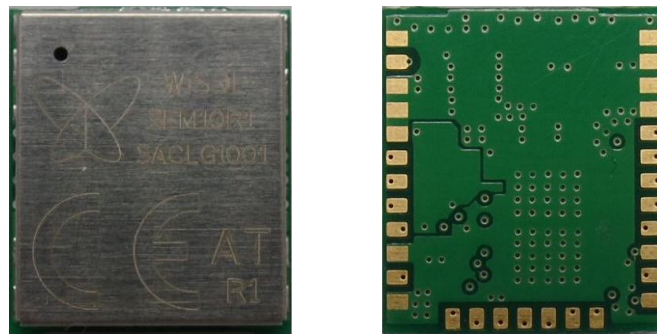


# WISOL / WSSF10R1AT

DATA SHEET Rev.14



## WISOL

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Rep. of Korea

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## 1. Scope

Description : Sigfox Module RCZ1

Type : SMD Type

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

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

## 2. Numbering of product

### 2-1. Product



### 2-2. Part No.

<b>W</b>	<b>S</b>	<b>S</b>	<b>F</b>	<b>M</b>	<b>1</b>	<b>0</b>	<b>R</b>	<b>1</b>	<b>A</b>	<b>T</b>
(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
(10),(11)	Application Type(Firm Ware Type) AT(AT command version) AP(API version)

### 3. Absolute Maximum Ratings

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

### 4. DC Characteristics

Symbol	Parameter	Min	Typ.	Max	Unit
VCC	Module input voltage	1.8	3.3	3.6	V
Current	Tx Current(@”15”setting,MOD)	-	65	-	mA
	Tx Current(@”14”setting,MOD)	-	54	-	mA
	Rx Current	-	15	-	mA
	Sleep Current	-	2	-	uA

### 5. 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 @CC=3.3V			0.8	V

## 6. RF Specifications

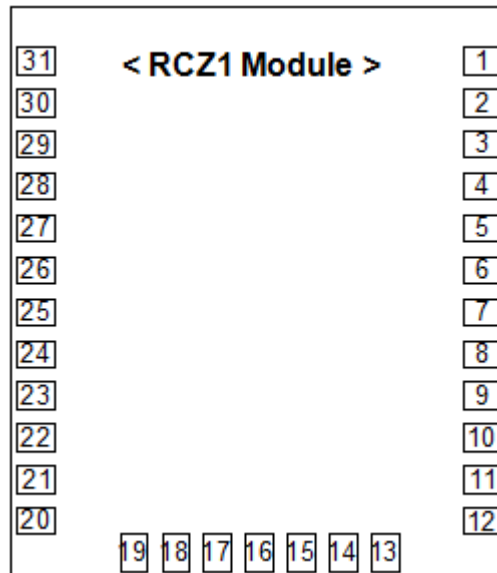
Conditions: VCC=3.3V, Temp=25°C

Parameter		Min	Typ.	Max	Unit
<b>RF Characteristics</b>					
RF Frequency	Tx		868.130		MHz
	Rx		869.525		MHz
Tx output power(at "15" setting)		12.5	13.5	15.5	dBm
Tx output power(at "14" setting)		11.5	12.5	14.5	dBm
Frequency Error Tolerance(+25°C)		-2.5	-	+2.5	ppm
2 <sup>nd</sup> Harmonics(conducted)		-	-37	-35	dBm
3 <sup>rd</sup> 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 14dBm, so we recommend to set 14 as default output setting.

## 7. Pin Description

7-1. 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/ SYSCCLK	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		

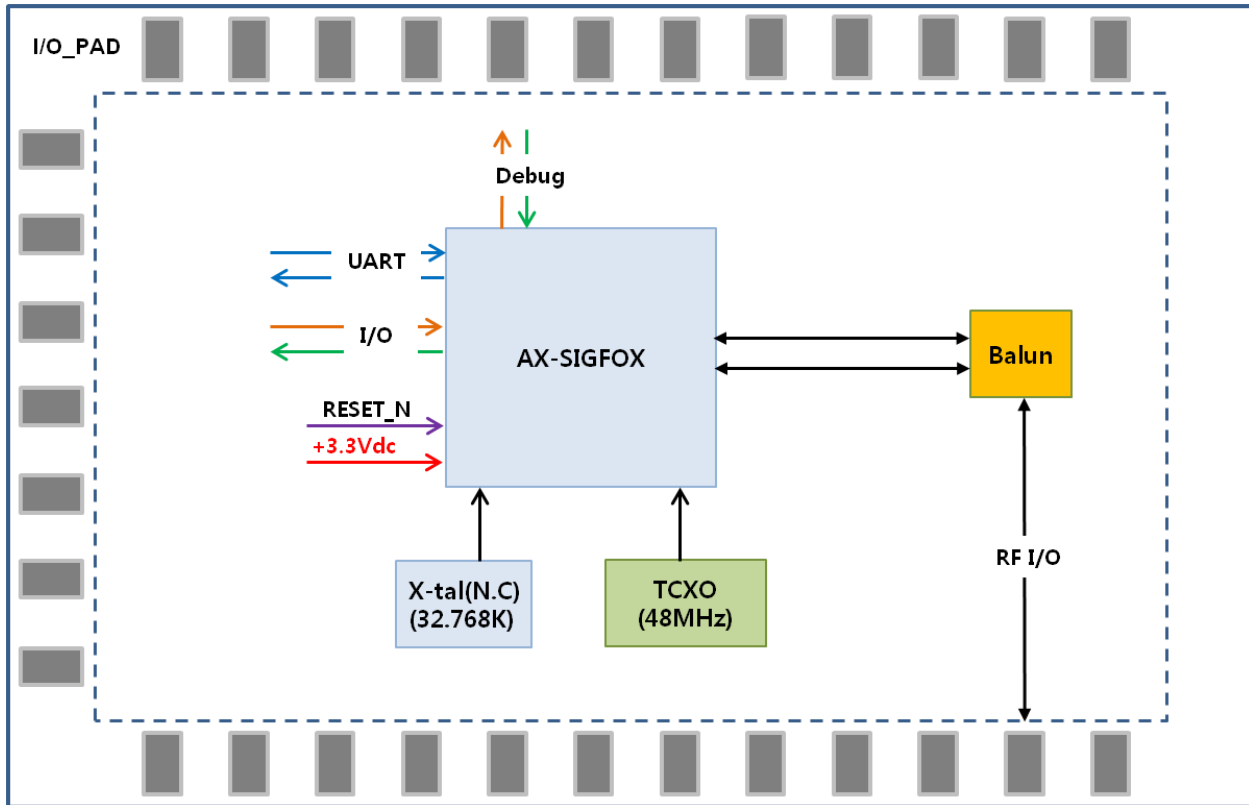
# Pin-map of RCZ1, RCZ2, RCZ3 and RCZ4 module is compatible (Pin to Pin)

## 7-2. 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 $\Sigma\Delta$ 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 $\Sigma\Delta$ 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 RCZ2 and RCZ4 module.

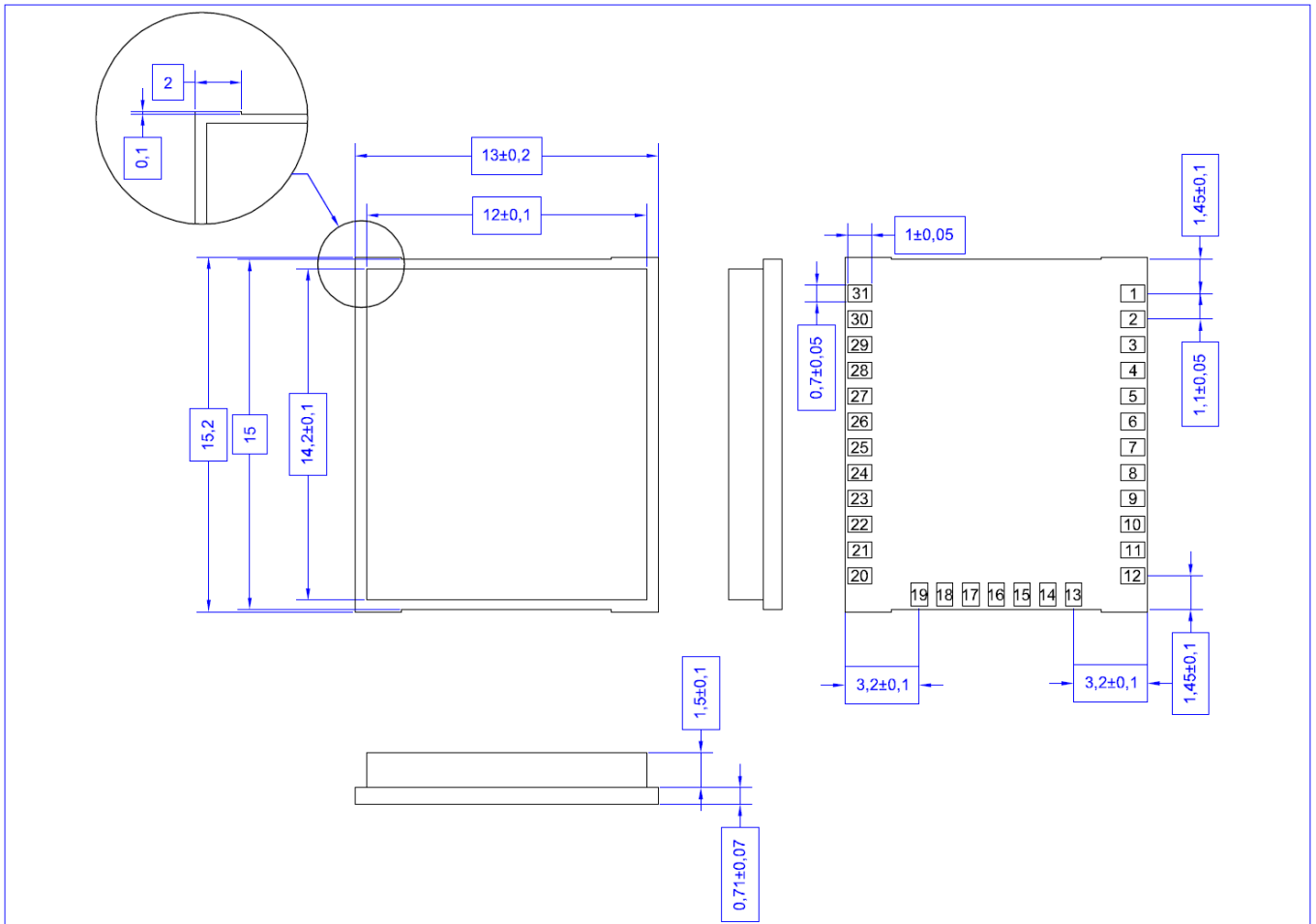
### 8. Block Diagram



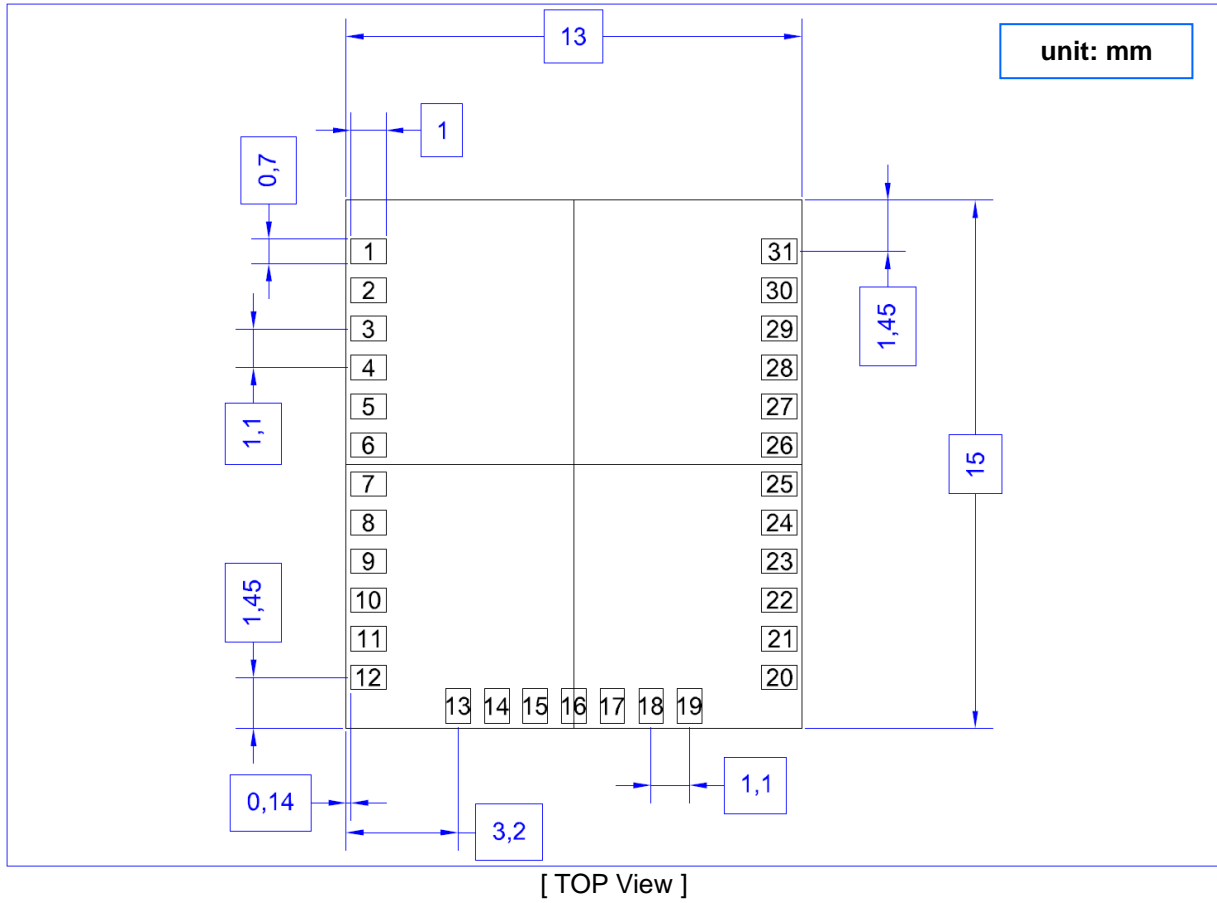


### 9. Dimensions & drawing

#### 9-1. Design dimension

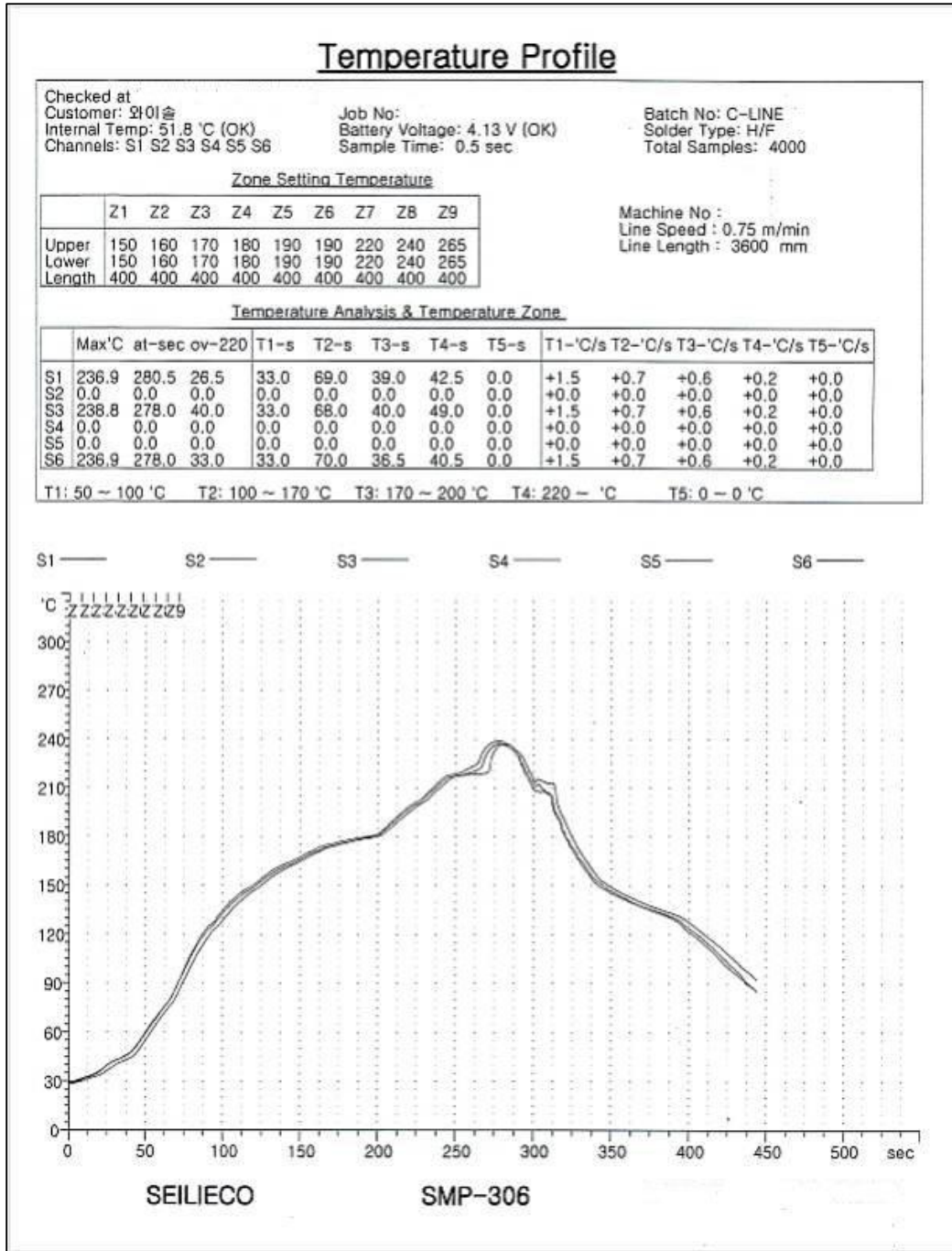


9-2. Soldering Footprint



10. Reflow profile

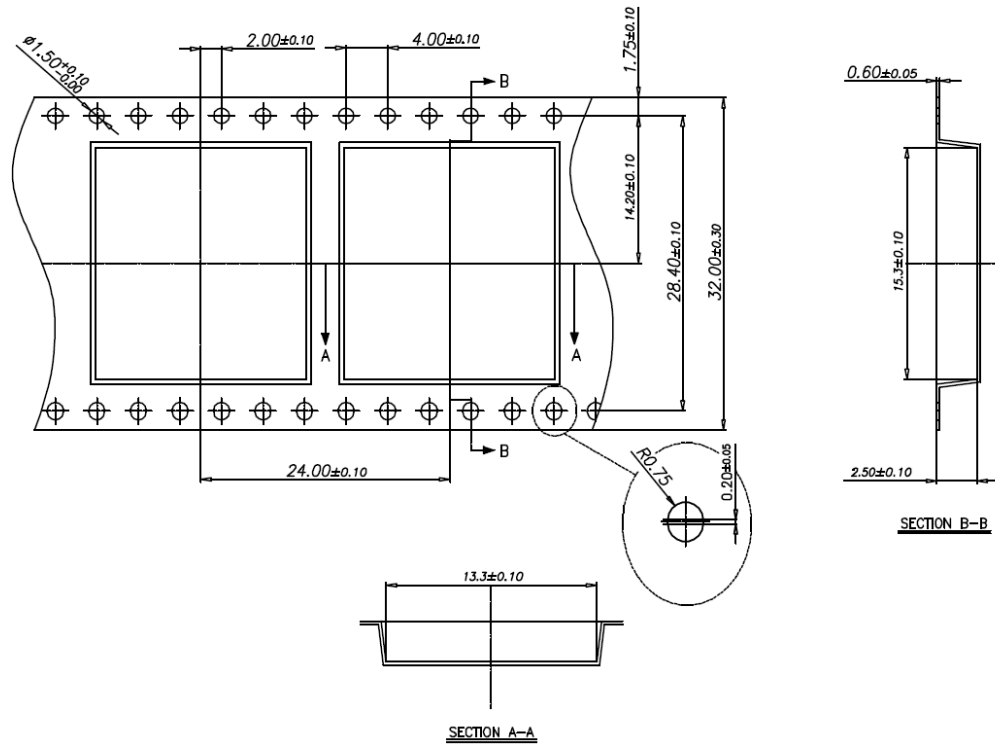
<Reflow profile of Module>



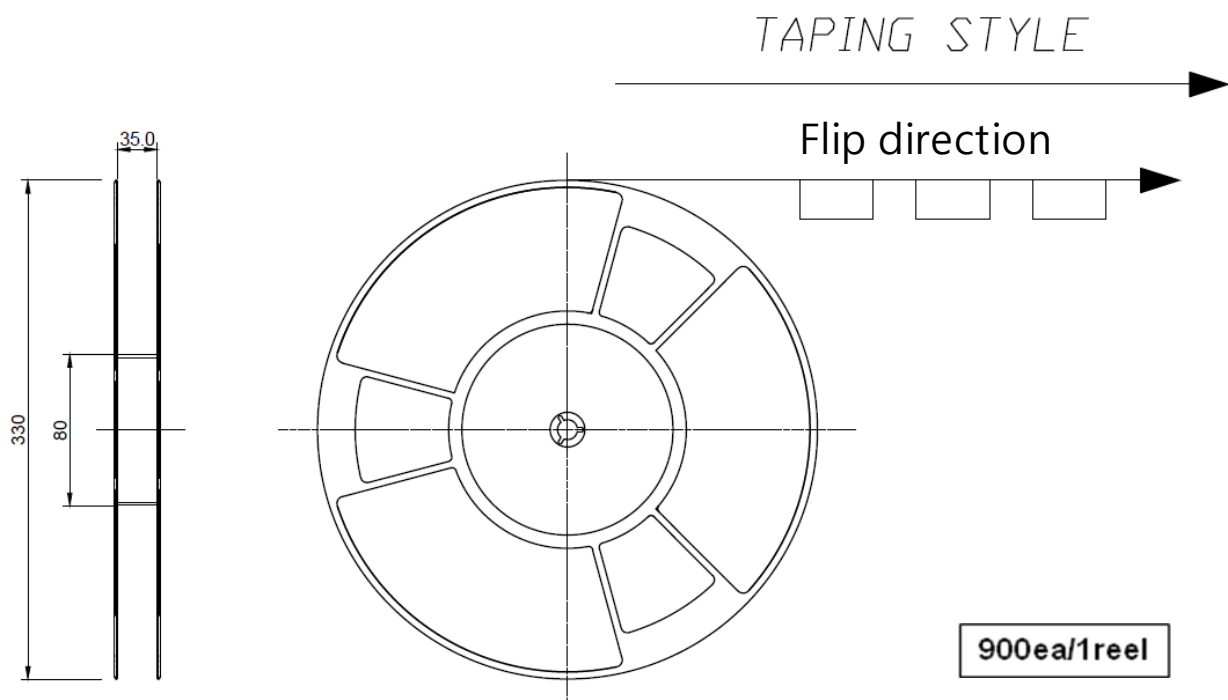
SPEC	Preheat	Soak	Ramp	PEAK
	50~100°C	100~170°C	220°C ↑	240°C
	1~2°C/sec	60~100sec	30~50sec	±5°C
result of measurement	1.5	69	44	237.5
	OK	OK	OK	OK

## 11. Package

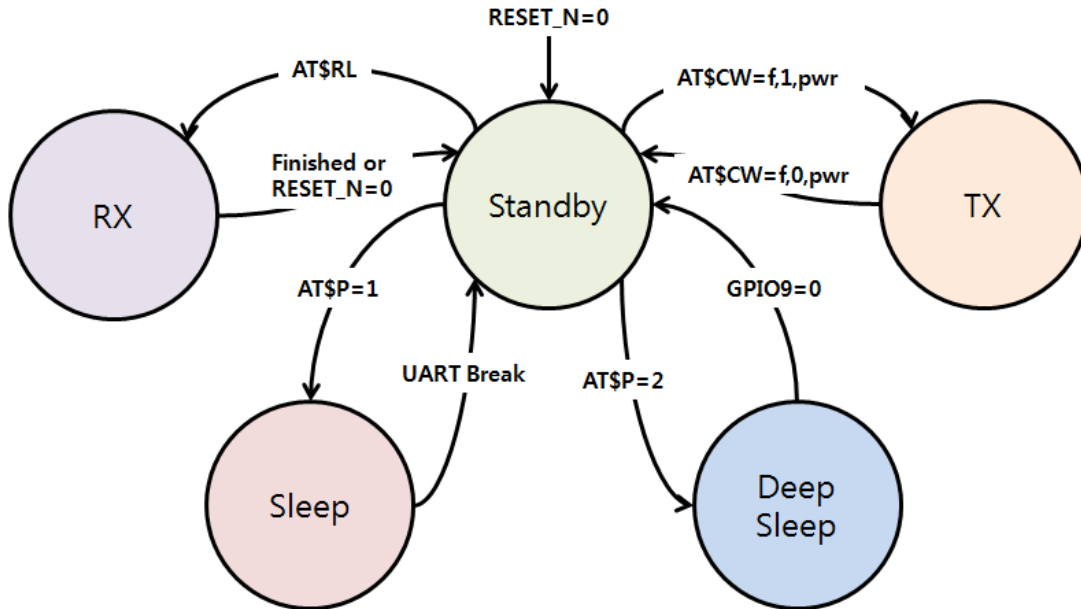
### 11-1. Dimension of Tape



### 11-2. Dimension of Reel



## 12. Power Modes



### 12-1. 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 EU ON : default power table '15') or Input AT command 'AT\$IF=868130000' 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 'ATD302=15'
  - 3) Disconnect UART Switch(SW10~SW11) on EVB
  - 4) And then, Check TX current

### 12-2. 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.

### 12-3. 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=idle 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

### 12-4. 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=idle 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
  - 5) If the module wakes up, Push the tact switch(SW2: wakeup PIN) on EVB