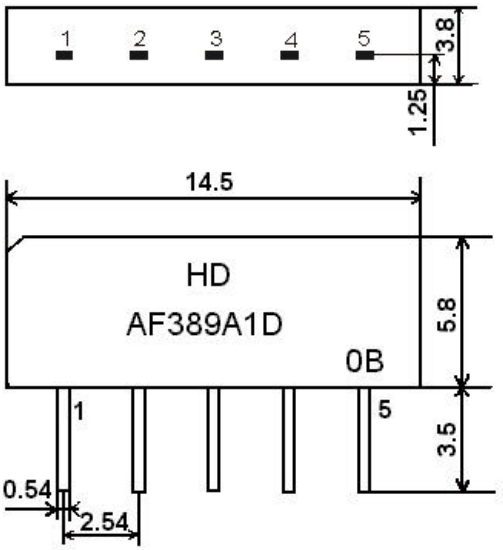
1. SCOPE

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

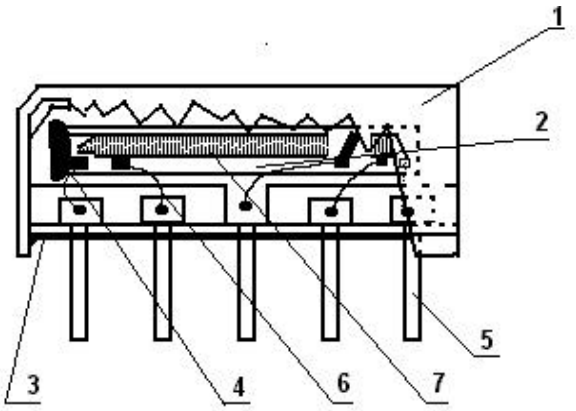
Type: AF389A1D



Unit : mm

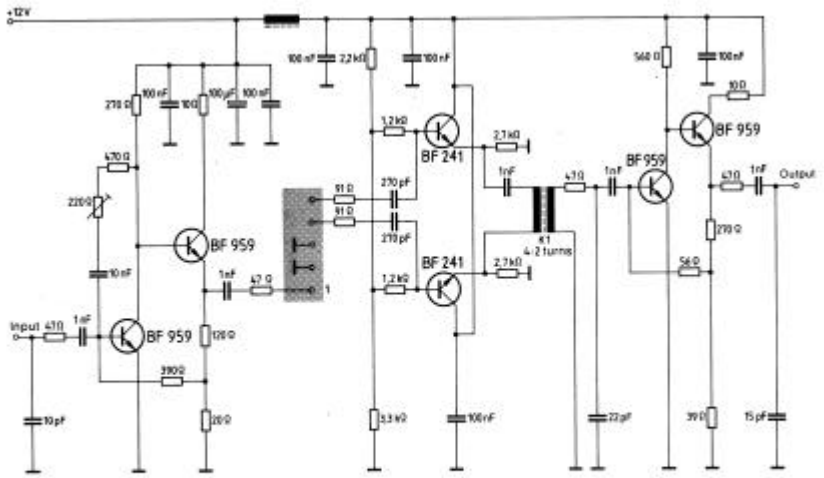
1 Input channel 1/ Input ground
2 Input ground / Input channel 2
3 Chip carrier - ground
4 Output
5 Output

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

Characteristics of channel 1

Source impedance Zs=50Ω

Load impedance Z_L=2kΩ//3pF T_A=25℃

Item		Freq	min	typ	max	
Insertion attenuation Reference level		40.40MHz	12.2	14.2	16.2	dB
Relative attenuation		33.90MHz	40.0	47.0	-	dB
		38.40MHz	40.0	50.0	-	dB
		41.90MHz	36.0	42.0	-	dB
		32.40MHz	40.0	47.0	-	dB
Sidelobe	25.00~38.40MHz		36.0	42.0	-	dB
	41.90~45.00MHz		31.0	36.0	-	dB
Temperature coefficient			-72			ppm/k

Characteristics of channel 2

Source impedance Zs=50Ω

Load impedance Z_L=2kΩ//3pF T_A=25℃

Item		Freq	min	typ	max	
Insertion attenuation Reference level		33.40MHz	13.0	15.0	17.0	dB
Relative attenuation		33.05MHz	-1.8	-0.3	1.2	dB
		32.90MHz	-1.4	0.1	1.6	dB
		32.40MHz	-1.7	-0.2	1.3	dB
		38.90MHz	37.0	45.0	-	dB
		34.47MHz	24.0	30.0	-	dB
		30.90MHz	30.0	36.0	-	dB
		40.40MHz	34.0	40.0	-	dB
		40.90MHz	35.0	42.0	-	dB
		41.40MHz	36.0	45.0	-	dB
Sidelobe	25.00~30.50MHz		36.0	42.0	-	dB
	40.40~45.00MHz		31.0	38.0	-	dB
Temperature coefficient			-72			ppm/k

3.3 Environmental Performance Characteristics

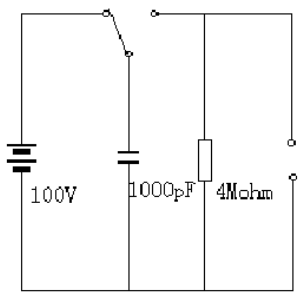
Item Test condition	Allowable change of absolute Level at center frequency(dB)
High temperature test 70℃ 1000H	< 1.0
Low temperature test -40℃ 1000H	< 1.0
Humidity test 40℃ 90-95% 1000H	< 1.0
Thermal shock -20℃==25℃==80℃ 20 cycle	< 1.0

30M 10M 30M	
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

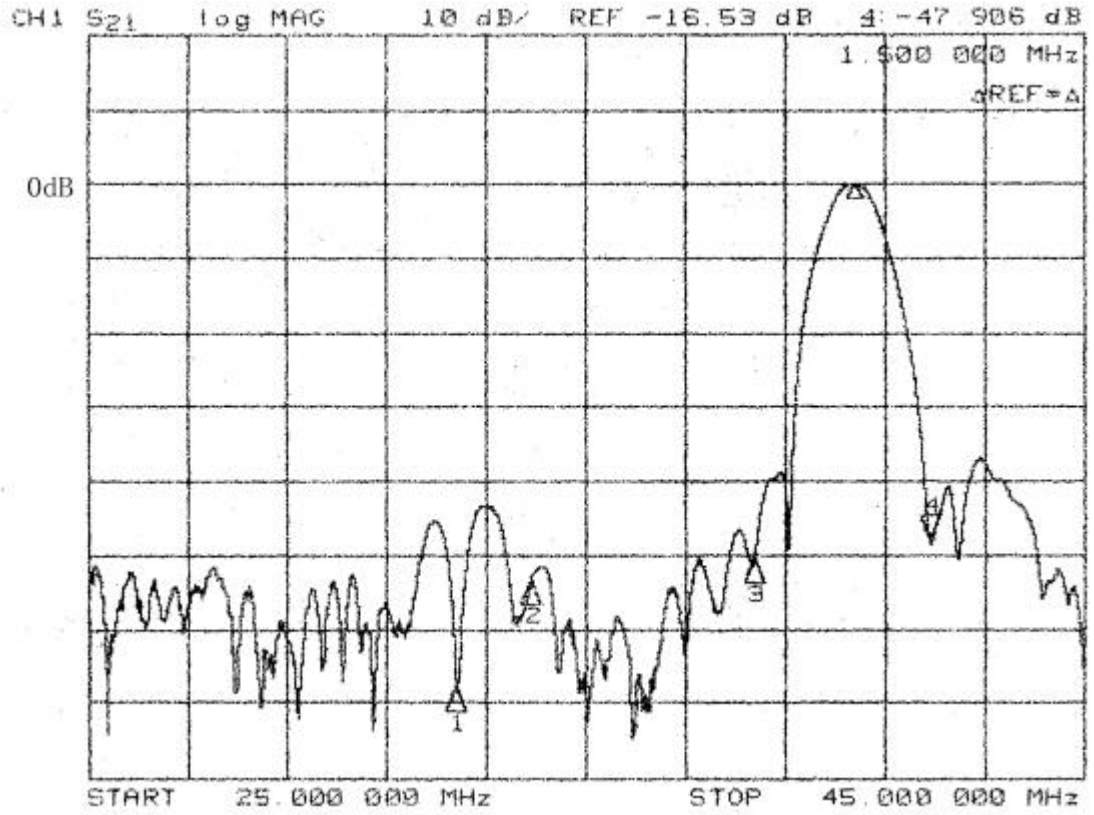
Item Test condition	Allowable change of absolute Level at center frequency(dB)
Vibration test 600-3300rpm amplitude 1.5mm 3 directions 2 H each	<1.0
Drop test On maple plate from 1 m high 3 times	<1.0
Lead pull test Pull with 1 kg force for 30 seconds	<1.0
Lead bend test 90° bending with 500g weigh 2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

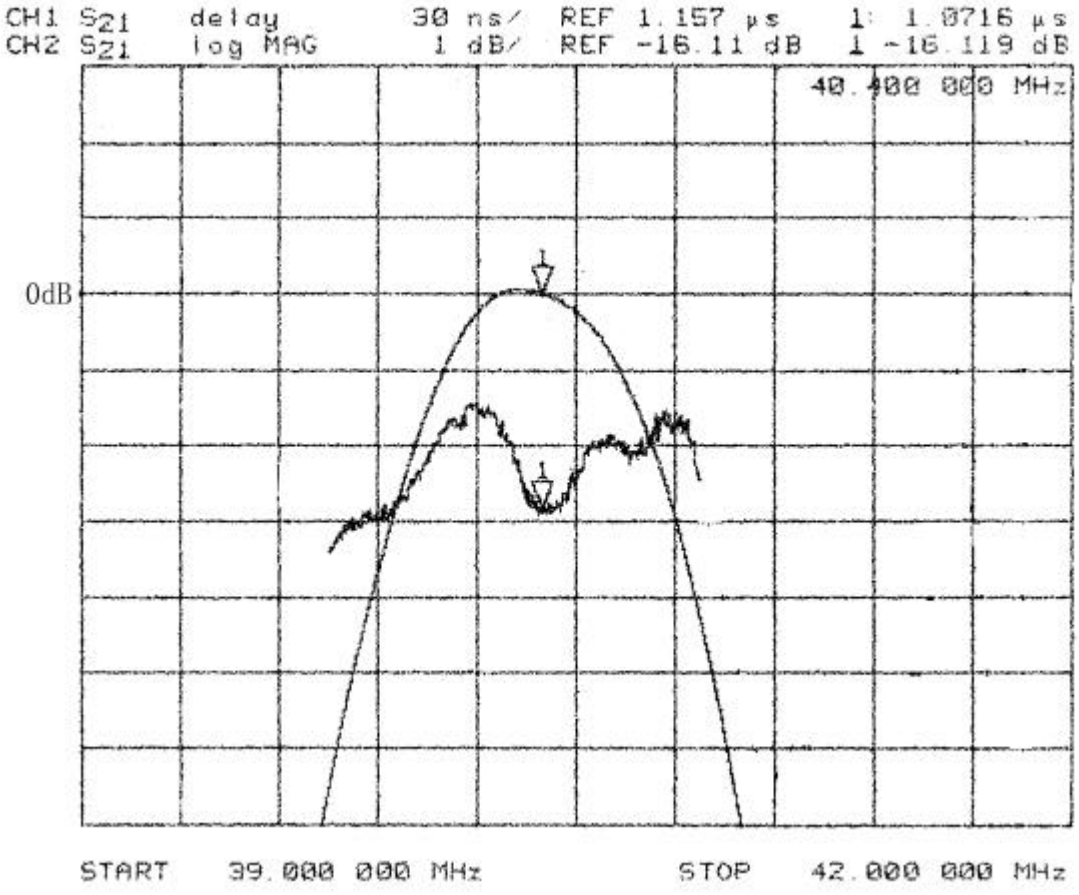
3.5 Voltage Discharge Test

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

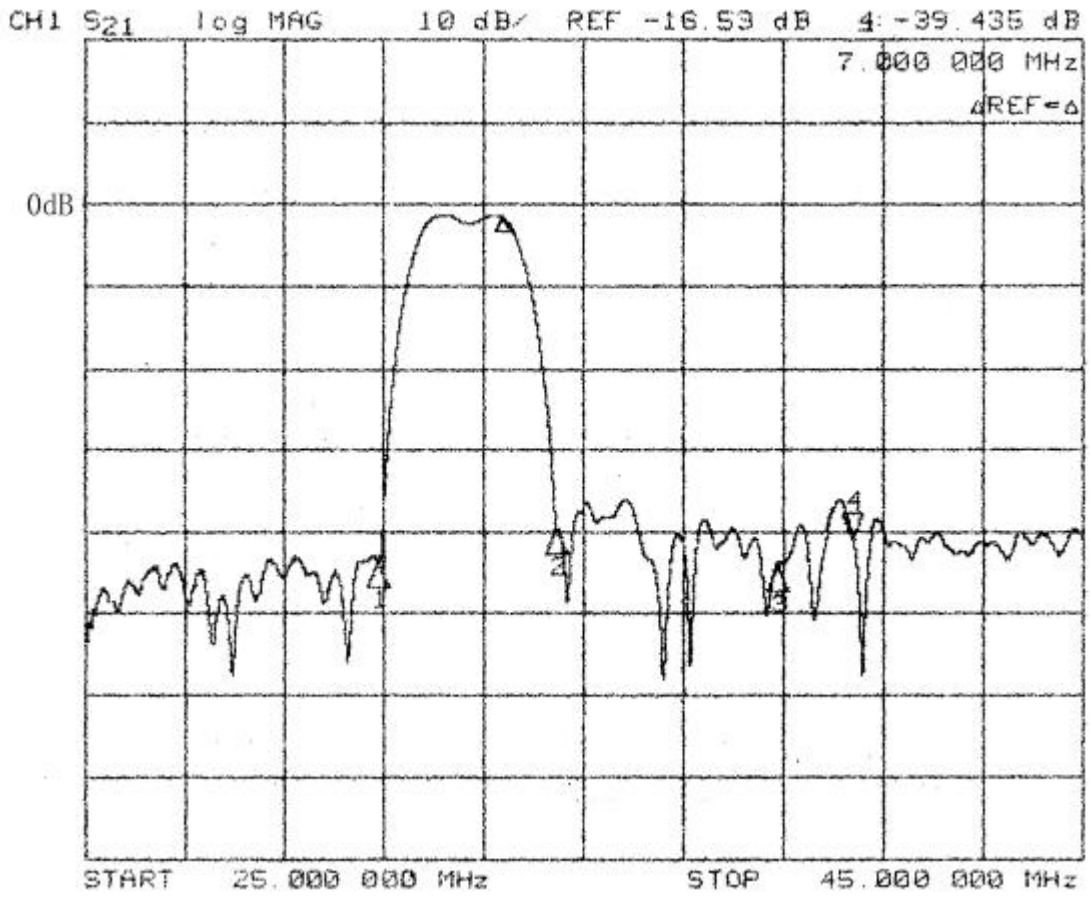
3.6 Frequency response

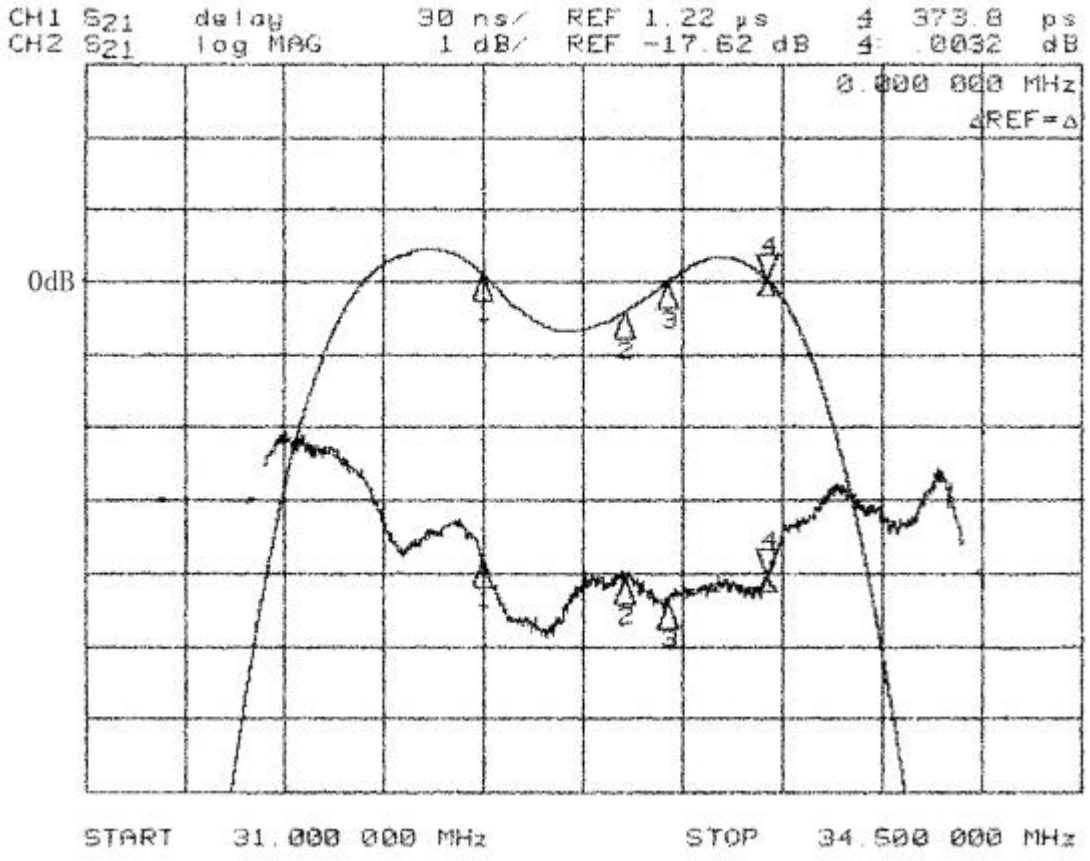
Frequency response of channel 1





Frequency response of channel 2


CH1 S21 log MAG 10 dB/ REF -16.53 dB Δ: -39.435 dB
7.000 000 MHz
ΔREF=Δ
0dB
START 25.000 000 MHz
STOP 45.000 000 MHz


CH1 S21 delay 30 ns/ REF 1.22 μs Δ 373.8 ps
CH2 S21 log MAG 1 dB/ REF -17.62 dB Δ .0032 dB
0.000 000 MHz
ΔREF=Δ
0dB
START 31.000 000 MHz
STOP 34.500 000 MHz