



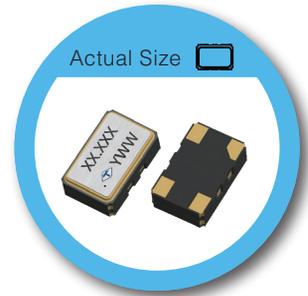
TW Type High Precision 5.0 x 3.2 mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator

FEATURE

- Conforms to AEC-Q200
- Typical 5.0 x 3.2 x 1.85 mm ceramic SMD package.
- ± 0.1 ppm, $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$; ± 0.05 ppm, $-10^{\circ}\text{C} \sim +70^{\circ}\text{C}$, ± 0.2 ppm, $-40 \sim +105^{\circ}\text{C}$
- CMOS and Clipped Sine wave (without DC-cut capacitor) output optional.

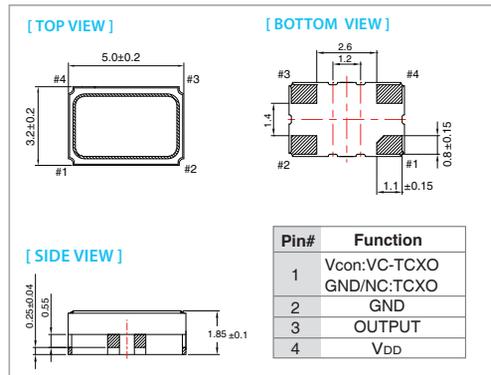
TYPICAL APPLICATION

- Base Stations, Stratum 3
- Femtocell

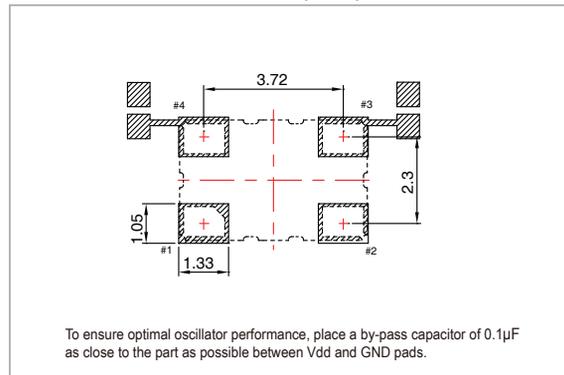


RoHS Compliant

DIMENSION (mm)



SOLDER PAD LAYOUT (mm)



ELECTRICAL SPECIFICATION

Parameter	2.5V		3.3V		Unit
	Min.	Max.	Min.	Max.	
Supply Voltage Variation (VDD)	VDD-5%	VDD+5%	VDD-5%	VDD+5%	V
Frequency Range	10	52	10	52	MHz
Standard Frequency (for CMOS)	10, 12.8, 13, 19.2, 20, 25, 26, 30.72				
Standard Frequency (for Clipped Sine Wave)	10, 12.8, 13, 19.2, 20, 25, 26, 30.72				
Frequency Tolerance*	-	± 2.0	-	± 2.0	ppm
Frequency Stability					
Vs Supply Voltage ($\pm 5\%$) change	-	± 0.1	-	± 0.1	ppm
Vs Load ($\pm 10\%$) change	-	± 0.1	-	± 0.1	
Vs Aging (@ 1st year)	-	± 1.0	-	± 1.0	
Supply Current (CMOS output)					
10 MHz \geq Fo \geq 40 MHz	-	6	-	6	mA
40 MHz > Fo \geq 52 MHz	-	8	-	8	
Supply Current (Clipped Sine Wave)	-	5	-	5	
Output Level (CMOS)					
Output High (Logic "1")	90%VDD	-	90%VDD	-	V
Output Low (Logic "0")	-	10%VDD	-	10%VDD	
Duty	45	55	45	55	%
Output Level (Clipped Sine Wave)	0.8	-	0.8	-	Vp-p
Load (CMOS)	15pF		15pF		
Load (Clipped Sine Wave)	10 K Ω // 10pF		10 K Ω // 10pF		
Control Voltage Range (VCTCXO)	0.5	2.5	0.5	2.5	V
Pulling Range (VCTCXO)	± 5.0	-	± 5.0	-	ppm
Vc Input Impedance (VCTCXO)	100	-	100	-	k Ω
Phase Noise @ 10 MHz					
100 Hz	-	-125	-	-125	dBc/Hz
1 kHz	-	-140	-	-140	
10 kHz	-	-150	-	-150	
Start time	-	10	-	10	mSec
Storage Temp. Range	-55	125	-55	125	$^{\circ}\text{C}$

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position. * Frequency at 25 $^{\circ}\text{C}$, 1 hour after reflow.

Frequency Stability vs. Temperature Range

Temp. ($^{\circ}\text{C}$)	ppm				
	± 0.05	± 0.1	± 0.2	± 0.28	± 0.5
-10 ~ +70	○	○	○	○	○
-20 ~ +70	△	○	○	○	○
-40 ~ +85	×	○	○	○	○
-40 ~ +105	×	×	○	○	○

* ○: Available △: Conditional X: Not available

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