

Test Report

FCC Part15 Subpart E(Class II Permissive Change)

Product Name : AC1750 Wireless Dual Band Gigabit Router

Model No. : Archer C8

FCC ID : TE7C8V2

Applicant : TP-LINK TECHNOLOGIES CO., LTD.

Address : Building 24 (floors 1,3,4,5) and 28 (floors1-4)
Central Science and Technology Park,Shennan Rd,
Nanshan, Shenzhen,China

Date of Receipt : Mar. 03, 2016

Test Date : Mar. 03, 2016~May. 11, 2016

Issued Date : May. 12, 2016

Report No. : 1632027R-RF-US-P09V01

Report Version : V1.0

Note : This report is based on QTK No. 1570321R, it is only update the adapter, so we re-evaluate items are output power, radiated emission and bandedge.

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by CNAS,TAF any agency of the government.

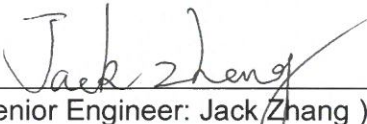
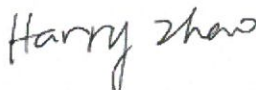
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Test Report Certification

Issued Date : May. 12, 2016

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Applicant : TP-LINK TECHNOLOGIES CO., LTD.
Address : Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science
and Technology Park,Shennan Rd, Nanshan,
Shenzhen,China
Manufacturer : TP-LINK TECHNOLOGIES CO., LTD
Address : Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science
and Technology Park,Shennan Rd, Nanshan,
Shenzhen,China
Model No. : Archer C8
FCC ID : TE7C8V2
EUT Voltage : AC 100-240V, 50/60Hz
Brand Name : TP-LINK
Applicable Standard : FCC CFR Title 47 Part 15 Subpart E: 2015
ANSI C63.4:2014;
ANSI C63.10:2013;
789033 D02 General UNII Test Procedures New Rules
v01r02
Test Result : Complied
Performed Location : Quietek Corporation - Suzhou EMC Laboratory
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006,
Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392;
Documented By : 
(Senior Adm. Specialist: Alice Ni)
Reviewed By : 
(Senior Engineer: Jack Zhang)
Approved By : 
(Engineering Manager : Harry Zhao)

Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety 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, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

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/tw/ctg/cts/accreditations.htm>

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

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

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

LinKou Testing Laboratory :

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

Suzhou Testing Laboratory :

No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006, Jiangsu, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1632027R-RF-US-P09V01	V1.0	Initial Issued Report	May 12, 2016

1. General Information

1.1. EUT Description

Product Name	AC1750 Wireless Dual Band Gigabit Router					
Brand Name	TP-LINK					
Model No.	Archer C8					
EUT Voltage	AC 100-240V, 50/60Hz					
Type of Modulation	OFDM					
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps					
	802.11n: up to 450Mbps					
	802.11ac: up to 1.3Gbps					
Channel Control	Auto					
Transmit modes	☒	802.11a	☒	802.11n(20MHz)	☒	802.11n(40MHz)
	☒	802.11ac(20MHz)	☒	802.11ac(40MHz)	☒	802.11ac(80MHz)
Support Bands	☐		☐	Outdoor AP		
	☒	5150MHz~5250MHz	☒	Indoor AP		
			☐	Fixed point-to-point AP		
			☐	Mobile and Portable Client		
	☐	5250MHz~5350MHz				
	☐	5470MHz~5725MHz	☐	With TDWR Channels		
			☐	Without TDWR Channels		
	☒	5725MHz~5850MHz				

1.2. Antenna information

Antenna Model	PIFA Antenna					
Antenna Manufacturer	TPLink					
Antenna Delivery	☐	1*TX+1*RX	☐	2*TX+2*RX	☒	3*TX+3*RX
Antenna Technology	☐	SISO				
	☒	MIMO	☐	Basic methodology with NANT transmit antennas		
			☐	Sectorized antenna systems		
			☐	Cross-polarized antennas		
			☐	Unequal antenna gains, with equal transmit powers		
			☒	Spatial Multiplexing		
			☒	Cyclic Delay Diversity (CDD)		
Antenna Type	Dipole					
Antenna Gain						

Antenna Technology	Ant Gain	Directional Gain	
		For Power	For PSD
☒ CDD	Ant0: 1.7 Ant1: 1.7 Ant2:1.7	1.7	6.47
☒ Beam-forming	Ant0: 1.7 Ant1: 1.7 Ant2:1.7	6.47	6.47

1.3. Working Frequency of Each Channel:

802.11a/n/ac(20MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz	48	5240 MHz
149	5745 MHz	153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825MHz	N/A	N/A	N/A	N/A	N/A	N/A
802.11n/ac(40MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	151	5755 MHz	159	5795 MHz
802.11ac(80MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	155	5775 MHz	N/A	N/A	N/A	N/A

1.4. Mode of Operation

Quietek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

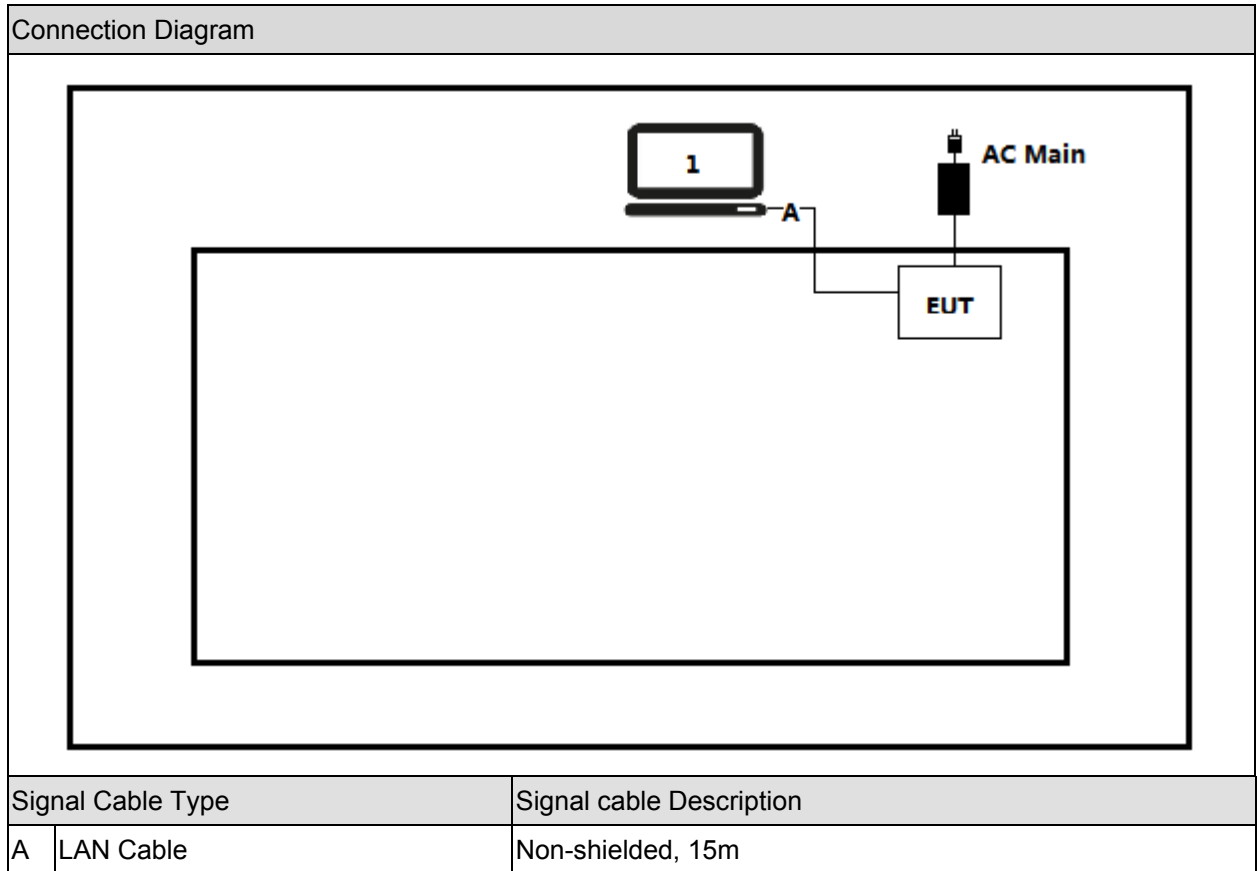
Test Mode
Mode 1: Transmit by 802.11a with CDD
Mode 2: Transmit by 802.11n(20MHz) with CDD
Mode 3: Transmit by 802.11n(40MHz) with CDD
Mode 4: Transmit by 802.11ac(20MHz) with CDD
Mode 5: Transmit by 802.11ac(40MHz) with CDD
Mode 6: Transmit by 802.11ac(80MHz) with CDD
Mode 7: Transmit by 802.11ac(20MHz) with beam-forming
Mode 8: Transmit by 802.11ac(40MHz) with beam-forming
Mode 9: Transmit by 802.11ac(80MHz) with beam-forming
Note 1: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

1.5. Tested System Details

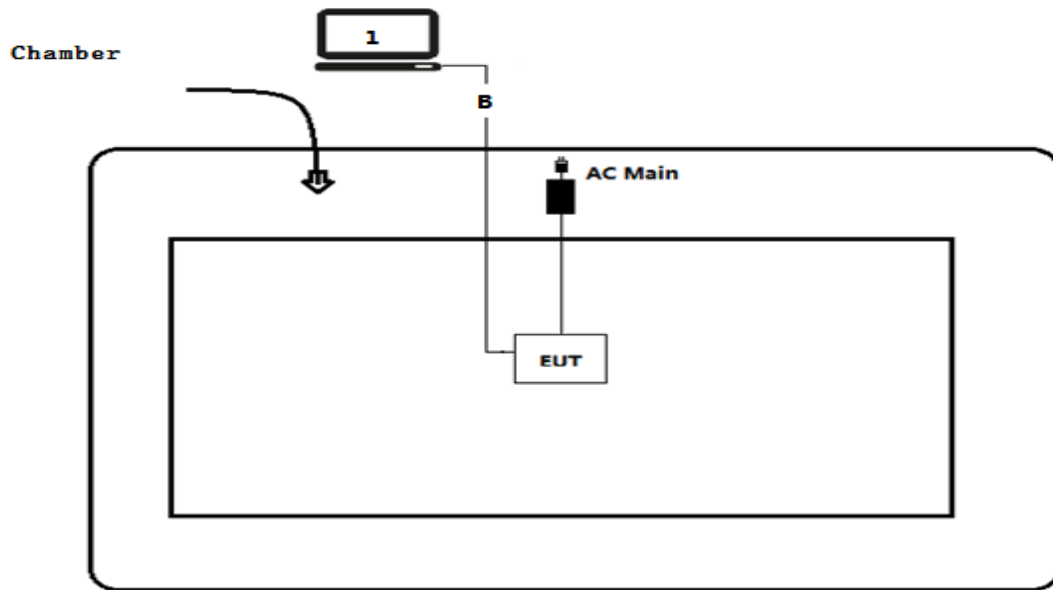
The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	Asus	N80V	8BN0AS226971468	None-shielded
2	Notebook	Lenovo	Think pad x220	SUA0600195	Non-shielded

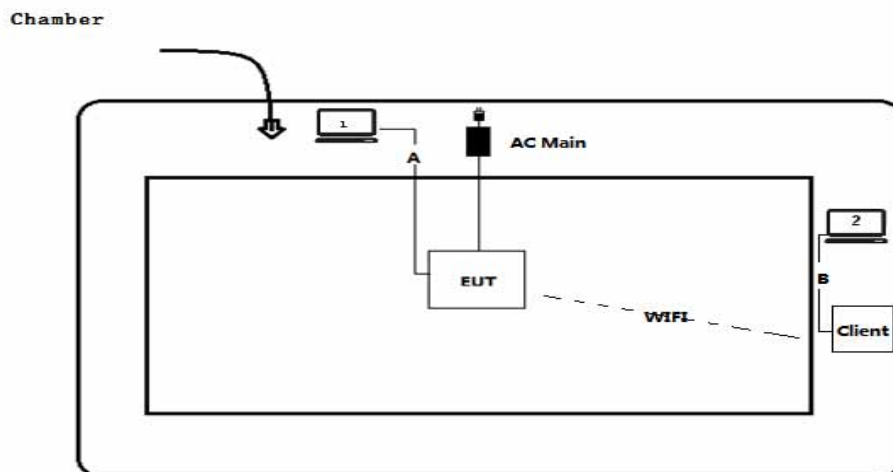
1.6. Configuration of Tested System



Connection Diagram



Connection Diagram



Signal Cable Type		Signal cable Description
A	LAN Cable	Non-shielded, 1.5m
B	LAN Cable	Non-shielded, 1.5m

1.7. EUT Exercise Software

With CDD:

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Input RF commands, and set the test mode and channel, then press OK to start to continue transmit or receive.

With Beamforming:

1	Setup the EUT and Client as shown on above.
2	Turn on the power of equipment.
3	Configure the client and connect the EUT.
3	Input RF commands, and set the test mode and channel, then use “Tfgen” to traffic and test.

2. Technical Test

2.1. Summary of Test Result

Performed Test Item	Normative References	Worse case mode	Limit	Result
Conducted Emission	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.207	802.11a	FCC 15.207	PASS
Radiated Emission	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.209	802.11a	FCC 15.209	PASS
Power Output	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.407(a)	802.11n(20MHz)	FCC 15.407(a)	PASS
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart E: 2015 Section 15.205, 15.407(b)	802.11n(40MHz)	FCC 15.407(b)	PASS

2.2. Test Frequency configuration:

Modulation Mode	Channel	Frequency	Channel	Frequency	Channel	Frequency
802.11a/n(20MHz)/ac(20MHz)	36	5180MHz	44	5200 MHz	48	5240MHz
	149	5745Mhz	157	5785MHz	165	5825MHz
802.11n(40MHz)/ac(40MHz)	38	5190MHz	46	5230 MHz	151	5755MHz
	159	5795Mhz	N/A	N/A	N/A	N/A
802.11ac(80MHz)	42	5210 MHz	155	5775MHz	N/A	N/A

2.3. Power Parameter Value of the test software

Test Mode	Test Channel	Power Setting (With CDD)	Power Setting (With Beamforming)
802.11a	5180	74	×
	5200	78	×
	5240	76	×
802.11n(20MHz)	5180	73	×
	5200	85	×
	5240	86	×
802.11ac(20MHz)	5180	72	80
	5200	85	87
	5240	85	87
802.11n(40MHz)	5190	48	×
	5230	87	×
802.11ac(40MHz)	5190	46	57
	5230	86	93
802.11ac(80MHz)	5210	39	46

2.4. Power vs Data Rate

MCS Index for 802.11n	Spatial Streams	Data Rate (Mbps)						
		802.11b	802.11g	802.11a	20MHz Bandwidth		40MHz Bandwidth	
					800ns GI	400ns GI	800ns GI	400ns GI
0	1	1	6	6	6.5	7.2	13.5	15.0
1	1	2	9	9	13.0	14.4	27.0	30.0
2	1	5.5	12	12	19.5	21.7	40.5	45.0
3	1	11	18	18	26.0	28.9	54.0	60.0
4	1	---	24	24	39.0	43.3	81.0	90.0
5	1	---	36	36	52.0	57.8	108.0	120.0
6	1	---	48	48	58.5	65.0	121.5	135.0
7	1	---	54	54	65.0	72.2	135.0	150.0
8	2	---	---	---	13.0	14.4	27.0	30.0
9	2	---	---	---	26.0	28.9	54.0	60.0
10	2	---	---	---	39.0	43.3	81.0	90.0
11	2	---	---	---	52.0	57.8	108.0	120.0
12	2	---	---	---	78.0	86.7	162.0	180.0
13	2	---	---	---	104.0	115.6	216.0	240.0
14	2	---	---	---	117.0	130.0	243.0	270.0
15	2	---	---	---	130.0	144.0	270.0	300.0
16	3	---	---	---	19.5	21.6	40.5	45
17	3	---	---	---	39	43.2	81	90
18	3	---	---	---	58.5	65.1	121.5	135
19	3	---	---	---	78	86.7	162	180
20	3	---	---	---	117	129.9	243	270
21	3	---	---	---	156	173.4	324	360
22	3	---	---	---	175.5	195	364.5	405
23	3	---	---	---	195	216.6	405	450

Note 1 : The blue form is the maximum power data rate

Spatial Streams (Note1)	MCS Index	Modulation type	Coding rate	Data Rate(Mb/s)							
				20MHz		40MHz		80MHz		160MHz	
				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
3	0	BPSK	1/2	19.5	21.6	40.5	45	87.9	97.5	175.5	195
	1	QPSK	1/2	39	43.2	81	90	175.5	195	351	390
	2	QPSK	3/4	58.5	65.1	121.5	135	263.4	292.5	526.5	585
	3	16-QAM	1/2	78	86.7	162	180	351	390	702	780
	4	16-QAM	3/4	117	129.9	243	270	526.5	585	1053	1170
	5	64-QAM	2/3	156	173.4	324	360	702	780	1404	1560
	6	64-QAM	3/4	175.5	195	364.5	405	789.9	877.5	1579.5	1755
	7	64-QAM	5/6	195	216.6	405	450	877.5	975	1755	1950
	8	256-QAM	3/4	234	260.1	486	540	1053	1170	2106	2340
	9	256-QAM	5/6	N/A	N/A	540	600	1170	1299.9	2340	2600.1

Note 1 : The blue form is the maximum power data rate

2.5. Duty Cycle

For 5.0GHz Band with CDD

Test Mode	Tx On (ms)	T (ms)	VBW	Tx On + Tx Off (ms)	Duty Cycle
802.11a	2.04	2.04	510Hz	2.18	93.58%
802.11n(20MHz)	1.92	1.92	520Hz	2.02	95.05%
802.11ac(20MHz)	1.92	1.91	530Hz	1.96	88.39%
802.11n(40MHz)	0.93	0.95	1.2kHz	1.04	97.87%
802.11ac(40MHz)	0.95	0.96	1.2KHz	0.98	96.06%
802.11ac(80MHz)	2.07	2.07	510Hz	2.18	95.48%

Note 1: T means the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Note 2: According to KDB 789033 , when test for Radiated Emission Band Edge and Radiated Emission,VBW $\geq 1/T$ will be used.

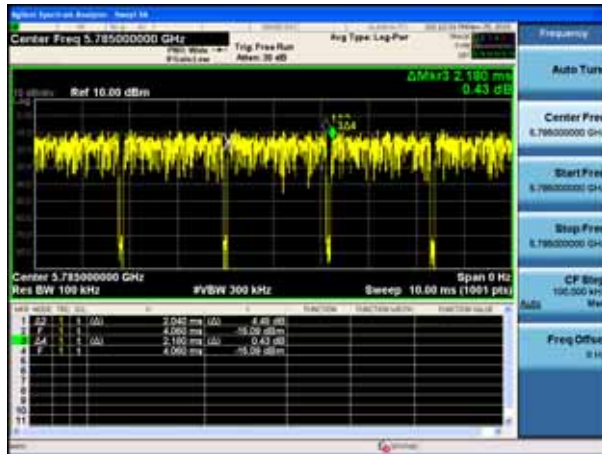
For 5.0GHz Band with Beamforming

Test Mode	Tx On (ms)	T (ms)	VBW	Tx On + Tx Off (ms)	Duty Cycle
802.11ac(20MHz)	1.92	1.92	530Hz	2.56	96.65%
802.11ac(40MHz)	0.73	0.73	1.4KHz	0.99	96.65%
802.11ac(80MHz)	2.01	2.01	510Hz	2.92	94.84%

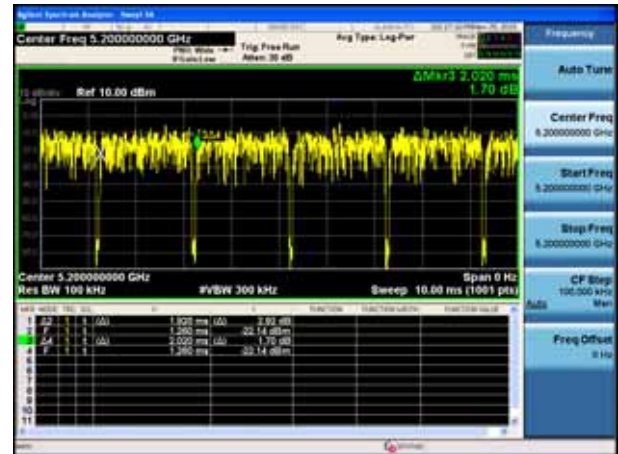
Note 1: T means the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Note 2: According to KDB 789033 , when test for Radiated Emission Band Edge and Radiated Emission,VBW $\geq 1/T$ will be used.

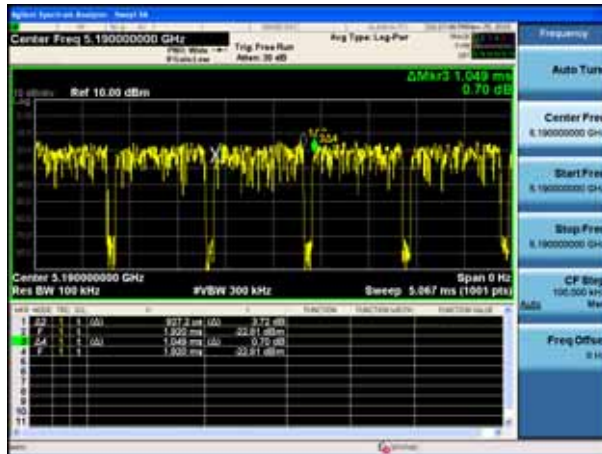
802.11a with CDD



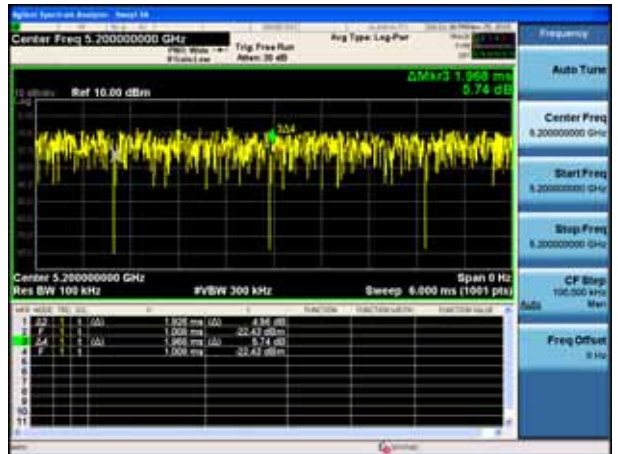
802.11n(20MHz) with CDD



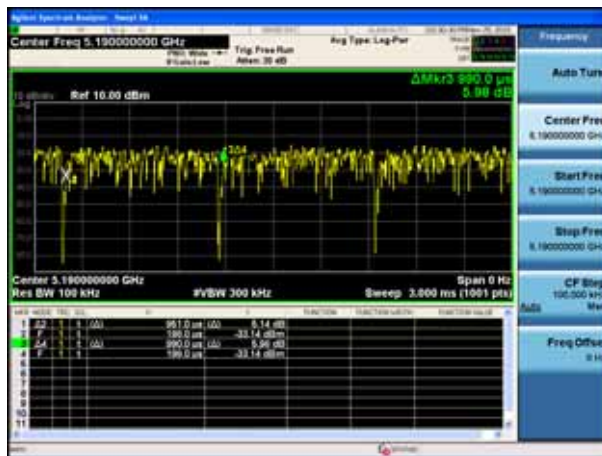
802.11n(40MHz) with CDD



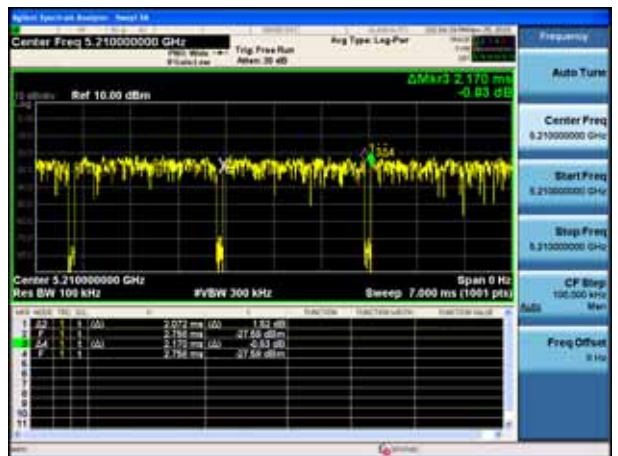
802.11ac(20MHz) with CDD



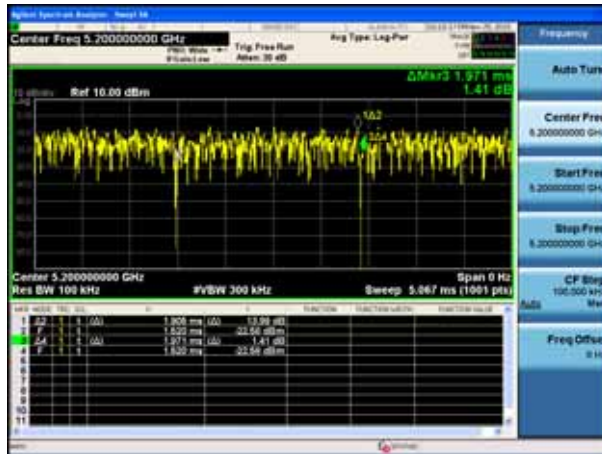
802.11ac(40MHz) with CDD



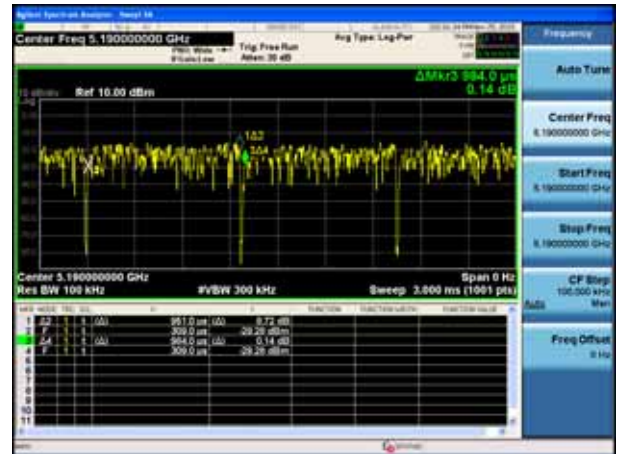
802.11ac(80MHz) with CDD



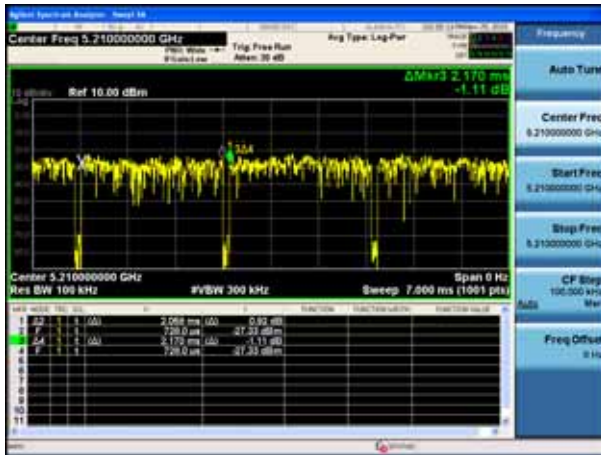
802.11ac(20MHz) with Beamforming



802.11ac(40MHz) with Beamforming



802.11ac(80MHz) with beamforming



2.6. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

2.7. Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	$\pm 2.02\text{dB}$
Radiated Emission	Below 1GHz $\pm 3.8\text{ dB}$
	Above 1GHz $\pm 3.9\text{ dB}$
RF Antenna Port Conducted Emission	$\pm 1.27\text{dB}$
Radiated Emission Band Edge	$\pm 3.9\text{dB}$
Occupied Bandwidth	$\pm 1\text{kHz}$
Power Spectral Density	$\pm 1.27\text{dB}$

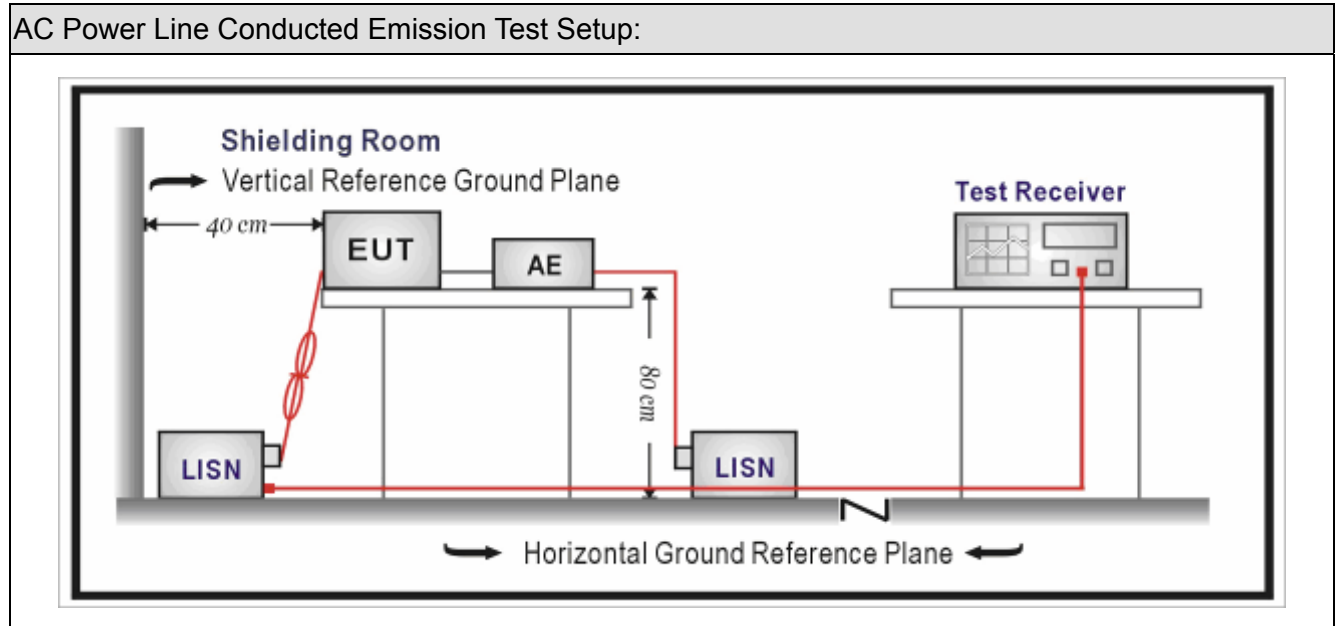
3. AC Power line Conducted Emission

3.1. Test Equipment

AC Power Line Conducted Emission / TR-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2016.03.29	2017.03.28
Two-Line V-Network	R&S	ENV216	100043	2016.03.29	2017.03.28
Two-Line V-Network	R&S	ENV216	100044	2015.09.17	2016.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2016.03.02	2017.03.01
50ohm Termination	SHX	TF2	07081401	2015.09.17	2016.09.16
Temperature/Humidity Meter	zhichen	ZC1-2	TR1-TH	2016.01.09	2017.01.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

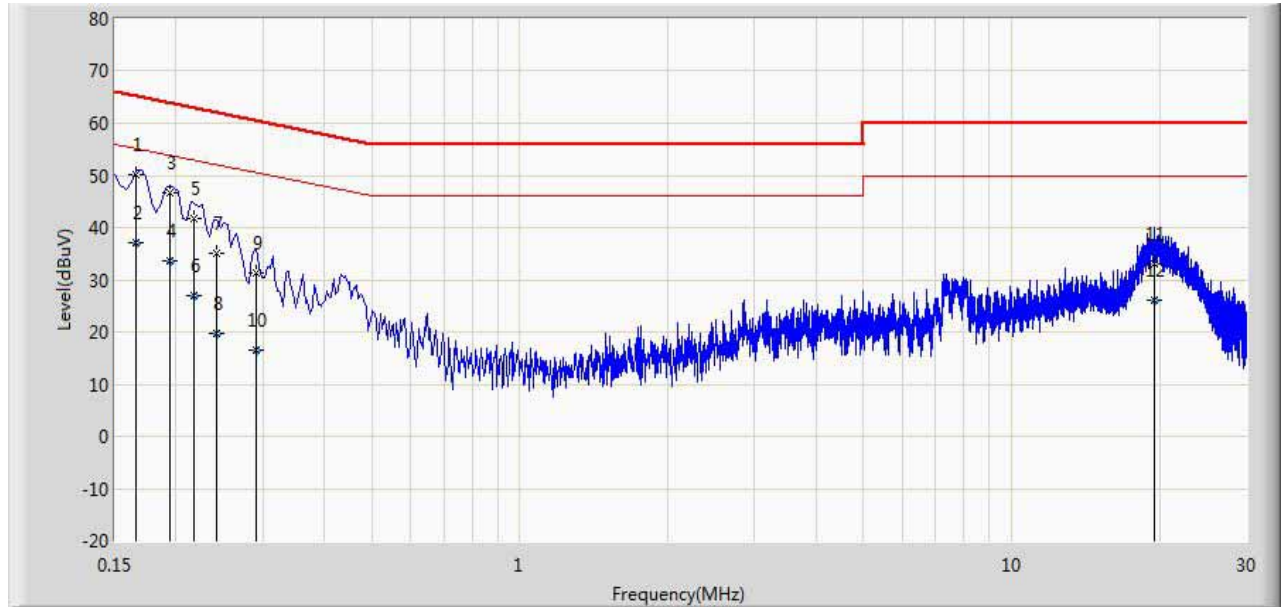
Frequency (MHz)	QP (dB μ V)	AV (dB μ V)
0.15 - 0.50	66 – 56	56 – 46
0.50 - 5.0	56	46
5.0 - 30	60	50
Note 1: The lower limit shall apply at the transition frequencies. Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

3.4. Test Procedure

Test Method			
	References Rule	Chapter	Item
☒	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices
☒	ANSI C63.4-2014	7	AC power-line conducted emission measurements

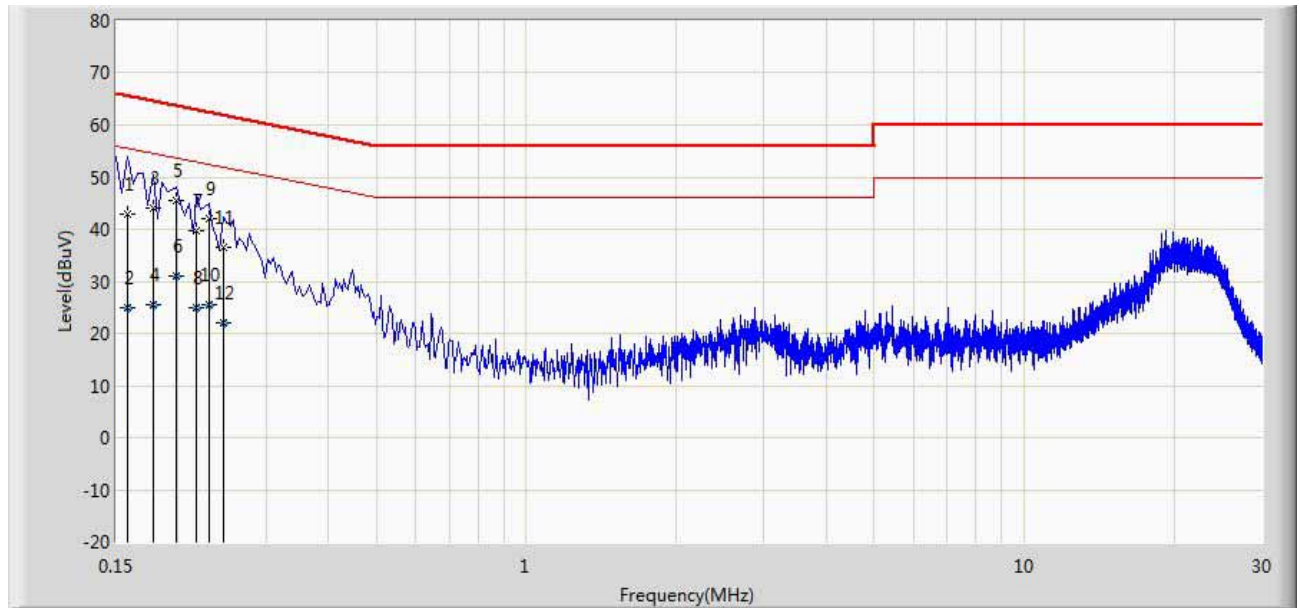
3.5. Test Result

Engineer: Jack	
Site: TR1	Time: 2016/05/03 - 09:05
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: AC1750 Wireless Dual Band Gigabit Router	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1	*	0.166	50.178	40.558	-14.980	65.158	9.620	QP
2		0.166	37.155	27.536	-18.003	55.158	9.620	AV
3		0.194	46.750	37.130	-17.113	63.864	9.621	QP
4		0.194	33.661	24.041	-20.202	53.864	9.621	AV
5		0.218	41.747	32.125	-21.148	62.895	9.622	QP
6		0.218	27.085	17.463	-25.810	52.895	9.622	AV
7		0.242	35.039	25.419	-26.989	62.027	9.619	QP
8		0.242	19.627	10.008	-32.400	52.027	9.619	AV
9		0.290	31.219	21.597	-29.306	60.524	9.622	QP
10		0.290	16.469	6.847	-34.056	50.524	9.622	AV
11		19.522	33.002	23.076	-26.998	60.000	9.926	QP
12		19.522	26.093	16.167	-23.907	50.000	9.926	AV

Engineer:	
Site: TR1	Time: 2016/05/03 - 09:11
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Neutral
EUT: AC1750 Wireless Dual Band Gigabit Router	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.158	43.022	33.422	-22.547	65.568	9.600	QP
2		0.158	24.934	15.334	-30.634	55.568	9.600	AV
3		0.178	44.005	34.407	-20.573	64.578	9.599	QP
4		0.178	25.550	15.951	-29.028	54.578	9.599	AV
5	*	0.198	45.560	35.959	-18.134	63.694	9.602	QP
6		0.198	31.124	21.522	-22.570	53.694	9.602	AV
7		0.218	39.664	30.061	-23.230	62.895	9.603	QP
8		0.218	24.938	15.335	-27.957	52.895	9.603	AV
9		0.230	42.078	32.477	-20.371	62.450	9.601	QP
10		0.230	25.423	15.821	-27.027	52.450	9.601	AV
11		0.246	36.479	26.877	-25.412	61.891	9.602	QP
12		0.246	21.976	12.374	-29.916	51.891	9.602	AV

4. Radiated Emission

4.1. Test Equipment

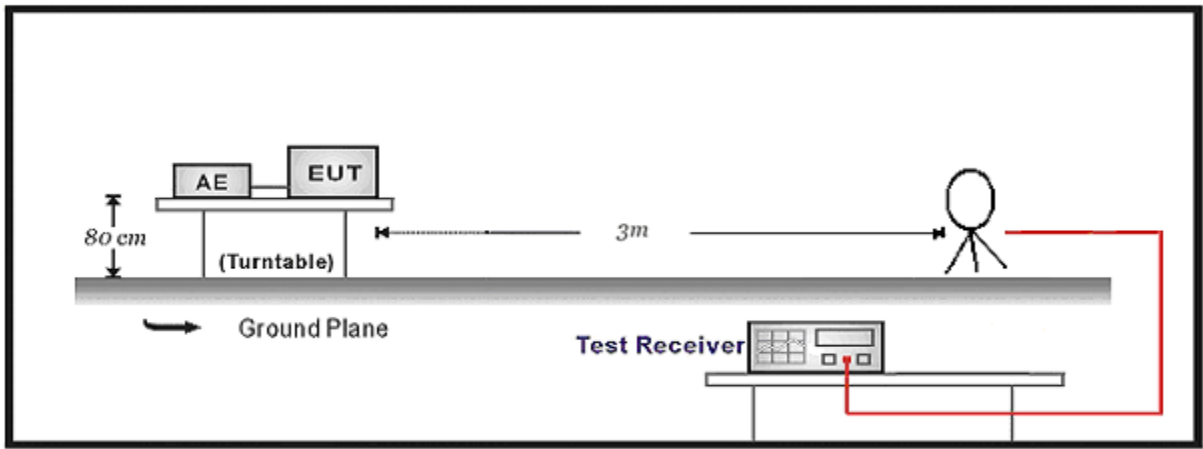
Radiated Emission / AC-2					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.29	2017.03.28
Loop Antenna	R&S	HFH2-Z2	833799/003	2015.11.18	2016.11.17
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2015.10.16	2016.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.03.02	2017.03.01
Temperature/Humidity Meter	Zhichen	ZC1-2	AC2-TH	2016.01.09	2017.01.08

Radiated Emission / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.08	2017.01.07
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.06	2017.05.05
Preamplifier	Quietek	AP-040G	CHM-0906001	2016.05.06	2017.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.22	2017.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2015.11.25	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.09	2017.01.08

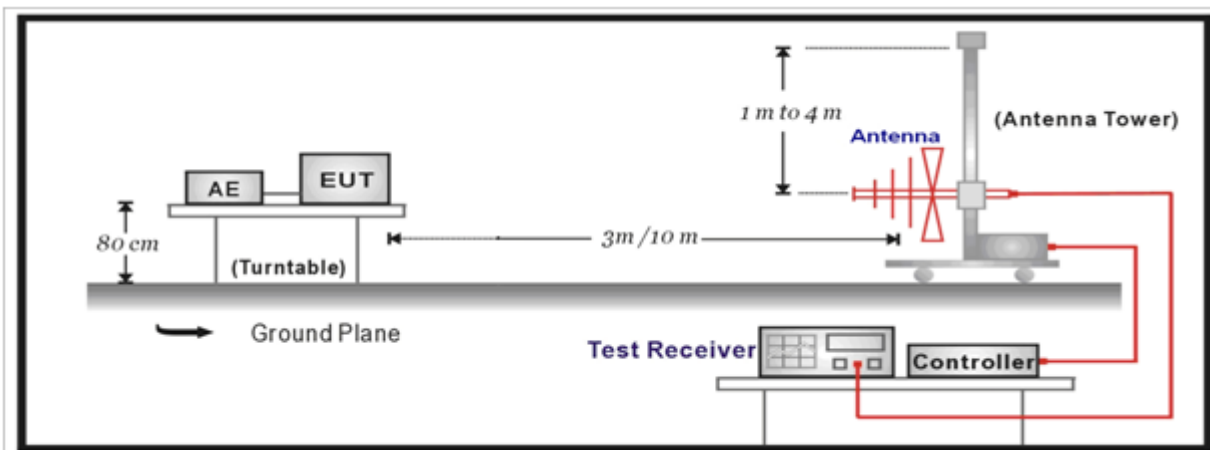
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup

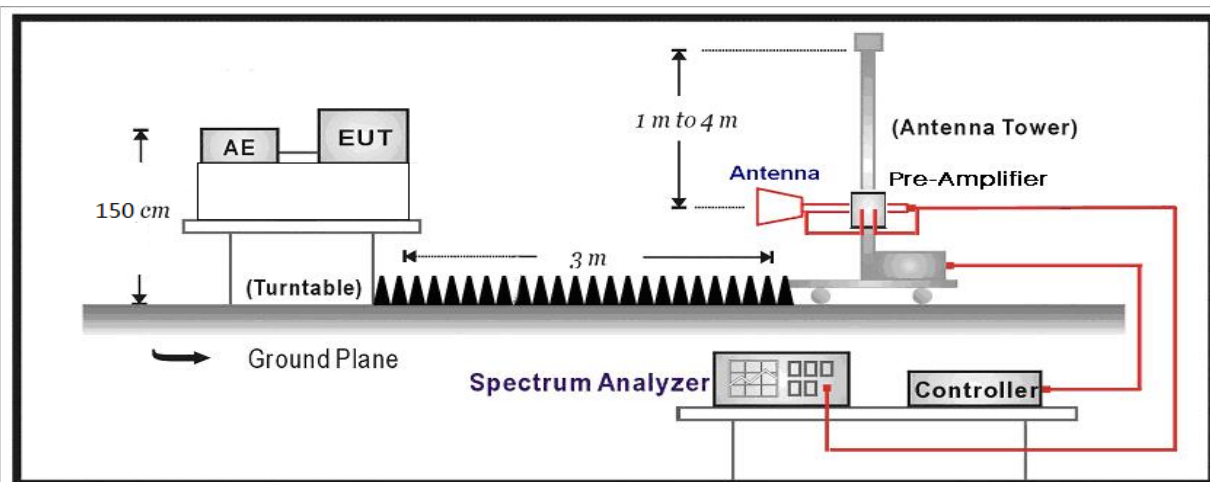
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dB μ V/m)
0.009-0.490	300	2400/F(kHz)
0.490-1.705	30	24000/F(kHz)
1.705-30.0	30	30
30-88	3	100**
88-216	3	150**
216-960	3	200**
Above 960	3	500

Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

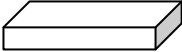
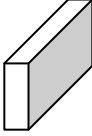
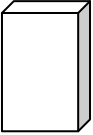
FCC Part 15 Subpart C Paragraph 15.205 (Restricted Band)			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			

FCC Part 15 Subpart C Paragraph 15.407(5)(b) (Unrestricted Band Emissions Limit)		
Operating Frequency Band (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength at 3m (dB μ V/m)
5150 - 5250	-27	68.3
5250 - 5350	-27	68.3
5470 - 5725	-27	68.3
5725 - 5825	-27 [Note(1)]	68.3
	-17 [Note(2)]	78.3
Note1: Outside the frequency range 5715 - 5835MHz. Note2: Within the frequency range from the band edge to 10MHz below or above the band edge, 5715 – 5725MHz and 5825 - 5835MHz.		

4.4. Test Procedure

Test Method				
	References Rule		Chapter	Description
☐	ANSI C63.10		12.7.3	Emissions in non-restricted frequency bands
☒	ANSI C63.10		12.7.2	Emissions in restricted frequency bands
	☒	ANSI C63.10	12.7.5	Radiated emission measurements
	☒	ANSI C63.10	12.7.6	Procedure for peak unwanted emissions measurements above 1000 MHz
	☒	ANSI C63.10	12.7.7	Procedures for average unwanted emissions measurements above 1000 MHz
	☐	ANSI C63.10	12.7.7.2	Method AD (average detection)—primary method
	☒	ANSI C63.10	12.7.7.3	Method VB-A (Alternative)
	☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
☐	FCC KDB 789033 D02v01r02		G.2	Unwanted Emissions that fall Outside of the Restricted Bands
☐	FCC KDB 789033 D02v01r02		G.1	Unwanted Emissions in the Restricted Bands
	☐	FCC KDB 789033 D02v01r02	G.4	Procedure for Unwanted Emissions Measurements below 1000 MHz
	☐	FCC KDB 789033 D02v01r02	G.5	Procedure for Unwanted Maximum Emissions Measurements above 1000 MHz
	☐	FCC KDB 789033 D02v01r02	G.6	Procedures for Average Unwanted Emissions Measurements above 1000 MHz
	☐	FCC KDB 789033 D02v01r02	G.6.c	Method AD (Average detection)—primary method
	☐	FCC KDB 789033 D02v01r02	G.6.d	Method VB (Averaging using reduced video bandwidth): Alternative method.

4.5. EUT test Axis definition

Item	Radiated Emission			
Device Category	☒	Indoor use		
	☐	Outdoor use		
	☐	Fix position use		
	☐	Mobile position use		
Test mode	Mode 1-9			
Test method	☒	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis ☐	Worst Axis ☒	Worst Axis ☐
	☐	Conducted		
	☐	Chain 0		
				
	☐	Chain 0	Chain 1	
				
	☐	Chain 0	Chain 1	Chain 2
				

4.6. Test Result

Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 1	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measured Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	36	H	10360.0	43.5	2.4	45.9	54(Note3)	8.1	PK
		V	10360.0	42.8	2.4	45.2	54(Note3)	8.8	PK
		H	15540.0	36.0	11.9	47.9	54(Note3)	6.1	PK
		V	15540.0	36.7	11.9	48.6	54(Note3)	5.4	PK
	40	H	10400.0	43.5	3.1	46.6	54(Note3)	7.4	PK
		V	10400.0	42.8	3.1	45.9	54(Note3)	8.1	PK
		H	15603.0	46.3	13.7	60.0	74	14.0	PK
		H	15604.0	29.8	13.7	43.5	54	10.5	AV
		V	15603.0	44.6	13.7	58.3	74	15.7	PK
		V	15600.6	30.5	13.6	44.1	54	9.9	AV
		H	10480.0	43.9	2.3	46.2	54(Note3)	7.8	PK
		V	10480.0	42.8	2.3	45.1	54(Note3)	8.9	AV
	48	H	15720.0	34.3	13.3	47.6	54(Note3)	6.4	PK
		V	15720.0	33.1	13.3	46.4	54(Note3)	7.6	PK

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 2	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measured Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	36	H	10360.0	42.4	2.4	44.8	54(Note3)	9.2	PK
		V	10360.0	42.8	2.4	45.2	54(Note3)	8.8	PK
		H	15540.0	28.6	11.9	40.5	54(Note3)	13.5	PK
		V	15540.0	28.4	11.9	40.3	54(Note3)	13.7	PK
	40	H	10400.0	42.9	3.1	46.0	54(Note3)	8.0	PK
		V	10400.0	42.2	3.1	45.3	54(Note3)	8.7	PK
		H	15600.0	32.1	13.6	45.7	54(Note3)	8.3	PK
		V	15560.0	28.8	13.7	42.5	54(Note3)	11.5	PK
	48	H	10480.0	45.1	2.3	47.4	54(Note3)	6.6	PK
		V	10480.0	43.7	2.3	46.0	54(Note3)	8.0	AV
		H	15720.0	34.9	13.3	48.2	54(Note3)	5.8	PK
		V	15720.0	34.1	13.3	47.4	54(Note3)	6.6	PK

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 3	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measured Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	38	H	10380.0	42.0	3.1	45.1	54(Note3)	8.9	PK
		V	10380.0	44.4	3.1	47.5	54(Note3)	6.5	PK
		H	15570.0	28.5	14.2	42.7	54(Note3)	11.3	PK
		V	15570.0	28.5	14.2	42.7	54(Note3)	11.3	PK
	46	H	10460.0	43.3	2.2	45.5	54(Note3)	8.5	PK
		V	10460.0	43.6	2.2	45.8	54(Note3)	8.2	PK
		H	15690.0	33.5	10.5	44.0	54(Note3)	10.0	PK
		V	15690.0	31.2	10.5	41.7	54(Note3)	12.3	PK

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 4	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measured Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	36	H	10360.0	42.8	2.4	45.2	54(Note3)	8.8	PK
		V	10360.0	43.0	2.4	45.4	54(Note3)	8.6	PK
		H	15540.0	29.3	11.9	41.2	54(Note3)	12.8	PK
		V	15540.0	29.2	11.9	41.1	54(Note3)	12.9	PK
	40	H	10400.0	44.0	3.1	47.1	54(Note3)	6.9	PK
		V	10400.0	42.6	3.1	45.7	54(Note3)	8.3	PK
		H	15600.0	35.1	13.6	48.7	54(Note3)	5.3	PK
		V	15600.0	31.9	13.6	45.5	54(Note3)	8.5	PK
	48	H	10480.0	45.3	2.3	47.6	54(Note3)	6.4	PK
		V	10480.0	43.3	2.3	45.6	54(Note3)	8.4	AV
		H	15720.0	37.8	13.3	51.1	54(Note3)	2.9	PK
		V	15720.0	33.5	13.3	46.8	54(Note3)	7.2	PK

1. Measure Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 5	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measured Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	38	H	10380.0	43.0	3.1	46.1	54(Note3)	7.9	PK
		V	10380.0	42.7	3.1	45.8	54(Note3)	8.2	PK
		H	15570.0	28.3	14.2	42.5	54(Note3)	11.5	PK
		V	15570.0	29.4	14.2	43.6	54(Note3)	10.4	PK
	46	H	10460.0	43.6	2.2	45.8	54(Note3)	8.2	PK
		V	10460.0	43.5	2.2	45.7	54(Note3)	8.3	PK
		H	15690.0	33.0	10.5	43.5	54(Note3)	10.5	PK
		V	15690.0	32.7	10.5	43.2	54(Note3)	10.8	PK

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 6	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	MeasuredLevel (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	42	H	10420.0	42.2	2.4	44.6	54(Note3)	9.4	PK
		V	10420.0	43.6	2.4	46.0	54(Note3)	8.0	PK
		H	15630.0	30.4	13.5	43.9	54(Note3)	10.1	PK
		V	15630.0	29.9	13.5	43.4	54(Note3)	10.6	PK

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 7	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measured Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	36	H	10360.0	41.6	2.4	44.0	54(Note3)	10.0	PK
		V	10360.0	41.3	2.4	43.7	54(Note3)	10.3	PK
		H	15540.0	27.3	11.8	39.1	54(Note3)	14.9	PK
		V	15540.0	28.0	12.1	40.1	54(Note3)	13.9	PK
	40	H	10400.0	42.2	3.3	45.5	54(Note3)	8.5	PK
		V	10400.0	40.2	3.8	44.0	54(Note3)	10.0	PK
		H	15600.0	33.8	13.5	47.3	54(Note3)	6.7	PK
		V	15600.0	30.9	13.2	44.1	54(Note3)	9.9	PK
	48	H	10480.0	43.3	3.1	46.4	54(Note3)	7.6	PK
		V	10480.0	41.7	2.9	44.6	54(Note3)	9.4	AV
		H	15720.0	36.5	13.6	50.1	54(Note3)	3.9	PK
		V	15720.0	33.2	13.6	46.8	54(Note3)	7.2	PK

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 8	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measured Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	38	H	10380.0	41.0	3.7	44.7	54(Note3)	9.3	PK
		V	10380.0	41.2	3.0	44.2	54(Note3)	9.8	PK
		H	15570.0	28.1	13.6	41.7	54(Note3)	12.3	PK
		V	15570.0	28.6	13.9	42.5	54(Note3)	11.5	PK
	46	H	10460.0	42.6	3.0	45.6	54(Note3)	8.4	PK
		V	10460.0	42.0	2.8	44.8	54(Note3)	9.2	PK
		H	15690.0	32.3	10.2	42.5	54(Note3)	11.5	PK
		V	15690.0	32.6	10.5	43.1	54(Note3)	10.9	PK

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

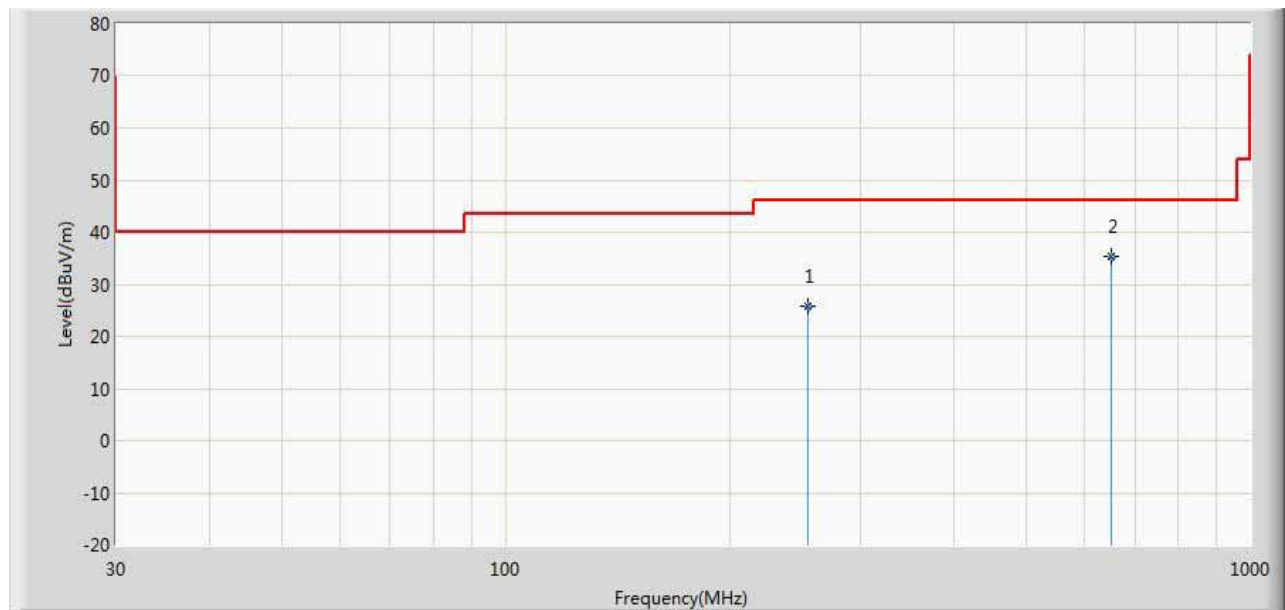
Product Name	:	AC1750 Wireless Dual Band Gigabit Router	Power	:	AC 120V/60Hz
Test Mode	:	Mode 9	Test Site	:	AC-5

Chain	CH	Antenna Polarity	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measured Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Ant 0+1+2	42	H	10420.0	40.6	3.2	43.8	54(Note3)	10.2	PK
		V	10420.0	42.3	2.9	45.2	54(Note3)	8.8	PK
		H	15630.0	28.5	13.0	41.5	54(Note3)	12.5	PK
		V	15630.0	28.8	13.0	41.8	54(Note3)	12.2	PK

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, 18GHz~40GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

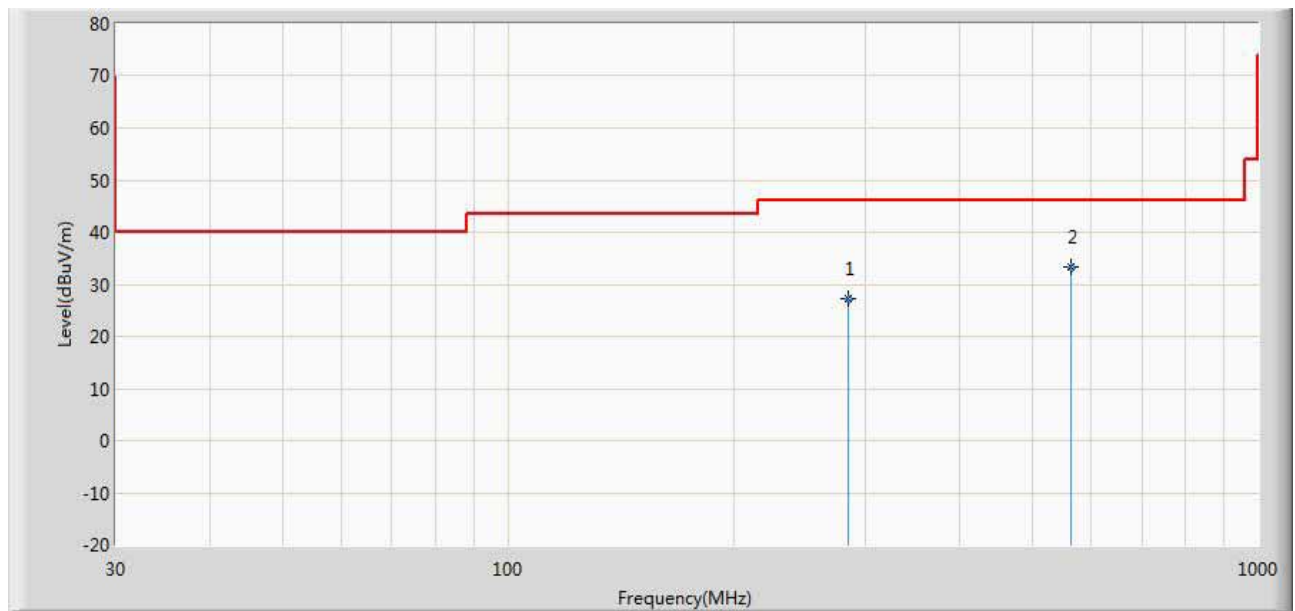
The worst case of Radiated Emission below 1GHz:

Engineer: Jack	
Site: AC2	Time: 2016/05/11 - 09:20
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: AC1750 Wireless Dual Band Gigabit Router	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		254.919	25.875	5.919	-20.125	46.000	19.956	QP
2	*	650.921	35.332	7.617	-10.668	46.000	27.714	QP

Engineer: Jack	
Site: AC2	Time: 2016/05/11 - 09:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: AC1750 Wireless Dual Band Gigabit Router	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		284.625	27.391	7.071	-18.609	46.000	20.320	QP
2	*	562.530	33.395	6.551	-12.605	46.000	26.844	QP

5. Power Output

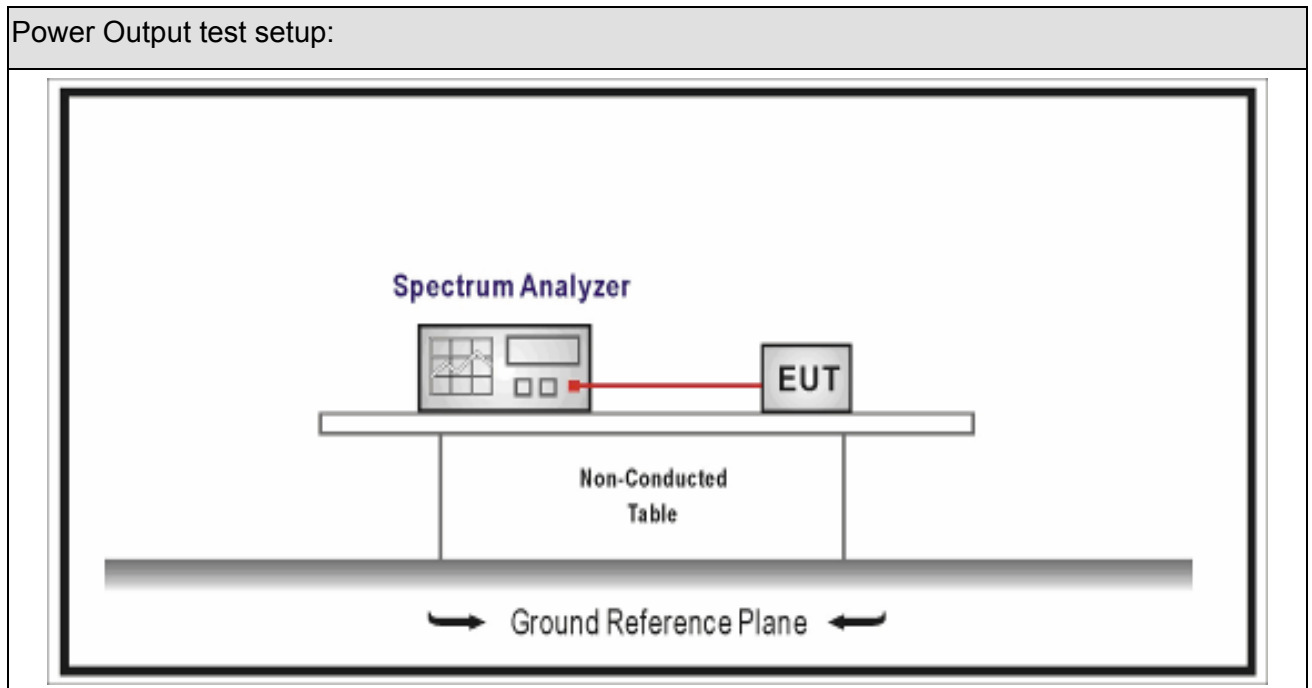
5.1. Test Equipment

Power Output / TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.11	2017.03.10
Power Sensor	Anritsu	MA2411B	0846014	2015.11.11	2016.11.10
Temperature/Humidity Meter	zhichen	ZC1-2	TR8-TH	2016.04.10	2017.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup

Power Output test setup:



5.3. Limit

Fundamental emission output power Limit	
☒	For the band 5.15-5.25 GHz
☐	Outdoor access point: the maximum conducted output power shall not exceed 1 W. If $G_{TX} > 6\text{dBi}$, then $P_{out} \leq 30 - (G_{TX} - 6)$ and $\leq 125\text{mW}$ at any angle above 30 degrees
☒	Indoor access point: the maximum conducted output power shall not exceed 1 W. If $G_{TX} > 6\text{dBi}$, then $P_{out} \leq 30 - (G_{TX} - 6)$
☐	Fixed point-to-point access points: the maximum conducted output power shall not exceed 1 W. If $G_{TX} > 23\text{dBi}$, then $P_{out} \leq 30 - (G_{TX} - 23)$
☐	Mobile and portable client devices: the maximum conducted output power shall not exceed 250mW. If $G_{TX} > 6\text{dBi}$, then $P_{out} \leq 24 - (G_{TX} - 6)$
☐	For the band 5.25-5.35 GHz:
☐	the maximum conducted output power shall not exceed 250mW or $11\text{dBm} + 10 \log B$, where B is the 26dB emission bandwidth in MHz. If $G_{TX} > 6\text{dBi}$, then $P_{out} \leq (\text{The lesser of } 24 \text{ or } 11\text{dBm} + 10 \log B) - (G_{TX} - 6)$
☐	For the 5.47-5.725 GHz:
☐	the maximum conducted output power shall not exceed 250mW or $11\text{dBm} + 10 \log B$, where B is the 26dB emission bandwidth in MHz. If $G_{TX} > 6\text{dBi}$, then $P_{out} \leq (\text{The lesser of } 24 \text{ or } 11\text{dBm} + 10 \log B) - (G_{TX} - 6)$
☐	For the band 5.725-5.85 GHz:
☐	Point-to-multipoint systems (P2M): the maximum conducted output power (P_{out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6 \text{ dBi}$, then $P_{out} = 30 - (G_{TX} - 6)$
☐	Point-to-point systems (P2P): the maximum conducted output power (P_{out}) shall not exceed the lesser of 1 W
Note 1 : G_{TX} directional gain of transmitting antennas. Note 2 : P_{out} is maximum peak conducted output power .	

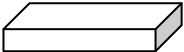
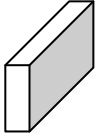
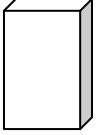
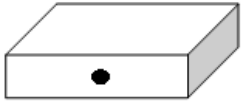
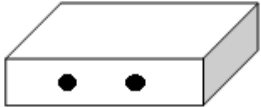
5.4. Test Procedure

Fundamental emission output power Test Method					
	References Rule		Chapter	Description	
☒	ANSI C63.10		12.3	Maximum conducted output power	
	☒	ANSI C63.10	12.3.2	Maximum conducted output power measurement using a spectrum analyzer (SA) or EMI receiver	
		☐	ANSI C63.10	12.3.2.2	Method SA-1
		☐	ANSI C63.10	12.3.2.3	Method SA-1A (alternative)
		☒	ANSI C63.10	12.3.2.4	Method SA-2
		☐	ANSI C63.10	12.3.2.5	Method SA-2A (alternative)
		☐	ANSI C63.10	12.3.2.6	Method SA-3
		☐	ANSI C63.10	12.3.2.7	Method SA-3A (alternative)
	☒	ANSI C63.10	12.3.3	Maximum conducted output power using a power meter	
		☐	ANSI C63.10	12.3.3.1	Method PM
		☒	ANSI C63.10	12.3.3.2	Method PM-G
☐	FCC KDB 789033 D02v01r02		E	Maximum conducted output power	
	☐	FCC KDB 789033 D02v01r02	E.2	Measurement using a Spectrum Analyzer or EMI Receiver (SA)	
		☐	FCC KDB 789033 D02v01r02	E.2.b	Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep)
		☐	FCC KDB 789033 D02v01r02	E.2.c	Method SA-1 Alternative (RMS detection with slow sweep and EUT transmitting continuously at full power)
		☐	FCC KDB 789033 D02v01r02	E.2.d	Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction)
		☐	FCC KDB 789033 D02v01r02	E.2.e	Method SA-2 Alternative (RMS detection with slow sweep with each spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction)

		☐	FCC KDB 789033 D02v01r02	E.2.f	Method SA-3 (RMS detection with max hold)
		☐	FCC KDB 789033 D02v01r02	E.2.g	Method SA-3 Alternative (Reduced VBW with max hold)
		☒	FCC KDB 789033 D02v01r02	E.3	Measurement using a Power Meter (PM)
		☐	FCC KDB 789033 D02v01r02	E.3.a	Method PM (Measurement using an RF average power meter)
		☒	FCC KDB 789033 D02v01r02	E.3.b	Method PM-G (Measurement using a gated RF average power meter)

Directional Gain Calculations for In-Band test method			
	References Rule		Chapter Description
☐	KDB 662911		F2)a) Basic methodology with NANT transmit antennas
	☐	KDB 662911	F2)a) (i) transmit signals are correlated
	☐	KDB 662911	F2)a) (ii) transmit signals are uncorrelated
☐	KDB 662911		F2)b) Sectorized antenna systems.
☐	KDB 662911		F2)c) Cross-polarized antennas
	☐	ANSI C63.10	F2)c) (i) Cross-polarized antennas with NANT = 2.
	☐	ANSI C63.10	F2)c) (ii) Multiple antennas
☐	KDB 662911		F2)d) Sectorized antenna systems.
	☐	KDB 662911	F2)d) (i) transmit signals are correlated
	☐	KDB 662911	F2)d) (ii) transmit signals are uncorrelated
☒	KDB 662911		F2)e) Spatial Multiplexing
	☒	KDB 662911	F2)e) (i) Antennas have the same gain
	☐	KDB 662911	F2)e) (ii) Antenna have the different gain with one spatial stream
	☐	KDB 662911	F2)e) (iii) Antenna have the different gain with more than one spatial stream
☒	KDB 662911		F2)f) Cyclic Delay Diversity (CDD)
	☒	KDB 662911	F2)f) (i) Antennas have the same gain
	☐	KDB 662911	F2)f) (ii) Antenna have the different gain with one spatial stream
	☐	KDB 662911	F2)f) (ii) Antenna have the different gain with more than one spatial stream

5.5. EUT test Axis definition

Item	Power Output			
Device Category	☒	Indoor use		
	☐	Outdoor use		
	☐	Fix position use		
	☐	Mobile position use		
Test mode	Mode 1-9			
Test method	☐	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis ☐	Worst Axis ☐	Worst Axis ☐
	☒	Conducted		
	☐	Chain 0		
				
	☐	Chain 0	Chain 1	
				
	☒	Chain 0	Chain 1	Chain 2
				

5.6. Test Result

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode: Transmit by CDD

Mode	Channel	Test Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	Directional Gain (dBi)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2				
1	36	5180	19.23	19.03	19.16	23.91	1.7	30	Pass
1	44	5220	20.23	20.08	20.13	24.92	1.7	30	Pass
1	48	5240	19.90	19.74	19.82	24.59	1.7	30	Pass
2	36	5180	18.89	18.77	18.80	23.59	1.7	30	Pass
2	44	5220	21.90	21.91	21.87	26.66	1.7	30	Pass
2	48	5240	21.90	21.77	21.83	26.60	1.7	30	Pass
3	38	5190	12.87	12.74	12.80	17.57	1.7	30	Pass
3	46	5230	21.92	21.81	21.87	26.64	1.7	30	Pass
4	36	5180	18.97	18.56	18.86	23.57	1.7	30	Pass
4	44	5220	22.13	22.08	22.00	26.84	1.7	30	Pass
4	48	5240	22.04	22.00	22.11	26.82	1.7	30	Pass
5	38	5190	12.75	12.70	12.71	17.49	1.7	30	Pass
5	46	5230	22.10	22.08	22.07	26.85	1.7	30	Pass
6	42	5210	10.97	10.87	10.87	15.67	1.7	30	Pass

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Power Output
Test Site	:	TR-8
Test Mode	:	Mode :Transmit by Beam-forming

Mode	Channel	Test Frequency (MHz)	Measurement Power Output (dBm)			Total Power (dBm)	Directional Gain (dBi)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2				
7	36	5180	21.02	20.91	20.92	25.72	6.47	29.53	Pass
7	44	5220	22.62	22.63	22.71	27.42	6.47	29.53	Pass
7	48	5240	20.71	20.67	20.70	25.46	6.47	29.53	Pass
8	38	5190	15.53	15.41	15.54	20.26	6.47	29.53	Pass
8	46	5230	24.12	23.97	24.20	28.87	6.47	29.53	Pass
9	42	5210	12.04	11.83	11.46	16.55	6.47	29.53	Pass

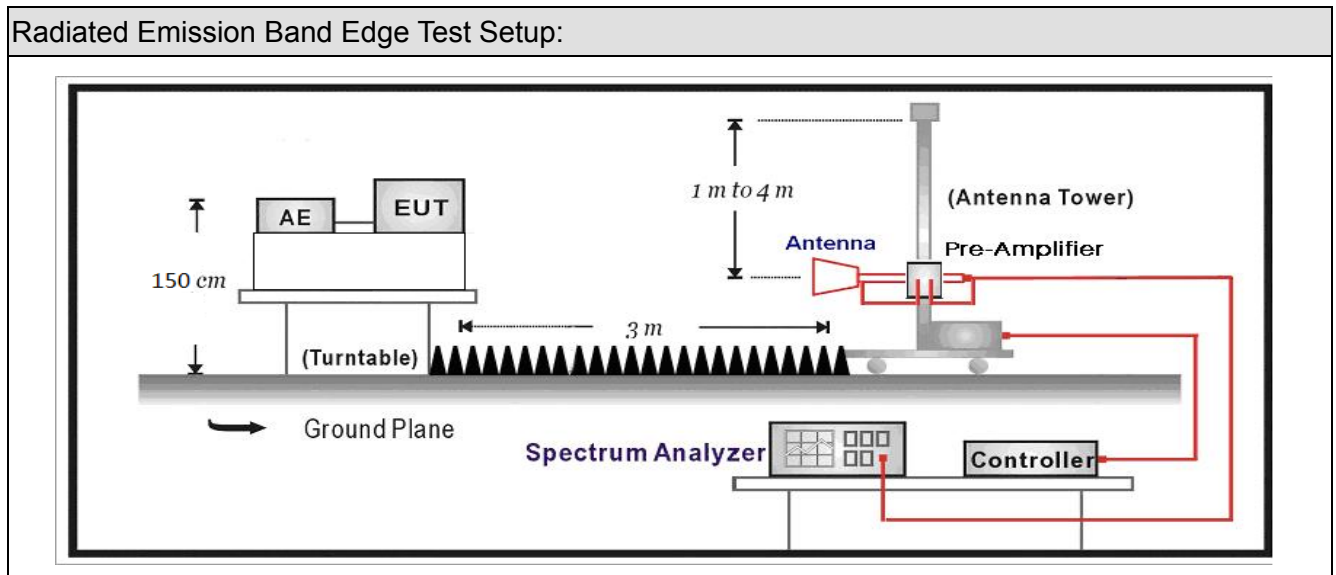
6. Radiated Emission Band Edge

6.1. Test Equipment

Radiated Emission Band Edge / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.11	2017.03.10
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.04	2017.05.03
Preamplifier	QuieTek	AP-040G	CHM-0906001	2016.05.04	2017.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2015.10.16	2016.10.15
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.08	2017.01.07
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.09	2017.01.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

FCC Part 15 Subpart C Paragraph 15.209 (Restricted Band Emissions Limit)		
Frequency (MHz)	Distance (m)	Level (dBμV/m)
0.009-0.490	300	2400/F(kHz)
0.490-1.705	30	24000/F(kHz)
1.705-30.0	30	30
30-88	3	100**
88-216	3	150**
216-960	3	200**
Above 960	3	500

Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

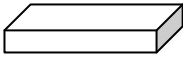
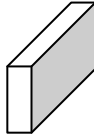
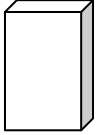
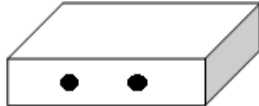
FCC Part 15 Subpart C Paragraph 15.205 (Restricted Band)			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			

FCC Part 15 Subpart C Paragraph 15.407(5)(b) (Unrestricted Band Emissions Limit)		
Operating Frequency Band (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength at 3m (dB μ V/m)
5150 - 5250	-27	68.3
5250 - 5350	-27	68.3
5470 - 5725	-27	68.3
5725 - 5825	-27 [Note(1)]	68.3
	-17 [Note(2)]	78.3
Note(1): Outside the frequency range 5715 - 5835MHz. Note(2): Within the frequency range from the band edge to 10MHz below or above the band edge, 5715 – 5725MHz and 5825 - 5835MHz.		

6.4. Test Procedure

Test Method				
	References Rule		Chapter	Description
☐	ANSI C63.10		12.7.3	Emissions in non-restricted frequency bands
☒	ANSI C63.10		12.7.2	Emissions in restricted frequency bands
	☒	ANSI C63.10	12.7.5	Radiated emission measurements
	☒	ANSI C63.10	12.7.6	Procedure for peak unwanted emissions measurements above 1000 MHz
	☒	ANSI C63.10	12.7.7	Procedures for average unwanted emissions measurements above 1000 MHz
	☐	ANSI C63.10	12.7.7.2	Method AD (average detection)—primary method
	☒	ANSI C63.10	12.7.7.3	Method VB-A (Alternative)
	☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
☐	FCC KDB 789033 D02v01r02		G.2	Unwanted Emissions that fall Outside of the Restricted Bands
☐	FCC KDB 789033 D02v01r02		G.1	Unwanted Emissions in the Restricted Bands
	☐	FCC KDB 789033 D02v01r02	G.4	Procedure for Unwanted Emissions Measurements below 1000 MHz
	☐	FCC KDB 789033 D02v01r02	G.5	Procedure for Unwanted Maximum Emissions Measurements above 1000 MHz
	☐	FCC KDB 789033 D02v01r02	G.6	Procedures for Average Unwanted Emissions Measurements above 1000 MHz
	☐	FCC KDB 789033 D02v01r02	G.6.c	Method AD (Average detection)—primary method
	☐	FCC KDB 789033 D02v01r02	G.6.d	Method VB (Averaging using reduced video bandwidth): Alternative method.

6.5. EUT test Axis definition

Item	Radiated Emission Band Edge			
Device Category	☒	Indoor use		
	☐	Outdoor use		
	☐	Fix position use		
	☐	Mobile position use		
Test mode	Mode 1-9			
Test method	☒	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis ☐	Worst Axis ☒	Worst Axis ☐
	☐	Conducted		
	☐	Chain 0		
				
	☐	Chain 0	Chain 1	
				
	☐	Chain 0	Chain 1	Chain 2
				

6.6. Test Result

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Radiated Emission Band Edge
Test Site	:	TR-8
Test Mode	:	Mode: Transmit by CDD

Mode	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36	V	5150.0	27.2	42.0	69.2	74.0	4.8	PK
		V	5150.0	11.3	42.0	53.3	54.0	0.7	AV
		H	5150.0	13.9	42.0	55.9	74.0	18.1	PK
		H	5150.0	0.1	42.0	42.1	54.0	11.9	AV
2	36	V	5150.0	11.6	42.0	53.6	54.0	0.4	PK
		V	5150.0	28.4	42.0	70.4	74.0	3.6	AV
		H	5150.0	15.1	42.0	57.1	74.0	16.9	PK
		H	5150.0	1.2	42.0	43.2	54.0	10.8	AV
3	38	V	5150.0	25.6	42.0	67.6	74.0	6.4	PK
		V	5150.0	11.1	42.0	53.1	54.0	0.9	AV
		H	5150.0	14.1	42.0	56.1	74.0	17.9	PK
		H	5150.0	2.3	42.0	44.3	54.0	9.7	AV
4	36	V	5150.0	28.4	42.0	70.4	74.0	3.6	PK
		V	5150.0	11.3	42.0	53.3	54.0	0.7	AV
		H	5150.0	14.1	42.0	56.1	74.0	17.9	PK
		H	5150.0	1.6	42.0	43.6	54.0	10.4	AV
5	38	V	5150.0	26.1	42.0	68.1	74.0	5.9	PK
		V	5150.0	11.1	42.0	53.1	54.0	0.9	AV
		H	5150.0	12.6	42.0	54.6	74.0	19.4	PK
		H	5150.0	1.5	42.0	43.5	54.0	10.5	AV
6	42	V	5150.0	23.6	42.0	65.6	74.0	8.4	PK
		V	5144.6	10.9	42.0	52.9	54.0	1.1	AV
		V	5150.0	11.1	42.0	53.1	54.0	0.9	AV
		H	5150.0	13.1	42.0	55.1	74.0	18.9	PK
		H	5150.0	1.8	42.0	43.8	54.0	10.2	AV

Product	:	AC1750 Wireless Dual Band Gigabit Router
Test Item	:	Radiated Emission Band Edge
Test Site	:	TR-8
Test Mode	:	Mode: Transmit by Beamforming

Mode	CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
7	36	V	5149.0	31.3	42.0	73.3	74.0	0.7	PK
		V	5150.0	26.5	42.0	68.5	74.0	5.5	PK
		V	5150.0	11.4	42.0	53.4	54.0	0.6	AV
		H	5150.0	15.6	42.0	57.6	74.0	16.4	PK
		H	5150.0	1.9	42.0	43.9	54.0	10.1	AV
8	38	V	5150.0	27.8	42.0	69.8	74.0	4.2	PK
		V	5150.0	11.8	42.0	53.8	54.0	0.2	AV
		H	5150.0	15.4	42.0	57.4	74.0	16.6	PK
		H	5150.0	2.3	42.0	44.3	54.0	9.7	AV
9	42	V	5122.6	29.8	42.1	71.9	74.0	2.1	PK
		V	5150.0	27.1	42.0	69.1	74.0	4.9	PK
		V	5142.7	10.9	42.1	53.0	54.0	1.0	AV
		V	5150.0	4.5	42.0	46.5	54.0	7.5	AV
		H	5150.0	21.6	42.0	63.6	74.0	10.4	PK
		H	5137.0	6.2	42.2	48.4	54.0	5.6	AV
		H	5150.0	-1.7	42.0	40.3	54.0	13.7	AV

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