

# HR314.5

314.5MHz One-Port SAW Resonator

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Approved by:
Checked by:
Issued by:

## SPECIFICATION

PRODUCT: SAW RESONATOR

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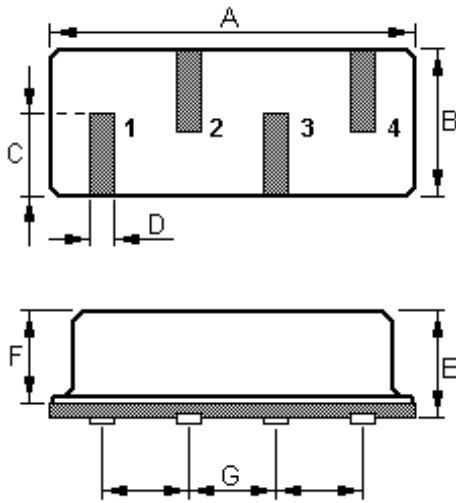
MODEL: HR314.5 F11-SMD

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**HOPE MICROELECTRONICS CO., LIMITED**

The HR314.5 is a true one-port, surface-acoustic-wave (SAW) resonator in a low-profile metal F11-SMD case. It provides reliable, fundamental-mode, quartz frequency stabilization i.e. in transmitters or local oscillators operating at 314.500 MHz.

1.Package Dimension (F11-SMD)



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

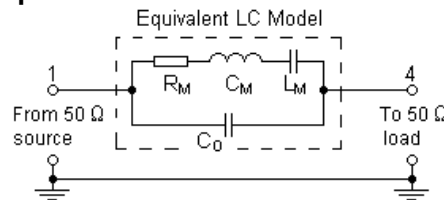
Dimension	Data (unit: mm)
A	11.0 ± 0.5
B	4.5 ± 0.5
C	2.45 ± 0.2
D	0.6 ± 0.05
E	4.1 ± 0.3
F	3.4 ± 0.3
G	2.54 ± 0.2

2. Marking

HR314.5

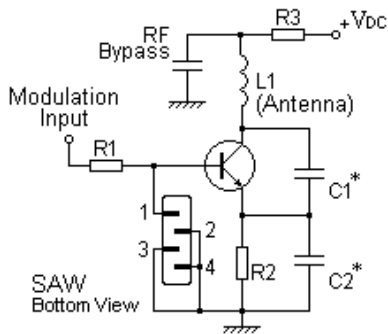
Color: Black or Blue

3. Equivalent LC Model and Test Circuit

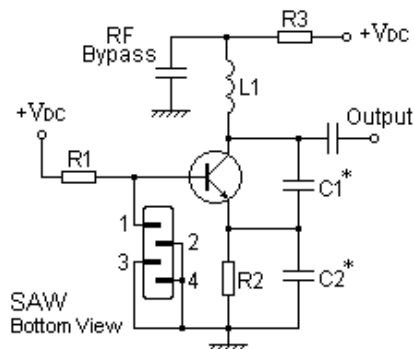


4. Typical Application Circuits

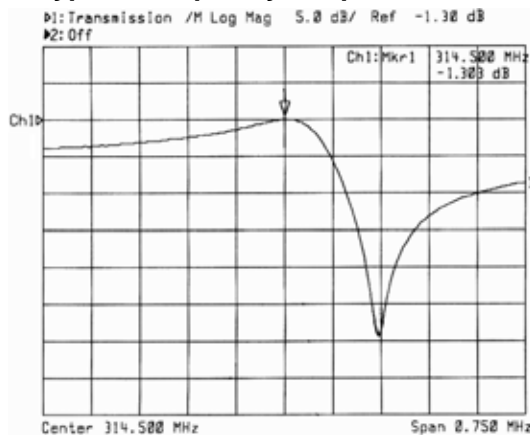
1) Low-Power Transmitter Application



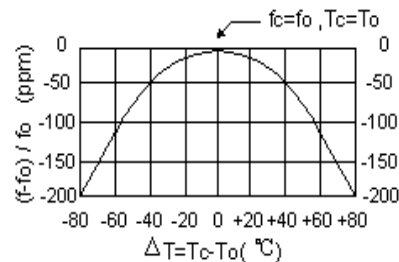
2) Local Oscillator Application



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	$f_c$	314.425		314.575	MHz
	Tolerance from 314.500 MHz	$\Delta f_c$		$\pm 75$		kHz
Insertion Loss		IL		1.6	2.2	dB
Quality Factor	Unloaded Q	$Q_U$		12,300		
	50 $\Omega$ Loaded Q	$Q_L$		2,050		
Temperature Stability	Turnover Temperature	$T_O$	25		55	
	Turnover Frequency	$f_o$		$f_c$		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	$R_M$		20	29	$\Omega$
	Motional Inductance	$L_M$		124.5532		$\mu$ H
	Motional Capacitance	$C_M$		2.0582		fF
	Shunt Static Capacitance	$C_O$	2.2	2.5	2.8	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°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,  $T_O$ , is the temperature of maximum (or turnover) frequency,  $f_o$ . The nominal frequency at any case temperature,  $T_C$ , may be calculated from:  $f = f_o [1 - \text{FTC} (T_O - T_C)^2]$ .
- 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 Terminal1 and Terminal4. 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 email [sales@hoperf.com](mailto:sales@hoperf.com).