# Module Integration Instructions

SPNYPAMOD-52832 is powerful, highly flexible, ultra-low power Bluetooth Low Energy 4.2 (BLE 4.2) modules using Nordic nRF52832 SoCs. It was designed for high data rate, short-range wireless communication in the 2.4GHz ISM band. With an ARM CortexTM M4F MCU, available 512KB flash, 64KB RAM, embedded 2.4GHz multi-protocol transceiver, power amplifier, and an integrated 2.4GHz Mini antenna or an UFL connector for external antenna.

The SPNYPAMOD-52832 is a 16.5 mm × 23 mm module with antenna. It allows developers to take full advantage of the nRF52832 by making all its I/O available via 36 SMD 1.1mm pitch pads.
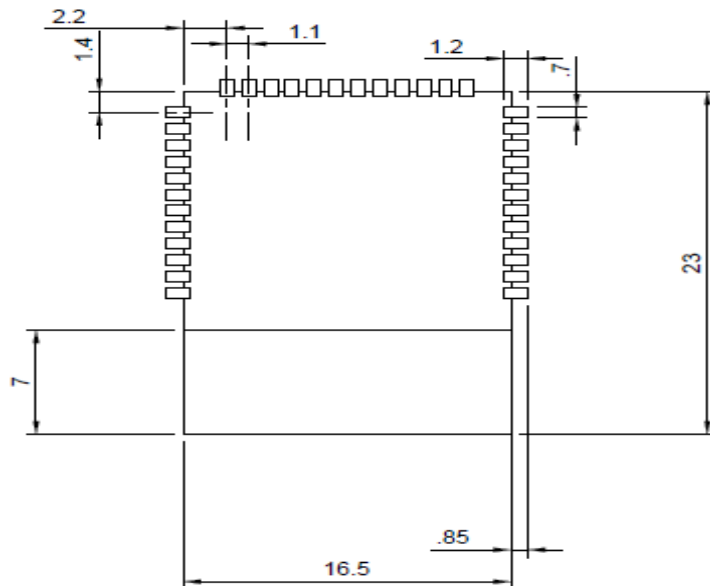
Four GPIOs are used to control power amplifier. Other GPIOs of nRF52832 can be accessed from main board.

Mechanical Specification:

36 SMD Package

TOP VIEW

SIDE VIEW
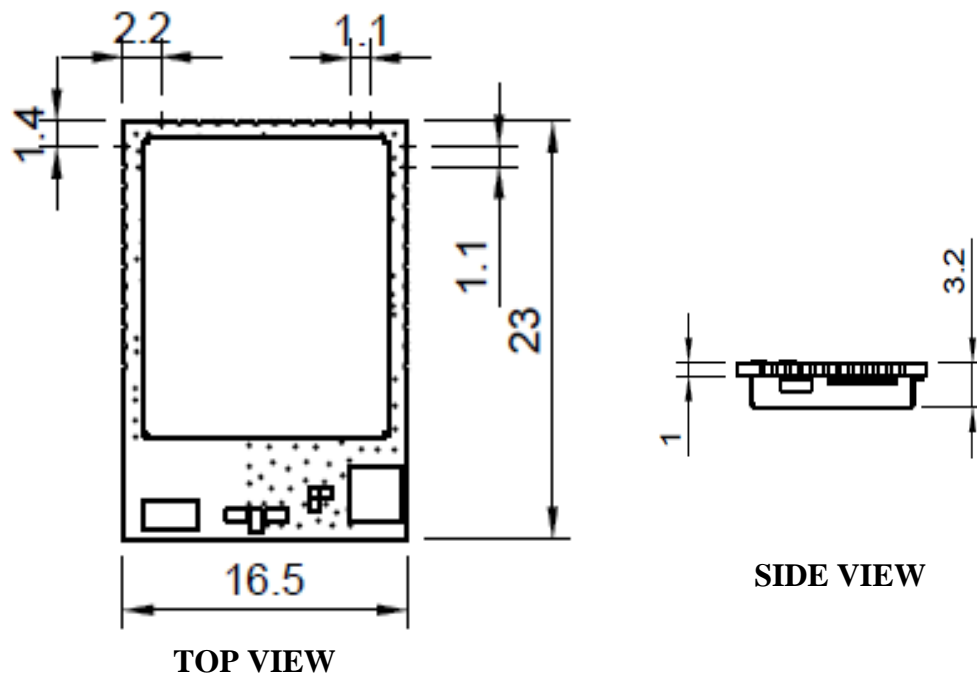
PCB Footprint and Dimensions:

List of applicable FCC rules:

- CFR 47 FCC Part 15, Subpart C, 15.203
- CFR 47 FCC Part 15, Subpart C, 15.205
- CFR 47 FCC Part 15, Subpart C, 15.207
- CFR 47 FCC Part 15, Subpart C, 15.209
- CFR 47 FCC Part 15, Subpart C, 15.247
- CFR 47 FCC Part 2, 2.1051
- CFR 47 FCC Part 2, 2.1053
- CFR 47 FCC Part 2, 2.1091

Operational use conditions:

Regulated power for the SPNYPAMOD-52832 is required. The input voltage Vcc range should be 1.7V to 3.6V. Suitable decoupling must be provided by external decoupling circuitry (1uF and 0.1uF). It can reduce the noise from power supply and increase power stability.

The following are required for software development

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

Flashing Firmware:

The Nordic Softdevice is required to use BLE application. There are many methods to flash the module. The official method from Nordic is to use nRFGo with J-Link. It is available on windows operating system.

Nordic Software:

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

Segger Embedded Studio IDE:

Embedded Studio is a complete all-in-one solution for managing, building, testing and deploying embedded applications. It supports everything from a powerful project manager and source code editor, included C/C++ compilers based on GCC, as well as CLANG/LLVM and an integrated debugger with advanced debug information windows and direct J-Link integration, right through to version control features for automatic deployment of finished applications. More information on Embedded Studio is available at: https://www.segger.com/products/development-tools/embedded-studio/

Trace Antenna Designs:
Not Applicable

RF exposure considerations:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must be at least 20 cm from the user and must not be co-located or operating in conjunction with any other antenna or transmitter.

 The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide.
Note: Any modifications made to the module will void the Grant of Certification.

FCC ID Location:
OEM Warning statement (Module)
The modular transmitter must be equipped with either a permanently affixed label or must be capable of electronically displaying its FCC identification number：

If using a permanently affixed label, the modular transmitter must be labeled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2ATL5SPNYPAMOD."
Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Additional testing:

The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module. Appropriate measurements (e.g. 15 B compliance, 15C intentional emissions (Fundamental + Out-of-Band Emission)) and if applicable additional equipment authorizations (e.g. Verification , DoC) of the host device to be addressed by the integrator/manufacturer.