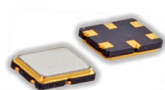


7.0X5.0

RoHS Compliant
Lead-free soldering

RoHS Compliant
Lead free
Lead-free soldering



Features

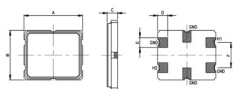
- Ceramic Seam-Welded Package
- Excellent Reliability
- Ultra Miniature Package
- Suitable for Surface Mount Technology and IR Reflow Process
- For application in wireless communications system

Type(TY)	Crystal Filter
Size(mm)	7.0X5.0
Frequency(MHz)	21.4 ~ 90
Overtone	Fundamental or 3rd OT
Pole	2 / 3
Bandwidth	±3.75KHz ~ ±7.5KHz
Insertion Loss	3dB max

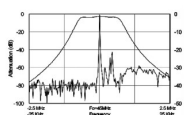
Consult factory representative for special requirements.

Typical Frequencies

21.400000	45.000000
90.000000	



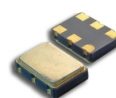
A	B	C	D	E	F
7.00	5.00	1.27	1.21	0.99	2.54
±0.18	±0.18	±0.20	±0.13	±0.13	±0.13



13.7X9.4 / 7.0X5.0

PECL/CMOS/LVDS
RoHS Compliant
Lead-free soldering

RoHS Compliant
Lead free
Lead-free soldering



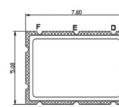
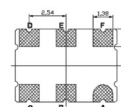
Features

- SMD type SAW Oscillator
- 3.3V Operation / Complementary PECL Output
- Main application: SONET & Remote Keyless Entry

Type(TS)	SAW Oscillator
Size(mm)	13.7X9.4 / 7.0X5.0
Frequency(MHz)	212.5 ~ 700 / 156~1000 / 150~700
Output Level	PECL /CMOS /LVDS
Operating Temp Range(°C)	-40 ~ +85
Supply Voltage	2.5V~3.3V
Output Load	50ohms

Applications WLAN, Cable Modem, AV Sender, DECT, GSM, CDMA, IS-95, W-CDMA,

Consult factory sales representative for other specifications.



Pin	Connection
A	OE
B	N.C.
C	GND
D	OUT
E	OUT
F	Vcc

7.0X5.0

RF Sine Wave
RoHS Compliant
Lead-free soldering

RoHS Compliant
Lead free
Lead-free soldering



Features

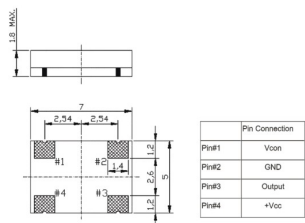
- SMD type SAW Oscillator
- Excellent for High-density Packaging
- Excellent Frequency Stability & Phase Noise

Type(TS)	SAW Oscillator
Size(mm)	7.0X5.0
Frequency(MHz)	315 ~ 868.35
Output Level	RF Sine Wave
Operating Temp Range(°C)	-40 ~ +85
Supply Voltage	12V
Output Load	50ohms

Consult factory sales representative for other specifications.

Typical Frequencies

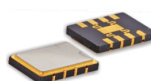
315	433.92
868.35	



13.7X9.4 / 7.0X5.0

RoHS Compliant
Lead-free soldering

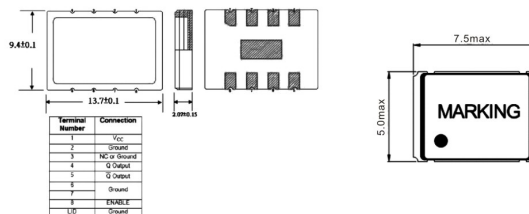
RoHS Compliant
Lead free
Lead-free soldering



Features

- Ceramic Seam Weld Package
- Excellent Reliability Performance
- Ultra Miniature Package
- Available to Surface Mount Technology and IR Reflow Process
- For use in wireless communications devices

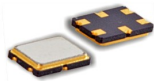
Type(TH)	VCSO
Size(mm)	13.7X9.4 / 7.0X5.0
Frequency(MHz)	156 ~ 1000
Output Level	CMOS
Frequency Stability(Over all)	25ppm ~ ±50ppm
Operating Temp Range(°C)	-40 ~ +85
Supply Voltage	2.5V ~ 3.3V
Output Load	15pF
Applications	WLAN, Cable Modem, AV Transmitter, DECT, GSM, CDMA, IS-95, W-CDMA,



7.0X5.0

PECL
RoHS Compliant
Lead-free soldering

RoHS Compliant
Lead free
Lead-free soldering



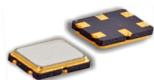
Features

- SMD type Crystal Oscillator
- High Frequency XO / 3.3V Operation / Complementary PECL Output
- Optional stand-by function for output (Tri-state output)
- Main applications : WLAN, SONET/SDH/DWDM, Gigabite Ethernet, Storage Area Network, Digital Video

Type(TW)	Crystal Oscillator
Size(mm)	7.0X5.0
Frequency(MHz)	50-800
Output Level	PECL
Frequency Stability(Over all)	±25ppm ~ ±100ppm
Operating Temp Range(°C)	-20 ~ +70 / -40 ~ +85
Supply Voltage	2.5V ~ 3.3V
Output Load	50Ω

7.0X5.0

CMOS
RoHS Compliant
Lead-free soldering



Features

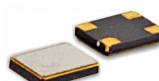
- SMD type Crystal Oscillator
- Excellent for High-density Packaging
- High Frequency Stability
- Good Phase Noise

Type(TW)	Crystal Oscillator
Size(mm)	7.0X5.0
Frequency(MHz)	2-200
Output Level	CMOS
Frequency Stability(Over all)	±25ppm ~ ±50ppm
Operating Temp Range(°C)	-20 ~ +70 / -40 ~ +85
Supply Voltage	2.5V ~ 3.3V
Output Load	15pF

5.0X3.2 / 3.2X2.5 / 2.5X2.0 / 2.0X1.6

CMOS
RoHS Compliant
Lead-free soldering

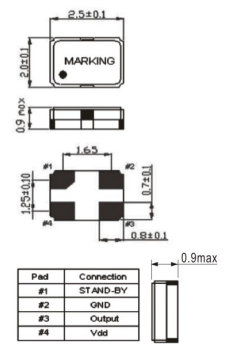
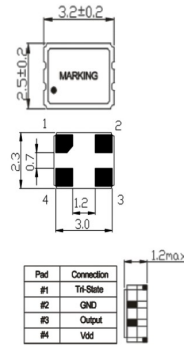
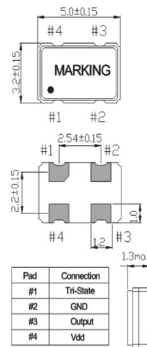
RoHS Compliant
Lead free
Lead-free soldering



Features

- Ultra Small Package
- Excellent for High-density Packaging
- High Frequency Stability
- Good Phase Noise Performance

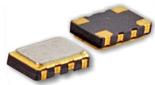
Type(TW)	Crystal Oscillator
Size(mm)	5.0X3.2 / 3.2X2.5 / 2.5X2.0 / 2.0X1.6
Frequency(MHz)	2 ~ 72
Output Level	CMOS
Frequency Stability(Over all)	25ppm ~ ±50ppm
Operating Temp Range(°C)	-20 ~ +70 / -40 ~ +85
Supply Voltage	1.8V~3.3V
Output Load	15pF



5.0X3.2 / 3.2X2.5 / 2.5X2.0 / 2.0X1.6

RoHS Compliant
Lead-free soldering

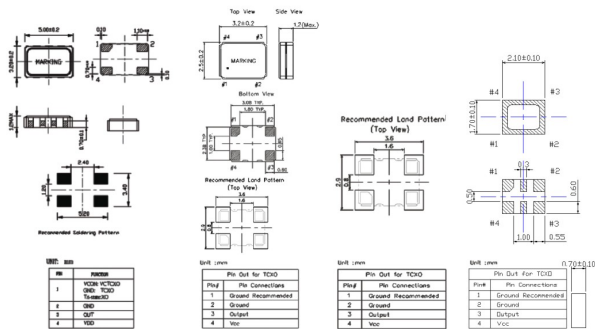
RoHS Compliant
Lead-free
Lead-free soldering



Features

- SMD type Temperature Compensated Crystal Oscillators
- Miniature and lightweight
- Low phase noise
- One Chip IC assures high reliability
- Main applications: Mobile phones, GPS applications and other mobile communications systems

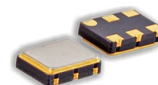
Type(TX)	TCXO
Size(mm)	5.0X3.2 / 3.2X2.5 / 2.5X2.0 / 2.0X1.6
Frequency(MHz)	10 ~ 52
Tolerance(25±3°C)	±0.5ppm ~ ±1.5ppm
Frequency Stability	±0.5ppm / ±1.5ppm / ±2.0ppm
Operating Temp Range(°C)	-30 ~ +85 / -20 ~ +70 / -40 ~ +85
Voltage Input (Vdd)	1.8V ~ 3.3V
Output	Clipped Sine Wave



7.0x5.0/ 3.2x2.5

RoHS Compliant
Lead-free soldering

RoHS Compliant
Lead-free
Lead-free soldering

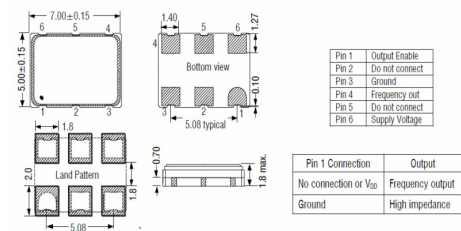


Features

- Surface Mount Hermetic Package
- Excellent Reliability Performance
- Ultra Miniature Package
- Main applications: Smart Metering, W/L Audio, Alarm & Security

Type(TX)	TCXO
Size(mm)	7.0X5.0/3.2X2.5
Frequency(MHz)	32.768K
Frequency Stability	±5 ppm
Tolerance(25°C +/- 3°C)	±1.5ppm
Operating Temp Range(°C)	-40 ~ +85
Voltage Input(Vdd)	1.8V, 2.5V, 3V, 3.3V, or 5V +/- 5%
Output	CMOS Square Wave

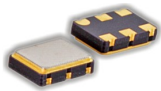
Package Dimensions and Suggested Land Pattern: 5x7 mm Package unit: mm



5.0X3.2/7.0X5.0

PECL/CMOS
RoHS Compliant
Lead-free soldering

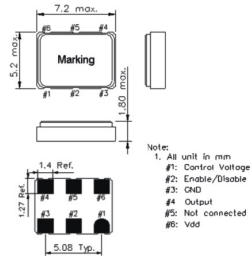
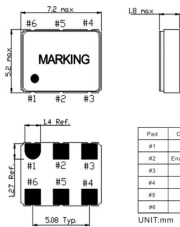
RoHS Compliant
Lead free
Lead-free soldering



Features

- SMD type Crystal Oscillator
- High Frequency XO / 3.3V Operation / Complementary PECL Output / CMOS
- Optionable stand-by function for output (Tri-state output)
- Main applications : WLAN, SONET/SDH/DWDM, Gigabite Ethernet, Storage Area Network, Digital Video

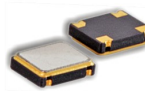
Type(TX)	VCXO
Size(mm)	5.0X3.2/7.0X5.0
Frequency(MHz)	10 ~ 800
Frequency Stability	± 50ppm
Pull Range	± 100ppm(min)
Operating Temp Range(°C)	-10 ~ +70 / -40 ~ +85
Supply Voltage	3.3V
Control Voltage	+ 1.65V ± 1.5V
Output Level	PECL / CMOS
Output Load	50Ω / 15pF



7.0X5.0 / 5.0X3.2 / 3.2X2.5 / 2.5X2.0

CMOS
RoHS Compliant
Lead-free soldering

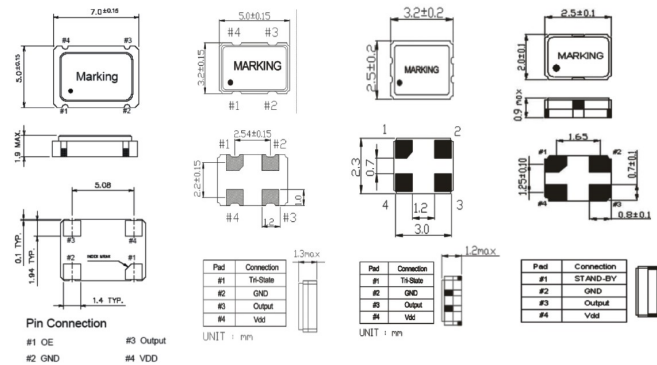
RoHS Compliant
Lead free
Lead-free soldering



Features

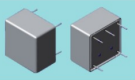
- SMD type Crystal Oscillator
- Excellent for High-density Packaging
- High Frequency Stability
- High Phase Noise

Type(TW)	PXO
Size(mm)	7.0X5.0 / 5.0X3.2 / 3.2X2.5 / 2.5X2.0
Frequency(MHz)	Up to 200
Output Level	CMOS
Frequency Stability(Over all)	± 25ppm ~ ± 50ppm
Operating Temp Range(°C)	-20 ~ +70 / -40 ~ +85
Supply Voltage	2.5V ~ 3.3V
Output Load	15pF



OCXO
25.8X25.8mm
Series

Outline drawing

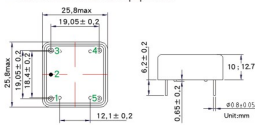


Features

- High stability with small size
- Low cost for high volume
- Low power consumption
- Fast warm-up

Applications

- Base stations
- Synthesizers
- Communication & test equipments



Performance specs

Power Supply	• 3.3V ±5%	• 5V ±5%	• 12V ±5%
Consumption	0.9W steady state 2~2.5W optional start-up state(<2 minutes)		
Warm-up time	<10ppb after 10 minutes Vs, 2 Hours reading (5C cut)		
Frequency range	5~100 MHz		
Initial tolerance	200ppb (100 ppb optional)		
Temperature instability	0~70 C	-20~70 C	-40~85 C
5~20 MHz	AT: 5~50 ppb SC: 4~20 ppb	5~50 ppb 4~20 ppb	10~50 ppb *
20~40 MHz	AT: 5~50 ppb SC: 4~20 ppb	5~50 ppb 4~20 ppb	10~100 ppb *
40~100 MHz	AT: 10~100 ppb SC: 4~50 ppb	10~100 ppb 4~50 ppb	20~100 ppb *

* Please contact with us for data

Output signal

- HCMOS/TTL 15pF/5 TTL load, duty cycle 40~60%
- Sinus 50 Harmonics -30dBc, non-harmonics -70dBc

Freq tuning range

- SC: 0.5ppm~1ppm Linearity: 10%
- AT: 1~3ppm Linearity: 10~20%

Phase noise (10MHz SC typical)

10Hz	100Hz	1KHz	10KHz	100KHz
-125dBc	-135dBc	-145dBc	-155dBc	-155dBc

Aging

- SC: 20~50ppb
- AT: 50~200ppb

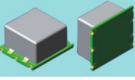
Pin function

1: RF Output	2: Case ground	3: Vctri*
4: Vref	5: Vcc	

** Electrical Frequency Control optional

OCXO
25.4X22mm
Series

Outline drawing

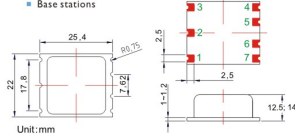


Features

- SMD package for reflow
- Output signal enable
- High stability
- Fast warm-up & accurate oven-alarm

Applications

- Test equipments
- Communication equipments
- Base stations



Performance specs

Power Supply	• 3.3V ±5%	• 5V ±5%	• 12V ±5%
Consumption	1.1W steady state 2~4W optional start-up state(<2 minutes)		
Warm-up time	<10ppb after 10 minutes Vs, 3 Hours reading (5C cut)		
Frequency range	5~40 MHz		
Initial tolerance	200ppb (100 ppb optional)		
Temperature instability	0~70 C	-20~70 C	-40~85 C
5~12 MHz	AT: 10~50 ppb SC: 2~10 ppb	10~50 ppb 2~20 ppb	20~50 ppb *
12~26 MHz	AT: 10~50 ppb SC: 2~10 ppb	10~50 ppb 20~20 ppb	20~100 ppb *
26~40 MHz	AT: 10~50 ppb SC: 5~20 ppb	20~50 ppb 5~20 ppb	20~100 ppb *

* Please contact with us for data

Output signal

- HCMOS/TTL 15pF/5 TTL load, duty cycle 40~60%
- Sinus 50 Harmonics -30dBc, non-harmonics -70dBc

Freq tuning range

- SC: 0.5ppm~1ppm Linearity: 10%
- AT: 1~3ppm Linearity: 10~20%

Phase noise (10MHz AT typical)

10Hz	100Hz	1KHz	10KHz	100KHz
-125dBc	-135dBc	-145dBc	-155dBc	-155dBc

Aging

- SC: 20~50ppb
- AT: 100~300ppb

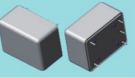
Pin function

1: RF output	2: Oven Alarm	3: Case GND	4: Vref
5: Vctri	6: Enable	7: Vcc	

** Electrical Frequency Control optional

OCXO
35.8X27mm
Series

Outline drawing

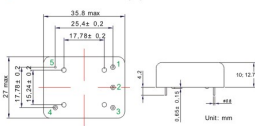


Features

- Eu standard package
- High stability
- Low power consumption
- Fast warm-up

Applications

- Base stations
- Synthesizers
- Communication & test equipments



Performance specs

Power Supply	• 3.3V ±5%	• 5V ±5%	• 12V ±5%
Consumption	0.9W steady state 2~4W optional start-up state(<2 minutes)		
Warm-up time	<10ppb after 10 minutes Vs, 2 Hours reading (5C cut)		
Frequency range	5~100 MHz		
Initial tolerance	200ppb (100 ppb optional)		
Temperature instability	0~70 C	-20~70 C	-40~85 C
5~20 MHz	AT: 5~50 ppb SC: 1~20 ppb	5~50 ppb 1~20 ppb	5~50 ppb *
20~40 MHz	AT: 5~50 ppb SC: 2~20 ppb	5~50 ppb 2~20 ppb	10~100 ppb *
40~100 MHz	AT: 10~100 ppb SC: 4~50 ppb	10~100 ppb 4~50 ppb	20~100 ppb *

* Please contact with us for data

Output signal

- HCMOS/TTL 15pF/5 TTL load, duty cycle 40~60%
- Sinus 50 Harmonics -30dBc, non-harmonics -70dBc

Freq tuning range

- SC: 0.5ppm~1ppm Linearity: 10%
- AT: 1~3ppm Linearity: 10~20%

Phase noise (10MHz SC typical)

10Hz	100Hz	1KHz	10KHz	100KHz
-125dBc	-135dBc	-145dBc	-155dBc	-155dBc

Aging

- SC: 20~50ppb
- AT: 50~200ppb

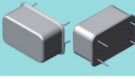
Pin function

1: Vct r**	2: Vref	3: Vcc
4: RF Output	5: Case ground	

** Electrical Frequency Control optional
Height optional: 10mm~13mm

OCXO
20.3X12.7mm
Series

Outline drawing

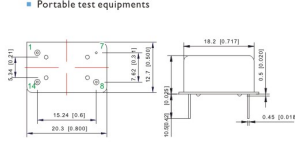


Features

- DIP14 small size
- Low cost for high volume
- Low power consumption
- Fast warm-up

Applications

- Base stations
- Communication equipments
- Portable test equipments



Performance specs

Power Supply	• 3.3V ±5%	• 5V ±5%	• 12V ±5%
Consumption	0.6W steady state 2.5W start-up state(<2 minutes)		
Warm-up time	<20ppb after 10 minutes Vs, 3 Hours reading		
Frequency range	2.048~40 MHz		
Initial tolerance	200ppb (100 ppb optional)		
Temperature instability	0~70 C	-20~70 C	-40~85 C
2.048~12 MHz	AT: 30~100 ppb SC: 20~50 ppb	50~100 ppb 30~50 ppb	70~200 ppb *
12~26 MHz	AT: 30~100 ppb SC: 20~50 ppb	50~100 ppb 30~50 ppb	100~200 ppb *
26~40 MHz	AT: 50~200 ppb SC: 30~100 ppb	100~200 ppb 50~100 ppb	30~100 ppb *

* Please contact with us for data

Output signal

- HCMOS/TTL 15pF/5 TTL load, duty cycle 40~60%
- Sinus 50 Harmonics -30dBc, non-harmonics -70dBc

Freq tuning range

- SC: 0.5ppm~1ppm Linearity: 10%
- AT: 1~3ppm Linearity: 10~20%

Phase noise (10MHz AT typical)

10Hz	100Hz	1KHz	10KHz	100KHz
-105dBc	-125dBc	-145dBc	-150dBc	-152dBc

Aging

- SC: 100~200ppb
- AT: 200~500ppb

Pin function

1: Vct r**	7: Case ground
8: RF Output	14: Vcc

** Electrical Frequency Control optional

8.2X6.0 / 5.5X4.8

RoHS Compliant
Lead-free soldering

RoHS Compliant
Lead free
Lead-free soldering

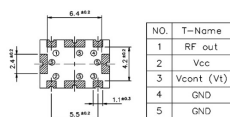
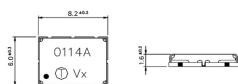


Features

- Wide Tuning range
- Small package
- Low phase noise
- Up to 2.4GHz
- Main applications : DCS/GSM, ISM Bands Wireless Telemetry,WiFi Radio.

Type(TV)	Voltage Controlled Oscillator
Size(mm)	8.2X6.0 / 5.5X4.8
Frequency(MHz)	800 ~ 2400
Voltage	+2.2 to +12VDC
Power	Power Efficient
Phase Noise	Exceptionally Low Phase Noise
Operating Temp Range(°C)	-40 ~ +85
Tuning Range	Ultra Wide Tuning Range

Consult factory for special requirements

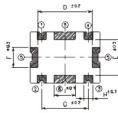


NO.	T-Name
1	RF out
2	Vcc
3	Vcont (Vt)
4	GND
5	GND

- A=5.5-
- B=4.8-
- C=1.7-
- D=4.5-
- E=3.4-
- F=1.7-
- G=3.5-
- H=0.7-
- I=1.5-



- Pin #1= RF OUT-
- Pin #2= Vcc-
- Pin #3= Vcont (Vt)-
- Pin #4= GND-
- Pin #5= GND-
- Pin #6= GND-
-



SAW Filter Standard Package (Reference Only)

Package Size	1.4X1.1	2.0X1.6	2.0X2.5	3.0X3.0	3.8X3.8	5.0X5.0	5.0X3.5	7.0X5.0
13"				3000	3000	3000	3000	2000
7"	3000	3000	2000	1000	1000	1000	1000	1000

Package Size	9.0X7.0	11.4X5.0	13.3X6.5	19X6.5	25X9.0	13.7X9.4
7"	500	500	500	500	500	200

Crystal Standard Package (Reference Only)

Package Size	2.0X1.6	2.0X2.5	2.5X3.2	2.5X4.0	5.0X3.2	6.0X3.5	7.0X5.0
13"					3000	1000	
7"	3000	3000	3000	1000			1000



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