

RST2016H [Preliminary]

1.0 Specification References

Parameter	Description
a. Rakon part number	T6500
b. Description	26.0 MHz RST2016H TCXO
c. Package	L x W x H: 2.0 x 1.6 x 0.7 mm



2.0 Absolute Maximum Rating ¹

Parameter	Min.	Max.	Unit
a. Power supply	-0.6	+4.6	V
b. Storage temperature	-40	125	°C

3.0 Frequency Characteristics

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Nominal frequency		26.0		MHz	
b. Frequency calibration			±1	ppm	Offset from nominal frequency measured at 25°C ±2°C
c. Reflow shift			±1	ppm	Two consecutive reflows as per attached profile after 2 hours relaxation at 25°C
d. Temperature range	-40		105	°C	The operating temperature range over which the frequency stability is measured
e. Frequency stability over temperature			±0.5	ppm	Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range ² Control voltage set to midpoint of control voltage
f. Thermal Hysteresis			0.6	ppm	Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C
g. Sensitivity to supply voltage variations			±0.1	ppm	Supply voltage varied ±5% at 25°C
h. Sensitivity to load variations			±0.2	ppm	±10% load change at 25°C ³
i. Long term stability			±1 ±3 ±5	ppm	Frequency drift over the first year at 25°C Frequency drift over 5 years at 25°C Frequency drift over 10 years at 25°C

4.0 Power Supply

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Supply voltage (V _{DD})		1.8		V	With a tolerance of ±5%
b. Supply current			2.0	mA	At maximum V _{DD} ³

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

² Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents on the oscillator can lead to short term frequency drift.

³ Specified for load stated in oscillator output section at 25°C.

5.0 Control Voltage (VCO)

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Control voltage range	0.3		1.5	V	The nominal VCO value is midway between the minimum and maximum. Voltage control should not exceed the supply voltage +0.2V or GND.
b. Frequency tuning	10			ppm	Frequency shift from minimum to maximum VCO
c. Linearity			10	%	Deviation from straight line curve fit
d. Control voltage input resistance		500		k Ω	Measured between VCO and GND pin

6.0 Oscillator Output

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Output waveform					DC coupled clipped sine-wave ⁴
b. Output voltage level	0.8			V _{pk-pk}	At minimum supply voltage ³
c. Output load					10k Ω // 10pF \pm 10%
d. Start-up time (amplitude)			0.5	ms	Within 90% of the minimum specified output level
e. Start-up time (frequency)			2	ms	Within \pm 0.5ppm of steady state frequency

7.0 SSB Phase Noise (26.0 MHz, at 25°C)

Parameter	Typ.	Max.	Unit.	Test Condition / Description
a. 1Hz offset	-64		dBc/Hz	
b. 10Hz offset	-95		dBc/Hz	
c. 100Hz offset	-120		dBc/Hz	
d. 1kHz offset	-140		dBc/Hz	
e. 10kHz offset	-156		dBc/Hz	
f. 100kHz offset	-156		dBc/Hz	

8.0 Marking

Parameter	Test Condition / Description																																																																																																														
a. Type	Engraved																																																																																																														
b. Line 1	[R ##M# YM] R = Rakon, ##M# = Frequency (M=MHz, e.g. 19M2=19.2MHz) ⁵ , YM = Date code*																																																																																																														
c. Line 2	[o] = Pin 1, [A_ _XXX] = Internal code																																																																																																														
d. Date code*	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th colspan="6">Y - Year Code</th> <th colspan="4">M - Month Code</th> </tr> <tr> <th>Code</th> <th>Year</th> <th>Code</th> <th>Year</th> <th>Code</th> <th>Year</th> <th>Code</th> <th>Month</th> <th>Code</th> <th>Month</th> </tr> </thead> <tbody> <tr> <td>A</td><td>2010</td><td>J</td><td>2019</td><td>S</td><td>2028</td><td>1</td><td>Jan</td><td>7</td><td>Jul</td> </tr> <tr> <td>B</td><td>2011</td><td>K</td><td>2020</td><td>T</td><td>2029</td><td>2</td><td>Feb</td><td>8</td><td>Aug</td> </tr> <tr> <td>C</td><td>2012</td><td>L</td><td>2021</td><td>U</td><td>2030</td><td>3</td><td>Mar</td><td>9</td><td>Sep</td> </tr> <tr> <td>D</td><td>2013</td><td>M</td><td>2022</td><td>V</td><td>2031</td><td>4</td><td>Apr</td><td>A</td><td>Oct</td> </tr> <tr> <td>E</td><td>2014</td><td>N</td><td>2023</td><td>W</td><td>2032</td><td>5</td><td>May</td><td>B</td><td>Nov</td> </tr> <tr> <td>F</td><td>2015</td><td>O</td><td>2024</td><td>X</td><td>2033</td><td>6</td><td>Jun</td><td>C</td><td>Dec</td> </tr> <tr> <td>G</td><td>2016</td><td>P</td><td>2025</td><td>Y</td><td>2034</td><td></td><td></td><td></td><td></td> </tr> <tr> <td>H</td><td>2017</td><td>Q</td><td>2026</td><td>Z</td><td>2035</td><td></td><td></td><td></td><td></td> </tr> <tr> <td>I</td><td>2018</td><td>R</td><td>2027</td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>	Y - Year Code						M - Month Code				Code	Year	Code	Year	Code	Year	Code	Month	Code	Month	A	2010	J	2019	S	2028	1	Jan	7	Jul	B	2011	K	2020	T	2029	2	Feb	8	Aug	C	2012	L	2021	U	2030	3	Mar	9	Sep	D	2013	M	2022	V	2031	4	Apr	A	Oct	E	2014	N	2023	W	2032	5	May	B	Nov	F	2015	O	2024	X	2033	6	Jun	C	Dec	G	2016	P	2025	Y	2034					H	2017	Q	2026	Z	2035					I	2018	R	2027						
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⁴ External AC-Coupling capacitor required. 1nF or greater recommended.

⁵ Frequency marking is only represented by the first three significant digits. For example, on an RIT2016F TCXO at 16.368MHz, its frequency code marking will be 16M3.

9.0 Manufacturing Information

Parameter	Test Condition / Description
a. Reflow	Solder reflow processes as per profile attached
b. Packaging description	Tape and reel. Standard packing quantity is 4000 units per reel

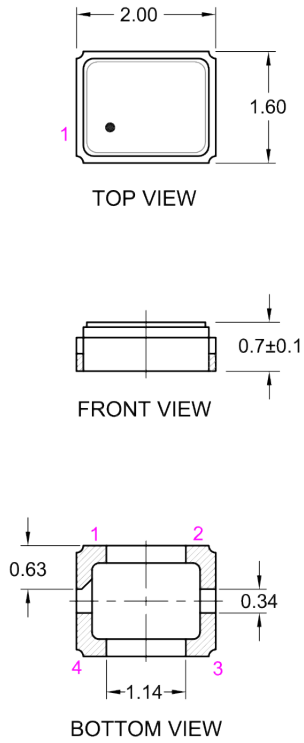
10.0 Environmental Specification

Parameter	Test Condition / Description
a. RoHS compliant	Yes
b. Shock	[MIL-STD-202 M213]. Half sine-wave acceleration of 3000g peak amplitude. Duration: 0.3ms, Velocity: 12.3ft/s ⁶
c. Moisture resistance	[MIL-STD-202 M106g]. 1000 hours at 85°C, 85% relative humidity. Biased ⁶
d. Thermal cycling	[JESD22 METHOD JA-104C]. 1000 temperature cycles, where each cycle consists of a 25 minutes soak time at -40°C followed by a 25 minute soak time at 85°C, with a 60 second maximum transition time between temperatures. Air to air transition ⁶
e. Vibration	[JESD22-B103-B]. 10g peak acceleration for 4 minutes per sweep. 4 sweeps in each of the 3 orientations. Swept from 20-2000Hz ⁶

⁶ Frequency shift ≤ 1 ppm after environmental conditions.

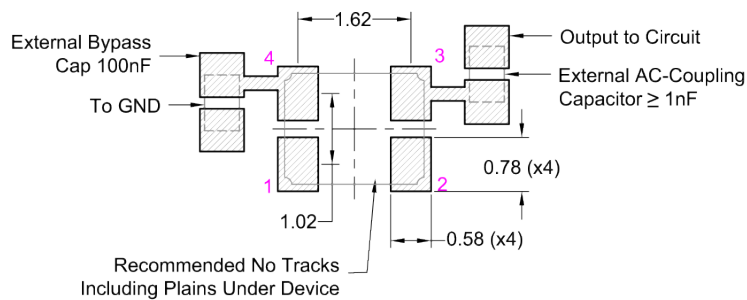
11.0 Model Outline

MODEL OUTLINE



Pin	Connections
1	VCO
2	GND
3	OUTPUT
4	Supply Voltage (VDD)

RECOMMENDED PAD LAYOUT - TOP VIEW



TITLE: RIT/RST2016 SERIES MODEL (Package A)

FILENAME: CAT1559

TOLERANCES:

RELATED DRAWINGS:

REVISION: A

XX =

DATE: 25-Nov-2020

X.X = ±0.20

SCALE: 10 : 1

X.XX = ±0.15

Millimetres

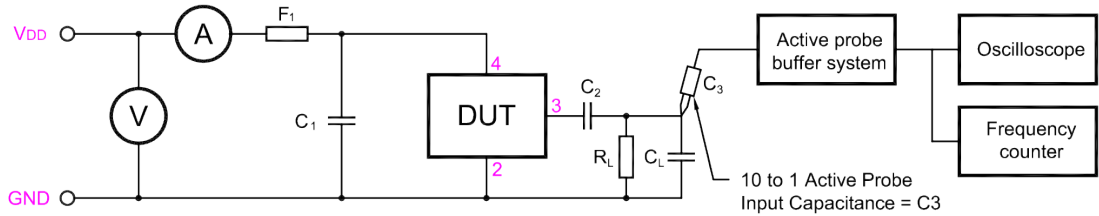
X.XXX =

X° =

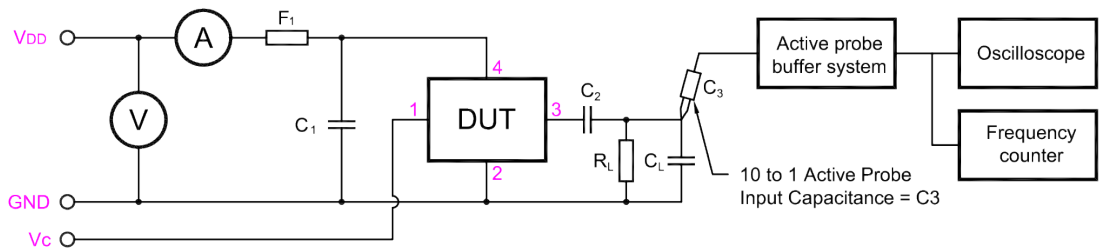
Hole =

12.0 Test Circuit

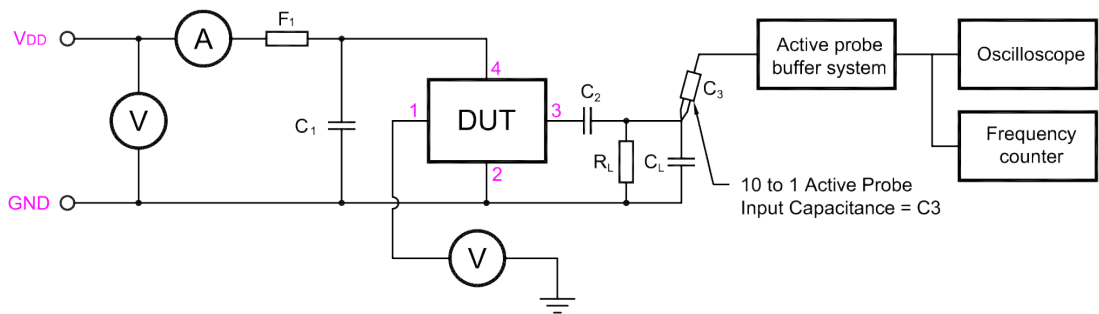
TCXO TEST CIRCUIT:



VCTCXO TEST CIRCUIT:



TCXO TEST CIRCUIT (T-Sensor):



<p>C_1: 100nF C_2: ≥ 1nF R_L: 10K</p>	<p>$C_T = C_L + C_3$ (C_3 - Oscilloscope probe capacitance) C_T as stated in OSCILLATOR OUTPUT section F_1: A ferrite bead or a resistor between $22\Omega \sim 47\Omega$ recommended.</p>
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TITLE: IT/RIT H SERIES TCXO TEST CIRCUIT

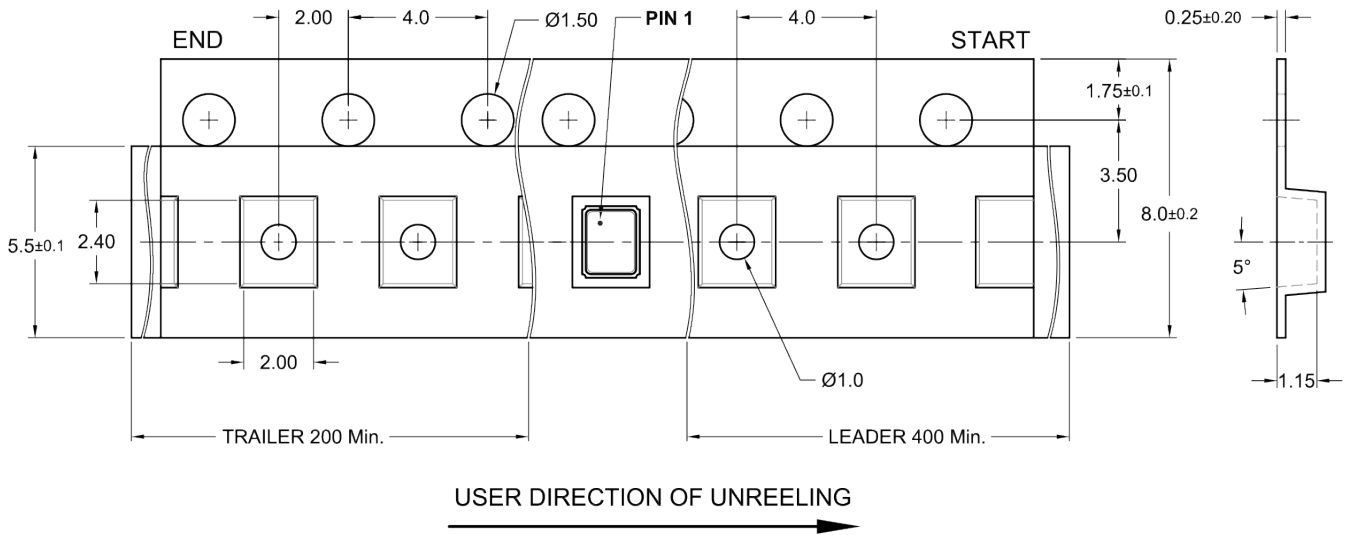
FILENAME: CAT956

RELATED DRAWINGS:

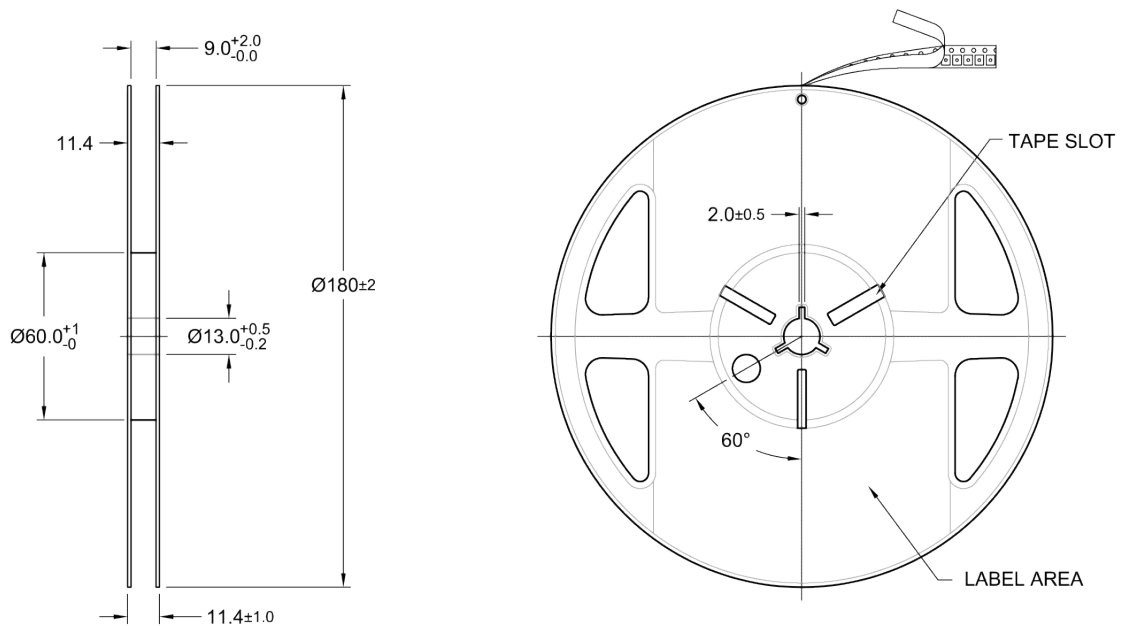
REVISION: D
 DATE: 10-Sep-2019
 SCALE: NTS
 Millimetres

13.0 Tape and Reel

TAPE DETAILS



REEL DETAILS



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

TITLE: RST/RIT/IT 2016 TAPE & REEL (Package A, N)

RELATED DRAWINGS:

FILENAME: CAT1087

REVISION: C

DATE: 09-Jun-2020

SCALE: As above

Millimetres

TOLERANCES:

XX =

X.X = ±0.2

X.XX = ±0.10

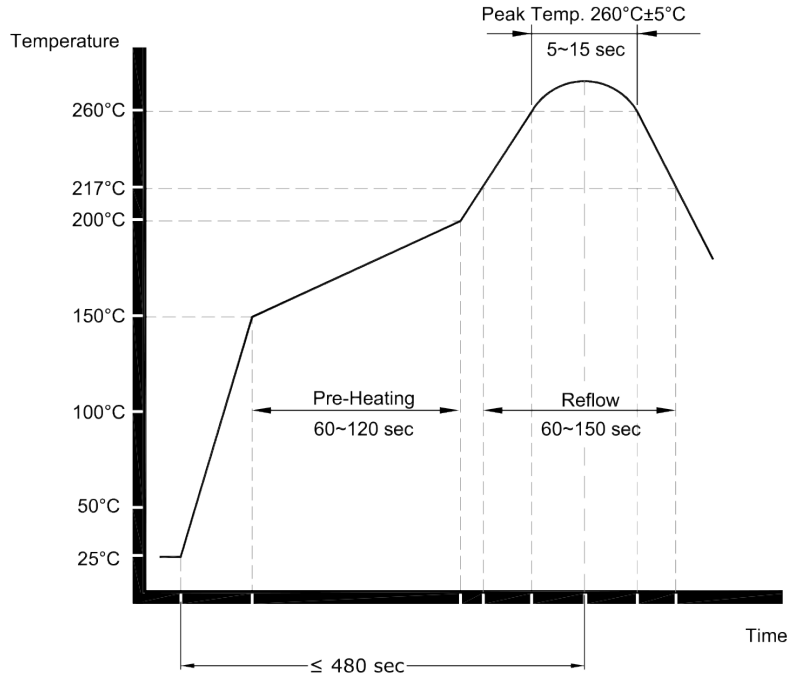
X.XXX =

X° =

Hole =

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14.0 Reflow



TITLE: Pb-FREE Reflow (Package A/AG)

RELATED DRAWINGS:

FILENAME: CAT1036

REVISION: B

DATE: 03-Mar-2017

SCALE: NTS

Millimetres

TOLERANCES:

XX =

X.X =

X.XX =

X.XXX =

X° =

Hole =

15.0 Specification History

Revision	User	Notes	Approver(s)	Date
A	PK	Specification created to duplicate T6468.	KH/ TL	2021-04-21