



Approved by:
Checked by:
Issued by:

# SPECIFICATION

PRODUCT: SAW FILTER

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MODEL: HB3613S (X6966D) SMD

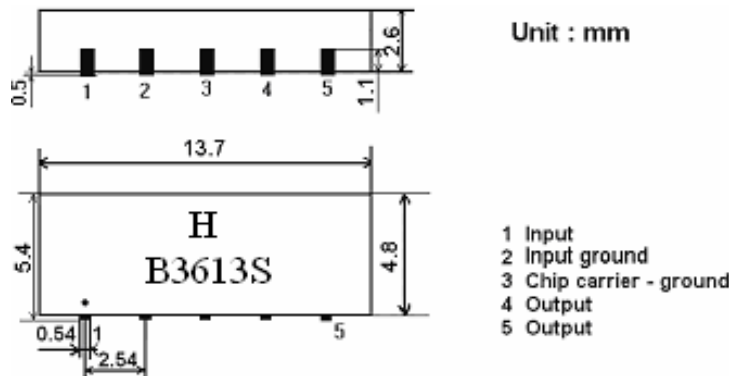
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**HOPE MICROELECTRONICS CO., LIMITED**

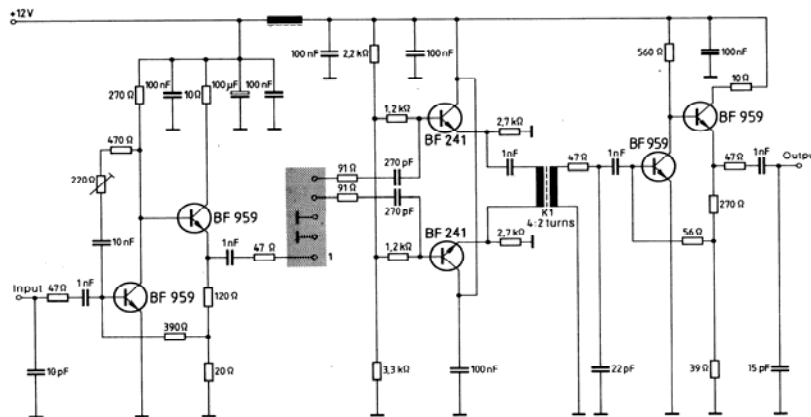
# 1. Construction

## 1.1 Dimension and materials

Type : B3613S



## 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°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°C ~ +60°C

## 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°C ~ +70°C

**Reference temperature** +25°C

## 2.1 Maximum Rating

<b>DC voltage</b>	<b>VDC</b>	<b>12</b>	<b>V</b>	<b>Between any terminals</b>
<b>AC voltage</b>	<b>Vpp</b>	<b>10</b>	<b>V</b>	<b>Between any terminals</b>

## 2.2 Electrical Characteristics

Source impedance  $Z_s=50\ \Omega$

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

Item	Freq	min	typ	max	
Center frequency	Fo	36.05	36.125	36.20	MHz
Insertion attenuation Reference level	36.125MHz	18.3	20.3	22.3	dB
Pass bandwidth	B1dB	-	7.5	-	MHz
	B3dB	-	8.0	-	MHz
	B30dB	-	9.4	-	MHz
Relative attenuation	32.32MHz	-	1.2	-	dB
	39.93MHz	-0.4	1.1	2.6	dB
	32.13MHz	1.6	3.1	4.6	dB
	40.13MHz	1.7	3.2	4.7	dB
	31.25MHz	35.0	48.0	-	dB
	47.25MHz	40.0	52.0	-	dB
Sidelobe	25.00~29.50MHz	35.0	41.0		dB
	29.50~31.25MHz	31.0	37.0		dB
	40.90~43.50MHz	31.0	37.0		dB
	43.50~50.00MHz	35.0	42.0		dB
<b>Reflected wave signal suppression</b> 1.2 us ... 6.0 us after main pulse (test pulse 250 ns , carrier frequency 36.125 MHz)		42.0	52.0		dB
<b>Feedthrough signal suppression</b> 1.3 us ... 1.2 us before main pulse (test pulse 250 ns , carrier frequency 36.125 MHz)		45.0	54.0		dB
<b>Group delay ripple (p-p)</b> 32.13 ~ 40.13 Mhz		-	50	-	ns
<b>Impedance at 36.125 Mhz</b>		-	-	-	-
Input: $Z_{in} = R_{in} // C_{in}$		-	2.9//14.1	-	k $\Omega$ // pF
Output: $Z_{in} = R_{in} // C_{in}$		-	2.4//4.4	-	k $\Omega$ // pF
<b>Temperature coefficient of frequency</b>			-72		ppm/k

## 2.3 Environmental Performance Characteristics

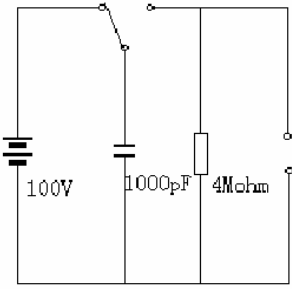
Item Test condition	Allowable change of absolute Level at center frequency(dB)
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High temperature test 70°C 1000H	< 1.0
Low temperature test -40°C 1000H	< 1.0
Humidity test 40°C 90-95% 1000H	< 1.0
Thermal shock -20°C==25°C==80°C 20 cycle 30M 10M 30M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

#### 2.4 Mechanical Test

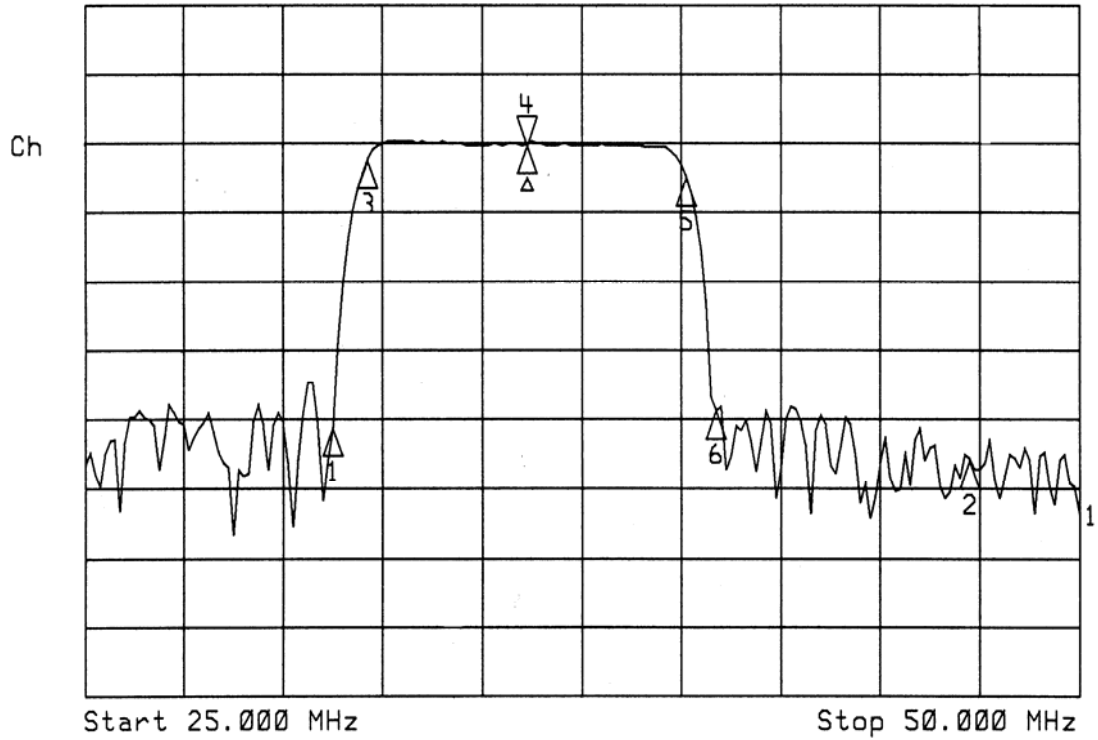
Item Test condition	Allowable change of absolute Level at center frequency(dB)
Vibration test 600-3300rpm amplitude 1.5mm 3 directions 2 H each	<1.0
Drop test On maple plate from 1 m high 3 times	<1.0
Lead pull test Pull with 1 kg force for 30 seconds	<1.0
Lead bend test 90° bending with 500g weigh 2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

►1: Transmission /M Log Mag 10.0 dB/ Ref -20.75 dB  
 ►2: Off



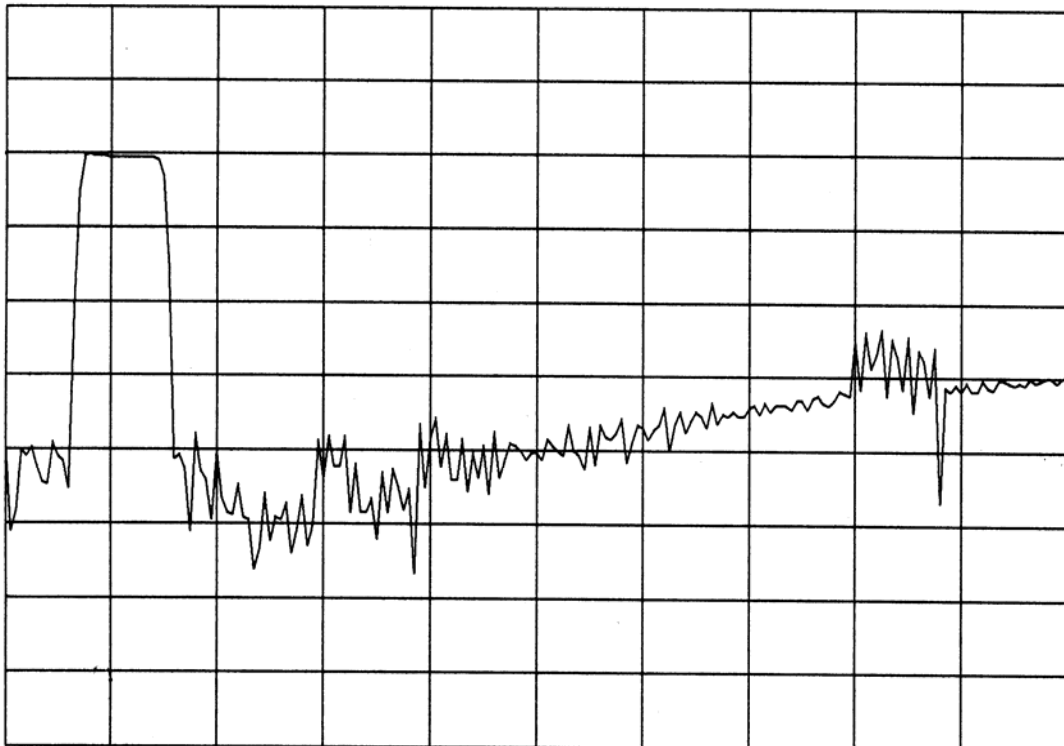
Mkr	ΔFreq (MHz)	Ch 1 (dB)	Freq (MHz)	Ch 2 (dB)
1	-4.875	-41.12		
2	11.125	-45.78		
3	-3.995	-2.10		
4	0.000	0.00		
5	4.005	-4.82		
6	4.775	-38.51		
7				
8				

CH1 S21 log MAG 1 dB/ REF -20.71 dB 2: -.0028 dB  
 CH2 S21 delay 30 ns/ REF 1.311 ps 2 127.1 ps



START 30.000 000 MHz STOP 42.000 000 MHz

►1: Transmission /M Log Mag 10.0 dB/ Ref -21.32 dB



Start 25.000 MHz

Stop 125.000 MHz