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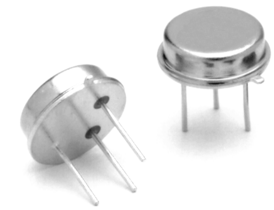
RO3075

345.0 MHz SAW Resonator



TO39-3 Case

- ***Ideal for 345.0 MHz Transmitters***
- ***Very Low Series Resistance***
- ***Quartz Stability***
- ***Rugged, Hermetic, TO39-3 Package***

The RO3075 is a true one-port, surface-acoustic-wave (SAW) resonator in TO39-3 case. It provides reliable, fundamental-mode, quartz frequency stabilization of fixed-frequency transmitters operating at 345.0 MHz.

Absolute Maximum Ratings

Rating	Value	Units
CW RF Power Dissipation	+5	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	344.930		345.070	MHz
	Tolerance from 345.0 MHz	Δf_C			±70	±100	kHz
Insertion Loss		IL	2, 5, 6		0.9	1.8	dB
Quality Factor	Unloaded Q	Q_U	5, 6, 7		7900		
	50 Ω Loaded Q	Q_L			750		
Temperature Stability	Turnover Temperature	T_O	6, 7, 8	10	25	40	°C
	Turnover Frequency	f_O			f_C-5		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 Terminals			5	1.0			MΩ
RF Equivalent RLC Model	Motional Resistance	R_M	5, 7, 9		10.5		Ω
	Motional Inductance	L_M			38		µH
	Motional Capacitance	C_M			5.6		fF
	Pin 1 to Pin 2 Static Capacitance	C_O	5, 6, 9		4.2		pF
	Transducer Static Capacitance	C_P	5, 6, 7, 9		4.0		pF
Test Fixture Shunt Inductance		L_{TEST}	2, 7		50.7		nH
Lid Symbolization		RFM / 3075					

CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

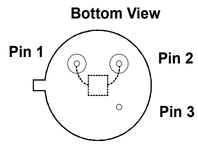
NOTES:

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 Ω 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 the two terminals 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: $C_P \approx C_O$ - 0.25pF.

Electrical Connections

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

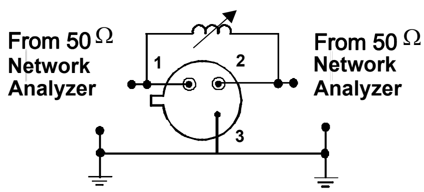
Pin	Connection
1	Terminal 1
2	Terminal 2
3	Case Ground



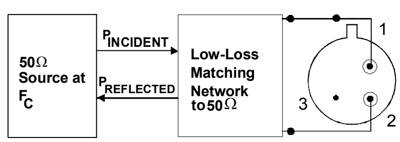
Typical Test Circuit

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

Electrical Test:



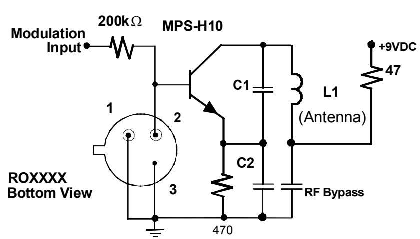
Power Test:



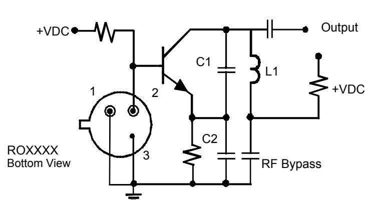
CW RF Power Dissipation = $P_{INCIDENT} - P_{REFLECTED}$

Typical Application Circuits

Typical Low-Power Transmitter Application:

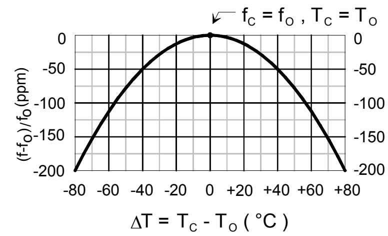


Typical Local Oscillator Application:



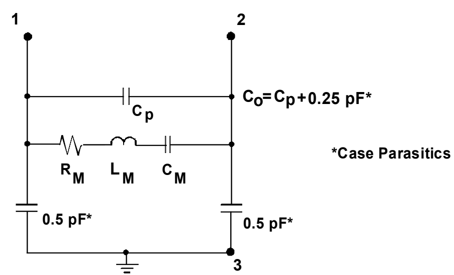
Temperature Characteristics

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

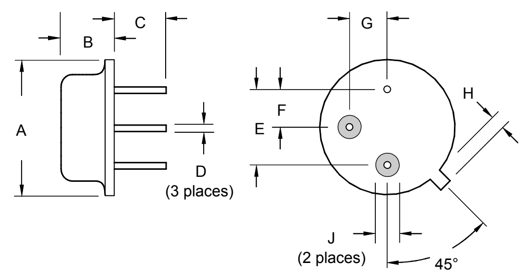


Equivalent LC Model

The following equivalent LC model is valid near resonance:



Case Design



Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A		9.30		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	