RGX-3

Overview
Acceleration tolerant SMD AT-cut quartz crystal in ceramic package with 6.0 mm x 3.5 mm footprint

Description
Very small SMD AT-cut quartz crystal specifically designed to operate in vibration prone environments. Parts are able to survive acceleration 20,000G and higher with minimal parameter change. Vibration G-sensitivity significantly reduced. True SMD style, ceramic package with metal lid, seamed sealed. The product is supplied on tape and reel.

Recommended Applications
GPS, Agriculture, Avionics, Guidance, Navigation, Military, Other.

Form factor
6.0 mm x 3.5 mm

Features
G-sensitivity down to 0.2ppb/G
Low aging
Up to 50,000G acceleration event survival
Very good short term stability

RGX-3 Specifications

1.0 Specification References

1.1	Model Description	RGX-3
1.2	RoHS compliant	Yes

2.0 Frequency Characteristics

	Parameter	Test Condition	Value	Units
2.1	Fundamental frequency range	Nominal frequency referenced to frequency at 23°C ±2°C	10 to 26	MHz
2.2	Calibration tolerance	Frequency at 23°C ±2°C (Note 1)	10 to 20	±ppm
2.3	Frequency stability over temperature	Referenced to frequency reading at 25°C and the specified Load Capacitance (Note 2)	4 to 40	±ppm
2.4	Temperature range	Maximum operating temperature available (Note 3)	-45 to 95	°C
2.5	Frequency perturbations	Peak to peak deviation from the frequency vs. temperature 5th order curve fit. Minimum of 1 frequency reading every 3°C, over the operating temperature range	0.2 to 1	ppm
2.6	Short term stability	Root Allan Variance for 1 second Tau	1 max	ppb
2.7	Long term stability	Frequency drift over 1 year (Note 1)	1 max	±ppm
2.8	Long term stability	Frequency drift over 10 years (Note 1)	5 max	±ppm
2.9	G-Sensitivity	Gamma vector of all three axes from 30Hz to 1500Hz, typical values. Values as low as 0.2ppb/G available depending on design (Note 1, 4)	0.2 to 0.8	ppb/G
2.10	Frequency offset after acceleration event	20,000G/2ms acceleration event in the z axis. Theoretical recovery time of 100ms (Note 4)	-3 to 0	ppm

3.0 Electrical

	Parameter	Test Condition	Value	Units
3.1	Load capacitance (CL)	Frequency is calibrated to a load at room temperature. Value required to be specified (Note 5)	7 to 35	pF
3.2	Pullability	Load and the crystal design dependant (Note 6)	2 to 40	ppm/pF
3.3	Drive level	Operating specification	100 max	micro W

4.0 ESR

	Parameter	Test Condition	Value	Units
4.1	Fundamental	10MHz to 26MHz (Note 1)	50 max	Ohms

5.0 Environmental

	Parameter	Test Condition	Value	Units
5.1	Shock	Half sine wave acceleration of 3,000G peak amplitude for 0.3ms		
5.2	Vibration	10G RMS 30Hz to 1500Hz duration of 2 hours in each axis (Note 7)		
5.3	Humidity	After 48 hours at 85°C 85% relative humidity non-condensing (Note 7)		
5.4	Thermal shock	Exposed at -40°C for 30 minutes then to 85°C for 30 minutes constantly for a period of 5 days (Note 7)		
5.5	Storage temperature	-55 to 105°C		

6.0 Manufacturing Information

	Parameter	Test Condition
6.1	Reflow	Able to withstand solder reflow process. See reflow profile attached
6.2	Packaging description	Tape and Reel. 2000pcs per reel standard. Refer to drawing for details

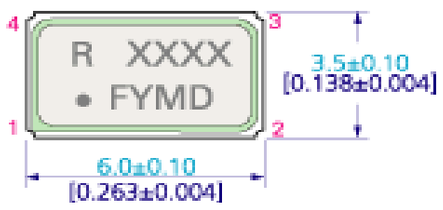
7.0 Marking

	Parameter	Test Condition
7.1	Type	Laser engraved
7.2	Line 1	Rakon Logo and the last four characters of the Rakon Part Number
7.3	Line 2	Pin 1 mark and Date Code

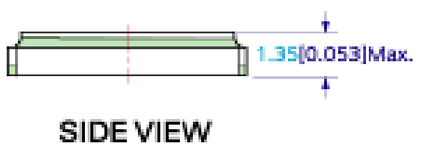
8.0 Specification Notes

	Parameter	Test Condition
8.1	Note 1	The maximum value is the specification. A minimum value, if present, indicates the tightest specification available
8.2	Note 2	A maximum frequency stability over the temperature range needs to be specified
8.3	Note 3	The operating temperature range needs to be specified
8.4	Note 4	The min. G-Sensitivity and max. acceleration event survival specifications cannot be met at the same time. Please contact Rakon Sales with specific requirements
8.5	Note 5	The crystal frequency is calibrated to a load between min. and max. Series Resonance options are available for this model, and under certain conditions, loads above 35pF may also be available
8.6	Note 6	A more precise min. and/or max. maybe specified should the exact pullability be of importance for a particular application
8.7	Note 7	The environmental condition will cause less than 1ppm shift in frequency measured at 25°C

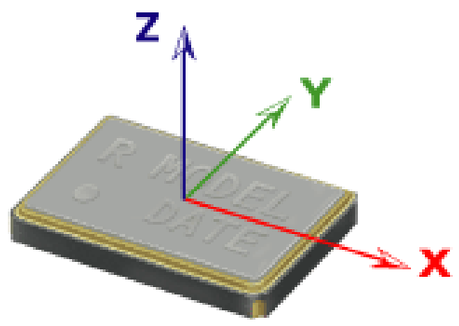
MODEL OUTLINE



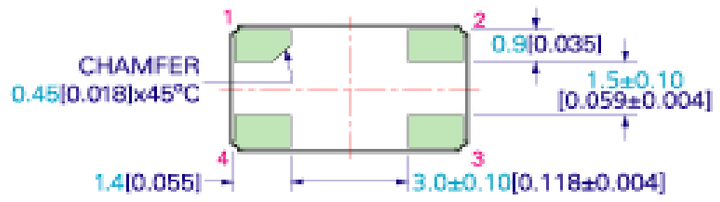
TOP VIEW



SIDE VIEW



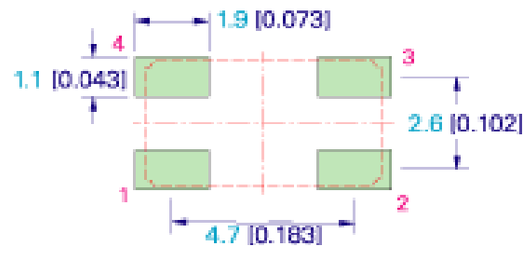
MODEL COORDINATE ORIENTATION



BOTTOM VIEW

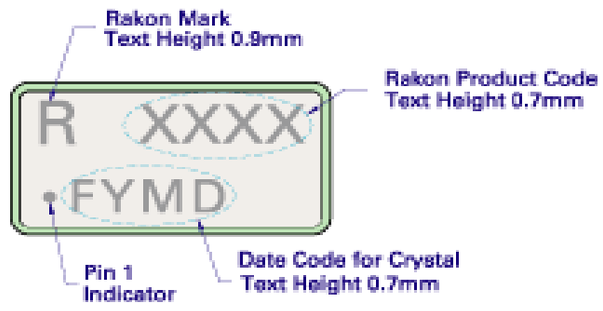
PIN CONNECTIONS	
1	CRYSTAL
2	GND
3	CRYSTAL
4	GND

RECOMMENDED PAD LAYOUT - TOP VIEW



TITLE: RGX-3 MODEL	FILENAME: CAT351	Tolerance:
RELATED DRAWINGS:	REVISION: C	XX = ±0.5
	DATE: 15-Oct-09	X.X = ±0.2
	SCALE: 5 : 1	X.XX = ±0.10
	Millimetres [inch]	X.XXX = ±0.05
		X° = ±1.0°
		Hole = ±0.10

LID MARKING

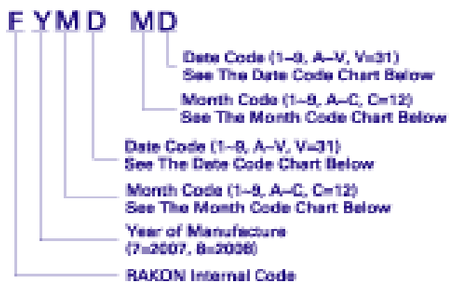


M - Month code

Month	Code
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C

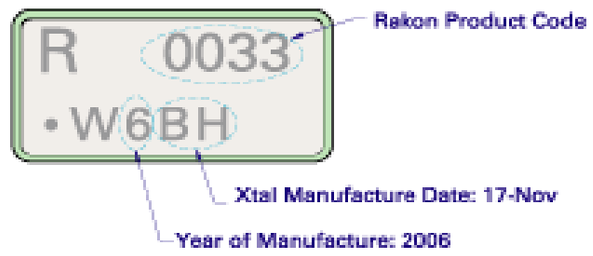
D - Date code

Date	Code	Date	Code	Date	Code
1	1	13	D	25	P
2	2	14	E	26	Q
3	3	15	F	27	R
4	4	16	G	28	S
5	5	17	H	29	T
6	6	18	I	30	U
7	7	19	J	31	V
8	8	20	K		
9	9	21	L		
10	A	22	M		
11	B	23	N		
12	C	24	O		

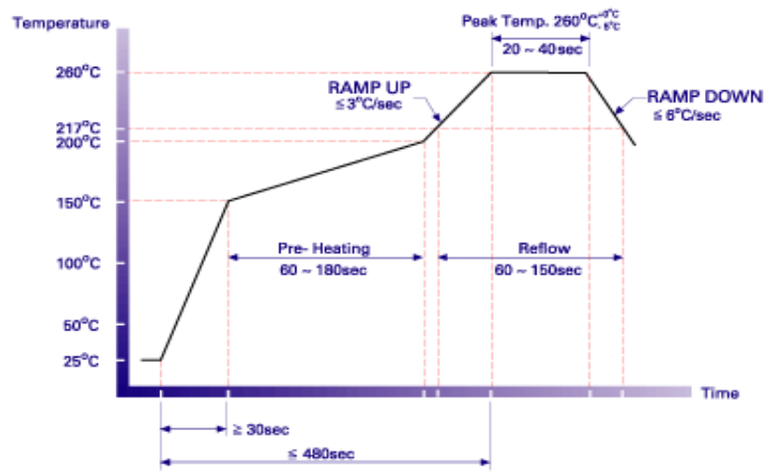


Note: 1 MUST BE DIFFERENT TO I.

MARKING EXAMPLE



TITLE: RSX-3/RGX-3 SERIES LID MARKING	FILENAME:	CAT190
RELATED DRAWINGS:	REVISION:	C
	DATE:	27-Feb-07
	SCALE:	NTS
	Millimetres [inch]	

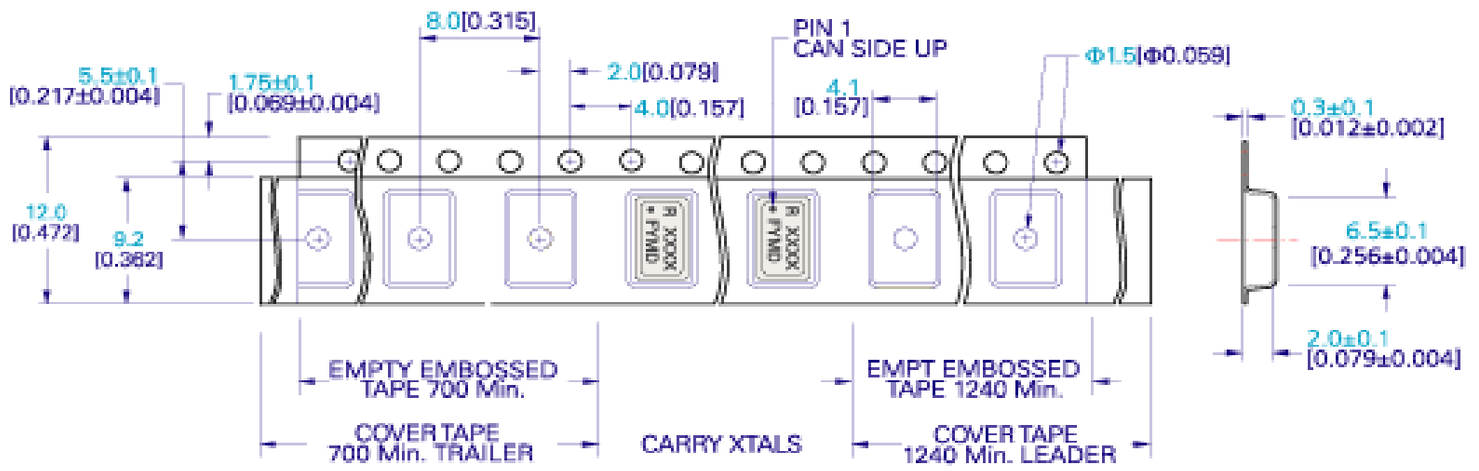


NOTE:

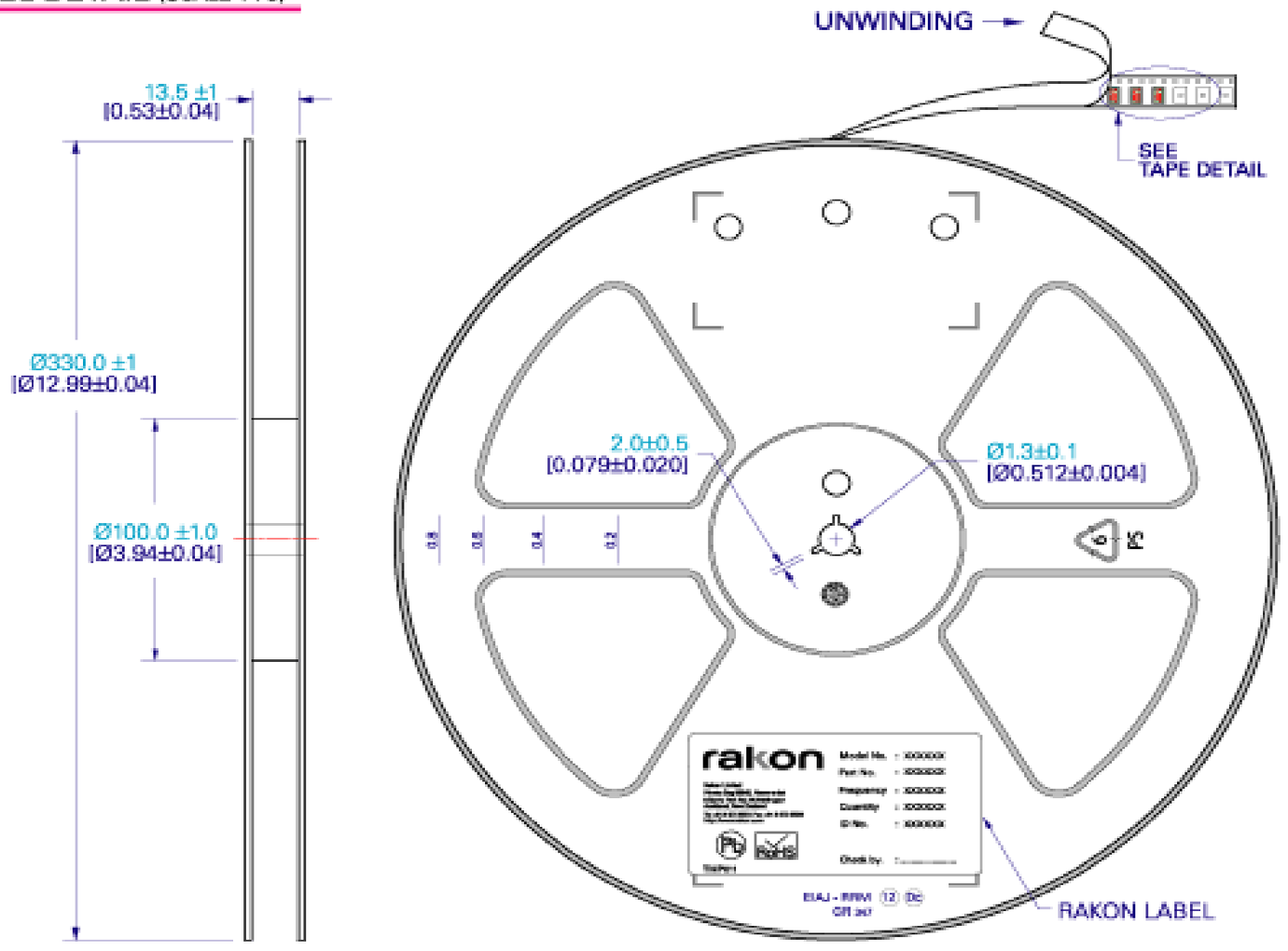
The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon RSX/RGX crystals are determined by the solder paste manufacturer's specification. It is recommended that the Reflow Profile used does not exceed the one shown above.

TITLE: RSX/RGX CRYSTALS Pb-FREE REFLOW	FILENAME:	CAT353
RELATED DRAWINGS:	REVISION:	B
	DATE:	01-Feb-07
	SCALE:	NTS
	Millimetres [inch]	

TAPE DETAIL (SCALE 2 : 1)



REEL DETAIL (SCALE 1 : 5)



NOTE: 1. Φ330mm REEL's MAXIMUM PACKING QUANTITY IS 4000 CRYSTAL REEL.
2. Pb NOT SHOW ON THE LABEL FOR RGX-3 SERIES MODELS.