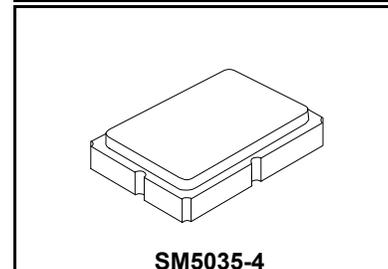


- **Designed for 916.5 MHz Transmitters**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Surface-mount Ceramic Case**
- **Complies with Directive 2002/95/EC (RoHS)**
- **Tape and Reel Standard per ANSI/EIA-481**
- **Moisture Sensitivity Level: 1**
- **AEC-Q200 Qualified**

RO3144A

**916.5 MHz
SAW
Resonator**



The RO3144A 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 916.5 MHz.

Absolute Maximum Ratings

Rating	Value	Units
CW RF Power Dissipation	0	dBm
DC Voltage Between Terminals	±30	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	f_C		916.300		916.700	MHz
Tolerance from 916.5 MHz	Δf_C				±200	kHz
Insertion Loss	IL			1.2	2.5	dB
Quality Factor	Unloaded Q	Q_U		6600		
	50 Ω Loaded Q	Q_L		750		
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 ²
Frequency Aging	Absolute Value during the First Year	fA		<±10		ppm/yr
DC Insulation Resistance between Any Two Terminals			1.0			M Ω
RF Equivalent RLC Model	Motional Resistance	R_M		13.1		Ω
	Motional Inductance	L_M		15		μ H
	Motional Capacitance	C_M		2.1		fF
	Shunt Static Capacitance	C_O		2.09		pF
Test Fixture Shunt Inductance	L_{TEST}			14.5		nH
Lid Symbolization: YY = Year, WW = Week, S = Shift			663, <u>YYWWS</u>			



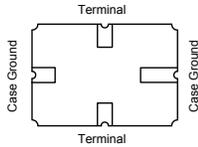
CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

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

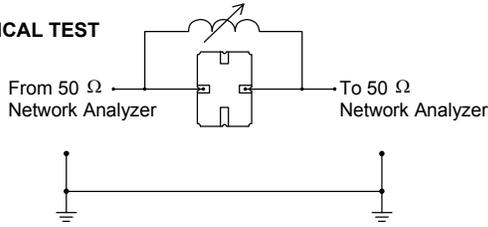
The SAW resonator is bidirectional and may be installed with either orientation. The two terminals are interchangeable and unnumbered. The callout NC indicates no internal connection. The NC pads assist with mechanical positioning and stability. External grounding of the NC pads is recommended to help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



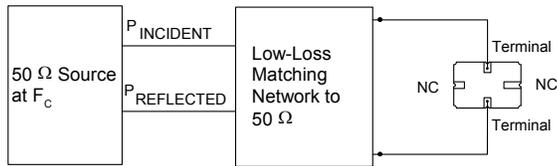
Typical Test Circuit

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

ELECTRICAL TEST



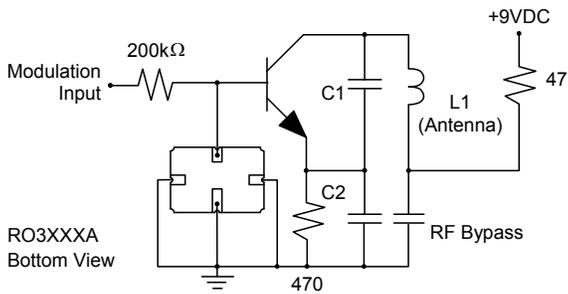
POWER TEST



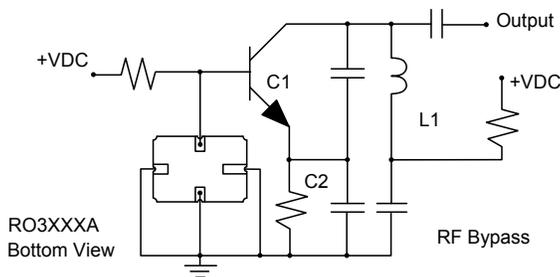
$$CW \text{ RF Power Dissipation} = P_{INCIDENT} - P_{REFLECTED}$$

Typical Application Circuits

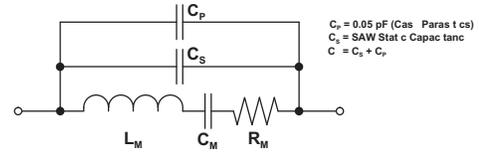
Typical Low-Power Transmitter Application



Typical Local Oscillator Applications



Equivalent RLC Model



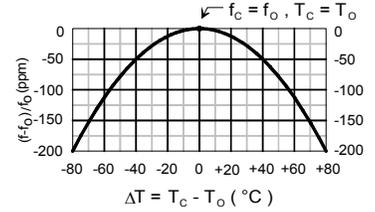
$$C_P = 0.05 \text{ pF (Cas Paras t cs)}$$

$$C_O = \text{SAW Stat c Capac tanc}$$

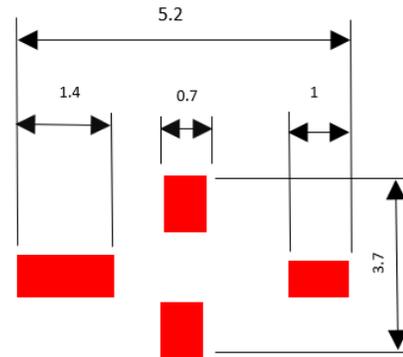
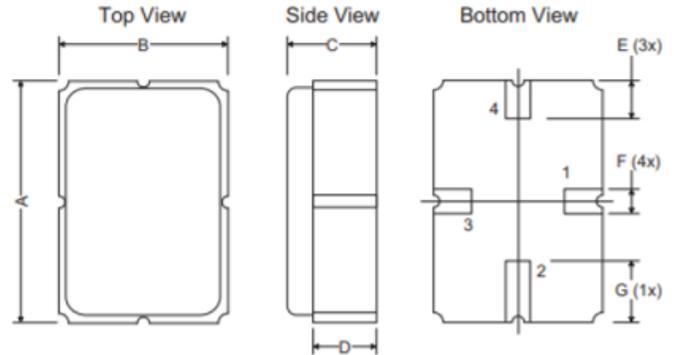
$$C = C_S + C_P$$

Temperature Characteristics

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



Case



PCB Footprint

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.

