TAS5612L-TAS5614LDDVEVM

This user's guide provides specifications for the evaluation module (EVM) for TAS5612L and TAS5614L Digital Input Class-D Power Stages with the TAS5558 Digital Audio Processor with PWM output from Texas Instruments. The user's guide also describes operation of the EVM and provides design information including schematic, bill of materials, and PCB layout.

Contents

PurePath is a trademark of Texas Instruments.

List of Tables

1 Introduction

The TAS5612L-TAS5614LDDVEVM PurePath™ EVM demonstrates the current version of TAS5612LDDV or TAS5614LDDV integrated circuit power stage with TAS5558 from Texas Instruments (TI).

The TAS5612L and TAS5614L are high-performance, integrated Stereo Feedback Digital Amplifier Power Stages designed to drive 4-Ω speakers at up to 150 W per channel for TAS5614LDDV and 125 W per channel for TAS5612LDDV. They require only a passive demodulation filter to deliver efficient high quality audio amplification.

The TAS5558 is a high-performance 32-bit (24-bit input) multi channel PurePath Digital Pulse Width Modulator (PWM) with fully symmetrical AD modulation scheme. The device also has Digital Audio Processing (DAP) that provides 48 bit signal processing, advanced performance and a high level of system integration.

This EVM can be configured as 2 BTL channels for stereo evaluation or 1 PBTL (parallel BTL) channel for subwoofer evaluation. Together with a TI Input-USB Board 3, it provides a complete stereo digital audio amplifier system which includes digital input (S/PDIF), analog inputs, interface to PC and DAP features like digital volume control, input and output mixers, automute, tone controls, loudness, EQ filters and dynamic range compression (DRC). There are configuration options for power stage failure protection.

> **NOTE:** **TAS5612L-TAS5614LDDVEVM is shipped with the current version of the TAS5614L installed. Evaluate the current version of TAS5612L by visiting the product folder at www.ti.com and requesting a free sample. Replace the TAS5614L with the TAS5612L.**

Table 1. TAS5612L-TAS5614LDDVEVM Specification

Key Parameters	Values
TAS5614L Power Supply Voltage	12–38 Vdc
TAS5612L Power Supply Voltage	12–34 Vdc
Number of Channels	2 × BTL or 1 × PBTL
Load Impedance BTL	4–8 Ohm
Load Impedance PBTL	2–4 Ohm
TAS5614L Output power BTL	150 W / 4 Ohm / 10% THD+N
TAS5614L Output power PBTL	300 W / 2 Ohm / 10% THD+N
TAS5612L Output power BTL	125 W / 4 Ohm / 10% THD+N
TAS5612L Output power PBTL	250 W / 2 Ohm / 10% THD+N
Dynamic Range (DNR)	> 105 dB
PWM Processor	TAS5558
Output Stage	TAS5614LDDV or TAS5612LDDV

> **NOTE:** The heatsink in TAS5612L-TAS5614LDDVEVM is designed to comply with time requirements of the "Amplifier Rule", US Federal Trade Commission 16 CFR 432, when the EVM is operated at power levels specified above. If continuous operation at specified output power is required it is necessary to provide forced air flow through the heatsink.
>
> (The FTC regulation specifies operation in 25°C ambient temperature for one hour at 1/8 specified output power (18.75W per channel for TAS5614LDDVEVM, 15.63W per channel for TAS5612LDDVEVM) and then for 5 minutes at specified output power (150W per channel for TAS5614LDDVEVM, 125W per channel for TAS5612LDDVEVM). Then distortion vs. output power can be measured. TAS5612L-TAS5614LDDVEVM provides specified output power for several minutes or more without thermal shutdown. THD is not specified for this test but is typically near 10%.)
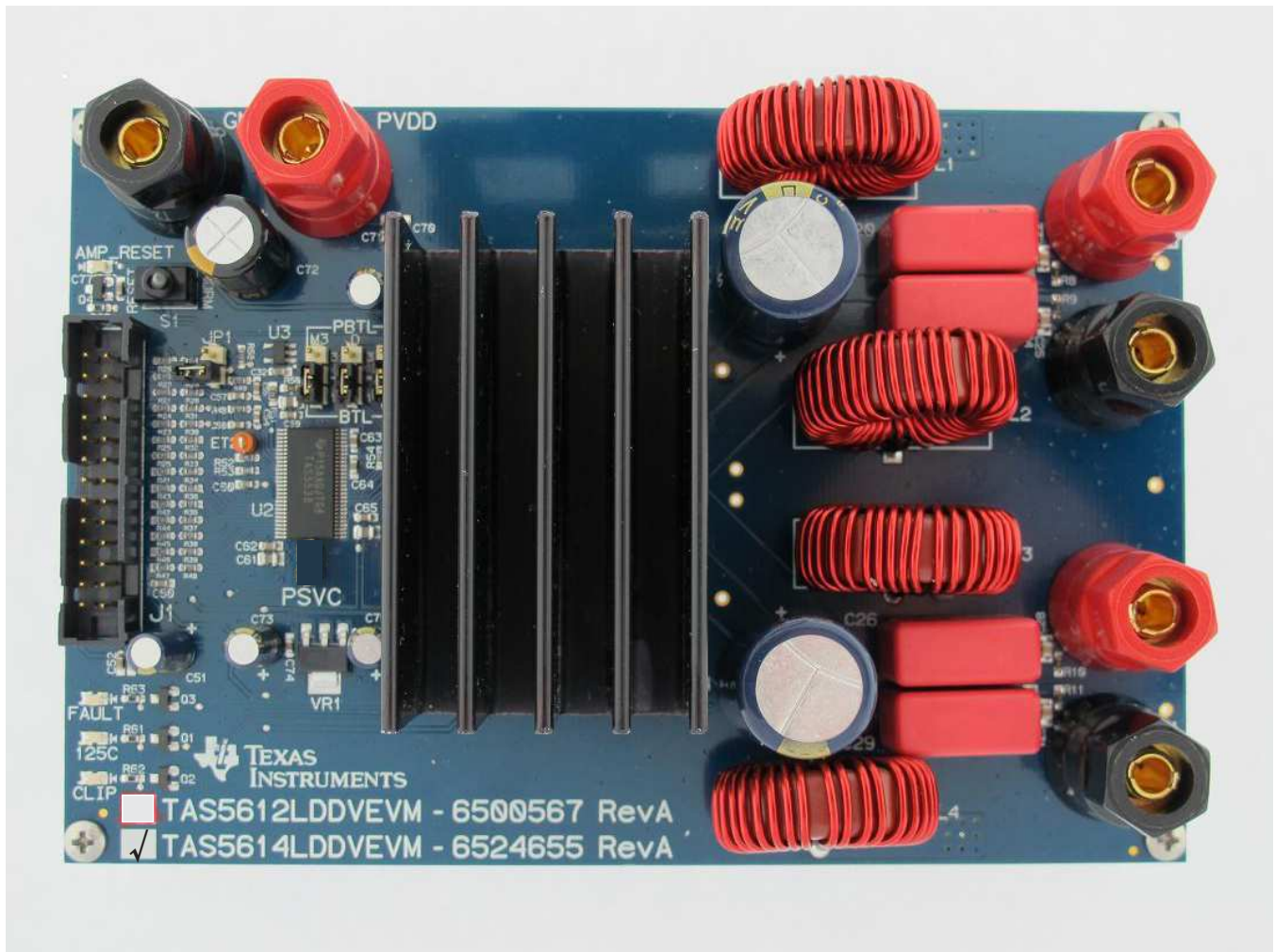
Figure 1. TAS5612L-TAS5614LDDVEVM
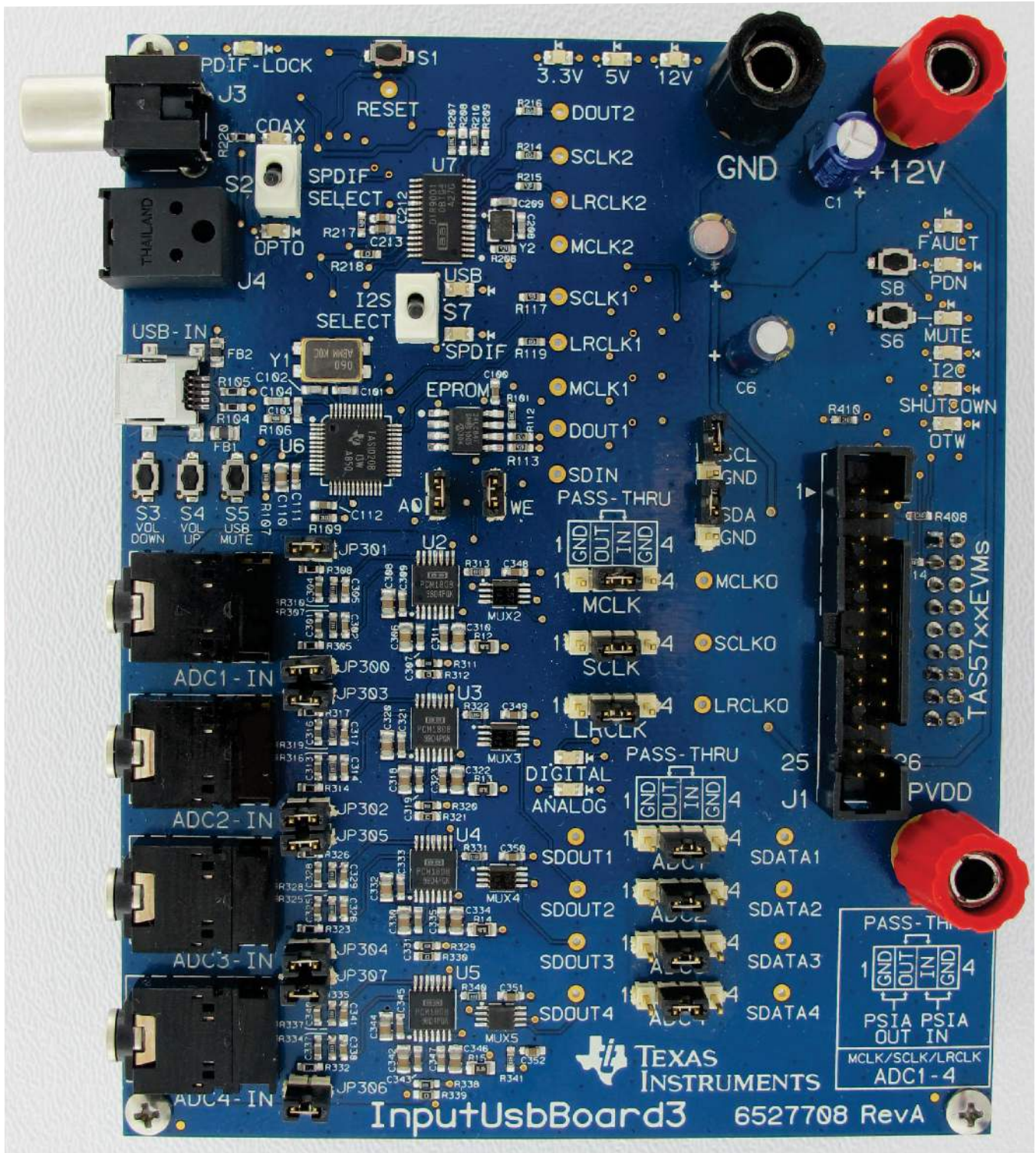
Figure 2. Input-USB Board3

Gerber (layout) files are available at: http://www.ti.com.

The EVM is delivered with a TI Input-USB Board 3 to connect to an input source and to a PC for control. Refer to Unpacking the EVM.

TAS5612L-TAS5614LDDVEVM Features

• Stereo PurePath Digital evaluation module.
• Self-contained protection system (overcurrent, overtemperature, undervoltage and missing PWM input).
• Standard I²S and I²C / Control connector for TI input board
• Double-sided plated-through PCB layout.
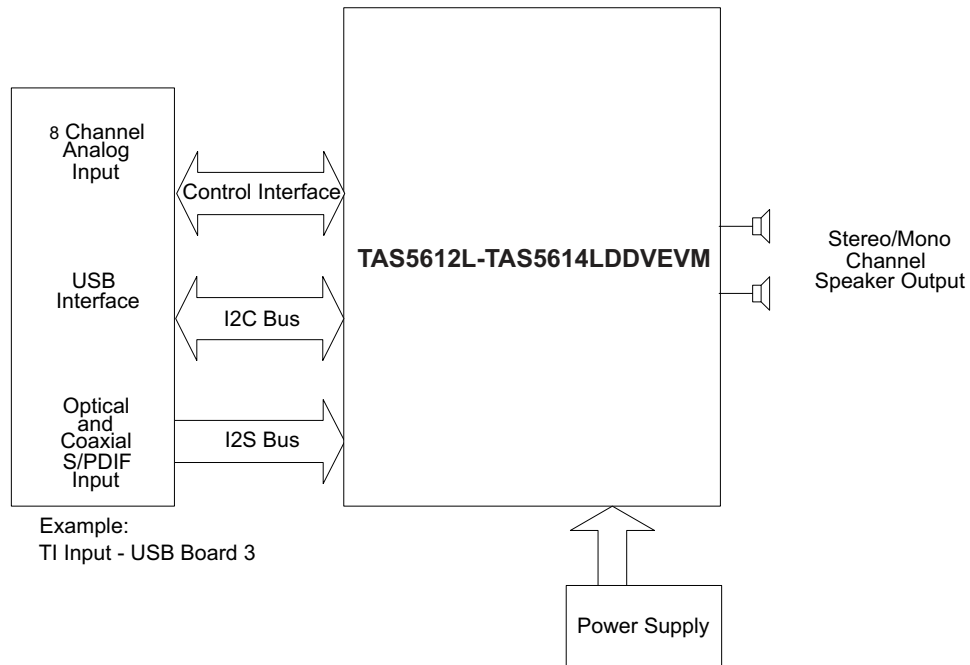
Figure 3. Integrated PurePath Digital Amplifier System

EVM Physical Structure

Physical structure of the TAS5612L-TAS5614LDDVEVM is illustrated in Figure 4.
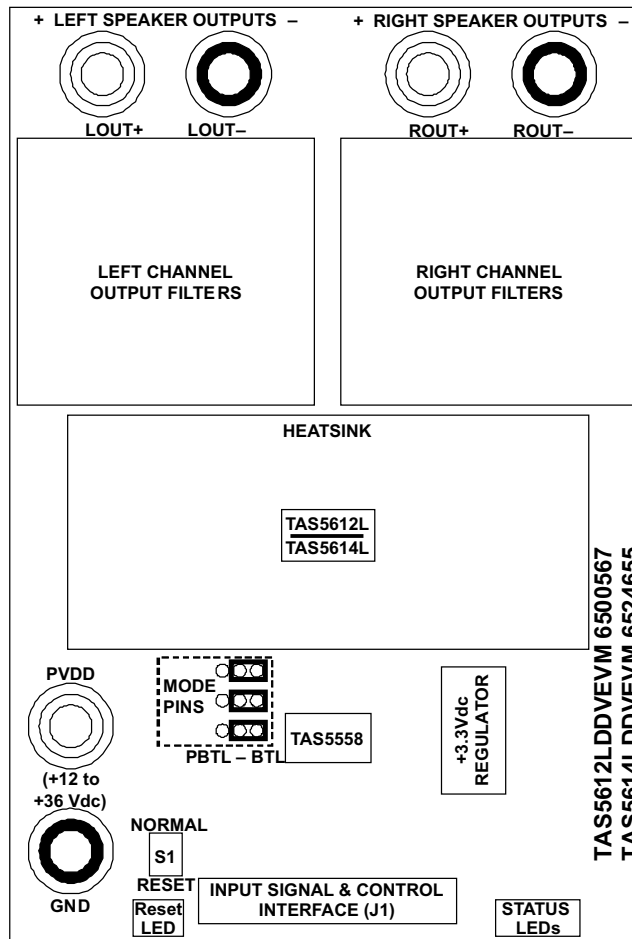
Figure 4. Physical Structure of the TAS5612L-TAS5614LDDVEVM (Approximate Layout)

2 Quick Setup Guide

This section describes the TAS5612L-TAS5614LDDVEVM power supplies and system interfaces. It provides information regarding handling and unpacking, absolute operating conditions, and switch and jumper positions. It also provides a step-by-step guide to setting up the TAS5612L-TAS5614LDDVEVM for device evaluation.

2.1 Electrostatic Discharge Warning

Many of the components of the TAS5612L-TAS5614LDDVEVM are susceptible to damage by electrostatic discharge (ESD). Customers are advised to observe proper ESD handling precautions when unpacking and handling the EVM, including the use of a grounded wrist strap at an approved ESD workstation.

CAUTION

Failure to observe ESD handling procedures can result in damage to EVM components.

2.2 Unpacking the EVM

Upon opening the TAS5612L-TAS5614LDDVEVM package, check to make sure that the following items are included:

- 1 pc. TAS5612L-TAS5614LDDVEVM using 1 TAS5558 and 1 TAS5612LDDV or TAS5614LDDV.
- 1 pc. TI Input-USB Board 3 for interfacing TAS5612L-TAS5614LDDVEVM to SPDIF/analog sources and PC for control.
- 1 pc. Signal and Control Interface IDC cable for connection to an I^{2}S front-end like the Input-USB Board 3.
- If any of these items are missing, contact the nearest Texas Instruments Product Information Center to inquire about a replacement.

Connect the Input-USB Board 3 to the TAS5612L/14LDDVEVM using the delivered IDC cable.

Power Supply Setup

Two power supplies are needed to power the TAS5612L-TAS5614LDDVEVM. Voltage and current requirements for the PVDD power supply are shown in the table below. Connect this power supply to the EVM using banana cables or wires secured to the power supply binding posts PVDD and GND. A second power supply, 12Vdc at 500mA, is required to power Input-USB Board 3. Connect the 12V power supply to the Input-USB Board 3 using banana cables or wires secured to the power supply binding posts +12V and GND.

Table 2. Recommended PVDD Power Supply Voltages

Description	Voltage Range	Current Requirements	Binding Post
TAS5614L Power Supply Voltage	12–38 Vdc	16 A	PVDD
TAS5612L Power Supply Voltage	12–34 Vdc	14 A	PVDD

CAUTION

NOTE: Applying voltages above specifications in Table 2 can cause permanent damage to the hardware. Verify polarity of power supply connections before powering the EVM.

NOTE: The length of the power supply cable must be minimized. Increasing length of PSU cable is likely to increase distortion for the amplifier at high output levels and low frequencies.

2.3 Speaker Connection

> **CAUTION**
>
> Both positive and negative speaker outputs are floating and cannot be connected to ground (that is, through an oscilloscope). To measure a BTL output connect an oscilloscope probe to each side of the output, connect both ground clips to EVM ground and use the oscilloscope math functions to show the difference between the 2 probe signals.

2.4 Output Configuration BTL and PBTL

When changing mode from BTL to PBTL, make sure that the AMP_RESET switch is set to RESET before changing shunts on Mode headers M3, D and C.
- For BTL mode place a shunt on pins 1 and 2 of each header, at the positions marked BTL.
- For PBTL mode place a shunt on pins 3 and 2 of each header, at the positions marked PBTL.

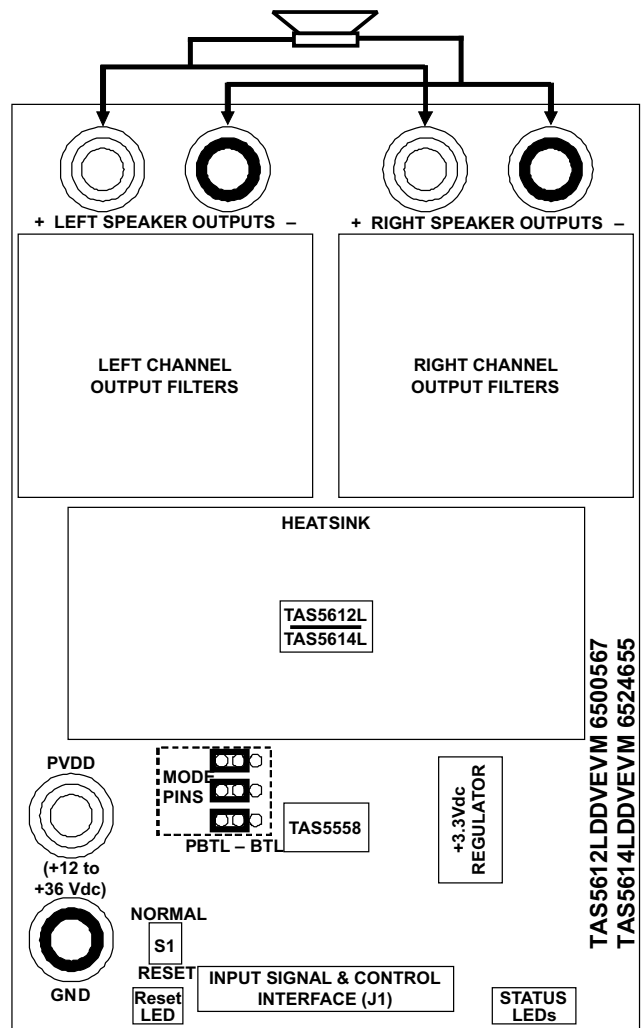In PBTL mode the load must be connected according to Figure 5:

Figure 5. PBTL Mode Configuration

3 GUI Software Installation and Startup

The TAS5612L-TAS5614LDDVEVM is controlled by the Input-USB Board 3 the PurePath Console GUI and TAS5612 plug-in. The TAS5612 GUI provides control of all registers in the TAS5558. Connect the USB cable (not supplied) between the host PC and jack USB-IN on the Input-USB Board 3. Then turn on the 12-V power supply and the PVDD power supply in that order.

3.1 Software Installation

Download the PurePath Console GUI from the TI Web site (http://cc.ext.ti.com). The TI Web site always has the latest release and any updates to versions of the GUI. A request must be submitted to download the software.

Execute the GUI install program, setup_PurePathConsole_Main_vxx_revxx.exe. Once the program is installed, the program group and shortcut icon is created in Start → Program → Texas Instruments Inc → PurePathConsole → Choose Target. When the GUI comes up, select TAS5612.

3.2 Software Quick-Start Guide

The EVM is initialized upon PurePath Console GUI startup. Audio is streaming to the headphones if Window Media (or similar program) is playing and mini-USB EVM is selected in the sound playback properties. The following indicators show both PurePath Console GUI and EVM are operating correctly:

- On the EVM, the VALID LED (green) is on
- On the PurePath Console GUI, both green LEDs on the bottom left corner are on

3.3 Using the EVM Software

3.3.1 Main Tab

Figure 6 illustrates the main tab when the GUI starts up. Clicking the TAS5612 icon directs you to the device block diagram.
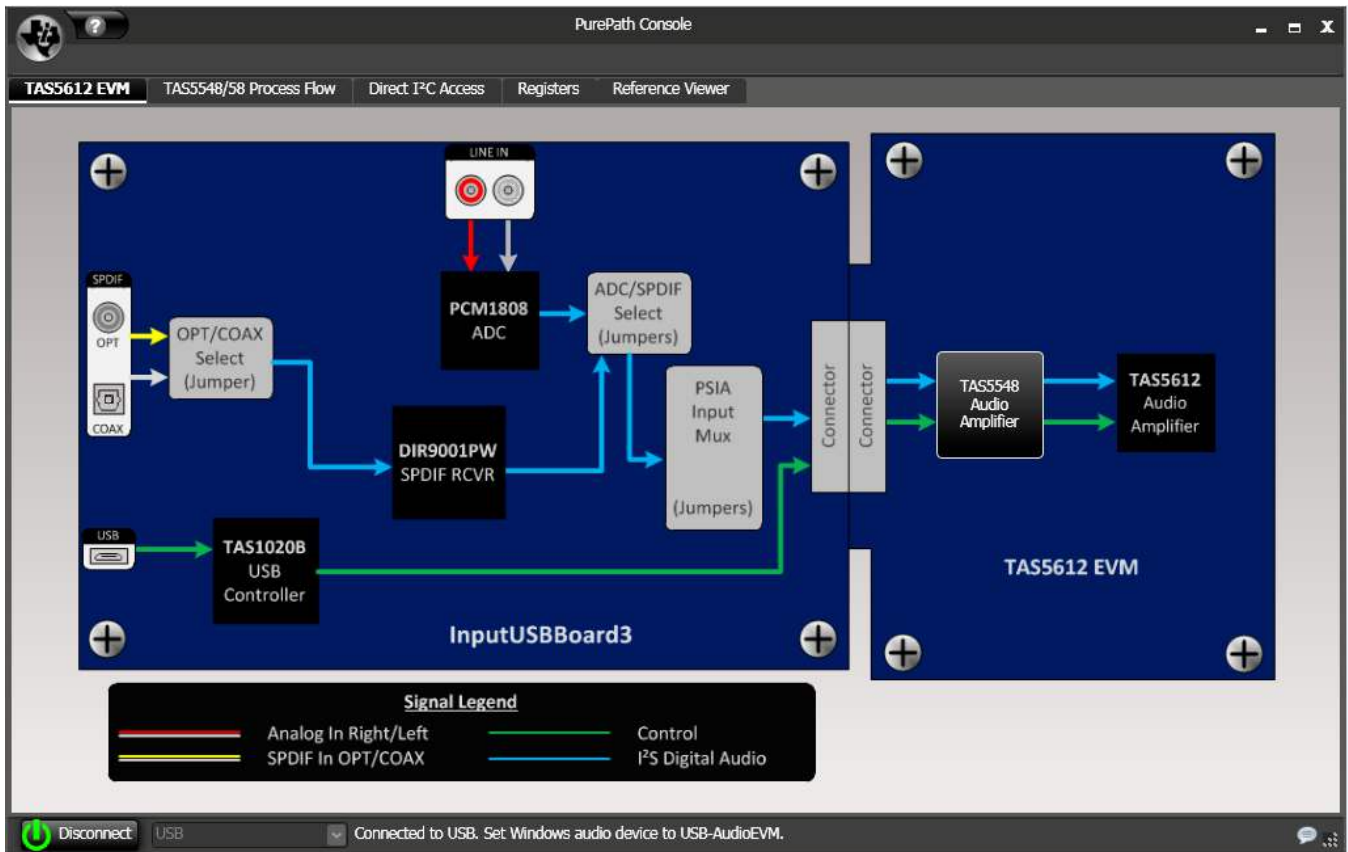
Figure 6. Main Tab

3.3.2 Block Diagram Tab

This tab shows major blocks of the device. To control the device, click on the digital audio processor (DAP) bringing up the TAS5558 process flow tab.

3.3.3 Process Flow Tab

The process flow tab, Figure 7,controls the TAS5558 main functions: EQ, DRC, input and output mixing, tone, and volume.
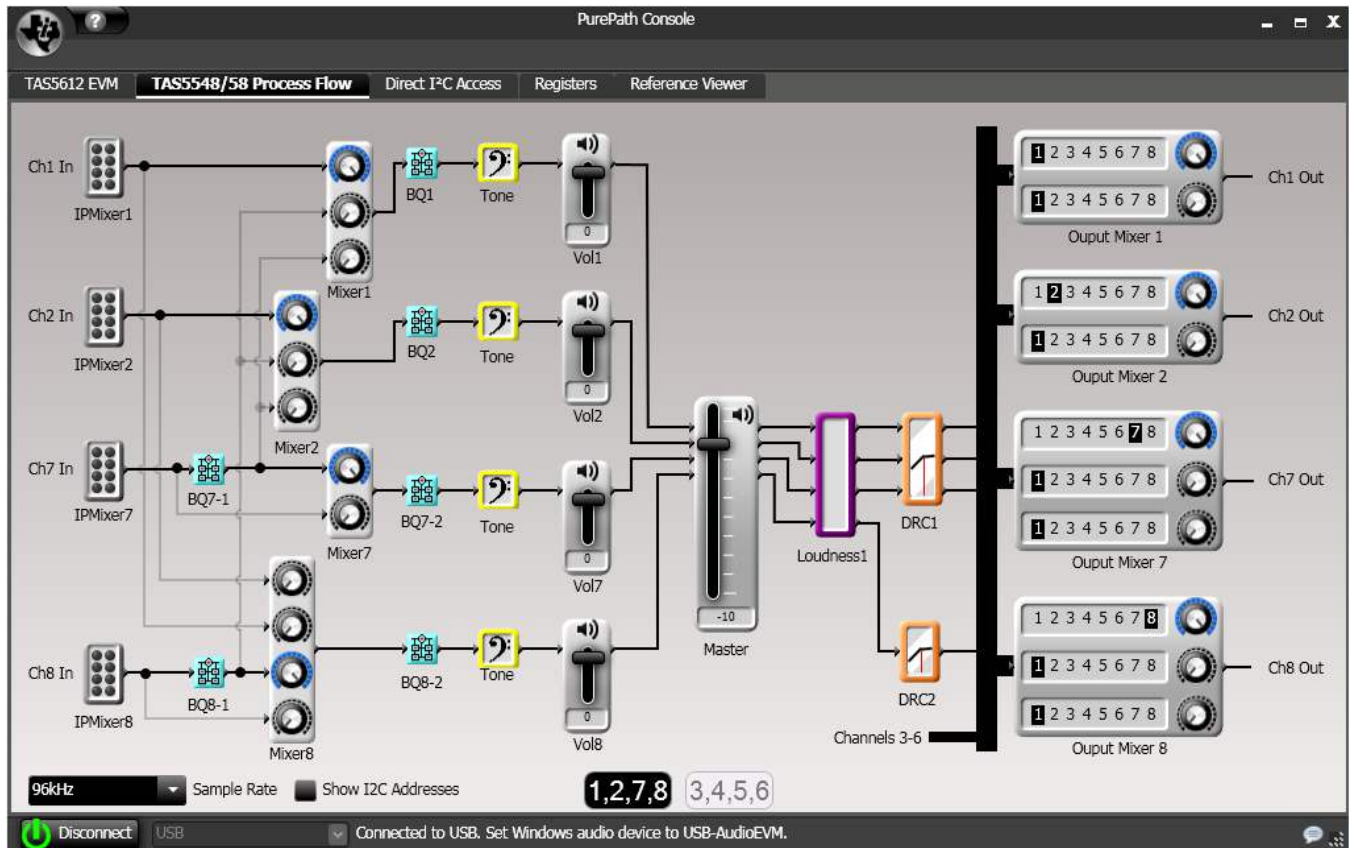
Figure 7. Process Flow Tab

3.3.4   Direct I²C Access Tab

Reading and writing I²C registers is performed on the tab illustrated in Figure 8.

Figure 8. Direct I²C Access

3.3.5   TAS5558 Registers Tab

The TAS5558 registers tab, illustrated in Figure 9, shows the current I²C register values (hexadecimal and decimal).
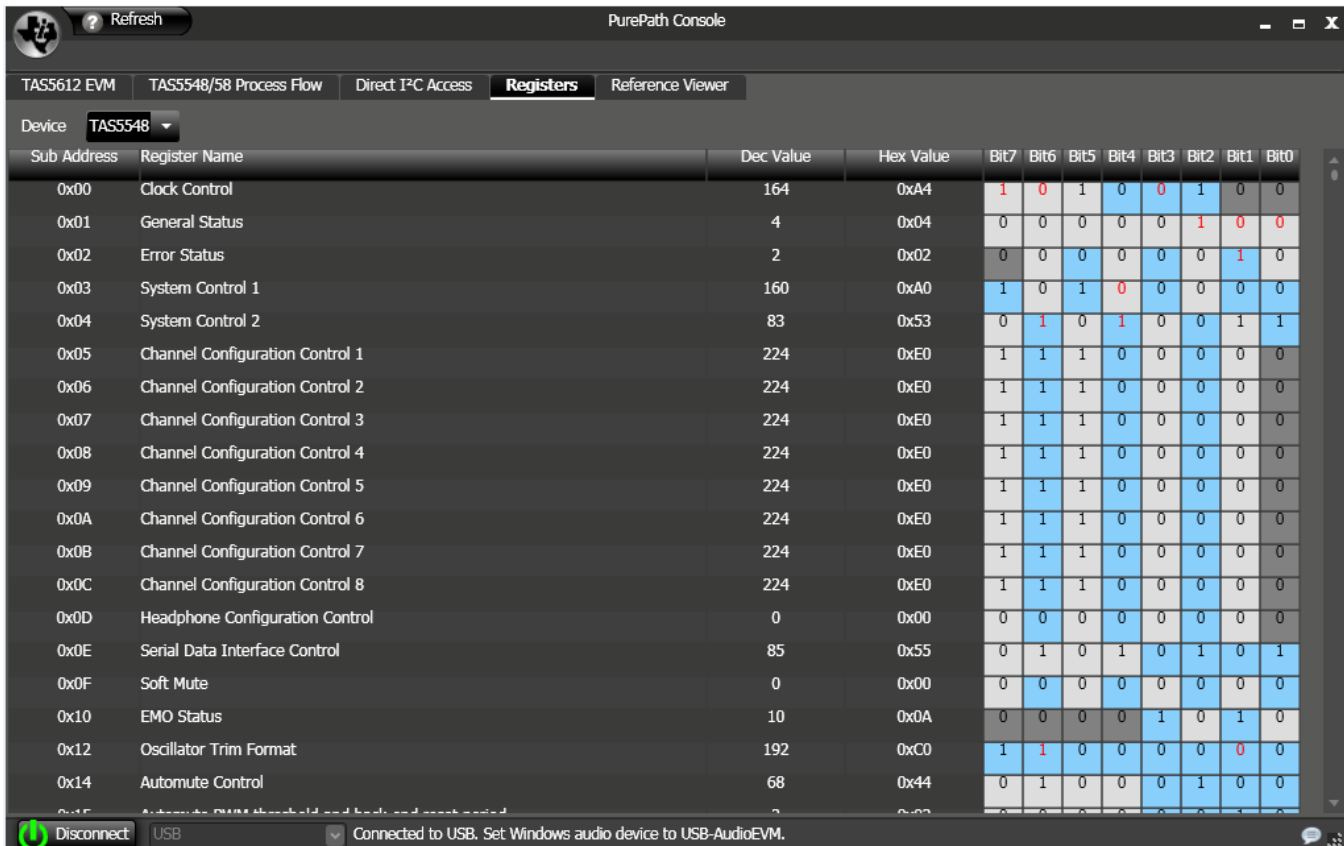
Figure 9. Registers Tab (Selecting Biquad GUI)

3.4 Self-Protection and Fault Reporting

The TAS5612L and TAS5614L are self-protecting devices that provide overtemperature, overcurrent, undervoltage and missing-PWM-input protection, with extensive fault reporting. For full descriptions of these functions consult data sheet SLAS847 for TAS5612LA and data sheet SLAS846 for TAS5614LA.
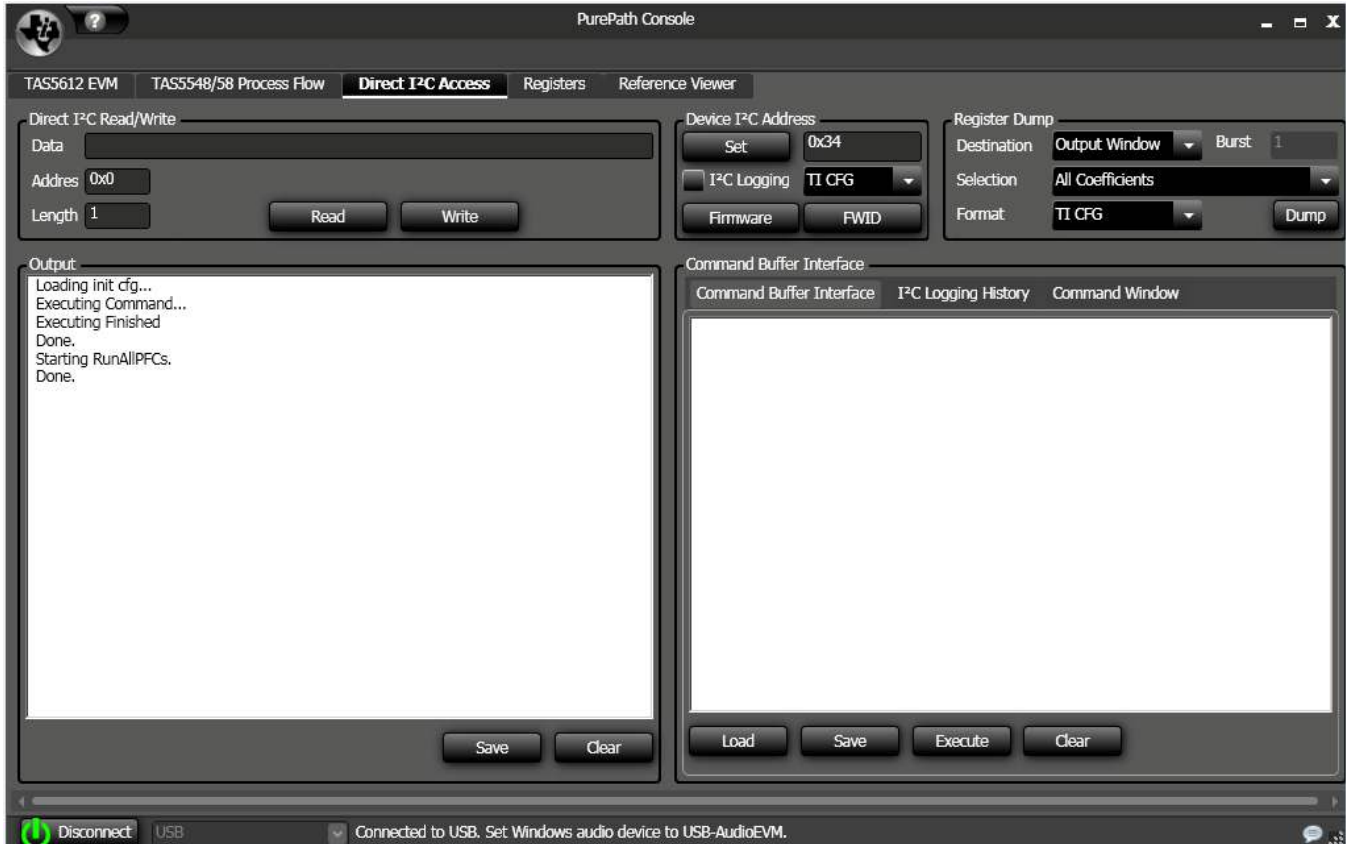
4 Related Documentation from Texas Instruments

The following table lists data sheets that provide detailed descriptions of integrated circuits from TI that are used in the TAS5612L-TAS5614LDDVEVM. These data sheets can be obtained at http://www.ti.com.

Related Documentation from Texas Instruments

Part Number	Literature Number
TAS5558	SLES273
TAS5612LA	SLAS847
TAS5614LA	SLAS846
TPS3825-33	SLVS165
TLV1117-33C	SLVS561

4.1 Additional Documentation

1. *System Design Considerations for True Digital Audio Power Amplifiers* (SLAA117)
2. *Digital Audio Measurements* (SLAA114)
3. *PSRR for PurePath Digital Audio Amplifiers* (SLEA049)

4. *Power Rating in Audio Amplifier* (SLEA047)

5. *PurePath Digital AM Interference Avoidance* (SLEA040)

6. *Click & Pop Measurements Technique* (SLEA044)

7. *Power Supply Recommendations for DVD-Receivers* (SLEA027)

8. *Implementation of Power Supply Volume Control* (SLEA038)

5   Design Information

This appendix includes design information for the TAS5612L-TAS5614LDDVEVM. This information is presented in the following order.

*   Table 3 Bill of Materials for TAS5614LDDVEVM
*   Section 5.1 EVM Custom Component Vendors
*   Section 5.2 TAS5612L-TAS5614LDDVEVM PCB SPECIFICATION
*   Section 5.3 EVM PCB Layers
*   Section 5.4 EVM and Input-USB Board 3 Schematics

Table 3. Bill of Materials for TAS5614LDDVEVM

Manu Part No.	Qty.	Ref Des	Vendor Part No.	Description	Vendor	Manu.
TI-SEMICONDUCTORS						
TAS5614LDDV	1	U1	TAS5614LDDV	150W-STEREO/300W-MONO PUREPATH DIGITAL AMP HTSSOP44-DDV ROHS	Texas Instruments	Texas Instruments
TAS5558	1	U2	TAS5558	8 CHANNEL HD COMPATIBLE AUDIO PROCESSOR TAS5558-DGG ROHS	Texas Instruments	Texas Instruments
TPS3825-33DBVT	1	U3	296-2636-1	PROCESSOR SUPERVISORY CIRCUITS 2.93V 200ms SOT23-DBV5 ROHS	Digi-Key	Texas Instruments
TLV1117-33CDCYR	1	VR1	296-21112-1-ND	VOLT REG LDO 3.3V 800mA SOT223-DCY ROHS	Digi-Key	Texas Instruments
SEMICONDUCTORS						
2N7002	4	Q1, Q2, Q3, Q4	2N7002NCT	N-FET 60V 115mA 200mW 7.5 OHM@10V SOT23-DBV3 ROHS	Digi-Key	Fairchild
SML-LXT0805SRW-TR	3	125C, FAULT, AMP_RESET	67-1555-1	LED, RED 2.0V SMD0805 ROHS	Digi-Key	Lumex Opto
SML-LXT0805YW-TR	1	CLIP	67-1554-1	LED, YELLOW 2.0V SMD0805 ROHS	Digi-Key	Lumex Opto
CAPACITORS						
C1206C102K1RACTU	4	C21, C24, C27, C30	399-1222-1	CAP SMD1206 CERM 1000PFD 100V 1% C0G ROHS	Digi-Key	Kemet
GRM188R71H472KA01D	2	C54, C55	490-1506-1	CAP SMD0603 CERM 4700PFD 50V 10% X7R ROHS	Digi-Key	Murata
GRM21BR72A103KA01L	5	C22, C25, C28, C31, C70	490-1652-1	CAP SMD0805 CERM 0.01UFD 100V 10% X7R ROHS	Digi-Key	Murata
GRM188R71H333KA61D	4	C16, C17, C18, C19	490-3286-1-ND	CAP SMD0603 CERM 0.033UFD 50V 10% X7R ROHS	Digi-Key	Murata
GRM188R71C473KA01D	2	C56, C57	490-1529-1	CAP SMD0603 CERM 0.047UFD 16V 10% ROHS	Digi-Key	Murata
GRM188R71C104KA01D	17	C2, C3, C4, C7, C32, C50, C52, C53, C59, C60, C62, C63, C64, C65, C74, C76, C77	490-1532-1-ND	CAP SMD0603 CERM 0.1UFD 16V 10% X7R ROHS	Digi-Key	Murata
MKP4 -.68/250/20	4	C20, C23, C26, C29	MKP4 -0.68/250/20	CAP POLYPRO FILM MKP4 0.68UFD 250V 20% ROHS	WIMA	WIMA
C1608X7R1C105K	2	C5, C6	445-1604-1	CAP SMD0603 CERM 1.0UFD 16V 10% X7R ROHS	Digi-Key	TDK
GRM21BR71H105KA12L	5	C8, C9, C10, C11, C71	490-4736-1-ND	CAP SMD0805 CERM 1.0UFD 50V 10% X7R ROHS	Digi-Key	Murata
GRM21BR61C106KE15L	3	C58, C61, C66	490-3886-1	CAP SMD0805 CERM 10UFD 16V 10% X5R ROHS	Digi-Key	Murata
CAPACITORS						
EEU-FC1C470	4	C1, C51, C73, C75	P11196	CAP 47UFD 16V RAD ALUM ELEC FC ROHS	Digi-Key	Panasonic
UKZ1H470MPM	1	C72	493-3194	CAP ALUM ELEC KZ RADIAL 47UFD 50V 20% ROHS	Digi-Key	Nichicon
EEU-FC1H102	2	C12, C14	P10333-ND	CAP ALUM ELEC FC RADIAL 1000UFD 50V 20% ROHS	Digi-Key	Panasonic
RESISTORS						
RMCF0402ZT0R00	2	R12, R13	RMCF0402ZT0R00CT	ZERO OHM JUMPER SMT 0402 0 OHM 1/16W,5% ROHS	Digi-Key	Stackpole Electronics
ERJ-3GEY0R00V	1	R51	P0.0GCT	RESISTOR SMD0603 0.0 OHM 5% THICK FILM 1/10W ROHS	Digi-Key	Panasonic
ERJ-3GEYJ1R0V	1	R50	P1.0GCT	RESISTOR SMD0603 1.0 OHMS 1% THICK FILM 1/10W ROHS	Digi-Key	Panasonic
ERJ-3GEYJ3R3V	8	R1, R7, R8, R9, R10, R11, R14, R60	P3.3GCT	RESISTOR SMD0603 3.3 OHMS 5% 1/10W ROHS	Digi-Key	Panasonic
ERJ-3GEYJ470V	19	R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R54, R55, R56, R57, R58	P47GCT	RESISTOR SMD0603 47 OHMS 5% 1/10W ROHS	Digi-Key	Panasonic
CRCW0603100RFKEA	3	R4, R5, R6	541-100HCT	RESISTOR SMD0603 100 OHM 1/10W 1% ROHS	Digi-Key	Vishay
ERJ-3GEYJ471V	2	R48, R49	P470GCT	RESISTOR SMD0603 470 OHMS 5% 1/10W ROHS	Digi-Key	Panasonic
ERJ-3GEYJ472V	4	R61, R62, R63, R65	P4.7KGCT	RESISTOR SMD0603 4.7K OHMS 5% 1/10W ROHS	Digi-Key	Panasonic

Table 3. Bill of Materials for TAS5614LDDVEVM (continued)

Manu Part No.	Qty.	Ref Des	Vendor Part No.	Description	Vendor	Manu.
ERJ-3EKF1002V	14	R20, R21, R22, R23, R24, R25, R26, R41, R42, R43, R44, R45, R46, R47	P10.0KHCT	RESISTOR SMD0603 10.0K 1% THICK FILM 1/10W ROHS	Digi-Key	Panasonic
RMCF0603FT15K0	1	R52	RMCF0603FT15K0CT	RESISTOR SMD0603 15.0K OHMS 1% 1/10W ROHS	Digi-Key	Stackpole Electronics
RC0603FR-0718KL	1	R53	311-18.0KHRCT	RESISTOR SMD0603 THICK FILM 18.0K OHMS 1% 1/10W ROHS	Digi-Key	Yageo
RC0603FR-0730KL	1	R2	311-30.0KHRCT	RESISTOR SMD0603 THICK FILM 30.0K 1% 1/10W ROHS	Digi-Key	Yageo
ERJ-3GEYJ473V	1	R3	P47KGCT	RESISTOR SMD0603 47K OHMS 5% 1/10W ROHS	Digi-Key	Panasonic
INDUCTORS						
MA5172-AE	4	L1, L2, L3, L4	MA5172-AE	SHIELDED POWER INDUCTOR 10uH 10A ROHS	Coil Craft	Coil Craft
HEADERS						
N2526-6002-RB	1	J1	MHC26K-ND	HEADER SHROUDED 100LS MALE GOLD 2X13 PINS ROHS	Digi-Key	3M
PBC02SAAN	1	JP1	S1011E-02-ND	HEADER THRU MALE 2 PIN 100LS GOLD ROHS	Digi-Key	Sullins
PBC03SAAN	3	C, D, M3	S1011E-03-ND	HEADER THRU MALE 3 PIN 100LS GOLD ROHS	Digi-Key	Sullins
TESTPOINTS AND SWITCHES						
5003	1	ET2	5003K	PC TESTPOINT, ORANGE, ROHS	Digi-Key	Keystone Electronics
G12AP-RO	1	S1	360-1758	SWITCH THRU SPDT STRAIGHT ULTRA MINIATURE ROHS	Digi-Key	NKK
BINDING POSTS						
5018-0	3	GND, LOUT-, ROUT-	565-5018-0	BINDING POST, BLACK 60V 30A GOLD ROHS	Mouser	Pomona
5018-2	3	PVDD, LOUT+, ROUT+	565-5018-2	BINDING POST, RED 60V 30A GOLD ROHS	Mouser	Pomona
SHUNTS						
SPC02SYAN	4	JP1, C(1-2), D(1-2), M3(1-2)	S9001	SHUNT, BLACK AU FLASH 0.100LS	Digi-Key	Sullins
HEAT SINKS AND HARDWARE						
ATSTI1OP-563-C1-R0	1	HS1	ATSTI1OP-563-C1-R0	HEATSINK ALUMINUM ATS 36x54mm 36.8mm PITCH ROHS	ATS	ATS
92000A118	2	HS1	92000A118	PHILIPS PANHEAD SCREW M3x8mm STAINLESS STEEL ROHS	McMaster- Carr	McMaster- Carr
92148A150	2	HS1	92148A150	SPLIT WASHER M3 STAINLESS STEEL ROHS	McMaster- Carr	McMaster- Carr
STANDOFFS AND HARDWARE						
94868A178	4	NA	94868A178	STANDOFF M3x25mm 4.5mm DIA HEX STAINLESS STEEL F-F ROHS	McMaster- Carr	McMaster- Carr
92000A118	4	NA	92000A118	PHILIPS PANHEAD SCREW M3x8mm STAINLESS STEEL ROHS	McMaster- Carr	McMaster- Carr
92148A150	4	NA	92148A150	SPLIT WASHER M3 STAINLESS STEEL ROHS	McMaster- Carr	McMaster- Carr
Component Count:	163					
COMPONENTS NOT ASSEMBLED						
CR1, CR2, CR3, CR4, L+, L-, OA, OB, OC, OD, R+, R-, PVDD_AB, PVDD_CD, M1, M2, GNDx2, PSVC						

5.1 *EVM Custom Component Vendors*

TAS5612LDDVEVM and TAS5614LDDVEVM include inductors and heatsinks from 2 custom component vendors designed specifically for the EVMs. These vendors carry stock for small orders on their shelves.

Advanced Thermal Solutions (ATS), in Norwood, MA, USA, provide a heatsink optimized for these EVMs, ATS-TI1OP-563-C1. Information on this heatsink can be obtained from Leonard Alter at lalter@qats.com. ATS design and manufacture a large line of off-the-shelf and patented high performance heatsinks. They also design and manufacture research quality thermal test and measurement equipment and offer thermal evaluation and design services. Information about their products and services is available at www.qats.com.

Coilcraft, in Cary, IL, USA, provide a 10µH inductor optimized for these EVMs, MA5172-AE. Information on this component can be found in the data sheet for the MA5172 inductor family at www.coilcraft.com. Coilcraft make a variety of other inductors for Class D amplifiers, most of which are *AEC-Q200* Grade 1 certified for automotive applications. Free evaluation samples and on-line ordering are available at www.coilcraft.com.

5.2 *TAS5612L-TAS5614LDDVEVM PCB SPECIFICATION*

PCB IDENTIFICATION:	TAS5612L-TAS5614LDDVEVM_RevA
PCB TYPE:	DOUBLE-SIDED PLATED-THROUGH
PCB SIZE:	142 x 96 mm
LAMINATE TYPE:	FR4
LAMINATE THICKNESS:	1.6mm
COPPER THICKNESS:	70 µm (2 ounce) (INCLUDING PLATING EXTERIOR LAYER)
COPPER PLATING IN HOLES:	70 µm (2 ounce)
MINIMUM HOLE DIAMETER:	0.3 mm (12 mils)
SILKSCREEN:	WHITE - REMOVE SILKSCREEN FROM SOLDER & PRE-TINNED AREAS
SOLDER MASK:	BLUE
APPROX. HOLE COUNT:	570
PROTECTIVE COATING:	ENIG (ELECTROLESS NICKEL / IMMERSION GOLD)
ELECTRICAL TEST:	PCB MUST BE ELECTRICAL TESTED
COMMENTS:	FAB NOTES ARE IN THE DRILL DRAWING FILE

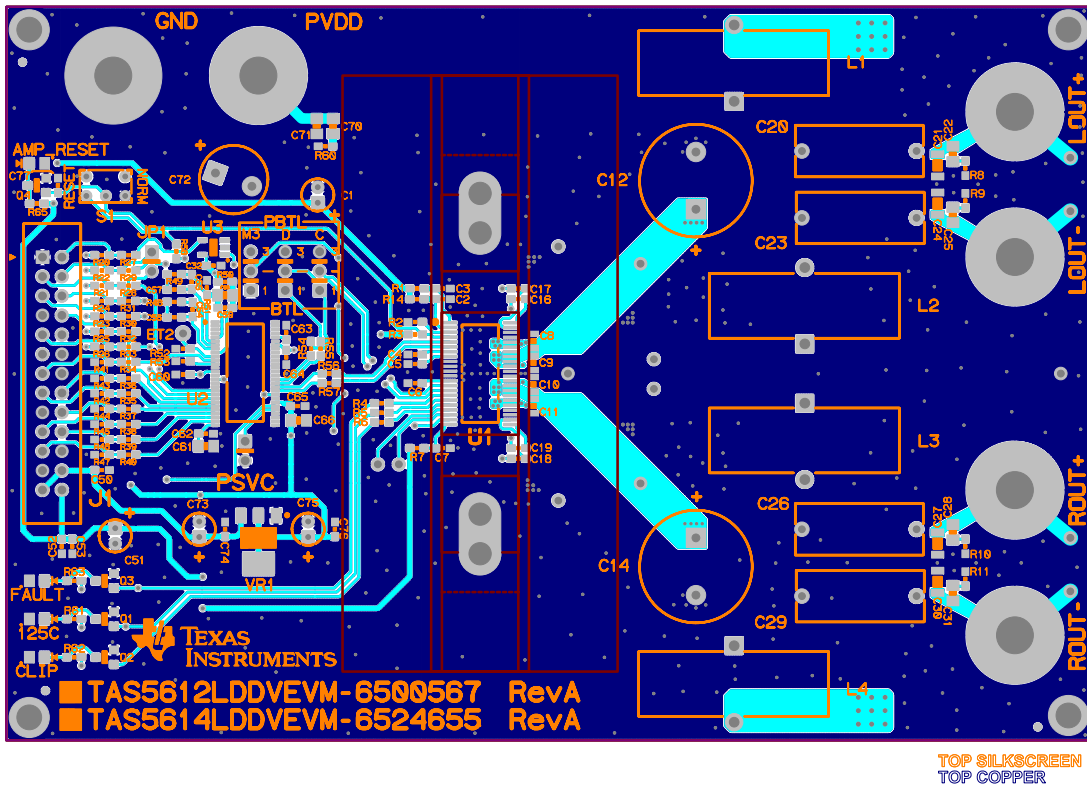## 5.3 EVM PCB Layers

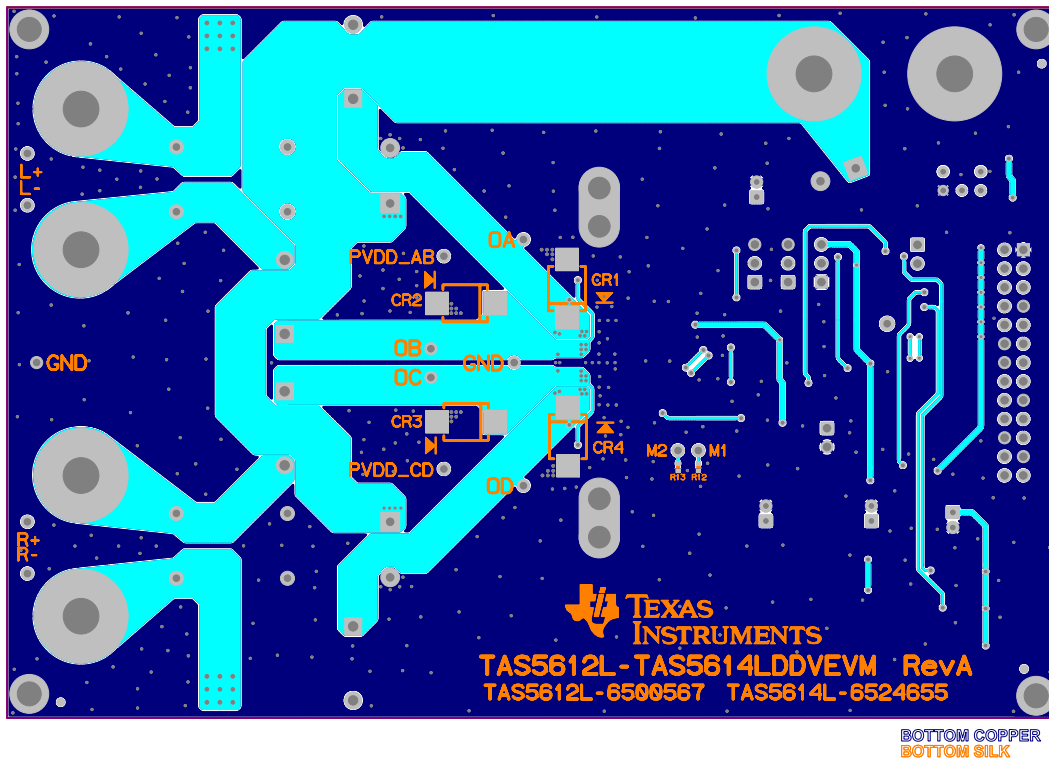**Figure 10. Top Composite PCB Layer**

Figure 11. Bottom Composite PCB Layer

5.4 EVM and Input-USB Board 3 Schematics

The EVM and Input-USB Board 3 schematics are illustrated in Figure 12 through Figure 22.
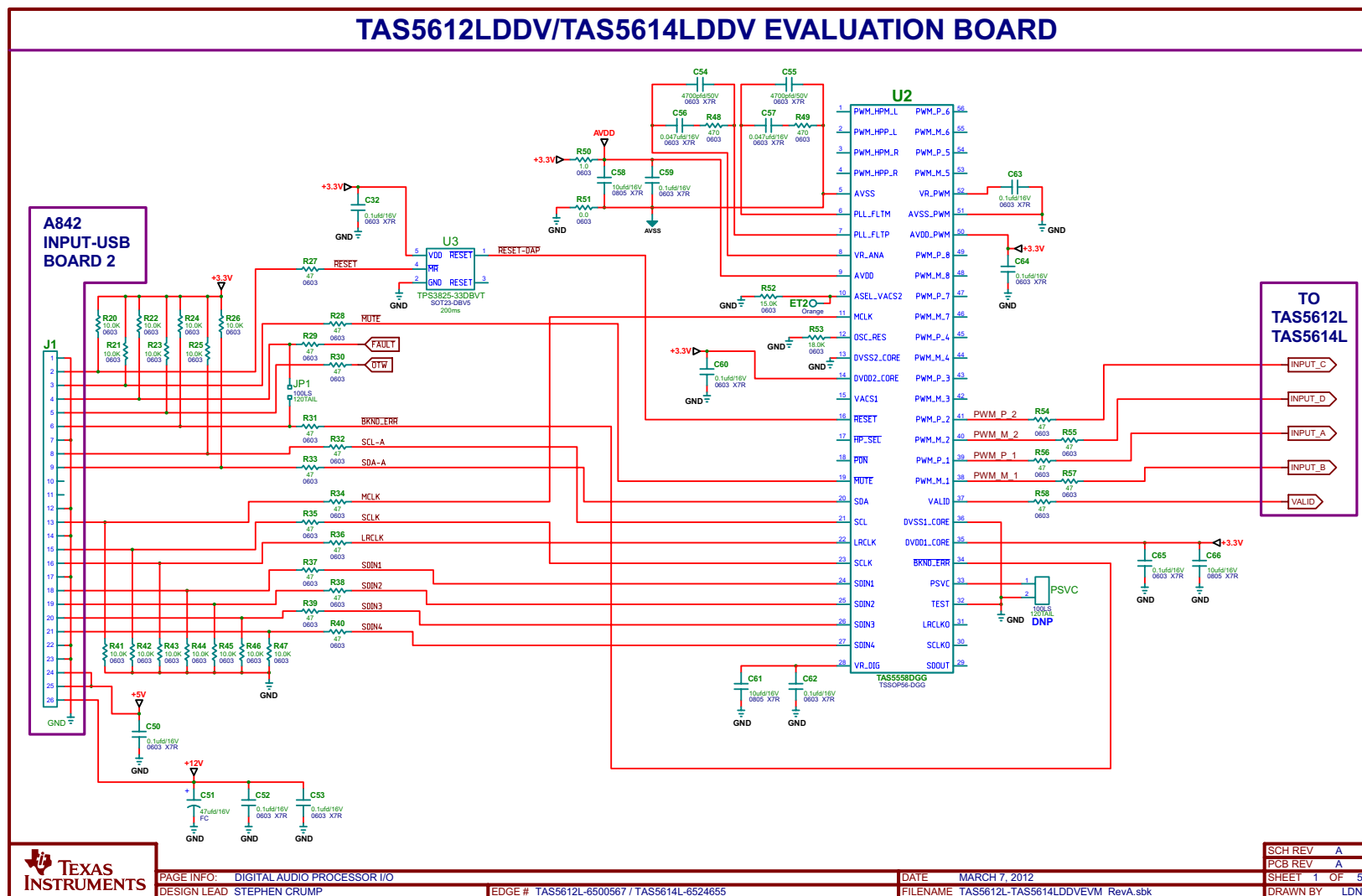

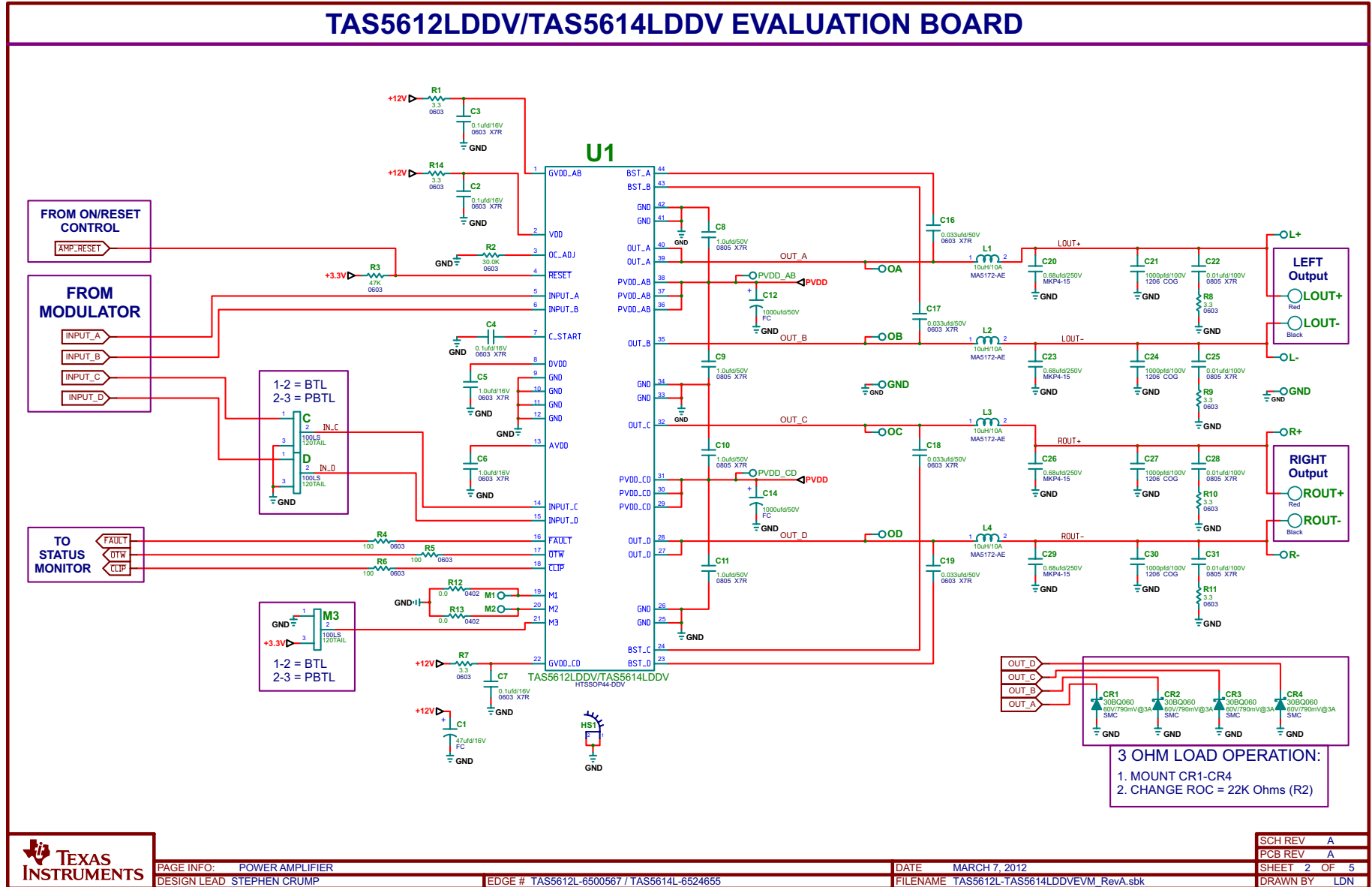**Figure 12. TAS5612L-TAS5614LDDV Evaluation Board Digital Audio Processor I/O**
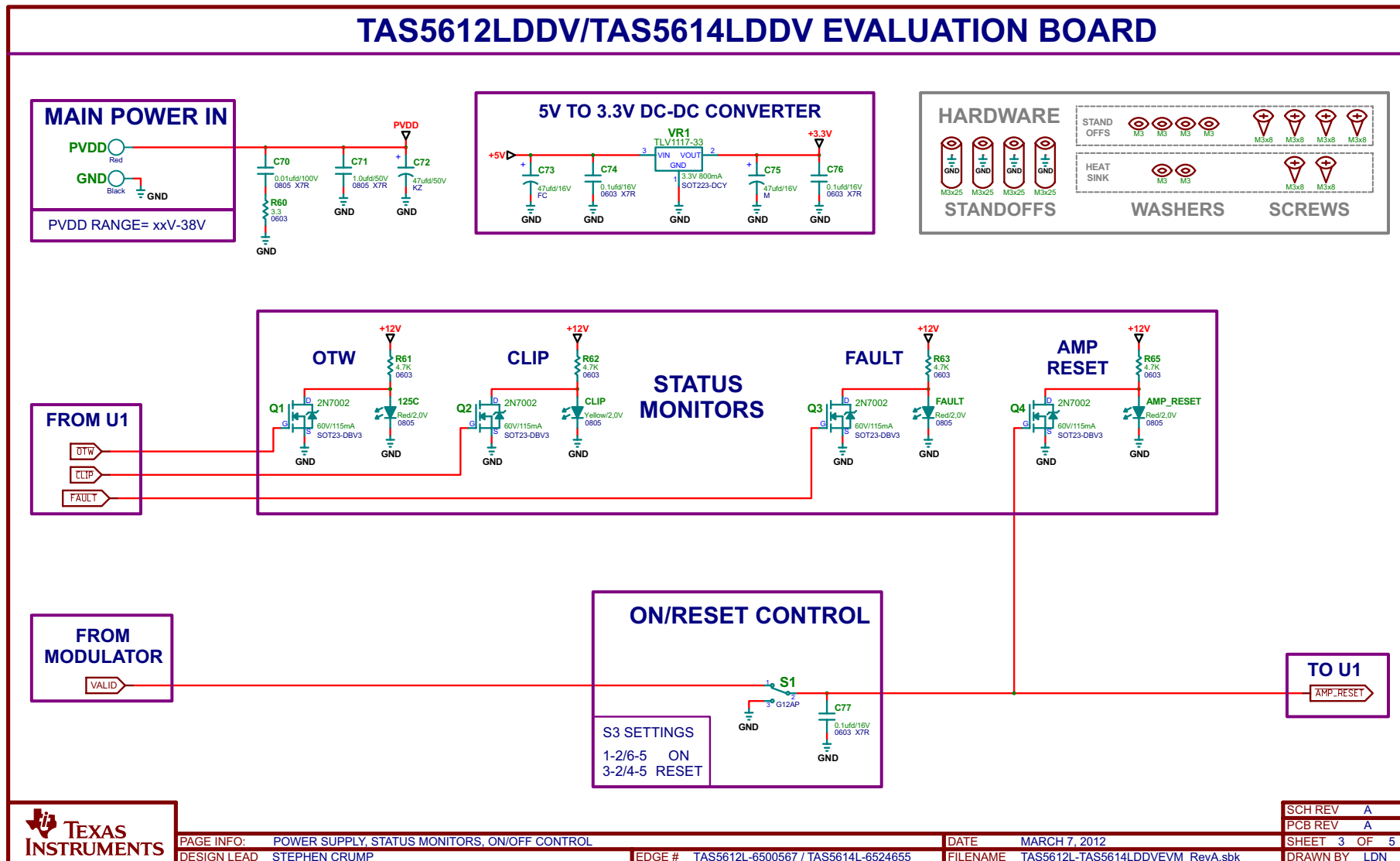
TAS5612LDDV/TAS5614LDDV EVALUATION BOARD

Figure 13. TAS5612L-TAS5614LDDV Evaluation Board Power Amplifier

TAS5612LDDV/TAS5614LDDV EVALUATION BOARD

MAIN POWER IN

PVDD ○ Red

GND ○ Black ⏚ GND

PVDD RANGE= xxV-38V

PVDD

C70
0.01ufd/100V
0805 X7R

C71
1.0ufd/50V
0805 X7R

C72
47ufd/50V
KZ

R60
3.3
0603

GND GND GND GND

5V TO 3.3V DC-DC CONVERTER

VR1
TLV1117-33

+5V

C73
47ufd/16V
FC

C74
0.1ufd/16V
0603 X7R

3 VIN VOUT 2
GND
1
3.3V 800mA
SOT223-DCY

+3.3V

C75
47ufd/16V
M

C76
0.1ufd/16V
0603 X7R

GND GND GND GND GND

HARDWARE

STAND OFFS | M3 M3 M3 M3 | M3x8 M3x8 M3x8 M3x8

GND GND GND GND
M3x25 M3x25 M3x25 M3x25

HEAT SINK | M3 M3 | M3x8 M3x8

M3x25 M3x25

STANDOFFS | WASHERS | SCREWS

STATUS MONITORS

OTW +12V
R61 4.7K 0603
Q1 2N7002
60V/115mA SOT23-DBV3
125C Red/2.0V 0805
GND GND

CLIP +12V
R62 4.7K 0603
Q2 2N7002
60V/115mA SOT23-DBV3
CLIP Yellow/2.0V 0805
GND GND

FAULT +12V
R63 4.7K 0603
Q3 2N7002
60V/115mA SOT23-DBV3
FAULT Red/2.0V 0805
GND GND

AMP RESET +12V
R65 4.7K 0603
Q4 2N7002
60V/115mA SOT23-DBV3
AMP_RESET Red/2.0V 0805
GND GND

FROM U1

OTW
CLIP
FAULT

ON/RESET CONTROL

FROM MODULATOR

VALID

S1
1
2 G12AP
3
GND

C77
0.1ufd/16V
0603 X7R
GND

S3 SETTINGS
1-2/6-5   ON
3-2/4-5 RESET

TO U1

AMP_RESET

Figure 14. TAS5612L-TAS5614LDDV Evaluation Board Power Supply, Status Monitors, On and Off Control

TAS5612LDDV/TAS5614LDDV EVALUATION BOARD

REVISION HISTORY

REVISION	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE	MARCH 7, 2012	SC

TEXAS INSTRUMENTS

PAGE INFO:	REVISION HISTORY			SCH REV	A
				PCB REV	A
		DATE	MARCH 7, 2012	SHEET 4 OF 5
DESIGN LEAD STEPHEN CRUMP		EDGE # TAS5612L-6500567 / TAS5614L-6524655	FILENAME TAS5612L-TAS5614LDDVEVM_RevA.sbk	DRAWN BY LDN

Figure 15. TAS5612L-TAS5614LDDV Evaluation Board Revision History

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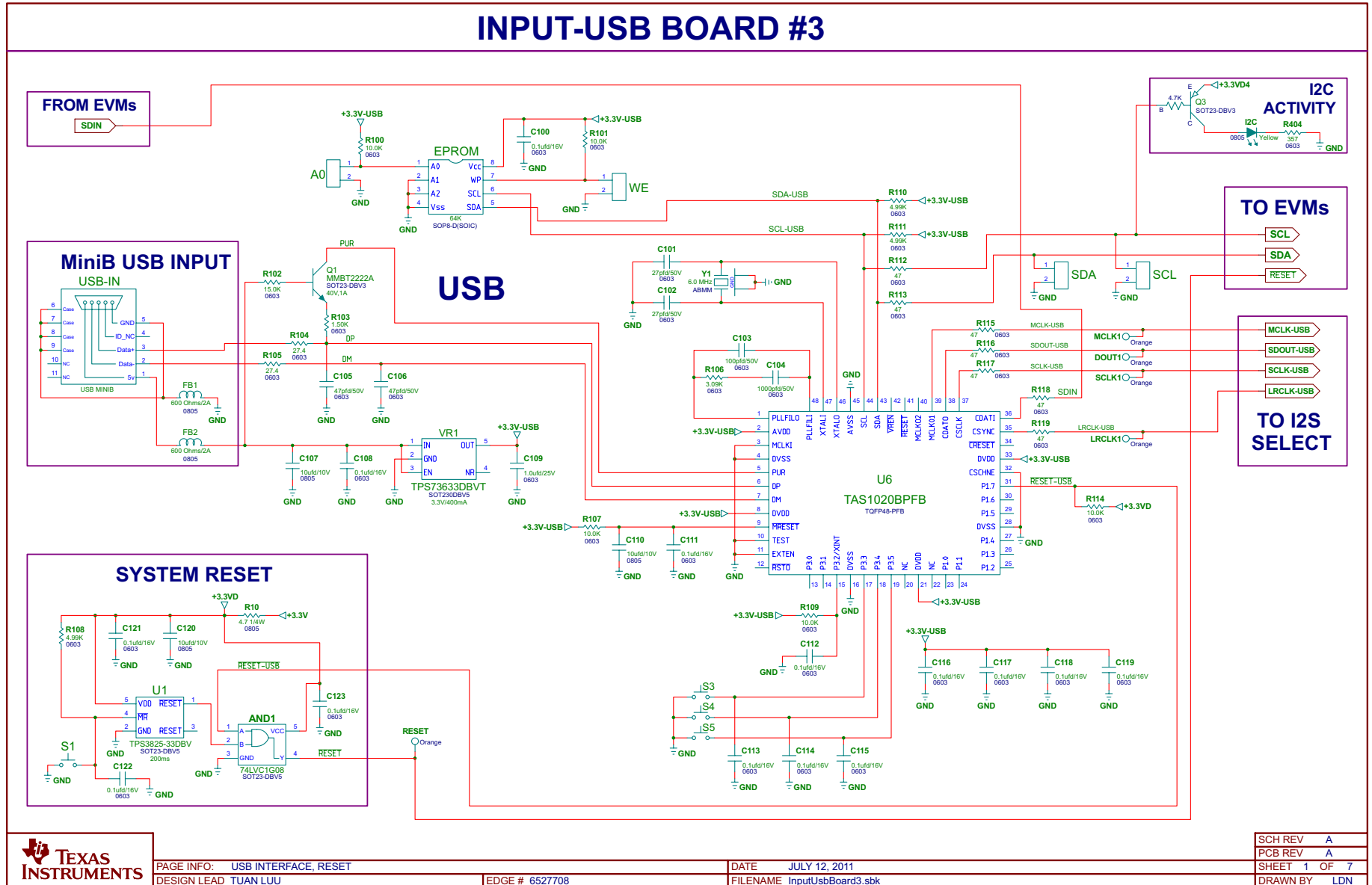**Figure 16. TAS5612L-TAS5614LDDV Evaluation Board Disclaimer**

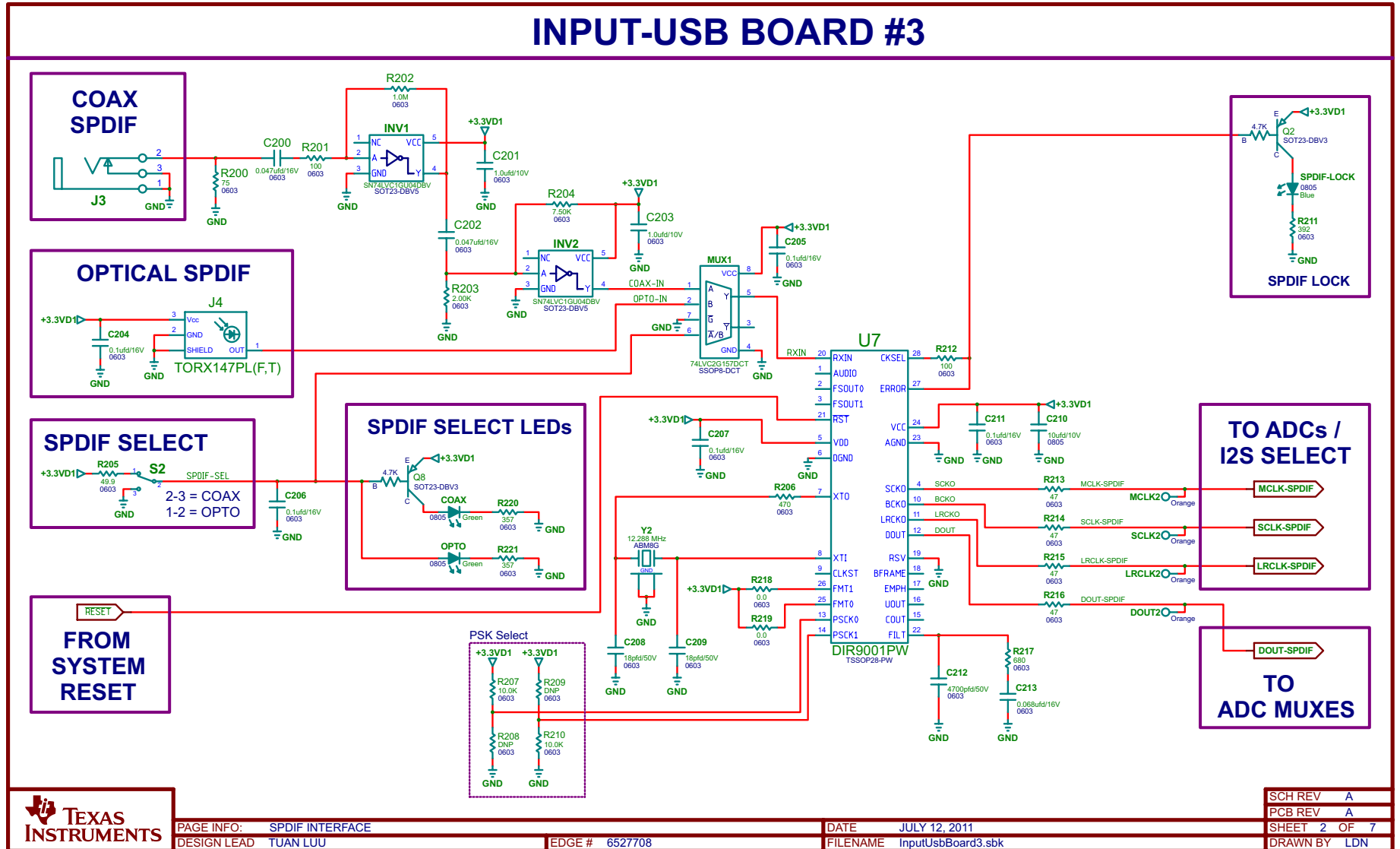Figure 17. Input - USB Board Schematic, USB Interface Reset

INPUT-USB BOARD #3

Figure 18. Input - USB Board Schematic, SPDIF Interface

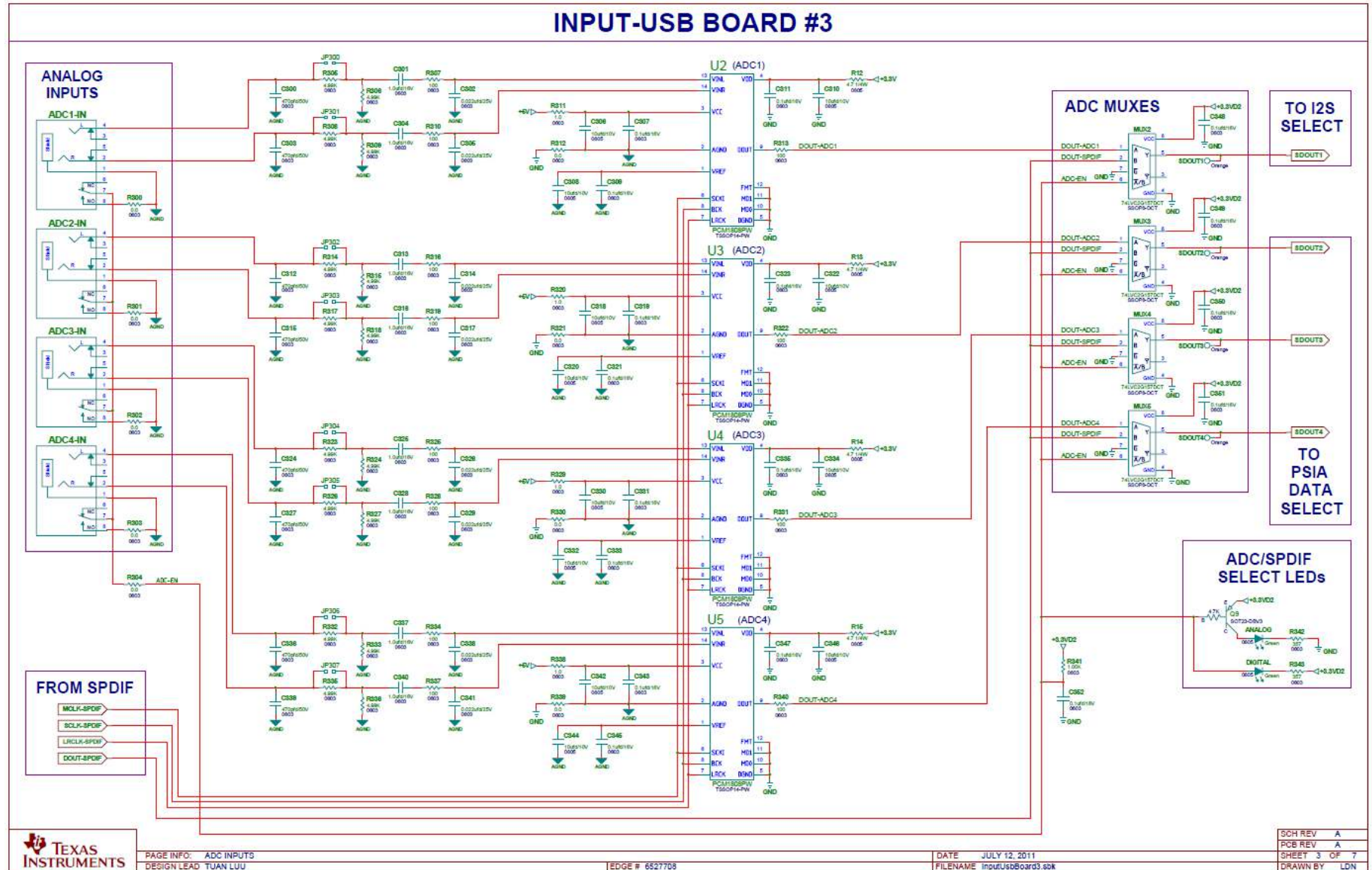Copyright © 2012–2015, Texas Instruments Incorporated

Figure 19. Input - USB Board Schematic, PSIA Inputs, Data Select, and EVM Connector

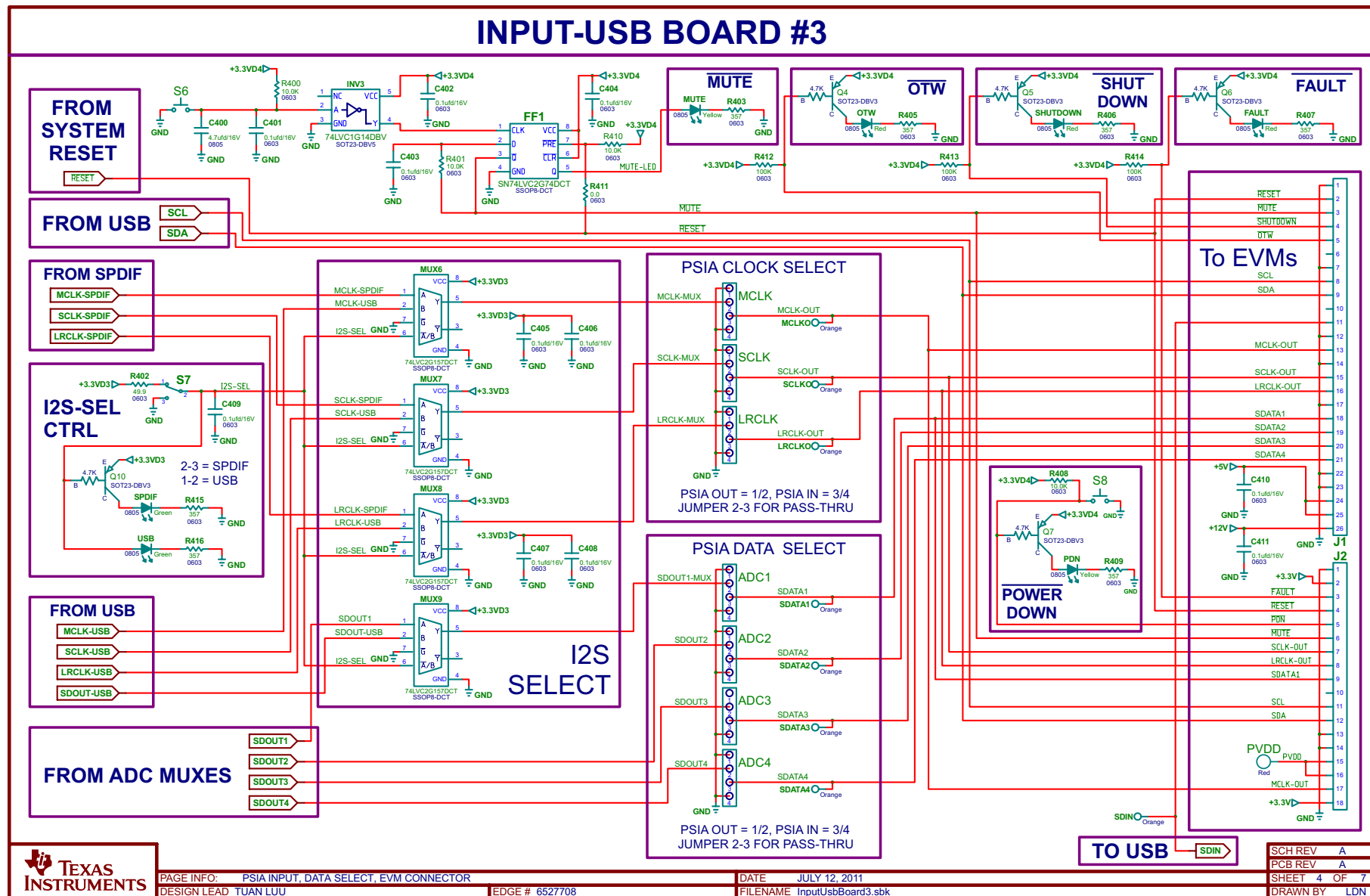Figure 20. Input - USB Board Schematic, Power Inputs and Supplies

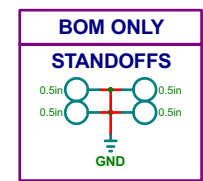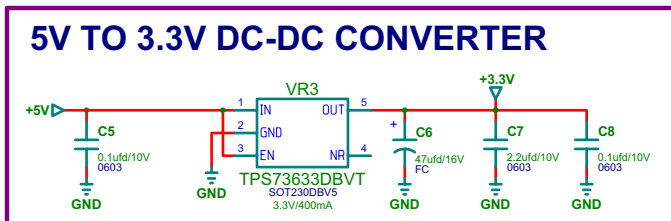Copyright © 2012–2015, Texas Instruments Incorporated

INPUT-USB BOARD #3

MAIN POWER IN

PVDD TO 5V SWITCHER

5V TO 3.3V DC-DC CONVERTER

SPDIF

ADC
MUXES

I2S
SELECT
MUXES

SWITCHES
AND
LEDs

BOM ONLY

STANDOFFS
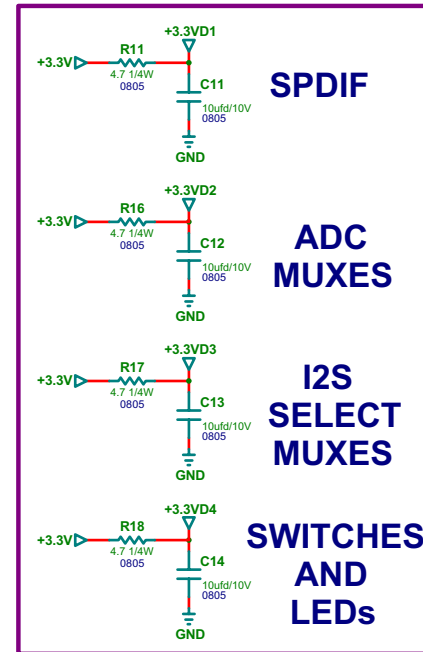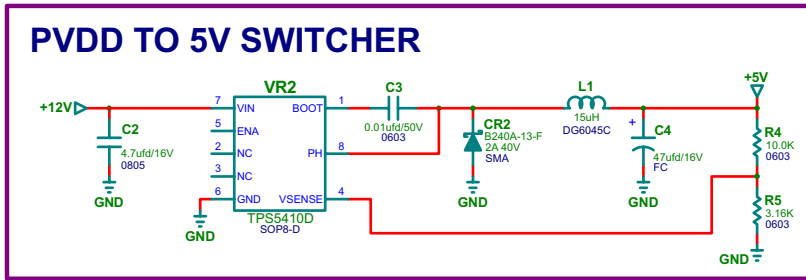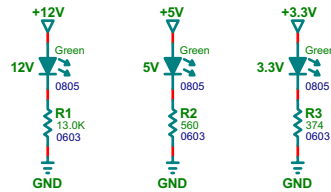
Figure 21. Input - USB Board Schematic, Revision History

INPUT-USB BOARD #3

REVISION HISTORY

REVISION	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE	JULY 12, 2011	TL

			SCH REV	A
			PCB REV	A
PAGE INFO: REVISION HISTORY		DATE JULY 12, 2011	SHEET 6 OF 7	
DESIGN LEAD TUAN LUU	EDGE # 6527708	FILENAME InputUsbBoard3.sbk	DRAWN BY LDN	

Figure 22. Input - USB Board Revision History

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Figure 23. USB Board Schematic Disclaimer

Revision History

Changes from A Revision (September 2013) to B Revision **Page**

Revision History

Changes from B Revision (May 2014) to C Revision **Page**

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        CAUTION

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- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

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2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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