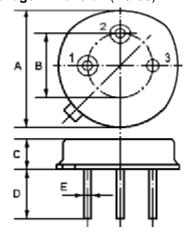


Tel: +44 118 979 1238 Fax: +44 118 979 1283

Email: info@actcrystals.com

The ACTR433A/433.92/TO39-1.5 is a true one-port, surface-acoustic-wave (**SAW**) resonator in a low-profile metal **TO-39** case. It provides reliable, fundamental-mode, quartz frequency stabilization i.e. in transmitters or local oscillators operating at **433.920** MHz.

## 1.Package Dimension (TO-39)

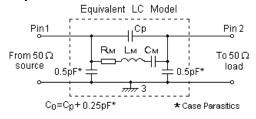


#### 2.

Pin	Configuration		
1	Input / Output		
2	Output / Input		
3	Case Ground		

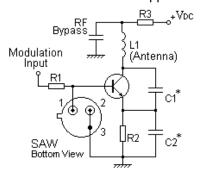
Dimension	Data (unit: mm)				
А	9.30±0.20				
В	5.08±0.10				
С	3.40±0.20				
D	3±0.20/5±0.20				
Е	0.45±0.20				

#### 3. Equivalent LC Model and Test Circuit

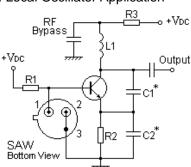


## 4. Typical Application Circuits

### 1) Low-Power Transmitter Application



### 2) Local Oscillator Application



Issue: 1 C1

Date: SEPT 04

In keeping with our ongoing policy of product evolvement and improvement, the above specification is subject to change without notice.

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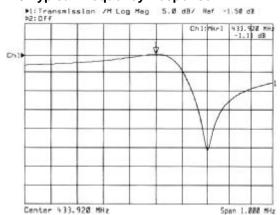
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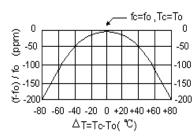
Issue: 1 C1

Date: SEPT 04

# 5. Typical Frequency Response



# **6.Temperature Characteristics**



The curve shown above accounts for resonator contribution only and does not include oscillator temperature characteristics.

#### 7.Performance

# 7-1.Maximum Ratings

Rating	Value	Units
CW RF Power Dissipation	0	dBm
DC Voltage Between Any Two Pins	±30V	VDC
Case Temperature	-40 to +85	°C

## 7-2. Electronic Characteristics

	Characteristic	Sym	Minimum	Typical	Maximum	Units
Centre Frequency (+25°C)	Absolute Frequency	f <sub>C</sub>	433.845		433.995	MHz
	Tolerance from 433.920MHz	$\Delta f_{C}$		±75		kHz
Insertion Loss		IL		1.5	2.2	dB
Quality Factor	Unloaded Q	Q <sub>U</sub>		11,600		
	50 Ω Loaded Q	$Q_L$		1,850		
	Turnover Temperature	T <sub>0</sub>	25		55	°C
Temperature Stability	Turnover Frequency	f <sub>0</sub>		fc		kHz
	Frequency Temperature Coefficient	FTC		0.032		ppm/°C 2
Frequency Aging Absolute Value during the First Year		f <sub>A</sub>		≤10		ppm/yr
DC Insulation Resistance Between Any Two Pins			1.0			MΩ
RF Equivalent RLC Model	Motional Resistance	R <sub>M</sub>		19	29	Ω
	Motional Inductance	L <sub>M</sub>		80.7885		μН
	Motional Capacitance	См		1.6669		fF
	Pin 1 to Pin 2 Static Capacitance	C <sub>0</sub>	1.65	1.95	2.25	pF

## i CAUTION: Electrostatic Sensitive Device. Observe precautions for handling!

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Date: SEPT 04

- 1. The centre frequency,  $f_C$ , is measured at the minimum IL point with the resonator in the 50  $\Omega$  test system. 2. Unless noted otherwise, case temperature  $T_C = +25^{\circ}C \pm 2^{\circ}C$ .
- 3. Frequency aging is the change in fc 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.
- Turnover temperature, T<sub>0</sub>, is the temperature of maximum (or turnover) frequency, f<sub>0</sub>. The nominal frequency at any case temperature,  $T_C$ , may be calculated from:  $f = f_0 [1 - FTC (T_0 - T_C)^2]$ .
- This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance C<sub>0</sub> is the measured static (non-motional) capacitance between Pin1 and Pin2. The measurement includes case parasitic capacitance.
- 6. Derived mathematically from one or more of the following directly measured parameters: f c, IL, 3 dB bandwidth, f<sub>C</sub> versus T<sub>C</sub>, and C<sub>0</sub>.
- 7. The specifications of this device are based on the test circuit shown above and subject to change or obsolescence without notice.
- 8. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
- 9. Our liability is only assumed for the Surface Acoustic Wave (SAW) component(s) per se, not for applications, processes and circuits implemented within components or assemblies.

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