Approved by:
Checked by:
Issued by:

SPECIFICATION

PRODUCT: SAW FILTER

MODEL: HB4401D (X6965D) SIP5D

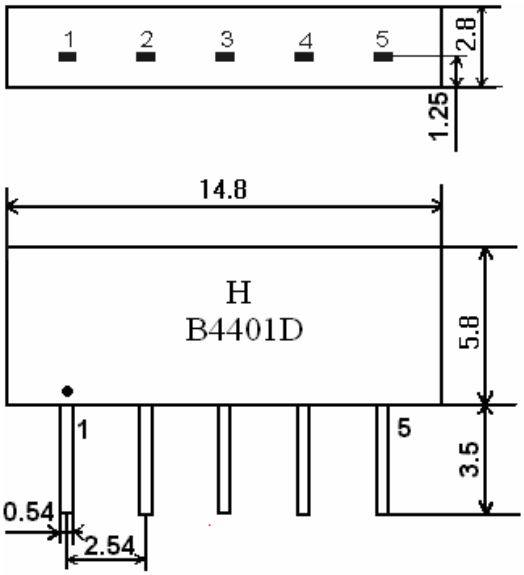
HOPE MICROELECTRONICS CO.,LIMITED

Tel:+86-755-82973806 Fax:+86-755-82973550 E-mail: sales@hoperf.com http://www.hoperf.com

1.Construction

1.1 Dimension and materials

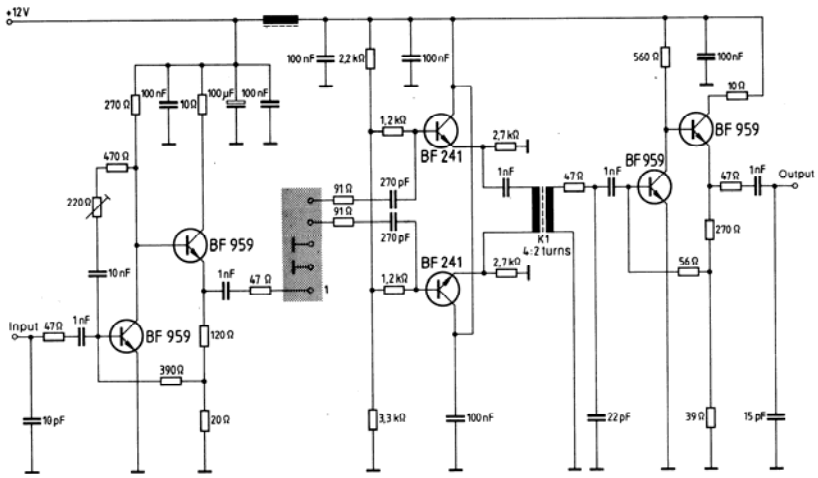
Type : B4401D



Unit : mm

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

1.2. Circuit construction, measurement circuit



Test circuit for SIP-5 filter
Input impedance of the symmetrical post-amplifier: 2 kΩ in parallel with 3 pF

2.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℃

2.1 Maximum Rating

DC voltage	**VDC**	**12**	**V**	**Between any terminals**
AC voltage	**Vpp**	**10**	**V**	**Between any terminals**

2.2 Electrical Characteristics

Source impedance Zs=50Ω

Load impedance Z_L=2kΩ//3pF T_A=25℃

		Freq	min	typ	max	
Center frequency		Fo	43.96	44.06	44.16	MHz
Insertion attenuation Reference level		44.06MHz	12.9	14.7	16.5	dB
Pass bandwidth		B_{3dB}	-	6.1	-	MHz
		B_{30dB}	-	7.7	-	MHz
Amplitude ripple (41.53~46.59 MHz)				0.4	0.8	dB
Relative attenuation		41.53MHz	-	0.3	-	dB
		46.59MHz	-	0.4	-	dB
		41.06MHz	1.4	2.7	4.0	dB
		47.06MHz	1.5	3.0	4.5	dB
		47.31MHz	-	6.2	-	dB
		39.81MHz	37.0	52.0	-	dB
Sidelobe	35.06~39.46MHz		38.0	47.0		dB
	39.46~40.06MHz		36.0	41.0		dB
	48.06~50.06MHz		35.0	40.0		dB
	50.06~55.06MHz		38.0	45.0		dB
Reflected wave signal suppression 1.3 us … 6.0 us after main pulse (test pulse 250 ns , carrier frequency 44.06 MHz)			42.0	52.0		dB
Feedthrough signal suppression 1.3 us … 1.2 us before main pulse (test pulse 250 ns , carrier frequency 44.06 MHz)			45.0	54.0		dB

Group delay ripple (p-p) 41.53 ~ 46.59 Mhz	-	40	-	ns
Impedance at 44.06 Mhz Input: Zin = Rin//Cin Output: Zin = Rin//Cin	- - -	- 1.3//16.1 1.1//5.6	- - -	- kΩ//pF kΩ//pF
Temperature coefficient	-72			ppm/K

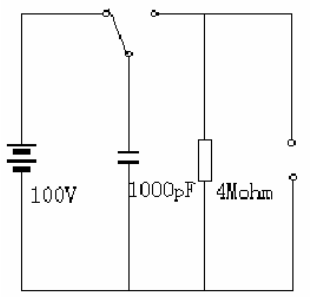
2.3 Environmental Performance Characteristics

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

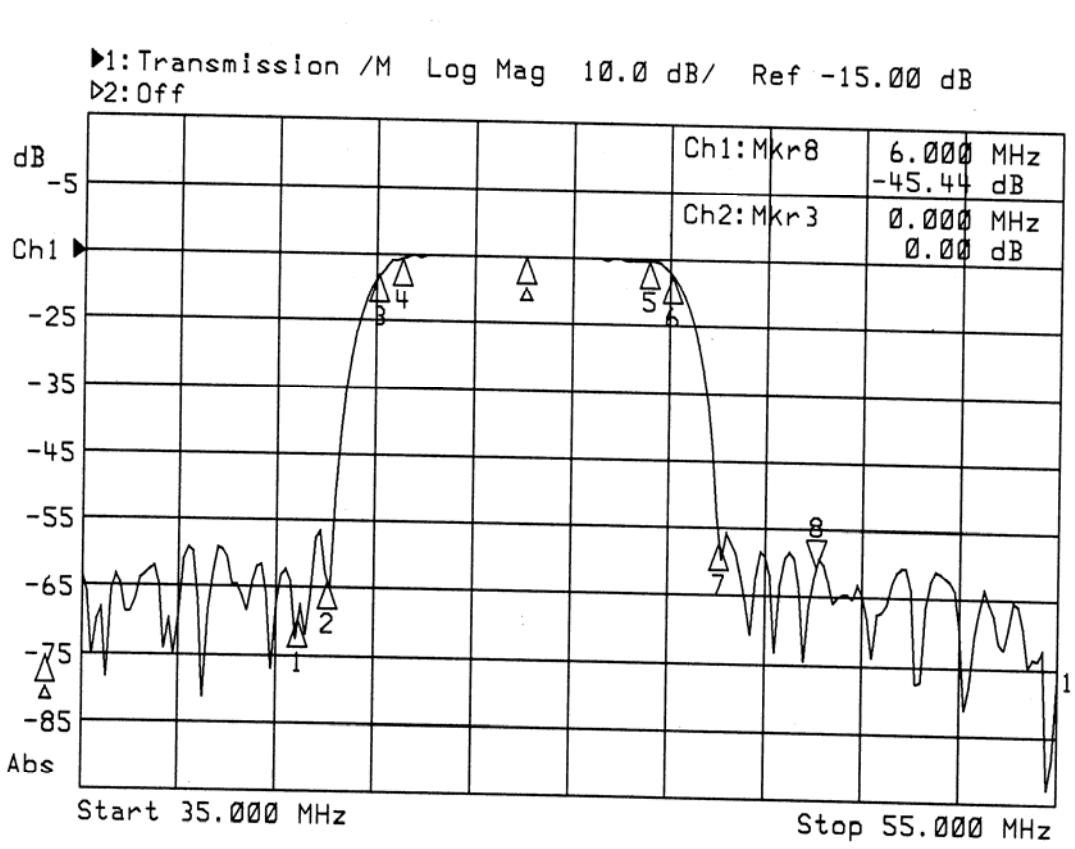
2.4 Mechanical Test

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

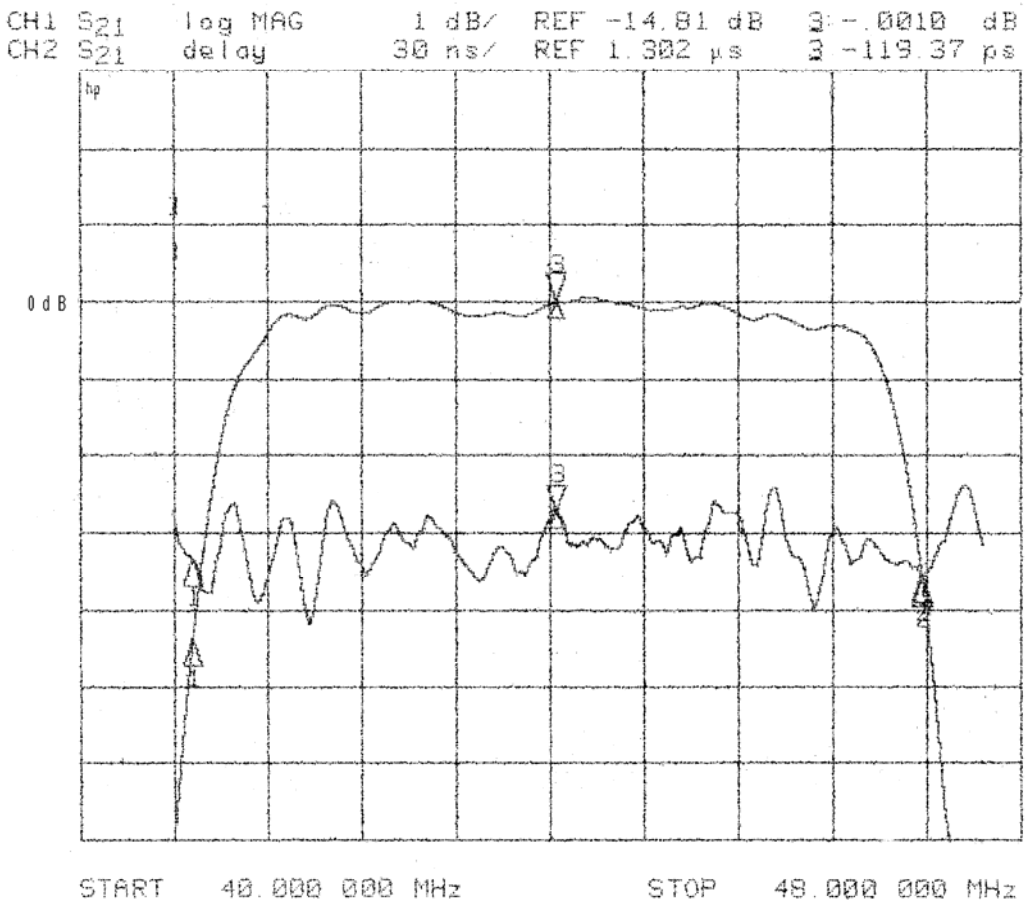
2.5 Voltage Discharge Test

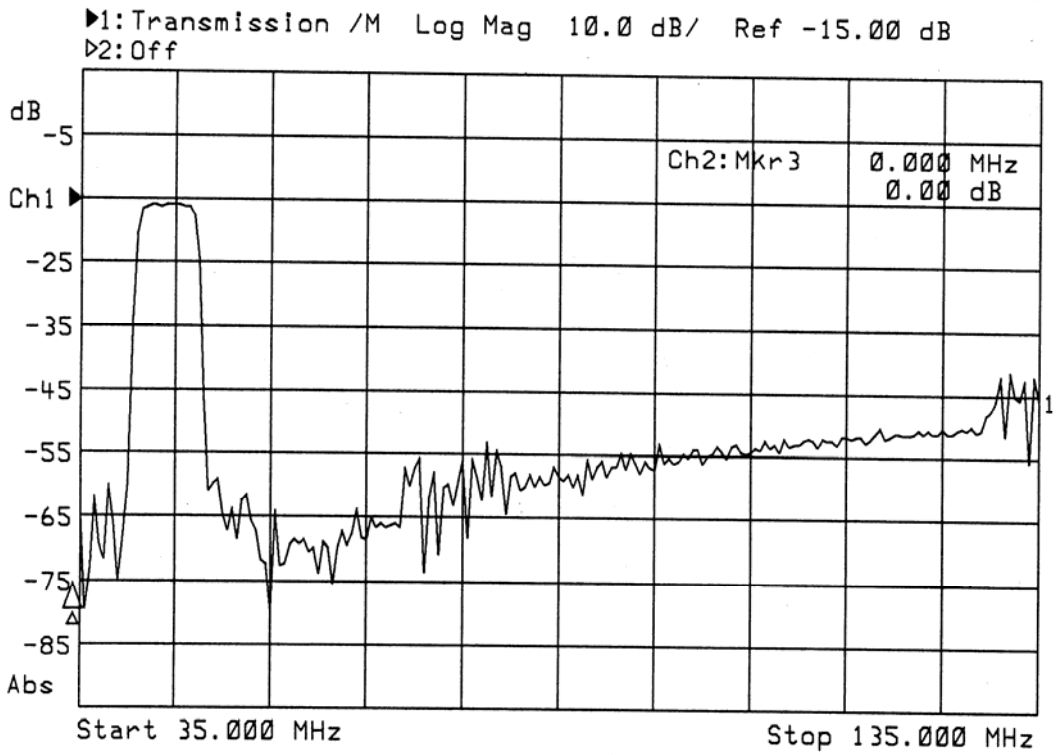
Item Test condition	Allowable change of absolute Level at center frequency(dB)
Surge test Between any two electrode 	<1.0

2.6 Frequency response：



Mkr	ΔFreq (MHz)	Ch 1 (dB)	Freq (MHz)	Ch 2 (dB)
1	-4.600	-54.47		
2	-4.000	-49.11		
3	-3.000	-3.15		
4	-2.530	-0.57		
5	2.530	-0.36		
6	3.000	-2.44		
7	4.000	-42.19		
8	6.000	-45.44		


CH1 S21 log MAG 1 dB/ REF -14.81 dB 3: -.0010 dB
CH2 S21 delay 30 ns/ REF 1.302 µs 3 -119.37 ps
0dB
START 40.000 000 MHz
STOP 48.000 000 MHz


▶1:Transmission /M Log Mag 10.0 dB/ Ref -15.00 dB
▷2:Off
dB
-5
Ch1 ▶
-25
-35
-45
-55
-65
-75
-85
Abs
Ch2:Mkr3 0.000 MHz
0.00 dB
Start 35.000 MHz
Stop 135.000 MHz