

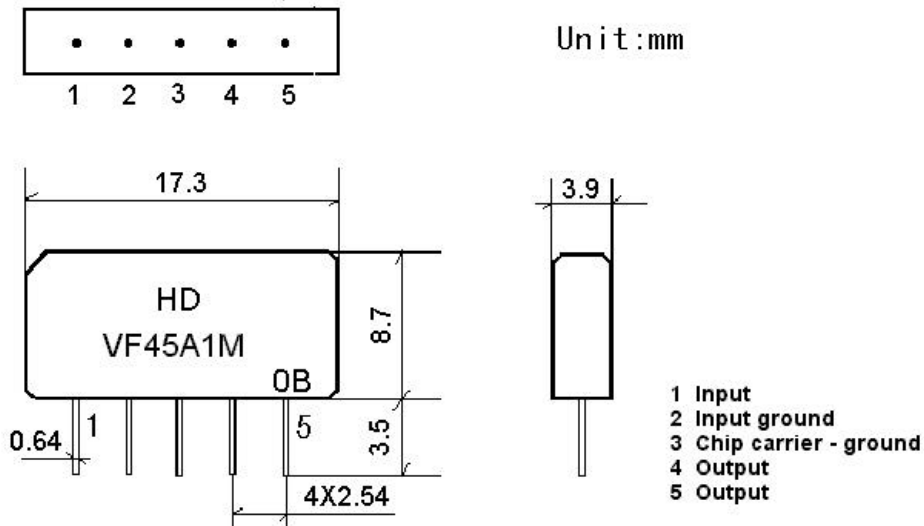
## 1.SCOPE

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

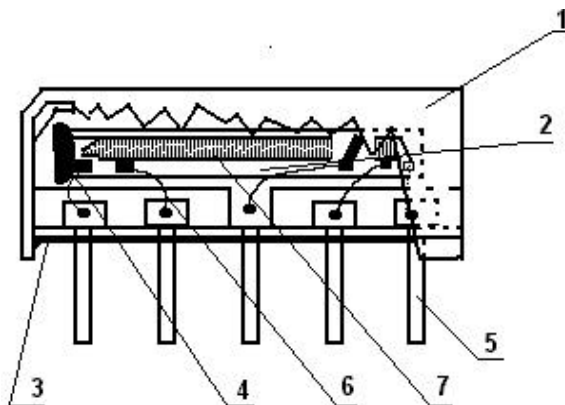
### 2.1 Dimension and materials

Type : VF45A1M



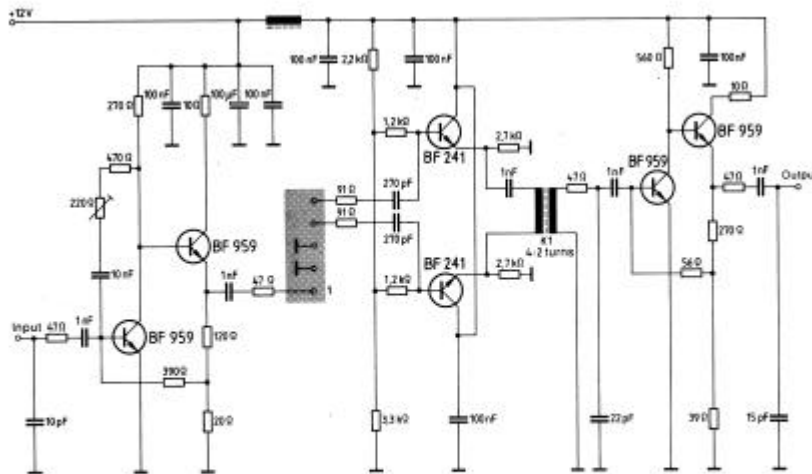
0: year(0,1,2,3,4,5,6,7,8,9)

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 k $\Omega$  in parallel with 3 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 ~ +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
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### 3.2 Electrical Characteristics

Source impedance

$Z_s=50$

Load impedance

$Z_L=2k //3pF$

$T_A=25$

Item	Freq	min	typ	max	
<b>Insertion attenuation</b> Reference level	44.06MHz	10.0	12.0	14.0	dB
<b>Relative attenuation</b>	45.81MHz	4.4	5.9	7.4	dB
	42.23MHz	0.7	2.2	3.7	dB
	41.31MHz	25.0	35.0	-	dB
	39.81MHz	42.0	55.0	-	dB
	47.31MHz	40.0	51.0	-	dB
<b>Sidelobe</b>	35.06~39.81MHz	36.0	42.0	-	dB
	47.31~55.06MHz	35.0	40.0	-	dB
<b>Reflected wave signal suppression</b> 1.1 us ... 6.0 us after main pulse (test pulse 250 ns , carrier frequency 44.06 MHz)		40.0	52.0		dB
<b>Feedthrough signal suppression</b> 1.2 us ... 1.1 us after main pulse (test pulse 250 ns , carrier frequency 44.06 MHz)		45.0	55.0		dB
<b>Group delay ripple (p-p)</b>		-	50	-	ns
<b>Temperature coefficient of frequency</b>		-72			Ppm/k

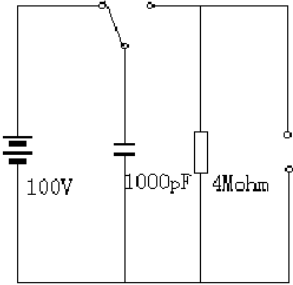
### 3.3 Environmental Performance Characteristics

Item Test condition	Allowable change of absolute Level at center frequency(dB)
High temperature test 70 1000H	< 1.0
Low temperature test -40 1000H	< 1.0
Humidity test 40 90-95% 1000H	< 1.0
Thermal shock -20 ==25 ==80 20 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

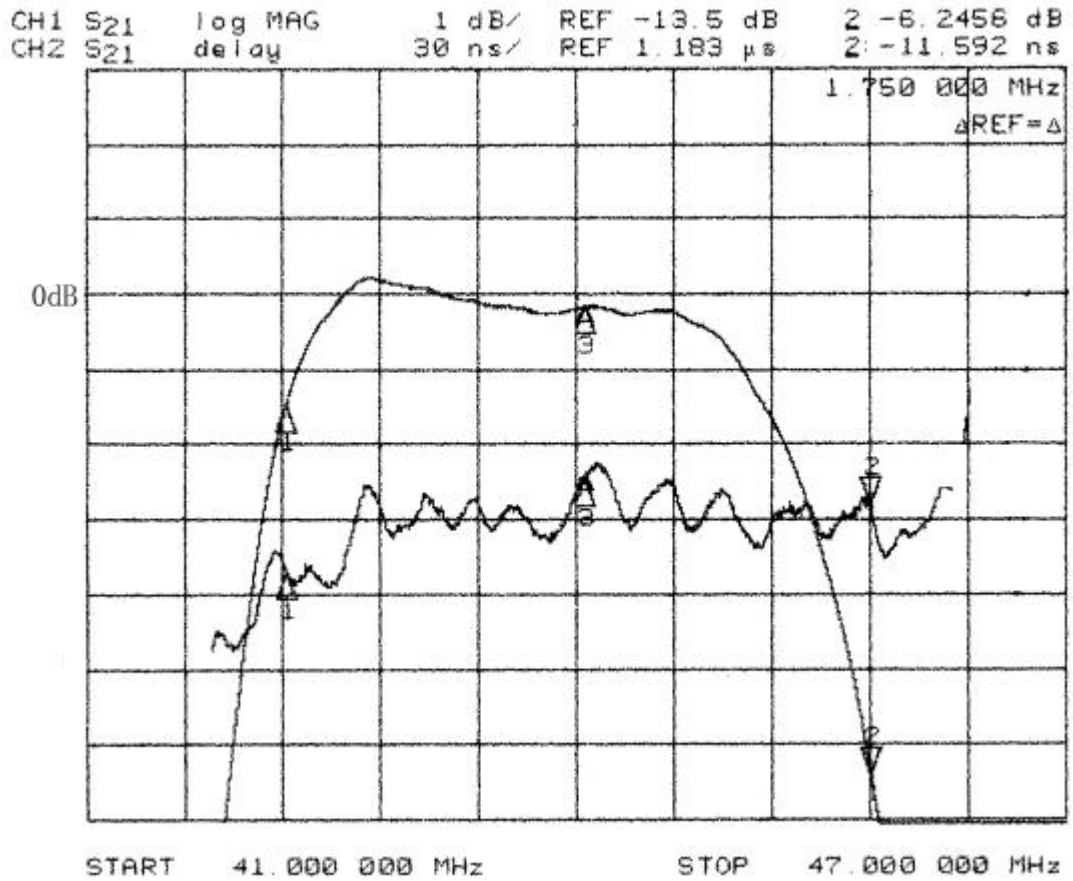
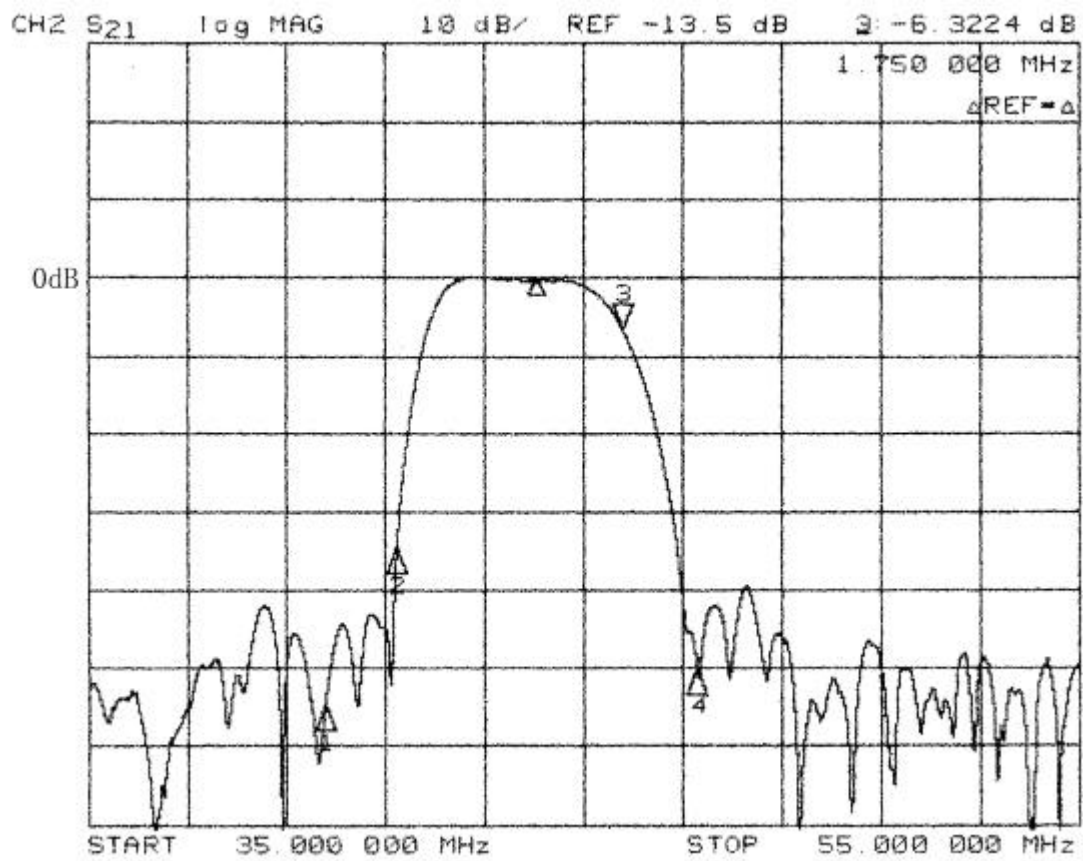
### 3.4 Mechanical Test

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

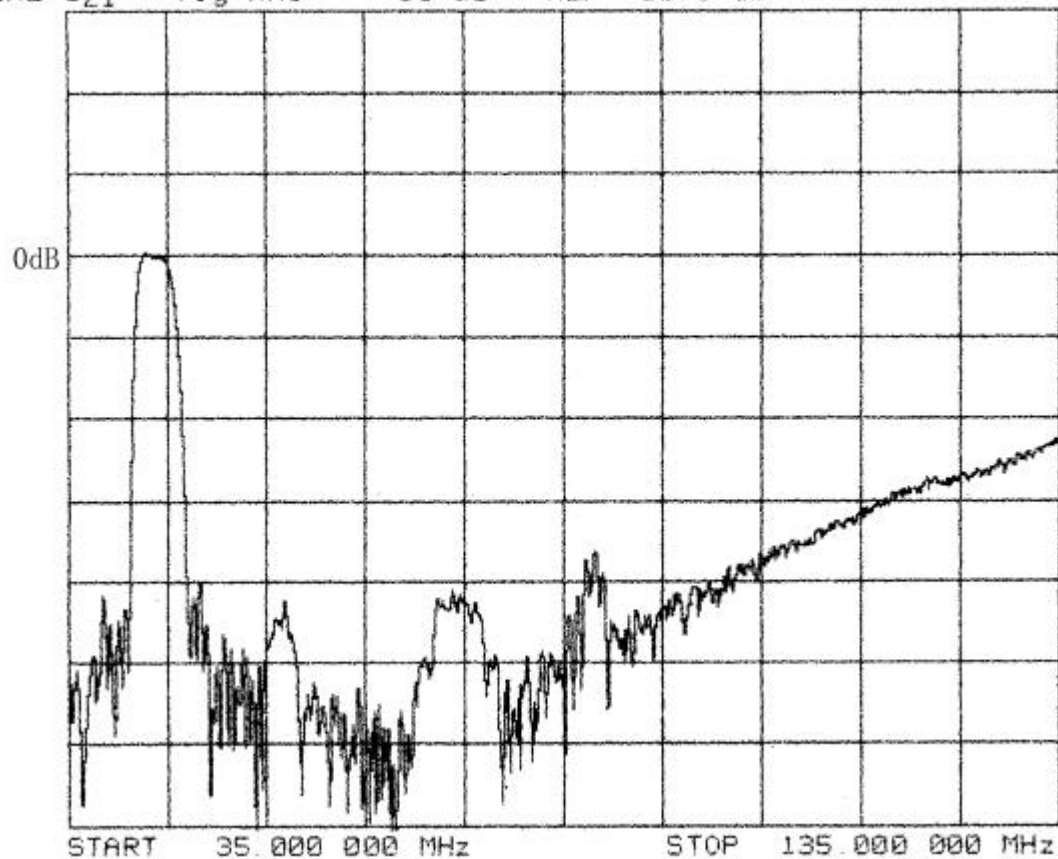
### 3.5 Voltage Discharge Test

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

### 3.6 Frequency response



CH2 S21 log MAG 10 dB/ REF -13.5 dB



CH2 S21 log MAG 10 dB/ REF -22 dB

