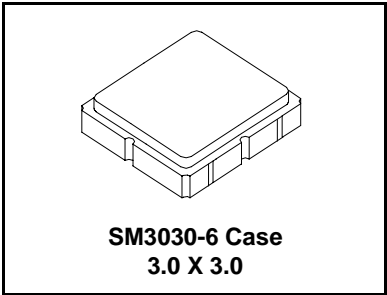


# RO3101E-14

## 433.92 MHz SAW Resonator



- **Ideal for European 433.92 MHz Transmitters**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Complies with Directive 2002/95/EC (RoHS)**



The RO3101E-14 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 433.92 MHz. This SAW is designed specifically for remote-control and wireless security transmitters operating in Europe under ETSI I-ETS 300 220-1.

### Absolute Maximum Ratings

Rating	Value	Units
Input Power Level	0	dBm
DC voltage	12	VDC
Storage Temperature Range	-40 to +125	°C
Operating Temperature Range	-40 to +105	°C
Soldering Temperature (10 seconds / 5 cycles max.)	260	°C

### Electrical Characteristics

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Center Frequency (+25 °C)	Absolute Frequency	$f_C$		433.820		434.020	MHz
	Tolerance from 433.920 MHz	$\Delta f_C$				±100	kHz
Insertion Loss		IL			1.4	2.2	dB
Quality Factor	Unloaded Q	$Q_U$			8280		
	50 $\Omega$ Loaded Q	$Q_L$			1228		
Temperature Stability	Turnover Temperature	$T_O$		10	25	35	°C
	Turnover Frequency	$f_O$			$f_C$		
	Frequency Temperature Coefficient	FTC			0.032		ppm/°C <sup>2</sup>
Frequency Aging	Absolute Value during the First Year	$ f_A $			≤10		ppm/yr
DC Insulation Resistance between Any Two Terminals				1.0			M $\Omega$
RF Equivalent RLC Model	Motional Resistance	$R_M$			17.5		$\Omega$
	Motional Inductance	$L_M$			53.5		$\mu$ H
	Motional Capacitance	$C_M$			2.5		fF
	Shunt Static Capacitance	$C_O$			2.5		pF
Test Fixture Shunt Inductance		$L_{TEST}$			53.2		nH
Lid Symbolization (in addition to Lot and/or Date Codes)	902, <u>YWWS</u>						
Standard Reel Quantity	Reel Size 13 Inch					4000 Pieces/Reel	

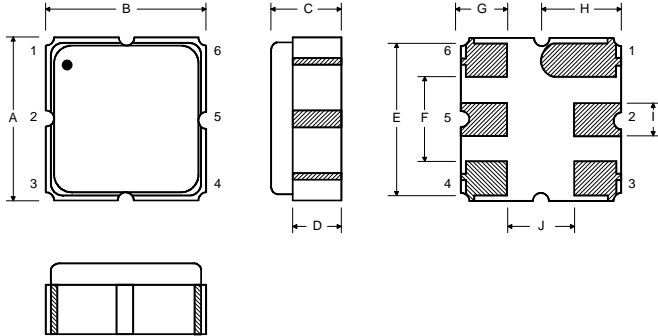
**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**  
**NOTES:**

1. The design, manufacturing process, and specifications of this device are subject to change.
2. US or International patents may apply.

## 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



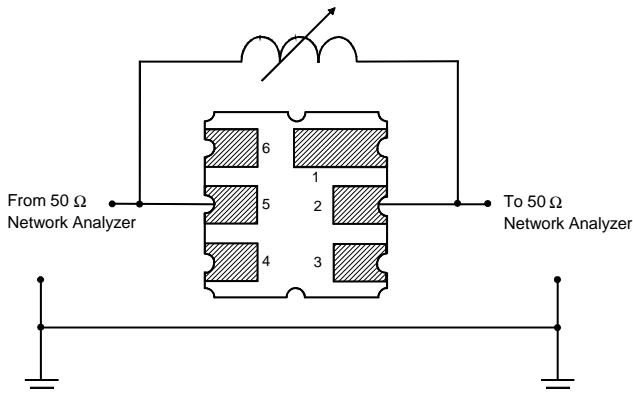
## Case Dimensions

Dimension	mm			Inches		
	Min	Nom	Max	Min	Nom	Max
A	2.87	3.0	3.13	0.113	0.118	0.123
B	2.87	3.0	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	1.6	1.73	0.058	0.063	0.068
G	0.72	0.85	0.98	0.028	0.033	0.038
H	1.37	1.5	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

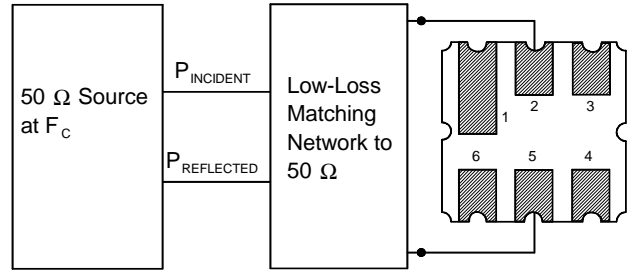
## Typical Test Circuit

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

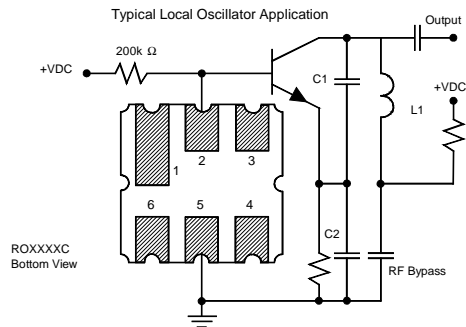
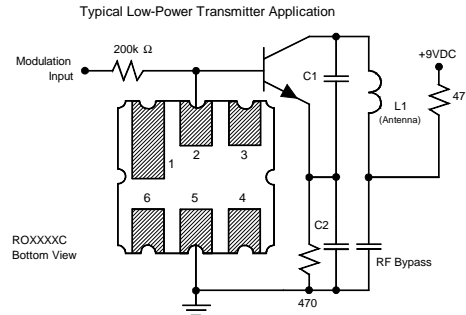
## Electrical Test



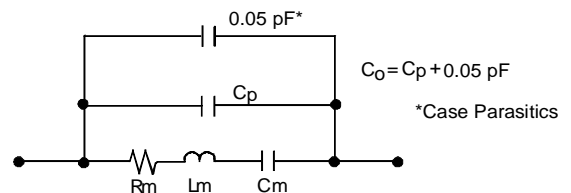
## Power Test



## Typical Application Circuits

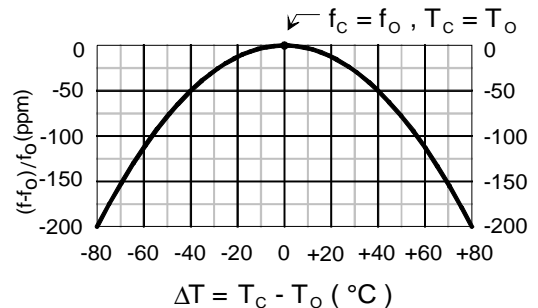


## Equivalent LC Model



## 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.

