

# Harman International Industries, Inc.

# RF TEST REPORT

**Report Type:**

FCC Part 15.407 & ISED RSS-247 RF report

**Model:**

LUXASTR01

**REPORT NUMBER:**

210402581SHA-003

**ISSUE DATE:**

May 29, 2021

**DOCUMENT CONTROL NUMBER:**

TTRF15.407\_V1 © 2017 Intertek



**Applicant:** Harman International Industries, Inc.  
8500, Balboa Blvd, Northridge, CA,91329, USA

**Manufacturer:** Anam Electronics Co., Ltd.  
27, Digital-ro 27ga-gil, Guro-gu, Seoul, 08375, Republic of Korea

**Product Name:** WiFi Module

**Type/Model:** LUXASTR01

**FCC ID:** APILUXASTR01

**IC:** 6132A-LUXASTR01

## SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

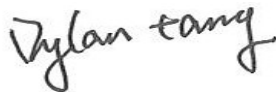
**47CFR Part 15 (2017):** Radio Frequency Devices (Subpart C)

**ANSI C63.10 (2013):** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

**RSS-247 Issue 2 (February 2017):** Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

**RSS-Gen Issue 5 (April 2018):** General Requirements for Compliance of Radio Apparatus

**PREPARED BY:**



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## Revision History

Report No.	Version	Description	Issued Date
210402581SHA-003	Rev. 01	C2PC	May 29, 2021

## Measurement result summary

TEST ITEM	FCC REFERENCE	IC REFERENCE	RESULT
26 dB Bandwidth & 99% Occupied Bandwidth	15.407(a)	RSS-247 Issue 2 Clause 6	NA
Minimum 6dB Bandwidth	15.407(e)	RSS-247 Issue 2 Clause 6	NA
Maximum Conducted Output Power	15.407(a)	RSS-247 Issue 2 Clause 6	Verified
Power spectral density	15.407(a)	RSS-247 Issue 2 Clause 6	NA
Radiated emission	15.407(b) 15.205 15.209	RSS-247 Issue 2 Clause 6 RSS-Gen Issue 5 Clause 8.9&8.10	Pass
Power line conducted emission	15.407(b) 15.207	RSS-Gen Issue 5 Clause 8.8	Pass
Frequency Stability	15.407(g)	RSS-Gen Issue 5 Clause 8.11	NA
Antenna requirement	15.203	-	Pass

**Notes:**

- 1: NA =Not Applicable
2. Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.
- 3: Additions, Deviations and Exclusions from Standards: None.
4. Verified= This report is based on the previous report that add three Antennas. For specific changes, need to verified power.

## 1 GENERAL INFORMATION

### 1.1 Description of Equipment Under Test (EUT)

Product name:	WiFi Module
Type/Model:	LUXASTR01
Description of EUT:	The EUT is a WiFi Platform Module, which supports 802.11a/b/g/n/ac mode.
Rating:	DC 5V
EUT type:	<input checked="" type="checkbox"/> Table top <input type="checkbox"/> Floor standing
Sample number :	G212B019
Product Marketing Name:	WiFi & BT Platform Module
Hardware Version:	LUXASTR01
Sample received date:	May 6, 2021
Date of test:	April 28, 2020 ~ May 27, 2021

### 1.2 Technical Specification

#### FCC

Frequency Range:	5150 ~ 5250MHz 5250 ~ 5350MHz 5470 ~ 5725MHz 5725 ~ 5850MHz
Support Standards:	802.11a, 802.11n(HT20), 802.11n(HT40), 802.11ac(VHT20), 802.11ac(VHT40), 802.11ac(VHT80)
Type of Modulation:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Number:	For 5180 ~ 5240MHz band: Channel 36 - 48 For 5260 ~ 5320MHz Band: Channel 52 - 64 For 5500 ~ 5700MHz Band: Channel 100 - 140 For 5745 ~ 5825MHz band: Channel 149 - 165
Antenna port Information:	Chip antenna: ant1 3.75dBi, ant2 3.75dBi PCB antenna: ant1 3.94dBi, ant2 3.94dBi Pole antenna: ant1 3.32dBi, ant2 3.32dBi

#### IC

Frequency Range:	5150 ~ 5250MHz 5250 ~ 5350MHz 5470 ~ 5600MHz 5650 ~ 5725MHz 5725 ~ 5850MHz
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<b>Support Standards:</b>	802.11a, 802.11n(HT20), 802.11n(HT40), 802.11ac(VHT20), 802.11ac(VHT40), 802.11ac(VHT80)
<b>Type of Modulation:</b>	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
<b>Channel Number:</b>	For 5180 ~ 5240MHz band: Channel 36 - 48 For 5260 ~ 5320MHz Band: Channel 52 - 64 For 5500 ~ 5580MHz Band: Channel 100 - 116 For 5660 ~ 5700MHz Band: Channel 132 - 140 For 5745 ~ 5850MHz band: Channel 149 - 165
<b>Antenna port Information:</b>	Chip antenna: ant1 3.75dBi, ant2 3.75dBi PCB antenna: ant1 3.94dBi, ant2 3.94dBi Pole antenna: ant1 3.32dBi, ant2 3.32dBi

**1.3 Antenna information**

Antenna information:			
No.	Antenna Type	Gain	Note
0	Chip Antenna	3.75dBi	Internal type
1	PCB Antenna	3.94dBi	Internal type
2	Pole Antenna	3.32dBi	External type

Mode	Tx/Rx Function	Beamforming function	CDD function	Directional gain (dBi)
802.11a	1Tx/1Rx	NO	NO	-
802.11n(HT20) 802.11ac(VHT20)	2Tx/2Rx	NO	NO	-
802.11n(HT40) 802.11ac(VHT40)	2Tx/2Rx	NO	NO	-
802.11ac(VHT80)	2Tx/2Rx	NO	NO	-

Note: For 802.11a mode, it only supports 1TX.  
For 802.11n and 802.11ac modes, it can support 2TX, all the two transmit signals are completely uncorrelated with each other, so the directional gain =  $10 \log ((10^{G1/10} + 10^{G2/10} + \dots + 10^{Gn/10}) / N_{ANT})$

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**1.4 Description of Test Facility**

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN1175
	IC Registration Lab Registration code No.: 2042B-1
	VCCI Registration Lab Registration No.: R-4243, G-845, C-4723, T-2252
	NVLAP Accreditation Lab NVLAP LAB CODE: 200849-0
	A2LA Accreditation Lab Certificate Number: 3309.02



## 2 TEST SPECIFICATIONS

### 2.1 Standards or specification

47CFR Part 15 (2017)  
 ANSI C63.10 (2013)  
 RSS-247 Issue 2 (February 2017)  
 RSS-Gen Issue 5 (April 2018)  
 KDB 558074 (v04)

### 2.2 Mode of operation during the test

While testing transmitting mode of EUT, the continuously transmission was applied by following software.

Software name	Manufacturer	Version	Supplied by
SecureCRT	-	-	Client

The lowest, middle and highest channel were tested as representatives.

Frequency Band (MHz)	Mode	Lowest (MHz)	Middle (MHz)	Highest (MHz)
5150~5250MHz	802.11a	5180	5220	5240
	802.11n20	5180	5220	5240
	802.11n40	5190	/	5230
	802.11ac80	5210	/	/
5250~5350MHz	802.11a	5260	5300	5320
	802.11n20	5260	5300	5320
	802.11n40	5270	/	5310
	802.11ac80	5290	/	/
5470~5725MHz	802.11a	5500	5580	5700
	802.11n20	5500	5580	5700
	802.11n40	5510	5550	5670
	802.11ac80	5530	/	/
5725~5850MHz	802.11a	5745	5785	5825
	802.11n20	5745	5785	5825
	802.11n40	5755	/	5795
	802.11ac80	5775	/	/

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After this pre-scan with the RF power, the following data rate was chosen to do the test as the worst case.

Test software and Power Setting parameter		
Supply voltage	120V/60Hz	
Frequency Band (MHz)	Mode	Worst case data rate
5150~5250	802.11a	6Mbps
	802.11n20	MCS0
	802.11n40	MCS0
	802.11ac80	MCS0
5250~5350	802.11a	6Mbps
	802.11n20	MCS0
	802.11n40	MCS0
	802.11ac80	MCS0
5500~5725	802.11a	6Mbps
	802.11n20	MCS0
	802.11n40	MCS0
	802.11ac80	MCS0
5725~5850	802.11a	6Mbps
	802.11n20	MCS0
	802.11n40	MCS0
	802.11ac80	MCS0

### 2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

### 2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	Laptop computer	DELL 5480	-
2	RF cable	/	0.2m length; 0.8dB loss

### 2.5 Test environment condition:

Test items	Temperature	Humidity
26 dB Bandwidth & 99% Occupied Bandwidth	23°C	52% RH
Minimum 6dB Bandwidth		
Maximum Conducted Output Power		
Power spectral density		
Radiated Emissions in restricted frequency bands	22°C	55% RH
Power line conducted emission	21°C	53% RH

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**2.6 Instrument list**

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCS 30	EC 2107	2021-07-14
<input checked="" type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2021-11-09
Radiated Emission					
Used	Equipment	Manufacturer	Type	Serial Number	Due date
<input checked="" type="checkbox"/>	3m Chamber & Accessory Equipment	ETS-LINDGREN	3m	N/A	2024-01-21
<input checked="" type="checkbox"/>	Receiver	R&S	ESIB26	100114	2021-11-17
<input checked="" type="checkbox"/>	Loop Antenna	ETS-LINDGREN	6502	00202525	2021-11-13
<input checked="" type="checkbox"/>	Broadband Antenna	ETS-LINDGREN	3142E	00201566	2021-11-13
<input checked="" type="checkbox"/>	6dB Attenuator	Talent	RA6A5-N-18	18103001	2021-11-13
<input checked="" type="checkbox"/>	Preamplifier	HP	8447F	2805A02960	2021-11-09
<input checked="" type="checkbox"/>	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	2022-05-28
<input checked="" type="checkbox"/>	Pre-amplifier	ETS-LINDGREN	118385	00201874	2021-11-09
<input checked="" type="checkbox"/>	Horn Antenna	ETS-LINDGREN	3116C	00200180	2021-06-18
<input checked="" type="checkbox"/>	Pre-amplifier	ETS-LINDGREN	118384	00202652	2021-11-13
<input checked="" type="checkbox"/>	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2022-03-15
<input checked="" type="checkbox"/>	PXA Signal Analyzer	Keysight	N9030B	EC 6078	2022-06-09
<input checked="" type="checkbox"/>	Power sensor	Agilent	U2021XA	EC 5338-1	2022-03-15
<input checked="" type="checkbox"/>	Vector Signal Generator	Agilent	N5182B	EC 5175	2022-03-17
<input checked="" type="checkbox"/>	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2022-03-17
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCI 7	EC 4501	2021-09-16
<input type="checkbox"/>	Universal Radio Communication Tester	R&S	CMW500	EC5944	2021-12-09
<input type="checkbox"/>	Universal Radio Communication Tester	R&S	CMW500	Ec6209	2021-12-30
<input checked="" type="checkbox"/>	Signal generator	Agilent	N5182A	Ec6172	2021-08-21
<input checked="" type="checkbox"/>	Signal generator	Agilent	N5181A	Ec6171	2021-08-21
<input checked="" type="checkbox"/>	Climate chamber	GWS	MT3065	EC 6021	2022-03-04
Additional instrument					

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Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2022-03-02
<input checked="" type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 4620	2021-09-09

## 2.7 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Measurement uncertainty
Maximum peak output power	± 0.74dB
Radiated Emissions in restricted frequency bands below 1GHz	± 4.90dB
Radiated Emissions in restricted frequency bands above 1GHz	± 5.02dB
Emission outside the frequency band	± 2.89dB
Power line conducted emission	± 3.19dB

### 3 Maximum conducted output power and e.i.r.p.

Test result: Pass

#### 3.1 Limit

For an outdoor access point operating in the band 5.15-5.25GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W provided the maximum antenna gain does not exceed 6dBi.

The maximum e.i.r.p. at any elevation angle above 30 degrees from the horizon must not exceed 125mW (21 dBm).

For an indoor access point operating in the band 5.15-5.25GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6dBi.

For fixed point-to-point access points operating in the band 5.15-5.25GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W.

For client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi.

For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or  $11\text{dBm} + 10\log B$ , where B is the 26dB emission bandwidth in megahertz.

For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W.

For Frequency Band 5150-5250 MHz, the maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log 10B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 99% emission bandwidth in megahertz.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log 10B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6dBi are used, the maximum

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conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 3.2 Measurement Procedure

The EUT was tested according to test procedure of “KDB789033 D02 General UNII Test Procedures New Rules”

#### For 802.11a and 802.11n(HT20) mode:

- (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.  
The EUT is configured to transmit continuously or to transmit with a constant duty cycle.  
At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.  
The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
- (ii) If the transmitter does not transmit continuously, measure the duty cycle,  $x$ , of the transmitter output signal as described in II.B.
- (iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
- (iv) Adjust the measurement in dBm by adding  $10 \log (1/x)$  where  $x$  is the duty cycle (e.g.,  $10 \log (1/0.25)$  if the duty cycle is 25%).

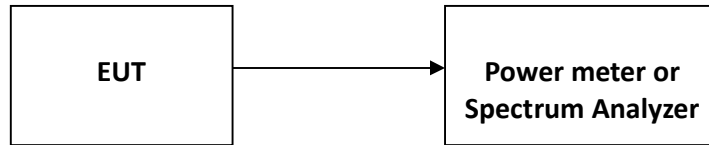
#### For 802.11n(HT40) and 802.11ac(VHT80):

- (i) Measure the duty cycle,  $x$ , of the transmitter output signal as described in II.B.
- (ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (iii) Set RBW = 1 MHz.
- (iv) Set VBW  $\geq$  3 MHz.
- (v) Number of points in sweep  $\geq 2 \times$  span / RBW. (This ensures that bin-to-bin spacing is  $\leq$  RBW/2, so that narrowband signals are not lost between frequency bins.)
- (vi) Sweep time = auto.
- (vii) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
- (viii) Do not use sweep triggering. Allow the sweep to “free run.”
- (ix) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
- (x) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (xi) Add  $10 \log (1/x)$ , where  $x$  is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add  $10 \log (1/0.25) = 6$  dB if the duty cycle is 25%.



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**3.3 Test Configuration**



**3.4 Test Results of Maximum conducted output power and e.i.r.p.**

PCB antenna

U-NII-1 AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Power Limit (dBm)	EIRP (dBm)	IC EIRP Limit (dBm)
802.11a	5180	Ant0	0.00	4.76	4.76	24	8.70	22
	5180	Ant1	0.00	4.93	4.93	24	8.87	22
	5200	Ant0	0.00	6.89	6.89	24	10.83	22
	5200	Ant1	0.00	7.36	7.36	24	11.30	22
	5240	Ant0	0.00	6.78	6.78	24	10.72	22
	5240	Ant1	0.00	7.19	7.19	24	11.13	22
802.11n (HT20) MIMO	5180	Ant0+Ant1	0.00	5.57	8.27	24	12.21	22
				4.92				
	5200	Ant0+Ant1	0.00	7.38	10.30	24	14.24	22
				7.19				
	5240	Ant0+Ant1	0.00	7.48	10.35	24	14.29	22
				7.20				
802.11n (HT40) MIMO	5190	Ant0+Ant1	0.00	5.07	7.39	24	11.33	22
				3.56				
	5230	Ant0+Ant1	0.00	10.43	13.18	24	17.12	22
				9.89				
802.11ac (VT20) MIMO	5180	Ant0+Ant1	0.00	5.15	8.13	24	12.07	22
				5.08				
	5200	Ant0+Ant1	0.00	7.45	10.44	24	14.38	22
				7.41				

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	5240	Ant0+Ant1	0.00	7.52	10.40	24	14.34	22
				7.26				
802.11ac (VT40) MIMO	5190	Ant0+Ant1	0.00	4.99	7.31	24	11.25	22
				3.49				
	5230	Ant0+Ant1	0.13	10.42	13.09	24	17.03	22
				9.71				
802.11ac (VHT80)	5210	Ant0+Ant1	0.86	7.09	10.09	24	14.03	23
				7.07				

U-NII-2a AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Limit (dBm)	EIRP (dBm)	IC Limit (dBm)
802.11a	5260	Ant0	0.00	14.55	14.55	24	18.49	23
	5260	Ant1	0.00	14.28	14.28	24	18.22	23
	5300	Ant0	0.00	14.43	14.43	24	18.37	23
	5300	Ant1	0.00	14.05	14.05	24	17.99	23
	5320	Ant0	0.00	12.87	12.87	24	16.81	23
	5320	Ant1	0.00	12.50	12.50	24	16.44	23
802.11n (HT20) MIMO	5260	Ant0+Ant1	0.00	14.45	17.45	24	21.39	23
				14.42				
	5300	Ant0+Ant1	0.00	14.59	17.45	24	21.39	23
				14.28				
	5320	Ant0+Ant1	0.00	12.24	15.55	24	19.49	23
				12.82				
802.11n (HT40) MIMO	5270	Ant0+Ant1	0.00	13.71	16.60	24	20.54	24
				13.46				
	5310	Ant0+Ant1	0.00	11.00	13.32	24	17.26	24
				9.49				
802.11ac (VT20) MIMO	5260	Ant0+Ant1	0.00	14.66	17.54	24	21.48	23
				14.40				
	5300	Ant0+Ant1	0.00	14.46	17.33	24	21.27	23
				14.18				

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	5240	Ant0+Ant1	0.00	7.52	10.40	24	14.34	23
				7.26				
802.11ac (VT40) MIMO	5270	Ant0+Ant1	0.00	13.61	16.50	24	20.44	24
				13.37				
	5310	Ant0+Ant1	0.00	11.07	13.42	24	17.37	24
				9.64				
802.11ac (VHT80)	5290	Ant0+Ant1	0.13	8.80	11.65	24	15.59	24
				8.47				

U-NII-2C AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Limit (dBm)	EIRP (dBm)	IC Limit (dBm)
802.11a	5500	Ant0	0.00	11.42	11.42	24	15.36	23
	5500	Ant1	0.00	11.15	11.15	24	15.09	23
	5600	Ant0	0.00	11.12	11.12	24	15.06	23
	5600	Ant1	0.00	10.95	10.95	24	14.89	23
	5700	Ant0	0.00	11.33	11.33	24	15.27	23
	5700	Ant1	0.00	11.05	11.05	24	14.99	23
802.11n (HT20) MIMO	5500	Ant0+Ant1	0.00	11.55	14.44	24	18.38	23
				11.31				
	5580	Ant0+Ant1	0.00	11.20	14.09	24	18.03	23
				10.95				
	5700	Ant0+Ant1	0.00	11.44	14.30	24	18.24	23
				11.14				
802.11n (HT40) MIMO	5510	Ant0+Ant1	0.00	9.32	12.05	24	15.99	24
				8.75				
	5590	Ant0+Ant1	0.00	13.47	16.35	24	20.29	24
				13.21				
	5670	Ant0+Ant1	0.00	13.52	16.33	24	20.27	24
				13.11				
802.11ac (VT20) MIMO	5500	Ant0+Ant1	0.00	11.48	14.43	24	18.37	23
				11.36				
	5580	Ant0+Ant1	0.00	11.08	14.01	24	17.95	23
				10.92				

**TEST REPORT**

	5700	Ant0+Ant1	0.00	11.41	14.35	24	18.29	23
				11.27				
802.11ac (VT40) MIMO	5510	Ant0+Ant1	0.00	9.19	11.97	24	15.91	24
				8.71				
	5590	Ant0+Ant1	0.00	13.43	16.27	24	20.21	24
				13.09				
5670	Ant0+Ant1	0.00	13.56	16.36	24	20.30	24	
			13.13					
802.11ac (VHT80) MIMO	5530	Ant0+Ant1	0.14	7.69	10.46	24	14.40	24

U-NII-3 AVGSA Output Power						
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	Limit (dBm)
802.11a	5745	Ant0	0.00	10.35	10.35	30
	5745	Ant1	0.00	10.10	10.10	30
	5785	Ant0	0.00	10.77	10.77	30
	5785	Ant1	0.00	10.45	10.45	30
	5825	Ant0	0.00	9.73	9.73	30
	5825	Ant1	0.00	9.45	9.45	30
802.11n (HT20) MIMO	5745	Ant0+Ant1	0.00	10.85	13.69	30
				10.50		
	5785	Ant0+Ant1	0.00	10.94	13.89	30
				10.81		
5825	Ant0+Ant1	0.00	10.60	13.26	30	
			9.87			
802.11n (HT40) MIMO	5755	Ant0+Ant1	0.00	13.40	16.22	30
				13.02		
	5795	Ant0+Ant1	0.00	13.16	16.07	30
				12.96		
802.11ac (HT20)	5745	Ant0+Ant1	0.00	10.68	13.56	30
				10.42		

**TEST REPORT**

MIMO	5785	Ant0+Ant1	0.00	10.94	13.78	30
				10.59		
	5825	Ant0+Ant1	0.00	10.62	13.27	30
				9.86		
802.11ac (HT40) MIMO	5755	Ant0+Ant1	0.00	13.44	16.31	30
				13.15		
	5795	Ant0+Ant1	0.00	13.32	16.13	30
			0.00	12.92		
802.11ac (VHT80) MIMO	5775	Ant0+Ant1	0.14	11.33	14.03	30
				10.68		

## Chip antenna

U-NII-1 AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Power Limit (dBm)	EIRP (dBm)	IC EIRP Limit (dBm)
802.11a	5180	Ant0	0.00	4.76	4.76	24	8.51	22
	5180	Ant1	0.00	4.93	4.93	24	8.68	22
	5200	Ant0	0.00	6.89	6.89	24	10.64	22
	5200	Ant1	0.00	7.36	7.36	24	11.11	22
	5240	Ant0	0.00	6.78	6.78	24	10.53	22
	5240	Ant1	0.00	7.19	7.19	24	10.94	22
802.11n (HT20) MIMO	5180	Ant0+Ant1	0.00	5.57	8.27	24	12.02	22
				4.92				
	5200	Ant0+Ant1	0.00	7.38	10.30	24	14.05	22
				7.19				
5240	Ant0+Ant1	0.00	7.48	10.35	24	14.10	22	
			7.20					
802.11n (HT40) MIMO	5190	Ant0+Ant1	0.00	5.07	7.39	24	11.14	22
				3.56				
	5230	Ant0+Ant1	0.00	10.43	13.18	24	16.93	22
				9.89				
802.11ac (VT20) MIMO	5180	Ant0+Ant1	0.00	5.15	8.13	24	11.88	22
				5.08				

**TEST REPORT**

	5200	Ant0+Ant1	0.00	7.45	10.44	24	14.19	22
				7.41				
	5240	Ant0+Ant1	0.00	7.52	10.40	24	14.15	22
				7.26				
802.11ac (VT40) MIMO	5190	Ant0+Ant1	0.00	4.99	7.31	24	11.06	22
				3.49				
	5230	Ant0+Ant1	0.13	10.42	13.09	24	16.84	22
				9.71				
802.11ac (VHT80)	5210	Ant0+Ant1	0.86	7.09	10.09	24	13.84	23
				7.07				

U-NII-2a AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Limit (dBm)	EIRP (dBm)	IC Limit (dBm)
802.11a	5260	Ant0	0.00	14.55	14.55	24	18.30	23
	5260	Ant1	0.00	14.28	14.28	24	18.03	23
	5300	Ant0	0.00	14.43	14.43	24	18.18	23
	5300	Ant1	0.00	14.05	14.05	24	17.80	23
	5320	Ant0	0.00	12.87	12.87	24	16.62	23
	5320	Ant1	0.00	12.50	12.50	24	16.25	23
802.11n (HT20) MIMO	5260	Ant0+Ant1	0.00	14.45	17.45	24	21.20	23
				14.42				
	5300	Ant0+Ant1	0.00	14.59	17.45	24	21.20	23
				14.28				
	5320	Ant0+Ant1	0.00	12.24	15.55	24	19.30	23
				12.82				
802.11n (HT40) MIMO	5270	Ant0+Ant1	0.00	13.71	16.60	24	20.35	24
				13.46				
	5310	Ant0+Ant1	0.00	11.00	13.32	24	17.07	24
				9.49				
802.11ac (VT20) MIMO	5260	Ant0+Ant1	0.00	14.66	17.54	24	21.29	23
				14.40				

**TEST REPORT**

	5300	Ant0+Ant1	0.00	14.46	17.33	24	21.08	23
				14.18				
	5320	Ant0+Ant1	0.00	12.25	15.51	24	19.26	23
				12.74				
802.11ac (VT40) MIMO	5270	Ant0+Ant1	0.00	13.61	16.50	24	20.25	24
				13.37				
	5310	Ant0+Ant1	0.00	11.07	13.42	24	17.17	24
				9.64				
802.11ac (VHT80)	5290	Ant0+Ant1	0.13	8.80	11.65	24	15.40	24
				8.47				

U-NII-2C AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Limit (dBm)	EIRP (dBm)	IC Limit (dBm)
802.11a	5500	Ant0	0.00	11.42	11.42	24	15.17	23
	5500	Ant1	0.00	11.15	11.15	24	14.9	23
	5600	Ant0	0.00	11.12	11.12	24	14.87	23
	5600	Ant1	0.00	10.95	10.95	24	14.70	23
	5700	Ant0	0.00	11.33	11.33	24	15.08	23
	5700	Ant1	0.00	11.05	11.05	24	14.80	23
802.11n (HT20) MIMO	5500	Ant0+Ant1	0.00	11.55	14.44	24	18.19	23
				11.31				
	5580	Ant0+Ant1	0.00	11.20	14.09	24	17.84	23
	5700	Ant0+Ant1	0.00	10.95	14.30	24	18.05	23
				11.14				
802.11n (HT40) MIMO	5510	Ant0+Ant1	0.00	9.32	12.05	24	15.80	24
				8.75				
	5590	Ant0+Ant1	0.00	13.47	16.35	24	20.10	24
	5670	Ant0+Ant1	0.00	13.21	16.33	24	20.08	24
				13.52				
	5500	Ant0+Ant1	0.00	13.11	14.43	24	18.18	23
				11.48				
802.11ac (VT20) MIMO				11.36				

**TEST REPORT**

	5580	Ant0+Ant1	0.00	11.08	14.01	24	17.76	23
				10.92				
	5700	Ant0+Ant1	0.00	11.41	14.35	24	18.10	23
				11.27				
802.11ac (VT40) MIMO	5510	Ant0+Ant1	0.00	9.19	11.97	24	15.72	24
				8.71				
	5590	Ant0+Ant1	0.00	13.43	16.27	24	20.02	24
				13.09				
	5670	Ant0+Ant1	0.00	13.56	16.36	24	20.11	24
				13.13				
802.11ac (VHT80) MIMO	5530	Ant0+Ant1	0.14	7.69	10.46	24	14.21	24

U-NII-3 AVGSA Output Power						
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	Limit (dBm)
802.11a	5745	Ant0	0.00	10.35	10.35	30
	5745	Ant1	0.00	10.10	10.10	30
	5785	Ant0	0.00	10.77	10.77	30
	5785	Ant1	0.00	10.45	10.45	30
	5825	Ant0	0.00	9.73	9.73	30
	5825	Ant1	0.00	9.45	9.45	30
802.11n (HT20) MIMO	5745	Ant0+Ant1	0.00	10.85	13.69	30
				10.50		
	5785	Ant0+Ant1	0.00	10.94	13.89	30
				10.81		
	5825	Ant0+Ant1	0.00	10.60	13.26	30
				9.87		
802.11n (HT40) MIMO	5755	Ant0+Ant1	0.00	13.40	16.22	30
				13.02		
	5795	Ant0+Ant1	0.00	13.16	16.07	30
				12.96		



**TEST REPORT**

802.11ac (HT20) MIMO	5745	Ant0+Ant1	0.00	10.68	13.56	30
				10.42		
	5785	Ant0+Ant1	0.00	10.94	13.78	30
				10.59		
	5825	Ant0+Ant1	0.00	10.62	13.27	30
				9.86		
802.11ac (HT40) MIMO	5755	Ant0+Ant1	0.00	13.44	16.31	30
				13.15		
	5795	Ant0+Ant1	0.00	13.32	16.13	30
			0.00	12.92		
802.11ac (VHT80) MIMO	5775	Ant0+Ant1	0.14	11.33	14.03	30

Pole antenna

U-NII-1 AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Power Limit (dBm)	EIRP (dBm)	IC EIRP Limit (dBm)
802.11a	5180	Ant0	0.00	4.76	4.76	24	8.08	22
	5180	Ant1	0.00	4.93	4.93	24	8.25	22
	5200	Ant0	0.00	6.89	6.89	24	10.21	22
	5200	Ant1	0.00	7.36	7.36	24	10.68	22
	5240	Ant0	0.00	6.78	6.78	24	10.10	22
	5240	Ant1	0.00	7.19	7.19	24	10.51	22
802.11n (HT20) MIMO	5180	Ant0+Ant1	0.00	5.57	8.27	24	11.59	22
				4.92				
	5200	Ant0+Ant1	0.00	7.38	10.30	24	13.62	22
				7.19				
	5240	Ant0+Ant1	0.00	7.48	10.35	24	13.67	22
				7.20				
802.11n (HT40) MIMO	5190	Ant0+Ant1	0.00	5.07	7.39	24	10.71	22
				3.56				
	5230	Ant0+Ant1	0.00	10.43	13.18	24	16.50	22
				9.89				

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802.11ac (VT20) MIMO	5180	Ant0+Ant1	0.00	5.15	8.13	24	11.45	22
				5.08				
	5200	Ant0+Ant1	0.00	7.45	10.44	24	13.76	22
				7.41				
	5240	Ant0+Ant1	0.00	7.52	10.40	24	13.72	22
				7.26				
802.11ac (VT40) MIMO	5190	Ant0+Ant1	0.00	4.99	7.31	24	10.63	22
				3.49				
	5230	Ant0+Ant1	0.13	10.42	13.09	24	16.41	22
				9.71				
802.11ac (VHT80)	5210	Ant0+Ant1	0.86	7.09	10.09	24	13.41	23
				7.07				

U-NII-2a AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Limit (dBm)	EIRP (dBm)	IC Limit (dBm)
802.11a	5260	Ant0	0.00	14.55	14.55	24	17.87	23
		Ant1		14.28				
	5300	Ant0	0.00	14.43	14.43	24	17.75	23
		Ant1		14.05				
	5320	Ant0	0.00	12.87	12.87	24	16.19	23
		Ant1		12.50				
802.11n (HT20) MIMO	5260	Ant0+Ant1	0.00	14.45	17.45	24	20.77	23
				14.42				
	5300	Ant0+Ant1	0.00	14.59	17.45	24	20.77	23
				14.28				
	5320	Ant0+Ant1	0.00	12.24	15.55	24	18.87	23
				12.82				
802.11n (HT40) MIMO	5270	Ant0+Ant1	0.00	13.71	16.60	24	19.92	24
				13.46				
	5310	Ant0+Ant1	0.00	11.00	13.32	24	16.64	24
				9.49				

**TEST REPORT**

802.11ac (VT20) MIMO	5260	Ant0+Ant1	0.00	14.66	17.54	24	20.86	23
				14.40				
	5300	Ant0+Ant1	0.00	14.46	17.33	24	20.65	23
				14.18				
	5320	Ant0+Ant1	0.00	12.25	15.51	24	18.83	23
				12.74				
802.11ac (VT40) MIMO	5270	Ant0+Ant1	0.00	13.61	16.50	24	19.82	24
				13.37				
	5310	Ant0+Ant1	0.00	11.07	13.42	24	16.74	24
				9.64				
802.11ac (VHT80)	5290	Ant0+Ant1	0.13	8.80	11.65	24	14.97	24
				8.47				

U-NII-2C AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	FCC Limit (dBm)	EIRP (dBm)	IC Limit (dBm)
802.11a	5500	Ant0	0.00	11.42	11.42	24	14.74	23
		Ant1		11.15				
	5600	Ant0	0.00	11.12	11.12	24	14.44	23
		Ant1		10.95				
	5700	Ant0	0.00	11.33	11.33	24	14.65	23
		Ant1		11.05				
802.11n (HT20) MIMO	5500	Ant0+Ant1	0.00	11.55	14.44	24	17.76	23
				11.31				
	5580	Ant0+Ant1	0.00	11.20	14.09	24	17.41	23
				10.95				
	5700	Ant0+Ant1	0.00	11.44	14.30	24	17.62	23
				11.14				
802.11n (HT40) MIMO	5510	Ant0+Ant1	0.00	9.32	12.05	24	15.37	24
				8.75				
	5590	Ant0+Ant1	0.00	13.47	16.35	24	19.67	24
				13.21				
	5670	Ant0+Ant1	0.00	13.52	16.33	24	19.65	24
				13.11				

**TEST REPORT**

802.11ac (VT20) MIMO	5500	Ant0+Ant1	0.00	11.48	14.43	24	17.75	23
				11.36				
	5580	Ant0+Ant1	0.00	11.08	14.01	24	17.33	23
				10.92				
	5700	Ant0+Ant1	0.00	11.41	14.35	24	17.67	23
				11.27				
802.11ac (VT40) MIMO	5510	Ant0+Ant1	0.00	9.19	11.97	24	15.29	24
				8.71				
	5590	Ant0+Ant1	0.00	13.43	16.27	24	19.59	24
				13.09				
	5670	Ant0+Ant1	0.00	13.56	16.36	24	19.68	24
				13.13				
802.11ac (VHT80) MIMO	5530	Ant0+Ant1	0.14	7.69	10.46	24	13.78	24

U-NII-3 AVGSA Output Power						
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total Power (dBm)	Limit (dBm)
802.11a	5745	Ant0	0.00	10.35	10.35	30
	5745	Ant1	0.00	10.10	10.10	30
	5785	Ant0	0.00	10.77	10.77	30
	5785	Ant1	0.00	10.45	10.45	30
	5825	Ant0	0.00	9.73	9.73	30
	5825	Ant1	0.00	9.45	9.45	30
802.11n (HT20) MIMO	5745	Ant0+Ant1	0.00	10.85	13.69	30
				10.50		
	5785	Ant0+Ant1	0.00	10.94	13.89	30
				10.81		
	5825	Ant0+Ant1	0.00	10.60	13.26	30
				9.87		
802.11n (HT40) MIMO	5755	Ant0+Ant1	0.00	13.40	16.22	30
				13.02		
	5795	Ant0+Ant1	0.00	13.16		30

**TEST REPORT**

				12.96	16.07	
802.11ac (HT20) MIMO	5745	Ant0+Ant1	0.00	10.68	13.56	30
				10.42		
	5785	Ant0+Ant1	0.00	10.94	13.78	30
				10.59		
	5825	Ant0+Ant1	0.00	10.62	13.27	30
				9.86		
802.11ac (HT40) MIMO	5755	Ant0+Ant1	0.00	13.44	16.31	30
				13.15		
	5795	Ant0+Ant1	0.00	13.32	16.13	30
			0.00	12.92		
802.11ac (VHT80) MIMO	5775	Ant0+Ant1	0.14	11.33	14.03	30

**TEST REPORT**

## 4 Radiated Emissions

**Test result: Pass**

### 4.1 Limit

The radiated emissions which fall in the restricted bands, and the radiated emissions below 1GHz, must comply with the radiated emission limits specified showed as below:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

The radiated emissions which fall outside the restrict bands, should comply with the EIRP limit as below:

For transmitters operating in the 5.15 - 5.25 / 5.25 - 5.35 / 5.47 - 5.725GHz band:

Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBμV/m)
<5150	-27	68.20
>5350		
<5470		
>5725		

For transmitters operating in the 5.725 - 5.85GHz band:

Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (3m) (dBμV/m)
<5650	-27	68.20
5650 ~ 5700	-27 ~ 10	68.20 ~ 105.20
5700 ~ 5720	10 ~ 15.6	105.20 ~ 110.80
5720 ~ 5725	15.6 ~ 27	110.80 ~ 122.20
5850 ~ 5855	27 ~ 15.6	122.20 ~ 110.80
5855 ~ 5875	15.6 ~ 10	110.80 ~ 105.20
5875 ~ 5925	10 ~ -27	105.20 ~ 68.20
>5925	-27	68.20

**TEST REPORT****4.2 Measurement Procedure****For Radiated emission below 30MHz:**

- a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) Both X and Y axes of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

**For Radiated emission above 30MHz:**

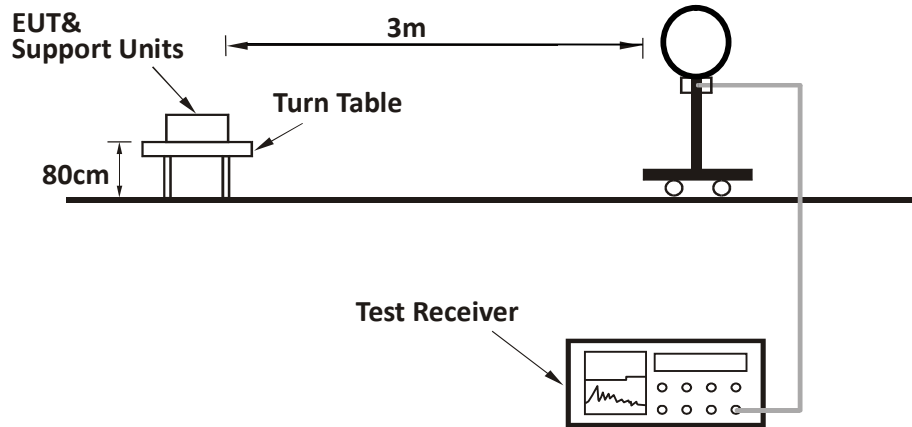
- a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

**Note:**

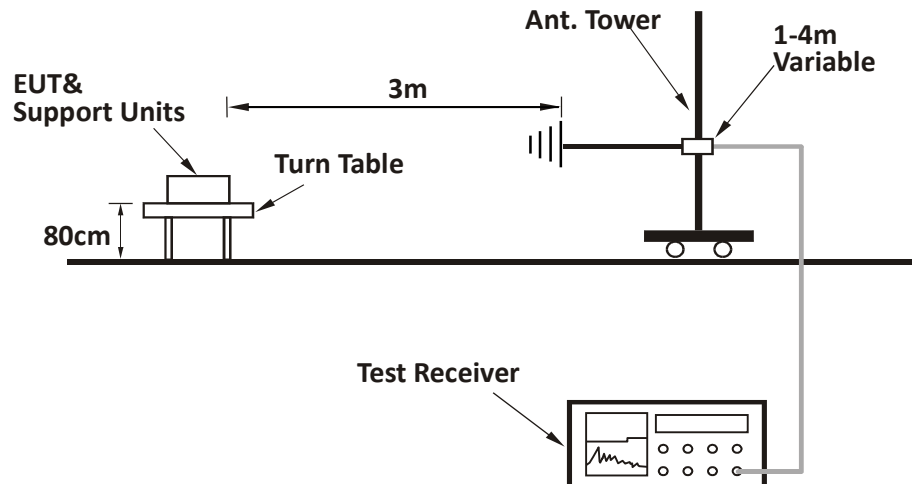
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98%) or 3 x RBW (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported

### 4.3 Test Configuration

For Radiated emission below 30MHz:

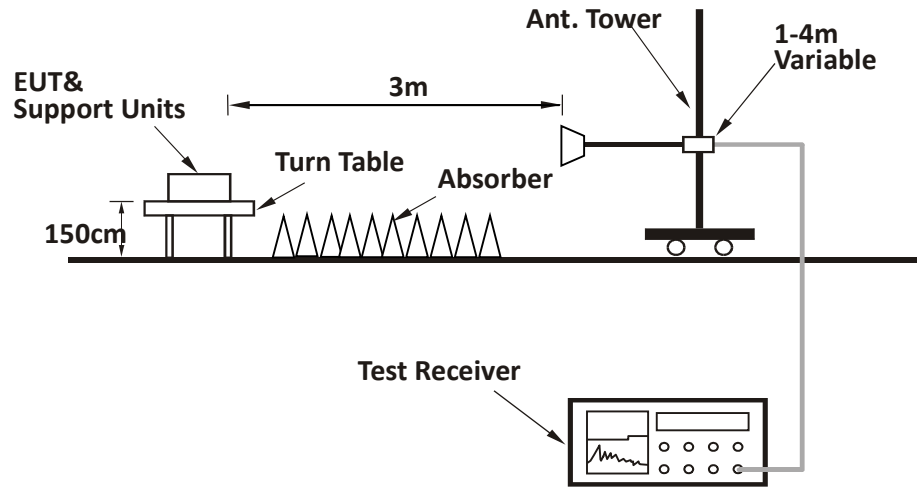


For Radiated emission 30MHz to 1GHz:





**For Radiated emission above 1GHz:**



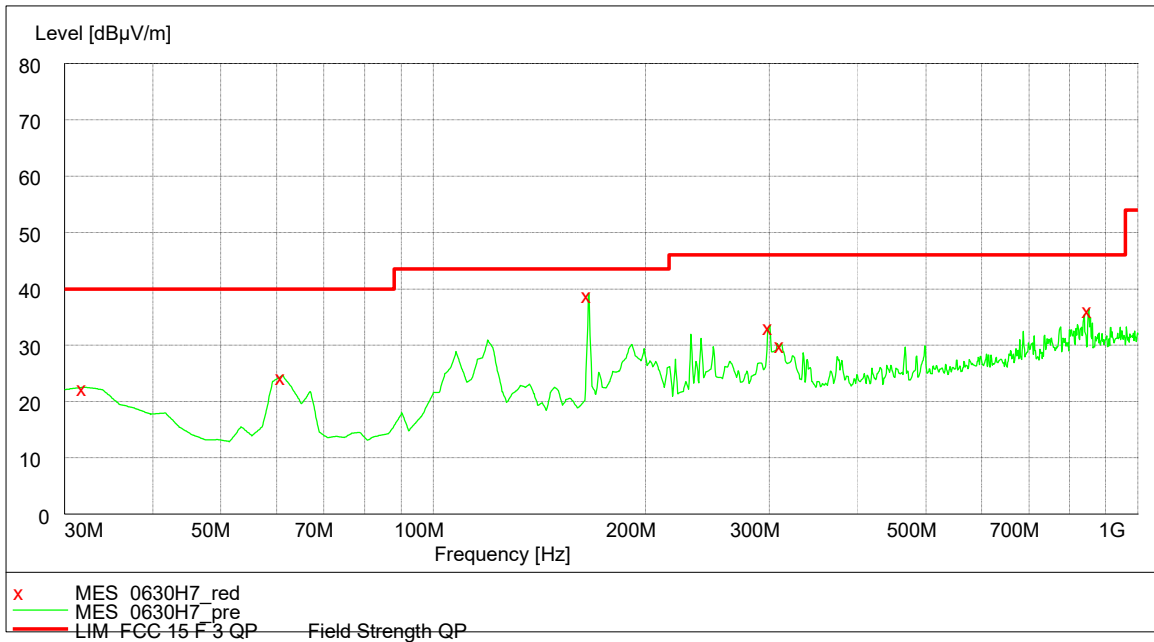
**TEST REPORT**

**4.4 Test Results of Radiated Emissions**

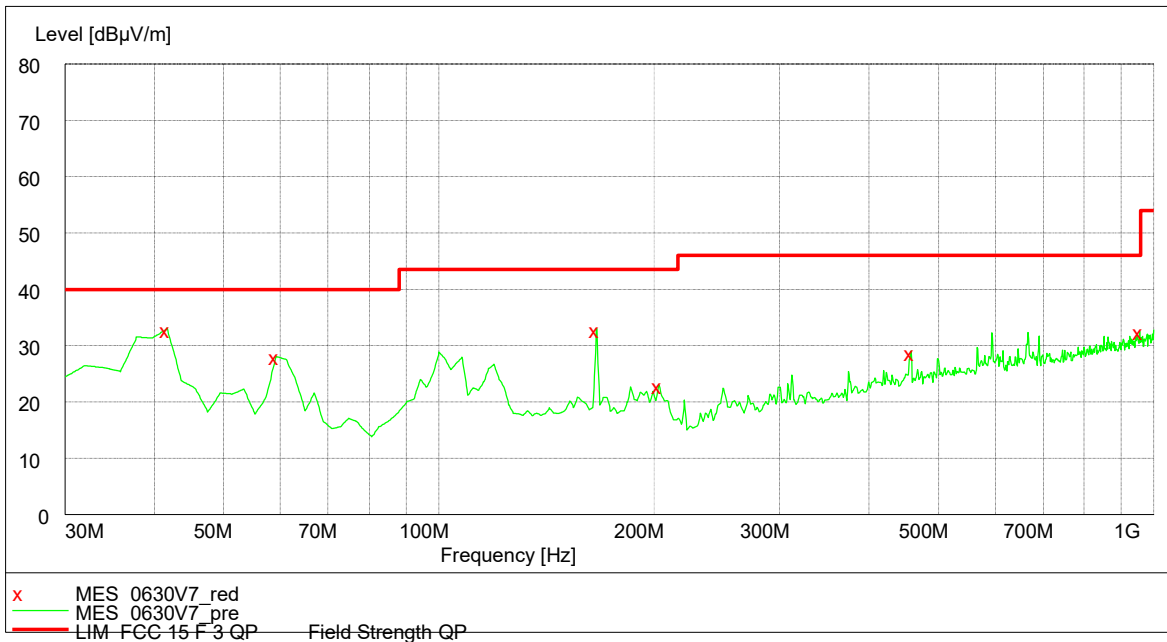
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

The worst waveform from 30MHz to 1000MHz is listed as below(Chip antenna 802.11n40):

Horizontal



Vertical



**TEST REPORT**

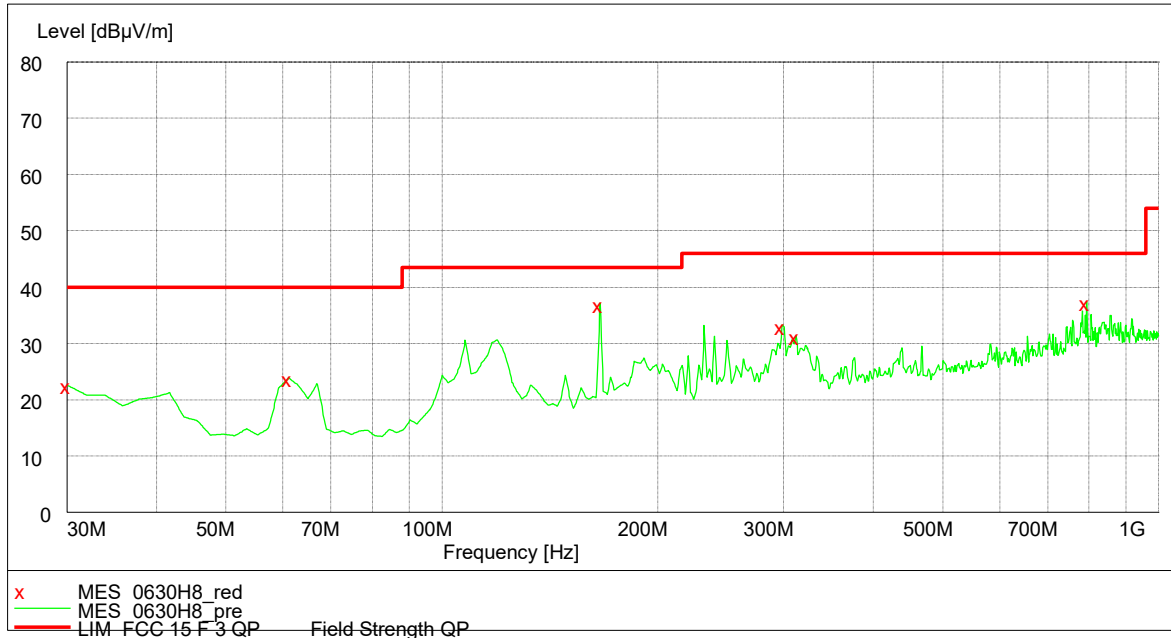
**Test data 30MHz~1GHz:**

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	31.94	22.60	17.6	40.00	17.4	PK
H	61.10	24.60	7.10	40.00	15.4	PK
H	166.07	39.20	11.1	43.50	4.3	PK
H	300.20	33.50	14.9	46.00	12.5	PK
H	311.86	30.30	15.3	46.00	15.7	PK
H	852.26	36.40	23.3	46.00	9.6	PK
V	41.66	33.00	12.6	40.00	7.0	PK
V	59.16	28.10	7.20	40.00	11.9	PK
V	166.07	33.00	11.1	43.50	10.5	PK
V	203.01	23.00	11.1	43.50	20.5	PK
V	457.66	29.00	18.9	46.00	17.0	PK
V	955.29	32.60	24.3	46.00	13.4	PK

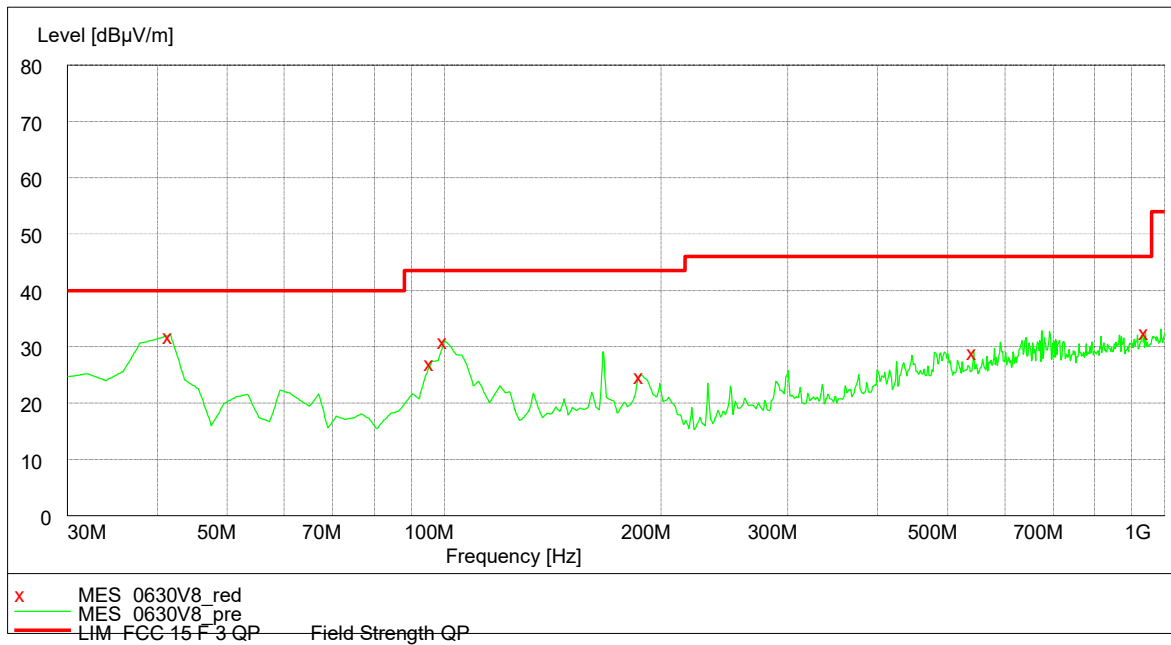
**TEST REPORT**

The worst waveform from 30MHz to 1000MHz is listed as below(PCB antenna 802.11n40):

**Horizontal**



**Vertical**



**TEST REPORT**

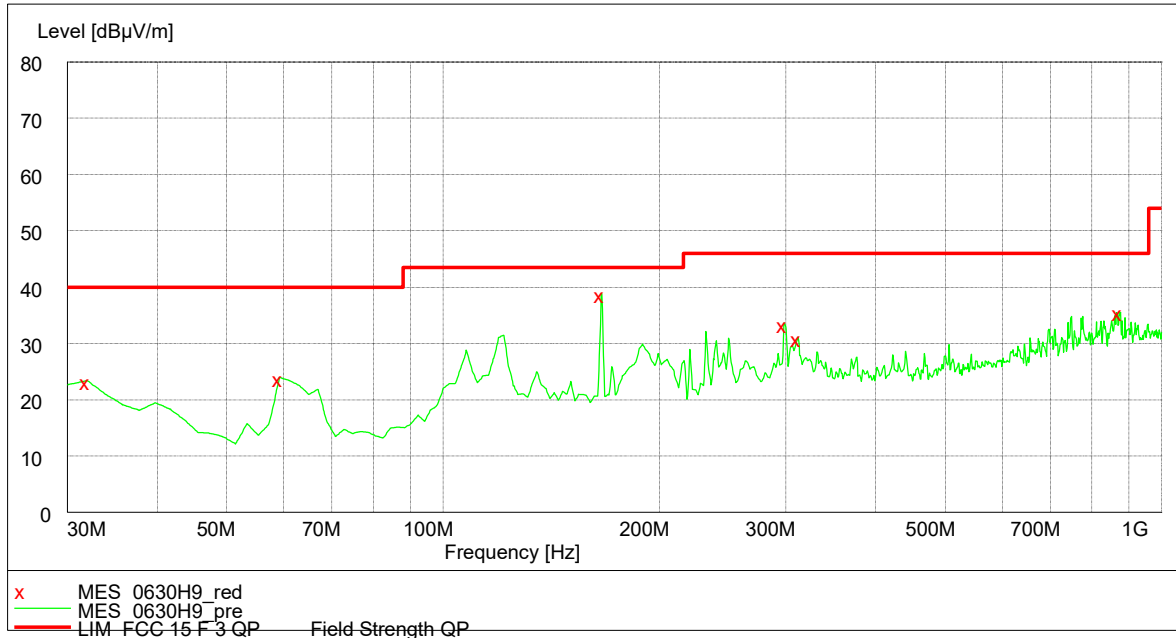
**Test data 30MHz~1GHz:**

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	30.00	22.60	18.8	40.00	17.4	PK
H	61.10	23.90	7.10	40.00	16.1	PK
H	166.07	37.10	11.1	43.50	4.8	PK
H	298.26	33.20	14.9	46.00	6.4	PK
H	311.86	31.30	15.3	46.00	14.7	PK
H	793.95	37.50	12.6	46.00	8.5	PK
V	41.66	32.10	11.3	40.00	7.9	PK
V	96.09	31.20	17.0	43.50	16.2	PK
V	99.98	25.10	12.1	43.50	12.3	PK
V	187.45	34.40	10.8	43.50	18.4	PK
V	543.19	29.20	20.2	46.00	16.8	PK
V	941.68	32.80	24.1	46.00	13.2	PK

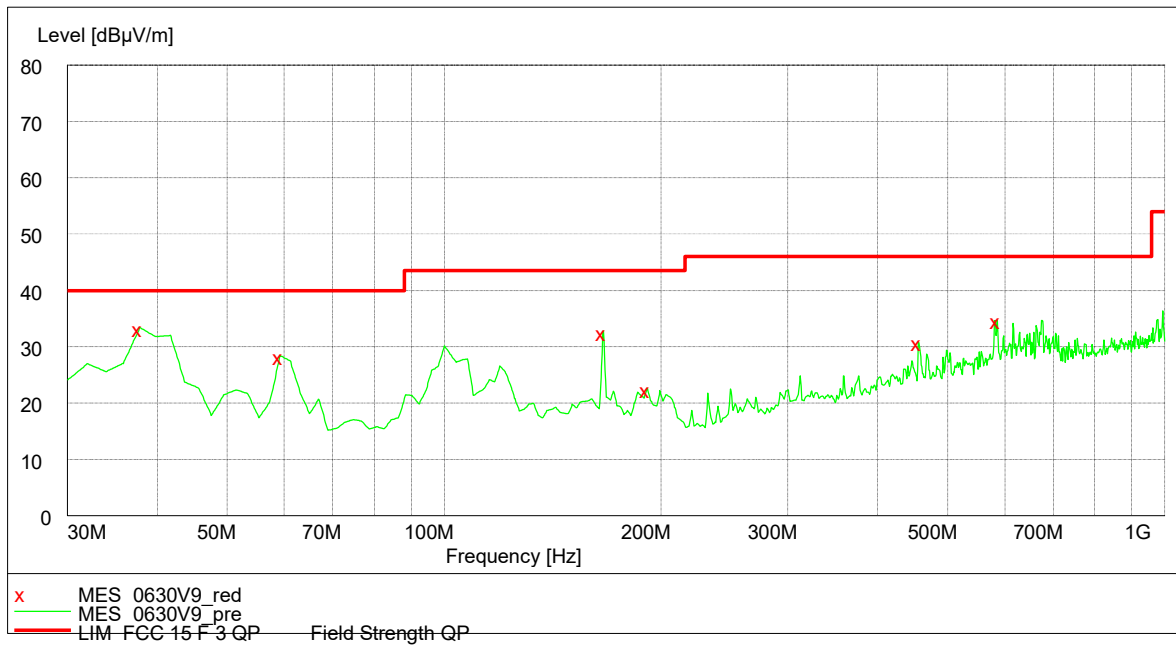
**TEST REPORT**

The worst waveform from 30MHz to 1000MHz is listed as below(Pole antenna 802.11n40):

**Horizontal**



**Vertical**



**TEST REPORT**

**Test data 30MHz~1GHz:**

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	31.94	23.40	17.6	40.00	16.6	PK
H	59.16	24.00	7.20	40.00	16.0	PK
H	166.07	38.80	11.1	43.50	4.7	PK
H	298.26	33.60	14.9	46.00	12.4	PK
H	311.86	31.10	15.3	46.00	14.9	PK
H	873.65	35.60	23.5	46.00	10.4	PK
V	37.78	33.40	14.5	40.00	6.6	PK
V	59.19	28.40	7.20	40.00	11.6	PK
V	166.07	32.70	11.1	43.50	10.8	PK
V	191.34	22.60	10.9	43.50	20.9	PK
V	455.71	30.90	18.9	46.00	15.1	PK
V	585.95	34.70	20.7	46.00	11.3	PK

**TEST REPORT**

**Test result above 1GHz:**

The emission was conducted from 1GHz to 40GHz

**pole antenna**

**U-NII-1 Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5180.00	40.50	99.10	Fundamental	/	PK
	V	5180.00	40.50	91.50	Fundamental	/	PK
	H	5150.00	40.30	50.70	74.00	23.30	PK
	V	5150.00	40.30	48.30	74.00	25.70	PK
	H	10360.00	14.50	45.90	74.00	28.10	PK
	V	10360.00	14.50	44.55	74.00	29.45	PK
M	H	10400.00	14.50	46.20	74.00	27.80	PK
	V	10400.00	14.50	45.55	74.00	28.45	PK
H	H	5240.00	40.70	102.80	Fundamental	/	PK
	V	5240.00	40.70	95.90	Fundamental	/	PK
	H	5350.00	41.10	50.90	74.00	23.10	
	V	5350.00	41.10	50.80	74.00	23.20	PK
	H	10480.00	14.50	47.02	74.00	26.98	PK
	V	10480.00	14.50	46.58	74.00	27.42	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5180.00	40.50	99.30	Fundamental	/	PK
	V	5180.00	40.50	90.70	Fundamental	/	PK
	H	5150.00	40.30	48.60	74.00	25.40	PK
	V	5150.00	40.30	48.90	54.00	5.10	AV
	H	10360.00	14.50	45.35	74.00	28.65	PK
	V	10360.00	14.50	43.25	74.00	30.75	PK



**TEST REPORT**

M	H	10400.00	14.50	46.85	74.00	27.15	PK
	V	10400.00	14.50	45.15	74.00	28.85	PK
H	H	5240.00	40.70	101.00	Fundamental	/	PK
	V	5240.00	40.70	94.10	Fundamental	/	PK
	H	5350.00	41.10	48.70	74.00	25.30	PK
	V	5350.00	41.10	48.40	74.00	25.60	PK
	H	10480.00	14.50	47.08	74.00	26.92	PK
	V	10480.00	14.50	45.16	74.00	28.84	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5190.00	40.50	93.60	Fundamental	/	PK
	V	5190.00	40.50	88.10	Fundamental	/	PK
	H	5150.00	40.30	48.50	74.00	25.50	PK
	V	5150.00	40.30	47.60	74.00	26.40	PK
	H	10380.00	14.50	47.36	74.00	26.64	PK
	V	10380.00	14.50	46.68	74.00	27.32	PK
H	H	5230.00	40.70	101.20	Fundamental	/	PK
	V	5230.00	40.70	94.70	Fundamental	/	PK
	H	5350.00	41.10	48.60	74.00	25.40	PK
	V	5350.00	41.10	49.80	74.00	24.20	PK
	H	10460.00	14.50	47.86	74.00	26.14	PK
	V	10460.00	14.50	46.95	74.00	27.05	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
M	H	5210.00	40.50	94.90	Fundamental	/	PK
	V	5210.00	40.50	94.90	Fundamental	/	PK
	H	5150.00	40.30	58.40	74.00	15.60	PK

**TEST REPORT**

	H	5150.00	40.30	49.40	54.00	4.60	AV
	V	5150.00	40.30	51.40	74.00	22.60	PK
	H	10420.00	14.50	48.45	74.00	25.55	PK
	V	10420.00	14.50	47.10	74.00	26.90	PK

**U-NII-2A Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	10527.30	14.40	48.15	74.00	25.85	PK
	V	10528.30	14.40	46.82	74.00	27.18	PK
M	H	10604.30	14.40	48.96	74.00	25.04	PK
	V	10604.70	14.40	46.28	74.00	27.72	PK
H	H	5320.00	41.20	109.40	Fundamental	/	PK
	V	5320.00	41.20	102.70	Fundamental	/	PK
	H	5350.00	41.10	59.30	74.00	14.70	PK
	H	5350.00	41.10	46.20	54.00	7.80	AV
	V	5350.00	41.10	53.90	74.00	20.10	PK
	H	10640.00	14.40	48.98	74.00	25.02	PK
	V	10640.00	14.40	46.80	74.00	27.20	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	10528.30	14.40	47.58	74.00	26.42	PK
	V	10528.50	14.40	46.85	74.00	27.15	PK
M	H	10606.60	14.40	48.46	74.00	25.54	PK
	V	10606.90	14.40	46.06	74.00	27.94	PK
H	H	5320.00	41.10	106.90	Fundamental	/	PK
	V	5320.00	41.10	102.80	Fundamental	/	PK
	H	5350.00	41.10	53.90	74.00	20.10	PK

**TEST REPORT**

	V	5350.00	41.10	53.80	74.00	20.20	PK
	H	10640.00	14.40	49.25	74.00	24.75	PK
	V	10640.00	14.40	47.89	74.00	26.11	PK

**802.11n40**

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	H	10546.20	14.40	48.45	74.00	25.55	PK
	V	10546.30	14.40	47.15	74.00	26.85	PK
H	H	5310.00	41.20	103.30	Fundamental	/	PK
	V	5310.00	41.20	97.10	Fundamental	/	PK
	H	5350.00	41.10	53.90	74.00	20.10	PK
	V	5350.00	41.10	53.20	74.00	20.80	PK
	H	10620.00	14.40	49.38	74.00	24.62	PK
	V	10620.00	14.40	47.55	74.00	26.45	PK

**802.11ac80**

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5290.00	41.10	97.70	Fundamental	/	PK
	V	5290.00	41.10	91.80	Fundamental	/	PK
	H	5350.00	41.10	53.40	74.00	20.60	PK
	V	5350.00	41.10	50.80	74.00	23.20	PK
	H	10580.00	14.40	48.27	74.00	25.73	PK
	V	10580.00	14.40	46.68	74.00	27.32	PK

**TEST REPORT**

**U-NII-2C Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5500.00	41.30	107.50	Fundamental	/	PK
	V	5500.00	41.40	103.40	Fundamental	/	PK
	H	5460.00	41.40	53.90	74.00	20.10	PK
	V	5460.00	41.40	53.80	74.00	20.20	PK
	H	11000.00	14.20	49.58	74.00	24.42	PK
	V	11000.00	14.20	48.74	74.00	25.26	PK
M	H	11206.60	14.10	50.05	74.00	23.95	PK
	V	11206.50	14.10	49.55	74.00	24.45	PK
H	H	11407.50	14.00	50.85	74.00	23.15	PK
	V	11407.40	14.00	48.90	74.00	25.10	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5500.00	41.30	106.30	Fundamental	/	PK
	V	5500.00	41.30	102.60	Fundamental	/	PK
	H	5460.00	41.40	53.80	74.00	20.20	PK
	V	5460.00	41.40	53.50	74.00	20.50	PK
	H	11000.00	14.20	49.45	74.00	24.55	PK
	V	11000.00	14.20	47.28	74.00	26.72	PK
M	H	11207.50	14.10	49.90	74.00	24.10	PK
	V	11207.50	14.10	48.56	74.00	25.44	PK
H	H	11405.70	14.00	49.55	74.00	24.45	PK
	V	11405.70	14.00	47.80	74.00	26.20	PK

**TEST REPORT**

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5510.00	41.40	100.50	Fundamental	/	PK
	V	5510.00	41.40	97.30	Fundamental	/	PK
	H	5460.00	41.40	53.50	74.00	20.50	PK
	V	5460.00	41.40	52.60	74.00	21.40	PK
	H	11020.00	14.20	49.16	74.00	24.84	PK
	V	11020.00	14.20	47.25	74.00	26.75	PK
M	H	11178.30	14.10	50.76	74.00	23.24	PK
	V	11178.40	14.10	49.39	74.00	24.61	PK
H	H	11337.60	14.00	49.05	74.00	24.95	PK
	V	11337.60	14.00	47.58	74.00	26.42	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5530.00	41.40	96.80	Fundamental	/	PK
	V	5530.00	41.40	94.60	Fundamental	/	PK
	H	5460.00	41.40	52.90	74.00	21.10	PK
	V	5460.00	41.40	51.30	74.00	22.70	PK
	H	11067.70	14.10	50.26	74.00	23.74	PK
	V	11068.10	14.10	49.84	74.00	24.16	PK
H	H	11206.40	14.00	50.20	74.00	23.80	PK
	V	11206.40	14.00	48.38	74.00	25.62	PK

**U-NII-3 Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5745.00	41.60	103.50	Fundamental	/	PK

**TEST REPORT**

	V	5745.00	41.60	100.50	Fundamental	/	PK
	H	5638.00	41.60	55.50	68.20	12.70	PK
	V	5602.00	41.40	54.80	68.20	13.40	PK
	H	11490.00	13.80	50.40	74.00	23.60	PK
	V	11490.00	13.80	48.85	74.00	25.15	PK
M	H	11576.80	13.70	50.16	74.00	23.84	PK
	V	11576.80	13.70	49.90	74.00	24.10	PK
H	H	5825.00	41.90	104.20	Fundamental	/	PK
	V	5825.00	41.90	101.80	Fundamental	/	PK
	H	5985.00	42.30	56.20	68.20	12.00	PK
	V	5986.00	42.40	55.30	68.20	12.90	PK
	H	11650.00	13.70	49.58	74.00	24.42	PK
	V	11650.00	13.70	48.05	74.00	25.95	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5745.00	41.70	103.50	Fundamental	/	PK
	V	5745.00	41.70	99.50	Fundamental	/	PK
	H	5594.00	41.30	56.00	68.80	12.80	PK
	V	5620.00	41.50	54.70	68.80	14.10	PK
	H	11495.00	13.80	49.66	74.00	24.34	PK
	V	11495.00	13.80	47.95	74.00	26.05	PK
M	H	11578.80	13.70	48.10	74.00	25.90	PK
	V	11578.14	13.70	46.18	74.00	27.82	PK
H	H	5825.00	41.90	103.50	Fundamental	/	PK
	V	5825.00	41.90	99.10	Fundamental	/	PK
	H	5963.00	42.40	54.90	68.80	13.90	PK
	V	5977.00	42.40	55.10	68.80	13.70	PK
	H	11658.70	13.70	49.58	74.00	24.42	PK

**TEST REPORT**

	V	11658.70	13.70	46.19	74.00	27.81	PK
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## 802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5755.00	41.70	103.10	Fundamental	/	PK
	V	5755.00	41.70	98.70	Fundamental	/	PK
	H	5949.00	42.40	55.20	68.80	13.60	PK
	V	5570.00	41.40	54.50	68.80	14.30	PK
	H	11510.00	13.70	49.55	74.00	24.45	PK
	V	11510.00	13.70	47.37	74.00	26.63	PK
H	H	5795.00	41.80	102.50	Fundamental	/	PK
	V	5795.00	41.80	100.40	Fundamental	/	PK
	H	6012.00	42.40	56.50	68.80	12.3	PK
	V	5980.00	42.40	54.80	68.80	14.00	PK
	H	11598.20	13.70	50.10	74.00	23.90	PK
	V	11598.40	13.70	48.58	74.00	25.42	PK

## 802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5775.00	41.80	97.40	Fundamental	/	PK
	V	5775.00	41.80	94.00	Fundamental	/	PK
	H	5960.00	42.40	54.80	68.80	14.00	PK
	V	5945.00	42.40	55.60	68.80	13.20	PK
	H	11510.00	13.70	49.68	74.00	24.32	PK
	V	11510.00	13.70	48.15	74.00	25.85	PK

**TEST REPORT**

**PCB Antenna**

**U-NII-1 Band:**

**802.11a**

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5180.00	40.50	98.50	Fundamental	/	PK
	V	5180.00	40.50	90.05	Fundamental	/	PK
	H	5150.00	40.30	49.58	74.00	24.42	PK
	V	5150.00	40.30	47.55	74.00	26.45	PK
	H	10360.00	14.50	46.90	74.00	27.10	PK
	V	10360.00	14.50	44.15	74.00	29.85	PK
M	H	10400.00	14.50	46.80	74.00	27.20	PK
	V	10400.00	14.50	45.20	74.00	28.80	PK
H	H	5240.00	40.70	101.25	Fundamental	/	PK
	V	5240.00	40.70	94.15	Fundamental	/	PK
	H	5350.00	41.10	51.10	74.00	22.90	PK
	V	5350.00	41.10	49.06	74.00	24.94	PK
	H	10480.00	14.50	47.55	74.00	26.45	PK
	V	10480.00	14.50	45.15	74.00	28.85	PK

**802.11n20**

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5180.00	40.50	98.15	Fundamental	/	PK
	V	5180.00	40.50	90.00	Fundamental	/	PK
	H	5150.00	40.30	49.10	74.00	24.90	PK
	V	5150.00	40.30	48.55	54.00	5.45	AV
	H	10360.00	14.50	46.25	74.00	27.75	PK
	V	10360.00	14.50	42.58	74.00	31.42	PK
M	H	10400.00	14.50	47.01	74.00	26.99	PK



**TEST REPORT**

	V	10400.00	14.50	45.58	74.00	28.42	PK
H	H	5240.00	40.70	100.58	Fundamental	/	PK
	V	5240.00	40.70	93.40	Fundamental	/	PK
	H	5350.00	41.10	49.01	74.00	24.99	PK
	V	5350.00	41.10	48.05	74.00	25.95	PK
	H	10480.00	14.50	47.65	74.00	26.35	PK
	V	10480.00	14.50	49.80	74.00	24.20	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5190.00	40.50	93.10	Fundamental	/	PK
	V	5190.00	40.50	88.26	Fundamental	/	PK
	H	5150.00	40.30	49.15	74.00	24.85	PK
	V	5150.00	40.30	47.15	74.00	26.85	PK
	H	10380.00	14.50	47.90	74.00	26.10	PK
	V	10380.00	14.50	46.10	74.00	27.90	PK
H	H	5230.00	40.70	100.85	Fundamental	/	PK
	V	5230.00	40.70	93.80	Fundamental	/	PK
	H	5350.00	41.10	49.00	74.00	25.00	PK
	V	5350.00	41.10	48.16	74.00	25.84	PK
	H	10460.00	14.50	48.16	74.00	25.84	PK
	V	10460.00	14.50	47.15	74.00	26.85	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
M	H	5210.00	40.50	95.10	Fundamental	/	PK
	V	5210.00	40.50	94.25	Fundamental	/	PK
	H	5150.00	40.30	58.25	74.00	15.75	PK
	H	5150.00	40.30	50.12	54.00	3.88	AV

**TEST REPORT**

	V	5150.00	40.30	51.80	74.00	22.20	PK
	H	10420.00	14.50	49.20	74.00	24.80	PK
	V	10420.00	14.50	47.85	74.00	26.15	PK

**U-NII-2A Band:**

## 802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	10527.30	14.40	49.10	74.00	24.90	PK
	V	10528.30	14.40	47.16	74.00	26.84	PK
M	H	10604.30	14.40	49.12	74.00	24.88	PK
	V	10604.70	14.40	47.87	74.00	26.13	PK
H	H	5320.00	41.20	108.55	Fundamental	/	PK
	V	5320.00	41.20	102.10	Fundamental	/	PK
	H	5350.00	41.10	60.12	74.00	13.88	PK
	H	5350.00	41.10	47.18	54.00	6.82	AV
	V	5350.00	41.10	53.15	74.00	20.85	PK
	H	10640.00	14.40	49.05	74.00	24.95	PK
	V	10640.00	14.40	47.15	74.00	26.85	PK

## 802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	10528.30	14.40	48.10	74.00	25.90	PK
	V	10528.50	14.40	46.55	74.00	27.45	PK
M	H	10606.60	14.40	49.01	74.00	24.99	PK
	V	10606.90	14.40	47.26	74.00	26.74	PK
H	H	5320.00	41.10	105.85	Fundamental	/	PK
	V	5320.00	41.10	102.80	Fundamental	/	PK
	H	5350.00	41.10	53.25	74.00	20.75	PK
	V	5350.00	41.10	52.10	74.00	21.90	PK

**TEST REPORT**

	H	10640.00	14.40	50.00	74.00	24.00	PK
	V	10640.00	14.40	48.26	74.00	25.74	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	H	10546.20	14.40	48.96	74.00	25.04	PK
	V	10546.30	14.40	46.15	74.00	27.85	PK
H	H	5310.00	41.20	102.55	Fundamental	/	PK
	V	5310.00	41.20	96.50	Fundamental	/	PK
	H	5350.00	41.10	53.45	74.00	20.55	PK
	V	5350.00	41.10	52.10	74.00	21.90	PK
	H	10620.00	14.40	49.25	74.00	24.75	PK
	V	10620.00	14.40	47.06	74.00	26.94	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5290.00	41.10	96.55	Fundamental	/	PK
	V	5290.00	41.10	90.90	Fundamental	/	PK
	H	5350.00	41.10	53.75	74.00	20.25	PK
	V	5350.00	41.10	51.20	74.00	22.80	PK
	H	10580.00	14.40	49.10	74.00	24.90	PK
	V	10580.00	14.40	47.26	74.00	26.74	PK

**TEST REPORT**

**U-NII-2C Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5500.00	41.30	106.58	Fundamental	/	PK
	V	5500.00	41.40	103.02	Fundamental	/	PK
	H	5460.00	41.40	53.15	74.00	20.85	PK
	V	5460.00	41.40	52.16	74.00	21.84	PK
	H	11000.00	14.20	50.05	74.00	23.95	PK
	V	11000.00	14.20	49.18	74.00	24.82	PK
M	H	11206.60	14.10	50.65	74.00	23.35	PK
	V	11206.50	14.10	49.10	74.00	24.90	PK
H	H	11407.50	14.00	51.86	74.00	22.14	PK
	V	11407.40	14.00	49.05	74.00	24.95	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5500.00	41.30	105.16	Fundamental	/	PK
	V	5500.00	41.30	101.55	Fundamental	/	PK
	H	5460.00	41.40	52.15	74.00	21.85	PK
	V	5460.00	41.40	50.10	74.00	23.90	PK
	H	11000.00	14.20	49.55	74.00	24.45	PK
	V	11000.00	14.20	47.10	74.00	26.90	PK
M	H	11207.50	14.10	50.05	74.00	23.95	PK
	V	11207.50	14.10	48.15	74.00	25.85	PK
H	H	11405.70	14.00	49.22	74.00	24.78	PK
	V	11405.70	14.00	48.08	74.00	25.92	PK

**TEST REPORT**

## 802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5510.00	41.40	99.85	Fundamental	/	PK
	V	5510.00	41.40	97.30	Fundamental	/	PK
	H	5460.00	41.40	53.10	74.00	20.90	PK
	V	5460.00	41.40	51.55	74.00	22.45	PK
	H	11020.00	14.20	49.35	74.00	24.65	PK
	V	11020.00	14.20	48.05	74.00	25.95	PK
M	H	11178.30	14.10	51.22	74.00	22.78	PK
	V	11178.40	14.10	49.10	74.00	24.90	PK
H	H	11337.60	14.00	49.98	74.00	24.02	PK
	V	11337.60	14.00	48.18	74.00	25.82	PK

## 802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5530.00	41.40	95.85	Fundamental	/	PK
	V	5530.00	41.40	94.25	Fundamental	/	PK
	H	5460.00	41.40	53.05	74.00	20.95	PK
	V	5460.00	41.40	52.10	74.00	21.90	PK
	H	11067.70	14.10	50.88	74.00	23.12	PK
	V	11068.10	14.10	49.26	74.00	24.74	PK
H	H	11206.40	14.00	51.08	74.00	22.92	PK
	V	11206.40	14.00	49.11	74.00	24.89	PK

**U-NII-3 Band:**

## 802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5745.00	41.60	102.16	Fundamental	/	PK

**TEST REPORT**

	V	5745.00	41.60	99.89	Fundamental	/	PK
	H	5638.00	41.60	56.05	68.20	12.15	PK
	V	5602.00	41.40	55.10	68.20	13.10	PK
	H	11490.00	13.80	50.98	74.00	23.02	PK
	V	11490.00	13.80	48.25	74.00	25.75	PK
M	H	11576.80	13.70	50.45	74.00	23.55	PK
	V	11576.80	13.70	49.52	74.00	24.48	PK
H	H	5825.00	41.90	103.15	Fundamental	/	PK
	V	5825.00	41.90	101.10	Fundamental	/	PK
	H	5985.00	42.30	55.85	68.20	12.35	PK
	V	5986.00	42.40	54.10	68.20	14.10	PK
	H	11650.00	13.70	49.15	74.00	24.85	PK
	V	11650.00	13.70	48.06	74.00	25.94	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5745.00	41.70	102.16	Fundamental	/	PK
	V	5745.00	41.70	98.50	Fundamental	/	PK
	H	5594.00	41.30	56.25	68.80	12.55	PK
	V	5620.00	41.50	54.05	68.80	14.75	PK
	H	11495.00	13.80	49.18	74.00	24.82	PK
	V	11495.00	13.80	48.10	74.00	25.90	PK
M	H	11578.80	13.70	48.90	74.00	25.10	PK
	V	11578.14	13.70	47.18	74.00	26.82	PK
H	H	5825.00	41.90	102.58	Fundamental	/	PK
	V	5825.00	41.90	98.85	Fundamental	/	PK
	H	5963.00	42.40	55.48	68.80	13.32	PK
	V	5977.00	42.40	54.10	68.80	14.70	PK
	H	11658.70	13.70	50.05	74.00	23.95	PK

**TEST REPORT**

	V	11658.70	13.70	48.98	74.00	25.02	PK
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802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5755.00	41.70	102.55	Fundamental	/	PK
	V	5755.00	41.70	99.50	Fundamental	/	PK
	H	5949.00	42.40	54.58	68.80	14.22	PK
	V	5570.00	41.40	52.10	68.80	16.70	PK
	H	11510.00	13.70	50.15	74.00	23.85	PK
	V	11510.00	13.70	48.05	74.00	25.95	PK
H	H	5795.00	41.80	101.55	Fundamental	/	PK
	V	5795.00	41.80	99.85	Fundamental	/	PK
	H	6012.00	42.40	56.91	68.80	11.89	PK
	V	5980.00	42.40	55.05	68.80	13.75	PK
	H	11598.20	13.70	50.59	74.00	23.41	PK
	V	11598.40	13.70	49.18	74.00	24.82	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5775.00	41.80	97.00	Fundamental	/	PK
	V	5775.00	41.80	93.56	Fundamental	/	PK
	H	5960.00	42.40	55.10	68.80	13.70	PK
	V	5945.00	42.40	53.88	68.80	14.92	P
	H	11510.00	13.70	50.55	74.00	23.45	PK
	V	11510.00	13.70	49.16	74.00	24.84	PK

**TEST REPORT**

**Chip antenna**

**U-NII-1 Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5180.00	40.50	102.45	Fundamental	/	PK
	V	5180.00	40.50	95.01	Fundamental	/	PK
	H	5150.00	40.30	53.10	74.00	20.90	PK
	V	5150.00	40.30	50.55	74.00	23.45	PK
	H	10360.00	14.50	46.15	74.00	27.85	PK
	V	10360.00	14.50	46.01	74.00	27.99	PK
M	H	10400.00	14.50	47.00	74.00	27.00	PK
	V	10400.00	14.50	46.25	74.00	27.75	PK
H	H	5240.00	40.70	104.15	Fundamental	/	PK
	V	5240.00	40.70	97.20	Fundamental	/	PK
	H	5350.00	41.10	55.10	74.00	18.9	PK
	H	5350.00	41.10	48.95	54.00	5.05	AV
	V	5350.00	41.10	51.26	74.00	22.74	PK
	H	10480.00	14.50	48.20	74.00	25.80	PK
	V	10480.00	14.50	47.26	74.00	26.74	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5180.00	40.50	102.55	Fundamental	/	PK
	V	5180.00	40.50	95.45	Fundamental	/	PK
	H	5150.00	40.30	51.10	74.00	22.90	PK
	V	5150.00	40.30	49.58	54.00	4.42	AV
	H	10360.00	14.50	46.10	74.00	27.90	PK
	V	10360.00	14.50	44.98	74.00	29.02	PK



**TEST REPORT**

M	H	10400.00	14.50	47.85	74.00	26.15	PK
	V	10400.00	14.50	46.30	74.00	27.70	PK
H	H	5240.00	40.70	103.58	Fundamental	/	PK
	V	5240.00	40.70	96.10	Fundamental	/	PK
	H	5350.00	41.10	50.37	74.00	23.63	PK
	V	5350.00	41.10	49.15	74.00	24.85	PK
	H	10480.00	14.50	48.90	74.00	25.10	PK
	V	10480.00	14.50	46.58	74.00	27.42	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5190.00	40.50	96.10	Fundamental	/	PK
	V	5190.00	40.50	90.35	Fundamental	/	PK
	H	5150.00	40.30	49.58	74.00	24.42	PK
	V	5150.00	40.30	48.35	74.00	25.65	PK
	H	10380.00	14.50	47.05	74.00	26.95	PK
	V	10380.00	14.50	47.58	74.00	26.42	PK
H	H	5230.00	40.70	105.10	Fundamental	/	PK
	V	5230.00	40.70	99.80	Fundamental	/	PK
	H	5350.00	41.10	50.15	74.00	23.85	PK
	V	5350.00	41.10	49.55	74.00	24.45	PK
	H	10460.00	14.50	48.68	74.00	25.32	PK
	V	10460.00	14.50	47.65	74.00	26.35	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
M	H	5210.00	40.50	101.45	Fundamental	/	PK
	V	5210.00	40.50	96.58	Fundamental	/	PK
	H	5150.00	40.30	59.40	74.00	14.60	PK

**TEST REPORT**

	H	5150.00	40.30	50.36	54.00	3.64	AV
	V	5150.00	40.30	52.45	74.00	21.55	PK
	H	10420.00	14.50	49.45	74.00	24.55	PK
	V	10420.00	14.50	49.01	74.00	24.99	PK

**U-NII-2A Band:**

## 802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	10527.30	14.40	49.35	74.00	24.65	PK
	V	10528.30	14.40	47.58	74.00	26.42	PK
M	H	10604.30	14.40	50.15	74.00	23.85	PK
	V	10604.70	14.40	48.50	74.00	25.50	PK
H	H	5320.00	41.20	110.45	Fundamental	/	PK
	V	5320.00	41.20	103.56	Fundamental	/	PK
	H	5350.00	41.10	63.15	74.00	10.85	PK
	H	5350.00	41.10	52.56	54.00	1.44	AV
	V	5350.00	41.10	56.89	74.00	17.11	PK
	V	5350.00	41.10	50.38	54.00	3.62	AV
	H	10640.00	14.40	49.59	74.00	24.41	PK
	V	10640.00	14.40	47.88	74.00	26.12	PK

## 802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	10528.30	14.40	49.60	74.00	24.40	PK
	V	10528.50	14.40	47.86	74.00	26.14	PK
M	H	10606.60	14.40	49.01	74.00	24.99	PK
	V	10606.90	14.40	47.80	74.00	26.20	PK
H	H	5320.00	41.10	108.45	Fundamental	/	PK
	V	5320.00	41.10	103.25	Fundamental	/	PK

**TEST REPORT**

	H	5350.00	41.10	59.49	74.00	14.51	PK
	H	5350.00	41.10	50.49	54.00	3.51	AV
	V	5350.00	41.10	55.58	74.00	18.42	PK
	V	5350.00	41.10	48.10	54.00	5.90	AV
	H	10640.00	14.40	50.35	74.00	23.65	PK
	V	10640.00	14.40	48.30	74.00	25.70	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
	H	10546.20	14.40	49.50	74.00	24.50	PK
	V	10546.30	14.40	48.55	74.00	25.45	PK
H	H	5310.00	41.20	105.30	Fundamental	/	PK
	V	5310.00	41.20	98.45	Fundamental	/	PK
	H	5350.00	41.10	57.30	74.00	16.70	PK
	H	5350.00	41.10	48.10	54.00	5.90	AV
	V	5350.00	41.10	53.90	74.00	20.10	PK
	H	10620.00	14.40	50.10	74.00	23.90	PK
V	10620.00	14.40	48.58	74.00	25.42	PK	

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5290.00	41.10	100.39	Fundamental	/	PK
	V	5290.00	41.10	93.55	Fundamental	/	PK
	H	5350.00	41.10	53.95	74.00	20.05	PK
	V	5350.00	41.10	51.45	74.00	22.55	PK
	H	10580.00	14.40	49.05	74.00	24.95	PK
	V	10580.00	14.40	47.25	74.00	26.75	PK

**TEST REPORT**

**U-NII-2C Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5500.00	41.30	109.47	Fundamental	/	PK
	V	5500.00	41.40	105.30	Fundamental	/	PK
	H	5460.00	41.40	59.55	74.00	14.45	PK
	H	5460.00	41.40	50.15	54.00	3.85	AV
	V	5460.00	41.40	55.80	74.00	18.20	PK
	V	5460.00	41.40	48.80	54.00	5.20	AV
	H	11000.00	14.20	50.16	74.00	23.84	PK
	V	11000.00	14.20	49.35	74.00	24.65	PK
M	H	11206.60	14.10	51.25	74.00	22.75	PK
	V	11206.50	14.10	50.30	74.00	23.70	PK
H	H	11407.50	14.00	51.85	74.00	22.15	PK
	V	11407.40	14.00	49.06	74.00	24.94	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5500.00	41.30	108.36	Fundamental	/	PK
	V	5500.00	41.30	104.58	Fundamental	/	PK
	H	5460.00	41.40	56.38	74.00	17.62	PK
	H	5460.00	41.40	49.06	54.00	4.94	AV
	V	5460.00	41.40	53.98	74.00	20.02	PK
	H	11000.00	14.20	50.46	74.00	23.54	PK
	V	11000.00	14.20	48.90	74.00	25.10	PK
M	H	11207.50	14.10	50.15	74.00	23.85	PK
	V	11207.50	14.10	49.56	74.00	24.44	PK
H	H	11405.70	14.00	50.58	74.00	23.42	PK

**TEST REPORT**

	V	11405.70	14.00	48.90	74.00	25.10	PK
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802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5510.00	41.40	102.45	Fundamental	/	PK
	V	5510.00	41.40	98.10	Fundamental	/	PK
	H	5460.00	41.40	53.90	74.00	20.10	PK
	V	5460.00	41.40	52.78	74.00	21.22	PK
	H	11020.00	14.20	50.15	74.00	23.85	PK
	V	11020.00	14.20	48.90	74.00	25.10	PK
M	H	11178.30	14.10	51.35	74.00	22.65	PK
	V	11178.40	14.10	50.28	74.00	23.72	PK
H	H	11337.60	14.00	50.85	74.00	23.15	PK
	V	11337.60	14.00	49.10	74.00	24.90	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5530.00	41.40	99.50	Fundamental	/	PK
	V	5530.00	41.40	95.30	Fundamental	/	PK
	H	5460.00	41.40	53.55	74.00	20.45	PK
	V	5460.00	41.40	52.10	74.00	21.90	PK
	H	11067.70	14.10	51.05	74.00	22.95	PK
	V	11068.10	14.10	50.18	74.00	23.82	PK
H	H	11206.40	14.00	50.90	74.00	23.10	PK
	V	11206.40	14.00	49.10	74.00	24.90	PK

**U-NII-3 Band:**

802.11a

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
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**TEST REPORT**

L	H	5745.00	41.60	105.20	Fundamental	/	PK
	V	5745.00	41.60	101.55	Fundamental	/	PK
	H	5638.00	41.60	56.10	68.20	12.10	PK
	V	5602.00	41.40	55.01	68.20	13.19	PK
	H	11490.00	13.80	52.15	74.00	21.85	PK
	V	11490.00	13.80	49.08	74.00	24.92	PK
M	H	11576.80	13.70	51.45	74.00	22.55	PK
	V	11576.80	13.70	50.05	74.00	23.95	PK
H	H	5825.00	41.90	106.59	Fundamental	/	PK
	V	5825.00	41.90	102.55	Fundamental	/	PK
	H	5985.00	42.30	57.01	68.20	11.19	PK
	V	5986.00	42.40	56.20	68.20	12.00	PK
	H	11650.00	13.70	50.10	74.00	23.90	PK
	V	11650.00	13.70	49.01	74.00	24.99	PK

802.11n20

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5745.00	41.70	104.95	Fundamental	/	PK
	V	5745.00	41.70	100.55	Fundamental	/	PK
	H	5594.00	41.30	56.98	68.80	11.82	PK
	V	5620.00	41.50	55.10	68.80	13.70	PK
	H	11495.00	13.80	50.45	74.00	23.55	PK
	V	11495.00	13.80	48.90	74.00	25.10	PK
M	H	11578.80	13.70	49.10	74.00	24.90	PK
	V	11578.14	13.70	47.25	74.00	26.75	PK
H	H	5825.00	41.90	104.55	Fundamental	/	PK
	V	5825.00	41.90	101.02	Fundamental	/	PK
	H	5963.00	42.40	56.88	68.80	11.92	PK
	V	5977.00	42.40	55.56	68.80	13.24	PK

**TEST REPORT**

	H	11658.70	13.70	50.19	74.00	23.81	PK
	V	11658.70	13.70	47.89	74.00	26.11	PK

802.11n40

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5755.00	41.70	105.66	Fundamental	/	PK
	V	5755.00	41.70	100.98	Fundamental	/	PK
	H	5949.00	42.40	56.56	68.80	12.24	PK
	V	5570.00	41.40	55.05	68.80	13.75	PK
	H	11510.00	13.70	50.19	74.00	23.81	PK
	V	11510.00	13.70	48.90	74.00	25.10	PK
H	H	5795.00	41.80	106.20	Fundamental	/	PK
	V	5795.00	41.80	101.32	Fundamental	/	PK
	H	6012.00	42.40	57.00	68.80	11.80	PK
	V	5980.00	42.40	56.30	68.80	12.50	PK
	H	11598.20	13.70	50.98	74.00	23.02	PK
	V	11598.40	13.70	49.58	74.00	24.42	PK

802.11ac80

Channel	Polarity	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	5775.00	41.80	100.01	Fundamental	/	PK
	V	5775.00	41.80	96.34	Fundamental	/	PK
	H	5960.00	42.40	55.87	68.80	12.93	PK
	V	5945.00	42.40	54.10	68.80	14.70	PK
	H	11510.00	13.70	50.38	74.00	23.62	PK
	V	11510.00	13.70	49.05	74.00	24.95	PK

**TEST REPORT**

- Remark: 1. Correct Factor = Antenna Factor + Cable Loss (- Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.  
2. Corrected Reading = Original Receiver Reading + Correct Factor  
3. Margin = Limit - Corrected Reading  
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,  
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV,  
Limit = 40.00dBuV/m.  
Then Correct Factor =  $30.20 + 2.00 - 32.00 = 0.20\text{dB/m}$ ;  
Corrected Reading =  $10\text{dBuV} + 0.20\text{dB/m} = 10.20\text{dBuV/m}$ ;  
Margin =  $40.00\text{dBuV/m} - 10.20\text{dBuV/m} = 29.80\text{dB}$ .



## 5 Power line conducted emission

Test result: Pass

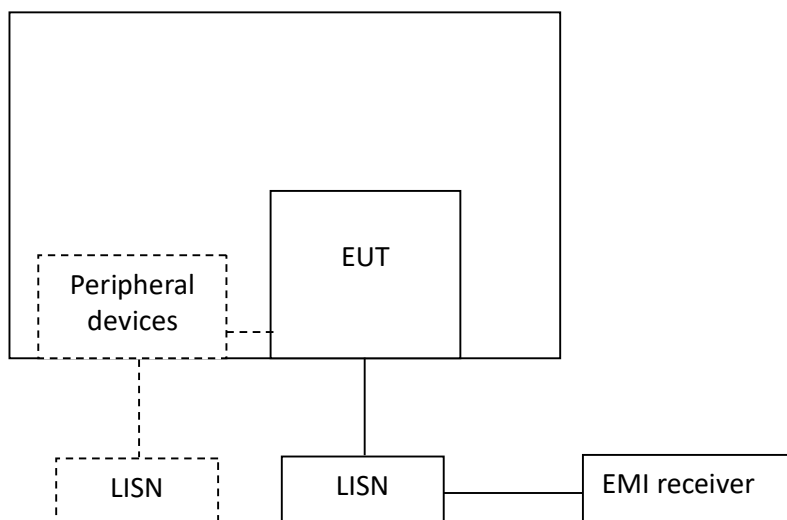
### 5.1 Measurement Procedure

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

### 5.2 Test Configuration

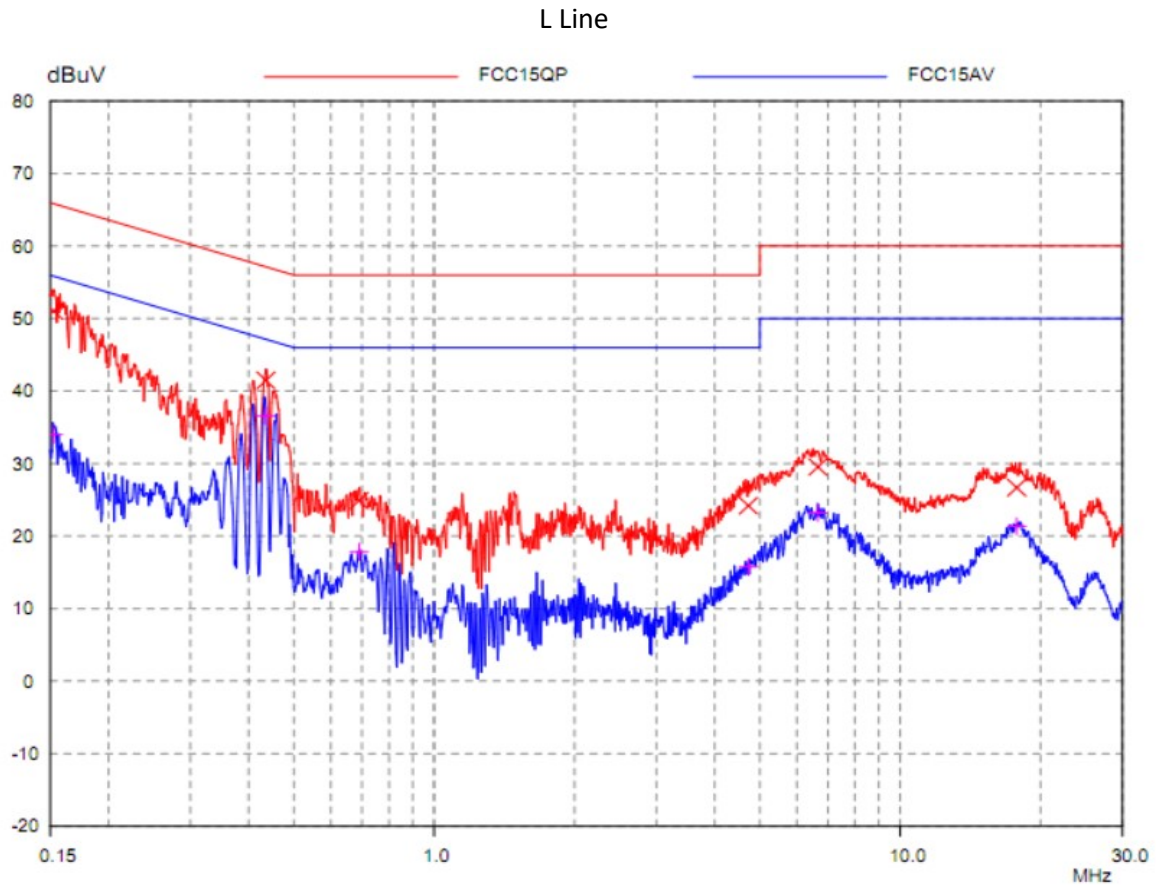


**TEST REPORT**

**5.3 Test Results of Power line conducted emission**

The worst waveform from 30MHz to 1000MHz is listed as below:

**Test Curve:**



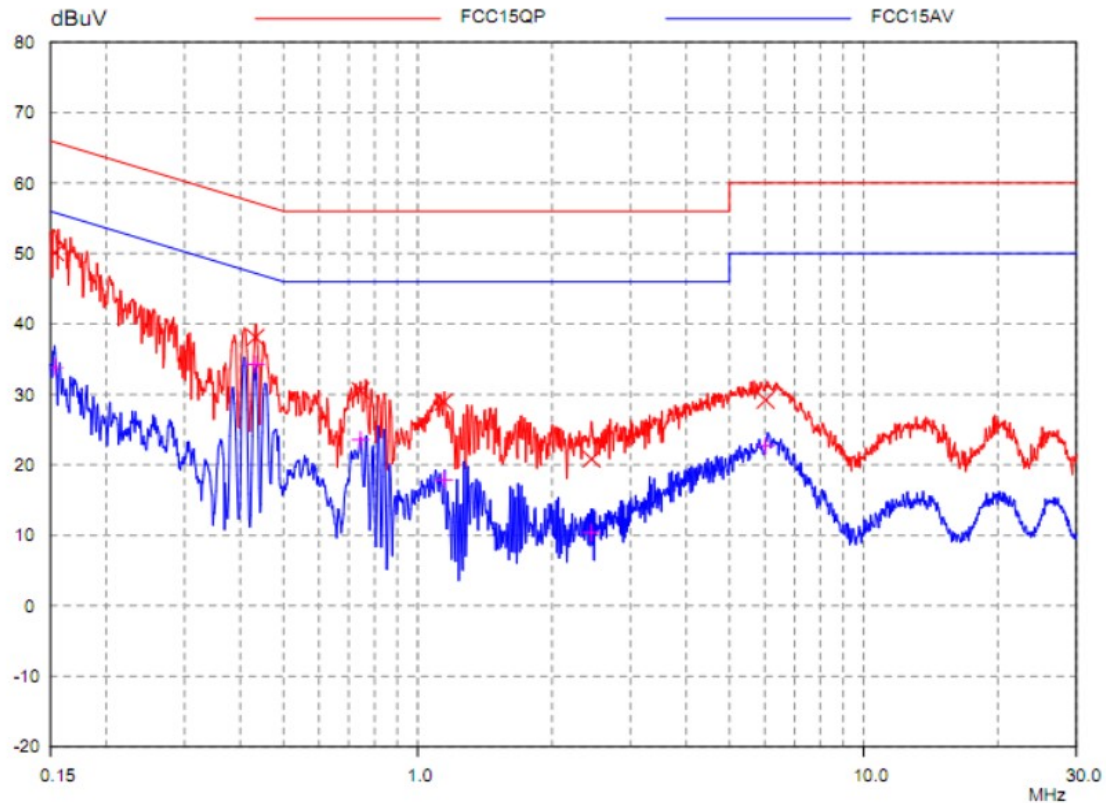
**Test Data:**

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.1524	51.04	65.87	14.83	33.97	55.87	21.90
0.4355	41.48	57.15	15.67	36.57	47.15	10.58
0.6892	24.89	56.00	31.11	17.83	46.00	28.17
4.7208	24.18	56.00	31.82	15.75	46.00	30.25
6.6545	29.54	60.00	30.46	23.20	50.00	26.80
17.766	26.67	60.00	33.33	21.34	50.00	28.66

## TEST REPORT

### Test Curve:

N Line



### Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.1536	50.12	65.80	15.68	33.88	55.80	21.92
0.4320	38.10	57.21	19.11	34.25	47.21	12.96
0.7435	30.54	56.00	25.46	23.57	46.00	22.43
1.1443	28.95	56.00	27.05	17.85	46.00	28.15
2.4529	20.84	56.00	35.16	10.38	46.00	35.62
6.0224	29.18	60.00	30.82	22.69	50.00	27.31

Remark: 1. Correct Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Corrected Reading

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

**TEST REPORT**

**6 Antenna requirement**

**Requirement:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

**Result:**

EUT uses unique coupling to the intentional radiator, so it can comply with the provisions of this section.

\*\*\*\*\* END \*\*\*\*\*