

E7219LF



1.0 Specification References

| Parameter | Description |
|----------------------|--|
| a. Rakon part number | E7219LF |
| b. Description | 20.0MHz RPT5032N TCVCXO |
| c. Version | A (2016-05-04) - 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. 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 | | 20.0 | | 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 over temperature | | | ±0.28 | ppm | Reference to (F _{MAX} +F _{MIN})/2 |
| f. Frequency slope over temperature | | | ±0.2 | ppm/°C | ≤ 2°C step size |
| g. Supply voltage stability | | | ±0.1 | ppm | ±5% variation, reference to frequency at nominal supply voltage |
| h. Load sensitivity | | | ±0.1 | ppm | ±5pF variation, reference to frequency at nominal load |
| i. Long term stability | | | ±1 ±2.5 | ppm | 1 year 20 years |
| j. Acceleration sensitivity | | | 2 | ppb/g | Gamma vector of all 3 axes from 30 to 1500 Hz |
| k. 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 | | 4 | 6 | 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 | | | ppm | Reference to frequency at Vc=1.5V |
| c. Slope | | +7 | | ppm/V | |
| d. Linearity | | | 2 | % | |
| 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 & LVTTTL 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 | | 5 | 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 | -85 | dBc/Hz | |
| c. 100Hz offset | -115 | dBc/Hz | |
| d. 1kHz offset | -135 | dBc/Hz | |
| e. 10kHz offset | -150 | dBc/Hz | |
| f. 100kHz offset | -152 | dBc/Hz | |
| g. 1MHz offset | -153 | dBc/Hz | |

8.0 Pin Connections

| Parameter | Description |
|-----------|----------------------|
| a. Pin 1 | Control Voltage (Vc) |
| b. Pin 2 | GND |
| c. Pin 3 | RF Output |
| d. Pin 4 | Supply Voltage (Vcc) |

9.0 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 |

10.0 Manufacturing Information

| Parameter | Description |
|--------------------------|---|
| a. Reflow soldering | See reflow profile diagram |
| b. Packaging description | See 5032 series tape & reel drawing. Quantity 51 to 1000 units are supplied on Ø178mm (7") reel, 1001 to 2000 units are supplied on Ø330mm (13") reel |

11.0 Environmental Specification

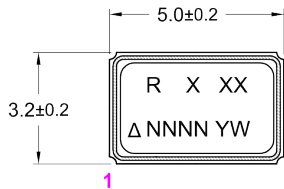
| Parameter | Description |
|---|---|
| a. RoHS | Parts are fully compliant with the European Union directives 2002/95/EC and 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Note the RoHS compliant parts are suitable for assembly using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

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:

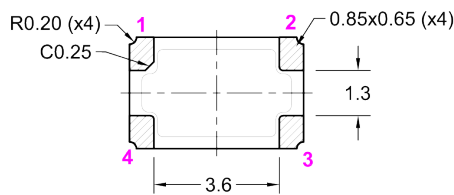
MODEL DRAWING



TOP VIEW



FRONT VIEW



BOTTOM VIEW

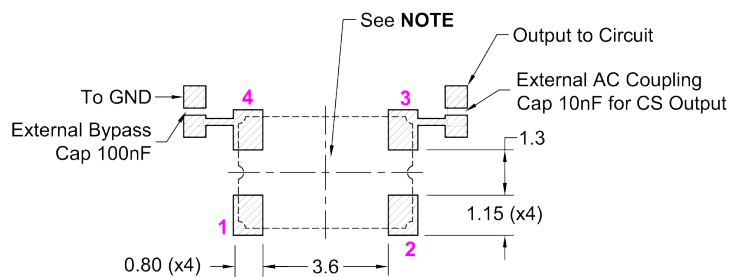
Pin Connections

| Pin | Connections |
|-----|----------------------|
| 1 | Do not connect |
| 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: CFPT9300 / RPT5032N MODEL (4 Pad)

FILENAME: CAT1582

TOLERANCES:

RELATED DRAWINGS:

REVISION: A

XX =

DATE: 10-Nov-2021

X.X = ±0.2

SCALE: 5 : 1

X.XX = ±0.13

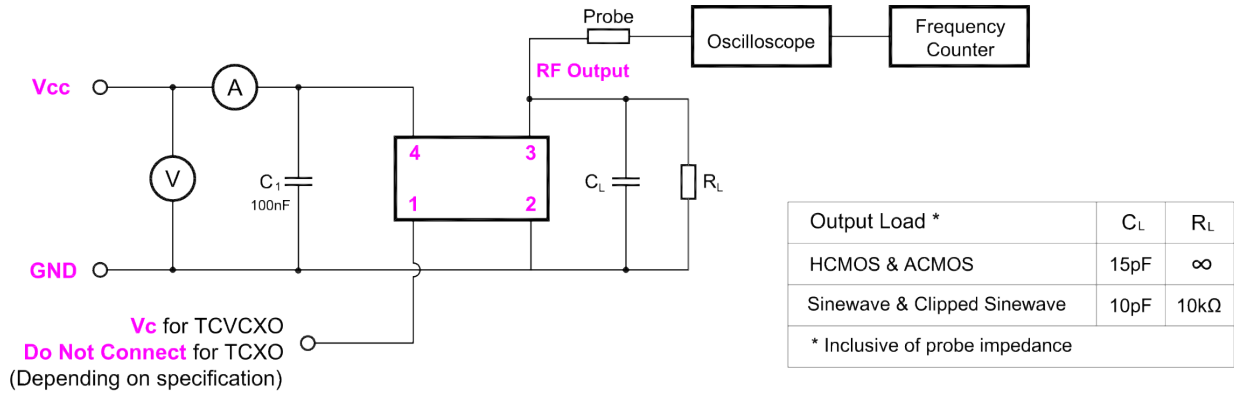
Millimetres

X.XXX =

X° =

Hole =

14.0 Test Circuit:



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

FILENAME: CAT874

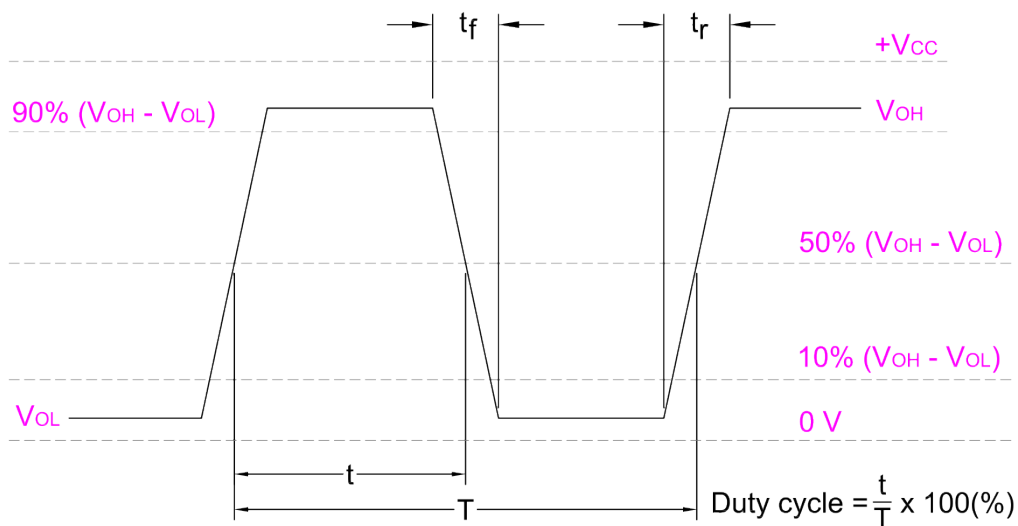
RELATED DRAWINGS:

REVISION: A
DATE: 06-Mar-14
SCALE: NTS
Millimetres



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OUTPUT WAVEFORM - HCMOS & ACMOS:



TITLE: Pluto+ TCXO/TCVCXO OUTPUT WAVEFORM

FILENAME: CAT784

RELATED DRAWINGS:

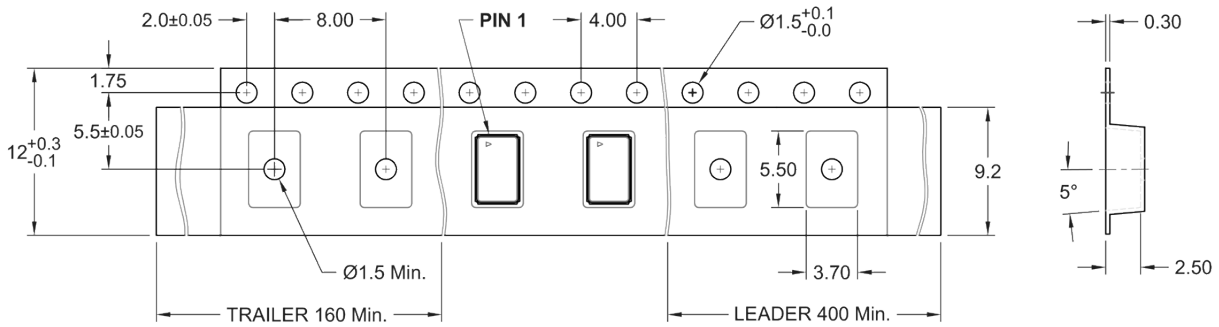
REVISION: A
DATE: 15-Mar-13
SCALE: NTS
Millimetres



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15.0 Tape and Reel (Ø178mm/ Ø330mm):

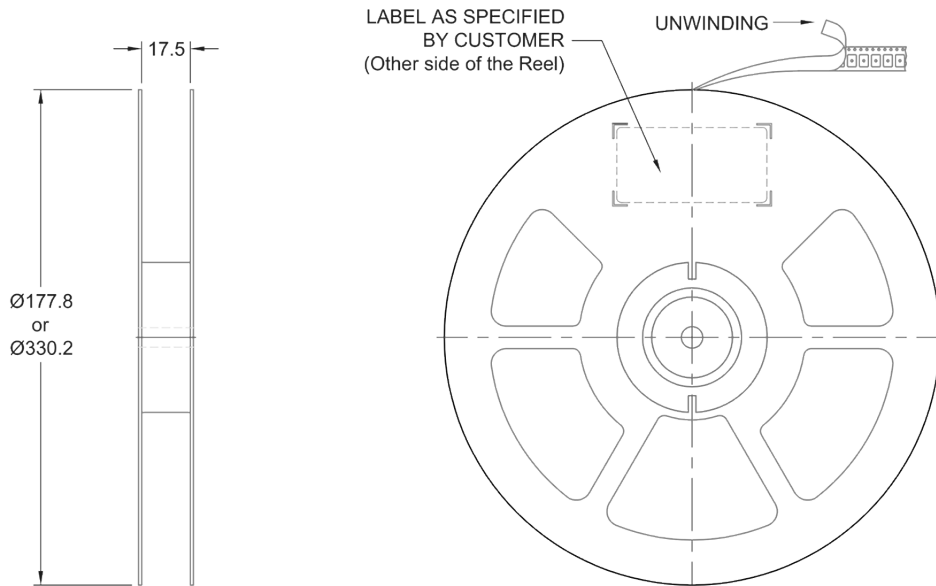
TAPE DETAILS



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

RELATED DRAWINGS:

FILENAME: CAT811

REVISION: A

DATE: 12-Aug-13

SCALE:

Millimetres

TOLERANCES:

XX =

X.X = ± 0.2

X.XX = ± 0.10

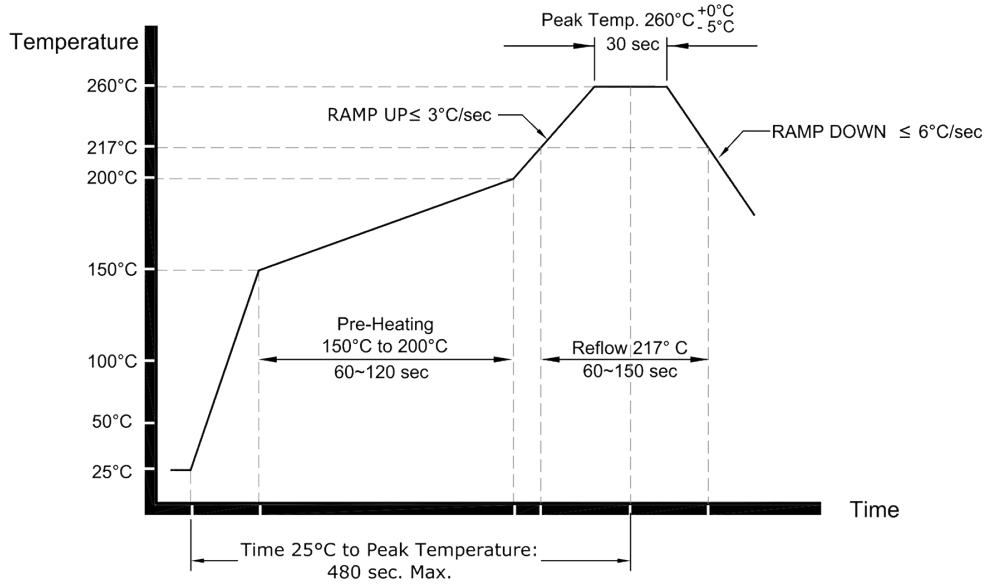
X.XXX =

X° =

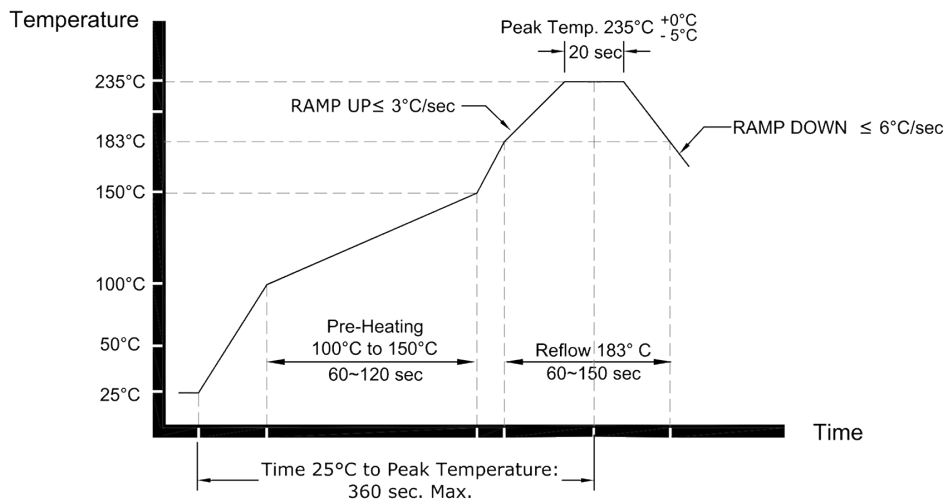
Hole =

16.0 Reflow: RPT5032N

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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17.0 Specification History

| Version | User | Changes | Approver | Date |
|---------|------|---|----------|------------|
| A | JO | Initial issue | DW | 2016-05-04 |
| B | NR | Change in outline drawing from model template | BC | 2024-06-12 |