



## Description

- Sub 1ppm performance TCXO/VCTCXO, a single chip oscillator and analogue compensation circuit operating over an extended temperature range. Its ability to function down to a supply voltage of 2.4V and low power consumption make it particularly suitable for mobile applications.
- No ref voltage, ageing adj option
- Model CFPT-9006-1A
- Model Issue number 14

## Frequency Parameters

- Frequency 12.80MHz
- Frequency Tolerance ±1.00ppm
- Tolerance Condition @ 25°C
- Frequency Stability ±1.00ppm
- Operating Temperature Range -40.00 to 85.00°C
- Acceleration sensitivity (Gamma vector, 3-axes, 30-1500Hz): <2 ppb/g typ
- Ageing:
  - ±1ppm max in 1st year, frequency ≤20MHz
  - ±3ppm max for 10 years (including the 1st year), frequency ≤20MHz
  - ±2ppm max in 1st year, frequency >20MHz
  - ±5ppm max for 10 years (including the 1st year), frequency >20MHz
- Supply Voltage Variation (±10% change reference to frequency at nominal supply voltage): ±0.2ppm typ
- Load Variation (±5pF change reference to frequency at nominal load): ±0.2ppm typ
- After Reflow: ±1ppm max

## Electrical Parameters

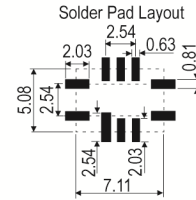
- Supply Voltage 3.3V ±10%
- Current Draw:
  - 1+Frequency(MHz)\*Supply(V)\*{Load(pF)+15}\*10<sup>-3</sup> mA
  - e.g. 20MHz, 3.3V, 15pF ≈ 2mA



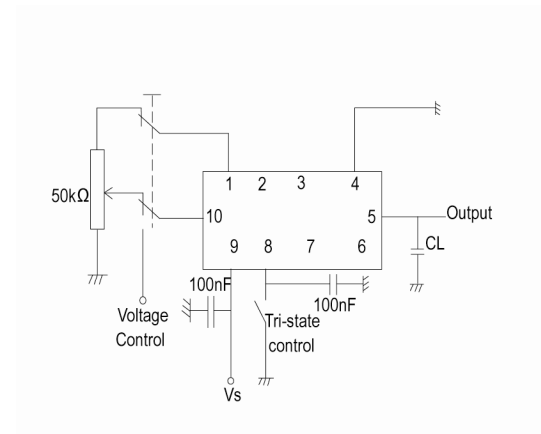
## Outline (mm)



- Pad Connections
- Vref (N/C if not required)
  - N/C
  - Do not connect
  - GND
  - Output
  - N/C
  - N/C
  - Tri-state Control (Enable)
  - +Vs
  - Voltage Control or N/C



## Test Circuit



## Sales Office Contact Details:

UK: +44 (0)1460 270200  
Germany: 0800 1808 443

France: 0800 901 383  
USA: +1.760.318.2824

Email: [info@iqdfrequencyproducts.com](mailto:info@iqdfrequencyproducts.com)  
Web: [www.iqdfrequencyproducts.com](http://www.iqdfrequencyproducts.com)

**Frequency Adjustment**

- Optional reference voltage output on pad 1, suitable for potentiometer supply or DAC reference:
  1. No output (standard option)
  2. 2.2V for min  $V_s > 2.4V$
  3. 2.7V for min  $V_s > 3.0V$Maximum load current (mA) =  $V_{ref}/10$
- For manual frequency adjustment connect an external 50k $\Omega$  potentiometer between pad 1 (Reference Voltage) and pad 4 (GND) with wiper connected to pad 10 (Voltage Control). Please specify reference voltage as part of the ordering code.
- Standard Voltage Control Ranges:
  - Without Reference Voltage  $V_s = 3.3V$  1.65V $\pm$ 1.0V
  - With Reference Voltage  $V_s = 0V$  to  $V_{ref}$
- Linearity: 1% max
- Slope: Positive
- Input Impedance: 100k $\Omega$  min
- Modulation Bandwidth: 2kHz min
- A. Standard Pulling Adjustment:
  - $\pm 5ppm$  min, frequency  $\leq 20MHz$
  - $\pm 7ppm$  min, frequency  $> 20MHz$
- B. No frequency adjustment initial calibration @ 25°C  $\leq \pm 1.0ppm$
- C. High Pulling  $\pm 10ppm$  to  $\pm 20ppm$  can be available depending on frequency and stability options (please contact an IQD Sales Office)

**Output Details**

- Output Compatibility HCMOS
- Drive Capability 15pF
- Rise and Fall Time 8.0ns max
- Duty Cycle 45/55%
- VoL: <10%  $V_s$   
VoH: >90%  $V_s$

**Output Control**

- Tri-state Operation:
  - Logic '1' (>60%  $V_s$ ) or no connection to pad 8 enables output
  - Logic '0' (<20%  $V_s$ ) to pad 8 disables outputThe tristate control (enable) pin has a internal 100k $\Omega$  pull up resistor which allows the pin to be left unconnected if not required. When in tristate mode, the output stage is disabled, but the oscillator and compensation circuit are still active (current consumption typ.  $\leq 1.0mA$ ).

**Noise Parameters**

- Phase Noise (typical @ 13.0MHz):
  - 65dBc/Hz @ 1Hz
  - 95dBc/Hz @ 10Hz
  - 120dBc/Hz @ 100Hz
  - 135dBc/Hz @ 1kHz
  - 140dBc/Hz @ 10kHz
  - 145dBc/Hz @ 100kHz

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**Environmental Parameters**

- Storage Temperature Range: -55 to 125°C
- Thermal Shock: IEC 60068-2-14, Test Nc Conditions: 15 cycles -55C to +125C
- Mechanical Shock: IEC 60068-2-27, Test Ea Conditions: 15 cycles 1500g 0.5ms 5 pulses/axis
- Vibration: IEC 60068-2-6, Test Fc, Conditions: 20g from 10 – 2000 Hz 12 hours total
- Solderability: MIL-STD-202, Method 208, Category 3

**Manufacturing Details**

- Pb-free Reflow Soldering: 260°C max for 30sec max
- RoHS Terminations NiCoAu
- RoHS Reflow Temp 260degC 30s

**Compliance**

- RoHS Status (2011/65/EU) Compliant
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): 1

**Packaging Details**

- Pack Style: Bulk Bulk pack  
Pack Size: 10
- *Alternative packing option available*

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Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### 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](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

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moschip.ru\_9