FCC Test Report

Report No.:	RF170822C09-3
FCC ID:	JEH-5555-01XX
Marketing name:	NCR Orderman5+
Test Model:	5555-01XX
Received Date:	Aug. 22, 2017
Test Date:	Dec. 26, 2017 ~ Dec. 29, 2017
Issued Date:	Jan. 30, 2018
Applicant:	NCR
Address:	864 Spring Street NW Atlanta, GA 30308
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF170822C09-3	Original Release	Jan. 30, 2018

1 Certificate of Conformity

Product:	5555-01XX
Brand:	NCR
Marketing name:	NCR Orderman5+
Test Model:	5555-01XX
Sample Status:	Production Unit
Applicant:	NCR
Test Date:	Dec. 26, 2017 ~ Dec. 29, 2017
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Jan. 30, 2018

Gina Liu / Specialist

Approved by : _____ , **Date:** Jan. 30, 2018

Dylan Chiou / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	**Test Item**	**Result**	**Remarks**
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -16.15 dB at 0.35296 MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -6.35 dB at 11490 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6 dB Bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	**Frequency**	**Expended Uncertainty (k=2) (±)**
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	5555-01XX
Brand	NCR
Marketing name	NCR Orderman5+
Test Model	5555-01XX
Status of EUT	Production Unit
Power Supply Rating	3.7 Vdc (Li-ion battery)
Modulation Type	64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps 802.11n: 72.2 Mbps
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5700 MHz, 5745 ~ 5825 MHz
Number of Channel	5180 ~ 5240 MHz: 4 for 802.11a, 802.11n (HT20) 5260 ~ 5320 MHz: 4 for 802.11a, 802.11n (HT20) 5500 ~ 5700 MHz: 11 for 802.11a, 802.11n (HT20) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20)
Output Power	19.231 mW for 5180 ~ 5240 MHz 19.231 mW for 5260 ~ 5320 MHz 19.588 mW for 5500 ~ 5700 MHz 16.596 mW for 5745 ~ 5825 MHz
Antenna Type	PIFA antenna with 4.61 dBi gain (5180 ~ 5240 MHz) PIFA antenna with 4.73 dBi gain (5260 ~ 5320 MHz) PIFA antenna with 4.16 dBi gain (5500 ~ 5700 MHz) PIFA antenna with 2.36 dBi gain (5745 ~ 5825 MHz)
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT provides one completed transmitter and one receiver.

Modulation Mode	Tx Function
802.11a	1TX
802.11n (HT20)	1TX
802.11ac (VHT20)	1TX

* The modulation and bandwidth are similar for 802.11n mode for HT20 and 802.11ac mode for VHT20, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Battery	NCR	5555-0105-8801	3.7 Vdc, 3150 mAh
BT/WLAN Module	USI	WM-BAN-BM-07_S	--
OSR Module	TI	CC1125	--
NFC Module	NXP	NPC100	--
LCD Panel	Holitech	QDF8504-5.0	5”

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

For 5180 ~ 5240 MHz

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

For 5260 ~ 5320 MHz

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
56	5280	64	5320

For 5500 ~ 5700 MHz

11 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	124	5620
104	5520	128	5640
108	5540	132	5660
112	5560	136	5680
116	5580	140	5700
120	5600		

For 5745 ~ 5825 MHz:

5 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	161	5805
153	5765	165	5825
157	5785		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1 GHz **RE<1G:** Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Note:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
-	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
-	5500-5700	802.11a	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 140	100, 116, 140	OFDM	BPSK	MCS0
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
	5745-5825	802.11n (HT20)	149 to 165	149	OFDM	BPSK	MCS0

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5745-5825	802.11n (HT20)	149 to 165	149	OFDM	BPSK	MCS0

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
-	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
-	5500-5700	802.11a	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 140	100, 116, 140	OFDM	BPSK	MCS0
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
APCM	25 deg. C, 65 % RH	3.7 Vdc	Luke Chen

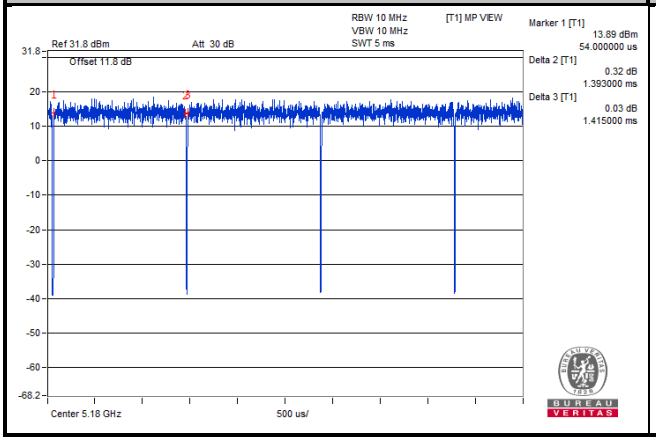
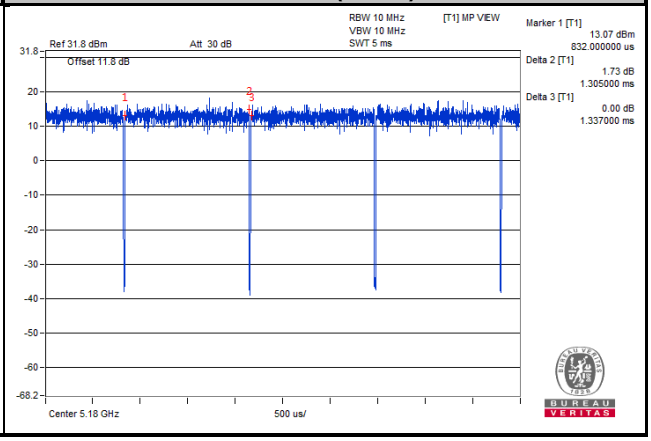
3.3 Duty Cycle of Test Signal

MODULATION TYPE: BPSK

802.11a: Duty cycle of test signal is > 98 %, duty factor is not required.

Duty cycle of test signal is < 98 %, duty factor is required.

802.11n (HT20): Duty cycle = 1.305/1.337 = 0.976, Duty factor = 10 * log(1/0.976) = 0.11

802.11a	802.11n (HT20)
	

3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

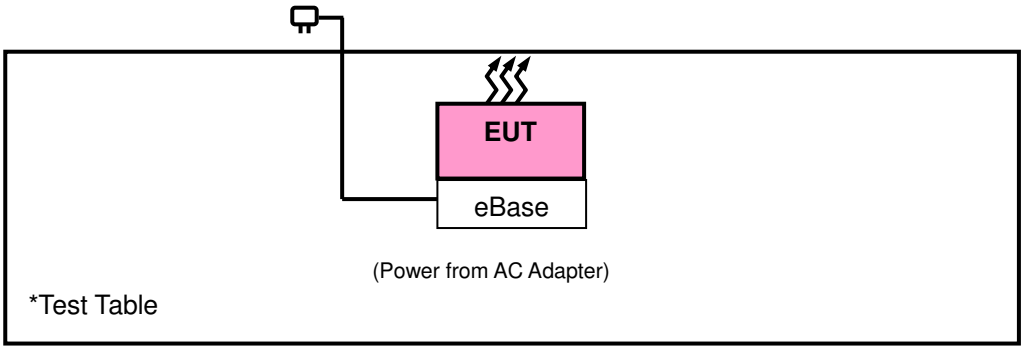
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	NCR Orderman5 eBase	NCR	5555-02XX	N/A	N/A
2.	Adapter	UMEC	UP0181M-05PE	N/A	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A
2.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1, 2 was provided by client.

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)
789033 D02 General UNII Test Procedures New Rules v02r01
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

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

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

4.1.2 Limits of Unwanted Emission Out of the Restricted Bands

Applicable To		Limit	
789033 D02 General UNII Test Procedures New Rules v02r01		Field Strength at 3 m	
		PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Frequency Band	**Applicable To**	**EIRP Limit**	**Equivalent Field Strength at 3 m**
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2 (dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8 (dBμV/m) *3 PK:122.2 (dBμV/m) *4
	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

*1 beyond 75 MHz or more above of the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 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:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts).

4.1.3 Test Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Feb. 17, 2017	Feb. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220314	Nov. 24, 2017	Nov. 23, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	100115	Nov. 23, 2017	Nov. 22, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 06, 2017	Dec. 05, 2018
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 12, 2017	Dec. 11, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 01, 2017	Nov. 30, 2018
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 17, 2017	Apr. 16, 2018
Loop Antenna	HLA 6121	45745	May 19, 2017	May 18, 2018
Preamplifier EMCI	EMC001340	980201	Nov. 01, 2017	Oct. 30, 2018
Bluetooth Tester	CBT	100946	Jul. 29, 2016	Jul. 28, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 13, 2017	Oct. 12, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable HUBER+SUHNNER	EMC104-SM-SM-8000&3000	140811+170717	Oct. 20, 2017	Oct. 19, 2018
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 20, 2017	Oct. 19, 2018
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 08, 2017	Sep. 07, 2018
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 30, 2017	Jun. 29, 2018

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 10.

3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.

4. The IC Site Registration No. is IC7450F-10.

4.1.4 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:

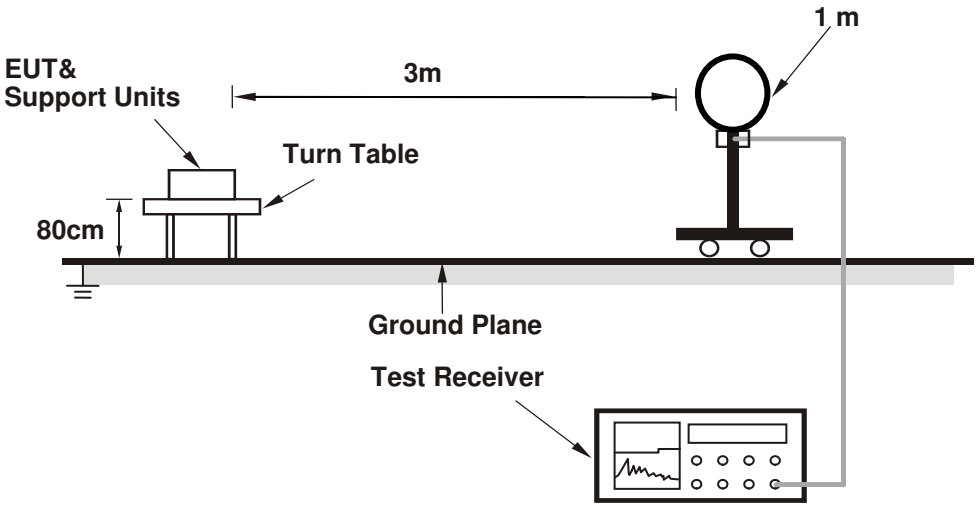
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for Average (Duty cycle < 98 %) detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.5 Deviation from Test Standard

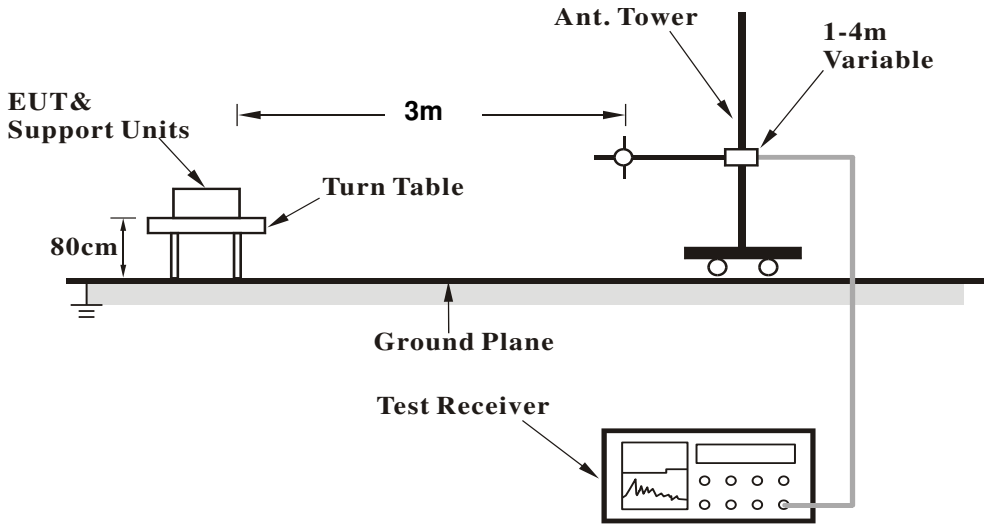
No deviation.

4.1.6 Test Set Up

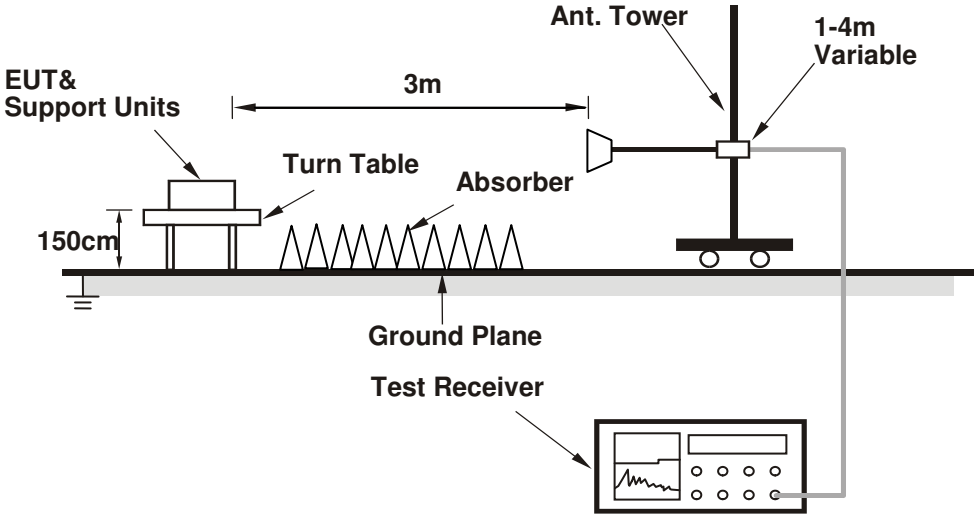
<Radiated emission below 30 MHz>



<Frequency Range below 1 GHz>



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.7 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.8 Test Results

Above 1 GHz Data：

802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 36	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5147.6	42.98	42.4	54	-11.02	31.56	6.34	37.32	170	338	Average
5147.6	55.13	54.55	74	-18.87	31.56	6.34	37.32	170	338	Peak
5180	93.66	93.04			31.59	6.37	37.34	170	338	Average
5180	103.6	102.98			31.59	6.37	37.34	170	338	Peak
*10360	54.9	57.66	68.2	-13.3	39.48	10.21	52.45	251	145	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5147.6	42.09	41.51	54	-11.91	31.56	6.34	37.32	150	7	Average
5147.6	57.32	56.74	74	-16.68	31.56	6.34	37.32	150	7	Peak
5180	92.82	92.2			31.59	6.37	37.34	150	7	Average
5180	102.91	102.29			31.59	6.37	37.34	150	7	Peak
*10360	54.75	57.51	68.2	-13.45	39.48	10.21	52.45	222	214	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5180 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 44	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5143.25	41.06	40.47	54	-12.94	31.56	6.33	37.3	166	338	Average
5143.25	53.31	52.72	74	-20.69	31.56	6.33	37.3	166	338	Peak
5220	95.87	95.22			31.61	6.4	37.36	166	338	Average
5220	105.02	104.37			31.61	6.4	37.36	166	338	Peak
5437.56	41.02	39.89	54	-12.98	31.76	6.5	37.13	166	338	Average
5437.56	51.71	50.58	74	-22.29	31.76	6.5	37.13	166	338	Peak
*10400	55.29	58.03	68.2	-12.91	39.51	10.2	52.45	102	254	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5140.7	38.4	37.81	54	-15.6	31.56	6.33	37.3	163	3	Average
5140.7	51.32	50.73	74	-22.68	31.56	6.33	37.3	163	3	Peak
5220	90.47	89.82			31.61	6.4	37.36	163	3	Average
5220	100.46	99.81			31.61	6.4	37.36	163	3	Peak
5437.45	42.69	41.56	54	-11.31	31.76	6.5	37.13	163	3	Average
5437.45	52.36	51.23	74	-21.64	31.76	6.5	37.13	163	3	Peak
*10400	54.43	57.17	68.2	-13.77	39.51	10.2	52.45	222	251	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5220 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 48	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5136.8	40.03	39.45	54	-13.97	31.55	6.33	37.3	200	341	Average
5136.8	52.49	51.91	74	-21.51	31.55	6.33	37.3	200	341	Peak
5240	95.3	94.58			31.62	6.42	37.32	200	341	Average
5240	105.3	104.58			31.62	6.42	37.32	200	341	Peak
5375.19	39.33	38.32	54	-14.67	31.72	6.47	37.18	200	341	Average
5375.19	51.8	50.79	74	-22.2	31.72	6.47	37.18	200	341	Peak
*10480	55.02	57.86	68.2	-13.18	39.6	10.22	52.66	111	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5133.35	38.17	37.6	54	-15.83	31.55	6.32	37.3	156	3	Average
5133.35	50.65	50.08	74	-23.35	31.55	6.32	37.3	156	3	Peak
5240	90.63	89.91			31.62	6.42	37.32	156	3	Average
5240	100.66	99.94			31.62	6.42	37.32	156	3	Peak
5432.06	39.77	38.65	54	-14.23	31.76	6.49	37.13	156	3	Average
5432.06	52.36	51.24	74	-21.64	31.76	6.49	37.13	156	3	Peak
*10480	53.26	56.1	68.2	-14.94	39.6	10.22	52.66	222	256	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 52	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5047.1	38.27	37.78	54	-15.73	31.49	6.25	37.25	102	271	Average
5047.1	52.03	51.54	74	-21.97	31.49	6.25	37.25	102	271	Peak
5260	90.65	89.84			31.65	6.43	37.27	102	271	Average
5260	100.22	99.41			31.65	6.43	37.27	102	271	Peak
5361	38.39	37.38	54	-15.61	31.72	6.47	37.18	102	271	Average
5361	51.16	50.15	74	-22.84	31.72	6.47	37.18	102	271	Peak
*10520	55.83	58.63	68.2	-12.37	39.66	10.27	52.73	111	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5100.65	38.14	37.6	54	-15.86	31.53	6.29	37.28	170	348	Average
5100.65	50.68	50.14	74	-23.32	31.53	6.29	37.28	170	348	Peak
5260	90.67	89.86			31.65	6.43	37.27	170	348	Average
5260	100.67	99.86			31.65	6.43	37.27	170	348	Peak
5386.52	38.41	37.39	54	-15.59	31.73	6.47	37.18	170	348	Average
5386.52	51.17	50.15	74	-22.83	31.73	6.47	37.18	170	348	Peak
*10520	54.29	57.09	68.2	-13.91	39.66	10.27	52.73	256	145	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 60	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5112.2	37.99	37.43	54	-16.01	31.54	6.3	37.28	101	272	Average
5112.2	51.05	50.49	74	-22.95	31.54	6.3	37.28	101	272	Peak
5300	87.66	86.72			31.67	6.46	37.19	101	272	Average
5300	97.89	96.95			31.67	6.46	37.19	101	272	Peak
5379.26	38.62	37.6	54	-15.38	31.73	6.47	37.18	101	272	Average
5379.26	51.19	50.17	74	-22.81	31.73	6.47	37.18	101	272	Peak
10600	45.69	48.52	54	-8.31	39.85	10.43	53.11	222	201	Average
10600	55.69	58.52	74	-18.31	39.85	10.43	53.11	222	201	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5072.75	38.15	37.63	54	-15.85	31.52	6.27	37.27	115	336	Average
5072.75	50.91	50.39	74	-23.09	31.52	6.27	37.27	115	336	Peak
5300	90.79	89.85			31.67	6.46	37.19	115	336	Average
5300	100.5	99.56			31.67	6.46	37.19	115	336	Peak
5378.5	38.62	37.6	54	-15.38	31.73	6.47	37.18	101	272	Average
5378.5	51.19	50.17	74	-22.81	31.73	6.47	37.18	101	272	Peak
10600	43.7	46.53	54	-10.3	39.85	10.43	53.11	111	125	Average
10600	53.43	56.26	74	-20.57	39.85	10.43	53.11	111	125	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 64	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	86.67	85.72			31.68	6.46	37.19	102	253	Average
5320	97.05	96.1			31.68	6.46	37.19	102	253	Peak
5363.53	39.23	38.22	54	-14.77	31.72	6.47	37.18	102	253	Average
5363.53	51.83	50.82	74	-22.17	31.72	6.47	37.18	102	253	Peak
10640	45.75	48.53	54	-8.25	39.93	10.36	53.07	201	125	Average
10640	55.75	58.53	74	-18.25	39.93	10.36	53.07	201	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	87.67	86.72			31.68	6.46	37.19	115	347	Average
5320	98	97.05			31.68	6.46	37.19	115	347	Peak
5398.51	39.35	38.32	54	-14.65	31.74	6.47	37.18	115	347	Average
5398.51	51.88	50.85	74	-22.12	31.74	6.47	37.18	115	347	Peak
10640	43.74	46.52	54	-10.26	39.93	10.36	53.07	325	211	Average
10640	53.62	56.4	74	-20.38	39.93	10.36	53.07	325	211	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 100	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5451.28	43.02	41.82	54	-10.98	31.77	6.51	37.08	198	78	Average
5451.28	55.17	53.97	74	-18.83	31.77	6.51	37.08	198	78	Peak
*5470	57.61	56.38	68.2	-10.59	31.79	6.52	37.08	198	78	Peak
5500	95.01	93.69			31.81	6.54	37.03	198	78	Average
5500	104.95	103.63			31.81	6.54	37.03	198	78	Peak
*5725	51.23	49.72	68.2	-16.97	32.18	6.76	37.43	198	78	Peak
11000	44.34	46.24	54	-9.66	40.73	10.4	53.03	251	145	Average
11000	54.62	56.52	74	-19.38	40.73	10.4	53.03	251	145	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5458.48	41.62	40.42	54	-10.98	31.77	6.51	37.08	154	2	Average
5458.48	53.37	52.17	74	-18.83	31.77	6.51	37.08	154	2	Peak
*5470	54.65	53.42	68.2	-13.55	31.79	6.52	37.08	154	2	Peak
5500	91.76	90.44			31.81	6.54	37.03	154	2	Average
5500	101.76	100.44			31.81	6.54	37.03	154	2	Peak
*5725	50.64	49.13	68.2	-17.56	32.18	6.76	37.43	154	2	Peak
11000	41.36	43.26	54	-9.66	40.73	10.4	53.03	125	256	Average
11000	51.48	53.38	74	-19.38	40.73	10.4	53.03	125	256	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 116	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5457.68	39.39	38.19	54	-10.98	31.77	6.51	37.08	187	78	Average
5457.68	52.03	50.83	74	-18.83	31.77	6.51	37.08	187	78	Peak
*5470	52.65	51.43	68.2	-15.55	31.79	6.51	37.08	187	78	Peak
5580	94.43	93.02			31.92	6.65	37.16	187	78	Average
5580	104.38	102.97			31.92	6.65	37.16	187	78	Peak
*5725	50.92	49.41	68.2	-17.28	32.18	6.76	37.43	187	78	Peak
11160	44.83	46.53	54	-9.66	40.56	10.52	52.78	125	214	Average
11160	54.83	56.53	74	-19.38	40.56	10.52	52.78	125	214	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5436.4	38.9	37.77	54	-10.98	31.76	6.5	37.13	153	6	Average
5436.4	51.85	50.72	74	-18.83	31.76	6.5	37.13	153	6	Peak
*5470	51.5	50.28	68.2	-16.7	31.79	6.51	37.08	153	6	Peak
5580	90.14	88.73			31.92	6.65	37.16	153	6	Average
5580	100.14	98.73			31.92	6.65	37.16	153	6	Peak
*5725	50.05	48.54	68.2	-18.15	32.18	6.76	37.43	153	6	Peak
11160	44.83	46.53	54	-9.66	40.56	10.52	52.78	125	145	Average
11160	55.17	56.87	74	-19.38	40.56	10.52	52.78	125	145	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 140	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5386.16	38.7	37.68	54	-10.98	31.73	6.47	37.18	201	75	Average
5386.16	51.68	50.66	74	-18.83	31.73	6.47	37.18	201	75	Peak
*5470	50.53	49.3	68.2	-17.67	31.79	6.52	37.08	201	75	Peak
5700	93.38	91.93			32.12	6.73	37.4	201	75	Average
5700	103.7	102.25			32.12	6.73	37.4	201	75	Peak
*5725	60.49	58.98	68.2	-7.71	32.18	6.76	37.43	201	75	Peak
11400	46.63	48.53	54	-9.66	40.33	10.47	52.7	111	125	Average
11400	56.73	58.63	74	-19.38	40.33	10.47	52.7	111	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5455.6	37.87	36.67	54	-10.98	31.77	6.51	37.08	149	41	Average
5455.6	50.73	49.53	74	-18.83	31.77	6.51	37.08	149	41	Peak
*5470	50.37	49.14	68.2	-17.83	31.79	6.52	37.08	149	41	Peak
5700	89.11	87.66			32.12	6.73	37.4	149	41	Average
5700	98.91	97.46			32.12	6.73	37.4	149	41	Peak
*5725	53.62	52.11	68.2	-14.58	32.18	6.76	37.43	149	41	Peak
11400	44.63	46.53	54	-9.66	40.33	10.47	52.7	111	112	Average
11400	54.34	56.24	74	-19.38	40.33	10.47	52.7	111	112	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 149	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	93.51	91.99			32.21	6.78	37.47	201	28	Average
5745	103.12	101.6			32.21	6.78	37.47	201	28	Peak
11490	46.71	48.58	54	-7.29	40.25	10.66	52.78	201	145	Average
11490	57.09	58.96	74	-16.91	40.25	10.66	52.78	201	145	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	85.1	83.58			32.21	6.78	37.47	105	245	Average
5745	95.1	93.58			32.21	6.78	37.47	105	245	Peak
11490	44.65	46.52	54	-9.35	40.25	10.66	52.78	201	174	Average
11490	54.78	56.65	74	-19.22	40.25	10.66	52.78	201	174	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5643.575	51.51	50.05	68.2	-16.69	32.04	6.7	37.28	201	28	Peak
5661.15	53.14	51.71	76.48	-23.34	32.06	6.71	37.34	201	28	Peak
5917.65	50.49	48.64	73.62	-23.13	32.49	6.86	37.5	201	28	Peak
5930.475	50.67	48.79	68.2	-17.53	32.52	6.86	37.5	201	28	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5629.325	51.2	49.78	68.2	-17	32.01	6.69	37.28	105	245	Peak
5654.5	51.13	49.7	71.54	-20.41	32.06	6.71	37.34	105	245	Peak
5916.225	49.93	48.08	74.67	-24.74	32.49	6.86	37.5	105	245	Peak
5935.225	50.86	48.98	68.2	-17.34	32.52	6.86	37.5	105	245	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 157	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	93.68	92.14			32.26	6.82	37.54	205	34	Average
5785	103.6	102.06			32.26	6.82	37.54	205	34	Peak
11570	45.4	47.52	54	-8.6	40.13	10.76	53.01	222	251	Average
11570	55.4	57.52	74	-18.6	40.13	10.76	53.01	222	251	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	85.62	84.08			32.26	6.82	37.54	102	246	Average
5785	96.01	94.47			32.26	6.82	37.54	102	246	Peak
11570	43.73	45.85	54	-10.27	40.13	10.76	53.01	325	214	Average
11570	53.34	55.46	74	-20.66	40.13	10.76	53.01	325	214	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5645.475	49.78	48.32	68.2	-18.42	32.04	6.7	37.28	205	34	Peak
5658.3	50.58	49.15	74.36	-23.78	32.06	6.71	37.34	205	34	Peak
5916.7	49.19	47.34	74.32	-25.13	32.49	6.86	37.5	205	34	Peak
5938.075	50.63	48.74	68.2	-17.57	32.52	6.87	37.5	205	34	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5643.1	50.69	49.23	68.2	-17.51	32.04	6.7	37.28	102	246	Peak
5662.1	51.32	49.89	77.18	-25.86	32.06	6.71	37.34	102	246	Peak
5913.85	50.69	48.84	76.42	-25.73	32.49	6.86	37.5	102	246	Peak
5941.875	51.1	49.18	68.2	-17.1	32.55	6.87	37.5	102	246	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 165	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	93.72	92.06			32.35	6.84	37.53	186	35	Average
5825	103.67	102.01			32.35	6.84	37.53	186	35	Peak
11650	44.22	46.53	54	-9.78	40.03	10.8	53.14	201	145	Average
11650	54.22	56.53	74	-19.78	40.03	10.8	53.14	201	145	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	86.72	85.06			32.35	6.84	37.53	108	246	Average
5825	96.24	94.58			32.35	6.84	37.53	108	246	Peak
11650	41.22	43.53	54	-12.78	40.03	10.8	53.14	145	184	Average
11650	50.93	53.24	74	-23.07	40.03	10.8	53.14	145	184	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5644.525	52.07	50.61	68.2	-16.13	32.04	6.7	37.28	186	35	Peak
5659.25	52.72	51.29	75.07	-22.35	32.06	6.71	37.34	186	35	Peak
5919.55	50.18	48.33	72.22	-22.04	32.49	6.86	37.5	186	35	Peak
5938.55	52.12	50.2	68.2	-16.08	32.55	6.87	37.5	186	35	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5644.05	50.74	49.28	68.2	-17.46	32.04	6.7	37.28	108	246	Peak
5659.25	50.29	48.86	75.07	-24.78	32.06	6.71	37.34	108	246	Peak
5917.175	49.24	47.39	73.97	-24.73	32.49	6.86	37.5	108	246	Peak
5936.65	50.87	48.99	68.2	-17.33	32.52	6.86	37.5	108	246	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 36	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5147.45	43.35	42.77	54	-10.65	31.56	6.34	37.32	176	344	Average
5147.45	55.37	54.79	74	-18.63	31.56	6.34	37.32	176	344	Peak
5180	94.61	93.99			31.59	6.37	37.34	176	344	Average
5180	104.61	103.99			31.59	6.37	37.34	176	344	Peak
*10360	55.77	58.53	68.2	-12.43	39.48	10.21	52.45	111	145	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5136.65	39.43	38.85	54	-14.57	31.55	6.33	37.3	147	2	Average
5136.65	51.62	51.04	74	-22.38	31.55	6.33	37.3	147	2	Peak
5180	88.22	87.6			31.59	6.37	37.34	147	2	Average
5180	98.2	97.58			31.59	6.37	37.34	147	2	Peak
*10360	54.44	57.2	68.2	-13.76	39.48	10.21	52.45	232	214	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5180 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 44	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5117.75	40.42	39.85	54	-13.58	31.54	6.31	37.28	194	349	Average
5117.75	52.36	51.79	74	-21.64	31.54	6.31	37.28	194	349	Peak
5220	93.84	93.19			31.61	6.4	37.36	194	349	Average
5220	103.84	103.19			31.61	6.4	37.36	194	349	Peak
5363.97	40.75	39.74	54	-13.25	31.72	6.47	37.18	194	349	Average
5363.97	51.98	50.97	74	-22.02	31.72	6.47	37.18	194	349	Peak
*10400	55.52	58.26	68.2	-12.68	39.51	10.2	52.45	325	214	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5046.65	38.28	37.79	54	-15.72	31.49	6.25	37.25	137	0	Average
5046.65	52.02	51.53	74	-21.98	31.49	6.25	37.25	137	0	Peak
5220	87.54	86.89			31.61	6.4	37.36	137	0	Average
5220	97.21	96.56			31.61	6.4	37.36	137	0	Peak
5416.44	39.77	38.72	54	-14.23	31.75	6.48	37.18	137	0	Average
5416.44	51.69	50.64	74	-22.31	31.75	6.48	37.18	137	0	Peak
*10400	53.88	56.62	68.2	-14.32	39.51	10.2	52.45	214	154	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5220 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 48	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5145.2	39.14	38.56	54	-14.86	31.56	6.34	37.32	187	350	Average
5145.2	51.6	51.02	74	-22.4	31.56	6.34	37.32	187	350	Peak
5240	93.63	92.91			31.62	6.42	37.32	187	350	Average
5240	103.59	102.87			31.62	6.42	37.32	187	350	Peak
5364.52	39.13	38.12	54	-14.87	31.72	6.47	37.18	187	350	Average
5364.52	51.83	50.82	74	-22.17	31.72	6.47	37.18	187	350	Peak
*10480	55.8	58.64	68.2	-12.4	39.6	10.22	52.66	111	154	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5137.4	37.9	37.32	54	-16.1	31.55	6.33	37.3	138	0	Average
5137.4	50.32	49.74	74	-23.68	31.55	6.33	37.3	138	0	Peak
5240	86.3	85.58			31.62	6.42	37.32	138	0	Average
5240	96.2	95.48			31.62	6.42	37.32	138	0	Peak
5423.7	38.99	37.93	54	-15.01	31.75	6.49	37.18	138	0	Average
5423.7	51.26	50.2	74	-22.74	31.75	6.49	37.18	138	0	Peak
*10480	54.53	57.37	68.2	-13.67	39.6	10.22	52.66	201	314	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 52	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5129.45	37.97	37.4	54	-16.03	31.55	6.32	37.3	101	271	Average
5129.45	51.1	50.53	74	-22.9	31.55	6.32	37.3	101	271	Peak
5260	87.61	86.8			31.65	6.43	37.27	101	271	Average
5260	97.16	96.35			31.65	6.43	37.27	101	271	Peak
5378.93	38.22	37.2	54	-15.78	31.73	6.47	37.18	101	271	Average
5378.93	52.06	51.04	74	-21.94	31.73	6.47	37.18	101	271	Peak
*10520	54.72	57.52	68.2	-13.48	39.66	10.27	52.73	111	145	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5057.45	38.07	37.55	54	-15.93	31.51	6.26	37.25	108	337	Average
5057.45	50.8	50.28	74	-23.2	31.51	6.26	37.25	108	337	Peak
5260	89.67	88.86			31.65	6.43	37.27	108	337	Average
5260	99.63	98.82			31.65	6.43	37.27	108	337	Peak
5436.79	38.23	37.1	54	-15.77	31.76	6.5	37.13	108	337	Average
5436.79	51.08	49.95	74	-22.92	31.76	6.5	37.13	108	337	Peak
*10520	52.88	55.68	68.2	-15.32	39.66	10.27	52.73	232	158	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 60	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5095.1	37.84	37.3	54	-16.16	31.53	6.29	37.28	102	272	Average
5095.1	52.32	51.78	74	-21.68	31.53	6.29	37.28	102	272	Peak
5300	86.66	85.72			31.67	6.46	37.19	102	272	Average
5300	96.67	95.73			31.67	6.46	37.19	102	272	Peak
5421.17	38.36	37.31	54	-15.64	31.75	6.48	37.18	102	272	Average
5421.17	51.07	50.02	74	-22.93	31.75	6.48	37.18	102	272	Peak
10600	44.7	47.53	54	-9.3	39.85	10.43	53.11	232	251	Average
10600	54.7	57.53	74	-19.3	39.85	10.43	53.11	232	251	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5027.45	37.81	37.34	54	-16.19	31.48	6.23	37.24	150	337	Average
5027.45	50.5	50.03	74	-23.5	31.48	6.23	37.24	150	337	Peak
5300	88.51	87.57			31.67	6.46	37.19	150	337	Average
5300	98.51	97.57			31.67	6.46	37.19	150	337	Peak
5397.96	38.29	37.26	54	-15.71	31.74	6.47	37.18	150	337	Average
5397.96	50.9	49.87	74	-23.1	31.74	6.47	37.18	150	337	Peak
10600	42.79	45.62	54	-11.21	39.85	10.43	53.11	214	154	Average
10600	52.88	55.71	74	-21.12	39.85	10.43	53.11	214	154	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 64	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	85.4	84.45			31.68	6.46	37.19	102	270	Average
5320	95.35	94.4			31.68	6.46	37.19	102	270	Peak
5366.17	38.63	37.62	54	-15.37	31.72	6.47	37.18	102	270	Average
5366.17	52.11	51.1	74	-21.89	31.72	6.47	37.18	102	270	Peak
10640	45.48	48.26	54	-8.52	39.93	10.36	53.07	201	125	Average
10640	55.75	58.53	74	-18.25	39.93	10.36	53.07	201	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	87.67	86.72			31.68	6.46	37.19	109	342	Average
5320	97.65	96.7			31.68	6.46	37.19	109	342	Peak
5417.43	38.96	37.91	54	-15.04	31.75	6.48	37.18	109	342	Average
5417.43	51.45	50.4	74	-22.55	31.75	6.48	37.18	109	342	Peak
10640	43.48	46.26	54	-10.52	39.93	10.36	53.07	222	236	Average
10640	53.36	56.14	74	-20.64	39.93	10.36	53.07	222	236	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 100	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5459.28	42.5	41.3	54	-10.98	31.77	6.51	37.08	211	70	Average
5459.28	54.72	53.52	74	-18.83	31.77	6.51	37.08	211	70	Peak
*5470	54.5	53.27	68.2	-13.7	31.79	6.52	37.08	211	70	Peak
5500	93.15	91.83			31.81	6.54	37.03	211	70	Average
5500	103.11	101.79			31.81	6.54	37.03	211	70	Peak
*5725	50.74	49.23	68.2	-17.46	32.18	6.76	37.43	211	70	Peak
11000	47.63	49.53	54	-9.66	40.73	10.4	53.03	252	126	Average
11000	57.62	59.52	74	-19.38	40.73	10.4	53.03	252	126	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5452.4	41.14	39.94	54	-10.98	31.77	6.51	37.08	165	8	Average
5452.4	53.59	52.39	74	-18.83	31.77	6.51	37.08	165	8	Peak
*5470	54.6	53.38	68.2	-13.6	31.79	6.51	37.08	165	8	Peak
5500	89.88	88.56			31.81	6.54	37.03	165	8	Average
5500	100.02	98.7			31.81	6.54	37.03	165	8	Peak
*5725	50.21	48.7	68.2	-17.99	32.18	6.76	37.43	165	8	Peak
11000	45.63	47.53	54	-9.66	40.73	10.4	53.03	251	145	Average
11000	55.16	57.06	74	-19.38	40.73	10.4	53.03	251	145	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 116	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5438.96	38.92	37.79	54	-10.98	31.76	6.5	37.13	170	30	Average
5438.96	52.2	51.07	74	-18.83	31.76	6.5	37.13	170	30	Peak
*5470	51.2	49.97	68.2	-17	31.79	6.52	37.08	170	30	Peak
5580	93.43	92.02			31.92	6.65	37.16	170	30	Average
5580	103.31	101.9			31.92	6.65	37.16	170	30	Peak
*5725	51.53	50.02	68.2	-16.67	32.18	6.76	37.43	170	30	Peak
11160	46.83	48.53	54	-9.66	40.56	10.52	52.78	232	251	Average
11160	56.94	58.64	74	-19.38	40.56	10.52	52.78	232	251	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5371.12	38.96	37.95	54	-10.98	31.72	6.47	37.18	162	8	Average
5371.12	51.18	50.17	74	-18.83	31.72	6.47	37.18	162	8	Peak
*5470	50.68	49.45	68.2	-17.52	31.79	6.52	37.08	162	8	Peak
5580	90.02	88.61			31.92	6.65	37.16	162	8	Average
5580	99.69	98.28			31.92	6.65	37.16	162	8	Peak
*5725	50.37	48.86	68.2	-17.83	32.18	6.76	37.43	162	8	Peak
11160	44.83	46.53	54	-9.66	40.56	10.52	52.78	252	265	Average
11160	54.76	56.46	74	-19.38	40.56	10.52	52.78	252	265	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 140	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5426.32	38.41	37.3	54	-10.98	31.75	6.49	37.13	175	30	Average
5426.32	51.49	50.38	74	-18.83	31.75	6.49	37.13	175	30	Peak
*5470	50.25	49.05	68.2	-17.95	31.77	6.51	37.08	175	30	Peak
5700	92.64	91.19			32.12	6.73	37.4	175	30	Average
5700	102.59	101.14			32.12	6.73	37.4	175	30	Peak
*5725	59.23	57.72	68.2	-8.97	32.18	6.76	37.43	175	30	Peak
11400	46.73	48.63	54	-9.66	40.33	10.47	52.7	201	125	Average
11400	56.79	58.69	74	-19.38	40.33	10.47	52.7	201	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Factor (dB/m)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5393.52	38.13	37.11	54	-10.98	31.73	6.47	37.18	114	9	Average
5393.52	51.05	50.03	74	-18.83	31.73	6.47	37.18	114	9	Peak
*5470	50.8	49.6	68.2	-17.4	31.77	6.51	37.08	114	9	Peak
5700	85.37	83.92			32.12	6.73	37.4	114	9	Average
5700	94.86	93.41			32.12	6.73	37.4	114	9	Peak
*5725	51.82	50.31	68.2	-16.38	32.18	6.76	37.43	114	9	Peak
11400	44.82	46.72	54	-9.66	40.33	10.47	52.7	251	145	Average
11400	54.85	56.75	74	-19.38	40.33	10.47	52.7	251	145	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 149	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	92.64	91.12			32.21	6.78	37.47	203	37	Average
5745	102.54	101.02			32.21	6.78	37.47	203	37	Peak
11490	47.65	49.52	54	-6.35	40.25	10.66	52.78	251	145	Average
11490	57.65	59.52	74	-16.35	40.25	10.66	52.78	251	145	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	92.64	91.12			32.21	6.78	37.47	193	34	Average
5745	102.65	101.13			32.21	6.78	37.47	193	34	Peak
11490	45.37	47.24	54	-8.63	40.25	10.66	52.78	214	325	Average
11490	55.36	57.23	74	-18.64	40.25	10.66	52.78	214	325	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5641.675	49.91	48.45	68.2	-18.29	32.04	6.7	37.28	203	37	Peak
5660.2	50.81	49.38	75.77	-24.96	32.06	6.71	37.34	203	37	Peak
5916.225	48.8	46.95	74.67	-25.87	32.49	6.86	37.5	203	37	Peak
5940.925	50.24	48.32	68.2	-17.96	32.55	6.87	37.5	203	37	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5616.5	51.1	49.62	68.2	-17.1	32.01	6.69	37.22	191	34	Peak
5664	51.63	50.2	78.59	-26.96	32.06	6.71	37.34	191	34	Peak
5917.65	50.93	49.08	73.62	-22.69	32.49	6.86	37.5	191	34	Peak
5934.275	49.85	47.97	68.2	-18.35	32.52	6.86	37.5	191	34	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 157	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	90.66	89.12			32.26	6.82	37.54	203	37	Average
5785	100.81	99.27			32.26	6.82	37.54	203	37	Peak
11570	46.51	48.63	54	-7.49	40.13	10.76	53.01	251	214	Average
11570	56.4	58.52	74	-17.6	40.13	10.76	53.01	251	214	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	83.72	82.18			32.26	6.82	37.54	100	239	Average
5785	93.57	92.03			32.26	6.82	37.54	100	239	Peak
11570	44.11	46.23	54	-9.89	40.13	10.76	53.01	325	214	Average
11570	54.19	56.31	74	-19.81	40.13	10.76	53.01	325	214	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5641.675	51.75	50.29	68.2	-16.45	32.04	6.7	37.28	203	37	Peak
5658.3	50.87	49.44	74.36	-23.49	32.06	6.71	37.34	203	37	Peak
5916.7	49.81	47.96	74.32	-24.51	32.49	6.86	37.5	203	37	Peak
5950.9	52.24	50.32	68.2	-15.96	32.55	6.87	37.5	203	37	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5639.3	51	49.54	68.2	-17.2	32.04	6.7	37.28	100	239	Peak
5663.525	47.93	46.5	78.24	-30.31	32.06	6.71	37.34	100	239	Peak
5916.7	49.48	47.63	74.32	-24.84	32.49	6.86	37.5	100	239	Peak
5934.275	49.88	48	68.2	-18.32	32.52	6.86	37.5	100	239	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 165	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	90.72	89.06			32.35	6.84	37.53	202	36	Average
5825	100.92	99.26			32.35	6.84	37.53	202	36	Peak
11650	46.22	48.53	54	-7.78	40.03	10.8	53.14	111	125	Average
11650	56.22	58.53	74	-17.78	40.03	10.8	53.14	111	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	83.71	82.05			32.35	6.84	37.53	107	239	Average
5825	93.99	92.33			32.35	6.84	37.53	107	239	Peak
11650	44.22	46.53	54	-9.78	40.03	10.8	53.14	251	145	Average
11650	54.59	56.9	74	-19.41	40.03	10.8	53.14	251	145	Peak

<Ouf of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5615.075	52.77	51.32	68.2	-15.43	31.98	6.69	37.22	202	36	Peak
5656.4	51.07	49.64	72.95	-21.88	32.06	6.71	37.34	202	36	Peak
5920.975	49.56	47.71	71.17	-21.61	32.49	6.86	37.5	202	36	Peak
5939.975	51.8	49.88	68.2	-16.4	32.55	6.87	37.5	202	36	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5644.05	51.05	49.59	68.2	-17.15	32.04	6.7	37.28	107	239	Peak
5656.875	49.12	47.69	73.31	-24.19	32.06	6.71	37.34	107	239	Peak
5916.7	50.03	48.18	74.32	-24.29	32.49	6.86	37.5	107	239	Peak
5949.475	51.43	49.51	68.2	-16.77	32.55	6.87	37.5	107	239	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band

9 kHz ~ 30 MHz Data:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 149	**Frequency Range**	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
152.22	32.74	50.7	43.5	-10.76	12.71	0.99	31.66	200	0	Peak
210.42	33.23	53.73	43.5	-10.27	9.81	1.28	31.59	200	0	Peak
280.26	29.85	47.72	46	-16.15	12.37	1.58	31.82	200	0	Peak
728.4	27.04	33.99	46	-18.96	21.22	3.43	31.6	200	0	Peak
795.33	27.76	33.36	46	-18.24	22.16	3.66	31.42	200	0	Peak
909.79	31.7	36.11	46	-14.3	23.56	4.08	32.05	200	0	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
60.07	28.64	47.48	40	-11.36	11.94	0.58	31.36	100	0	Peak
151.25	26.51	44.46	43.5	-16.99	12.71	0.98	31.64	100	0	Peak
195.87	25.55	46.43	43.5	-17.95	9.64	1.21	31.73	100	0	Peak
752.65	26.93	33.19	46	-19.07	21.56	3.52	31.34	100	0	Peak
845.77	29.03	34.24	46	-16.97	22.81	3.82	31.84	100	0	Peak
944.71	30	33.91	46	-16	23.76	4.21	31.88	100	0	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 23, 2017	Nov. 22, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

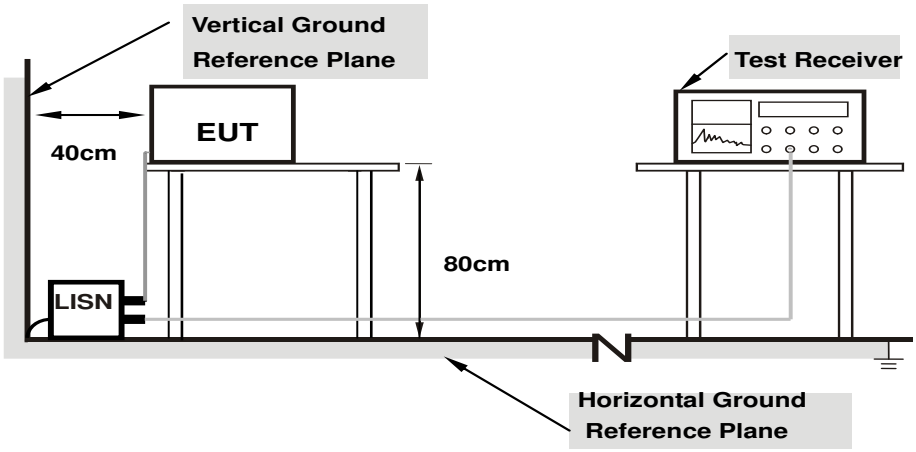
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit -20 dB) was not recorded.

Note: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

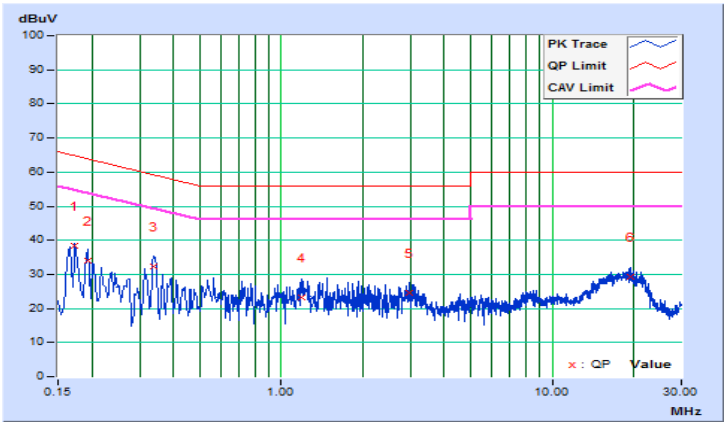
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Getaz Yang	Test Date	2017/12/28

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17346	10.39	27.83	13.38	38.22	23.77	64.79	54.79	-26.57	-31.02
2	0.19305	10.39	23.72	10.88	34.11	21.27	63.90	53.90	-29.79	-32.63
3	0.33750	10.40	21.90	16.00	32.30	26.40	59.26	49.26	-26.96	-22.86
4	1.19397	10.43	12.94	6.51	23.37	16.94	56.00	46.00	-32.63	-29.06
5	2.96911	10.51	14.20	4.65	24.71	15.16	56.00	46.00	-31.29	-30.84
6	19.40284	11.32	18.02	7.50	29.34	18.82	60.00	50.00	-30.66	-31.18

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

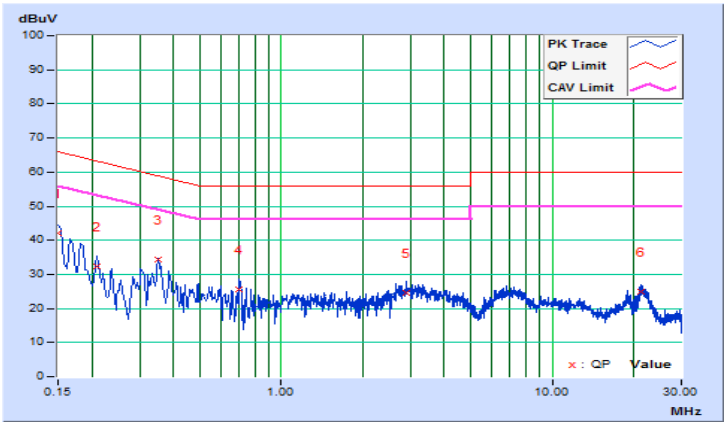


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Getaz Yang	Test Date	2017/12/28

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.15	31.86	16.92	42.01	27.07	66.00	56.00	-23.99	-28.93
2	0.20865	10.16	22.33	14.88	32.49	25.04	63.26	53.26	-30.77	-28.22
3	**0.35296**	**10.17**	**24.27**	**22.57**	**34.44**	**32.74**	**58.89**	**48.89**	**-24.45**	**-16.15**
4	0.70131	10.18	15.55	3.10	25.73	13.28	56.00	46.00	-30.27	-32.72
5	2.88700	10.28	14.20	5.93	24.48	16.21	56.00	46.00	-31.52	-29.79
6	21.41649	11.00	13.76	5.24	24.76	16.24	60.00	50.00	-35.24	-33.76

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



4.3 Transmit Power Measurment

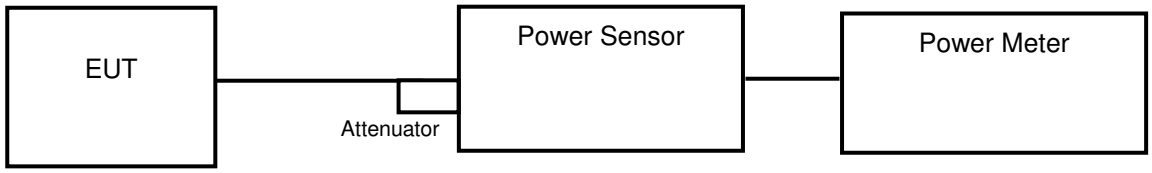
4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125 mW (21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Mobile and Portable client device	250 mW (24 dBm)
U-NII-2A	√		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-2C	√		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-3	√		1 Watt (30 dBm)

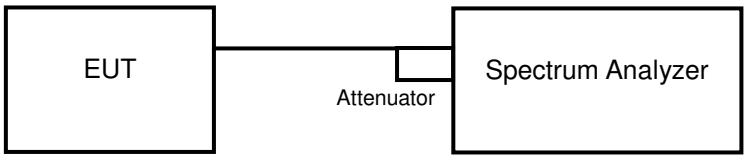
*B is the 26 dB emission bandwidth in megahertz

4.3.2 Test Setup

<Power Output Measurement>



<26 dB Bandwidth>



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Average Power Measurement

<802.11a, 802.11n (HT20)>

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

26 dB Bandwidth

1) Set RBW = approximately 1 % of the emission bandwidth.
2) Set the VBW > RBW.
3) Detector = Peak.
4) Trace mode = max hold.
5) 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 %.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	18.664	12.71	24	Pass
44	5220	19.143	12.82	24	Pass
48	5240	19.231	12.84	24	Pass
52	5260	18.535	12.68	24	Pass
60	5300	18.880	12.76	24	Pass
64	5320	19.231	12.84	24	Pass
100	5500	19.588	12.92	24	Pass
116	5580	19.364	12.87	24	Pass
140	5700	18.578	12.69	24	Pass
149	5745	16.406	12.15	30	Pass
157	5785	16.596	12.20	30	Pass
165	5825	16.218	12.10	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

1. 11 dBm + 10log (23.67) = 24.74dBm > 24 dBm.
2. 11 dBm + 10log (23.42) = 24.70dBm > 24 dBm.
3. 11 dBm + 10log (23.63) = 24.73dBm > 24 dBm.
4. 11 dBm + 10log (23.93) = 24.79dBm > 24 dBm.
5. 11 dBm + 10log (23.65) = 24.74dBm > 24 dBm.
6. 11 dBm + 10log (23.78) = 24.76dBm > 24 dBm.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	15.382	11.87	24	Pass
44	5220	15.596	11.93	24	Pass
48	5240	15.417	11.88	24	Pass
52	5260	15.171	11.81	24	Pass
60	5300	15.241	11.83	24	Pass
64	5320	15.631	11.94	24	Pass
100	5500	15.488	11.90	24	Pass
116	5580	15.276	11.84	24	Pass
140	5700	15.031	11.77	24	Pass
149	5745	13.614	11.34	30	Pass
157	5785	13.459	11.29	30	Pass
165	5825	13.836	11.41	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

1. 11 dBm + 10log (24.17) = 24.83dBm > 24 dBm.
2. 11 dBm + 10log (24.53) = 24.90dBm > 24 dBm.
3. 11 dBm + 10log (24.05) = 24.81dBm > 24 dBm.
4. 11 dBm + 10log (24.59) = 24.91dBm > 24 dBm.
5. 11 dBm + 10log (24.55) = 24.90dBm > 24 dBm.
6. 11 dBm + 10log (23.95) = 24.79dBm > 24 dBm.

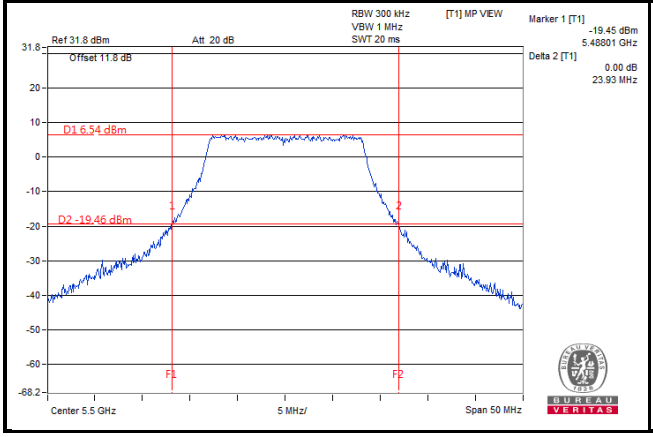
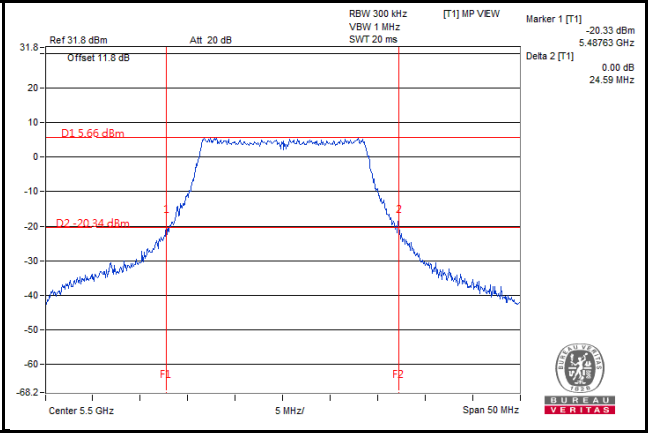
26 dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	23.33
44	5220	23.35
48	5240	23.39
52	5260	23.67
60	5300	23.42
64	5320	23.63
100	5500	23.93
116	5580	23.65
140	5700	23.78

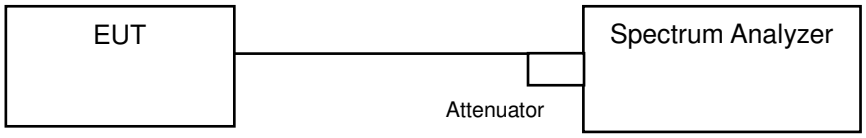
802.11n (HT20)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	23.97
44	5220	24.40
48	5240	24.46
52	5260	24.17
60	5300	24.53
64	5320	24.05
100	5500	24.59
116	5580	24.55
140	5700	23.95

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to SAMPLE. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

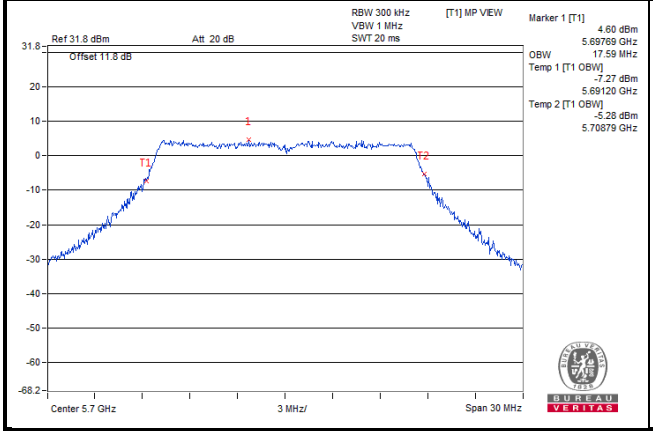
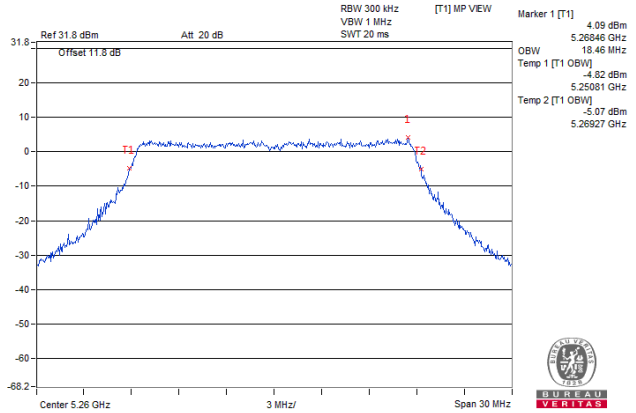
4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.50
40	5200	17.54
48	5240	17.54
52	5260	17.54
60	5300	17.54
64	5320	17.54
100	5500	17.54
116	5580	17.50
140	5700	17.59
149	5745	17.11
157	5785	17.15
165	5825	17.15

802.11n (HT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	18.41
40	5200	18.46
48	5240	18.41
52	5260	18.46
60	5300	18.41
64	5320	18.41
100	5500	18.46
116	5580	18.41
140	5700	18.41
149	5745	18.12
157	5785	18.20
165	5825	18.10

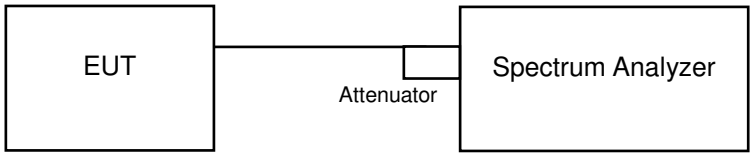
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17 dBm/MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Mobile and Portable client device	11 dBm/MHz
U-NII-2A	√		11 dBm/MHz
U-NII-2C	√		11 dBm/MHz
U-NII-3	√		30 dBm/500 kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

※For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
4. Sweep time = auto, trigger set to “free run”.
5. Trace average at least 100 traces in power averaging mode.
6. Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Results

For U-NII-1, U-NII-2A, U-NII-2C Band

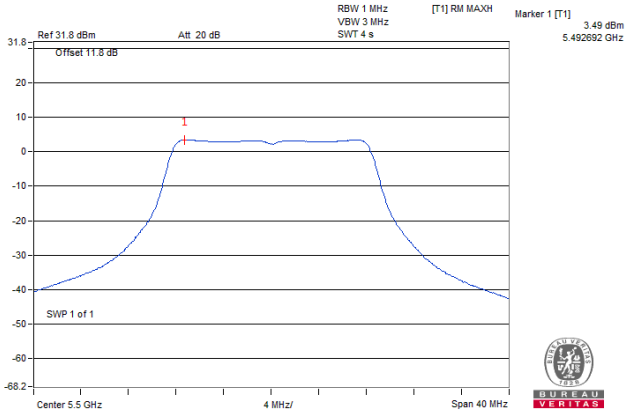
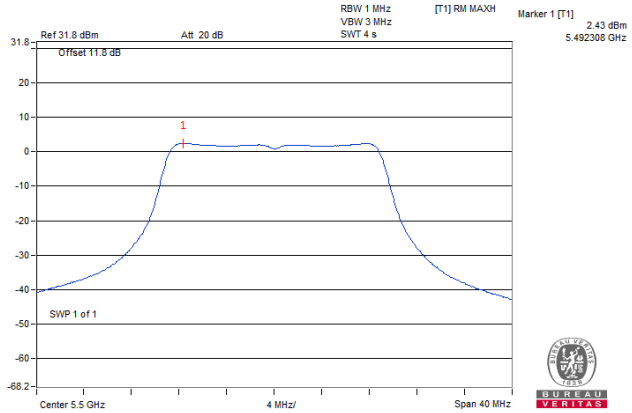
802.11a

Channel	Frequency (MHz)	PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
36	5180	1.37	11	Pass
44	5220	1.40	11	Pass
48	5240	1.70	11	Pass
52	5260	1.86	11	Pass
60	5300	2.10	11	Pass
64	5320	2.40	11	Pass
100	5500	3.49	11	Pass
116	5580	2.98	11	Pass
140	5700	1.45	11	Pass

802.11n (HT20)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
36	5180	0.14	0.11	0.25	11	Pass
44	5220	0.35	0.11	0.46	11	Pass
48	5240	0.33	0.11	0.44	11	Pass
52	5260	0.66	0.11	0.77	11	Pass
60	5300	1.04	0.11	1.15	11	Pass
64	5320	1.29	0.11	1.40	11	Pass
100	5500	2.43	0.11	2.54	11	Pass
116	5580	1.81	0.11	1.92	11	Pass
140	5700	-0.03	0.11	0.08	11	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	

For U-NII-3 Band

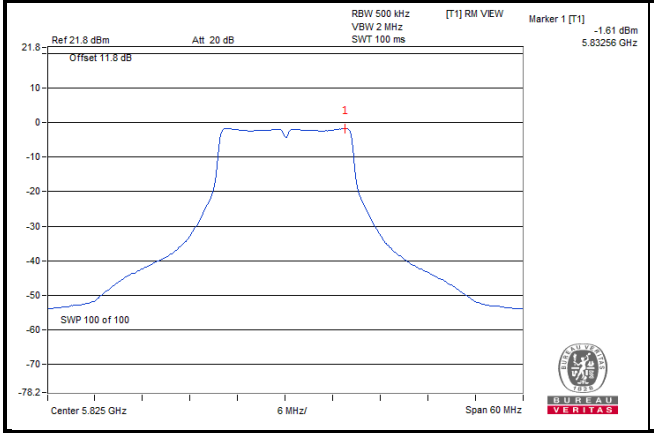
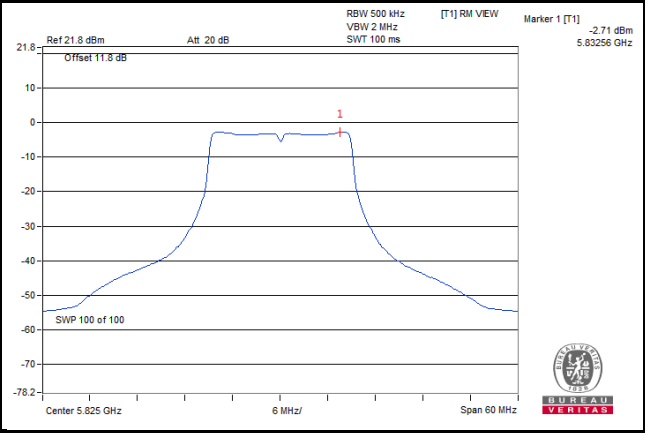
802.11a

Channel	Freq. (MHz)	PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
149	5745	-2.14	30	Pass
157	5785	-2.07	30	Pass
165	5825	-1.61	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/500 kHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
149	5745	-3.21	0.11	-3.10	30	Pass
157	5785	-3.22	0.11	-3.11	30	Pass
165	5825	-2.71	0.11	-2.60	30	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

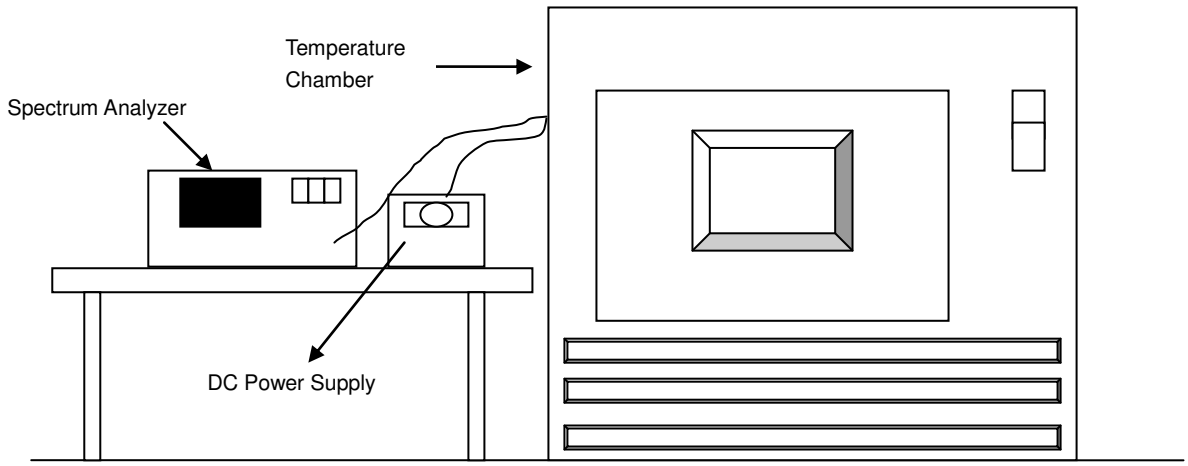
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	

4.6 Frequency Stability

4.6.1 Limit of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.6.4 Test Procedure

a. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
b. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
c. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
50	120	5179.9865	-2.61000	5179.9877	-2.37000	5179.9884	-2.24000	5179.987	-2.51000
40	120	5179.9972	-0.54000	5179.9996	-0.08000	5179.999	-0.19000	5180.0012	0.23000
30	120	5180.0101	1.95000	5180.0108	2.08000	5180.0101	1.95000	5180.0087	1.68000
20	120	5180.0125	2.41000	5180.0089	1.72000	5180.0116	2.24000	5180.0092	1.78000
10	120	5179.9773	-4.38000	5179.9781	-4.23000	5179.9778	-4.29000	5179.9759	-4.65000
0	120	5180.0094	1.81000	5180.0067	1.29000	5180.0079	1.53000	5180.0087	1.68000
-10	120	5180.0148	2.86000	5180.0148	2.86000	5180.0185	3.57000	5180.0184	3.55000
-20	120	5180.0226	4.36000	5180.0201	3.88000	5180.0179	3.46000	5180.0199	3.84000
-30	120	5180.01	1.93000	5180.0098	1.89000	5180.0123	2.37000	5180.0077	1.49000

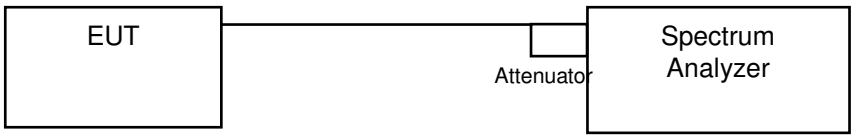
Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	138	5180.0133	2.57000	5180.009	1.74000	5180.0116	2.24000	5180.0098	1.89000
	120	5180.0125	2.41000	5180.0089	1.72000	5180.0116	2.24000	5180.0092	1.78000
	102	5180.0134	2.59000	5180.0083	1.60000	5180.0111	2.14000	5180.0087	1.68000

4.7 6 dB Bandwidth Measurment

4.7.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

a. Set resolution bandwidth (RBW) = 100 kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

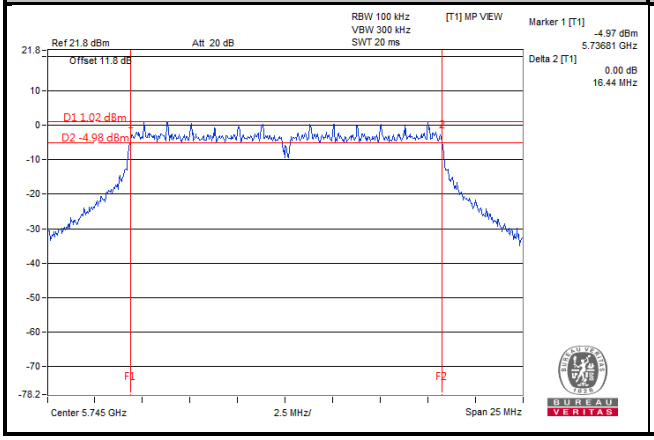
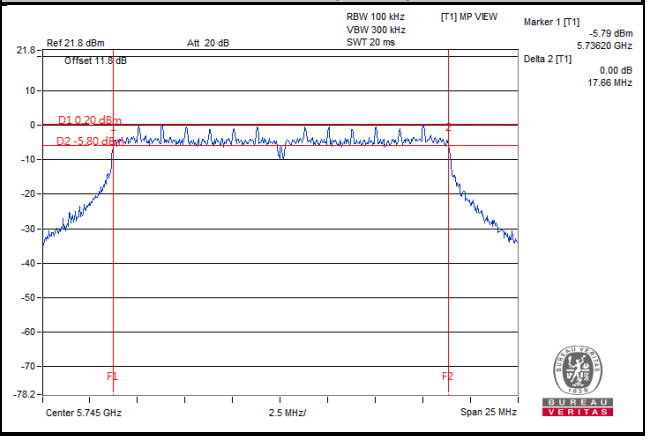
4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.44	0.5	Pass
157	5785	16.42	0.5	Pass
165	5825	16.44	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	17.66	0.5	Pass
157	5785	17.66	0.5	Pass
165	5825	17.63	0.5	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	

5 Pictures of Test Arrangements

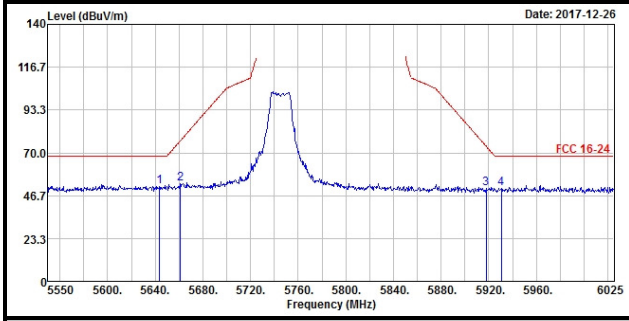
Please refer to the attached file (Test Setup Photo).

Annex A- Radiated Out of Band Emisison (OOBE) Measurement (For U-NII-3 band)

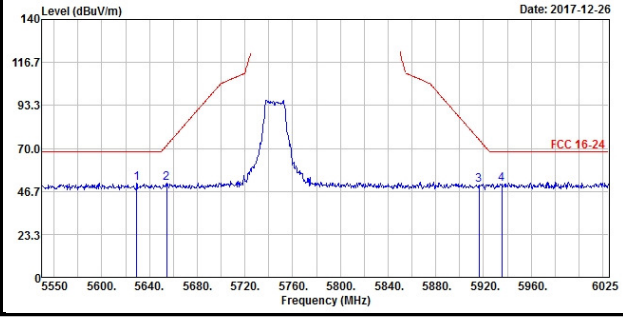
802.11a

Ch 149

Horizontal

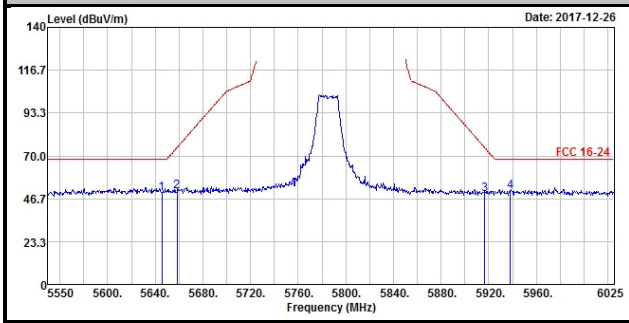


Vertical

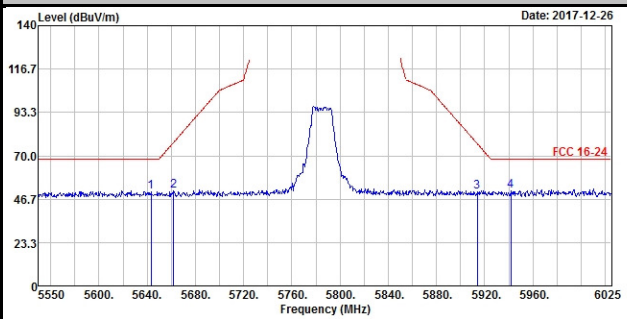


Ch 157

Horizontal

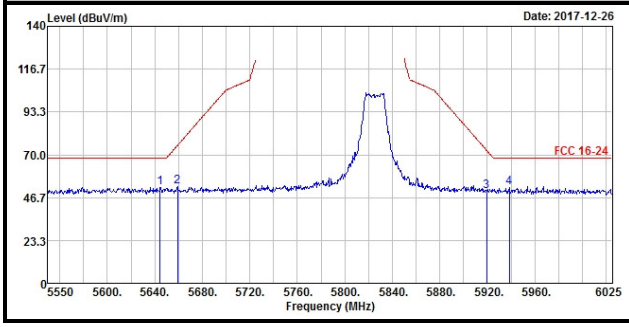


Vertical

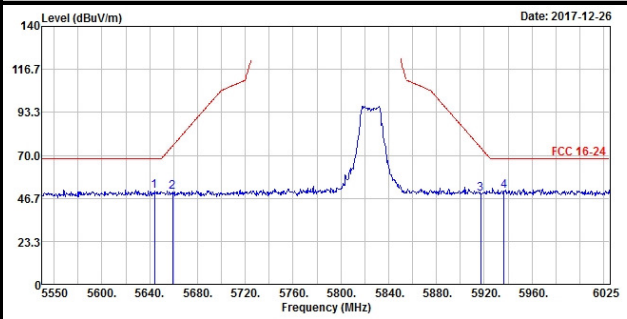


Ch 165

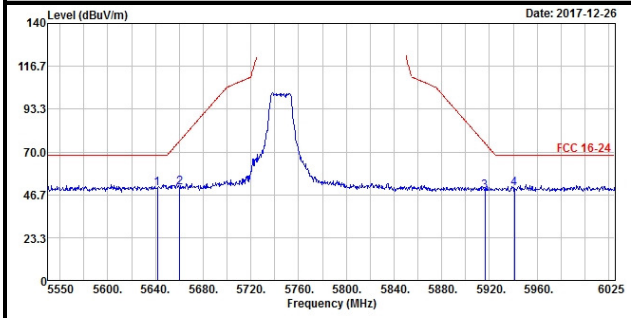
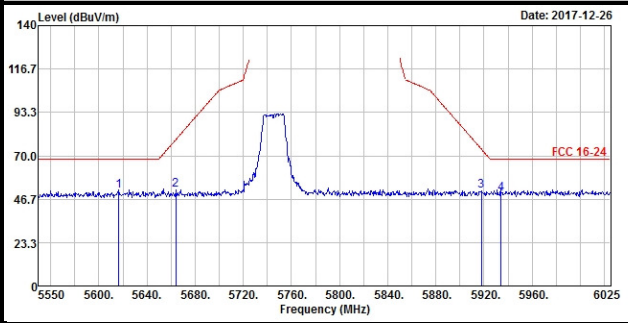
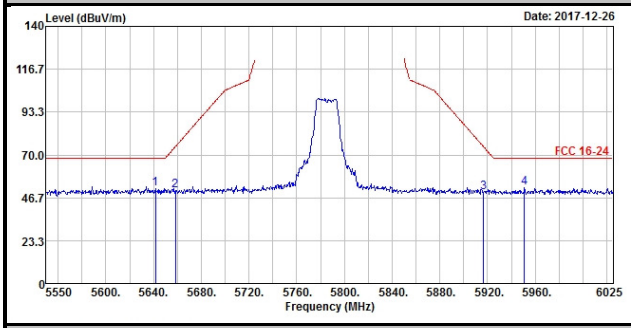
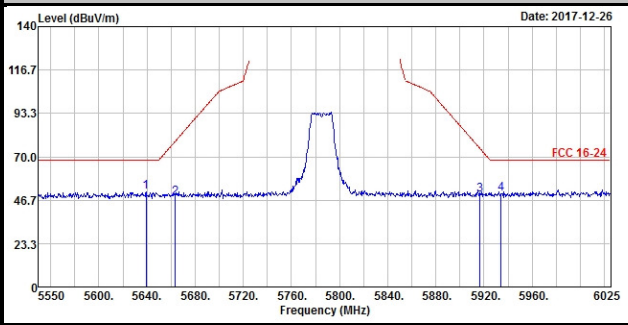
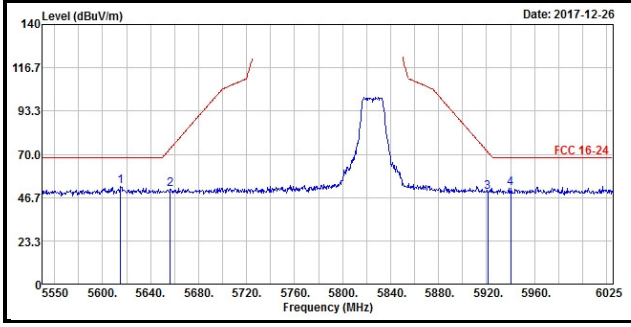
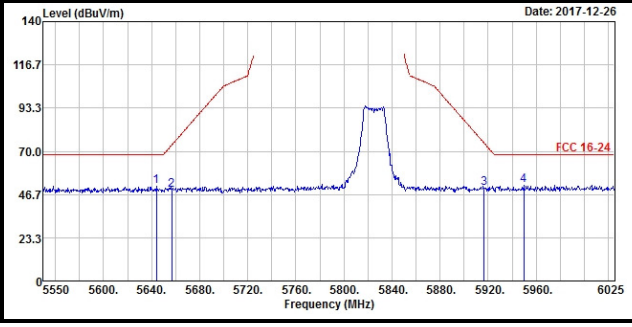
Horizontal



Vertical



802.11n (HT20)

Ch 149	
Horizontal	**Vertical**
	
Ch 157	
Horizontal	**Vertical**
	
Ch 165	
Horizontal	**Vertical**
	

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

--- END ---