EVM User's Guide: TAA5242EVM-K TAD5242EVM-K TAC5142EVM-K TAC5242EVM-K TAD5142EVM-K

TAx5x42EVM-K Hardware Control Evaluation Module

Description

The TAx5x42EVM-K evaluation module (EVM) allows the user to test the capabilities of Texas Instruments' TAC5242; a two-channel hardware control high-performance Codec, TAC5142 a two-channel hardware control Codec, TAA5242 a two-channel hardware control high-performance ADC, TAD5242 a two-channel hardware control high-performance DAC or TAD5142 a two-channel hardware control DAC. The evaluation module is paired with the AC-MB, a flexible motherboard which provides power, control and digital audio data to the evaluation module. Other variants listed are also supported where the user replaces the U1 unit with the device of interest.

Get Started

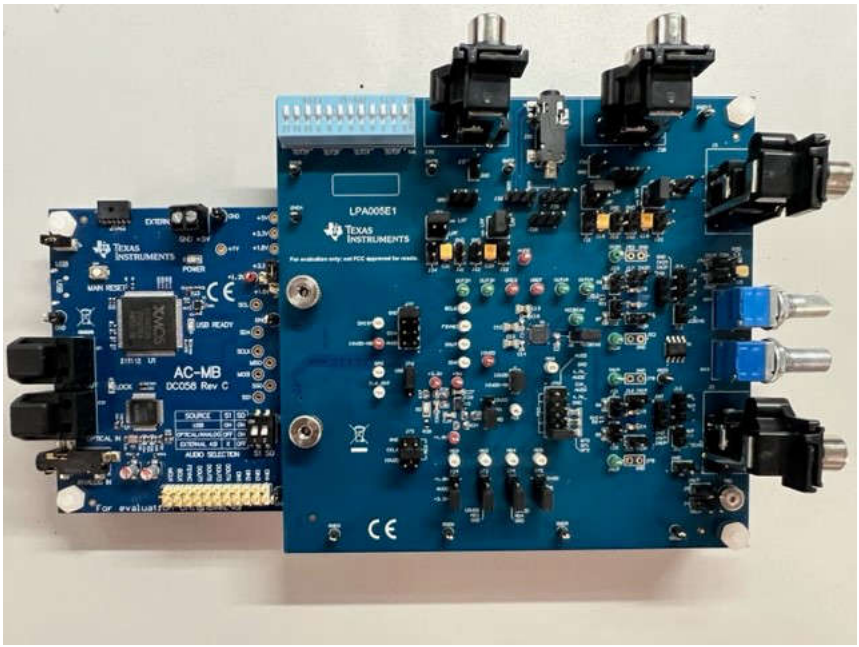
1. Order the EVM from TAx5x1x product folder.
2. Download the latest TAx5x1x data sheet.

Features

- High performance Mono/Stereo Codec with dynamic range: 120 dB DAC and 115 dB ADC
- Standard performance Mono/Stereo Codec with dynamic range: 106 dB DAC and 102 dB ADC
- On-board microphones provided for voice recording testing
- Direct access to digital audio signals and control interface for simple end-system integration
- USB connection to PC provides power, control, and streaming audio data for easy evaluation

Applications

- AV receivers
- Video conference systems
- IP network camera
- Speakers



1 Evaluation Module Overview

1.1 Introduction

The TAx5x42EVM is an evaluation module (EVM) designed to demonstrate the performance and functionality of the TAx5x42 family of devices. This family includes the devices shown in Table 1-1 with differences in performance and function noted.

Table 1-1. TAx5x42 Hardware Control Family

Device	ADC DR (dB)	DAC DR (dB)	Feature
TAC5242	115	120	Stereo CODEC
TAC5142	102	106	Stereo CODEC
TAA5242	115	NA	Stereo ADC
TAD5242	NA	120	Stereo DAC
TAD5142	NA	106	Stereo DAC

This user's guide describes the functionality of TAC5242EVM-K, TAC5142EVM-K, TAA5242EVM-K, TAD5242EVM-K or TAD5142EVM-K evaluation kit obtainable from ti.com.

1.2 Kit Contents

- TAC5242, TAC5142, TAA5242, TAD5242 or TAD5142 device
- TAx5x42 EVM/daughterboard
- AC-MB Controller/motherboard

1.3 Specification

The TAx5x42EVM-K evaluation module (EVM) paired with the AC-MB, a flexible motherboard which provides power, control and digital audio data to the evaluation module allows user to record and playback audio signal. The configuration for the TAC5242, TAC5142, TAA5242, TAD5242 or TAD5142 device is done through the various Multi-Function pins (MD0 - MD6).

1.4 Device Information

- TAC5242, a hardware control low power stereo audio codec with 115 dB dynamic range ADC, 120 dB dynamic range DAC.
- TAC5142, a hardware control low power stereo audio codec with 102 dB dynamic range ADC, 106 dB dynamic range DAC.
- TAA5242, a hardware control low-power stereo audio ADC with 115 dB dynamic range.
- TAD5242, a hardware control low-power stereo audio DAC with 120 dB dynamic range.
- TAD5142, a hardware control low-power stereo audio DAC with 106 dB dynamic range.

2 Hardware

2.1 Setup

The evaluation kit consists of the TAx5x42EVM daughterboard and the AC-MB controller board. The controller board is used to provide power, control, and digital audio signals to the evaluation module. The daughterboard contains the TAx5x42 device and the input output connections.

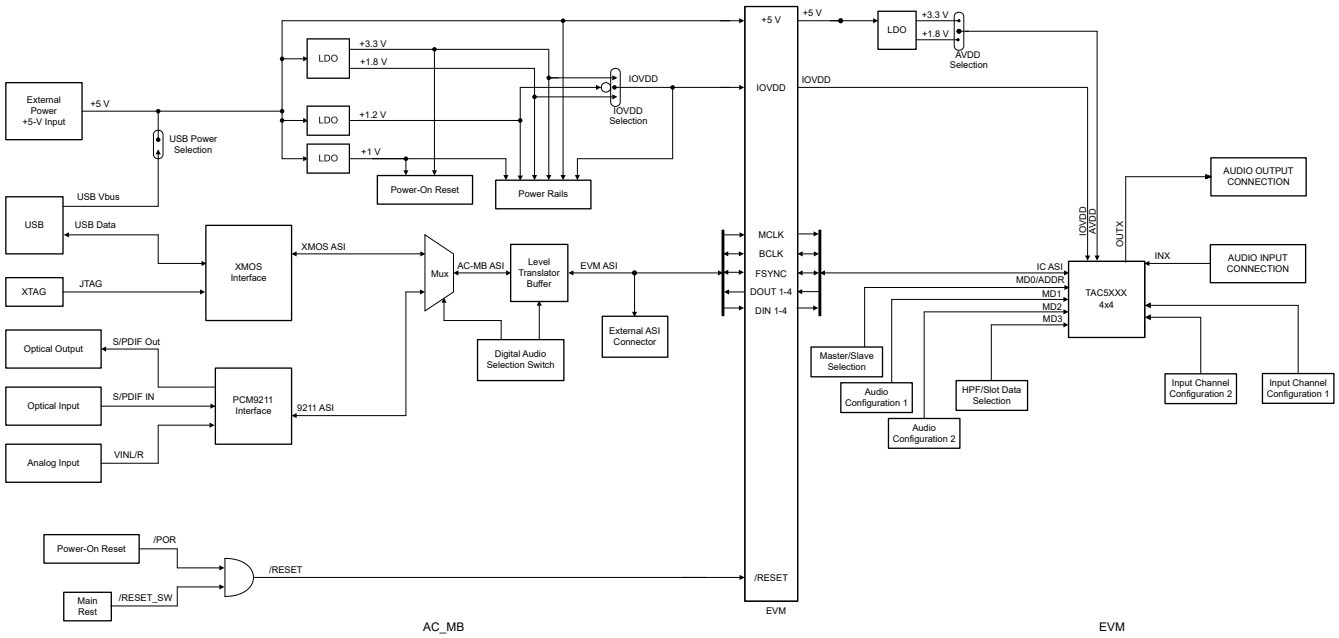


Figure 2-1. TAx5x42 EVM Block Diagram

2.2 AC-MB Settings

2.2.1 Audio Serial Interface Settings

The AC-MB provides the digital audio signals to the evaluation module from the universal serial bus (USB), optical, stereo jack, and external audio serial interface (ASI) header. Figure 2-2 shows a block diagram of the ASI routing on the AC-MB.

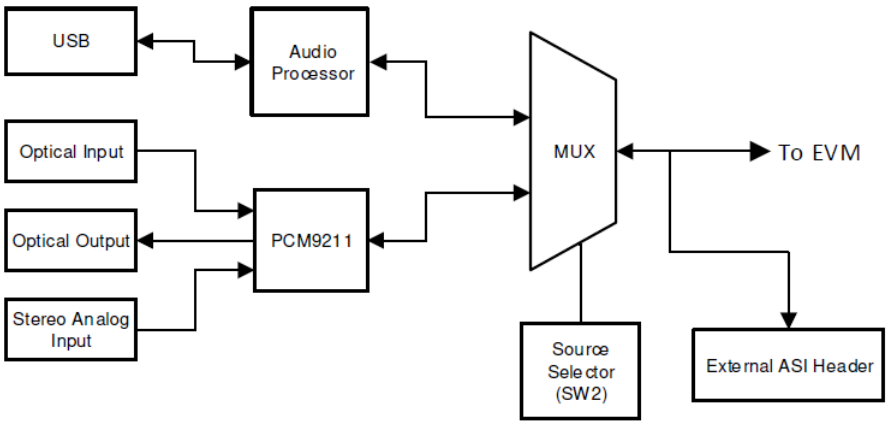


Figure 2-2. AC-MB Audio Interface Block Diagram

Switch SW2 on the AC-MB selects the audio serial bus that interfaces with the PCM6xx0EVM. Next to switch SW2, the AC-MB has a quick reference table to identify the audio serial interface source options and switch settings. The AC-MB acts as the Controller for the audio serial interface, with three different modes of operation: USB, optical or analog, or external ASI.

The serial interface clocks and data are provided from the USB interface. The sampling rate and format are determined by the USB audio class driver on the operating system. The default settings for the USB audio interface are 32-bit frame size, 48-kHz sampling rate, BCLK and FSYNC ratio is 256, and the format is timedivision multiplexing (TDM).

2.2.1.1 USB Mode

The AC-MB is detected by the OS as an audio device with the name TI USB Audio UAC2.0. Figure 2-3 shows the AC-MB audio setting for the USB mode of operation.

Figure 2-3. AC-MB USB Audio Setting

2.2.1.2 Optical or Auxiliary Analog Audio Input Mode

Serial interface signals are provided from the PCM9211 digital transceiver, which is capable of sending digital data to the EVM from an analog input or optical input. Meanwhile, the data from the EVM can be streamed through the optical output.

Figure 2-4 shows the AC-MB audio setting for the optical and analog mode of operation.

Figure 2-4. AC-MB Optical or Auxiliary Analog Audio Input Setting

The optical output of the AC-MB streams the data captured on the EVM with the format determined by the input source used. When there is an optical input connected, the LOCK LED must be ON, and the PCM9211 streams the audio serial interface clocks with the format determined by the optical input frame. The digital data from the optical input is streamed to the evaluation module. If the optical input is not connected, the PCM9211 captures the input signal provided through the analog input, and streams the signal to the evaluation module. This feature can be useful when a digital input digital-to-analog converter (DAC) is connected to the AC-MB, providing an analog input for quick evaluation. In auxiliary analog audio mode, the audio serial interface format is fixed to a 24-bit, 48-kHz, I2S mode.

2.2.1.3 External Audio Interface Mode

In this mode, the audio serial interface clocks for the evaluation board are provided through connector J7 from an external source. This architecture allows an external system to be used for communication with the evaluation board, such as a different host processor or test equipment (Audio Precision®). The clocks generated from the USB interface and PCM9211 are isolated with this setting. Figure 2-5 shows the AC-MB audio setting for the external mode of operation.

Figure 2-5. AC-MB External Audio Interface Setting

Figure 2-6 shows how to connect the external audio interface. Odd numbered pins are signal carrying, and even numbered pins are connected to ground.

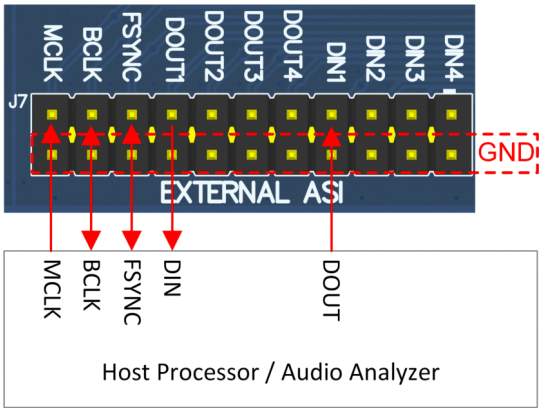


Figure 2-6. AC-MB Connection with External Audio Serial Interface

2.2.2 AC-MB Power Supply

The complete EVM system is powered from a single 5-V power supply. However, the motherboard has different low-dropout regulators (LDOs) integrated that provide the required power supplies to the different blocks of the board. Figure 2-7 shows a block diagram depicting the power structure of the AC-MB.

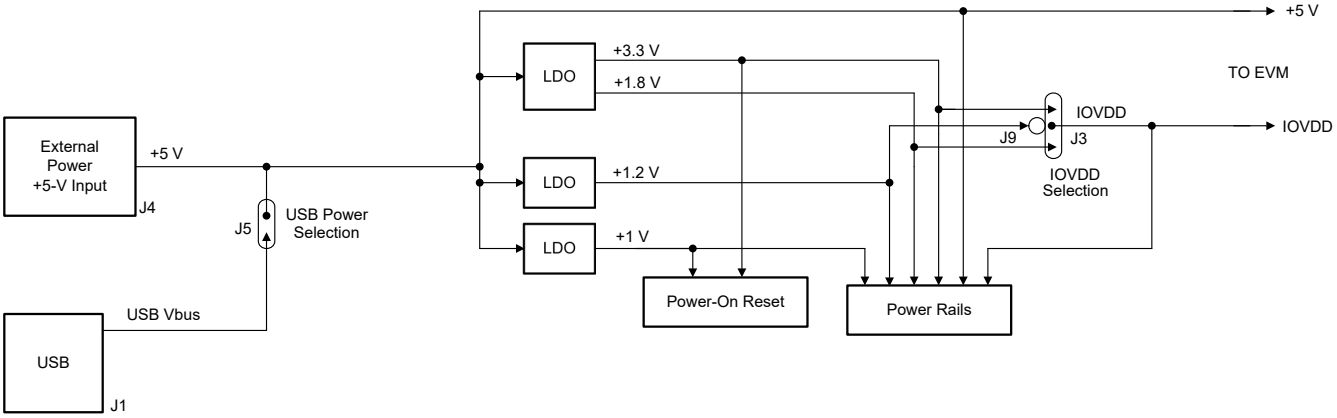


Figure 2-7. Power-Supply Distribution of the AC-MB

The AC-MB can be powered from the host computer by using the USB 5-V power supply (VBUS) by shorting header J5, USB POWER. Additionally, the AC-MB can be powered from an external power supply connected to terminal J4, EXTERNAL POWER. Header J5 must be open for external supply operation. The IOVDD voltage for the digital signals that is provided to the evaluation module is generated on the motherboard from the main power supply (USB or external).

The voltage levels available are 1.2V, 1.8 V and 3.3 V, and can be selected via the J9, J3 header IOVDD. For 1.2-V operation, short pin 1 of header J9 and pin 2 of header J3, for 1.8-V operation, short pins 2 and 3 of header J3; for 3.3-V operation, short pins 1 and 2 of header J3. When the motherboard is fully powered and the power supplies from the onboard LDOs are correct, the green POWER LED (D3) turns ON. The USB READY LED indicates that a successful USB communication is established between the AC-MB and the host computer.

2.3 TAx5x42EVM-K Hardware Settings

2.3.1 TAx5x42 EVM Input Hardware Settings

The TAx5x42 evaluation module has several input configuration options and offers extensive flexibility to allow the user to evaluate the device across multiple operation modes. The different operation modes are highlighted in this section.

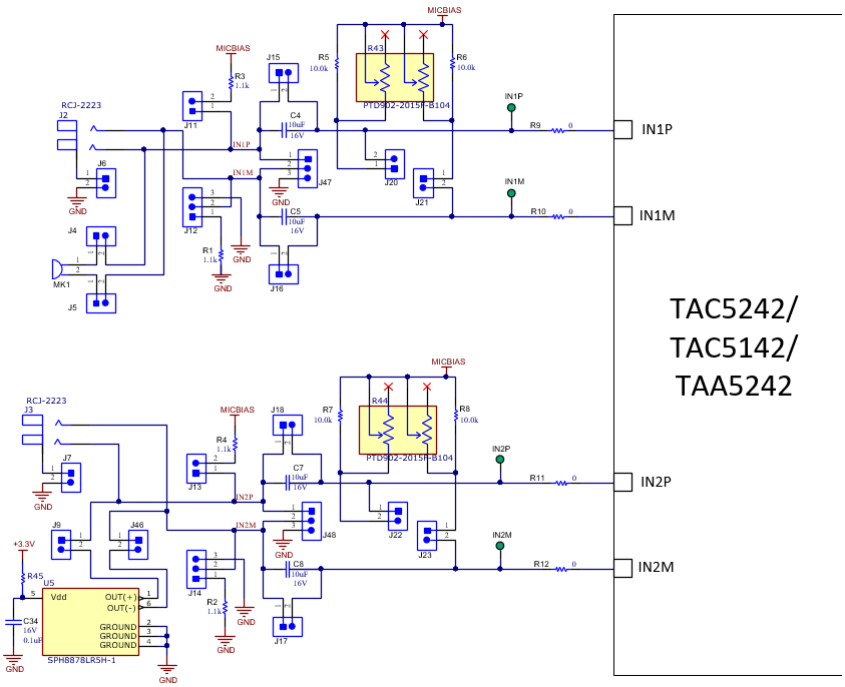


Figure 2-8. TAC5242/TAC5142/TAA5242 EVM Input Architecture for Channel 1 and 2

The IN1 and IN2 input architecture allows these two channels to be quickly configured to support any of the supported operation modes. The INxP and INxM pins of the TAx5x42 can optionally connect to onboard microphones for quick evaluation of a microphone in AC- or DC-coupled modes. Jumper configuration details can be found in Table 2-1.

For TAD5242 or TAD5142, IN1 and IN2 components are not populated.

Table 2-1. Input Jumper Configuration

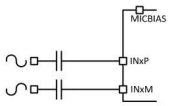
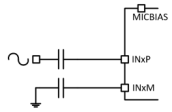
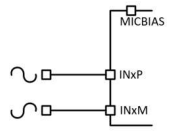
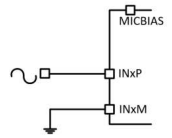
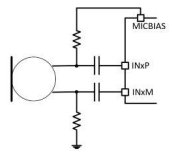
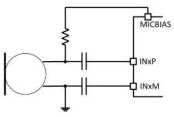
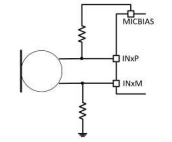
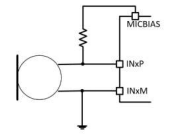
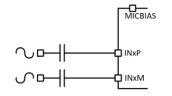
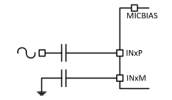
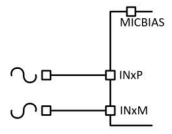
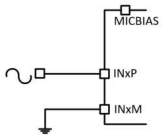
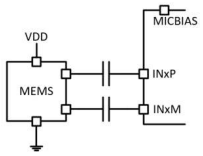
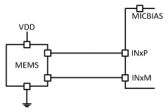
Input Terminal	Input Mode	Installed Jumpers	Uninstalled Jumper	Input Swing	Topology
IN1	LINE-IN Differential, AC-coupled	J8	J4, J5, J6, J11, J12, J15, J16, J20, J21	2 V_{RMS}	
	LINE-IN Single-ended, AC-coupled	J6, J8, J12 (2-3)	J4, J5, J11, J15, J16, J20, J21	1 V_{RMS}	
	LINE-IN Differential, DC-coupled	J15, J16	J4, J5, J6, J11, J12, J20, J21, J8 (DUT MICBIAS is not used)	2 V_{RMS}	
	LINE-IN Single-ended, DC-coupled	J6, J12 (2-3), J15, J16	J4, J5, J11, J20, J21, J8 (DUT MICBIAS is not used)	1 V_{RMS}	
	On-board Electret Condenser Microphone (ECM) Differential, AC-coupled	J4, J5, J8, J11, J12 (1-2)	J6, J15, J16, J20, J21	Refer to Microphone data sheet	
	On-board Electret Condenser Microphone (ECM) Single-ended, AC-coupled	J4, J5, J8, J11, J12 (2-3)	J6, J15, J16, J20, J21	Refer to Microphone data sheet	
	On-board Electret Condenser Microphone (ECM) Differential, DC-coupled	J4, J5, J8, J11, J12 (1-2), J15, J16	J6, J20, J21	Refer to Microphone data sheet	
	On-board Electret Condenser Microphone (ECM) Single-ended, DC-coupled	J4, J5, J8, J11, J12 (2-3), J15, J16	J6, J20, J21	Refer to Microphone data sheet	
IN2	LINE-IN Differential, AC-coupled	J8	J7, J9, J13, J14, J17, J18, J22, J23, J46	2 V_{RMS}	
	LINE-IN Single-ended, AC-coupled	J7, J8, J14 (2-3)	J9, J13, J17, J18, J22, J23, J46	1 V_{RMS}	
	LINE-IN Differential, DC-coupled	J17, J18	J7, J9, J13, J14, J22, J23, J46, J8 (DUT MICBIAS is not used)	2 V_{RMS}	

Table 2-1. Input Jumper Configuration (continued)

Input Terminal	Input Mode	Installed Jumpers	Uninstalled Jumper	Input Swing	Topology
	LINE-IN Single-ended, DC-coupled	J7, J14 (2-3), J17, J18	J9, J13, J22, J23, J46, J8 (DUT MICBIAS is not used)	1 V_{RMS}	
	On-board Analog MEMS microphone, AC-coupled	J8, J9, J46	J7, J13, J14, J17, J18, J22, J23	Refer to Microphone data sheet	
	On-board Analog MEMS microphone, DC-coupled	J9, J17, J18, J46	J7, J13, J14, J22, J23, J8 (DUT MICBIAS is not used)	Refer to Microphone data sheet	

2.3.1.1 Line Inputs

For the line input configuration shown in Figure 2-8, the TAx5x42 captures the audio signal provided through RCA terminals J2 (IN1), J3 (IN2) or header J47 or J48. The RCA white connector is connected to the INxP and RCA red connector is connected to the INxM. Depending on differential or single-ended configuration, populate J6 or J7 jumper as described in the Input Jumper Configuration table above accordingly. The input accepted in AC/DC-Coupled mode is a differential 2-VRMS full-scale audio signal and if a single-ended source is used, the 1-VRMS signal is supported.

2.3.1.2 On-board Microphone Input

For the on-board microphone input configuration shown in Figure 2-8, the TAx5x42 records the audio captured from the microphones MK1 (ECM) or U5 (Analog MEMS), which is located on the bottom of the board. Electret Microphone (MK1) is connected to IN1P/M, and MICBIAS is used to power the on-board microphone, so header J8 must be installed. For MEMS microphone (U5), this can be configured as either a single ended or differential input and is connected to IN2P/M. There must not be any connections to J2 or J3 while the on-board microphone is used to preserve the performance of the microphone. A possibility that the gain adjustment can be needed in the device depends on the microphone sensitivity.

2.3.2 TAx5x42 EVM Output Hardware Settings

The TAx5x42 evaluation module has several output configuration options and offers flexibility to allow the user to evaluate the device with different load conditions and configurations. The different configurations are highlighted in this section.

2.3.2.1 TAx5x42 Analog Audio Output

The EVM analog audio output port provides option for AC/DC-Coupled, filter/filter-less path for easy evaluation. By default the filter components are not populated.

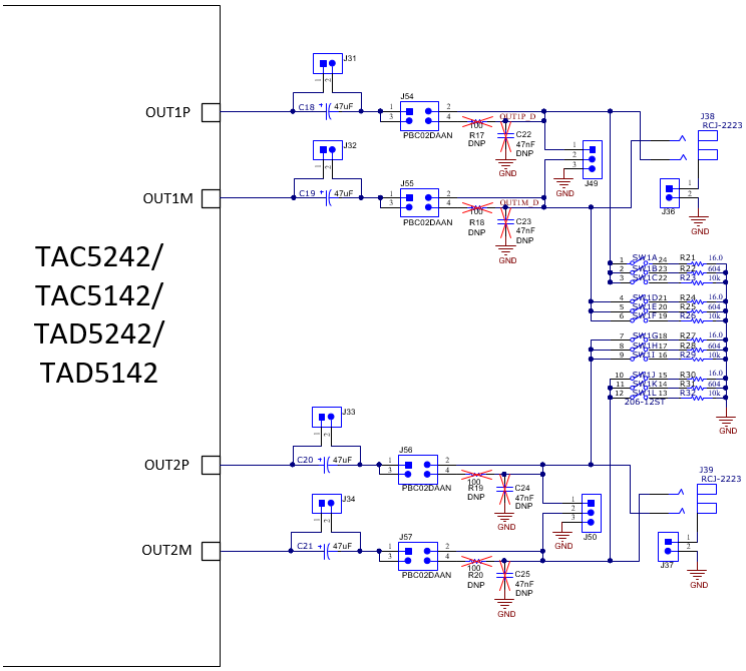


Figure 2-9. TAC5242/TAC5142/TAD5242/TAD5142 EVM Output Architecture

OUT1 and OUT2 audio output pins have connection options with external load or the on-board load selections. A pair of RCA connectors, white from OUTP and red from OUTM allow users to connect to external device either as differential or single ended. Jumper header J36 or J37 needs to be populated if single-ended is desired or removed otherwise for differential configuration.

Switch SW1 allows users to select respective load for each output pair for 16 Ohm, 604 Ohm or 10K Ohm if needed. These resistors are for quick evaluation and can be bypassed for actual load. SW1 and the output RCA connectors are located on the top left hand side shown in co below.

Table 2-2. SW1 Pin

SW1 pin	Load Configuration	Resistor Rating
1, 4, 7, 10	16 Ohm	0.5 W
2, 5, 8, 11	604 Ohm	0.125 W
3, 6, 9, 12	10 KOhm	0.4 W

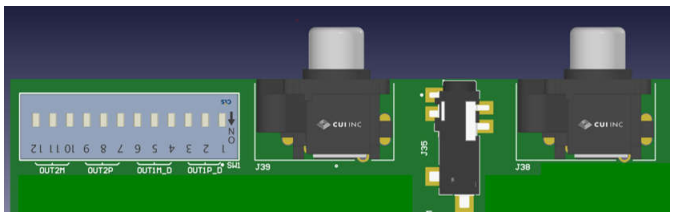


Figure 2-10. TAC5242/TAC5142/TAD5242/TAD5142 Analog Output Connections

For TAA5242, OUT1 and OUT2 components are not populated.

2.3.3 Multi-Function Hardware Configurations

These hardware-control device configurations are set through the Multi-Function Device Pins, MD0 to MD6 setting which is described in the following sections.

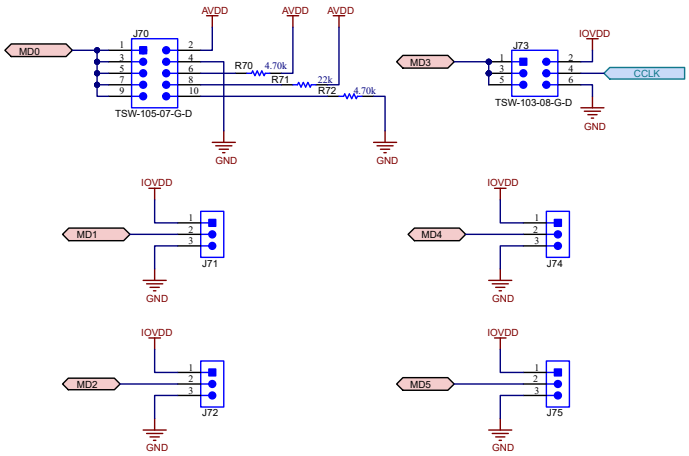


Figure 2-11. Multi-Function Pin Setting

2.3.3.1 MD0 Hardware Configurations

MD0 sets the codec mode as well as the different audio format as shown in the table below for all the device variants.

Table 2-3. MD0 Setting

Setting	Audio Mode & Format
Short to AVDD Supply	Controller I2S
Short to Ground	Target I2S
Short to AVDD with 4.7KOhm	Controller TDM
Short to AVDD with 22KOhm	Target LJ
Short to Ground with 4.7KOhm	Target TDM

2.3.3.2 MD1 and MD2 Hardware Configurations

MD1 and MD2 settings provide the following configuration for these devices as shown in the table below.

Table 2-4. MD1 and MD2 Setting

MD1,MD2	TAC5242		TAC5142		TAA5242 (ADC only variant)		TAD5242/TAD5142 (DAC only variant)	
	Target Mode	Controller Mode	Target Mode	Controller Mode	Target Mode	Controller Mode	Target Mode	Controller Mode
2'b00	AVDD=3.3V, Word Length= 32, Linear Phase Decimation/ Interpolation	Frame Rate= MCLK/256, Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128Fs (up to 96K), BCLK=64Fs for higher Rates for Controller TDM	AVDD=3.3V, Word Length= 32, Linear Phase Decimation/ Interpolation	Frame Rate= MCLK/256, Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128Fs (up to 96K), BCLK=64Fs for higher Rates for Controller TDM	AVDD=3.3V, Word Length= 32, Linear Phase Decimation/ Interpolation	Frame Rate= MCLK/256, Word Length=32, BCLK=64Fs for Controller I2S, BCLK=256Fs(up to 48K Fs), BCLK=128Fs (up to 96K), BCLK=64Fs for higher Rates for Controller TDM	AVDD=3.3V, Word Length= 32, Linear Phase Decimation/ Interpolation	Frame Rate= MCLK/256, Word Length=32, BCLK=64Fs for Controller I2S, BCLK=256Fs(up to 48K Fs), BCLK=128Fs (up to 96K), BCLK=64Fs for higher Rates for Controller TDM
2'b01	AVDD=1.8V, Word Length= 32, Linear Phase Decimation/ Interpolation	Frame Rate= MCLK/128, Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128Fs (up to 96K), BCLK=64Fs for higher Rates for Controller TDM	AVDD=1.8V, Word Length= 32, Linear Phase Decimation/ Interpolation	Frame Rate= MCLK/128, Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128Fs (up to 96K), BCLK=64Fs for higher Rates for Controller TDM	AVDD=1.8V, Word Length= 32, Linear Phase Decimation/ Interpolation	Frame Rate= MCLK/128, Word Length=32, BCLK=64Fs for Controller I2S, BCLK=256Fs(up to 48K Fs), BCLK=128Fs (up to 96K Fs), BCLK=64Fs for higher Rates for Controller TDM	AVDD=1.8V, Word Length= 32, Linear Phase Decimation/ Interpolation	Frame Rate= MCLK/128, Word Length=32, BCLK=64Fs for Controller I2S, BCLK=256Fs(up to 48K Fs), BCLK=128Fs (up to 96K Fs), BCLK=64Fs for higher Rates for Controller TDM
2'b10	AVDD=3.3V, Word Length= 24, Linear Phase Decimation/ Interpolation	Frame Rate=96/88.2 KSPS Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128FS for Controller TDM	AVDD=3.3V, Word Length= 24, Linear Phase Decimation/ Interpolation	Frame Rate=96/88.2 KSPS Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128FS for Controller TDM	AVDD=3.3V, Word Length= 24, Linear Phase Decimation/ Interpolation	Frame Rate=96/88.2 KSPS Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128FS for Controller TDM	AVDD=3.3V, Word Length= 24, Linear Phase Decimation/ Interpolation	Frame Rate=96/88.2 KSPS Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128FS for Controller TDM

Table 2-4. MD1 and MD2 Setting (continued)

MD1,MD2	TAC5242		TAC5142		TAA5242 (ADC only variant)		TAD5242/TAD5142 (DAC only variant)	
	Target Mode	Controller Mode	Target Mode	Controller Mode	Target Mode	Controller Mode	Target Mode	Controller Mode
2'b11	AVDD=3.3V, Word Length=16, Linear Phase Decimation/ Interpolation	Frame Rate = 48/44.1 KSPS Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128FS for Controller TDM	AVDD=3.3V, Word Length=16, Linear Phase Decimation/ Interpolation	Frame Rate = 48/44.1 KSPS Word Length=32, BCLK=64Fs for Controller I2S, BCLK=128FS for Controller TDM	AVDD=3.3V, Word Length=16, Linear Phase Decimation/ Interpolation	Frame Rate = 48/44.1 KSPS Word Length=32, BCLK=64Fs for Controller I2S, BCLK=256FS for Controller TDM	AVDD=3.3V, Word Length=16, Linear Phase Decimation/ Interpolation	Frame Rate = 48/44.1 KSPS Word Length=32, BCLK=64Fs for Controller I2S, BCLK=256FS for Controller TDM

2.3.3.3 MD3 Hardware Configurations

MD3 setting provides the following configuration for these devices as shown in the table below.

Table 2-5. MD3 Setting

MD3	TAC5242		TAC5142		TAA5242 (ADC only variant)		TAD5242/TAD5142 (DAC only variant)	
	Target Mode	Controller Mode	Target Mode	Controller Mode	Target Mode	Controller Mode	Target Mode	Controller Mode
1'b0	I2S/LJ Mode--> HPF=1Hz@48 KHz, Quick Charge =50ms TDM Mode--> Slot 0 and 1 is data, HPF=1Hz@48 KHz and Quick Charge=50ms	MCLK Input, HPF=1Hz@48 KHz, Quick Charge=50ms	I2S/LJ Mode--> HPF=1Hz@48 KHz, Quick Charge =50ms TDM Mode--> Slot 0 and 1 is data, HPF=1Hz@48 KHz and Quick Charge=50ms	MCLK Input, HPF=1Hz@48 KHz, Quick Charge=50ms	I2S/LJ Mode--> HPF=1Hz@48 KHz, Quick Charge =50ms TDM Mode--> Daisy chain disable, HPF=1Hz@48 KHz and Quick Charge=50ms	MCLK Input, HPF=1Hz@48 KHz, Quick Charge=50ms	Output Quick Charge Enabled	MCLK Input
1'b1	I2S/LJ Mode --> HPF=12Hz@48KHz, Quick Charge =12.5ms TDM Mode --> Slot 2 and 3 is data, HPF=1Hz@48 KHz and Quick Charge=50ms	MCLK Input, HPF=1Hz@48 KHz, Quick Charge=50ms	I2S/LJ Mode --> HPF=12Hz@48KHz, Quick Charge =12.5ms TDM Mode --> Slot 2 and 3 is data, HPF=1Hz@48 KHz and Quick Charge=50ms	MCLK Input, HPF=1Hz@48 KHz, Quick Charge=50ms	I2S/LJ Mode --> HPF=12Hz@48KHz, Quick Charge =12.5ms TDM Mode --> Daisy chain Enable, HPF=1Hz@48 KHz and Quick Charge=50ms	MCLK Input, HPF=1Hz@48 KHz, Quick Charge=50ms	Output Quick Charge Disabled	MCLK Input

2.3.3.4 MD4 and MD5 Hardware Configurations

MD4 and MD5 settings provide the following configuration for these devices as shown in the table below.

Table 2-6. MD4-MD5 Setting

MD4, MD5	TAC5242	TAC5142	TAA5242 (ADC only variant)	TAD5242/TAD5142 (DAC only variant)
	Target/Controller Mode	Target/Controller Mode	Target/Controller Mode	Target/Controller Mode
2'b00	ADC Diff(AC Coupled with 50 mV CM Tolerance), DAC Diff LO (Highest Performance)	ADC Diff(AC Coupled with 50 mV CM Tolerance), DAC Diff LO (Highest Performance)	ADC Diff(AC Coupled with 50 mV CM Tolerance)	DAC Diff LO (Highest Performance)
2'b01	ADC Diff (AC/DC Coupled, Rail to Rail CM Tolerance), DAC Diff (High Drive Load)	ADC Diff (AC/DC Coupled, Rail to Rail CM Tolerance), DAC Diff (High Drive Load)	ADC Diff (AC/DC Coupled, Rail to Rail CM Tolerance)	DAC Diff (High Drive Load)
2'b10	ADC SE, DAC SE LO	ADC SE, DAC SE LO	ADC SE	DAC SE LO
2'b11	ADC SE , DAC Pseudo Diff HP	ADC SE , DAC Pseudo Diff HP	ADC Diff (Low Power Mode, AC/DC Coupled, Rail to Rail CM Tolerance)	DAC Pseudo Diff HP

2.3.3.5 MD6 (DIN/DOUT) Hardware Configuration

MD6 is designated to either an ADC or a DAC variant device only through the DIN and DOUT configuration as shown in the table below.

Connect DIN for ADC device to either GND or IOVDD to configure a stereo or mono ADC.

Connect DOUT for DAC device to either GND or IOVDD to configure a stereo or mono DAC.

For E1 EVM, the connection is made through *blue-wire* based on either an ADC or a DAC is populated on the board.

Table 2-7. MD6 (DIN/DOUT)

	ADC only variant (TAA5242/TAA5142)		DAC only variant (TAD5242/TAD5142)	
	Function target mode	Controller mode	Function target mode	Controller mode
DIN/DOUT	TDM mode--> DIN=DAISY_DIN I2S/LJ mode--> DIN=GND -> Stereo ADC DIN=IOVDD -> Mono Left ADC		TDM mode-->DOUT=Daisy_DOUT I2S/LJ mode--> DOUT_IN=GND -> Stereo DAC DOUT_IN=IOVDD -> Mono Left DAC	

3 Software

3.1 System Overview

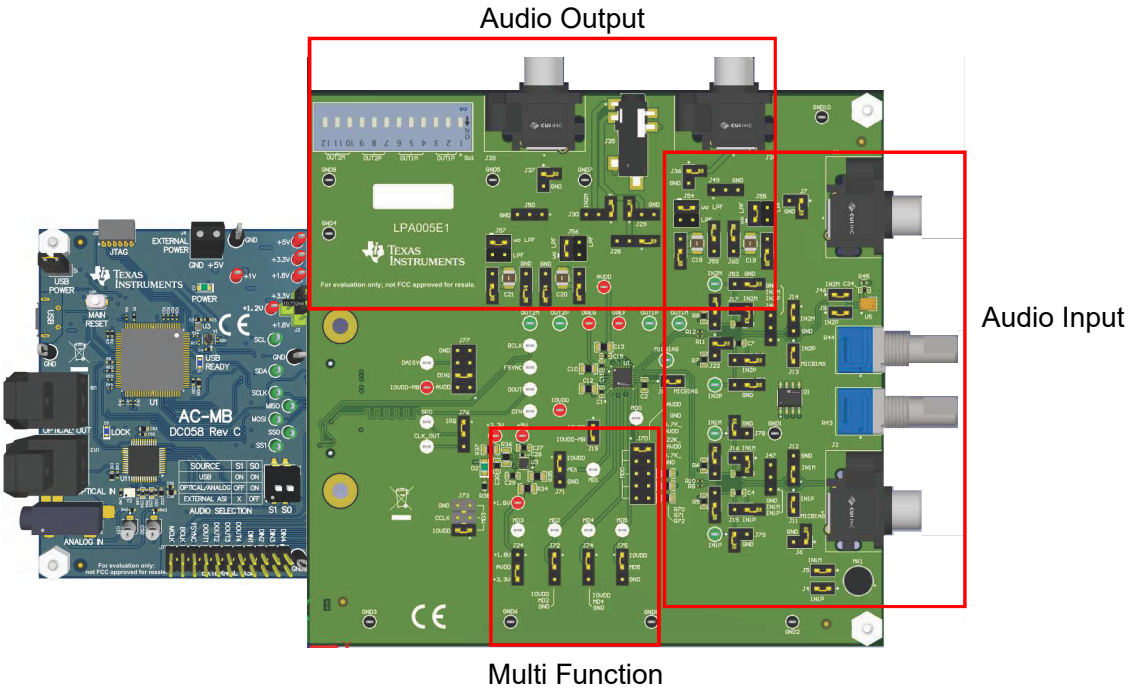


Figure 3-1. System Overview

3.2 Configuration Example

Below is an example of configuring this hardware control device for record or playback.

Table 3-1. Configuration Example

	Configuration	MD0	MD1	MD2	MD3	MD4	MD5	MD6 (DIN/ DOUT)
Record Path (TAA5242)	Target I2S, 32-bit, DIFF AC-coupled, STEREO	GND	GND	GND	GND	GND	GND	DIN = GND
Playback Path (TAD5242)	Target I2S, 32-bit, DIFF Line-Out, STEREO	GND	GND	GND	GND	GND	GND	DOUT = GND

4 Hardware Design Files

This section provides the schematics, layout example and bill of materials (BOM) for each TAx5x42 EVM variant.

4.1 Schematics

TAC5242 EVM Schematic

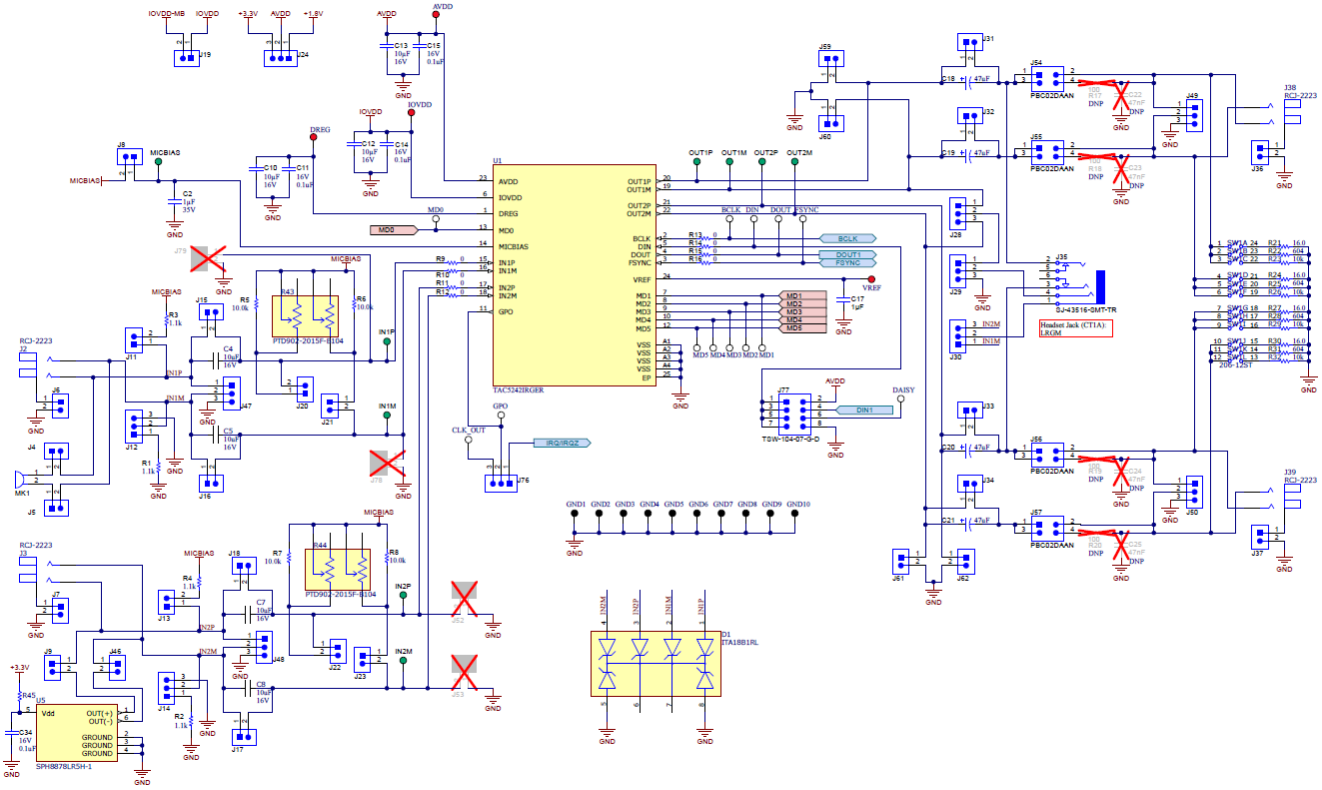


Figure 4-1. TAC5242 EVM Main DUT Schematic

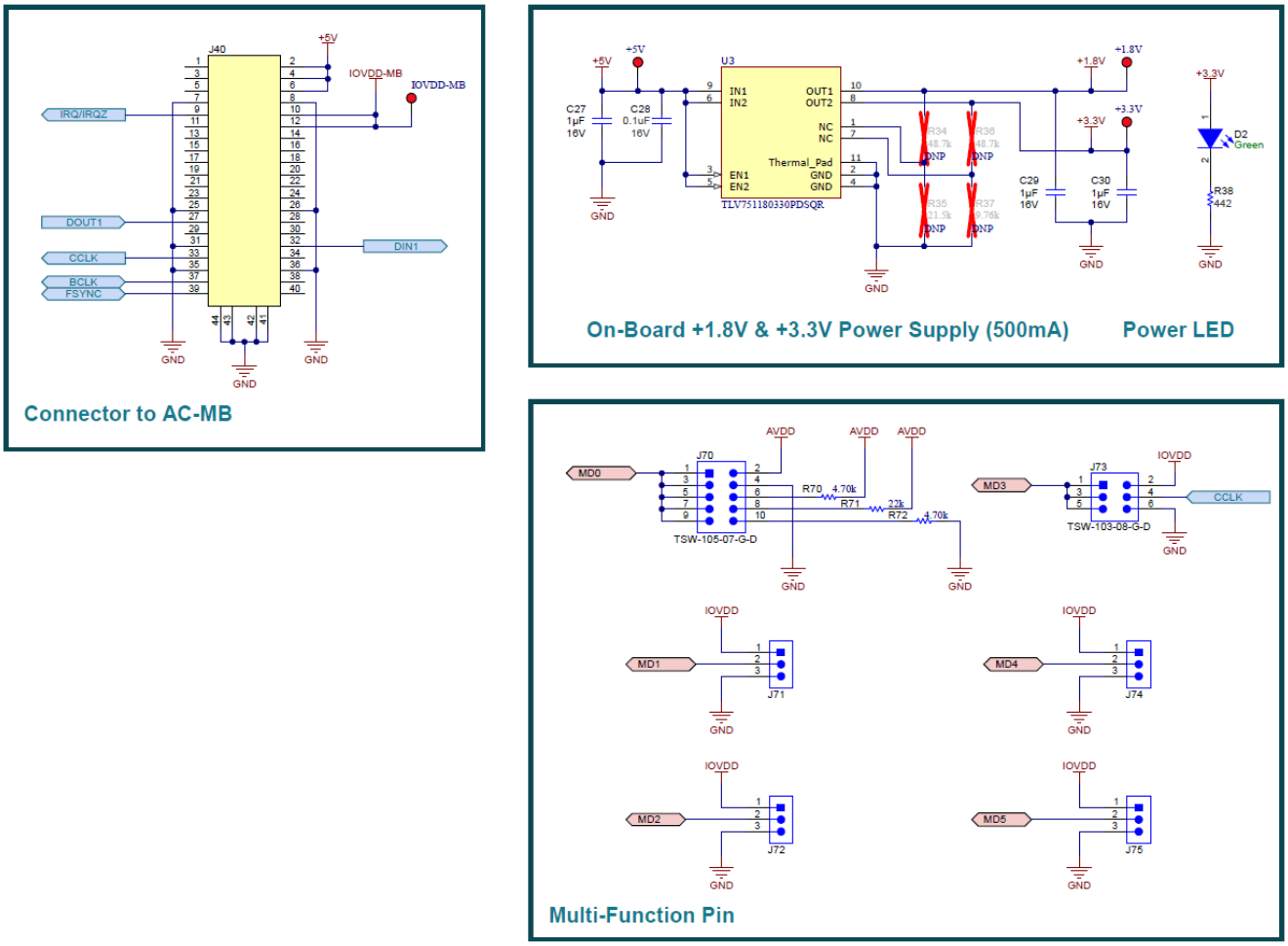


Figure 4-2. TAC5242 EVM Connectors and Supporting Circuitry Schematic

TAC5142 EVM Schematic

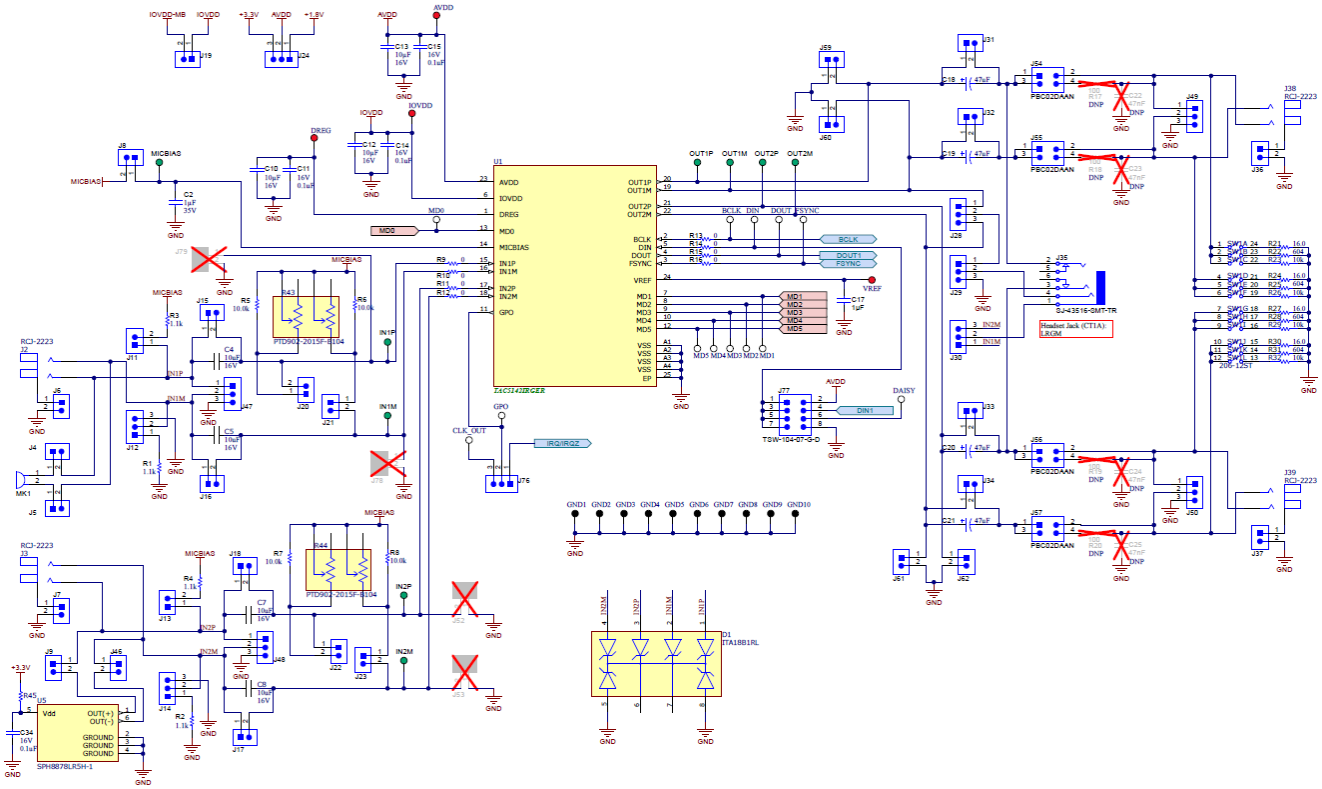


Figure 4-3. TAC5142 EVM Main DUT Schematic

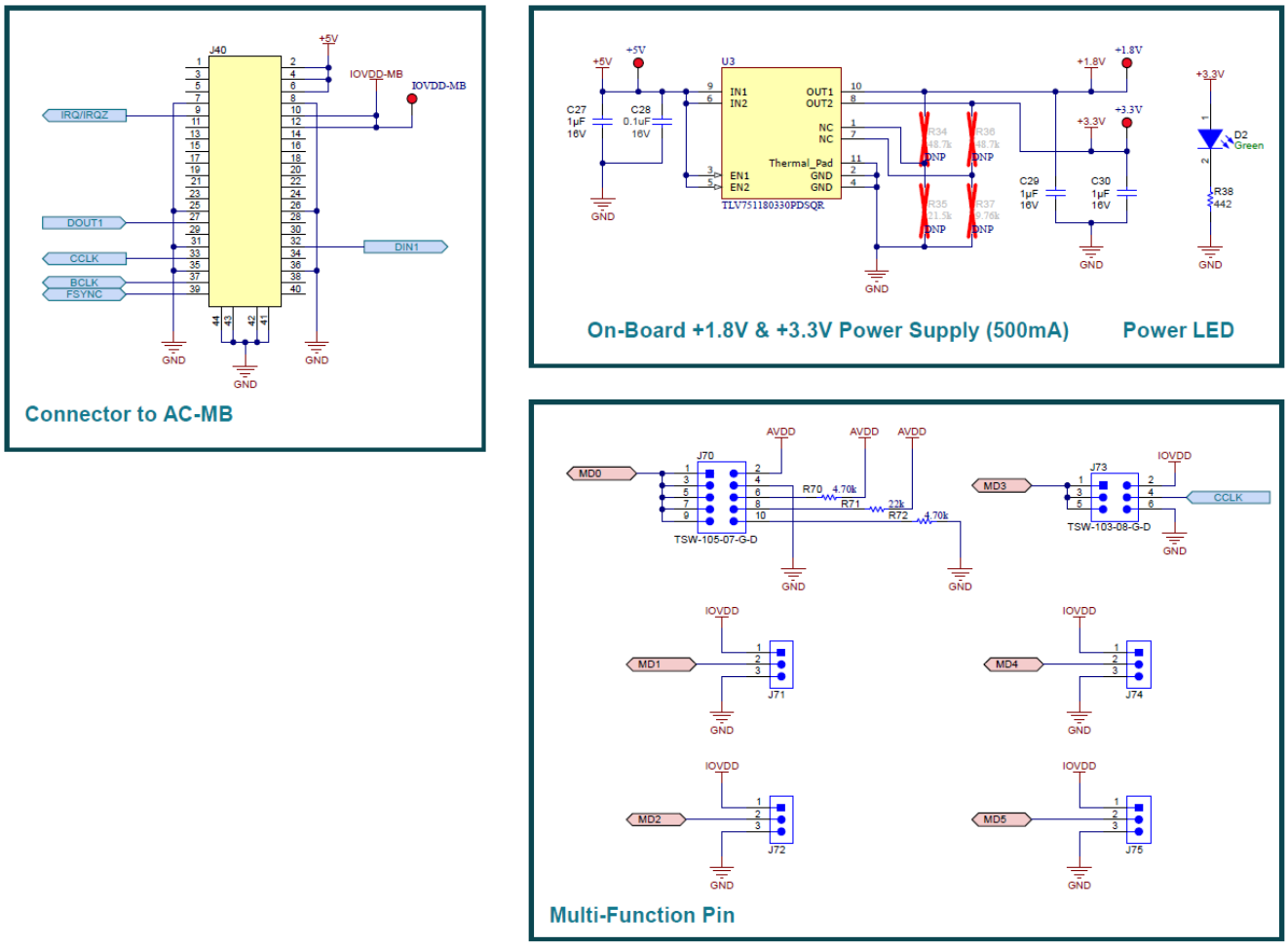


Figure 4-4. TAC5142 EVM Connectors and Supporting Circuitry Schematic

TAA5242 EVM Schematic

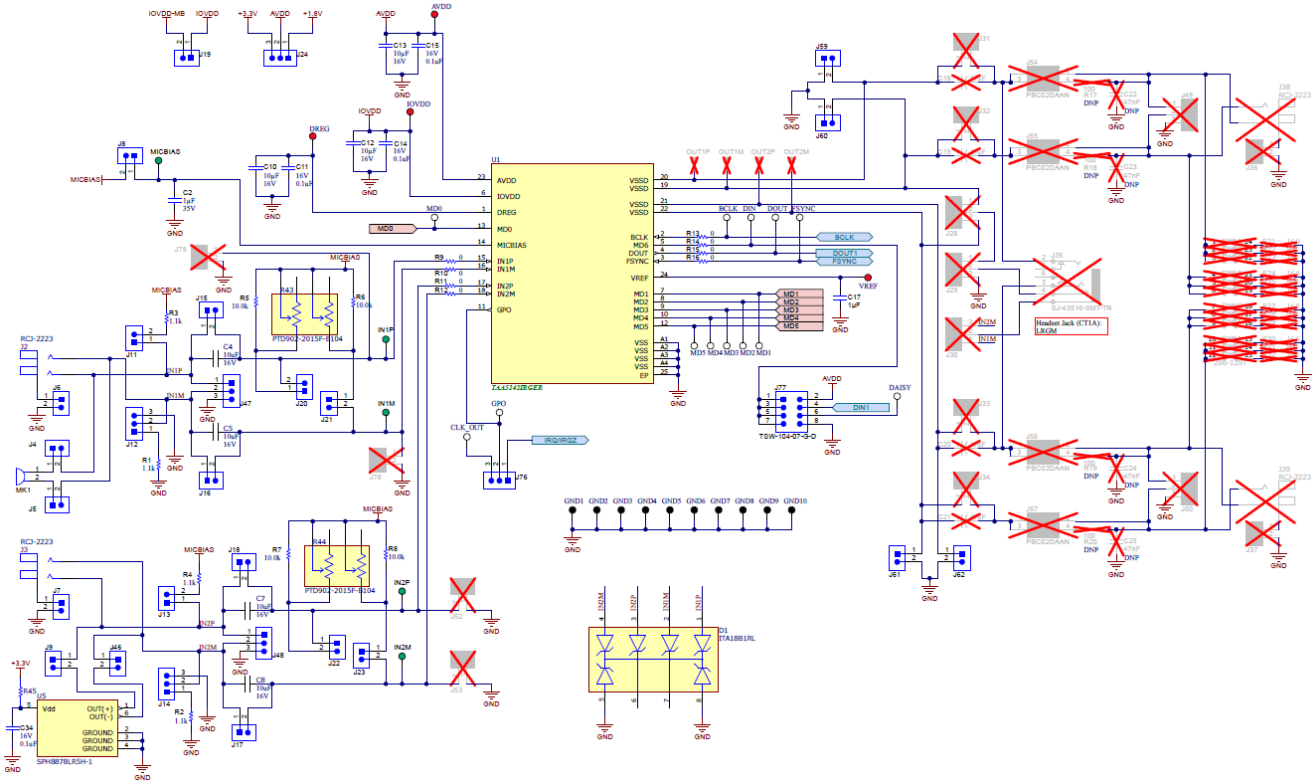


Figure 4-5. TAA5242 EVM Main DUT Schematic

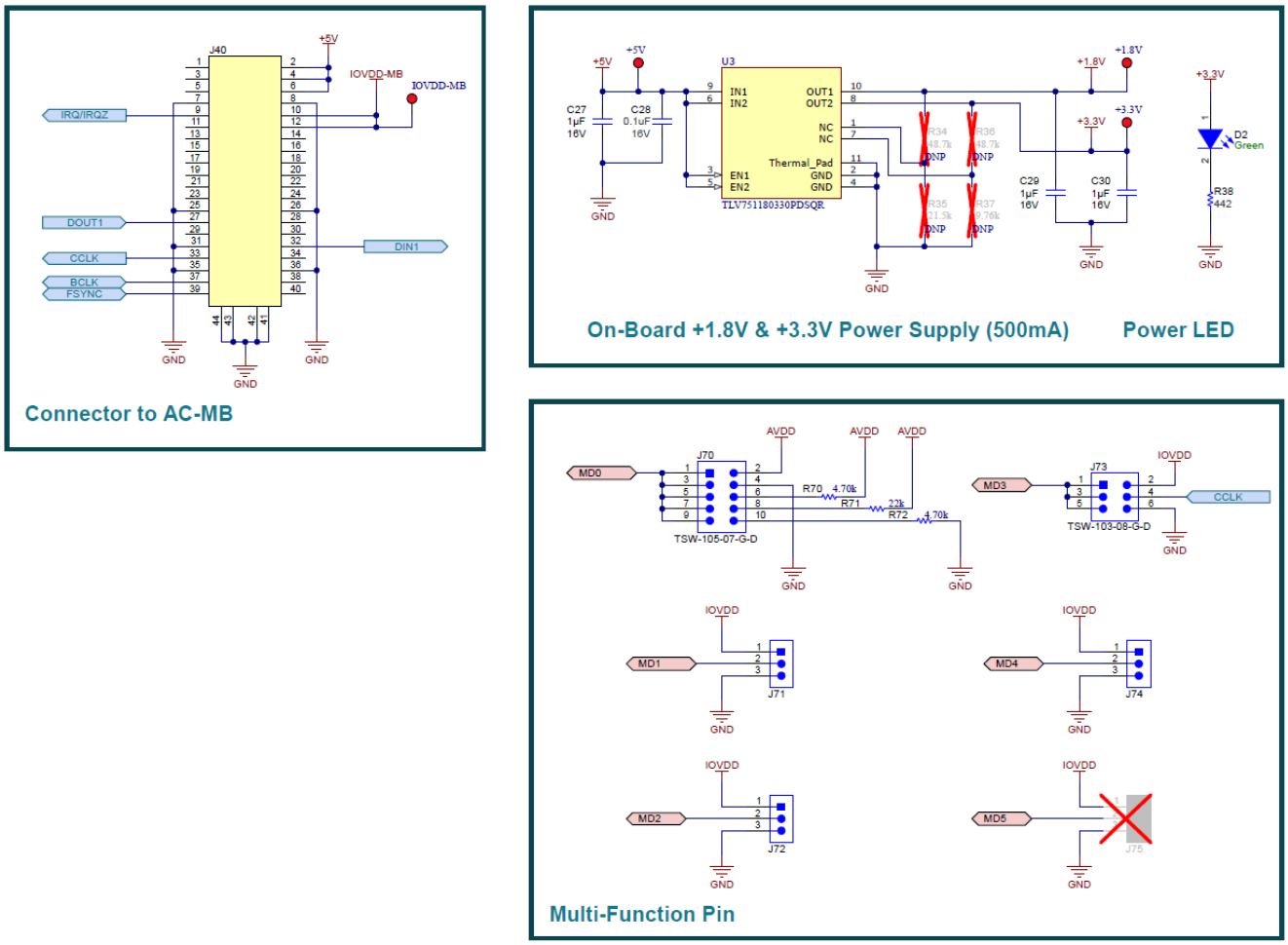


Figure 4-6. TAA5242 EVM Connectors and Supporting Circuitry Schematic

TAD5242 EVM Schematic

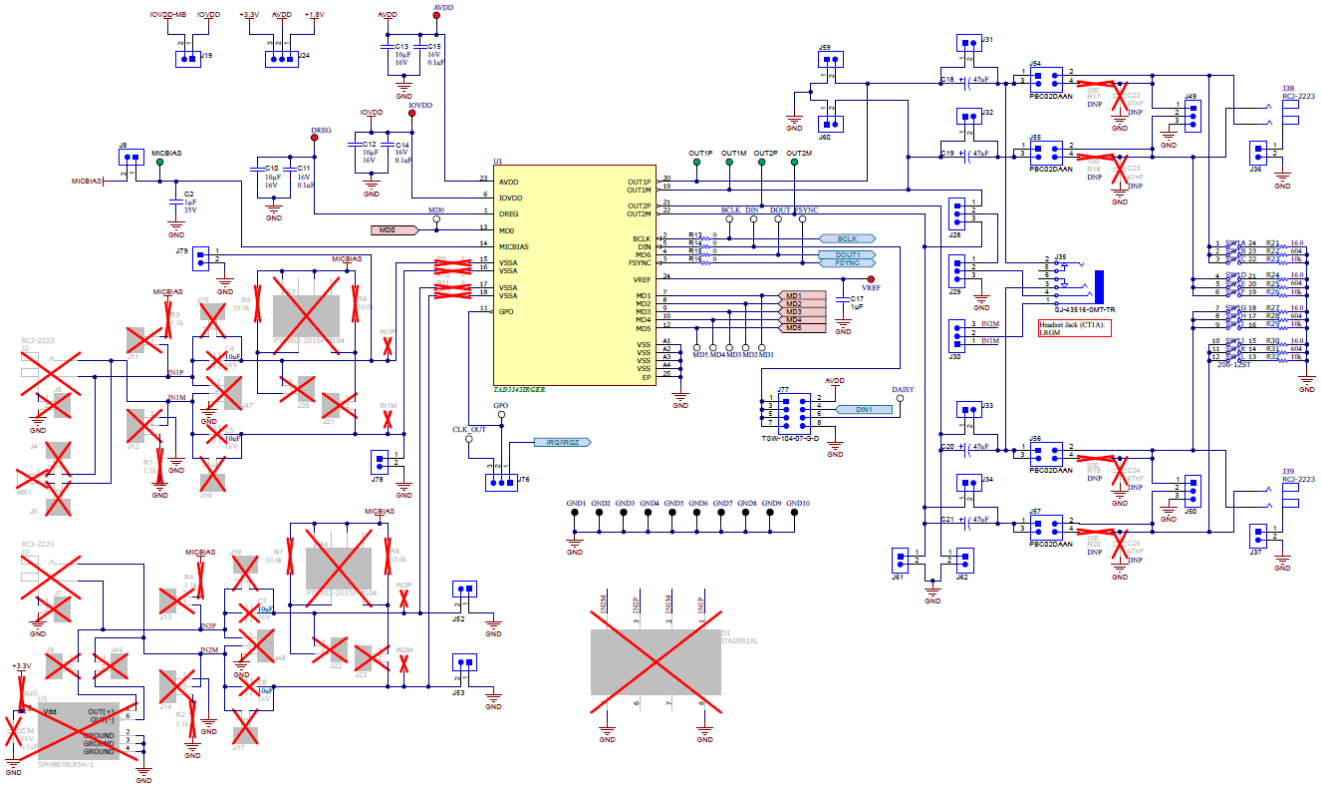


Figure 4-7. TAD5242 EVM Main DUT Schematic

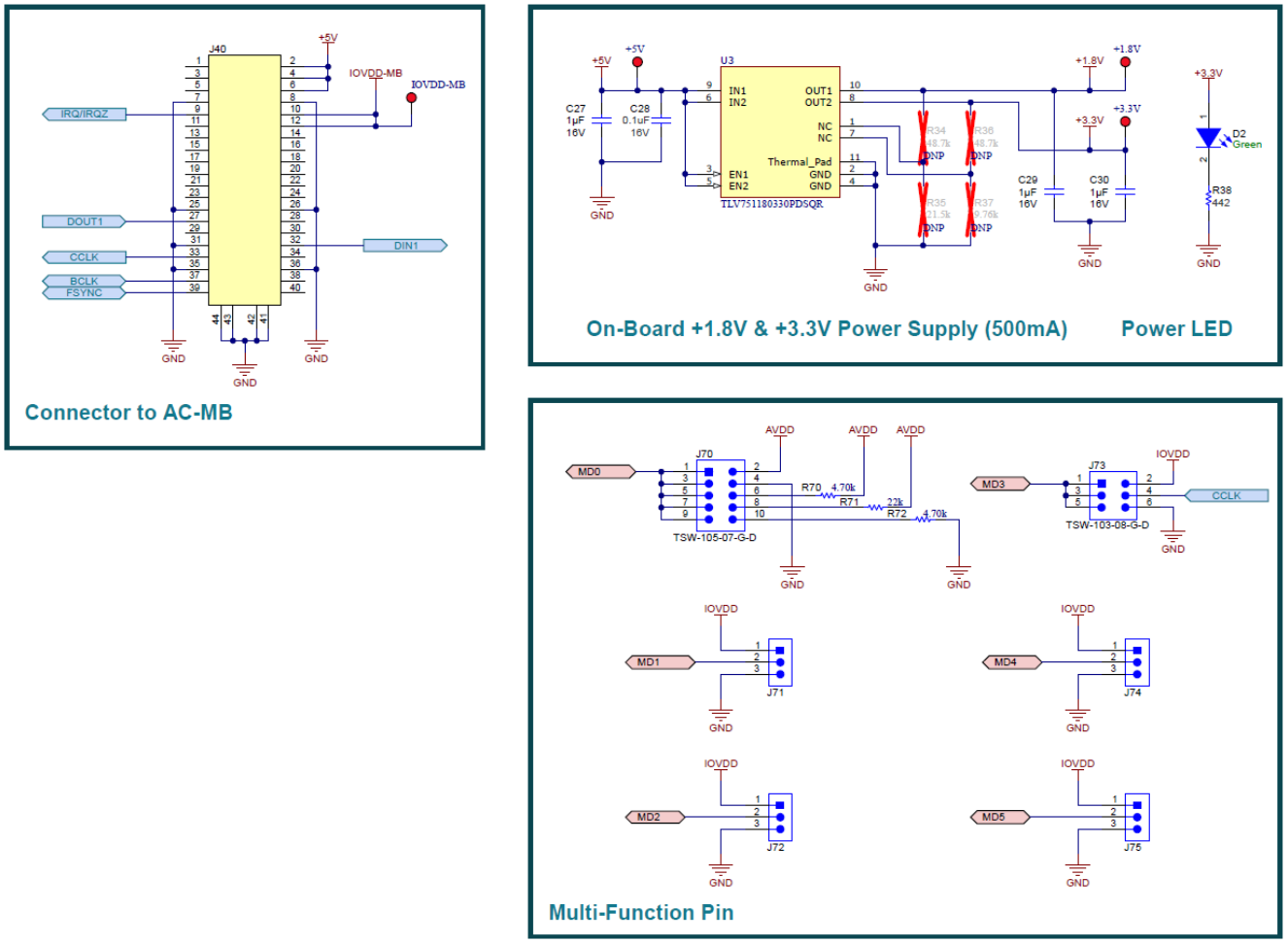


Figure 4-8. TAD5242 EVM Connectors and Supporting Circuitry Schematic

TAD5142 EVM Schematic

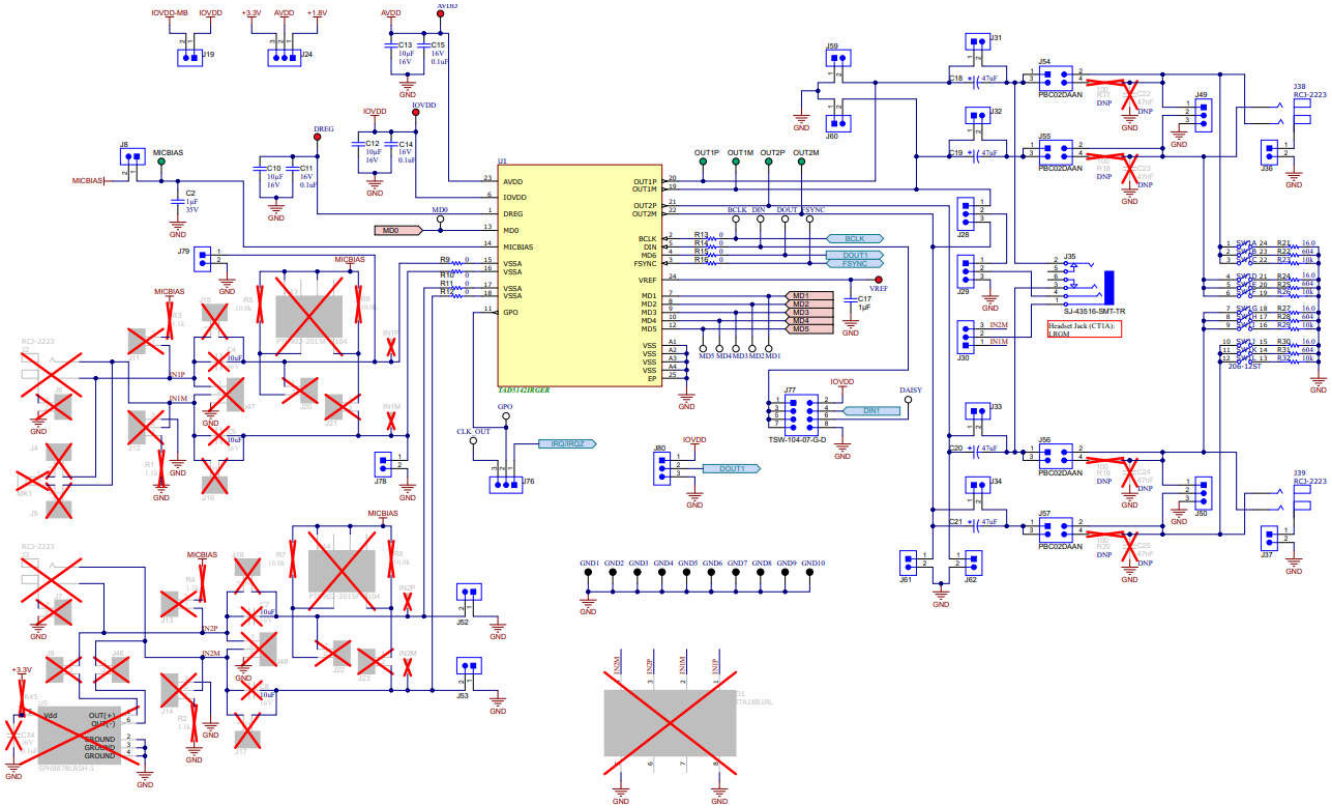


Figure 4-9. TAD5142 EVM Main DUT Schematic

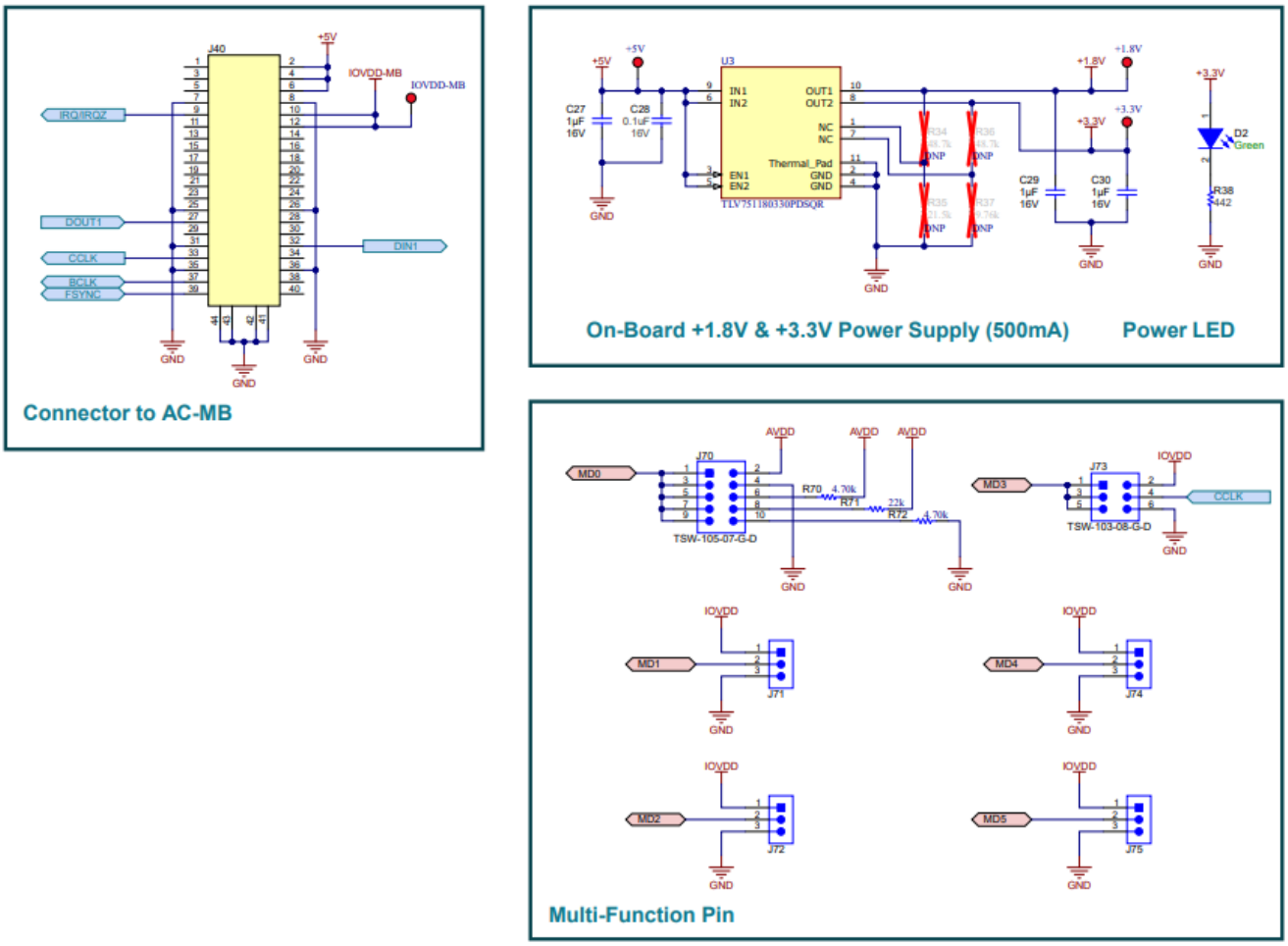


Figure 4-10. TAD5142 EVM Connectors and Supporting Circuitry Schematic

4.2 PCB Layout

The board layout consists of the top and bottom silkscreen, the top and bottom layer routings, the power planes, the 2 inner layout routings and the ground planes. The layout applies to all the TAx5x42 device family.

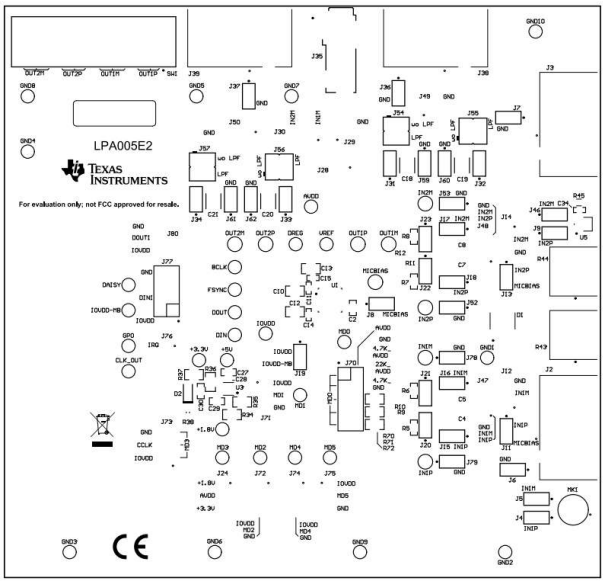


Figure 4-11. TAx5x42 EVM Top Silkscreen

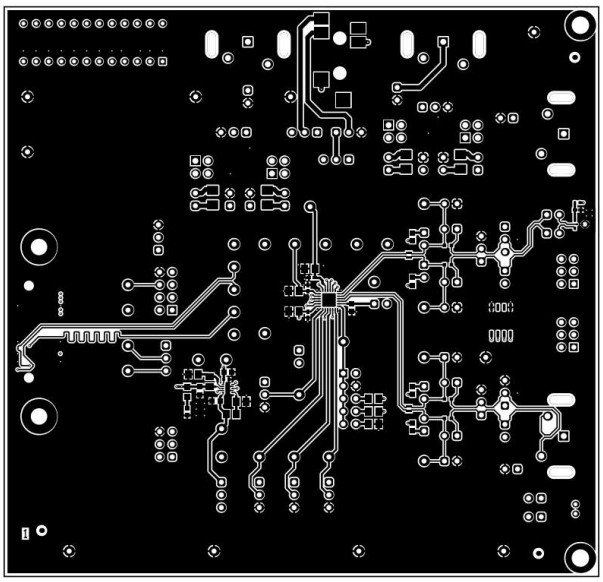


Figure 4-12. TAx5x42 EVM Top Layer

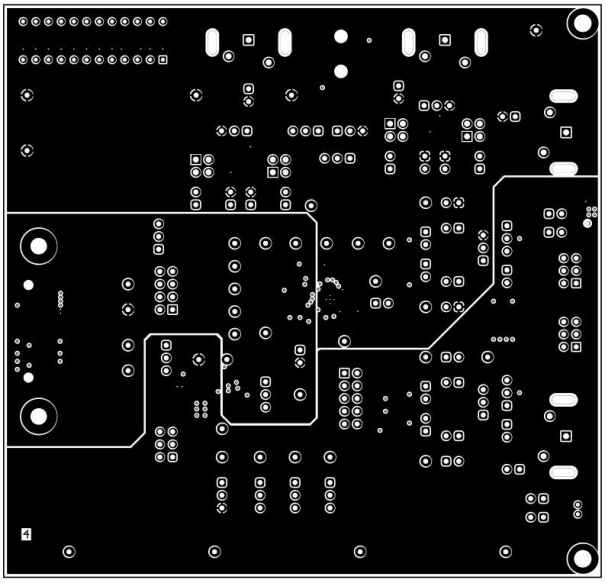


Figure 4-13. TAx5x42 EVM Power Layer 1

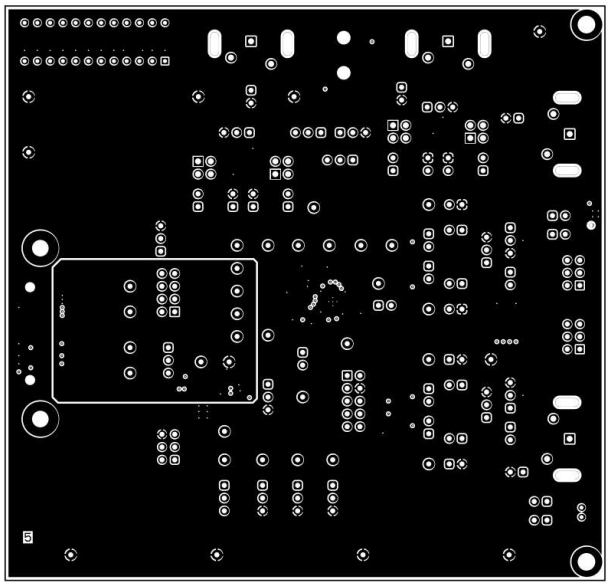


Figure 4-14. TAx5x42 EVM Power Layer 2

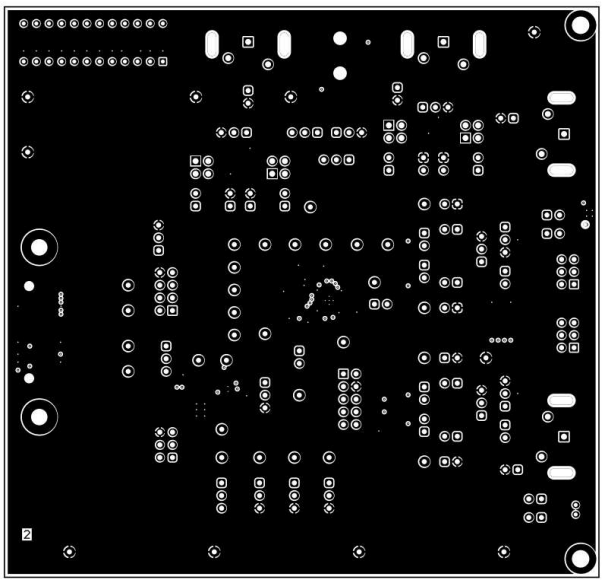


Figure 4-15. TAx5x42 EVM Ground Layer 1

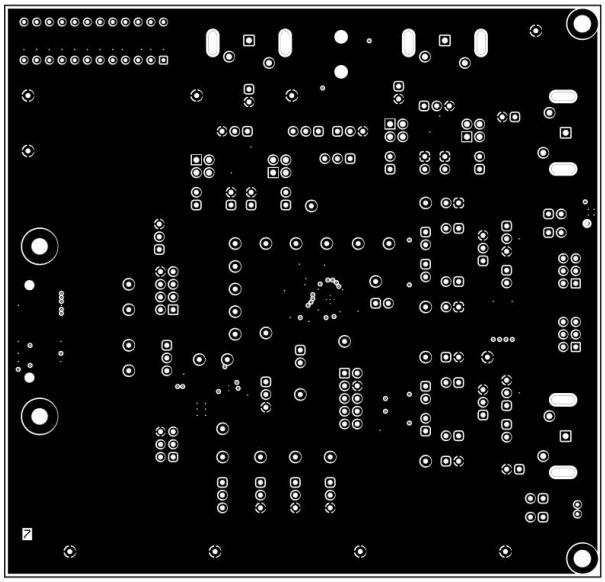


Figure 4-16. TAx5x42 EVM Ground Layer 2

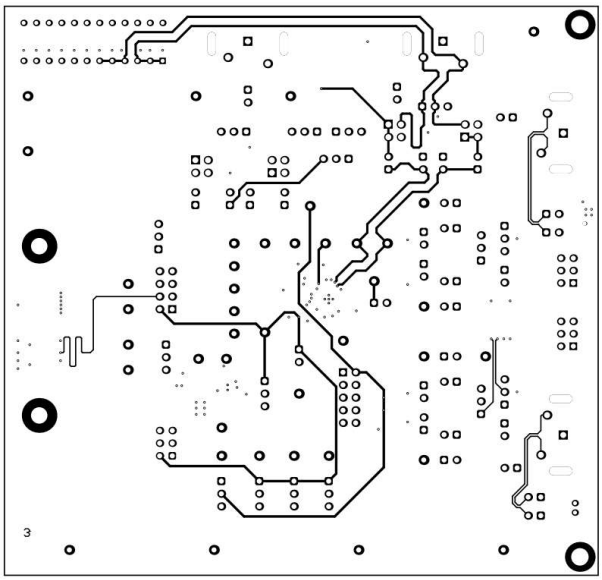


Figure 4-17. TAx5x42 EVM Signal Layer 1

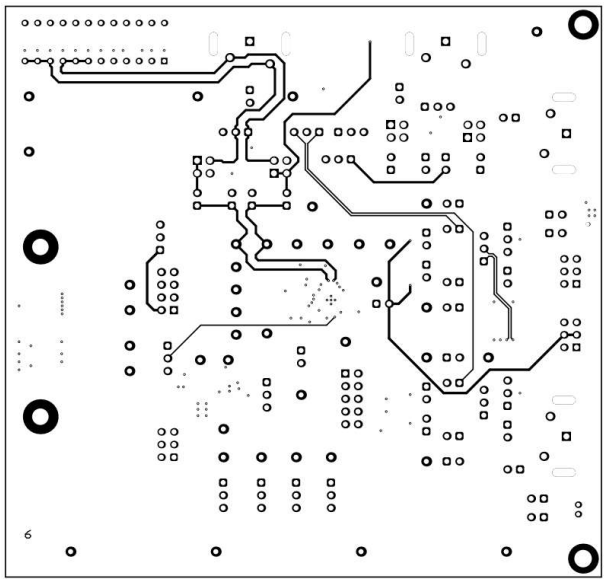


Figure 4-18. TAx5x42 EVM Signal Layer 2

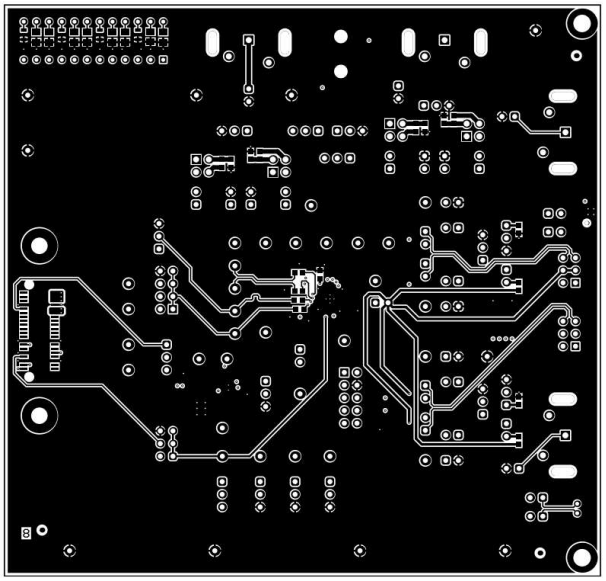


Figure 4-19. TAx5x42 EVM Bottom Layer

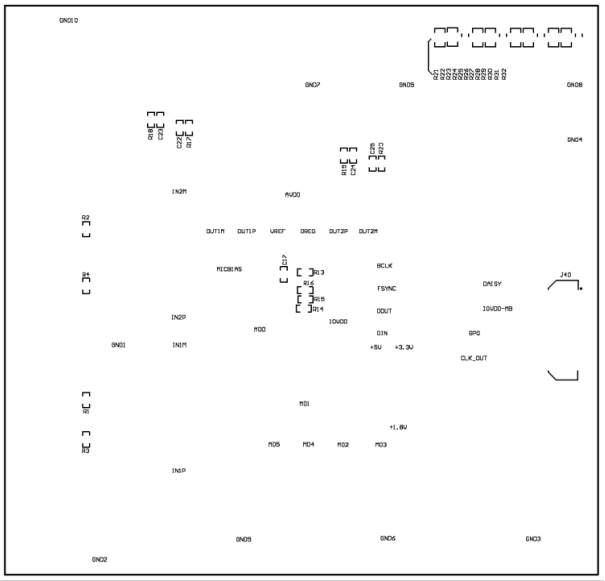


Figure 4-20. TAx5x42 EVM Bottom Silkscreen

4.3 Bill of Materials (BOM)

4.3.1 TAC5242 EVM Bill of Materials

Table 4-1. Bill of Materials

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
!PCB	1		Printed Circuit Board		LPA005	Any		
+1.8V, +3.3V, +5V, AVDD, DREG, IOVDD, IOVDD-MB, VREF	8		Test Point, Miniature, Red, TH	Red Miniature Testpoint	5000	Keystone Electronics		
BCLK, CLK_OUT, DAISY, DIN, DOUT, FSYNC, GPO, MD0, MD1, MD2, MD3, MD4, MD5	13		Test Point, Miniature, White, TH	White Miniature Testpoint	5002	Keystone Electronics		
C2	1	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X7R, 0603	0603	C1608X7R1V105K080AC	TDK		
C4, C5, C7, C8	4		CAP CER 10UF 16 V X5R 0603	0603 (1608 Metric)	C1608X5R1C106M080AB	TDK Corporation		
C10, C12, C13	3	10uF	CAP, CERM, 10 µF, 16 V,+/- 10%, X7R, 0805	0805	EMK212BB7106KG-T	Taiyo Yuden		
C11, C14, C15, C28, C34	5	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		
C17, C27, C29, C30	4	1uF	CAP, CERM, 1 uF, 16 V, +/- 10%, X7R, 0603	0603	8.85012E+11	Wurth Elektronik		
C18, C19, C20, C21	4	47uF	CAP, TA, 47 uF, 10 V, +/- 10%, 0.5 ohm, SMD	3528-21	TPSB476K010R0500	AVX		
D1	1		28 V Clamp 25 A (8/20µs) Ipp Tvs Diode Surface Mount 8-SOIC	SOIC8	ITA18B1RL	STMicroelectronics		
D2	1	Green	LED, Green, SMD	LED_0805	LTST-C170KGKT	Lite-On		
GND1, GND2, GND3, GND4, GND5, GND6, GND7, GND8, GND9, GND10	10		Test Point, Miniature, Black, TH	Black Miniature Testpoint	5001	Keystone Electronics		

Table 4-1. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
H1, H2	2		Small nylon hex nut, 0.10 thick with a 0.250 outside diameter and a 4-40 threading	Hex Nut,4-40 Thread, 250" Head Dia	9605	Keystone		
H3, H4	2		HEX STANDOFF 4-40 NYLON 3/4"	HEX STANDOFF 4-40 NYLON 3/4"	4804	Keystone		
IN1M, IN1P, IN2M, IN2P, MICBIAS, OUT1M, OUT1P, OUT2M, OUT2P	9		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone		
J2, J3, J38, J39	4		3.20mm ID, 9.00mm OD (RCA) Phono (RCA) Jack Mono Connector Solder	CONN_RCA_DUAL	RCJ-2223	CUI Devices		
J4, J5, J6, J7, J8, J9, J11, J13, J15, J16, J17, J18, J19, J20, J21, J22, J23, J31, J32, J33, J34, J36, J37, J46, J59, J60, J61, J62	28		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
J12, J14, J24, J28, J29, J30, J47, J48, J49, J50, J71, J72, J74, J75, J76	15		Header, 100mil, 3x1, Gold, TH	3x1 Header	TSW-103-07-G-S	Samtec		
J35	1		AUDIO JACK 3.5mm 4COND, SMT	AUDIO JACK 3.5mm 4COND, SMT	SJ-43516-SMT-TR	CUI Inc.		
J40	1		Connector, Header, High Speed, 20 pairs, SMT	QTE-020-01-X-D-A	QTE-020-01-L-D-A	Samtec		
J54, J55, J56, J57	4		Header, 2.54mm, 2x2, Gold, TH	Header, 2.54mm, 2x2, TH	PBC02DAAN	Sullins Connector Solutions		
J70	1		Header, 100mil, 5x2, Gold, TH	5x2 Header	TSW-105-07-G-D	Samtec		
J73	1		Header, 2.54mm, 3x2, Gold, TH	Header, 2.54mm, 3x2, TH	TSW-103-08-G-D	Samtec		
J77	1		Header, 100mil, 4x2, Gold, TH	4x2 Header	TSW-104-07-G-D	Samtec		

Table 4-1. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
LBL1	1		Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll	PCB Label 0.650 x 0.200 inch	THT-14-423-10	Brady		
MK1	1		Microphone, Condenser, Analog, Omnidirectional, -42DB, TH	6 mm DIA	POM-2242P-C33-R	PUI Audio		
R1, R2, R3, R4	4	1.1k	RES, 1.1 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031K10JNEA	Vishay-Dale		
R5, R6, R7, R8	4	10.0k	RES, 10.0 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603FT10K0	Stackpole Electronics Inc		
R9, R10, R11, R12	4	0	RES, 0, 5%, 0.05 W, 0201	0201	CRCW02010000Z0ED	Vishay-Dale		
R13, R14, R15, R16	4	0	RES, 0, 0%, 0.25 W, AEC-Q200 Grade 0, 0603	0603	RCS06030000Z0EA	Vishay-Dale		
R21, R24, R27, R30	4	16	RES, 16.0, 1%, 0.5 W, 0805	0805	ERJ-P06F16R0V	Panasonic		
R22, R25, R28, R31	4	604	RES, 604, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW0805604RFKEA	Vishay-Dale		
R23, R26, R29, R32	4		RES SMD 10K OHM 5% 0.4W 0805	0805	ESR10EZPJ103	Rohm Semiconductor		
R38	1	442	RES, 442, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW0603442RFKEA	Vishay-Dale		
R43, R44	2	100 kΩ	Res POT Carbon Element 100kOhm 20% 1/20W/1/40W PC Pins Thru-Hole	PTH_POT_9MM50_24MM65	PTD902-2015F-B104	Bourns		
R45	1	10k	10k ±5% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Moisture Resistant Thick Film	0402	RC0402JR-1310KL	Yageo		
R70, R72	2	4.70k	RES, 4.70 k, 0.1%, 0.125 W, 0805	0805	RG2012P-472-B-T5	Susumu Co Ltd		
R71	1	22k	RES, 22 k, 5%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080522K0JNEA	Vishay-Dale		

Table 4-1. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
SH1, SH2, SH3, SH5, SH6, SH7, SH8, SH9, SH10, SH11, SH12, SH13, SH15, SH16, SH17, SH18, SH19, SH20, SH21, SH22, SH23, SH24, SH27, SH28, SH29, SH30, SH31, SH32, SH33, SH34, SH35, SH36, SH37, SH38, SH39, SH40, SH41, SH42, SH43, SH44, SH45, SH46, SH47, SH48, SH49, SH50	46	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
SW1	1		Dip Switch SPST 12 Position Through Hole Slide (Standard) Actuator 50 mA 24VDC	DIP24	206-12ST	CTS		
U1	1		TAC5242IRGER	VQFN24	TAC5242IRGER	Texas Instruments		
U3	1		500-mA, low-IQ, high-PSRR, dual-channel low-dropout (LDO) voltage regulator 10-WSON -40 to 125	WSON10	TLV751180330PDSQR	Texas Instruments		
U5	1		Approx. 7 Hz-36 kHz Analog Microphone MEMS (Silicon) Approx. 2.3 V-3.6 V Omnidirectional (-44dB ±0.5dB SPL) Solder Pads	LGA	SPH8878LR5H-1	Knowles	SPH1878LR5H-C	Knowles
C22, C23, C24, C25	0	0.047uF	CAP, CERM, 0.047 uF, 50 V, +/- 10%, X7R, 0603	0603	C1608X7R1H473K080AA	TDK		
FID1, FID2, FID3, FID4, FID5, FID6	0		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A		
J52, J53, J78, J79	0		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
R17, R18, R19, R20	0	100	RES, 100, 1%, 0.1 W, 0603	0603	RC0603FR-07100RL	Yageo		

Table 4-1. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
R34, R36	0	48.7k	RES, 48.7 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080548K7FKEA	Vishay-Dale		
R35	0	21.5k	RES, 21.5 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080521K5FKEA	Vishay-Dale		
R37	0	9.76k	RES, 9.76 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW08059K76FKEA	Vishay-Dale		
SH4, SH14, SH25, SH26	0	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M

4.3.2 TAC5142 EVM Bill of Materials

Table 4-2. Bill of Materials

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
!PCB	1		Printed Circuit Board		LPA005	Any		
+1.8V, +3.3V, +5V, AVDD, DREG, IOVDD, IOVDD-MB, VREF	8		Test Point, Miniature, Red, TH	Red Miniature Testpoint	5000	Keystone Electronics		
BCLK, CLK_OUT, DAISY, DIN, DOUT, FSYNC, GPO, MD0, MD1, MD2, MD3, MD4, MD5	13		Test Point, Miniature, White, TH	White Miniature Testpoint	5002	Keystone Electronics		
C2	1	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X7R, 0603	0603	C1608X7R1V105K080AC	TDK		
C4, C5, C7, C8	4		CAP CER 10UF 16 V X5R 0603	0603 (1608 Metric)	C1608X5R1C106M080AB	TDK Corporation		
C10, C12, C13	3	10uF	CAP, CERM, 10 µF, 16 V,+/- 10%, X7R, 0805	0805	EMK212BB7106KG-T	Taiyo Yuden		
C11, C14, C15, C28, C34	5	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		
C17, C27, C29, C30	4	1uF	CAP, CERM, 1 uF, 16 V, +/- 10%, X7R, 0603	0603	8.85012E+11	Wurth Elektronik		
C18, C19, C20, C21	4	47uF	CAP, TA, 47 uF, 10 V, +/- 10%, 0.5 ohm, SMD	3528-21	TPSB476K010R0500	AVX		
D1	1		28 V Clamp 25 A (8/20µs) Ipp Tvs Diode Surface Mount 8-SOIC	SOIC8	ITA18B1RL	STMicroelectronics		
D2	1	Green	LED, Green, SMD	LED_0805	LTST-C170KGKT	Lite-On		
GND1, GND2, GND3, GND4, GND5, GND6, GND7, GND8, GND9, GND10	10		Test Point, Miniature, Black, TH	Black Miniature Testpoint	5001	Keystone Electronics		

Table 4-2. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
H1, H2	2		Small nylon hex nut, 0.10 thick with a 0.250 outside diameter and a 4-40 threading	Hex Nut,4-40 Thread, 250" Head Dia	9605	Keystone		
H3, H4	2		HEX STANDOFF 4-40 NYLON 3/4"	HEX STANDOFF 4-40 NYLON 3/4"	4804	Keystone		
IN1M, IN1P, IN2M, IN2P, MICBIAS, OUT1M, OUT1P, OUT2M, OUT2P	9		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone		
J2, J3, J38, J39	4		3.20mm ID, 9.00mm OD (RCA) Phono (RCA) Jack Mono Connector Solder	CONN_RCA_DUAL	RCJ-2223	CUI Devices		
J4, J5, J6, J7, J8, J9, J11, J13, J15, J16, J17, J18, J19, J20, J21, J22, J23, J31, J32, J33, J34, J36, J37, J46, J59, J60, J61, J62	28		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
J12, J14, J24, J28, J29, J30, J47, J48, J49, J50, J71, J72, J74, J75, J76	15		Header, 100mil, 3x1, Gold, TH	3x1 Header	TSW-103-07-G-S	Samtec		
J35	1		AUDIO JACK 3.5mm 4COND, SMT	AUDIO JACK 3.5mm 4COND, SMT	SJ-43516-SMT-TR	CUI Inc.		
J40	1		Connector, Header, High Speed, 20 pairs, SMT	QTE-020-01-X-D-A	QTE-020-01-L-D-A	Samtec		
J54, J55, J56, J57	4		Header, 2.54mm, 2x2, Gold, TH	Header, 2.54mm, 2x2, TH	PBC02DAAN	Sullins Connector Solutions		
J70	1		Header, 100mil, 5x2, Gold, TH	5x2 Header	TSW-105-07-G-D	Samtec		
J73	1		Header, 2.54mm, 3x2, Gold, TH	Header, 2.54mm, 3x2, TH	TSW-103-08-G-D	Samtec		
J77	1		Header, 100mil, 4x2, Gold, TH	4x2 Header	TSW-104-07-G-D	Samtec		

Table 4-2. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
LBL1	1		Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll	PCB Label 0.650 x 0.200 inch	THT-14-423-10	Brady		
MK1	1		Microphone, Condenser, Analog, Omnidirectional, -42DB, TH	6 mm DIA	POM-2242P-C33-R	PUI Audio		
R1, R2, R3, R4	4	1.1k	RES, 1.1 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031K10JNEA	Vishay-Dale		
R5, R6, R7, R8	4	10.0k	RES, 10.0 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603FT10K0	Stackpole Electronics Inc		
R9, R10, R11, R12	4	0	RES, 0, 5%, 0.05 W, 0201	0201	CRCW02010000Z0ED	Vishay-Dale		
R13, R14, R15, R16	4	0	RES, 0, 0%, 0.25 W, AEC-Q200 Grade 0, 0603	0603	RCS06030000Z0EA	Vishay-Dale		
R21, R24, R27, R30	4	16	RES, 16.0, 1%, 0.5 W, 0805	0805	ERJ-P06F16R0V	Panasonic		
R22, R25, R28, R31	4	604	RES, 604, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW0805604RFKEA	Vishay-Dale		
R23, R26, R29, R32	4		RES SMD 10K OHM 5% 0.4W 0805	0805	ESR10EZPJ103	Rohm Semiconductor		
R38	1	442	RES, 442, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW0603442RFKEA	Vishay-Dale		
R43, R44	2	100 kΩ	Res POT Carbon Element 100kOhm 20% 1/20W/1/40W PC Pins Thru-Hole	PTH_POT_9MM50_24MM65	PTD902-2015F-B104	Bourns		
R45	1	10k	10k ±5% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Moisture Resistant Thick Film	0402	RC0402JR-1310KL	Yageo		
R70, R72	2	4.70k	RES, 4.70 k, 0.1%, 0.125 W, 0805	0805	RG2012P-472-B-T5	Susumu Co Ltd		
R71	1	22k	RES, 22 k, 5%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080522K0JNEA	Vishay-Dale		

Table 4-2. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
SH1, SH2, SH3, SH5, SH6, SH7, SH8, SH9, SH10, SH11, SH12, SH13, SH15, SH16, SH17, SH18, SH19, SH20, SH21, SH22, SH23, SH24, SH27, SH28, SH29, SH30, SH31, SH32, SH33, SH34, SH35, SH36, SH37, SH38, SH39, SH40, SH41, SH42, SH43, SH44, SH45, SH46, SH47, SH48, SH49, SH50	46	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
SW1	1		Dip Switch SPST 12 Position Through Hole Slide (Standard) Actuator 50 mA 24VDC	DIP24	206-12ST	CTS		
U1	1		TAC5142IRGER	VQFN24	TAC5142IRGER	Texas Instruments		
U3	1		500-mA, low-IQ, high-PSRR, dual-channel low-dropout (LDO) voltage regulator 10-WSON -40 to 125	WSON10	TLV751180330PDSQR	Texas Instruments		
U5	1		Approx. 7 Hz-36 kHz Analog Microphone MEMS (Silicon) Approx. 2.3 V-3.6 V Omnidirectional (-44dB ±0.5dB SPL) Solder Pads	LGA	SPH8878LR5H-1	Knowles	SPH1878LR5H-C	Knowles
C22, C23, C24, C25	0	0.047uF	CAP, CERM, 0.047 uF, 50 V, +/- 10%, X7R, 0603	0603	C1608X7R1H473K080AA	TDK		
FID1, FID2, FID3, FID4, FID5, FID6	0		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A		

Table 4-2. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
J52, J53, J78, J79	0		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
R17, R18, R19, R20	0	100	RES, 100, 1%, 0.1 W, 0603	0603	RC0603FR-07100RL	Yageo		
R34, R36	0	48.7k	RES, 48.7 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080548K7FKEA	Vishay-Dale		
R35	0	21.5k	RES, 21.5 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080521K5FKEA	Vishay-Dale		
R37	0	9.76k	RES, 9.76 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW08059K76FKEA	Vishay-Dale		
SH4, SH14, SH25, SH26	0	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M

4.3.3 TAA5242 EVM Bill of Materials

Table 4-3. Bill of Materials

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
!PCB	1		Printed Circuit Board		LPA005	Any		
+1.8V, +3.3V, +5V, AVDD, DREG, IOVDD, IOVDD-MB, VREF	8		Test Point, Miniature, Red, TH	Red Miniature Testpoint	5000	Keystone Electronics		
BCLK, CLK_OUT, DAISY, DIN, DOUT, FSYNC, GPO, MD0, MD1, MD2, MD3, MD4, MD5	13		Test Point, Miniature, White, TH	White Miniature Testpoint	5002	Keystone Electronics		
C2	1	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X7R, 0603	0603	C1608X7R1V105K080AC	TDK		
C4, C5, C7, C8	4		CAP CER 10UF 16 V X5R 0603	0603 (1608 Metric)	C1608X5R1C106M080AB	TDK Corporation		
C10, C12, C13	3	10uF	CAP, CERM, 10 µF, 16 V,+/- 10%, X7R, 0805	0805	EMK212BB7106KG-T	Taiyo Yuden		
C11, C14, C15, C28, C34	5	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		
C17, C27, C29, C30	4	1uF	CAP, CERM, 1 uF, 16 V, +/- 10%, X7R, 0603	0603	8.85012E+11	Wurth Elektronik		
D1	1		28 V Clamp 25 A (8/20µs) Ipp Tvs Diode Surface Mount 8-SOIC	SOIC8	ITA18B1RL	STMicroelectronics		
D2	1	Green	LED, Green, SMD	LED_0805	LTST-C170KGKT	Lite-On		
GND1, GND2, GND3, GND4, GND5, GND6, GND7, GND8, GND9, GND10	10		Test Point, Miniature, Black, TH	Black Miniature Testpoint	5001	Keystone Electronics		
H1, H2	2		Small nylon hex nut, 0.10 thick with a 0.250 outside diameter and a 4-40 threading	Hex Nut,4-40 Thread, 250" Head Dia	9605	Keystone		
H3, H4	2		HEX STANDOFF 4-40 NYLON 3/4"	HEX STANDOFF 4-40 NYLON 3/4"	4804	Keystone		

Table 4-3. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
IN1M, IN1P, IN2M, IN2P, MICBIAS	5		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone		
J2, J3	2		3.20mm ID, 9.00mm OD (RCA) Phono (RCA) Jack Mono Connector Solder	CONN_RCA_DUAL	RCJ-2223	CUI Devices		
J4, J5, J6, J7, J8, J9, J11, J13, J15, J16, J17, J18, J19, J20, J21, J22, J23, J46, J59, J60, J61, J62	22		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
J12, J14, J24, J47, J48, J71, J72, J74, J76	9		Header, 100mil, 3x1, Gold, TH	3x1 Header	TSW-103-07-G-S	Samtec		
J40	1		Connector, Header, High Speed, 20 pairs, SMT	QTE-020-01-X-D-A	QTE-020-01-L-D-A	Samtec		
J70	1		Header, 100mil, 5x2, Gold, TH	5x2 Header	TSW-105-07-G-D	Samtec		
J73	1		Header, 2.54mm, 3x2, Gold, TH	Header, 2.54mm, 3x2, TH	TSW-103-08-G-D	Samtec		
J77	1		Header, 100mil, 4x2, Gold, TH	4x2 Header	TSW-104-07-G-D	Samtec		
LBL1	1		Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll	PCB Label 0.650 x 0.200 inch	THT-14-423-10	Brady		
MK1	1		Microphone, Condenser, Analog, Omnidirectional, -42DB, TH	6 mm DIA	POM-2242P-C33-R	PUI Audio		
R1, R2, R3, R4	4	1.1k	RES, 1.1 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031K10JNEA	Vishay-Dale		
R5, R6, R7, R8	4	10.0k	RES, 10.0 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603FT10K0	Stackpole Electronics Inc		
R9, R10, R11, R12	4	0	RES, 0, 5%, 0.05 W, 0201	0201	CRCW02010000Z0ED	Vishay-Dale		
R13, R14, R15, R16	4	0	RES, 0, 0%, 0.25 W, AEC-Q200 Grade 0, 0603	0603	RCS06030000Z0EA	Vishay-Dale		

Table 4-3. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
R38	1	442	RES, 442, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW0603442RFKEA	Vishay-Dale		
R43, R44	2	100 kΩ	Res POT Carbon Element 100kOhm 20% 1/20W/1/40W PC Pins Thru-Hole	PTH_POT_9MM50_24MM65	PTD902-2015F-B104	Bourns		
R45	1	10k	10k ±5% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Moisture Resistant Thick Film	0402	RC0402JR-1310KL	Yageo		
R70, R72	2	4.70k	RES, 4.70 k, 0.1%, 0.125 W, 0805	0805	RG2012P-472-B-T5	Susumu Co Ltd		
R71	1	22k	RES, 22 k, 5%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080522K0JNEA	Vishay-Dale		
SH1, SH2, SH3, SH5, SH6, SH7, SH8, SH9, SH10, SH11, SH12, SH13, SH15, SH16, SH17, SH18, SH19, SH20, SH21, SH22, SH23, SH24, SH27, SH28, SH42, SH43, SH44, SH45, SH46, SH47, SH48, SH49	32	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
U1	1		Sirius Pin Controlled Low Voltage Stereo	VQFN24	TAA5242IRGER	Texas Instruments		
U3	1		500-mA, low-IQ, high-PSRR, dual-channel low-dropout (LDO) voltage regulator 10-WSON -40 to 125	WSON10	TLV751180330PDSQR	Texas Instruments		
U5	1		Approx. 7 Hz-36 kHz Analog Microphone MEMS (Silicon) Approx. 2.3 V-3.6 V Omnidirectional (-44dB ±0.5dB SPL) Solder Pads	LGA	SPH8878LR5H-1	Knowles	SPH1878LR5H-C	Knowles
C18, C19, C20, C21	0	47uF	CAP, TA, 47 uF, 10 V, +/- 10%, 0.5 ohm, SMD	3528-21	TPSB476K010R0500	AVX		
C22, C23, C24, C25	0	0.047uF	CAP, CERM, 0.047 uF, 50 V, +/- 10%, X7R, 0603	0603	C1608X7R1H473K080AA	TDK		

Table 4-3. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
FID1, FID2, FID3, FID4, FID5, FID6	0		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A		
J28, J29, J30, J49, J50, J75	0		Header, 100mil, 3x1, Gold, TH	3x1 Header	TSW-103-07-G-S	Samtec		
J31, J32, J33, J34, J36, J37, J52, J53, J78, J79	0		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
J35	0		AUDIO JACK 3.5mm 4COND, SMT	AUDIO JACK 3.5mm 4COND, SMT	SJ-43516-SMT-TR	CUI Inc.		
J38, J39	0		3.20mm ID, 9.00mm OD (RCA) Phono (RCA) Jack Mono Connector Solder	CONN_RCA_DUAL	RCJ-2223	CUI Devices		
J54, J55, J56, J57	0		Header, 2.54mm, 2x2, Gold, TH	Header, 2.54mm, 2x2, TH	PBC02DAAN	Sullins Connector Solutions		
OUT1M, OUT1P, OUT2M, OUT2P	0		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone		
R17, R18, R19, R20	0	100	RES, 100, 1%, 0.1 W, 0603	0603	RC0603FR-07100RL	Yageo		
R21, R24, R27, R30	0	16	RES, 16.0, 1%, 0.5 W, 0805	0805	ERJ-P06F16R0V	Panasonic		
R22, R25, R28, R31	0	604	RES, 604, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW0805604RFKEA	Vishay-Dale		
R23, R26, R29, R32	0		RES SMD 10K OHM 5% 0.4W 0805	0805	ESR10EZPJ103	Rohm Semiconductor		
R34, R36	0	48.7k	RES, 48.7 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080548K7FKEA	Vishay-Dale		
R35	0	21.5k	RES, 21.5 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080521K5FKEA	Vishay-Dale		
R37	0	9.76k	RES, 9.76 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW08059K76FKEA	Vishay-Dale		

Table 4-3. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
SH4, SH14, SH25, SH26, SH29, SH30, SH31, SH32, SH33, SH34, SH35, SH36, SH37, SH38, SH39, SH40, SH41, SH50	0	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
SW1	0		Dip Switch SPST 12 Position Through Hole Slide (Standard) Actuator 50 mA 24VDC	DIP24	206-12ST	CTS		

4.3.4 TAD5242 EVM Bill of Materials

Table 4-4. Bill of Materials

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
!PCB	1		Printed Circuit Board		LPA005	Any		
+1.8V, +3.3V, +5V, AVDD, DREG, IOVDD, IOVDD-MB, VREF	8		Test Point, Miniature, Red, TH	Red Miniature Testpoint	5000	Keystone Electronics		
BCLK, CLK_OUT, DAISY, DIN, DOUT, FSYNC, GPO, MD0, MD1, MD2, MD3, MD4, MD5	13		Test Point, Miniature, White, TH	White Miniature Testpoint	5002	Keystone Electronics		
C2	1	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X7R, 0603	0603	C1608X7R1V105K080AC	TDK		
C10, C12, C13	3	10uF	CAP, CERM, 10 µF, 16 V,+/- 10%, X7R, 0805	0805	EMK212BB7106KG-T	Taiyo Yuden		
C11, C14, C15, C28	4	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		
C17, C27, C29, C30	4	1uF	CAP, CERM, 1 uF, 16 V, +/- 10%, X7R, 0603	0603	8.85012E+11	Wurth Elektronik		
C18, C19, C20, C21	4	47uF	CAP, TA, 47 uF, 10 V, +/- 10%, 0.5 ohm, SMD	3528-21	TPSB476K010R0500	AVX		
D2	1	Green	LED, Green, SMD	LED_0805	LTST-C170KGKT	Lite-On		
FID1, FID2, FID3, FID4, FID5, FID6	6		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A		
GND1, GND2, GND3, GND4, GND5, GND6, GND7, GND8, GND9, GND10	10		Test Point, Miniature, Black, TH	Black Miniature Testpoint	5001	Keystone Electronics		
H1, H2	2		Small nylon hex nut, 0.10 thick with a 0.250 outside diameter and a 4-40 threading	Hex Nut,4-40 Thread, 250" Head Dia	9605	Keystone		
H3, H4	2		HEX STANDOFF 4-40 NYLON 3/4"	HEX STANDOFF 4-40 NYLON 3/4"	4804	Keystone		

Table 4-4. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
J8, J19, J31, J32, J33, J34, J36, J37, J52, J53, J59, J60, J61, J62, J78, J79	16		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
J24, J28, J29, J30, J49, J50, J71, J72, J74, J75, J76	11		Header, 100mil, 3x1, Gold, TH	3x1 Header	TSW-103-07-G-S	Samtec		
J35	1		AUDIO JACK 3.5mm 4COND, SMT	AUDIO JACK 3.5mm 4COND, SMT	SJ-43516-SMT-TR	CUI Inc.		
J38, J39	2		3.20mm ID, 9.00mm OD (RCA) Phono (RCA) Jack Mono Connector Solder	CONN_RCA_DUAL	RCJ-2223	CUI Devices		
J40	1		Connector, Header, High Speed, 20 pairs, SMT	QTE-020-01-X-D-A	QTE-020-01-L-D-A	Samtec		
J54, J55, J56, J57	4		Header, 2.54mm, 2x2, Gold, TH	Header, 2.54mm, 2x2, TH	PBC02DAAN	Sullins Connector Solutions		
J70	1		Header, 100mil, 5x2, Gold, TH	5x2 Header	TSW-105-07-G-D	Samtec		
J73	1		Header, 2.54mm, 3x2, Gold, TH	Header, 2.54mm, 3x2, TH	TSW-103-08-G-D	Samtec		
J77	1		Header, 100mil, 4x2, Gold, TH	4x2 Header	TSW-104-07-G-D	Samtec		
LBL1	1		Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll	PCB Label 0.650 x 0.200 inch	THT-14-423-10	Brady		
MICBIAS, OUT1M, OUT1P, OUT2M, OUT2P	5		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone		
R13, R14, R15, R16	4	0	RES, 0, 0%, 0.25 W, AEC-Q200 Grade 0, 0603	0603	RCS06030000Z0EA	Vishay-Dale		
R21, R24, R27, R30	4	16	RES, 16.0, 1%, 0.5 W, 0805	0805	ERJ-P06F16R0V	Panasonic		
R22, R25, R28, R31	4	604	RES, 604, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW0805604RFKEA	Vishay-Dale		
R23, R26, R29, R32	4		RES SMD 10K OHM 5% 0.4W 0805	0805	ESR10EZPJ103	Rohm Semiconductor		

Table 4-4. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
R38	1	442	RES, 442, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW0603442RFKEA	Vishay-Dale		
R70, R72	2	4.70k	RES, 4.70 k, 0.1%, 0.125 W, 0805	0805	RG2012P-472-B-T5	Susumu Co Ltd		
R71	1	22k	RES, 22 k, 5%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080522K0JNEA	Vishay-Dale		
SH1, SH2, SH3, SH4, SH14, SH15, SH25, SH26, SH27, SH28, SH29, SH30, SH31, SH32, SH33, SH34, SH35, SH36, SH37, SH38, SH39, SH40, SH41, SH42, SH43, SH44, SH45, SH46, SH47, SH48, SH49, SH50	32	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
SW1	1		Dip Switch SPST 12 Position Through Hole Slide (Standard) Actuator 50 mA 24VDC	DIP24	206-12ST	CTS		
U1	1		Epsilon Pin Controlled Stereo	VQFN24	TAD5242IRGER	Texas Instruments		
U3	1		500-mA, low-IQ, high-PSRR, dual-channel low-dropout (LDO) voltage regulator 10-WSON -40 to 125	WSON10	TLV751180330PDSQR	Texas Instruments		
C4, C5, C7, C8	0		CAP CER 10UF 16 V X5R 0603	0603 (1608 Metric)	C1608X5R1C106M080AB	TDK Corporation		
C22, C23, C24, C25	0	0.047uF	CAP, CERM, 0.047 uF, 50 V, +/- 10%, X7R, 0603	0603	C1608X7R1H473K080AA	TDK		
C34	0	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		
D1	0		28 V Clamp 25 A (8/20µs) Ipp Tvs Diode Surface Mount 8-SOIC	SOIC8	ITA18B1RL	STMicroelectronics		
IN1M, IN1P, IN2M, IN2P	0		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone		

Table 4-4. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
J2, J3	0		3.20mm ID, 9.00mm OD (RCA) Phono (RCA) Jack Mono Connector Solder	CONN_RCA_DUAL	RCJ-2223	CUI Devices		
J4, J5, J6, J7, J9, J11, J13, J15, J16, J17, J18, J20, J21, J22, J23, J46	0		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
J12, J14, J47, J48	0		Header, 100mil, 3x1, Gold, TH	3x1 Header	TSW-103-07-G-S	Samtec		
MK1	0		Microphone, Condenser, Analog, Omnidirectional, -42DB, TH	6 mm DIA	POM-2242P-C33-R	PUI Audio		
R1, R2, R3, R4	0	1.1k	RES, 1.1 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031K10JNEA	Vishay-Dale		
R5, R6, R7, R8	0	10.0k	RES, 10.0 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603FT10K0	Stackpole Electronics Inc		
R9, R10, R11, R12	0	0	RES, 0, 5%, 0.05 W, 0201	0201	CRCW02010000Z0ED	Vishay-Dale		
R17, R18, R19, R20	0	100	RES, 100, 1%, 0.1 W, 0603	0603	RC0603FR-07100RL	Yageo		
R34, R36	0	48.7k	RES, 48.7 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080548K7FKEA	Vishay-Dale		
R35	0	21.5k	RES, 21.5 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080521K5FKEA	Vishay-Dale		
R37	0	9.76k	RES, 9.76 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW08059K76FKEA	Vishay-Dale		
R43, R44	0	100 kΩ	Res POT Carbon Element 100kOhm 20% 1/20W/1/40W PC Pins Thru-Hole	PTH_POT_9MM50_24MM65	PTD902-2015F-B104	Bourns		
R45	0	10k	10k ±5% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Moisture Resistant Thick Film	0402	RC0402JR-1310KL	Yageo		

Table 4-4. Bill of Materials (continued)

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
SH5, SH6, SH7, SH8, SH9, SH10, SH11, SH12, SH13, SH16, SH17, SH18, SH19, SH20, SH21, SH22, SH23, SH24	0	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
U5	0		Approx. 7 Hz-36 kHz Analog Microphone MEMS (Silicon) Approx. 2.3 V-3.6 V Omnidirectional (-44dB ±0.5dB SPL) Solder Pads	LGA	SPH8878LR5H-1	Knowles		

4.3.5 TAD5142 EVM Bill of Materials

Table 4-5. Bill of Materials

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
!PCB	1		Printed Circuit Board		LPA005	Any		
+1.8V, +3.3V, +5V, AVDD, DREG, IOVDD, IOVDD-MB, VREF	8		Test Point, Miniature, Red, TH	Red Miniature Testpoint	5000	Keystone Electronics		
BCLK, CLK_OUT, DAISY, DIN, DOUT, FSYNC, GPO, MD0, MD1, MD2, MD3, MD4, MD5	13		Test Point, Miniature, White, TH	White Miniature Testpoint	5002	Keystone Electronics		
C2	1	1uF	CAP, CERM, 1 uF, 35 V, +/- 10%, X7R, 0603	0603	C1608X7R1V105K080AC	TDK		
C10, C12, C13	3	10uF	CAP, CERM, 10 µF, 16 V,+/- 10%, X7R, 0805	0805	EMK212BB7106KG-T	Taiyo Yuden		
C11, C14, C15, C28	4	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		
C17, C27, C29, C30	4	1uF	CAP, CERM, 1 uF, 16 V, +/- 10%, X7R, 0603	0603	8.85012E+11	Wurth Elektronik		
C18, C19, C20, C21	4	47uF	CAP, TA, 47 uF, 10 V, +/- 10%, 0.5 ohm, SMD	3528-21	TPSB476K010R0500	AVX		
D2	1	Green	LED, Green, SMD	LED_0805	LTST-C170KGKT	Lite-On		
FID1, FID2, FID3, FID4, FID5, FID6	6		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A		
GND1, GND2, GND3, GND4, GND5, GND6, GND7, GND8, GND9, GND10	10		Test Point, Miniature, Black, TH	Black Miniature Testpoint	5001	Keystone Electronics		

Table 4-5. Bill of Materials (continued)

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
H1, H2	2		Small nylon hex nut, 0.10 thick with a 0.250 outside diameter and a 4-40 threading	Hex Nut,4-40 Thread, 250" Head Dia	9605	Keystone		
H3, H4	2		HEX STANDOFF 4-40 NYLON 3/4"	HEX STANDOFF 4-40 NYLON 3/4"	4804	Keystone		
J8, J19, J31, J32, J33, J34, J36, J37, J52, J53, J59, J60, J61, J62, J78, J79	16		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
J24, J28, J29, J30, J49, J50, J71, J72, J74, J75, J76, J80	12		Header, 100mil, 3x1, Gold, TH	3x1 Header	TSW-103-07-G-S	Samtec		
J35	1		AUDIO JACK 3.5mm 4COND, SMT	AUDIO JACK 3.5mm 4COND, SMT	SJ-43516-SMT-TR	CUI Inc.		
J38, J39	2		3.20mm ID, 9.00mm OD (RCA) Phono (RCA) Jack Mono Connector Solder	CONN_RCA_DUAL	RCJ-2223	CUI Devices		
J40	1		Connector, Header, High Speed, 20 pairs, SMT	QTE-020-01-X-D-A	QTE-020-01-L-D-A	Samtec		
J54, J55, J56, J57	4		Header, 2.54mm, 2x2, Gold, TH	Header, 2.54mm, 2x2, TH	PBC02DAAN	Sullins Connector Solutions		
J70	1		Header, 100mil, 5x2, Gold, TH	5x2 Header	TSW-105-07-G-D	Samtec		
J73	1		Header, 2.54mm, 3x2, Gold, TH	Header, 2.54mm, 3x2, TH	TSW-103-08-G-D	Samtec		
J77	1		Header, 100mil, 4x2, Gold, TH	4x2 Header	TSW-104-07-G-D	Samtec		
LBL1	1		Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll	PCB Label 0.650 x 0.200 inch	THT-14-423-10	Brady		

Table 4-5. Bill of Materials (continued)

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
MICBIAS, OUT1M, OUT1P, OUT2M, OUT2P	5		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone		
R9, R10, R11, R12	4	0	RES, 0, 5%, 0.05 W, 0201	0201	CRCW02010000Z0ED	Vishay-Dale		
R13, R14, R15, R16	4	0	RES, 0, 0%, 0.25 W, AEC-Q200 Grade 0, 0603	0603	RCS06030000Z0EA	Vishay-Dale		
R21, R24, R27, R30	4	16	RES, 16.0, 1%, 0.5 W, 0805	0805	ERJ-P06F16R0V	Panasonic		
R22, R25, R28, R31	4	604	RES, 604, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW0805604RFKEA	Vishay-Dale		
R23, R26, R29, R32	4		RES SMD 10K OHM 5% 0.4W 0805	0805	ESR10EZPJ103	Rohm Semiconductor		
R38	1	442	RES, 442, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW0603442RFKEA	Vishay-Dale		
R70, R72	2	4.70k	RES, 4.70 k, 0.1%, 0.125 W, 0805	0805	RG2012P-472-B-T5	Susumu Co Ltd		
R71	1	22k	RES, 22 k, 5%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080522K0JNEA	Vishay-Dale		

Table 4-5. Bill of Materials (continued)

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
SH1, SH2, SH3, SH4, SH14, SH15, SH25, SH26, SH27, SH28, SH29, SH30, SH31, SH32, SH33, SH34, SH35, SH36, SH37, SH38, SH39, SH40, SH41, SH42, SH43, SH44, SH45, SH46, SH47, SH48, SH49, SH50, SH51	33	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
SW1	1		Dip Switch SPST 12 Position Through Hole Slide (Standard) Actuator 50 mA 24VDC	DIP24	206-12ST	CTS		
U1	1		Epsilon Pin Controlled Stereo	VQFN24	TAD5142IRGER	Texas Instruments		
U3	1		500-mA, low-IQ, high-PSRR, dual-channel low-dropout (LDO) voltage regulator 10-WSON -40 to 125	WSON10	TLV751180330PDSQR	Texas Instruments		
C4, C5, C7, C8	0		CAP CER 10UF 16 V X5R 0603	0603 (1608 Metric)	C1608X5R1C106M080AB	TDK Corporation		
C22, C23, C24, C25	0	0.047uF	CAP, CERM, 0.047 uF, 50 V, +/- 10%, X7R, 0603	0603	C1608X7R1H473K080AA	TDK		
C34	0	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	8.85012E+11	Wurth Elektronik		
D1	0		28 V Clamp 25 A (8/20µs) Ipp Tvs Diode Surface Mount 8-SOIC	SOIC8	ITA18B1RL	STMicroelectronics		
IN1M, IN1P, IN2M, IN2P	0		Test Point, Miniature, Green, TH	Green Miniature Testpoint	5116	Keystone		

Table 4-5. Bill of Materials (continued)

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
J2, J3	0		3.20mm ID, 9.00mm OD (RCA) Phono (RCA) Jack Mono Connector Solder	CONN_RCA_DUAL	RCJ-2223	CUI Devices		
J4, J5, J6, J7, J9, J11, J13, J15, J16, J17, J18, J20, J21, J22, J23, J46	0		Header, 100mil, 2x1, Gold, TH	2x1 Header	TSW-102-07-G-S	Samtec		
J12, J14, J47, J48	0		Header, 100mil, 3x1, Gold, TH	3x1 Header	TSW-103-07-G-S	Samtec		
MK1	0		Microphone, Condenser, Analog, Omnidirectional, -42DB, TH	6 mm DIA	POM-2242P-C33-R	PUI Audio		
R1, R2, R3, R4	0	1.1k	RES, 1.1 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031K10JNEA	Vishay-Dale		
R5, R6, R7, R8	0	10.0k	RES, 10.0 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	RMCF0603FT10K0	Stackpole Electronics Inc		
R17, R18, R19, R20	0	100	RES, 100, 1%, 0.1 W, 0603	0603	RC0603FR-07100RL	Yageo		
R34, R36	0	48.7k	RES, 48.7 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080548K7FKEA	Vishay-Dale		
R35	0	21.5k	RES, 21.5 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW080521K5FKEA	Vishay-Dale		
R37	0	9.76k	RES, 9.76 k, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW08059K76FKEA	Vishay-Dale		
R43, R44	0	100 kΩ	Res POT Carbon Element 100kOhm 20% 1/20W/1/40W PC Pins Thru-Hole	PTH_POT_9MM50_24MM65	PTD902-2015F-B104	Bourns		
R45	0	10k	10k ±5% 0.063W, 1/16W Chip Resistor 0402 (1005 Metric) Moisture Resistant Thick Film	0402	RC0402JR-1310KL	Yageo		

Table 4-5. Bill of Materials (continued)

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer	Alternate Part Number	Alternate Manufacturer
SH5, SH6, SH7, SH8, SH9, SH10, SH11, SH12, SH13, SH16, SH17, SH18, SH19, SH20, SH21, SH22, SH23, SH24	0	1x2	Shunt, 100mil, Gold plated, Black	Shunt	SNT-100-BK-G	Samtec	969102-0000-DA	3M
U5	0		Approx. 7 Hz - 36 kHz Analog Microphone MEMS (Silicon) Approx. 2.3 V - 3.6 V Omnidirectional (-44dB ±0.5dB SPL) Solder Pads	LGA	SPH8878LR5H-1	Knowles		

5 Additional Information

5.1 Trademarks

Audio Precision® is a registered trademark of Audio Precision, Inc.
All trademarks are the property of their respective owners.

6 References

Cable Reference

The following are cables that can be used for evaluation with external audio instrument like Audio Precision:

- BNC Male to RCA Male Cable
- RCA Speaker Cable with Banana Plugs

7 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision * (October 2023) to Revision A (December 2023)	Page
• Added TAD5142 variant to *TAx5x42 Hardware Control Family* table	2
• Added TAD5142 schematic	15
• Added TAD5142 PCB layout figures	25
• Added *Bill of Materials* table for TAD5142	48

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.

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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。

なお、本製品は、上記の「ご使用にあたっての注意」を譲渡先、移転先に通知しない限り、譲渡、移転できないものとします。

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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.

5. *Accuracy of Information:* To the extent TI provides information on the availability and function of EVMs, TI attempts to be as accurate as possible. However, TI does not warrant the accuracy of EVM descriptions, EVM availability or other information on its websites as accurate, complete, reliable, current, or error-free.

6. *Disclaimers:*

6.1 EXCEPT AS SET FORTH ABOVE, EVMS AND ANY MATERIALS PROVIDED WITH THE EVM (INCLUDING, BUT NOT LIMITED TO, REFERENCE DESIGNS AND THE DESIGN OF THE EVM ITSELF) ARE PROVIDED "AS IS" AND "WITH ALL FAULTS." TI DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, REGARDING SUCH ITEMS, INCLUDING BUT NOT LIMITED TO ANY EPIDEMIC FAILURE WARRANTY OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF ANY THIRD PARTY PATENTS, COPYRIGHTS, TRADE SECRETS OR OTHER INTELLECTUAL PROPERTY RIGHTS.

6.2 EXCEPT FOR THE LIMITED RIGHT TO USE THE EVM SET FORTH HEREIN, NOTHING IN THESE TERMS SHALL BE CONSTRUED AS GRANTING OR CONFERRING ANY RIGHTS BY LICENSE, PATENT, OR ANY OTHER INDUSTRIAL OR INTELLECTUAL PROPERTY RIGHT OF TI, ITS SUPPLIERS/LICENSORS OR ANY OTHER THIRD PARTY, TO USE THE EVM IN ANY FINISHED END-USER OR READY-TO-USE FINAL PRODUCT, OR FOR ANY INVENTION, DISCOVERY OR IMPROVEMENT, REGARDLESS OF WHEN MADE, CONCEIVED OR ACQUIRED.

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