

## 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  $\pm 0.2$  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):  $\pm 0.2$  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

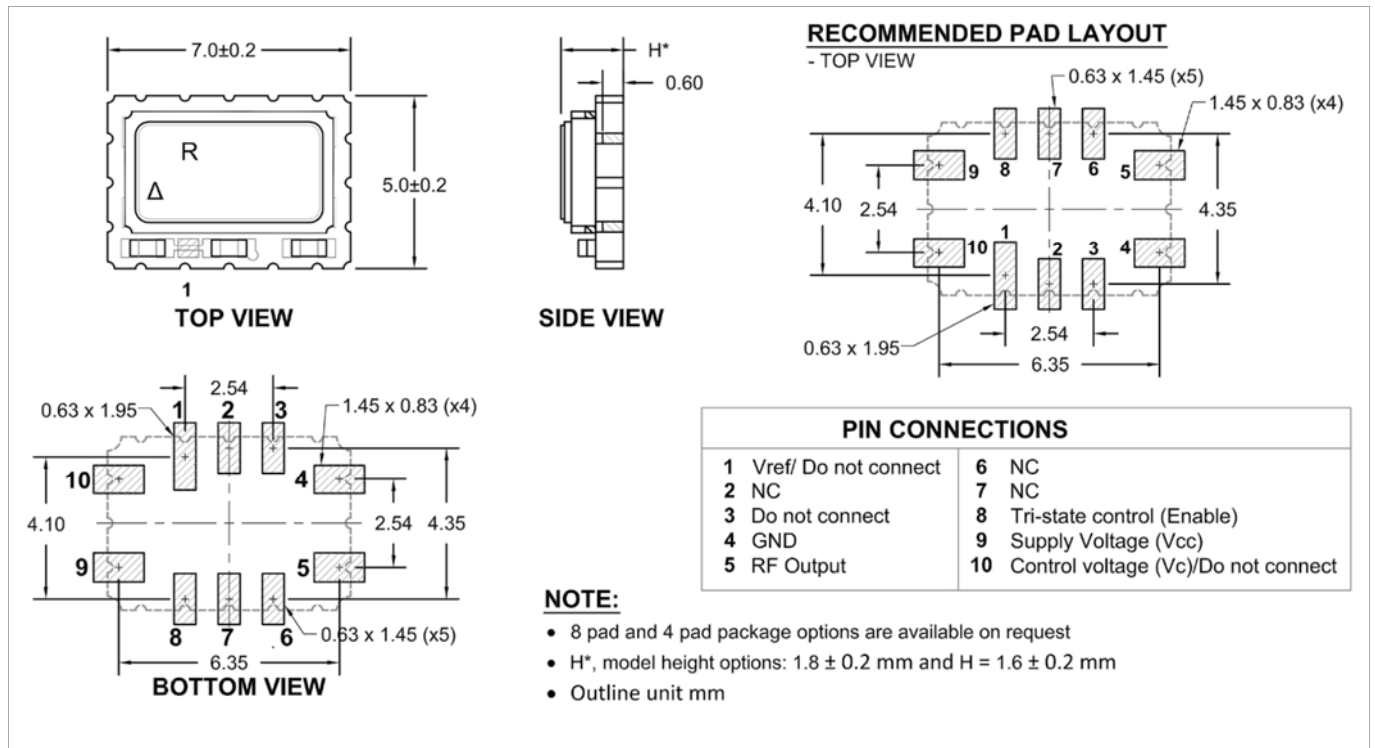
7.0 x 5.0 x 1.8/1.6 mm



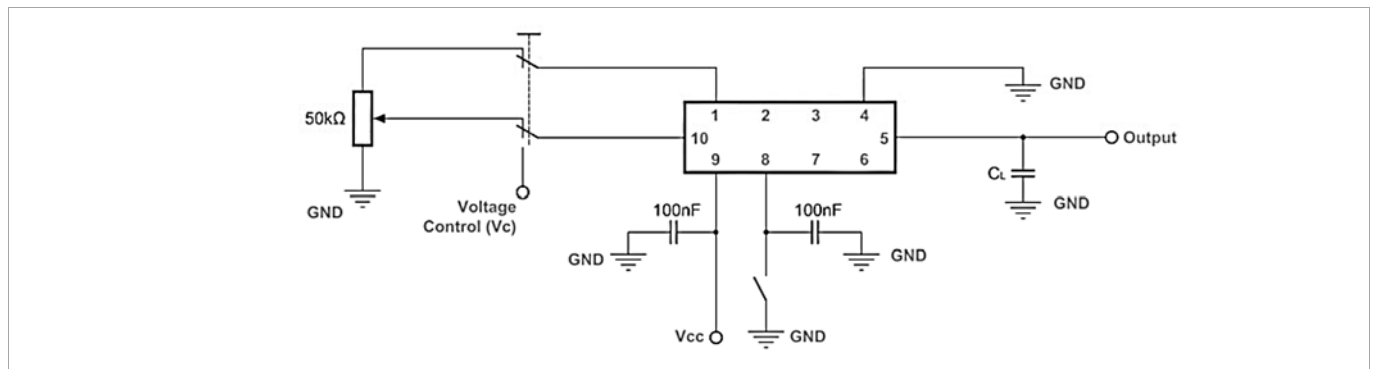
## Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		10 – 40		MHz	
Frequency calibration			$\pm 1$	ppm	Initial accuracy at $25 \pm 1^\circ\text{C}$
Reflow shift			$\pm 0.5$	ppm	Pre to post reflow $\Delta F$ (measured $\geq 60$ 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		$\pm 0.2$		ppm	$\pm 5\%$ variation Reference to frequency at nominal $V_{\text{CC}}$
Load sensitivity		$\pm 0.2$		ppm	<ul style="list-style-type: none"> <li>• HCMOS, AC MOS: <math>\pm 5\text{pF}</math> variation,</li> <li>• Clipped sine wave / Sine wave: <math>\pm 10\%</math> variation reference to frequency at nominal load</li> </ul>
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, $V_{\text{CC}}$	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					
$\leq 26\text{MHz}$	$\pm 5$			ppm	
$> 26\text{MHz}$	$\pm 7$			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



### Test Circuit



### Output Waveform – HCMOS

