CFPO-SC SERIES OCXO

ISSUE 5; 1 NOVEMBER 2008 - RoHS 2002/95/EC

Description

- A range of Oven Controlled Crystal Oscillators (OCXO's) manufactured for us by Rakon that don't require customers to re-calibrate their equipment over the lifetime of operation. Key performance characteristics are:

  - Free-run stability range over lifetime operation from: $\pm1.6\times10^{-8}$ (CFPO-SC1 for replacing Rubidium clocks) to $\pm1\times10^{-7}$ (CFPO-SC4)

  - Holdover range over 24 hours operation: From $7\mu s$ over -20 to $70°C$ (CFPO-SC2) to $10\mu s$ with $\pm15°C$ ambient change

Package Outlines

- 50.8 x 50.8 x 38mm (50B) CFPO-SC-1
- 50.8 x 50.8 x 25mm (50) CFPO-SC-2
- 51 X 41 X 25mm (51) CFPO-SC-3
- 40 X 30 X 20mm (40) CFPO-SC-4

Frequency Range

- 5 to 15MHz

Standard Frequencies

- 5, 8.192, 10, 10.24MHz
- Higher frequencies may be available upon request
- Initial tolerance @ 25°C Fo $\pm1\times10^{-8}$

Output Compatibility & Load

- Standard: Sine +7dBm ±2dBm into 50Ω load (S)
- Optional: HCMOS (C)

Operating Temperature Range

- –20 to 70°C

Storage Temperature Range

- –55 to 85°C

Supply Voltage

- Standard: 12V (12)
- Optional: 15V (15)

Power Consumption (CFPO-SC1 / others)

- Warm-up: <7.0W / 6.0W
- @25°C: <2.5W / 1.8W (calm air)

Warm Up Time @ 25°C (typical)

- $\pm1\times10^{-8}$ after 15 mins (for CFPO-SC1)
- $\pm1\times10^{-8}$ after 10 mins (for others)

Retrace after 24 hours on / 24 hours off @25°C

- $\pm2\times10^{-9}$ after 60 minutes

Frequency Adjustment

- > $\pm5.0\times10^{-8}$ from 0V to reference voltage
- EFC monotonic and positive slope (negative slope optional)

Oven Alarm "logic level" signal (optional) (A)

- Logic "0" during warm-up time and if oven is not operating
- Logic "1" when temperature regulation is operating

Reference Voltage Ouput (optional no reference voltage)

- CFPO-SC-1 pkg 50B 8.0V±0.3V
- CFPO-SC-2 pkg 50   8.2V±0.3V (options = 5V/6.2V)
- CFPO-SC-3 pkg 51   8.2V±0.3V (options = 5V/6.2V)
- CFPO-SC-4 pkg 40   8.0V±0.3V

Harmonic Distortion

- Harmonics < –40dBc
- Spurious < –80dBc

Phase Noise @ 10.0MHz typical (sinewave)

- 1Hz ≤ –100dBc/Hz
- 10Hz ≤ –130dBc/Hz
- 100Hz ≤ –145dBc/Hz
- 1kHz ≤ –155dBc/Hz
- 10kHz ≤ –158dBc/Hz

Environmental (non-operating)

- Shock: 50g for 11ms
- Vibration: 10g for 10 to 500Hz

Marking Includes

- Frequency + Serial Number + Date Code

Packaging

- Bulk

Minimum Order Information Required

- Frequency + Model Number + Package Outline + Output Signal + Supply Voltage + Oven Alarm (if applicable) + Reference Voltage (if applicable)

Electrical Specification - maximum limiting values

Operating Temperature Range	Stability within Temperature Range pk to pk	Long Term Stability @ 25°C after 30 days operation				Frequency Adjustment from 0V to V Ref** (pk-pk)	Cumulated Over Lifetime (all causes)	Reference Voltages	Standard Package Type (max height)	Model Number
		Per Day	Per Month	Per Year	Over 15 Years					
−20 to 70°C	$\leq 1 \times 10^{-10}$	$\leq \pm 2 \times 10^{-11}$	$\leq \pm 6 \times 10^{-10}$	$\leq \pm 5 \times 10^{-9}$	$\leq \pm 1.5 \times 10^{-8}$	$\geq \pm 5 \times 10^{-11}$	$\geq \pm 1.6 \times 10^{-8}$	8.0V±0.3V	(50B) 38mm	CFPO-SC-1
	$\leq 2 \times 10^{-10}$	$\leq \pm 5 \times 10^{-11}$	$\leq \pm 1.5 \times 10^{-9}$	$\leq \pm 1.2 \times 10^{-8}$	$\leq \pm 3.5 \times 10^{-8}$	$\geq \pm 1 \times 10^{-10}$	$\geq \pm 5.0 \times 10^{-8}$	8.2V±0.3V Option 5V or 6.2V	(50) 25mm	CFPO-SC-2
	$\leq 5 \times 10^{-10}$	$\leq \pm 1 \times 10^{-10}$	$\leq \pm 3 \times 10^{-9}$	$\leq \pm 1.5 \times 10^{-8}$	$\leq \pm 5 \times 10^{-8}$	$\geq \pm 2 \times 10^{-10}$	$\geq \pm 7.0 \times 10^{-8}$	8.2V±0.3V Option 5V or 6.2V	(51) 25mm	CFPO-SC-3
	$\leq 1 \times 10^{-9}$	$\leq \pm 2 \times 10^{-10}$	$\leq \pm 5 \times 10^{-9}$	$\leq \pm 3 \times 10^{-8}$	$\leq \pm 9 \times 10^{-8}$	$\geq \pm 5 \times 10^{-10}$	$\geq \pm 1.0 \times 10^{-7}$	8.0V±0.3V	(40) 20mm	CFPO-SC-4

Ordering Example   CFPO-SC-1   50B S 12 A 8.0 10.0MHz
Model Number ———————
Package Outline (50B) (50) (51) (40) ———————
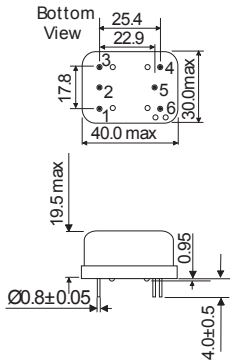Output Signal (S) (C) ———————
Supply Voltage (12) (15) ———————
Oven Alarm Option (A) ———————
Reference Voltage 8.0, 8.2, 5.0, 6.2 (Option N = No Reference Voltage) ———————
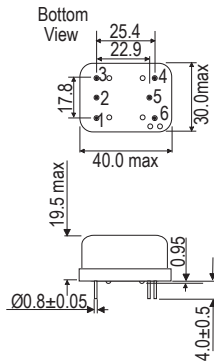Frequency (MHz) ———————

For non standard options such as different temperature ranges, negative slope EFC, cold start-up then please contact our sales office

Outline (mm) - Package 40 (without Oven Alarm)

Bottom View
25.4
22.9
17.8
30.0 max
40.0 max
19.5 max
0.95
Ø0.8±0.05
4.0±0.5

Pin Function
1. Input frequency control
2. Output reference voltage
3. Input supply (+)
4. Output signal
5. Mechanical GND and (-) supply

All tolerances ±0.2mm

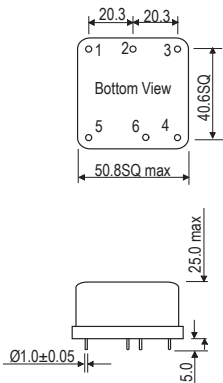**Outline (mm) - Package 40 (with Oven Alarm)**

Bottom View
25.4
22.9
17.8
30.0 max
40.0 max
19.5 max
0.95
Ø0.8±0.05
4.0±0.5

Pin Function
1. Frequency Control Input
2. Output reference voltage
3. Input supply (+)
4. Output signal
5. Mechanical GND and (-) supply
6. Oven alarm
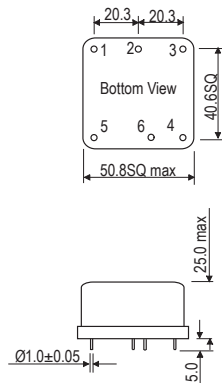
All tolerances ±0.2mm

CFPO-SC SERIES OCXOs (continued)

Outline (mm) - Package 50 (without Oven Alarm)

20.3 | 20.3

○1 2○ 3○

Bottom View

40.6SQ

5 6 4

50.8SQ max

Pin Function
1. Frequency Control Input
2. Output ref. voltage
3. Output signal
4. Mechanical GND and (–) supply
5. Input supply (+)

All tolerances ±0.2mm

25.0 max
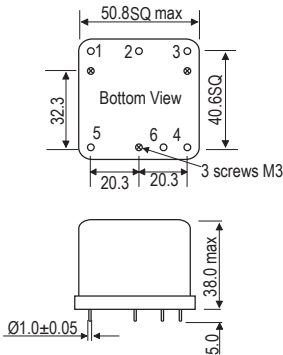
Ø1.0±0.05

5.0

Outline (mm) - Package 50 (with Oven Alarm)

20.3 | 20.3

○1 2○ 3○

Bottom View

40.6SQ

5 6 4

50.8SQ max

Pin Function
1. Frequency Control Input
2. Output ref. voltage
3. Output signal
4. Mechanical GND and (–) supply
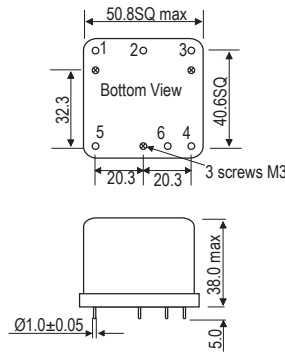5. Input supply (+)
6. Oven alarm

All tolerances ±0.2mm

25.0 max

Ø1.0±0.05

5.0

Outline (mm) - Package 50B (without Oven Alarm)

50.8SQ max

○1 2○ 3○

Bottom View

32.3

40.6SQ

5 6 4

20.3 | 20.3

3 screws M3

Pin | Function
1 | Frequency Control Input
2 | Output reference voltage
3 | Output signal
4 | Mechanical ground and (-) supply
5 | Input supply (+)
6 | Oven Alarm

All tolerances ±0.2mm

38.0 max

Ø1.0±0.05

5.0

Outline (mm) - Package 50B (with Oven Alarm)

50.8SQ max

○1 2○ 3○

Bottom View

32.3

40.6SQ

5 6 4

20.3 | 20.3

3 screws M3

Pin | Function
1 | Frequency Control Input
2 | Output reference voltage
3 | Output signal
4 | Mechanical ground and (-) supply
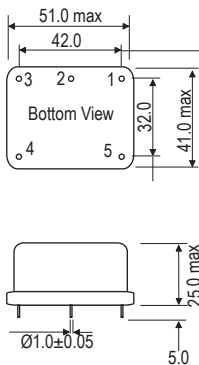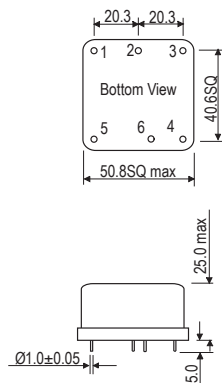5 | Input supply (+)
6. | Oven alarm

All tolerances ±0.2mm

38.0 max

Ø1.0±0.05

5.0

Outline (mm) - Package 51 (without Oven Alarm)

51.0 max

42.0

○3 2○ 1○

Bottom View

32.0

41.0 max

○4 5○

Pin Function
1 | Mechanical GND and supply
2 | Frequency Control Input
3 | Ref. voltage output
4 | Supply Input
5 | Signal output

All tolerances ±0.2mm

25.0 max

Ø1.0±0.05

5.0

Outline (mm) - Package 51 (with Oven Alarm)

20.3 | 20.3

○1 2○ 3○

Bottom View

40.6SQ

5 6 4

50.8SQ max

Pin Function
1. Frequency Control Input
2. Output ref. voltage
3. Output signal
4. Mechanical GND and (–) supply
5. Input supply (+)
6. Oven alarm

All tolerances ±0.2mm

25.0 max

Ø1.0±0.05

5.0