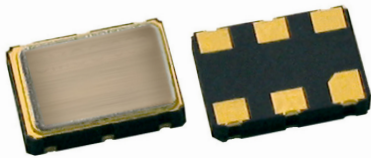


# 1.8V/2.5V/3.3V LP-HCSL XO

# UCQ Series



### Product Description

The DIODES UCQ XO series is crystal oscillator family optimized to save board space. The series consists of high performance LP-HCSL crystal oscillators with ultra low jitter performance to meet strict chipset requirements. It supports various options including wider frequency range, 1.8V/2.5V/3.3V voltage, and various stabilities. It is designed to meet the clock source specifications for communication systems, and other high performance equipment.

### Product Features

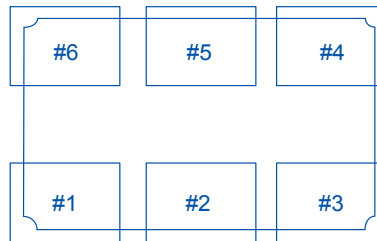
- Ultra Low Phase Jitter
  - 0.07ps typ. 0.1ps RMS max. (12kHz to 20MHz)
- Extended Temperature Range up to 125°C
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The UCQ XO series is suitable for automotive applications requiring specific change control; this part is AEC-Q104 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

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

### Application(s)

- Automotive

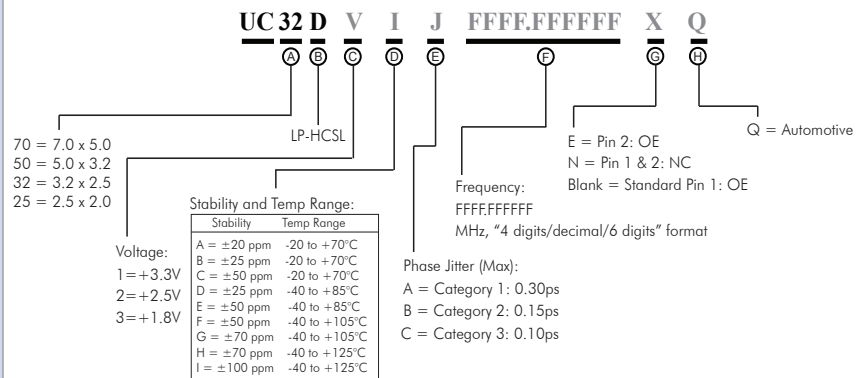
### Top View Pin Location



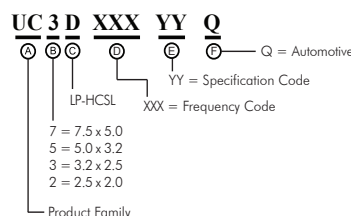
### Pin Functions

Pin	Function
1	OE or NC
2	OE or NC
3	Ground
4	Output
5	Output N
6	V <sub>CC</sub>

### Part Ordering Information Category 1



### Part Ordering Information Category 2



### 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.
4. Automotive products are AEC-Q100 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.

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Ultra Low Jitter Crystal Oscillator

## Electrical Performance

Parameter	Min.	Typ.	Max.	Units	Notes
Output Frequency	25		212.5	MHz	
Supply Voltage	3.135	3.3	3.465	V	See ordering options
	2.375	2.5	2.625		
	1.71	1.8	1.89		
Supply Current, Output Enabled		10	15	mA	25~156.25MHz
		15	20	mA	156.251~212.5MHz
Supply Current, Output Disabled			100	uA	
Frequency Stability			±100	ppm	See ordering options
Operating Temperature Range	-40		+125	°C	See ordering options
Output Logic 0, V <sub>OL</sub>	-0.15			V	
Output Logic 1, V <sub>OH</sub>			0.9	V	
Output Load	R <sub>S</sub> = 0Ω, R <sub>P</sub> = Open, C <sub>L</sub> = 2pF				LP-HCSL termination
Output Differential Voltage Swing	1.2	1.5	1.8	V	
Output Common Mode	0.35	0.38	0.45	V	Q and QB crossing point
Edge Rate	1		6	V/ns	Measured from -150mV to +150mV on different waveform
Duty Cycle	45		55	%	Measured 50% V <sub>DD</sub>
Rise and Fall Time		0.3	0.5	ns	Measured from V <sub>OL</sub> = 0.175V to V <sub>OH</sub> = 0.525V
Output RMS Phase Jitter - PCIe® Gen 4			0.3	ps	100MHz
Output RMS Phase Jitter - PCIe Gen 5			0.15	ps	
Output RMS Phase Jitter - PCIe Gen 6			0.1	ps	
Jitter, Phase RMS, Category 1		0.2	0.3	ps	25~39.999999MHz, Freq. offset from 12kHz to 5MHz
					40~100MHz, Freq. offset from 12kHz to 20MHz
Jitter, Phase RMS, Category 2		0.1	0.15	ps	100.000001~149.999999MHz, , Freq. offset from 12kHz to 20MHz
Jitter, Phase RMS, Category 3		0.07	0.1	ps	150~212.5MHz, , Freq. offset from 12kHz to 20MHz

### 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.

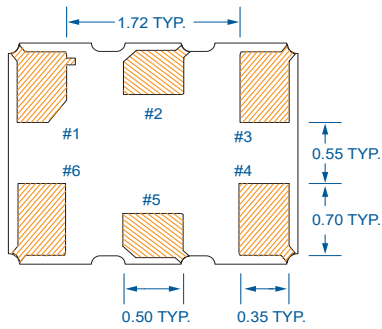
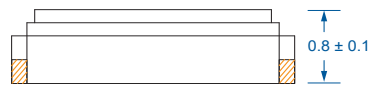
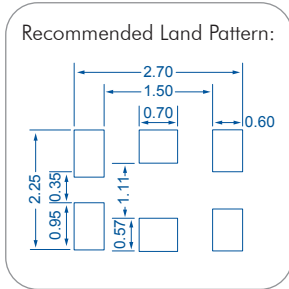
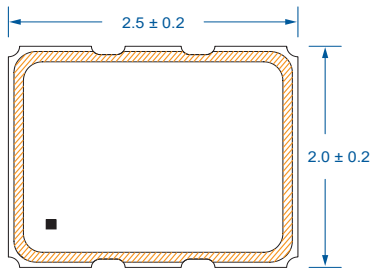
## Output Enable / Disable Function

Parameter	Min.	Typ.	Max.	Units	Notes
Input Voltage (pin 1), Output Enable	0.7 V <sub>CC</sub>			V	or open
Input Voltage (pin 1), Output Disable (low power standby)			0.3 V <sub>CC</sub>	V	Output is Hi-Z
Output Disable Delay			200	ns	
Output Enable Delay			2	ms	
Start up Time			5	ms	

## Absolute Maximum Ratings

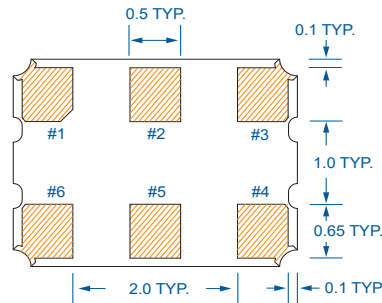
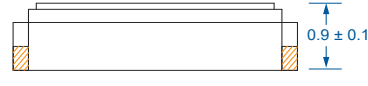
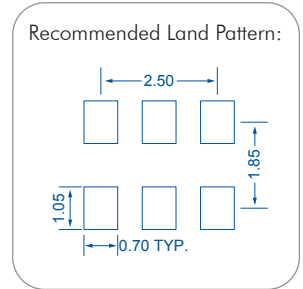
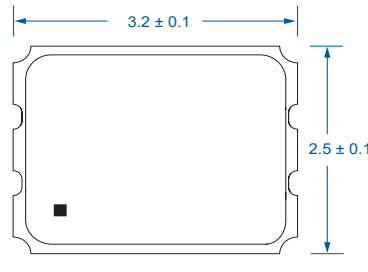
Parameter	Min.	Typ.	Max.	Units	Notes
Storage Temperature	-55		+125	°C	

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



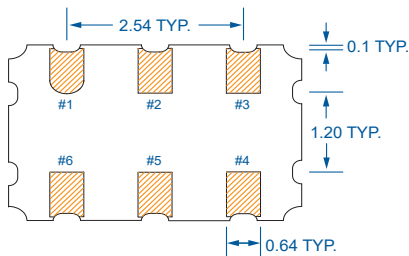
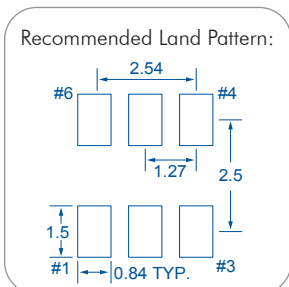
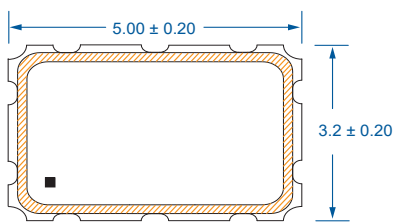
\*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

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



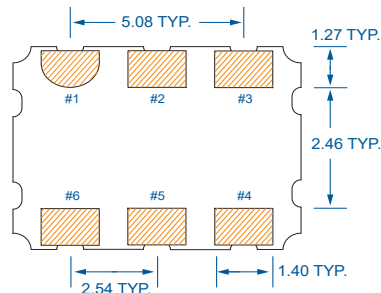
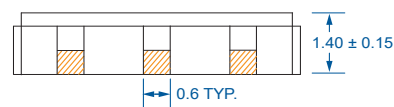
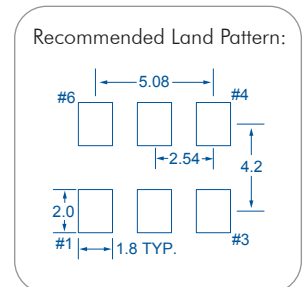
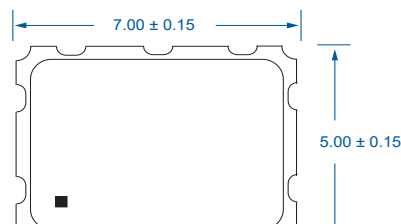
\*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

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



\*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)**



\*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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