

SEONG JI / SRM100A

P/N: WSSRM100A00

DATA SHEET Rev.00

SEONG JI

54-33, DongtanHana1(i)-gil, Hwaseong-si, Gyeonggi-do
18423, Korea

<http://www.seongji.co.kr>

► CONTENTS

1. Approval Revision Record	3
2. Scope	4
3. Numbering of product	5
3-1. Product	5
3-2. Part No.	5
3-3. Lot. No.	6
4. Absolute Maximum Ratings	7
5. DC Characteristics	7
6. I/O Specifications	7
7. RF Specifications	8
7-1. Sigfox.....	8
7-1-1. Electrical Specification	8
7-1-2. Receiver, Transmitter Specification	8
7-2. BLE.....	9
7-2-1. Electrical Specification	9
7-2-2. Receiver, Transmitter Specification	9
8. Pin Description	10
8-1. Interface PIN(Half Thru-hole Type : 40 Pin) Top view	10
8-2. Interface PIN description	11
9. Block Diagram	12
10. Reference Schematic	12
11. Dimensions & drawing	13
11-1. Design dimension.....	13
11-2. Recommend Foot print	13
12. Reflow profile	14
13. Package	15
13-1. Dimension of Tape.....	15
13-2. Dimension of Reel	15
13-3. IN BOX	16
13-4. OUT BOX	16
13-5. IN BOX Label	17
13-6. OUT BOX Label	17
14. CLI Command	18

1. Approval Revision Record

NO	REASON	RECORD OF REVISION	Date	Remark
1	REV 00	Initial Releases	2019-05-03	- - - - -

2. Scope

The SRM100A is a sub-1GHz with PA and Bluetooth low energy ultra low power wireless MCU Module. This module is built-in STM S2-LP and BlueNRG-2 chip.

This module is available worldwide.

- Description
 - Sigfox Configuration RC1, 2, 3, 4, 5
 - BLE : Support version BT5.0(TBD)
 - UART interface
 - 8GPIOs and 2ADCs
 - Include 64K-bit EEPROM
- PIN Type : Half thru-hole SMD Type
- Dimension : 19.5mm(W) x 21.5mm(L) x 2.5mm(H)

This module has not complete SIGFOX P1 verification and RF regulatory certification.

3. Numbering of product

3-1. Product



3-2. Part No.

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

No.	EXPLANATION
(1),(2)	Product Type(WS:Wireless Solution)
(3)	Application(S:Sigfox)
(4)	Application(R:Roaming)
(5)	Type(M:Module)
(6),(7),(8)	Group model
(9)	Derived model : Sub Part(A:Default)
(10),(11)	Managed Code : Default(00)

3-3. Lot. No.

S	A	F	D	C	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												
	Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027		
	Mark	E	F	G	H	I	J	K	L	M	N		
(4)	Month												
	Month	1	2	3	4	5	6	7	8	9	10	11	12
	Mark	A	B	C	D	E	F	G	H	I	J	K	L
(5)	Day												
	Day	1	2	3	4	5	6	7	8	9	10		
	Mark	1	2	3	4	5	6	7	8	9	A		
	Day	11	12	13	14	15	16	17	18	19	20		
	Mark	B	C	D	E	F	G	H	I	J	K		
	Day	21	22	23	24	25	26	27	28	29	30	31	
	Mark	L	M	N	O	P	Q	R	S	T	U	V	
(6), (7)	Model Serial Number (10,11,12,13...)												
(8), (9)	A Serial Number (1serial: 640ea)												

4. Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
VCC	Module input voltage	-0.2 to +3.9	V
OT	Operating Temperature	-30 to +85	°C
ST	Storage Temperature	-40 to +125	°C
Ves	Electrostatic handling(HBM)	TBD	V

5. DC Characteristics

Symbol	Parameter	Min	Typ.	Max	Unit
VCC	Module input voltage	2.7	3.3	3.6	V

6. I/O Specifications

Symbol	Parameter	Min	Typ.	Max	Unit
VIL	Low level input voltage			0.3*VCC	V
VIH	High level input voltage	0.65*VCC			V
VOL	Low level output voltage			0.4	V
VOH	High level output voltage	0.7*VCC			

7. RF Specifications

7-1. Sigfox

7-1-1. Electrical Specification

Conditions: VCC=3.3V, Temp=25 °C, reduce_output_power=0

Parameter		Min	Typ.	Max	Unit
Current	Tx Current(@+13.7dBm, CW) RC1,RC3,RC5		24		mA
	Tx Current(@+23.5dBm, CW) RC2,RC4		160		mA
	RX Current		24		mA
	Sleep Current		TBD		uA

7-1-2. Receiver, Transmitter Specification

Conditions: VCC=3.3V, Temp=25 °C

Parameter			Min	Typ.	Max	Unit
RF Frequency Range	RC1	Tx	868.034	868.130	868.226	MHz
		Rx	869.429	869.525	869.621	MHz
	RC2	Tx	902.104	902.2	902.296	MHz
		Rx	905.104	905.2	905.296	MHz
	RC3	Tx	923.104	923.2	923.296	MHz
		Rx	922.104	922.2	922.296	MHz
	RC4	Tx	920.704	920.8	920.896	MHz
		Rx	922.204	922.3	922.396	MHz
	RC5	Tx	923.004	923.1	923.196	MHz
		Rx	922.004	922.1	922.196	MHz
Tx output power	RC1, RC3, RC5			+13.7		dBm
	RC2, RC4			+23.5		dBm
Frequency Error Tolerance(+25°C)			-3.0	-	+3.0	ppm
2 nd Harmonics(conducted)			-	-	-35	dBm
3 rd Harmonics(conducted)			-	-	-35	dBm
Rx Sensitivity(@600bps, GFSK)			-	-127	-	dBm
Rx Spurious Emission(30MHz~12.75GHz)			-	-	-54	dBm

7-2. BLE

* BLE feature will be implemented.

7-2-1. Electrical Specification

Parameter		Min	Typ.	Max	Unit
BLE	Tx mode(@+8dBm, Cont.Tx)		14		mA
	Rx mode		13		mA

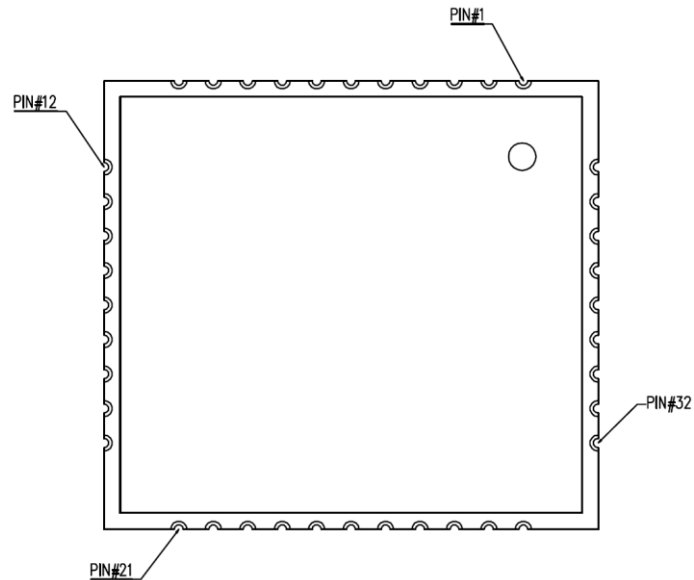
7-2-2. Receiver, Transmitter Specification

Conditions: VCC=3.3V, Temp=25°C

Parameter	Min	Typ.	Max	Unit
RF Frequency Range	2.402	-	2.480	GHz
Output Power	-	8	10	dBm
6dB bandwidth for modulated carrier(1Mbps)	500			KHz
1 st adjacent channel transmit power 2Mhz		-35		dBm
2 nd Aduacent channel transmit power >3		-40		dBm
Sensitivity(BER<0.1%)		-88		dBm
Saturation(BER<0.1%)		11		dBm

8. Pin Description

8-1. Interface PIN(Half Thru-hole Type : 40 Pin) Top view

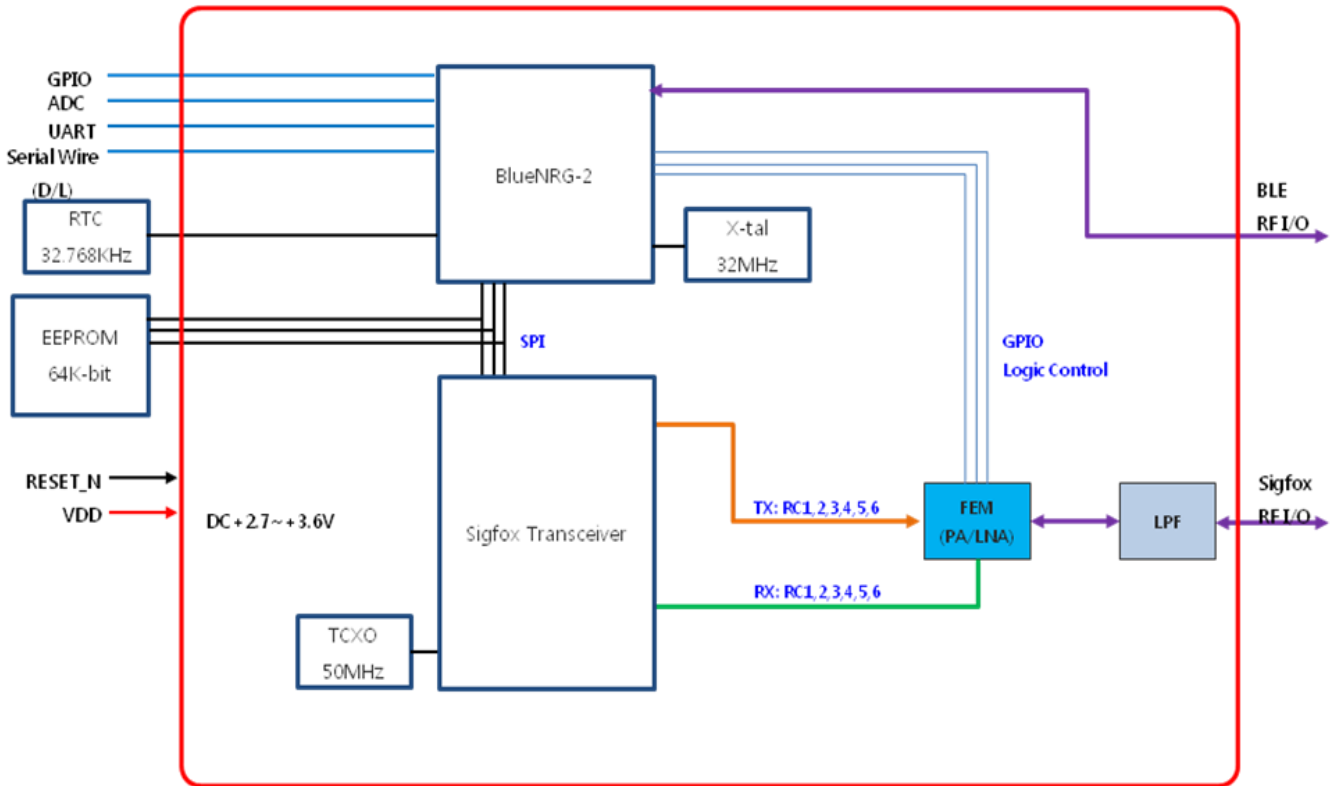


NO	PIN NAME	NO	PIN NAME	NO	PIN NAME
1	GND	16	DIO6	31	GND
2	GND	17	VCC	32	GND
3	GND	18	GND	33	GND
4	GND	19	UART_TXD	34	GND
5	GND	20	UART_RXD	35	GND
6	GND	21	GPIO2	36	SIGFOX_ANT
7	DIO13	22	DIO18	37	GND
8	DIO12	23	DIO15	38	GND
9	DIO11	24	DIO14	39	BLE_ANT
10	SWDIO	25	ADC2	40	GND
11	SWCLK	26	ADC1		
12	RESETN	27	GND		
13	N.C	28	GND		
14	DIO8	29	GND		
15	DIO7/BOOT	30	GND		

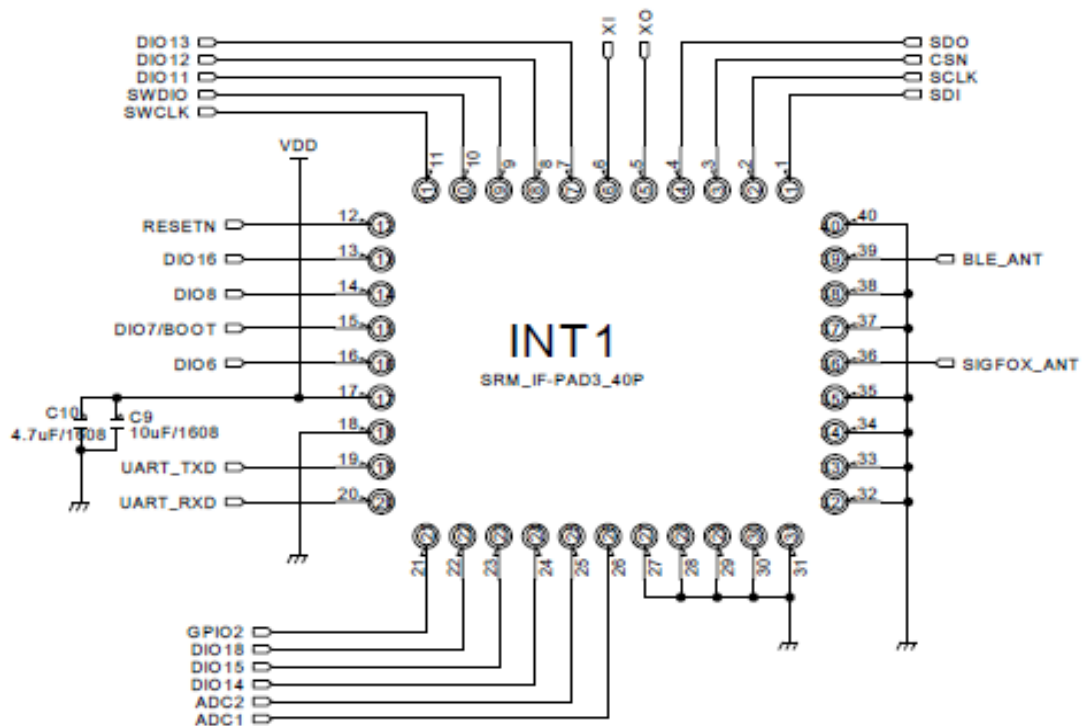
8-2. Interface PIN description

Pin No.	Pin name	Type	Descript	Remark
1~6	GND	GND	Common ground	
7	DIO13	I/O	General purpose digital I/O	
8	DIO12	I/O	General purpose digital I/O	
9	DIO11	I/O	General purpose digital I/O	
10	SWDIO	I	Serial wire debug clock in	
11	SWCLK	I/O	Serial wire debug data in/output	
12	RESETN	I	System reset	
13	N.C	N.C	not connected.	
14	DIO8	I/O	General purpose digital I/O	
15	DIO7/BOOT	I/O	Bootloader pin, General purpose digital I/O	
16	DIO6	I/O	General purpose digital I/O	
17	VCC	VCC	Supply voltage input, +3.3Vdc typ.	
18	GND	GND	Common ground	
19	UART_TXD	O	Uart tx data	
20	UART_RXD	I	Uart Rx data	
21	GPIO2	O	Signal monitor pin	
22	DIO18	I/O	General purpose digital I/O	
23	DIO15	I/O	General purpose digital I/O, I2C1_DAT	
24	DIO14	I/O	General purpose digital I/O, I2C1_CLK	
25	ADC2	I	ADC input 1	
26	ADC1	I	ADC input 2	
27~35	GND	GND	Common ground	
36	SIGFOX_ANT	RF I/O	Sigfox RF in/out put	
37,38	GND	GND	Common ground	
39	BLE_ANT	RF I/O	BLE RF in/out put	
40	GND	GND	Common ground	

9. Block Diagram

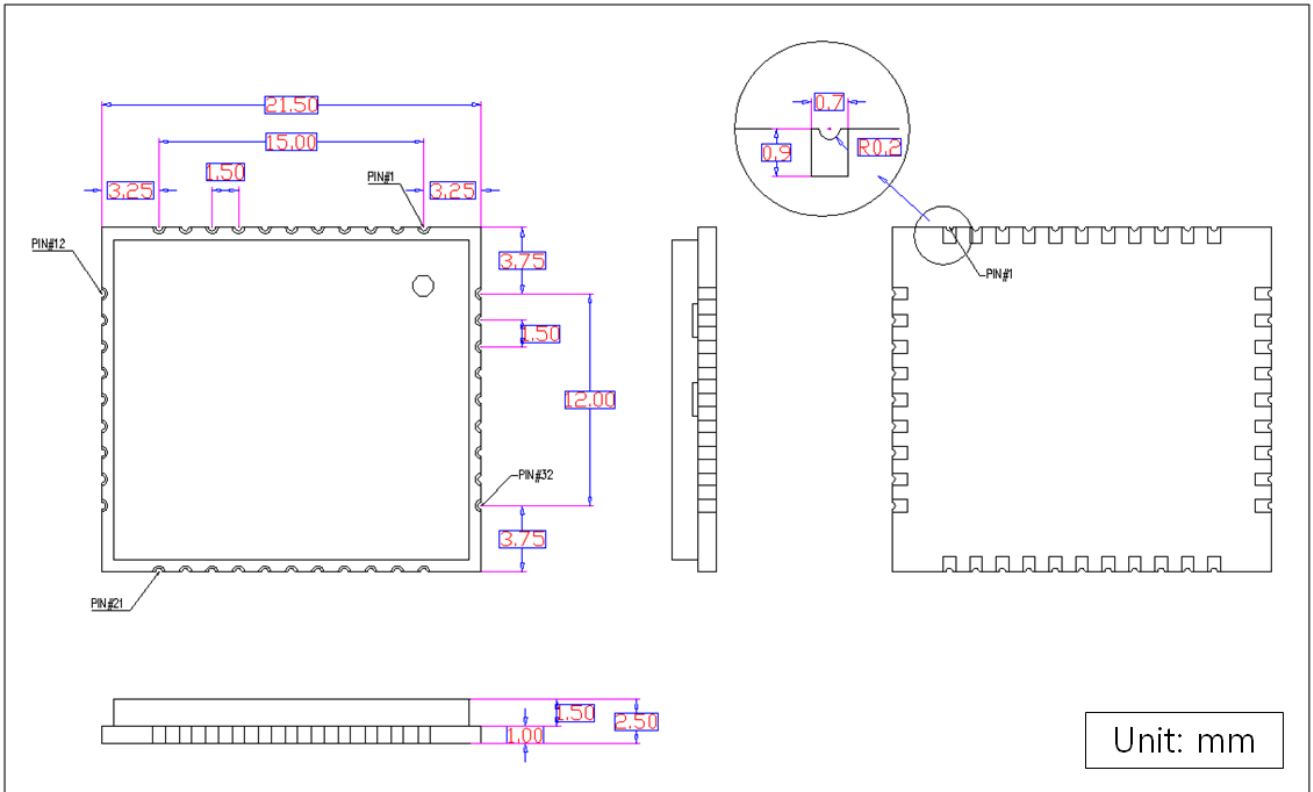


10. Reference Schematic

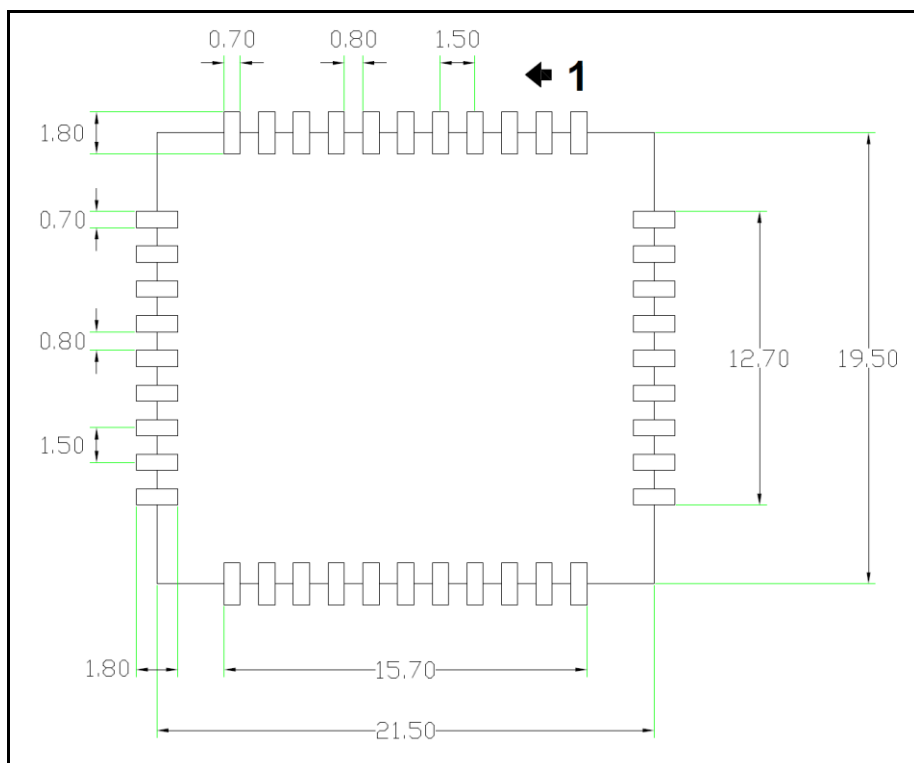


11. Dimensions & drawing

11-1. Design dimension

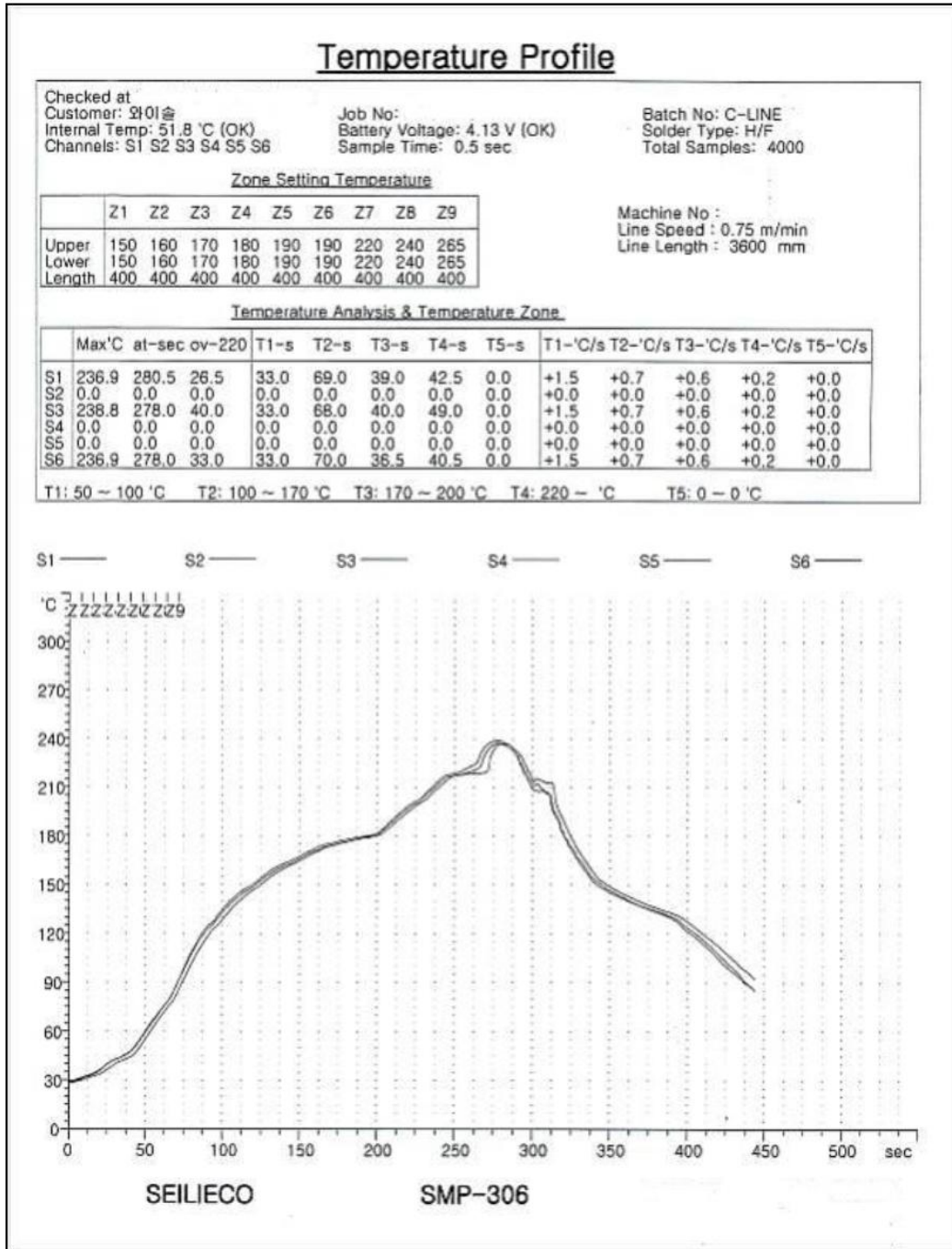


11-2. Recommend Foot print



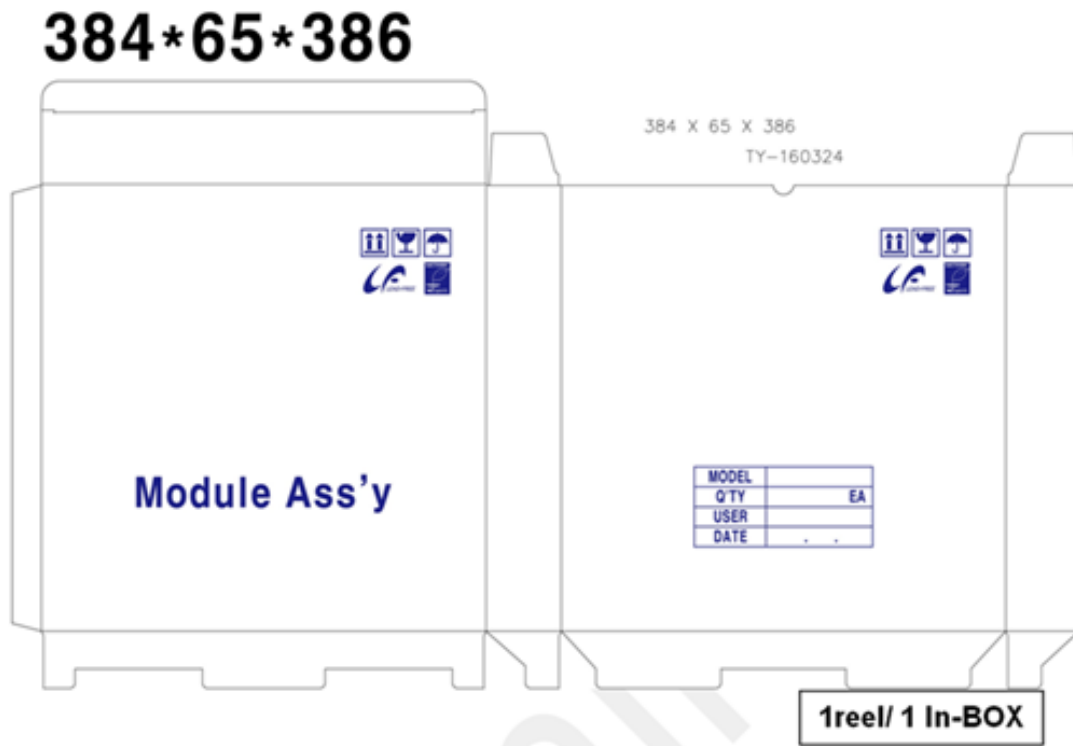
12. Reflow profile

<Reflow profile of Module>



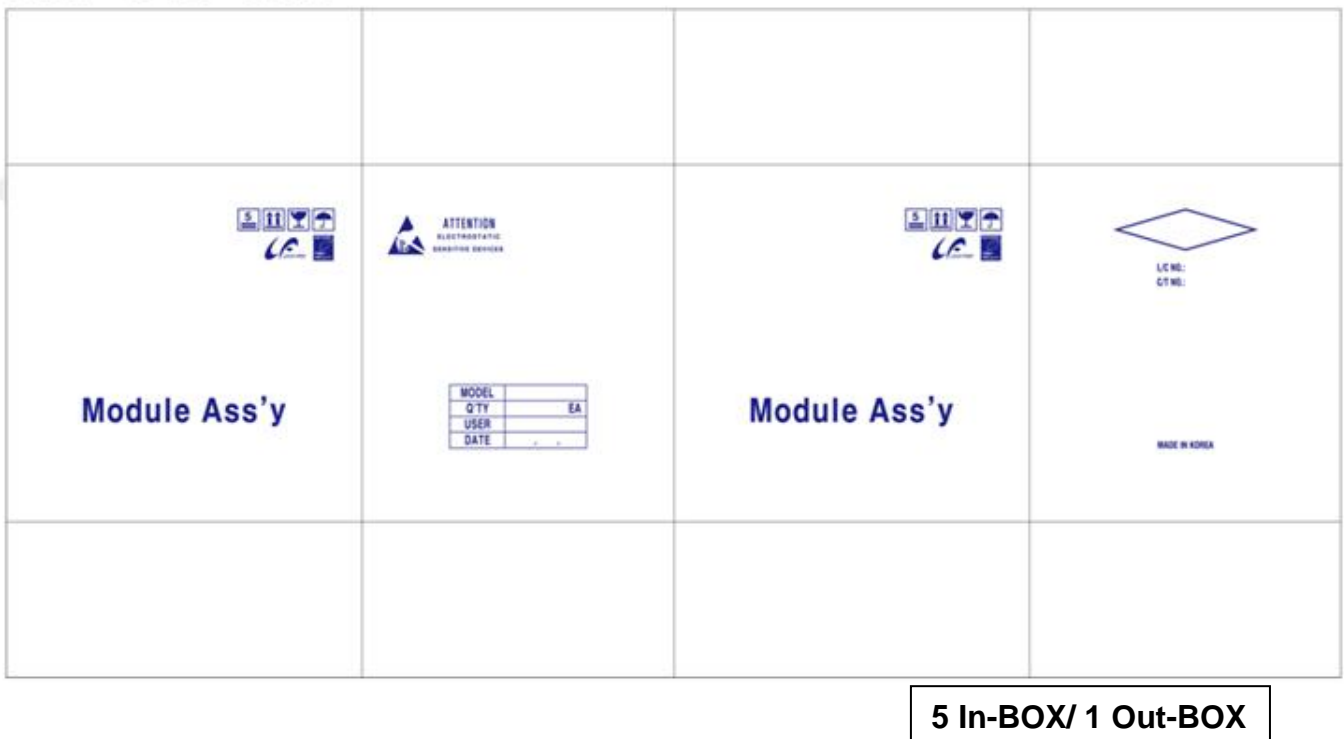
SPEC	Preheat	Soak	Ramp	PEAK
	50~100°C	100~170°C	220°C ↑	240°C
	1~2°C/sec	60~100sec	30~50sec	±5°C
result of measurement	1.5	69	44	237.5
	OK	OK	OK	OK

13-3. IN BOX

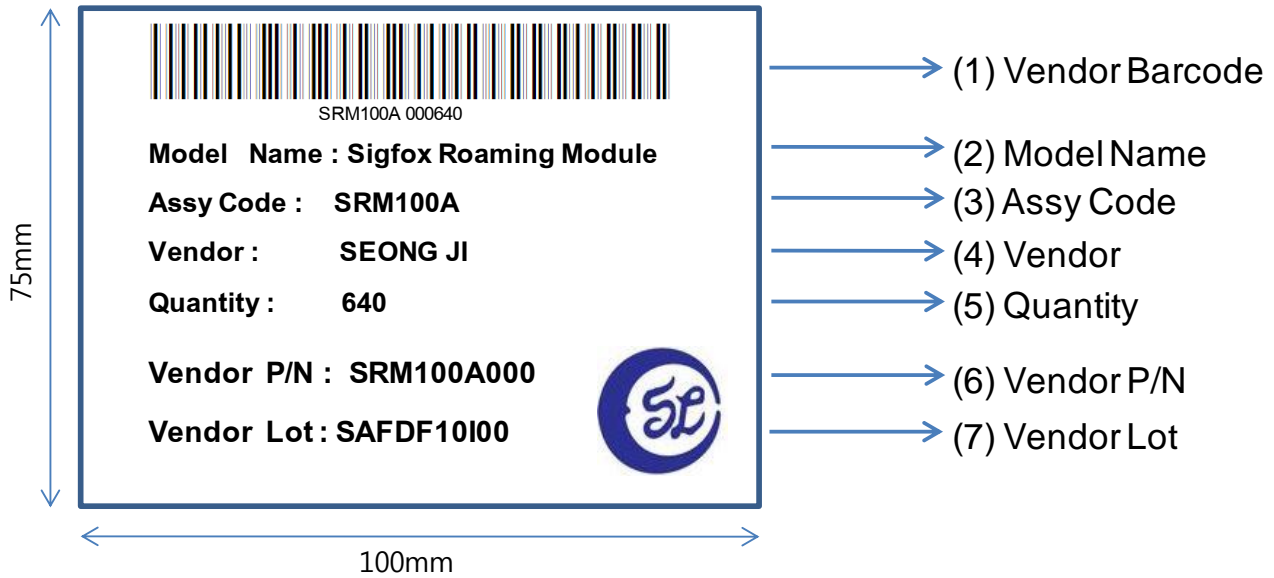


13-4. OUT BOX

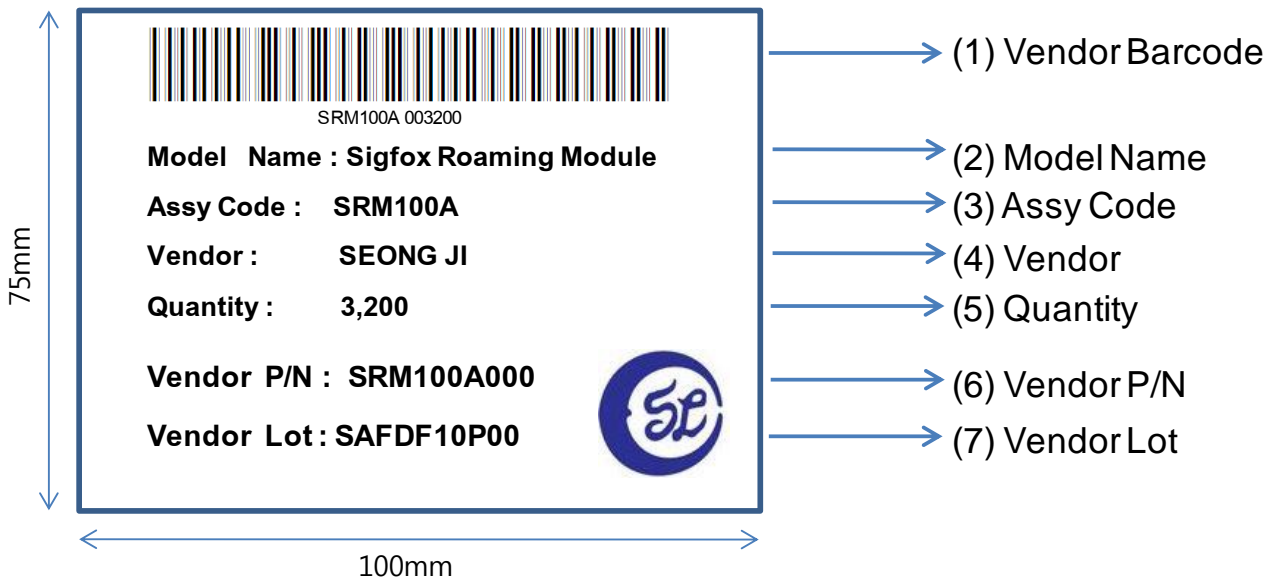
387*340*390



13-5. IN BOX Label



13-6. OUT BOX Label



14. CLI Command

Name	Arg	Arguments description	Description
node_close		None	Closes the Sigfox library, resetting its state
node_open	u	rc : pointer to sfx_rc_t type representing the RC number (RC1=1, RC2=2, RC3C=3, RC4=4, RC5=5 or RC6=6).	
Node_open_with_zone	u		
node_get_info		None	
node_get_version	u	type : The type of version (0=Sigfox, 1=MCU, 2=RF, 5=Monarch, 6=Device)	
node_send_bit	uuu	bit_value : bit value to send (0 or 1) tx_repeat : tx repeat value (default : 2) initiate_downlink_flag : wait for a response after transmitting. (0 or 1)	This function is used to send a single bit. It is mainly used when the node seeks downlink data (and not to transmit).
node_send_frame	buu	cust_data : pointer to the data to transmit ex) ASCII : "12345678" Hexa : {0102030405060708} tx_repeat : tx repeat value (default : 2) initiate_downlink_flag : wait for a response after transmitting. (0 or 1)	DM00365435.pdf Please refer to page 9 of the "DM00365435.pdf" file
Node_execute_monarch_scan	uuu	rc_capability : rc 6 5 4 3 2 1 bit 5 4 3 2 1 0 time : scan time time_unit : 0: ms, 1:sec, 2:min, 3:hour	Execute Monarch scan. rc_capability, time, unit
Node_stop_monarch_scan		None	This function stops any ongoing RC scan
node_set_std_config	wwwv	config_word1 : ch1 ~ 32 for RC2,4 config_word2 : ch33~64 for RC2,4 config_word3 : ch65~86 for RC2,4 timer_enable : (0,1) for RC2,4	DM00365435.pdf Please refer to page 10 of the "DM00365435.pdf" file
Node_get_std_config		none	Get std_config value.
start_continuous_transmission	wu	frequency : Frequency at which the signal has to be generated type : Type of modulation to use in continuous mode (SFX_NO_MODULATION=0 SFX_DBPSK_100BPS=1 SFX_DBPSK_600BPS=2)	Executes a continuous wave or modulation depending on the parameter type
stop_continuous_transmission		None	Stop the current continuous transmission
node_test_mode	uu	rc : pointer to sfx_rc_t type representing the RC number (0, 1, 2, 3, 4, 5 or 6). test_mode : (SFX_TEST_MODE_TX_BPSK =0 SFX_TEST_MODE_TX_PROTOCOL =1 SFX_TEST_MODE_RX_PROTOCOL =2 SFX_TEST_MODE_RX_GFSK =3 SFX_TEST_MODE_RX_SENSI =4 SFX_TEST_MODE_TX_SYNTH =5 SFX_TEST_MODE_TX_FREQ_DISTRIBUTION =6 SFX_TEST_MODE_TX_BIT=11 SFX_TEST_MODE_PUBLIC_KEY=12 SFX_TEST_MODE_NVM=13)	Sigfox test mode rc : 0 : RC1 1 : RC2 2 : RC3A 3 : RC3C 4 : RC4 5 : RC5 6 : RC6
node_monarch_test_mode	uuu	rc : pointer to sfx_rc_t type representing the RC number (0, 1, 2, 3, 4, 5 or 6). test_mode : (SFX_TEST_MODE_RX_MONARCH_PATERN_LISTENING_SWEEP=7 SFX_TEST_MODE_RX_MONARCH_PATERN_LISTENING_WINDOW=8 SFX_TEST_MODE_RX_MONARCH_BEACON=9 SFX_TEST_MODE_RX_MONARCH_SENSI=10) rc_capability : rc 6 5 4 3 2 1 bit 5 4 3 2 1 0	Sigfox monarch test mode rc : 0 : RC1 1 : RC2 2 : RC3A 3 : RC3C 4 : RC4 5 : RC5 6 : RC6
switch_public_key	u	key : private=0, public=1	Switch device on public or private key.
Switch_test_credentials	u	credentials : 1 : test ID, PAC 0 : module ID, PAC	Set test credentials 1=On, 0=Off

Sigfox Roaming Module

Revision: 00

set_payload_encryption	u	enc : encryption enable : 1 disable : 0	Payload encryption
switch_pa	u	pa : set external power amplifier (1 if a PA, 0 if not.).	Instructs the library to configure the S2-LP for a external PA (Power Amplifier).
set_smpps_voltage	u	smpps : smpps voltage of the device (1.2V=1.... 1.8V=7) The default is to use the S2-LP at 1.8V	Instructs the library to configure the S2-LP with a user defined smpps frequency
get_smpps_voltage		None	Get SMPS voltage
set_rssi_offset	u	rssi_value : Rssi offset value in dB	Set an RSSI offset for the RSSI. Very useful if the RF frontend has an LNA or to calibrate the RSSI measurement.
get_rssi_offset		None	Get the RSSI offset for the RSSI
set_xtal_frequency	w	xtal : xtal value in Hz	Sets the XTAL frequency of the S2-LP in Hertz (default is 50MHz).
get_xtal_frequency		None	Get xtal frequency
set_xtal_frequency_offset	w	freq_offset : RF offset value in Hz	Sets the RF frequency offset in Hertz (default is 0 Hz).
get_xtal_frequency_offset		None	Get xtal frequency offset
reduce_output_power	v	o_pwr : power reduction in half dB	Reduces the output power of the transmitted signal by a factor (reduction*0.5dB against the actual value)
get_reduce_output_power		None	Get reduce output power
set_lbt_thr_offset	u	lbt : LBT threshold offset	Set LBT threshold offset
get_lbt_thr_offset		None	Get LBT threshold offset
get_id		None	ID stored in the current node
get_pac		None	PAC stored in the current node
get_rcz		None	RCZ stored in the current node
get_lib_version	u	lib_ver : 0 : Sigfox, 1 : MCU_API 2 : RF_API, 5 : MONARCH_API 6 : DEVICE_CONFIG_API	Get version of specified module
_set_rcz	u	rc : pointer to sfx_rc_t type representing the RC number (RC1=1, RC2=2, RC3C=3, RC4=4, RC5=5 or RC6=6).	Set rc

ESD Warning



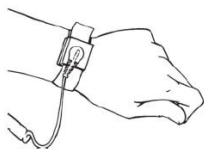
This modules are ESD sensitive devices, appropriate precautions should be taken during the module assembly in the final product. Mechanical impact and harsh tools must be avoided during the module assembly in the final product.

Product ESD specification:

- HBM TBD

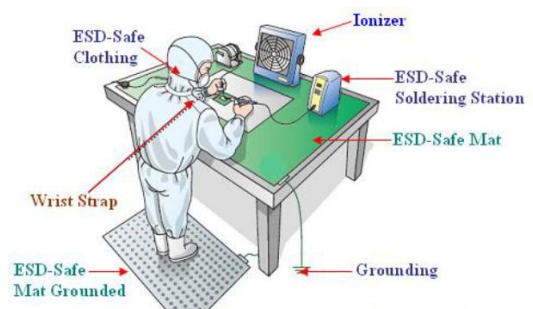
The following precautions must be taken:

- 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.