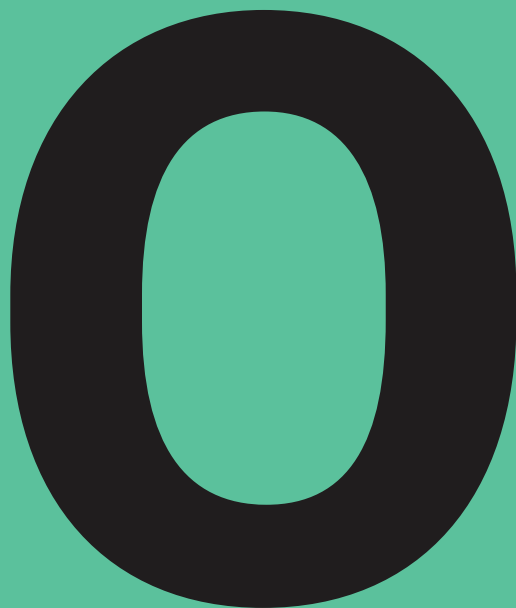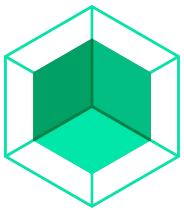Samsung

ARTIK™ Modules

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020 Product Brief

Samsung ARTIK™ Modules

ARTIK 020 Bluetooth® Module Product Brief

The ARTIK 020 is a Bluetooth® Module targeted for Bluetooth low energy applications where reliable RF, low-power consumption, and easy application development are key requirements. At +8 dBm TX power, ARTIK 020 is ideal for applications requiring short and medium range Bluetooth connectivity.
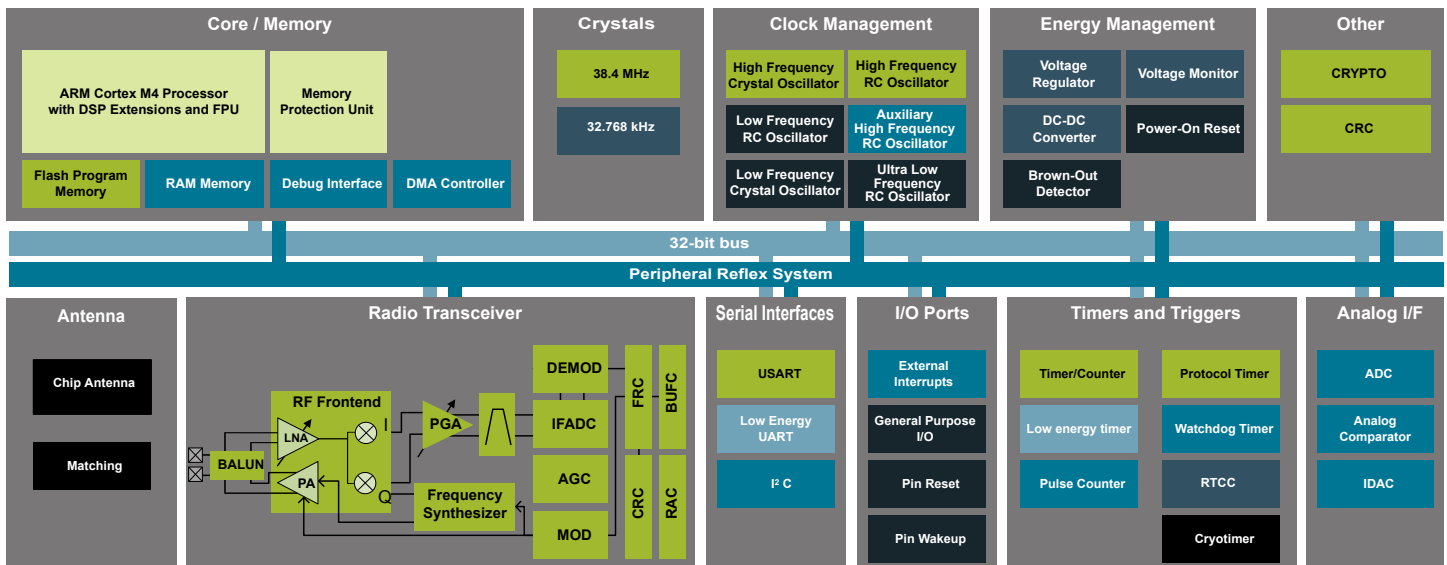
The ARTIK 020 integrates all of the necessary elements required for a Bluetooth application: Bluetooth low energy radio, a software stack, and GATT-based profiles, and it can also host end user applications, which means no external microcontroller is required in size, price or power constrained devices. The ARTIK 020 Bluetooth Module also has highly flexible hardware interfaces to connect to different peripherals or sensors.

ARTIK 020 can be used in a wide variety of applications:

- IoT Sensors and End Devices
- Commercial and Retail
- Health and Wellness
- Industrial, Home and Building Automation
- Smart Phone, Tablet and PC Accessories

KEY FEATURES

- Bluetooth 4.2 Compliant
- Integrated antenna
- TX power: up to +8 dBm
- RX sensitivity: down to -92 dBm
- Range: up to 200 meters
- 32-bit ARM® Cortex®-M4 core at 40 MHz
- Flash memory: 256 kB
- RAM: 32 kB
- Autonomous Hardware Crypto Accelerator and Random Number Generator
- Integrated DC-DC Converter
- Onboard Bluetooth stack

Core / Memory

- ARM Cortex M4 Processor with DSP Extensions and FPU
- Memory Protection Unit
- Flash Program Memory
- RAM Memory
- Debug Interface
- DMA Controller

Crystals

- 38.4 MHz
- 32.768 kHz

Clock Management

- High Frequency Crystal Oscillator
- High Frequency RC Oscillator
- Low Frequency RC Oscillator
- Auxiliary High Frequency RC Oscillator
- Low Frequency Crystal Oscillator
- Ultra Low Frequency RC Oscillator

Energy Management

- Voltage Regulator
- Voltage Monitor
- DC-DC Converter
- Power-On Reset
- Brown-Out Detector

Other

- CRYPTO
- CRC

32-bit bus

Peripheral Reflex System

Antenna

- Chip Antenna
- Matching

Radio Transceiver

- DEMOD
- IFADC
- AGC
- MOD
- FRC
- BUFC
- CRC
- RAC
- RF Frontend
  - LNA
  - PGA
  - PA
  - BALUN
- Frequency Synthesizer

Serial Interfaces

- USART
- Low Energy UART
- I² C

I/O Ports

- External Interrupts
- General Purpose I/O
- Pin Reset
- Pin Wakeup

Timers and Triggers

- Timer/Counter
- Protocol Timer
- Low energy timer
- Watchdog Timer
- Pulse Counter
- RTCC
- Cryotimer

Analog I/F

- ADC
- Analog Comparator
- IDAC

Lowest power mode with peripheral operational:

| EM0— Active | EM1— Sleep | EM2— Deep Sleep | EM3— Stop | EM4— Hibernate | EM4— Shutoff |

1. Feature List

The ARTIK 020 highlighted features are listed below.

- **Low Power Wireless System-on-Chip**.
  - High Performance 32-bit 40 MHz ARM Cortex®-M4 with DSP instruction and floating-point unit for efficient signal processing
  - 256 kB flash program memory
  - 32 kB RAM data memory
  - 2.4 GHz radio operation
  - TX power up to +8 dBm
- **Low Energy Consumption**
  - 8.7 mA RX current at 2.4 GHz
  - 8.2 mA TX current @ 0 dBm output power at 2.4 GHz
  - 63 µA/MHz in Active Mode (EM0)
  - 2.5 µA EM2 DeepSleep current (full RAM retention and RTCC running from LFXO)
  - 2.1 µA EM3 Stop current (State/RAM retention)
  - Wake on Radio with signal strength detection, preamble pattern detection, frame detection and timeout
- **High Receiver Performance**
  - -92 dBm sensitivity @ 1 Mbit/s GFSK (2.4 GHz)
- **Supported Protocols**
  - Bluetooth®
- **Support for Internet Security**
  - General Purpose CRC
  - Random Number Generator
  - Hardware Cryptographic Acceleration for AES 128/256, SHA-1, SHA-2 (SHA-224 and SHA-256) and ECC

- **Wide Selection of MCU peripherals**
  - 12-bit 1 Msps SAR Analog to Digital Converter (ADC)
  - 2× Analog Comparator (ACMP)
  - Digital to Analog Current Converter (IDAC)
  - 25 pins connected to analog channels (APORT) shared between Analog Comparators, ADC, and IDAC
  - 25 General Purpose I/O pins with output state retention and asynchronous interrupts
  - 8 Channel DMA Controller
  - 12 Channel Peripheral Reflex System (PRS)
  - 2×16-bit Timer/Counter
    - 3 + 4 Compare/Capture/PWM channels
  - 32-bit Real Time Counter and Calendar
  - 16-bit Low Energy Timer for waveform generation
  - 32-bit Ultra Low Energy Timer/Counter for periodic wake-up from any Energy Mode
  - 16-bit Pulse Counter with asynchronous operation
  - Watchdog Timer with dedicated RC oscillator @ 50nA
  - 2×Universal Synchronous/Asynchronous Receiver/Transmitter (UART/SPI/SmartCard (ISO 7816)/IrDA/I^{2}S)
  - Low Energy UART (LEUART™)
  - I^{2}C interface with SMBus support and address recognition in EM3 Stop
- **Wide Operating Range**
  - 1.85 V to 3.8 V single power supply
  - 2.4 V to 3.8 V when using DC-DC
  - Integrated DC-DC
  - -40 °C to +85 °C
- **Dimensions**
  - 12.9 x 15.00 x 2.2 mm

2. Ordering Information

Ordering Code	Description	Max TX Power	Antenna	Packaging	Production Status
ARTIK-020-AV2	ARTIK 020 Bluetooth Module	+8 dBm	Integrated chip antenna	Cut Reel (100 pcs)	Full Production (certified)
ARTIK-020-AV2R	ARTIK 020 Bluetooth Module	+8 dBm	Integrated chip antenna	Reel (1000 pcs)	Full Production (certified)
SIP-KITSLF001	ARTIK 020 Bluetooth Kit [1]	—	—	Development Kit	—
Note:					
1. IAR license required for Bluetooth® software development.					

Samsung
ARTIK™
Modules

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