

PBLN51822mDataSheet

v0.0.2e

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Revision History

No.	Version	Date	Part	Description
1	0.0.1e	2015-02-24	All	First release of Preliminary Product Specification
2	0.0.2e	2015-06-03	Schematic	Changed the default antenna is ANT2.

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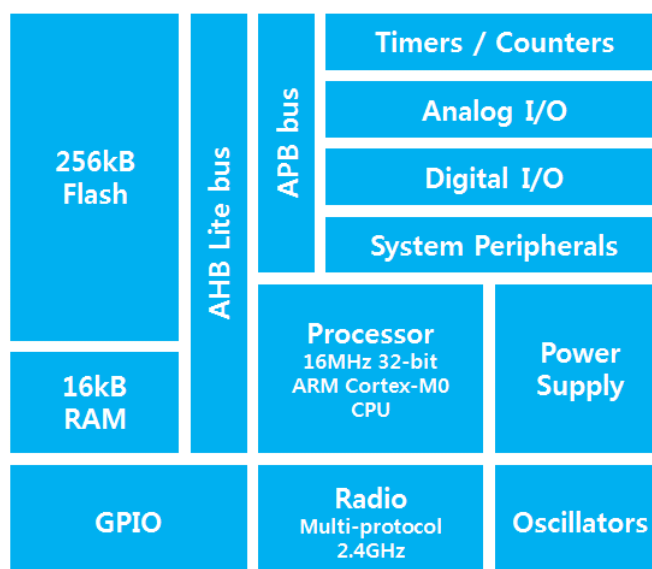
1. PBLN51822m Introduction

PBLN51822m is an ultra-low power 2.4 GHz wireless System on Chip (SoC) module, a 32 bit ARM® Cortex™-M0 CPU, flash memory, and analog and digital peripherals.

PBLN51822m can support **Bluetooth® Low Energy** and a range of proprietary 2.4 GHz protocols, such as Gazell from Nordic Semiconductor.

Fully qualified Bluetooth Low Energy stacks for PBLN51822m are implemented in the S100 series of SoftDevices.

The S1x0 series of SoftDevices are available for free and can be downloaded and installed on PBLN51822m independent of your own application code.



Key Features

- 2.4 GHz transceiver
 - 93 dBm sensitivity in Bluetooth® low energy mode
 - 250 kbps, 1 Mbps, 2 Mbps supported data rates
 - TX Power -20 to +4 dBm in 4 dB steps
 - TX Power -30 dBm Whisper mode
 - 13 mA peak RX, 10.5 mA peak TX (0 dBm)
 - RSSI (1 dB resolution)
- ARM® Cortex™-M0 32 bit processor
 - 275 µA/MHz running from flash memory
 - 150 µA/MHz running from RAM
 - Serial Wire Debug (SWD)
- S1x0 series SoftDevice ready
- Memory
 - 256 kB or 128 kB embedded flash program memory
 - 16 kB RAM
- Support for non-concurrent multiprotocol operation
 - On-air compatibility with nRF24L series
- Flexible Power Management
 - Supply voltage range 1.8 V to 3.6 V
 - 2.5 µs wake-up using 16 MHz RCOSC
 - 0.4 µA @ 3 V OFF mode
 - 0.5 µA @ 3 V in OFF mode + 1 region RAM retention
 - 2.3 µA @ 3 V ON mode, all blocks IDLE
- 8/9/10 bit ADC - 8 configurable channels
- 6 General Purpose I/O Pins
- One 32 bit and two 16 bit timers with counter mode
- SPI Master
- Two-wire Master (I2C compatible)
- UART (CTS/RTS)
- CPU independent Programmable Peripheral Interconnect (PPI)
- Quadrature Decoder (QDEC)
- AES HW encryption
- Real Time Counter (RTC)

Applications

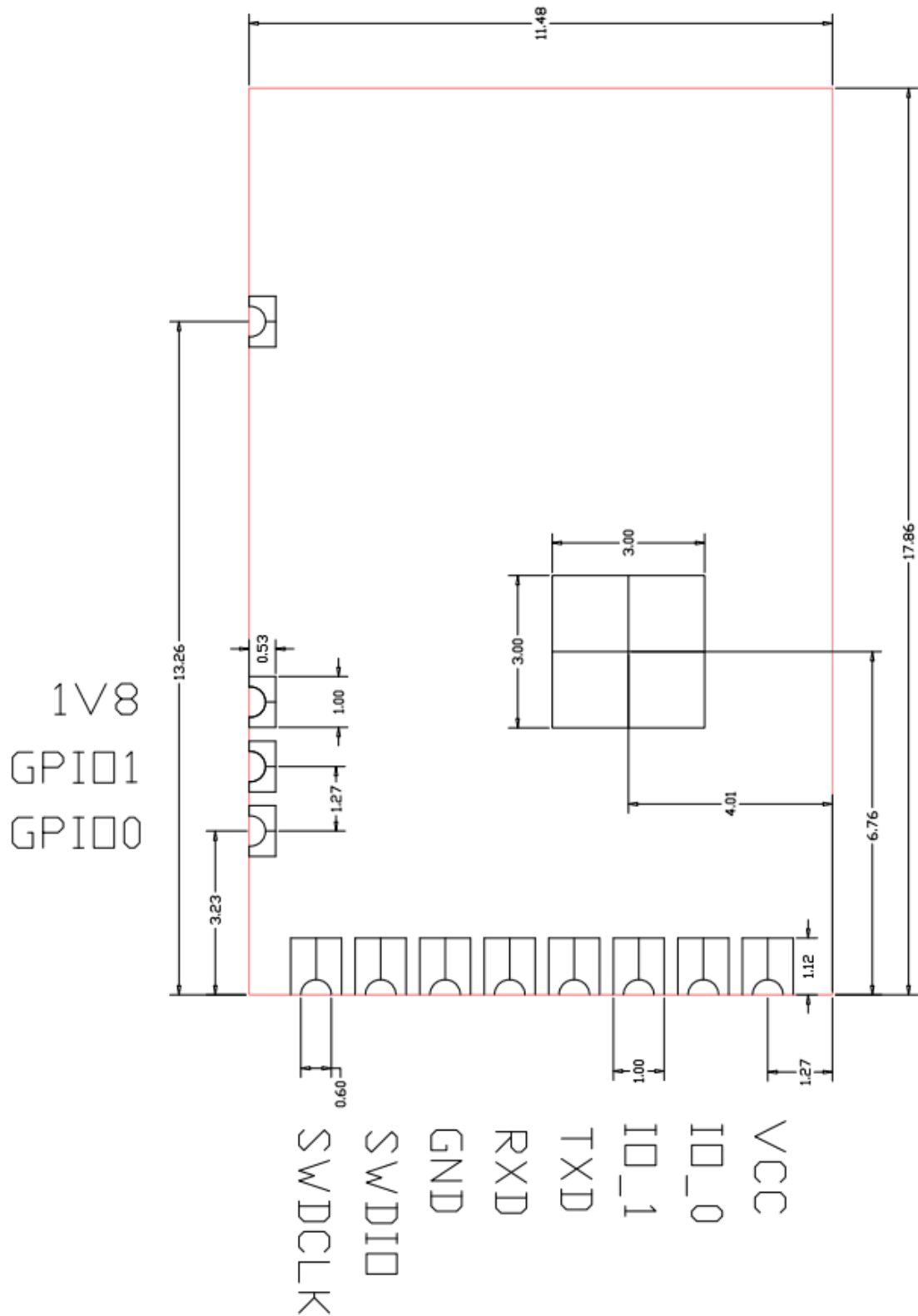
- Computer peripherals and I/O devices
 - Mouse
 - Keyboard
 - Multi-touch trackpad
- Interactive entertainment devices
 - Remote control
 - 3D Glasses
 - Gaming controller
- Personal Area Networks
 - Health/fitness sensor and monitor devices
 - Medical devices
 - Key-fobs + wrist watch
- Remote control toys

Specifications

Frequency band	2.4GHz ISM (2.40000–2.4835GHz)
On-air data rate	250 kbps, 1 Mbps or 2 Mbps
Modulation	GFSK
Output power	Programmable: +4 to -20dBm in 4dB steps
Sensitivity	-92.5dBm Bluetooth low energy -96dBm at 250kb -90dBm at 1Mbps -85dBm at 2Mbps
Radio current consumption LDO at 1.8V	16mA - TX at +4dBm output power 10.5mA - TX at 0dBm output power 13mA - RX at 1Mbps
Radio current consumption DC-DC at 3V	10.5mA - TX at +4dBm output power 8.1mA - TX at 0dBm output power 9.5mA - RX at 1Mbps
Microcontroller	32-bit ARM Cortex M0
Program Memory	128/256kB Flash RAM 16/32kB
Oscillators	16MHz crystal oscillator 16MHz RC oscillator 32kHz crystal oscillator 32kHz RC oscillator (± 250 ppm)
System current consumption	420nA - No RAM retention 530nA - 8k RAM retention 2 μ A - All peripherals in IDLE mode
Hardware Security	128-bit AES ECB/CCM/AAR co-processor
GPIO	31 configurable
Digital I/O	X2 Hardware SPI master 2X 2-wire master UART Quadrature demodulator
Peripherals	10-bit ADC RNG Temperature sensor RTC
PPI	16-channel
Voltage regulator	LDO (1.8 to 3.6V) 1.8V Low Power (1.75 to 1.95V)
Timers/counters	2 x 16 bit, 1 x 24bit, 2 x 24bit, RTC

Pin	Module Pin Name	Pin Name	Pin Function	Description
1	ANT3		Antenna	Ground (0 V)
2	1V8	DEC2	Power	Analog Power supply
3	GPIO1	P0.26 AIN0 XL2	Digital I/O Analog input Analog output	General purpose I/O pin ADC input 0 Connection for 32.768 kHz crystal
4	GPIO0	P0.27 AIN1 XL1	Digital I/O Analog input Analog input	General purpose I/O pin ADC input 1 Connection for 32.768 kHz crystal or external 32.768 kHz clock reference
5	SWDCLK	SWDCLK	Digital input	HW debug and flash programming I/O
6	SWDIO	SWDIO/nRESET	Digital I/O	System reset (active low). Also HW debug and flashprogramming I/O
7	GND	GND	Power	Ground (0 V)
8	RXD	P0.06 AIN7 AREF1	Digital I/O Analog input Analog input	General purpose I/O pin ADC input 7 ADC Reference voltage
9	TXD	P0.04 AIN5	Digital I/O Analog input	General purpose I/O pin ADC input 5
10	IO_1	P0.02 AIN3	Digital I/O Analog input	General purpose I/O pin ADC input 3
11	IO_0	P0.00 AREF0	Digital I/O Analog input	General purpose I/O pin ADC Reference voltage
12	VCC	VDD	Power	Power supply

2. PBLN51822m Layout



※unit of standard length = mm

FCC Information

This device complies with part 15 of the FCC Results. Operation is subject to the following two conditions :

- (1) This device may not cause harmful interface, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

- 1.1. Reorient or relocate the receiving antenna.
- 1.2. Increase the separation between the equipment and receiver.
- 1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.
- 1.4. Consult the dealer or experienced radio/TV technician for help.

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Information for OEM Integrator

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

End product labelling

The label for end product must include "Contains FCC ID: 2AEEY-PBLN51822M".

"CAUTION : Exposure to Radio Frequency Radiation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated with minimum distance of 20cm between the radiator and your body. This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users."