

CFPO-20,-21,-22,-23 TC-OCXO

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Preliminary Specification

Recommended for new designs

Delivery Options

- Please contact our sales office for current leadtimes

Description

- A series of high stability crystal oscillators, using a hybrid combination of oven control and temperature compensation capable of sub 0.05ppm stability. By using a loosely controlled miniature oven that is thermally isolated from the ambient the frequency stability of a crystal oscillator is enhanced. Stability is further improved by compensating the residual frequency error with C-MAC's proprietary ASIC "Pluto", a single chip oscillator with analogue compensation circuit. The combination of these two functions result in an oscillator with the best stability / power consumption ratio and fast warm-up, making it particularly suitable for battery powered applications

Standard Frequencies

- HCMOS only: 5, 6.4, 8, 8.192MHz
- HCMOS & Clipped Sinewave 10.0, 12.8, 16.0, 16.384 and 20.0MHz
- Other frequencies in the range 1.25 to 33MHz may be available upon request

Waveform

- Standard
Square HCMOS 15pF load
Clipped Sinewave 10kΩ // 10pF, AC-coupled
- Optional
Square HCMOS 50pF max. load
Sinewave 10kΩ // 10pF, DC-coupled

Supply Voltage

- Operating range 3.3V or 5.0V, see table.

Input Power	-20 to 70°C	-40 to 85°C
■ Warm-up	≤ 1.0W	≤ 1.0W
■ Steady state @ 25°C	≤ 270mW	≤ 350mW
■ Steady state @ -20°C	≤ 400mW	≤ 525mW
■ Steady state @ -40°C		≤ 600mW

Warm-up time to reach ±0.01ppm of final frequency

- ≤ 30 secs. (@25°C)

Ageing

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

Frequency Stability

- Temperature: see table
- Supply Voltage Variation, ±5% ±0.1ppm typ.
- Load Coefficient, 15pF ±5pF (HCMOS) or 10kΩ // 10pF ±10% (clipped sinewave) ±0.1ppm typ.

Frequency Adjustment, three options

- A Ageing adjustment by means of external Voltage Control applied to pad 1 (standard option)
- Range (frequency ≤ 20MHz) ≥ ±5ppm
 - Range (frequency > 20MHz) ≥ ±7ppm
 - Linearity ≤ 0.5%
 - Slope Positive
 - Input Resistance ≥ 100kΩ
 - Modulation Bandwidth ≥ 2kHz
 - Standard control voltage range 1.5V±1V
- B Ageing adjustment by means of an external 100kΩ potentiometer connected as a variable resistor from pad 1 to ground.
- Range (frequency ≤ 20MHz) ≥ ±5ppm
 - Range (frequency > 20MHz) ≥ ±7ppm
- C No frequency adjustment
- Initial calibration ≤ ±0.5ppm

Storage Temperature Range

- -55 to 125°C

Environmental Specification

- Vibration: IEC 60068-2-6, test Fc: 10-60Hz 0.75mm displacement, 60-2000Hz 100m/s² (10gn) acceleration, 4 hours in each of three mutually perpendicular axes at 1 octave per minute.
- Mechanical Shock: IEC 60068-2-27, test Ea; 1000m/s² (100gn) acceleration for 6ms duration, Half sine pulse, 3 shocks in each direction along three mutually perpendicular axes (18 shocks total)
- Parts with the suffix "LF" on the ordering code and part number 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: The RoHS compliant parts are suitable for assembly using both Lead-free solders and Lead/Tin solders.

- Marking: Laser Marked

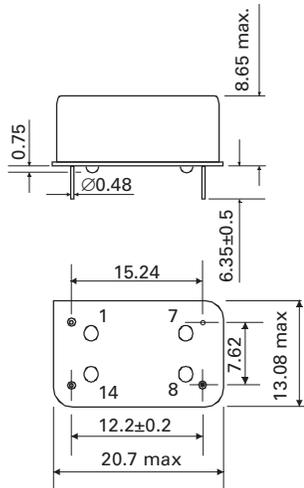
Marking, includes

- CMAC
- Part number (Pxxxx)
- Pad 1 / Static sensitivity identifier (triangle)
- Device date / location code (YYWWL)

Package

- Hermetically sealed, industry standard, DIL 14/4 leaded package

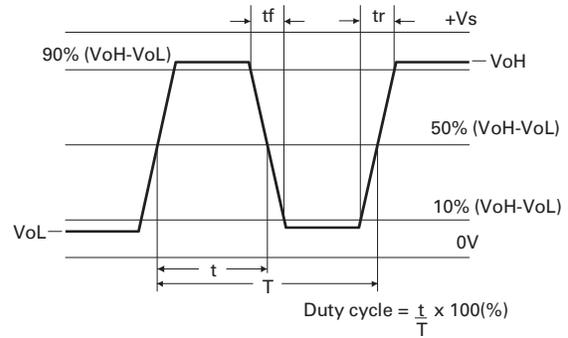
Outline in mm.



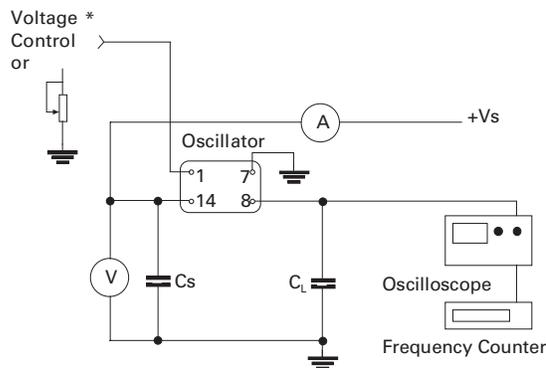
Pin Function

1. Frequency Adjust (leave unconnected in case the 'no frequency adjust' option has been ordered)
7. GND
8. Output
14. +Vs

Output Waveform - HCMOS



Test Circuit



C_L = Load 15pF (HCMOS or 10k Ω // 10pF (Clipped Sinewave), inclusive of probe and jig capacitance.)
 C_s = 100nF

*The GND of the control voltage needs to be connected directly to pin 7 as ground lead impedance may cause performance degradation



