

- **Ideal for 916.50 MHz Transmitters**
- **Nominal Phase Shift of 180° at Resonance**
- **Quartz Stability**
- **Ultra Miniature Ceramic SMD Package (QCC8C)**

# SQ5002

Absolute Maximum Rating (Ta=25°C)		
Parameter	Rating	Unit
CW RF Power Dissipation	$P$	10
DC Voltage	$V_{DC}$	±30
Operating Temperature Range	$T_A$	-10 ~ +60
Storage Temperature Range	$T_{stg}$	-40 ~ +85

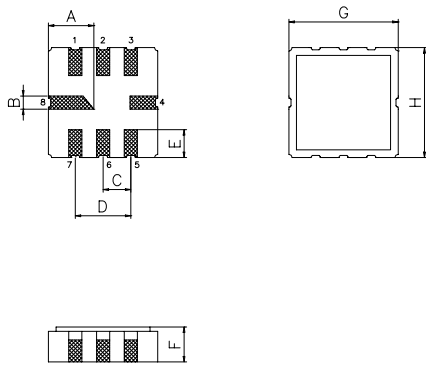
Electronic Characteristics						
Parameter	Sym	Minimum	Typical	Maximum	Unit	
Frequency (25°C)	Nominal Frequency	$f_c$	NS	916.50	NS	MHz
	Tolerance from 916.50 MHz	$\Delta f_c$	-	-	± 150	KHz
Insertion Loss		$IL$	-	6.5	9.0	dB
Quality Factor	Unloaded Q-Value	$Q_U$	-	6,650	-	-
	50Ω Loaded Q-Value	$Q_L$	-	3,500	-	-
Temperature Stability	Turnover Temperature	$T_o$	25	-	55	°C
	Turnover Frequency	$f_o$	-	$f_c$	-	KHz
	Frequency Temperature Coefficient	$FTC$	-	0.032	-	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	-	-	MΩ
RF Equivalent RLC Model	Motional Resistance	$R_M$	-	111.35	182	Ω
	Motional Inductance	$L_M$	-	128.5222	-	μH
	Motional Capacitance	$C_M$	-	0.2349	-	fF
	Shunt Static Capacitance	$C_o$	2.30	2.55	2.80	pF

NS = Not Specified

**Note:**

- The frequency  $f_c$  is the frequency of minimum IL with the resonator in the specified test fixture in a 50Ω test system with VSWR ≤ 1.2:1.
- Unless noted otherwise, case temperature TC = +25°C±2°C.
- 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, T0, is the temperature of maximum (or turnover) frequency, f0. The nominal frequency at any case temperature, TC, may be calculated from:  $f = f_o [1 - FTC (T_o - T_o)^2]$ .
- 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 input terminal and ground or output terminal and ground.
- 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  $C_o$ .
- 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 to sales@vanlong.com.

## Package Dimensions (QCC8C)



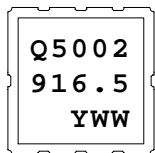
## Electrical Connections

Terminals	Connection
2	Terminal 1
6	Terminal 2
4,8	Case-Ground
1,3,5,7	NC

## Package Dimensions

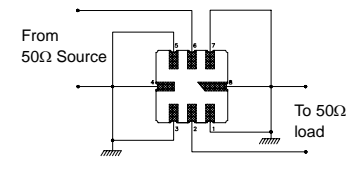
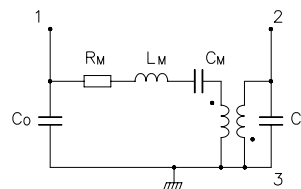
Dimensions	Nom (mm)	Dimensions	Nom (mm)
A	2.08	E	1.20
B	0.60	F	1.35
C	1.27	G	5.00
D	2.54	H	5.00

## Marking



1. Q5002 - Part Code
2. Frequency in MHz
3. Date Code:  
 Y : Last digit of year  
 WW : Week No.

## Equivalent LC Model and Test Circuit

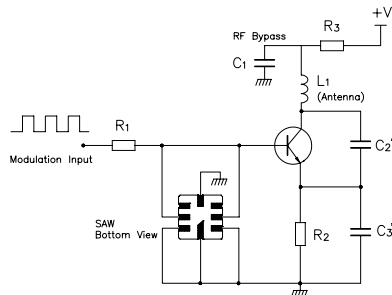


Equivalent LC Model

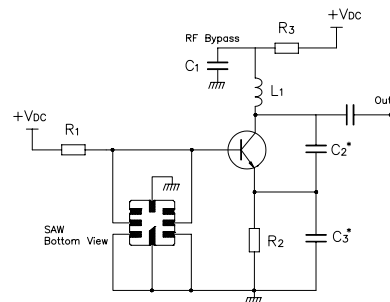
Test Circuit

## Typical Application Circuit

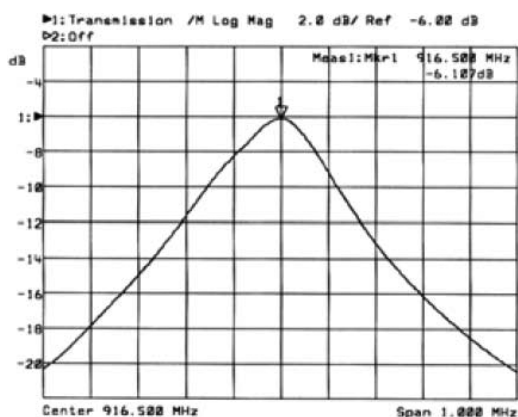
### Low Power Transmitter Application



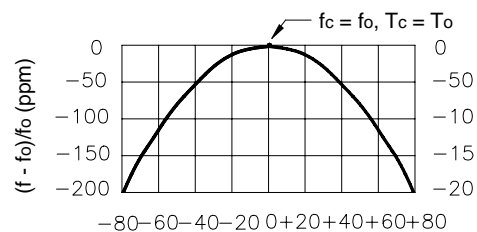
### Local Oscillator Application



## Typical Frequency Response



## Temperature Characteristics



$$\Delta T = T_c - T_o \text{ (}^\circ\text{C)}$$

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