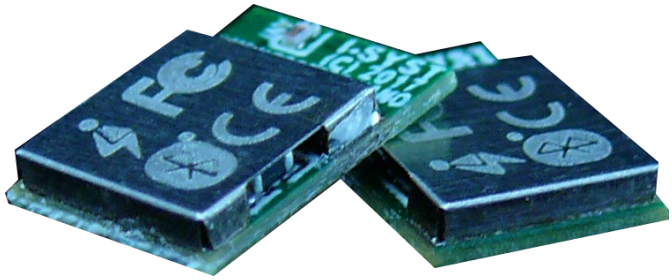
HARDWARE REFERENCE

BLYST Nano
IMM-NRF52832-NANO
Module

Bluetooth 5 Low Energy



Part No : IBLE832N

CE

FCCID : 2ATLY-52832NANO

i-SYST INC

Limited Warranty

The IMM-NRF52832-NANO module is warranted against defects in materials and workmanship for a period of 30 days from the date of purchase from I-SYST or from an authorized dealer.

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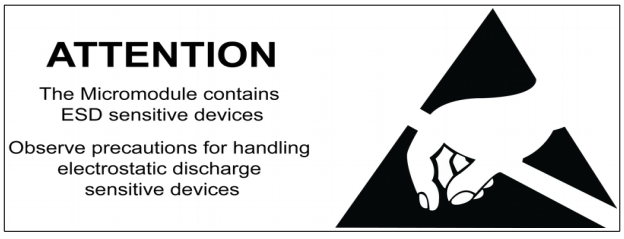
Bluetooth® is a registered trade mark of Bluetooth SIG



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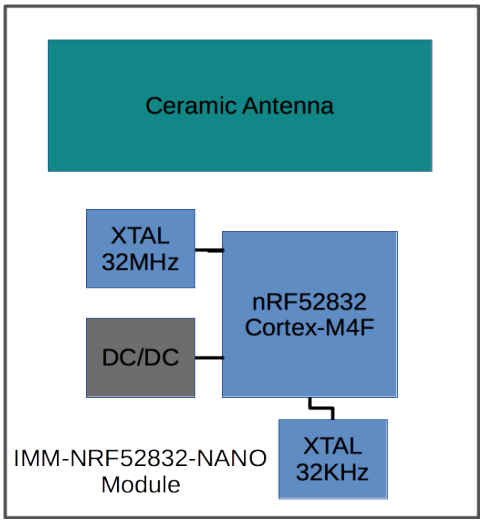
Introduction

The nRF52832 is an ultra low power System on Chip (SoC) from Nordic Semiconductor. It integrates the nRF52 series 2.4GHz transceiver, a 32 bits ARM® Cortex™-M4F MCU, Flash memory, analog and digital I/O. The nRF52832 supports Bluetooth 5 Low Energy.

The IMM-NRF52832-NANO is a 10 x 7 x 1.6 mm module with embedded ceramic antenna. It allows developers to take full advantage of the nRF52832 by making all its I/O available via 34 SMD 0.5mm pitch pads.

Features:

- 32 bits ARM® Cortex™-M4F @ 64MHz.
- 2.4GHz transceiver, Bluetooth 5 LE
- 64KB SRAM.
- 512KB Flash
- 32 MHz Crystal 25PPM
- 32.768 KHz Crystal 20PPM
- DC/DC power mode configuration
- 30 configurable I/O pins
- Type 2 NFC-A Tag with wakeup on field
- 8 configurable 12 bits, 200 ksps ADC
- Digital microphone interface
- 3 x 4 channels PWM
- AES hardware encryption
- RNG, RTC
- Temperature sensor
- Up to 4 PWM
- Digital interfaces SPI Master/Slave, 2-wire Master (I2C compatible), UART (CTS/RTS)
- Quadrature decoder
- Low power comparator
- Operating voltage : 1.8V to 3.6V
- Dimension : 10 x 7 x 1.6 mm
- FCC & CE certified



Module Layout

Dimensions and I/O pins layout

Bellow is the direct relationship of the module pads and the nRF52832 I/O pins.

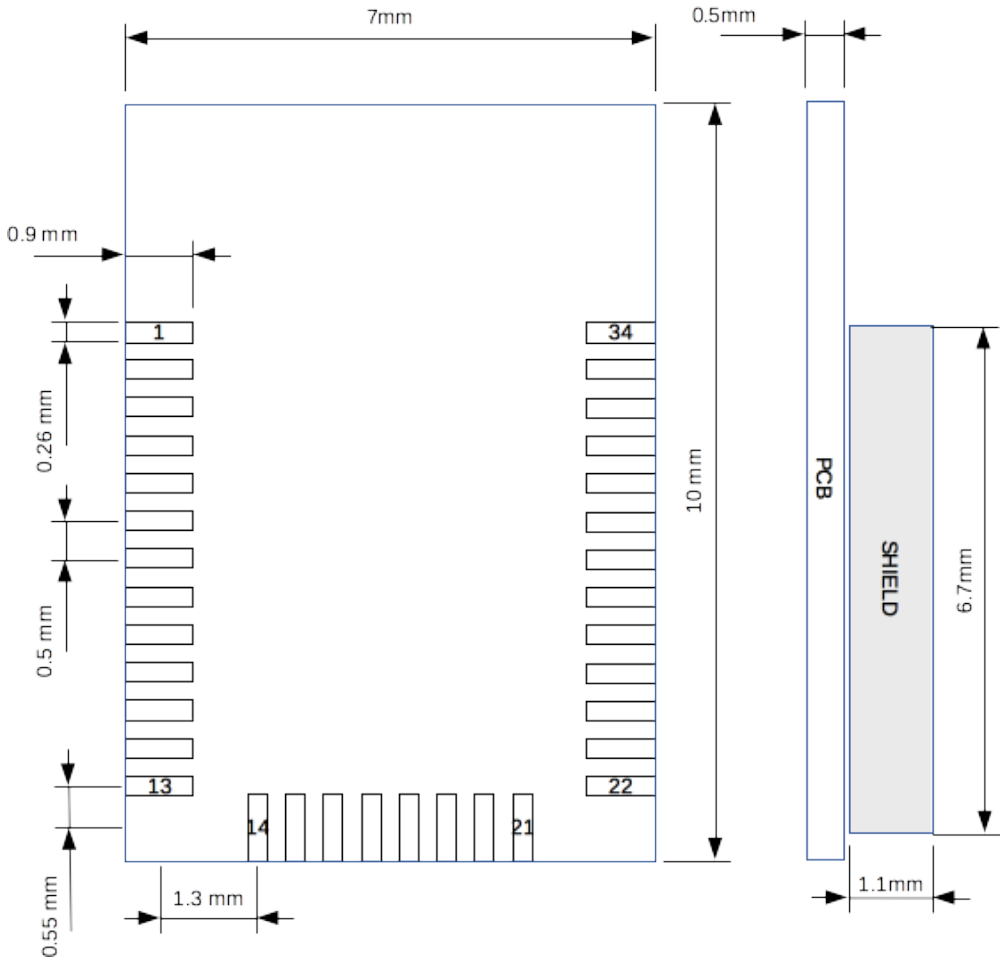


Fig. 1: Dimensions top view

Pin Number	Pin Name	Description
1	P0.22	GPIO 22
2	P0.21/nRESET	GPIO 21 or RESET active low
3	P0.20	GPIO 20
4	P0.19	GPIO 19
5	P0.18	GPIO 18
6	P0.17	GPIO 17
7	P0.16	GPIO 16
8	P0.15	GPIO 15
9	P0.14	GPIO 14
10	P0.13	GPIO 13
11	P0.12	GPIO 12
12	P0.11	GPIO 11
13	P0.10/NFC2	GPIO 10 or NFC2 tag
14	P0.09/NFC1	GPIO 9 or NFC1 tag
15	P0.08	GPIO 8
16	P0.07	GPIO 7
17	P0.06	GPIO 6
18	SWDIO	JTAG Data
19	SWDCLK	JTAG Clock
20	VDD	Power 1.8V-3.6V
21	GND	Ground
22	P0.05/AIN3	GPIO 5 or Analog Input 3
23	P0.04/AIN2	GPIO 4 or Analog Input 2
24	P0.03/AIN1	GPIO 3 or Analog Input 1
25	P0.02/AIN0	GPIO 2 or Analog Input 0
26	P0.31/AIN7	GPIO 31 or Analog Input 7
27	P0.30/AIN6	GPIO 30 or Analog Input 6
28	P0.29/AIN5	GPIO 29 or Analog Input 5
29	P0.28/AIN4	GPIO 28 or Analog Input 4
30	P0.27	GPIO 27
31	P0.26	GPIO 26
32	P0.25	GPIO 25
33	P0.24	GPIO 24
34	P0.23	GPIO 23

SMD Footprint

Note : Do not route any traces or planes under the indicated antenna area.

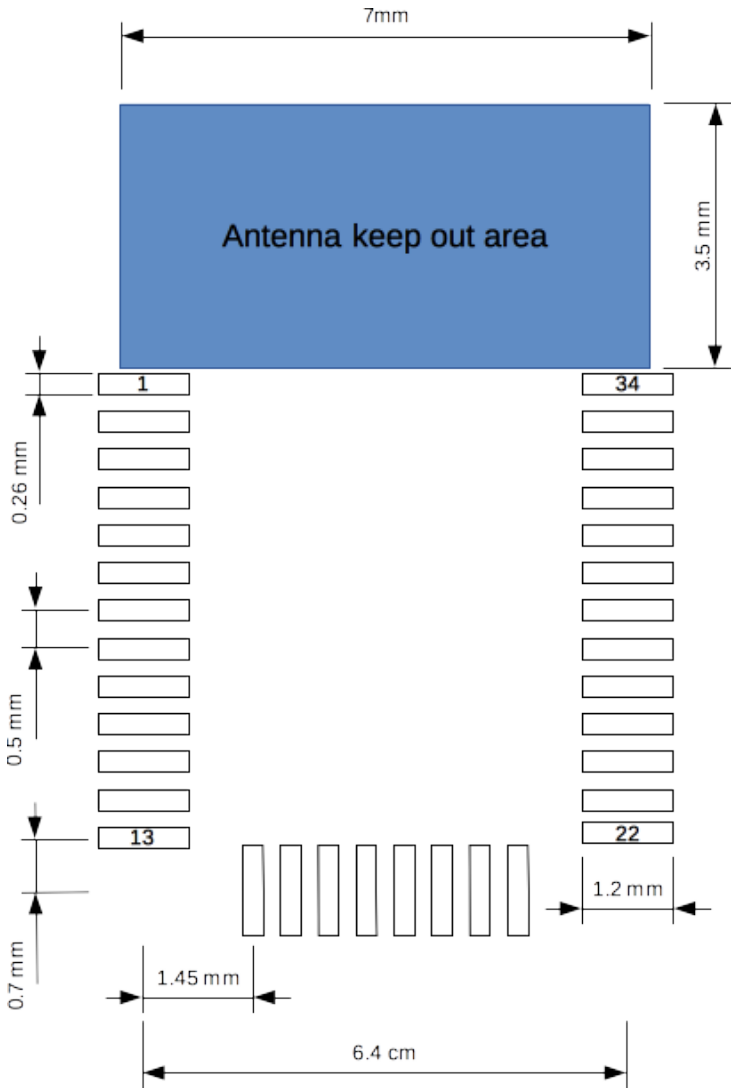


Fig. 2: SMD footprint top view

Quick Start

Requirements

The follows are required for software development

- Debug J-Tag : IDAP-Link, Segger J-Link, or any ARM compatible J-Tag.
- Nordic SDK & Softdevice BLE stack (https://developer.nordicsemi.com/)
- C/C++ embedded software development environment : Eclipse, Keil, CrossWorks, ...

Flashing firmware

The Nordic Softdevice is required to use BLE application. There are many methods to flash it in the module. The official method from Nordic is to use nRFGo with J-Link. This program is available only on Windows operating system. The other method is to use IDAP-Link with IDAPnRFProg for OSX & Windows. More details available on blog page http://embeddedsoftdev.blogspot.ca/p/ehal-nrf51.html. The IDAPnRFProg can program Softdevice, DFU and Firmware app without requiring mergehex. It can parallel program multiple nRF51 boards at once when multiple IDAP-Link are connected to PC..

Breakout board

The module can also be mounted on the optional breakout board, the IBK-BLUEIO-NANO. This breakout board has all I/O pins routed out to standard DIP32, 2.54mm pitch header pin, with onboard LED indicator and coin battery holder. Ready to be mounted on a breadboard. The SWD pins are also routed out for debug probe. Connect it to the IDAP-Link for OpenOCD debugging or turn the IMM-NRF52832-NANO into mBed compatible.

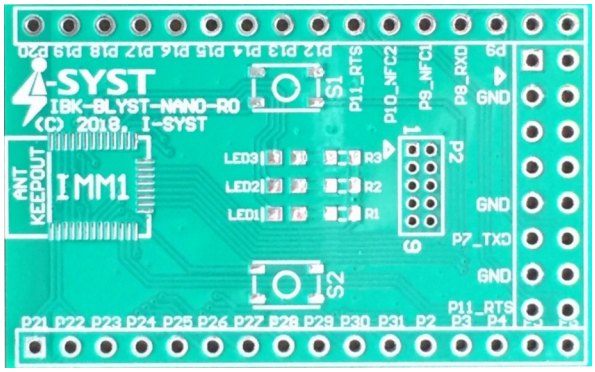


Fig. 3: IBK-BLYST-NANO.

Breakout PCB for the IMM-BLYST-NANO module

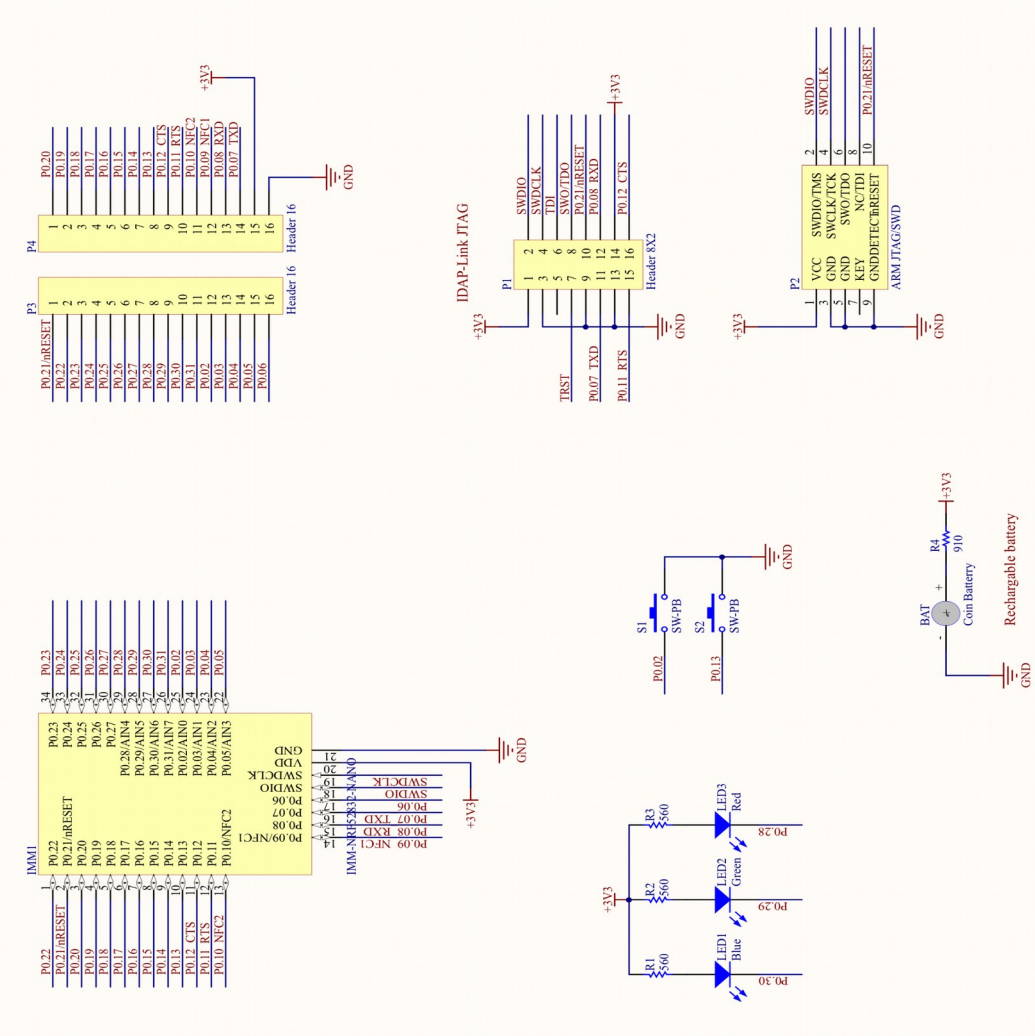


Fig. 4: IBK-BLYST-NANO Schematic

J-Tag wiring

The IMM-NRF52832-NANO module has exposed the SWD (Serial Wire Debug) pins SWDIO & SWCLK, see I/O layout section. The module can be directly connected to a J-Tag tool for development by wiring the 2 SWD and the optional Reset pins to the appropriate pins on the J-Tag connector. The VIN must be wire to the VCC pin on the J-Tag. GND pad is also require to be connected to GND on J-Tag.

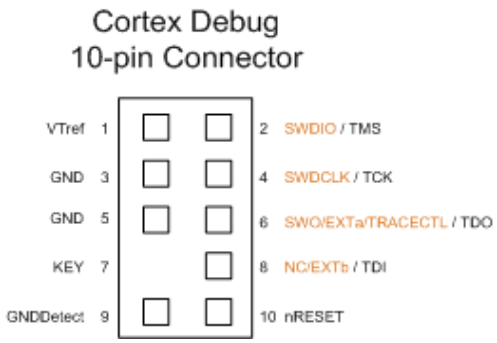


Fig. 5: ARM JTAGE Connector

The module can be powered from 1.8V to 3.6V on VIN. It could be coin battery or DC supply source.

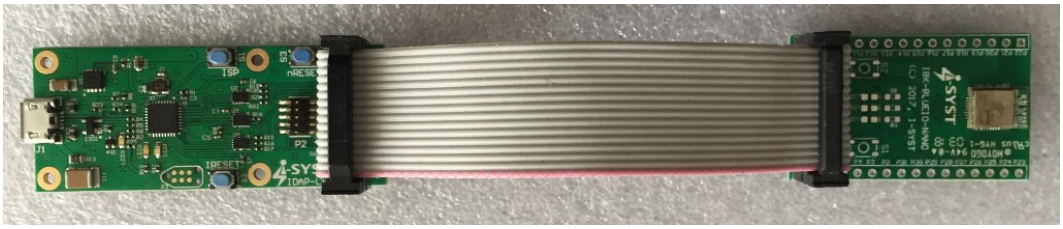


Fig. 6: IDAP-Link JTag with IBK-BLUEIO-NANO for development with the IMM-NRF52832-NANO module

Nordic Software

The Nordic SDK and software tools can be download from http://developer.nordicsemi.com and http://www.nordicsemi.com. Community support forum at https://devzone.nordicsemi.com.

Eclipse IDE

Eclipse with GCC is the most cost effective software development environment. It is 100% free. The drawback is that it requires a bit of gymnastics to setup. Fortunately many Blog posts are available on the Internet showing step by step. Follow this blog to setup the Eclipse IDE & GCC compiler: http://embeddedsoftdev.blogspot.ca/p/eclipse.html.

There are samples code in the Nordic SDK itself. Other Eclipse based example code are available from this Blog page http://embeddedsoftdev.blogspot.ca/p/ehal-nrf51.html

CE Certificate of conformity

Certificate of Conformity

Certificate No.: ZKS18005559

Holder of Certificate	:	I-SYST Inc. 212-6415 Corbiere, Brossard, QC., Canada J4Z 0H7
Manufacturer	:	I-SYST Inc. 212-6415 Corbiere, Brossard, QC., Canada J4Z 0H7
Description of Product	:	BLE Module
Model No.	:	IMM-NRF52832-NANO
Trade Name	:	I-SYST
Description of Object	:	DC 1.6-3.6V
Test Standards	:	EN 300328 V2.1.1 (2016-11) Draft EN 301489-1 V2.2.0 (2017-03) Draft EN 301489-17 V3.2.0 (2017-03) EN 62479:2010 EN 60950-1:2006+A11:2009+A12:2011+A1:2010+A2:2013
Applicable Directives	:	2014/53/EU
Report No.	:	ZKS180300257E-1, ZKS180300257E-2, ZKS180300257E-3, ZKS180300257S

Based upon the referenced test report(s), sample of the above product have been found to comply with the harmonized standards and directives listed on this certificate. Other standards and directives may be relevant to the product. The manufacturer may indicate compliance by signing a declaration of conformity themselves and applying the mark to product identical to the test sample(s) if the product complies with all relevant CE mark directives requirements.

CE

Certification Body

Frank Feng / General Manager

SHENZHEN ZRLK TESTING TECHNOLOGY CO.,LTD Approved

Date: June 15, 2018

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