E7310LF

1.0 Specification References

Parameter	Description
a. Rakon part number	E7310LF
b. Description	40.0MHz RPT7050D TCXO
c. Version	B (2018-08-13) - PROVISIONAL
d. Package	L x W: 7.0 x 5.0 mm nom, H: 1.8mm 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		40.0		MHz	
b. Frequency calibration			±1	ppm	At 25°C ± 2°C, at time of shipment, reference to nominal frequency
c. Reflow shift			±0.5	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)
d. Operating temperature range	-55		+85	°C	
e. Frequency stability over temperature			±0.28 ±1	ppm	-40°C to +85°C -55°C to -40°C Reference to $(F_{MAX} + F_{MIN})/2$
f. Frequency slope over temperature			±0.2	ppm/°C	ΔT ≤ 2°C
g. Supply voltage stability			±0.2	ppm	±5% variation, reference to frequency at nominal supply voltage
h. Load sensitivity			±0.4	ppm	±10% variation, reference to frequency at nominal load
i. Long term stability (at 25°C)			±2 ±4 ±5 ±5.5	ppm	1st year 10 years 15 years 20 years
j. Root Allan Variance		$4*10^{-10}$ $4*10^{-10}$			tau = 0.1s tau = 1s
k. Acceleration sensitivity		0.2	0.5	ppb/*g*	Gamma vector all axes over operating temperature range
l. Start-up time			15	ms	90% final 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			4.5	mA	

5.0 Oscillator Output

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

6.0 Pin Connections

Parameter	Connection
a. Pin 1	Do not connect (GND optional)
b. Pin 2	GND
c. Pin 3	RF Output
d. Pin 4	Supply Voltage (Vcc)

7.0 SSB Phase Noise (static, at 25°C)

Parameter	Typ.	Unit.	Test Condition / Description
a. 1Hz offset	-55	dBc/Hz	
b. 10Hz offset	-85	dBc/Hz	
c. 100Hz offset	-119	dBc/Hz	
d. 1kHz offset	-137	dBc/Hz	
e. 10kHz offset	-148	dBc/Hz	
f. 100kHz offset	-152	dBc/Hz	
g. 1MHz offset	-152	dBc/Hz	

8.0 Marking

Parameter	Description
a. Crystal 1 – Line 1	[R X YW] R = Rakon, X YW = Manufacturing Identifier
b. Crystal 1 – Line 2	[NNNN Δ] NNNN = abbreviated part number, Δ = static sensitivity identifier, pin 1 indicator
c. Crystal 2	Crystal 2 rotated by 180°
d. Crystal 2 – Line 1	[R X YW] R = Rakon, X YW = Manufacturing Identifier
e. Crystal 2 – Line 2	[YW] YW = manufacturing date code

9.0 Manufacturing Information

Parameter	Description
a. Reflow soldering	See reflow profile diagram. Solderability: MIL-STD-202, method 208, category 3
b. Packaging description	Tape and reel. Standard packing quantity is 500 pieces per reel.
c. Application note	For optimum performance follow the instructions in Guidelines for use of Pluto/Pluto+™ Ultra-Stable TCXOs

10.0 Environmental Specification

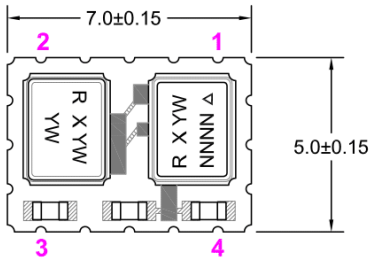
Parameter	Description
a. Storage temperature	-55°C to 125°C
b. Marking	Laser marked
c. RoHS	Parts are fully compliant with the European Union directives 2002/95/EC & 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Note the RoHS compliant parts are suitable for assembly using both Lead-free solders and Tin / Lead solders.

11.0 Disclaimer

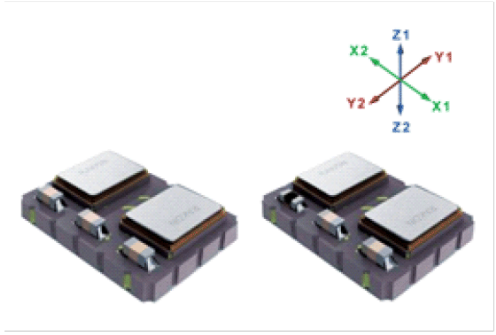
Parameter	Description
a. Disclaimer	"Samples supplied according to this specification are supplied from our development or pre-production programme and as such are not qualification approved products. No condition, warranty or representation regarding quality, suitability, performance, life or continuation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

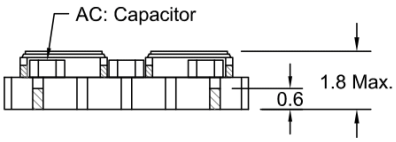
12.0 Model Outline:

MODEL DRAWING

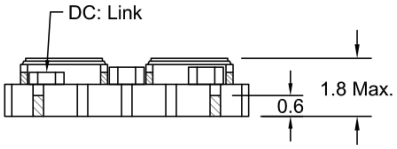


TOP VIEW

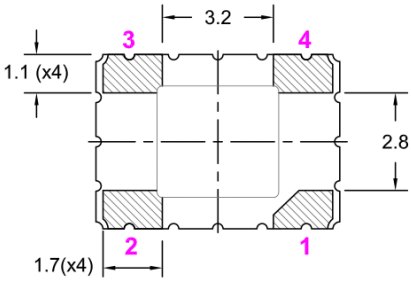




FRONT VIEW (AC)



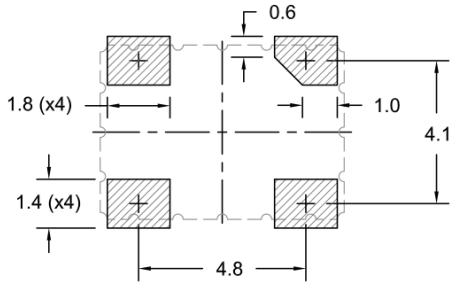
FRONT VIEW (DC)



BOTTOM VIEW

NOTE:
Pin connections are detailed in the specification.

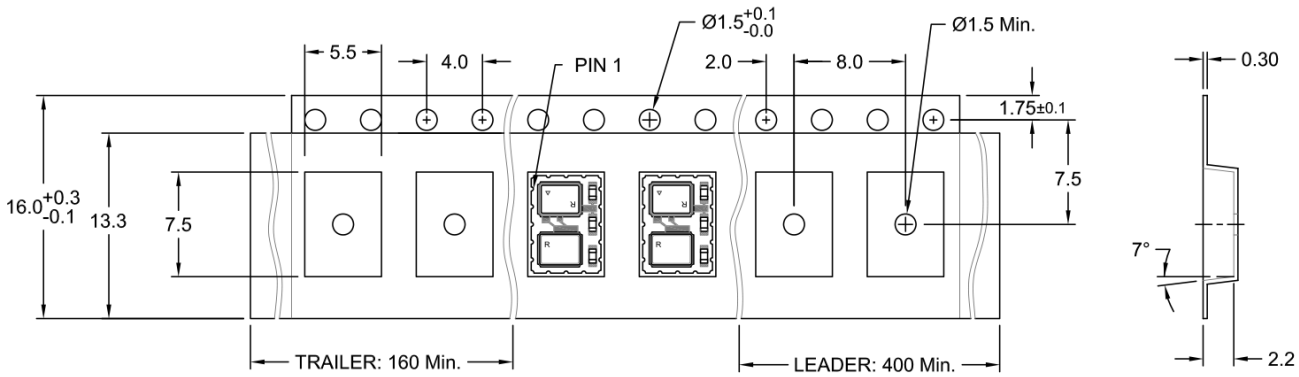
RECOMMENDED PAD LAYOUT - TOP VIEW



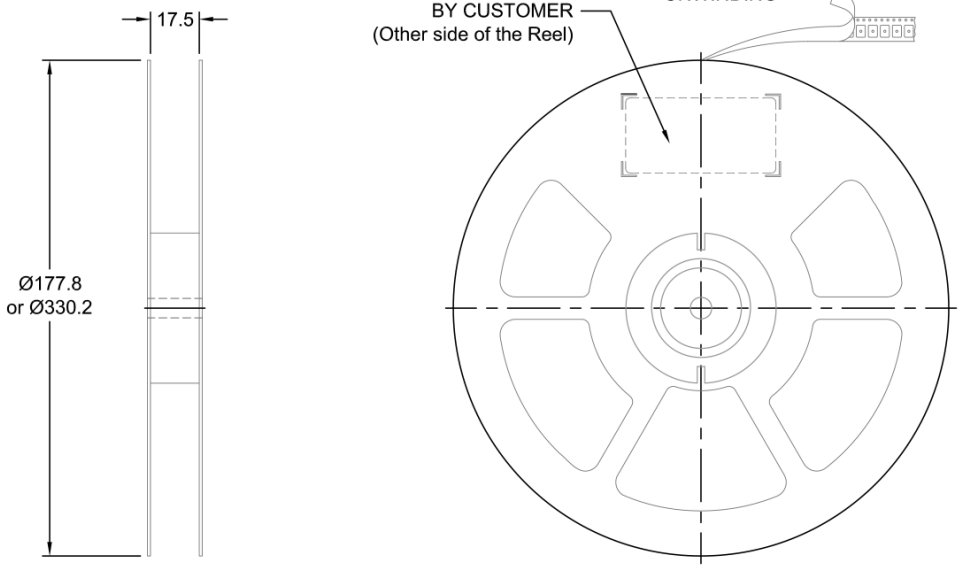
TITLE: RPT7050D MODEL	FILENAME: CAT891	TOLERANCES:	
RELATED DRAWINGS:	REVISION: B	XX	=
	DATE: 05-Mar-2015	X.X	= ±0.2
	SCALE: 5 : 1	X.XX	= ±0.10
	Millimetres	X.XXX	= ±0.05
		X°	=
		Hole	=

13.0 Tape and Reel (Ø178mm/ Ø330mm):

TAPE DETAILS



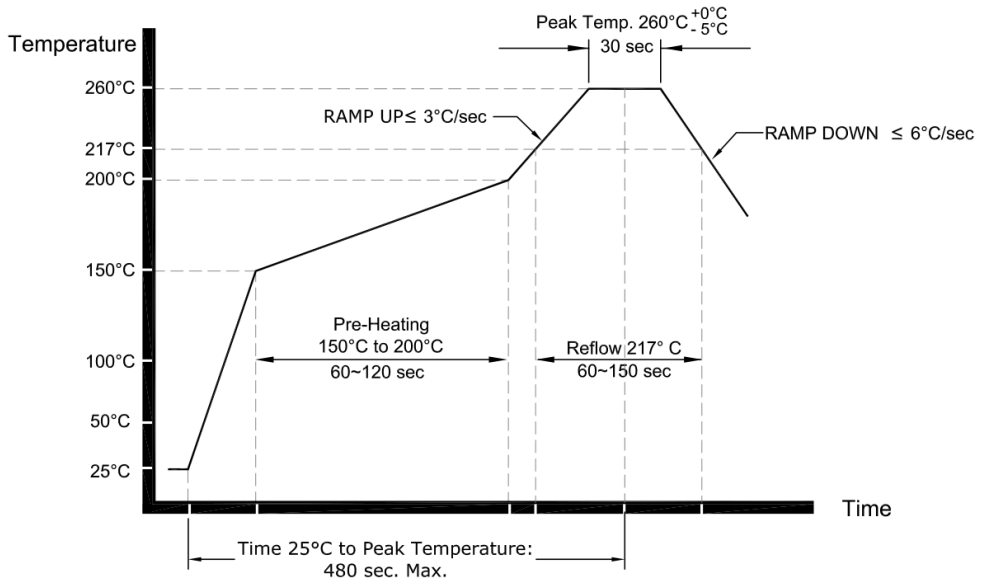
REEL DETAILS



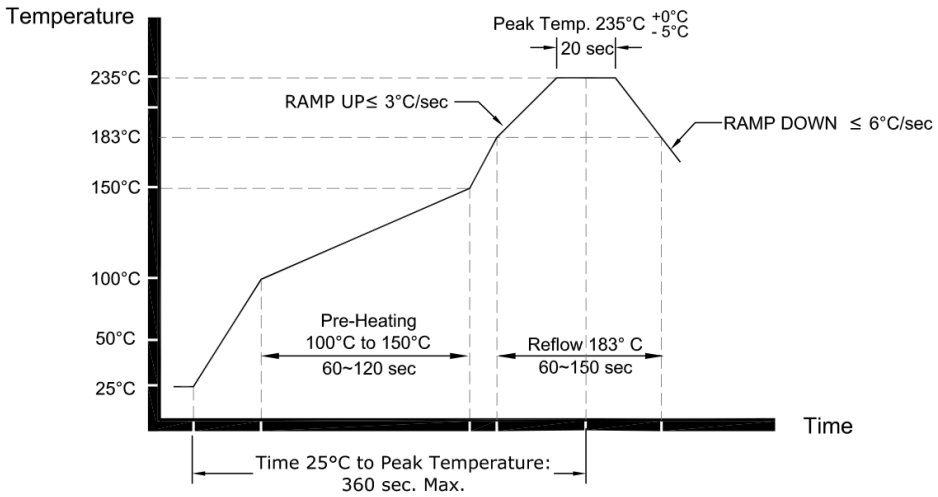
TITLE: RPT7050D SERIES TAPE & REEL	FILENAME: CAT892	TOLERANCES:	
RELATED DRAWINGS:	REVISION: A	XX =	
	DATE: 30-Oct-2014	X.X = ±0.2	
	SCALE:	X.XX = ±0.10	
	Millimetres	X.XXX =	
		X° =	
		Hole =	

14.0 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: RPT7050D SERIES REFLOW	FILENAME: CAT893
RELATED DRAWINGS:	REVISION: A
	DATE: 30-Oct-2014
	SCALE: NTS
	Millimetres

15.0 Specification History

Version	User	Changes	Approver	Date
A	JO	Initial issue	ML	2016-09-06
B	JO	Extended temperature range to -55°C to +85°C and reduced stability to ±0.28ppm (-40°C to +85°C), updated model image, modified environmental section.	ML	2018-08-13