

- **Ideal for 441.20 MHz Transmitters**
- **Very Low Insertion Loss**
- **Quartz Stability**
- **Rugged, Hermetic, Low Profile TO-39 Package**

# SR441

| Absolute Maximum Rating (Ta=25°C) |           |           |      |
|-----------------------------------|-----------|-----------|------|
| Parameter                         |           | Rating    | Unit |
| CW RF Power Dissipation           | $P$       | 0         | dBm  |
| DC Voltage                        | $V_{DC}$  | $\pm 30$  | V    |
| Operating Temperature Range       | $T_A$     | -10 ~ +60 | °C   |
| Storage Temperature Range         | $T_{stg}$ | -40 ~ +85 | °C   |

| Electronic Characteristics                    |                                      |              |         |          |          |                     |
|---|--------------------------------------|--------------|---------|----------|----------|---------------------|
|   | Parameter                            | Sym          | Minimum | Typical  | Maximum  | Unit                |
| Frequency (25°C)                              | Nominal Frequency                    | $f_C$        | NS      | 441.20   | NS       | MHz                 |
|   | Tolerance from 441.20 MHz            | $\Delta f_C$ | -       | -        | $\pm 75$ | KHz                 |
| Insertion Loss                                |                                      | $IL$         | -       | 2.7      | 3.1      | dB                  |
| Quality Factor                                | Unloaded Q-Value                     | $Q_U$        | -       | 13,460   | -        | -                   |
|   | 50Ω Loaded Q-Value                   | $Q_L$        | -       | 3,600    | -        | -                   |
| Temperature Stability                         | Turnover Temperature                 | $T_O$        | 25      | -        | 55       | °C                  |
|   | Turnover Frequency                   | $f_O$        | -       | $f_C$    | -        | KHz                 |
|   | Frequency Temperature Coefficient    | $FTC$        | -       | -0.032   | -        | ppm/°C <sup>2</sup> |
| Frequency Aging                               | Absolute Value during the First Year | $ f_A $      | -       | -        | 10       | ppm/yr              |
| DC Insulation Resistance Between any Two Pins |                                      | -            | 1.0     | -        | -        | MΩ                  |
| RF Equivalent RLC Model                       | Motional Resistance                  | $R_M$        | -       | 36.5     | 43.0     | Ω                   |
|   | Motional Inductance                  | $L_M$        | -       | 177.3536 | -        | μH                  |
|   | Motional Capacitance                 | $C_M$        | -       | 0.7345   | -        | fF                  |
|   | Pin 1 to Pin 2 Static Capacitance    | $C_O$        | 1.00    | 1.15     | 1.30     | pF                  |

NS = Not Specified

**Notes:**

- The center frequency,  $f_C$ , is measured at the minimum IL point with the resonator in the 50Ω test system.
- Unless noted otherwise, case temperature  $T_C = +25^\circ\text{C} \pm 2^\circ\text{C}$ .
- 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.
- 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:  $f = f_O [1 - FTC (T_O - T_C)^2]$ .
- This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance  $C_O$  is the measured static (nonmotional) capacitance between Pin1 and Pin2. The measurement includes case parasitic capacitance.
- Derived mathematically from one or more of the following directly measured parameters:  $f_C$ ,  $IL$ , 3 dB bandwidth,  $f_C$  versus  $T_C$ , and  $C_O$ .
- The specifications of this device are based on the test circuit shown above and subject to change or obsolescence without notice.
- Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
- Our liability is only assumed for the Surface Acoustic Wave (SAW) component(s) per se, not for applications, processes and circuits implemented within components or assemblies.
- For questions on technology, prices and delivery please contact our sales offices or e-mail to sales@vanlong.com.

# 441.20 MHz One-Port SAW Resonator



## Package Dimensions (TO-39)



## Electrical Connections

| Terminals | Connection    |
|-----------|---------------|
| 1         | Input/ Output |
| 2         | Output/ Input |
| 3         | Case-Ground   |

## Package Dimensions

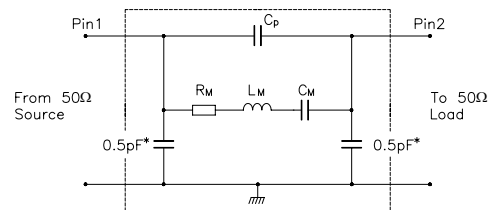
| Dimensions | Nom (mm)     |       |
|------------|--------------|-------|
|            | Min          | Max   |
| A          | 9.10         | 9.50  |
| B          | 3.20         | 3.60  |
| C          | 2.80         | 3.20  |
| D          | Φ0.25        | Φ0.65 |
| E          | 4.98         | 5.18  |
| F          | 2.54 Nominal |       |
| G          | 0.4          | 0.5   |

## Marking



Ink Marking  
Color: Black or Blue

## Equivalent LC Model and Test Circuit



## Typical Application Circuit

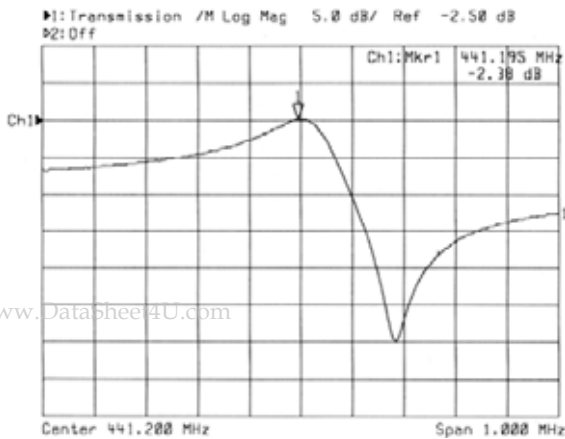
### Low Power Transmitter Application



### Local Oscillator Application



## Typical Frequency Response



## Temperature Characteristics



$$\Delta T = T_c - T_o \text{ (}^\circ\text{C)}$$

The curve shown above accounts for resonator contribution only and does not include oscillator temperature characteristics.