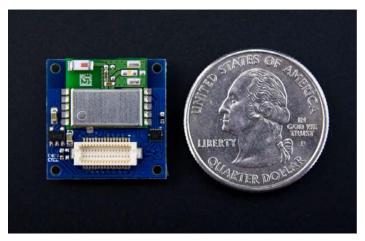# BLUETOOTH LOW ENERGY TINYSHIELD (ST)

ASD2116-R

DESCRIPTION

Our new **Bluetooth Low Energy** (**BLE**) **TinyShield** combines both master and slave modes into one module! This TinyShield allows you to connect your TinyDuino system to any compatible iOS or Android device using Bluetooth Low Energy (also known as Bluetooth Smart and Bluetooth 4.1). This technology is great for low power sensors and accessories and works with most modern phones. This shield acts as a drop-in hardware and software replacement for NRF8001 (Nordic) TinyShield projects. Unlike previous BLE TinyShields, your Arduino sketch code can modify your module's connection parameters directly.

This TinyShield is based around the **BlueNRG-MS** chipset by **STMicroelectronics,** which comes in the **SPBTLE-RF** module. The TinyShield also includes power supply and level shifters on the board, so you can run your TinyDuino from 3.0V – 5V.

Since the **SPBTLE-RF** module supports both master and slave modes, you can communicate both with a Bluetooth LE device (i.e. a smartphone) and another **BLE TinyShield** or other BLE module with slave mode. If you have one of our previous BLE models, a **BlueGiga** or a **Nordic**, it can communicate with those as well.

Note: This product is for advanced users, and typically requires that the user develops their own iOS or Android BLE app in order to use this.

*To learn more about the **TinyDuino Platform,** click **here***
https://tinycircuits.com/pages/tinyduino-overview

TECHNICAL DETAILS

*To see what other TinyShields this will work with or conflict with, check out the **TinyShield Compatibility Matrix***

Nordic BLE nRF8001 Specs

- o Fully Bluetooth v4.1 compliant
    - o Supports master and slave modes
    - o Multiple modes supported simultaneously
- o Integrated Bluetooth Smart stack
    - o GAP, ATT/GATT, SM, L2CAP, LL, RFPHY
    - o Bluetooth Smart profiles
- o Radio performance
    - o Integrated chip antenna
    - o TX power: +4 dBm
    - o Receiver sensitivity: -88 dBm
    - o Range: up to 20m

TinyDuino Power Requirements

- o Voltage: 3.0V - 5.5V
- o Current:

    - o Transmit: 10.9mA (+4 dBm)
    - o Receive: 7.3mA (Standard mode)
    - o Down to 8.7µA average for 1s connection interval
    - o Down to 14.5µA average for 500ms connection interval
    - o Down to 26.1µA average for 250ms connection interval
    - o Down to 119.9µA average for 50ms connection interval
    - o Deep Sleep Mode: 1.7 µA
    - o Due to the low current, this board can be run using the TinyDuino coin cell option

Pins Used

SPI Interface used

- o **2 - SPI_IRQ:** This signal is the interrupt output from the SPBTLE-RF to the TinyDuino.
- o **9 - BT_RESET:** This signal is the reset signal to the SPBTLE-RF.
- o **10 - SPI_CS:** This signal is the SPI chip select for the SPBTLE-RF.
- o **11 - MOSI:** This signal is the serial SPI data out of the TinyDuino and into the radio transceiver.
- o **12 - MISO:** This signal is the serial SPI data out of the radio transceiver and into the TinyDuino.
- o **13 - SPI_CLK:** This signal is the serial SPI clock out of the TinyDuino and into the radio transceiver.

Dimensions

- o 20mm x 20mm (.787 inches x .787 inches)
- o Max Height (from lower bottom TinyShield Connector to upper top TinyShield Connector): 5.11mm (0.201 inches)
- o Weight: 1.49 grams (0.053 ounces)

NOTES

o The interrupt signal can be changed from pin 2 to pin 3 by removing resistor R2 and soldering it to position R3.