

Ultra Low Noise Crystal Oscillator

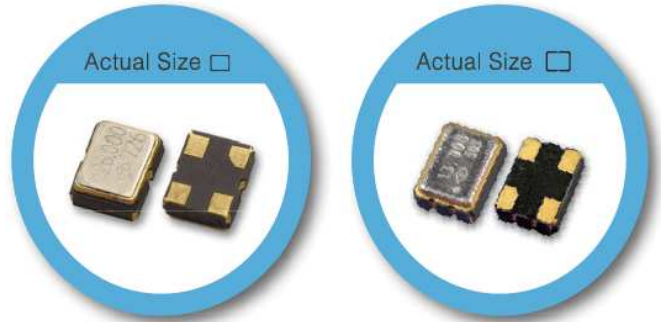
OX-U/OY-U Series - 3.2 x 2.5 / 2.5 x 2.0 mm SMD Crystal Oscillator

FEATURE

- Ultra Low Phase Noise designed specifically for Hi-Resolution Audio (HiFi, HD Audio)
- F=45.1584MHz (@1.8V, 25°C): typical low close-in phase noise of -100dBc/Hz@10Hz-offset, -127dBc/Hz@100Hz-offset, and a noise floor of -157dBc/Hz
- F=49.152MHz (@1.8V, 25°C): typical low close-in phase noise of -100dBc/Hz@10Hz-offset, -128dBc/Hz@100Hz-offset, and a noise floor of -157dBc/Hz
- Wide operating temperature range: -40 to +105°C

TYPICAL APPLICATION

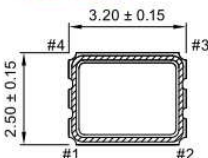
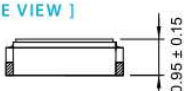
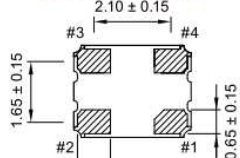
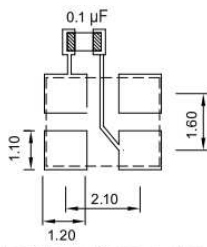
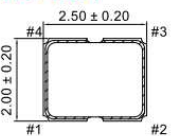
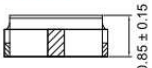
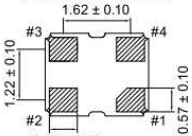
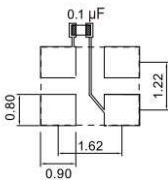
- Automotive multimedia, Automotive radar
- DACs and ADCs for Hi-Fi, Digital Audio Broadcasting (DAB), Professional audio equipment
- Smartphone, Tablet, Wireless module



RoHS Compliant

DIMENSION (mm)

SOLDER PAD LAYOUT (mm)

<p>[TOP VIEW]</p>  <p>3.20 ± 0.15 2.50 ± 0.15</p> <p>#4 #3 #1 #2</p> <p>[SIDE VIEW]</p>  <p>0.95 ± 0.15</p> <p>[BOTTOM VIEW]</p>  <p>2.10 ± 0.15 1.65 ± 0.15 0.65 ± 0.15 0.90 ± 0.15</p> <table border="1"> <tr><th>Pin#</th><th>Function</th></tr> <tr><td>1</td><td>Tri-state</td></tr> <tr><td>2</td><td>GND</td></tr> <tr><td>3</td><td>Output</td></tr> <tr><td>4</td><td>VDD</td></tr> </table>	Pin#	Function	1	Tri-state	2	GND	3	Output	4	VDD	 <p>0.1 μF 1.10 1.60 2.10 1.20</p> <p>To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.</p>
Pin#	Function										
1	Tri-state										
2	GND										
3	Output										
4	VDD										
<p>[TOP VIEW]</p>  <p>2.50 ± 0.20 2.00 ± 0.20</p> <p>#4 #3 #1 #2</p> <p>[SIDE VIEW]</p>  <p>0.85 ± 0.15</p> <p>[BOTTOM VIEW]</p>  <p>1.62 ± 0.10 1.22 ± 0.10 0.67 ± 0.10 0.57 ± 0.10</p> <table border="1"> <tr><th>Pin#</th><th>Function</th></tr> <tr><td>1</td><td>Tri-state</td></tr> <tr><td>2</td><td>GND</td></tr> <tr><td>3</td><td>Output</td></tr> <tr><td>4</td><td>VDD</td></tr> </table>	Pin#	Function	1	Tri-state	2	GND	3	Output	4	VDD	 <p>0.1 μF 1.22 1.62 0.90 0.80</p> <p>To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.</p>
Pin#	Function										
1	Tri-state										
2	GND										
3	Output										
4	VDD										

ELECTRICAL SPECIFICATION

Parameter	3.3V		2.5V		1.8V		Unit
	Min.	Max.	Min.	Max.	Min.	Max.	
Supply Voltage Variation (VDD)	VDD-10%	VDD+10%	VDD-10%	VDD+10%	VDD-10%	VDD+10%	V
Frequency Range	20	60	20	60	20	60	MHz
Supply Current	20 ≤ Fo ≤ 60MHz		--	8	--	7	mA
Duty Cycle	45	55	45	55	45	55	%
Output Level (CMOS)	Output High (Logic "1")		2.97		2.25		V
	Output Low (Logic "0")			0.33		0.25	
Transition Time: Rise/Fall Time+		6		6		6	nSec
Start Time		2		2		2	mSec
Tri-State(Input to Pin 1)	Enable (High voltage or floating)		2.31		1.75		V
	Disable (Low voltage or GND)			0.99		0.75	
RMS Phase Jitter (integrated 12kHz ~ 20MHz)		0.5		0.5		0.5	pSec
Aging (@25°C, 1st year)		±3		±3		±3	ppm
Storage Temp. Range	-55	125	-55	125	-55	125	°C
Phase Noise (Typ.)	F=20MHz		F=40MHz		F=60MHz		dBc/Hz
1.8V,25°C	1 kHz offset	-147	-143	-139	-139	-139	
	100 kHz offset	-156	-154	-150	-150	-150	
2.5 to 3.3V, 25°C	1 kHz offset	-151	-148	-142	-142	-142	
	100 kHz offset	-157	-156	-156	-156	-156	

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position
+Transition times are measured between 10% and 90% of VDD, with an output load of 15pF

FREQ. STABILITY vs. TEMP. RANGE

Temp. (°C)	ppm	±20	±25	±30	±50
		-10~+60	○	○	○
-20~+70	△	○	○	○	○
-40~+85	×	○	○	○	○
-40~+105	×	×	△	○	○

* O: Available △: Conditional X: Not available

*Inclusive of calibration @ 25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration

Note: not all combination of options are available. Other specifications may be available upon request.

Specifications subject to change without notice

Model Numbering Guide – Crystal Oscillator

Available options

Type	package (mm)	Supply Voltage(V)	Tri-State Function	Freq. Stability (ppm)	Temp. Range(°C)	Output Logic and Symmetry	Oscillator Mode	Appearance	Lead Free	Dash	Freq. (MHz)
O: Oscillator	Z:2.0 x 1.6 Y:2.5 x 2.0 X:3.2 x 2.5 V:5.0 x 3.2 C:7.0 x 5.0	E: 2.8/3.0/3.3 J: 2.5 K: 1.8 P: 1.5 L: 1.2 M: 0.9	T: Fixed-Freq with Tri-State M: Multiplier Freq with Tri-State(only for V/C package) U: Ultra Low Noise design	A: ±5 B: ±10 P: ±15 C: ±20 D: ±25 E: ±30 F: ±40 G: ±50 H: ±100	E: 0~+85 I: -10~+60 C: -20~+70 D: -30~+85 L: -40~+85 J: -40~+105 H: -40~+125 F: -55~+125	J: CMOS 15pF / 50±5% K: CMOS 15pF / 50±10%					
P: Programmable Oscillator	Y: 2.5 x 2.0 X: 3.2 x 2.5	E: 2.8/3.0/3.3 J: 2.5 K: 1.8	T: Fixed-Freq with Tri-State	C: ±20 D: ±25 G: ±50 H: ±100		J: CMOS 15pF / 50±5%	A: AT Fundamental T: AT 3rd Overtone	N :Normal	F: RoHS Compliant	-	XX.XXXXXX
O: Oscillator (Differential Output)	A:3.2x2.5 W:5.0x3.2 T:7.0x5.0	E: 3.3 J: 2.5	T: Input to pin 2 (std.) R: Input to pin 1 (case by case) U: Ultra Low Jitter design (Only for T package)	D: ±25 G: ±50 H: ±100	I: -10~+60 C: -20~+70 D: -30~+85 L: -40~+85	L: LVPECL / 50±5% V: LVDS / 50±5% H: HCSL / 50±5%	Not Selectable by Customer				
O: Oscillator (Fast Delivery series)	W:5.0x3.2 T:7.0x5.0	E: 3.3 J: 2.5	M: Multiplier Freq with pin 2 Tri-State N: Multiplier Freq. with PIN 1 Tri-State	D: ±25 G: ±50 H: ±100		J: CMOS 15pF / 50±5% L: LVPECL / 50±5% V: LVDS / 50±5%					

O Y E T C C J A N F - 13.000000

*Not all combinations of options are available.

Example: OYETCCJANF-13.000000

Type	Oscillator
Package	2.5 x 2.0 mm
Supply Voltage(V)	3.3 V
Tri-State .	Fixed-Freq.
Freq. Stability	±20ppm
Temp Range	-20~+70 °C
Output	CMOS 15 pF / Symmetry 50±5%
Oscillator Mode	AT Fundamental
Appearance	Normal Appearance
Lead Free	RoHs Compliant
Frequency	13.000000 MHz