RST2016N

1.0 Specification References

Parameter	Description
a. Rakon part number	T6612
b. Description	40.0 MHz RST2016N TCXO
c. Package	L x W x H: 2.0 x 1.6 x 0.7 mm nom.

2.0 Absolute Maximum Rating [1]

Parameter	Min.	Max.	Unit
a. Power supply	-0.3	+4.6	V
b. Storage temperature	-40	85	°C

3.0 Frequency Characteristics

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Nominal frequency		40.0		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	-20		70	°C	The operating temperature range over which the frequency stability is measured
e. Frequency stability over temperature			±1	ppm	Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range[2]
f. Frequency slope			±0.05	ppm/°C	Minimum of one frequency reading every 2°C over the operating temperature range[2]
g. Frequency jumps magnitude			20	ppb	Temperature ramped through a complete orbit covering the full temperature range; at a rate up to 10°C/min
h. Static temperature hysteresis			0.6	ppm	Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C
i. Sensitivity to supply voltage variations			±0.1	ppm	Supply voltage varied ±5% at 25°C
j. Sensitivity to load variations			±0.2	ppm	±10% load change at 25°C[3]
k. Long term stability			±1	ppm	Frequency drift over 1 year at 25°C

4.0 Power Supply

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Supply voltage (V_{DD})		1.8 – 3.3		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 Oscillator Output

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
a. Output waveform					DC coupled clipped sinewave[4]
b. Output voltage level	0.8			Vpk-pk	At minimum supply voltage[3]
c. Output load	9	10	11	kΩ/pF	(10kΩ // 10pF) ±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 ±0.5ppm of steady state frequency.

6.0 SSB Phase Noise (40.0 MHz, at 25°C)

Parameter	Typ.	Max.	Unit.	Test Condition / Description
a. 1Hz offset	-62		dBc/Hz	
b. 10Hz offset	-90		dBc/Hz	
c. 100Hz offset	-112		dBc/Hz	
d. 1kHz offset	-132		dBc/Hz	
e. 10kHz offset	-145		dBc/Hz	
f. 100kHz offset	-147		dBc/Hz	

7.0 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	[• XXXX XXX] • = Pin 1, XXXX = Internal Code, XXX = Lot Code
d. Date code*	Y - Year Code / M - Month Code

Y - Year Code

Code	Year	Code	Year	Code	Year
A	2010	J	2019	S	2028
B	2011	K	2020	T	2029
C	2012	L	2021	U	2030
D	2013	M	2022	V	2031
E	2014	N	2023	W	2032
F	2015	O	2024	X	2033
G	2016	P	2025	Y	2034
H	2017	Q	2026	Z	2035
I	2018	R	2027		

M - Month Code

Code	Month	Code	Month
1	Jan	7	Jul
2	Feb	8	Aug
3	Mar	9	Sep
4	Apr	A	Oct
5	May	B	Nov
6	Jun	C	Dec

8.0 Manufacturing Information

Parameter	Test Condition / Description
a. Reflow	Solder reflow processes as per profile attached
b. Packaging description	Tape and reel. Standard packing quantity (SPQ) is 3000 units/reel

[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 RST2016N TCXO at 16.368MHz, its frequency code marking will be 16M3.

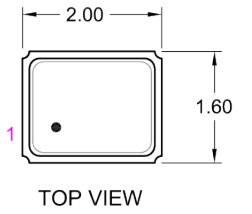
9.0 Environmental Specification

Parameter	Test Condition / Description
a. RoHS compliant	Yes
b. Shock	Free dropping from 150 cm height 5 times on a hard wooden board
c. Moisture resistance	500 ±12 hours at 60°C ±3°C, 85% relative humidity[6]
d. Thermal cycling	The unit shall be subjected to 100 successive change of temperature cycles, then 25 ±2℃ over 2 hours before testing, each cycle as below: **Temperature** — **Duration:** 1. -40 +0/-6°C — 30 ±3 minutes 2. 25°C ±2°C — 2 – 3 minutes 3. 85 +4/-0°C — 30 ±3 minutes 4. 25°C ±2°C — 2 – 3 minutes
e. Vibration	Frequency: 10 – 200 Hz Amplitude (total excursion): 1.5 mm (10 – 36 Hz), 4G (36 – 200 Hz) Sweep time: 1 oct/min 3 direction time: 2 hours for each X, Y, Z axis

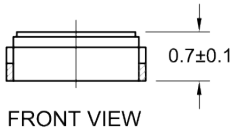
[6] Frequency shift ≤2ppm after environmental conditions.

10.0 Model Outline

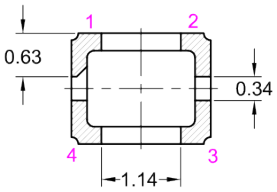
MODEL OUTLINE



TOP VIEW



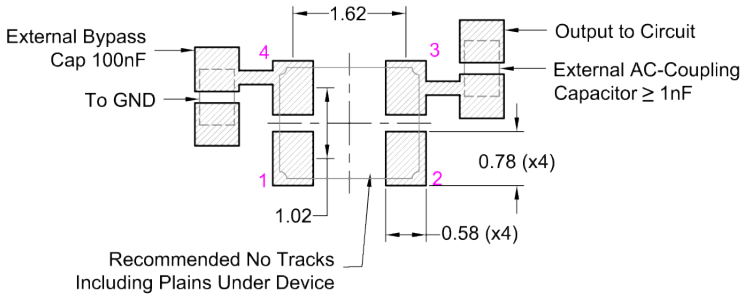
FRONT VIEW



BOTTOM VIEW

Pin	Connections
1	GND / NC
2	GND
3	OUTPUT
4	Supply Voltage (V_{DD})

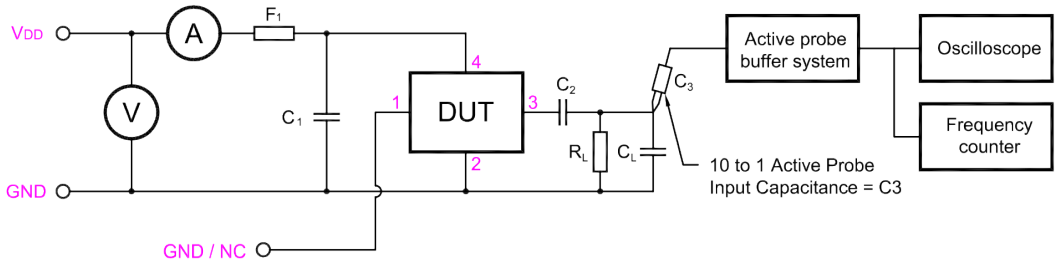
RECOMMENDED PAD LAYOUT - TOP VIEW



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 =

11.0 Test Circuit

CLIPPED SINEWAVE:

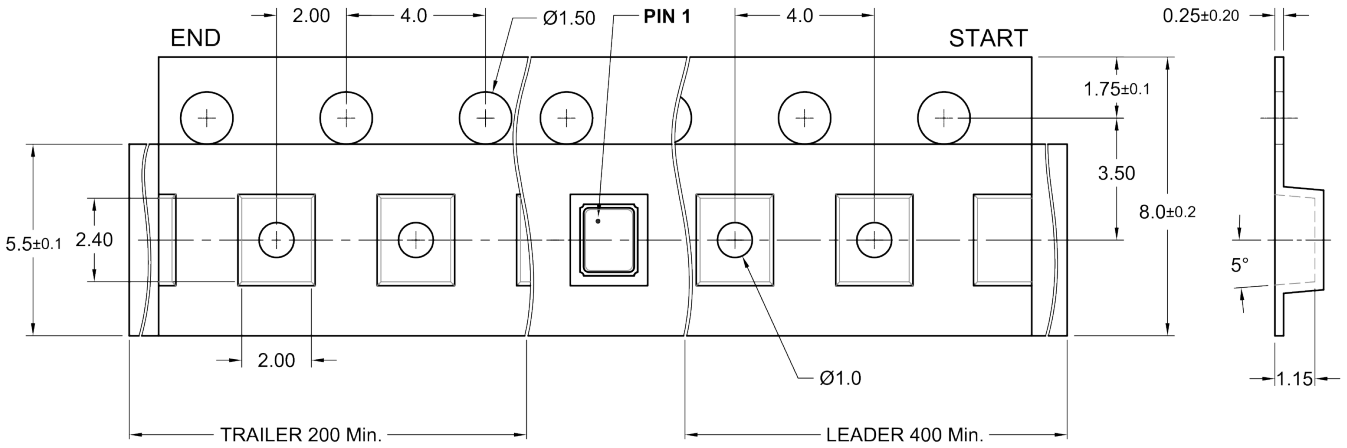


C_1: 100nF C_2: ≥1nF R_L: 10K	$C_T = C_L + C_3$ (C_3 - Oscilloscope probe capacitance) C_T as stated in OSCILLATOR OUTPUT section F_1: A ferrite bead or a resistor between 22Ω ~ 47Ω recommended.

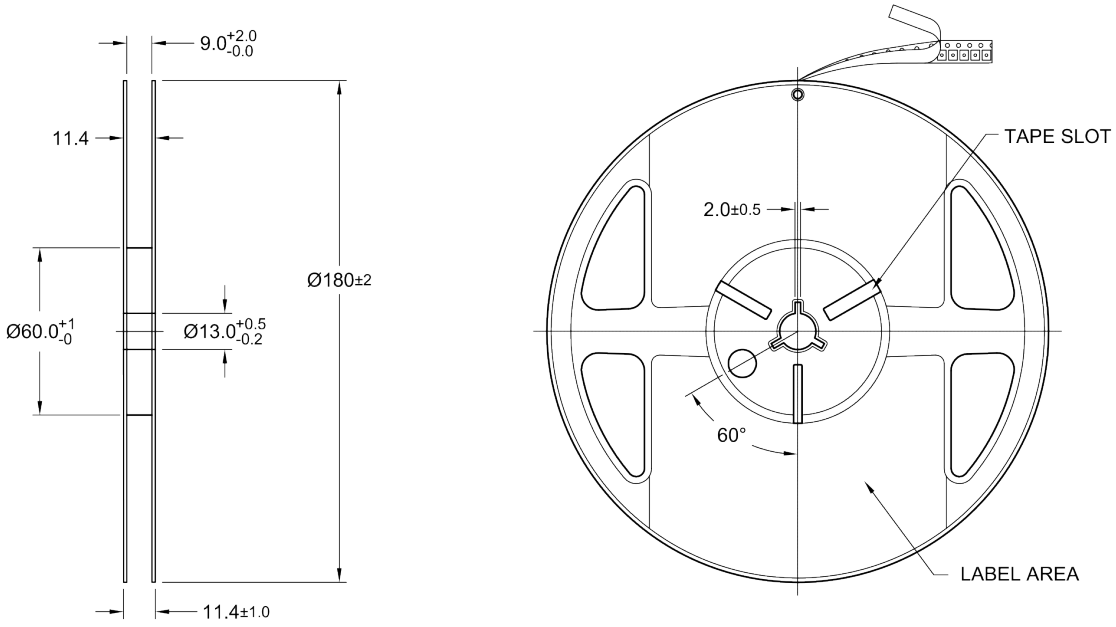
TITLE: RIT/RST N SERIES HS-TCXO TEST CIRCUIT (Package A)	FILENAME: CAT1563
RELATED DRAWINGS:	REVISION: A
	DATE: 01-Dec-2020
	SCALE: NTS
	Millimetres

12.0 Tape and Reel

TAPE DETAILS



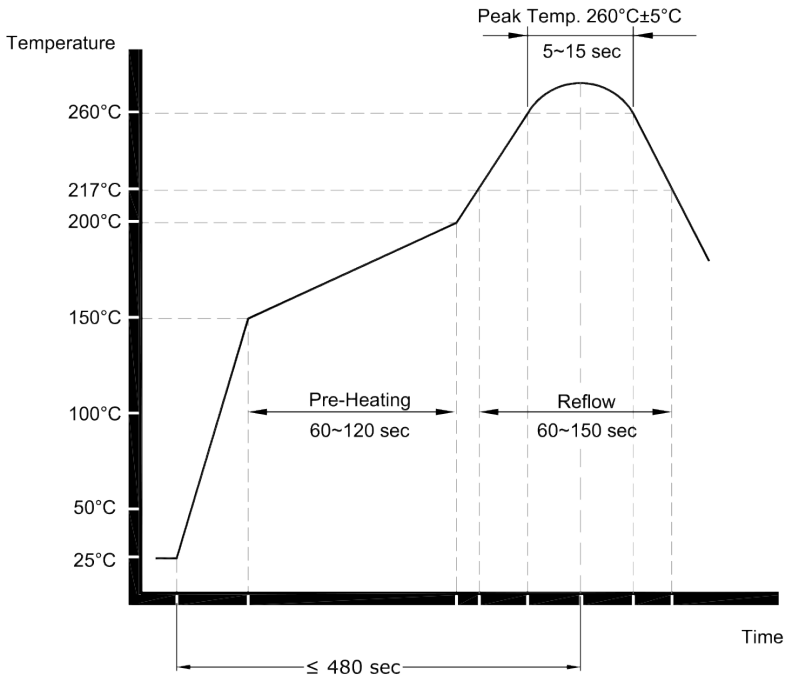
REEL DETAILS



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)	FILENAME: CAT1087	TOLERANCES: XX = X.X = ±0.2 X.XX = ±0.10 X.XXX = X° = Hole =
RELATED DRAWINGS:	REVISION: C	
	DATE: 09-Jun-2020	
	SCALE: As above	
	Millimetres	

13.0 Reflow



TITLE: Pb-FREE Reflow (Package A/AG)	FILENAME: CAT1036	TOLERANCES:	
RELATED DRAWINGS:	REVISION: B	XX =	
	DATE: 03-Mar-2017	X.X =	
	SCALE: NTS	X.XX =	
	Millimetres	X.XXX =	
		X° =	
		Hole =	

14.0 Specification History

Revision	User	Notes	Approver(s)	Date
A	RS	Specification created	CG/ TL	2022-04-01
B	RXP	Change TemesXpress to RakonXpress	CG	2022-12-05