

HD3SS213 Evaluation Module

This is the user's guide for the evaluation module (EVM) of the HD3SS213. The purpose of this user's guide is to facilitate an easy evaluation process of the HD3SS213 DisplayPort switch.

The contents of this user's guide are meant to provide an overview of the HD3SS213, which includes highlighting its key features, operating conditions, and how to setup this EVM for use in a system level evaluation.

The construction of the HD3SS213 EVM also serves as a reference design that can be easily modified for any intended application. Target applications include Notebooks, Desktops and Docking Stations. Schematic and layout information is included at the end of this manual.

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1 Introduction

The HD3SS213 is a high-speed passive switch capable of switching two full DisplayPort 4 lane ports from one of two sources to one target location in an application or one source to one of two targets. For DisplayPort Applications the HD3SS213 also supports switching of the Auxiliary (AUX), Display Data Channel (DDC) and Hot Plug Detect (HPD) signals.

This EVM was designed to be used as a medium connection between one DisplayPort source and one of two DisplayPort sinks. The interface to the EVM consists of a standard DisplayPort connector to connect the EVM to your system set up via standard DisplayPort cables. Your test setup should look similar to [Figure 1](#)

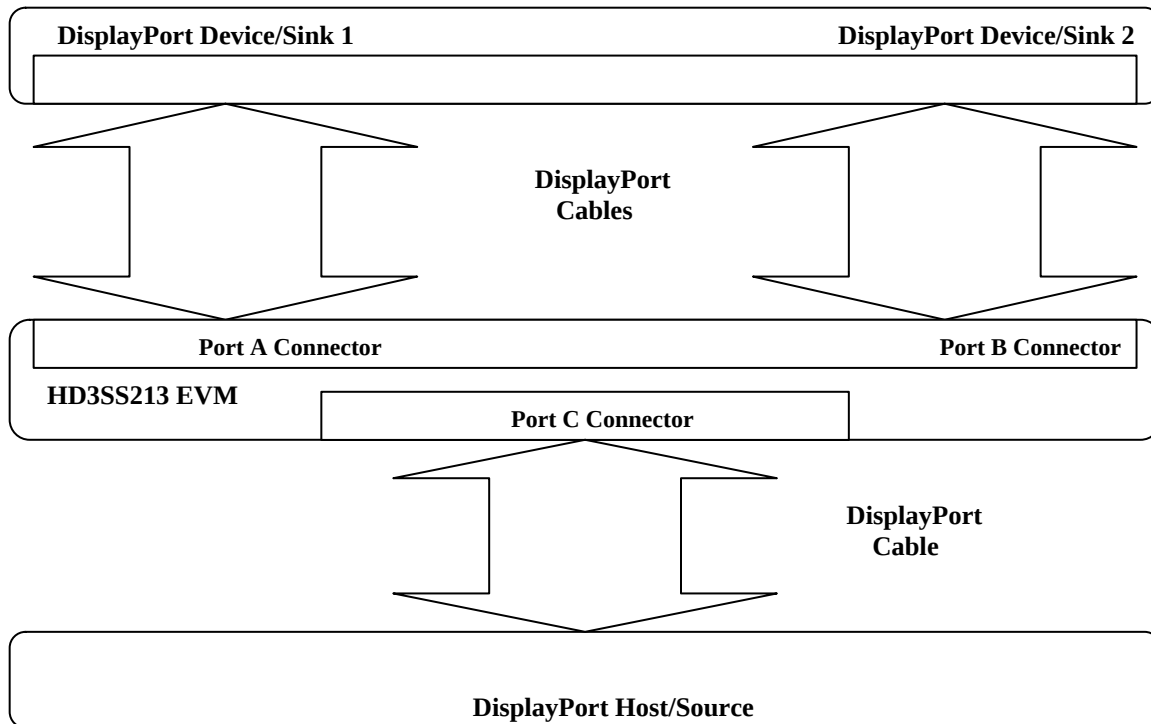


Figure 1. HD3SS213 EVM Simple System Block Diagram

2 HD3SS213 EVM Kit Contents

This EVM kit should contain the following items:

- HD3SS213 EVM board
- 9V DC Power Supply
- This user's manual

3 Description of EVM Board

The HD3SS213 EVM is designed to provide easy evaluation of the HD3SS213 device. It is also meant to serve as a reference design to show a practical example of how to use the device in a mass-production system. [Table 1](#) highlights the EVM jumper functionality and configuration.

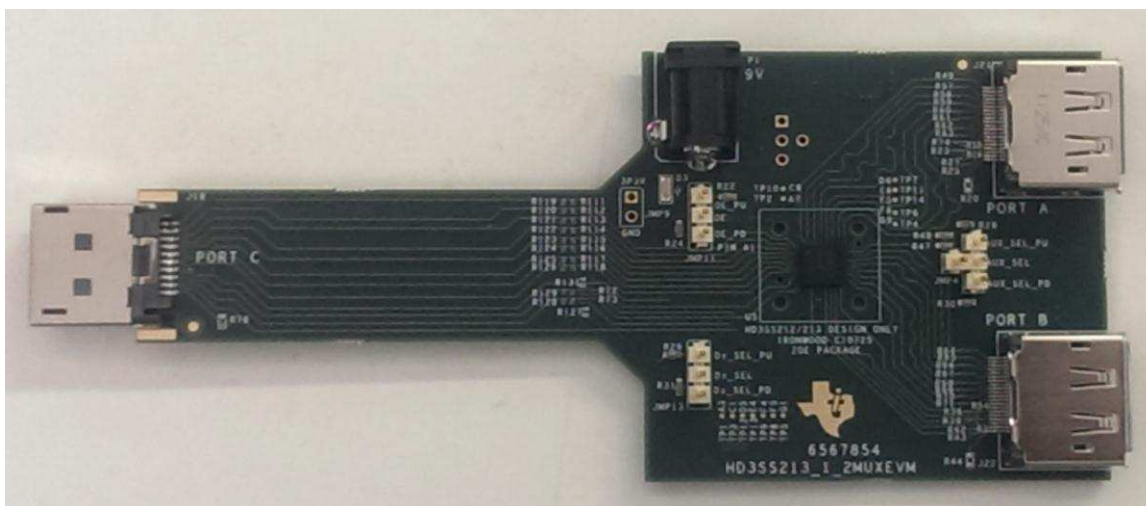


Figure 2. HD3SS213 EVM Picture [Top Side]

Table 1. HD3SS213 EVM Jumper Description and Settings

Jumper Configuration		
JMP10	VDD Selection	No Connect for Nominal 3.3V Supply Voltage Jumper pins 1-2 for 3.6V Supply Voltage Jumper pins 2-3 for 3.0V Supply Voltage
JMP11	HD3SS213 Output Enable	Jumper pins 1-2 to enable device outputs (Default) Jumper pins 2-3 to disable device outputs
JMP4	HD3SS213 AUX SEL	Jumper pins 1-2 to enable Port B to C Connection Jumper pins 2-3 to enable Port A to C Connection
JMP13	HD3SS213 Dx SEL	Jumper pins 1-2 to enable Port B to C Connection Jumper pins 2-3 to enable Port A to C Connection

4 Power for the HD3SS213 EVM

The HD3SS213 EVM kit comes with a +9V DC power supply that plugs into a wall socket.

5 Monitoring the Device Current

To observe current consumption of the HD3SS213 in the device evaluation, the HD3SS213 EVM includes the option of monitoring the current draw of the device. In order to enable this feature, the following steps must be taken:

1. Un-install the ferrite bead located at L2.
2. Obtain a power supply with the ability to display its current draw (or connect a current meter in series to the power supply) and connect to JMP 9

Turn on the power supply and observe the measured current on the power supply display (or current meter).

6 PCB Construction

This section discusses the construction of the EVM boards. It includes the board schematics and layout files to show how the board was built.

6.1 HD3SS213 EVM Board Schematics

This section shows the board schematic sheets for the EVM.

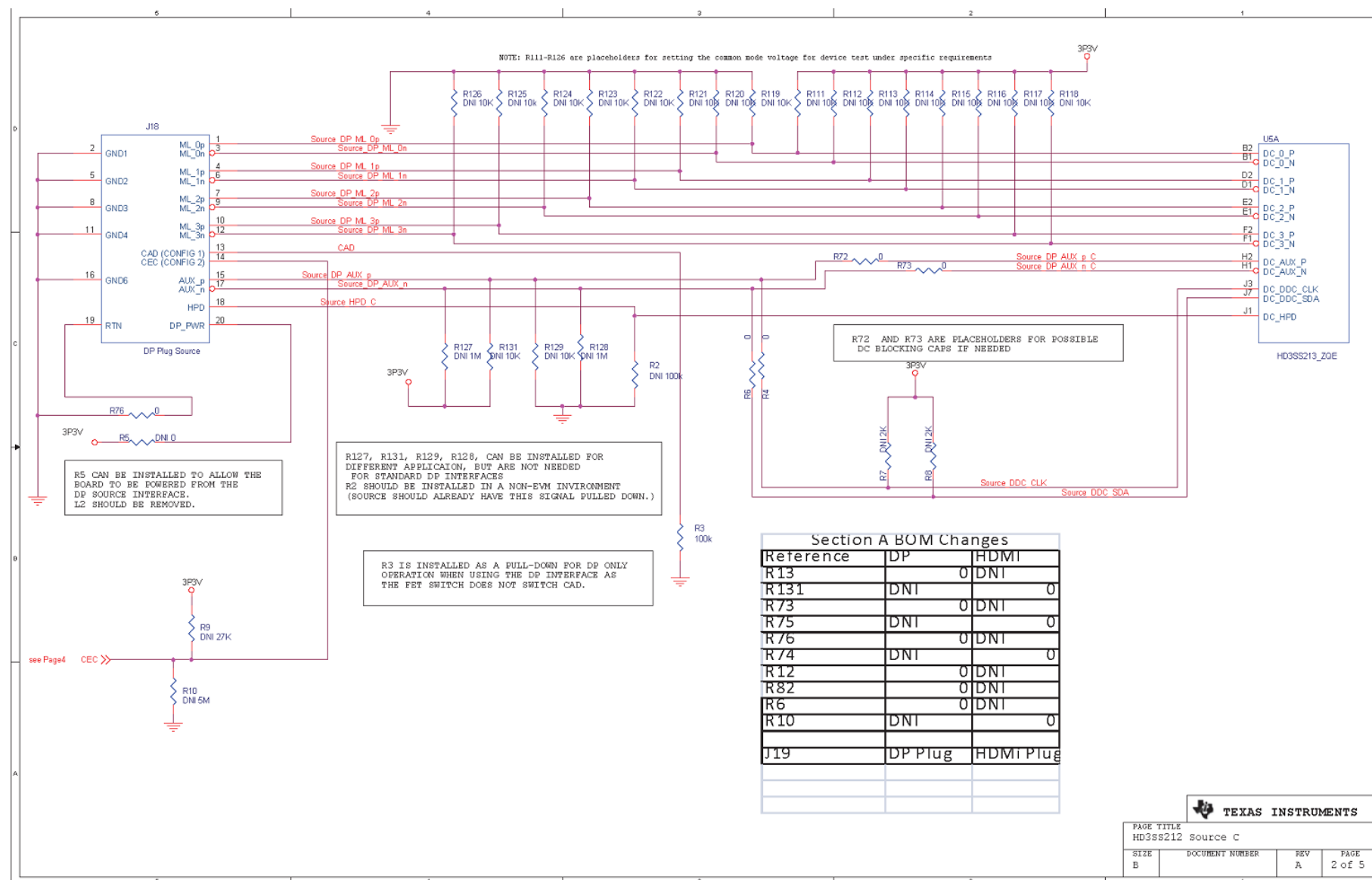


Figure 3. HD3SS213 EVM Schematic Source Port C

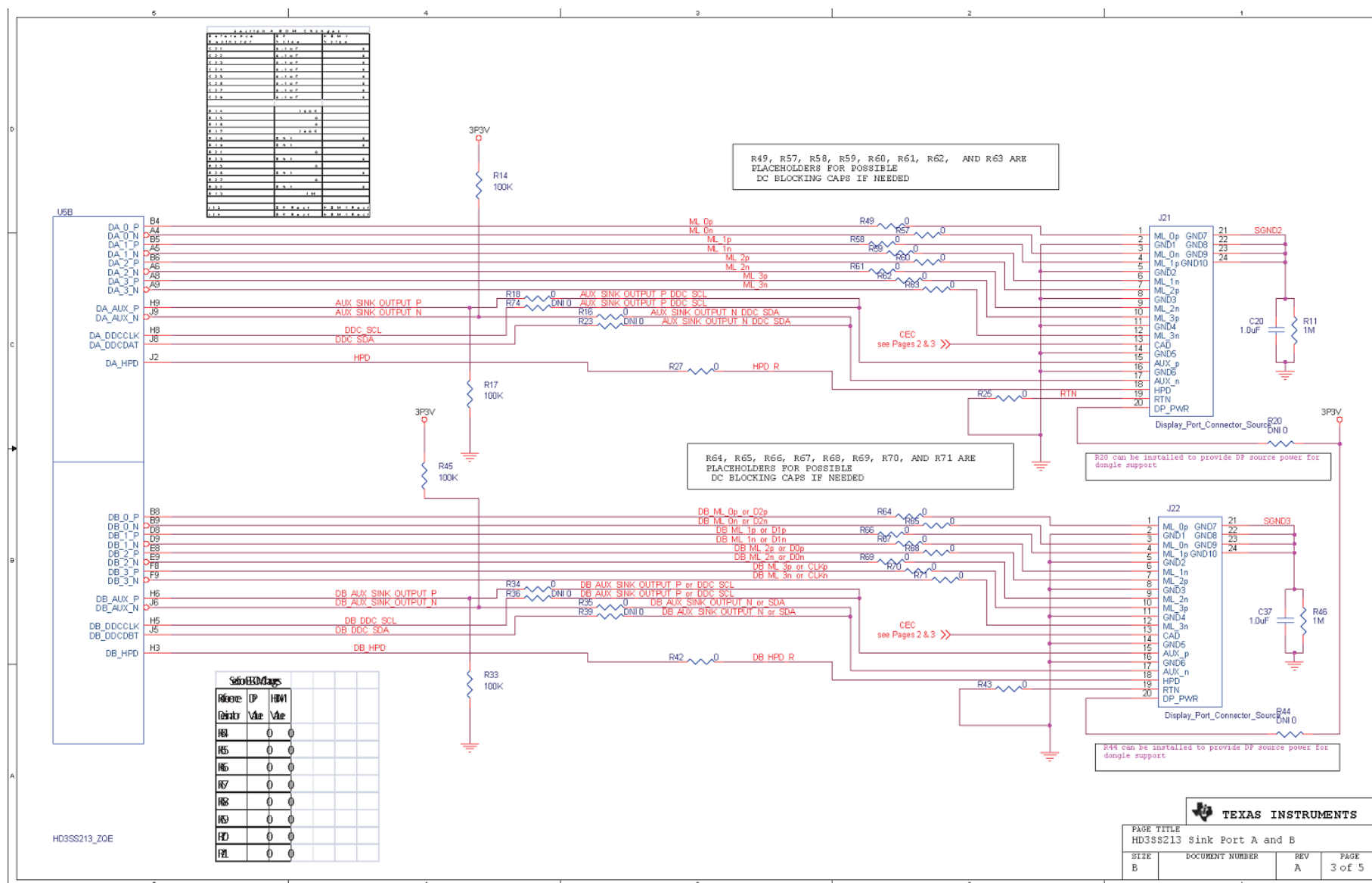


Figure 4. HD3SS213 EVM Schematic Sink Ports A and B

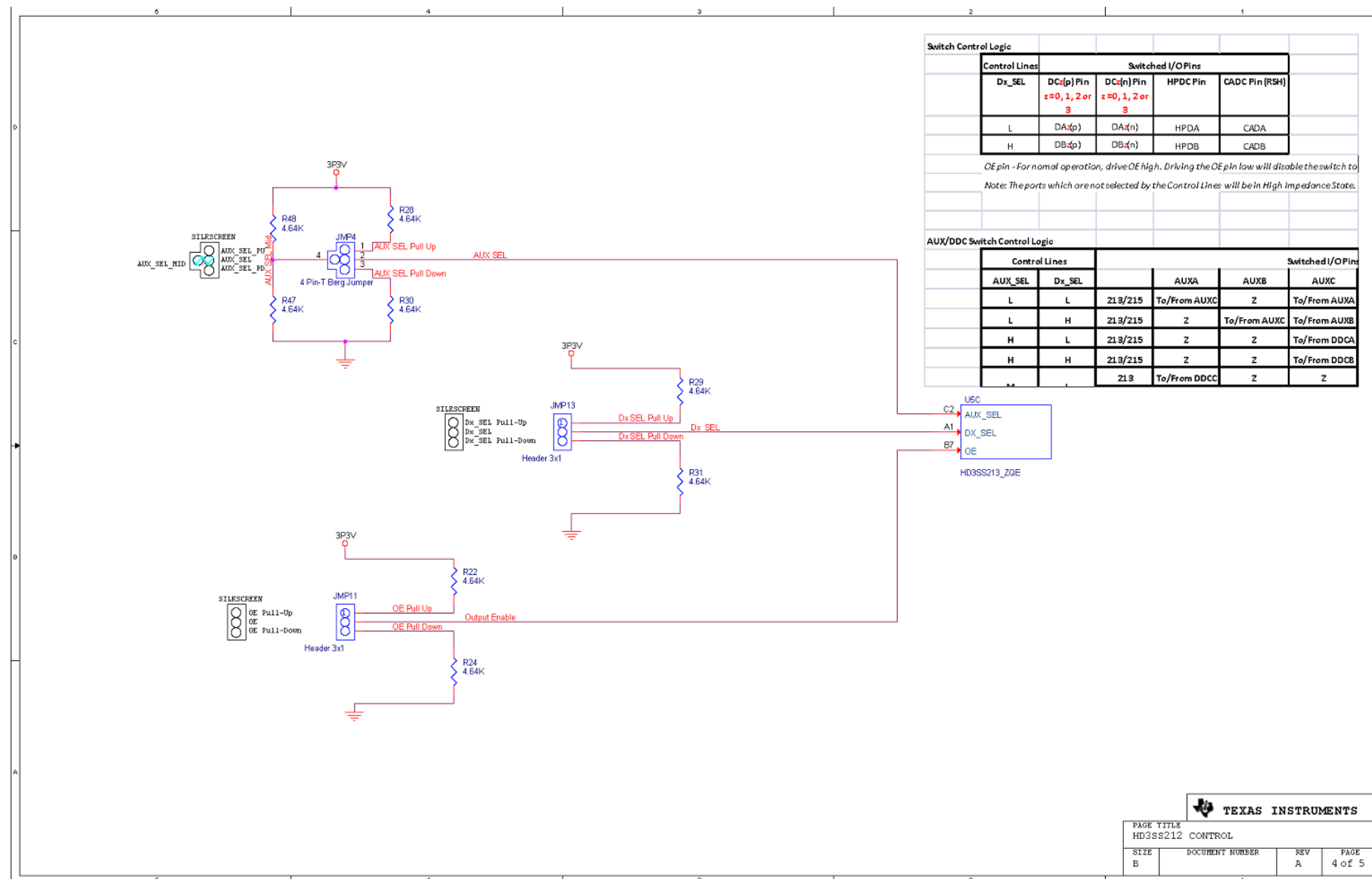


Figure 5. HD3SS213 EVM Control

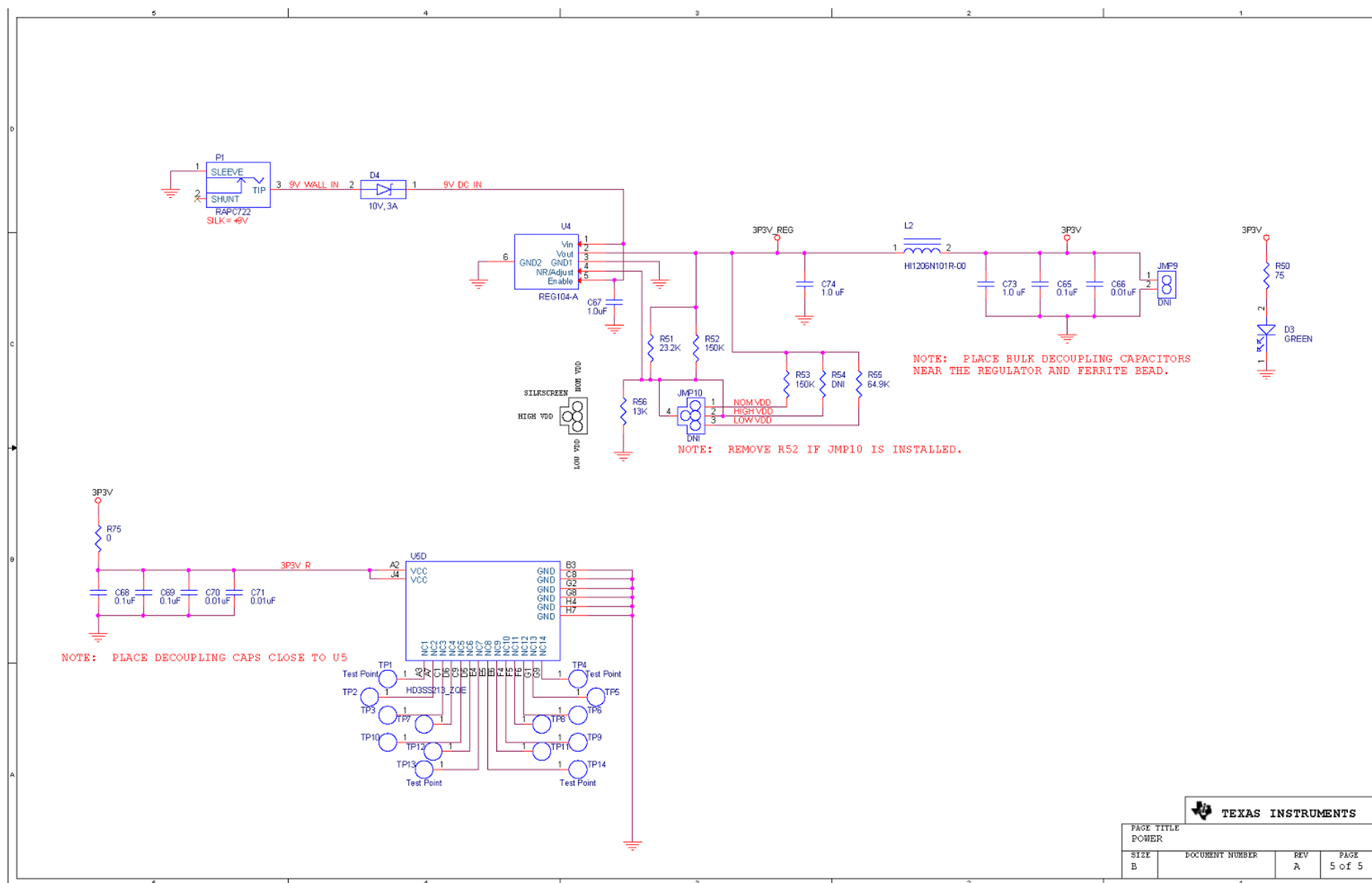


Figure 6. HD3SS213 EVM Power

6.2 HD3SS213 EVM Board Layout

This EVM was designed to show the implementation of this device on a 4-layer board.

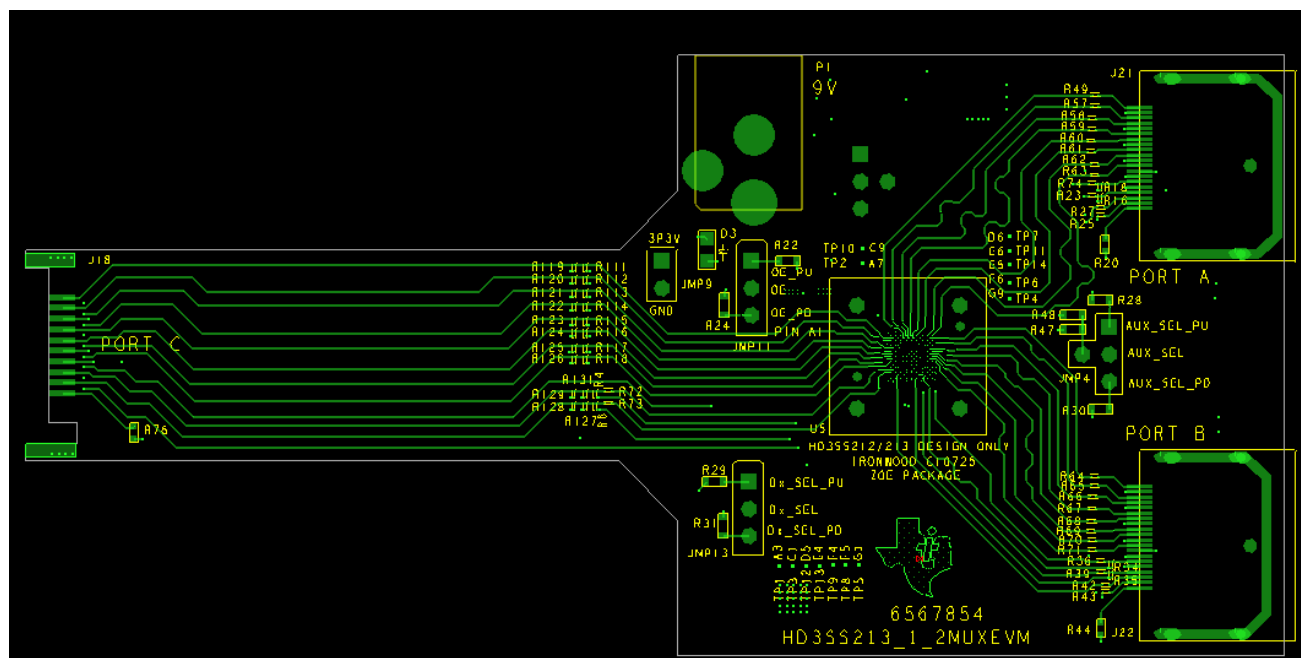


Figure 7. HD3SS213 EVM Layout Layer 1 [Top]

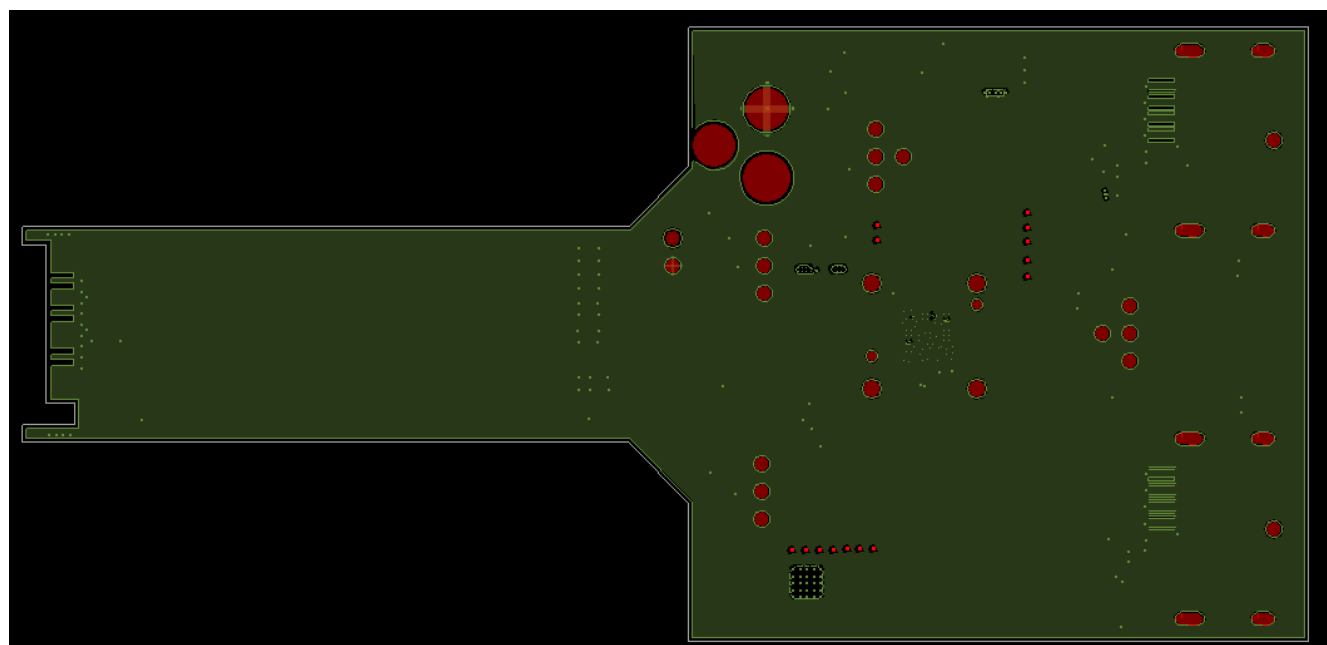


Figure 8. HD3SS213 EVM Layout Layer 2 [GND]

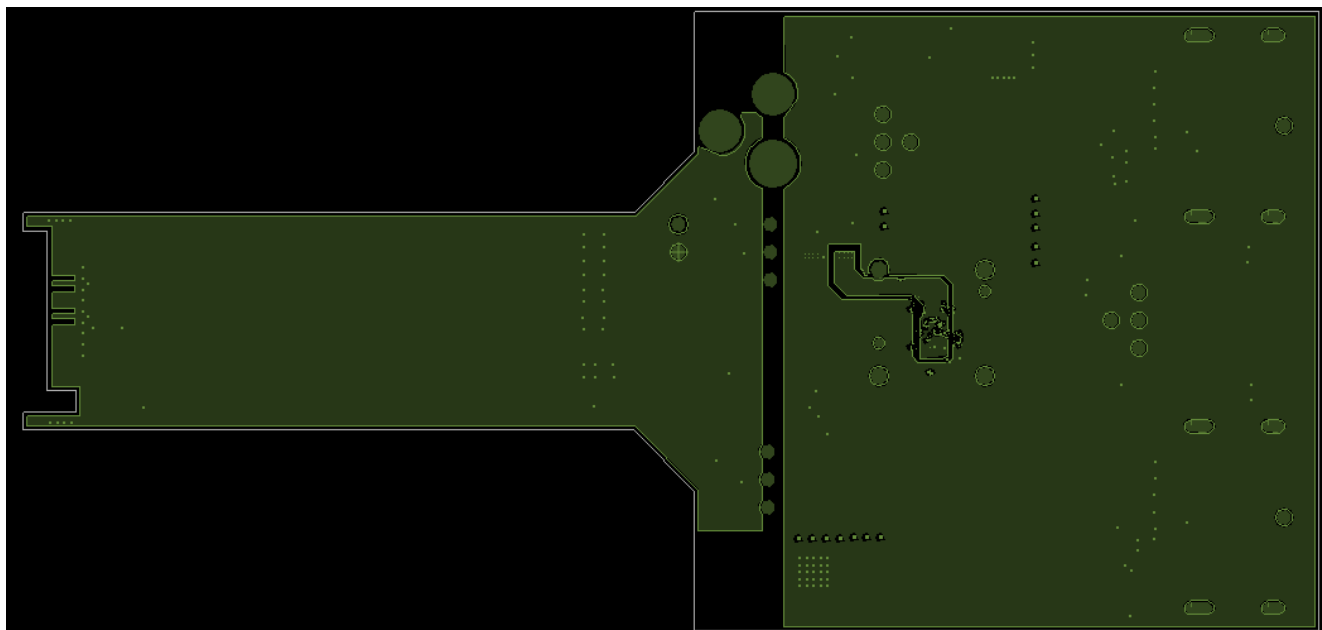


Figure 9. HD3SS213 EVM Layout Layer 3 [VCC]

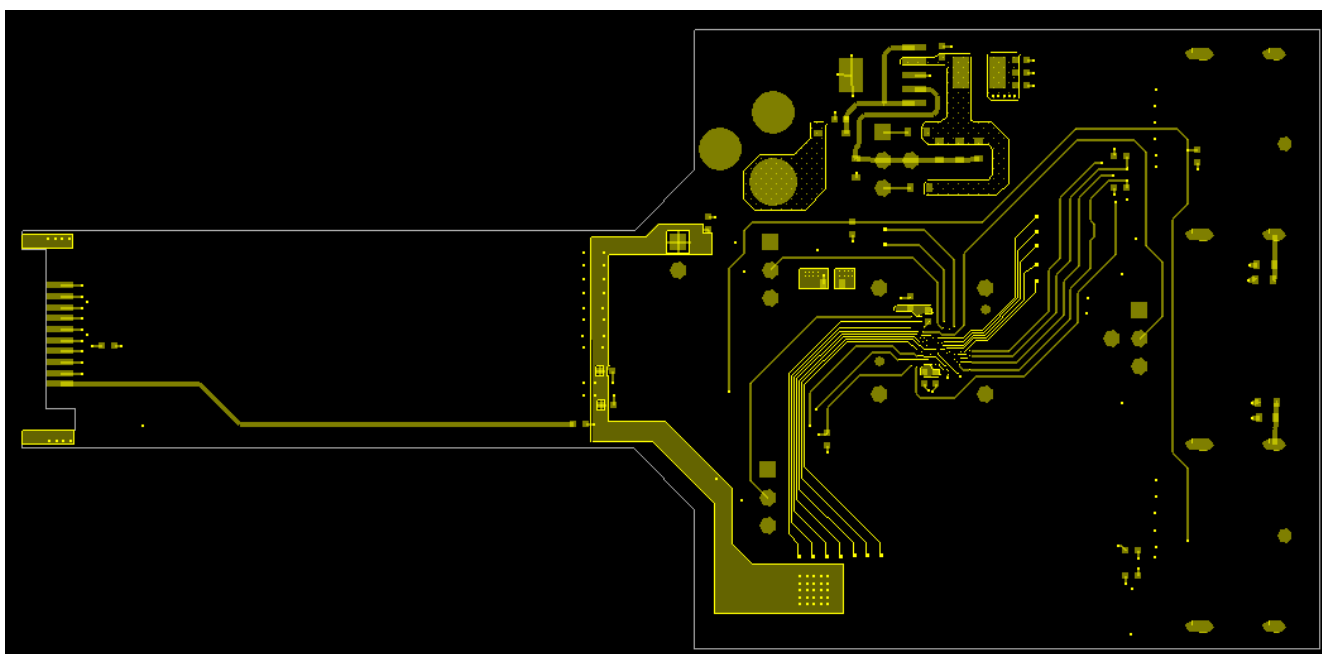


Figure 10. HD3SS213 EVM Layout Layer 4 [Bottom]

7 HD3SS213 EVM Board Construction

The HD3SS213 EVM board is a 4-layer board constructed of FR4 – TurboClad 370 material. The board stack-up consists of a signal layer on top, a ground layer, power layer, and a signal layer on bottom.

NOTE: Note: To achieve the desired impedance, it is recommended that you consult the board manufacturer for their process and design requirements.

8 HD3SS213 EVM Material Listing

Table 2. EVM Bill of Materials

Item	Quantity	Reference	Value
1	2	C20, C37	1.0uF
2	3	C65, C68, C69	0.1uF
3	3	C66, C70, C71	0.01uF
4	1	C67	1.0uF
5	2	C73, C74	1.0 uF
6	1	D3	GREEN
7	1	D4	10V, 3A
8	1	JMP4	4 Pin-T Berg Jumper
9	1	JMP9	DNI
10	1	JMP10	DNI
11	2	JMP11, JMP13	Header 3x1
12	1	J18	DP Plug Source
13	2	J21, J22	Display_Port_Connector_Source
14	1	L2	HI1206N101R-00
15	1	P1	RAPC722
16	1	R2	DNI 100k
17	5	R3, R14, R17, R33, R45	100K
18	28	R4, R6, R16, R18, R25, R27, R34, R35, R42, R43, R49, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73	0
19	3	R5 R20, R44	DNI 0
20	2	R7, R8	DNI 2K
21	1	R9	DNI 27K
22	1	R10	DNI 5M
23	2	R11, R46	1M
24	8	R22, R24, R28, R29, R30, R31, R47, R48	4.64K
25	4	R23, R36, R39, R74	DNI 0
26	1	R50	75
27	1	R51	23.2K
28	2	R52, R53	150K
29	1	R54	DNI
30	1	R55	64.9K
31	1	R56	13K
32	1	R75	0
33	1	R76	0
34	18	R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R129, R131	DNI 10K
35	2	R127, R128	DNI 1M
36	14	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14	Test Point
37	1	U4	REG104-A
38	1	U5	HD3SS213_ZQE

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