EFR32FG25 Flex Gecko Wireless SoC Family Data Short

The EFR32FG25 Flex Gecko SoC is an ideal solution for sub-GHz Wi-SUN applications for metering, lighting, and distribution automation.

The high-performance sub-GHz radio provides long range and is not susceptible to 2.4 GHz interference from technologies like Wi-Fi.

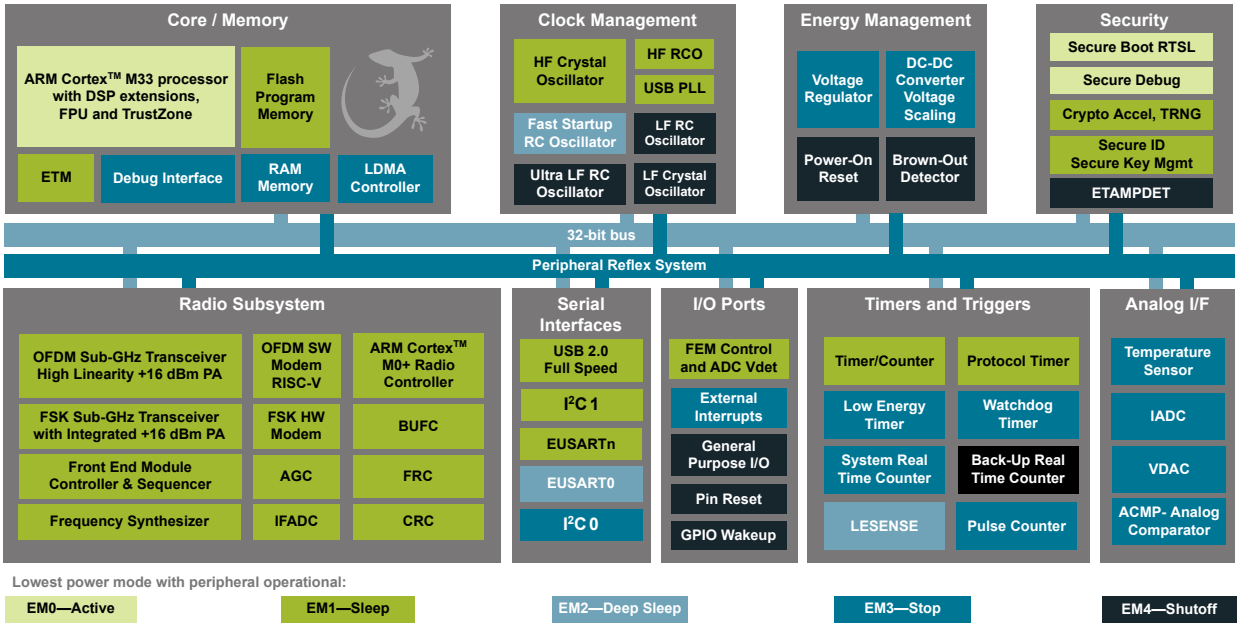
The single die, multi-core solution, provides industry leading security, high throughput, and an integrated power amplifier to enable the next level of secure connectivity for IoT devices.

EFR32FG25 applications include:

- Smart Electric Metering
- Street Lighting
- Distribution automation
- Industrial applications
- Municipal infrastructure

KEY FEATURES

- 32-bit ARM® Cortex®-M33 core with 97.5 MHz maximum operating frequency
- Up to 1920 kB of flash and 512 kB of RAM
- Wi-SUN Multi-rate OFDM, FSK, and O-QPSK modulations
- Integrated PA with up to 16 dBm (Sub-GHz) TX power
- Robust peripheral set and up to 37 GPIO
- Operation up to 125 °C



1. Feature List

The EFR32FG25 highlighted features are listed below.

- **Low Power Wireless System-on-Chip**
  - High Performance 32-bit 97.5 MHz ARM Cortex®-M33 with DSP instruction and floating-point unit for efficient signal processing
  - Up to 1920 kB flash program memory
  - Up to 512 kB RAM data memory
  - Sub-GHz radio operation
  - TX power up to 16 dBm
- **Low Energy Consumption**
  - 6.28 mA RX current at 924 MHz (400 kbps 4-GFSK)
  - 58.6 mA TX current @ 13 dBm output power at 923.6 MHz with CW from FSK PA
  - 76.6 mA TX current @ 16 dBm output power at 915 MHz with CW from FSK PA
  - 186 mA TX current @ 16 dBm output power at 914 MHz (2.4 Mbps Wi-SUN OFDM Option 1, MCS6)
  - 30 µA/MHz in Active Mode (EM0) at 97.5 MHz
  - 4.6 µA EM2 DeepSleep current (512 kB RAM retention and RTC running from LFXO)
  - 2.6 µA EM2 DeepSleep current (32 kB RAM retention and RTC running from LFRCO)
- **High Receiver Performance**
  - -106.3 dBm sensitivity @ 300 kbps 923.7 MHz Wi-SUN OFDM Option 3, MCS4
  - -114.5 dBm sensitivity @ 50 kbps 923.6 MHz Wi-SUN FSK #1b with FEC
  - -126.3 dBm sensitivity @ 4.8 kbps 915 MHz O-QPSK
  - -123.9 dBm sensitivity @ 6.25 kbps 914 MHz SUN O-QPSK
  - -95.3 dBm sensitivity @ 2.4 Mbps 914 MHz Wi-SUN OFDM Option 1, MCS6
  - -114.1 dBm sensitivity @ 50 kbps 866.5 MHz Wi-SUN FSK #1a with FEC
  - -112.7 dBm sensitivity @ 50 kbps 866.5 MHz OFDM Option 4, MCS2
- **Supported Modulation Format**
  - Wi-SUN MR OFDM MCS 0-6 (all 4 Options)
  - 802.15.4 SUN MR O-QPSK with DSSS
  - Wi-SUN FSK
  - 2 (G)FSK with fully configurable shaping
  - (G)MSK
- **Protocol Support**
  - Proprietary
  - Wi-SUN
- **Wide selection of MCU peripherals**
  - Analog to Digital Converter (ADC)
    - 12-bit @ 1 Msps
    - 16-bit @ 76.9 ksps
  - 2 × Analog Comparator (ACMP)
  - Digital to Analog Converter (VDAC) with two channels
  - Low-Energy Sensor Interface (LESENSE)
  - Up to 37 General Purpose I/O pins with output state retention and asynchronous interrupts
  - 8 Channel DMA Controller
  - 12 Channel Peripheral Reflex System (PRS)
  - 6 × 16-bit Timer/Counter with 3 Compare/Capture/PWM channels
  - 2 × 32-bit Timer/Counter with 3 Compare/Capture/PWM channels
  - 32-bit Real Time Counter
  - 24-bit Low Energy Timer for waveform generation
  - 2 × Watchdog Timer
  - 1 × USB2.0 Full Speed port, Device only
  - 5 × EUSART (Enhanced Universal Synchronous/Asynchronous Receiver/Transmitter)
    - EUSART0 operates in EM2
    - SPI and IrDA supported by EUSART
  - 2 × I^2C interface with SMBus support
  - High Frequency Crystal Oscillator clock sharing using buffered sine wave clock output
  - Die temperature sensor with ±2 °C typical accuracy across temperature range
- **Wide Operating Range**
  - 1.71 to 3.8 V VDD power supply
  - 3.45 to 3.8 V PAVDD power supply for OFDM
  - -40 °C to +125 °C
- **Secure Vault**
  - Secure Boot with Root of Trust and Secure Loader (RTSL)
  - Hardware Cryptographic Acceleration with DPA countermeasures for AES128/256, SHA-1, SHA-2 (up to 256-bit), ECC (up to 256-bit), ECDSA, ECDH and J-Pake
  - True Random Number Generator (TRNG) compliant with NIST SP800-90 and AIS-31
  - ARM® TrustZone®
  - Secure Debug with lock/unlock
- **Packages**
  - **QFN56** 7 mm × 7 mm × 0.85 mm

2. Ordering Information

Table 2.1. Ordering Information

Ordering Code	Modem Feature	Max TX Power	Flash (kB)	RAM (kB)	Secure Vault	GPIO	Package / Pinout	Temp Range
EFR32FG25B222F1920IM56-B	• OFDM • FSK • O-QPSK	16 dBm	1920	512	High	36		-40 to 125 °C
EFR32FG25B221F1920IM56-B	• OFDM • FSK • O-QPSK	16 dBm	1920	512	High	37		-40 to 125 °C
EFR32FG25B212F1920IM56-B	• FSK • O-QPSK	16 dBm	1920	512	High	36		-40 to 125 °C
EFR32FG25B211F1920IM56-B	• FSK • O-QPSK	16 dBm	1920	512	High	37		-40 to 125 °C
EFR32FG25B121F1152IM56-B	• OFDM • FSK • O-QPSK	16 dBm	1152	256	High	37		-40 to 125 °C
EFR32FG25B111F1152IM56-B	• FSK • O-QPSK	16 dBm	1152	256	High	37		-40 to 125 °C
EFR32FG25A221F1920IM56-B	• OFDM • FSK • O-QPSK	16 dBm	1920	512	Mid	37		-40 to 125 °C
EFR32FG25A211F1920IM56-B	• FSK • O-QPSK	16 dBm	1920	512	Mid	37		-40 to 125 °C
EFR32FG25A121F1152IM56-B	• OFDM • FSK • O-QPSK	16 dBm	1152	256	Mid	37		-40 to 125 °C
EFR32FG25A111F1152IM56-B	• FSK • O-QPSK	16 dBm	1152	256	Mid	37		-40 to 125 °C