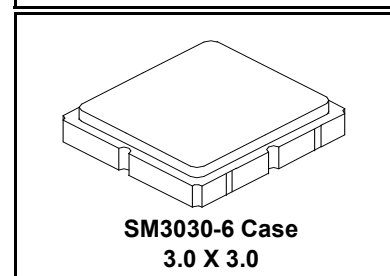


**RO3103E**

**418.00 MHz  
SAW  
Resonator**



- **Ideal for 418.00 MHz Remote Control and Security Transmitters**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Surface-mount Ceramic Case**
- **Complies with Directive 2002/95/EC (RoHS)**
- **Tape and Reel Standard per ANSI/EIA-481**
- **Moisture Sensitivity Level: 1**
- **AEC-Q200 Qualified**

The RO3103E 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 418.00 MHz. This SAW is designed specifically for AM transmitters used in remote control and wireless security applications.

**Absolute Maximum Ratings**

Rating	Value	Units
CW RF Power Dissipation (See 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 maximum)	+260	°C

**Electrical Characteristics**

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units		
Frequency, +25 °C	Nominal Frequency	$f_C$	417.925		418.075	MHz		
	Tolerance from 418.00 MHz	$\Delta f_C$					±75	kHz
Insertion Loss		IL		1.3	2.0	dB		
Quality Factor	Unloaded Q	$Q_U$		10700				
	50 Ω Loaded Q	$Q_L$		1500				
Temperature Stability	Turnover Temperature	$T_O$	10	25	40	°C		
	Turnover Frequency	$f_O$					$f_C$	
	Frequency Temperature Coefficient	FTC					0.032	
Frequency Aging	Absolute Value during the First Year	$ f_A $		10		ppm/yr		
DC Insulation Resistance between Any Two Terminals			1.0			MΩ		
RF Equivalent RLC Model	Motional Resistance	$R_M$		16.7		Ω		
	Motional Inductance	$L_M$		67		μH		
	Motional Capacitance	$C_M$		2.2		fF		
	Transducer Static Capacitance	$C_O$		2.4		pF		
Test Fixture Shunt Inductance		$L_{TEST}$		62		nH		
Lid Symbolization: Y = Year, WW = Week, S = Shift			676, 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.**

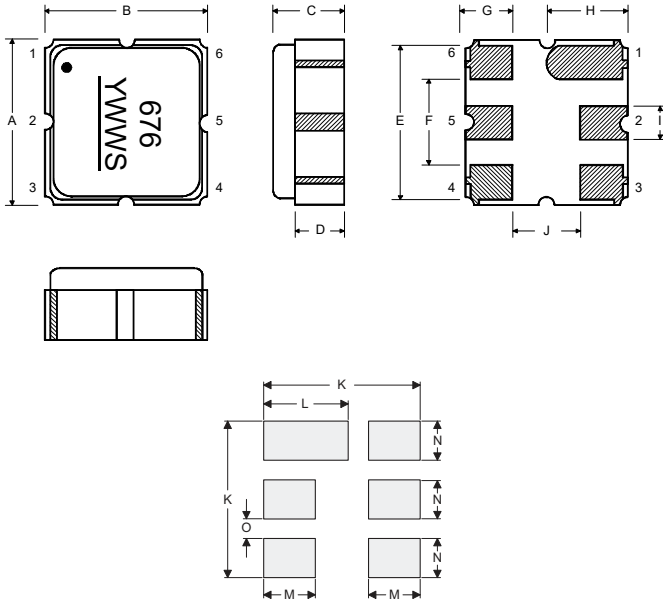
**NOTES:**

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.

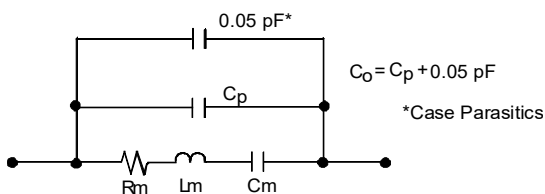
Pin	Connection
1	NC
2	Terminal
3	NC
4	NC
5	Terminal
6	NC



## Case and Typical PCB Land Dimensions

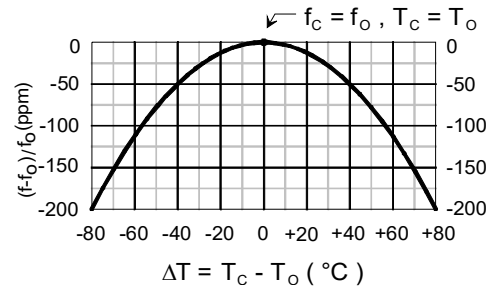
Ref	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	2.87	3.00	3.13	0.113	0.118	0.123
B	2.87	3.00	3.13	0.113	0.118	0.123
C	1.12	1.25	1.38	0.044	0.049	0.054
D	0.77	0.90	1.03	0.030	0.035	0.040
E	2.67	2.80	2.93	0.105	0.110	0.115
F	1.47	1.60	1.73	0.058	0.063	0.068
G	0.72	0.85	0.98	0.028	0.033	0.038
H	1.37	1.50	1.63	0.054	0.059	0.064
I	0.47	0.60	0.73	0.019	0.024	0.029
J	1.17	1.30	1.43	0.046	0.051	0.056
K		3.20			0.126	
L		1.70			0.067	
M		1.05			0.041	
N		0.81			0.032	
O		0.38			0.015	

## Equivalent RLC Model



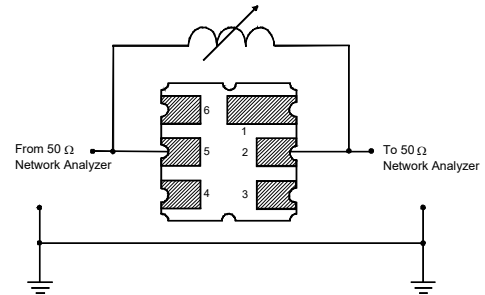
## Temperature Characteristics

The curve shown accounts for resonator contribution only and does not include external LC component temperature effects.

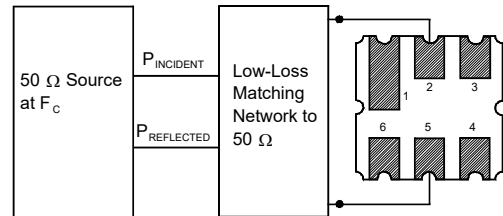


## Characterization Test Circuit

Inductor  $L_{\text{TEST}}$  is tuned to resonate with the static capacitance,  $C_0$ , at  $F_c$ .

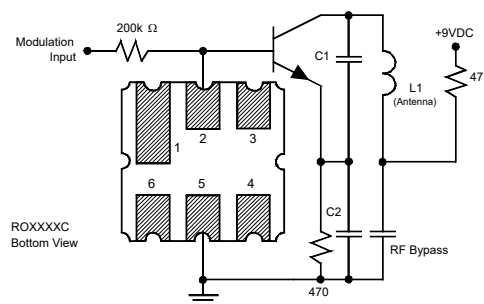


## Power Dissipation Test

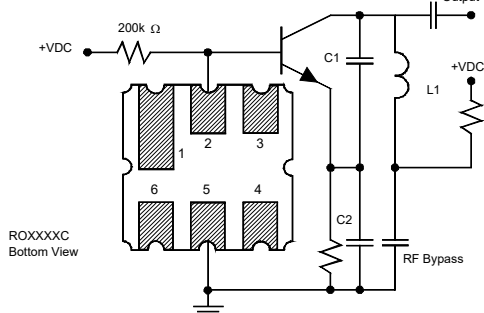


## Example Application Circuits

Typical Low-Power Transmitter Application



Typical Local Oscillator Application



## 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.

