

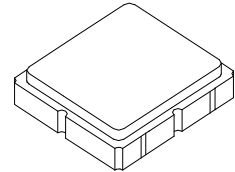


AEC-Q200

This component was always RoHS compliant from the first date of manufacture.

**RO3156E**

**868.950 MHz  
SAW Resonator**



**SM3030-6 3 x 3 mm Case**

- **Designed for European 868.95 MHz SRD Transmitters**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Complies with Directive 2002/95/EC (RoHS)**



The RO3156E 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 868.95 MHz. This SAW is designed specifically for SRD remote control and wireless security transmitters operating under ETSI EN 300 220.

**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, 10 seconds / 5 cycles maximum	+260	°C

**Electrical Characteristics**

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Frequency, +25 °C	RO3156E	f <sub>C</sub>		868.750		869.150	MHz
	RO3156E-1			868.800		869.100	
	RO3156E-2			868.850		869.050	
Tolerance from 868.95 MHz	RO3156E	Δf <sub>C</sub>				±200	kHz
	RO3156E-1					±150	
	RO3156E-2					±100	
Insertion Loss		IL			1.2	2.0	dB
Quality Factor	Unloaded Q	Q <sub>U</sub>			6700		
	50 Ω Loaded Q	Q <sub>L</sub>			800		
Temperature Stability	Turnover Temperature	T <sub>O</sub>		10	25	40	°C
	Turnover Frequency	f <sub>O</sub>			f <sub>C</sub>		kHz
	Frequency Temperature Coefficient	FTC			0.032		ppm/°C <sup>2</sup>
Frequency Aging	Absolute Value during the First Year	fA			<±10		ppm/yr
DC Insulation Resistance between Any Two Terminals				1.0			MΩ
RF Equivalent RLC Model	Motional Resistance	R <sub>M</sub>			14.1		Ω
	Motional Inductance	L <sub>M</sub>			17.2		μH
	Motional Capacitance	C <sub>M</sub>			2.0		fF
	Shunt Static Capacitance	C <sub>O</sub>			2.3		pF
Test Fixture Shunt Inductance		L <sub>TEST</sub>			14.6		nH
Lid Symbolization (in addition to Lot and/or Date Codes)					708, YWWS		
Standard Reel Quantity	Reel Size 7 Inch		10			500 Pieces / Reel	
	Reel Size 13 Inch					3000 Pieces / Reel	



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

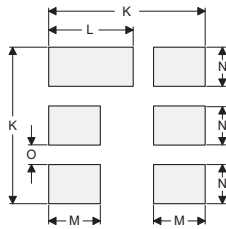
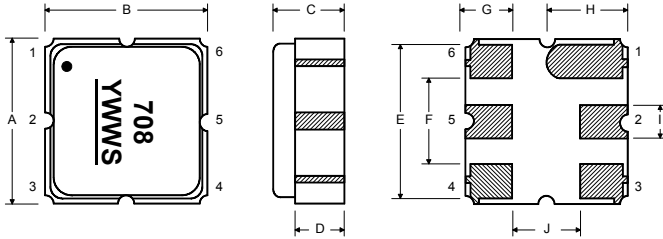
**NOTES:**

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

**Electrical Connections**

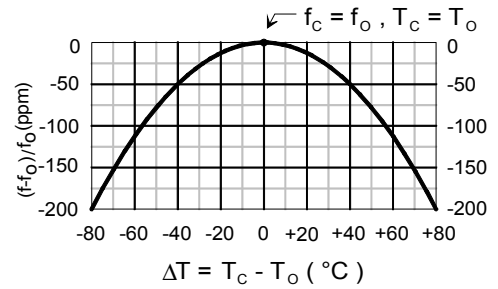
The SAW resonator is bidirectional and may be installed with either orientation. The two terminals are interchangeable and unnumbered. The callout NC indicates no internal connection. The NC pads assist with mechanical positioning and stability. External grounding of the NC pads is recommended to help reduce

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



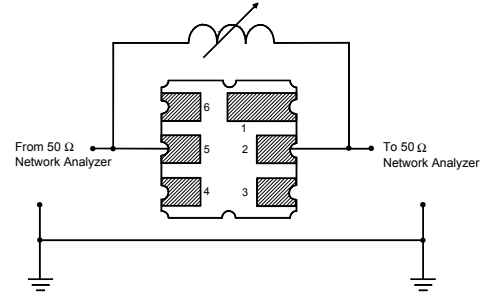
**Temperature Characteristics**

The curve shown accounts for resonator

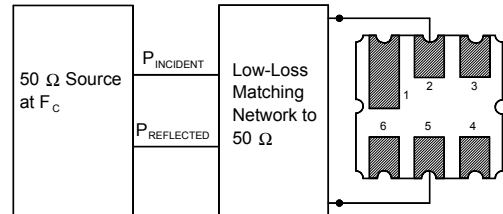


**Characterization Test Circuit**

Inductor  $L_{TEST}$  is tuned to resonate with the static capacitance,  $C_O$ , at  $F_C$ .



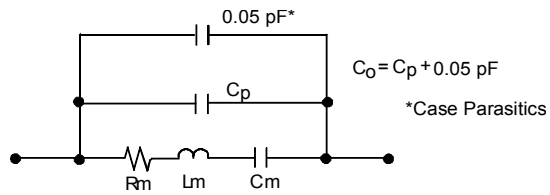
**Power Dissipation Test**



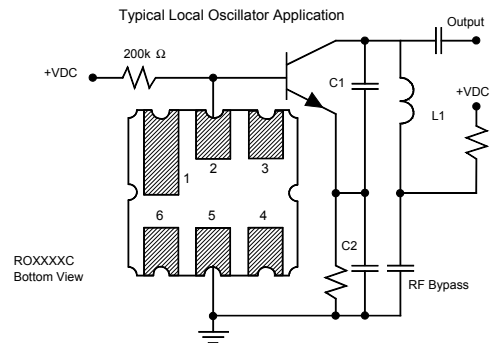
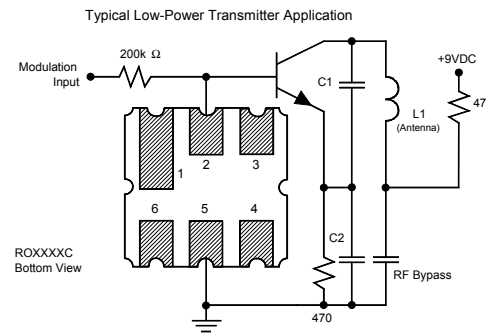
## Case and Typical PCB Land Dimensions

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



## 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.

