E7715LF



1.0 Specification References

Parameter	Description
a. Rakon part number	E7715LF
b. Description	10.0MHz RPT5032N TCVCXO
c. Version	A (2018-03-19) - PROVISIONAL
d. Package	L x W: 5.0 x 3.2 mm nom., H: 1.7 mm max. (4 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. All other inputs	-0.5	Vcc + 0.5	V
d. Power dissipation		100	mW

3.0 Frequency Characteristics

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Nominal frequency		10.0		MHz	
b. Frequency calibration			±1	ppm	Initial accuracy at 25°C ±1°C, Vc=1.5V
c. Reflow shift			±0.5	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)
d. Operating temperature range	-40		+85	°C	
e. Frequency stability			±0.28	ppm	Reference to $(F_{MAX} + F_{MIN})/2$
f. Supply voltage stability		±25		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			±1 ±3	ppm	1 year 10 years
i. Acceleration sensitivity		< 2		ppb/*g*	Gamma vector of all 3 axes from 30 to 1500 Hz
j. Start-up time			5	ms	90% amplitude

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

4.0 Power Supply

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

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	±5		±10	ppm	Reference to frequency at Vc=1.5V
c. Slope		+7		ppm/V	
d. Linearity			1	%	
e. Port input impedance	100			kΩ	
f. Modulation bandwidth	2			kHz	

6.0 Oscillator Output – HCMOS

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Output waveform					HCMOS (LVCMOS & LVTTL compatible as per JESD8C)
b. Output voltage level low (V_{OL})			10% Vcc	V	
c. Output voltage level high (V_{OH})	90% Vcc			V	
d. Rise and fall time			8	ns	10% to 90% level
e. Duty cycle	45		55	%	At 50% level
f. Load		15		pF	

7.0 SSB Phase Noise (at 25°C)

Parameter	Typ.	Unit.	Test Condition / Description
a. 1Hz offset	-65	dBc/Hz	
b. 10Hz offset	-95	dBc/Hz	
c. 100Hz offset	-119	dBc/Hz	
d. 1kHz offset	-135	dBc/Hz	
e. 10kHz offset	-147	dBc/Hz	
f. 100kHz offset	-150	dBc/Hz	
g. 1MHz offset	-152	dBc/Hz	

8.0 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

9.0 Manufacturing Information

Parameter	Description
a. Reflow soldering	See reflow profile diagram
b. Packaging description	Tape and reel (see drawing)
c. Application note	For optimum performance follow the instructions in Guidelines for use of Pluto/Pluto+™ Ultra-Stable TCXOs

10.0 Environmental Specification

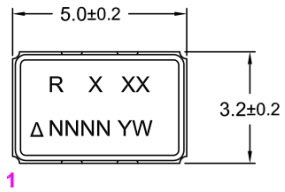
Parameter	Description
a. RoHS	Parts are fully compliant with the European Union directives 2002/95/EC and 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Note the RoHS compliant parts are suitable for assembly using both Lead-free solders 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, 20*g*, 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)

11.0 Disclaimer

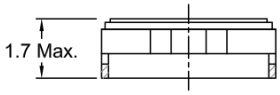
Parameter	Description
a. Disclaimer	"Samples supplied according to this specification are supplied from our development or pre-production programme and as such are not qualification approved products. No condition, warranty or representation regarding quality, suitability, performance, life or continuation 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

12.0 Model Outline:

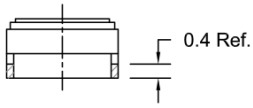
MODEL DRAWING



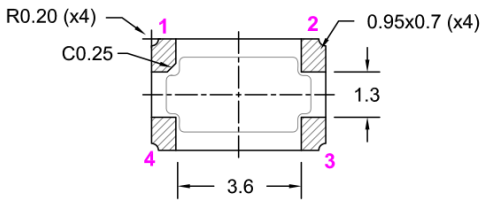
TOP VIEW



FRONT VIEW



SIDE VIEW



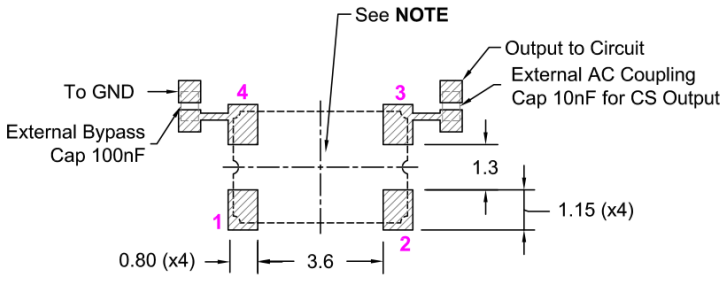
BOTTOM VIEW

Pin	Connections
1	Control Voltage (Vc)
2	GND
3	RF Output
4	Supply Voltage (Vcc)

NOTE:

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

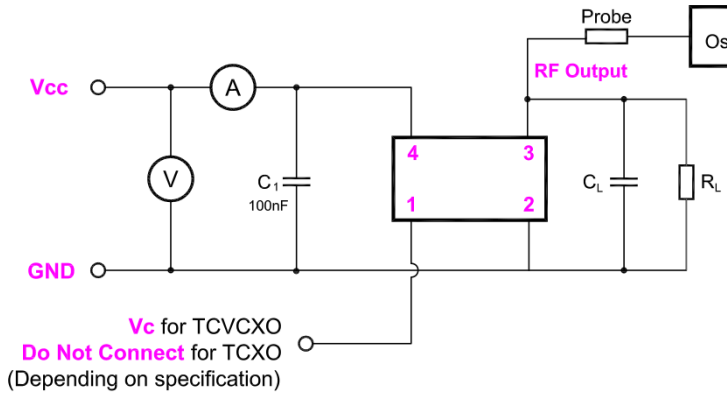
RECOMMENDED PAD LAYOUT - TOP VIEW



TITLE: RPT5032 MODEL (4 Pad, H1.7mm Max.)	FILENAME: CAT871	TOLERANCES:
RELATED DRAWINGS:	REVISION: A	XX =
	DATE: 06-Mar-14	X.X = ±0.2
	SCALE:	X.XX = ±0.13
	Millimetres	X.XXX =
		X° =
		Hole =

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13.0 Test Circuit and Output Waveform:



Output Load *	C_L	R_L
HCMOS & ACMOS	15pF	∞
Sinewave & Clipped Sinewave	10pF	10kΩ
* Inclusive of probe impedance		

TITLE: Pluto+ TCXO/VCTCXO TEST CIRCUIT (4 Pad)

FILENAME: CAT874

RELATED DRAWINGS:

REVISION: A

DATE: 06-Mar-14

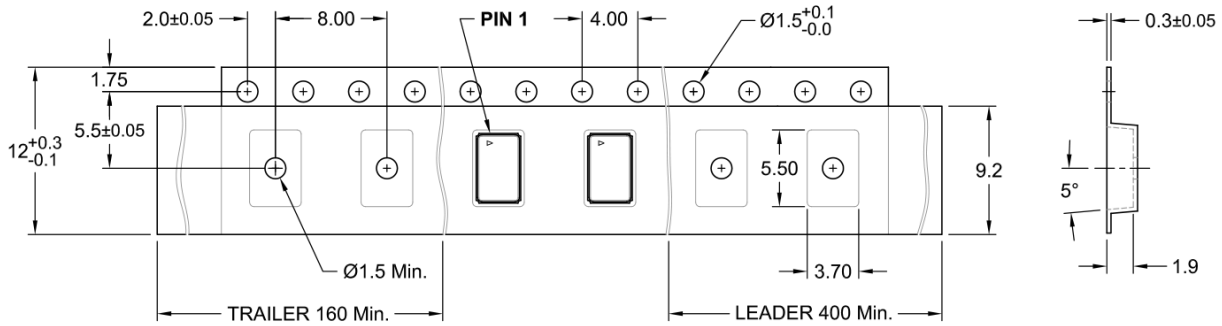
SCALE: NTS

Millimetres

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14.0 Tape and Reel (Ø178mm/ Ø330mm):

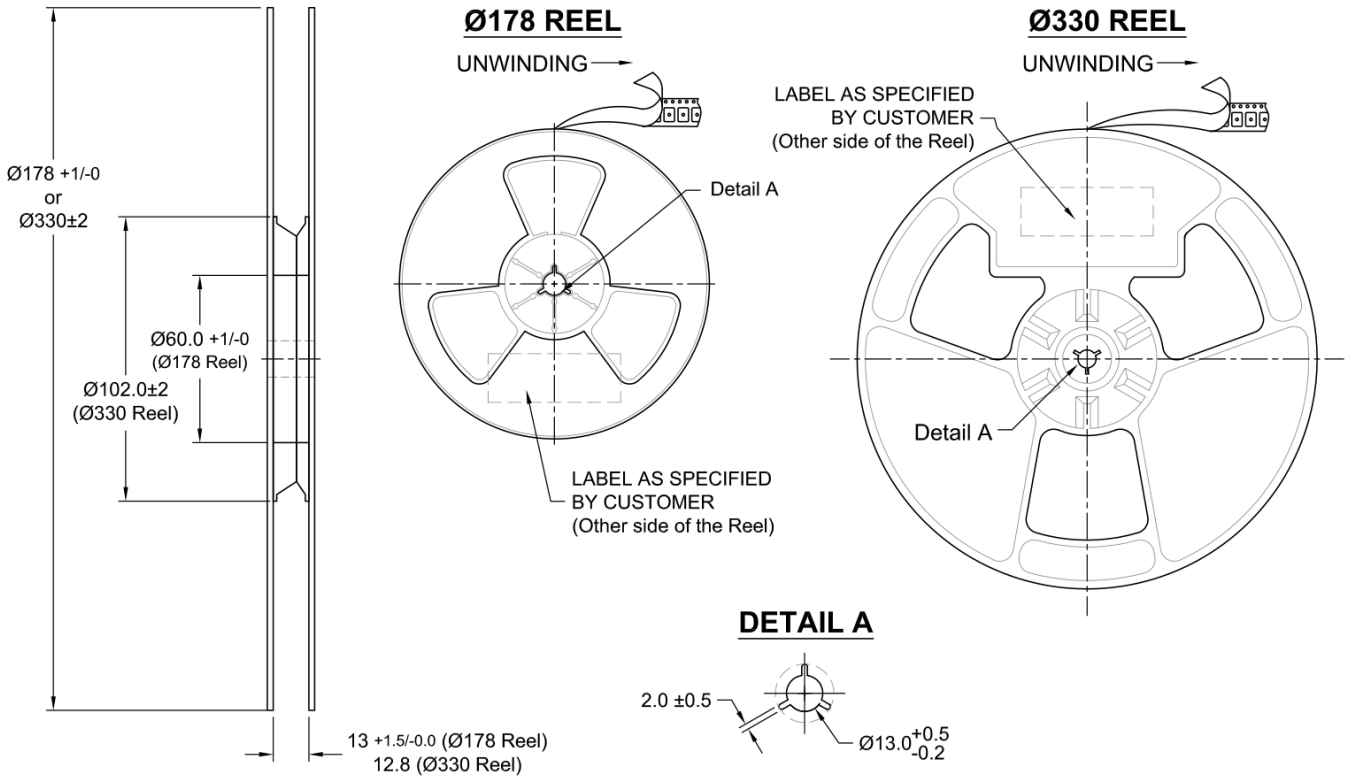
TAPE DETAILS



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

REEL DETAILS

Not To Scale

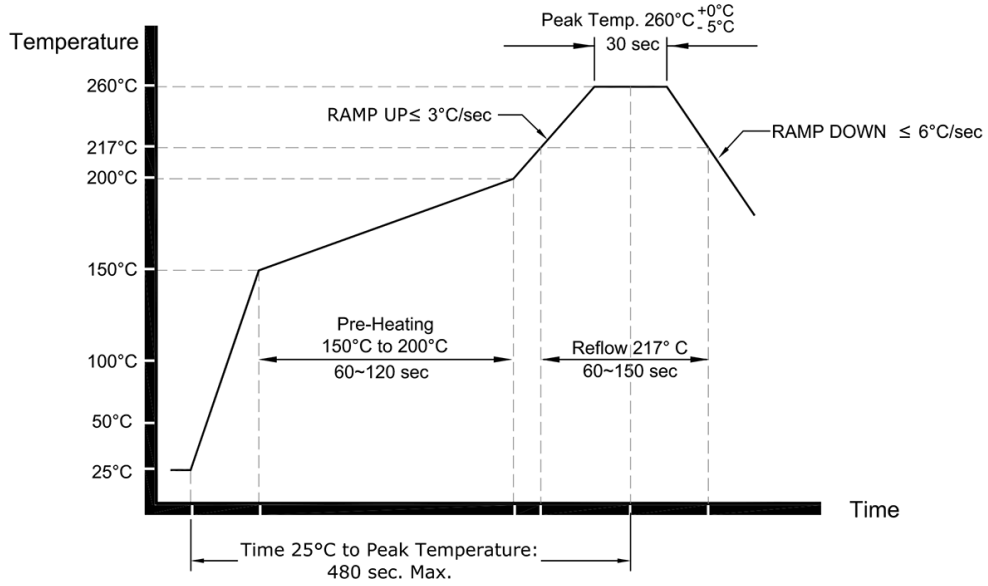


TITLE: PLUTO+ 5032 SERIES TAPE & REEL	FILENAME: CAT811	TOLERANCES:
RELATED DRAWINGS:	REVISION: B	XX = ±1
	DATE: 06-Mar-2017	X.X = ±0.2
	SCALE:	X.XX = ±0.1
	Millimetres	X.XXX =
		X° =
		Hole =

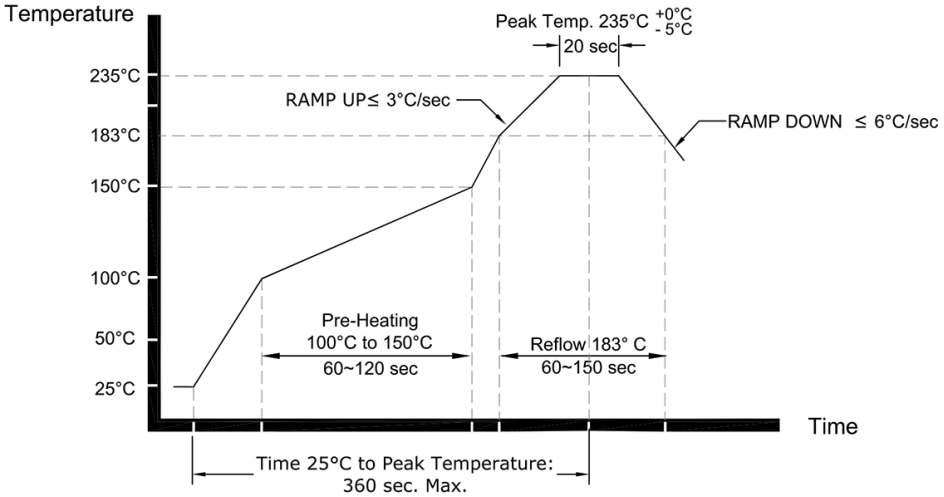
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15.0 Reflow:

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

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16.0 Specification History

Version	User	Changes	Approver	Date
A	JO	Initial issue	MH	2018-03-19