

FCC Test Report

Report No.: RF151221C01-7

FCC ID: HFS-QTAFN5

Test Model: QTAFN5

Received Date: Dec. 21, 2015

Test Date: Dec. 30, 2015 ~ Jan. 07, 2016

Issued Date: Jan. 14, 2016

Applicant: Quanta Computer Inc.

Address: No. 188, Wen Hwa 2nd RD., Kuei Shan Dist, Tao Yuan City, Taiwan

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 (1): No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan
Hsien 333, Taiwan, R.O.C.

Test Location (2): No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan,
R.O.C



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Release Control Record

Issue No.	Description	Date Issued
RF151221C01-7	Original Release	Jan. 14, 2016



1 Certificate of Conformity

Product: FN5

Test Model: QTAFN5

Sample Status: Identical Prototype

Applicant: Quanta Computer Inc.

Test Date: Dec. 30, 2015 ~ Jan. 07, 2016

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 EMC characteristics under the conditions specified in this report.

Prepared by : Evonne Liu , **Date:** Jan. 14, 2016
Evonne Liu / Specialist

Approved by : Stanley Wu , **Date:** Jan. 14, 2016
Stanley Wu / Assistant Manager

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 -6.59 dB at 0.38827 MHz.
15.407(b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.96 dB at 5470 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
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.

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	Expanded 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	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	FN5
Test Model	QTAFN5
Status of EUT	Identical Prototype
Power Supply Rating	5Vdc or 12Vdc (adapter) 3.8 Vdc (Li-ion battery)
Modulation Type	256QAM, 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: up to MCS7 802.11ac: up to V9
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) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80) 5260 ~ 5320 MHz: 4 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80) 5500 ~ 5700 MHz: 11 for 802.11a, 802.11n (HT20) 5 for 802.11n (HT40) 2 for 802.11ac (VHT80) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80)
Output Power	32.81 mW for 5180 ~ 5240 MHz 32.51 mW for 5260 ~ 5320 MHz 33.04 mW for 5500 ~ 5700 MHz 32.81 mW for 5745 ~ 5825 MHz
Antenna Type	PIFA antenna with -1.9 dBi gain (5180 ~ 5240 MHz) PIFA antenna with -1.9 dBi gain (5260 ~ 5320 MHz) PIFA antenna with -2.9 dBi gain (5500 ~ 5700 MHz) PIFA antenna with -3.2 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 1 completed transmitter and 1 receiver.

Modulation Mode	Tx Function
802.11a	1TX
802.11n (HT20)	1TX
802.11n (HT40)	1TX
802.11ac (VHT80)	1TX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for HT20 / HT40, 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
Adapter	Chicony	W15-018N2A	I/P: 100-240Vac, 50-60Hz, 0.6A O/P: 5Vdc, 3A or 12Vdc, 1.5A 1.8m shielded cable w/o core
Battery	McNair	MLP446164	3.8Vdc, 2650mAh
LTE Chip	INTEL	PMB 5746	--
WLAN Chip	INTEL	WCS8170	--

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

2 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
42	5210

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

2 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	62	5310

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
58	5290

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		

5 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	126	5630
110	5550	134	5670
118	5590		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	122	5610

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		

2 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
155	5775

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE \geq 1G	RE $<$ 1G	PLC	APCM	
-	√	√	√	√	-

Where **RE \geq 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 **X-plane** (5180 ~ 5240 MHz) and **Y-plane** (5260 ~ 5825 MHz).

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	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	MCS0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	V0
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	MCS0
-	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	MCS0
-	802.11ac (VHT80)		58	58	OFDM	BPSK	V0
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	MCS0
-	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	MCS0
-	802.11ac (VHT80)		106 to 122	106, 122	OFDM	BPSK	V0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	MCS0
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	MCS0
-	802.11ac (VHT80)		155	155	OFDM	BPSK	V0

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	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	MCS0
-	802.11ac (VHT80)	5260-5320	58	58	OFDM	BPSK	V0
-	802.11ac (VHT80)	5500-5700	106 to 122	106	OFDM	BPSK	V0
-	802.11ac (VHT80)	5745-5825	155	155	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	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11ac (VHT80)	5500-5700	106 to 122	106	OFDM	BPSK	V0

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	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	MCS0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	V0
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	MCS0
-	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	MCS0
-	802.11ac (VHT80)		58	58	OFDM	BPSK	V0
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	MCS0
-	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	MCS0
-	802.11ac (VHT80)		106 to 122	106, 122	OFDM	BPSK	V0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	MCS0
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	MCS0
-	802.11ac (VHT80)		155	155	OFDM	BPSK	V0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Hwa Chiang
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian
APCM	25 deg. C, 65 % RH	3.8 Vdc	Luke Chen

3.3 Duty Cycle of Test Signal

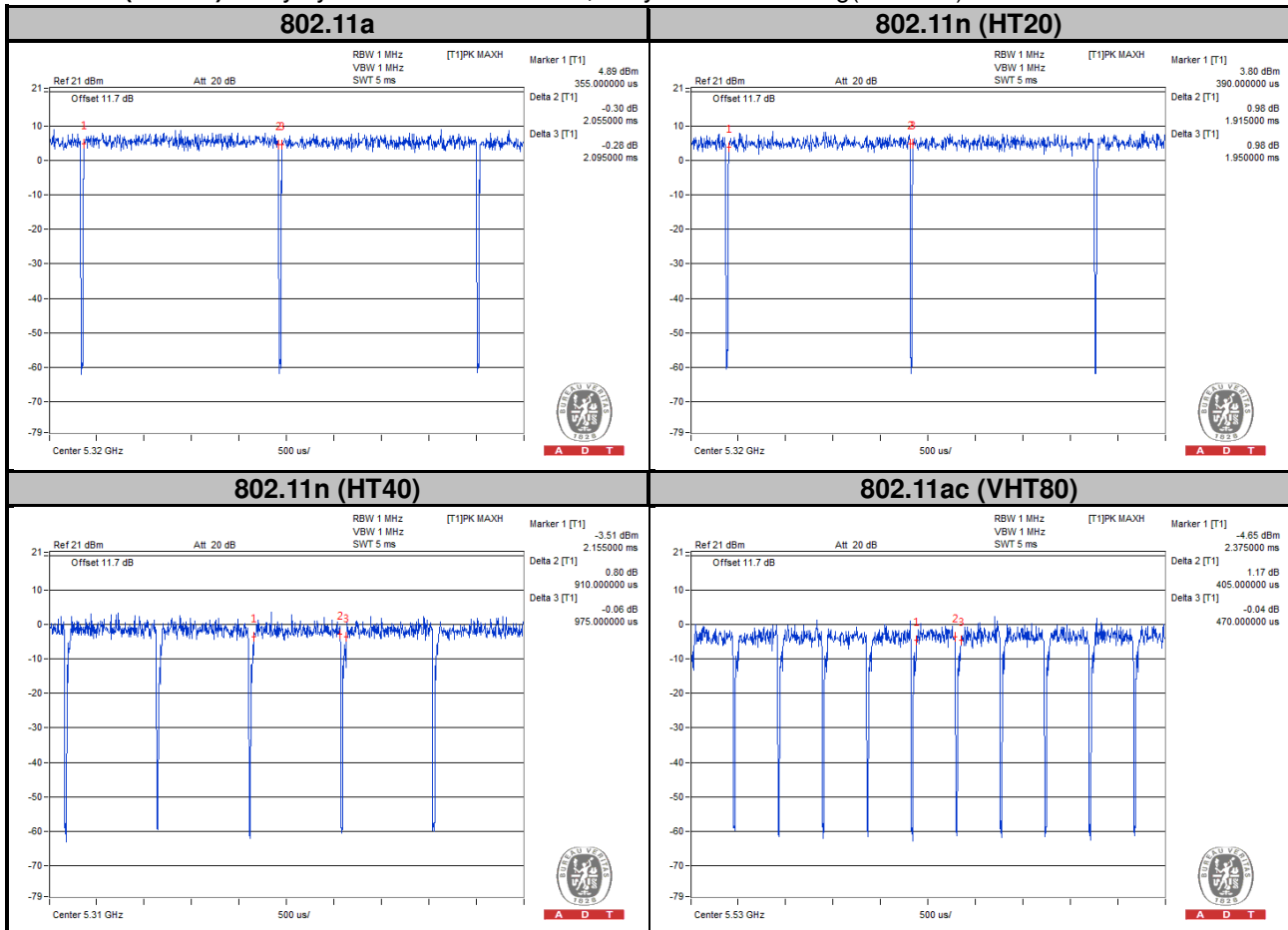
MODULATION TYPE: BPSK

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

802.11n (HT20): Duty cycle of test signal is > 98 %, duty factor is not required.

802.11n (HT40): Duty cycle = $910/975 = 0.933$, Duty factor = $10 * \log(1/0.933) = 0.30$

802.11ac (VHT80): Duty cycle = $405/470 = 0.861$, Duty factor = $10 * \log(1/0.861) = 0.65$



MODULATION TYPE: QPSK

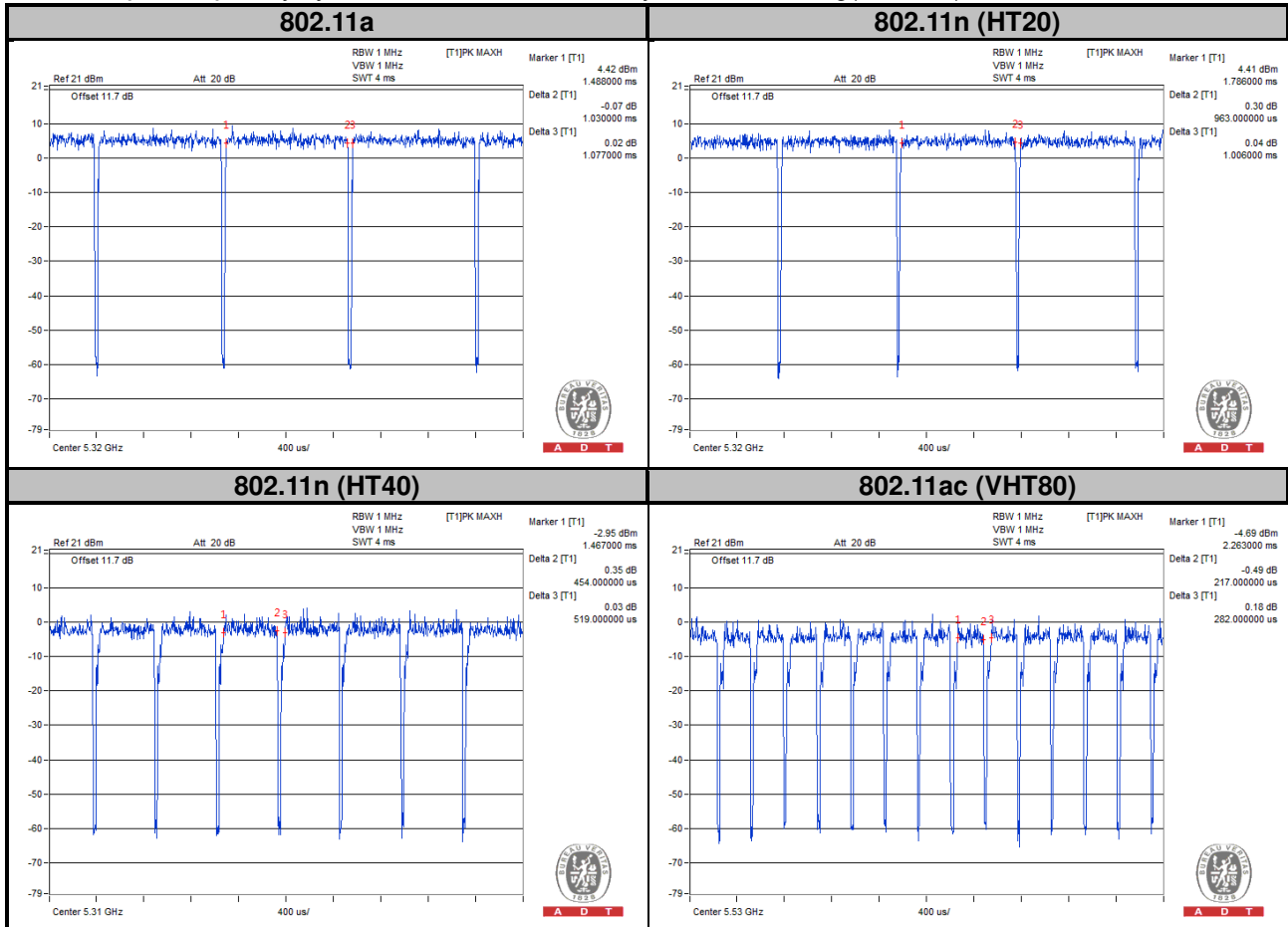
Duty cycle of test signal is < 98 %, duty factor is required.

802.11a: Duty cycle = $1.030/1.077 = 0.956$, Duty factor = $10 * \log(1/0.956) = 0.19$

802.11n (HT20): Duty cycle = $0.963/1.006 = 0.957$, Duty factor = $10 * \log(1/0.957) = 0.19$

802.11n (HT40): Duty cycle = $454/519 = 0.874$, Duty factor = $10 * \log(1/0.874) = 0.58$

802.11ac (VHT80): Duty cycle = $217/282 = 0.769$, Duty factor = $10 * \log(1/0.769) = 1.14$



MODULATION TYPE: 16QAM

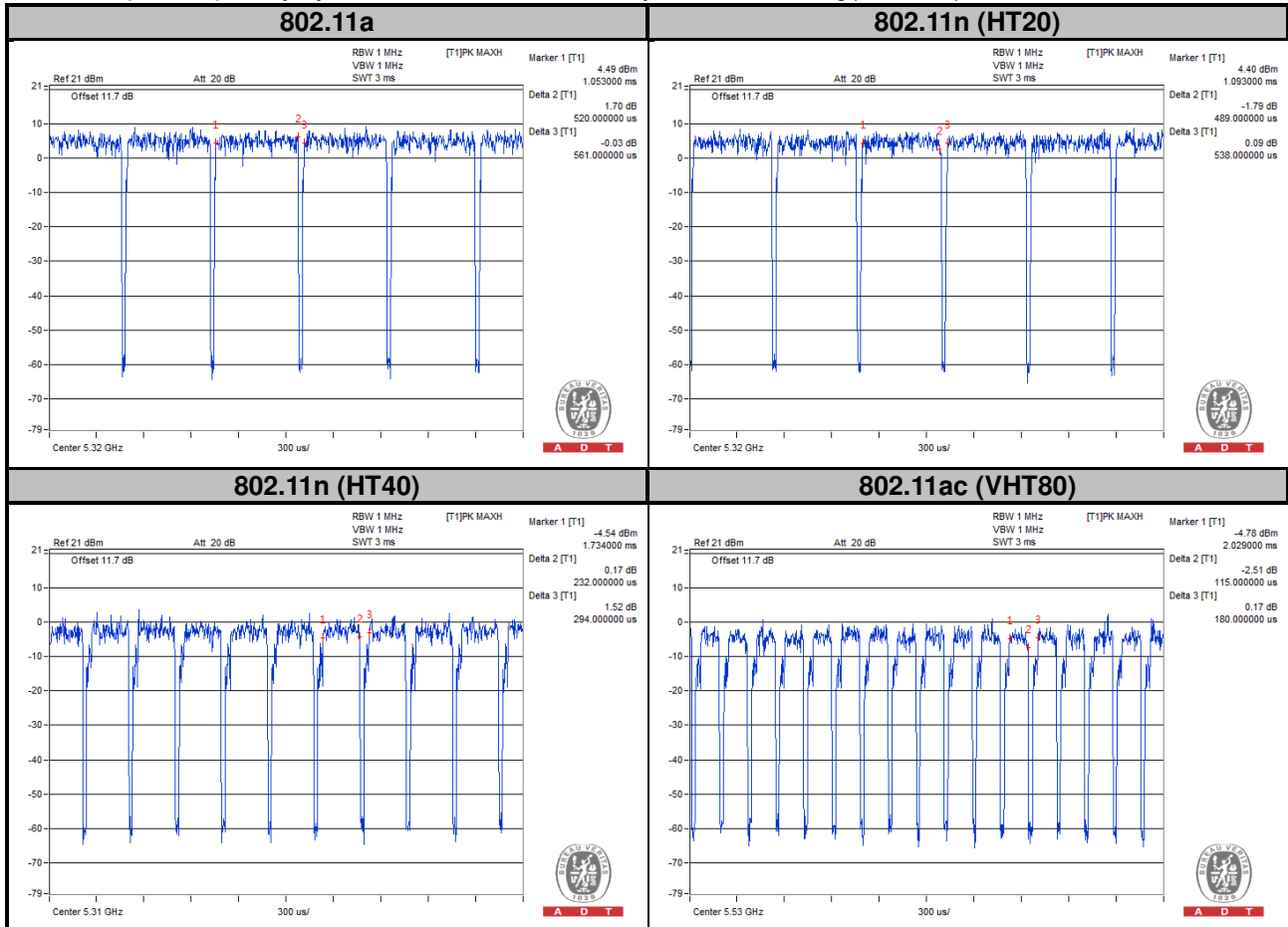
Duty cycle of test signal is < 98 %, duty factor is required.

802.11a: Duty cycle = 520/561 = 0.926, Duty factor = $10 * \log(1/0.926) = 0.33$

802.11n (HT20): Duty cycle = 489/538 = 0.908, Duty factor = $10 * \log(1/0.908) = 0.41$

802.11n (HT40): Duty cycle = 232/294 = 0.789, Duty factor = $10 * \log(1/0.789) = 1.03$

802.11ac (VHT80): Duty cycle = 115/180 = 0.638, Duty factor = $10 * \log(1/0.638) = 0.95$



MODULATION TYPE: 64QAM

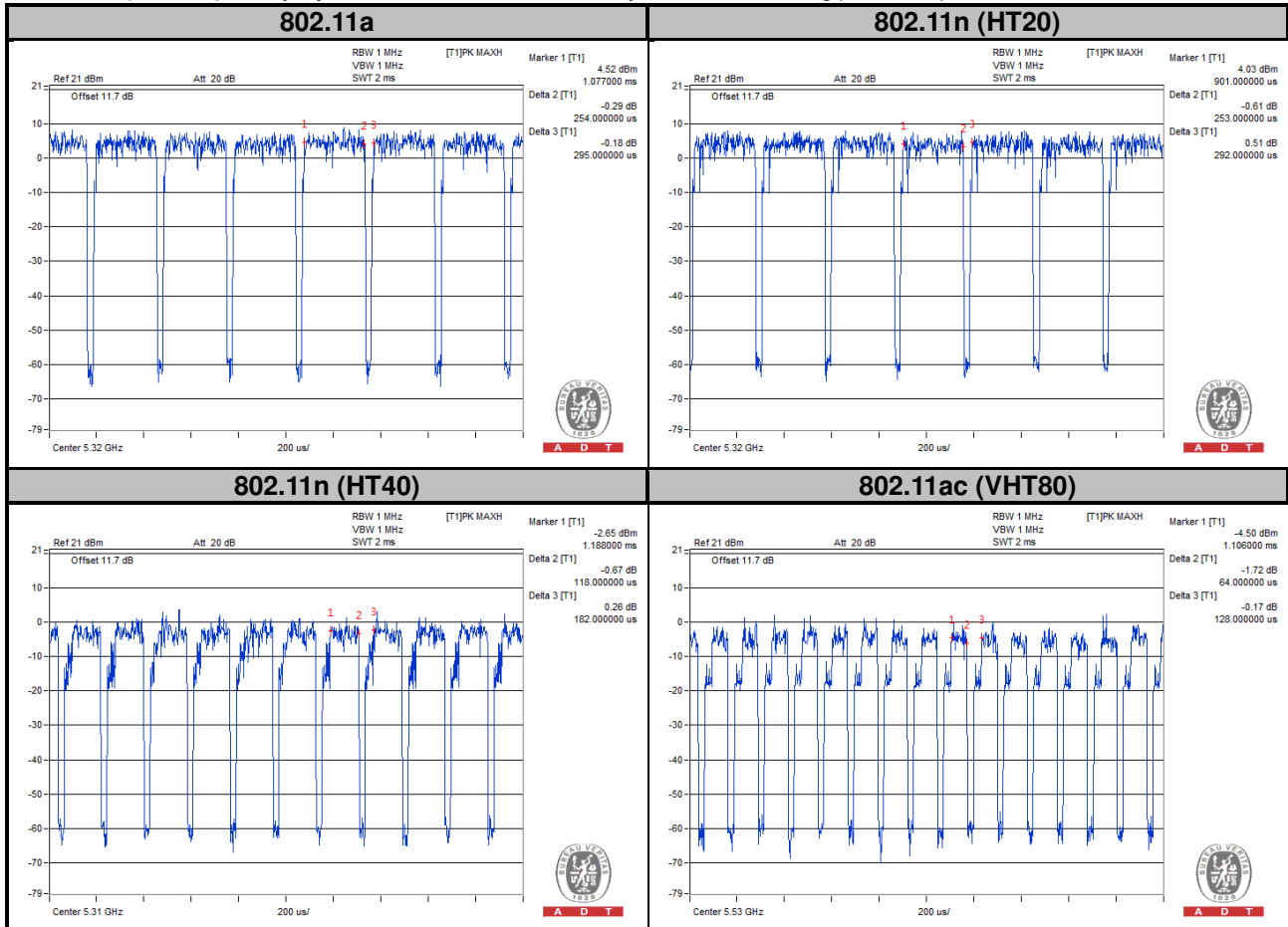
Duty cycle of test signal is < 98 %, duty factor is required.

802.11a: Duty cycle = 254/295 = 0.861, Duty factor = $10 * \log(1/0.861) = 0.65$

802.11n (HT20): Duty cycle = 253/292 = 0.866, Duty factor = $10 * \log(1/0.866) = 0.62$

802.11n (HT40): Duty cycle = 118/182 = 0.648, Duty factor = $10 * \log(1/0.648) = 1.88$

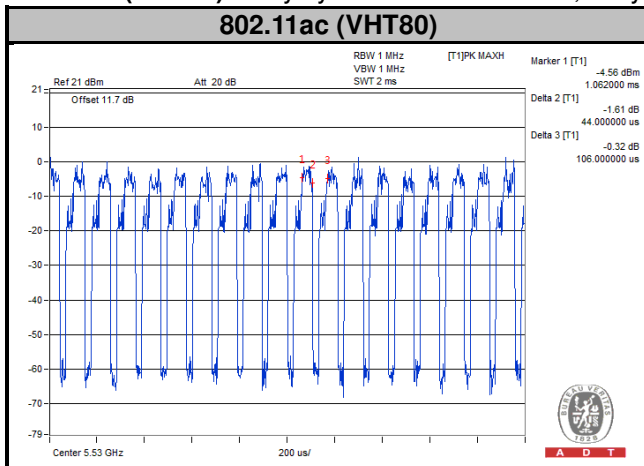
802.11ac (VHT80): Duty cycle = 64/128 = 0.500, Duty factor = $10 * \log(1/0.500) = 3.01$



MODULATION TYPE: 256QAM

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

802.11ac (VHT80): Duty cycle = 44/106 = 0.415, Duty factor = $10 * \log(1/0.415) = 3.82$



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.

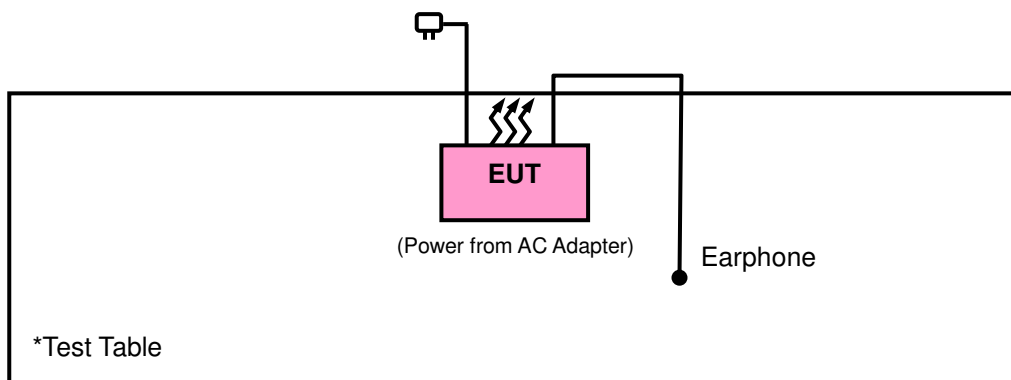
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Earphone	N/A	N/A	N/A	N/A

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

Note:

1. All power cords of the above support units are non-shielded (1.8m).

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 v01

644545 D01 Guidance for IEEE 802 11ac v01r02

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. 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 v01	Field Strength at 3 m	
	PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK: -27 (dBm/MHz) ^{*1} PK: -17 (dBm/MHz) ^{*2}	PK: 68.2 (dBμV/m) ^{*1} PK: 78.2 (dBμV/m) ^{*2}

NOTE: ^{*1} beyond 10 MHz of the band edge ^{*2} within 10 MHz of band edge

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

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

4.1.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	May 19, 2015	May 18, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 04, 2015	Feb. 04, 2016
HORN Antenna ETS-Lindgren	3117	00143293	Jan. 05, 2015	Jan. 04, 2016
Bluetooth Tester	CBT	100980	Apr. 27, 2015	Apr. 26, 2017
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Preamplifier Agilent	310N	187226	Jun. 29, 2015	Jun. 28, 2016
Preamplifier Agilent	83017A	MY39501357	Jun. 29, 2015	Jun. 28, 2016
Power Meter Anritsu	ML2495A	1232002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor Anritsu	MA2411B	1207325	Sep. 21, 2015	Sep. 20, 2016
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 27, 2015	Jun. 26, 2016
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 27, 2015	Jun. 26, 2016
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 04, 2015	Feb. 03, 2016

- 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 HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Site Registration No. is 149147.
5. The IC Site Registration No. is IC7450I-1.

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:

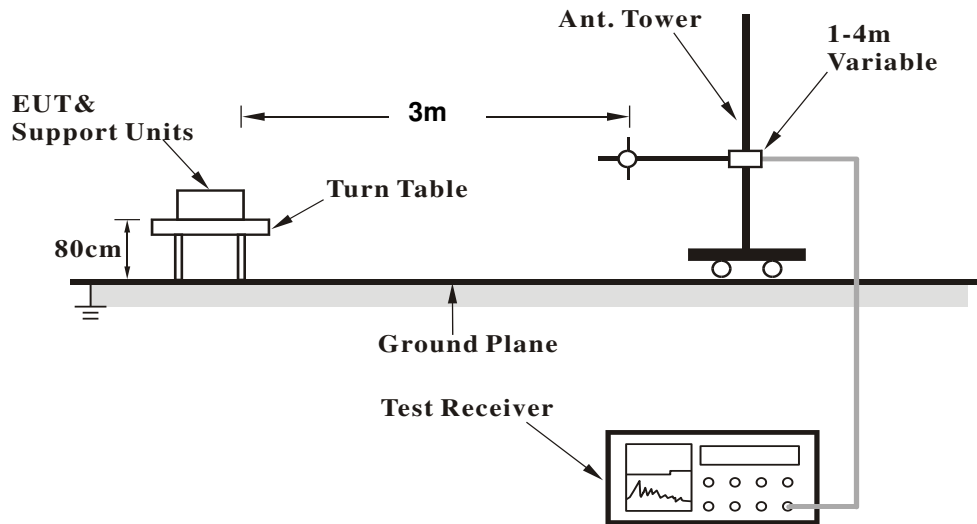
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for RMS Average (Duty cycle < 98 %) for Average detection (AV) at frequency above 1 GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle \geq 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

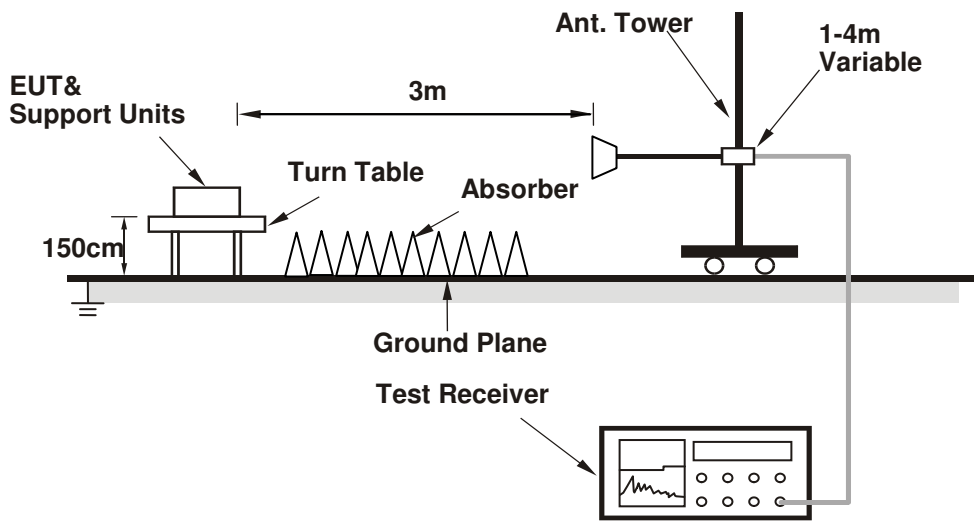
No deviation.

4.1.6 Test Set Up

<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

- Placed the EUT on a testing table.
- 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	Karl Lee

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
5150	53	44.75	54	-1	34.12	8.13	34	172	12	Average
5150	65.69	57.44	74	-8.31	34.12	8.13	34	172	12	Peak
5180	97.46	89.15			34.15	8.16	34	172	12	Average
5180	105.85	97.54			34.15	8.16	34	172	12	Peak
5366	42.61	33.97	54	-11.39	34.29	8.38	34.03	172	12	Average
5366	57.76	49.12	74	-16.24	34.29	8.38	34.03	172	12	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
5150	51.25	43	54	-2.75	34.12	8.13	34	100	205	Average
5150	62.36	54.11	74	-11.64	34.12	8.13	34	100	205	Peak
5180	96.57	88.26			34.15	8.16	34	100	205	Average
5180	104.46	96.15			34.15	8.16	34	100	205	Peak
5430	42.58	33.79	54	-11.42	34.35	8.48	34.04	100	205	Average
5430	57.19	48.4	74	-16.81	34.35	8.48	34.04	100	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5180 MHz: Fundamental frequency.



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	Karl Lee

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
5146	45	36.75	54	-9	34.12	8.13	34	172	12	Average
5146	57.62	49.37	74	-16.38	34.12	8.13	34	172	12	Peak
5220	97.7	89.31			34.17	8.22	34	172	12	Average
5220	105.55	97.16			34.17	8.22	34	172	12	Peak
5458	43.47	34.65	54	-10.53	34.36	8.51	34.05	172	12	Average
5458	57.02	48.2	74	-16.98	34.36	8.51	34.05	172	12	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
5144	44.45	36.2	54	-9.55	34.12	8.13	34	100	205	Average
5144	58.39	50.14	74	-15.61	34.12	8.13	34	100	205	Peak
5220	96.5	88.11			34.17	8.22	34	100	205	Average
5220	104.75	96.36			34.17	8.22	34	100	205	Peak
5442	42.73	33.94	54	-11.27	34.35	8.48	34.04	100	205	Average
5442	58.55	49.76	74	-15.45	34.35	8.48	34.04	100	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5220 MHz: Fundamental frequency.

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	Karl Lee

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
5038	44.04	35.97	54	-9.96	34.04	8	33.97	187	12	Average
5038	57.12	49.05	74	-16.88	34.04	8	33.97	187	12	Peak
5240	97.64	89.2			34.19	8.26	34.01	187	12	Average
5240	105.44	97			34.19	8.26	34.01	187	12	Peak
5352	42.66	34.03	54	-11.34	34.28	8.38	34.03	187	12	Average
5352	56.93	48.3	74	-17.07	34.28	8.38	34.03	187	12	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
5110	42.96	34.76	54	-11.04	34.09	8.1	33.99	105	205	Average
5110	57.51	49.31	74	-16.49	34.09	8.1	33.99	105	205	Peak
5240	96.04	87.6			34.19	8.26	34.01	105	205	Average
5240	104.81	96.37			34.19	8.26	34.01	105	205	Peak
5452	42.58	33.76	54	-11.42	34.36	8.51	34.05	105	205	Average
5452	57.21	48.39	74	-16.79	34.36	8.51	34.05	105	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5240 MHz: Fundamental frequency.

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	Karl Lee

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
5078	43.57	35.45	54	-10.43	34.07	8.03	33.98	104	243	Average
5078	58.09	49.97	74	-15.91	34.07	8.03	33.98	104	243	Peak
5260	97.68	89.22			34.21	8.26	34.01	104	243	Average
5260	105.16	96.7			34.21	8.26	34.01	104	243	Peak
5424	43.21	34.44	54	-10.79	34.33	8.48	34.04	104	243	Average
5424	57.76	48.99	74	-16.24	34.33	8.48	34.04	104	243	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
5118	43.11	34.91	54	-10.89	34.09	8.1	33.99	122	38	Average
5118	57.58	49.38	74	-16.42	34.09	8.1	33.99	122	38	Peak
5260	96.77	88.31			34.21	8.26	34.01	122	38	Average
5260	104.89	96.43			34.21	8.26	34.01	122	38	Peak
5412	42.84	34.11	54	-11.16	34.33	8.44	34.04	122	38	Average
5412	58.06	49.33	74	-15.94	34.33	8.44	34.04	122	38	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5260 MHz: Fundamental frequency.



A D T

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	Karl Lee

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
5052	43.26	35.2	54	-10.74	34.04	8	33.98	103	244	Average
5052	57.25	49.19	74	-16.75	34.04	8	33.98	103	244	Peak
5300	98.48	89.94			34.24	8.32	34.02	103	244	Average
5300	105.66	97.12			34.24	8.32	34.02	103	244	Peak
5454	44.42	35.6	54	-9.58	34.36	8.51	34.05	103	244	Average
5454	58.59	49.77	74	-15.41	34.36	8.51	34.05	103	244	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
5084	43.76	35.6	54	-10.24	34.07	8.07	33.98	108	38	Average
5084	57.07	48.91	74	-16.93	34.07	8.07	33.98	108	38	Peak
5300	97.13	88.59			34.24	8.32	34.02	108	38	Average
5300	104.19	95.65			34.24	8.32	34.02	108	38	Peak
5380	43.2	34.52	54	-10.8	34.31	8.41	34.04	108	38	Average
5380	57.59	48.91	74	-16.41	34.31	8.41	34.04	108	38	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5300 MHz: Fundamental frequency.

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	Karl Lee

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
5088	43.01	34.85	54	-10.99	34.07	8.07	33.98	103	244	Average
5088	57.91	49.75	74	-16.09	34.07	8.07	33.98	103	244	Peak
5320	97.86	89.28			34.25	8.35	34.02	103	244	Average
5320	105.62	97.04			34.25	8.35	34.02	103	244	Peak
5400	46.01	37.29	54	-7.99	34.32	8.44	34.04	103	244	Average
5400	57.88	49.16	74	-16.12	34.32	8.44	34.04	103	244	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
5118	43.13	34.93	54	-10.87	34.09	8.1	33.99	120	29	Average
5118	57.26	49.06	74	-16.74	34.09	8.1	33.99	120	29	Peak
5320	96.91	88.33			34.25	8.35	34.02	120	29	Average
5320	104.84	96.26			34.25	8.35	34.02	120	29	Peak
5354	45.41	36.78	54	-8.59	34.28	8.38	34.03	120	29	Average
5354	57.56	48.93	74	-16.44	34.28	8.38	34.03	120	29	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5320 MHz: Fundamental frequency.

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	Karl Lee

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
5456	45.31	36.49	54	-8.69	34.36	8.51	34.05	100	239	Average
5456	58.29	49.47	74	-15.71	34.36	8.51	34.05	100	239	Peak
5470	60.88	52.05	68.2	-7.32	34.37	8.51	34.05	100	239	Peak
5500	98.21	89.29			34.4	8.57	34.05	100	239	Average
5500	105.44	96.52			34.4	8.57	34.05	100	239	Peak
5725	56.93	47.77	68.2	-11.27	34.62	8.65	34.11	100	239	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
5390	44.33	35.65	54	-9.67	34.31	8.41	34.04	110	20	Average
5390	57.53	48.85	74	-16.47	34.31	8.41	34.04	110	20	Peak
5470	58.06	49.23	68.2	-10.14	34.37	8.51	34.05	110	20	Peak
5500	95.34	86.42			34.4	8.57	34.05	110	20	Average
5500	102.15	93.23			34.4	8.57	34.05	110	20	Peak
5725	56.49	47.33	68.2	-11.71	34.62	8.65	34.11	110	20	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5500 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: 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	Karl Lee

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
5452	43.3	34.48	54	-10.7	34.36	8.51	34.05	112	238	Average
5452	57.83	49.01	74	-16.17	34.36	8.51	34.05	112	238	Peak
5470	57.43	48.6	68.2	-10.77	34.37	8.51	34.05	112	238	Peak
5580	97.9	88.91			34.47	8.6	34.08	112	238	Average
5580	105.84	96.85			34.47	8.6	34.08	112	238	Peak
5725	55.93	46.77	68.2	-12.27	34.62	8.65	34.11	112	238	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
5352	42.91	34.28	54	-11.09	34.28	8.38	34.03	111	124	Average
5352	57.73	49.1	74	-16.27	34.28	8.38	34.03	111	124	Peak
5470	57.3	48.47	68.2	-10.9	34.37	8.51	34.05	111	124	Peak
5580	94.31	85.32			34.47	8.6	34.08	111	124	Average
5580	102.07	93.08			34.47	8.6	34.08	111	124	Peak
5725	56.88	47.72	68.2	-11.32	34.62	8.65	34.11	111	124	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5580 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: 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	Karl Lee

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
5354	42.59	33.96	54	-11.41	34.28	8.38	34.03	104	241	Average
5354	57.49	48.86	74	-16.51	34.28	8.38	34.03	104	241	Peak
5470	55.3	46.47	68.2	-12.9	34.37	8.51	34.05	104	241	Peak
5700	97.68	88.55			34.59	8.64	34.1	104	241	Average
5700	105	95.87			34.59	8.64	34.1	104	241	Peak
5725	65.02	55.86	68.2	-3.18	34.62	8.65	34.11	104	241	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	42.83	34.01	54	-11.17	34.36	8.51	34.05	112	12	Average
5452	56.47	47.65	74	-17.53	34.36	8.51	34.05	112	12	Peak
5470	55.29	46.46	68.2	-12.91	34.37	8.51	34.05	112	12	Peak
5700	95.76	86.63			34.59	8.64	34.1	112	12	Average
5700	102.44	93.31			34.59	8.64	34.1	112	12	Peak
5725	58.89	49.73	68.2	-9.31	34.62	8.65	34.11	112	12	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5700 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: 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	Karl Lee

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
*5708	57.61	48.46	68.2	-10.59	34.61	8.65	34.11	146	122	Peak
*5724	64.53	55.37	78.2	-13.67	34.62	8.65	34.11	146	122	Peak
5745	94.6	85.41			34.64	8.66	34.11	146	122	Average
5745	101.54	92.35			34.64	8.66	34.11	146	122	Peak
*5860	57.12	47.8	78.2	-21.08	34.76	8.7	34.14	146	122	Peak
*5866	57.49	48.16	68.2	-10.71	34.76	8.71	34.14	146	122	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
*5708	56.48	47.33	68.2	-11.72	34.61	8.65	34.11	100	10	Peak
*5724	60.33	51.17	78.2	-17.87	34.62	8.65	34.11	100	10	Peak
5745	91.9	82.71			34.64	8.66	34.11	100	10	Average
5745	98.84	89.65			34.64	8.66	34.11	100	10	Peak
*5854	57.29	47.97	78.2	-20.91	34.76	8.7	34.14	100	10	Peak
*5868	56.19	46.86	68.2	-12.01	34.76	8.71	34.14	100	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745 MHz: Fundamental frequency.
- *: 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	Karl Lee

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
*5712	56.17	47.02	68.2	-12.03	34.61	8.65	34.11	146	122	Peak
*5718	56.11	46.95	78.2	-22.09	34.62	8.65	34.11	146	122	Peak
5785	94.46	85.23			34.68	8.68	34.13	146	122	Average
5785	101.39	92.16			34.68	8.68	34.13	146	122	Peak
*5854	58.24	48.92	78.2	-19.96	34.76	8.7	34.14	146	122	Peak
*5862	56.13	46.8	68.2	-12.07	34.76	8.71	34.14	146	122	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
*5714	55.34	46.19	68.2	-12.86	34.61	8.65	34.11	138	10	Peak
*5718	56.22	47.06	78.2	-21.98	34.62	8.65	34.11	138	10	Peak
5785	91.76	82.53			34.68	8.68	34.13	138	10	Average
5785	98.31	89.08			34.68	8.68	34.13	138	10	Peak
*5854	56.54	47.22	78.2	-21.66	34.76	8.7	34.14	138	10	Peak
*5870	56.29	46.96	68.2	-11.91	34.76	8.71	34.14	138	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785 MHz: Fundamental frequency.
- *: 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	Karl Lee

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
*5706	55.84	46.69	68.2	-12.36	34.61	8.65	34.11	158	122	Peak
*5718	55.49	46.33	78.2	-22.71	34.62	8.65	34.11	158	122	Peak
5825	94.22	84.93			34.73	8.69	34.13	158	122	Average
5825	101.46	92.17			34.73	8.69	34.13	158	122	Peak
*5852	57.08	47.78	78.2	-21.12	34.74	8.7	34.14	158	122	Peak
*5866	56.6	47.27	68.2	-11.6	34.76	8.71	34.14	158	122	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
*5706	56.41	47.26	68.2	-11.79	34.61	8.65	34.11	130	10	Peak
*5722	56.42	47.26	78.2	-21.78	34.62	8.65	34.11	130	10	Peak
5825	91.02	81.73			34.73	8.69	34.13	130	10	Average
5825	98.62	89.33			34.73	8.69	34.13	130	10	Peak
*5854	57.66	48.34	78.2	-20.54	34.76	8.7	34.14	130	10	Peak
*5868	57.6	48.27	68.2	-10.6	34.76	8.71	34.14	130	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825 MHz: Fundamental frequency.
- *: 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	Karl Lee

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
5150	52.8	44.55	54	-1.2	34.12	8.13	34	172	12	Average
5150	64.35	56.1	74	-9.65	34.12	8.13	34	172	12	Peak
5180	96.21	87.9			34.15	8.16	34	172	12	Average
5180	104.12	95.81			34.15	8.16	34	172	12	Peak
5444	42.93	34.14	54	-11.07	34.35	8.48	34.04	172	12	Average
5444	57.94	49.15	74	-16.06	34.35	8.48	34.04	172	12	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
5150	51.47	43.22	54	-2.53	34.12	8.13	34	100	205	Average
5150	63.13	54.88	74	-10.87	34.12	8.13	34	100	205	Peak
5180	95.57	87.26			34.15	8.16	34	100	205	Average
5180	103.03	94.72			34.15	8.16	34	100	205	Peak
5454	42.77	33.95	54	-11.23	34.36	8.51	34.05	100	205	Average
5454	57.12	48.3	74	-16.88	34.36	8.51	34.05	100	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5180 MHz: Fundamental frequency.

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	Karl Lee

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
5138	45.24	36.99	54	-8.76	34.11	8.13	33.99	172	12	Average
5138	57.38	49.13	74	-16.62	34.11	8.13	33.99	172	12	Peak
5220	96.42	88.03			34.17	8.22	34	172	12	Average
5220	104.5	96.11			34.17	8.22	34	172	12	Peak
5448	42.97	34.14	54	-11.03	34.36	8.51	34.04	172	12	Average
5448	57.48	48.65	74	-16.52	34.36	8.51	34.04	172	12	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
5026	42.3	34.27	54	-11.7	34.03	7.97	33.97	106	205	Average
5026	56.91	48.88	74	-17.09	34.03	7.97	33.97	106	205	Peak
5220	95.53	87.14			34.17	8.22	34	106	205	Average
5220	103.71	95.32			34.17	8.22	34	106	205	Peak
5460	42.62	33.8	54	-11.38	34.36	8.51	34.05	106	205	Average
5460	57.51	48.69	74	-16.49	34.36	8.51	34.05	106	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5220 MHz: Fundamental frequency.

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	Karl Lee

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
5148	44.35	36.1	54	-9.65	34.12	8.13	34	187	12	Average
5148	57.03	48.78	74	-16.97	34.12	8.13	34	187	12	Peak
5240	96.8	88.36			34.19	8.26	34.01	187	12	Average
5240	104.72	96.28			34.19	8.26	34.01	187	12	Peak
5444	43.02	34.23	54	-10.98	34.35	8.48	34.04	187	12	Average
5444	58.3	49.51	74	-15.7	34.35	8.48	34.04	187	12	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
5040	42.94	34.87	54	-11.06	34.04	8	33.97	105	205	Average
5040	56.23	48.16	74	-17.77	34.04	8	33.97	105	205	Peak
5240	95.79	87.35			34.19	8.26	34.01	105	205	Average
5240	103.5	95.06			34.19	8.26	34.01	105	205	Peak
5372	42.56	33.89	54	-11.44	34.29	8.41	34.03	105	205	Average
5372	57.25	48.58	74	-16.75	34.29	8.41	34.03	105	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5240 MHz: Fundamental frequency.



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	Karl Lee

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
5080	43.48	35.36	54	-10.52	34.07	8.03	33.98	104	243	Average
5080	58.03	49.91	74	-15.97	34.07	8.03	33.98	104	243	Peak
5260	97.28	88.82			34.21	8.26	34.01	104	243	Average
5260	104.93	96.47			34.21	8.26	34.01	104	243	Peak
5448	43.34	34.51	54	-10.66	34.36	8.51	34.04	104	243	Average
5448	58.45	49.62	74	-15.55	34.36	8.51	34.04	104	243	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
5096	43.24	35.08	54	-10.76	34.08	8.07	33.99	122	38	Average
5096	57.49	49.33	74	-16.51	34.08	8.07	33.99	122	38	Peak
5260	96.36	87.9			34.21	8.26	34.01	122	38	Average
5260	103.68	95.22			34.21	8.26	34.01	122	38	Peak
5454	42.9	34.08	54	-11.1	34.36	8.51	34.05	122	38	Average
5454	58.02	49.2	74	-15.98	34.36	8.51	34.05	122	38	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5260 MHz: Fundamental frequency.



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	Karl Lee

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
5108	43.42	35.22	54	-10.58	34.09	8.1	33.99	103	244	Average
5108	57.74	49.54	74	-16.26	34.09	8.1	33.99	103	244	Peak
5300	96.08	87.54			34.24	8.32	34.02	103	244	Average
5300	104.27	95.73			34.24	8.32	34.02	103	244	Peak
5350	44.17	35.54	54	-9.83	34.28	8.38	34.03	103	244	Average
5350	57.7	49.07	74	-16.3	34.28	8.38	34.03	103	244	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
5146	43.65	35.4	54	-10.35	34.12	8.13	34	108	38	Average
5146	57.9	49.65	74	-16.1	34.12	8.13	34	108	38	Peak
5300	94.74	86.2			34.24	8.32	34.02	108	38	Average
5300	103.27	94.73			34.24	8.32	34.02	108	38	Peak
5380	43.16	34.48	54	-10.84	34.31	8.41	34.04	108	38	Average
5380	57.72	49.04	74	-16.28	34.31	8.41	34.04	108	38	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5300 MHz: Fundamental frequency.

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	Karl Lee

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
5086	43.21	35.05	54	-10.79	34.07	8.07	33.98	103	244	Average
5086	57.28	49.12	74	-16.72	34.07	8.07	33.98	103	244	Peak
5320	97.62	89.04			34.25	8.35	34.02	103	244	Average
5320	105.07	96.49			34.25	8.35	34.02	103	244	Peak
5350	46.57	37.94	54	-7.43	34.28	8.38	34.03	103	244	Average
5350	59.07	50.44	74	-14.93	34.28	8.38	34.03	103	244	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	43.13	35.01	54	-10.87	34.07	8.03	33.98	120	29	Average
5072	56.9	48.78	74	-17.1	34.07	8.03	33.98	120	29	Peak
5320	96.8	88.22			34.25	8.35	34.02	120	29	Average
5320	103.44	94.86			34.25	8.35	34.02	120	29	Peak
5350	45.87	37.24	54	-8.13	34.28	8.38	34.03	120	29	Average
5350	58.57	49.94	74	-15.43	34.28	8.38	34.03	120	29	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5320 MHz: Fundamental frequency.



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	Karl Lee

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
5456	45.66	36.84	54	-8.34	34.36	8.51	34.05	100	239	Average
5456	58.03	49.21	74	-15.97	34.36	8.51	34.05	100	239	Peak
5470	63.13	54.3	68.2	-5.07	34.37	8.51	34.05	100	239	Peak
5500	98.37	89.45			34.4	8.57	34.05	100	239	Average
5500	105.19	96.27			34.4	8.57	34.05	100	239	Peak
5725	56.07	46.91	68.2	-12.13	34.62	8.65	34.11	100	239	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
5448	44.74	35.91	54	-9.26	34.36	8.51	34.04	110	20	Average
5448	58.04	49.21	74	-15.96	34.36	8.51	34.04	110	20	Peak
5470	57.82	48.99	68.2	-10.38	34.37	8.51	34.05	110	20	Peak
5500	95.33	86.41			34.4	8.57	34.05	110	20	Average
5500	102.14	93.22			34.4	8.57	34.05	110	20	Peak
5725	56.31	47.15	68.2	-11.89	34.62	8.65	34.11	110	20	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5500 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: 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	Karl Lee

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
5446	43.09	34.26	54	-10.91	34.36	8.51	34.04	112	238	Average
5446	59.43	50.6	74	-14.57	34.36	8.51	34.04	112	238	Peak
5470	56.52	47.69	68.2	-11.68	34.37	8.51	34.05	112	238	Peak
5580	98.09	89.1			34.47	8.6	34.08	112	238	Average
5580	105.3	96.31			34.47	8.6	34.08	112	238	Peak
5725	56.76	47.6	68.2	-11.44	34.62	8.65	34.11	112	238	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
5444	43.12	34.33	54	-10.88	34.35	8.48	34.04	111	124	Average
5444	58.48	49.69	74	-15.52	34.35	8.48	34.04	111	124	Peak
5470	56.84	48.01	68.2	-11.36	34.37	8.51	34.05	111	124	Peak
5580	94.44	85.45			34.47	8.6	34.08	111	124	Average
5580	102.61	93.62			34.47	8.6	34.08	111	124	Peak
5725	57.51	48.35	68.2	-10.69	34.62	8.65	34.11	111	124	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5580 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: 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	Karl Lee

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
5460	43.07	34.25	54	-10.93	34.36	8.51	34.05	104	241	Average
5460	57.17	48.35	74	-16.83	34.36	8.51	34.05	104	241	Peak
5470	54.91	46.08	68.2	-13.29	34.37	8.51	34.05	104	241	Peak
5700	97.94	88.81			34.59	8.64	34.1	104	241	Average
5700	105.15	96.02			34.59	8.64	34.1	104	241	Peak
5725	64.18	55.02	68.2	-4.02	34.62	8.65	34.11	104	241	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
5360	44.56	35.93	54	-9.44	34.28	8.38	34.03	112	13	Average
5360	57.14	48.51	74	-16.86	34.28	8.38	34.03	112	13	Peak
5470	55.95	47.12	68.2	-12.25	34.37	8.51	34.05	112	13	Peak
5700	94.81	85.68			34.59	8.64	34.1	112	13	Average
5700	102.02	92.89			34.59	8.64	34.1	112	13	Peak
5725	60.13	50.97	68.2	-8.07	34.62	8.65	34.11	112	13	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5700 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: 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	Karl Lee

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
*5710	57.34	48.19	68.2	-10.86	34.61	8.65	34.11	146	122	Peak
*5724	66.27	57.11	78.2	-11.93	34.62	8.65	34.11	146	122	Peak
5745	93.23	84.04			34.64	8.66	34.11	146	122	Average
5745	100.66	91.47			34.64	8.66	34.11	146	122	Peak
*5860	55.97	46.65	78.2	-22.23	34.76	8.7	34.14	146	122	Peak
*5866	56.5	47.17	68.2	-11.7	34.76	8.71	34.14	146	122	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
*5714	56.45	47.3	68.2	-11.75	34.61	8.65	34.11	100	10	Peak
*5724	60.92	51.76	78.2	-17.28	34.62	8.65	34.11	100	10	Peak
5745	90.75	81.56			34.64	8.66	34.11	100	10	Average
5745	97.59	88.4			34.64	8.66	34.11	100	10	Peak
*5856	56.9	47.58	78.2	-21.3	34.76	8.7	34.14	100	10	Peak
*5868	55.9	46.57	68.2	-12.3	34.76	8.71	34.14	100	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745 MHz: Fundamental frequency.
- *: Out of restricted band



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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	Karl Lee

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
*5710	57.41	48.26	68.2	-10.79	34.61	8.65	34.11	146	122	Peak
*5724	57.94	48.78	78.2	-20.26	34.62	8.65	34.11	146	122	Peak
5785	93.82	84.59			34.68	8.68	34.13	146	122	Average
5785	100.7	91.47			34.68	8.68	34.13	146	122	Peak
*5856	57.7	48.38	78.2	-20.5	34.76	8.7	34.14	146	122	Peak
*5870	58.05	48.72	68.2	-10.15	34.76	8.71	34.14	146	122	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
*5710	56.44	47.29	68.2	-11.76	34.61	8.65	34.11	138	10	Peak
*5716	56.61	47.46	78.2	-21.59	34.61	8.65	34.11	138	10	Peak
5785	90.99	81.76			34.68	8.68	34.13	138	10	Average
5785	97.2	87.97			34.68	8.68	34.13	138	10	Peak
*5852	56.33	47.03	78.2	-21.87	34.74	8.7	34.14	138	10	Peak
*5864	55.98	46.65	68.2	-12.22	34.76	8.71	34.14	138	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785 MHz: Fundamental frequency.
- *: 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	Karl Lee

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
*5706	56.61	47.46	68.2	-11.59	34.61	8.65	34.11	158	122	Peak
*5724	56.97	47.81	78.2	-21.23	34.62	8.65	34.11	158	122	Peak
5825	93.54	84.25			34.73	8.69	34.13	158	122	Average
5825	100.19	90.9			34.73	8.69	34.13	158	122	Peak
*5858	59.23	49.91	78.2	-18.97	34.76	8.7	34.14	158	122	Peak
*5866	57.04	47.71	68.2	-11.16	34.76	8.71	34.14	158	122	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
*5706	56.99	47.84	68.2	-11.21	34.61	8.65	34.11	130	10	Peak
*5718	57.01	47.85	78.2	-21.19	34.62	8.65	34.11	130	10	Peak
5825	90.12	80.83			34.73	8.69	34.13	130	10	Average
5825	97.75	88.46			34.73	8.69	34.13	130	10	Peak
*5854	57.46	48.14	78.2	-20.74	34.76	8.7	34.14	130	10	Peak
*5862	57.73	48.4	68.2	-10.47	34.76	8.71	34.14	130	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825 MHz: Fundamental frequency.
- *: Out of restricted band

802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 38	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	Karl Lee

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
5150	52.53	44.28	54	-1.47	34.12	8.13	34	172	12	Average
5150	62.74	54.49	74	-11.26	34.12	8.13	34	172	12	Peak
5190	92.34	84			34.15	8.19	34	172	12	Average
5190	99.42	91.08			34.15	8.19	34	172	12	Peak
5430	43.42	34.63	54	-10.58	34.35	8.48	34.04	172	12	Average
5430	56.88	48.09	74	-17.12	34.35	8.48	34.04	172	12	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
5150	51.44	43.19	54	-2.56	34.12	8.13	34	100	205	Average
5150	62.25	54	74	-11.75	34.12	8.13	34	100	205	Peak
5190	91.38	83.04			34.15	8.19	34	100	205	Average
5190	98.45	90.11			34.15	8.19	34	100	205	Peak
5420	43.36	34.59	54	-10.64	34.33	8.48	34.04	100	205	Average
5420	56.31	47.54	74	-17.69	34.33	8.48	34.04	100	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5190 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 46	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	Karl Lee

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
5122	46.19	37.99	54	-7.81	34.09	8.1	33.99	172	12	Average
5122	57.81	49.61	74	-16.19	34.09	8.1	33.99	172	12	Peak
5230	93.58	85.18			34.19	8.22	34.01	172	12	Average
5230	100.17	91.77			34.19	8.22	34.01	172	12	Peak
5452	43.48	34.66	54	-10.52	34.36	8.51	34.05	172	12	Average
5452	57.08	48.26	74	-16.92	34.36	8.51	34.05	172	12	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
5112	43.69	35.49	54	-10.31	34.09	8.1	33.99	105	205	Average
5112	56.61	48.41	74	-17.39	34.09	8.1	33.99	105	205	Peak
5230	92.51	84.11			34.19	8.22	34.01	105	205	Average
5230	99.31	90.91			34.19	8.22	34.01	105	205	Peak
5460	43.32	34.5	54	-10.68	34.36	8.51	34.05	105	205	Average
5460	57.4	48.58	74	-16.6	34.36	8.51	34.05	105	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5230 MHz: Fundamental frequency.



EUT Test Condition		Measurement Detail	
Channel	Channel 54	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	Karl Lee

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
5082	44.12	35.96	54	-9.88	34.07	8.07	33.98	104	243	Average
5082	57.68	49.52	74	-16.32	34.07	8.07	33.98	104	243	Peak
5270	94.41	85.92			34.21	8.29	34.01	104	243	Average
5270	102.13	93.64			34.21	8.29	34.01	104	243	Peak
5458	43.91	35.09	54	-10.09	34.36	8.51	34.05	104	243	Average
5458	57.36	48.54	74	-16.64	34.36	8.51	34.05	104	243	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
5110	44.32	36.12	54	-9.68	34.09	8.1	33.99	108	31	Average
5110	57.14	48.94	74	-16.86	34.09	8.1	33.99	108	31	Peak
5270	94.18	85.69			34.21	8.29	34.01	108	31	Average
5270	101.74	93.25			34.21	8.29	34.01	108	31	Peak
5436	43.53	34.74	54	-10.47	34.35	8.48	34.04	108	31	Average
5436	58.28	49.49	74	-15.72	34.35	8.48	34.04	108	31	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5270 MHz: Fundamental frequency.



EUT Test Condition		Measurement Detail	
Channel	Channel 62	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	Karl Lee

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
5050	43.4	35.34	54	-10.6	34.04	8	33.98	103	244	Average
5050	57.32	49.26	74	-16.68	34.04	8	33.98	103	244	Peak
5310	94.22	85.67			34.25	8.32	34.02	103	244	Average
5310	102.11	93.56			34.25	8.32	34.02	103	244	Peak
5350	47.95	39.32	54	-6.05	34.28	8.38	34.03	103	244	Average
5350	60.13	51.5	74	-13.87	34.28	8.38	34.03	103	244	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	43.59	35.43	54	-10.41	34.08	8.07	33.99	120	29	Average
5100	57.52	49.36	74	-16.48	34.08	8.07	33.99	120	29	Peak
5310	93.31	84.76			34.25	8.32	34.02	120	29	Average
5310	101.84	93.29			34.25	8.32	34.02	120	29	Peak
5350	48	39.37	54	-6	34.28	8.38	34.03	120	29	Average
5350	60.12	51.49	74	-13.88	34.28	8.38	34.03	120	29	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5310 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 102	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	Karl Lee

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
5460	48.14	39.32	54	-5.86	34.36	8.51	34.05	100	239	Average
5460	59.59	50.77	74	-14.41	34.36	8.51	34.05	100	239	Peak
5470	63.82	54.99	68.2	-4.38	34.37	8.51	34.05	100	239	Peak
5510	94.98	86.07			34.4	8.57	34.06	100	239	Average
5510	102.31	93.4			34.4	8.57	34.06	100	239	Peak
5725	56.67	47.51	68.2	-11.53	34.62	8.65	34.11	100	239	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
5448	46.71	37.88	54	-7.29	34.36	8.51	34.04	110	20	Average
5448	58.28	49.45	74	-15.72	34.36	8.51	34.04	110	20	Peak
5470	60.86	52.03	68.2	-7.34	34.37	8.51	34.05	110	20	Peak
5510	92.63	83.72			34.4	8.57	34.06	110	20	Average
5510	99.58	90.67			34.4	8.57	34.06	110	20	Peak
5725	56.41	47.25	68.2	-11.79	34.62	8.65	34.11	110	20	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5510 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: Out of restricted band



EUT Test Condition		Measurement Detail	
Channel	Channel 110	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	Karl Lee

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
5434	45.09	36.3	54	-8.91	34.35	8.48	34.04	100	240	Average
5434	58.13	49.34	74	-15.87	34.35	8.48	34.04	100	240	Peak
5470	56.96	48.13	68.2	-11.24	34.37	8.51	34.05	100	240	Peak
5550	95.65	86.68			34.45	8.59	34.07	100	240	Average
5550	102.6	93.63			34.45	8.59	34.07	100	240	Peak
5725	56.15	46.99	68.2	-12.05	34.62	8.65	34.11	100	240	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
5366	43.23	34.59	54	-10.77	34.29	8.38	34.03	120	47	Average
5366	57.46	48.82	74	-16.54	34.29	8.38	34.03	120	47	Peak
5470	56.77	47.94	68.2	-11.43	34.37	8.51	34.05	120	47	Peak
5550	92.84	83.87			34.45	8.59	34.07	120	47	Average
5550	99.97	91			34.45	8.59	34.07	120	47	Peak
5725	56.51	47.35	68.2	-11.69	34.62	8.65	34.11	120	47	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5550 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: Out of restricted band

EUT Test Condition		Measurement Detail	
Channel	Channel 134	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	Karl Lee

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
5456	43.51	34.69	54	-10.49	34.36	8.51	34.05	104	239	Average
5456	57.7	48.88	74	-16.3	34.36	8.51	34.05	104	239	Peak
5470	56.07	47.24	68.2	-12.13	34.37	8.51	34.05	104	239	Peak
5670	94.77	85.67			34.57	8.63	34.1	104	239	Average
5670	102.24	93.14			34.57	8.63	34.1	104	239	Peak
5725	60.77	51.61	68.2	-7.43	34.62	8.65	34.11	104	239	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
5384	43.27	34.59	54	-10.73	34.31	8.41	34.04	112	13	Average
5384	57.07	48.39	74	-16.93	34.31	8.41	34.04	112	13	Peak
5470	55.97	47.14	68.2	-12.23	34.37	8.51	34.05	112	13	Peak
5670	92.22	83.12			34.57	8.63	34.1	112	13	Average
5670	99.36	90.26			34.57	8.63	34.1	112	13	Peak
5725	56.55	47.39	68.2	-11.65	34.62	8.65	34.11	112	13	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5670 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: Out of restricted band

EUT Test Condition		Measurement Detail	
Channel	Channel 151	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	Karl Lee

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
*5714	58.26	49.11	68.2	-9.94	34.61	8.65	34.11	146	122	Peak
*5724	62.02	52.86	78.2	-16.18	34.62	8.65	34.11	146	122	Peak
5755	91.42	82.21			34.66	8.66	34.11	146	122	Average
5755	98.42	89.21			34.66	8.66	34.11	146	122	Peak
*5858	56.66	47.34	78.2	-21.54	34.76	8.7	34.14	146	122	Peak
*5870	56.62	47.29	68.2	-11.58	34.76	8.71	34.14	146	122	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
*5706	56.63	47.48	68.2	-11.57	34.61	8.65	34.11	100	10	Peak
*5724	57.7	48.54	78.2	-20.5	34.62	8.65	34.11	100	10	Peak
5755	88.22	79.01			34.66	8.66	34.11	100	10	Average
5755	95.41	86.2			34.66	8.66	34.11	100	10	Peak
*5858	57.78	48.46	78.2	-20.42	34.76	8.7	34.14	100	10	Peak
*5868	56.73	47.4	68.2	-11.47	34.76	8.71	34.14	100	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5755 MHz: Fundamental frequency.
- *: Out of restricted band

EUT Test Condition		Measurement Detail	
Channel	Channel 159	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	Karl Lee

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
*5708	57.63	48.48	68.2	-10.57	34.61	8.65	34.11	146	122	Peak
*5718	57.16	48	78.2	-21.04	34.62	8.65	34.11	146	122	Peak
5795	91.03	81.79			34.69	8.68	34.13	146	122	Average
5795	98.07	88.83			34.69	8.68	34.13	146	122	Peak
*5854	59.76	50.44	78.2	-18.44	34.76	8.7	34.14	146	122	Peak
*5868	58	48.67	68.2	-10.2	34.76	8.71	34.14	146	122	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
*5712	56.54	47.39	68.2	-11.66	34.61	8.65	34.11	131	10	Peak
*5716	56.3	47.15	78.2	-21.9	34.61	8.65	34.11	131	10	Peak
5795	88.8	79.56			34.69	8.68	34.13	131	10	Average
5795	95.24	86			34.69	8.68	34.13	131	10	Peak
*5852	57.8	48.5	78.2	-20.4	34.74	8.7	34.14	131	10	Peak
*5868	55.92	46.59	68.2	-12.28	34.76	8.71	34.14	131	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5795 MHz: Fundamental frequency.
- *: Out of restricted band

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	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	Karl Lee

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
5142	52.34	44.08	54	-1.66	34.12	8.13	33.99	172	12	Average
5142	61.98	53.72	74	-12.02	34.12	8.13	33.99	172	12	Peak
5210	89.07	80.71			34.17	8.19	34	172	12	Average
5210	96.33	87.97			34.17	8.19	34	172	12	Peak
5426	43.47	34.7	54	-10.53	34.33	8.48	34.04	172	12	Average
5426	58.44	49.67	74	-15.56	34.33	8.48	34.04	172	12	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
5130	50.95	42.73	54	-3.05	34.11	8.1	33.99	100	205	Average
5130	62.35	54.13	74	-11.65	34.11	8.1	33.99	100	205	Peak
5210	87.91	79.55			34.17	8.19	34	100	205	Average
5210	95.43	87.07			34.17	8.19	34	100	205	Peak
5374	43.27	34.61	54	-10.73	34.29	8.41	34.04	100	205	Average
5374	57.22	48.56	74	-16.78	34.29	8.41	34.04	100	205	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5210 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 58	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	Karl Lee

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
5102	45.87	37.71	54	-8.13	34.08	8.07	33.99	103	244	Average
5102	59.14	50.98	74	-14.86	34.08	8.07	33.99	103	244	Peak
5290	92.18	83.65			34.23	8.32	34.02	103	244	Average
5290	100.56	92.03			34.23	8.32	34.02	103	244	Peak
5354	52.94	44.31	54	-1.06	34.28	8.38	34.03	103	244	Average
5354	63.89	55.26	74	-10.11	34.28	8.38	34.03	103	244	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
5146	46.5	38.25	54	-7.5	34.12	8.13	34	108	38	Average
5146	58.26	50.01	74	-15.74	34.12	8.13	34	108	38	Peak
5290	91.41	82.88			34.23	8.32	34.02	108	38	Average
5290	99.55	91.02			34.23	8.32	34.02	108	38	Peak
5350	49.08	40.45	54	-4.92	34.28	8.38	34.03	108	38	Average
5350	60.84	52.21	74	-13.16	34.28	8.38	34.03	108	38	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5290 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 106	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	Karl Lee

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
5458	52.97	44.15	54	-1.03	34.36	8.51	34.05	100	239	Average
5458	64.89	56.07	74	-9.11	34.36	8.51	34.05	100	239	Peak
5470	67.24	58.41	68.2	-0.96	34.37	8.51	34.05	100	239	Peak
5530	92.8	83.87			34.42	8.58	34.07	100	239	Average
5530	100.55	91.62			34.42	8.58	34.07	100	239	Peak
5725	57.42	48.26	68.2	-10.78	34.62	8.65	34.11	100	239	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
5450	51.83	43.01	54	-2.17	34.36	8.51	34.05	110	20	Average
5450	62.36	53.54	74	-11.64	34.36	8.51	34.05	110	20	Peak
5470	65.83	57	68.2	-2.37	34.37	8.51	34.05	110	20	Peak
5530	89.28	80.35			34.42	8.58	34.07	110	20	Average
5530	97.85	88.92			34.42	8.58	34.07	110	20	Peak
5725	55.81	46.65	68.2	-12.39	34.62	8.65	34.11	110	20	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5530 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: Out of restricted band

EUT Test Condition		Measurement Detail	
Channel	Channel 122	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	Karl Lee

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
5434	45.37	36.58	54	-8.63	34.35	8.48	34.04	112	238	Average
5434	58.07	49.28	74	-15.93	34.35	8.48	34.04	112	238	Peak
5470	59.69	50.86	68.2	-8.51	34.37	8.51	34.05	112	238	Peak
5610	92.94	83.91			34.5	8.61	34.08	112	238	Average
5610	100.66	91.63			34.5	8.61	34.08	112	238	Peak
5725	61.25	52.09	68.2	-6.95	34.62	8.65	34.11	112	238	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
5360	43.46	34.83	54	-10.54	34.28	8.38	34.03	111	124	Average
5360	56.88	48.25	74	-17.12	34.28	8.38	34.03	111	124	Peak
5470	55.07	46.24	68.2	-13.13	34.37	8.51	34.05	111	124	Peak
5610	89.5	80.47			34.5	8.61	34.08	111	124	Average
5610	97.03	88			34.5	8.61	34.08	111	124	Peak
5725	55.1	45.94	68.2	-13.1	34.62	8.65	34.11	111	124	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5610 MHz: Fundamental frequency.
- 5470 MHz & 5725 MHz: Out of restricted band



EUT Test Condition		Measurement Detail	
Channel	Channel 155	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	Karl Lee

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
*5710	59.31	50.16	68.2	-8.89	34.61	8.65	34.11	145	122	Peak
*5720	59.88	50.72	78.2	-18.32	34.62	8.65	34.11	145	122	Peak
5775	89.75	80.52			34.68	8.67	34.12	145	122	Average
5775	96.61	87.38			34.68	8.67	34.12	145	122	Peak
*5858	68.49	59.17	78.2	-9.71	34.76	8.7	34.14	145	122	Peak
*5862	66.65	57.32	68.2	-1.55	34.76	8.71	34.14	145	122	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
*5712	58.45	49.3	68.2	-9.75	34.61	8.65	34.11	132	10	Peak
*5720	58.2	49.04	78.2	-20	34.62	8.65	34.11	132	10	Peak
5775	86.05	76.82			34.68	8.67	34.12	132	10	Average
5775	93.62	84.39			34.68	8.67	34.12	132	10	Peak
*5856	61.47	52.15	78.2	-16.73	34.76	8.7	34.14	132	10	Peak
*5862	59.01	49.68	68.2	-9.19	34.76	8.71	34.14	132	10	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5775 MHz: Fundamental frequency.
- *: 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:

802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 36	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	Hwa Chiang

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
30	19.72	33.45	40	-20.28	17.8	0.74	32.27	192	254	Peak
114.51	21.03	42.91	43.5	-22.47	9.09	1.28	32.25	133	279	Peak
165.27	16.76	37.14	43.5	-26.74	10.36	1.52	32.26	166	209	Peak
413.4	17.66	29.57	46	-28.34	17.88	2.41	32.2	178	284	Peak
632.5	22.79	29.92	46	-23.21	22.1	2.93	32.16	157	197	Peak
917.4	28.21	30.07	46	-17.79	25.96	3.53	31.35	195	163	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
30	29.35	43.08	40	-10.65	17.8	0.74	32.27	138	85	Peak
77.79	23.58	46.36	40	-16.42	8.33	1.11	32.22	173	251	Peak
110.73	21.59	43.2	43.5	-21.91	9.36	1.28	32.25	158	259	Peak
428.8	17.72	29.74	46	-28.28	17.75	2.41	32.18	170	263	Peak
650.7	22.68	29.74	46	-23.32	22.1	2.99	32.15	148	128	Peak
921.6	27.8	29.39	46	-18.2	26.2	3.53	31.32	184	38	Peak

Remarks:

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

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 58	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	Hwa Chiang

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
79.68	16.74	39.45	40	-23.26	8.39	1.11	32.21	126	62	Peak
112.08	19.46	41.21	43.5	-24.04	9.22	1.28	32.25	185	104	Peak
143.4	17.78	39.06	43.5	-25.72	9.61	1.38	32.27	106	346	Peak
402.2	17.28	29.1	46	-28.72	18.06	2.34	32.22	192	266	Peak
617.8	22.62	30.06	46	-23.38	21.81	2.93	32.18	189	77	Peak
921.6	28.64	30.23	46	-17.36	26.2	3.53	31.32	176	357	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
30.27	29.06	43.04	40	-10.94	17.55	0.74	32.27	191	224	Peak
77.79	23.06	45.84	40	-16.94	8.33	1.11	32.22	145	254	Peak
111.27	21.26	42.92	43.5	-22.24	9.31	1.28	32.25	169	182	Peak
472.9	19.49	30.24	46	-26.51	18.81	2.56	32.12	165	203	Peak
677.3	24.15	29.86	46	-21.85	23.36	3.05	32.12	149	269	Peak
922.3	27.94	29.53	46	-18.06	26.2	3.53	31.32	132	240	Peak

Remarks:

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

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 106	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	Hwa Chiang

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
30.27	17.87	31.85	40	-22.13	17.55	0.74	32.27	128	157	Peak
111.27	20.59	42.25	43.5	-22.91	9.31	1.28	32.25	104	64	Peak
140.16	19.05	40.58	43.5	-24.45	9.36	1.38	32.27	150	89	Peak
454.7	17.82	29.29	46	-28.18	18.18	2.49	32.14	187	289	Peak
718.6	24.15	29.79	46	-21.85	23.31	3.16	32.11	199	179	Peak
937	27.87	29.26	46	-18.13	26.2	3.62	31.21	105	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
30	28.95	42.68	40	-11.05	17.8	0.74	32.27	139	339	Peak
77.79	23.97	46.75	40	-16.03	8.33	1.11	32.22	107	274	Peak
110.19	20.61	42.18	43.5	-22.89	9.4	1.28	32.25	190	128	Peak
474.3	19.61	30.27	46	-26.39	18.9	2.56	32.12	129	274	Peak
678	24.92	30.62	46	-21.08	23.36	3.05	32.11	199	227	Peak
930	28.37	29.81	46	-17.63	26.2	3.62	31.26	144	49	Peak

Remarks:

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

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 155	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	Hwa Chiang

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
79.68	16.18	38.89	40	-23.82	8.39	1.11	32.21	114	175	Peak
111	19.26	40.92	43.5	-24.24	9.31	1.28	32.25	126	319	Peak
141.51	18.48	39.95	43.5	-25.02	9.42	1.38	32.27	133	185	Peak
408.5	17.1	28.95	46	-28.9	17.95	2.41	32.21	103	274	Peak
671.7	23.96	29.63	46	-22.04	23.4	3.05	32.12	116	287	Peak
935.6	27.97	29.36	46	-18.03	26.2	3.62	31.21	115	360	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
30	28.67	42.4	40	-11.33	17.8	0.74	32.27	156	324	Peak
77.52	24.98	47.76	40	-15.02	8.33	1.11	32.22	177	245	Peak
111.81	21.35	43.05	43.5	-22.15	9.27	1.28	32.25	147	289	Peak
393.8	17.6	29.82	46	-28.4	17.65	2.34	32.21	126	148	Peak
669.6	23.78	29.68	46	-22.22	23.18	3.05	32.13	107	258	Peak
941.2	28.82	30.18	46	-17.18	26.2	3.62	31.18	184	317	Peak

Remarks:

- 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. 16, 2015	Nov. 15, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2015	Feb. 25, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2015	Jul. 23, 2016
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

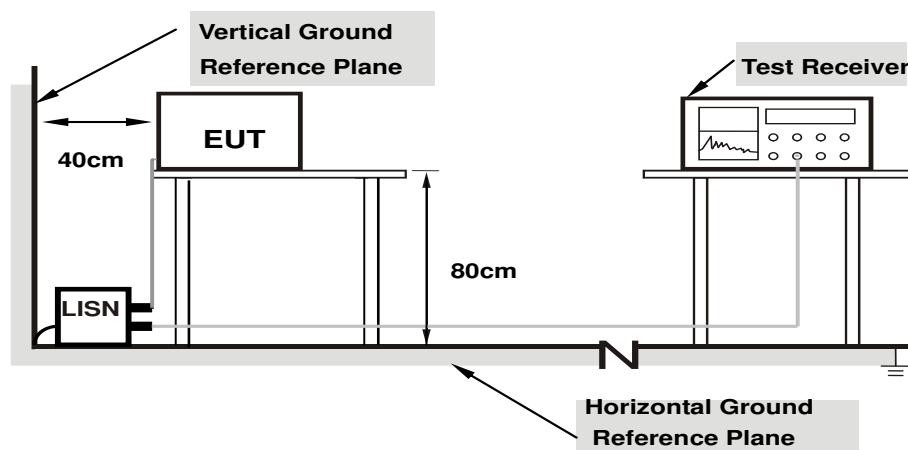
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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 cm 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.

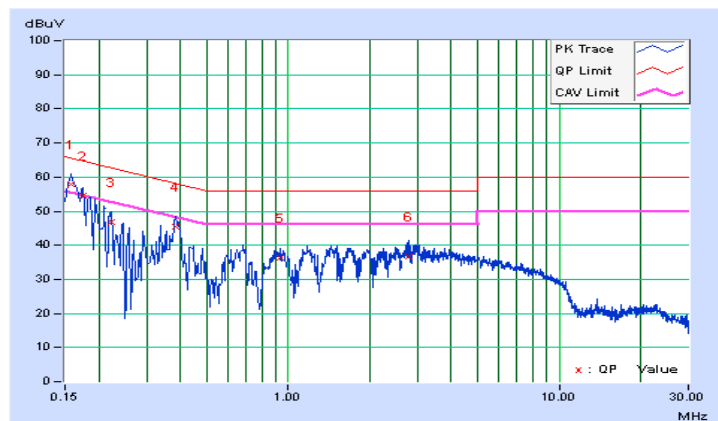
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/1/7

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	0.15800	9.93	47.99	35.64	57.92	45.57	65.57	55.57	-7.65	-10.00
2	0.17384	9.94	44.72	31.40	54.66	41.34	64.77	54.77	-10.12	-13.44
3	0.22200	9.96	36.98	24.83	46.94	34.79	62.74	52.74	-15.80	-17.95
4	0.38600	10.02	35.40	26.92	45.42	36.94	58.15	48.15	-12.72	-11.20
5	0.93400	10.10	26.16	20.36	36.26	30.46	56.00	46.00	-19.74	-15.54
6	2.79000	10.24	26.47	21.40	36.71	31.64	56.00	46.00	-19.29	-14.36

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

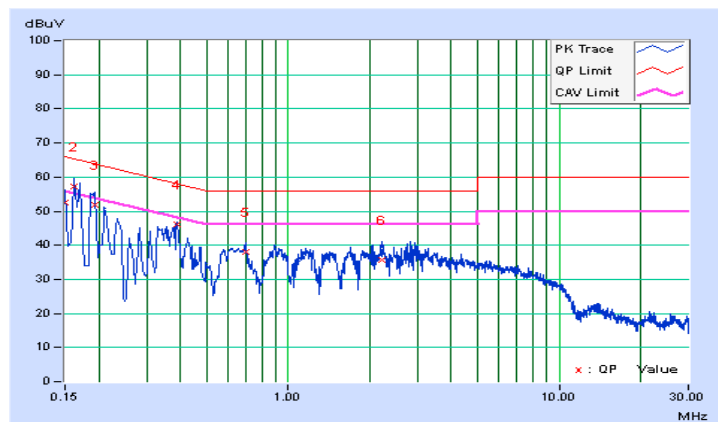


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/1/7

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	9.92	42.58	29.90	52.50	39.82	66.00	56.00	-13.50	-16.18
2	0.16190	9.93	47.36	33.68	57.29	43.61	65.37	55.37	-8.08	-11.76
3	0.19316	9.94	41.96	24.32	51.90	34.26	63.90	53.90	-12.00	-19.64
4	0.38827	10.02	36.09	31.49	46.11	41.51	58.10	48.10	-11.99	-6.59
5	0.69400	10.07	27.93	22.15	38.00	32.22	56.00	46.00	-18.00	-13.78
6	2.23000	10.19	25.63	20.80	35.82	30.99	56.00	46.00	-20.18	-15.01

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 Measurement

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 \leq 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

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

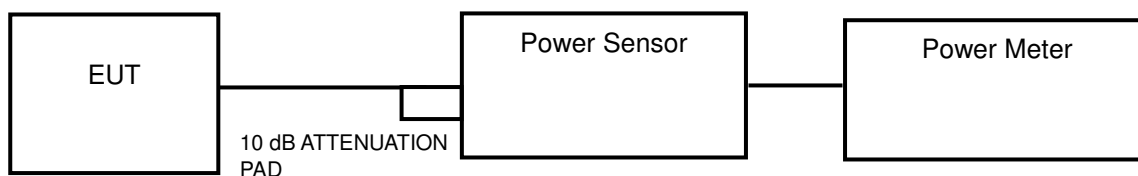
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20 MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

<Power Output Measurement>



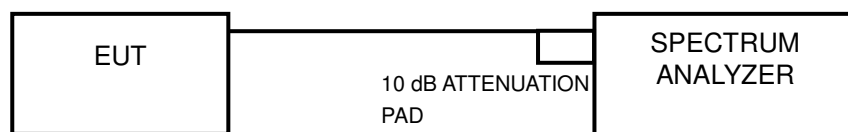
(802.11abgn 用上圖)

or



(802.11ac 用上圖)

<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), 802.11n (HT40)>

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.

<802.11ac (VHT80)>

Method SA-1 is used to perform output power measurement, trigger and gating function of spectrum analyzer 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 from Test 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	31.48	14.98	24	Pass
44	5220	32.81	15.16	24	Pass
48	5240	31.12	14.93	24	Pass
52	5260	33.19	15.21	24	Pass
60	5300	31.26	14.95	24	Pass
64	5320	30.48	14.84	24	Pass
100	5500	30.48	14.84	24	Pass
116	5580	30.97	14.91	24	Pass
140	5700	30.13	14.79	24	Pass
149	5745	32.81	15.16	30	Pass
157	5785	32.58	15.13	30	Pass
165	5825	31.12	14.93	30	Pass

NOTE:

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

1. $11 \text{ dBm} + 10\log(23.66) = 24.74 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(23.53) = 24.72 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(23.68) = 24.74 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(23.87) = 24.78 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(23.47) = 24.71 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(23.49) = 24.71 \text{ dBm} > 24 \text{ dBm}$.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	30.62	14.86	24	Pass
44	5220	32.28	15.09	24	Pass
48	5240	31.19	14.94	24	Pass
52	5260	31.12	14.93	24	Pass
60	5300	29.85	14.75	24	Pass
64	5320	29.72	14.73	24	Pass
100	5500	33.04	15.19	24	Pass
116	5580	32.73	15.15	24	Pass
140	5700	31.41	14.97	24	Pass
149	5745	32.66	15.14	30	Pass
157	5785	31.92	15.04	30	Pass
165	5825	31.26	14.95	30	Pass

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

- $11 \text{ dBm} + 10\log(23.62) = 24.73 \text{ dBm} > 24 \text{ dBm}$.
- $11 \text{ dBm} + 10\log(23.94) = 24.79 \text{ dBm} > 24 \text{ dBm}$.
- $11 \text{ dBm} + 10\log(24.68) = 24.92 \text{ dBm} > 24 \text{ dBm}$.
- $11 \text{ dBm} + 10\log(23.83) = 24.77 \text{ dBm} > 24 \text{ dBm}$.
- $11 \text{ dBm} + 10\log(24.69) = 24.93 \text{ dBm} > 24 \text{ dBm}$.
- $11 \text{ dBm} + 10\log(23.88) = 24.78 \text{ dBm} > 24 \text{ dBm}$.

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
38	5190	26.00	14.15	24	Pass
46	5230	32.73	15.15	24	Pass
54	5270	32.51	15.12	24	Pass
62	5310	31.48	14.98	24	Pass
102	5510	30.34	14.82	24	Pass
110	5550	30.83	14.89	24	Pass
134	5670	30.55	14.85	24	Pass
151	5755	31.70	15.01	30	Pass
159	5795	32.06	15.06	30	Pass

NOTE:

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

1. $11 \text{ dBm} + 10\log(45.77) = 27.61 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(45.29) = 27.56 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(45.43) = 27.57 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(45.03) = 27.54 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(45.53) = 27.58 \text{ dBm} > 24 \text{ dBm}$.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
42	5210	16.83	12.26	24	Pass
58	5290	32.21	15.08	24	Pass
106	5530	30.97	14.91	24	Pass
122	5610	31.33	14.96	24	Pass
155	5775	31.41	14.97	30	Pass

NOTE:

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

1. $11 \text{ dBm} + 10\log(86.05) = 30.35 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(85.43) = 30.32 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(81.43) = 30.11 \text{ dBm} > 24 \text{ dBm}$.

26 dB Bandwidth:
802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	Pass / Fail
36	5180	24.21	Pass
44	5220	23.47	Pass
48	5240	23.73	Pass
52	5260	23.66	Pass
60	5300	23.53	Pass
64	5320	23.68	Pass
100	5500	23.87	Pass
116	5580	23.47	Pass
140	5700	23.49	Pass

802.11n (HT20)

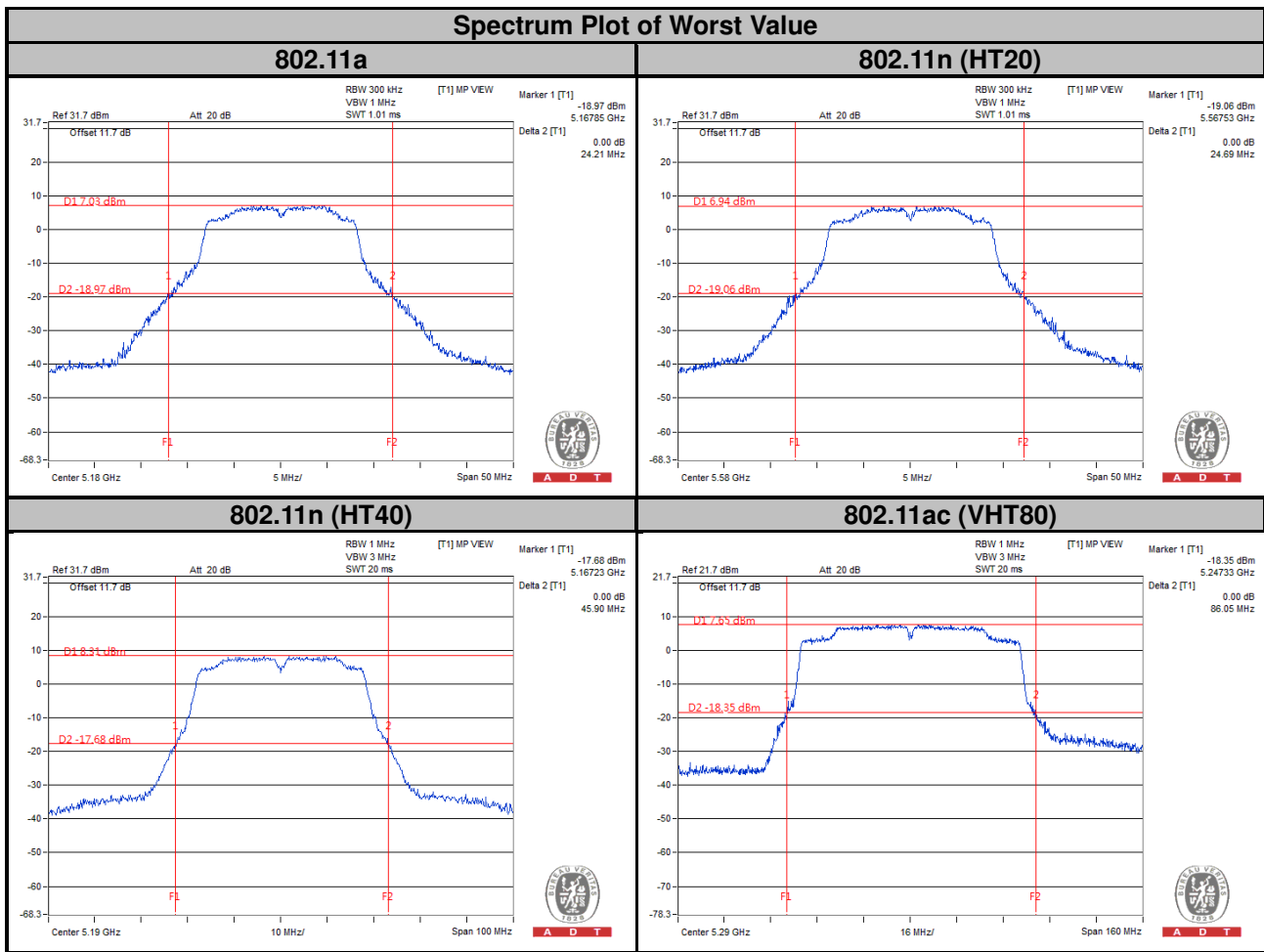
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	Pass / Fail
36	5180	23.66	Pass
44	5220	24.46	Pass
48	5240	24.27	Pass
52	5260	23.62	Pass
60	5300	23.94	Pass
64	5320	24.68	Pass
100	5500	23.83	Pass
116	5580	24.69	Pass
140	5700	23.88	Pass

802.11n (HT40)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	Pass / Fail
38	5190	45.90	Pass
46	5230	45.43	Pass
54	5270	45.77	Pass
62	5310	45.29	Pass
102	5510	45.43	Pass
110	5550	45.03	Pass
134	5670	45.53	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	Pass / Fail
42	5210	84.62	Pass
58	5290	86.05	Pass
106	5530	85.43	Pass
122	5610	81.43	Pass

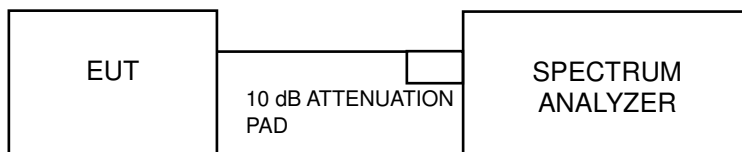


4.4 Peak Power Spectral Density Measurement

4.4.1 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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.4.4 Test Procedures

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

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW \geq 3 MHz, 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

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW \geq 3 MHz, 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 $10 \log(1/\text{duty cycle})$

※For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW \geq 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300 \text{ kHz})$
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

※For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW \geq 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300 \text{ kHz})$
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add $10 \log (1/\text{duty cycle})$

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

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

4.4.7 Test Results

For U-NII-1, U-NII-2A, U-NII-2C Band
802.11a

Channel	Frequency (MHz)	PSD (dBm)	Maximum Limit (dBm)	Pass / Fail
36	5180	4.03	11	Pass
44	5220	4.12	11	Pass
48	5240	3.99	11	Pass
52	5260	3.93	11	Pass
60	5300	3.57	11	Pass
64	5320	3.53	11	Pass
100	5500	3.64	11	Pass
116	5580	3.75	11	Pass
140	5700	3.79	11	Pass

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm)	Maximum Limit (dBm)	Pass / Fail
36	5180	3.77	11	Pass
44	5220	3.78	11	Pass
48	5240	3.72	11	Pass
52	5260	3.63	11	Pass
60	5300	3.32	11	Pass
64	5320	3.21	11	Pass
100	5500	3.81	11	Pass
116	5580	3.92	11	Pass
140	5700	3.92	11	Pass

802.11n (HT40)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Maximum Limit (dBm)	Pass / Fail
38	5190	-0.92	0.30	-0.62	11	Pass
46	5230	0.47	0.30	0.77	11	Pass
54	5270	0.27	0.30	0.57	11	Pass
62	5310	0.02	0.30	0.32	11	Pass
102	5510	-0.02	0.30	0.28	11	Pass
110	5550	0.18	0.30	0.48	11	Pass
134	5670	0.12	0.30	0.42	11	Pass

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

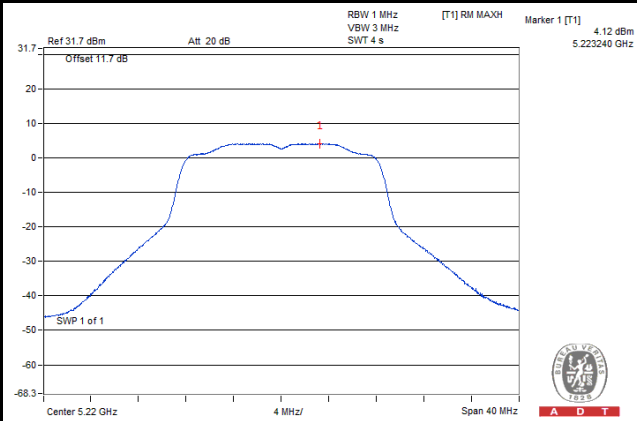
802.11ac (VHT80)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Maximum Limit (dBm)	Pass / Fail
42	5210	-5.81	0.65	-5.16	11	Pass
58	5290	-1.83	0.65	-1.18	11	Pass
106	5530	-2.09	0.65	-1.44	11	Pass
122	5610	-2.50	0.65	-1.85	11	Pass

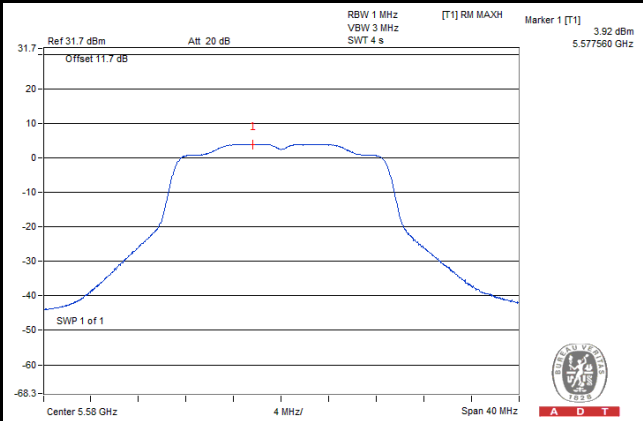
NOTE: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

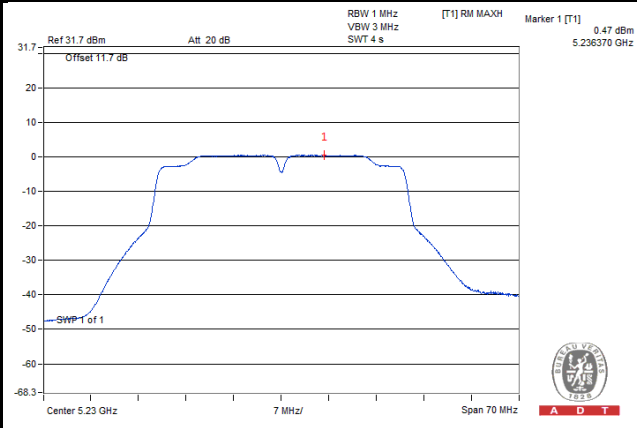
802.11a



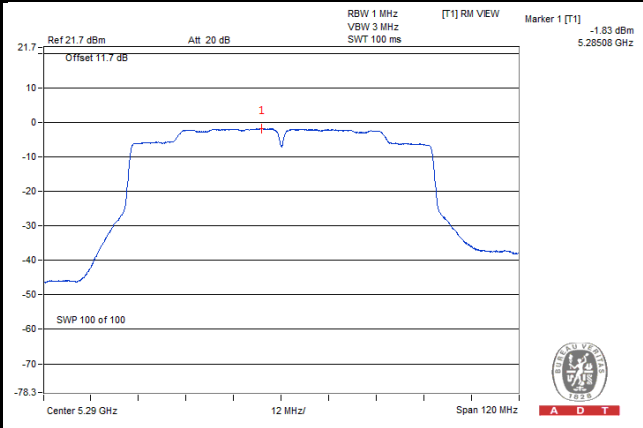
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



For U-NII-3 Band

802.11a

Channel	Freq. (MHz)	PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
149	5745	0.59	30	Pass
157	5785	0.78	30	Pass
165	5825	1.13	30	Pass

802.11n (HT20)

Channel	Freq. (MHz)	PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
149	5745	0.30	30	Pass
157	5785	0.47	30	Pass
165	5825	0.91	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Limit (dBm/500 kHz)	Pass / Fail
151	5755	-3.00	0.30	-2.70	30	Pass
159	5795	-2.50	0.30	-2.20	30	Pass

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

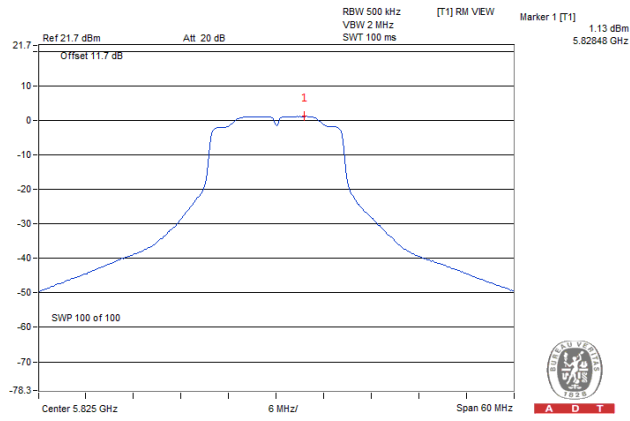
802.11ac (VHT80)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Limit (dBm/500 kHz)	Pass / Fail
155	5775	-5.46	0.65	-4.81	30	Pass

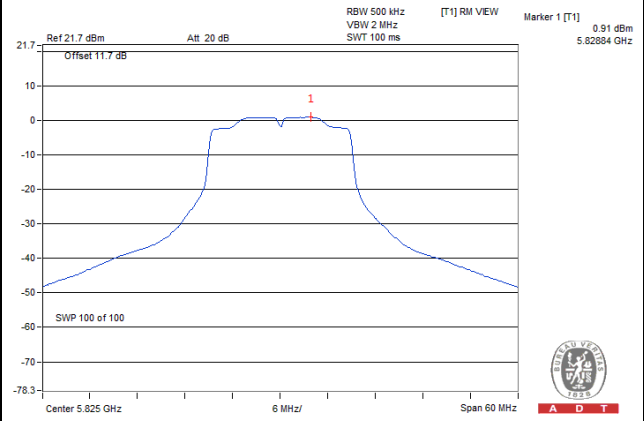
NOTE: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

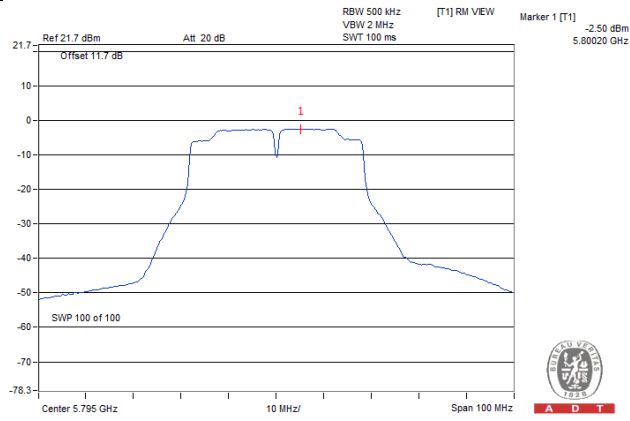
802.11a



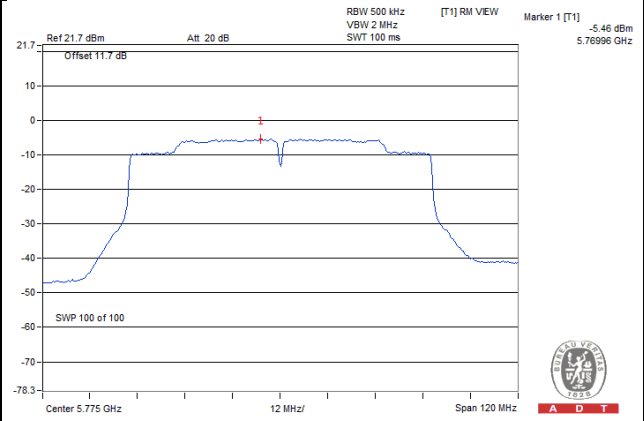
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

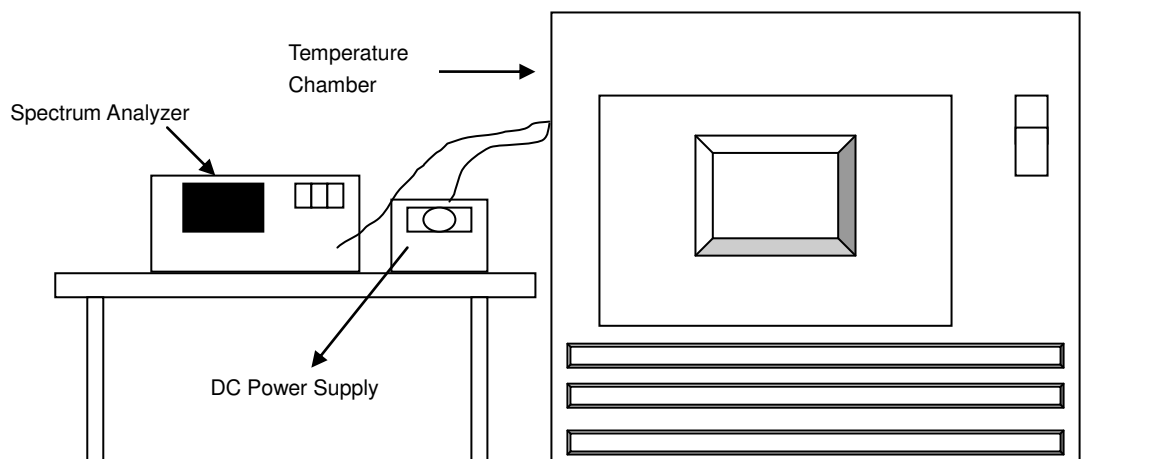


4.5 Frequency Stability

4.5.1 Limit of Frequency Stability Measurement

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

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 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5320 MHz									
Temp. (°C)	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)
55	3.8	5320.013366	2.512	5320.013673	2.570	5320.013551	2.547	5320.013803	2.595
50	3.8	5320.014334	2.694	5320.014154	2.661	5320.014044	2.640	5320.014361	2.699
40	3.8	5320.013846	2.603	5320.014416	2.710	5320.013798	2.594	5320.014627	2.749
30	3.8	5320.015848	2.979	5320.015574	2.927	5320.015242	2.865	5320.015614	2.935
20	3.8	5320.016552	3.111	5320.016351	3.073	5320.016125	3.031	5320.016752	3.149
10	3.8	5320.017824	3.350	5320.017778	3.342	5320.017653	3.318	5320.017711	3.329
0	3.8	5320.016499	3.101	5320.016393	3.081	5320.016509	3.103	5320.016396	3.082
-10	3.8	5320.014880	2.797	5320.015295	2.875	5320.014870	2.795	5320.015163	2.850
-20	3.8	5320.013968	2.626	5320.014351	2.698	5320.014809	2.784	5320.014526	2.730
-30	3.8	5320.013333	2.506	5320.013238	2.488	5320.013148	2.471	5320.013164	2.474

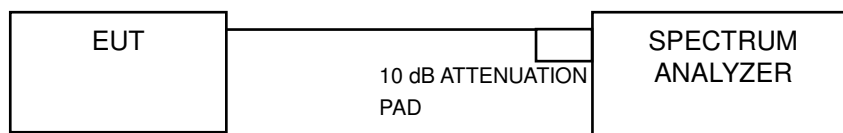
Frequency Stability Versus Temp.									
Operating Frequency: 5320 MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	3.5	5320.028773	5.408	5320.028573	5.371	5320.029012	5.453	5320.028585	5.373
	3.8	5320.016552	3.111	5320.016351	3.073	5320.016125	3.031	5320.016752	3.149
	4.2	5320.030726	5.776	5320.030244	5.685	5320.030574	5.747	5320.030372	5.709

4.6 6 dB Bandwidth Measurement

4.6.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

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

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	15.37	0.5	Pass
157	5785	15.47	0.5	Pass
165	5825	15.36	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	15.18	0.5	Pass
157	5785	15.18	0.5	Pass
165	5825	15.48	0.5	Pass

802.11n (HT40)

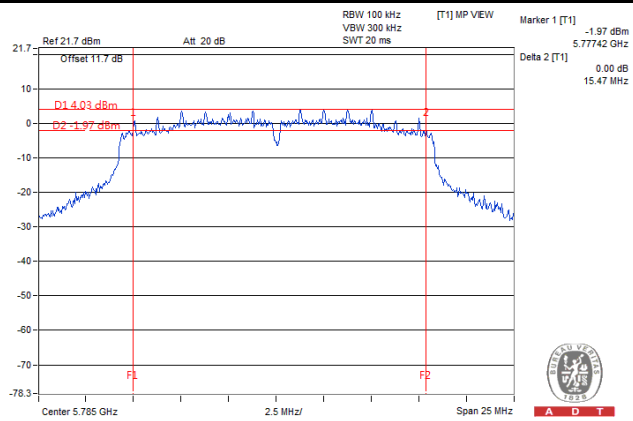
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
151	5755	35.18	0.5	Pass
159	5795	35.20	0.5	Pass

802.11ac (VHT80)

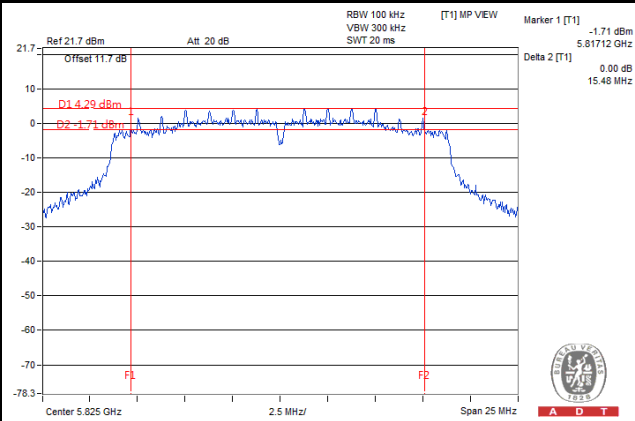
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
155	5775	75.24	0.5	Pass

Spectrum Plot of Worst Value

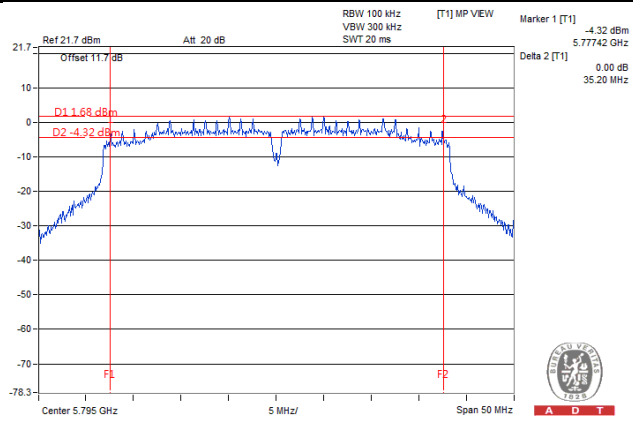
802.11a



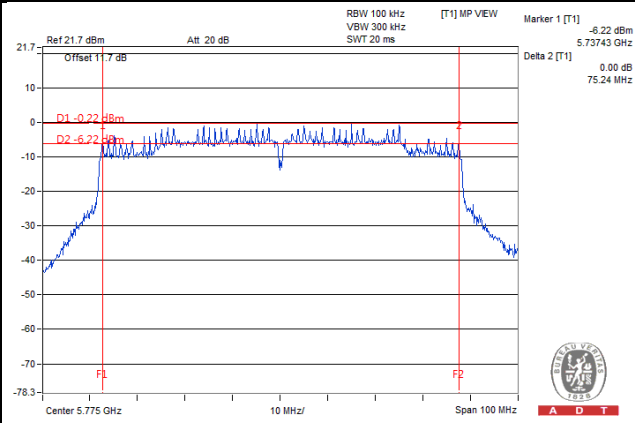
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)





5 Pictures of Test Arrangements

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



A D T

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 accredited and approved 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.

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