Precision timing makes the difference

We've been providing world-leading service for over 25 years

Product Presentation 2017

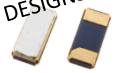
Golledge

Surface Mount Quartz Crystals – 32.768kHz

Watch crystals for commercial and industrial applications

Available in a range of packages and pad configurations, Golledge watch crystals always offer the most competitive solution.

RECOMMENDED FOR NEW DESIGNS



GSX-315

Access the GSX-315 datasheet here

Access the GRX-315 datasheet here

- 84% size reduction/3% cost reduction compared to GSX-200
- Automotive(AEC-Q200) option available (**GRX-315**)
- Compatible with CM315/FC135
- Board Area = 4.8mm²
- Highly competitive
- Core Stock

GSX-200

Access the GSX-200 datasheet here

- Highly suitable as drop in replacement for existing designs

CM8V-T1A 32.768kHz

High shock and vibration resistance
Board Area 2.4mm²
AEQ-200 optional
Extended temp range

Access the CM8V-T1A datasheet here

CM9V 32.768kHz

Ultra-miniature package
Board Area 1.6mm²
AEQ-200 optional
Extended temp range

Access the CM9V datasheet here

CONSIDER FOR NEW DESIGNS

GWX-2012 32.768kHz

Suitable for high volume applications
Board Area 2.4mm²

Access the GWX-2012 datasheet here

32.768kHz Crystals for harsh environments: CM8V-T1A/M

Access the CM8V-T1A/M datasheet here

- Wide operating temperature range -55 to +125°C
- High shock and vibration resistance, 5000g 0.3ms ½ sine
- AEC-Q200 qualification available
- Board Area = 2.4mm²
- Lightweight at only 4.6mg

Surface Mount Quartz Crystals – Commercial/Industrial

High frequency crystals for commercial, applications

Packages as small as 1.6 x 1.0mm and exceptionally competitive pricing available

RECOMMENDED FOR NEW DESIGNS

GSX-331 (3225) from 10.0MHz ~ 125MHz

Board area 8.0mm^2
Widest range of developed frequencies
±10ppm with little or no cost implication

Industry standard footprint

Lowest cost for small size

Good range of stock

AEC-Q200 option available (**GRX-330**)

Access the GSX-331 datasheet here

Access the GRX-330 datasheet here

CONSIDER FOR NEW DESIGNS

GSX-321 from 12.0MHz ~ 66.0MHz

Board area 5.0mm^2

Fast growing range of developed frequencies

Industry standard footprint

Low cost for small size available from 12MHz upwards

AEC-Q200 option available (**GRX-320**)

Access the GSX-321 datasheet here

GSX-221 (2016) from 16.0MHz ~ 56.0MHz

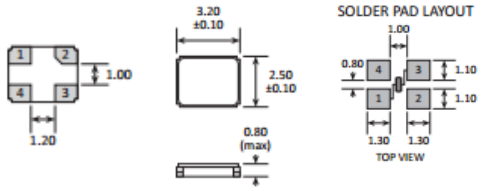
Consider for next generation designs

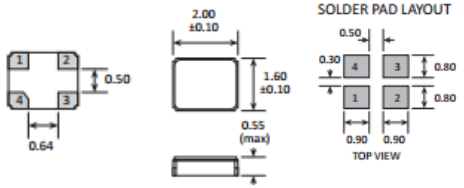
Industry standard footprint when board area is critical

AEC-Q200 option now available! (**GRX-220**)

±10ppm as standard
Board area 3.2mm^2

Access the GSX-221 datasheet here





Ultra-miniature solution – GSX-211

Access the GSX-211 datasheet here

- Ultra-miniature surface mount packages of 1.6 x 1.0mm
- Component height of only 0.5mm
- Board area of only 1.6mm^2
- Competitive pricing for cutting edge solution

Surface Mount Quartz Crystals – Special Applications

High frequency crystals for specialist high frequency and harsh environments

Frequencies as high as 315MHz available

Crystals for ultra-high frequency demands

GSX-228 (2016) from 20.0MHz ~ 315 MHz

Board area 3.2mm²

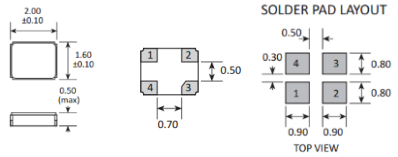
Available up to 315MHz

Plasma etched inverted mesa process

Fundamental mode crystal means greater precision and low phase noise

Miniature surface mount package

Access the GSX-228 datasheet here



GSX-328 (2520) from 16.0MHz ~ 315 MHz

Board area 5.0mm²

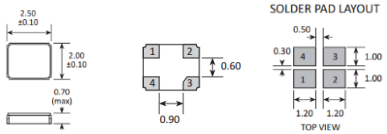
Available up to 315MHz

Plasma etched inverted mesa process

Fundamental mode crystal means greater precision and low phase noise

Miniature surface mount package

Access the GSX-328 datasheet here



GSX-338 (3225) from 10.0MHz ~ 315 MHz

Board area 8.0mm²

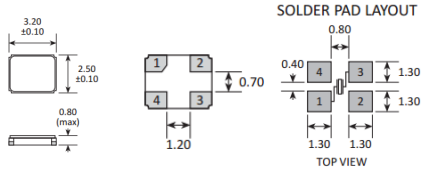
Available up to 315MHz

Low minimum frequency of 10MHz

Fundamental mode crystal means greater precision and low phase noise

Miniature surface mount package

Access the GSX-338 datasheet here

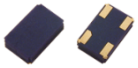


Crystals for harsh environments

CC2A-T1AH from 10.0 ~ 40.0MHz

Access the CC2A-T1AH datasheet here

- High shock and vibration resistance 10,000g, 0.3ms ½ sine
- Board area 16mm²
- Wide operating temp range -55 to +200°C



CC6A-T1AH from 16.0 ~ 40.0 MHz

Access the CC6A-T1AH datasheet here

- High shock and vibration resistance 10,000g, 0.3ms ½ sine
- Board area 8mm²
- Wide operating temp range -55 to +200°C

Surface Mount Oscillators– 32.768kHz

Clock oscillators for commercial and industrial applications

Wide supply voltage and operating temperature ranges available

GFO-3301 (3225) @ 32.768 kHz

Wide operating supply voltage range

Extremely low current consumption

Industry standard footprint

Board area 8.0mm²

Access the GFO-3301 datasheet here

GAO-3201 (2520) @ 32.768 kHz

Good stability over temperature

Wide operating supply voltage range

Industry standard footprint

Board area 5.0mm²

Access the GAO-3201 datasheet here

OV7604C7 (3215) @ 32.768 kHz

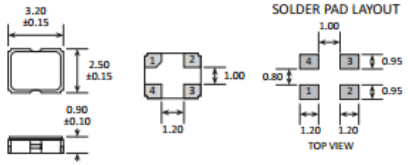
High shock and vibration resistance
Ultra low current consumption

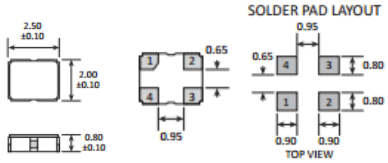
Wide operating supply voltage range

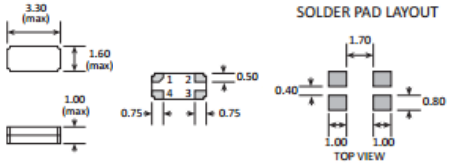
Extended temperature range applications

Board area 4.8mm²

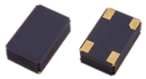
Access the OV7604C7 datasheet here







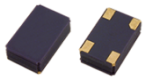
32.768kHz Oscillators for military and harsh environments



MCSO1ELS

Access the MCSO1ELS datasheet here

- Highly shock and vibration proof up to 10,000g , 0.3ms ½ sine
- Extreme temperature ranges up to 200°C
- High stability & low ageing under extremes due to SC cut crystal
- Low current consumption of only 110uA and very fast start up



MCSO2EU

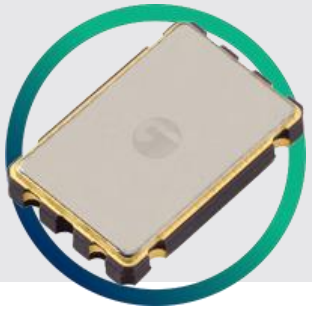
Access the MCSO2EU datasheet here

- Highly shock and vibration proof from 10 to 2000Hz/80g
- Ultra-low current consumption <20uA
- Extreme temperature ranges up to 175°C
- Frequency stability guaranteed for 1000h at T_{MAX}

Surface Mount Oscillators – Commercial/Industrial

Competitively priced oscillators suitable for commercial applications

Frequencies up to 200MHz with highly competitive pricing



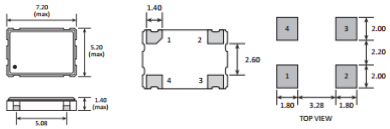
GXO-7531/U108 (7050) from 12.0kHz ~ 200MHz

Widest range of developed frequencies and specifications held in stock

Long established industry standard
Excellent jitter performance
Board area 35mm²
CMOS Output

Access the GX0-7531 datasheet here

Access the GX0-U108 datasheet here



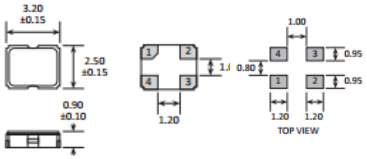
GXO-3301 (3225) from 0.625MHz ~ 75.0MHz

Win-win! Board area 8.0mm²

75% **size reduction** &
10% **cost reduction** on average over 7050 package

Industry standard footprint
CMOS output
Low voltage operation
Excellent jitter performance
Tight stability options
AEC-Q200 qualified optional

Access the GXO-3301 datasheet here



GXO-3201 (2520) from 0.75MHz ~ 50.0MHz

CMOS output
Low voltage operation

Best price and size combination
Board area 5.0mm²

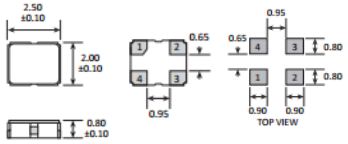
Excellent jitter performance

Industry standard footprint

Tight stability options

AEC-Q200 qualified optional

Access the GXO-3201 datasheet here



GXO-2201 (2016) from 1.50MHz ~ 54.0MHz

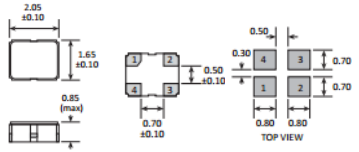
Board area 3.2mm²

Lightweight weighing only 8.86mg

Industry standard footprint
CMOS output
Low voltage operation

Limited number of developed frequencies

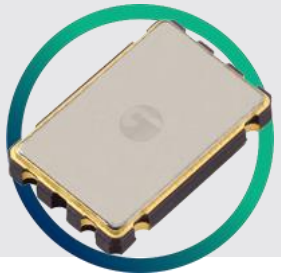
Access the GXO-2201 datasheet here



Surface Mount Oscillators – Special Applications

High frequency components and those suitable for harsh environment

Frequencies up to 225MHz and high shock and vibration resistance

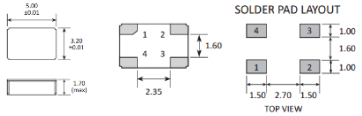


Oscillators for harsh environments

MCSO2E from 10.0kHz ~ 100MHz

5.0x3.2x1.60mm - Board area 16mm²
Wide operating temperature range
-55 to +210°C
Excellent high temperature operating life (HTOL)
High Temperature Mechanical shock (HTMS)
High Temperature Mechanical Vibration (HTMV)

Access the MCSO2E datasheet here



MCSO2 & MCSO2L from 20.0MHz ~ 225MHz

Board area 16.0mm²

Military temperature range
-55 to +125°C option

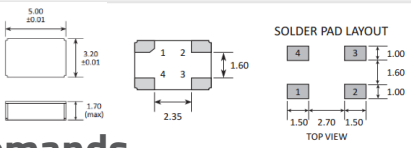
Excellent shock & vibration resistance

Enable / disable tristate option (>500kHz)

Wide frequency range available

Access the MCSO2 datasheet here

Access the MCSO2L (LVDS) datasheet here



MCSO6E from 10.0kHz ~ 60.0MHz

Board area 8.0mm²

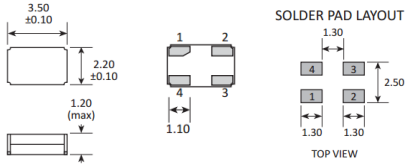
Extreme temperature ranges, up to 210°C options available

Excellent shock & vibration resistance

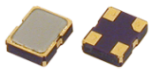
Enable / disable tristate option (>500kHz)

Wide frequency range available

Access the MCSO6E datasheet here



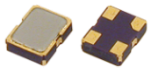
Oscillators for ultra-high frequency demands



GXO-U121 from 1.80MHz ~ 170MHz

Access the GXO-U121 datasheet here

- Board area 3.2mm²
- Highly competitive at small and medium quantities
- Short lead time



GXO-3200 from 10.0MHz ~ 170MHz

Access the GXO-3200 datasheet here

- High precision with tight stability options
- High frequency fundamental – no multiplier
- Board area 5.0mm²
- Custom frequencies available

Temperature Compensated Oscillators – TCXOs

Tight stability in miniature surface mount packages

Frequencies available up to 100MHz with stabilities as good as ±0.5ppm

GTXO-253 (C25) from 10 MHz ~ 52.0 MHz

2.5x2.0x1.0mm

Board area 5.0mm²

38% size reduction & **no cost increase over the 3225 package size**

Industry standard footprint

Good phase noise

Tight stability from ±0.5ppm over wide temperature range -30 to +85°C with **little or no cost penalty**

Voltage control frequency adjust option

Growing number of developed frequencies

AEC-Q200 qualified optional

Suitable for high volume consumer applications as well as industrial and automotive.

Access the GTXO-253 datasheet here

Access the GTXO-C25 (CMOS) datasheet here

GTXO-203 from 16 MHz ~ 52.0 MHz

2.0x1.6x0.8

Board area 3.2mm²

Industry standard footprint

Good phase noise

Tight stability ±0.5ppm over wide temperature range -30 to +85°C

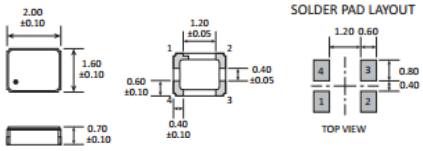
Voltage control frequency adjust option

Limited number of developed frequencies

AEC-Q200 qualified optional

Suitable for high volume consumer applications as well as industrial and automotive.

Access the GTXO-203 datasheet here



GTXO-14 from 6.40 MHz ~ 100 MHz

CMOS, clipped sine **and true sinewave** output options

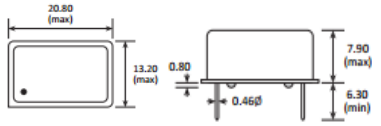
All inclusive stability of **±4.6ppm over 20 years**

Excellent holdover stability

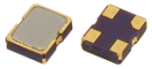
Industrial temperature range options

Stratum 3 compliant models

Access the GTXO-14 datasheet here



TCXOs below 10MHz:



GTXO-91/93 (C31) from 8.0 MHz ~ 52.0 MHz

Access the GTXO-91 datasheet here

Access the GTXO-93 datasheet here

Access the GTXO-C31 datasheet here

- 3.2x2.5x1.2mm
- Board area 8.0mm²
- Industry standard footprint
- Good phase noise
- Tight stability ±0.5ppm over wide temperature range -30 to +85°C with **little or no cost penalty**
- Analogue compensation
- AEC-Q200 qualified optional

Voltage Controlled Oscillators – VCXOs

Gain control with our wide range of VCXOs

Frequencies available up to 800MHz

GVXO-331
from 1.5 MHz ~ 64.0 MHz

3.2x2.5x0.9mm

Board area 8.0mm²

size reduction & **cost reduction**

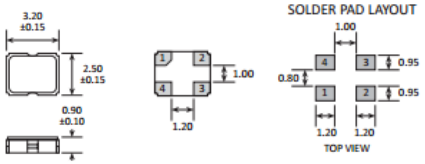
Industry standard footprint

1.8V, 2.8V and 3.3V supply options

Wide frequency pullability for size

Good frequency stability over industrial temperature range

Access the GVXO-331 datasheet here



GVXO-533
from 1.0 MHz ~ 125.0 MHz

5.0x3.2x1.5mm

Board area 16.0mm²

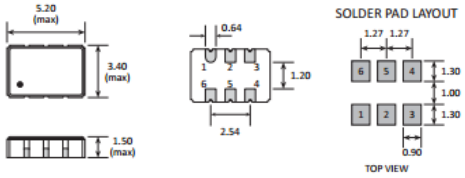
Industry standard footprint

Wide frequency pullability for size

Good frequency stability over industrial temperature range

Stock of many developed frequencies

Access the GVXO-533 datasheet here



GVXO-54 (52)
from 12.0 MHz ~ 800.0 MHz

7.0x5.0x2.0mm

Board area 35.0mm²

Industry standard footprint

High frequency

Complementary LV-PECL and LVDS outputs

Access the GVXO-54 (52) datasheet here

GVXO-E33 (L33)
from 40.0 MHz ~ 250.0 MHz

3.2x2.5x1.1mm

Board area 8.0mm²

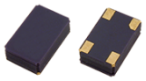
Multiplier free design

Designed for high speed transfer

Access the GVXO-E33 datasheet here

Access the GVXO-L33 datasheet here

VCXOs for Military and Harsh Environments:



VCXO2E from 5.0 MHz ~ 40.0 MHz

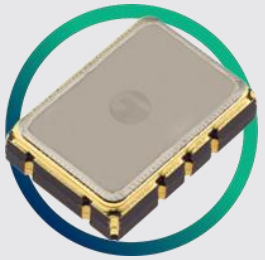
Access the VCXO2E datasheet here

- 5.0 x 3.2 x 1.7mm
- Board area 16.0mm²
- Extreme temperature ranges up to 210°C
- Wide pulling range
- High shock & vibration resistance
- Low current consumption

Surface Acoustic Wave Devices – SAWs

We have one of the widest available ranges of SAW products

Powerful filtering up to 2.5GHz



GSRS - SAW Resonators From 100MHz ~ 1.1GHz

Industry standard footprints

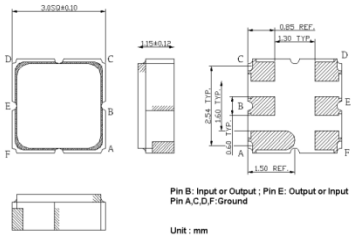
Large range of frequencies

Commonly used frequencies available from stock

Suitable for airborne communications and ISM band applications among others

Present a high level of value

Access the GSRS datasheet here



GSIF - IF SAW Filters from 30MHz ~ 1GHz

Over 270 custom developed SAWs

Variety of passbands available

Low insertion loss

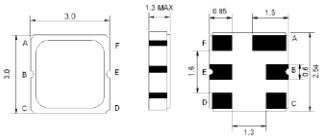
Wide range of stock available for sample orders

Industry standard footprints 5.2x5.2 and 3.1x3.1mm packages

Suitable for satellite communications, GPS, GNSS and wireless communications among others

Balanced output options available

Access the GSIF datasheet here



GSRF - RF SAW Filters from 100MHz ~ 2.7GHz

Over 540 custom developed SAWs

Industry standard footprints with ultra miniature options available

1.4x1.1mm 1.1x0.9mm packages

Low insertion loss

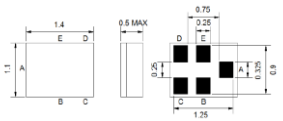
Variety of pass bands and centre frequencies available

Wide range of stock available for sample evaluation

Pad configuration options available

Balanced output options available

Access the GSRF datasheet here



GSDX - SAW Duplexers from 700MHz ~ 2.5GHz

Space saving through component reduction

Industry standard footprints

Packages from 1.8x1.4mm to 3.8x3.8x1.45 footprints available

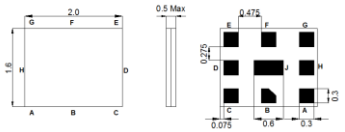
Low insertion attenuation

Typical insertion loss of <3dB

Ultra-miniature for maximum space saving

Suitable for use within the Cellular, CDMA, WCDMA, and LTE bands.

Access GSDX details here



Monolithic Crystal Filters

Highly accurate filtering at low frequencies

Tiny surface mount space-saving packages available

GMCF-21 @ 21.40 MHz

2 and 4 pole options

Industry standard UM-1 and UM-5 packages

Leaded or surface mount options available

Wide range of frequency/bandwidths in stock

Custom designs

Commercial and Industrial applications

Access the GMCF-21 datasheet here

GSF-75 21.40, 45.0, 50.0 and 70.0 MHz

7.0x5.0x1.5mm surface mount package

4 pole single package

Excellent stop band performance

Space saving

Low height

Commercial and Industrial applications

Custom frequencies available

Access the GSF-75 datasheet here

GMCF-45 @ 45.0 MHz

Low cost

2 and 4 pole options

Industry standard UM-1 and UM-5 packages

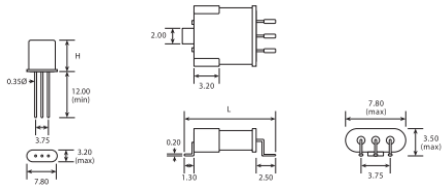
Leaded or surface mount options available

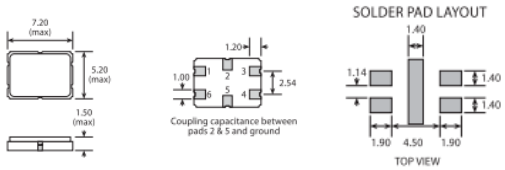
Wide range of frequency/bandwidths in stock

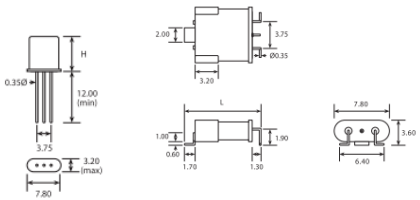
Custom designs

Commercial and Industrial applications

Access the GMCF-45 datasheet here







Real Time Clock Modules - RTCs

Gain flexibility with our low power RTCs

And some of the world's smallest packages

Uncompensated
Maximum power saving

RV-1805-C3 @ 32.7680 kHz

3.7 x 2.5 x 0.9mm

Board area 9.5mm^2

Ultra Low Power 60nA

±2.0ppm @25°C

Backup Battery Switchover

Auto calibrated RC-mode consuming 22nA

Several hours operation using an MLCC

Trickle charge circuit

Event input

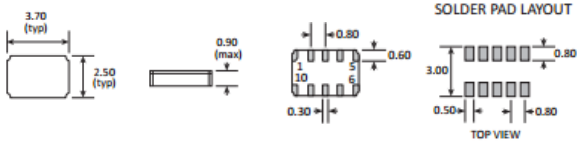
512 Bytes of user RAM

Programmable CLKOUT frequencies

I^{2}C Bus Compatible

AEC-Q200 qualified optional

Access the RV1805C3 datasheet here



Temperature Compensated
Maximum stability

RV-8803-C7 @ 32.7680 kHz

3.2 x 1.5 x 0.80mm

Board area 4.8mm^2

Worlds Smallest Temperature Compensated RTC Module

±3.0ppm -40°C to +85°C

Current consumption <240nA

Integrated Temperature Sensor

Time stamp event input

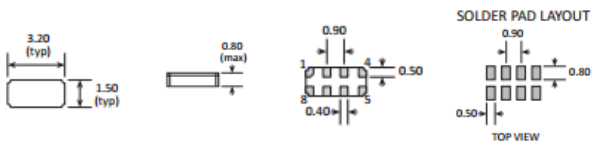
User RAM

Programmable CLKOUT frequencies

I^{2}C Bus compatible

AEC-Q200 qualified optional

Access the RV8803C7 datasheet here



Oven Controlled Oscillators - OCXOs

Highly accurate signal fidelity and fantastic aging and stability characteristics

Check out our range of OCXOs when you need the very best

HCD 380 and HCD 381 from 30.0 MHz ~ 100.0 MHz

36.0x27.0x15.0mm

Standard European IEC CO-08 pin-out

Superior temperature stability <0.01ppm

daily ageing <0.001ppm

phase noise <-160dBc @ 10kHz

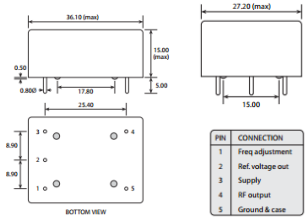
SC-cut crystal - No multiplier

Custom design options

Ideal reference source for SHF and EHF applications

Access the HCD380 datasheet here

Access the HCD381 datasheet here



HCD 660 from 5.0 MHz ~ 20.0 MHz

50.0x50.0x24.0mm

Standard European pin-out

Mind blowing temperature stability <0.001ppm

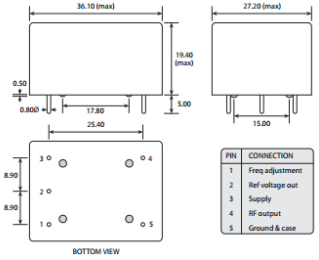
daily ageing <0.0002ppm

Close in phase noise < -140dBc/Hz @ 10Hz

Custom design options

Super high quality reference source for base station applications

Access the HCD660 datasheet here



GOXO-149 from 10.0 MHz ~ 80.0 MHz

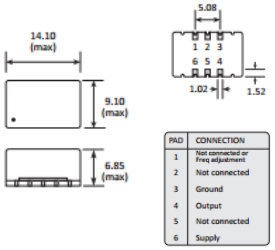
14.0x9.0x7.9mm

Surface mount package

Temperature stability 0.02ppm

Overall stability including 20 years ageing ±4.6ppm **meeting telecoms industry specifications** <-154dBc/Hz @ 10kHz

Access the GOXO-149 datasheet here



SCOCXOHS from 10.0 MHz ~ 120.0 MHz

20.0x12.5x7.8mm

DIL 14 style package

Temperature stability 0.05ppm

Good long term ageing stability <2.5ppm in 10 years

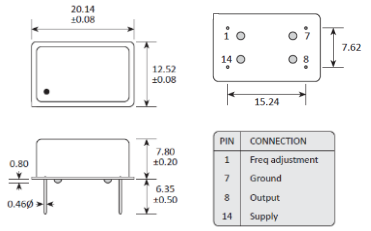
Phase noise < -160dBc/Hz @ 10kHz

Fast warm up

Custom design options

Ideal for telecom , avionics and defence applications

Access the SCOCXOHS datasheet here



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Thank You

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