iotTech

ITM1100

IEEE 802.11b/g/n 1T1R WLAN

IOT Module Datasheet

Revision History

Date	Revision Content	Revised By	Version
2015/10/30	- Initial released	Issac	1.0
2016/09/07	- Update packing information	Ken Wu	1.1
2016/10/12	- Update RF spec.	Ken Wu	1.2
2016/10/19	- Update RF & temperature. spec. - Revise GPIO total numbers.	Ken Wu	1.3
2018/11/02	- Update packing info	Issac Chen	1.4

Contents

1. General Description

The iotTech ITM1100 is a high-performance and a low-power single-chip module providing for the highest level of integration for internet of thing embedded systems. This wireless module to support all mandatory IEEE 802.11 b/g/n standard and data rate up to 150Mbps, as well as 20MHz and 40MHz bandwidth transmission, 400ns short guard interval.

It includes additional LDOs and DC-DC buck convertor that could provide noise isolation for digital and analog supplies and excellent power efficient with minimum BOM cost.
The ITM1100 module provides multiple peripheral interfaces including UART, I2C, SPI, I2S, ADC, PWM…etc., via 19 GPIO pins.

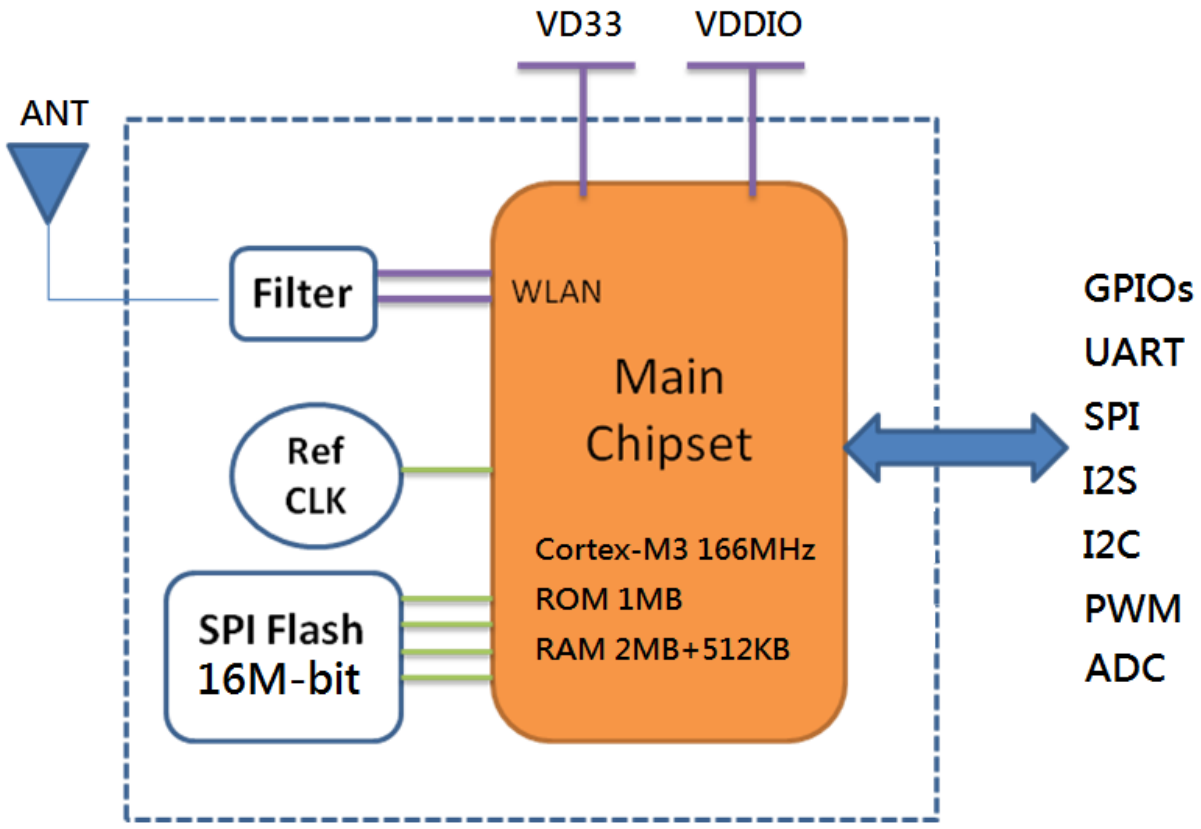
This compact module is a total solution for Wi-Fi technologies. The module is specifically developed for IOT embedded system devices.

2. Features

- WLAN Standard Support
  - IEEE802.11 b/g/n compatible, 1T1R, 2.4GHz band
  - 802.11e QoS Enhancement (WMM)
  - 802.11i (WPA,WPA2). Open, shared key, and pair-wise key authentication service
  - Wi-Fi WPS support
  - Wi-Fi Direct support
  - Light Weight TCP/IP protocol
- WLAN MAC Feature
  - Frame Aggregation for increased MAC efficiency (A-MSDU, A-MPDU)
  - Low latency immediate High-Throughput Block Acknowledgement (HT-BA)
  - Long NAV for media reservation with CF-End for NAV release
  - PHY-level spoofing to enhance legacy compatibility
  - Power saving mechanism
- WLAN PHY Feature
  - 20MHz and 40MHz bandwidth transmission
  - Short guard interval 400ns
  - DSSS with DBPSK and DQPSK, CCK modulation with long/short preamble
  - OFDM with BPSK, QPSK, 16QAM, and 640QAM modulation. Convolution Coding Rate: 1/2, 2/3, 3/4, and 5/6
  - Maximum data rate 54Mbps at 802.11g, and 150Mbps at 802.11n
  - Fast receiver AGC
  - On-chip ADC/DAC

- CPU and Peripheral Interface
  - ARM Cortex-M3 166MHz
  - 1MB ROM and 2MB+512KB RAM
  - I2S with 8/16/32/48/96/44.1/88.2KHz sample rate
  - Max 3 I2C interfaces
  - 1 SPI support : 1 high-speed SPI up to 20.8MHz
  - 2 UARTs support: 1 high-speed UART up to 4MHz
  - Max 4 PWMs with configurable duration and duty cycle from 0~100%
  - One 16-bit AD converter
  - Maximum 19 GPIOs

The block diagram of ITM1100 module is depicted in the figure below.



3. General Specification

Operating temperature	-10°C to 70°C
Storage temperature	-40°C to 85°C

3.1 Voltages

3.1.1 Absolute Maximum Ratings

Symbol	Description	Min.	Max.	Unit
VD33	3.3V Supply Voltage	-0.5	3.6	V
VDDIO_E	Digital I/O Supply Voltage	-0.5	3.6	V

3.1.2 Recommended Operating Ratings

Test conditions: At room temperature 25°C				
Symbol	**Min.**	**Typ.**	**Max.**	**Unit**
VD33	3.0	3.3	3.6	V
VDDIO_E	1.7	1.8~3.3	3.6	V

Note: The voltage of VDDIO_E is depended on system I/O voltage.

Test conditions: At operating temperature -10°C ~70°C				
Symbol	**Min.**	**Typ.**	**Max.**	**Unit**
VD33	3.0	3.3	3.6	V
VDDIO_E	1.7	1.8~3.3	3.6	V

3.2 Wi-Fi RF Specification (RX)

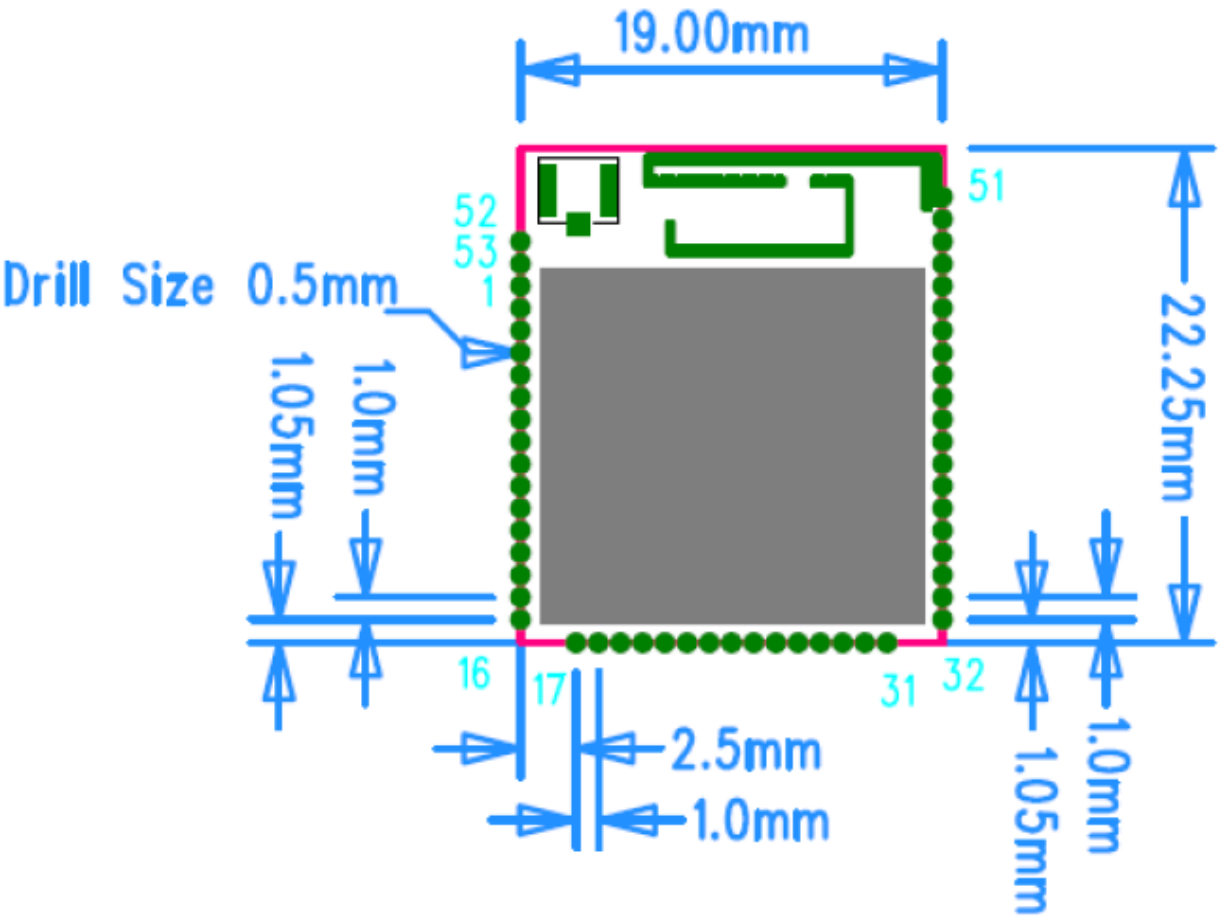
Parameters	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Frequency Range		2412		2484	MHz
RX Sensitivity 11b @ 8% PER	- 1Mbps		-90	-83	dBm
	- 2Mbps		-88	-80	dBm
	- 5.5Mbps		-86	-79	dBm
	- 11Mbps		-84	-76	dBm
RX Sensitivity 11g @ 10% PER	- 6Mbps		-88	-82	dBm
	- 9Mbps		-86	-81	dBm
	- 12Mbps		-84	-79	dBm
	- 18Mbps		-82	-77	dBm
	- 24Mbps		-79	-74	dBm
	- 36Mbps		-75	-70	dBm
	- 48Mbps		-71	-66	dBm
	- 54Mbps		-70	-65	dBm
Receive Sensitivity (11n,20MHz) @10% PER	- MCS0		-87	-82	dBm
	- MCS=1		-83	-79	dBm
	- MCS=2		-81	-77	dBm
	- MCS=3		-78	-74	dBm
	- MCS=4		-75	-70	dBm
	- MCS=5		-71	-66	dBm
	- MCS=6		-70	-65	dBm
	- MCS=7		-68	-64	dBm
Receive Sensitivity (11n,40MHz) @10% PER	- MCS0		-84	-79	dBm
	- MCS=1		-80	-76	dBm
	- MCS=2		-78	-74	dBm
	- MCS=3		-75	-71	dBm
	- MCS=4		-75	-67	dBm
	- MCS=5		-67	-63	dBm
	- MCS=6		-66	-62	dBm
	- MCS=7		-65	-61	dBm
Maximum Receive Level	802.11b	-20	0		dBm
	802.11g	-20	0		dBm
	802.11n	-20	0		dBm

3.3 Wi-Fi RF Specification (TX)

Parameters	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Frequency Range		2412		2484	MHz
Output Power	802.11b	15	16	18	dBm
	802.11g	12	14	16	dBm
	802.11n	11	13	15	dBm
@EVM	802.11b / 11Mbps	--	-20	-10	dB
	802.11g / 54Mbps	--	-29	-25	dB
	802.11n / MCS7	--	-30	-28	dB

4. Pin Assignments

4.1 PCB Pin Outline



4.2 Pin Definition

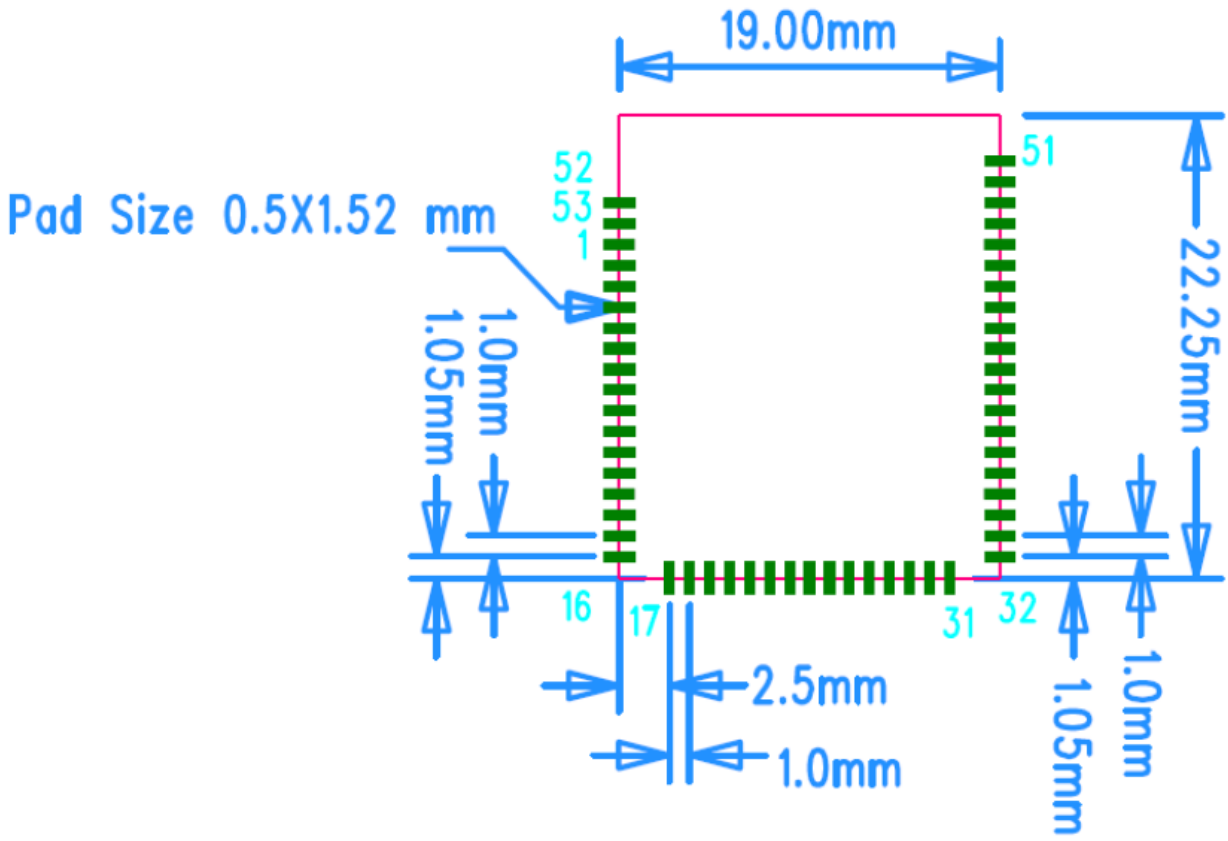
NO	Name	Type	Description
1	GND	G	Ground connections
2	GND	G	Ground connections
3	NC	—	Floating (Don’t connected to ground)
4	NC	—	Floating (Don’t connected to ground)
5	NC	—	Floating (Don’t connected to ground)
6	NC	—	Floating (Don’t connected to ground)
7	VDDIO_E	P	3.3V Digital IO Supply Power
8	NC	—	Floating (Don’t connected to ground)
9	GPIOE_4	I/O	GPIO (JTAG CLK)
10	GPIOE_3	I/O	GPIO (JTAG TMS)
11	GPIOE_2	I/O	GPIO (JTAG TDO)
12	GPIOE_1	I/O	GPIO (JTAG TDI)
13	GPIOE_0	I/O	GPIO (JTAG TRST)
14	NC	—	Floating (Don’t connected to ground)
15	ADC_CH2	I	ADC Input
16	NC	—	Floating (Don’t connected to ground)
17	GND	G	Ground connections
18	CHIP_EN	I	Chip Enable Pin (H: Enable; L: Shutdown)
19	NC	—	Floating (Don’t connected to ground)
20	NC	—	Floating (Don’t connected to ground)
21	NC	—	Floating (Don’t connected to ground)
22	GPIOA_3	I/O	GPIO (CP reset)
23	NC	—	Floating (Don’t connected to ground)
24	GPIOA_5	I/O	GPIO (LED Light)
25	GPIOA_7	I/O	GPIO (UART TX)
26	GPIOA_6	I/O	GPIO (UART RX)
27	GND	G	Ground connections
28	NC	—	Floating (Don’t connected to ground)
29	NC	—	Floating (Don’t connected to ground)
30	GND	G	Ground connections
31	NC	—	Floating (Don’t connected to ground)
32	NC	—	Floating (Don’t connected to ground)
33	GND	G	Ground connections

34	VD33	P	3.3V System Supply Power
35	GND	G	Ground connections
36	GPIOC_3	I/O	GPIO (SPI MISO)
37	GPIOC_2	I/O	GPIO (SPI MOSI)
38	GPIOC_1	I/O	GPIO (SPI CLK)
39	GPIOC_0	I/O	GPIO (SPI CS)
40	GPIOC_4	I/O	GPIO (I2C SDA)
41	GPIOC_5	I/O	GPIO (I2C SCL)
42	GPIOB_3	I/O	GPIO (I2C SDA)
43	GPIOB_2	I/O	GPIO (I2C SCL)
44	GPIOB_1	I/O	GPIO (UART RX for console)
45	GPIOB_0	I/O	GPIO (UART TX for console)
46	NC	—	Floating (Don’t connected to ground)
47	NC	—	Floating (Don’t connected to ground)
48	GND	G	Ground connections
49	NFCIP_1	I/O	NFC input differential signal
50	NFCIN_1	I/O	NFC input differential signal
51	AGND	G	Ground connections
52	GND	G	Ground connections
53	RF_1	I/O	WLAN RF signal

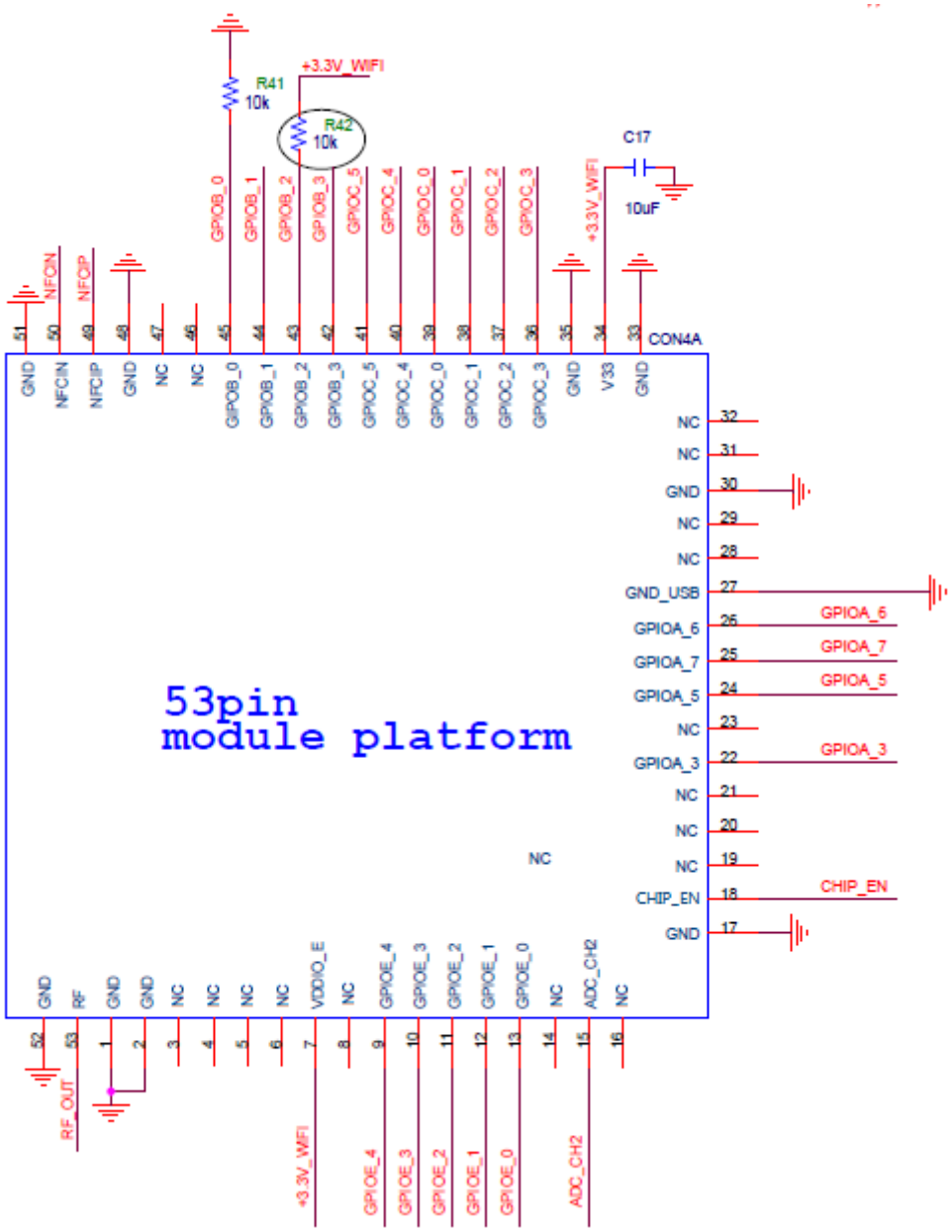
5. Dimensions

5.1 Layout Recommendation

(Unit: mm)



6. Reference Design

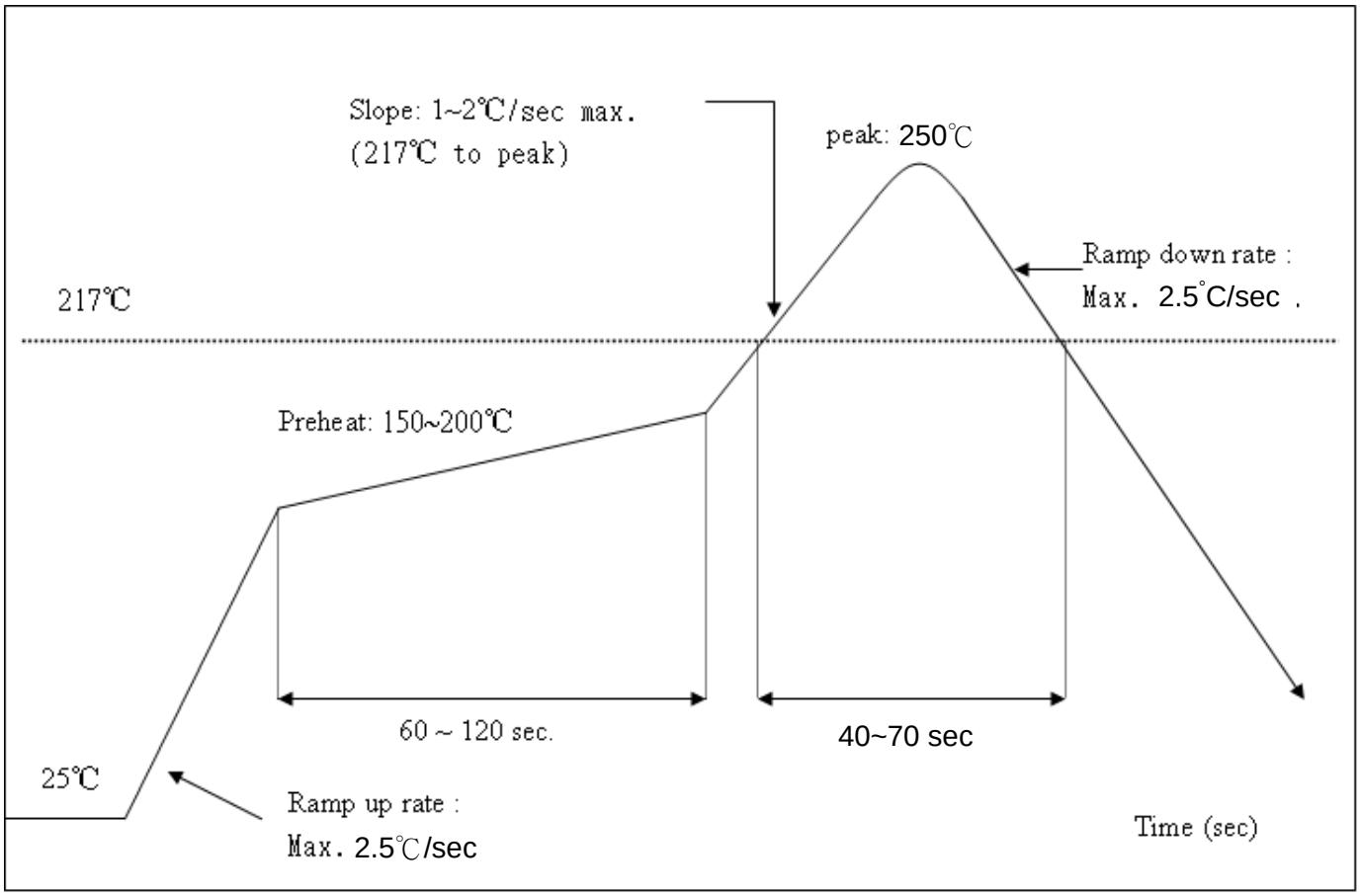


7. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times

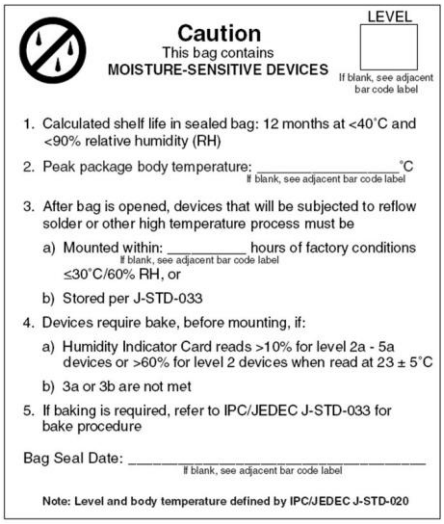


8. Packing Information

8.1 Label

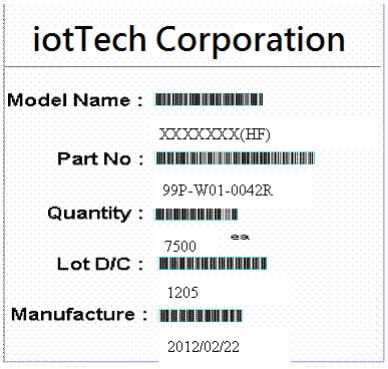
Label A → Anti-static and humidity notice

Label B → MSL caution / Storage Condition



Label C → Inner box label .

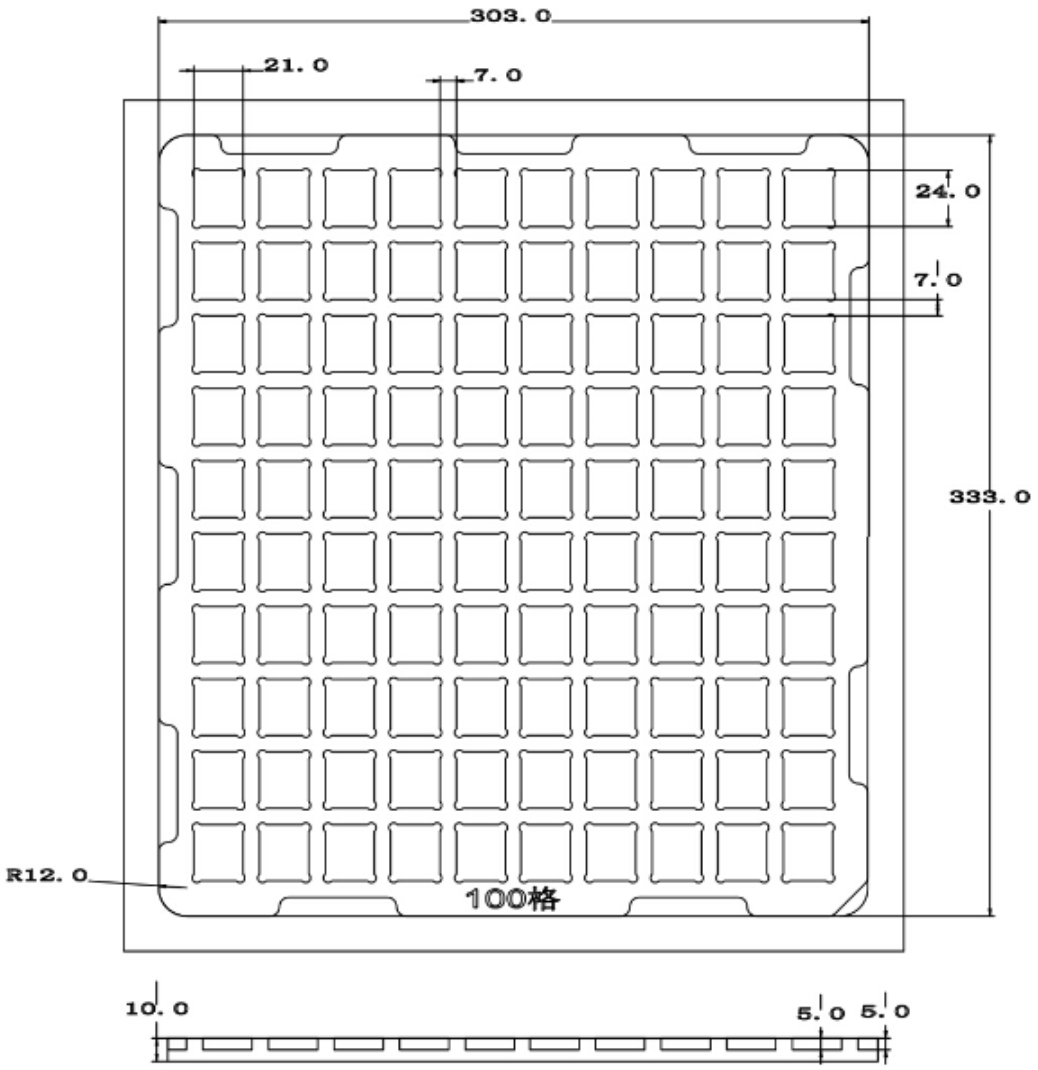
Label D → Carton box label .

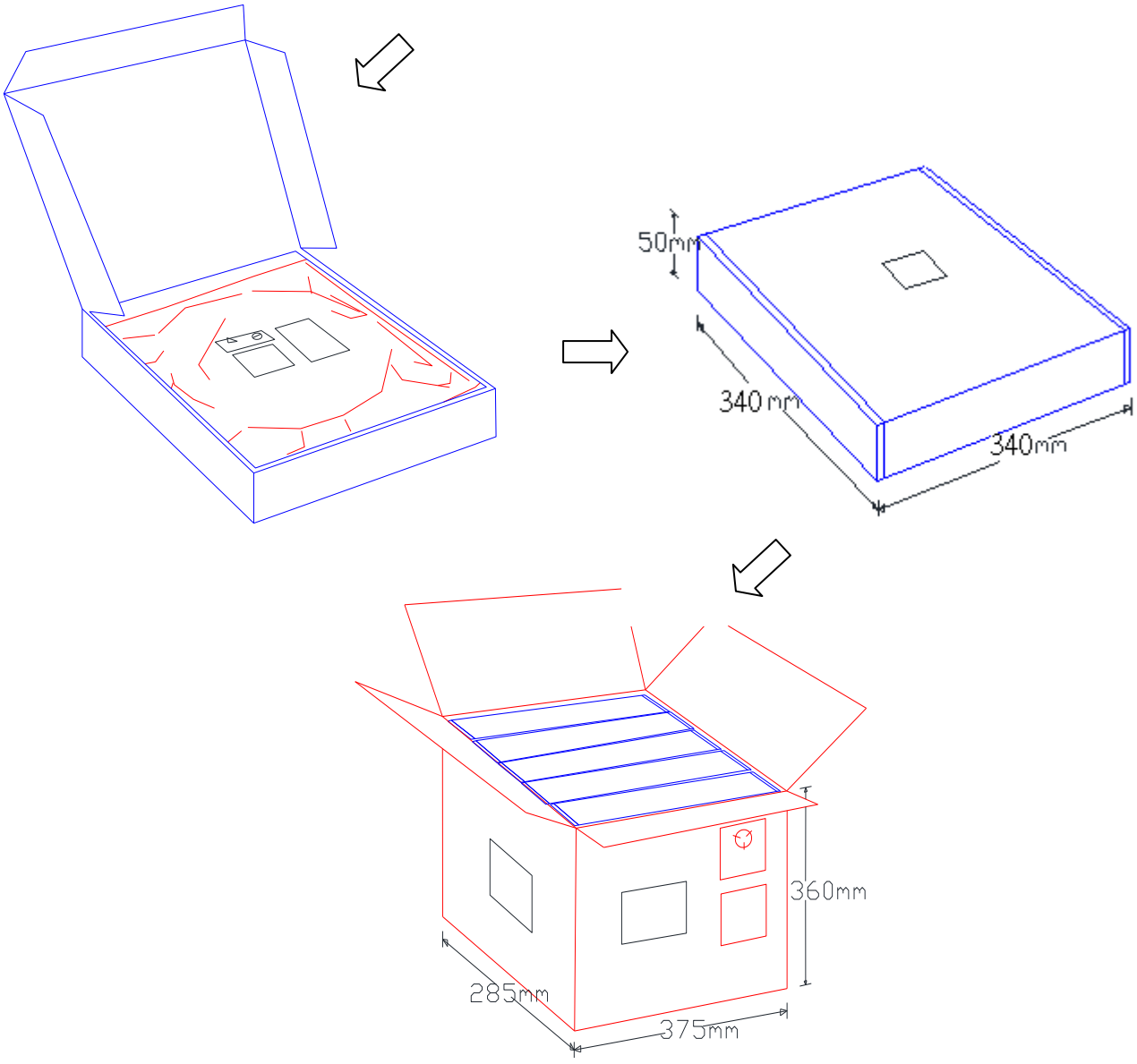


8.2 Dimension

Blister Packing :

- 100 pcs / Tray
- 10 Trays / Vacuum Bag




50mm
340mm
340mm
360mm
285mm
375mm