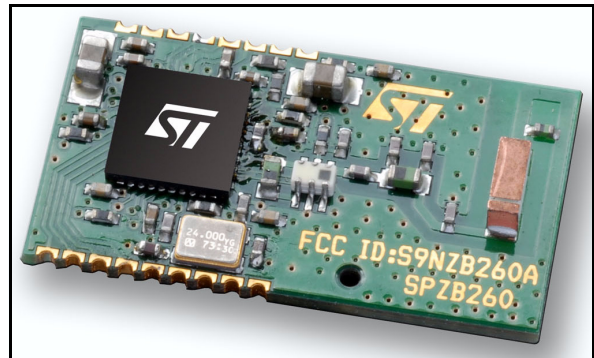


Features

- Integrated 2.4GHz ,IEEE 802,15,4-compliant transceiver:
 - 0 dBm nominal TX output power
 - -92 dBm RX sensitivity
 - + 2 dBm in boost mode
 - RX filtering for co-existence with IEEE 802.11g and Bluetooth devices
 - Integrated VCO and loop filter
- Integrated IEEE 802.15.4 PHY and MAC
- Controlled by a Standard Serial Line for an easy interface of host microcontrollers (SPI)
- Embedded flash and integrated RAM for program and data storage
- On board 24 MHz stable Xtal
- Integrated RC oscillator (typ 10KHz) for low power operation
- 1 μ A power consumption in Deep sleep mode
- Watchdog timer and power on reset
- Pins available for Non-intrusive debug interface (SIF)
- Single supply voltage 2.1 to 3.6 Vdc.
- Available Link and Activity outputs for external
- Indication / monitor
- CE compliant
- FCC compliant (FCC ID:S9NZB260A)

Applications

- Industrial controls
- Sensor networking
- Monitoring of remote systems
- Home applications
- Security systems
- Lighting controls



Description

SPZB260 is a low power consumption ZigBee module optimized for embedded applications. It enables OEMs to easily add wireless capability to electronic devices.

The module is based on SN260 ZigBee Network Processor which integrates a 2.4GHz, IEEE 802.15.4-compliant transceiver as well as IEEE 802.15.4 PHY and MAC.

24 MHz high stability Xtal is available aboard the module to perform the timing requirements as per ZigBee specifications.

A single supply voltage is requested to power the module. An integrated 2.5 GHz specific Murata antenna is aboard. The voltage supply also determines the I/O ports level allowing an easy interface with the host system.

The module is controlled by means of a standard serial interface (SPI) allowing the connections to a variety of Host microcontrollers.

(for other information and details, please refer to SN260 Datasheet available at www.st.com)

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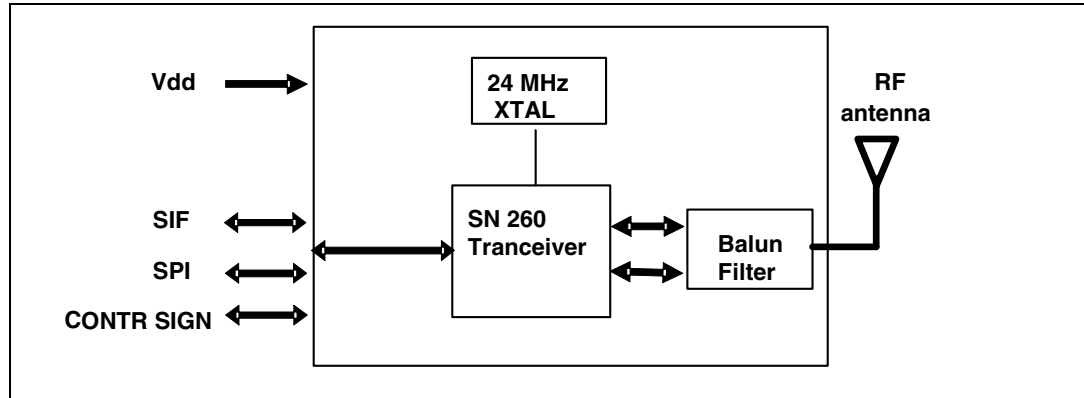
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1 Block diagram

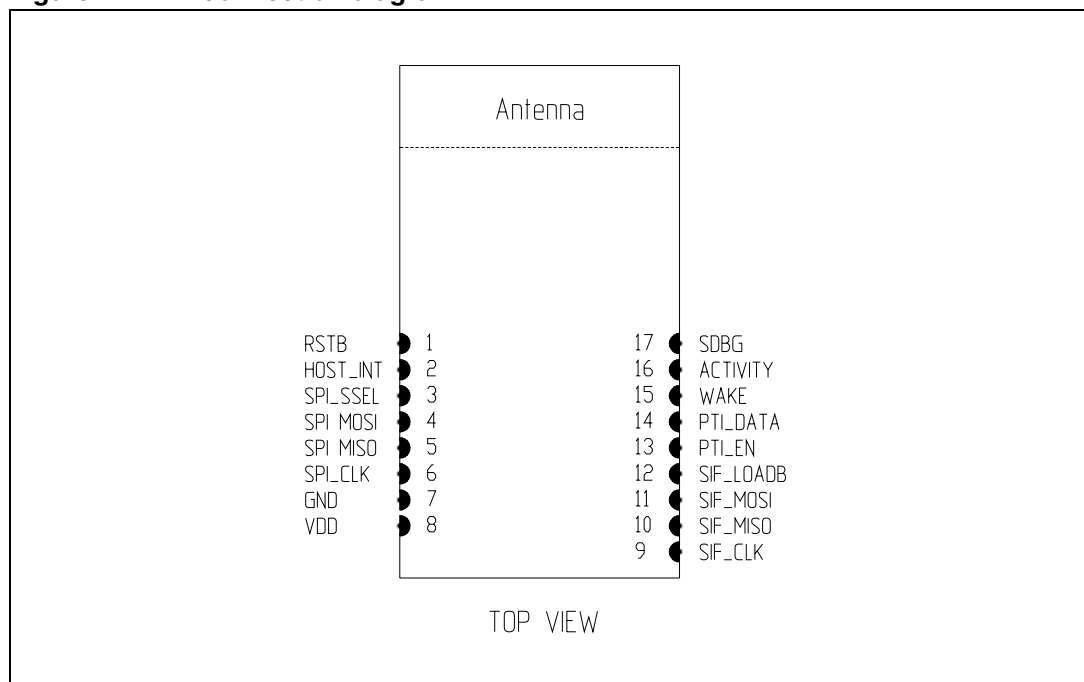
Figure 1. Block diagram



2 Pin settings

2.1 Pin connections

Figure 2. Pin connection diagram



2.2 Pin description

Table 1. Pin description

| Pin n | Pin name | Direction | Description |
|-------|-----------|-----------|---|
| 1 | RSTB | I | Active low reset (an internal pull-up of 30 kohm typ is provided) |
| 2 | HOST_INT | O | Host Interrupt Signal (from ZB Module to Host) |
| 3 | SPI_SSEL | I | SPI Slave Select (from Host to ZB Module) |
| 4 | SPI MOSI | I | SPI Data , Master Out / Slave In (from host to ZB Module) |
| 5 | SPI MISO | O | SPI Data , Master In / Slave Out (from ZB Module to host) |
| 6 | SPI_CLK | I | SPI clock |
| 7 | GND | --- | Ground |
| 8 | VDD | --- | Input power supply |
| 9 | SIF_CLK | I | Non-intrusive debug Interface Serial interface Clock Signal (internal pulldown) |
| 10 | SIF_MISO | O | Non-intrusive debug Interface Serial interface Master IN/ Slave Out |
| 11 | SIF_MOSI | I | Non-intrusive debug Interface Serial interface Master Out/ Slave In To guarantee a proper signal level when in deep sleep mode connect a 10kΩ resistor to GND |
| 12 | SIF_LOADB | I/O | Non-intrusive debug Interface Serial interface Load strobe (Open collector with internal pull-up) To improve noise immunity connect a 10kΩ resistor to V _{DD} |
| 13 | PTI_EN | O | Frame Signal of Packet Trace Interface (PTI) |
| 14 | PTI_DATA | O | Data Signal of Packet Trace Interface (PTI) |
| 15 | WAKE | I | Wake Interrupt Signal from Host to ZB Module |
| 16 | ACTIVITY | O | Activity signal for application debug /monitor |
| 17 | SDBG | O | |

3 Maximum ratings

3.1 Absolute maximum ratings

Table 2. Absolute maximum ratings

| Symbol | Parameter | Values | | Unit |
|------------|----------------------------------|--------|----------------------|------|
| | | Min | Max | |
| V_{DD} | Module supply voltage | -0.3 | 3.6 | V |
| V_{IN} | Input voltage on any digital pin | -0.3 | V _{DD} +0.3 | V |
| T_{stg} | Storage temperature | -40 | +85 | °C |
| T_{sold} | Soldering temperature < 10s | | 240 | |

3.2 Operating ranges

Table 3. Operating ranges

| Symbol | Parameter | Conditions | Values | | | Unit |
|-----------|-------------------------------|--------------------|--------|-----|-----|------|
| | | | Min | Typ | Max | |
| V_{DD} | Module supply voltage | - 20°C < T < 70 °C | 2.1 | 3.3 | 3.6 | V |
| T_{stg} | Operating ambient temperature | | -20 | | +70 | °C |

4 Electrical characteristics

4.1 DC electrical characteristics

Table 4. DC electrical characteristics

| Symbol | Parameter | Conditions | Values | | | Unit |
|--------|---------------------------|-------------------------------|--------|-----|-----|------|
| | | | Min | Typ | Max | |
| IRX | RX current (boost mode) | Vdd = 3.0 V, T = 25 °C | | 38 | | mA |
| IRX | RX current (normal mode) | Vdd = 3.0 V, T = 25 °C | | 36 | | mA |
| ITX | TX current (boost mode) | Vdd = 3.0 V, T = 25 °C | | 42 | | mA |
| ITX | TX current (normal mode) | Vdd = 3.0 V, T = 25 °C | | 36 | | mA |
| IDS | Deep sleep current | 2.1 < Vdd < 3.6 V T = 25°C | | | 1 | µA |

4.2 DC I/O specification

Table 5. DC Input / Output specification

| Symbol | Parameter | Conditions | Values | | | Unit |
|--------|--------------------------------------|-------------------|------------|-----|------------|------|
| | | | Min | Typ | Max | |
| VIL | Low Level Input Voltage | 2.1 < Vdd < 3.6 V | 0 | | 0.2 x Vdd | V |
| VIH | High level input voltage | 2.1 < Vdd < 3.6 V | 0.8 x Vdd | | Vdd | V |
| lil | Input current for logic 0 | 2.1 < Vdd < 3.6 V | | | -0.5 | mA |
| lih | Input current for logic 1 | 2.1 < Vdd < 3.6 V | | | 0.5 | mA |
| Ripu | Input pull-up resistor | | | 30 | | kΩ |
| Ripd | Input pull-down resistor | | | 30 | | kΩ |
| VOL | Low level output voltage | | 0 | | 0.18 x Vdd | V |
| VOH | High level output voltage | | 0.82 x Vdd | | Vdd | V |
| IOHS | Output source current | | | | 4 | mA |
| IOLS | Output sink current | | | | 4 | mA |
| IOHH | Output source current (pin 15,16,17) | | | | 8 | mA |
| IOLH | Output sink current (pin 15,16,17) | | | | 8 | mA |
| IOTot | Total output current for I/O | | | | 40 | mA |

4.3 RF electrical characteristics

Table 6. RF electrical characteristics

| Symbol | Parameter | Conditions | Values | | | Unit |
|--------|----------------------------|-------------------------|--------|----------|------|------|
| | | | Min | Typ | Max | |
| | Frequency range | 2.1 < Vdd < 3.6 V | 2405 | | 2480 | MHz |
| TX | Output power | | | 0 | | dBm |
| RX | Sensitivity | Vdd = 3.0V, 1% PER | | -92 | | dBm |
| CFE | Carrier frequency error | Vdd=3.0V -20 / + 70 °C | -40 | | 40 | ppm |
| | Error Vector magnitude | Normal / boost mode | | 15 | 25 | % |
| | Adjacent channel rejection | +/- 5 MHz +/- 10 MHz | | 35 40 | | dBm |

5 Mechanical dimensions

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

Figure 3. Mechanical dimensions

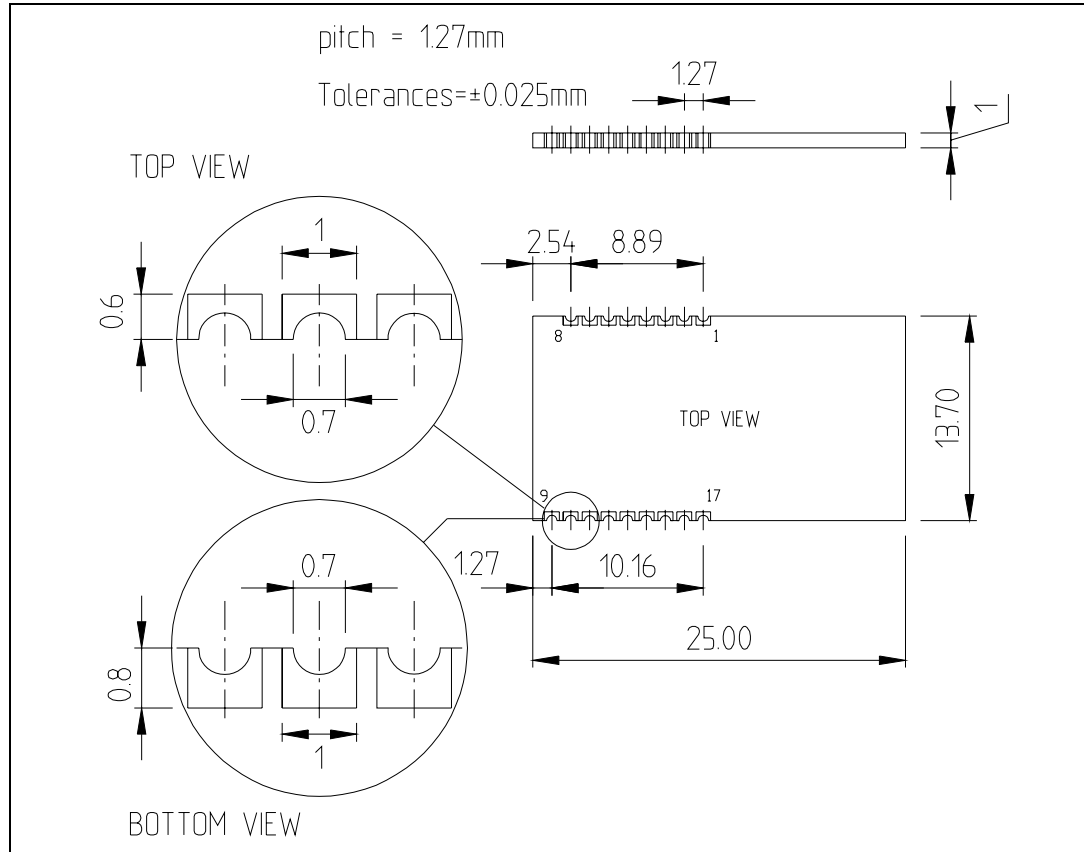
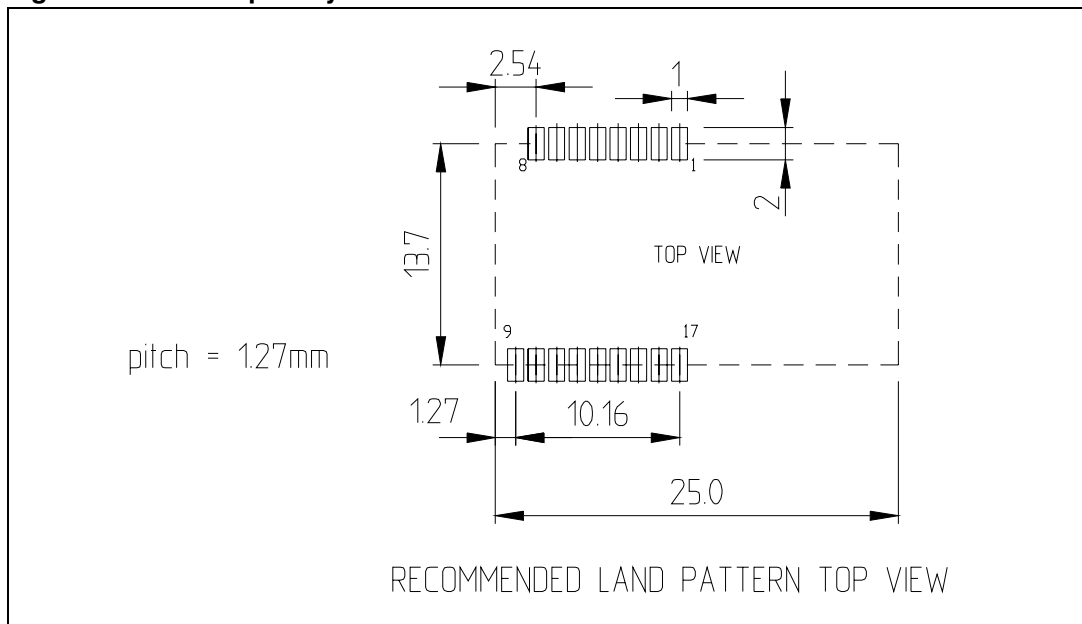


Figure 4. Solder pad layout



Appendix A FCC statement

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.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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 to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

Consult the dealer or an experienced radio/TV technician for help.

Antenna

Our module type SPZB260 is for OEM integrations only. The end-user product will be professionally installed in such a manner that only the authorized antennas are used.

Caution

Any changes or modifications not expressed approved by the part responsible for compliance could cause the module to cease to comply with FCC rules part 15, and thus void the user's authority to operate the equipment.

A.1 Label instruction

Instruction manual for FCC ID labeling

Module type: ZigBee module *SPZB260*

FCC-ID: S9NZB260A

This intends to inform you how to specify the FCC ID of our ZigBee module SPZB260 on your final product.

Based on the Public Notice from FCC, the product into which our transmitter module is installed must display a label referring to the enclosed module.

The label should use wording such as “Contains Transmitter module FCC ID: S9NZB260A or “Contains FCC ID: S9NZB260A , any similar wording that expressed the same meaning may be use.

It shows an example below

Contains FCC ID: S9NZB260A

A.2 Special requirement for Modular application

The following requirements are fulfilled:

1. The modular transmitter must have its own RF shielding:
The RF module used on the board fulfils the emission requirements of the FCC rules without additional shielding.
2. The modular transmitter must have buffered modulation/data inputs:
The module has a memory management unit inside of the IC. The processor interfacing with the external application by means general purpose I/O (GPIO) , Uart, SPI. The processor interfaces also the RF part of the module exchanging data and command with it. Inside the processor a flash memory is available to download the customer application and the ZigBee profiles.
3. The modular transmitter must have its own power supply regulation:
The IC contains an own voltage regulation. In case of changes in the supply voltage VCC (for example caused by temperature changes or other effects), the internal voltage will be stabilized.
4. The modular transmitter must comply with the antenna requirements of Section 15.203 and 15.204:
The RF module is for OEM (Original Equipment Manufacturer) integration only. The end-user product will be professionally installed in such a manner that only the authorized antenna is used.
5. The modular transmitter must be tested in a stand-alone configuration:
The RF module was tested in a stand-alone configuration.
6. The modular transmitter must be labelled with its own FCC ID number:
The RF module will be labelled with its own FCC ID number. When the module is installed inside the end-product, the label is not visible. The OEM manufacturer is instructed how to apply the exterior label.

7. The modular transmitter must comply with any specific rule or operating requirements applicable to the transmitter and the manufacturer must provide adequate instructions along with the module to explain any such requirements:
The EUT is compliant with all applicable FCC rules. Detail instructions are given in the product Users Guide.
8. The modular transmitter must comply with any applicable RF exposure requirements.
 - Maximum measured power output: 3,08 mW
 - Maximum antenna gain: 0,6 dBi = numeric gain 1,148 (see also FCC test report)

Maximum permissible exposure defined in 47 CFR 1.1310: 1 mW/cm².

The RF module operates at low power level so it does not exceed the Commission's RF exposure guidelines limits; furthermore, Spread spectrum transmitters operate according to the Section 15.247 are categorically excluded from routine environmental evaluation.

6 Revision history

Table 7. Document revision history

| Date | Revision | Changes |
|-------------|----------|---------------|
| 07-Sep-2007 | 1 | First release |

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