TVP5147 Anti-Aliasing Filters

1 Overview

This document describes the anti-aliasing filters used on the TVP5147EVM Rev1.1. They are designed based on the sampling frequencies of the ADC(s) given the particular input and apply to both NTSC and PAL video color standards. The filters are also designed to minimize system costs by using standard EIA values.

Table 1. TVP5147 EVM Anti-Aliasing Filter Specifics

Input Type	Sampling Frequency (f_s)	Cutoff Frequency (f_c)	Over-sampling	ADCs Used	Comments
CVBS	27MHz	~6.8MHz	2x	1	Each ADC provides 2x oversampling with CVBS
S-Video	27MHz	~6.8MHz	2x	2	Both Y and C are 2x oversampled using two ADCs
Y	27MHz	~6.8MHz	2x	1	YPbPr is 2x oversampled using one ADC
Pb/Pr	13.5MHz	~6.8MHz	1x	1	PbPr of YPbPr is sampled using one ADC

2 Anti-Aliasing Filter for CVBS, S-Video, and YPbPr

This anti-aliasing filter is designed for the CVBS, S-Video and YPbPr input signals on the TVP5147M1 EVM Revision 1.1. The frequency response and group delay curves for this filter design are shown below.

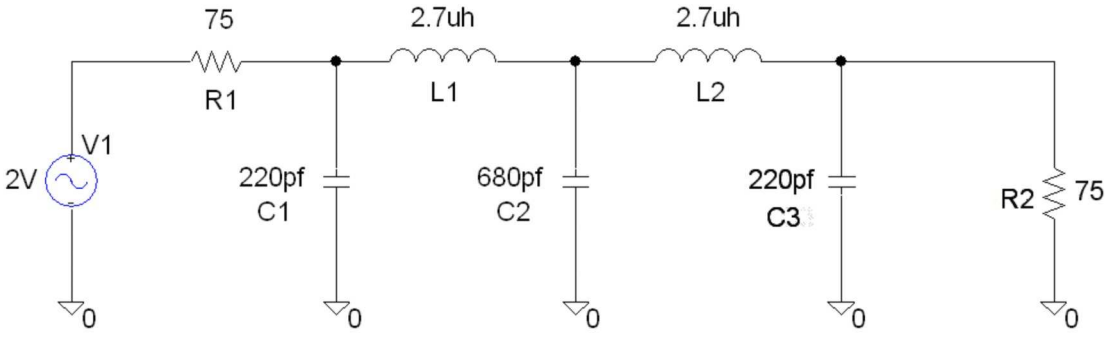

Figure 1. Schematic

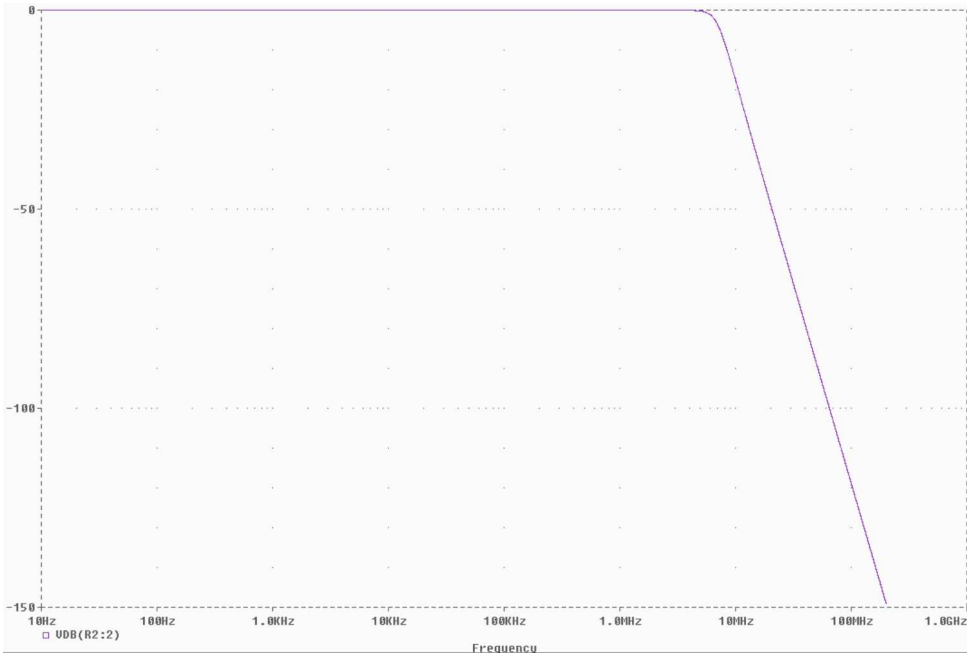

Figure 2. Frequency Response

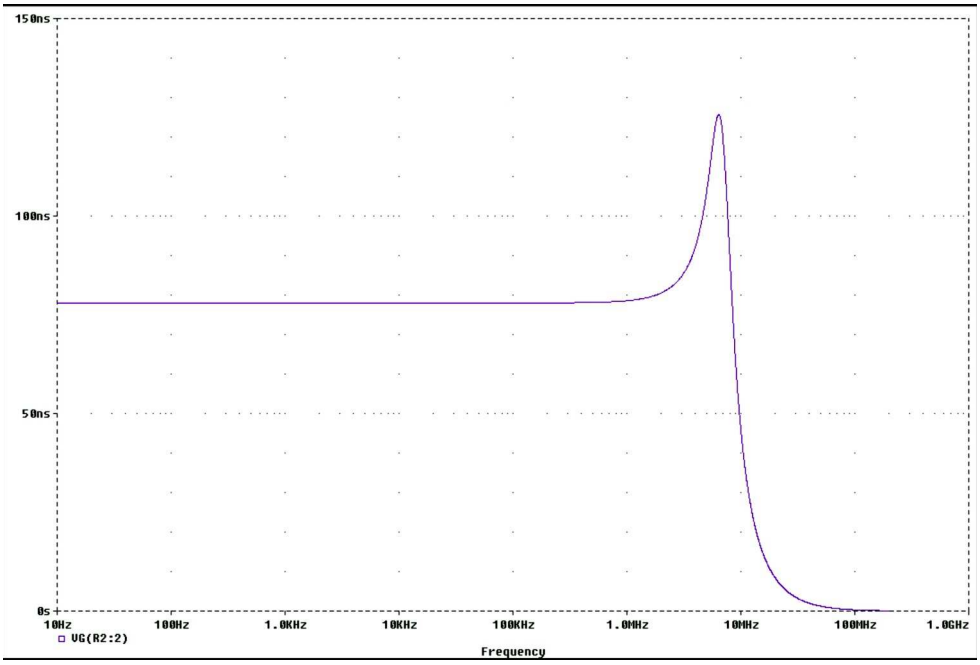

Figure 3. Group Delay Response

Table 2. Example Anti-Aliasing Filter Characteristics (Detail)

Frequency	Composite Filter		Comments
	Amplitude	Delay	
3.58 MHz	-.05 dB	89 ns	NTSC color subcarrier
4.2 MHz	-0.1 dB	89 ns	NTSC bandwidth
4.43 MHz	-0.1 dB	97 ns	PAL color subcarrier
6.0 MHz	-1.1 dB	123 ns	PAL-D bandwidth
13.5 MHz	-31 dB	21ns	Pixel rate
27.0 MHz	-61.8 dB	4 ns	Sample rate

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