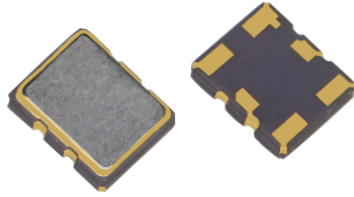


The World's Smallest Ultra Low Jitter Crystal Oscillator  
2.5 x 2.0mm

2.5V/3.3V HCSL XO

UF254/UF24



2.5 x 2.0mm Ceramic SMD

**Product Features**

- Ultra Low Phase Jitter  
□ 0.06ps typ. 0.08ps 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)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.

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

**Product Description**

The UF254/UF24 XO series is the world's smallest crystal oscillator family optimized to save board space. The series consists of high performance HCSL crystal oscillators with ultra low jitter performance to meet strict chipset requirements. It supports various options including wider frequency range, 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.

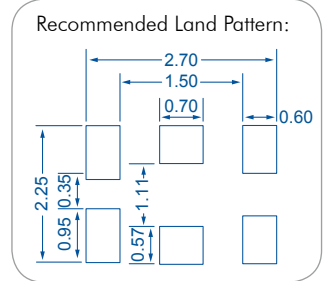
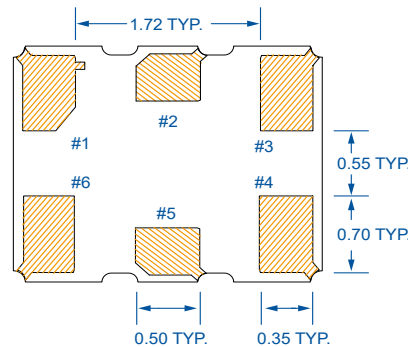
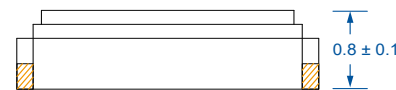
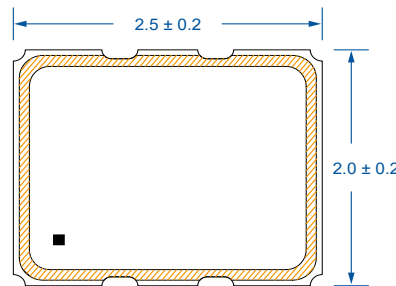
**Applications**

- Networking Systems
- Optical Module
- Servers and Storage Systems
- Profession Video Equipment
- Test and Measurement
- FPGA/ASIC Clock Generation
- 112G Serial Applications

**Notes:**

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

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



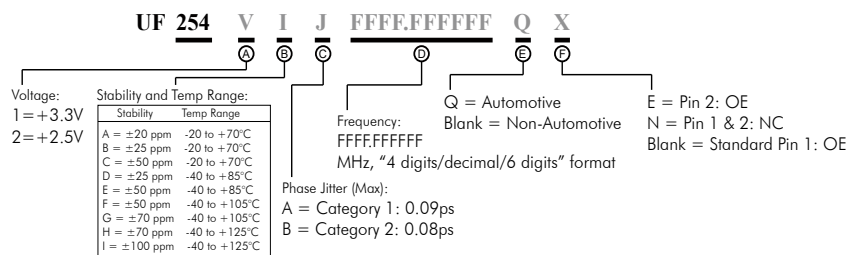
\*Extended high frequency power decoupling is recommended (see test circuit for minimum recommendation). To ensure optimal performance, do not route RF traces beneath the package.

**Pin Functions:**

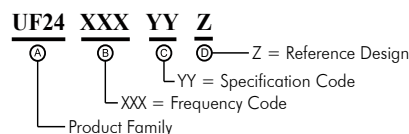
Pin	Function
1	OE or NC
2	OE or NC
3	Ground
4	Output
5	Output N
6	VCC

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

**Part Ordering Information Category:**



**\*For Reference Design Part:**



## Electrical Performance

Parameter	Min.	Typ.	Max.	Units	Notes
Output Frequency	100		212.5	MHz	
Supply Voltage	3.135	3.3	3.465	V	See ordering options
	2.375	2.5	2.625		
Supply Current, Output Enabled			40	mA	All temperature range except -40°C to 125°C
			50	mA	-40°C to 125°C
Supply Current, Output Disabled			30	uA	
Frequency Stability			±100	ppm	See ordering options
Operating Temperature Range	-40		+125	°C	See ordering options
Output Logic 0, $V_{OL}$	-0.15			V	
Output Logic 1, $V_{OH}$			0.9	V	
Output Load	$R_S = 33\Omega$ , $R_P = 50\Omega$ , $C_L = 2pF$				HCSL termination
Output Differential Voltage Swing	1.12	1.5	1.8	V	
Output Common Mode	0.35	0.38	0.42	V	Q and QB crossing point
Edge Rate	1		4	V/ns	Measured from -150mV to +150mV on different waveform
Duty Cycle	45		55	%	Measured 50% $V_{DD}$
Rise and Fall Time			0.7	ns	Measured from $V_{OL} = 0.175V$ to $V_{OH} = 0.525V$
Output RMS Phase Jitter - PCIe Gen 4			0.3	ps	100MHz
Output RMS Phase Jitter - PCIe Gen 5			0.1	ps	
Jitter, Phase RMS (1- $\sigma$ ), Category 1		0.07	0.09	ps	At 156.25MHz, 3.3V. Offset frequency 12kHz to 20MHz
Jitter, Phase RMS (1- $\sigma$ ), Category 2		0.06	0.08	ps	

### 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 $V_{CC}$			V	or open
Input Voltage (pin 1), Output Disable (low power standby)			0.3 $V_{CC}$	V	Output is Hi-Z
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\\_hcsl.pdf](https://www.diodes.com/assets/sre/tc_hcsl.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-2520-xo.pdf>

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