

FEATURES

- **Clipped Sine Output**
- **Optional Voltage Control for Frequency Tuning [VCTCXO]**
- 5.0mm x 3.2mm Surface Mount Package
- Frequency Range 5 – 52 MHz
- Fundamental Crystal Design
- Operating Voltage, +3.3Vdc or +5.0Vdc
- Overall Frequency Stability ± 4.6 ppm
- Operating Temperature to -40°C to $+85^{\circ}\text{C}$
- Tape & Reel Packaging Standard, EIA-418
- **RoHS/Green Compliant [6/6]**



APPLICATIONS

The Model 580 is a quartz based analog TCXO with a Clipped Sine output and optional frequency tuning. M580 is suitable for applications requiring Stratum 3 performance such as base stations, small cells, 1588 and Synchronous Ethernet timing, wireless communications, test and measurement.

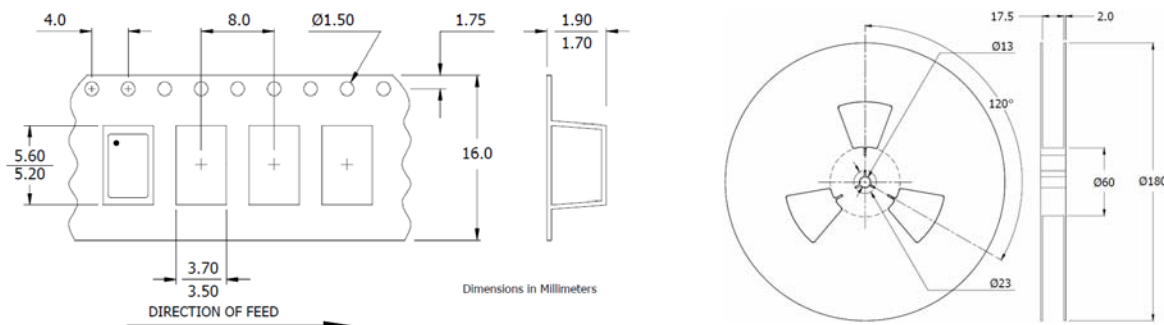
ORDERING INFORMATION



**Not all performance combinations and frequencies may be available.
Contact your local CTS Representative or CTS Customer Service for availability.**

PACKAGING INFORMATION [reference]

Device quantity is 1k pcs. maximum per 180mm reel.



ELECTRICAL CHARACTERISTICS

| PARAMETER | | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT | | | | | |
|--------------------------|--|----------------------------------|--|----------------|-------|-----------------|-------|-------|--|---|---|------|
| ELECTRICAL PARAMETERS | Maximum Supply Voltage | V _{CC} | - | -0.6 | - | 6.0 | V | | | | | |
| | Maximum Control Voltage | V _C | - | -0.5 | - | V _{CC} | V | | | | | |
| | Storage Temperature | T _{STG} | - | -40 | - | +100 | °C | | | | | |
| | Operating Temperature | T _A | - | -20 | +25 | +70 | °C | | | | | |
| | Order Code 'C' | | | | | | | | | | | |
| | Order Code 'I' | | | -40 | | +85 | | | | | | |
| | Frequency Range | f ₀ | - | 5 | - | 52 | MHz | | | | | |
| | Supply Voltage | V _{CC} | ±5% | | 2.85 | 3.0 | 3.15 | V | | | | |
| | Order Code 'R' | | | | 3.14 | 3.3 | 3.47 | | | | | |
| | Order Code 'L' | | | | 4.75 | 5.0 | 5.25 | | | | | |
| | Order Code 'S' | | | | | | | | | | | |
| | Supply Current | I _{CC} | - | - | - | - | 3.5 | mA | | | | |
| | Frequency Stability | Δf/f ₀ | Reference to f ₀ , Including 20 years aging @ +25°C, at time of shipment | - | - | - | 4.60 | ± ppm | | | | |
| | Overall Frequency Stability | | | | | | | | | | | |
| | vs. Initial Calibration | | | | | | | | | | | |
| | vs. Operating Temperature ¹ | | | | | | | | [Fmax. - Fmin.]/2, over -40°C to +85°C | - | - | 0.28 |
| | vs. Supply Voltage | | | | | | | | ±5% change @ +25°C | - | - | 0.20 |
| | vs. Load | | | | | | | | ±5% change | - | - | 0.20 |
| | vs. Aging | 20 years @ +40°C | - | - | 3.00 | | | | | | | |
| | Holdover | Δf/f ₀ | [Fmax. - Fmin.]/2, over 24 hours | - | - | - | 0.40 | | | | | |
| | Control Voltage | V _C | - | 0.5 | 1.5 | 2.5 | V | | | | | |
| | Frequency Tuning [VCTCXO Only] | - | V _C = 1.5V ±1.0V, monotonic positive | | 5 - 8 | | ± ppm | | | | | |
| | V _C Input Impedance | ZV _C | - | 100 | - | - | kOhm | | | | | |
| | Output Waveform | | AC coupled Clipped Sinewave | | | | | | | | | |
| | Output Voltage Levels | | | 0.8 | - | - | Vp-p | | | | | |
| | Output Load | R _L // C _L | - | 10kOhm // 10pF | | | | | | | | |
| | Output Duty Cycle | SYM | @ 50% Level | 45 | - | 55 | % | | | | | |
| | Start Up Time | T _S | - | - | - | 2 | ms | | | | | |
| Phase Noise ² | - | - | | | | dBc/Hz | | | | | | |

Notes:

- See Ordering Information for stability options.
- Phase Noise performance may vary based on output frequency. See example plot at 10MHz below.



MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



MARKING INFORMATION

1. M580 – CTS Model Series.
 2. ● – Pin 1 identifier.
 3. C – CTS identifier.
 4. D – Date code. See Table II for codes.
 5. xxx – Frequency Code.
- Refer to document 016-1454-0, Frequency Code Tables.

NOTES

1. DO NOT make connections to non-labeled pins. Castellation pins may have internal connections used in the manufacturing process.
2. Termination pads (e4); barrier plating is nickel [Ni] with gold [Au] flash plate.
3. Reflow conditions per JEDEC J-STD-020, 260°C maximum.
4. MSL = 1.

D.U.T. PIN ASSIGNMENTS

| PIN | SYMBOL | DESCRIPTION |
|-----|-----------------|---------------------------------------|
| 1 | V _C | Control Voltage – VCTCXO NC - TCXO |
| 2 | GND | Circuit & Package Ground |
| 3 | Output | Clipped Sine Wave Output |
| 4 | V _{CC} | Supply Voltage |

1. DC-Cut Capacitor Required.
Add 1000pF capacitor between TCXO output and input of load.

SUGGESTED SOLDER PAD GEOMETRY



TEST CIRCUIT – CLIPPED SINE LOAD



* DC-Cut Capacitor: Add 1000pF capacitor between the TCXO output and input of load.

TABLE II – DATE CODE

| YEAR | | MONTH | | | | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|------|------|-------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 2001 | 2005 | 2009 | 2013 | 2017 | A | B | C | D | E | F | G | H | J | K | L |
| 2002 | 2006 | 2010 | 2014 | 2018 | N | P | Q | R | S | T | U | V | W | X | Y | Z | |
| 2003 | 2007 | 2011 | 2015 | 2019 | a | b | c | d | e | f | g | h | j | k | l | m | |
| 2004 | 2008 | 2012 | 2016 | 2020 | n | p | q | r | s | t | u | v | w | x | y | z | |

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9