

ABLUE TECHNOLOGY

PTR5620DG

**Bluetooth 5.2 ready multi-protocol
USB Dongle**

**Embedded Cortex™ M4 32 bit processor
Support Bluetooth Direct Finding AOA/AOD,
Support Zigbee, Thread, MESH, ANT
Ideal choice of IoT and Smart product**

The PTR5620DG ultra-low power Bluetooth 5 ready multiprotocol USB Dongle based on the nRF52820 from Nordic Semiconductor. The module can support Bluetooth 5.2 by upgrading the protocol stack. The module with an ARM® Cortex™ M4 32 bit processor, 256KB Flash/32KB RAM, Bluetooth 5.1 Direct Finding AOA/AOD support, embedded 2.4GHz transceiver, provide a complete solution with no additional RF design, Bluetooth 5, ANT/ANT+, 802.15.4 and 2.4GHz proprietary multiprotocol support, allowing faster time to market, while simplifying designs, reducing BOM costs, also reduce the burden of Regulatory approvals to enter the world market. Making you more quickly into the Bluetooth smart application and remove the worries.



Features

- ◆ Nordic nRF52820 with ARM Cortex M4
- ◆ Multiprotocol support : Bluetooth 5.1, ANT/ANT+, and 2.4GHz proprietary, 802.15.4 Thread and Zigbee, .
- ◆ Bluetooth 5.1 Direction Finding AOA/AOD
- ◆ Bluetooth 5: 2 /1Mbps, 500 kbps, 125 kbps
- ◆ IEEE 802.15.4-2006: 250 kbps
- ◆ Proprietary 2.4 GHz: 2 Mbps, 1 Mbps
- ◆ Integrated DC-DC converter
- ◆ Serial Wire Debug (SWD)
- ◆ Nordic SoftDevice Ready
- ◆ Over-the-Air (OTA) firmware update
- ◆ Flash/RAM: 256KB/32KB.
- ◆ low-power comparator with wake-up from System OFF mode
- ◆ 12 bit/200KSPS ADC
- ◆ Two 2-wire Master/Slave (I2C compatible)
- ◆ 2 SPI Master/ 1 SPI Slave)
- ◆ 1 UART (with CTS/RTS and DMA)
- ◆ USB 2.0 full speed (12 Mbps) controller
- ◆ 20 channel CPU independent Programmable Peripheral Interconnect (PPI).
- ◆ Quadrature Demodulator (QDEC)
- ◆ 128-bit AES HW encryption
- ◆ 4 x 32 bits timers, 2 xReal Time Counters (RTC)
- ◆ TX power: +8dBm to-20dBm in 4 dB steps.
- ◆ PCB antenna
- ◆ Sizes about: 18.5x14.7 x6.2mm
- ◆ DC/DC on board
- ◆ No external components required
- ◆ Operation voltage: 4.5V to 5.5V

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Typical Applications:

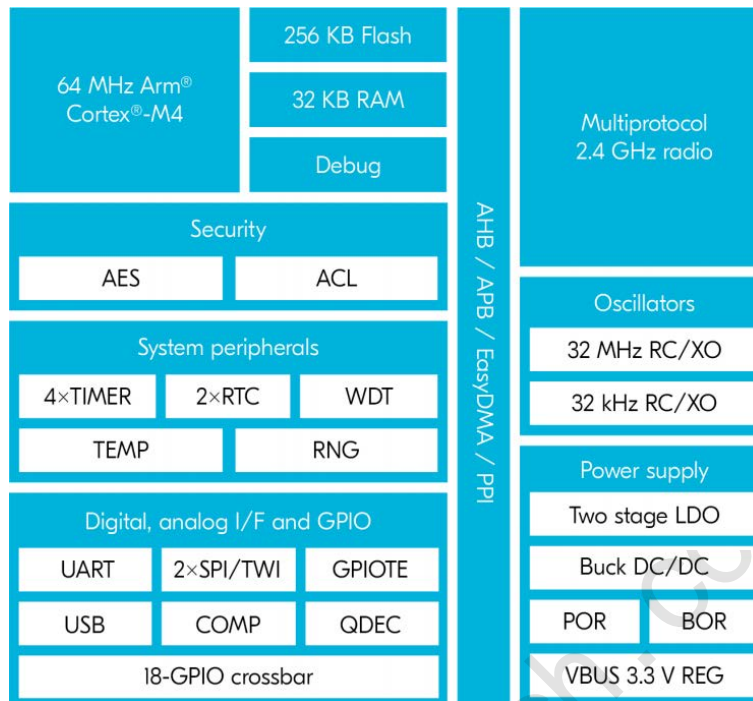
- - 2.4 GHz Bluetooth low energy systems
- - Proprietary 2.4 GHz systems
- - Sports and leisure equipment
- - Mobile phone accessories, Connected Appliances
- - Health Care and Medical
- - Consumer Electronics, Game pads
- - Human Interface Devices, Remote control
- - Building environment control / monitoring
- - RFID, Security Applications, Low-Power Sensors
- - Bluetooth Low Energy GateWay
- - iBeacons™, Eddystone™, Indoor navigation
- - Lighting Products
- - Fitness devices, Wearables
- - MCU to PC link, PC to PC Link
- - Wireless USB communication
- - Wireless Mouse, Wireless Keyboard, Wireless Joystick, Wireless Voice
- - Remote data acquisition
- - Wireless Medical parameters data acquisition
- - Authorisation / Access control
- - Automatic Meter Reading (AMR)
- - Building environment control / monitoring

Quick Specifications:

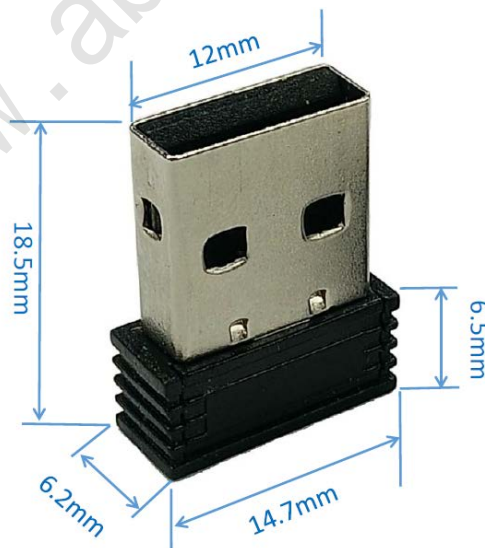
Multi-protocol	
Version	Bluetooth 5.2 and Higher/ANT/2.4GHz Proprietary/802.15.4/Zigbee
Security	AES-128
Radio	
Frequency	2.360GHz to 2.500GHz
Modulations	GFSK at 2/1 Mbps, Long range 125/500kbps, 802.15.4- 250 kbps
Transmit power	+8dBm to -20dBm
Receiver sensitivity	-103dBm@BLE 125kbps(long range), -95dBm@BLE 1M
Antenna	Integrated PCB Antenna / Ext. IPX Antenna
Current Consumption	
TX only @ +8 dBm, @ 3V, DC/DC enabled	14.0 mA
TX only @ 0 dBm, @ 3V, DC/DC enabled	4.9 mA
RX only @ 1 Mbps @ 3V, DC/DC enabled	4.7 mA
CPU @ 64MHz from flash @ 3V, DC/DC	3.3 mA
System On	1.5 μ A
System Off	0.6 μ A
Operating conditions	
Power supply	1.7~5.5V
Operating temperature	-25~+85 °C

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Block diagram:



Dimensions:



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Radio Specifications:

Parameter	Min.	Typ.	Max.	Unit
Frequency Range	2402		2480	MHz
Maximum Output Power		+8		dBm
Rx Sensitivity Level, BLE1 Mbps		-95		dBm
Rx Sensitivity Level, BLE Long Range 125 kbps		-103		dBm
Data Rate on air	125		2000	kbps
Operating Temperature Range	-40	25	85	°C

Radio current consumption (transmitter):

Parameter	Min.	Typ.	Max.	Unit
TX only current (DC/DC, 3 V) PRF = +8 dBm		14.0		mA
TX only current (DC/DC, 3 V) PRF = +4 dBm		9.4		mA
TX only current (DC/DC, 3 V) PRF = +0 dBm		4.9		mA
TX only current (DC/DC, 3 V) PRF = -4 dBm		3.8		mA
TX only current (DC/DC, 3 V) PRF = -8 dBm		3.4		mA
TX only current (DC/DC, 3 V) PRF = -20 dBm		2.7		mA

Radio current consumption (Receiver):

Parameter	Min.	Typ.	Max.	Unit
RX only current (DC/DC, 3 V) 1 Mbps BLE		4.7		mA
RX only current (DC/DC, 3 V) 2 Mbps BLE		5.2		mA

Operating Conditions:

Parameter	Min.	Typ.	Max.	Unit
Supply voltages				
VDD	1.7	3.0	+3.6	V
VDDH	2.5	3.7	+5.5	V
VBUS	4.35	5	+5.5	V
Operating Temperature Range	-40	25	85	°C

Absolute Maximum Ratings:

Parameter	Min.	Max.	Unit
Supply voltages			
VDD	-0.3	+3.9	V
VDDH	-0.3	+5.8	V
VBUS	-0.3	+5.8	V
VSS	0	0	V
I/O pin voltage			

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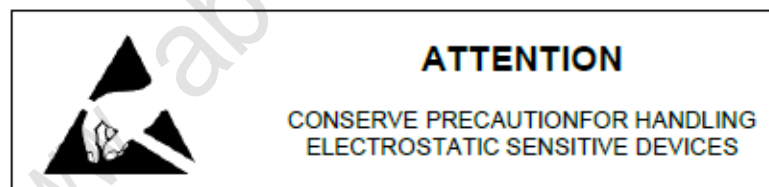
Voltage on GPIO pins ($V_{DD} \leq 3.6V$)	-0.3	VDD + 0.3	
Voltage on GPIO pins ($V_{DD} > 3.6V$)	-0.3	+3.9	
NFC antenna pin current		80	mA
RF input level		10	dBm
Environmental			
ESD Human Body Model		3	kV
ESD Human Body Model Class		2	
ESD Charged Device Model		1	kV
Storage temperature	-40	125	°C
Flash memory Endurance		10000	Write/erase cycles

Note: Exceeding one or more of the limiting values may cause permanent damage to the module.

Notes and Cautions:

Handling and Storage

- (1) Keep module away from other high frequency devices which may interfere with operation such as other transmitters and devices generating high frequencies.
- (2) Do not expose the module to the following conditions: Corrosive gasses such as Cl₂, H₂S, NH₃, SO₂, or NO_x Extreme humidity or salty air Prolonged exposure to direct Sunlight Temperatures beyond those specified for storage.
- (3) Do not apply mechanical stress.
- (4) Do not drop or shock the module.
- (5) Avoid static electricity, ESD and high voltage as these may damage the module.



Moisture Sensitivity

All plastic packages absorb moisture. During typical solder reflow operations when SMDs are mounted onto a PCB, the entire PCB and device population are exposed to a rapid change in ambient temperature. Any absorbed moisture is quickly turned into superheated steam. This sudden change in vapor pressure can cause the package to swell. If the pressure exerted exceeds the flexural strength of the plastic mold compound, then it is possible to crack the package. Even if the package does not crack, interfacial delamination can occur.

Since the device package is sensitive to moisture absorption, it is recommended to bake the product before assembly.



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Life Support Applications

Products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Customers using or selling these products for use in such applications do so at their own risk.

Additional Customization

We provide extensive customization, design and manufacturing services to ensure the perfect fit for your product. Our wide selection of modules allows developers to create any number of products. Should you need more information and assistance in integrating this module or developing your product, please contact us.

- Custom Hardware design including Modules, RF and Antenna Design
- Bluetooth Low Energy and Firmware Development
- Mobile Apps for iOS and Android
- Cloud Platform

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Ordering Information:

Part Number	Description
PTR5620DG	Bluetooth 5.2 USB Dongle, On board PCB antenna