

Application Brief 42017

PAL Performance of the ML6427 and ML6428 for Post-DAC Reconstruction Filtering

INTRODUCTION

The ML6427 and ML6428 are ideal reconstruction filters for use on NTSC and PAL signals.

The frequency response of the ML6427 and ML6428 can be optimized for PAL signals, in particular for its color subcarrier. Currently, these devices are down by 1.3dB at 4.8MHz, (which is in the upper sideband of the PAL subcarrier). See the "0pF" curve in Figure 1.

METHOD

A simple and inexpensive solution to optimize the devices for PAL performance is to add a small capacitor (approximately 330pF) in parallel with the output source

termination resistor. Figures 4 and 5 show the ML6427 with this peaking capacitor at designations C31 through C37. This added capacitance will raise the frequency response at 4.8MHz from -1.3 dB to -0.25dB. See the "330pF" curve in Figure 1.

When this capacitor is added the stopband rejection at 27MHz goes from -42dB to -38dB. See Figure 2. This is an easy implementation for extending the bandwidth of these devices. The differential group delay is slightly increased with the capacitor, going from 8ns to 13ns. This extra amount of differential group delay is small, and it is unnoticeable for systems with video that have been digitized at clock rates around 13.5MHz. See Figure 3.

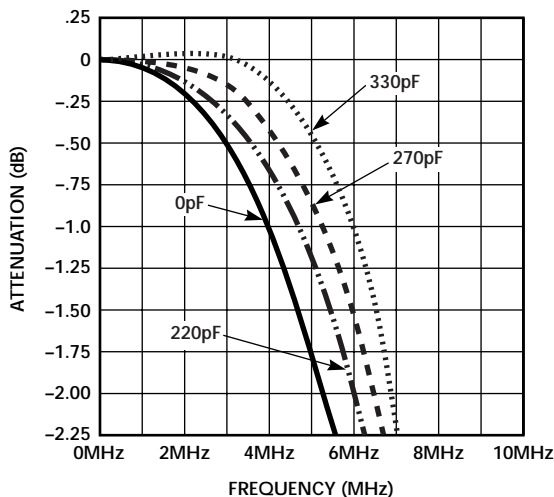


Figure 1. Varying the f_c of the ML6427 and ML6428 with External Peaking Caps

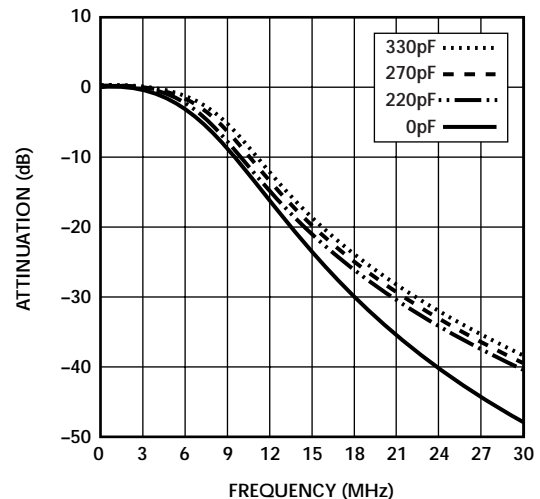


Figure 2. Varying the Attenuation of the ML6427 and ML6428 with External Peaking Caps

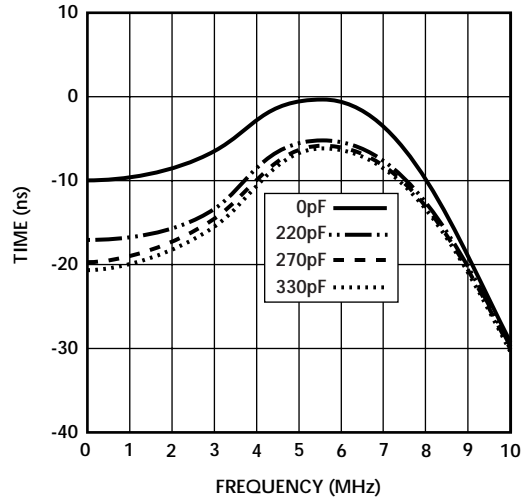


Figure 3. Varying Group Delay of the ML6427 and ML6428 with External Peaking Caps

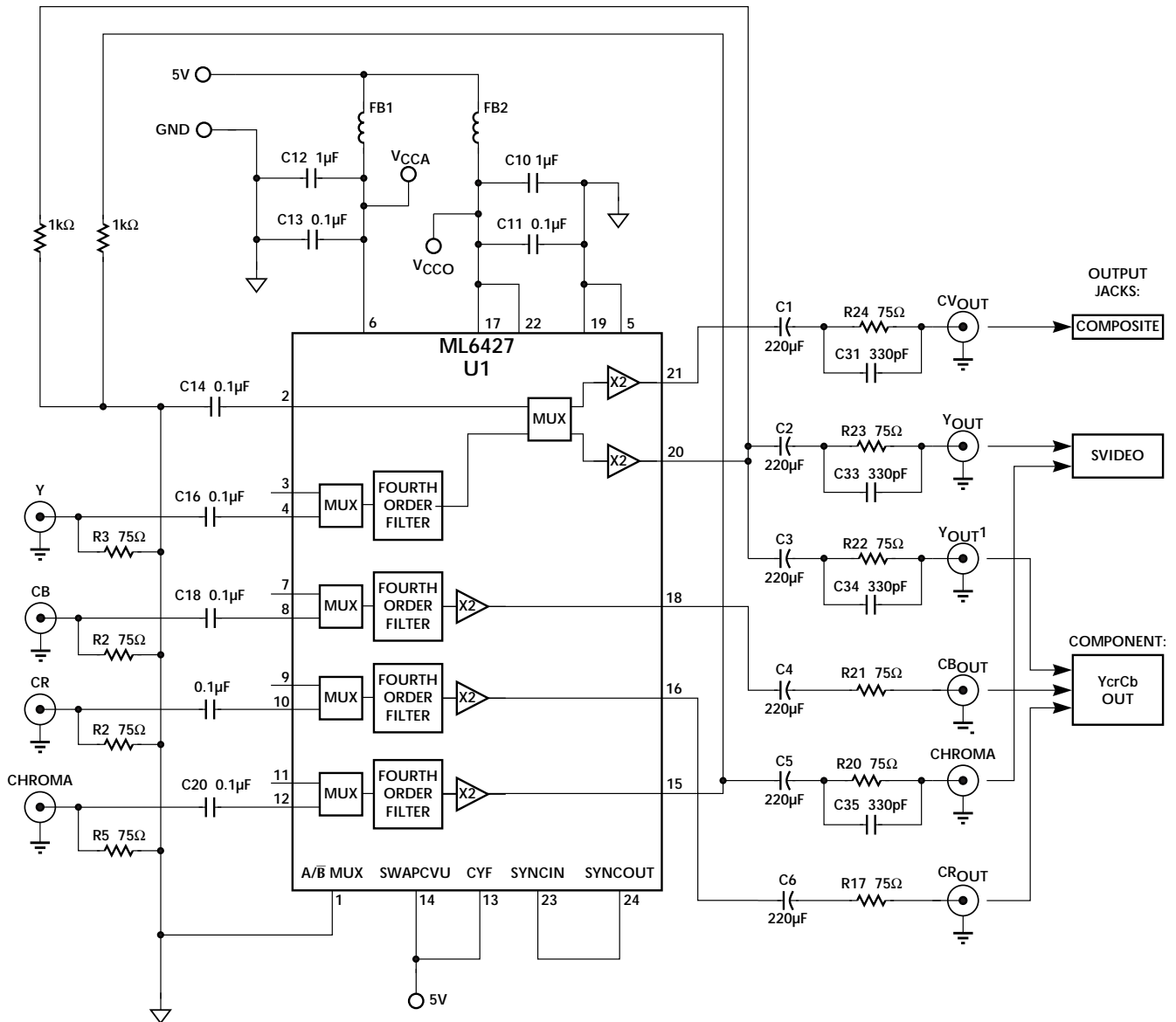


Figure 4. Composite Video Generation

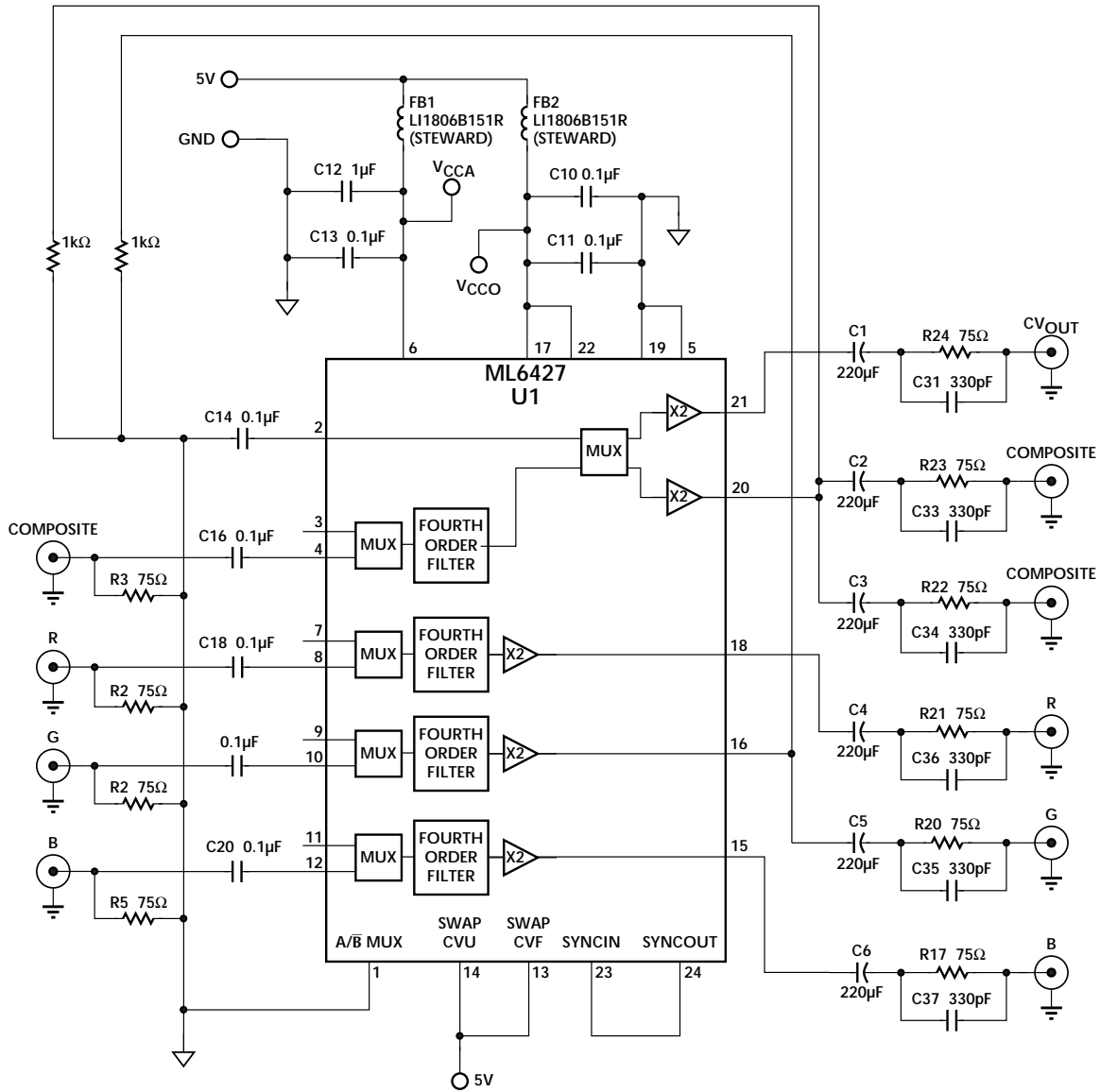


Figure 5. Video for SCART

DEVICE		PEAKING CAPACITOR (C31 TO C37)			
		0pF	220pF	270pF	330pF
ML6427 And ML6428	f_c 3dB Point (Note 1)	6.7MHz	7.4MHz	7.7MHz	8.2MHz
	Attenuation @ 27MHz	-42dB	-38dB	-38dB	-37dB
	Differential Group Delay 0 – 7MHz	8ns	10ns	12ns	13ns

Note: 1: ML6427 and ML6428 f_c adjusted from 6.7 to 8.2MHz. Table 1 is a summary of performance. Figures 1,2, and 3 provide ranges of performance for interpolation

Table 1. Peaking Capacitor Optimization of the ML6427 and ML6428

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