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Approved by:

Checked by:

Issued by:

# ***SPECIFICATION***

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**PRODUCT: SAW RESONATOR**

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**MODEL: HDR433MS3(SM-3)**

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**MARKING: HD451**

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# SHOULDER ELECTRONICS LIMITED

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## 1. SCOPE

This specification shall cover the characteristics of 1-port SAW resonator with 433.92M used for remote-control security.

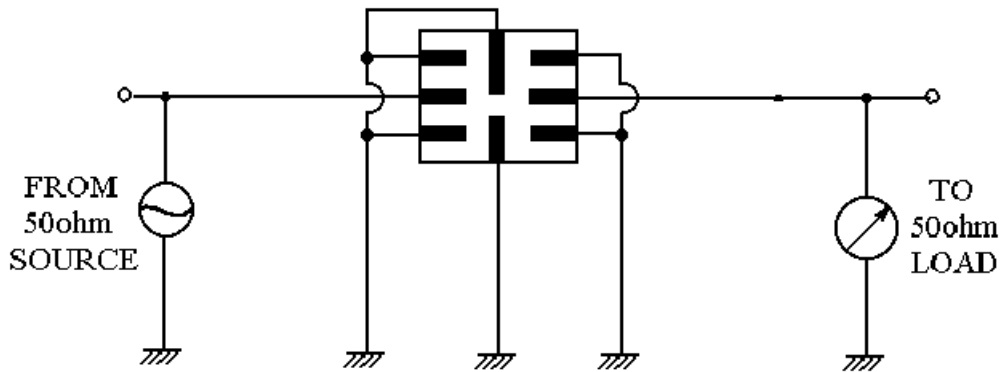
## 2. ELECTRICAL SPECIFICATION

DC Voltage VDC	10V
AC Voltage Vpp	10V 50Hz/60Hz
Operation temperature	-20°C to +85°C
Storage temperature	-45°C to +85°C
RF Power Dissipation	0dBm

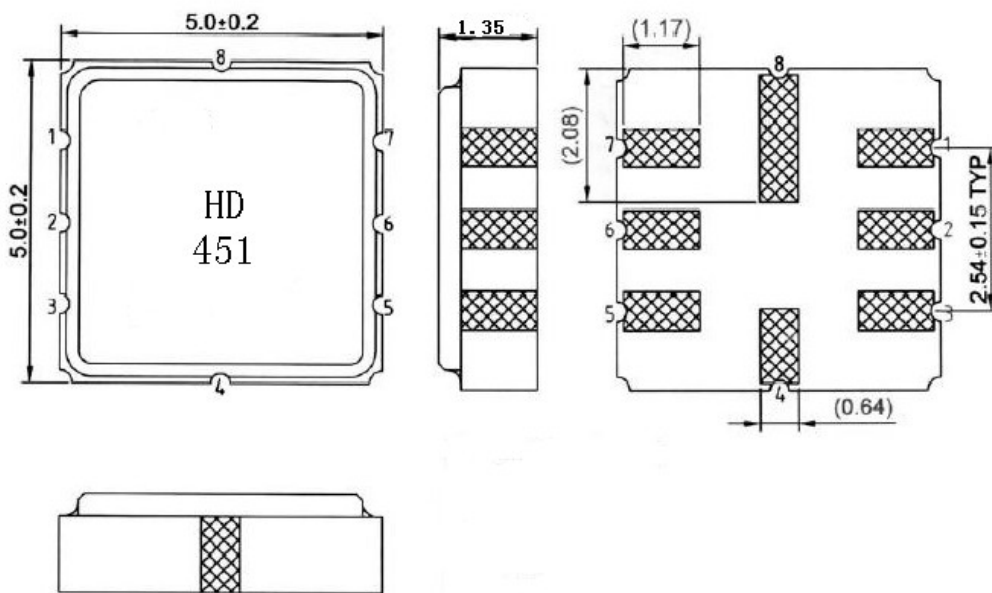
Electronic Characteristics

Item	Unites	Minimum	Typical	Maximum		
Center Frequency	MHz	433.770	433.920	434.070		
Insertion Loss	dB		1.5	2.5		
Quality Factor Unload Q			12,800			
50Ω Loaded Q			1,000			
Temperature Turnover Temperature	°C		10	25	40	
Stability Turnover Frequency	KHz			fo		
Freq.temp.Coefficient	ppm/°C <sup>2</sup>		0,032			
Frequency Aging	ppm/yr		<±10			
DC. Insulation Resistance	MΩ		1.0			
Motional Resistance R1	Ω		18	26		
RF Equivalent Motional Inductance L1	μH			86		
RLC Model Motional Capacitance C1	pF			1.5		
Pin 1 to Pin 2 Staic Capacitance	pF		1.7	2.0	2.3	
Transducer Static Capacitance	pF			1.9		

## 3. TEST CIRCUIT



#### 4. DIMENSION



- 2.Input
- 6.Output
- 1.3.5.7.Gound
- 4.8 Ground

#### 5. ENVIRONMENTAL CHARACTERISTICS

##### 5-1 Temperature cycling

Subject the device to a low temperature of  $-40^{\circ}\text{C}$  for 30 minutes. Following by a high temperature of  $+25^{\circ}\text{C}$  for 5 Minutes and a higher

temperature of +85°C for 30 Minutes. Then release the device into the room conditions for 1 to 2 hours prior to the measurement. It shall meet the specifications in table 1.

#### 5-2 Resistance to solder heat

Submerge the device terminals into the solder bath at 260°C ±5°C for 10±1 sec. Then release the device into the room conditions for 4 hours. It shall meet the specifications in table 1.

#### 5-3 Solderability

Submerge the device terminals into the solder bath at 245°C ±5°C for 5s, More than 95% area of the soldering pad must be covered with new solder. It shall meet the specifications in table 1.

#### 5-4 Mechanical shock

Drop the device randomly onto the concrete floor from the height of 1 m 3 times. the filter shall fulfill the specifications in table 1.

#### 5-5 Vibration

Subject the device to the vibration for 2 hour each in x,y and z axes with the amplitude of 1.5 mm at 10 to 55 hz. The filter shall fulfill the specifications in table 1.

## **6. REMARK**

### 6.1 Static voltage

Static voltage between signal load & ground may cause deterioration & destruction of the component. Please avoid static voltage.

### 6.2 Ultrasonic cleaning

Ultrasonic vibration may cause deterioration & destruction of the component. Please avoid ultrasonic cleaning

### 6.3 Soldering

Only leads of component may be soldered. Please avoid soldering another part of component.