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# ***SPECIFICATION***

**PRODUCT: SAW RESONATOR**

**MODEL: HDR433M F11 -150~+150K**



**SHOULDER ELECTRONICS LIMITED**

## 1. SCOPE

This specification shall cover the characteristics of 1-port SAW resonator with 433M used for remote-control security.

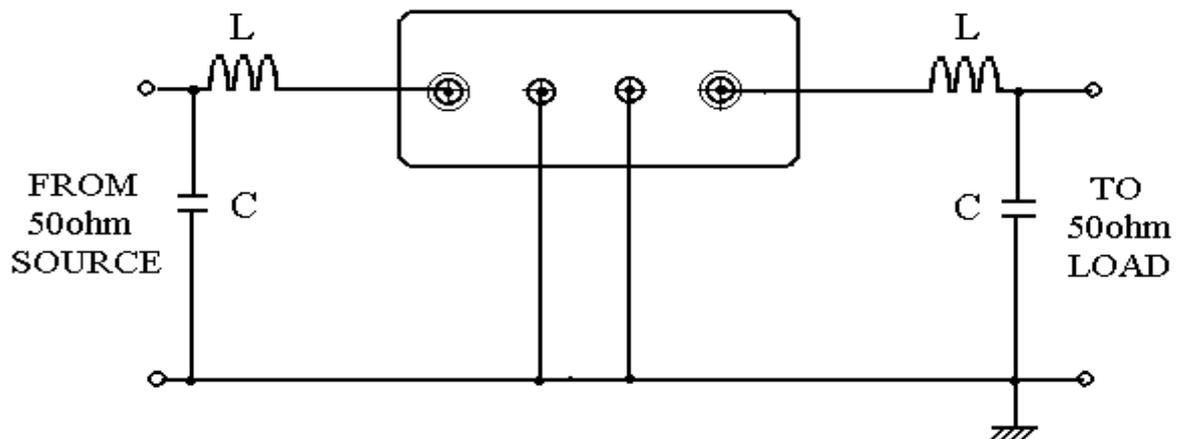
## 2. ELECTRICAL SPECIFICATION

DC Voltage VDC	10V
AC Voltage Vpp	10V50Hz/60Hz
Operation temperature	-20°C to +85°C
Storage temperature	-45°C to +85°C
RF Power Dissipation	0dBm

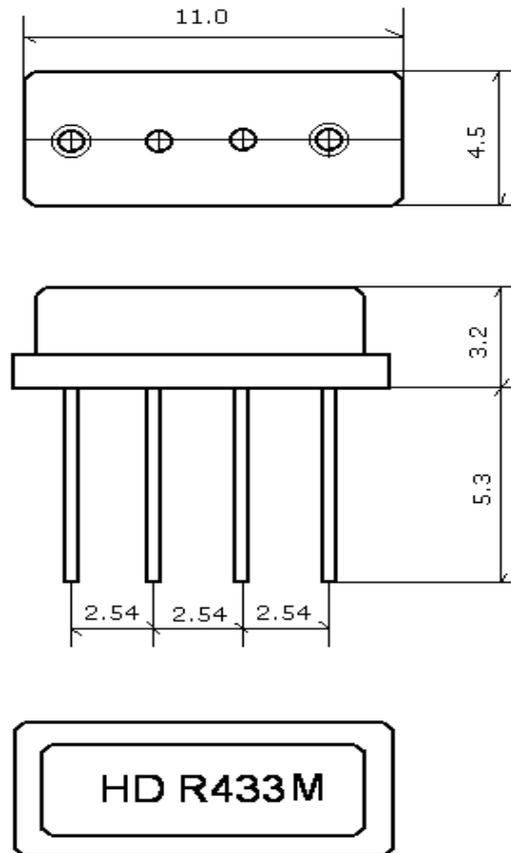
### Electronic Characteristics

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	
50 Ω Loaded Q			1,000	
Temperature	Turnover Temperature	°C	39	
Stability	Turnover Frequency	KHz	$f_0 \pm 2.7$	
	Freq.temp.Coefficient	ppm/°C <sup>2</sup>	0.037	
Frequency Aging	ppm/yr		$< \pm 10$	
DC. Insulation Resistance	M Ω	1.0		
RF Equivalent	Motional Resistance R1	Ω	18	26
	Motional Inductance L1	μ H	86	
	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



## 5. ENVIRONMENTAL CHARACTERISTICS

### 5-1 High temperature exposure

Subject the device to +85°C for 16 hours. Then release the filter into the room conditions for 24 hours prior to the measurement. It shall fulfill the specifications in table 1.

### 5-2 Low temperature exposure

Subject the device to -20°C for 16 hours. Then release the device into the room conditions for 24 hours prior to the measurement. It shall fulfill the specifications in table 1.

### 5-3 Temperature cycling

Subject the device to a low temperature of -40°C for 30 minutes. Following by a high temperature of +80°C for 30 Minutes. Then release the device into the room conditions for 24 hours prior to the measurement. It shall meet the specifications in table 1.

### 5-4 Resistance to solder heat

Dip the device terminals no closer than 1.5mm into the solder bath at 260°C ±10°C for 10 ±1 sec. Then release the device into the room conditions for 4 hours. The device shall meet the specifications in table 1.

### 5-5 Solderability

Subject the device terminals into the solder bath at  $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$  for 5s, More than 95% area of the terminals must be covered with new solder. It shall meet the specifications in table 1.

#### 5-6 Mechanical shock

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

#### 5-7 Vibration

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

#### 5-8 Lead fatigue

##### 5-8-1 Pulling test

Weight along with the direction of lead without an shock 1kg. The device shall satisfy all the initial Characteristics.

##### 5-8-2 Bending test

Lead shall be subject to withstand against  $90^{\circ}\text{C}$  bending with 450g weight in the direction of thickness. This operation shall be done toward both direction. The device shall show no evidence of damage and shall satisfy all the initial electrical characteristics.

## 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

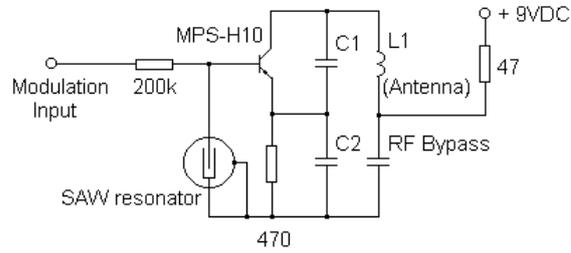
Ultrasonic vibration may cause deterioration & destruction of the component. Please avoid ultrasonic cleaning

### 6.3 Soldering

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

## 7. TYPICAL APPLICATION CIRCUIT

### Typical low-power Transmitter Application



### Typical Local Oscillator Application

