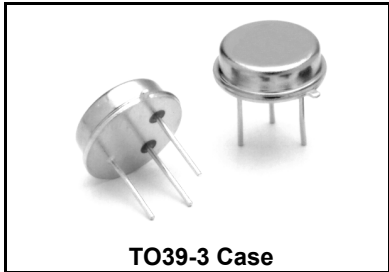


RO3023

**433.97 MHz
SAW
Resonator**



- **Ideal for European 433.92 MHz Transmitters**
- **Low Series Resistance**
- **Quartz Stability**
- **Rugged, Hermetic, Low-Profile TO39 Case**

The RO3023 is a true one-port, surface-acoustic-wave (SAW) resonator in a low-profile TO39 case. It provides reliable, fundamental-mode, quartz frequency stabilization of fixed-frequency transmitters operating at 433.92 MHz. The RO3023 is designed specifically for remote-control and wireless security devices operating in Europe under ETSI I-ETS 300 220 and in Germany under FTZ 17 TR 2100.

Absolute Maximum Ratings

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

Electrical Characteristics

| Characteristic | | Sym | Notes | Minimum | Typical | Maximum | Units | | | | |
|---|--------------------------------------|--------------|------------|---------|---------|---------|---------------------|--|-------------|-----|---------------------|
| Center Frequency at +25 °C | Absolute Frequency | f_C | 2, 3, 4, 5 | 433.895 | | 434.045 | MHz | | | | |
| | Tolerance from 433.970 MHz | Δf_C | | | | | | | ±75 | kHz | |
| Insertion Loss | | IL | 2, 5, 6 | | 2.5 | 4.8 | dB | | | | |
| Quality Factor | Unloaded Q | Q_U | 5, 6, 7 | | 8,500 | | | | | | |
| | 50 W Loaded Q | Q_L | | | | | | | 2200 | | |
| Temperature Stability | Turnover Temperature | T_O | 6, 7, 8 | 10 | 25 | 40 | °C | | | | |
| | Turnover Frequency | f_O | | | | | | | $f_C + 2.3$ | | kHz |
| | Frequency Temperature Coefficient | FTC | | | | | | | 0.037 | | ppm/°C ² |
| Frequency Aging | Absolute Value during the First Year | fA | 1 | | ≤10 | | ppm/yr | | | | |
| DC Insulation Resistance between Any Two Pins | | | 5 | 1.0 | | | MΩ | | | | |
| RF Equivalent RLC Model | Motional Resistance | R_M | 5, 7, 9 | | 34.5 | | Ω | | | | |
| | Motional Inductance | L_M | | | | | | | 107 | | μH |
| | Motional Capacitance | C_M | | | | | | | 1.3 | | fF |
| | Pin 1 to Pin 2 Static Capacitance | C_O | 5, 6, 9 | | 2.1 | | pF | | | | |
| | Transducer Static Capacitance | C_P | 5, 6, 7, 9 | | 1.8 | | pF | | | | |
| Test Fixture Shunt Inductance | | L_{TEST} | 2, 7 | | 68.2 | | nH | | | | |
| Lid Symbolization | | | | | | | RFM RO3023 Datecode | | | | |

CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

NOTES:

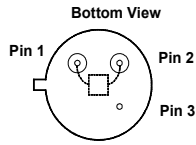
- Frequency aging is the change in f_C with time and is specified at +65°C or less. Aging may exceed the specification for prolonged temperatures above +65°C. Typically, aging is greatest the first year after manufacture, decreasing in subsequent years.
- The center frequency, f_C , is measured at the minimum insertion loss point, IL_{MIN} , with the resonator in the 50 Ω test system (VSWR ≤ 1.2:1). The shunt inductance, L_{TEST} , is tuned for parallel resonance with C_O at f_C .
- One or more of the following United States patents apply: 4,454,488 and 4,616,197.
- Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
- Unless noted otherwise, case temperature $T_C = +25°C \pm 2°C$.
- The design, manufacturing process, and specifications of this device are subject to change without notice.
- 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 .
- 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 .
- 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 Pin1 and Pin 2 measured at low frequency (10 MHz) with a capacitance meter. The measurement includes case parasitic capacitance with a floating case. For usual grounded case applications (with ground connected to either Pin 1 or Pin 2 and to the case), add approximately 0.25 pF to C_O .

Discontinued

Electrical Connections

This one-port, two-terminal SAW resonator is bidirectional. The terminals are interchangeable with the exception of circuit board layout.

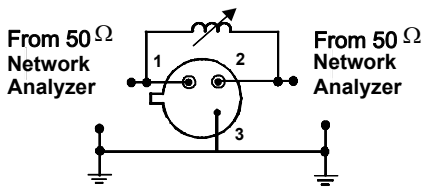
| Pin | Connection |
|-----|-------------|
| 1 | Terminal 1 |
| 2 | Terminal 2 |
| 3 | Case Ground |



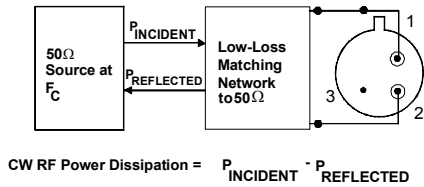
Typical Test Circuit

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

Electrical Test:

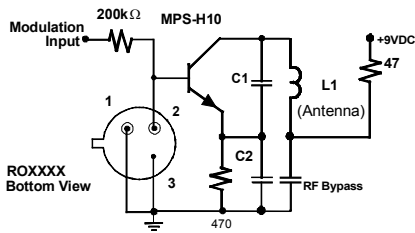


Power Test:

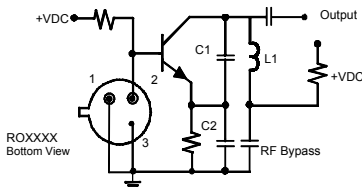


Typical Application Circuits

Typical Low-Power Transmitter Application:

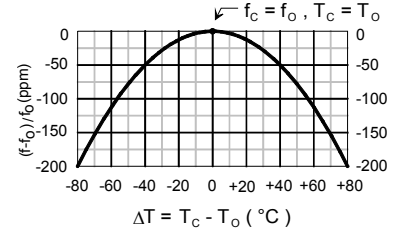


Typical Local Oscillator Application:



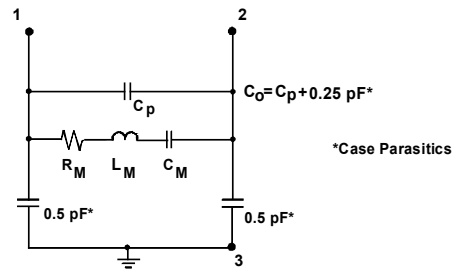
Temperature Characteristics

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

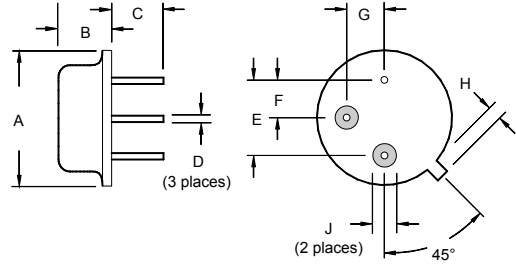


Equivalent LC Model

The following equivalent LC model is valid near resonance:



Case Design



| Dimensions | Millimeters | | Inches | |
|------------|--------------|------|---------------|-------|
| | Min | Max | Min | Max |
| A | | 9.30 | | 0.366 |
| B | | 3.18 | | 0.125 |
| C | 2.50 | 3.50 | 0.098 | 0.138 |
| D | 0.46 Nominal | | 0.018 Nominal | |
| E | 5.08 Nominal | | 0.200 Nominal | |
| F | 2.54 Nominal | | 0.100 Nominal | |
| G | 2.54 Nominal | | 0.100 Nominal | |
| H | | 1.02 | | 0.040 |
| J | 1.40 | | 0.055 | |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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