

**SPEC NO :**

# SPECIFICATION

CUSTOMER

PRODUCT

MODEL NO

PREPARED

APPROVED

\_\_\_\_\_ SAW FILTER \_\_\_\_\_  
\_\_\_\_\_ HDIF389B1M SIP5K \_\_\_\_\_  
\_\_\_\_\_ CHECKED \_\_\_\_\_  
\_\_\_\_\_ D A T E \_\_\_\_\_ 2004-8-15 \_\_\_\_\_  
\_\_\_\_\_

CUSTOMER RECEIVED:		
CHECKED	APPROVED	DATE

## Shoulder Electronics Limited

History Record

Date	Spec. No.	Part No.	Customer No.	Modify Content	Remark

## 1.SCOPE

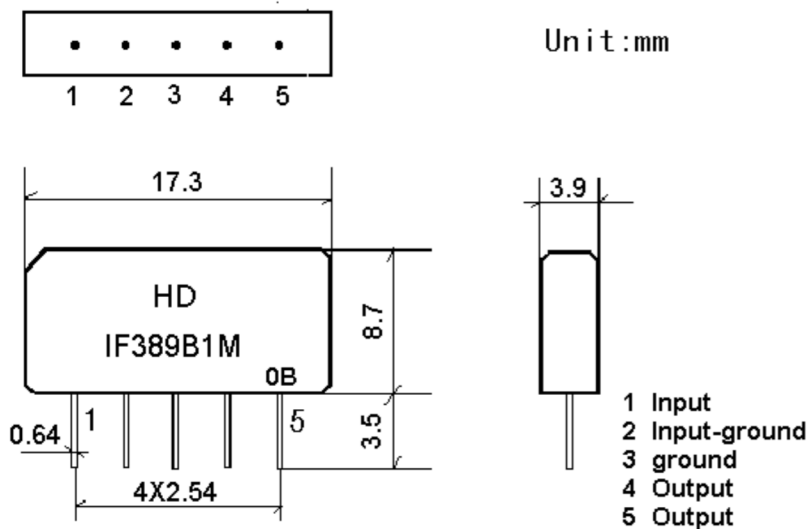
SHOULDER's SAW filter series have broad line up products meeting all broadcast standard including NTSC,PAL and SECAM systems. These filters are composed of two interdigital transducers on a single-crystal. piezoelectrical chip. they are used in electronic equipments such as TV and so on.

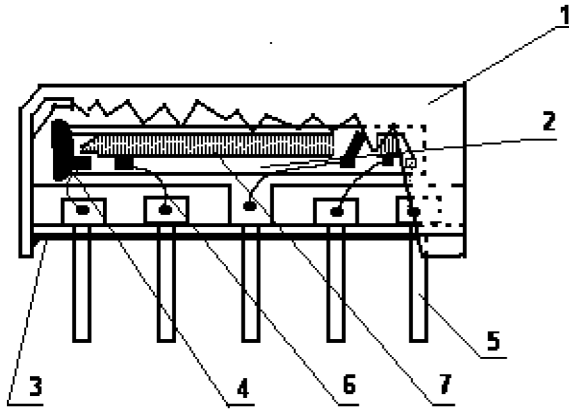
## 2.Construction

### 2.1 Dimension and materials

Manufacturer's name : SHOULDER ELECTRONICS Co. LTD(CHINA)

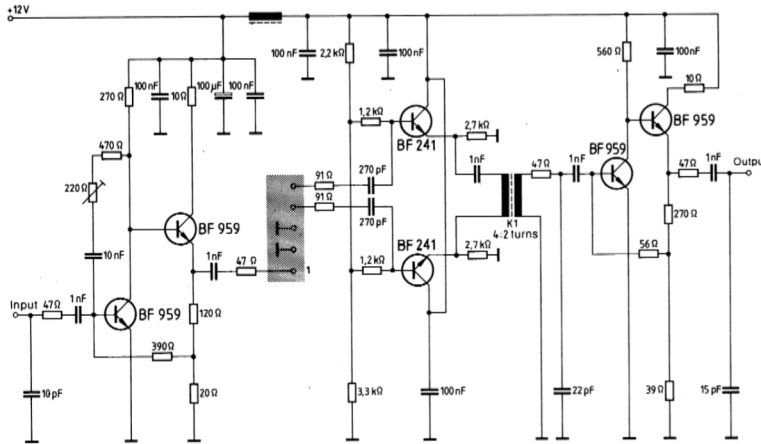
Type : IF389B1M





Components	Materials
1.Outer casing	PPS
2.Substrate	Lithium niobate
3.Base	Epoxy resin
4.Absorber	Epoxy resin
5.Lead	Cu alloy+Au plate
6.Bonding wire	AlSi alloy
7.Electrode	Al

**2.2. Circuit construction, measurement circuit**



Test circuit for SIP-5 filter  
Input impedance of the symmetrical post-amplifier: 2 kΩ in parallel with 3 pF

**3.Characteristics**

Items	Conditions	Specifications
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<p>Standard atmospheric conditions</p>	<p>Unless otherwise specified , the standard rang of atmospheric conditions for making measurements and tests is as follows;          Ambient temperature : 15°C to 35°C          Relative humidity : 25% to 85%          Air pressure : 86kPa to 106kPa</p>	<p>There shall be no damage.</p>
<p>Operating temperature rang</p>	<p>Operating temperature rang is the rang of ambient temperatures in which the filter can be operated continuously. -10°C ~ +60°C</p>	
<p>Storage temperature rang</p>	<p>Storage temperature rang is the rang of ambient temperatures at which the filter can be stored without damage.          Conditions are as specified elsewhere in these specifications. -40°C ~ +70°C</p>	
<p>Reference temperature</p>	<p>+25°C</p>	

### 3.1 Maximum Rating

<b>DC voltage</b>	<b>VDC</b>	<b>12</b>	<b>V</b>	<b>Between any terminals</b>
<b>AC voltage</b>	<b>Vpp</b>	<b>10</b>	<b>V</b>	<b>Between any terminals</b>

### 3.2 Electrical Characteristics

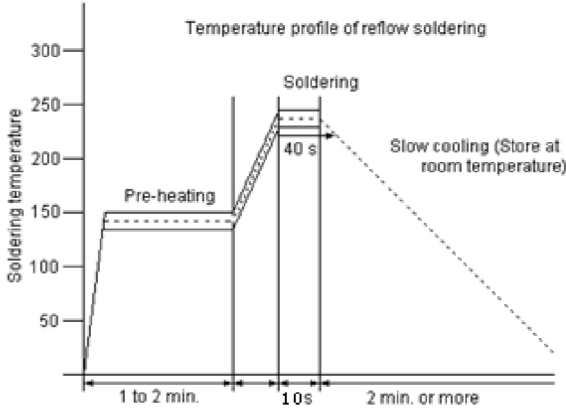
Source impedance  $Z_s=50\Omega$

Load impedance  $Z_L=2k\Omega/3pF$   $T_A=25^\circ C$

Items	Freq	Min	typ	max	
Insertion attenuation Reference level	37.4MHz	16.1	17.6	19.1	dB
<b>Relative attenuation</b>	38.9MHz	4.2	5.7	7.2	dB
	34.47MHz	2.3	3.8	5.3	dB
	32.4MHz	18.8	20.3	-	dB
	33.4MHz	19.4	20.9	-	dB
	30.9MHz	44.0	58		dB
	40.4MHz	42.0	52		dB
Sidelobe	25.00~30.90MHz	35.0	45		dB
	40.40~45.00MHz	35.0	42		dB
Temperature coefficient			-72		Ppm/k

### 3.3 Environmental Performance Characteristics

Item	Condition	Specifications
High temperature	The specimen shall be store at a temperature of $80\pm 2^\circ C$ for $96\pm 4h$ . Then it shall be subjected to standard atmospheric conditions for 1h, after which measurement shall be made within 1h.	Mechanical characteristics and specifications in electrical characteristics shall be satisfied. There shall be no excessive change in appearance.
Low temperature	The specimen shall be store at a temperature of $-20\pm 3^\circ C$ for $96\pm 4h$ . Then it shall be subjected to standard atmospheric conditions for 1h, after which measurement shall be made within 1h.	
Humidity	The specimen shall be store at a temperature of $40\pm 2^\circ C$ with relative humidity of 90% to 96% for $96\pm 4h$ . Then it shall be subjected to standard atmospheric conditions for 1h, after which measurement shall be made within 1h.	
Thermal shock	The specimen shall be subjected to 8 continuous cycles each as shown below. Then it shall be	

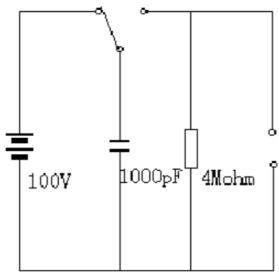
	<p>subjected to standard atmospheric conditions for 1h, after which measurement shall be made within 1h.</p> <table border="1" data-bbox="467 346 1003 625"> <thead> <tr> <th></th> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+25 °C=&gt;-40 °C</td> <td>0.5h</td> </tr> <tr> <td>2</td> <td>-40 °C</td> <td>4h</td> </tr> <tr> <td>3</td> <td>-40 °C=&gt;+85 °C</td> <td>2h</td> </tr> <tr> <td>4</td> <td>+85 °C</td> <td>4h</td> </tr> <tr> <td>5</td> <td>+85 °C=&gt;+25 °C</td> <td>0.5h</td> </tr> <tr> <td>6</td> <td>+25 °C</td> <td>1h</td> </tr> </tbody> </table>		Temperature	Duration	1	+25 °C=>-40 °C	0.5h	2	-40 °C	4h	3	-40 °C=>+85 °C	2h	4	+85 °C	4h	5	+85 °C=>+25 °C	0.5h	6	+25 °C	1h	
	Temperature	Duration																					
1	+25 °C=>-40 °C	0.5h																					
2	-40 °C	4h																					
3	-40 °C=>+85 °C	2h																					
4	+85 °C	4h																					
5	+85 °C=>+25 °C	0.5h																					
6	+25 °C	1h																					
<p>Resistance to Soldering heat</p>	<p>Reflow soldering method Peak: 255 ±5 °C, 220 ±5 °C, 40s At electrode temperature of the specimen.</p>  <p>The specimen shall be passed through the reflow furnace with the condition shown in the above profile for 1 time.</p> <p>The specimen shall be stored at standard atmospheric conditions for 1h, after which the measurement shall be made. Test board shall be 1.6 mm thick. Base material shall be glass fabric base epoxy resin.</p>																						
<p>Solder ability</p>	<p>Immerse the pins melt solder at 260°C+5/-0°C for 5 sec.</p>	<p>More then 95% of total area of the pins should be covered with solder</p>																					



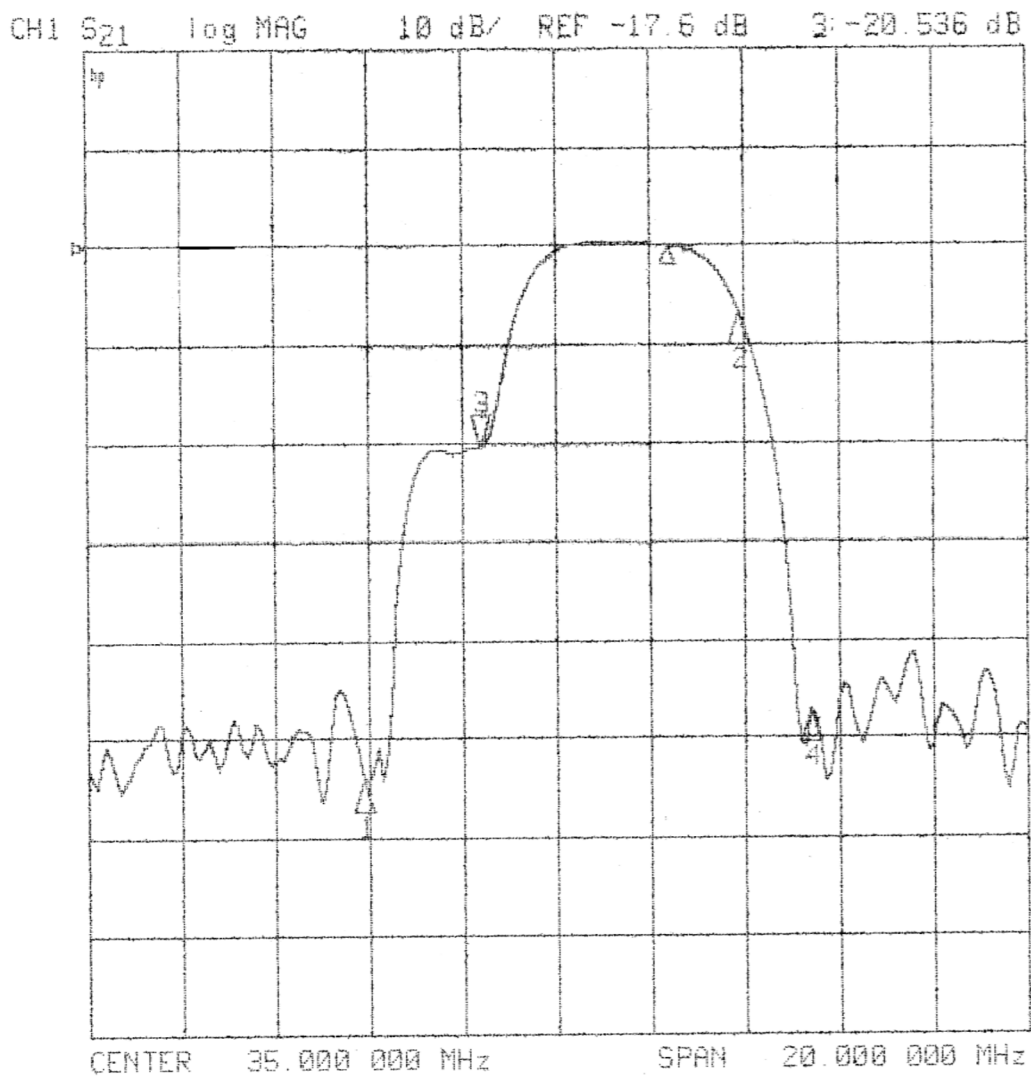
**3.4 Mechanical Test**

Items	Conditions	Specifications
Vibration	600-3300rpm amplitude 1.5mm 3 directions 2 H each	There shall be no damage.
Drop	On maple plate from 1 m high 3 times	
Lead pull	Pull with 1 kg force for 30 seconds	
Lead bend	90° bending with 500g weigh 2 times	

**3.5 Voltage Discharge Test**

Item	Condition	Specifications
Surge	Between any two electrode 	There shall be no damage

3.6 Frequency response



CH1 S21 delay 30 ns/ REF 1.17 ps 2: 17.228 ns  
CH2 S21 log MAG 1 dB/ REF -17.6 dB 2 -5.6048 dB



CENTER 36.500 000 MHz

SPAN 7.000 000 MHz

CH1 S21 log MAG 10 dB/ REF -17.6 dB

