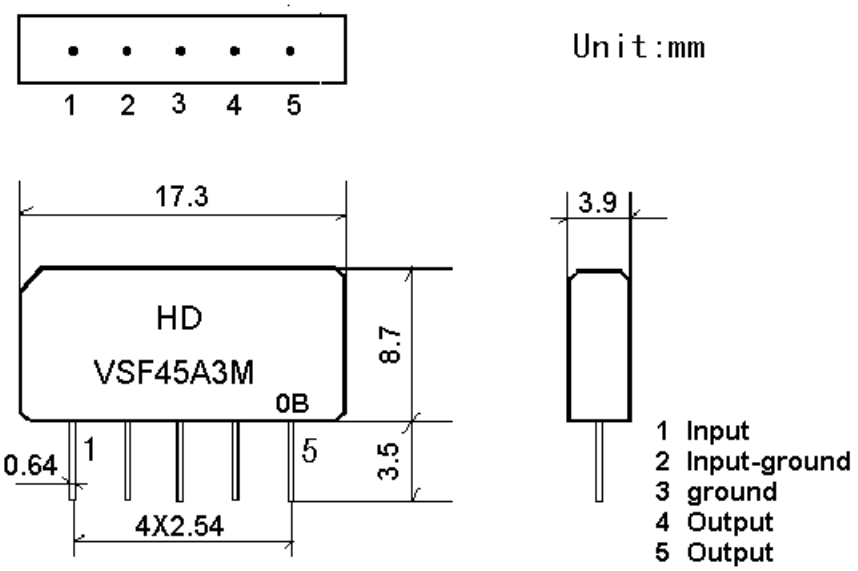
# 1. SCOPE

**The 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

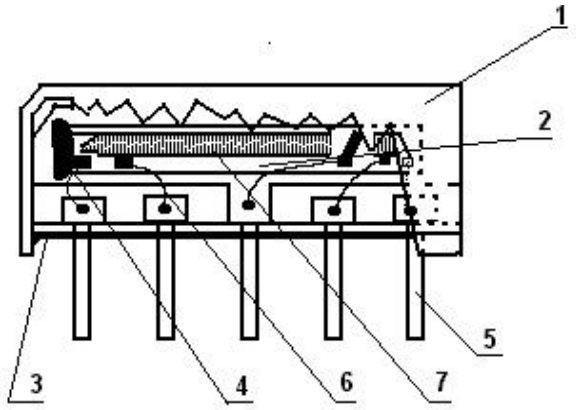
**2.1 Dimension and materials**

**Type: VSF45A3M**




**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 |

## 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℃ ~ +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 Zs=50Ω
Load impedance $Z_L$=50Ω $T_A$=25℃

| Item | Freq | min | typ | max | |
|---|---|---|---|---|---|
| Insertion attenuation Reference level | 43.50MHz | 22.0 | 24.0 | 26.0 | dB |
| Relative attenuation | 45.75MHz | -1.8 | -0.3 | 1.2 | dB |
| | 46.50MHz | 1.0 | 2.5 | 4.0 | dB |
| | 41.25MHz | -1.7 | -0.2 | 1.3 | dB |
| | 39.75MHz | 29.0 | 37.0 | | dB |

| | | | | | |
|---|---|---|---|---|---|
| | 47.25MHz | 29.0 | 38.0 | | dB |
| Sidelobe | 35.00~39.25MHz | 26.0 | 30.0 | | dB |
| | 47.75~55.00MHz | 26.0 | 32.0 | | dB |
| Temperature coefficient | | -72 | | | ppm/k |

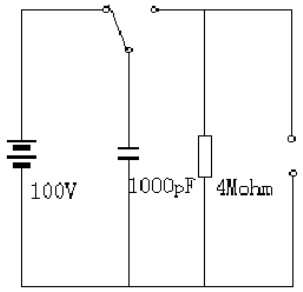
### 3.3 Environmental Performance Characteristics

| 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<br>area of the pins should<br>be covered with solder |

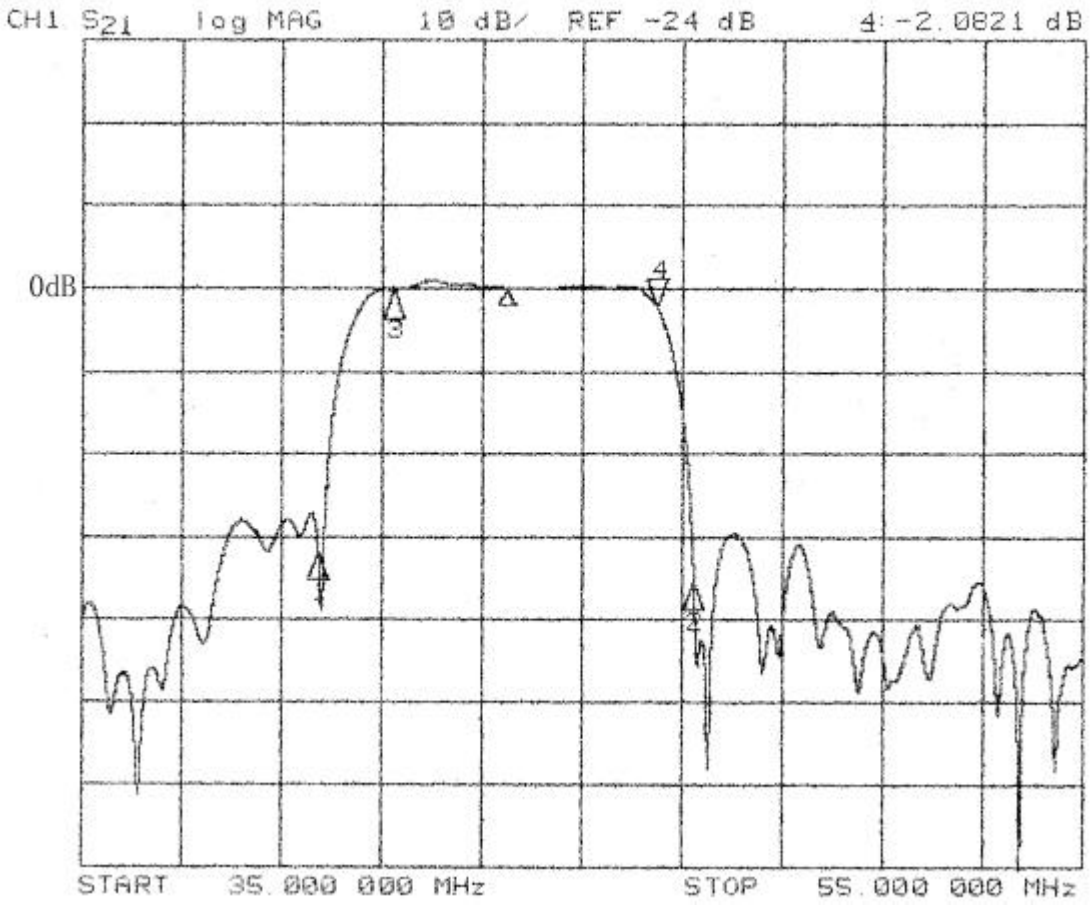
### 3.4 Mechanical Test

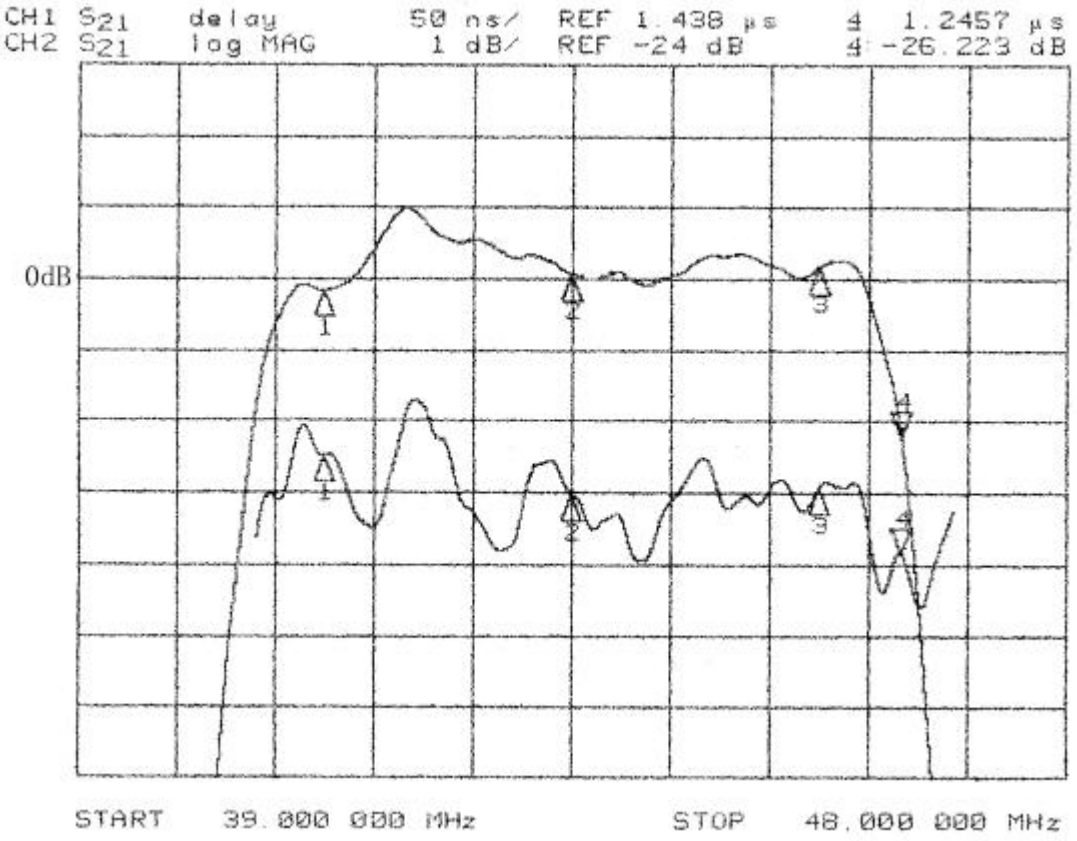
| Item<br>Test condition | Allowable change of absolute Level at center frequency(dB) |
|---|---|
| Vibration test<br>600-3300rpm amplitude 1.5mm<br>3 directions 2 H each | <1.0 |
| Drop test<br>On maple plate from 1 m high 3 times | <1.0 |
| Lead pull test<br>Pull with 1 kg force for 30 seconds | <1.0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

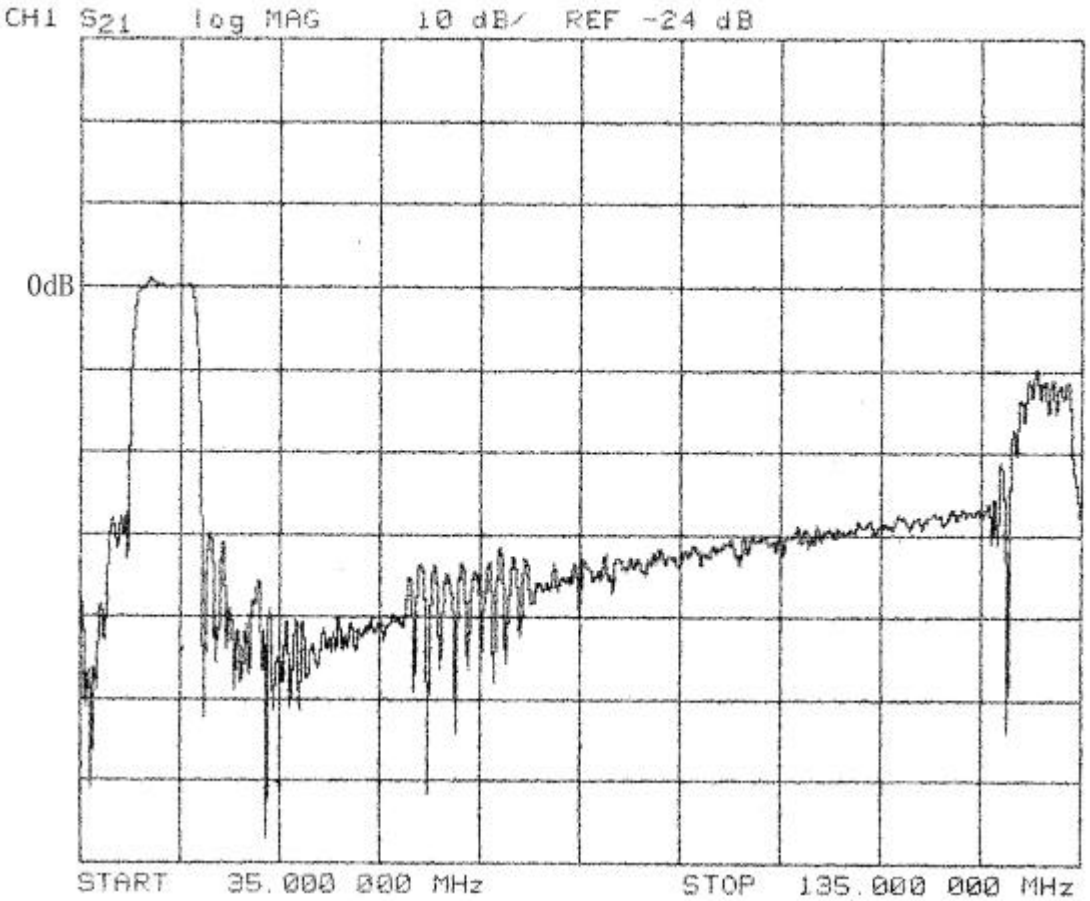
### 3.5 Voltage Discharge Test

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

**3.6 Frequency response**




CH1 S21 delay 50 ns/ REF 1.438 µs 1.2457 µs
CH2 S21 log MAG 1 dB/ REF -24 dB -26.223 dB
0dB
START 39.000 000 MHz
STOP 48.000 000 MHz


CH1 S21 log MAG 10 dB/ REF -24 dB
0dB
START 35.000 000 MHz
STOP 135.000 000 MHz