



iTM1189F-C

IEEE 802.11b/g/n 1T1R WLAN Module Datasheet

Revision History

Date	Revision Content	Revised By	Version
2018/05/16	- Initial released	Ken Wu	0.1
2018/08/31	- Update Info	Ken Wu	1.0
2018/11/05	- Update Info	Ken Wu	1.1
2019/02/18	- New P/N for module with shielding case	Ken Wu	1.1
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1. General Description

The iotTech iTM1189F-C is a low-cost and a highly integrated single-chip WLAN module which has all of the Wi-Fi functionalities. The highly integrated module makes the possibilities of web browsing, VoIP, headsets and other applications. With seamless roaming capabilities and advanced security, also could interact with different vendors' 802.11b/g/n Access Points in the wireless LAN.

It is designed to support all mandatory IEEE 802.11b data rates of 1, 2, 5.5 and 11 Mbps, all 802.11g payload data rates of 6, 9, 12, 18, 24, 36, 48 and 54 Mbps, as well as 802.11n MCS0~MCS7, 20MHz/40MHz, 800ns and 400ns guard interval. The integrated module provides SDIO interface for Wi-Fi.

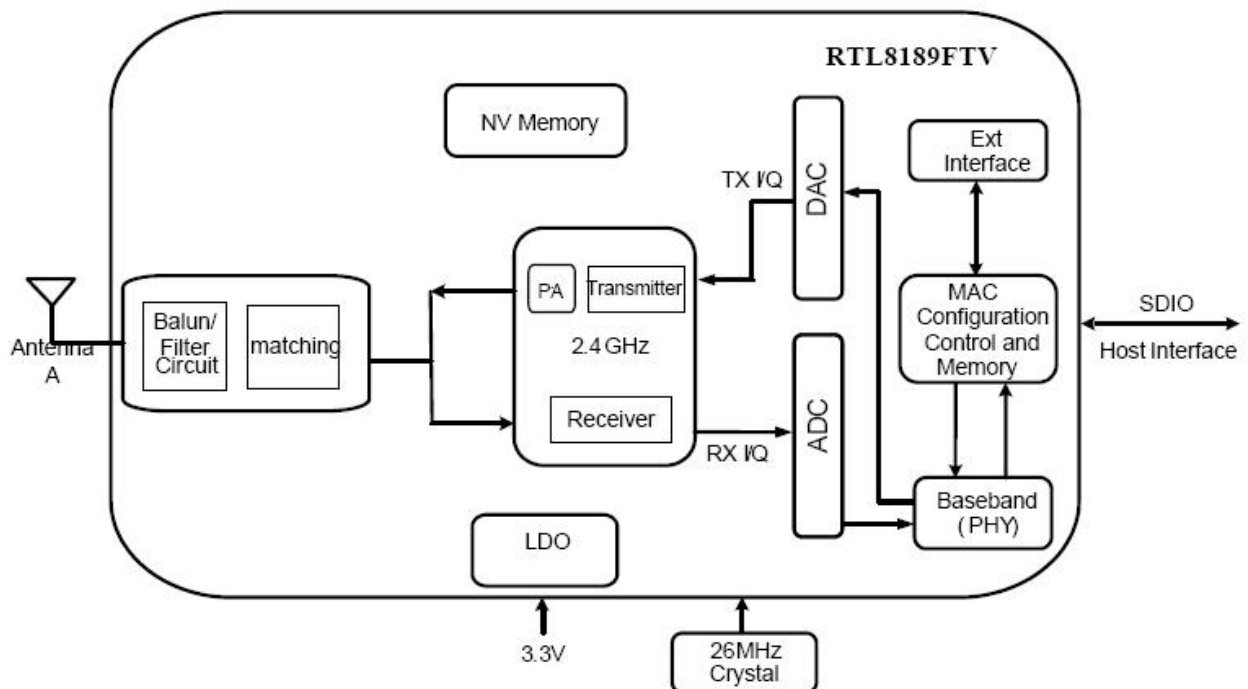
It includes additional LDOs that could provide noise isolation for digital and analog supplies and excellent power efficient with minimum BOM cost.

This compact module is a total solution for Wi-Fi technologies. The module is specifically developed for Tablet, OTT box and Portable devices.

2. Features

- WLAN chipset: Realtek RTL8189FTV
- Operate at ISM frequency bands (2.4GHz)
- SDIO 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 RTL8189FTV chipset is shown as 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
VBAT	Input supply Voltage	-0.3	3.6	V
VDDIO	Digital/Bluetooth/SDIO Voltage	-0.3	3.6	V

3.1.2 Recommended Operating Ratings

Test conditions: At room temperature				
Symbol	Min.	Typ.	Max.	Unit
VBAT	3.0	3.3	3.6	V
VDDIO	1.75	3.3	3.6	V

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

Test conditions: At operating temperature -10°C ~70°C				
Symbol	Min.	Typ.	Max.	Unit
VBAT	3.0	3.3	3.6	V
VDDIO	1.75	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		-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

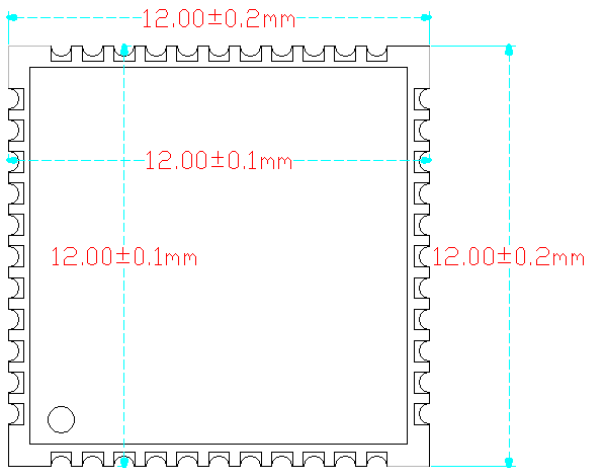
TX Mode: (Continuous mode)	210mA (MCS7/BW40/13dBm)
RX Mode: (Conituous mode)	115mA (MCS7/BW40/-60dBm)
Associated Idle power saving with DTIM=3	2.1mA
Unassociated Idle:	0.1mA
RF disable Mode:	0.1mA

(Typical by using LDO)

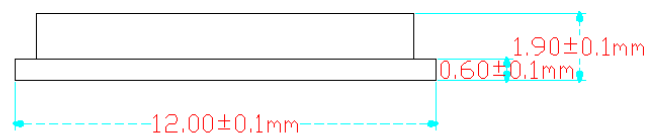
4. Pin Assignments

4.1 PCB Pin Outline (12X12mm)

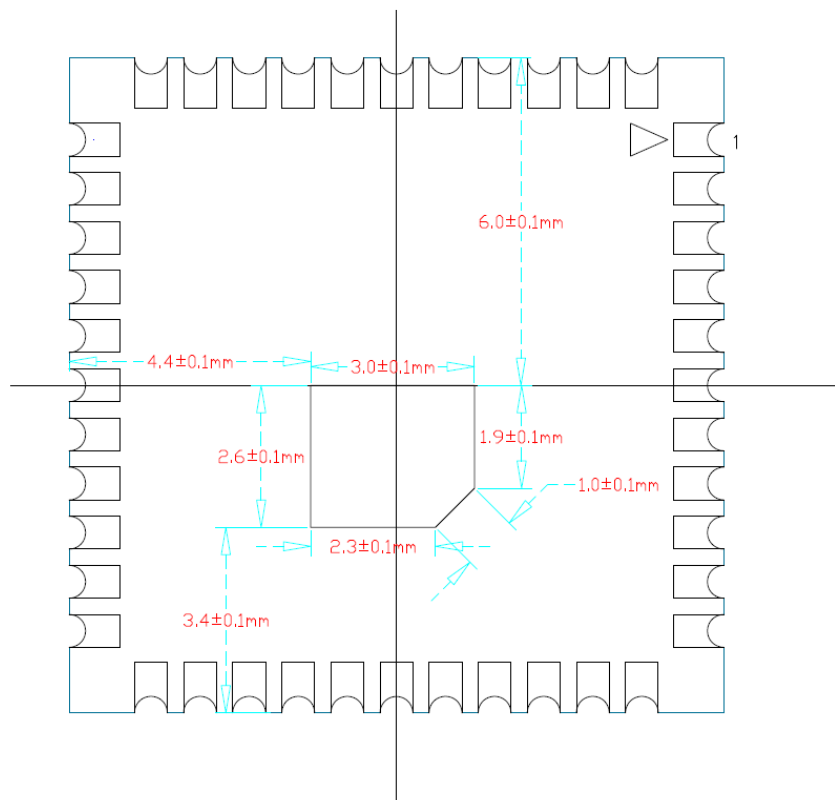
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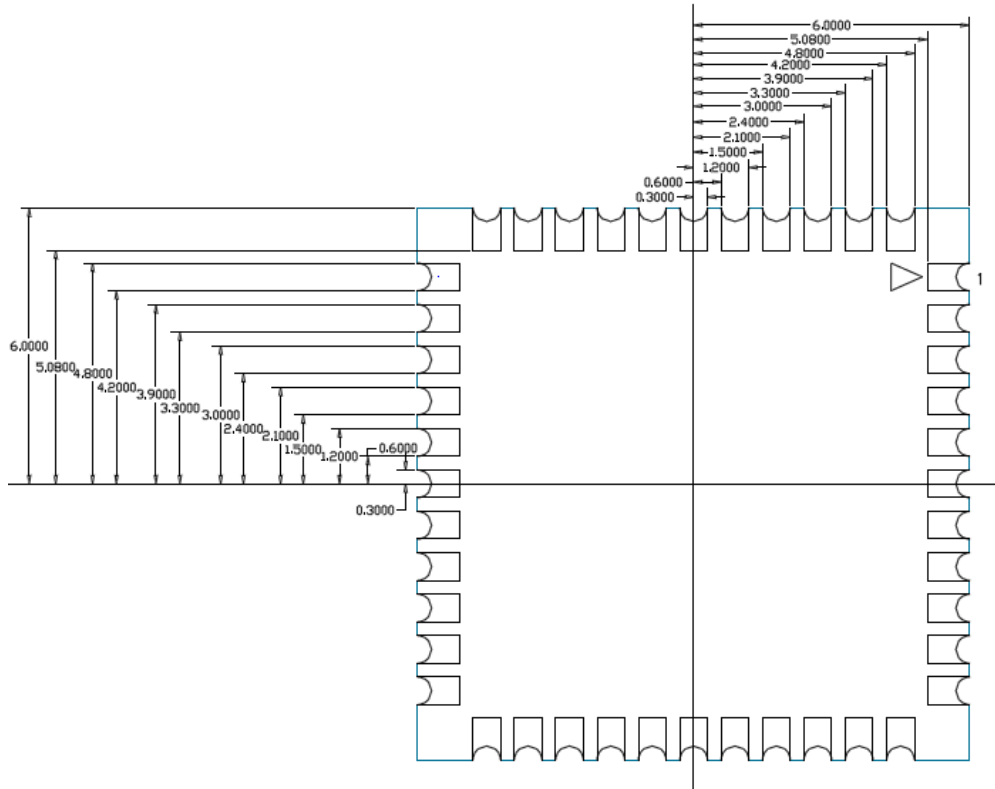


< SIDE VIEW >



< BOTTOM VIEW >





4.2 Pin Definition

NO	Name	Type	Description
1	GND	—	Ground connections
2	RF_OUT	I/O	RF I/O port
3	GND	—	Ground connections
4	NC	—	Floating (Don't connect it to ground)
5	NC	—	Floating (Don't connect it to ground)
6	NC	—	Floating (Don't connect it to ground)
7	NC	—	Floating (Don't connect it to ground)
8	NC	—	Floating (Don't connect it to ground)
9	VBAT	P	Main power voltage source input
10	NC	—	Floating (Don't connect it to ground)
11	NC	—	Floating (Don't connect it to ground)
12	LDO_EN	I	WLAN device power enable/disable
13	WL_HOST_WAKE	—	WLAN device wakes up Host
14	SDIO_DATA_2	I/O	SDIO data line 2
15	SDIO_DATA_3	I/O	SDIO data line3
16	SDIO_DATA_CMD	I/O	SDIO command line
17	SDIO_DATA_CLK	I/O	SDIO CLK line
18	SDIO_DATA_0	I/O	SDIO data line 0

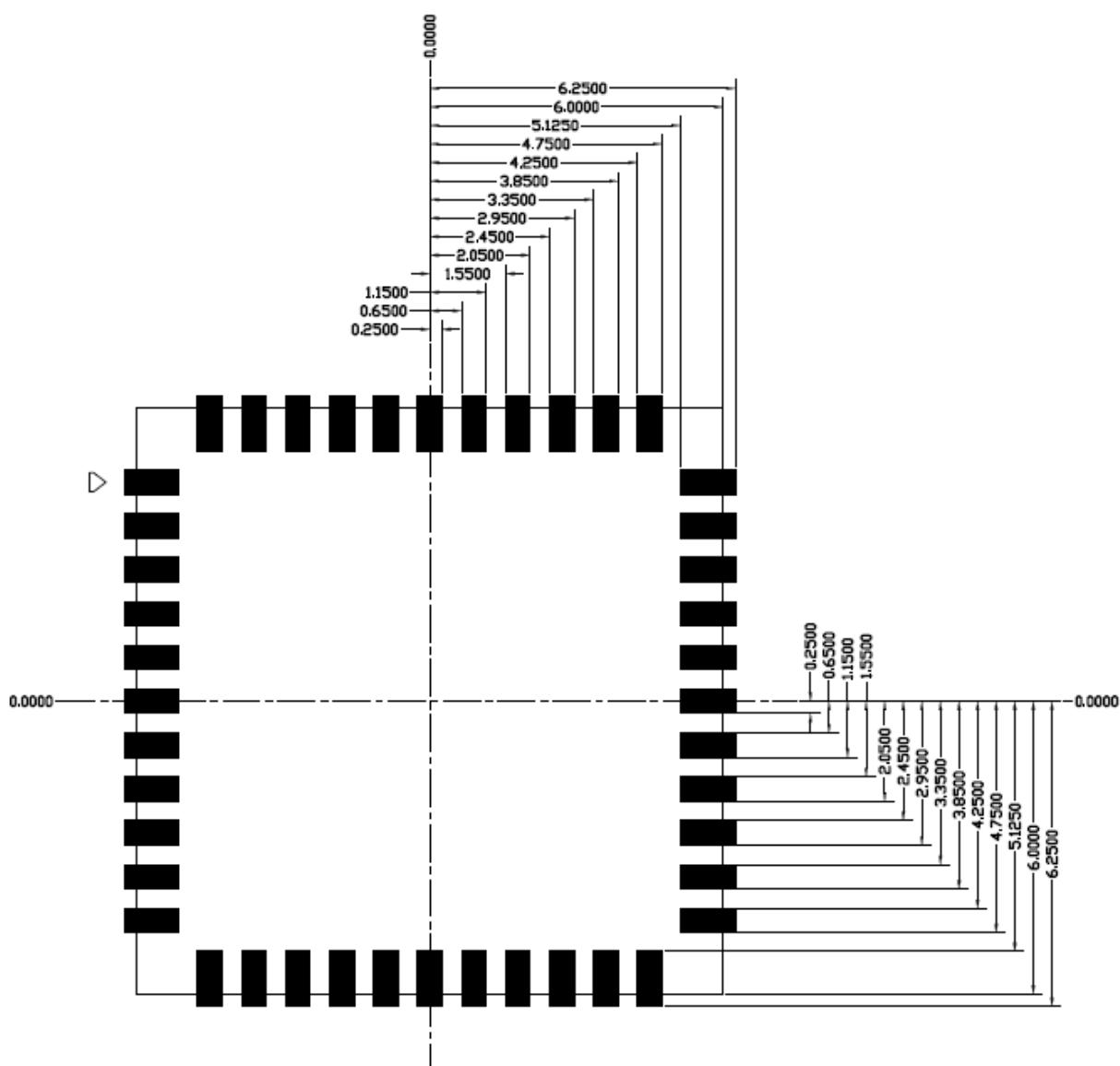
19	SDIO_DATA_1	I/O	SDIO data line 1
20	GND	—	Ground connections
21	NC	—	Floating (Don't connect it to ground)
22	VDDIO	P	I/O Voltage supply input
23	NC	—	Floating (Don't connect it to ground)
24	LPO	I	External Low Power Clock input (32.768KHz)
25	NC	—	Floating (Don't connect it to ground)
26	NC	—	Floating (Don't connect it to ground)
27	NC	—	Floating (Don't connect it to ground)
28	NC	—	Floating (Don't connect it to ground)
29	NC	—	Floating (Don't connect it to ground)
30	NC	—	Floating (Don't connect it to ground)
31	GND	—	Ground connections
32	NC	—	Floating (Don't connect it to ground)
33	GND	—	Ground connections
34	NC	—	Floating (Don't connect it to ground)
35	NC	—	Floating (Don't connect it to ground)
36	GND	—	Ground connections
37	NC	—	Floating (Don't connect it to ground)
38	NC	—	Floating (Don't connect it to ground)
39	NC	—	Floating (Don't connect it to ground)
40	NC	—	Floating (Don't connect it to ground)
41	NC	—	Floating (Don't connect it to ground)
42	NC	—	Floating (Don't connect it to ground)
43	NC	—	Floating (Don't connect it to ground)
44	NC	—	Floating (Don't connect it to ground)

5. Dimensions

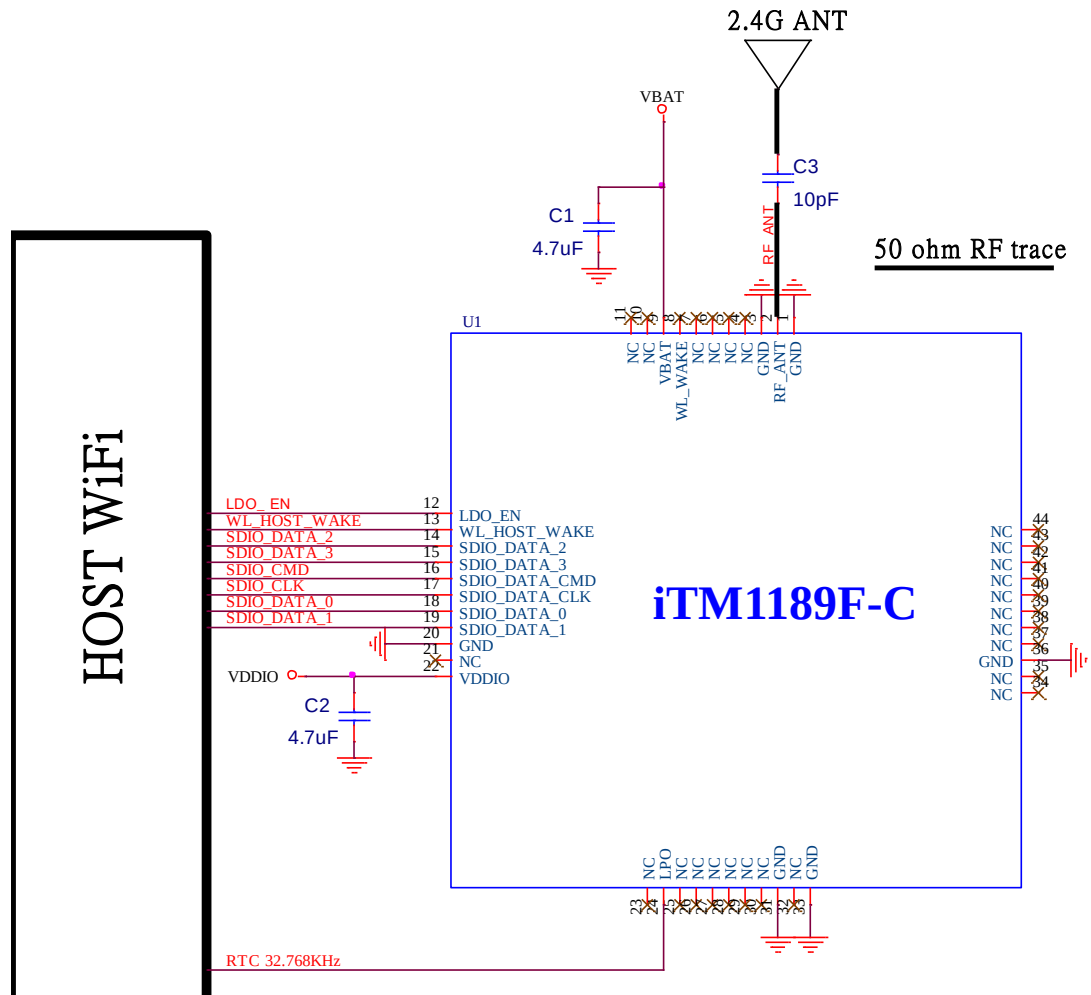
5.1 Layout Recommendation

(Unit: mm)

< TOP VIEW >



6. Reference Design

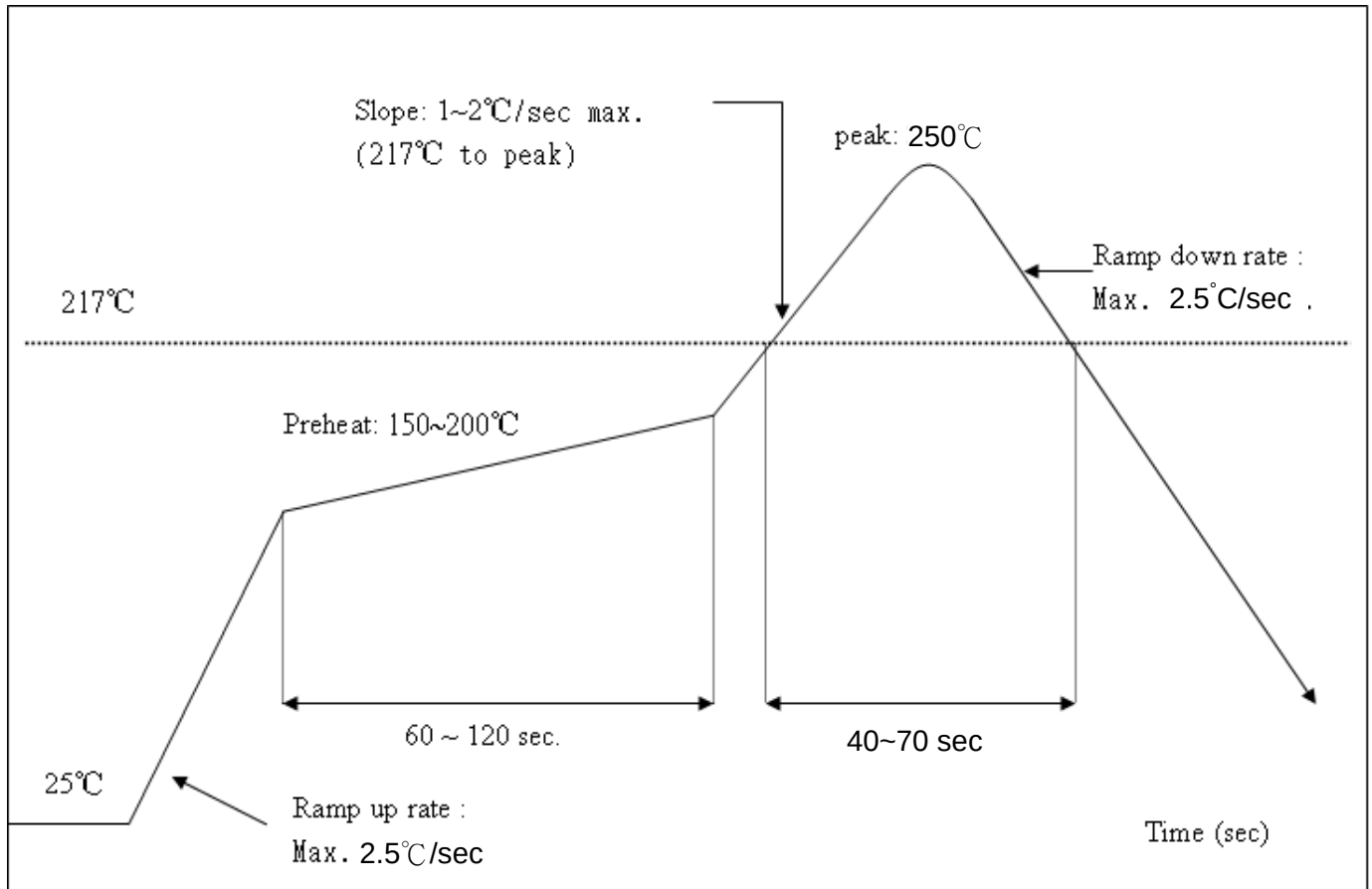


7. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : $<250^{\circ}\text{C}$

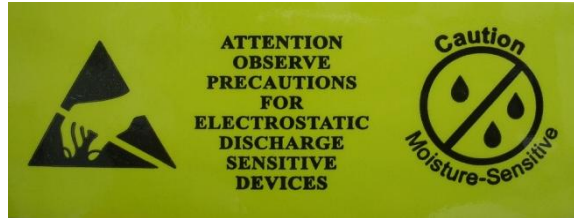
Number of Times : ≤ 2 times



8. Packing Information

8.1 Label

Label A → Anti-static and humidity notice



Label B → MSL caution / Storage Condition

	Caution	LEVEL
	This bag contains MOISTURE-SENSITIVE DEVICES	 If blank, see adjacent bar code label
1. Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH) 2. Peak package body temperature: _____ °C # blank, see adjacent bar code label 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 # blank, see adjacent bar code label ≤30°C/60% RH, or 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: _____ # blank, see adjacent bar code label Note: Level and body temperature defined by IPC/JEDEC J-STD-020		

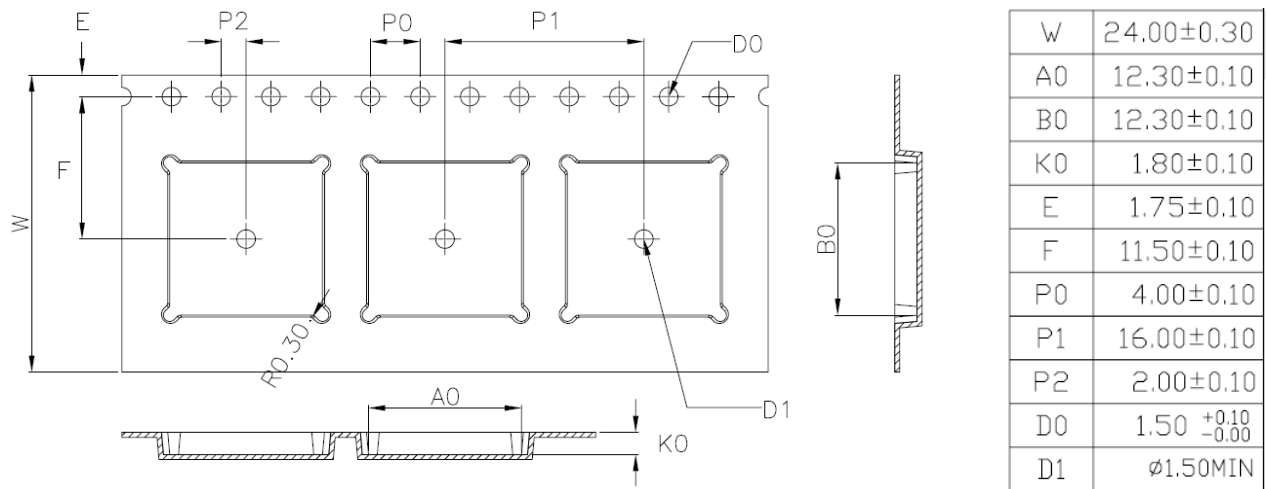
Label C → Inner box label .

PKG S/N :	
Model:	
P/N :	
Qty :	
Date Code :	
Lot Code :	

Label D → Carton box label .

iotTech Corporation	
Model Name :	
Part No :	
Quantity :	
Lot D/C :	
Manufacture :	

8.2 Dimension



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 : $0.30 \pm 0.05 \text{ mm}$.
6. Packing length per 22" reel : 98.5 Meters.(1:3)
7. Component load per 13" reel : 1500 pcs.

