Z-Wave and Z-Wave Long Range 700/800 SDK 7.17.0.0 Pre-Certified GA
Gecko SDK Suite 4.0
December 15, 2021

Z-Wave and Z-Wave Long Range 700/800 are designed to meet the demands of the future smart home, where increasing needs for more sensors and battery-operated devices require both long range and low power. Context-aware environments are the next evolution in the smart home market, and they require technologies that have been optimized specifically for these applications.

100% Interoperable: Every product in the Z-Wave ecosystem works with every other product, regardless of type, brand, manufacturer or version. No other smart home/IoT protocol can make this claim.

Best-In-Class Security: Z-Wave's Security 2 (S2) framework provides end-to-end encryption and the most advanced security for smart home devices and controllers. Homes with S2 Z-Wave devices are virtually un-hackable.

SmartStart Easy Installation: SmartStart radically simplifies the installation of smart devices by using QR code scans for uniform, trouble-free setup. Devices and systems can be pre-configured dramatically easing deployments.

Backwards-Compatible: Z-Wave certification mandates backward-compatibility. The first Z-Wave devices on the market, more than ten years old, still perform as intended in networks with the latest Z-Wave technologies.

For more information about the certification status of Z-Wave and Z-Wave Long Range 700/800 SDK v7.17.0 Pre-Certified GA, see section 9 Product Life Cycle and Certification.

These release notes cover SDK version(s):

7.17.0.0 Pre-Certified GA released December 15, 2021

KEY FEATURES

- Z-Wave 800 - Lower power compared to 700
  - 55 % reduction in Rx current
  - 35% reduction in Tx current
- Z-Wave 800 – Longer range compared to 700
  - Integrated +20 dBm PA
  - 9 dBm sensitivity improvement for Z-Wave Mesh
  - 3 dBm sensitivity improvement for Z-Wave Long Range
- Z-Wave 800 – Best-in-class security
  - S2 and Secure Vault
- Underlying architecture changed to component-based design
- New features improving application development

Compatibility and Use Notices

For more information about security updates and notices, see the Security chapter of the Gecko Platform Release notes installed with this SDK or on the Silicon Labs Release Notes page. Silicon Labs also strongly recommends that you subscribe to Security Advisories for up-to-date information. For instructions, or if you are new to the Z-Wave 700/800 SDK, see 8 Using This Release.

Contents

1 Supported Radio Boards

This section describes the radio boards supported by the certified and pre-certified applications for 700 and 800 Series, respectively.

Table 1-1. Supported Radio Boards.

Series	Radio Board	Description	Applications
800	BRD4204B	EFR32ZG23: ZW-LR, SoC & 14 dBm	Serial API using BRD4001A
800	BRD4204C	EFR32ZG23: ZW-LR, SoC, 14 dBm & Secure Vault	Serial API using BRD4001A
800	BRD4204D	EFR32ZG23: ZW-LR, SoC, 14 dBm, Secure Vault & external 32kHz crystal mounted	Serial API using BRD4001A
800	BRD4205A	ZGM230S: ZW-LR, SiP & 14 dBm	Applications using BRD4001A/BRD8029A
800	BRD4205B	ZGM230S: ZW-LR, SiP, 14 dBm & Secure Vault	Applications using BRD4001A/BRD8029A
800	BRD4210A	ZGM230S: ZW-LR, SiP, 20 dBm & Secure Vault	Applications using BRD4001A/BRD8029A
700	BRD4200A	ZGM130S: SiP & 14 dBm	Applications using BRD4001A/BRD8029A
700	BRD4201A	EFR32ZG14: SoC & 14 dBm	Serial API using BRD4001A
700	BRD4202A	ZGM130S: SiP, 14 dBm & no SAW filters	Applications using BRD4001A/BRD8029A
700	BRD4206A	EFR32ZG14: ZW-LR, SoC & 14 dBm	Serial API using BRD4001A
700	BRD4207A	ZGM130S: ZW-LR, SiP & 14 dBm	Applications using BRD4001A/BRD8029A
700	BRD4208A	EFR32ZG14: ZW-LR, SoC & 20 dBm	Serial API using BRD4001A
700	BRD4209A	ZGM130S: ZW-LR, SiP & 20 dBm	Applications using BRD4001A/BRD8029A

The applications in the above table need a radio board in combination with BRD4001A – Wireless Starter Kit Mainboard (WSTK) and BRD8029A – Buttons and LEDs Expansion Board. The Serial APIs in the above table only need a radio board and a BRD4001A – Wireless Starter Kit Mainboard (WSTK). Refer to *INS14278: How to Use Certified Apps* and *INS14816: How to Use Pre-Certified Apps*, for details.

ZW-LR indicate that the radio boardsupports both Z-Wave and Z-Wave Long Range. 14/20 dBm indicates the transmit power of the radio board. Secure Vault is an industry-leading suite of state-of-the-art security features that address escalating Internet of Things (IoT) threats.

2 Z-Wave Protocol

2.1 New Items

The Gecko Software Development Kit version 4.00 introduces a new underlying platform architecture based on components. The Z-Wave SDK 7.17.x now uses this component structure and the structure and build method of Z-Wave applications has therefore changed compared to previous releases of Z-Wave SDK. The new component structure offers several new features in the GSDK:

- Search and filter to find and discover software components that work with the target device
- Automatically pull in all component dependencies and initialization code
- Configurable software components including peripheral units and drivers
- All configuration settings in C header files for usage outside of Simplicity Studio
- Configuration validation to alert developers to errors or issues
- GNU makefiles as a build option

Other changes specific to the Z-Wave Gecko SDK:

- main() is now part of the application
- The FreeRTOS configuration is available for application developers
- The region can be configured in Simplicity Studio GUI

2.2 Improvements

None

2.3 Fixed Issues

ID #	Description
731682	500 controller can now wakeup a 800 based FLiRS end device.

2.4   Known Issues in the Current Release

Issues in bold were added since the previous release. If you have missed a release, recent release notes are available on https://www.silabs.com/products/software.

ID #	Description	Workaround

756403	**FreeRTOS tickCount overflow after 49.7 days. A SensorPIR running in EM4 stops working after 50 days.**	**The workaround is to do a reset regularly. Make a function like this:**
		``c
		void ResetWorkaround()
		{
		  //Enqueue soft reset command to protocol
		  SZwaveCommandPackage Command;
		  Command.eCommandType = EZWAVECOMMANDTYPE_SOFT_RESET;
		  EQueueNotifyingStatus Status =
		QueueNotifyingSendToBack(g_pAppHandles-
		>pZwCommandQueue, (uint8_t *)&Command, 500);
		  ASSERT(EQUEUENOTIFYING_STATUS_SUCCESS == Status);
		}
		``
		and call it with a frequency less than 50 days.

753756	**Network Wide Inclusion (NWI) of 500-based apps doesn't work through 800 repeaters.**	**None**
758250	**BRD4205B has wrong Tx output power in the range -5 to 0 dBm.**	**None**
757837	**BRD4210A has 20 dBm Tx output power despite being set to 14 dBm.**	**None**
754134	**Does not support QFN40 SoCs.**	**None**
759440	**Does not support Secure Vault Mid SoCs.**	**Using Secure Vault High instead of Mid is recommended, as this frees up approx. 20 KB of flash for the application.**
355095	In small networks Assign Return Routes will only generate direct range or one-hop routes even though multi-hop routes are possible.	None
361273	Transport Service is used when it is necessary to split a frame in two parts due to size. However, Transport Service does not forward RSSI information from the lower layers but only routing information. The RSSI value is the difference between LWR RSSI and background RSSI. As a consequence it is not possible to use RSSI for large frames handled by Transport Service in a network health calculation.	None

2.5   Deprecated Items

None

2.6   Removed Items

None

3 Z-Wave Plus V2 Application Framework

3.1 New Items

None

3.2 Improvements

For a detailed description of application development using the Z-Wave Plus V2 Framework, refer to *INS14259: Z-Wave Plus V2 Application Framework SDK7.*

A porting guide are also available for customers that want to migrate 800 hardware. The guideline contains a detailed example on how to port a non-UC 700 based Switch On/Off App (7.16.3) to a UC 800 based Switch On/Off App (7.17.0), refer to *APL14836: Application Note for Porting Z-Wave Appl. SW from 700 to 800 hardware.*

3.3 Fixed Issues

None

3.4 Known Issues in the Current Release

Issues in bold were added since the previous release. If you have missed a release, recent release notes are available on https://www.silabs.com/products/software.

ID #	Description	Workaround
757988	**OTA firmware update is not working on 700 and 800 boards.**	**None**
752879	**Link Time Optimisation (LTO) is not supported because we have seen a number of issues when enabling this feature.**	**None**
369430	All S2 multicast frames are sent using verified delivery S2_TXOPTION_VERIFY_DELIVERY whether or not a response is expected.	Change source code depending on the frame sent.
473723	True status doesn't report correctly if there are multiple instances like colors (in Color Switch CC), endpoints, etc.	None

3.5 Deprecated Items

None

3.6 Removed Items

None

4 Certified Applications

The certified applications based on v7.x.1+ will be formally certified by a certification house. However, the first release (v7.x.0) will only contain pre-certified applications based on a certification test using CTT v3. Refer to *INS14278: How to Use Certified Apps* for details.

4.1 Door Lock Key Pad

4.1.1 New Items

None

4.1.2 Improvements

None

4.1.3 Fixed Issues

ID #	Description
652906	RSSI measurements on classic channels fail after reset or power cycle.

4.1.4 Known Issues in the Current Release

None

4.1.5 Deprecated Items

None

4.1.6 Removed Items

None

4.2 LED Bulb

4.2.1 New Items

None

4.2.2 Improvements

None

4.2.3 Fixed Issues

None

4.2.4 Known Issues in the Current Release

None

4.2.5 Deprecated Items

None

4.2.6 Removed Items

None

4.3 Power Strip

4.3.1 New Items

None

4.3.2 Improvements

None

4.3.3 Fixed Issues

None

4.3.4 Known Issues in the Current Release

None

4.3.5 Deprecated Items

None

4.3.6 Removed Items

None

4.4 Sensor PIR

4.4.1 New Items

None

4.4.2 Improvements

None

4.4.3 Fixed Issues

None

4.4.4 Known Issues in the Current Release

Issues in bold were added since the previous release. If you have missed a release, recent release notes are available on https://www.silabs.com/products/software.

ID #	Description	Workaround
758906	**Wakeup current has increased on both 700 and 800 SoCs. Caused by an unintentional IR calibration performed at start-up.**	None.

4.4.5 Deprecated Items

None

4.4.6 Removed Items

None

4.5 Switch On/Off

4.5.1 New Items

None

4.5.2 Improvements

None

4.5.3 Fixed Issues

None

4.5.4 Known Issues in the Current Release

None

4.5.5 Deprecated Items

None

4.5.6 Removed Items

None

4.6 Wall Controller

4.6.1 New Items

None

4.6.2 Improvements

None

4.6.3 Fixed Issues

None

4.6.4 Known Issues in the Current Release

None

4.6.5 Deprecated Items

None

4.6.6 Removed Items

None

5   Pre-Certified Applications

The pre-certified applications will not be formally certified but certification tests have been performed based on CTT v3. Refer to *INS14816: How to Use Pre-Certified Apps* for details.

5.1   Multilevel Sensor

5.1.1   New Items

None

5.1.2   Improvements

None

5.1.3   Fixed Issues

None

5.1.4   Known Issues in the Current Release

None

5.1.5   Deprecated Items

None

5.1.6   Removed Items

None

6 Serial API Bridge Controller

Beginning with version 7.16, when backing up and restoring a SerialAPI via the FUNC_ID_NVM_BACKUP_RESTORE, the SerialAPI will automatically upgrade the protocol non-volatile memory (NVM) to the latest version. Any backup made of a 7.16 or later SerialAPI can be restored to its original version or to a later version of the SerialAPI without any manual upgrade of the protocol NVM being necessary.

The serial interface is unchanged in version 8.

6.1 New Items

None

6.2 Improvements

None

6.3 Fixed Issues

None

6.4 Known Issues in the Current Release

Issues in bold were added since the previous release. If you have missed a release, recent release notes are available on https://www.silabs.com/products/software.

ID #	Description	Workaround
387655	Pre-built SerialAPI delivered in Simplicity Studio will not work if the ZG14 bootloader is also flashed to the radio board.	Use serialAPI without bootloader or, if OTW support is needed, contact the Z-Wave Apps team for workaround.

6.5 Deprecated Items

None.

6.6 Removed Items

None

7   Important Changes

7.1   Command Classes

Invoking command class handlers, delivered in the SDK, will cause the build to fail. To resolve such build errors, remove the call to the command class handler that causes the error from `Transport_ApplicationCommandHandlerEx()` in the application source file.

Z-Wave Application Framework (ZAF) automatically invokes the correct command class handler based on the received frame. `Transport_ApplicationCommandHandlerEx()` is defined as a weak function in ZW_TransportEndpoint.c and therefore leaving the function defined in the application will not break the build.

All command classes delivered in the SDK use one of multiple REGISTER_CC macros. Non-Silicon Labs command class implementations must use one of those macros as well.

Given that all command classes use REGISTER_CC() or later, `Transport_ApplicationCommandHandlerEx()` can be removed from an existing application main source file.

7.2   Association Group Information for Lifeline

`CC_AGI_LifeLineGroupSetup()` no longer has any effect. Its previous functionality was to configure the list of command class / command pairs that would be reported in the Association Group Command List Report. The content of the Association Group Command List Report is now automatically populated by ZAF.

ZAF only reports command class / command pairs that are implemented by ZAF and required according to https://sdomembers.z-wavealliance.org/wg/AWG/document/120.

Non-Silicon Labs command class implementations must use REGISTER_CC_V3() to be listed in the Association Group Command List Report. See existing Silicon Labs implementations for an example.

If optional command class / command pairs are desired in the Association Group Command List Report, use REGISTER_CC_V3().

7.3   Network Learn Mode

The function used in ZAF to set network learn mode has been modified so it will no longer have wakeUpReason as input. Parameters related to the wake up reason are now handled directly in the ZWave protocol.

The new format for `ZAF_setNetworkLearnMode()` is:

```
void ZAF_setNetworkLearnMode(E_NETWORK_LEARN_MODE_ACTION bMode)
```

8   Using This Release

This release contains the following

- Z-Wave Plus V2 Application Framework
- Z-Wave Certified Applications for a broad range of smart home applications
- Z-Wave Protocol and Serial API Applications

If you are a first-time user, Z-Wave documentation is installed with the SDK. See INS14280: Z-Wave Getting Started for End Devices, INS14278: How to Use Certified Apps in Z-Wave, and INS14281: Z-Wave Getting Started for Controller Devices for instructions.

This SDK depends on a Gecko Platform. The Gecko Platform code provides functionality that supports protocol plugins and APIs in the form of drivers and other lower layer features that interact directly with Silicon Labs chips and modules. Gecko Platform components include EMLIB, EMDRV, RAIL Library, NVM3, PSA, and mbedTLS. Gecko Platform release notes are available through Simplicity Studio's Launcher Perspective.

8.1   Installation and Use

Order a Z-Wave Wireless Starter kit. The kit offers the easiest and fastest way to start evaluation and development of your own Z-Wave mesh application. It provides a single world-wide development kit for both end devices and gateways with multiple radio boards, with which developers can create a mesh network and evaluate the Z-Wave module.

The Z-Wave and Z-Wave Long Range 700/800 SDK is provided as part of the Gecko SDK (GSDK), the suite of Silicon Labs SDKs. To quickly get started with the GSDK, install Simplicity Studio 5, which will set up your development environment and walk you through GSDK installation. Simplicity Studio 5 includes everything needed for IoT product development with Silicon Labs devices, including a resource and project launcher, software configuration tools, full IDE with GNU toolchain, and analysis tools. Installation instructions are provided in the online Simplicity Studio 5 User's Guide.

Alternatively, Gecko SDK may be installed manually by downloading or cloning the latest from GitHub. See https://github.com/SiliconLabs/gecko_sdk for more information.

Simplicity Studio installs the GSDK by default in:

- (Windows): C:\Users\<NAME>\SimplicityStudio\SDKs\gecko_sdk
- (MacOS): /Users/<NAME>/SimplicityStudio/SDKs/gecko_sdk

To implement a specific application, Silicon Labs recommends starting with one of the existing pre-certified apps with the desired Role Type.
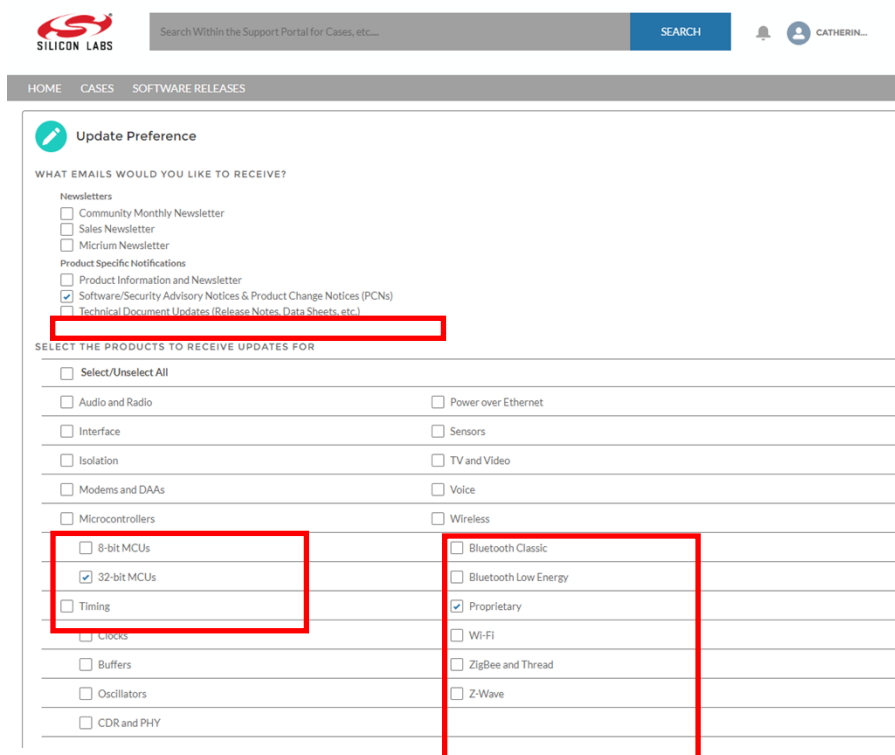
8.2   Security Information

Secure Vault Integration

This version of the stack are using secure vault interface for key management of asymmetric keys (ECC Curve 25519) and Symmetric keys (AES).

Security Advisories

To subscribe to Security Advisories, log in to the Silicon Labs customer portal, then select **Account Home**. Click **HOME** to go to the portal home page and then click the **Manage Notifications** tile. Make sure that 'Software/Security Advisory Notices & Product Change Notices (PCNs)' is checked, and that you are subscribed at minimum for your platform and protocol. Click **Save** to save any changes.

8.3 Support

Development Kit customers are eligible for training and technical support.

See support resources and contact Silicon Laboratories support at http://www.silabs.com/support.

9 Product Life Cycle and Certification

Silicon Labs will add new features based on market requirements and continuously improve the Z-Wave Protocol to position the Z-Wave Ecosystem. The Z-Wave Protocol Life Cycle is a process to provide rapid innovation, new features, and robust matured protocol release to Z-Wave Partners. The Z-Wave Protocol Life Cycle defines the maturation process of Z-Wave Protocol generations and consist of three phases divided in five Life Cycle stages.

Ascent Phase (BETA)

Silicon Labs releases new Z-Wave protocol generations (branches), i.e., initial BETA release of a Z-Wave Protocol generation that will introduce major new features/functions or support for a new Z-Wave Single Chip generation. This release is not certified and not eligible for certification.

Maturity Phase (ACTIVE/MAINTAINED)

Each new generation will generate follow-on matured releases to resolve protocol issues prioritized by Silicon Labs and based on input from Z-Wave Alliance Partners.

Decline Phase (MONITORED/OBSOLETE)

After a period of 17-24 months in the maturity phase a branch/release is discontinued and for an additional period (up to 24 months) a discontinued branch/release will be monitored since products based on this branch may still be shipping or under warranty in the field.

Table 9-1. Z-Wave SDK Life Cycle Status

Series	SDK Version	Release Date [DD-MM-YYYY]	Life Cycle Status
700/800	7.17.0 Pre-Certified GA	08-DEC-2021	Beta
700	7.16.2 GA	08-SEP-2021	Active
700	7.16.1 GA	21-JUL-2021	Maintained
700	7.16.0 Pre-Certified GA	16-JUN-2021	Obsolete
700	7.15.4 GA	07-APR-2021	Active
700	7.15.2 Pre-Certified GA	27-JAN-2021	Maintained
700	7.15.1 Pre-Certified GA	09-DEC-2020	Monitored
700	7.14.3 GA	14-OCT-2020	Maintained
700	7.14.2 GA	09-SEP2020	Monitored
700	7.14.1 GA	29-JUL-2020	Obsolete
700	7.14.0 Beta	24-JUN-2020	Obsolete
700	7.13.10 GA	18-AUG-2021	Active
700	7.13.9 GA	03-MAR-2021	Maintained
700	7.13.8 GA	28-OCT-2020	Monitored
700	7.13.7 GA	12-AUG-2020	Obsolete
700	7.13.6 GA	27-MAY-2020	Obsolete
700	7.13.5 GA	29-APR-2020	Obsolete
700	7.13.4 GA	15-APR-2020	Obsolete
700	7.13.3 GA	20-MAR-2020	Obsolete
700	7.13.2 GA	21-FEB-2020	Obsolete
700	7.13.1 GA	24-JAN-2020	Obsolete
700	7.13.0 Beta	13-DEC-2019	Obsolete
700	7.12.2 GA	26-NOV-2019	Obsolete
700	7.12.1 GA	20-SEP-2019	Obsolete
700	7.11.1 GA	12-JUL-2019	Obsolete
700	7.11.0 GA	29-MAR-2019	Obsolete

A change in the Z-Wave SDK utilized for a specific device does require recertification; however, the type of certification required, the amount of testing needed, and the associated fees depend on the scope of the change.

Table 9-2. Z-Wave Certification in case of a SDK upgrade.

Series	SDK Version	Upgrade to SDK Version	Type of Certification
700/800	7.17.0 Pre-Certified GA	NA	-
700	7.16.2 GA	NA	-
700	7.16.1 GA	7.16.2 GA	Re-certification
700	7.16.0 Pre-Certified GA	7.16.1 GA	Full certification
700	7.15.4 GA	7.16.1 GA	Full certification
700	7.15.2 Pre-Certified GA	7.15.4 GA	Full certification
700	7.15.1 Pre-Certified GA	7.15.2 Pre-Certified GA	Full certification
700	7.14.3 GA	7.15.1 Pre-Certified GA	Full certification
700	7.14.2 GA	7.14.3 GA	Re-certification
700	7.14.1 GA	7.14.2 GA	Re-certification
700	7.14.0 Beta	7.14.1 GA	Full certification
700	7.13.10 GA	7.14.1 GA	Re-certification
700	7.13.9 GA	7.13.10 GA	Re-certification
700	7.13.8 GA	7.13.9 GA	Re-certification
700	7.13.7 GA	7.13.8 GA	Re-certification
700	7.13.6 GA	7.13.7 GA	Re-certification
700	7.13.5 GA	7.13.6 GA	Re-certification
700	7.13.4 GA	7.13.5 GA	Re-certification
700	7.13.3 GA	7.13.4 GA	Re-certification
700	7.13.2 GA	7.13.3 GA	Re-certification
700	7.13.1 GA	7.13.2 GA	Re-certification
700	7.13.0 Beta	7.13.1 GA	Full certification
700	7.12.2 GA	7.13.1 GA	Re-certification
700	7.12.1 GA	7.13.1+ GA	Re-certification
700	7.11.1 GA	7.14.1+ GA 7.13.1+ GA	Re-certification Re-certification
700	7.11.0 GA	7.14.1+ GA 7.13.1+ GA	Re-certification Re-certification

10 Legal

10.1 Disclaimer

Silicon Labs intends to provide customers with the latest, accurate, and in-depth documentation of all peripherals and modules available for system and software implementers using or intending to use the Silicon Labs products. Characterization data, available modules and peripherals, memory sizes and memory addresses refer to each specific device, and "Typical" parameters provided can and do vary in different applications. Application examples described herein are for illustrative purposes only. Silicon Labs reserves the right to make changes without further notice to the product information, specifications, and descriptions herein, and does not give warranties as to the accuracy or completeness of the included information. Without prior notification, Silicon Labs may update product firmware during the manufacturing process for security or reliability reasons. Such changes will not alter the specifications or the performance of the product. Silicon Labs shall have no liability for the consequences of use of the information supplied in this document. This document does not imply or expressly grant any license to design or fabricate any integrated circuits. The products are not designed or authorized to be used within any FDA Class III devices, applications for which FDA premarket approval is required or Life Support Systems without the specific written consent of Silicon Labs. A "Life Support System" is any product or system intended to support or sustain life and/or health, which, if it fails, can be reasonably expected to result in significant personal injury or death. Silicon Labs products are not designed or authorized for military applications. Silicon Labs products shall under no circumstances be used in weapons of mass destruction including (but not limited to) nuclear, biological or chemical weapons, or missiles capable of delivering such weapons. Silicon Labs disclaims all express and implied warranties and shall not be responsible or liable for any injuries or damages related to use of a Silicon Labs product in such unauthorized applications. **Note: This content may contain offensive terminology that is now obsolete. Silicon Labs is replacing these terms with inclusive language wherever possible. For more information, visit www.silabs.com/about-us/inclusive-lexicon-project**

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