1.SCOPE

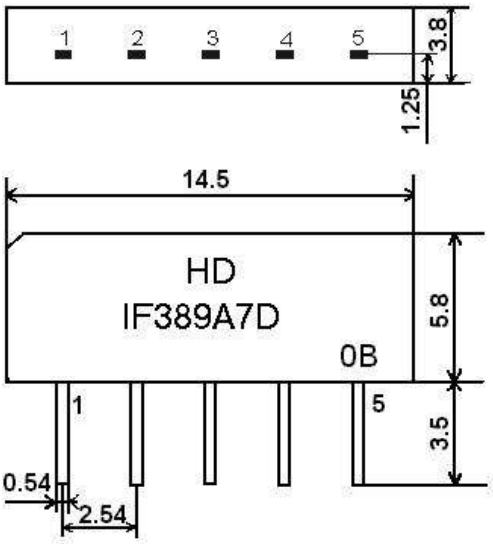
SHOULDER's SAW filter series have broad line up products meeting all broadcast standard including NTSC,PAL and SECAM systems. These filters are composed of two interdigital transducers on a single-crystal. piezoelectrical chip. they are used in electronic equipments such as TV and so on.

2.Construction

2.1 Dimension and materials

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

Type : IF389A7D

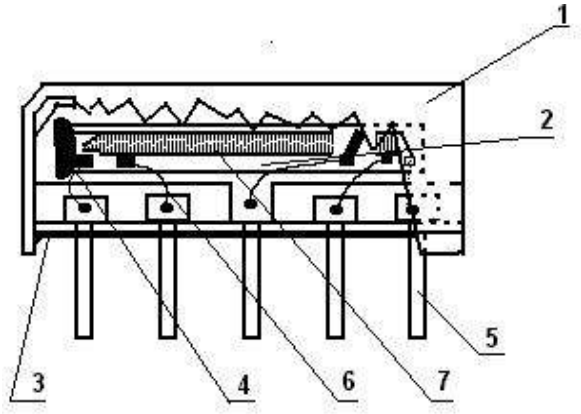


Unit : mm

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

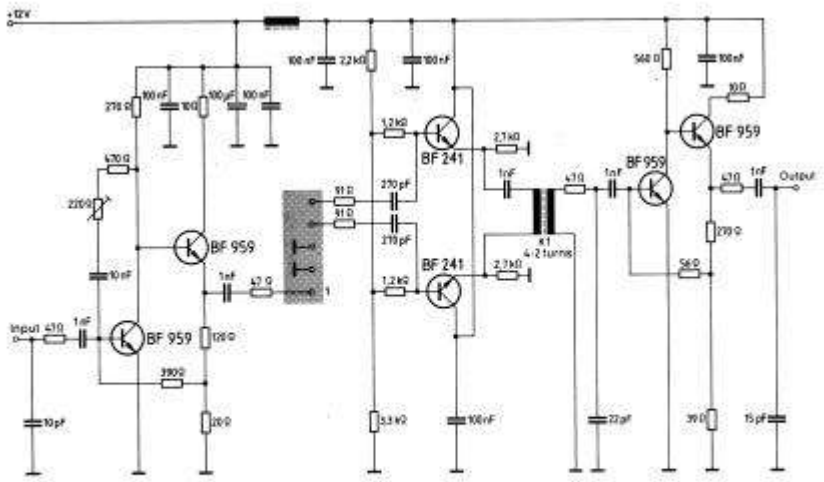
0: year(0,1,2,3,4,5,6,7,8,9)

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 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=2kΩ//3pF T_A=25℃

Items		Freq	Min	typ	max	
Insertion attenuation Reference level		37.40MHz	14.8	16.8	18.8	dB
Relative attenuation		38.90MHz	4.4	5.9	7.4	dB
		34.47MHz	1.3	2.8	4.3	dB
		33.40MHz	17.6	19.6	21.6	dB
		30.90MHz	40.0	55.0		dB
		31.90MHz	40.0	50.0		dB
		32.40MHz	42.0	54.0		dB
		40.40MHz	40.0	52.0		dB
		41.40MHz	40.0	54.0		dB
Sidelobe	25.00~31.90MHz		35.0	43.0		dB
	40.40~45.00MHz		35.0	40.0		dB
Temperature coefficient			-72			Ppm/k

3.3 Environmental Performance Characteristics

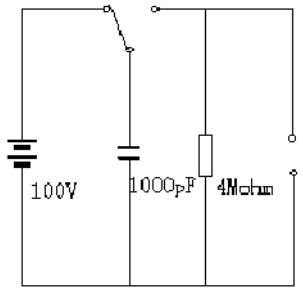
Item Test condition	Allowable change of absolute Level at center frequency(dB)
High temperature test 70℃ 1000H	< 1.0
Low temperature test -40℃ 1000H	< 1.0
Humidity test 40℃ 90-95% 1000H	< 1.0
Thermal shock -20℃==25℃==80℃ 20 cycle 30M 10M 30M	< 1.0
Solder temperature test Sold temp.260℃ for 10 sec.	< 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

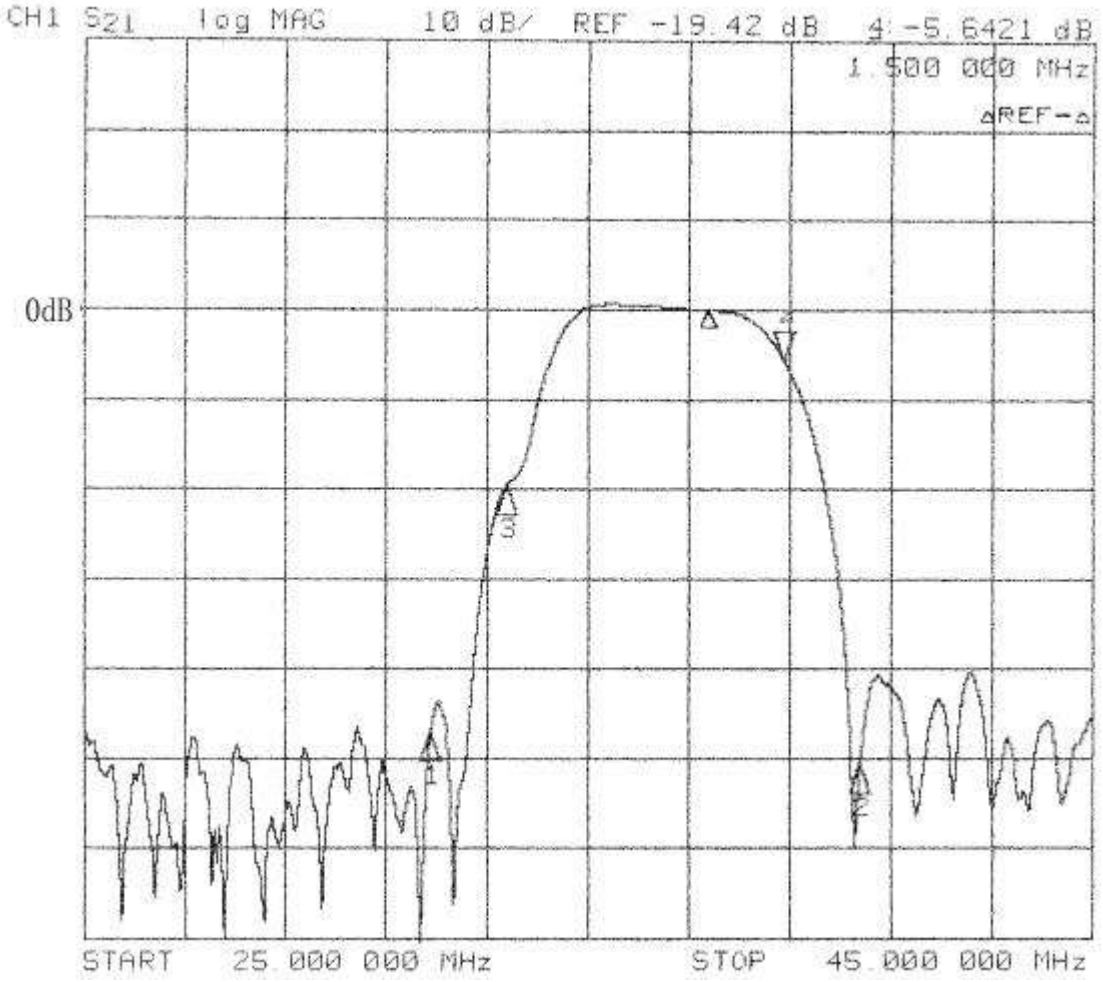
Item Test condition	Allowable change of absolute Level at center frequency(dB)
Vibration test 600-3300rpm amplitude 1.5mm 3 directions 2 H each	<1.0

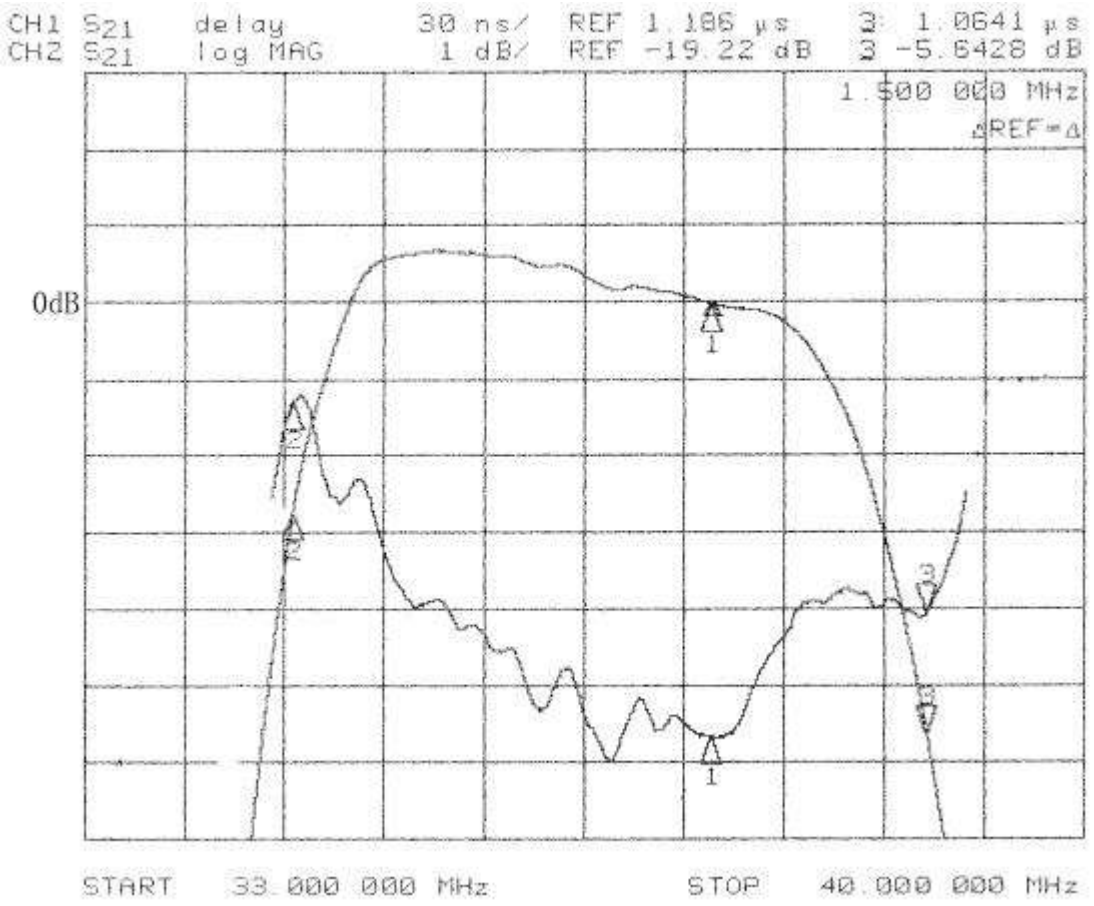
Drop test On maple plate from 1 m high 3 times	<1.0
Lead pull test Pull with 1 kg force for 30 seconds	<1.0
Lead bend test 90^{o} bending with 500g weigh 2 times	<1.0

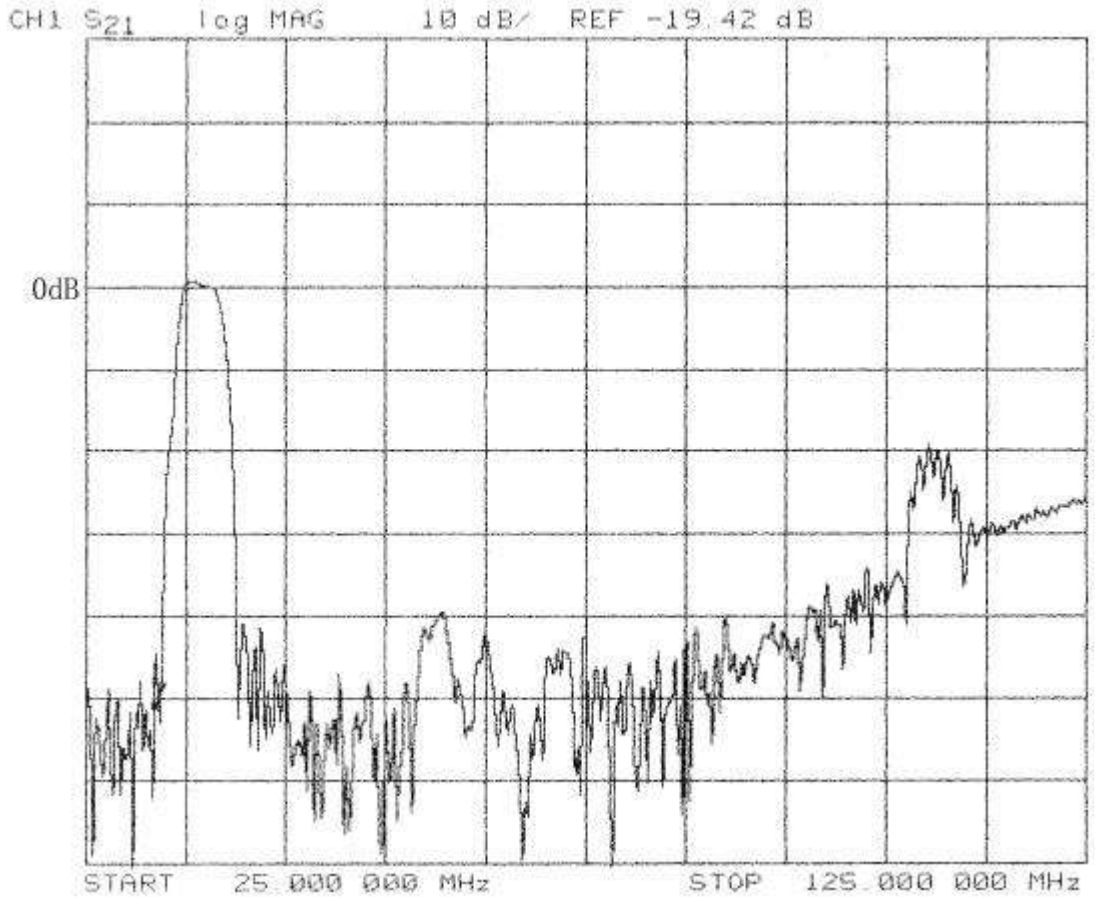
3.5 Voltage Discharge Test

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 log MAG 10 dB/ REF -19.42 dB 4 -5.6421 dB
1.500 000 MHz
ΔREF-Δ
0dB
START 25.000 000 MHz
STOP 45.000 000 MHz


CH1 S21 delay 30 ns/ REF 1.186 µs 3 1.0641 µs
CH2 S21 log MAG 1 dB/ REF -19.22 dB 3 -5.6428 dB
1.500 000 MHz
ΔREF=Δ
0dB
START 33.000 000 MHz
STOP 40.000 000 MHz


CH1 S21 log MAG 10 dB/ REF -19.42 dB
0dB
START 25.000 000 MHz
STOP 125.000 000 MHz

Time domain response: