

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.

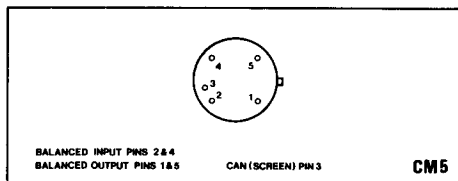


Fig. 1 Pin connections (viewed from beneath)

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.

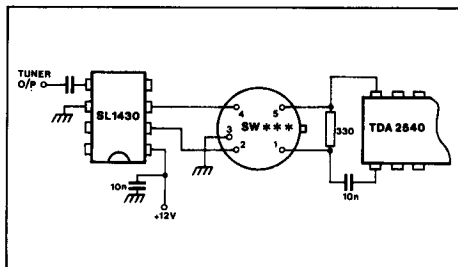


Fig. 2 Typical application

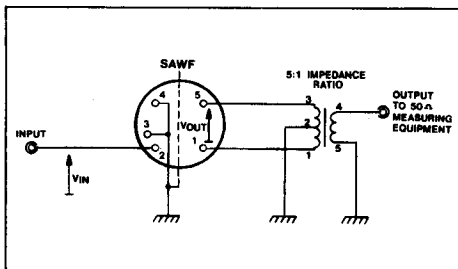


Fig. 3 Test circuit

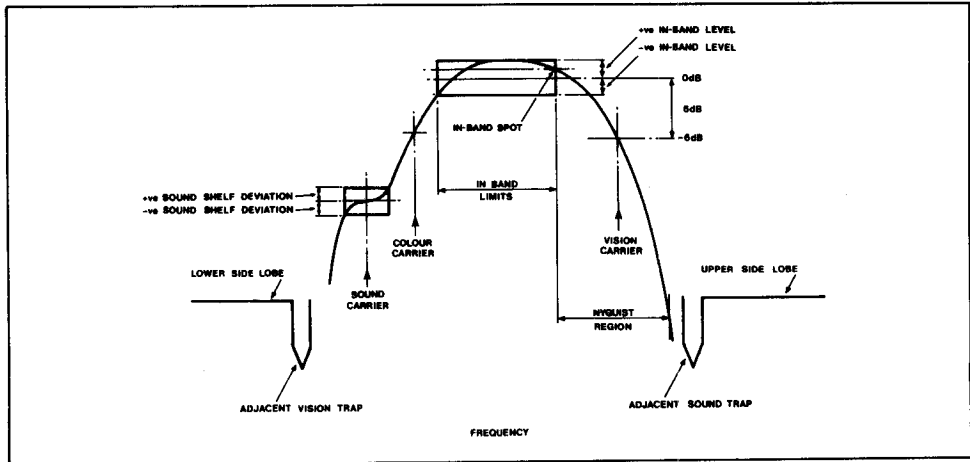


Fig. 4 Amplitude characteristics

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 | | | -72 | | 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 | | | 1.5kΩ// 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 | | | 1.6kΩ// 10 pf | | | |
| Output pins 1 & 5 | | | 1.2kΩ// 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 | |
| 2Tsin 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

