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**SPEC NO :**

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# SPECIFICATION

CUSTOMER □ □ □

PRODUCT □ □ □

CRYSTAL RESONATOR

MODEL NO □ □ □ 49S-SMD 3.579545MHz to 27MHz -16-30/30/A

PREPARED □ □ □ LEO CHECKED □ □ □ YORK

APPROVED □ □ □ LIUMING D A T E □ □ □ 2011-12-8

□□□□ CUSTOMER RECEIVED:		
□□ CHECKED	□□ APPROVED	□□ DATE



## Shoulder Electronics Limited



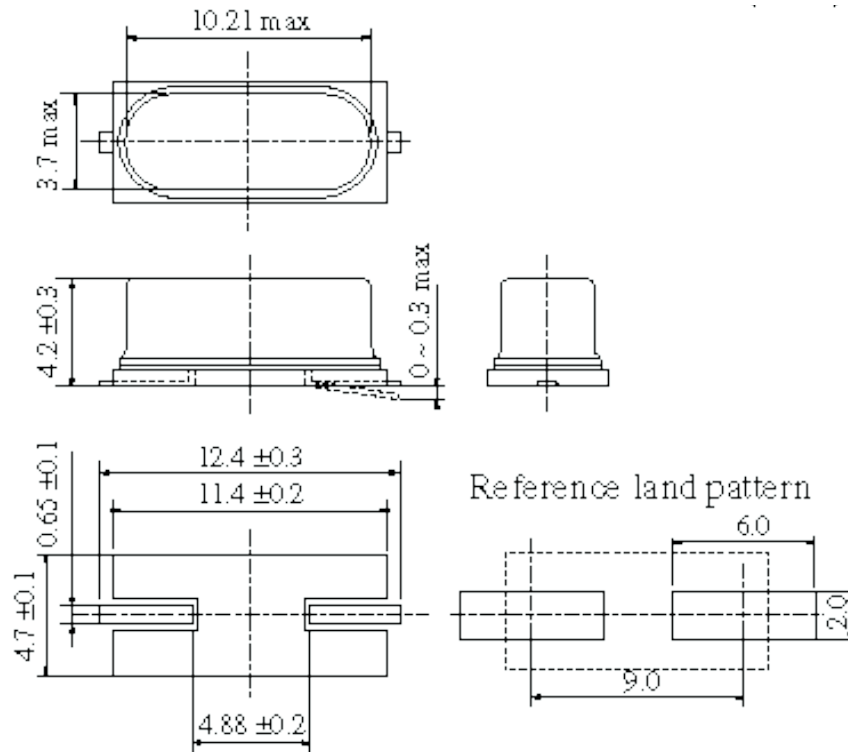
**1. SPECIFICATION**

FREQUENCY RANGE	3.579545MHz to 27MHz
LOAD CAPACITANCE	16PF
FREQUENCY TOLERANCE AT 25°C+/-2°C	-/+30PPM
FREQUENCY STABILITY AT -20 TO +70°C	-/+30PPM
OPERATING TEMPERATURE RANGE	-20TO +70°C
OSCILLATING MODE/CUTTING	Fundamental
STORAGE TEMPERATURE RANGE	-40 TO +85°C
EQUIVALENT SERIES RESISTANCE (ESR)	See ESR table
DRIVE LEVEL	100μW
SHUNT CAPACITANCE	7PF MAX
AGING	-/+5PPM PER YEAR
INSULATION RESISTANCE	500 MOhm MIN

**2. ESR TABLE (Ohm)**

Overtone	Frequency Range (MHz)	Equivalent Series Resistance (Ω)
Fundamental	3.500 ~ 3.700	150 max
	3.701 ~ 3.999	120 max
	4.000 ~ 4.999	100 max
	5.000 ~ 5.999	80 max
	6.000 ~ 11.999	60 max
	12.000 ~ 33.500	40 max
3rd overtone	27.000 ~ 39.999	100 max
	40.000 ~ 75.000	80 max

### 3. DIMENSIONS



### 4. MECHANICAL SPECIFICATION

#### 1) Terminal Strength

##### Lead pulling test

Conditions: Load 907.2 gram  
 Direction To the downward  
 Duration of applied force 5 seconds  
 Results: There should be no distortion in appearance.

##### Lead bending test

Conditions: Load 453.6 gram  
 Bending angle 90° to normal position  
 Rate of bending 3 seconds in each cycle  
 Number of bending 3  
 Results: There should be no distortion in appearance.

#### 2) Lead solderability test

Conditions: Dipping in solder (+230°C±5°C) for 5 seconds  
 Results: More than 95% of surface being tested should be coated uniformly with solder.

#### 3) Vibration test

Conditions: Frequency 10 – 55Hz  
 Amplitude 0.762mm  
 Sweep 1.0 minute  
 Duration 2 hours  
 Results: Frequency and wave form of tested products must remain within specifications.

**4) Drop test**

Conditions: Method of drop Natural drop

Dropping floor Hard wood board

Height 75cm

Number of drops 3 times

Results: Frequency and wave form of tested products must remain within specifications.

**5. ENVIRONMENTAL SPECIFICATION****1) Temperature test***Temperature cycling test*

Conditions: Steps of cycle 1) At -55°C,30 minutes

2) At +25°C,10 - 15 minutes

3) At +85°C,30 minutes

4) At +25°C,10 - 15 minutes

Number of cycles 3 times

Results: Frequency and wave form of tested products must remain within specifications.

*Low Temperature test*

Conditions: Temperature -20°C±2°C

Length of test 96 hours

Results: There should be no stain on surface of products.

Frequency and wave form of tested products must remain within specifications.

**2) Aging test**

Conditions: Temperature +85°C±20°C

Length of test 96 hours

Results: Deviation of frequency must be less than ±3ppm

**3) Salt spray test**

Conditions: Temperature +35°C±2°C

Length of test 48 hours

NaCl % 5%

Results: There should be no stain on surface of products.

**4) Humidity test**

Conditions: Temperature +40°C±2°C

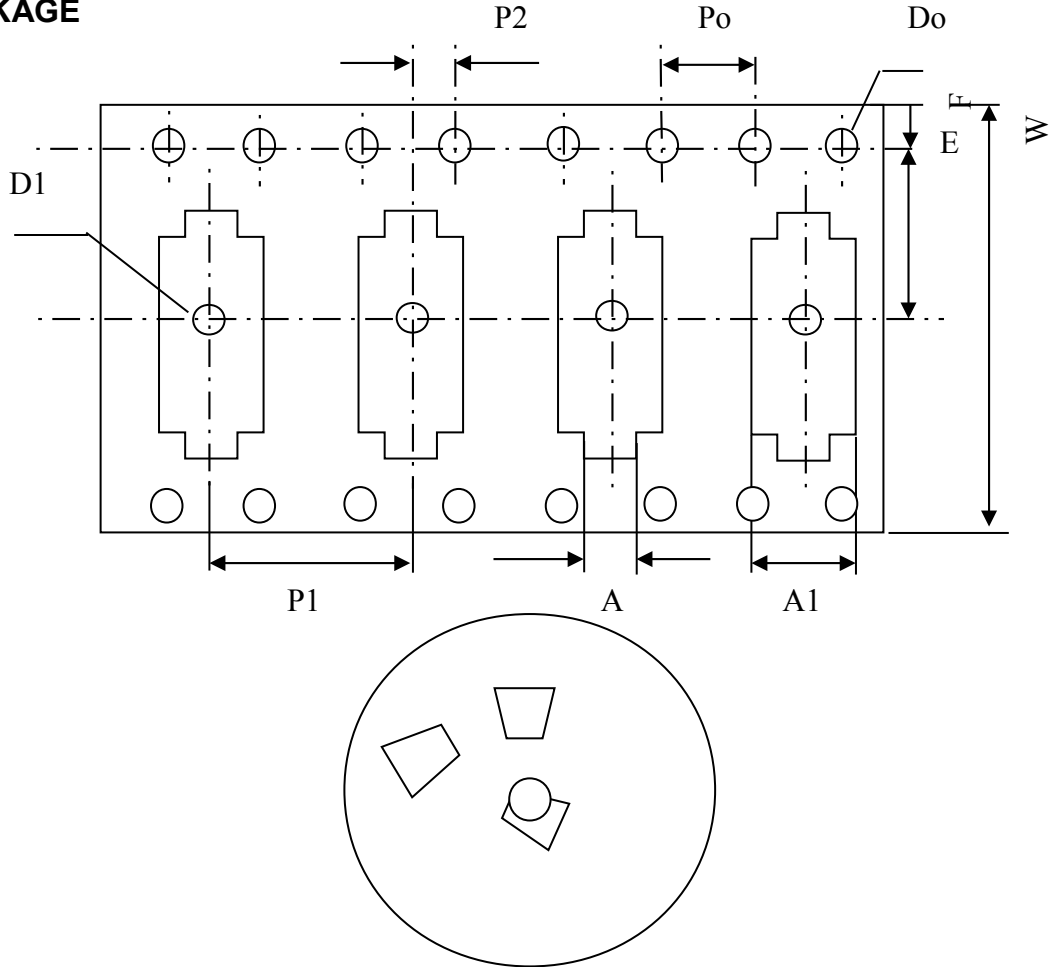
Relative humidity 90 - 95%

Length of test 96 hours

Results: a. Insulation resistance must be 500 MΩ/100 Vac. minimum

b. Resistance and wave form must remain within specifications.

**6. PACKAGE**



Symbol	A	P1	P2	Po	Do	F	W
Dimensions	5.0	8.0 or 12.0	2.0	4.0	1.6	11.5	24.0
Symbol	E	D1					
Dimensions	1.8	2.2					

1000PCS / BOX (330X330X40)  
 10000PCS / CARTON (360X360X420)