

EVM User's Guide: TAS5832EVM

TAS5832 评估模块



说明

TAS5832EVM 展示了最新的 TI 数字输入 D 类闭环放大器。该 EVM 是一款独立的 EVM，不需要额外的电路即可运行。用户可将 TAS5832EVM 配置为立体声或单声道输出，并且该 EVM 包含一个可选的升压电源，用于使用 TAS5832 H 类算法。

开始使用

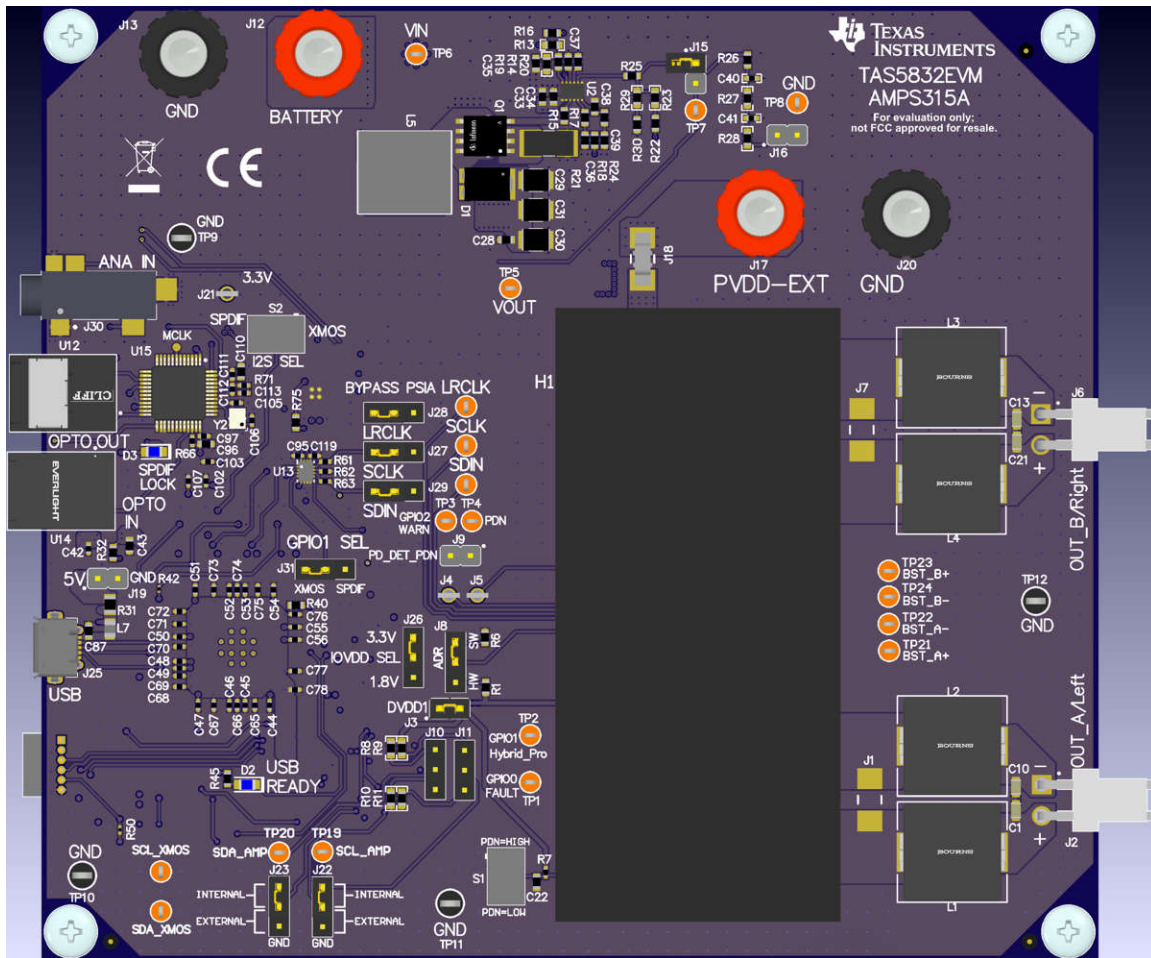
1. 订购 [TAS5832](#) 评估模块并申请访问权限，以从 [TAS5832EVM 产品页面](#) 下载 PurePath™ Console 3 (PPC3)。
2. 阅读 TAS5832 数据表。
3. 如有任何疑问，请访问 [E2E 论坛](#)。

特性

- 用于音频包络跟踪的 TAS5832 H 类算法
- 集成 LM5155 升压以提供客户系统设计参考
- H 类系统配置：9V 电池输入，基于音频包络跟踪升压至 PVDD 电源轨
- 默认系统配置：需要外部 PVDD 电源
- 以 BTL 或 PBTL 模式运行
- 提供灵活的输入信号路由 (USB、模拟、光纤和外部 I2S)
- 基于 PurePath™ Console 3 软件 (GUI) 的展示、评估和开发环境
- 可选硬件控制模式，可通过引脚配置设置开关频率、模拟增益、BTL/PBTL 模式和逐周期电流限制

应用

- [LCD 电视](#)、[OLED 电视](#)、[激光电视](#)、[移动智能电视](#)
- [智能扬声器](#)、[智能显示屏](#)、[条形音箱](#)、[无线扬声器](#)
- [钢琴](#)、[键盘](#)、[合成器](#)、[专业扬声器系统](#)
- [专业会议系统](#)、[企业用投影仪](#)



TAS5832EVM 硬件板

1 评估模块概述

1.1 简介

本用户指南介绍了 TAS5832 评估模块 (EVM) 的运行情况。TAS5832EVM 是一款独立式 EVM。使用 PurePath™ Console 3 GUI (PPC3) 来初始化和操作该 EVM。本文档的主要内容包括：

1. 硬件说明和实现
2. TAS5832EVM 操作

需要的设备和附件：

1. TAS5832EVM
2. USB Micro Type-B 电缆
3. 电源单元 (PSU)
4. 扬声器和电缆
5. 运行 Windows 7、Windows 8、Windows 10 或 Windows 11 的台式机或笔记本电脑
6. 音频来源：可以是 DVD 播放器 (使用光缆或模拟电缆连接) 或来自 Windows 7、Windows 8、Windows 10 或 Windows 11 的播放媒体。

1.2 套件内容

该评估模块仅包含 TAS5832EVM。套件中不包含扬声器，但是，任何额定输出功率为预期输出功率的扬声器或虚拟负载均可连接到输出连接器。同样，套件中不包含电源，必须根据需要 H 类算法还是恒定电源电压来给相应的香蕉插孔提供电源。如果使用软件模式，则还需要 Micro-USB 电缆。

1.3 规格

TAS5832 是一款采用先进 H 类算法的数字输入立体声高效闭环 D 类音频放大器，可提高系统效率并减少发热而不会产生削波失真。TAS5832EVM 具有可选的电池电源输入 (用于将 LM5155 用于 H 类控制)、可绕过 LM5155 升压的外部电源输入、通过 PurePath™ Console 3 (PPC3) 进行的 USB 控制，以及灵活的音频输入选项。TAS5832EVM 还可以使用硬件控制模式进行配置，该模式支持通过引脚配置来设置开关频率、模拟增益、BTL/PBTL 模式和逐周期电流限制阈值。此模式专为免去终端系统软件驱动程序集成工作而设计。

1.4 排查

本节提供了一系列针对在使用 TAS5832EVM 时可能发生的问题的解决方案。

- 没有音频正在播放，但器件处于开启状态，输出正在切换
 - 确保 I2S 跳线 (J27、J28 和 J29) 连接至“旁路”选项，或已连接外部 PSIA
 - 如果使用 USB 音频，请确保将 I2S 选择开关 (S2) 设置为 XMOS；如果使用光学或模拟输入，请确保将 SPDIF 设置为 XMOS
 - 如果使用 USB 音频作为输入，请确保选择 EVM 作为播放器件，并且正确设置音量
 - 确保器件未在寄存器 0x03 中静音
 - 将 I2S 信号探测到器件中，并确保 SDIN 符合预期
- 无音频正在播放，输出未切换
 - 读取寄存器 0x70 至 0x73 来检查是否存在任何故障，并根据需要进行调整。寄存器 0x78 可用于在故障解决后清除故障
- PPC3 可以连接到 EVM，但无法与 TAS5832 通信
 - 确保 I²C 跳线 (J22 和 J23) 已插入
 - 确保为器件安装了正确的 PVDD 跳线并通电，即跳线 J18 用于外部 PVDD，或者 J14 用于 H 类控制

2 硬件

2.1 硬件设置

软件控制模式

1. 将扬声器连接到 TAS5832EVM。
2. 确保跳线配置正确，符合表 2-1 和表 2-2 中所述的所需配置
3. 将 PSU 连接到 TAS5832EVM 并打开电源。
4. 将 USB 电缆从 PC 插入 TAS5832EVM。确保 USB READY LED (蓝色) 亮起。
5. 如果使用光源，则蓝色 SPDIF LOCK LED 亮起。

表 2-1. 升压跳线配置

跳线	名称	LM5155 升压模式配置	外部客户升压模式配置
J12、J13	电池，GND	IN - 电池输入 (9V)	OUT
J17、J20	PVDD、GND	OUT	IN - 外部 PVDD
J14	PVDD_LM5155	IN	OUT
J18	PVDD_EXT	OUT	IN
J16	BST_Bypass	OUT	OUT
J15	Ext_BST	IN	OUT

表 2-2. 控制模式跳线配置

跳线	名称	软件控制模式	硬件控制模式
J8	ADR/HW	2-3 - SW (默认 0xC0 地址)	1-2 - HW
J10	SDA/HW_SEL0	OUT	根据需要，1-2 或 2-3
J11	SCL/HW_SEL1	OUT	根据需要，1-2 或 2-3
J22	SCL	1-2 - 内部 (默认)	输出
J23	SDA	1-2 - 内部 (默认)	输出

硬件控制模式

1. 将扬声器连接到 TAS5832EVM。
2. 确保跳线配置正确且模式适当：请参阅表 2-1 和表 2-2。处于硬件控制模式时使用外部 PVDD。
3. 将 S2 配置为 SPDIF 输入源。
4. 请注意，在硬件控制模式下，某些配置需要在 EVM 板上修改电阻器。有关更多详细信息，请参阅表 2-3 和表 2-4。
5. 将 PSU 连接到 TAS5832EVM 并打开电源。
6. 将 USB 电缆从 PC 插入 TAS5832EVM。USB READY LED (蓝色) 也亮起。
7. 如果使用光源，则蓝色 SPDIF LOCK LED 亮起。

2.2 详细操作

TAS5832EVM 只需单电源即可运行。用户可以选择三个不同的音频源：

1. 将 S2 开关切换至 XMOS 以通过 Windows Media Player 流式传输音频。
2. 将 S2 开关切换至 SPDIF 以使用光纤电缆或模拟电缆通过 DVD 播放器流式传输音频。
3. 如果需要 Audio Precision 的可编程串行接口适配器 (PSIA) 等外部数字音频源，请使用跳线插入外部 I2S 信号。

TAS5832EVM 支持 3.3V 和 1.8V DVDD 和 IOVDD。使用跳线 (J26) 根据要求进行相应的选择。

TAS5832EVM 提供可选的板载 LM5155 升压 H 类评估或具有 H 类控制的外部客户系统升压：

1. 板载 LM5155 升压 H 类评估
 - 通过 J12 和 J13 输入 9V 电池电源。通过移除 J18 来旁路外部 PVDD
 - TAS5832 PVDD 来自 LM5155 升压输出：J14 - 输入，J18 - 输出
 - TAS5832 H 类引脚路由到 LM5155 FB 引脚：J15 - 输入，J16 - 输出
2. 具有 H 类控制的外部客户系统升压
 - TAS5832 H 类引脚路由，用于通过 TP7 FB 和 TP8 GND 进行外部客户系统升压 FB 控制：J15 = 输出，J16 = 输出
 - TAS5832 PVDD 通过 J17 PVDD 和 J20 GND 的客户系统升压输出：J14 - 输出，J18 - 输入

USB 连接还用于提供与 EVM 上的两个 TAS5832 器件的 I²C 通信。PurePath™ Console 3 (PPC3) 是一款软件工具，可用于初始化和操作此 EVM。

此外，TAS5832 有可选硬件控制模式，可通过引脚配置来配置开关频率、模拟增益、BTL/PBTL 模式和逐周期电流限制。可以根据将 J8 ADR/HW 修改为 HW、将 J10 SDA/HW_SEL0 修改为所需模式（根据表 2-3）并将 J11 SCK/HW_SEL1 修改为所需模式（根据表 2-4）来启用硬件控制模式。

表 2-3. 硬件控制 - HW_SEL0 引脚 5

R11 (GND)	R9 (DVDD)	模拟增益	H 桥输出配置
0 Ω	DNP	33.0 V _p /FS	BTL
1k Ω	DNP	23.4 V _p /FS	BTL
4.7k Ω	DNP	16.4 V _p /FS	BTL
15k Ω	DNP	8.3 V _p /FS	BTL
DNP	33k Ω	8.3 V _p /FS	PBTL
DNP	6.8k Ω	16.4 V _p /FS	PBTL
DNP	1.5k Ω	23.4 V _p /FS	PBTL
DNP	0 Ω	33.0 V _p /FS	PBTL

表 2-4. 硬件控制 - HW_SEL1 引脚 6

R10 (GND)	R8 (DVDD)	F _{SW} 和 D 级环路带宽	逐周期电流限制阈值	展频	调制
0 Ω	DNP	768kHz F _{SW} ，175kHz 带宽	CBC 阈值 = 80% OCP	禁用	1SPW
1k Ω	DNP	768kHz F _{SW} ，175kHz 带宽	CBC 禁用	禁用	1SPW
4.7k Ω	DNP	768kHz F _{SW} ，175kHz 带宽	CBC 阈值 = 40% OCP	禁用	1SPW
15k Ω	DNP	768kHz F _{SW} ，175kHz 带宽	CBC 阈值 = 60% OCP	禁用	1SPW
DNP	33k Ω	480kHz F _{SW} ，100kHz 带宽	CBC 禁用	启用	BD
DNP	6.8k Ω	480kHz F _{SW} ，100kHz 带宽	CBC 阈值 = 80% OCP	启用	BD
DNP	1.5k Ω	480kHz F _{SW} ，100kHz 带宽	CBC 阈值 = 40% OCP	启用	BD
DNP	0 Ω	480kHz F _{SW} ，100kHz 带宽	CBC 阈值 = 60% OCP	启用	BD

3 硬件设计文件

3.1 原理图

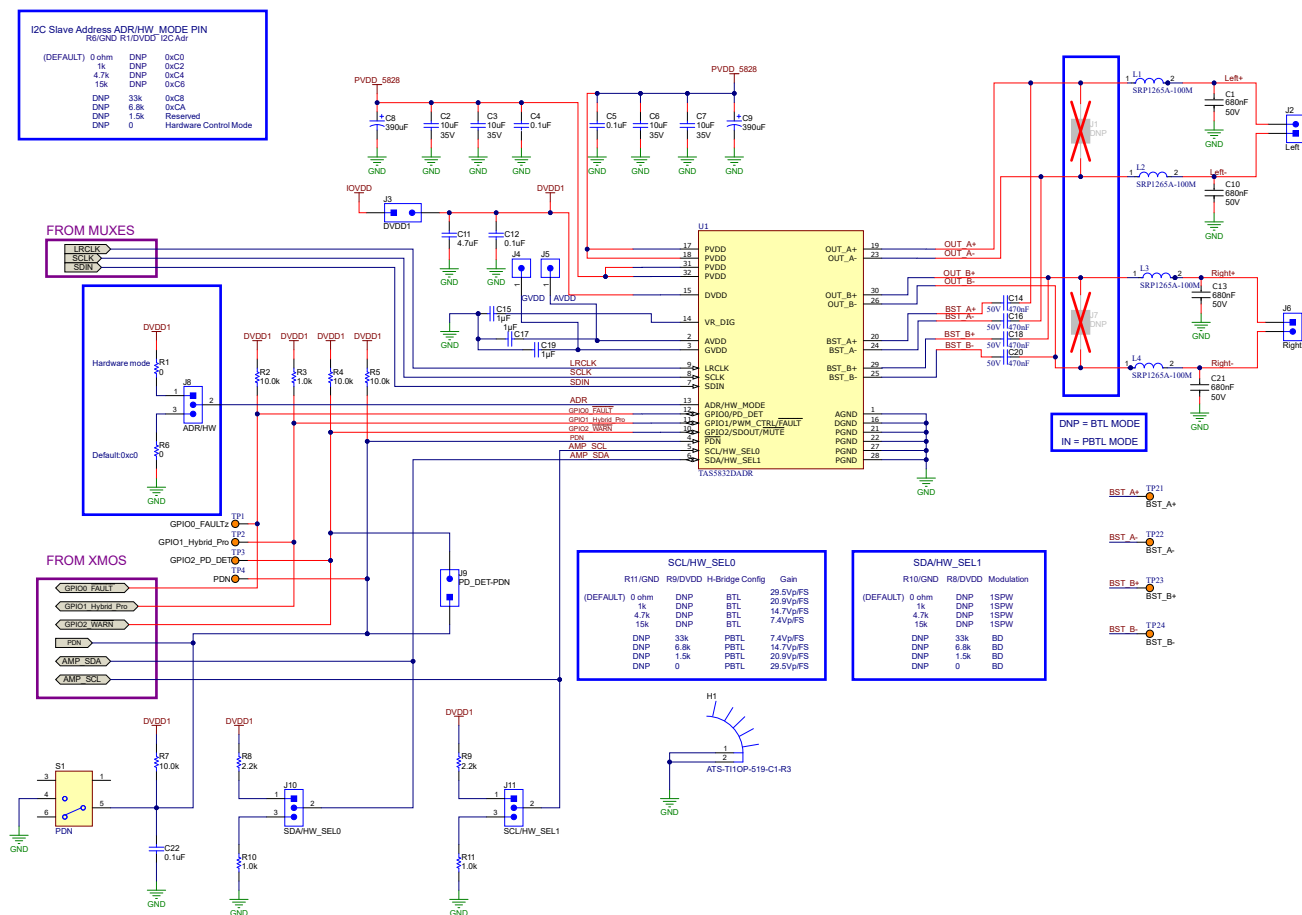


图 3-1. TAS5832EVM 原理图 (第 1 个, 共 5 个)

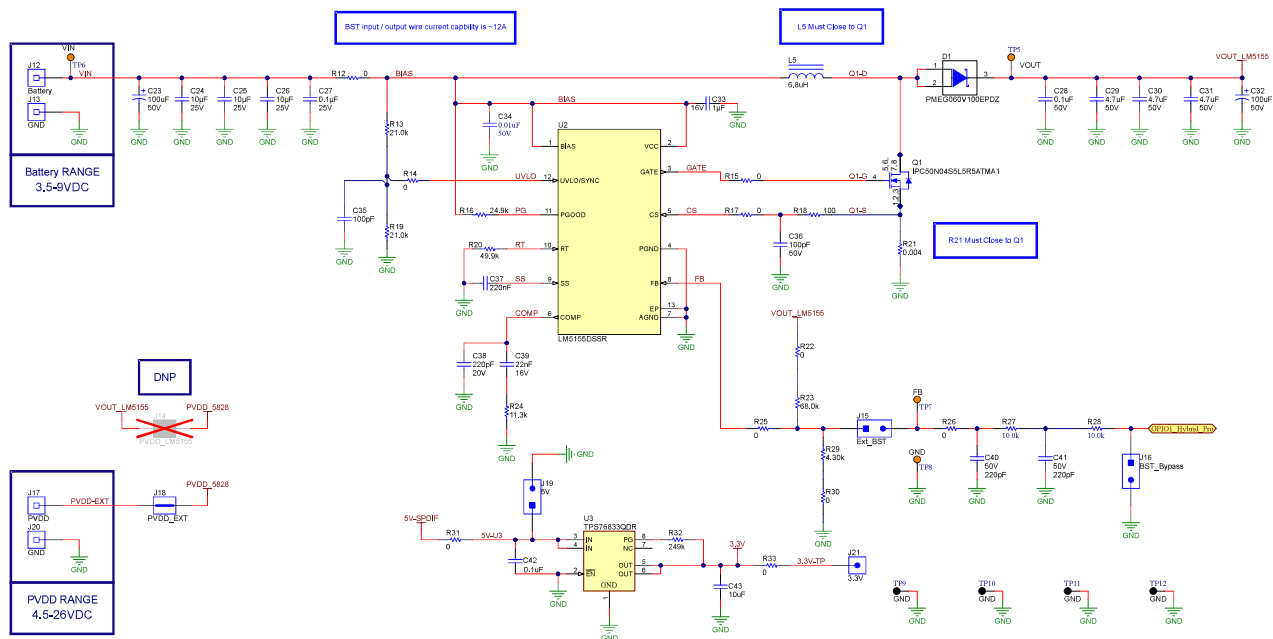


图 3-2. TAS5832EVM 原理图 (第 2 个, 共 5 个)

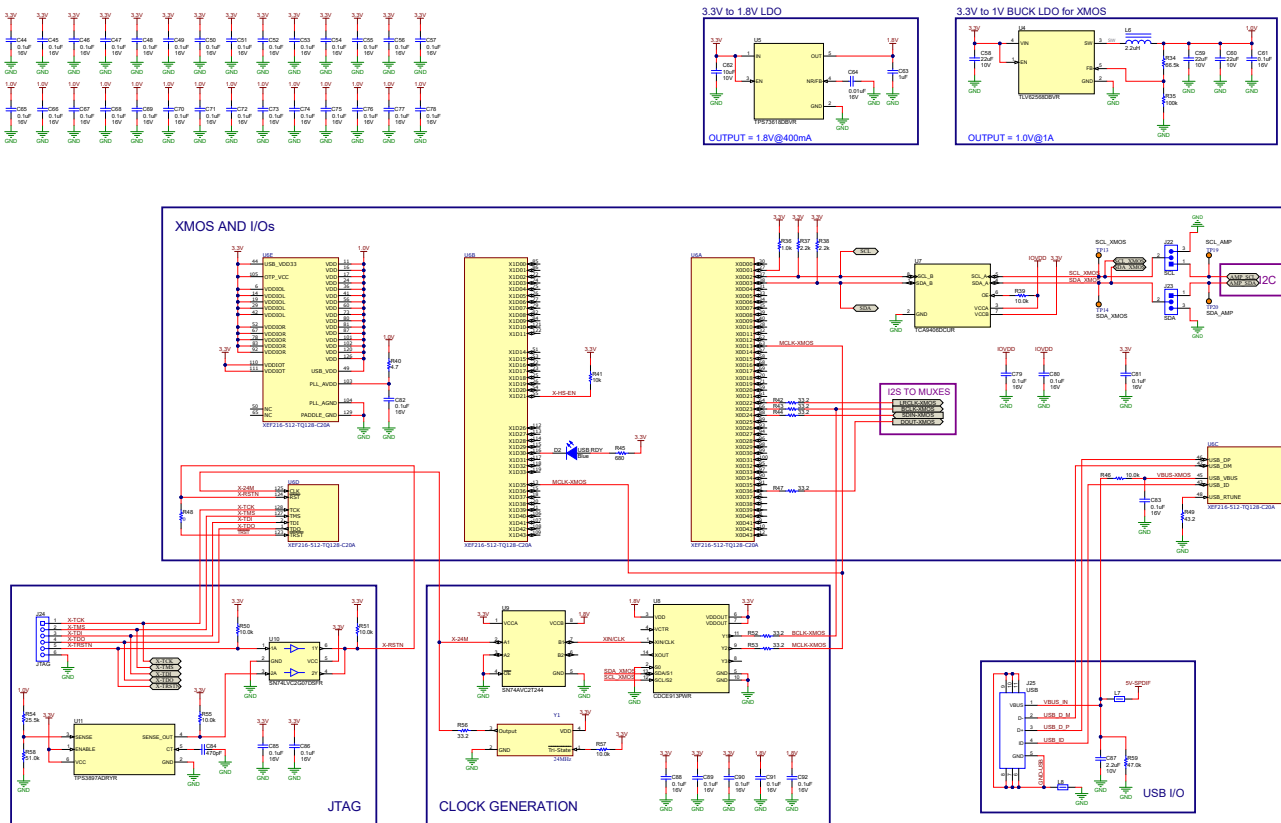


图 3-3. TAS5832EVM 原理图 (第 3 个, 共 5 个)

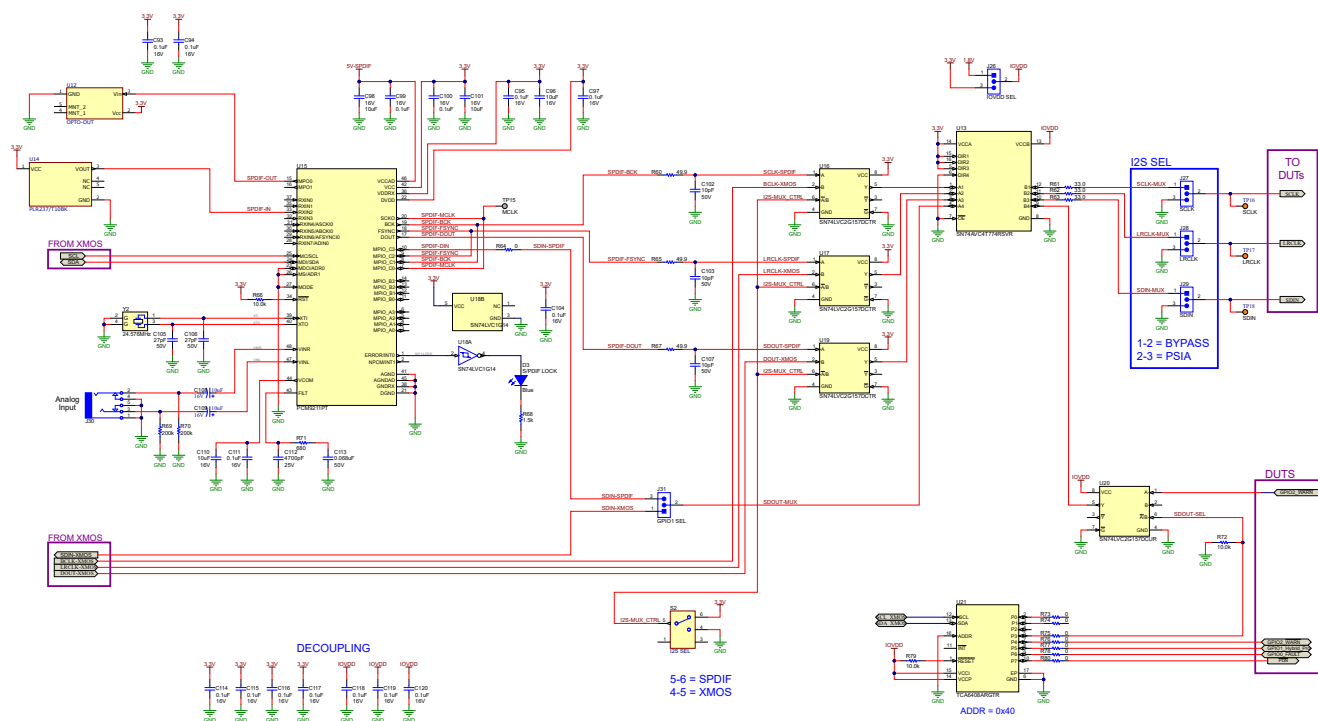


图 3-4. TAS5832EVM 原理图 (第 4 个, 共 5 个)



IPC81

PCB Number: AMPS315
PCB Rev: A

Printed Circuit Board

Logo2

PCB
LOGO
Texas Instruments

Logo3

PCB
LOGO
FCC disclaimer

Logo4

PCB
LOGO
WEEE logo

Logo1



ZZ1

Assembly Note

These assemblies are ESD sensitive, ESD precautions shall be observed.

ZZ2

Assembly Note

These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.

ZZ3

Assembly Note

These assemblies must comply with workmanship standards IPC-A-610 Class 2, unless otherwise specified.

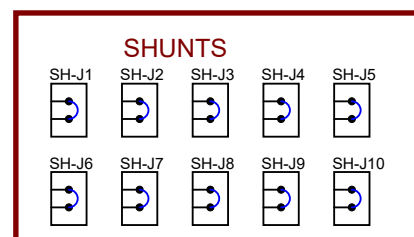


图 3-5. TAS5832EVM 原理图 (第 5 个 , 共 5 个)

3.2 电路板布局布线

图 3-6 和图 3-7 展示了 EVM 电路板布局布线。

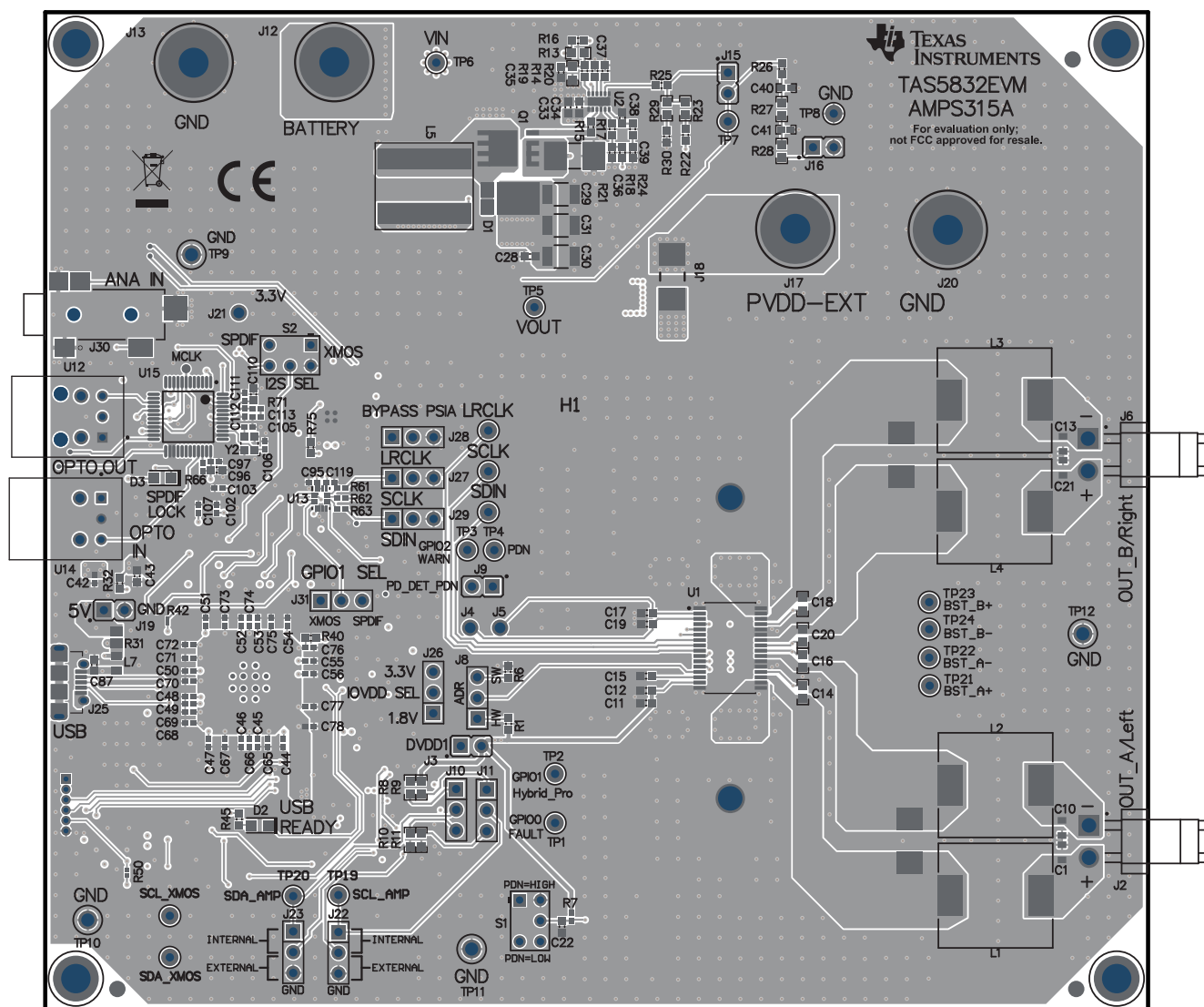


图 3-6. TAS5832EVM 顶部丝印

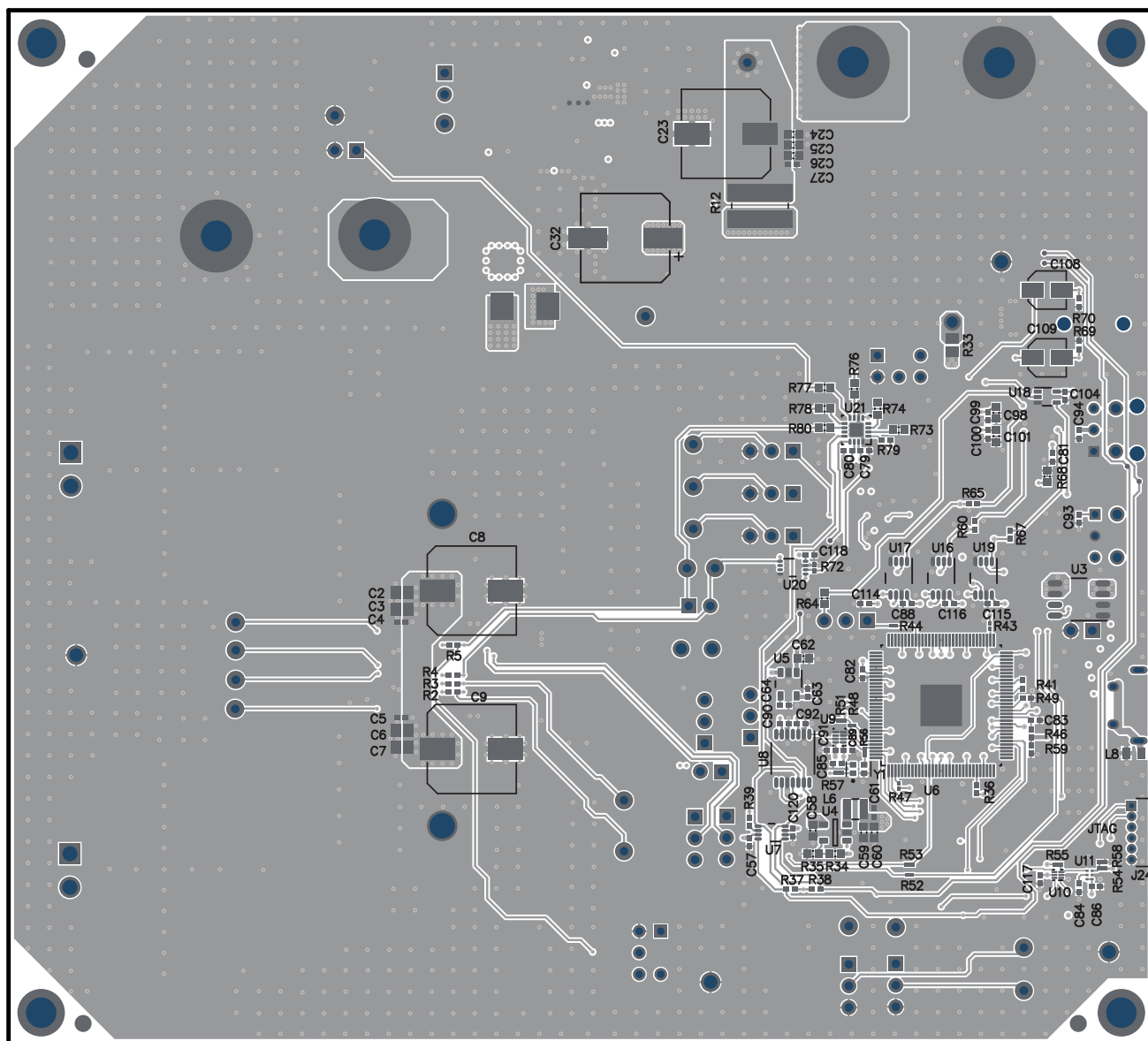


图 3-7. TAS5832EVM 底部覆盖层

3.3 物料清单

位号	数量	值	说明	封装参考	器件型号	制造商
C1、C10、C13、C21	4	0.68uF	电容, 陶瓷, 0.68 μ F 50V X7R 0805	0805	CGA4J3X7R1H684M125 AB	TDK
C2、C3、C6、C7	4	10uF	电容, 陶瓷, 10uF, 35V, +/-10%, X5R, 0805	0805	C2012X5R1V106K085AC	TDK
C4、C5	2	0.1uF	电容, 陶瓷, 0.1 μ F, 50V, +/-10%, X7R, AEC-Q200 1 级, 0402	0402	CGA2B3X7R1H104K050 BB	TDK
C8、C9	2	390uF	电容, 铝制, 390 μ F, 35V, +/-20%, 0.08 Ω , SMD	10x10	UCL1V391MNL1GS	Nichicon
C11	1	4.7 μ F	电容, 陶瓷, 4.7uF, 10V, +/-10%, X5R, 0603	0603	C0603C475K8PACTU	Kemet
C12、C22	2	0.1uF	电容, 陶瓷, 0.1 μ F, 16V, +/-10%, X7R, 0603	0603	C0603C104K4RACTU	Kemet
C14、C16、C18、C20	4	0.47uF	电容, 陶瓷, 0.47 μ F, 50V, +/-10%, X7R, 0603	0603	C1608X7R1H474K080AC	TDK
C15、C17、C19	3	1uF	电容器, 陶瓷, 1 μ F, 16V, +/-20%, X7R, 0603	0603	CL10B105MO8NNWC	Samsung
C23	1	100uF	电容, 混合聚合物, 100uF, 50V, +/-20%, 28 Ω , 10x10 SMD	10x10	EEHZC1H101P	Panasonic
C24、C25、C26	3	10uF	电容器, 陶瓷, 10 μ F, 25V, +/- 10%, X5R, 0603	0603	GRM188R61E106KA73D	MuRata
C27	1	0.1uF	电容, 陶瓷, 0.1 μ F, 25V, +/-10%, X7R, AEC-Q200 1 级, 0402	0402	CGA2B3X7R1E104K050 BB	TDK
C28	1	0.1uF	电容, 陶瓷, 0.1 μ F, 50V, +/-10%, X7R, AEC-Q200 1 级, 0603	0603	CGA3E2X7R1H104K080 AA	TDK
C29、C30、C31	3	4.7 μ F	电容, 陶瓷, 4.7uF, 50V, +/-10%, X7R, AEC-Q200 1 级, 1210	1210	CGA6P3X7R1H475K250 AB	TDK
C32	1	100uF	电容, 铝聚合物, 100 μ F, 50V, +/-20%, 0.025 Ω , AEC-Q200 2 级, D10xL10mm SMD	D10xL10mm	HHXB500ARA101MJA0G	Chemi-Con
C33	1	1uF	电容, 陶瓷, 1 μ F, 16V, $\pm$ 20%, X7R, AEC-Q200 1 级, 0603	0603	GCM188R71C105MA64D	MuRata
C34	1	0.01uF	电容, 陶瓷, 1 μ F, 50V, $\pm$ 10%, X7R, AEC-Q200 0.01 级, 0603	0603	GCM188R71H103KA37D	MuRata
C35、C36	2	100pF	电容, 陶瓷, 100pF, 50V, +/-1%, C0G/NP0, 0603	0603	C0603C101F5GACTU	Kemet
C37	1	0.22uF	电容, 陶瓷, 0.22uF, 50V, +/-10%, X7R, AEC-Q200 1 级, 0603	0603	CGA3E3X7R1H224K080 AB	TDK

位号	数量	值	说明	封装参考	器件型号	制造商
C38	1	220pF	电容, 陶瓷, 220pF, 20V, +/-5%, C0G/ NP0, AEC-Q200 1 级, 0603	0603	CGA3E2C0G1H221J080 AA	TDK
C39	1	0.022uF	电容, 陶瓷, 0.022uF, 16V, +/-10%, X7R, 0603	0603	C0603C223K4RACTU	Kemet
C40、C41	2	220pF	电容, 陶瓷, 220pF, 50V, +/-5%, C0G/ NP0, AEC-Q200 1 级, 0402	0402	CGA2B2C0G1H221J050 BA	TDK
C42、C44、C45、C46、 C47、C48、C49、C50、 C51、C52、C53、C54、 C55、C56、C57、C61、 C65、C66、C67、C68、 C69、C70、C71、C72、 C73、C74、C75、C76、 C77、C78、C79、C80、 C81、C82、C83、C85、 C86、C88、C89、C90、 C91、C92、C93、C94、 C95、C97、C99、 C100、C104、C111、 C114、C115、C116、 C117、C118、C119、 C120	57	0.1uF	电容, 陶瓷, 0.1uF, 16V, +/-10%, X7R, 0402	0402	885012205037	Wurth Elektronik
C43、C62	2	10uF	电容, 陶瓷, 10uF, 10V, +/-20%, X5R, 0603	0603	C1608X5R1A106M080A C	TDK
C58、C59、C60	3	22uF	电容, 陶瓷, 22uF, 10V, +/-20%, X5R, 0603	0603	C1608X5R1A226M080A C	TDK
C63	1	1uF	电容, 陶瓷, 1uF, 6.3V, +/-20%, X5R, 0402	0402	GRM152R60J105ME15D	MuRata
C64	1	0.01uF	电容, 陶瓷, 0.01uF, 16V, +/- 10%, X7R, 0402	0402	885012205031	Wurth Elektronik
C84	1	470pF	电容, 陶瓷, 470pF, 50V, +/-5%, C0G/ NP0, 0402	0402	GRM1555C1H471JA01D	MuRata
C87	1	2.2 u F	电容, 陶瓷, 2.2uF, 10V, +/-10%, X7R, 0603	0603	GRM188R71A225KE15D	MuRata
C96、C98、C101、C110	4	10uF	电容, 陶瓷, 10uF, 16V, +/-20%, X5R, 0603	0603	EMK107BBJ106MA-T	Taiyo Yuden
C102、C103、C107	3	10pF	电容, 陶瓷, 10pF, 50V, +/-5%, C0G/ NP0, 0402	0402	885012005055	Wurth Elektronik
C105、C106	2	27pF	电容, 陶瓷, 27pF, 50V, +/-5%, C0G/ NP0, 0402	0402	GJM1555C1H270JB01	MuRata
C108、C109	2	10uF	电容, 铝制, 10uF, 16V, +/-20%, 3 Ω, SMD	SMT 径向 B	EEE-FC1C100R	Panasonic

位号	数量	值	说明	封装参考	器件型号	制造商
C112	1	4700pF	电容, 陶瓷, 4700pF, 25V, +/-10%, X7R, 0402	0402	CC0402KRX7R8BB472	Yageo
C113	1	0.068uF	电容, 陶瓷, 0.068uF, 50V, +/-10%, X7R, AEC-Q200 1 级, 0402	0402	CGA2B3X7R1H683K050 BB	TDK
D1	1	60V	二极管, 肖特基, 60V, 10A, AEC-Q101, CFP15	CFP15	PMEG060V100EPDZ	Nexperia
D2、D3	2	蓝色	LED, 蓝色, SMD	LED_0805	LTST-C170TBKT	Lite-On
H1	1		散热器, 垂直	散热器	ATS-TI10P-519-C1-R3	Advanced Thermal Solutions
H2、H3、H4、H5	4		机械螺钉盘 PHILLIPS M3	M3 螺钉	RM3X8MM 2701	APM HEXSEAL
H6、H7、H8、H9	4		六角螺柱, 12mm, M3, 铝	铝质 M3 12mm 六角螺柱	24434	Keystone
J2、J6	2		接头 (摩擦锁), 3.96mm, 2x1, 锡, R/A, TH	接头, 2x1, 3.96mm, R/A	B2PS-VH(LF)(SN)	JST Manufacturing
J3、J9、J15、J16、J19	5		接头, 100mil, 2x1, 金, TH	Sullins 100mil, 1x2, 绝缘体上方 230mil	PBC02SAAN	Sullins Connector Solutions
J4、J5、J21	3			测试点, TH 插槽测试点	1040	Keystone
J8、J10、J11、J22、J23、J26、J27、J28、J29、J31	10		接头, 100mil, 3x1, 金, TH	PBC03SAAN	PBC03SAAN	Sullins Connector Solutions
J12、J17	2		接线柱、红色、TH	11.4x27.2mm	7006	Keystone
J13、J20	2		接线柱、黑色、TH	11.4x27.2mm	7007	Keystone
J18	1		跳线 TIN SMD	6.85mm x 0.97mm x 2.51mm	S1911-46R	Harwin
J24	1		插座, 50mil, 6x1, 金, R/A, TH	6x1 插座	LPPB061NGCN-RC	Sullins Connector Solutions
J25	1		连接器, 插座, Micro-USB Type AB, R/A, 底部安装 SMT	5.6mm x 2.5mm x 8.2mm	475890001	Molex
J30	1		音频插孔, 3.5mm, 立体声, R/A, SMT	电话插孔, 6x5x17mm	35RASMT4BHNTRX	Switchcraft
L1、L2、L3、L4	4	10uH	电感器、屏蔽鼓芯、绕线电感器 10A	SMD	SRP1265A-100M	Bourns Inc.
L5	1	6.8uH	电感器, 屏蔽, 铁氧体, 6.8uH, 18.5A, 0.01 Ω , SMD	电感器, 11.3mm x 10mm x 10mm	XAL1010-682MEB	Coilcraft
L6	1	2.2 μ H	电感, 多层, 铁氧体, 2.2uH, 1.3A, 0.08 Ω , SMD	SMD, 封装 2.5x2mm, 高度 1.2mm	LQM2HPN2R2MG0L	MuRata
L7、L8	2	600 Ω	铁氧体磁珠, 600 Ω (100MHz 时), 2A, 0805	0805	MPZ2012S601AT000	TDK
Q1	1	40V	MOSFET, N 沟道, 40V, 50A, AEC-Q101, SON-8	SON-8	IPC50N04S5L5R5ATMA1	Infineon Technologies

位号	数量	值	说明	封装参考	器件型号	制造商
R1、R6、R15、R17、R22、R25、R26、R30、R73、R74、R75、R76、R77、R78、R80	15	0	电阻，0，5%，0.1W，0603	0603	RC0603JR-070RL	Yageo
R2	1	15.0k	电阻，15.0k Ω ，0.1%，0.063W，AEC-Q200 0 级，0402	0402	ERA-2AEB153X	Panasonic
R3、R36	2	1.0k	电阻，1.0k，5%，0.063W，AEC-Q200 0 级，0402	0402	CRCW04021K00JNED	Vishay-Dale
R4、R5、R7、R66、R79	5	10.0k	电阻，10.0k，1%，0.063W，AEC-Q200 0 级，0402	0402	CRCW040210K0FKED	Vishay-Dale
R8、R9	2	2.2k	电阻，2.2k，5%，0.1W，0603	0603	RC0603JR-072K2L	Yageo
R10、R11	2	1.0k	电阻，1.0k，5%，0.1W，0603	0603	RC0603JR-071KL	Yageo
R12	1	0	电阻，0，5%，2W，2512 宽	2512 宽	RCL12250000Z0EG	Vishay Draloric
R13、R19	2	21.0k	电阻，21.0k Ω ，1%，0.1W，0603	0603	RC0603FR-0721KL	Yageo
R14、R64	2	0	电阻，0，1%，0.1W，AEC-Q200 0 级，0603	0603	RMCF0603ZTOR00	Stackpole Electronics Inc
R16	1	24.9k	电阻，24.9k Ω ，1%，0.1W，0603	0603	RC0603FR-0724K9L	Yageo
R18	1	100	电阻，100，1%，0.1W，0603	0603	RC0603FR-07100RL	Yageo
R20	1	49.9k	电阻，49.9k，1%，0.1W，AEC-Q200 0 级，0603	0603	CRCW060349K9FKEA	Vishay-Dale
R21	1	0.004	电阻，0.004，1%，3W，AEC-Q200 0 级，6.4mm x 3.2mm	6.4mm x 3.2mm	ERJ-MS4SF4M0U	Panasonic
R23	1	68.0k	电阻，68.0k，1%，0.1W，0603	0603	RC0603FR-0768KL	Yageo
R24	1	11.3k	电阻，11.3k，1%，0.1W，AEC-Q200 0 级，0603	0603	CRCW060311K3FKEA	Vishay-Dale
R27、R28	2	10.0k	电阻，10.0k，1%，0.1W，0603	0603	ERJ-3EKF1002V	Panasonic
R29	1	4.30k	电阻，4.30k，1%，0.1W，0603	0603	RC0603FR-074K3L	Yageo
R31、R33	2	0	电阻，0，5%，0.125W，0805	0805	RC0805JR-070RL	Yageo America
R32	1	249k	电阻，249k，1%，0.1W，0603	0603	RC0603FR-07249KL	Yageo
R34	1	66.5k	电阻，66.5k，1%，0.1W，0603	0603	RC0603FR-0766K5L	Yageo
R35	1	100k	电阻，100k，1%，0.1W，0603	0603	RC0603FR-07100KL	Yageo
R37、R38	2	2.2k	电阻，2.2k，5%，0.063W，AEC-Q200 0 级，0402	0402	CRCW04022K20JNED	Vishay-Dale
R39、R46	2	10.0k	电阻，10.0k，1%，0.1W，0402	0402	ERJ-2RKF1002X	Panasonic
R40	1	4.7	电阻，4.7，5%，0.1W，AEC-Q200 0 级，0603	0603	CRCW06034R70JNEA	Vishay-Dale

位号	数量	值	说明	封装参考	器件型号	制造商
R41	1	10k	电阻, 10k, 5%, 0.063W, AEC-Q200 0级, 0402	0402	CRCW040210K0JNED	Vishay-Dale
R42、R43、R44、R47、R52、R53、R56	7	33.2	电阻, 33.2, 1%, 0.05W, 0201	0201	RC0201FR-0733R2L	Yageo America
R45	1	680	电阻, 680, 1%, 0.1W, 0603	0603	RC0603FR-07680RL	Yageo
R48	1	0	电阻, 0, 5%, 0.05W, AEC-Q200 0级, 0201	0201	ERJ-1GN0R00C	Panasonic
R49	1	43.2	电阻, 43.2, 1%, 0.1W, AEC-Q200 0级, 0402	0402	ERJ2RKF43R2X	Panasonic
R50、R51、R55、R57、R72	5	10.0k	电阻, 10.0k, 1%, 0.05W, 0201	0201	CRCW020110K0FKED	Vishay-Dale
R54	1	25.5k	电阻, 25.5k, 1%, 0.05W, 0201	0201	RC0201FR-0725K5L	Yageo America
R58	1	51.0k	电阻, 51.0k, 1%, 0.05W, 0201	0201	RC0201FR-0751KL	Yageo America
R59	1	47.0k	电阻, 47.0k, 1%, 0.0625W, 0402	0402	RC0402FR-0747KL	Yageo America
R60、R65、R67	3	49.9	电阻, 49.9, 1%, 0.063W, AEC-Q200 0级, 0402	0402	CRCW040249R9FKED	Vishay-Dale
R61、R62、R63	3	33.0	电阻, 33.0, 1%, 0.1W, 0402	0402	ERJ-2RKF33R0X	Panasonic
R68	1	1.5k	电阻, 1.5k, 5%, 0.1W, AEC-Q200 0级, 0603	0603	CRCW06031K50JNEA	Vishay-Dale
R69、R70	2	200k	电阻, 200k, 5%, 0.063W, AEC-Q200 0级, 0402	0402	CRCW0402200KJNED	Vishay-Dale
R71	1	680	电阻, 680, 5%, 0.063W, AEC-Q200 0级, 0402	0402	CRCW0402680RJNED	Vishay-Dale
S1、S2	2		开关, SPDT, 开-开, 2位, TH	开关, 7mm x 4.5mm	200USP1T1A1M2RE	E-Switch
SH-J1、SH-J2、SH-J3、SH-J4、SH-J5、SH-J6、SH-J7、SH-J8、SH-J9、SH-J10	10	1x2	分流器, 100mil, 镀金, 黑色	分流器	SNT-100-BK-G	Samtec
TP1、TP2、TP3、TP4、TP5、TP6、TP7、TP8、TP13、TP14、TP16、TP17、TP18、TP19、TP20、TP21、TP22、TP23、TP24	19		测试点, 微型, 橙色, TH	橙色微型测试点	5003	Keystone Electronics
TP9、TP10、TP11、TP12	4		测试点, 紧凑型, 黑色, TH	黑色紧凑型测试点	5006	Keystone Electronics
U1	1		TAS5832DADR	TSSOP32	TAS5832DADR	德州仪器 (TI)
U2	1		2.2MHz 宽输入非同步升压, Sepic, 反激式控制器, DSS0012B (WSON-12)	DSS0012B	LM5155DSSR	德州仪器 (TI)

位号	数量	值	说明	封装参考	器件型号	制造商
U3	1		单输出快速瞬态响应 LDO, 1A, 固定 3.3V 输出, 2.7V 至 10V 输入, 具有低 IQ, 8 引脚 SOIC (D), -40°C 至 125°C, 绿色环保 (符合 RoHS 标准, 无镉/溴)	D0008A	TPS76833QDR	德州仪器 (TI)
U4	1		采用 SOT23-5 封装的 1A 高效降压转换器, DBV005A, DBV0005A (SOT-5)	DBV0005A	TLV62568DBVR	德州仪器 (TI)
U5	1		单路输出 LDO, 400mA, 可调电压 (1.2 至 5.5V), 无电容器, 低噪声, 反向电流保护, DBV0005A (SOT-23-5)	DBV0005A	TPS73618DBVR	德州仪器 (TI)
U6	1		XCore XEF 微控制器 IC 32 位 16 核 2000MIP 2MB (2M x 8) 闪存 128-TQFP (14x14)	TQFP128	XEF216-512-TQ128-C20A	XMOS
U7	1		2 位双向 1MHz I ² C 总线和 SMBus 电压电平转换器, DCU0008A (VSSOP-8)	DCU0008A	TCA9406DCUR	德州仪器 (TI)
U8	1		具有 2.5V 或 3.3V LVCMOS 输出的可编程 1-PLL VCXO 时钟合成器, PW0014A (TSSOP-14)	PW0014A	CDCE913PWR	德州仪器 (TI)
U9	1		双位双电源总线收发器, DQM0008A (X2SON-8)	DQM0008A	SN74AVC2T244DQMR	德州仪器 (TI)
U10	1		具有开漏输出的增强型产品双路缓冲器/驱动器, DCK0006A (SOT-SC70-6)	DSF0006A	SN74LVC2G07DSFR	德州仪器 (TI)
U11	1		具有高电平有效开漏输出的单通道超小型可调监控电路, DRY0006A (USON-6)	DRY0006A	TPS3897ADRYR	德州仪器 (TI)
U12	1		光学插孔发送器 OTJ-8	OTJ8	FCR684208T	Cliff Electronic Components
U13	1		具有可配置电压电平转换和三态输出的 4 位双电源总线收发器, RSV0016A (UQFN-16)	RSV0016A	SN74AVC4T774RSVR	德州仪器 (TI)
U14	1		光学接收器 25Mbps 单路 650nm	PTH_9MM70_13MM50	PLR237/T10BK	Everlight Electronics
U15	1		216kHz 数字音频接口收发器 (DIX), 带立体声 ADC 和布线, PCM, S/PDIF, ADC, 模拟为 4.5V 至 5.5V, DIX 为 2.9V 至 3.6V, -40°C 至 85°C, 48 引脚 LQFP (PT), 环保 (符合 RoHS 标准, 无镉/溴)	PT0048A	PCM9211PT	德州仪器 (TI)
U16、U17、U19	3		单路 2 线路至 1 线路数据选择器/多路复用器, DCT0008A, LARGE T&R	DCT0008A	SN74LVC2G157DCTR	德州仪器 (TI)
U18	1		单路施密特触发逆变器, DCK0005A (SOT-SC70-5)	DCK0005A	SN74LVC1G14DCKR	德州仪器 (TI)
U20	1		单路 2 线路至 1 线路数据选择器/多路复用器, DCU0008A, LARGE T&R	DCU0008A	SN74LVC2G157DCUR	德州仪器 (TI)

位号	数量	值	说明	封装参考	器件型号	制造商
U21	1		低压 8 位 I2C 和 SMBus I/O 扩展器, 1.65V 至 5.5V, -40°C 至 85°C, 16 引脚 QFN (RGT), 绿色环保 (符合 RoHS 标准, 无镉/溴)	RGT0016A	TCA6408ARGTR	德州仪器 (TI)
Y1	1		晶体振荡器 24MHz ±50ppm HCMOS 3.3V SMD 2mm x 1.6mm	SMD_2MM0_1MM6	ASA-24.000MHZ-L-T	Abracon
Y2	1		晶振, 24.576MHz, 10pF, SMD	2.5x0.5x2.0mm	ABM10-24.576MHZ-E20-T	Abracon Corporation

4 其他信息

4.1 商标

PurePath™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

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 DEGRADATION 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 instructions, 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/sds/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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3.3.3 *Notice for EVMs for Power Line Communication:* Please see http://www.tij.co.jp/sds/ti_ja/general/eStore/notice_02.page

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3.4 European Union

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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.

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