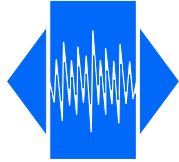# VTX7E

**High** reliable, wide temperature range -55 to +125°C analogue temperature compensated (VC)TCXO

**QuartzCom**
the communications company

## *Generic specification*

| Frequency range | 8.000 ~ 52.000 MHz | | |
|---|---|---|---|
| Frequency stability: | | | |
| vs. temperature referenced to $(F_{MAX}+F_{MIN})/2$ | ≤ ±0.5 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 | 1.8 ppb/g | per axis | |
| Short term stability ADEV | < $5*10^{-10}$ | $\tau$ = 1.0 s | |
| Frequency tolerance ex. factory @ +25 °C | ≤ ±0.1 ppm | @ +25 °C | |
| **Output signal** | **Clipped sine wave** | **CMOS** | (∗) |
| Output level | > 0.8 Vp-p | $V_{OH}$ > 0.9∗Vcc / $V_{OL}$ < 0.1∗Vcc | |
| Output load | 10 kΩ // 10 pF | 15 pF Max. | |
| Current consumption, depending on frequency | 1.5 ~ 7 mA | 2 ~ 10 mA | |
| Control voltage (Vc) | +1.50 V ±1.0 V | | (∗) |
| EFC input impedance | > 100 kΩ | | |
| Start-up time | < 2 ms | | |
| Phase noise (typical value for 40 MHz) | -85 dBc/Hz @ 10 Hz<br>-112 dBc/Hz @ 100 Hz<br>-134 dBc/Hz @ 1 kHz<br>-145 dBc/Hz @ 10 kHz<br>-149 dBc/Hz @ 100 kHz<br>-149 dBc/Hz @ 1 MHz | | |
| Operating temperature range | -55 ~ +125 °C | | (∗) |
| Storage temperature range | -55 ~ +125 °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**
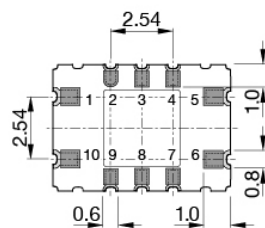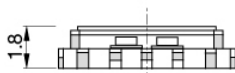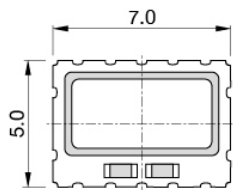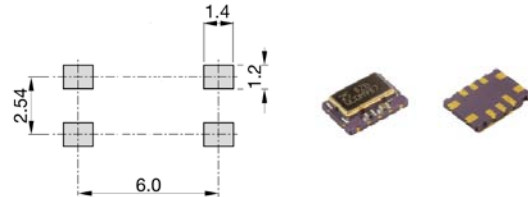


Pin function
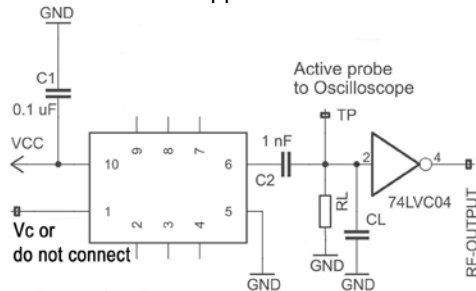
# 1     Vc (EFC) for VC-TCXO
        **Do not connect for**
**TCXO** # 5        GND
# 6     Output
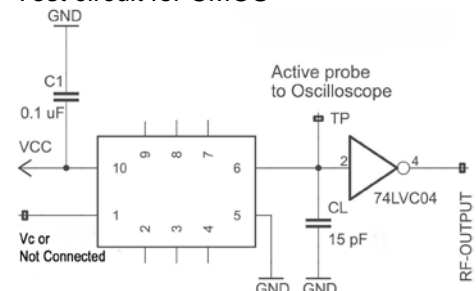# 10    Vcc

**Do not contact:**
**#1, #2, #3, #4, #7, #8 & #9**

Soldering pattern
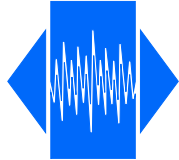


Test circuit for Clipped Sine Wave



Test circuit for CMOS

# VTX7E

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**QuartzCom**
the communications company

## *Generic specification*

## Ordering code

| (0)7E-(1)(2)-(3)(4)-(5)-40.000MHz | *Example:* **VT7E-C33-NNu50-V05-40.000MHz** |
|---|---|

| **(0) Oscillator type** | **(1) Output signal** | **(2) Supply voltage** | **(3) Operating temperature** |
|---|---|---|---|
| TX = TCXO<br>VT = VC-TCXO | H = CMOS<br>C= Clipped sine wave | 28 = 2.8 V<br>30 = 3.0 V<br>33 = 3.3 V | JK = -20 to +70 °C<br>NN = -40 to +85 °C<br>QN = -55 to +85 °C<br>NR = -40 to +105 °C<br>QV = -55 to +125 °C |
| **(4) Frequency stability**<br><br>u25 = ± 0.25 ppm<br>u50 = ± 0.50 ppm<br>1u0 = ± 1.00 ppm<br>1u5 = ± 1.50 ppm | **(5) Pulling range**<br>  (VT only)<br><br>V05 = 1.5 ± 1.0 V  ±5 ppm<br>V08 = 1.5 ± 1.0 V  ±8 ppm<br><br>Z = special spec | | |

Frequency stability vs. temperature

| ppm | ≤± 0.25 | ≤± 0.28 | ≤± 0.50 | ≤± 1.00 | ≤± 1.50 |
|---|---|---|---|---|---|
| -20 to +70 °C | Δ | O | O | O | O |
| -40 to +85 °C | Δ | Δ | O | O | O |
| -40 to +95 °C | X | Δ | Δ | Δ | O |
| -40 to +105 °C | X | Δ | Δ | Δ | O |
| -55 to +85 °C | X | X | Δ | Δ | O |
| -60 to +125 °C | X | X | Δ | Δ | O |

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

## Environmental conditions

| Test | IEC 60068 Part… | IEC 60679-1 Clause | MIL-STD-202G Method | MIL-STD-810F Method | MIL-PRF-55310D Clause | Test conditions (IEC) |
|---|---|---|---|---|---|---|
| Sealing tests (if applicable) | 2-17 | 5.6.2 | 112E | | 3.6.1.2 | Gross leak: Test Qc,<br>Fine leak: Test Qk |
| Solderability<br>Resistance to soldering heat | 2-20<br>2-58 | 5.6.3 | 208H<br>210F | | 3.6.52<br>3.6.48 | Test Ta method 1,<br>Test $Td_1$ method 2,<br>Test $Td_2$ method 2 |
| Shock * | 2-27 | 5.6.8 | 213B Cond C | 516.4 | 3.6.40 | Test Ea, 3 x per axis 100 g,<br>6 ms half-sine pulse |
| Vibration, sinusoidal* | 2-6 | 5.6.7.1 | 204D Cond A | 516.4-4 | 3.6.38.1<br>3.6.38.2 | Test Fc, 30 min per axis,<br>10 Hz – 55 Hz 0,75 mm; 55 Hz – 2 kHz,<br>10 g |
| Vibration, random* | 2-64 | 5.6.7.3 | 214A | 514.5 | 3.6.38.3<br>3.6.38.4 | Test Fdb |
| Endurance tests<br>- ageing<br>- extended ageing | | 5.7.1<br>5.7.2 | 108A | | 4.8.35 | 30 days @ 85 °C<br>1000 h, 2000 h, 8000 h @ 85 °C |

Other environmental conditions on request

28 Dec. 20

**2011/65/EU  RoHS  compliant**

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From design to production
in Switzerland

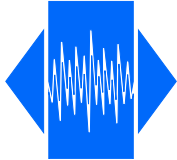**QuartzCom AG reserves the right to make spec changes to this product**

# VTX7E

**High** reliable, wide temperature range -55 to +125°C
analogue temperature compensated (VC)TCXO

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the communications company

## *Generic specification*

## 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
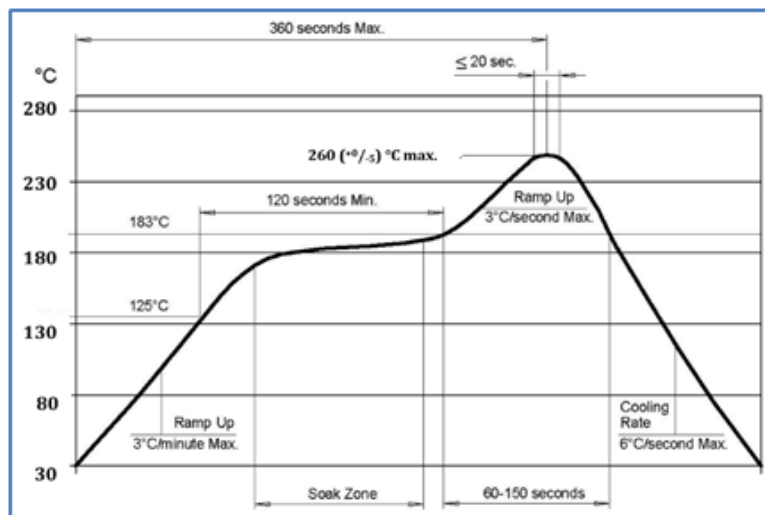


Avoid washing or welding processes using Ultrasonic energy. These processes can damage the crystal due to mechanical resonance of the crystal blanks.

### 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.