

- **Ideal for European 868.35 MHz Transmitters**
- **Very Low Series Resistance**
- **Quartz Stability**
- **Complies with Directive 2002/95/EC (RoHS)**
- **Tape and Reel Standard per ANSI/EIA-481**
- **Moisture Sensitivity Level: 1**
- **AEC-Q200 Qualified**

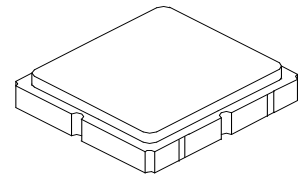
The RO3164E is a true one-port, surface-acoustic-wave (SAW) resonator in a surface-mount ceramic case. It provides reliable, fundamental-mode, quartz frequency stabilization of fixed-frequency transmitters operating at 868.35 MHz. This SAW is designed specifically for remote-control and wireless security transmitters operating under ETSI-ETS 300 220 in Europe and under FTZ 17 TR 2100 in Germany.

Absolute Maximum Ratings

| Rating | Value | Units |
|-----------------------------|-------------|-------|
| Input Power Level | 0 | dBm |
| DC Voltage | 12 | VDC |
| Storage Temperature | -40 to +125 | °C |
| Operating Temperature Range | -40 to +125 | °C |
| Soldering Temperature | +260 | °C |

RO3164E

**868.35 MHz
SAW Resonator**



**SM3030-6 Case
3.0 X 3.0**

Electrical Characteristics

| Characteristic | Sym | Notes | Minimum | Typical | Maximum | Units |
|----------------------------------------------------|--------------------------------------|-------|-----------|--------------------|---------|---------------------|
| Frequency (+25 °C) Nominal Frequency | f_C | | 868.150 | | 868.550 | MHz |
| Tolerance from 868.35 MHz | Δf_C | | | | ±200 | kHz |
| Insertion Loss | IL | | | 1.3 | 2.0 | dB |
| Quality Factor | Unloaded Q | Q_U | | 7200 | | |
| | 50 Ω Loaded Q | Q_L | | 975 | | |
| 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 | | | MΩ |
| RF Equivalent RLC Model | Motional Resistance | R_M | | 16 | | Ω |
| | Motional Inductance | L_M | | 20 | | μH |
| | Motional Capacitance | C_M | | 1.7 | | fF |
| | Shunt Static Capacitance | C_O | | 1.6 | | pF |
| Test Fixture Shunt Inductance | L_{TEST} | | | 20 | | nH |
| Lid Symbolization (Y = Year, WW = Week, S = Shift) | | | 686, YWWS | | | |
| Standard Reel Quantity | Reel Size 7 Inch | | | 500 Pieces / Reel | | |
| | Reel Size 13 Inch | | | 3000 Pieces / Reel | | |



CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

NOTES:

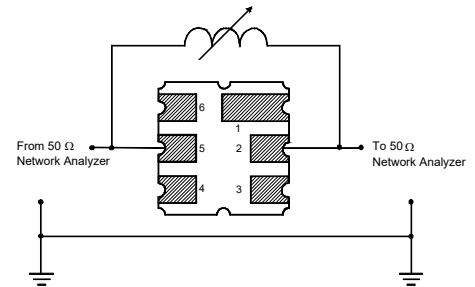
1. The design, manufacturing process, and specifications of this device are subject to change.
2. US or International patents may apply.
3. RoHS compliant from the first date of manufacture.

Electrical Connections

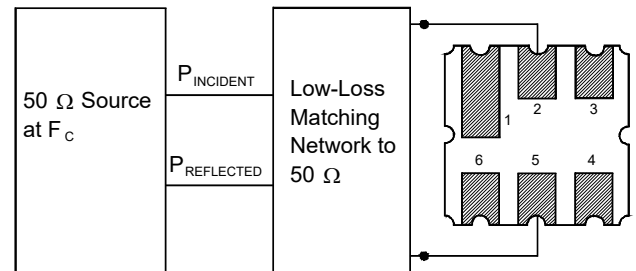
The SAW resonator is bidirectional and may be installed with either orientation. The two terminals are interchangeable and unnumbered. The callout NC indicates no internal connection. The NC pads assist with mechanical positioning and stability. External grounding of the NC pads is recommended to help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

| Pin | Connection |
|-----|------------|
| 1 | NC |
| 2 | Terminal |
| 3 | NC |
| 4 | NC |
| 5 | Terminal |
| 6 | NC |

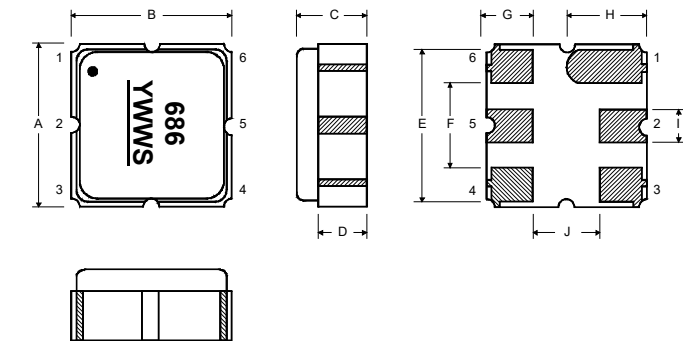
Electrical Test



Power Test



Typical Application Circuits



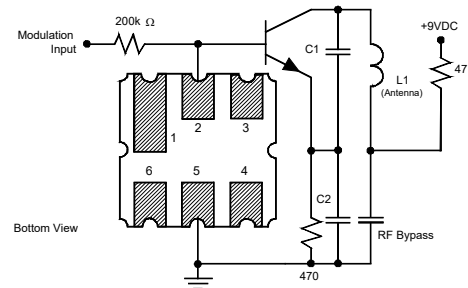
Case Dimensions

| 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 |

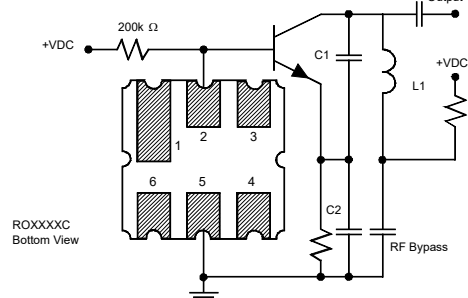
Typical Test Circuit

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

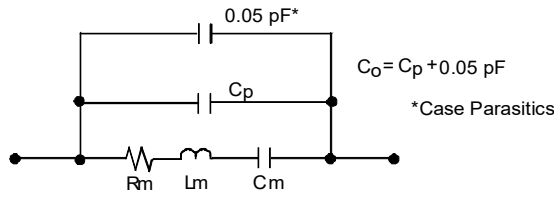
Typical Low-Power Transmitter Application



Typical Local Oscillator Application

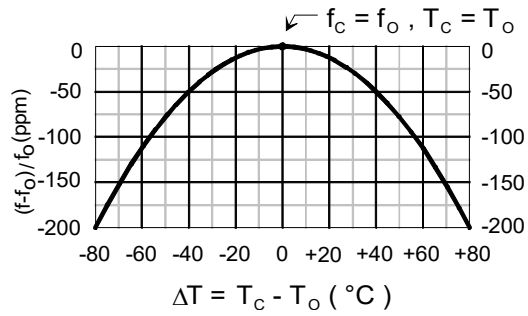


Equivalent LC Model



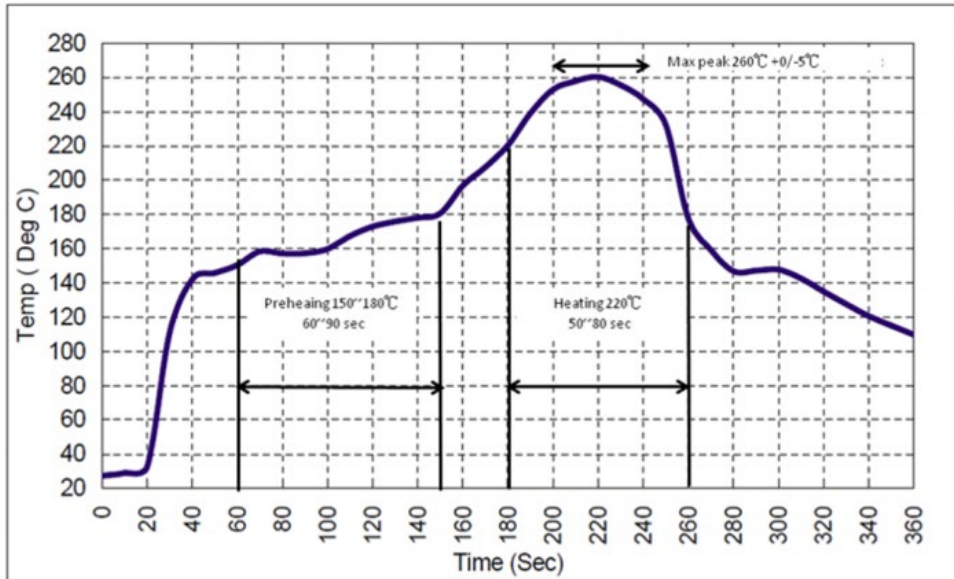
Temperature Characteristics

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.



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