



| |
|--------------|
| Approved by: |
| Checked by: |
| Issued by: |

SPECIFICATION

P/N: SJK-SR447M-TO39

深圳市晶科鑫实业有限公司
SHENZHEN CRYSTAL TECHNOLOGY INDUSTRIAL CO., LTD.

Tel: 86-755-88352809
E-mail: sjksale@126.com

Fax: 86-755-88353718
URL: [Http://www.q-crystal.com](http://www.q-crystal.com)



One-Port SAW Resonator For Wireless Remote Control

- I Very Low Series Resistance
- I Quartz Stability
- I Rugged, Hermetic, Low-Profile TO39 or F11 Case

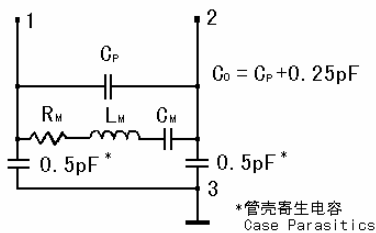
The SR447M is a true one-port, surface-acoustic-wave (SAW) resonator in a low-profile TO39 or F11 or QCC8C case. It provides reliable, fundamental-mode, quartz frequency stabilization of fixed-frequency transmitters operating at 447.675MHz. The SR447M is designed specifically for wireless remote control and security transmitters, Typically for Automotive-keyless-entry, Operating in the USA under FCC Part 15, in Canada under DoC RSS-210, and in Italy .

1. Marking R447

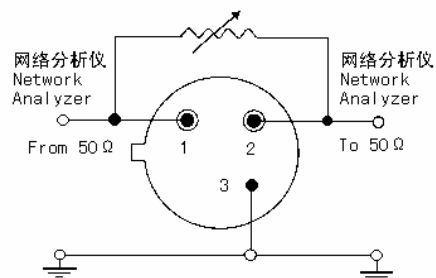
2. Package Dimension



3. Equivalent LC Model



4. Test Circuit



5. Absolute Maximum Ratings

| Rating | Value | Units |
|---------------------------------|------------|-------|
| CW RF Power Dissipation | +0 | dBm |
| DC Voltage Between Any Two Pins | 0 | VDC |
| Case Temperature | -40 to +85 | °C |



One-Port SAW Resonator For Wireless Remote Control

6. Electrical Characteristics

| Characteristic | | Sym | Min | Typical | Max | Units |
|--|-----------------------------------|--------------|---------|-----------|----------|---------------------|
| Center Frequency (+25 °C) | Absolute Frequency | f_c | 447.625 | 447.675 | 447.725 | MHz |
| | Tolerance from 315.00MHz | Δf_c | | | ± 50 | kHz |
| Insertion Loss | | IL | | 1.2 | 2.2 | dB |
| Quality Factor | Unloaded Q | Q_U | | 14600 | | |
| | 50 Ω Loaded Q | Q_L | | 2000 | | |
| Temperature Stability | Turnover Temperature | T_O | 23 | 38 | 53 | °C |
| | Turnover Frequency | f_O | | f_{c+2} | | kHz |
| | Freq. Temp. Coefficient | FTC | | 0.037 | | ppm/°C ² |
| Frequency Aging Absolute Value during the First Year | | $ f_A $ | | ≤ 10 | | ppm/yr |
| DC Insulation Resistance between Any Two Pins | | | 1.0 | | | M Ω |
| RF Equivalent RLC Model | Motional Resistance | R_M | | 15 | 29 | Ω |
| | Motional Inductance | L_M | | 109 | | μ H |
| | Motional Capacitance | C_M | | 2.2 | | fF |
| | Pin 1 to Pin 2 Static Capacitance | C_O | 2.3 | 2.6 | 2.9 | pF |
| Transducer Static Capacitance | | C_P | | 2.3 | | pF |
| Test Fixture Shunt Inductance | | L_{TEST} | | 93 | | nH |

CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

Notes:

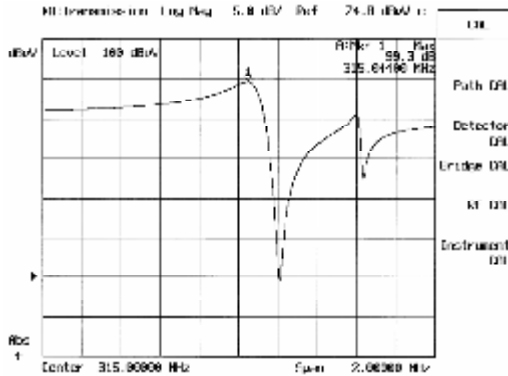
1. Frequency aging is the change in f_c with time and is specified at +65°C or less. Aging may exceed the specification for prolonged temperatures above +65°C. Typically, aging is greatest the first year after manufacture, decreasing in subsequent years.
2. The center frequency, f_c , is measured at the minimum insertion loss point, IL_{MIN} , with the resonator in the 50 Ω test system ($VSWR \leq 1.2:1$). The shunt inductance, L_{TEST} , is tuned for parallel resonance with C_O at f_c .
3. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
4. Unless noted otherwise, case temperature $T_C = +25^\circ\text{C} \pm 2^\circ\text{C}$.
5. Derived mathematically from one or more of the following directly measured parameters: f_c , IL, 3dB bandwidth, f_c versus T_C , and C_O .
6. Turnover temperature, T_O , is the temperature of maximum (or turnover) frequency, f_O . The nominal frequency at any case temperature, T_C , may be calculated from: $f = f_O [1 - FTC(T_O - T_C)^2]$. Typically, oscillator T_O is 20°C less than the specified resonator T_O .
7. This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance C_O is the static (nonmotional) capacitance between Pin 1 and Pin 2 measured at low frequency (10MHz) with a capacitance meter. The measurement includes parasitic capacitance with floating case. For usual grounded case applications (with ground connected to either pin 1 or pin 2 and to the case), add approximately 0.25pF to C_O .

The design, manufacturing process, and specifications of this device are subject to change without notice.

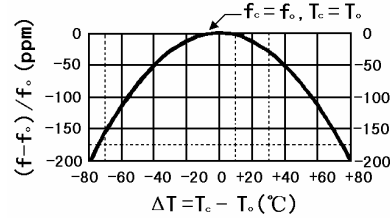


One-Port SAW Resonator For Wireless Remote Control

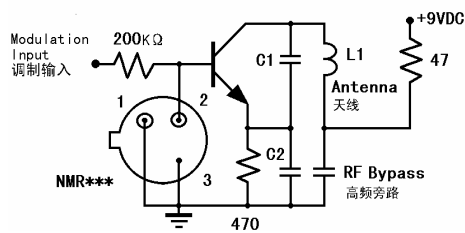
7. Typical Frequency Response



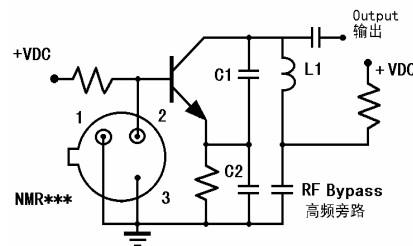
8. Temperature Characteristic



9. Application Circuits



Low-Power Transmitter Application



Local Oscillator Application

10. Reliability

- | Mechanical Shock: The components shall remain within the electrical specifications after 1000 shocks, acceleration 392m/s^2 , duration 6 milliseconds.
- | Vibration Fatigue: The components shall remain within the electrical specifications after loaded vibration at 20 Hz, amplitude 1.5 mm, for 2 hours.
- | Terminal Strength: The components shall remain within the electrical specifications after pulled 2 Kgs weight for 10 seconds towards an axis of each terminal.
- | High Temperature Storage: The components shall remain within the electrical specifications after being kept at the $85^\circ\text{C} \pm 2^\circ\text{C}$ for 48 hours, then kept at room temperature for 2 hours.
- | Low Temperature Storage: The components shall remain within the electrical specifications after being kept at the $-25^\circ\text{C} \pm 2^\circ\text{C}$ for 48 hours, then kept at room temperature for 2 hours.
- | Temperature Cycle: The components shall remain within the electrical specifications after 5 Cycles of high and low temperature testing (one cycle: 80°C for 30 minutes \rightarrow 25°C for 5 minutes \rightarrow -25°C for 30 minutes) than kept at room temperature for 2 hours.
- | Solder-heat Resistance: The components shall remain within the electrical specifications after dipped in the solder at 260°C for 10 ± 1 seconds, then kept at room temperature for 2 hours. (Terminal must be dipped leaving 1.5 mm from the case).
- | Solder ability: Solder ability of terminal shall be kept at more than 80% after dipped in the solder flux at $230^\circ\text{C} \pm 5^\circ\text{C}$ for 5 ± 1 second.