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Approved	by:
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SPECIFICATION

PRODUCT: SAW FILTER

MODEL: HDBF36A5D 2.3mm



SHOULDER ELECTRONICS LIMITED

1.SCOPE

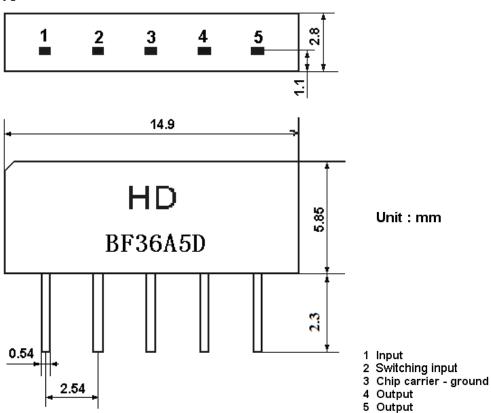
SHOULDER'S SAW filter series have broad line up products meeting all broadcast standard including NTSC,PAL and SECAM systems. These filters are composed of two interdigital transducers on a single-crystal. piezoelectrical chip. they are used in electronic equipments such as TV and so on.

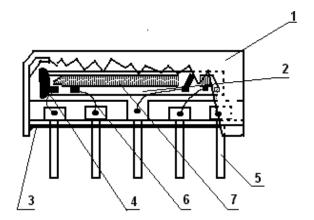
2. Construction

2.1 Dimension and materials

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

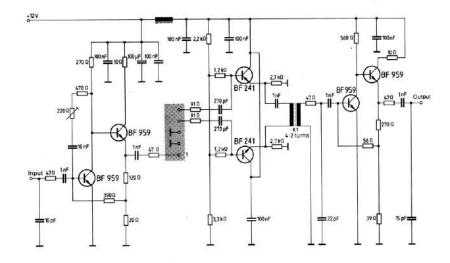
Type: BF36A5D





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 Ω in parallel with 3 pF

3. Characteristics

Items	Conditions	Specifications
Standard atmospheric conditions	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	
Operating temperature rang	Operating temperature rang is the rang of ambient temperatures in which the filter can be operated continuously. $-10^{\circ}\text{C} \sim +60^{\circ}\text{C}$	There shall be no damage.
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. $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$	
Reference temperature	+25℃	

3.1 Maximum Rating

DC voltage	VDC	12	V	Between any terminals
AC voltage	Vpp	10	${f V}$	Between any terminals

3.2 Electrical Characteristics

Characteristics of channel 1 (switching input pin 2 connected to pin 3)

Source impedance $Zs=50 \Omega$

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

Iten	1	Freq	min	typ	max	
Center fre	quency	Fo	-	36.17	-	MHz
Insertion attenuation Reference level		36.17MHz	19.0	21.0	23.0	dB
		B1.5dB	7.4	7.7	8.0	MHz
Pass band	lwidth	B3dB	7.7	8.0	8.3	MHz
rass band	iwiani	B10dB	8.6	8.9	9.2	MHz
		B30dB	8.8	9.4	10.0	MHz
	25.00~3	31.15MHz	33.0	40.0	-	dB
Sidelobe	41.15~42.0MHz		31.0	36.0	-	dB
	42.00~	45.00MHz	34.0	41.0	-	dB
Reflected wave signal suppression 1.2 us 6.0 us after main pulse (test pulse 250 ns, carrier frequency 36.17 MHz)			42.0	50.0		dB
Group delay ripple (p-p) 32.25~40.05 MHz			-	50	-	ns
Temperature coefficient				-72	•	ppm/k

Characteristics of channel 2 (switching input pin 2 connected to pin 1)

Source impedance $Zs=50 \Omega$

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

		// op-			1 A-23 C	
Iten	1	Freq	min	typ	max	
Center fre	quency	Fo	-	36.17	-	MHz
Insertion att		36.17MHz	19.0	21.0	23.0	dB
		B1.5dB	6.4	6.7	7.0	MHz
Pass band	li.d4h	B3dB	6.7	7.0	7.3	MHz
Pass Danc	ıwıatıı	B10dB	7.7	8.0	8.3	MHz
		B30dB	7.9	8.5	9.1	MHz
Sidelobe	25.00~3	31.55MHz	33.0	40.0	-	dB
Sidelobe	40.75~	45.00MHz	31.0	36.0	-	dB
Reflected wave signal suppression 1.2 us 6.0 us after main pulse (test pulse 250 ns, carrier frequency 36.17 MHz)			42.0	50.0		dB
Group delay ripple (p-p) 32.75~39.55 MHz			-	50	-	ns
Tempe	erature coef	ficient		-72	•	ppm/k

3.3 Environmental Performance Characteristics

5.5 Ellyllon	mental Performance Charac			
Item	Conditio			Specifications
High	The specimen shall be store	_		
temperature	$80\pm2^{\circ}$ C for 96±4h. Then it	•		
	standard atmospheric cond			
	which measurement shall be			
Low	The specimen shall be store	•		
temperature	-20 ± 3 °C for 96±4h. Then it	3		
	standard atmospheric cond			
77 11	which measurement shall be			
Humidity	The specimen shall be store	-		
	$40\pm2^{\circ}$ C with relative humic	•		
	for 96±4h. Then it shall be	-		
	atmospheric conditions fo		which	
	measurement shall be made v			
Thermal	The specimen shall be subjection			
shock	cycles each as shown belo			
	subjected to standard atmos 1h, after which measurem	•		
	within 1h.	ient shan be	made	
	Temperature	Duration		
	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	0.5h		
	2 -40 °C	4h		
	1,0			Mechanical
	10 0 7 00 0	2h		characteristics and
	4 +85 °C	4h		specifications in
	5 +85 °C=>+25 °C	0.5h		electrical
	6 +25 °C	1h		characteristics shall be satisfied. There
Resistance to	Reflow soldering method			shall be no
Soldering	Peak: 255 ± 5 °C, 220 ± 5 °C	C, 40s		excessive change in
heat	At electrode temperature of t	he specimen.		appearance.
	1 +			Tr ····
	300 —	ile of reflow soldering		
	Sold	ering		
	g 250	<u>.</u>		
	gg 200— 40 s	Slow cooling (S		
	Pre-heating	N	240000000000000000000000000000000000000	
	F			
	250 — 200 —			
	50—			
		` \.		
	1 to 2 min, 10s	=		
	The specimen shall be passe	2 min, or more	eflow	
	furnace with the condition	•		
	profile for 1 time.			
	*	stored at sta	ndard	
	atmospheric conditions for			
<u> </u>		,		

	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.	total	area (of the
		pins	shoul	d be
		cover	ed with	solder

3.4 Mechanical Test

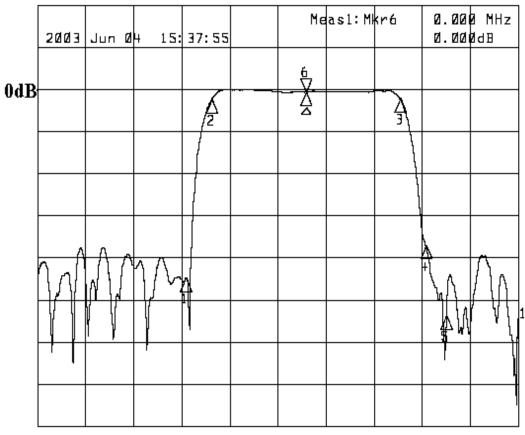
Items	Conditions	Specifications
Vibration	600-3300rpm amplitude 1.5mm	
	3 directions 2 H each	
Drop	On maple plate from 1 m high 3 times	
_		There shall be no
Lead pull	Pull with 1 kg force for 30 seconds	damage.
Lead bend	90° bending with 500g weigh 2 times	

3.5 Voltage Discharge Test

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

3.6 Frequency response of channel 1:

▶1:Transmission /M Log Mag 10.0 dB/



Start 25.000 MHz

Stop 45.000 MHz

1:M	kr∆(MHz)	dВ	2: Mkr (MHz) dB
1:	-5.0200	-44.327	
2:	-3.9200	-1.771	
3:	3.8800	-1.557	
4:	4.9800	-36.572	
5:	5.8300	-53.315	
6>	0.0000	0.000	
1			

Frequency response of channel 2:

▶1:Transmission /M Log Mag 10.0 dB/

	2003	D nuL	4 15:	42: 28	Me	as1: M	kr5	0.00 0.00	MHz ddB
0dB					5 ▽				
				$\sqrt{2}$		-	$\sum_{\mathbf{E}}$		
				>			A	۸. ۸۵	. ^
	MV	\/	M				ļ.] [[]	$\mathbb{W}_{\mathbb{Q}}$
		1	1						1
		•		1					

Start 25.000 MHz

Stop 45.000 MHz

1:M	kr∆(MHz)	дΒ	2:Mkr (MHz) dB
1:	-4.5200	-54.774	
2:	-3.4400	-1.854	
3:	3.3800	-1.524	
4:	4.5800	-37.183	
5>	0.0000	0.000	