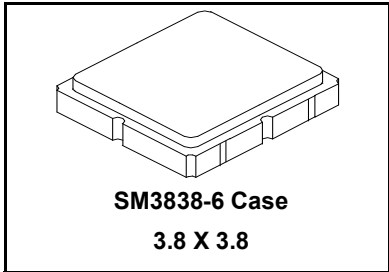


- Ideal for 303.825 MHz Transmitters
- Very Low Series Resistance
- Quartz Stability
- Surface Mount Ceramic Case with 21 mm<sup>2</sup> Footprint
- Complies with Directive 2002/95/EC (RoHS)
- Tape and Reel Standard per ANSI/EIA-481



**RO3104D-1**

**303.825 MHz  
SAW Resonator**



The RO3104D-1 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 303.825 MHz. This SAW is designed specifically for AM transmitters in wireless security and remote control applications operating in the USA under FCC Part 15, in Australia, in Japan, and in Korea.

**Absolute Maximum Ratings**

Rating	Value	Units
CW RF Power Dissipation (See Typical Test Circuit)	0	dBm
DC Voltage Between Terminals (Observe ESD Precautions)	12	VDC
Case Temperature	-40 to +85	°C
Soldering Temperature (10 seconds / 5 cycles max.)	260	°C

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Frequency (+25 °C)	Nominal Frequency	f <sub>C</sub>		303.775		303.875	MHz
	Tolerance from 303.825 MHz	Δf <sub>C</sub>				±50	kHz
Insertion Loss		IL			1.4	2.0	dB
Quality Factor	Unloaded Q	Q <sub>U</sub>			9500		
	50 Ω Loaded Q	Q <sub>L</sub>			1400		
Temperature Stability	Turnover Temperature	T <sub>O</sub>		10	25	40	°C
	Turnover Frequency	f <sub>O</sub>			f <sub>C</sub>		
	Frequency Temperature Coefficient	FTC			0.032		ppm/°C <sup>2</sup>
Frequency Aging	Absolute Value during the First Year	f <sub>A</sub>			10		ppm/yr
DC Insulation Resistance between Any Two Terminals				1.0			MΩ
RF Equivalent RLC Model	Motional Resistance	R <sub>M</sub>			16.7		Ω
	Motional Inductance	L <sub>M</sub>			82.8		μH
	Motional Capacitance	C <sub>M</sub>			3.3		fF
	Transducer Static Capacitance	C <sub>O</sub>			3.4		pF
Test Fixture Shunt Inductance		L <sub>TEST</sub>			80.4		nH
Lid Symbolization				759, YWWS			
Standard Reel Quantity	Reel Size 7 Inch			500 Pieces/Reel			
	Reel Size 13 Inch			3000 Pieces/Reel			



**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

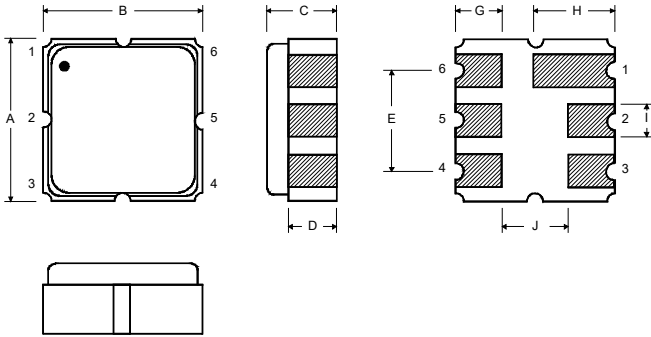
**NOTES:**

1. The design, manufacturing process, and specifications of this device are subject to change.
2. US or International patents may apply.
3. RoHS compliant from the first date of manufacture.

## 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.

Pin	Connection
1	NC
2	Terminal
3	NC
4	NC
5	Terminal
6	NC



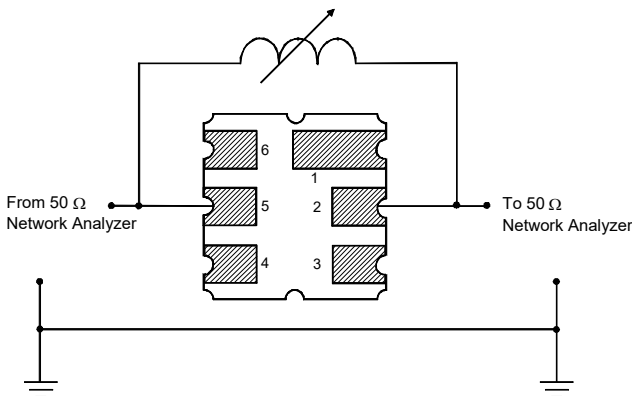
## Case Dimensions

Dimension	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	3.60	3.80	4.0	0.14	0.15	0.16
B	3.60	3.80	4.0	0.14	0.15	0.16
C	1.00	1.20	1.40	0.04	0.05	0.055
D	0.95	1.10	1.25	0.033	0.043	0.05
E	2.39	2.54	2.69	0.090	0.10	0.110
G	0.90	1.0	1.10	0.035	0.04	0.043
H	1.90	2.0	2.10	0.75	0.08	0.83
I	0.50	0.6	0.70	0.020	0.024	0.028
J	1.70	1.8	1.90	0.067	0.07	0.075

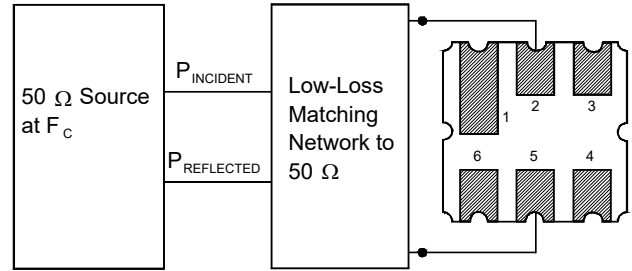
## Typical Test Circuit

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

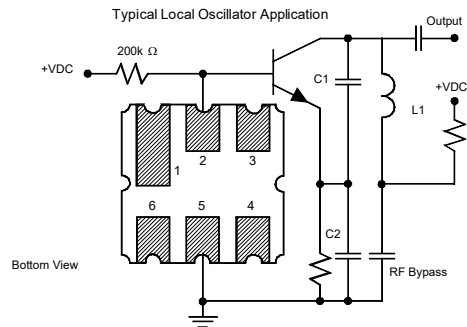
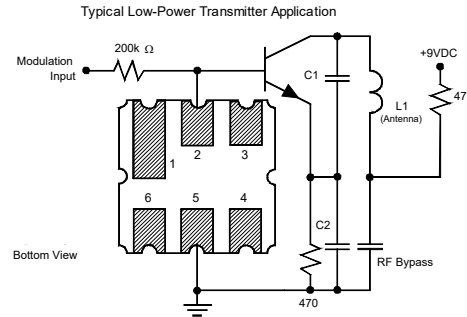
## Electrical Test



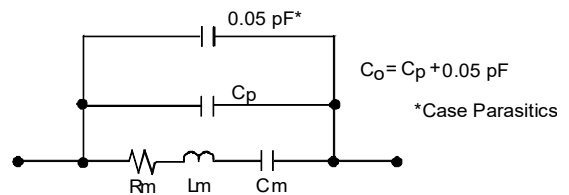
## Power Test



## Typical Application Circuits

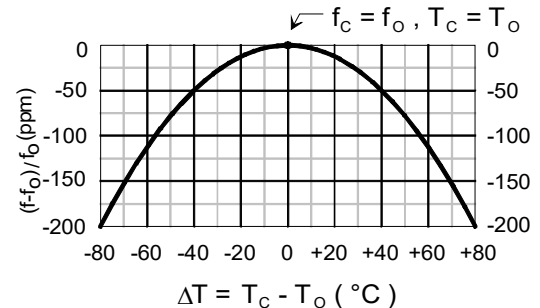


## Equivalent LC Model



## Temperature Characteristics

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



## Recommended Reflow Profile

1. Preheating shall be fixed at 150~180°C for 60~90 seconds.
2. Ascending time to preheating temperature 150°C shall be 30 seconds min.
3. Heating shall be fixed at 220°C for 50~80 seconds and at 260°C +0/-5°C peak (10 seconds).
4. Time: 5 times maximum.

