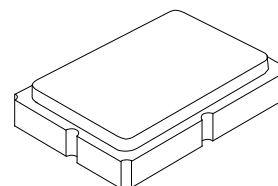


RO3073A

315.0 MHz SAW Resonator



SM5035-4

- **Designed for 315.0 MHz Transmitters**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Surface-mount Ceramic Case**
- **Complies with Directive 2002/95/EC (RoHS)**
- **Tape and Reel Standard per ANSI/EIA-481**
- **Moisture Sensitivity Level: 1**
- **AEC-Q200 Qualified**

The RO3073A is a one-port surface-acoustic-wave (SAW) resonator packaged in a surface-mount ceramic case. It provides reliable, fundamental-mode quartz frequency stabilization of fixed-frequency transmitters operating at 315.0 MHz. This SAW is designed specifically for remote control and wireless security transmitters.

Absolute Maximum Ratings

| Rating | Value | Units |
|--|------------|-------|
| CW RF Power Dissipation (See: Typical Test Circuit) | +0 | dBm |
| DC Voltage Between Terminals (Observe ESD Precautions) | ±30 | VDC |
| Case Temperature | -40 to +85 | °C |
| Soldering Temperature (10 seconds / 5 cycles maximum) | 260 | °C |

Electrical Characteristics

| Characteristic | Sym | Notes | Minimum | Typical | Maximum | Units |
|---|--------------------------------------|--------------|---------|---------|---------|---------------------|
| Center Frequency, +25 °C | Absolute Frequency | f_C | 314.925 | | 315.075 | MHz |
| | Tolerance from 315.0 MHz | Δf_C | | | ±75 | kHz |
| Insertion Loss | IL | | | 1.5 | 2.2 | dB |
| Quality Factor | Unloaded Q | Q_U | | 8000 | | |
| | 50 Ω Loaded Q | Q_L | | 1300 | | |
| Temperature Stability | Turnover Temperature | T_O | 10 | 25 | 40 | °C |
| | Turnover Frequency | f_O | | f_C | | |
| | Frequency Temperature Coefficient | FTC | | 0.032 | | ppm/°C ² |
| Frequency Aging | Absolute Value during the First Year | $ f_A $ | | ≤10 | | ppm/yr |
| DC Insulation Resistance between Any Two Terminals | | | 1.0 | | | M Ω |
| RF Equivalent RLC Model | Motional Resistance | R_M | | 19.4 | | Ω |
| | Motional Inductance | L_M | | 78.4 | | μ H |
| | Motional Capacitance | C_M | | 3.3 | | fF |
| | Shunt Static Capacitance | C_O | | 4.1 | | pF |
| Test Fixture Shunt Inductance | L_{TEST} | | | 64.2 | | nH |
| Lid Symbolization (YY = Year, WW = Week, S = Shift) | 656, YYWWS | | | | | |



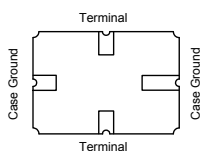
CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

NOTES:

1. The design, manufacturing process, and specifications of this device are subject to change.
2. US or International patents may apply.
3. RoHS compliant from the first date of manufacture.

Electrical Connections

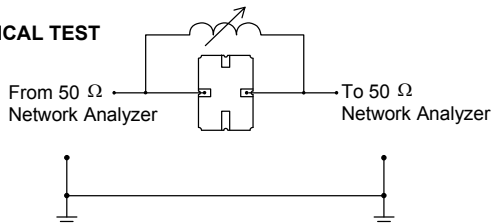
The SAW resonator is bidirectional and may be installed with either orientation. The two terminals are interchangeable and unnumbered. The callout NC indicates no internal connection. The NC pads assist with mechanical positioning and stability. External grounding of the NC pads is recommended to help reduce parasitic capacitance in the circuit.



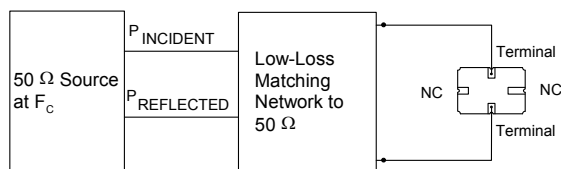
Typical Test Circuit

The test circuit inductor, L_{TEST} , is tuned to resonate with the static capacitance, C_O , at F_C .

ELECTRICAL TEST



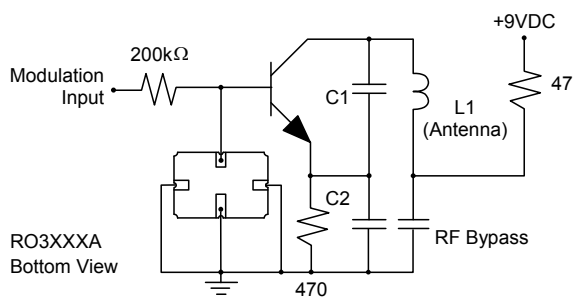
POWER TEST



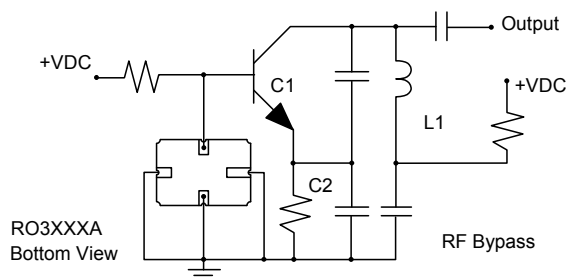
$$CW \text{ RF Power Dissipation} = P_{INCIDENT} - P_{REFLECTED}$$

Typical Application Circuits

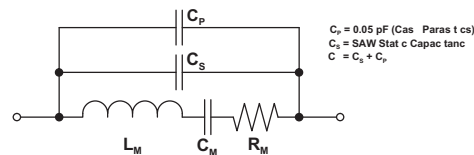
Typical Low-Power Transmitter Application



Typical Local Oscillator Applications



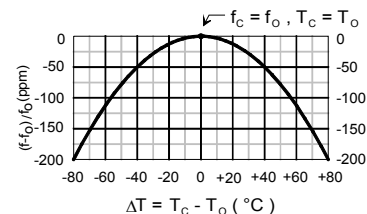
Equivalent RLC Model



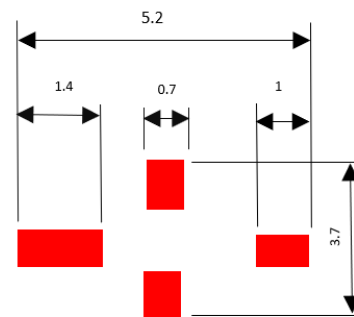
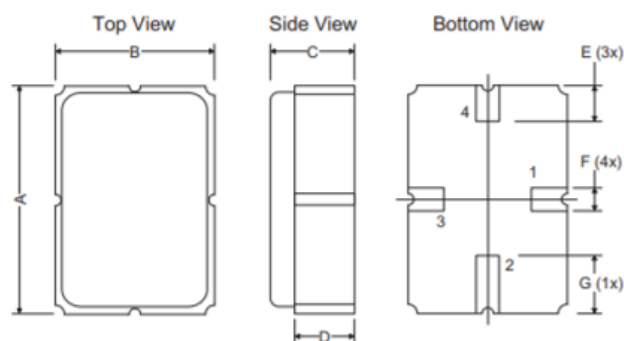
$C_P = 0.05 \text{ pF}$ (Case Parasitance)
 $C_S = \text{SAW Stat c Capacitance}$
 $C_O = C_P + C_S$

Temperature Characteristics

The curve shown on the right accounts for resonator contribution only and does not include LC component temperature contributions.



Case



PCB Footprint

| Dimensions | Millimeters | | | Inches | | |
|------------|-------------|------|------|--------|-------|-------|
| | Min | Nom | Max | Min | Nom | Max |
| A | 4.87 | 5.00 | 5.13 | 0.191 | 0.196 | 0.201 |
| B | 3.37 | 3.50 | 3.63 | 0.132 | 0.137 | 0.142 |
| C | 1.45 | 1.53 | 1.60 | 0.057 | 0.060 | 0.062 |
| D | 1.35 | 1.43 | 1.50 | 0.040 | 0.057 | 0.059 |
| E | 0.67 | 0.80 | 0.93 | 0.026 | 0.031 | 0.036 |
| F | 0.37 | 0.50 | 0.63 | 0.014 | 0.019 | 0.024 |
| G | 1.07 | 1.20 | 1.33 | 0.042 | 0.047 | 0.052 |

Recommended Reflow Profile

1. Preheating shall be fixed at 150~180°C for 60~90 seconds.
2. Ascending time to preheating temperature 150°C shall be 30 seconds min.
3. Heating shall be fixed at 220°C for 50~80 seconds and at 260°C +0/-5°C peak (10 seconds).
4. Time: 5 times maximum.



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