AN1447: EFR32xG22 to EFR32xG22E Compatibility and Migration Guide

This porting guide is for users migrating an existing design based on EFR32BG22, EFR32FG22, or EFR32MG22 to EFR32BG22E, EFR32FG22E, or EFR32MG22E. Migration entails both hardware and software considerations.

This application note covers the MCU compatibility and migration between EFR32xG22 and EFR32xG22E.

KEY POINTS

- EFR32xG22E maintains a high degree of pin and feature compatibility with EFR32xG22
- EFR32xG22E is largely compatible with EFR32xG22 except for some security features.
- Datasheets for each device detail specific performance metrics that may differ between EFR32xG22 and EFR32xG22E.

1. Introduction

This application note provides guidance on migrating from the EFR32xG22 family, which consists of the following:

- EFR32BG22
- EFR32MG22
- EFR32FG22

...to the EFR32xG22E family, which consists of the following:

- EFR32BG22E
- EFR32MG22E
- EFR32FG22E

This application note highlights the microcontroller-level differences between the EFR32xG22 and the EFR32xG22E. Certain orderable part numbers (OPNs) of EFR32xG22E are designed to be both pin- and hardware-compatible, as well as software-compatible, with EFR32xG22 devices, thus requiring only minor changes when porting designs.

Four factors must be considered when porting a design from EFR32xG22 to EFR32xG22E: pin-compatibility, external hardware compatibility, peripheral compatibility, and software compatibility.

1.1 Pins and External Hardware

Certain EFR32xG22E devices are pin-compatiable with EFR32xG22 devices in the same package. More information on the footprints, packages, and external hardware compatibility between EFR32xG22 devices and EFR32xG22E devices can be found in 2. Pin Compatibility and 3. External Hardware Migration.

1.2 Peripherals and Software

All of the software features in the SDKs that support EFR32xG22 are available on EFR32xG22E except for some Secure Engine features. Applications written for the EFR32xG22 can be recompiled and run on EFR32xG22E and vice versa. 4. Peripheral Compatibility and 5. Software Compatibility covers these areas in greater detail.

2. Pin Compatibility

EFR32xG22E devices are available in QFN40 and QFN32 packages. They are pin compatible with EFR32xG22 devices of the same package. EFR32xG22E devices are not available in TQFN32 packages and are not compatible with TQFN32 EFR32xG22 devices. For information on the OPNs in a specific package and their feature sets, refer to the device-specific datasheet.

3. External Hardware Migration

The external hardware components — including crystals, debugger, and power supply components — for EFR32xG22E devices and EFR32xG22 devices are compatible.

The EFR32xG22E has the same crystal oscillators as the EFR32xG22, and also share the same specifications for these oscillators. Furthermore, for EFR32xG22E devices that are pin compatible with the relevant EFR32xG22 devices, the debug capabilities and the debug connection layout are the same between them. The electrical specifications of the debug interface are also identical, and the same debug signals can be connected to a debug connector using the same footprint as in an EFR32xG22 design.

4. Peripheral Compatibility

All peripherals present on the EFR32xG22 are present on the EFR32xG22E, except for some security features. EFR32xG22E does not have any new peripherals.

4.1 Security

Compared to the EFR32xG22, the EFR32xG22E does not support the following security features:

- Secure boot with Root of Trust and Secure Loader (RTSL)
  - FSB and SSB code authentication disabled[1]
- Secure debug with Lock/Unlock
- TrustZone Secure Key Storage

The following features are supported by EFR32xG22E:

- Upgradeability of the Secure Firmware used during boot
- Option to enable Secure Firmware to verify the Second Stage Bootloader upgrade[1]

1. See AN1218 section 2.3.2

5. Software Compatibility

EFR32xG22 and EFR32xG22E are software compatible. In most cases, firmware images compiled for EFR32xG22 can be loaded and run on EFR32xG22E without issue. We recommend recompiling for EFR32xG22E to ensure no unsupported security functions are called.

6. Revision History

Revision 0.1

June, 2024

- Initial revision.

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