

# RSX-11



## SMD Communication Crystal

Low profile SMD AT-cut quartz crystal in a ceramic package with a 2.0 mm x 1.6 mm foot print.



### Product description

Miniature low profile AT-cut quartz crystal. True SMD style, ceramic package with nickel plated lid, seam welded. The product is supplied on tape and reel.

### Applications

- Automotive
- GPS
- Communications
- Handset
- Consumer Products
- PCMCIA CDPD cards
- PDA
- PND
- WiFi
- LBS Handset
- Other

### Features

- Low aging
- Low hysteresis
- Wide temperature range

### Specifications

#### 1.0 SPECIFICATION REFERENCE

| Line | Parameter         | Description |
|------|-------------------|-------------|
| 1.1  | Model description | RSX-11      |
| 1.2  | RoHS compliant    | Yes         |

#### 2.0 FREQUENCY CHARACTERISTICS

| Line | Parameter                            | Test Condition  | Value      | Unit  |
|------|--------------------------------------|---|------------|-------|
| 2.1  | Frequency range                      | Nominal frequency range available   | 19.2 to 52 | MHz   |
| 2.2  | Calibration tolerance                | Frequency at 25°C ±2°C and specified load capacitance   | ±10 to 50  | ppm   |
| 2.3  | Reflow shift                         | Frequency shift after reflow with 4 hours settling  | ±1 max     | ppm   |
| 2.4  | Frequency stability over temperature | Referenced to frequency reading at 25°C and the specified Load Capacitance (Note 2)   | ±15 to 50  | ppm   |
| 2.5  | Temperature range                    | Maximum operating temperature   | -40 to 85  | °C    |
| 2.6  | Frequency perturbations              | Peak-to-peak deviation from the frequency versus temperature curve fit 5th order. Minimum of 1 frequency reading every 3°C over operating temperature range | 1 max      | ppm   |
| 2.7  | Long term stability                  | Frequency drift over 1 year at 25°C   | ±1 max     | ppm   |
| 2.8  | G sensitivity                        | Gamma vector of all three axes from 30 Hz to 1500 Hz at 10 RMS (Note 1)   | 2 max      | ppb/g |

**3.0 ELECTRICAL**

| Line | Parameter                          | Test Condition   | Value    | Unit     |
|------|------------------------------------|--|----------|----------|
| 3.1  | Load capacitance (CL)              | Frequency is calibrated to a load at room temperature (Note 3) | 5 to 32  | pF       |
| 3.2  | Shunt capacitance                  | Operating specification  | 0.5 to 3 | pF       |
| 3.3  | Pull ability                       | Load and frequency dependant                                   | 0.5 min  | ppm/pF   |
| 3.4  | Drive level                        | Operating specification  | 30 max   | $\mu$ W  |
| 3.5  | Equivalent series resistance (ESR) |  | 85 max   | $\Omega$ |

**4.0 ENVIRONMENTAL**

| Line | Parameter           | Description   |
|------|---------------------|---|
| 4.1  | Shock               | Half sine-wave acceleration of 3000g peak amplitude. Duration: 0.3ms, Velocity: 12.3ft/s [MIL-STD-202 M213]   |
| 4.2  | Moisture resistance | 1000 hours at 85°C, 85% Relative Humidity. Biased. [MIL-STD-202 M106G]  |
| 4.3  | Temperature cycling | 1000 temperature cycles, where each cycle consists of a 25 minute soak time at -45°C followed by a 25 minute soak time at 85°C, with a 60 second maximum transition time between temperatures. Air to air transition. [JESD22 METHOD JA-104C] |
| 4.4  | Vibration           | 5g for 20 minutes. 12 cycles in each of 3 orientations. Test from 10-2000 Hz [JESD22-B103-B]  |
| 4.5  | Storage temperature | -55 to 105°C  |

**5.0 MANUFACTURING INFORMATION**

| Line | Parameter             | Description  |
|------|-----------------------|--|
| 5.1  | Washing               | Able to withstand aqueous washing processes  |
| 5.2  | Reflow                | Able to withstand forced convection reflow process. Refer to "RSX/RGX crystals Pb-free Reflow" drawing |
| 5.3  | Packaging description | Tape and reel. Standard packing quantity is 4000 units per reel  |

**6.0 MARKING**

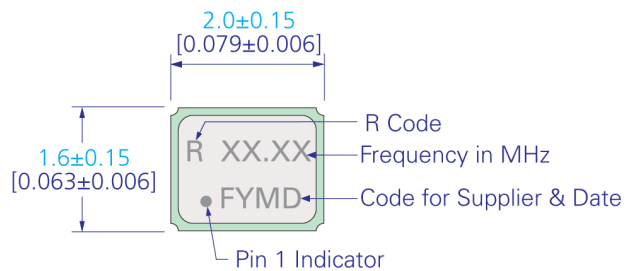
| Line | Parameter | Description            |
|------|-----------|------------------------|
| 6.1  | Type      | Laser engraved         |
| 6.2  | Line 1    | R and frequency in MHz |
| 6.3  | Line 2    | Pin 1 and date code    |

**7.0 SPECIFICATION NOTES**

| Line | Parameter | Description   |
|------|-----------|---|
| 7.1  | Note 1    | The maximum value is the specification. A minimum value, if present, indicates the tightest specification available   |
| 7.2  | Note 2    | Maximum frequency stability over the temperature range needs to be specified. Available values will depend on temperature range selected  |
| 7.3  | Note 3    | The frequency is calibrated to a load between minimum/maximum. Note that Series Resonance options are available for this model, and under certain conditions, loads above 50 pF may also be available |

**Drawing Name: RSX-11 Model Drawing**

MODEL DRAWING



TOP VIEW



SIDE VIEW

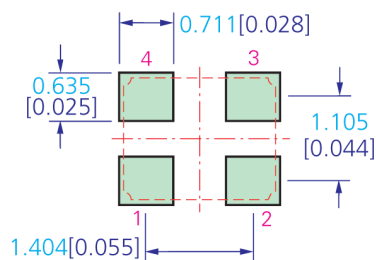


END VIEW

NOTE:  
Please contact Rakon factory for more information

| PIN CONNECTIONS |         |
|-----------------|---------|
| 1               | CRYSTAL |
| 2               | GND     |
| 3               | CRYSTAL |
| 4               | GND     |

RECOMMENDED PAD LAYOUT - TOP VIEW



TITLE: RSX-11 MODEL

RELATED DRAWINGS:

FILENAME: CAT482

REVISION: C

DATE: 06-Apr-11

SCALE: 10 : 1

Millimeters [inch]

Tolerance:

XX = ±0.5

X.X = ±0.2

X.XX = ±0.10

X.XXX = ±0.05

X° = ±1.0°

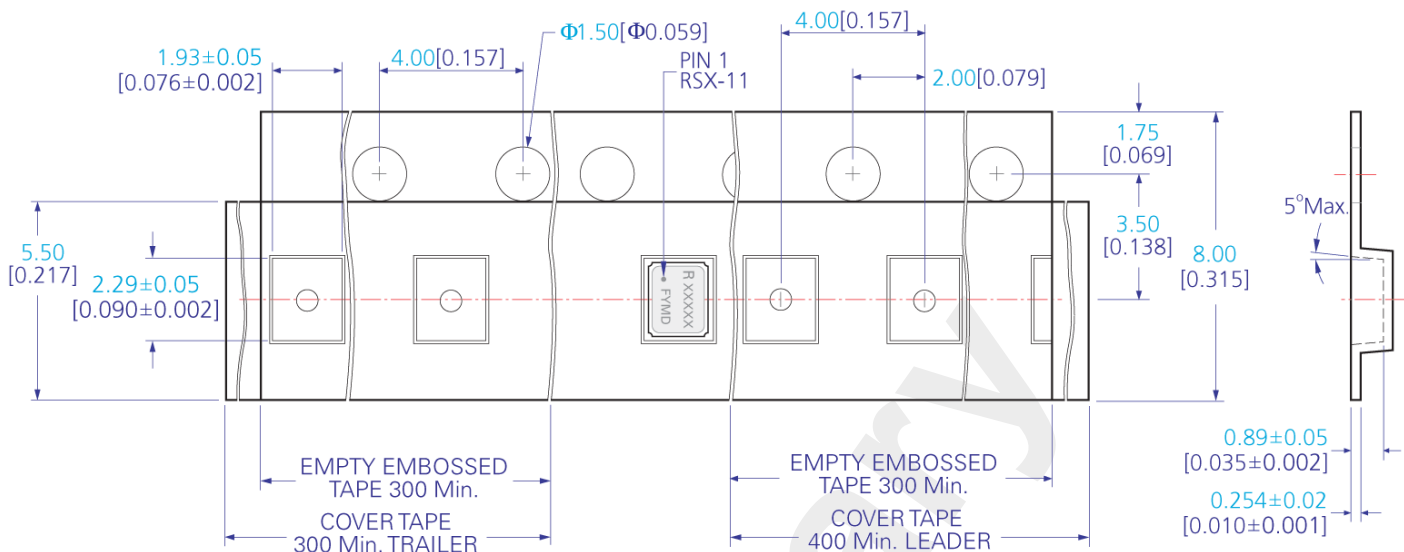
Hole = ±0.10

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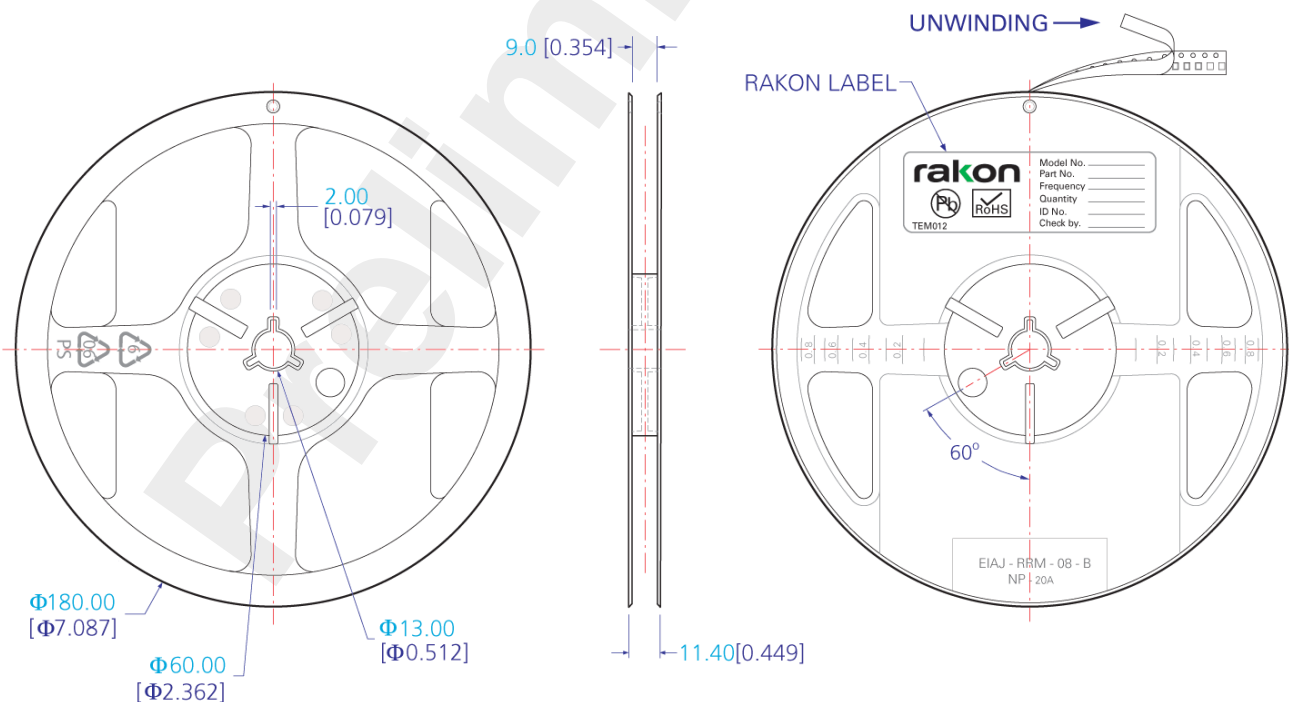
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**Drawing Name: RSX-11 Tape & Reel**

TAPE DETAIL (SCALE 5 : 1)



REEL DETAIL (SCALE 1 : 2.5)



TITLE: RSX-11 TAPE & REEL

RELATED DRAWINGS:

FILENAME: CAT518

REVISION: B

DATE: 19-Feb-10

SCALE: See Above

Millimeters [inch]

Tolerance:

XX = ±0.5

X.X = ±0.2

X.XX = ±0.10

X.XXX = ±0.05

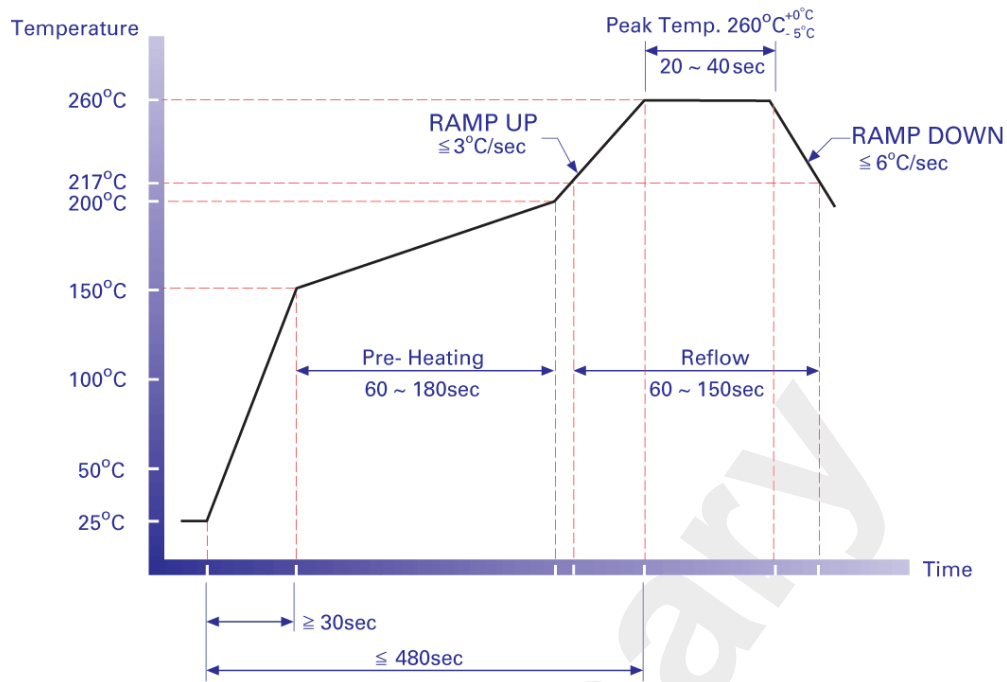
X° = ±1.0°

Hole = ±0.10



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## Drawing Name: RSX/RGX Crystals Pb-free Reflow



### 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]

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