


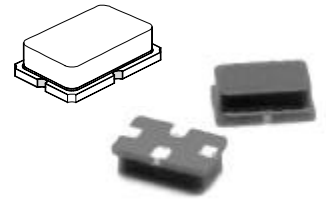


RO2073A-5

- **Ideal for European 315.05 MHz Transmitters**
- **Surface-Mount Ceramic Case with 21 mm² Footprint**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Complies with Directive 2002/95/EC (RoHS)** 

**315.05 MHz
SAW
Resonator**

The RO2073A-5 is a true one-port, surface-acoustic-wave (SAW) resonator in a surface-mount, ceramic case. It provides reliable, fundamental-mode, quartz frequency stabilization of fixed-frequency transmitters operating at 315.05 MHz. This SAW is designed specifically for remote-control and wireless security transmitters operating in the USA under FCC Part 15, in Canada under DoC RSS-210, and in Italy.



SM-2 Case

Absolute Maximum Ratings

Rating	Value	Units
CW RF Power Dissipation (See: Typical Test Circuit)	+0	dBm
DC voltage Between Terminals	±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 Tolerance from 315.05 MHz	f _C	2,3,4,5	314.975		315.125	MHz		
	Δf _C						±75	kHz
Insertion Loss	IL	2,5,6		1.3	2.2	dB		
Quality Factor	Q _U	5,6,7		15,300				
	Q _L						2,100	
Temperature Stability	T _O	6,7,8	10	25	40	°C		
	f _O						f _C	
	FTC						0.032	ppm/°C ²
Frequency Aging	fA	1		≤10		ppm/yr		
DC Insulation Resistance between Any Two Terminals		5	1.0			MΩ		
RF Equivalent RLC Model	R _M	5, 6, 7, 9		16	29	Ω		
	L _M						127.430	μH
	C _M						2.00267	fF
	C _O						2.0	2.3
Test Fixture Shunt Inductance	L _{TEST}	2, 7		110		nH		
Lid Symbolization (in addition to Lot and/or Date Codes)	151							



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 for all specifications.
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) fre-

quency, f_O. The nominal frequency at any case temperature, TC, may be calculated from: $f = f_O [1 - FTC (T_O - T_C)^2]$.

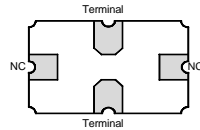
9. This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance C_O is the static (nonmotional) capacitance between the two terminals measured at low frequency (10 MHz) with a capacitance meter. The measurement includes parasitic capacitance with "NC" pads unconnected. Case parasitic capacitance is approximately 0.05pF. Transducer parallel capacitance can be calculated as: C_P ≈ C_O - 0.05 pF.

315.05 MHz

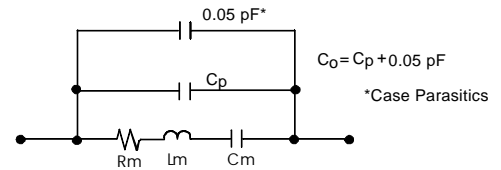
SAW Resonator

Electrical Connections

The SAW resonator is bidirectional and may be installed with either orientation. The two terminals are interchangeable and unnumbered. The callout NC indicates no internal connection. The NC pads assist with mechanical positioning and stability. External grounding of the NC pads is recommended to help reduce parasitic capacitance in the circuit.



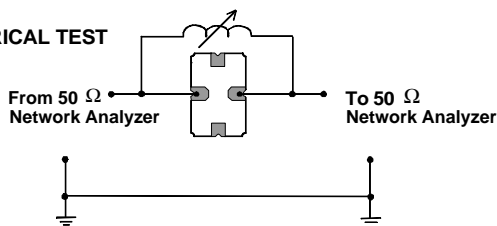
Equivalent LC Model



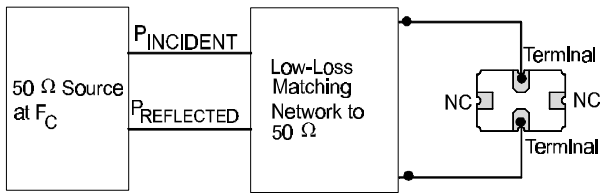
Typical Test Circuit

The test circuit inductor, L_{TEST} , is tuned to resonate with the static capacitance, C_0 , at F_C .

ELECTRICAL TEST



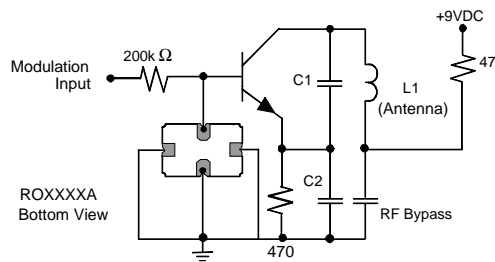
POWER TEST



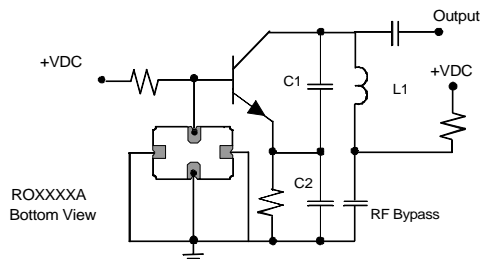
$$\text{CW RF Power Dissipation} = P_{\text{INCIDENT}} - P_{\text{REFLECTED}}$$

Typical Application Circuits

Typical Low-Power Transmitter Application

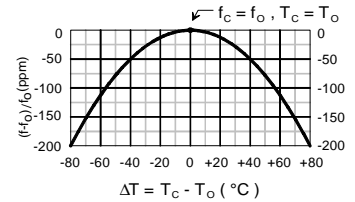


Typical Local Oscillator Application



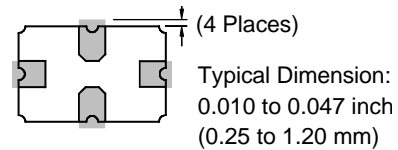
Temperature Characteristics

The curve shown on the right accounts for resonator contribution only and does not include LC component temperature contributions.



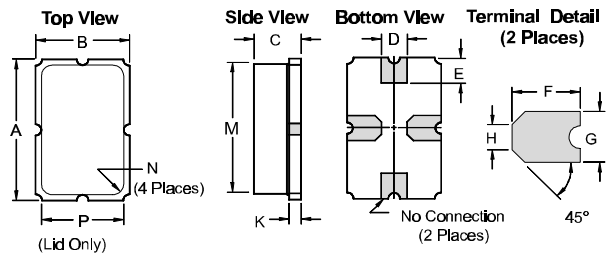
Typical Circuit Board Land Pattern

The circuit board land pattern shown below is one possible design. The optimum land pattern is dependent on the circuit board assembly process which varies by manufacturer. The distance between adjacent land edges should be at a maximum to minimize parasitic capacitance. Trace lengths from terminal lands to other components should be short and wide to minimize parasitic series inductances.



Case Design

The case material is black alumina with contrasting symbolization. All pads are nominally centered with respect to the base and consist of 40 to 70 microinches electroless gold on 60-350 microrinches electroless nickel.



Dimensions	Millimeters		Inches	
	Min	Max	Min	Max
A		5.97		0.235
B		3.94		0.155
C		2.16		0.085
D	0.94	1.10	0.037	0.043
E	0.83	1.20	0.033	0.047
F	1.16	1.53	0.046	0.060
G	0.94	1.10	0.037	0.043
H	0.43	0.59	0.017	0.023
K	0.43	0.59	0.017	0.023
M		5.31		0.209
N	0.38	0.64	0.015	0.025
P		3.28		0.129