

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



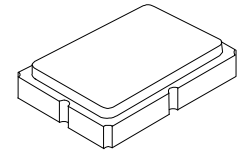
**RO3101A-12**

**433.92 MHz  
SAW  
Resonator**

The RO3101A-12 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 and in Germany under FTZ 17 TR 2100.

**Absolute Maximum Ratings**

Rating	Value	Units
CW RF Power Dissipation (See: Typical Test Circuit)	+0	dBm
DC voltage Between Terminals (Observe ESD Precautions)	±30	VDC
Case Temperature	-40 to +85	°C
Soldering Temperature (10 seconds / 5 cycles max.)	260	°C



**SM5035-4**

**Electrical Characteristics**

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Center Frequency (+25 °C)	Absolute Frequency	$f_C$		433.870		433.970	MHz
	Tolerance from 433.920 MHz	$\Delta f_C$				±50	kHz
Insertion Loss		IL			1.5	1.7	dB
Quality Factor	Unloaded Q	$Q_U$			9000		
	50 Ω Loaded Q	$Q_L$			1458		
Temperature Stability	Turnover Temperature	$T_O$		10	25	40	°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			MΩ
RF Equivalent RLC Model	Motional Resistance	$R_M$			19.4		Ω
	Motional Inductance	$L_M$			63.8		μH
	Motional Capacitance	$C_M$			2.11		fF
	Shunt Static Capacitance	$C_O$			2.4		pF
Test Fixture Shunt Inductance		$L_{TEST}$			55.1		nH
Lid Symbolization (in addition to Lot and/or Date Codes)					791, YWWS		



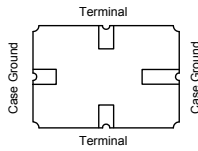
**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.**

**NOTES:**

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

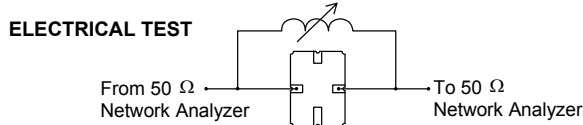
## Electrical Connections

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.

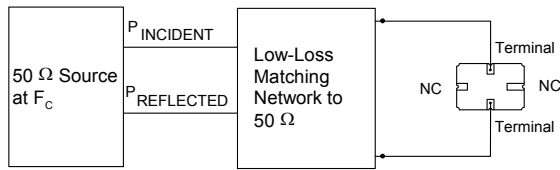


## Typical Test Circuit

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



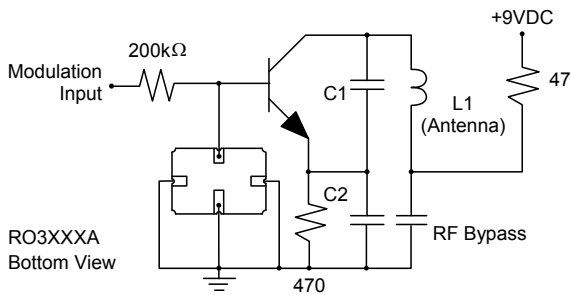
## POWER TEST



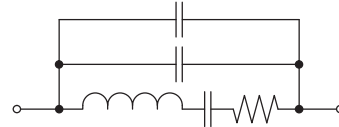
$$CW \text{ RF Power Dissipation} = P_{INCIDENT} - P_{REFLECTED}$$

## Typical Application Circuits

### Typical Low-Power Transmitter Application

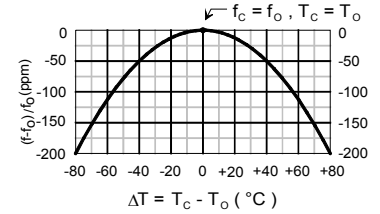


## Equivalent RLC Model

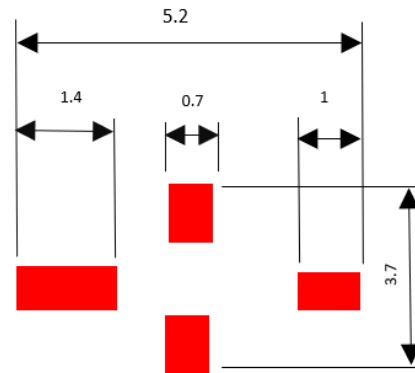
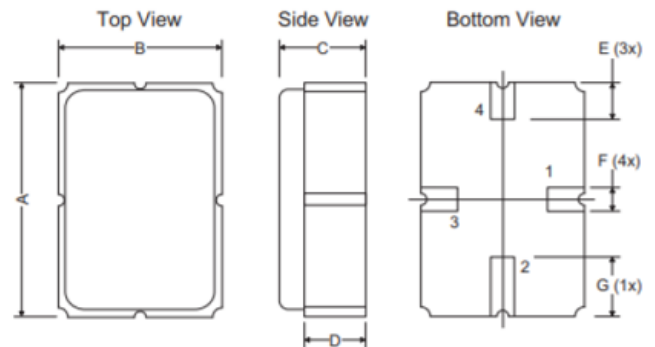


## Temperature Characteristics

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

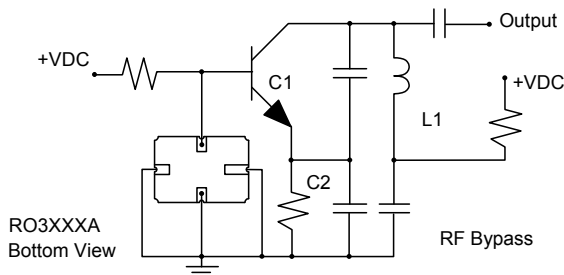


## Case



PCB Footprint

### Typical Local Oscillator Applications



Dimensions	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	4.87	5.00	5.13	0.191	0.196	0.201
B	3.37	3.50	3.63	0.132	0.137	0.142
C	1.45	1.53	1.60	0.057	0.060	0.062
D	1.35	1.43	1.50	0.040	0.057	0.059
E	0.67	0.80	0.93	0.026	0.031	0.036
F	0.37	0.50	0.63	0.014	0.019	0.024
G	1.07	1.20	1.33	0.042	0.047	0.052

## 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.

