

---

Approved by:

Checked by:

Issued by:

# ***SPECIFICATION***

---

**PRODUCT: SAW RESONATOR**

---

**MODEL: HDR433MS20(SM-20)**

---

**MARKING: HD2401**

---



# SHOULDER ELECTRONICS LIMITED

---

## 1.SCOPE

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

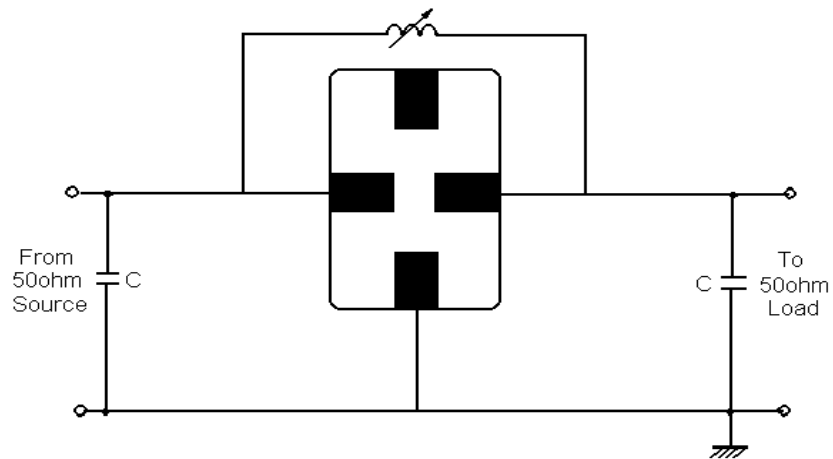
## 2. ELECTRICAL SPECIFICATION

DC Voltage VDC	10V
AC Voltage Vpp	10V50Hz/60Hz
Operation temperature	-40°C to +85°C
Storage temperature	+45°C to +85°C
RF Power Dissipation	0dBm

### Electronic Characteristics

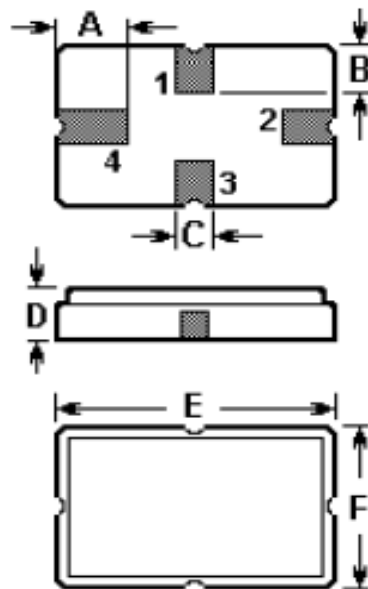
Item	Unites	Minimum	Typical	Maximum	
Center Frequency	MHz	433.770	433.920	434.070	
Insertion Loss	dB		1.5	2.5	
Quality Factor Unload Q			12,800		
50Ω Loaded Q			1,000		
Temperature Stability	Turnover Temperature	°C	10	25	40
	Turnover Frequency	KHz		fo	
	Freq.temp.Coefficient	ppm/°C <sup>2</sup>		0.032	
Frequency Aging	ppm/yr		<±10		
DC. Insulation Resistance	MΩ	1.0			
RF Equivalent	Motional Resistance R1	Ω	18	26	
RLC Model	Motional Inductance L1	μH	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

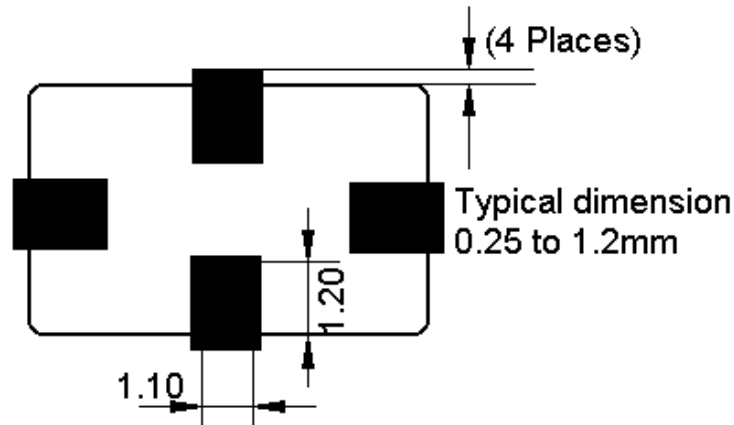
4-1 Typical dimension(unit: mm)



Sign	Data (unit: mm)	Sign	Data (unit: mm)
A	$1.2 \pm 0.1$	D	$1.4 \pm 0.1$
B	$0.8 \pm 0.1$	E	$5.0 \pm 0.1$
C	0.5	F	$3.5 \pm 0.1$

Pin	Configuration
1	Input / Output
3	Output / Input
2/4	Case Ground

4-2 Typical circuit board land patter



## 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  $+85^{\circ}\text{C}$  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  $240^{\circ}\text{C} \pm 5^{\circ}\text{C}$  for  $10 \pm 1$  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  $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$  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

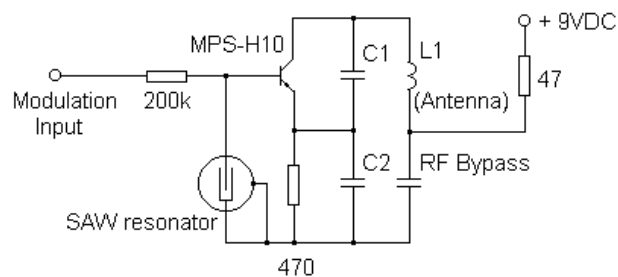
Ultrasonic vibration may cause deterioration & destruction of the component. Please avoid ultrasonic cleaning

### 6.3 Soldering

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

## 7. Typical Application Circuit

### Typical low-power Transmitter Application



### Typical Local Oscillator Application

