

## 1.SCOPE

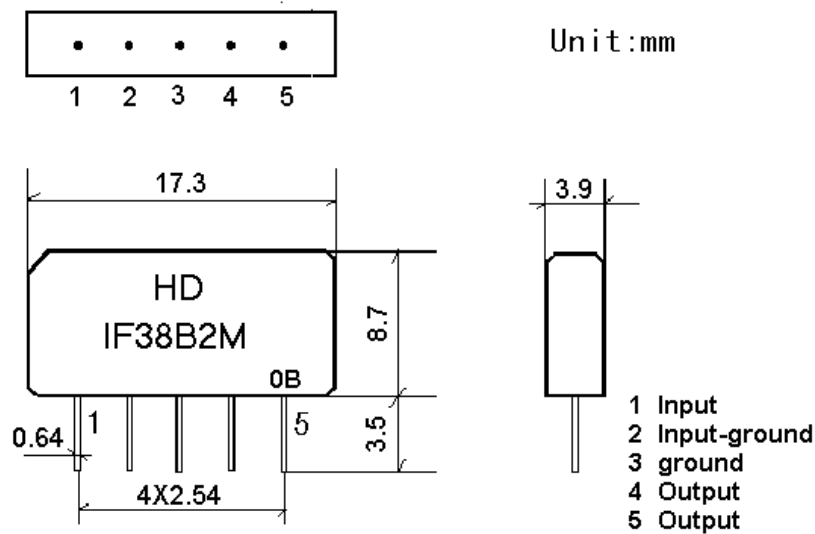
Shoulder's SAW filter series have broad line up products meeting all broadcast standard including NTSC,PAL and SECAM systems. These filters are composed of two interdigital transducers on a single-crystal. piezoelectrical chip. they are used in electronic equipments such as TV and so on.

## 2.Construction

### 2.1 Dimension and materials

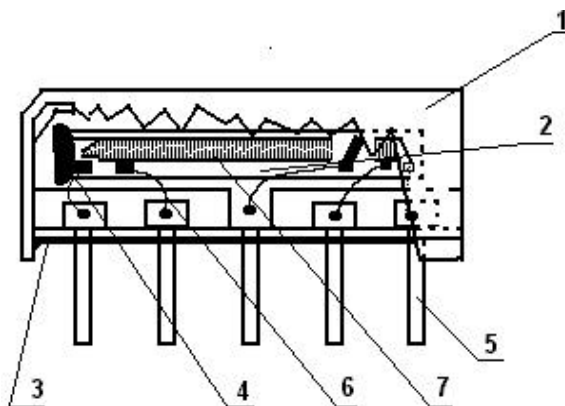
Manufacturer's name : SHOULDER ELECTRONICS Co. LTD(CHINA)

Type : IF38B2M



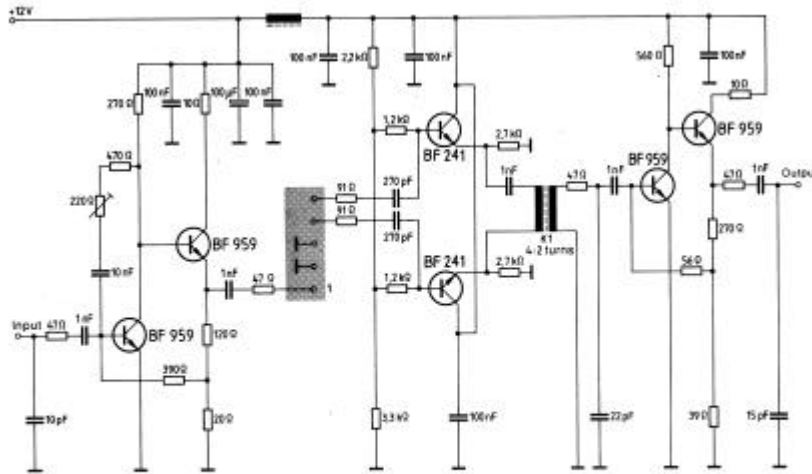
0: year(0,1,2,3,4,5,6,7,8,9)

B:product in this quarter(A:1~3,B:4~6,C:7~9,D:10~12)



| 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

#### Standard atmospheric conditions

Unless otherwise specified , the standard range of atmospheric conditions for making measurements and tests is as follows;

- Ambient temperature : 15 to 35
- Relative humidity : 25% to 85%
- Air pressure : 86kPa to 106kPa

#### Operating temperature rang

Operating temperature rang is the rang of ambient temperatures in which the filter can be operated continuously. -10 ~ +60

#### Storage temperature rang

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 ~ +70

#### Reference temperature +25

#### 3.1 Maximum Rating

|            |     |    |   |                       |
|------------|-----|----|---|-----------------------|
| DC voltage | VDC | 12 | V | Between any terminals |
| AC voltage | Vpp | 10 | V | Between any terminals |

#### 3.2 Electrical Characteristics

Source impedance  $Z_s=50$   
 Load impedance  $Z_L=2k //3pF$   $T_A=25$

| Items                                    | Freq           | Min  | typ  | max  |       |
|--|----------------|------|------|------|-------|
| Insertion attenuation<br>Reference level | 36.50MHz       | 15.5 | 17.5 | 19.5 | dB    |
| Relative attenuation                     | 38.00MHz       | 4.5  | 6.0  | 7.5  | dB    |
|  | 33.57MHz       | 1.0  | 2.5  | 4.0  | dB    |
|  | 32.50MHz       | 14.0 | 16.0 | 18.0 | dB    |
|  | 31.50MHz       | 14.0 | 16.0 | 18.0 | dB    |
|  | 30.00MHz       | 40.0 | 52.0 |      | dB    |
|  | 39.50MHz       | 40.0 | 51.0 |      | dB    |
| Sidelobe                                 | 25.00~30.00MHz | 35.0 | 41.0 |      | dB    |
|  | 39.50~45.00MHz | 31.0 | 37.0 |      | dB    |
| Temperature coefficient                  |                | -72  |      |      | Ppm/k |

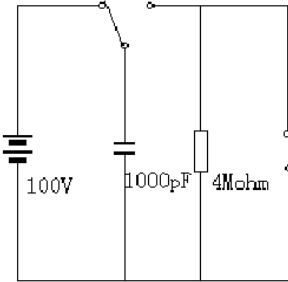
### 3.3 Environmental Performance Characteristics

| Item Test condition  | Allowable change of absolute Level at center frequency(dB)            |
|--|---|
| High temperature test<br>70 1000H                                    | < 1.0   |
| Low temperature test<br>-40 1000H                                    | < 1.0   |
| Humidity test<br>40 90-95% 1000H                                     | < 1.0   |
| Thermal shock<br>-20 ==25 ==80 20 cycle<br>30M 10M 30M               | < 1.0   |
| Solder temperature test<br>Sold temp.260 for 10 sec.                 | < 1.0   |
| Soldering<br>Immerse the pins melt solder<br>at 260 +5/-0 for 5 sec. | More then 95% of total area of the pins should be covered with solder |

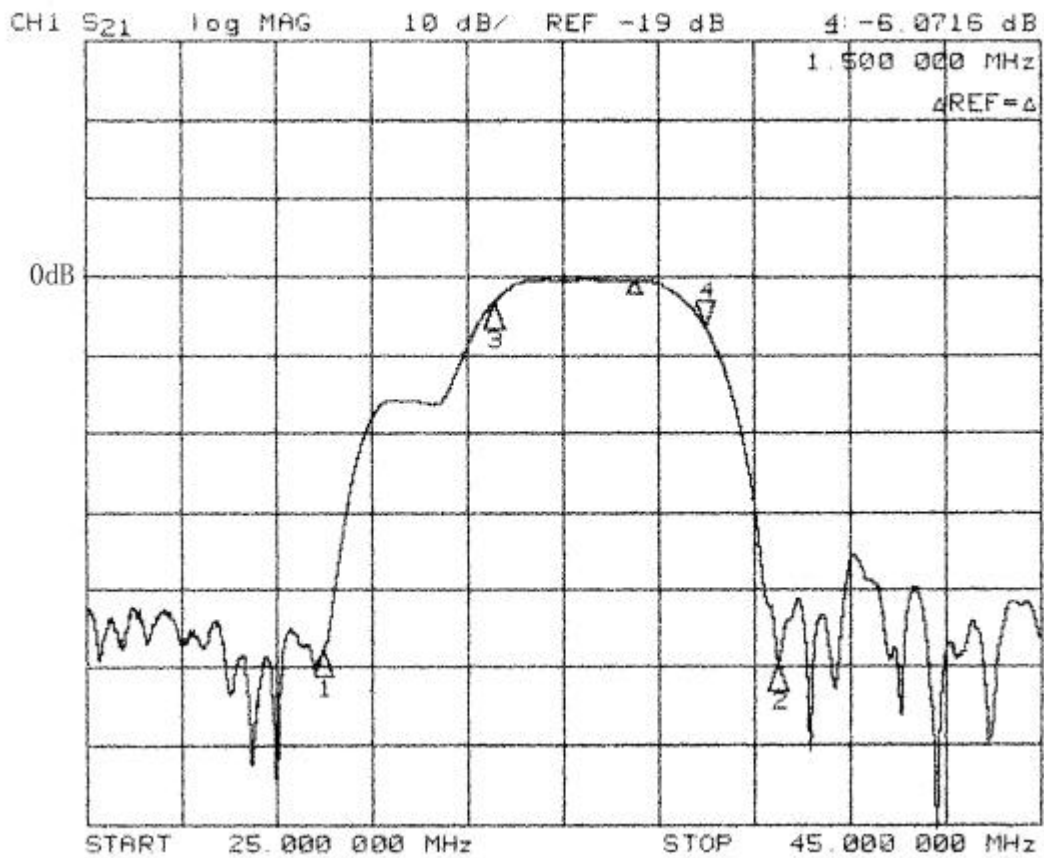
### 3.4 Mechanical Test

| Item Test condition  | Allowable change of absolute Level at center frequency(dB) |
|--|--|
| Vibration test<br>600-3300rpm amplitude 1.5mm<br>3 directions 2 H each | <1.0   |
| Drop test<br>On maple plate from 1 m high 3 times                      | <1.0   |
| Lead pull test<br>Pull with 1 kg force for 30 seconds                  | <1.0   |
| Lead bend test<br>90° bending with 500g weigh 2 times                  | <1.0   |

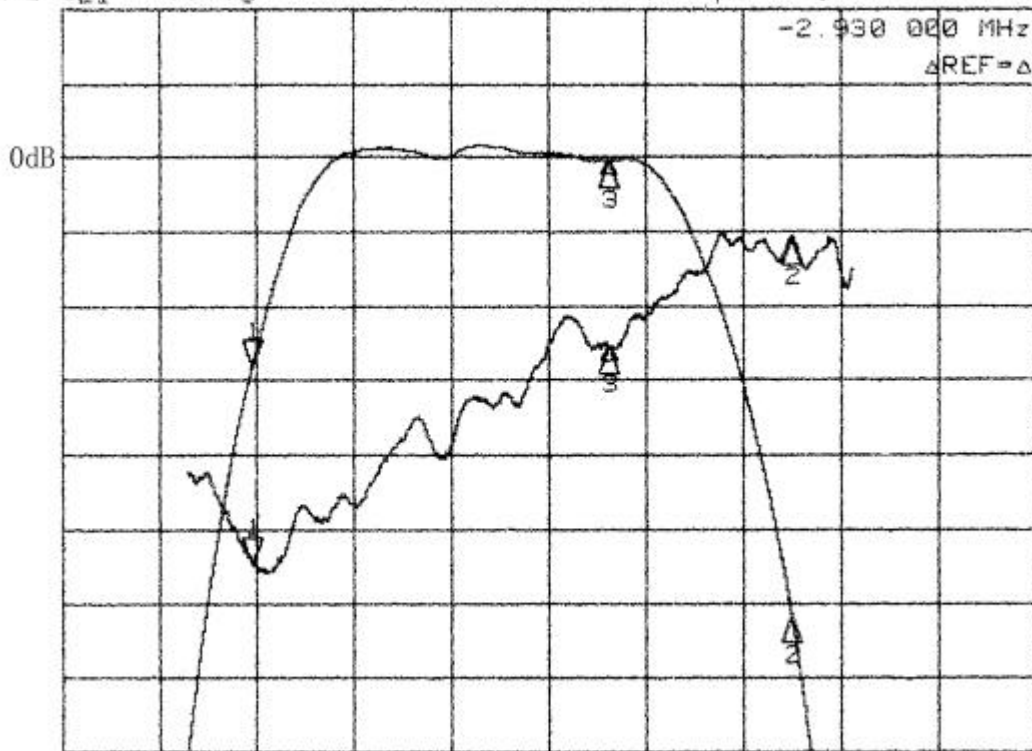
### 3.5 Voltage Discharge Test

| Item<br>Test condition   | Allowable change of absolute<br>Level at center frequency(dB) |
|--|---|
| Surge test<br>Between any two electrode<br><br> | <1.0  |

### 3.6 Frequency response

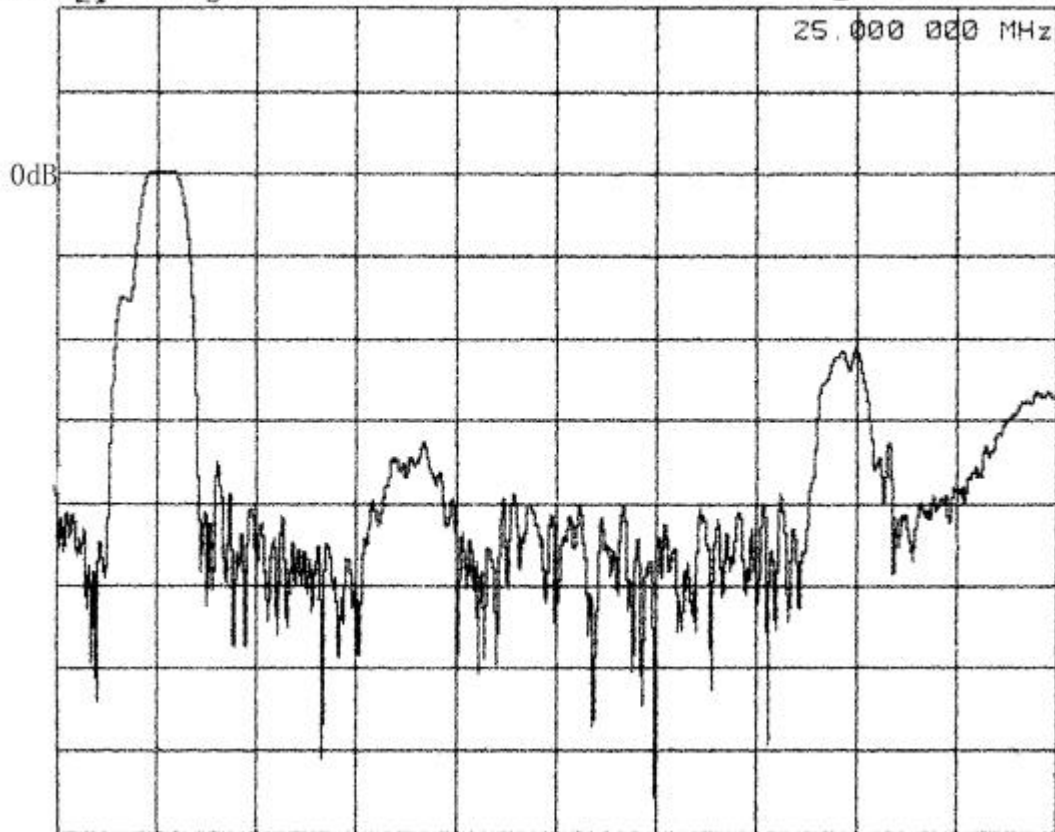


CH1 S21 log MAG 1 dB/ REF -18.84 dB 1 -2.7748 dB  
CH2 S21 delay 30 ns/ REF 2.752  $\mu$ s 1 -87.834 ns



START 32.000 000 MHz STOP 40.000 000 MHz

CH2 S21 log MAG 10 dB/ REF -19 dB 1 -58.31 dB



START 25.000 000 MHz STOP 125.000 000 MHz

**Time domain response:**

