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## SDS Module (US) - 102545 - User Manual

### Summary:

The SDS Module (US) **shall be used only in internal Disruptive Technologies products** and is mounted inside the products during manufacturing according to a manufacturing flow developed and maintained by Disruptive Technologies engineers. A simple installation guide is given for reference only.

The SDS Module (US) is designed to support the proprietary RF protocol Secure Data Shot (SDS) of Disruptive Technologies and shall be used in devices for establishing an RF link with SDS enabled devices.

### Revision History Table

Named revision	Date + Time stamp YYYY-MM-DD HR:MM	Tag name: Document started, Document ready for review, Document approved
	2022-02-25	Document started

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## 1. Installation and use of the module

The SDS Module (US) **shall be used only in internal Disruptive Technologies products** and is mounted inside the products during manufacturing according to a manufacturing flow developed and maintained by Disruptive Technologies engineers. A simple installation guide is given for reference only.

## 2. General description

The SDS Module (US), with part number 102545, is designed to support the proprietary Disruptive Technologies RF protocol, Secure Data Shot (SDS). The module shall be used in products for establishing an RF link with SDS enabled devices.

The SDS Module (US) contains two radio chips and two antennas for simultaneous reception in two different bands. Details can be found in the “Block Diagram” section in this document.

The radio part of the SDS Module (US) connects to the system through a UART interface with flow control and two GPIOs.

## 3. Compliance Statement

The FCC and Industry Canada statements as printed below apply to the SDS Module (US). The FCC and Industry Canada statements must be included in the user manual of any host product incorporating the module and both must be printed on the host product exterior if it is big enough to accommodate the print.

### **FCC (Federal Communications Commission) statements**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) The device may not cause harmful interference, and
- 2) The device Module must accept any interference received, including interference that may cause undesired operation.

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Important 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.

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This transmitter must not be co-located or operating in conjunction with any other antennas or transmitters. It is the responsibility of the host device manufacturer to ensure continued compliance with FCC rule part 15B once the module has been installed in the host device.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The concerned end product must be labeled to say  
"Contains FCC ID: 2ATFX-102545"

### Industry Canada statements

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions:

- 1) The device may not cause interference, and
- 2) The device must accept any interference, including interference that may cause undesired operation of the device.

Important note: To comply with Industry Canada RF exposure limits, the antenna used for this device must be installed to provide a separation distance of at least 20cm from all persons. RF exposure is in accordance with RSS-102, section 2.5.2.

The concerned end product must be labelled to say:  
"Contains IC: 25087-102545"

### Declarations d'Industry Canada

Cet équipement est conforme aux normes d'exemption de licence RSS d'Industry Canada. Son utilisation est soumise aux deux conditions suivantes:

- 1) Le dispositif ne doit pas provoquer d'interférence, et
- 2) Le dispositif doit accepter toute interférence, y compris des interférences susceptibles de provoquer un fonctionnement indésirable de l'équipement.

Remarque importante: Pour respecter les limites d'exposition aux radiofréquences d'Industry Canada, l'antenne utilisée pour cet appareil doit être installée pour fournir une distance de séparation d'au moins 20 cm de toutes les personnes. L'exposition aux RF est conforme à la norme RSS-102, section 2.5.2.

Le produit final concerne doit porter une étiquette avec la mention:  
"Contient IC: 25087-102545"

## 4. Block Diagram

The block diagram of the SDS Module (US) is shown in figure 1.

Block diagram  
102545 - SDS Module (US)

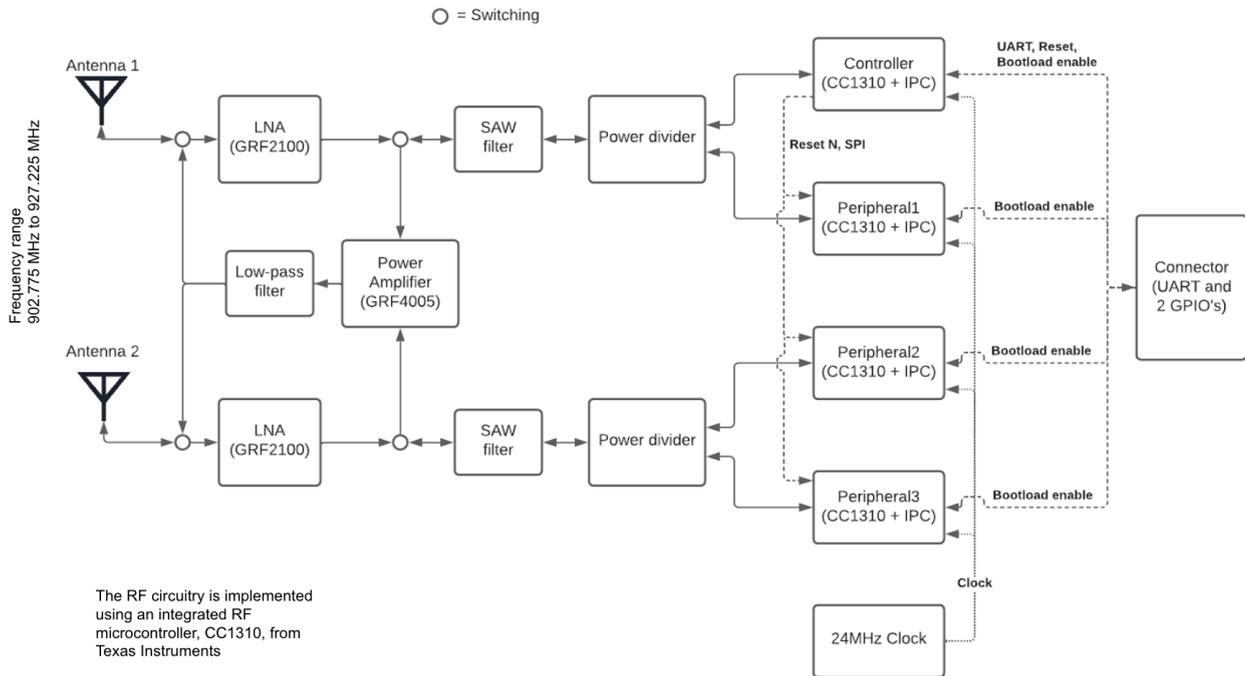


Figure 1. Block diagram

Two antennas are integrated in the SDS Module (US) for communication with sensors in the ISM band to ensure good radio diversity. The two antennas are used to receive and transmit signals both in the Standard and the Boost mode. There is one radio for each of the four combinations of antennas and modes. An external system processor is required to control the SDS Module (US) and manage the data traffic for all the four radios. Simultaneous transmission from two radios or two antennas is not possible. All radios and antennas are, however, continuously enabled to receive (RX).

The radio part of the SDS Module (US) connects to the system through a standard UART interface with flow control and two digital GPIO pins. All signals are available on a connector as described in the section “Electrical Interface”.

## 5. Antenna requirements

There are two antennas in the design. Both are included on the module PCB and are an integral part of the module. The antenna details are:

Internal antennas, ANT1 and ANT2, for ISM communication with the SDS Module (US) are present inside the module:

- Antenna Type: Integrated PCB Antenna
- Antenna Details : PN 102436 “CCON v2 PCB”

- Manufacturer: Disruptive Technologies Research AS

The antennas are located on the module as shown in figure 2 below.

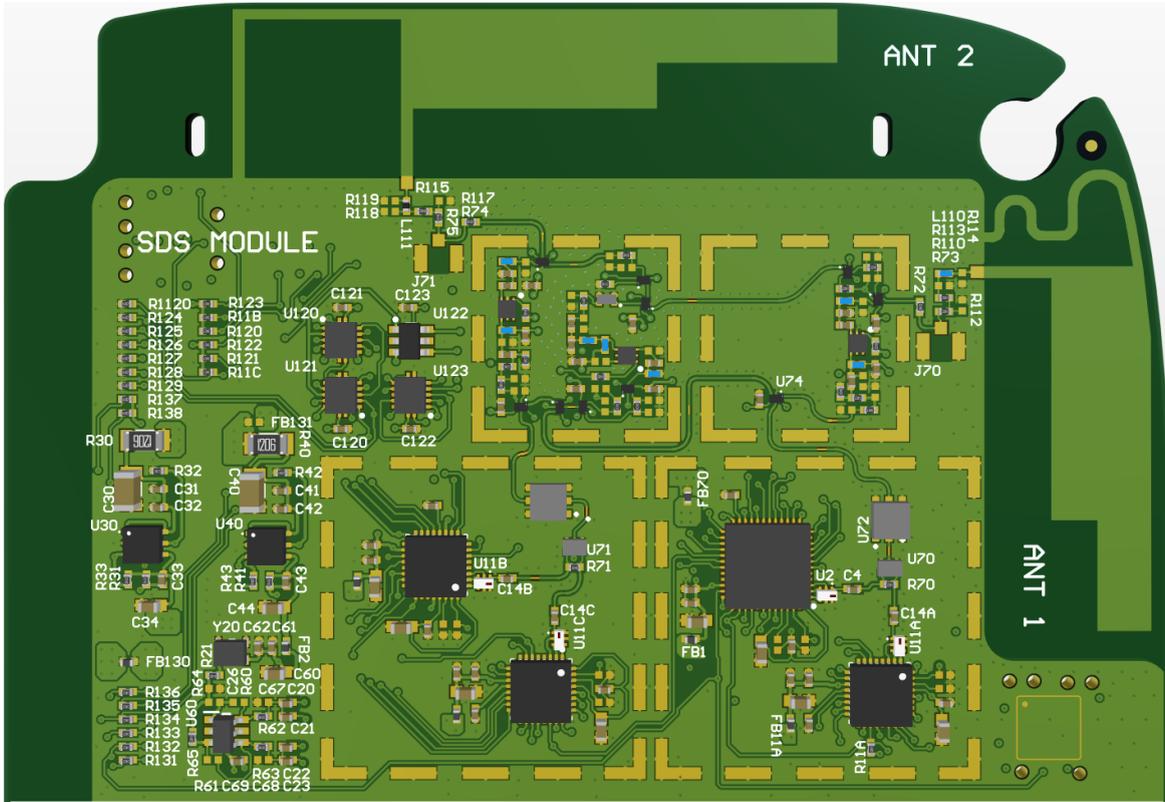


Figure 2. Location of antenna 1 (ANT 1) and antenna 2 (ANT 2)

## 6. Electrical Interface

The electrical interface to the SDS Module (US) is available on a connector, J130 and J131, and on the edge of the PCB. It consists of power supply pins, ground pins, and digital I/O pins. The power supply is regulated inside the module to supply all the power domains of the module.

Table 1 lists the electrical parameters of the signals.

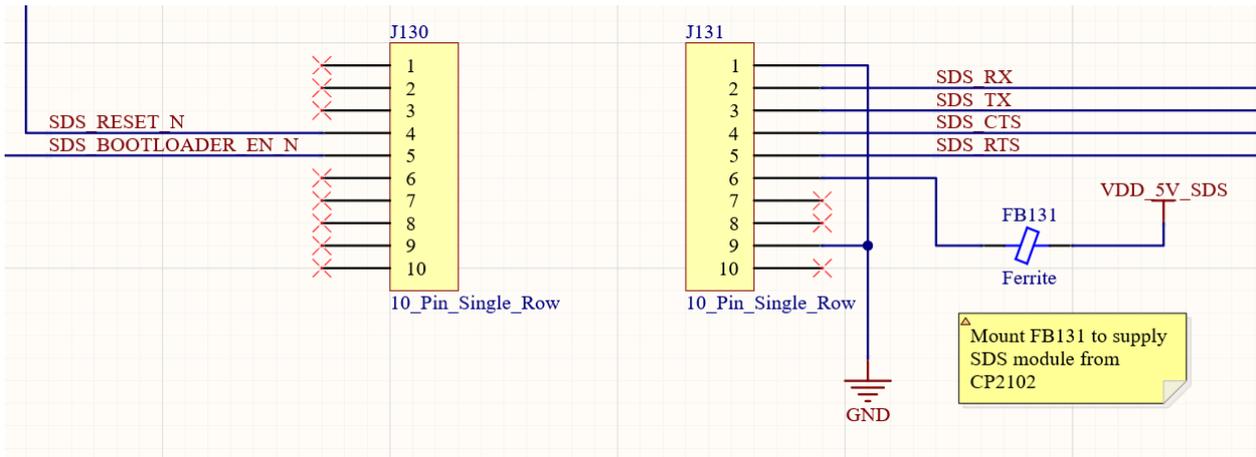


Figure 3. Electrical interface to the SDS Module (US)

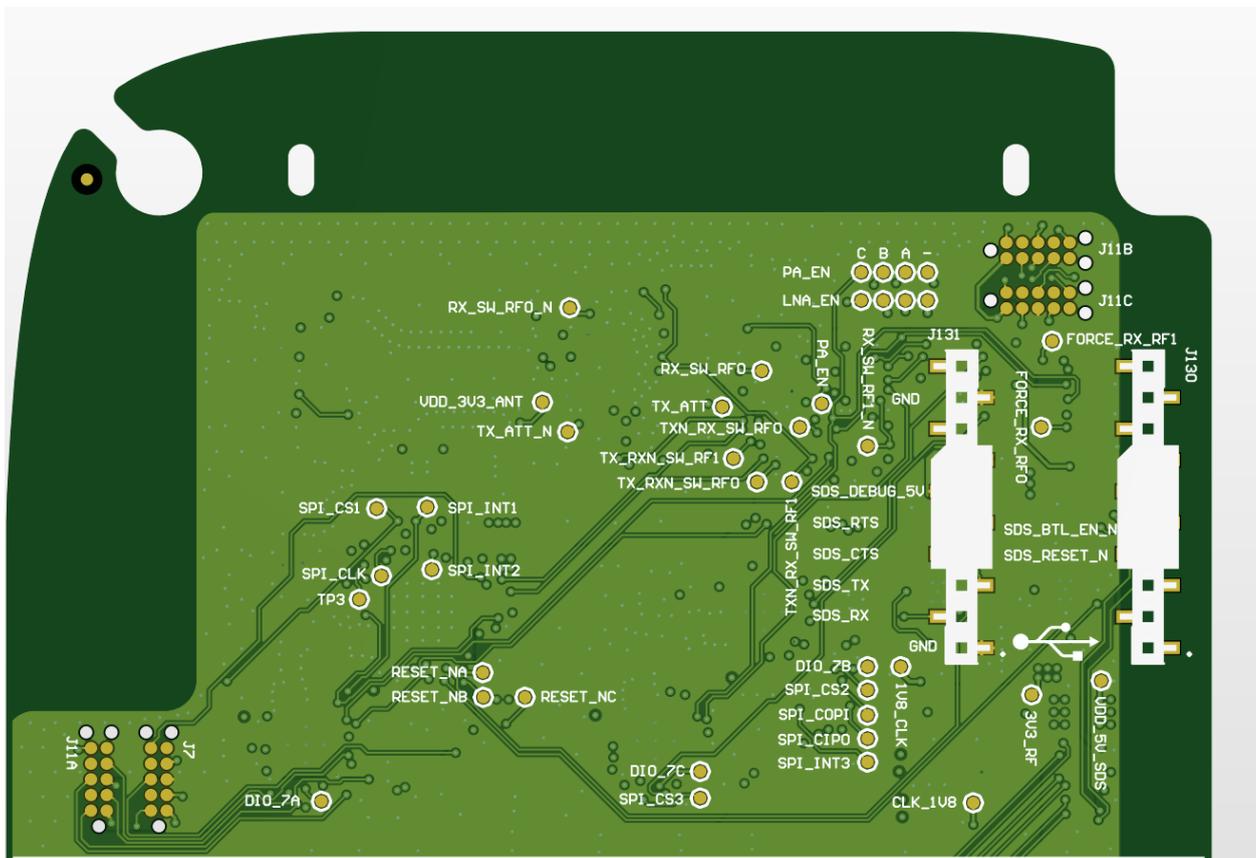


Figure 4. Back side of the board showing header J130 and J131.

Table 1

Group (signal)	Min	Typ	Max	Unit
Supply voltage (VDD_5V_SDS)	4.5	5.0	5.25	V
Supply current			1	A

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Ground (GND)	Connect closely to system ground			
Digital I/O signaling voltage	3.0	3.3	3.6	V

## 7. Requirements for assembly

- Make sure no metal objects touch the antennas in the assembly
- Secure mechanical support for the PCB and avoid mechanical stress on connectors
- Use 3.3V CMOS digital signaling for interface pins
- Do not remove any of the shield boxes assembled around the RF circuitry
- Make sure the supply can provide 1 A of continuous current to the +5 V supply connector