

E7240LF

1.0 Specification References

Parameter	Description
a. Rakon part number	E7240LF
b. Description	40.0MHz RPT5032A TCVCXO
c. Version	A (2016-06-01) - PROVISIONAL
d. Package	L x W: 5.0 x 3.2 mm nom., H: 2.1 mm max (6 pad)



2.0 Absolute Maximum Ratings ¹

Parameter	Min.	Max.	Unit.
a. Junction temperature		150	°C
b. Supply voltage (Vcc)	-0.5	7	V
c. Control voltage (Vc)	-0.5	9	V
d. All other inputs	-0.5	Vcc + 0.5	V
e. Power dissipation		100	mW

3.0 Frequency Characteristics

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Nominal frequency		40.0		MHz	
b. Frequency calibration			±1	ppm	Initial accuracy at 25°C ±1°C, Vc=1.5V
c. Reflow shift			±1	ppm	Pre to post reflow ΔF, 2x reflow (measured ≥ 60 minutes after reflow)
d. Operating temperature range	-40		85	°C	
e. Frequency stability over temperature			±280	ppb	Reference to (F _{MAX} + F _{MIN})/2
f. Supply voltage stability		±50		ppb	±5% variation, reference to frequency at nominal supply voltage
g. Load sensitivity		±50		ppb	±10% variation, reference to frequency at nominal load
h. Long term stability			±2 ±4	ppm ppm	1 year 10 years
i. Acceleration stability		< 2		ppb/g	Gamma vector, 3-axes, 30-1500Hz
j. Start-up time			15	ms	90% amplitude

4.0 Power Supply

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Supply voltage (Vcc)		3.3		V	±5%
b. Supply current		3.9	5	mA	

¹ Operating beyond this limit may result in change or permanent damage to the device.

5.0 Control Voltage (Vc)

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Control voltage range	0.5		2.5	V	
b. Frequency tuning	±7		±15	ppm	Reference to frequency at Vc=1.5V
c. Slope		+9		ppm/V	
d. Linearity			1	%	
e. Port input impedance	100			kΩ	
f. Modulation bandwidth	1			Hz	

6.0 Oscillator Output – Clipped Sinewave (CS)

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Output waveform					DC coupled clipped sinewave
b. Output voltage level	0.8	1.1		Vpp	
c. Output load resistance		10		kΩ	
d. Output load capacitance		10		pF	

7.0 Tri-State Control²

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Tri-state mode					The device features a tri-state mode which allows the output to be disabled and brought into a high impedance state
b. Tri-state control (pin 6), input level low (V _{IL})			20%Vcc	V	Device disabled (output in high impedance state)
c. Tri-state control (pin 6), input level high (V _{IH})	60%Vcc			V	Device enabled (operating)
d. Current when in tri-state mode		2		mA	
e. Output enable time			100	μs	

8.0 Pin Connections

Parameter	Connections
a. Pin 1	Control Voltage (Vc)
b. Pin 2	GND
c. Pin 3	Do not connect
d. Pin 4	RF Output (if an AC coupled output is required a 10nF capacitor should be placed in series with the output)
e. Pin 5	Supply Voltage (Vcc)
f. Pin 6	Tri-state Control (Enable) ²

² The tristate control (enable) input pin has an internal 100kΩ pull up resistor which allows it to be left unconnected if not used. When in tristate mode, the output stage is disabled, but the oscillator and compensation circuit are still active.

9.0 SSB Phase Noise and RMS Jitter (at 25°C)

Parameter	Typ.	Max.	Unit.	Test Condition / Description
a. 1Hz offset	-58		dBc/Hz	
b. 10Hz offset	-87		dBc/Hz	
c. 100Hz offset	-119		dBc/Hz	
d. 1kHz offset	-138		dBc/Hz	
e. 10kHz offset	-148		dBc/Hz	
f. 100kHz offset	-152		dBc/Hz	
g. 1MHz offset	-153		dBc/Hz	
h. RMS Jitter	0.28		ps	12kHz ~ 5MHz

10.0 Marking

Parameter	Description
a. Type	Laser marked
b. Line 1	[R X XX] R = Rakon, X XX = manufacturing identifier
c. Line 2	[Δ nnnn YW] Δ = pin 1 mark, nnnn = abbreviated part number, YW = device date code

11.0 Manufacturing Information

Parameter	Description
a. Reflow soldering	See reflow profile diagram
b. Packaging description	Tape and reel, 51 to 1000 units per Ø178mm (Ø 7") reel, 1001 to 2000 units per Ø330mm (Ø 13") reel

12.0 Environmental Specification

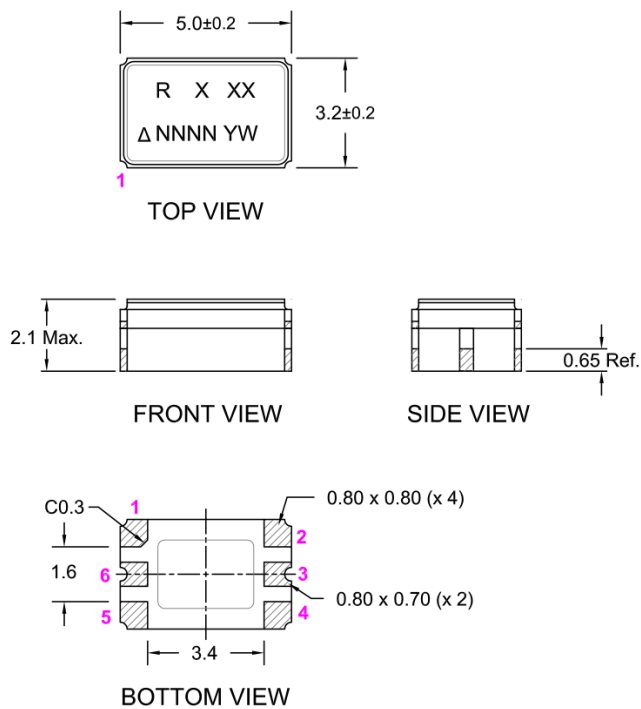
Parameter	Description
a. RoHS compliant	Parts are fully compliant with the European Union directives 2002/95/EC and 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Note the parts are suitable for assembly using both Lead-free solders and Tin / Lead solders.
b. Solderability	JESD22-B102, M1, condition E (IPC/EIA J-STD-002A), 245°C for 5s, precondition for 16 hours at +150°C
c. High Temperature Operating Life (HTOL)	JESD22-A108, 1008 hours at +125°C
d. Temperature cycle	JESD22-A104, 500 cycles, -55°C to +125°C
e. Low temperature storage	IEC 60068-2-1 test Ab, 1000 hours at -55°C
f. High temperature storage	IEC 60068-2-2 test Bb, 1000 hours at +125°C
g. Moisture resistance	JESD22-A113, MSL = 1
h. Temperature / Humidity bias	JESD22-A101, 1008 hours at +85°C / 85% R.H., precondition: 3 Reflow cycles (peak temperature 260°C)
i. Mechanical vibration	JESD22-B103, 20g, 60-2000Hz, 4 hours in each of three axes (12 hours total)
j. Mechanical shock	JESD22-B104, 1500g _n , 0.5ms, 5 pulses in each of 6 directions
k. Aging	MIL-PRF-55310, 1008 hours at +85°C, precondition: 3 Reflow cycles (peak temperature 260°C)
l. Resistance to soldering heat	IPC/JEDEC J-STD-020, 3 reflow cycles (peak temperature 260°C)

13.0 Disclaimer

Parameter	Description
a. Disclaimer	"Samples supplied according to this specification are supplied from our development or pre-production programme and as such are not qualification approved products. No condition, warranty or representation regarding quality, suitability, performance, life or continuation of supply is given or implied and Guarantee in clause 6.1 of our standard Conditions of Sale is not applicable. The right is reserved to change the design or specification or cease supply without notice." RAKON Limited

14.0 Model Outline:

MODEL DRAWING



PIN CONNECTIONS

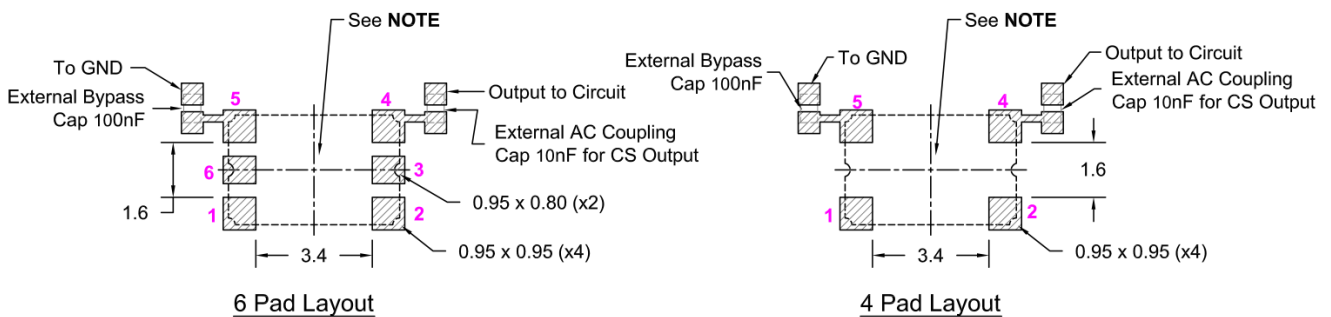
1 *	Do Not Connect / Vc
2	GND
3 *	Do Not Connect / Vref / Vtemp
4	RF Output
5	Vcc
6	Enable

* Depending on specification

NOTE:

- The area between the pads is a keep-out area, no tracks or ground plane allowed on any layer.

RECOMMENDED PAD LAYOUT - TOP VIEW



TITLE: RPT5032 MODEL (6 Pad, H2.1mm Max.)

RELATED DRAWINGS:

FILENAME: CAT794

REVISION: C

DATE: 05-Mar-14

SCALE:

Millimetres

TOLERANCES:

XX =

X.X = ±0.2

X.XX = ±0.10

X.XXX =

X° =

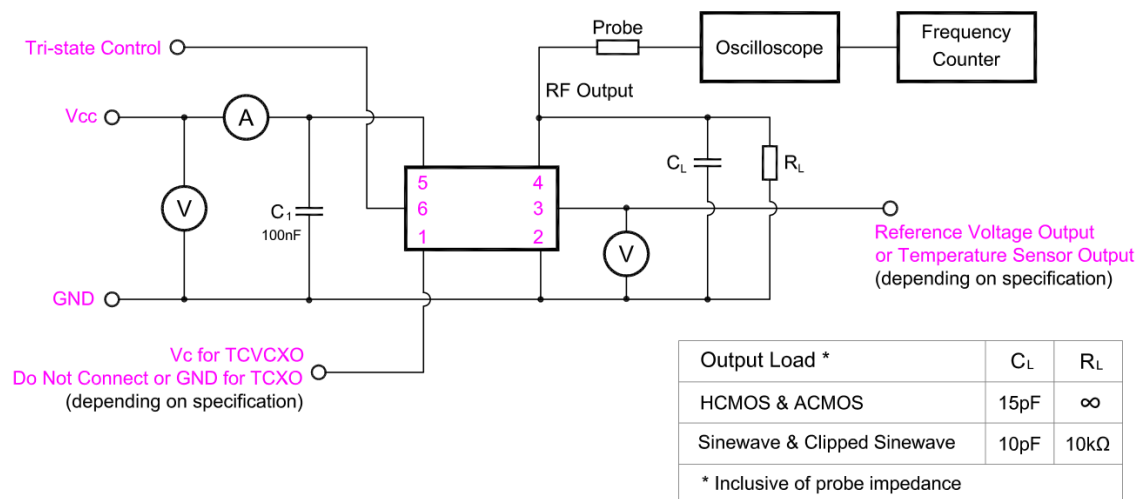
Hole =

rakon

© 2013 Rakon Limited

15.0 Test Circuit:

6 PIN TEST CIRCUIT:



TITLE: Pluto+ TCXO/TCVCXO TEST CIRCUIT

FILENAME: CAT781

RELATED DRAWINGS:

REVISION: A

DATE: 20-Mar-13

SCALE: NTS

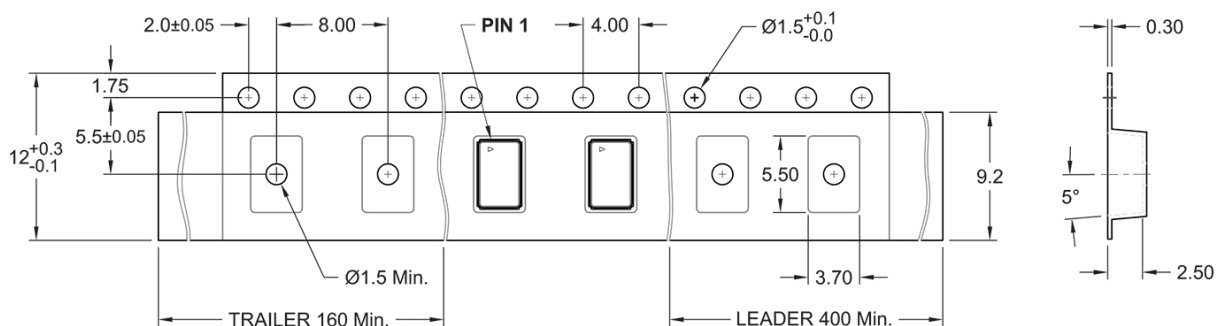
Millimetres

rakon

© 2013 Rakon Limited

16.0 Tape and Reel (Ø178mm/ Ø330mm):

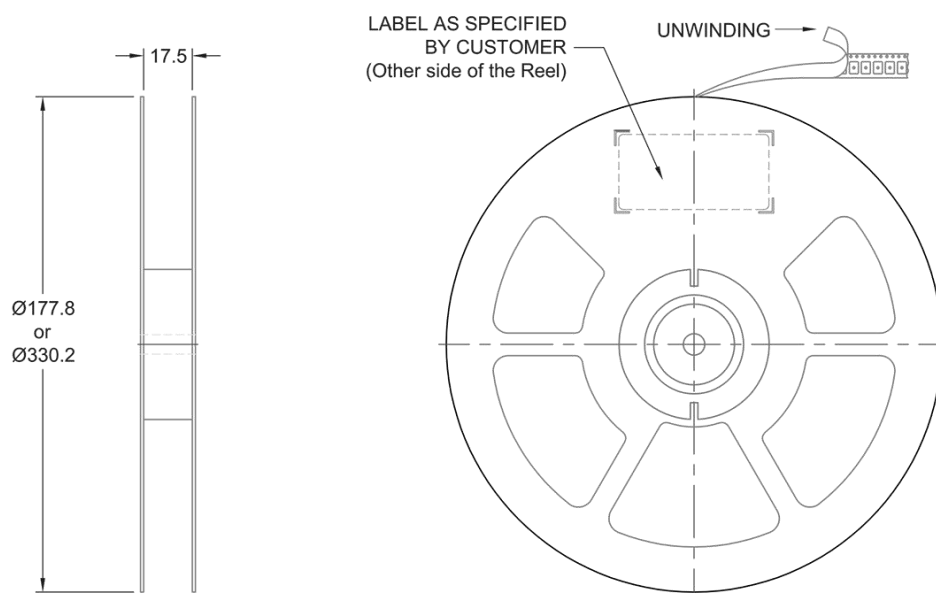
TAPE DETAILS



NOTE:

- 1) 10 sprocket hole pitch cumulative tolerance ± 0.20 .
- 2) Camber not to exceed 1.0mm in 250mm.

REEL DETAILS



TITLE: PLUTO+ 5032 SERIES TAPE & REEL

FILENAME: CAT811

TOLERANCES:

RELATED DRAWINGS:

REVISION: A

XX =

DATE: 12-Aug-13

X.X = ± 0.2

SCALE:

X.XX = ± 0.10

Millimetres

X° =

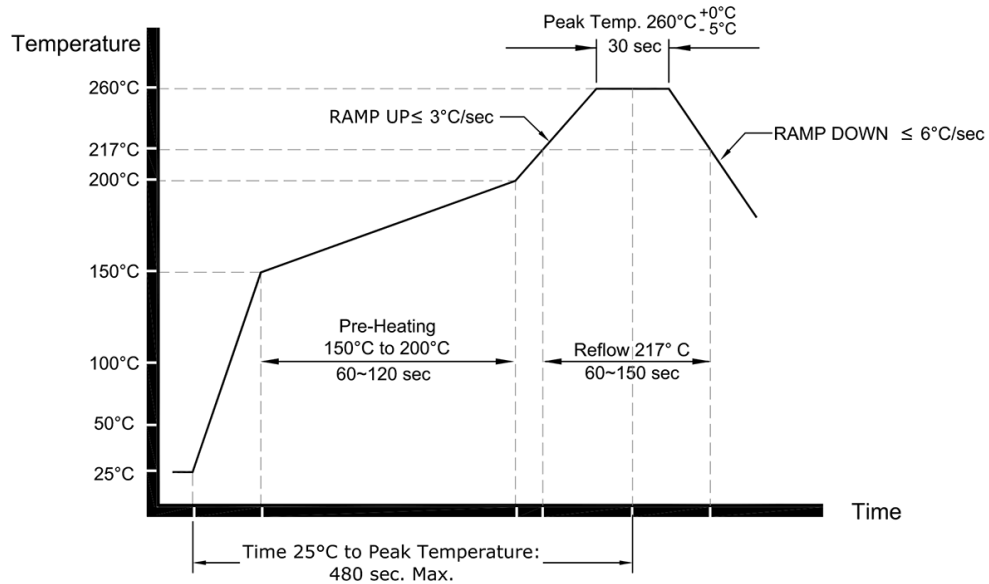
Hole =

rakon

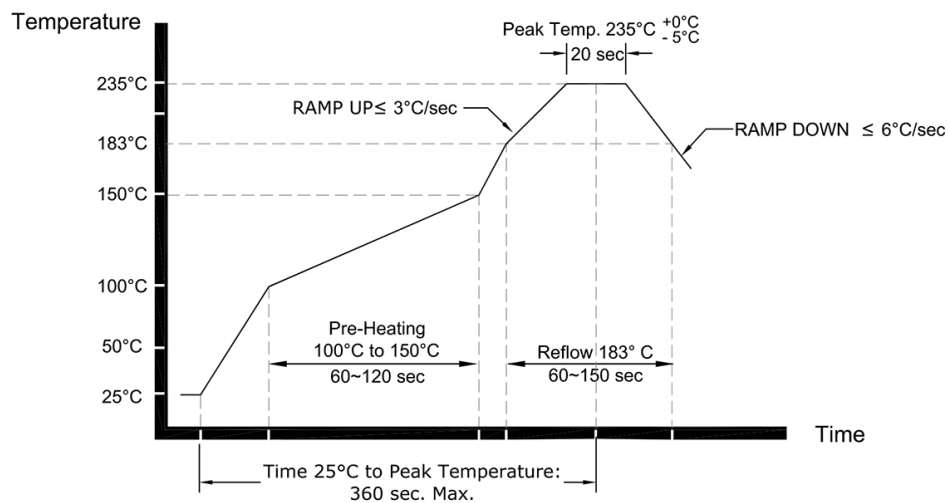
© 2013 Rakon Limited

17.0 Reflow:

Pb-Free Reflow Soldering Profile *



Sn-Pb Eutectic Reflow Soldering Profile *



*** NOTE:**

These profile were used during the qualification testing of the product and therefore represents worst case conditions. They are not recommended for use by the customer in the actual assembly of these parts.

TITLE: Pluto 7050 Series TCXO Reflow

FILENAME: CAT711

RELATED DRAWINGS:

REVISION: B

DATE: 25-Jun-13

SCALE: NTS

Millimetres

rakon

© 2013 Rakon Limited

18.0 Specification History

Version	User	Changes	Approver	Date
A.	JO	Initial issue	JO	2016-06-01