



GigaDevice



Secure 32-bit MCU with Built-In Wi-Fi Radio: Single-Chip Solution for High-Performance IoT Applications

GigaDevice Meets Multiple Requirements for IoT Applications with a Single Chip, the GD32W515 MCU

IoT applications for the smart home, consumer devices, or industrial systems increasingly use sophisticated artificial intelligence (AI) algorithms that require high computing performance. They also need to connect securely to a Wi-Fi® hub or gateway in the home or factory to provide high-speed access to the internet.

The GD32W515 Does it All

GigaDevice has packed all the functionality required by IoT applications into a single SoC microcontroller.

High Compute Performance

The GD32W515 is based on the Arm® Cortex®-M33 processor core operating up to 180MHz. It provides headroom for running Wi-Fi protocol software as well as the application. The MCU is ideal for edge computing functions such as speech recognition, keyword wakeup, and AI algorithms.

Strong Security

The security capabilities of the Cortex®-M33 core are fully realized in the PSA Level 1-certified GD32W515. It supports the TrustZone® hardware security architecture, providing a trusted execution area for services such as secure key storage and device authentication.

Built-In Wi-Fi Networking

The GD32W515 integrates a Wi-Fi MAC/baseband/radio module on-chip. A total link budget of 118.6dBm ensures excellent connectivity even in challenging environments.



- 180MHz Arm® Cortex®-M33 core
PSA Level 1 certified
- 2.4GHz 802.11b/g/n
Wi-Fi® module
- Up to 2MB of on-chip
Flash
Supports up to 32MB of
external Flash
- Rich set of peripherals
and interfaces



psacertified™
level one





GD32W515: Integrated 32-bit Wireless Microcontroller with Strong Security

Clock, Reset and Supply Management

Internal 16MHz + 32KHz RC oscillators
 Integrated system clock PLL
 Power Supply 1.6 to 3.6V
 Supply Supervisor: POR/PDR/LVD
 Multiple Power Saving Modes

Arm® Cortex®-M33 core (180MHz)

TrustZone®
 DSP instruction extension
 Single-precision Floating Point Unit (FPU)
 Nested Vectored Interrupt Controller (NVIC)
 Memory Protection Unit (MPU)
 SW/JTAG Debug

Memory

Up to 2MB on-chip Flash memory
 Quad SPI Flash interface up to 32MB of external memory
 Up to 448KB SRAM memory
 Secure Boot Loader

Timers

1 x 16-bit advanced timer
 2 x 32-bit general timers
 4 x 16-bit general timers
 1 x 16-bit basic timer
 Up to 4 channels of PWM
 2 x Watchdogs
 1 x 24-bit SysTick timer
 1x RTC

RF Block

Single-stream 802.11b/g/n Wi-Fi radio module
 21dBm maximum transmit power
 -97.6dBm receive sensitivity
 48dB adjacent channel rejection
 iPerf throughput of up to 50Mbps

Connectivity

3 x USART
 2 x I²C
 2 x SPI
 1 x I²S
 1 x SDIO
 1x QSPI
 1x SQPI
 1 x Full-Speed USB 2.0

Peripherals

Up to 43 GPIOs
 TrustZone® Protection Controller Unit (TZPCU)
 Digital Camera Interface (DCI)
 Touch Sensing Interface (TSI)
 High-Performance Digital Filter (HPDF) for external sigma delta (Σ - Δ) modulator

Analog

1 x 12-bit SAR ADC 2.5 MSPS

Part Number	Flash	SRAM	GPIO	Package	Dimensions
GD32W515TGQ6	1024KB	384KB	Up to 25	QFN36	5 x 5 x 0.75mm
GD32W515TIQ6	2048KB	448KB	Up to 25	QFN36	5 x 5 x 0.75mm
GD32W515P0Q6	0KB	448KB	Up to 43	QFN56	7 x 7 x 0.75mm
GD32W515PIQ6	2048KB	448KB	Up to 43	QFN56	7 x 7 x 0.75mm

Development tools

GD32W515P-EVAL

The full-featured evaluation boards based on the GD32W515PIQ6 support application development and debugging, demonstrating the complete functional capabilities of the device.

GD32W515T-START

An entry-level kit based on the GD32W515TIQ6 is ideal for evaluating Wi-Fi-radio performance in wireless system development projects.