EVM User's Guide: TAS5802PWPEVM

TAS5802PWP 评估模块

说明

TAS5802PWPEVM 评估模块 (EVM) 可帮助设计人员评估 TAS5802PWP 数字输入闭环 D 类放大器的运行情况和性能。TAS5802PWP 是一款立体声高性能闭环 D 类放大器，具有低功耗和先进的音频处理功能。名为 PurePath™ Control Console 3 的图形用户界面用于将 USB 连接到 EVM。该 EVM 具有光纤 SPDIF 输入、I2S、TDM 以及通过 USB 接口的音频输入。

开始使用

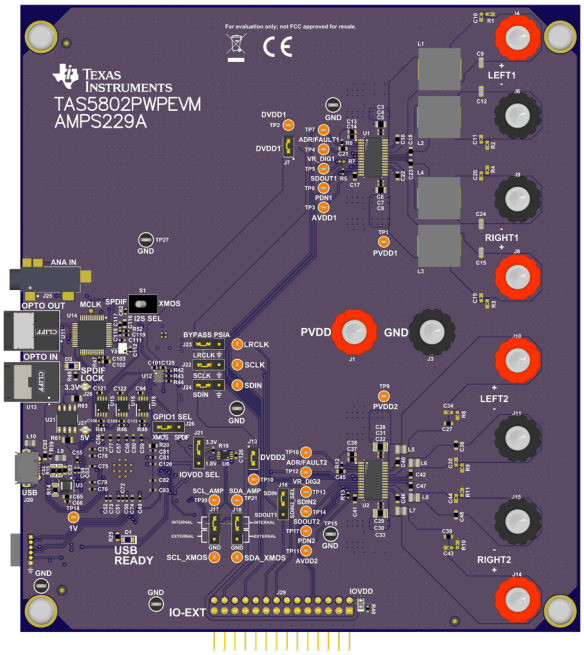
1. 订购 TAS5802PWPEVM
2. 下载最新版本的 PurePath™ Control Console 3 GUI (PPC3) 并请求访问 TAS5802-SW
3. 阅读此 TAS5802PWPEVM 用户指南
4. 如有疑问或若要寻求支持，请参阅 TAS5802 数据表或 E2E

特性

- 支持 96kHz 输入采样率
- 提供灵活的输入信号路由 (USB、模拟、光纤和外部 I2S)
- 通过 PurePath Console 3 软件 (GUI) 展示、评估和开发环境

应用

- LCD 电视、OLED 电视、移动智能电视、激光电视
- 智能扬声器、智能显示屏、条形音箱、无线扬声器
- 笔记本电脑、台式计算机主板
- 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



TAS5802PWPEVM

1 评估模块概述

1.1 简介

本用户指南介绍了 TAS5802PWP 评估模块 (EVM) 的运行情况。TAS5802PWPEVM 是一款独立式 EVM。使用 PurePath Control Console 3 GUI (PPC3) 来初始化和操作该 EVM。要利用高级处理特性，请使用 TAS5802-SW 配置 DSP 处理块，写入 I^2C 命令

1.2 套件内容

- TAS5802PWPEVM
- EVM 免责声明自述文件

1.3 规格

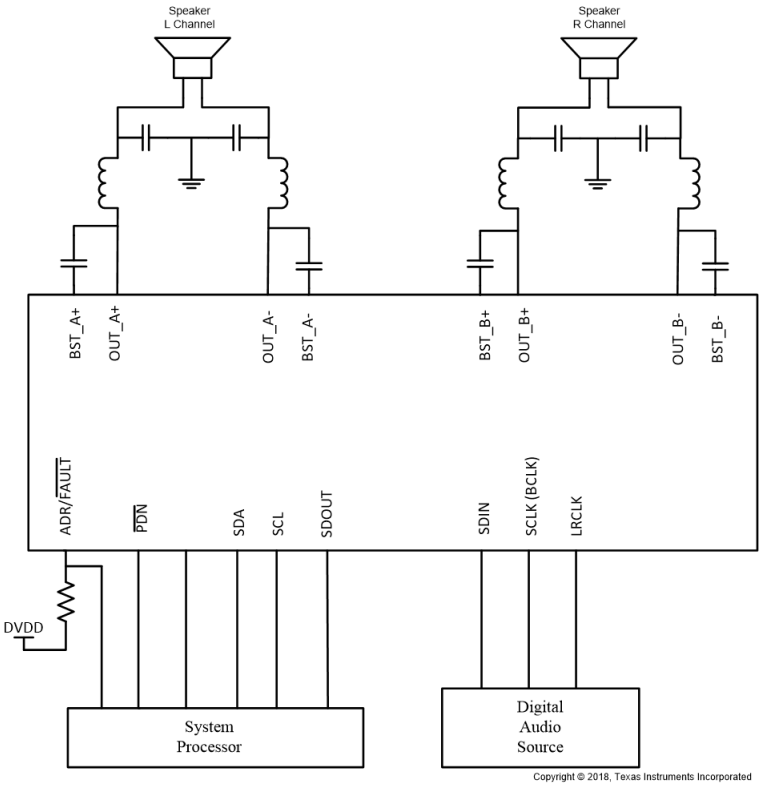


图 1-1. TAS5802 简化版系统图

1.4 器件信息

TAS5802PWPEVM 展示了最新的 TI 数字输入 D 类闭环放大器。TAS5802PWP 是一款具有高级处理功能的数字输入立体声高效闭环 D 类音频放大器。TAS5802PWPEVM 是一款独立的 EVM，它具有单路电源输入、通过 PurePath 控制台 3 (PPC3) 实现的 USB 控制以及灵活的音频输入选项。

2 硬件

2.1 设置

软件控制模式

1. 将扬声器连接到 TAS5802PWPEVM。
2. 将 PSU 连接到 TAS5802PWPEVM 并打开电源。
3. 将 USB 电缆从 PC 插入 TAS5802PWPEVM。USB 就绪 LED（蓝色）也亮起。
4. 如果使用光源，则蓝色 SPDIF LOCK LED 亮起。
5. 使用 PPC3 初始化 TAS5802PWP 器件，以开始播放音频和测试不同的特性。

2.1.1 I²C 器件地址

在 EVM 上，第一个 TAS5802PWP 器件的默认 7 位 I²C 地址设置为 0xA8，第二个器件的默认地址设置为 0xAA 。

2.2 接头和跳线信息

表 2-1. TAS5802 电路跳线

位号	名称	位置	说明
J2	PVDD_EXT	IN: 默认，外部 PVDD 为器件 1 提供 PVDD OUT：器件 1 的 PVDD 断开连接	驱动第一个 TAS5802 的模拟电源。如果要测量 PVDD 电流消耗，可以使用此跳线作为电流探头
J5	PVDD1	IN: 默认，外部 PVDD 为器件 1 提供 PVDD OUT：器件 1 的 PVDD 断开连接	驱动第一个 TAS5802 的模拟电源。如果要测量 PVDD 电流消耗，可以使用此跳线作为电流探头
J7	DVDD1	IN: 默认，IOVDD 为器件 1 提供 DVDD OUT：器件 1 的 DVDD 断开连接	驱动第一个 TAS5802 的数字电源。如果要测量 DVDD 电流消耗，则需要从外部将 DVDD 驱动至引脚 2
J12	PVDD2	IN: 默认，外部 PVDD 为器件 2 提供 PVDD OUT：器件 2 的 PVDD 断开连接	驱动第二个 TAS5802 的模拟电源。如果要测量 PVDD 电流消耗，可以使用此跳线作为电流探头
J13	DVDD2	IN: 默认，IOVDD 为器件 2 提供 DVDD OUT：器件 2 的 DVDD 断开连接	驱动第二个 TAS5802 的数字电源。如果要测量 DVDD 电流消耗，则需要从外部将 DVDD 驱动至引脚 2
J16	SDIN2_SEL	1-2：来自 I2S 多路复用器的 SDIN 2-3：默认，来自第一个 TAS5802 的 SDOUT 的 SDIN	为第二个器件选择串行数据输入。

表 2-2. R6：I2C 地址 = 器件 1

R6	地址
4.7kΩ（默认值）	0xA8
15kΩ	0xAA
47kΩ	0xAC
120kΩ	0xAE

表 2-3. J12：I2C 地址 = 器件 2

R12	地址
4.7kΩ	0xA8
15kΩ（默认值）	0xAA
47kΩ	0xAC
120kΩ	0xAE

表 2-4. XMOS 电路跳线

位号	名称	位置	说明
J17	SCL	1-2：默认，PPC3 将 XMOS I2C 总线驱动至 TAS5802 OUT：使用引脚 1 和 3 从外部将 SCL 驱动至 EVM 上的 TAS5802	SCL 跳线提供了一些选项来提供或接收 I2C 信号。默认配置将 XMOS I2C 总线连接到 TAS5802 以使用 PPC3 来配置器件。断开跳线可将 XMOS I2C 总线连接到外部 TAS5802 系统板，以便使用引脚 2 和 3 通过 PPC3 配置该器件。或者，可以使用外部 I2C 总线通过引脚 1 和 3 来驱动 EVM 上的 TAS5802。
J18	SDA	1-2：默认，PPC3 将 XMOS I2C 总线驱动至 TAS5802 OUT：使用引脚 1 和 3 从外部将 SDA 驱动至 EVM 上的 TAS5802	SDA 跳线提供了一些选项来提供或接收 I2C 信号。默认配置将 XMOS I2C 总线连接到 TAS5802 以使用 PPC3 来配置器件。断开跳线可将 XMOS I2C 总线连接到外部 TAS5802 系统板，以便使用引脚 2 和 3 通过 PPC3 配置该器件。或者，可以使用外部 I2C 总线通过引脚 1 和 3 来驱动 EVM 上的 TAS5802。

表 2-5. 音频输入 IO 电路跳线和开关

位号	名称	位置	说明
J21	IOVDD	1-2：1.8V IOVDD 2-3：默认，3.3V IOVDD	设置数字接口的 IOVDD 电压
J22	SCLK	1-2：默认，旁路模式，可将 SPDIF 和 XMOS I2S 输入发送到 TAS5802 2-3：将外部 PSIA 连接器连接到引脚 2-3，以将输入驱动至 TAS5802	将 SCLK 输入设置为使用 USB/光学输入在内部驱动，或使用 PSIA 连接器从外部驱动
J23	LRCLK	1-2：默认，旁路模式，可将 SPDIF 和 XMOS I2S 输入发送到 TAS5802 2-3：将外部 PSIA 连接器连接到引脚 2-3，以将输入驱动至 TAS5802	将 LRCLK 输入设置为使用 USB/光学输入在内部驱动，或使用 PSIA 连接器从外部驱动
J24	SDIN	1-2：默认，旁路模式，可将 SPDIF 和 XMOS I2S 输入发送到 TAS5802 2-3：将外部 PSIA 连接器连接到引脚 2-3，以将输入驱动至 TAS5802	将 SDIN 输入设置为使用 USB/光学输入在内部驱动，或使用 PSIA 连接器从外部驱动
J26	GPIO1 SEL	1-2：默认，将 SDOUT 数据发送到 XMOS 2-3：将 SDOUT 数据发送到 SPIDIF 光学输出	如果器件不使用 H 类特性，则可以使用该跳线将输出 I2S/TDM 数据发送到 XMOS 和 USB 或光学输出的外部源

表 2-6. J33：IO-EXT 引脚说明

编号	名称	说明
所有奇数引脚（1 至 27）	GND	接地连接。
2	IOVDD	3.3V 或 1.8V 数字电源。
4.6	不适用	未使用的悬空引脚。
8	SCL	TAS5802 的 I²C 串行控制时钟输入。
10	SDA	TAS5802 的 I²C 串行控制时钟输入。
12	LRCLK	I²S/TDM 帧时钟。
14	SCLK	I²S/TDM 位时钟。
16	SDIN	I²S/TDM 数据。
18	SDOUT1	来自第一个 TAS5802 的 SDOUT。
20	SDOUT2	来自第二个 TAS5802 的 SDOUT。
22	$\overline{\text{PDN1}}$	关断，第一个器件低电平有效。PDN 将放大器置于关断状态，关闭所有内部稳压器。
24	$\overline{\text{PDN2}}$	关断，第二个器件低电平有效。PDN 将放大器置于关断状态，关闭所有内部稳压器。
26	ADR_$\overline{\text{FAULT1}}$	第二个 TAS5802 的低电平有效故障引脚。
28	ADR_$\overline{\text{FAULT2}}$	第二个 TAS5802 的低电平有效故障引脚。

2.3 测试点

表 2-7. 测试点

位号	名称	说明
TP1	PVDD1	器件 1 的 PVDD
TP2	DVDD1	器件 1 的数字电源
TP3	AVDD1	器件 1 的 AVDD 内部稳压电压
TP4	VR_DIG1	器件 1 的 VR_DIG 内部稳压电压
TP5	SDOUT1	器件 1 的串行数据输出
TP7	ADR/FAULT1	器件 1 的低电平有效故障引脚
TP8	PDN1	器件 1 的低电平有效关断输入
TP9	PVDD2	器件 2 的 PVDD
TP10	DVDD2	器件 2 的数字电源
TP11	AVDD2	器件 2 的 AVDD 内部稳压电压
TP12	VR_DIG2	器件 2 的 VR_DIG 内部稳压电压
TP13	SDIN2	器件 2 的串行数据输入
TP14	SDOUT2	器件 2 的串行数据输出
TP16	ADR/FAULT2	器件 2 的低电平有效故障引脚
TP17	PDN2	器件 2 的低电平有效关断输入
TP18	1V	XMOS 中使用的 1V 电源轨。
TP19	SCL_XMOS	由 XMOS 生成的 I2C 串行时钟输入的探测点。
TP20	SCL_AMP	进入 TAS5802 的 I2C 串行时钟输入的探测点
TP21	SDA_AMP	进入 TAS5827 的 I2C 串行控制数据接口输入/输出。
TP22	SDA_XMOS	由 XMOS 生成的 I2C 串行控制数据接口输入/输出。
TP23	MCLK	在串行数据端口的输入数据线路上有效的数字信号的主时钟
TP24	SCLK	在串行数据端口的输入数据线路上有效的数字信号的位时钟。
TP25	LRCLK	在串行端口的输入数据线上有效的数字信号的字选择时钟。在 I2S、LJ 和 RJ 中，这对应于左声道和右声道边界。在 TDM 模式下，这对应于帧同步边界。
TP26	SDIN	串行数据端口的数据线路。
所有其他 TP	GND	探针的接地基准引脚。

3 硬件设计文件

3.1 原理图

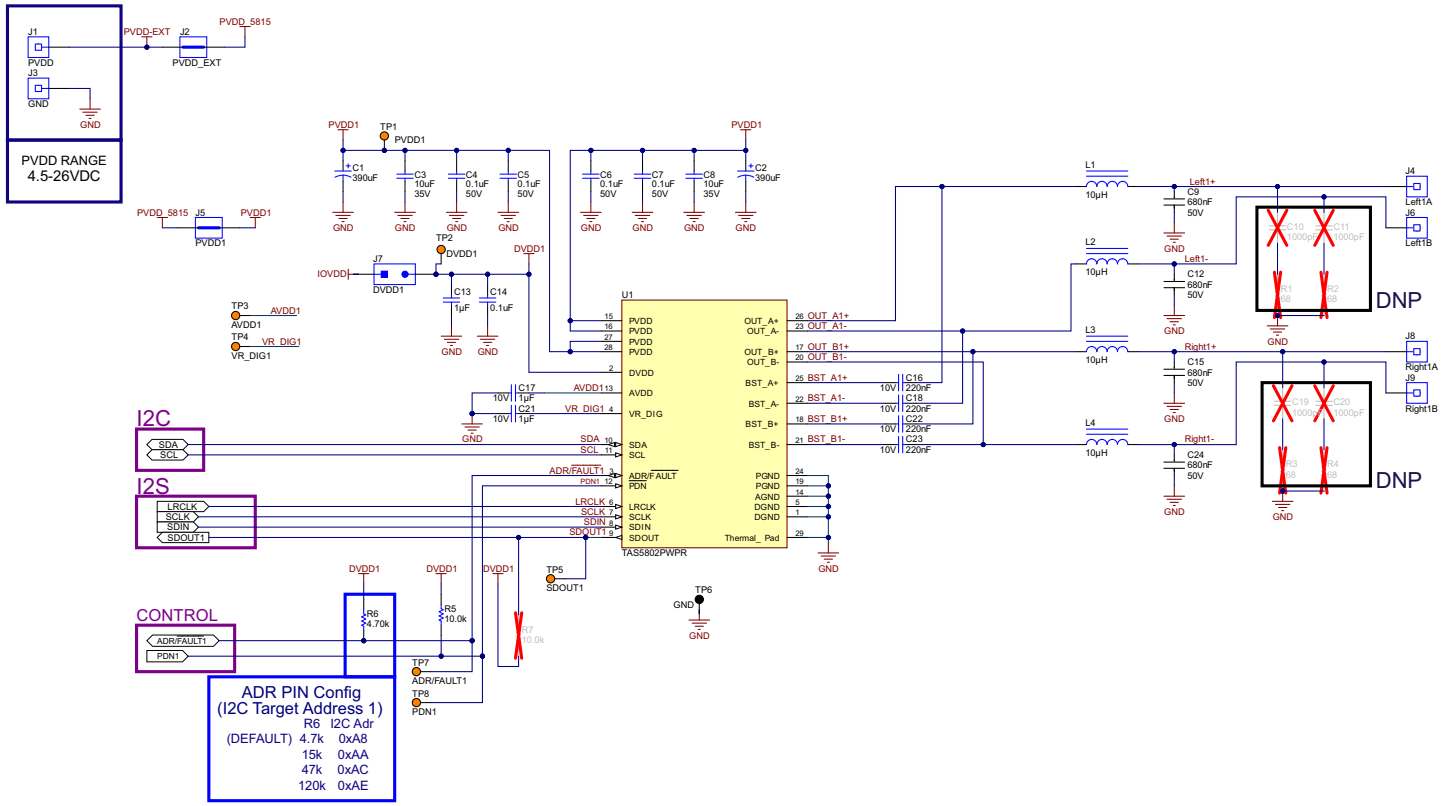


图 3-1. TAS5802PWPEVM 原理图 (第 1 个 , 共 6 个)

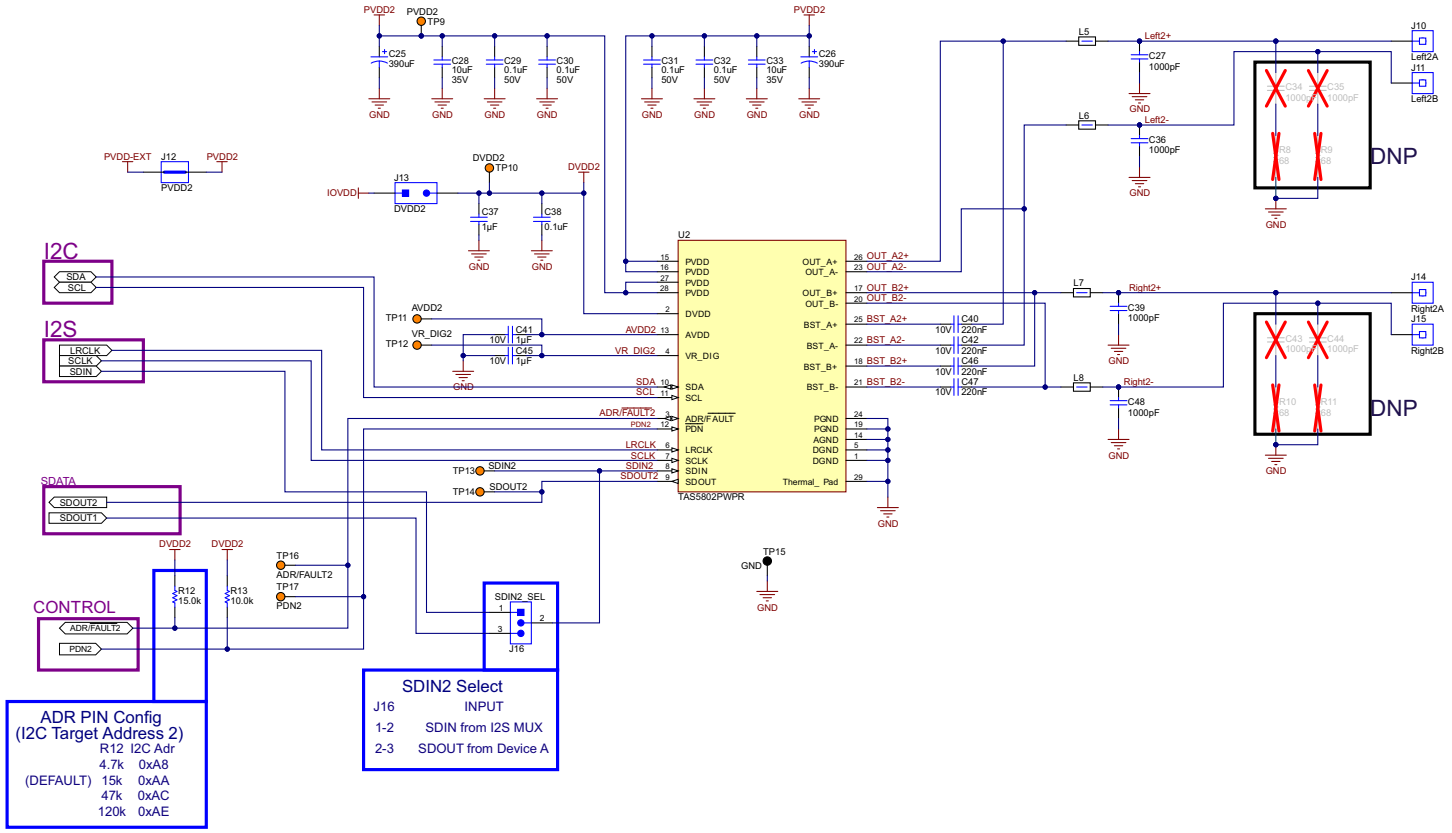


图 3-2. TAS5802PWPEVM 原理图 (第 2 个 , 共 6 个)

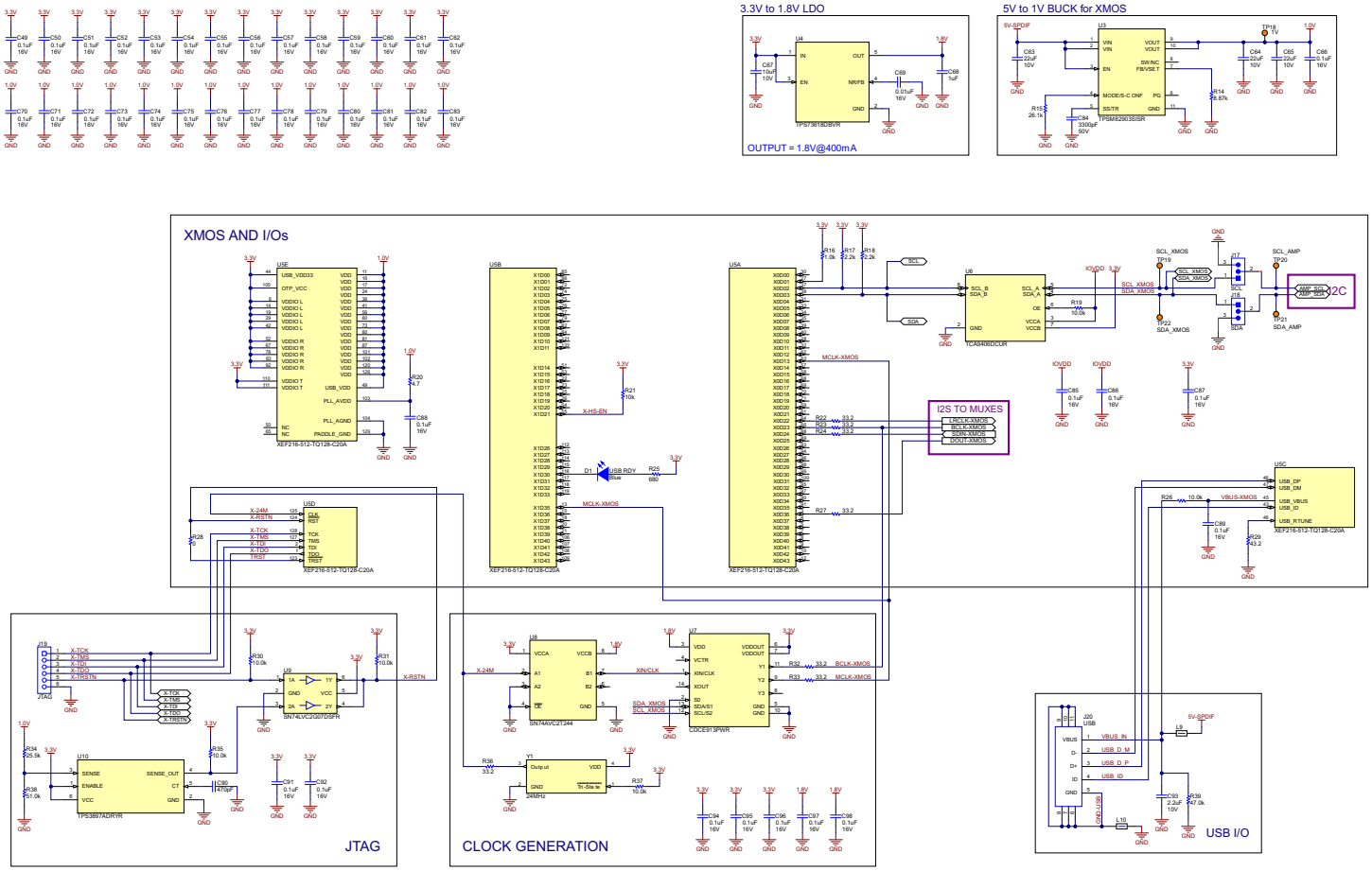


图 3-3. TAS5802PWPEVM 原理图 (第 3 个 , 共 6 个)

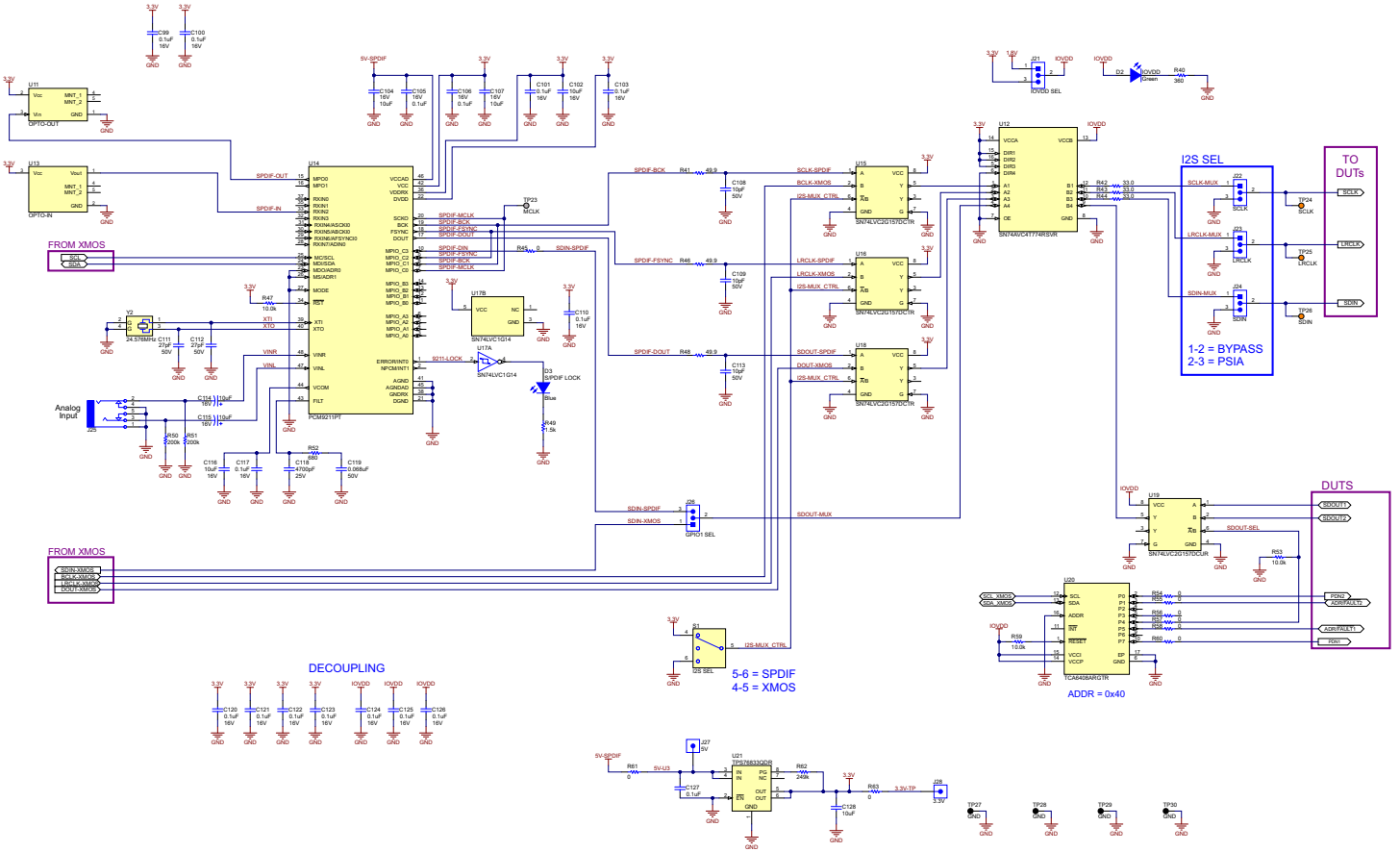


图 3-4. TAS5802PWPEVM 原理图 (第 4 个 , 共 6 个)

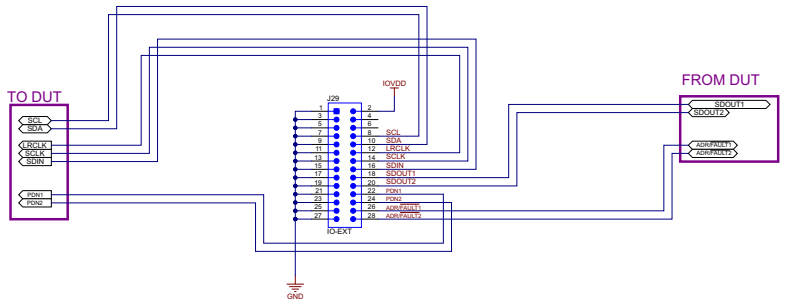


图 3-5. TAS5802PWPEVM 原理图 (第 5 个 , 共 6 个)

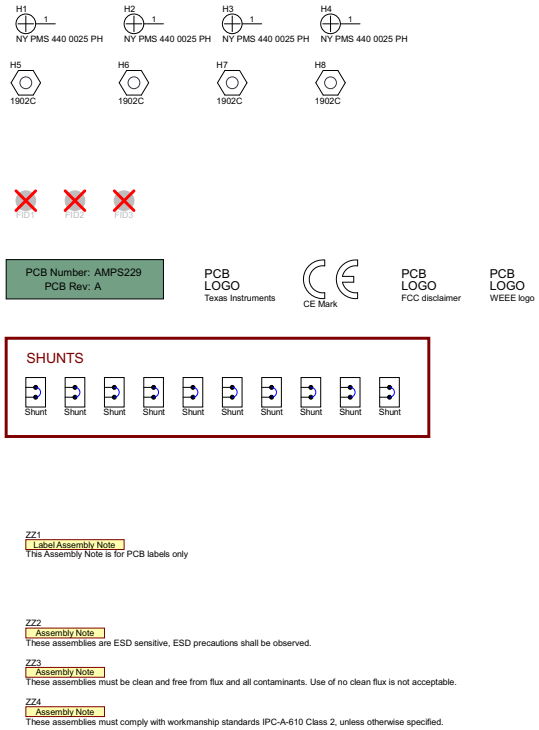


图 3-6. TAS5802PWPEVM 原理图 (第 6 个 , 共 6 个)

3.2 PCB 布局

图 3-7 和图 3-8 展示了 EVM 电路板布局布线。

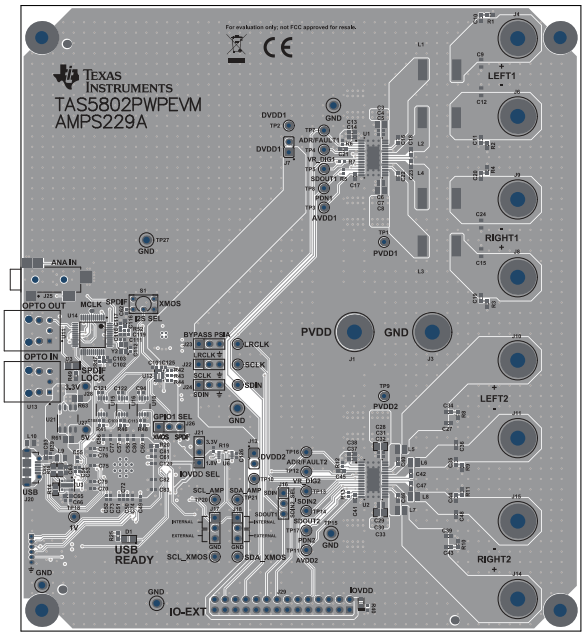


图 3-7. TAS5802PWPEVM 顶部丝印

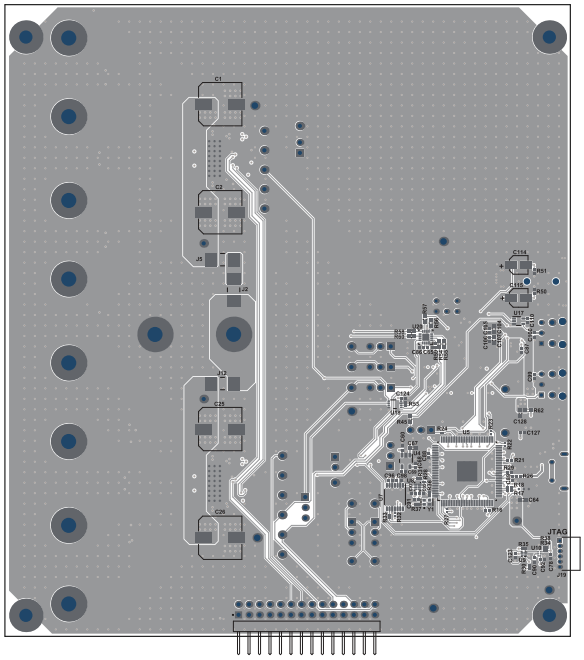


图 3-8. TAS5802PWPEVM 底部覆盖层

3.3 物料清单

表 3-1. 物料清单

位号	数量	值	说明	封装参考	器件型号	制造商	备选器件型号	备选制造商
C1、C2、C25、C26	4	390uF	电容，铝制，390µF，35V，+/-20%，0.08Ω，SMD	10x10	UCL1V391MNL1GS	Nichicon		
C3、C8、C28、C33	4	10uF	CAP，CERM，10µF，35V，+/-10%，X5R，0805	0805	GRM21BR6YA106KE43L	MuRata		
C4、C5、C6、C7、C29、C30、C31、C32	8	0.1uF	电容，陶瓷，0.1µF，50V，+/-10%，X7R，AEC-Q200 1 级，0402	0402	CGA2B3X7R1H104K050BB	TDK		
C9、C12、C15、C24	4		电容，陶瓷，0.68µF 50V X7R 0805	0805	CGA4J3X7R1H684M125AB	TDK Corporation		
C13、C37	2	1uF	电容，陶瓷，1µF，50V，+/-10%，X7R，0603	0603	UMK107AB7105KA-T	Taiyo Yuden		
C14、C38	2	0.1uF	电容，陶瓷，0.1uF，50V，+/-10%，X7R，0603	0603	C0603C104K5RACTU	Kemet		
C16、C18、C22、C23、C40、C42、C46、C47	8	0.22uF	电容，陶瓷，0.22uF，10V，+/-10%，X7R，0603	0603	GRM188R71A224KA01D	MuRata		
C17、C21、C41、C45	4	1uF	电容，陶瓷，1µF，10V，+/-10%，X7R，0603	0603	LMK107B7105KA-T	Taiyo Yuden		
C27、C36、C39、C48	4	1000pF	电容，陶瓷，1000pF，100V，+/-10%，X7R，0603	0603	GRM188R72A102KA01D	MuRata		

表 3-1. 物料清单（续）

位号	数量	值	说明	封装参考	器件型号	制造商	备选器件型号	备选制造商
C49、C50、C51、C52、C53、C54、C55、C56、C57、C58、C59、C60、C61、C62、C66、C70、C71、C72、C73、C74、C75、C76、C77、C78、C79、C80、C81、C82、C83、C85、C86、C87、C88、C89、C91、C92、C94、C95、C96、C97、C98、C99、C100、C101、C103、C105、C106、C110、C117、C120、C121、C122、C123、C124、C125、C126、C127	57	0.1uF	电容，陶瓷，0.1uF，16V，+/-10%，X7R，0402	0402	8.85012E+11	Wurth Elektronik		
C63、C64、C65	3	22uF	电容，陶瓷，22uF，10V，+/-20%，X5R，0603	0603	C1608X5R1A226M080AC	TDK		
C67、C128	2	10uF	电容，陶瓷，10uF，10V，+/-20%，X5R，0603	0603	C1608X5R1A106M080AC	TDK		
C68	1	1uF	电容，陶瓷，1uF，6.3V，+/-20%，X5R，0402	0402	GRM152R60J105ME15D	MuRata		
C69	1	0.01uF	电容，陶瓷，0.01uF，16V，+/-10%，X7R，0402	0402	8.85012E+11	Wurth Elektronik		
C84	1	3300pF	电容，陶瓷，3300pF，50V，+/-5%，C0G/NP0，0603	0603	GRM1885C1H332JA01D	MuRata		
C90	1	470pF	电容，陶瓷，470pF，50V，+/-5%，C0G/NP0，0402	0402	GRM1555C1H471JA01D	MuRata		

表 3-1. 物料清单（续）

位号	数量	值	说明	封装参考	器件型号	制造商	备选器件型号	备选制造商
C93	1	2.2uF	电容，陶瓷，2.2uF，10V，+/-10%，X7R，0603	0603	GRM188R71A225KE15D	MuRata		
C102、C104、C107、C116	4	10uF	电容，陶瓷，10uF，16V，+/-20%，X5R，0603	0603	EMK107BBJ106MA-T	Taiyo Yuden	GMC10X5R106M16NT	CAL-CHIP ELECTRONICS, INC.
C108、C109、C113	3	10pF	电容，陶瓷，10pF，50V，+/-5%，C0G/NP0，0402	0402	8.85012E+11	Wurth Elektronik		
C111、C112	2	27pF	电容，陶瓷，27pF，50V，+/-5%，C0G/NP0，0402	0402	GJM1555C1H270JB01D	MuRata		
C114、C115	2	10uF	电容器，铝制，10uF，16V，+/-20%，SMD	D55	EMVE160ADA100MD55G	Chemi-Con	UWX1C100MCL1GB	Nichicon
C118	1	4700pF	电容，陶瓷，4700pF，25V，+/-10%，X7R，0402	0402	CC0402KRX7R8BB472	Yageo		
C119	1	0.068uF	电容，陶瓷，0.068µF，50V，+/–10%，X7R，AEC-Q200 1 级，0402	0402	CGA2B3X7R1H683K050BB	TDK		
D1、D3	2	蓝色	LED，蓝色，SMD	LED_0805	LTST-C170TBKT	Lite-On		
D2	1	绿色	LED，绿色，SMD	LED_0603	150060GS75000	Wurth Elektronik		
H1、H2、H3、H4	4		机械螺钉，圆头，#4-40 x 1/4，尼龙，飞利浦盘形头	螺钉	NY PMS 440 0025 PH	B&F Fastener Supply		
H5、H6、H7、H8	4		六角螺柱，0.5"L #4-40，尼龙	螺柱	1902C	Keystone		
J1、J4、J8、J10、J14	5		接线柱、红色、TH	11.4x27.2mm	7006	Keystone		
J2、J5、J12	3		跳线 TIN SMD	6.85mm x 0.97mm x 2.51mm	S1911-46R	Harwin		
J3、J6、J9、J11、J15	5		接线柱、黑色、TH	11.4x27.2mm	7007	Keystone		
J7、J13	2		接头，100mil，2x1，金，TH	Sullins 100mil，1x2，绝缘体上方 230mil	PBC02SAAN	Sullins Connector Solutions		
J16、J17、J18、J21、J22、J23、J24、J26	8		接头，100mil，3x1，金，TH	PBC03SAAN	PBC03SAAN	Sullins Connector Solutions		
J19	1		插座，50mil，6x1，金，R/A，TH	6x1 插座	LPPB061NGCN-RC	Sullins Connector Solutions		

表 3-1. 物料清单（续）

位号	数量	值	说明	封装参考	器件型号	制造商	备选器件型号	备选制造商
J20	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		
J25	1		音频插孔，3.5mm，立体声，R/A，SMT	电话插孔，6x5x17mm	35RASMT4BHNTRX	Switchcraft		
J27、J28	2			测试点，TH 插槽测试点	1040	Keystone		
J29	1		接头，100mil，14x2，金，R/A，TH	14x2 R/A 接头	TSW-114-08-G-D-RA	Samtec		
L1、L2、L3、L4	4	10uH	电感，屏蔽，铁氧体，10µH，4.4A，0.0304Ω，SMD		1274AS-H-100M=P3	MuRata		
L5、L6、L7、L8	4	300Ω	铁氧体磁珠，300ohm（在 100MHz 时），3.1A，0806	0806	NFZ2MSM301SN10L	MuRata		
L9、L10	2	600Ω	铁氧体磁珠，600ohm（在 100MHz 时），2A，0805	0805	MPZ2012S601AT000	TDK		
R5、R13	2	15.0k	电阻，15.0kΩ，0.1%，0.063W，AEC-Q200 0 级，0402	0402	ERA-2AEB153X	Panasonic		
R6	1	4.70k	电阻，4.70k，1%，0.0625W，0402	0402	RC0402FR-074K7L	Yageo America		
R12	1	15.0k	电阻，15.0k，1%，0.063W，0402	0402	RC0402FR-0715KL	Yageo America		
R14	1	8.87k	电阻，8.87k，1%，0.1W，AEC-Q200 0 级，0603	0603	CRCW06038K87FKEA	Vishay-Dale		
R15	1	26.1k	电阻，26.1k，0.1%，0.1W，0603	0603	RT0603BRD0726K1L	Yageo America		
R16	1	1.0k	电阻，1.0k，5%，0.063W，AEC-Q200 0 级，0402	0402	CRCW04021K00JNED	Vishay-Dale	CRCW04021K00JNTD	Vishay Dale
R17、R18	2	2.2k	电阻，2.2k，5%，0.063W，AEC-Q200 0 级，0402	0402	CRCW04022K20JNED	Vishay-Dale		
R19、R26	2	10.0k	电阻，10.0k，1%，0.1W，0402	0402	ERJ-2RKF1002X	Panasonic	ERJ-U02F1002X	Panasonic
R20	1	4.7	电阻，4.7，5%，0.1W，AEC-Q200 0 级，0603	0603	CRCW06034R70JNEA	Vishay-Dale		
R21	1	10k	电阻，10k，5%，0.063W，AEC-Q200 0 级，0402	0402	CRCW040210K0JNED	Vishay-Dale	ERJ-U02F1002X	Panasonic
R22、R23、R24、R27、R32、R33、R36	7	33.2	电阻，33.2，1%，0.05W，0201	0201	RC0201FR-0733R2L	Yageo America		
R25	1	680	电阻，680，1%，0.1W，0603	0603	RC0603FR-07680RL	Yageo		
R28	1	0	电阻，0，5%，0.05W，AEC-Q200 0 级，0201	0201	ERJ-1GN0R00C	Panasonic		

表 3-1. 物料清单（续）

位号	数量	值	说明	封装参考	器件型号	制造商	备选器件型号	备选制造商
R29	1	43.2	电阻，43.2，1%，0.1W，AEC-Q200 0 级，0402	0402	ERJ2RKF43R2X	Panasonic		
R30、R31、R35、R37、R53	5	10.0k	电阻，10.0k，1%，0.05W，0201	0201	CRCW020110K0FKED	Vishay-Dale		
R34	1	25.5k	电阻，25.5k，1%，0.05W，0201	0201	RC0201FR-0725K5L	Yageo America		
R38	1	51.0k	电阻，51.0k，1%，0.05W，0201	0201	RC0201FR-0751KL	Yageo America		
R39	1	47.0k	电阻，47.0k，1%，0.0625W，0402	0402	RC0402FR-0747KL	Yageo America		
R40	1	360	电阻，360，5%，0.063W，AEC-Q200 0 级，0402	0402	CRCW0402360RJNED	Vishay-Dale		
R41、R46、R48	3	49.9	电阻，49.9，1%，0.063W，AEC-Q200 0 级，0402	0402	CRCW040249R9FKED	Vishay-Dale	CRCW040249R9FKEDC	Vishay-Dale
R42、R43、R44	3	33	电阻，33.0，1%，0.1W，0402	0402	ERJ-2RKF33R0X	Panasonic	ERJ-U02F33R0X	Panasonic
R45	1	0	电阻，0，1%，0.1W，AEC-Q200 0 级，0603	0603	RMCF0603ZT0R00	Stackpole Electronics Inc		
R47、R59	2	10.0k	电阻，10.0k，1%，0.063W，AEC-Q200 0 级，0402	0402	CRCW040210K0FKED	Vishay-Dale		
R49	1	1.5k	电阻，1.5k，5%，0.1W，AEC-Q200 0 级，0603	0603	CRCW06031K50JNEA	Vishay-Dale	CRCW06031K50JNEAC	Vishay-Dale
R50、R51	2	200k	电阻，200k，5%，0.063W，AEC-Q200 0 级，0402	0402	CRCW0402200KJNED	Vishay-Dale		
R52	1	680	电阻，680，5%，0.063W，AEC-Q200 0 级，0402	0402	CRCW0402680RJNED	Vishay-Dale		
R54、R55、R56、R57、R58、R60	6	0	电阻，0，5%，0.1W，0603	0603	RC0603JR-070RL	Yageo		
R61、R63	2	0	电阻，0，5%，0.125W，0805	0805	RC0805JR-070RL	Yageo America		
R62	1	249k	电阻，249k，1%，0.1W，0603	0603	RC0603FR-07249KL	Yageo		
S1	1		开关，切换，SPDT 1Pos，TH	7 X 11 X4.5mm	G12AP	NKK 开关		
SH1、SH2、SH3、SH4、SH5、SH6、SH7、SH8、SH9、SH10	10	1x2	分流器，100mil，镀金，黑色	分流器	SNT-100-BK-G	Samtec	969102-0000-DA	3M

表 3-1. 物料清单（续）

位号	数量	值	说明	封装参考	器件型号	制造商	备选器件型号	备选制造商
TP1、TP2、TP3、TP4、TP5、TP7、TP8、TP9、TP10、TP11、TP12、TP13、TP14、TP16、TP17、TP18、TP19、TP20、TP21、TP22、TP24、TP25、TP26	23		测试点，微型，橙色，TH	橙色微型测试点	5003	Keystone Electronics		
TP6、TP15、TP27、TP28、TP29、TP30	6		测试点，紧凑型，黑色，TH	黑色紧凑型测试点	5006	Keystone Electronics		
U1、U2	2		具有 96kHz 增强处理能力和较低空闲功率损耗的 20W 立体声、无电感器、数字输入、闭环 D 类音频放大器，HTSSOP28	HTSSOP28	TAS5802PWPR	德州仪器 (TI)		
U3	1		采用 MicroSiP 封装且具有集成电感器的 3V 至 17V 高效低 IQ 降压转换器模块	uSiL11	TPSM82903SISR	德州仪器 (TI)		
U4	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)		
U5	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		
U6	1		2 位双向 1MHz I2C 总线和 SMBus 电压电平转换器，DCU0008A (VSSOP-8)	DCU0008A	TCA9406DCUR	德州仪器 (TI)		
U7	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)	CDCE913PW	德州仪器 (TI)
U8	1		双位双电源总线收发器，DQM0008A (X2SON-8)	DQM0008A	SN74AVC2T244DQMR	德州仪器 (TI)		
U9	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)		

表 3-1. 物料清单（续）

位号	数量	值	说明	封装参考	器件型号	制造商	备选器件型号	备选制造商
U10	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)		
U11	1		光学插孔发送器 OTJ-8	OTJ8	FCR684208T	Cliff Electronic Components		
U12	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)		德州仪器 (TI)
U13	1		光纤接收器数字音频，光纤 16Mbps - 约 2.7V 至 5.5V 10mA	CONN_FIBER_OPTIC	FCR684208R	Cliff		
U14	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，无锑/溴）	PT0048A	PCM9211PT	德州仪器 (TI)		
U15、U16、U18	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)	SN74LVC2G157DCUT	德州仪器 (TI)
U17	1		单路施密特触发逆变器，DCK0005A (SOT-SC70-5)	DCK0005A	SN74LVC1G14DCKR	德州仪器 (TI)	SN74LVC1G14DCKT	德州仪器 (TI)
U19	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)	SN74LVC2G157DCUT	德州仪器 (TI)
U20	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，无锑/溴）	RGT0016A	TCA6408ARGTR	德州仪器 (TI)		
U21	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，无锑/溴）	D0008A	TPS76833QDR	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。

5 修订历史记录

注：以前版本的页码可能与当前版本的页码不同

Changes from Revision A (December 2024) to Revision B (February 2026)	Page
• 首次公开发布。	1

Changes from Revision * (November 2024) to Revision A (December 2024)	Page
• 将文档状态从“公开披露”更改为“选择性披露”	0

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.

【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。

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。

上記を遵守頂けない場合は、電波法の罰則が適用される可能性があることをご留意ください。 日本テキサス・インスツルメンツ株式会社

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.

7. *USER'S INDEMNITY OBLIGATIONS AND REPRESENTATIONS.* USER WILL DEFEND, INDEMNIFY AND HOLD TI, ITS LICENSORS AND THEIR REPRESENTATIVES HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS, DAMAGES, LOSSES, EXPENSES, COSTS AND LIABILITIES (COLLECTIVELY, "CLAIMS") ARISING OUT OF OR IN CONNECTION WITH ANY HANDLING OR USE OF THE EVM THAT IS NOT IN ACCORDANCE WITH THESE TERMS. THIS OBLIGATION SHALL APPLY WHETHER CLAIMS ARISE UNDER STATUTE, REGULATION, OR THE LAW OF TORT, CONTRACT OR ANY OTHER LEGAL THEORY, AND EVEN IF THE EVM FAILS TO PERFORM AS DESCRIBED OR EXPECTED.

8. *Limitations on Damages and Liability:*

   8.1 *General Limitations*. IN NO EVENT SHALL TI BE LIABLE FOR ANY SPECIAL, COLLATERAL, INDIRECT, PUNITIVE, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES IN CONNECTION WITH OR ARISING OUT OF THESE TERMS OR THE USE OF THE EVMS , REGARDLESS OF WHETHER TI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. EXCLUDED DAMAGES INCLUDE, BUT ARE NOT LIMITED TO, COST OF REMOVAL OR REINSTALLATION, ANCILLARY COSTS TO THE PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, RETESTING, OUTSIDE COMPUTER TIME, LABOR COSTS, LOSS OF GOODWILL, LOSS OF PROFITS, LOSS OF SAVINGS, LOSS OF USE, LOSS OF DATA, OR BUSINESS INTERRUPTION. NO CLAIM, SUIT OR ACTION SHALL BE BROUGHT AGAINST TI MORE THAN TWELVE (12) MONTHS AFTER THE EVENT THAT GAVE RISE TO THE CAUSE OF ACTION HAS OCCURRED.

   8.2 *Specific Limitations.* IN NO EVENT SHALL TI'S AGGREGATE LIABILITY FROM ANY USE OF AN EVM PROVIDED HEREUNDER, INCLUDING FROM ANY WARRANTY, INDEMITY OR OTHER OBLIGATION ARISING OUT OF OR IN CONNECTION WITH THESE TERMS, , EXCEED THE TOTAL AMOUNT PAID TO TI BY USER FOR THE PARTICULAR EVM(S) AT ISSUE DURING THE PRIOR TWELVE (12) MONTHS WITH RESPECT TO WHICH LOSSES OR DAMAGES ARE CLAIMED. THE EXISTENCE OF MORE THAN ONE CLAIM SHALL NOT ENLARGE OR EXTEND THIS LIMIT.

9. *Return Policy.* Except as otherwise provided, TI does not offer any refunds, returns, or exchanges. Furthermore, no return of EVM(s) will be accepted if the package has been opened and no return of the EVM(s) will be accepted if they are damaged or otherwise not in a resalable condition. If User feels it has been incorrectly charged for the EVM(s) it ordered or that delivery violates the applicable order, User should contact TI. All refunds will be made in full within thirty (30) working days from the return of the components(s), excluding any postage or packaging costs.

10. *Governing Law:* These terms and conditions shall be governed by and interpreted in accordance with the laws of the State of Texas, without reference to conflict-of-laws principles. User agrees that non-exclusive jurisdiction for any dispute arising out of or relating to these terms and conditions lies within courts located in the State of Texas and consents to venue in Dallas County, Texas. Notwithstanding the foregoing, any judgment may be enforced in any United States or foreign court, and TI may seek injunctive relief in any United States or foreign court.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265

重要通知和免责声明

TI“按原样”提供技术和可靠性数据（包括数据表）、设计资源（包括参考设计）、应用或其他设计建议、网络工具、安全信息和其他资源，不保证没有瑕疵且不做出任何明示或暗示的担保，包括但不限于对适销性、与某特定用途的适用性或不侵犯任何第三方知识产权的暗示担保。

这些资源可供使用 TI 产品进行设计的熟练开发人员使用。您将自行承担以下全部责任：(1) 针对您的应用选择合适的 TI 产品，(2) 设计、验证并测试您的应用，(3) 确保您的应用满足相应标准以及任何其他安全、安保法规或其他要求。

这些资源如有变更，恕不另行通知。TI 授权您仅可将这些资源用于研发本资源所述的 TI 产品的相关应用。严禁以其他方式对这些资源进行复制或展示。您无权使用任何其他 TI 知识产权或任何第三方知识产权。对于因您对这些资源的使用而对 TI 及其代表造成的任何索赔、损害、成本、损失和债务，您将全额赔偿，TI 对此概不负责。

TI 提供的产品受 TI 销售条款)、TI 通用质量指南 或 ti.com 上其他适用条款或 TI 产品随附的其他适用条款的约束。TI 提供这些资源并不会扩展或以其他方式更改 TI 针对 TI 产品发布的适用的担保或担保免责声明。 除非德州仪器 (TI) 明确将某产品指定为定制产品或客户特定产品，否则其产品均为按确定价格收入目录的标准通用器件。

TI 反对并拒绝您可能提出的任何其他或不同的条款。

最后更新日期：2025 年 10 月