

# TAS2770 Stereo Evaluation Module

This user's guide describes the characteristics, operation, and use of the TAS2770EVM-STEREO Reference Board. A complete schematic diagram, printed-circuit board layouts, and bill of materials are included in this document.

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## Trademarks

### 1 Description

The TAS2770 is a mono digital input Class-D audio amplifier optimized for efficiently driving high peak power into small loudspeakers. The Class-D amplifier is capable of delivering 18.3 W of peak power into a 4  $\Omega$  load while sustaining 1 % THD+N at a battery voltage of 13.8 V. Integrated speaker voltage and current sense provides for real time monitoring of loudspeaker behavior. Up to eight devices can share a common bus via either I2S/TDM + I2C or Soundwire<sup>SM</sup> interfaces. Two PDM inputs are provided for low latency playback or sensor aggregation.

The TAS2770EVM-STEREO supports evaluation and development with the TAS2770 device through the following interfaces:

- USB interface
  - TAS2770 control through PurePath™ Console 3 (PPC3) GUI, USB-HID
  - USB-class audio device, compatible with Microsoft® Windows® 7+
- Digital audio AP and PSIA interface through 100-mil headers
- I2C interface for TAS2770 control
- Soundwire<sup>SM</sup> interface for TAS2770 control

### 2 Specifications

**Table 1. Reference Board Specifications**

Amplifier power supply (VBAT)	4.5 V to 16 V
EVM power supply	4.5 V to 16 V
IO power supply (IOVDD)	1.65 V to 1.95 V
Output Power	18.3 W
USB, USB class-audio	Micro-USB B

### 3 Software

The TAS2770EVM-STEREO can be easily configured with PurePath™ Console 3 running the TAS2770 plug-in.

Please refer to the TAS2770 PurePath Console User's guide for detailed descriptions of the software features.

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**NOTE:** The evaluation driver currently distributed for use with this EVM will periodically inject a tone into the data stream. This behavior is intentional for this version of the driver. Legal procurement of the full release version of this driver is in process which will resolve this issue. As soon as it is available it will be provided to the end user.

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### 4 Stereo Setup

1. Install PurePath™ Console 3 with the TAS2770EVM-STEREO plug-in
2. Connect the first speaker to J10 on the EVM. Alternatively, J23 and J24 can be used for speaker connections.
3. Connect a second speaker to J29 on the EVM. Alternatively, J28 and J30 can be used for speaker connections.
4. Attach a power supply to connector J9. There is also an alternate barrel jack connector (J19) adjacent to this connector.
5. Set jumper J13 to select the desired I2C address for channel 1.
6. Set jumper J31 to select the desired I2C address for channel 2.

7. Connect the EVM to a Windows® 7+ PC with a micro-USB cable (J16).

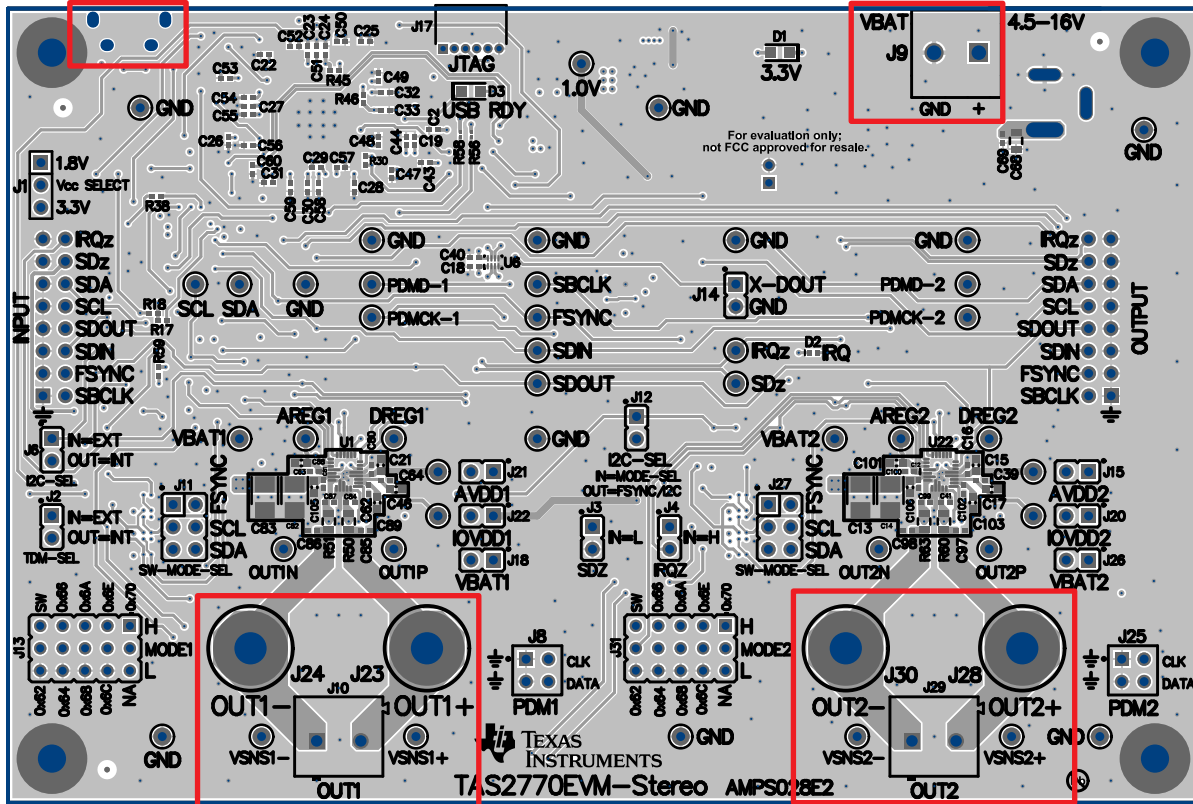


Figure 1. TAS2770EVM-STEREO Stereo Configuration

8. Verify that the EVM is the default playback device by opening the sound dialog from the Windows® Control Panel as shown in Figure 2.

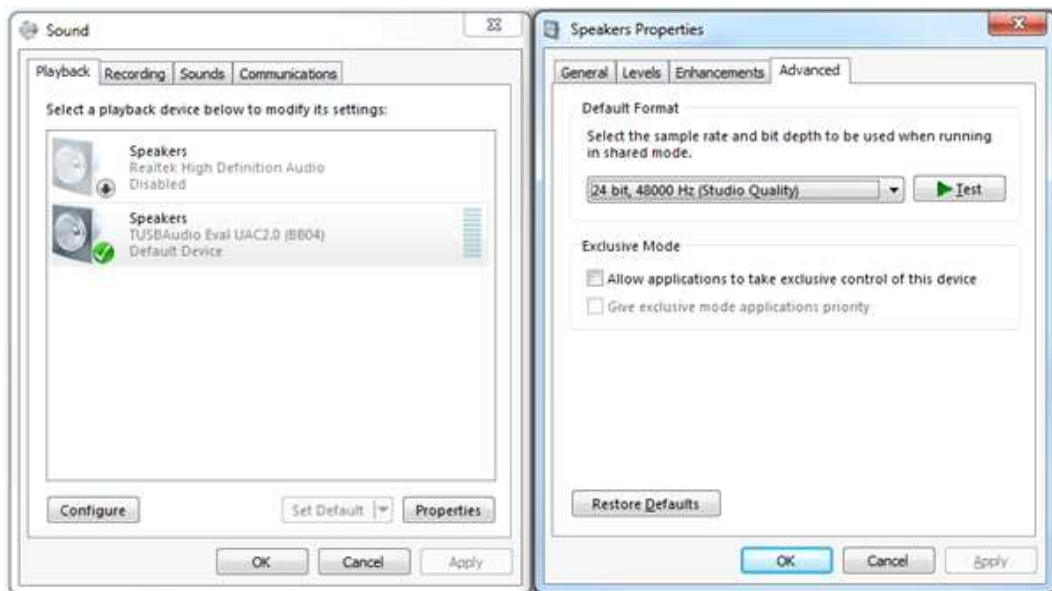
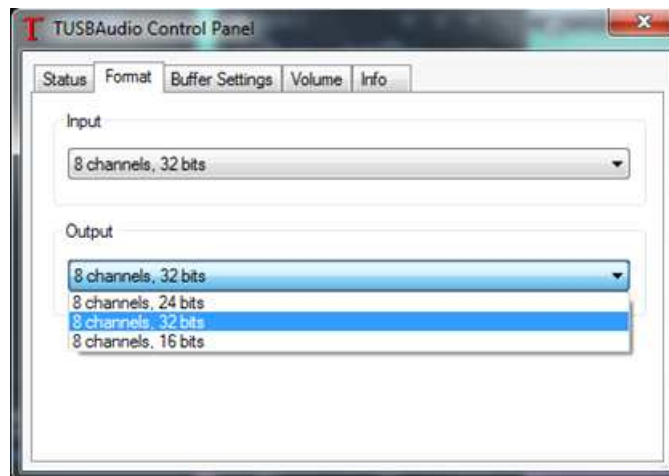


Figure 2. Playback Device Settings

9. Set the sampling rate using the Windows® setting by opening Properties > Advanced. The TAS2770EVM-STEREO supports 44.1 KHz and 48KHz sampling rates.

10. Set the bit depth as desired using the Thesycon Control Panel accessible from the system tray shown in [Figure 3](#).
11. Proceed to configure the device using PPC3.



**Figure 3. Thesycon Driver Control Panel**

Please refer to Figure 8 for default jumper settings.

## 5 Mono Setup

1. Install PurePath™ Console 3 with the TAS2770EVM-STEREO plug-in
2. Connect the first speaker to J10 on the EVM. Alternatively, J23 and J24 can be used for speaker connections.
3. Attach a power supply to connector J9. There is also an alternate barrel jack connector (J19) adjacent to this connector.
4. Set jumper J13 to select the desired I2C address for channel 1.
5. Connect the EVM to a Windows® 7+ PC with a micro-USB cable (J16).

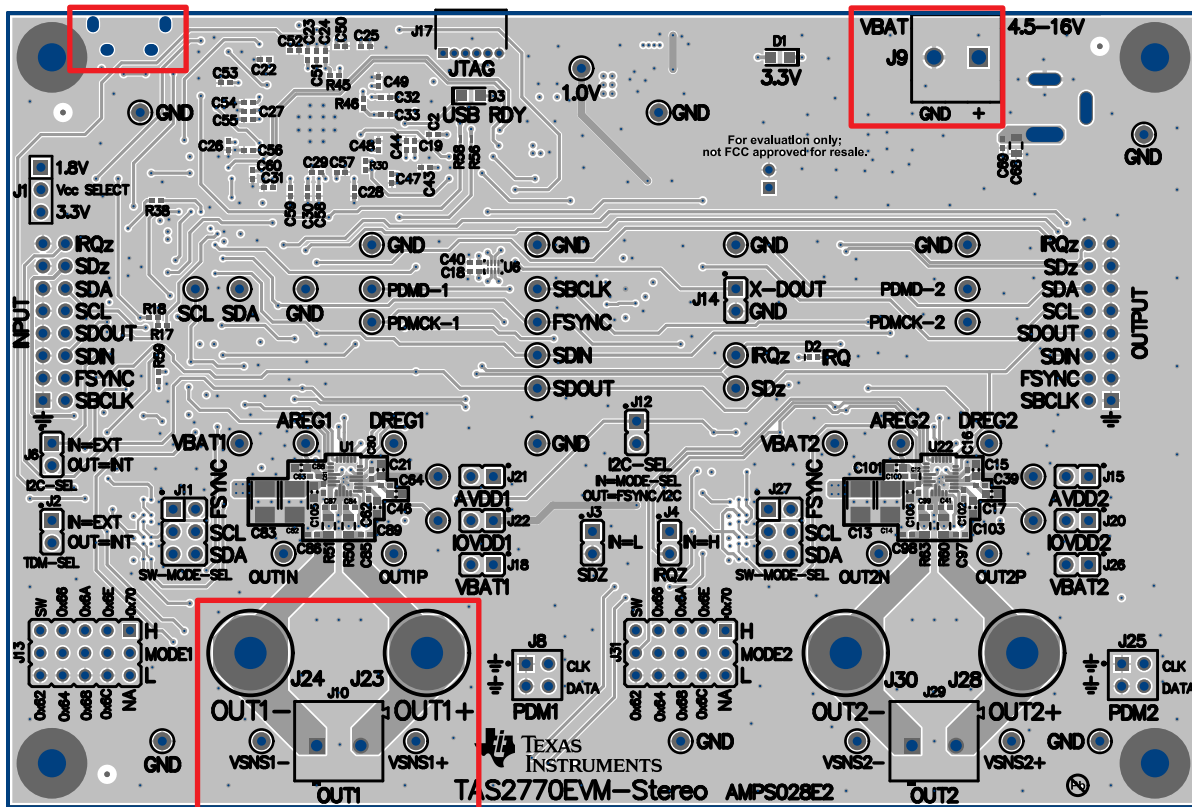


Figure 4. TAS2770EVM-STEREO Mono Configuration

6. Verify that the EVM is the default playback device by opening the sound dialog from the Windows® Control Panel as shown in [Figure 2](#).
7. Set the sampling rate using the Windows® setting by opening Properties > Advanced. The TAS2770EVM-STEREO supports 44.1 KHz and 48KHz sampling rates.
8. Set the bit depth as desired using the Thesycon Control Panel accessible from the system tray shown in [Figure 3](#).
9. Proceed to configure the device using PPC3.

## 6 Multi-Channel Setup

1. Install PurePath™ Console 3 with the TAS2770EVM-STEREO plug-in
2. Connect up to 4 TAS2770EVM-STEREOs together using connectors J5 and J7.
3. Attach a power supply to each board.
4. The leftmost board should have jumpers set to match the Stereo configuration. On all other boards insert a jumper on J2 and J6. See [Figure 5](#) for details.
5. Set Jumpers J13 and J31 on each board to a unique address.
6. Configure the sampling rate and bit depth as discussed in Mono Setup steps 6-8.
7. Proceed to configure the device using PPC3.
8. Connect the leftmost EVM to a Windows® 7+ PC with a micro-USB cable (J16).

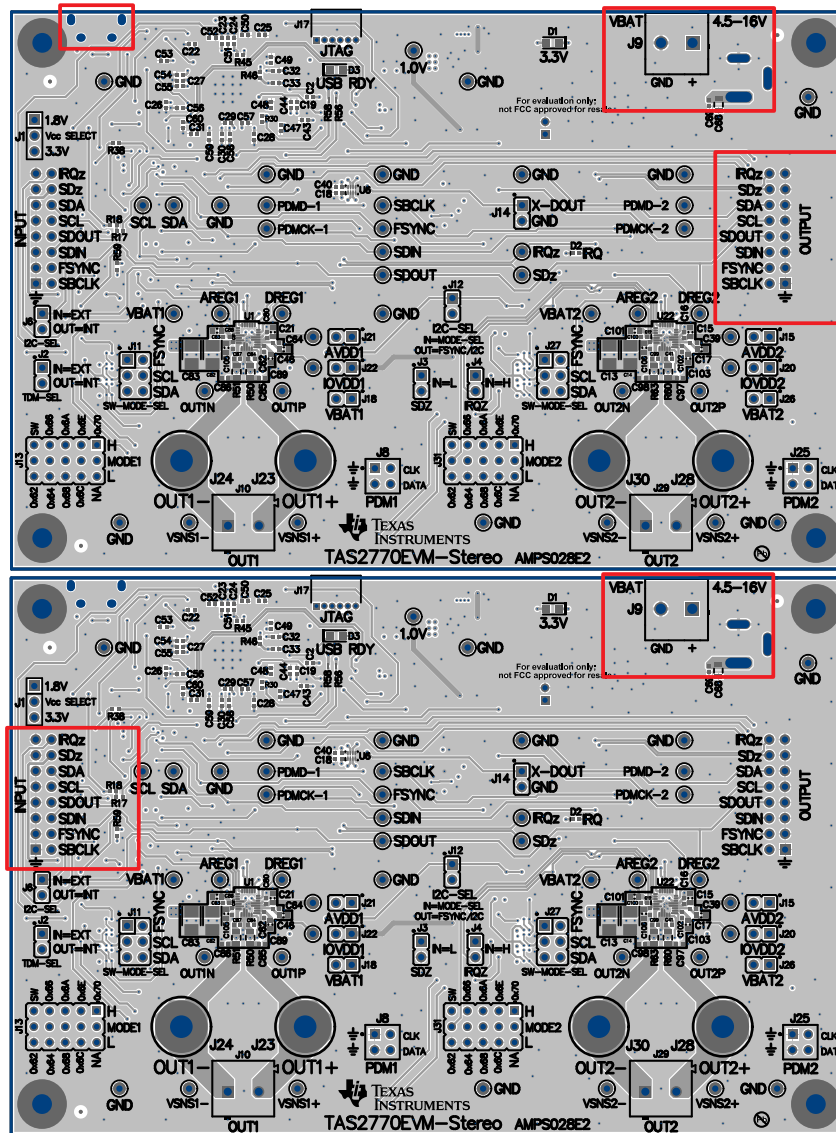


Figure 5. Multi-Channel Setup

## 7 Digital Audio Interfaces

The various digital audio interfaces on the TAS2770 Reference Board can be selected through hardware settings and software settings. Several headers close to the TAS2770 device allow access to the following digital audio signals:

- I2S Data out(SDOUT) from the TAS2770 (for example, current and voltage sense data)
- I2S Data in(SDIN) to the TAS2770
- I2S Word clock or fram sync(FSYNC)
- I2S Bit clock(SBCLK)
- PDM Clock (PDMCLK0) – optional input source for TAS2770
- PDM Clock (PDMCLK1) – optional input source for TAS2770
- PDM Data (PDMD0) – optional input source for TAS2770
- PDM Data (PDMD1) – optional input source for TAS2770
- I<sup>2</sup>C Clock (SCLK)

- I<sup>2</sup>C Data (SDA)
  - TAS2770 can be configured for SoundwireSM Mode as well:
    - SoundwireSM clock - SBCLK
    - SoundwireSM data - SDOUT
    - SoundwireSM address – SDA
    - SoundwireSM address – FSYNC
    - SoundwireSM address – SCL

A jumper inserted in the SW slot of J13 sets the TAS2770 to SoundwireSM mode. Then J11 can be set as desired to configure the device address.

The selection between USB (internal) and External inputs is controlled by jumpers J2 and J6. These jumpers set TDM and I2C respectively.

## 7.1 Digital Audio Interface Selection

### 7.1.1 USB

The TAS2770 Reference Board contains an XMOS microcontroller that acts as a USB HID and USB-class audio interface. To select USB, remove jumpers J6 and J2. Insert a jumper in J12. This is shown in Figure 6.

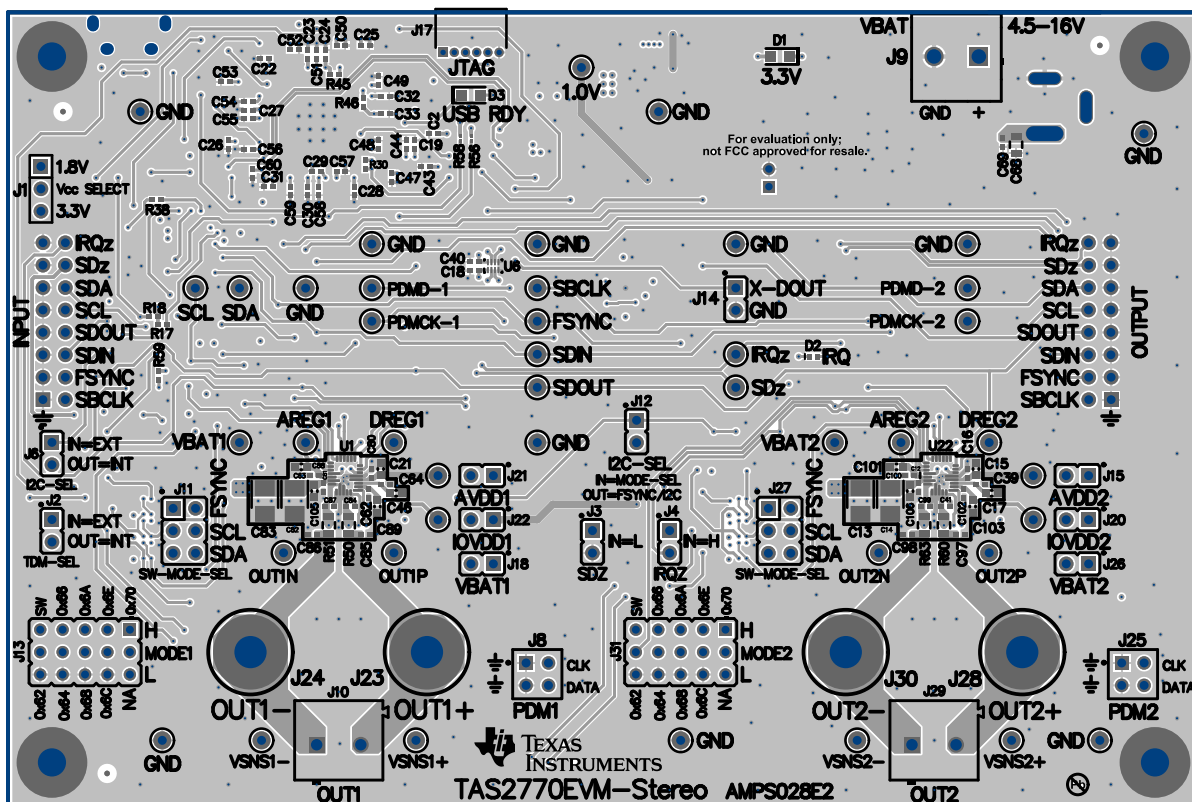


Figure 6. USB Audio Input Configuration

### 7.1.2 Direct (AP/PSIA)

Insert a jumper on J2 and connect the external digital audio source (for example AP or PSIA) to the external input header pin. The odd numbered pins on this header provide a ground for each signal. This is shown in Figure 9. Note that the jumper setting for J1 must reflect the logic level of the external source.

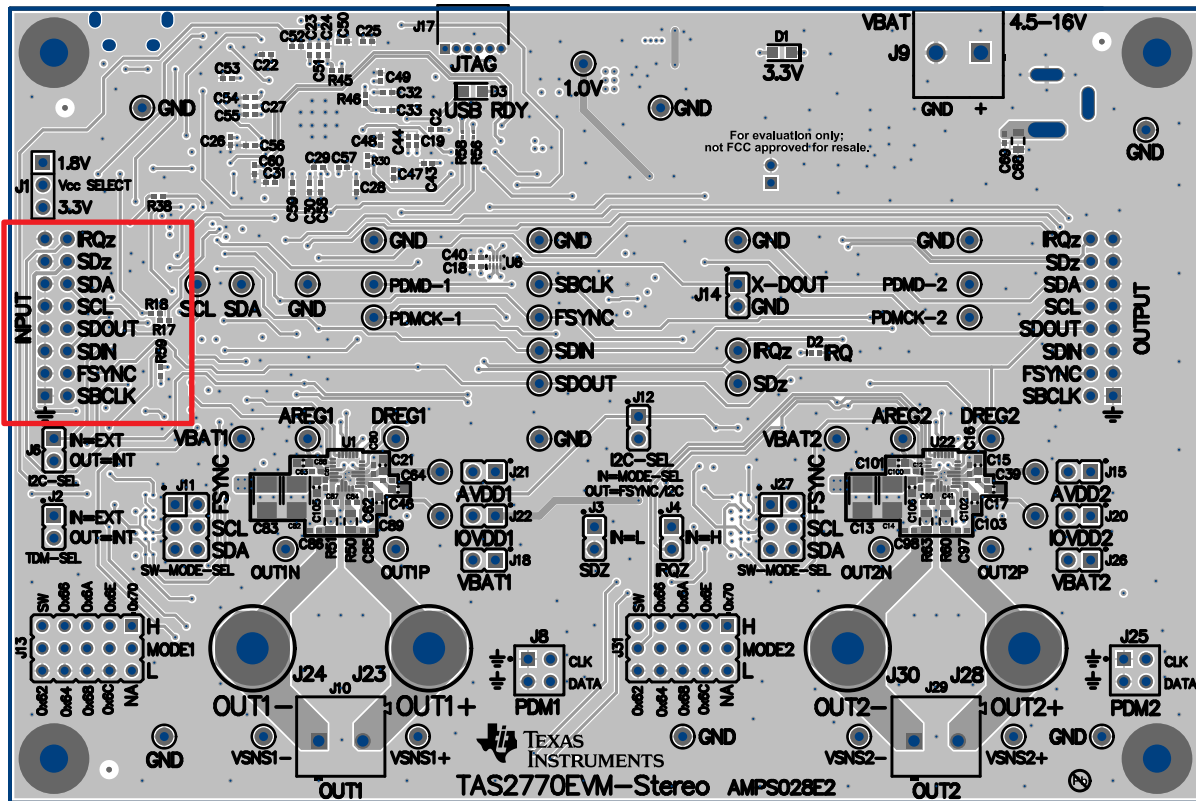


Figure 7. AP/PSIA Input Configuration



## 8 Hardware Documentation

### 8.1 TAS2770EVM-STEREO Schematics

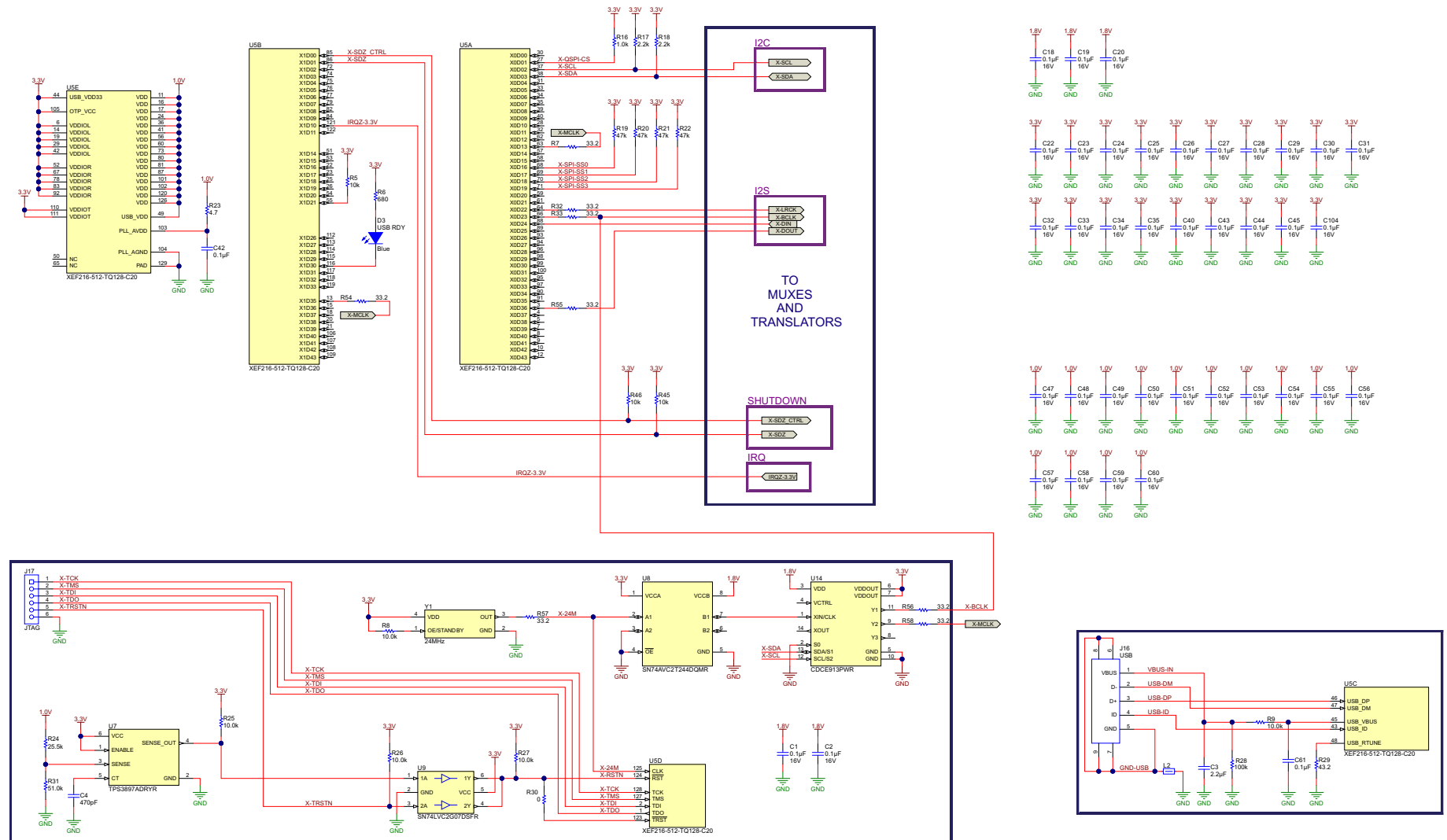


Figure 8. Schematic: XMOS USB Controller

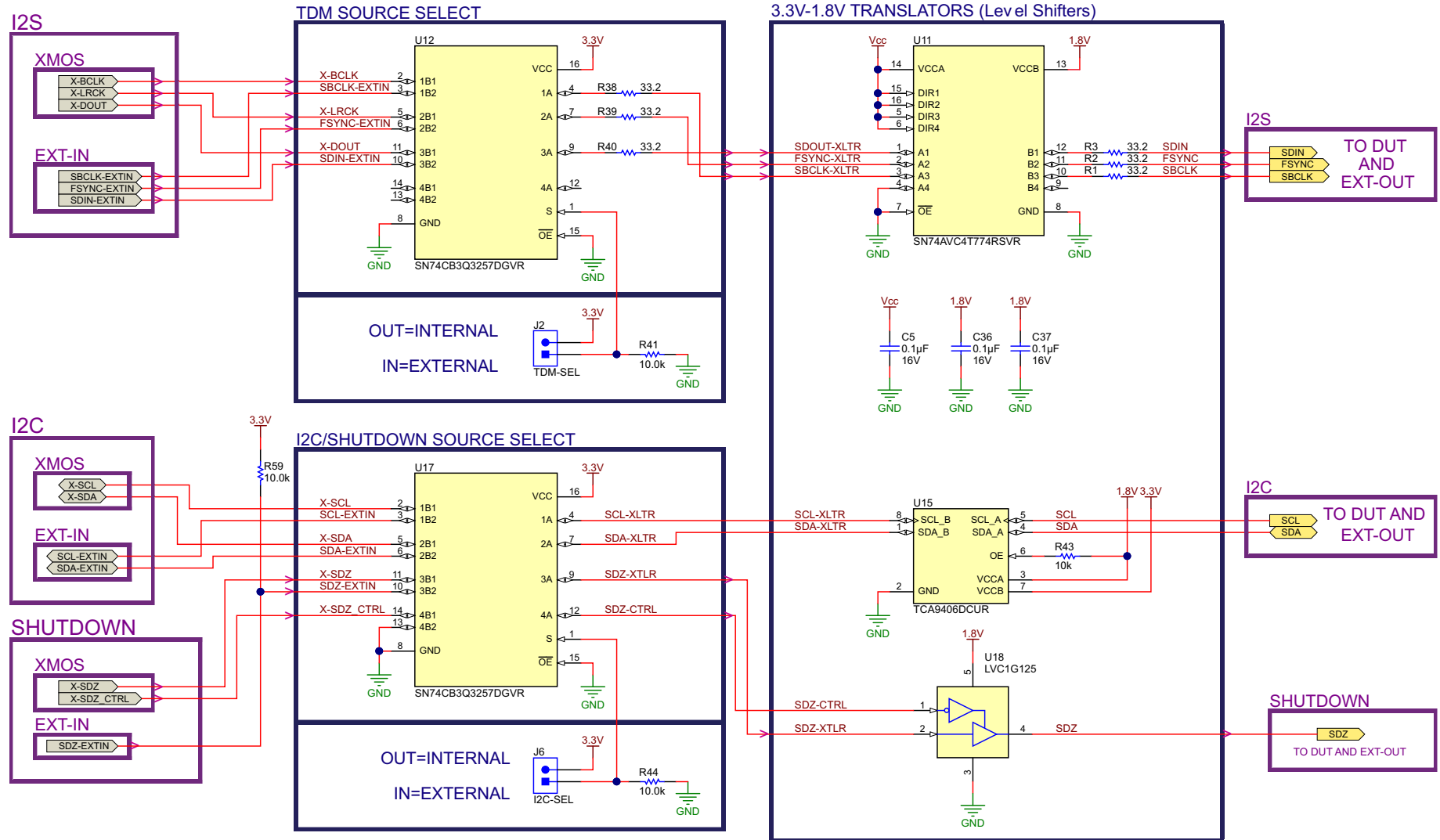


Figure 9. Schematic: Input Multiplexing and Level Shift

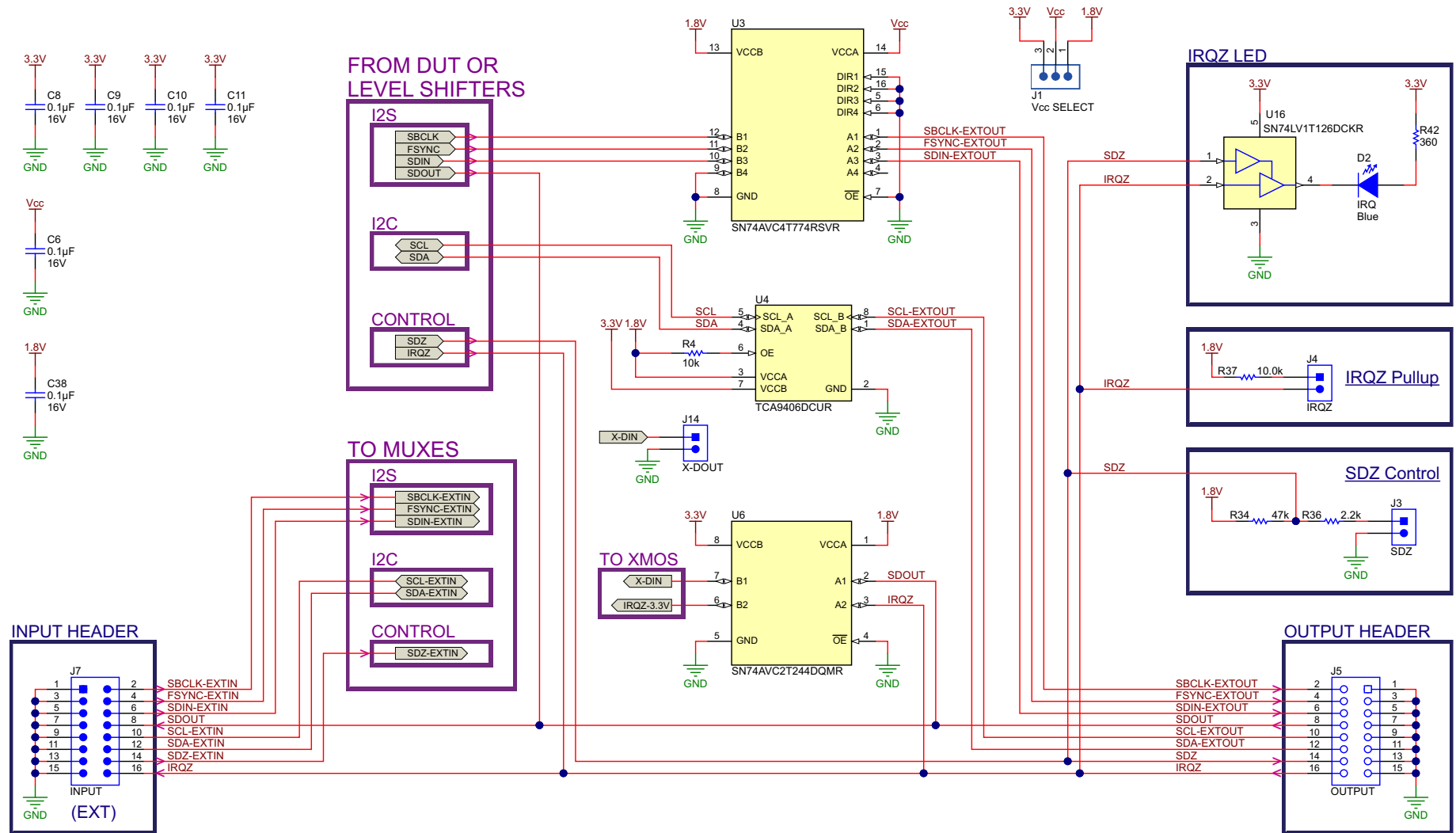


Figure 10. Schematic: External Input / Output Routing

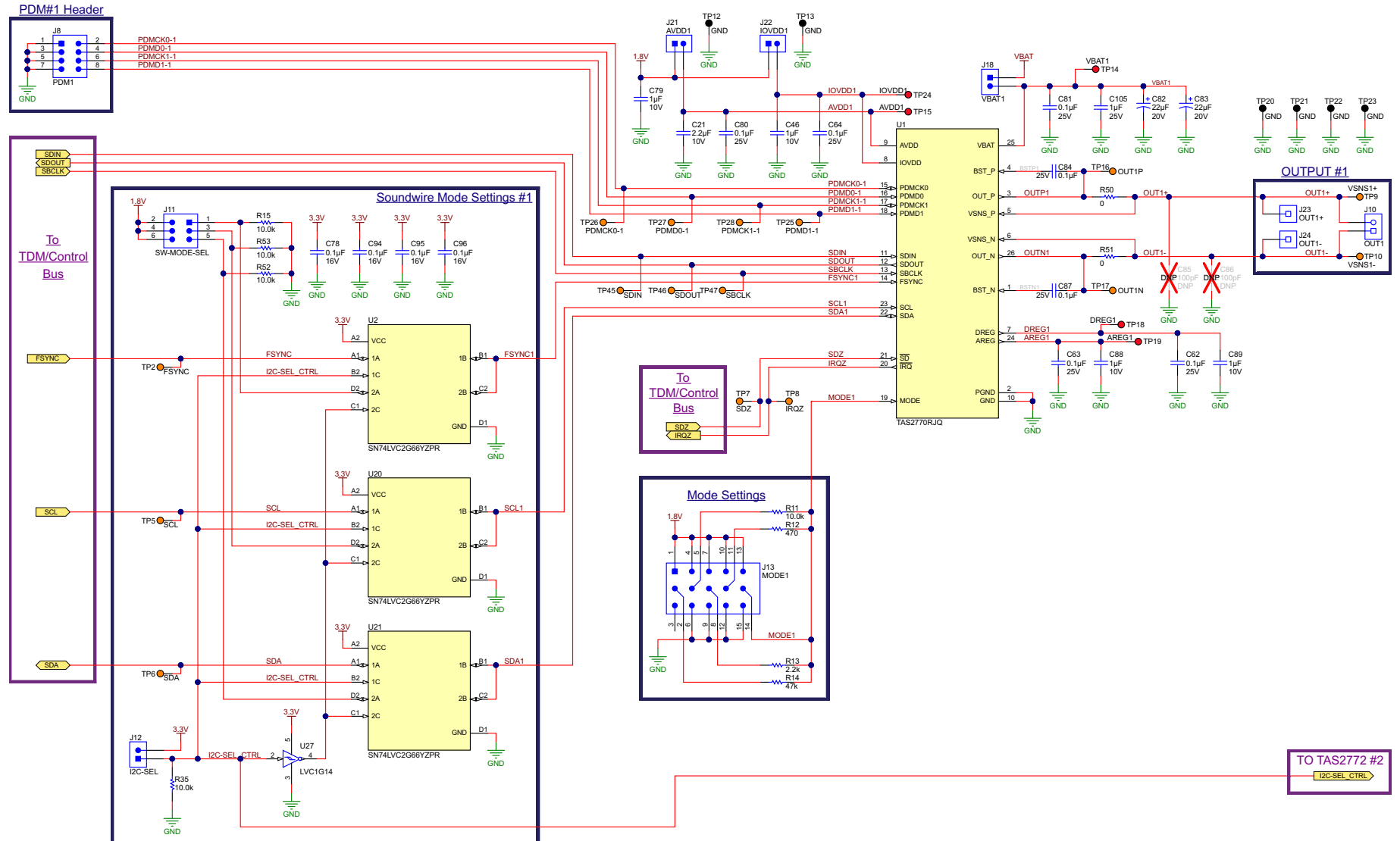


Figure 11. Schematic: TAS2770 Channel 1 Control

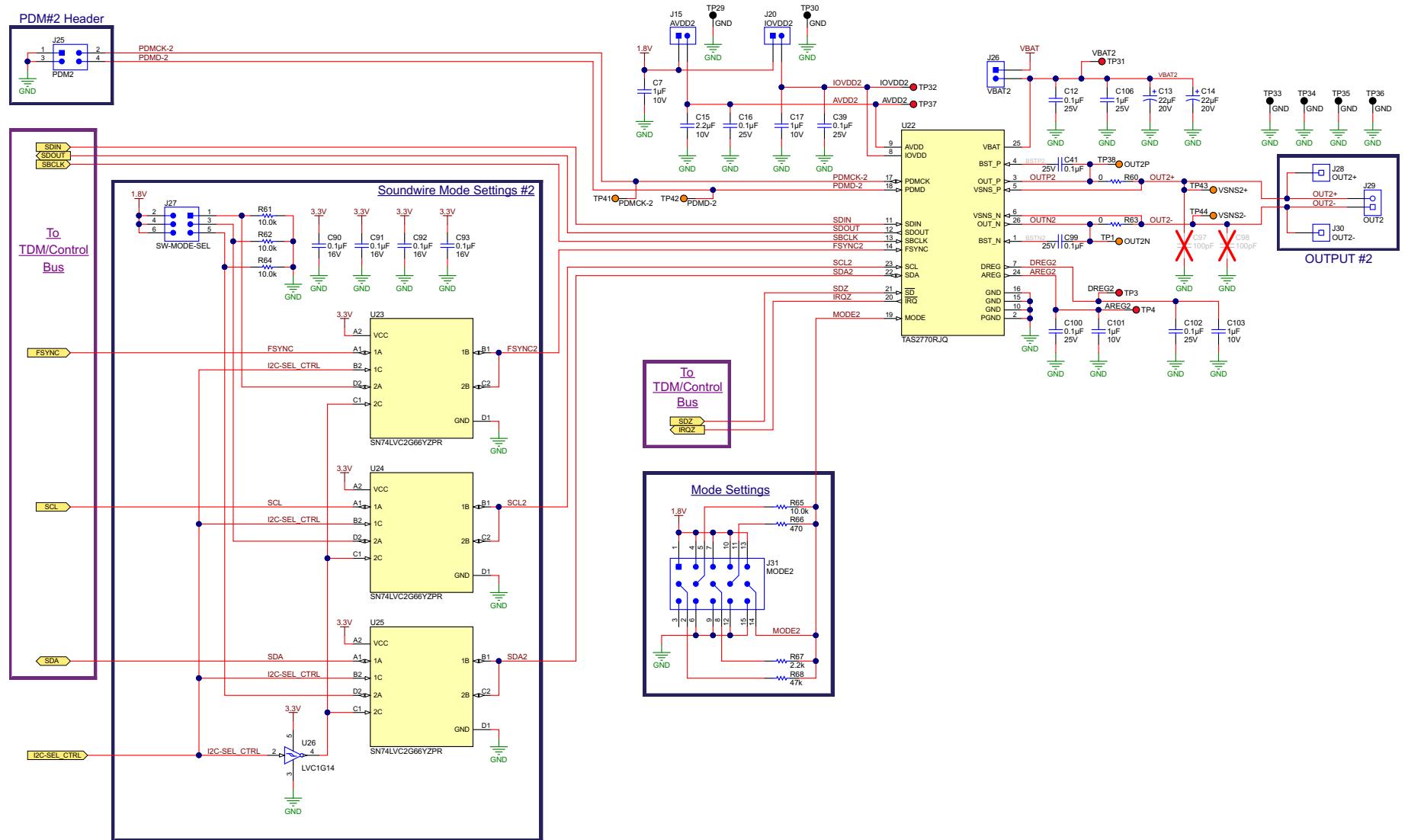


Figure 12. TAS2770 Channel 2 Control

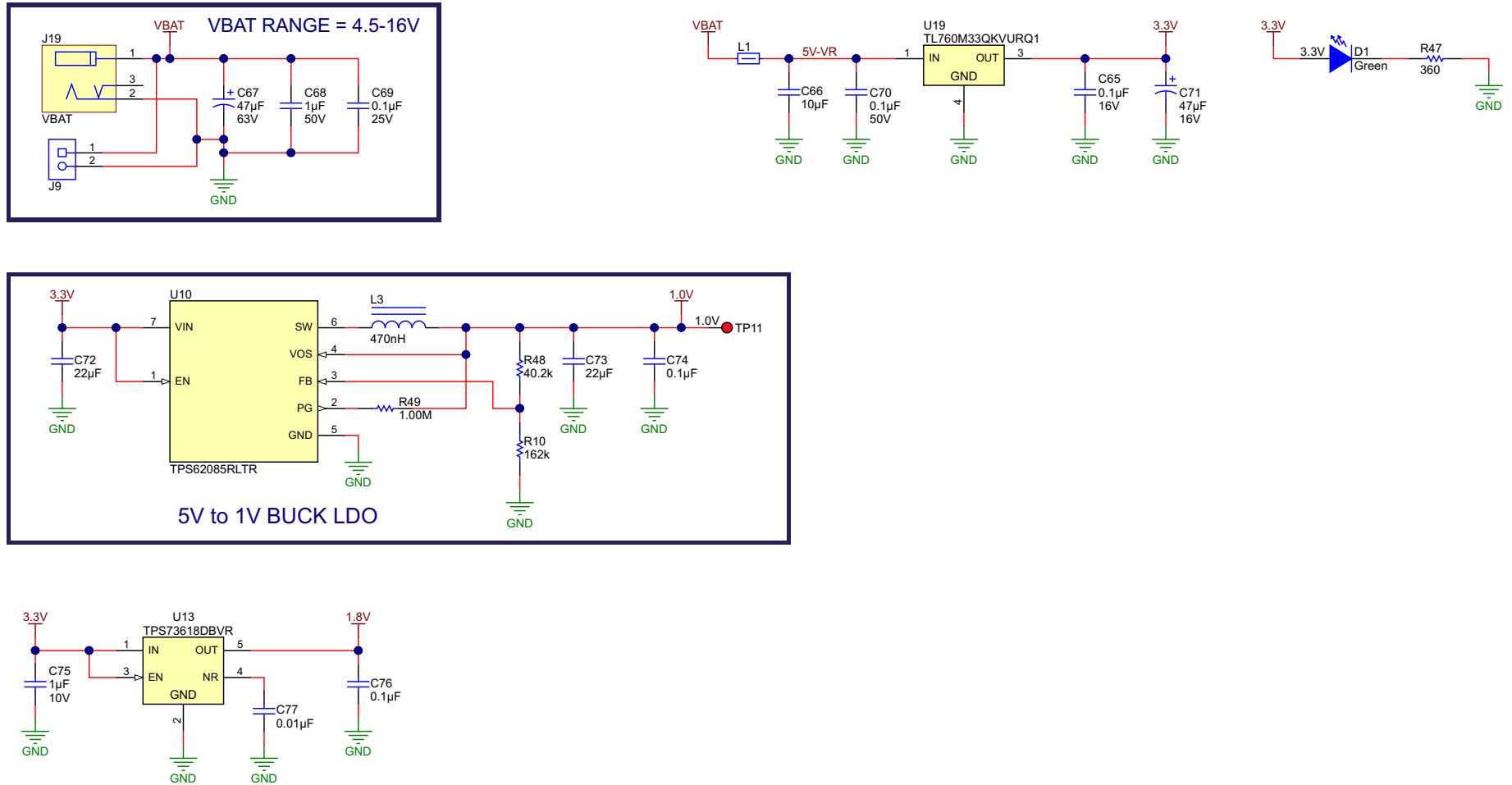


Figure 13. On-Board Power

## 8.2 TAS2770 Reference Board Printed Circuit Board Layout

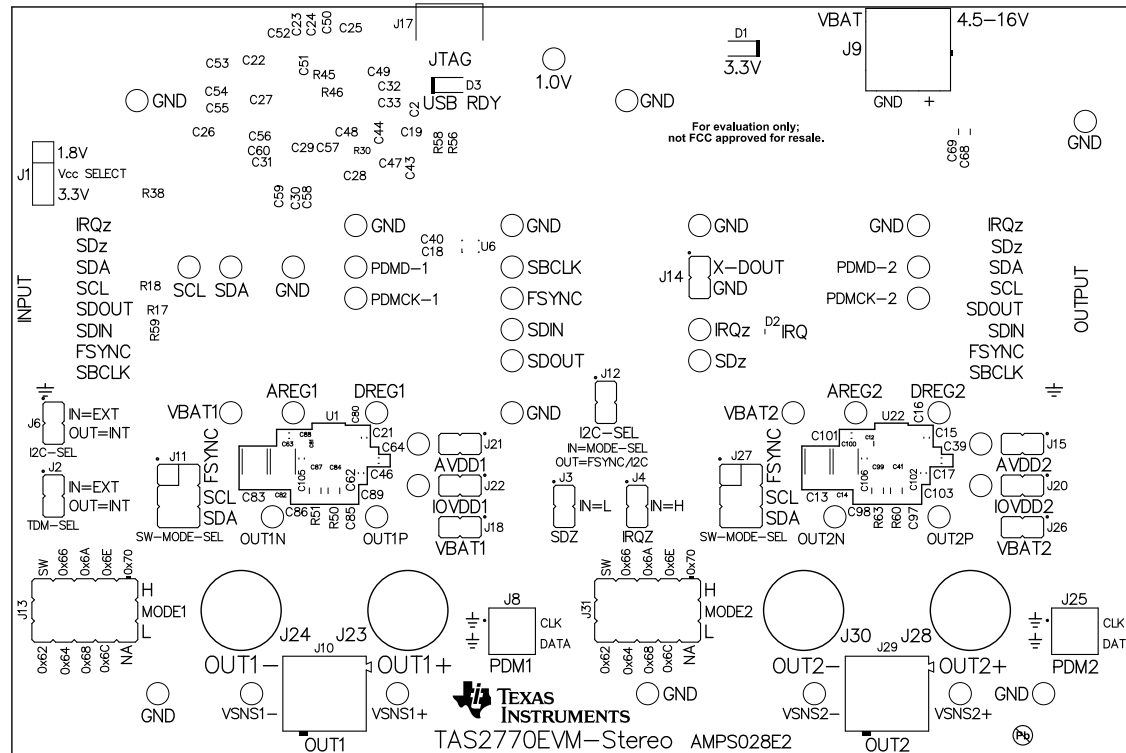


Figure 14. PCB: Top Silkscreen

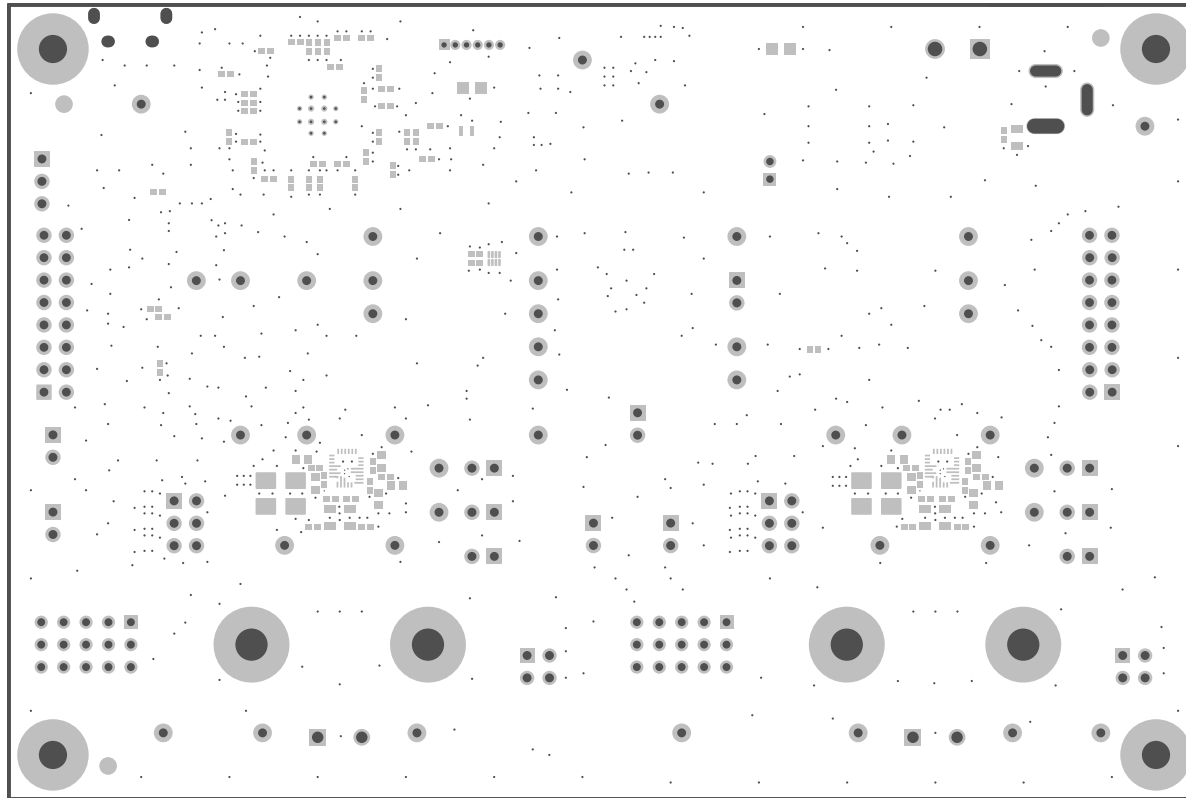


Figure 15. PCB: Top Solder Mask



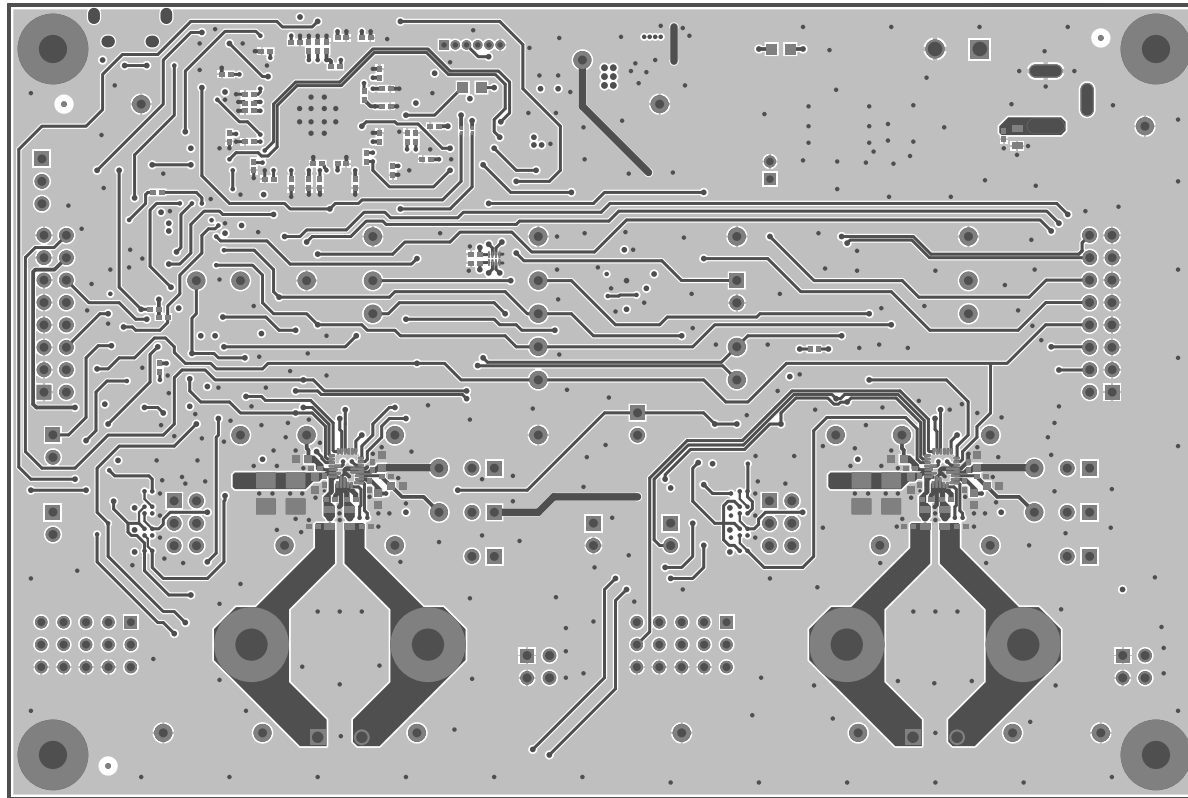
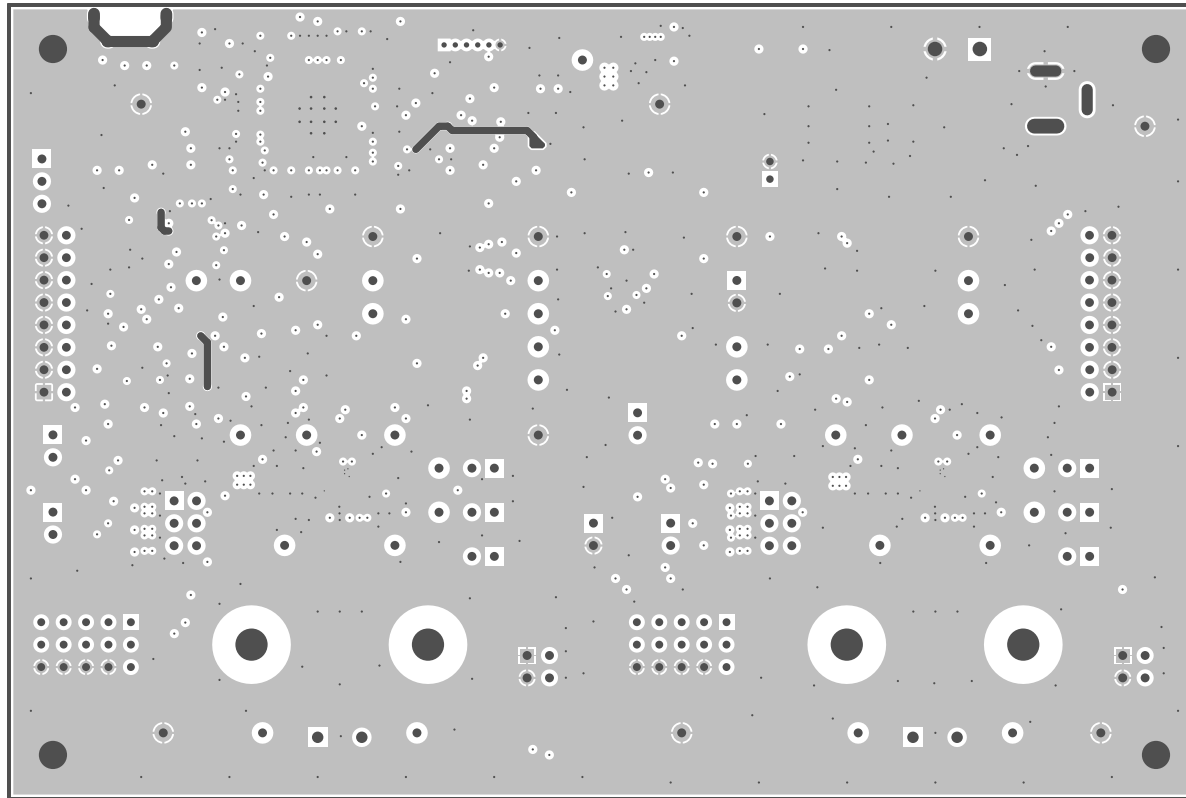


Figure 16. PCB: Top Copper



**Figure 17. PCB: Copper Layer 2**

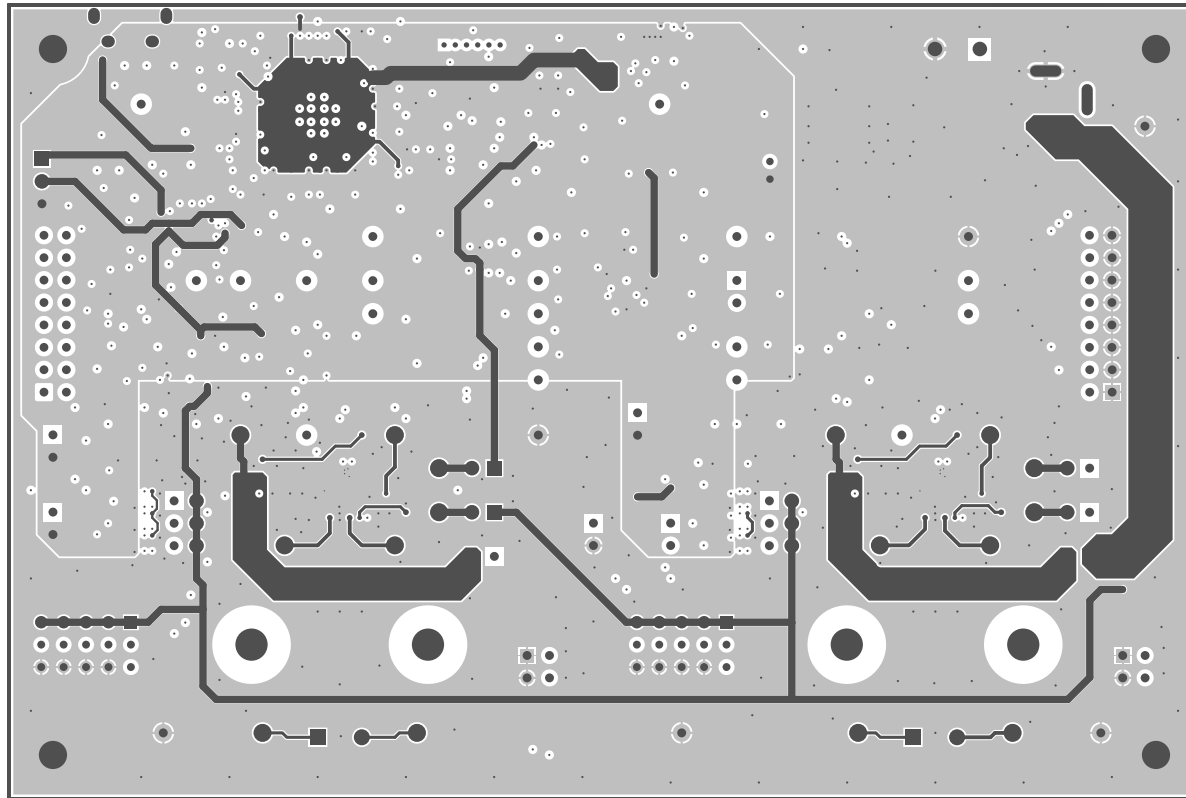
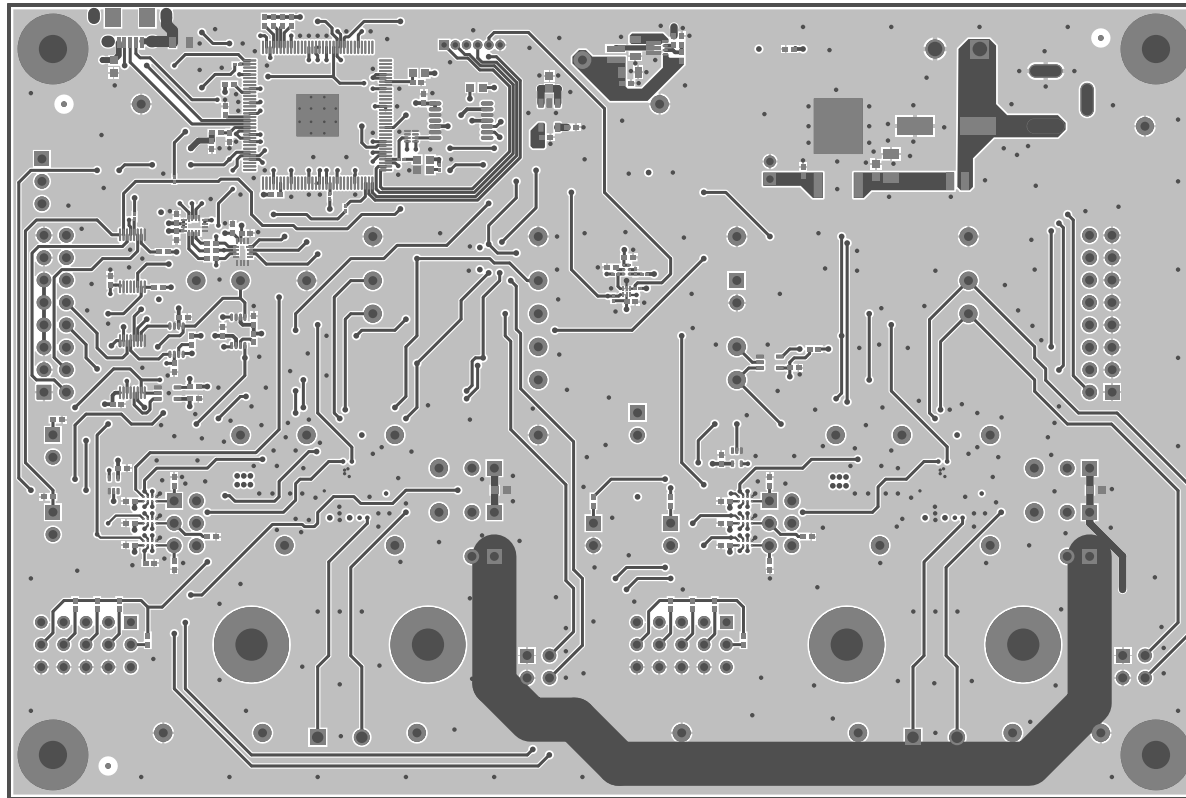
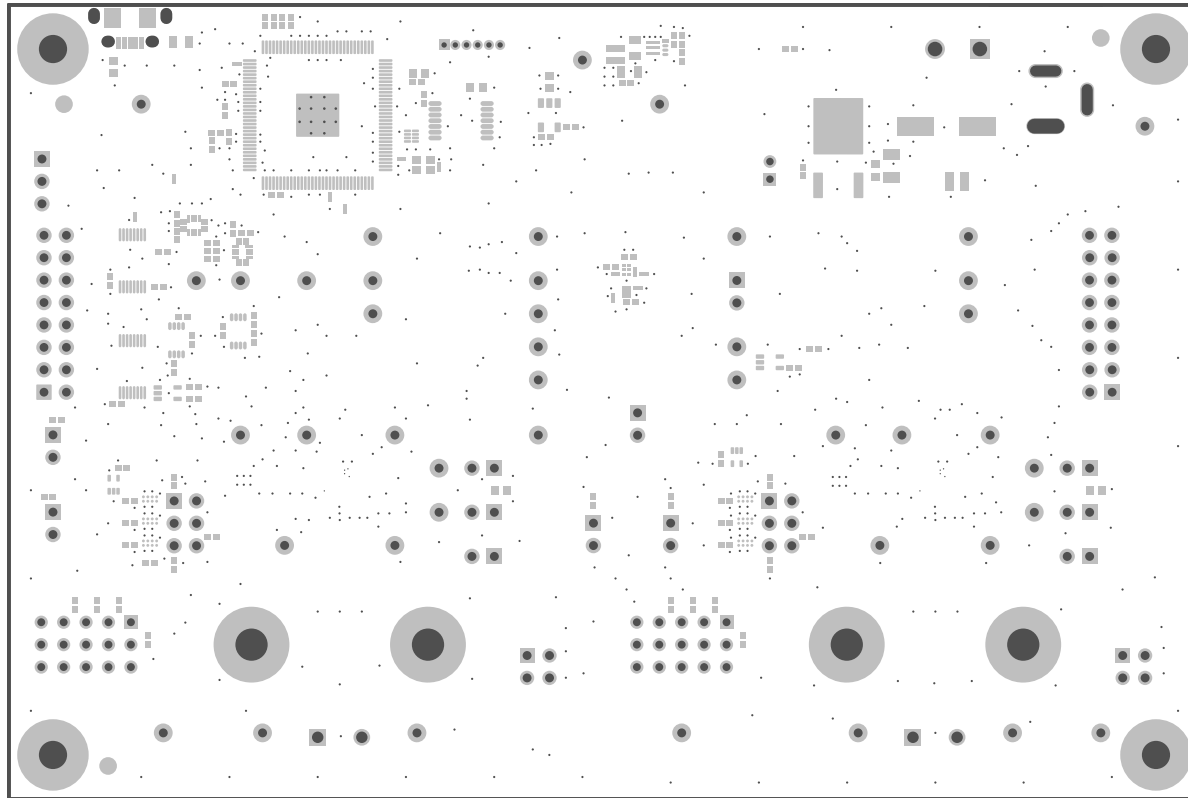


Figure 18. PCB: Copper Layer 3



**Figure 19. PCB: Bottom Copper**



**Figure 20. PCB: Bottom Solder Mask**

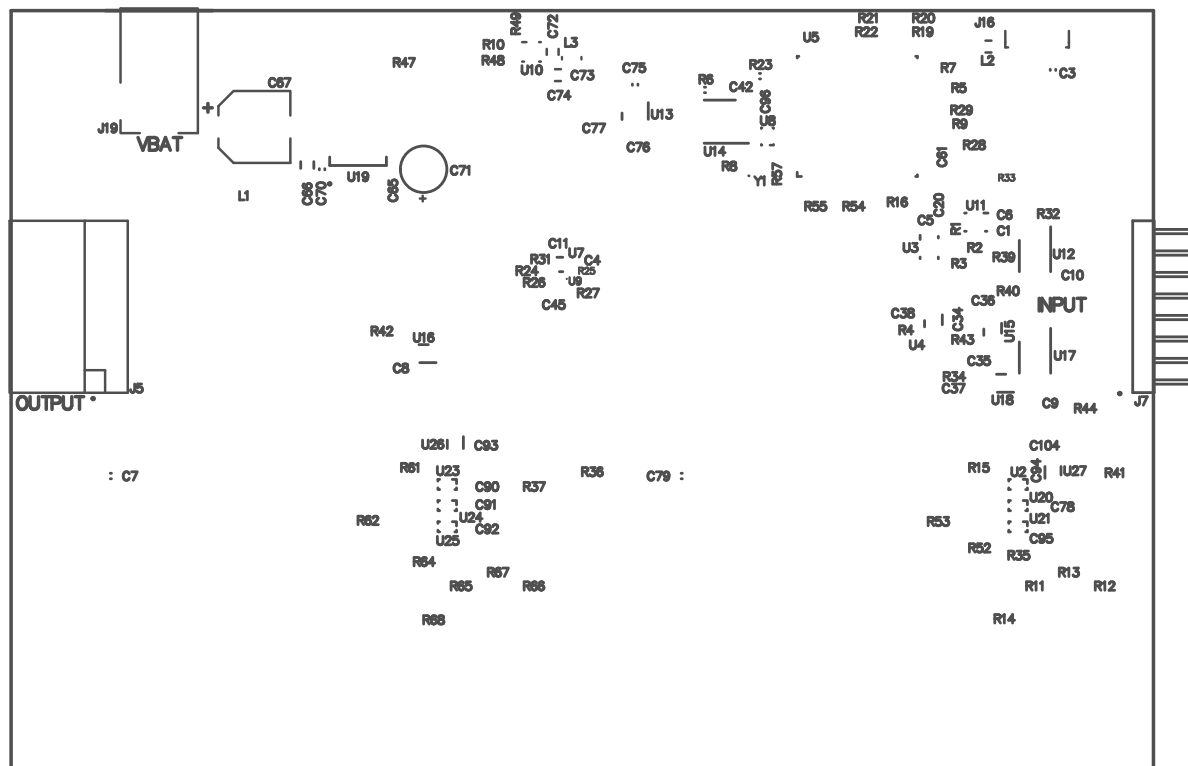


Figure 21. PCB: Bottom Silk Screen

### 8.3 TAS2770 Reference Board Bill of Materials

**Table 2. TAS2770 Reference Board Bill of Materials**

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
!PCB1	1		Printed Circuit Board		NA	Any	-	-
C1, C2, C5, C6, C8, C9, C10, C11, C18, C19, C20, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C40, C43, C44, C45, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C78, C90, C91, C92, C93, C94, C95, C96, C104	55	0.1 $\mu$ F	CAP, CERM, 0.1 $\mu$ F, 16 V, $\pm$ 10%, X7R, 0402	0402	GRM155R71C104KA88D	MuRata		
C3	1	2.2 $\mu$ F	CAP, CERM, 2.2 $\mu$ F, 10 V, $\pm$ 10%, X7R, 0603	0603	GRM188R71A225KE15D	MuRata		
C4	1	470 pF	CAP, CERM, 470 pF, 25 V, $\pm$ 5%, C0G/NP0, 0402	0402	GRM1555C1E471JA01D	MuRata		
C7, C17, C46, C75, C79, C88, C89, C101, C103	9	1 $\mu$ F	CAP, CERM, 1 $\mu$ F, 10 V, $\pm$ 10%, X7R, 0603	0603	GRM188R71A105KA61D	MuRata		
C12, C16, C39, C41, C62, C63, C64, C69, C80, C81, C84, C87, C99, C100, C102	15	0.1 $\mu$ F	CAP, CERM, 0.1 $\mu$ F, 25 V, $\pm$ 20%, X7R, 0402	0402	C1005X7R1E104M050BB	TDK		
C13, C14, C82, C83	4	22 $\mu$ F	CAP, Tantalum Polymer, 22 $\mu$ F, 20 V, $\pm$ 20%, 0.09 $\Omega$ , 3528-21 SMD	3528-21	TCJB226M020R0090	AVX		

**Table 2. TAS2770 Reference Board Bill of Materials (continued)**

C15, C21	2	2.2 $\mu$ F	CAP, CERM, 2.2 $\mu$ F, 10 V, $\pm$ 10%, X7R, 0603	0603	C1608X7R1A225 K080AC	TDK		
C42, C61, C65, C74	4	0.1 $\mu$ F	CAP, CERM, 0.1 $\mu$ F, 16 V, $\pm$ 10%, X7R, 0402	0402	GRM155R71C10 4KA88D	MuRata		
C66	1	10 $\mu$ F	CAP, CERM, 10 $\mu$ F, 35 V, $\pm$ 10%, X7R, 1206	1206	GMK316AB7106 KL	Taiyo Yuden		
C67	1	47 $\mu$ F	CAP, AL, 47 $\mu$ F, 63 V, $\pm$ 20%, 0.65 $\Omega$ , AEC-Q200 Grade 2, SMD	SMT Radial F	EEE-FK1J470P	Panasonic		
C68	1	1 $\mu$ F	CAP, CERM, 1 $\mu$ F, 50 V, $\pm$ 10%, X7R, 0805	0805	GRM21BR71H10 5KA12L	MuRata		
C70	1	0.1 $\mu$ F	CAP, CERM, 0.1 $\mu$ F, 50 V, $\pm$ 10%, X7R, 0603	0603	GCM188R71H10 4KA57D	MuRata		
C71	1	47 $\mu$ F	CAP, AL, 47 $\mu$ F, 16 V, $\pm$ 20%, 0.8 $\Omega$ , AEC-Q200 Grade 2, TH	D5xL11mm	EEU-FC1C470	Panasonic		
C72, C73	2	22 $\mu$ F	CAP, CERM, 22 $\mu$ F, 10 V, $\pm$ 20%, X7R, 0805	0805	GRM21BZ71A22 6ME15L	MuRata		
C76	1	0.1 $\mu$ F	CAP, CERM, 0.1 $\mu$ F, 10 V, $\pm$ 10%, X7R, 0402	0402	GRM155R71A10 4KA01D	MuRata		
C77	1	0.01 $\mu$ F	CAP, CERM, 0.01 $\mu$ F, 6.3 V, $\pm$ 10%, X7R, 0402	0402	GRM155R70J10 3KA01D	MuRata		
C105, C106	2	1 $\mu$ F	CAP, CERM, 1 $\mu$ F, 25 V, $\pm$ 10%, X5R, 0603	0603	GRM188R61E10 5KA12D	MuRata		
D1	1	Green	LED, Green, SMD	LED_0805	LTST-C171GKT	Lite-On		
D2	1	Blue	LED, Blue, SMD	Blue LED	SMLP12BC7TT8 6	Rohm		
D3	1	Blue	LED, Blue, SMD	LED_0805	LTST-C170TBKT	Lite-On		



**Table 2. TAS2770 Reference Board Bill of Materials (continued)**

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	1		Header, 100mil, 3x1, Gold, TH	PBC03SAAN	PBC03SAAN	Sullins Connector Solutions		
J2, J3, J4, J6, J12, J14, J15, J18, J20, J21, J22, J26	12		Header, 100mil, 2x1, Gold, TH	Sullins 100 mil, 1 x 2, 230 mil above insulator	PBC02SAAN	Sullins Connector Solutions		
J5	1		Receptacle, 100mil, 8x2, Gold, R/A, TH	SSQ-108-02-G-D-RA	SSQ-108-02-G-D-RA	Samtec		
J7	1		Header, 100mil, 8x2, Gold, R/A, TH	8x2 R/A Header	TSW-108-08-G-D-RA	Samtec		
J8, J25	2		Header, 100mil, 4x2, Tin, TH	Header, 4x2, 100mil, Tin	PEC04DAAN	Sullins Connector Solutions		
J9	1		Terminal Block, 5.08mm, 2x1, TH	Terminal Block, 5.08mm, 2x1, TH	0395443002	Molex		
J10, J29	2		Terminal Block, 5 mm, 2x1, Tin, TH	Terminal Block, 5 mm, 2x1, TH	691 101 710 002	Wurth Elektronik		
J11, J27	2		Header, 100mil, 3x2, Gold, TH	Sullins 100mil, 2x3, 230 mil above insulator	PBC03DAAN	Sullins Connector Solutions		
J13, J31	2		Header, 2.54mm, 5x3, Gold, TH	Header, 2.54mm, 5x3, TH	804-10-015-10-002000	Mill-Max		
J16	1		Connector, Receptacle, Micro-USB Type AB, R/A, Bottom Mount SMT	Connector, USB Micro AB	DX4R205JJAR1 800	JAE Electronics		
J17	1		Receptacle, 50mil, 6x1, Gold, R/A, TH	6x1 Receptacle	LPPB061NGCN-RC	Sullins Connector Solutions		
J19	1		Power Jack, mini, 2.5mm OD, R/A, TH	Jack, 14.5x11x9mm	RAPC712X	Switchcraft		

**Table 2. TAS2770 Reference Board Bill of Materials (continued)**

J23, J28	2		Binding Post, RED, TH	11.4x27.2mm	7006	Keystone		
J24, J30	2		Binding Post, BLACK, TH	11.4x27.2mm	7007	Keystone		
L1	1	300 Ω	Ferrite Bead, 300 Ω @ 100 MHz, 3.1 A, 0806	0806	NFZ2MSM301S N10L	MuRata		
L2	1	600 Ω	Ferrite Bead, 600 Ω @ 100MHz, 2A, 0805	0805	MPZ2012S601A	TDK		
L3	1	470nH	Inductor, Shielded Drum Core, Ferrite, 470 nH, 2 A, 0.059 Ω, SMD	Inductor, 2x1.2x2mm	VLS2012ET- R47N	TDK		
R1, R2, R3, R38, R39, R40	6	33.2	RES, 33.2, 1%, 0.063 W, 0402	0402	CRCW040233R2 FKED	Vishay-Dale		
R4, R5, R43, R45, R46	5	10k	RES, 10 k, 5%, 0.063 W, 0402	0402	CRCW040210K0 JNED	Vishay-Dale		
R6	1	680	RES, 680, 1%, 0.1 W, 0603	0603	RC0603FR- 07680RL	Yageo America		
R7, R32, R33, R54, R55, R56, R57, R58	8	33.2	RES, 33.2, 1%, 0.05 W, 0201	0201	RC0201FR- 0733R2L	Yageo America		
R8, R25, R26, R27	4	10.0k	RES, 10.0 k, 1%, 0.05 W, 0201	0201	CRCW020110K0 FKED	Vishay-Dale		
R9	1	10.0k	RES, 10.0 k, 1%, 0.1 W, 0402	0402	ERJ-2RKF1002X	Panasonic		
R10	1	162k	RES, 162 k, 1%, 0.063 W, 0402	0402	CRCW0402162K FKED	Vishay-Dale		
R11, R15, R35, R37, R52, R53, R61, R62, R64, R65	10	10.0k	RES, 10.0 k, 1%, 0.063 W, 0402	0402	CRCW040210K0 FKED	Vishay-Dale		
R12, R66	2	470	RES, 470, 1%, 0.1 W, AEC- Q200 Grade 0, 0402	0402	ERJ-2RKF4700X	Panasonic		
R13, R17, R18, R36, R67	5	2.2k	RES, 2.2 k, 5%, 0.063 W, 0402	0402	CRCW04022K20 JNED	Vishay-Dale		
R14, R19, R20, R21, R22, R34, R68	7	47k	RES, 47 k, 5%, 0.063 W, 0402	0402	CRCW040247K0 JNED	Vishay-Dale		

Table 2. TAS2770 Reference Board Bill of Materials (continued)

R16	1	1.0k	RES, 1.0 k, 5%, 0.063 W, 0402	0402	CRCW04021K00 JNED	Vishay-Dale		
R23	1	4.7	RES, 4.7, 5%, 0.1 W, 0603	0603	CRCW06034R70 JNEA	Vishay-Dale		
R24	1	25.5k	RES, 25.5 k, 1%, 0.05 W, 0201	0201	RC0201FR- 0725K5L	Yageo America		
R28	1	100k	RES, 100 k, 5%, 0.063 W, 0402	0402	CRCW0402100K JNED	Vishay-Dale		
R29	1	43.2	RES, 43.2, 1%, 0.063 W, 0402	0402	CRCW040243R2 FKED	Vishay-Dale		
R30	1	0	RES, 0, 5%, 0.063 W, 0402	0402	CRCW04020000 Z0ED	Vishay-Dale		
R31	1	51.0k	RES, 51.0 k, 1%, 0.05 W, 0201	0201	RC0201FR- 0751KL	Yageo America		
R41, R44, R59	3	10.0k	RES, 10.0k $\Omega$ , 1%, 0.063W, 0402	0402	CRCW040210K0 FKED	Vishay-Dale		
R42	1	360	RES, 360 $\Omega$ , 5%, 0.063W, 0402	0402	CRCW0402360R JNED	Vishay-Dale		
R47	1	360	RES, 360, 5%, 0.063 W, 0402	0402	CRCW0402360R JNED	Vishay-Dale		
R48	1	40.2k	RES, 40.2 k, 1%, 0.063 W, 0402	0402	CRCW040240K2 FKED	Vishay-Dale		
R49	1	1.00Meg	RES, 1.00 M, 1%, 0.063 W, 0402	0402	CRCW04021M0 0FKED	Vishay-Dale		
R50, R51, R60, R63	4	0	RES, 0, 5%, 0.125 W, 0805	0805	RC0805JR- 070RL	Yageo America		
SH1, SH2, SH3, SH4, SH5, SH6, SH7, SH8, SH9, SH10, SH11, SH12, SH13, SH14, SH15, SH16	16	1x2	Shunt, 100mil, Gold plated, Black	Shunt	969102-0000-DA	3M	SNT-100-BK-G	Samtec

**Table 2. TAS2770 Reference Board Bill of Materials (continued)**

TP1, TP2, TP5, TP6, TP7, TP8, TP9, TP10, TP16, TP17, TP25, TP26, TP27, TP28, TP38, TP39, TP40, TP41, TP42, TP43, TP44, TP45, TP46, TP47	24	Orange	Test Point, Miniature, Orange, TH	Orange Miniature Testpoint	5003	Keystone		
TP3, TP4, TP11, TP14, TP15, TP18, TP19, TP24, TP31, TP32, TP37	11		Test Point, Miniature, Red, TH	Red Miniature Testpoint	5000	Keystone		
TP12, TP13, TP20, TP21, TP22, TP23, TP29, TP30, TP33, TP34, TP35, TP36	12		Test Point, Miniature, Black, TH	Black Miniature Testpoint	5001	Keystone		
U1, U22	2		TAS2770RJQ,	RJQ0026A	TAS2770RJQ	Texas Instruments		Texas Instruments
U2, U20, U21, U23, U24, U25	6		Dual Bilateral Analog Switch, YZP0008ADAD (DSBGA-8)	YZP0008ADAD	SN74LVC2G66Y ZPR	Texas Instruments		Texas Instruments
U3, U11	2		4-BIT DUAL-SUPPLY BUS TRANSCEIVER WITH CONFIGURABLE VOLTAGE TRANSLATION AND 3-STATE OUTPUTS, RSV0016A (UQFN-16)	RSV0016A	SN74AVC4T774 RSVR	Texas Instruments		Texas Instruments

Table 2. TAS2770 Reference Board Bill of Materials (continued)

U4, U15	2		TCA9406 Dual Bidirectional 1-MHz I2C-BUS and SMBus Voltage Level-Translator, 1.65 to 3.6 V, -40 to 85 degC, 8-pin US8 (DCU), Green (RoHS & no Sb/Br)	DCU0008A	TCA9406DCUR	Texas Instruments	Equivalent	Texas Instruments
U5	1		IC MCU 512KB RAM, 128TQFP	TQFP-128	XEF216-512-TQ128-C20	XMOS semiconductor		
U6	1		Dual-Bit Dual-Supply Bus Transceiver, DQM0008A (X2SON-8)	DQM0008A	SN74AVC2T244 DQMR	Texas Instruments		Texas Instruments
U7	1		Single-Channel, Adjustable Supervisory Circuit in Ultra-Small Package, DRY0006A (USON-6)	DRY0006A	TPS3897ADRYR	Texas Instruments	TPS3897ADRYT	Texas Instruments
U8	1		2-BIT UNIDIRECTIONAL VOLTAGE-LEVEL TRANSLATOR, DQM0008A (X2SON-8)	DQM0008A	SN74AVC2T244 DQMR	Texas Instruments		Texas Instruments
U9	1		DUAL BUFFER/DRIVER WITH OPEN DRAIN OUTPUTS, DSF0006A	DSF0006A	SN74LVC2G07D SFR	Texas Instruments		Texas Instruments
U10	1		3-A Step-Down Converter with Hiccup Short Circuit Protection in 2x2 QFN Package, RLT0007A	RLT0007A	TPS62085RLTR	Texas Instruments	TPS62085RLTT	Texas Instruments

**Table 2. TAS2770 Reference Board Bill of Materials (continued)**

U12, U17	2		4-Bit 1-of-2 FET Multiplexer/Demultiplexer 2.5-V/3.3-V Low-Voltage High-Bandwidth Bus Switch, DGV0016A	DGV0016A	SN74CB3Q3257 DGV	Texas Instruments		Texas Instruments
U13	1		Single Output Low Noise LDO, 400 mA, Fixed 1.8 V Output, 1.7 to 5.5 V Input, with Reverse Current Protection, 5-pin SOT-23 (DBV), -40 to 85 degC, Green (RoHS & no Sb/Br)	DBV0005A	TPS73618DBVR	Texas Instruments	Equivalent	Texas Instruments
U14	1		Programmable 1-PLL VCXO Clock Synthesizer With 1.8-V, 2.5-V, and 3.3-V Outputs, PW0014A (TSSOP-14)	PW0014A	CDCE913PWR	Texas Instruments	CDCE913PW	Texas Instruments
U16	1		Single Power Supply Single Buffer Gate with 3-State Output CMOS Logic Level Shifter, DCK0005A	DCK0005A	SN74LV1T126D CKR	Texas Instruments		Texas Instruments
U18	1		Single Bus Buffer Gate With 3-State Output, DCK0005A (SOT-5)	DCK0005A	SN74LVC1G125 DCKR	Texas Instruments	SN74LVC1G125 DCKT	Texas Instruments
U19	1		Single Output Automotive LDO, 500 mA, Fixed 3.3 V Output, 3.8 to 26 V Input, 3-pin PFM (KVU), -40 to 125 degC, Green (RoHS & no Sb/Br)	KVU0003A	TL760M33QKVU RQ1	Texas Instruments	Equivalent	Texas Instruments

**Table 2. TAS2770 Reference Board Bill of Materials (continued)**

U26, U27	2		SINGLE SCHMITT-TRIGGER INVERTER, DRL0005A (SOT-5)	DRL0005A	SN74LVC1G14D RLR	Texas Instruments		Texas Instruments
Y1	1		OSC, 24 MHz, 2.25 - 3.63 V, SMD	2x1.6mm	ASTMLPA-24.000MHZ-EJ-E-T	Abracon Corporation		





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