

## Micro high stability surface mount OCXO

Miniature OCXO for where performance versus space is at a premium. Frequency range from 5MHz to 40MHz. 3.3V, 5V & 12V supply.



### Product description

The CFPO11 series of oscillators are designed with direct heating on a single board. They are optimized designs for Stratum 3E & 3 timing modules, in a SMD package.

### Applications

- Base stations
- LTE networks
- Small cells
- Time & frequency reference
- WiMAX/WiBro
- SONET/SDH
- Stratum 3 & 3E timing modules

### Features

- Excellent phase noise performance
- Excellent temperature stability
- Hold over better than 10 $\mu$ s over 24 hours

### Specifications

#### 1.0 SPECIFICATION REFERENCES

Line	Parameter	Description
1.1	Model Description	CFPO11
1.2	RoHS compliant	Yes. Part number with suffix 'LF'
1.3	Package size available	25.0mm x 22.0mm x 15.0mm (package 25AS, non-hermetic)
1.4	Package size available	25.0mm x 22.0mm x 12.0mm (package 25LP, non-hermetic)
1.5	Package size available	25.0mm x 22.0mm x 10.5mm (package 25LP, non-hermetic)
1.6	Package size available	25.0mm x 22.0mm x 15mm (package 25LP, non-hermetic)

#### 2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Value	Unit
2.1	Frequency range	Standard frequencies: 10; 12.8; 13; 16.384; 20; 26MHz	5 to 40	MHz
2.2	Frequency stability over temperature	See part number builder diagram for frequency stabilities vs temperature range and associated order codes	10 to 100	ppb
2.3	Supply voltage stability	Frequency stability vs supply voltage change ( $\pm$ 5%) and load change (1 to 2 HCMOS)	$\pm$ 5 max	ppb
2.4	Load sensitivity		5 max	ppb
2.5	Long term stability	Refer to part number builder for long term stability (30 days after operation) and associated order codes: values shown per year	30 to 300	ppb

#### 3.0 POWER SUPPLY

Line	Parameter	Test Condition	Value	Unit
3.1	Supply voltage	Standard supply voltage (optional: 3.3V or 12V)	5	V
3.2	Power consumption	Warm-up	2.5 max	W
3.3	Power consumption	25°C (calm air)	1.5 max	W
3.4	Warm-up time	To within $\pm$ 10ppb with reference to frequency after 1 hour	5 max	mn

#### 4.0 CONTROL VOLTAGE

Line	Parameter	Test Condition	Value	Unit
4.1	Frequency tuning	See attached table (part number builder) for frequency adjustment and associated order codes	0.5 to 2	ppm
4.2	Linearity		10 max	%

#### 5.0 OSCILLATOR OUTPUT-HCMOS

Line	Parameter	Test Condition	Value	Unit
5.1	Output waveform	HCMOS		
5.2	Duty cycle	50%±5%		
5.3	Rise and fall times	≤10ns	10 to 90	%

#### 6.0 PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
6.1	SSB phase noise power density at 1Hz offset	Typical values for a 10MHz oscillator at 25°C	-95	dBc/Hz
6.2	SSB phase noise power density at 10Hz offset	Typical values for a 10MHz oscillator at 25°C	-125	dBc/Hz
6.3	SSB phase noise power density at 100Hz offset	Typical values for a 10MHz oscillator at 25°C	-145	dBc/Hz
6.4	SSB phase noise power density at 1kHz offset	Typical values for a 10MHz oscillator at 25°C	-150	dBc/Hz
6.5	SSB phase noise power density at 10kHz offset	Typical values for a 10MHz oscillator at 25°C	-152	dBc/Hz
6.6	SSB phase noise power density at 100kHz offset	Typical values for a 10MHz oscillator at 25°C	-155	dBc/Hz

#### 7.0 OTHER FEATURES

Line	Parameter	Test Condition	Value	Unit
7.1	Reference voltage, Vref	with 3.3V supply	2.7 to 2.9	V
7.2	Reference voltage, Vref	with 5.0V supply	3.8 to 4.2	V
7.3	Reference voltage, Vref	with 12V supply = 4.0V±0.2V	3.8 to 4.2	V
7.4	Retrace	After 24 hours off after 60 minutes on	10 max	ppb
7.5	Sub-harmonics		-25 max	dBc
7.6	Spurious		-80 max	dBc

#### 8.0 ENVIRONMENTAL INFORMATION

Line	Parameter	Description
8.1	Shock	Half sine 50g 11ms / 3 per direction, IEC 68-2-27 test Ea. / severity 50A
8.2	Vibration	Vibration - 10g / 10 - 500Hz, IEC 68-2-06 test Fc. / severity 500 / 10
8.3	Storage temperature	-45°C to 85°C

#### 9.0 MARKING

Line	Parameter	Description
9.1	Type	Printed label on can (See marking diagram)
9.2	Line 1	RAKON or customer logo

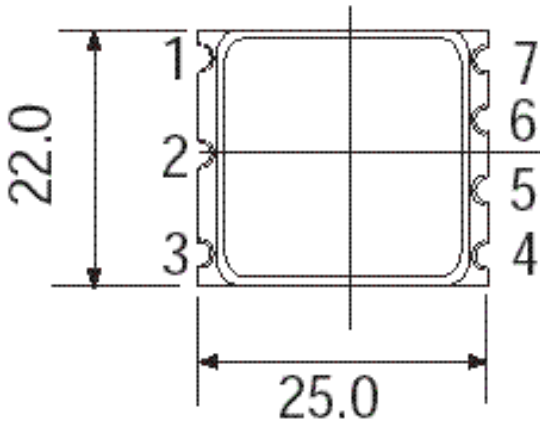
## 10.0 MANUFACTURING INFORMATION

Line	Parameter	Description
10.1	Reflow shift	Reflow soldering
10.2	Packaging description	Parts supplied on tape and reel

## 11.0 NOTES

Line	Parameter	Description
11.1	1	Standard frequencies: 10, 12.8, 13, 16.384, 20, 26MHz

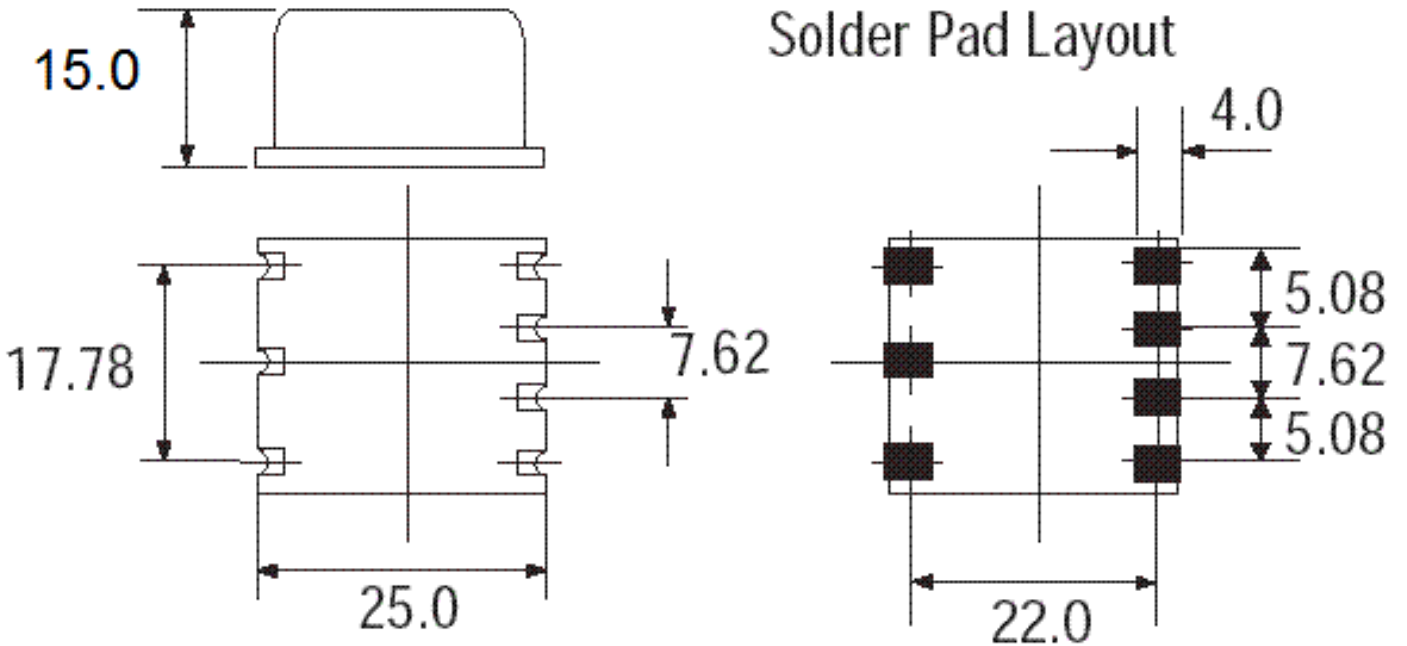
## Outline in mm - (scale 1:2) - Package 25 AS



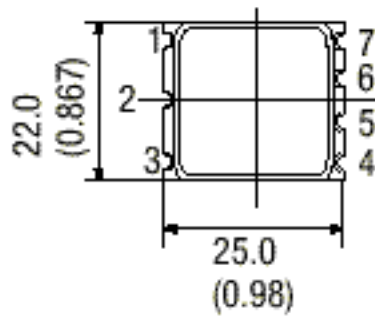
### Pad Connections

1. Frequency Control
2. Ref. Voltage
3. +Vs
4. RF Output
5. N/C
6. N/C
7. GND

### Solder Pad Layout

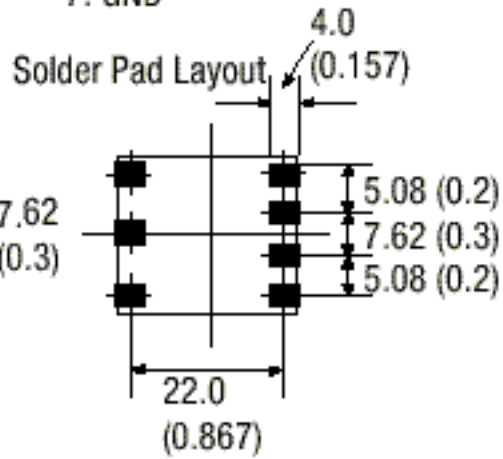
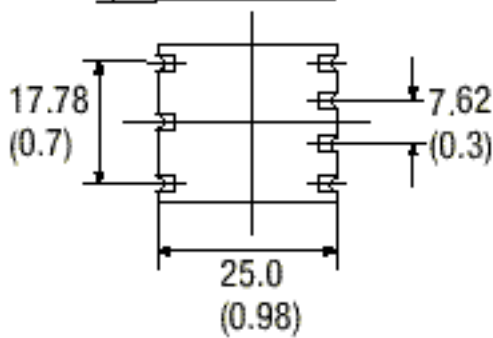
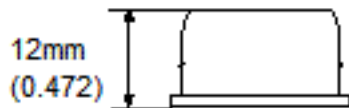


### Outline in mm (inches) - Package 25LP



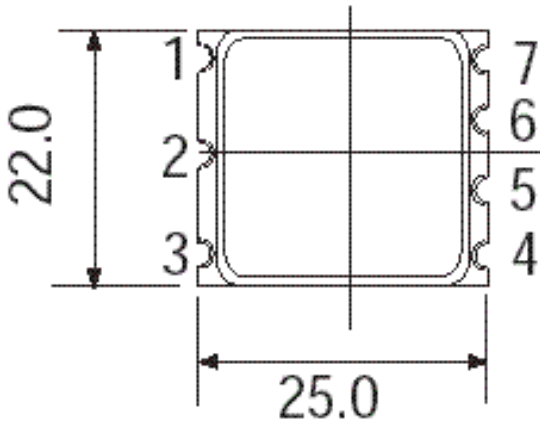
#### Pad Connections (top view)

- 1. Frequency Control
- 2. Ref. Voltage
- 3. +Vs
- 4. RF Output
- 5. N/C
- 6. N/C
- 7. GND



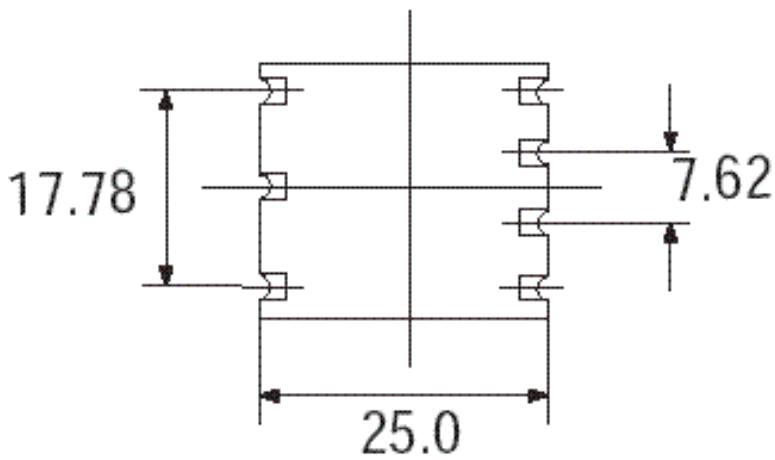
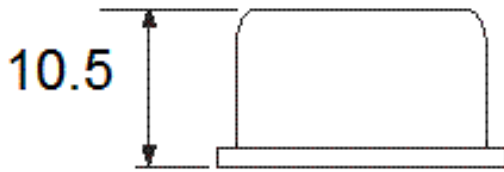
Tolerance  $\pm 0.2\text{mm}$  ( $\pm 0.008$ )

## Outline in mm - (scale 1:2) - Package 25LP

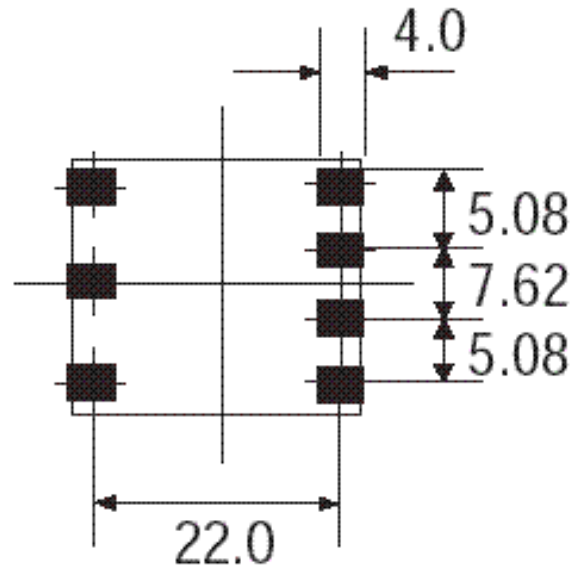


### Pad Connections

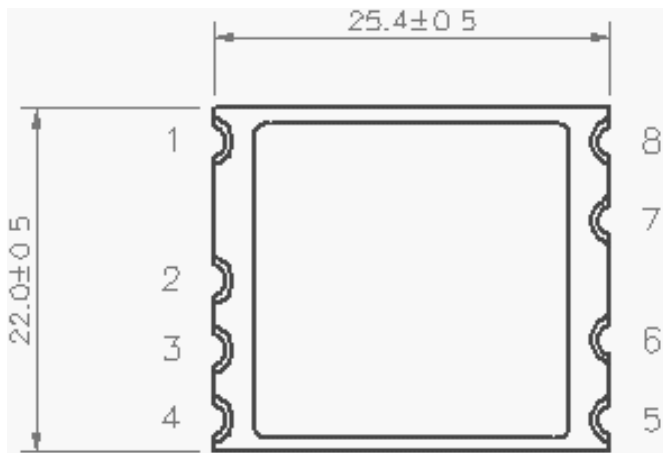
1. Frequency Control
2. Ref. Voltage
3. +Vs
4. RF Output
5. N/C
6. N/C
7. GND



### Solder Pad Layout

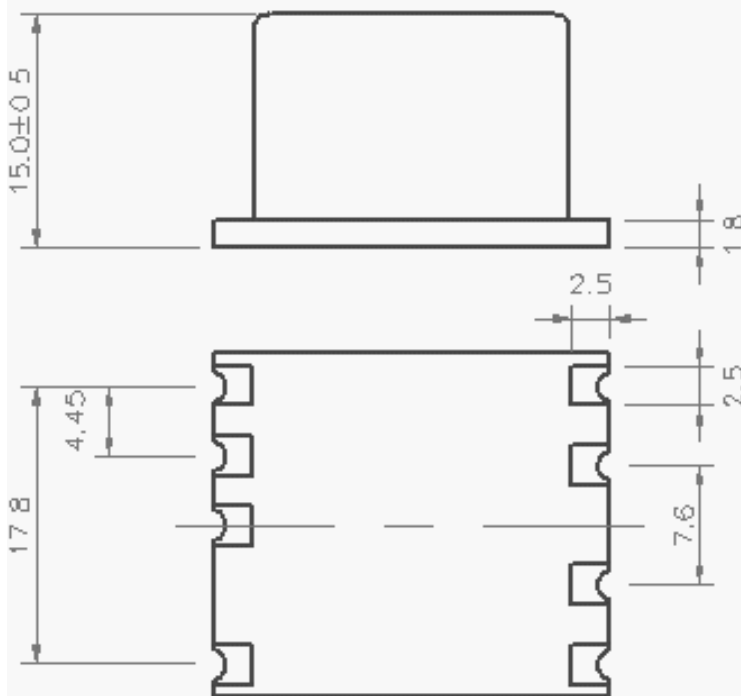


Drawing Name: CFPO11 Hermetic Holder (H 15mm)

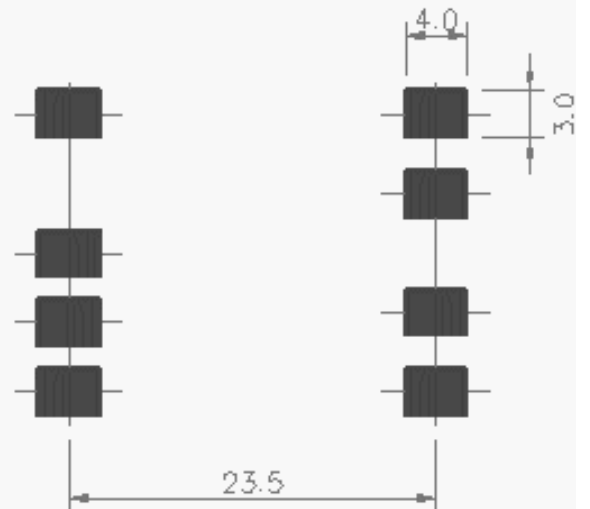


Outline drawing (Top view )

- 1- Frequency control input
- 2- Reference voltage
- 3- optional : Output Enabling
- 4- Supply voltage
- 5- Output signal
- 8- Ground ( mechanical & supply)



RECOMMENDED LAND PATTERN



**CFPO11 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 )

**RAKON**

**CFPO 11 A1**

**Fo: 26 MHz**

**S/N: A12345**

**DC: 0918**



Drawing Name: CFPO11 Part Number Builder

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

