

E7116LF

1.0 Specification References

Parameter	Description
a. Rakon part number	E7116LF
b. Description	50.0MHz RPT7050A TCXO
c. Version	A (2016-01-28) - PROVISIONAL
d. Package	L x W: 7.0 x 5.0 mm nom, H: 2.0mm 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		50.0		MHz	
b. Frequency calibration			±1	ppm	Initial accuracy at 25°C ±1°C
c. Reflow shift			±1	ppm	
d. Operating temperature range	-40		85	°C	
e. Frequency stability over temperature			±0.28	ppm	Reference to (F _{MAX} + F _{MIN})/2
f. Supply voltage stability			±0.1	ppm	±5% variation, reference to frequency at nominal supply voltage
g. Load sensitivity			±0.1	ppm	±10% variation, reference to frequency at nominal load
h. Long term stability			±2 ±5	ppm	per 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		7.2	10	mA	

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

5.0 Oscillator Output – HCMOS

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

6.0 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% V_{CC}	V	Device disabled (output in high impedance state)
c. Tri-state control (pin 6), input level high (V_{IH})	60% V_{CC}			V	Device enabled (operating)
d. Current when in tri-state mode		2		mA	
e. Output enable time			100	μ s	

7.0 Pin Connections

Parameter	Connection
a. Pin 1	Do not connect (GND optional)
b. Pin 2	GND
c. Pin 3	Do not connect
d. Pin 4	RF Output
e. Pin 5	Supply Voltage (V_{CC})
f. Pin 6	Tri-state Control (Enable) ²

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

Parameter	Typ.	Unit.	Test Condition / Description
a. 1Hz offset	-50	dBc/Hz	
b. 10Hz offset	-75	dBc/Hz	
c. 100Hz offset	-110	dBc/Hz	
d. 1kHz offset	-135	dBc/Hz	
e. 10kHz offset	-145	dBc/Hz	
f. 100kHz offset	-150	dBc/Hz	
g. 1MHz offset	-155	dBc/Hz	
h. RMS Jitter	200	fs	12kHz ~ 5MHz

² The tri-state control (enable) input pin has an internal 100k Ω 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.

9.0 Marking

Parameter	Description
a. Type	Laser marked
b. Line 1	[R # YW] R = Rakon, # YW = manufacturing identifier
c. Line 2*	[EXXXX YW] EXXXX = abbreviated part number, YW = device date code
d. Note	* Rotated by 180°

10.0 Manufacturing Information

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

11.0 Environmental Specification

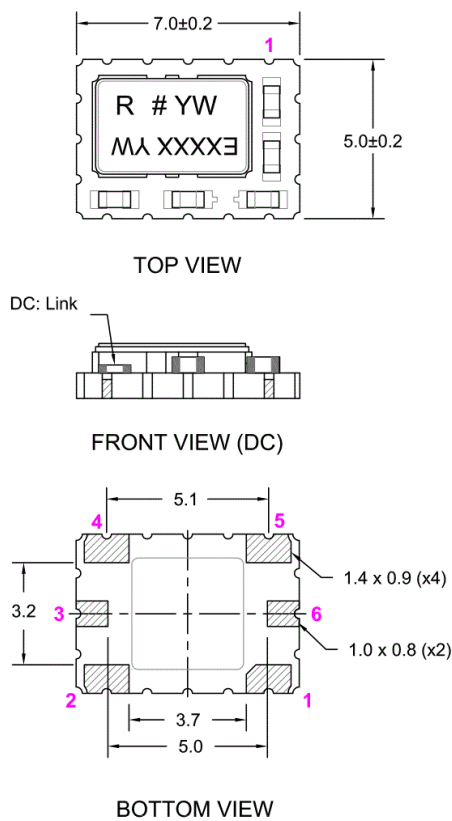
Parameter	Description
a. RoHS	Parts are fully compliant with the European Union directives 2002/95/EC and 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Note the RoHS compliant parts are suitable for assembly using both Lead-free solders 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 +150°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)

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

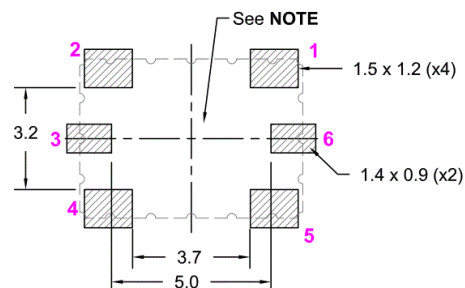


PIN CONNECTIONS	
1 *	Do Not Connect / Vc
2	GND
3 *	Do Not Connect / Vref / Vtemp
4	RF Output
5	Vcc
6	Enable
* Depending on specification	

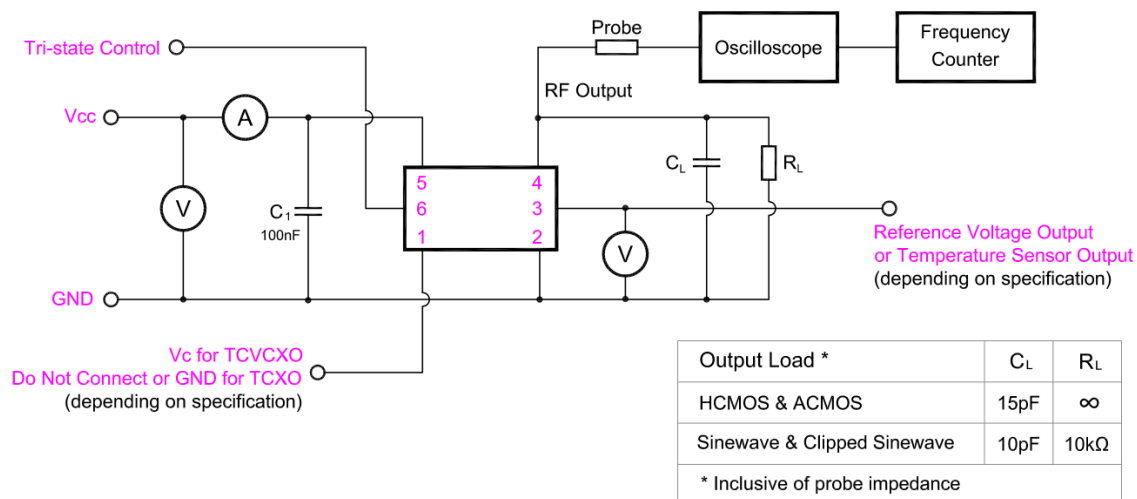
NOTE:

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

RECOMMENDED PAD LAYOUT - TOP VIEW



6 PIN TEST CIRCUIT:



FILENAME: CAT781

REVISION: A

DATE: 20-Mar-13

SCALE: NTS

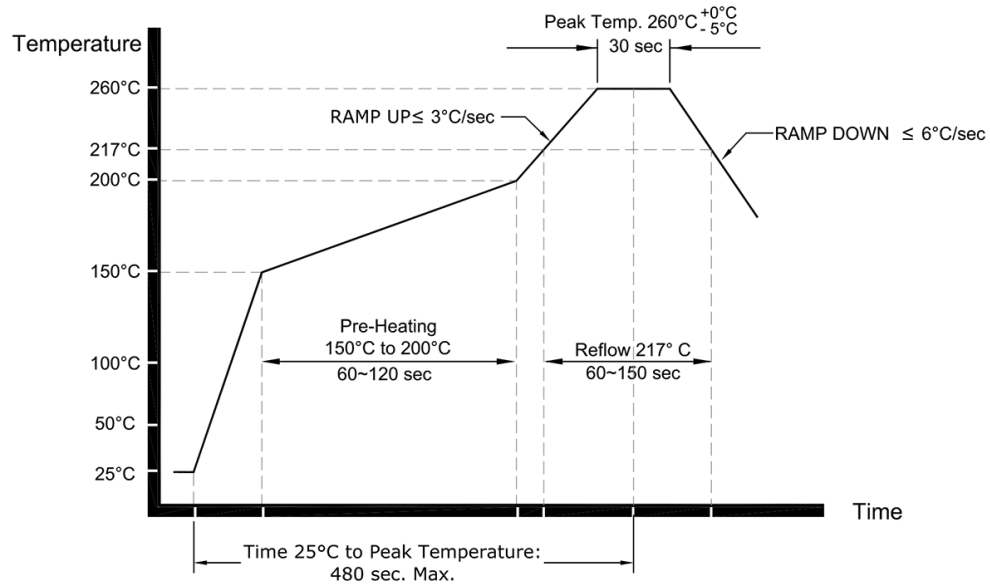
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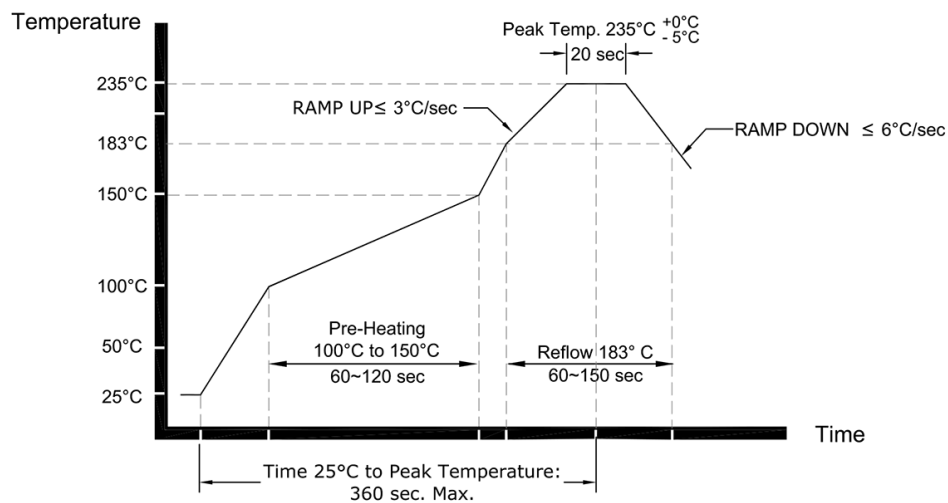
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16.0 Reflow:

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

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17.0 Specification History

Version	User	Changes	Approver	Date
A	JO	Initial issue	TB/NC/KW	2016-01-28