

SMD Temperature Compensated Crystal Oscillator (PLUTO)

A series of lead free surface mountable TCXO/TCVCXO for medium to high volume applications where small size (5 x 3.2 mm) and high performance are prerequisites.

Product description

The CFPT9300 uses Rakon's proprietary 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.

**Applications**

- Communications
- Other

Features

- HCMOS or clipped sinewave output
- Stability $\pm 0.2\text{ppm}$ over $-20/70^\circ\text{C}$ or $\pm 0.3\text{ppm}$ over $-40/85^\circ\text{C}$

Specifications**1.0 SPECIFICATION REFERENCES**

Line	Parameter	Description
1.1	Model description	CFPT9300
1.2	RoHS compliant	Yes
1.3	Package size	5.0 x 3.2 x 1.7 mm (see model drawing)

2.0 FREQUENCY CHARACTERISTICS (ALL)

Line	Parameter	Test Condition	Value	Unit
2.1	Frequency range	Frequency range available (note 1 & 2)	1.25 to 52	MHz
2.2	Frequency calibration	Initial calibration @ 25°C	± 1 max	ppm
2.3	Frequency stability over temperature	Reference to $(F_{\text{max}} + F_{\text{min}})/2$	± 0.2 to 2	ppm
2.4	Temperature range	Operating temperature range over which temperature stability is measured	-40 to 85	°C
2.5	Reflow shift	Measured ≥ 60 minutes after reflow	± 1 max	ppm

3.0 FREQUENCY CHARACTERISTICS (CLIPPED SINEWAVE)

Line	Parameter	Test Condition	Value	Unit
3.1	Supply voltage stability	$\pm 5\%$ variation, reference to frequency at nominal supply voltage, typical	± 0.1	ppm
3.2	Load sensitivity	$\pm 10\%$ variation, reference to frequency at nominal load, typical	± 0.05	ppm

4.0 FREQUENCY CHARACTERISTICS (HCMOS)

Line	Parameter	Test Condition	Value	Unit
4.1	Supply voltage stability <20MHz	±5% variation, reference to frequency at nominal supply voltage, typical	±0.1	ppm
4.2	Supply voltage stability 20 - 35MHz	±5% variation, reference to frequency at nominal supply voltage, typical	±0.3	ppm
4.3	Supply voltage stability 35 - 52MHz	±5% variation, reference to frequency at nominal supply voltage, typical	±0.5	ppm
4.4	Load sensitivity <20MHz	±5pF variation, reference to frequency at nominal load, typical	±0.2	ppm
4.5	Load sensitivity 20 - 35MHz	±5pF variation, reference to frequency at nominal load, typical	±0.3	ppm
4.6	Load sensitivity 35 - 52MHz	±5pF variation, reference to frequency at nominal load, typical	±0.5	ppm

5.0 LONG TERM STABILITY

Line	Parameter	Test Condition	Value	Unit
5.1	In first year	≤20MHz	±1 max	ppm
5.2	In first year	>20MHz	±2 max	ppm
5.3	For 10 years	≤20MHz	±3 max	ppm
5.4	For 10 years	>20MHz	±5 max	ppm

6.0 POWER SUPPLY

Line	Parameter	Test Condition	Value	Unit
6.1	Supply voltage	Nominal supply voltage (±10%) to be specified as part of model code	2.4 to 6	V
6.2	Current HCMOS	typically: $1 + \text{frequency}(\text{MHz}) * \text{supply}(\text{V}) * \{\text{load}(\text{pF}) + 15\} * 10^{-3} \text{mA}$ e.g 20MHz, 3.3V, 15pF approximately equals 3mA		
6.3	Current Clipped Sinewave	typically: $1 + \text{frequency}(\text{MHz}) * 1.2 * \{\text{load}(\text{pF}) + 30\} * 10^{-3} \text{mA}$ e.g 20MHz, 10pF approximately equals 2mA		

7.0 CONTROL VOLTAGE

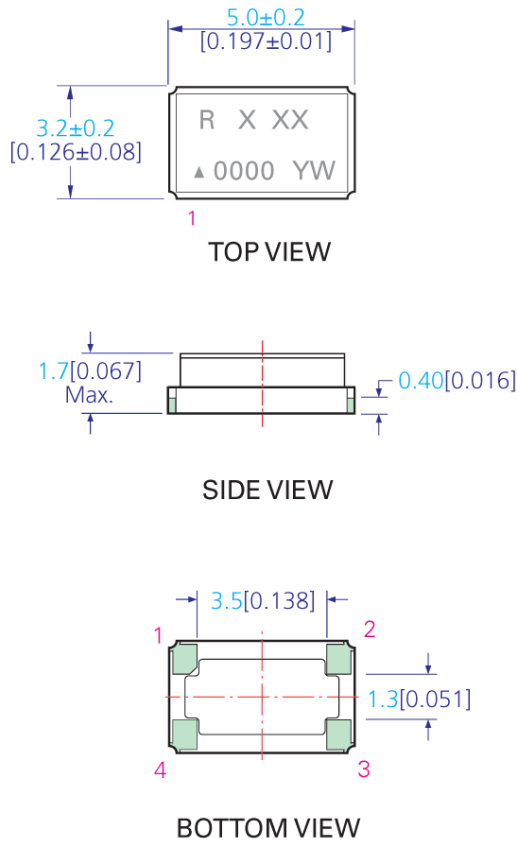
Line	Parameter	Test Condition	Value	Unit
7.1	Control voltage range		0.5 to 2.5	V
7.2	Frequency tuning	Frequency ≤20MHz (note 3)	±5 min	ppm
7.3	Frequency tuning	Frequency >20MHz (note 3)	±7 min	ppm
7.4	Frequency tuning	Custom request	±5 to 20	ppm
7.5	Port input impedance	Measured between control voltage and GND pin	100 min	kΩ
7.6	Linearity		2 max	%
7.7	Slope	Positive		
7.8	Modulation bandwidth		2 min	kHz

8.0 OSCILLATOR OUTPUT- CLIPPED SINEWAVE

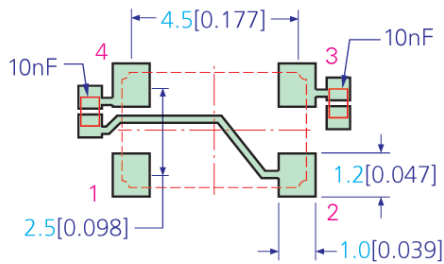
Line	Parameter	Test Condition	Value	Unit
8.1	Output waveform	Clipped sinewave		
8.2	Output voltage level	Peak to peak voltage measured at minimum supply voltage	0.8 min	V
8.3	Output load resistance		10	kΩ
8.4	Output load capacitance		10	pF

Drawing Name: CFPT9300 Model Drawing

MODEL DRAWING



RECOMMENDED PAD LAYOUT - TOP VIEW



NOTE:

- 1) Pin connections are detailed in the specification.
- 2) 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.

TITLE: CFPT9300 MODEL OUTLINE DRAWING

FILENAME: CFPT9300_MD

RELATED DRAWINGS:

REVISION: B

DATE: 22-Jul-10

SCALE: 5 : 1

Millimeters [inch]

Tolerance:

XX = ± 0.5

X.X = ± 0.2

X.XX = ± 0.10

X.XXX = ± 0.05

X^o = $\pm 1.0^{\circ}$

Hole = ± 0.10

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