



TC5747 LCD Interface

Application Note

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Revision Log

Rev	Description	Date	Done By
0.1	Created	21 st Sept. 2004	Gal
0.2	Fixed errors in schematic (changed AND gates to OR gate)	22 September 2004	Gal

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1. Introduction

This document describes the connection of a TC5747 camera sensor to a system with a host (baseband) processor and an LCD display device.

The TC5747 was designed to enable a “glueless” interface between a host controller and an LCD display device. The TC5747 makes it possible for the host to control the LCD directly using its pass-through interface. During preview mode, pass-through mode is disabled and the TC5747 transmits video data to the LCD directly without host operations.

To achieve a glueless connection requires addressing certain TC5747 design features, as below:

- By default, the bypass mode is only activated when HLCD_CSN is asserted. This means that possible LCD requirements for set-up or hold time of data/address with respect to HLCD_CSN, will not be met.
- When the bypass mode is not activated (HLCD_CSN deasserted), the LCD outputs (data, address and control signals) switch to tri-state mode, which means that control signals to the LCD are not de-asserted properly, and require strong external pull resistors.
- The LCD_CS1 & LCD_CS2 outputs demux control is problematic, since controlling it requires that TC5747 be in power-on mode, whereas normally it would be in sleep mode.

In order to properly connect the TC5747 to an LCD, some external glue logic has been designed.

Below two options for connecting to an LCD are described.

2. Interfacing to a Single Display LCD (Option 1)

(Single display LCD has only one chip select input)

From the host (baseband), we dedicate one chip select line (**LCD_TC_CS_n**) which will be used to access both the camera host interface and the LCD using the pass-through interface. A GPO (**LCD/CAM_n**) is used by the host to select between accessing the camera or the LCD data bus.

The TC5747 **HLCD_CSN** input was connected to the GPIO in order to solve possible set-up and hold time issues. In this way, this input remains constantly low during access to the LCD and thus allows the address and data signals to always pass-through.

A1 is the host address bus line, and is used for both the camera and the LCD **RS** input.

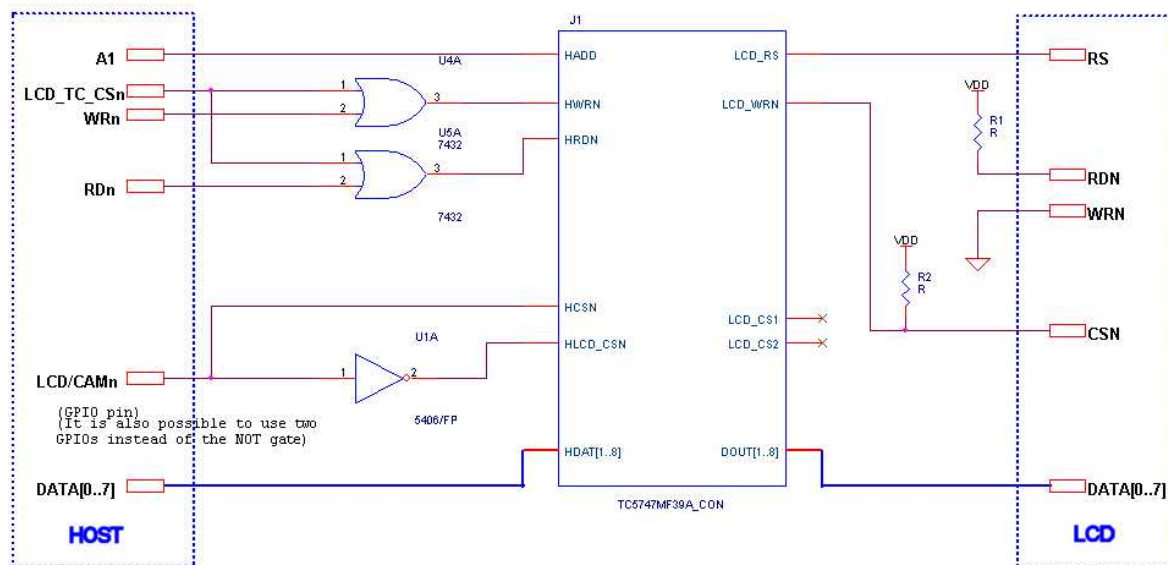


Figure 1 - Interfacing to single display LCD

On the LCD side, we pull up the **RDN** input (if it exists). This design does not support read from LCD, which is not useful in most cases.

We connect the **WRN** input to ground. And connect the LCD **CSN** to the camera **LCD_WRN** output. In this configuration it is not required to use the camera **LCD_CS1** and **LCD_CS2** outputs.

3. Interfacing to Dual Display LCD (Option 2)

(The dual display LCD has two chip select inputs)

This design is similar to Option 1, but uses another GPIO (**Sub/bMain**) from the host to select between access to the Main or the Sub-LCD. This GPIO is used to select the display both for preview and bypass mode.

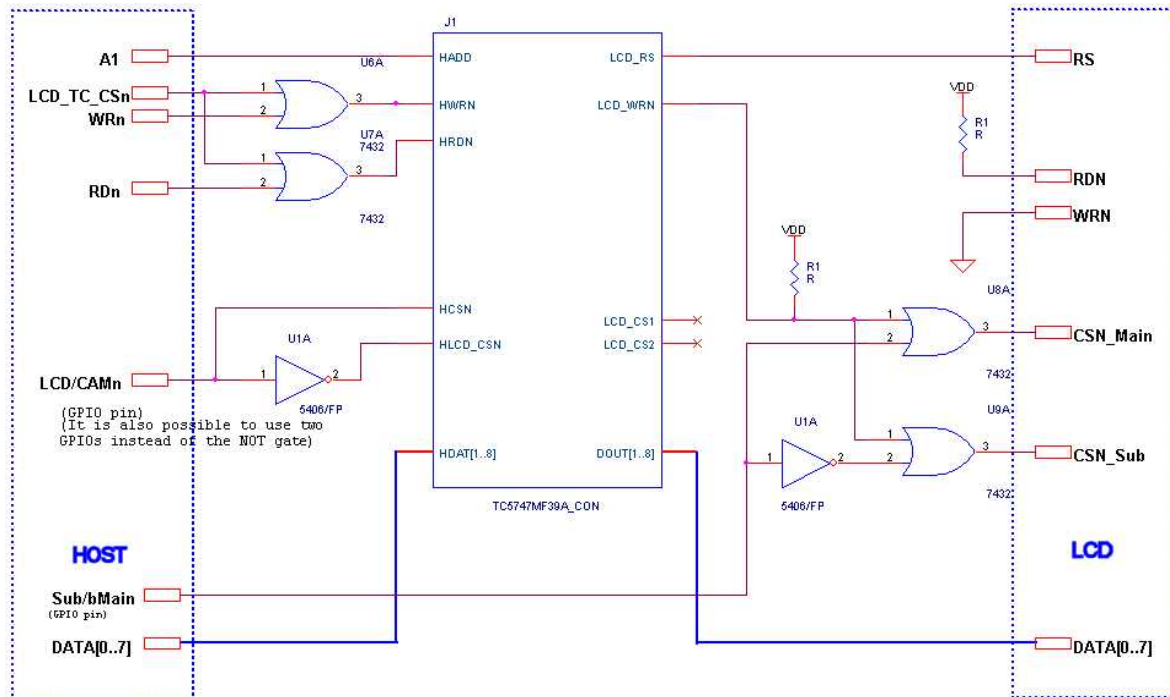


Figure 2– Interfacing to dual display LCD