![Texas Instruments logo]

PCM5242EVM User's Guide

This user's guide describes the PCM5242EVM, an exceptionally high-performance PCM DAC. A system overview, hardware and software descriptions, schematics, bill of materials (BOM), and the printed-circuit board (PCB) layouts are included in this user's guide.

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1   Introduction

The PCM5242EVM is an exceptionally high-performance PCM DAC. The board runs on power from the USB connection. Digital audio inputs can be sourced from USB, optical, coaxial SPDIF, or external digital inputs. The analog output is available through the stereo XLR jack connections.

2   What's in the Box?

2.1   *PCM5242EVM*

Figure 1 shows the PCM5242EVM.
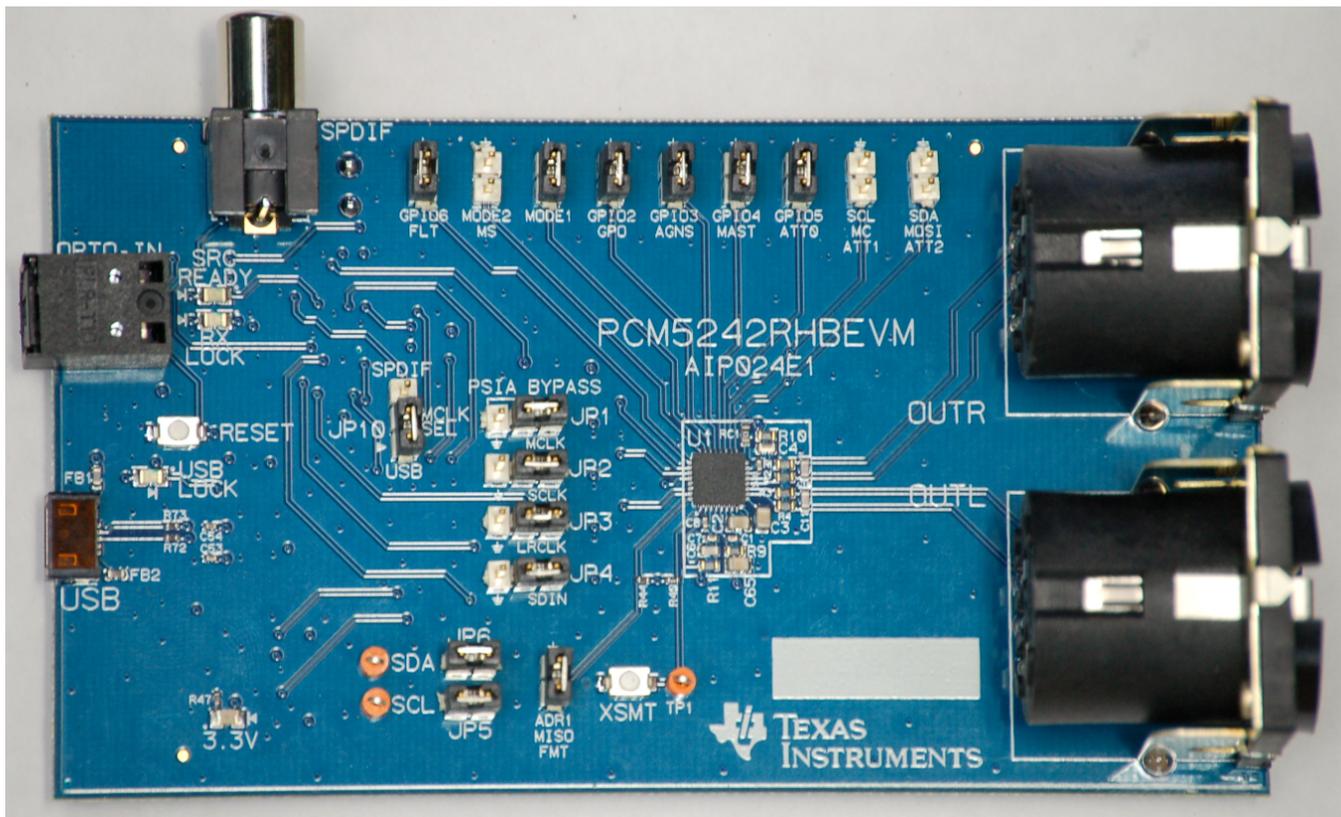
Figure 1. PCM5242EVM

# 3   Getting Started

3.1   *System Hardware Overview*

The PCM5242EVM is an exceptionally high performance PCM DAC. The board runs on power from the USB connection. Digital audio inputs can be sourced from USB, optical, coaxial SPDIF, or external inputs. The analog output is available from the stereo XLR jacks. The small solution size can be seen in the white box around U1 in the top silkscreen.

3.2 Block Diagram

Figure 2 illustrates the PCM5242EVM block diagram.
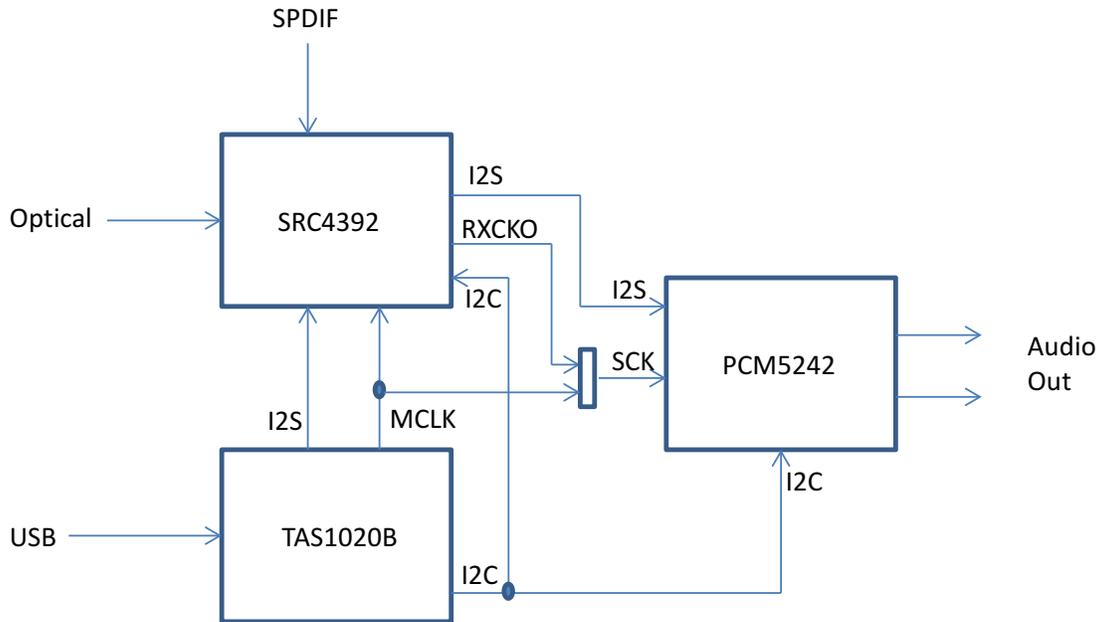
Figure 2. PCM5242EVM Block Diagram

The PCM5242EVM can be run in one of 4 different modes. These modes control how the audio data is routed to the PCM5242.

Mode 1: Play audio through USB – In mode 1, digital audio from the USB connection is routed to the PCM5242 through the SRC4392. The master clock is routed from the TAS1020B to the PCM5242 by placing JP10 to the *USB* position (JP10 short from pin 2 to pin 3). I²C commands are routed from USB to all of the devices on the board.
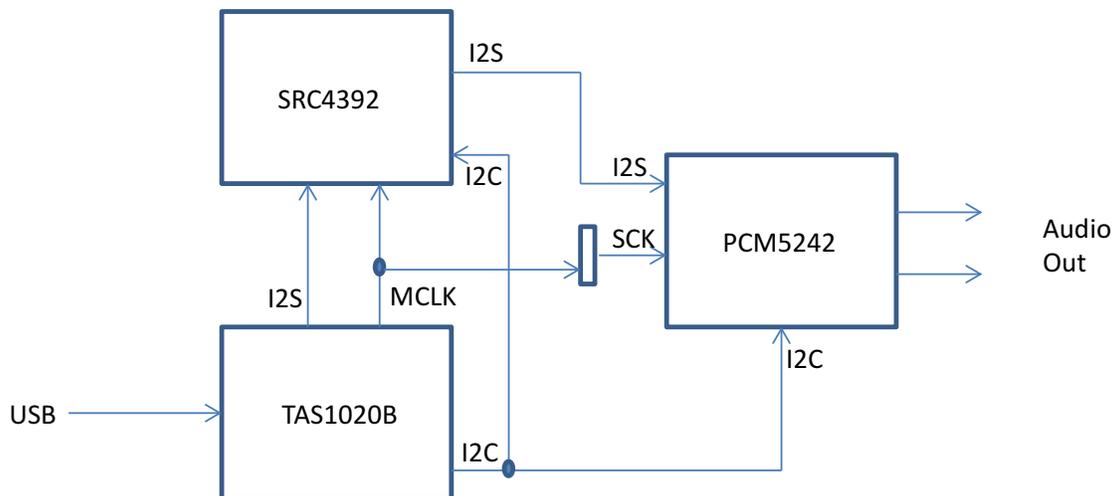
Figure 3. Mode 1 Block Diagram – USB Audio

Mode 2: Play audio through the Optical Input – In mode 2, digital audio from the optical input is routed to the PCM5242 through the SRC4392. The master clock is routed from the SRC4392's RXCKO to the PCM5242 by placing JP10 to the *SPDIF* position (JP10 short from pin 1 to pin 2). I²C commands are routed from USB to all of the devices on the board.
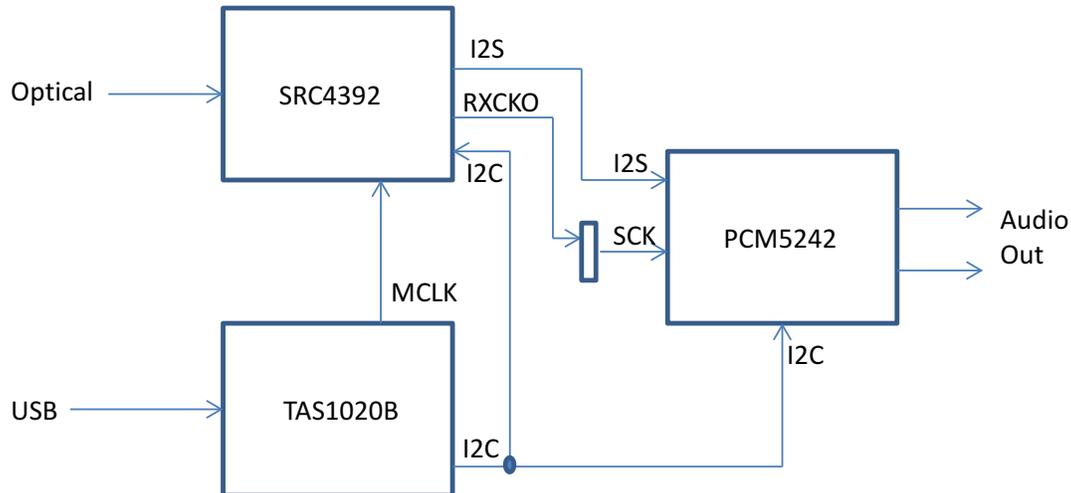
Figure 4. Mode 2 Block Diagram – Optical Audio Input

Mode 3: Play through Coaxial SPDIF Input – In mode 3, digital audio from the Coaxial SPDIF input is routed to the PCM5242 through the SRC4392. The master clock is routed from the SRC4392's RXCKO to the PCM5242 by placing JP10 to the *SPDIF* position (JP10 short from pin 1 to pin 2). I²C commands are routed from USB to all of the devices on the board
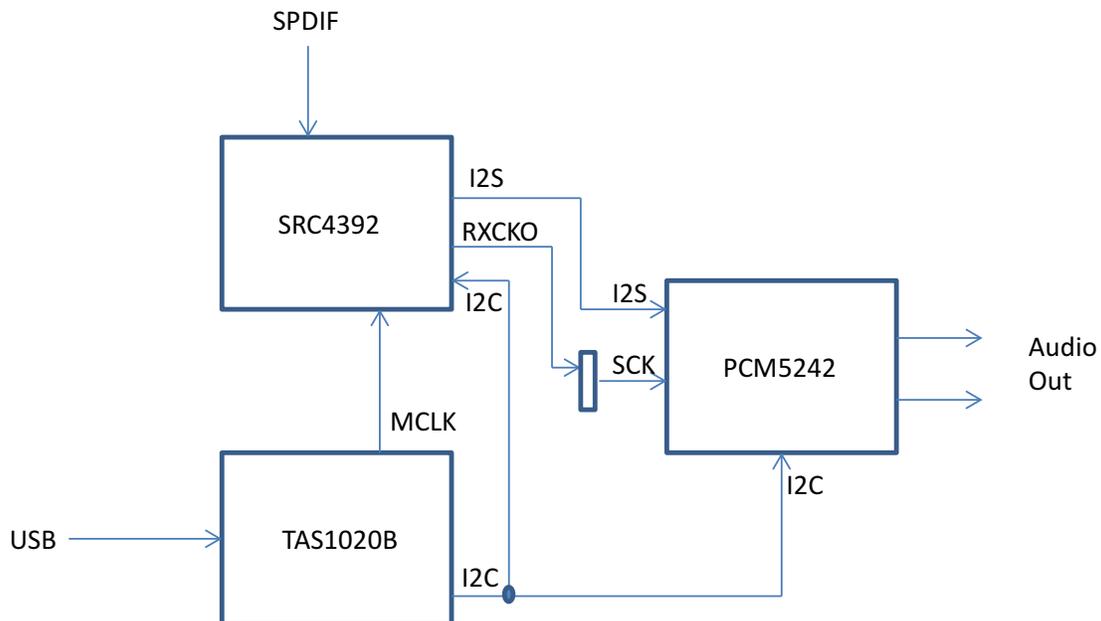
**Figure 5. Mode 3 Block Diagram – SPDIF Audio Input**

Mode 4: Play through External Input – In mode 4, digital audio and clocking can be provided by an external source through JP1 – JP4. I^{2}C commands are still routed from USB to all of the devices on the board.
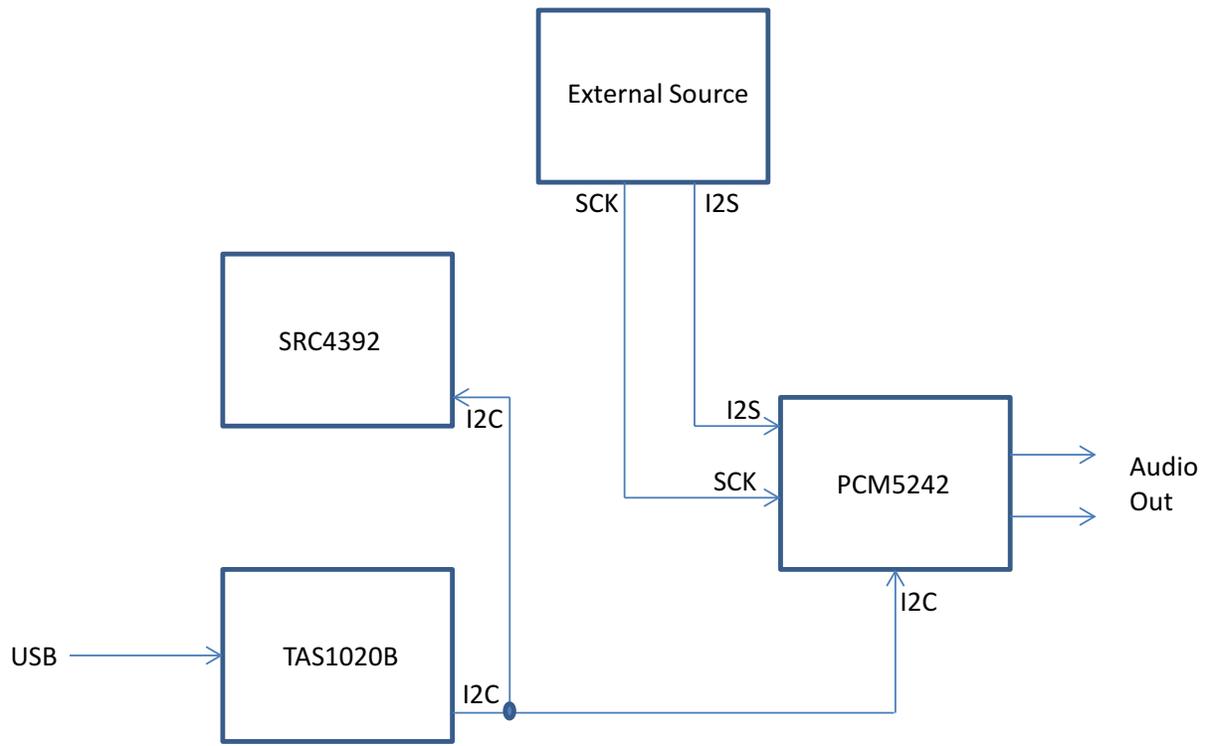

Figure 6. Mode 4 Block Diagram – External Audio Input

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4   Hardware

4.1   Power Requirements

The PCM5242EVM is powered through the USB connection. All necessary supplies are derived from the USB 5-V supply.

4.2   Jumpers and Headers

JP1: MCLK – This 3-pin connector routes the master clock to the PCM5242. When shorted from pin 2 to pin 3, the MCLK will be routed from the SRC4392/TAS1020B. It can also be used to input an external MCLK by removing the shunt and inserting a signal on pin 2. Pin 1 is ground.

JP2: BCLK – This 3-pin connector routes the bit clock to the PCM5242. When shorted from pin 2 to pin 3, the BCLK will be routed from the SRC4392. It can also be used to input an external BCLK by removing the shunt and inserting a signal on pin 2. Pin 1 is ground.

JP3: LRCK – This 3-pin connector routes the left/right clock to the PCM5242. When shorted from pin 2 to pin 3, the LRCK will be routed from the SRC4392. It can also be used to input an external LRCK by removing the shunt and inserting a signal on pin 2. Pin 1 is ground

JP4: SDIN – This 3-pin connector routes the serial input data to the PCM5242. When shorted from pin 2 to pin 3, the SDIN will be routed from the SRC4392. It can also be used to input an external SDIN by removing the shunt and inserting a signal on pin 2. Pin 1 is ground.

JP5: SCL – This 2-pin connector routes the I2C SCL signal from the TAS1020B/USB controller to the PCM5242

JP6: SDA – This 2-pin connector routes the I2C SDA signal from the TAS1020B.USB controller to the PCM5242

JP10: MCLK Select – This 3-pin connector selects which source the PCM5242 will use for MCLK. Short from pin 1 to pin 2 for SPDIF clock from the SRC4392. Short between pin 2 and pin 3 for USB clock from the TAS1020B.

5   Software

The EVM is controlled through the PurePath™ Console. Request PurePath Console access here: www.ti.com/tool/purepathconsole. Once access is granted, download the PurePath Console here: http://cc.ext.ti.com

For more information on HybridFlow, please refer to the HybridFlow user's guide in the EVM product folder.

6 Appendix A

This appendix contains the PCM5242EVM schematics, BOM, and the PCB layouts.

6.1 *Schematic*

to show the PCM5242EVM schematics.
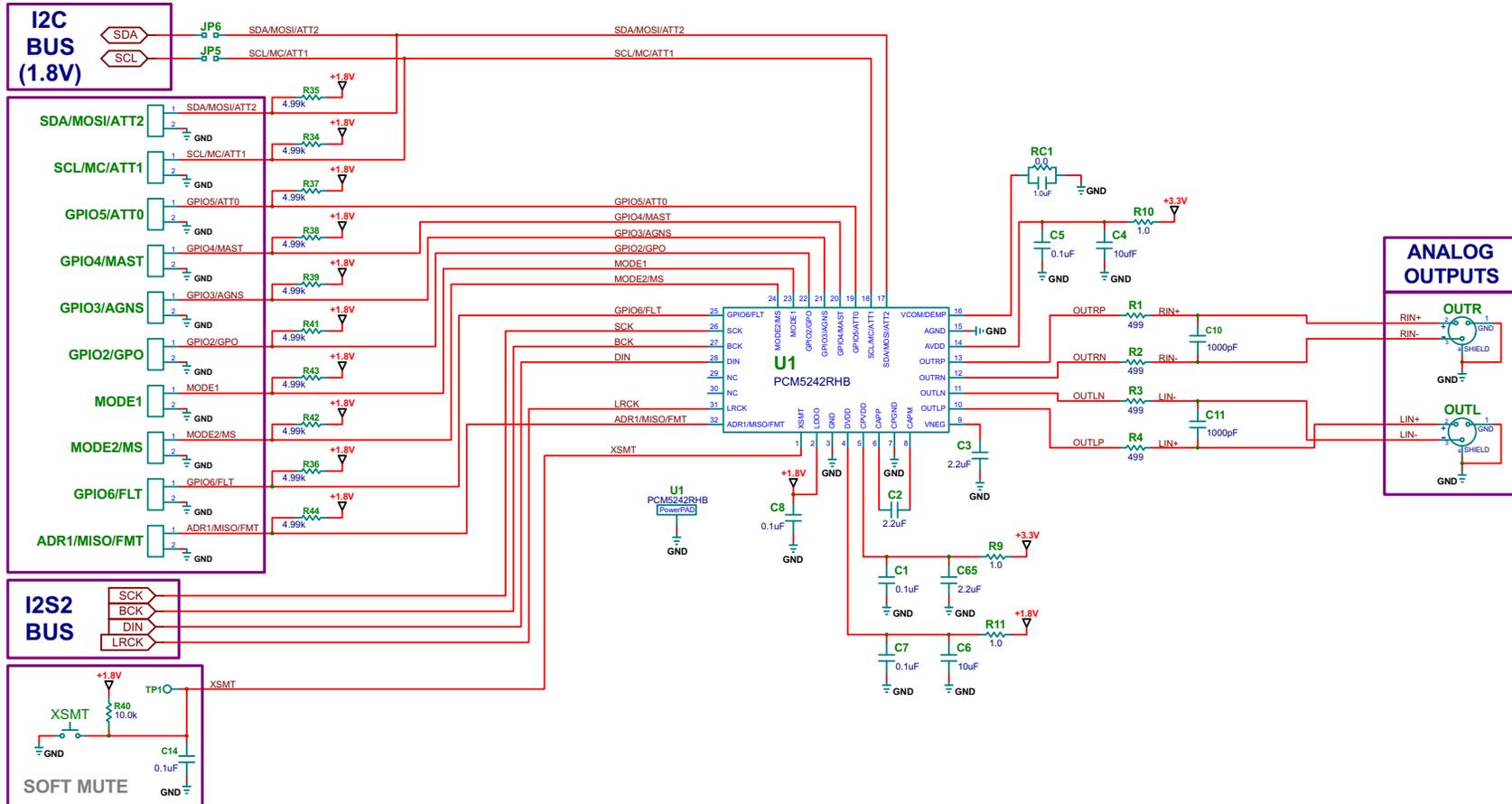
**Figure 7. PCM5242EVM Schematic Evaluation Module**
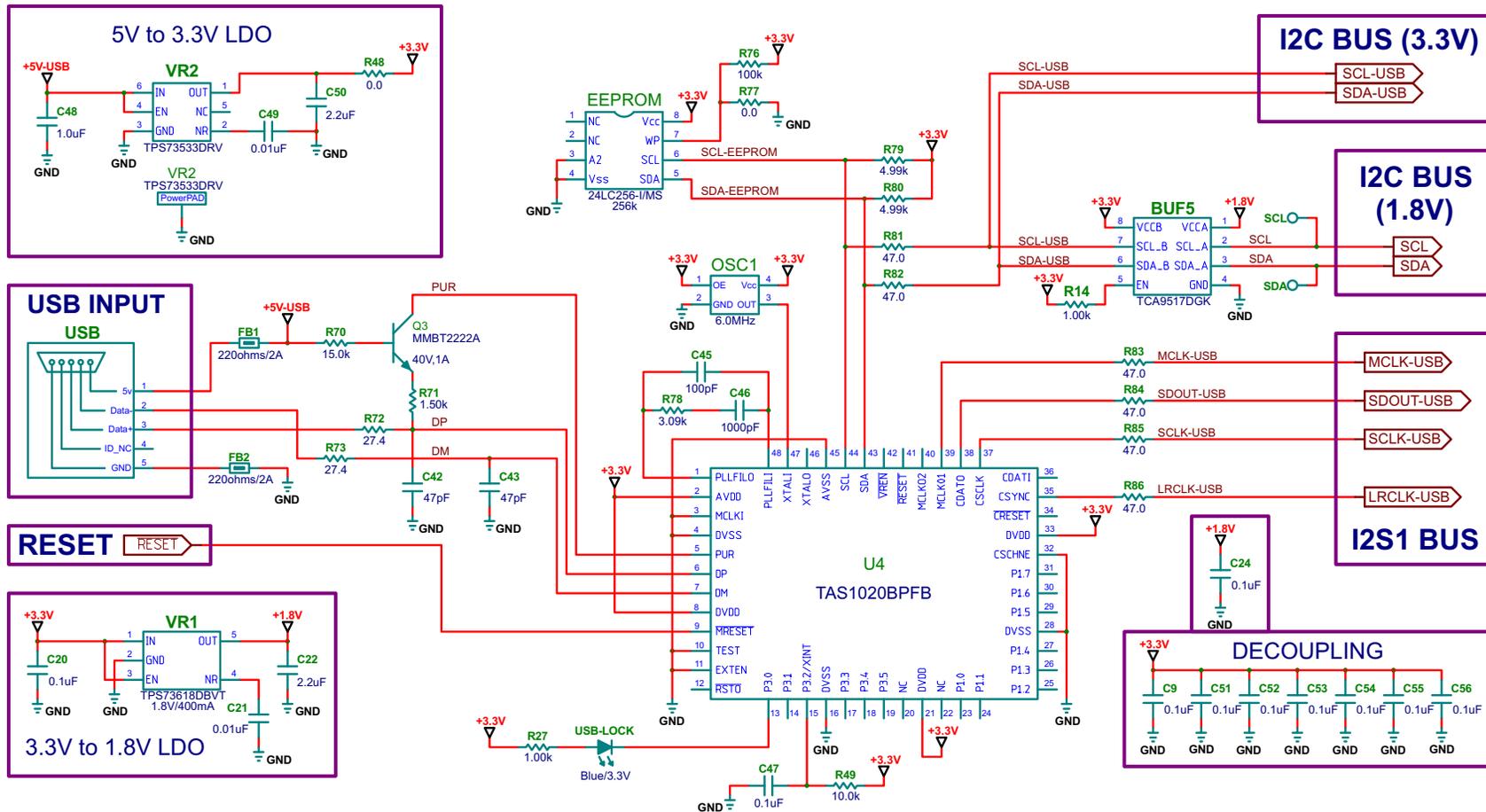
Figure 8. PCM5242EVM Schematic USB to I²C/I²S Converter

Figure 9. PCM5242EVM Schematic Sample Rate Converter

6.2 Bill of Materials

Table 1 lists the PCM5242EVM BOM.

Table 1. Bill of Materials[(1)(2)(3)(4)]

Item	Manu Part Num	Manu	QTY	Ref Designators	Description
1	AIP024A	ANY	1	PCB	PCM5242RHBEVM Board (Pre-Release)
2	PCM5242RHB	TEXAS INSTRUMENTS	1	U1	24-BIT 384KHz AUDIO STEREO DAC w/MINI DSP QFN32-RHB ROHS
3	SRC4392IPFBR	TEXAS INSTRUMENTS	1	U3	2 CHAN,ASYNC,SAMPLE RATE CONV W/DIG AUDIO REC/XMTR ROHS
4	TAS1020BPFB	TEXAS INSTRUMENTS	1	U4	USB STREAMING CONTROLLER TQFP48-PFB ROHS
5	SN74AUP1G125DRLR	TEXAS INSTRUMENTS	4	BUF1, BUF2, BUF3, BUF4	SINGLE BUS BUFFER GATE WITH 3-STATE OUTPUT SOT553-DRL5 ROHS
6	TCA9517DGKR	TEXAS INSTRUMENTS	1	BUF5	IC LVL-TRANSL I2C BUS REP,MSOP8-DGK,ROHS
7	TPS73618DBVT	TEXAS INSTRUMENTS	1	VR1	VOLT REG 1.8V 400MA LDO CAP FREE NMOS SOT23-DBV5 ROHS
8	TPS73533DRVT	TEXAS INSTRUMENTS	1	VR2	LDO VOLTREG 3.3V 500mA LO CURRENT LO NOISE HI PSRR SON6-DRV ROHS
9	24LC256-I/MS	MICROCHIP	1	EEPROM	SERIAL EEPROM I2C 256K 400kHz MSOP8-MS ROHS
10	PLR135/T10	EVERLIGHT ELECTRONICS	1	OPTO-IN	PHOTOLINK FIBER OPTIC RECEIVER 2.4-5.5V 15MB PCB-RA SHUTTER ROHS
11	MMBT2222A-7-F	DIODES INC.	1	Q3	TRANSISTOR NPN GENERAL PURPOSE 40V 1A SOT23 DBV3 ROHS
12	LTST-C171TBKT	LITE-ON INC.	3	RX-LOCK, USB-LOCK, SRC-READY	LED, BLUE 3.3V SMD0805 ROHS
13	SML-LXT0805GW-TR	LUMEX OPTO	1	3.3V	LED, RED 2.0V SMD0805 ROHS
14	625L3I006M00000	CTS FREQUENCY CONTROLS	1	OSC1	OSCILLATOR SMT 6.0MHz 3.3V OUT-ENABLE ROHS
15	GRM155R71C104KA88J	MURATA	28	C1, C5, C7, C8, C9, C14, C17, C18, C19, C20, C23, C24, C30, C31, C32, C33, C35, C38, C41, C47, C51, C52, C53, C54, C55, C56, C63, C64	CAP SMD0402 CERM 0.1UFD 16V X7R 10% ROHS
16	CGA4J3X7R1E225K125AB	MURATA	3	C2, C3, C65	CAP SMD0805 CERM 2.2UFD 25V 10% X7R ROHS
17	C1608X5R1A106K	TDK CORP	4	C4, C6, C34, C37	CAP SMD0603 CERM 10ufd 10V 10% X5R ROHS
18	C1608C0G1H102J	TDK CORP.	2	C10, C11	CAP SMD0603 CERM 1000PFD 50V 5% COG ROHS
19	0402YC103KAT2A	AVX	2	C21, C49	CAP SMD0402 CERM 0.01ufd 16V 10% X7R ROHS
20	GRM188R61A225KE34J	MURATA	1	C22	CAP SMD0603 CERM 2.2UFD 10V 10% X5R ROHS
21	500R07N470JV4T	JOHANSON	2	C42, C43	CAP SMD0402 CERM 47pfd 50V 5% COG ROHS
22	CC0402JRNPO9BN101	YAGEO	1	C45	CAP SMD0402 CERM 100pfd 50V 5% NPO ROHS
23	CC0402KRX7R7BB102	YAGEO	1	C46	CAP SMD0402 CERM 1000pfd 16V 10% X7R ROHS
24	EMK107B7105KA-T	TAIYO YUDEN	1	C48	CAP SMD0603 CERM 1.0UFD 16V 10% X7R ROHS
25	GRM188R71A225KE15D	MURATA	1	C50	CAP SMD0603 CERM 2.2UFD 10V 10% X7R ROHS
26	RC0603FR-07499RL	YAGEO	4	R1, R2, R3, R4	RESISTOR SMD0603 THICK FILM 499 OHM 1% 1/10W ROHS
27	RC0402FR-0747RL	YAGEO	10	R5, R6, R7, R8, R81, R82, R83, R84, R85, R86	RESISTOR SMD0402 THICK FILM 47.0 OHMS 1% 1/16W ROHS
28	ERJ-3GEYJ1R0V	PANASONIC	3	R9, R10, R11	RESISTOR SMD0603 1.0 OHMS 1% THICK FILM 1/10W ROHS
29	ERJ-2RKF1001X	PANASONIC	3	R14, R27, R51	RESISTOR SMD0402 1.00K 1%,1/16W ROHS
30	ERJ-2RKF4991X	PANASONIC	13	R34, R35, R36, R37, R38, R39, R41, R42, R43, R44, R52, R79, R80	RESISTOR SMD0402 4.99K 1%,1/16W ROHS
31	CRCW040210K0FKED	VISHAY	3	R40, R49, R69	RESISTOR SMD0402 10.0K OHMS 1% 1/16W ROHS

[(1)] These assemblies are ESD sensitive, observe ESD precautions.
[(2)] These assemblies must be clean and free from flux and all contaminants. Use of no-clean flux is not acceptable.
[(3)] These assemblies must comply with workmanship standards IPC-A-610 Class 2.
[(4)] Ref designators marked with an asterisk ('**') cannot be substituted. All other components can be substituted with equivalent MFG's components.

Table 1. Bill of Materials[1][2][3][4] (continued)

Item	Manu Part Num	Manu	QTY	Ref Designators	Description
32	CRCW0402360RFKED	VISHAY	1	R47	RESISTOR SMD0402 360 1/16W 1% ROHS
33	RMCF0603ZT0R00	STACKPOLE ELECTRONICS	1	R48	RESISTOR SMD0603 ZERO OHMS 1/10W ROHS
34	CRCW060375R0FKEA	VISHAY	1	R50	RESISTOR SMD0603 75 OHMS 1% 1/10W ROHS
35	CRCW060322R1FKEA	VISHAY	2	R53, R55	RESISTOR SMD0603 22.1 OHMS 1% 1/10W ROHS
36	RC0402FR-0715KL	YAGEO	1	R70	RESISTOR SMD0402 THICK FILM 15.0K OHM 1% 1/16W ROHS
37	RMCF0402FT1K50	STACKPOLE ELECTRONICS	1	R71	RESISTOR SMD0402 1.50K OHMS 1% 1/16W ROHS
38	ERJ-2RKF27R4X	PANASONIC	2	R72, R73	RESISTOR SMD0402 THICK FILM 27.4 OHMS 1/10W 1% ROHS
39	ERJ-2RKF1003X	PANASONIC	1	R76	RESISTOR SMD0402 THICK FILM 100K OHMS 1/16W 1% ROHS
40	RMCF0402ZT0R00	STACKPOLE ELECTRONICS	1	R77	ZERO OHM JUMPER SMT 0402 0 OHM 1/16W,5% ROHS
41	RC0402FR-073K09L	YAGEO	1	R78	RESISTOR SMD0402 THICK FILM 3.09K OHM 1% 1/16W ROHS
42	ERJ-3GEY0R00V	PANASONIC	1	RC1	RESISTOR SMD0603 0.0 OHM 5% THICK FILM 1/10W ROHS
43	MPZ1608S221A	TDK	2	FB1, FB2	FERRITE CHIP, 220 OHMS 2A 100MHZ SMD 0603 ROHS
44	PBC03SAAN	SULLINS	5	JP1, JP2, JP3, JP4, JP10	HEADER THRU MALE 3 PIN 100LS 120 TAIL GOLD ROHS
45	PBC02SAAN	SULLINS	12	JP5, JP6, MODE1, MODE2/MS, GPIO2/GPO, GPIO6/FLT, GPIO3/AGNS, GPIO4/MAST, GPIO5/ATT0, SCL/MC/ATT1, ADR1/MISO/FMT, SDA/MOSI/ATT2	HEADER THRU MALE 2 PIN 100LS 120 TAIL GOLD ROHS
46	PQG3MRA112	SWITCHCRAFT	2	OUTL, OUTR	JACK XLR-MALE RA 3 PIN BLACK SHELL TIN PINS ROHS
47	ZX62WD1-B-5PC	HIROSE	1	USB	JACK USB FEMALE TYPEB MICRO SMT-RA 5PIN ROHS
48	RCJ-041	CUI STACK	1	SPDIF	RCA JACK THRU RA-FEMALE BLACK ROHS
49	5003	KEYSTONE ELECTRONICS	4	SCL, SDA, TP1, RXCKI	PC TESTPOINT, ORANGE, ROHS
50	5001	KEYSTONE ELECTRONICS	1	GND	PC TESTPOINT, BLACK, ROHS
51	TL1015AF160QG	E-SWITCH	2	XSMT, RESET	SWITCH, MOM, 160G SMT 4X3MM ROHS
52	SJ61A2	3M	4	BUMPONS	BUMPON RUBBER BLACK 0.375in x 0.235in ROHS
53	969102-0000-DA	3M	17	JP1, JP2, JP3, JP4, JP5, JP6, JP10, MODE1, MODE2/MS, GPIO2/GPO, GPIO6/FLT, GPIO3/AGNS, GPIO4/MAST, GPIO5/ATT0, SCL/MC/ATT1, ADR1/MISO/FMT, SDA/MOSI/ATT2	SHUNT BLACK AU FLASH 0.100LS OPEN TOP ROHS

6.3 PCB Layouts

Figure 10 through Figure 20 illustrate the PCM5242EVM PCB layouts.

Figure 10. PCM5242EVM Top Silkscreen

Figure 11. PCM5242EVM Bottom Silkscreen
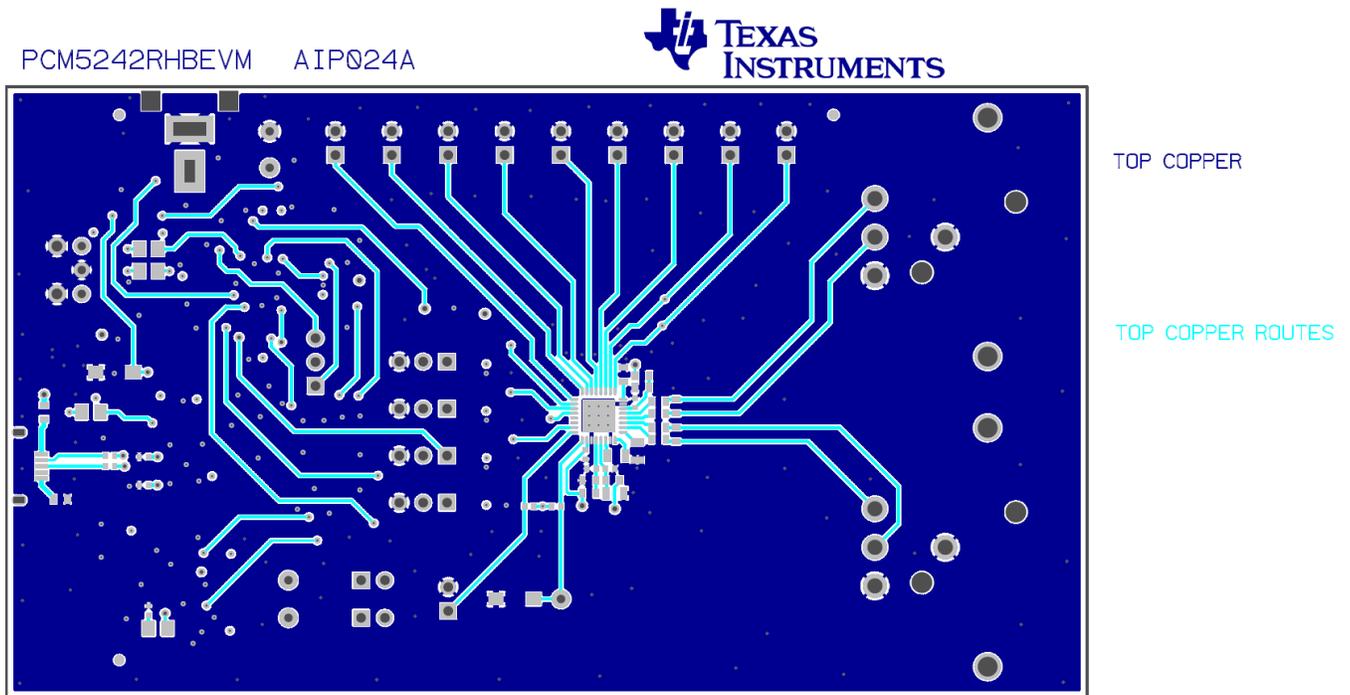
Figure 12. PCM5242EVM Top Copper
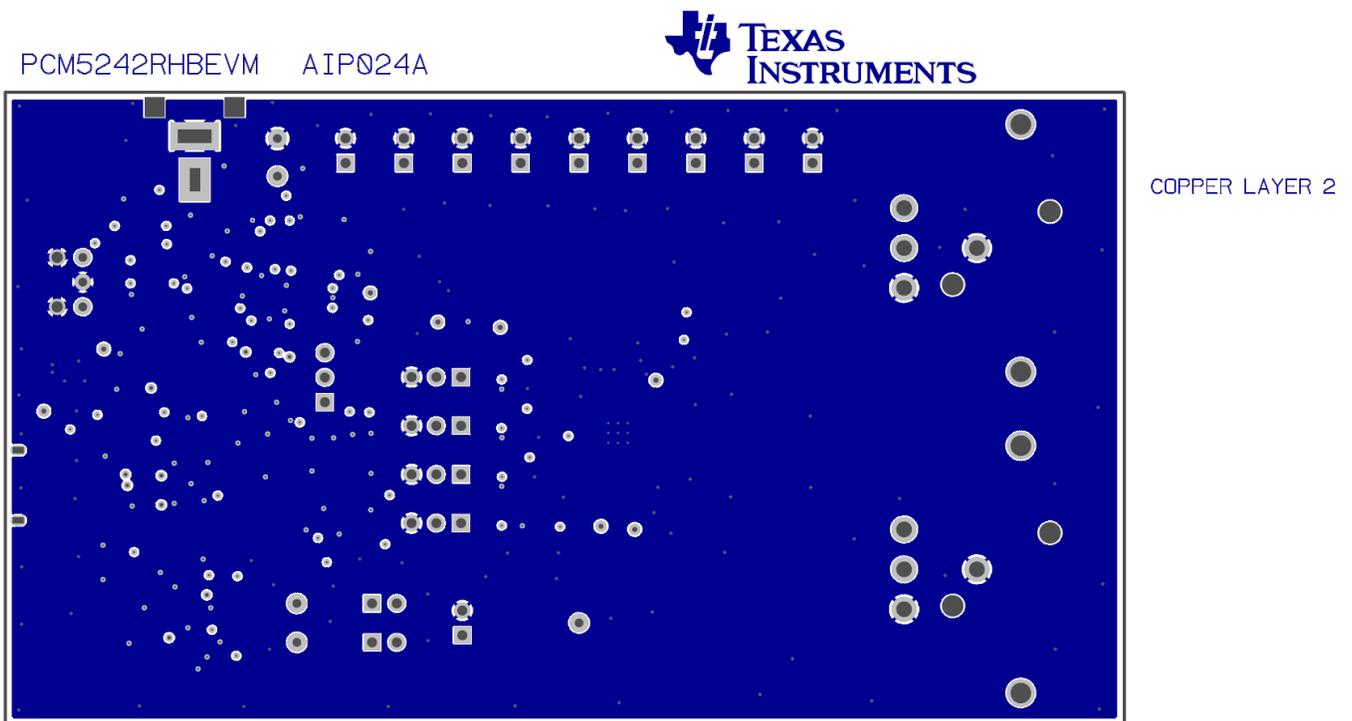
Figure 13. PCM5242EVM Layer 2
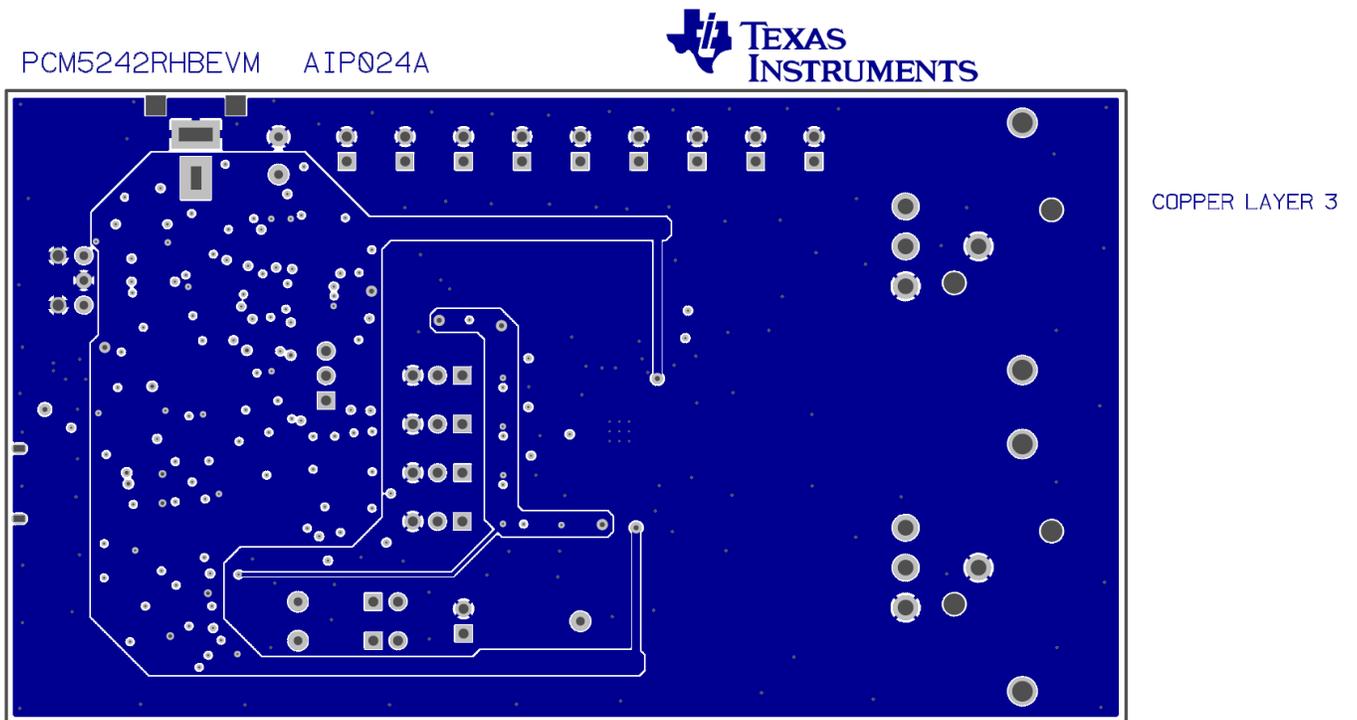
Figure 14. PCM5242EVM Layer 3
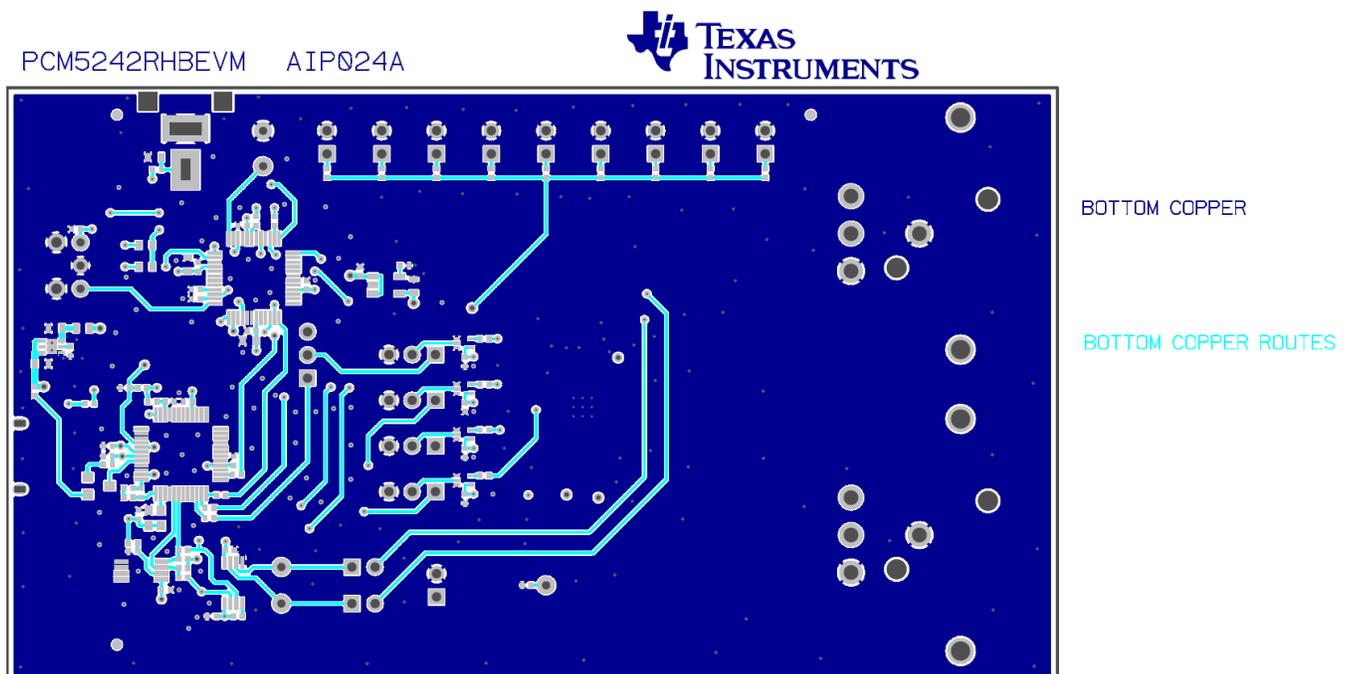
Figure 15. PCM5242EVM Bottom Copper
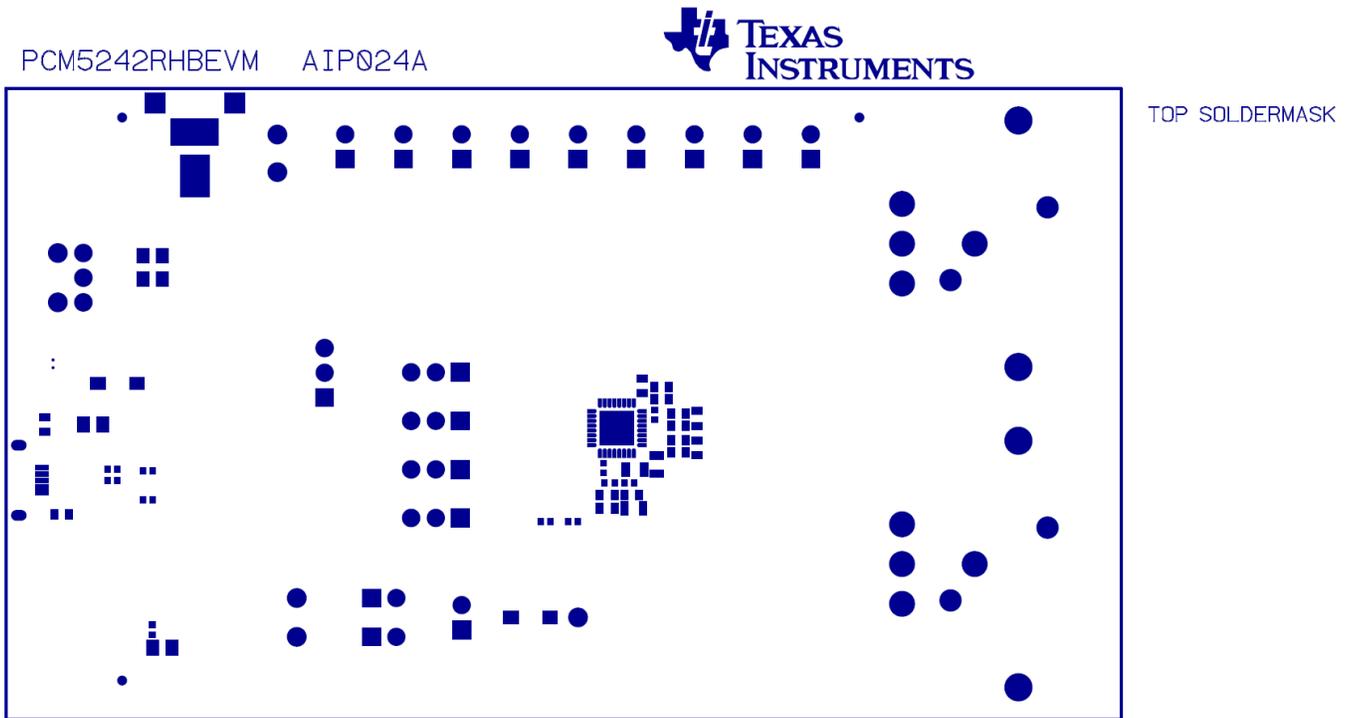
Figure 16. PCM5242EVM Top Soldermask
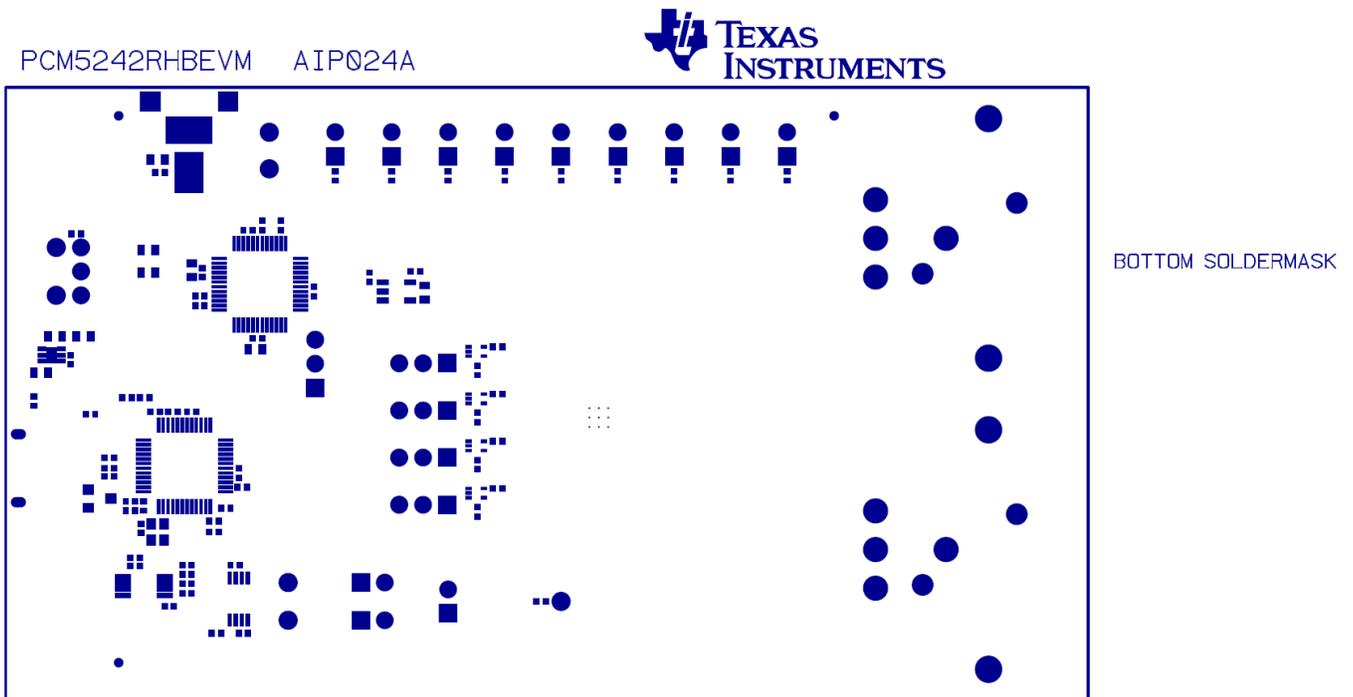
Figure 17. PCM5242EVM Bottom Soldermask

PCM5242RHBEVM   AIP024A
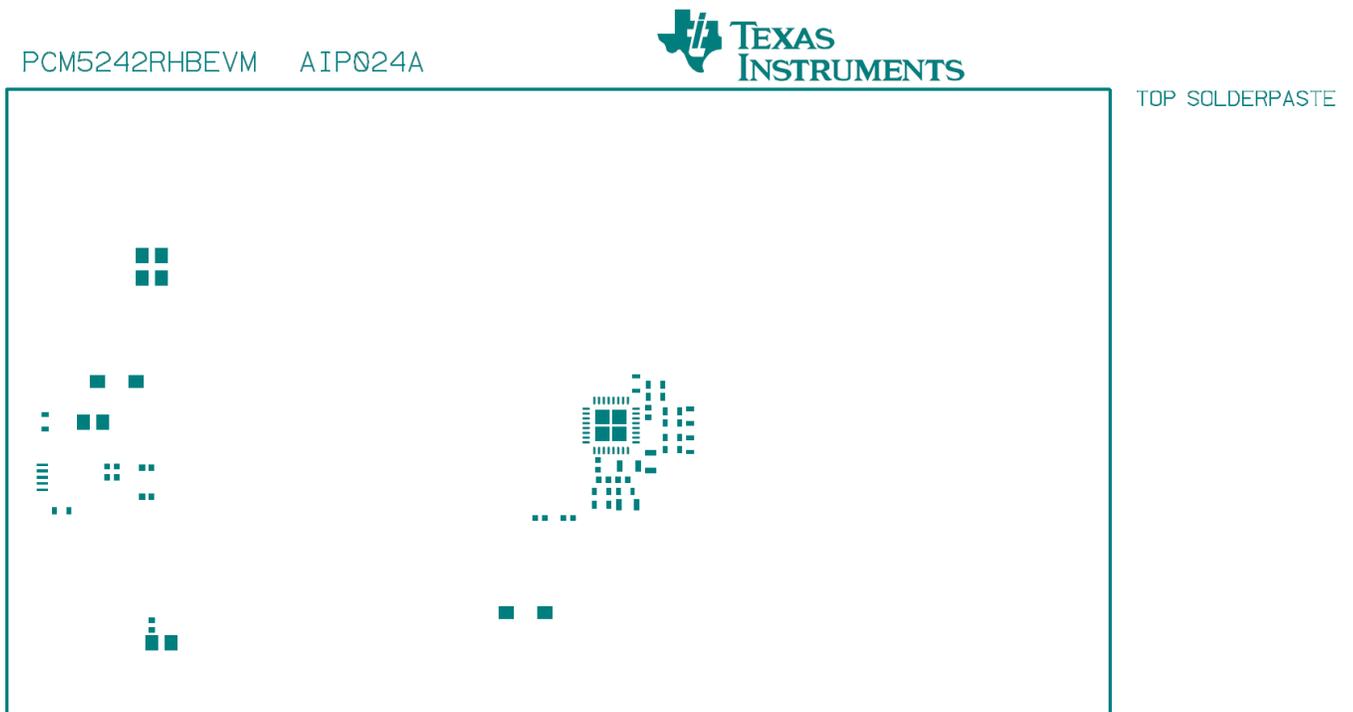
TOP SOLDERPASTE

Figure 18. PCM5242EVM Top Solderpaste

PCM5242RHBEVM   AIP024A

BOTTOM SOLDERPASTE
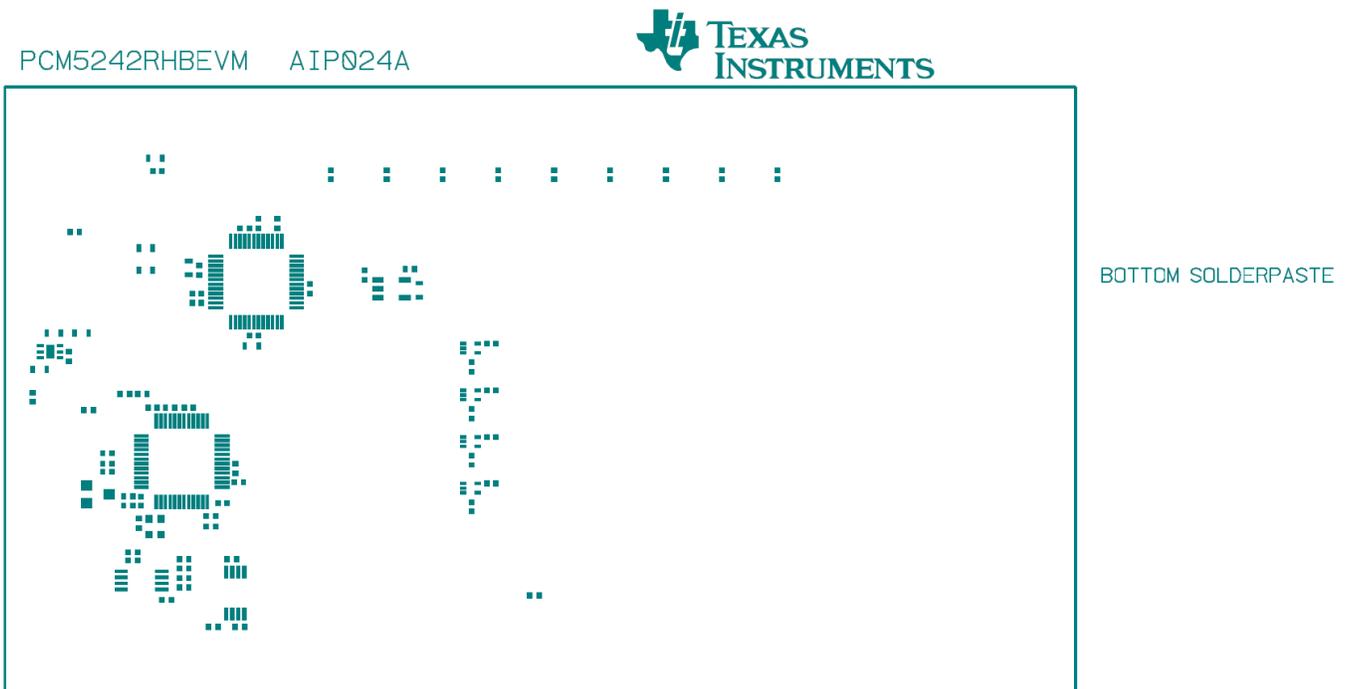
Figure 19. PCM5242EVM Bottom Solderpaste
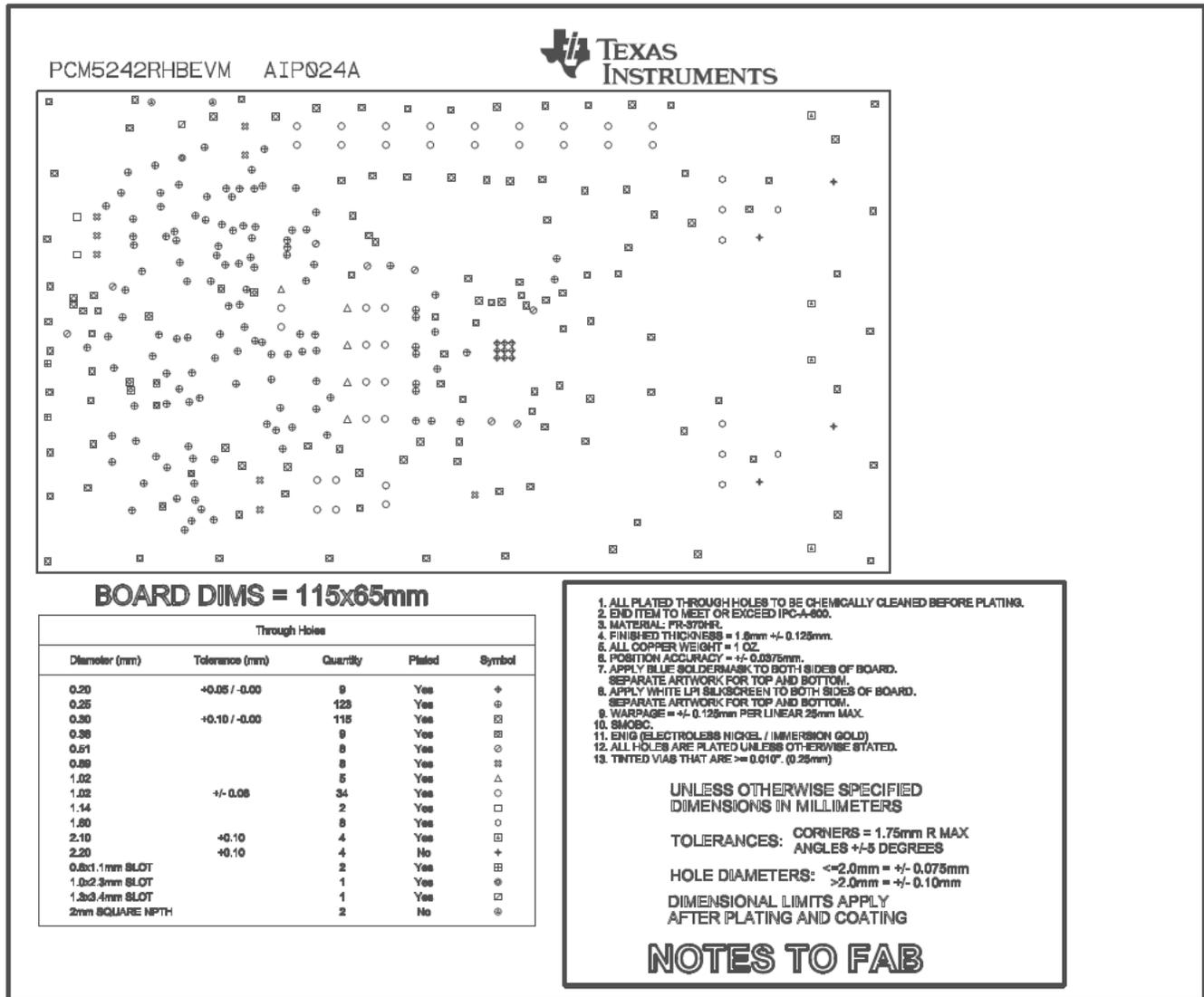
Figure 20. PCM5242EVM Drill Drawing

Revision History

Changes from Original (September 2014) to A Revision   **Page**

• Changed text and links in the *Software* section. 6

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

STANDARD TERMS AND CONDITIONS FOR EVALUATION MODULES

1. *Delivery:* TI delivers TI evaluation boards, kits, or modules, including any accompanying demonstration software, components, or documentation (collectively, an "EVM" or "EVMs") to the User ("User") in accordance with the terms and conditions set forth herein. Acceptance of the EVM is expressly subject to the following terms and conditions.

    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 and conditions 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 and conditions 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 any defects that are 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. Moreover, TI shall not be liable for any defects that result from User's design, specifications or instructions for such EVMs. Testing and other quality control techniques are used to the extent TI deems necessary or as mandated by government requirements. TI does not test all parameters of each EVM.

    2.3 If any EVM fails to conform to the warranty set forth above, TI's sole liability shall be at its option to repair or replace such EVM, 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.

3. *Regulatory Notices:*

    3.1 *United States*

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

        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*

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSS standard(s). 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。
   http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page

   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 by Radio Law of Japan to follow the instructions below with respect to EVMs:

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

   2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or

   3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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

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

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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
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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:*

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