EVM User's Guide:

MSP-LITO-G3507 Evaluation Module

Description

The MSP-LITO-G3507 Evaluation Module is an easy-to use evaluation module for the MSPM0G3507 microcontroller (MCU). The EVM is a small, complete, and breadboard-friendly board which contains the basic components needed for a complete MSPM0G3507-based system. Different from the LP-MSPM0G3507, this EVM is a minimum MSPM0G3507 system board because this EVM doesn't contain special function module such as the onboard debug probe, thermistor, light sensor and other analog component. However, this EVM contains an onboard button and LED for quick integration of a simple user interface.

Features

- Minimum and simple system board which is breadboard-friendly and easy to set up a customized system
- Two buttons, one for MCU reset and one for user GPIO input. Two LEDs, one for user interaction and one for indicating that power supply is normal.
- Supports BSL invoke through GPIO directly and XDS110
- Combines with another minimum debugger XDS110-ETP for use

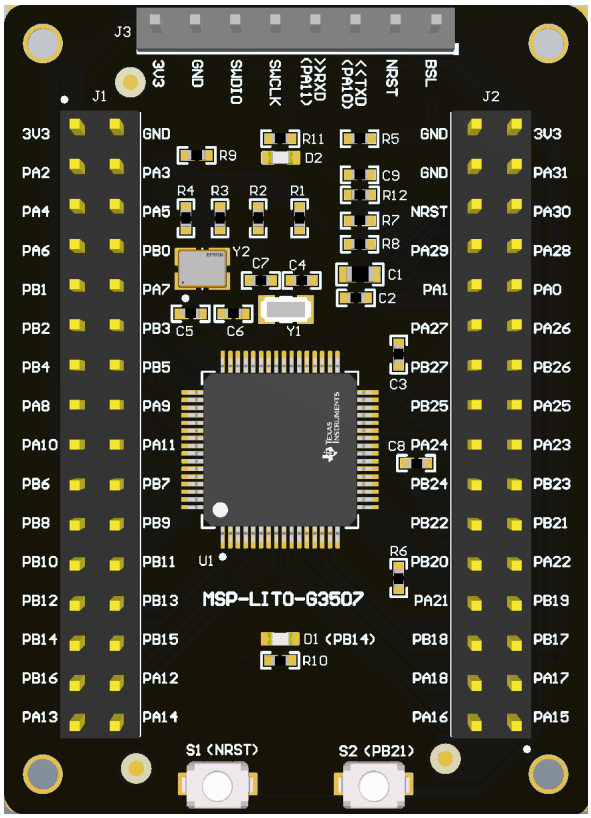


Figure 1-1. MSP-LITO-G3507 Evaluation Module

Table of Contents

1 Evaluation Module Overview

1.1 Introduction

The MSPM0G3507 is an Arm® 32-bit Cortex®-M0+ CPU with frequency up to 80MHz. The device features 128KB of embedded flash memory combined with 32KB of on-chip RAM. The integrated high-performance analog peripherals like 12-bit 4-Msps SAR ADC, zero-drift and zero-crossover chopper op-amps (OPA), 12-bit 1-MSPS digital-to-analog converter (DAC), high-speed comparators (COMP) and general purpose amplifier (GPAMP) help users design the system.

This EVM has the 2 * 32-pin headers. Rapid prototyping is simplified by connecting other modules which is needed by customer through the headers and Dupont lines. And this minimum system EVM can be plugged into breadboard directly to set up a completed & customized application system easily.

Free software development tools are also available such as TI's Code Composer Studio™ IDE, IAR Embedded Workbench™ IDE, and Keil® µVision® IDE. To get started quickly and find available resources in the MSPM0 software development kit (SDK), visit the TI Cloud Developer Zone. MSPM0 MCUs are also supported by extensive online collateral, training with MSP Academy, and online support through the TI E2E™ support forums.

1.2 Kit Contents

Kit Contents

- MSP-LITO-G3507 Evaluation

Software Examples

- Sysconfig Compatibility
- SDK examples

1.3 Specification

MSP-LITO-G3507-EVM needs to be used combining with one debugger, such as XDS110-ETP, LP-XDS110, LP-XDS110ET, and others because there is no onboard debugger. Please follow below steps for fast application on the MSP-LITO-G3507-EVM.

First step: Connection with debugger and computer

For example, we combine MSP-LITO-G3507 and XDS110-ETP to use. Connect the Evaluation Module with XDS110-ETP through the J3, then connect the XDS110-ETP with a computer through the USB plug. And another way is to use the onboard debugger on LP-MSPM0G3507, etc. and connect the debugger to a computer through the USB cable.

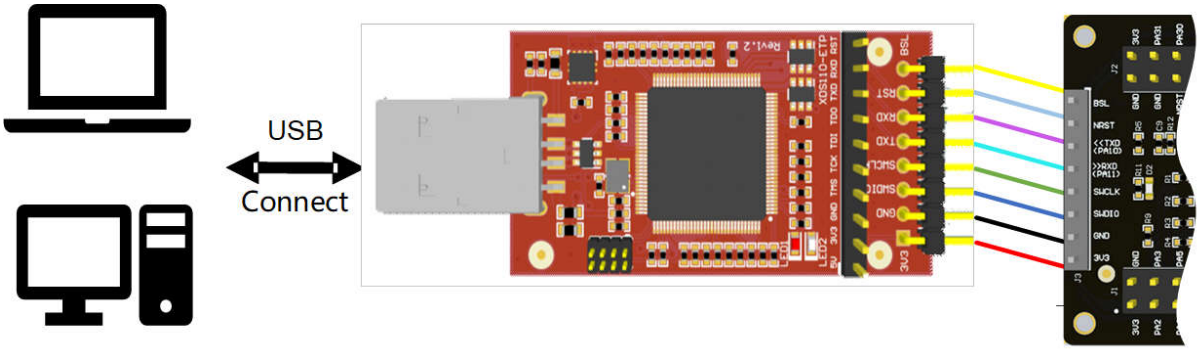


Figure 1-1. Connection with XDS110-ETP and computer

Next steps: Looking into the Provided Code

After the EVM hardware connection is already, the fun can begin. It's time to open an integrated development environment and start editing the code examples. See Section 4 for available IDEs and where to download them.

Code examples are provided in the MSPM0 SDK. Code is licensed under BSD, and TI encourages reuse and modifications to fit specific needs. See MSPM0 SDK User Guide for more details about code examples available.

The quickest way to get started using the EVM is to use TI's cloud development tools. The cloud-based Resource Explorer provides access to all of the examples and resources in MSPM0 SDK. Code Composer Studio Cloud is a simple Cloud-based IDE that enables developing and running applications on the EVM. SysConfig for MSPM0 is another graphical tool that can be utilized to easily and quickly setup your MSPM0G3507 device, pins, and peripherals to fit your development needs. SysConfig is strongly encouraged to be used when starting any new project.

1.4 Device Information

More information about the MSPM0G3507 device is available. For every MSPM0 device, the documentation is organized as shown in Table 1-1.

Table 1-1. Device Documentation

Document	For MSPM0G3507	Description
Device family TRM	MSPM0 G-Series 80MHz Microcontrollers Technical Reference Manual.	Architectural information about the device, including all modules and peripherals such as clocks, timers, ADC, and so on
Device-specific data sheet	MSPM0G350x Mixed-Signal Microcontrollers With CAN-FD Interface	Device-specific information and all parametric information for this device

2 Hardware

Figure 2-1 shows an overview of the MSP-LITO-G3507-EVM hardware.

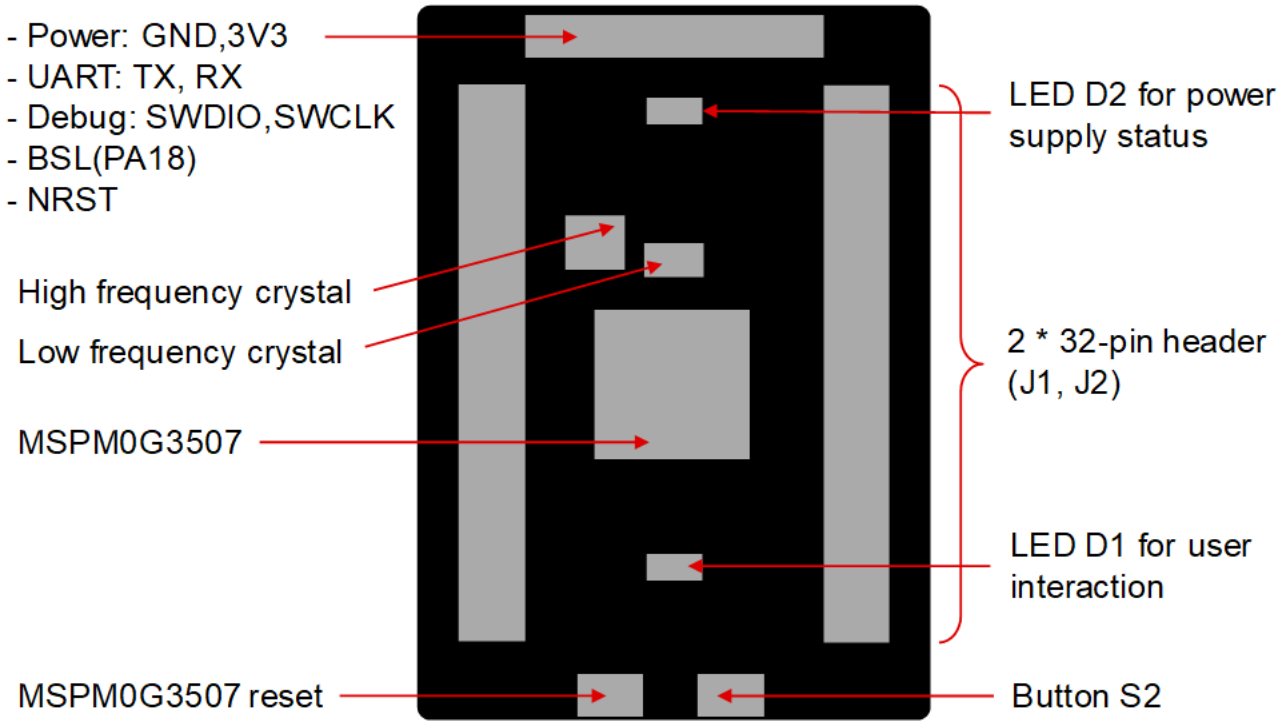


Figure 2-1. MSP-LITO-G3507-EVM Overview

Block Diagram

Figure 2-2 shows the simple block diagram of MSP-LITO-G3507-EVM.

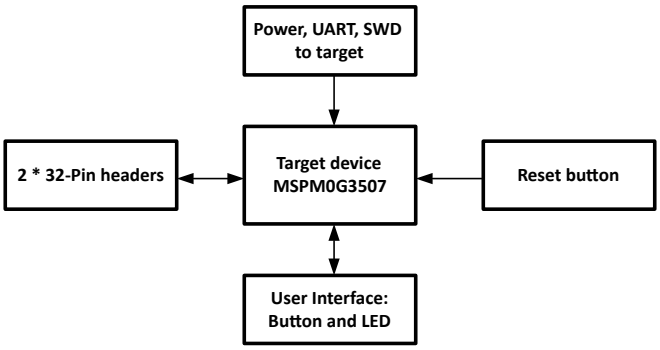


Figure 2-2. Block Diagram

2.1 Hardware Features

2.1.1 MSPM0G3507 MCU

The MSPM0G3507 devices provide 128KB of embedded flash program memory with built-in error correction code (ECC) and 32KB of SRAM with hardware parity. The devices also incorporate a memory protection unit, 7-channel DMA, math accelerator, and a variety of high-performance analog peripherals such as two 12-bit 4-Msps ADCs, a configurable internal shared voltage reference, one 12-bit DAC, three high speed comparators with built-in reference DACs, two zero-drift op-amps with programmable gain, and one general-purpose amplifier. The devices also offer intelligent digital peripherals such as two 16-bit advanced control timers, three 16-bit general purpose timers, one 32-bit high resolution timer, two windowed-watchdog timers, and one RTC with

alarm and calendar mode. These devices provide data integrity and encryption peripherals (AES, CRC, TRNG) and enhanced communication interfaces (four UART, two I2C, two SPI, and one CAN 2.0/FD).

Device feature include:

- 1.62V to 3.6V operation
- Arm 32-bit Cortex-M0+ with memory protection unit, up to 80MHz
- 128KB of flash with built-in ECC and 32KB of SRAM with hardware parity
- Two 12-bit 4-Msps ADCs
- 12-bit DAC
- Two zero-drift zero-crossover chopper op-amps
- Two 16-bit advanced control timers
- Three 16-bit general-purpose timers
- One 32-bit high-resolution time
- 60 GPIO

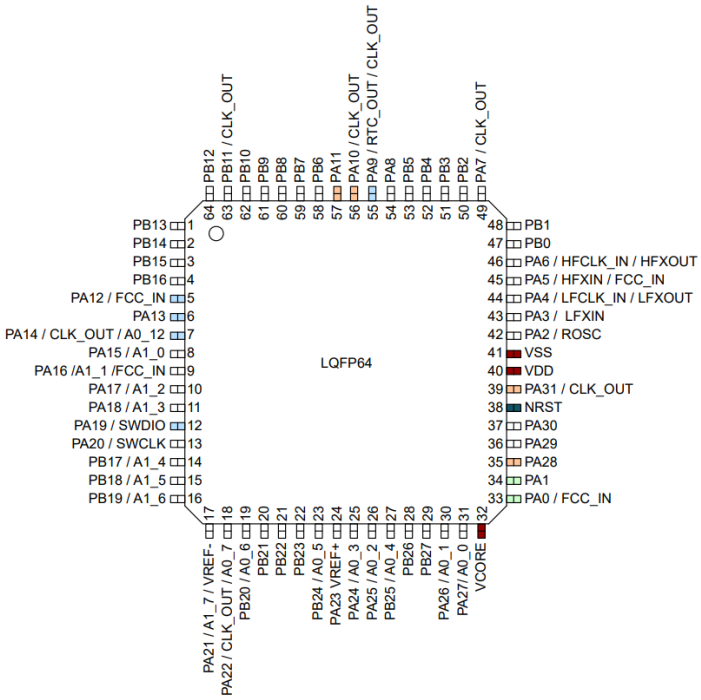


Figure 2-3. LQFP64 (VQFN) (Top View)

2.1.2 Application (or Backchannel) UART

After connecting MSP-LITO-G3507-EVM with one debugger which has a UART channel (such as XDS110-ETP, LP-XDS110, etc) or UART-USB transfer equipment, the backchannel UART allows communication with the USB host that is not part of the target application's main functionality. This is very useful during development, and also provides a communication channel to the PC host side. This can be used to create graphical user interfaces (GUIs) and other programs on the PC that communicate with the MSP-LITO-G3507.

On the target MSPM0G3507 side, the backchannel is connected to the UART0 module (PA10 and PA11).

2.1.3 Using an External Debug Probe

MSP-LITO-G3507-EVM doesn't have onboard debugger so this EVM needs to use an external debug probe connecting through J3 such as XDS110-ETP-EVM (the mini XDS110 debugger), LP-XDS110, or LP-XDS110-ET, etc.

2.2 Power

The EVM board accommodates various powering methods, including through the external debugger, and 3V3 header (on J1 and J2) power directly.

The most common power-supply scenario is from USB through the external debugger. External debugger regulates the power from USB to 3.3V for debugger operation and 3.3V to the MSP-LITO-G3507 side. Power from the external debugger is controlled by J3.

The 3v3 header (on J1 and J2) is present on the board to supply external power directly. Complying with the device voltage operation specifications when supplying external power is important. The MSPM0G3507 has an operating range of 1.62V to 3.6V. More information can be found in the MSPM0G350x Mixed-Signal Microcontrollers With CAN-FD Interface data sheet.

2.3 Clocking

The internal SYSOSC is 32MHz as default at the accuracy of 2.5%. To achieve higher accuracy, a 0.1% 100kΩ resistor is connected to the ROSC pin, PA2. If higher accuracy is not needed, then resistor R9 can be depopulated, and pin PA2 used for the other functions. The MCLK is sourced by 32MHz SYSOSC at default. CPUCLK is sourced directly from MCLK and MCLK can be configured up to 80MHz by enable SYSPLL. The low-power clock (ULPCLK) can be sourced by MCLK and used as clock source for PD0 peripherals. For more clock tree details see Section 2.3 Clock Module (CKM) of the MSPM0 G-Series 80MHz Microcontrollers Technical Reference Manual.

2.4 Pinout

This EVM has the 2 * 32-Pin headers which can help customer set up the application system rapidly through connecting with other modules. Figure 2-4 shows the MSP-LITO-G3507 headers Pinout. For the complete functionality of all pins, please refer to the MSPM0G350x Mixed-Signal Microcontrollers With CAN-FD Interface data sheet. Through the 2 * 32-Pin headers, this EVM can also be plugged into a breadboard and help customer set up a completed & customized system on the breadboard easily.

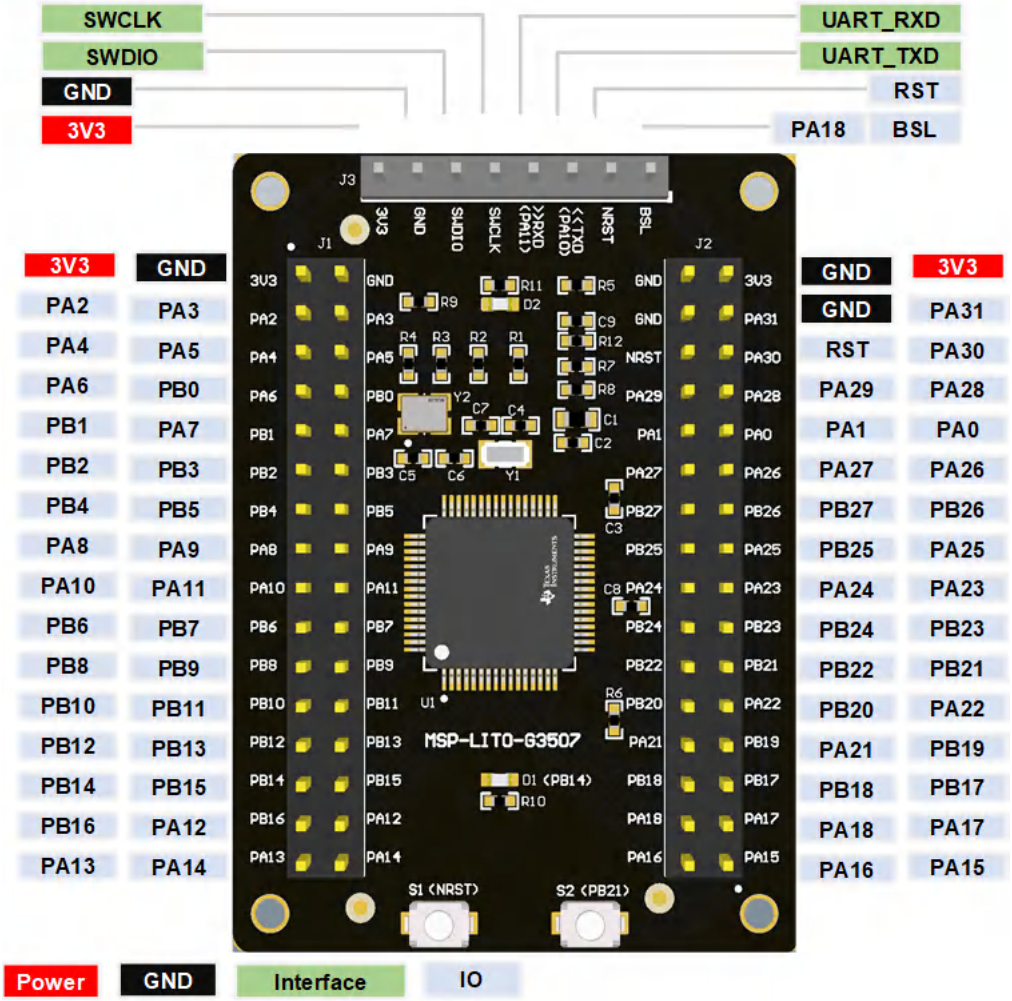
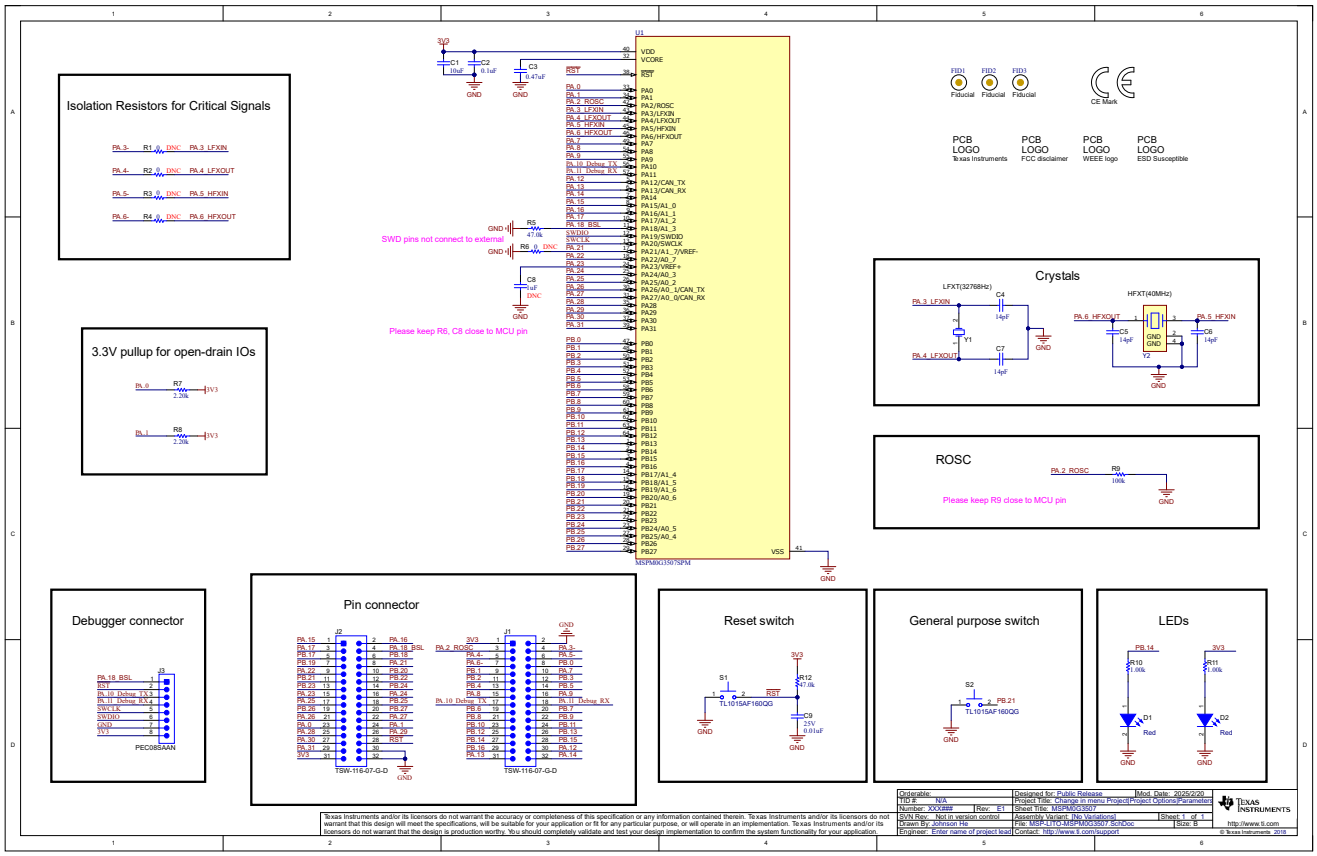


Figure 2-4. MSP-LITO-G3507 headers Pinout

3 Hardware Design Files

3.1 Hardware Design Files



3.2 PCB Layouts

The application note MSPM0 G-Series MCUs Hardware Development Guide covers information needed for hardware development with MSPM0 G series MCUs, including detailed hardware design information for power supplies, reset circuitry, clocks, debugger connections, key analog peripherals, communication interfaces, GPIOs, and board layout guidance. It can be referred for MSPM0 schematic design and PCB layout guidance.

3.3 Bill of Materials (BOM)

Table 3-1. MSP-LITO-G3507 Evaluation Module BOM Table

Designator	Description	PartNumber	Manufacturer	Quantity
C1	CAP, CERM, 10 uF, 6.3V, +/- 20%, X5R, 0603	CC0603MRX5R5BB106	Yageo	1
C2	CAP, CERM, 0.1 uF, 50V, +/- 20%, X5R, 0402	CC0402KRX5R9BB104	Yageo	1
C3	CAP, CERM, 0.47 uF, 6.3V, +/- 10%, X5R, 0402	CC0402KRX5R5BB474	Yageo	1
C4, C5, C6, C7	CAP, CERM, 14 pF, 50V,+/- 5%, C0G/NP0, AEC-Q200 Grade 1, 0402	GCQ1555C1H140JB01D	MuRata	4
C8	CAP, CERM, 1 uF, 25V, +/- 10%, X5R, 0402	CC0402KRX5R8BB105	Yageo	1
C9	CAP, CERM, 0.01 uF, 25V, +/- 10%, X7R, 0402	CC0402KRX7R8BB103	Yageo	1
D1, D2	LED, Red, SMD	SML-D12U1WT86	Rohm	2

Table 3-1. MSP-LITO-G3507 Evaluation Module BOM Table (continued)

Designator	Description	PartNumber	Manufacturer	Quantity
FID1, FID2, FID3	Fiducial mark. There is nothing to buy or mount.	N/A	N/A	3
J1, J2	Header, 100mil, 16x2, Gold, TH	NS-201-SH0384-201S-2*16P(F)	NS-TECH	2
J3	Header, 100mil, 8x1, Tin, TH	NS-201-SH0385-201S-1*8P(F)	NS-TECH	1
R5, R12	RES, 47.0 k, 1%, 0.0625 W, 0402	RC0402FR-0747KL	Yageo America	2
R7, R8	RES, 2.20 k, 1%, 0.063 W, 0402	RC0402FR-072K2L	Yageo America	2
R9	RES, 100 k, 0.1%, 0.063 W, 0402	AT0402BRD07100KL	Yageo	1
R10, R11	RES, 1.00 k, 1%, 0.0625 W, 0402	RC0402FR-071KL	Yageo America	2
S1, S2	Switch, Tactile, SPST-NO, 0.05A, 12V, SMT	TS3929A-020C(W)-J4.4	switech	2
U1	Mixed-Signal Microcontrollers With CAN-FD Interface LQFP64	MSPM0G3507SPM	Texas Instruments	1
Y1	Crystal, 32.768KHz, 12.5 pF, SMD	X1A0001410014	Epson	1
Y2	Crystal 40MHz ±10ppm (Tol) ±20ppm (Stability) 12pF FUND 40Ohm 4-Pin Mini-CSMD T/R	X1E0000210179	Seiko Epson	1

4 Software Examples

MSPM0_SDK has a set of simple C examples that demonstrate how to use the entire set of peripherals on the MSPM0G3507 MCU. Every MSP derivative has a set of these code examples. When starting a new project or adding a new peripheral, these examples serve as a great starting point. See the MSPM0 SDK documentation for more details about available software.

5 Resources

5.1 Integrated Development Environments

Although the source files can be viewed with any text editor, more can be done with the projects if the projects opened with a development environment like Code Composer Studio IDE (CCS), IAR Embedded Workbench IDE, or KIEL IDE.

5.1.1 TI Cloud Development Tools

TI's Cloud-based software development tools provide instant access to MSPM0 SDK content and a web-based IDE.

5.1.2 TI Resource Explorer Cloud

TI Resource Explorer Cloud provides a web interface for browsing examples, libraries, and documentation found in MSPM0SDK without having to download files to your local drive. Visit TI Resource Explorer Cloud at dev.ti.com.

5.1.3 Code Composer Studio Cloud

Code Composer Studio Cloud (CCS Cloud) is a web-based IDE that enables you to quickly create, edit, build, and debug applications for your application system. No need to download and install large software packages, simply connect your debugger & EVM and begin. You can choose to select from a large variety of examples in MSPM0SDK software or develop your own application. CCS Cloud supports debug features such as execution control, breakpoints, and viewing variables.

For more information, see the full comparison between CCS Cloud and CCS Desktop.

Visit Code Composer Studio Cloud at dev.ti.com.

5.1.4 Code Composer Studio IDE

Code Composer Studio Desktop is a professional integrated development environment that supports the TI Microcontroller and Embedded Processors portfolio. Code Composer Studio comprises a suite of tools used to develop and debug embedded applications. Code Composer Studio includes an optimizing C/C++ compiler, source code editor, project build environment, debugger, profiler, and many other features.

Learn more about CCS and download at http://www.ti.com/tool/ccstudio. Access the MSPM0 SDK and MSPM0L1306 code examples by using TI Resource Explorer within CCS.

5.2 MSPM0 SDK and TI Resource Explorer

TI Resource Explorer is a tool integrated into CCS that allows the user to browse through available design resources. TI Resource Explorer helps the user quickly find what is needed inside packages. TI Resource Explorer is well organized to find everything that is needed quickly, and the user can import software projects into the workspace in one click.

TI Resource Explorer Cloud is one of the TI Cloud Development tools, and is tightly integrated with CCS Cloud to deliver the best cloud based IDE experience.

5.3 Community Resources

5.3.1 TI E2E Forums

Search the forums at e2e.ti.com. If you cannot find your answer, post your question to the community!

6 Additional Information

6.1 Trademarks

All trademarks are the property of their respective owners.

7 Revision History

DATE	REVISION	NOTES
July 2025	*	Initial Release

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.

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3. 技術基準適合証明を取得後ご使用いただく。

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

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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