

## 规格书 SPECIFICATION FOR APPROVAL

供应商名称: SUPPLIER:	深圳创维-RGB 电子有限公司
制造商名称名称: MANUFACTURER:	深圳创维-RGB 电子有限公司
客户名称: CUSTOMER:	深圳创维-RGB 电子有限公司
部品名称: PARTNAME:	WIFI/BT 模块
厂家型号: SPEC TYPE:	NTUD-T4
创维物料编码: SKYWORTH PART NO:	
规格描述: SPECIFICATION SICES:	单频 WIFI(2T2R)+BT
制表日期: DATE:	2018.12.19

承制方 MANUFACTURER		
拟制 DRAFTER	审核 CHECK	批准 APPROVER
董国发	丁星	段晓伟

承制方名称（盖章）：

地址：

电话：

传真：

网址：

E-MAIL：

# WIFI 模块产品规格书

## (Specification Of WIFI Module)

产品名称 : WIFI 模块  
(Product Name) \_\_\_\_\_  
产品型号 : NTUD-T4  
(Model) \_\_\_\_\_  
版 本 : 第一版  
(Version) \_\_\_\_\_  
日 期 : 2018/12/19  
(Date) \_\_\_\_\_

设计确认 (DESIGN VALIDATION)		
拟制 (DESCRIBED)	审核 (CHECKED)	批准 (APPROVED)
董国发	丁星	段晓伟

深圳创维-RGB 电子有限公司

SHENZHEN SKYWORTH-RGB ELECTRONICS CO., LTD.

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Baoan District, Shenzhen, China.

电话(TEL): 0755-29689333 传真(FAX): 0755-29689332

网址(NET): <http://www.skyworth.com>

# 认证厂家记录

(Certified manufacturer's record)

注：通过认证的厂家填入下表

(Fill the following table by the certified manufacturer)

序号 (Number)	厂家编号 (Manufacturer number)	厂家名称 (Manufacturer name)	厂家型号 (Manufacturer model)	确认 (Approved by)
1	534L	深圳创维-RGB 电子有限公司	NTUD-T4	董国发

**变 更 记 录 表**  
(Change record table)

序号 (Number)	版本 (Revision)	主要变更内容 (Main change content)	变更日期 (Change data)	更改者 (Change person)
1	Ver00.00	Initial version	2018.12.19	董国发

# Technical specifications

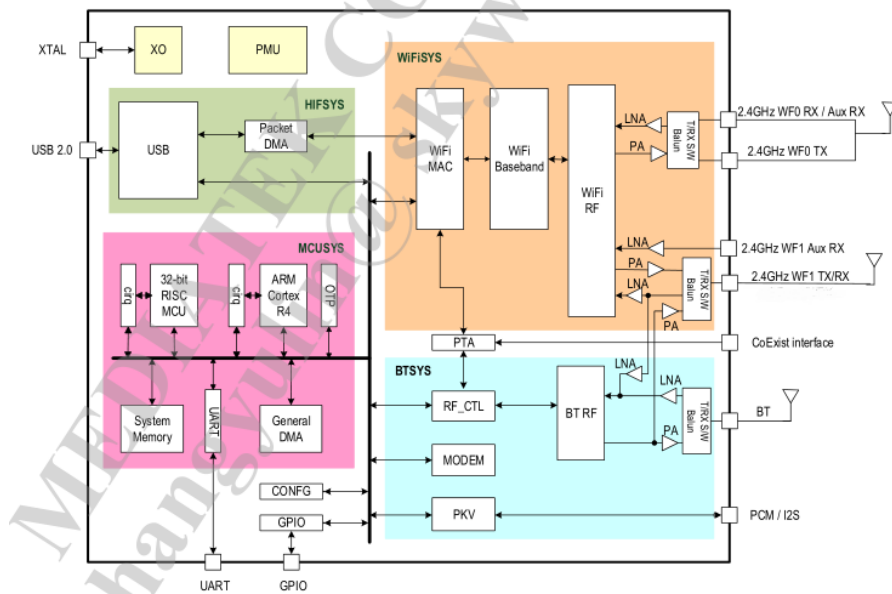
## 1. Summary

This module is based on the MTK7638GUN scheme, which is in line with the 802.11b/g/n standard, 2.4GHz, WIFI dual antenna, Bluetooth independent antenna design, Bluetooth support 2.1/5.0.

## 2. Characteristics

- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate.
- Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11n standard to provide wireless 300Mbps data rate.
- Operation at 2.4~2.5GHz frequency band to meet worldwide regulations
- Supports infrastructure networks via Access Point and ad-hoc network via peer-to-peer communication
- Supports IEEE 802.11i (WPA and WPA2), WAPI. enhanced security
- Friendly user configuration and diagnostic utilities
- Drivers support Win10, Win8, Win7, XP, Linux
- ROHS compliant

## 3. Block diagram



#### 4. Module performance parameters:

<b>The main chip</b>	MTK7638GUN
<b>Working frequency</b>	2.400~2.4835GHz
<b>WiFi standard</b>	802.11 b/g/n (2T2R)
<b>BT standard</b>	Bluetooth2.1+EDR/4.2/5.0+BLE
<b>Modulation mode</b>	11b: DBPSK, DQPSK and CCK and DSSS 11g: BPSK, QPSK, 16QAM, 64QAM and OFDM 11n: MCS0~15 OFDM
<b>Data rate</b>	11b: 1, 2, 5.5 and 11Mbps 11g: 6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: MCS0~15, up to 300Mbps
<b>Output connector specifications</b>	On_board
<b>Interface data standards</b>	USB 2.0
<b>PCB data</b>	Layer 2 row board design
<b>PCB size</b>	27*33*1mm
<b>Working temperature</b>	0°C to +60°C
<b>Storage temperature</b>	-40°C to +85°C
<b>Working voltage</b>	3.3V +/-10%

#### 5. Definition module output connector feet:

Pin #	Name	Description
1	BT-WAKE	BT WAKE HOST
2	WOW	WIFI WAKE HOST
3	GND	GND
4	GND	GND
5	D+	USB Data DP
6	D-	USB Data DN
7	VCC	3.3V DC Power supply input
8	EN	Enable the module

## 6. Module performance parameters:

a) 802.11b BW20MHz Mode 2.4GHz

Items	Contents				
Specification	IEEE802.11b				
Mode	DSSS / CCK				
Channel	CH1 to CH11				
Data rate	1,2, 5.5 ,11Mbps				
<b>DC Characteristics</b>	Min.	Typ.	Max.	Unit	Remark
1.DC current (Average) @5V input					
1) TX only @17dBm (continue Tx SISO)	-	400	450	mA	
2) TX throughput mode	-	400	450	mA	
3) RX throughput mode	-	200	250	mA	
<b>TX Characteristics</b>	Min.	Typ.	Max.	Unit	
2. Power Levels(Calibrated)					
1) 17dBm Target (For Each antenna port)	16	17	18	dBm	
3. Spectrum Mask @ target power					
1) fc +/-11MHz to +/-22MHz	-	-	-30	dBr	
2) fc > +/-22MHz	-	-	-50	dBr	
4 Constellation Error(EVM)@ target power					
1) 11Mbps			8	%	
5. Frequency Error	-25	0	+25	ppm	
<b>RX Characteristics (2R)</b>	Min.	Typ.	Max.	Unit	
6 Minimum Input Level Sensitivity					
1) 1Mbps (FER ≤ 8%)	-	-95	-83	dBm	
2) 2Mbps (FER ≤ 8%)	-	-93	-80	dBm	
3) 5.5Mbps (FER ≤ 8%)	-	-90	-79	dBm	
4) 11Mbps (FER ≤ 8%)	-	-86	-76	dBm	
7 Maximum Input Level (FER ≤ 8%)	-20	-10	-	dBm	

b) 802.11g BW20MHz Mode 2.4GHz

Items	Contents				
Specification	IEEE802.11g				
Mode	OFDM				
Channel	CH1 to CH11				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
<b>DC Characteristics</b>	Min.	Typ.	Max.	Unit	Remark
1. DC current (Average) @5V input					
1) TX only @14dBm (continue Tx SISO)	-	235	250	mA	
2) TX throughput mode	-	235	250	mA	
3) RX throughput mode	-	165	180	mA	
<b>TX Characteristics</b>	Min.	Typ.	Max.	Unit	
2. Power Levels					
1) 14dBm Target (For Each antenna port)	13	14	15	dBm	
3. Spectrum Mask @ target power					
1) at fc +/- 11MHz	-	-	-20	dBr	
2) at fc +/- 20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-40	dBr	
4 Constellation Error(EVM)@ target power					
1) 6Mbps	-	-	-5	dB	
2) 9Mbps	-	-	-8	dB	
3) 12Mbps	-	-	-10	dB	
4) 18Mbps	-	-	-13	dB	
5) 24Mbps	-	-	-16	dB	
6) 36Mbps	-	-	-19	dB	
7) 48Mbps	-	-	-22	dB	
8) 54Mbps	-	-30	-25	dB	
5 Frequency Error	-25	0	+25	ppm	
<b>RX Characteristics (2R)</b>	Min.	Typ.	Max.	Unit	
6 Minimum Input Level Sensitivity					
1) 6Mbps (PER $\leq$ 10%)	-	-93	-85	dBm	
2) 9Mbps (PER $\leq$ 10%)	-	-92	-84	dBm	
3) 12Mbps (PER $\leq$ 10%)	-	-90	-82	dBm	
4) 18Mbps (PER $\leq$ 10%)	-	-88	-80	dBm	
5) 24Mbps (PER $\leq$ 10%)	-	-85	-77	dBm	
6) 36Mbps (PER $\leq$ 10%)	-	-82	-73	dBm	
7) 48Mbps (PER $\leq$ 10%)	-	-78	-69	dBm	
8) 54Mbps (PER $\leq$ 10%)	-	-77	-68	dBm	
7 Maximum Input Level (PER $\leq$ 10%)	-20	-10	-	dBm	

c) 802.11n HT20 Mode 2. 4GHz



Items	Contents				
Specification	IEEE802.11n HT20 @ 2.4GHz				
Mode	OFDM				
Channel	CH1 to CH11				
Data rate (MCS index)	MCS0-MCS15				
<b>DC Characteristics</b>	Min.	Typ.	Max.	Unit	Remark
1. DC current (Average) @5V input					
1) TX only @ 13dBm Target(each port), (continue Tx MIMO MCS15)	-	330	360	mA	
2) TX throughput mode (MCS7)	-	300	350	mA	
3) RX throughput mode	-	165	180	mA	
<b>TX Characteristics</b>	Min.	Typ.	Max.	Unit	
2. Power Levels					
1) 13dBm Target (For Each antenna port)	12	13	14	dBm	
2) 13dBm Target (Combined two antenna port)	15	17	19	dBm	
3. Spectrum Mask @14.5dBm					
1) at fc +/- 11MHz	-	-	-20	dBr	
2) at fc +/- 20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-45	dBr	
4. Constellation Error(EVM)@ target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-30	-28	dB	
5. Frequency Error	-25	0	+25	ppm	
<b>RX Characteristics (2R)</b>	Min.	Typ.	Max.	Unit	
6. Minimum Input Level Sensitivity					
1) MCS0 (PER $\leq$ 10%)		-91	-85	dBm	
2) MCS1 (PER $\leq$ 10%)		-88	-82	dBm	
3) MCS2 (PER $\leq$ 10%)		-87	-80	dBm	
4) MCS3 (PER $\leq$ 10%)		-83	-77	dBm	
5) MCS4 (PER $\leq$ 10%)		-81	-73	dBm	
6) MCS5 (PER $\leq$ 10%)		-76	-69	dBm	
7) MCS6 (PER $\leq$ 10%)		-75	-68	dBm	
8) MCS7 (PER $\leq$ 10%)		-75	-67	dBm	
9) MCS8(PER $\leq$ 10%)	-	-89	-82	dBm	
10) MCS9(PER $\leq$ 10%)	-	-87	-79	dBm	
11) MCS10 (PER $\leq$ 10%)	-	-84	-77	dBm	
12) MCS11(PER $\leq$ 10%)	-	-81	-74	dBm	
13) MCS12(PER $\leq$ 10%)	-	-78	-70	dBm	
14) MCS13(PER $\leq$ 10%)	-	-73	-66	dBm	
15) MCS14(PER $\leq$ 10%)	-	-72	-65	dBm	
16) MCS15(PER $\leq$ 10%)		71	-64	dBm	
7. Maximum Input Level (PER $\leq$ 10%)	-20	-10	-	dBm	

d) 802.11n HT40 Mode 2.4GHz

Items	Contents				
Specification	IEEE802.11n HT40 @ 2.4GHz				
Mode	OFDM				
Channel	CH3 to CH9				
Data rate (MCS index)	MCS0-MCS15				
<b>DC Characteristics</b>	Min.	Typ.	Max.	Unit	Remark
1. DC current (Average) @5V input					
1) TX only @ 13dBm Target(each port), (continue Tx MIMO MCS15)	-	330	360	mA	
2) TX throughput mode	-	300	350	mA	
3) RX throughput mode	-	165	180	mA	
<b>TX Characteristics</b>	Min.	Typ.	Max.	Unit	
2. Power Levels (Calibrated)					
1) 13dBm Target (For Each antenna port)	12	13	14	dBm	
2) 13dBm Target (Combined two antenna port)	15	17	19	dBm	
3. Spectrum Mask @13dBm					
1) at fc +/- 22MHz	-	-	-20	dBr	
2) at fc +/- 40MHz	-	-	-28	dBr	
3) at fc > +/-60MHz	-	-	-45	dBr	
4. Constellation Error(EVM)@target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-30	-28	dB	
5. Frequency Error	-25	0	+25	ppm	
<b>RX Characteristics (2R)</b>	Min.	Typ.	Max.	Unit	
6. Minimum Input Level Sensitivity					
1) MCS15 (PER ≤ 10%)	-	-67	-61	dBm	
2) MCS14 (PER ≤ 10%)	-	-69	-62	dBm	
3) MCS13 (PER ≤ 10%)	-	-70	-63	dBm	
4) MCS12 (PER ≤ 10%)	-	-75	-67	dBm	
5) MCS11 (PER ≤ 10%)	-	-78	-71	dBm	
6) MCS10 (PER ≤ 10%)	-	-82	-74	dBm	
7) MCS9 (PER ≤ 10%)	-	-83	-76	dBm	
8) MCS8 (PER ≤ 10%)	-	-87	-79	dBm	
1) MCS7 (PER ≤ 10%)	-	-71	-64	dBm	
2) MCS6 (PER ≤ 10%)	-	-72	-65	dBm	
3) MCS5 (PER ≤ 10%)	-	-74	-66	dBm	
4) MCS4 (PER ≤ 10%)	-	-78	-70	dBm	
5) MCS3 (PER ≤ 10%)	-	-81	-74	dBm	
6) MCS2 (PER ≤ 10%)	-	-84	-77	dBm	
7) MCS1 (PER ≤ 10%)	-	-86	-79	dBm	
8) MCS0 (PER ≤ 10%)	-	-88	-82	dBm	
7. Maximum Input Level (PER ≤ 10%)	-20	-10	-	dBm	

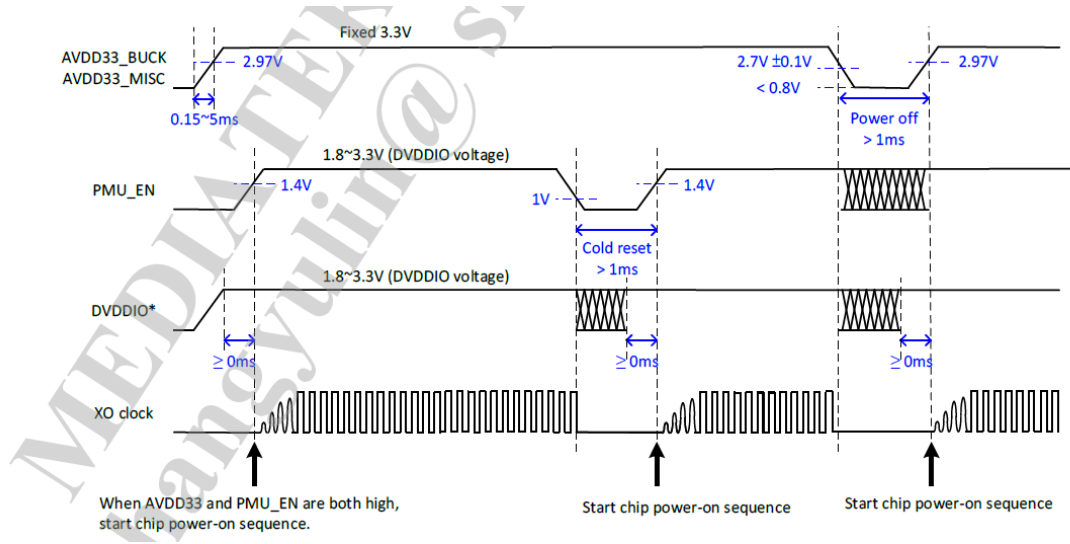
e)Bt basic rate transmitter specification

Parameter	Description	Performance			
		Min	Typ	Max	Unit
Frequency range		2402	-	2480	MHz
Output power	At maximum putout level	-	3.57	-	dBm
Modulation characteristic	$\Delta f1$ avg	-	155.785	-	KHz

## 7. The antenna gain:

WiFi antenna on PCB	
Operating Frequency	2.412~2.484GHz
VSWR	<2.0
Peak Gain	3.4dBi/3.4dBi@2.4GHz
External pull of BT antenna	
Operating Frequency	2400-2500(MHz)
VSWR	<=2.0:1
Peak Gain	3.1dBi
Antenna Type	RFcable+PCB

## 8. Power timing requirements:



9、Product photo:





全球研发中心  
模组工程研究院  
电声与配件线  
2018. 12. 19

深圳创维-**RGB** 电子有限公司 RoHS2.0 及 REACH 符合性自我声明表

产品型号：NTUD-U5

材料名称	有毒有害物质或元素										
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二 苯醚 (PBDE)	邻苯二 甲酸二 丁基酯 (DBP)	邻苯二甲 酸甲苯 基丁酯 (BBP)	邻邻苯二 甲酸二 (2-乙基 己基) 酯 (DEHP)	邻苯二甲 酸二异 丁酯 (DIBP)	备注
所有部	○	○	○	○	○	○	○	○	○	○	
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○：表示该有毒有害物质在该部件所有均质材料中的含量均在 2011/65/EU 规定的限量要求以下。

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 2011/65/EU 规定的限量要求。

(供应商应将其原材料按要求进行拆分，并按照此表格进行详细标注,对不能满足标准要求的零部件进行具体的原因描述)

整体部件			是否符合(EC) No 1907/2006 标准要求
	SVHC (高关注物质)		是
	禁止和限制物质“附件 17”		是
原材料部件			是否符合(EC) No 1907/2006 标准要求
	所有部件	SVHC (高关注物质)	是
		禁止和限制物质“附件 17”	是
	材料名称 2	SVHC (高关注物质)	
		禁止和限制物质“附件 17”	
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注：1、根据(EC) No 1907/2006 标准要求进行管控 SVHC（高关注物质）及禁止和限制物质。 如果在标准值以内填写是，反之则填写否。

2、请在页面加盖公司印章。