N32WB03x Bluetooth® Low Energy wireless SoC Family

Product Brief

N32WB03x series use 32-bit ARM Cortex-M0 core, support BLE 5.1 and SIG Mesh, and feature a frequency up to 64 MHz, 4.2 mA radio transmit current, 3.8 mA radio receive current , +6 dBm maximum transmitting power, and -96 dBm @BLE 1 Mbps RX sensitivity.

Product Brief

N32WB03x Bluetooth® Low Energy wireless SoC Family is Nations' next generation of high performance, ultra-low power dissipation chips that support BLE 5.1. Equipped with 32-bit ARM Cortex®-M0 core, it features a frequency up to 64 MHz, 48 KB+16KB SRAM integrated on the chip, and 256/512 KB Flash.

Integrated with an advanced BLE 5.1 RF transceiver, it is compliant with the BLE 5.1 standard and provided with multiple modes including standard 1 Mbps BLE mode, enhanced 2 Mbps BLE mode. In the 1 Mbps or 2 Mbps BLE mode, it supports RSSI, master/slave role, multi-connection, packet length expansion, KEYSCAN, IRC, 10-bit 1.33 Msps ADC , analog MIC input, PGA, basic, universal and advanced timers, RTC, WWDG, IWDG, LPUART, USART, SPI, I2C, and other peripherals.

It is applicable to many application scenarios including Bluetooth KEY, OBU, data transmission module, Bluetooth voice remote controller, and smart home.

Key Features

- **CPU Core**
  - 32-bit ARM Cortex-M0 core
  - Frequency up to 64 MHz
- **Storage**
  - 256/512 KB Flash
  - 64 KB SRAM
- **Power Dissipation**
  - Radio receive current: 3.8 mA@3 V
  - Radio transmit current: 4.2 mA @0 dBm/3.3 V
  - Sleep mode (48 KB RAM retention): 1.4 μA@3 V
  - PD mode: 130 nA

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- **RF Specification**
  - RX sensitivity: -96 dBm @BLE 1 Mbps
  - RX sensitivity: -93 dBm @BLE 2 Mbps
  - Power of programmable transmitter: up to +6 dBm
  - Single end antenna
- **Clock**
  - HSE: 32 MHz high speed external crystal
  - LSE: 32.768 KHz low speed external crystal
  - HSI: high speed internal RC 64 MHz
  - LSI: low speed internal RC 32 KHz
  - Support one clock output; different clock output can be configured; clock can be output after divided by four.
- **Reset**
  - Power-on/off/external pin reset
  - Watchdog reset
- **Communications Interface**
  - 2 × USART interfaces, with rate up to 4 Mbps (configurable as ISO7816, IrDA, LIN)
  - 1 × LPUART interface, featuring low-power dissipation, supporting communication rate up to 9,600 bps and low-power wakeup in Sleep mode
  - 2 × SPI interfaces, with rate up to 16 MHz, master/slave configurable, supporting I2S
  - 1 × I2C interface, with rate up to 1 MHz, master/slave configurable
- **Counter**
  - 1 × 16-bit advanced counter, supporting functions like input capture, output compare, PWM output, and quadrature encoder input; 4 independent channels, 3 of which support 6 complementary PWM outputs
  - 1 × 16-bit general-purpose counter, supporting functions like input capture, output compare, PWM output, and monopulse output, with 4 independent channels
  - 1 × 16-bit basic counter
  - 1 × 24-bit system timer
  - 1 × 7-bit window watchdog (WWDG)
  - 1 × 12-bit independent watchdog (IWDG)

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- **Analog Interface**
  - 1 × 10-bit 1.33 Msps ADC, supporting 5 external single-ended channels, 1 differential MIC channel, 2 internal channels
  - Built-in PGA up to 128x
  - MIC BIAS voltage, adjustable between 1.6 V and 2.3 V
- **21 × GPIO, supporting multiplexing**
- **1 × high speed 5-channel DMA controller**
- **1 × IR transmission controller, supporting all infrared remote control protocols**
- **1 × KEYSCAN module, where 8/10/13 GPIOs support 44/65/104 key functions respectively**
- **RTC real-time clock, supporting perpetual calendar (that can identify leap years), alarm events, and periodic wakeup**
- **Support hardware CRC16 and CRC32 operations**
- **Operating Conditions**
  - Operating voltage: 1.8V/2.32 V~3.6 V
  - Operating temperature: -40°C~85°C/105°C
  - ESD: ±2 KV (HBM)
- **Encapsulation**
  - QFN32 (4 mm × 4 mm)
- **Ordering information**

Series	Part Number
N32WB03x	N32WB031KCQ6-1 N32WB031KEQ6-2 N32WB031KEQ6-1 N32WB031KEQ7-1

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