

## ADV780x 2D-Only Operation

### Abstract

The ADV780x supports an SDR or a DDR SDRAM external memory interface. It uses this external memory for 3D combing, 3D digital noise reduction, and for time base correction.

For applications that do not require these advanced features, the ADV780x can operate without the external SDRAM. This document outlines the hardware and software changes required to operate the ADV780x without 3D functionality.

### Hardware Changes

It is necessary to implement the following hardware changes in order to operate the ADV780x without the SDRAM memory connected:

- SDRAM VDD supplies should be connected to DVDDIO
- SDRAM VREF should be connected to DGND
- DQ and DQS lines should be connected to ground through a 4k7 resistor
- All other memory pins can be left unconnected

For more information, refer to Figure 1.

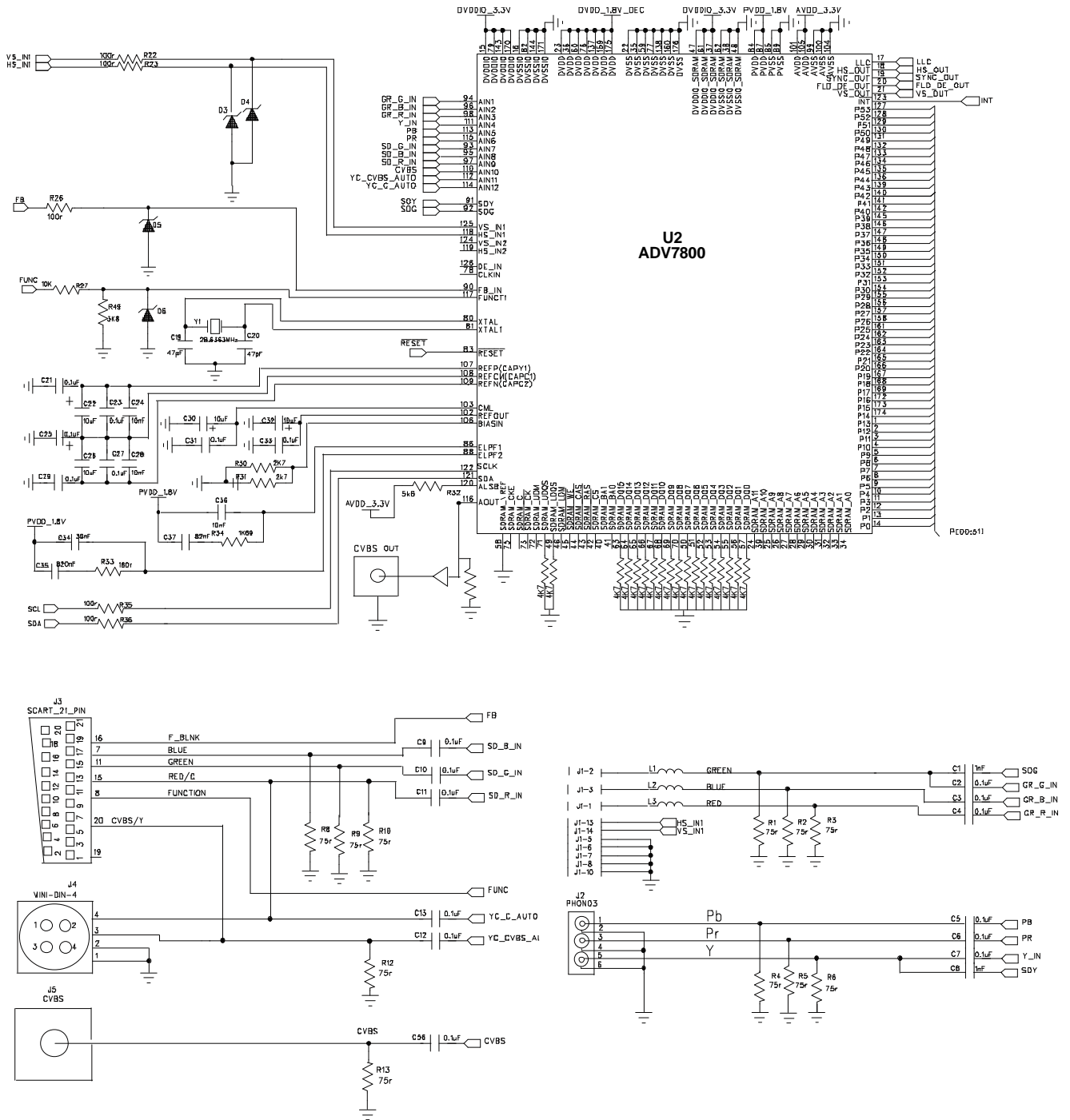


Figure 1: Typical Connection Diagram (without external memory)

## Software Changes

A number of software changes are required for correct operation with external memory disconnected:

- ADV7800 memory pins should be tristated.
  - IO Map Register 0x29 bit [4] should be set to 1.
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- Disable 3D comb, 3D DNR, Frame TBC.
  - SDP Map Register 0x12 bit [0], [1], and [2] respectively should be set to 0.
- Disable clock to external memory. This is recommended to give lower power consumption.
  - IO Map Register 0x39 bit [6] should be set to 1.
- Disable Y\_2D\_PK\_EN. This control enables 2D detail enhancements for 2D combed areas of image in 3D comb modes. This should only be used in a 3D application.
  - SDP Map Register 0x0E bit [4] should be set to 0.

## Sample Script

```
##SDP CVBS##
:SDP CVBS 2D-Only NTSC/PAL/SECAM 10 Bit 4X1 422 Out through Encoder AV Codes:
42 2B 8D ; DLL Phase Adjust
42 19 0D ; DLL Phase Adjust
42 2B 00 ; DLL Phase Adjust
42 29 91 ; Tristate memory interface, I2c Block Read Enable, Enable Genlock
42 39 41 ; Power down memory interface clocks
42 00 01 ; CVBS 4x1
42 06 80 ; Power Down Aout_DAC
42 08 07 ; Only ADC 0 Powered Up
42 0B 04 ; DCA Phase 4
42 10 90 ; Enable External Bias
42 11 80 ; ADI Recommended
42 12 07 ; AA_FILT_EN
42 14 51 ; AA_FILT BW3
42 53 46 ; ADI Recommend
42 55 46 ; ADI Recommended
82 00 7F ; Autodetect PAL NTSC SECAM
82 01 00 ; Pedestal Off
82 03 E5 ; ADI Recommended
82 07 8B ; Enable Color Kill
82 0D E6 ; Clamp speed adjustment
82 0E 01 ; Disable Y_2D_PK_EN
82 12 00 ; Disable 3D Comb DNR Frame TBC
82 8D 08 ; Chroma target value
82 8E 70 ; Chroma target value
82 42 33 ; ADI Recommended
82 45 43 ; ADI Recommended
82 61 06 ; ADI Recommended
82 65 53 ; ADI Recommended
82 67 9C ; ADI Recommended
82 73 F7 ; ADI Recommended
82 C7 01 ; ADI Recommended
54 17 02 ; Software Reset
54 00 FC ; Power up all Dacs & PLL
54 01 80 ; SD Mode only, Data input on Y-Bus
54 80 10 ; SAF Luma filter enabled, NTSC mode
54 82 C9 ; Step control on, pixel data valid, pedestal on, PrPb SSAF on, CVBS/YC out
54 84 06 ; Enable SFL
54 88 10 ; Pix10 Enable
54 87 20 ; PAI/NTSC auto-detect enabled
End
```