

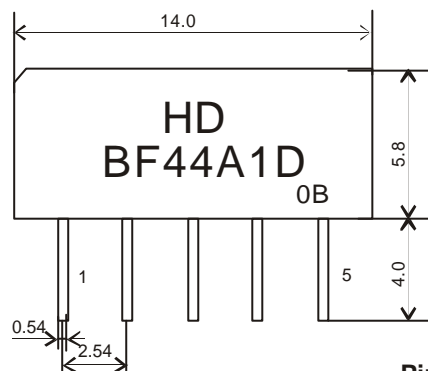
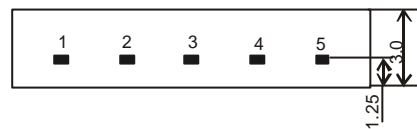
## 1.SCOPE

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

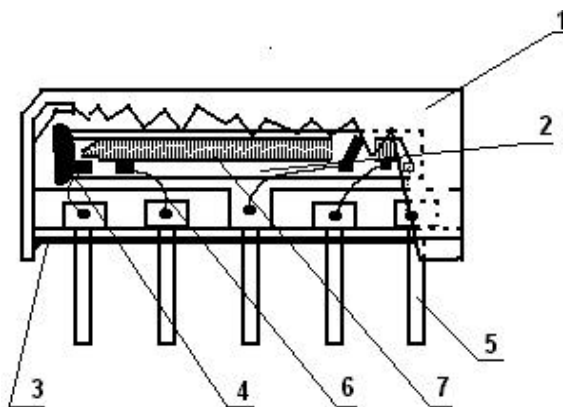
### 2.1 Dimension and materials

Type : BF44A1D



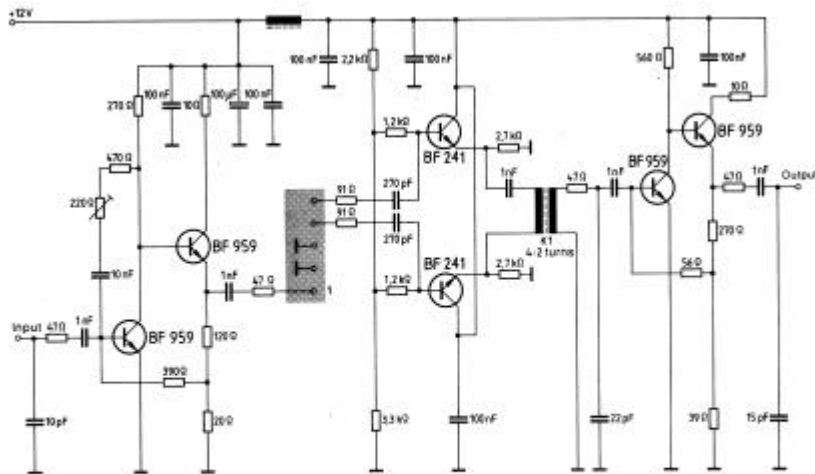
#### Pin configuration

- 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

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

$Z_L=2k \ //3pF$

$T_A=25$

Item	Freq	min	typ	max	
Center frequency	Fo	-	44.00	-	MHz
Insertion attenuation Reference level	44.06MHz	13.1	15.1	17.1	dB
Pass bandwidth	B <sub>3dB</sub>	-	6.1	-	MHz
	B <sub>30dB</sub>	-	7.6	-	MHz
Relative attenuation	40.96MHz	-	2.5	-	dB
	47.16MHz	-	2.6	-	dB
Sidelobe	35.06~40.06MHz	35.0	41.0		dB
	48.06~50.06MHz	34.0	40.0		dB
	50.06~55.06MHz	38.0	44.0		dB
Temperature coefficient				-72	ppm/k

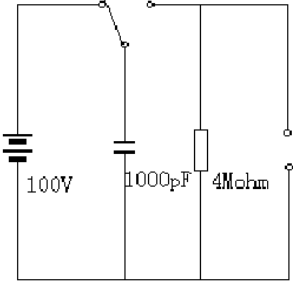
### 3.3 Environmental Performance Characteristics

Item Test condition	Allowable change of absolute Level at center frequency(dB)
High temperature test 70 500H	< 1.0
Low temperature test -40 500H	< 1.0
Humidity test 40 90-95% 500H	< 1.0
Thermal shock -20 ==25 ==80 5 cycle 30M 10M 30M	< 1.0
Solder temperature test Sold temp.260 for 10 sec.	< 1.0
Soldering Immerse the pins melt solder at 260 +5/-0 for 5 sec.	More then 95% of total area of the pins should be covered with solder

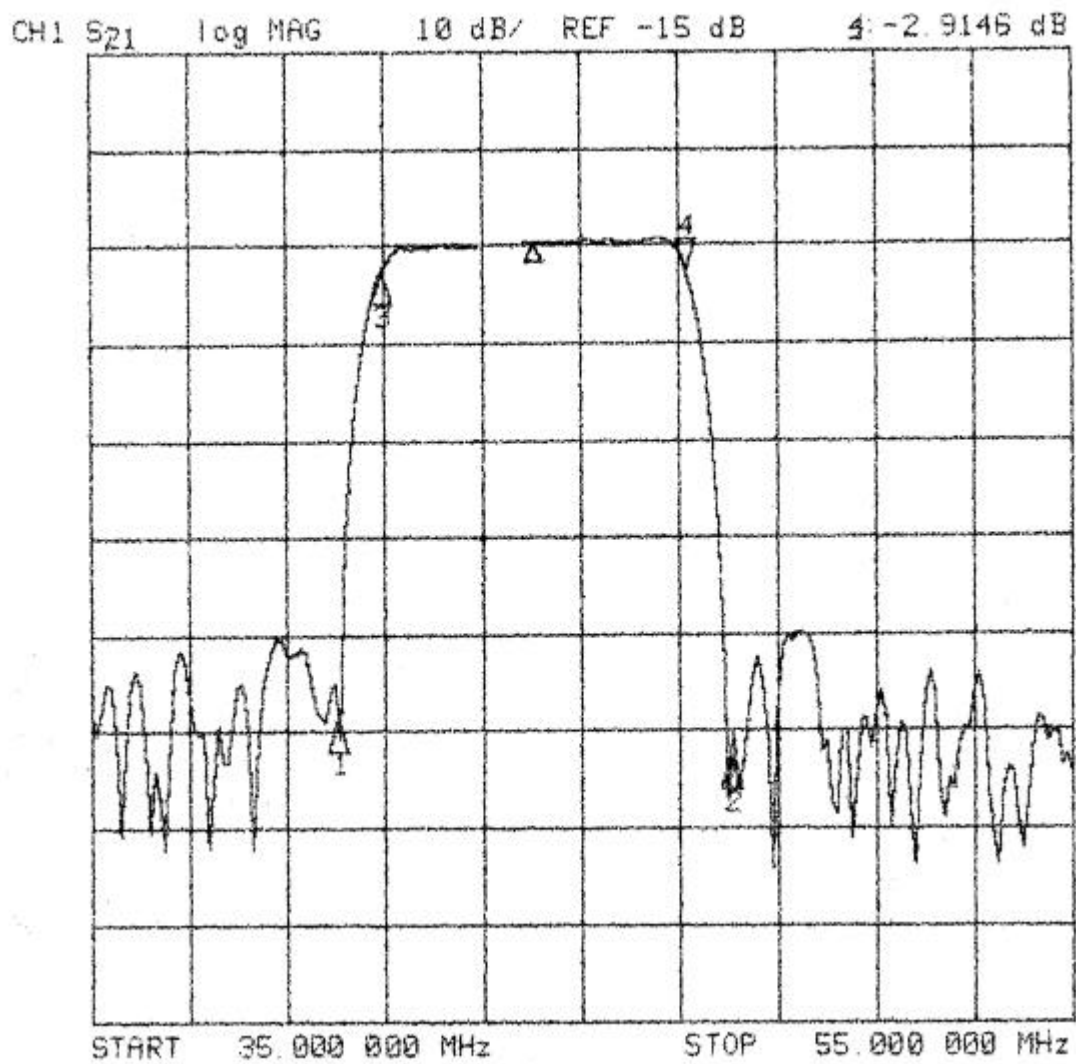
### 3.4 Mechanical Test

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

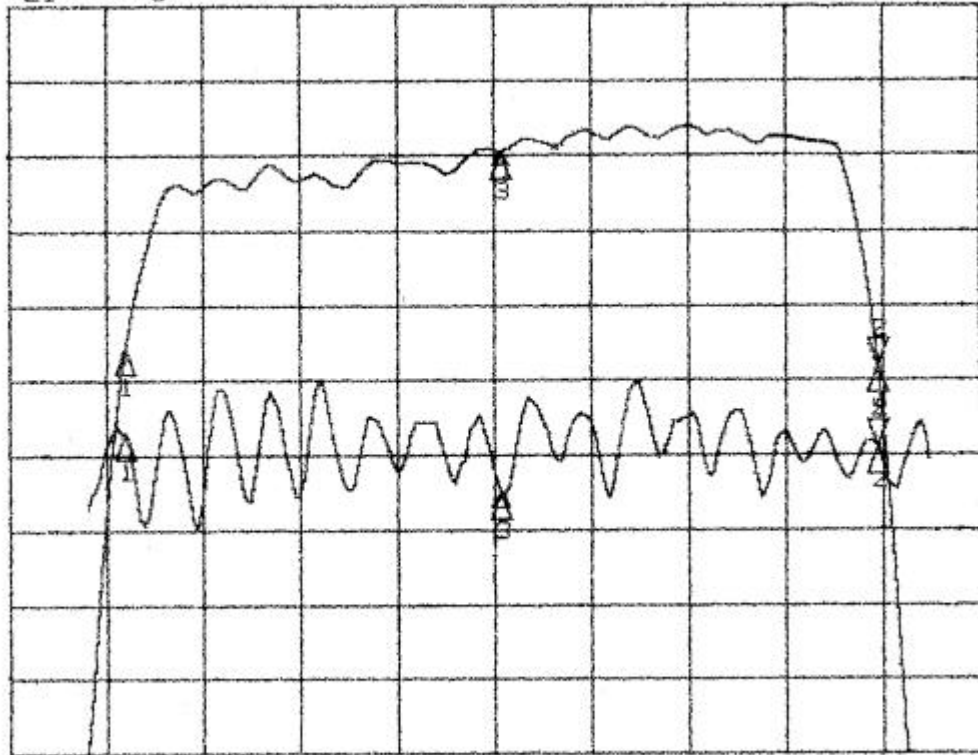
### 3.5 Voltage Discharge Test

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

### 3.6 Frequency response

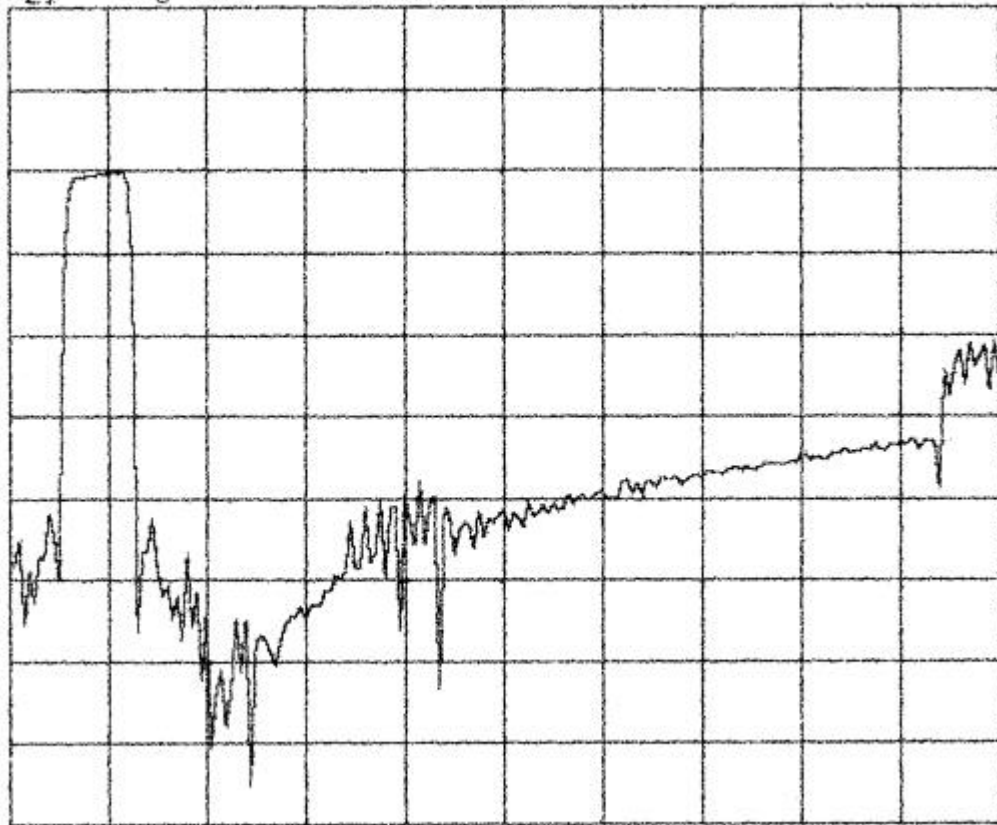


CH1 S21 delay 30 ns/ REF 1.321  $\mu$ s Z: 18.12 ns  
CH2 S21 log MAG 1 dB/ REF -14.8 dB Z: -2.876 dB



START 48.000 000 MHz STOP 48.000 000 MHz

CH1 S21 log MAG 10 dB/ REF -15 dB



START 35.000 000 MHz STOP 135.000 000 MHz

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