

TAS2562YFPEVM-DC User's Guide

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Trademarks

1 Export Control Notice

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2 Trademarks

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3 Description

The TAS2562YFPEVM-DC is designed to demonstrate the performance of TAS2562 in a stereo configuration. The design utilizes the PPC3-EVM-MB hardware to provide an interface and supply voltages to the EVM. TAS2562 is a mono, digital-input, Class-D audio amplifier optimized for efficiently driving high peak power into small loudspeaker applications. The Class-D amplifier is capable of delivering 6W of peak power into a 4 Ω load at a battery voltage of 4.2 V. Integrated speaker voltage and current sense provides real time monitoring of loud speakers. Up to four device can share a common bus via I2S/TDM + I²C interfaces.

TAS2562YFPEVM-DC used in conjunction with PPC3-EVM-MB supports evaluation and development with the TAS2562 device through the following interfaces:

- USB Interface
- Software control via PurePath™ Console 3 (PPC 3) GUI, USB-HID
- USB-class audio device, compatible with Microsoft Windows 7+
- External 100 – mil headers
- PSIA - I2S/TDM interface
- I²C
- Hardware Shutdown Control
- Interrupt Output

NOTE: Please refer to PPC3-EVM-MB User's Guide ([SLEU120](#)) for detailed configuration details.

4 Specifications

[Table 1](#) lists the supply, input, and output requirements for TAS2562YFP.

Table 1. Specifications

| | |
|--|----------------|
| Supply Voltage - VBAT | 2.7 to 5.5 V |
| Supply Voltage - VDD | 1.65 to 1.95 V |
| Supply Voltage - PVDD (external mode only) | VBAT to 16 V |
| Input Logic | VDD |
| Output Power | 6 W |
| USB, USB class-audio | Micro-USB |

NOTE: PPC3-EVM-MB supports a VBAT range from 4.5 to 26 V. To apply a VBAT supply in the range of 2.7 to 4.5 V, it is highly recommended to remove Jumpers J3 and J6 and to apply this voltage directly to pin 2 of the respective header while simultaneously powering PPC3-EVM-MB with 5 V. Otherwise it is possible that on-board supplies may collapse.

5 Software

The TAS2562 can be easily configured with PPC3 running the TAS2562 plug-in. To request access to the software first request a myTI.com account [here](#).

After creating an account, navigate to the [TAS2562 product page](#) and follow the link in the information box to request access to the software.

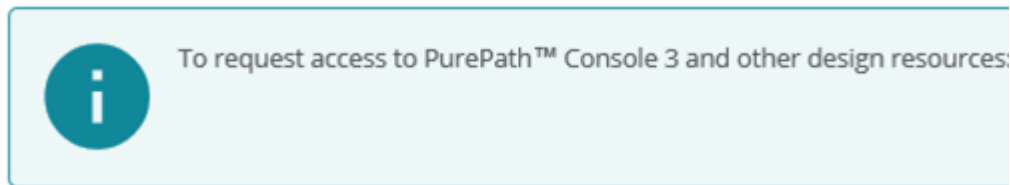


Figure 1. Requesting PPC3 Access

6 Device Configuration

The default configuration for the TAS2562 is described below in [Table 2](#) and [Figure 2](#).

6.1 Default Jumper Settings

Table 2. Default Jumper Settings

| Jumper | Setting | Description |
|----------|---------|-------------|
| J11 | L | Ch 2 ADDR 1 |
| J10 | H | Ch 2 ADDR 0 |
| J4 | Insert | Ch 2 VDD |
| J14 | Removed | Ch 2 Out |
| J3 | Insert | Ch 2 VBAT |
| J9 – 1&2 | Insert | Ch 2 GPIO |
| J9 – 3&4 | Insert | Ch 1 GPIO |
| J6 | Insert | Ch 1 VBAT |
| J16 | Insert | EEPROM WP |
| J15 | Insert | Ch 1 Out |
| J7 | Insert | Ch 1 VDD |
| J12 | L | Ch 1 ADDR0 |
| J13 | L | Ch 1 ADDR1 |

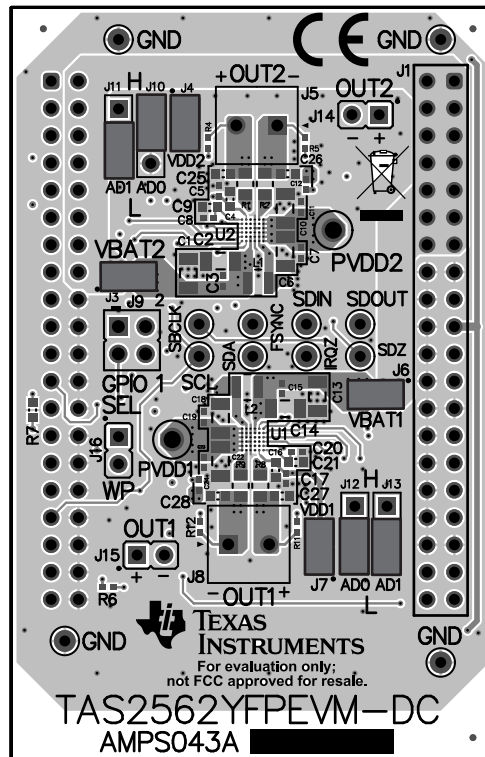


Figure 2. Default Jumper Settings

6.2 Address Select Jumpers

Table 3. Address Select Jumpers

| Address | Pin A0 | Pin A1 |
|---------|--------|--------|
| 0x98 | L | L |
| 0x9A | H | L |
| 0x9C | L | H |
| 0x9E | H | H |

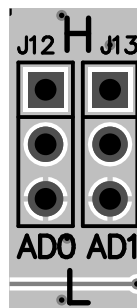


Figure 3. Address Select

TAS2562 supports 4 user configurable I²C addresses shown in [Section 6.2](#). Use J12 & J13 to configure Channel 1 and J10 & J11 to configure Channel 2 as shown in [Figure 3](#).

6.3 Mono Setup

Use the following instructions to complete a mono setup:

1. Install PPC3 with the TAS2562 plug-in.
2. Connect a speaker to J8 on the TAS2562YFPEVM-DC.
3. Remove the jumpers at J3 and J4 as shown in [Figure 4](#).

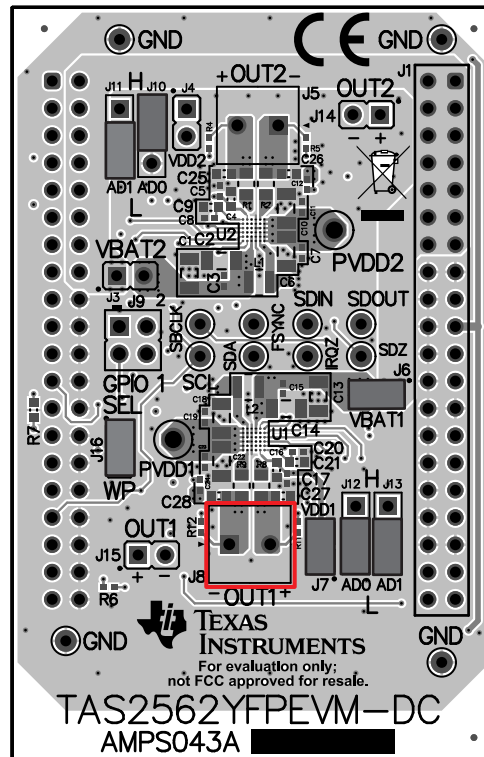


Figure 4. Mono Setup

4. Set the jumpers at J12 and J13 to the desired I²C address as shown in [Section 6.2](#).
5. Configure PPC3-EVM-MB as described in [SLEU120](#).
 - USB control for I²C
 - USB control for I2S
 - 3.3 V I²C
 - 3.3 V I2S
 - 1.8 V IOVDD
6. Connect a 5V supply to connector J12 or J11 on PPC3-EVM-MB
7. Connect a Micro USB Cable from PC to PPC3-EVM-MB
8. Verify that TI USB Audio UAC2.0 is the default playback device by opening the sound dialog from the Windows Control Panel

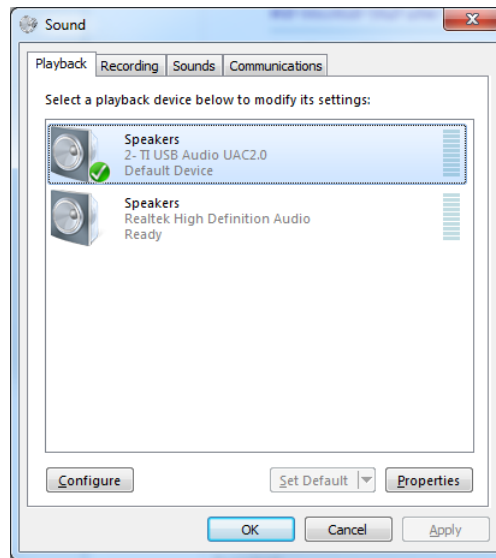


Figure 5. Windows Playback Devices

9. Set the maximum bit depth using the Texas Instruments USB Audio Device Control Panel found in the system tray

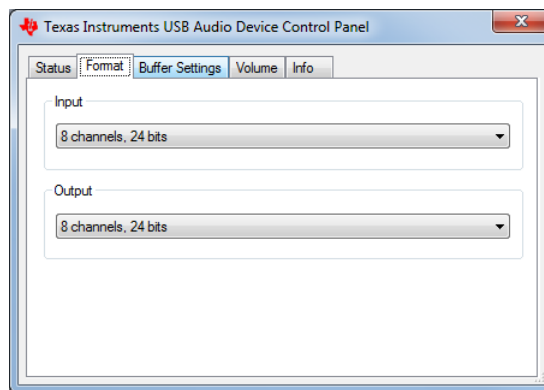


Figure 6. Texas Instruments USB Audio Device Control Panel

10. Set the sampling rate
 - Right click TI USB Audio UAC2.0
 - Select Properties
 - Click advanced tab
 - Select Rate

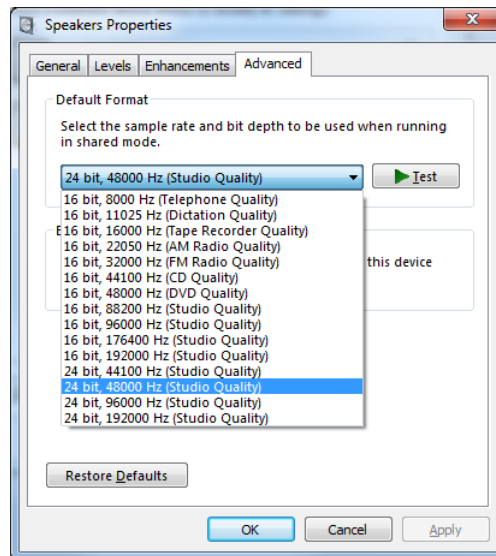


Figure 7. Windows Playback device Sample Rate

11. Configure the device using the TAS2562 PPC3 Plug-in

6.4 Stereo Setup

Use the following instructions to complete a stereo setup:

1. Install PPC3 with the TAS2562 plug-in
2. Connect a speaker to both J8 and J5 on the TAS2562YFPEVM-DC
3. Set the jumpers at J12 & J13 and J11 & J10 to the unique I²C address as shown in [Section 6.2](#)

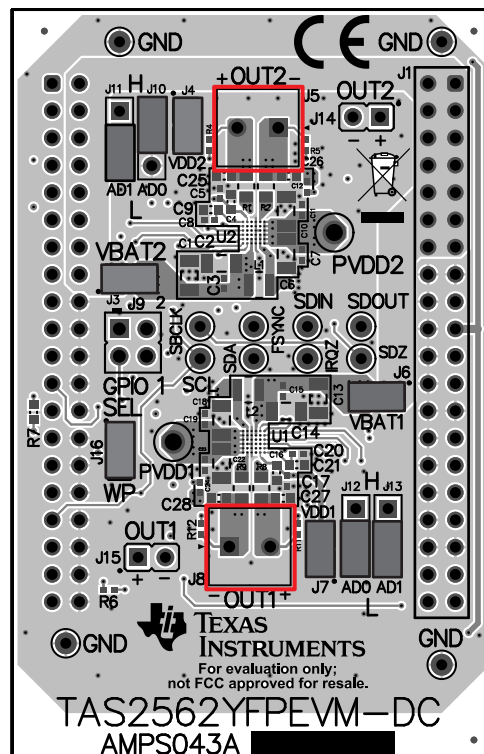


Figure 8. Stereo Setup

4. Configure PPC3-EVM-MB as described in
 - USB control for I²C
 - USB control for I2S
 - 3.3 V I²C
 - 3.3 V I2S
 - 1.8 V IOVDD
5. Connect a 5V supply to connector J12 or J11 on PPC3-EVM-MB
6. Connect a Micro USB Cable from PC to PPC3-EVM-MB
7. Verify that TI USB Audio UAC2.0 is the default playback device by opening the sound dialog from the Windows Control Panel

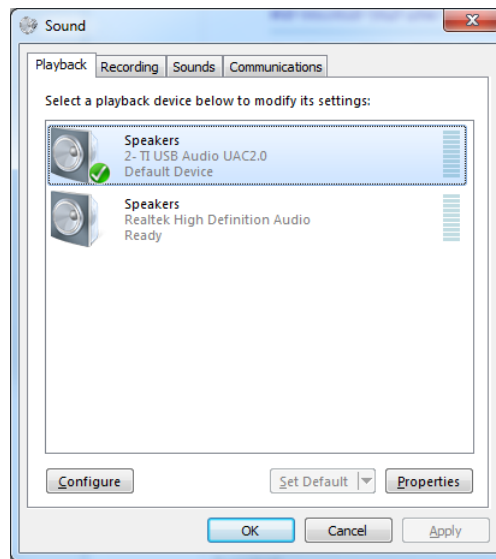


Figure 9. Windows Playback Devices

8. Set the maximum bit depth using the Texas Instruments USB Audio Device Control Panel found in the system tray

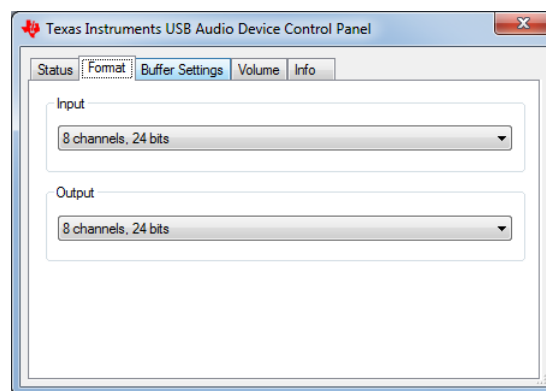


Figure 10. Texas Instruments USB Audio Device Control Panel

9. Set the sampling rate
 - Right click TI USB AUdio UAC2.0
 - Select Properties
 - Click advanced tab
 - Select Rate

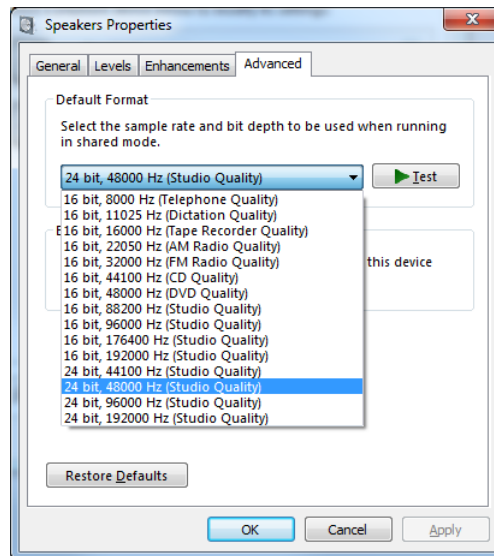


Figure 11. Windows Playback device Sample Rate

10. Configure the device using the TAS2562 PPC3 Plug-in

7 Digital Audio Interfaces

Select the various digital audio interfaces on the TAS2770EVM Reference Board through hardware settings and software settings. Several headers on PPC3-EVM-MB allow access to the following digital audio signals:

- I2S Data out (SDOUT) from the TAS2562 (for example, current and voltage sense data)
- I2S Data in (SDIN) to the TAS2562
- I2S Word clock or frame sync (FSYNC)
- I2S Bit clock (SBCLK)
- I²C Clock (SCLK)
- I²C Data (SDA) The selection between USB (internal) and external inputs is set using the control header on PPC3-EVM-MB.

Please refer to for detailed configuration settings.

8 EVM Schematics

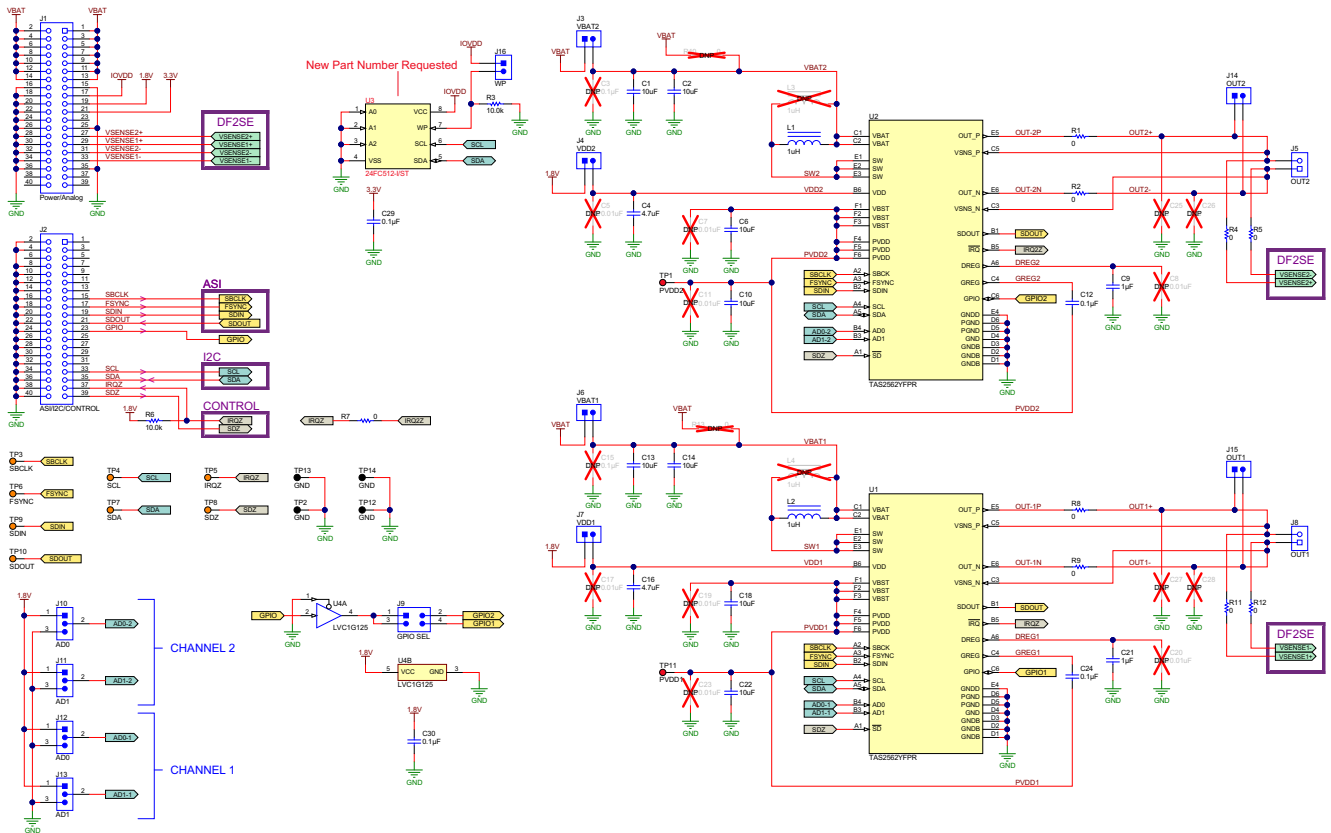


Figure 12. EVM Schematic

9 EVM Layer Plots

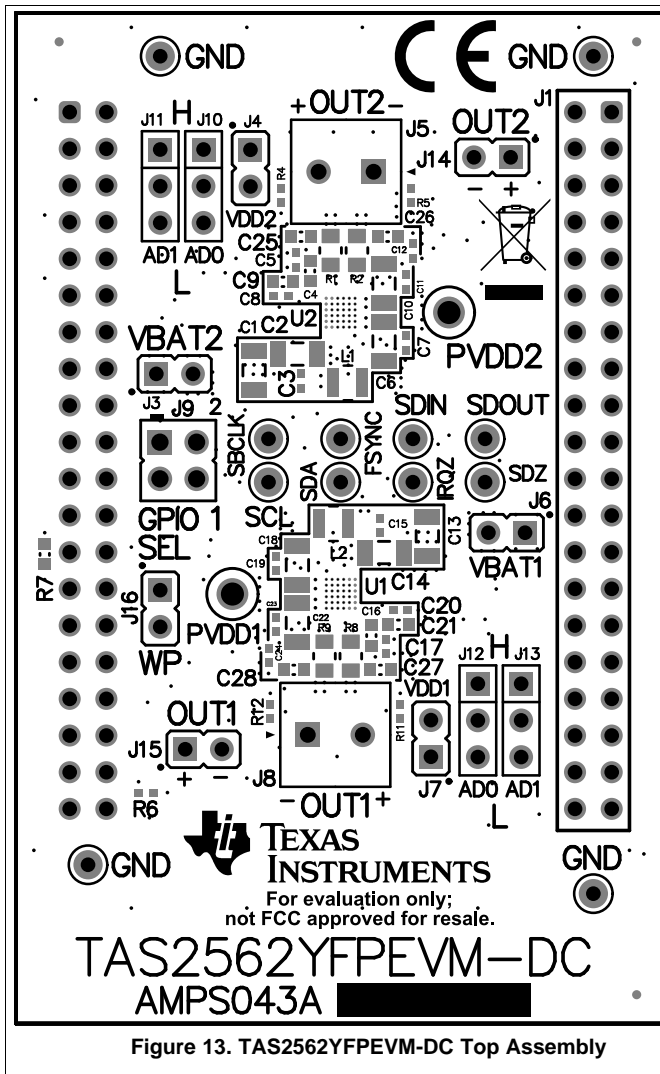


Figure 13. TAS2562YFPEVM-DC Top Assembly

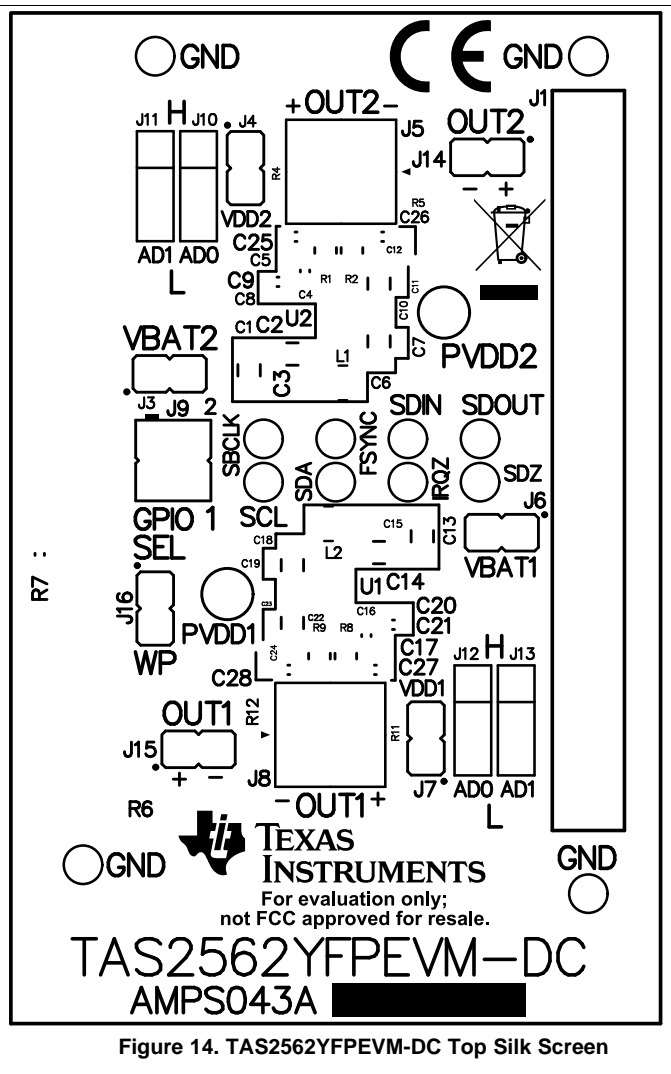


Figure 14. TAS2562YFPEVM-DC Top Silk Screen

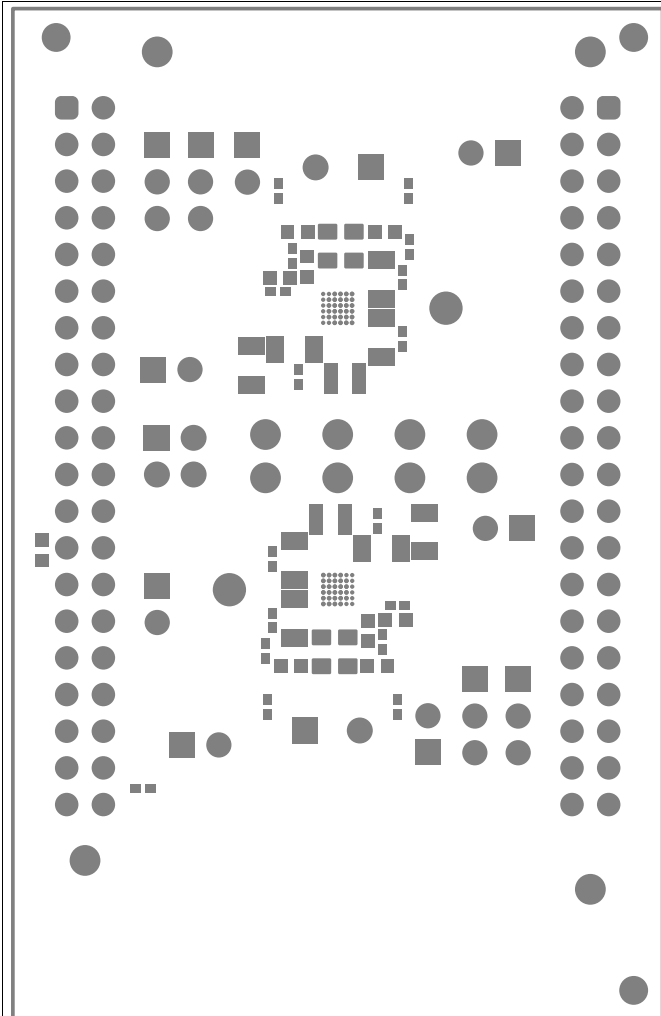


Figure 15. TAS2562YFPEVM-DC Top Solder Mask

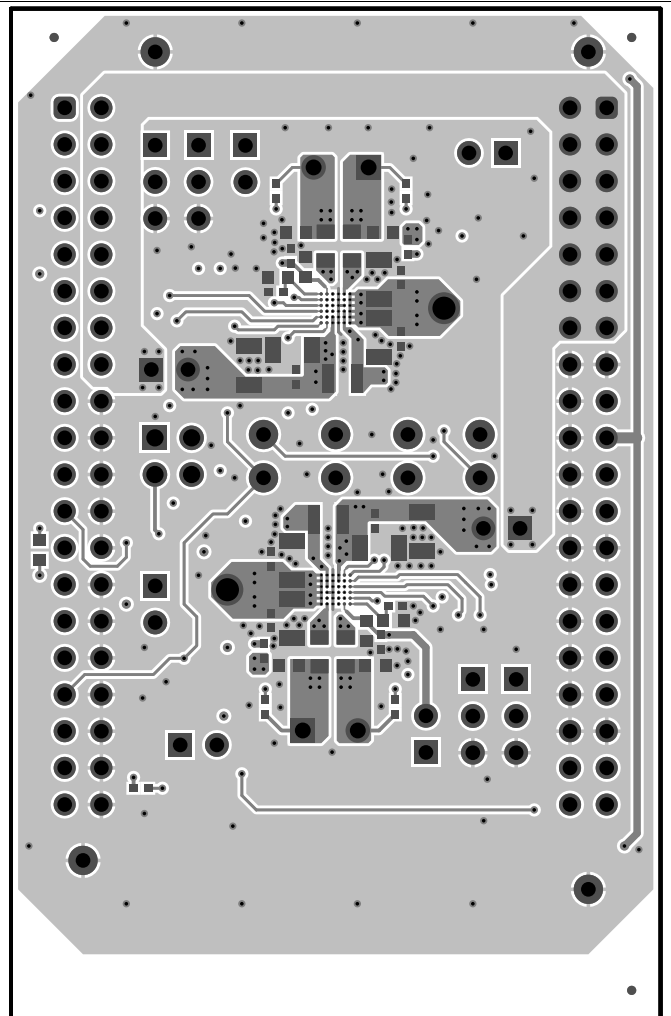


Figure 16. TAS2562YFPEVM-DC Top Copper

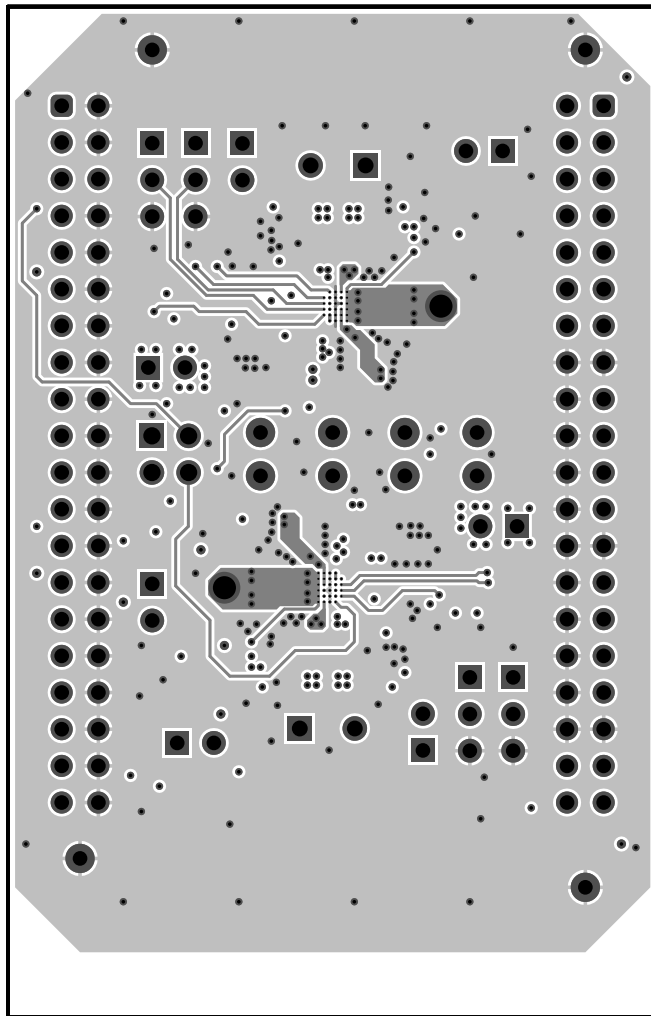


Figure 17. TAS2562YFPEVM-DC Copper Layer 2

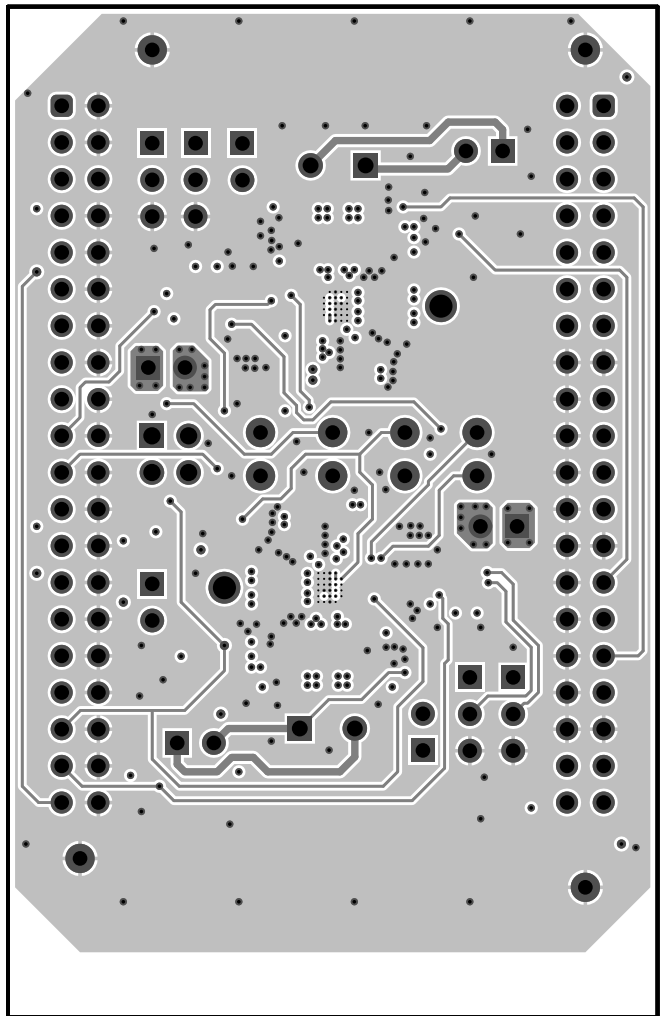


Figure 18. TAS2562YFPEVM-DC Copper Layer 3

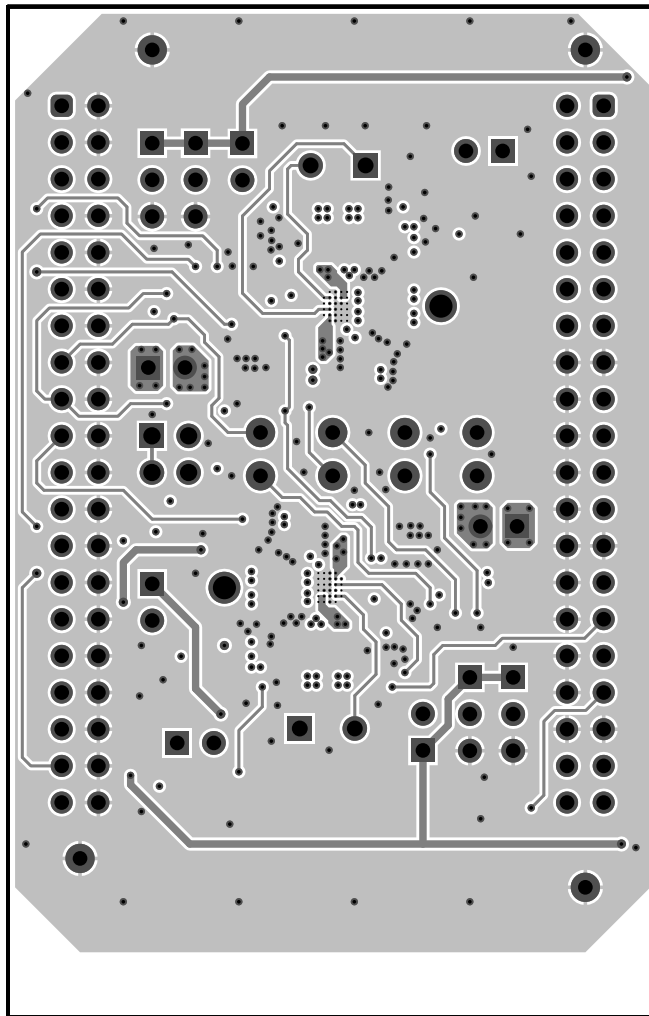


Figure 19. TAS2562YFPEVM-DC Copper Layer 4

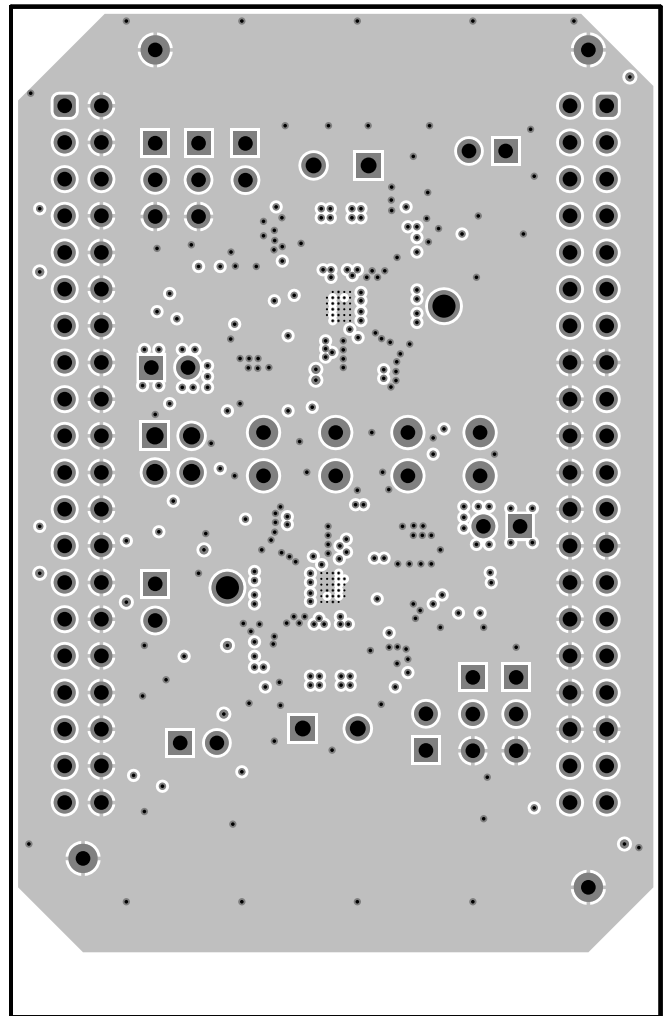


Figure 20. TAS2562YFPEVM-DC Copper Layer 5

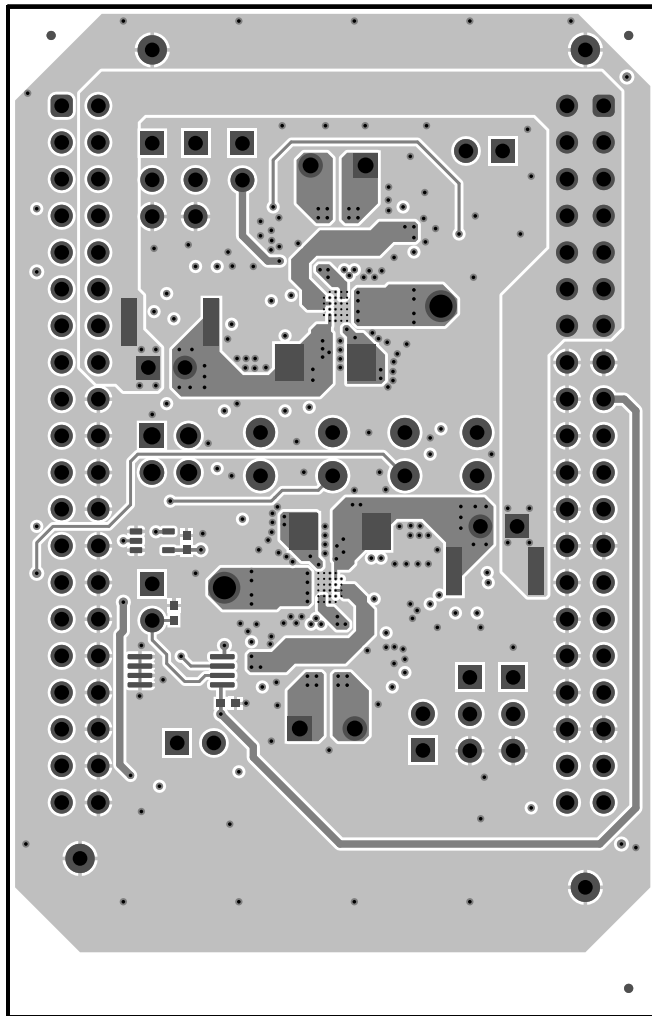


Figure 21. TAS2562YFPEVM-DC Bottom Copper

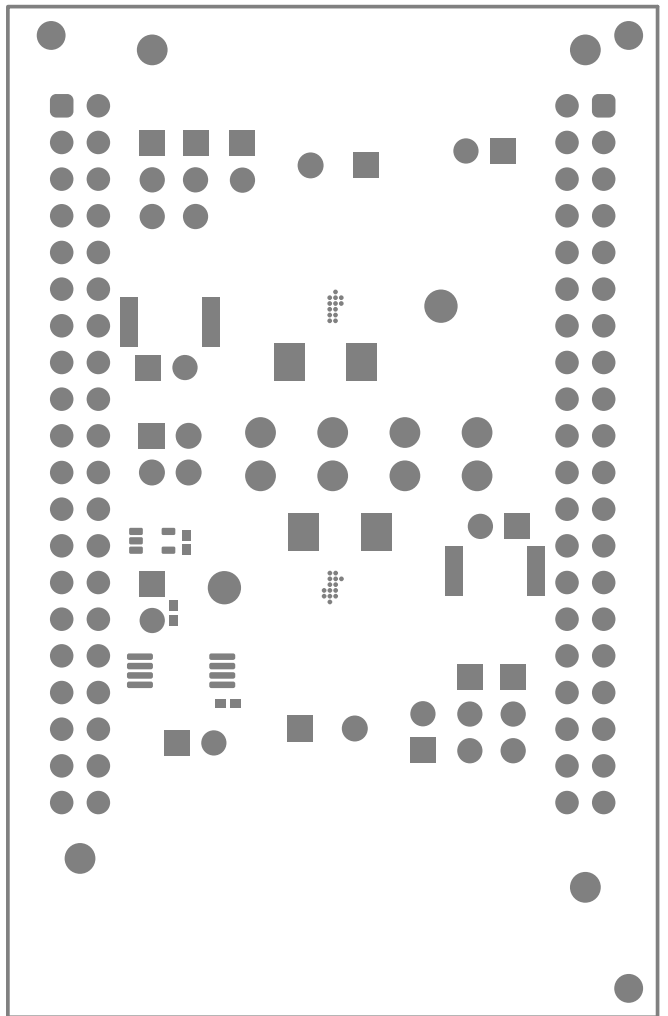


Figure 22. TAS2562YFPEVM-DC Bottom Solder

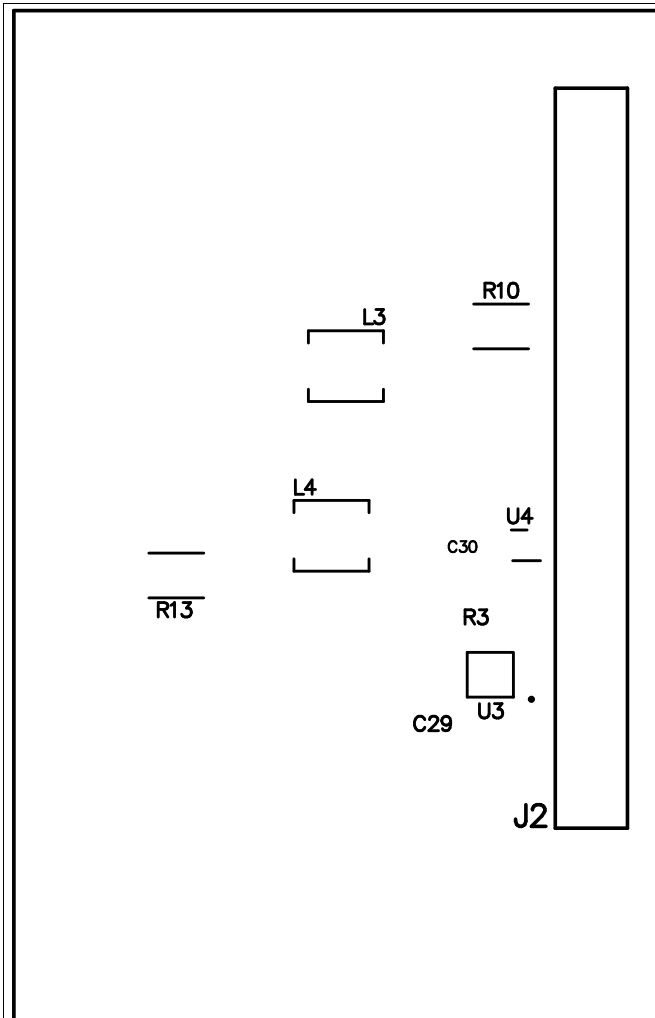


Figure 23. TAS2562YFPEVM-DC Bottom Silk Screen

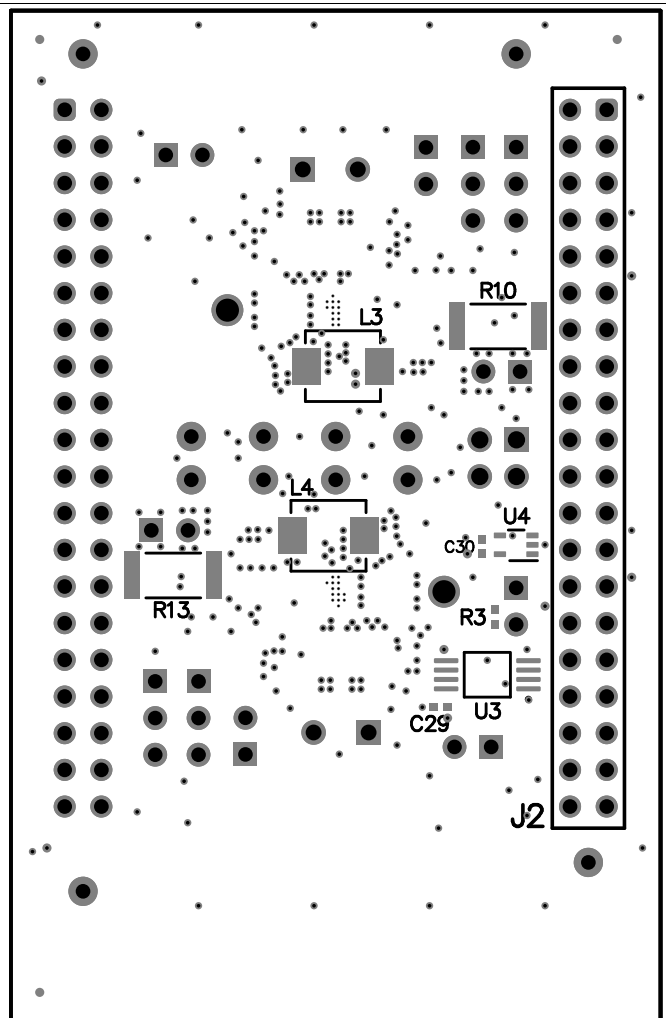


Figure 24. TAS2562YFPEVM-DC Bottom Assembly

10 Bill of Materials

Table 4. Bill of Materials

| Designator | Value | Description | PackageReference | PartNumber | Manufacturer | Alternate PartNumber | Alternate Manufacturer |
|-------------------------------------|-------|--|------------------|-----------------------|--------------|----------------------|------------------------|
| !PCB1 | | Printed Circuit Board | | AMPS043 | Any | | |
| C1, C2, C6, C10, C13, C14, C18, C22 | 10uF | CAP, CERM, 10 uF, 35 V, +/- 10%, X7R, AEC-Q200 Grade 1, 1206_190 | 1206_190 | CGA5L1X7R1 V106K160AC | TDK | | |
| C4, C16 | 4.7uF | CAP, CERM, 4.7 uF, 10 V, +/- 10%, X5R, 0603 | 0603 | CGB3B1X5R1 A475K055AC | TDK | | |
| C9, C21 | 1uF | CAP, CERM, 1 uF, 16 V, +/- 20%, X7R, 0603 | 0603 | CL10B105MO 8NNWC | Samsung | | |

Table 4. Bill of Materials (continued)

| | | | | | | | |
|---|-------|--|--|-----------------------|-----------------------------|----------------|-------------------|
| C12, C24, C29, C30 | 0.1uF | CAP, CERM, 0.1 μ F, 25 V,+/- 10%, X7R, AEC-Q200 Grade 1, 0402 | 0402 | CGA2B3X7R1 E104K050BB | TDK | | |
| J1, J2 | | Receptacle, 2.54mm, 20x2, Gold, TH | Receptacle, 2.54mm, 20x2, TH | SSQ-120-23-G-D | Samtec | | |
| J3, J4, J6, J7, J14, J15, J16 | | Header, 100mil, 2x1, Gold, TH | Sullins 100mil, 1x2, 230 mil above insulator | PBC02SAAN | Sullins Connector Solutions | | |
| J5, J8 | | Conn Term Block, 2POS, 3.81mm, TH | 2POS Terminal Block | 1727010 | Phoenix Contact | | |
| J9 | | Header, 2.54mm, 2x2, Gold, TH | Header, 2.54mm, 2x2, TH | PBC02DAAN | Sullins Connector Solutions | | |
| J10, J11, J12, J13 | | Header, 100mil, 3x1, Gold, TH | PBC03SAAN | PBC03SAAN | Sullins Connector Solutions | | |
| L1, L2 | 1uH | Inductor, Shielded, Metal Composite, 1 uH, 3.3 A, 0.04 ohm, SMD | 2.5x1.2x2mm | DFE252012F-1R0M=P2 | MuRata Toko | | |
| R1, R2, R8, R9 | 0 | RES, 0, 5%, 0.125 W, 0805 | 0805 | RC0805JR-070RL | Yageo America | | |
| R3, R6 | 10.0k | RES, 10.0 k, 1%, 0.063 W, AEC-Q200 Grade 0, 0402 | 0402 | RMCF0402FT 10K0 | Stackpole Electronics Inc | | |
| R4, R5, R11, R12 | 0 | RES, 0, 5%, 0.063 W, 0402 | 0402 | ERJ-2GE0R00X | Panasonic | | |
| R7 | 0 | RES, 0, 5%, 0.1 W, 0603 | 0603 | ERJ-3GEY0R00V | Panasonic | | |
| SH-J1, SH-J2, SH-J3, SH-J4, SH-J5, SH-J6, SH-J7, SH-J8, SH-J9, SH-J10, SH-J11 | 1x2 | Shunt, 100mil, Gold plated, Black | Shunt | SNT-100-BK-G | Samtec | 969102-0000-DA | 3M |
| TP1, TP11 | | Test Point, Compact, Red, TH | Red Compact Testpoint | 5005 | Keystone | | |
| TP2, TP12, TP13, TP14 | | Test Point, Miniature, Black, TH | Black Miniature Testpoint | 5001 | Keystone | | |
| TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10 | | Test Point, Miniature, Orange, TH | Orange Miniature Testpoint | 5003 | Keystone | | |
| U1, U2 | | 6W Boosted Class-D Audio Amplifier with IV-sense, YFP0036-C02 (DSBGA-36) | YFP0036-C02 | TAS2562YFP R | Texas Instruments | TAS2562YFP T | Texas Instruments |

Table 4. Bill of Materials (continued)

| | | | | | | | |
|--|--------|--|----------|--------------------------|----------------------|--|--|
| U3 | | EEPROM, 512KBIT, 400KHZ, 8TSSOP | TSSOP-8 | 24FC512-I/ST | Microchip | | |
| U4 | | Single Bus Buffer Gate With 3-State Outputs, DCK0005A, LARGE T&R | DCK0005A | SN74LVC1G1 25DCKR | Texas Instruments | | |
| C3, C15 | 0.1uF | CAP, CERM, 0.1 μ F, 25 V, +/- 10%, X7R, AEC- Q200 Grade 1, 0402 | 0402 | CGA2B3X7R1 E104K050BB | TDK | | |
| C5, C7, C8, C11, C17, C19, C20, C23 | 0.01uF | CAP, CERM, 0.01 μ F, 25 V, +/- 10%, X7R, 0402 | 0402 | GCM155R71E 103KA37D | MuRata | | |
| C25, C26, C27, C28 | 1uF | CAP, CERM, 1 μ F, 16 V,+/- 20%, X7R, 0603 | 0603 | CL10B105MO 8NNWC | Samsung | | |
| FID1, FID2, FID3, FID4, FID5, FID6 | | Fiducial mark. There is nothing to buy or mount. | N/A | N/A | N/A | | |
| L3, L4 | 1uH | Inductor, 1 uH, 7 A, 0.014 ohm, SMD | 4.15x4mm | PCMB053T- 1R0MS | Susumu Co Ltd | | |
| R10, R13 | 0 | RES, 0, 5%, 1 W, 2512 | 2512 | RC6432J000C S | Samsung | | |

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