

EVM User's Guide: SK-LCD3

SK-LCD3 评估模块



说明

SK-LCD3 800x1280 DSI LCD 显示配件套件是用于 AM62P、AM62L 处理器 (如 [SK-AM62P-LP](#)、[TMDS62LEVM](#) 等) 入门套件评估模块 (EVM) 的附加配件, 可为 HMI、工业 PC 及其他需要显示功能的应用场景添加触摸和显示功能。TFT LCD 屏幕为 7.0" 显示屏, 具有 WUXGA 分辨率 (800x1280) 并支持电容式触控。

开始使用

1. 在 [SK-LCD3](#) 上订购该 LCD。
2. 下载 LCD [设计文件](#)。

3. 阅读本 EVM 用户指南

特性

- 7.0 英寸 TFT LCD 显示屏, 具有 800 × 1280 WXGA 分辨率
- 支持多点触控的电容式触控面板
- 用于高速视频连接的 MIPI DSI 接口
- 用于亮度调节和电源开关的手动控制按钮

应用

- 智能家居设备
- [人机界面 \(HMI\)](#)
- [智能仪表](#)



SK-LCD3 EVM 模块

1 评估模块概述

1.1 简介

本指南介绍了如何使用德州仪器 (TI) 的 Sitara™ 处理器 EVM 来实现和操作 SK-LCD3 显示配件套件。SK-LCD3 是一款多功能器件，可在嵌入式系统原型和商业应用中整合先进的显示和触控功能。以下各节将介绍显示评估设置的基本硬件架构和硬件连接。

1.2 套件内容

该软件包包括：

- SK-LCD3 EVM
- 螺柱和紧固件

1.3 规格

- 显示类型：具有 800 × 1280 WXGA 分辨率和电容式触控面板的 7.0 英寸 TFT-LCD 模块
- 接口：具有时钟使能功能的 MIPI-DSI 4 通道数据接口 (Data [3:0])，可实现高速视频传输
- 触摸控制器：支持 I2C 通信和中断的 ILI2511 电容式触控面板控制器
- 背光控制：具有可调节亮度控制 (BRIGHT+ 或 BRIGHT-) 和开关功能的 RT8511B LED 驱动器
- 电源：带标准直流连接器的 12V 外部电源输入

1.4 器件信息

SK-LCD3 是一款评估模块 (EVM)，搭载 7.0 英寸 TFT-LCD 显示屏，集成了电容式触控功能。此开发平台旨在演示和评估支持 MIPI-DSI 接口连接的 LCD 显示性能。该 EVM 包含用于系统控制的 HT66F30-1 微控制器、用于背光管理的 RT8511B LED 驱动器以及用于多点触控输入检测的 ILI2511 触摸控制器。

该模块为从事显示应用的开发人员提供了全面的设计方案，支持多种接口选项，包括 MIPI 数据通道、I2C 通信和各种控制信号。SK-LCD3 EVM 内置具有直流/直流转换功能的电源管理模块，并支持 3.3V 和 12V 电源域，可作为参考设计，帮助开发人员将高质量显示设计集成到嵌入式系统和消费类电子产品应用中。

2 修订版和适用的 EVM

表 2-1 列出了各种 SK-LCD3 EVM PCB 设计修订版本和适用的 EVM。具体 PCB 版本如 PCB 上的丝印所示，具体组件型号也会在另外的贴纸标签上标示。

表 2-1. 修订版和适用的 EVM

OPN	修订版本	说明	适用的 EVM
SK-LCD3	修订版 A	量产版本	- SK-AM62P-LP - TMD62LEVM

3 硬件

3.1 其他图像



图 3-1. LCD 顶面

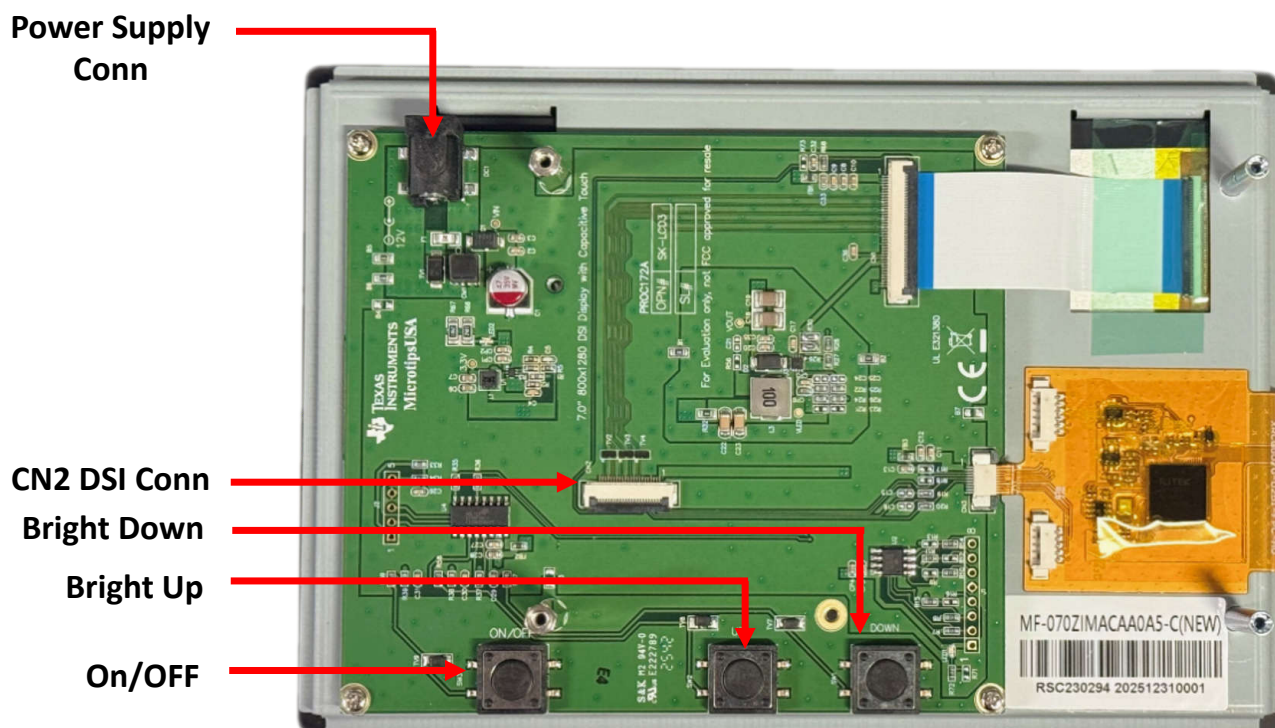


图 3-2. LCD 底面

3.2 系统说明

SK-LCD3 套件包含 7.0 英寸 800x1280 像素的 TFT LCD 和适配器板。该适配器板将 40 引脚 LCD 接口连接转换为与 Sitara MPU EVM DSI 连接器兼容的 22 引脚接口。该适配器板还包含一个用于驱动 LCD 背光的 LED 驱动电路，以及一个通过按钮控制 LCD 背光启用和亮度的 MCU。

3.3 功能方框图

图 3-3 显示了 SK-LCD3 功能方框图。使用适配器板中的 CN1、CN3 和 BL 连接器将适配器板连接到 LCD 面板。使用 LCD 适配器板上的 CN2 连接器将 LCD 套件连接到 EVM。

MF-070ZIMACAA0A5-C
Microtips USA

7.0 inch TFT LCD Module
800 x 1280 WXGA, Portrait

Block Diagram:

- Host (Orange Box):** Provides 12V, 3.3V, and GND. Receives MIPI Data[3:0], CLK, EEPROM 3.3V, VOUT, FB, and SCL, SDA, /RST, /INT, 3.3V, GND.
- Module (Blue Box):**
 - MCU (HT66F30-1):** Receives BRIGHT+, BRIGHT-, ON/OFF, I2C, /RST, /INT. Outputs MIPI DataE[3:0] and CLKE to ESD.
 - LED DRIVER (RT8511B):** Receives 3.3V from MCU. Outputs BL (Backlight).
 - POWER DC TO DC (PCT & MCU):** Receives 12V. Outputs 3.3V to MCU and LED DRIVER.
 - PROJECT CAPACITIVE TOUCH PANEL (ILI2511):** Receives 12V. Outputs to CN3.
 - ESD (Electrostatic Discharge):** Receives MIPI DataE[3:0] and CLKE from MCU. Outputs to CN1.
 - BL (Backlight):** Receives output from LED DRIVER.
 - CN1, CN2, CN3:** Connectors for host interface.

3.4 电源方框图

采用外部 12V 电源适配器为 LCD 供电。适配器板上有一个 3.3V 降压转换器，用于为 MCU 和触摸屏供电。采用 EVM 为 EEPROM 和 LCD 模块供电。适配器板上的背光驱动器为 LCD 背光提供所需的电压和电流。MCU 控制 LCD 的使能和亮度。

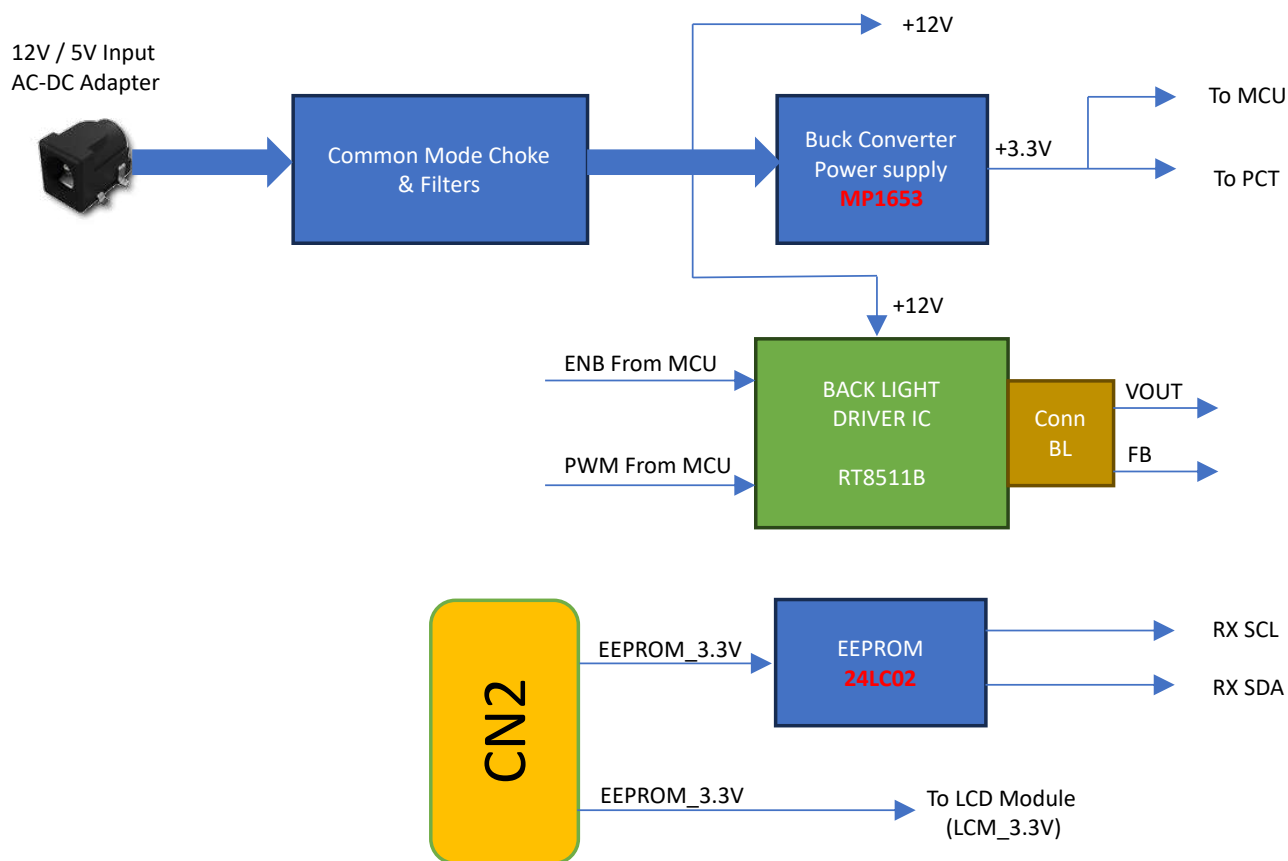


图 3-4. 电源方框图

3.5 设置

3.5.1 LCD 和 EVM 连接

SK-AM62P-LP 评估模块和 SK-LCD3 显示组件通过 22 引脚同侧触点扁平柔性电缆连接 (电缆制造商 : Molex , 部件型号 : 0150200237) 。扁平柔性电缆连接到 SK-LCD3 显示模块上的连接器 CN2 和 SK-AM62P-LP 评估模块上的连接器 J25 (DSI)。此评估模块使用开发套件中提供的螺柱和紧固件以机械方式固定到 LCD 组件上。对于电源要求 , SK-LCD3 显示模块需要使用一个连接到连接器 DC1 的 12V 外部电源。

备注

确保引脚 1 连接保持在电缆的同一侧。

TI 推荐用于为 LCD 加电的 12V 外部电源适配器为 **MFR : CUI , PN : SDI65-12-UD-P5**。

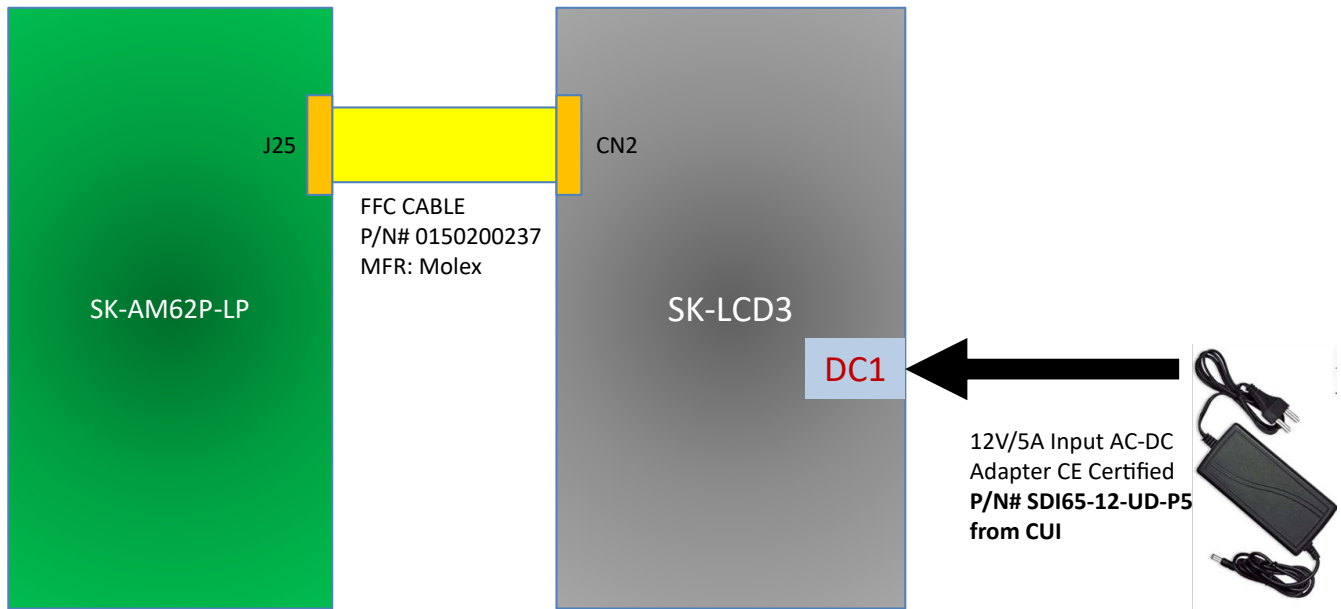


图 3-5. LCD 和 EVM 连接图

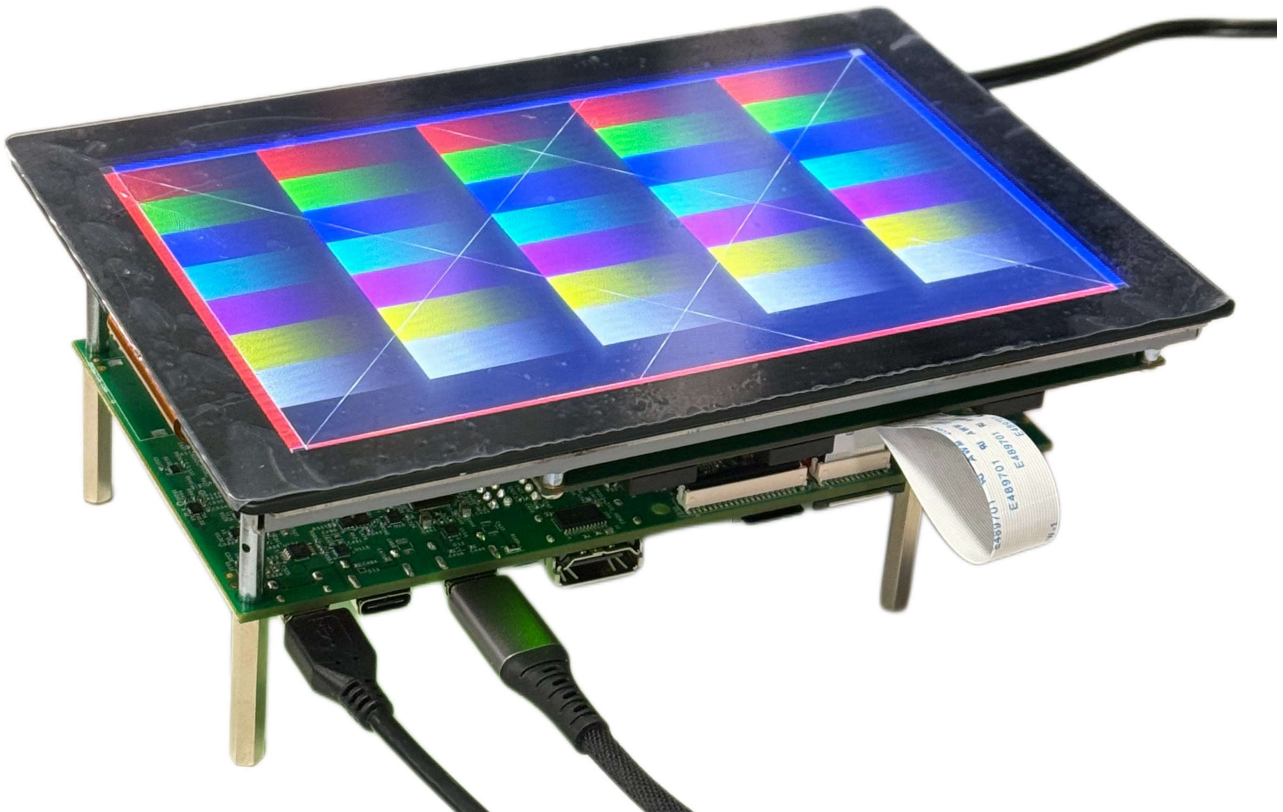


图 3-6. LCD 和 EVM 组装

3.6 接口信号映射

下表提供了 SK-AM62P-LP EVM 的 DSI 连接器 (J25) 与 SK-LCD3 显示模块的接口连接器 (CN2) 之间的完整引脚对引脚信号映射。该引脚排列定义支持通过 22 引脚扁平柔性电缆互连实现正确的信号路由，从而实现电力输送、I2C 通信、GPIO 控制和高速 MIPI DSI 差分数据传输。

表 3-1. LCD 和 EVM 连接器引脚排列

引脚编号	EVM DSI 连接器	LCD 连接器
1	VCC_3V3_SYS	EEPROM_3.3V
2	SoC_I2C0_SDA	RX_SDA
3	SoC_I2C0_SCL	RX_SCL
4	DGND	GND
5	DSI_GPIO1	PCT_INT1
6	DSI_GPIO0	PCT_RST1
7	DGND	GND
8	DSI_TX3_P	MIPI_3P
9	DSI_TX3_N	MIPI_3N
10	DGND	GND
11	DSI_TX2_P	MIPI_2P
12	DSI_TX2_N	MIPI_2N
13	DGND	GND
14	DSI_TXCLK_P	MIPI_CLKP
15	DSI_TXCLK_N	MIPI_CLKN
16	DGND	GND
17	DSI_TX1_P	MIPI_1P
18	DSI_TX1_N	MIPI_1N
19	DGND	GND
20	DSI_TX0_P	MIPI_0P
21	DSI_TX0_N	MIPI_0N
22	DGND	GND

4 硬件设计文件

4.1 原理图

包括原理图、PCB 布局和物料清单 (BOM) 在内的硬件设计文件附于[设计文件](#)中。

4.2 PCB 布局

包括原理图、PCB 布局和物料清单 (BOM) 在内的硬件设计文件附于[设计文件](#)中。

4.3 物料清单 (BOM)

包括原理图、PCB 布局和物料清单 (BOM) 在内的硬件设计文件附于[设计文件](#)中。

5 EMC、EMI 和 ESD 合规性

5.1 合规性和认证

备注

IO 电缆的最大长度不得超过三米。

安装在产品上的元件对静电放电 (ESD) 很敏感。在 ESD 受控环境中使用本产品。例如，温湿度受控的环境可以限制 ESD 的积聚。连接产品时，采用 ESD 防护措施，例如腕带和 ESD 垫。

用户应尽可能采取一切预防措施，例如使用 ESD 腕带确保自身妥善接地、穿着 ESD 外套和防护鞋。确认实验室配备 ESD 安全垫和 ESD 安全测试台。

该产品用于类似实验室条件下的基本电磁环境，应用标准符合 EN IEC 61326-1:2021。

6 其他信息

6.1 商标

Sitara™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

7 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 * (February 2026) to Revision A (July 2026)	Page
• 在页眉中添加了 SK-LCD3.....	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 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.

【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。

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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/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.

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