EVM User's Guide: TAS5815PWPEVM

TAS5815PWP Evaluation Module

Description

The TAS5815PWPEVM evaluation module (EVM) helps designers evaluate the operation and performance of the TAS5815PWP Digital Input, Closed-Loop Class-D Amplifier. The TAS5815PWP is a stereo high-performance closed-loop Class-D amp with low power dissipation and advanced audio processing. The graphical user interface or GUI called PurePath™ Control Console 3 is used to interface with USB to the EVM. The EVM has optical SPDIF inputs, I2S, TDM, and audio inputs through the USB interface.

Get Started

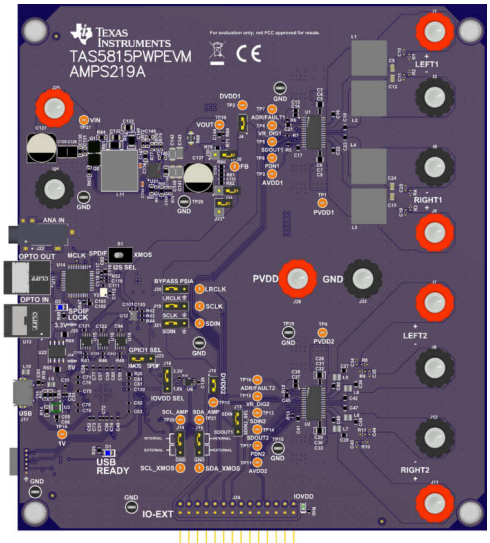
1. Order the TAS5815PWPEVM
2. Download the latest version of the PurePath™ Control Console 3 GUI (PPC3) and request access to TAS5815-SW
3. Read the TAS5815PWPEVM user's guide
4. Refer to the TAS5815 data sheet or E2E for questions and support

Features

- The integrated DSP of the TAS5815PWP enables Class-H envelope tracking, eliminating the need for development of complex tracking software or an external microcontroller
- Optional TPS552882 buck-boost can be configured for device A to evaluate Class-H efficiency performance
- Default system configuration: PVDD supplied directly to TAS5815PWP-A and TAS5815PWP-B to evaluate system performance with a L-C filter or the filter-free ferrite bead output configuration
- Provides flexible input signal routing (USB, analog, optical and external I2S)
- Demonstration, evaluation and development environment via the PurePath Console 3 software (GUI)

Applications

- LCD TV, OLED TV, mobile smart TV, laser TV
- Smart speakers, smart displays, sound bars, wireless speakers
- Notebook PC, desktop PC motherboard
- Piano, keyboard, synthesizer, professional speaker systems
- Professional conference systems, enterprise projectors



TAS5815PWPEVM

1 Evaluation Module Overview

1.1 Introduction

This user's guide describes the operation of the TAS5815PWP Evaluation Modules (EVM). The TAS5815PWPEVM is a stand-alone EVM. Use the PurePath Control Console 3 GUI (PPC3) to initialize and operate this EVM. To utilize the advanced processing features, use the TAS5815-SW to configure the DSP processing blocks and write I^2C commands.

1.2 Kit Contents

- TAS5815PWPEVM
- EVM Disclaimer Read Me

1.3 Specification

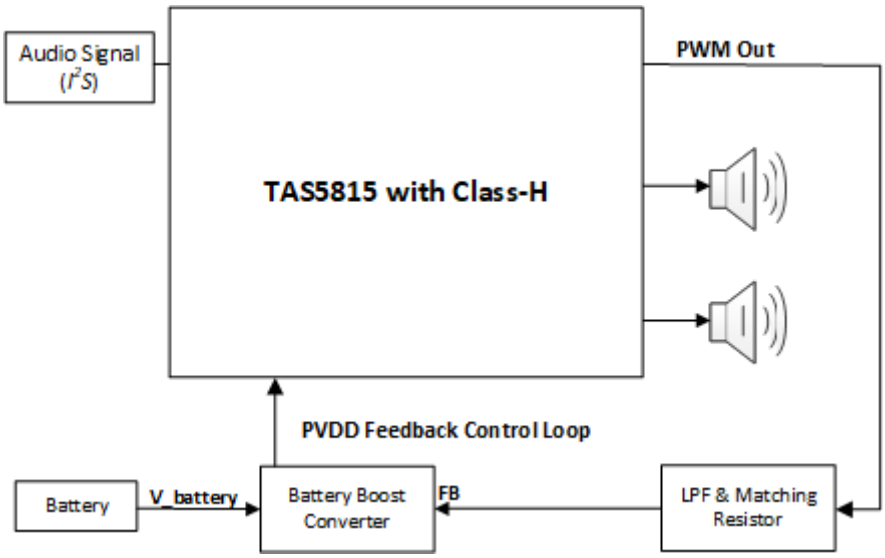


Figure 1-1. TAS5815 Simplified System Diagram

1.4 Device Information

The TAS5815PWPEVM showcases the latest TI digital input Class-D closed loop amplifier. The TAS5815 is a digital input stereo high-efficiency Closed-Loop Class-D audio amplifier with an advanced Class-H algorithm to improve system efficiency and reduce heat without clipping distortion. The TAS5815PWPEVM is a stand-alone EVM, which has an optional battery power supply input with TPS552882 buck-boost or external power supply input bypassing the TPA552882 buck-boost, USB control via PurePath Control Console 3 (PPC3), and flexible audio input options.

2 Hardware

2.1 Setup

Software Control Mode

1. Connect speakers to TAS5815PWPEVM.
2. Connect a PSU to the TAS5815PWPEVM and turn on the power.
3. Plug in a USB cable from the PC to the TAS5815PWPEVM. The USB READY LED (Blue) is also illuminated.
4. If an optical source is used, then he blue SPDIF LOCK LED is illuminated.
5. Make sure jumpers configuration are correct with the appropriate mode:

Table 2-1. Boost Jumpers Configurations

Jumper	Name	Direct PVDD Supply (Default Configuration)	TPS552882 Buck-Boost Mode Configurations	External Customer Boost Mode Configurations
J25, J26	Battery, GND	OUT	IN - Battery input	OUT
J28, J32	PVDD, GND	IN - External PVDD	OUT	IN - External PVDD
J27	PVDD_DCDC	OUT	IN	OUT
J29	PVDD_EXT	IN	OUT	IN
J33	BST_Bypass	OUT	OUT	OUT
J30	Ext_BST	OUT	IN	OUT
J31	ClassH_PWM	OUT	IN	IN

6. Initialize the TAS5815PWP device using PPC3 to begin playing audio and testing the different features.

2.1.1 I²C Device Addresses

The default 7-bit I²C address on the EVM is set to 0xA0 for the only one TAS5815PWP device.

2.2 Header and Jumper Information

Table 2-2. TAS5815PWP Circuit Jumpers

Designator	Name	Positions	Description
J4	DVDD1	IN: Default, IOVDD supplies DVDD for device 1 OUT: DVDD disconnected for device 1	Drives the digital power supply for the first TAS5815PWP. If DVDD current draw wants to be measured need to externally drive DVDD to pin 2
J10	DVDD2	IN: Default, IOVDD supplies DVDD for device 2 OUT: DVDD disconnected for device 2	Drives the digital power supply for the second TAS5815PWP. If DVDD current draw wants to be measured need to externally drive DVDD to pin 2
J2	PVDD1	IN: Default, PVDD_5815 supplies PVDD for device 1 OUT: PVDD disconnected for device 1	Drives the analog power supply for the first TAS5815PWP device
J9	PVDD2	IN: Default, PVDD_5815 supplies PVDD for device 2 OUT: PVDD disconnected for device 2	Drives the analog power supply for the second TAS5815PWP device
J13	SDIN2_SEL	1-2: Default, SDIN from I2S MUX 2-3: SDOUT from Device A	Selects the SDIN for the second TAS5815PWP
J1	Left1A	N/A	Positive output for the left channel of device 1
J3	Left1B	N/A	Negative output for the left channel of device 1
J5	Right1A	N/A	Positive output for the right channel of device 1
J6	Right1B	N/A	Negative output for the right channel of device 1
J7	Left2A	N/A	Positive output for the left channel of device 2
J8	Left2B	N/A	Negative output for the left channel of device 2
J11	Right2A	N/A	Positive output for the right channel of device 2
J12	Right2B	N/A	Negative output for the right channel of device 2

Table 2-3. R6: Device 1 - I²C Address

R6	Address
4.7kΩ	0xA8
15kΩ	0xAA
47kΩ	0xAC
120kΩ	0xAE

Table 2-4. R12: Device 2 - I²C Address

R12	Address
4.7kΩ	0xA8
15kΩ	0xAA
47kΩ	0xAC
120kΩ	0xAE

Table 2-5. XMOS Circuit Jumpers

Designator	Name	Position	Description
J14	SCL	1-2: Default, PPC3 drives XMOS I2C bus to the TAS5815PWPs OUT: Use Pin 1 and 3 to drive SCL externally to the two TAS5815PWP on the EVM	The SCL Jumper offers a few options to provide or receive I2C signals. Default configuration connects the XMOS I2C bus to the two TAS5815PWP to configure the device with PPC3. Disconnecting the jumper allows for the XMOS I2C bus to be connected to an external TAS5815 system board to configure that device with PPC3 using pins 2 and 3. Alternatively can use an external I2C bus to drive the two TAS5815PWP on the EVM using pins 1 and 3.
J15	SDA	1-2: Default, PPC3 drives XMOS I2C bus to the two TAS5815PWP OUT: Use Pin 1 and 3 to drive SDA externally to the two TAS5815PWP on the EVM	The SDA Jumper offers a few options to provide or receive I2C signals. Default configuration connects the XMOS I2C bus to the two TAS5815PWP to configure the device with PPC3. Disconnecting the jumper allows for the XMOS I2C bus to be connected to an external TAS5815 system board to configure that device with PPC3 using pins 2 and 3. Alternatively can use an external I2C bus to drive the two TAS5815PWP on the EVM using pins 1 and 3.

Table 2-6. Audio Input IO Circuit Jumpers and Switches

Designator	Name	Positions	Description
J18	IOVDD SEL	1-2: 1.8V IOVDD 2-3: Default, 3.3V IOVDD	Sets the IOVDD voltage for the Digital Interfaces
J19	SCLK	1-2: Default, Bypass mode that sends SPDIF/ XMOS I2S input to the two TAS5815PWP 2-3: Connect external PSIA connector to Pin 2-3 to drive input to the two TAS5815PWP	Sets the SCLK input to be driven internally using USB or optical input or driven externally with a PSIA connector
J20	LRCLK	1-2: Default, Bypass mode that sends SPDIF/ XMOS I2S input to the two TAS5815PWP 2-3: Connect external PSIA connector to Pin 2-3 to drive input to the two TAS5815PWP	Sets the LRCLK input to be driven internally using USB or optical input or driven externally with a PSIA connector
J21	SDIN	1-2: Default, Bypass mode that sends SPDIF/ XMOS I2S input to the two TAS5815PWP 2-3: Connect external PSIA connector to Pin 2-3 to drive input to the two TAS5815PWP	Sets the SDIN input to be driven internally using USB or optical input or driven externally with a PSIA connector
J23	GPIO1 SEL	1-2: Default, sends the SDOUT data to the XMOS 2-3: Sends SDOUT Data to SPIDIF Optical Output	If the device is not using the Class-H feature, then this jumper can be using to sent the output I2S/TDM data to an external source of either the XMOS and USB or the optical output
S1	I2S SEL	XMOS: Default, audio input from XMOS SPDIF: Audio input from SPDIF	Sets the audio input source for the two TAS5815PWP on the EVM

Table 2-7. Power Supply Circuit Jumpers

Designator	Name	Positions	Description
J30	Ext_BST	IN: Default, TAS5815PWP Class H PWM output drives the TPS552882 Buck-Boost voltage through the Feedback Pin OUT: Disconnect Class H PWM signal	This jumper is used to connect the TPS552882 Feedback Pin to the voltage generated by the Class H PWM Control Signal of the TAS5815PWP
J33	BST_Bypass	IN: Max BST Output OUT: Default	When the device is using Class-H, shorting the BST Bypass jumper sets the TPS552882 Boost to the max Boost Output
J31	ClassH_PWM	IN: Default, TAS5815PWP Class H PWM output is sent to the TPS552882 OUT: Disconnect TAS5815PWP Class H PWM signal	When using Class H, shorting this jumper lets the TAS5815PWP drive the TPS552882 Buck-Boost voltage.
J34	5V	N/A	The 5V rail used to power various components on the EVM.
J35	3.3V	N/A	The 3.3V rail used to power various components on the EVM.
J27	PVDD_DCDC	IN: TPS552882 Buck-Boost voltage is sent to the TAS5815PWP OUT: Default, no Buck-Boost connection	This jumper lets the user decide to use the TPS552882 Buck-Boost voltage for the TAS5815PWP devices
J29	PVDD_EXT	IN: Default, an external PVDD is sent to the TAS5815PWP OUT: no external PVDD connection	This jumper lets the user decide to use an external PVDD supply for the TAS5815PWP devices
J25	Battery	N/A	Battery input to the TAS5815PWP EVM
J28	PVDD	N/A	External PVDD input to the TAS5815PWP EVM
J26/J32	GND	N/A	Battery and PVDD ground inputs to the TAS5815PWP EVM

Table 2-8. J24: IO-EXT Pin Description

Number	Name	Description
All odd pins (1 to 27)	GND	Ground connection
2	IOVDD	The 3.3V or 1.8V digital power supply
4,6	N/A	Unused floating pins
8	SCL	I^2C serial control clock input for the TAS5815PWP
10	SDA	I^2C serial control clock input for the TAS5815PWP
12	LRCLK	I^2S/TDM Frame Clock
14	SCLK	I^2S/TDM Bit Clock
16	SDIN	I^2S/TDM Data
18	SDOUT_Hybrid_Pro	General-purpose input/output configured to be the Class-H PWM control pin or SDOUT of device 1
20	SDOUT2	General-purpose input/output configured to be the SDOUT of device 2
22	$\overline{\text{PDN1}}$	Power down signal for device 1
24	$\overline{\text{PDN2}}$	Power down signal for device 2
26	ADR_$\overline{\text{FAULT1}}$	Address and fault signal for device 1
28	ADR_$\overline{\text{FAULT2}}$	Address and fault signal for device 2

2.3 Test Points

Table 2-9. Test Points

Designator	Name	Description
TP1	PVDD1	PVDD voltage supply device 1
TP2	DVDD1	DVDD voltage supply of device 1
TP3	AVDD1	AVDD internally regulated voltage of device 1
TP4	VR_DIG1	VR_DIG internally regulated voltage of device 1
TP5	SDOUT1	General-purpose input/output configured to be the Class-H PWM control pin or SDOUT for device 1
TP7	ADR_FAULT1	Fault terminal for device 1,which is pulled LOW when an internal fault occurs
TP8	PDN1	Power down, active-low for device 1. PDN place the amplifier in Shutdown, turn off all internal regulators
TP9	PVDD2	PVDD voltage supply device 2
TP10	DVDD2	DVDD voltage supply of device 2
TP11	AVDD2	AVDD internally regulated voltage of device 2
TP12	VR_DIG2	VR_DIG internally regulated voltage of device 2
TP13	SDIN2	Serial Data Input to device 2
TP14	SDOUT2	General-purpose input/output configured to be the Class-H PWM control pin or SDOUT for device 2
TP16	ADR_FAULT2	Fault terminal for device 2,which is pulled LOW when an internal fault occurs
TP17	PDN2	Power down, active-low for device 2. PDN place the amplifier in Shutdown, turn off all internal regulators
TP18	1V	The 1V rail used in the XMOS
TP19	SCL_XMOS	Probe point for the I2C serial clock input going generated by the XMOS
TP20	SCL_AMP	Probe point for the I2C serial clock input going into the two TAS5815PWP
TP21	SDA_AMP	The I2C serial control data interface input/output going into the two TAS5815PWP
TP22	SDA_XMOS	The I2C serial control data interface input/output generated by the XMOS
TP24	SCLK	Bit clock for the digital signal that is active on the input data line of the serial data port
TP25	LRCLK	Word select clock for the digital signal that is active on the serial port's input data line. In I2S, LJ and RJ, this corresponds to the left channel and right channel boundary. In TDM mode, this corresponds to the frame sync boundary
TP26	SDIN	Data line to the serial data port
TP27	VIN	Battery input voltage into the TPS552882
TP28	VOUT	TPS552882 boost output voltage
TP30	FB	TPS552882 Feedback pin used to control the output boost voltage
All other TP	GND	Ground reference pins for probes

3 Hardware Design Files

3.1 Schematics

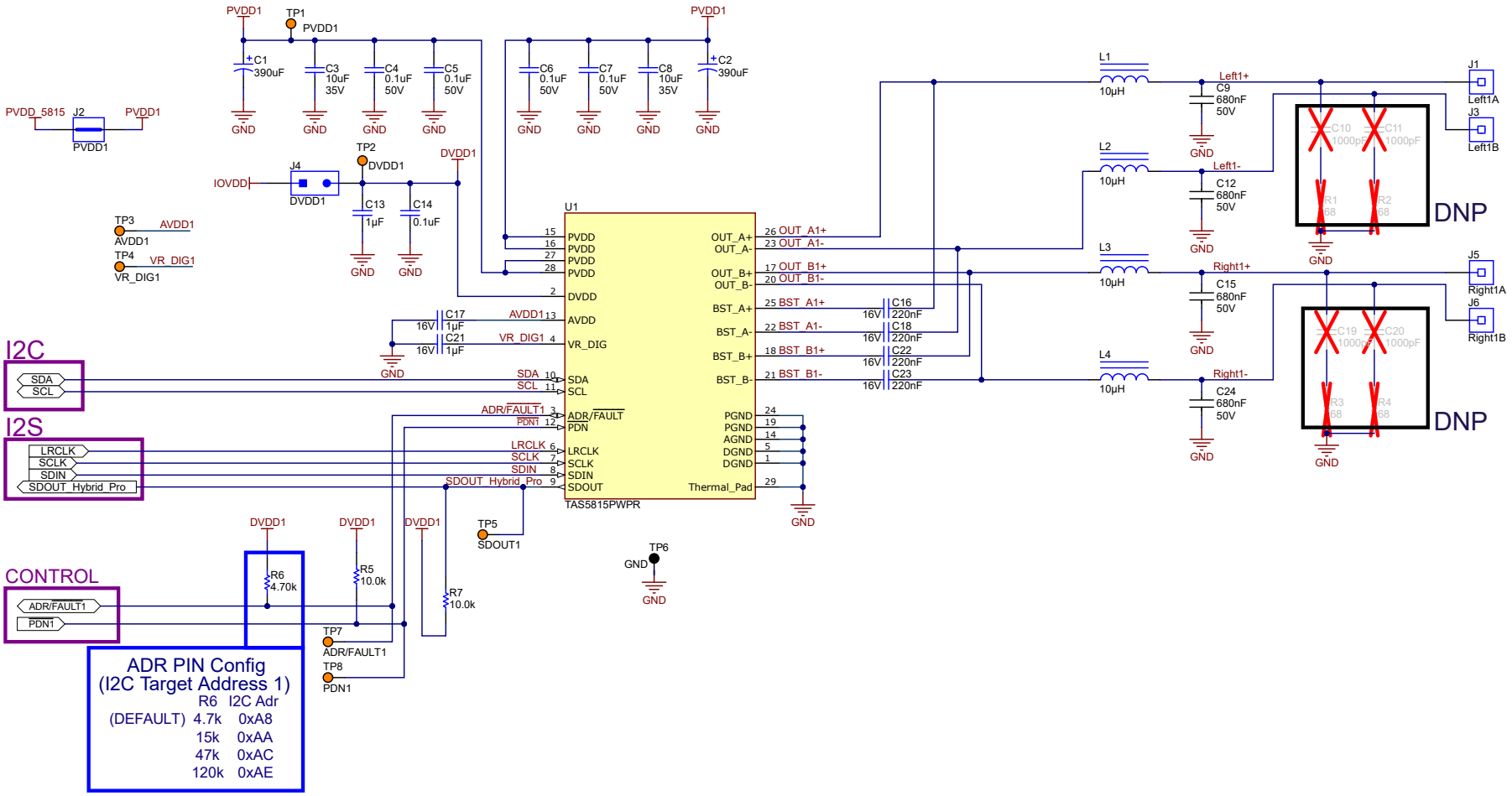


Figure 3-1. TAS5815PWPEVM Schematic (1 of 6)

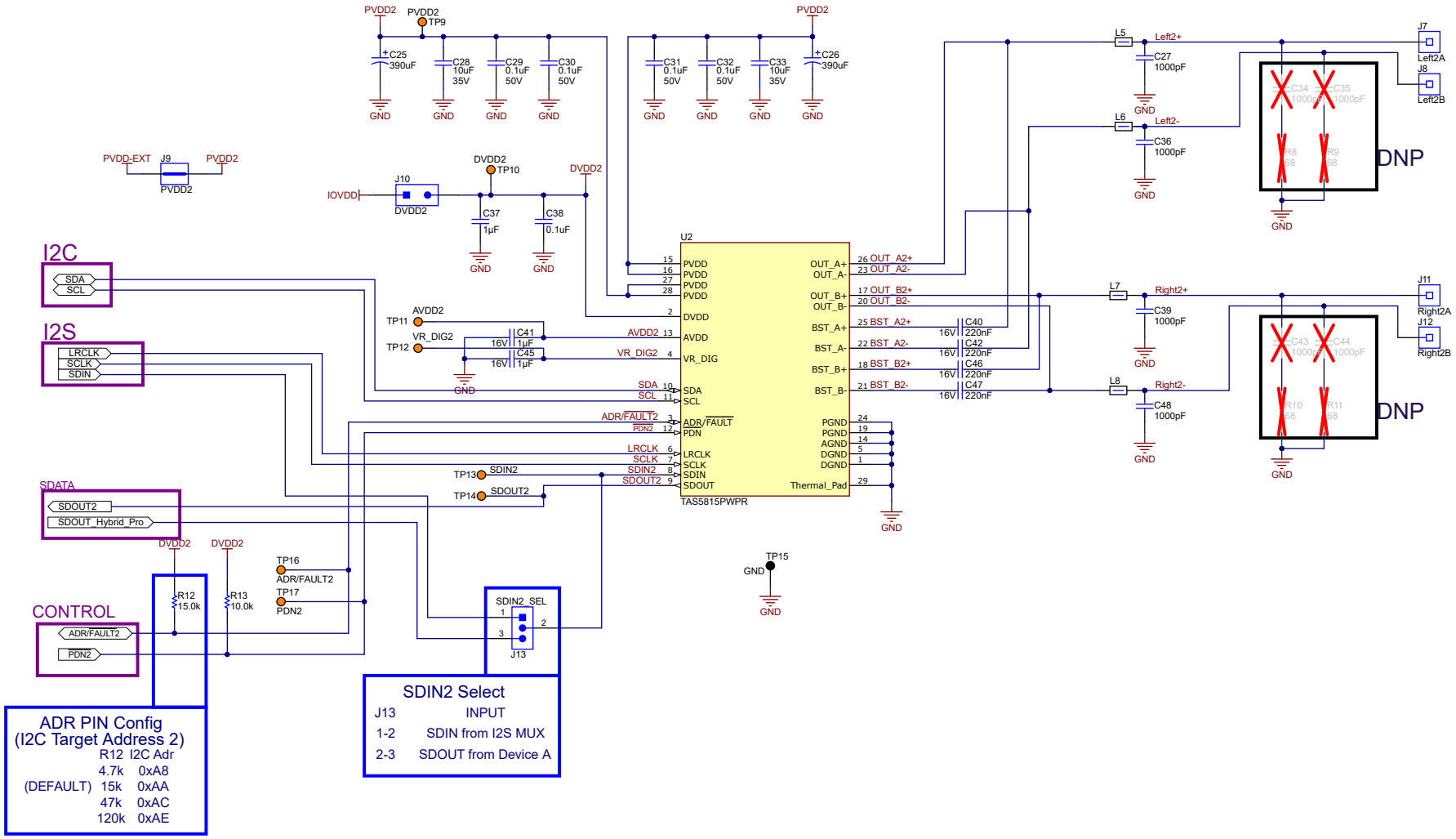


Figure 3-2. TAS5815PWPEVM Schematic (2 of 6)

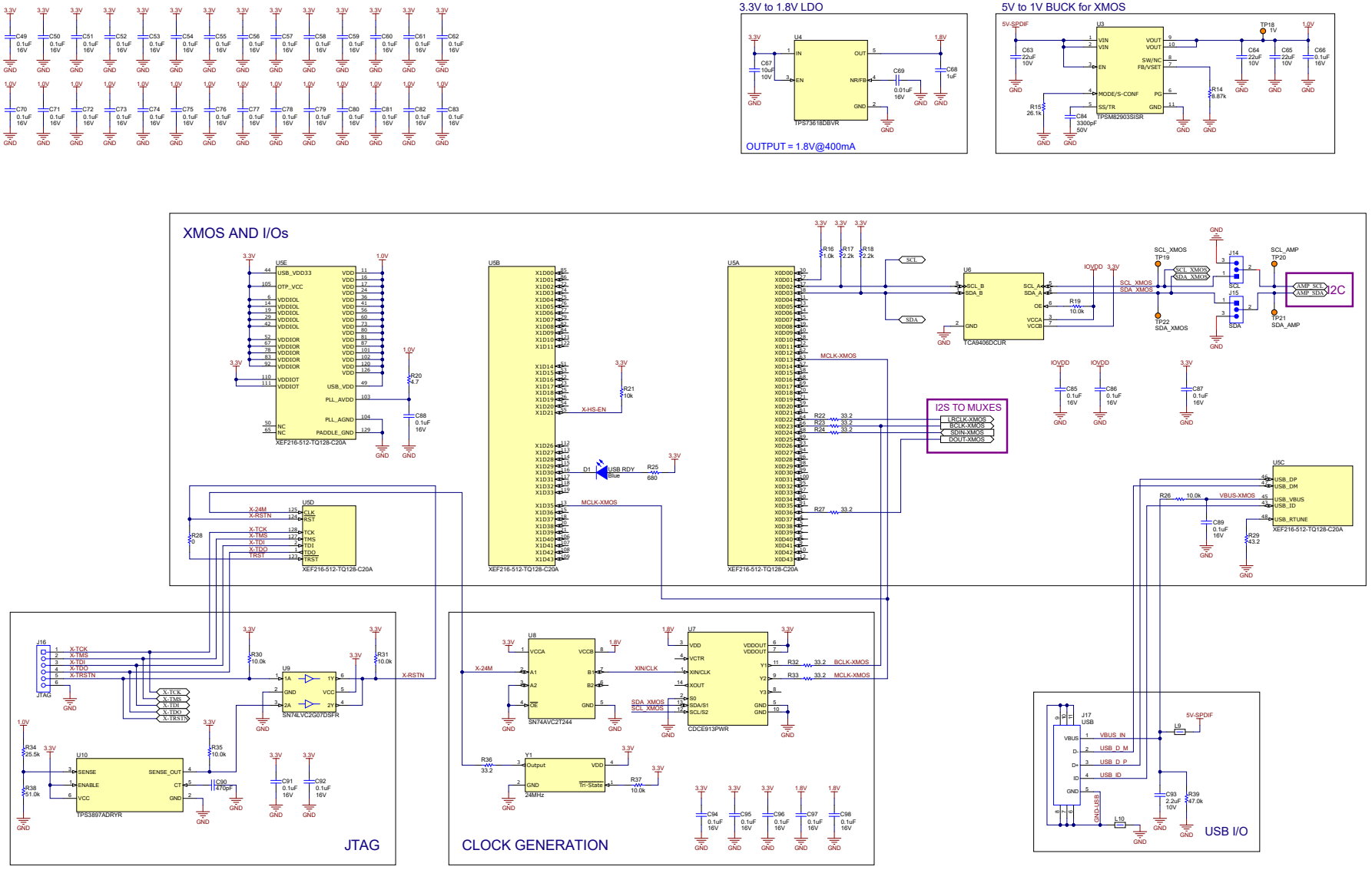


Figure 3-3. TAS5815PWPEVM Schematic (3 of 6)

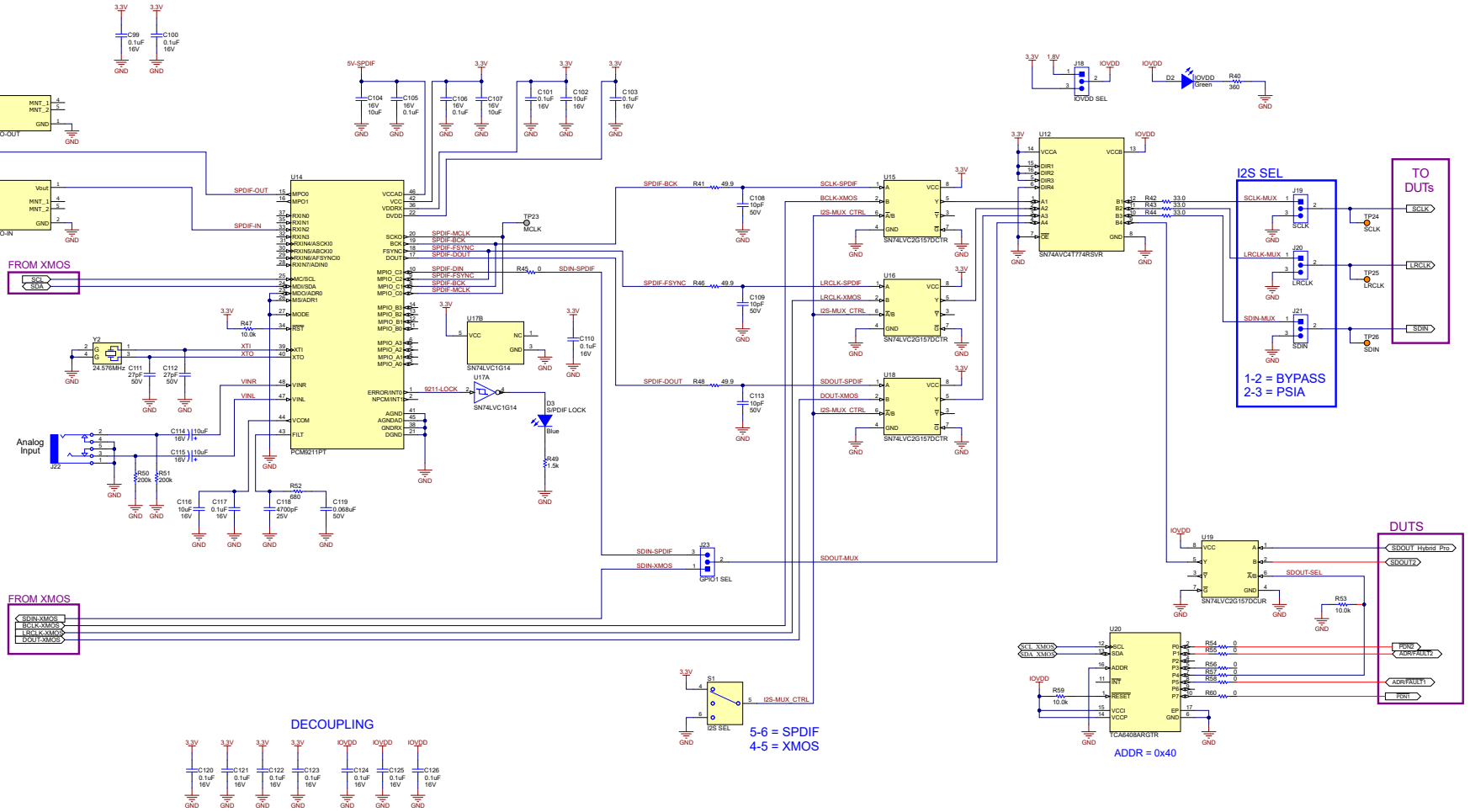


Figure 3-4. TAS5815PWPEVM Schematic (4 of 6)

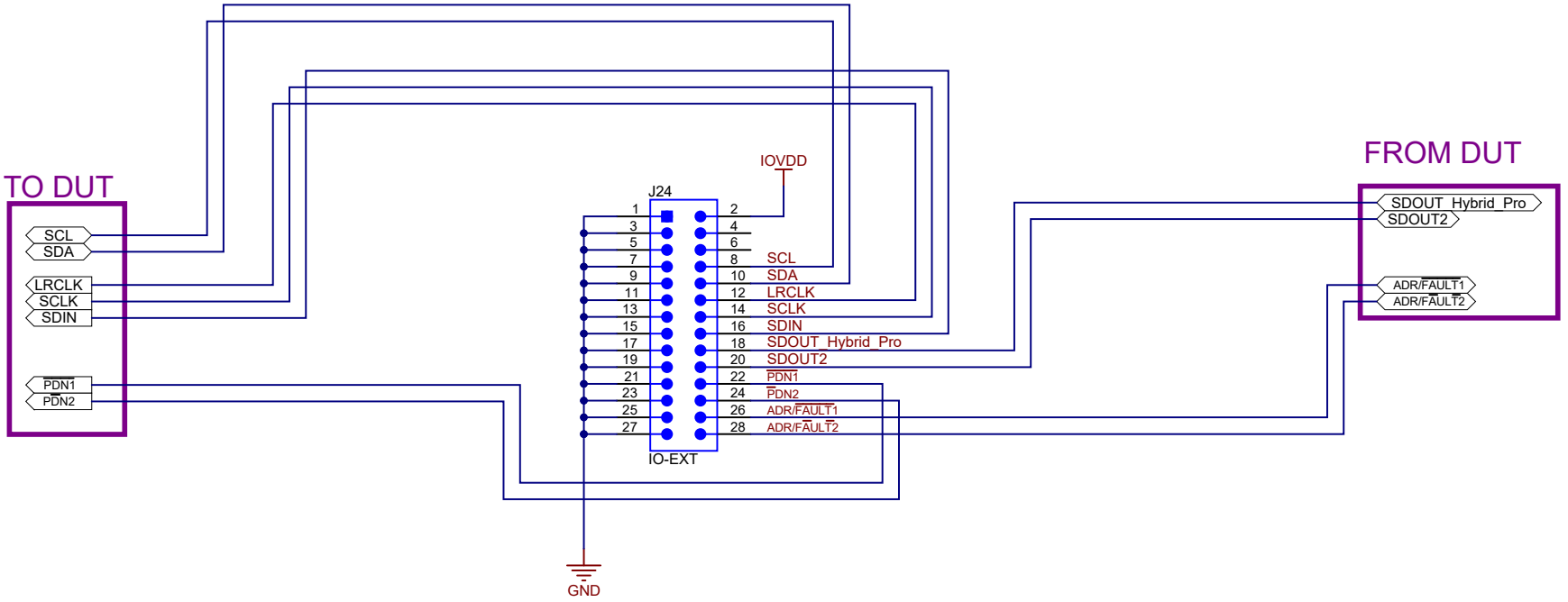


Figure 3-5. TAS5815PWPEVM Schematic (5 of 6)

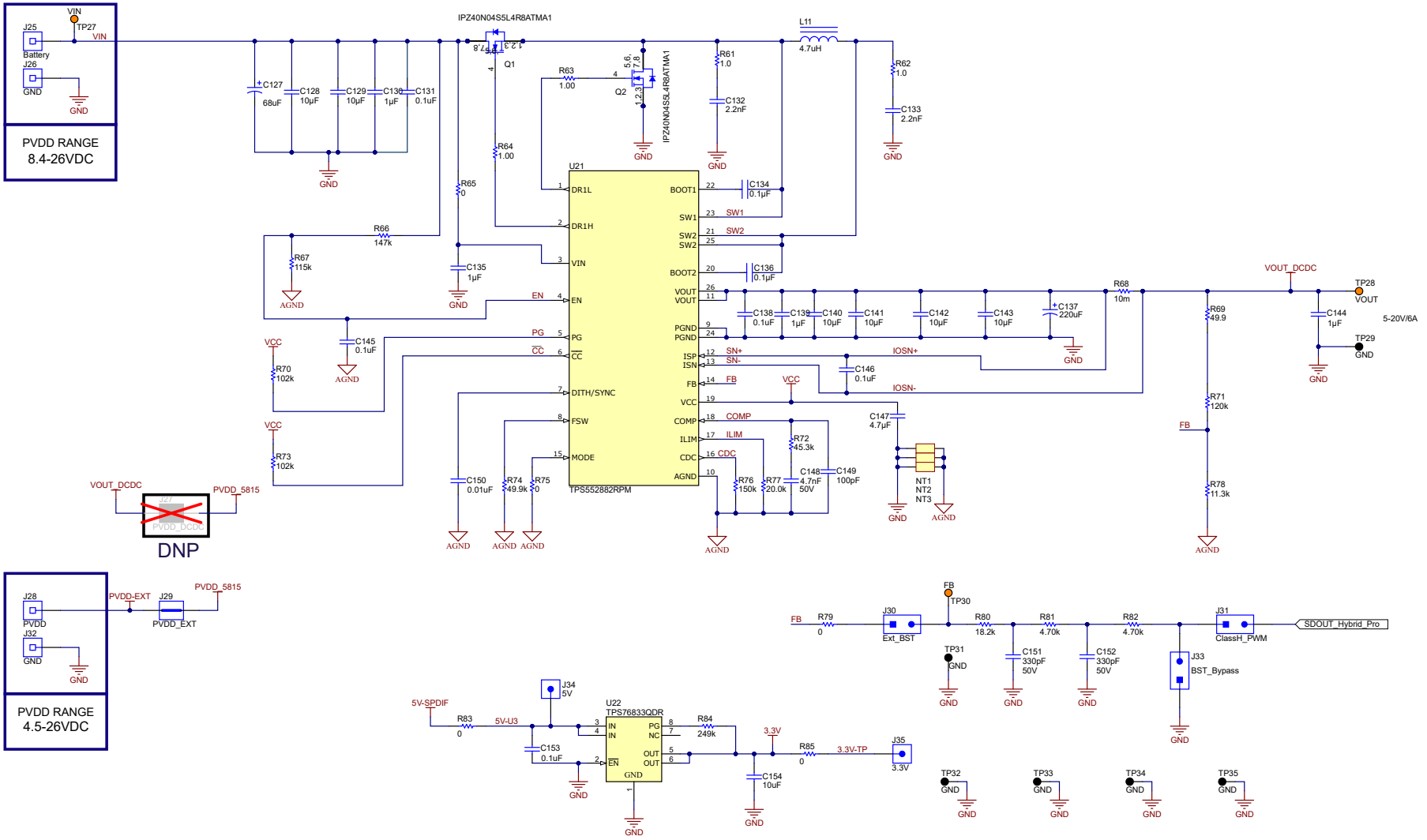


Figure 3-6. TAS5815PWPEVM Schematic (6 of 6)

3.2 PCB Layout

Figure 3-7 and Figure 3-8 illustrate the board layouts for the EVM.

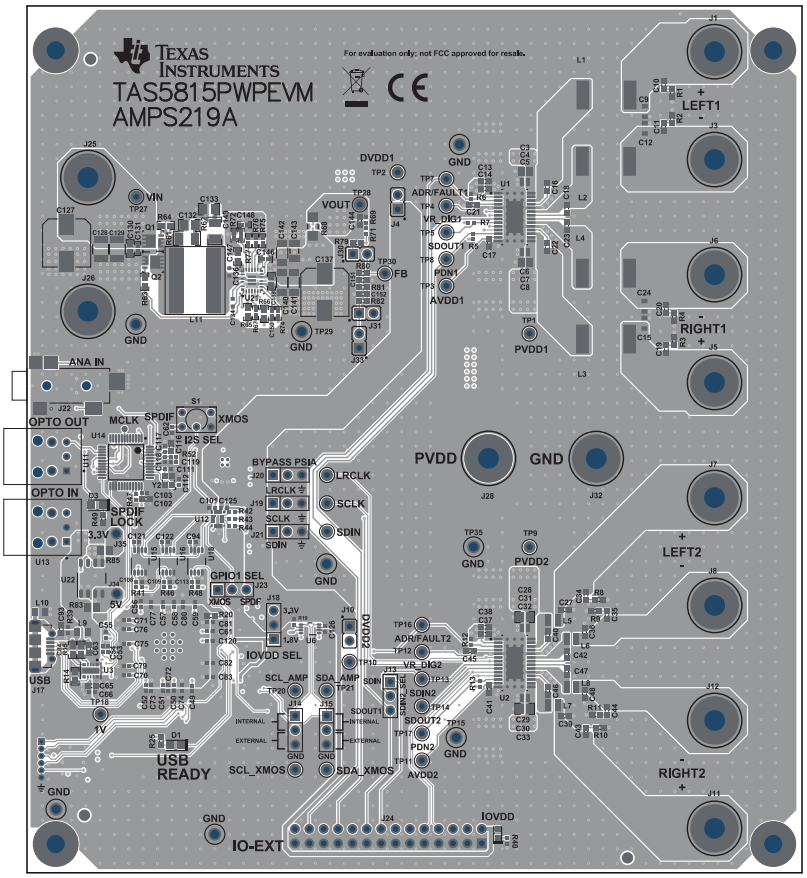


Figure 3-7. TAS5815PWPEVM Top Overlay

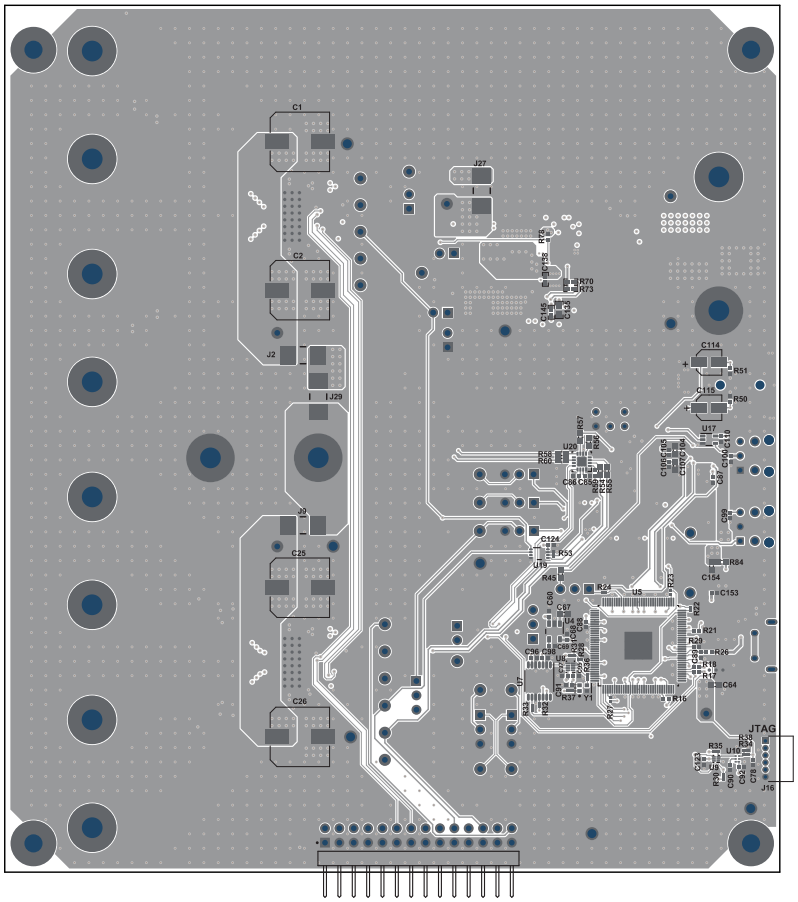


Figure 3-8. TAS5815PWPEVM Bottom Overlay

3.3 Bill of Materials

Table 3-1. Bill of Materials

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
C1, C2, C25, C26	4	390uF	CAP, AL, 390uF, 35V, +/- 20%, 0.08 ohm, SMD	10x10	UCL1V391MNL1GS	Nichicon		
C3, C8, C28, C33	4	10uF	CAP, CERM, 10uF, 35V, +/- 10%, X5R, 0805	0805	GRM21BR6YA106KE43L	MuRata		
C4, C5, C6, C7, C29, C30, C31, C32, C131, C138, C145, C146	12	0.1uF	CAP, CERM, 0.1uF, 50V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H104K050BB	TDK		
C9, C12, C15, C24	4		CAP CER 0.68UF 50V X7R 0805	0805	CGA4J3X7R1H684M125AB	TDK Corporation		
C13, C37	2	1uF	CAP, CERM, 1uF, 25V, +/- 10%, X7R, 0603	0603	C0603C105K3RACTU	Kemet		
C14, C38	2	0.1uF	CAP, CERM, 0.1uF, 50V, +/- 10%, X7R, 0603	0603	C0603C104K5RACTU	Kemet		
C16, C18, C22, C23, C40, C42, C46, C47	8	0.22uF	CAP, CERM, 0.22uF, 16V, +/- 10%, X7R, 0603	0603	C1608X7R1C224K080AC	TDK		
C17, C21, C41, C45	4	1uF	CAP, CERM, 1µF, 16V,+/- 10%, X7R, 0603	0603	CL10B105KO8NFNC	Samsung Electro-Mechanics		
C27, C36, C39, C48	4	1000pF	CAP, CERM, 1000pF, 100V, +/- 10%, X7R, 0603	0603	06031C102KAT2A	AVX		
C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C66, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C85, C86, C87, C88, C89, C91, C92, C94, C95, C96, C97, C98, C99, C100, C101, C103, C105, C106, C110, C117, C120, C121, C122, C123, C124, C125, C126, C153	57	0.1uF	CAP, CERM, 0.1uF, 16V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		

Table 3-1. Bill of Materials (continued)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
C63, C64, C65	3	22uF	CAP, CERM, 22uF, 10V, +/- 20%, X5R, 0603	0603	C1608X5R1A226M080AC	TDK		
C67, C154	2	10uF	CAP, CERM, 10uF, 10V, +/- 20%, X5R, 0603	0603	C1608X5R1A106M080AC	TDK		
C68	1	1uF	CAP, CERM, 1uF, 6.3V, +/- 20%, X5R, 0402	0402	GRM152R60J105ME15D	MuRata		
C69	1	0.01uF	CAP, CERM, 0.01uF, 16V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		
C84	1	3300pF	CAP, CERM, 3300pF, 50V, +/- 5%, C0G/NP0, 0603	0603	GRM1885C1H332JA01D	MuRata		
C90	1	470pF	CAP, CERM, 470pF, 50V, +/- 5%, C0G/NP0, 0402	0402	GRM1555C1H471JA01D	MuRata		
C93	1	2.2uF	CAP, CERM, 2.2uF, 10V, +/- 10%, X7R, 0603	0603	GRM188R71A225KE15D	MuRata		
C102, C104, C107, C116	4	10uF	CAP, CERM, 10uF, 16V, +/- 20%, X5R, 0603	0603	EMK107BBJ106MA-T	Taiyo Yuden	GMC10X5R106M16NT	CAL-CHIP ELECTRONICS, INC.
C108, C109, C113	3	10pF	CAP, CERM, 10pF, 50V, +/- 5%, C0G/NP0, 0402	0402	8.85012E+11	Wurth Elektronik		
C111, C112	2	27pF	CAP, CERM, 27pF, 50V, +/- 5%, C0G/NP0, 0402	0402	GJM1555C1H270JB01D	MuRata		
C114, C115	2	10uF	CAP, AL, 10uF, 16V, +/- 20%, SMD	D55	EMVE160ADA100MD55G	Chemi-Con	UWX1C100MCL1GB	Nichicon
C118	1	4700pF	CAP, CERM, 4700pF, 25V,+/- 10%, X7R, 0402	0402	CC0402KRX7R8BB472	Yageo		
C119	1	0.068uF	CAP, CERM, 0.068uF, 50V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H683K050BB	TDK		
C127	1	68uF	CAP, Polymer Hybrid, 68uF, 50V, +/- 20%, 30 ohm, 8x10 SMD	8x10	EEHZA1H680P	Panasonic		
C128, C129	2	10uF	CAP, CERM, 10µF, 75V,+/- 20%, X7R, AEC-Q200 Grade 1, 1210	1210	CGA6P1X7R1N106M250AC	TDK		
C130, C135, C139, C144	4	1uF	CAP, CERM, 1µF, 50V,+/- 20%, X5R, AEC-Q200 Grade 3, 0603	0603	GRT188R61H105ME13D	MuRata		
C132, C133	2	2200pF	CAP, CERM, 2200pF, 250V, +/- 10%, X7R, 0805	0805	GRM21AR72E222KW01D	MuRata		
C134, C136	2		0.1µF ±10% 50V Ceramic Capacitor X8L 0603 (1608 Metric)	0603	GCM188L81H104KA57D	Murata Electronics North America		
C137	1	220uF	CAP, Polymer Hybrid, 220uF, 25V, +/- 20%, 27 ohm, 8x10 SMD	8x10	EEHZC1E221P	Panasonic		

Table 3-1. Bill of Materials (continued)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
C140, C141, C142, C143	4	10uF	CAP, CERM, 10µF, 50V,+/- 10%, X7R, AEC-Q200 Grade 1, 1206	1206	CGA5L1X7R1H106K160AC	TDK		
C147	1	4.7uF	CAP, CERM, 4.7µF, 16V,+/- 10%, X5R, AEC-Q200 Grade 3, 0603	0603	GRT188R61C475KE13D	MuRata		
C148	1	4700pF	CAP, CERM, 4700pF, 50V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B2X7R1H472K050BA	TDK		
C149	1	100pF	CAP, CERM, 100pF, 50V, +/- 5%, C0G/NP0, AEC-Q200 Grade 1, 0402	0402	CGA2B2C0G1H101J050BA	TDK		
C150	1	0.01uF	CAP, CERM, 0.01uF, 50V, +/- 10%, X7R, AEC-Q200 Grade 1, 0402	0402	CGA2B3X7R1H103K050BB	TDK		
C151, C152	2	330pF	CAP, CERM, 330pF, 50V, +/- 5%, C0G/NP0, 0603	0603	C0603C331J5GACTU	Kemet		
D1, D3	2	Blue	LED, Blue, SMD	LED_0805	LTST-C170TBKT	Lite-On		
D2	1	Green	LED, Green, SMD	LED_0603	150060GS75000	Wurth Elektronik		
H1, H2, H3, H4	4		Machine Screw, Round, #4-40 x 1/4, Nylon, Philips panhead	Screw	NY PMS 440 0025 PH	B&F Fastener Supply		
H5, H6, H7, H8	4		Standoff, Hex, 0.5"L #4-40 Nylon	Standoff	1902C	Keystone		
J1, J5, J7, J11, J25, J28	6		Binding Post, RED, TH	11.4x27.2mm	7006	Keystone		
J2, J9, J29	3		JUMPER TIN SMD	6.85x0.97x2.51 mm	S1911-46R	Harwin		
J3, J6, J8, J12, J26, J32	6		Binding Post, BLACK, TH	11.4x27.2mm	7007	Keystone		
J4, J10, J30, J31, J33	5		Header, 100mil, 2x1, Gold, TH	Sullins 100mil, 1x2, 230 mil above insulator	PBC02SAAN	Sullins Connector Solutions		
J13, J14, J15, J18, J19, J20, J21, J23	8		Header, 100mil, 3x1, Gold, TH	PBC03SAAN	PBC03SAAN	Sullins Connector Solutions		
J16	1		Receptacle, 50mil, 6x1, Gold, R/A, TH	6x1 Receptacle	LPPB061NGCN-RC	Sullins Connector Solutions		
J17	1		Connector, Receptacle, Micro-USB Type AB, R/A, Bottom Mount SMT	5.6x2.5x8.2mm	475890001	Molex		
J22	1		Audio Jack, 3.5mm, Stereo, R/A, SMT	Phone Jack, 6x5x17mm	35RASMT4BHNTRX	Switchcraft		
J24	1		Header, 100mil, 14x2, Gold, R/A, TH	14x2 R/A Header	TSW-114-08-G-D-RA	Samtec		
J34, J35	2			Test point, TH Slot Test point	1040	Keystone		

Table 3-1. Bill of Materials (continued)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
L1, L2, L3, L4	4	10uH	Inductor, Shielded, Ferrite, 10µH, 4.4A, 0.0304 ohm, SMD		1274AS-H-100M=P3	MuRata		
L5, L6, L7, L8	4	300 ohm	Ferrite Bead, 300 ohm at 100MHz, 3.1A, 0806	0806	NFZ2MSM301SN10L	MuRata		
L9, L10	2	600 ohm	Ferrite Bead, 600 ohm at 100MHz, 2A, 0805	0805	MPZ2012S601AT000	TDK		
L11	1	4.7uH	Inductor, Shielded, Composite, 4.7uH, 24A, 0.01 ohm, SMD	Inductor, 11.3x10x10mm	XAL1010-472MEB	Coilcraft		
Q1, Q2	2	40V	MOSFET, N-CH, 40V, 40A, AEC-Q101, SON-8	SON-8	IPZ40N04S5L4R8ATMA1	Infineon Technologies		None
R5, R13	2	15.0k	RES, 15.0 k, .1%, .063 W, AEC-Q200 Grade 0, 0402	0402	ERA-2AEB153X	Panasonic		
R6	1	4.70k	RES, 4.70 k, 1%, 0.0625 W, 0402	0402	RC0402FR-074K7L	Yageo America		
R7, R21	2	10k	RES, 10 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040210K0JNED	Vishay-Dale	[NoValue], ERJ-U02F1002X	[NoValue], Panasonic
R12	1	15.0k	RES, 15.0 k, 1%, 0.063 W, 0402	0402	RC0402FR-0715KL	Yageo America		
R14	1	8.87k	RES, 8.87 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06038K87FKEA	Vishay-Dale		
R15	1	26.1k	RES, 26.1 k, 0.1%, 0.1 W, 0603	0603	RT0603BRD0726K1L	Yageo America		
R16	1	1.0k	RES, 1.0 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04021K00JNED	Vishay-Dale	CRCW04021K00JNTD	Vishay Dale
R17, R18	2	2.2k	RES, 2.2 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04022K20JNED	Vishay-Dale		
R19, R26	2	10.0k	RES, 10.0 k, 1%, 0.1 W, 0402	0402	ERJ-2RKF1002X	Panasonic	ERJ-U02F1002X	Panasonic
R20	1	4.7	RES, 4.7, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06034R70JNEA	Vishay-Dale		
R22, R23, R24, R27, R32, R33, R36	7	33.2	RES, 33.2, 1%, 0.05 W, 0201	0201	RC0201FR-0733R2L	Yageo America		
R25	1	680	RES, 680, 1%, 0.1 W, 0603	0603	RC0603FR-07680RL	Yageo		
R28	1	0	RES, 0, 5%, .05 W, AEC-Q200 Grade 0, 0201	0201	ERJ-1GN0R00C	Panasonic		
R29	1	43.2	RES, 43.2, 1%, 0.1 W, AEC-Q200 Grade 0, 0402	0402	ERJ2RKF43R2X	Panasonic		
R30, R31, R35, R37, R53	5	10.0k	RES, 10.0 k, 1%, 0.05 W, 0201	0201	CRCW020110K0FKED	Vishay-Dale		
R34	1	25.5k	RES, 25.5 k, 1%, 0.05 W, 0201	0201	RC0201FR-0725K5L	Yageo America		
R38	1	51.0k	RES, 51.0 k, 1%, 0.05 W, 0201	0201	RC0201FR-0751KL	Yageo America		

Table 3-1. Bill of Materials (continued)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
R39	1	47.0k	RES, 47.0 k, 1%, 0.0625 W, 0402	0402	RC0402FR-0747KL	Yageo America		
R40	1	360	RES, 360, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402360RJNED	Vishay-Dale		
R41, R46, R48, R69	4	49.9	RES, 49.9, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040249R9FKED	Vishay-Dale	CRCW040249R9FKEDC, [NoValue]	Vishay-Dale, [NoValue]
R42, R43, R44	3	33	RES, 33.0, 1%, 0.1 W, 0402	0402	ERJ-2RKF33R0X	Panasonic	ERJ-U02F33R0X	Panasonic
R45	1	0	RES, 0, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603ZT0R00	Stackpole Electronics Inc		
R47, R59	2	10.0k	RES, 10.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040210K0FKED	Vishay-Dale		
R49	1	1.5k	RES, 1.5 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031K50JNEA	Vishay-Dale	CRCW06031K50JNEAC	Vishay-Dale
R50, R51	2	200k	RES, 200 k, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402200KJNED	Vishay-Dale		
R52	1	680	RES, 680, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402680RJNED	Vishay-Dale		
R54, R55, R56, R57, R58, R60, R79	7	0	RES, 0, 5%, 0.1 W, 0603	0603	RC0603JR-070RL	Yageo		
R61, R62	2	1	RES, 1.0, 5%, 0.5 W, 1206	1206	CRM1206-JW-1R0ELF	Bourns		
R63, R64	2	1	RES, 1.00, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031R00FKEA	Vishay-Dale		
R65	1	0	RES, 0, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06030000Z0EA	Vishay-Dale		
R66	1	147k	RES, 147 k, 1%, 0.1 W, 0603	0603	RC0603FR-07147KL	Yageo		
R67	1	115k	RES, 115 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402115KFKED	Vishay-Dale		
R68	1		10 mOhms ±1% 1W Chip Resistor 1206 (3216 Metric) Automotive AEC-Q200, Current Sense, Moisture Resistant Metal Element	1206	CRF1206-FZ-R010ELF	Bourns		
R70, R73	2	102k	RES, 102 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402102KFKED	Vishay-Dale		
R71	1	120k	RES, 120 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0402	0402	ERJ-2RKF1203X	Panasonic		
R72	1	45.3k	RES, 45.3 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040245K3FKED	Vishay-Dale		
R74	1	49.9k	RES, 49.9 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040249K9FKED	Vishay-Dale		

Table 3-1. Bill of Materials (continued)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
R75	1	0	RES, 0, 5%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW04020000Z0ED	Vishay-Dale		
R76	1	150k	RES, 150 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW0402150KFKED	Vishay-Dale		
R77	1	20.0k	RES, 20.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040220K0FKED	Vishay-Dale		
R78	1	11.3k	RES, 11.3 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402	0402	CRCW040211K3FKED	Vishay-Dale		
R80	1	18.2k	RES, 18.2 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW060318K2FKEA	Vishay-Dale		
R81, R82	2	4.70k	RES, 4.70 k, 0.1%, 0.1 W, 0603	0603	RT0603BRD074K7L	Yageo America		
R83, R85	2	0	RES, 0, 5%, 0.125 W, 0805	0805	RC0805JR-070RL	Yageo America		
R84	1	249k	RES, 249 k, 1%, 0.1 W, 0603	0603	RC0603FR-07249KL	Yageo		
S1	1		Switch, Toggle, SPDT 1Pos, TH	7 X 11 X4.5 mm	G12AP	NKK Switches		
SH1, SH2, SH3, SH4, SH5, SH6, SH7, SH8, SH9, SH10, SH11, SH12, SH13	13	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
TP1, TP2, TP3, TP4, TP5, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP24, TP25, TP26, TP27, TP28, TP30	26		Test Point, Miniature, Orange, TH	Orange Miniature Test point	5003	Keystone Electronics		
TP6, TP15, TP29, TP31, TP32, TP33, TP34, TP35	8		Test Point, Compact, Black, TH	Black Compact Test point	5006	Keystone Electronics		
U1, U2	2		20W Stereo, Inductor-Less, Digital Input, Closed-Loop Class-D Audio Amplifier with 96Khz Extended Processing and Low Idle Power Dissipation, HTSSOP28	HTSSOP28	TAS5815PWPR	Texas Instruments		
U3	1		3V to 17V, High Efficiency and Low IQ Buck Converter Module in MicroSiP Package with Integrated Inductor	uSiL11	TPSM82903SISR	Texas Instruments		

Table 3-1. Bill of Materials (continued)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
U4	1		Single Output LDO, 400mA, Adj. (1.2 to 5.5V), Cap free, Low Noise, Reverse Current Protection, DBV0005A (SOT-23-5)	DBV0005A	TPS73618DBVR	Texas Instruments		
U5	1		XCore XEF Microcontroller IC 32-Bit 16-Core 2000MIPs 2MB (2M x 8) FLASH 128-TQFP (14x14)	TQFP128	XEF216-512-TQ128-C20A	XMOS		
U6	1		2-Bit Bidirectional 1MHz I2C Bus and SMBus Voltage-Level Shifter, DCU0008A (VSSOP-8)	DCU0008A	TCA9406DCUR	Texas Instruments		
U7	1		Programmable 1-PLL VCXO Clock Synthesizer with 2.5V or 3.3V LVCMOS Outputs, PW0014A (TSSOP-14)	PW0014A	CDCE913PWR	Texas Instruments	CDCE913PW	Texas Instruments
U8	1		Dual-Bit Dual-Supply Bus Transceiver, DQM0008A (X2SON-8)	DQM0008A	SN74AVC2T244DQMR	Texas Instruments		
U9	1		Enhanced Product Dual Buffer/ Driver with Open-Drain Output, DCK0006A (SOT-SC70-6)	DSF0006A	SN74LVC2G07DSFR	Texas Instruments		
U10	1		Single-Channel Ultra-Small Adjustable Supervisory Circuit With Active-High Open-Drain Output, DRY0006A (USON-6)	DRY0006A	TPS3897ADRYR	Texas Instruments		
U11	1		Optical Jack Transmitter OTJ-8	OTJ8	FCR684208T	Cliff Electronic Components		
U12	1		4-Bit Dual-Supply Bus Transceiver With Configurable Voltage-Level Shifting and 3-State Outputs, RSV0016A (UQFN-16)	RSV0016A	SN74AVC4T774RSVR	Texas Instruments		Texas Instruments
U13	1		Fiber Optic Receiver Digital Audio, Optical 16Mbps - approx. 2.7V-5.5V 10mA	CONN_FIBER_OPTIC	FCR684208R	Cliff		
U14	1		216kHz Digital Audio Interface Transceiver (DIX) with Stereo ADC and Routing, PCM, S / PDIF, ADC, 4.5 - 5.5V for Analog, 2.9 - 3.6V for DIX, -40 to 85 degC, 48-Pin LQFP (PT), Green (RoHS & no Sb/Br)	PT0048A	PCM9211PT	Texas Instruments		
U15, U16, U18	3		Single 2-Line to 1-Line Data Selector/Multiplexer, DCT0008A, LARGE T&R	DCT0008A	SN74LVC2G157DCTR	Texas Instruments	SN74LVC2G157DCUT	Texas Instruments

Table 3-1. Bill of Materials (continued)

Designator	QTY	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
U17	1		Single Schmitt-Trigger Inverter, DCK0005A (SOT-SC70-5)	DCK0005A	SN74LVC1G14DCKR	Texas Instruments	SN74LVC1G14DCKT	Texas Instruments
U19	1		Single 2-Line to 1-Line Data Selector/Multiplexer, DCU0008A, LARGE T&R	DCU0008A	SN74LVC2G157DCUR	Texas Instruments	SN74LVC2G157DCUT	Texas Instruments
U20	1		Low-Voltage 8-Bit I2C and SMBus I/O Expander, 1.65 to 5.5V, -40 to 85 degC, 16-pin QFN (RGT), Green (RoHS & no Sb/Br)	RGT0016A	TCA6408ARGTR	Texas Instruments		
U21	1		36V, 16A Buck-boost Converter	VQFN-HR26	TPS552882RPM	Texas Instruments		
U22	1		Single Output Fast Transient Response LDO, 1A, Fixed 3.3V Output, 2.7 to 10V Input, with Low IQ, 8-pin SOIC (D), -40 to 125 degC, Green (RoHS & no Sb/Br)	D0008A	TPS76833QDR	Texas Instruments		
Y1	1		Crystal Oscillator 24MHz ±50ppm HCMOS 3.3V SMD 2x1.6mm	SMD_2MM0_1MM6	ASA-24.000MHZ-L-T	Abracon		
Y2	1		Crystal, 24.576MHz, 10pF, SMD	2.5x0.5x2.0mm	ABM10-24.576MHZ-E20-T	Abracon Corporation		

4 Additional Information

4.1 Trademarks

PurePath™ is a trademark of Texas Instruments.
All trademarks are the property of their respective owners.

STANDARD TERMS FOR EVALUATION MODULES

1. *Delivery:* TI delivers TI evaluation boards, kits, or modules, including any accompanying demonstration software, components, and/or documentation which may be provided together or separately (collectively, an “EVM” or “EVMs”) to the User (“User”) in accordance with the terms set forth herein. User's acceptance of the EVM is expressly subject to the following terms.

   1.1 EVMs are intended solely for product or software developers for use in a research and development setting to facilitate feasibility evaluation, experimentation, or scientific analysis of TI semiconductors products. EVMs have no direct function and are not finished products. EVMs shall not be directly or indirectly assembled as a part or subassembly in any finished product. For clarification, any software or software tools provided with the EVM (“Software”) shall not be subject to the terms and conditions set forth herein but rather shall be subject to the applicable terms that accompany such Software

   1.2 EVMs are not intended for consumer or household use. EVMs may not be sold, sublicensed, leased, rented, loaned, assigned, or otherwise distributed for commercial purposes by Users, in whole or in part, or used in any finished product or production system.

2 *Limited Warranty and Related Remedies/Disclaimers*:

   2.1 These terms do not apply to Software. The warranty, if any, for Software is covered in the applicable Software License Agreement.

   2.2 TI warrants that the TI EVM will conform to TI's published specifications for ninety (90) days after the date TI delivers such EVM to User. Notwithstanding the foregoing, TI shall not be liable for a nonconforming EVM if (a) the nonconformity was caused by neglect, misuse or mistreatment by an entity other than TI, including improper installation or testing, or for any EVMs that have been altered or modified in any way by an entity other than TI, (b) the nonconformity resulted from User's design, specifications or instructions for such EVMs or improper system design, or (c) User has not paid on time. Testing and other quality control techniques are used to the extent TI deems necessary. TI does not test all parameters of each EVM. User's claims against TI under this Section 2 are void if User fails to notify TI of any apparent defects in the EVMs within ten (10) business days after delivery, or of any hidden defects with ten (10) business days after the defect has been detected.

   2.3 TI's sole liability shall be at its option to repair or replace EVMs that fail to conform to the warranty set forth above, or credit User's account for such EVM. TI's liability under this warranty shall be limited to EVMs that are returned during the warranty period to the address designated by TI and that are determined by TI not to conform to such warranty. If TI elects to repair or replace such EVM, TI shall have a reasonable time to repair such EVM or provide replacements. Repaired EVMs shall be warranted for the remainder of the original warranty period. Replaced EVMs shall be warranted for a new full ninety (90) day warranty period.

WARNING

Evaluation Kits are intended solely for use by technically qualified, professional electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems, and subsystems.

User shall operate the Evaluation Kit within TI’s recommended guidelines and any applicable legal or environmental requirements as well as reasonable and customary safeguards. Failure to set up and/or operate the Evaluation Kit within TI’s recommended guidelines may result in personal injury or death or property damage. Proper set up entails following TI’s instructions for electrical ratings of interface circuits such as input, output and electrical loads.

NOTE:

EXPOSURE TO ELECTROSTATIC DISCHARGE (ESD) MAY CAUSE DEGREDATION OR FAILURE OF THE EVALUATION KIT; TI RECOMMENDS STORAGE OF THE EVALUATION KIT IN A PROTECTIVE ESD BAG.

3 *Regulatory Notices:*

3.1 *United States*

3.1.1 *Notice applicable to EVMs not FCC-Approved:*

FCC NOTICE: This kit is designed to allow product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter.

3.1.2 *For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant:*

CAUTION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement for Class A EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Interference Statement for Class B EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *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.*

3.2 *Canada*

3.2.1 *For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247*

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSSs. 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.

Concernant les EVMs avec appareils radio:

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.

Concerning EVMs Including Detachable Antennas:

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

3.3 *Japan*

3.3.1 *Notice for EVMs delivered in Japan:* Please see http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page 日本国内に輸入される評価用キット、ボードについては、次のところをご覧ください。

https://www.ti.com/ja-jp/legal/notice-for-evaluation-kits-delivered-in-japan.html

3.3.2 *Notice for Users of EVMs Considered "Radio Frequency Products" in Japan:* EVMs entering Japan may not be certified by TI as conforming to Technical Regulations of Radio Law of Japan.

If User uses EVMs in Japan, not certified to Technical Regulations of Radio Law of Japan, User is required to follow the instructions set forth by Radio Law of Japan, which includes, but is not limited to, the instructions below with respect to EVMs (which for the avoidance of doubt are stated strictly for convenience and should be verified by User):

1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
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.

【無線電波を送信する製品の開発キットをお使いになる際の注意事項】 開発キットの中には技術基準適合証明を受けていないものがあります。 技術適合証明を受けていないもののご使用に際しては、電波法遵守のため、以下のいずれかの措置を取っていただく必要がありますのでご注意ください。

1. 電波法施行規則第6条第1項第1号に基づく平成18年3月28日総務省告示第173号で定められた電波暗室等の試験設備でご使用いただく。
2. 実験局の免許を取得後ご使用いただく。
3. 技術基準適合証明を取得後ご使用いただく。

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上記を遵守頂けない場合は、電波法の罰則が適用される可能性があることをご留意ください。 日本テキサス・インスツルメンツ株式会社

東京都新宿区西新宿 6 丁目 2 4 番 1 号

西新宿三井ビル

3.3.3 *Notice for EVMs for Power Line Communication:* Please see http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_02.page

電力線搬送波通信についての開発キットをお使いになる際の注意事項については、次のところをご覧ください。https://www.ti.com/ja-jp/legal/notice-for-evaluation-kits-for-power-line-communication.html

3.4 *European Union*

3.4.1 *For EVMs subject to EU Directive 2014/30/EU (Electromagnetic Compatibility Directive)*:

This is a class A product intended for use in environments other than domestic environments that are connected to a low-voltage power-supply network that supplies buildings used for domestic purposes. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

4 *EVM Use Restrictions and Warnings:*

4.1 EVMS ARE NOT FOR USE IN FUNCTIONAL SAFETY AND/OR SAFETY CRITICAL EVALUATIONS, INCLUDING BUT NOT LIMITED TO EVALUATIONS OF LIFE SUPPORT APPLICATIONS.

4.2 User must read and apply the user guide and other available documentation provided by TI regarding the EVM prior to handling or using the EVM, including without limitation any warning or restriction notices. The notices contain important safety information related to, for example, temperatures and voltages.

4.3 *Safety-Related Warnings and Restrictions:*

4.3.1 User shall operate the EVM within TI's recommended specifications and environmental considerations stated in the user guide, other available documentation provided by TI, and any other applicable requirements and employ reasonable and customary safeguards. Exceeding the specified performance ratings and specifications (including but not limited to input and output voltage, current, power, and environmental ranges) for the EVM may cause personal injury or death, or property damage. If there are questions concerning performance ratings and specifications, User should contact a TI field representative prior to connecting interface electronics including input power and intended loads. Any loads applied outside of the specified output range may also result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM user guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative. During normal operation, even with the inputs and outputs kept within the specified allowable ranges, some circuit components may have elevated case temperatures. These components include but are not limited to linear regulators, switching transistors, pass transistors, current sense resistors, and heat sinks, which can be identified using the information in the associated documentation. When working with the EVM, please be aware that the EVM may become very warm.

4.3.2 EVMs are intended solely for use by technically qualified, professional electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems, and subsystems. User assumes all responsibility and liability for proper and safe handling and use of the EVM by User or its employees, affiliates, contractors or designees. User assumes all responsibility and liability to ensure that any interfaces (electronic and/or mechanical) between the EVM and any human body are designed with suitable isolation and means to safely limit accessible leakage currents to minimize the risk of electrical shock hazard. User assumes all responsibility and liability for any improper or unsafe handling or use of the EVM by User or its employees, affiliates, contractors or designees.

4.4 User assumes all responsibility and liability to determine whether the EVM is subject to any applicable international, federal, state, or local laws and regulations related to User's handling and use of the EVM and, if applicable, User assumes all responsibility and liability for compliance in all respects with such laws and regulations. User assumes all responsibility and liability for proper disposal and recycling of the EVM consistent with all applicable international, federal, state, and local requirements.

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