

CFPT9000

The CFPT9000 is a series of surface mountable 7.0 x 5.0 mm Temperature Compensated Voltage Controlled Crystal Oscillators (TCVCXOs) for medium to high volume applications where small size and high performance are prerequisites. It uses Rakon's proprietary ASIC 'Pluto™', a single chip oscillator and analogue compensation circuit, capable of sub ± 0.2 ppm performance over an extended temperature range. Its ability to function down to a supply voltage of 2.4 V and low power consumption makes it particularly suitable for mobile applications.

Features

- Frequency stability (FvT): ± 0.2 to 1.5 ppm
- Wide frequency range
- Voltage control, T-sense, clipped sinewave, sinewave, CMOS, AC MOS and HCMOS options

Applications

- Time and frequency reference
 - Positioning
 - Test and Measurement
 - Telecommunications

7.0 x 5.0 x 1.8/1.6 mm



Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency (Fn)		10 – 40		MHz	
Frequency calibration			± 1	ppm	Initial accuracy at $25 \pm 1^\circ\text{C}$
Reflow shift			± 0.5	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)
Operating temperature range	-40		85	$^\circ\text{C}$	
Frequency stability over temperature			$\pm 0.5 - \pm 1.5$	ppm	Reference to $(F_{\text{max}} + F_{\text{min}})/2$. The best available stability depends on the nominal frequency and selected operating temperature range
Supply voltage stability		± 0.2		ppm	$\pm 5\%$ variation Reference to frequency at nominal V_{CC}
Load sensitivity		± 0.2		ppm	<ul style="list-style-type: none"> • HCMOS, AC MOS: $\pm 5\text{pF}$ variation, • Clipped sine wave / Sine wave: $\pm 10\%$ variation reference to frequency at nominal load
Long term stability (aging)					
$\leq 26\text{MHz}$			$\pm 1 - 2$	ppm	1 year
$> 26\text{MHz}$			$\pm 3 - 5$	ppm	10 years
Acceleration stability		< 2		ppb/g	Gamma vector, 3 axes, 30 – 1500Hz
Start-up time			5 – 15	ms	90% amplitude
Supply voltage, V_{CC}	2.2		6	V	$\pm 5\%$, standard values are 3.0, 3.3 and 5.0V
Current (C/Sine)		2		mA	
Current (Sine)		8		mA	
Current (HCMOS)		4		mA	
Current (AC MOS)		8		mA	
Control voltage, V_c	0.5		2.5	V	
Frequency tuning					
$\leq 26\text{MHz}$	± 5			ppm	
$> 26\text{MHz}$	± 7			ppm	
Root Allan Variance (20MHz)		5		10^{-11}	$\tau = 1.0\text{s}$
Oscillator output options					Clipped sine wave, sine wave, HCMOS (LVCMOS & LVTTTL compatible as per JESD8C) and AC MOS
Tri-state control					
Input level low (pin 6)			$0.2V_{\text{CC}}$	V	Device disabled, output in high impedance state
Input level high (pin 6)	$0.6V_{\text{CC}}$			V	Device enabled and operating

Model Outline and Recommended Pad Layout

RECOMMENDED PAD LAYOUT - TOP VIEW

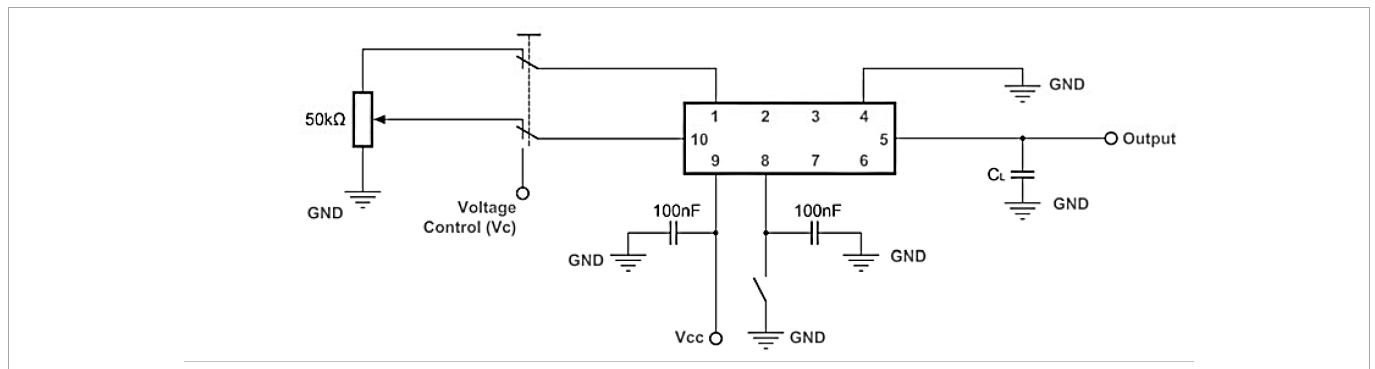
PIN CONNECTIONS

1 Vref/ Do not connect	6 NC
2 NC	7 NC
3 Do not connect	8 Tri-state control (Enable)
4 GND	9 Supply Voltage (Vcc)
5 RF Output	10 Control voltage (Vc)/Do not connect

NOTE:

- 8 pad and 4 pad package options are available on request
- H*, model height options: 1.8 ± 0.2 mm and H = 1.6 ± 0.2 mm
- Outline unit mm

Test Circuit



Output Waveform – HCMOS

