iotTech

iTM1188-F-C

IEEE 802.11 b/g/n 2.4GHz 1T1R

USB Wi-Fi Module Datasheet

Revision History

Date	Revision Content	Revised By	Version
2017/12/11	- Initial released	Issac Chen	1.0
2018/04/13	- Test result revised	Issac Chen	1.1
2018/12/11	- Dimension info update	Ken Wu	1.2
2018/01/17	- Thermal Pad info update	Ken Wu	1.3
2019/04/24	- Layout Recommendation info update	Ken Wu	1.4
2019/05/23	- Naming and dimension info. changed	Issac Chen	1.51

Contents

1. General Description

The iotTech iTM1188-F-C is a small size and low profile of WiFi module, board size is 12.2mm*13.0mm with module thickness of 1.7mm. It can be easily manufactured on SMT process and highly suitable for tablet PC, ultra book, mobile device and consumer products. It provides USB interface for WiFi to connect with host processor. The WiFi throughput can go up to 150Mbps in theory by using 1x1 802.11n b/g/n MIMO technology.

iTM1188-F-C uses Realtek RTL8188FTV, a highly integrated WiFi single chip based on advanced COMS process. RTL8188FTV integrates whole 2.4GHz 1T1R WiFi function blocks into a chip, such as USB, MAC, BB, AFE, RFE, PA, EEPROM and LDO/SWR, except fewer passive components remained on PCB.

2. Features

- Operate at ISM frequency bands (2.4GHz)
- USB for Wi-Fi
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i
- Enterprise level security which can apply WPA/WPA2 certification for WiFi.
- WiFi 1 transmitter and 1 receiver allow data rates supporting up to 150 Mbps downstream and 150 Mbps upstream PHY rates

The general functional block diagram of RTL8188FTV chipset is shown as below.

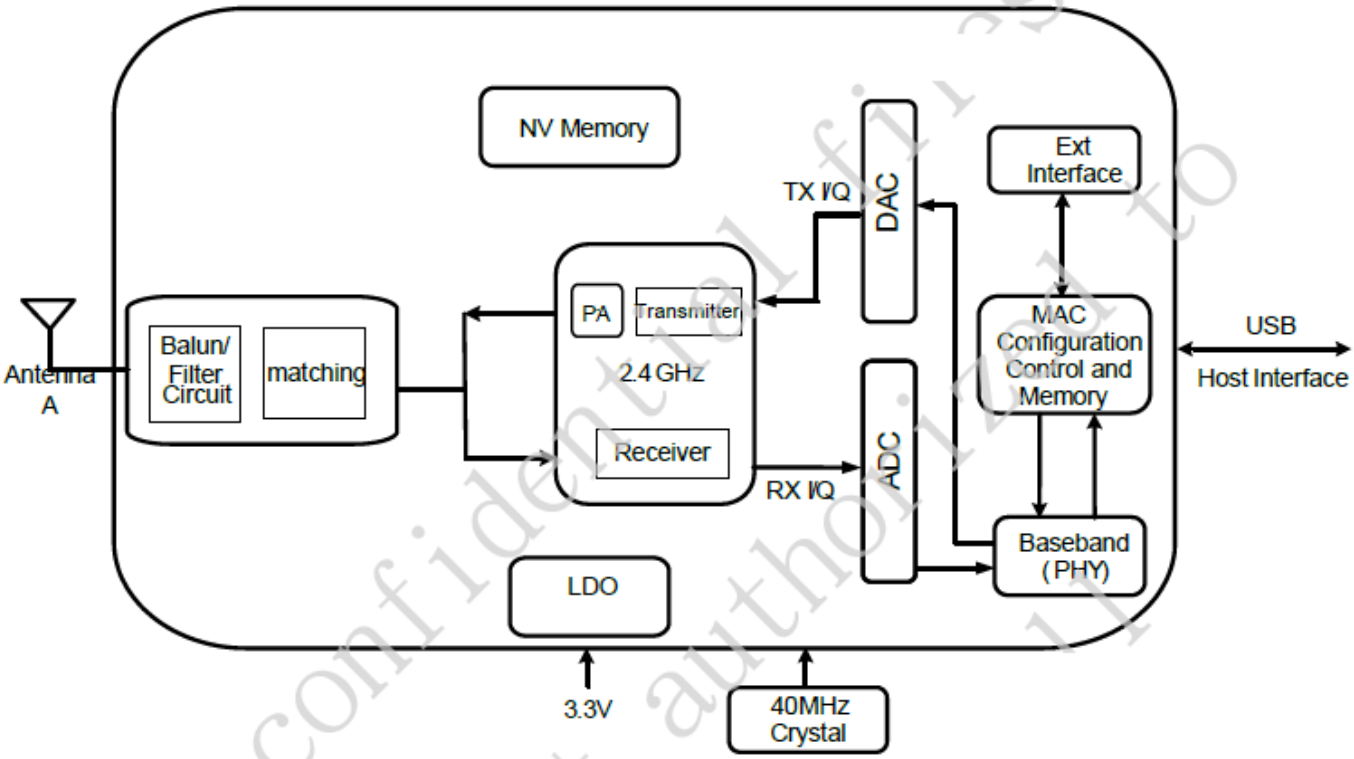


Figure 1. Single-Band 11n (1x1) Solution

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
VIN	Input supply Voltage	-0.3	3.6	V

3.1.2 Recommended Operating Ratings

Test conditions: At room temperature				
Symbol	**Min.**	**Typ.**	**Max.**	**Unit**
VIN	3.15	3.3	3.45	V

Test conditions: At operating temperature 0°C ~70°C				
Symbol	**Min.**	**Typ.**	**Max.**	**Unit**
VIN	3.15	3.3	3.45	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		-91	-83	dBm
	- 2Mbps		-89	-80	dBm
	- 5.5Mbps		-87	-79	dBm
	- 11Mbps		-85	-76	dBm
RX Sensitivity 11g @ 10% PER	- 6Mbps		-87	-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		-84	-79	dBm
	- MCS=2		-82	-77	dBm
	- MCS=3		-79	-74	dBm
	- MCS=4		-75	-70	dBm
	- MCS=5		-71	-66	dBm
	- MCS=6		-70	-65	dBm
	- MCS=7		-69	-64	dBm
Receive Sensitivity (11n,40MHz) @10% PER	- MCS0		-84	-79	dBm
	- MCS=1		-81	-76	dBm
	- MCS=2		-79	-74	dBm
	- MCS=3		-76	-71	dBm
	- MCS=4		-72	-67	dBm
	- MCS=5		-68	-63	dBm
	- MCS=6		-67	-62	dBm
	- MCS=7		-66	-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

3.4 Power Consumption

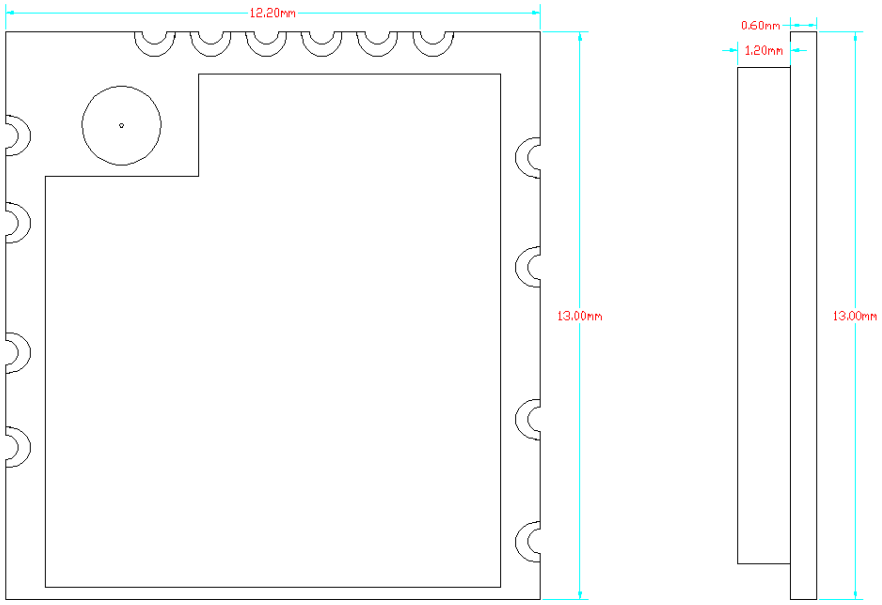
TX Mode: (Continuous mode)	240mA (MCS7/BW40/13dBm)
RX Mode: (Conituous mode)	140mA (MCS7/BW40/-60dBm)
Associated Idle power saving with DTIM=3	2.1mA
Unassociated Idle:	0.1mA
RF disable Mode:	0.1mA

(Typical by using LDO)

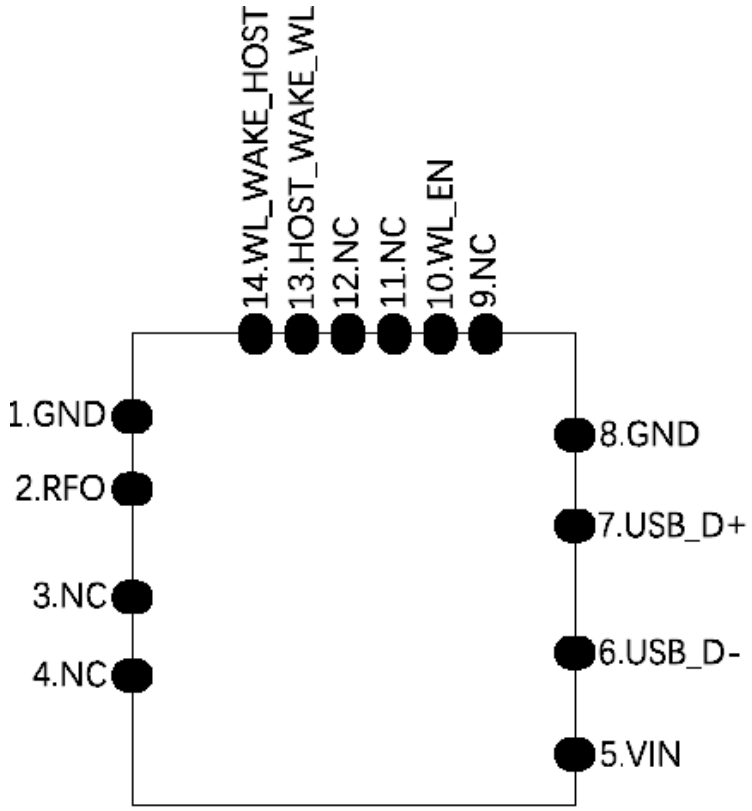
4. Pin Assignments

4.1 PCB Pin Outline

< TOP VIEW >



4.2 Pin Definition



PIN Assignment

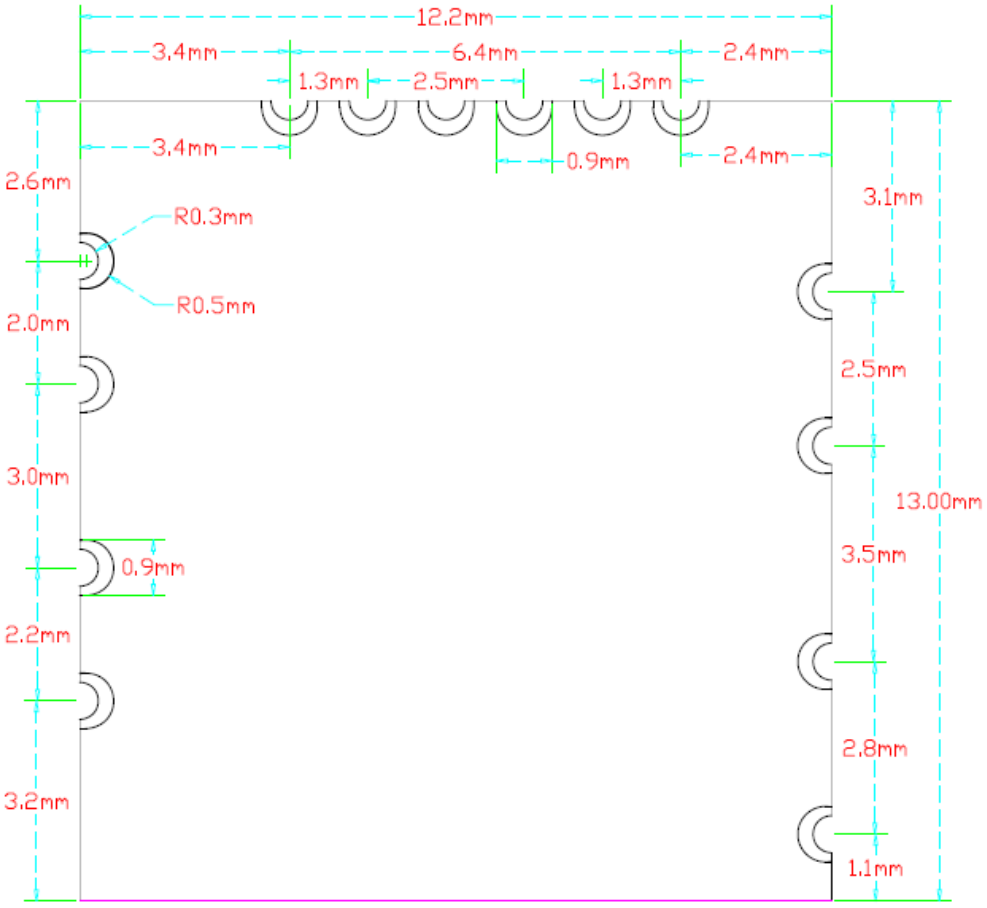
Pin #	Name	Description
1	GND	Ground
2	RF0	WLAN RF output
3	NC	Floating (NC)
4	NC	Floating (NC)
5	VIN	Main power voltage source input
6	USB_D-	USB_D-
7	USB_D+	USB_D+
8	GND	Ground
9	NC	Floating (NC) if not used
10	NC (WL_EN)	Floating (WLAN enable/disable) if not used
11	NC	Floating (NC) if not used
12	NC	Floating (NC) if not used
13	NC (HOST_WAKE_WL)	Floating (Host wake up WLAN device) if not used
14	NC (WL_WAKE_HOST)	Floating (WLAN device wake up host) if not used
Total	14PINS	12.9*12.2*2.0mm Package

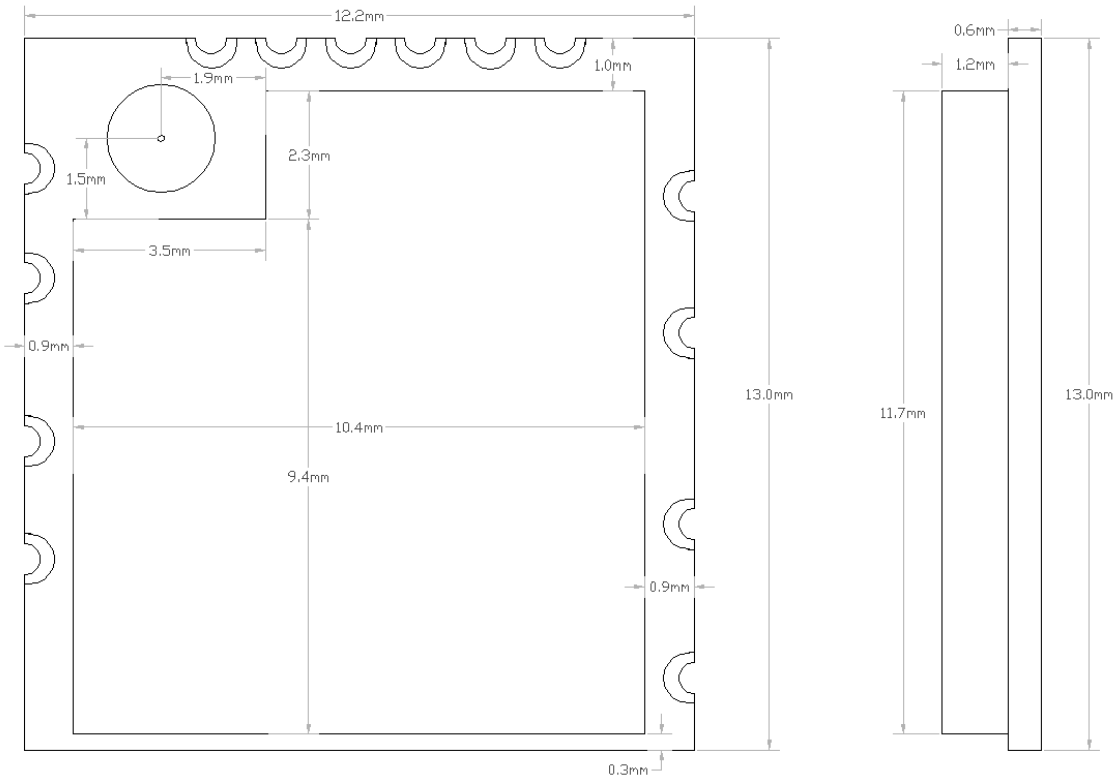
5. Dimensions

5.1 Layout Recommendation

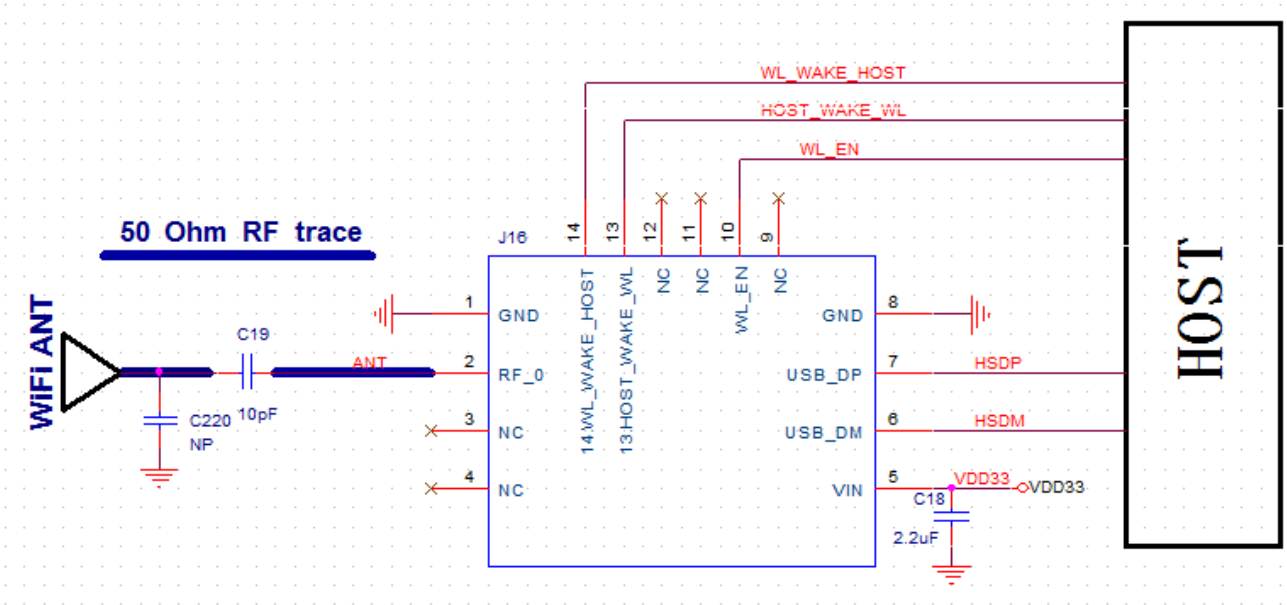
(Unit: mm)

< TOP VIEW >





6. Reference Design



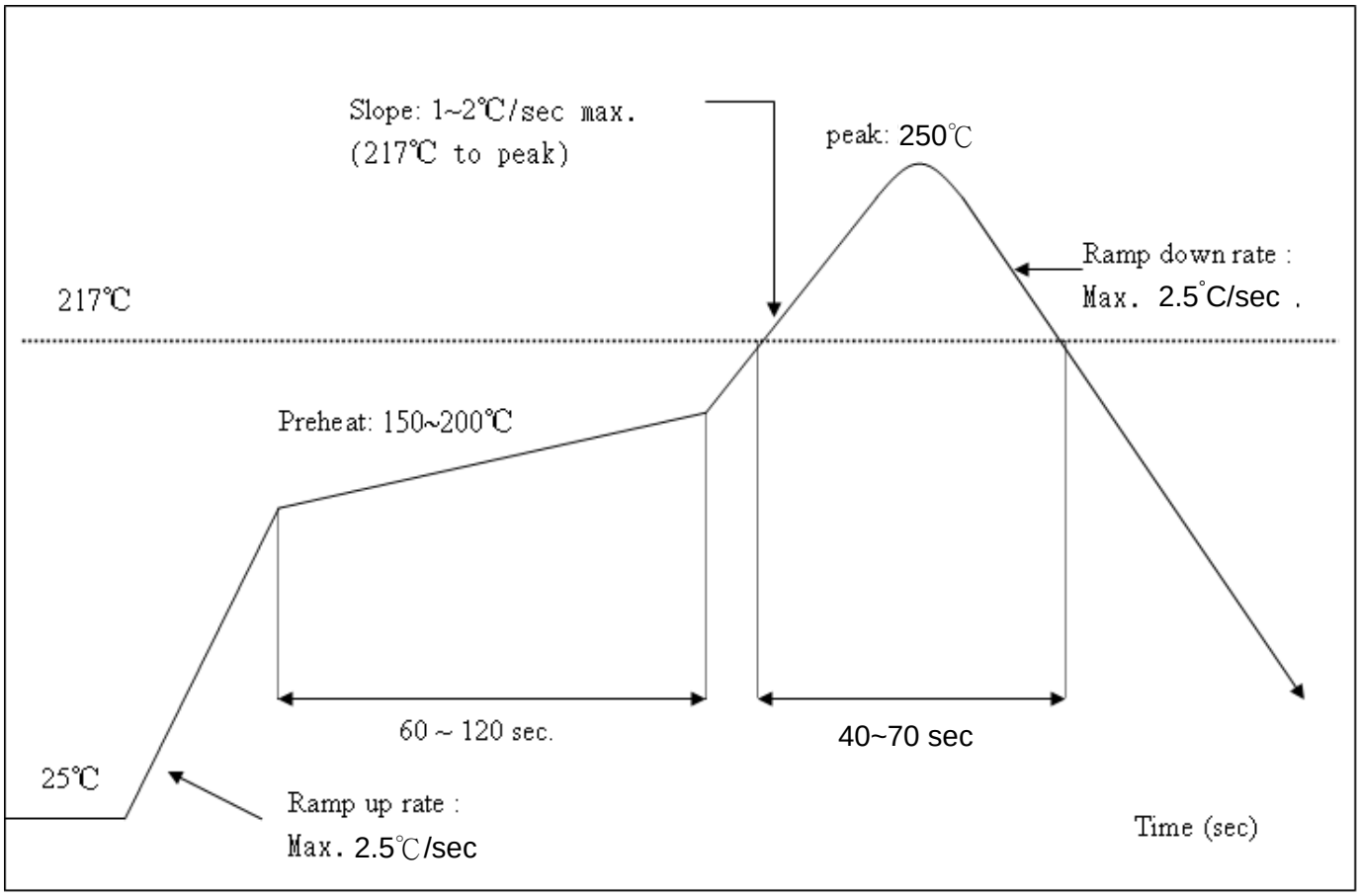
Pin 10/13/14 can be not connected if not used for additional control.

7. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times

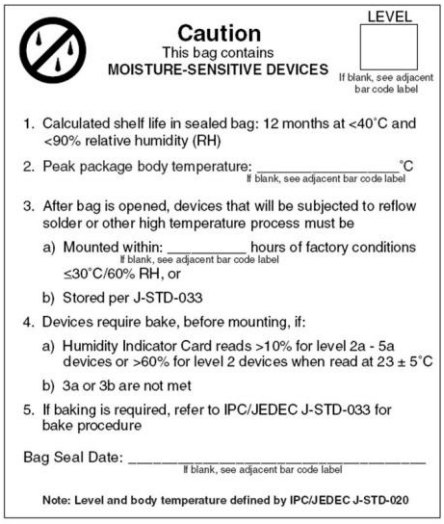


8. Packing Information

9.1 Label

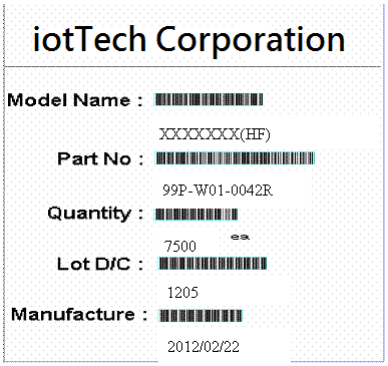
Label A → Anti-static and humidity notice

Label B → MSL caution / Storage Condition

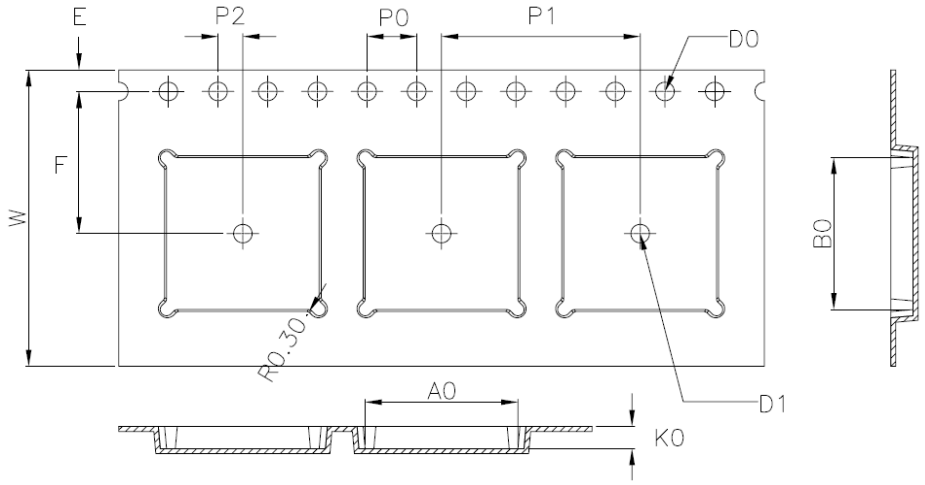


Label C → Inner box label .

Label D → Carton box label .

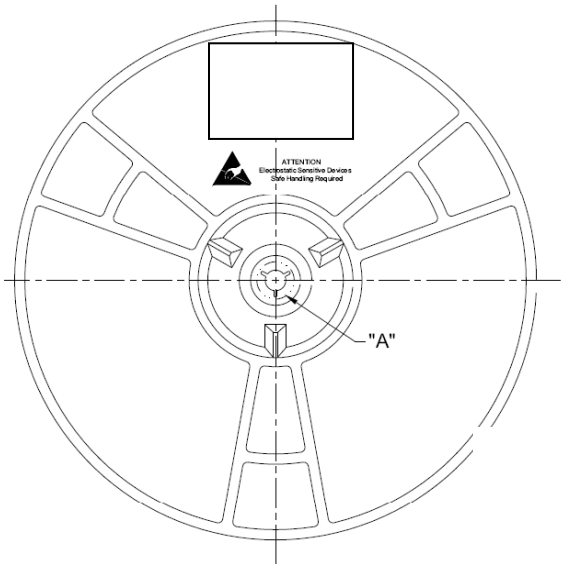


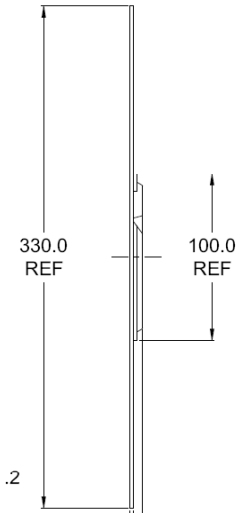
9.2 Dimension

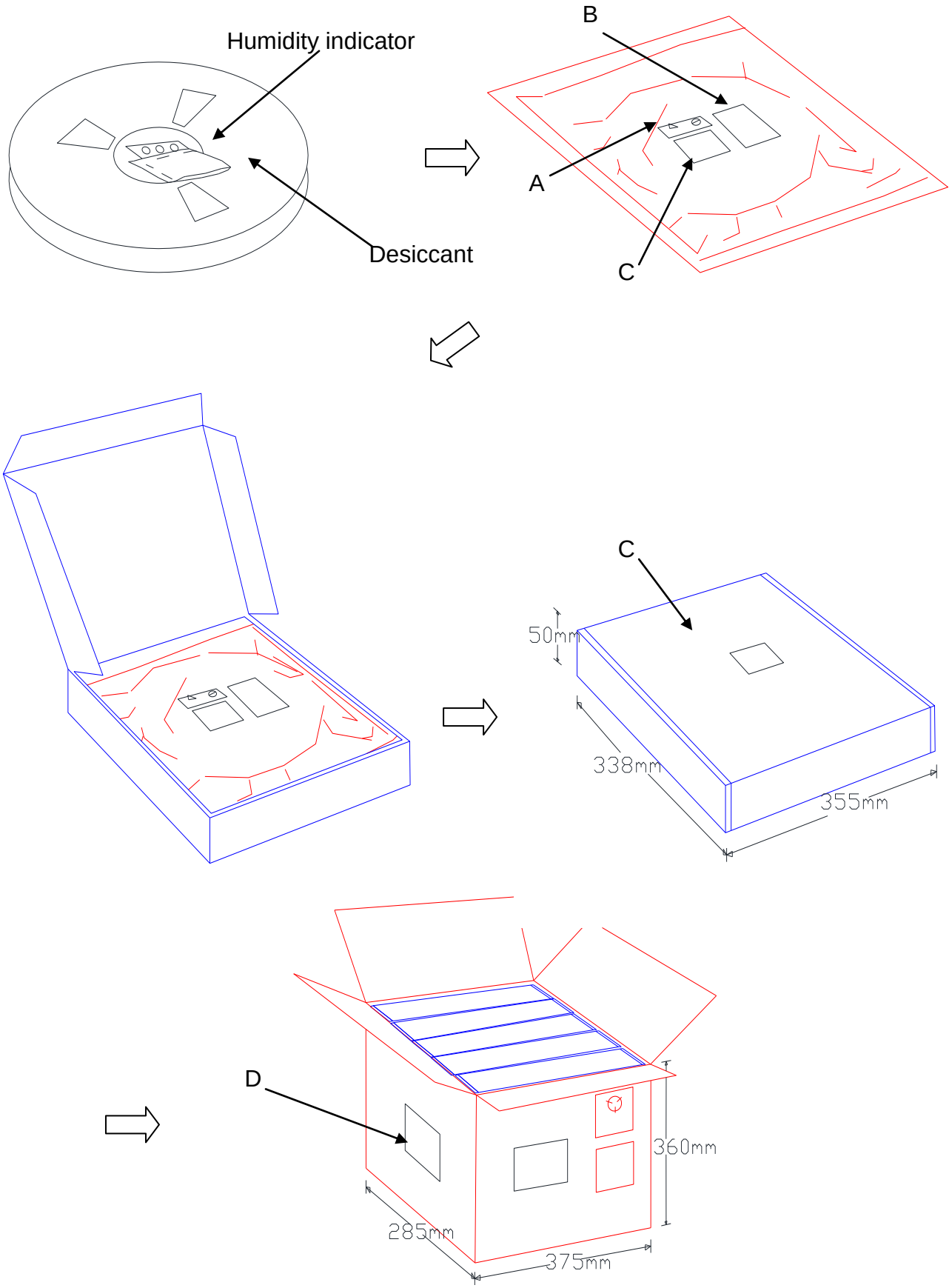


W	24.00±0.30
A0	12.60±0.10
B0	13.30±0.10
K0	1.80±0.10
E	1.75±0.10
F	11.65±0.10
P0	4.00±0.10
P1	17.00±0.10
P2	2.00±0.10
D0	1.50±0.10
D1	ϕ1.50MIN

1. 10 sprocket hole pitch cumulative tolerance ±0.20.
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30±0.05mm.
6. Packing length per 22" reel : 98.5 Meters.(1:3)
7. Component load per 13" reel : 1500 pcs.






Humidity indicator
Desiccant
B
A
C
C
50mm
338mm
355mm
D
360mm
285mm
375mm