

# HR916.5A

916.5MHz One-Port SAW Resonator For Wireless Remote Control

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Approved by:
Checked by:
Issued by:

## SPECIFICATION

PRODUCT: SAW RESONATOR

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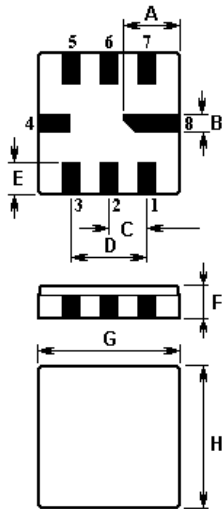
MODEL: HR916.5a QCC8C

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**HOPE MICROELECTRONICS CO.,LIMITED**

The HR916.5A is a true one-port, surface-acoustic-wave (SAW) resonator in a surface-mount ceramic QCC8C case. It provides reliable, fundamental-mode, quartz frequency stabilization i.e. in transmitters or local oscillators operating at 916.500 MHz.

1.Package Dimension (QCC8C)



Pin	Configuration
2	Terminal1
6	Terminal2
4,8	Case Ground
1,3,5,7	Empty

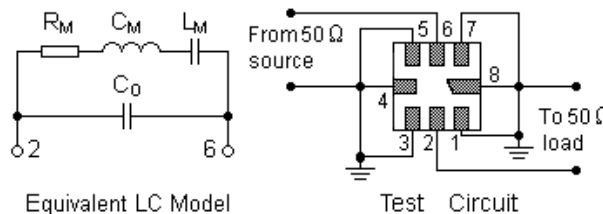
Sign	Data (unit: mm)	Sign	Data (unit: mm)
A	2.08	E	1.2
B	0.6	F	1.35
C	1.27	G	5.0
D	2.54	H	5.0

2.Marking

HR916.5A

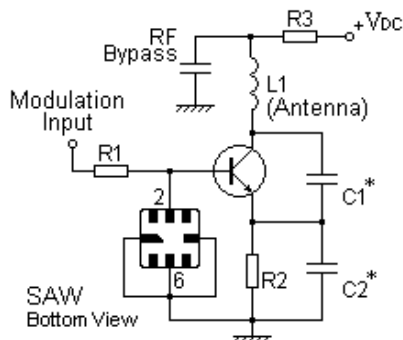
Laser Marking

3.Equivalent LC Model and Test Circuit

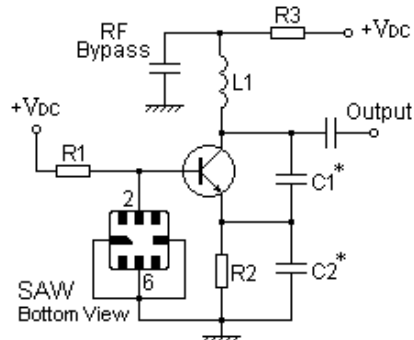


4.Typical Application Circuits

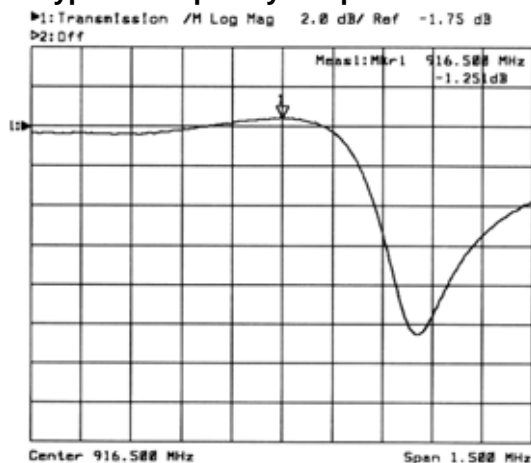
1) Low-Power Transmitter Application



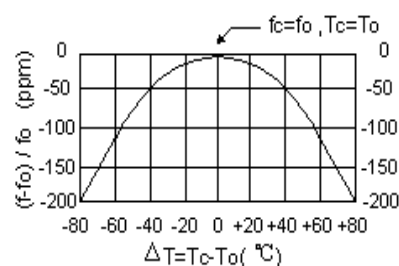
2) Local Oscillator Application



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 Ratings

Rating		Value	Unit
CW RF Power Dissipation	$P$	0	dBm
DC Voltage Between Terminals	$V_{DC}$	$\pm 30$	V
Storage Temperature Range	$T_{stg}$	-40 to +85	
Operating Temperature Range	$T_A$	-10 to +60	

### 7-2.Electronic Characteristics

Characteristic		Sym	Minimum	Typical	Maximum	Unit
Center Frequency (+25 °C)	Absolute Frequency	$f_c$	916.350		916.650	MHz
	Tolerance from 916.500 MHz	$\Delta f_c$		$\pm 150$		kHz
Insertion Loss		$I_L$		1.5	2.2	dB
Quality Factor	Unloaded Q	$Q_U$		10,020		
	50 $\Omega$ Loaded Q	$Q_L$		1,500		
Temperature Stability	Turnover Temperature	$T_0$	25		55	
	Turnover Frequency	$f_0$		$f_c$		kHz
	Frequency Temperature Coefficient	FTC		0.032		ppm/ °C
Frequency Aging	Absolute Value during the First Year	$ f_A $		10		ppm/yr
DC Insulation Resistance Between Any Two Terminals			1.0			M $\Omega$
RF Equivalent RLC Model	Motional Resistance	$R_M$		19	29	$\Omega$
	Motional Inductance	$L_M$		31.0132		$\mu$ H
	Motional Capacitance	$C_M$		0.9734		fF
	Shunt Static Capacitance	$C_0$	1.8	2.1	2.4	pF

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

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- The center frequency,  $f_c$ , is measured at the minimum IL point with the resonator in the 50  $\Omega$  test system.
- Unless noted otherwise, case temperature  $T_C = +25^\circ\text{C} \pm 2^\circ\text{C}$ .
- Frequency aging is the change in  $f_c$  with time and is specified at  $+65^\circ\text{C}$  or less. Aging may exceed the specification for prolonged temperatures above  $+65^\circ\text{C}$ . Typically, aging is greatest the first year after manufacture, decreasing in subsequent years.
- 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:  $f = f_0 [1 - \text{FTC} (T_0 - T_C)^2]$ .
- This equivalent RLC model approximates resonator performance near the resonant frequency and is provided for reference only. The capacitance  $C_0$  is the measured static (nonmotional) capacitance between the two terminals. The measurement includes case parasitic capacitance.
- 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.
- Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
- 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.
- For questions on technology, prices and delivery, please contact our sales offices or e-mail [sales@hoperf.com](mailto:sales@hoperf.com).