

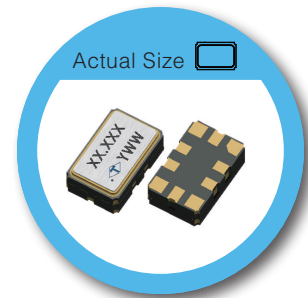
TL Type High Precision and High Temperature 5.0 x 3.2 mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator

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

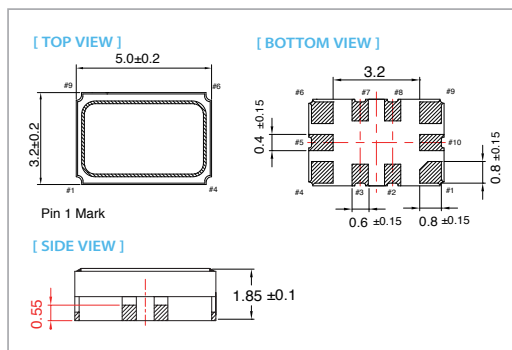
TYPICAL APPLICATIONS

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

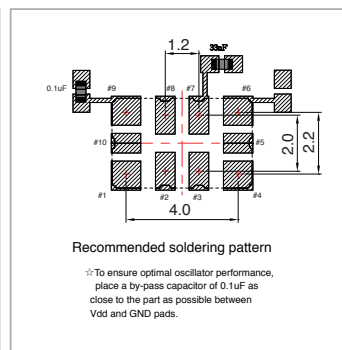


RoHS Compliant

DIMENSION (mm)



SOLDER PAD LAYOUT (mm)



PIN FUNCTION

| PIN# | FUNCTION |
|------|--------------------------------------|
| 1 | V _{CON} :VC-TCXO NC:TCXO |
| 2 | NC |
| 3 | NC |
| 4 | GND |
| 5 | Tri-state |
| 6 | Fout |
| 7 | VC Filter |
| 8 | NC |
| 9 | V _{DD} |
| 10 | GND |

ELECTRICAL SPECIFICATION

| Parameter | | 3.3V | | 2.5V | | Unit |
|---|--------------------|---------------------|---------------------|---------------------|---------------------|------|
| | | Min. | Max. | Min. | Max. | |
| Supply Voltage Variation (V _{DD}) | | V _{DD} -5% | V _{DD} +5% | V _{DD} -5% | V _{DD} +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 _{DD} | - | 90%V _{DD} | - | V |
| | Output Low | - | 10%V _{DD} | - | 10%V _{DD} | 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 _{DD} | - | 80%V _{DD} | - | V |
| | Disable | - | 20%V _{DD} | - | 20%V _{DD} | |
| 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 | × | △ | ○ | ○ | ○ | ○ |

* ○: 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.