



iTM1723-DU

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

Revision History

Date	Revision Content	Revised By	Version
2018/05/16	- Initial released	Issac Chen	0.1
2018/11/02	- Update outline and dimension	Ken Wu	1.0

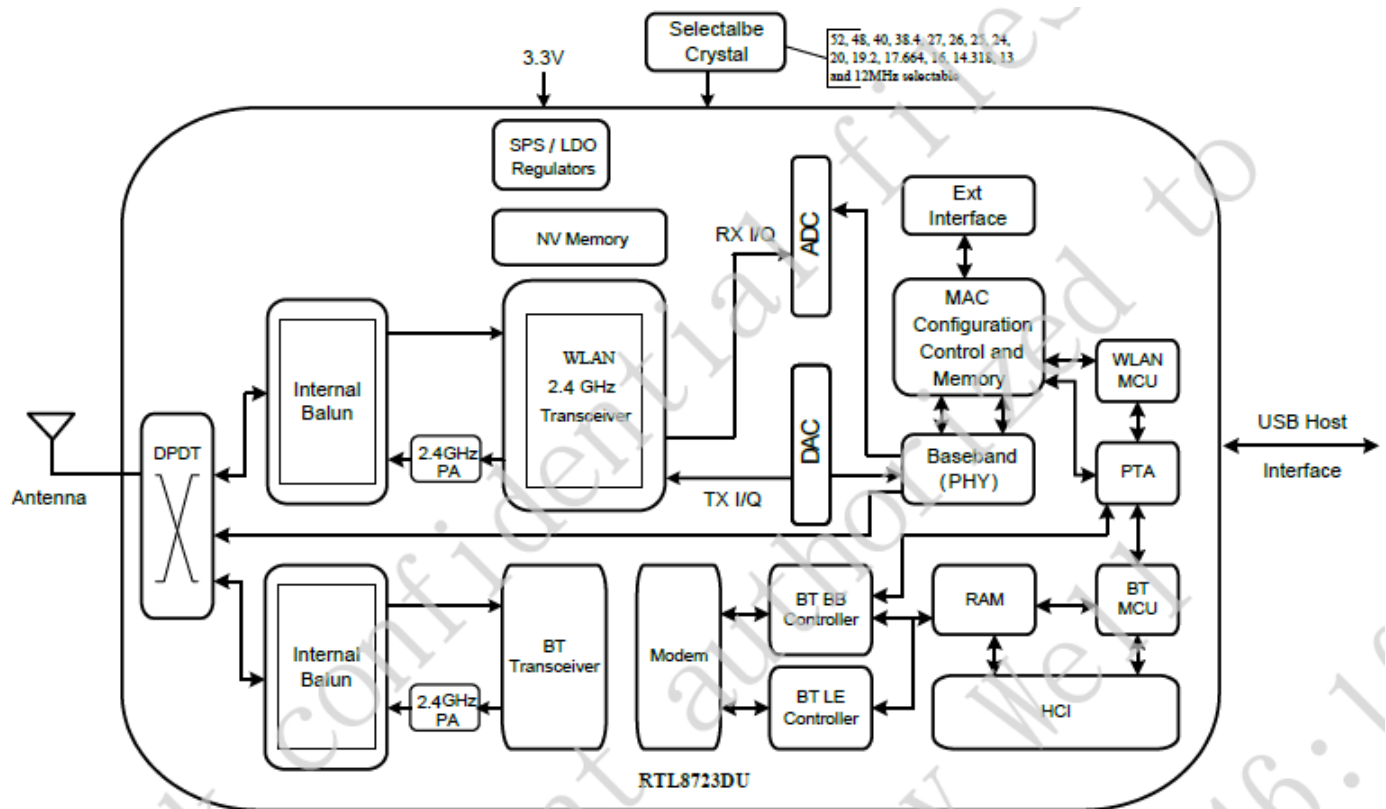
Contents

Revision History.....	1
Contents	2
1. General Description	3
2. Features.....	4
3. General Specification	5
3.1 Voltages.....	5
3.1.1 Absolute Maximum Ratings	5
3.1.2 Recommended Operating Ratings	5
3.2 Wi-Fi RF Specification (RX)	6
3.3 Wi-Fi RF Specification (TX)	7
3.4 Power Consumption	7
4. Pin Assignments.....	8
4.1 PCB Pin Outline.....	8
4.2 Pin Definition	9
5. Dimensions	10
5.1 Layout Recommendation.....	10
6. Reference Design	11
7. Recommended Reflow Profile	12
8. Packing Information	13
8.1 Label.....	13
8.2 Dimension.....	14

1. General Description

The iotTech iTM1723-DU is a small size and low profile of WiFi + BT Combo module with LGA (Land-Grid Array) footprint, board size is 12.2mm*13.0mm 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 USB interface for WiFi to connect with host processor and high speed USB 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 150Mbps in theory by using 1x1 802.11n b/g/n MIMO technology and Bluetooth can support BT2.1+EDR/BT3.0 and BT4.2.

iTM1723-DU uses Realtek RTL8723DU, a highly integrated WiFi/BT single chip based on advanced COMS process. RTL8723DU integrates whole WiFi/BT 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 WiFi and 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 4.2 Dual mode
- 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 functional block diagram of RTL8723DU chipset is shown as below.

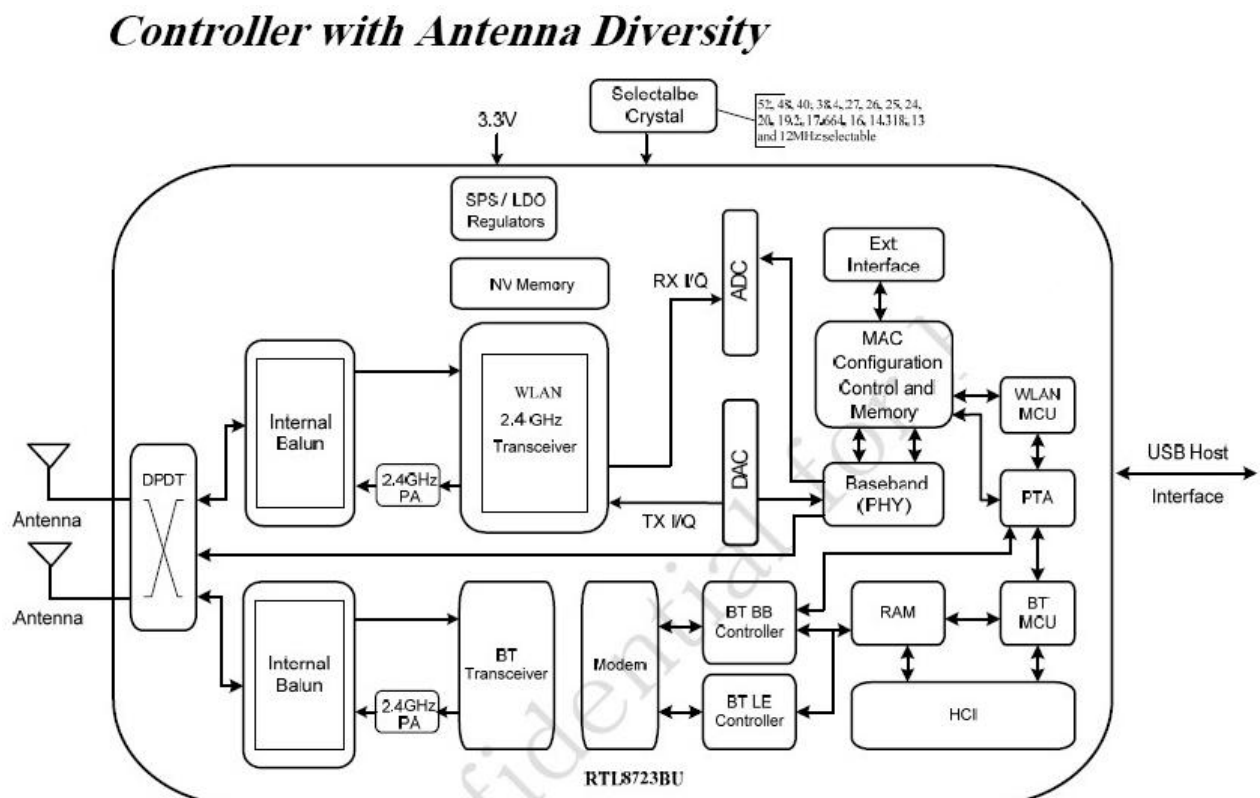


Figure 1. Single-Band 11n (1x1) and Integrated Bluetooth Controller Solution with Antenna Diversity

3. General Specification

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

Note: The I/O voltage of ITM1031 same as VBAT.

Test conditions: At operating temperature 0°C ~70°C				
Symbol	Min.	Typ.	Max.	Unit
VBAT	3.0	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		-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		-76	-71	dBm
	- MCS=4		-73	-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

WiFi only:

TX Mode: (Continuous mode)	200mA
(MCS7/BW40/13dBm)	
RX Mode: (Conituous mode)	170mA
(MCS7/BW40/-60dBm)	
Associated Idle power saving with DTIM=3	2.1mA
Unassociated Idle:	0.1mA
RF disable Mode:	0.1mA

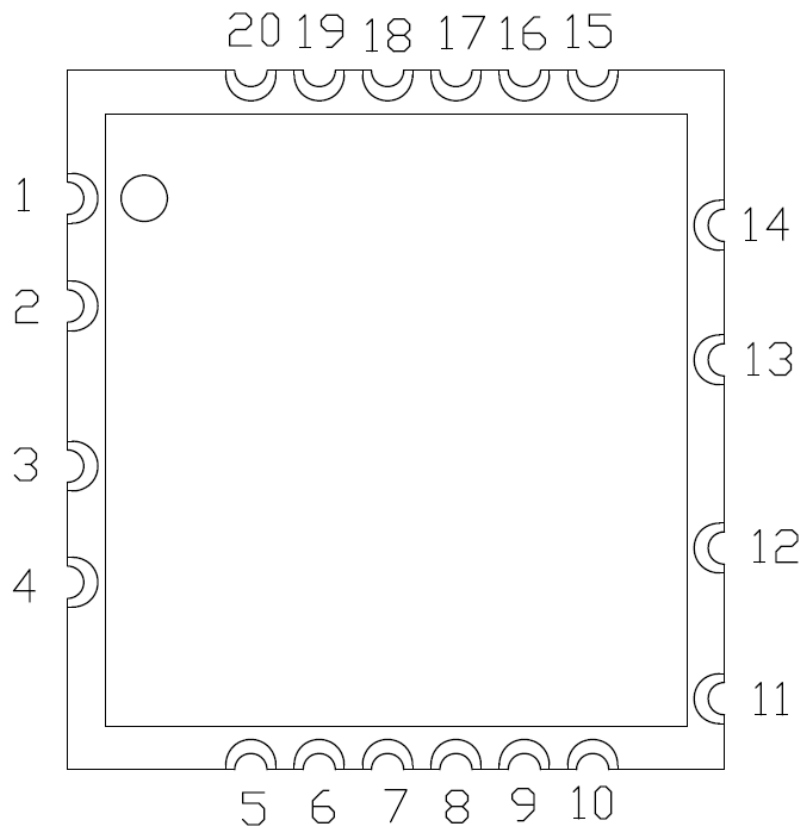
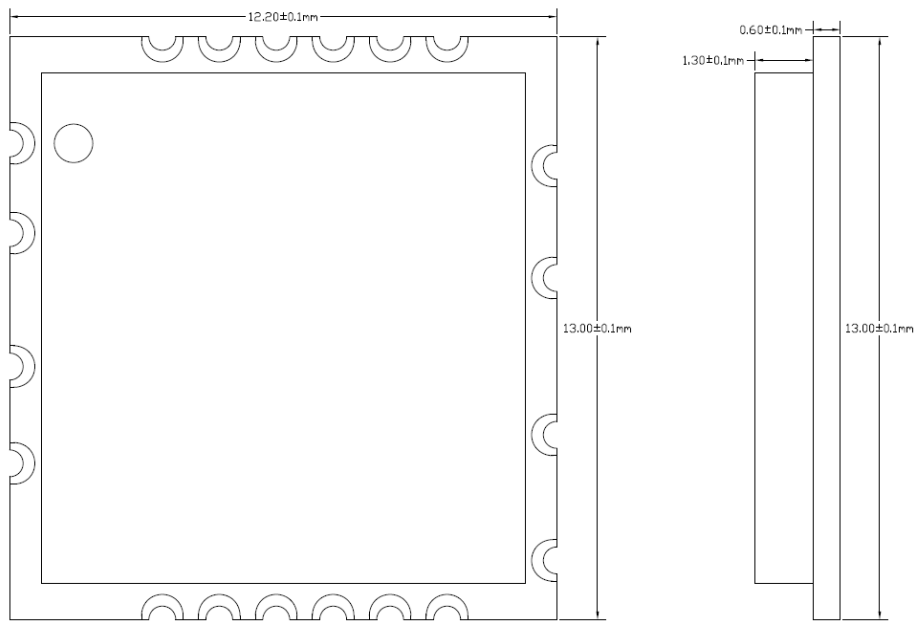
BT:

Inquiry & Page Scan:	0.9 mA
ACL no traffic:	7.5mA
SCO HV3:	15.0mA

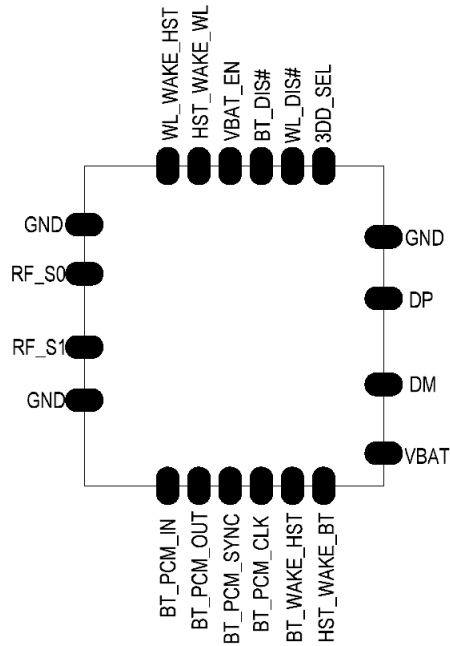
4. Pin Assignments

4.1 PCB Pin Outline

< TOP VIEW >



4.2 Pin Definition

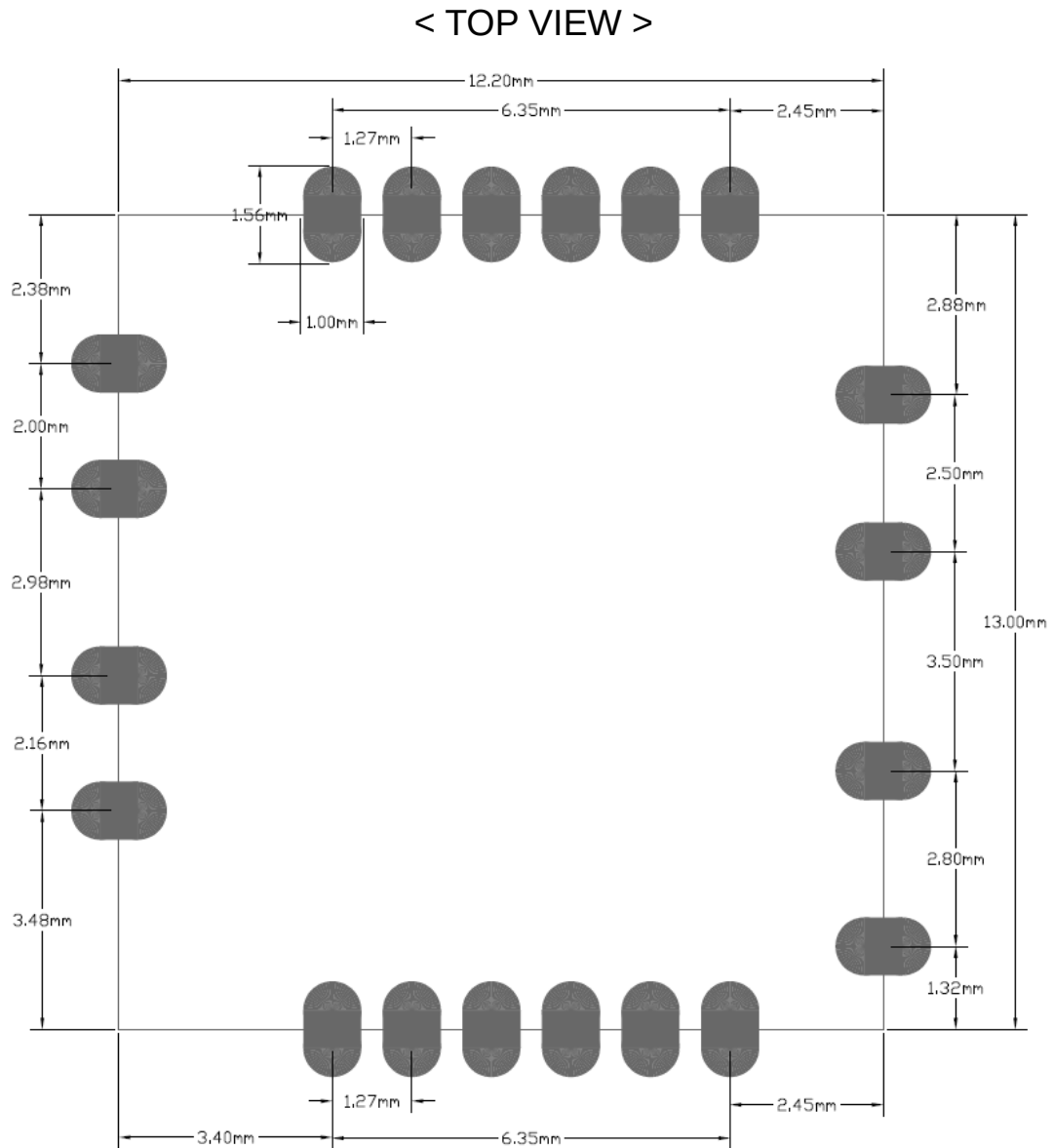


Pin #	Name	Description
1	GND	Ground
2	RF_S0	RF/BT output
3	RF_S1	NC
4	GND	Ground
5	BT_PCM_IN	BT PCM data input
6	BT_PCM_OUT	BT PCM data output
7	BT_PCM_SYNC	BT PCM sync signal
8	BT_PCM_CLK	BT PCM clock signal
9	BT_WAKE_HST	Bluetooth device wake up host
10	HST_WAKE_BT	Host wake up Bluetooth device
11	VBAT	Main power voltage source input 3.3V
12	DM	USB2.0 differential pair for WLAN And Bluetooth
13	DP	USB2.0 differential pair for WLAN And Bluetooth
14	GND	Ground
15	3DD_SEL	NC
16	WL_DIS#	WLAN enable
17	BT_DIS#	Bluetooth enable
18	VBAT_EN	Module enable
19	HST_WAKE_WL	Host wake up WLAN device
20	WL_WAKE_HST	WLAN device wake up host
Total	20PINS	13.0*12.2*2.0mm Package

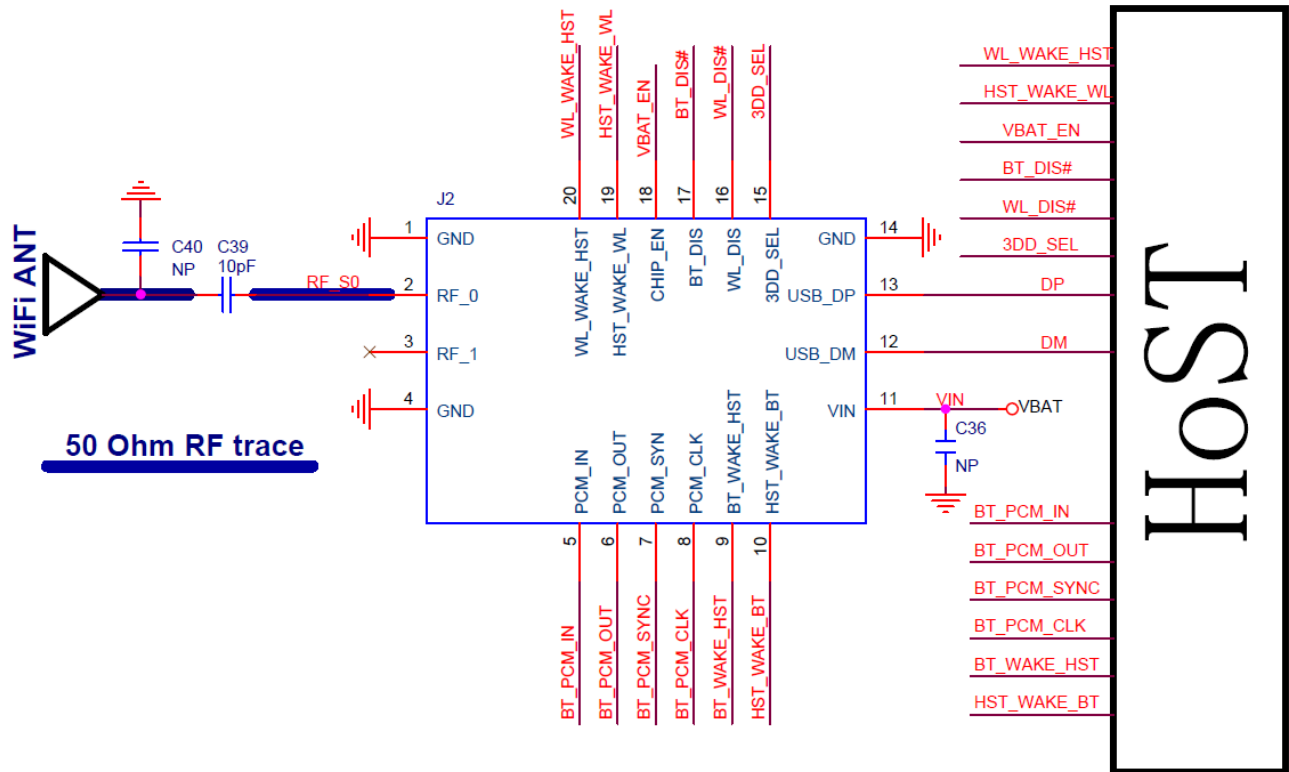
5. Dimensions

5.1 Layout Recommendation

(Unit: mm)



6. Reference Design

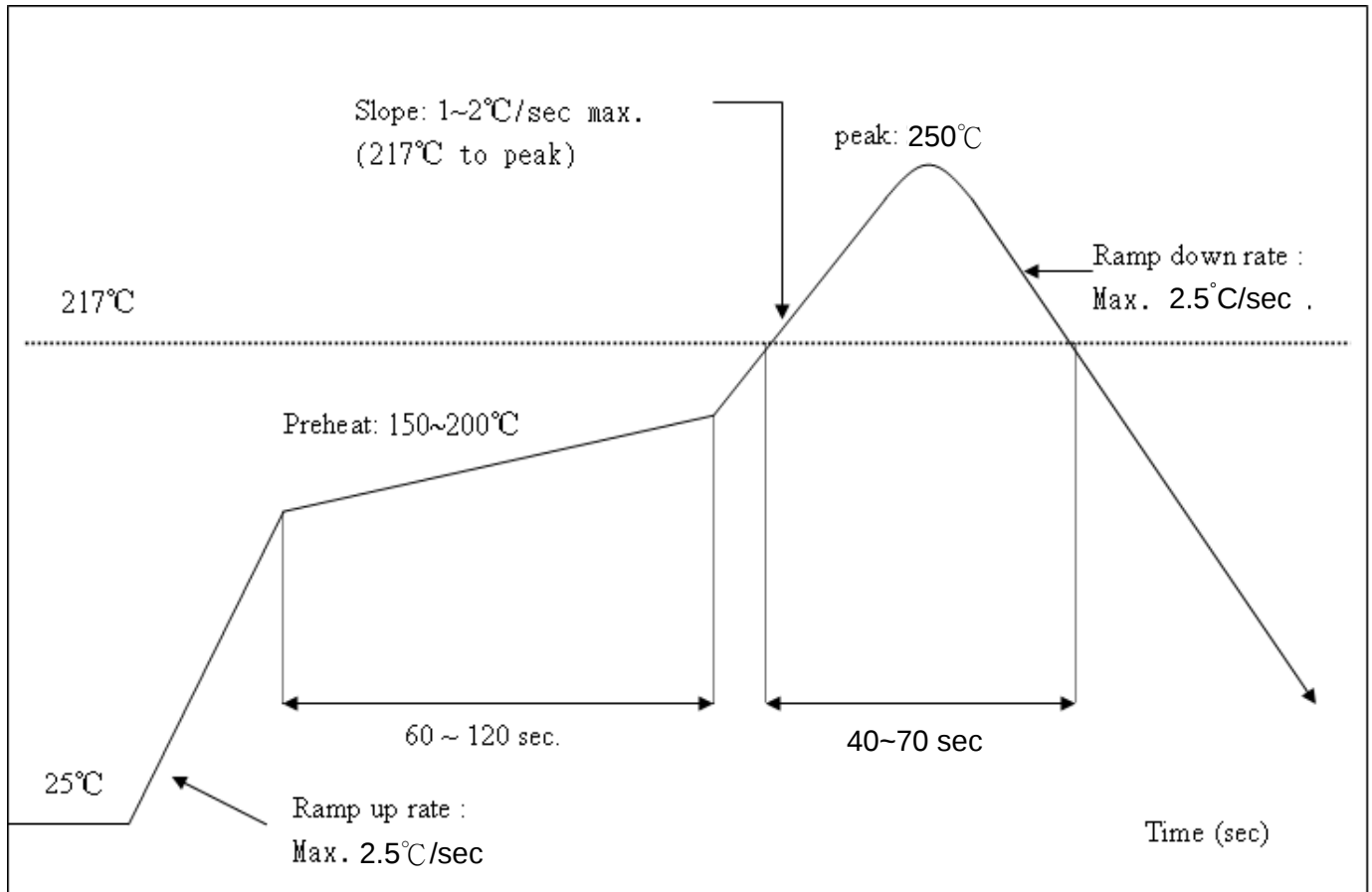


7. Recommended Reflow Profile

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

	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 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 ≤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		

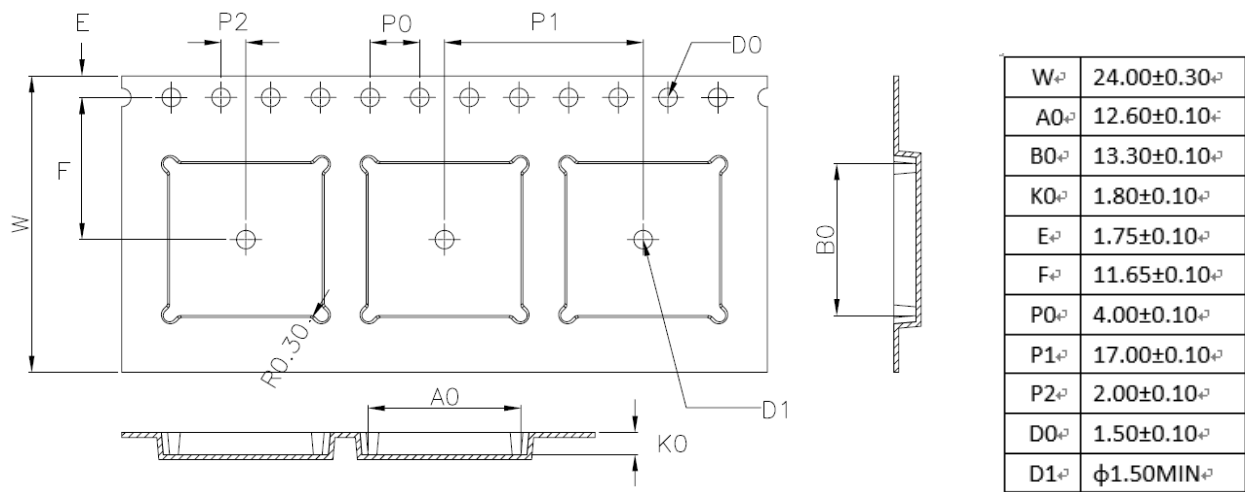
Label C → Inner box label .

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

