

Variant FCC Test Report

Report No.: RF131014C20D

FCC ID: MSQ-M80T

Test Model: M80T (Refer to item 3.1 for more details)

Received Date: Oct. 24, 2013

Test Date: Oct. 24, 2013 ~ May 18, 2016

Issued Date: May 25, 2016

Applicant: ASUSTeK COMPUTER INC.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Release Control Record

Issue No.	Description	Date Issued
RF131014C20D	Original Release	May 25, 2016

1 Certificate of Conformity

Product: ASUS Tablet

Brand: ASUS

Test Model: M80T (Refer to item 3.1 for more details)

Sample Status: Production Unit

Applicant: ASUSTeK COMPUTER INC.

Test Date: Oct. 24, 2013 ~ May 18, 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:** May 25, 2016
Evonne Liu / Specialist

Approved by : Stanley Wu, **Date:** May 25, 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 -18.32 dB at 0.45118 MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -2.46 dB at 5146 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) ($\pm$)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	ASUS Tablet
Brand	ASUS
Test Model	M80T (Refer to NOTE)
Status of EUT	Production Unit
Power Supply Rating	3.85Vdc (Battery) 5Vdc (Adapter or host equipment)
Modulation Type	64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps 802.11n: up to MCS7
Operating Frequency	5180 ~ 5240 MHz, 5745 ~ 5825 MHz
Number of Channel	5180 ~ 5240 MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40)
Output Power	22.34 mW for 5180 ~ 5240 MHz 20.18 mW for 5745 ~ 5825 MHz
Antenna Type	PIFA antenna with -0.97 dBi gain (5180 ~ 5240 MHz) PIFA antenna with -0.30 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. This report is issued as a supplementary report to BV ADT report no. 131014C20-2. The difference compared with original report is update B1, B4 & C2PC; therefore the EUT is re-tested in this report.
2. The detail information of model names and the differences are as below.

System	MODEL NAME	Remark
Windows only	M80T / L80T / R80T	All the models are identically, the difference model severed as marketing strategy.
Android Only	M81T / L81T / R81T	
Dual OS	M82T / L82T / R82T	

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

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

4. The EUT contains following accessory devices.

Product	Brand	Model	Description
AC Adapter 1	ASUS	W12-010N3A	I/P: 100-240Vac, 50-60Hz, 0.3A O/P: 5Vdc, 2A
AC Adapter 2	ASUS	AD897320	I/P: 100-240Vac, 50-60Hz, 0.3A O/P: 5Vdc, 2A
Li-ion Battery	ASUS	C11P1304	Rating: 3.85Vdc, 15.5Wh, 3910mAh
USB cable 1	ASUS	AA781000	0.9m cable
USB cable 2	ASUS	L65U2009-CS-B	0.9m cable
Micro SD card	Sandisk	SDSDQAB-008G-859	--
CPU	Intel	UTFCBGA1380	--
LCD Panel	INNOLUX	N080ICE-GB1(C2)	--
Video Camera 1 (Front)	LITEON	12P2SF181C	--
Video Camera 2 (Rear)	LITEON	12P2BA536	--
WLAN/BT Module	Broadcom	BCM43241S	--
eMMC 1 (SKU 1)	Sandisk	SDIN8DE4-32G-1002K	--
eMMC 2 (SKU 2)	Sandisk	SDIN8DE4-64G-1002K	--
eMMC 3 (SKU 3)	HYNIX	H26M64003DQR(32G)	--
eMMC 4 (SKU 4)	HYNIX	H26M78003BFR (64G)	--

5. 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

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

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 **Z-plane** for 5180 ~ 5240MHz and **Y-plane** for 5745 ~ 5825MHz.

2. "-" means no effect.

Radiated Emission Test (Above 1 GHz):

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

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

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
-		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	MCS0
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
-		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	MCS0

Radiated Emission Test (Below 1 GHz):

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

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

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5745-5825	802.11n (HT40)	151 to 159	151	OFDM	BPSK	MCS0

Power Line Conducted Emission Test:

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

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

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5745-5825	802.11n (HT40)	151 to 159	151	OFDM	BPSK	MCS0

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
-		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	MCS0
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
-		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	MCS0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Anson Lin, Toby Tian
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian
APCM	25 deg. C, 65 % RH	120 Vac, 60 Hz	Taylor Liu

3.3 Duty Cycle of Test Signal

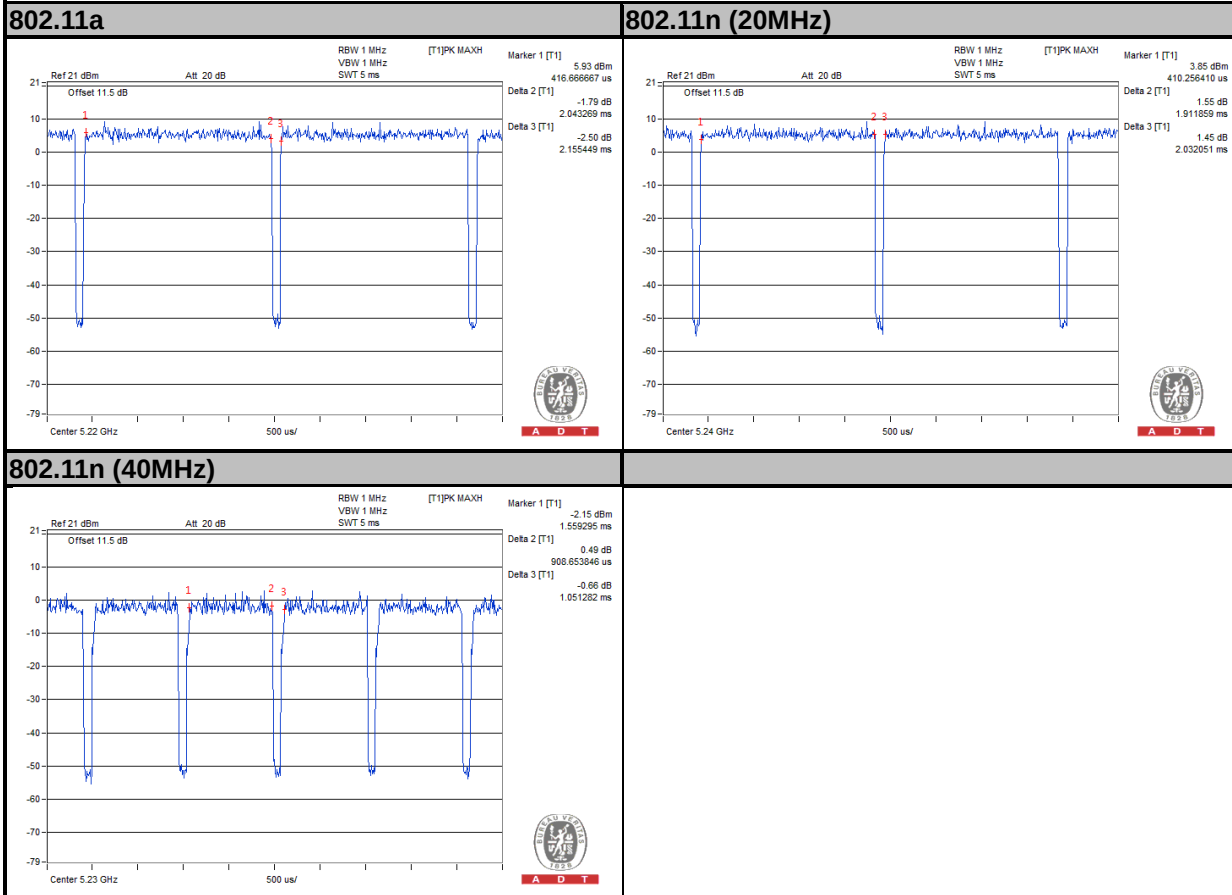
MODULATION TYPE: BPSK

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

802.11a: Duty cycle = $2.043/2.155 = 0.948$, Duty factor = $10 * \log(1/0.948) = 0.23$

802.11n (20MHz): Duty cycle = $1.911/2.032 = 0.940$, Duty factor = $10 * \log(1/0.940) = 0.26$

802.11n (40MHz): Duty cycle = $0.908/1.051 = 0.864$, Duty factor = $10 * \log(1/0.864) = 0.63$



MODULATION TYPE: QPSK

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

802.11a: Duty cycle = $1.025/1.145 = 0.895$, Duty factor = $10 * \log(1/0.895) = 0.48$

802.11n (20MHz): Duty cycle = $0.966/1.078 = 0.896$, Duty factor = $10 * \log(1/0.896) = 0.48$

802.11n (40MHz): Duty cycle = $459/591 = 0.777$, Duty factor = $10 * \log(1/0.777) = 1.09$



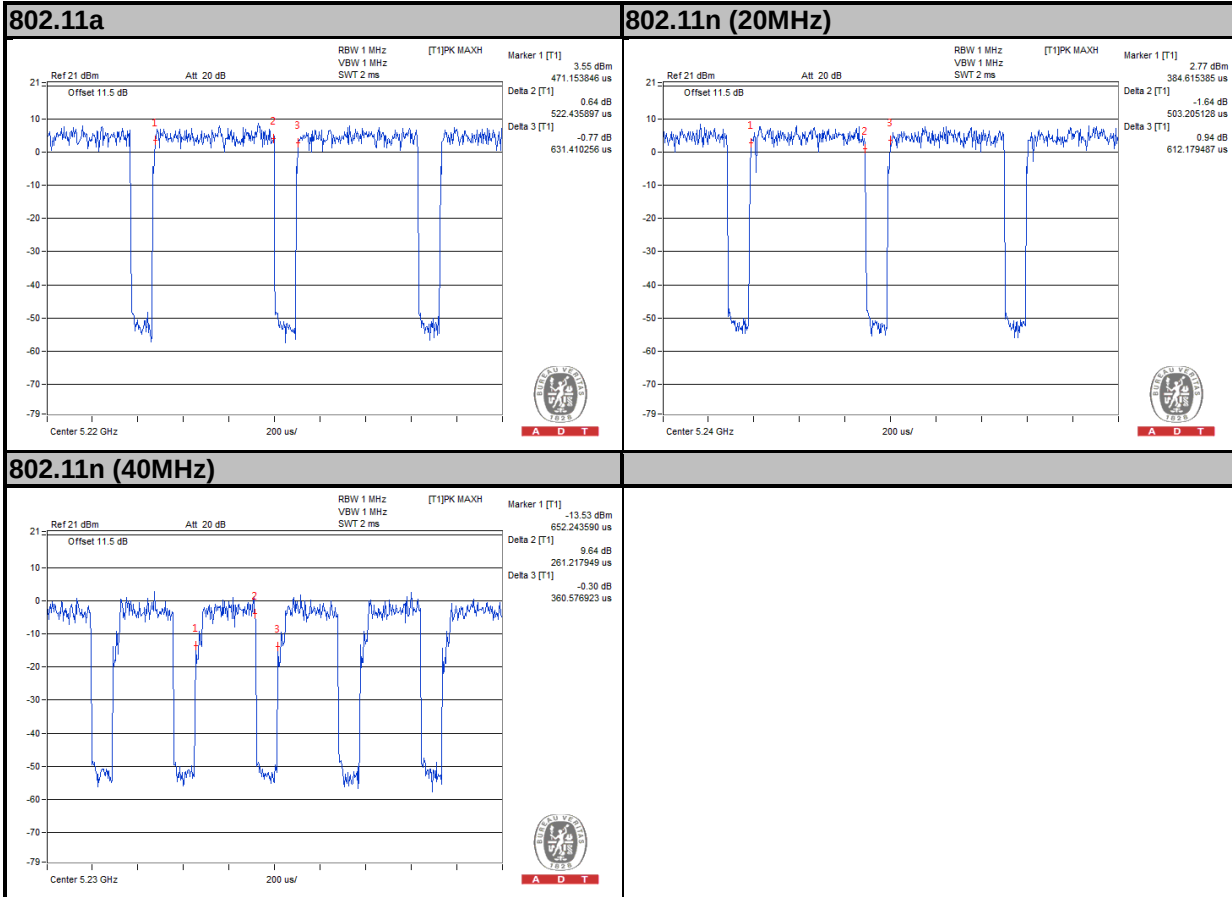
MODULATION TYPE: 16QAM

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

802.11a: Duty cycle = $522/631 = 0.827$, Duty factor = $10 * \log(1/0.827) = 0.82$

802.11n (20MHz): Duty cycle = $503/612 = 0.822$, Duty factor = $10 * \log(1/0.822) = 0.85$

802.11n (40MHz): Duty cycle = $261/360 = 0.724$, Duty factor = $10 * \log(1/0.724) = 1.40$



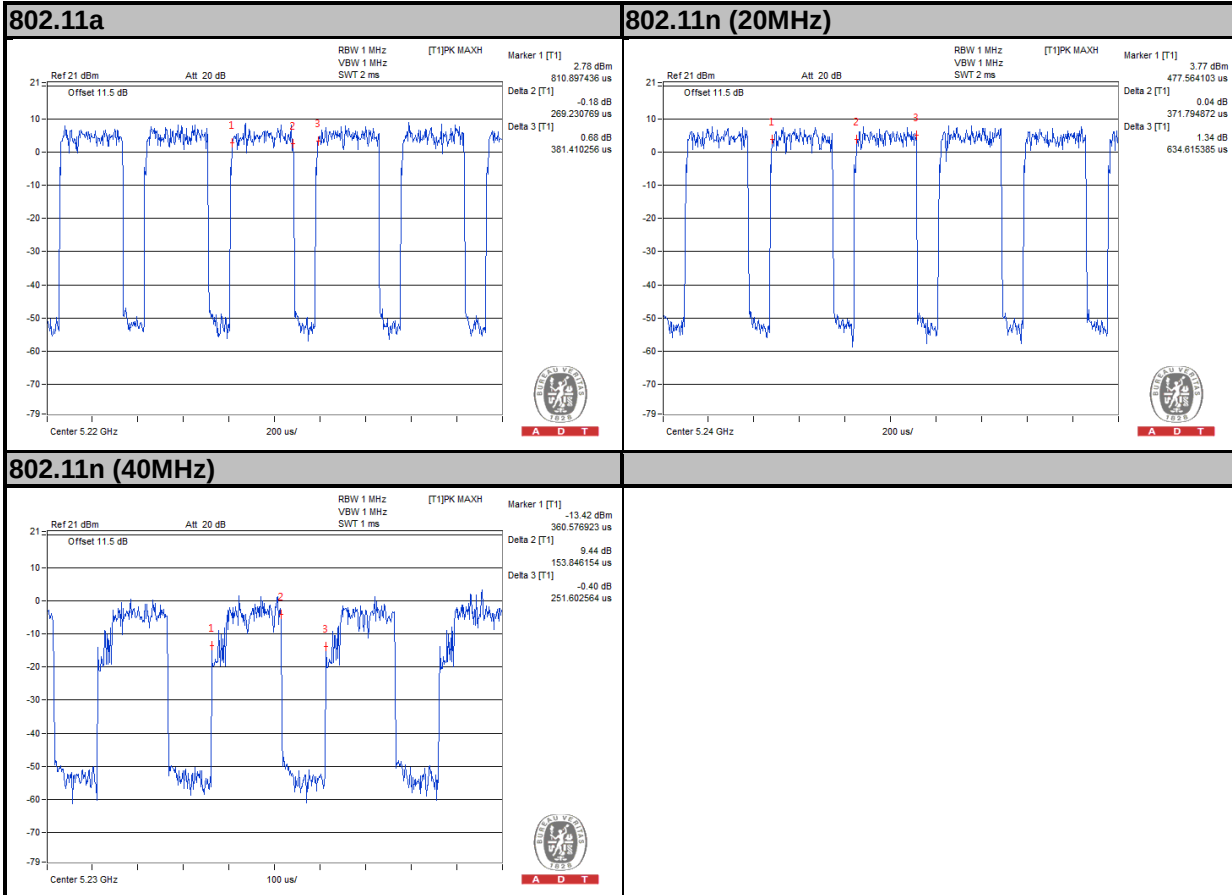
MODULATION TYPE: 64QAM

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

802.11a: Duty cycle = $269/381 = 0.705$, Duty factor = $10 * \log(1/0.705) = 1.51$

802.11n (20MHz): Duty cycle = $371/634 = 0.585$, Duty factor = $10 * \log(1/0.585) = 2.32$

802.11n (40MHz): Duty cycle = $153/251 = 0.611$, Duty factor = $10 * \log(1/0.611) = 2.14$



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.

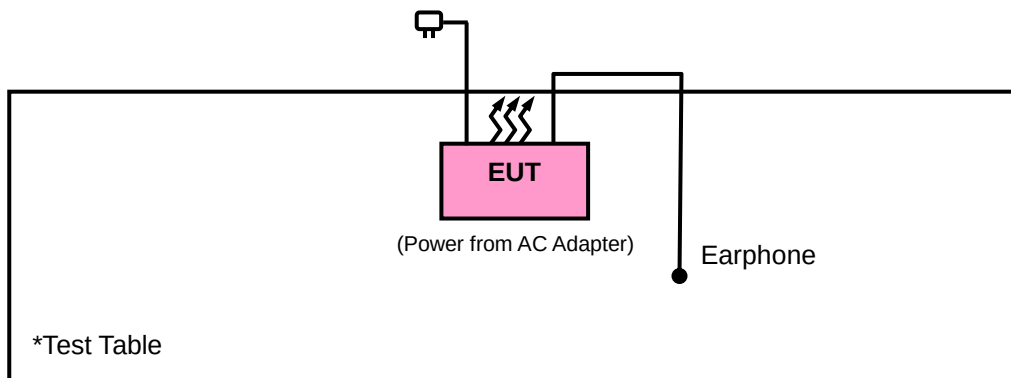
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Earphone	N/A	N/A	N/A	N/A

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 v01r02

ANSI C63.10-2013

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

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 v01r02	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:

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

4.1.3 Test Instruments

For 5180-5240MHz

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100744	Apr. 15, 2013	Apr. 14, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2012	Dec. 16, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 07, 2013	Jan. 06, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 25, 2012	Dec. 24, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 184045	980116	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2012	Dec. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2013	Oct. 17, 2014
RF signal cable Worken	RG-213	NA	Dec. 29, 2012	Dec. 28, 2013
Software	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Power Meter	ML2495A	1012010	Jul. 31, 2013	Jul. 30, 2014
Power Sensor	MA2411B	1315050	Jul. 31, 2013	Jul. 30, 2014

- 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in HwaYa Chamber 10.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 690701.
6. The IC Site Registration No. is IC 7450F-10.

For 5745-5825MHz

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Jan. 21, 2016	Jan. 20, 2017
Spectrum Analyzer Agilent	N9010A	MY52220314	Sep. 03, 2015	Sep. 02, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 04, 2016	Jan. 03, 2017
Double Ridge Guide Horn Antenna EMCO	3115	5619	Jan. 04, 2016	Jan. 03, 2017
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Jan. 08, 2016	Jan. 07, 2017
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
Bluetooth Tester	CBT	100980	Apr. 27, 2015	Apr. 26, 2017
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Preamplifier EMCI	EMC 012645	980115	Dec. 21, 2015	Dec. 20, 2016
Preamplifier EMCI	EMC 184045	980116	Dec. 21, 2015	Dec. 20, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2015	Dec. 27, 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 HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 12, 2015	Oct. 11, 2016
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 12, 2015	Oct. 11, 2016
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 12, 2015	Oct. 11, 2016
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

- Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 10.
 3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
 4. The FCC Site Registration No. is 690701.
 5. The IC Site Registration No. is IC7450F-10.

4.1.4 Test Procedures

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

Note:

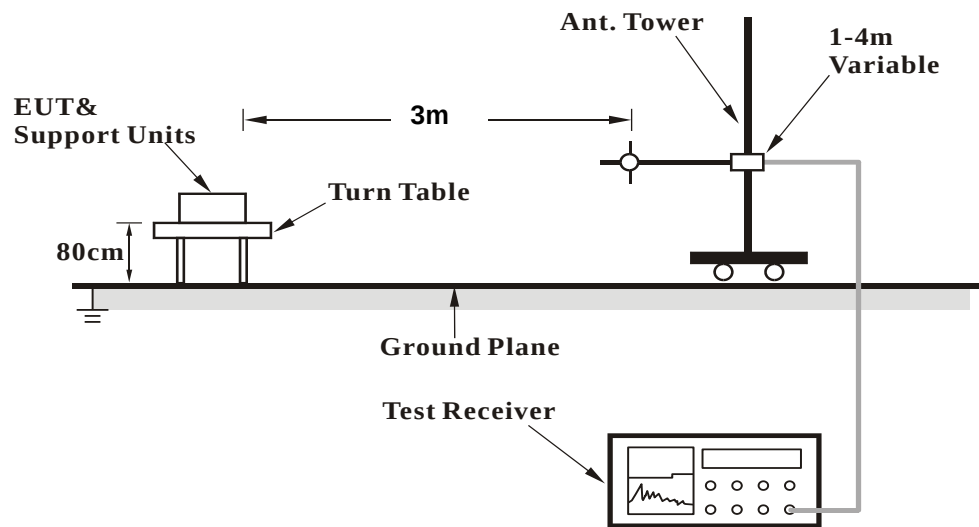
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
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

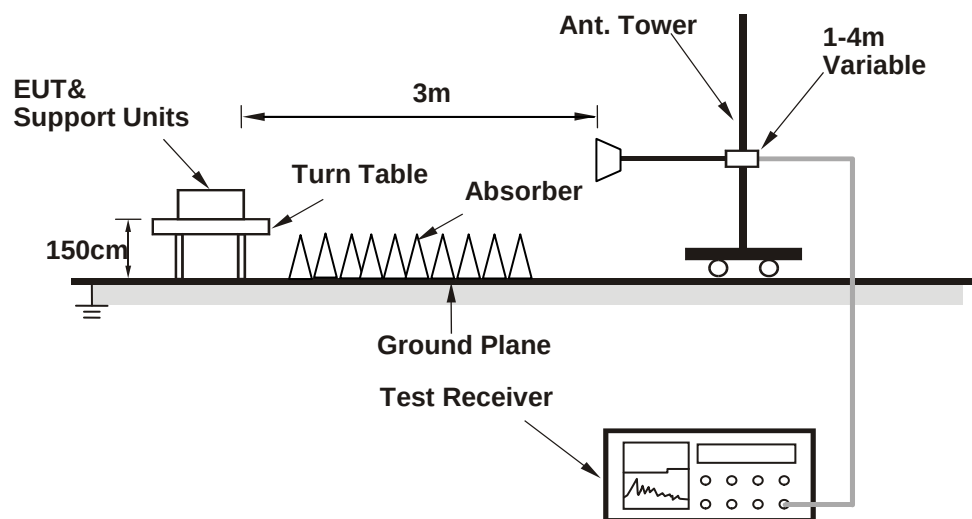
No deviation.

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	Anson Lin

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	48.48	49.17	54	-5.52	31.32	5.29	37.3	100	55	Average
5142	63.85	64.54	74	-10.15	31.32	5.29	37.3	100	55	Peak
5180	97.82	98.5			31.35	5.31	37.34	100	55	Average
5180	106.54	107.22			31.35	5.31	37.34	100	55	Peak
5456	38.78	38.86	54	-15.22	31.56	5.44	37.08	100	55	Average
5456	56.71	56.79	74	-17.29	31.56	5.44	37.08	100	55	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	45.03	45.74	54	-8.97	31.32	5.29	37.32	123	332	Average
5150	60.52	61.23	74	-13.48	31.32	5.29	37.32	123	332	Peak
5180	95.53	96.21			31.35	5.31	37.34	123	332	Average
5180	104.45	105.13			31.35	5.31	37.34	123	332	Peak
5428	38.09	38.27	54	-15.91	31.53	5.42	37.13	123	332	Average
5428	55.93	56.11	74	-18.07	31.53	5.42	37.13	123	332	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	Anson Lin

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
5024	43.1	43.87	54	-10.9	31.23	5.24	37.24	125	56	Average
5024	57.32	58.09	74	-16.68	31.23	5.24	37.24	125	56	Peak
5220	96.96	97.62			31.37	5.33	37.36	125	56	Average
5220	105.57	106.23			31.37	5.33	37.36	125	56	Peak
5444	39.1	39.24	54	-14.9	31.55	5.44	37.13	125	56	Average
5444	55.9	56.04	74	-18.1	31.55	5.44	37.13	125	56	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
5148	39.87	40.58	54	-14.13	31.32	5.29	37.32	112	337	Average
5148	56.38	57.09	74	-17.62	31.32	5.29	37.32	112	337	Peak
5220	95.99	96.65			31.37	5.33	37.36	112	337	Average
5220	104.59	105.25			31.37	5.33	37.36	112	337	Peak
5372	38.95	39.24	54	-15.05	31.49	5.4	37.18	112	337	Average
5372	56.04	56.33	74	-17.96	31.49	5.4	37.18	112	337	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	Anson Lin

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
5020	43.11	43.9	54	-10.89	31.21	5.24	37.24	100	55	Average
5020	57.03	57.82	74	-16.97	31.21	5.24	37.24	100	55	Peak
5240	97.37	97.96			31.39	5.34	37.32	100	55	Average
5240	105.66	106.25			31.39	5.34	37.32	100	55	Peak
5438	38.59	38.73	54	-15.41	31.55	5.44	37.13	100	55	Average
5438	55.63	55.77	74	-18.37	31.55	5.44	37.13	100	55	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
5104	38.53	39.26	54	-15.47	31.28	5.27	37.28	100	336	Average
5104	56.01	56.74	74	-17.99	31.28	5.27	37.28	100	336	Peak
5240	95.84	96.43			31.39	5.34	37.32	100	336	Average
5240	104.51	105.1			31.39	5.34	37.32	100	336	Peak
5436	39.3	39.46	54	-14.7	31.55	5.42	37.13	100	336	Average
5436	55.68	55.84	74	-18.32	31.55	5.42	37.13	100	336	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 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	Toby Tian

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	59.87	58.68	68.2	-8.33	31.93	6.69	37.43	213	6	Peak
*5725	60.72	59.44	78.2	-17.48	31.96	6.75	37.43	213	6	Peak
5745	89.55	88.28			31.99	6.75	37.47	213	6	Average
5745	98.93	97.66			31.99	6.75	37.47	213	6	Peak
*5850	60.88	59.36	78.2	-17.32	32.15	6.88	37.51	213	6	Peak
*5861	60.36	58.73	68.2	-7.84	32.18	6.95	37.5	213	6	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	60.54	59.35	68.2	-7.66	31.93	6.69	37.43	198	280	Peak
*5725	62.25	60.97	78.2	-15.95	31.96	6.75	37.43	198	280	Peak
5745	96.06	94.79			31.99	6.75	37.47	198	280	Average
5745	105.72	104.45			31.99	6.75	37.47	198	280	Peak
*5850	58.72	57.2	78.2	-19.48	32.15	6.88	37.51	198	280	Peak
*5861	59.46	57.83	68.2	-8.74	32.18	6.95	37.5	198	280	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	Toby Tian

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	60.18	58.99	68.2	-8.02	31.93	6.69	37.43	211	8	Peak
*5725	60.56	59.28	78.2	-17.64	31.96	6.75	37.43	211	8	Peak
5785	89.55	88.23			32.04	6.82	37.54	211	8	Average
5785	98.9	97.58			32.04	6.82	37.54	211	8	Peak
*5850	59.19	57.67	78.2	-19.01	32.15	6.88	37.51	211	8	Peak
*5861	60.33	58.7	68.2	-7.87	32.18	6.95	37.5	211	8	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	59.52	58.33	68.2	-8.68	31.93	6.69	37.43	199	278	Peak
*5725	59.87	58.59	78.2	-18.33	31.96	6.75	37.43	199	278	Peak
5785	96.1	94.78			32.04	6.82	37.54	199	278	Average
5785	105.64	104.32			32.04	6.82	37.54	199	278	Peak
*5850	60.42	58.9	78.2	-17.78	32.15	6.88	37.51	199	278	Peak
*5861	60.86	59.23	68.2	-7.34	32.18	6.95	37.5	199	278	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	Toby Tian

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	60.9	59.71	68.2	-7.3	31.93	6.69	37.43	214	3	Peak
*5725	59.67	58.39	78.2	-18.53	31.96	6.75	37.43	214	3	Peak
5825	89.74	88.27			32.12	6.88	37.53	214	3	Average
5825	98.96	97.49			32.12	6.88	37.53	214	3	Peak
*5850	60.52	59	78.2	-17.68	32.15	6.88	37.51	214	3	Peak
*5861	60.8	59.17	68.2	-7.4	32.18	6.95	37.5	214	3	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	60.46	59.27	68.2	-7.74	31.93	6.69	37.43	197	283	Peak
*5725	61.73	60.45	78.2	-16.47	31.96	6.75	37.43	197	283	Peak
5825	96.4	94.93			32.12	6.88	37.53	197	283	Average
5825	105.7	104.23			32.12	6.88	37.53	197	283	Peak
*5850	60.54	59.02	78.2	-17.66	32.15	6.88	37.51	197	283	Peak
*5861	61.26	59.63	68.2	-6.94	32.18	6.95	37.5	197	283	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	Anson Lin

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	49.39	50.08	54	-4.61	31.32	5.29	37.3	110	131	Average
5142	62.56	63.25	74	-11.44	31.32	5.29	37.3	110	131	Peak
5180	97.66	98.34			31.35	5.31	37.34	110	131	Average
5180	105.81	106.49			31.35	5.31	37.34	110	131	Peak
5428	40.91	41.09	54	-13.09	31.53	5.42	37.13	110	131	Average
5428	56.66	56.84	74	-17.34	31.53	5.42	37.13	110	131	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	45.85	46.56	54	-8.15	31.32	5.29	37.32	112	10	Average
5150	61.29	62	74	-12.71	31.32	5.29	37.32	112	10	Peak
5180	96.82	97.5			31.35	5.31	37.34	112	10	Average
5180	105.9	106.58			31.35	5.31	37.34	112	10	Peak
5432	40.93	41.09	54	-13.07	31.55	5.42	37.13	112	10	Average
5432	56.98	57.14	74	-17.02	31.55	5.42	37.13	112	10	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	Anson Lin

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
5140	42.46	43.15	54	-11.54	31.32	5.29	37.3	108	133	Average
5140	57.35	58.04	74	-16.65	31.32	5.29	37.3	108	133	Peak
5220	98.44	99.1			31.37	5.33	37.36	108	133	Average
5220	107.09	107.75			31.37	5.33	37.36	108	133	Peak
5366	40.06	40.35	54	-13.94	31.49	5.4	37.18	108	133	Average
5366	56.31	56.6	74	-17.69	31.49	5.4	37.18	108	133	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
5050	40.37	41.13	54	-13.63	31.24	5.25	37.25	102	8	Average
5050	56.24	57	74	-17.76	31.24	5.25	37.25	102	8	Peak
5220	97.46	98.12			31.37	5.33	37.36	102	8	Average
5220	106.24	106.9			31.37	5.33	37.36	102	8	Peak
5436	39.72	39.88	54	-14.28	31.55	5.42	37.13	102	8	Average
5436	57.2	57.36	74	-16.8	31.55	5.42	37.13	102	8	Peak

Remarks:

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

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
5024	43.59	44.36	54	-10.41	31.23	5.24	37.24	130	134	Average
5024	57.98	58.75	74	-16.02	31.23	5.24	37.24	130	134	Peak
5240	97.69	98.28			31.39	5.34	37.32	130	134	Average
5240	105.83	106.42			31.39	5.34	37.32	130	134	Peak
5460	39.99	40.07	54	-14.01	31.56	5.44	37.08	130	134	Average
5460	56.23	56.31	74	-17.77	31.56	5.44	37.08	130	134	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
5138	40.26	40.96	54	-13.74	31.31	5.29	37.3	104	9	Average
5138	56.85	57.55	74	-17.15	31.31	5.29	37.3	104	9	Peak
5240	96.09	96.68			31.39	5.34	37.32	104	9	Average
5240	105.09	105.68			31.39	5.34	37.32	104	9	Peak
5428	40.04	40.22	54	-13.96	31.53	5.42	37.13	104	9	Average
5428	56.26	56.44	74	-17.74	31.53	5.42	37.13	104	9	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 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	Toby Tian

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	58.63	57.44	68.2	-9.57	31.93	6.69	37.43	214	7	Peak
*5725	59.45	58.17	78.2	-18.75	31.96	6.75	37.43	214	7	Peak
5745	89.43	88.16			31.99	6.75	37.47	214	7	Average
5745	98.86	97.59			31.99	6.75	37.47	214	7	Peak
*5850	61.16	59.64	78.2	-17.04	32.15	6.88	37.51	214	7	Peak
*5861	59.03	57.4	68.2	-9.17	32.18	6.95	37.5	214	7	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	61.65	60.46	68.2	-6.55	31.93	6.69	37.43	201	293	Peak
*5725	61.17	59.89	78.2	-17.03	31.96	6.75	37.43	201	293	Peak
5745	95.79	94.52			31.99	6.75	37.47	201	293	Average
5745	105.35	104.08			31.99	6.75	37.47	201	293	Peak
*5850	58.93	57.41	78.2	-19.27	32.15	6.88	37.51	201	293	Peak
*5861	60.15	58.52	68.2	-8.05	32.18	6.95	37.5	201	293	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	Toby Tian

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	59.86	58.67	68.2	-8.34	31.93	6.69	37.43	212	10	Peak
*5725	59.38	58.1	78.2	-18.82	31.96	6.75	37.43	212	10	Peak
5785	89.47	88.15			32.04	6.82	37.54	212	10	Average
5785	98.89	97.57			32.04	6.82	37.54	212	10	Peak
*5850	60.23	58.71	78.2	-17.97	32.15	6.88	37.51	212	10	Peak
*5861	60.87	59.24	68.2	-7.33	32.18	6.95	37.5	212	10	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	60.31	59.12	68.2	-7.89	31.93	6.69	37.43	198	269	Peak
*5725	60.5	59.22	78.2	-17.7	31.96	6.75	37.43	198	269	Peak
5785	95.71	94.39			32.04	6.82	37.54	198	269	Average
5785	105.23	103.91			32.04	6.82	37.54	198	269	Peak
*5850	59.73	58.21	78.2	-18.47	32.15	6.88	37.51	198	269	Peak
*5861	60.89	59.26	68.2	-7.31	32.18	6.95	37.5	198	269	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	Toby Tian

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	60.67	59.48	68.2	-7.53	31.93	6.69	37.43	212	18	Peak
*5725	60.42	59.14	78.2	-17.78	31.96	6.75	37.43	212	18	Peak
5825	89.58	88.11			32.12	6.88	37.53	212	18	Average
5825	98.81	97.34			32.12	6.88	37.53	212	18	Peak
*5850	60.64	59.12	78.2	-17.56	32.15	6.88	37.51	212	18	Peak
*5861	59.65	58.02	68.2	-8.55	32.18	6.95	37.5	212	18	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	61.18	59.99	68.2	-7.02	31.93	6.69	37.43	196	289	Peak
*5725	60.65	59.37	78.2	-17.55	31.96	6.75	37.43	196	289	Peak
5825	95.85	94.38			32.12	6.88	37.53	196	289	Average
5825	105.19	103.72			32.12	6.88	37.53	196	289	Peak
*5850	61.55	60.03	78.2	-16.65	32.15	6.88	37.51	196	289	Peak
*5861	61.24	59.61	68.2	-6.96	32.18	6.95	37.5	196	289	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

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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	Anson Lin

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	51.54	52.25	54	-2.46	31.32	5.29	37.32	100	130	Average
5146	66.82	67.53	74	-7.18	31.32	5.29	37.32	100	130	Peak
5190	93.06	93.73			31.35	5.32	37.34	100	130	Average
5190	102.24	102.91			31.35	5.32	37.34	100	130	Peak
5434	39.16	39.32	54	-14.84	31.55	5.42	37.13	100	130	Average
5434	55.7	55.86	74	-18.3	31.55	5.42	37.13	100	130	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	47.66	48.37	54	-6.34	31.32	5.29	37.32	112	10	Average
5146	62.63	63.34	74	-11.37	31.32	5.29	37.32	112	10	Peak
5190	91.71	92.38			31.35	5.32	37.34	112	10	Average
5190	102.03	102.7			31.35	5.32	37.34	112	10	Peak
5460	39.86	39.94	54	-14.14	31.56	5.44	37.08	112	10	Average
5460	56.19	56.27	74	-17.81	31.56	5.44	37.08	112	10	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	Anson Lin

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	44.62	45.33	54	-9.38	31.32	5.29	37.32	120	133	Average
5148	58.25	58.96	74	-15.75	31.32	5.29	37.32	120	133	Peak
5230	94.51	95.11			31.39	5.33	37.32	120	133	Average
5230	104.24	104.84			31.39	5.33	37.32	120	133	Peak
5356	39.4	39.71	54	-14.6	31.48	5.39	37.18	120	133	Average
5356	56.45	56.76	74	-17.55	31.48	5.39	37.18	120	133	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
5142	41.9	42.59	54	-12.1	31.32	5.29	37.3	111	9	Average
5142	56.27	56.96	74	-17.73	31.32	5.29	37.3	111	9	Peak
5230	93.61	94.21			31.39	5.33	37.32	111	9	Average
5230	102.42	103.02			31.39	5.33	37.32	111	9	Peak
5408	40.44	40.69	54	-13.56	31.52	5.41	37.18	111	9	Average
5408	55.76	56.01	74	-18.24	31.52	5.41	37.18	111	9	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	Anson Lin

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
5128	43.01	34.79	54	-10.99	34.11	8.1	33.99	167	86	Average
5128	56.25	48.03	74	-17.75	34.11	8.1	33.99	167	86	Peak
5270	95.94	87.45			34.21	8.29	34.01	167	86	Average
5270	102.52	94.03			34.21	8.29	34.01	167	86	Peak
5366	47.5	38.86	54	-6.5	34.29	8.38	34.03	167	86	Average
5366	59.39	50.75	74	-14.61	34.29	8.38	34.03	167	86	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
5042	42.75	34.69	54	-11.25	34.04	8	33.98	114	318	Average
5042	57.37	49.31	74	-16.63	34.04	8	33.98	114	318	Peak
5270	89.4	80.91			34.21	8.29	34.01	114	318	Average
5270	97.35	88.86			34.21	8.29	34.01	114	318	Peak
5436	43.58	34.79	54	-10.42	34.35	8.48	34.04	114	318	Average
5436	57.82	49.03	74	-16.18	34.35	8.48	34.04	114	318	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 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	Toby Tian

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	59.83	58.64	68.2	-8.37	31.93	6.69	37.43	214	16	Peak
*5725	61.22	59.94	78.2	-16.98	31.96	6.75	37.43	214	16	Peak
5755	86.53	85.24			32.01	6.75	37.47	214	16	Average
5755	95.72	94.43			32.01	6.75	37.47	214	16	Peak
*5850	59.59	58.07	78.2	-18.61	32.15	6.88	37.51	214	16	Peak
*5861	60.49	58.86	68.2	-7.71	32.18	6.95	37.5	214	16	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	63.94	62.75	68.2	-4.26	31.93	6.69	37.43	200	274	Peak
*5725	63.64	62.36	78.2	-14.56	31.96	6.75	37.43	200	274	Peak
5755	93	91.71			32.01	6.75	37.47	200	274	Average
5755	102.3	101.01			32.01	6.75	37.47	200	274	Peak
*5850	60.07	58.55	78.2	-18.13	32.15	6.88	37.51	200	274	Peak
*5861	61.06	59.43	68.2	-7.14	32.18	6.95	37.5	200	274	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	Toby Tian

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	59.53	58.34	68.2	-8.67	31.93	6.69	37.43	210	25	Peak
*5725	59.73	58.45	78.2	-18.47	31.96	6.75	37.43	210	25	Peak
5795	86.27	84.92			32.07	6.82	37.54	210	25	Average
5795	95.59	94.24			32.07	6.82	37.54	210	25	Peak
*5850	60.25	58.73	78.2	-17.95	32.15	6.88	37.51	210	25	Peak
*5861	60.11	58.48	68.2	-8.09	32.18	6.95	37.5	210	25	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	61.23	60.04	68.2	-6.97	31.93	6.69	37.43	199	296	Peak
*5725	60.98	59.7	78.2	-17.22	31.96	6.75	37.43	199	296	Peak
5795	92.88	91.53			32.07	6.82	37.54	199	296	Average
5795	102.24	100.89			32.07	6.82	37.54	199	296	Peak
*5850	60.39	58.87	78.2	-17.81	32.15	6.88	37.51	199	296	Peak
*5861	61.37	59.74	68.2	-6.83	32.18	6.95	37.5	199	296	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

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:

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EUT Test Condition		Measurement Detail	
Channel	Channel 151	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	Toby Tian

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
64.92	33.38	52.78	40	-6.62	11.35	0.84	31.59	122	198	Peak
82.38	33.29	55.82	40	-6.71	8.16	0.91	31.6	123	47	Peak
199.75	22.48	43.6	43.5	-21.02	9.36	1.29	31.77	111	157	Peak
276.38	22.99	41.07	46	-23.01	12.25	1.57	31.9	102	349	Peak
600.36	33.03	43.41	46	-12.97	19.61	2.26	32.25	138	249	Peak
731.31	31.28	39.09	46	-14.72	21.26	2.51	31.58	102	223	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	27.18	45.76	40	-12.82	11.98	0.58	31.14	140	178	Peak
64.92	28.47	47.87	40	-11.53	11.35	0.84	31.59	115	226	Peak
82.38	30.08	52.61	40	-9.92	8.16	0.91	31.6	113	20	Peak
276.38	19.86	37.94	46	-26.14	12.25	1.57	31.9	132	338	Peak
588.72	22.68	33.24	46	-23.32	19.34	2.24	32.14	111	160	Peak
731.31	31.58	39.39	46	-14.42	21.26	2.51	31.58	101	61	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, 2016	Feb. 25, 2017
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

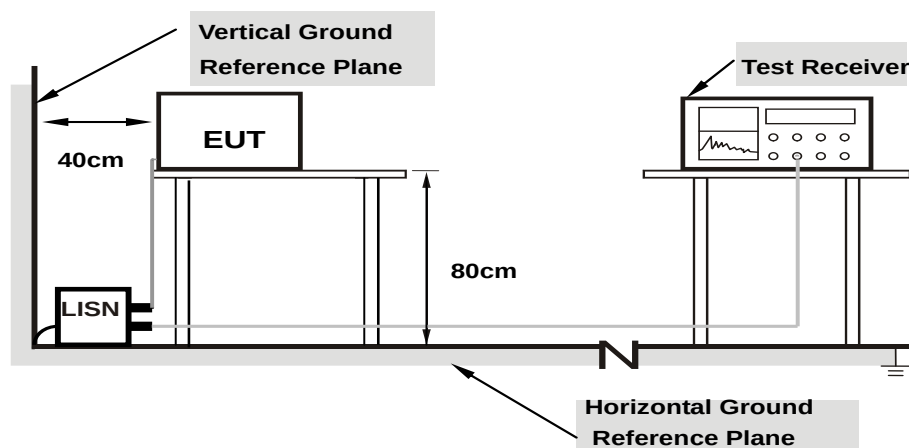
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

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

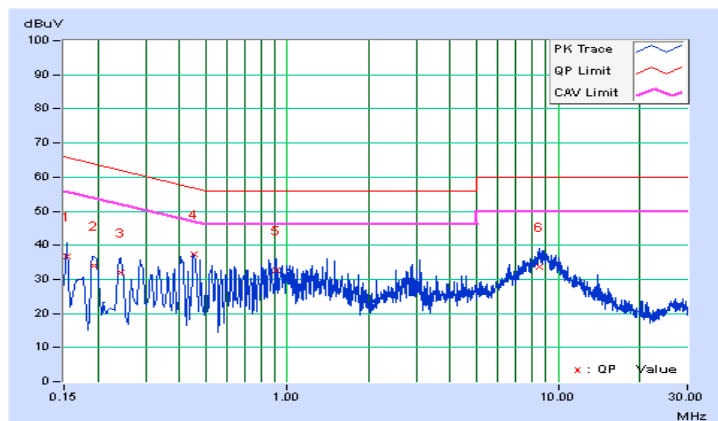
4.2.7 Test Results

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	2016/5/18

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	0.15400	10.02	26.56	15.03	36.58	25.05	65.78	55.78	-29.21	-30.74
2	0.19265	10.03	24.09	11.82	34.12	21.85	63.92	53.92	-29.80	-32.07
3	0.24164	10.05	21.87	9.71	31.92	19.76	62.04	52.04	-30.12	-32.28
4	0.45118	10.13	27.36	18.41	37.49	28.54	56.85	46.85	-19.37	-18.32
5	0.90600	10.19	22.59	13.26	32.78	23.45	56.00	46.00	-23.22	-22.55
6	8.47800	10.65	23.13	15.09	33.78	25.74	60.00	50.00	-26.22	-24.26

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

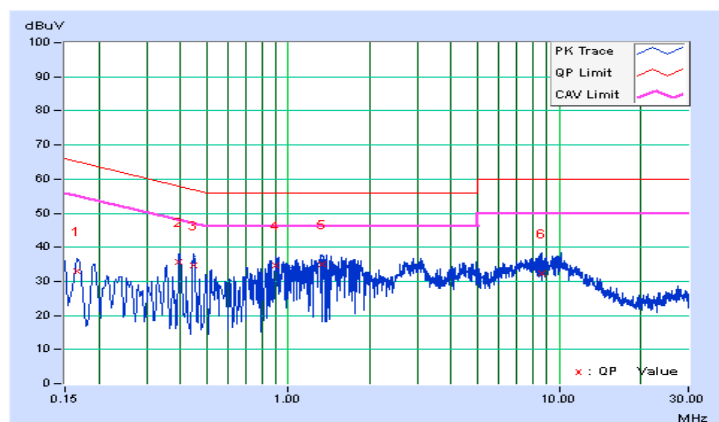


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/5/18

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	0.16623	10.03	22.95	12.75	32.98	22.78	65.15	55.15	-32.17	-32.37
2	0.39445	10.13	25.41	13.91	35.54	24.04	57.97	47.97	-22.43	-23.93
3	0.44999	10.14	24.55	14.91	34.69	25.05	56.88	46.88	-22.19	-21.83
4	0.90200	10.20	24.47	14.90	34.67	25.10	56.00	46.00	-21.33	-20.90
5	1.34200	10.23	24.68	11.76	34.91	21.99	56.00	46.00	-21.09	-24.01
6	8.59800	10.71	21.67	13.54	32.38	24.25	60.00	50.00	-27.62	-25.75

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

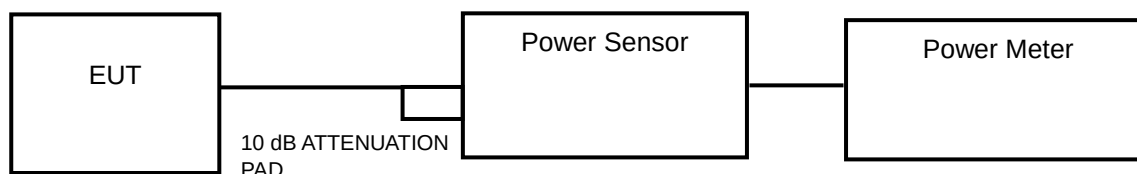
4.3.1 Limits of Transmit Power Measurement

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)

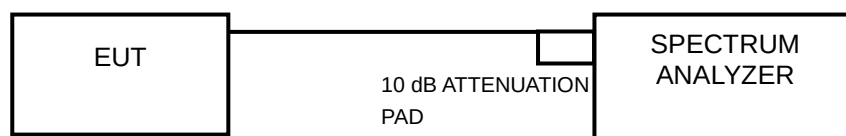
*B is the 26 dB emission bandwidth in megahertz

4.3.2 Test Setup

<Power Output Measurement>



<26 dB Bandwidth>



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Average Power Measurement

<802.11a, 802.11n (HT20), 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.

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	21.53	13.33	24	Pass
44	5220	22.13	13.45	24	Pass
48	5240	21.88	13.40	24	Pass
149	5745	20.18	13.05	30	Pass
157	5785	19.91	12.99	30	Pass
165	5825	20.00	13.01	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	21.09	13.24	24	Pass
44	5220	22.23	13.47	24	Pass
48	5240	22.34	13.49	24	Pass
149	5745	19.45	12.89	30	Pass
157	5785	19.28	12.85	30	Pass
165	5825	19.01	12.79	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
38	5190	20.05	13.02	24	Pass
46	5230	20.75	13.17	24	Pass
151	5755	18.41	12.65	30	Pass
159	5795	18.11	12.58	30	Pass

26 dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	19.93
44	5220	19.98
48	5240	19.79

802.11n (HT20)

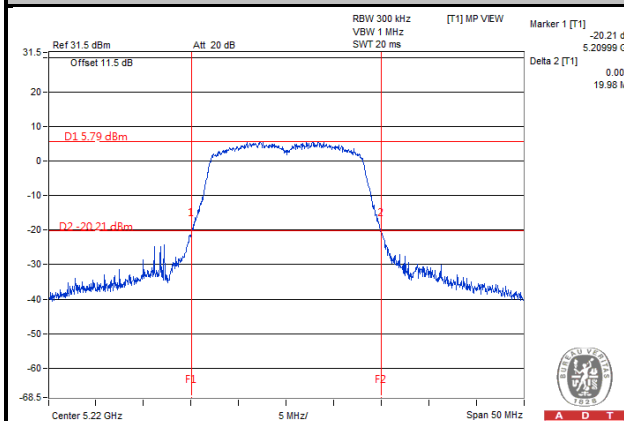
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	20.63
44	5220	20.39
48	5240	20.52

802.11n (HT40)

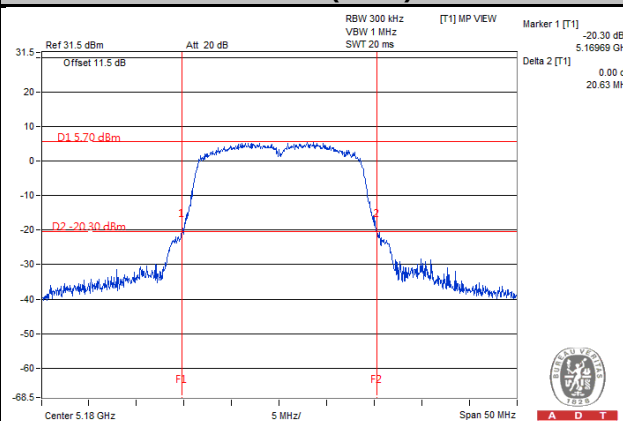
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
38	5190	47.55
46	5230	45.98

Spectrum Plot of Worst Value

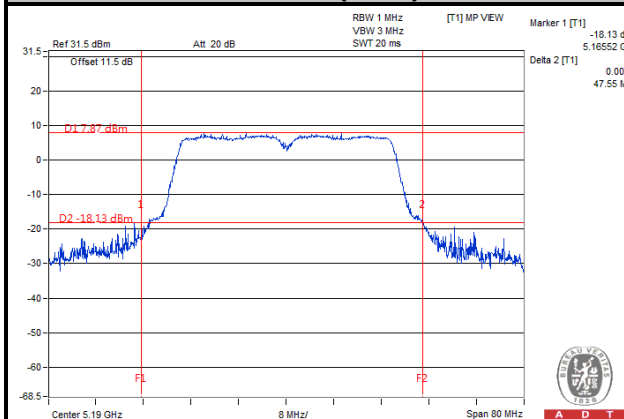
802.11a



802.11n (HT20)



802.11n (HT40)

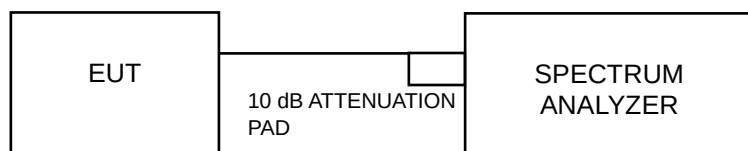


4.4 Peak Power Spectral Density Measurement

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-2

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

※For U-NII-3:

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

4.4.5 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

802.11a

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Maximum Limit (dBm)	Pass / Fail
36	5180	2.22	0.23	2.45	11	Pass
44	5220	2.84	0.23	3.07	11	Pass
48	5240	2.49	0.23	2.72	11	Pass

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

802.11n (HT20)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Maximum Limit (dBm)	Pass / Fail
36	5180	1.96	0.26	2.22	11	Pass
44	5220	2.11	0.26	2.37	11	Pass
48	5240	2.66	0.26	2.92	11	Pass

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

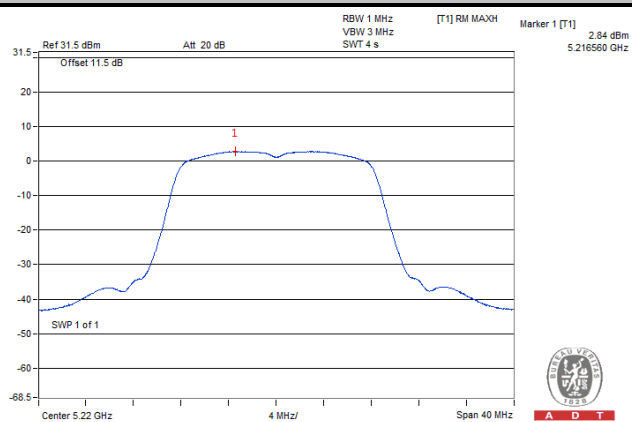
802.11n (HT40)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Maximum Limit (dBm)	Pass / Fail
38	5190	-1.87	0.63	-1.24	11	Pass
46	5230	-1.27	0.63	-0.64	11	Pass

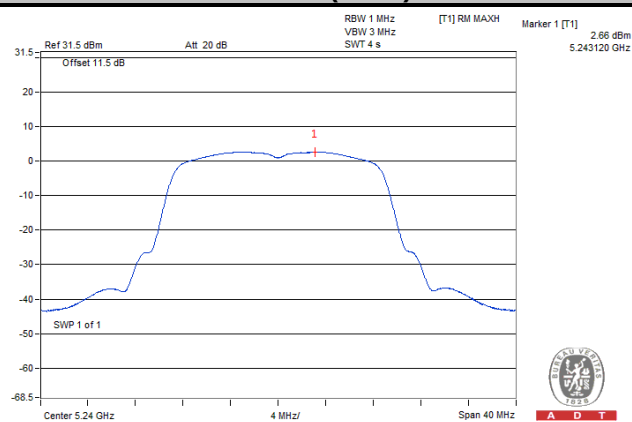
Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

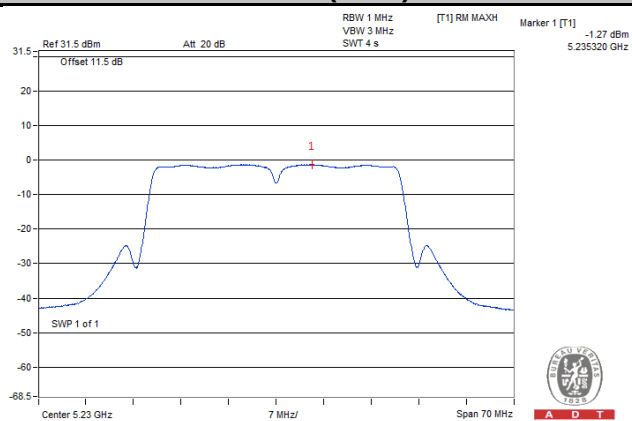
802.11a



802.11n (HT20)



802.11n (HT40)



For U-NII-3 Band

802.11a

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Limit (dBm/500 kHz)	Pass / Fail
149	5745	-2.00	0.23	-1.77	30	Pass
157	5785	-2.01	0.23	-1.78	30	Pass
165	5825	-1.72	0.23	-1.49	30	Pass

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

802.11n (HT20)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Limit (dBm/500 kHz)	Pass / Fail
149	5745	-2.44	0.26	-2.18	30	Pass
157	5785	-2.32	0.26	-2.06	30	Pass
165	5825	-2.06	0.26	-1.80	30	Pass

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

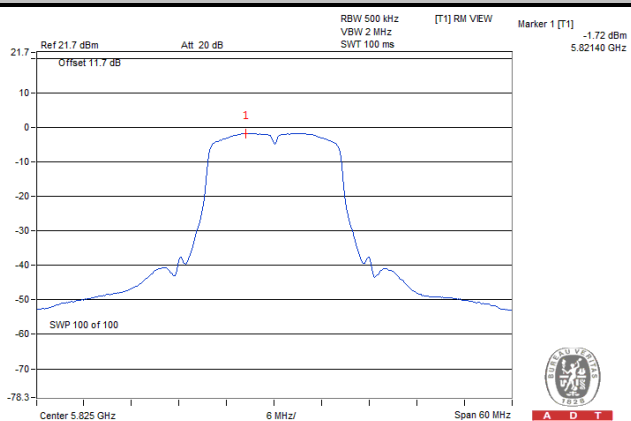
802.11n (HT40)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm)	Duty Factor	PSD with Duty Factor (dBm)	Limit (dBm/500 kHz)	Pass / Fail
151	5755	-6.30	0.63	-5.67	30	Pass
159	5795	-6.04	0.63	-5.41	30	Pass

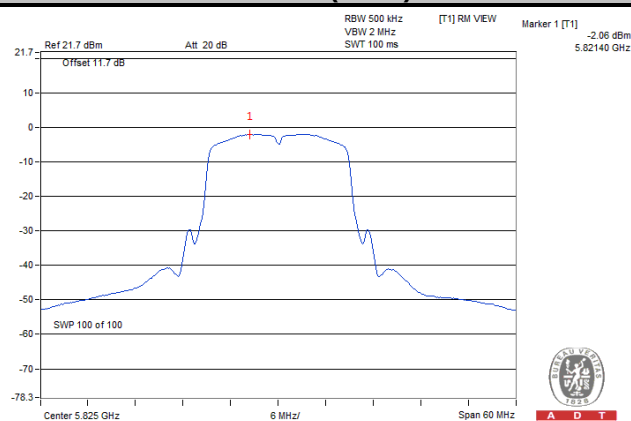
Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

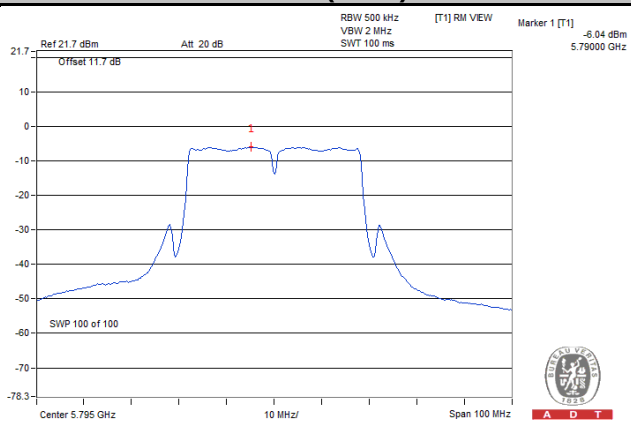
802.11a



802.11n (HT20)



802.11n (HT40)

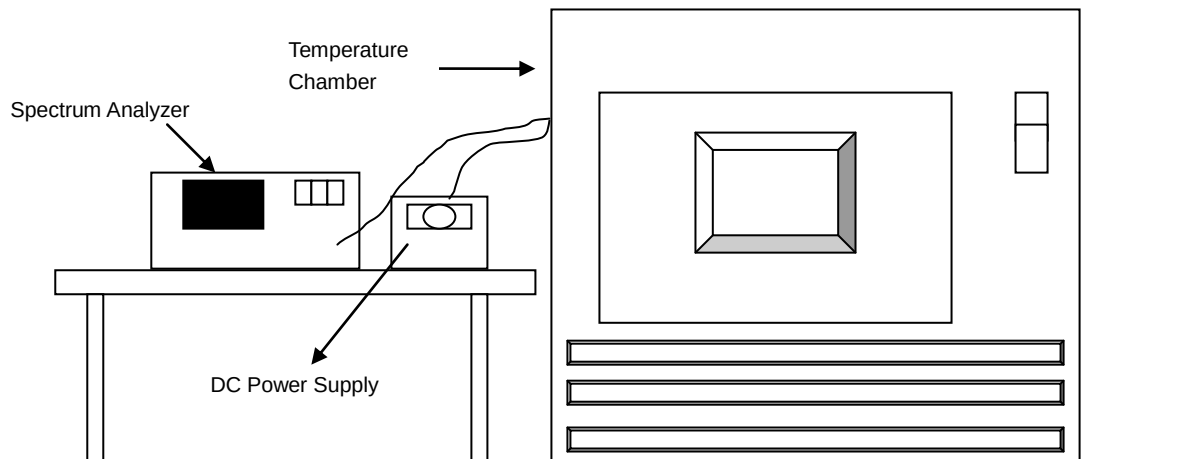


4.5 Frequency Stability

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

- 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.
- 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.
- 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: 5180 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)
50	3.85	5180.024918	4.810	5180.024767	4.781	5180.025296	4.883	5180.024867	4.801
40	3.85	5180.024514	4.732	5180.025013	4.829	5180.025115	4.848	5180.024710	4.770
30	3.85	5180.026569	5.129	5180.026257	5.069	5180.026275	5.072	5180.026502	5.116
20	3.85	5180.027142	5.240	5180.026924	5.198	5180.027120	5.236	5180.027001	5.213
10	3.85	5180.028385	5.480	5180.028337	5.470	5180.028428	5.488	5180.028515	5.505
0	3.85	5180.027067	5.225	5180.027234	5.258	5180.027484	5.306	5180.027236	5.258
-10	3.85	5180.025693	4.960	5180.025371	4.898	5180.025916	5.003	5180.025550	4.932
-20	3.85	5180.025354	4.895	5180.025245	4.874	5180.024846	4.797	5180.025247	4.874
-30	3.85	5180.023674	4.570	5180.024125	4.657	5180.023923	4.618	5180.023713	4.578

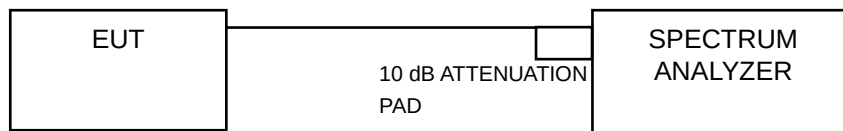
Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
Temp. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	3.6	5180.020569	3.971	5180.020601	3.977	5180.021218	4.096	5180.020566	3.970
	3.85	5180.027142	5.240	5180.026924	5.198	5180.027120	5.236	5180.027001	5.213
	4.2	5180.022587	4.360	5180.022504	4.344	5180.022135	4.273	5180.022340	4.313

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	15.39	0.5	Pass
157	5785	15.69	0.5	Pass
165	5825	15.48	0.5	Pass

802.11n (HT20)

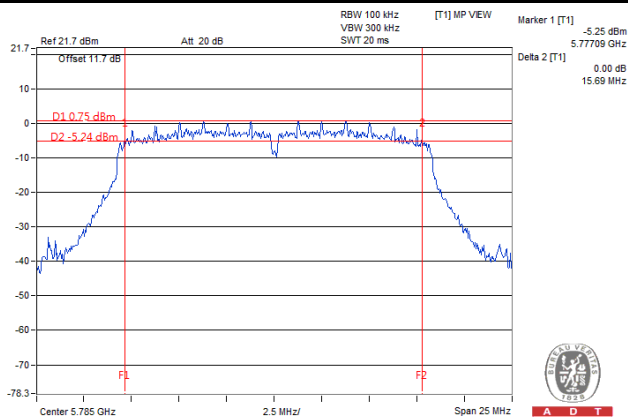
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	15.47	0.5	Pass
157	5785	15.18	0.5	Pass
165	5825	16.05	0.5	Pass

802.11n (HT40)

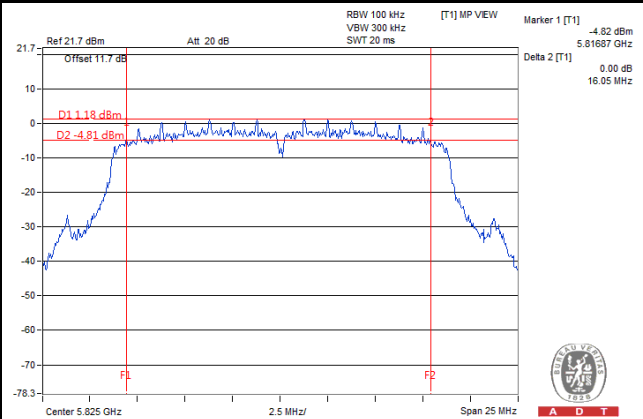
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
151	5755	36.22	0.5	Pass
159	5795	36.38	0.5	Pass

Spectrum Plot of Worst Value

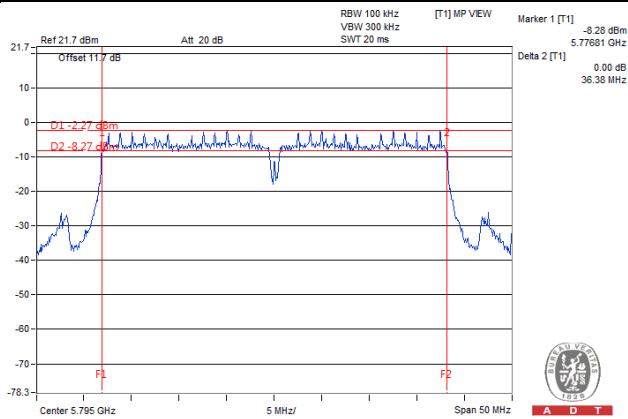
802.11a



802.11n (HT20)



802.11n (HT40)



5 Pictures of Test Arrangements

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

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:

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Hsin Chu EMC/RF/Telecom Lab

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Hwa Ya EMC/RF/Safety

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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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