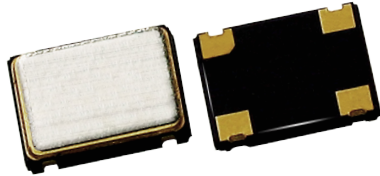


2.5V/3.3V CMOS SSXO

MXQ Series



Product Description

The MXQ Series is used in digital electronic systems to reduce the Electro-Magnetic Interference (EMI). The device uses proprietary PLL and Spread-Spectrum Clock Generator (SSCG) technology to synthesize from and modulate the frequency of the input crystal. Measured radiated energy at the fundamental and harmonic frequencies are reduced to comply with Electro Magnetic Compliance (EMC) requirement. The internal factory setting function enables flexible selection of output frequency, modulation rate and spread ratios.

Product Features

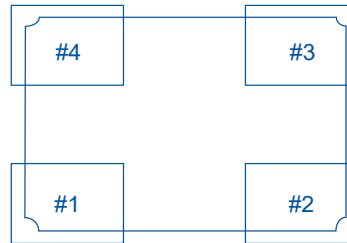
- Wide Frequency Range: 5MHz to 120MHz
- Flexible Modulation Rate Options
- Center Spread: $\pm 0.125\%$ to $\pm 2.0\%$
- Down Spread: -0.25% to -4%
- Output Enable with Internal Pull-Up (Default Enable)
- Very Low Power Consumption
- Industry Standard 2.0 x 1.6mm to 7.0 x 5.0mm Ceramic SMD Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The MXQ Series is suitable for automotive applications requiring specific change control; this part is AEC-Q100 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

<https://www.diodes.com/quality/product-definitions/>

Application(s)

- Automotive Image Systems

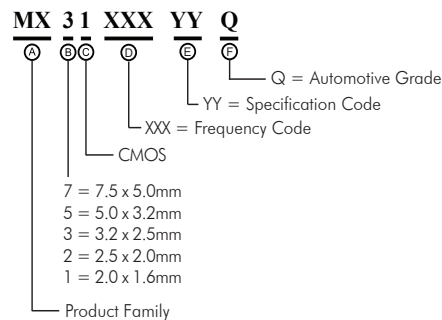
Top View Pin Location



Pin Functions

Pin	Function
1	OE
2	Ground
3	Output
4	V _{DD}

Part Ordering Information



Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

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Spread Spectrum Crystal Oscillator

Absolute Maximum Ratings

Parameter	Min.	Typ.	Max.	Units	Notes
Supply Voltage Range	-0.5		+3.63	V	
Input Voltage Range	-0.5		VDD+0.5	V	
Junction Temperature			+150	°C	

Electrical Performance

Parameter	Min.	Typ.	Max.	Units	Notes
Output Frequency	5		120	MHz	
Supply Voltage	2.97	3.3	3.63	V	
	2.375	2.5	2.625		
Supply Current, Output Enabled		10	15	mA	5MHz to 66MHz
		15	20	mA	66MHz to 120MHz
Supply Current, Output Disabled		0.7	1	mA	
Frequency Stability	±25		±100	ppm	
Operating Temperature Range	-40		+125	°C	
Storage Temperature Range	-55		+150	°C	
Output Logic 0, V _{OL}	10%VDD			V	
Output Logic 1, V _{OH}			90%VDD	V	
Output Load			15	pF	
Duty Cycle	45		55	%	Measured 50% V _{DD}
Rise and Fall Time		1.5	3	ns	Measured 20/80% of Waveform
Cycle To Cycle Jitter (CCJ)		150	200	ps	
Spread Spectrum Ratio	Center SS	±0.125	±2	%	
	Down SS	-4.0	-0.25	%	
Modulation Frequency	30		40	KHz	
Modulation Profile	Triangular				

Notes:

- Stability includes all combinations of operating temperature, load changes, rated input (supply) voltage changes, initial calibration tolerance (25°C), aging (1 year at 25°C average effective ambient temperature), shock and vibration.
- For specifications other than those listed, please contact sales.

Output Enable / Disable Function

Parameter	Min.	Typ.	Max.	Units	Notes
Input Voltage (pin 1), Output Enable	0.7 V _{DD}			V	or open
Input Voltage (pin 1), Output Disable (low power standby)			0.3 V _{DD}	V	Output is Hi-Z
Output Disable Delay			200	ns	
Output Enable Delay			2	ms	
Start up Time			3	ms	

For the latest product information visit: <https://www.diodes.com/products/connectivity-and-timing/crystal-and-crystal-oscillator/>

For test circuit go to: <http://www.diodes.com/assets/sre/tc-cmos2.pdf>

For soldering reflow profile and reliability test ratings go to: <https://www.diodes.com/assets/sre/reflow.pdf>

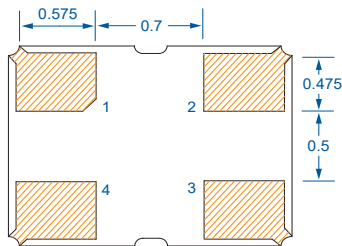
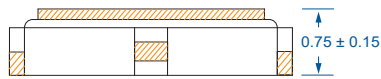
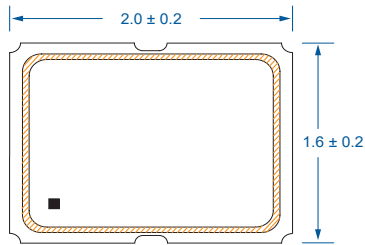
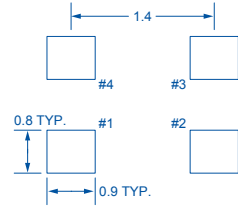
For tape and reel information go to: <https://www.diodes.com/assets/sre/tr-2016-xo.pdf>

For tape and reel information go to: <https://www.diodes.com/assets/sre/tr-2520-xo.pdf>

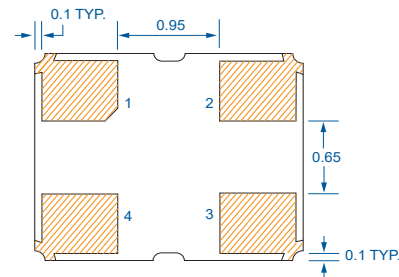
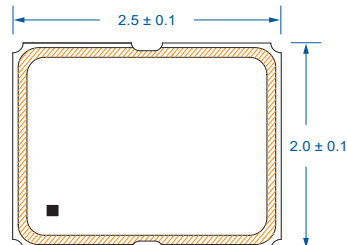
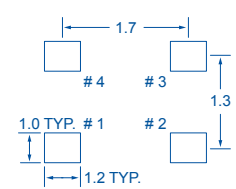
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For tape and reel information go to: <https://www.diodes.com/assets/sre/tr-5032-xo.pdf>

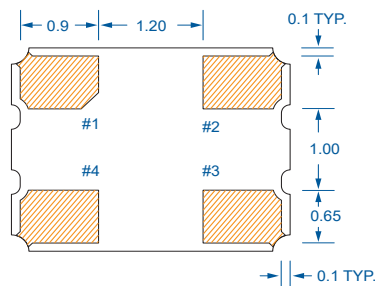
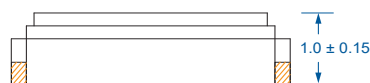
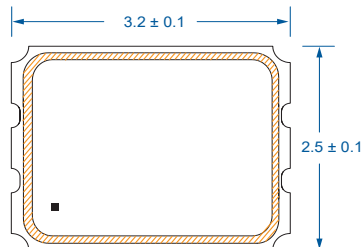
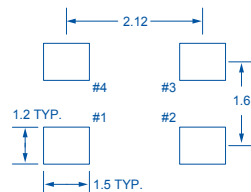
For tape and reel information go to: <https://www.diodes.com/assets/sre/tr-7050-xo.pdf>

Package: 2.0 x 1.6 (Scale: none; dimensions are in mm)**Recommended Land Pattern:**

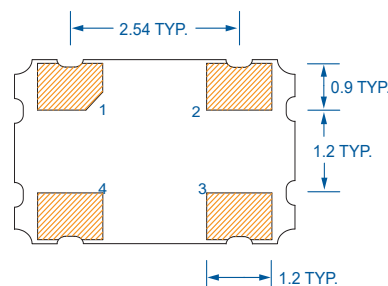
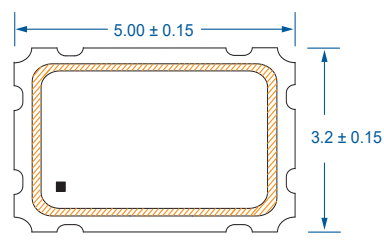
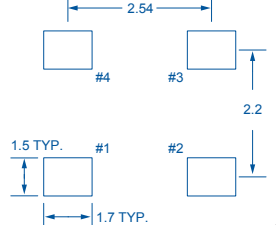
*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

Package: 2.5 x 2.0 (Scale: none; dimensions are in mm)**Recommended Land Pattern:**

*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

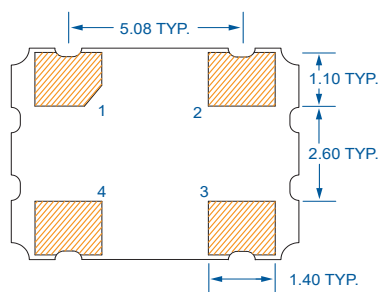
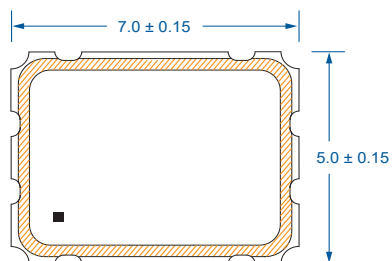
Package: 3.2 x 2.5 (Scale: none; dimensions are in mm)**Recommended Land Pattern:**

*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

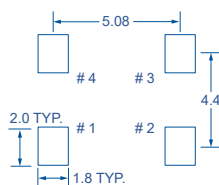
Package: 5.0 x 3.2 (Scale: none; dimensions are in mm)**Recommended Land Pattern:**

*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

Package: 7.0 x 5.0 (Scale: none; dimensions are in mm)



Recommended Land Pattern:



*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

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