

# BX\_RF03

## BT 5.0 – BLE / MESH SoC

### Features

- Complies with Bluetooth 5.0 with 1M / 2M bps data rates.

#### ■ Radio Transceiver

- -93 dBm RX sensitivity at 1Mbps mode
- -90 dBm RX sensitivity at 2Mbps mode
- RF output power levels: -20dBm, 0dBm, 3dBm and 8dBm
- 50dB RSSI dynamic range

#### ■ Supply Current

- 4.3mA in RX and 4.4mA in TX with On Chip DCDC Converter@4.3V
- 5.5mA in RX and 5.7mA in TX with On Chip DCDC Converter@3.3V

#### ■ Ultralow Current Mode

- Sleep current : 2.5uA ~ 6uA, SRAM ( 16 KB ~ 208 KB ) retention
- Average current: 20uA , during 1.28 sec cycle time ( Active / Sleep )  
[Notice: Active \( Broadcasting ADV \) / Sleep \( 208 KB SRAM retention \)](#)

#### ■ Analog Interfaces

- 1 Embedding ADC in pin VBAT with Battery monitoring function from 5.5V to 2.0V
- Temperature sensor from -40°C to 125°C

#### ■ Digital Interfaces

- Up to 10 GPIOs
- 1 Internal Quad-SPI Flash interface
- 2 UART -  
Flow control up to 1Mbps and supports all the baud rate under 1Mbps, IRDA is supported
- 2 IIC -  
Master / Slave programmable and speed up to 1Mbps
- 2 Timers and 1 Watch-dog Timer
- 5 PWM Outputs

#### ■ Integrated 32-bit MCU

- Clock frequency: 16MHz, **32MHz ( Major )** , 48MHz, 64MHz, 80MHz and **96MHz ( Max )**
- CPU Benchmarking : 2.07 Coremark / MHz
- SWD debug interface
- AHB / APB bus matrix with speed up to 96MHz

#### ■ Memories

- 4Mb Flash
- 128 KB ROM ( Boot ROM and BLE stack )
- 208 KB SRAM
  - ◆ Composed of **6 pages of 32KB** and **1 page of 16KB** , with retention capability
  - ◆ Each 32KB can be set into retention state separately and exchange memory for BLE connection data
  - ◆ 16KB of 4 way cache controller for external SPI flash which enable CPU run on the external SPI flash, this 16KB cache can be also used as system SRAM when cache is disabled

### Power Management

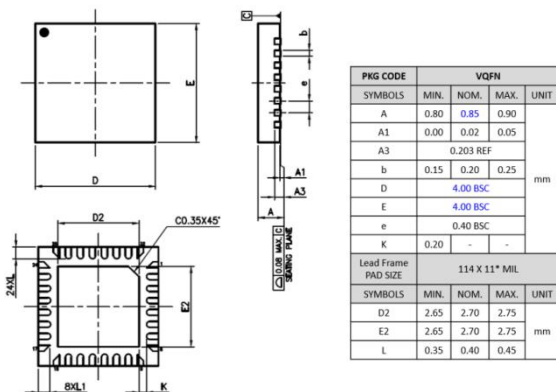
- 2.3-5.0V power input
- One 1.2V Integrated DCDC buck converter
- One 1.8V LDO with 40mA output
- Two 3.3V LDO with 50mA & 25mA output each

### Cryptographic Engine

- ECC
- AES-128

### Package

- QFN32 ( 4 X 4 mm<sup>2</sup> )



### Pin Description

Pin	Symbol	Type	Description	Pin	Symbol	Type	Description
1	P02	DIO	FUNC_I002/GPIO02	18	P23	DIO	FUNC_I021/GPIO23
2	P15	DIO	FUNC_I013/GPIO15	19	XTAL32XP	AI	32.768 kHz Crystal input (+)
3	P16	DIO	FUNC_I014/GPIO16	20	XTAL32KN	AI	32.768 kHz Crystal input (-)
4	P17	DIO	FUNC_I015/GPIO17	21	VDD_3V2	PO	Supply to external 3.3V
5	P12	DIO	FUNC_I010/GPIO12	22	VDD_BAT2	PI	Guard ring power supply
6	P13	DIO	FUNC_I011/GPIO13	23	VDD_VCO	PI	VCO power supply
7	VDD_3V1	PO	Supply to external 3.3V	24	LOOP_C	AIO	PLL loop filter external capacitor.
8	VDD_1V8	PO	Supply to external 1.8V	25	VDD_CP	PI	PLL power supply
9	VDD_DIG	PI	Digital circuit power supply	26	VDD_RF1	PI	RF power supply
10	VDD_1V2	PO	DC/DC Converter output	27	RF_P	AIO	RF input/output
11	VDD_BAT	PI	Battery supply voltage	28	RF_N	AIO	RF input/output
12	Ext Reset	DI	Pull low internally. High active.	29	VDD_A	PI	Power supply for an analog circuit
13	P00	DIO	swck/GPIO00	30	VDD_BAT1	PI	ADC power supply
14	P01	DIO	swd/GPIO01	31	XTAL32MP	AI	32 MHz Crystal input (+)
15	VDD_CPU	PO	VDD_CPU output	32	XTAL32MN	AI	32 MHz Crystal input (-)
16	VDD_AWO	PO	VDD_AWO output	IC Ground pad		GND	Backside GND plane. Must be connected to the GND.
17	P22	DIO	FUNC_I020/GPIO22				

NOTE: AI : analog input AO : analog output AIO : analog input/output

DI : digital input DIO : digital input/output PI : power input PO : power output

### Operating Temperature

- -25°C to 85°C

### Module

- BX2400-mRF03b-S1a



Size	Pin out	IO	Component	TX PWR	RX SEN	Interface	Functions
21*15 mm <sup>2</sup> (2 layer)	14 Pins	10 GPIO	30 pcs (Standard) Op t i o n	1 pcs (Added)	0 dBm (default)	-93dBm @1Mbps	(1) SWD (2) UART (3) IIC
		NO Ext. ADC		9 pcs (Reduced)	8 dBm (Max)	-90dBm @2Mbps	



Ver 2.5