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INNOVATOR IN ELECTRONICS

Discontinued

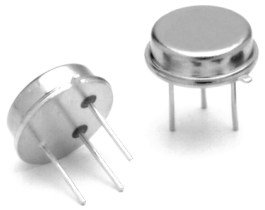
RFM products are now Murata products.

RO2100

295.05 MHz SAW Resonator

- ***Ideal for 295 MHz Oscillators***
- ***Low Series Resistance***
- ***Quartz Stability***
- ***Rugged, Hermetic, Low-Profile TO39 Case***
- ***Complies with Directive 2002/95/EC (RoHS)***

The RO2100 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 oscillators operating at 295.05 MHz.



TO39-3 Case

Absolute Maximum Ratings

Rating	Value	Units
CW RF Power Dissipation	+5	dBm
DC Voltage Between Terminals	±30	VDC
Case Temperature	-40 to +85	°C
Soldering Temperature (10 seconds / 5 cycles MAX)	260	°C

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Center Frequency at +25 °C	Absolute Frequency	f_C	2, 3, 4, 5	294.950		295.150	MHz
	Tolerance from 295.05 MHz	Δf_C				±100	kHz
Insertion Loss		IL	2, 5, 6		3.1	7.0	dB
Quality Factor	Unloaded Q	Q_U	5, 6, 7		13,000		
	50 Ω Loaded Q	Q_L			3,900		
Temperature Stability	Turnover Temperature	T_O	6, 7, 8	30	45	57	°C
	Turnover Frequency	f_O			f_C + .004		kHz
	Frequency Temperature Coefficient	FTC			0.032		ppm/°C^2
Frequency Aging	Absolute Value during the First Year	|fA|	1			±10	ppm/yr
DC Insulation Resistance between Pin 1 and Pin 2			5	1.0			MΩ
RF Equivalent RLC Model	Motional Resistance	R_M	5, 6, 7, 9		43	78	Ω
	Motional Inductance	L_M			309.913		µH
	Motional Capacitance	C_M			0.93888		fF
	Pin 1 to Pin 2 Static Capacitance	C_O	5, 6, 9	1.9	2.2	2.5	pF
	Transducer Static Capacitance	C_P	5, 6, 7, 9		2.4		pF
Test Fixture Shunt Inductance		L_{TEST}	2, 7		121		nH
Lid Symbolization		RFM RO2100					

CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

Notes:

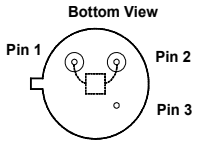
1. Lifetime (10 year) frequency aging.
2. The center frequency, f_C, is measured at the minimum insertion loss point, IL_{MIN}, with the resonator in the 50 W test system (VSWR ≤ 1.2:1). The shunt inductance, L_{TEST}, is tuned for parallel resonance with C_O at f_C.
3. One or more of the following United States patents apply: 4,454,488 and 4,616,197.
4. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
5. Unless noted otherwise, case temperature T_C = +25°C±2°C.
6. The design, manufacturing process, and specifications of this device are subject to change without notice.
7. 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.
8. 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: $f = f_O [1 - FTC (T_O - T_C)^2]$.
9. 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 (10 MHz) with a capacitance meter. The measurement includes parasitic capacitance with a floating case. Case parasitic capacitance is approximately 0.25pF. Transducer parallel capacitance can be calculated as: $C_P \approx C_O - 0.25$ pF.

Discontinued

Electrical Connections

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

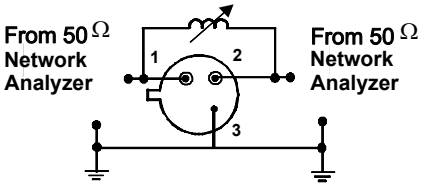
Pin	Connection
1	Terminal 1
2	Terminal 2
3	Case Ground



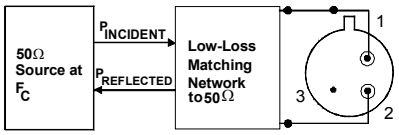
Typical Test Circuit

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

Electrical Test:



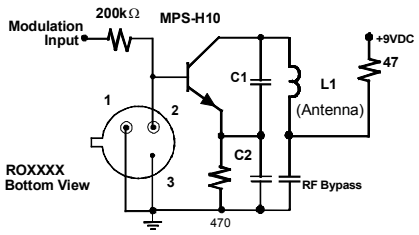
Power Test:



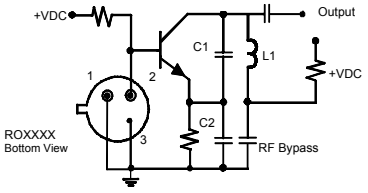
CW RF Power Dissipation = $P_{INCIDENT} - P_{REFLECTED}$

Typical Application Circuits

Typical Low-Power Transmitter Application:

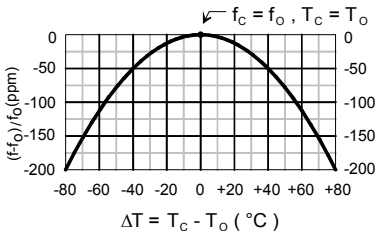


Typical Local Oscillator Application:



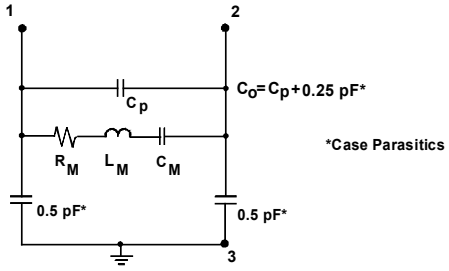
Temperature Characteristics

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

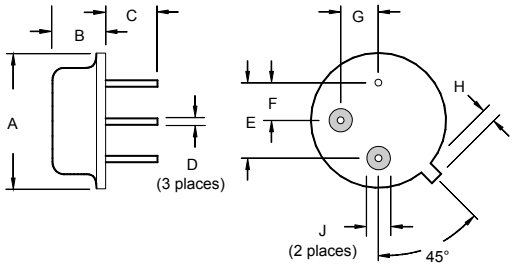


Equivalent LC Model

The following equivalent LC model is valid near resonance:



Case Design



Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A		9.40		0.370
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	