DW-SBTM1

Bluetooth Module
User Manual / Functional Description

DATAWIND

Table of Contents:

Regulatory Compliance Requirements:

US FCC requirements:

Following text must be copied exactly in the user's manual of the device that uses this Bluetooth Module.

Information for Class B Unintentional Radiators (FCC 15.21 & 15.105:

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 instruction manual, 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 of 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.

The User may find the following booklet helpful: *How to identify and resolve Radio-TV Interference Problems*. This booklet may be available from the U.S. Government Printing Office, Washington, D.C. 20402.

FCC 15.21 & 15.105 warning:

Warning: Changes or modifications not expressly approved by DATAWIND could void the user's authority to operate the equipment.

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.

Industry Canada Compliance Requirements:

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Following text must be copied exactly into the product's user manual.

FCC ID: R37-DWSBTM1
IC: ###-DWSBTM1 (TBD)
Bluetooth QPL: ###-DWSBTM1 (TBD)

For any queries please use following phone number: 1-877-878-DATA (1-877-878-3282) or email at: compliance@datawind.com.

Design Requirements:

DATAWIND's Bluetooth Module generates and radiates Radio-Frequency energy. The usage of the module into a final product has to meet following conditions:

(1) OEM/Users cannot alter or modify the module in any way.
(2) Antenna cannot be removed and or replaced by other transmitting means. Changes or modifications not expressly approved by DATAWIND could void the user's authority to operate the equipment.

Stand-alone Bluetooth Module User Manual

DATAWIND

General Description:

> NOTE: All references to internal parts are to be crosschecked against BOM as they represent confidential information.

FCC:
R37-DWSBTM1

IC:###-DWSBTM1

BT:###-DWSBTM1

> DW-SBTM1 is a standalone Bluetooth module running HCI level Bluetooth stack. It enables data connectivity over distances as much as 10m (30ft). The HCI interface is standard to ###FLASH or ###ROM parts (check BOM).

> DW-SBTM1F = uses ###Flash part (check BOM)
> DW-SBTM1R = uses ###ROM part (check BOM)

> The integrated circuit includes both the RF processor as well as the baseband (BB) processor. All the related Bluetooth protocols that deal with RF modulation, channel hoping sequence and timing, are dealt within the chip. It also has an internal regulator for the core and RF circuitry, and internal VCO and PLL filter.

> The module consists of the ###ROM/###FLASH chip (check BOM), a 10ppm crystal, antenna balloon and filter, and permanently attached antenna (see picture and internal schematic). A RF shield covers all the components, except antenna.

Module UART Interface:

UART_TX

UART_RX

UART_RTS

UART_CTS
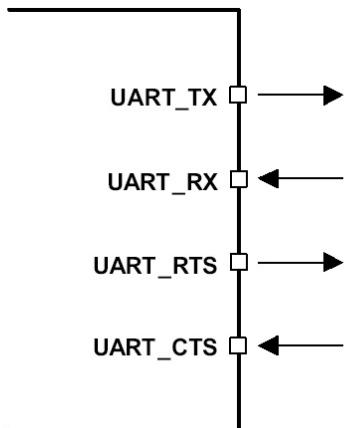
UART Specifications:

Power-on baud rate:	115200bps
Flow control:	RTS/CTS
Parity:	None
Number of stop bits:	1
Data bits:	8

For the Flash based module the set-up of the UART interface has to be done through the SPI port, as part of the general module set-up. For production, the setup is done at the same time as the general programming of the module. For the ROM based module, UART is set-up at power-on through jumpers

NOTE: UART port has standard logic levels. It can connect directly to a CPU/MPU UART port, but it needs an external level translator in order to connect to standard RS232 COMM ports.

Levels on UART pins are between GND and VDD1. UART_RTS, and UART_CTS are active low. The UART port buffer is used for both sending payload data and controlling the module. Payload data is embedded in standard HCI protocol.

Specifications:

General Specifications:

|	
Frequency Range:	2402MHz – 2480MHz
Channel Spacing:	1MHz
Number of channels:	79
Operating Voltage:	3.3V nominal
Operating Current:	60mA nominal during Tx mode

Environmental Specifications:

Storage Range:	-20°C to +85°C
Operating Range:	-5°C to +50°C
Humidity:	5% to 95% non condensing

Electrical Specifications:

Nominal Electrical settings:

Pin	Pin Name	Nominal level	MAX level
1.	GND	Ref. Level (GND)	
2.	VDD1	1.8V	2.2V
3.	SPI_MISO	3.3V	VDD2+0.4V
4.	SPI_CSB	3.3V	VDD2+0.4V
5.	SPI_CLK	3.3V	VDD2+0.4V
6.	SPI_MOSI	3.3V	VDD2+0.4V
7.	VDD2	3.3V	3.6V
8.	GND	Ref. Level (GND)	
9.	UART_CTS	3.3V	VDD2+0.4V
10.	UART_RTS	3.3V	VDD2+0.4V
11.	UART_TX	3.3V	VDD2+0.4V
12.	UART_RX	3.3V	VDD2+0.4V
13.	Reserved	N/A	N/A
14.	Reserved	N/A	N/A
15.	Reserved	N/A	N/A
16.	Reserved	N/A	N/A
17.	GND	Ref. Level (GND)	
18.	Reserved	N/A	N/A
19.	Reserved	N/A	N/A
20.	Reserved	N/A	N/A
21.	Reserved	N/A	N/A
22.	Reserved	N/A	N/A
23.	RESET	3.3V	VDD2+0.4V
24.	GND	Ref. Level (GND)	
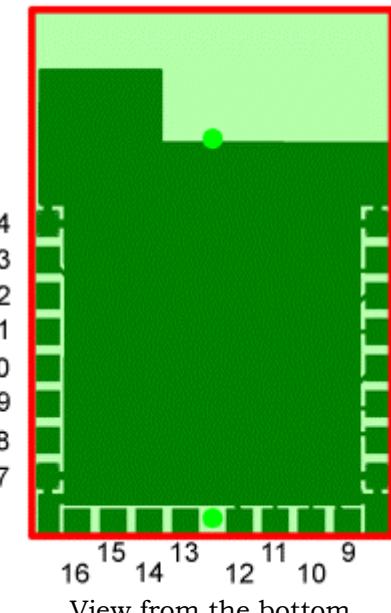
View from the bottom

Note: VDD2 is internally regulated from VDD1 coming through VDD_ANA pin. It can be supplied externally, but then tight regulation and filtering is required (less than 10mVpp). Check original manufacturer IC data book for more details (Check BOM for part number)

RESET pin is active high and has to stay on for at least 5ms for a proper reset of the module.

Pin name	Pin state during reset
UART_TX	Output tri-stated with weak pull-up
UART_RX	Input with weak pull-down
UART_RTS	Output tri-stated with weak pull-up
UART_CTS	Input with weak pull-down
SPI_CSB	Input with weak pull-up
SPI_CLK	Input with weak pull-down
SPI_MISO	Output tri-stated with weak pull-down
SPI_MOSI	Input with weak pull-down

Usage requirements and recommendations:

(a) Pre-regulate VDD1 to 3.3V. Allowable input range is 2.2V to 3.6V. The chip already has internal regulator for all RF circuitry, and CPU circuitry.

(b) Use chokes on the supply line to limit the amount of conducted and radiated signals. External power supply filtering is required to achieve good radio performance.

(c) Use series resistors of up to 100ohms on UART signal lines in order to attenuate conducted interference

(d) Placing of the module should be done such manner that the closest PCB is at least 3mm away from the antenna and preferably on the bottom side. The antenna should have no metallic obstruction on at leas two sides parallel to the long dimension of antenna (Antenna should not be shielded!!!)

(e) Care should be taken in placing the module such the antenna does not radiate directly into sensitive circuitry, and thus affecting the functionality of the whole device.

Stand-alone Bluetooth Module User Manual

Mechanical specifications:

View from the bottom

Pin 1
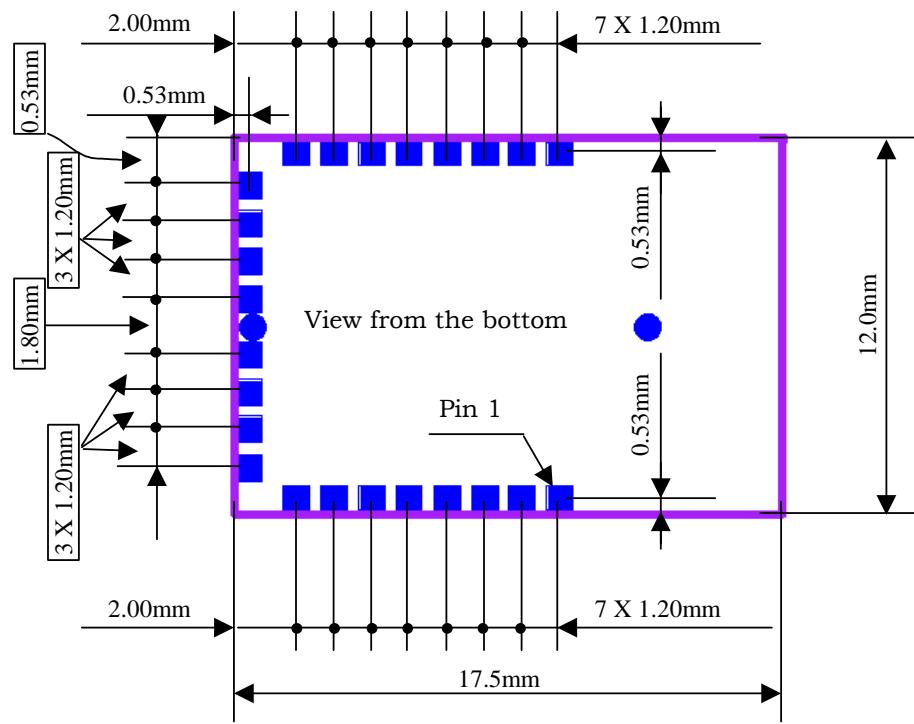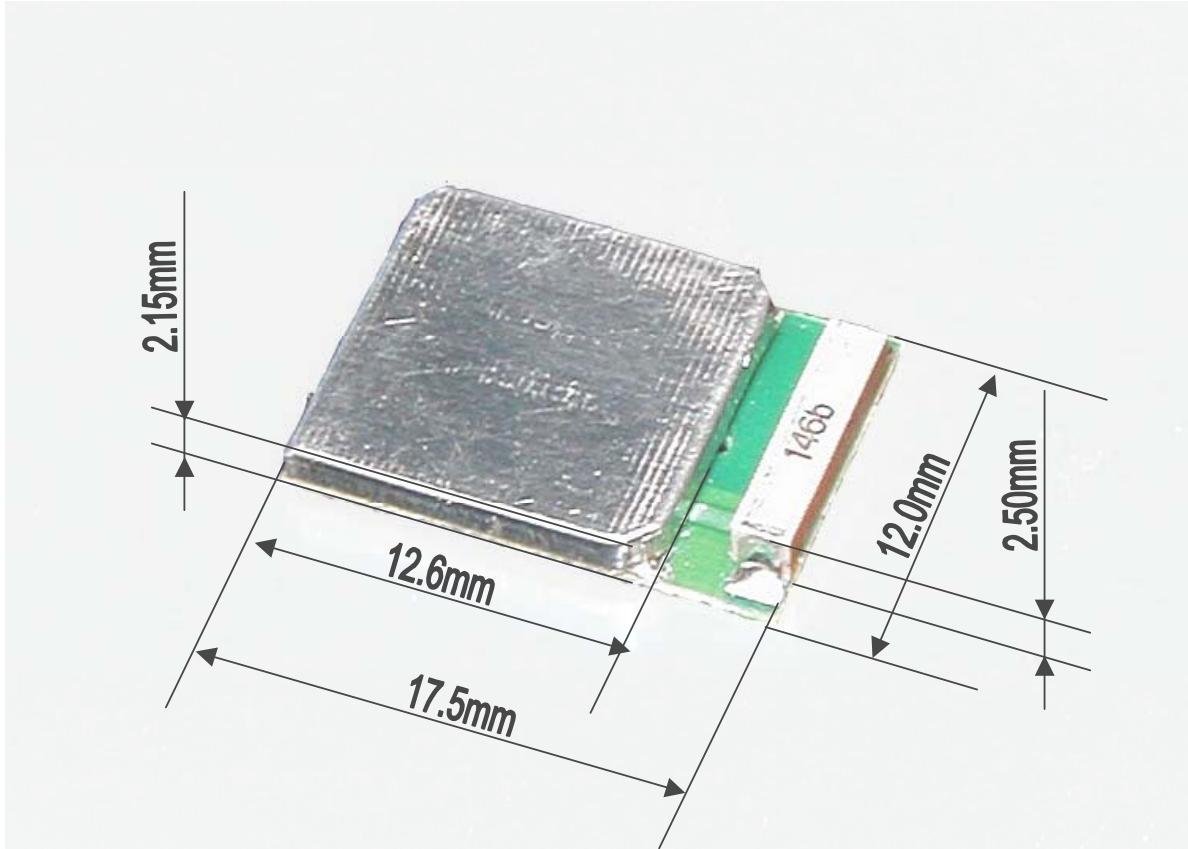
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May 03/04	00	First document draft	All

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