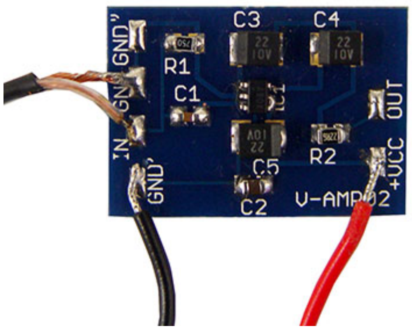
AMP-VID6
VIDEO AMPLIFIER-BUFFER



Video amp **AMP-VID6** with 6dB gain and a video buffer with sync-tip clamp is all-in-one is designed to drive DC-coupled, 150 ohms back-terminated video loads in portable video applications such as digital still cams, portable DVD players, digital camcorders, PDAs, video enabled cell phones, portable game systems, and notebook computers. The input clamp positions the videowaveform at the output and allows the AMP-VID6 to be used as a DC-coupled output driver.

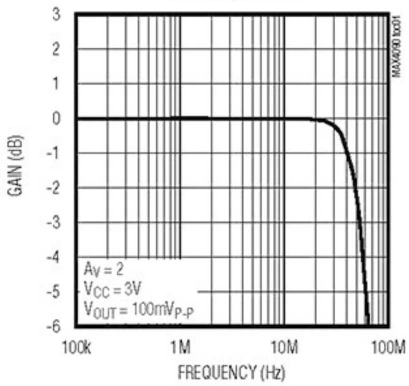
The AMP-VID6 operates from a single 2.7V to 5.5V supply and consumes only 6.5mA of supply current. The input signal to the AMP-VID6 is AC-coupled through a capacitor into an active sync-tip clamp circuit, which places the minimum of the video signal at approximately 0.38V. The output buffer amplifies the video signal while still maintaining the 0.38V clamp voltage at the output. For example, if VIN = 0.38V, then VOUT = 0.38V. If VIN = 1.38V, then VOUT = 0.38V + (2 x1V) = 2.38V. The net result is that a 2V video output signal swings within the usable output voltage range of the output buffer when VCC = 3V.

In most video applications, the video signal generated from the DAC requires a reconstruction filter to smooth out the signal and attenuate the sampling aliases. The **AMP-VID6** is a direct DC-coupled output driver, which can be used after the reconstruction filter to drive the video signal. The driving load from the video DAC can be varied from 75∧ to 300∧. A low input impedance (<100∧) is required by the **AMP-VID6** in normal operation, special care must be taken when a reconstruction filter is used in front of the **AMP-VID6**. For standard video signal, the video passband is about
6MHz and the system oversampling frequency is at 27MHz. Normally, a 9MHz BW lowpass filter can be used for the reconstruction filter. This section demonstrates the methods to build simple 2nd- and 3rd-order passive butterworth lowpass filters at the 9MHz cutoff frequency and the techniques to use them with the **AMP-VID6** (Figures 1 and 4).

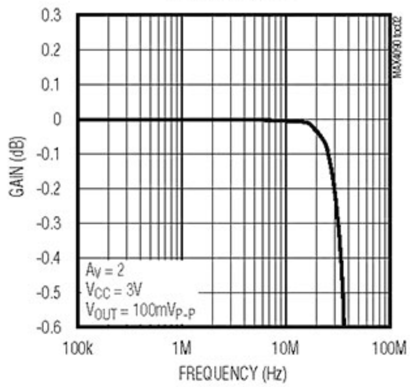
Typical Operating Characteristics

(V_{CC} = 3.0V, GND = 0V, FB shorted to OUT, C_{IN} = 0.1µF, R_{IN} = 75Ω to GND, R_L = 150Ω to GND, $\overline{SHDN}$ = V_{CC}, T_A = +25°C, unless otherwise noted.)

SMALL-SIGNAL GAIN vs. FREQUENCY



SMALL-SIGNAL GAIN FLATNESS vs. FREQUENCY



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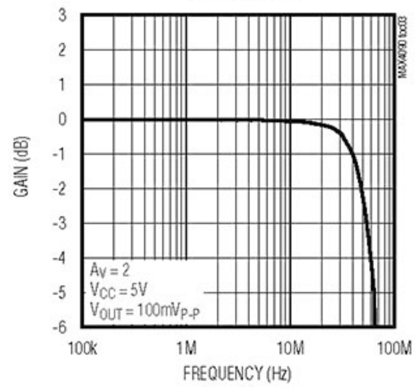
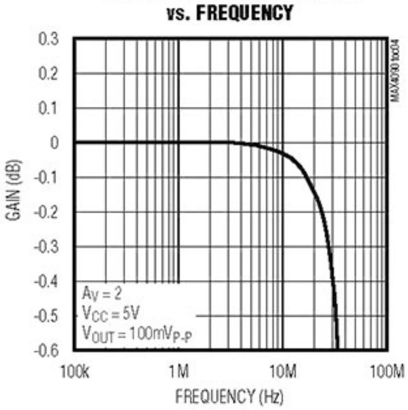
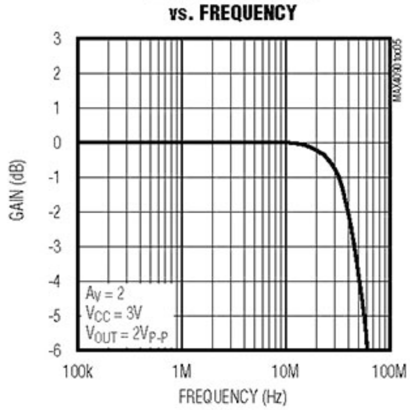


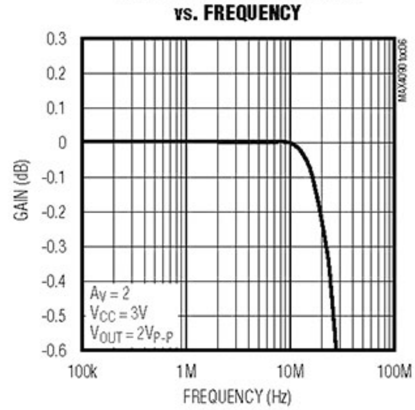
SMALL-SIGNAL GAIN FLATNESS vs. FREQUENCY



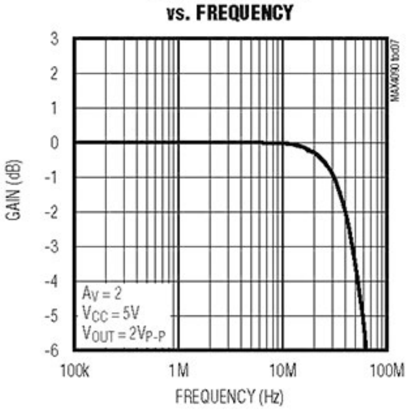
LARGE-SIGNAL GAIN vs. FREQUENCY



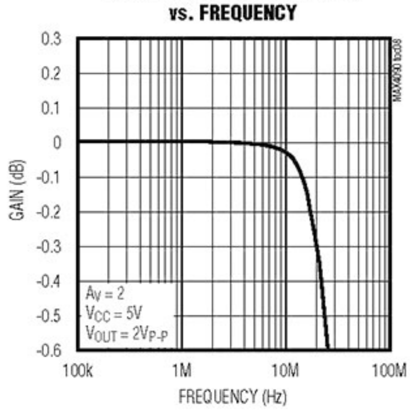
LARGE-SIGNAL GAIN FLATNESS vs. FREQUENCY



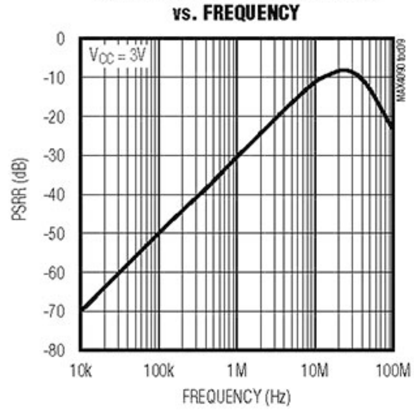
LARGE-SIGNAL GAIN vs. FREQUENCY



LARGE-SIGNAL GAIN FLATNESS vs. FREQUENCY



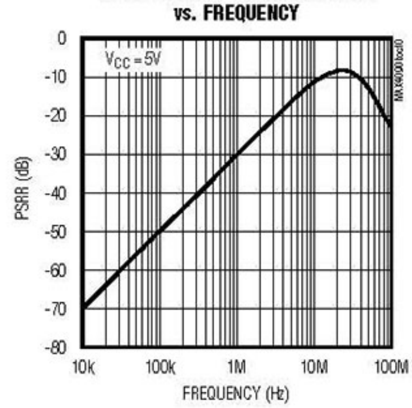
POWER-SUPPLY REJECTION RATIO vs. FREQUENCY



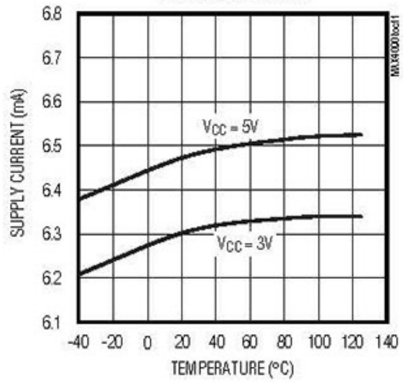
Typical Operating Characteristics (continued)

(V_{CC} = 3.0V, GND = 0V, FB shorted to OUT, C_{IN} = 0.1µF, R_{IN} = 75Ω to GND, R_L = 150Ω to GND, $\overline{SHDN}$ = V_{CC}, T_A = +25°C, unless otherwise noted.)

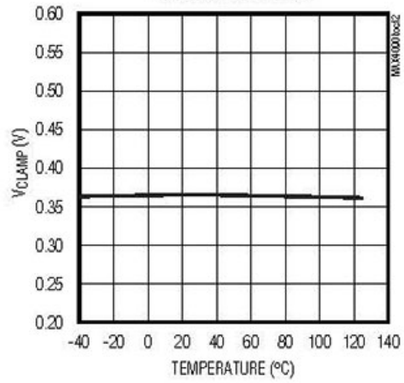
POWER-SUPPLY REJECTION RATIO vs. FREQUENCY



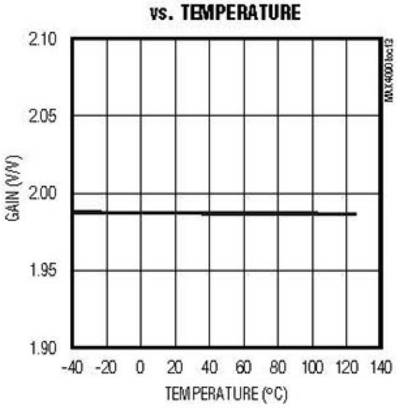
QUIESCENT SUPPLY CURRENT vs. TEMPERATURE



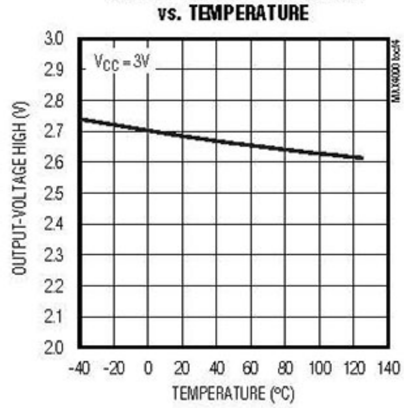
CLAMP VOLTAGE vs. TEMPERATURE



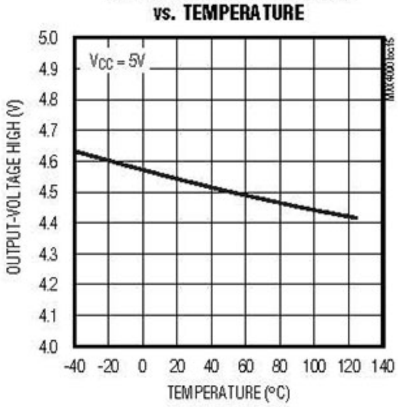
VOLTAGE GAIN vs. TEMPERATURE



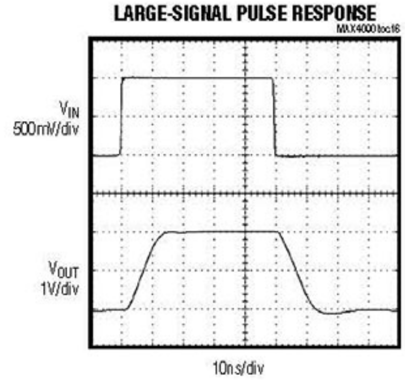
OUTPUT-VOLTAGE HIGH SWING vs. TEMPERATURE



OUTPUT-VOLTAGE HIGH SWING vs. TEMPERATURE



LARGE-SIGNAL PULSE RESPONSE



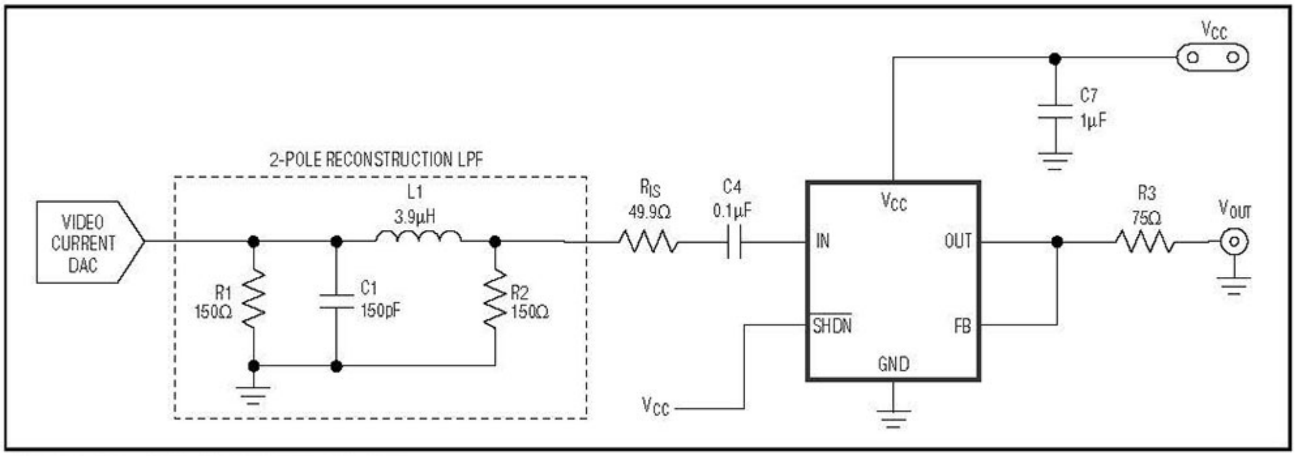


Figure 1. 2nd-Order Butterworth LPF with AMP-VID6

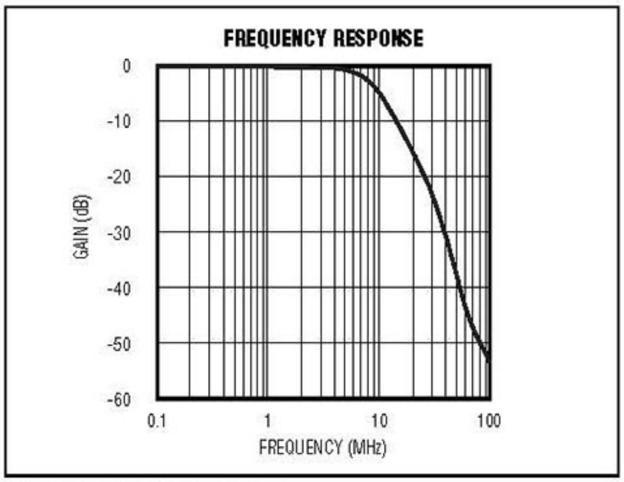


Figure 2. Frequency Response

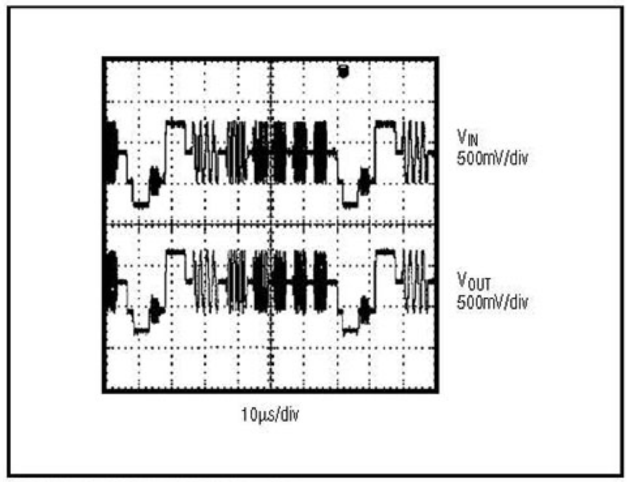


Figure 3. Multiburst Response

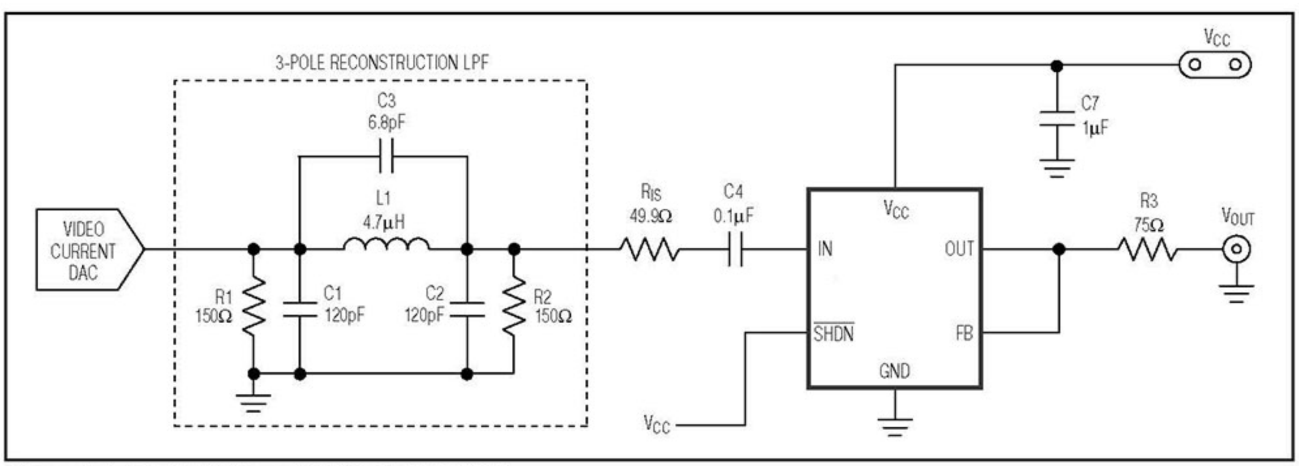


Figure 4. 3rd-Order Butterworth LPF with **AMP-VID6**

Table 2. Bench Measurement Values

R1 = R2 (Ω)	C1 (pf)	L1 (µH)	R_{IS} (Ω)	3dB BW (MHz)	ATTENUATION AT 27MHz (dB)
75	330	1.8	0	8.7	20
150	150	3.9	50	9.0	20
200	120	4.7	50	9.3	22
300	82	8.2	100	8.7	20

Table 3. 3rd-Order Butterworth Lowpass Filter Normalized Values

Rn1 = Rn2 (Ω)	Cn1 (F)	Cn2 (F)	Cn3 (F)	Ln1 (H)
1	0.923	0.923	0.06	1.846

Table 4. Bench Measurement Values

R1 = R2 (Ω)	C1 (pF)	C2 (pF)	C3 (pF)	L (µH)	R_{IS} (Ω)	3dB BW (MHz)	ATTENUATION AT 27MHz (dB)
75	220	220	15.0	2.2	0	9.3	43
150	120	120	6.8	4.7	50	8.9	50
300	56	56	3.3	10.0	100	9.0	45

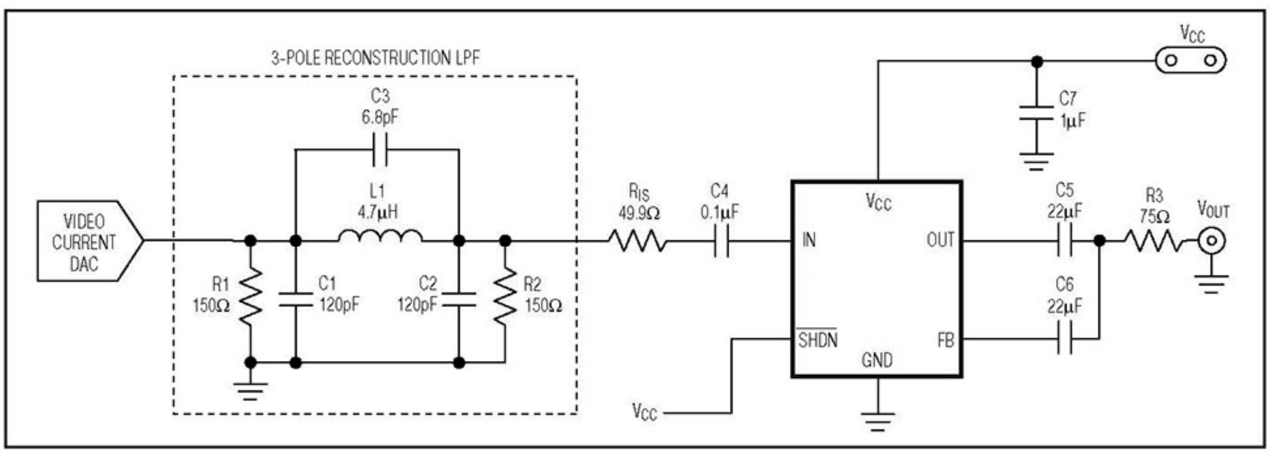


Figure 6. Sag Correction Configuration