Module Specification

Module Name	TTIT-U25D1TRW61-11UC		
Module Description	IEEE 802.11a/b/g/n/ac (1T1R) Dual-Band Module		
	USB Interface		
Reversion	V1.6		
Date			
Nater Approve Field			
Engineer	**QC**	**Sales**	
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1. Introduction

Nater Tech woule like to announce a low-cost and low power consumption module Which has all of the WiFi functionalities,It is a highly-integrated IEEE 802.11a/b/g/n/ac MAC/Baseband/RF WLAN single chip. For Wireless LAN(WLAN)operation.The module provides USB interface for WiFi,and provides simple legacy and 20MHz/40MHz/80MHz co-existence mechanism to ensure backward and network compatibility.

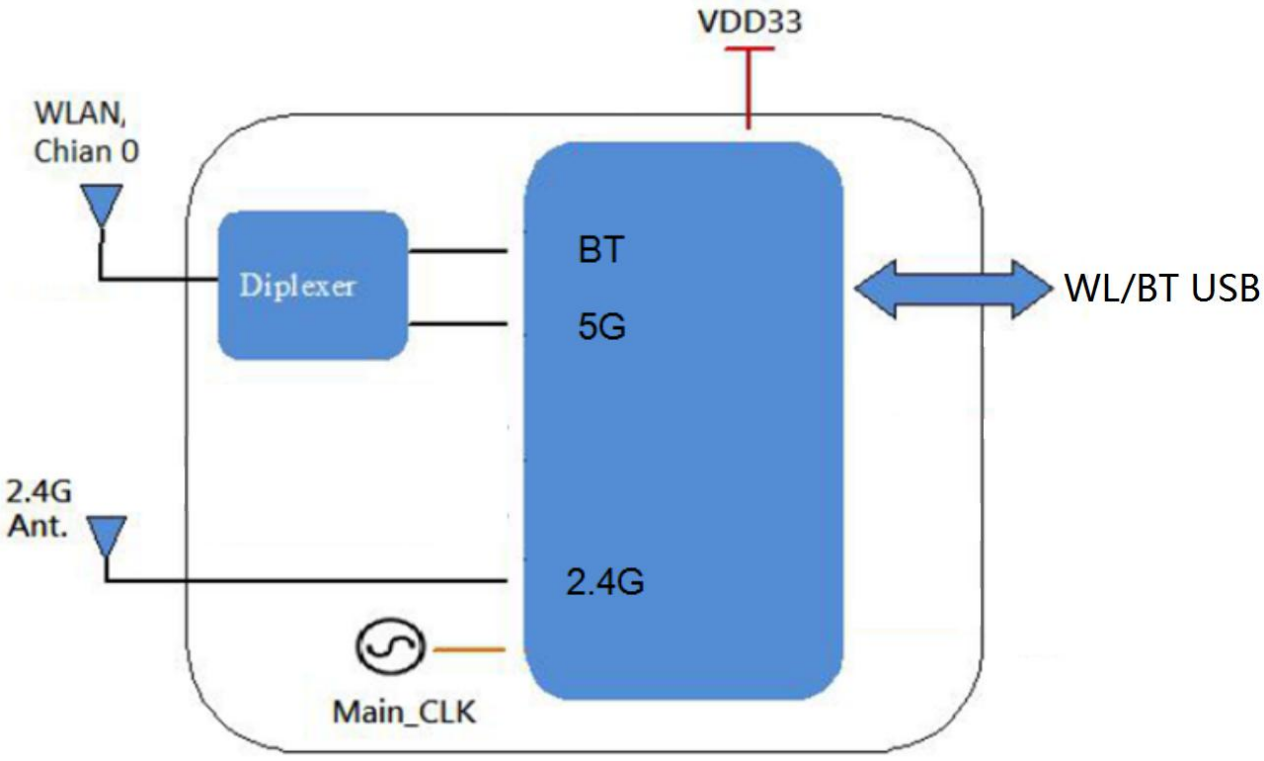
The wireless module complies with IEEE 802.11 a/b/g/n/ac standard and it can achieve up to a speed of 433.3Mbps with single stream in 802.11ac draft to connect to the wireless LAN.

The compact module is a total solution for WiFi technologies,The module is specifically developed for Smart phones and Portable devices.

2. Features

- Support 802.11ac 1T1R,Wave2 compliant with MU-MIMO STA mode
- Complete 802.11n MIMO solution for 2.4GHz and 5.8GHz band
- Complies with USB2.0 for WLAN controller
- USB LPM/Selective Suspend supported

The block diagram of module is depicted in the figure below.



3. General Specification

3.1 General Specification

Model Name	TTIT-U25D1TRW61-11UC
Product Description	Support WiFi functionalities
Dimension	L x W x H: 12 x 13 x 1.6 (typical) mm
WiFi Interface	USB 2.0
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 85°C

3.1.2 Recommended Operating Rating

		Min.	Typ.	Max.	Unit
Operating Temperature		0	25	70	deg.C
VCC33		3.0	3.3	3.6	V
Power Consumption (mA)	Transmit@MCS7 HT40,11n	190			
	Receive@MCS7 HT40,11n	80			
	Transmit@MCS7 HT20,11n	188			
	Receive@MCS7 HT20,11n	78			

4. WiFi RF Specification

4.1 2.4GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11b/g/n/ac, WiFi compliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz：Ch1 ~ Ch14
Output Power	802.11b /CCK : 16 dBm ± 1.5 dB @ EVM ≤ -9dB
	802.11g /64-QAM(R=3/4) : 15 dBm ± 1.5 dB @ EVM ≤ -25dB
	802.11n /64-QAM(R=5/6) : 14 dBm ± 1.5 dB @ EVM ≤ -28dB
Receive Sensitivity (11b) @8% PER	- 1Mbps PER @ -88 dBm, typical
	- 2Mbps PER @ -82 dBm, typical
	- 5.5Mbps PER @ -81 dBm, typical
	- 11Mbps PER @ -80 dBm, typical
Receive Sensitivity (11g) @10% PER	- 6Mbps PER @ -80 dBm, typical
	- 9Mbps PER @ -80 dBm, typical
	- 12Mbps PER @ -78 dBm, typical
	- 18Mbps PER @ -76 dBm, typical
	- 24Mbps PER @ -74 dBm, typical
	- 36Mbps PER @ -71 dBm, typical
	- 48Mbps PER @ -69 dBm, typical
	- 54Mbps PER @ -67 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -84 dBm, typical
	- MCS=1 PER @ -80 dBm, typical
	- MCS=2 PER @ -79 dBm, typical
	- MCS=3 PER @ -75 dBm, typical
	- MCS=4 PER @ -72 dBm, typical
	- MCS=5 PER @ -70 dBm, typical
	- MCS=6 PER @ -67 dBm, typical
	- MCS=7 PER @ -66 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -84 dBm, typical
	- MCS=1 PER @ -80 dBm, typical
	- MCS=2 PER @ -79 dBm, typical
	- MCS=3 PER @ -75 dBm, typical
	- MCS=4 PER @ -71 dBm, typical
	- MCS=5 PER @ -67 dBm, typical
	- MCS=6 PER @ -65 dBm, typical

	- MCS=7	PER @ -64 dBm, typical
Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0	PER @ -86 dBm, typical
	- MCS=1	PER @ -83 dBm, typical
	- MCS=2	PER @ -82 dBm, typical
	- MCS=3	PER @ -78 dBm, typical
	- MCS=4	PER @ -75 dBm, typical
	- MCS=5	PER @ -71 dBm, typical
	- MCS=6	PER @ -69 dBm, typical
	- MCS=7	PER @ -68 dBm, typical
	- MCS=8	PER @ -63 dBm, typical
Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0	PER @ -84 dBm, typical
	- MCS=1	PER @ -81 dBm, typical
	- MCS=2	PER @ -79 dBm, typical
	- MCS=3	PER @ -76 dBm, typical
	- MCS=4	PER @ -73 dBm, typical
	- MCS=5	PER @ -68 dBm, typical
	- MCS=6	PER @ -67 dBm, typical
	- MCS=7	PER @ -65 dBm, typical
	- MCS=8	PER @ -61 dBm, typical
	- MCS=9	PER @ -60 dBm, typical

4 .2 5GHz RF Specification

Feature	**Description**
WLAN Standard	IEEE 802.11a/b/g/n/ac, Wi-Fi compliant
Frequency Range	4.900 GHz ~ 5.845 GHz (5.0 GHz ISM Band)
Number of Channels	5.0GHz：Please see the table[1]
Modulation	802.11a/n : 64-QAM,16-QAM, QPSK, BPSK 802.11ac : 256-QAM, 64-QAM,16-QAM, QPSK, BPSK
Output Power	802.11a /64-QAM(R=3/4) : 14 dBm ± 1.5 dB @ EVM ≤ -25dB
	802.11n /64-QAM(R=5/6) : 13 dBm ± 1.5 dB @ EVM ≤ -28dB
	802.11ac/256-QAM(R=3/4) : 12 dBm ± 1.5 dB @ EVM ≤ -30dB
	802.11ac/256-QAM(R=5/6) : 10 dBm ± 1.5 dB @ EVM ≤ -32dB
Receive Sensitivity (11a, 20MHz) @10% PER	- 6Mbps PER @ -85 dBm, typical
	- 9Mbps PER @ -83 dBm, typical
	- 12Mbps PER @ -82 dBm, typical

	- 18Mbps	PER @ -80 dBm, typical
	- 24Mbps	PER @ -76 dBm, typical
	- 36Mbps	PER @ -73 dBm, typical
	- 48Mbps	PER @ -68 dBm, typical
	- 54Mbps	PER @ -67 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -85 dBm, typical
	- MCS=1	PER @ -83 dBm, typical
	- MCS=2	PER @ -80 dBm, typical
	- MCS=3	PER @ -77 dBm, typical
	- MCS=4	PER @ -73 dBm, typical
	- MCS=5	PER @ -69 dBm, typical
	- MCS=6	PER @ -67 dBm, typical
	- MCS=7	PER @ -66 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0	PER @ -83 dBm, typical
	- MCS=1	PER @ -80 dBm, typical
	- MCS=2	PER @ -78 dBm, typical
	- MCS=3	PER @ -75 dBm, typical
	- MCS=4	PER @ -72 dBm, typical
	- MCS=5	PER @ -67 dBm, typical
	- MCS=6	PER @ -66 dBm, typical
	- MCS=7	PER @ -64 dBm, typical
Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0	PER @ -86 dBm, typical
	- MCS=1	PER @ -84 dBm, typical
	- MCS=2	PER @ -81 dBm, typical
	- MCS=3	PER @ -77 dBm, typical
	- MCS=4	PER @ -74 dBm, typical
	- MCS=5	PER @ -70 dBm, typical
	- MCS=6	PER @ -68 dBm, typical
	- MCS=7	PER @ -67 dBm, typical
	- MCS=8	PER @ -63 dBm, typical
Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0	PER @ -83 dBm, typical
	- MCS=1	PER @ -79 dBm, typical
	- MCS=2	PER @ -77 dBm, typical
	- MCS=3	PER @ -74 dBm, typical
	- MCS=4	PER @ -71 dBm, typical
	- MCS=5	PER @ -66 dBm, typical
	- MCS=6	PER @ -64 dBm, typical

	- MCS=7	PER @ -62 dBm, typical
	- MCS=8	PER @ -60 dBm, typical
	- MCS=9	PER @ -59 dBm, typical
Receive Sensitivity (11ac,80MHz) @10% PER	- MCS=0	PER @ -80 dBm, typical
	- MCS=1	PER @ -77 dBm, typical
	- MCS=2	PER @ -75 dBm, typical
	- MCS=3	PER @ -71 dBm, typical
	- MCS=4	PER @ -68 dBm, typical
	- MCS=5	PER @ -66 dBm, typical
	- MCS=6	PER @ -62 dBm, typical
	- MCS=7	PER @ -60 dBm, typical
	- MCS=8	PER @ -57 dBm, typical
	- MCS=9	PER @ -56 dBm, typical

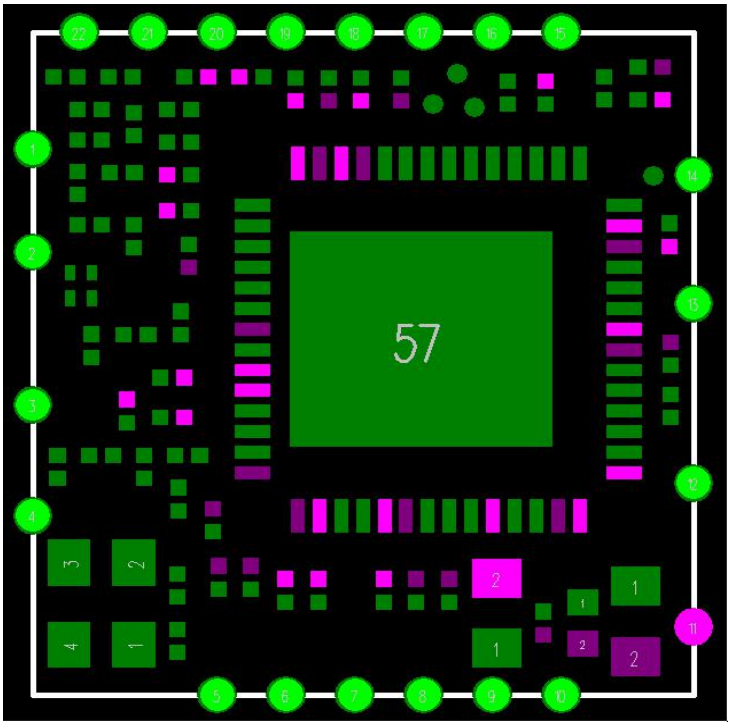
[1]5GHz Channel table

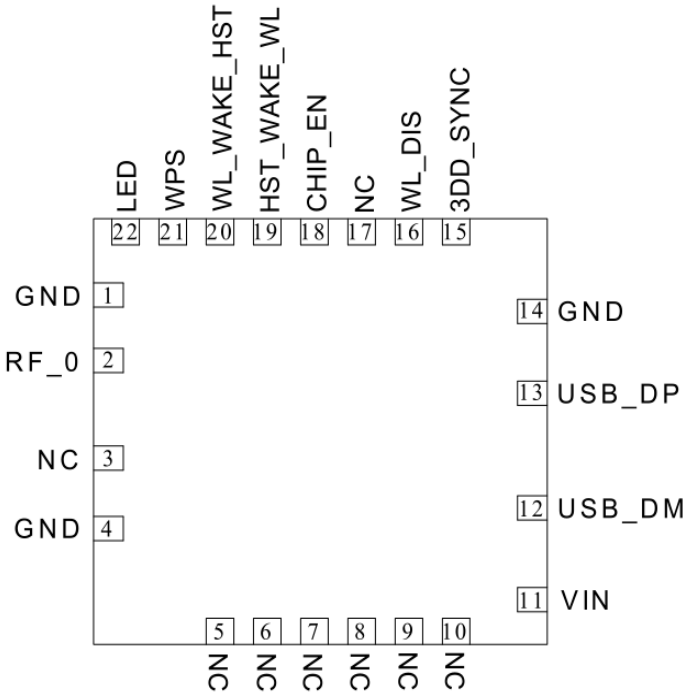
Band (GHz)	Operating Channel Numbers	Channel center frequencies(MHz)
5.15GHz~5.25GHz	36	5180
	40	5200
	44	5220
	48	5240
5.25GHz~5.35GHz	52	5260
	56	5280
	60	5300
	64	5320
5.5GHz~5.7GHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620
	128	5640
	132	5660
	136	5680
	140	5700
5.725GHz~5.825GHz	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

5.Pin Assignments

5.1Pin Outline

< TOP VIEW >





5.2Pin Definition

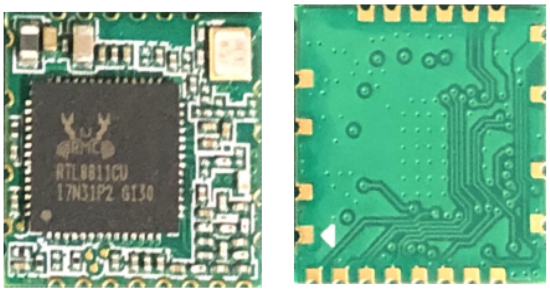
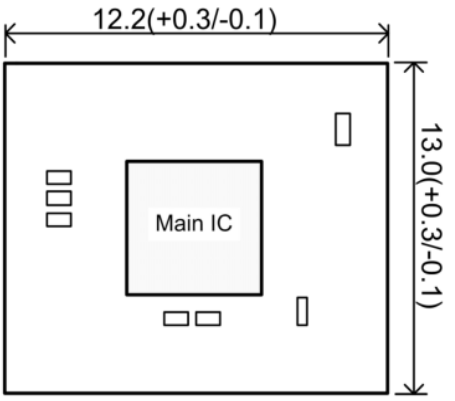
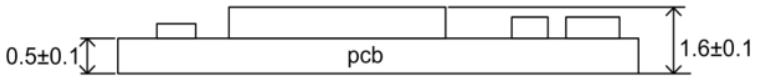
NO	Name	Description
1	GND	Ground connections
2	WL_ANT	WLAN 2G S1 RF Differential
3	NC	Floating (Don't connected to ground)
4	GND	Ground connections
5	NC	Floating (Don't connected to ground)
6	NC	Floating (Don't connected to ground)
7	NC	Floating (Don't connected to ground)
8	NC	Floating (Don't connected to ground)
9	NC	Floating (Don't connected to ground)
10	NC	Floating (Don't connected to ground)
11	VDD33	3.3V POWER INPUT
12	D-	USB DATA DM
13	D+	USB DATA DP
14	GND	Ground connections
15	GPIO1	3DD_SYNC GPIO
16	WL_DIS	WIFI DISABLE
17	NC	Floating (Don't connected to ground)
18	CHIP_EN	CHIP ENABLE
19	HOST_WAKE_WL	HOST to wake-up WIFI device
20	WL_WAKE_HOST	WIFI device to wake-up HOST
21	GPIO2	WPS GPIO
22	GPIO8	LED GPIO

6.Dimensions

6.1Physical Dimensions

(Unit: mm)

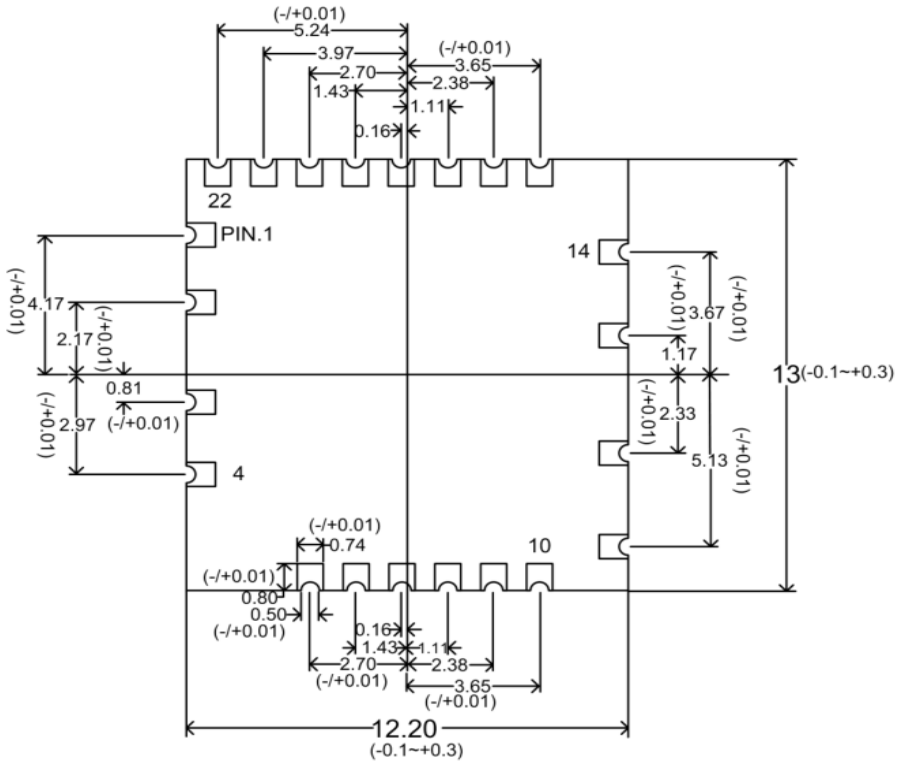
< TOP VIEW > < Side View >

L x W : 12.2 x 13 mm 	< TOP VIEW > 
H: 1.6 mm	< Side View > 
Weight	0.45g

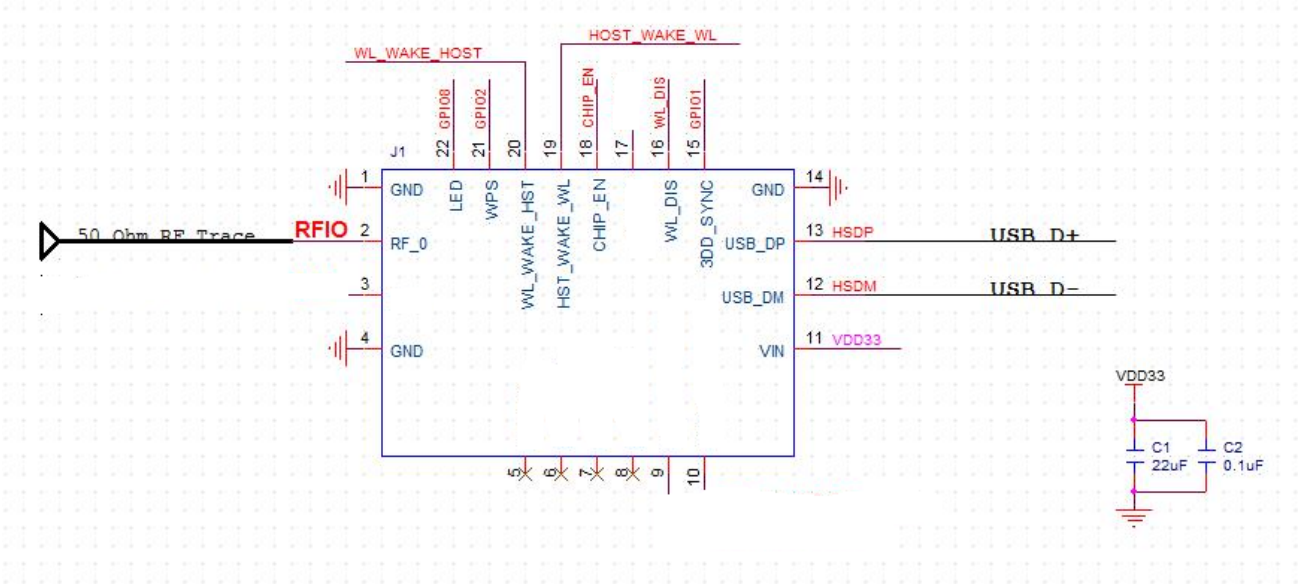
6.2Layout Recommendation

(Unit: mm)

< TOP VIEW >



7.Reference Design



8.Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times