

# Shoulder 好达

SHOULDER ELECTRONICS LIMITED

## CRYSTAL RESONATOR Data Sheet

PRODUCT 产品: CRYSTAL RESONATOR

MODEL NO 型号: SMD0603

PREPARED 编制: Fengyu

CHECKED 审核: York

APPROVED 批准: Lijiating

DATE 日期: 2008-01-25

## 1. Feature

- RoHS Compliant(Lead Free)
- Surface Mount Package
- High precision characteristic covering up to high frequency range
- Higher frequency stability and reliability
- Tape and Reel available

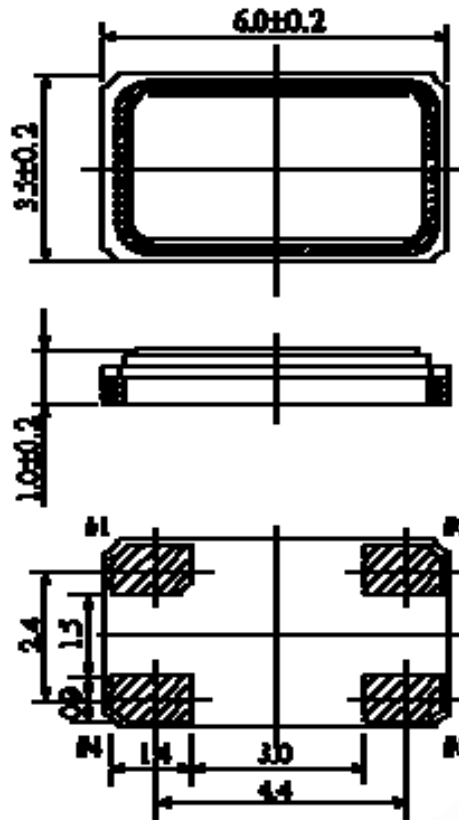
## 2. Specification

Type	SMD0603
Frequency Range	10.00 ~ 160.00 MHz
Overtone	See table
Frequency Tolerance (25±3°C)	±10/±15/±20/± 30 ppm
Temperature Characteristics (in reference to +25°C)	±10/±15/±20/± 30 ppm
Operating Temperature Range	-10 ~ +60°C
ESR	See table
Drive Level	10 μW (100 μW max)
Standard Load Capacitance	10 /20 /30 pF
Operable Temperature Range	-40 ~ +85°C

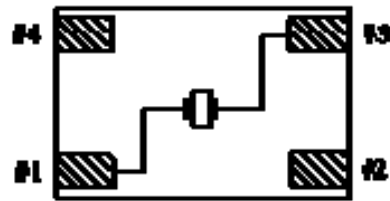
Table equivalent series resistance(Ω)

Overtone	Frequency Range(MHz)	Equivalent Series Resistance (Ω)
Fundamental	10 ~ 40	60 max
3rd overtone	40 ~ 160	100 max

### 3. Dimensions

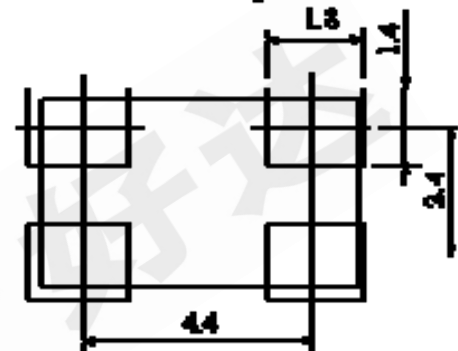


#### Internal connections (Top View)



Note) #2, #4, is connected with a cover.  
(Please connect with a GND or a power supply.)

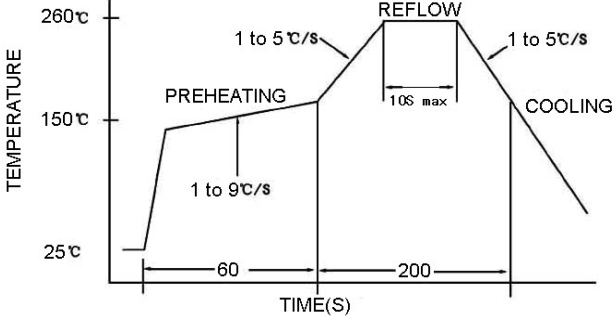
#### Reference land pattern



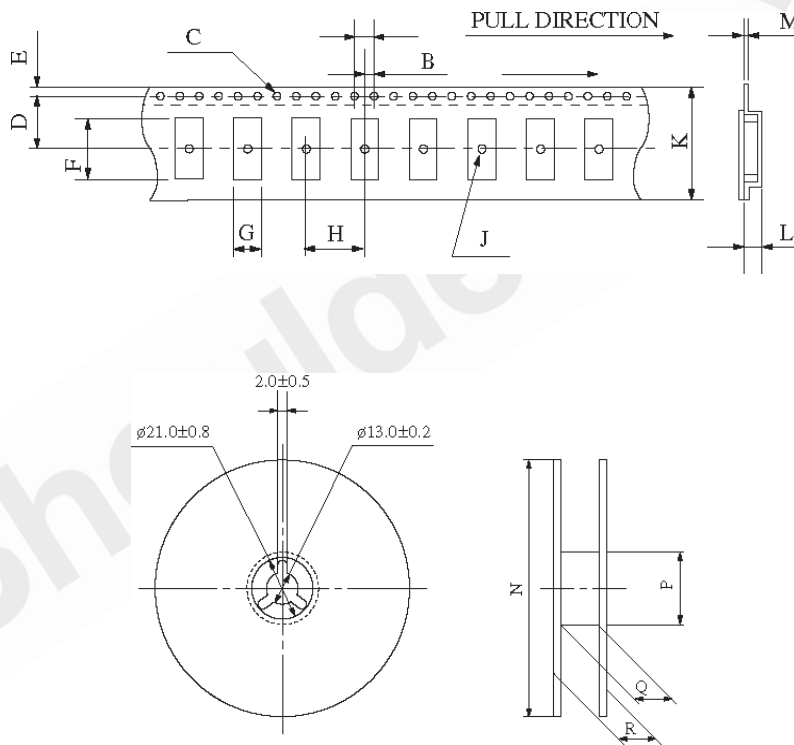
### 4. Reliability Characteristics

Item	Condition	Specifications
4.1 Solderability	Solder bath temperature: $260^{\circ}\text{C}$ , duration: 5 seconds, Solder: 100% tin	A new uniform coating of solder shall cover a minimum of 95% of the end surface .
4.2 Resistance to soldering heat	Solder temperature $260 \pm 3^{\circ}\text{C}$ ,Immersion time: 10 S Solder bath composition: 100% tin	No electrical and mechanical damage. Electrical characteristics shall be satisfied.
4.3 Vibration	The frequency range: from 10Hz to 55Hz and return to 10Hz Amplitude: 1.5mm This motion shall be applied for a period of 2 h in each of 3 mutually perpendicular axes ( total of 6h)	No electrical and mechanical damage. Electrical characteristics shall be satisfied.

4.4	Drop test	Drop from 75cm height on 3cm hard wooden board for 6 times	No electrical and mechanical damage Electrical characteristics shall be satisfied.		
4.5	Cold Storage	The unit shall be stored at a temperature of $-40\pm 3^{\circ}\text{C}$ for 500 H. then it shall be subjected to standard atmospheric conditions for 1h after which measurement shall be made.	Electrical characteristics shall be satisfied.		
4.6	High temperature high humidity storage (steady state)	The unit shall be stored at a temperature of $40\pm 2^{\circ}\text{C}$ with relative humidity of 95% for 500h, then it shall be subjected to standard atmospheric conditions for 2h after which measurement shall be made.	Electrical characteristics shall be satisfied.		
4.7	Thermal shock	The unit shall be subjected to 50 successive Change of temperature cycles. Each as shown in table below, then it shall be subjected to standard atmospheric conditions for 1h after which measurement shall be made.	Electrical characteristics shall be satisfied.		
				Temperature	Duration
		1		$-40\pm 3^{\circ}\text{C}$	15minutes
		2.		$100\pm 2^{\circ}\text{C}$	15minutes
		3.		Transition time	Within 10 seconds
4.8	Sealing	Helium leakage detector shall used to measure the leakage rate of gas through any faulty seal. Pressure: 500Kpa, duration:120 minutes	Leakage rate $\leq 1\cdot 10^{-9}\text{ Pa}\cdot\text{m}^3/\text{S}$		
4.9	High temperature Life test	The unit shall be stored at a temperature of $85\pm 3^{\circ}\text{C}$ for 720h,then it shall be subjected to standard atmospheric condition for 1h after which measurement shall be made.	Electrical characteristics shall be satisfied.		
4.10	Salt spray test	Temperature $+35^{\circ}\text{C}\pm 2^{\circ}\text{C}$ Duration 48 hours NaCl % 5%	No rust. Electrical characteristics shall be satisfied.		

4.11	Soldering Profile		Reflow temperature: Solder with lead: 240°C +/-5 Solder without lead: 260°C +/-5
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### 5. Package



SMD 0603	A	B	C	D	E	F	G	H	J
	4.0 ± 0.1	2.0 ± 0.1	∅1.5 +0.1 -0	5.5±0.1	1.75±0.1	5.4 ± 0.1	3.5 ± 0.1	8.0 ± 0.1	∅1.5 +0.1 -0
	K	L	M	N	P	Q	R	Quantity	
	12.0±0.2	1.4 ± 0.1	0.3±0.05	∅180 +0 -3	∅60 +1 -0	13.0±0.3	16.5 max	1000	