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# Approval Sheet

## Product Specification

Part Description: Bluetooth Module

Customer Part No:

Movon Part No: SBT-M1

**Acknowledgement of reception**

**We have received the attached specification**

Date

Company:

\_\_\_\_\_

Dept:

\_\_\_\_\_

Representative

Received by

\_\_\_\_\_

\_\_\_\_\_

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## Revision Record

Rev. No	Date	Item	Modifications	Approved
1.0	2013. 06. 28	SBT-M1	First Issued	

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## 1 Operation Temperature

-20℃ ~ +70℃

## 2 RoHS Compliance

This component can meet with ROHS compliance

## Overview

### 1. Substrate :

Printed Circuit Board

### 2. Pattern:

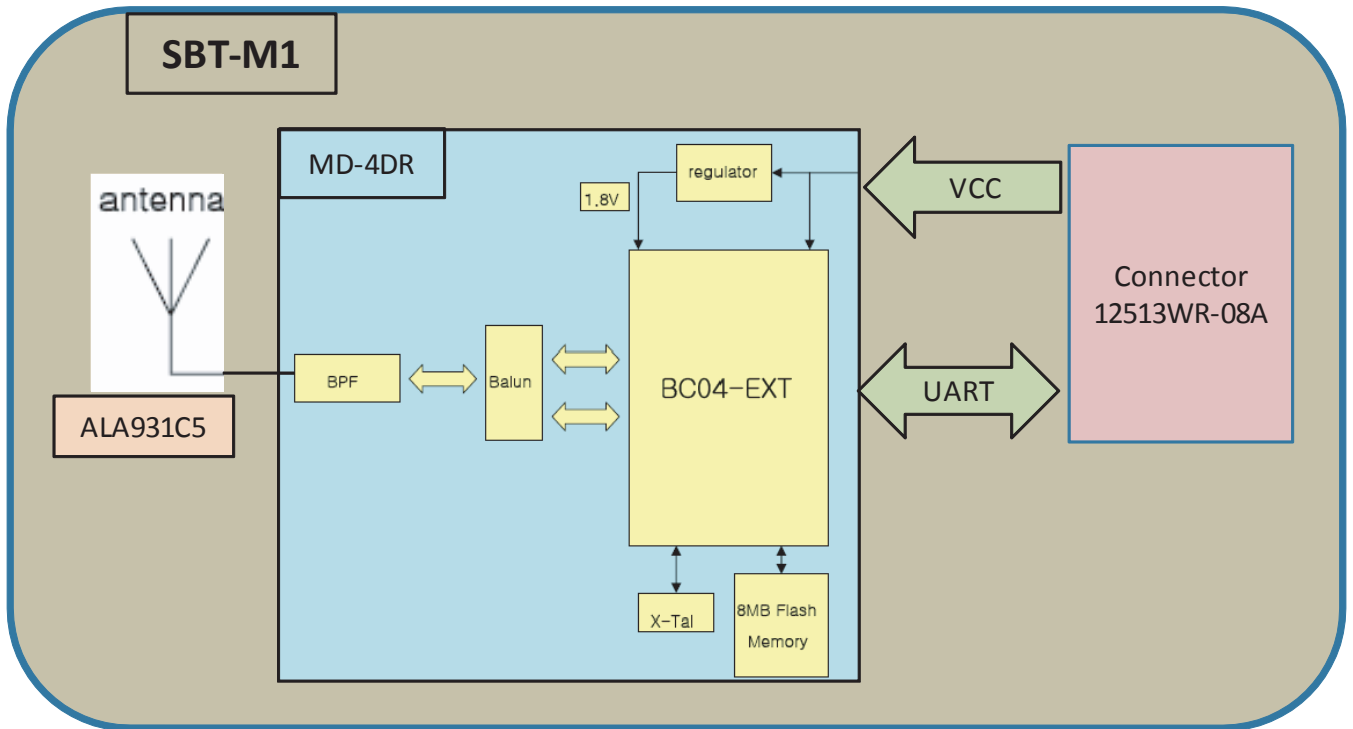
1) Strip Line

2) Ground

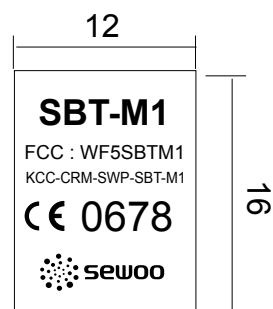
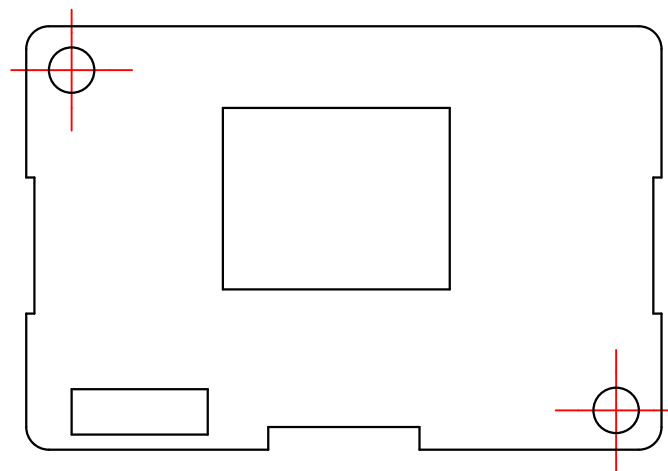
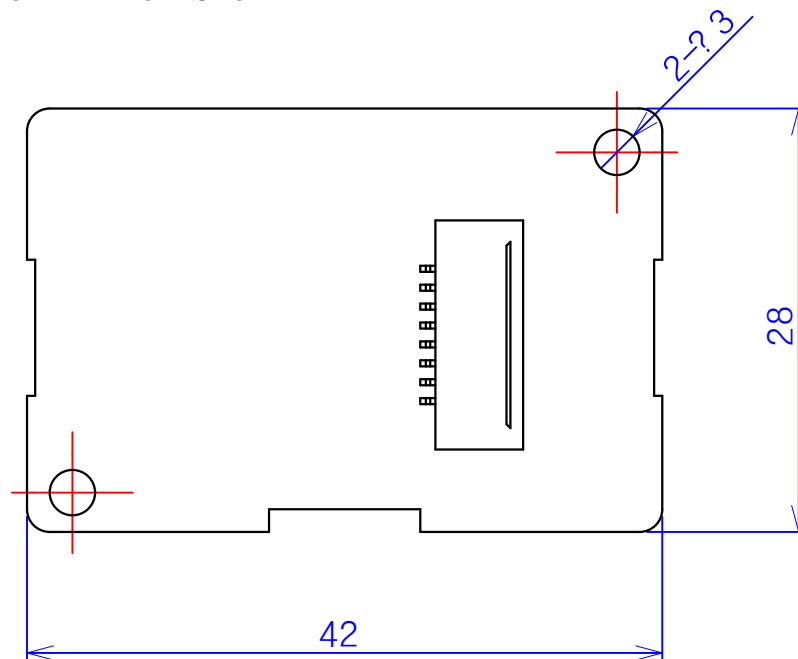
3) Via Hole

4) PSR Ink

## Block Diagram



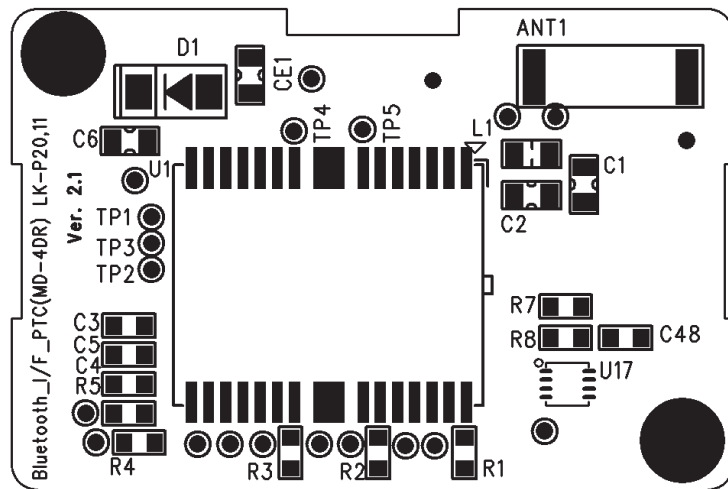
## Shape and Dimension



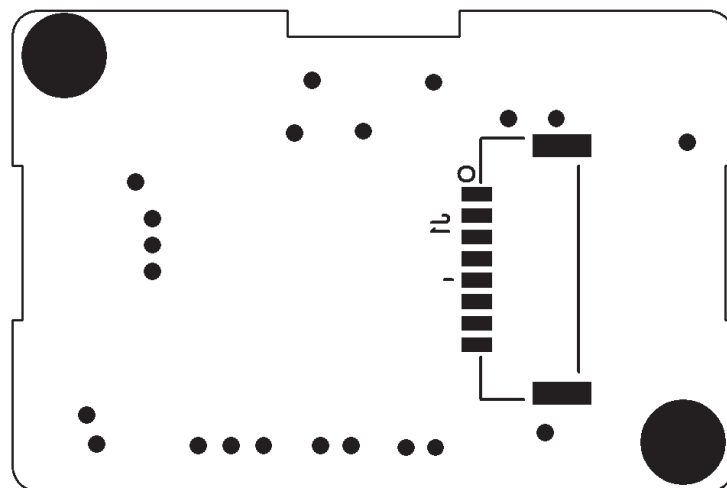
## Pin Map

PIO No.	Pin Name	Description	Pad Type
1	GND	Common Ground	
2	GND	Common Ground	
3	CONTROL	Module Control Singnal	
4	RST	Reset Signal	
5	DTR	UART request to clear to active low	
6	RXD	UART Data Output	
7	TXD	UART Data Output	
8	Vcc	Power Supply	Power

## Top View



## bottom View





# Specifications of Quality Evaluation and Reliability Test

## 1. Standard Electrical Characteristics

Items	Contents			
Bluetooth Specification	2.0			
Frequency Range(Rx / Tx)	2402 – 2480MHz			
Channel Spacing	1MHz			
Number of RF Channel	79			
Power Class	2			
Operating Mode(Rx / Tx)	Time division multiplex either transmit or receive frequency hopping after on Rx/Tx cycle			
	Min	Typ	Max	Unit
Receiver Performance				
Sensitivity(BER ≤ 0.1%)				
-Sensitivity single slot packets	-70	-82		dBm
-Sensitivity multi slot packets	-70	-82		dBm
Maximum input level	-20			dBm
Transmitter Performance				
Tx power	-6	1	4	dBm
Frequency range	2400<f <sub>l</sub> , f <sub>h</sub> <2483.5			MHz
20dB Bandwidth	f <sub>h</sub> - f <sub>l</sub> <1			MHz
Adjacent channel power	P[N]<-20dBm for abs(M-N)=2 P[N]<-40dBm for abs(M-N)≥3 -40dBm≤P[i]≤-20dBm Less than for 3 channels			
Modulation Characteristics				
-Modulation δf1avg	140		175	kHz
-Modulation δf2avg	115			kHz
- δf2/ δf1	0.8			
Initial Carrier Frequency Tolerance	-75		75	
Carrier Frequency Drift(Drift rate/50us)	-20		20	kHz

Note: The above-mentioned values have been obtained according to our own measuring methods and may vary depending on the circuit, in which this component is actually incorporated. You are, therefore, kindly requested to test the performance of this component by incorporating it in your set.

## **FCC Information**

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 CLASS B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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 correct the interference by one or more of the following measures:

- 1.1. Reorient or relocate the receiving antenna.
- 1.2. Increase the separation between the equipment and receiver.
- 1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.
- 1.4. Consult the dealer or experienced radio/TV technician for help.

## **WARNING**

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

"CAUTION : Exposure to Radio Frequency Radiation.

Antenna shall be mounted in such a manner to minimize the potential for human contact during normal operation. The antenna should not be contacted during operation to avoid the possibility of exceeding the FCC radio frequency exposure limit.

### **OEM Responsibilities to comply with FCC Regulations**

The SBT-M1 Module has been certified for integration into products only by OEM integrators under the following conditions:

- The antenna(s) must be installed such that a minimum separation distance of 5mm is maintained between the radiator (antenna) and all persons at all times.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

As long as the two conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions cannot be met (for certain configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Maximum antenna gain allowed for use with this device is 3.5 dBi

### **End Product Labeling**

The SBT-M1 Module is labeled with its own FCC ID. If the FCC ID 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. In that case, the final end product must be labeled in a visible area with the following:

**“Contains Transmitter Module FCC ID: WF5SBTM1”**

or

**“Contains FCC ID: WF5SBTM1”**