

SW153 SW172 SW173 SW174 SW203 SW250 SW260 SW453

SURFACE ACOUSTIC WAVE COLOUR TV IF FILTERS

This comprehensive range of TV IF filters utilises Plessey Surface Acoustic Wave technology and is suitable for use in colour or monochrome television receivers world wide. The frequency pass-band and phase response of each of these highly stable devices are tailored to the relative transmission standard. The devices require no adjustment and are packaged in a totally hermetic Metal/Glass T08 package.

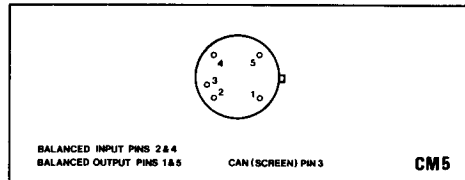


Fig. 1 Pin connections (viewed from beneath)

FEATURES

- No Adjustment Necessary
- Low Cost
- Compact Dimensions
- High Stability
- High Reliability
- Comprehensive Range of Standards Available

APPLICATION NOTES

The input drive and output load circuitry should provide a low impedance across at least one device port to minimise spurious signals due to secondary device characteristics. Fig. 2 shows a typical application, the SL1430 providing a very low drive impedance. The 330 Ω load resistor is included to ensure stability of the TDA2540 and may be omitted in some designs that do not use this device.

Care must be taken with the printed circuit board layout, and the use of balanced input and output is advised to ensure low levels of direct breakthrough. The device must also be mounted with minimum lead length. Application introduced direct breakthrough will exhibit itself as a deterioration in amplitude and group delay ripple, and a screen image approximately 1.5 μ s before the main response.

TEST CIRCUIT

The recommended test circuit is shown in Fig.3. When used in a 50 Ω system, with the input unterminated, the extra loss introduced by the test circuit is 2.5dB.

An earthed metal screen of at least 2 x 3cm should be incorporated between the leads as shown. A suitable transformer is available from MINI-CIRCUITS, New York, U.S.A., type number T5-1T.

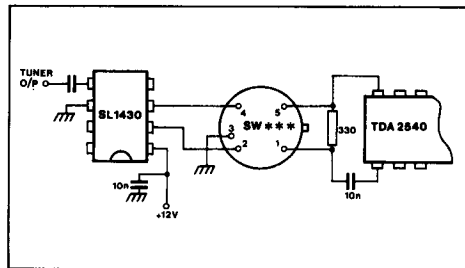


Fig. 2 Typical application

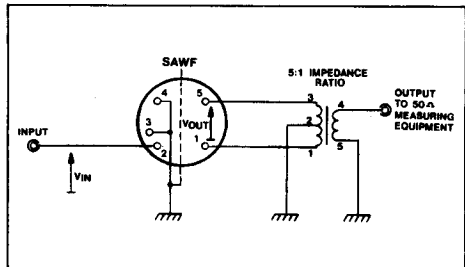


Fig. 3 Test circuit

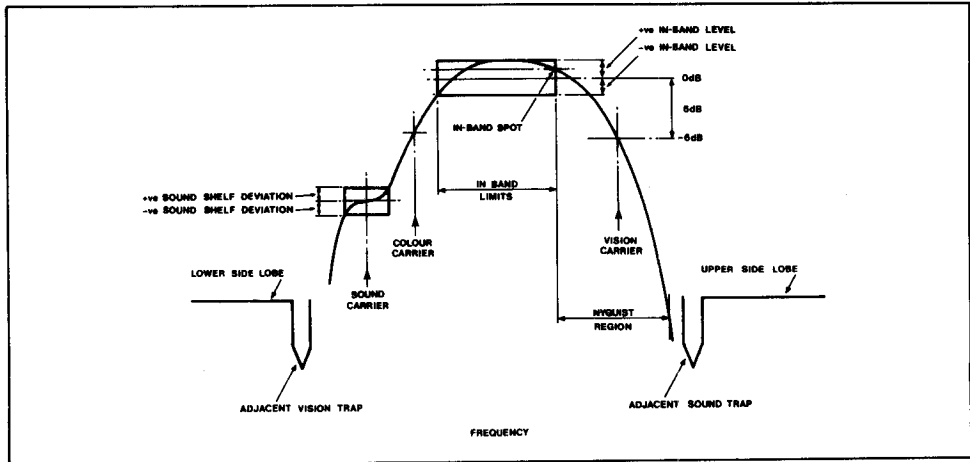


Fig. 4 Amplitude characteristics

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated) :-
 Ambient temperature +35°C
 Input drive impedance 50 Ω
 Load impedance 250 Ω balanced

The amplitude level at the vision carrier frequency is taken to be -6dB and is then used as a reference for all other relevant measurements (see Fig. 4). The insertion loss is defined as the voltage ratio $2V_{IN}/V_{OUT}$ in the test circuit (Fig.3) at the vision carrier frequency and is expressed in dB. This relates to the 0dB level shown in Fig.4.

The amplitude characteristics given in the Electrical Characteristic tables are defined in Fig. 4. The response in the Nyquist region is guaranteed by the measurement of the $2T \sin^2$ pulse and bar K rating after synchronous demodulation.

In-band amplitude ripple is defined as the worst deviation from the mean over any 500kHz bandwidth between the two defined in-band frequency limits.

The measurement of spurious outputs includes those due to internal reflections and direct breakthrough, a $2T \sin^2$ pulse being used and measurements being made between 2 and 1μs before, and 1 and 4μs after, the centre of the main response.

SW153

The SW153 is a TV IF filter for the United Kingdom PAL standard, system I, with a vision carrier frequency of 39.5MHz.

Characteristic	Frequency MHz	Value			Units	Conditions
		Min.	Typ.	Max.		
Vision carrier	39.5	Ref. level	-6		dB	Peak
Colour carrier	35.1	-6	-3	0	dB	
Sound carrier	33.5	-25	-22	-19	dB	
Sound shelf deviation	33.2-33.8		±1	±3	dB	
In-band level	36-38	-2	0	2	dB	
In band spot	38	-1.5	0	1.5	dB	
In-band ripple	36-38		0.5	1	dB	
Adjacent vision trap	31.5	-45	-55		dB	
Adjacent sound trap	41.5	-40	-50		dB	
Lower side lobe	26.5-31.5	-40	-50		dB	
Upper side lobe	41.5-46.5	-36	-42		dB	
	46.5-100		-30		dB	
Insertion loss		18	21	24	dB	
2T sin ² pulse and bar K rating	39.5		1.5	2	%	
Group delay deviation	34.5-40.5		10	40	ns	
Spurious outputs	39.5		-48	-42	dB	
Temperature coefficient of frequency					ppm/°C	
Small signal impedances						
Input pins 2 & 4			1.6k Ω// 8pF			
Output pins 1 & 5			1.8k Ω// 10pF			

SW172

The SW172 is a TV IF filter for the European PAL standard systems B & G with a vision carrier frequency of 38.9MHz.

Characteristic	Frequency (MHz)	Value			Units	Conditions
		Min.	Typ.	Max.		
Vision Carrier	38.9	Ref. level -6			dB	Peak
Colour Carrier	34.5	-5	-3	-1	dB	
Sound Carrier	33.4		-27	-24	dB	
Sound Shelf	33.1 to 33.5		-28	-20	dB	
In-band level	35.5 to 37.4	-1.5	0	1.5	dB	
In-band ripple	35.5 to 37.4		0.5	1	dB	
Adjacent vision trap						
UHF	30.9	-42	-48		dB	
VHF	31.8 to 32	-46	-50		dB	
Adjacent sound trap						
VHF	40.3 to 40.5	-42	-46		dB	
UHF	41.4	-40	-44		dB	
Lower side lobe	27.5 to 31.9	-40	-44		dB	
Upper side lobe	40.4 to 45	-38	-42		dB	
	45 to 100		-30		dB	
Insertion loss		18	20	23	dB-	
2Tsin ² pulse and bar K rating	38.9		2	3	%	
Group delay deviation	34.1		80		ns	
	34.5	40	60	80	ns	
	34.15		0		ns	
	36.9		-90		ns	
	37.9		-55		ns	
	39.9		-20		ns	
Spurious outputs	38.9		-48	-42	dB	
Temperature Coefficient of frequency			-90		ppm/°C	
Small signal impedances						
Input pins 2 & 4			1.6kΩ// 10pf			
Output pins 1 & 5			1kΩ// 12pf			

SW173

The SW173 is a TV IF filter for the European PAL standard, systems B and G, with a vision frequency of 38.9MHz

Characteristic	Frequency MHz	Value			Units	Conditions
		Min.	Typ.	Max.		
Vision carrier	38.9	Ref. level -6			dB	Peak
Colour carrier	34.5	-5	-3	-1	dB	
Sound carrier	33.4	-23	-20	-17	dB	
Sound shelf deviation	33.1-33.5		±2	±4	dB	
In-band level	35.5-37.4	-2	0	2	dB	
In-band spot	37.4	-1.5	0	1.5	dB	
In-band ripple	35.5-37.4		0.75	1.5	dB	
Adjacent vision trap						
UHF	30.9	-40	-43		dB	
VHF	31.9	-42	-46		dB	
Adjacent sound trap						
VHF	40.4	-42	-46		dB	
UHF	41.4	-40	-43		dB	
Lower side lobe	27.5-31.9	-37	-42		dB	
Upper side lobe	40.4-45	-37	-42		dB	
	45-100		-30		dB	
Insertion loss		18	20	23	dB	
2T sin ² pulse and bar K rating	38.9		2	3	%	

SW173 (Continued)

Characteristic	Frequency MHz	Value			Units	Conditions
		Min.	Typ.	Max.		
Group delay deviation	34.1		400		ns	Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz
	34.5		170		ns	
	35.15		0		ns	
	36.9		-90		ns	
	37.9		-53		ns	
	39.9		-53		ns	
Spurious outputs	38.9		-48	-42	dB	
Temperature coefficient of frequency			-72		ppm/°C	
Small signal impedances			1.6kΩ//			
Input pins 2 & 4			8pF			
Output pins 1 & 5			1.8kΩ//			
			10pF			

SW174 ADVANCE INFORMATION *

The SW174 is a TV IF filter for the European PAL standard systems B & G with a vision carrier frequency of 38.9MHz

Characteristic	Frequency MHz	Value			Units	Conditions
		Min.	Typ.	Max.		
Vision Carrier	38.9		Ref. level -6		dB	
Colour Carrier	34.5	-4	-2	0	dB	
Sound Carrier	33.4	-23	-20	-17	dB	
Sound Shelf deviation	32.8 to 33.5		+2/-4	+4/-6	dB	
In-band level	35.5 to 37.4	-1.5	0	1.5	dB	Peak
In-band ripple	35.5 to 37.4		0.5	1	dB	
Adjacent vision trap						
UHF	30.9	-42	-48		dB	
VHF	31.8 to 32	-46	-50		dB	
Adjacent sound trap						
VHF	40.1 to 40.3	-40	-46		dB	
	40.3 to 40.5	-46	-50		dB	
UHF	41.4	-40	-44		dB	
Lower side lobe	27.5 to 31.9	-40	-46		dB	
Upper side lobe	40.4 to 45	-38	-42		dB	
	45 to 100		-30		dB	
Insertion loss		18	20	23	dB	
2Tsin ² pulse and bar K rating	38.9		2	3	%	
Group delay deviation	34.1		80		ns	Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz Reference 0 @ 38.9MHz
	34.5	40	60	80	ns	
	35.15		0		ns	
	36.9		-90		ns	
	37.9		-55		ns	
	39.9		-20		ns	
Spurious outputs	38.9		-48	-42	dB	
Temperature Coefficient of frequency			-90		ppm/°C	
Small signal impedances			1.6kΩ//			
Input pins 2 & 4			10pf			
Output pins 1 & 5			1kΩ//			
			12pf			

* Advance information is issued to advise Customers of new additions to the Plessey Semiconductors range which, nevertheless, still have 'pre-production' status. Details given may, therefore, change without notice although we would expect this performance data to be representative of 'full production' status product in most cases. Please contact your local Plessey Semiconductors Sales Office for details of current status.

SW203

The SW203 is a TV IF filter for the North American NTSC standard systems M & N with a vision carrier frequency of 45.75 MHz.

Characteristic	Frequency MHz	Value			Units	Conditions
		Min.	Typ.	Max.		
Vision Carrier	45.75	Ref. level - 6			dB	Peak
Colour Carrier	42.17	-6	-3	0	dB	
Sound Carrier	41.25	-23	-19	-15	dB	
In-band level	43 to 44.25	-2	0	2	dB	
In-band ripple	43 to 44.25		0.5	1.5	dB	
Adjacent vision trap	39.75	-40	-50		dB	
Adjacent sound trap	47.5	-38	-46		dB	
Lower side lobe	35 to 39.75	-35	-40		dB	
Upper side lobe	47.5 to 52.5 52.5 to 125	-35	-40		dB	
Insertion loss		12	15	20	dB	
2Tsin ² pulse and bar K rating	45.75		2	3	%	
Group delay deviation	43 to 44.25		20		ns	
Spurious outputs			-46	-40	dB	
Temperature Coefficient of frequency			-72		ppm/°C	
Small signal impedances						
Input pins 2 & 4			1 kΩ// 13 pf			
Output pins 1 & 5			1.5 kΩ// 11 pf			

SW250 ADVANCE INFORMATION

The SW250 is a TV IF filter for the French SECAM standard systems L & L' with a vision carrier frequency of 32.7 MHz.

Characteristic	Frequency MHz	Value			Units	Conditions
		Min.	Typ.	Max.		
Vision Carrier	32.7	Ref. level - 6			dB	Peak
Colour Carrier	37	-2	-0.5	1	dB	
	38	-3	-6	-9	dB	
In-band level	34.5 to 36	-2	0	2	dB	
In-band ripple	34.5 to 36		1	1.5	dB	
Adjacent vision trap	40.7	-38	-43		dB	
Adjacent sound trap	31.2	-46	-50		dB	
Own Sound UHF	39.2	-43	-46		dB	
VHF	43.85	-43	-46		dB	
Lower side lobe	26 to 31.2	-38	-42		dB	
Upper side lobe	39.2 to 45 45 to 90	-38	-42		dB	
Insertion loss		19	22	25	dB	
2Tsin ² pulse and bar K rating			2	3	%	
Group delay deviation	34.5 to 36		15	50	ns	
Spurious outputs	32.7		-48	-42	dB	
Temperature Coefficient of frequency			-90		ppm/°C	
Small signal impedances						
Input pins 2 & 4			1.6 kΩ// 10 pf			
Output pins 1 & 5			1.2 kΩ// 11 pf			

SW260 ADVANCE INFORMATION

The SW260 is a TV IF filter for the Eastern European SECAM standard system D and compatible with systems B and G with a vision carrier frequency of 38MHz.

Characteristic	Frequency MHz	Value			Units	Conditions
		Min.	Typ.	Max.		
Vision Carrier	38	Ref. level -6			dB	Peak
Colour Carrier	33.1	-6	-3	0	dB	
	33.7	-4	-2	0	dB	
Sound Carrier	31.5	-24	-21	-18	dB	
Sound Shelf	31.3 to 32.5	-27		-15	dB	
In-band level	34.5 to 36.5	-2	0	+2	dB	
In-band ripple	34.5 to 36.5		1	2	dB	
Adjacent vision trap	30	-43	-50		dB	
Adjacent sound trap	39.5	-40	-46		dB	
Lower side lobe	25.5 to 30	-37	-42		dB	
Upper side lobe	39.5 to 44.5 44.5 to 100	-37	-42 -30		dB	
Insertion loss		18	20	24	dB	
2T sin ² pulse and bar K rating	38		2	3	%	
Group delay deviation	32.5 to 39		15	50	ns	
Spurious outputs	38		-46	-40	dB	
Temperature Coefficient of frequency			-72		ppm/°C	
Small signal impedances						
Input pins 2 & 4			1.6kΩ// 8pf			
Output pins 1 & 5			1.8kΩ// 10pf			

SW453 ADVANCE INFORMATION

The SW453 is a TV IF filter for the South African PAL standard, system I, with a vision carrier frequency of 38.9MHz.

Characteristic	Frequency MHz	Value			Units	Conditions
		Min.	Typ.	Max.		
Vision carrier	38.9	Ref. level -6			dB	Peak
Colour carrier	34.47	-6	-3	0	dB	
Sound carrier	32.9	-25	-22	-19	dB	
In-band level	35.5-37.4	-2.5	0	2.5	dB	
In-band ripple	35.5-37.4		0.5	1.5	dB	
Adjacent vision trap	30.9	-40	-46		dB	
Adjacent sound trap	40.9	-38	-43		dB	
Lower side lobe	25.8-30.9	-38	-45		dB	
Upper side lobe	40.9-46	-35	-40		dB	
Insertion loss		18	20	24	dB	
2T sin ² pulse and bar K rating	38.9		1.5	2	%	
Group delay deviation	35.5-37.4		25	50	ns	
Spurious outputs	38.9		-46	-40	dB	
Temperature coefficient of frequency			-72		ppm/°C	
Small signal impedances						
Input pins 2 & 4			1.6kΩ// 8pF			
Output pins 1 & 5			1.8kΩ// 10pF			

ABSOLUTE MAXIMUM RATINGS

Storage temperature	-25°C to +85°C
Operating temperature	-10°C to +70°C
Pin to pin voltage	30V (short term) 10V (continuous)
Pin to case voltage	100V

TYPICAL AMPLITUDE RESPONSES

