

FCC Test Report

Product Name : Dual-band Wireless-AC1200 Gigabit Router

Trade Name : ASUS

Model No. : RT-AC56U, RT-AC56R

FCC ID. : MSQ-RTAC56UA

Applicant : ASUSTeK COMPUTER INC.

Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt : May 09, 2016

Issued Date : May 13, 2016

Report No. : 1650232R-RFUSP42V00

Report Version : V1.0



The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Test Report Certification

Issued Date: May 13, 2016

Report No. : 1650232R-RFUSP42V00



Product Name : Dual-band Wireless-AC1200 Gigabit Router
Applicant : ASUSTeK COMPUTER INC.
Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan
Manufacturer : Compal Networking KunShan) Co.,Ltd
Model No. : RT-AC56U, RT-AC56R
FCC ID. : MSQ-RTAC56UA
EUT Voltage : AC 100-240V, 50-60Hz
Testing Voltage : AC 120V/60Hz
Trade Name : ASUS
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.407: 2015
ANSI C63.10: 2009
Test Lab : Quietek Hsin Chu Laboratory
Test Result : Complied

The test results relate only to the samples tested.

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Documented By :

A handwritten signature in blue ink, appearing to read "Carol Tsai".

(Carol Tsai / Senior Engineering Adm. Specialist)

Tested By :

A handwritten signature in blue ink, appearing to read "JuBo Shen".

(JuBo Shen / Senior Engineer)

Approved By :

A handwritten signature in blue ink, appearing to read "Roy Wang".

(Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
139121R-RFUSP46V01	V1.0	Initial issue of report	Sep. 03, 2013
13B0052R-RFUSP58V00	V1.0	Change EUT hardware version to 2.2 & 2.3 Verify radiation emission (under 1GHz). Update internal photo.	Nov. 26, 2013
1650232R-RFUSP42V00	V1.0	Update WLAN 5G band 1 standard to FCC 15.407.	May 13, 2016

Laboratory Information

We, **Quietek Corporation**, are an independent RF consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025 specified testing scopes:

Taiwan R.O.C.	: TAF, Accreditation Number: 3024
USA	: FCC, Registration Number: 365520
Canada	: IC, Submission No: 181665 / IC Registration Number: 4075C-4

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site:<http://www.quietek.com/english/about/certificates.aspx?bval=5>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :
http://www.quietek.com/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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1. General Information

1.1. EUT Description

Product Name	Dual-band Wireless-AC1200 Gigabit Router	
Product Type	WLAN (2TX, 2RX)	
Trade Name	ASUS	
Model No.	RT-AC56U, RT-AC56R	
Frequency Range/ Channel Number	IEEE 802.11a/ IEEE 802.11n (20MHz) / IEEE 802.11ac (20MHz)	5180~5240MHz / 4 Channels
	IEEE 802.11n (40MHz) / IEEE 802.11ac (40MHz)	5190~5230MHz / 2 Channels
	IEEE 802.11ac (80MHz)	5210~5210MHz / 1 Channel
Type of Modulation	IEEE 802.11a/n/ac	Orthogonal Frequency Division Multiplexing (OFDM)
Data Speed	IEEE 802.11a	6, 9, 18, 24, 36, 48, 54Mbps
	IEEE 802.11n	Support a subset of the combination of GI, MCS 0~MCS 15 and bandwidth defined in 802.11n
	IEEE 802.11ac	Support a subset of the combination of GI, MCS 0~MCS 9 and bandwidth defined in 802.11ac

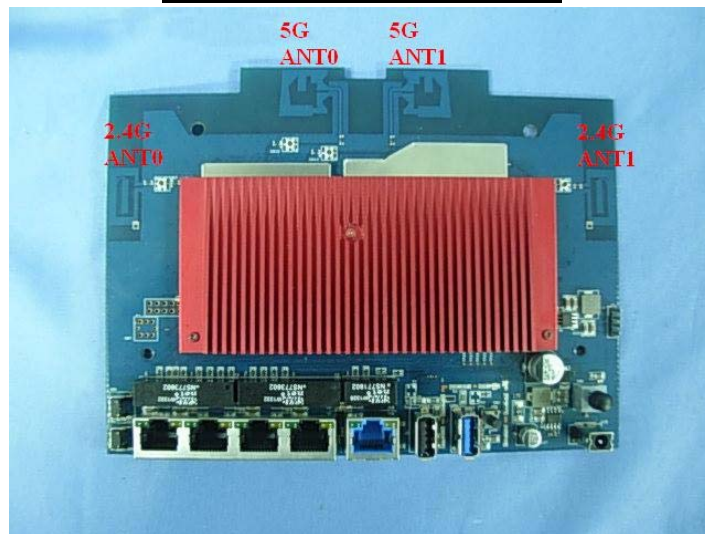
Antenna Information	
Antenna Gain	Ant0: 3.07dBi, Ant1:3.07dBi
Beamforming Gain	3dB
Antenna Type	PCB on Antenna

Accessories Information	
LAN Cable	YFC-BONEAGLE , Non-Shielded, 1.5m
LAN Cable	Cablex Electronics , Non-Shielded, 1.5m
LAN Cable	SHENZHEN , Non-Shielded, 1.5m
Power Adatper	PIE, AD890326 I/P : 100-240V~50/60Hz 0.8A O/P : 19V $\approx$ 1.75A Cable Out: Non-Shielded, 2.3m
Power Adapter	Enertronix, EXA1206UH I/P : AC 100-240V~50-60Hz, 1.0A O/P : 19Vdc $\approx$ 1.75A Cable Out: Non-Shielded, 2.3m

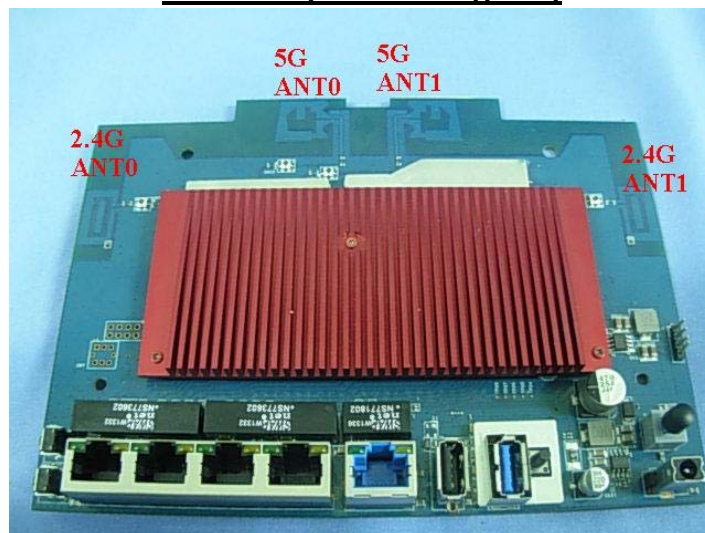
ANT-TX / RX & Bandwidth

ANT-TX / RX	TX			RX		
	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
IEEE802.11a	✓			✓		
IEEE802.11n	✓	✓		✓	✓	
IEEE802.11ac	✓	✓	✓	✓	✓	✓

2TX / 2RX (Blue Board)(V2.2)



2TX / 2RX (Blue Board)(V2.3)



IEEE 802.11n

MCS Index	Modulation	R	N _{BPSCS}	N _{CBPS}		N _{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI	
								20MHz	40MHz	20MHz	40MHz
0	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.2	15.0
1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.4	30.0
2	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.7	45.0
3	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.9	60.0
4	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.3	90.0
5	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.8	120.0
6	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.0	135.0
7	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.2	150.0

Note 1: Support of 400ns GI is optional on transmit and receive.

Table 1 – MCS parameters for TX Antenna number = 1

MCS Index	Modulation	R	N _{BPSCS}	N _{CBPS}		N _{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI	
								20MHz	40MHz	20MHz	40MHz
8	BPSK	1/2	1	104	216	52	108	13.0	27.0	14.4	30.0
9	QPSK	1/2	2	208	432	104	216	26.0	54.0	28.9	60.0
10	QPSK	3/4	2	208	432	156	324	39.0	81.0	43.3	90.0
11	16-QAM	1/2	4	416	864	208	432	52.0	108.0	57.8	120.0
12	16-QAM	3/4	4	416	864	312	648	78.0	162.0	86.7	180.0
13	64-QAM	2/3	6	624	1296	416	864	104.0	216.0	115.6	240.0
14	64-QAM	3/4	6	624	1296	468	972	117.0	243.0	130.0	270.0
15	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0	144.4	300.0

Note 1: Support of 400ns GI is optional on transmit and receive.

Table 2 – MCS parameters for TX Antenna number = 2

Symbol	Explanation
R	Code rate
N _{BPSC}	Number of coded bits per single carrier
N _{CBPS}	Number of coded bits per symbol
N _{DBPS}	Number of data bits per symbol
GI	guard interval

Draft IEEE 802.11ac Data Rate

Spatial Streams (Note1)	MCS Index	Modulation type	Coding rate	Data Rate(Mb/s)							
				20 MHz		40 MHz		80 MHz		160 MHz	
				Guard Interval		Guard Interval		Guard Interval		Guard Interval	
				800ns	400ns	800ns	400ns	800ns	400ns	800ns	400ns
1	0	BPSK	1/2	6.5	7.2	13.5	15	29.3	32.5	58.5	65
	1	QPSK	1/2	13	14.4	27	30	58.5	65	117	130
	2	QPSK	3/4	19.5	21.7	40.5	45	87.8	97.5	175.5	195
	3	16-QAM	1/2	26	28.9	54	60	117	130	234	260
	4	16-QAM	3/4	39	43.3	81	90	175.5	195	351	390
	5	64-QAM	2/3	52	57.8	108	120	234	260	468	520
	6	64-QAM	3/4	58.5	65	121.5	135	263.3	292.5	526.5	585
	7	64-QAM	5/6	65	72.2	135	150	292.5	325	585	650
	8	256-QAM	3/4	78	86.7	162	180	351	390	702	780
	9	256-QAM	5/6	N/A	N/A	180	200	390	433.3	780	866.7
2	0	BPSK	1/2	13	14.4	27	30	58.6	65	117	130
	1	QPSK	1/2	26	28.8	54	60	117	130	234	260
	2	QPSK	3/4	39	43.4	81	90	175.6	195	351	390
	3	16-QAM	1/2	52	57.8	108	120	234	260	468	520
	4	16-QAM	3/4	78	86.6	162	180	351	390	702	780
	5	64-QAM	2/3	104	115.6	216	240	468	520	936	1040
	6	64-QAM	3/4	117	130	243	270	526.6	585	1053	1170
	7	64-QAM	5/6	130	144.4	270	300	585	650	1170	1300
	8	256-QAM	3/4	156	173.4	324	360	702	780	1404	1560
	9	256-QAM	5/6	N/A	N/A	360	400	780	866.6	1560	1733.4

IEEE 802.11a & IEEE 802.11n (20MHz) & IEEE 802.11ac (20MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

IEEE 802.11n (40MHz) & IEEE 802.11ac (40MHz)

Working Frequency of Each Channel			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

IEEE 802.11ac (80MHz)

Working Frequency of Each Channel	
Channel	Frequency
42	5210 MHz

Note:

1. This device is a Dual-band Wireless-AC1200 Gigabit Router including 2.4GHz b/g/n and 5GHz a/n (2x2) transmitting and receiving function.
2. The variation of model number is for different strategy of marketing.
3. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.407.
4. Regards to the frequency band operation; the lowest, middle and highest frequency of channel were selected to perform the test, and then shown on this report.
5. The function of the 2.4GHz & 5.8GHz transmitting is measured and makes a test report of the report number: 13B0052R-RFUSP70V00 & 1650232R-RFUSP42V00-A.
6. This device is a composite device in accordance with Part 15 regulations. The receiving function receiving was tested and its test report number is 13B0052R-RFUSP15V00 under Declaration of Conformity.
7. The difference between ver.2.2 and Ver.2.3 of the "Blue Board":

Location of component	Modify	Note
R113, R114, R7, R10, R12,R57	Remove R113, R114 (5.1Kohm) , R7,R10 (10Kohm) and Add R12,R57 (10Kohm).	Improve USB device compatibility issue

8. For this project, this device no increase power level, so update WLAN 5G band 1 standard to FCC 15E new rule without any tested.

Attachment 1

- **Original Report**