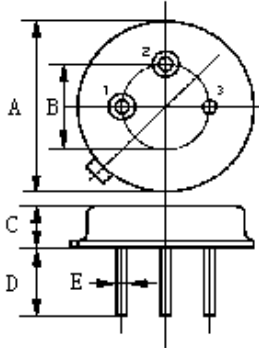


The GWR433A is a true one-port, surface-acoustic-wave (SAW) resonator in a low-profile TO-39 case. It provides reliable, fundamental-mode, quartz frequency stabilization of fixed-frequency transmitters operating at **433.92 MHz**.

### 1.Package Dimension (TO-39)



Pin	Connection
1	Terminal1
2	Terminal2
3	Case Ground

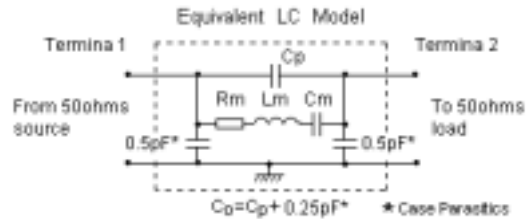
	Data (unit: mm)
A	9.30±0.20
B	5.08±0.10
C	3.40±0.20
D	3±0.20 / 5±0.20
E	0.45±0.20

### 2. Marking

**GWR433A**

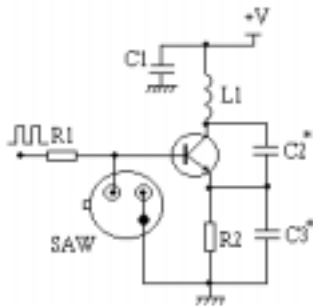
Color: Black or Blue

### 3. Equivalent LC Model and Test Circuit

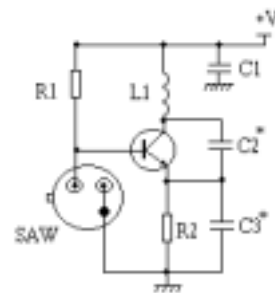


### 4. Typical Application Circuit

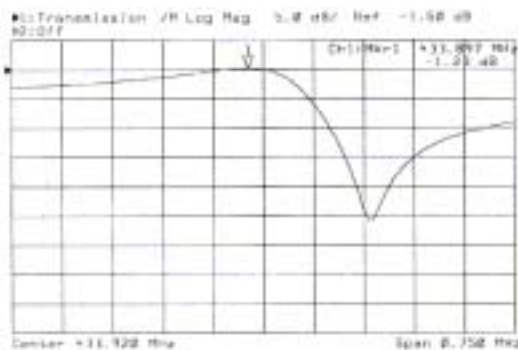
#### 1) Telecontrol Circuitry



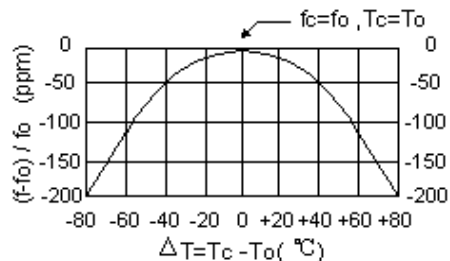
#### 2) Local Oscillator Application



### 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 Rating

Rating	Value	Units
CW RF Power Dissipation	+10	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
Center Frequency (+25°C)	Absolute Frequency	$f_c$	433.845		433.995	MHz
	Tolerance from 433.92 MHz	$f_c$		±75		kHz
Insertion Loss		IL		1.5	2.2	dB
Quality Factor	Unloaded Q	$Q_U$		12,500		
	50 Loaded Q	$Q_L$		2,000		
Temperature Stability	Turnover Temperature	$T_O$	25	40	55	°C
	Turnover Frequency	$f_o$		$f_c$		kHz
	Frequency Temperature Coefficient	FTC		0.037		ppm/°C <sup>2</sup>
Frequency Aging	Absolute Value during the First Year	$f_A$		≤10		ppm/yr
DC Insulation Resistance Between Any Two Pins			1.0			M
RF Equivalent RLC Model	Motional Resistance	$R_M$		19	29	
	Motional Inductance	$L_M$		120.311		H
	Motional Capacitance	$C_M$		2.1240		fF
	Pin 1 to Pin 2 Static Capacitance	$C_O$		2.1		pF

**CAUTION: Electrostatic Sensitive Device. Observe precautions for handling !**

#### NOTES:

- 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.
- The center frequency,  $f_c$ , is the frequency of minimum IL with the resonator in the specified test fixture in a 50 test system with VSWR ≤ 1.2 : 1. Typically,  $f_{oscillator}$  or  $f_{transmitter}$  is less than the resonator  $f_c$ .
- Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
- Unless noted otherwise, case temperature  $T_C = +25°C ± 2°C$ .
- The design, manufacturing process, and specifications of this device are subject to change without notice.
- Derived mathematically from one or more of the following directly measured parameters:  $f_c$ , IL, 3 dB bandwidth,  $f_c$  versus  $T_C$ , and  $C_O$ .
- Turnover temperature,  $T_O$ , is the temperature of maximum (or turnover) frequency,  $f_o$ . The nominal center 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 20°C less than the specified resonator  $T_O$ .
- This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance  $C_O$  is the measured static (nonmotional) capacitance between either pin 1 and ground or pin 2 and ground. The measurement includes case parasitic capacitance with a floating case. For usual grounded case applications (with ground connected to either pin 1 or pin 2 and to the case), add approximately 0.25 pF to  $C_O$ .