

Approval Sheet

Product Specification

Part Description: **Bluetooth Module**

Customer Part No:

MOVON Part No: MD-BRC101

Acknowledgement of reception

We have received the attached specification

Date 2020. 08 .27

Company

MOVON Corporation.

Dept.

MOVON R&D LAB

Representative

Kerry.Shim

Received by

Revision Record

No	Date	Item	Modifications	Approved
1	2020.03.26	MD-BRC101	First Issued	
2	2020.04.13	MD-BRC101	Second Issued	
3	2020.07.02	MD-BRC101	Third Issued	
4	2020.08.27	MD-BRC101	Fourth Issued	

1. Module Features

- Complies with Bluetooth Core Specification version 5.1 and supports dual mode (BR/EDR + Low Energy Controllers)
- Complies with HS-UART with configurable baud rate for Bluetooth
- Enhanced BT/Wi-Fi Coexistence Control to improve transmission quality in different profiles
- Build-in 32K oscillator

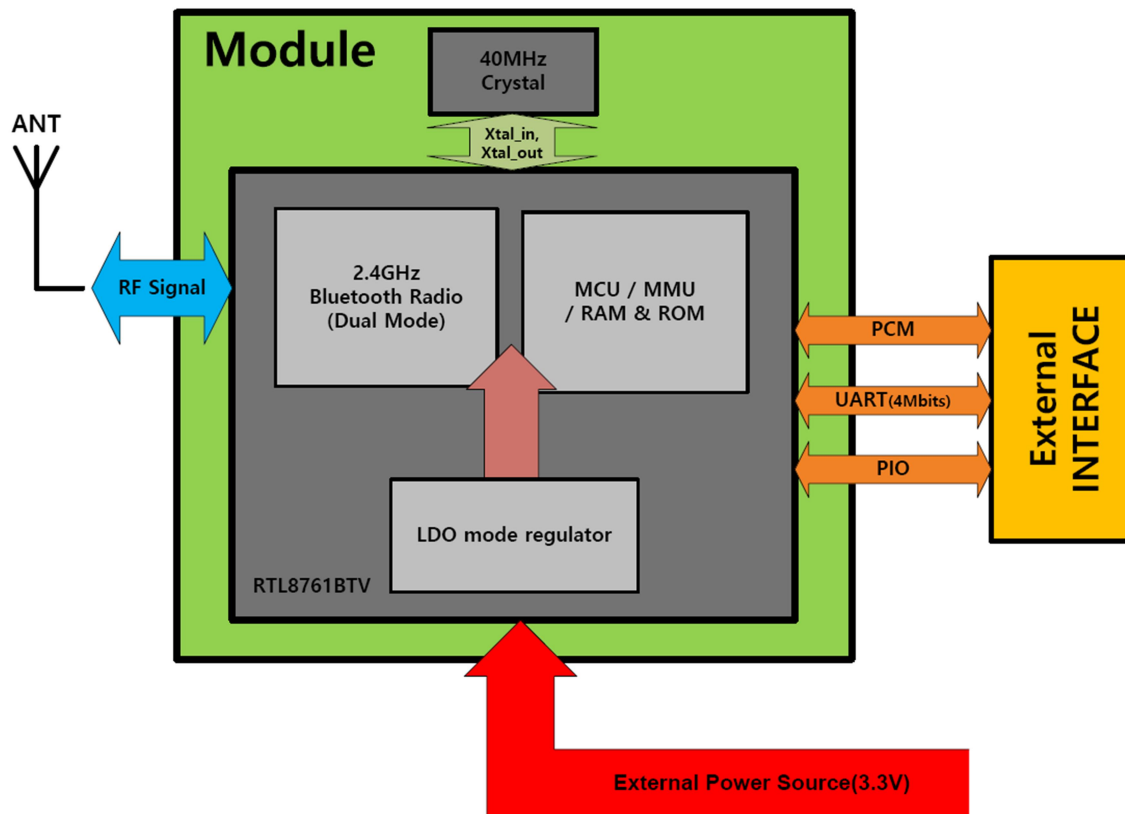
2. Applications

- Set top Box Devices
- USB Bluetooth Dongles Devices
- AI Speaker
- Mobile Printer

3. Features

- Size (13mm X 12mm X 2.8mm)
- Surface Mountable

4. Overview



5. Electrical Characteristics

Parameter	Min	Nor	Max	Unit
Supply Voltage (VDDIO33,REG_IN)	3.0	3.3	3.63	V
Storage Temperature	-40		+125	°C

6. LED

The MD-BRC101 support GPIO assignment to drive the LED for status indication

Parameter	Min	Nor	Max	Unit
Driving capacity	-	-	12	mA
GPIO V_{OH}	1.8	-	3.6	V
GPIO V_{OL}	-	0.2	-	V

7. RF specification

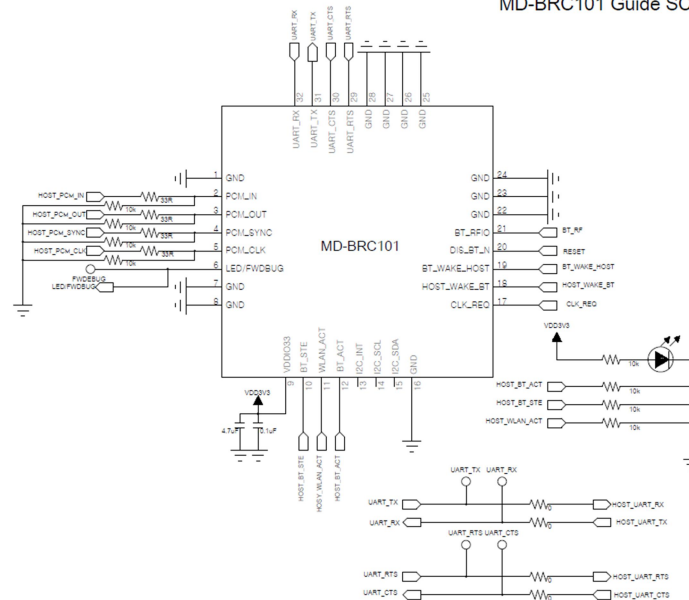
Parameter	Min	Typ	Max	SPEC
Receiver RF Specifications				
Frequency Range	2402	–	2480	
RX sensitivity				
BER @ Pin = -70dBm (%)	0.000	0.000	0.000	≤ 0.1
EDR 2Mbps BER @ Pin = -70dBm	0.00e+000	0.00e+000	0.00e+000	$\leq 10^{-4}$
EDR 3Mbps BER @ Pin = -70dBm	0.00e+000	0.00e+000	0.00e+000	$\leq 10^{-4}$
Maximum input Level				
BER @ Pin = -20dBm(%)	0.000	0.000	0.000	≤ 0.1
Transmitter RF Specifications				
Frequency range	2402	–	2480	MHz
TX Output Power				
Average Power(dBm)	4.92	5.47	4.90	-6~+20
Modulation Accuracy				
Δf_{1avg} (kHz)	164.8	164.6	164.7	140~175
Δf_{2avg} (kHz)	150.8	150.4	150.7	≥ 115
Δf_{2max} (kHz)	134.7	132.5	127.8	≥ 115
Δf_{2max} Pass Rate (%)	100	100	100	≥ 99.9
$\Delta f_{2avg} / \Delta f_{1avg}$	0.91	0.91	0.91	≥ 0.8
Initial Carrier Frequency Tolerance				
Average Offset(KHz)	2.9	2.5	3.2	-75~+75
Max Offset(KHz)	4.1	4.0	4.2	-75~+75
Min Offset(KHz)	1.1	0.4	0.4	-75~+75
Carrier Frequency Drift				
Drift Rate / 50us(KHz)	2.27	2.33	3.61	≤ 20
DH1 Max Drift(KHz)	-6	-6	-5	$\leq \pm 25$
DH1 Avg Drift(KHz)	-4	-2	-3	$\leq \pm 25$
DH3 Max Drift(KHz)	-5	-5	-7	$\leq \pm 40$
DH3 Avg Drift(KHz)	-3	-4	-5	$\leq \pm 40$
DH5 Max Drift(KHz)	-6	-7	-6	$\leq \pm 40$
DH5 Avg Drift(KHz)	-4	-4	-5	$\leq \pm 40$

8.Pin Description

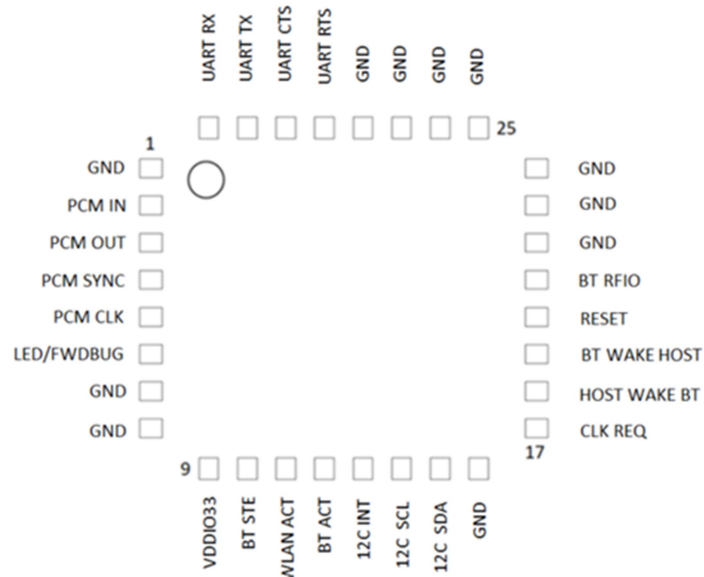
PIN No.	Pin Name	Description	Pad Type
1	GND	Ground connection	
2	PCM_IN/GPIOA[0]	PCM_IN or Programmable A input/output line [0]	
3	PCM_OUT/GPIOA[1]	PCM_OUT or Programmable A input/output line [1]	
4	PCM_SYNC/GPIOA[2]	PCM_SYNC or Programmable A input/output line [2]	
5	PCM_CLOCK/GPIOA[3]	PCM Clock or Programmable A input/output line [3]	
6	LED/FWDEBUG	LED Function pin or Firmware Log Debug	
7	GND	Ground connection	
8	GND	Ground connection	
9	VDDIO33	3.3V power input	
10	BT_STE	Bluetooth Normal Operation & Test Mode	Active Mode : Low Test/Debug Mode : High
11	WLAN_ACT	Reserved interface for RTK	Active Mode : Need to connect 10K to GND
12	BT_ACT	BT Internal Power Mode Select	connect 10K to GND
13	I2C_INT/GPIOB[2]	I2C_INT or Programmable B input/output line [2]	
14	I2C_SCL/GPIOB[1]	I2C_SCL or Programmable B input/output line [1]	
15	I2C_SDA/GPIOB[0]	I2C_SDA or Programmable B input/output line [0]	
16	GND	Ground connection	
17	CLK_REQ/GPIOA[15]	Reserved interface for RTK	
18	HOST_WAKE_BT	Host sleep signal to BT	
19	BT_WAKE_HOST	wake up to Host	
20	DIS_BT_N	Hardware Reset Pin	Active Mode : Low
21	BT_RFIO	Bluetooth RF Port	
22	GND	Ground connection	
23	GND	Ground connection	
24	GND	Ground connection	
25	GND	Ground connection	
26	GND	Ground connection	
27	GND	Ground connection	
28	GND	Ground connection	
29	UART_RTS	UART RTS	
30	UART_CTS	UART CTS	
31	UART_TX	UART transmit data	
32	UART_RX	UART receive data	

9.GUIDE CIRCUIT

MD-BRC101 Guide SCH.

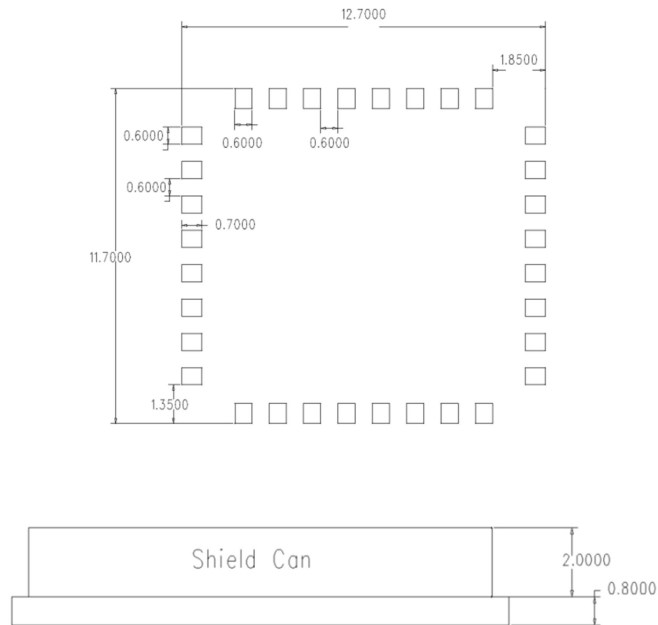


10.PIN MAP

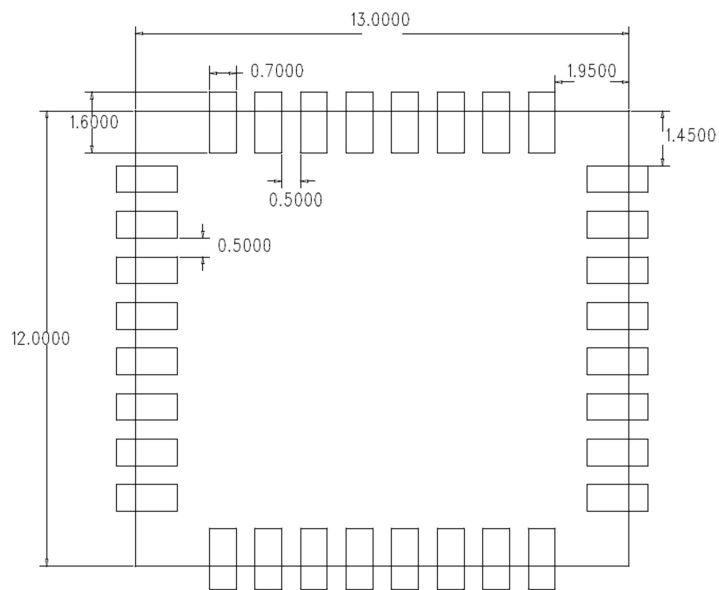


<Top View>

11. Dimension(unit :mm)



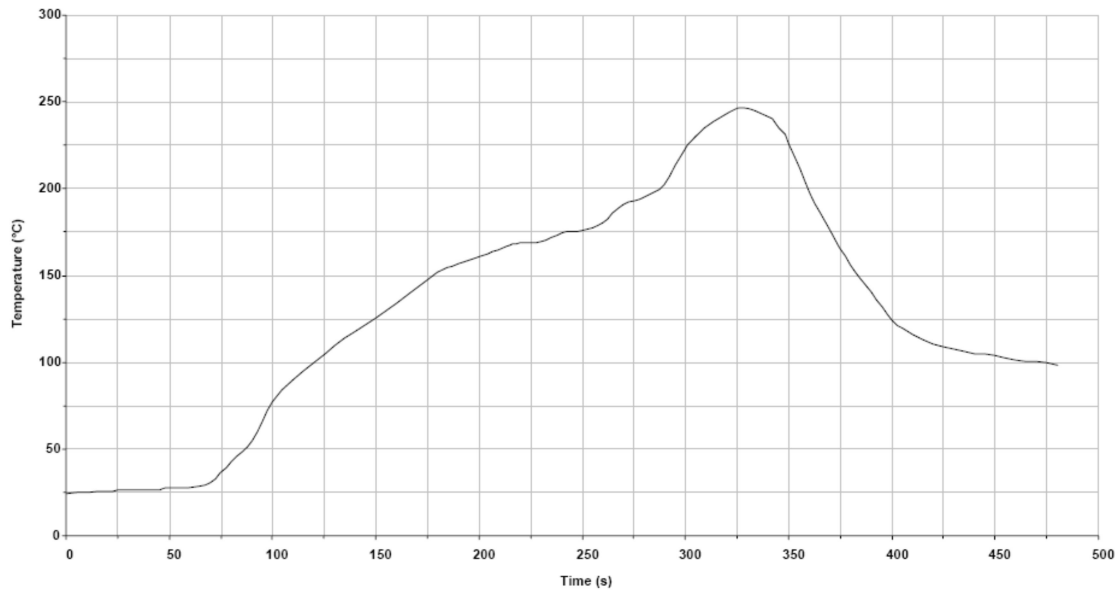
12. Recommended PCB Pattern(Unit : mm)



Soldering & Cleaning Conditions

1. Soldering Conditions

-Solder: Lead Free solder



Key features of the profile:

- Initial ramp = 1-2.5°C/sec to 175°C $\pm$ 25°C equilibrium
- Equilibrium time = 60 to 180 seconds
- Peak temperature = 245°C $\pm$ 5°C
- Ramp to maximum temperature (245°C) = 3°C/sec max.
- Time on maximum temperature = within 10sec
- Time above liquidus temperature (217°C): 45-90 seconds
- Device absolute maximum reflow temperature: 260°C

2. Cleaning conditions

- 1) Cleaning Temperature: 60°C max.
(40°C max. for alternatives and alcohol cleaning agents)
- 2) Ultrasonic
Power: 15W/l max.
Duration: 5 minutes max.
Frequency: 28 to 29 kHz
Care should be taken not to cause resonance of the PCB and mounted products.

3. Handling & Storage

- 1) Handling
 - I) Avoid applying excessive stress to products to prevent damage.
 - II) Do not touch winding with sharp objects such as tweezers to prevent wire breakage.
 - III) Do not apply excessive force to products mounted on boards to prevent core breakage.
- 2) Storage condition

To avoid damaging the solderability of the external electrodes, be sure to observe the following points.

 - I) Storage Period

Even under ideal storage conditions BT module electrode solderability decreases as time passes, so BT module should be used within 60 days from the time of delivery.
 - II) Baking Procedure
- 3) If bag is opened and a module is not reflowed within 168 hours, then you must bake modules as below.
 - Module with Reel Packing: 45°C / 12hours
 - Module out of Reel Packing : 125°C / 2hours.

III) Storage conditions

Storage products in a warehouse in compliance with the following conditions

- Temperature: 15 to 35°C
- Humidity: 20 to 70% (relative humidity)
- Do not subject products to rapid changes in temperature and humidity.
- Do not store them in corrosive gas atmosphere such as one containing sulfurous Acid gas or alkaline gas.

4. Note:

Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.

All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.

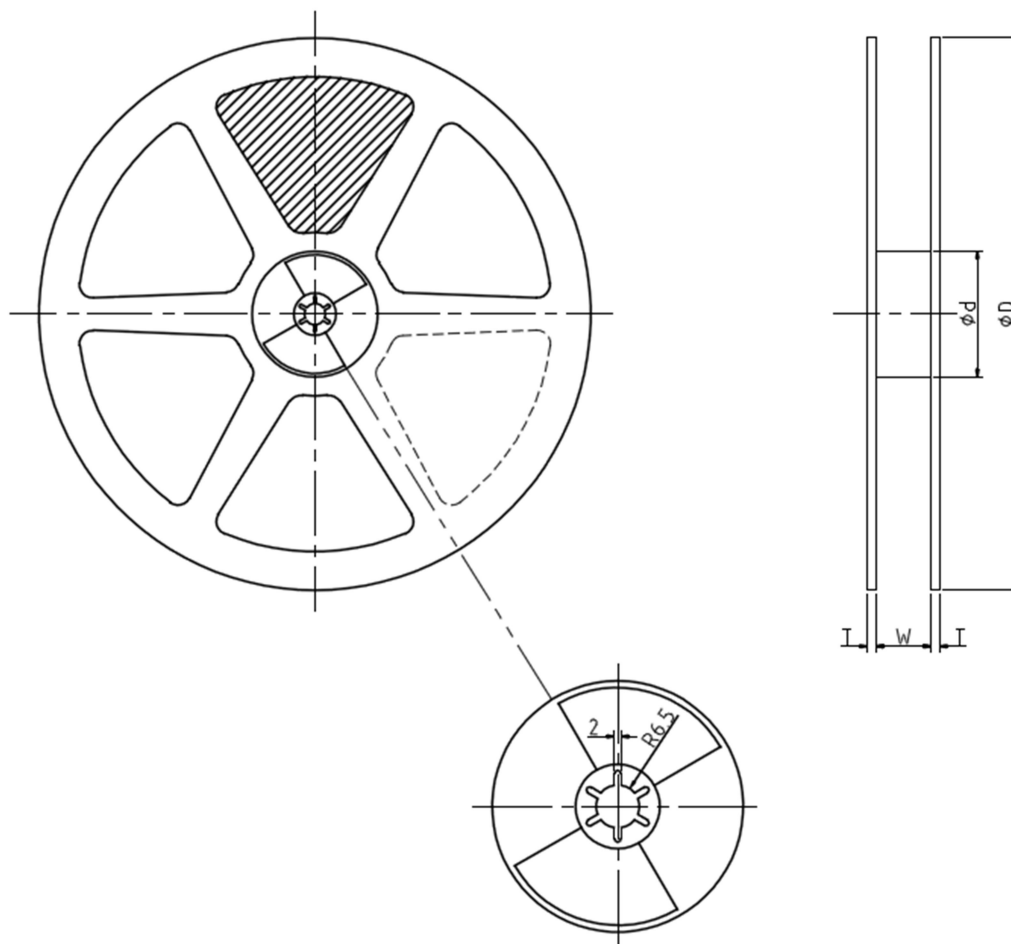
We consider it not appropriate to include other terms and conditions for transaction warranty in product specifications, drawings or other technical documents. Therefore, even if your original part of this product specification includes such terms and conditions as warranty clause, product liability clause, or intellectual property infringement liability clause, we are not able to accept such terms and conditions in this product specification unless they are based on the governmental regulation or what we have agreed other wise in a separate contact. We would like to suggest that you propose to discuss them under negotiation of contract.

Reel information

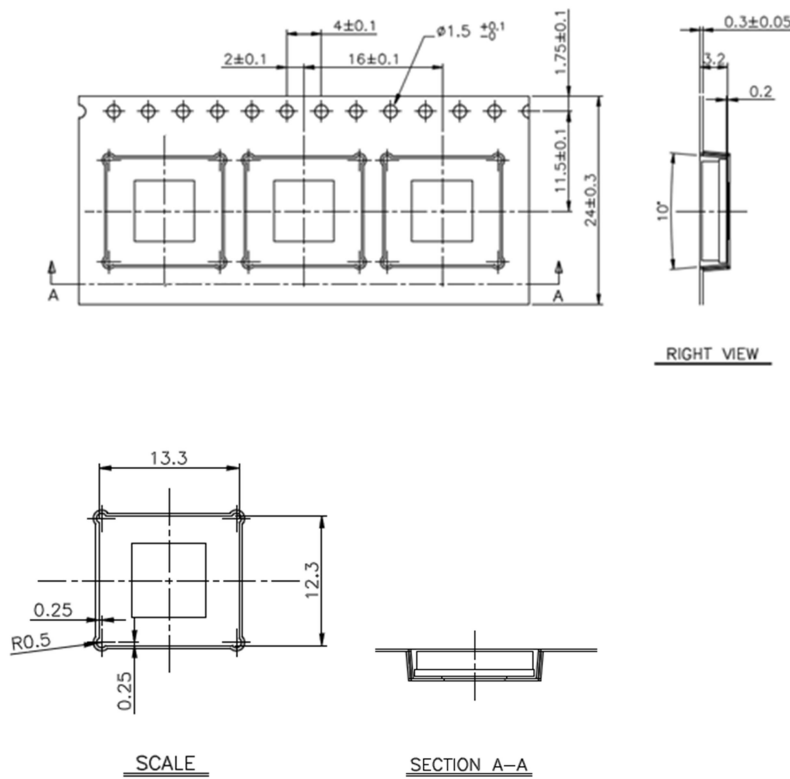
1. Reel dimension

Unit: mm

	$\varnothing D$	$\varnothing b$	T	W
Size	$\varnothing 330^{+0.2}_{-2.0}$	$\varnothing 80^{+0.5}_{-0.2}$	$2^{+0.5}$	2.55



2. Tape dimension



3. Weight information

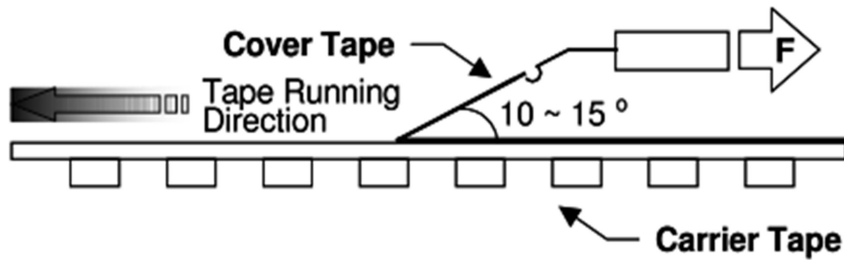
- 1) Module (1 PCS) : 0.8g
- 2) Reel (1,000 PCS) : 1.24Kg

4. Tape type

- 1) Carrier Tape : PolyStylene
- 2) Cover Tape : Polyester

5. Cover tape detachment

- 1) Detachment strength : $F = 20 \sim 90g$
- 2) Detachment speed : 50mm/sec



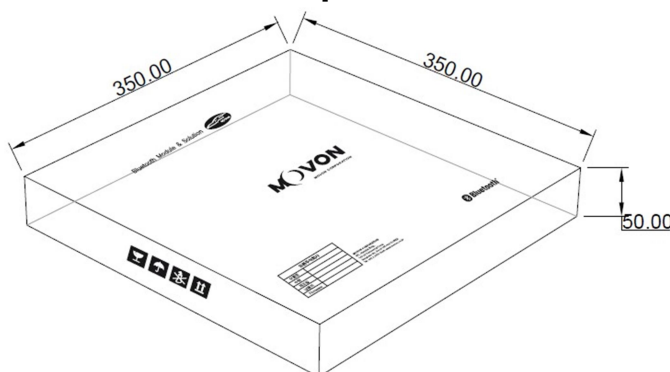
6. Module label specification



7. Reel label specification

모본(주)	
모델명	MD-BRC101
수량	1,000pcs
제조일	2020.07.01
납품처	인텍디지털
펌웨어 ID	-

8. Out carton box specification



PACKING METHOD	
Parts Name	BLUETOOTH MODULE
Model Name	MD-BRC101
Box Size (mm)	355 mm(W) * 358 mm(D) * 50 mm(H)
Box MATERIAL	CARTON BOX
Box WEIGHT (Kg)	1.5(Kg)
QUANTITY (EA)	1,000(EA)
Packing METHOD	Packing STATION(PHOTO)
1) Reel PACK ↓ 2) 진공 정전 PACK 작업 ↓ 3) BOX 포장 및 라벨링	  
*Packing CAUTION	
1.Total box weight must not exceed 8.2Kg(including Box). 2.Box Size must not exceed 650mm(W) * 550mm(D) * 450mm(H). 3.Part content sheet must be attached. *Model Name, Parts Name, Parts Code,Quantity,Date	