

Approved by:
Checked by:
Issued by:

# **SPECIFICATION**

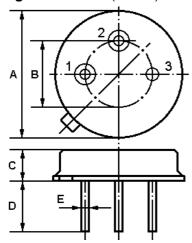
PRODUCT: SAW RESONATOR

MODEL: HR316.8 TO-39

HOPE MICROELECTRONICS CO.,LIMITED

The HR316.8 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 **316.800** MHz.

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



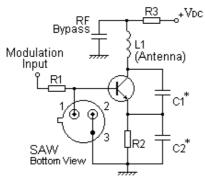
#### 2.Marking

# HR316.8

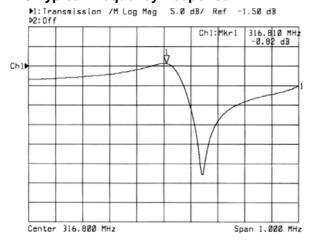
Color: Black or Blue

# **4.Typical Application Circuits**

1) Low-Power Transmitter Application



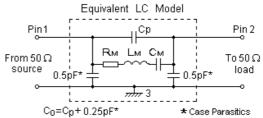
#### 5. Typical Frequency Response



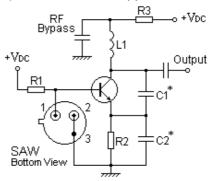
# Pin Configuration 1 Input / Output 2 Output / Input 3 Case Ground

Dimension	Data (unit: mm)				
Α	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				

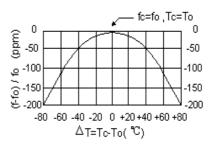
#### 3. Equivalent LC Model and Test Circuit



### 2) Local Oscillator Application



#### **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	Unit	
CW RF Power Dissipation	Р	0	dBm
DC Voltage Between Any two Pins	$V_{ m DC}$	± 30	V
Storage Temperature Range	$T_{\rm stg}$	-40 to +85	
Operating Temperature Range	T <sub>A</sub>	-10 to +60	

#### 7-2. Electronic Characteristics

	Characteristic	Sym	Minimum	Typical	Maximum	Unit
Center Frequency (+25 )	Absolute Frequency	f <sub>C</sub>	316.725		316.875	MHz
	Tolerance from 316.800MHz	$\Delta f_{C}$		± 75		kHz
Insertion Loss		IL		1.3	1.8	dB
Quality Factor	Unloaded Q	Q <sub>U</sub>		13,800		
	50 Ω Loaded Q	$Q_L$		1,900		
Temperature Stability	Turnover Temperature	T <sub>0</sub>	25		55	
	Turnover Frequency	f <sub>0</sub>		f <sub>C</sub>		kHz
	Frequency Temperature Coefficient	FTC		0.032		ppm/ <sup>2</sup>
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>		16	23	Ω
	Motional Inductance	L <sub>M</sub>		110.7814		μН
	Motional Capacitance	См		2.2806		fF
	Pin 1 to Pin 2 Static Capacitance	C <sub>0</sub>	2.35	2.65	2.95	pF

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

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- 1. The center frequency, f<sub>C</sub>, is measured at the minimum IL point with the resonator in the 50 test system.
- 2. Unless noted otherwise, case temperature  $T_C = +25^{\circ}C \pm 2^{\circ}C$ .
- Frequency aging is the change in f<sub>C</sub> 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:  $f = f_0 [1 FTC (T_0 T_C)^2]$ .
- 5. This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance C<sub>0</sub> is the measured static (nonmotional) 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,  $f_C$  versus  $T_C$ , and  $C_0$ .
- 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.
- 10. For questions on technology, prices and delivery, please contact our sales offices or e-mail sales@hoperf.com.