



- **Ideal for European 868.35 MHz Transmitters**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Surface-Mount Ceramic Case with 21 mm² Footprint**

The RO2164A 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 868.35 MHz. This SAW is designed specifically for remote-control and wireless security transmitters operating under ETSI-ETS 300 220 in Europe and under FTZ 17 TR 2100 in Germany.

Absolute Maximum Ratings

Rating	Value	Units
CW RF Power Dissipation	+5	dBm
DC Voltage Between Terminals	±30	VDC
Case Temperature	-40 to +85	°C
Soldering Temperature	+250	°C

RO2164A
RO2164A-1
RO2164A-2

868.35 MHz
SAW
Resonator



Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Frequency (+25 °C) Nominal Frequency RO2164A RO2164A-1 RO2164A-2	f_C	2,3,4,5	868.275 868.200 868.250		868.425 868.500 868.450	MHz
Tolerance from 868.35 MHz RO2164A RO2164A-1 RO2164A-2	Δf_C				±75 ±150 ±100	kHz
Insertion Loss	IL	2,5,6		1.1	2.0	dB
Quality Factor Unloaded Q 50 Ω Loaded Q	Q_U Q_L	5,6,7		24,737 4,000		
Temperature Stability Turnover Temperature Turnover Frequency Frequency Temperature Coefficient	T_O f_O FTC	6,7,8	10	25 f_C 0.032	40	°C kHz ppm/°C ²
Frequency Aging Absolute Value during the First Year	fA	1		<±10		ppm/yr
DC Insulation Resistance between Any Two Terminals		5	1.0			M Ω
RF Equivalent RLC Model Motional Resistance Motional Inductance Motional Capacitance Shunt Static Capacitance	R_M L_M C_M C_O	5, 6, 7, 9		19.2889 87.455 0.3841 3.1		Ω μ H fF pF
Test Fixture Shunt Inductance	L_{TEST}	2, 7		10.8365		nH
Lid Symbolization (in addition to Lot and/or Date Codes)				260		



CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

Notes:

1. Frequency aging is the change in f_C with time and is specified at +65°C or less. Aging may exceed the specification for prolonged temperatures above +65°C. Typically, aging is greatest the first year after manufacture, decreasing in subsequent years.
2. The center frequency, f_C , is measured at the minimum insertion loss point, IL_{MIN} , with the resonator in the 50 Ω test system ($VSWR \leq 1.2:1$). The shunt inductance, L_{TEST} , is tuned for parallel resonance with C_O at f_C . Typically, $f_{OSCILLATOR}$ or $f_{TRANSMITTER}$ is approximately equal to the resonator f_C .
3. One or more of the following United States patents apply: 4,454,488 and 4,616,197.
4. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
5. Unless noted otherwise, case temperature $T_C = +25^\circ\text{C} \pm 2^\circ\text{C}$.
6. The design, manufacturing process, and specifications of this device are subject to change without notice.
7. Derived mathematically from one or more of the following directly measured parameters: f_C , IL, 3 dB bandwidth, f_C versus T_C , and C_O .
8. Turnover temperature, T_O , is the temperature of maximum (or turnover) frequency, f_O . The nominal frequency at any case temperature, T_C , may be calculated from: $f = f_O [1 - FTC (T_O - T_C)^2]$. Typically oscillator T_O is approximately equal to the specified resonator T_O .
9. This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance C_O is the static (nonmotional) capacitance between the two terminals measured at low frequency (10 MHz) with a capacitance meter. The measurement includes parasitic capacitance with "NC" pads unconnected. Case parasitic capacitance is approximately 0.05 pF. Transducer parallel capacitance can be calculated as: $C_P = C_O - 0.05 \text{ pF}$.

SAW Resonator