



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

Revision History	2
Contents	3
1. General Description	4
2. Features	5
3. General Specification	6
3.1 Voltages.....	6
3.1.1 Absolute Maximum Ratings	6
3.1.2 Recommended Operating Ratings	6
3.2 Wi-Fi RF Specification (RX)	7
3.3 Wi-Fi RF Specification (TX)	8
3.4 Power Consumption	8
4. Pin Assignments	9
4.1 PCB Pin Outline.....	9
4.2 Pin Definition.....	9
5. Dimensions	11
5.1 Layout Recommendation	11
6. Reference Design	12
7. Recommended Reflow Profile	13
8. Packing Information	14
9.1 Label.....	14
9.2 Dimension.....	15

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.

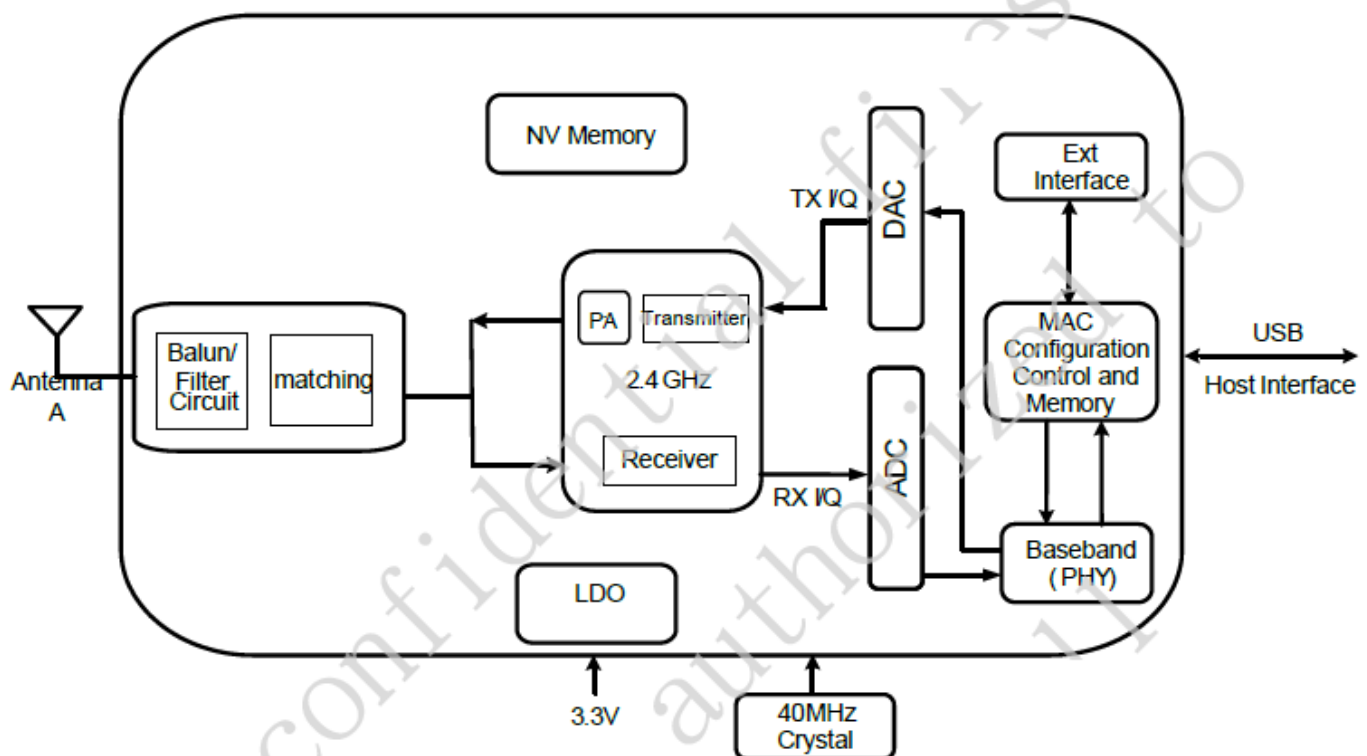


Figure 1. Single-Band 11n (1x1) Solution

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
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

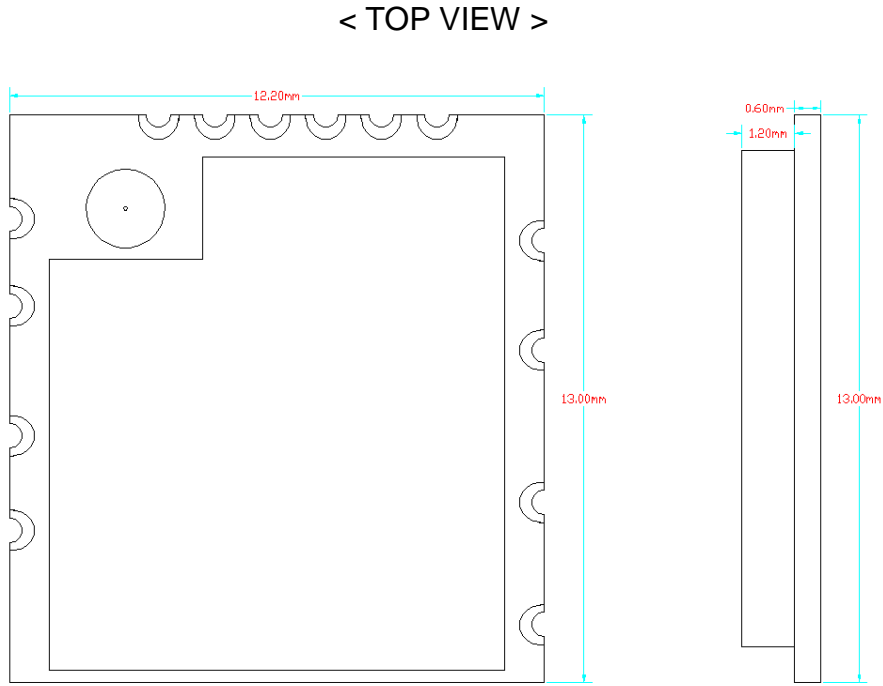
3.4 Power Consumption

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

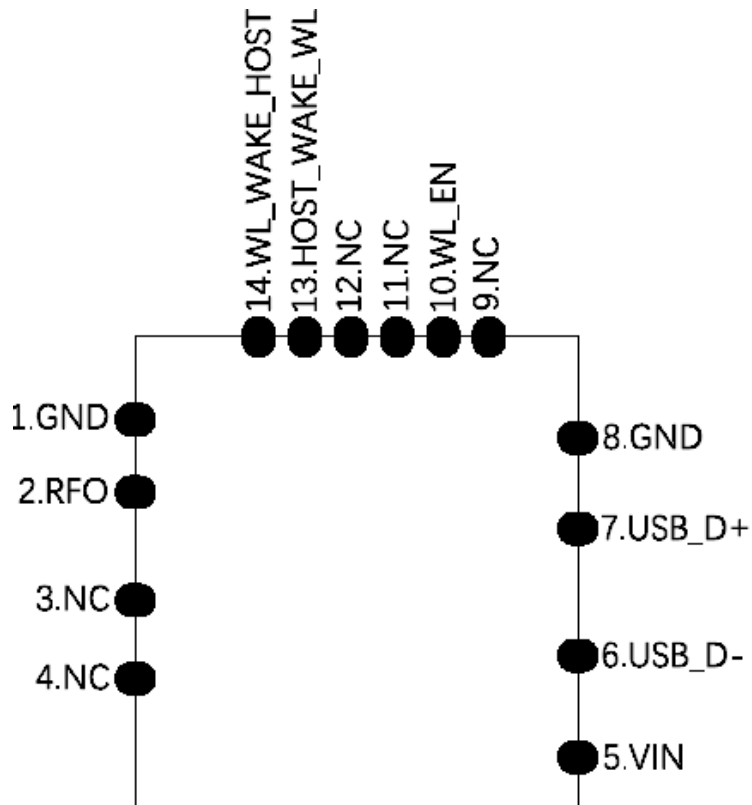
(Typical by using LDO)

4. Pin Assignments

4.1 PCB Pin Outline



4.2 Pin Definition



PIN Assignment

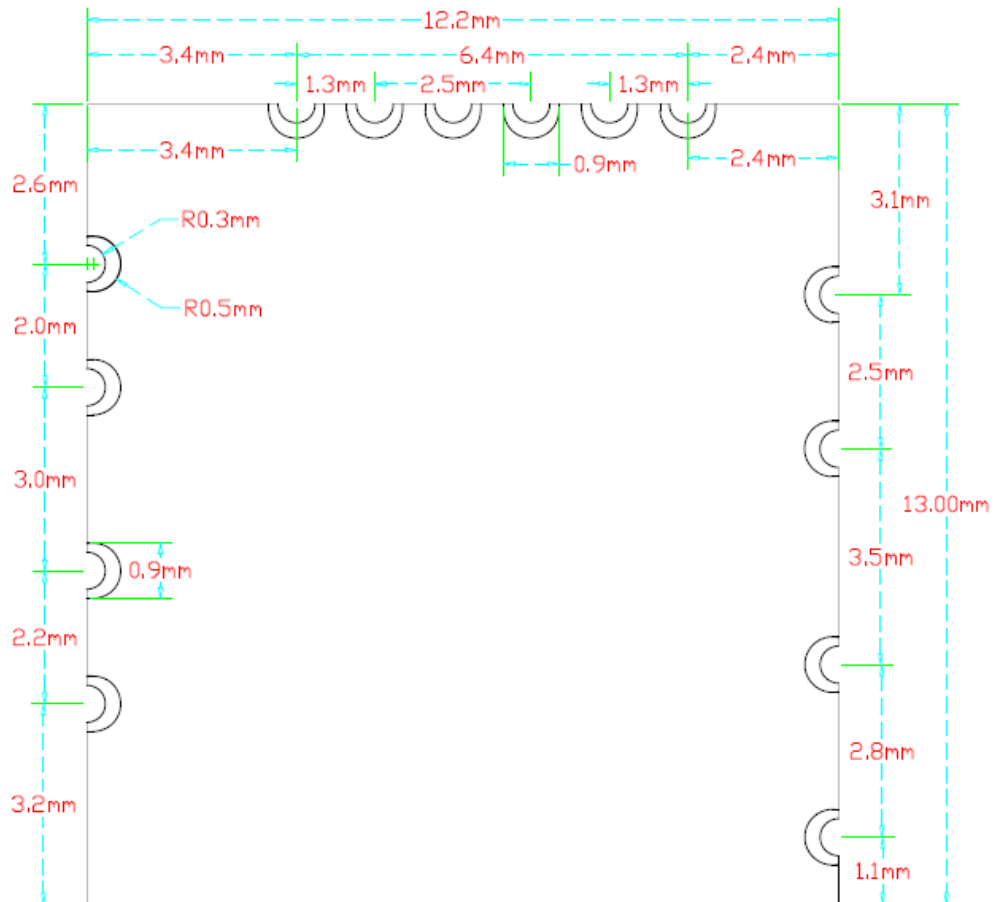
Pin #	Name	Description
1	GND	Ground
2	RF0	WLAN RF output
3	NC	Floating (NC)
4	NC	Floating (NC)
5	VIN	Main power voltage source input
6	USB_D-	USB_D-
7	USB_D+	USB_D+
8	GND	Ground
9	NC	Floating (NC) if not used
10	NC (WL_EN)	Floating (WLAN enable/disable) if not used
11	NC	Floating (NC) if not used
12	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

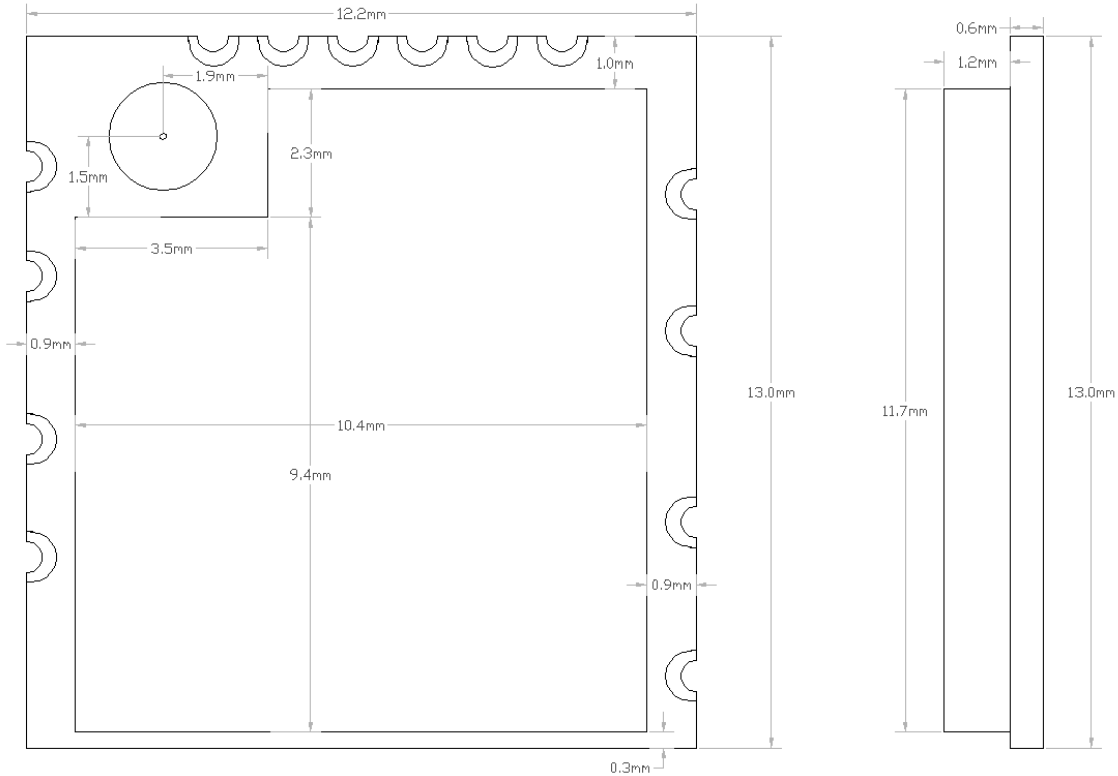
5. Dimensions

5.1 Layout Recommendation

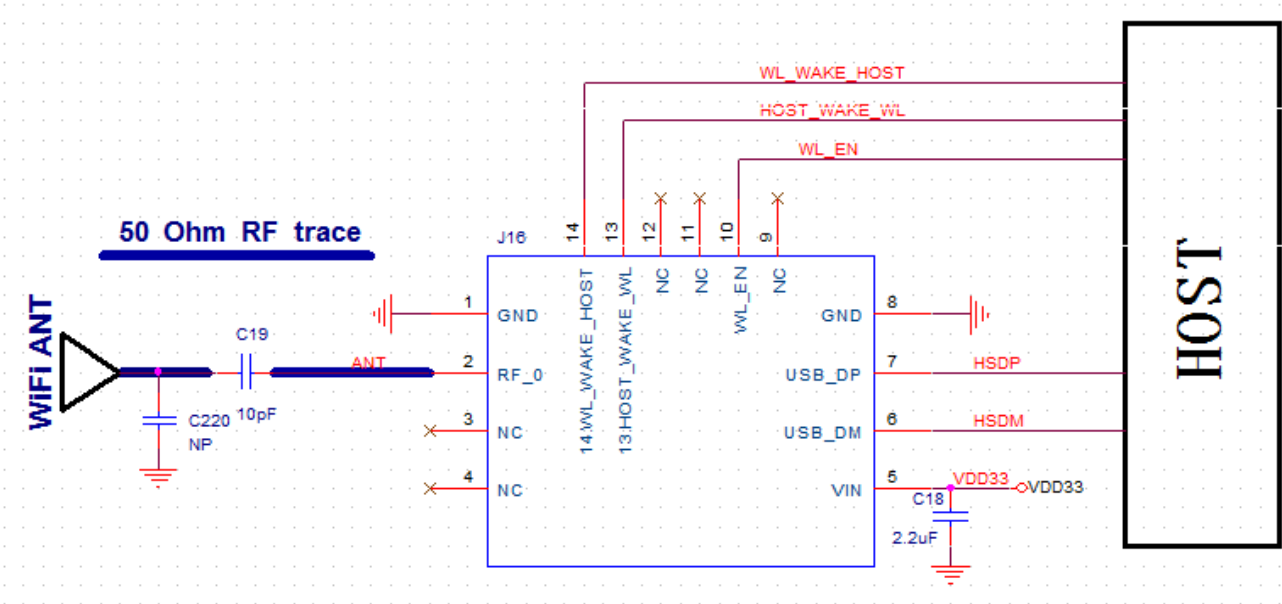
(Unit: mm)

< TOP VIEW >





6. Reference Design



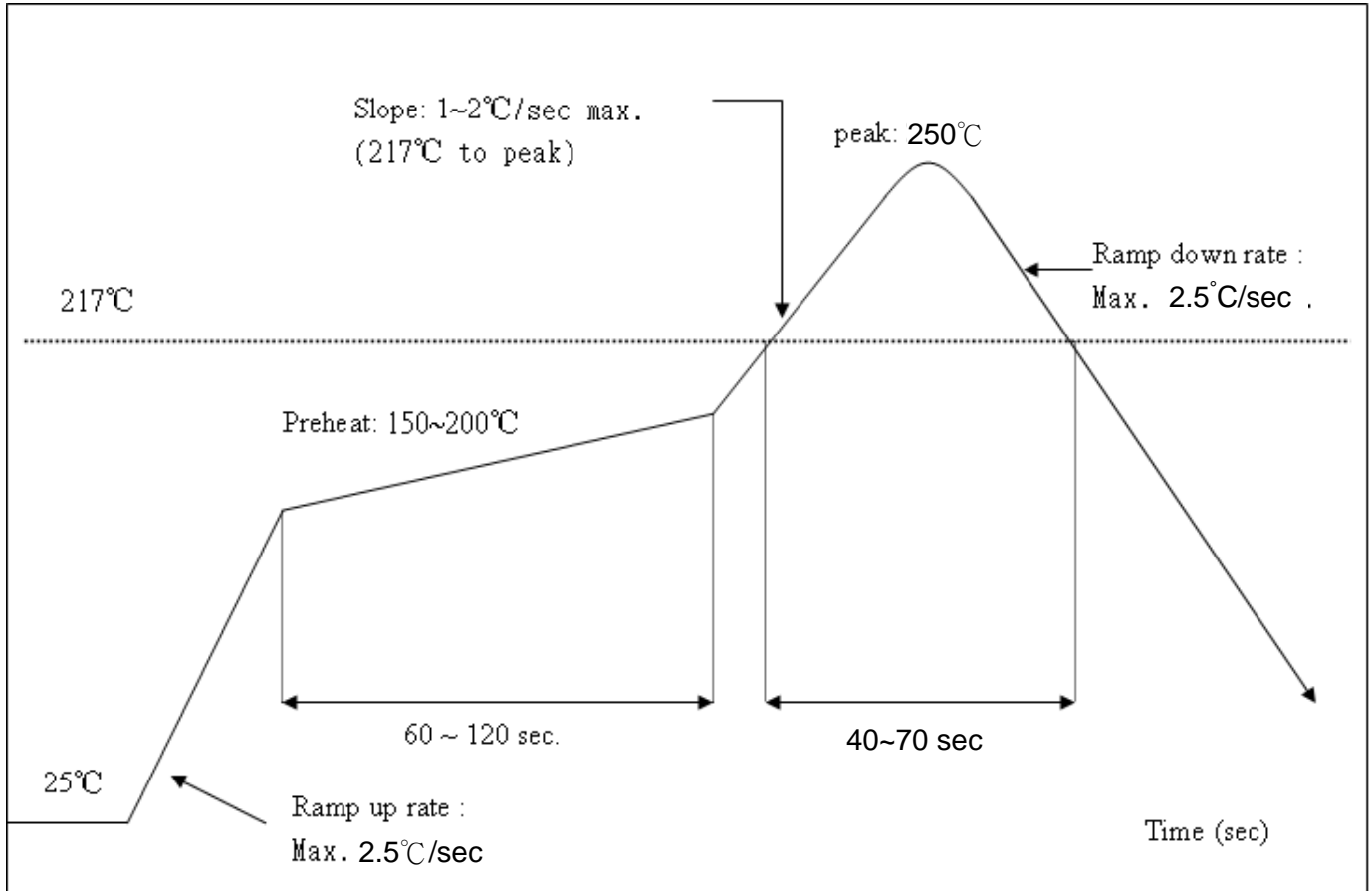
Pin 10/13/14 can be not connected if not used for additional control.

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

	Caution	LEVEL <input type="text"/>
	This bag contains MOISTURE-SENSITIVE DEVICES	
<small>If blank, see adjacent bar code label</small>		
1. Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)		
2. Peak package body temperature: _____ °C <small>If blank, see adjacent bar code label</small>		
3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be		
a) Mounted within: _____ hours of factory conditions <small>≤30°C/60% RH, or</small>		
b) Stored per J-STD-033		
4. Devices require bake, before mounting, if:		
a) Humidity Indicator Card reads >10% for level 2a - 5a devices or >60% for level 2 devices when read at 23 ± 5°C		
b) 3a or 3b are not met		
5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure		
Bag Seal Date: _____ <small>If blank, see adjacent bar code label</small>		
<small>Note: Level and body temperature defined by IPC/JEDEC J-STD-020</small>		

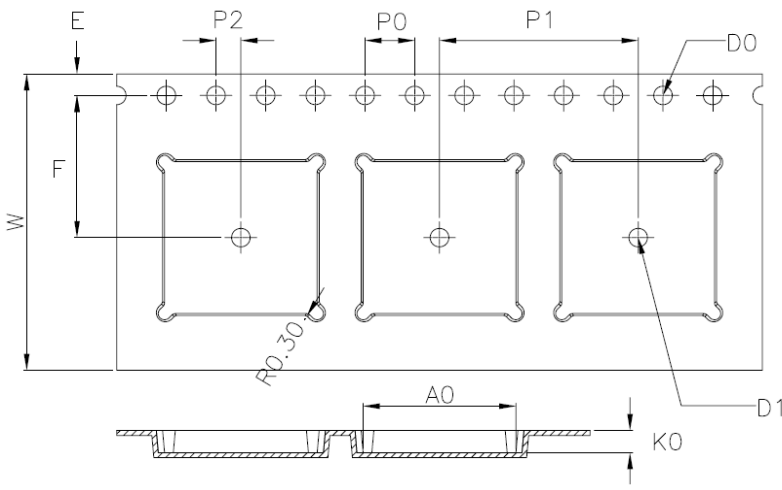
Label C → Inner box label .

PKG S/N :	
	9PKG12013100001
Model:	
	XXXXXXXX(HF)
P/N :	
	99P-W01-0042R
Qty :	
	1500
Date Code :	
	1205
Lot Code :	
	T0C102B

Label D → Carton box label .

iotTech Corporation	
Model Name :	
	XXXXXXXX(HF)
Part No :	
	99P-W01-0042R
Quantity :	
	7500
Lot D/C :	
	1205
Manufacture :	
	2012/02/22

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.

