

BMD-340

Bluetooth 5 + 802.15.4

Certified wireless module for the Nordic nRF52840

Overview

Rigado's BMD-340 is an advanced, highly flexible, ultra-low power multiprotocol SoM that enables Bluetooth 5 (BLE), Zigbee & Thread (IEEE 802.15.4) connectivity for portable, extremely low power embedded systems. With an ARM® Cortex™-M4F CPU, integrated 2.4GHz transceiver, and an integrated antenna, the BMD-340 provides a complete RF solution allowing faster time to market with reduced development costs.

Providing full use of the Nordic nRF52840's capabilities and peripherals, the BMD-340 can power the most demanding applications, all while simplifying designs and reducing BOM costs. The BMD-340 is an ideal solution for designs that require the latest Bluetooth 5 features or 802.15.4 based networking for Thread. Increased integration with built-in USB and 5.5V compatible DC/DC supply reduces design complexity and BOM cost, while expanding possible applications. BMD-340 designs are footprint compatible with the BMD-300/301, providing low-cost flexibility for tiered product lineups.

Applications

- Climate Control
- Lighting
- Safety and Security
- Home Appliances
- Access Control
- Internet of Things
- Home Health Care
- Advanced Remote Controls
- Smart Energy Management
- Low-Power Sensor Networks
- Interactive Entertainment
- Key Fobs
- Environmental Monitoring
- Hotel Automation
- Office Automation

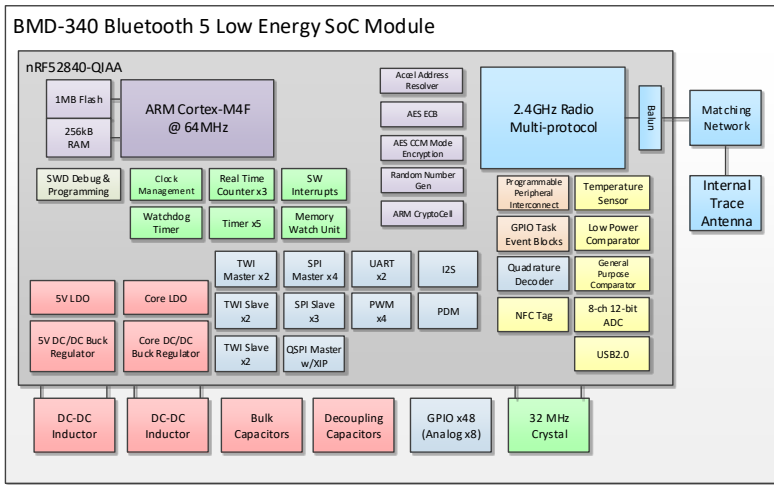
Key Features

- Complete Bluetooth 5, Thread & Zigbee (802.15.4) solution
- Powerful & ultra-efficient 64MHz 32-bit ARM® Cortex™ M4F CPU with 1MB Flash & 256kB RAM
- USB 2.0 and built in DC / DC converter for direct USB / Li-Ion power
- Transmitter certifications: FCC (USA), IC (Canada)
- Transmitter compliance: CE (Europe), RCM (Australia / New Zealand)
- Bluetooth qualified & Thread compliant
- Sub-footprint compatible with BMD-300/301 (Nordic nRF52832) & BMD-330 (Nordic nRF52810) Rigado modules

Quick Specifications

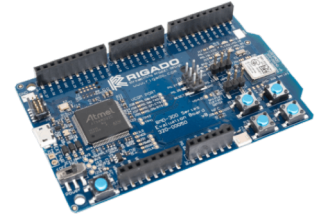
- Supply: 1.7V – 5.5V
- TX Power: 0 dBm @ 5.3mA, +8dBm max
- BLE Rx Sensitivity: -96 dBm @ 5.4mA
- BLE Coded Rx Sensitivity: -103 dBm
- Pins: 48 GPIO (8 Analog) + USB
- Interfaces: UART / I2C / SPI / PWM / I2S PDM / NFC / ADC / USB2.0
- Memory: 1MB Flash / 256kB RAM
- Dimensions: 10.2 x 15.0 x 1.9mm
- Operating Temp: -40°C to +85°C

Block Diagram



Evaluation Kit

The BMD-340 evaluation kit provides a great starting point for Bluetooth 5 Low Energy and Thread projects.



It is designed for ease of use while still providing full access to the features of the BMD-340. The built-in USB programmer allows for easy programming and configuration. All the I/O are accessible and Arduino R3 form factor connectors support plug-and-play accessory shields.

Specifications

General	
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +125°C
Physical Dimensions	10.2 x 15.0 x 1.9 mm
Operating Supply	1.7V to 5.5V
Material	RoHS compliant
MAC Address	Unique MAC address provided (in flash & on label)

2.4 GHz Transceiver	
Protocols	BT 5 LE Concurrent Peripheral / Central (S140) Thread (OpenThread-based) Zigbee
Frequency	2.360GHz to 2.5000GHz
IEEE Standard 802.15.4 Modulation	OQPSK @ 250kbps
Bluetooth Low Energy 5 Modulation	GFSK @ 2Mbps, 1Mbps + 500kbps/125kbps coded
IEEE Standard 802.15.4 Receiver sensitivity	-100 dBm
Bluetooth Low Energy 5 Receiver sensitivity	-96 dBm (1Mbps), -103 dBm (125kbps coded)
Transmit power	+8 dBm to -40 dBm
RSSI	-20 to -90 dBm, 1 dB resolution
Antenna	Integrated antenna

Approvals	
FCC	FCC part 15 modular qualification – FCC ID: 2AA9B10
IC	Industry Canada RSS-210 modular qualification – IC: 12208A-10
CE	EN 301 489-1 V2.1.1 EN 301 489-17 V3.1.1 EN 300 328 V2.1.1
Thread	Applying to be Thread Certified Component
Bluetooth	RF-PHY Component - DID: D040773

Ordering Information

- Production
- Available through Arrow, Future, Digi-Key & Mouser

Part Number	Description
BMD-340-A-R	BMD-340 module, nRF52840-Q1AA, integrated antenna
BMD-340-A-EVAL	BMD-340 Evaluation Kit with Segger programmer

Power Consumption	
Radio - Tx	13.6mA @ +8dBm, 5.3mA @ 0dBm (DCDC, 3V)
Radio - Rx	5.4mA @ 1Mbps (DCDC, 3V)
CPU - running	52µA/MHz running from flash, 3.3mA @ 64MHz 44µA/MHz running from RAM, 2.8mA @ 64MHz
CPU - off/idle	1.5µA in ON mode, no RAM retention, with RTC 0.97µA in ON mode, no RAM retention, all blocks IDLE 0.4µA in OFF mode, +23nA per 4Kb RAM retention

Peripherals	
UART	2 blocks. 1200 baud to 1M baud, parity, CTS & RTS support
SPI Master	4 blocks. 125kHz to 8Mhz clock rates
SPI Slave	3 blocks. 125kHz to 8Mhz clock rates
QSPI Master	1 block. Max 32MHz. XIP support
TWI (I2C) Master	2 blocks. 100kHz to 400kHz clock rates
TWI (I2C) Slave	2 blocks. 100kHz to 400kHz clock rates
NFC	NFC-A, 13.56MHz, 106kbps, wake-on-field
PDM	1 block. 2 microphones (left/right) 16kHz sample rate, 16-bit
I2S	1 block. Master and Slave, bidirectional
ADC	8-ch, 12-bit @ 200ksps
PWM	4 blocks, 4 channels each
LP Comparator	8-ch, VDD, int & ext ref, 15 levels
GP Comparator	8-ch, VDD & internal ref, 64 levels
Temp. Sensor	Internal, -40°C to 85°C, +/- 4°C, 0.25°C resolution
GPIO	48 - Input High: 0.7 x VDD, Input Low: 0.3 x VDD, 13kΩ pull-up/pull-down
Timers	5 x 32-bit & 3 x 24-bit RTC with 12-bit prescaler, watchdog
USB	1 block. USB2.0 full speed, 12Mbps. 2 control, 14 bulk/interrupt endpoints

About Rigado

Rigado powers edge connectivity for more than 300 global IoT customers. Our gateways, modules and secure updating platform significantly reduce the time, cost & risk of building & managing IoT solutions.

Rigado is headquartered in Oregon, USA with offices in London, UK and Shenzhen, China. Visit us to learn more at www.rigado.com.