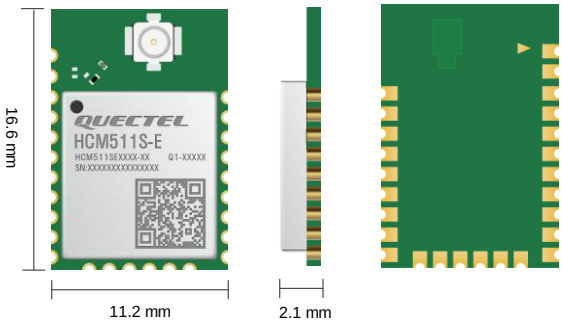
Quectel HCM511S-E

BLE 5.4 Module
Compact LCC Package



HCM511S-E is a high-performance MCU Bluetooth module launched by Quectel. It boasts an ARM Cortex-M33 processor with a frequency of up to 76.8 MHz and supports BLE 5.4. The module features built-in 32 KB RAM and 352 KB/512 KB flash (optional), ensuring efficient performance.

HCM511S-E is in an LCC form factor with an ultra-compact size of 16.6 mm × 11.2 mm × 2.1 mm, which optimizes the size and cost for end-products. HCM511S-E provides two optional antenna (interface) designs: 1st generation RF coaxial connector and pin antenna interface, which are compatible with diverse designs.

HCM511S-E supports standard Bluetooth mesh network low-power nodes (optional), increasing network scalability and node counts with mesh topology, which is suitable for digital keys, asset tags and beacons, portable medical devices, low-power nodes for smart homes, battery-operated motion sensors, etc.

Key Features

- BLE 5.4
- 32 KB RAM, 352 KB/ 512 KB flash (optional)
- Bluetooth mesh network low-power nodes (optional)
- 1 USART, 1 SWD, and 14 GPIOs by default, 18 GPIOs which can be multiplexed for various interfaces including EUART, I2C, ADC, and PDM in Open solution
- Operating temperature range: -40 °C to +85 °C
- Max. transmit power: 8 dBm
- 1st generation RF coaxial connector, pin antenna interface (optional)

BLE 5.4

LCC Form Factor

Compact Size

Multiple Interfaces

Operating Temperature Range: -40 °C to +85 °C

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BLE 5.4	HCM511S-E
Bluetooth Protocol	BLE 5.4
Encryption Mode	AES128/256, SHA-1, SHA-2, ECC, ECDSA, ECDH, TRNG, secure boot
Operating Mode	BLE (Bluetooth Low Energy)
Bluetooth Antenna	1st generation RF coaxial connector/ pin antenna interface (optional)
Kernel	ARM Cortex-M33 (up to 76.8 MHz)
RAM	32 KB
Flash	352 KB/ 512 KB (optional)
Dimensions	16.6 mm × 11.2 mm × 2.1 mm
Weight	Approx. 0.62 g
Temperature Range	
Operating Temperature Range	-40 °C to +85 °C
Storage Temperature Range	-45 °C to +95 °C
Certifications	
Regulatory	**Europe:** CE **America:** FCC **Canada:** IC **China:** SRRC **Australia/New Zealand:** RCM **Japan:** TELEC **Brazil:** Anatel*
Others	Bluetooth
Interfaces	
Interfaces①	USART, EUART, SWD, I2C, ADC, PDM, etc.
Electrical Features	
Power Supply Voltage	VBAT: 1.71–3.8 V, Typ. 3.3 V
RF Performance	

		Receiver Sensitivity	Transmit Power
BLE	**1 Mbps**	-98 dBm ±2 dB	≤ 8 dBm
	2 Mbps	-95 dBm ±2 dB	≤ 8 dBm
	BLE (S = 2) ②	-102 dBm ±2 dB	≤ 8 dBm
	BLE (S = 8) ②	-106 dBm ±2 dB	≤ 8 dBm

Ordering Code	Flash	Transmit Power	Operating Temperature Range	Antenna	Development Board (Only for Debugging)
HCM511SEAAMD-1X	352 KB	≤ 8 dBm	-40 °C to +85 °C	1st generation RF coaxial connector	HCM511SEAATB-1X
HCM511SEABMD-1X	512 KB	≤ 8 dBm	-40 °C to +85 °C	1st generation RF coaxial connector	HCM511SEABTB-1X
HCM511SEABMD-0L	512 KB	≤ 8 dBm	-40 °C to +85 °C	Pin antenna interface	HCM511SEABTB-0L

NOTE:

1. ①: See hardware design manual for details of the module interfaces.
2. ②: Only applicable to the module model with built-in 512 KB flash.
3. *: In progress.

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