Keywords: level shift video signals, video amplifiers

APPLICATION NOTE 4028

How to Level Shift Video Signals for DC-Coupled Video Amplifiers/Filters

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Abstract: This application note describes a method to level shift a -0.3V to 0.7V video signal to 0 to 1V.

Maxim offers chips for filtering and amplifying analog video signals. Many of these chips are designed to be connected to the output of a video digital-to-analog converter (DAC).

To characterize the video performance of these video amplifiers/filters, standard video test signals such as color bars are applied. Although the video test signals from most video test-pattern generators range between -0.3V and 0.7V, many Maxim chips expect a video signal between 0 and 1V. The simple circuit shown in **Figure 1** can level shift the output of the video test generator so that the resulting signal is between 0 and 1V.

The circuit consists of a first amplifier with a gain of -1, followed by a second amplifier in a gain of -2. Hence, the total gain is +2. By moving the wiper of the potentiometer connected to the noninverting input on the second amplifier, the output DC level can be adjusted.

The input termination resistance of the level-shift circuit in Figure 1 is still approximately 75Ω. This is because the parallel combination of the 100Ω resistor to ground and the 300Ω input resistance of the inverting amplifier is 75Ω.

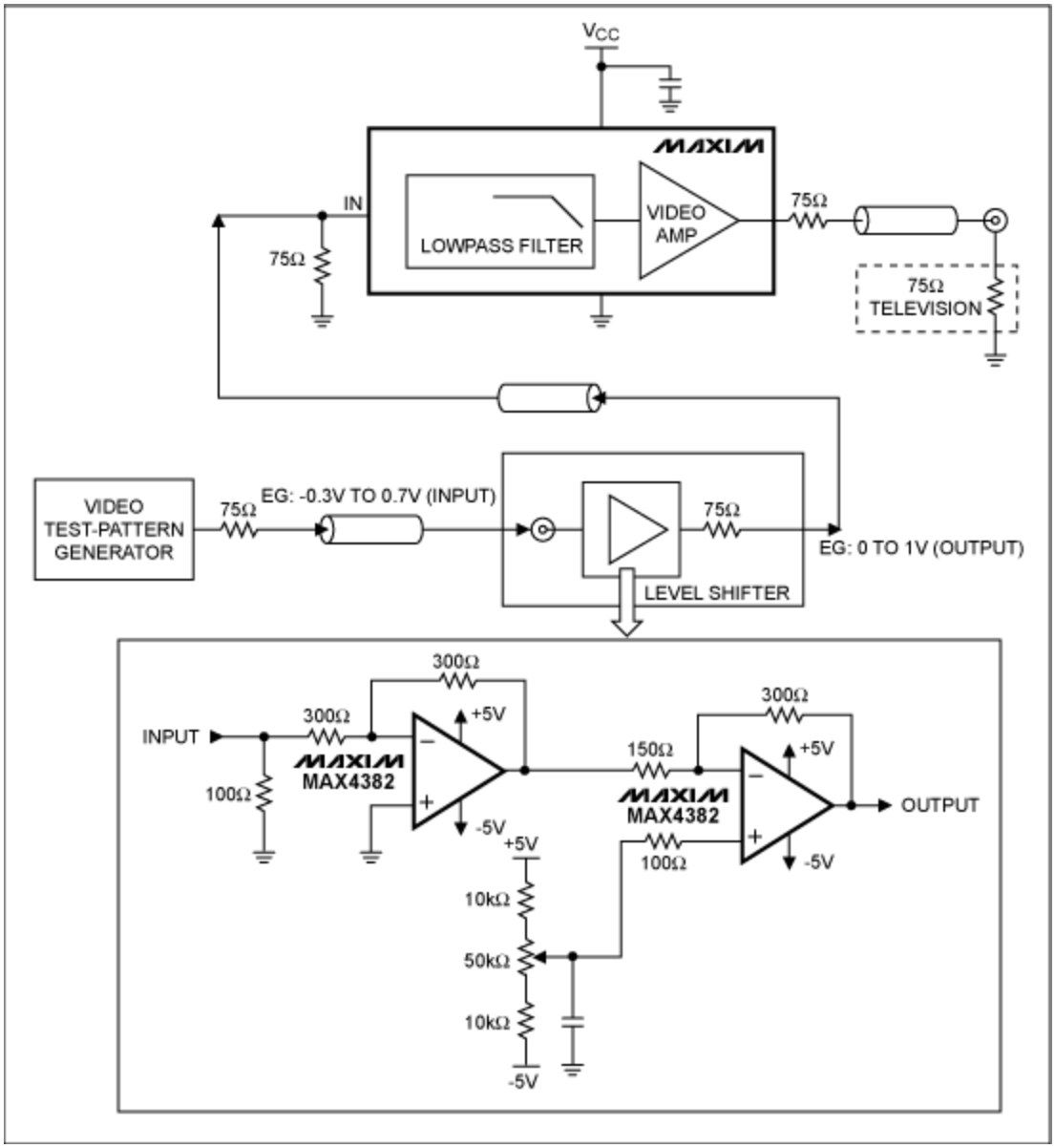

Figure 1. Implementation of a level shifter.

Figure 2 shows a standard NTSC composite test-video signal (color-bar signal generated with a Tektronix 1910 digital generator), to which a DC offset is added.

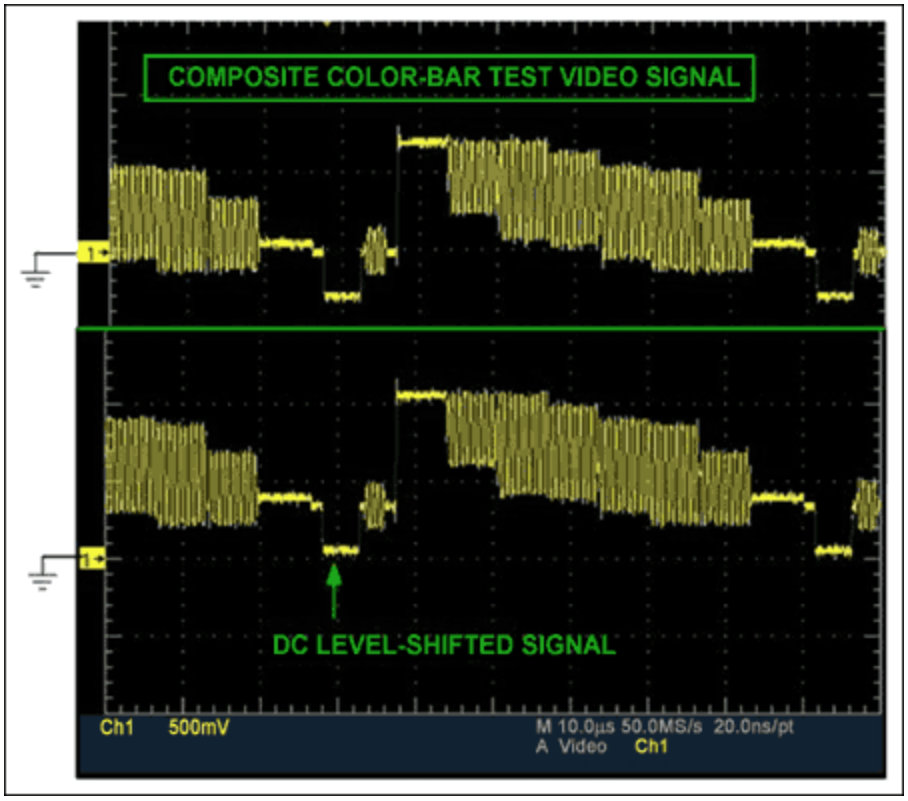

Figure 2. Composite color-bar test video signal.

Figure 3 shows the component S-video signals, both luma and chroma (color bar generated with a Quantum Data 802 BT video test generator), to which an offset voltage is added to level shift the test signal.

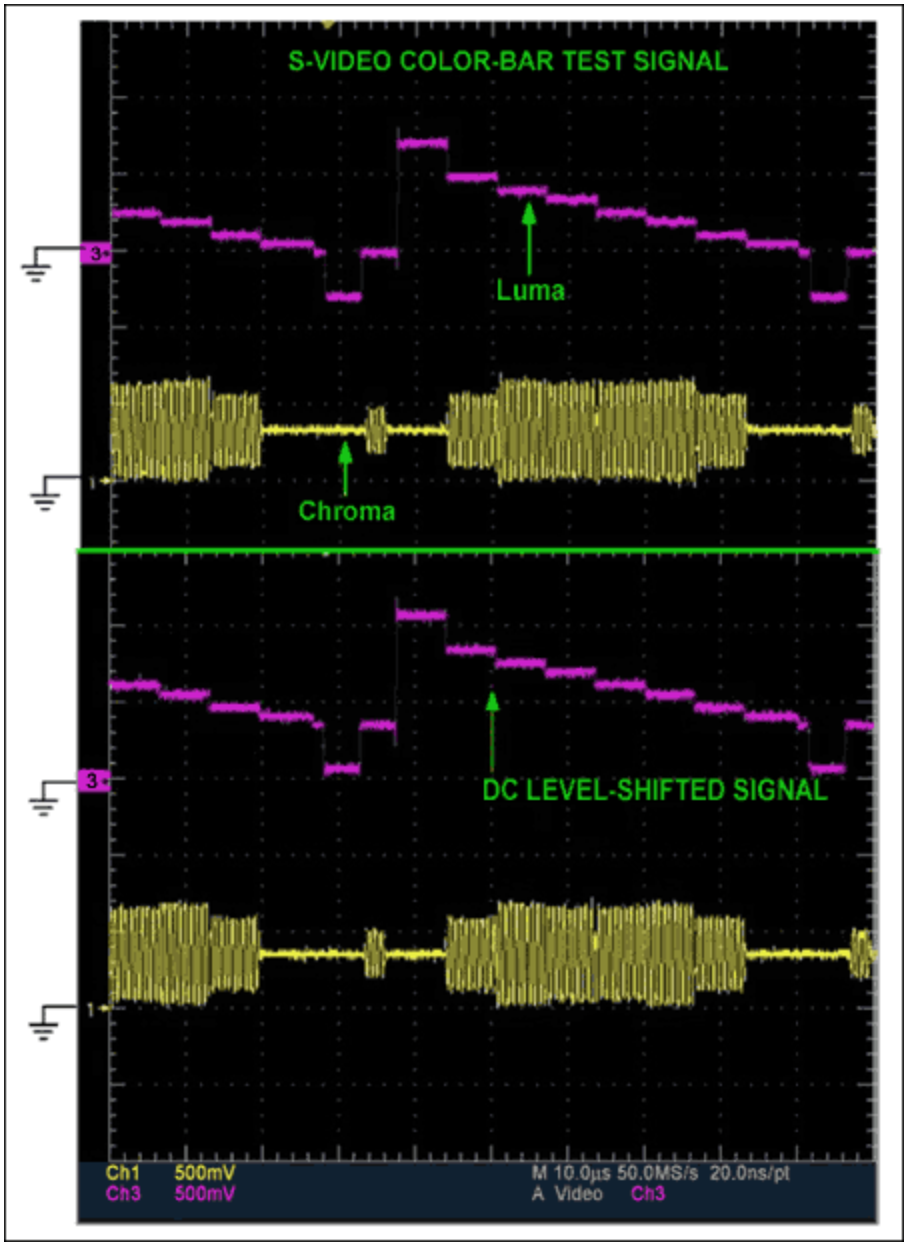

Figure 3. An S-video color-bar test video signal.

Figure 4 shows the 1080i format test signal (generated with a Quantum Data 802 BT video test generator), to which an offset voltage is added to level shift the test signal.

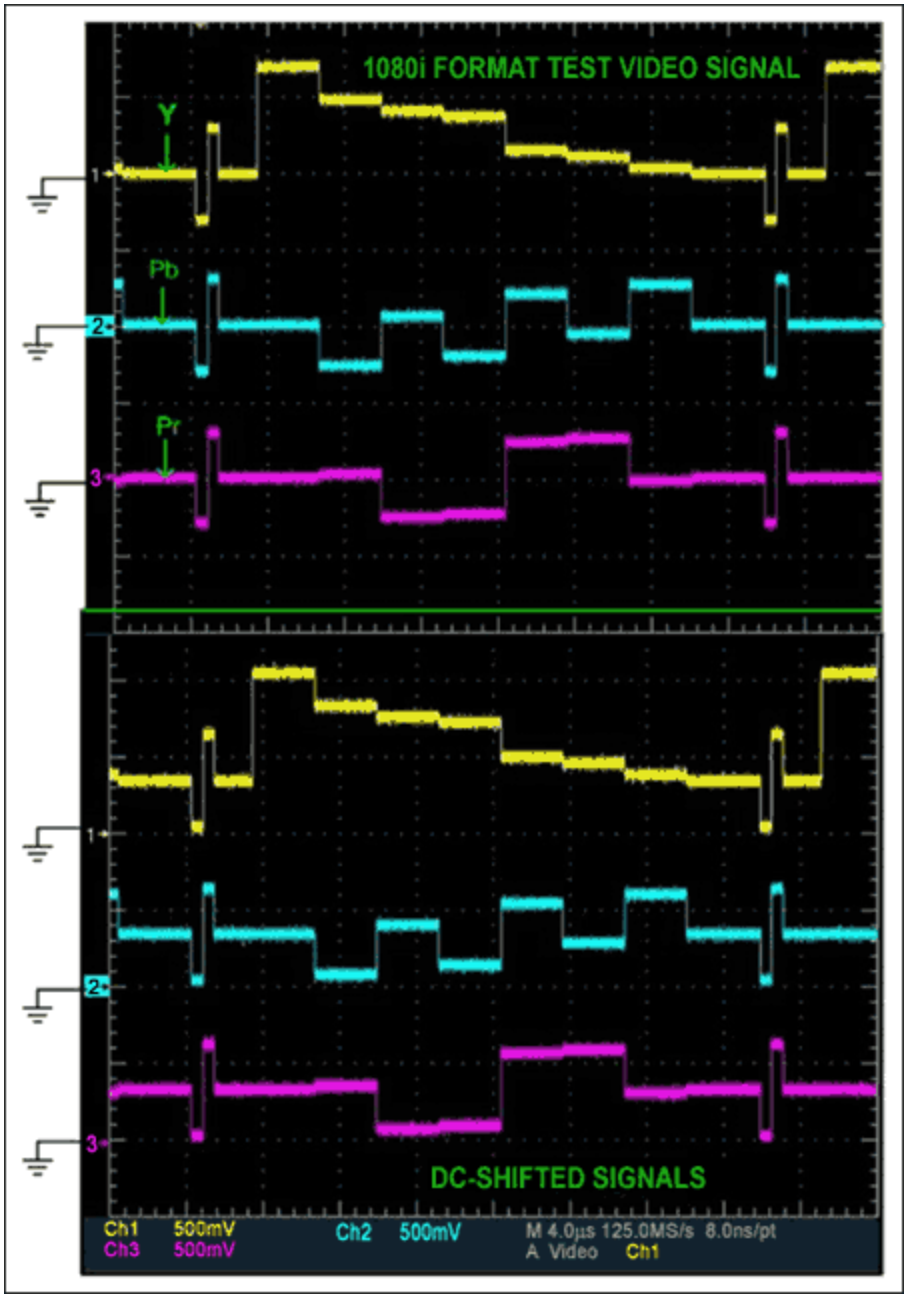

Figure 4. 1080i format test video signal.

Related Parts		
MAX9502	2.5V Video Amplifier with Reconstruction Filter	Free Samples

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