

E8480LF



1.0 Specification References

Parameter	Description
a. Rakon part number	E8480LF
b. Description	40.0MHz RPT5032A TCVCXO
c. Version	A (2021-03-09)
d. Package	L x W x H: 5.0 x 3.2 x 1.9 mm nom. (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. 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	Initial accuracy at 25°C ±1°C, Vc=1.5V
c. Reflow shift (2x reflow)			±1	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)
d. Operating temperature range	-10		+70	°C	
e. Frequency stability over temperature			±100	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

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)	3.135	3.3	3.465	V	
b. Supply current		3.9	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	±7		±15	ppm	Reference to frequency at Vc=1.5V
c. Gain transfer (Kv)		+9		ppm/V	
d. Linearity			1	%	Deviation from a straight line curve fit
e. Port input impedance	100			kΩ	
f. Modulation bandwidth		15		Hz	

6.0 Oscillator Output – Clipped Sinewave

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	

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

8.0 SSB Phase Noise & Jitter (at 25°C)

Parameter	Typ.	Unit.	Test Condition / Description
a. 1Hz offset	-54	dBc/Hz	
b. 10Hz offset	-85	dBc/Hz	
c. 100Hz offset	-118	dBc/Hz	
d. 1kHz offset	-138	dBc/Hz	
e. 10kHz offset	-145	dBc/Hz	
f. 100kHz offset	-151	dBc/Hz	
g. 1MHz offset	-153	dBc/Hz	
h. RMS Jitter	0.28	ps	12kHz~5MHz

9.0 Marking

Parameter	Description
a. Type	Laser marked
b. Line 1	[R X XX] R = Rakon, XXX = manufacturing identifier
c. Line 2	[Δ 8480 YW] Δ = pin 1 mark, 8480 = abbreviated part number, YW = device date code

10.0 Manufacturing Information

Parameter	Description
a. Reflow soldering	Reflow profile as per IPC/JEDECJ-STD-020E (see drawing)
b. Packaging description	Tape & Reel as per EIA-481-E (see drawing)
c. Application note	For optimum performance follow the instructions in Guidelines for use of Pluto/Pluto+™ Ultra-Stable TCXOs

11.0 Environmental Specification

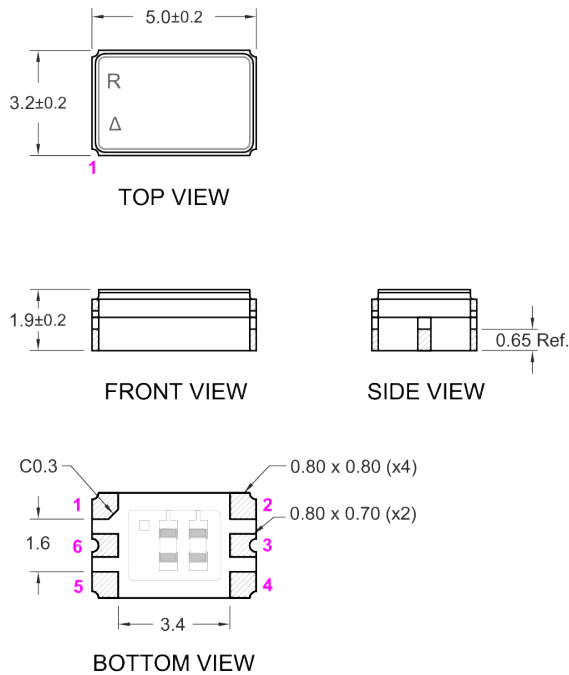
Parameter	Description
a. RoHS	Parts are fully compliant with the European Union directives 2011/65/EU and 2015/863/EU (amending annex II to directive 2011/65/EU) on the restriction of the use of certain hazardous substances in electrical and electronic equipment
b. Solderability	JESD22-B102, M1, condition 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 = 3
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/JEDECJ-STD-020, 3 reflow cycles (peak temperature 260°C)

12.0 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

13.0 Model Outline:

MODEL DRAWING



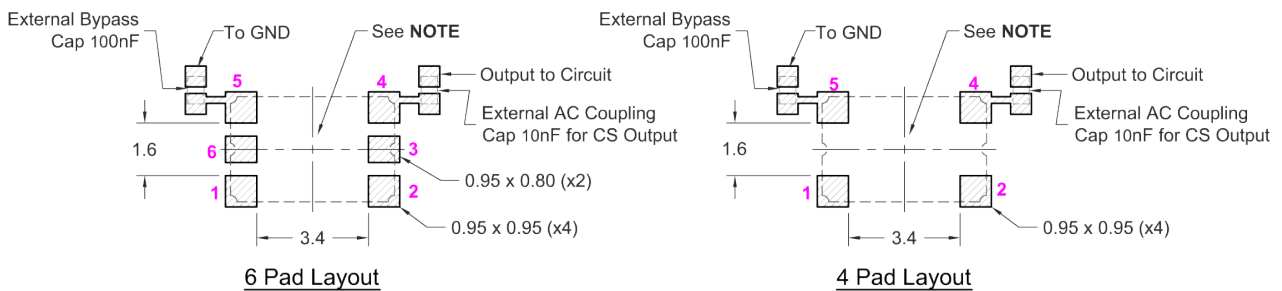
Pin Connections

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

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)

RELATED DRAWINGS:

FILENAME: CAT794

REVISION: E

DATE: 23-Jun-2020

SCALE: 5 : 1

Millimetres

TOLERANCES:

XX =

X.X = ±0.2

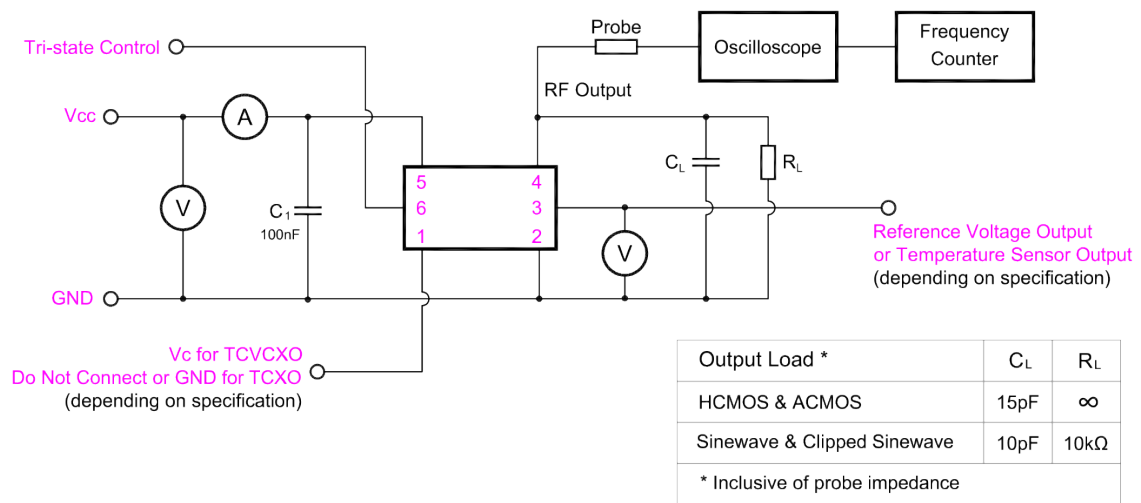
X.XX = ±0.10

X.XXX =

X° =

Hole =

14.0 Test Circuit:



TITLE: Pluto+ TCXO/TCVCXO TEST CIRCUIT

FILENAME: CAT781

RELATED DRAWINGS:

REVISION: A

DATE: 20-Mar-13

SCALE: NTS

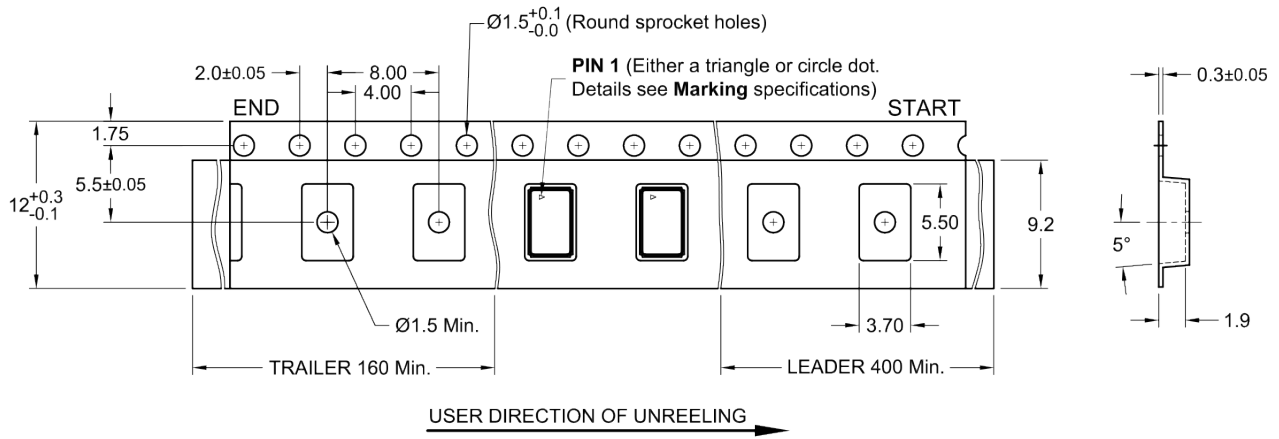
Millimetres

rakon

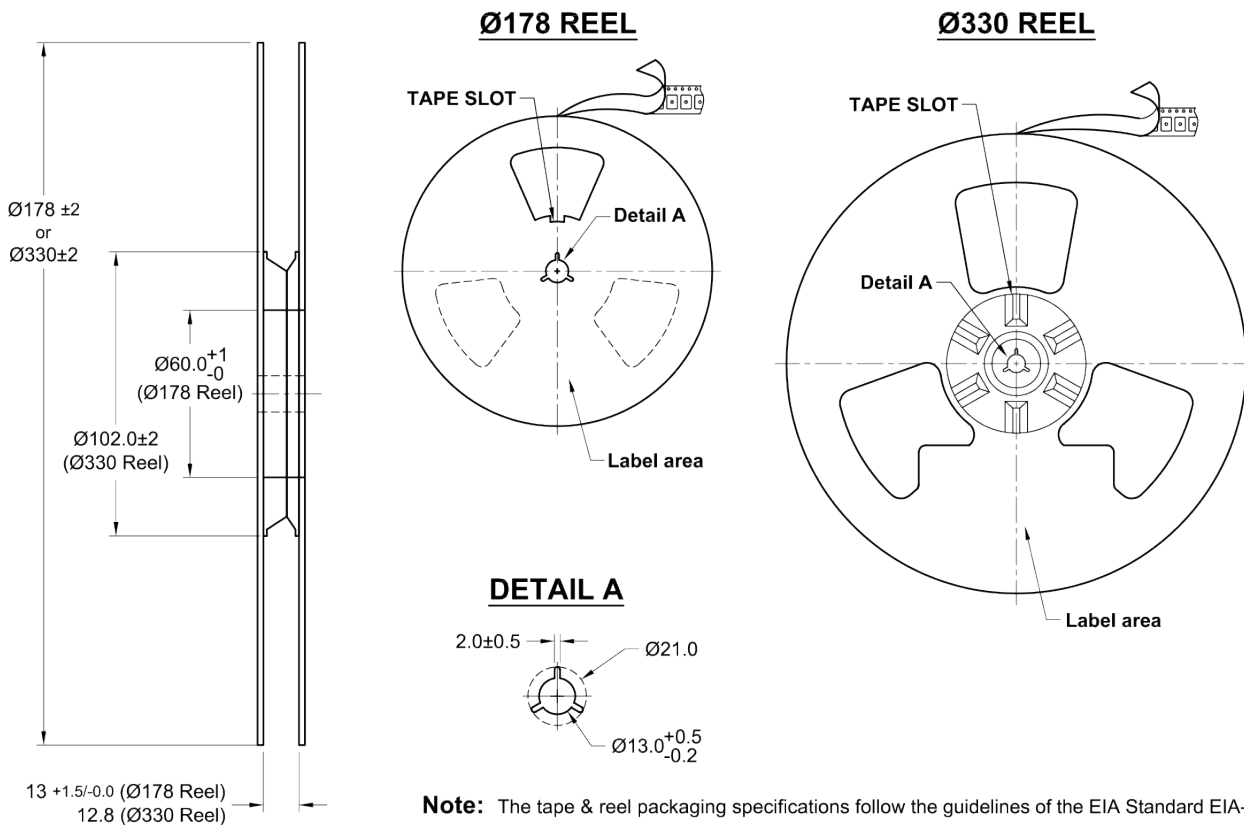
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15.0 Tape and Reel (Ø178mm / Ø330mm):

TAPE DETAILS



REEL DETAILS



Note: The tape & reel packaging specifications follow the guidelines of the EIA Standard EIA-481-E.

TITLE: PLUTO+ 5032 SERIES TAPE & REEL

FILENAME: CAT811

TOLERANCES:

RELATED DRAWINGS:

REVISION: C

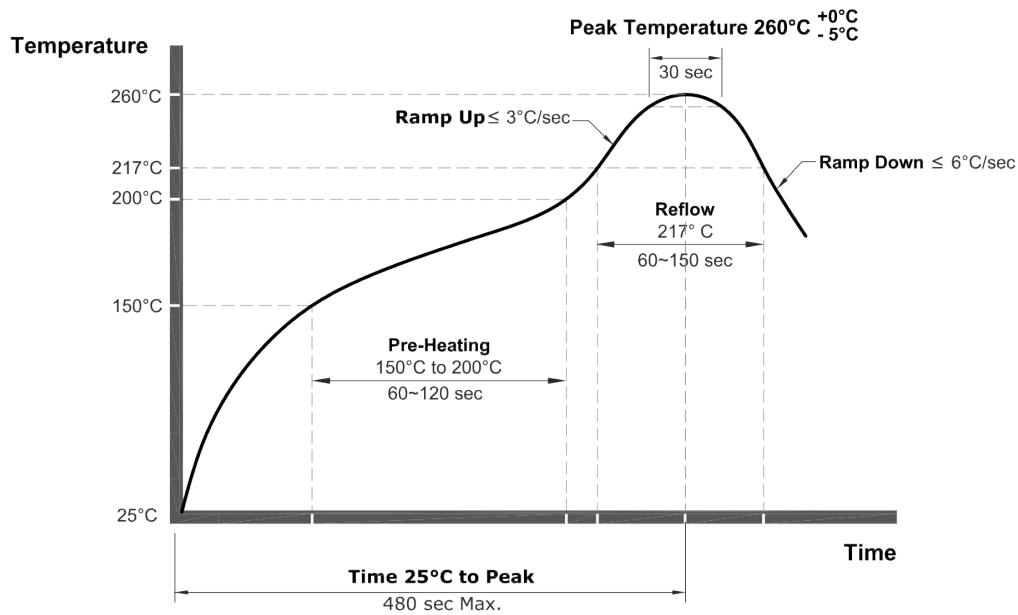
XX = ±1
 X.X = ±0.2
 X.XX = ±0.1
 X.XXX =
 X° =
 Hole =

DATE: 24-Jul-2020

SCALE:

Millimetres

16.0 Reflow:



Note:

- The Pb-free Reflow follows the guidelines of IPC/JEDC J-STD-020E.
-
- The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon products is determined by the solder paste Manufacturer's specification. It is recommended that the Reflow Profile used does not exceed the one shown above.

TITLE: Pb-Free Oscillator Reflow (Classification Temperature Tc = 260°C)

FILENAME: CAT541

RELATED DRAWINGS:

REVISION: C

DATE: 15-May-2019

SCALE: NTS

Millimetres

rakon

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17.0 Specification History

Version	User	Changes	Approver	Date
A	JO	Initial issue	MC/BC	2021-03-09