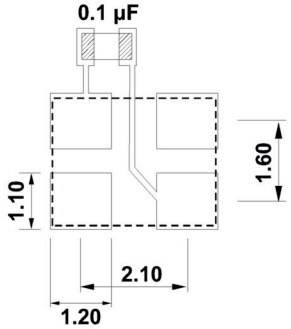
Relative humidity: 40% ~ 70%

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 10	± 15	± 20
@-20~70°C	○	○	○
@-30~85°C	○	○	○
@-40~85°C	○	○	○
@-40~95°C	×	○	○

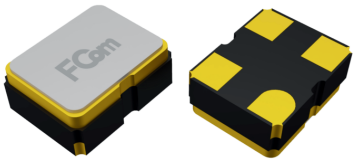
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-low Power OSC

Series FCO-2C-UP

Ultra-low Power SMD OSC 2.5×2.0 mm



Feature

- 0.9V, 1.2V, 1.5V ultra-low power supply
- Singled-end Output: CMOS
- Low Noise, 0.3ps at 12kHz~20MHz offsets
- Pb-free/RoHS Compliant

Application

- IoT, Game Console, Smartphone
- Wearable Device
- Digital Camera
- Digital Consumer Electronics

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency Range		F		1~50		MHz	
Supply Voltage		Vdd	**0.9V**	**1.2V**	**1.5V**	V	Typ.
Current Consumption	@15pF Load	Icc	1.5	2	3	mA	Max.
	1MHz ≦ Fo < 10MHz		0.9	1	1.2		Max. @No Load Condition
	10MHz ≦ Fo < 20MHz		1	1.2	1.2		
	20 MHz ≦ Fo < 50 MHz		1.2	1.5	1.5		
Transition Time: Rise/Fall Time	1MHz ≦ Fo < 10MHz	Tr/Tf	4	3	3	nSec	Max. @10% ~ 90% @ load 15pF
	10MHz ≦ Fo < 20MHz		3	3	3		
	20 MHz ≦ Fo < 50 MHz		2	2	2		
Stand by Current		Icc(ST)	-	-	100	uA	
Output Load (CMOS)		CL		15		pF	
Output Level		VoH	90% Vdd	-	-	V	Output High
		VoL	-	-	10% Vdd	V	Output Low
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable
		VIL	-	-	30% Vdd	V	Disable
Supply Voltage		Vdd	**0.9V**	**1.2V**	**1.5V**	V	Typ.
Phase Noise	1kHz offset	PN	-130	-133	-135	dBc/Hz	At VDD=1.2V, Fout=24MHz
	10kHz offset		-140	-143	-143		
	100kHz offset		-148	-150	-150		
	1MHz offset		-152	-155	-155		
Period Jitter		Pk	-	-	40	pSec	
RMS Phase Jitter		PJ	-	0.3	1.0	pSec	Integrated 12 KHz~20 MHz
Duty Cycle		TH/T	45	~	55	%	
Start-up Time		Tosc	-	-	4	mSec	
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C

Test condition

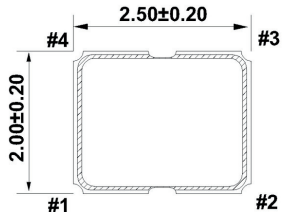
Ambient temperature: 25 ± 5°C

Relative humidity: 40% ~ 70%

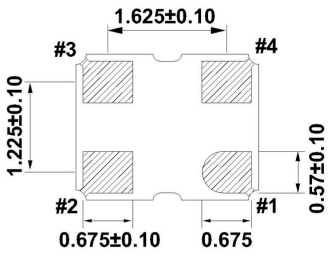
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

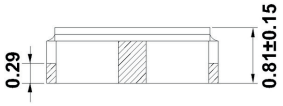
DIMENSION(mm)

TOP VIEW

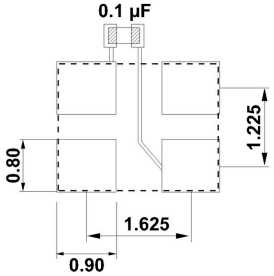


BOTTOM VIEW





PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○

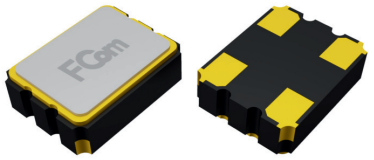
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-low Power OSC

Series FCO-3C-UP

Ultra-low Power SMD OSC 3.2×2.5 mm



Feature

- 0.9V, 1.2V, 1.5V ultra-low power supply
- Singled-end Output: CMOS
- Low Noise, 0.3ps at 12kHz~20MHz offsets
- Pb-free/RoHS Compliant

Application

- IoT, Game Console, Smartphone
- Wearable Device
- Digital Camera
- Digital Consumer Electronics

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency Range		F		1~50		MHz	
Supply Voltage		Vdd	**0.9V**	**1.2V**	**1.5V**	V	Typ.
Current Consumption	@15pF Load	Icc	1.5	2	3	mA	Max.
	1MHz ≦ Fo < 10MHz		0.9	1	1.2		Max. @No Load Condition
	10MHz ≦ Fo < 20MHz		1	1.2	1.2		
	20 MHz ≦ Fo < 50 MHz		1.2	1.5	1.5		
Transition Time: Rise/Fall Time	1MHz ≦ Fo < 10MHz	Tr/Tf	4	3	3	nSec	@10% ~ 90% @ load 15pF
	10MHz ≦ Fo < 20MHz		3	3	3		
	20 MHz ≦ Fo < 50 MHz		2	2	2		
Stand by Current		Icc(ST)	-	-	100	uA	
Output Load (CMOS)		CL		15		pF	
Output Level		VoH	90% Vdd	-	-	V	Output High
		VoL	-	-	10% Vdd	V	Output Low
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable
		VIL	-	-	30% Vdd	V	Disable
Supply Voltage		Vdd	**0.9V**	**1.2V**	**1.5V**	V	Typ.
Phase Noise	1kHz offset	PN	-130	-133	-135	dBc/Hz	At VDD=1.2V, Fout=24MHz
	10kHz offset		-140	-143	-143		
	100kHz offset		-148	-150	-150		
	1MHz offset		-152	-155	-155		
Period Jitter		Pk	-	-	40	pSec	
RMS Phase Jitter		PJ	-	0.3	1.0	pSec	Integrated 12 KHz~20 MHz
Duty Cycle		TH/T	45	~	55	%	
Start-up Time		Tosc	-	-	4	mSec	
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C

Test condition

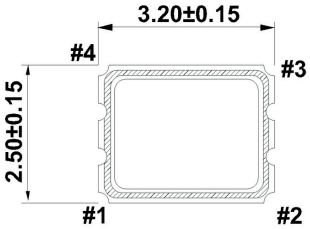
Ambient temperature: 25 ± 5°C

Relative humidity: 40% ~ 70%

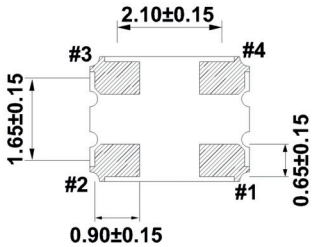
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

TOP VIEW



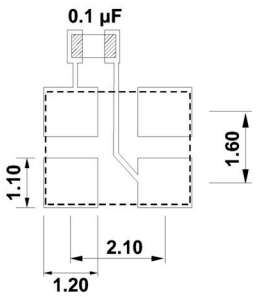
BOTTOM VIEW



SIDE VIEW



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

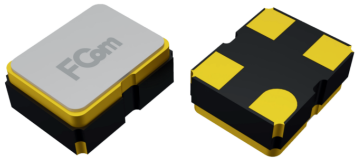
ppm / Temp.(°C)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Extended Temp. OSC

Series FCO-2C-WT



Super-wide Oper. Temp. SMD OSC 2.5×2.0 mm

Feature

- Operating Temp. Range -55°C to 125°C available
- Low jitter and phase noise
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tight symmetry (45 to 55%) available
- Tri-state enable/disable

Application

- Extreme environment applications
- Oil drilling, geothermal
- Commercial space, car/aircraft engine, aerospace & military
- Industrial instrumentation, Automotive

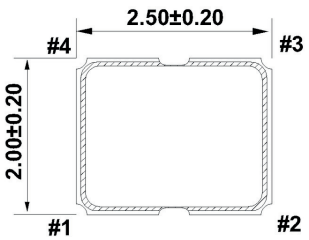
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	1.25~100			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Voltage		Vdd	1.8V	2.5V	3.3V	V	Typ.	
Current Consumption	Fo ≦80 MHz	Icc	5	8	10	mA	Max.	
	Fo > 80 MHz		8	10	15			
Transition Time	Rise/Fall Time	Tr/Tf	5	4	3	nSec	Max. @10% ~ 90%, load 15pF	
Output Load (CMOS)		CL	15			pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
Period Jitter		Pk	-	-	40	pSec		
RMS Phase Jitter		PJ	-	0.2	1.0	pSec	Integrated 12 KHz~20 MHz	
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	2	mSec		
Aging		ppm/yr	±3			ppm/yr	1st. Year at 25°C	

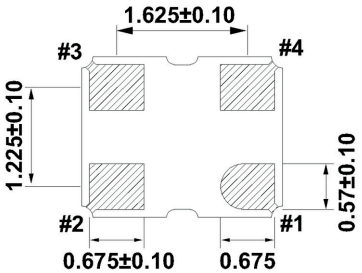
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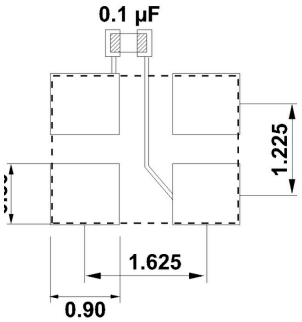
DIMENSION(mm)

TOP VIEW



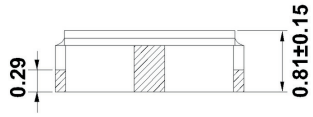
BOTTOM VIEW





Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

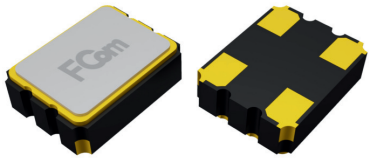
ppm / Temp.(°C)	± 30	± 40	± 50	± 100
@-40~85°C	○	○	○	○
@-40~105°C	△	○	○	○
@-40~125°C	×	×	△	○
@-55~125°C	×	×	×	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Extended Temp. OSC

Series FCO-3C-WT

Super-wide Oper. Temp. SMD OSC 3.2×2.5 mm



Feature

- Operating Temp. Range -55°C to 125°C available
- Low jitter and phase noise
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tight symmetry (45 to 55%) available
- Tri-state enable/disable

Application

- Extreme environment applications
- Oil drilling, geothermal
- Commercial space, car/aircraft engine, aerospace & military
- Industrial instrumentation, Automotive

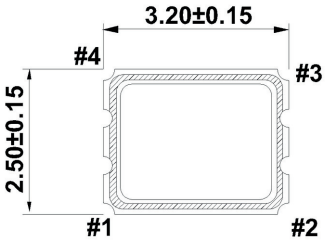
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	1.25~100			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Voltage		Vdd	1.8V	2.5V	3.3V	V	Typ.	
Current Consumption	Fo ≦80 MHz	Icc	5	8	10	mA	Max.	
	Fo > 80 MHz		8	10	15			
Transition Time	Rise/Fall Time	Tr/Tf	5	4	3	nSec	Max. @10% ~ 90%, load 15pF	
Output Load (CMOS)		CL	15			pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
Period Jitter		Pk	-	-	40	pSec		
RMS Phase Jitter		PJ	-	0.2	1.0	pSec	Integrated 12 KHz~20 MHz	
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	2	mSec		
Aging		ppm/yr	±3			ppm/yr	1st. Year at 25°C	

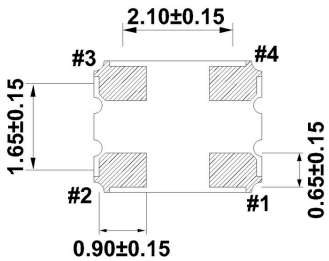
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

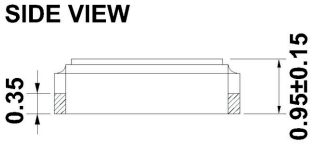
TOP VIEW



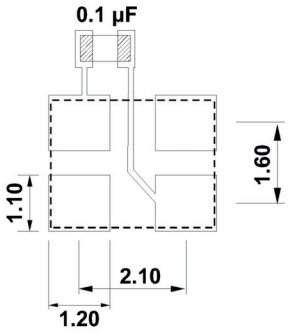
BOTTOM VIEW



SIDE VIEW



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

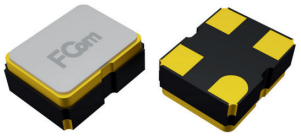
FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 30	± 40	± 50	± 100
@-40~85°C	○	○	○	○
@-40~105°C	△	○	○	○
@-40~125°C	×	×	△	○
@-55~125°C	×	×	×	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Power & Jitter FASTXO

Series FCO-6P-PJ



Programable Low Power & Jitter SMD OSC 2.0×1.6 mm

Feature

- Operation supply voltage: 1.8V, 2.5V and 3.3V
- Frequency Stability ±20ppm over -40°C to 105°C
- Low phase jitter: < 1 pS (0.8 pS, typ.) RMS
- Tri-state enable / disable mode

Application

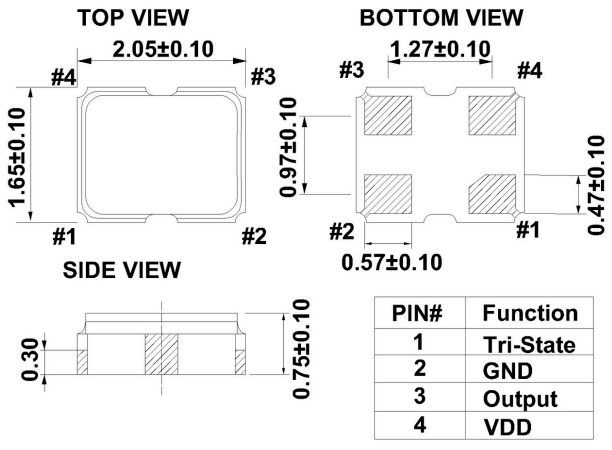
- IoT, Smartphone
- Game console
- Mobile device
- Wearable device

ELECTRICAL SPECIFICATIONS

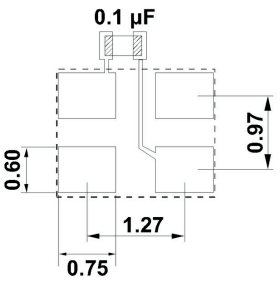
Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F		1~200		MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
VDD Sensitivity (±5%)			-2	-	2	ppm		
Supply Voltage		Vdd	**1.8V**	**2.5V**	**3.3V**	V	Typ.	
Current Consumption	1MHz ≦ Fo < 30MHz	Icc	25	27	27	mA	Max. @15pF Loading	
	30MHz ≦ Fo < 75MHz		25	27	27			
	75MHz ≦ Fo < 125MHz		25	30	30			
	125MHz ≦ Fo < 170MHz		-	35	35			
	170MHz ≦ Fo ≦ 200MHz		-	35	40			
Transition Time: Rise/Fall Time	1MHz ≦ Fo < 10MHz	Tr/Tf	4	4	3	nSec	Max. @10% ~ 90% @ load 15pF	
	10MHz ≦ Fo < 125MHz		3	3	2			
	125MHz ≦ Fo < 200MHz		-	2	2			
Stand by Current	@PD Mode	Icc(ST)	-	-	400	uA		
	@OE Mode		-	-	25	mA		
Output Load		CL		15		pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
RMS Phase Jitter	Integer Mode	PJ	-	0.8	1.5	pSec	Offset 12kHz~20MHz @50MHz	
	Fractional Mode		-	-	2.0			
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	8	mSec		
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

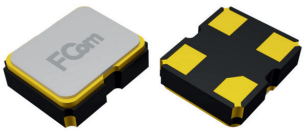
FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 15	± 20	± 25	± 50
@-20~70°C	△	○	○	○
@-40~85°C	×	△	○	○
@-40~105°C	×	△	○	○
@-40~125°C	×	×	×	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Power & Jitter FASTXO

Series FCO-2P-PJ



Programable Low Power & Jitter SMD OSC 2.5×2.0 mm

Feature

- Operation supply voltage: 1.8V, 2.5V and 3.3V
- Frequency Stability ±20ppm over -40°C to 105°C
- Low phase jitter: < 1 pS (0.8 pS, typ.) RMS
- Tri-state enable / disable mode

Application

- Computer Peripherals
- Set-top Box , HDTV
- DSC, PDA
- Wearable device

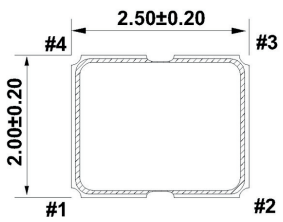
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F		1~200		MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
VDD Sensitivity (±5%)			-2	-	2	ppm		
Supply Voltage		Vdd	**1.8V**	**2.5V**	**3.3V**	V	Typ.	
Current Consumption	1MHz ≦ Fo < 30MHz	Icc	25	27	27	mA	Max. @15pF Loading	
	30MHz ≦ Fo < 75MHz		25	27	27			
	75MHz ≦ Fo < 125MHz		25	30	30			
	125MHz ≦ Fo < 170MHz		-	35	35			
	170MHz ≦ Fo ≦ 200MHz		-	35	40			
Transition Time: Rise/Fall Time	1MHz ≦ Fo < 10MHz	Tr/Tf	4	4	3	nSec	Max. @10% ~ 90% @ load 15pF	
	10MHz ≦ Fo < 125MHz		3	3	2			
	125MHz ≦ Fo < 200MHz		-	2	2			
Stand by Current	@PD Mode	Icc(ST)	-	-	400	uA		
	@OE Mode		-	-	25	mA		
Output Load		CL		15		pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
RMS Phase Jitter	Integer Mode	PJ	-	0.8	1.5	pSec	Offset 12kHz~20MHz @50MHz	
	Fractional Mode		-	-	2.0			
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	8	mSec		
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C	

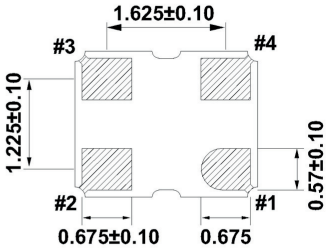
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

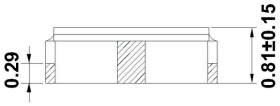
DIMENSION(mm)

TOP VIEW

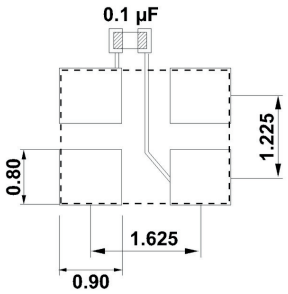


BOTTOM VIEW





PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

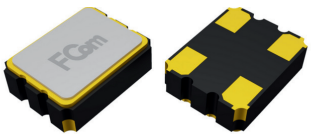
FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 15	± 20	± 25	± 50
@-20~70°C	△	○	○	○
@-40~85°C	×	△	○	○
@-40~105°C	×	△	○	○
@-40~125°C	×	×	×	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Power & Jitter FASTXO

Series FCO-3P-PJ



Programable Low Power & Jitter SMD OSC 3.2×2.5 mm

Feature

- Operation supply voltage: 1.8V, 2.5V and 3.3V
- Frequency Stability ±20ppm over -40°C to 105°C
- Low phase jitter: < 1 pS (0.8 pS, typ.) RMS
- Tri-state enable / disable mode

Application

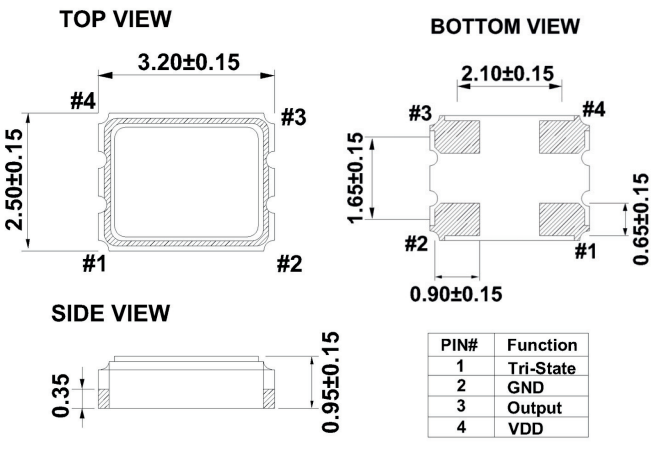
- Computer Peripherals
- Set-top Box , HDTV
- DSC, PDA
- Wearable device

ELECTRICAL SPECIFICATIONS

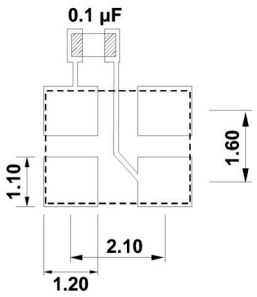
Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F		1~200		MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
VDD Sensitivity (±5%)			-2	-	2	ppm		
Supply Voltage		Vdd	**1.8V**	**2.5V**	**3.3V**	V	Typ.	
Current Consumption	1MHz ≦ Fo < 30MHz	Icc	25	27	27	mA	Max. @15pF Loading	
	30MHz ≦ Fo < 75MHz		25	27	27			
	75MHz ≦ Fo < 125MHz		25	30	30			
	125MHz ≦ Fo < 170MHz		-	35	35			
	170MHz ≦ Fo ≦ 200MHz		-	35	40			
Transition Time: Rise/Fall Time	1MHz ≦ Fo < 10MHz	Tr/Tf	4	4	3	nSec	Max. @10% ~ 90% @ load 15pF	
	10MHz ≦ Fo < 125MHz		3	3	2			
	125MHz ≦ Fo < 200MHz		-	2	2			
Stand by Current	@PD Mode	Icc(ST)	-	-	400	uA		
	@OE Mode		-	-	25	mA		
Output Load		CL		15		pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
RMS Phase Jitter	Integer Mode	PJ	-	0.8	1.5	pSec	Offset 12kHz~20MHz @50MHz	
	Fractional Mode		-	-	2.0			
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	8	mSec		
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

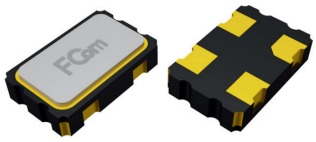
FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 15	± 20	± 25	± 50
@-20~70°C	△	○	○	○
@-40~85°C	×	△	○	○
@-40~105°C	×	△	○	○
@-40~125°C	×	×	×	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Power & Jitter FASTXO

Series FCO-5P-PJ



Programable Low Power & Jitter SMD OSC 5.0×3.2 mm

Feature

- Operation supply voltage: 1.8V, 2.5V and 3.3V
- Frequency Stability ±20ppm over -40°C to 105°C
- Low phase jitter: < 1 pS (0.8 pS, typ.) RMS
- Tri-state enable / disable mode

Application

- Mobile Phone, GPS
- WLAN, Wireless
- Fiber/10G-bit Ethernet
- Notebook, PDA, DSC

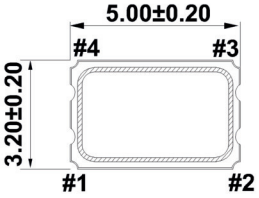
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency Range		F		1~200		MHz	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
VDD Sensitivity (±5%)			-2	-	2	ppm	
Supply Voltage		Vdd	**1.8V**	**2.5V**	**3.3V**	V	Typ.
Current Consumption	1MHz ≦ Fo < 30MHz	Icc	25	27	27	mA	Max. @15pF Loading
	30MHz ≦ Fo < 75MHz		25	27	27		
	75MHz ≦ Fo < 125MHz		25	30	30		
	125MHz ≦ Fo < 170MHz		-	35	35		
	170MHz ≦ Fo ≦ 200MHz		-	35	40		
Transition Time: Rise/Fall Time	1MHz ≦ Fo < 10MHz	Tr/Tf	4	4	3	nSec	Max. @10% ~ 90% @ load 15pF
	10MHz ≦ Fo < 125MHz		3	3	2		
	125MHz ≦ Fo < 200MHz		-	2	2		
Stand by Current	@PD Mode	Icc(ST)	-	-	400	uA	
	@OE Mode		-	-	25	mA	
Output Load		CL		15		pF	
Output Level		VoH	90% Vdd	-	-	V	Output High
		VoL	-	-	10% Vdd	V	Output Low
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable
		VIL	-	-	30% Vdd	V	Disable
RMS Phase Jitter	Integer Mode	PJ	-	0.8	1.5	pSec	Offset 12kHz~20MHz @50MHz
	Fractional Mode		-	-	2.0		
Duty Cycle		TH/T	45	~	55	%	
Start-up Time		Tosc	-	-	8	mSec	
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C

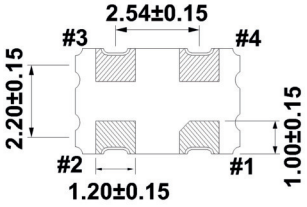
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

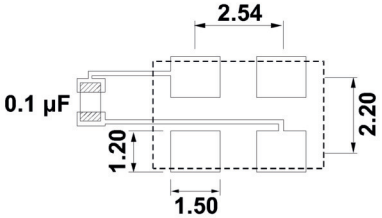
DIMENSION(mm)

TOP VIEW



BOTTOM VIEW

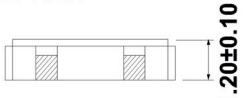




Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 15	± 20	± 25	± 50
@-20~70°C	△	○	○	○
@-40~85°C	×	△	○	○
@-40~105°C	×	△	○	○
@-40~125°C	×	×	×	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Power & Jitter FASTXO

Series FCO-7P-PJ



Programable Low Power & Jitter SMD OSC 7.0×5.0 mm

Feature

- Operation supply voltage: 1.8V, 2.5V and 3.3V
- Frequency Stability ±20ppm over -40°C to 105°C
- Low phase jitter: < 1 pS (0.8 pS, typ.) RMS
- Tri-state enable / disable mode

Application

- PC main board, VGA card
- xDSL, WLAN
- Fiber/10G-bit Ethernet
- Notebook, PDA, DSC

ELECTRICAL SPECIFICATIONS

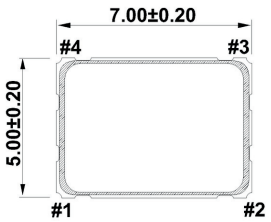
Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency Range		F		1~200		MHz	
VDD Sensitivity (±5%)			-2	-	2	ppm	
Supply Voltage		Vdd	**1.8V**	**2.5V**	**3.3V**	V	Typ.
Current Consumption	1MHz ≦ Fo < 30MHz	Icc	25	27	27	mA	Max. @15pF Loading
	30MHz ≦ Fo < 75MHz		25	27	27		
	75MHz ≦ Fo < 125MHz		25	30	30		
	125MHz ≦ Fo < 170MHz		-	35	35		
	170MHz ≦ Fo ≦ 200MHz		-	35	40		
Transition Time: Rise/Fall Time	1MHz ≦ Fo < 10MHz	Tr/Tf	4	4	3	nSec	Max. @10% ~ 90% @ load 15pF
	10MHz ≦ Fo < 125MHz		3	3	2		
	125MHz ≦ Fo < 200MHz		-	2	2		
Stand by Current	@PD Mode	Icc(ST)	-	-	400	uA	
	@OE Mode		-	-	25	mA	
Output Load		CL		15		pF	
Output Level		VoH	90% Vdd	-	-	V	Output High
		VoL	-	-	10% Vdd	V	Output Low
Tri-State Mode (Input to Pin 1)		VIH	70% Vdd	-	-	V	Enable
		VIL	-	-	30% Vdd	V	Disable
RMS Phase Jitter	Integer Mode	PJ	-	0.8	1.5	pSec	Offset 12kHz~20MHz @50MHz
	Fractional Mode		-	-	2.0		
Duty Cycle		TH/T	45	~	55	%	
Start-up Time		Tosc	-	-	8	mSec	
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C

Test condition
Ambient temperature: 25 ± 5°C
Relative humidity: 40% ~ 70%

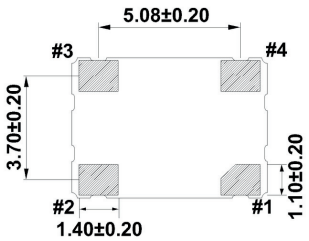
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

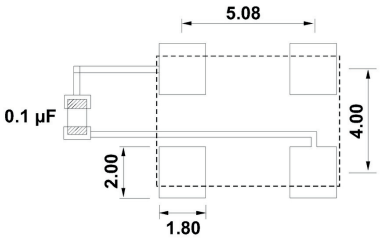
DIMENSION(mm)

TOP VIEW



BOTTOM VIEW

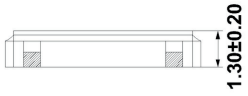




Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	Tri-State
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

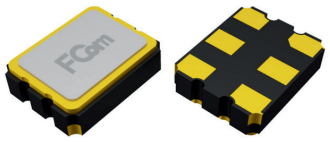
Temp.(°C) \ ppm	± 15	± 20	± 25	± 50
@-20~70°C	△	○	○	○
@-40~85°C	×	△	○	○
@-40~105°C	×	△	○	○
@-40~125°C	×	×	×	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-Low Jitter FASTXO

Series FCO-3P-UJ

Ultra-Low Phase Jitter FASTXO 3.2×2.5 mm



Feature

- Frequency support from 10MHz to 250MHz
- Very low phase jitter: <1 pS(0.8 pS, typ.) RMS
- Singled-end output : CMOS
- Tri-state enable/disable

Application

- High-Speed Gigabite Ethernet
- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access/Smart Grid

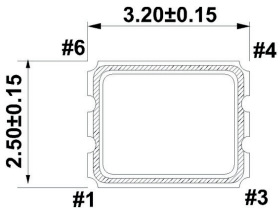
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	10~250			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Voltage		Vdd	-	2.5V	3.3V	V	Typ.	
Supply Current		Icc(ST)	-	45	50	mA		
Output Loading	10MHz~200MHz		-	15	15	pF	Max.	
	200MHz~250MHz		-	5	5			
Transition Time: Rise Time/Fall Time		Tr/Tf	-	3	3	nSec	Max. @10% ~ 90%	
Stand by Current		Icc(ST)	-	-	18	mA		
Output Load (CMOS)		CL	15			pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
Phase Noise @VDD=3.3V, fout=250MHz	1kHz offset		-	-107	-	dBc/Hz		
	10kHz offset		-	-111	-			
	100kHz offse		-	-114	-			
	1MHz offset		-	-125	-			
	20MHz offset		-	-147	-			
RMS Phase Jitter		PJ	-	0.8	1.5	pSec	Integrated 12KHz~20MHz	
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	10	mSec		
Aging		ppm/yr	±3			ppm/yr	1st. Year at 25°C	

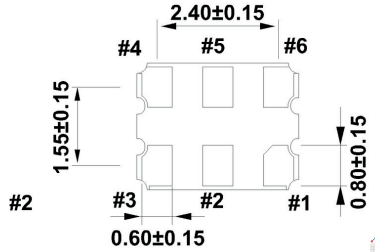
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

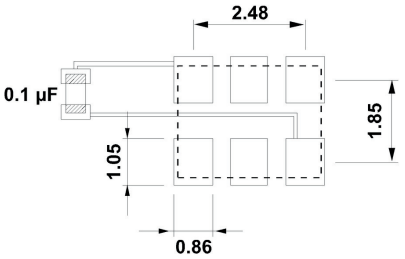
TOP VIEW



BOTTOM VIEW



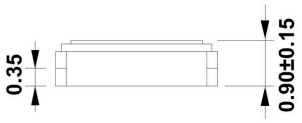
#2



Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	△

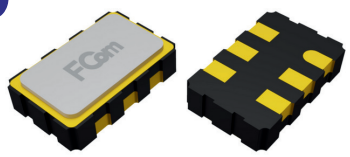
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-Low Jitter FASTXO

Series FCO-5P-UJ

Ultra-Low Phase Jitter FASTXO 5.0×3.2 mm



Feature

- Frequency support from 10MHz to 250MHz
- Very low phase jitter:<1pS(0.6pS, typ.)RMS
- Singled-end output : CMOS
- Tri-state enable/disable

Application

- Fiber Channel, Storage
- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access/Smart Grid

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency Range		F		10~250		MHz	
Standard Frequency		F(ST)		106.25, 125, 133.33, 150, 155.52, 158.25, 187.5, 212.5		MHz	
Supply Voltage		Vdd	-	2.5V	3.3V	V	Typ.
Supply Current		Icc(ST)	-	30	30	mA	
Rise Time/Fall Time		Tr/Tf	-	-	1.5	nSec	Max. @10% ~ 90%
Output Load (CMOS)		CL		15		pF	
Output Level		VoH	90% Vdd	-	-	V	Output High
		VoL	-	-	10% Vdd	V	Output Low
Tri-State Mode (Input to Pin 2 or Pin 1)		VIH	70% Vdd	-	-	V	Enable
		VIL	-	-	30% Vdd	V	Disable
Phase Noise @125 MHz	100 Hz	PN	-	-	-75	dBc/Hz	
	1 kHz		-	-	-105		
	10 kHz		-	-	-120		
RMS Phase Jitter (At Integer Mode)		PJ	-	0.6	1.0	pSec	Integrated 12KHz~20MHz
Duty Cycle		TH/T	45	~	55	%	
Start-up Time		Tosc	-	-	10	mSec	
Aging		ppm/yr		±3		ppm/yr	1st. Year at 25°C

Test condition

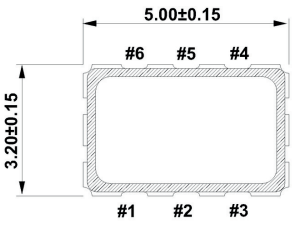
Ambient temperature: 25 ± 5°C

Relative humidity: 40% ~ 70%

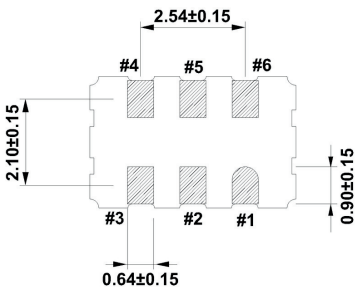
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

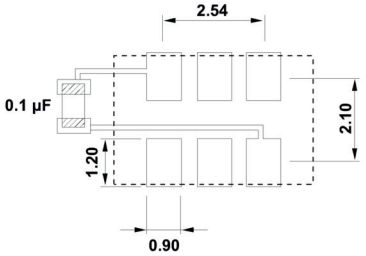
DIMENSION(mm)

TOP VIEW



BOTTOM VIEW

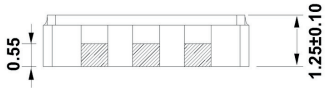




Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○

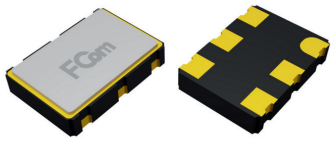
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-Low Jitter FASTXO

Series FCO-7P-UJ

Ultra-Low Phase Jitter FASTXO 7.0×5.0 mm



Feature

- Frequency support from 10MHz to 250MHz
- Very low phase jitter: <1 pS(0.6 pS, typ.) RMS
- Singled-end output : CMOS
- Tri-state enable/disable

Application

- High-Speed Gigabite Ethernet
- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access/Smart Grid
- Fiber Channel, Storage Area Network

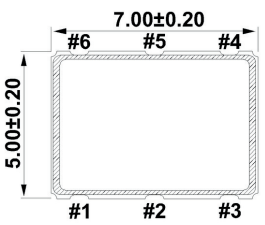
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes	
Frequency Range		F	10~250			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	106.25, 125, 133.33, 150, 155.52, 156.25, 187.5, 212.5			MHz		
Supply Voltage		Vdd	-	2.5V	3.3V	V	Typ.	
Supply Current		Icc(ST)	-	-	30	mA		
Rise Time/Fall Time		Tr/Tf	-	-	1.5	nSec	Max. @10% ~ 90%	
Output Load (CMOS)		CL	15			pF		
Output Level		VoH	90% Vdd	-	-	V	Output High	
		VoL	-	-	10% Vdd	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	-	V	Enable	
		VIL	-	-	30% Vdd	V	Disable	
Phase Noise @125 MHz	100 Hz	PN	-	-	-75	dBc/Hz		
	1 kHz		-	-	-105			
	10 kHz		-	-	-120			
RMS Phase Jitter (At Integer Mode)		PJ	-	0.6	1.0	pSec	Integrated 12KHz~20MHz	
Duty Cycle		TH/T	45	~	55	%		
Start-up Time		Tosc	-	-	10	mSec		
Aging		ppm/yr	±3			ppm/yr	1st. Year at 25°C	

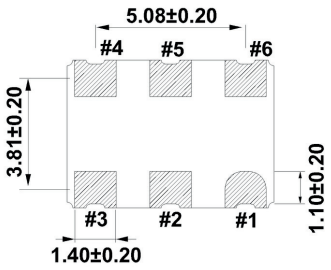
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

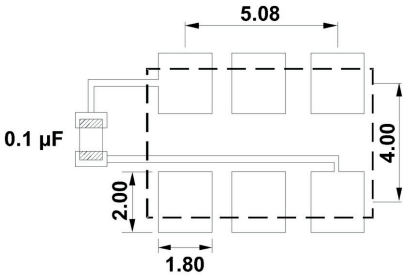
DIMENSION(mm)

TOP VIEW



BOTTOM VIEW

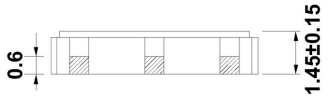




Solder Pad Layout(mm)

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

FREQ. STABILITY vs. TEMP. RANGE

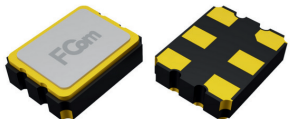
Temp.(°C) \ ppm	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	△

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output OSC

Series FCO-2L



SMD Differential Output Crystal Oscillator 2.5×2.0 mm

Feature

- Frequency support up to 220MHz
- Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

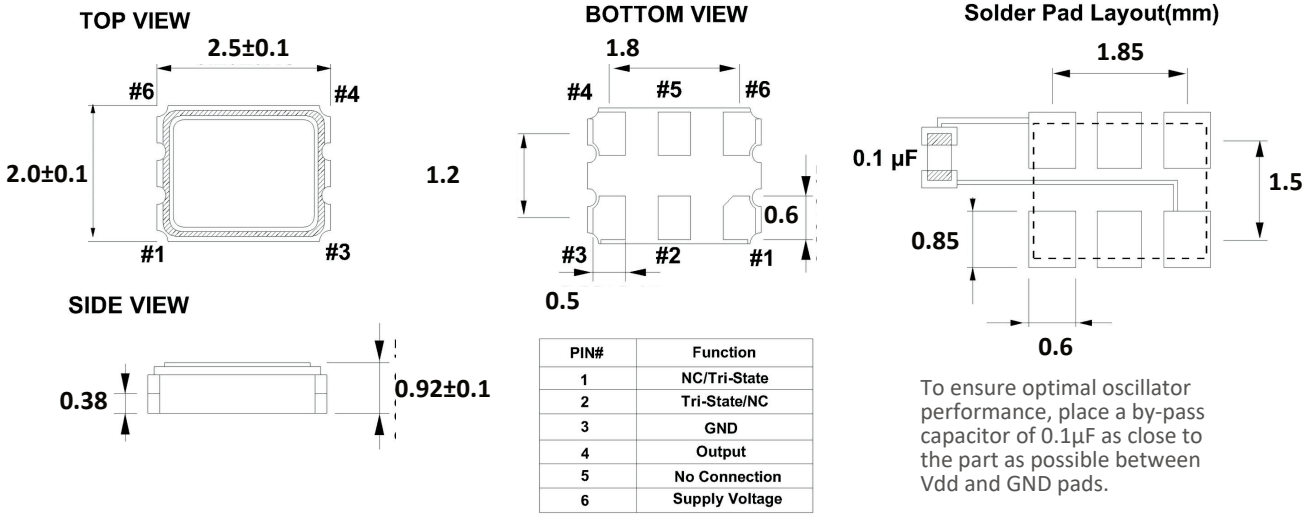
- 10Gbit Ethernet, Fiber Channel
- Storage Area Network, SONET
- Enterprise Servers, Telecom
- Reference Clocks for ADC and DAC

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	13.5~220				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	100, 125, 156.25				MHz		
Supply Current		Icc	-	55	-	55	mA		
Transition Time	Rise Time	Tr	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	0.6	-	0.6			
Output Level		VoH	2.215	2.42	1.415	1.64	V	Output High	
		VoL	1.49	1.68	0.69	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz			-143		-145				
100 kHz			-151	-	-154				
1 MHz			-155	-	-155				
RMS Phase Jitter	13.5MHz~80MHz	PJ	-	1	-	1	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
	80MHz~220MHz		-	0.3	-	0.3			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	30	-	30	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

Parameters	Symbol	LVDS						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	13.5~220						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125, 156.25						MHz		
Supply Current	Icc	-	35	-	30	-	20	mA		
Transition Time	Tr	-	0.3	-	0.3	-	0.5	nSec	Measured from 20% ~ 80%	
	Tf	-	0.3	-	0.3	-	0.5			
Output Level	Vdiff	0.24	0.45	0.24	0.45	0.24	0.45		VOD, OUT-OUTN	
	VoH	-	1.6	-	1.6	-	1.6	V		
	VoL	0.9	-	0.9	-	0.9	-	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						µA	Max	
Output Load	RL	100Ω (Between OUT & OUTN)						Ω		
Start-up Time	Tosc	-	5	-	5	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

Parameters	Symbol	HCSL						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~135						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125						MHz		
Supply Current	Icc	-	42	-	42	-	30	mA		
Transition Time	Tr	-	0.6	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Tf	-	0.6	-	0.6	-	0.6			
Output Level	VoH	0.6	0.9	0.6	0.9	0.55	1.0	V		
	VoL	-0.15	0.15	-0.15	0.15	-0.15	0.15	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						µA	Max	
Output Load	RL	50 to GND						Ω		
Start-up Time	Tosc	-	10	-	10	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

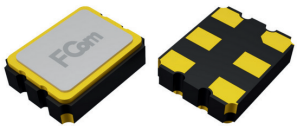
Temp.(°C) \ ppm	± 25	± 50
@-20~70°C	○	○
@-40~85°C	○	○
@-40~105°C	×	○
@-40~125°C	×	△

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output OSC

Series FCO-3L



SMD Differential Output Crystal Oscillator 3.2×2.5 mm

Feature

- Output Frequency up to 220MHz
- Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

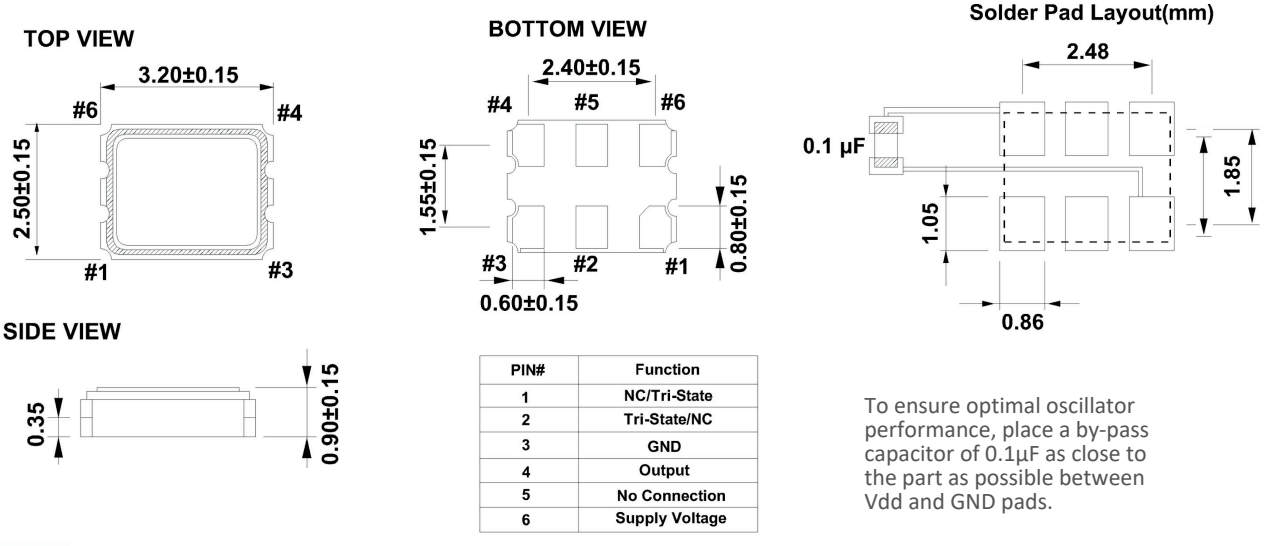
- 10Gbit Ethernet, Fiber Channel
- Storage Area Network, SONET
- Enterprise Servers, Telecom
- Reference Clocks for ADC and DAC

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	13.5~220				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	100, 125, 156.25				MHz		
Supply Current		Icc	-	55	-	55	mA		
Transition Time	Rise Time	Tr	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	0.6	-	0.6			
Output Level		VoH	2.215	2.42	1.415	1.64	V	Output High	
		VoL	1.49	1.68	0.69	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz			-143		-145				
100 kHz			-151	-	-154				
1 MHz			-155	-	-155				
RMS Phase Jitter	13.5MHz~80MHz	PJ	-	1	-	1	pSec	Integrated 12 kHz~20MHz @ 3.3V	
	80MHz~220MHz		-	0.3	-	0.3			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	30	-	30	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

Parameters	Symbol	LVDS						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	13.5~220						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125, 156.25						MHz		
Supply Current	Icc	-	35	-	30	-	20	mA		
Transition Time	Tr	-	0.3	-	0.3	-	0.5	nSec	Measured from 20% ~ 80%	
	Tf	-	0.3	-	0.3	-	0.5			
Output Level	Vdiff	0.24	0.45	0.24	0.45	0.24	0.45		VOD, OUT-OUTN	
	VoH	-	1.6	-	1.6	-	1.6	V		
	VoL	0.9	-	0.9	-	0.9	-	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						µA	Max	
Output Load	RL	100Ω (Between OUT & OUTN)						Ω		
Start-up Time	Tosc	-	5	-	5	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

Parameters	Symbol	HCSL						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~135						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125						MHz		
Supply Current	Icc	-	42	-	42	-	30	mA		
Transition Time	Tr	-	0.6	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Tf	-	0.6	-	0.6	-	0.6			
Output Level	VoH	0.6	0.9	0.6	0.9	0.55	1.0	V		
	VoL	-0.15	0.15	-0.15	0.15	-0.15	0.15	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						µA	Max	
Output Load	RL	50 to GND						Ω		
Start-up Time	Tosc	-	10	-	10	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 25	± 50
@-20~70°C	○	○
@-40~85°C	○	○
@-40~105°C	×	○
@-40~125°C	×	△

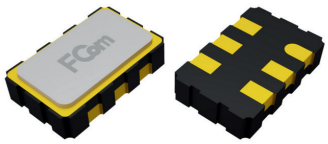
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output OSC

Series FCO-5L

SMD Differential Output Crystal Oscillator 5.0×3.2 mm



Feature

- Frequency support up to 220MHz
- Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

- 10Gbit Ethernet, Fiber Channel
- Storage Area Network, SONET
- Enterprise Servers, Telecom
- Reference Clocks for ADC and DAC

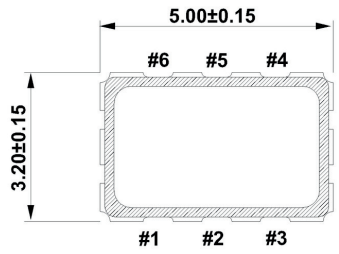
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	13.5~220				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	100, 125, 156.25				MHz		
Supply Current		Icc	-	55	-	55	mA		
Transition Time	Rise Time	Tr	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	0.6	-	0.6			
Output Level		VoH	2.215	2.42	1.415	1.64	V	Output High	
		VoL	1.49	1.68	0.69	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz			-143		-145				
100 kHz			-151	-	-154				
1 MHz			-155	-	-155				
RMS Phase Jitter	13.5MHz~80MHz	PJ	-	1	-	1	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
	80MHz~220MHz		-	0.3	-	0.3			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	10	-	10	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

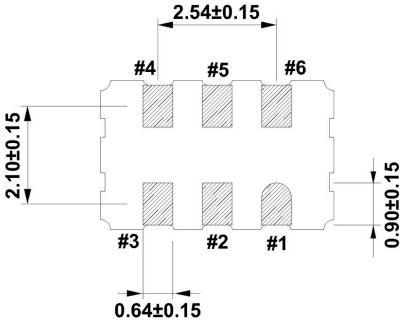
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

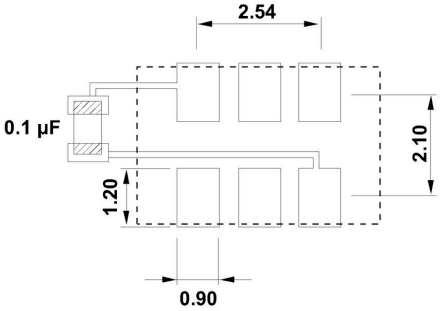
TOP VIEW



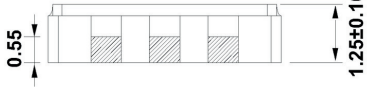
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

Parameters	Symbol	LVDS						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	13.5~220						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125, 156.25						MHz		
Supply Current	Icc	-	35	-	30	-	20	mA		
Transition Time	Tr	-	0.3	-	0.3	-	0.5	nSec	Measured from 20% ~ 80%	
	Tf	-	0.3	-	0.3	-	0.5			
Output Level	Vdiff	0.24	0.45	0.24	0.45	0.24	0.45		VOD, OUT-OUTN	
	VoH	-	1.6	-	1.6	-	1.6	V		
	VoL	0.9	-	0.9	-	0.9	-	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						µA	Max	
Output Load	RL	100Ω (Between OUT & OUTN)						Ω		
Start-up Time	Tosc	-	5	-	5	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

Parameters	Symbol	HCSL						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~135						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125						MHz		
Supply Current	Icc	-	42	-	42	-	30	mA		
Transition Time	Tr	-	0.6	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Tf	-	0.6	-	0.6	-	0.6			
Output Level	VoH	0.6	0.9	0.6	0.9	0.55	1.0	V		
	VoL	-0.15	0.15	-0.15	0.15	-0.15	0.15	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						µA	Max	
Output Load	RL	50 to GND						Ω		
Start-up Time	Tosc	-	10	-	10	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

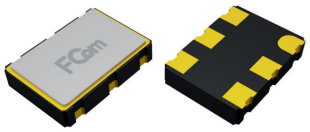
Temp.(°C) \ ppm	± 25	± 50
@-20~70°C	○	○
@-40~85°C	○	○
@-40~105°C	×	○
@-40~125°C	×	△

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output OSC

Series FCO-7L



SMD Differential Output Crystal Oscillator 7.0×5.0 mm

Feature

- Frequency support up to 220MHz
- Very low phase jitter: 0.15 pS, typ. RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

- 10Gbit Ethernet, Fiber Channel
- Storage Area Network, SONET
- Enterprise Servers, Telecom
- Reference Clocks for ADC and DAC

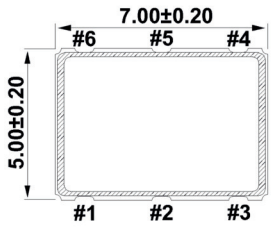
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	13.5~220				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	100, 125, 156.25				MHz		
Supply Current		Icc	-	55	-	55	mA		
Transition Time	Rise Time	Tr	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	0.6	-	0.6			
Output Level		VoH	2.215	2.42	1.415	1.64	V	Output High	
		VoL	1.49	1.68	0.69	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz			-143		-145				
100 kHz			-151	-	-154				
1 MHz			-155	-	-155				
RMS Phase Jitter	13.5MHz~80MHz	PJ	-	1	-	1	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
	80MHz~220MHz		-	0.3	-	0.3			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	10	-	10	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

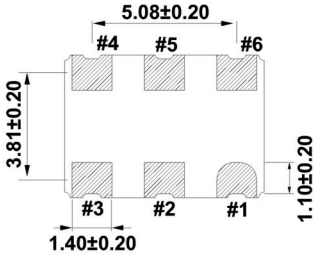
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

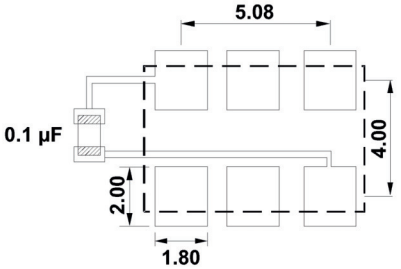
TOP VIEW



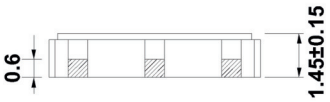
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

Parameters	Symbol	LVDS						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	13.5~220						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125, 156.25						MHz		
Supply Current	Icc	-	35	-	30	-	20	mA		
Transition Time	Tr	-	0.3	-	0.3	-	0.5	nSec	Measured from 20% ~ 80%	
	Tf	-	0.3	-	0.3	-	0.5			
Output Level	Vdiff	0.24	0.45	0.24	0.45	0.24	0.45		VOD, OUT-OUTN	
	VoH	-	1.6	-	1.6	-	1.6	V		
	VoL	0.9	-	0.9	-	0.9	-	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						µA	Max	
Output Load	RL	100Ω (Between OUT & OUTN)						Ω		
Start-up Time	Tosc	-	5	-	5	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

Parameters	Symbol	HCSL						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~135						MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency	F(ST)	100, 125						MHz		
Supply Current	Icc	-	42	-	42	-	30	mA		
Transition Time	Tr	-	0.6	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Tf	-	0.6	-	0.6	-	0.6			
Output Level	VoH	0.6	0.9	0.6	0.9	0.55	1.0	V		
	VoL	-0.15	0.15	-0.15	0.15	-0.15	0.15	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-145		-145		-142				
100 kHz		-153	-	-153		-150				
1 MHz		-155	-	-155		-153				
RMS Phase Jitter	PJ	-	0.3	-	0.3	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	10						µA	Max	
Output Load	RL	50 to GND						Ω		
Start-up Time	Tosc	-	10	-	10	-	10	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 25	± 50
@-20~70°C	○	○
@-40~85°C	○	○
@-40~105°C	×	○
@-40~125°C	×	△

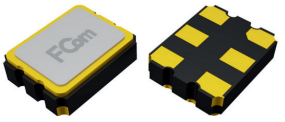
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-Low Jitter Differential OSC

Series FCO-2L-UJ

Ultra Low Jitter Differential Output OSC 2.5×2.0 mm



Feature

- Frequency support up to 220MHz
- Very low phase jitter: 50 fs, typ. RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

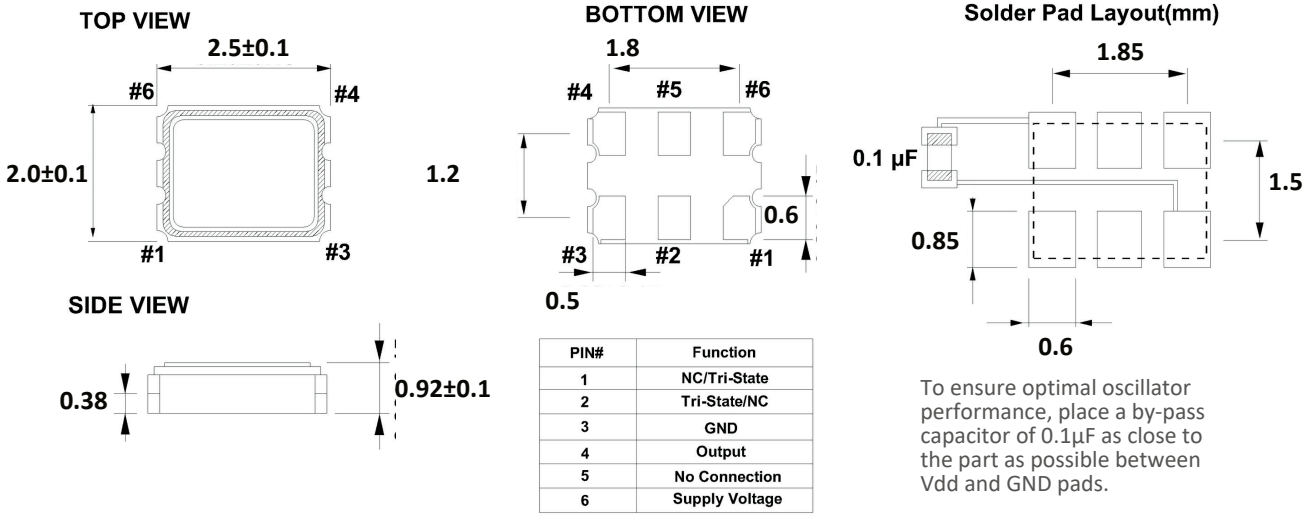
- 40Gbit/100Gbit Ethernet, MAN
- SONET, Fiber Channel
- Test Instrumentation

ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	100~220				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	100, 125, 156.25				MHz		
Supply Current		Icc	-	65	-	65	mA		
Transition Time	Rise Time	Tr	-	0.4	-	0.4	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	0.4	-	0.4			
Output Level		VoH	2.215	2.42	1.415	1.64	V	Output High	
		VoL	1.49	1.68	0.69	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz			-150		-150				
100 kHz			-155	-	-155				
1 MHz			-160	-	-160				
RMS Phase Jitter	@156.25MHz	PJ	-	0.1	-	0.1	pSec	Integrated 12 kHz ~20 MHz @ 3.3V	
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	30	-	30	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	5				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

Parameters	Symbol	LVDS						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~175						MHz		
Standard Frequency	F(ST)	100, 125, 156.25						MHz		
Supply Current	Icc	-	35	-	35	-	25	mA		
Transition Time	Tr	-	0.3	-	0.3	-	0.4	nSec	Measured from 20% ~ 80%	
	Tf	-	0.3	-	0.3	-	0.4			
Output Level	Vdiff	0.24	0.45	0.24	0.45	0.24	0.45		VOD, OUT-OUTN	
	VoH	-	1.6	-	1.6	-	1.6	V		
	VoL	0.9	-	0.9	-	0.9	-	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-150		-150		-150				
100 kHz		-155	-	-155		-155				
1 MHz		-160	-	-160		-160				
RMS Phase Jitter @ 156.25MHz	PJ	-	0.1	-	0.1	-	0.1	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	30						µA	Max	
Output Load	RL	100Ω (Between OUT & OUTN)						Ω		
Start-up Time	Tosc	-	5	-	5	-	5	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

Parameters	Symbol	HCSL						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~135						MHz		
Standard Frequency	F(ST)	100, 125						MHz		
Supply Current	Icc	-	46	-	46	-	46	mA		
Transition Time	Tr	-	0.6	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Tf	-	0.6	-	0.6	-	0.6			
Output Level	VoH	0.6	0.9	0.6	0.9	0.5	1.0	V		
	VoL	-0.15	0.15	-0.15	0.15	-0.15	0.15	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-150		-150		-150				
100 kHz		-155	-	-155		-155				
1 MHz		-160	-	-160		-160				
RMS Phase Jitter @ 156.25MHz	PJ	-	0.1	-	0.1	-	0.1	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	30						µA	Max	
Output Load	RL	50 to GND						Ω		
Start-up Time	Tosc	-	5	-	5	-	5	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	△	○	○
@-40~105°C	×	×	○
@-40~125°C	×	×	△

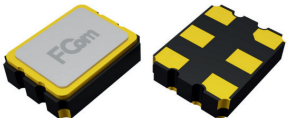
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-Low Jitter Differential OSC

Series FCO-3L-UJ

Ultra Low Jitter Differential Output OSC 3.2×2.5 mm



Feature

- Frequency support up to 220MHz
- Very low phase jitter: 0.05pS, typ.
  RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

- 40Gbit/100Gbit Ethernet, MAN
- SONET, Fiber Channel
- Test Instrumentation

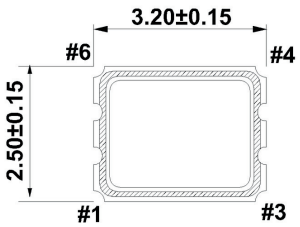
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	100~220				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	100, 125, 156.25				MHz		
Supply Current		Icc	-	65	-	65	mA		
Transition Time	Rise Time	Tr	-	0.4	-	0.4	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	0.4	-	0.4			
Output Level		VoH	2.215	2.42	1.415	1.64	V	Output High	
		VoL	1.49	1.68	0.69	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz			-150		-150				
100 kHz			-155	-	-155				
1 MHz			-160	-	-160				
RMS Phase Jitter	@156.25MHz	PJ	-	0.1	-	0.1	pSec	Integrated 12 kHz ~20 MHz @ 3.3V	
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	30	-	30	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	5				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

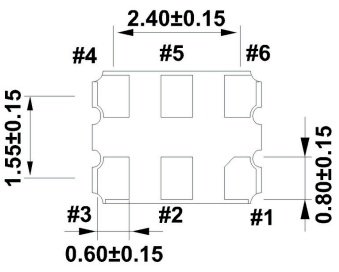
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

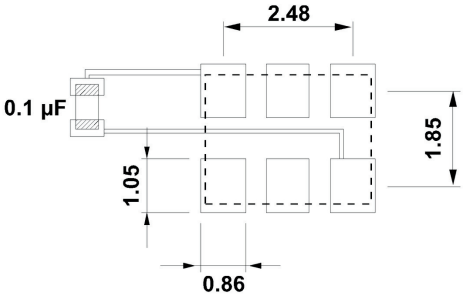
TOP VIEW



BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

Parameters	Symbol	LVDS						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~175						MHz		
Standard Frequency	F(ST)	100, 125, 156.25						MHz		
Supply Current	Icc	-	35	-	35	-	25	mA		
Transition Time	Tr	-	0.3	-	0.3	-	0.4	nSec	Measured from 20% ~ 80%	
	Tf	-	0.3	-	0.3	-	0.4			
Output Level	Vdiff	0.24	0.45	0.24	0.45	0.24	0.45		VOD, OUT-OUTN	
	VoH	-	1.6	-	1.6	-	1.6	V		
	VoL	0.9	-	0.9	-	0.9	-	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-150		-150		-150				
100 kHz		-155	-	-155		-155				
1 MHz		-160	-	-160		-160				
RMS Phase Jitter @156.25MHz	PJ	-	0.1	-	0.1	-	0.3	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	30						µA	Max	
Output Load	RL	100Ω (Between OUT & OUTN)						Ω		
Start-up Time	Tosc	-	5	-	5	-	5	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

Parameters	Symbol	HCSL						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~135						MHz		
Standard Frequency	F(ST)	100, 125						MHz		
Supply Current	Icc	-	46	-	46	-	46	mA		
Transition Time	Tr	-	0.6	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Tf	-	0.6	-	0.6	-	0.6			
Output Level	VoH	0.6	0.9	0.6	0.9	0.5	1.0	V		
	VoL	-0.15	0.15	-0.15	0.15	-0.15	0.15	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-150		-150		-150				
100 kHz		-155	-	-155		-155				
1 MHz		-160	-	-160		-160				
RMS Phase Jitter	PJ	-	0.1	-	0.1	-	0.1	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	30						µA	Max	
Output Load	RL	50 to GND						Ω		
Start-up Time	Tosc	-	5	-	5	-	5	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	△	○	○
@-40~105°C	×	×	○
@-40~125°C	×	×	△

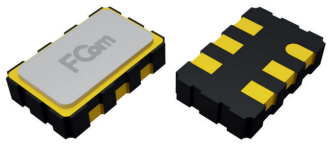
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-Low Jitter Differential OSC

Series FCO-5L-UJ

Ultra Low Jitter Differential Output OSC 5.0×3.2 mm



Feature

- Frequency support up to 220MHz
- Very low phase jitter: 0.05 pS, typ.
  RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

- 40Gbit/100Gbit Ethernet, MAN
- SONET, Fiber Channel
- Test Instrumentation

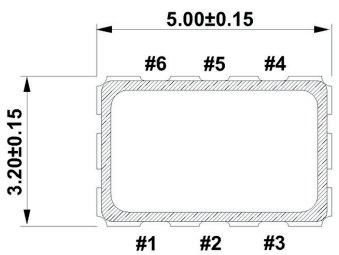
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	100~220				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	100, 125, 156.25				MHz		
Supply Current		Icc	-	65	-	65	mA		
Transition Time	Rise Time	Tr	-	0.4	-	0.4	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	0.4	-	0.4			
Output Level		VoH	2.215	2.42	1.415	1.64	V	Output High	
		VoL	1.49	1.68	0.69	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz			-150		-150				
100 kHz			-155	-	-155				
1 MHz			-160	-	-160				
RMS Phase Jitter	@156.25MHz	PJ	-	0.1	-	0.1	pSec	Integrated 12 kHz ~20 MHz @ 3.3V	
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	30	-	30	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	5				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

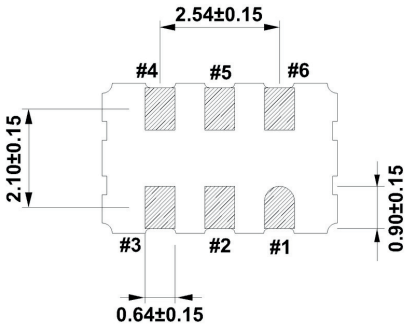
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

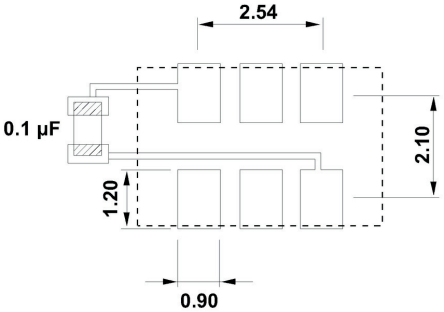
TOP VIEW



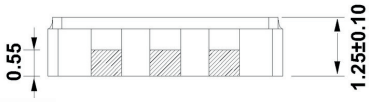
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

Parameters	Symbol	LVDS						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~175						MHz		
Standard Frequency	F(ST)	100, 125, 156.25						MHz		
Supply Current	Icc	-	35	-	35	-	25	mA		
Transition Time	Tr	-	0.3	-	0.3	-	0.4	nSec	Measured from 20% ~ 80%	
	Tf	-	0.3	-	0.3	-	0.4			
Output Level	Vdiff	0.24	0.45	0.24	0.45	0.24	0.45		VOD, OUT-OUTN	
	VoH	-	1.6	-	1.6	-	1.6	V		
	VoL	0.9	-	0.9	-	0.9	-	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-150		-150		-150				
100 kHz		-155	-	-155		-155				
1 MHz		-160	-	-160		-160				
RMS Phase Jitter @ 156.25MHz	PJ	-	0.1	-	0.1	-	0.1	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	30						µA	Max	
Output Load	RL	100Ω (Between OUT & OUTN)						Ω		
Start-up Time	Tosc	-	5	-	5	-	5	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

Parameters	Symbol	HCSL						Units	Notes	
		3.3V		2.5V		1.8V				
		Min.	Max.	Min.	Max.	Min.	Max.			
Frequency Range	F	100~135						MHz		
Standard Frequency	F(ST)	100, 125						MHz		
Supply Current	Icc	-	46	-	46	-	46	mA		
Transition Time	Tr	-	0.6	-	0.6	-	0.6	nSec	Measured from 20% ~ 80%	
	Tf	-	0.6	-	0.6	-	0.6			
Output Level	VoH	0.6	0.9	0.6	0.9	0.5	1.0	V		
	VoL	-0.15	0.15	-0.15	0.15	-0.15	0.15	V		
Tri-State Mode	VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable	Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
	VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
10 kHz		-150		-150		-150				
100 kHz		-155	-	-155		-155				
1 MHz		-160	-	-160		-160				
RMS Phase Jitter @ 156.25MHz	PJ	-	0.1	-	0.1	-	0.1	pSec	Integrated 12 kHz~20 MHz @ 3.3V	
Duty Cycle	TH/T	45 ~ 55						%		
Stand by Current	Icc(ST)	30						µA	Max	
Output Load	RL	50 to GND						Ω		
Start-up Time	Tosc	-	5	-	5	-	5	mSec		
Aging	ppm/yr	±3						ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 20	± 25	± 50
@-20~70°C	○	○	○
@-40~85°C	△	○	○
@-40~105°C	×	×	○
@-40~125°C	×	×	△

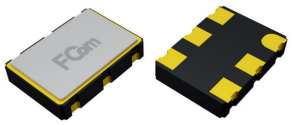
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Ultra-Low Jitter Differential OSC

Series FCO-7L-UJ

Ultra Low Jitter Differential Output OSC 7.0×5.0 mm



Feature

- Frequency support up to 220MHz
- Very low phase jitter: < 100 fs RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

- 40Gbit/100Gbit Ethernet, MAN
- SONET, Fiber Channel
- WLAN/WiMAX, xDSL
- Test Instrumentation

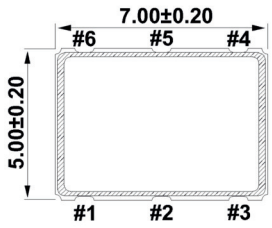
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	70~170		100~160		MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	100,125,155.52,156.25				MHz		
Supply Current		Icc	-	75	-	75	mA		
Transition Time	Rise/Fall Time	Tr/Tf	-	1.0	-	1.0	nSec	From 20% ~ 80%	
Output Level		VoH	2.275	-	1.475	-	V	Output High	
		VoL	-	1.68	-	1.095	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	100 Hz	PN	-100				dBc/Hz	@ 156.25MHz	
	1 kHz		-130						
	10 kHz		-150						
RMS Phase Jitter	@156.25MHz	PJ	< 100 fs RMS Integrated 12 kHz ~ 20 MHz				pSec		
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	30	-	30	μA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

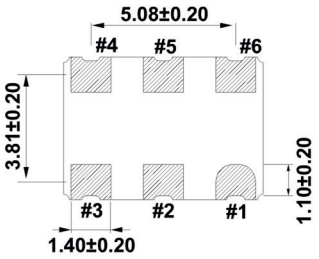
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

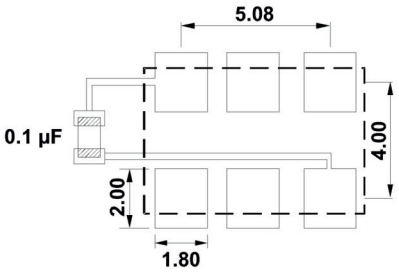
TOP VIEW



BOTTOM VIEW

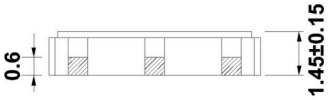


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

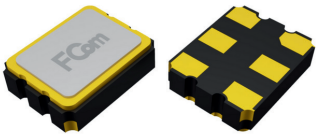
FREQ. STABILITY vs. TEMP. RANGE

Temp.(°C) \ ppm	± 25	± 50
@-10~60°C	△	○
@-20~70°C	△	○
@-40~85°C	×	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output FASTXO

Series FCO-3L-PG



SMD Differential Output FASTXO 3.2×2.5 mm

Feature

- Frequency support up to 1.5GHz
- Low phase jitter: 0.6 pS, typ. RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access, Smart Grid
- High-Speed Gigabite Ethernet
- Storages Area Network, SONET, Fiber Channel

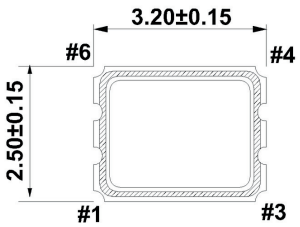
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Current		Icc	-	50	-	45	mA		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	1.0	-	1.0			
Output Level		VoH	2.27	2.7	1.47	1.9	V	Output High	
		VoL	1.45	1.7	0.65	0.9	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=250MHz	
1 kHz			-107	-	-107	-			
10 kHz			-111	-	-111	-			
100 kHz			-114	-	-114	-			
1 MHz			-125	-	-125	-			
20 MHz			-147	-	-147	-			
RMS Phase Jitterr (12 kHz~20 MHz)	Fractional Mode	PJ	0.8	1.5	0.8	1.5	pSec		
	Integer Mode		0.6	1.2	0.6	1.2			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	18	-	18	mA		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

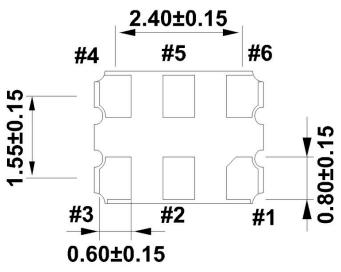
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

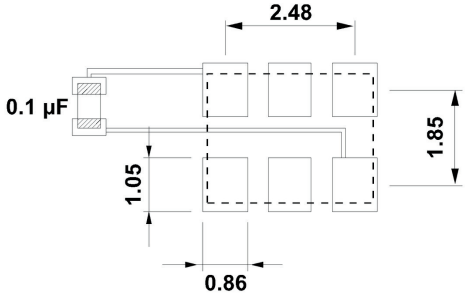
TOP VIEW



BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

Parameters		Symbol	LVDS				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Current		Icc	-	45	-	35	mA		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	1.0	-	1.0			
Output Level		VoH	-	1.6	-	1.6	V	Output High	
		VoL	0.9	-	0.9	-	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	**Typ.**	**Max.**	**Typ.**	**Max.**	dBc/Hz	At VDD=3.3V, fout=250MHz	
1 kHz			-107	-	-107	-			
10 kHz			-111	-	-111	-			
100 kHz			-114	-	-114	-			
1 MHz			-125	-	-125	-			
20 MHz			-147	-	-147	-			
RMS Phase Jitterr (12 kHz~20 MHz)	Fractional Mode	PJ	0.8	1.5	0.8	1.5	pSec		
	Integer Mode		0.6	1.2	0.6	1.2			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	18	-	18	mA		
Output Load		RL	100Ω				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

FREQ. STABILITY vs. TEMP. RANGE

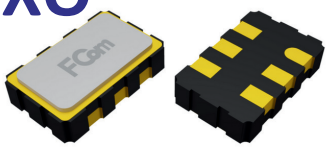
ppm / Temp.(°C)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	○

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output FASTXO

Series FCO-5L-PG



SMD Differential Output FASTXO 5.0×3.2 mm

Feature

- Industry Standard 5.0 x 3.2 x 1.25
- Very low phase jitter: 0.6 pS, typ. RMS from 12kHz - 20MHz
- Fast delivery
- Tri-state enable/disable

Application

- Storage Area Network, SONET
- High-Speed Gigabit Ethernet, Fiber Channel
- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access, Smart Grid

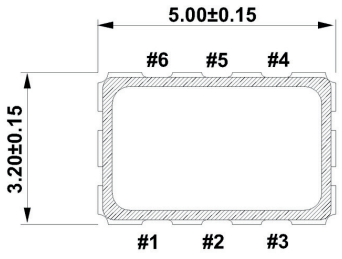
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	106.25, 125, 133.33, 150, 155.52, 156.25, 187.5, 212.5, 312.5, 622.08				MHz		
Supply Current		Icc	-	50	-	50	mA		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	1.0	-	1.0			
Output Level		VoH	2.275	-	1.475	-	V	Output High	
		VoL	-	1.68	-	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
100 Hz			-	-85	-	-85			
1 kHz			-	-105	-	-105			
10 kHz			-	-115	-	-115			
RMS Phase JitterIntegrated 12 kHz~20MHz		PJ	-	1.2	-	1.2	pSec		
Duty Cycle		TH/T	45 ~ 55				%		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

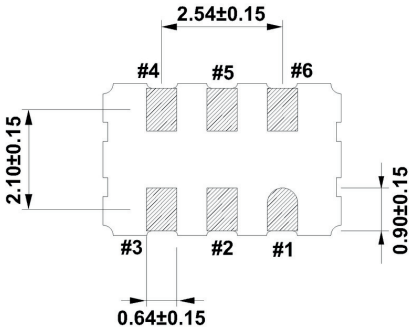
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

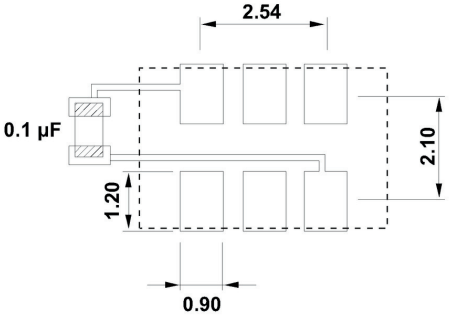
TOP VIEW



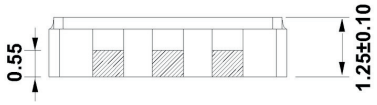
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

Parameters		Symbol	LVDS				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	106.25, 125, 133.33, 150, 155.52, 156.25, 187.5, 212.5, 312.5, 622.08				MHz		
Supply Current		Icc	-	50	-	50	mA		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	1.0	-	1.0			
Output Level		VoH	-	1.6	-	1.6	V	Output High	
		VoL	0.9	-	0.9	-	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=156.25MHz	
100 Hz			-	-85	-	-85			
1 kHz			-	-105	-	-105			
10 kHz			-	-115	-	-115			
RMS Phase JitterIntegrated 12 kHz~20MHz		PJ	-	1.2	-	1.2	pSec		
Duty Cycle		TH/T	45 ~ 55				%		
Output Load		RL	100Ω				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

FREQ. STABILITY vs. TEMP. RANGE

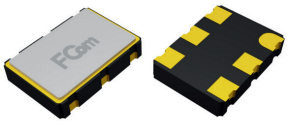
ppm / Temp.(°C)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output FASTXO

Series FCO-7L-PG



SMD Differential Output FASTXO 7.0×5.0 mm

Feature

- Frequency support up to 1.5GHz
- Low phase jitter: 0.6 pS, typ. RMS from 12kHz - 20MHz
- Tri-state enable/disable

Application

- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access, Smart Grid
- High-Speed Gigabite Ethernet
- Storages Area Network, SONET

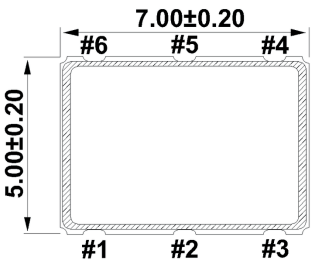
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	106.25, 125, 133.33, 150, 155.52, 156.25, 187.5, 212.5, 312.5, 622.08				MHz		
Supply Current		Icc	-	50	-	50	mA		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	1.0	-	1.0			
Output Level		VoH	2.275	-	1.475	-	V	Output High	
		VoL	-	1.68	-	0.88	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	100 Hz	PN	-94		-94		dBc/Hz	At VDD=3.3V, fout=156.25MHz	
	1 kHz		-113		-113				
	10 kHz		-122		-122				
RMS Phase JitterIntegrated 12 kHz~20MHz		PJ	-	1.2	-	1.2	pSec		
Duty Cycle		TH/T	45 ~ 55				%		
Output Load		RL	50Ω, VDD – 2V				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

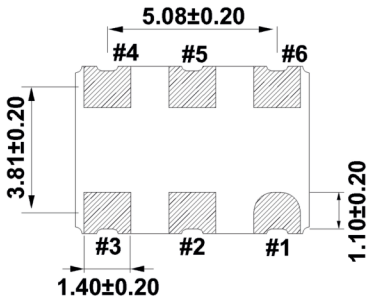
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

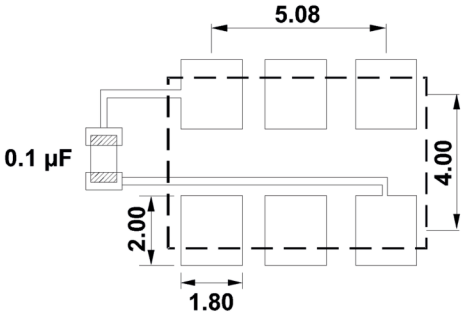
TOP VIEW



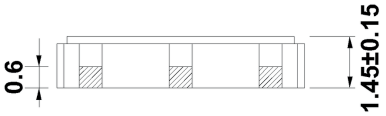
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

Parameters		Symbol	LVDS				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F(ST)	106.25, 125, 133.33, 150, 155.52, 156.25, 187.5, 212.5, 312.5, 622.08				MHz		
Supply Current		Icc	-	50	-	50	mA		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec	Measured from 20% ~ 80%	
	Fall Time	Tf	-	1.0	-	1.0			
Output Level		VoH	-	1.6	-	1.6	V	Output High	
		VoL	0.9	-	0.9	-	V	Output Low	
Tri-State Mode		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise	100 Hz	PN	-94		-94		dBc/Hz	At VDD=3.3V, fout=156.25MHz	
	1 kHz		-113		-112				
	10 kHz		-122		-122				
RMS Phase JitterIntegrated 12 kHz~20MHz		PJ	-	1.2	-	1.2	pSec		
Duty Cycle		TH/T	45 ~ 55				%		
Output Load		RL	100Ω				/		
Start-up Time		Tosc	10				mSec	Max	
Aging		ppm/yr	±3				ppm/yr	1st. Year at 25°C	

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(℃)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○

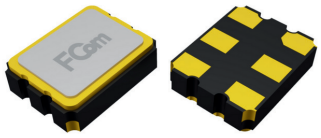
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom CMOS Output SMD VCXO

Series FVC-3X

Standard CMOS Output SMD VCXO 3.2×2.5 mm



Feature

- Low power supply voltage: 3.3, 2.8 supply options
- Frequency support from 2MHz to 66MHz
- Tri-state enable/disable

Application

- High-Speed Gigabite Ethernet, SONET
- Fiber Channel, Storages Area Network
- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access, Smart Grid

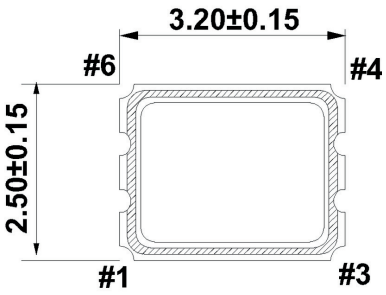
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	CMOS				Units	Notes	
			3.3V		2.8V				
			Typ.	Max.	Typ.	Max.			
Frequency Range		F	2~66				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Current		Icc	10	-	10	-	mA		
Transition Time	Rise Time	Tr	5.0	-	5.0	-	nSec	Measured from 10% ~ 90%	
	Fall Time	Tf							
Output Level		VoH	2.97	-	2.52	-	V	Output High	
		VoL	-	0.33	-	0.28	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=250MHz	
1 kHz			-107	-	-107	-			
10 kHz			-111	-	-111	-			
100 kHz			-114	-	-114	-			
1 MHz			-125	-	-125	-			
20 MHz			-147	-	-147	-			
RMS Phase Jitterr (12kHz~20 MHz)	Fractional Mode	PJ	0.8	1.5	0.8	1.5	pSec		
	Integer Mode		0.6	1.2	0.6	1.2			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	18	-	18	µA		
Output Load		RL	-	15	-	15	pF		
Start-up Time		Tosc	10				mSec	Max	
Parameters		**Symbol**	**Control Voltage Function on Pin 1**				**Units**	**Notes**	
			3.3V		**2.8V**				
			Typ.	**Max.**	**Typ.**	**Max.**			
Control Voltage Center		Vc	1.65		1.25		V		
Control Voltage Range			0.3	3	0.25	2.25			
Frequency Pulling Range			±50	±150	±50	±150	ppm		
Linearity			5	10	5	10	%		
Modulation Bandwidth			20	-	20	-	kHz		
VC Input Impedance			1	-	1	-	MΩ		

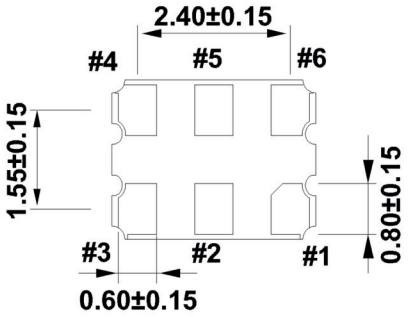
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

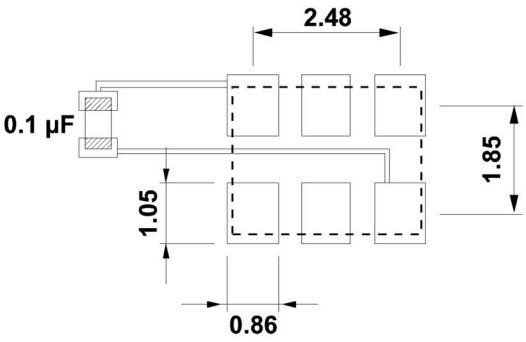
TOP VIEW



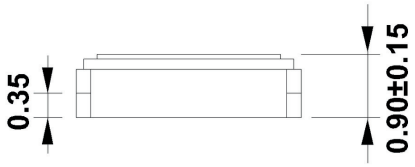
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(°C)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	△

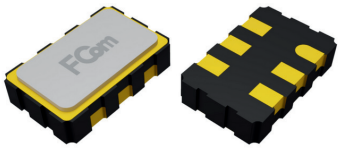
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom CMOS Output SMD VCXO

Series FVC-5X

Standard CMOS Output SMD VCXO 5.0×3.2 mm



Feature

- Typical 5.0×3.2×1.25mm 6 pads ceramic SMD package
- Tight symmetry (45 to 55%) available
- Output frequency up to 170MHz
- Tri-state enable/disable

Application

- Set-top Box, HDTV
- WiMAX/WLAN
- xDSL/ VoIP
- Cable modem

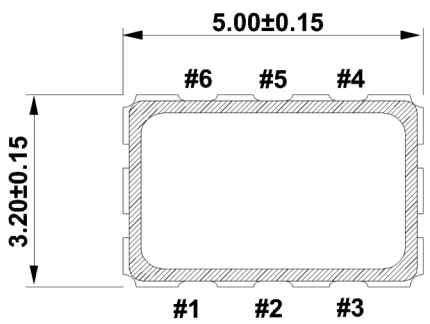
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	CMOS 3.3V Min.	CMOS 3.3V Max.	Units	Notes	
Frequency Range		F	1.5~170		MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Current	1.5≦Fo<20 MHz	Icc	-	10	mA		
	120≦Fo<50 MHz		-	20			
	50≦Fo<170 MHz		-	30			
Absolute Pulling Range		APR	±50	-	ppm		
Control Voltage Range		Vc	0.3	3.0	V		
Transition Time Rise/Fall Time	1.5≦Fo<20 MHz	Tr/Tf	-	5.0	nSec	Between 10% and 90% of VDD, with an output load of 15pF	
	20≦Fo<50 MHz		-	4.0			
	50≦Fo<170 MHz		-	3.0			
Output Level		VoH	2.97	-	V	Output High	
		VoL	-	0.33	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	dBc/Hz	@38.4MHz	
100 Hz			-100	-			
1 kHz			-133	-			
10 kHz			-140	-			
RMS Phase Jitterr	12kHz~20MHz	PJ		1	pSec		
Period Jitter		Pk	-	40	pSec		
Linearity			-	10	%		
Modulation Bandwidth		BW	15	-	kHz	1.5≦Fo<170 MHz	
Input Impedance			10000	-	kΩ		
Start-up Time		Tosc	2		mSec	Max	
Aging			±3		ppm/yr.	@ 25°C 1st year	

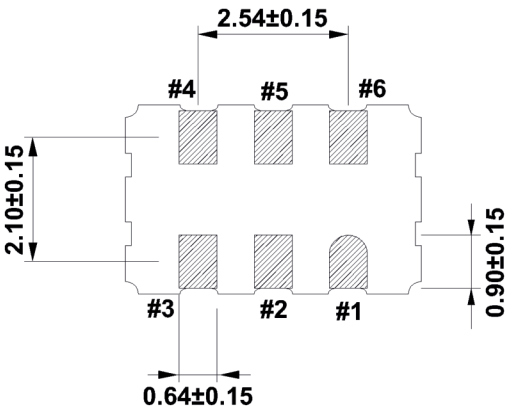
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

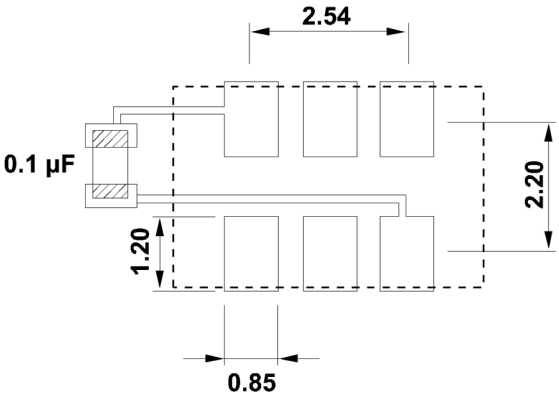
TOP VIEW



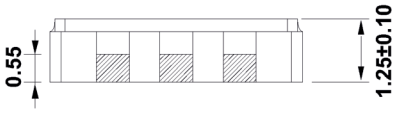
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(°C)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	○

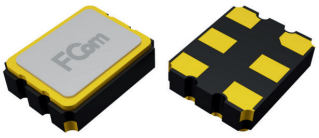
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Jitter FASTVCXO

Series FVC-3P-LJ

SMD Low Jitter FASTVCXO 3.2×2.5 mm



Feature

- Low power supply voltage: 3.3, 2.5 supply options
- Frequency support from 10MHz to 250MHz
- Low phase jitter typical: 0.6 ps RMS from 12kHz to 20MHz
- Tri-state enable/disable

Application

- High-Speed Gigabite Ethernet, SONET
- Fiber Channel, Storages Area Network
- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access, Smart Grid

ELECTRICAL SPECIFICATIONS

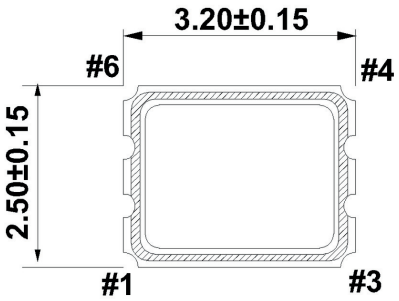
Parameters		Symbol	CMOS				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~250				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Current		Icc	-	50	-	45	mA		
Transition Time	Rise Time	Tr	-	3.0	-	3.0	nSec	Measured from 10% ~ 90%	
	Fall Time	Tf							
Output Level		VoH	2.97	-	2.25	-	V	Output High	
		VoL	-	0.33	-	0.25	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=250MHz	
1 kHz			-107	-	-107	-			
10 kHz			-111	-	-111	-			
100 kHz			-114	-	-114	-			
1 MHz			-125	-	-125	-			
20 MHz			-147	-	-147	-			
RMS Phase Jitterr (12kHz~20 MHz)	Fractional Mode	PJ	0.8	1.5	0.8	1.5	pSec		
	Integer Mode		0.6	1.2	0.6	1.2			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	18	-	18	µA		
Output Loading	10~200MHz	RL	-	15	-	15	pF		
	200~250MHz		-	5	-	5			
Start-up Time		Tosc	10				mSec	Max	

Parameters	Symbol	Control Voltage Function on Pin 1				Units	Notes
		3.3V		2.5V			
		Min.	Max.	Min.	Max.		
Control Voltage Center	Vc	1.65		1.25		V	
Control Voltage Range		0.3	3	0.25	2.25		
Frequency Pulling Range		±50	±150	±50	±150	ppm	
Linearity		5	10	5	10	%	
Modulation Bandwidth		10	-	10	-	kHz	
VC Input Impedance		1	-	1	-	MΩ	

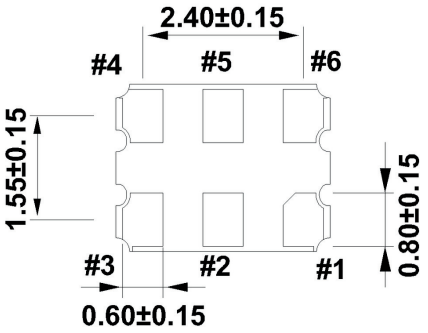
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

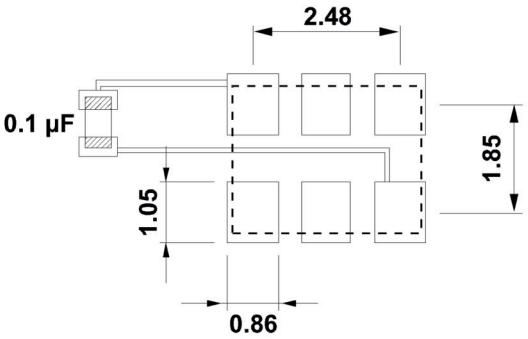
TOP VIEW



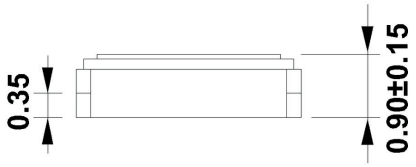
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(°C)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	△

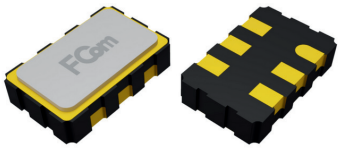
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Jitter FASTVCXO

Series FVC-5P-LJ

SMD Low Jitter FASTVCXO 5.0×3.2 mm



Feature

- Typical 5.0×3.2×1.25mm 6 pads ceramic SMD package
- Tight symmetry (45 to 55%) available
- Output frequency up to 250MHz
- Tri-state enable/disable

Application

- Set-top Box, HDTV
- WiMAX/WLAN
- xDSL/ VoIP
- Cable modem

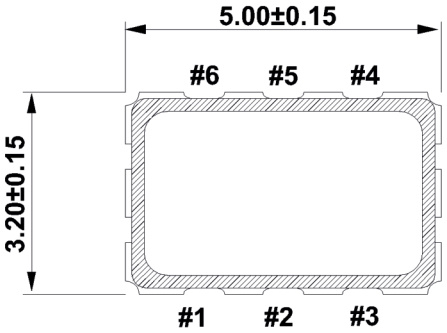
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	CMOS				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~250				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Current	10≦Fo<160MHz	Icc	-	40	-	40	mA		
	160≦Fo<250MHz		-	50	-	50			
Absolute Pulling Range		APR	±50	-	±50	-	ppm		
Control Voltage Range		Vc	0.3	3.0	0.3	3.0	V		
Transition Time	Rise Time	Tr	-	2.0	-	2.0	nSec	10≦Fo≦250MHz	
	Fall Time	Tf							
Output Level		VoH	2.97	-	2.97	-	V	Output High	
		VoL	-	0.33	-	0.33	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	**Typ.**	**Max.**	**Typ.**	**Max.**	dBc/Hz	@155.52MHz	
100 Hz			-75	-	-75	-			
1 kHz			-105	-	-105	-			
10 kHz			-125	-	-125	-			
RMS Phase Jitterr (12kHz~20MHz)	Fractional Mode	PJ	0.8	1.5	0.8	1.5	pSec		
	Integer Mode		0.6	1.2	0.6	1.2			
Period Jitter		Pk	-	150	-	150	pSec		
Linearity			-	10	-	10	%		
Modulation Bandwidth		BW	10	-	10	-	kHz		
Input Impedance			1000	-	1000	-	kΩ		
Start-up Time		Tosc	2				mSec	Max	
Aging			±3				ppm/yr.	@ 25°C 1st year	

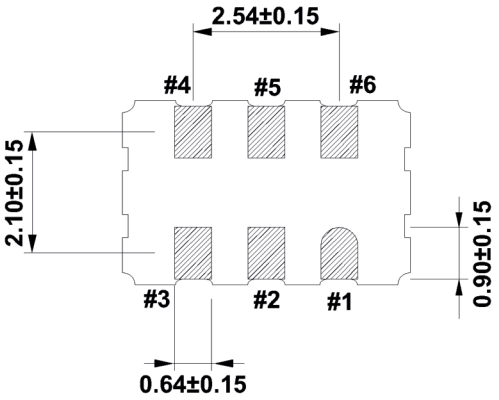
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

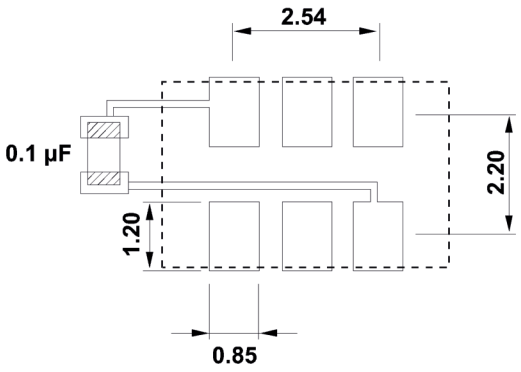
TOP VIEW



BOTTOM VIEW

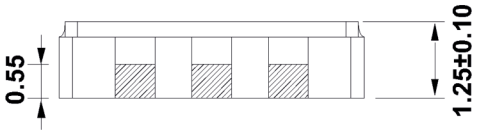


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(℃)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	×

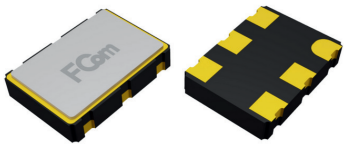
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Jitter FASTVCXO

Series FVC-7P-LJ

SMD Low Jitter FASTVCXO 7.0×5.0 mm



Feature

- Typical 7.0 x 5.0 x 1.45 mm 6 pads ceramic SMD package
- Tight symmetry (45 to 55%) available
- Output frequency up to 250MHz
- Tri-state enable/disable

Application

- Set-top Box, HDTV
- WiMAX/WLAN
- xDSL/ VoIP
- Cable modem

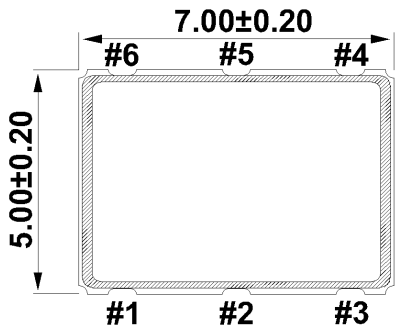
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	CMOS				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~250				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Supply Current	10≦Fo<160MHz	Icc	-	40	-	40	mA		
	160≦Fo<250MHz		-	50	-	50			
Absolute Pulling Range		APR	±50	-	±50	-	ppm		
Control Voltage Range		Vc	0.3	3.0	0.3	3.0	V		
Transition Time	Rise Time	Tr	-	2.0	-	2.0	nSec	10≦Fo≦250MHz	
	Fall Time	Tf							
Output Level		VoH	2.97	-	2.97	-	V	Output High	
		VoL	-	0.33	-	0.33	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	**Typ.**	**Max.**	**Typ.**	**Max.**	dBc/Hz	@155.52MHz	
100 Hz			-75	-	-75	-			
1 kHz			-105	-	-105	-			
10 kHz			-125	-	-125	-			
RMS Phase Jitterr (12kHz~20MHz)	Fractional Mode	PJ	0.8	1.5	0.8	1.5	pSec		
	Integer Mode		0.6	1.2	0.6	1.2			
Period Jitter		Pk	-	150	-	150	pSec		
Linearity			-	10	-	10	%		
Modulation Bandwidth		BW	10	-	10	-	kHz		
Input Impedance			1000	-	1000	-	kΩ		
Start-up Time		Tosc	2				mSec	Max	
Aging			±3				ppm/yr.	@ 25°C 1st year	

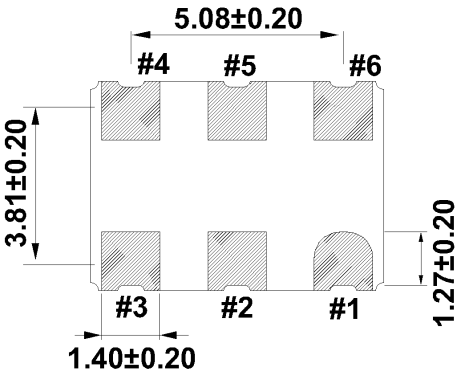
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

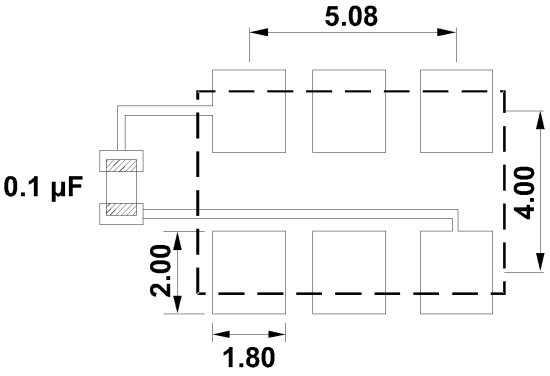
TOP VIEW



BOTTOM VIEW

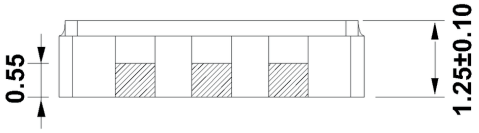


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	Vcon
2	Tri-State
3	GND
4	Output
5	NC
6	VDD

FREQ. STABILITY vs. TEMP. RANGE

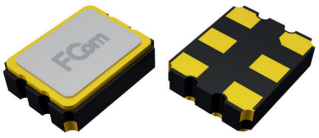
ppm / Temp.(℃)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	×

○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output FASTVCXO

Series FVC-3L-PG



SMD Differential Output FASTVCXO 3.2×2.5 mm

Feature

- Low power supply voltage: 3.3, 2.5 supply options
- Differential output : LVPECL, LVDS
- Low phase jitter typical: 0.6 ps RMS from 12kHz to 20MHz
- Tri-state enable/disable

Application

- High-Speed Gigabite Ethernet, SONET
- Fiber Channel, Storages Area Network
- Enterprise Server, SAS/SATA
- Microprocessors/DSP/FPGA
- Broadband Access, Smart Grid

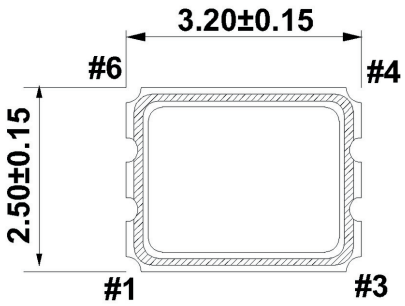
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL / LVDS				Units	Notes	
			3.3V		2.5V				
			Min.	Max.	Min.	Max.			
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature : 25 ± 5°C Relative humidity : 40% ~ 70%
Supply Current		Icc	-	50 / 45	-	45 / 35	mA		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec	Measured from 10% ~ 90%	
	Fall Time	Tf							
Output Level		VoH	2.27 / -	2.7 / 1.6	1.47 / -	1.9 / 1.6	V	Output High	
		VoL	1.45 / 0.9	1.7 / -	0.65 / 0.9	0.9 / -	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=250MHz	
1 kHz			-107	-	-107	-			
10 kHz			-111	-	-111	-			
100 kHz			-114	-	-114	-			
1 MHz			-125	-	-125	-			
20 MHz			-147	-	-147	-			
RMS Phase Jitterr (12kHz~20 MHz)	Fractional Mode	PJ	0.8	1.5	0.8	1.5	pSec		
	Integer Mode		0.6	1.2	0.6	1.2			
Duty Cycle		TH/T	45 ~ 55				%		
Stand by Current		Icc(ST)	-	18	-	18	mA		
Output Loading		RL	50Ω into VDD-2V / 100Ω				/		
Start-up Time		Tosc	10				mSec	Max	
Parameters		**Symbol**	**Control Voltage Function on Pin 1**				**Units**	**Notes**	
			3.3V		**2.5V**				
			Min.	**Max.**	**Min.**	**Max.**			
Control Voltage Center		Vc	1.65		1.25		V		
Control Voltage Range			0.3	3	0.25	2.25			
Frequency Pulling Range			±50	±150	±50	±150	ppm		
Linearity			5	10	5	10	%		
Modulation Bandwidth			10	-	10	-	kHz		
VC Input Impedance			1	-	1	-	MΩ		

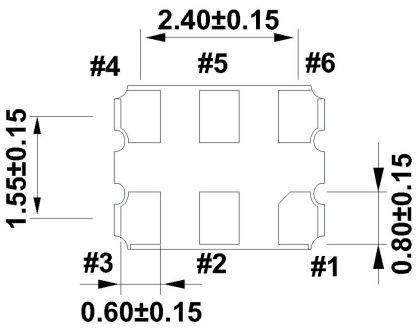
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

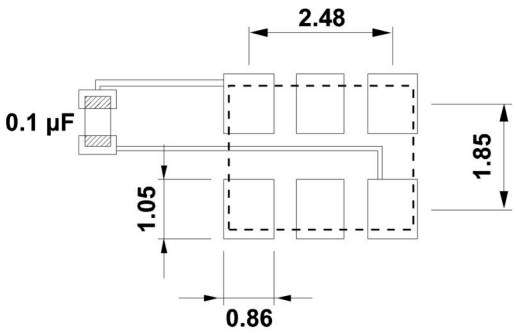
TOP VIEW



BOTTOM VIEW

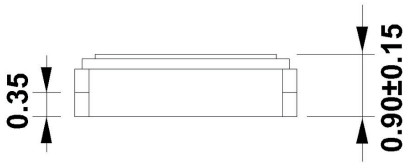


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	No Connection
6	Supply Voltage

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(℃)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	△

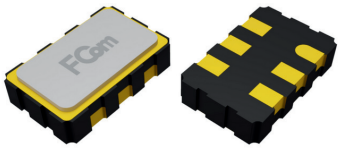
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output FASTVCXO

Series FVC-5L-PG

SMD Differential Output FASTVCXO 5.0×3.2 mm



Feature

- LVPECL / LVDS output
- Low jitter performance: < 1 ps RMS from 12k-20MHz
- Output frequency up to 1500 MHz
- Tri-state enable/disable

Application

- Set-top Box, HDTV
- WiMAX/WLAN
- Jitter Attenuator, ADC
- xDSL/ VoIP, Cable modem

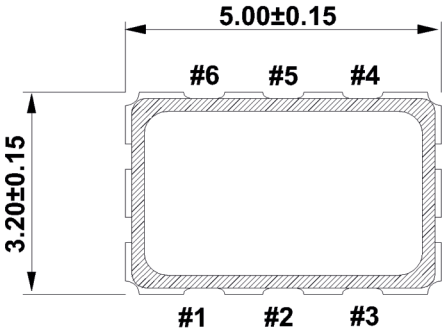
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL 2.5V / 3.3V Min.	LVPECL 2.5V / 3.3V Max.	LVDS 2.5V / 3.3V Min.	LVDS 2.5V / 3.3V Max.	Units	Notes	
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F	122.88, 125, 155.52, 200, 491.52, 622.08		125, 155.52, 200, 491.52		MHz		
Supply Current	100≦Fo<160MHz	Icc	-	75	-	50	mA		
	160≦Fo<1500MHz		-	100	-	75			
Absolute Pulling Range		APR	±50	-	±50	-	ppm		
Control Voltage Range		Vc	0.3	3.0	0.3	3.0	V		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec		
	Fall Time	Tf							
Output Level		VoH	2.275	-	-	1.6	V	Output High	
		VoL	-	1.68	0.9	-	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	**Typ.**	**Max.**	**Typ.**	**Max.**	dBc/Hz	@614.4MHz	
100 Hz			-70	-	-70	-			
1 kHz			-95	-	-95	-			
10 kHz			-105	-	-105	-			
RMS Phase Jitterr	Integer Mode	PJ	-	1.2	-	1.2	pSec	@12kHz~20MHz	
Linearity			-	10	-	10	%		
Modulation Bandwidth		BW	10	-	10	-	kHz		
Input Impedance			1000	-	1000	-	kΩ		
Start-up Time		Tosc	10				mSec	Max	
Aging			±3				ppm/yr.	@ 25°C 1st year	

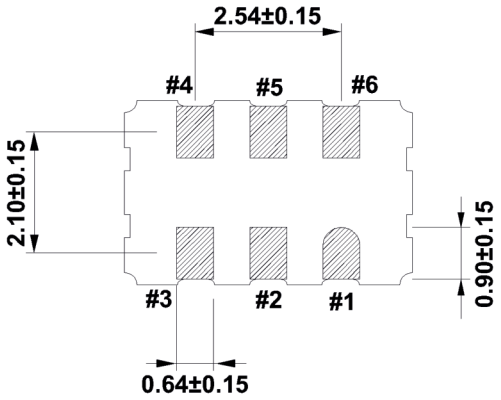
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

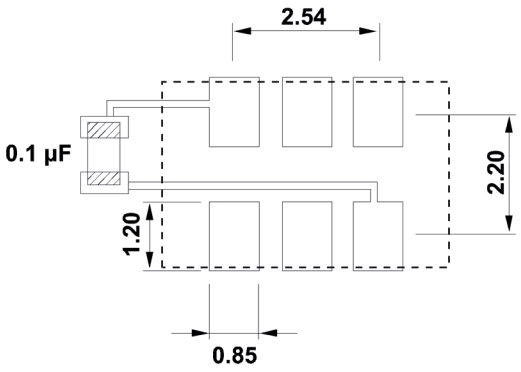
TOP VIEW



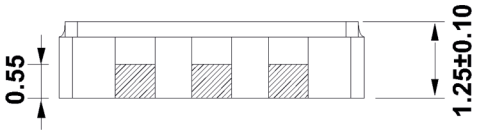
BOTTOM VIEW



Solder Pad Layout(mm)



SIDE VIEW



PIN#	Function
1	NC/Tri-State
2	Tri-State/NC
3	GND
4	Output
5	Comp.Output
6	VDD

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(℃)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	△

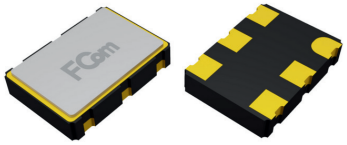
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Differential Output FASTVCXO

Series FVC-7L-PG

SMD Differential Output FASTVCXO 7.0×5.0 mm



Feature

- LVPECL / LVDS output
- Low jitter performance: < 1 ps RMS from 12k-20MHz
- Output frequency up to 1500 MHz
- Tri-state enable/disable

Application

- Set-top Box, HDTV
- WiMAX/WLAN
- Jitter Attenuator, ADC
- xDSL/ VoIP, Cable modem

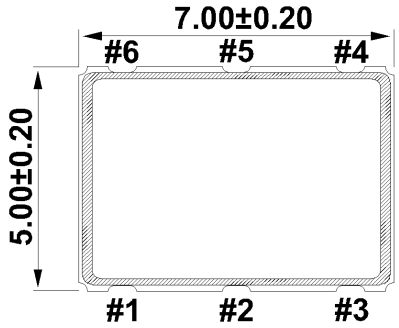
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL 2.5V / 3.3V Min.	LVPECL 2.5V / 3.3V Max.	LVDS 2.5V / 3.3V Min.	LVDS 2.5V / 3.3V Max.	Units	Notes	
Frequency Range		F	10~1500				MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Standard Frequency		F	122.88, 125, 155.52, 200, 491.52, 622.08		125, 155.52, 200, 491.52		MHz		
Supply Current	100≦Fo<160MHz	Icc	-	75	-	50	mA		
	160≦Fo<1500MHz		-	100	-	75			
Absolute Pulling Range		APR	±50	-	±50	-	ppm		
Control Voltage Range		Vc	0.3	3.0	0.3	3.0	V		
Transition Time	Rise Time	Tr	-	1.0	-	1.0	nSec		
	Fall Time	Tf							
Output Level		VoH	2.275	-	-	1.6	V	Output High	
		VoL	-	1.68	0.9	-	V	Output Low	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	70% Vdd	-	V	Enable	
		VIL	-	30% Vdd	-	30% Vdd	V	Disable	
Phase Noise		PN	**Typ.**	**Max.**	**Typ.**	**Max.**	dBc/Hz	@614.4MHz	
100 Hz			-70	-	-70	-			
1 kHz			-95	-	-95	-			
10 kHz			-105	-	-105	-			
RMS Phase Jitterr	Integer Mode	PJ	-	1.2	-	1.2	pSec	@12kHz~20MHz	
Linearity			-	10	-	10	%		
Modulation Bandwidth		BW	10	-	10	-	kHz		
Input Impedance			1000	-	1000	-	kΩ		
Start-up Time		Tosc	10				mSec	Max	
Aging			±3				ppm/yr.	@ 25°C 1st year	

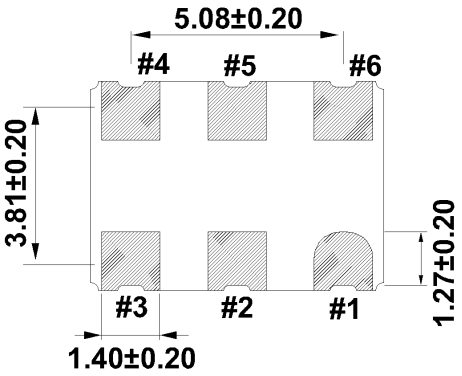
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

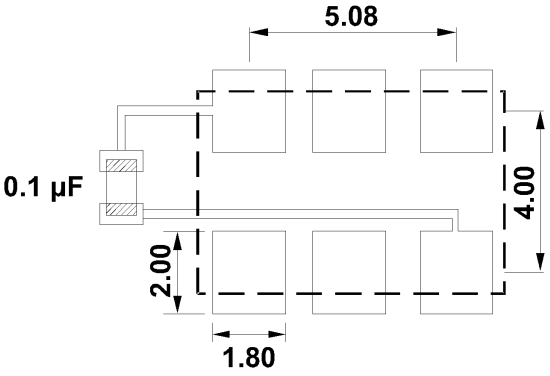
TOP VIEW



BOTTOM VIEW

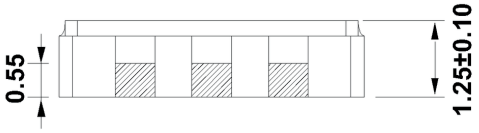


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	Vcon
2	Tri-State
3	GND
4	Output
5	NC
6	VDD

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(℃)	± 25	± 50
@-10~60°C	○	○
@-20~70°C	○	○
@-40~85°C	△	○
@-40~105°C	×	△

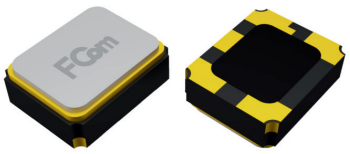
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard SMD VCTCXO

Series FVT-6S

SMD Standard VCTCXO 2.0×1.6 mm



Feature

- Typical 2.0 x 1.6 x 0.7 mm ceramic SMD package
- For automatic assembly
- Compactness and lightweight
- Miniature size and low profile

Application

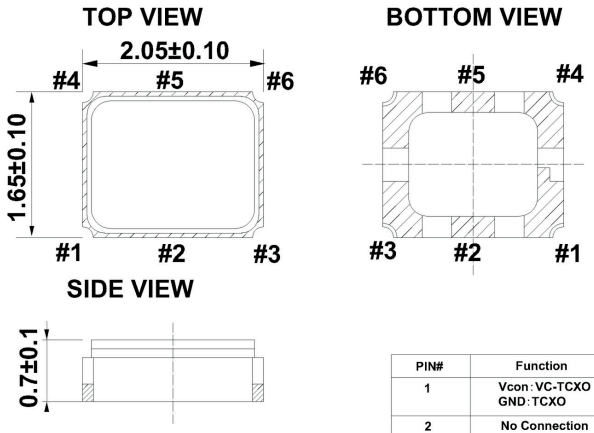
- GPS
- WiMAX, WLAN
- Mobile Phone
- IoT, wearable Electronics.

ELECTRICAL SPECIFICATIONS

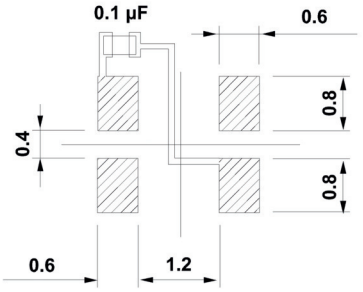
Parameters		Symbol	3.3 /3.0 /2.8 V		2.5V		1.8V		Units	Notes
			Min.	Max.	Min.	Max.	Min.	Max.		
Frequency Range		F	10~52						MHz	
Standard Frequency		F	16.369, 19.2, 26.0, 38.4						MHz	
Supply Current	10≤ Fos≤ 26 MHz	Icc	-	1.5	-	1.5	-	1.5	mA	
	26≤ Fos≤ 52 MHz		-	2.0	-	2.0	-	2.0		
Frequency Tolerance		Ft	-	±2.0	-	±2.0	-	±2.0	ppm	
Frequency stability	vs. Vdd	Fs	-	±0.2	-	±0.2	-	±0.2	ppm	±5%
	vs. Load		-	±0.2	-	±0.2	-	±0.2		±10%
	vs. Aging		-	±1.0	-	±1.0	-	±1.0		@1st year
Output Level		Vp-p	0.8	-	0.8	-	0.8	-	V	Clipped Sine Wave
Control Voltage Range			0.5	2.5	0.4	2.4	0.3	1.5	V	VCTCXO
Pulling Range			±5.0	-	±5.0	-	±5.0	-	ppm	VCTCXO
Vc Input Impedance			500	-	500	-	500	-	kΩ	VCTCXO
Phase Noise @ 19.2 MHz	100 Hz	PN	-115		-115		-115		dBc/Hz	
	1 kHz		-135		-135		-135			
	10 kHz		-148		-148		-148			
Output Loading		RL // CL	10 KΩ // 10pF							
Start-up Time		Tosc	2						mSec	Max

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



PIN#	Function
1	Vcon : VC-TCXO GND : TCXO
2	No Connection
3	GND
4	Output
5	No Connection
6	VDD



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

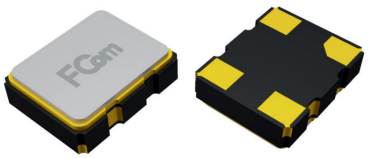
Temp.(°C) \ ppm	± 0.5	± 1.0	± 1.5	± 2.0	± 2.5
@-20~70°C	O	O	O	O	O
@-30~85°C	O	O	O	O	O
@-40~85°C	O	O	O	O	O

O: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard SMD VCTCXO

Series FVT-2S

SMD Standard VCTCXO 2.5×2.0 mm



Feature

- Typical 2.5 x 2.0 x 0.7 mm ceramic SMD package
- For automatic assembly
- Compactness and lightweight
- Miniature size and low thickness

Application

- GPS
- WiMAX, WLAN
- Mobile Phone
- IoT, wearable Electronics

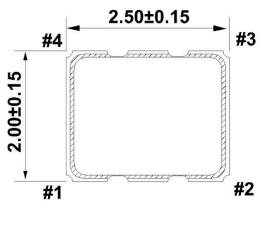
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	3.3 /3.0 /2.8 V		2.5V		1.8V		Units	Notes
			Min.	Max.	Min.	Max.	Min.	Max.		
Supply Voltage Variation		Vdd	2.66	3.465	2.375	2.625	1.71	1.89	V	
Frequency Range		F	10~52						MHz	
Standard Frequency		F	16.369, 19.2, 26.0, 38.4						MHz	
Supply Current	10≤ Fo≤ 26 MHz	Icc	-	1.5	-	1.5	-	1.5	mA	
	26≤ Fo≤ 52 MHz		-	2.0	-	2.0	-	2.0		
Frequency Tolerance		Ft	-	±2.0	-	±2.0	-	±2.0	ppm	
Frequency stability	vs. Vdd	Fs	-	±0.2	-	±0.2	-	±0.2	ppm	±5%
	vs. Load		-	±0.2	-	±0.2	-	±0.2		±10%
	vs. Aging		-	±1.0	-	±1.0	-	±1.0		@1st year
Output Level		Vp-p	0.8	-	0.8	-	0.8	-	V	Clipped Sine Wave
Control Voltage Range			0.5	2.5	0.4	2.4	0.3	1.5	V	VCTCXO
Pulling Range			±5.0	-	±5.0	-	±5.0	-	ppm	VCTCXO
Vc Input Impedance			500	-	500	-	500	-	kΩ	VCTCXO
Phase Noise @ 19.2 MHz	100 Hz	PN	-115		-115		-115		dBc/Hz	
	1 kHz		-135		-135		-135			
	10 kHz		-148		-148		-148			
Output Loading		RL // CL	10 KΩ // 10pF							
Start-up Time		Tosc	2						mSec	Max

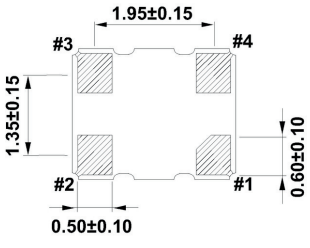
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

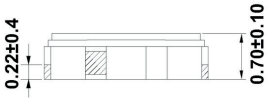
TOP VIEW



BOTTOM VIEW

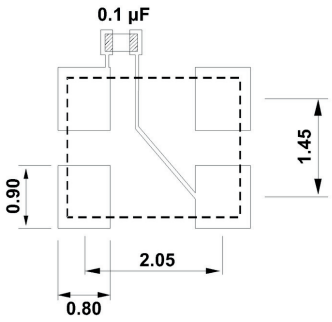


SIDE VIEW



PIN#	Function
1	VCON : VC-TCXO GND/NC : TCXO
2	GND
3	Output
4	VDD

Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

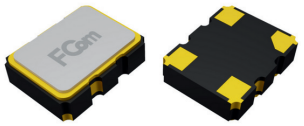
Temp.(°C) \ ppm	± 0.5	± 1.0	± 1.5	± 2.0	± 2.5
@-20~70°C	○	○	○	○	○
@-30~85°C	○	○	○	○	○
@-40~85°C	○	○	○	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard SMD VCTCXO

Series FVT-3S

SMD Standard VCTCXO 3.2×2.5 mm



Feature

- Typical 3.2 x 2.5 x 0.9 mm ceramic SMD package
- Low power consumption
- Compactness and lightweight
- Miniature size and low thickness

Application

- GPS
- WiMAX, WLAN
- Mobile Phone
- IoT

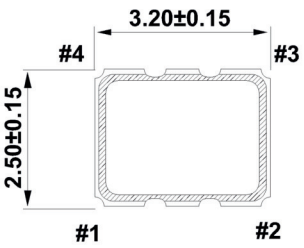
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	3.3 /3.0 /2.8 V		2.5V		1.8V		Units	Notes
			Min.	Max.	Min.	Max.	Min.	Max.		
Supply Voltage Variation		Vdd	2.66	3.465	2.375	2.625	1.71	1.89	V	
Frequency Range		F	10~52						MHz	
Standard Frequency		F	10, 12.8, 13, 16.368, 19.2, 19.44, 20, 25, 26, 27, 30 30.72, 32, 38.4						MHz	
Supply Current	10≤ Fo≤ 26 MHz	Icc	-	1.5	-	1.5	-	1.5	mA	
	26≤ Fo≤ 52 MHz		-	2.0	-	2.0	-	2.0		
Frequency Tolerance		Ft	-	±2.0	-	±2.0	-	±2.0	ppm	
Frequency stability	vs. Vdd	Fs	-	±0.2	-	±0.2	-	±0.2	ppm	±5%
	vs. Load		-	±0.2	-	±0.2	-	±0.2		±10%
	vs. Aging		-	±1.0	-	±1.0	-	±1.0		@1st year
Output Level		Vp-p	0.8	-	0.8	-	0.8	-	V	Clipped Sine Wave
Control Voltage Range			0.5	2.5	0.4	2.4	0.3	1.5	V	VCTCXO
Pulling Range			±5.0	-	±5.0	-	±5.0	-	ppm	VCTCXO
Vc Input Impedance			500	-	500	-	500	-	kΩ	VCTCXO
Phase Noise @ 19.2 MHz	100 Hz	PN	-115		-115		-115		dBc/Hz	
	1 kHz		-135		-135		-135			
	10 kHz		-148		-148		-148			
Output Loading		RL // CL	10 KΩ // 10pF							
Start-up Time		Tosc	2						mSec	Max

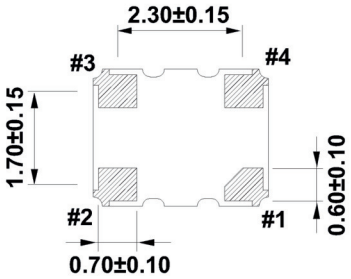
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

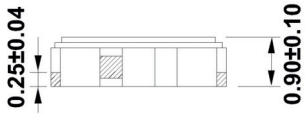
TOP VIEW



BOTTOM VIEW

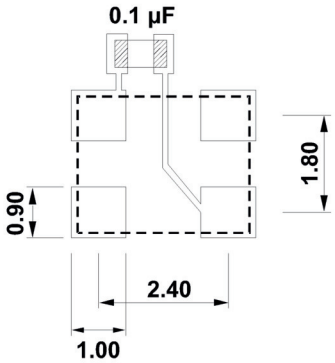


SIDE VIEW



PIN#	Function
1	VCON : VC-TCXO GND/NC : TCXO
2	GND
3	Output
4	VDD

Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

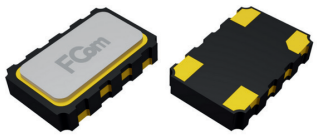
Temp.(°C) \ ppm	± 0.5	± 1.0	± 1.5	± 2.0	± 2.5
@-20~70°C	○	○	○	○	○
@-30~85°C	○	○	○	○	○
@-40~85°C	○	○	○	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard SMD VCTCXO

Series FVT-5S

SMD Standard VCTCXO 5.0×3.2 mm



Feature

- Typical 5.0 x 3.2 x 1.1 mm ceramic SMD package
- Low power consumption
- Compactness and lightweight
- Miniature size and low thickness

Application

- GPS
- WiMAX, WLAN
- Mobile Phone
- Telecommunication

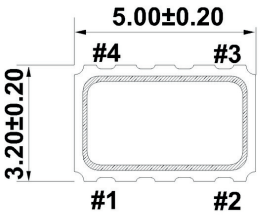
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	3.3 /3.0 /2.8 V		2.5V		1.8V		Units	Notes
			Min.	Max.	Min.	Max.	Min.	Max.		
Supply Voltage Variation		Vdd	2.66	3.465	2.375	2.625	1.71	1.89	V	
Frequency Range		F	10~52						MHz	
Standard Frequency		F	10, 12.8, 13, 16.368, 19.2, 19.44, 20, 25, 26, 27, 30 30.72, 32, 38.4						MHz	
Supply Current	10≤ Fo≤ 26 MHz	Icc	-	1.5	-	1.5	-	1.5	mA	Clipped Sine Wave
	26≤ Fo≤ 52 MHz		-	2.0	-	2.0	-	2.0		
Supply Current (CMOS)		Icc	-	10	-	7	-	5		
Frequency Tolerance		Ft	-	±2.0	-	±2.0	-	±2.0	ppm	
Frequency stability	vs. Vdd	Fs	-	±0.2	-	±0.2	-	±0.2	ppm	±5%
	vs. Load		-	±0.2	-	±0.2	-	±0.2		±10%
	vs. Aging		-	±1.0	-	±1.0	-	±1.0		@1st year
Control Voltage Range			0.5	2.5	0.4	2.4	0.3	1.5	V	VCTCXO
Pulling Range			±5.0	-	±5.0	-	±5.0	-	ppm	VCTCXO
Vc Input Impedance			500	-	500	-	500	-	kΩ	VCTCXO
Phase Noise @ 19.2 MHz	100 Hz	PN	-115		-115		-115		dBc/Hz	
	1 kHz		-135		-135		-135			
	10 kHz		-148		-148		-148			
Clipped Sine Wave	Output Level	V	0.8	-	0.8	-	0.8	-	V	
	Load	RL // CL	10 KΩ // 10pF						KΩ // pF	
CMOS	Output High	V	90%VDD	-	90%VDD	-	90%VDD	-	V	
	Output Low	V	-	10%VDD	-	10%VDD	-	10%VDD	V	
	Load	pF	-	15	-	15	-	15	pF	
Start-up Time		Tosc	2						mSec	Max

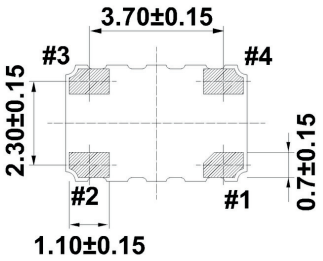
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

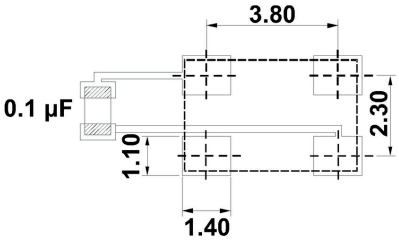
TOP VIEW



BOTTOM VIEW

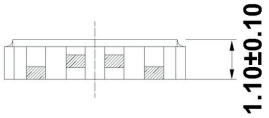


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	VCON:VC-TCXO GND/NC:TCXO
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(℃)	± 0.5	± 1.0	± 1.5	± 2.0	± 2.5
@-20~70°C	○	○	○	○	○
@-30~85°C	○	○	○	○	○
@-40~85°C	○	○	○	○	○

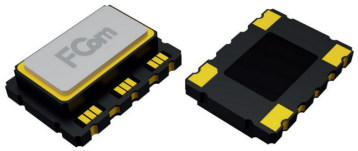
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard SMD VCTCXO

Series FVT-7S

SMD Standard VCTCXO 7.0×5.0 mm



Feature

- Typical 7.0 x 5.0 x 1.9 mm ceramic SMD package
- For automatic assembly
- Compactness and lightweight
- Low power consumption

Application

- Femtocell , Base Stations
- WiMAX, WLAN, WIFI
- Wireless Communications
- Mobile Phone

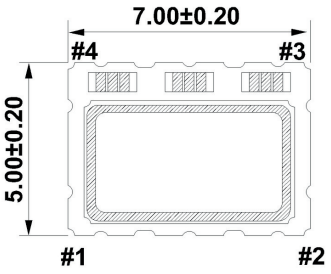
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	3.3 /3.0		2.5V		Units	Notes
			Min.	Max.	Min.	Max.		
Frequency Range		F	5~52				MHz	
Standard Frequency	CMOS	F	5, 6.4, 8, 8.192, 10, 12.5, 12.8, 16, 16.384, 19.44, 25, 26				MHz	
	Clipped Sine Wave		8, 8.192, 10, 12.5, 12.8, 16, 16.384, 19.44, 25, 26					
Supply Current	CMOS	Icc	-	6.0	-	6.0	mA	
	Clipped Sine Wave		-	3.5	-	3.5		
Frequency Tolerance		Ft	-	±2.0	-	±2.0	ppm	
Frequency stability	vs. Vdd	Fs	-	±0.1	-	±0.1	ppm	±5%
	vs. Load		-	±0.2	-	±0.2		±10%
	vs. Aging		-	±1.0	-	±1.0		@1st year
Output Level		Vp-p	0.8	-	0.8	-	V	Clipped Sine Wave
Control Voltage Range			0.5	2.5	0.4	2.4	V	VCTCXO
Pulling Range			±5.0	±12.0	±5.0	±12.0	ppm	VCTCXO
Vc Input Impedance			100	-	100	-	kΩ	VCTCXO
Phase Noise @ 19.2 MHz	100 Hz	PN	-115		-115		dBc/Hz	
	1 kHz		-135		-135			
	10 kHz		-148		-148			
Output Loading	CMOS	RL // CL	15pF				pF	
	Clipped Sine Wave		10 KΩ // 10pF					
Start-up Time		Tosc	2				mSec	Max

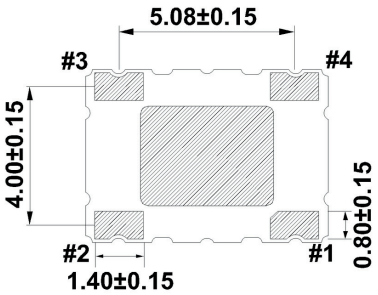
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

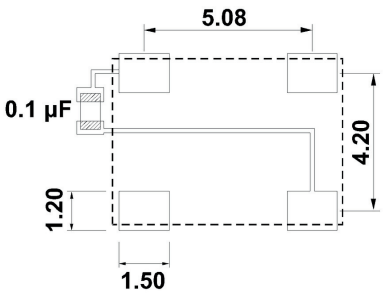
TOP VIEW



BOTTOM VIEW



Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	VCON:VC-TCXO GND/NC:TCXO
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

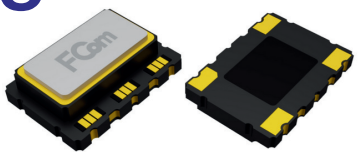
Temp.(℃) \ ppm	± 0.5	± 1.0
@-20~70°C	○	○
@-30~85°C	○	○
@-40~85°C	△	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Extended Temp. VCTCXO

Series FVT-7S-WT

Super-wide Oper. Temp. SMD VCTCXO 7.0×5.0 mm



Feature

- Typical 7.0 x 5.0 x 1.9 mm ceramic SMD package
- High Precision and High Temperature for -40°C~+95°C, ±0.1ppm, -40°C~+105°C, ±0.2ppm
- CMOS and Clipped Sine wave output optional

Application

- Femtocell , Base Stations
- WiMAX, WLAN, WIFI
- Wireless Communications

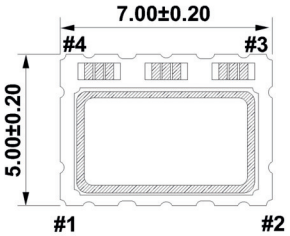
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	3.3		2.5V		Units	Notes
			Min.	Max.	Min.	Max.		
Frequency Range		F	10~52				MHz	
Standard Frequency		F	10, 19.2, 20				MHz	
Supply Current	CMOS	Icc	-	8.0	-	8.0	mA	
	Clipped Sine Wave		-	5.0	-	5.0		
Frequency Tolerance		Ft	-	±1.5	-	±1.5	ppm	
Frequency stability	vs. Vdd	Fs	-	±0.1	-	±0.05	ppm	±5%
	vs. Load		-	±0.05	-	±0.05		±10%
	vs. Aging		-	±1.0	-	±1.0		@1st year
Output Level	Output High (Logic "1")	V	90%VDD	-	90%VDD	-	V	CMOS
	Output Low (Logic "0")		-	10%VDD	-	10%VDD		
	Duty	TH/T	45	55	45	55	%	
	Clipped Sine Wave	Vp-p	0.8	-	0.8	-	V	
Control Voltage Range			0.5	2.5	0.5	2.5	V	VCTCXO
Pulling Range			±5.0	-	±5.0	-	ppm	VCTCXO
Vc Input Impedance			100	-	100	-	kΩ	VCTCXO
Phase Noise @ 19.2 MHz	100 Hz	PN	-130		-130		dBc/Hz	
	1 kHz		-148		-148			
	10 kHz		-156		-156			
Output Loading	CMOS	RL // CL	15pF					
	Clipped Sine Wave		10 KΩ // 10pF					
Start-up Time		Tosc	5				mSec	Max

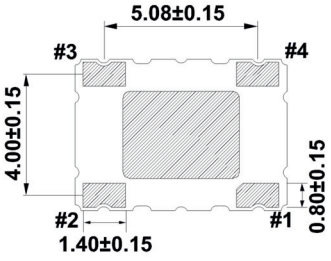
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

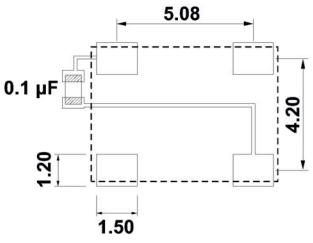
TOP VIEW



BOTTOM VIEW

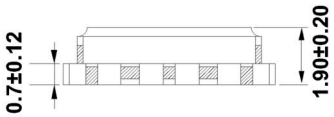


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	VCON : VC-TCXO GND/NC : TCXO
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(°C)	±0.05	±0.1	±0.2	±0.28	±0.5	±2.0
@-40~85°C	△	○	○	○	○	○
@-40~95°C	△	△	○	○	○	○
@-40~105°C	×	△	○	○	○	○

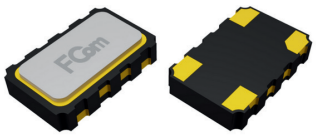
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom High Precision VCTCXO

Series FVT-5S-HP

High Precision SMD VCTCXO 5.0×3.2 mm



Feature

- Typical 5.0 x 3.2 x 1.85 mm ceramic SMD package
- ±0.28ppm @-40°C~+85°C
- ±0.05ppm @-10°C~+70°C
- CMOS and Clipped Sine wave output optional

Application

- Base Stations
- Stratum 3
- Femtocell

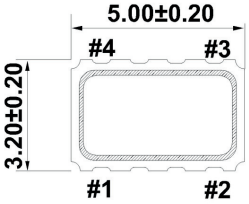
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	3.3V		2.5V		Units	Notes
			Min.	Max.	Min.	Max.		
Supply Voltage Variation		Vdd	2.66	3.465	2.375	2.625	V	
Frequency Range		F	10~52				MHz	
Standard Frequency		F	10, 12.8,13, 19.2, 20, 25, 26, 30.72				MHz	
Supply Current (Clipped Sine Wave)		Icc	-	5.0	-	5.0	mA	
Supply Current (CMOS)	10 ≤ Fo ≤ 40 MHz	Icc	-	6.0	-	6.0	mA	
	40 ≤ Fo ≤ 52 MHz		-	8.0	-	8.0		
Frequency Tolerance		Ft	-	±2.0	-	±2.0	ppm	
Frequency stability	vs. Vdd	Fs	-	±0.2	-	±0.2	ppm	±5%
	vs. Load		-	±0.2	-	±0.2		±10%
	vs. Aging		-	±1.0	-	±1.0		@1st year
Control Voltage Range			0.5	2.5	0.4	2.4	V	VCTCXO
Pulling Range			±5.0	-	±5.0	-	ppm	VCTCXO
Vc Input Impedance			100	-	100	-	kΩ	VCTCXO
Phase Noise @ 10 MHz	100 Hz	PN	-125		-125		dBc/Hz	
	1 kHz		-145		-145			
	10 kHz		-150		-150			
Clipped Sine Wave	Output Level	V	0.8	-	0.8	-	V	
	Load	RL // CL	10 KΩ // 10pF				KΩ // pF	
CMOS	Output High	V	90%VDD	-	90%VDD	-	V	
	Output Low	V	-	10%VDD	-	10%VDD	V	
	Load	pF	-	15	-	15	pF	
	Duty	TH/T	45	55	45	55	%	
Start-up Time		Tosc	2				mSec	Max

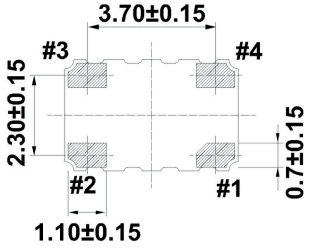
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

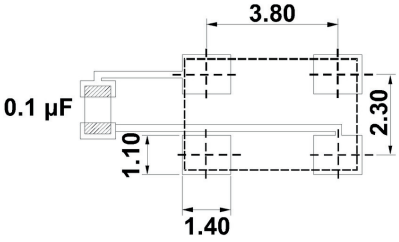
TOP VIEW



BOTTOM VIEW

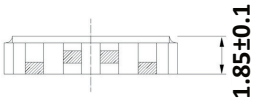


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	VCON : VC-TCXO GND/NC : TCXO
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

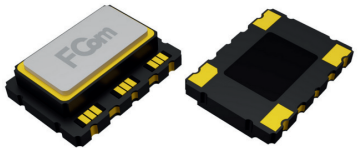
ppm / Temp.(°C)	± 0.05	± 0.1	± 0.2	± 0.28	± 0.5
@-10~70°C	○	○	○	○	○
@-20~70°C	×	○	○	○	○
@-40~85°C	×	×	△	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom High Precision VCTCXO

Series FVT-7S-HP

High Precision SMD VCTCXO 7.0×5.0 mm



Feature

- Typical 7.0 x 5.0 x 1.9 mm ceramic SMD package
- ±0.28ppm @-40°C~+85°C
- ±2.0ppm @-40°C~+105°C
- CMOS and Clipped Sine wave output optional

Application

- Femtocell , Base Stations
- WiMAX, WLAN, WIFI
- Wireless Communications

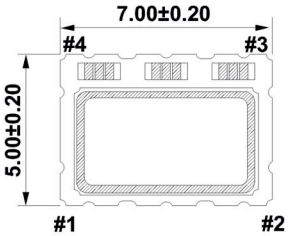
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	3.3		2.5V		Units	Notes
			Min.	Max.	Min.	Max.		
Frequency Range		F	5~52				MHz	
Standard Frequency		F	10, 12.8, 16.384, 19.2, 19.44, 20, 25, 26				MHz	
Supply Current	CMOS	Icc	-	8.0	-	8.0	mA	
	Clipped Sine Wave		-	5.0	-	5.0		
Frequency Tolerance		Ft	-	±2.0	-	±2.0	ppm	
Frequency stability	vs. Vdd	Fs	-	±0.1	-	±0.05	ppm	±5%
	vs. Load		-	±0.05	-	±0.05		±10%
	vs. Aging		-	±1.0	-	±1.0		@1st year
Output Level	Output High (Logic "1")	V	90%VDD	-	90%VDD	-	V	CMOS
	Output Low (Logic "0")		-	10%VDD	-	10%VDD		
	Duty	TH/T	45	55	45	55	%	
	Clipped Sine Wave	Vp-p	0.8	-	0.8	-	V	
Control Voltage Range			0.5	2.5	0.5	2.5	V	VCTCXO
Pulling Range			±5.0	-	±5.0	-	ppm	VCTCXO
Vc Input Impedance			100	-	100	-	kΩ	VCTCXO
Phase Noise @ 19.2 MHz	100 Hz	PN	-130		-130		dBc/Hz	
	1 kHz		-145		-145			
	10 kHz		-154		-154			
Output Loading	CMOS	RL // CL	15pF					
	Clipped Sine Wave		10 KΩ // 10pF					
Start-up Time		Tosc	5				mSec	Max

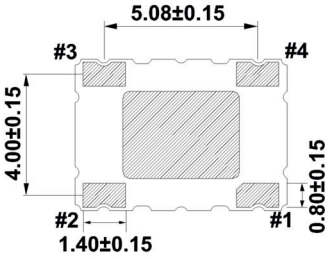
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

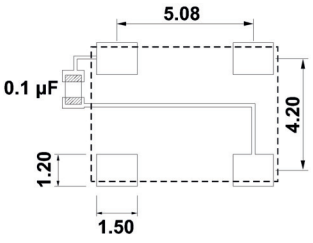
TOP VIEW



BOTTOM VIEW

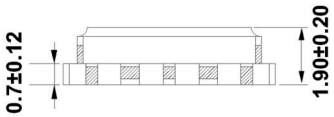


Solder Pad Layout(mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

SIDE VIEW



PIN#	Function
1	VCON:VC-TCXO GND/NC:TCXO
2	GND
3	Output
4	VDD

FREQ. STABILITY vs. TEMP. RANGE

ppm / Temp.(°C)	±0.05	±0.1	±0.2	±0.28	±0.5	±2.0
@-40~85°C	△	○	○	○	○	○
@-40~95°C	△	△	○	○	○	○
@-40~105°C	×	△	○	○	○	○

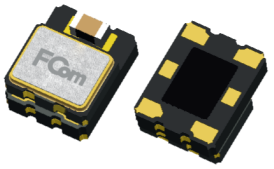
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Jitter SMD TCXO

Series FVT-3S-LJ

Low Jitter SMD TCXO 3.2×2.5 mm



Feature

- Low power supply voltage: 3.3V and 2.5V options
- Low Phase Jitter typical 0.6 pS RMS at 12kHz to 20MHz frequency offsets
- Differential output frequency support from 10MHz to 1.5GHz

Application

- High-Speed Gigabit Ethernet, SONET
- Fiber Channel, Strorages Area Network
- Enterprise Server, SAS/SATA, Smart Grid
- Microprocessors/DSP/FPGA, Broadband Access

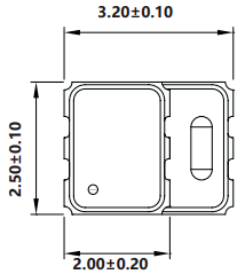
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	LVPECL		LVDS		CMOS		Units	Notes
			Min.	Max.	Min.	Max.	Min.	Max.		
Supply Voltage Variation		Vdd	2.5	3.3	2.5	3.3	2.5	3.3	V	
Frequency Range		F	10~1500				10~250		MHz	
Supply Current		Icc	-	54	-	45	-	40	mA	
Tri-State Mode (Input to Pin 2)		VIH	70% Vdd	-	70% Vdd	-	70% Vdd	-	V	Enable
		VIL	-	30% Vdd	-	30% Vdd	-	30% Vdd		Disable
Output Level		VoH	VDD-1.03	VDD-0.6	-	1.6	90% Vdd	-	V	Output Hight
		VoL	VDD-1.85	VDD-1.6	0.9	-	-	10% Vdd		Output Low
Transition Time	Rise Time	Tr	-	0.5 (20% - 80%)	-	1.0 (20% - 80%)	-	3.0 (10% - 90%)	nSec	
	Fall Time	Tf								
Stand by Current		Icc(ST)	-	20	-	20	-	20	mA	
Output Loading		RL	50Ω into VDD-2V		100 Ω		-	15pF		
Phase Noise		PN	Typ.	Max.	Typ.	Max.	Typ.	Max.	dBc/Hz	At VDD=3.3V, fout=250MHz
1 kHz			-107	-	-107	-	-107	-		
10 kHz			-111	-	-111	-	-111	-		
100 kHz			-114	-	-114	-	-114	-		
1 MHz			-125	-	-125	-	-125	-		
20 MHz			-147	-	-147	-	-147	-		
RMS Phase Jitterr	Fractional Mode	PJ	0.8	1.5	0.8	1.5	0.8	1.5	pSec	12kHz~20 MHz
	Integer Mode		0.6	1.2	0.6	1.2	0.6	1.2		
Duty Cycle			45	55	45	55	45	55	%	
Start-up Time		Tosc	-	5	-	5	-	5	mSec	

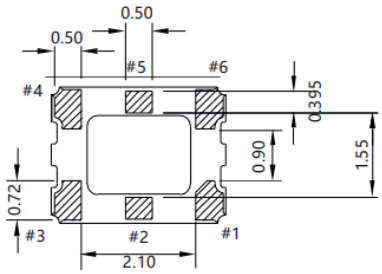
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DIMENSION(mm)

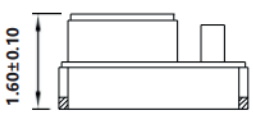
TOP VIEW



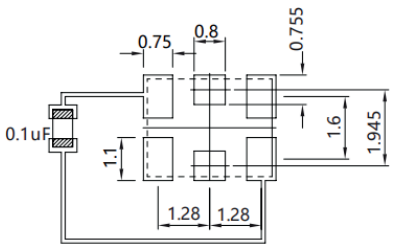
BOTTOM VIEW



SIDE VIEW



Type	CMOS	Differential
Pad	Function	Function
1	No Connection	No Connection
2	Tri-State	Tri-State
3	GND	
4	Output	Output
5	No Connection	Comp. Output
6	Supply Voltage(VDD)	



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.

FREQ. STABILITY vs. TEMP. RANGE

Temp.(℃) \ ppm	± 1.0	± 2.0	± 2.5
@-30~85°C	○	○	○
@-40~85°C	△	○	○

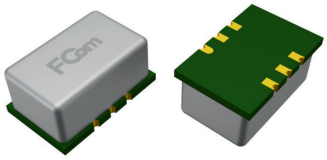
○: Available △: Conditional ×: Not available

Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Low Phase Noise TCXO

Series FVT-9S-LN

Very Low Noise SMD TCXO 14×9 mm



Feature

- Low Phase Noise
- High Stability for Stratum 3
- Small SMD Package

Application

- Time Synchronization
- Microwave Communication
- Test & Measurement
- Telecom Systems
- Satellite Communication

ELECTRICAL SPECIFICATIONS

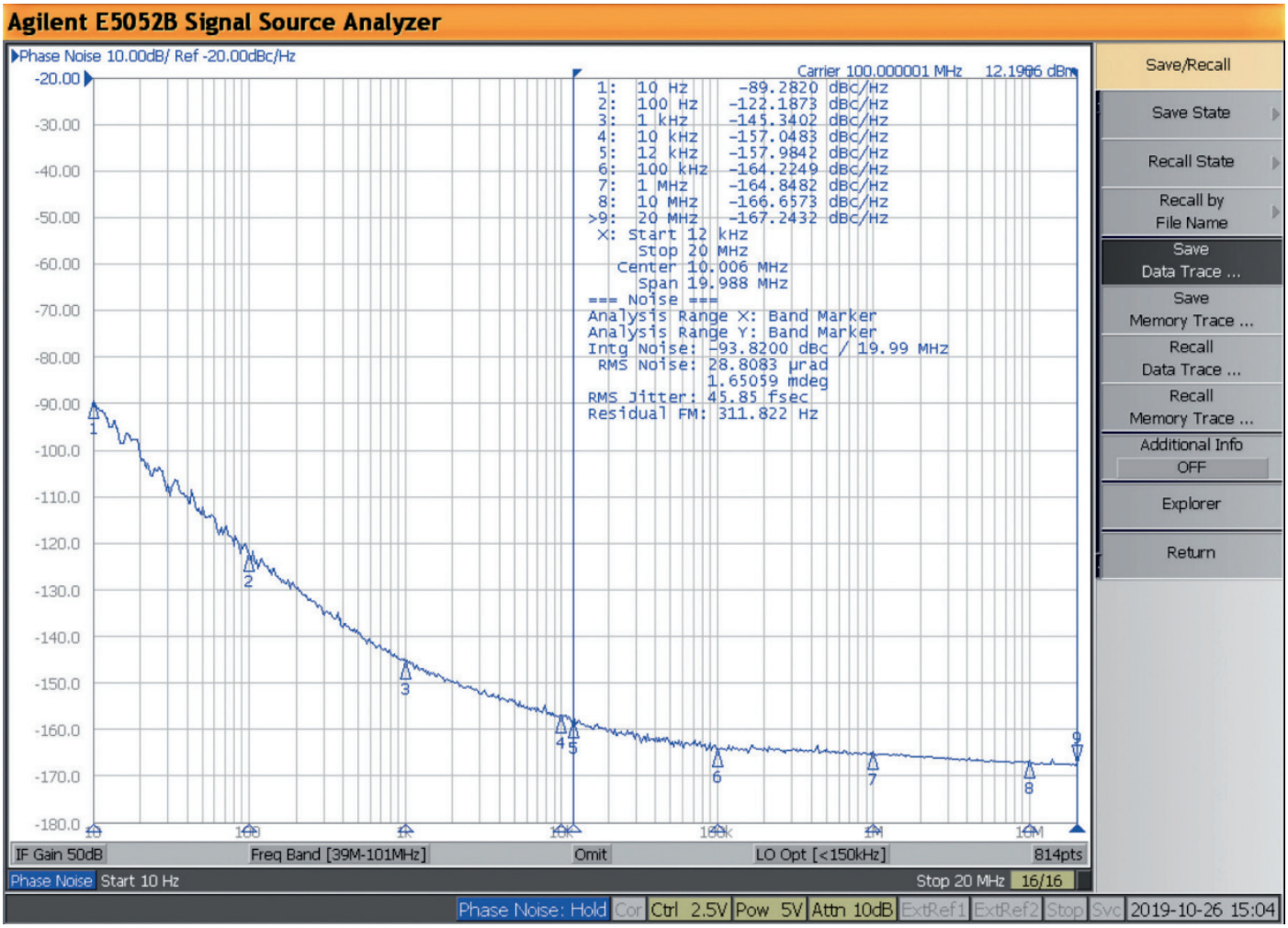
Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Frequency (Fo)		F	40	-	150	MHz	
Frequency Stability (Overall)		Fs		±4.6		ppm	
Holdover		-	-0.37	-	+0.37	ppm	Over 24 Hours
Initial Tolerance		-	-1.0	-	+1.0	ppm	at 25℃
Operating Temperature Range		Topr		-40℃~ +85℃		℃	
Storage Temperature Range		Tstg		-40℃~ +105℃		℃	
Waveform		-		Sine Wave		-	
Level		-		+8		dBm	
Load		-		50		Ω	
Harmonics			-	-	-30	dBc	
Waveform		-		CMOS		-	
Output Level	Output High	VH	2.97	-	-	V	
	Output Low	VL	-	-	0.33	V	
	Duty Cycle	TH/T	45		55	%	
Rise/Fall Time		Tr/Tf	-	-	3	nSec	
Load		CL	-	15	-	pF	
Control Voltage Range (VCTCXO)		-	0.5	-	2.5	V	
Pulling Range (VCTCXO)		-	±5	-	-	ppm	
Vc Input Impedance (VCTCXO)		-	100	-	-	kΩ	
Phase Noise (Max.)	10Hz	PN			-87	dBc/Hz	
	100Hz				-117		
	1KHz				-141		
	10KHz				-148		
	100KHz				-155		
	1MKHz				-160		

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

INPUT POWER (PIN = VDD)

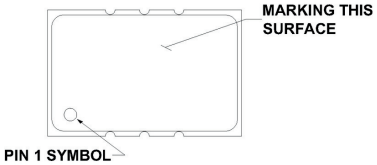
Parameter	Min.	Typ.	Max.	Units	Test Condition
Voltage		+3.3		V	
Current			35	mA	At maximum supply voltage

PHASE NOISE TEST DATA

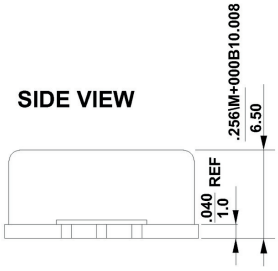


DIMENSION(mm)

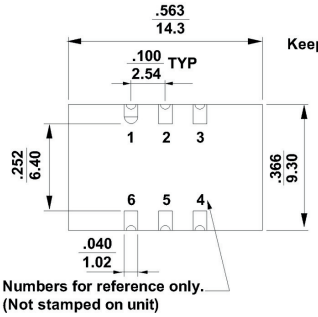
TOP VIEW



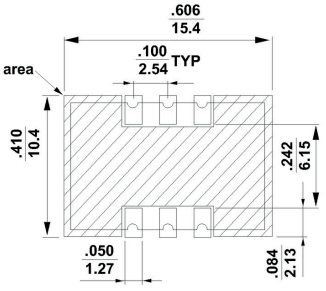
SIDE VIEW



BOTTOM VIEW



Solder Pad Layout(mm)



PIN CONNECTIONS	
PIN	FUNCTION
1 (See Note 1)	VCO INPUT or NOT CONNECTED
2 (See Note 1)	REFERENCE VOLTAGE or NOT CONNECTED
3	0 VOLTS AND CASE
4	R.F.OUTPUT
5	NOT CONNECTION
6	+VDC

Note:
1.If the specification does not specify parameters for either PIN 1,PIN 2 then that respective PIN is NOT internally CONNECTED.

INCH / mm (REFERENCE ONLY)

FCom Standard DIP OCXO

Series FOC-1D

Oven Controlled Crystal Oscillator 20.3x12.7 mm



Feature

- Dimension 20.3 x 12.7 x 11.0 mm typical
- Stratum 3 (Overall ± 4.6 ppm including 10 years aging.)

Application

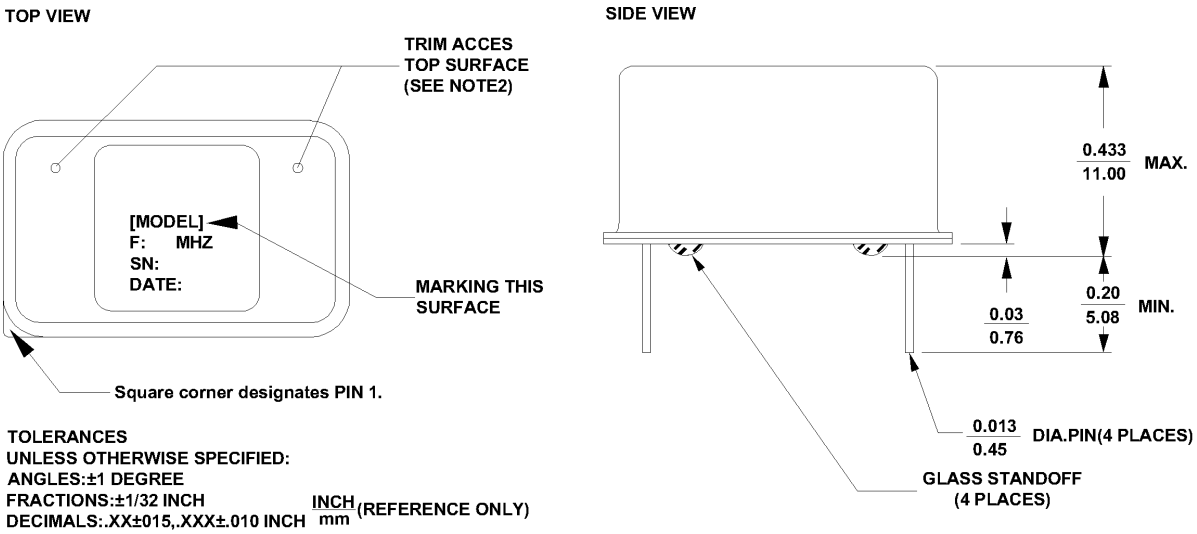
- SDH/SONET, Telecommunication base station
- Test and measurement equipment
- Synthesizer, Digital switch
- Reference Timing Circuit

ELECTRICAL SPECIFICATIONS

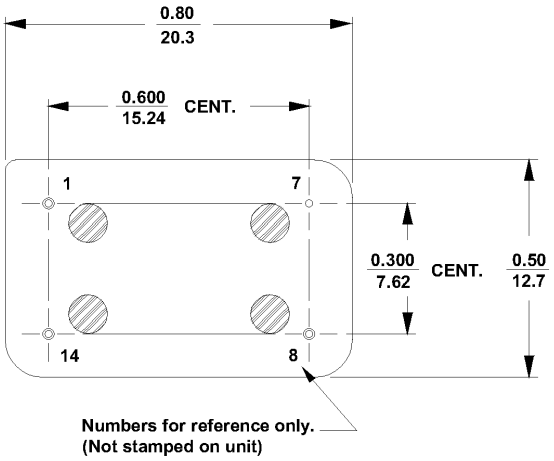
Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Output Frequency		F	10		40	MHz	
Waveform		-	Rectangular			-	Sine wave output is available.
"1" Level		VOH	2.4	-	-	V	
"0" Level		VOL	-	-	0.5	V	
Load		CL	-	15	-	pF	
Duty cycle		TH/T	45	50	55	%	@2.0 V
Spurious		-	-	-	-60	dBc	
Frequency Stability	Ambient	-	-0.1	-	+0.1	ppm	-30°C to +70°C, referenced to +25°C
	Aging		-5.0	-	+5.0	ppb	Per day,at time of shipment
	Daily		-5.0	-	+5.0	ppb	after 30 days
	Yearly		-0.5	-	+0.5	ppm	
	10 years		-3.0	-	+3.0	ppm	
	Voltage		-50	-	+50	ppb	±5% Change
	Warm-up		-0.1	-	+0.1	ppm	In 2 minutes @ +25°C, referenced to 1 hour
Phase Noise (Max.)	10Hz	PN	-	-	-105	dBc/Hz	
	100Hz		-	-	-130		
	1kHz		-	-	-140		
	10kHz		-	-	-150		
Electrical Frequency Adjustment	Range	-	-	-	-5.0	ppm	VCO@ 0V
			5.0	-	-		VCO@ +5.0V
	Control		0	2.5	5.0	V	
	Slope		-	Positive	-		
	VCO Input impedance		100	-	-	KΩ	
Input Power	Voltage	Vcc	4.75	5.0	5.25	V	3.3V input voltage is available.
	Current	Icc	-	-	400	mA	@ turn on
	Steady state	-	-	-	0.8	W	@ +25°C

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



TOLERANCES
UNLESS OTHERWISE SPECIFIED:
ANGLES:±1 DEGREE
FRACTIONS:±1/32 INCH
DECIMALS:.XX±015,.XXX±.010 INCH
INCH / mm (REFERENCE ONLY)



PIN CONNECTIONS	
PIN	FUNCTION
1 (See Note 1)	VCO INPUT OR NOT CONNECTED
7	0 VOLTS & CASE
8	R.F.OUTPUT
14	+VDC

Notes:
1.If the specification does not specify parameters for PIN 1 then PIN 1 is NOT intemally CONNECTED.
2.If the specification does not specify parameters for "MECHANICAL FREQUENC ADJUSTMENTthen there is no Trim Access

FREQ. STABILITY vs. TEMP. RANGE

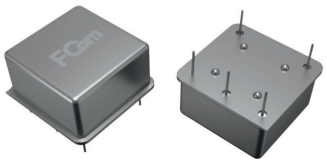
ppb / Temp.(℃)	± 50	± 100	± 200
@0~70°C	○	○	○
@-30~70°C	△	○	○
@-40~85°C	△	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard DIP OCXO

Series FOC-2D

Oven Controlled Crystal Oscillator 20.6x20.6 mm



Feature

- Dimension 20.6 x 20.6 x 11.0 mm typical
- SC Cut Crystal

Application

- SDH/SONET, Telecommunication base station
- Test and measurement equipment
- Synthesizer, Digital switch
- Reference Timing Circuit

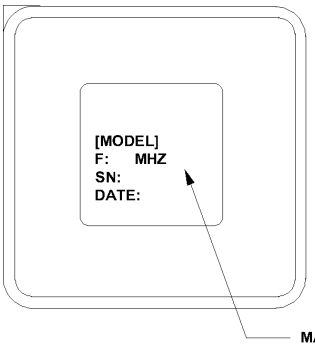
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Output Frequency		F	5	10	40	MHz	
Waveform		-	Rectangular			-	Sine wave output is available.
Level		-	HCMOS			-	
"1" Level		-	3.5	-	-	V	
"0" Level		-	-	-	0.5	V	
Load		CL	-	15	-	pF	
Duty cycle		TH/T	45	50	55	%	@2.0 V
Spurious		-	-	-	-60	dBc	
Frequency Stability	Ambient	-	-10	-	+10	ppb	-30°C to +70°C, referenced to +25°C
	Aging		-0.5	-	+0.5	ppb	Per day,at time of shipment
	Daily		-0.5	-	+0.5	ppb	after 30 days
	Yearly		-50	-	+50	ppb	
	10 years		-0.3	-	+0.3	ppm	
	Voltage		-0.5	-	+0.5	ppb	±5% Change
	Warm-up		-50	-	+50	ppb	In 3 minutes @ +25°C, referenced to 1 hour
Phase Noise (Max.)	10Hz	PN	-	-	-115	dBc/Hz	
	100Hz		-	-	-135		
	1kHz		-	-	-145		
	10kHz		-	-	-150		
Electrical Frequency Adjustment	Range	-	-	-	-0.5	ppm	VCO @ 0 V
			0.5	-	-		VCO @ +4.0 V
	Control		0	2	4	V	
	Slope		-	Positive	-		
	VCO Input impedance		100	-	-	KΩ	
Input Power	Voltage	Vcc	4.75	5.0	5.25	V	3.3V input voltage is available.
	Current	Icc	-	-	500	mA	@ turn on
	Steady state	-	-	-	1.0	W	@ +25°C
Reference Voltage	Voltage	-	3.8	4.0	4.2	V	
	Load	-	9	-	-	KΩ	

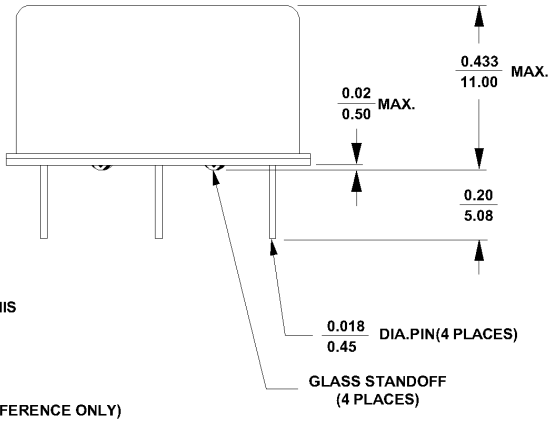
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

TOP VIEW



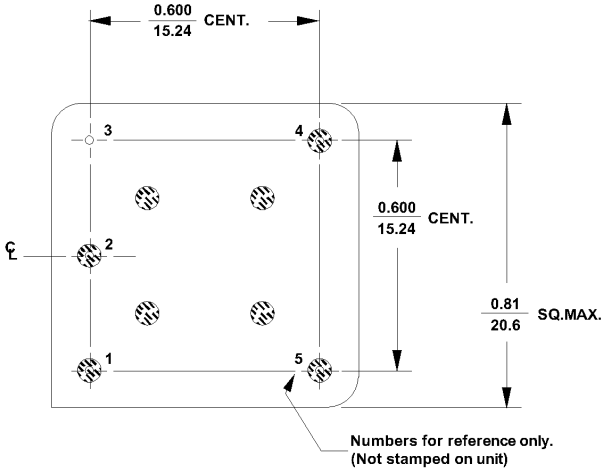
SIDE VIEW



TOLERANCES
UNLESS OTHERWISE SPECIFIED:
ANGLES:±1 DEGREE
FRACTIONS:±1/32 INCH
DECIMALS:.XX±015,.XXX±.010 INCH

INCH / mm (REFERENCE ONLY)

BOTTOM VIEW



PIN CONNECTIONS	
PIN	FUNCTION
1 (See Note 1)	VCO INPUT or NOT CONNECTED
2 (See Note 1)	REFERENCE VOLTAGE or NOT CONNECTED
3	0 VOLTS & CASE
4	R.F.OUTPUT
5	+VDC

PIN CONNECTIONS	
PIN	FUNCTION
1	+VDC
2	R.F.OUTPUT
3	0 VOLTS & CASE
4 (See Note 1)	VCO INPUT or NOT CONNECTED or R.F.ENABLE
5 (See Note 1)	REFERENCE VOLTAGE or NOT CONNECTED or OVEN MONITOR

Note:
1.If the specification does not specify parameters for either PIN1 or PIN2 (PIN4 or PIN5) then that respective PIN is NOT internally CONNECTED.

FREQ. STABILITY vs. TEMP. RANGE

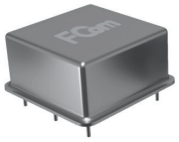
ppb / Temp.(℃)	± 5	± 10	± 20
@ 0~70°C	○	○	○
@-30~70°C	△	○	○
@-40~85°C	△	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard DIP OCXO

Series FOC-3D

Oven Controlled Crystal Oscillator 25.4x25.4 mm





Feature

- Dimension 25.4 x 25.4 x 12.7 mm typical
- SC Cut Crystal

Application

- SDH/SONET
- Telecommunication base station
- Test and measurement equipment
- Synthesizer, Digital switch
- Reference Timing Circuit

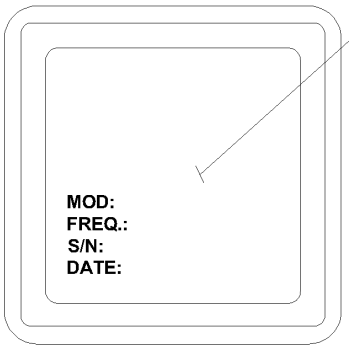
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Output Frequency		F	5	10	40	MHz	
Waveform		-	Rectangular			-	Sine wave output is available.
Level		-	TTL			-	
”1” Level		-	2.4	-	-	V	
”0” Level		-	-	-	0.4	V	
Load		CL	-	15	-	pF	
Duty cycle		TH/T	45	50	55	%	@ +1.4 V
Spurious		-	-	-	-60	dBc	
Frequency Stability	Ambient	-	-10	-	+10	ppb	-30°C to +70°C, referenced to +25°C
	Aging		-	-	-		
	Daily		-0.5	-	+0.5	ppb	after 30 days
	Yearly		-50	-	+50	ppb	
	10 years		-0.3	-	+0.3	ppm	
	Voltage		-5.0	-	+5.0	ppb	±5% Change
	Warm-up		-10	-	+10	ppm	In 10 minutes @ +25°C, referenced to 1 hour
Phase Noise (Max.)	10Hz	PN	-	-	-120	dBc/Hz	
	100Hz		-	-	-135		
	1kHz		-	-	-145		
	10kHz		-	-	-150		
Electrical Frequency Adjustment	Range	-	-	-	-0.5	ppm	VCO @ 0 V
			0.5	-	-		VCO @ +3.3 V
	Control		0	1.65	3.3	V	
	Slope		-	Positive	-		
	VCO Input impedance		100	-	-	KΩ	
Input Power	Voltage	Vcc	3.135	3.3	3.465	V	5.0V input voltage is available
	Current	Icc	-	-	1000	mA	@ turn on
	Steady state	-	-	-	1.3	W	@ +25°C

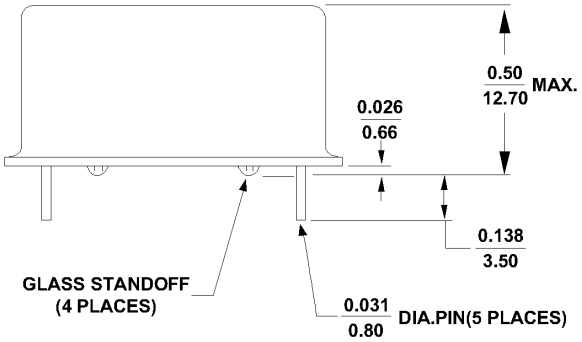
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

TOP VIEW



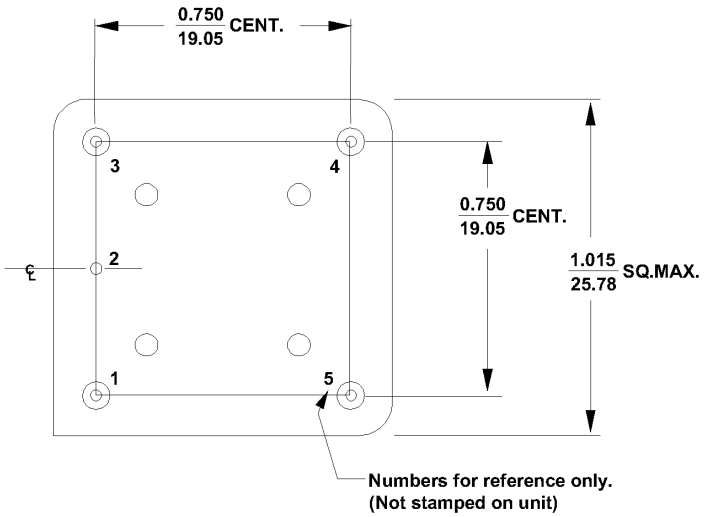
SIDE VIEW



TOLERANCES
UNLESS OTHERWISE SPECIFIED:
ANGLES:±1 DEGREE
FRACTIONS:±1/32 INCH
DECIMALS:.XX±015,.XXX±.010 INCH

INCH / mm (REFERENCE ONLY)

BOTTOM VIEW



PIN CONNECTIONS	
PIN	FUNCTION
1	R.F.OUTPUT
2	0 VOLTS & CASE
3 (See Note 1)	VCO INPUT or NOT CONNECTED
4	REFERENCE VOLTAGE or NOT CONNECTED or OVEN MONITOR
5	+VDC

Note:
1.If the specification does not specify parameters for either PIN3 or PIN4 then that respective PIN is NOT internally CONNECTED.

FREQ. STABILITY vs. TEMP. RANGE

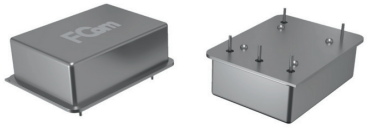
ppb / Temp.(°C)	± 3	± 5	± 10
@ 0~70°C	○	○	○
@-30~70°C	△	○	○
@-40~85°C	△	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard DIP OCXO

Series FOC-4D

Oven Controlled Crystal Oscillator 36.3x27.2 mm



Feature

- Dimension 36.3 x 27.2 x 12.7 mm typical
- SC Cut Crystal

Application

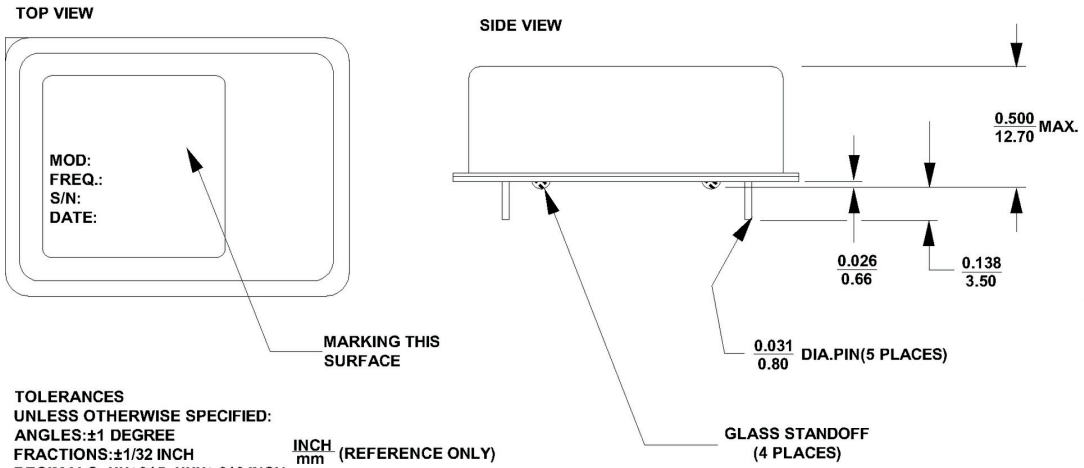
- SDH/SONET, Telecommunication base station
- Test and measurement equipment
- Synthesizer, Digital switch
- Reference Timing Circuit

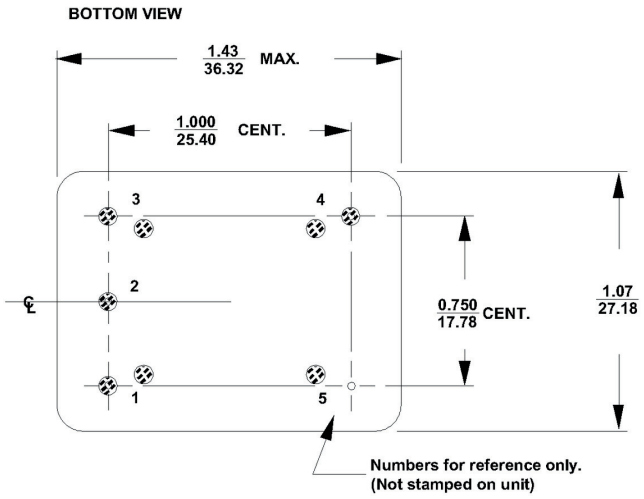
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Output Frequency		F	5	10	40	MHz	
Waveform		-	Rectangular			-	Sine wave output is available.
Level		-	TTL			-	
"1" Level		-	2.4	-	-	V	
"0" Level		-	-	-	0.4	V	
Load		CL	-	15	-	pF	
Duty cycle		TH/T	45	50	55	%	@ +1.4 V
Spurious		-	-	-	-60	dBc	
Frequency Stability	Ambient	-	-5.0	-	+5.0	ppb	-40°C to +85°C, referenced to +25°C
	Aging		-0.5	-	+0.5	ppb	Per day,at time of shipment
	Daily		-0.5	-	+0.5	ppb	after 30 days
	Yearly		-50	-	+50	ppb	
	10 years		-0.3	-	+0.3	ppm	
	Voltage		-0.5	-	+0.5	ppb	±5% Change
	Warm-up		-10	-	+10	ppm	In 10 minutes @ +25°C, referenced to 1 hour
Phase Noise (Max.)	10Hz	PN	-	-	-120	dBc/Hz	
	100Hz		-	-	-135		
	1kHz		-	-	-145		
	10kHz		-	-	-150		
Electrical Frequency Adjustment	Range	-	-	-	-0.5	ppm	VCO @ 0 V
			0.5	-	-		VCO @ +3.3 V
	Control		0	2.5	5.0	V	
	Slope		-	Positive	-		
	VCO Input impedance		100	-	-	KΩ	
Input Power	Voltage	Vcc	4.75	5.0	5.25	V	3.3V input voltage is available
	Current	Icc	-	-	850	mA	@ turn on
	Steady state	-	-	-	1.3	W	@ +25°C

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)





PIN CONNECTIONS	
PIN	FUNCTION
1 (See Note 1)	VCO INPUT or NOT CONNECTED
2 (See Note 1)	REFERENCE VOLTAGE or NOT CONNECTED
3	+VDC
4	R.F.OUTPUT
5	0 VOLTS & CASE

Note:
1.If the specification does not specify parameters for either PIN3 or PIN4 then that respective PIN is NOT internally CONNECTED.

FREQ. STABILITY vs. TEMP. RANGE

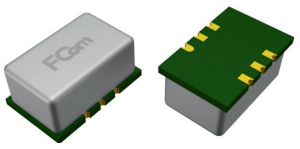
ppb / Temp.(°C)	± 3	± 5	± 10
@ 0~70°C	○	○	○
@-30~70°C	△	○	○
@-40~85°C	△	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard SMD OCXO

Series FOC-5S

Oven Controlled Crystal Oscillator 14.7 x 9.6 mm



Feature

- Dimension 14.7 x 9.6 x 8.2 mm Typical
- 6-Pin Hermetic SMD Package
- ±30 ppb stability over -40 to 85°C
- Stratum 3 (Overall ±4.6 ppm including 20 years aging.)

Application

- SDH/SONET, Telecommunication base station
- Test and measurement equipment
- Synthesizer, Digital switch, Reference Timing Circuit
- Packet Timing Protocol (e.g. 1588)

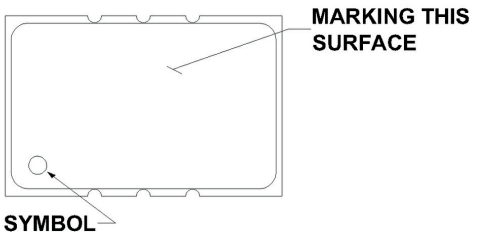
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Output Frequency		F	10	20	40	MHz	
Waveform		-	Rectangular			-	
Level		-	HCMOS			-	
”1” Level		-	2.4	-	-	V	
”0” Level		-	-	-	0.4	V	
Load		CL	-	15	-	pF	
Duty cycle		TH/T	45	50	55	%	@+1.65 V
Spurious		-	-	-	-60	dBc	
Frequency Stability	Ambient	-	-30	-	+30	ppb	-40°C to +85°C, referenced to +25°C
	Aging		-	-	-		
	Daily		-2.0	-	+2.0	ppb	after 30 days
	Yearly		-0.4	-	+0.4	ppm	
	10 years		-2.0	-	+2.0	ppm	
	Voltage		-5	-	+5	ppb	±5% Change
	Load		-10	-	+10	ppb	±10% Change
	Warm-up		-0.1	-	+0.1	ppm	In 5 minutes @ +25°C, referenced to 1 hour
Phase Noise @ 20 MHz	10Hz	PN	-	-98	-92	dBc/Hz	
	100Hz		-	-126	-120		
	1kHz		-	-145	-140		
	10kHz		-	-152	-150		
Electrical Frequency Adjustment	Range	-	-	-	-5.0	ppm	VCO @ 0 V
			5.0	-	-		VCO @ +3.3 V
	Control		0	1.65	3.3	V	
	Slope		-	Positive	-		
	VCO Input impedance		100	-	-	KΩ	
Input Power	Voltage	Vcc	3.135	3.3	3.465	V	5.0V input voltage is available
	Current	Icc	-	500	600	mA	@ turn on
	Steady state	-	-	0.5	0.6	W	@ +25°C

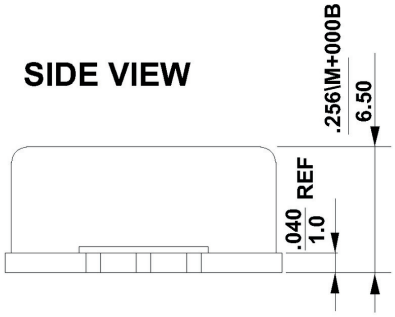
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

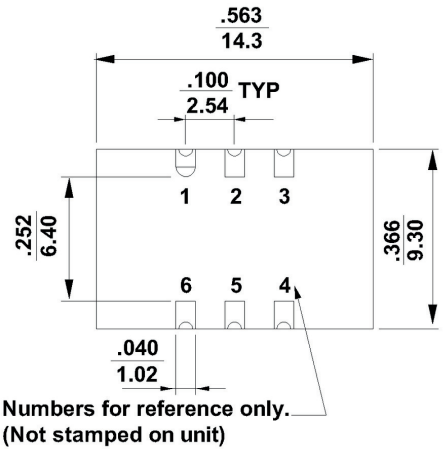
TOP VIEW



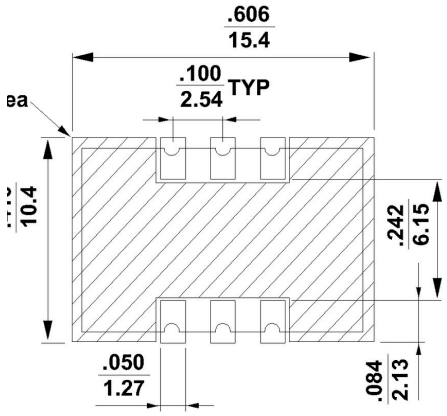
SIDE VIEW



BOTTOM VIEW



Solder Pad Layout(mm)



PIN CONNECTIONS	
PIN	FUNCTION
1 (See Note 1)	VCO INPUT or NOT CONNECTED
2 (See Note 1)	REFERENCE VOLTAGE or NOT CONNECTED
3	0 VOLTS AND CASE
4	R.F.OUTPUT
5	NOT CONNECTION
6	+VDC

1.If the specification does not specify parameters for either PIN 1,PIN 2 then that respective PIN is NOT internally CONNECTED.

INCH / mm (REFERENCE ONLY)

FREQ. STABILITY vs. TEMP. RANGE

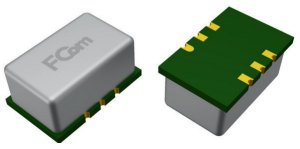
ppb / Temp.(℃)	± 10	± 20	± 30	± 50
@-20~70°C	△	○	○	○
@-40~85°C	×	△	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom LOW NOISE SMD OCXO

Series FOC-5S-LN

Low Noise SMD OCXO 14.7 x 9.6 mm



Feature

- Dimension 14.7 x 9.6 x 8.2 mm Typical
- 6-Pin Hermetic SMD Package
- ±10 ppb Stability over -40 to 85°C
- Very Low Phase Noise

Application

- SDH/SONET, Telecommunication base station
- Test and measurement equipment
- Synthesizer, Digital switch, Reference Timing Circuit
- Packet Timing Protocol (e.g. 1588)

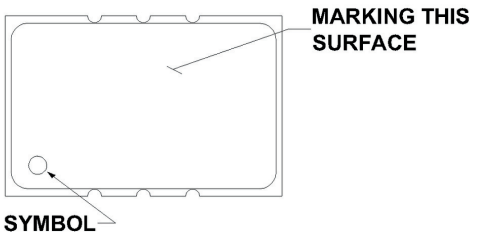
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Output Frequency		F	10	20	40	MHz	
Waveform		-	Rectangular			-	
Level		-	-			-	
"1" Level		-	2.4	-	-	V	
"0" Level		-	-	-	0.4	V	
Load		CL	-	15	-	pF	
Duty cycle		TH/T	45	50	55	%	@+1.65 V
Spurious		-	-	-	-60	dBc	
Frequency Stability	Ambient	-	-10	-	+10	ppb	-40°C to +85°C, referenced to +25°C
	Aging		-	-	-		
	Daily		-1.0	-	+1.0	ppb	after 30 days
	Yearly		-0.2	-	+0.2	ppm	
	10 years		-1.0	-	+1.0	ppm	
	Voltage		-5	-	+5	ppb	±5% Change
	Warm-up		-0.1	-	+0.1	ppm	In 5 minutes @ +25°C, referenced to 1 hour
Phase Noise @ 20 MHz	10Hz	PN	-	-126	-120	dBc/Hz	
	100Hz		-	-149	-145		
	1kHz		-	-160	-157		
	10kHz		-	-164	-162		
Electrical Frequency Adjustment	Range	-	-	-	-0.5	ppm	VCO @ 0 V
			0.5	-	-		VCO @ +3.3 V
	Control		0	1.65	3.3	V	
	Slope		-	Positive	-		
	VCO Input impedance		100	-	-	KΩ	
Input Power	Voltage	Vcc	3.135	3.3	3.465	V	5.0V input voltage is available
	Current	Icc	-	-	600	mA	@ turn on
	Steady state	-	-	0.5	0.6	W	@ +25°C

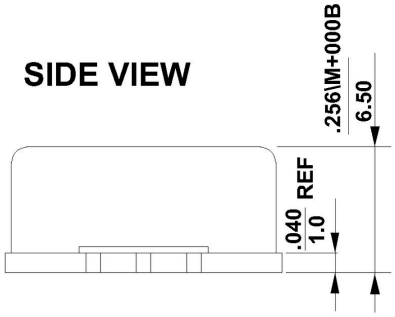
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

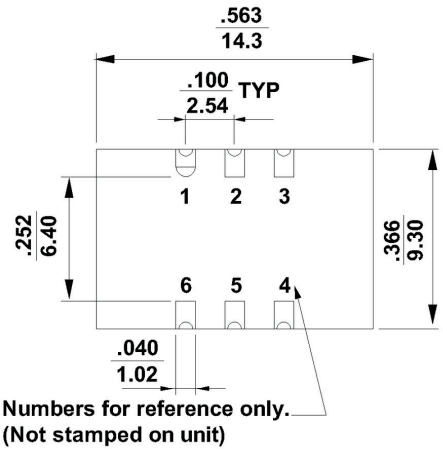
TOP VIEW



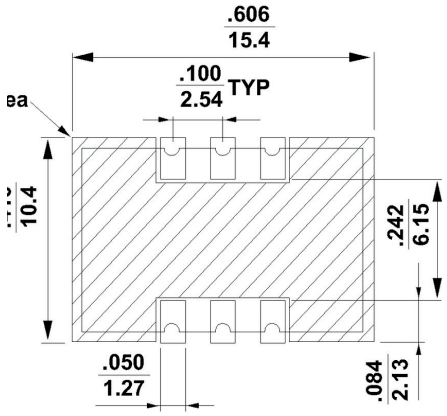
SIDE VIEW



BOTTOM VIEW



Solder Pad Layout(mm)



PIN CONNECTIONS	
PIN	FUNCTION
1 (See Note 1)	VCO INPUT or NOT CONNECTED
2 (See Note 1)	REFERENCE VOLTAGE or NOT CONNECTED
3	0 VOLTS AND CASE
4	R.F.OUTPUT
5	NOT CONNECTION
6	+VDC

1.If the specification does not specify parameters for either PIN 1,PIN 2 then that respective PIN is NOT internally CONNECTED.

INCH / mm (REFERENCE ONLY)

FREQ. STABILITY vs. TEMP. RANGE

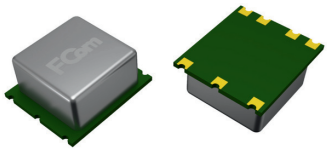
ppb / Temp.(℃)	± 5	± 10	± 20	± 30
@-20~70°C	○	○	○	○
@-40~85°C	△	○	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard SMD OCXO

Series FOC-6S

Oven Controlled Crystal Oscillator 25.4x22.1 mm



Feature

- Dimension 25.4 x 22.1 x 11.0 mm Typical
- SC Cut Crystal

Application

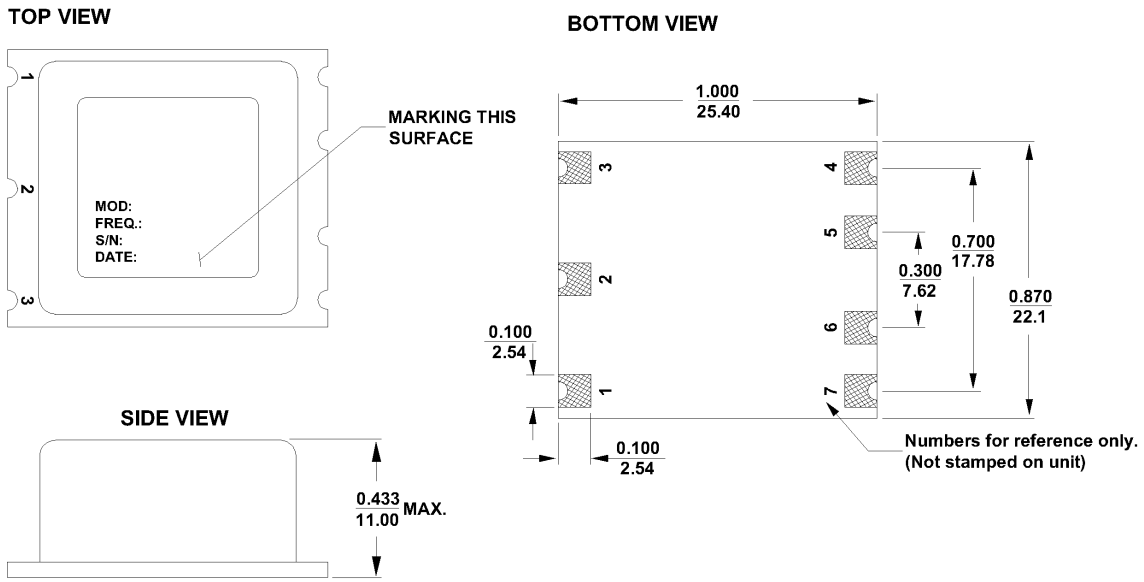
- SDH/SONET, Telecommunication base station
- Test and measurement equipment
- Synthesizer, Digital switch, Reference Timing Circuit

ELECTRICAL SPECIFICATIONS

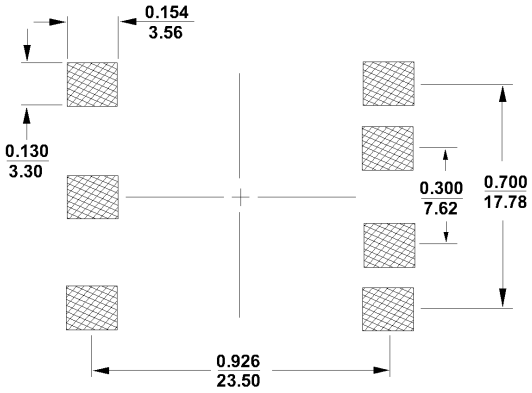
Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Output Frequency		F	5	10	40	MHz	
Waveform		-		Rectangular		-	
Level		-		HCMOS		-	
"1" Level		-	2.4	3.3	-	V	
"0" Level		-	-	-	0.4	V	
Load		CL	-	15	-	pF	
Duty cycle		TH/T	45	50	55	%	@+1.4V
Spurious		-	-	-	-60	dBc	
Frequency Stability	Ambient	-	-10	-	+10	ppb	0°C to +70°C, referenced to +25°C
	Aging		-0.5	-	+0.5	ppb	Per day,at time of shipment
	Daily		-0.5	-	+0.5	ppb	after 30 days
	Yearly		-50	-	+50	ppb	
	10 years		-0.4	-	+0.4	ppm	
	Voltage		-0.5	-	+0.5	ppb	±5% Change
	Warm-up		-10	-	+10	ppm	In 2 minutes @ +25°C, referenced to 1 hour
Phase Noise @ 20 MHz	10Hz	PN	-	-	-115	dBc/Hz	
	100Hz		-	-	-130		
	1kHz		-	-	-140		
	10kHz		-	-	-150		
Electrical Frequency Adjustment	Range	-	-	-	-0.5	ppm	VCO @ 0 V
			0.5	-	-		VCO @ +3.3 V
	Control		0	1.4	2.8	V	
	Slope		-	Positive	-		
	VCO Input impedance		100	-	-	KΩ	
Input Power	Voltage	Vcc	3.135	3.3	3.465	V	5.0V input voltage is available
	Current	Icc	-	-	1000	mA	@ turn on
	Steady state	-	-	-	1.2	W	@ +25°C
Reference Voltage	Voltage	-	2.7	2.8	2.9	V	
	Load	-	9	-	-	KΩ	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)



RECOMMENDED SOLDER PAD LAYOUT



PIN CONNECTIONS	
PIN	FUNCTION
1 (See Note 1)	VCO INPUT or NOT CONNECTED
2 (See Note 1)	REFERENCE VOLTAGE or NOT CONNECTED
3	+VDC
4	R.F.OUTPUT
5	OVEN MONITOR or NOT CONNECTION
6	NOT CONNECTION
7	0 VOLTS AND CASE

FREQ. STABILITY vs. TEMP. RANGE

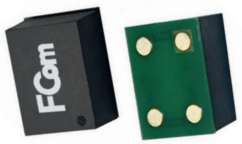
Temp.(°C) \ ppb	± 5	± 10	± 20
@0~70°C	○	○	○
@-30~70°C	△	○	○
@-40~85°C	△	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Standard SMD OCXO

Series FOC-7S

Oven Controlled Crystal Oscillator 9.7 x 7.5 mm



Feature

- Dimension 9.7 x 7.5mm, miniaturized 4-Pad SMD package
- Low Power Consumption
- ±20 ppb stability over -40 to 85°C
- Stratum 3 (Overall ±4.6 ppm including 20 years aging.)

Application

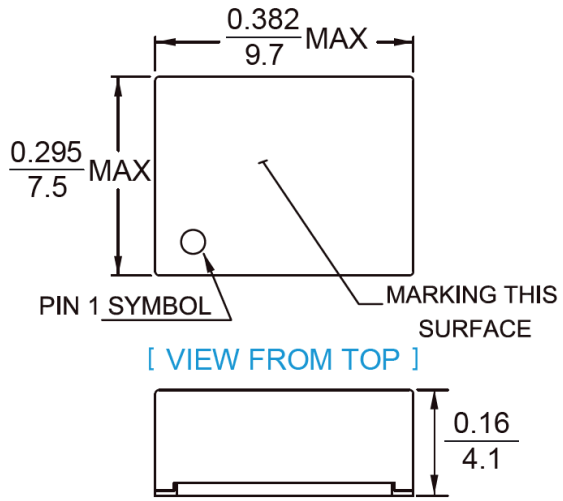
- Small Cell, Portable Telecommunication Device
- Test and Instrumentation
- Synthesizer, Digital switch, Reference Timing Circuit
- Packet Timing Protocol (e.g. IEEE-1588)

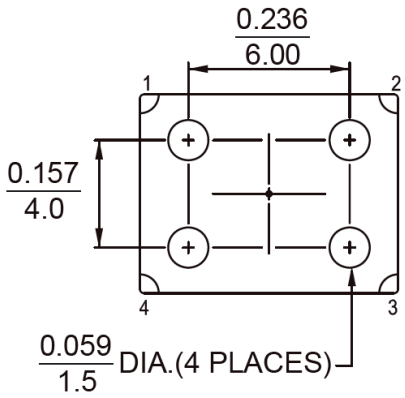
ELECTRICAL SPECIFICATIONS

Parameters		Symbol	Min.	Typ.	Max.	Units	Notes
Output Frequency		F	10	-	40	MHz	
Waveform		-	CMOS, Clipped Sine			-	
Level		-	-			-	
"1" Level	Rectangular	-	2.4	-	-	V	
"0" Level		-	-	-	0.4	V	
Duty cycle		TH/T	45	50	55	%	@+1.65 V
Clipped Sine		Vp-p	0.8	-	-	Vp-p	
Load (Rectangular/Clipped Sine)		-	15pF / 10Kohm//10pF			-	
Spurious		-	-	-	-60	dBc	
Frequency Stability	Ambient	-	-20	-	+20	ppb	-40°C to +85°C, referenced to +25°C
	Aging		-	-	-		
	Daily		-3.0	-	+3.0	ppb	after 30 days
	Yearly		-0.6	-	+0.6	ppm	
	10 years		-3.0	-	+3.0	ppm	
	Voltage		-5	-	+5	ppb	±5% Change
	Warm-up		-0.1	-	+0.1	ppm	In 5 minutes @ +25°C, referenced to 1 hour
Phase Noise @ 20 MHz	10Hz	PN	-	-98	-92	dBc/Hz	
	100Hz		-	-126	-120		
	1kHz		-	-145	-140		
	10kHz		-	-152	-150		
Electrical Frequency Adjustment	Range	-	-	-	-5.0	ppm	VCO @ 0 V
			5.0	-	-		VCO @ +3.3 V
	Control		0	1.65	3.3	V	
	Slope		-	Positive	-		
	VCO Input impedance		100	-	-	KΩ	
Input Power	Voltage	Vcc	3.135	3.3	3.465	V	
	Current	Icc	-	-	350	mA	@ turn on
	Steady state	-	-	0.3	0.4	W	@ +25°C

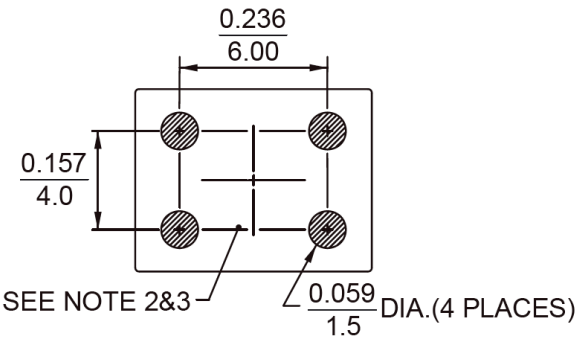
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)





Numbers for reference only.
(Not stamped on unit)
(VIEW FROM BOTTOM)



PIN CONNECTIONS	
PIN	FUNCTION
1 (See NOTE 1)	VCO INPUT or NOT CONNECTED
2	0 VOLTS AND CASE
3	R.F. OUTPUT
4	+VDC

RECOMMENDED SOLDER PAD LAYOUT

Notes 1.
If the specification does not specify parameters for PIN 1 , then PIN 1 must remain unconnected.

Notes 2.
Copper in this area should be kept to a minimum to reduce heat loss from OCXO.

Notes 3.
Bottom side refiow is forbidden unless specified in oscillator specification.

Notes 4. Aqueous cleaning is FORBIDDEN

Notes 5. Test condition : A 0.1uF and 10uF X7R decoupling capacitor is required close to the unit.

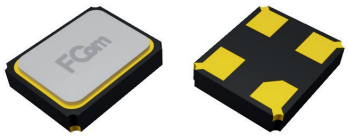
FREQ. STABILITY vs. TEMP. RANGE

ppb / Temp.(°C)	± 5	± 10	± 20	± 30	± 50
@-20~70°C	△	○	○	○	○
@-40~85°C	×	△	○	○	○

○: Available △: Conditional ×: Not available
Inclusive of calibration @25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration.

FCom Automotive Crystal

Series FCX-2S-A



SMD Seam Sealed Automotive Crystals 2.0x1.6 mm

Feature

- Size 2.0×1.6, Ultra thin, thickness 0.5mm
- High precision and high frequency stability
- AEC-Q200 Compliant
- RoHS and REACH Compliant, Pb-free

Application

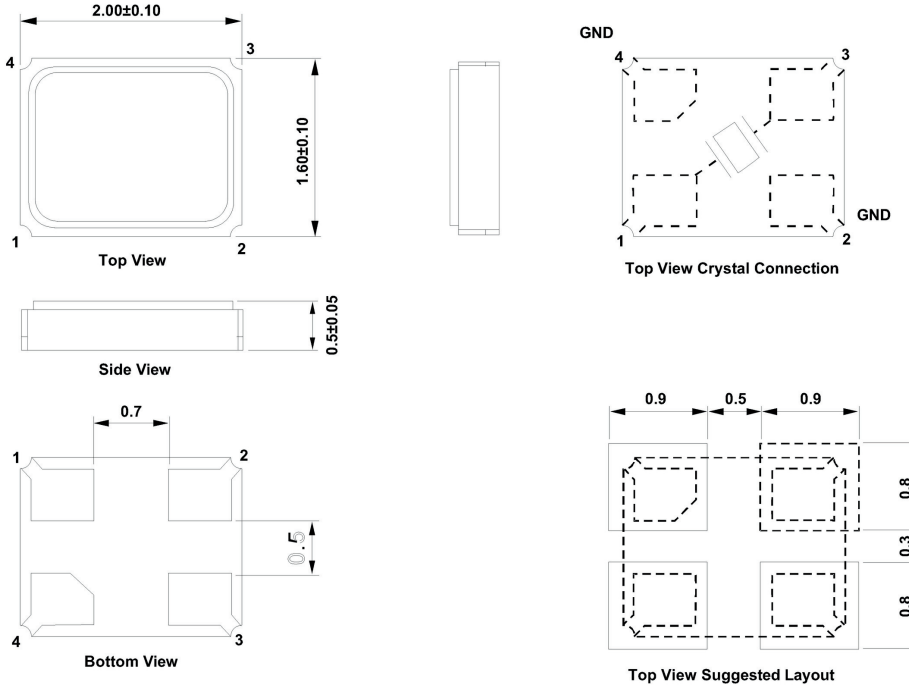
- Automotive Wireless Communication
- In-Vehicle Infotainment system
- Camera, Radar, Lidar, TPMS, Smart Key
- Battery Management System, Body Control
- Power steering, Breaking System, Engine Control

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	16 ~ 52			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25℃	
Frequency Stability Over Operating Temp. Range (Reference 25℃)	ST	± 50			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	120	Ohm	16~30MHz	
		-	-	80		30~40MHz	
		-	-	50		40~52MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

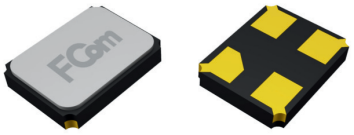
DIMENSION(mm)



FCom Automotive Crystal

Series FCX-2M-A

SMD Seam Sealed Automotive Crystals 2.5x2.0 mm



Feature

- Industry Standard Package: 2.5*2.0*0.55mm
- AEC-Q200 Compliant
- High precision and high reliability
- RoHS and REACH Compliant, Pb-free

Application

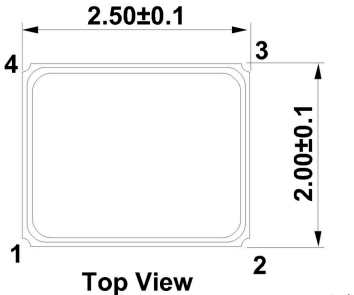
- Automotive Wireless Communication
- In-Vehicle Infotainment system
- Camera, Radar, Lidar, TPMS, Smart Key
- Battery Management System, Body Control
- Power steering, Breaking System, Engine Control

ELECTRICAL SPECIFICATIONS

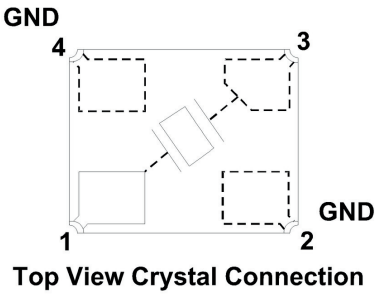
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	12 ~ 54			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25℃	
Frequency Stability Over Operating Temp. Range (Reference 25℃)	ST	± 50			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	160	Ohm	12~16MHz	
		-	-	100		16~20MHz	
		-	-	80		20~54MHz	
Aging	-	± 3			ppm	1st Year	

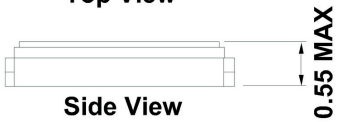
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

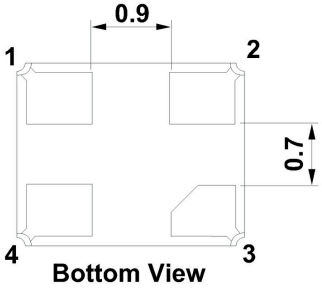
DIMENSION(mm)

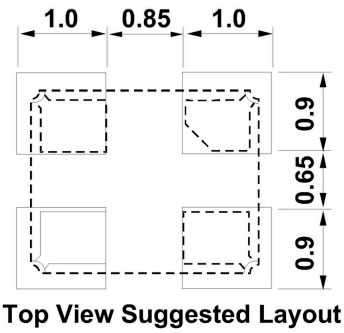








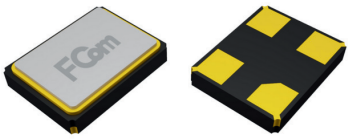




FCom Automotive Crystal

Series FCX-3M-A

SMD Seam Sealed Automotive Crystals 3.2x2.5 mm



Feature

- Size 3.2×2.5, Ultra thin, thickness 0.70mm
- Excellent heat resistance and environmental characteristics
- High precision and high frequency stability
- RoHS and REACH Compliant, Pb-free
- AEC-Q200 Compliant

Application

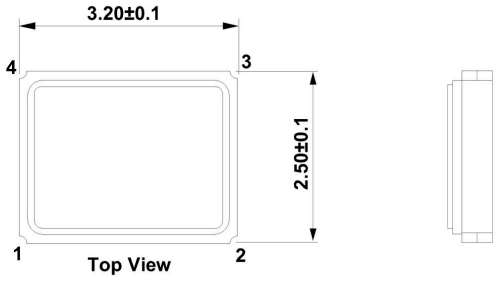
- Automotive Wireless Communication
- In-Vehicle Infotainment system
- Camera, Radar, Lidar, TPMS, Smart Key
- Battery Management System, Body Control
- Power steering, Breaking System, Engine Control

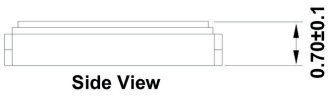
ELECTRICAL SPECIFICATIONS

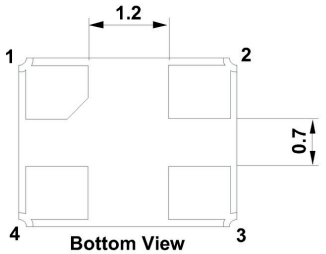
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~ 50			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 50			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	200	Ohm	8~20MHz	
		-	-	60		20~26MHz	
		-	-	40		26~50MHz	
Aging	-	± 3			ppm	1st Year	

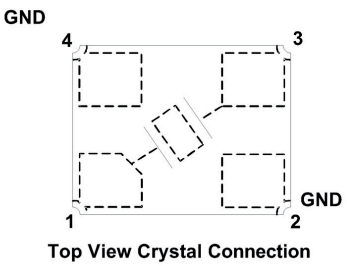
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

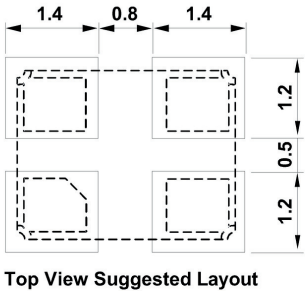
DIMENSION(mm)









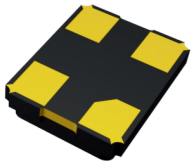


FCom Automotive Crystal

Series FCX-3G-A

SMD Glass Sealed Automotive Ceramic 3.2x2.5 mm





Feature

- Industry Standard Package: 3.2*2.5*0.8mm
- Excellent heat resistance and environmental characteristic
- High precision and high reliability
- Contain Pb exempted by RoHS directive
- AEC-Q200 Compliant

Application

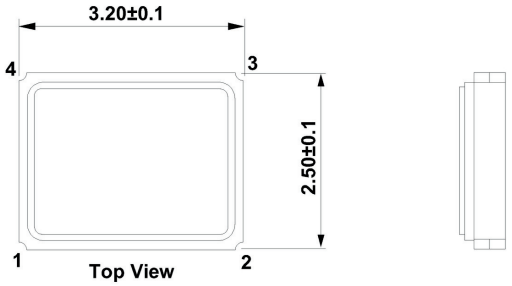
- Automotive Ethernet
- In-Vehicle Infotainment system
- Battery Management System, Body Control
- Instrument clusters
- Power steering, Breaking System, Engine Control

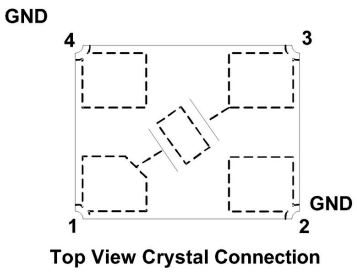
ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~ 54			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 50			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	300	Ohm	8~16MHz	
		-	-	100		16~26MHz	
		-	-	60		26~54MHz	
Aging	-	± 3			ppm	1st Year	

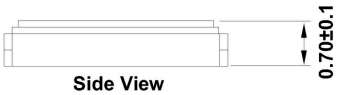
Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

DIMENSION(mm)

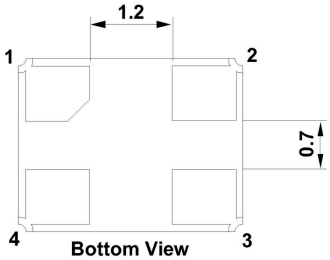




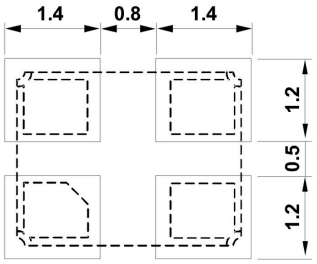
Top View Crystal Connection



Side View



Bottom View

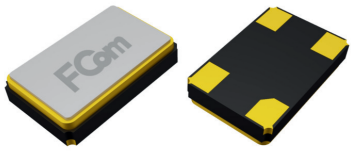


Top View Suggested Layout

FCom Automotive Crystal

Series FCX-5M-A

SMD Seam Sealed Automotive Crystals 5.0x3.2 mm



Feature

- Size 5.0×3.2, thickness 0.90mm
- High precision and high frequency stability
- Excellent heat resistance and environmental characteristics
- RoHS and REACH Compliant, Pb-free
- AEC-Q200 Compliant

Application

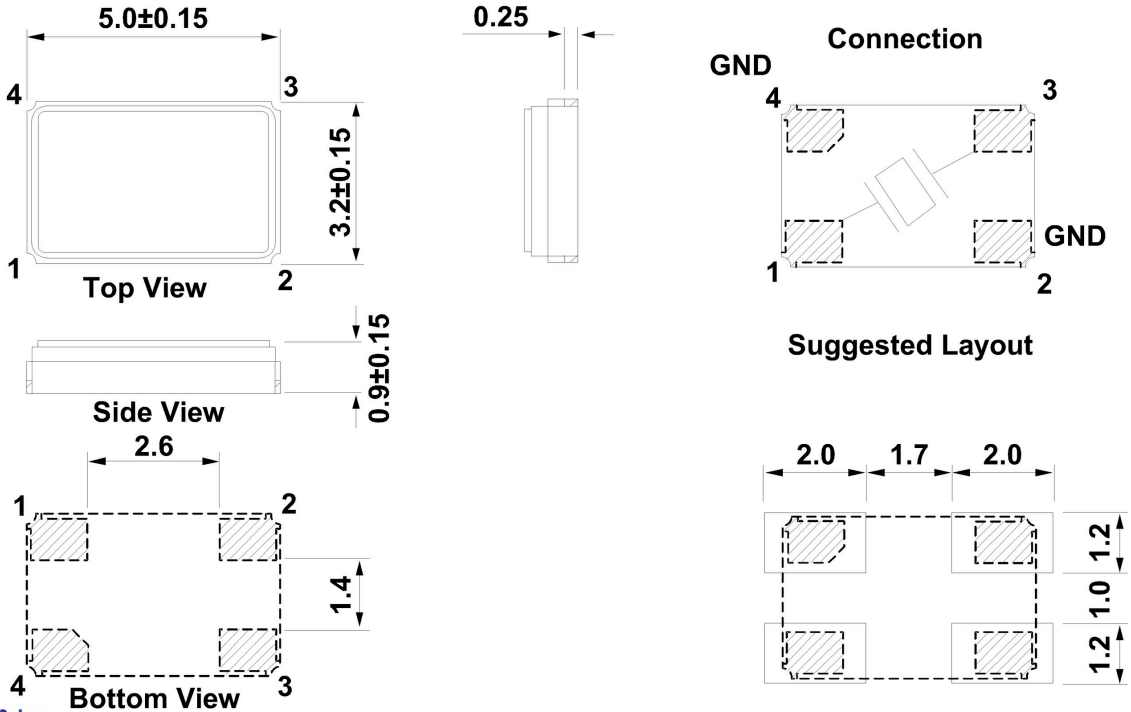
- Automotive Wireless Communication
- In-Vehicle Infotainment system
- Camera, Radar, Lidar, TPMS, Smart Key
- Battery Management System, Body Control
- Power steering, Breaking System, Engine Control

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~ 54			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 50			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	10	100	uW		
Equivalent Series Resistance	ESR	-	-	100	Ohm	8~20MHz	
		-	-	80		20~26MHz	
		-	-	50		26~54MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

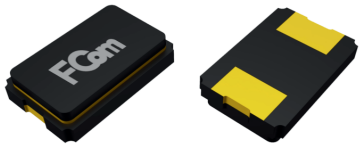
DIMENSION(mm)



FCom Automotive Crystal

Series FCX-5G-A

SMD Glass Sealed Automotive Ceramic 5.0×3.2 mm



Feature

- Industry Standard Package: 5.0*3.2*1.3mm
- Excellent heat resistance and environmental characteristic
- High precision and high reliability
- Contain Pb exempted by RoHS directive
- AEC-Q200 Compliant

Application

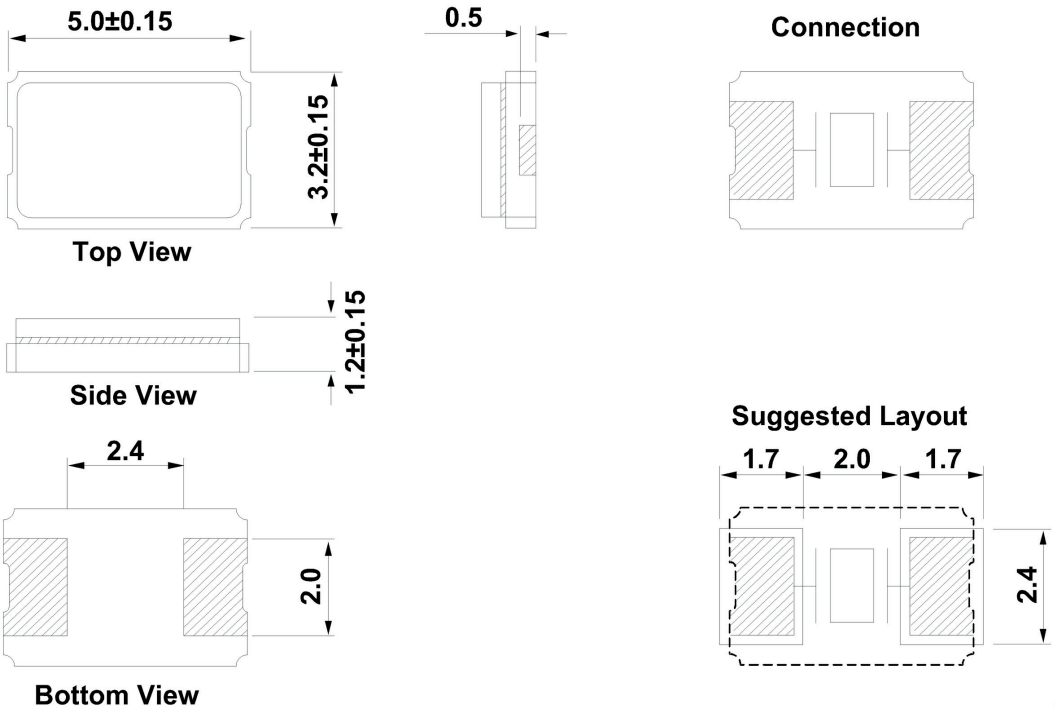
- Automotive Wireless Communication
- In-Vehicle Infotainment system
- Camera, Radar, Lidar, TPMS, Smart Key
- Battery Management System, Body Control
- Power steering, Breaking System, Engine Control

ELECTRICAL SPECIFICATIONS

Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F	8 ~ 54			MHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance	FT	± 10			ppm	@25°C	
Frequency Stability Over Operating Temp. Range (Reference 25°C)	ST	± 50			ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL	6 , 10, 18 or specify			pF		
Drive Level	DL	-	50	200	uW		
Equivalent Series Resistance	ESR	-	-	140	Ohm	8~20MHz	
		-	-	80		20~26MHz	
		-	-	60		26~54MHz	
Aging	-	± 3			ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

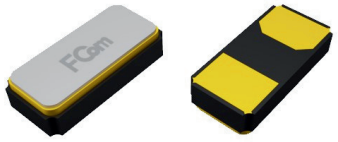
DIMENSION(mm)



FCom Automotive Crystal

Series FCT-3M-A

SMD Package Automotive 3.2×1.5 mm 32.768kHz



Feature

- Ultra small size 3.2×1.5×0.75mm
- High reliability environmental performance
- High frequency stability and high precision
- RoHS and REACH Compliant , Pb-free
- AEC-Q200 Compliant for Automotive RTC

Application

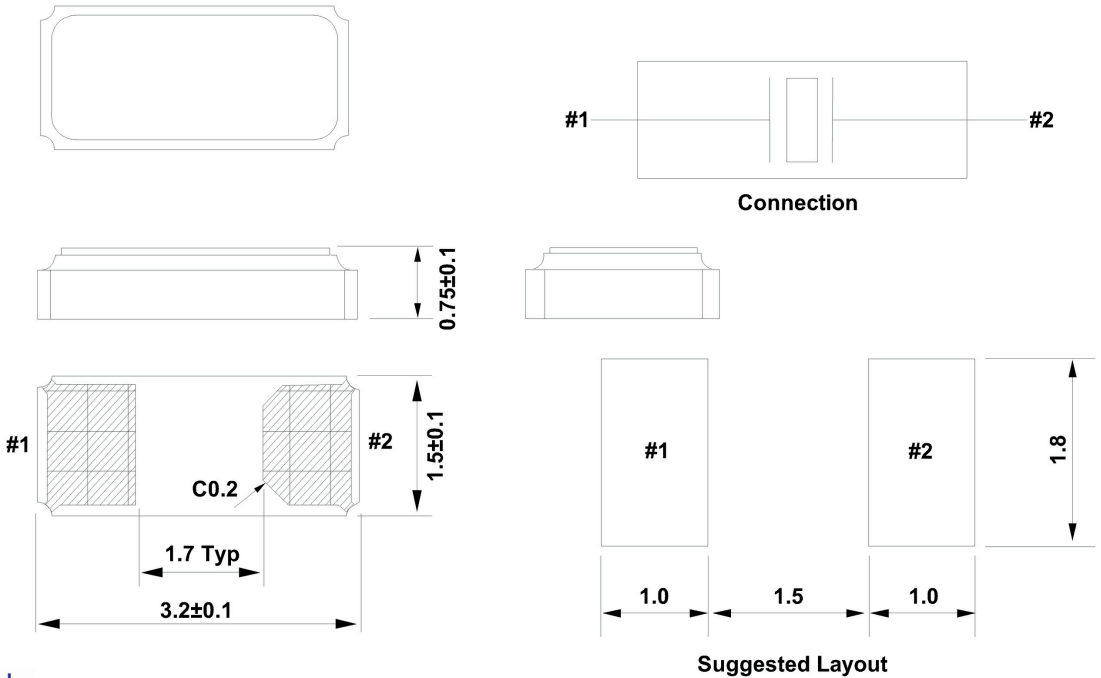
- Real Time Clock for automotive
- System in sleep mode or low energy mode Timekeeping

ELECTRICAL SPECIFICATIONS

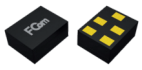
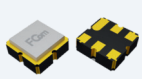
Parameters	Symbol	Min.	Typ.	Max.	Units	Notes	
Nominal Frequency	F		32.768		kHz		Test condition Ambient temperature: 25 ± 5°C Relative humidity: 40% ~ 70%
Frequency Tolerance (at 25℃)	FT		± 5, ± 10, ± 20		ppm	@-40~85°C	
			± 10, ± 20, ± 30		ppm	@-40~105°C	
			± 10, ± 20, ± 30		ppm	@-40~125°C	
Operating Temperature	Topr	-40	25	125	°C		
Load Capacitance	CL		6, 7, 9, 12.5 or specify		pF		
Drive Level	DL	-	0.1	0.5	uW		
Equivalent Series Resistance	ESR	-	-	70	Kohm		
Shunt Capacitance	C0		1.6		pF		
Temperature Coefficient	-		-0.036±0.005		ppm/T²		
Insulation Resistance	-	500	-	-	Mohm	DC100V±15V	
Aging	-		± 3		ppm	1st Year	

Note : The table shows common spec. if you have special spec. requirement , please feel free to contact our salesperson.

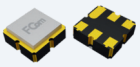
DIMENSION(mm)



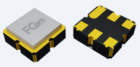
FCom SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
101	FSF-0907-1197M420-62M4	0.9 x 0.7 mm 	1197.420 MHz	62.4 MHz	-
102	FSF-0907-1582M470-46M84		1582.470 MHz	46.84	-
103	FSF-1109-1176M000-20M46	1.1 x 0.9 mm 	1176.000 MHz	20.46 MHz	-
104	FSF-1109-1176M450-50M		1176.450 MHz	50 (3dB) MHz	1.2 dB
105	FSF-1109-1189M000-50M		1189.000 MHz	50 (3dB) MHz	2.5 dB
106	FSF-1109-1189M000-50M		1189.000 MHz	50 MHz	1.9 dB
107	FSF-1109-1197M420-62M4		1197.420 MHz	62.4 MHz	-
108	FSF-1109-1575M420-54M		1575.420 MHz	54 (3dB) MHz	1.3 dB
109	FSF-1109-1582M000-46M8		1582.000 MHz	46.8 MHz	-
110	FSF-1109-1582M400-70M		1582.400 MHz	70 (3dB) MHz	1.6 dB
111	FSF-1109-1582M470-46M84		1582.470 MHz	46.84 MHz	-
112	FSF-1411-1237M000-80M	1.4 x 1.1 mm 	1237.000 MHz	80 MHz	-
113	FSF-1411-1568M000-44M		1568.000 MHz	44 (3dB) MHz	2.2 dB
114	FSF-1411-1575M420-64M		1575.420 MHz	64(3dB) MHz	0.9 dB
115	FSF-1411-1575M420-44M		1575.420 MHz	44 (3dB) MHz	1.3 dB
116	FSF-1411-1575M420-2M		1575.420 MHz	2 MHz	-
117	FSF-1411-1582M000-46M8		1582.000 MHz	46.8 MHz	-
118	FSF-1411-1582M400-70M		1582.400 MHz	70 (3dB) MHz	1.8 dB
119	FSF-1411-1615M680-8M16		1615.680 MHz	8.16 MHz	-
120	FSF-1411-2491M750-16M		2491.750 MHz	16 MHz	-
121	FSF-3030-876M000-10M	3.0 x 3.0 mm 	876.000 MHz	10 MHz	2.5 dB
122	FSF-3030-1176M000-20M		1176.000 MHz	20 MHz	2 dB
123	FSF-3030-1176M450-20M44		1176.450 MHz	20.44 MHz	1.9 dB
124	FSF-3030-1176M450-20M46		1176.450 MHz	20.46 MHz	1 dB
125	FSF-3030-1176M450-56M		1176.450 MHz	56 (3dB) MHz	2.0 dB
126	FSF-3030-1176M500-20M		1176.500 MHz	20 MHz	-
127	FSF-3030-1191M000-51M		1191.000 MHz	51 MHz	-
128	FSF-3030-1191M795-32M		1191.795 MHz	32 MHz	2.4 dB
129	FSF-3030-1191M500-51M		1191.500 MHz	51 MHz	3.8 dB

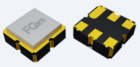
FCom SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
130	FSF-3030-1199M000-108M	3.0 x 3.0 mm 	1199.000 MHz	108 MHz	5.0 dB
131	FSF-3030-1207M000-20M		1207.000 MHz	20 MHz	2 dB
132	FSF-3030-1207M000-25M8		1207.000 MHz	25.8 MHz	-
133	FSF-3030-1207M000-35M		1207.000 MHz	35 (3dB) MHz	2.5 dB
134	FSF-3030-1207M000-36M		1207.000 MHz	36(3dB) MHz	2.5 dB
135	FSF-3030-1207M140-10M23		1207.140 MHz	10.23 MHz	3.2 dB
136	FSF-3030-1218M000-40M		1218.000 MHz	40 MHz	2.9 dB
137	FSF-3030-1222M000-80M		1222.000 MHz	80 MHz	1.2 dB
138	FSF-3030-1222M000-112M		1222.000 MHz	112 MHz	4.8 dB
139	FSF-3030-1224M000-108M		1224.000 MHz	108 MHz	-
140	FSF-3030-1224M000-130M		1224.000 MHz	130 (3dB) MHz	4.8 dB
141	FSF-3030-1227M000-57M4		1227.000 MHz	57.4 MHz	2 dB
142	FSF-3030-1227M000-75M5		1227.000 MHz	75.5 MHz	-
143	FSF-3030-1227M000-35M		1227.000 MHz	35(3dB) MHz	2.5 dB
144	FSF-3030-1227M000-57M		1227.000 MHz	57 (3dB) MHz	1.8 dB
145	FSF-3030-1228M000-20M		1228.000 MHz	20 MHz	2 dB
146	FSF-3030-1228M000-62M		1228.000 MHz	62 MHz	3.8 dB
147	FSF-3030-1237M000-80M		1237.000 MHz	80 MHz	3.0 dB
148	FSF-3030-1240M000-8M		1240.000 MHz	8 MHz	3.5 dB
149	FSF-3030-1240M000-20M		1240.000 MHz	20 MHz	1.9 dB
150	FSF-3030-1245M000-96M		1245.000 MHz	96 (3dB) MHz	2.9 dB
151	FSF-3030-1246M000-8M		1246.000 MHz	8 MHz	3.5 dB
152	FSF-3030-1247M500-61M		1247.500 MHz	61 MHz	3.8 dB
153	FSF-3030-1252M000-25M		1252.000 MHz	25 MHz	2.5 dB
154	FSF-3030-1268M000-20M		1268.000 MHz	20 MHz	1.8 dB
155	FSF-3030-1268M000-20M5		1268.000 MHz	20.5 MHz	-
156	FSF-3030-1268M520-36M6		1268.520 MHz	36.6 (3dB) MHz	3 dB
157	FSF-3030-1268M520-20M46		1268.520 MHz	20.46 MHz	1.4 dB
158	FSF-3030-1268M520-36M		1268.520 MHz	36 (3dB) MHz	2.5 dB

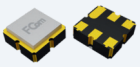
FCom SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
159	FSF-3030-1268M520-64M	3.0 x 3.0 mm 	1268.520 MHz	64 (3dB) MHz	1.0 dB
160	FSF-3030-1268M520-20M		1268.520 MHz	20 (1dB) MHz	3.0 dB
161	FSF-3030-1268M520-27M		1268.520 MHz	27 (3dB) MHz	3.5 dB
162	FSF-3030-1268M520-50M		1268.520 MHz	50 (1dB) MHz	0.9 dB
163	FSF-3030-1268M520-40M		1268.520 MHz	40 (3dB) MHz	2.0 dB
164	FSF-3030-1268M520-57M		1268.520 MHz	57 (3dB) MHz	1.8 dB
165	FSF-3030-1278M000-20M		1278.000 MHz	20 MHz	2 dB
166	FSF-3030-1542M000-34M		1542.000 MHz	34 MHz	1.3 dB
167	FSF-3030-1550M000-20M		1550.000 MHz	20 MHz	4 dB
168	FSF-3030-1561M000-12M		1561.000 MHz	12 (3dB) MHz	4 dB
169	FSF-3030-1561M000-20M		1561.000 MHz	20 (3dB) MHz	4.3 dB
170	FSF-3030-1561M000-21M		1561.000 MHz	21 MHz	4 dB Good rectangle coefficient
171	FSF-3030-1561M000-21M		1561.000 MHz	21 MHz	2.3 dB Low insertion loss
172	FSF-3030-1561M000-31M		1561.000 MHz	31 (3dB) MHz	3.0 dB
173	FSF-3030-1561M000-39M5		1561.000 MHz	39.5 MHz	-
174	FSF-3030-1561M100-4M092		1561.100 MHz	4.092 MHz	7.5 dB
175	FSF-3030-1562M000-55M		1562.000 MHz	55 (3dB) MHz	1.8 dB
176	FSF-3030-1566M000-28M		1566.000 MHz	28 (3dB) MHz	4.0 dB
177	FSF-3030-1567M000-27M		1567.000 MHz	27 (1dB) MHz	1.8 dB
178	FSF-3030-1568M000-18M		1568.000 MHz	18 MHz	1.8 dB
179	FSF-3030-1568M000-59M		1568.000 MHz	59 (3dB) MHz	1.0 dB
180	FSF-3030-1568M000-30M		1568.000 MHz	30 (1dB) MHz	1.5 dB
181	FSF-3030-1568M000-52M		1568.000 MHz	52 (3dB) MHz	2.1 dB
182	FSF-3030-1568M000-43M		1568.000 MHz	43 (3dB) MHz	1.5 dB
183	FSF-3030-1570M000-20M		1570.000 MHz	20 MHz	4 dB
184	FSF-3030-1572M000-30M		1572.000 MHz	30 MHz	2 dB
185	FSF-3030-1572M500-30M		1572.500 MHz	30 MHz	-
186	FSF-3030-1573M000-62M		1573.000 MHz	62 (3dB) MHz	0.75 dB
187	FSF-3030-1573M000-80M		1573.000 MHz	80 (3dB) MHz	2.8 dB

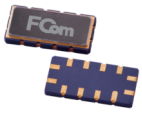
FCom SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
188	FSF-3030-1575M420-47M		1575.420 MHz	47 (3dB) MHz	1.5 dB
189	FSF-3030-1575M420-64M		1575.420 MHz	64 (3dB) MHz	1.0 dB
190	FSF-3030-1575M420-26M		1575.420 MHz	26 (3dB) MHz	3.2 dB
191	FSF-3030-1575M420-27M		1575.420 MHz	27 (3dB) MHz	3.5 dB
192	FSF-3030-1575M420-20M		1575.420 MHz	20 (3dB) MHz	3.2 dB
193	FSF-3030-1575M420-74M		1575.420 MHz	74 (3dB) MHz	0.9 dB
194	FSF-3030-1575M420-35M		1575.420 MHz	35 (3dB) MHz	1.5 dB
195	FSF-3030-1575M420-27M		1575.420 MHz	27 (1dB) MHz	1.8 dB
196	FSF-3030-1575M420-32M736		1575.420 MHz	32.736 MHz	1.4 dB
197	FSF-3030-1575M420-2M		1575.420 MHz	2 MHz	2 dB
198	FSF-3030-1575M420-20M46		1575.420 MHz	20.46 MHz	-
199	FSF-3030-1576M000-34M	3.0 x 3.0 mm 	1576.000 MHz	34 MHz	1.2 dB
200	FSF-3030-1584M000-50M		1584.000 MHz	50 MHz	1.0dB-1.2dB small insertion loss
201	FSF-3030-1584M000-50M		1584.000 MHz	50 MHz	2.0-2.5 dB
202	FSF-3030-1585M000-59M		1585.000 MHz	59 MHz	2.6 dB
203	FSF-3030-1586M000-42M		1586.000 MHz	42 MHz	1.2 dB
204	FSF-3030-1588M000-20M		1588.000 MHz	20 MHz	4 dB
205	FSF-3030-1588M000-82M		1588.000 MHz	82 (3dB) MHz	2.0 dB
206	FSF-3030-1590M000-52M		1590.000 MHz	52 (3dB) MHz	3.0 dB
207	FSF-3030-1602M000-64M		1602.000 MHz	64 (3dB) MHz	1.0 dB
208	FSF-3030-1602M000-21M		1602.000 MHz	21 (1dB) MHz	3.2 dB
209	FSF-3030-1602M000-30M		1602.000 MHz	30 (3dB) MHz	3.5 dB
210	FSF-3030-1602M000-27M		1602.000 MHz	27 (1dB) MHz	1.8 dB
211	FSF-3030-1602M000-20M		1602.000 MHz	20 MHz	4 dB High rectangularity
212	FSF-3030-1602M000-35M		1602.000 MHz	35 (3dB) MHz	3.3 dB
213	FSF-3030-1602M000-20M		1602.000 MHz	20 MHz	2 dB Low insertion loss
214	FSF-3030-1602M000-37M2		1602.000 MHz	37.2 MHz	-
215	FSF-3030-1610M000-20M		1610.000 MHz	20 MHz	4 dB
216	FSF-3030-1615M000-20M		1615.000 MHz	20 MHz	4.5 dB Good rectangle coefficient

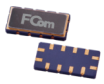
FCom SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
217	FSF-3030-1575M420-47M	3.0 x 3.0 mm 	1575.420 MHz	47 (3dB) MHz	1.5 dB
218	FSF-3030-1575M420-64M		1575.420 MHz	64 (3dB) MHz	1.0 dB
219	FSF-3030-1575M420-26M		1575.420 MHz	26 (3dB) MHz	3.2 dB
220	FSF-3030-1575M420-27M		1575.420 MHz	27 (3dB) MHz	3.5 dB
221	FSF-3030-1575M420-20M		1575.420 MHz	20 (3dB) MHz	3.2 dB
222	FSF-3030-1575M420-74M		1575.420 MHz	74 (3dB) MHz	0.9 dB
223	FSF-3030-1575M420-35M		1575.420 MHz	35 (3dB) MHz	1.5 dB
224	FSF-3030-1575M420-27M		1575.420 MHz	27 (1dB) MHz	1.8 dB
225	FSF-3030-1575M420-32M736		1575.420 MHz	32.736 MHz	1.4 dB
226	FSF-3030-1575M420-2M		1575.420 MHz	2 MHz	2 dB
227	FSF-3030-1575M420-20M46		1575.420 MHz	20.46 MHz	-
228	FSF-3030-1576M000-34M		1576.000 MHz	34 MHz	1.2 dB
229	FSF-3030-1584M000-50M		1584.000 MHz	50 MHz	1.0dB-1.2dB small insertion loss
230	FSF-3030-1584M000-50M		1584.000 MHz	50 MHz	2.0-2.5 dB
231	FSF-3030-1585M000-59M		1585.000 MHz	59 MHz	2.6 dB
232	FSF-3030-1586M000-42M		1586.000 MHz	42 MHz	1.2 dB
233	FSF-3030-1588M000-20M		1588.000 MHz	20 MHz	4 dB
234	FSF-3030-1588M000-82M		1588.000 MHz	82 (3dB) MHz	2.0 dB
235	FSF-3030-1590M000-52M		1590.000 MHz	52 (3dB) MHz	3.0 dB
236	FSF-3030-1602M000-64M		1602.000 MHz	64 (3dB) MHz	1.0 dB
237	FSF-3030-1602M000-21M		1602.000 MHz	21 (1dB) MHz	3.2 dB
238	FSF-3030-1602M000-30M		1602.000 MHz	30 (3dB) MHz	3.5 dB
239	FSF-3030-1602M000-27M		1602.000 MHz	27 (1dB) MHz	1.8 dB
240	FSF-3030-1602M000-20M		1602.000 MHz	20 MHz	4 dB High rectangularity
241	FSF-3030-1602M000-35M		1602.000 MHz	35 (3dB) MHz	3.3 dB
242	FSF-3030-1602M000-20M		1602.000 MHz	20 MHz	2 dB low insertion loss
243	FSF-3030-1602M000-37M2		1602.000 MHz	37.2 MHz	-
244	FSF-3030-1610M000-20M		1610.000 MHz	20 MHz	4 dB
245	FSF-3030-1615M000-20M		1615.000 MHz	20 MHz	4.5 dB Good rectangle coefficient

FCom SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
246	FSF-7050-135M000-7M	7.0 x 5.0 mm 	135.000 MHz	7 (3dB) MHz	22 dB
247	FSF-7050-140M000-0.24M		140.000 MHz	0.24 (3dB) MHz	5 dB
248	FSF-7050-159M000-30M		159.000 MHz	30 (1dB) MHz	15(max) dB
249	FSF-7050-162M000-0.14M		162.000 MHz	0.14 (3dB) MHz	5 （max） dB
250	FSF-7050-164M180-0.1M		164.180 MHz	0.1 (1dB) MHz	2.2 dB
251	FSF-7050-178M500-9M8		178.500 MHz	9.8 (3dB) MHz	15 （max） dB
252	FSF-7050-200M000-25M		200.000 MHz	25 (1dB) MHz	15 （max） dB
253	FSF-7050-243M000-0.13M		243.000 MHz	0.13 (1dB) MHz	5.5 dB
254	FSF-7050-294M200-4M5		294.200 MHz	4.5 (1dB) MHz	15 （max） dB
255	FSF-7050-294M200-20M		294.200 MHz	20 (1.2dB) MHz	23 （max） dB
256	FSF-7050-274M200-11M5		294.200 MHz	11.5 (1dB) MHz	15 （max） dB
257	FSF-7050-294M200-12M5		294.200 MHz	12.5 (1dB) MHz	15 （max） dB
258	FSF-7050-294M520-21M		294.520 MHz	21 (3dB) MHz	20 （max） dB
259	FSF-1145-164M180-0.075M	11.0 x 4.5 mm	164.180 MHz	0.075(1dB) MHz	4 (max) dB
260	FSF-1145-169M200-0.12M		169.200 MHz	0.12 (3dB) MHz	4 (max) dB
261	FSF-1145-173M080-0.12M		173.080 MHz	0.12 (3dB) MHz	4 (max) dB
262	FSF-1145-173M130-0.12M		173.130 MHz	0.12 (3dB) MHz	4 (max) dB
263	FSF-1145-900M000-7M		900.000 MHz	7 (3dB) MHz	4 dB
264	FSF-1145-900M000-8M5		900.000 MHz	8.5 (3dB) MHz	7 dB
265	FSF-1365-35M420-2M	13.3 x 6.5 mm 	35.420 MHz	2 MHz	19 dB
266	FSF-1365-60M000-15M		60.000 MHz	15 (1dB) MHz	15 (max) dB
267	FSF-1365-70M000-0.09M		70.000 MHz	0.09 (1dB) MHz	4 dB
268	FSF-1365-70M000-27M4		70.000 MHz	27.4 (3dB) MHz	20 dB
269	FSF-1365-76M800-0.21M		76.800 MHz	0.21 (3dB) MHz	7 dB
270	FSF-1365-108M050-50M		108.050 MHz	50 (1dB) MHz	4 dB
271	FSF-1365-115M000-11M18		115.000 MHz	11.18(1dB) MHz	13.5 dB
272	FSF-1365-117M960-50M		117.960 MHz	50 (1dB) MHz	4 dB
273	FSF-1365-121M500-50M		121.500 MHz	50 (1dB) MHz	4 dB
274	FSF-1365-138M000-0.06M		138.000 MHz	0.06 (1dB) MHz	5 (max) dB

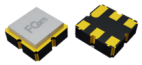
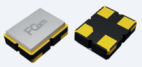
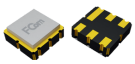
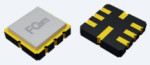
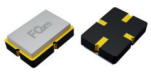
FCom SAW Filter

No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
275	FSF-1365-140M000-0.24M	13.3 x 6.5 mm 	140.000 MHz	0.24 (3dB) MHz	5 dB
276	FSF-1365-156M800-0.07M		156.800 MHz	0.07 (1dB) MHz	3 dB
277	FSF-39-480M000-27M	TO-39 	480.000 MHz	27 (3dB) MHz	20 dB
278	FSF-39-479M500-27M		479.500 MHz	27 (3dB) MHz	21 dB
279	FSF-39-479M500-16M		479.500 MHz	16 (3dB) MHz	23.5 dB
280	FSF-39-480M000-18M		480.000 MHz	18 (3dB) MHz	21 dB
281	FSF-1272-135M000-7M	12.0 x 7.2	135.000 MHz	7 (3dB) MHz	16.5 dB
282	FSF-1365-36M170-0.3M	13.0 x 6.5	36.170 MHz	0.3 (1dB) MHz	16 dB
283	FSF-1365-46M000-4M3		46.000 MHz	4.3 (3dB) MHz	9 dB
284	FSF-1367-35M420-1M	13.7 x 6.7	35.420 MHz	1 (3dB) MHz	19 dB
285	FSF-1606-50M500-0.7M	16.0 x 6.0	50.500 MHz	0.7 (3dB) MHz	12.3 dB
286	FSF-1606-57M000-0.85M		57.000 MHz	0.85 (2dB) MHz	12.5 dB
287	FSF-1885-44M000-4M7	18.6 x 8.5	44.000 MHz	4.7 (1dB) MHz	25 dB
288	FSF-2212-62M500-0.36M	22.2 x 12.8	62.500 MHz	0.36 (3dB) MHz	6.5 dB
289	FSF-2212-70M000-41M		70.000 MHz	41 (3dB) MHz	24.7 dB
290	FSF-2212-70M000-31M		70.000 MHz	31 (3dB) MHz	22.3 dB
291	FSF-2212-70M000-20M55		70.000 MHz	20.55(3dB) MHz	26.2 dB
292	FSF-2212-70M000-16M7		70.000 MHz	16.7 (3dB) MHz	23 dB
293	FSF-2212-70M000-12M7		70.000 MHz	12.7 (3dB) MHz	23.3 dB
294	FSF-2212-70M000-13M		70.000 MHz	13 (3dB) MHz	23 dB
295	FSF-2212-70M000-4M2		70.000 MHz	4.2 (3dB) MHz	21.5 dB
296	FSF-2212-70M000-3M6		70.000 MHz	3.6 (3dB) MHz	24 dB
297	FSF-2212-140M000-28M35		140.000 MHz	28.35(3dB) MHz	24.8 dB
298	FSF-2212-140M000-25M8		140.000 MHz	25.8 (3dB) MHz	21.7 dB
299	FSF-2212-140M000-6M3		140.000 MHz	6.3 (3dB) MHz	28 dB
300	FSF-2212-186M000-4M		186.000 MHz	4 (1dB) MHz	17 dB
301	FSF-2712-70M000-1M24	27.0 x 12.8	70.000 MHz	1.24 (3dB) MHz	20.8 dB
302	FSF-2712-140M000-1M82		140.000 MHz	1.82(1.5dB)MHz	28 dB

FCom SAW Filter

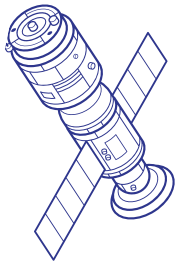
No.	Series	Package	Frequency - Center	Bandwidth	Insertion Loss
303	FSF-3512-70M000-6M32	35.0 x 12.8	70.000 MHz	6.32 (3dB) MHz	25 dB
304	FSF-3512-70M000-19M28		70.000 MHz	19.28(3dB) MHz	34.5 dB
305	FSF-3512-70M000-5M24		70.000 MHz	5.24 (3dB) MHz	20 dB
306	FSF-3512-140M000-10M		140.000 MHz	10 MHz	29 (max) dB
307	FSF-3512-140M000-10M2		140.000 MHz	10.2 (3dB) MHz	26 (max) dB
308	FSF-3512-140M000-15M2		140.000 MHz	15.2 (3dB) MHz	28 dB
309	FSF-3512-140M000-20M05		140.000 MHz	20.05(1.5dB)MHz	27 dB
310	FSF-3512-140M000-19M3		140.000 MHz	19.3(1.5dB)MHz	28 dB
311	FSF-3512-140M000-25M04		140.000 MHz	25.04(1.5dB)MHz	28.8 dB
312	FSF-3513-90M000-14M2	35.0 x 13.0	90.000 MHz	14.2 (1dB) MHz	25.5 dB
313	FSF-3616-21M400-0.25M	36.0 x 16.0	21.400 MHz	0.25 (1dB) MHz	10 dB

FCom SAW Resonator

No.	Series	Package	Frequency - Center	Insertion Loss
314	FSR-3030-315M000	3.0 x 3.0 mm 	315.000 MHz	1.0 dB
315	FSR-3030-433M920		433.920 MHz	1.2 dB
316	FSR-3225-315M000	3.2 x 2.5 mm 	315.000 MHz	1.0 dB
317	FSR-3225-433M920		433.920 MHz	1.3 dB
318	FSR-3838-315M000	3.8 x 3.8 mm 	315.000 MHz	1.7 dB
319	FSR-3838-315M500		315.500 MHz	1.9 dB
320	FSR-3838-433M920		433.920 MHz	1.7 dB
321	FSR-5050-311M063	5.0 x 5.0 mm 	311.063 MHz	1.3 dB
322	FSR-5050-315M000		315.000 MHz	0.8 dB
323	FSR-5050-433M000		433.000 MHz	1.5 dB
324	FSR-5050-433M920		433.920 MHz	1.6 dB
325	FSR-5050-433M920		433.920 MHz	1.1 dB
326	FSR-5035-163M735	5.0 x 3.5 mm 	163.735 MHz	2.2 dB
327	FSR-5035-168M760		168.760 MHz	2.5 dB
328	FSR-5035-172M635		172.635 MHz	2.5 dB
329	FSR-5035-172M690		172.690 MHz	2.6 dB
330	FSR-5035-172M785		172.785 MHz	2.5 dB
331	FSR-5035-315M000		315.000	0.8 dB
332	FSR-5035-318M000		318.000 MHz	1.3 dB
333	FSR-5035-340M000		340.000 MHz	1.5 dB
334	FSR-5035-423M220		423.220 MHz	1.1 dB
335	FSR-5035-433M920		433.920 MHz	1.5 dB
336	FSR-8334-315M000	8.36 x 3.45	315.000 MHz	1.1 dB
337	FSR-8334-346M500		346.500 MHz	2 dB
338	FSR-1146-433M920	11.9 x 4.6	433.920 MHz	2.5 dB

FCom SAW Resonator

No.	Series	Package	Frequency - Center	Insertion Loss
339	FSR-1145-315M500	11.0*4.5	315.500 MHz	1.5 dB
340	FSR-1145-300M000		300.000 MHz	1.2 dB
341	FSR-1145-303M000		303.000 MHz	1.3 dB
342	FSR-1145-303M825		303.825 MHz	1.3 dB
343	FSR-1145-303M875		303.875 MHz	1.2 dB
344	FSR-1145-310M000		310.000 MHz	1.7 dB
345	FSR-1145-315M500		315.500 MHz	1.5 dB
346	FSR-1145-315M000		315.000 MHz	1.3 dB
347	FSR-1145-318M000		318.000 MHz	1.6 dB
348	FSR-1145-345M000		345.000 MHz	1.5 dB
349	FSR-1145-360M000		360.000 MHz	1.6 dB
350	FSR-1145-370M000		370.000 MHz	1.6 dB
351	FSR-1145-380M000		380.000 MHz	1.1 dB
352	FSR-1145-390M000		390.000 MHz	1.1 dB
353	FSR-1145-433M920		433.920 MHz	1.7 dB
354	FSR-1145-433M920		433.920 MHz	2 dB
355	FSR-1145-433M920		433.920 MHz	1 dB



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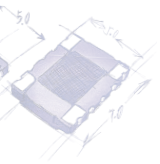
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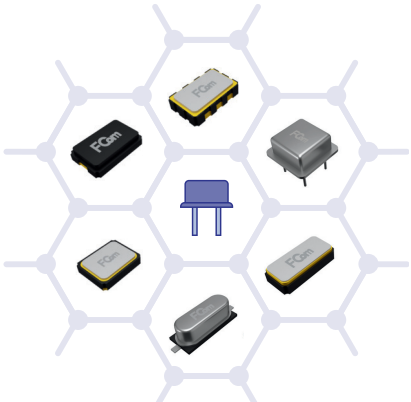
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