

EVM User's Guide: TPSM852892EVM

TPSM852892EVM 降压/升压模块的评估模块



说明

TPSM852892EVM 旨在演示 TPSM852892 器件的特性和功能，后者是一款高性能、高效率的同步降压/升压模块。TPSM852892EVM 的出厂默认设置允许在 3V 至 36V 的输入电压范围内运行。所有这些特性提高了设计灵活性，优化了整体性能，并降低了 BOM 及设计成本。

开始使用

1. 在 [ti.com](https://www.ti.com) 上订购 EVM。
2. 请仔细阅读本用户指南。
3. 按照说明准备工作台设置。在处理 EVM 时采取预防措施，防止 ESD 造成损坏。
4. 按照建议的步骤为 EVM 上电。

5. 运行测试和测量。在测试期间，请注意 EVM 产生的高压和高温。

特性

- 宽输入和输出电压范围
- 用户可灵活优化环路补偿
- 轻负载状态下的可编程 PFM 和 FPWM 模式
- 可选可编程扩展频谱
- 针对电缆上压降的可调输出电压补偿
- 丰富的保护特性

应用

- [激光测距仪](#)
- [电动手术工具](#)
- [参数测量单元 \(PMU\)](#)



1 评估模块概述

1.1 简介

TPSM852892 集成了四个 MOSFET 和一个功率电感器，可为各种应用提供紧凑型设计，并经过优化，可将电池电压转换为电源轨。TPSM852892 具有可调节外部环路补偿、可编程开关频率、可选展频和丰富的保护功能。TPSM852892 还通过可选输出电流限制和断续模式保护，在持续过载情况下确保安全工作。

本用户指南介绍了 TPSM852892EVM 评估模块的特性和操作。本文档提供了有关如何使用评估模块的说明。本文档中的评估板、评估模块和 EVM 等术语均指 TPSM852892EVM。本文档还包含原理图、参考印刷电路板 (PCB) 布局和完整的物料清单 (BOM)。



1.2 套件内容

表 1-1 详细说明了 EVM 套件的内容。

表 1-1. EVM 套件物品

项目	数量
TPSM852892EVM	1

1.3 规格

表 1-2 提供了 TPSM852892EVM 性能规格的汇总。所有规格均为在 25°C 环境温度下的值。

表 1-2. 性能规格汇总

参数	测试条件	值	单位
输入电压		3.0-36	V
输出电压		0.8-22	V
最大输出电流	$V_{IN} \geq 5V, V_{OUT} = 10V$	2	A
	$V_{IN} \geq 6V, V_{OUT} = 12V$		
	$V_{IN} \geq 12V, V_{OUT} = 20V$		
默认开关频率		400	kHz

1.4 器件信息

TPSM852892 是一款降压/升压模块，集成了四个 MOSFET 和功率电感器，可为各种应用提供紧凑型器件。该器件的输入电压高达 36V。开关频率可通过外部电阻在 400kHz 至 1.0MHz 之间进行编程，并且可与外部时钟同步。可选配展频功能，以更大限度地减少峰值 EMI。提供输出过压保护、平均电感器电流限制、逐周期峰值电流限制和输出短路保护。如需了解 TPSM852892 完全集成式降压/升压模块的更多详细信息，可参阅 [TPSM852892 36V, 8A 降压/升压模块数据表](#)。

TPSM852892EVM 的出厂默认设置允许在 3V 至 36V 的输入电压范围内运行。此外，用户还可以通过更改 FSW 引脚上的电阻值来修改 EVM 以调整开关频率。

2 硬件

本节介绍了如何正确连接、设置和使用 TPSM852892EVM。

2.1 连接器、测试点和跳线说明

本节介绍了如何正确连接、设置和使用 TPSM852892EVM。

2.1.1 连接器和测试点说明

如表 2-1 中所示，此 EVM 包含 I/O 连接器和测试点。电源必须连接到输入连接器 J1 和 J2。负载必须连接到输出连接器 J3 和 J4。

表 2-1. 连接器和测试点

参考指示符	说明
J1	输入电压正连接
J2	输入电压回路连接
J3	输出电压连接
J4	输出电压回路连接

2.1.2 跳线配置

2.1.2.1 JP1 (使能)

JP1 跳线可启用器件。默认情况下此跳线置于 OFF 位置。将跳线置于 ON 位置可启用器件。

2.1.2.2 JP5 (同步)

JP5 跳线用于频率抖动选择。将跳线穿过 JP6 可禁用频率抖动功能。当使用频率抖动功能，则使 JP5 保持断开状态。

2.1.2.3 JP4 (内部或外部 VCC 选择)

JP4 跳线用于内部 LDO 或外部 VCC 选择。默认情况下此跳线设为 VCC 位置，器件选择内部 LDO 作为 VCC 源。

当输入电压和输出电压均为高电平时，为了更大程度地降低内部 LDO 的功率损耗，可以在 VCC 引脚上施加 5V 外部电源，为 TPSM852892 供电。使跳线跨接 EXTVCC 和 AGND，以将器件 VCC 源设置为外部。外部 5V 电源的输出电流应不小于 100mA，且必须在 4.75V 至 5.5V 的调节范围内。

2.2 测试程序

1. 将电源电流限值设置为 10A。将电源电压设置为约 12V。关闭电源。将电源的正输出连接到 J1，负输出连接到 J2。
2. 将负载连接到 J3 实现正连接，将负载连接到 J4 实现负连接。
3. 打开电源。
4. 将 JP1 跳线设为跨接 EN 和 ON。默认输出电压为 12V。
5. 缓慢增大负载，同时监控 J3 和 J4 之间的输出电压。当负载电流小于 5A 时，输出电压必须保持在调节的范围内。
6. 从 5V 至 20V 缓慢扫描输入电压。负载电流低于 表 1-2 中指定的最大负载电流时，输出电压必须保持在调节范围内。
7. 关闭负载和电源。然后打开负载，使输出电容器放电。

3 硬件设计文件

本节提供了 TPSM852892 原理图、电路板布局布线和物料清单 (BOM)。

3.1 原理图

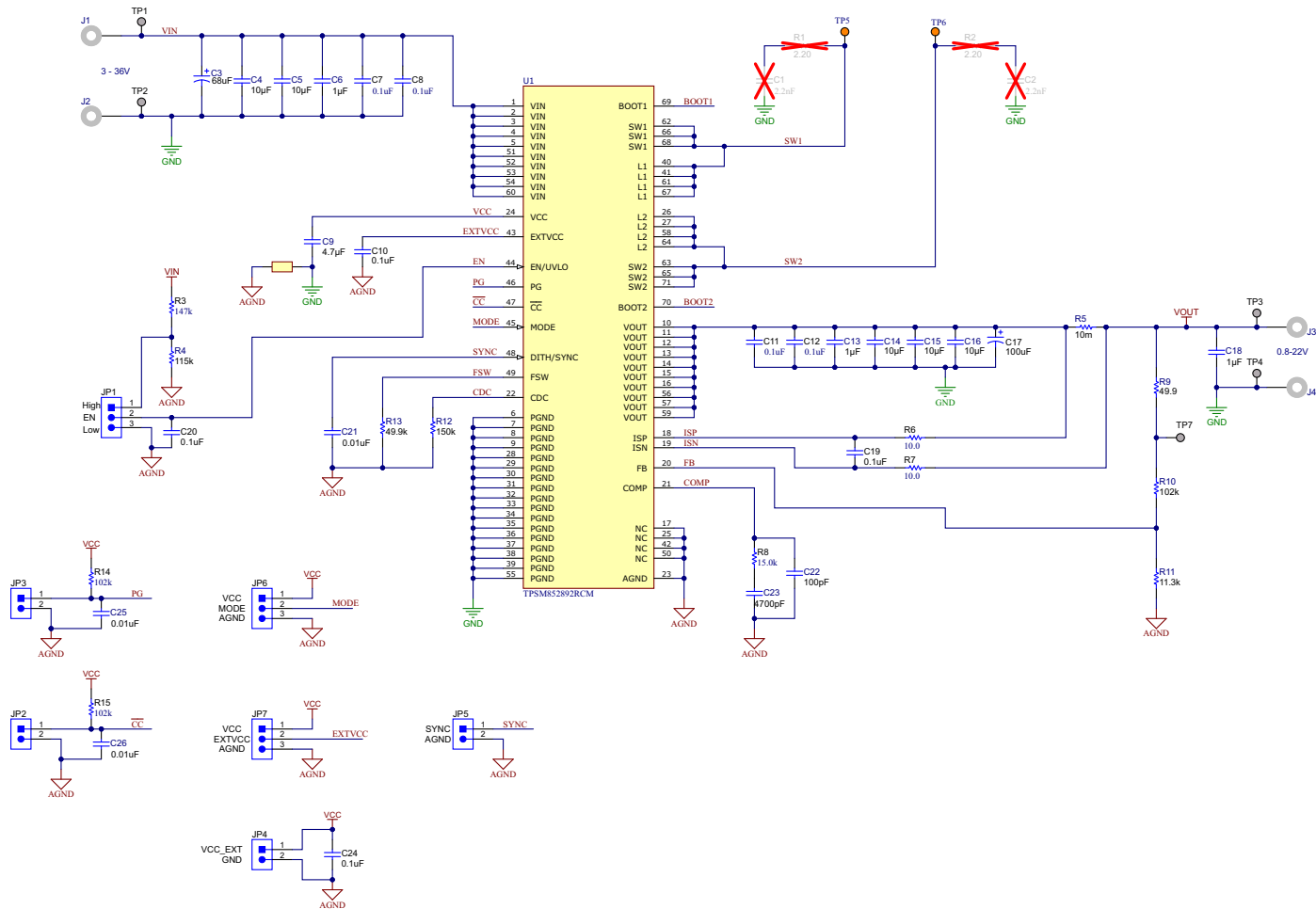


图 3-1. TPSM852892EVM 原理图

3.2 PCB 布局

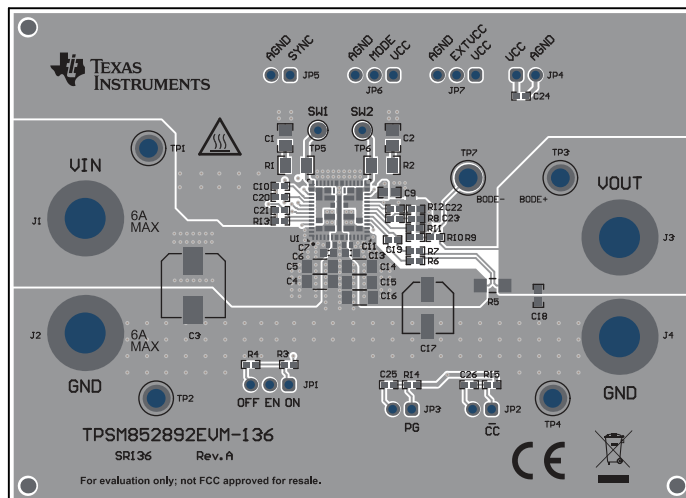


图 3-2. TPSM852892EVM 顶层布局

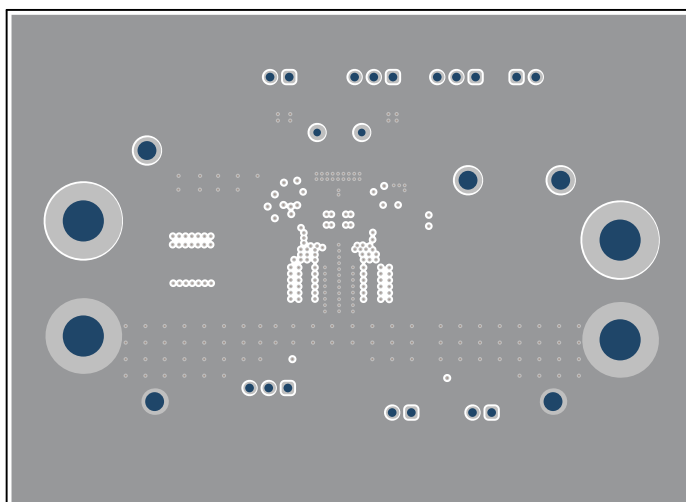


图 3-3. TPSM852892EVM 内层 1

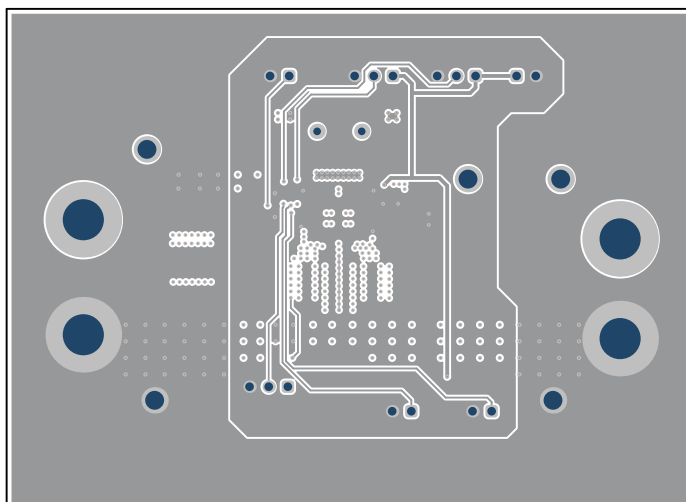


图 3-4. TPSM852892EVM 内层 2

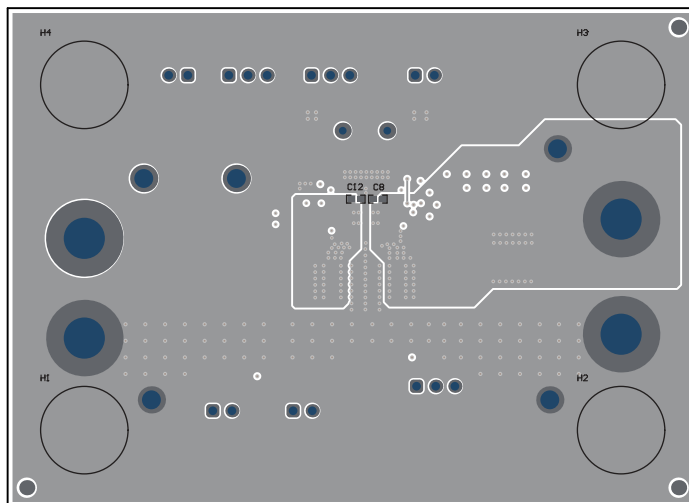


图 3-5. TPSM852892EVM 底面布局

3.3 物料清单

表 3-1. 物料清单

位号	数量	值	说明	封装	器件型号	制造商
C3	1	68uF	电容, 混合聚合物, 68μF, 50V, ±20%, 30 Ω, 8x10 SMD	8x10	EEHZA1H680P	Panasonic
C4、C5、C14、C15、C16	5	10uF	电容, 陶瓷, 10μF, 50V, +/-10%, X7R, AEC-Q200 1 级, 1206	1206	CGA5L1X7R1H106K160AC	TDK
C6、C13、C18	3	1uF	电容, 陶瓷, 1μF, 50V, +/-20%, X5R, AEC-Q200 3 级, 0603	0603	GRT188R61H105ME13D	MuRata
C7、C8、C11、C12	4	0.1uF	电容, 陶瓷, 0.1uF, 50V, ±20%, X7R, 0402	0402	GRM155R71H104ME14D	MuRata
C9	1	4.7uF	电容, 陶瓷, 4.7μF, 16V, +/-10%, X5R, AEC-Q200 3 级, 0603	0603	GRT188R61C475KE13D	MuRata
C10、C19、C20、C24	4	0.1uF	电容, 陶瓷, 0.1uF, 50V, ± 10%, X7R, AEC-Q200 1 级, 0402	0402	CGA2B3X7R1H104K050BB	TDK
C17	1	100uF	电容, 铝, 100μF, 35V, AEC-Q200 2 级, SMD	D6.3xL5.8mm	EEHZK1V101XP	Panasonic
C21、C25、C26	3	0.01uF	电容, 陶瓷, 0.01uF, 50V, ± 10%, X7R, AEC-Q200 1 级, 0402	0402	CGA2B3X7R1H103K050BB	TDK
C22	1	100pF	电容, 陶瓷, 100pF, 50V, +/-5%, C0G/NP0, AEC-Q200 1 级, 0402	0402	CGA2B2C0G1H101J050BA	TDK
C23	1	4700pF	电容, 陶瓷, 4700pF, 50V, ± 10%, X7R, AEC-Q200 1 级, 0402	0402	CGA2B2X7R1H472K050BA	TDK
FID4、FID5、FID6	3		基准标记。没有需要购买或安装的元件。	不适用	不适用	不适用
J1、J2、J3、J4	4		标准香蕉插头, 非绝缘, 6.73mm	标准香蕉插头, 非绝缘, 6.73mm	575-6	Keystone
JP1、JP6、JP7	3		接头, 2.54mm, 3x1, 金, TH	接头, 2.54mm, 3x1, TH	61300311121	Würth Elektronik
JP2、JP3、JP4、JP5	4		接头, 2.54mm, 2x1, 金, TH	接头, 2.54mm, 2x1, TH	61300211121	Würth Elektronik
R3	1	147k	电阻, 147k, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW0402147KFKE D	Vishay-Dale
R5	1		10 mOhm ±1% 1W 片上电阻 1206 (公制 3216), 汽车 AEC-Q200, 电流检测, 防潮金属元件	1206	CRF1206-FZ-R010ELF	Bourns
R4	1	115k	电阻, 115k, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW0402115KFKE D	Vishay-Dale
R9	1	49.9	电阻, 49.9, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW040249R9FK ED	Vishay-Dale

表 3-1. 物料清单 (续)

位号	数量	值	说明	封装	器件型号	制造商
R6 , R7	2	10	电阻, 10.0, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW040210R0FKED	Vishay-Dale
R8	1	15.0k	电阻, 15.0k, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW040215K0FKE D	Vishay-Dale
R13	1	49.9k	电阻, 49.9k, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW040249K9FKE D	Vishay-Dale
R12	1	150k	电阻, 150k, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW0402150KFKE D	Vishay-Dale
R10、R14、R15	3	102k	电阻, 102k, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW0402102KFKE D	Vishay-Dale
R11	1	11.3k	电阻, 11.3k, 1%, 0.063W, AEC-Q200 0 级, 0402	0402	CRCW040211K3FKE D	Vishay-Dale
SH-JP1、SH-JP2、 SH-JP3、SH-JP4	6		分流器, 100mil, 镀金, 黑色	分流器, 2 位, 100mil	881545-2	TE Connectivity
TP5、TP6	2		测试点, 微型, 橙色, TH	橙色微型测试点	5003	Keystone Electronics
TP1、TP2、TP3、 TP4、TP7	5		引脚, 双转塔, TH	Keystone1502-2	1502-2	Keystone
U1	1		36V, 6A 降压/升压 模块	QFN-FCMOD71	TPSM852892RCM	德州仪器 (TI)
C1、C2	0	2200pF	电容, 陶瓷, 2200pF, 250V, $\pm 10\%$, X7R, 0805	0805	GRM21AR72E222KW01D	MuRata
FID1、FID2、FID3	0		基准标记。没有需要购买或安装的元件。	不适用	不适用	不适用
R1、R2	0	2.2	电阻, 2.20, 1%, 0.25W, AEC-Q200 0 级, 1206	1206	ERJ-8RQF2R2V	Panasonic

4 其他信息

商标

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 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/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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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。
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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

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.

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