

FCC 15.407 NII 5 GHz WLAN Report

for

TP-LINK TECHNOLOGIES CO., LTD.

**Building 24 (floors 1,3,4,5) and 28 (floors 1-4),
Central Science and Technology Park,
Nanshan, Shenzhen, China 518057**

Brand	: TP-LINK
Product Name	: AC750 WiFi Range Extender
Model Name	: RE200
FCC ID	: TE7RE200

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TEST REPORT CERTIFICATION

Applicant : TP-LINK TECHNOLOGIES CO., LTD.
Manufacture : TP-LINK TECHNOLOGIES CO., LTD.
Product Name : AC750 WiFi Range Extender
Model No. : RE200
Serial No. : N/A
Brand : TP-LINK

Applicable Standards:

FCC Rules and Regulations Part 15 Subpart C, Oct. 2014
ANSI C63.4:2009
KDB 789033 D02 General NII Test Procedures New Rules V01

AUDIX Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report. **AUDIX Technology Corp.** does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Test: 2014. 11. 21 ~ 2015. 03. 20

Date of Report: 2015. 03. 31

Producer : Annie Yu
(Annie Yu/Administrator)

Signatory: Ben Cheng
(Ben Cheng/Manager)

1. REPORT HISTORY

Revision	Date	Revision Summary	Report Number
0	2015. 03. 31	Original Report.	EM-F140741

2. SUMMARY OF TEST RESULTS

Rule	Description	Results
15.207	Conducted Emission	PASS
15.247(d)/15.205	Radiated Band Edge and Radiated Spurious Emission	PASS
15.407(a)(5)/15.407(e)	Emission Bandwidth Measurement	PASS
15.407(a)	Maximum Output Power	PASS
15.407(b)	Conducted Band Edges and Conducted Spurious Emission	PASS
15.407(a)	Power Spectral Density	PASS
15.203	Antenna Requirement	PASS

3. GENERAL INFORMATION

3.1. Description of EUT

Product	AC750 WiFi Range Extender																										
Model Number	RE200																										
Serial Number	N/A																										
Brand Name	TP-LINK																										
Applicant	TP-LINK TECHNOLOGIES CO., LTD. Building 24 (floors 1,3,4,5) and 28 (floors1-4), Central Science and Technology Park, Nanshan, Shenzhen, China 518057																										
Manufacture	TP-LINK TECHNOLOGIES CO., LTD. Building 24 (floors 1,3,4,5) and 28 (floors1-4), Central Science and Technology Park, Nanshan, Shenzhen, China 518057																										
RF Features	802.11a/b/g/n/ac																										
Transmit Type	<table><thead><tr><th colspan="2">2.4 GHz</th></tr></thead><tbody><tr><td>802.11b</td><td>2T2R</td></tr><tr><td>802.11g</td><td>2T2R</td></tr><tr><td>802.11n-HT20</td><td>2T2R</td></tr><tr><td>802.11n-HT40</td><td>2T2R</td></tr></tbody></table> <table><thead><tr><th colspan="4">UNII Bands</th></tr></thead><tbody><tr><td>802.11a</td><td>1T1R</td><td>802.11ac-VHT20</td><td>1T1R</td></tr><tr><td>802.11n-HT20</td><td>1T1R</td><td>802.11ac-VHT40</td><td>1T1R</td></tr><tr><td>802.11n-HT40</td><td>1T1R</td><td>802.11ac-VHT80</td><td>1T1R</td></tr></tbody></table>	2.4 GHz		802.11b	2T2R	802.11g	2T2R	802.11n-HT20	2T2R	802.11n-HT40	2T2R	UNII Bands				802.11a	1T1R	802.11ac-VHT20	1T1R	802.11n-HT20	1T1R	802.11ac-VHT40	1T1R	802.11n-HT40	1T1R	802.11ac-VHT80	1T1R
2.4 GHz																											
802.11b	2T2R																										
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802.11n-HT20	1T1R	802.11ac-VHT40	1T1R																								
802.11n-HT40	1T1R	802.11ac-VHT80	1T1R																								
Device Category	☐ Outdoor Access Point ☐ Fixed point-to-point Access Point ☐ Indoor Access Point ☒ Mobile and Portable client device																										
Date of Receipt of Sample	2014. 11. 03																										

3.2. EUT Specifications Assessed in Current Report

Mode	UNII Band	Fundamental Range (MHz)	Channel Number	Modulation	Data Rate (Mbps)	
802.11a	I	5180-5240	4	OFDM (BPSK/QPSK/16QAM/64QAM)	6/9/12/18/24/36/48/54	
	III	5745-5825	5			
802.11n-HT20	I	5180-5240	4	OFDM (BPSK/QPSK/16QAM/64QAM)	Up to 300	
	III	5745-5825	5			
802.11n-HT40	I	5190-5230	2	OFDM (BPSK/QPSK/16QAM/64QAM)		
	III	5755-5795	2			
802.11ac-VHT20	I	5180-5240	4	OFDM (BPSK/QPSK/16QAM/64QAM)		Up to 433
	III	5745-5825	5			
802.11ac-VHT40	I	5190-5230	2	OFDM (BPSK/QPSK/16QAM/64QAM)		
	III	5755-5795	2			
802.11ac-VHT80	I	5210	1	OFDM (BPSK/QPSK/16QAM/64QAM)		
	III	5775	1			

Channel List					
802.11a/n-HT20/ac-VHT20					
UNII Band	Channel Number	Frequency (MHz)	UNII Band	Channel Number	Frequency (MHz)
I	36	5180	III	149	5745
	40	5200		153	5765
	44	5220		157	5785
	48	5240		161	5805
				165	5825

Channel List					
802.11n-HT40/ac-VHT40					
UNII Band	Channel Number	Frequency (MHz)	UNII Band	Channel Number	Frequency (MHz)
I	38	5190	II-2C	151	5755
	46	5230		159	5795

Channel List					
802.11ac-VHT80					
UNII Band	Channel Number	Frequency (MHz)	UNII Band	Channel Number	Frequency (MHz)
I	42	5210	III	155	5775

Note 1: 802.11ac has similar modulation to 802.11n at 20 MHz and 40 MHz bandwidths, we assess the worst case to be the representative mode in this report.

2: Test modes are presented at section 3.5.

3.3. Antenna Information

Manufacture	Antenna Type	Frequency	Max Gain (dBi)		Directional Gain (dBi)
			Chain 0	Chain 1	
TP-LINK	PCB	2.4GHz	4.45	3.41	6.96

Note: Directional gain = $10 \log[(10^{4.45/20} + 10^{3.41/20})^2 / 2] = 6.96 \text{ dBi}$

Manufacture	Antenna Type	Frequency	UNII Band	Max Gain (dBi)
TP-LINK	PCB	5GHz	I	3.50
			III	4.08

3.4. Data Rate Relative to Output Power

802.11a				802.11ac-VHT20			
Channel	Modulation	Date Rate	Power (dBm)	Channel	Modulation	Date Rate	Power (dBm)
36	BPSK	6	18.15	36	BPSK	MCS0	17.30
36	QPSK	9	18.12	36	QPSK	MCS1	17.19
36	QPSK	12	18.02	36	QPSK	MCS2	17.26
36	16-QAM	18	17.97	36	16-QAM	MCS3	17.18
36	16-QAM	24	16.56	36	16-QAM	MCS4	15.62
36	64-QAM	36	16.40	36	64-QAM	MCS5	15.51
36	64-QAM	48	14.41	36	64-QAM	MCS6	13.52
36	64-QAM	54	14.24	36	64-QAM	MCS7	13.49

802.11ac-VHT40				802.11ac-VHT80			
Channel	Modulation	Date Rate	Power (dBm)	Channel	Modulation	Date Rate	Power (dBm)
38	BPSK	MCS0	13.93	42	BPSK	MCS0	11.01
38	QPSK	MCS1	13.81	42	QPSK	MCS1	10.76
38	QPSK	MCS2	13.66	42	QPSK	MCS2	10.64
38	16-QAM	MCS3	13.54	42	16-QAM	MCS3	10.42
38	16-QAM	MCS4	11.97	42	16-QAM	MCS4	8.80
38	64-QAM	MCS5	11.77	42	64-QAM	MCS5	8.56
38	64-QAM	MCS6	9.73	42	64-QAM	MCS6	6.53
38	64-QAM	MCS7	9.60	42	64-QAM	MCS7	6.37

Note: Above results are assessed in average power.

3.5. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
802.11a	0.99	N/A	N/A
802.11n-HT20/ 802.11ac-VHT20	0.99	N/A	N/A
802.11n-HT40/ 802.11ac-VHT40	0.98	N/A	N/A
802.11ac-VHT80	0.94	0.366	0.27

Note: When duty cycle is less than 98% (0.98) that duty cycle factor $10\log(1/x)$ is needed to add in conducted test items measured in average detector.

AC Conduction	
Test Case	Normal operation

Item	Mode	Data Rate	Test Channel
Radiated Test Case	802.11a	6 Mbps	36/64/100
	802.11ac-VHT20	MCS0	36/64/100
	802.11ac-VHT40	MCS0	38/62/102
	802.11ac-VHT80	MCS0	42/58/106
	802.11a	6 Mbps	36/40/48/
	802.11ac-VHT20	MCS0	149/157/165
	802.11ac-VHT40	MCS0	38/46/151/159
	802.11ac-VHT80	MCS0	42/155

Item		Mode	Data Rate	Test Channel
Conducted Test Case	Emission Bandwidth	802.11a	6 Mbps	36/40/48/ 149/157/165
		802.11ac-VHT20	MCS0	
		802.11ac-VHT40	MCS0	38/46/151/159
		802.11ac-VHT80	MCS0	42/155
	Maximum output power	802.11a	6 Mbps	36/40/48/ 149/157/165
		802.11ac-VHT20	MCS0	
		802.11ac-VHT40	MCS0	38/46/151/159
		802.11ac-VHT80	MCS0	42/155
	Emission Limitations	802.11a	6 Mbps	36/40/48/ 149/157/165
		802.11ac-VHT20	MCS0	
		802.11ac-VHT40	MCS0	38/46//151/159
		802.11ac-VHT80	MCS0	42/155
	Power spectral density	802.11a	MCS0	36/40/48/ 149/157/165
		802.11ac-VHT20	MCS0	
		802.11ac-VHT40	MCS0	38/46//151/159
		802.11ac-VHT80	MCS0	42/155

Note 1: Low, mid, and high channels were measured, only the worst channel of each modulation was presented in this report.

3.6. Tested Supporting System List

3.6.1. Support Peripheral Unit

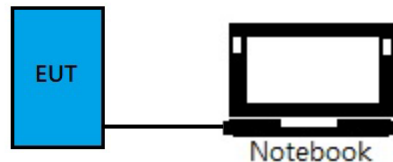
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook PC	acer	Acer Aspire 4755G	N/A	HLZ-AR5B97
2.	Power Socket	N/A	N/A	N/A	N/A

3.6.2. Cable Lists

No.	Cable Description Of The Above Support Units
1.	LAN Cable: Non-Shielded, Detachable, 1.5m Adapter: DELTA, M/N ADP-90CDDDB, DC Power Cord: Non-Shielded, Detachable, 1.8m AC Power Cord: Non-Shielded, Undetachable, 1.8m Bonded a ferrite core
2.	Power Cord: Non-Shielded, Undetachable, 1.8m

3.7. Setup Configuration

3.7.1. EUT Configuration for Power Line Emission



3.7.2. EUT Configuration for Conducted Test Items



3.8. Operating Condition of EUT

Test program “MT7620QA” is used for enabling EUT WLAN function under continues transmitting and choosing data rate/ channel.

3.9. Description of Test Facility

Test Firm Name	:	AUDIX Technology Corporation EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan
Test Location & Facility	:	No. 7 Shielded Room No. 67-4, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Semi-Anechoic Chamber No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan May 11, 2012 File on Federal Communication Commission Registration Number: 90993
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724

3.10. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.5dB
Radiation Test (Distance: 3m)	30MHz~300MHz	± 3.64dB
	300MHz~1000MHz	± 4.70dB
	Above 1GHz	± 4.94dB

Remark : Uncertainty = $k_{uc}(y)$

Test Item	Uncertainty
Emission Bandwidth	± 0.2kHz
Maximum output power	± 0.33dB
Power spectral density	± 0.13dB
Conducted Emission Limitations	± 0.13dB

4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESCI	101276	2014. 06. 18	1 Year
2.	A.M.N.	R&S	ENV4200	100169	2014. 05. 30	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-881-13	2014. 01. 15	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	101495	2014. 01. 18	1 Year

4.2. Radiated Emission Measurement

4.2.1. Frequency Range 30MHz~1000MHz

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 15	1 Year
2.	Test Receiver	R & S	ESCS30	100338	2014. 06. 24	1 Year
3.	Amplifier	HP	8447D	2944A06305	2015. 02. 12	1 Year
4.	Bilog Antenna	TESEQ	CBL6112D	33821	2014. 08. 02	1 Year

4.2.2. Frequency Range 30MHz~1000MHz

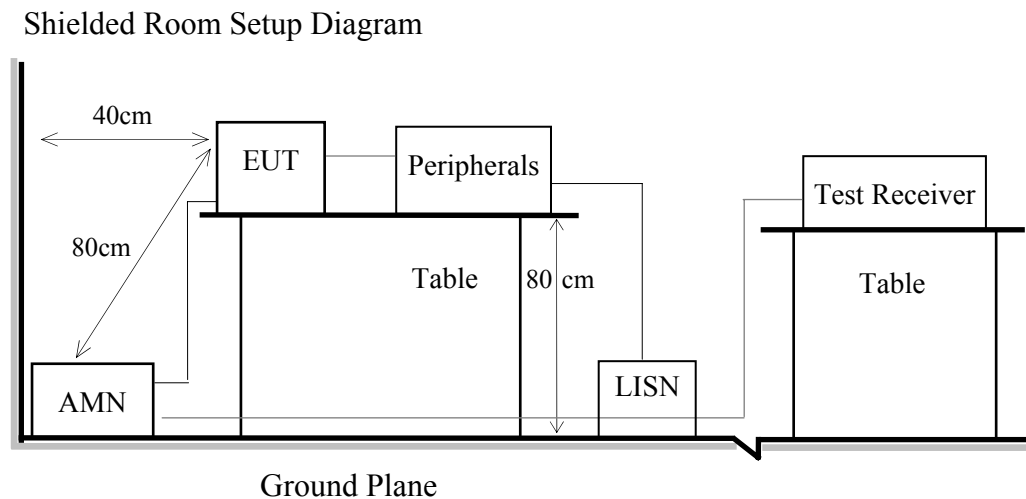
Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2014. 09. 15	1 Year
2.	Test Receiver	R & S	ESCS30	100338	2014. 06. 24	1 Year
3.	Amplifier	Agilent	8449B	3008A00529	2015. 01. 22	1 Year
4.	5G Notch Filter	Microwave Circuits	N0452502	459775	2015. 01. 11	1 Year
5.	5G Notch Filter	Microwave Circuits	N0555983	459481	2015. 01. 11	1 Year
6.	5G Notch Filter	Microwave Circuits	N0258771	459776	2015. 01. 11	1 Year
7.	Horn Antenna	EMCO	3115	9609-4927	2014. 06. 17	1 Year
8.	Horn Antenna	EMCO	3116	2653	2014. 10. 14	1 Year

4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	2014. 07. 24	1 Year
2.	Power Meter	Anritsu	ML2495A	1145008	2014. 10. 17	1 Year
3.	Power Sensor	Anritsu	MA2411B	1126096	2014. 10. 17	1 Year

5. CONDUCTED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup



5.2. Power Line Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark 1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.

2.: The lower limit applies to the band edges.

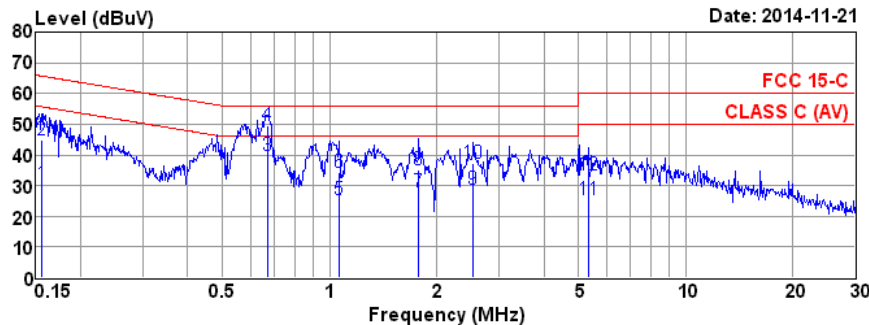
5.3. Test Procedure

- 5.3.1. To set up the EUT as indicated in ANSI C63.4. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.
- 5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).
- 5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)
- 5.3.4. Checking frequency range from 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Conducted Emission Measurement Results

PASSED.

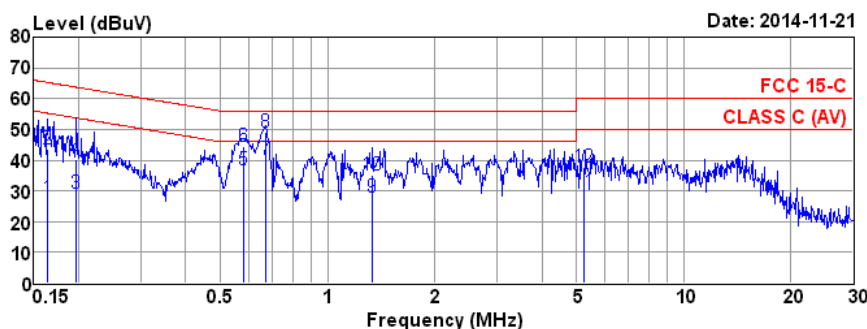
Test Date	2014/11/21	Temp./Hum.	25°C/52%
Test Voltage	AC 120V, 60Hz		



Site no. : No.7 Shielded Room Data no. : 8
Condition : ENV4200 100169 Phase : NEUTRAL
Limit : FCC 15-C
Env. / Ins. : 25°C / 52% ESCI (1276) Engineer : John
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : OPERATING

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.156	10.66	0.02	9.85	10.02	30.55	55.69	25.14	Average
2	0.156	10.66	0.02	9.85	24.30	44.83	65.69	20.86	QP
3	0.668	10.46	0.04	9.85	19.66	40.01	46.00	5.99	Average
4	0.668	10.46	0.04	9.85	29.01	49.36	56.00	6.64	QP
5	1.065	10.45	0.04	9.85	5.28	25.62	46.00	20.38	Average
6	1.065	10.45	0.04	9.85	14.08	34.42	56.00	21.58	QP
7	1.781	10.47	0.06	9.86	7.39	27.78	46.00	18.22	Average
8	1.781	10.47	0.06	9.86	14.80	35.19	56.00	20.81	QP
9	2.540	10.52	0.07	9.85	8.31	28.75	46.00	17.25	Average
10	2.540	10.52	0.07	9.85	16.83	37.27	56.00	18.73	QP
11	5.333	10.80	0.10	9.87	4.56	25.33	50.00	24.67	Average
12	5.333	10.80	0.10	9.87	12.76	33.53	60.00	26.47	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.



Site no. : No.7 Shielded Room Data no. : 7
Condition : ENV4200 100169 Phase : LINE
Limit : FCC 15-C
Env. / Ins. : 25°C / 52% ESCI (1276) Engineer : John
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : OPERATING

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.163	10.64	0.02	9.85	7.12	27.63	55.30	27.67	Average
2	0.163	10.64	0.02	9.85	22.98	43.49	65.30	21.81	QP
3	0.198	10.60	0.03	9.85	8.74	29.22	53.71	24.49	Average
4	0.198	10.60	0.03	9.85	19.69	40.17	63.71	23.54	QP
5	0.582	10.47	0.03	9.86	16.46	36.82	46.00	9.18	Average
6	0.582	10.47	0.03	9.86	24.17	44.53	56.00	11.47	QP
7	0.668	10.47	0.04	9.85	19.74	40.10	46.00	5.90	Average
8	0.668	10.47	0.04	9.85	28.91	49.27	56.00	6.73	QP
9	1.338	10.48	0.05	9.85	7.54	27.92	46.00	18.08	Average
10	1.338	10.48	0.05	9.85	14.81	35.19	56.00	20.81	QP
11	5.249	10.78	0.10	9.87	8.93	29.68	50.00	20.32	Average
12	5.249	10.78	0.10	9.87	17.04	37.79	60.00	22.21	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.
2. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.

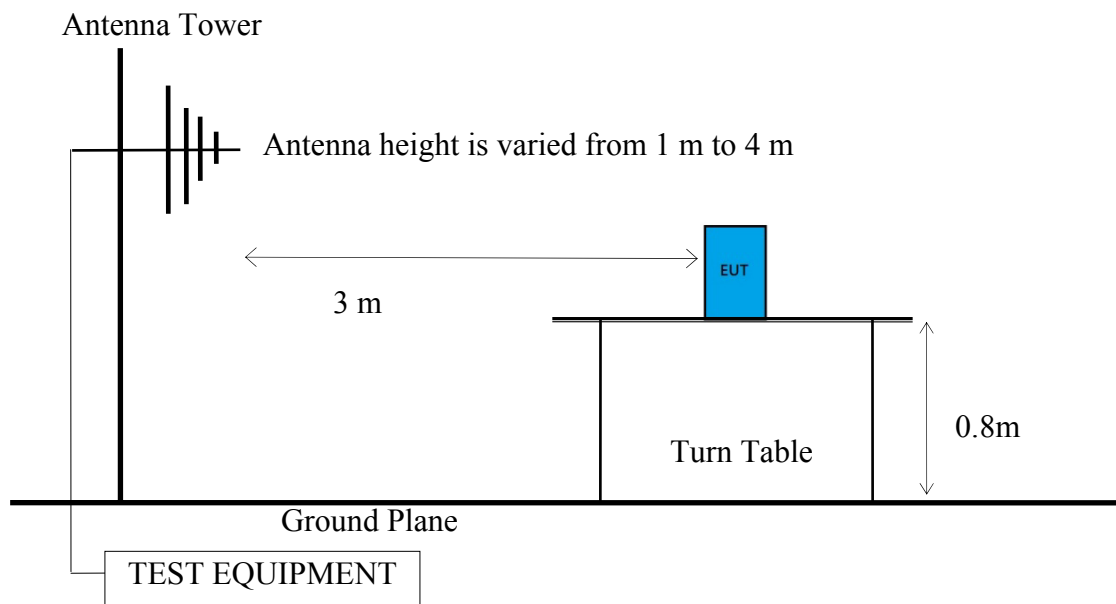
6. RADIATED EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup

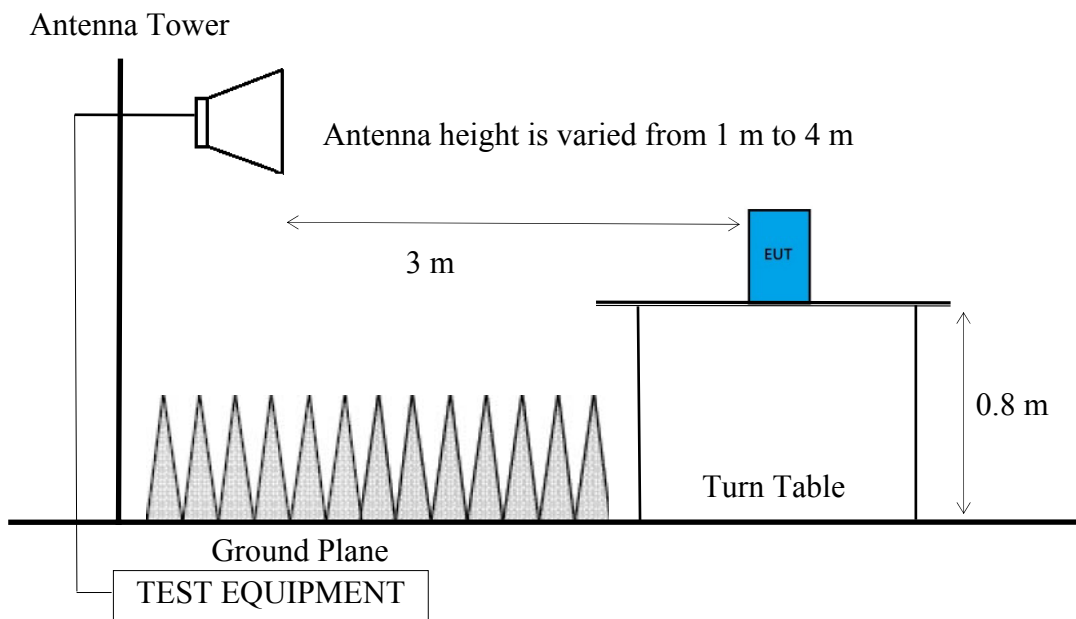
6.1.1. Block Diagram of connection between EUT and simulators

Indicated as section 3.7

6.1.2. Setup Diagram for 30-1000 MHz



6.1.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

Radiated emissions fall in restricted bands, as defined in Section 15.205 must be in compliance with the radiated emission limits specified in 15.209 as below.

6.2.1. General Limit

Frequency (MHz)	Distance (m)	Field Strengths Limits	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 $\text{dB}\mu\text{V/m}$ (Peak) 54.0 $\text{dB}\mu\text{V/m}$ (Average)	

Remark: (1) $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$

- (2) The tighter limit applies to the edge between two frequency bands.
- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) Fundamental and emission fall within operation band are exempted from this section.
- (5) Pursuant to ANSI C63.4: 8.3.2.2., if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

6.2.2. Limit for non-restricted frequency above 1 GHz

Frequency Band (MHz)	E.I.R.P. Limit	Field Strength Limit at 3 m
5150 to 5250	-27 dBm	68.2
5250 to 5350		68.2
5470 to 5725		68.2
5725 to 5850	-17 dBm/MHz ^{Note 1} -27 dBm/MHz ^{Note 2}	78.2 ^{Note 1} 68.2 ^{Note 2}

Note 1: Applicable to frequency within 10MHz to band edge.

2: Applicable to frequency beyond 10 MHz out of band edge.

3: Field Strength at 3 m = E.I.R.P. + 95.2 dB

6.3. Test Procedure

The EUT setup on the turn find table which has 80 cm height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2009 regulation.

Frequency below 1 GHz:

Spectrum Analyzer is used for pre-testing with following setting:

- (1) RBW = 120 kHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required. Otherwise using Q.P. for finally measurement.

Frequency above 1GHz to 10th harmonic (up to 40 GHz):

Peak Detector:

- (1) RBW = 1 MHz
- (2) VBW $\geq 3 \times$ RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the average detector is not required. Otherwise using average detector for finally measurement.

Average Detector:

- (1) RBW = 1 MHz
- (2) VBW $\geq 1/ T$.

Modulation Type	T (ms)	1/ T (Hz)	VBW Setting
802.11a	N/A	N/A	10Hz
802.11ac-VHT20	N/A	N/A	10Hz
802.11ac-VHT40	N/A	N/A	10Hz
802.11ac-VHT80	0.366	2732	3kHz

N/A: 1/ T is not implemented when duty cycle presented in section 3.5.1 is $\geq 98 \%$.

- (1) Detector = Peak.
- (2) Sweep time = auto.
- (3) Trace mode = max hold.
- (4) Allow sweeps to continue until the trace stabilizes.

6.4. Measurement Result Explanation

Peak Emission Level = Antenna Factor + Cable Loss + Meter Reading

Margin = Limit - Emission Level

6.5. Test Results

PASSED.

Test Date	2015/03/26	Temp./Hum.	22°C/51%
Test Voltage	AC 120V/60Hz		

6.5.1. Emissions within Restricted Frequency Bands

6.5.1.1. Frequency Below 1 GHz

Mode	802.11a	UNII Band	I
		Frequency	TX 5240MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
288.02	12.96	4.58	24.94	42.48	46.00	3.52	Peak
335.55	14.08	5.05	23.41	42.54	46.00	3.46	Peak
359.80	14.64	5.28	19.26	39.18	46.00	6.82	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
35.82	15.47	2.44	20.71	38.62	40.00	1.38	Peak
288.02	12.96	4.58	20.99	38.53	46.00	7.47	Peak
335.55	14.08	5.05	21.74	40.87	46.00	5.13	Peak

Mode	802.11a	UNII Band	III
		Frequency	TX 5785MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
288.02	12.96	4.58	25.52	43.06	46.00	2.94	Peak
335.55	14.08	5.05	23.83	42.96	46.00	3.04	Peak
359.80	14.64	5.28	20.43	40.35	46.00	5.65	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
33.88	16.49	2.41	20.04	38.94	40.00	1.06	Peak
288.02	12.96	4.58	22.57	40.11	46.00	5.89	Peak
335.55	14.08	5.05	22.77	41.90	46.00	4.10	Peak

Mode	802.11ac-VHT20	UNII Band	I
		Frequency	TX 5240MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
288.02	12.96	4.58	25.68	43.22	46.00	2.78	Peak
335.55	14.08	5.05	24.35	43.48	46.00	2.52	Peak
359.80	14.64	5.28	20.60	40.52	46.00	5.48	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
35.82	15.47	2.44	19.80	37.71	40.00	2.29	Peak
288.02	12.96	4.58	21.85	39.39	46.00	6.61	Peak
335.55	14.08	5.05	22.32	41.45	46.00	4.55	Peak

Mode	802.11ac-VHT20	UNII Band	III
		Frequency	TX 5785MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
288.02	12.96	4.58	24.77	42.31	46.00	3.69	Peak
335.55	14.08	5.05	22.45	41.58	46.00	4.42	Peak
359.80	14.64	5.28	19.00	38.92	46.00	7.08	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
33.88	16.49	2.41	19.65	38.55	40.00	1.45	Peak
288.02	12.96	4.58	22.10	39.64	46.00	6.36	Peak
335.55	14.08	5.05	21.89	41.02	46.00	4.98	Peak

Mode	802.11ac-VHT40	UNII Band	I
		Frequency	TX 5230MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
104.69	11.25	3.26	21.27	35.78	43.50	7.72	Peak
228.02	12.96	4.58	24.32	41.86	46.00	4.14	Peak
335.55	14.08	5.05	22.18	41.31	46.00	4.69	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
33.88	16.49	2.41	19.75	38.65	40.00	1.35	Peak
197.81	9.26	3.96	25.56	38.78	43.50	4.72	Peak
335.55	14.08	5.05	21.52	40.65	46.00	5.35	Peak

Mode	802.11ac-VHT40	UNII Band	III
		Frequency	TX 5795MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
288.02	12.96	4.58	24.91	42.45	46.00	3.55	Peak
335.55	14.08	5.05	23.60	42.73	46.00	3.27	Peak
359.80	14.64	5.28	19.76	39.68	46.00	6.32	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
32.91	17.04	2.38	19.19	38.61	40.00	1.39	Peak
288.02	12.96	4.58	21.76	39.30	46.00	6.70	Peak
355.55	14.08	5.05	21.88	41.01	46.00	4.99	Peak

Mode	802.11ac-VHT80	UNII Band	I
		Frequency	TX 5210MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
240.49	11.86	4.27	19.45	35.58	46.00	10.42	Peak
288.02	12.96	4.58	21.71	39.25	46.00	6.75	Peak
355.55	14.08	5.05	18.98	38.11	46.00	7.89	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
33.88	16.49	2.41	18.88	37.78	40.00	2.22	Peak
288.02	12.96	4.58	20.90	38.44	46.00	7.56	Peak
335.55	14.08	5.05	20.10	39.23	46.00	6.77	Peak

Mode	802.11ac-VHT80	UNII Band	III
		Frequency	TX 5775MHz

Antenna at Horizontal Polarization

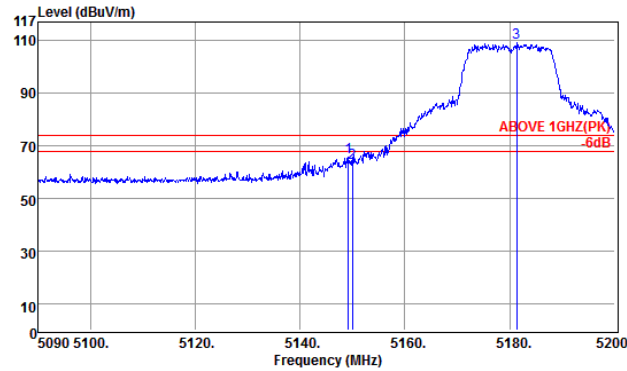
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
288.02	12.96	4.58	23.79	41.33	46.00	4.67	Peak
335.55	14.08	5.05	21.88	41.01	46.00	4.99	Peak
359.80	14.64	5.28	18.14	38.06	46.00	7.94	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
33.88	16.49	2.41	19.50	38.40	40.00	1.60	Peak
120.21	12.28	3.37	19.40	35.05	43.50	8.45	Peak
335.55	14.08	5.05	17.90	37.03	46.00	8.97	Peak

6.5.1.2. Frequency Above 1 GHz to 10th harmonics

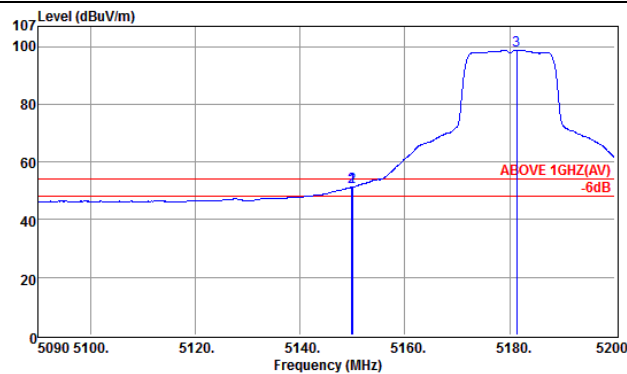
Band Edge:



Site no. : Audix NO.1 3m Chamber Data no. : 1
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/80Hz
Test Mode : Tx 5180MHz(802.11a)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.18	33.61	8.42	23.86	65.89	74.00	8.11	Peak
2	5149.96	33.61	8.42	21.31	63.34	74.00	10.66	Peak
3	5181.30	33.65	8.45	66.90	109.00	74.00	-35.00	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



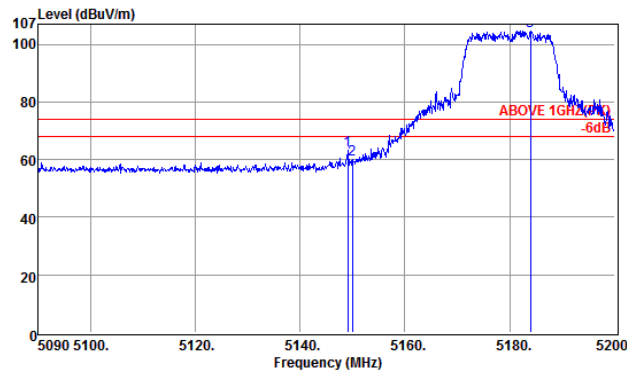
Site no. : Audix NO.1 3m Chamber Data no. : 2
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/80Hz
Test Mode : Tx 5180MHz(802.11a)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.84	33.61	8.42	9.21	51.24	54.00	2.76	Average
2	5149.96	33.61	8.42	9.24	51.27	54.00	2.73	Average
3	5181.30	33.65	8.45	56.75	96.65	54.00	-42.65	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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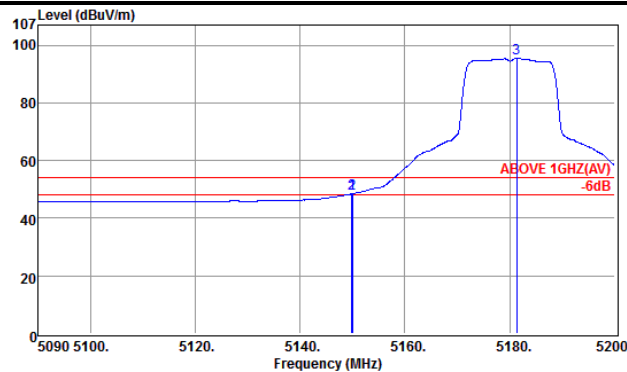


Site no. : Audix NO.1 3m Chamber
Dis. / Ant. : 3m 3115(4927)
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 22°C/51% N9010A
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5180MHz(802.11a)

Data no. : 3
Ant. pol. : VERTICAL
Engineer : Chuntse_Wu

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.07	33.61	8.42	21.09	83.12	74.00	10.88	Peak
2	5149.95	33.61	8.42	18.18	80.19	74.00	13.81	Peak
3	5183.94	33.65	8.45	82.68	104.78	74.00	-30.78	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

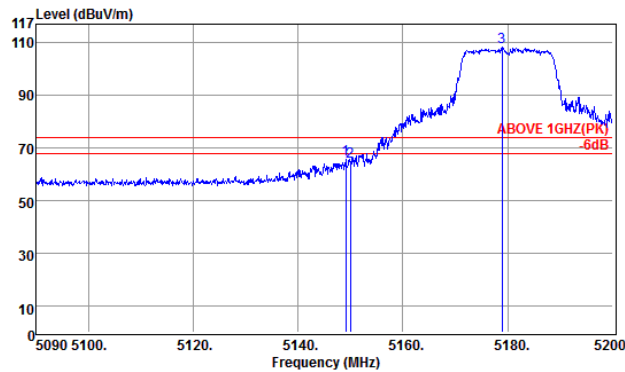


Site no. : Audix NO.1 3m Chamber
Dis. / Ant. : 3m 3115(4927)
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 22°C/51% N9010A
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5180MHz(802.11a)

Data no. : 4
Ant. pol. : VERTICAL
Engineer : Chuntse_Wu

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.84	33.61	8.42	8.39	48.42	54.00	5.58	Average
2	5149.95	33.61	8.42	8.48	48.49	54.00	5.51	Average
3	5181.30	33.65	8.45	53.36	95.46	54.00	-41.46	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

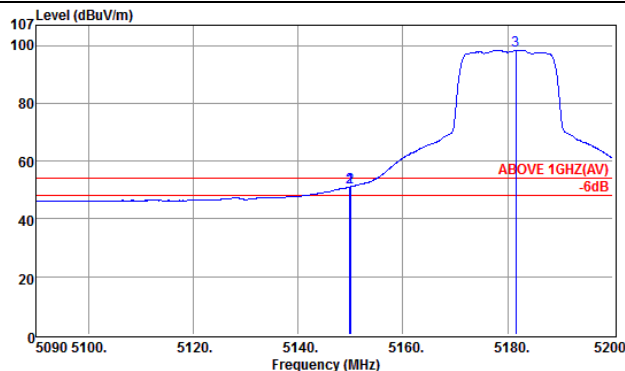


Site no. : Audix NO.1 3m Chamber
Dis. / Ant. : 3m 3115(4927)
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 22°C/51% N9010A
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5180MHz(802.11ac20)

Data no. : 1
Ant. pol. : HORIZONTAL
Engineer : Chuntse_Wu

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.07	33.61	8.42	23.80	65.83	74.00	8.17	Peak
2	5149.95	33.61	8.42	22.82	64.85	74.00	9.15	Peak
3	5178.38	33.65	8.45	66.09	108.19	74.00	-34.19	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : Audix NO.1 3m Chamber
Dis. / Ant. : 3m 3115(4927)
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 22°C/51% N9010A
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5180MHz(802.11ac20)

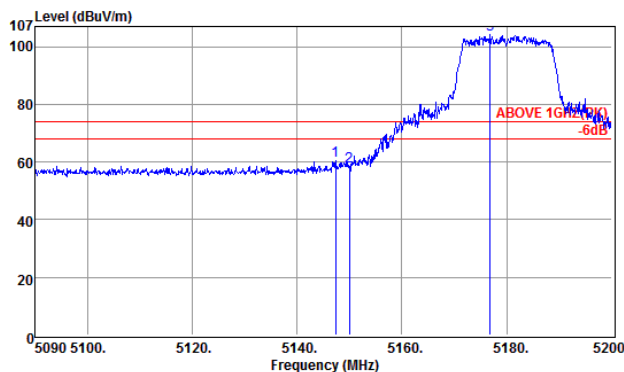
Data no. : 2
Ant. pol. : HORIZONTAL
Engineer : Chuntse_Wu

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.84	33.61	8.42	8.93	51.01	54.00	2.99	Average
2	5149.95	33.61	8.42	9.05	51.08	54.00	2.92	Average
3	5181.52	33.65	8.45	58.32	98.42	54.00	-44.42	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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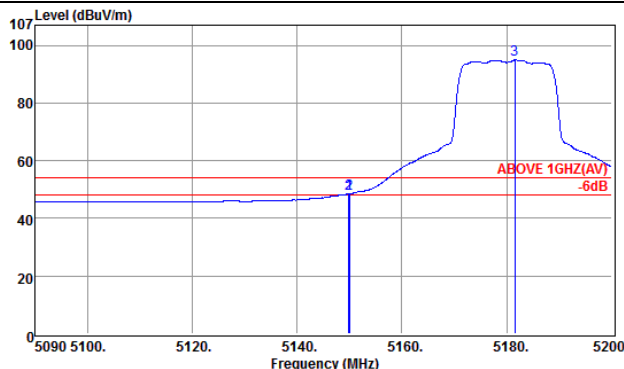
Tel: +886 2 26099301
Fax: +886 2 26099303



Site no. : Audix NO.1 3m Chamber Data no. : 3
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5180MHz(802.11ac20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5147.31	33.61	8.42	18.55	80.58	74.00	13.42	Peak
2	5149.95	33.61	8.42	18.39	58.42	74.00	15.58	Peak
3	5176.79	33.65	8.45	62.18	104.28	74.00	-30.28	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



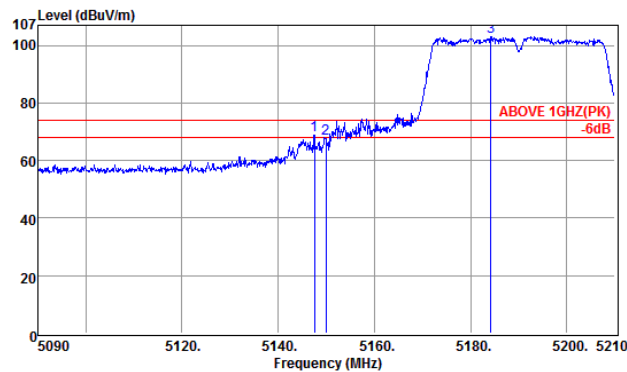
Site no. : Audix NO.1 3m Chamber Data no. : 4
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5180MHz(802.11ac20)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.84	33.61	8.42	6.55	48.58	54.00	5.42	Average
2	5149.95	33.61	8.42	6.56	48.58	54.00	5.41	Average
3	5181.52	33.65	8.45	52.80	94.90	54.00	-40.90	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

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New Taipei City244, Taiwan

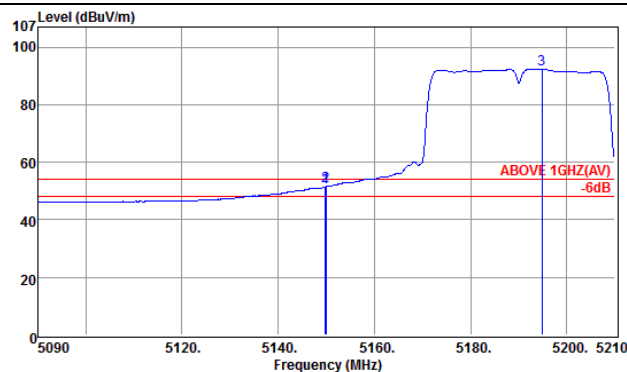
Tel: +886 2 26099301
Fax: +886 2 26099303



Site no. : Audix NO.1 3m Chamber Data no. : 1
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5190MHz(802.11ac40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5147.60	33.61	8.42	28.94	83.97	74.00	5.03	Peak
2	5150.00	33.61	8.42	25.61	87.64	74.00	6.36	Peak
3	5184.20	33.65	8.45	80.85	102.95	74.00	-28.95	Peak

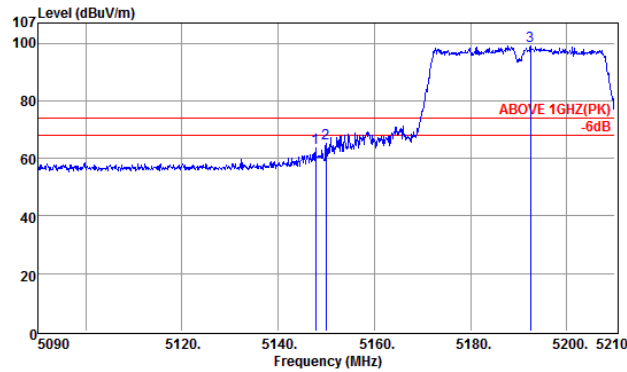
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : Audix NO.1 3m Chamber Data no. : 2
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5190MHz(802.11ac40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5148.88	33.61	8.42	9.45	51.48	54.00	2.52	Average
2	5150.00	33.61	8.42	9.51	51.54	54.00	2.46	Average
3	5184.88	33.68	8.48	50.24	92.38	54.00	-38.38	Average

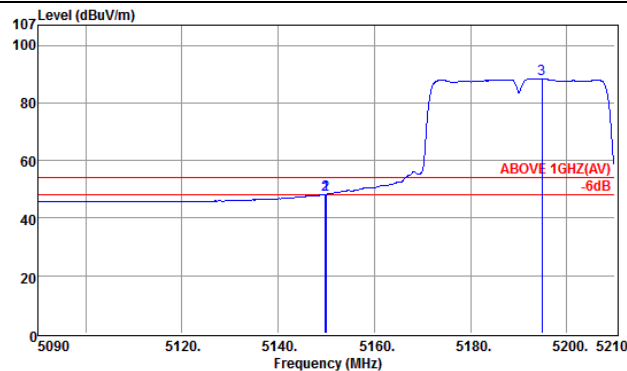
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : Audix NO.1 3m Chamber Data no. : 3
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5190MHz(802.11ac40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5147.84	33.61	8.42	21.59	63.62	74.00	10.38	Peak
2	5150.00	33.61	8.42	23.31	65.34	74.00	8.66	Peak
3	5192.48	33.68	8.46	57.00	89.14	74.00	-25.14	Peak

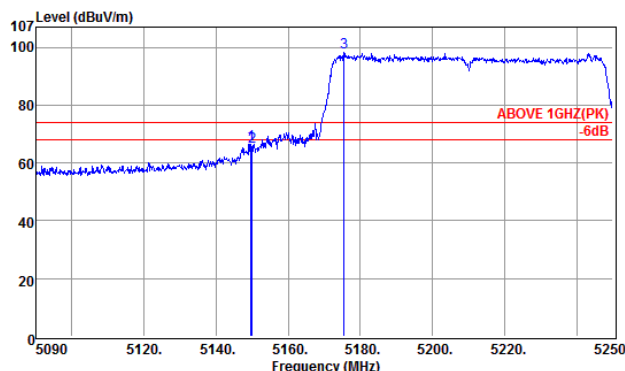
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : Audix NO.1 3m Chamber Data no. : 4
Dis. / Ant. : 3m 3115(4927) Ant. pol. : VERTICAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5190MHz(802.11ac40)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5148.88	33.61	8.42	8.19	48.22	54.00	5.78	Average
2	5150.00	33.61	8.42	6.28	48.29	54.00	5.71	Average
3	5194.88	33.68	8.46	46.28	83.42	54.00	-34.42	Average

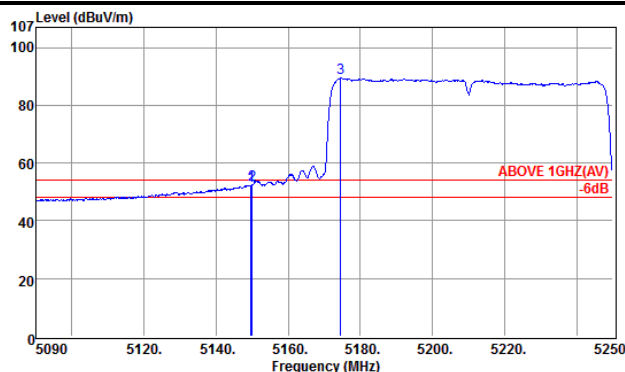
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : Audix NO.1 3m Chamber Data no. : 1
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5210MHz(802.11ac80)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.68	33.61	8.42	24.54	66.57	74.00	7.43	Peak
2	5150.00	33.61	8.42	23.57	65.60	74.00	8.40	Peak
3	5175.44	33.65	8.45	56.05	98.15	74.00	-24.15	Peak

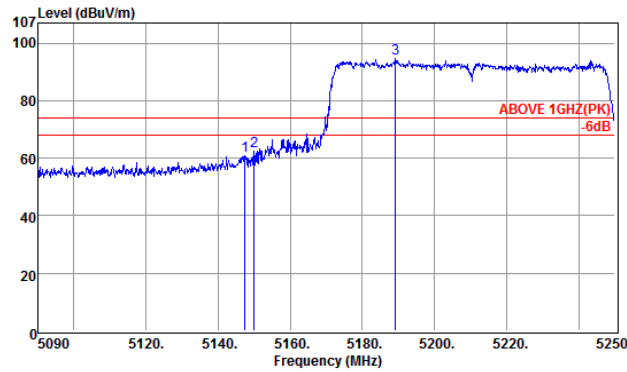
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : Audix NO.1 3m Chamber Data no. : 2
Dis. / Ant. : 3m 3115(4927) Ant. pol. : HORIZONTAL
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 22°C/51% N9010A Engineer : Chuntse_Wu
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5210MHz(802.11ac80)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.68	33.61	8.42	10.19	52.22	54.00	1.78	Average
2	5150.00	33.61	8.42	10.63	52.66	54.00	1.34	Average
3	5174.48	33.65	8.45	47.29	89.39	54.00	-35.39	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

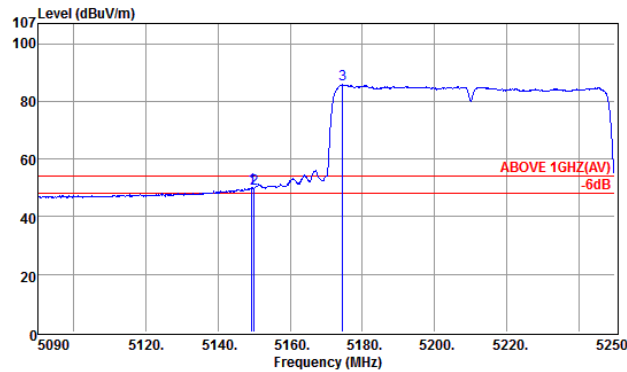


Site no. : Audix NO.1 3m Chamber
Dis. / Ant. : 3m 3115(4927)
Limit : ABOVE 1GHZ(PK)
Env. / Ins. : 22°C/51% N9010A
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5210MHz(802.11ac80)

Data no. : 3
Ant. pol. : VERTICAL
Engineer : Chuntse_Wu

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5147.44	33.61	8.42	19.01	61.04	74.00	12.96	Peak
2	5150.00	33.61	8.42	20.32	62.35	74.00	11.65	Peak
3	5189.20	33.68	8.46	52.45	94.59	74.00	-20.59	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : Audix NO.1 3m Chamber
Dis. / Ant. : 3m 3115(4927)
Limit : ABOVE 1GHZ(AV)
Env. / Ins. : 22°C/51% N9010A
EUT : RE200
Power Rating : 120Vac/60Hz
Test Mode : Tx 5210MHz(802.11ac80)

Data no. : 4
Ant. pol. : VERTICAL
Engineer : Chuntse_Wu

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	5149.36	33.61	8.42	7.97	50.00	54.00	4.00	Average
2	5150.00	33.61	8.42	7.84	49.87	54.00	4.13	Average
3	5174.48	33.65	8.45	43.64	85.74	54.00	-31.74	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

6.5.2. Emissions outside the frequency band:

The emissions (up to 40GHz) not reported for there is no emission be found.

6.5.3. Emissions in Non-restricted Frequency Bands

Pursuant to KDB 558074 D01 v03r02 that emission levels below the 15.209 general radiated emissions limits is not required.

Mode	802.11a	UNII Band	I
		Frequency	TX 5240MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10482.00	38.10	12.05	16.11	66.26	68.20	1.94	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10482.00	38.10	12.05	10.82	60.97	68.20	7.23	Peak

Mode	802.11ac-VHT20	UNII Band	I
		Frequency	TX 5240MHz

Antenna at Horizontal Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10471.50	38.10	12.05	15.91	66.06	68.20	2.14	Peak

Mode	802.11ac-VHT40	UNII Band	I
		Frequency	TX 5230MHz

Antenna at Horizontal Polarization

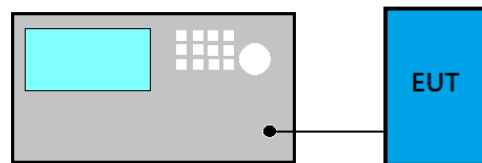
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10461.00	38.10	12.05	15.58	65.73	68.20	2.47	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
10461.00	38.10	12.05	10.45	60.60	68.20	7.60	Peak

7. EMISSION BANDWIDTH MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Specification Limits

Frequency Band (MHz)	Limit
5150 to 5250	Reference only
5250 to 5350	
5470 to 5725	
5725 to 5850	$\geq 500\text{kHz}$

7.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01:

■ Applicable to all bands except to 5725 MHz- 5850 MHz

- (1) Set RBW= 1% of the emission bandwidth
- (2) Set VBW > RBW
- (3) Detector = Peak
- (4) Trace mode = max hold
- (5) Setting channel bandwidth function x dB to -26 dB to record the final bandwidth.

■ 5725 MHz- 5850 MHz

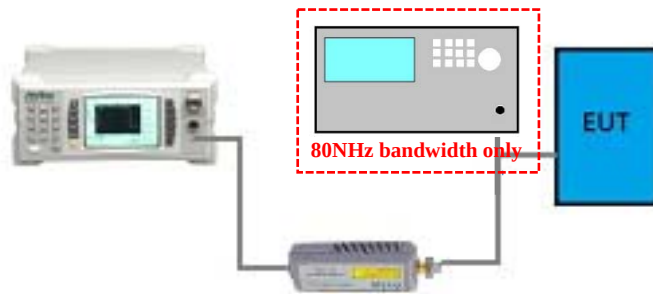
- (1) Set RBW = 100 kHz.
- (2) Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x dB to -6 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

8. MAXIMUM OUTPUT POWER MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. Specification Limits

Frequency Band (MHz)	Category	Limit
5150 to 5250	Outdoor Access Point	1 W(30 dBm)/ Max e.i.r.p. ≤ 125 mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon
	Fixed point-to-point Access Point	1 W(30 dBm)
	Indoor Access Point	1 W(30 dBm)
	Mobile and Portable client device	250 mW(24 dBm)
5250 to 5350	N/A	250 mW or $11 \text{ dBm} + 10 \log B$ ^{Note1}
5470 to 5725		250 mW or $11 \text{ dBm} + 10 \log B$ ^{Note1}
5725 to 5850		1 W(30 dBm)

Note 1: B is the 26 dB emission bandwidth, which presented in section 7 and appendix A.1.

8.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01:

■ **Method AVGPM (Measurement using an RF average power meter):**

EUT is connected to power sensor and record the maximum average output power and duty cycle factor is added when duty cycle presented in section 3.5.1 is < 98%.

■ **Method AVGSA-2 (Spectrum channel power)**

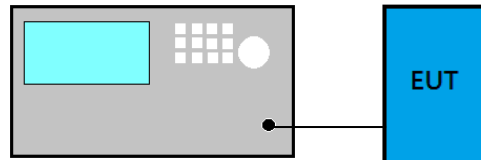
- (1) Set span to at least 1.5 times the OBW
- (2) Set RBW = 1 MHz
- (3) Set the video bandwidth (VBW) $\geq$ 3 MHz.
- (4) Detector = RMS.
- (5) Trace mode = trace average at least 100 traces
- (6) Sweep = auto couple.
- (7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
- (8) Duty cycle factor is added when duty cycle presented in section 3.5.1 is < 98%.

8.4. Test Results

Please refer to Appendix A

9. EMISSION LIMITATIONS MEASUREMENT

9.1. Block Diagram of Test Setup



9.2. Specification Limits

- 9.2.1. For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 9.2.2. For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 9.2.3. For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- 9.2.4. For transmitters operating in the 5.725-5.85GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

9.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01:

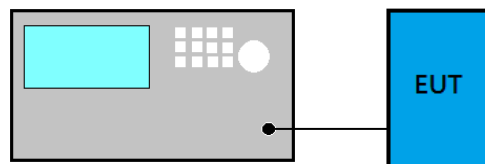
- (1) RBW = 1 MHz
- (2) VBW $\geq 3 \times$ RBW
- (3) Detector = Peak
- (4) Sweep time = auto
- (5) Trace mode = max hold
- (6) Allow sweeps to continue until the trace stabilizes.

9.4. Test Results

Please refer to Appendix A

10. POWER SPECTRAL DENSITY MEASUREMENT

10.1. Block Diagram of Test Setup



10.2. Specification Limits

Frequency Band (MHz)	Category	Limit
5150 to 5250	Outdoor Access Point	17dBm/1MHz
	Fixed point-to-point Access Point	
	Indoor Access Point	
	Mobile and Portable client device	11 dBm/1MHz
5250 to 5350	N/A	11 dBm/1MHz
5470 to 5725		11 dBm/1MHz
5725 to 5850		30dBm/500 kHz

10.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01:

■ Method AVGSA-2 (Spectrum channel power)

- (1) Set span to at least 1.5 times the OBW
- (2) Set RBW = 1 MHz
- (3) Set the video bandwidth (VBW) $\geq$ 3 MHz.
- (4) Detector = RMS.
- (5) Trace mode = trace average at least 100 traces
- (6) Sweep = auto couple.
- (7) Use peak search function to find out the maximum power density.
- (8) Duty cycle factor is added when duty cycle presented in section 3.5.1 is $< 98\%$.

10.4. Test Results

Please refer to Appendix A

11.DEVIATION TO TEST SPECIFICATIONS

【NONE】