

CP2114 EVALUATION KIT USER'S GUIDE

1. Kit Contents

The CP2114 Evaluation Kit is available in four configurations shown in Table 1:

Table 1. Evaluation Kits

Kit Name	Components
CP2114-EK	■ CP2114 evaluation board ■ USB cable ■ RS-232 serial cable
CP2114-CS42L55EK	■ CP2114 evaluation board ■ Daughter card with Cirrus Logic CS42L55 CODEC ■ Ear bud headphones ■ Audio cable (3.5 mm male to male) ■ USB Cable ■ RS-232 serial cable
CP2114-WM8523EK	■ CP2114 evaluation board ■ Daughter card with Wolfson Microelectronics WM8523 DAC ■ Ear bud headphones ■ USB Cable ■ RS-232 serial cable
CP2114-PCM1774EK	■ CP2114 evaluation board ■ Daughter card with Texas Instruments PCM1774 DAC ■ Ear bud headphones ■ USB Cable ■ RS-232 serial cable

This document applies to all CP2114 kits.

2. Software Setup

The example applications as well as additional documentation can be found here: www.silabs.com/CP2114

- AN721 Software (AN721SW)
 - USB and GPIO configuration utility: See AN721 for more information on customizing USB and GPIO settings.
 - Audio (DAC/CODEC) configuration utility: See Section 4 for more information using the DAC Configuration utility.
- CP2114 Data Sheet
- CP2114 Evaluation Kit User's Guide
- AN433: CP2110/4 HID-to-UART API Specification
- AN434: CP2110/4 Interface Specification
- CP2114 Quick Start Guide

3. CP2114 Hardware Interface

For information on using the CP2114, see the CP2114 Quick Start Guide, available at www.silabs.com/CP2114. Figure 1, Figure 2, Figure 3, and Figure 4 show each evaluation board as well as important features.

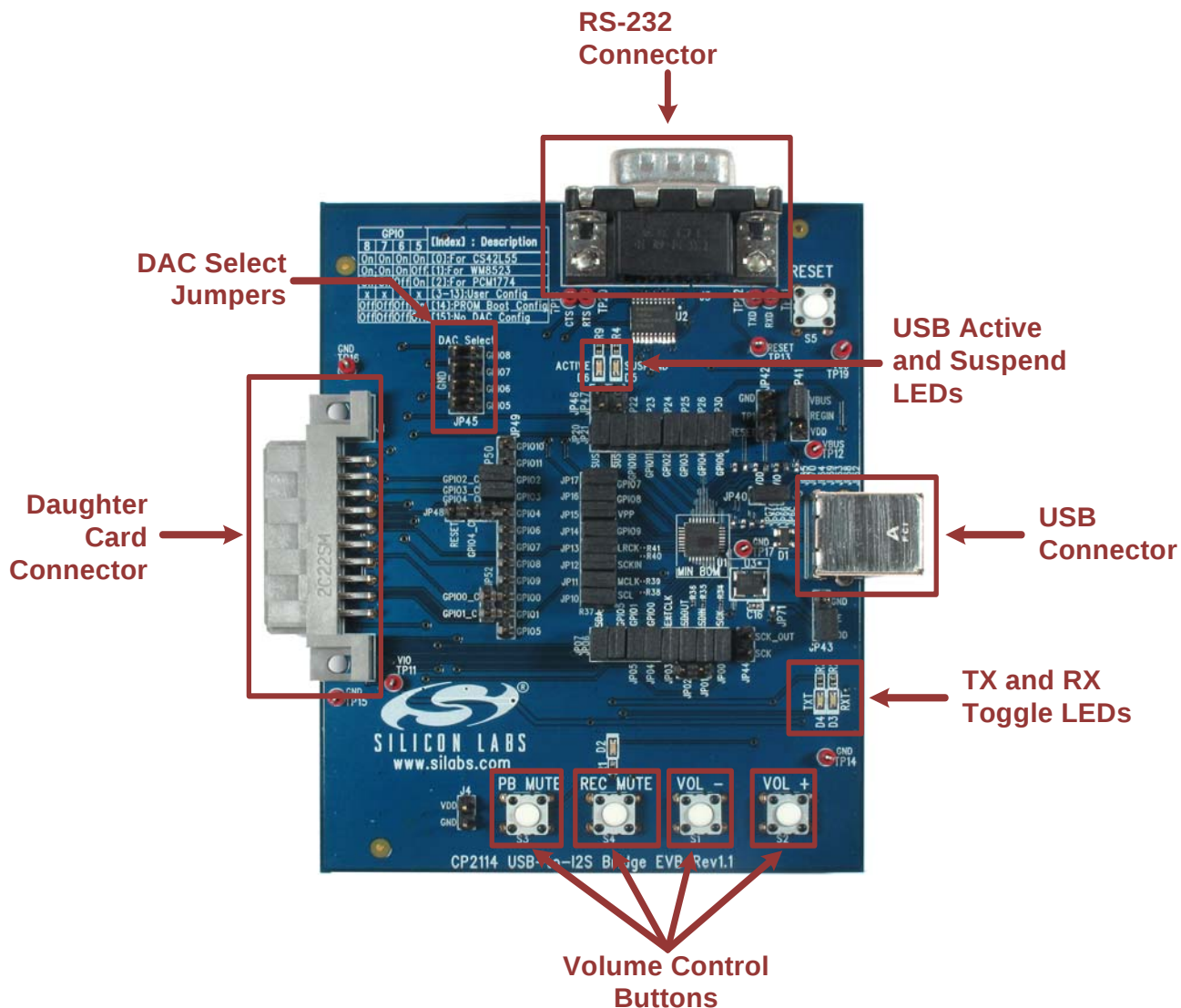


Figure 1. CP2114 Evaluation Board Features

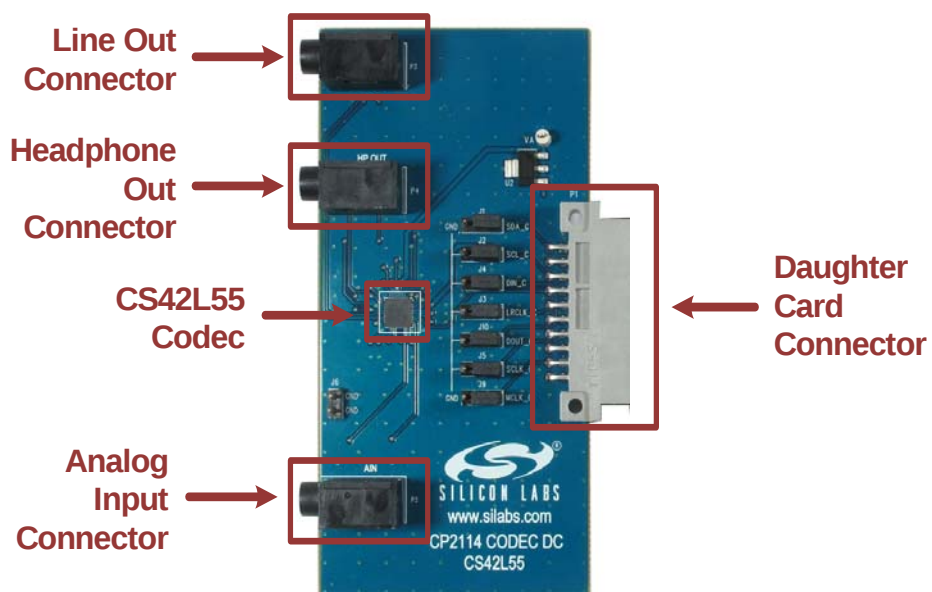


Figure 2. CS42L55 Daughter Card Features

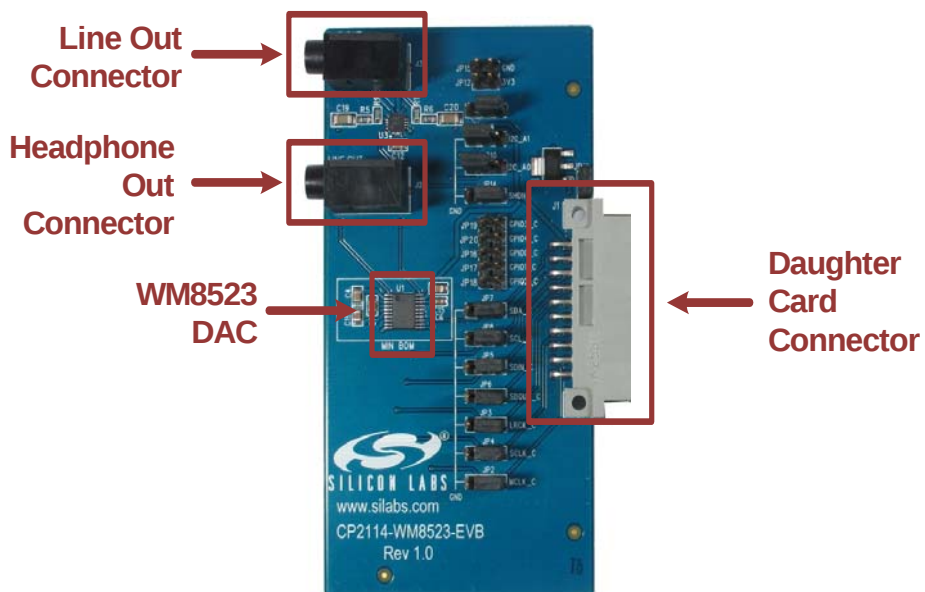


Figure 3. WM8523 Daughter Card Features

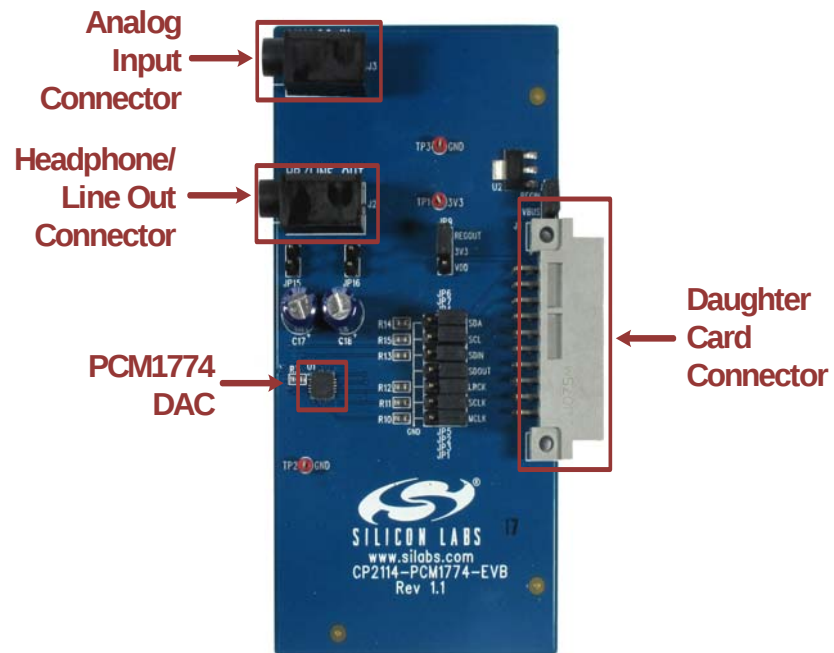


Figure 4. PCM1774 Daughter Card Features

4. DAC Configuration Application (AN721SW)

The DAC Configuration utility is an application within the AN721 software (AN721SW) package that allows audio configuration strings to be sent to the CP2114 one-time programmable memory or RAM. The audio string is used by the CP2114 to configure the DAC/CODEC. To access the DAC Configuration utility, run the AN721SW and connect to the CP2114 device.

After connecting to the device, select *Advanced Configuration*, then *DAC Configuration*. After this, the DAC Configuration utility shown in Figure 5 will appear. This AN721SW package is available at www.silabs.com/CP2114.

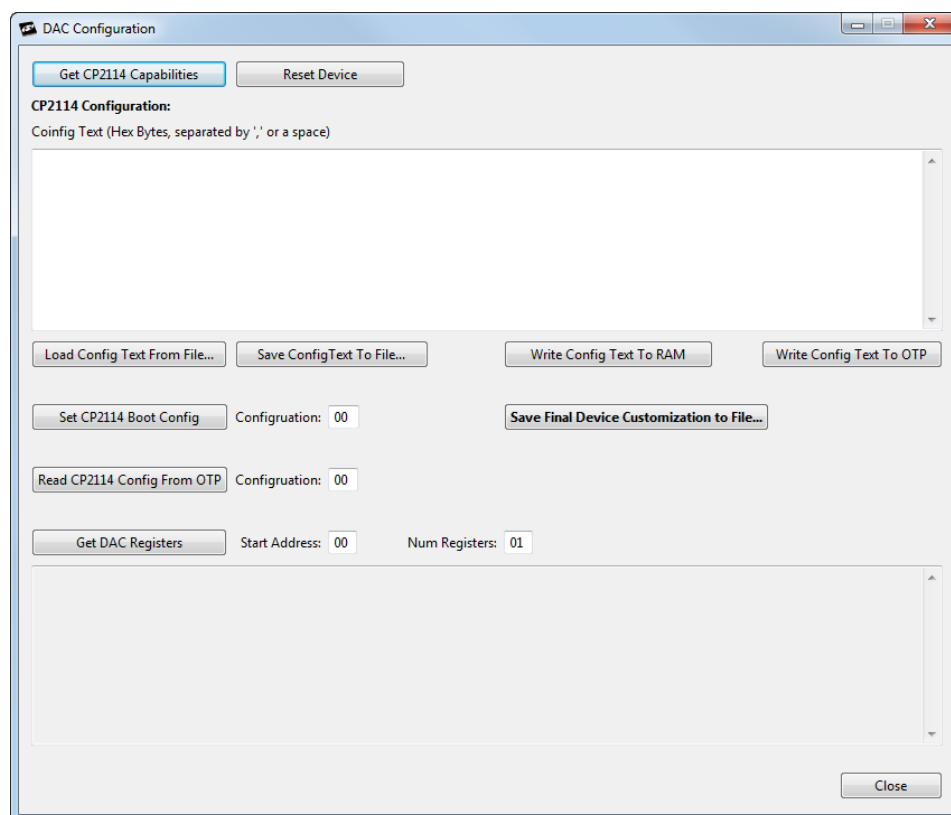


Figure 5. AN721: DAC Configuration

4.1. Application Command Descriptions

4.1.1. Get CP2114 Capabilities

This button will report the current configuration of the one-time programmable memory. With the default pin configuration and no jumpers installed on GPIO.5, GPIO.6, GPIO.7, or GPIO.8, the utility will display the following:

* *CP2114 Caps*

AvailableBootIndices: 0x20

AvailableOtpConfigs: 0x1D

CurrentBootConfig: 0xFF

AvailableOtpConfigSpace: 0x1532

The **AvailableBootIndices: 0x20** parameter indicates that all 32 boot index slots are available for programming.

The **AvailableOtpConfigs: 0x1D** parameter indicates that there are 29 CP2114 configurations available in the one-time programmable memory.

The CP2114 EVB ships with three default configurations in OTP at the following indices:

Index 0: Audio out and audio in streams both set to Asynchronous with CS42L55 DAC settings.

Index 1: Audio out and audio in streams both set to Asynchronous with WM8523 DAC settings.

Index 2: Audio out and audio in streams both set to Asynchronous with PCM1774 DAC settings.

The **CurrentBootConfig** parameter with a value of 0xFF indicates the CP2114 will not configure any DAC devices on a reset or boot. This occurs when

- DAC select input feature is turned on and no jumpers are installed on GPIO.5, GPIO.6, GPIO.7, and GPIO.8.
- DAC select input feature is turned on and the GPIO value is set to “Use OTP Boot Config” while no valid boot config entry is found in the one-time programmable memory.
- DAC select input feature is turned off and there is no valid Boot Config entry in the one-time programmable memory.

The CP2114 has 32 programmable boot configuration entries by default. (The CP2114 boot configuration can be changed up to a total of 32 times.)

The final parameter, **AvailableOtpConfigSpace: 0x1532** indicates there are 0x1532 (5426) bytes of programmable memory available to support new configurations.

4.1.2. Reset Device

This button forces a CP2114 reset.

4.1.3. Load Config Text from File

Loads configuration text from a file into the **Config Text** window.

4.1.4. Save Config Text to File

Saves the text in the **Config Text** window to a file.

4.1.5. Write Config Text to RAM

Writes the configuration displayed in the **Config Text** window into the CP2114 RAM. The DAC configurations are also written to the DAC. This operation will cause the CP2114 to disconnect and reconnect on the USB bus. This configuration is not retained on device reset.

4.1.6. Write Config Text to OTP

Writes the configuration in the **Config Text** window to the one-time programmable memory. The configuration does not become the active configuration in RAM unless it's specified in CP2114 Boot Config or via DAC select GPIO pins followed by power cycling or resetting the device.

4.1.7. Read CP2114 Config from OTP

After specifying the configuration number in the text box to the right of the button and clicking the button, the utility will display the one-time programmable memory configuration in the output window.

4.1.8. Set CP2114 Boot Config

After specifying the configuration number in the text box to the right of the button and clicking the button, the boot configuration index is programmed into the one-time programmable memory space.

Note: The CP2114 boot configuration index can be changed up to 32 times.

4.1.9. Get DAC Registers

Displays one or more DAC registers in the output window. To display a contiguous range of DAC registers enter the starting register address in the **Start Address** field and the number of registers to read in the **Num Registers** field. Click **Get DAC Registers** and the register values will be displayed in the status window as hex comma-separated values.

4.1.10. Save Final Device Customization to File

Save the final 5.5 kB of customized data into a file for one-time programming in production.

4.2. Using the Application

Use the following steps to program the CP2114 using the DAC configuration utility:

1. Click **Get CP2114 Capabilities** and note the boot index, available OTP boot index slots, and available OTP config space.
2. Click **Load Config Text from File** if there is one available; otherwise write the config text into the Config Text window directly.
3. Click **Write Config Text to RAM**. This will cause CP2114 to re-enumerate over USB. Once CP2114 device is seen by the Host again, verify the device's audio functionalities including volume control and mute control. Adjust the value in **Config Text** if necessary and repeat **Write Config Text to RAM** until desired result is achieved.
4. Verify the DAC registers have the desired setting by entering the **Start Address** and **Num Registers** and clicking **Get DAC Registers**.
5. Click **Save Config Text to File** to save a copy of the text in the **Config Text** window.
6. Click **Write Config Text to OTP** after all functionalities have been completely verified in RAM. The new config will consume one Boot Config index slot and some one-time programmable config space. The index of this new config should be the next available index. For example, if **Get CP2114 Capabilities** returned AvailableOtpConfigs of 0x1D, this Configuration index will be 3.
7. Enter the index of the new config and click **Read CP2114 Config from OTP**. Verify the data returned is as expected.
8. Click **Get CP2114 Capabilities** and verify the available OTP config space is (2+Config Data bytes) less than the previous value. The firmware inserts 2-byte length before the Config Data when writing to OTP. Available OTP Configs should be 1 less than the previous value.
9. Enter the Configuration index of the new Config and click **Set CP2114 Boot Config** to make CP2114 to boot from the new Config.
10. Reset the CP2114.
11. Verify CP2114 boots up properly with DAC functioning properly. Verify volume and mute integration with the Host. Click **Save Final Device Configuration to File** for OTP programming in production.

4.3. Audio Configuration String Format

The audio configuration string input format is comma or space-separated hex values (a combination of comma and space separation is not allowed). The CP2114 data sheet available at www.silabs.com/CP2114 discusses the audio configuration string in detail.

5. Evaluation Board Overview

5.1. CP2114-EB Overview

The CP2114 Evaluation Kit includes an evaluation board with a CP2114 device pre-installed for user evaluation and software development. Numerous input/output (I/O) connections are provided to facilitate prototyping using the evaluation board. Refer to Figure 6 for the locations of the various I/O connectors.

J1	Daughter card connector
J2	USB connector for USB interface
J3	DB9 connector for RS-232 interface
JP00-JP30	CP2114 pin connector
JP40	VIO power connector
JP41	REGIN Power Connector and Self-Powered Mode Connector
JP42	Test point connector
JP43	Si500 enable connector
JP44	SCKIN to SCK connector
JP45	DAC selection connector
JP46	Green USB <u>ACTIVE</u> LED connector
JP47	Red USB <u>SUSPEND</u> LED connector
JP48	Daughter card reset connector
JP49	CP2114 GPIO signal header
JP50, JP52	Daughter card GPIO signal header
D2	Red record mute LED
D3	Red receive toggle LED
D4	Red <u>transmit toggle</u> LED
D5	Red USB <u>SUSPEND</u> LED
D6	Green USB <u>ACTIVE</u> LED
SW1-SW4	Audio control buttons
SW5	Reset button

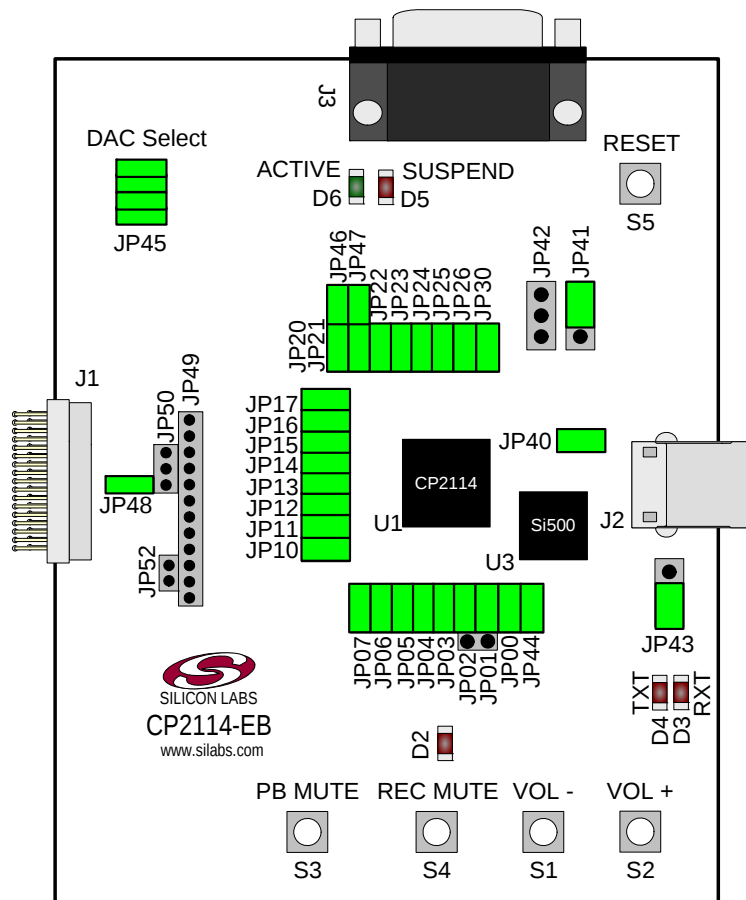


Figure 6. CP2114 Evaluation Board with Default Shorting Blocks Installed

5.1.1. Daughter Card Connector (J1)

The J1 connector is used to connect to a CP2114 daughter card.

5.1.2. Universal Serial Bus (USB) Interface (J2)

A Universal Serial Bus (USB) connector (J2) is provided to facilitate connections to the USB interface on the CP2114. See Table 2 for the USB pin definitions.

Table 2. USB Connector Pin Descriptions

Pin #	Description
1	VBUS
2	D-
3	D+
4	GND (Ground)

5.1.3. UART Signals (J3)

An RS-232 transceiver circuit and DB9 connector (J3) are provided on the evaluation board to connect the CP2114 to external serial devices. See Table 3 for the RS-232 J3 pin descriptions.

Table 3. RS-232 Pin Descriptions

Pin	Signal	CP2114 Direction	Description
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
5	GND		Ground
7	RTS	Output	Request to Send
8	CTS	Input	Clear to Send

5.1.4. CP2114 Pin Connectors (JP00-JP30)

The JP00-JP30 connectors connect and disconnect CP2114 pins from external circuits. By default, all of these jumpers are populated.

5.1.5. VIO Power Connector (JP40)

This header (JP40) is included on the evaluation board to provide VIO power options. Populating the shorting block connects the CP2114 VIO input (pin 6) to CP2114 VDD (pin 7). Remove the shorting block to power VIO from an external source and connect the power source to pin 2 of the header.

5.1.6. REGIN Power Connector and Self-Powered Mode Connector (JP41)

The JP41 header is used to connect the CP2114 REGIN pin (pin 8) to the VBUS source from the USB connector (default) or to the CP2114 VDD pin (pin 7). When connected to the VBUS source, the device is intended for bus-powered operation. When connected to the CP2114 VDD pin, the device is intended for self-powered operation. In self-powered operation, an external power source can be connected to the JP41 header to power the VDD pin directly.

5.1.7. Test Point Connector (JP42)

The JP42 header contains test points and is not used in normal operation.

5.1.8. Si500 Enable Connector (JP43)

The JP43 header controls the power to the Si500 CMOS clock. Shorting pin 1 to pin 2 on the header will connect CP2114 VDD (pin 7) to the Si500. Shorting pin 2 to pin 3 on the header will place the Si500 in powerdown mode. The setting of JP43 depends on the desired clocking mode.

5.1.9. SCK to SCKIN Connector (JP44)

The JP44 jumper should be left installed.

5.1.10. DAC Selection Connector (JP45)

The JP45 header is used to select the CP2114 boot configuration after a reset. When a jumper is populated, the corresponding GPIO pin is connected to ground. When a jumper is removed, the corresponding GPIO pin is weakly pulled high.

Note: If any of the four DAC select pins are configured for a function other than DAC selection, the CP2114 will not use the DAC select pins to choose a boot configuration.

5.1.11. Green USB ACTIVE LED and Connector (JP46, D6)

The JP46 header is used to connect the CP2114 SUSPEND pin (pin 18) to the D6 green LED. When the LED is on, the device has enumerated with the PC operating normally. When the LED is off, the device has not yet enumerated or is in the USB Suspend state.

5.1.12. Red USB SUSPEND LED and Connector (JP47, D5)

The JP47 header is used to connect the CP2114 SUSPEND pin (pin 17) to the D5 red LED. When the LED is on, the device has enumerated with the PC operating normally. When the LED is off, the device has not yet enumerated or is in the USB Suspend state.

5.1.13. Daughter Card Reset Connector (JP48)

The JP48 header connects reset to the GPIO4_C pin on the daughter card connector (J1). On the CS42L55 daughter card, GPIO4_C is connected to the CS42L55 RESET pin. The GPIO4_C pin is unconnected on the WM8523 and PCM1774 daughter cards because the DACs do not have a hardware reset input.

5.1.14. CP2114 GPIO Signal Connector (JP49)

The connector JP49 provides easy access to all of the CP2114 GPIO signals.

5.1.15. Daughter Card Signal Header (JP50, JP52)

The headers JP50 and JP52 allow the connection of GPIO0-4 signals to the corresponding daughter card signals (GPIOx_C). These jumpers can be used to route the appropriate GPIO signals to a custom daughter card.

5.1.16. Audio Control Buttons and Red Record Mute LED (SW1-SW4, D2)

SW1 through SW4 send audio control commands when pressed. In addition, the red record mute LED (D2) will turn on when the record mute button is pressed (SW4).

Table 4. Audio Control Buttons

LED	Pins
S1	Volume –
S2	Volume +
S3	Playback Mute
S4	Record Mute

5.1.17. Red Receive Toggle and Transmit Toggle LEDs (D3, D4)

The LEDs D3 and D4 will toggle when transmitting and receiving UART data. In order to use this functionality, the GPIO pins must first be configured for TX Toggle and RX Toggle modes. By default, these pins are used for DAC select 0 and DAC select 1.

5.1.18. Reset Button (SW5)

SW5 externally pulls the CP2114 reset pin (pin 10) low when pressed. If SW5 is held down, the CP2114 will remain in reset until the button is released.

5.2. CS42L55-EB Overview

The CS42L55 evaluation board contains a pre-installed CS42L55 for evaluation and preliminary software development with the CP2114 evaluation board. Refer to Figure 7 for the locations of the various I/O connectors on the CS42L55-EB.

P1	Daughter card connector
P2	Analog input connector
P3	Line output connector
P4	Headphone output connector
J1-J5	I2S/I2C signal connectors
J9, J10	I2S/I2C signal connectors

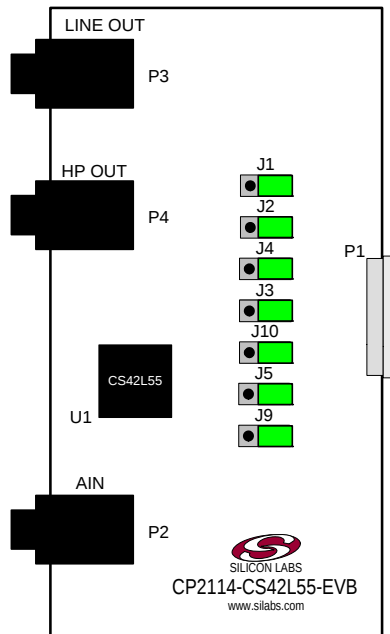


Figure 7. CS42L55 Evaluation Board with Default Shorting Blocks Installed

5.2.1. Daughter Card Connector (P1)

The P1 connector is used to connect to a CP2114 evaluation board (CP2114-EB). The CS42L55-EB must be plugged into a CP2114 evaluation board to function properly.

5.2.2. Analog Input Connector (P2)

The P2 connector is used to connect an input device to the CS42L55 evaluation board.

5.2.3. Line Output Connector (P3)

The P3 connector is used to connect powered speakers to the CS42L55 evaluation board.

5.2.4. Headphone Output Connector (P4)

The P4 connector is used to connect headphones to the CS42L55 evaluation board.

5.2.5. I2S/I2C Signal Connectors (JP1-JP5, JP9, JP10)

Connectors JP1 through JP7, JP9, and JP10 are provided to allow access to the I2S/I2C signals between the CP2114 and CS42L55. Placing a shorting block between pins 1 and 2 will connect the CP2114 to the CS42L55. Placing a shorting block between pins 2 and 3 will connect the corresponding CS42L55 pin to ground. When monitoring the I2S signals, connect the scope probe ground lead to the adjacent ground pin.

5.3. WM8523-EB Overview

The WM8523 evaluation board contains a pre-installed WM8523 for evaluation and preliminary software development with the CP2114 evaluation board. Refer to Figure 8 for the locations of the various I/O connectors on the WM8523-EB.

J1	Daughter card connector
J2	Line output connector
J3	Headphone output connector
JP2-JP10	I2S and I2C signal connectors
JP11	Voltage regulator input connector
JP12	WM8523 supply voltage header
JP13	WM8523 supply voltage connector
JP14	Headphone amplifier SHDN header
JP15	Ground header
JP16-JP20	GPIO header for SHDN control

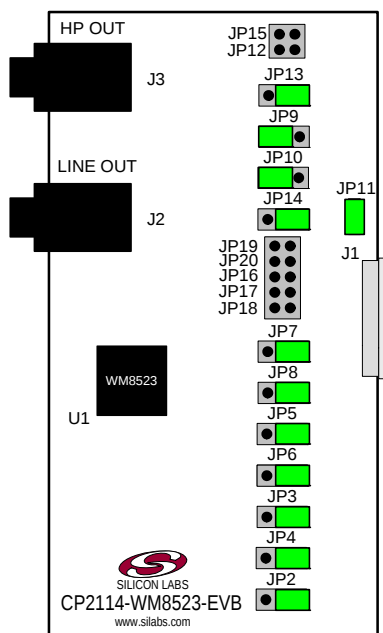


Figure 8. WM8523 Evaluation Board with Default Shorting Blocks Installed

5.3.1. Daughter Card Connector (J1)

The J1 connector is used to connect to a CP2114 evaluation board (CP2114-EB). The WM8523-EB must be plugged into a CP2114 evaluation board to function properly.

5.3.2. Line Output Connector (J2)

The J2 connector is used to connect powered speakers to the WM8523 evaluation board.

5.3.3. Headphone Output Connector (J3)

The J3 connector is used to connect headphones to the WM8523 evaluation board.

5.3.4. I2S/I2C Signal Connectors (JP2-JP10)

Connectors JP2 through JP10 are provided to allow access to the I2S/I2C signals between the CP2114 and WM8523. Placing a shorting block between pins 1 and 2 will connect the CP2114 to the WM8523. Placing a shorting block between pins 2 and 3 will connect the corresponding WM8523 pin to ground. When monitoring the I2S signals, connect the scope probe ground lead to the adjacent ground pin.

5.3.5. Voltage Regulator Connector (JP11)

The JP11 connector is used to connect the VBUS signal being supplied to the CP2114 to the input of the voltage regulator on the WM8253 evaluation board. Installing this jumper connects the VBUS signal to the regulator output. If another voltage supply is used, JP11 should be removed and the supply should be connected to pin 2 of the header.

5.3.6. WM8253 Supply Voltage Header (JP12)

The JP12 header provides access to the WM8253 supply voltage.

5.3.7. WM8253 Supply Voltage Connector (JP13)

This header (JP13) is included on the evaluation board to provide several power options for the WM8253. The following describes the function of each pin:

- Shorting pins 1,2: Connects the regulator output on the WM8253-EB to the supply of the WM8253.
- Shorting pins 2,3: Connects the CP2114 VDD (CP2114 pin 7) to the supply of the WM8253.

5.3.8. Headphone Amplifier SHDN Header (JP14, JP16–JP20)

The jumpers JP14 and JP16-JP20 control the headphone amplifier shutdown (SHDN) pin. The headphone amplifier is enabled when SHDN is high and disabled when SHDN is low. In the default configuration (jumper shorting pins 1 and 2), the headphone amp is always enabled. Shorting pins 2 and 3 on JP14 will disable the headphone amplifier. Removing JP14 and connecting one of JP16-JP20 allows the host to control the headphone amp via GPIO pin. In this case, the corresponding GPIO-GPIO_C jumper must also be installed on the CP2114-EK board.

5.3.9. Ground Header (JP15)

The JP15 header provides access to ground.

5.4. PCM1774-EB Overview

The PCM1774 evaluation board includes contains a pre-installed a PCM1774 for evaluation and preliminary software development with the CP2114 evaluation board. Refer to Figure 9 for the locations of the various I/O connectors on the PCM1774-EB.

J1	Daughter card connector
J2	Headphone/line output connector
J3	Analog input connector
JP1-JP7	I2S signal connectors
JP8	Voltage regulator connector
JP9	PCM1774 supply voltage connector
JP15, JP16	External capacitor connectors

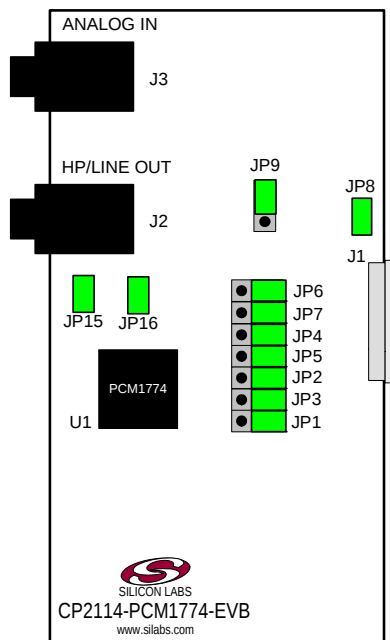


Figure 9. PCM1774 Evaluation Board with Default Shorting Blocks Installed

5.4.1. Daughter Card Connector (J1)

The J1 connector is used to connect to a CP2114 evaluation board (CP2114-EB). The PCM1774-EB must be plugged into a CP2114 evaluation board to function properly.

5.4.2. Headphone/Line Output Connector (J2)

The J2 connector is used to connect headphones or powered speakers to the PCM1774 evaluation board.

5.4.3. Analog Input Connector (J3)

The J3 connector is used to connect an input device to the PCM1774 evaluation board.

5.4.4. I2S/I2C Signal Connectors (JP1–JP7)

Connectors JP1 through JP7 are provided to allow access to the I2S/I2C signals between the CP2114 and PCM1774. Placing a shorting block between pins 1 and 2 will connect the CP2114 to the PCM1774. Placing a shorting block between pins 2 and 3 will connect the corresponding PCM1774 pin to ground. When monitoring the I2S signals, connect the scope probe ground lead to the adjacent ground pin.

5.4.5. Voltage Regulator Connector (JP8)

The JP8 connector is used to connect the VBUS signal being supplied to the CP2114 to the input of the voltage regulator on the PCM1774 evaluation board. Installing this jumper connects the VBUS signal to the regulator output. If another voltage supply is used, JP8 should be removed and the supply should be connected to pin 2 of the header.

5.4.6. PCM1774 Supply Voltage Connector (JP9)

This header (JP9) is included on the evaluation board to provide several power options for the PCM1774. The following describes the function of each pin:

- Shorting pins 1,2: Connects the regulator output on the PCM1774-EB to the supply of the PCM1774.
- Shorting pins 2,3: Connects the CP2114 VDD (CP2114 pin 7) to the supply of the PCM1774.

5.4.7. External Capacitor Connectors (JP15, JP16)

The JP15 and JP16 connectors allow external capacitors to be connected to the HP/LINE OUT connector. For best low frequency response (35 Hz cutoff), remove the jumpers on JP15 and JP16. For maximum power output (45 Hz cutoff), place the jumpers on JP15 and JP16.

6. Schematics

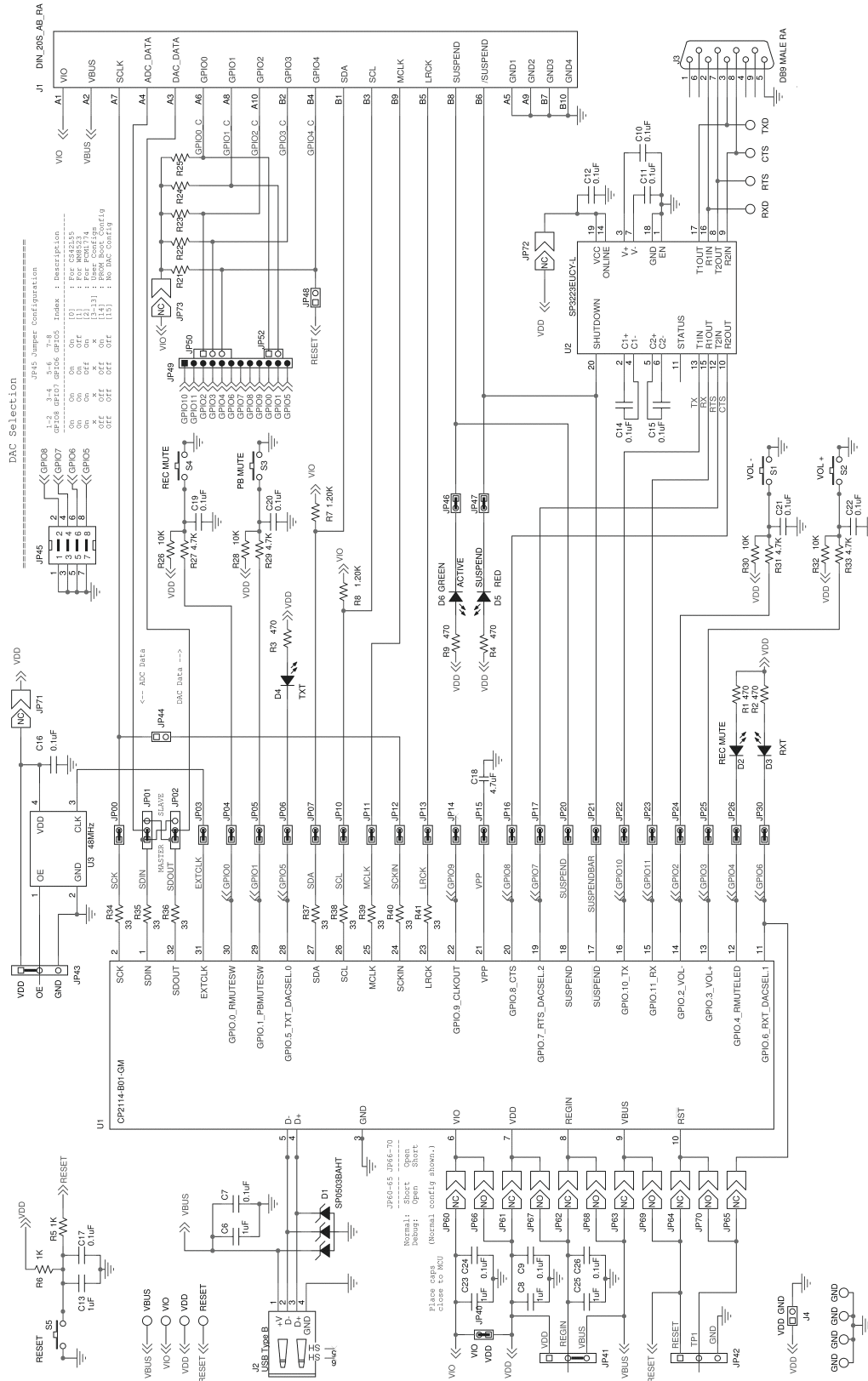


Figure 10. CP2114 Evaluation Board Schematic

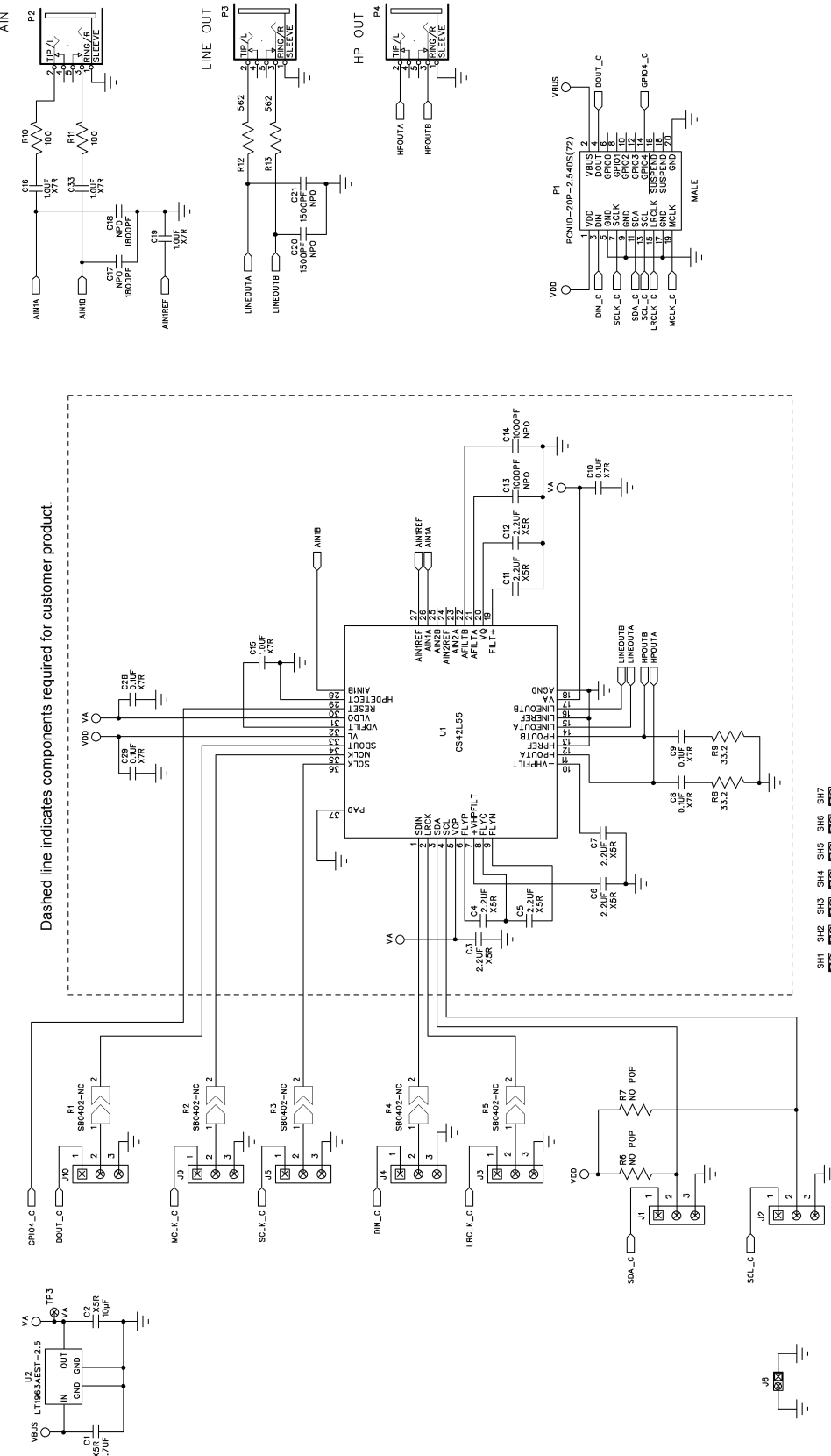


Figure 11. CS42L55 Evaluation Board Schematic

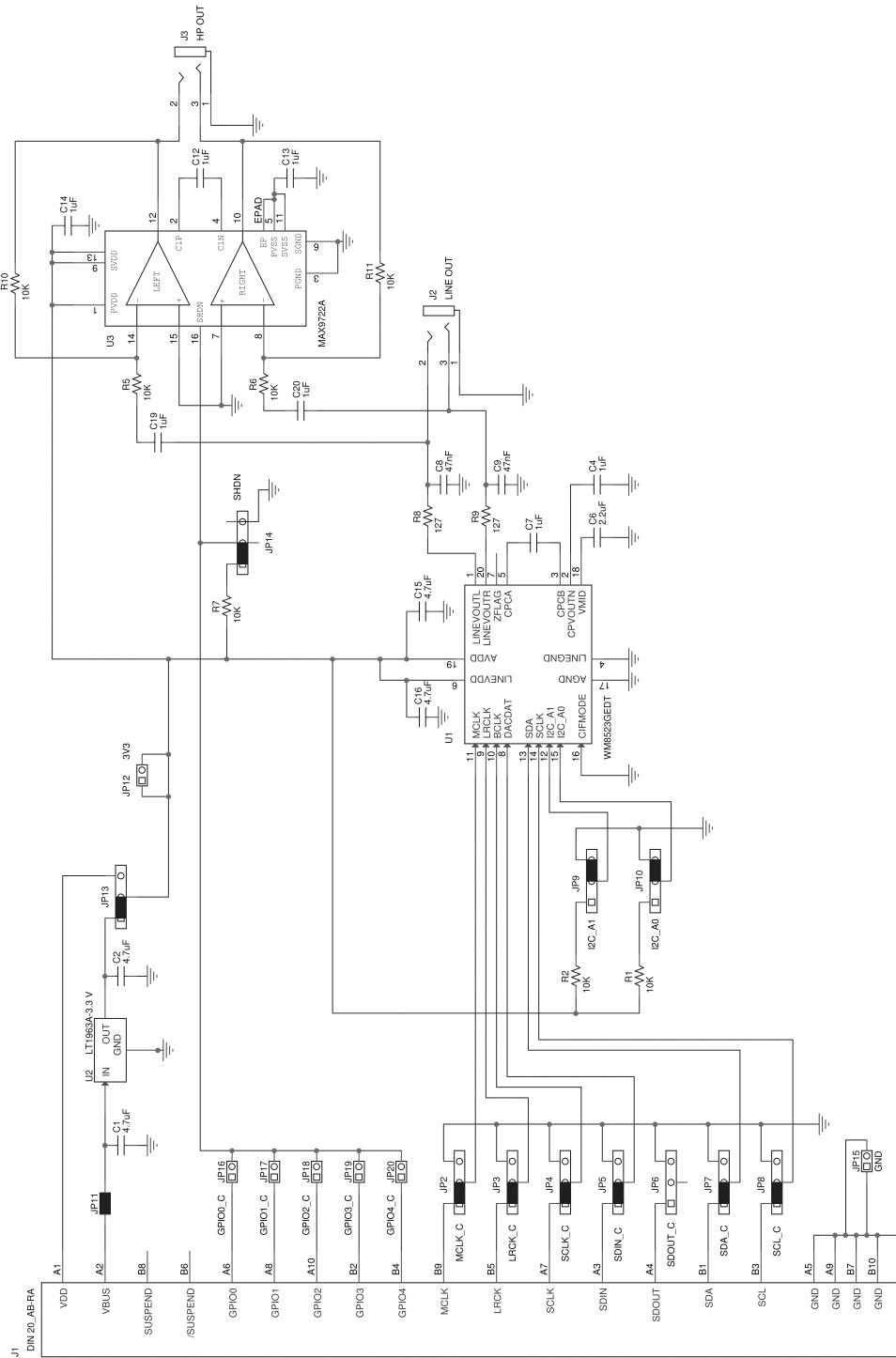


Figure 12. WM8523 Evaluation Board Schematic

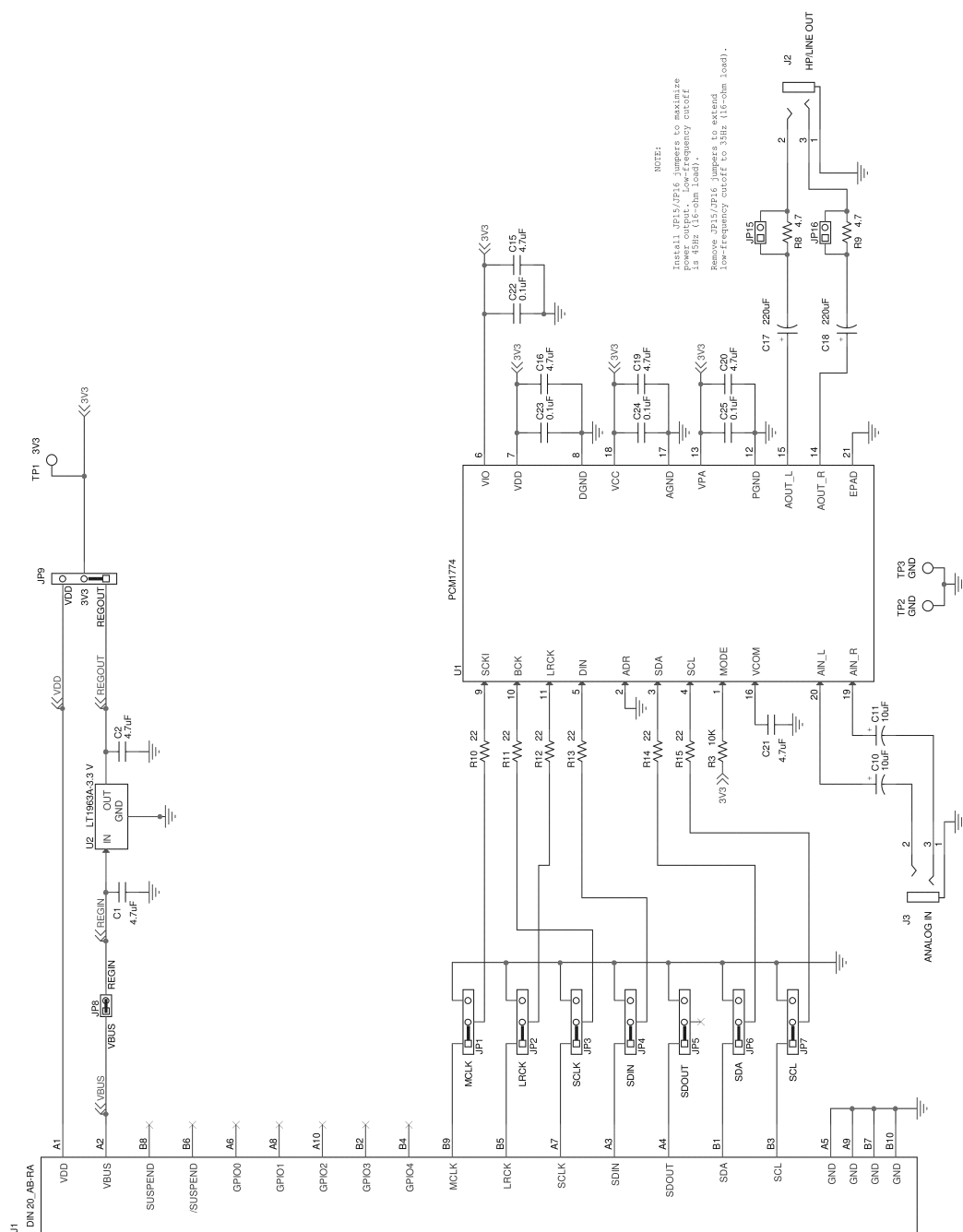


Figure 13. PCM1774 Evaluation Board Schematic

7. Bill of Materials

Table 5. CP2114 Evaluation Board (CP2114-EB) Bill of Materials

Reference	Part Number	Source	Description
C18	C0603X5R6R3-475K	Venkel	4.7 μ F 6.3 V $\pm$ 10% X5R 0603
C19 C20 C21 C22	C0603X7R250-104K	Venkel	0.1 μ F 25 V $\pm$ 10% X7R 0603
C6 C8 C13 C23 C25	C0603X5R160-105K	Venkel	1 μ F 16 V $\pm$ 10% X5R 0603
C7 C9 C10 C11 C12 C14 C15 C16 C17 C24 C26	C0402X7R160-104K	Venkel	0.1 μ F 16 V $\pm$ 10% X7R 0402
D1	SP0503BAHTG	Littlefuse	300 mW 20 V TVS SOT143-AK
D2 D3 D4 D5	SML-LX0603IW	Lumex Inc.	RED 30 mA LED 0603
D6	SML-LX0603GW	Lumex Inc.	GREEN 25 mA LED 0603
J1	PCN10C-20S-2.54DS(72)	Hirose Electric Co Ltd	CONN, DIN HEADER, 20POS, DUAL R/A, FEMALE
J2	292304-1	Tyco	USB Type B Connector
J3	D09P33E4GX00LF	FCI	DB9 MALE RA D-SUB
J4 JP00 JP03 JP04 JP05 JP06 JP07 JP10 JP11 JP12 JP13 JP14 JP15 JP16 JP17 JP20 JP21 JP22 JP23 JP24 JP25 JP26 JP30 JP40 JP44 JP46 JP47 JP48 JP52	TSW-102-07-T-S	Samtec	JUMPER Header CONN1X2
JP01 JP02 JP41 JP42 JP43 JP50	TSW-103-07-T-S	Samtec	JUMPER Header CONN1X3
JP45	TSW-104-07-T-D	Samtec	JUMPER Header CONN4x2
JP49	TSW-112-07-T-S	Samtec	JUMPER Header CONN1x12

Table 5. CP2114 Evaluation Board (CP2114-EB) Bill of Materials

Reference	Part Number	Source	Description
JS1 JS2 JS3 JS4 JS5 JS6 JS7 JS8 JS9 JS10 JS11 JS12 JS13 JS14 JS15 JS16 JS17 JS18 JS19 JS20 JS21 JS22 JS23 JS24 JS30 JS32 JS33 JS35 JS37 JS38 JS39 JS40 JS41	SNT-100-BK-T	Samtec	Jumper Shunt
R1 R2 R3 R4 R9	CR0402-16W-471J	Venkel	470 1/16 W ±5% ThickFilm 0402
R21 R22 R23 R24 R25 R26 R28 R30 R32	CR0603-10W-103J	Venkel	10K 1/10 W ±5% ThickFilm 0603
R27 R29 R31 R33	CR0603-10W-472J	Venkel	4.7K 1/10 W ±5% ThickFilm 0603
R34 R35 R36 R37 R38 R39 R40 R41	CR0201-20W-33R0F	Venkel	33 1/20 W ±1% ThickFilm 0201
R5 R6	CR0603-16W-102J	Venkel	1K 1/16 W ±5% ThickFilm 0603
R7 R8	CR0603-10W-1201F	Venkel	1.20K 1/10 W ±1% ThickFilm 0603
S1 S2 S3 S4 S5	EVQ-PAD04M	Panasonic Corp	Momentary Tactile Switch SW4N6.5X4.5
TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22	151-207-RC	Kobiconn	RED Loop Testpoint
U1	CP2114-B01-GM	Silicon Laboratories	CP2114 USB Audio to Digital Audio Bridge QFN32N5X5P0.5
U2	SP3223EUCY-L	Exar Corporation	RS232 Transceiver TSSOP20N6.4P0.65
U3	500SAAC48M0000ACF	SiLabs	48 MHz 3.3 V CMOS ±150PPM Si500S OSC4N3.2X4.0

Table 6. Cirrus Logic CS42L55 Evaluation Board (CS42L55-EB) Bill of Materials

Reference	Part Number	Source	Description
C8-10 C28-29	C0603C104J3RACTU	Kemet	CAP, 0.1 μ F, X7R, CERAMIC, 0603, 25 V, $\pm$ 5%, OR EQ, RoHS.
C15-16 C19 C33	C1608X7R1C105K	TDK Corporation	CAP CERAMIC, 1.0 μ F, X7R, 0603, 16 V, $\pm$ 10%, OR EQ, RoHS.
C13-14	CC0805JRNPO9BN102	Yageo	CAP CERAMIC, 1000 pF, NPO, 0805, 50 V, $\pm$ 5%, OR EQ, RoHS.
C2	EMK212BJ106KG-T	Taiyo Yuden	CAP, CER, 10 μ F, 16V, X5R, 0805 OR EQ, RoHS
C20-21	ECJ-2VC1H152J	Panasonic Electronic Components	CAP, 1500 pF, NP0, CERAMIC, 0805, 50 V, $\pm$ 5%, OR EQ, RoHS.
C17-18	GRM2165C1H182JA01D	Murata Electronics North America	CAP, 1800 pF, NP0, CERAMIC, 0805, 50 V, $\pm$ 5%, OR EQ, RoHS.
C3-7 C11-12	GRM188R61C225KE15D	Murata Electronics North America	CAP, 2.2 μ F, CERAMIC, 16 V, X5R, 0603, $\pm$ 10%, OR EQ, RoHS.
C1	EMK212BJ475KG-T	Taiyo Yuden	CAP, CER, 4.7 μ F, 16 V, 10%, X5R, 0805 OR EQ, RoHS.
P1	PCN10-20P-2.54DS(72)	Hirose Electric Co Ltd	CONN, DIN HEADER, 20POS, DUAL R/A, MALE, RoHS.
U1	CS42L55-CNZ	Cirrus Logic Inc	STEREO CODEC, QFN36-5X5 mm, RoHS.
J6	PBC02SAAN	Sullins Connector Solutions	STAKE HEADER, 1X2, 0.1" CTR, GOLD, OR EQ, RoHS.
J1-5 J9-10	PBC03SAAN	Sullins Connector Solutions	STAKE HEADER, 1X3, 0.1" CTRS, OR EQ, RoHS.
U2	LT1963AEST-2.5	Linear Technology	LDO REG, 2.5 V, 1.5 A, SOT223
R10-11	ERJ-3EKF1000V	Panasonic Electronic Components	RES, 100 OHM, SMT, 0603, 1/10 W, $\pm$ 1%, OR EQ, RoHS.
R8-9	RT0805FRE0733R2L	Yageo	RES, 33.2 OHM, SMT, 0805, 1/8 W, $\pm$ 1%, OR EQ, RoHS.
R12-13	ERJ-6ENF5620V	Panasonic Electronic Components	RES, 562 OHM, SMT, 0805, 1/8 W, $\pm$ 1%, OR EQ, RoHS.
R1-5	N/A		SOLDER BUMP JUMPER, NC, 0402
SH1-7	SPC02SYAN	Sullins Connector Solutions	CONN, JUMPER SHORTING, TIN, OR EQ, RoHS.
SF1-4	SJ61A6	3M	BUMPON PROTECTIVE, BUMPER, SILICONE, OR EQ, RoHS.
P2-4	SJ1-3535NG	CUI Inc	CONN, JACK STEREO, 3 POS, 3.5 MM, PTH, RoHS.
TP3	5002	Keystone Electronics	TEST POINT, PC COMPACT, .063"D WHITE, OR EQ, RoHS.
Components Not Installed (NI)			
R6-7			RES, SMT, 0603, OR EQ, RoHS. (NI)

Table 7. Wolfson Microelectronics WM8523 Evaluation Board (WM8523-EB) Bill of Materials

Reference	Part Number	Source	Description
C1 C2 C15 C16	C0805X5R160-475K	Venkel	4.7 μ F 16 V $\pm$ 10% X5R 0805
C19 C20	C1206X7R250-105K	Venkel	1 μ F 25 V $\pm$ 10% X7R 1206
C4 C7 C12 C13 C14	C0805X7R160-105M	Venkel	1 μ F 16 V $\pm$ 20% X7R 0805
C6	C0603X7R100-225K	Venkel	2.2 μ F 10 V $\pm$ 10% X7R 0603
C8 C9	C1206C0G500-473J	Venkel	47 nF 50 V $\pm$ 5% COG 1206
J1	PCN10-20P-2.54DS(72)	Hirose Electric Co Ltd	CONN, DIN HEADER, 20POS, DUAL R/A, MALE, RoHS.
J2 J3	SJ1-3535NG	CUI	Audio Jack
JP11 JP12 JP15 JP16 JP17 JP18 JP19 JP20	TSW-102-07-T-S	Samtec	JUMPER Header CONN1X2
JP2 JP3 JP4 JP5 JP6 JP7 JP8 JP9 JP10 JP13 JP14	TSW-103-07-T-S	Samtec	JUMPER Header CONN1X3
JS1 JS2 JS3 JS4 JS5 JS6 JS7 JS8 JS9 JS10 JS11	SNT-100-BK-T	Samtec	Jumper Shunt
R1 R2 R5 R6 R7 R10 R11	CR0603-10W-1002F	Venkel	10K 1/10 W $\pm$ 1% ThickFilm 0603
R8 R9	CR0603-10W-1270F	Venkel	127 1/10 W $\pm$ 1% ThickFilm 0603
SF1 SF2 SF3 SF4	SJ61A6	3M	BUMPON PROTECTIVE, BUMPER , SILI- CONE, OR EQ, RoHS.
U1	WM8523GEDT	Wolfson Microelectronics	WM8523GEDT DAC TSSOP20N6.4P0.65
U2	LT1963AEST-3.3#PBF	Linear Technologies	3.3 V 1.5 A max LDO SOT223
U3	MAX9722AETE	Maxim	130 mW 2.4 V-5.5 V AMPLIFIER QFN16N3X3P0.5E

Table 8. Texas Instruments PCM1774 Evaluation Board (PCM1774-EB) Bill of Materials

Reference	Part Number	Source	Description
C1 C2 C15 C16 C19 C20 C21	C0805X5R160-475K	Venkel	4.7 μ F 16 V $\pm$ 10% X5R 0805
C10 C11	TA016TCM106KA	Venkel	10 μ F 16 V $\pm$ 10% TANT C3216
C17 C18	ECA1CM221	Panasonic	220 μ F 16 V $\pm$ 20% Alum_Elec C2.5X6.3 MM
C22 C23 C24 C25	C0603X7R250-104K	Venkel	0.1 μ F 25 V $\pm$ 10% X7R 0603
J1	PCN10-20P-2.54DS(72)	Hirose Electric Co Ltd	CONN, DIN HEADER, 20POS, DUAL R/A, MALE, RoHS.
J2 J3	SJ1-3535NG	CUI	Audio Jack
JP1 JP2 JP3 JP4 JP5 JP6 JP7 JP9	TSW-103-07-T-S	Samtec	JUMPER Header CONN1X3
JP8 JP15 JP16	TSW-102-07-T-S	Samtec	JUMPER Header CONN1X2
JS1 JS3 JS4 JS6 JS7 JS9 JS10 JS11 JS12	SNT-100-BK-T	Samtec	Jumper Shunt
R10 R11 R12 R13 R14 R15	CR0603-16W-22R0F	Venkel	22 1/16 W $\pm$ 1% ThickFilm 0603
R3	CR0603-10W-1002F	Venkel	10K 1/10 W $\pm$ 1% ThickFilm 0603
R8 R9	CR0805-10W-4R7J	Venkel	4.7 1/10 W $\pm$ 5% ThickFilm 0805
SF1 SF2 SF3 SF4	SJ61A6	3M	BUMPON PROTECTIVE, BUMPER , SILI- CONE, OR EQ, RoHS.
TP1 TP2 TP3	151-207-RC	Kobiconn	RED Loop Testpoint
U1	PCM1774RGP	Texas Instruments	PCM1774 DAC QFN20N4X4P0.5
U2	LT1963AEST-3.3#PBF	Linear Technologies	3.3 V 1.5 A max LDO SOT223

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