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FCC TEST REPORT

Under
FCC 15 Subpart E, Paragraph 15.407
Operation within the bands 5.15-5.25 GHz, 5.25-5.35 GHz,
5.47-5.725 GHz and 5.725-5.85 GHz
(NII) Unlicensed National Information Infrastructure

Prepared For :

Grandstream Networks, Inc.

126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

FCC ID: YZZGXV3370
EUT: IP Multimedia Phone
Model: GXV3370

May 11, 2018 **Issue Date:**
Original Report **Report Type:**
 **Test Engineer:** Jacky Huang
 **Review By:** Apollo Liu / Manager

Table of Contents

Report Revision History

Report #	Version	Description	Issued Date
KSZ2018031601J04	Rev.01	Initial issue of report	May 7, 2018
KSZ2018031601J04	Rev.02	Update the signature of cover page & section 1.2 & section 1.7	May 11, 2018

1. General Information

1. 1 Notes

The test results of this report relate exclusively to the test item specified in 1.6. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

1. 2 Testing Laboratory

Test Firm Name:	**Ke Mei Ou Lab Co., Ltd.**
Test Firm Address:	2013-2016, 20th Floor, Business Center, Jiahui Xin Cheng, No 3027, Shen Nan Road, Fu Tian, Shen Zhen, Guang Dong, P. R. China
FCC Designation Number:	CN1532
Test Firm Registration Number:	344480
Internet:	www.kmolab.com
Email:	kmo@kmolab.com
ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements, This approval results is accepted by MRA of ILAC.	

1. 3 Details of Applicant

Name: **Grandstream Networks, Inc.**
Address: **126 Brookline Ave, 3rd Floor Boston, MA 02215, USA**

1. 4 Application Details

Date of Receipt of Application: March 16, 2018
Date of Receipt of Test Item: March 16, 2018
Date of Test : March 23~May 7, 2018

1. 5 Details of Manufacturer

Name: **Grandstream Networks, Inc.**
Address: **126 Brookline Ave, 3rd Floor Boston, MA 02215, USA**

1. 6 Test Item

EUT Feature	
EUT Description:	IP Multimedia Phone
Brand Name:	Grandstream
Model Name:	GXV3370
EUT RF Technology:	☒Bluetooth v3.0 + EDR ☒ Bluetooth v4.0 LE ☐Bluetooth v4.2 LE ☐Bluetooth v5.0 LE ☒WLAN 2.4GHz 802.11b/g/n HT/20/40 ☒WLAN 5GHz 802.11a/n HT20/HT40 ☐WLAN 5GHz 802.11ac VHT20/VHT40/VHT80
HW Version:	v1.2A
SW Version:	1.0.0.5
EUT Stage:	Identical Prototype
Note: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

Additional Information

Standard Product Specification		
Tx/Rx Frequency Range	☒5150~5250 MHz	☒5250~5350 MHz
	☒5470~5725 MHz	☒5725~5850 MHz
Communication Mode	☒IP Based (Load Based)	☐Frame Based
TPC Function	☐With TPC	☒Without TPC
Weather Band	☐With 5600~5650MHz	☒Without 5600~5650MHz
Beamforming Function	☐With beamforming	☒Without beamforming
Operating Mode	☐Outdoor access point	☒Indoor access point
	☐Fixed point-to-point access points	☒Mobile and portable client devices
	☐Master	☐Slave with radar detection
	☒Slave without radar detection	
Antenna Type / Gain	☒5150~5250 MHz	
	Ant.1: Internal PCB Antenna with gain 4 dBi	
	☒5250~5350 MHz	
	Ant.1: Internal PCB Antenna with gain 4 dBi	
	☒5470~5725 MHz	
	Ant.1: Internal PCB Antenna with gain 4 dBi	
	☒5725~5850 MHz	
	Ant.1: Internal PCB Antenna with gain 4 dBi	
Type of Modulation	☒802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) ☐802.11ac : OFDM (BPSK / QPSK / 16QAM / 64 QAM / 256QAM)	
Antenna Function for Transmitter	802.11 a/n SISO ☒Ant. 1 ☐Ant. 2 802.11 a/n/ac SISO ☐Ant. 1 ☐Ant. 2 802.11n/ac MIMO ☐Ant. 1 ☐Ant. 2	

Note:
1) 802.11a only support SISO mode, 802.11n/ac support SISO & MIMO mode.
2) For 802.11a SISO mode, only test one Antenna by referring to its higher conducted power.
3) For 802.11n/ac mode, only test MIMO mode because the MIMO power is higher than SISO power.
4) MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2
5) For 802.11n HT20 & 802.11ac VHT20 mode, the whole testing has assessed only one by referring to their higher conducted power.
6) For 802.11n HT40 & 802.11ac VHT40 mode, the whole testing has assessed only one by referring to their higher conducted power.

Specification of Accessory				
☒AC/DC Adapter #1 (US)	**Brand Name**	Sunlight	**Model Name**	H18US1200150A
	Power Rating	I/P: AC 100-240V~50/60Hz, 0.8A; O/P:DC 12V /1.5A		
☒AC/DC Adapter #2 (US)	**Brand Name**	Frecom	**Model Name**	F18W8-120150SPAUY
	Power Rating	I/P: AC 100-240V~50/60Hz, 0.6A; O/P:DC 12V /1.5A		

1. 7 Applicable Standards

Applicable Standards
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards: FCC Part 15 Subpart E FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 ANSI C63.10-2013
Note: 1) All test items were verified and recorded according to the standards and without any deviation during the test. 2) This EUT has also been tested and complied with the requirements of FCC 15 Part 15, Subpart B, recorded in a separate test report.

2. Technical Test

2. 1 Summary of Test Results

The EUT has been tested according to the following specifications:

FCC Rules	Test Type	Limit	Result	Notes
2.1049 & 15.403(i)	26dB & 99% Bandwidth	-	PASS	Complies.
15.407(a)	Maximum Conducted Output Power	FCC ≤ 24 dBm	PASS	Complies.
15.407(a)	Power Spectral Density	FCC ≤ 11 dBm	PASS	Complies.
15.407(b)	Unwanted Emissions	15.407(b) & 15.209(a)	PASS	Complies.
15.207	AC Conducted Emission	15.207(a)	PASS	Complies
15.407(g)	Frequency Stability	Within Operation Band	PASS	Complies
15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	PASS	Complies
15.203 & 15.407(a)	Antenna Requirement	N/A	PASS	Complies
1.1307(b)(1) & 2.1091	Maximum Permissible Exposure (MPE)	< 1mW/cm^2	PASS	Complies

2. 2 Antenna Requirement

Regulation

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Result

The EUT has one internal PCB antenna, which was permanently attached and the gain is 3 dBi, Therefore the EUT complies with Section 15.203 of the FCC rules.

Please refer to section 4.4 in this test report; antenna connector complied with the requirements

3. EUT Modifications

No modification by test lab.

4. Conducted Power Line Test

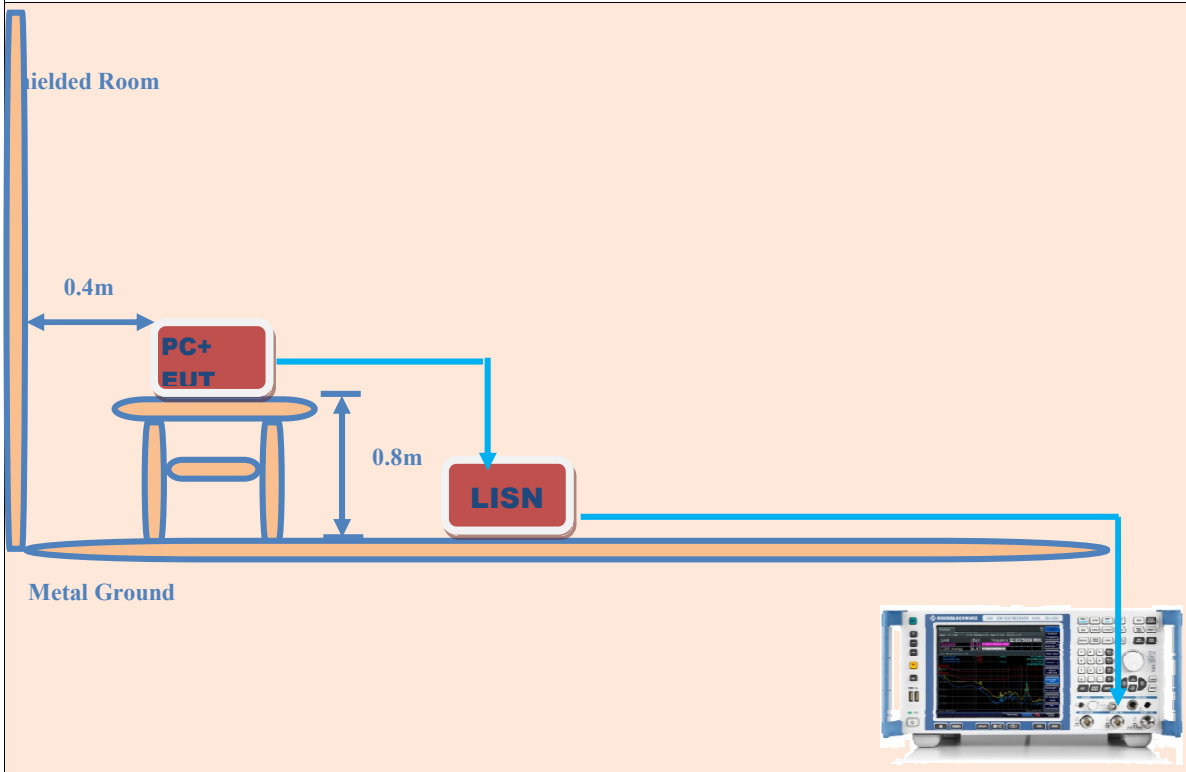
4. 1 Test Equipment

Please refer to Section 10 this report.

4. 2 Test Procedure

Test Method	
☒	The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission., the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

4. 3 Test Setup

Test Setup
AC Line Conducted Emissions

This test is applicable for radio equipment and/or ancillary equipment for fixed use powered by the AC mains. This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or a representative configuration of the combination of radio and ancillary equipment. This test assesses the level of internally generated electrical noise present on the AC power input/output ports.

4. 4 Configuration of the EUT

WiFi Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

SISO Antenna	
Modulation	**Data Rate**
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
MIMO Antenna	

Summary Tables of Test Mode	
AC Conducted Emission	Mode 1: Bluetooth Link with Controller + WLAN Link(5G) + USB Cable (Adapter #1 mode) Mode 2: Bluetooth Link with Controller + WLAN Link(5G) + USB Cable (Adapter #2 mode)
Note: 1) The worst case of conducted emission is mode 2; only the worst case was reported. 2) For Radiated case, The tests were performed with Adapter #1, Controller and USB Cable. 3) For 802.11n HT20 mode, the whole testing has assessed only one by referring to their higher conducted power. 4) For 802.11n HT40 mode, the whole testing has assessed only one by referring to their higher conducted power.	

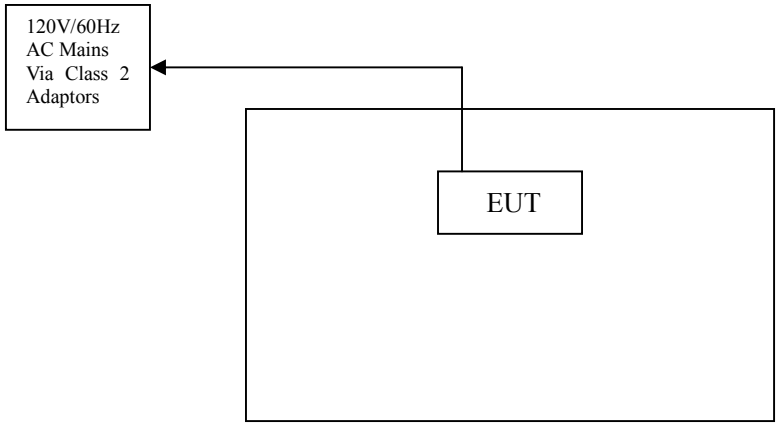
EUT Operation Test Setup
For WLAN function, the engineering test program was provided and enabled to make EUT continuous transmit/receive. For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

Support Unit				
Device	**Manufacturer**	**Model # Serial #**	**FCC ID/ DoC**	**Cable**
Notebook	ACER	ZQE	HLZ-AR5B97	1.5m unshielded power cord
-	-	-	-	-

USA Carrier Frequency for 5GHz Band			
Frequency Band	**Modulation Type**	**Channel**	**Center Frequency(MHz)**
5150~5250 MHz Band 1 (U-NII-1)	802.11 a	36	5180
		40	5200
		48	5240
	802.11 n20	36	5180
		40	5200
		48	5240
	802.11 n40	38	5190
		46	5230
Frequency Band	**Modulation Type**	**Channel**	**Center Frequency(MHz)**
5250~5350 MHz Band 2 (U-NII-2A)	802.11 a	52	5260
		56	5280
		64	5320
	802.11 n20	52	5260
		56	5280
		64	5320
	802.11 n40	54	5270
		62	5310
Frequency Band	**Modulation Type**	**Channel**	**Center Frequency(MHz)**
5470~5725 MHz Band 3 (U-NII-2C)	802.11 a	100	5500
		120	5600
		140	5700
		144	5720
	802.11 n20	100	5500
		120	5600
		140	5700
		144	5720
	802.11 n40	102	5510
		118	5590
		142	5710
Frequency Band	**Modulation Type**	**Channel**	**Center Frequency(MHz)**
5725~5850 MHz Band 4 (U-NII-3)	802.11 a	149	5745
		157	5785
		165	5825
	802.11 n20	149	5745
		157	5785
		165	5825
	802.11 n40	151	5755
		159	5795

4. 5 EUT Operating Condition

Operating condition is according to ANSI C63.10:2013.
A. Setup the EUT and simulators as shown on follow.
B. Enable RF signal and confirm EUT active.
c. Modulate output capacity of EUT up to specification.

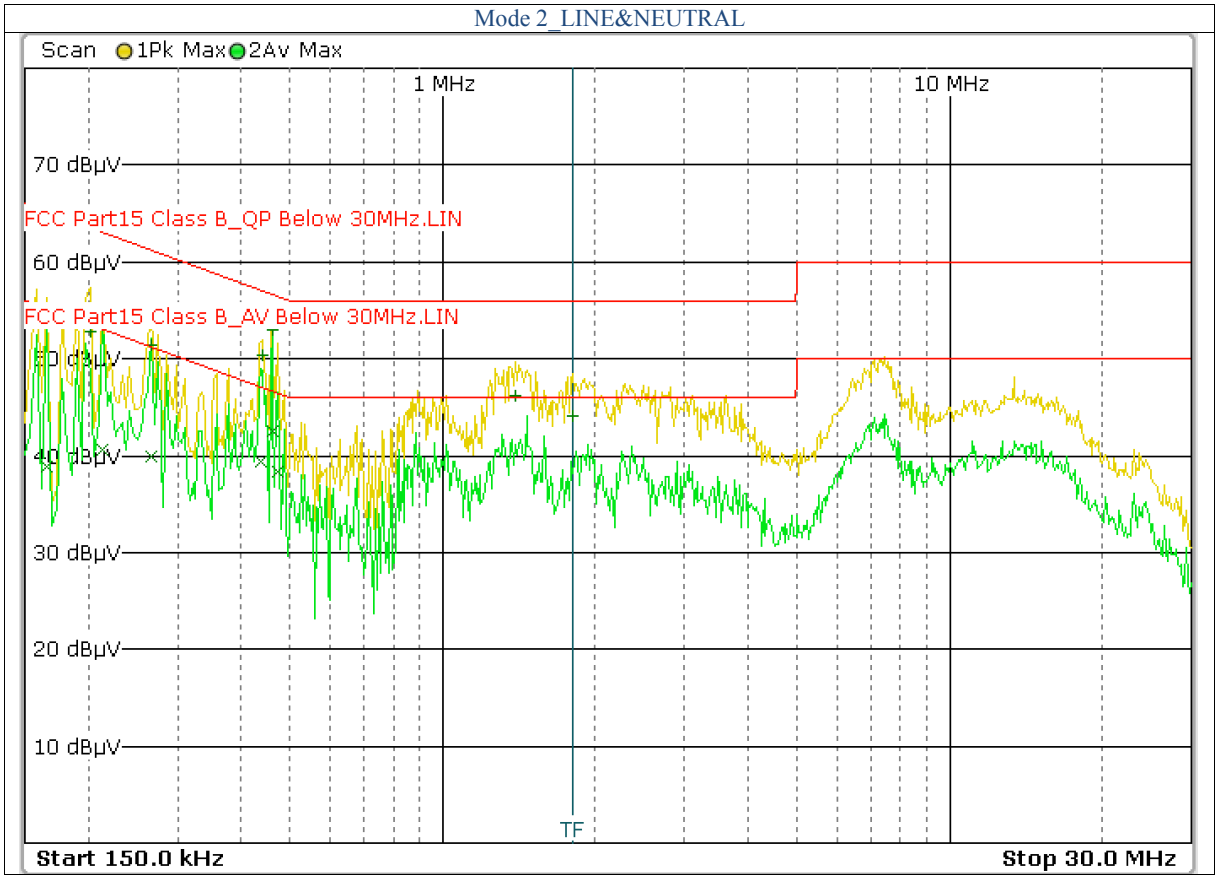


4. 6 Conducted Power Line Emission Limits

FCC Part 15 Paragraph 15.207 (dBuV)	
Frequency Range (MHz)	**QP/AV**
0.15 – 0.5	66-56/56-46
0.5 – 5.0	56/46
5.0 - 30	60/50

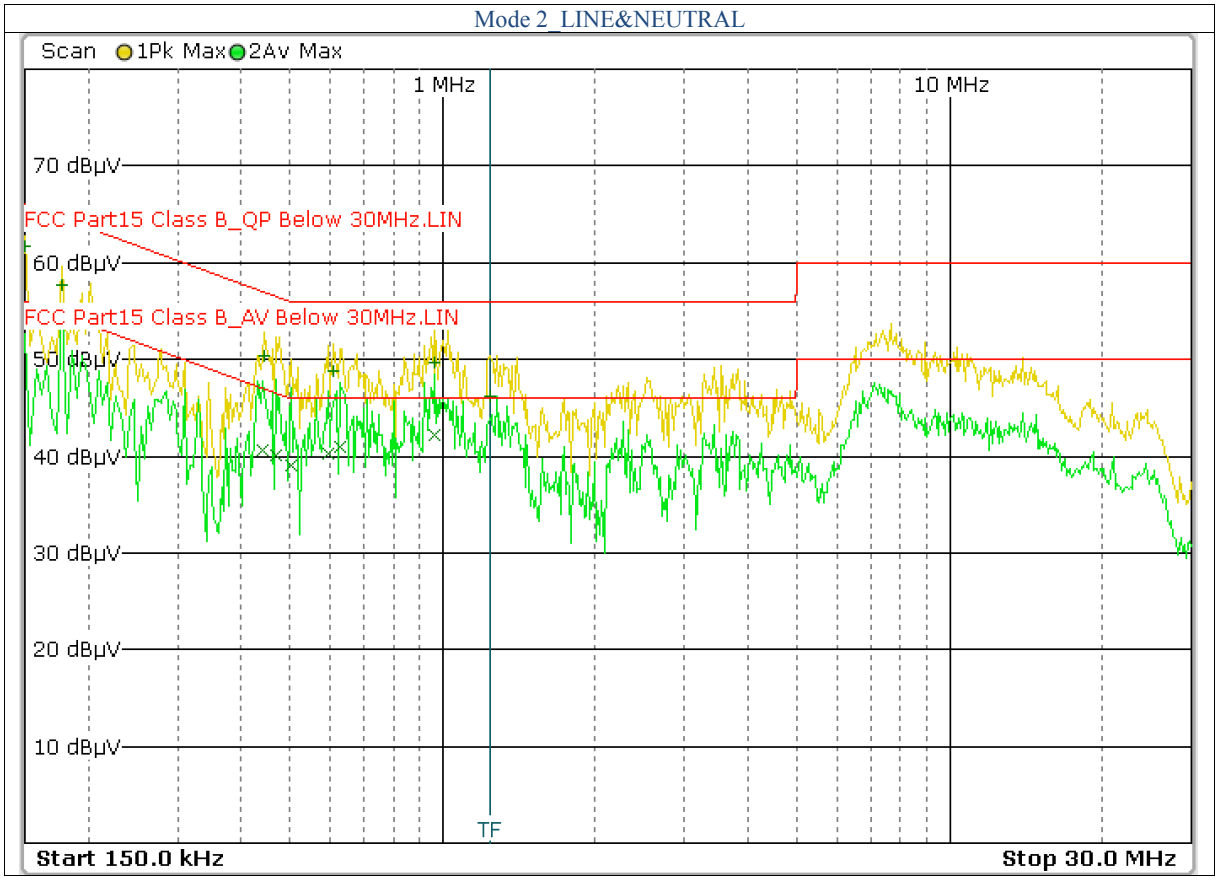
Note: In the above table, the tighter limit applies at the band edges.

4. 7 Conducted Power Line Test Result



FCC15										
Frequency (MHz)	Read Level (dBuV) QP	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV) QP	Emission (dBuV) AV	Line/ Neutral	Limit (dBuV) QP	Limit (dBuV) AV	Margin(dBuV) QP	Margin(dBuV) AV
0.202	42.49	30.37	10.30	52.79	40.67	Line	63.53	53.53	-10.74	-12.86
0.266	41.08	29.65	10.30	51.38	39.95	Line	61.24	51.24	-9.86	-11.29
0.442	40.01	29.02	10.40	50.41	39.42	Line	57.02	47.02	-6.61	-7.60
0.462	42.53	32.07	10.40	52.93	42.47	Line	56.66	46.66	-3.73	-4.19
1.390	35.76	22.15	10.50	46.26	32.65	Line	56.00	46.00	-9.74	-13.35
1.810	33.74	19.72	10.40	44.14	30.12	Line	56.00	46.00	-11.86	-15.88
FCC15										

Note:
1.Uncertainty in conducted emission measured is <+/ -2dB.
2.The emission levels of other frequencies were very low against the limit.
3.All Reading Levels are Quasi-Peak and Average value.
4.Emission = Meter Reading + Factor; Factor = Insertion Loss + Cable Loss.
5.Margin Value= Emission Level - Limit Value.



FCC15										
Frequency (MHz)	Read Level (dBuV) QP	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV) QP	Emission (dBuV) AV	Line/ Neutral	Limit (dBuV) QP	Limit (dBuV) AV	Margin(dBuV) QP	Margin(dBuV) AV
0.150	51.47	32.35	10.30	61.77	42.65	Neutral	66.00	56.00	-4.23	-13.35
0.178	47.35	29.91	10.30	57.65	40.21	Neutral	64.58	54.58	-6.93	-14.37
0.446	40.00	30.27	10.40	50.4	40.67	Neutral	56.95	46.95	-6.55	-6.28
0.470	40.20	29.61	10.40	50.6	40.01	Neutral	56.51	46.51	-5.91	-6.50
0.610	38.47	29.80	10.40	48.87	40.2	Neutral	56.00	46.00	-7.13	-5.80
0.966	39.24	31.77	10.40	49.64	42.17	Neutral	56.00	46.00	-6.36	-3.83
FCC15										

Note:
1.Uncertainty in conducted emission measured is <+/ -2dB.
2.The emission levels of other frequencies were very low against the limit.
3.All Reading Levels are Quasi-Peak and Average value.
4.Emission = Meter Reading + Factor; Factor = Insertion Loss + Cable Loss.
5.Margin Value= Emission Level - Limit Value.

5. FCC Part 15.407 Requirements for 802.11a/n/ac Systems

5. 1 Test Equipment

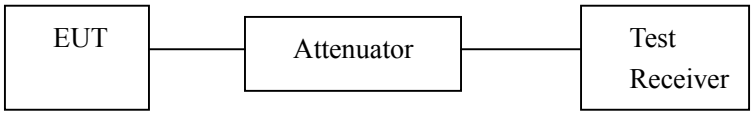
Please refer to Section 10 this report.

5. 2 Test Procedure

<table>
<tr><td colspan="3">26dB Bandwidth and 99% Occupied Bandwidth:</td></tr>
<tr><td>Test Method:</td><td colspan="2">Test was performed in accordance with KDB789033 D02 v02r01
a)The transmitter was radiated to the spectrum analyzer in peak hold mode.
b)Measure the maximum width of the emission that is 26 dB down from the peak of the emission Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.</td></tr>
<tr><td colspan="3">Test Equipment Setting – 26dB Bandwidth:</td></tr>
<tr><td colspan="2">a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.</td><td>c) Detector = Peak.
d) Trace mode = max hold.</td></tr>
<tr><td colspan="3">Test Equipment Setting – 99% Bandwidth:</td></tr>
<tr><td colspan="2">The following procedure shall be used for measuring (99%) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1% to 5% of the OBW
4. Set VBW ≥ 3 RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.</td><td>6. Use the 99% power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.</td></tr>
<tr><td colspan="3">Test Equipment Setting – Minimum Emission Bandwidth for the band 5.725−5.85 GHz</td></tr>
<tr><td colspan="2">Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725−5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 RBW.
c) Detector = Peak.
d) Trace mode = max hold.</td><td>e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.</td></tr>
<tr><td colspan="3">6dB Bandwidth</td></tr>
<tr><td>Test Method:</td><td colspan="2">According to section II. C(2) Minimum Emission Bandwidth for the band 5.725−5.85 GHz of 789033 D02 General UNII Test Procedures New Rules v02r01</td></tr>
<tr><td>Test Equipment Setting</td><td>a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 RBW.
c) Detector = Peak.</td><td>d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.</td></tr>
<tr><td colspan="3">Maximum Conducted Output Power Measurement:</td></tr>
<tr><td>Test Method:</td><td colspan="2">Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter. Refer to III.A and III.C for additional guidance for devices that use channel aggregation.</td></tr>
<tr><td colspan="3">Test Equipment Setting</td></tr>
<tr><td colspan="2">(i) Measure the duty cycle, x, of the transmitter output signal as described in II.B.
(ii) Set span to encompass the entire EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
(iii) Set RBW = 1 MHz.
(iv) Set VBW ≥ 3 MHz.
(v) Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
(vi) Manually set sweep time ≥ 10 × (number of points in sweep) × (total on/off period of the transmitted signal).
(vii) Set detector = power averaging (rms).
(viii) Perform a single sweep.</td><td>(ix) 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 spectrum.
(x) Add 10 log (1/x), where x is the duty cycle, to the measured power in order 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%.</td></tr>
</table>

Power Spectral Density:	
Test Method:	a) Set RBW ≥ 1/T, where T is defined in II.B.l.a). b) Set VBW ≥ 3 RBW. c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement. d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement. e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
Test Equipment Setting:	
a) Set RBW = 300 kHz. b) Set the video bandwidth (VBW) ≥ 3 RBW. c) Detector = Peak. d) Trace mode = max hold.	
Band edge measurements:	
Test Method:	According to section II.G.3(d) General Requirements for Unwanted Emissions Measurements of 789033 D02 General UNII Test Procedures New Rules v02r01 Unwanted band-edge emissions may be measured using either of the special band-edge measurement techniques (the marker-delta or integration methods) described in the following paragraphs. Note that the marker-delta method is primarily a radiated measurement technique that requires the 99% occupied bandwidth edge to be within 2 MHz of the authorized band edge, whereas the integration method can be used in either a radiated or conducted measurement without any special requirement with regards to the displacement of the unwanted emission(s) relative to the authorized bandwidth.
Test Equipment Setting:	
a) Set RBW = 100 kHz. b) Set the video bandwidth (VBW) ≥ 3 RBW. c) Detector = Peak. d) Trace mode = max hold.	
Frequency Stability Measurement:	
Test Method:	a)The transmitter output (antenna port) was connected to the spectrum analyzer. b)EUT have transmitted absence of modulation signal and fixed channelize. c)Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. d)Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings. e)fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm (IEEE 802.11 specification). f)The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value g)Extreme temperature is 0°C~40°C
Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: Entire absence of modulation emissions bandwidth c)RBW: 10 kHz d)VBW: 10 kHz	e)Sweep Time: Auto

5. 3 Test Setup



5. 4 Configuration of the EUT

Same as section 4.4 of this report

5. 5 EUT Operating Condition

Same as section 4.5 of this report.

5. 6 Limit

<table>
<tr><td colspan="2">26dB Bandwidth and 99% Occupied Bandwidth:</td></tr>
<tr><td>Limit:</td><td>No restriction limits.</td></tr>
<tr><td colspan="2">6 dB Bandwidth:</td></tr>
<tr><td>Limit:</td><td>For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.</td></tr>
<tr><td colspan="2">Maximum Conducted Output Power Measurement:</td></tr>
<tr><td colspan="2">☒5.15~5.25 GHz</td></tr>
<tr><td>☐Limit of Outdoor access point:</td><td>☐Limit of Indoor access point:</td></tr>
<tr><td>The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).</td><td>The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</td></tr>
<tr><td>☐Limit of Fixed point-to-point access points:</td><td>☒Limit of Mobile and portable client devices:</td></tr>
<tr><td>The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.</td><td>The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</td></tr>
<tr><td colspan="2">☒5.25-5.35 GHz & ☒5.470-5.725 GHz</td></tr>
<tr><td colspan="2">The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</td></tr>
<tr><td colspan="2">☒5.725~5.85 GHz</td></tr>
<tr><td colspan="2">The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.</td></tr>
<tr><td colspan="2">Power Spectral Density</td></tr>
<tr><td colspan="2">☒5.15~5.25 GHz</td></tr>
<tr><td>☐Limit of Outdoor access point: 17 dBm/MHz</td><td>☐Limit of Indoor access point: 17 dBm/MHz</td></tr>
<tr><td>☐Limit of Fixed point-to-point access points: 17 dBm/MHz</td><td>☒Limit of Mobile and portable client devices: 11 dBm/MHz</td></tr>
<tr><td>☒5.25-5.35 GHz</td><td>11 dBm/MHz</td></tr>
<tr><td>☒5.470-5.725 GHz</td><td>11 dBm/MHz</td></tr>
<tr><td>☒5.725~5.85 GHz</td><td>30 dBm/500kHz</td></tr>
<tr><td colspan="2">Frequency Stability Measurement:</td></tr>
<tr><td>Limit:</td><td>In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user’s manual.
The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).</td></tr>
</table>

5. 7 Test Result

A. 26dB Bandwidth and 99% Occupied Bandwidth

Refer to Appendix_NII_WiFi

B. 6 dB Bandwidth

Refer to Appendix_NII_WiFi

C. Peak Power

Refer to Appendix_NII_WiFi

D. Peak Power Spectral Density

Refer to Appendix_NII_WiFi

E. Frequency Stability

Item	Voltage(V)
VH	126.50
VN	110.00
VL	93.50

Item	Temperature(℃)
0	0
10	10
20	20
30	30
40	40

Refer to Appendix_NII_WiFi

6. Transmitter Spurious Radiated Emission & Band Edge Emissions

6. 1 Test Equipment

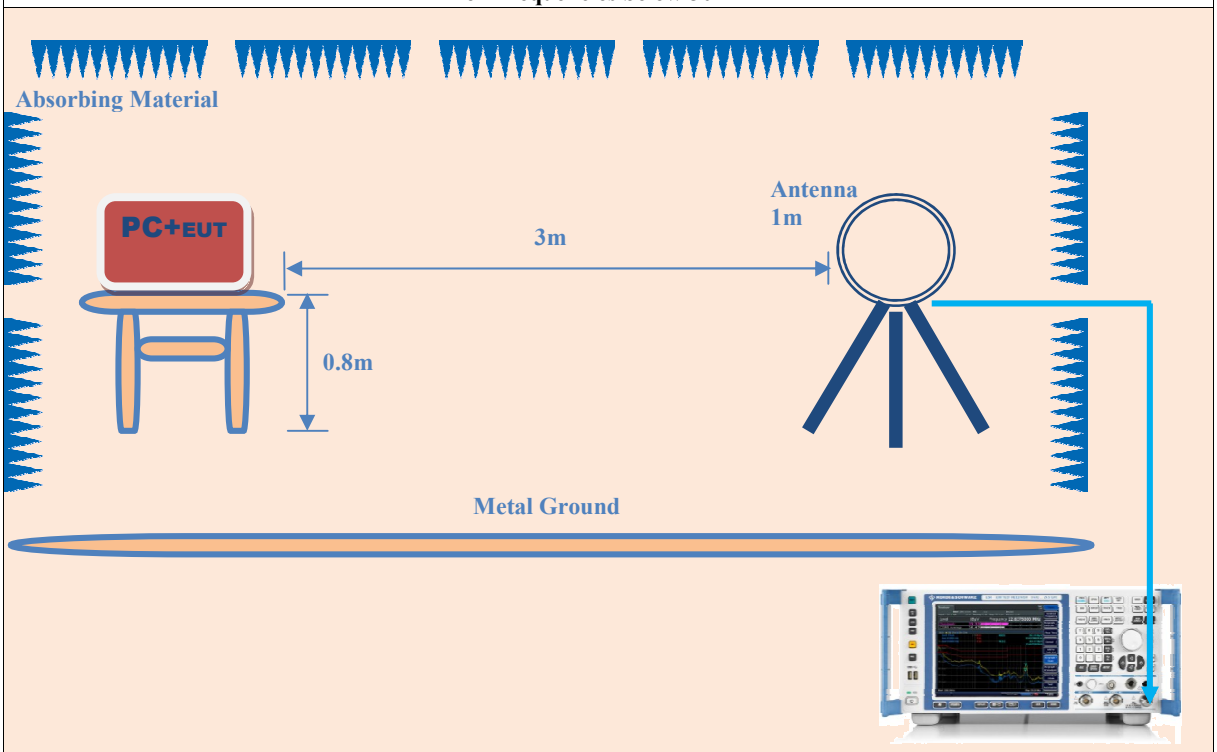
Please refer to Section 10 this report.

6. 2 Test Procedure

<table>
<tr><td colspan="3">Spurious Radiated Emission & Band Edge Emissions Measurement:</td></tr>
<tr><td>Test Method:</td><td colspan="2">a.)The EUT was tested according to ANSI C63.10.
b)The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10.
c)The frequency spectrum from 9 kHz to 40 GHz was investigated. All readings from 9 kHz to 150 kHz are quasi-peak values with a resolution bandwidth of 200 Hz. All readings from 150 kHz to 30 MHz are quasi-peak values with a resolution bandwidth of 9 KHz. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz , peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
d)The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. The Receiving antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency. Emissions below 30MHz were measured with a loop antenna while emission above 30MHz were measured using a broadband E-field antenna.
e) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
f)Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.10.</td></tr>
<tr><td colspan="3">Radiated Emissions Measurement:</td></tr>
<tr><td colspan="3">Test Equipment Setting:</td></tr>
<tr><td>a)Attenuation: Auto
b)Start Frequency: 1000 MHz
c)Stop Frequency: 40GHz
d)RBW/VBW (Emission in restricted band):
1MHz / 3MHz for Peak,
1MHz / 1/T for Average</td><td colspan="2">e)RBW/VBW(Emission in non-restricted band)
1MHz / 3MHz for peak</td></tr>
<tr><td colspan="3">Band Edge Emissions Measurement:</td></tr>
<tr><td colspan="3">Test Equipment Setting:</td></tr>
<tr><td>a)Attenuation: Auto
b)Span Frequency: 100 MHz
c)RBW/VBW (Emission in restricted band):
1MHz / 3MHz for Peak,
1MHz / 1/T for Average</td><td colspan="2">d)RBW/VBW(Emission in non-restricted band)
1MHz / 3MHz for peak</td></tr>
</table>

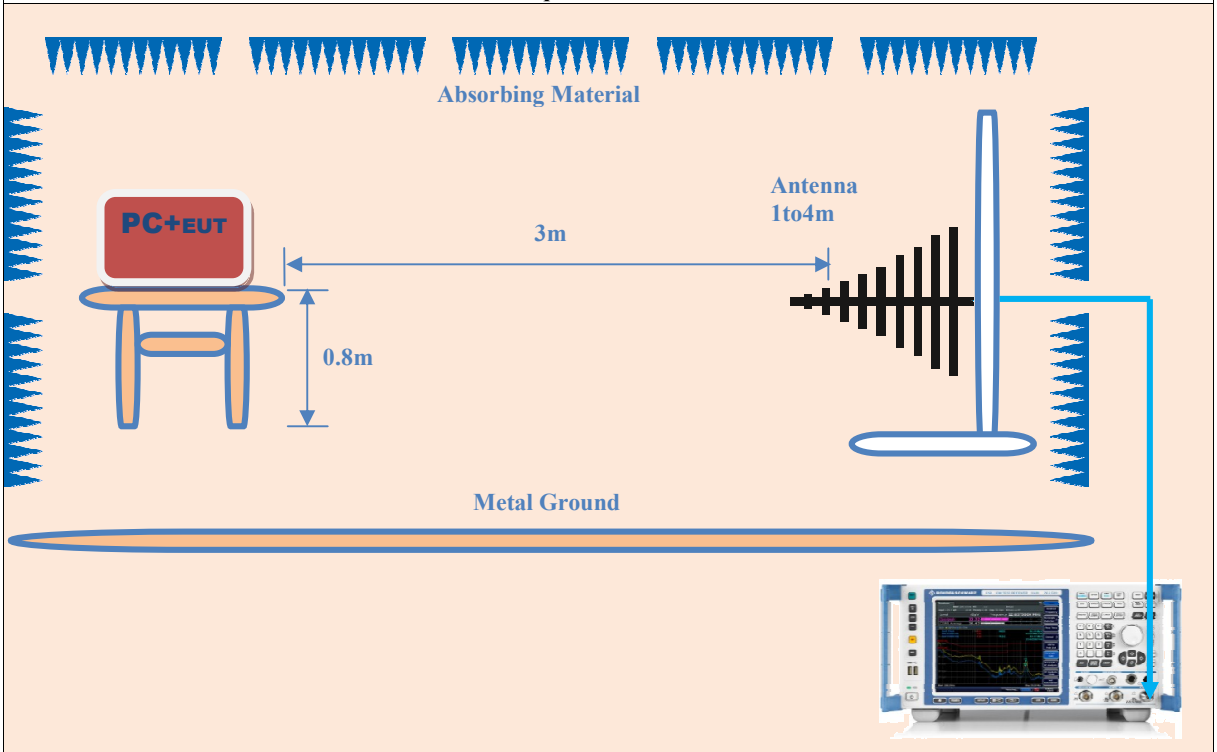
6. 3 Test Setup

For Frequencies below 30MHz



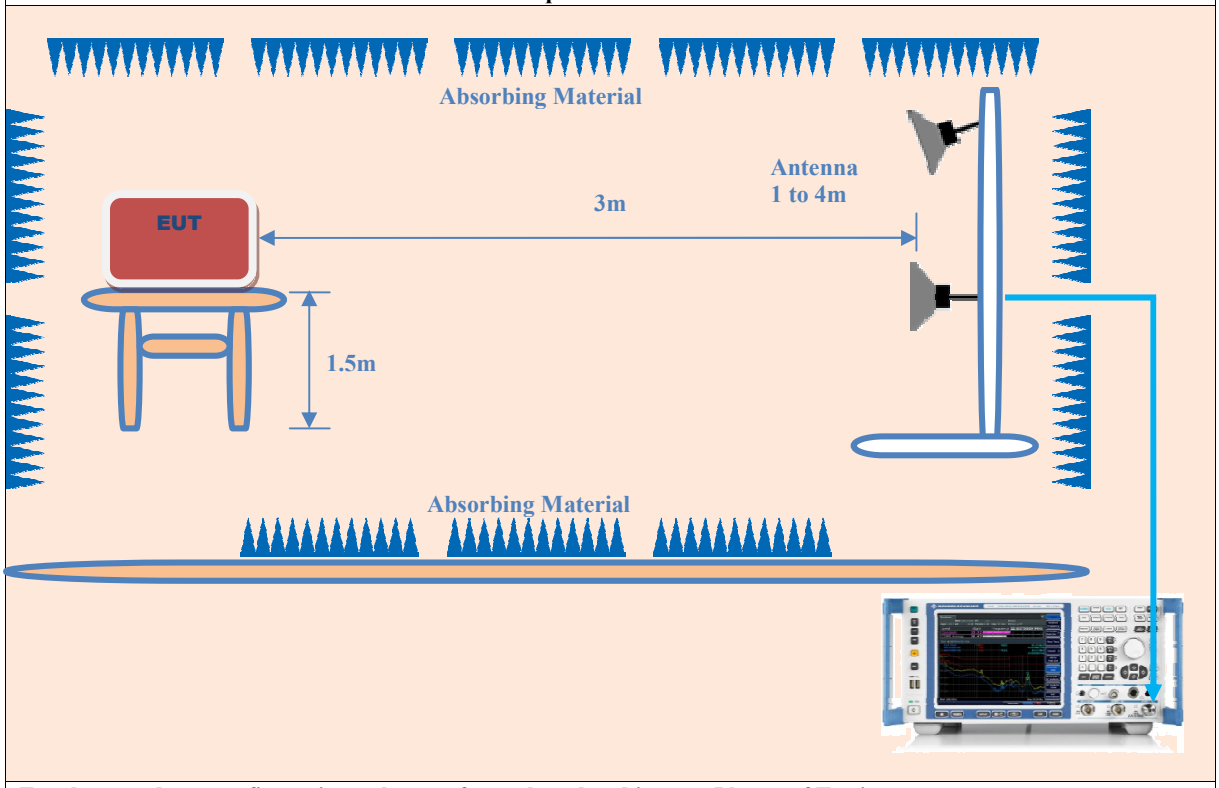
For the actual test configuration , please refer to the related items – Photos of Testing

For Frequencies below 1GHz



For the actual test configuration , please refer to the related items – Photos of Testing

For Frequencies above 1GHz



For the actual test configuration , please refer to the related items – Photos of Testing

6. 4 Configuration of the EUT

Same as section 4.4 of this report

6. 5 EUT Operating Condition

Same as section 4.5 of this report.

6. 6 Limit

Spurious Radiated Emission & Band Edge Emissions Measurement:				
Rule			**Limit**	
789033 D02 General UNII Test Procedure New Rules v01r03			Field Strength @3m	
			PK / 74 (dBuV/m	AV / 54 (dBuV/m)
Band	**Rule**		**EIRP Limit**	**Equivalent Field Strength @3m**
5.150-5.250 GHz	15.407(b)(1)		PK / -27 (dBm/MHz)	PK / 68.2 (dBuV/m)
5.250-5.350 GHz	15.407(b)(2)		PK / -27 (dBm/MHz)	PK / 68.2 (dBuV/m)
5.470-5.725 GHz	15.407(b)(3)		PK / -27 (dBm/MHz)	PK / 68.2 (dBuV/m)
5.725-5.850 GHz	☒	15.407(b)(4)(i)	PK / -27 (dBm/MHz) note1 PK / 10 (dBm/MHz) note2 PK / 15.6 (dBm/MHz) note3 PK / 27 (dBm/MHz) note4	PK / 68.2 (dBuV/m) note1 PK / 105.2 (dBuV/m) note2 PK / 110.8 (dBuV/m) note3 PK / 122.2 (dBuV/m) note4
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
note1: beyond 75 MHz or more above of the band edge. note2: below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. note3: below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. note4: from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.				
Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength: $E = \frac{1000000\sqrt{30P}}{3}$ uV/m, Where P is the eirp (Watts).				

FCC CFR 47, Part 15, Subpart C, Para, 15.205(a) – Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
[1]0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	([2])
13.36–13.41.			

[1]UntilFebruary1,1999,this restricted band shall be 0.490–0.510MHz.
[2]Above 38.6

FCC 47 CFR, Part 15.209(a) – Field Strength Limits within Restricted Frequency Bands

Frequency(MHz)	Field strength (microvolts/meter)	Measure-mentdis-tance (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
Above960	500	3

6. 7 Test Result

Restricted Frequency Bands Data: Band 1_5150~5250MHz

802.11a _CH 36										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5011.200	37.36	27.44	12.90	50.26	40.34	Horiz./	74.0	54.0	-23.74	-13.66
5149.260	38.45	28.73	12.90	51.35	41.63	Vert.	74.0	54.0	-22.65	-12.37
802.11a_CH 40										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5006.130	38.13	27.36	12.90	51.03	40.26	Horiz./	74.0	54.0	-22.97	-13.74
5104.200	38.48	28.51	12.90	51.38	41.41	Vert.	74.0	54.0	-22.62	-12.59
802.11a _CH 48										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5048.660	37.51	27.45	12.90	50.41	40.35	Horiz./	74.0	54.0	-23.59	-13.65
5014.620	38.06	27.77	12.90	50.96	40.67	Vert.	74.0	54.0	-23.04	-13.33
5432.240	36.70	27.33	12.90	49.60	40.23	Horiz./	74.0	54.0	-24.40	-13.77
5452.100	37.34	28.44	12.90	50.24	41.34	Vert.	74.0	54.0	-23.76	-12.66

802.11n HT20_CH 36										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5057.620	36.78	27.35	12.90	49.68	40.25	Horiz./	74.0	54.0	-24.32	-13.75
5114.960	37.59	28.34	12.90	50.49	41.24	Vert.	74.0	54.0	-23.51	-12.76
802.11n HT20_CH 40										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5062.130	37.23	28.06	12.90	50.13	40.96	Horiz./	74.0	54.0	-23.87	-13.04
5081.460	37.72	28.53	12.90	50.62	41.43	Vert.	74.0	54.0	-23.38	-12.57
5406.300	36.79	27.72	12.90	49.69	40.62	Horiz./	74.0	54.0	-24.31	-13.38
5442.540	36.97	27.88	12.90	49.87	40.78	Vert.	74.0	54.0	-24.13	-13.22
802.11n HT20_CH 48										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5026.800	37.68	28.66	12.90	50.58	41.56	Horiz./	74.0	54.0	-23.42	-12.44
5056.310	37.80	28.82	12.90	50.70	41.72	Vert.	74.0	54.0	-23.30	-12.28
5443.620	37.42	27.83	12.90	50.32	40.73	Horiz./	74.0	54.0	-23.68	-13.27
5442.540	37.74	27.91	12.90	50.64	40.81	Vert.	74.0	54.0	-23.36	-13.19

802.11n HT40_CH 38										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5146.800	39.73	29.26	12.90	52.63	42.16	Horiz./	74.0	54.0	-21.37	-11.84
5413.600	40.75	29.72	12.90	53.65	42.62	Vert.	74.0	54.0	-20.35	-11.38
5432.500	35.72	28.13	12.90	48.62	41.03	Horiz./	74.0	54.0	-25.38	-12.97
5443.270	37.74	28.18	12.90	50.64	41.08	Vert.	74.0	54.0	-23.36	-12.92
802.11n HT40_CH 46										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5148.320	37.31	29.17	12.90	50.21	42.07	Horiz./	74.0	54.0	-23.79	-11.93
5432.800	36.96	28.15	12.90	49.86	41.05	Vert.	74.0	54.0	-24.14	-12.95
5455.280	37.44	28.13	12.90	50.34	41.03	Horiz./	74.0	54.0	-23.66	-12.97
5450.300	36.97	27.43	12.90	49.87	40.33	Vert.	74.0	54.0	-24.13	-13.67

Restricted Frequency Bands Data: Band 2_5250~5350MHz

802.11a _CH 52										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5118.960	36.42	28.38	12.90	49.32	41.28	Horiz./	74.0	54.0	-24.68	-12.72
5411.270	38.02	28.44	12.90	50.92	41.34	Vert.	74.0	54.0	-23.08	-12.66
5420.640	38.12	28.62	12.90	51.02	41.52	Horiz./	74.0	54.0	-22.98	-12.48
5452.230	38.48	28.87	12.90	51.38	41.77	Vert.	74.0	54.0	-22.62	-12.23
802.11a_CH 56										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5026.100	36.61	27.97	12.90	49.51	40.87	Horiz./	74.0	54.0	-24.49	-13.13
5097.000	36.93	28.34	12.90	49.83	41.24	Vert.	74.0	54.0	-24.17	-12.76
5457.100	36.41	27.32	12.90	49.31	40.22	Horiz./	74.0	54.0	-24.69	-13.78
5378.200	37.72	27.79	12.90	50.62	40.69	Vert.	74.0	54.0	-23.38	-13.31
802.11a _CH 64										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5353.100	38.20	27.39	12.90	51.10	40.29	Horiz./	74.0	54.0	-22.90	-13.71
5350.600	39.23	29.45	12.90	52.13	42.35	Vert.	74.0	54.0	-21.87	-11.65

802.11n HT20_CH 52										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5055.230	37.40	28.31	12.90	50.30	41.21	Horiz./	74.0	54.0	-23.70	-12.79
5001.260	37.79	28.93	12.90	50.69	41.83	Vert.	74.0	54.0	-23.31	-12.17
5384.100	36.78	27.36	12.90	49.68	40.26	Horiz./	74.0	54.0	-24.32	-13.74
5354.610	37.33	27.41	12.90	50.23	40.31	Vert.	74.0	54.0	-23.77	-13.69
802.11n HT20_CH 56										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5017.600	37.21	28.38	12.90	50.11	41.28	Horiz./	74.0	54.0	-23.89	-12.72
5075.700	37.42	28.74	12.90	50.32	41.64	Vert.	74.0	54.0	-23.68	-12.36
5457.300	37.07	28.02	12.90	49.97	40.92	Horiz./	74.0	54.0	-24.03	-13.08
5350.020	37.36	28.15	12.90	50.26	41.05	Vert.	74.0	54.0	-23.74	-12.95
802.11n HT20_CH 64										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5355.100	39.44	29.79	12.90	52.34	42.69	Horiz./	74.0	54.0	-21.66	-11.31
5356.200	39.95	29.91	12.90	52.85	42.81	Vert.	74.0	54.0	-21.15	-11.19

802.11n HT40_CH 54										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5062.800	36.92	28.43	12.90	49.82	41.33	Horiz./	74.0	54.0	-24.18	-12.67
5082.100	37.27	28.62	12.90	50.17	41.52	Vert.	74.0	54.0	-23.83	-12.48
5449.200	36.21	28.66	12.90	49.11	41.56	Horiz./	74.0	54.0	-24.89	-12.44
5351.300	38.12	29.41	12.90	51.02	42.31	Vert.	74.0	54.0	-22.98	-11.69
802.11n HT40_CH 62										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5077.200	37.33	28.18	12.90	50.23	41.08	Horiz./	74.0	54.0	-23.77	-12.92
5125.300	38.21	28.52	12.90	51.11	41.42	Vert.	74.0	54.0	-22.89	-12.58
5350.260	38.16	28.87	12.90	51.06	41.77	Horiz./	74.0	54.0	-22.94	-12.23
5354.610	42.33	33.35	12.90	55.23	46.25	Vert.	74.0	54.0	-18.77	-7.75

Restricted Frequency Bands Data: Band 3_5470~5725MHz

802.11a _CH 100										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5446.800	36.75	28.13	12.90	49.65	41.03	Horiz./	74.0	54.0	-24.35	-12.97
5462.110	39.26	29.49	12.90	52.16	42.39	Vert.	74.0	54.0	-21.84	-11.61
802.11a_CH 116										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5468.050	36.41	27.36	12.90	49.31	40.26	Horiz./	74.0	54.0	-24.69	-13.74
5465.130	36.99	27.72	12.90	49.89	40.62	Vert.	74.0	54.0	-24.11	-13.38
5763.590	36.17	28.15	13.10	49.27	41.25	Horiz./	74.0	54.0	-24.73	-12.75
5760.380	36.73	28.54	13.10	49.83	41.64	Vert.	74.0	54.0	-24.17	-12.36
802.11a _CH 140										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5750.160	37.19	28.02	13.10	50.29	41.12	Horiz./	74.0	54.0	-23.71	-12.88
5725.300	39.86	28.76	13.10	52.96	41.86	Vert.	74.0	54.0	-21.04	-12.14

802.11n HT20_CH 100										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5468.200	37.35	28.52	12.90	50.25	41.42	Horiz./	74.0	54.0	-23.75	-12.58
5466.100	40.74	29.69	12.90	53.64	42.59	Vert.	74.0	54.0	-20.36	-11.41
802.11n HT20_CH 116										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5425.650	35.72	27.23	12.90	48.62	40.13	Horiz./	74.0	54.0	-25.38	-13.87
5466.200	36.82	28.15	12.90	49.72	41.05	Vert.	74.0	54.0	-24.28	-12.95
5760.200	37.21	28.12	13.10	50.31	41.22	Horiz./	74.0	54.0	-23.69	-12.78
5733.200	37.54	28.65	13.10	50.64	41.75	Vert.	74.0	54.0	-23.36	-12.25
802.11n HT20_CH 140										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5725.600	39.52	28.23	13.10	52.62	41.33	Horiz./	74.0	54.0	-21.38	-12.67
5725.500	43.44	29.09	13.10	56.54	42.19	Vert.	74.0	54.0	-17.46	-11.81

802.11n HT40_CH 102										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5468.300	39.23	29.81	12.90	52.13	42.71	Horiz./	74.0	54.0	-21.87	-11.29
5460.200	41.72	29.86	12.90	54.62	42.76	Vert.	74.0	54.0	-19.38	-11.24
5735.100	35.54	27.18	13.10	48.64	40.28	Horiz./	74.0	54.0	-25.36	-13.72
5735.200	37.21	28.05	13.10	50.31	41.15	Vert.	74.0	54.0	-23.69	-12.85
802.11n HT40_CH 110										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5444.800	38.12	28.43	12.90	51.02	41.33	Horiz./	74.0	54.0	-22.98	-12.67
5406.180	37.46	27.67	12.90	50.36	40.57	Vert.	74.0	54.0	-23.64	-13.43
5743.200	35.11	27.31	13.10	48.21	40.41	Horiz./	74.0	54.0	-25.79	-13.59
5747.300	36.94	27.86	13.10	50.04	40.96	Vert.	74.0	54.0	-23.96	-13.04
802.11n HT40_CH 134										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5413.100	35.46	28.22	12.90	48.36	41.12	Horiz./	74.0	54.0	-25.64	-12.88
5455.100	36.62	29.65	12.90	49.52	42.55	Vert.	74.0	54.0	-24.48	-11.45
5725.300	38.28	28.43	13.10	51.38	41.53	Horiz./	74.0	54.0	-22.62	-12.47
5726.300	41.46	29.27	13.10	54.56	42.37	Vert.	74.0	54.0	-19.44	-11.63

Restricted Frequency Bands Data: Band 4_5725~5850MHz

802.11a _CH 149									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
5648.300	38.05	-	13.10	51.15	-	Horiz./	68.20	-	-17.05	-
5649.700	38.29	-	13.10	51.39	-	Vert.	68.20	-	-16.81	-
5718.690	37.31	-	13.10	50.41	-	Horiz./	110.43	-	-60.02	-
5719.100	40.65	-	13.10	53.75	-	Vert.	110.55	-	-56.80	-
802.11a_CH 157										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
5647.300	38.05	-	13.10	51.15	-	Horiz./	68.20	-	-17.05	-
5665.000	38.29	-	13.10	51.39	-	Vert.	79.33	-	-27.94	-
5863.400	37.31	-	13.10	50.41	-	Horiz./	108.45	-	-58.04	-
5940.600	38.10	-	13.10	51.20	-	Vert.	68.20	-	-17.00	-
802.11a _CH 165										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
5851.300	37.21	-	13.10	50.31	-	Horiz./	119.24	-	-68.93	-
5852.600	40.17	-	13.10	53.27	-	Vert.	116.27	-	-63.00	-
5890.210	37.43	-	13.10	50.53	-	Horiz./	93.91	-	-43.38	-
5878.100	38.54	-	13.10	51.64	-	Vert.	102.90	-	-51.26	-

802.11n HT20_CH 149									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
5613.000	36.46	-	13.10	49.56	-	Horiz./	68.20	-	-18.64	-
5665.400	37.02	-	13.10	50.12	-	Vert.	79.63	-	-29.51	-
5645.600	37.12	-	13.10	50.22	-	Horiz./	68.20	-	-17.98	-
5724.600	46.41	-	13.10	59.51	-	Vert.	121.29	-	-61.78	-
802.11n HT20_CH 157										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
5638.200	36.18	-	13.10	49.28	-	Horiz./	68.20	-	-18.92	-
5618.400	37.62	-	13.10	50.72	-	Vert.	68.20	-	-17.48	-
5943.600	36.47	-	13.10	49.57	-	Horiz./	68.20	-	-18.63	-
5931.500	36.70	-	13.10	49.80	-	Vert.	68.20	-	-18.40	-
802.11n HT20_CH 165										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
5851.400	39.58	-	13.10	52.68	-	Horiz./	119.01	-	-66.33	-
5850.200	41.80	-	13.10	54.90	-	Vert.	121.74	-	-66.84	-
5926.300	37.11	-	13.10	50.21	-	Horiz./	68.20	-	-17.99	-
5931.500	39.50	-	13.10	52.60	-	Vert.	68.20	-	-15.60	-

802.11n HT40_CH 151										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5625.700	36.79	-	13.10	49.89	-	Horiz./	68.20	-	-18.31	-
5719.800	50.47	-	13.10	63.57	-	Vert.	110.74	-	-47.17	-
5933.800	37.17	-	13.10	50.27	-	Horiz./	68.20	-	-17.93	-
5938.600	39.55	-	13.10	52.65	-	Vert.	68.20	-	-15.55	-
802.11n HT40_CH 159										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
5617.400	37.37	-	13.10	50.47	-	Horiz./	68.20	-	-17.73	-
5618.900	37.32	-	13.10	50.42	-	Vert.	68.20	-	-17.78	-
5937.800	36.46	-	13.10	49.56	-	Horiz./	68.20	-	-18.64	-
5939.700	38.53	-	13.10	51.63	-	Vert.	68.20	-	-16.57	-

Note: (1) All Reading Levels below 1GHz are Quasi-Peak, above are peak and average value.
(2) Emission Level = Reading Level + Probe Factor + Cable Loss - Preamp Gain.
(3) Span shall wide enough to fully capture thee mission being measured;
Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement.
For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
(4) The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
(5)Where an emission level is indicated by a –, levels had a margin greater than 20 dB when compared to the limit.

Harmonics Radiated Emission Data: Band 1_5150~5250MHz

802.11a _CH 36									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10360.000	23.52	-	24.00	47.52	-	Horiz./	74.0	54.0	-26.48	-
10360.000	18.15	-	31.10	49.25	-	Vert.	74.0	54.0	-24.75	-
15540.000	24.23	-	24.00	48.23	-	Horiz./	74.0	54.0	-25.77	-
15540.000	19.40	-	31.10	50.50	-	Vert.	74.0	54.0	-23.50	-
802.11a _CH 40										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10440.000	22.46	-	24.00	46.46	-	Horiz./	74.00	54.00	-27.54	-
10440.000	18.27	-	31.10	49.37	-	Vert.	74.00	54.00	-24.63	-
15660.000	24.51	-	24.00	48.51	-	Horiz./	74.00	54.00	-25.49	-
15660.000	18.52	-	31.10	49.62	-	Vert.	74.00	54.00	-24.38	-
802.11a _CH 48										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10480.000	23.23	-	24.00	47.23	-	Horiz./	74.00	54.00	-26.77	-
10480.000	18.04	-	31.10	49.14	-	Vert.	74.00	54.00	-24.86	-
15720.000	24.96	-	24.00	48.96	-	Horiz./	74.00	54.00	-25.04	-
15720.000	18.70	-	31.10	49.80	-	Vert.	74.00	54.00	-24.20	-

802.11n HT20_CH 36									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10360.000	24.42	-	24.00	48.42	-	Horiz./	74.00	54.00	-25.58	-
10360.000	17.68	-	31.10	48.78	-	Vert.	74.00	54.00	-25.22	-
15540.000	24.37	-	24.00	48.37	-	Horiz./	74.00	54.00	-25.63	-
15540.000	17.59	-	31.10	48.69	-	Vert.	74.00	54.00	-25.31	-
802.11n HT20_CH 40										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10400.000	24.65	-	24.00	48.65	-	Horiz./	74.00	54.00	-25.35	-
10400.000	17.86	-	31.10	48.96	-	Vert.	74.00	54.00	-25.04	-
15600.000	24.19	-	24.00	48.19	-	Horiz./	74.00	54.00	-25.81	-
15600.000	19.24	-	31.10	50.34	-	Vert.	74.00	54.00	-23.66	-
802.11n HT20_CH 48										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10480.000	23.68	-	24.00	47.68	-	Horiz./	74.00	54.00	-26.32	-
10480.000	18.77	-	31.10	49.87	-	Vert.	74.00	54.00	-24.13	-
15720.000	23.73	-	24.00	47.73	-	Horiz./	74.00	54.00	-26.27	-
15720.000	19.04	-	31.10	50.14	-	Vert.	74.00	54.00	-23.86	-

802.11n HT40_CH 38										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
10380.000	23.65	-	24.00	47.65	-	Horiz./	74.00	54.00	-26.35	-
10380.000	17.83	-	31.10	48.93	-	Vert.	74.00	54.00	-25.07	-
15570.000	23.53	-	24.00	47.53	-	Horiz./	74.00	54.00	-26.47	-
15570.000	18.94	-	31.10	50.04	-	Vert.	74.00	54.00	-23.96	-
802.11n HT40_CH 46										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
10460.000	24.12	-	24.00	48.12	-	Horiz./	74.00	54.00	-25.88	-
10460.000	18.28	-	31.10	49.38	-	Vert.	74.00	54.00	-24.62	-
15690.000	24.27	-	24.00	48.27	-	Horiz./	74.00	54.00	-25.73	-
15690.000	18.66	-	31.10	49.76	-	Vert.	74.00	54.00	-24.24	-

Harmonics Radiated Emission Data: Band 2_5250~5350MHz

802.11a _CH 52										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10520.000	24.37	-	24.00	48.37	-	Horiz./	74.00	54.00	-25.63	-
10520.000	18.54	-	31.10	49.64	-	Vert.	74.00	54.00	-24.36	-
15780.000	25.28	-	24.00	49.28	-	Horiz./	74.00	54.00	-24.72	-
15780.000	18.56	-	31.10	49.66	-	Vert.	74.00	54.00	-24.34	-
802.11a_CH 56										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10560.000	23.95	-	24.00	47.95	-	Horiz./	74.00	54.00	-26.05	-
10560.000	17.16	-	31.10	48.26	-	Vert.	74.00	54.00	-25.74	-
15840.000	24.67	-	24.00	48.67	-	Horiz./	74.00	54.00	-25.33	-
15840.000	18.21	-	31.10	49.31	-	Vert.	74.00	54.00	-24.69	-
802.11a _CH 64										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10640.000	23.26	-	24.00	47.26	-	Horiz./	74.00	54.00	-26.74	-
10640.000	16.11	-	31.10	47.21	-	Vert.	74.00	54.00	-26.79	-
15960.000	24.32	-	24.00	48.32	-	Horiz./	74.00	54.00	-25.68	-
15960.000	17.26	-	31.10	48.36	-	Vert.	74.00	54.00	-25.64	-

802.11n HT20_CH 52										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10520.000	24.27	-	24.00	48.27	-	Horiz./	74.00	54.00	-25.73	-
10520.000	17.54	-	31.10	48.64	-	Vert.	74.00	54.00	-25.36	-
15780.000	25.31	-	24.00	49.31	-	Horiz./	74.00	54.00	-24.69	-
15780.000	18.27	-	31.10	49.37	-	Vert.	74.00	54.00	-24.63	-
802.11n HT20_CH 56										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10560.000	23.49	-	24.00	47.49	-	Horiz./	74.00	54.00	-26.51	-
10560.000	18.28	-	31.10	49.38	-	Vert.	74.00	54.00	-24.62	-
15840.000	24.62	-	24.00	48.62	-	Horiz./	74.00	54.00	-25.38	-
15840.000	17.86	-	31.10	48.96	-	Vert.	74.00	54.00	-25.04	-
802.11n HT20_CH 64										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
10640.000	25.36	-	24.00	49.36	-	Horiz./	74.00	54.00	-24.64	-
10640.000	17.54	-	31.10	48.64	-	Vert.	74.00	54.00	-25.36	-
15960.000	25.65	-	24.00	49.65	-	Horiz./	74.00	54.00	-24.35	-
15960.000	17.17	-	31.10	48.27	-	Vert.	74.00	54.00	-25.73	-

802.11n HT40_CH 54										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
10540.000	23.38	-	24.00	47.38	-	Horiz./	74.00	54.00	-26.62	-
10540.000	16.59	-	31.10	47.69	-	Vert.	74.00	54.00	-26.31	-
15810.000	25.31	-	24.00	49.31	-	Horiz./	74.00	54.00	-24.69	-
15810.000	18.55	-	31.10	49.65	-	Vert.	74.00	54.00	-24.35	-
802.11n HT40_CH 62										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
10620.000	23.58	-	24.00	47.58	-	Horiz./	74.00	54.00	-26.42	-
10620.000	17.69	-	31.10	48.79	-	Vert.	74.00	54.00	-25.21	-
15930.000	26.20	-	24.00	50.20	-	Horiz./	74.00	54.00	-23.80	-
15930.000	18.52	-	31.10	49.62	-	Vert.	74.00	54.00	-24.38	-

Note: (1) All Reading Levels below 1GHz are Quasi-Peak, above are peak and average value.
(2) Emission Level = Reading Level + Probe Factor + Cable Loss - Preamp Gain.
(3) Span shall wide enough to fully capture thee mission being measured;
Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement.
For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
(4) The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
(5)Where an emission level is indicated by a –, levels had a margin greater than 20 dB when compared to the limit.

Harmonics Radiated Emission Data: Band 3_5470~5725MHz

802.11a _CH 100									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11000.000	24.42	-	24.10	48.52	-	Horiz./	74.00	54.00	-25.48	-
11000.000	19.89	-	28.70	48.59	-	Vert.	74.00	54.00	-25.41	-
16500.000	25.24	-	24.10	49.34	-	Horiz./	74.00	54.00	-24.66	-
16500.000	20.94	-	28.70	49.64	-	Vert.	74.00	54.00	-24.36	-
802.11a_CH 116										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11160.000	23.42	-	24.10	47.52	-	Horiz./	74.00	54.00	-26.48	-
11160.000	18.98	-	28.70	47.68	-	Vert.	74.00	54.00	-26.32	-
16740.000	26.02	-	24.10	50.12	-	Horiz./	74.00	54.00	-23.88	-
16740.000	20.68	-	28.70	49.38	-	Vert.	74.00	54.00	-24.62	-
802.11a _CH 140										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11400.000	21.47	-	24.10	45.57	-	Horiz./	74.00	54.00	-28.43	-
11400.000	12.66	-	33.20	45.86	-	Vert.	74.00	54.00	-28.14	-
17100.000	26.52	-	24.10	50.62	-	Horiz./	74.00	54.00	-23.38	-
17100.000	16.95	-	33.20	50.15	-	Vert.	74.00	54.00	-23.85	-
802.11a _CH 144										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11440.000	25.16	-	24.10	49.26	-	Horiz./	74.0	54.0	-24.74	-
11440.000	26.29	-	24.10	50.39	-	Vert.	74.0	54.0	-23.61	-
17160.000	17.07	-	33.20	50.27	-	Horiz./	74.0	54.0	-23.73	-
17160.000	17.49	-	33.20	50.69	-	Vert.	74.0	54.0	-23.31	-

802.11n HT20_CH 100									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11000.000	23.72	-	24.10	47.82	-	Horiz./	74.00	54.00	-26.18	-
11000.000	18.98	-	28.70	47.68	-	Vert.	74.00	54.00	-26.32	-
16500.000	25.32	-	24.10	49.42	-	Horiz./	74.00	54.00	-24.58	-
16500.000	20.83	-	28.70	49.53	-	Vert.	74.00	54.00	-24.47	-
802.11n HT20_CH 116										
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11160.000	22.62	-	24.10	46.72	-	Horiz./	74.00	54.00	-27.28	-
11160.000	23.28	-	24.10	47.38	-	Vert.	74.00	54.00	-26.62	-
16740.000	21.95	-	28.70	50.65	-	Horiz./	74.00	54.00	-23.35	-
16740.000	21.73	-	28.70	50.43	-	Vert.	74.00	54.00	-23.57	-

802.11n HT20_CH 140									
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
11400.000	22.42	-	24.10	46.52	-	Horiz./	74.00	54.00	-27.48	-
11400.000	22.47	-	24.10	46.57	-	Vert.	74.00	54.00	-27.43	-
17100.000	15.99	-	33.20	49.19	-	Horiz./	74.00	54.00	-24.81	-
17100.000	17.47	-	33.20	50.67	-	Vert.	74.00	54.00	-23.33	-
802.11n HT20_CH 144										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
11440.000	25.18	-	24.10	49.28	-	Horiz./	74.0	54.0	-24.72	-
11440.000	25.76	-	24.10	49.86	-	Vert.	74.0	54.0	-24.14	-
17160.000	17.21	-	33.20	50.41	-	Horiz./	74.0	54.0	-23.59	-
17160.000	17.53	-	33.20	50.73	-	Vert.	74.0	54.0	-23.27	-

802.11n HT40_CH 102									
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
11020.000	23.26	-	24.10	47.36	-	Horiz./	74.00	54.00	-26.64	-
11020.000	23.52	-	24.10	47.62	-	Vert.	74.00	54.00	-26.38	-
16530.000	20.84	-	28.70	49.54	-	Horiz./	74.00	54.00	-24.46	-
16530.000	21.15	-	28.70	49.85	-	Vert.	74.00	54.00	-24.15	-
802.11n HT40_CH 110										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
11100.000	23.43	-	24.10	47.53	-	Horiz./	74.00	54.00	-26.47	-
11100.000	23.22	-	24.10	47.32	-	Vert.	74.00	54.00	-26.68	-
16650.000	21.78	-	28.70	50.48	-	Horiz./	74.00	54.00	-23.52	-
16650.000	20.91	-	28.70	49.61	-	Vert.	74.00	54.00	-24.39	-
802.11n HT40_CH 134										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
11340.000	22.41	-	24.10	46.51	-	Horiz./	74.00	54.00	-27.49	-
11340.000	22.72	-	24.10	46.82	-	Vert.	74.00	54.00	-27.18	-
17010.000	16.69	-	33.20	49.89	-	Horiz./	74.00	54.00	-24.11	-
17010.000	17.77	-	33.20	50.97	-	Vert.	74.00	54.00	-23.03	-

Harmonics Radiated Emission Data: Band 4_5725~5850MHz

802.11a _CH 149									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11490.000	21.52	-	24.10	45.62	-	Horiz./	74.00	54.00	-28.38	-
11490.000	21.57	-	24.10	45.67	-	Vert.	74.00	54.00	-28.33	-
17235.000	16.93	-	33.20	50.13	-	Horiz./	74.00	54.00	-23.87	-
17235.000	16.99	-	33.20	50.19	-	Vert.	74.00	54.00	-23.81	-
802.11a_CH 157									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11570.000	25.92	-	24.20	50.12	-	Horiz./	74.00	54.00	-23.88	-
11570.000	26.04	-	24.20	50.24	-	Vert.	74.00	54.00	-23.76	-
17355.000	16.65	-	33.20	49.85	-	Horiz./	74.00	54.00	-24.15	-
17355.000	17.27	-	33.20	50.47	-	Vert.	74.00	54.00	-23.53	-
802.11a _CH 165									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11650.000	26.11	-	24.20	50.31	-	Horiz./	74.00	54.00	-23.69	-
11650.000	25.47	-	24.20	49.67	-	Vert.	74.00	54.00	-24.33	-
17475.000	16.72	-	33.20	49.92	-	Horiz./	74.00	54.00	-24.08	-
17475.000	17.14	-	33.20	50.34	-	Vert.	74.00	54.00	-23.66	-

802.11n HT20_CH 149									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11490.000	26.03	-	24.10	50.13	-	Horiz./	74.00	54.00	-23.87	-
11490.000	25.75	-	24.10	49.85	-	Vert.	74.00	54.00	-24.15	-
17235.000	17.44	-	33.20	50.64	-	Horiz./	74.00	54.00	-23.36	-
17235.000	16.57	-	33.20	49.77	-	Vert.	74.00	54.00	-24.23	-
802.11n HT20_CH 157									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11570.000	25.32	-	24.20	49.52		Horiz./	74.00	54.00	-24.48	-
11570.000	26.63	-	24.20	50.83		Vert.	74.00	54.00	-23.17	-
17355.000	17.05	-	33.20	50.25		Horiz./	74.00	54.00	-23.75	-
17355.000	17.26	-	33.20	50.46		Vert.	74.00	54.00	-23.54	-
802.11n HT20_CH 165									
Frequency (MHz)	Read Level (dBuV) PK	AV	Factor (dB)	Emission (dBuV/m) PK	AV	Horiz./ Vert.	Limit (dBuV/m) PK	AV	Margin(dB) PK	AV
11650.000	26.06	-	24.20	50.26	-	Horiz./	74.00	54.00	-23.74	-
11650.000	25.38	-	24.20	49.58	-	Vert.	74.00	54.00	-24.42	-
17475.000	17.07	-	33.20	50.27	-	Horiz./	74.00	54.00	-23.73	-
17475.000	17.04	-	33.20	50.24	-	Vert.	74.00	54.00	-23.76	-

802.11n HT40_CH 151										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
11510.000	25.93	-	24.20	50.13	-	Horiz./	74.00	54.00	-23.87	-
11510.000	26.15	-	24.20	50.35	-	Vert.	74.00	54.00	-23.65	-
17265.000	17.21	-	33.20	50.41	-	Horiz./	74.00	54.00	-23.59	-
17265.000	17.44	-	33.20	50.64	-	Vert.	74.00	54.00	-23.36	-
802.11n HT40_CH 159										
Frequency (MHz)	Read Level (dBuV) PK	Read Level (dBuV) AV	Factor (dB)	Emission (dBuV/m) PK	Emission (dBuV/m) AV	Horiz./ Vert.	Limit (dBuV/m) PK	Limit (dBuV/m) AV	Margin(dB) PK	Margin(dB) AV
11590.000	26.21	-	24.20	50.41	-	Horiz./	74.00	54.00	-23.59	-
11590.000	26.55	-	24.20	50.75	-	Vert.	74.00	54.00	-23.25	-
17385.000	17.18	-	33.20	50.38	-	Horiz./	74.00	54.00	-23.62	-
17385.000	17.66	-	33.20	50.86	-	Vert.	74.00	54.00	-23.14	-

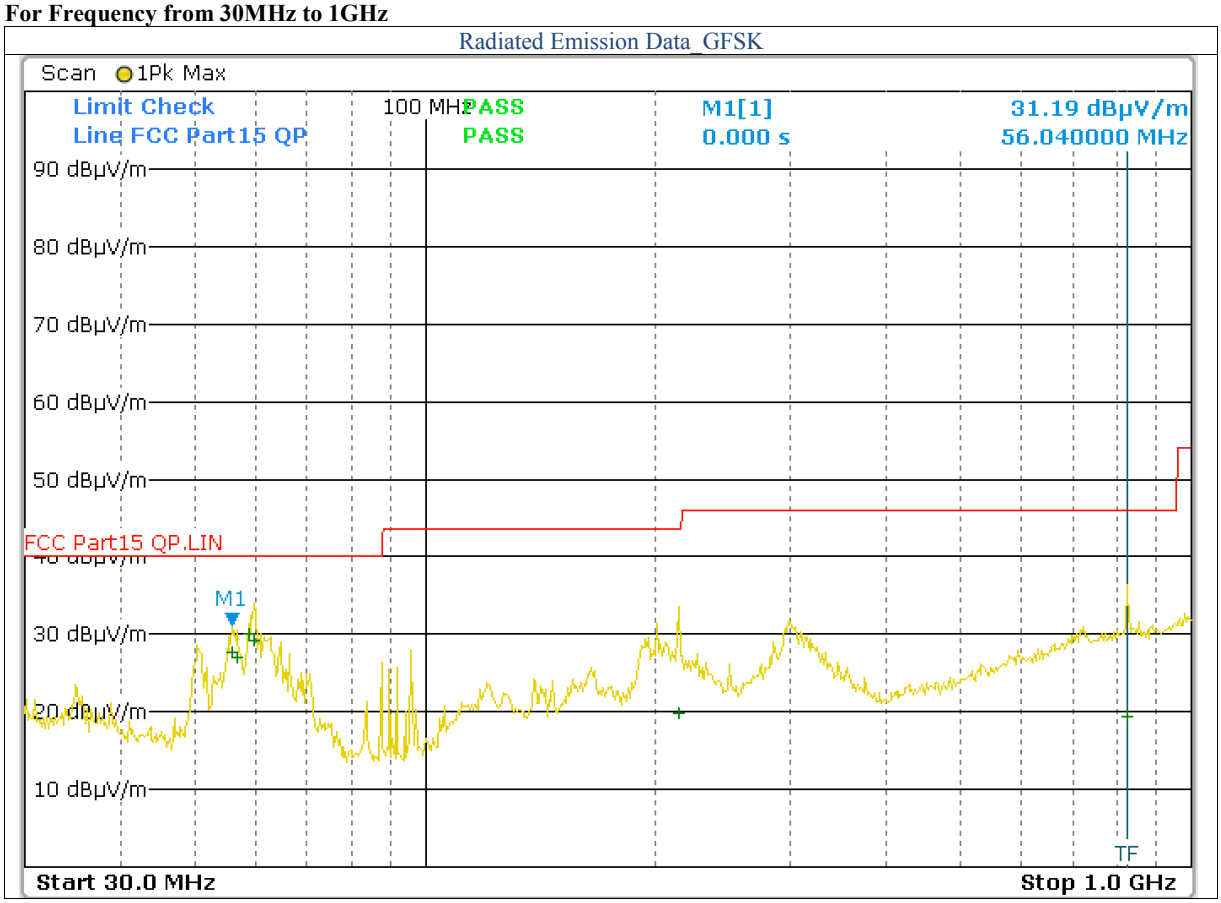
Note: (1) All Reading Levels below 1GHz are Quasi-Peak, above are peak and average value.
(2) Emission Level = Reading Level + Probe Factor + Cable Loss - Preamp Gain.
(3) Span shall wide enough to fully capture thee mission being measured;
Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement.
For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
(4) The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
(5)Where an emission level is indicated by a –, levels had a margin greater than 20 dB when compared to the limit.

General Radiated Emission Data
For Frequency below 30MHz

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Emission (dBuV/m)	Horiz./ Vert.	Limit (dBuV/m)	Margin (dB)
N/A						
N/A						
N/A						
N/A						
N/A						
N/A						

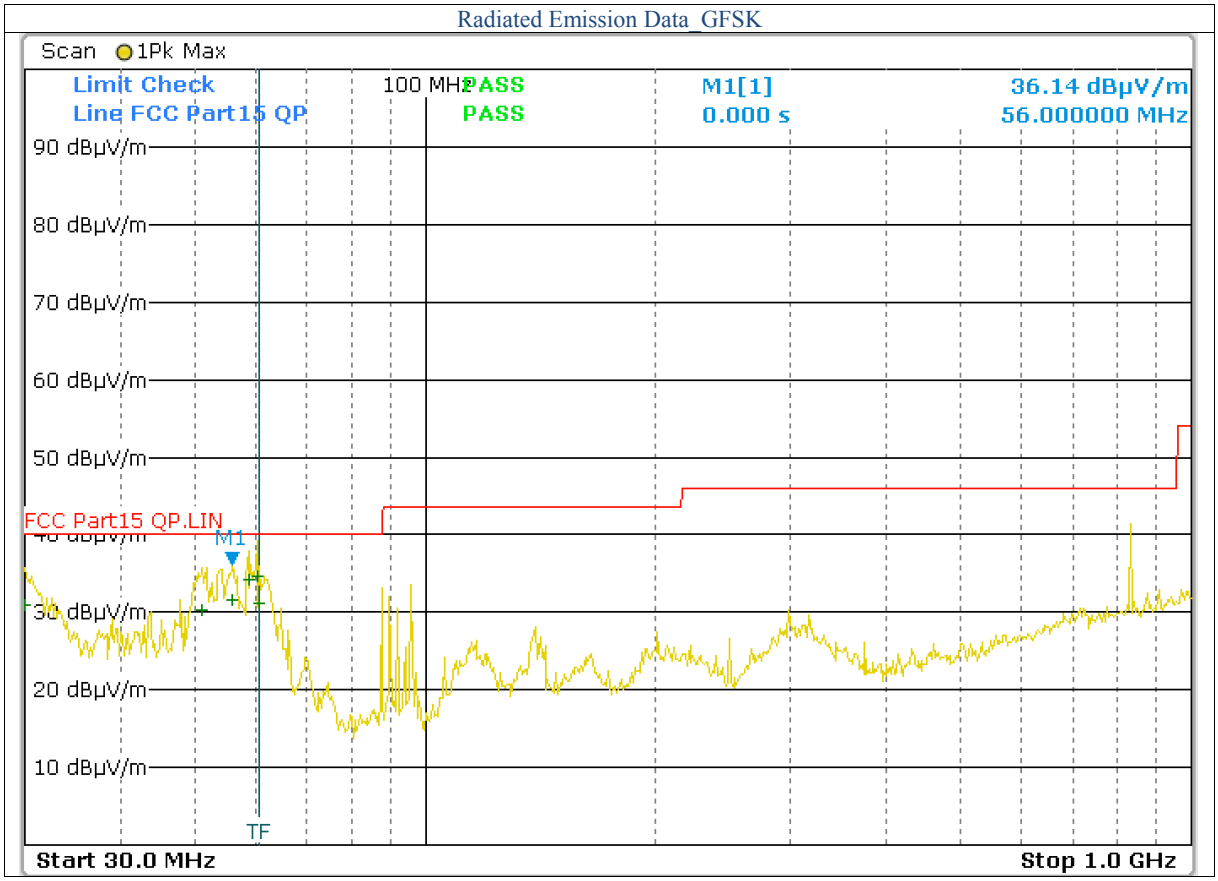
Note: (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
(2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
(3) Emission Level = Reading Level + Probe Factor + Cable Loss.

For Frequency from 30MHz to 1GHz



Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Emission (dBuV/m)	Horiz./ Vert.	Limit (dBuV/m)	Margin (dB)
56.040	16.99	10.66	27.65	Horiz./	40.0	-12.35
56.600	16.27	10.66	26.93	Horiz./	40.0	-13.07
58.720	19.43	10.66	30.09	Horiz./	40.0	-9.91
59.760	18.53	10.66	29.19	Horiz./	40.0	-10.81
214.120	4.59	18.19	22.78	Horiz./	43.5	-20.72
826.400	0.81	22.68	23.49	Horiz./	46.0	-22.51

Radiated Emission Data_GFSK



Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Emission (dBuV/m)	Horiz./ Vert.	Limit (dBuV/m)	Margin (dB)
30.000	18.80	12.06	30.86	Vert.	40.0	-9.14
51.120	19.69	10.66	30.35	Vert.	40.0	-9.65
56.000	20.99	10.66	31.65	Vert.	40.0	-8.35
58.720	23.63	10.66	34.29	Vert.	40.0	-5.71
60.240	25.93	8.81	34.74	Vert.	40.0	-5.26
60.900	22.29	8.81	31.10	Vert.	40.0	-8.90

Note:
(1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
(2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
(3) Emission Level = Reading Level + Probe Factor + Cable Loss.

7. RF Exposure Requirements

7. 1 Limit

According to FCC 15.247(e)(i) and FCC 1.1307(b)(1), 2.1091 Systems operating under provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commissions guidelines.

TABLE1—LIMITSFORMAXIMUMPERMISSIBLEEXPOSURE(MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A)Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	*100	6
3.0–30	1842/f	4.89/f	*900/f^2	6
30–300	61.4	0.163	1.0	6
300–1,500			f/300	6
1,500–100,000			5	6
(B)Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*100	30
1.34–30	824/f	2.19/f	*180/f^2	30
30–300	27.5	0.073	0.2	30
300–1,500			f/1500	30
1,500–100,000			1.0	30

f=frequency in MHz*=Plane-wave equivalent power density

7. 2 MPE Calculation Method

The MPE was calculated at a given distance to show compliance with the power density limit.
The following formula was used to calculate the Power Density:

$$S = PG/4\pi R^2$$

S=Power density (in appropriate units, e.g. mW/cm^2)
P=Power input to the antenna
G=Power gain of the antenna relative to an isotropic radiator
R=Distance to the center of radiation of the antenna (e.g. cm)

7. 3 Test Result

Mode/Band	Maximum Antenna gain (dBi)	Maximum tune-up Conducted Power (dBm)	Evaluation Distance(cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
5.15-5.25 GHz	4.0	15.22	20	0.0166	1.0
5.25-5.35 GHz	4.0	16.09	20	0.0203	1.0
5.47-5.725 GHz	4.0	16.14	20	0.0206	1.0
5.725-5.85 GHz	4.0	15.86	20	0.0193	1.0

Note: BT and 2.4GHz or 5GHz Wi-Fi can't transmit simultaneously.

8. Photos of Testing

8. 1 EUT Test Photographs

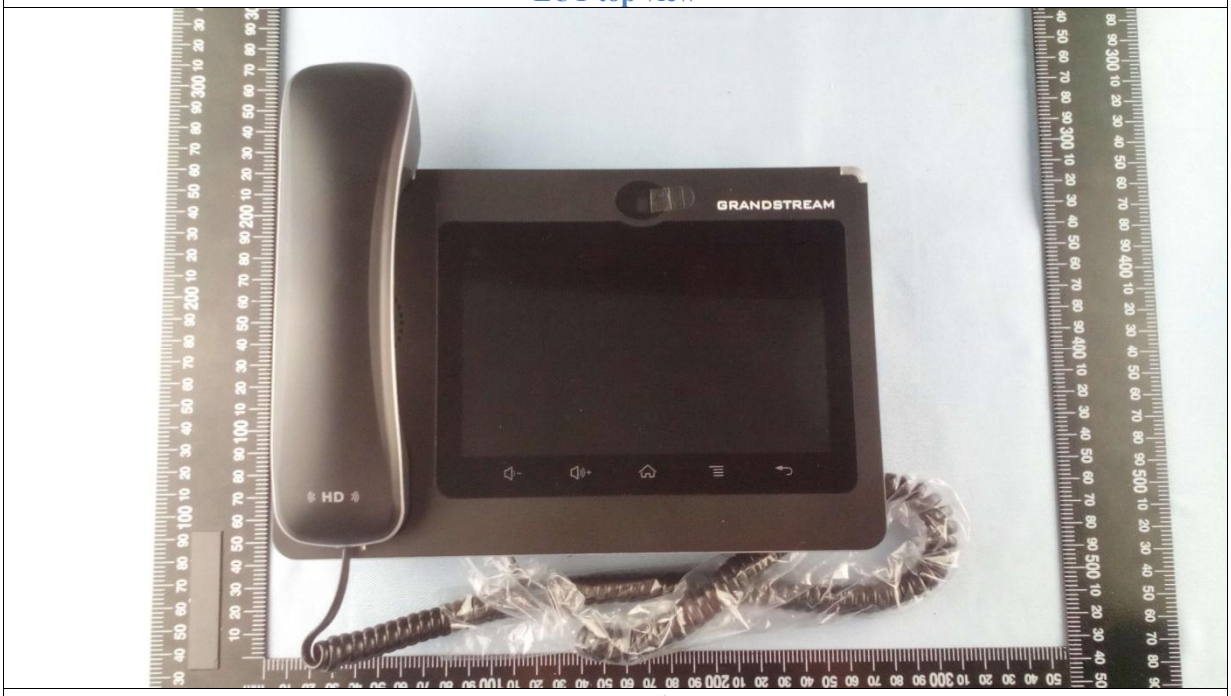
Conducted Emission test view


Radiated Emission test view (Frequency from 30MHz to 1GHz)


Radiated Emission test view (Frequency above 1GHz)

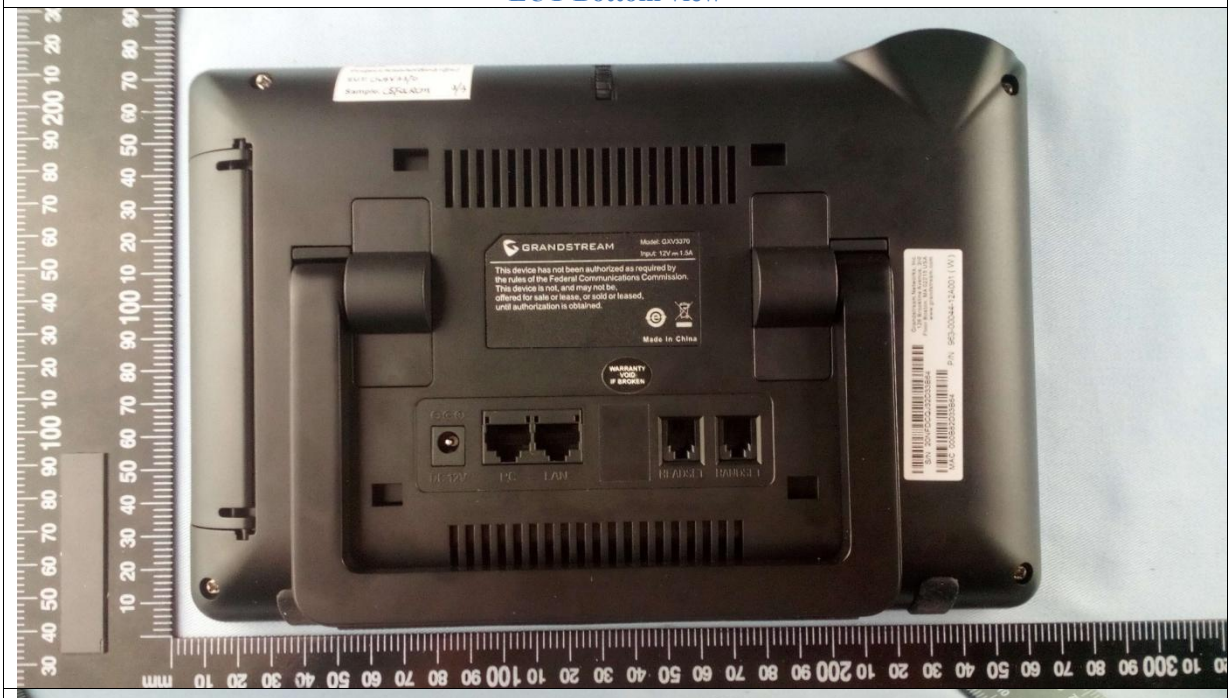

8. 2 EUT Detailed Photographs

EUT top view

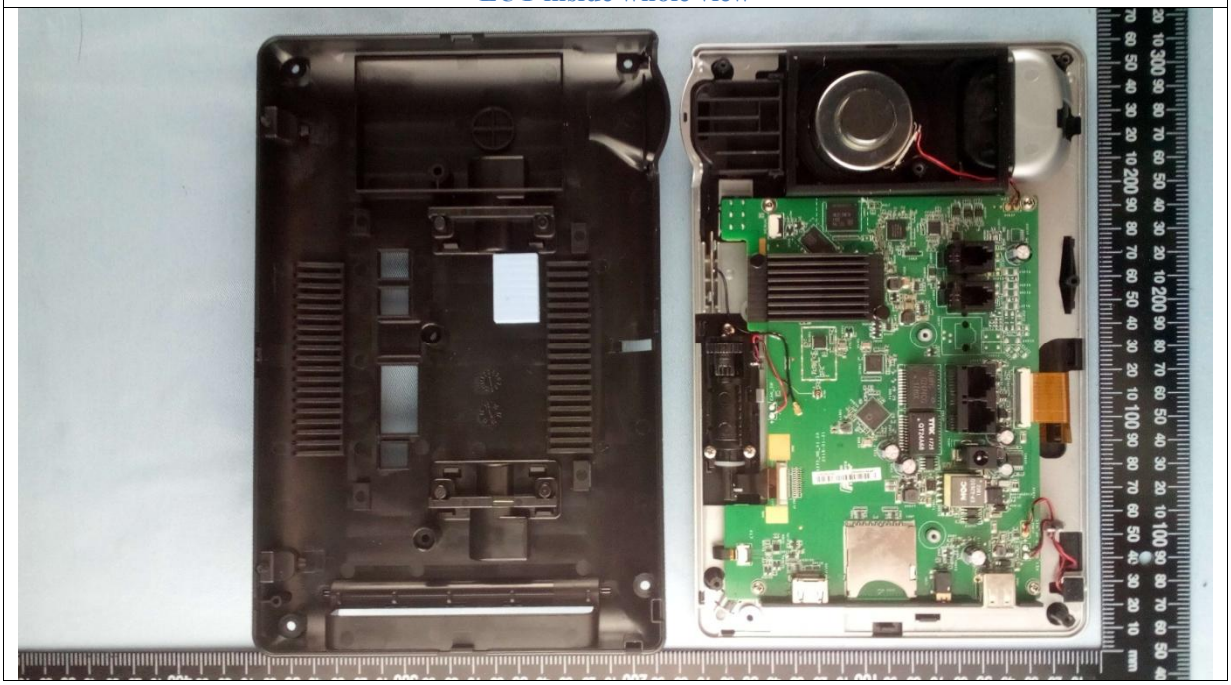


EUT Top view

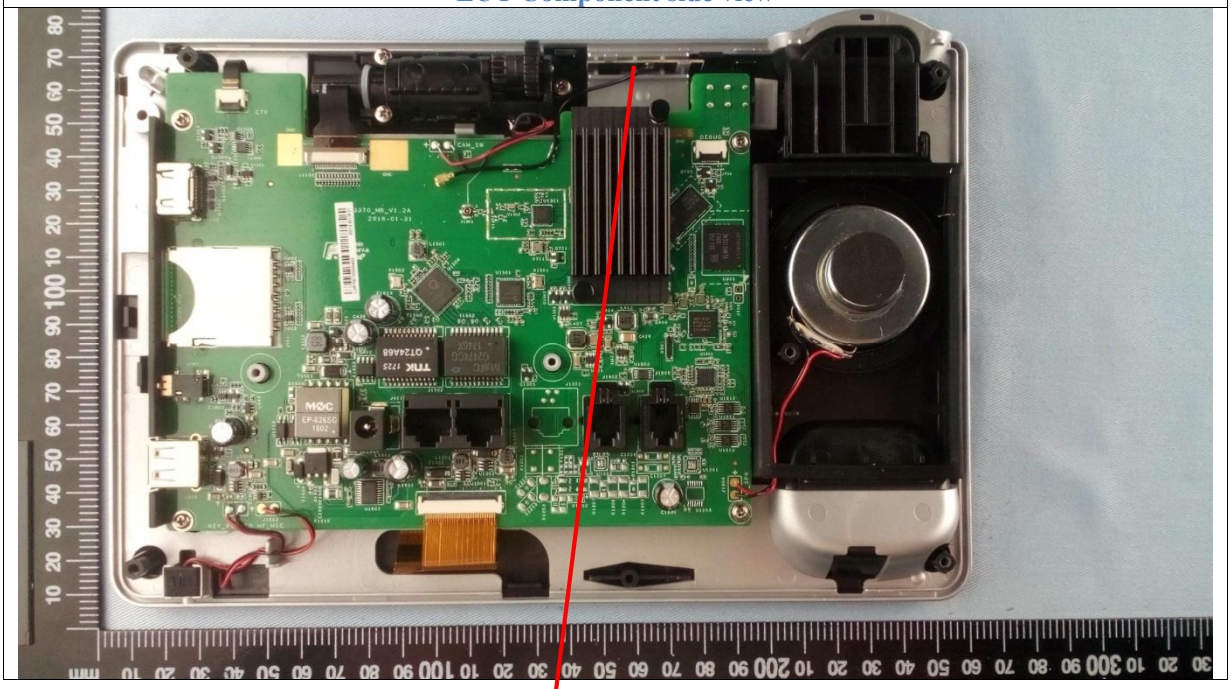
EUT Bottom view



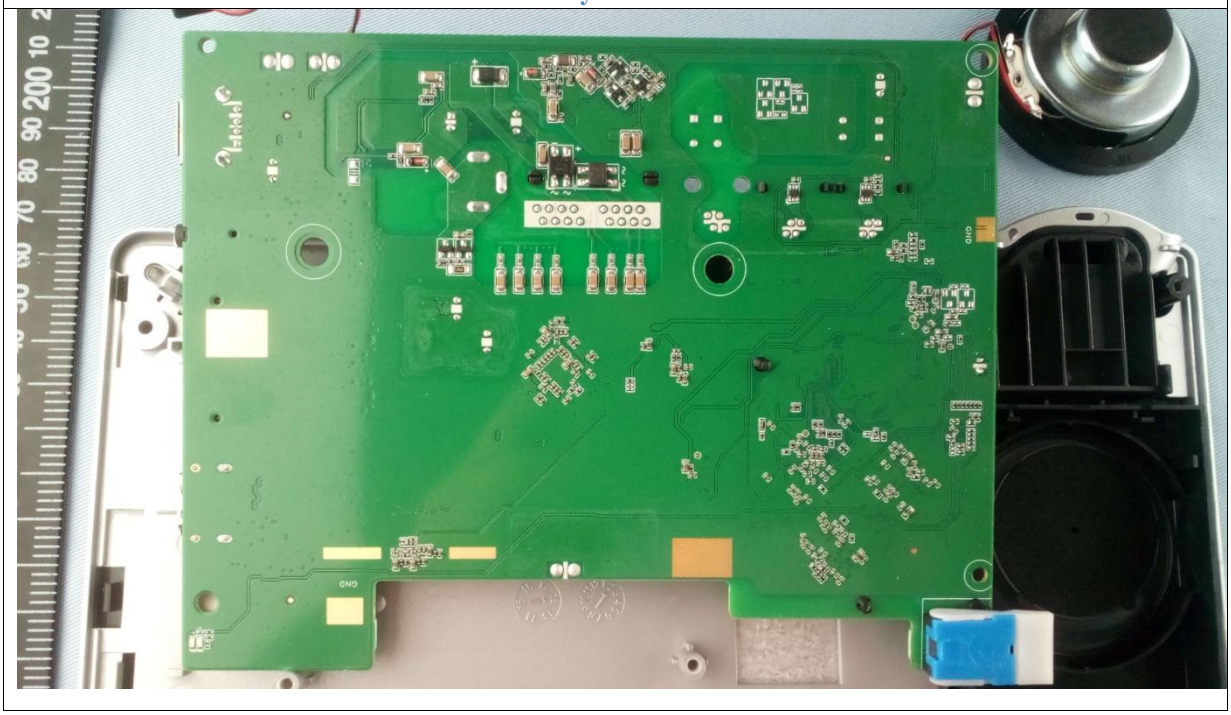
EUT inside whole view



EUT Component side view



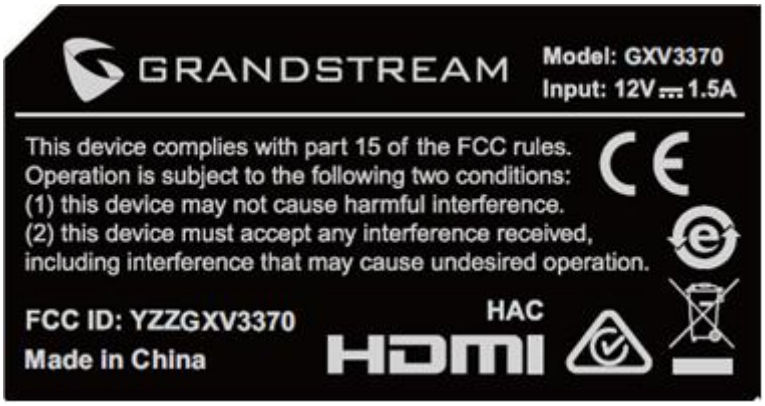
EUT Layout side view



AC/DC Adapter view

AC/DC Adapter view

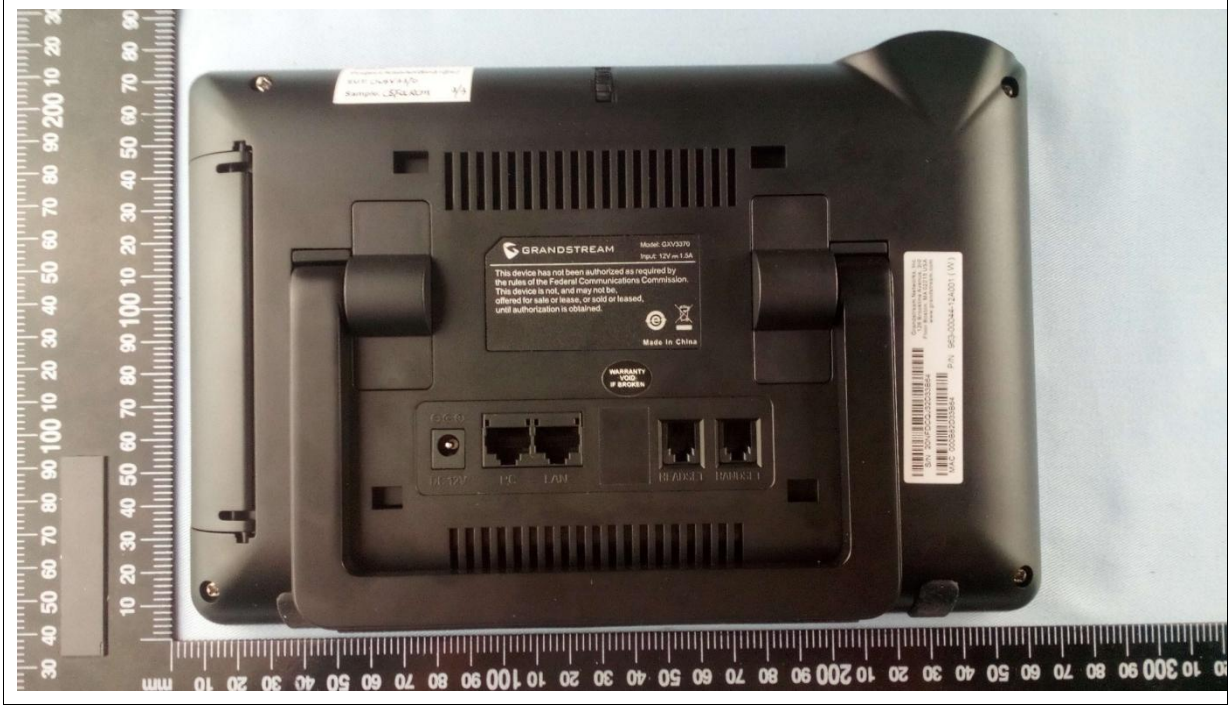
9. FCC ID Label



The following note shall be conspicuously placed in the user manual: "**Operation is subject to the following two conditions: (1) this device may not cause interference, and(2) this device must accept any interference, including interferencethat may cause undesired operation of this device.**"

The Label must not be a stick-on paper label. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT



10. Test Equipment

Equipment/ Facilities	Manufacturer	Model #	Serial No.	Due Date
Turntable	Innco systems GmbH	CT-0801	KMO-SZ114	NCR
Antenna Tower	Innco systems GmbH	MA-4640-XP-ET	KMO-SZ115	NCR
Controller	Innco systems GmbH	CO3000	KMO-SZ116	NCR
Pre-Amplifier	Agilent	87405C	KMO-SZ155	Dec.6, 2019
Pre-Amplifier	Com-Power	PAM-840	KMO-SZ156	Dec.6, 2019
Horn Antenna	SCHWARZBECK	BBHA 9170	KMO-SZ157	Dec.6, 2019
EMI Test Receiver	Rohde & Schwarz	ESR7	KMO-SZ002	Dec.6, 2018
Spectrum Analyzer	Rohde & Schwarz	FSP40	KMO-SZ003	Dec.14, 2019
Loop Antenna	Rohde & Schwarz	HFH2-Z2	KMO-SZ004	Feb.21, 2020
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	KMO-SZ005	August 27, 2018
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	KMO-SZ006	August 19, 2018
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	KMO-SZ007	August 19, 2018
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	KMO-SZ008	August 19, 2018
AMN	Rohde & Schwarz	ESH3-Z5	KMO-SZ009	Dec.25, 2019
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	KMO-SZ077	Dec.25, 2019
ISN	SCHWARZBECK	NTFM 8158 CAT3	KMO-SZ070	Dec.25, 2019
ISN	SCHWARZBECK	NTFM 8158 CAT5	KMO-SZ071	Dec.25, 2019
ISN	SCHWARZBECK	NTFM 8158 CAT6	KMO-SZ072	Dec.25, 2019
KMO Shielded Room	KMO	KMO-001	KMO-SZ036	NCR
Coaxial Cable with N-Connectors	SCHWARZBECK	AK9515H	KMO-SZ037	Sep.18, 2019
AC Power Source / Analyzer	Agilent	6813B	KMO-SZ166	July 14, 2019
AC Power Source / Analyzer	Tektronix	PA1000	KMO-SZ229	Dec.18, 2019
Power Meter	Rohde & Schwarz	OSP-B157	KMO-HK015	Dec.14, 2019
Regulatory Test System 30 MHz to 40 GHz	Rohde & Schwarz	TS8997	KMO-HK015	Dec.14, 2019
Digital Radio Communication Tester	Rohde & Schwarz	CMD60	KMO-SZ169	Dec.14, 2019
UNIVERSAL RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMU200	KMO-SZ170	Dec.14, 2019
Program Control Telephone Exchanger	Excelltel	CDX8000-M	KMO-SZ221	NCR
3m Anechoic Chamber	KMO	KMO-3AC	KMO-3AC-1	Dec.23, 2019
Temperature Chamber	TABAI	PSL-4GTW	KMO-SZ230	Feb.10, 2019