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CFPT-9301, -9302 SMD TCVCXOs

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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

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, 40MHz

Frequency Range

- 1.5 to 52MHz

Output Compatibility & Load (standard)

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

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 offices

Supply Current (typically)

- HCMOS
  1+Frequency(MHz)*Supply(V)*{Load(pF)+15}*10^{-3}mA
  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

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)
  <20MHz ±0.2ppm typ
  20-<35MHz ±0.3ppm typ
  35-52MHz ±0.5ppm typ
  10kΩ // 10pF ± 10% ±0.05ppm typ

Ageing

- ±1ppm maximum in 1st year, frequency ≤20MHz
- ±3ppm maximum for 10 years (including the first year), frequency ≤20MHz
- ±2ppm maximum in 1st year, frequency >20MHz
- ±5ppm maximum for 10 years (includng the first year), frequency >20MHz

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

- Shock: IEC 60068-2-27, Test Ea: 1500G acceleration for 0.5ms, 3 shocks in each of 3 mutually perpendicular planes
- IEC 60068-2-6 test Fc. 10-60Hz 1.5mm displacement, 60-2000Hz at 20G, 4 hours in each of three mutually perpendicular axes at 1 oct/min

Non Standard Requirements

- Non standard requirements may be available upon request, please contact our sales offices

Packaging

- Loose in bulk pack, 10pcs per pack
- Tape and reel in accordance with EIA-481-D, 1kpcs per reel (please see pages 372 & 373)

Ordering Information (*minimum required)

- Frequency*
- Model*
- Frequency Adjustment Option*
- Output
- Frequency Stability (over operating temperature range)*
- Operating Temperature Range*
- Supply Voltage

Example

- 20.0MHz CFPT-9301 A
HCMOS ±1.0ppm –20 to 70C 3.3V

Registration No. FS566088
IQD Frequency Products Ltd, Station Road, Crewkerne, Somerset TA18 8AR, United Kingdom
+44 (0)1460 270200; Web: www.iqdfrequencyproducts.com
Americas - California, +1 (0)650 798 5047; Asia Pacific - Taiwan, +886 (0)2 8758 2283

chanhvinh.com

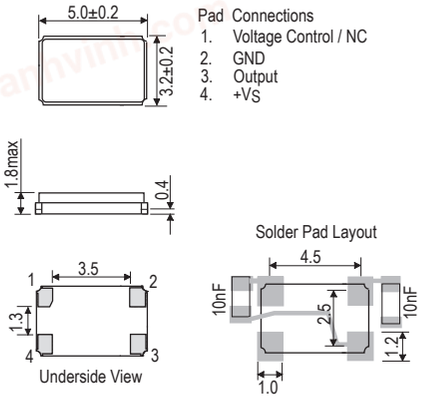
Electrical Specification - maximum limiting values

Frequency Range	Supply Voltage	Output Waveform	Output Levels	Rise Time (t_r)	Fall Time(t_f)	Duty Cycle	Model Number
1.5 to 52.0MHz	3.3V±10%*	HCMOS 15pF	$V_{OH} \geq 90\%\ V_S$ $V_{OL} \leq 10\%\ V_S$	8ns	8ns	45/55%	CFPT-9301
12.0 to 52.0MHz	3.0V±10%*	Clipped Sine 10kΩ//10pF	$V_{pk\text{-}pk} \geq 0.8V$	–	–	–	CFPT-9302
*Parts will operate correctly with ±10% supply voltage variation but supply coefficient is measured with ±5% variation							

Frequency Stabilities over Operating Temperature Range

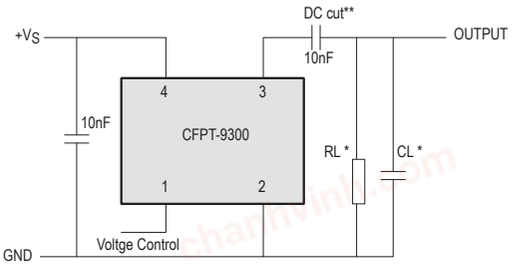
Operating Temperature Ranges	Frequency Stabilities v Operating Temperature Range				
	±0.2ppm	±0.3ppm	±0.5ppm	±1.0ppm	±2.0ppm
–20 to 70°C	✓**	✓**	✓	✓	✓
–40 to 85°C	–	✓**	✓**	✓	✓
**Stability/Temperature Range combinations may not be available for all frequencies, please contact our sales offices					

Outline (mm)



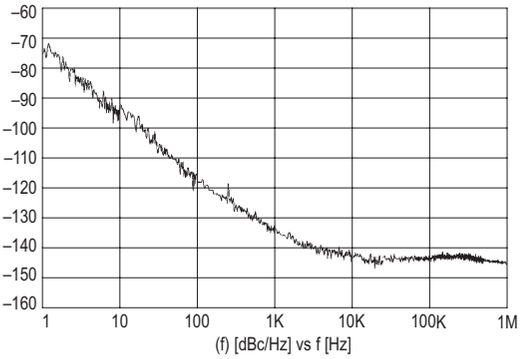
Low profile option: 1.4mm max height

Test Circuit



* Load 15pF (HCMOS) or 10kΩ // 10pF (clipped sinewave), inclusive of probe and jig capacitance
** DC cut capacitor required for AC coupled clipped sinewave

Typical Phase Noise at 14.4MHz



(f) [dBc/Hz] vs f [Hz]

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