# VTX5S

**High reliable**, accurate,
analogue temperature compensated (VC)TCXO

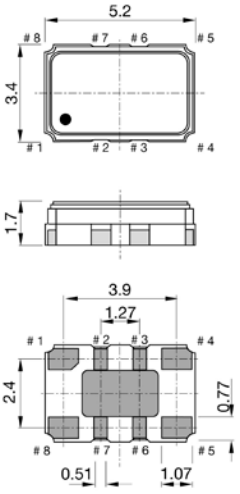
## *Generic specification*

| **Frequency range** | **5.0000 ~ 60.0000 MHz** | | |
|---|---|---|---|
| Standard frequencies (fundamental) | 5, 10, 12, 12.8, 13, 14.4, 16, 16.384, 16.36766, 19.2, 19.44, 20, 24, 25, 26, 32, 32.768, 38.88, 40, 50, 60(Δ) MHz | | |
| Frequency stability: | | | |
| vs. temperature<br>referenced to ($F_{MAX}$+$F_{MIN}$)/2 | ≤ ±0.50 ppm | over -40 to +85 °C | (∗) |
| vs. supply voltage changes<br>referenced to frequency at nominal supply | ≤ ±0.1 ppm | ±5 % | |
| vs. load changes<br>referenced to frequency at nominal load | ≤ ±0.1 ppm | ±5 % | |
| vs. aging @ +40 °C | ≤ ±1.0 ppm | 1st year | |
| G-sensitivity | < 2.0 ppb/g | per axis | |
| Frequency tolerance ex. factory | 0 ~ +1.0 ppm | @ +25 °C | |
| Supply voltage | +2.5 V, +3.0 V or +3.3 V | | (∗) |
| **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 | 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 #6 ➔ high or open<br>pin #6 ➔ low or GND | pin #5 ➔ oscillation<br>pin #5 ➔ high impedance | |

| Phase noise (typical value for 40 MHz) | LN (Low phase noise) | Standard | Frequency offset |
|---|---|---|---|
| | -85 dBc/Hz | -83 dBc/Hz | @ 10 Hz |
| | -115 dBc/Hz | -110 dBc/Hz | @ 100 Hz |
| | -138 dBc/Hz | -135 dBc/Hz | @ 1 kHz |
| | -150 dBc/Hz | -148 dBc/Hz | @ 10 kHz |
| | -154 dBc/Hz | -152 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) | |

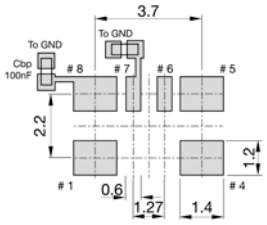
**(∗) See available options on page #2** **Note: Unless otherwise specified conditions are @+25 °C**

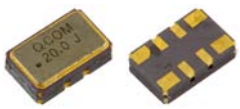



### Pin function

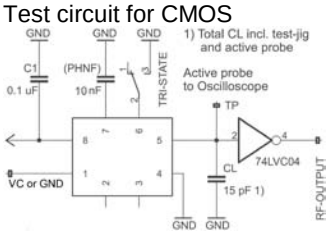
| | |
|---|---|
| # 1 | Vc (EFC) for VC-TCXO<br>GND or NC for TCXO |
| # 2 | do not connect |
| # 3 | do not connect |
| # 4 | GND |
| # 5 | OUTPUT |
| # 6 | Tri-state or do not connect |
| # 7 | LN: 10 nF to the GND<br>or do not connect |
| # 8 | Vcc |

### Soldering pattern

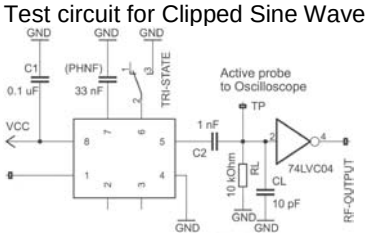


### Test circuit for CMOS




### Test circuit for Clipped Sine Wave




**2011/65/EU RoHS compliant**



QuartzCom AG
Bruehlstrasse 15
CH 2540 Grenchen
Switzerland

Fax +41 32 644 24 05
Tel +41 32 644 24 00
E-Mail sales@quartzcom.com
www.quartzcom.com

From design to production in Switzerland

# VTX5S

**High reliable**, accurate,
analogue temperature compensated (VC)TCXO

*Generic specification*

## Ordering code

**(0)5S-(1)(2)-(3)(4)-(5)(7)-40.000MHz** *Example:* ***VT5S-C33-NNu50-V05LN-40.000MHz***

| **(0) Oscillator type** | **(1) Output signal** | **(2) Supply voltage** | **(7) Phase noise option** |
|---|---|---|---|
| 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 | LN = Low phase noise<br>(-) = Standard |
| **(3) Operating temperature** | **(4) Frequency stability** | **(5) Pulling range** (VT only) | |
| JF = -20 to +50 °C<br>JK = -20 to +70 °C<br>NN = -40 to +85 °C<br>NR = -40 to +105 °C<br>QN = -55 to +85 °C | u25 = ± 0.25 ppm<br>u50 = ± 0.50 ppm<br>1u0 = ± 1.00 ppm<br>1u5 = ± 1.50 ppm | V05 = 1.5 ± 1.0 V ±5 ppm<br>V10 = 1.5 ± 1.0 V ±10 ppm<br><br>Z = special spec | |

Frequency stability vs. temperature

| ppm | ≤± 0.20 | ≤± 0.25 | ≤± 0.50 | ≤± 1.00 | ≤± 1.50 |
|---|---|---|---|---|---|
| -20 to +50 °C | O | O | O | O | O |
| -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 | X | X | Δ | Δ |
| -55 to +85 °C | X | X | X | X | Δ |

| |
|---|
| 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<br>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<br>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, 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 | | <br>5.7.1<br>5.7.2 | 108A | | 4.8.35 | <br>30 days @ 85 °C<br>1000 h, 2000 h, 8000 h @ 85 °C |

Other environmental conditions on request 28 Dec. 20



QuartzCom AG
Bruehlstrasse 15
CH 2540 Grenchen
Switzerland

Fax +41 32 644 24 05
Tel +41 32 644 24 00
E-Mail sales@quartzcom.com
www.quartzcom.com

From design to production in Switzerland

## Handling Recommendation for SMD Crystal & Crystal Oscillator

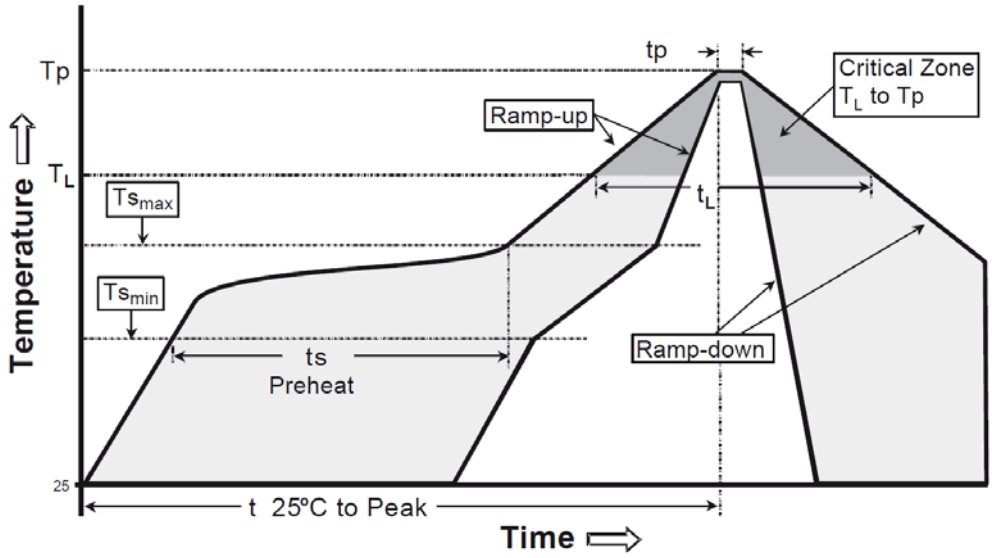
1. ESD Handling
   Crystal oscillators are electrostatic sensitive device. Therefore, direct touching of the terminals with fingers and without ESD precautions must be avoid.
   Proper handling must be made according to the established ESD handling rules IEC 61340-5-1 and EN 100015-1 to avoid degradations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

**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.



QuartzCom AG
Bruehlstrasse 15
CH 2540 Grenchen
Switzerland

Fax +41 32 644 24 05
Tel +41 32 644 24 00
E-Mail sales@quartzcom.com
www.quartzcom.com

From design to production in Switzerland