# TVP5151 Anti-Aliasing Filters

## 1 Overview

Anti-alias filtering may be required if out-of-band noise is present on the inputs to the TVP5151. Figure 1 shows two example filters with good cost/performance characteristics for typical applications. A different filter is shown for S-Video because the TVP5151 sample rate for each S-Video component is 13.5 MHz, compared to 27 MHz for composite video. Similarly effective noise attenuation therefore requires a steeper rolloff and a higher-order filter.

The example S-Video filter is shown in a form that can be implemented in two stages separated by a switch, so that only the second stage is used for composite video input. If a two-stage approach is not desired, then the 470-pF/180-pF capacitor pair may be replaced in the design with a single 680-pF capacitor.

Figure 2 and Table 1 show amplitude and group delay characteristics for the example filters of Figure 1.

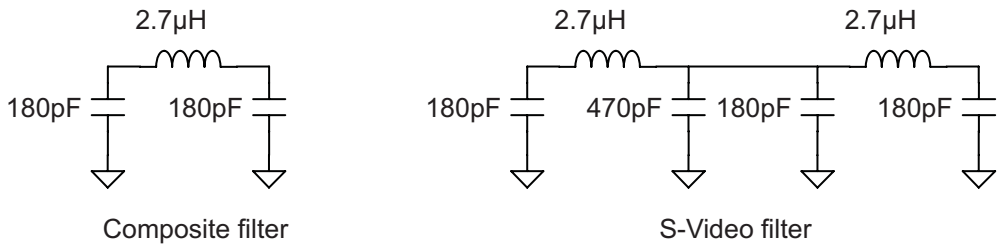


**Figure 1. Example Anti-Aliasing Filters for Composite and S-Video**

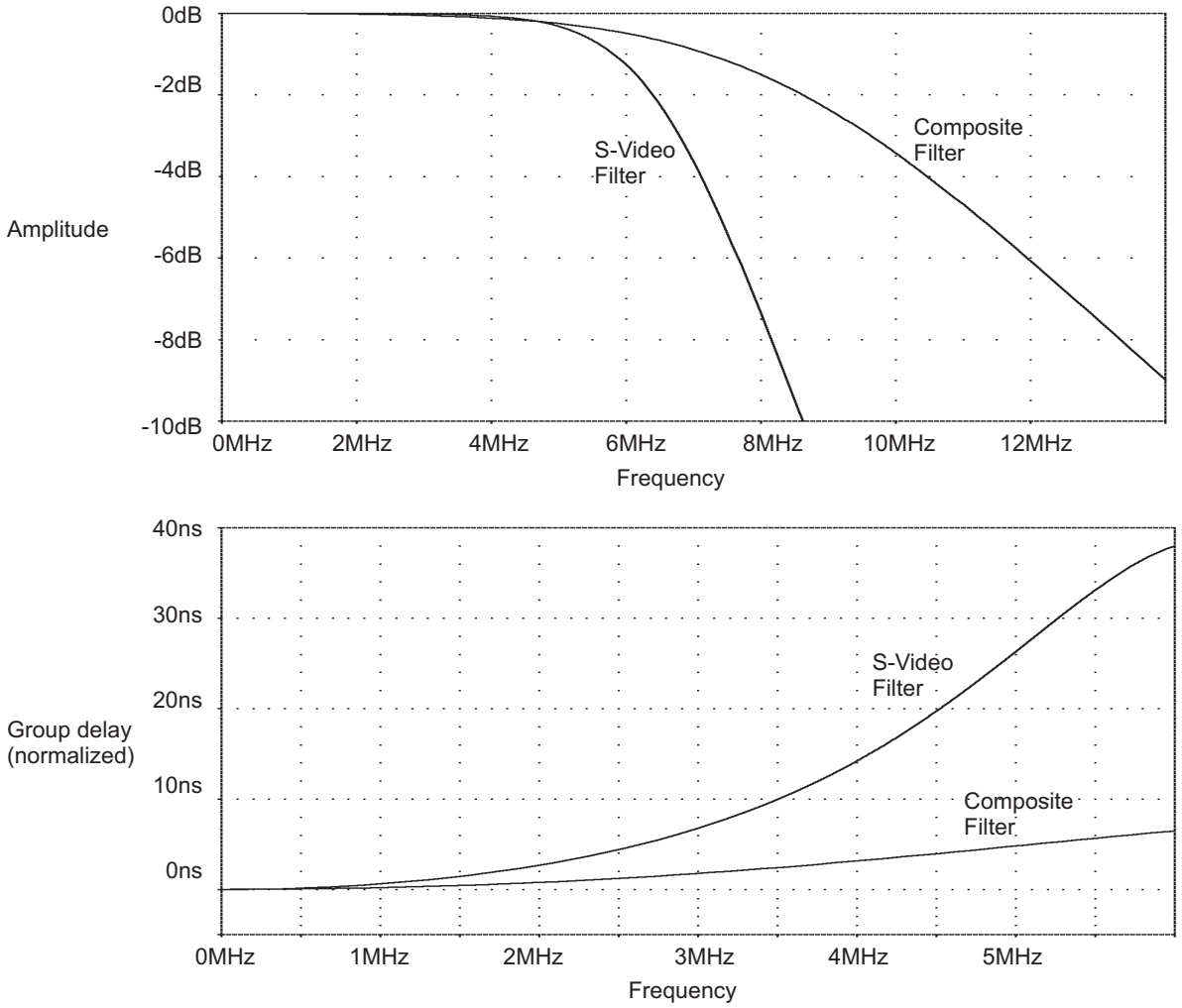


**Figure 2. Example Anti-Aliasing Filter Characteristics**

**Table 1. Example Anti-Aliasing Filter Characteristics (Detail)**

| Frequency | Composite Filter | | S-Video Filter | | Notes |
|---|---|---|---|---|---|
| | Amplitude | Delay | Amplitude | Delay | |
| 3.58 MHz | | 3 ns | | 11 ns | NTSC color subcarrier |
| 4.2 MHz | –0.1 dB | 4 ns | –0.1 dB | 16 ns | NTSC bandwidth |
| 4.43 MHz | | 4 ns | | 19 ns | PAL color subcarrier |
| 6 MHz | –0.5 dB | 7 ns | –1.3 dB | 38 ns | PAL-D bandwidth |
| 7.5 MHz | –1.1 dB | | –5.4 dB | | PAL sampled image for S-video |
| 9.3 MHz | –2.7 dB | | –13 dB | | NTSC sampled image for S-video |
| 21 MHz | –18 dB | | –47 dB | | PAL sampled image for composite |
| 22.8 MHz | –20 dB | | –51 dB | | PAL sampled image for composite |

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