



ITM1723-DS-C

IEEE 802.11 b/g/n 2.4GHz 1T1R Wi-Fi
with Bluetooth v2.1+EDR/Bluetooth
3.0/3.0+HS/4.2 Module Datasheet

V1.1

Revision History

Date	Revision Content	Revised By	Version
2023/06/28	- Initial released	Pendro Wu	1.0
2025/02/26	- RF parameter and pin define revision	Pendro Wu	1.1
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1. General Description

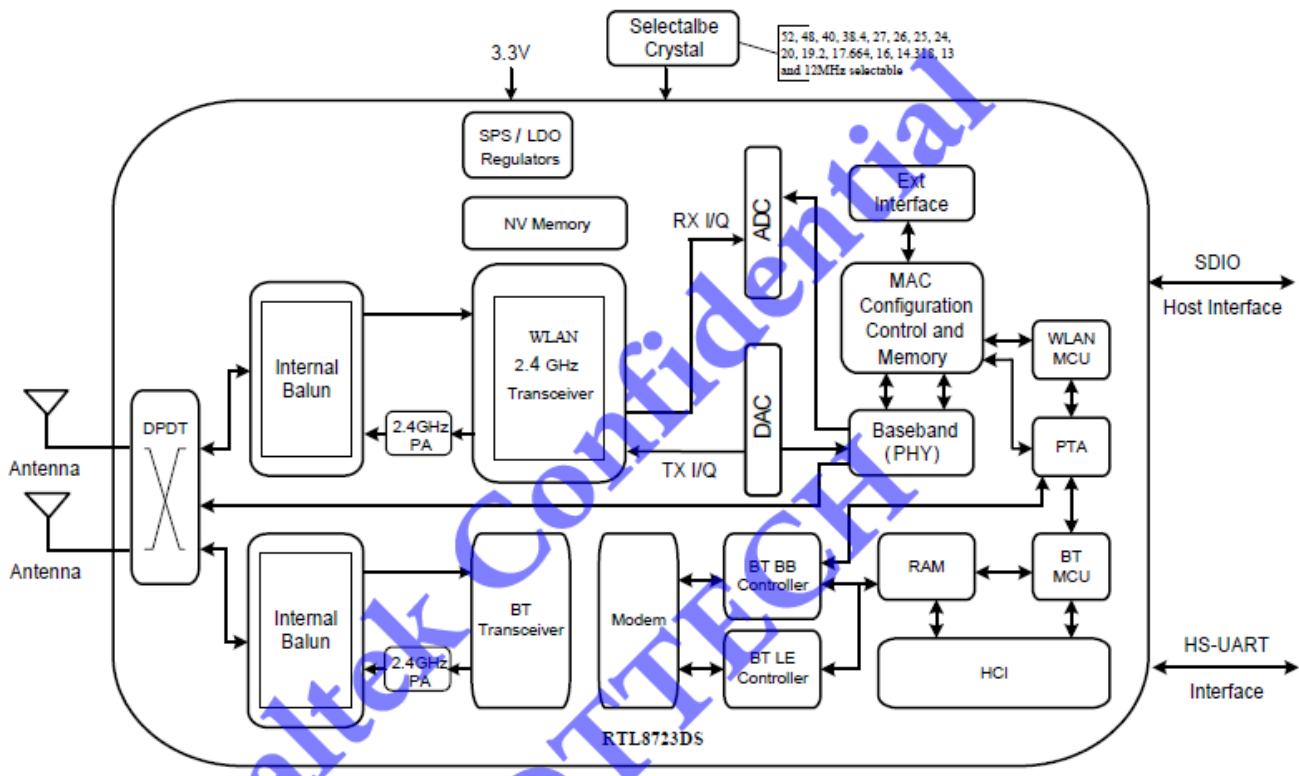
The iotTech iTM1723-DS-C is a small size and low profile of WiFi + BT Combo module with LGA (Land-Grid Array) footprint, board size is 12.0mm*12.0mm with module thickness of 2mm. It can be easily manufactured on SMT process and highly suitable for tablet PC, ultra book, mobile device and consumer products. It provides SDIO interface for WiFi to connect with host processor and high speed UART interface for BT. It also has a PCM interface for audio data transmission with direct link to external audio codec via BT controller. The WiFi throughput can go up to 150 Mbps in theory by using 1x1 802.11n b/g/n MIMO technologies and Bluetooth can support BT2.1+EDR/BT3.0, and BT4.0/4.2

iTM1723-DS-C uses Realtek RTL8723DS, a highly integrated WiFi+BT single chip based on advanced COMS process. RTL8723DS integrates whole WiFi/BT function blocks into a chip, such as MAC, BB, AFE, RFE, PA/LNA/Balun/DPDT, EEPROM and LDO/SWR, except fewer passive components remained on PCB.

2. Features

- Operate at ISM frequency bands (2.4GHz)
- SDIO for WiFi and UART for Bluetooth
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i
- Fully Qualified for Bluetooth 2.1+EDR specification including both 2Mbps and 3Mbps modulation mode
- Fully qualified for Bluetooth 3.0
- Fully qualified for Bluetooth 4.0 Dual mode
- Complies with Bluetooth core specification v4.2
- Full-speed Bluetooth operation with Piconet and Scatternet support
- 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 block diagram for ITM1723-DS-C module 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

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	1.62	1.8/3.3	3.6	V

Test conditions: At operating temperature -10°C ~70°C				
Symbol	Min.	Typ.	Max.	Unit
VBAT	3.0	3.3	3.6	V
VDDIO	1.62	1.8/3.3	3.6	V

- SDIO/UART/PCM signal level is determined by VDDIO voltage

3.2 Power Consumption

Wi-Fi	Condition	Typ.	Unit
Continuous TX mode	11n-HT40/MCS7/13dBm	210	mA
Continuous RX mode	11n-HT40/MCS7	70	mA
Associated Idle	DTIM=3	1.5	mA
RF Disable		0.1	mA
Bluetooth			
Inquiry and Page Scan		1	mA
ACL No Traffic		8	mA
SCO HV3		15	mA

- Typical by using SWR mode

3.3 Wi-Fi RF Specification (RX)

Parameters	Conditions	Min.	Typ.	Max.	Unit
Frequency Range		2412		2484	MHz
RX Sensitivity 11b @ 8% PER	- 1Mbps	-94	-92	-90	dBm
	- 2Mbps	-93	-91	-89	dBm
	- 5.5Mbps	-91	-89	-87	dBm
	- 11Mbps	-89	-87	-85	dBm
RX Sensitivity 11g @ 10% PER	- 6Mbps	-91	-89	-87	dBm
	- 9Mbps	-90	-88	-86	dBm
	- 12Mbps	-88	-86	-84	dBm
	- 18Mbps	-86	-84	-82	dBm
	- 24Mbps	-83	-81	-79	dBm
	- 36Mbps	-79	-77	-75	dBm
	- 48Mbps	-75	-73	-71	dBm
	- 54Mbps	-74	-72	-70	dBm
Receive Sensitivity (11n,20MHz) @10% PER	- MCS0	-91	-89	-87	dBm
	- MCS=1	-88	-86	-84	dBm
	- MCS=2	-86	-84	-82	dBm
	- MCS=3	-83	-81	-79	dBm
	- MCS=4	-79	-77	-75	dBm
	- MCS=5	-76	-74	-72	dBm
	- MCS=6	-74	-72	-70	dBm
	- MCS=7	-70	-68	-66	dBm
Receive Sensitivity (11n,40MHz) @10% PER	- MCS0	-88	-86	-84	dBm
	- MCS=1	-85	-83	-81	dBm
	- MCS=2	-83	-81	-79	dBm
	- MCS=3	-80	-78	-76	dBm
	- MCS=4	-76	-74	-72	dBm
	- MCS=5	-72	-70	-68	dBm
	- MCS=6	-71	-69	-67	dBm
	- MCS=7	-68	-66	-64	dBm
Maximum Receive Level	802.11b	-20	0		dBm
	802.11g	-20	0		dBm
	802.11n	-20	0		dBm

3.4 Wi-Fi RF Specification (TX)

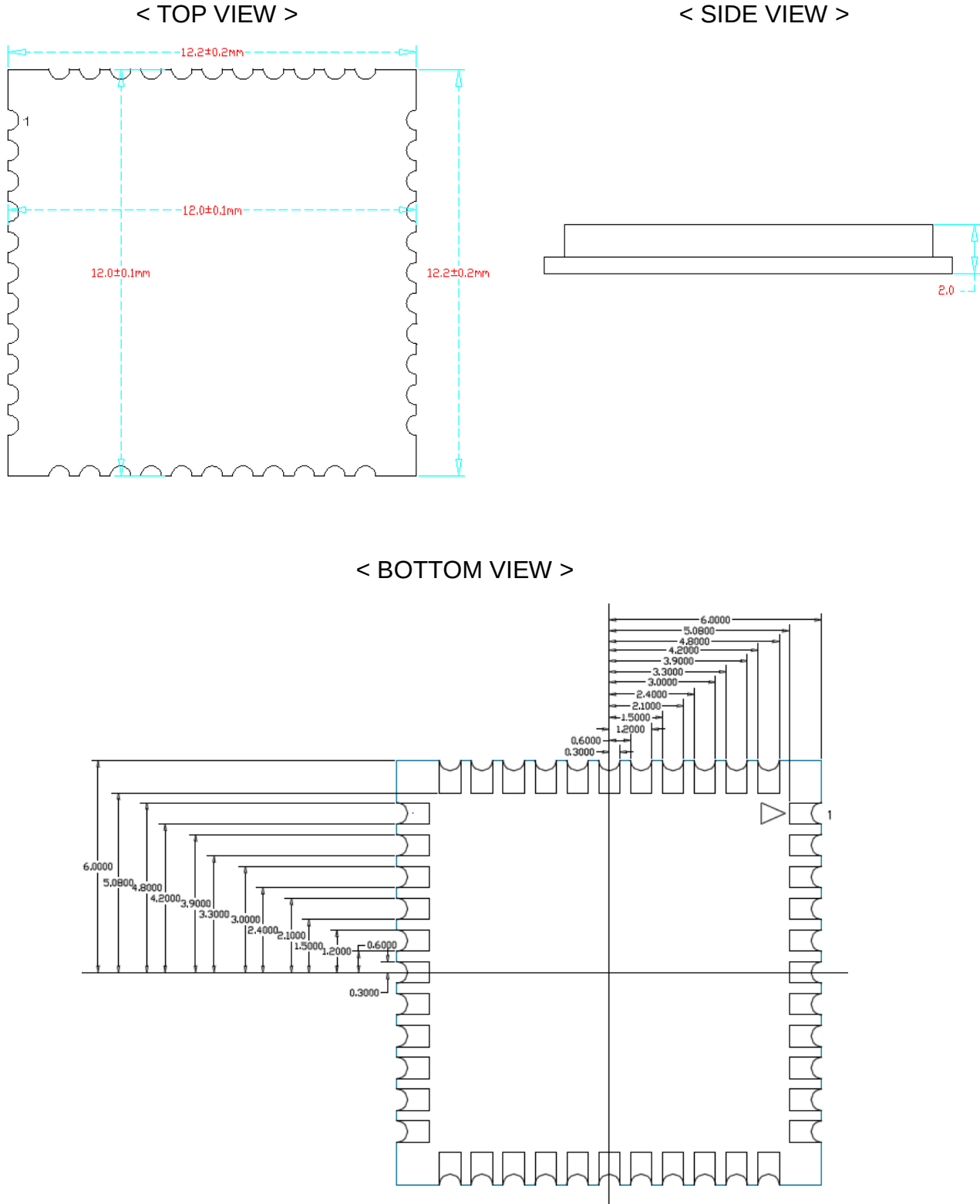
Parameters	Conditions	Min.	Typ.	Max.	Unit
Frequency Range		2412		2484	MHz
Output Power	802.11b	15	17	19	dBm
	802.11g	12	14	16	dBm
	802.11n	11	13	15	dBm
@EVM	802.11b / 11Mbps	--	-20	-10	dB
	802.11g / 54Mbps	--	-29	-25	dB
	802.11n / MCS7	--	-30	-28	dB

3.5 Bluetooth Specification

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V2.1/V3.0/V4.2.		
Host Interface	UART.		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2402 MHz ~ 2480 MHz.		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK.		
RF Specification			
	Min.	Typical.	Max.
Output Power (BR/EDR/BLE)		6dBm	10dBm
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-88dBm	-70dBm
Sensitivity @ BER=0.1% for π/4-DQPSK (2Mbps)		-85dBm	-70dBm
Sensitivity @ BER=0.1% for 8DPSK (3Mbps)		-83dBm	-70dBm
Sensitivity @ PER=30.8% for BLE		-90dBm	-70dBm
Maximum Input Level	GFSK (1Mbps):-20dBm		
	π/4-DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

4. Pin Assignments

4.1 PCB Pin Outline (12mmx12mmx2mm)



4.2 Pin Definition

Pin-No	Pin-Define	Type	Description
1	GND	GND	Ground
2	ANT	I/O	WLAN and Bluetooth RF I/O port
3	GND	GND	Ground
4	NC	NC	NC
5	NC	NC	NC
6	BT_WAKE	I	HOST wake-up Bluetooth device
7	BT_HOST_WAKE	O	Bluetooth device to wake-up HOST
8	NC	NC	NC
9	VBAT	Power	Main power voltage source input(3V~3.6V)
10	NC	NC	NC
11	NC	NC	NC
12	WL_REG_ON	I	Internal regulators power enable/disable
13	WL_HOST_WAKE	O	WLAN to wake-up HOST
14	SDIO_DATA_2	I/O	SDIO data line 2
15	SDIO_DATA_3	I/O	SDIO data line 3
16	SDIO_DATA_CMD	I/O	SDIO command line
17	SDIO_DATA_CLK	I/O	SDIO clock line
18	SDIO_DATA_0	I/O	SDIO data line 0
19	SDIO_DATA_1	I/O	SDIO data line 1
20	GND	GND	Ground
21	NC	NC	NC
22	VDDIO	Power	I/O Voltage supply input(3V~3.6V)
23	NC	NC	NC
24	RTC_CLK	I	External Low Power Clock input(32.768KHz)
25	PCM_OUT	I/O	PCM data output
26	PCM_CLK	I/O	PCM Clock
27	PCM_IN	I/O	PCM data input
28	PCM_SYNC	I/O	PCM sync signal
29	NC	NC	NC
30	NC	NC	NC
31	GND	GND	Ground
32	NC	NC	NC
33	GND	GND	Ground
34	BT_RST_N	I	Low asserting reset for Bluetooth core

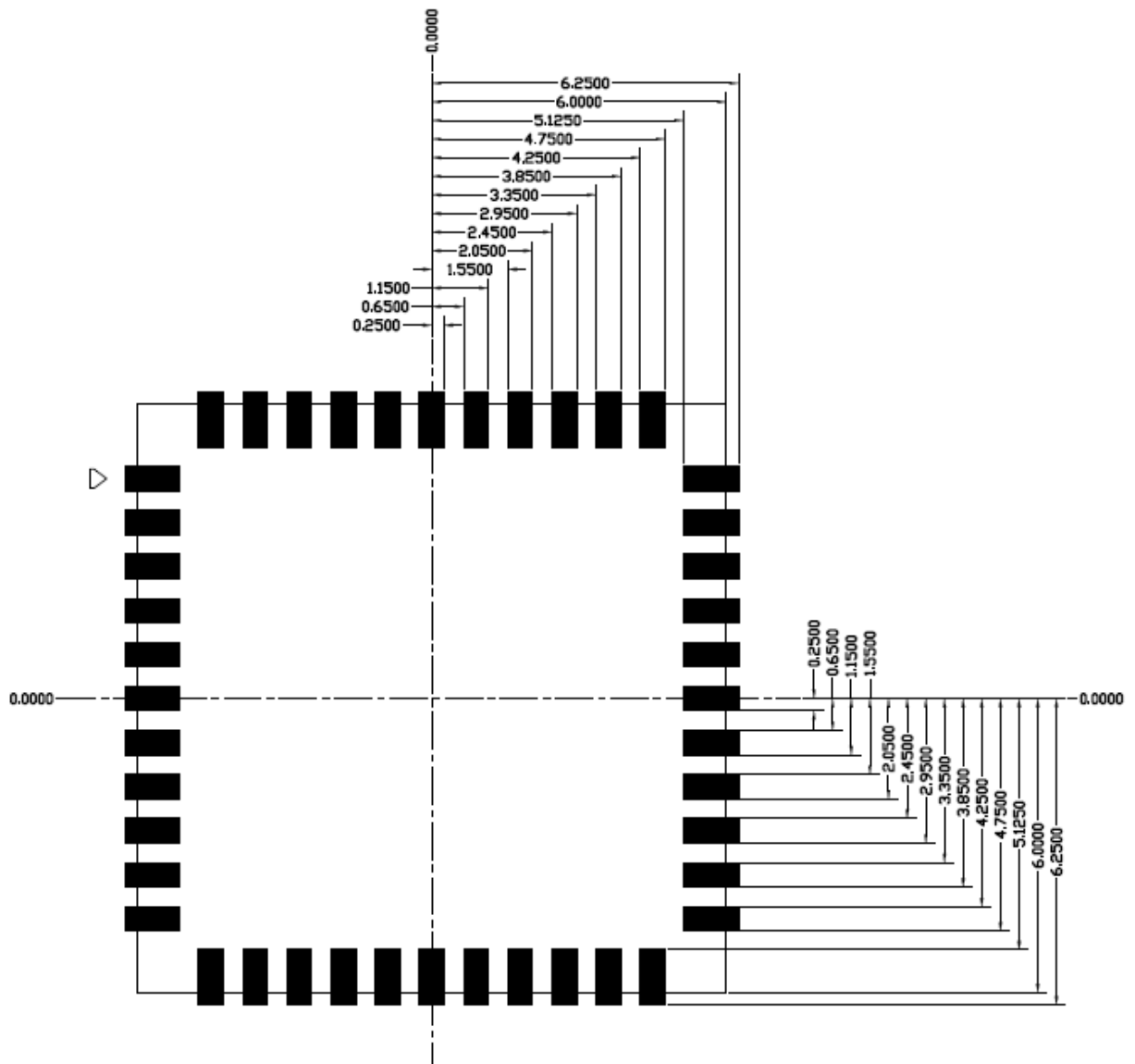
35	NC	NC	NC
36	GND	GND	Ground
37	NC	NC	NC
38	NC	NC	NC
39	NC	NC	NC
40	NC	NC	NC
41	UART_RTS_N	O	Bluetooth UART interface (Grounded)
42	UART_TXD	O	Bluetooth UART interface
43	UART_RXD	I	Bluetooth UART interface
44	UART_CTS_N	I	Bluetooth UART interface

5. Dimensions

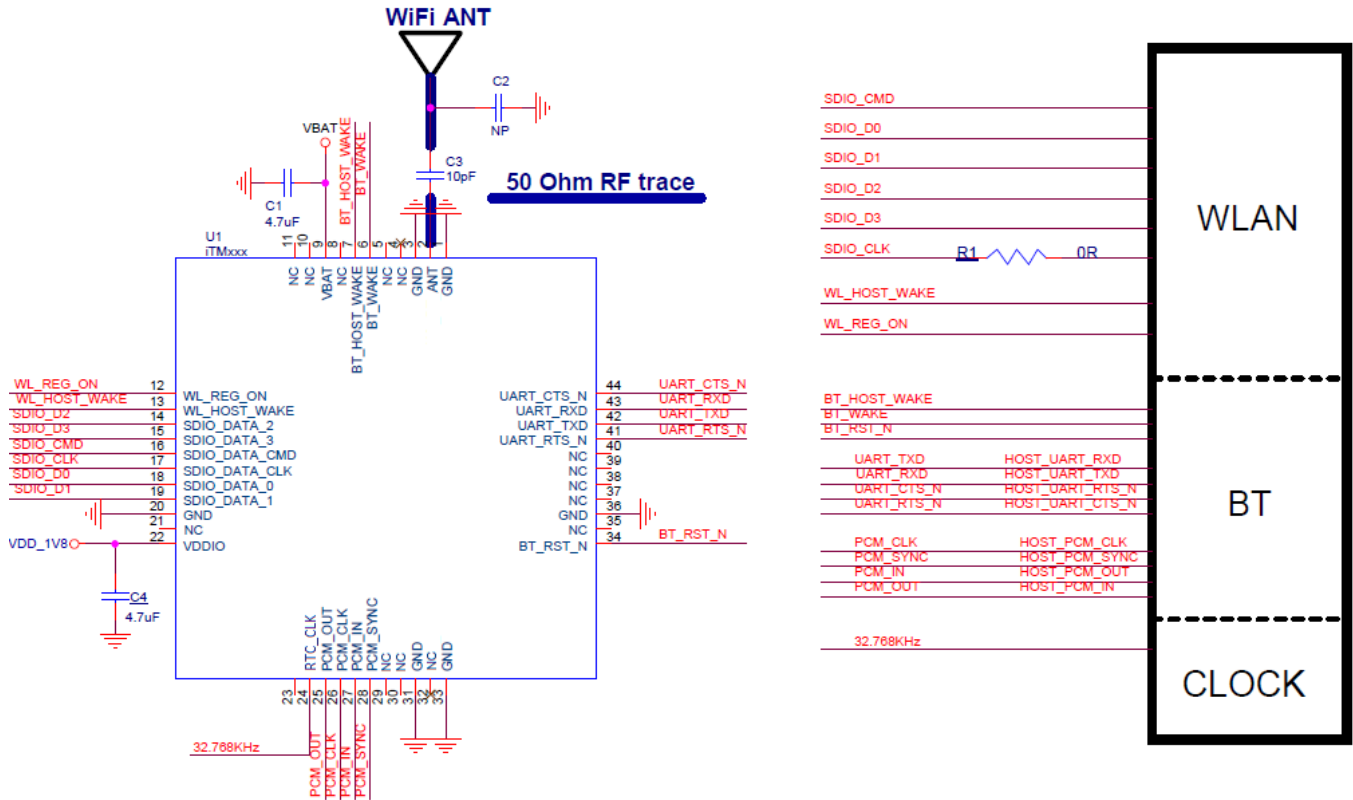
5.1 Layout Recommendation

(Unit: mm)

< TOP VIEW >



6. Reference Design

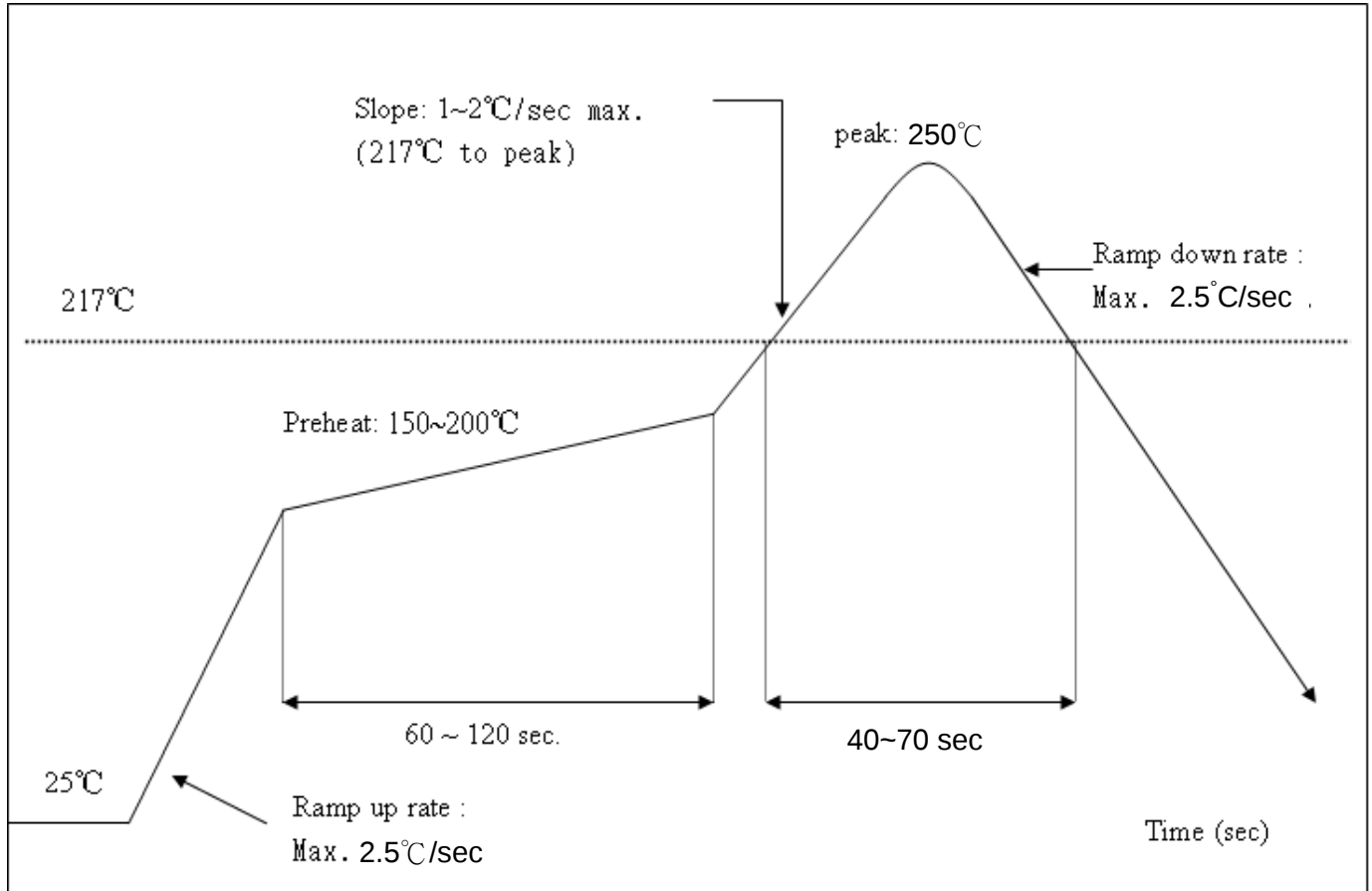


7. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

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

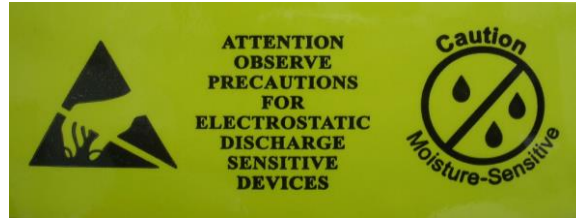
Number of Times : ≤ 2 times



8. Packing Information

9.1 Label

Label A → Anti-static and humidity notice



Label B → MSL caution / Storage Condition

	Caution This bag contains MOISTURE-SENSITIVE DEVICES	LEVEL 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 If 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 If 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: _____ If blank, see adjacent bar code label		
Note: Level and body temperature defined by IPC/JEDEC J-STD-020		

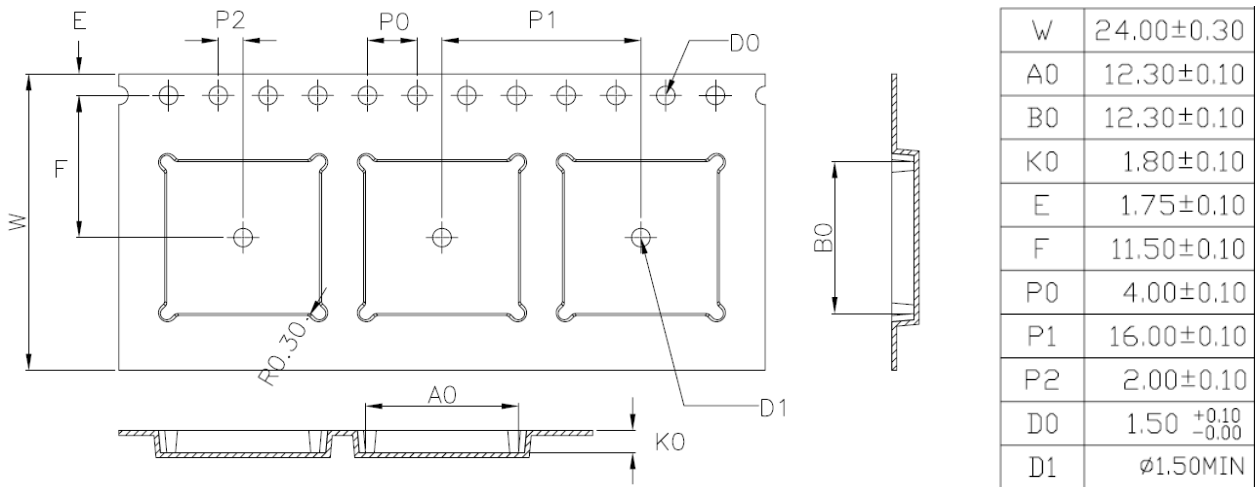
Label C → Inner box label .

PKG S/N :	
	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 ea
Lot D/C :	
	1205
Manufacture :	
	2012/02/22

9.2 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 ± 0.05 mm.
6. Packing length per 22" reel : 98.5 Meters.(1:3)
7. Component load per 13" reel : 1500 pcs.

