

# ES301 Module

High Performance Bluetooth Low Energy Wireless Module

## OVERVIEW

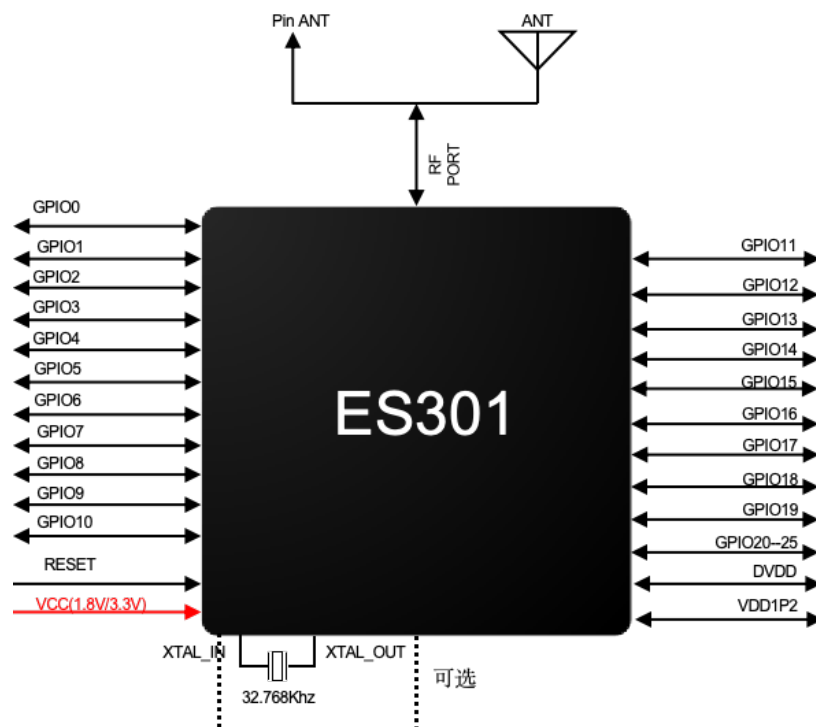
The ES301 is a Bluetooth 5.3 Low Energy and 2.4GHz proprietary multi-application module that merges the exceptional performance of a leading RF transceiver with a low-power ARM Cortex-M4 64MHz processor, power management unit, ADC, and intelligent I/O distribution controller. Notably, the ES301 module showcases outstanding ultra-low power performance, with broadcast power consumption as low as 9uA at a 1-second interval, and connection power consumption as low as 7uA at a 1-second interval.



The chip integrates a high-performance MCU with speeds of up to 64MHz, along with DMA, GPIO, SPI, UART, Timer, and Watchdog functionalities. It also supports a 32MHz external crystal and integrates a multi-purpose 12-bit ADC with a maximum of 12 channels. Additionally, the ES301 incorporates on-chip 80K SRAM and a 256-bit EFUSE, and it supports user-defined IDE system-on-chip development with SFLASH MCU and JTAG software upgrade capabilities.

ES301 operates in host less mode, capable of running both the Bluetooth stack and applications without an external MCU. It can also be used as a BLE transceiver in hosted (HCI) mode via UART interface (AT command) with an external host running Bluetooth stacks and applications. It has undergone rigorous regulatory compliance testing and is certified with FCC, CE, IC, SRRC and environmentally compliant with RoHS and WEEE directives.

## BLOCK DIAGRAM



## SPECIFICATION

ITEM	SPECIFICATION	
Microcontroller	ARM Cortex-M4 CPU (Maximum 64MHz) • EFUSE:256-bit • SRAM:80kB • Serial Flash:1MB • I-Cache RAM:8KB	
Standards	• Low Energy (BLE) compliant to Bluetooth SIG v5.3 • 2.4G proprietary features	
BLE Radio	Tx Power • -30dBm to +8dBm  Rx Sensitivity • 2Mbps:-96dbm • 1Mbps:-99dBm	Active Tx Power • RX mode: 3.4mA • Active TX mode:3.5mA@-20dBm • Active TX mode:4.2mA@0dBm • Active TX mode:4.5mA@4dBm • Active TX mode:6.8mA@7.5dBm • Advertising: 9uA (adv_interval:1s, payload: 23Byters,0dBm)
Power Consumption	Deep LPS: 1.2uA(with 16K RAM retention,32KHz RC)	
Peripherals	25 x GPIO(mux'ed) 2 x SPI(master or slave) 1 x I2C(master) 8 x DMA 2 x UART	8 x Timers 8 x PWM 1 x Watchdog Timer
Voltage	Input voltage:1.71V~3.6V, 3.3V (typical)	
Environmental	Temperature: • Operating: -30°C ~ 85°C • Storage: -40°C ~ 125°C	Humidity • Relative: < 90% Non-condensing • Storage: < 90% Non-condensing
Physical	Dimension: 6 x 6 x 0.9mm Weight: 0.18g	Pin: 33-pin stamp Antenna: Interior
Certification	BQB, FCC, CE, IC, SRRC, Rohs	

## ORDER INFORMATION

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