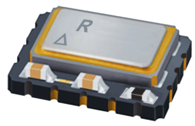
RFPT500

SMD Temperature Compensated Crystal Oscillator

SMD Temperature Compensated Crystal Oscillator for Stratum 3 applications.



Product description

The RFPT500 is based on Rakon's patented Pluto™ TCXO technology delivering industry leading performance. Tailored specifically to the requirements of Stratum 3 telecommunication applications the RFPT500 is a low cost solution which allows the system to be compliant with Belcore standards GR-253 and GR-1244. The standard package has 10 pads but 4 or 8 pad versions are available on request.

Applications

- IP timing
- Stratum 3
- Communications
- Other

Features

- Excellent holdover stability
- Exceptional free-running accuracy
- Very wide operating temperature range

Specifications

1.0 SPECIFICATION RFERENCES

Line	Parameter	Description
1.1	Part number	ExxxxLF
1.2	Description	RFPT500
1.3	Version	A (2014-05-20)
1.4	RoHS compliant	Yes

2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Value	Unit
2.1	Nominal frequency		10 to 30	MHz
2.2	Holdover stability, temperature	Reference (Fmax+Fmin)/2	±0.14 to 0.28	ppm
2.3	Holdover stability, 24 hour drift	24 hours, at constant temperature after 48 hours operation	±40 max	ppb/day
2.4	Max. slope (ΔF/ΔT) over temperature	Available upon request		
2.5	Temperature range		-40 to 85	°C
2.6	Free-run accuracy	Inclusive of calibration tolerance at 25°C, temperature, supply voltage 3.3V±5%, load 15pF±5pF, reflow soldering and ageing 20 years	±4.6 max	ppm
2.7	Supply voltage stability	±5% variation in supply voltage at 25°C	±0.1 max	ppm

3.0 POWER SUPPLY

Line	Parameter	Test Condition	Value	Unit
3.1	Supply voltage, Vs	±5%	2.5 to 6	V
3.2	Current		3 to 8	mA

4.0 VOLTAGE CONTROL

Line	Parameter	Description
4.1	Voltage Control	Fixed frequency is standard for the RFPT500 series but voltage control is available

5.0 OSCILLATOR OUTPUT

Line	Parameter	Test Condition	Value	Unit
5.1	Output waveform	HCMOS		
5.2	Output voltage low level		0.1 max	Vs
5.3	Output voltage high level		0.9 min	Vs
5.4	Output load	Nominal	15	pF
5.5	Duty cycle	At 50%	45 to 55	%
5.6	Rise and fall time	10% to 90%	8 max	ns

6.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
6.1	SSB phase noise power density at 1Hz offset	Typical values for a 12.8MHz oscillator at 25°C	-65	dBc/Hz
6.2	SSB phase noise power density at 10Hz offset	Typical values for a 12.8MHz oscillator at 25°C	-95	dBc/Hz
6.3	SSB phase noise power density at 100Hz offset	Typical values for a 12.8MHz oscillator at 25°C	-120	dBc/Hz
6.4	SSB phase noise power density at 1kHz offset	Typical values for a 12.8MHz oscillator at 25°C	-130	dBc/Hz
6.5	SSB phase noise power density at 10kHz offset	Typical values for a 12.8MHz oscillator at 25°C	-140	dBc/Hz
6.6	SSB phase noise power density at 100kHz offset	Typical values for a 12.8MHz oscillator at 25°C	-145	dBc/Hz

7.0 ENVIRONMENTAL

Line	Parameter	Description
7.1	Vibration	IEC 60068-2-6, test Fc, 10-60Hz 1.5mm displacement, 60-2000Hz at 10gn, 30 minutes in each of three mutually perpendicular axes at 1 octave per minute
7.2	Shock	IEC 60068-2-27, test Ea: 1500gn acceleration for 0.5ms duration, half-sine pulse, 3 shocks in each direction along three mutually perpendicular axes
7.3	Soldering	SMD product suitable for reflow soldering. Peak temperature 260°C. Maximum time above 220 °C, 60s
7.4	RoHS	Parts are fully compliant with the European Union directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Note these RoHS compliant parts are suitable for assembly using both lead-free solders and tin/lead solders
7.5	Storage temperature range	-55 to 125°C
7.6	Humidity	85% for 48 hours at 85°C, non-condensing

8.0 MARKING

Line	Parameter	Description
8.1	Type	Laser marked
8.2	Line 1	R and manufacturing identifier (X XX)
8.3	Line 2	Pad 1 / static sensitivity identifier (Δ), abbreviated part number (0000), device date code (YW) (refer to model drawing)

9.0 PIN CONNECTIONS

Line	Parameter	Description
9.1	Pin 1	Do not connect
9.2	Pin 2	NC
9.3	Pin 3	Do not connect
9.4	Pin 4	GND
9.5	Pin 5	RF Output
9.6	Pin 6	NC
9.7	Pin 7	NC
9.8	Pin 8	Tri-state control (Enable)*
9.9	Pin 9	Supply, +Vs
9.10	Pin 10	Do not connect
9.11	*	Leave unconnected if not required

10.0 MANUFACTURING INFORMATION

Line	Parameter	Description
10.1	Reflow	Solder reflow processes as per diagram (reflow profile). Solderability: MIL-STD-202, method 208, category 3
10.2	Packaging description	Quantity ≥ 100 pcs will be suplied on tape and reel

11.0 TRISTATE CONTROL

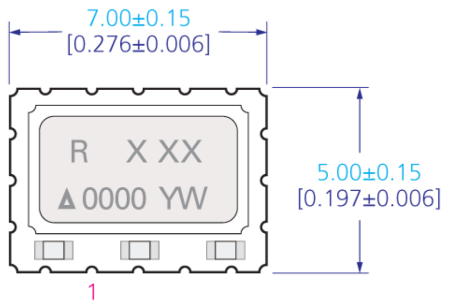
Line	Parameter	Description
11.1	Output enabled	Pad 8 open circuit or ≥0.6Vs. Output enabled
11.2	Output in tristate mode	Pad 8 ≤0.2Vs. Output high impedance. Note 2

12.0 NOTES

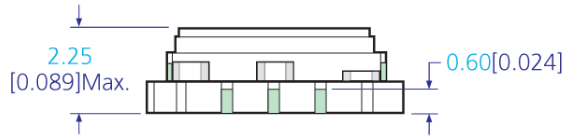
Line	Parameter	Description
12.1	Note 1	±0.14ppm over -40 to 85°C may not be available at all frequencies
12.2	Note 2	In tristate mode the ouput stage is disabled but the oscillator and compensation circuit are still active (current consumption approximately 1mA)

Drawing Name: RFPT500 Model Drawing

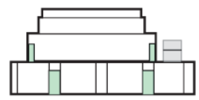
MODEL DRAWING



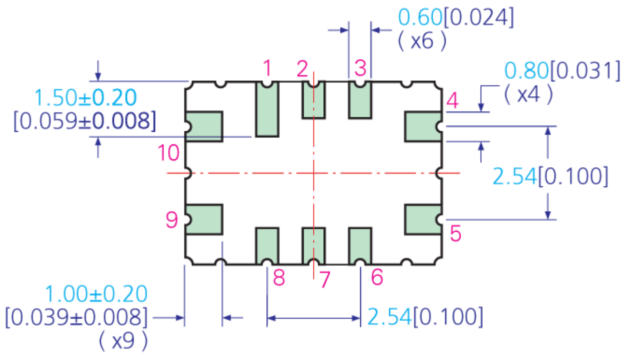
TOP VIEW



SIDE VIEW



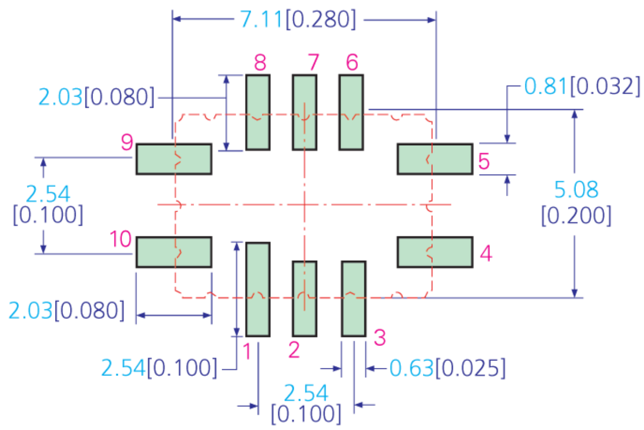
END VIEW



BOTTOM VIEW

NOTE: Pin connections are detailed in the specification

RECOMMENDED PAD LAYOUT - TOP VIEW



TITLE: RFPT500 MODEL OUTLINE DRAWING

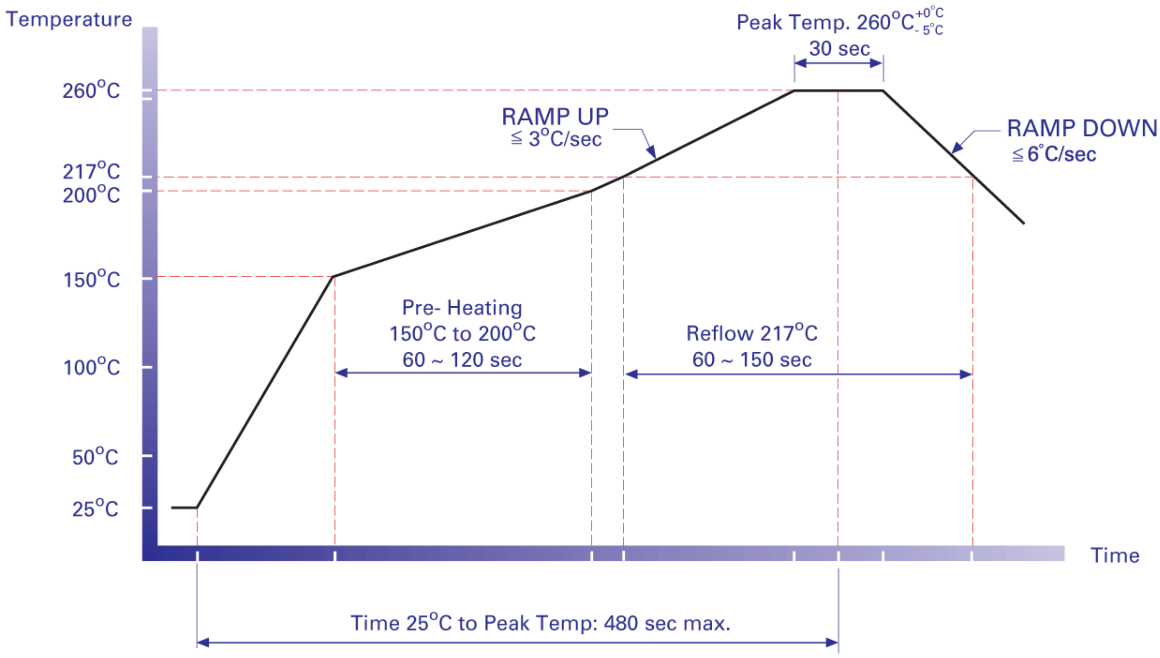
FILENAME: RFPT500_MD | REVISION: A

RELATED DRAWINGS: | DATE: 22-Jul-10 | SCALE: 5 : 1 | Millimeters [inch]

Tolerance:
XX = ±0.5
X.X = ±0.2
X.XX = ±0.10
X.XXX = ±0.05
X° = ±1.0°
Hole = ±0.10

Drawing Name: RFPT500 Series Reflow Profile

Pb-Free Reflow Soldering Profile *



* NOTE:
This profile was used during the qualification testing of the product and therefore represents worst case conditions. It is not recommended for use by the customer in the actual assembly of these parts.

TITLE: RFPT500 SERIES REFLOW PROFILE		Tolerance:
FILENAME: RFPT500_RF	REVISION: B	XX = ±0.5
RELATED DRAWINGS:	DATE: 09-Sep-10	X.X = ±0.2
	SCALE: NTS	X.XX = ±0.10
	Millimeters [inch]	X.XXX = ±0.05
		X° = ±1.0°
		Hole = ±0.10