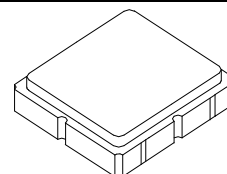


# RO3164E-3

## 868.35 MHz SAW Resonator



SM3030-6 Case  
3.0 X 3.0

- **Designed for European 868.35 MHz Transmitters**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Complies with Directive 2002/95/EC (RoHS)**
- **Tape and Reel Standard per ANSI/EIA-481**
- **Moisture Sensitivity Level: 1**
- **AEC-Q200 Qualified**

The RO3164E-3 is a one-port surface-acoustic-wave (SAW) resonator packaged in a surface-mount ceramic case. It provides reliable, fundamental-mode quartz frequency stabilization of fixed-frequency transmitters operating at 868.35 MHz. This SAW is designed specifically for remote-control and wireless security transmitters operating under ETSI EN 300 220-2.

### Absolute Maximum Ratings

Rating	Value	Units
Input Power Level	0	dBm
DC Voltage	12	VDC
Storage Temperature	-40 to +125	°C
Operating Temperature Range	-40 to +125	°C
Soldering Temperature	+260	°C

### Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Nominal Frequency, +25 °C	$f_C$		868.275		868.425	MHz
Tolerance from 868.35 MHz	$\Delta f_C$				$\pm 75$	kHz
Insertion Loss	IL			1.3	2.0	dB
Quality Factor	Unloaded Q	$Q_U$		27000		
	50 $\Omega$ Loaded Q	$Q_L$		4000		
Temperature Stability	Turnover Temperature	$T_O$	10	25	40	°C
	Turnover Frequency	$f_O$		$f_C$		kHz
	Frequency Temperature Coefficient	FTC		0.032		ppm/°C <sup>2</sup>
Frequency Aging	Absolute Value during the First Year	fA		< $\pm 10$		ppm/yr
DC Insulation Resistance between Any Two Terminals			1.0			M $\Omega$
RF Equivalent RLC Model	Motional Resistance	$R_M$		16		$\Omega$
	Motional Inductance	$L_M$		20		$\mu$ H
	Motional Capacitance	$C_M$		1.7		fF
	Shunt Static Capacitance	$C_O$		1.6		pF
Test Fixture Shunt Inductance	$L_{TEST}$			20		nH
Lid Symbolization (Y = Year, WW = Week, S = Shift)				934, 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.**

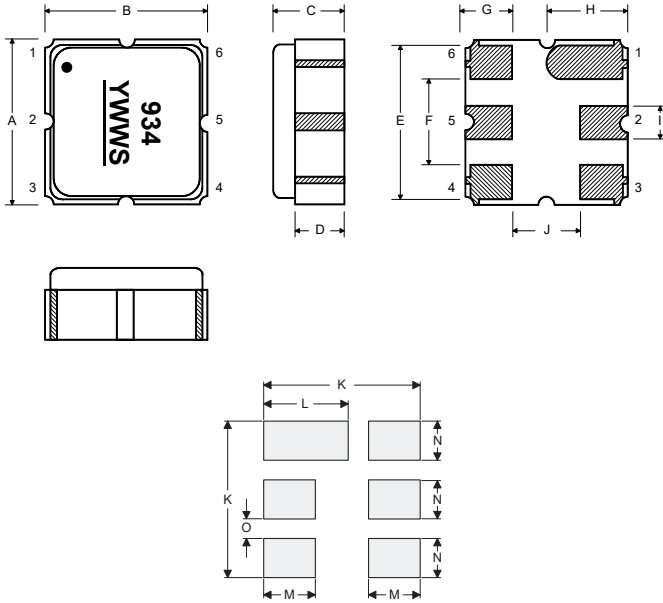
#### NOTES:

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.

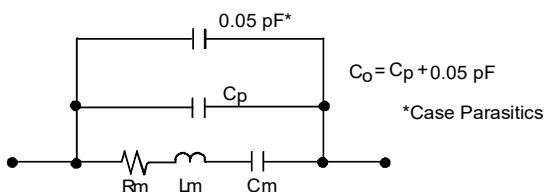
Pin	Connection
1	NC
2	Terminal
3	NC
4	NC
5	Terminal
6	NC



## Case and Typical PCB Land Dimensions

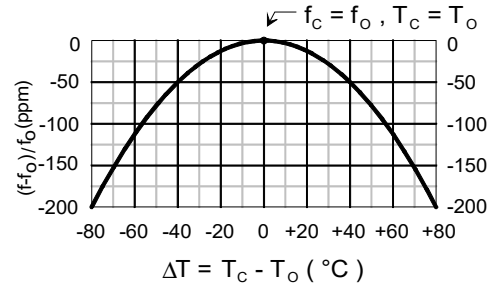
Ref	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	2.87	3.00	3.13	0.113	0.118	0.123
B	2.87	3.00	3.13	0.113	0.118	0.123
C	1.12	1.25	1.38	0.044	0.049	0.054
D	0.77	0.90	1.03	0.030	0.035	0.040
E	2.67	2.80	2.93	0.105	0.110	0.115
F	1.47	1.60	1.73	0.058	0.063	0.068
G	0.72	0.85	0.98	0.028	0.033	0.038
H	1.37	1.50	1.63	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



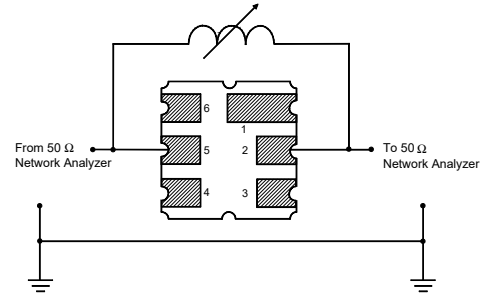
## Temperature Characteristics

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

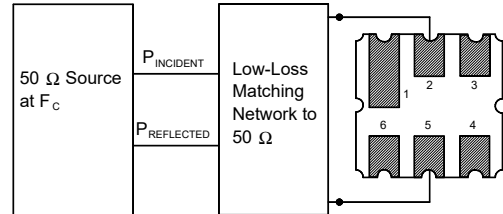


## Characterization Test Circuit

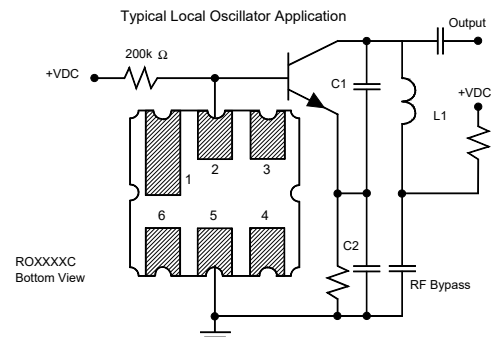
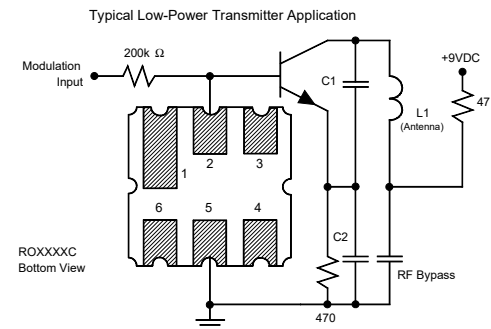
Inductor  $L_{\text{TEST}}$  is tuned to resonate with the static capacitance,  $C_0$ , at  $F_c$ .



## Power Dissipation Test



## Example Application Circuits



## 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.

