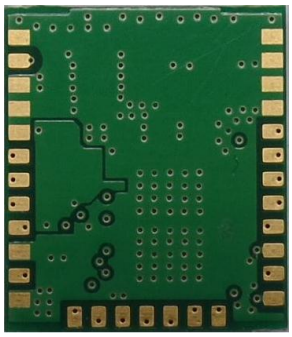
WISOL / SFM10R3

P/N: WSSFM10R3AT

DATA SHEET Rev.03



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STELIAU TECHNOLOGY

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1. Approval Revision Record

NO	REASON	RECORD OF REVISION	Date	Remark
1	REV00	WSSFM10R3AT Approval Releases	2017-04-11	
2	REV01	TELEC Mark added	2017-06-30	
3	REV02	DC characteristics changed	2017-09-04	
4	REV03	'ESD Warning' added.	2018-07-02	

2. Scope

Description : Sigfox Module RC3.a(BW=36KHz)

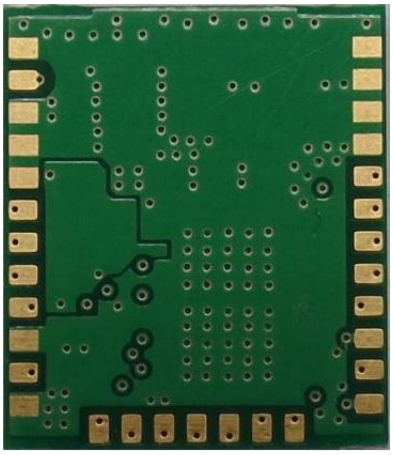
Type : SMD Type

PCBA Size : 13mm(W) x 15mm(L) x 2.21mm(H)

This module is SIGFOX verified and that the TELEC are completed.

3. Numbering of product

3-1. Product



3-2. Part No.

W	S	**S**	**F**	**M**	**1**	**0**	**R**	**3**	A	T
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

No.	EXPLANATION
(1),(2)	WISOL
(3),(4)	Application (SF:Sigfox)
(5)	Type (M:Module)
(6),(7)	Group model numbering
(8), (9)	Region Code(R3:Japan)
(10),(11)	Application Type(Firm Ware Type) AT(AT command version) AP(API version)

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3-3. Lot. No.

S	A	C	J	A	1	0	0	1
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

①	Sigfox Module
②	Manufacture Area Packing Lot: A / B / C Area: Korea / China / Vietnam
③	Year 2010 W, 2011 X, 2012 Y, 2013 Z, 2014 A, 2015 B, 2016 C, 2017 D, 2018 E, 2019 F
④	Month 1 A, 2 B, 3 C, 4 D, 5 E, 6 F, 7 G, 8 H, 9 I, 10 J, 11 K, 12 L
⑤	Day 1 1, 2 2, 3 3, 4 4, 5 5, 6 6, 7 7, 8 8, 9 9, 10 A 11 B, 12 C, 13 D, 14 E, 15 F, 16 G, 17 H, 18 I, 19 J, 20 K 21 L, 22 M, 23 N, 24 O, 25 P, 26 Q, 27 R, 28 S, 29 T, 30 U, 31 V
⑥⑦	Model Serial Number (10,11,12,13…)
⑧⑨	A Serial Number (1serial: 900ea)

4. Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
VCC	Module input voltage	-0.5 to 5.5	V
OT	Operating Temperature	-30 to +85	℃
ST	Storage Temperature	-40 to +125	℃

5. DC Characteristics

Symbol	Parameter	Min	Typ.	Max	Unit
VCC	Module input voltage	2.0	3.3	3.6	V
Current (@+3.3V)	Tx Current(@+14.0dBm,MOD)	-	57	-	mA
	Tx Current(@+13.0dBm,MOD)	-	47	-	mA
	Rx Current	-	13.5	-	mA
	Sleep Current Deep Sleep Current	-	1.7 0.13	-	uA

6. I/O Specifications

Symbol	Parameter	Min	Typ.	Max	Unit
VIH	High level input voltage @VCC=3.3V	2.0			V
VIL	Low level input voltage @VCC=3.3V			0.8	V

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7. RF Specifications

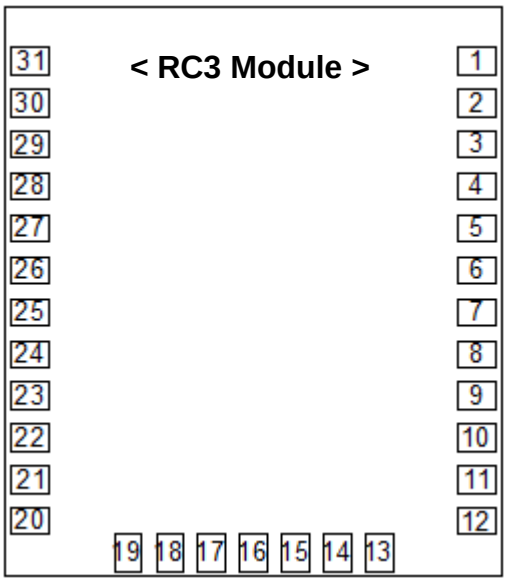
Conditions: VCC=3.3V, Temp=25℃

Parameter		Min	Typ.	Max	Unit
RF Characteristics					
RF Frequency	Tx(BW: 36KHz)		923.2		MHz
	Rx		922.2		MHz
Tx output power(at “15” setting)			14.0		dBm
Tx output power(at “14” setting)			13.0		dBm
Frequency Error Tolerance(+25℃)		-2.5	-	+2.5	ppm
2nd Harmonics(conducted)		-	-37	-35	dBm
3nd Harmonics(conducted)		-	-41	-35	dBm
Rx Sensitivity(@600bps, GFSK)		-	-127	-	dBm
Rx Spurious Emission(30MHz~12.75GHz)				-54	dBm

* Because of output power variation of modules the maximum output power can be over 13dBm, so we recommend to set 14 as default output setting.

8. Pin Description

8-1. Interface PIN(SMD Type : 31 Pin)_Bottom view



1	GND	9	GPIO5	17	TXLED/ DBG_CLK	25	GPIO2
2	GND	10	GPIO4	18	NC4/DBG_EN	26	GPIO3
3	GND	11	CPU_LED	19	RST_N	27	GND
4	GND	12	RADIO_LED	20	GND	28	GND
5	NC3/ SYSCLK	13	GPIO9	21	VDD_IO	29	GND
6	GPIO8	14	UARTTX	22	GND	30	RF_IO
7	GPIO7	15	UARTRX	23	GPIO0	31	GND
8	GPIO6	16	RXLED/ DBG_DATA	24	GPIO1		

Pin-map of RC1, RC2, RC3 and RC4 module is compatible (Pin to Pin)

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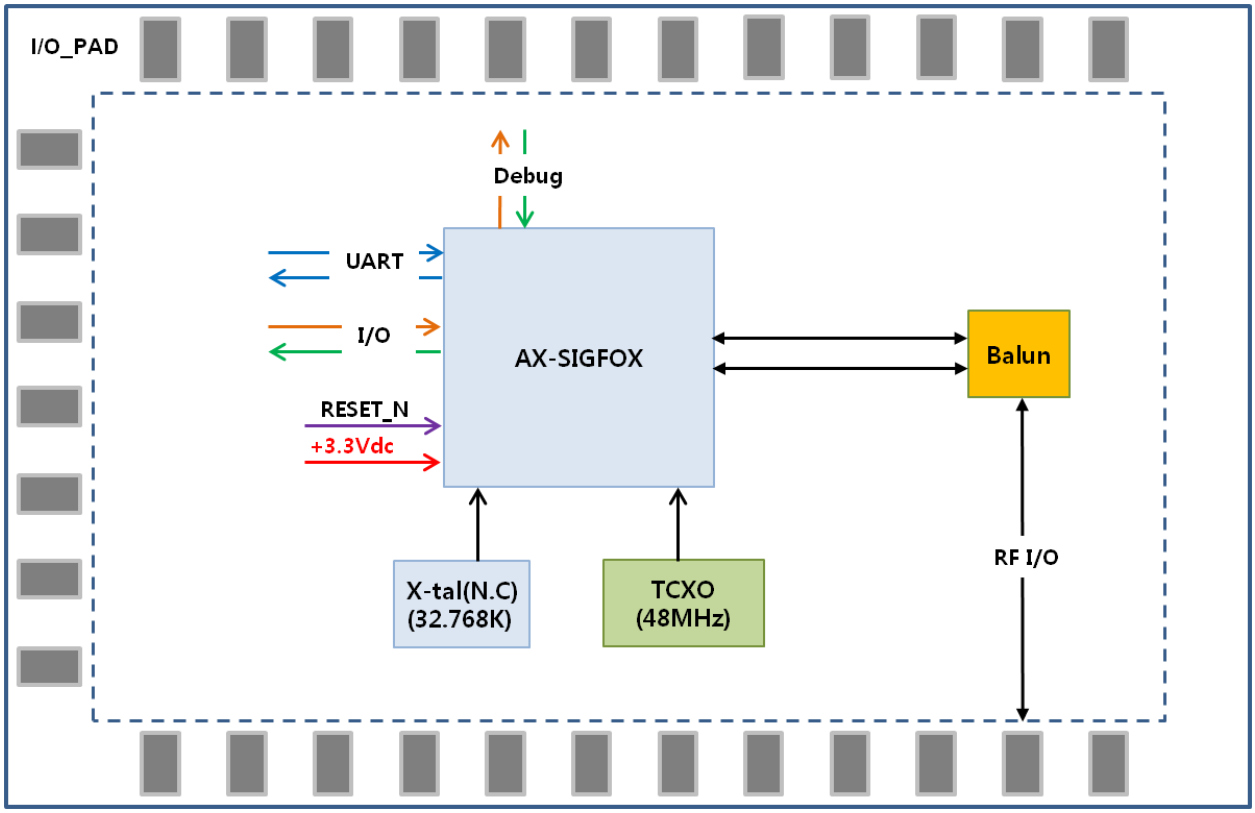
8-2. Interface PIN description

PIN(s)	NAME	TYPE	Description
1~4	GND	P	Ground
5	NC3/SYSCLK	N	Do not connect
6	GPIO8	I/O/PU	General purpose IO
7	GPIO7	I/O/PU	General purpose IO, selectable SPI functionality (MISO)
8	GPIO6	I/O/PU	General purpose IO, selectable SPI functionality (MOSI)
9	GPIO5	I/O/PU	General purpose IO, selectable SPI functionality (SCK)
10	GPIO4	I/O/PU	General purpose IO, selectable ∑Δ DAC functionality, selectable dock functionality
11	CPU_LED	O	CPU activity indicator
12	RADIO_LED	O	Radio activity indicator
13	GPIO9	I/O/PU	General purpose IO, wakeup from deep sleep
14	UARTTX	O	UART transmit
15	UARTRX	I/PU	UART receive
16	RXLED/DBG_DATA	O	Receive activity indicator
17	TXLED/DBG_CLK	O	Transmit activity indicator
18	NC4/DBG_EN	PD	Do not connect
19	RST_N	I/PU	Optional reset pin
20	GND	P	Ground
21	VDD_IO	P	Power supply
22	GND	P	Ground
23	GPIO0	I/O/A/PU	General purpose IO, selectable ADC functionality, selectable ∑Δ DAC functionality, selectable clock functionality
24	GPIO1	I/O/A/PU	General purpose IO, selectable ADC functionality
25	GPIO2*	I/O/A/PU	General purpose IO, selectable ADC functionality
26	GPIO3*	I/O/A/PU	General purpose IO, selectable ADC functionality
27	GND	P	Ground
28~29	GND	P	Ground
30	RF_IO	A	RF input/output
31	GND	P	Ground

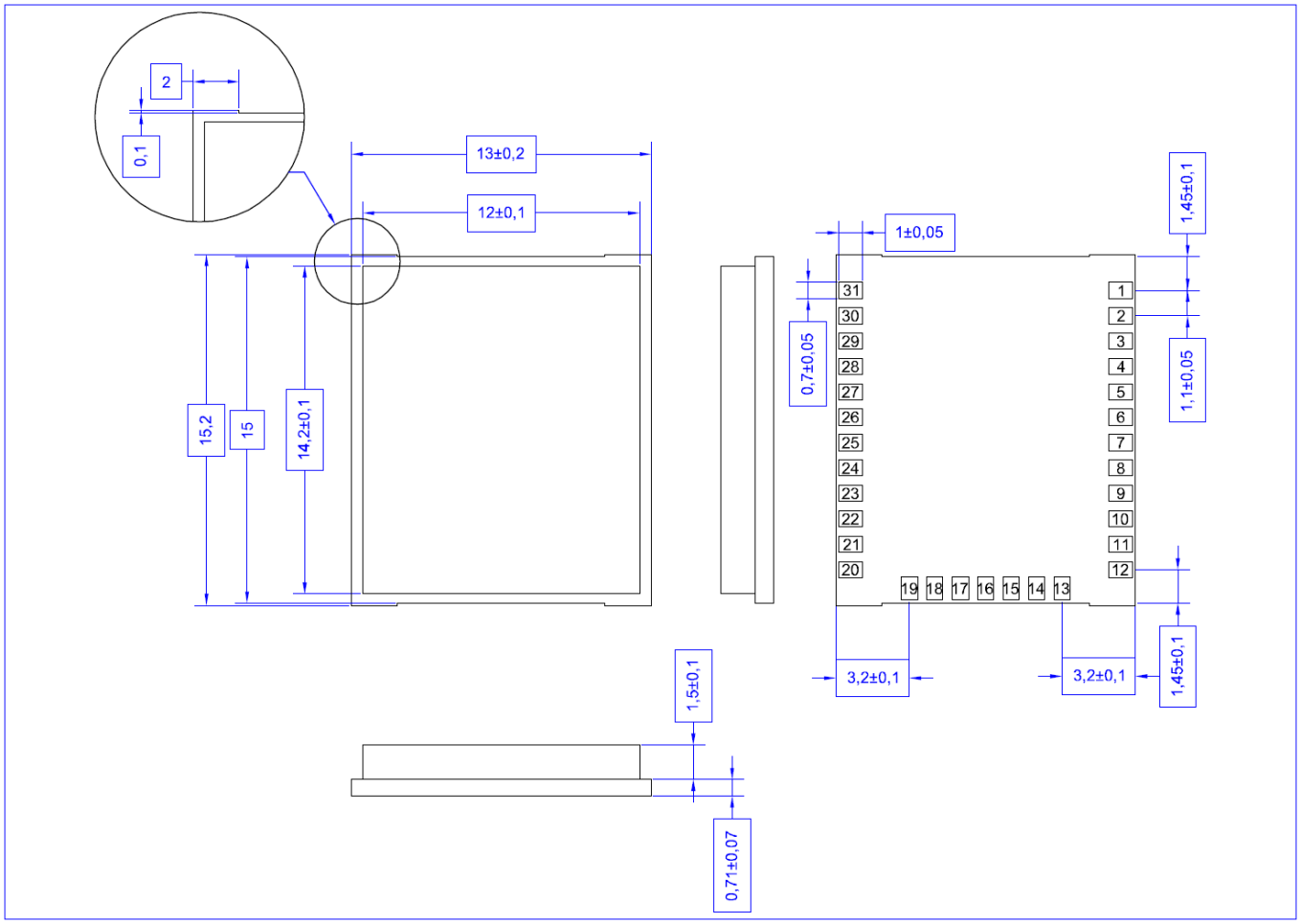
* The GPIO2 and GPIO3 pin as “Not connected” state if the product is designed to be compatible with RC2 and RC4 module.

9. Block Diagram

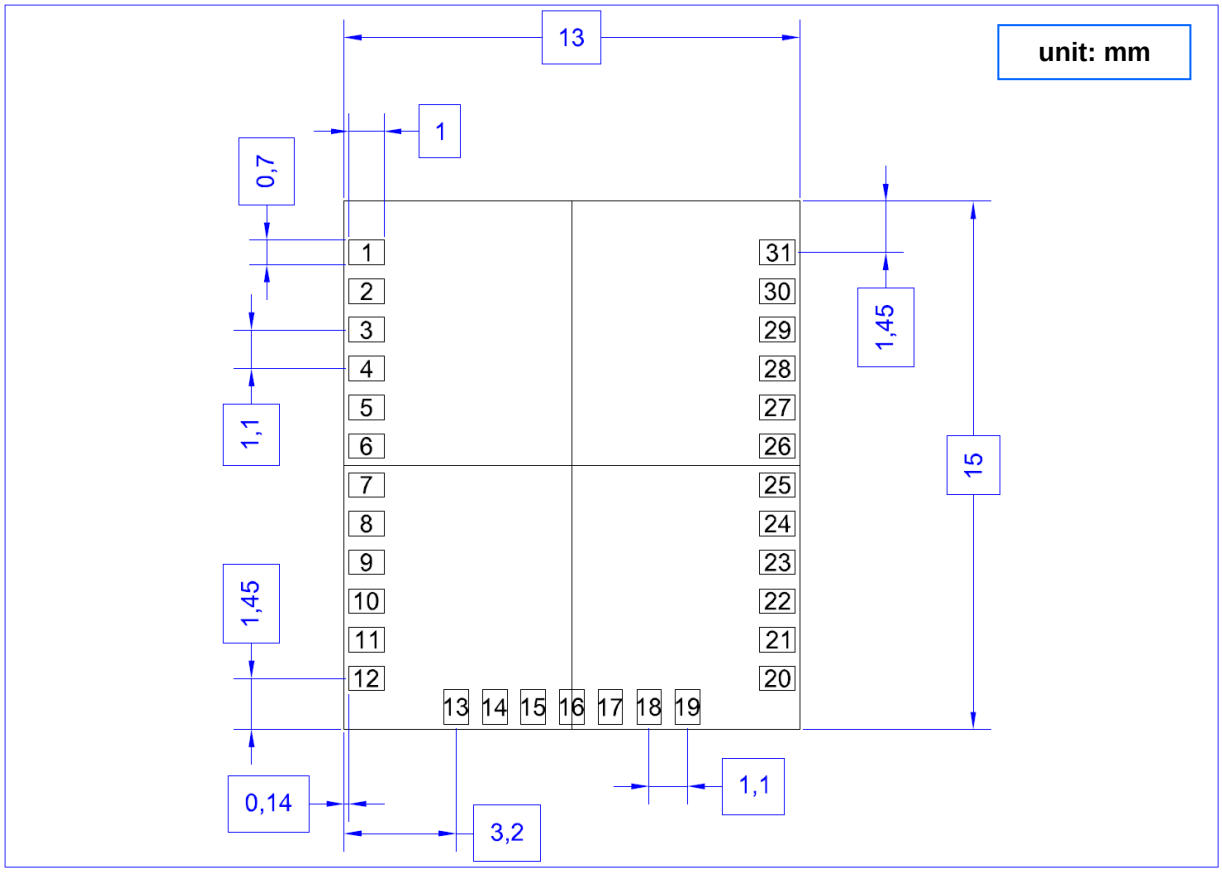


10. Dimensions & drawing

10-1. Design dimension



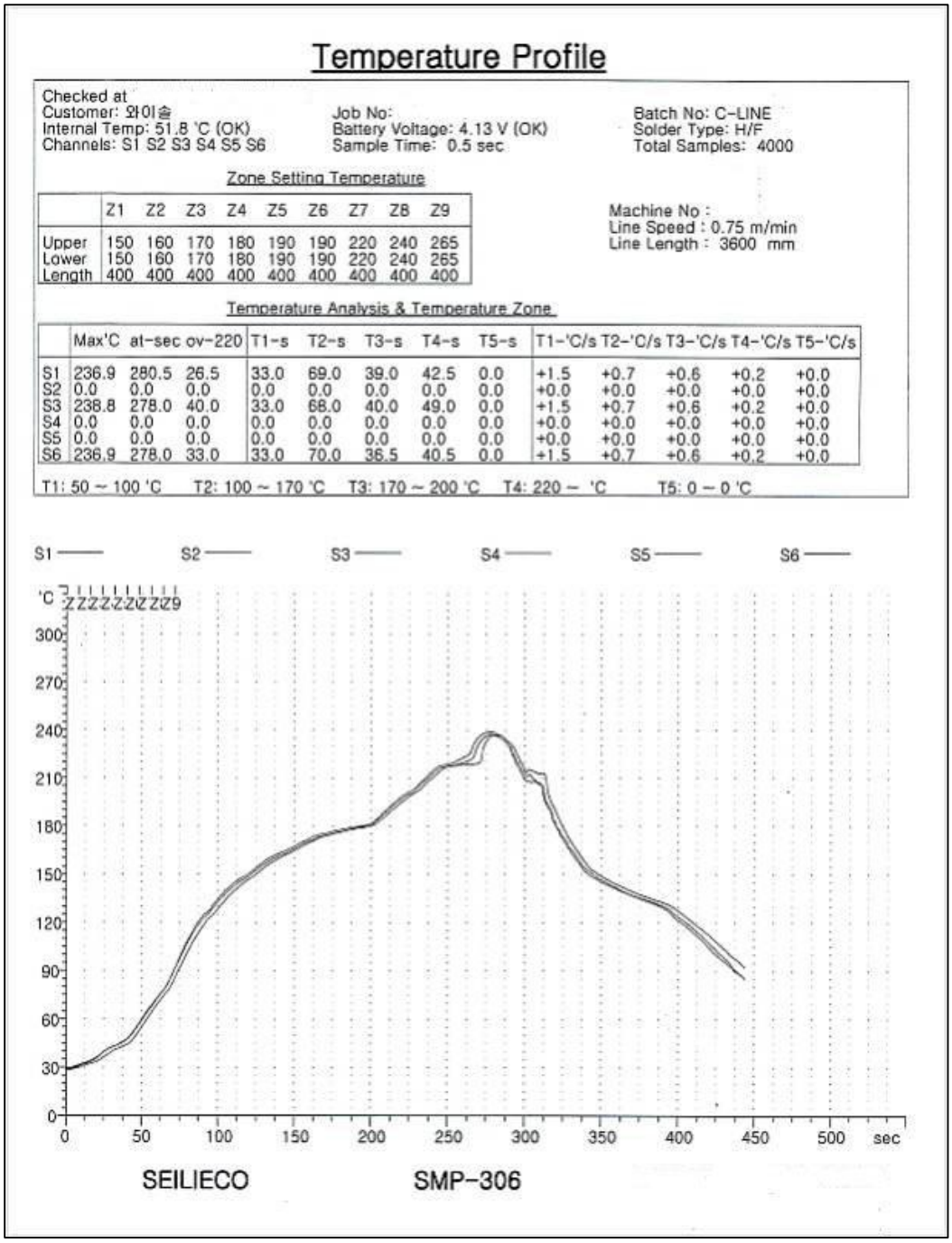
10-2. Soldering Footprint



[TOP View]

11. Reflow profile

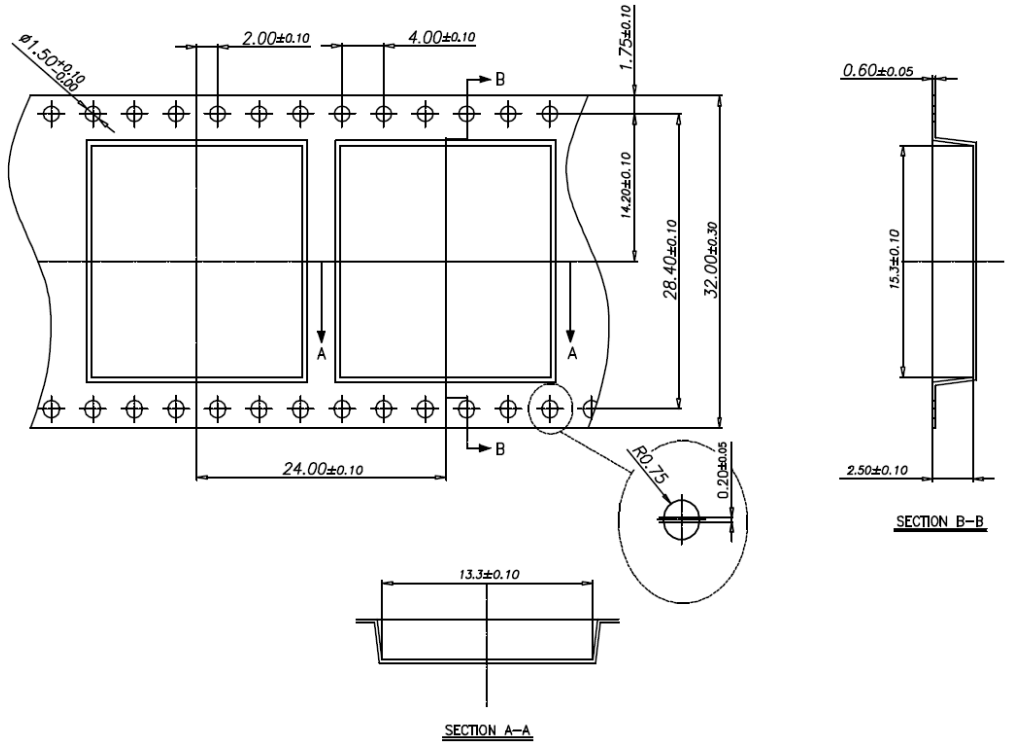
<Reflow profile of Module>



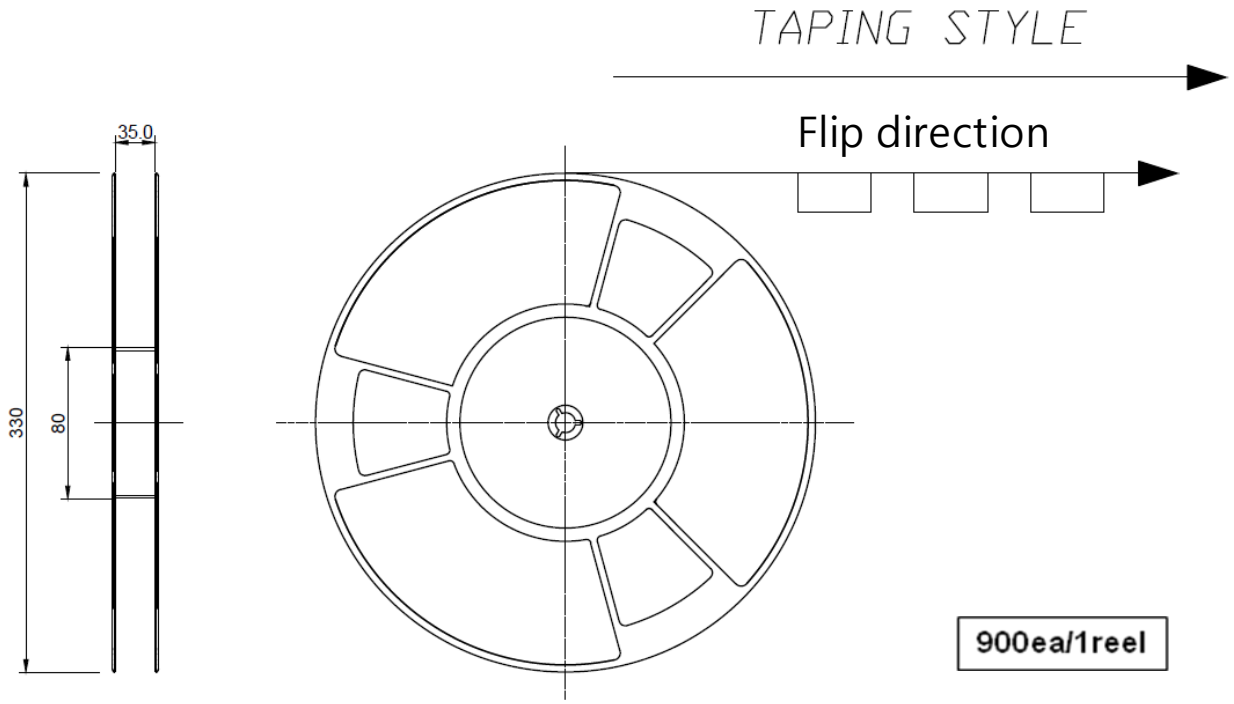
SPEC	Preheat	Soak	Ramp	PEAK
	50~100℃	100~170℃	220℃ ↑	240℃
	1~2℃/sec	60~100sec	30~50sec	±5℃
result of measurement	1.5	69	44	237.5
	OK	OK	OK	OK

12. Package

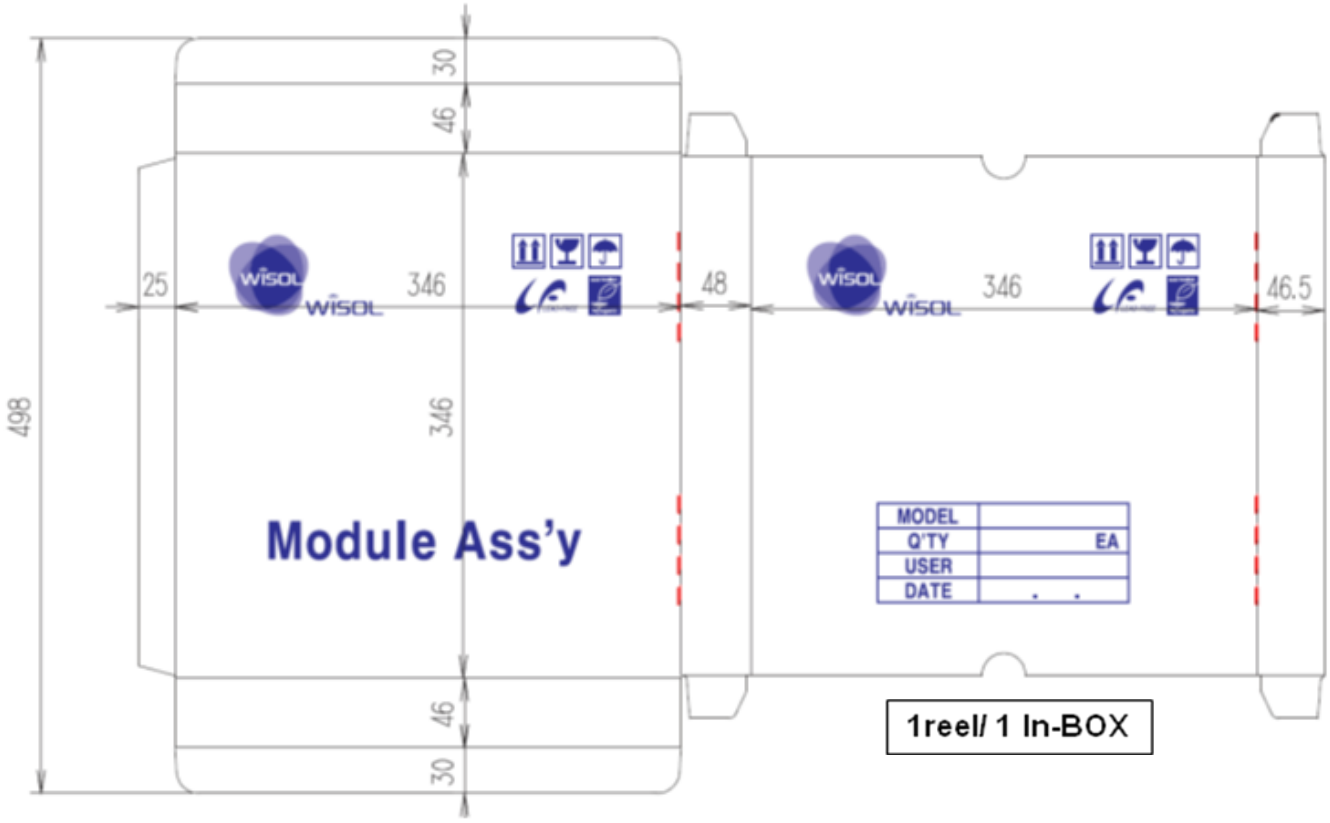
12-1. Dimension of Tape



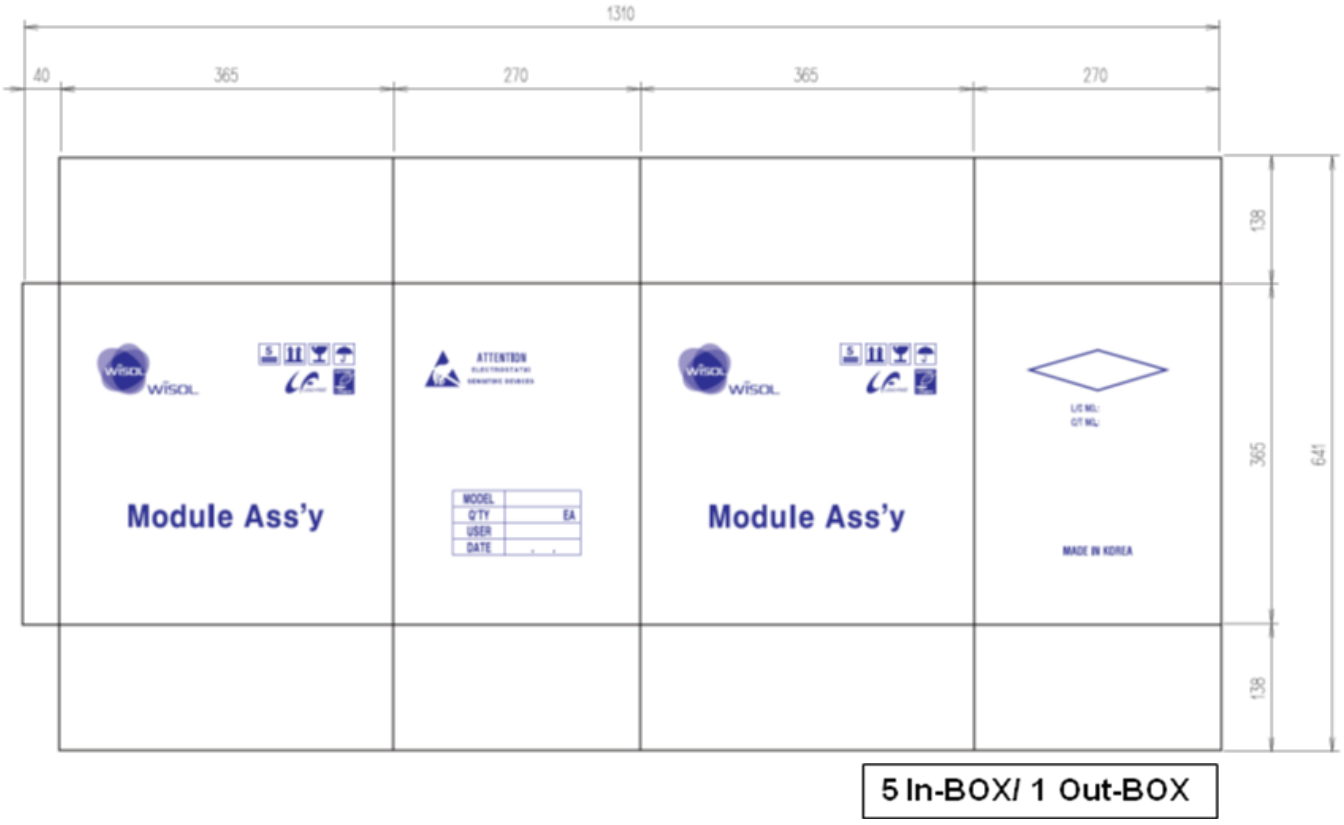
12-2. Dimension of Reel



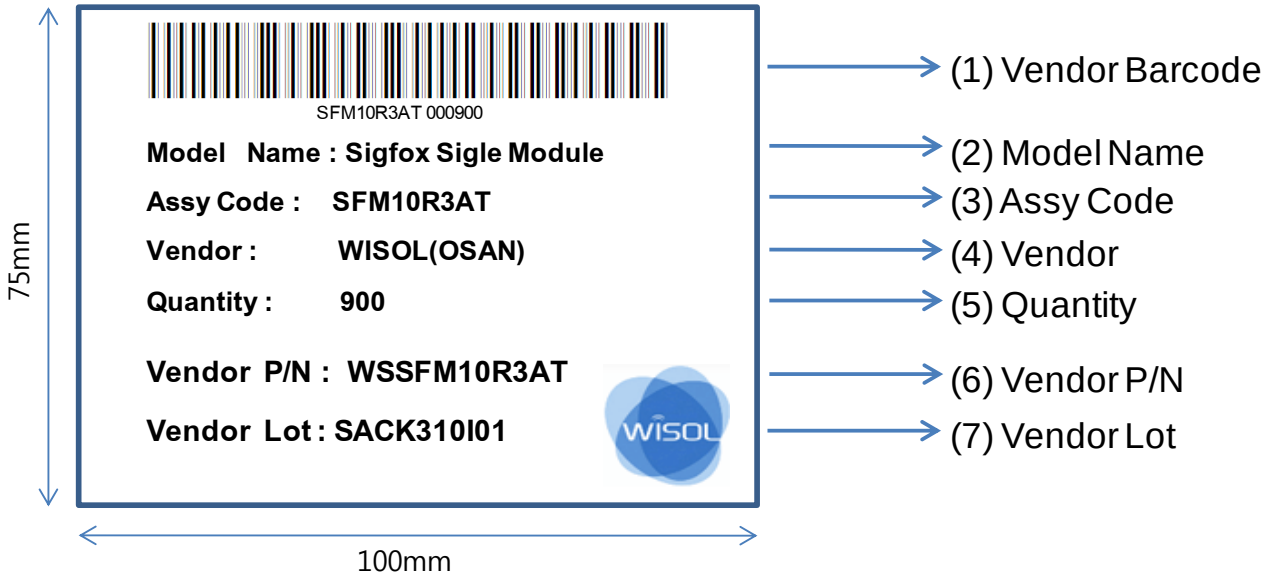
12-3. IN BOX



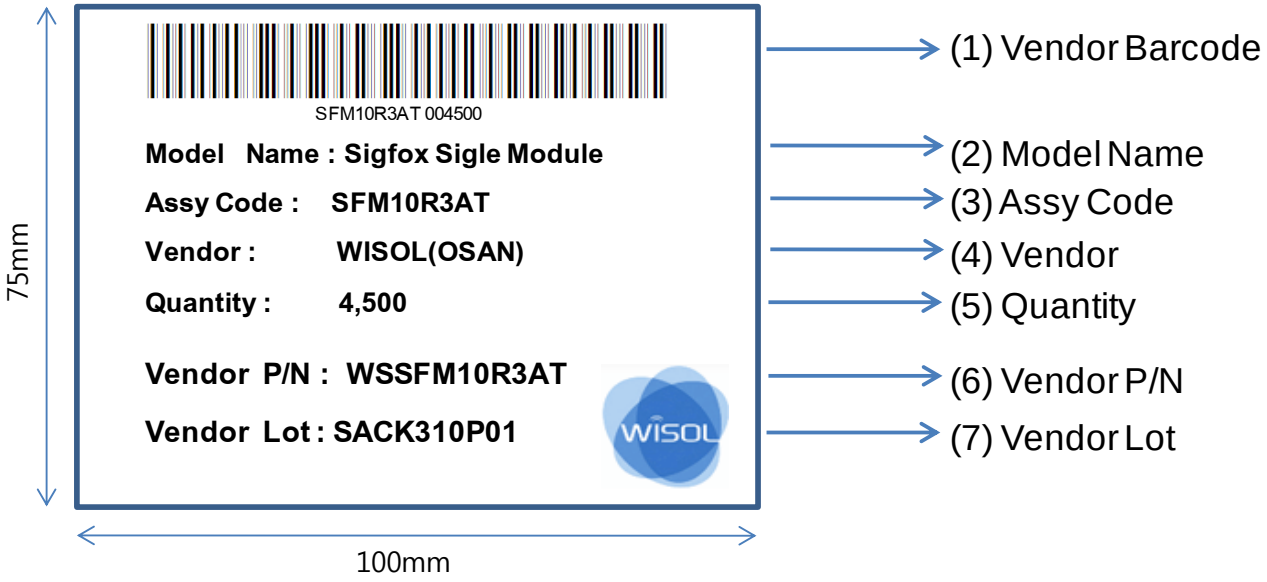
12-4. OUT BOX



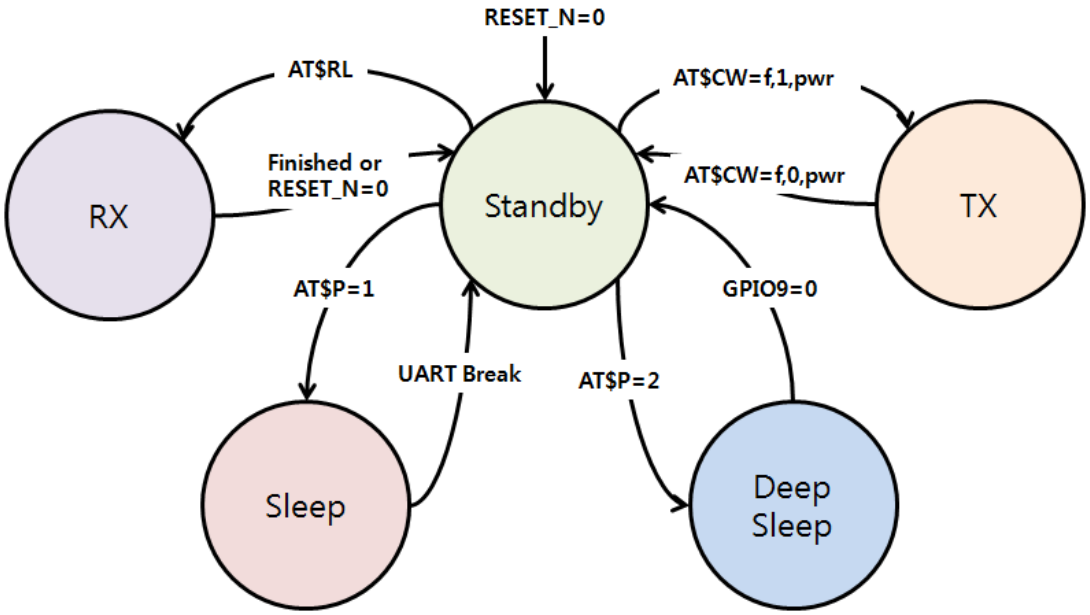
12-5. IN BOX Label



12-6. OUT BOX Label



13. Power Modes



13-1. TX current test

1. Disconnect Debug Switch(SW5~SW9) on EVB
2. Connect UART Switch(SW10~SW11) on EVB
3. Power switch ON(SW4) on EVB
4. Push the RESET Switch(SW1) on EVB
5. Initial mode=Standby mode (@500uA/ Remove J2-CPULED jumper)
6. TX current test method
   1) Input AT command 'AT' (UART condition checking)
   2) Click the Quick command (MOD JP ON : default power table '15') or
      Input AT command 'AT$IF=923200000 click 'Send' icon, then 'ATS302=15', click 'Send' Icon, 'AT$CB=-1,1' and then click 'Send' icon.
      For changing RF power, use 'ATS302=XX' and then click 'Send' icon instead of using 'ATS302=15'
   3) Disconnect UART Switch(SW10~SW11) on EVB
   4) And then, Check TX current

13-2. RX current test

1. Disconnect Debug Switch(SW5~SW9) on EVB
2. Connect UART Switch(SW10~SW11) on EVB
3. Power switch ON(SW4) on EVB
4. Push the RESET Switch(SW1) on EVB
5. Initial mode=Standby mode (@500uA/ Remove J4-CPULED jumper)
3. RX current test method
   1) Input AT command 'AT' (UART condition checking)
   2) Input AT command 'AT$RL' and then click 'Send' icon.
   3) Disconnect UART Switch(SW10~SW11) on EVB
   4) And then, Check TX current.

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13-3. Sleep current test

1. Disconnect Debug Switch(SW5~SW9) on EVB
2. Connect UART Switch(SW10~SW11) on EVB
3. Power switch ON(SW4) on EVB
4. Push the RESET Switch(SW1) on EVB
5. Initial mode= Standby mode (@500uA/ Remove J2-CPULED jumper)
6. Sleep current test method
   1) Input AT command‘AT’(UART condition checking)
   2) Input AT command‘AT$P=1’(sleep mode command)
   3) Disconnect UART Switch(SW10~SW11) on EVB
   4) And then, Check Sleep current

13-4. Deep sleep current test

1. Disconnect Debug Switch(SW5~SW9) on EVB
2. Connect UART Switch(SW10~SW11) on EVB
3. Power switch ON(SW4) on EVB
4. Push the RESET Switch(SW1) on EVB
5. Initial mode= Standby mode (@500uA/ Remove J2-CPULED jumper)
6. Sleep current test method
   1) Input AT command‘AT’(UART condition checking)
   2) Input AT command‘AT$P=2’(sleep mode command)
   3) Disconnect UART Switch(SW10~SW11) on EVB
   4) And then, Check Sleep current
   5) If the module wakes up, Push the tact switch(SW2: wakeup PIN) on EVB

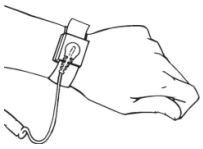
ESD Warning

This modules are ESD sensitive devices, appropriate precautions should be taken during the module assembly in the final product.
Mechanical impact and harsh tools must be avoided during the module assembly in the final product.

Product ESD specification:
• HBM ±2kV

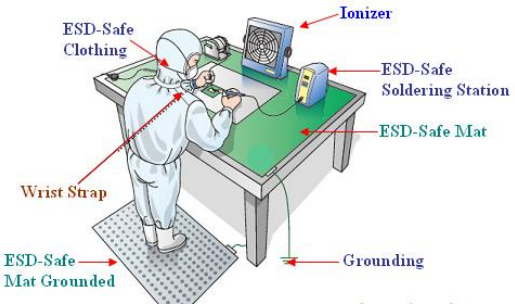
The following precautions must be taken:

• Do not open the protective conductive packaging until you have use the following, and are at an approved anti-static work station.



• Use a conductive wrist strap attached to a good earth ground.

• If working on a prototyping board, use a soldering iron or station that is marked as ESD-safe.
• If possible, use SMT equipment(reflow) when making prototype boards.
• Use an approved anti-static mat to cover your work surface.



• Always discharge yourself by touching a grounded bare metal surface or approved anti-static mat before picking up an ESD - sensitive electronic component.