

PCB Design Considerations of DAC outputs with Multiple Video Formats

Description of Problem

Picture ringing and connection detection failure may occur on the RGB bypass, CVBS, or s-video output because of improper implementation of the CH7xxx DACs. CH7xxx in this document refers to the following Chrontel Encoders: CH7009/CH7010/CH7011/CH7012, CH7015, CH7017, CH7019, CH7205, CH7301, and CH7303. This Technical Bulletin addresses the case in which two video reconstruction filter circuits are connected to a DAC intended to drive more than one type of video signals. When two filter circuits are connected to a DAC, the DAC connection detection scheme may also be affected.

Explanation of Problem

The picture ringing is caused by applying two video reconstruction filter circuits simultaneously to a DAC. Although some of the DACs are capable of driving more than one type of video outputs, each DAC is designed to output only one video output at a time. The additional circuitry connected to the DAC will affect the output. The DAC connection detection mechanism may also fail if more than one source terminators are connected to each DAC. This is primarily due to the fact that the detection mechanism is dependent on amount of load seen by each DAC. Please see AN71 for details.

Solution

The PCB designer must choose one output configuration then apply the corresponding video reconstruction filter circuit to it. The example shown in Figure 1 is the connection for a CH7xxx with TV out. Figure 2 shows the connection for RGB bypass.

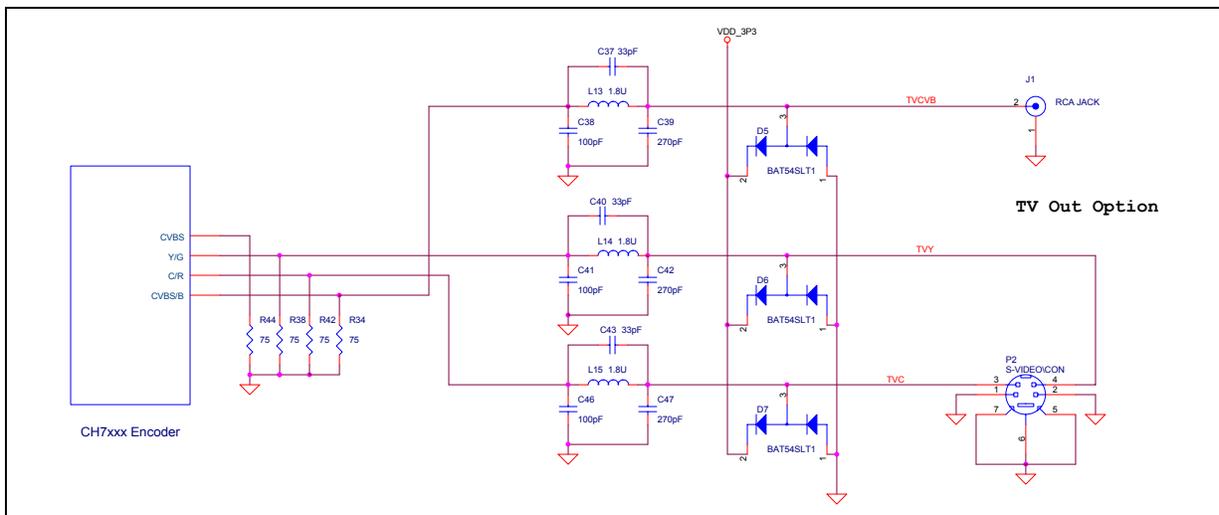


Figure 1: CH7xxx w/ TV output

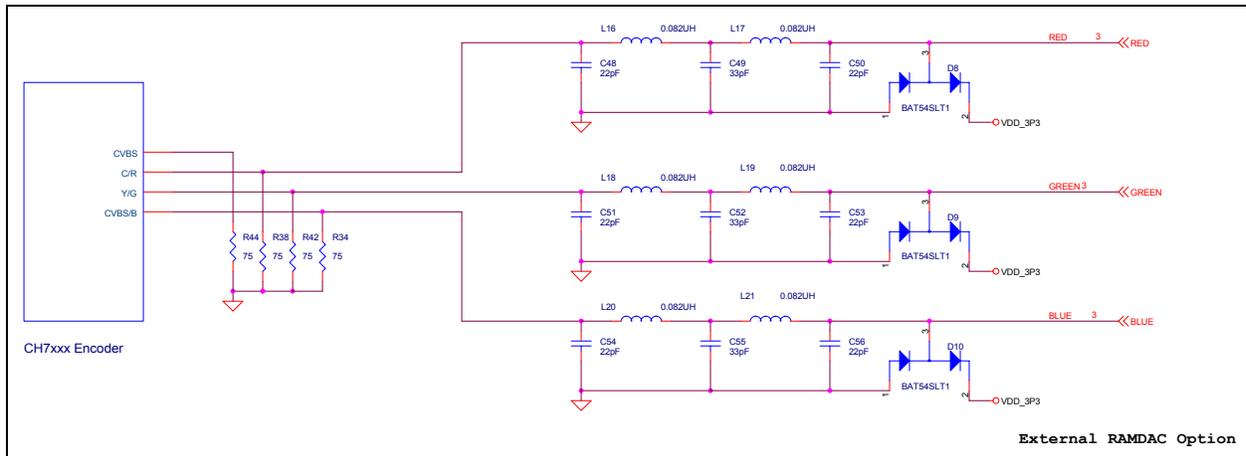


Figure 2: CH7xxx with RGB Bypass output

If desired, the PCB layout can be made to accommodate both an RGB bypass output as well as TV video output. Careful attention must be made to assure that two reconstruction filter circuits are not connected to each DAC. The two reconstruction filter circuits can be separated by means of a resistor stuffing option as shown below.

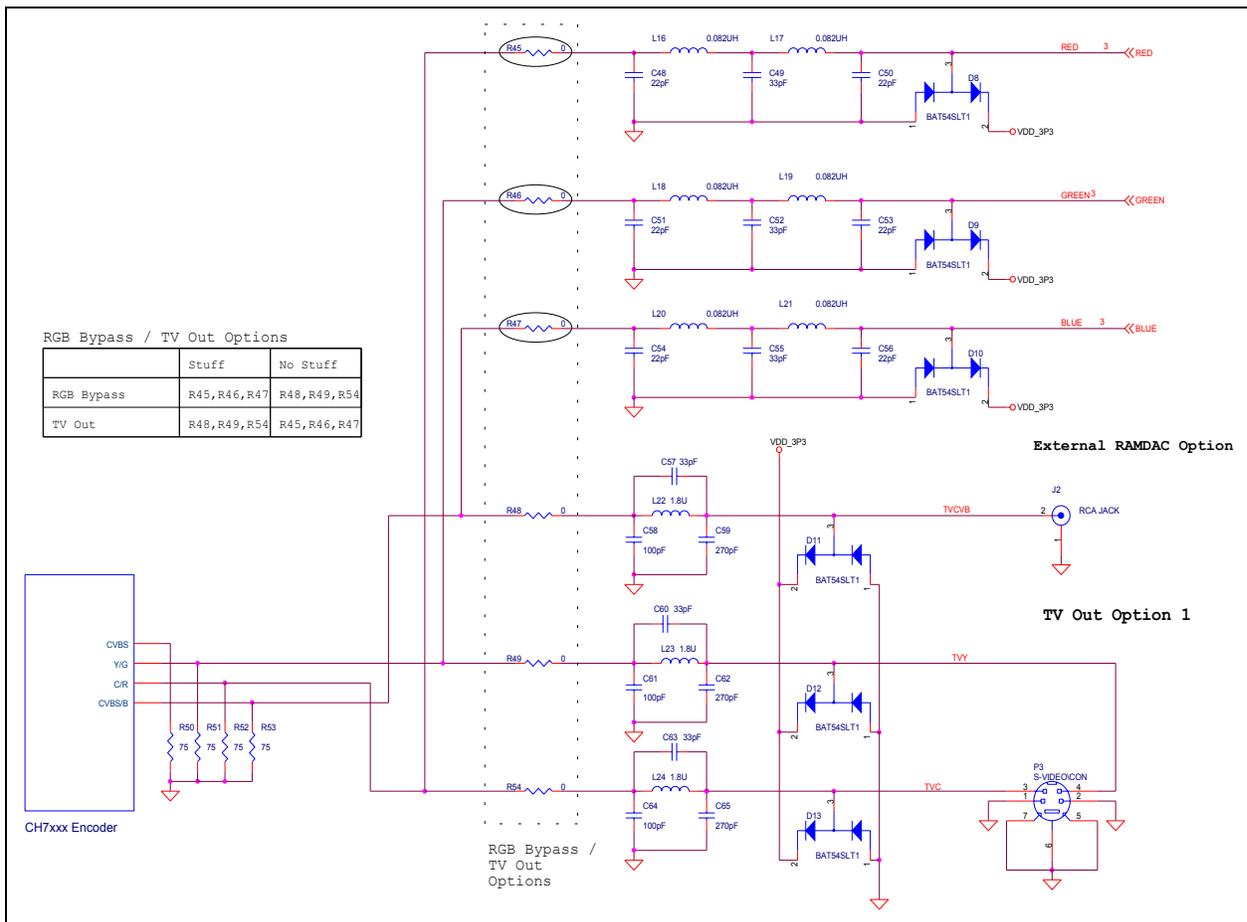


Figure 3: CH7xxx with RGB Bypass output

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Chrontel

**2210 O'Toole Avenue, Suite 100,
San Jose, CA 95131-1326
Tel: (408) 383-9328
Fax: (408) 383-9338
www.chrontel.com
E-mail: sales@chrontel.com**

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