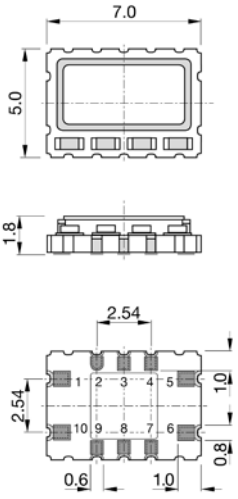
# VTX7R-LG

**Low G-sensitive**, vibration and shock resistant
analogue temperature compensated (VC)TCXO

## *Generic specification*

| **Frequency range** | **5.000 ~ 50.000 MHz** | | |
|---|---|---|---|
| **Standard frequencies** | 10, 12, 13, 15.36, 16.368, 20, 25, 27, 30, 33.6, 38.88, and 40 MHz | | |
| Frequency stability: | | | |
| vs. temperature referenced to (FMAX+FMIN)/2 | ≤ ±0.50 ppm | over -40 to +85 °C | (∗) |
| vs. supply voltage changes referenced to frequency at nominal supply | ≤ ±0.1 ppm | ±5 % | |
| vs. load changes referenced to frequency at nominal load | ≤ ±0.1 ppm | ±5 % | |
| vs. aging @ +40 °C | ≤ ±1.0 ppm | 1st year | |
| G-sensitivity | 0.25 ppb/g | per axis | (∗) |
| Frequency tolerance ex. factory @ +25 °C | 0 ~ +1.0 ppm | @ +25 °C | |
| Supply voltage (nominal value ±5 %) | +2.5 V ~ +3.3 V | | (∗) |
| **Output signal** | **Clipped sine wave** | **CMOS** | **(∗)** |
| Output level | > 0.8 Vp-p | VOH > 0.9∗Vcc / VOL < 0.1∗Vcc | |
| Output load | 10 kΩ // 10 pF | 15 pF Max. | |
| Current consumption, depending on frequency | 5 < mA | < 8 mA | |
| Electronic Frequency Control (EFC) | ΔF = ±5 to ±10 ppm positive slope | | (∗) |
| Control voltage (Vc) | +1.50 V ±1.0 V | | (∗) |
| EFC input impedance | > 100 kΩ | | |
| Tri-state function | pin #9 ➔ high or open<br>pin #9 ➔ low or GND | pin #6 ➔ oscillation<br>pin #6 ➔ high impedance | |
| Phase noise (typical value for 25 MHz) | -92 dBc/Hz @ 10 Hz<br>-120 dBc/Hz @ 100 Hz<br>-145 dBc/Hz @ 1 kHz<br>-155 dBc/Hz @ 10 kHz<br>-158 dBc/Hz @ 100 kHz | | |
| Operating temperature range | -40 ~ +85 °C | | (∗) |
| Storage temperature range | -55 ~ +105 °C | | |
| Reflow Profiles as per IPC/JEDEC J-STD-020C | ≤ 260 °C over 10 sec. Max. | | |
| Moisture sensitivity | Level 1 (unlimited) | | |

**(∗) See available options on page #2** **Note: Unless otherwise specified conditions are @+25 °C**

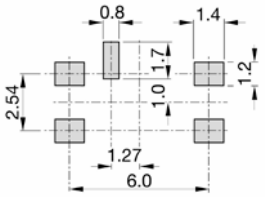


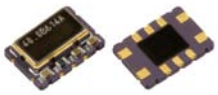

Pin function

| | |
|---|---|
| # 1 | Vc (EFC) for VC-TCXO<br>GND or NC for TCXO |
| # 5 | GND |
| # 6 | Output |
| # 9 | Tri-state or NC |
| # 10 | Vcc |

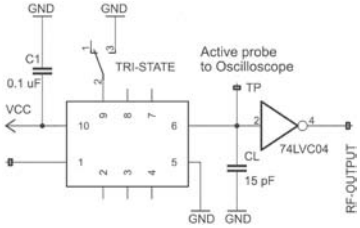
Do not contact #2, #3, #4, #7 & #8

Soldering pattern

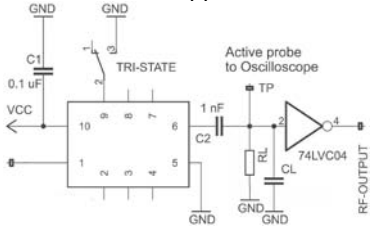


Test circuit for CMOS




Test circuit for Clipped Sine Wave




**2011/65/EU RoHS compliant**



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analogue temperature compensated (VC)TCXO

*Generic specification*

## Ordering code

**(0)7R-(1)(2)-(3)(4)-(5)(6)-25.000MHz** *Example:* ***TX7R-H33-NNu50-GC-25.000MHz***

| **Oscillator type** | **(1) Output signal** | **(2) Supply voltage** | **(6) G-sensitivity per axis** |
|---|---|---|---|
| TX = TCXO<br>VT = VC-TCXO | H = CMOS<br>C = Clipped sine wave | 25 = 2.5 V<br>30 = 3.0 V<br>33 = 3.3 V | GA = 0.10 ppb/g (Δ)<br>GB = 0.25 ppb/g<br>GC = 0.50 ppb/g<br>GD = 1.00 ppb/g<br>GE = 1.50 ppb/g |
| **(3) Operating temperature** | **(4) Frequency stability** | **(5) Pulling range** (VT only) | GZ = special spec |
| JK = -20 to +70 °C<br>NN = -40 to +85 °C<br>NP = -40 to +95 °C<br>QN = -55 to +85 °C | u50 = ± 0.50 ppm<br>1u0 = ± 1.00 ppm<br>1u5 = ± 1.50 ppm<br>2u0 = ± 2.00 ppm | V05 = 1.5 ± 1.0 V ±5 ppm<br>V10 = 1.5 ± 1.0 V ±10 ppm<br>Z = special spec | (Δ) Ask factory |

Frequency stability vs. temperature

| ppm | ≤± 0.50 | ≤± 1.00 | ≤± 1.50 | ≤± 2.00 |
|---|---|---|---|---|
| -20 to +70 °C | O | O | O | O |
| -40 to +85 °C | Δ | O | O | O |
| -40 to +95 °C | Δ | Δ | O | O |
| -55 to +85 °C | X | X | X | Δ |

| |
|---|
| Δ Ask factory |
| O Available |
| X Not available |

## G-Sensitivity performance

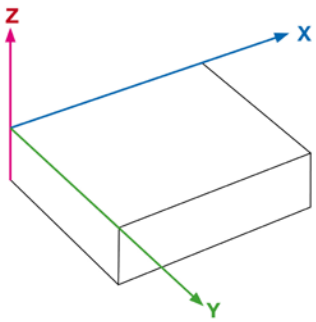
Noise shape vibration from 20-2'000 Hz
with 0.1 g²/Hz ($G_{RMS}$ = 14.11g) for the axis

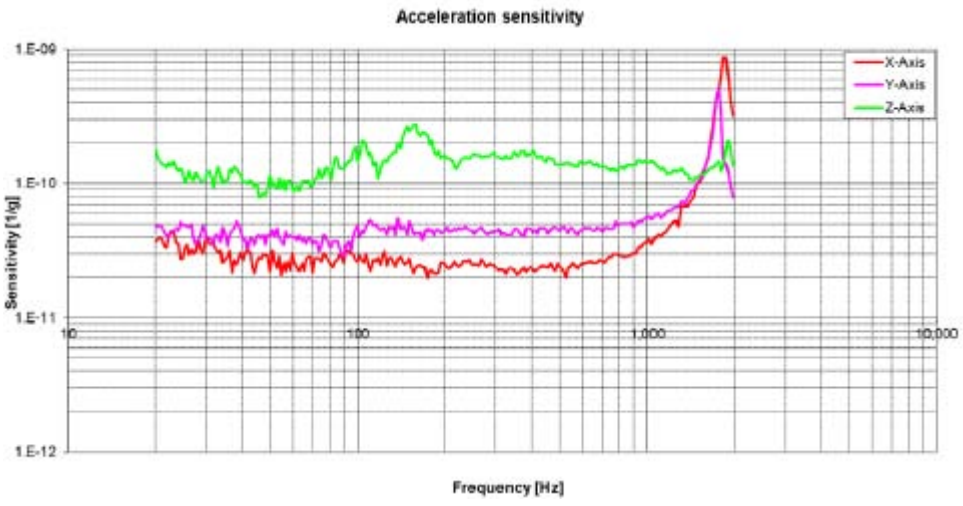
The table shows the averaged values of the G-Sensitivity in the range 20 Hz to 1000Hz.
At 1500 Hz appear resonances, which are caused by the mounting structure on the shaker.

VT7R-20MHz

| Osc-# | X-axis [1/g] | Y-axis [1/g] | Z-axis [1/g] | Gamma Γ [1/g] |
|---|---|---|---|---|
| A01 | 0.035 | 0.023 | 0.197 | 0.201 |
| A02 | 0.028 | 0.019 | 0.139 | 0.144 |
| A03 | 0.027 | 0.044 | 0.142 | 0.151 |
| A04 | 0.030 | 0.027 | 0.200 | 0.204 |

Definitions of vibration axes







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## Handling Recommendation for SMD Crystal & Crystal Oscillator

### 1. ESD Handling

Crystal oscillators are electrostatic sensitive device. Therefore, direct touching of the terminals with fingers and without ESD precautions must be avoid.
Proper handling must be made according to the established ESD handling rules IEC 61340-5-1 and EN 100015-1 to avoid degradations of the oscillator performance due to damages of the internal circuitry by electrostatic discharge.

### 2. Shocks & Vibrations

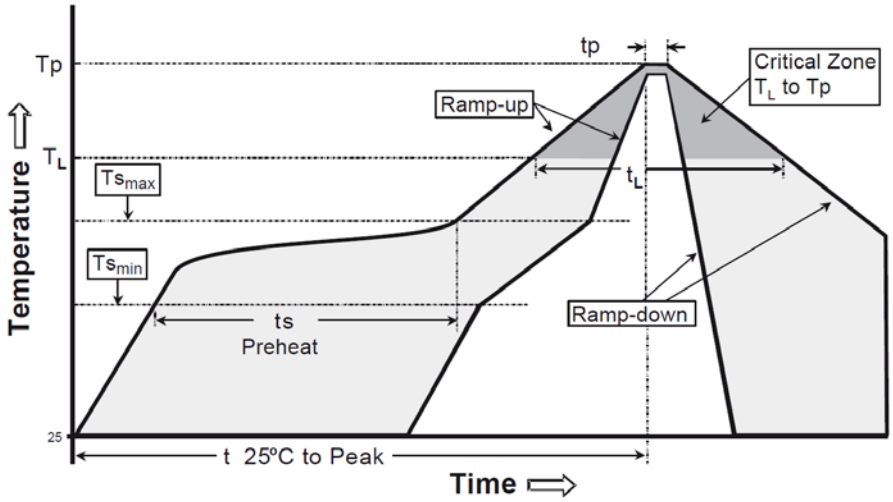
Excessive mechanical shocks and or vibrations during handling as well as manual and automatic assembly must be avoided.
If accidently, the component was dropped or subject to strong shock, component should be verified that the electrical function is still within the specification and still hermetically sealed.

### 3. Thermal Shocks

Avoid steep temperature gradients. It might lead to breakage of the crystal blank
Infrared reflow processes in general are safe.

### 4. Soldering & Cleaning

**Maximum Reflow Condition in accordance with JEDEC STD-020C**




Avoid washing or welding processes using Ultrasonic energy. These processes can damage the crystal due to mechanical resonance of the crystal blanks.

### 5. Coating

Using resin may have an impact on the oscillator characteristics.
If resin is used, please contact QuartzCom or our representative for more information.
In situations where resin would be used without contacting us in advance,
QuartzCom will not be responsible for any damages caused to the components or and injuries caused to people.

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