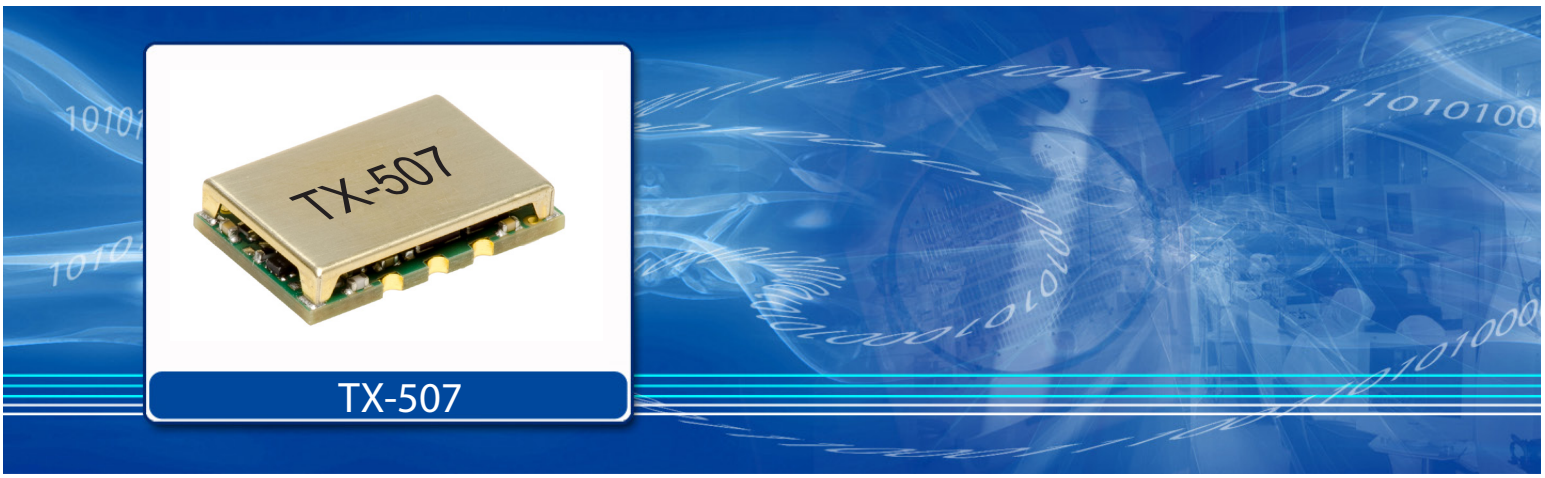
# TX-507

High Frequency
Temperature Compensated Crystal Oscillator




## Description

The TX-507 Temperatue Compensated Crystal Oscillator (TCXO) offers high frequency combined with an extended temperature range, available with CMOS and Sinewave output. The low phase noise, analog temperature compensated oscillator is using a direct crystal frequency to avoid subharmonics.

## Features

- Frequency Range [1] of 10 - 160 MHz
- Low Phase Noise
- Low Power Consumption
- Output: HCMOS, Sinewave
- Extended Temperature Range: -55 to +125°C
- Standard Frequencies : 10, 20, 50, 50.4, 60, 80, 100, 100.8, 125,160 MHz

## Applications

- Test Equipment
- Communication Equipment
- Military
- Industrial Application

## Performance Specifications

| Frequency Stabilities[1] | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | Min | Typical | Max | Units | Condition | |
| vs. operating temperature range<br>(referenced to +25°C) | -2<br>-1 | | +2<br>+1 | ppm<br>ppm | -55 to +125°C (option C)<br>-40 to +85°C (option E) | Options[3] |
| Initial tolerance | -1 | | +1 | ppm | at time of shipment, nominal EFC | |
| vs. supply voltage change | -0.2 | | +0.2 | ppm | $V_S$ ±5% static | |
| vs. supply voltage change | -0.8 | | +0.8 | ppm | $V_S$ ±5% static, only option C | |
| vs. load change | -0.1 | | +0.1 | ppm | Load ±10% static | |
| vs. aging / year | -1 | | +1 | ppm | after 30 days of operation | |
| vs. aging /10 yeras | -2.5 | | +2.5 | ppm | | |

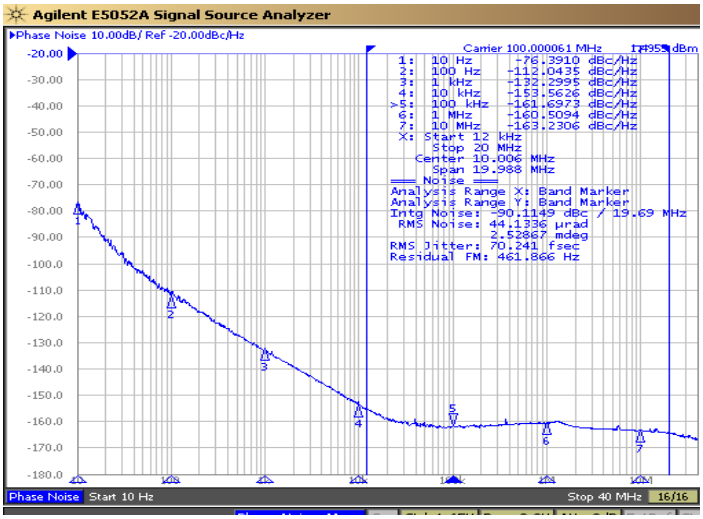
# Performance Specifications

| Supply Voltage (Vs) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | Min | Typical | Max | Units | Condition | |
| Supply voltage (standard) | 3.135 | 3.3 | 3.465 | VDC | | |
| Current consumption | | | 35 | mA | steady state @25°C, HCMOS, sinewave | |
| **RF Output** | | | | | | |
| Signal [standard] | HCMOS | | | | | |
| Load | 13.5 | 15 | 16.5 | pF | | |
| Signal Level (Vol) | | | 0.3 | VDC | with Vs=3.3V and 15pF Load | |
| Signal Level (Voh) | 2.6 | | | | with Vs=3.3V and 15pF Load | |
| Duty Cycle | 40 | | 60 | % | @ (Voh-Vol)/2 | |
| Rise and Fall time | | | 3 | ns | @15 pF 10 to 90 % | |
| Signal [Option] | Sinewave | | | | | |
| Load | 45 | 50 | 55 | Ohm | | |
| Output power | 0 | 3 | 6 | dBm | | |
| **Frequency Tuning (EFC)** | | | | | | |
| Tuning Range | Fixed TCXO; No adjust | | | | | Option |
| Tuning Range | ±10<br>±6 | | | ppm<br>ppm | Option<br>Standard Version | |
| Linearity | <10% | | | | | |
| Tuning Slope | Positive | | | | | |
| Control Input Impedance | 10 | | | kOhm | | |
| Control Voltage Range | 0.3 | 1.65 | 3.0 | VDC | with Vs=3.3V | |
| **Additional Parameters** | | | | | | |
| Phase Noise[2] | | -75<br>-112<br>-132<br>-153<br>-161<br>-160 | | dBc/Hz<br>dBc/Hz<br>dBc/Hz<br>dBc/Hz<br>dBc/Hz<br>dBc/Hz | 10 Hz<br>100 Hz<br>1 kHz<br>10 kHz<br>100 kHz<br>1 MHz | @ 100MHz<br>HCMOS<br>3.3V |
| Jitter | | 0.07 | | ps RMS | @ 12 kHz to 20 MHz | |
| Phase Noise[2] | | -78<br>-117<br>-137<br>-151<br>-159<br>-161 | | dBc/Hz<br>dBc/Hz<br>dBc/Hz<br>dBc/Hz<br>dBc/Hz<br>dBc/Hz | 10 Hz<br>100 Hz<br>1 kHz<br>10 kHz<br>100 kHz<br>1 MHz | @<br>50.4MHz<br>Sine<br>3.3V |
| Jitter | | 0.1 | | ps RMS | @ 12 kHz to 20 MHz | |
| Weight | | | 1.0 | g | | |
| Processing & Packing | Handling & Processing Note | | | | | |

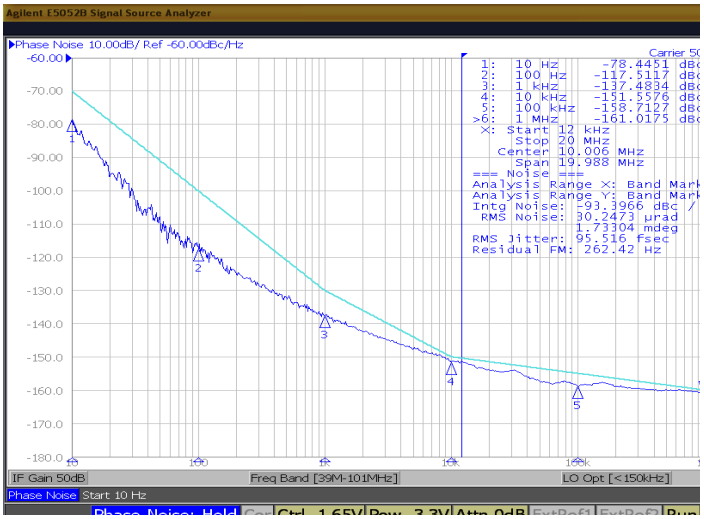
| Absolute Maximum Ratings | | | | | |
|---|---|---|---|---|---|
| supply voltage (Vs) | | | 6.0 | V | with Vs=3.3 VDC |
| supply voltage (Vs) | | | 3.6 | V | with Vs=3.3 VDC and for Option A & C |
| Output Load | | | 50 | pF | |
| Operable Temperature Range | -40 | | +90 | °C | for temeprature range option J & E |
| Operable Temperature Range | -55 | | +125 | °C | for temeprature range option A & C |
| Storage Temperature Range | -55 | | +125 | °C | |

## Typical Performance [2]

| Phase Noise |
|---|
| TX-507 @ 100MHz HCMOS |




| Phase Noise |
|---|
| TX-507 @ 50.4MHz Sinewave |

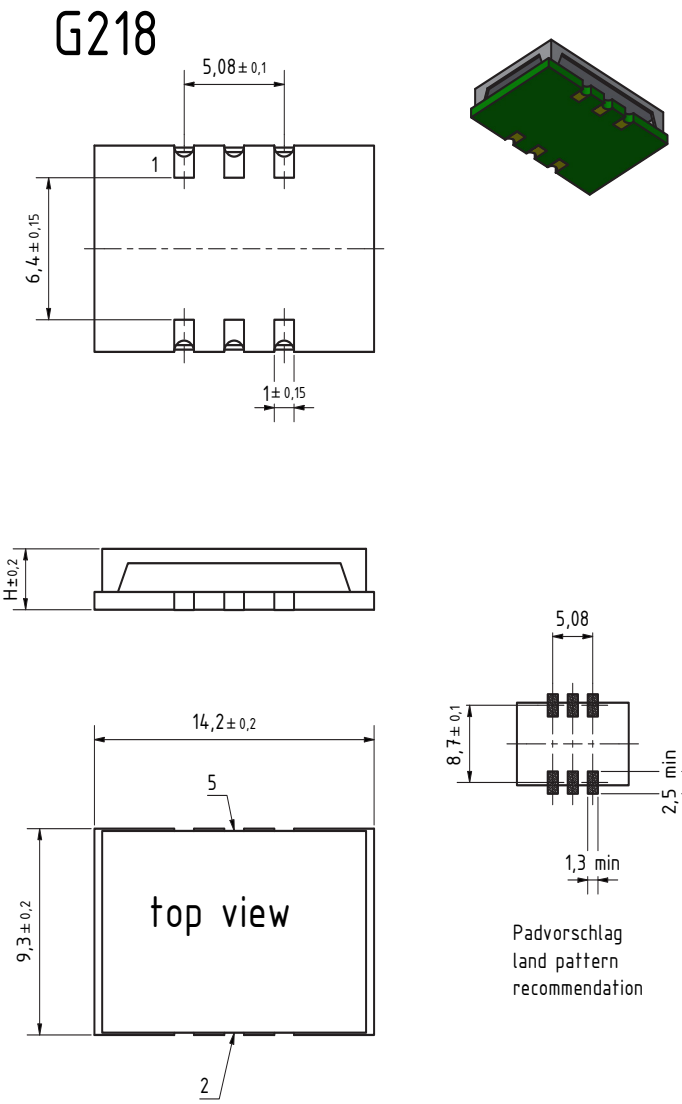



## Environmental Conditions

| | |
|---|---|
| Rapid Temperature Changes | MIL-883-1010 Cond B 300 cycles -55/125°C |
| Vibration sine | MIL-STD-883 Meth 2007 Cond A 20g 20-2000Hz 4x in each 3axis 4 min |
| Shock | MIL-STD-202 Meth 213B Cond. F; 1500g 0,5ms 6 shocks in each direction |
| Reflow Simulation Test | MIL-STD-202G Meth 210F Cond. K - Total 3x Lead free profile (for SMD) |
| ESD | JESD22-A114F Class 1B; 10* 1000V |
| Humidity Bias Life Test | JESD22-A101-C - 85°C/85% RH 1008h |
| High temp operating life(HTOL) | MIL-STD-202 Meth108A Cond C - 1000h @ 105°C power on |
| Low temp operating life(LTOL) | JESD22-A108 - 1000h@-55°C power on |
| RoHS Compliance | 100% ROHS compliant |
| MSL Level | JESD22-A113; MSL 2 |

# Outline Drawing / Enclosure

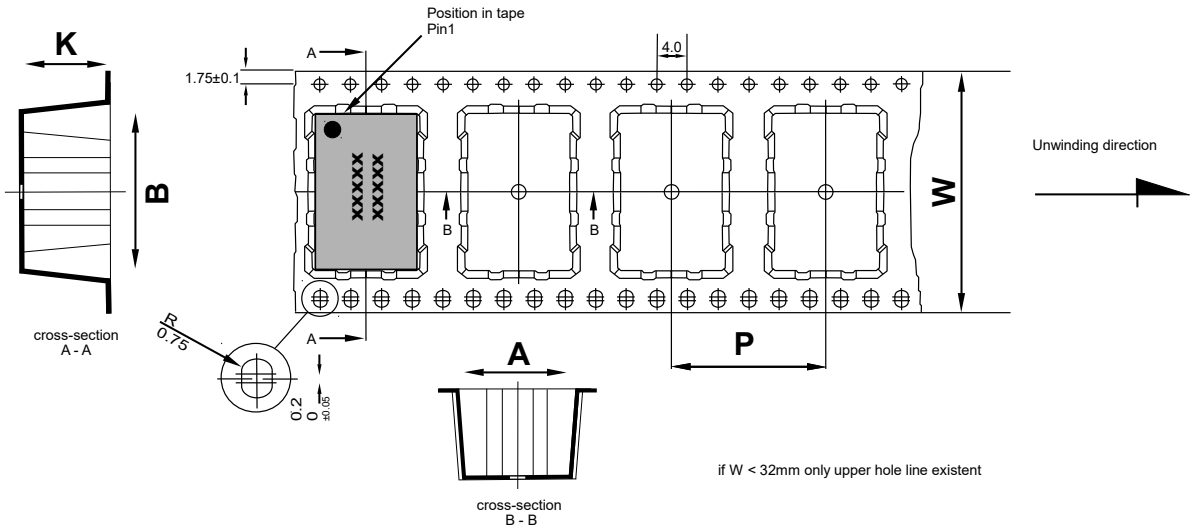
| TX-507 | |
|---|---|
| Type | Height "H" in mm |
| G218C | 2.8 (metal cap) |




Dimensions in mm

| Pin Connections (CMOS, Sinewave) | |
|---|---|
| 1 | Control Voltage Input (Vc) / N.C. |
| 2 | N.C. |
| 3 | Ground (Case) |
| 4 | RF-Output |
| 5 | N.C. |
| 6 | Supply Voltage Input (Vs) |

# Standard Shipping Method (TX-507)




Dimension in mm:

A, B and K are dependent uppon component dimensions

production tolerance complying DIN IEC 286-3

All dimensions in millimeters unless otherwise stated

| Enclosure Type | Tape Width W (mm) | Quantity per meter | Quantity per reel | Dimension P |
|---|---|---|---|---|
| G218C | 24 | 83.3 | 250 | 12 |

# Recommended Reflow Profile

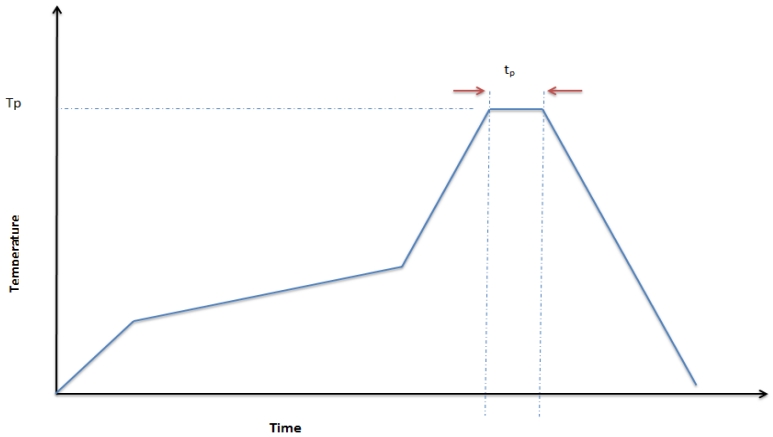
TP: max 250°C (@ solder joint, customer board level)

$T_p$: max: 10…30 sec

Additional Information:

This SMD oscillator has been designed for pick and place reflow soldering

SMD oscillators must be on the top side of the PCB during the reflow process.



## Ordering Information

**TX - 507 0 - E A E - 106 0 - 100M000000**

Product Family
TX: TCXO

Package
9x14mm TCXO SMD

Height
0: G218C / 2.8 mm (Standard)

Supply Voltage
E: 3.3V

RF Output Code
A: HCMOS
E: Sinewave

Temperature Range
E: -40°C to + 85°C
A: -55°C to +85°C
C: -55°C to +125°C

Stability Code[1]
206: ±2.00 ppm
106: ±1.00 ppm

Frequency Control
0: No Tuning
1: > ±6.0 ppm
2: > ±10.0 ppm

Frequency

**Notes:**
1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Phase noise degrades with increasing output frequency.
3. Contact factory for availability.

Unless other stated all values are valid at typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).

Subject to technical modification.

## Contact Information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