

# Ultra Low Jitter CMOS Crystal Oscillator 5.0 x 3.2mm

## 2.5/3.3V CMOS XO

## UX51/UX501



5.0 x 3.2mm Ceramic SMD

### Product Features

- Ultra low phase jitter for 40G/100G systems
  - 0.1ps RMS max. (12kHz to 20MHz), Category 1
  - 0.2ps RMS max. (12kHz to 20MHz), Category 1
  - 0.3ps RMS max. (12kHz to 20MHz), Category 2
- Industrial Temperature Range
- Pb-free & RoHS compliant

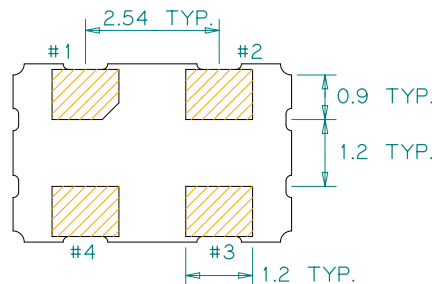
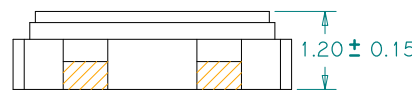
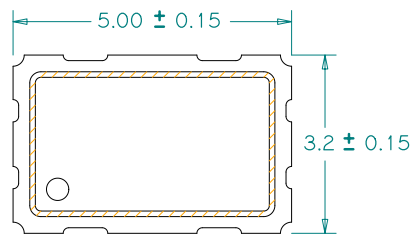
### Product Description

The UX51/UX501 XO series is a high performance CMOS crystal oscillator family with ultra low jitter performance. It supports various options including wider frequency range, 2.5/3.3 voltage, various stabilities, and different package sizes. It is designed to meet the clock source specifications for communication systems with 40G or 100G interfaces, and other high performance equipment.

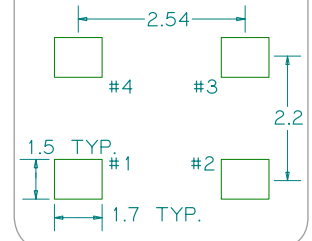
### Applications

- Networking Systems
- Servers and Storage Systems
- Profession Video Equipments
- Test and Measurement
- FPGA/ASIC Clock Generation

### Package: (Scale: none; dimensions are in mm)



#### Recommended Land Pattern:



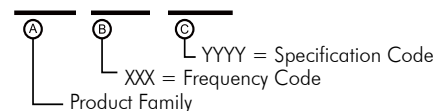
\*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

### Pin Functions:

Pin	Function
1	OE
2	GND
3	Q
4	V <sub>DD</sub>

### Part Ordering Information Category 1:

UX51 XXX YYY



\*Not for all frequencies in the frequency range. Please contact sales for details.

### Part Ordering Information Category 2:

UX 501 V I FFFF.FFFFFFFF

Voltage:

1=+3.3V  
2=+2.5V

Stability and Temp Range:

Stability	Temp Range
A = +/-20 ppm	-20/+70°C
B = +/-25 ppm	-20/+70°C
C = +/-50 ppm	-20/+70°C
D = +/-25 ppm	-40/+85°C
E = +/-50 ppm	-40/+85°C

Frequency:

FFFF.FFFFFFFF

MHz, "4 digits/decimal/6 digits" format

## Electrical Performance

Parameter		Min.	Typ.	Max.	Units	Notes
Output Frequency		40		156.25	MHz	
Supply Voltage		3.135	3.3	3.465	V	See ordering options
		2.375	2.5	2.625		
Supply Current, Output Enabled	Frequency 40~100MHz			25	mA	
	Frequency >100MHz			35		
Supply Current, Output Disabled				10	uA	
Frequency Stability				±50	ppm	See ordering options
Operating Temperature Range		-40		+85	°C	See ordering options
Output Logic 0, $V_{OL}$				10% $V_{DD}$	V	
Output Logic 1, $V_{OH}$		90% $V_{DD}$			V	
Output Load				15	pF	
Duty Cycle		45		55	%	Measured 50% $V_{DD}$
Rise and Fall Time				5	ns	Measured 20/80% of waveform
Jitter, Phase RMS (1- $\sigma$ ), Category 1				0.1	ps	12kHz to 20 MHz frequency band, See ordering information category 1
				0.2	ps	
Jitter, Phase RMS (1- $\sigma$ ), Category 2				0.3	ps	12kHz to 20 MHz frequency band, See ordering information category 2
Jitter, Accumulated RMS (1- $\sigma$ )				7	ps	20,000 Consecutive Periods
Jitter, pk-pk				40	ps	100,000 random periods

### 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
Internal Pullup Resistance	30			k $\Omega$	
Output Disable Delay			200	ns	
Output Enable Delay			2	ms	
Start up Time			3	ms	

## Absolute Maximum Ratings

Parameter	Min.	Typ.	Max.	Units	Notes
Storage Temperature	-55		+125	°C	

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

**For test circuit go to:** [https://www.diodes.com/assets/sre/tc\\_pecl.pdf](https://www.diodes.com/assets/sre/tc_pecl.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\\_5032\\_xo.pdf](https://www.diodes.com/assets/sre/tr_5032_xo.pdf)