

CFPT-9300 SMD TCVCXO

ISSUE 5; 22 MAY 2009 - RoHS 2002/95/EC

Description

- Surface mount temperature compensated voltage controlled crystal oscillators for medium to high volume applications where small size and high performance are prerequisites. Manufactured for us by Rakon utilising their Pluto™ ASIC technology and 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

Package Outline

- 5.0 x 3.2mm
- Optional low profile, nom dimensions 5.0 x 3.2 x 1.4mm

Standard Frequencies

- 10 (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

Frequency Range

- 1.5 to 52 MHz

Output Compatibility & Load (standard)

- HCMOS 15pF max
- Clipped sinewave 10kΩ // 10pF, DC-coupled

Output Compatibility & Load (options)

- AC MOS 50pF max
- Sinewave 10kΩ // 10pF, DC-coupled

Frequency Stability

- Temperature: see table
- Supply Voltage Variation, ±5%
HCMOS, < 20MHz ±0.1ppm typ.
HCMOS, 20-35MHz ±0.3ppm typ.
HCMOS, 35-52MHz ±0.5ppm typ.
Clipped Sinewave ±0.05ppm typ.
- Load Coefficient,
15pF ±5pF (HCMOS)
< 20 MHz ±0.2ppm typ
20-35 MHz ±0.5ppm typ
35-52 MHz ±0.8ppm typ
10kΩ // 10pF ± 10% ±0.05ppm typ

Supply Voltage

- Standard 3.0V, 3.3V (see table)
- Supply voltages in the range 2.4 to 6.0V available to order, please contact our sales office

Supply Current (typically)

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

Ageing

- ±1ppm maximum in first year, frequency <20MHz
- ±2ppm maximum in first year, frequency >20MHz
- ±3ppm maximum for 10 years (including the first year), frequency <20MHz
- ±5ppm maximum for 10 years (including the first year), frequency >20MHz
- ±1ppm maximum after reflow

Frequency Adjustment - option A (standard)

Ageing adjustment by means of external Control Voltage applied to pad 1

- Range (frequency ≤ 20MHz) ≥ ±5ppm
- Range (frequency ≥ 20MHz) ≥ ±7ppm
- Linearity ≤2%
- Slope Positive
- Input resistance ≥ 100kΩ
- Modulation bandwidth ≥ 2kHz
- Standard control voltage range 1.5V±1V

Frequency Adjustment - option B

No frequency adjustment

- Initial calibration ≤ ±1.0ppm

Storage Temperature Range

- -55 to +125°C

Environmental

- 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 planes 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 planes.

Marking Includes

- 'R' (Manufacturers ID) + Manufacturing identifier (X XX) + Pad 1 / Static sensitivity identifier (Triangle) + Abbreviated + Part Number + Date Code

Packaging

- Bulk or Tape & Reel

Minimum Order Information Required

- Frequency + Model Number + Frequency Stability vs Operating Temperature Range Code + Frequency Adjustment Code

Electrical Specification - maximum limiting values

Frequency Range	Supply Voltage	Output Waveform	Output Levels	Rise Time (tr)	Fall Time(tf)	Duty Cycle	Model Number
10.0 to 25.0MHz	3.3V $\pm 10\%$ *	HCMOS 15pF	VoH $\geq 90\%$ Vs VoL $\leq 10\%$ Vs	8ns	8ns	45/55%	CFPT-9301
25.0 to 50.0MHz	3.0V $\pm 10\%$ *	Clipped Sine 10k Ω /10pF	V pk-pk ≥ 0.8 V	—	—	—	CFPT-9302

*Parts will operate correctly with $\pm 10\%$ supply voltage variation but supply coefficient is measured with $\pm 5\%$ variation

Frequency Stabilities over Operating Temperature Range

Operating Temperature Ranges	Frequency Stabilities v Operating Temperature Range				
	± 0.2 ppm	± 0.3 ppm	± 0.5 ppm	± 1.0 ppm	± 2.0 ppm
-20 to 70°C	Code MS**	Code AS**	Code ES	Code FS	Code GS
-40 to 85°C	—	Code AX**	Code EX	Code FX	Code GX

Ordering Example

Frequency _____ 14.4MHz CFPT-9301 EX A

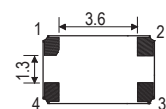
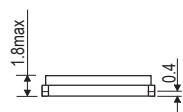
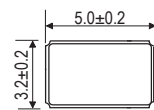
Model No. _____

Frequency Stability vs Operating Temperature Code _____

Frequency Adjustment Code _____

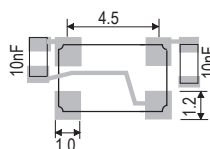
**Codes may not be available for all frequencies

Outline (mm)

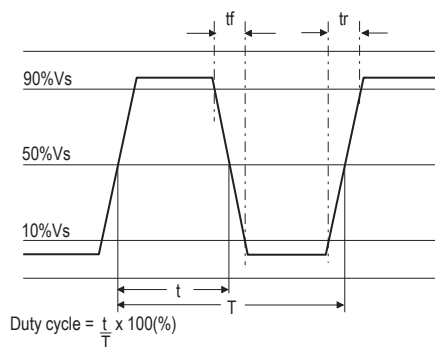


Pad Function

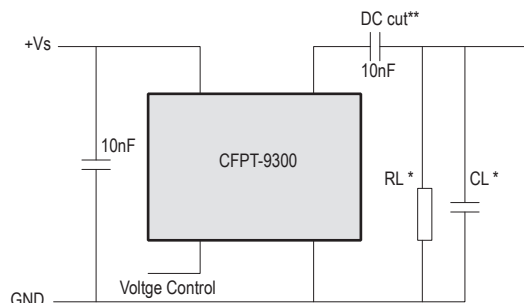
1. Voltage Control (leave unconnected in case the 'no frequency adjust' option has been ordered)
2. GND
3. Output
4. +Vs



Output Waveform



Test Circuit



Typical Phase Noise at 14.4MHz

