

Overview

Rigado's BMD-340 is an advanced, highly flexible, ultra-low power multiprotocol SoM that enables Bluetooth 5 (BLE) and 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.

Key Features

- Complete Bluetooth 5.0 and Thread (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
- Secure Bootloader (encrypted over-the-air updates)
- Transmitter certifications: FCC (USA), IC (Canada), MIC (Japan)
- Transmitter compliance: CE (Europe), RCM (Australia / New Zealand)
- Bluetooth qualified & Thread-compliant
- Sub-footprint compatible with BMD-300/301 (Nordic nRF52832)

Quick Specifications

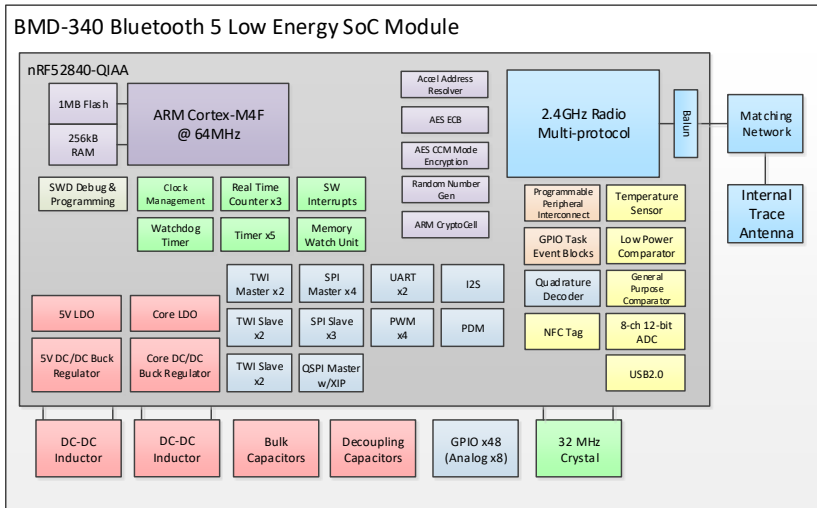
- Supply: 1.7V – 5.5V
- TX Power: 0 dBm @ 5.3mA, +8dBm max
- BLE Rx Sensitivity: -96 dBm @ 5.4mA
- BLE Coded Rx Sensitivity: -103 dBm
- Pins: 48 GPIO (8 Analog) + USB
- Interfaces: UART / I2C / SPI / PWM / I2S PDM / NFC / ADC / USB2.0
- Memory: 1MB Flash / 256kB RAM
- Dimensions: 10.2 x 15.0 x 1.9mm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

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
- Key Fobs
- Interactive Entertainment Devices
- Environmental Monitoring
- Hotel Automation
- Office Automation



Block Diagram



Secure Bootloader

Encrypted Over-The-Air (OTA), UART and USB firmware updates add a layer of security to your application. The BMD-340 Series bootloader uses AES-128 encryption allowing for secure updates of your application firmware, bootloader, and Bluetooth / Thread stacks over Bluetooth

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	
SoftDevices	BT 5 LE Concurrent Peripheral / Central (S140) BT 4.2 LE Concurrent Peripheral / Central (S132) Thread (OpenThread-based)
Frequency	2.360GHz to 2.500GHz
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 (All Pending – Estimated Q4 2017)	
FCC	FCC part 15 modular qualification – FCC ID: TBD
IC	Industry Canada RSS-210 modular qualification – IC: TBD
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: TBD

Power Consumption	
Radio - Tx	13.6mA @ +8dBm, 5.3mA @ 0dBm (DCDC, 3V)
Radio - Rx	5.4mA @ 1Mbps (DCDC, 3V)
CPU - running	56µA/MHz running from flash, 3.6mA @ 64MHz TBDµA/MHz running from RAM, TBDmA @ 64MHz
CPU - off/idle	TBDµA in ON mode, with RTC 0.7µA in ON mode, no RAM retention, all blocks IDLE 0.4µA in OFF mode, +30nA 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

Ordering Information

- [Order a Development Kit](#)
- [Contact Us](#) for pricing and ordering info

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

Availability Information

- Current Status: In Development
- Production: Q4 2017
- Modules will be available through Digi-Key and Arrow.

Design Services

Rigado has an experienced team of software, electrical, and mechanical engineers that provide solutions to today's technological challenges. Whether you need a network of industrial sensors, or a complete product ready for mass production; Rigado can turn your ideas into reality.

DeviceOps™

Rigado DeviceOps is a cloud-based platform for device monitoring and secure firmware updates at scale

- Easily track active devices & firmware versions
- Identify & define groups of devices as targets for updates
- Upload new firmware and create rules for distribution
- Rollout updates with configurable tiers & fail-safe controls
- Leverage secure connections that scale to support millions of end-node devices