

# TL Type High Precision and High Temperature 5.0 x 3.2 mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator

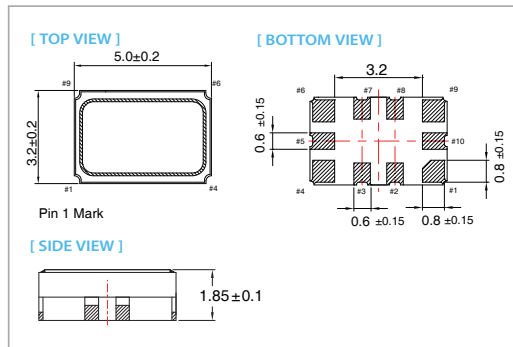
## FEATURES

- Typical 5.0 x 3.2 x 1.85 mm ceramic SMD package.
- High Precision for  $\pm 0.1 \text{ ppm}@-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ ,  $\pm 0.2 \text{ ppm}@-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$
- Frequency support from 10MHz to 52MHz
- Wide temperature range
- Tri-state Enable/Disable function
- Pb-free/RoHS compliant

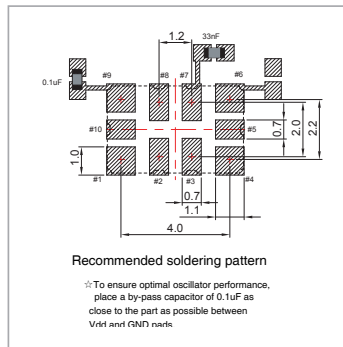
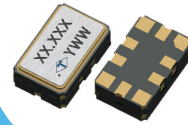
## TYPICAL APPLICATIONS

- Time Synchronization
- Microwave Communication
- Test & Measurement
- Telecom Systems
- Satellite Commutation

## DIMENSION (mm)



## SOLDER PAD LAYOUT (mm) PIN FUNCTION


 Actual Size 

**RoHS Compliant**

PIN#	FUNCTION
1	V <sub>CON</sub> :VC-TCXO NC:TCXO
2	NC
3	NC
4	GND
5	Tri-state
6	Fout
7	VC Filter
8	NC
9	V <sub>DD</sub>
10	GND

## ELECTRICAL SPECIFICATION

Parameter	3.3V		2.5V		Unit	
	Min.	Max.	Min.	Max.		
Supply Voltage Variation (V <sub>DD</sub> )	V <sub>DD</sub> -5%	V <sub>DD</sub> +5%	V <sub>DD</sub> -5%	V <sub>DD</sub> +5%	V	
Frequency Range	10	52	10	52	MHz	
Frequency Tolerance (@25°C)	-	±1.0	-	±1.0	ppm	
Frequency Stability						
Vs Supply Voltage (±5%) change	-	± 0.1	-	± 0.1	ppm	
Vs Load (±10%) change	-	± 0.05	-	± 0.05	ppm	
Vs Aging (@ 1st year)	-	± 1.0	-	± 1.0	ppm	
Output Waveform	CMOS					
Supply Current	10MHz ≥ Fo ≥ 38MHz	-	6.5	-	6.5	mA
	38MHz > Fo ≥ 52MHz	-	7.5	-	7.5	mA
Output Level	Output High	90%V <sub>DD</sub>	-	90%V <sub>DD</sub>	-	V
	Output Low	-	10%V <sub>DD</sub>	-	10%V <sub>DD</sub>	V
Transition Time (10% ~ 90%)	Rise Time	-	6.5	-	6.5	nSec
	Fall Time	-	6.5	-	6.5	nSec
Duty Cycle	45	55	45	55	%	
Load	-	15	-	15	pF	
Output Waveform	Clipped sine wave					
Supply Current	10MHz ≥ Fo ≥ 38MHz	-	4.5	-	4.5	mA
	38MHz > Fo ≥ 52MHz	-	5.0	-	5.0	mA
Output Level	0.8	-	0.8	-	Vp-p	
Load	10KΩ // 10pF		10KΩ // 10pF			

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

Parameter		3.3V		2.5V		Unit
		Min.	Max.	Min.	Max.	
Tri-State Control	Enable	80%V <sub>DD</sub>	-	80%V <sub>DD</sub>	-	V
	Disable	-	20%V <sub>DD</sub>	-	20%V <sub>DD</sub>	
Startup Time		-	5	-	5	mSec
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	-	KΩ
Phase Noise @TCXO VDD=3.3V, Fout=20MHz	100Hz offset	-122		-122		dBc/Hz
	1kHz offset	-142		-142		dBc/Hz
	10kHz offset	-154		-154		dBc/Hz
	100kHz offset	-157		-157		dBc/Hz
	1MHz offset	-159		-159		dBc/Hz

### FREQ. STABILITY vs. TEMP. RANGE

Temp. (°C) \ ppm	±0.05	±0.1	±0.2	±0.28	±0.5	±2.0
-10 ~ +60	○	○	○	○	○	○
-20 ~ +70	○	○	○	○	○	○
-40 ~ +85	△	○	○	○	○	○
-40 ~ +95	△	△	○	○	○	○
-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.