CFPO6

Miniature SC cut OCXO (CFPO6A) and a miniature AT cut OCXO (CFPO6B)

Miniature OCXO for where performance versus space is at a premium. Stratum 3 & Stratum 3E telecom applications / instrumentation. Frequency range from 5MHz to 65MHz. 3.3V, 5V & 12V supply.

Product description

The CFPO6 series of oscillators are designed with direct heating on a single board. They are optimized designs for Stratum 3E & 3 levels. The performance is very close to the CFPO5 but it is available in a smaller package.

Applications

- Basestation

Features

- Option for AT-cut crystal or SC-cut crystal
- Small size
- Standard frequencies: 10; 12.8; 13; 16.384; 20; 26MHz

Specifications

1.0 SPECIFICATION REFERENCES

Line	Parameter	Test Condition
1.1	Model Description	CFPO6
1.2	RoHS compliant	Yes. Part numbers with suffix 'LF'
1.3	Package size available	25.4mm x 25.4mm x 12.7mm (package 25)

2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Value	Unit
2.1	Frequency range	CFPO6 A1 or B1. Refer to note 1	5 to 40	MHz
2.2	Frequency range	CFPO6 A2 or B2. Refer to note 1	5 to 65	MHz
2.3	Frequency stability over temperature	See part number builder diagram for frequency stabilities vs temperature range and associated order codes		±ppb
2.4	Temperature range		-20 to 70	°C
2.5	Supply voltage stability	Frequency stability vs supply voltage change (±5%) and load change (1 to 2 HCMOS)	1	±ppb
2.6	Load sensitivity	Frequency stability vs supply voltage change (±5%) and load change (1 to 2 HCMOS)	1	±ppb
2.7	Long term stability	See part number builder diagram for long term stability (30 days and after operation) and associated order codes		±ppb

3.0 POWER SUPPLY

Line	Parameter	Test Condition	Value	Unit
3.1	Supply voltage	Standard supply voltage (optional: 3.3V or 12V)	4.75 to 5.25	V
3.2	Power consumption	Warm-up	3 max	W
3.3	Power consumption	25°C (calm air)	1.5 max	W
3.4	Warm-up time	±0.1ppm after 3 minutes; ±0.05ppm after 5 minutes		

4.0 CONTROL VOLTAGE

Line	Parameter	Test Condition	Value	Unit
4.1	Control voltage range	Min 0. Max Vref		V
4.2	Frequency tuning	See part number builder diagram for frequency adjustment and associated order codes		ppb
4.3	Linearity		10 max	%
4.4	Slope	(Negative optional). Positive		

5.0 OSCILLATOR OUTPUT-HCMOS

Line	Parameter	Test Condition	Value	Unit
5.1	Output waveform	HCMOS (duty cycle 50%±5%; rise and fall times [10-90%] ≤5ns typical 2ns)		dBm
5.2	Duty cycle	50%±5%		
5.3	Rise and fall times	≤5ns typical 2ns	10 to 90	%

6.0 OSCILLATOR OUTPUT- Pure sinewave

Line	Parameter	Test Condition	Value	Unit
6.1	Output waveform	Pure sinewave (optional sinewave >3dBm on 50Ω load)		dBm

7.0 PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
7.1	SSB phase noise power density at 10Hz offset	Typical values for a 10MHz oscillator at 25°C	-127	dBc/Hz
7.2	SSB phase noise power density at 100Hz offset	Typical values for a 10MHz oscillator at 25°C	-140	dBc/Hz
7.3	SSB phase noise power density at 1kHz offset	Typical values for a 10MHz oscillator at 25°C	-148	dBc/Hz
7.4	SSB phase noise power density at 10kHz offset	Typical values for a 10MHz oscillator at 25°C	-152	dBc/Hz

8.0 OTHER FEATURES

Line	Parameter	Test Condition	Value	Unit
8.1	Reference voltage, Vref	with 3.3V supply = 2.8V		
8.2	Reference voltage, Vref	with 5.0V supply= 4.0V		
8.3	Reference voltage, Vref	with 12V supply = 5.0V		
8.4	Harmonic distortion	Sub-harmonics	-35 max	dBc
8.5	Harmonic distortion	Non-harmonics	-80 max	dBc

9.0 ENVIRONMENTAL

Line	Parameter	Test Condition
9.1	Shock	Half sine 50g 11ms / 3 per direction, IEC 68-2-27 test Ea. / severity 50A
9.2	Vibration	Vibration - 10g / 10 - 500Hz, IEC 68-2-06, test Fc. / severity 500 / 10
9.3	Storage	-45°C to 85°C

10.0 MARKING

Line	Parameter	Test Condition
10.1	Type	Printed label on can (See marking diagram)
10.2	Line 1	RAKON or customer logo

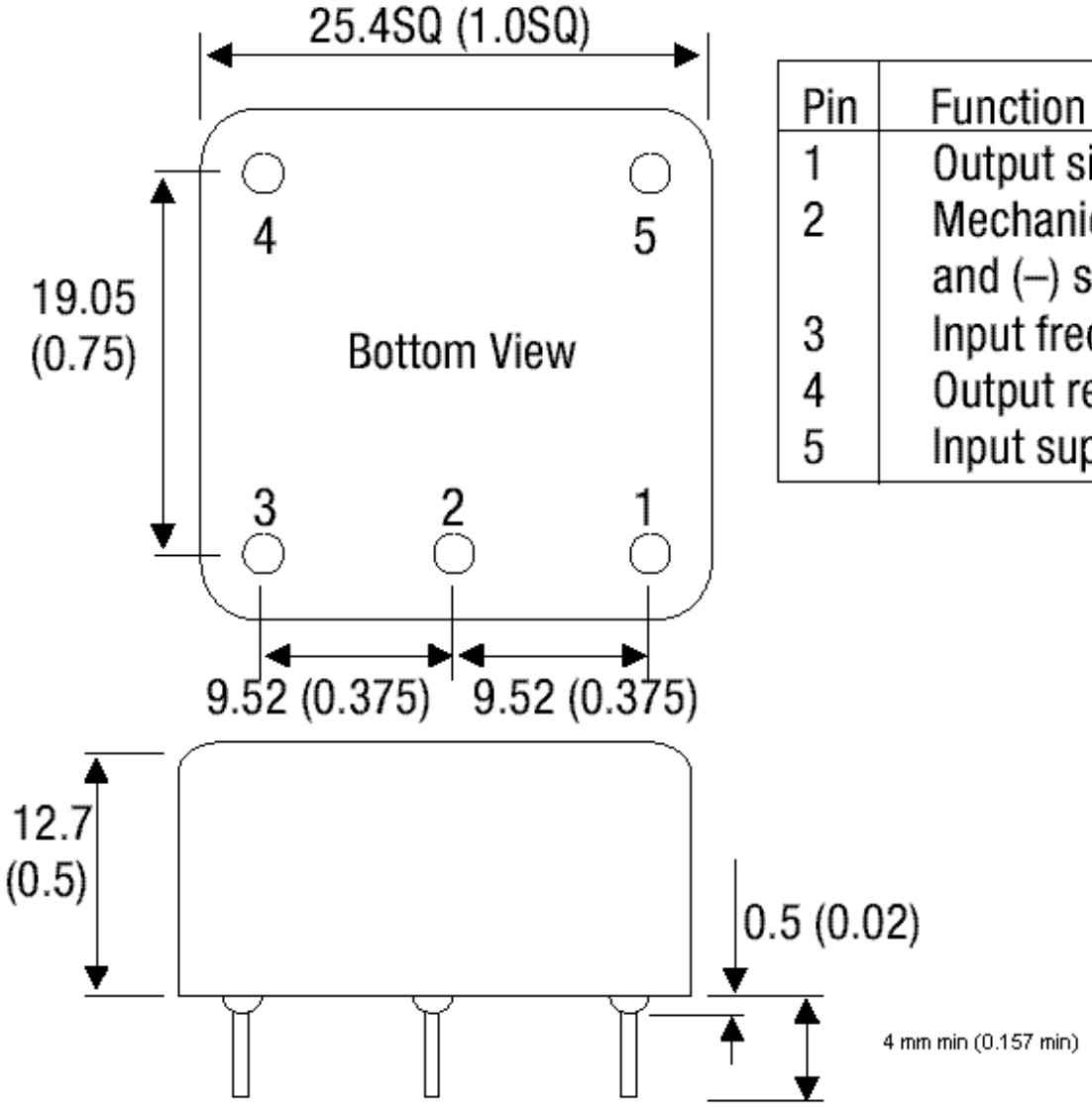
11.0 MANUFACTURING INFORMATION

Line	Parameter	Test Condition
11.1	Reflow shift	No reflow soldering. Hand and wave soldering only
11.2	Packaging description	Parts supplied in carton boxes, protected by foam (15 or 30 parts per box)

12.0 NOTES

Line	Parameter	Test Condition
12.1	1	Standard frequencies available: 10, 12.8, ,13, 16.384, 20, 26MHz

Outline in mm (inches) - Package 25



Pin	Function
1	Output signal
2	Mechanical ground and (–) supply
3	Input frequency control
4	Output ref. voltage
5	Input supply (+)

CFPO6 MARKING

Line 1: RAKON or Customer's logo

Line 2: RAKON or Customer's part number

Line 3: Nominal Frequency (F0) in MHz

Line 4: Serial number (1 letter & 5 numbers)

Line 5: Date Code (4 digits for year and week)

Operating temperature range	Stability within temperature range pk to pk	Long term stability (after 30 days operation)				Frequency adjustment from 0V to V ref (pk-pk)	Standard package Type	Model Number	Supply options
		Per day	Per Month	Per Year	Over 10 Years				
-20°C to 70°C	≤ 5 E-9	≤ ± 5 E-10	≤ ± 1 E-8	≤ ± 5 E-8	≤ ± 2.5 E-7	≥ 5E-7	25	CFPO-6 A1	3.3V / 5V / 12V
	≤ 2 E-8	≤ ± 1 E-9	≤ ± 3 E-8	≤ ± 1 E-7	≤ ± 5 E-7	≥ 5E-7	25	CFPO-6 A2	3.3V / 5V / 12V
-20°C to 70°C	≤ 5 E-8	≤± 1 E-9	≤ ± 3 E-8	≤ ± 1.5 E-7	≤ ± 7.5 E-7	≥ 2E-6	25	CFPO-6 B1	3.3V / 5V / 12V
	≤ 1 E-7	≤± 2 E-9	≤ ± 6 E-8	≤ ± 3 E-7	≤ ± 1.5 E-6	≥ 2E-6	25	CFPO-6 B2	3.3V / 5V / 12V

Ordering Example **CFPO-6-A2** **25** **C** **5** **10.0MHz**

Model number

Package outline(25)

Output signal (C)

Supply Voltage (5) (12V) (3.3V)

Frequency (MHz)