

Approved by:

Checked by:

Issued by:



SPECIFICATION

PRODUCT: SAW FILTER

MODEL: HDAF389A9D 2.3mm



SHOULDER ELECTRONICS LIMITED

1.SCOPE

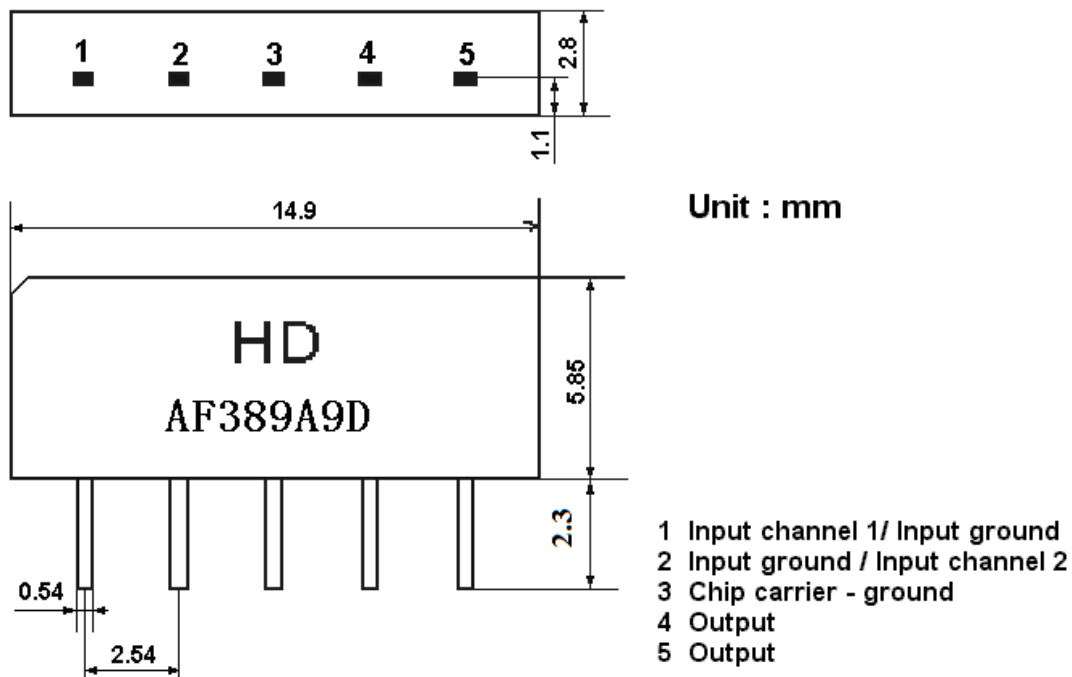
SHOULDER's SAW filter series have broad line up products meeting all broadcast standard including NTSC,PAL and SECAM systems. These filters are composed of two interdigital transducers on a single-crystal. piezoelectrical chip. they are used in electronic equipments such as TV and so on.

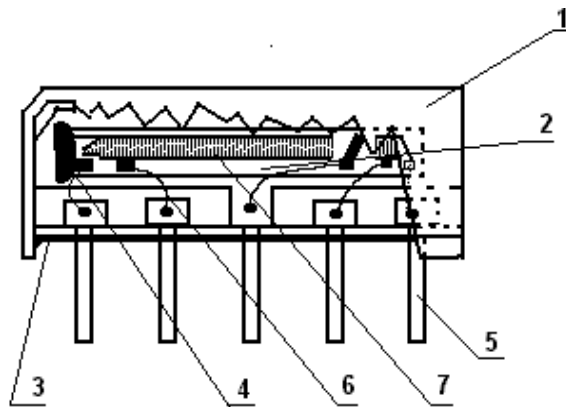
2.Construction

2.1 Dimension and materials

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

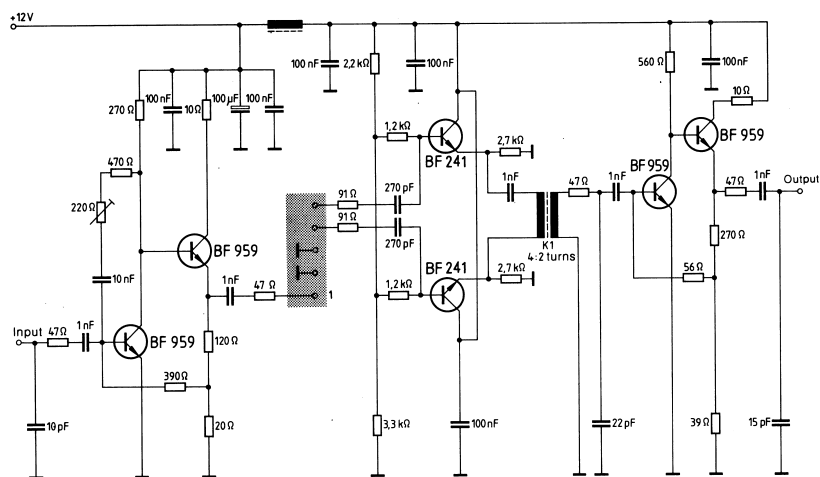
Type: AF389A9D





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

Items	Conditions	Specifications
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Standard atmos pheric conditi ons	Unless otherwise specified , the standard rang of atmospheric conditions for making measurements and tests is as follows; Ambient temperature : 15°C to 35°C Relative humidity : 25% to 85% Air pressure : 86kPa to 106kPa	There shall be no damage.
Operating temper ature rang	Operating temperature rang is the rang of ambient temperatures in which the filter can be operated continuously. -20°C ~ +60°C	
Storage temper ature 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°C ~ +70°C	
Reference temper ature	+25°C	

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 $Z_s=50\Omega$

Load impedance $Z_L=2k\Omega//3pF$ $T_A=25^\circ C$

Item	Freq	min	typ	max	
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Insertion attenuation Reference level		40.40MHz	14.6	16.6	18.6	dB
Relative attenuation		39.75MHz	-1.5	-0.3	0.9	dB
		38.40MHz	27.0	40.0	-	dB
		33.90MHz	37.0	45.0	-	dB
		41.90MHz	28.0	38.0	-	dB
		32.40MHz	38.0	45.0	-	dB
Sidelobe	25.00~33.90MHz		34.0	41.0	-	dB
	41.90~45.00MHz		28.0	34.0	-	dB
Temperature coefficient			-72			ppm/k

Characteristics of channel 2

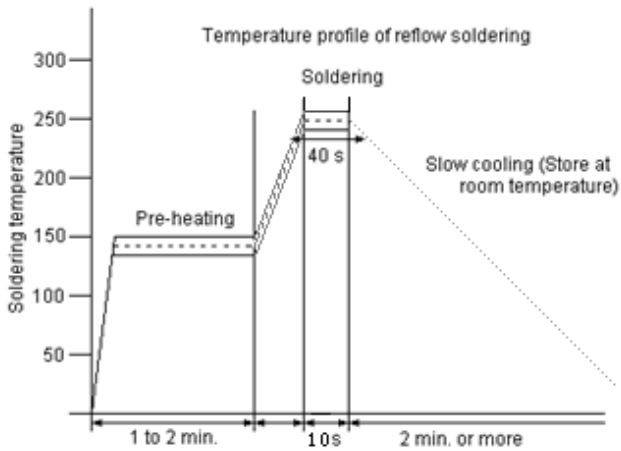
Source impedance $Z_s=50\Omega$

Load impedance $Z_L=2k\Omega/3pF$ $T_A=25^\circ C$

Item		Freq	min	typ	max	
Insertion attenuation Reference level		33.40MHz	14.0	16.0	18.0	dB
Relative attenuation		33.05MHz	-1.6	-0.4	0.8	dB
		32.90MHz	-1.6	-0.4	0.8	dB
		32.40MHz	0	1.2	2.4	dB
		38.90MHz	37.0	49.0	-	dB
		34.47MHz	23.0	31.0	-	dB
		30.90MHz	37.0	45.0	-	dB
		31.90MHz	-	9.4	-	dB
		40.40MHz	35.0	40.0	-	dB
		40.90MHz	35.0	42.0	-	dB
		41.40MHz	40.0	52.0	-	dB
Sidelobe	25.00~30.90MHz		36.0	42.0	-	dB
	38.90~45.00MHz		34.0	40.0	-	dB
Temperature coefficient			-72			ppm/k

3.3Environmental Performance Characteristics

Item	Condition	Specifications
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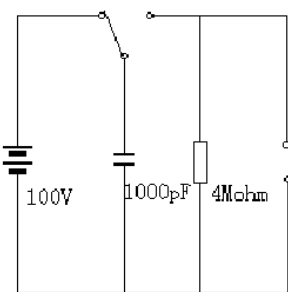
High temperature	The specimen shall be store at a temperature of $80\pm 2^{\circ}\text{C}$ for $96\pm 4\text{h}$. Then it shall be subjected to standard atmospheric conditions for 1h, after which measurement shall be made within 1h.	Mechanical characteristics and specifications in electrical characteristics shall be satisfied. There shall be no excessive change in appearance.																				
Low temperature	The specimen shall be store at a temperature of $-20\pm 3^{\circ}\text{C}$ for $96\pm 4\text{h}$. Then it shall be subjected to standard atmospheric conditions for 1h, after which measurement shall be made within 1h.																					
Humidity	The specimen shall be store at a temperature of $40\pm 2^{\circ}\text{C}$ with relative humidity of 90% to 96% for $96\pm 4\text{h}$. Then it shall be subjected to standard atmospheric conditions for 1h, after which measurement shall be made within 1h.																					
Thermal shock	<p>The specimen shall be subjected to 8 continuous cycles each as shown below. Then it shall be subjected to standard atmospheric conditions for 1h, after which measurement shall be made within 1h.</p> <table border="1"> <thead> <tr> <th></th><th>Temperature</th><th>Duration</th></tr> </thead> <tbody> <tr> <td>1</td><td>$+25^{\circ}\text{C} \Rightarrow -40^{\circ}\text{C}$</td><td>0.5h</td></tr> <tr> <td>2</td><td>-40°C</td><td>4h</td></tr> <tr> <td>3</td><td>$-40^{\circ}\text{C} \Rightarrow +85^{\circ}\text{C}$</td><td>2h</td></tr> <tr> <td>4</td><td>$+85^{\circ}\text{C}$</td><td>4h</td></tr> <tr> <td>5</td><td>$+85^{\circ}\text{C} \Rightarrow +25^{\circ}\text{C}$</td><td>0.5h</td></tr> <tr> <td>6</td><td>$+25^{\circ}\text{C}$</td><td>1h</td></tr> </tbody> </table>			Temperature	Duration	1	$+25^{\circ}\text{C} \Rightarrow -40^{\circ}\text{C}$	0.5h	2	-40°C	4h	3	$-40^{\circ}\text{C} \Rightarrow +85^{\circ}\text{C}$	2h	4	$+85^{\circ}\text{C}$	4h	5	$+85^{\circ}\text{C} \Rightarrow +25^{\circ}\text{C}$	0.5h	6	$+25^{\circ}\text{C}$
	Temperature	Duration																				
1	$+25^{\circ}\text{C} \Rightarrow -40^{\circ}\text{C}$	0.5h																				
2	-40°C	4h																				
3	$-40^{\circ}\text{C} \Rightarrow +85^{\circ}\text{C}$	2h																				
4	$+85^{\circ}\text{C}$	4h																				
5	$+85^{\circ}\text{C} \Rightarrow +25^{\circ}\text{C}$	0.5h																				
6	$+25^{\circ}\text{C}$	1h																				
Resistance to Soldering heat	<p>Reflow soldering method Peak: $255 \pm 5^{\circ}\text{C}$, $220 \pm 5^{\circ}\text{C}$, 40s At electrode temperature of the specimen.</p>  <p>The specimen shall be passed through the reflow furnace with the condition shown in the above profile for 1 time.</p>																					

	The specimen shall be stored at standard atmospheric conditions for 1h, after which the measurement shall be made. Test board shall be 1.6 mm thick. Base material shall be glass fabric base epoxy resin.	
Solder ability	Immerse the pins melt solder at 260°C+5/-0°C for 5 sec.	More then 95% of total area of the pins should be covered with solder

3.4Mechanical Test

Items	Conditions	Specifications
Vibration	600-3300rpm amplitude 1.5mm 3 directions 2 H each	There shall be no damage.
Drop	On maple plate from 1m high 3 times	
Lead pull	Pull with 1kg force for 30 seconds	
Lead bend	90° bending with 500g weigh 2 times	

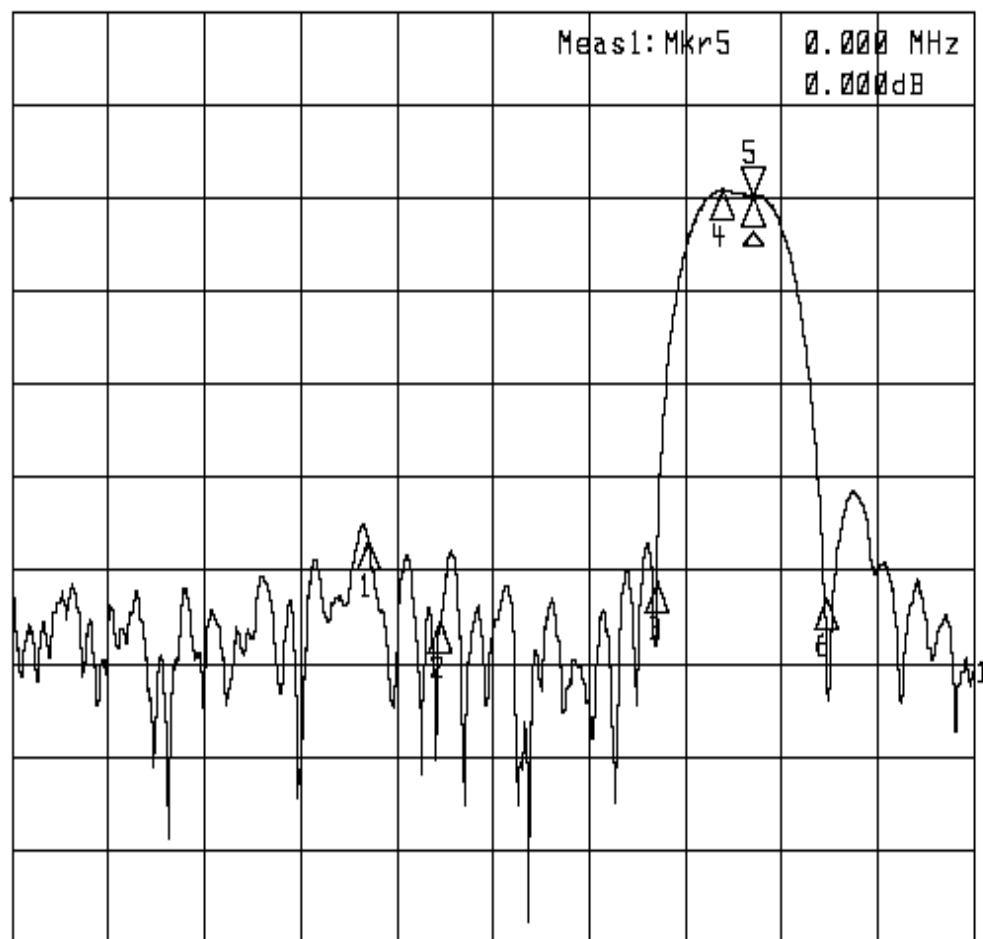
3.5Voltage Discharge Test

Item	Condition	Specifications
Surge	Between any two electrode 	There shall be no damage

3.6 Frequency response

Frequency response of channel 1:

►1: Transmission /M Log Mag 10.0 dB/



Start 25.000 MHz

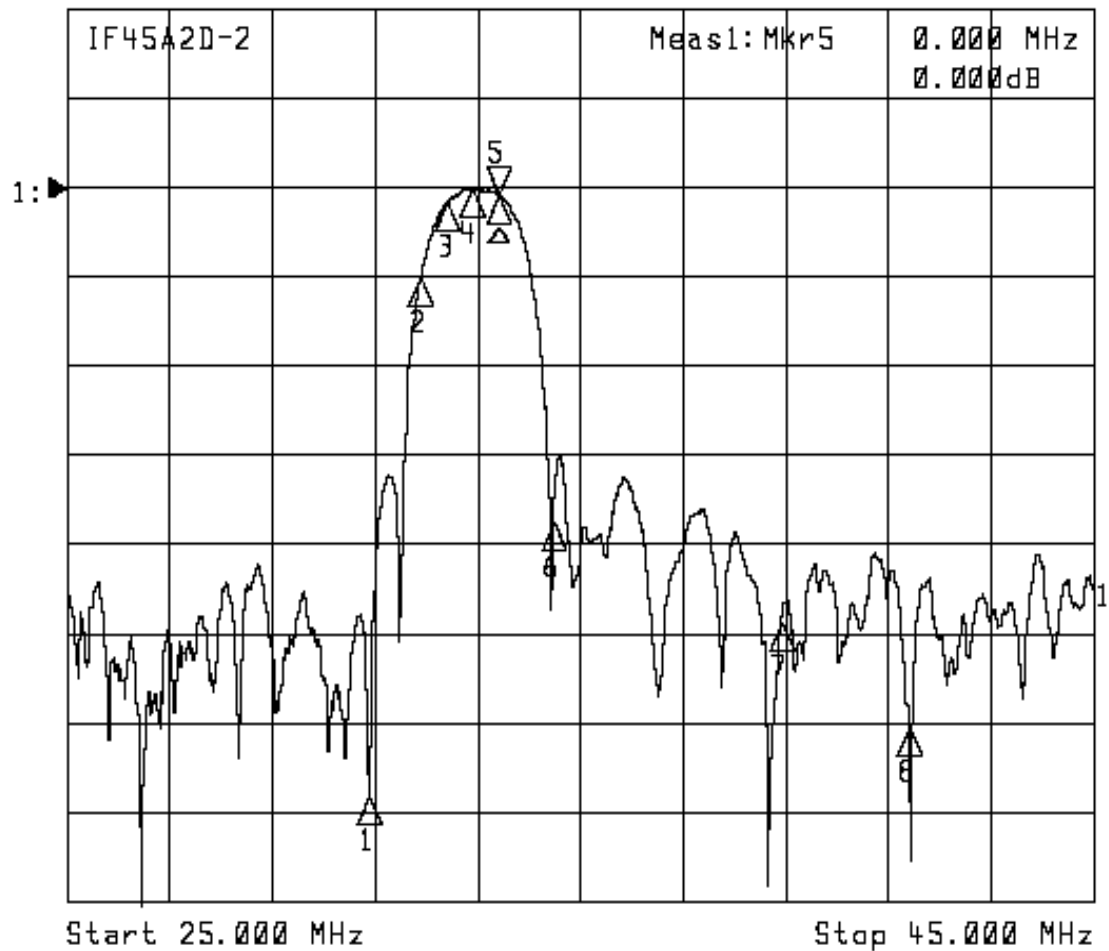
Stop 45.000 MHz

1: Mkr Δ (MHz)	dB	2: Mkr (MHz)	dB
1:	-8.0000	-37.026	
2:	-6.5000	-45.894	
3:	-2.0000	-41.663	
4:	-0.6500	0.592	
5:	0.0000	0.000	
6:	1.5000	-43.338	

Frequency response of channel 2:

►1:Transmission /M Log Mag 10.0 dB/ Ref -16.96 dB

►2:Off



1:MkrΔ(MHz)	dB	2:Mkr (MHz)	dB
1: -2.5000	-67.721		
2: -1.5000	-9.352		
3: -1.0000	-0.916		
4: -0.5000	0.570		
5> 0.0000	0.000		
6: 1.0700	-36.836		
7: 5.5000	-48.090		
8: 8.0000	-59.973		