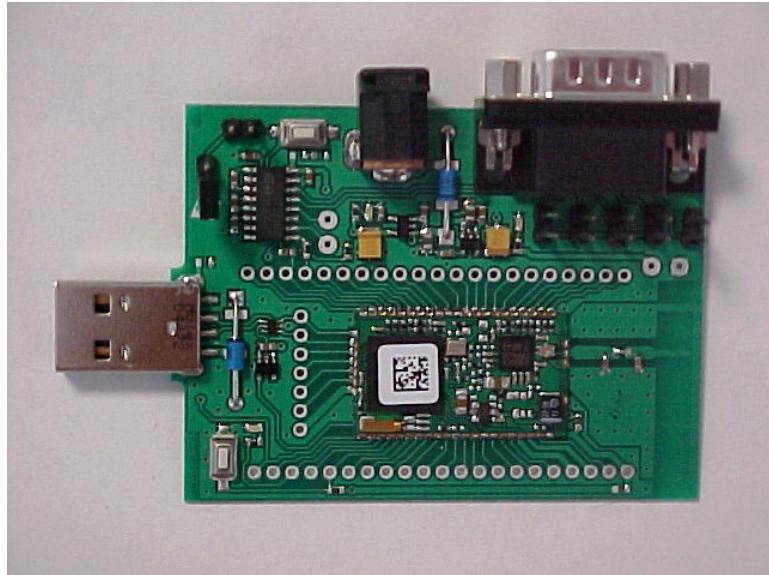


FEATURES

- Bluetooth V2.0 board
- Serial interface on DB9 connector
- USB connection
- PCB antenna on board
- Single 5 V supply voltage
- CE compliant
- FCC compliant
- FCC ID: S9N2425C2DB



DESCRIPTION

SPBT2425C2DB.xxx is a Bluetooth Class2 Demoboard for SPBT2425C2 Bluetooth module including the RF antenna. Suffix **xxx** identifies the Firmware release : **H** for **HCI** commands and **AT1** for **AT** commands.

SPBT2425C2DB.H is a board with a downloaded FW which enables the user to interface the Bluetooth module with HCI commands.

SPBT2425C2DB.AT1 is a board with a downloaded FW which enables the user to create a Bluetooth link with simple AT commands.

AT commands are sent by means the serial line which is accessible by the DB9 connector.

SPBT2425C2DB.xxx board can be supplied by an external 5V DC source or via the USB port.

1 - RECOMMENDED OPERATING CONDITIONS

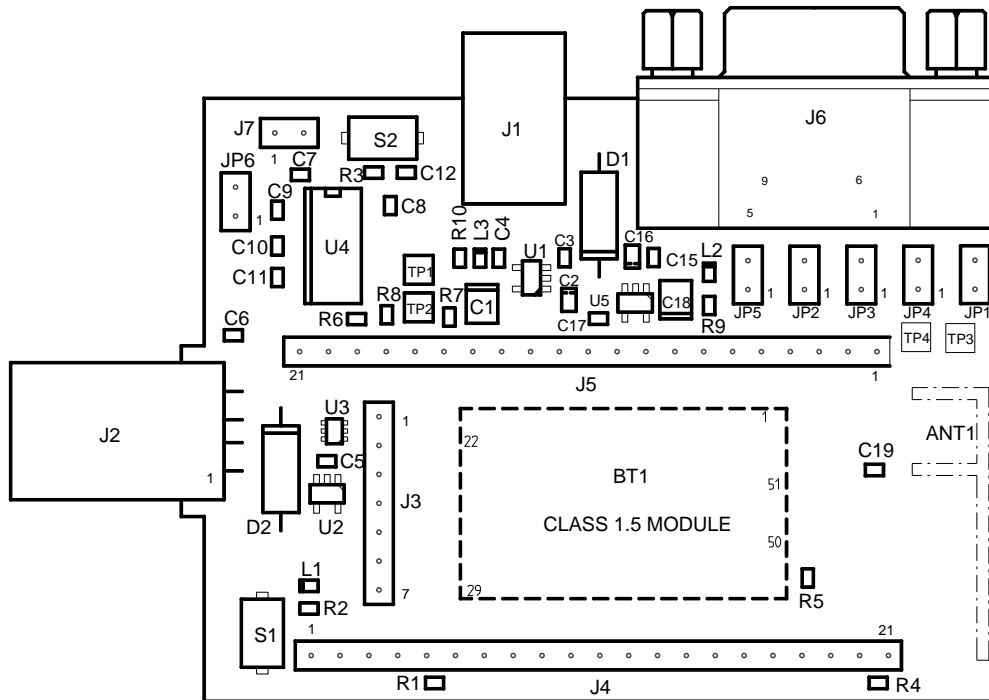
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-------------------------------|------------------|-----|-----|-----|------|
| VDD | Board Supply voltage | -20°C < T < 70°C | 4 | 5 | 6 | V |
| Tstg | Operating ambient temperature | | -20 | | +70 | °C |
| | | | | | | |

2 - I/O CONNECTIONS

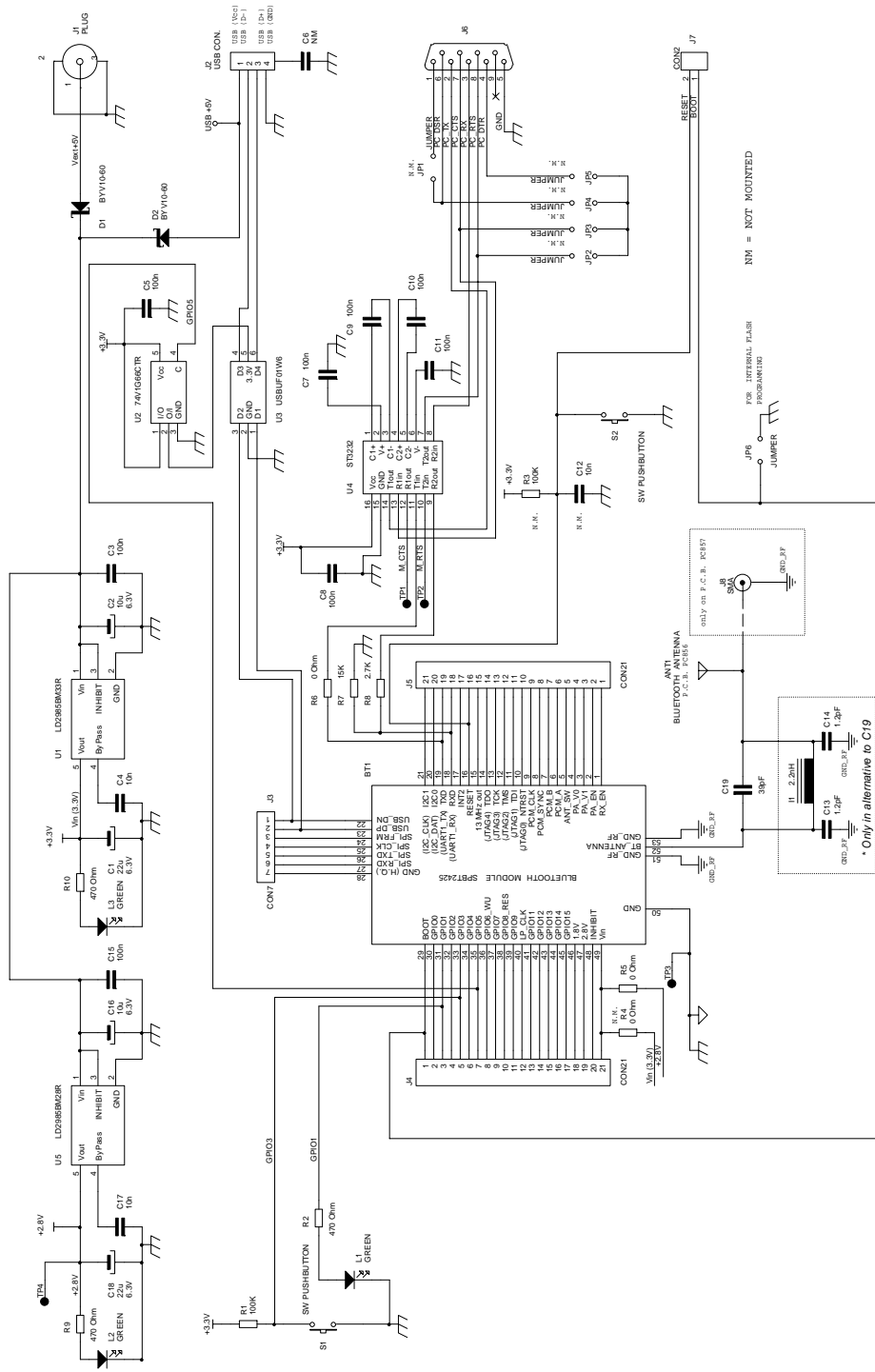
| DESCRIPTION | | |
|-------------|----|--|
| J1 | | Vcc Power supply plug (5V) |
| J2 | | USB Port When the USB port is connected , the 5V USB is used to supply the BT module (by means a voltage regulator) and the board itself When USB port is used 5V on J1 power plug can be avoided |
| J3 | 1 | USB_DN |
| | 2 | USB_DP |
| | 3 | SPI_FRM |
| | 4 | SPI_CLK |
| | 5 | SPI_TXD |
| | 6 | SPI_RXD |
| | 7 | GND |
| J4 | 1 | Boot |
| | 2 | GPIO 0 |
| | 3 | GPIO 1 |
| | 4 | GPIO 2 |
| | 5 | GPIO 3 |
| | 6 | GPIO 4 |
| | 7 | GPIO 5 |
| | 8 | GPIO 6 |
| | 9 | GPIO 7 |
| | 10 | GPIO 8 |
| | 11 | GPIO 9 |
| | 12 | LP_CK |
| | 13 | GPIO 11 |
| | 14 | GPIO 12 |
| | 15 | GPIO 13 |
| | 16 | GPIO 14 |
| | 17 | GPIO 15 |
| | 18 | 1.8V |
| | 19 | 2.8V |
| | 20 | INHIBIT |
| | 21 | VDD |
| J5 | 1 | RX_EN |
| | 2 | PA_EN |
| | 3 | PA_V1 |
| | 4 | PA_V0 |
| | 5 | ANT_SW |
| | 6 | PCM_A |
| | 7 | PCM_B |
| | 8 | PCM_SYNC |
| | 9 | PCM_CLK |
| | 10 | NTRST |
| | 11 | TDI |
| | 12 | TMS |
| | 13 | TCK |
| | 14 | TDO |
| | 15 | 13 MHz out |
| | 16 | RESET |
| | 17 | INT2 |
| | 18 | RXD |
| | 19 | TXD |
| | 20 | I2C0 |
| | 21 | I2C1 |

| DESCRIPTION | | |
|-------------|---|--|
| J6 | | Serial line port (DB9 male connector) On board is present a level translator to adapt the BT module digital levels to the RS232 standard levels. |
| J7 | 1 | Boot signal - If connected to GND the module can perform the downloading – see also JP6 |
| | 2 | Reset signal - A low level on this pin force the module in reset state - see also S2 |
| JP1 | | DB9 connector connection – see electrical drawing |
| JP2 | | DB9 connector connection – see electrical drawing |
| JP3 | | DB9 connector connection – see electrical drawing |
| JP4 | | DB9 connector connection – see electrical drawing |
| JP5 | | DB9 connector connection – see electrical drawing |
| JP6 | | Boot If connected to GND the module can perform the downloading |
| S1 | | N.O. push button connected to BT module GPIO3; when activated a Low level is applied to GPIO6 otherwise GPIO6 is at High level. |
| S2 | | Reset – Push button acting on the module reset pin |
| L1 | | LED connected to BT module GPIO1 . |
| L2 | | LED showing the presence of the 2.8 V internal voltage (2.8 V module version) |
| L3 | | LED showing the presence of the 3.3 V internal voltage (3.3 V module version) |

3 - BOARD LAYOUT



4 - ELECTRICAL DRAWING

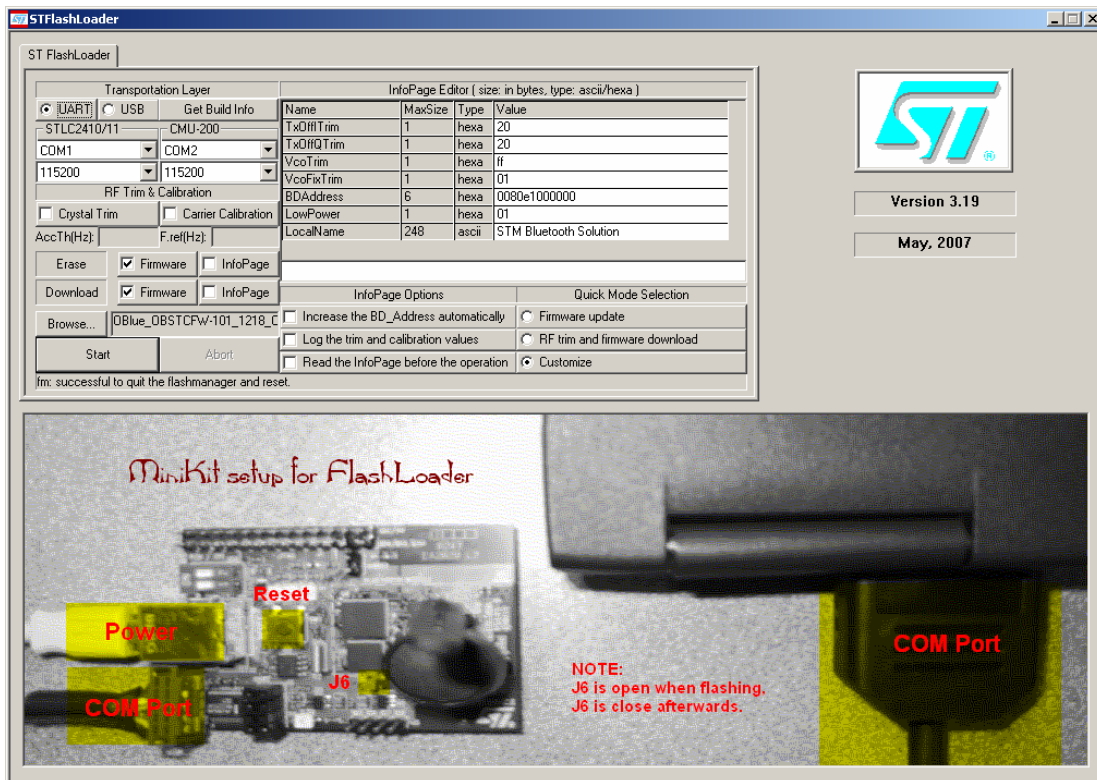


5 - DOWNLOADING

SPBT2425C2DB.xxx has also the possibility to be downloaded with a file developed by the user

To download a file into SPBT2425C2DB.xxx the following basics steps must be followed:

- connect the board to a PC by means a RS232 cable connected on COMx port
- put a jumper on JP6 (Boot pin to low level)
- connect the power supply cable to the board at +5V ext Vin
- open the “Flash loader “ program
- choose UART on Transportation layer section
- choose the appropriate COMx port
- with Browse , choose the firmware file to be downloaded
- Select “Firmware” in both the sections Erase and Download
- If Info Page must be rewritten choose Info Page in Erase and Download sections



- press start : on the dialog bar will appear “ reset the board”
- press S2 (reset) (a reset is generated) : on the dialog bar will appear the % of the downloading.
- At the end of the downloading a “successful ” or “fail “ message will appear.

6 - CERTIFICATIONS

6.1 - CE

Measurements have been performed in accordance with :

EN 300 328 V 1.6.1 (2004-11) : “ Electromagnetic compatibility and radio spectrum Matters (ERM); Wideband Transmission Systems; Data transmission equipment operating in the 2.4GHZ ISM band and using wide band modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE directive”

EN 301 489-17 V 1.2.1 :2002: “ Electromagnetic compatibility and radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services ; Part 17: Specific condition for 2.4GHz wideband transmission systems and 5 GHz High performance RLAN equipment.”

EN 60950-1 : “Information technology equipment -Safety –Part 1 : General requirements “

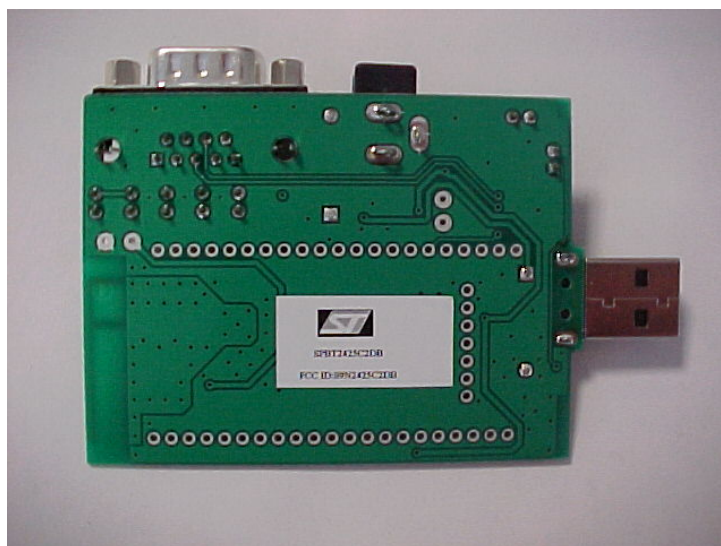
6.2 - FCC

To get compliance with FCC CFR47 part15 the following tests have been performed:

| CFR47 part 15 section | Title | Result |
|----------------------------------|---|--------|
| 15.203 15.247 (b) (4) (i) | Antenna requirements | pass |
| 15.247 (a) | Conducted emission | pass |
| 15.209 (a) (f) | Radiated emission | pass |
| 15.247 (a) | Frequency hopping –Spread Spectrum Spec | pass |
| 15.247 (b) | Maximum Peak Output power | pass |
| 15.247 (d) | 100 kHz Bandwidth of Frequency Band Edges | pass |
| 15.247 (d) | Conducted emission | pass |
| 15.247 (e) | Power Spectral density | pass |
| 15.247 (g) | FHSS transmission characteristics | pass |
| 15.247 (i) (§47CFR1.1307 (b)(1)) | RF Humane exposure | pass |

This board has the following FCC ID:

FCC ID:S9N2425C2DB



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 board type SPBT2425C2DB.xxx 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 party 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.

Label instruction**INSTRUCTION MANUAL FOR FCC ID LABELING**

Module type : Bluetooth class 2 board *SPBT2425C2DB.xxx* (*SPBT2425C2 module*
+ *PC856 carrier board*)

FCC-ID : S9N2425C2DB

This intends to inform you how to specify the FCC ID of our Bluetooth board SPBT2425C2DB 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: S9N2425C2DB or "Contains FCC ID: S9N2425C2DB, any similar wording that expressed the same meaning may be use.

It shows an example below

Contains FCC ID: S9N2425C2DB

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, USB, PCM, I2C, 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 Bluetooth profiles.

- 3) The modular transmitter must have its own power supply regulation:

The module 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: 2,33 mW
- Maximum antenna gain: 1 dBi = numeric gain 1,259 (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.

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