

SURFACE-MOUNT SAW RESONATOR

PART NO.: ACTR4001/433.92MHz/DCC6C

Product Type:		Customer:
SAW Resonator		
		Customer Part NO.:
		Issued Date:

PREPARED BY	CHECKED BY	APPROVED BY

In line with our ongoing policy of product evolution and improvement, the above specification may subject to change without notice

ISO9001 Registered

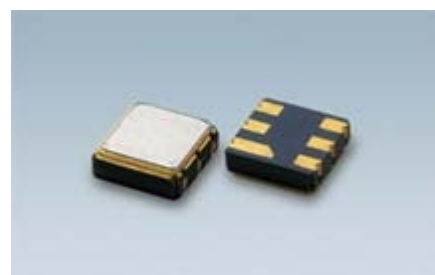
For quotations or further information please contact us at:

3 The Business Centre, Molly Millars Lane, Wokingham, Berkshire, RG41 2EY, UK

<http://www.actcrystals.com>

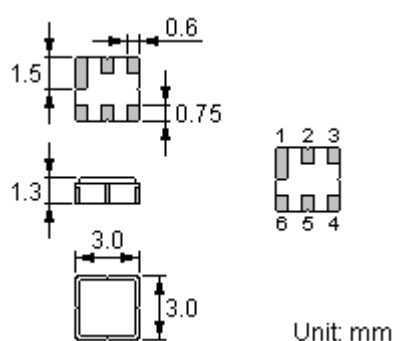
Features

- 1-port Resonator
- Provides reliable, fundamental mode, quartz Frequency stabilization i.e. in transmitters or Local oscillators
- **Surface Mounted Technology (SMT)**
- Lead-free production and RoHS compliance



Package Dimensions

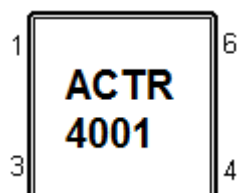
Ceramic Package: **DCC6C**



Pin Configuration

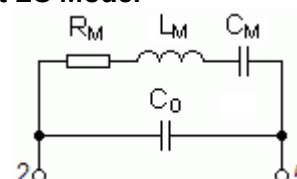
2	Input / Output
5	Output / Input
1, 3, 4, 6	Ground

Marking



Top View, Laser Printing
 "ACT": Manufacturer's mark
 "R": SAW resonator
 "4001": Part number

Equivalent LC Model



Maximum Ratings

Rating		Value	Unit
CW RF power dissipation	P	10	dBm
DC voltage between any terminals	V_{DC}	30	V
Operating temperature range	T_A	-40 ~ +85	°C
Storage temperature range	T_{stg}	-45 ~ +85	°C
Soldering Temperature (10 seconds)	T_S	260	°C

Electrical Characteristics

Characteristic		Sym	Minimum	Typical	Maximum	Unit
Center Frequency (+25°C)	Absolute Frequency	f_c	433.845		433.995	MHz
	Tolerance from 433.920 MHz	Δf_c			± 75	kHz
Insertion Loss		I_L		1.3	2.0	dB
Quality Factor	Unloaded Q	Q_U		10,200		
	50 Ω Loaded Q	Q_L		1,700		
Temperature Stability	Turnover Temperature	T_0	0		25	°C
	Turnover Frequency	f_0		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		20	26	Ω
	Motional Inductance	L_M		74.8619		μ H
	Motional Capacitance	C_M		1.7989		fF
	Shunt Static Capacitance	C_0	1.65	1.95	2.25	pF

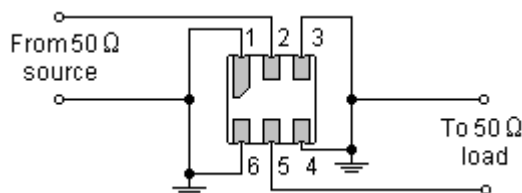
 **RoHS Compliant**

 **Electrostatic Sensitive Device**

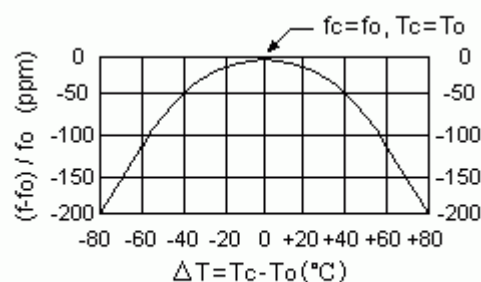
NOTE:

1. Unless noted otherwise, case temperature $T_C = +25^\circ\text{C} \pm 2^\circ\text{C}$.
2. The center frequency, f_c , is measured at the minimum insertion loss point with the resonator in the 50 Ω test system.
3. 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.
4. Turnover temperature, T_0 , is the temperature of maximum (or turnover) frequency, f_0 . The nominal frequency at any case temperature, T_C , may be calculated from: $f = f_0 [1 - \text{FTC} (T_0 - T_C)^2]$.
5. This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance C_0 is the static capacitance between the two terminals measured at low frequency (10MHz) with a capacitance meter. The measurement includes case parasitic capacitance.

Test Circuit



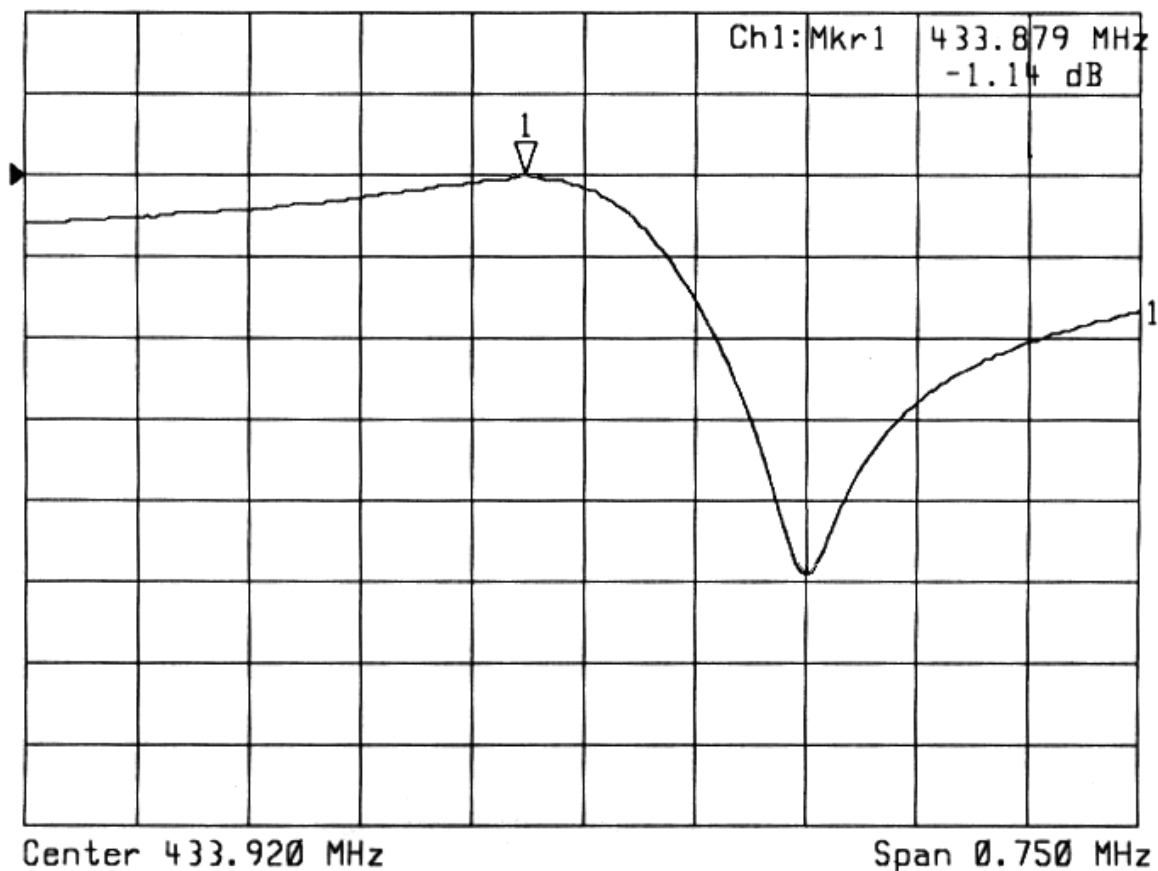
Temperature Characteristics



The curve shown above accounts for resonator contribution only.

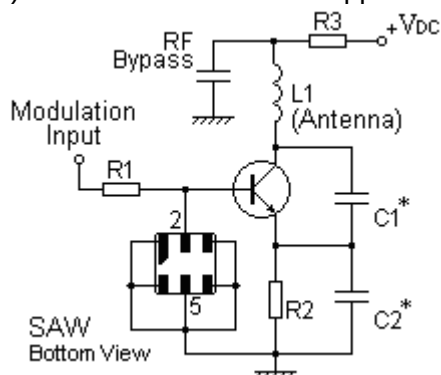
Typical Frequency Response

►1: Transmission /M Log Mag 5.0 dB/ Ref -1.00 dB
►2: Off

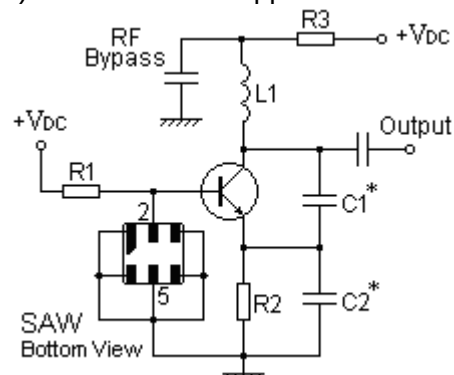


Typical Application Circuits

1) Low-Power Transmitter Application



2) Local Oscillator Application



Stability Characteristics

	Test item	Condition of test
1	Mechanical shock	(a) Drops: 3 times on concrete floor (b) Height: 1.0 m
2	Vibration resistance	(a) Frequency of vibration: 10~55Hz (b) Amplitude: 1.5 mm (c) Directions: X,Y and Z (d) Duration: 2 hours
3	Moisture resistance	(a) Condition: 40°C, 90~95% R.H. (b) Duration: 96 hours (c) Wait 4 hours before measurement
4	Climatic sequence	(a) +70°C for 16 hours (b) +55°C for 24 hours, 90~95% R.H. (c) -25°C for 2 hours (d) +40°C for 24 hours, 90~95% R.H. (e) Wait 4 hours before measurement
5	High temperature exposure	(a) Temperature: 70°C (b) Duration: 250 hours (c) Wait 4 hours before measurement
6	Thermal impact	(a) +70°C for 30 minutes $\Rightarrow$ -25°C for 30 minutes repeated 3 times (b) Wait 4 hours before measurement

Requirements: The SAW resonator shall remain within the electrical specifications after tests.

Remarks

- SAW devices should not be used in any type of fluid such as water, oil, organic solvent, etc.
- Be certain not to apply voltage exceeding the rated voltage of components.
- Do not operate outside the recommended operating temperature range of components.
- Sudden change of temperature shall be avoided, deterioration of the characteristics can occur.
- Be careful of soldering temperature and duration of components when soldering.
- Do not place soldering iron on the body of components.
- Be careful not to subject the terminals or leads of components to excessive force.
- SAW devices are electrostatic sensitive. Please avoid static voltage during operation and storage.
- Ultrasonic cleaning shall be avoided. Ultrasonic vibration may cause destruction of components.

Recommended Land Pattern

