

## 1.SCOPE

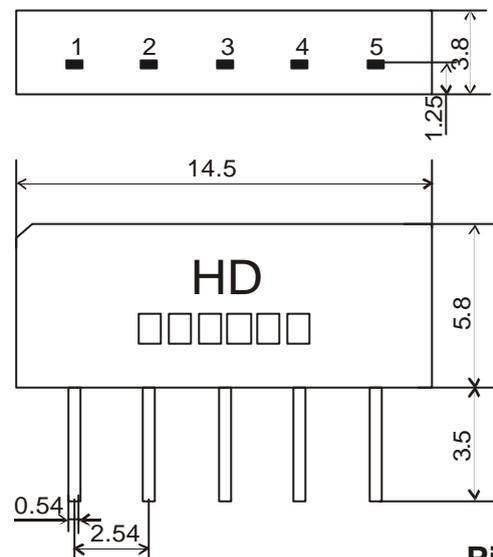
HAODA's SAW filter series have broad line up products meeting all broadcast standard including NTSC,PAL and SECAM systems. These filters are composed of two interdigital transducers on a single-crystal, piezoelectrical chip. they are used in electronic equipments such as TV and so on.

## 2.Construction

### 2.1 Dimension and materials

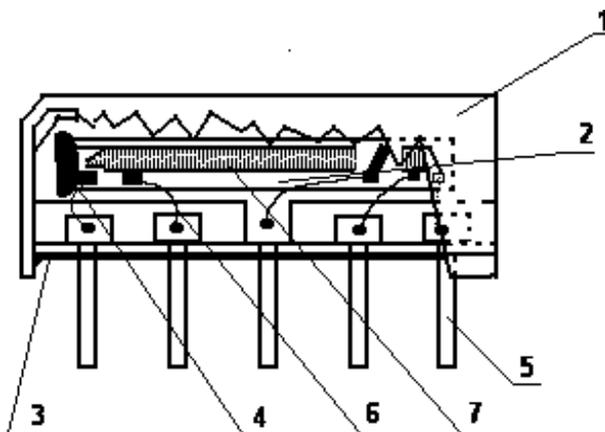
Manufacturer's name : HAODA ELECTRONICS Co. LTD(CHINA)

Type : IF389A1D



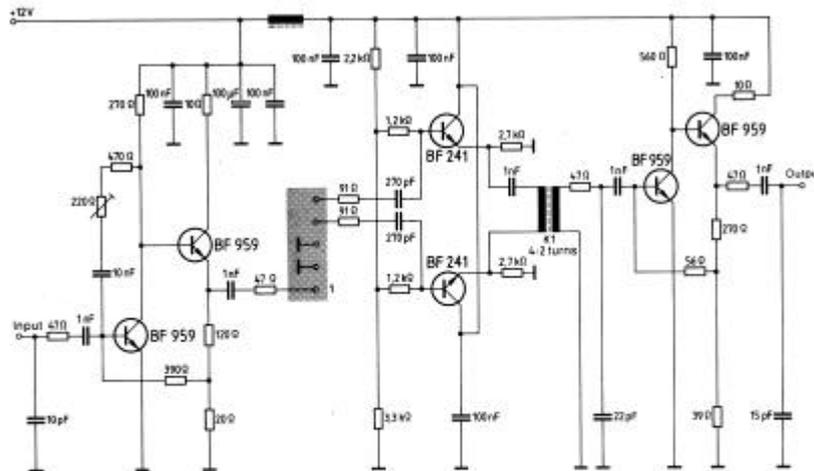
### Pin configuration

- 1 Input
- 2 Input-ground
- 3 Chip carrier-ground
- 4 Output
- 5 Output



| 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:  $2\text{ k}\Omega$  in parallel with  $3\text{ pF}$

## 3.Characteristics

### Standard atmospheric conditions

Unless otherwise specified , the standard rang 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.  $-10 \sim +60$

### 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.  $-40 \sim +70$

### Reference temperature +25

## 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  $Z_s=50$

Load impedance  $Z_L=2K // 3pF$   $T_A=25$

|   | Freq           | Min  | typ  | max  |       |
|---|----------------|------|------|------|-------|
| <b>Insertion attenuation</b><br>Reference level | 37.40MHz       | 13.5 | 15.5 | 17.5 | dB    |
| Relative attenuation                            | 38.90MHz       | 5.5  | 6.5  | 7.5  | dB    |
|   | 34.47MHz       | 1.2  | 2.7  | 4.2  | dB    |
|   | 33.40MHz       | 17.0 | 19.0 | 21.0 | dB    |
|   | 31.90MHz       | 42.0 | 50.0 | -    | dB    |
|   | 40.40MHz       | 42.0 | 55.0 |      | dB    |
|   | 41.40MHz       | 40.0 | 50.0 |      | dB    |
| <b>Sideloobe</b>                                | 25.00~31.90MHz | 34.0 | 40.0 |      | dB    |
|   | 40.40~45.00MHz | 33.0 | 38.0 |      | dB    |
| Temperature coefficient                         |                | -72  |      |      | ppm/k |

### 3.3 Environmental Performance Characteristics

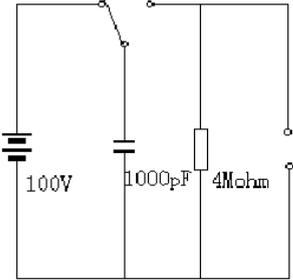
| Item Test condition  | Allowable change of absolute Level at center frequency(dB)            |
|--|---|
| High temperature test<br>70 1000H                                    | < 1.0   |
| Low temperature test<br>-40 1000H                                    | < 1.0   |
| Humidity test<br>40 90-95% 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   |

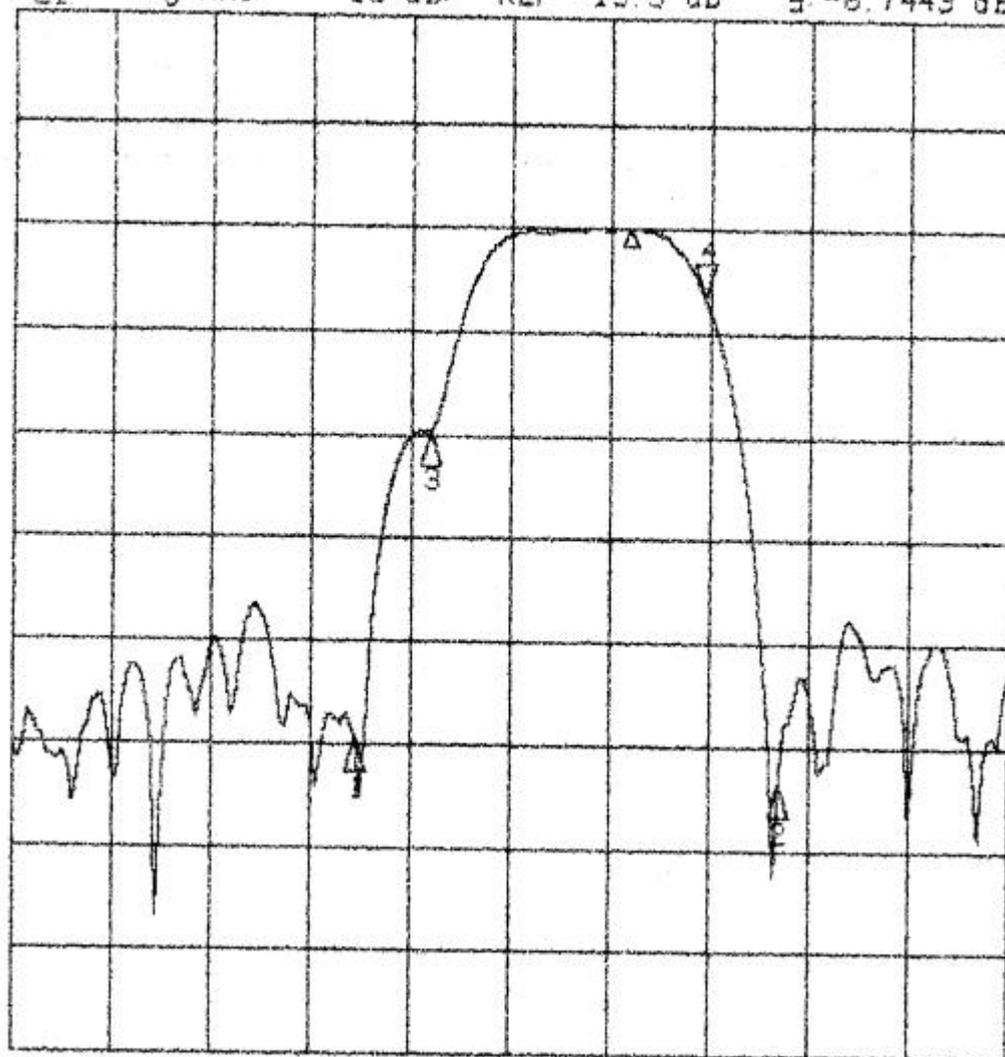
|   |      |
|---|------|
| Lead bend test<br>90° bending with 500g weigh 2 times | <1.0 |
|---|------|

**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  |

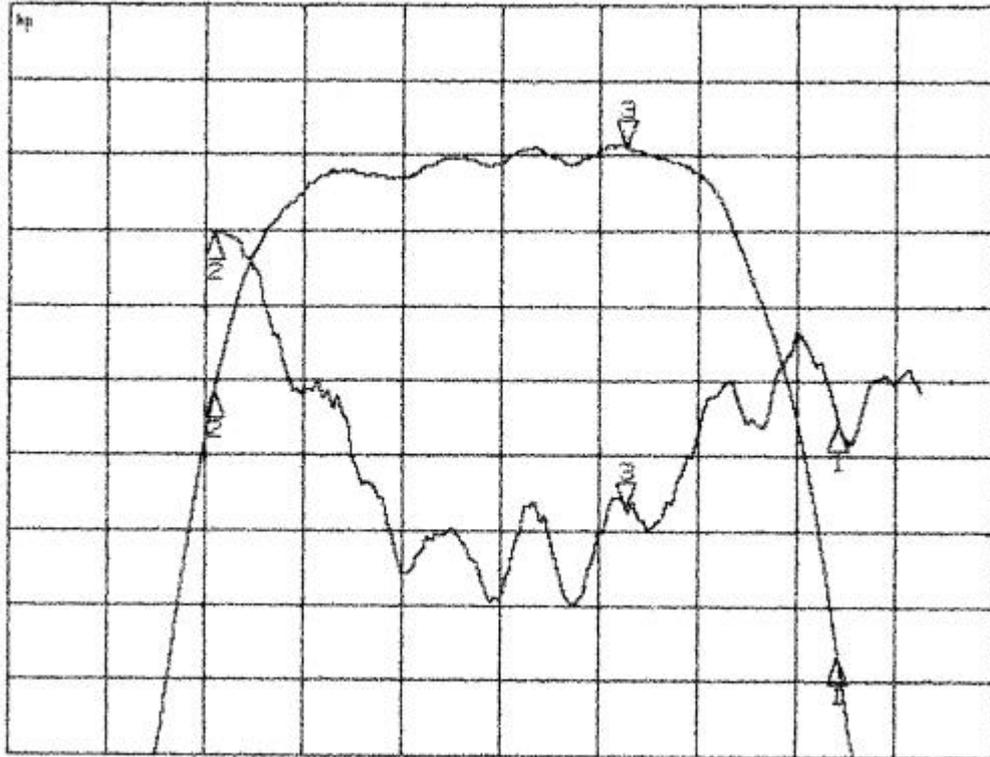
**3.6 Frequency response**

CHZ S21 log MAG 10 dB/ REF -15.5 dB 4: -8.7443 dB



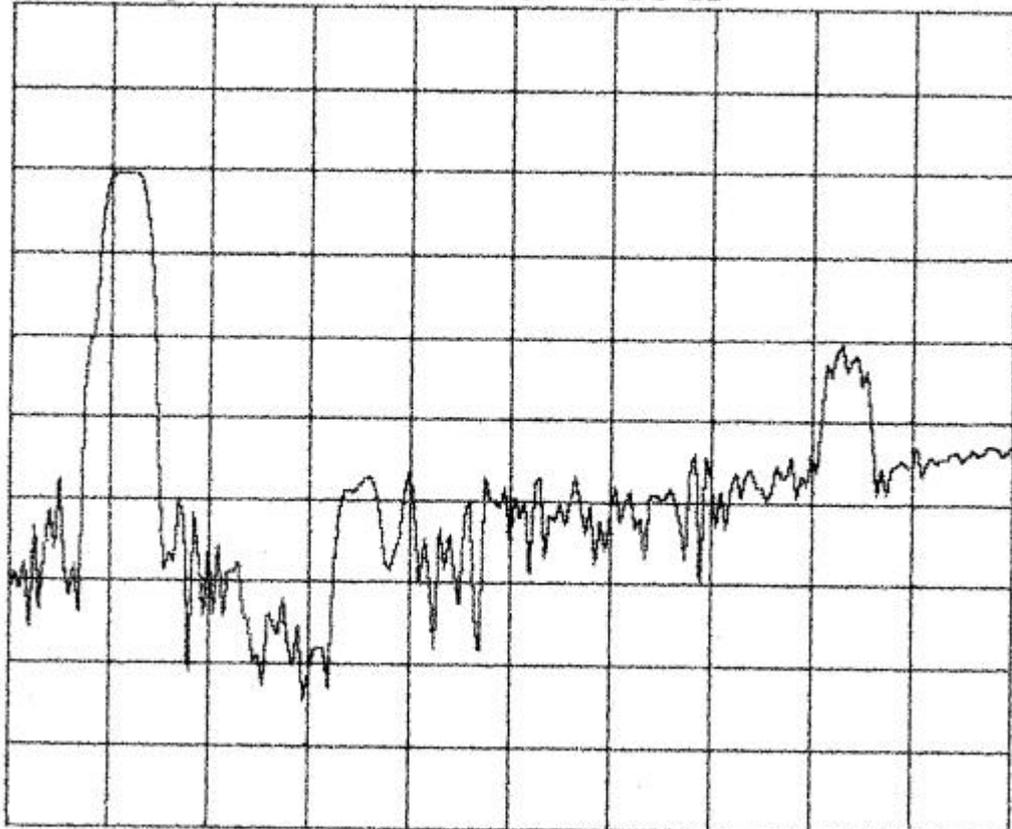
START 25.000 000 MHz STOP 45.000 000 MHz

CH1 S21 log MAG 1 dB/ REF -15.5 dB 2: -15.386 dB  
CH2 S21 delay 30 ns/ REF 825.9 ns 2: 684.67 ns



CENTER 36.500 000 MHz SPAN 7.000 000 MHz

CH2 S21 log MAG 10 dB/ REF -15.5 dB



START 25.000 000 MHz STOP 125.000 000 MHz