Product Specification
RTL8188EUS
WLAN 11b/g/n WIFI Module(1T1R)

Version A1.0

History

Document Release	Date	Modification	Initials	Approved
Version A1.0	2012/07/11	First version	Eddy	

Overview

RLT8188EUS is a WLAN 11n USB module, which fully supports the features and functional compliance of IEEE 802.11n,e and i standards. It supports up to150Mbps high-speed wireless network connections. It is designed to provide excellent performance with low power consumption and enhance the advantages of robust system and cost-effective. It is targeted at competitive superior performance, better power management applications.

Product block diagram

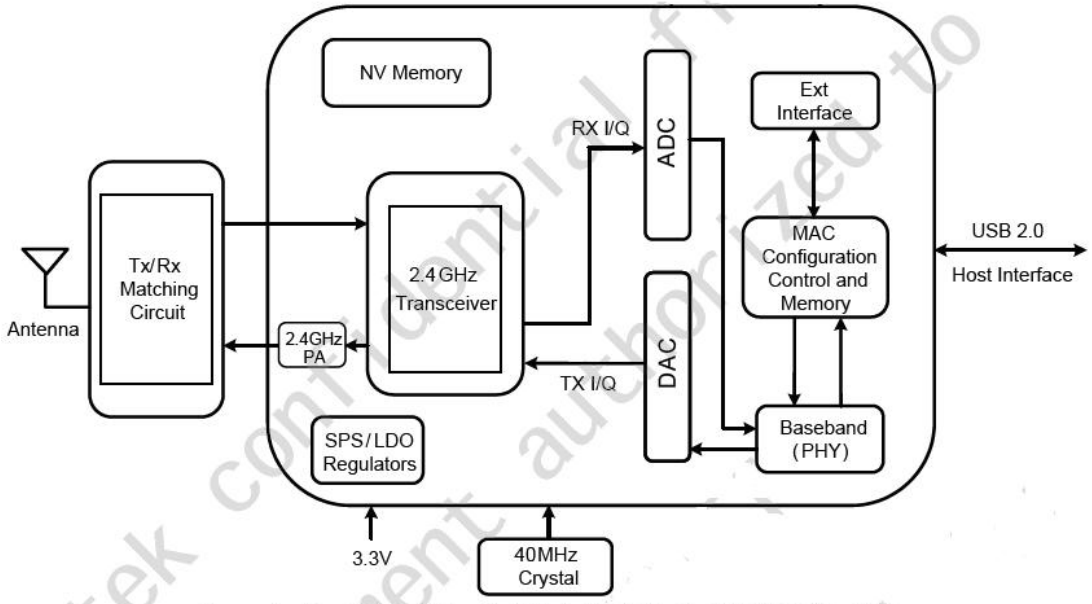


Figure 1. Single-Band 11n (1x1) Solution (11n 1x1 MAC/BB/RF+PA)

Features

Operates in 2.4 GHz frequency bands

1x1 MIMO technology improves effective throughput and range over

existing 802.11 b/g products

Data rates: up to 150Mbps

802.11e-compatible bursting and I standards

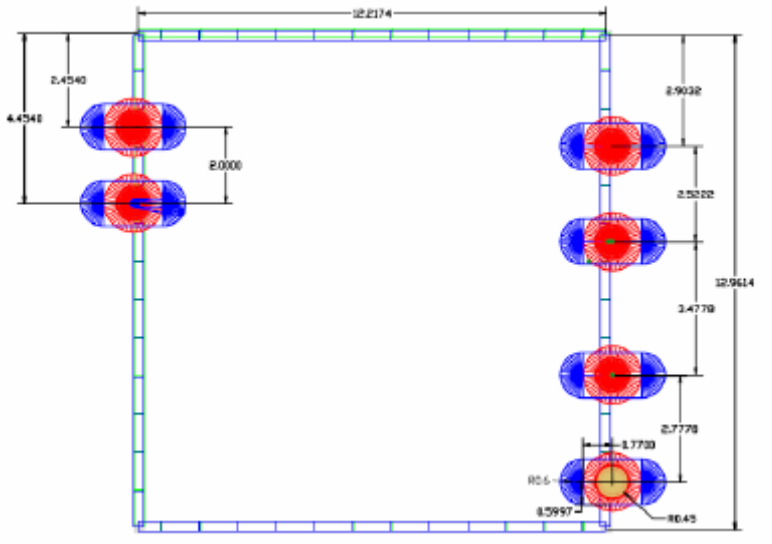
BPSK, QPSK, 16 QAM, 64 QAM modulation schemes

WEP, TKIP, and AES, WPA, WPA2 hardware encryption schemes

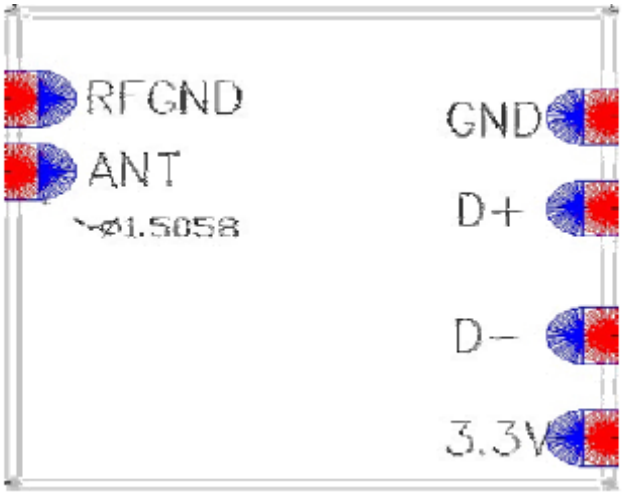
General Specification

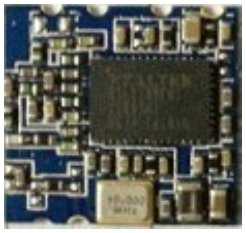
Model Name	RTL8188EUS
Product Name	WLAN 11n USB module
Standard	802.11b/g/n, 802.3, 802.3u
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 150Mbps
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM
Frequency Band	2.4GHz ISM Band
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE 802.11g/n:OFDM (Orthogonal Frequency Division Multiplexing)
RF Output Power	< 14dBm@11n,< 18dBm@11b,< 15dBm@11g
Operation Mode	Ad hoc, Infrastructure
Receiver Sensitivity	11Mbps -83dBm@8%,54Mbps -73dBm@10%,130Mbps -64dBm@10%
Operation Range	Up to 180 meters in open space
LED	Power
OS Support	Windows XP /Vista /Mac /Linux/Win7
Security	WEP, TKIP, AES, WPA, WPA2
Interface	USB 2.0
Power Consumption	DC 3.3V module - Transmit: max. 120 mA; Receive: max 70 mA
Operating Temperature	0 – 50° C ambient temperature
Storage Temperature	-40 ~ 70°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	12.95 x 12.17 x 1.6mm (LxWxH)

PCB Dimensions（Units: mm）



Pin Definition





3.3V	Supply volt3.3V
D-	High-Speed USB D- Signal
D+	High-Speed USB D+ Signal
GND	Ground
RFGND	GND
ANT	Antenna output

DC Characteristics

Parameter	Minimum	Typical	Maximum	Units
3.3V supply voltage	3.1	3.3	3.5	V
3.3V Rating current	-	-	150	mA

Parameters	Sym	Conditions	Min	Typ	Max	Unit
3.3V Supply Voltage	Vc33		3.1	3.3	3.5	V
1.5V Supply Voltage	Vc15		1.4	1.5	1.6	V
Receiving Tests the biggest receive						
3.3V Current Consumption	Icc33rx	H40MCS7		65		MA
3.3V Current Consumption	Icc33rx	OFDM 54M		70		MA
Transmission Biggest transmission test						
3.3V Current Consumption	Icc33tx	H40 MCS7		80		MA
3.3V Current Consumption	Icc33tx	OFDM 54M		85		MA
The depth waits for an opportunity	**Icc33tx/rx**			**2**		**MA**
Deep sleep	**Ic33tx/rx**			**2**		**MA**

TEST Characteristics

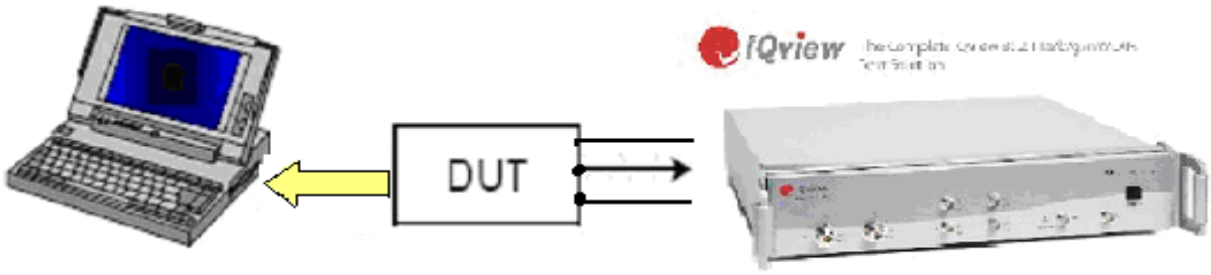
1. TX TEST

1.1 Output Power

Purpose: Verify the transmitter output power of the Device Under Test (DUT) is below conformance limit.

Pass Condition: The IEEE 802.11 specification is 20 dBm / 100mW max.

Test Environment:



Software: DUT generates continuous frames to IQview with XXX and measure the output power.

802.11b TX Test

802.11b Data Rate: 11Mbps														
Channel	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Output Power	18.19	17.93	18.06	18.01	18.08	18.74	18.01	18.03	18.51	18.83	18.01	18.56	18.63	18.05
EVM (%)	-23.7	-23.8	-23.9	-24.3	-24.1	-24.5	-24.3	-24.1	-24.2	-24.3	-23.9	-23.9	-24.1	-24.2
Freq.Offset (KHz)	-4.27	-4.55	-4.10	-4.26	-4.96	-5.16	-5.63	-5.33	-5.46	-4.65	-4.66	-5.10	-4.53	-4.56
Note: Criterion: Power > 17dBm, EVM < 10%, Frequency Offset < ±25ppm, Mask < -30dBc,														

802.11g TX Test

802.11g Data Rate: 54Mbps														
Channel	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Output Power	15.02	14.96	15.00	14.90	14.89	14.99	14.20	15.13	15.21	15.31	14.96	15.12	15.30	15.10
EVM (%)	-28.6	-28.9	-28.6	-28.7	-28.9	-29.3	-28.5	-29.0	-29.3	-29.2	-28.9	-29.4	-29.3	-29.1
Freq. Offset (KHz)	-5.02	-5.04	-5.20	-5.40	-5.01	-5.10	-4.96	-5.20	-5.07	-5.41	-5.21	-5.31	-5.62	-4.90
Note: Criterion: Power > 14dBm, EVM < -25, Frequency Offset < ±20ppm, Mask < -30dBc,														

802.11n(20) TX Test

802.11n Data Rate:MCS7 20M														
Channel	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Output Power	14.3	14.40	14.34	14.21	14.1	14.21	14.36	14.51	14.52	14.3	14.28	14.43	14.5	14.43
EVM (dB)	-31.2	-30.1	-30.9	-31.0	-31.5	-30.3	-29.8	-29.6	-31.0	-30.5	-29.8	-29.1	-30.4	-29.6
Freq. Offset (KHz)	-4.90	-5.20	-4.80	-5.10	-4.90	-5.10	-5.30	-5.60	-6.30	-5.80	-4.80	-6.00	-6.40	-5.60
Note: Criterion: Power > 13dBm, EVM < -28, Frequency Offset < ± 20ppm, Mask < -30dBc,														

802.11n(40M) TX Test

802.11N Data Rate: MCS7 40M														
Channel	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Output Power			14.7	14.67	14.79	14.01	14.60	14.50	14.90	14.90	14.2			
EVM			-30.4	-29.5	-29.3	-29.6	-30.1	-29.6	-29.5	-29.4	-29.2			

(dB)														
Freq. Offset (KHz)			-7.10	-7.60	-5.30	-4.70	-6.20	-6.30	-4.30	-5.60	-5.10			
Note: Criterion: Power > 13dBm, EVM < -28dB, Frequency Offset < ±25ppm, Mask < -25dBc														

2. RX TEST

802.11b RX Test

802.11b Data Rate: 11Mbps														
Channel	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
PER (dB)	-85.0	-85.0	-86.0	-85.0	-85.0	-85.0	-85.0	-85.0	-86.0	-86.0	-86.0	-86.0	-86.0	-86.0

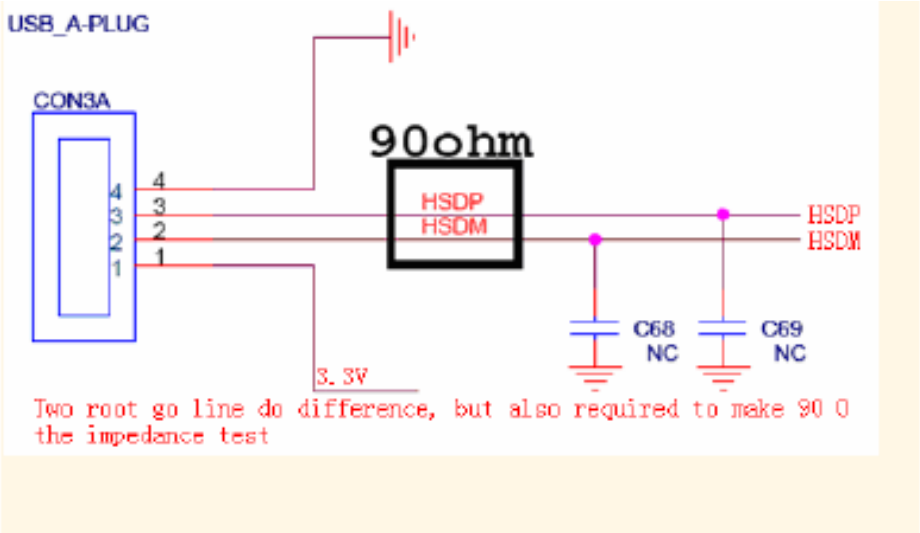
802.11g RX Test

802.11g Data Rate: 54Mbps														
Channel	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
PER (dB)	-72.0	-73.0	-72.0	-72.0	-72.0	-72.0	-72.0	-72.0	-73.0	-72.0	-72.0	-72.0	-73.0	-72.0

802.11n(20M)RX Test

802.11n Data Rate: MCS7 20M														
Channel	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
PER (dB)	-64.0	-64.0	-64.0	-64.0	-64.0	-64.0	-63.0	-64.0	-64.0	-64.0	-64.0	-64.0	-64.0	-65.0

USB interface electrical characteristics



贴片 **WIFI** 模块装机的前注意事项

1、客户在开钢网时一定要将 **WIFI** 模块焊盘的孔开大，请按 **1** 比 **1** 再向外扩大 **0.7Mm** 比例来开，厚度按 **0.12Mm**。

2、**WIFI** 模块在上线贴片前一定要烘烤 **12** 小时以上，温度在 **120** 度 **+-5** 度。

3、烘烤 **OK** 后建议马上上线，不要一烘烤 **OK** 后就将全部 **WIFI** 模块拿出烘烤箱。建议每小时贴多少拿多少出来。

4、有需要拿 **WIFI** 模时一定不要光着手去拿 **WIFI** 模块，一定要戴上手套及静电环。

5、过炉温度要根据客户主板的大小而定，一般像贴在平板电脑上 **250+-5** 度。