

CFPT-9300 Series Lead-Free Miniature High Precision TCXO / TCVCXO

ISSUE H; 29th APRIL 2005

Preliminary Specification

Recommended for new Designs

Delivery Options

- Please contact our sales office for current delivery times.

Description

- A series of Lead Free, surface mountable TCXO / TCVCXO for medium to high volume applications where small size and high performance are pre-requisites. This oscillator uses C-MAC's latest custom ASIC "Pluto", a single chip oscillator and analogue compensation circuit, capable of sub 0.3ppm performance over an extended temperature range. Its ability to function down to a supply voltage of 2.4V and low power consumption makes it particularly suitable for mobile applications.

Frequency

- Standard: 10.0 (HCMOS only), 12.688375, 12.8, 13, 14.4, 16, 16.367, 16.384, 16.8, 19.2, 19.44, 20, 24, 24.5535, 26, 32.768, 33.6, 36, 38.88 and 40 MHz
- Optional Range 1.5 to 52 MHz

Waveform

- Standard
 - Square HCMOS 15pF load
 - Clipped sinewave(CS) 10k Ω // 10pF, DC-coupled
- Optional
 - Square AC MOS 50pF max. load
 - Sinewave 10k Ω // 10pF, DC-coupled

Supply Voltage

- Operating range 2.4 to 6.0V, see table.

Current Consumption (typically)

- HCMOS
 $1 + \text{Frequency(MHz)} * \text{Supply(V)} * \{\text{Load(pF)} + 15\} * 10^{-3}$
 mA, e.g. 20MHz, 3.3V, 15pF \Rightarrow 3 mA
- Clipped Sinewave
 $1 + \text{Frequency(MHz)} * 1.2 * \{\text{Load(pF)} + 30\} * 10^{-3}$ mA
 e.g. 20MHz, 10pF \Rightarrow 2 mA

Package Outline

- SMD (surface mount device), ceramic carrier, nom. dimensions 5.0 x 3.2 x 1.6mm
- Optional low profile, nom dimensions 5.0 x 3.2 x 1.4mm

Ageing

- ± 1 ppm maximum in first year, frequency \leq 20MHz
- ± 2 ppm maximum in first year, frequency $>$ 20MHz
- ± 3 ppm maximum for 10 years, frequency \leq 20MHz
- ± 5 ppm maximum for 10 years, frequency $>$ 20MHz
- ± 1 ppm maximum after reflow

Frequency Stability

- Temperature: see table
- Supply Voltage Variation, $\pm 10\%$
 - HCMOS ± 0.2 ppm typ.
 - Clipped Sinewave ± 0.05 ppm typ.
- Load Coefficient,
 - 15pF \pm 5pF (HCMOS) ± 0.2 ppm typ.
 - 10k Ω // 10pF $\pm 10\%$ (CS) ± 0.05 ppm typ.

Frequency Adjustment, two options

- A** Ageing adjustment by means of external Control Voltage applied to pad 1 (standard option)
- Range (frequency \leq 20MHz) $\geq \pm 5$ ppm
 - Range (frequency $>$ 20MHz) $\geq \pm 7$ ppm
 - Linearity $\leq 2\%$
 - Slope Positive
 - Input resistance ≥ 100 k Ω
 - Modulation bandwidth ≥ 2 kHz
 - Standard control voltage range 1.5V \pm 1V
- B** No frequency adjustment
- Initial calibration $\leq \pm 1.0$ ppm

Storage Temperature Range

- -55 to +125 $^{\circ}$ C

Environmental Specification

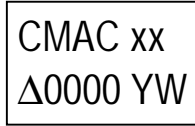
- Vibration: IEC 60068-2-6, test Fc, procedure B4: 10-60Hz 1.5 mm displacement, 60-2000Hz at 20gn, 4 hours in each of three mutually perpendicular axes at 1 octave per minute.
- Shock: IEC 60068-2-27, test Ea: 1500gn acceleration for 0.5ms duration, Half-sine pulse, 3 shocks in each direction along three mutually perpendicular axes.
- Soldering: SMD Product suitable for Reflow soldering. Peak temperature 260 $^{\circ}$ C. Maximum time above 220 $^{\circ}$ C, 60 sec.
- Marking: Laser Marked
- RoHS: Parts are fully compliant with the European Union directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Note: These RoHS compliant parts are suitable for assembly using both Lead-free solders and Tin/Lead solders.



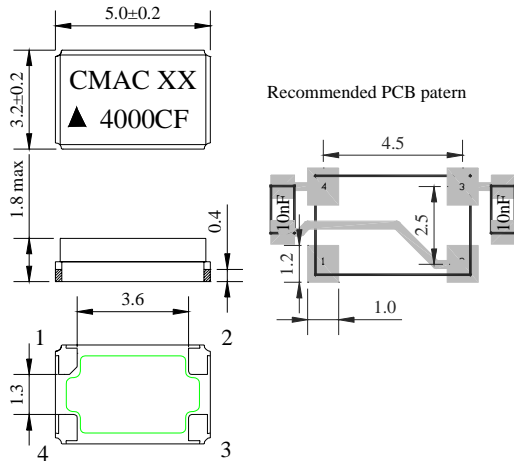
Frequency Products

Marking, includes

- CMAC
- Manufacturing identifier (xx)
- Pad 1 / Static sensitivity identifier (Triangle)
- Part Number (Four digits)
- Device date code (YW)



Outline in mm



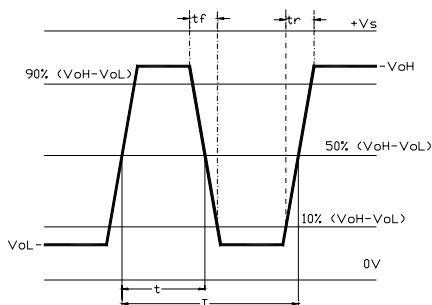
Pad Function

- 1 Voltage Control (leave unconnected in case the 'no frequency adjust' option has been ordered)
- 2 Ground
- 3 Output
- 4 Supply Voltage, Vs

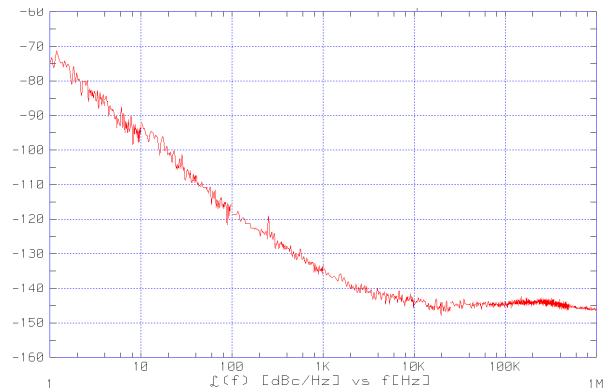
Low Profile option, 1.6mm max height.

Note: for correct operation a 10nF supply de-coupling capacitor should be placed next to the device, as shown above. If an AC coupled output is required a 10nF should be placed in series with output pad 3.

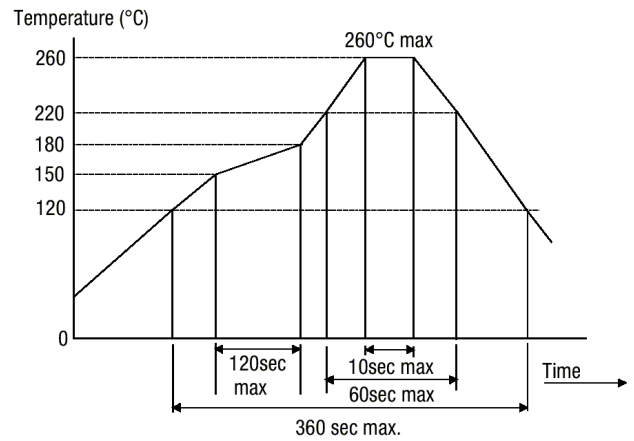
Output Waveform - HCMOS



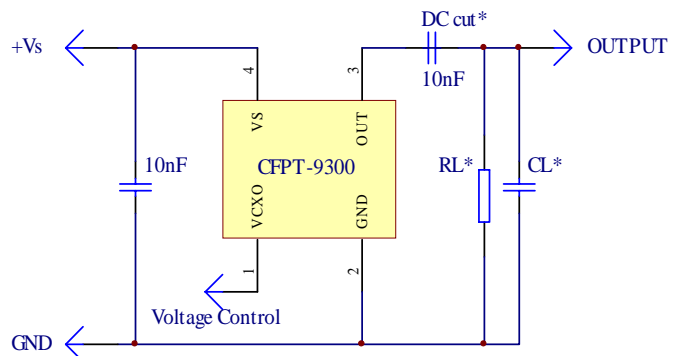
Typical Phase Noise at 14.4 MHz



Reflow Solder Profile



Test Circuit



*DC cut capacitor required for AC coupled Clipped sinewave.

*Load 15pF (HCMOS) or 10kΩ // 10pF (Clipped Sinewave), inclusive of probe and jig capacitance.

