

FCC Test Report

Report No.: RF160104C15-7

FCC ID: GKR-TP00078ASI

Test Model: TP00078A

Received Date: Jan. 04, 2016

Test Date: Jan. 30, 2016 ~ Feb. 02, 2016

Issued Date: Feb. 18, 2016

Applicant: Compal Electronics Inc.

Address: No.581, Ruiguang Rd., Neihu District, Taipei City, Taiwan 11492, R.O.C.

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)

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



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 Summary of Test Results.....	5
2.1 Measurement Uncertainty.....	5
2.2 Modification Record	5
3 General Information	6
3.1 General Description of EUT	6
3.2 Description of Test Modes.....	7
3.2.1 Test Mode Applicability and Tested Channel Detail.....	9
3.3 Description of Support Units	10
3.3.1 Configuration of System under Test	10
3.4 General Description of Applied Standards.....	10
4 Test Types and Results	11
4.1 Radiated Emission and Bandedge Measurement	11
4.1.1 Limits of Radiated Emission and Bandedge Measurement	11
4.1.2 Limits of Unwanted Emission Out of the Restricted Bands	11
4.1.3 Test Instruments	12
4.1.4 Test Procedures.....	13
4.1.5 Deviation from Test Standard	13
4.1.6 Test Set Up	14
4.1.7 EUT Operating Conditions.....	14
4.1.8 Test Results	15
4.2 Conducted Emission Measurement.....	27
4.2.1 Limits of Conducted Emission Measurement	27
4.2.2 Test Instruments	27
4.2.3 Test Procedures.....	28
4.2.4 Deviation from Test Standard	28
4.2.5 Test Setup.....	28
4.2.6 EUT Operating Conditions.....	28
4.2.7 Test Results	29
5 Pictures of Test Arrangements.....	31
Appendix – Information on the Testing Laboratories	32

**Release Control Record**

Issue No.	Description	Date Issued
RF160104C15-7	Original Release	Feb. 18, 2016

1 Certificate of Conformity

Product: Tablet Computer

Brand: Lenovo

Test Model: TP00078A

Sample Status: Production Unit

Applicant: Compal Electronics Inc.

Test Date: Jan. 30, 2016 ~ Feb. 02, 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:** Feb. 18, 2016
Evonne Liu / Specialist

Approved by : Stanley Wu, **Date:** Feb. 18, 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 -8.19 dB at 0.19255 MHz.
15.407(b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -3.49 dB at 5714 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	N/A	Refer to Note
15.407(a)(1/2/3)	Peak Power Spectral Density	N/A	Refer to Note
15.407(e)	6 dB Bandwidth	N/A	Refer to Note
15.407(g)	Frequency Stability	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note: Only test item of Conducted and Radiated Emissions were performed for this report. Other testing data is referring to Quietex module report (Test Report No.:1540055R-RFUSP05V00, Issue Date: May 18, 2015).

2.1 Measurement Uncertainty

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

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

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Tablet Computer
Brand	Lenovo
Test Model	TP00078A
Status of EUT	Production Unit
Power Supply Rating	20.0 Vdc (adapter) 15.2 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/ 6.0Mbps 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 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz) 5260 ~ 5320MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz) 5500 ~ 5700MHz: 8 for 802.11a, 802.11n (20MHz) 3 for 802.11n (40MHz) 1 for 802.11ac (80MHz) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz)
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

- The antenna information is listed as below.

Antenna Type	Brand Name	Parts Number	Antenna Gain	
			2.4GHz	5GHz
PIFA	Ethertronics Inc.	WLAN Main Antenna: 5002022 WLAN Aux. Antenna: 5002030	Main: 0.85 Aux.: -0.71	Main: 0.46 Aux.: 0.36

- The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	Tx Function
802.11a	1TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX
802.11ac (80MHz)	2TX

3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter 1	Lenovo	ADLX45NCC2A	I/P: 100-240Vac, 50-60Hz, 1.3A O/P: 20Vdc, 2.25A
Adapter 2	Lenovo	ADLX45NDC2A	I/P: 100-240Vac, 50-60Hz, 1.3A O/P: 20Vdc, 2.25A
Battery	Lenovo	SB10F46465	15.2Vdc, 2.895Ah
WLAN Module	Intel	8260NGW	--
WWAN Module	Sierra	EM7455	--

4. 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 (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
42	5210MHz

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 (40MHz):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
58	5290MHz

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 (40MHz):

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

2 channels are provided for 802.11ac (80MHz):

Channel	Frequency	Channel	Frequency
106	5530MHz	122	5610 MHz

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 (40MHz):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE $\geq$ 1G	RE<1G	PLC	
A	√	√	√	1TX (SISO)
B	√	√	-	2TX (MIMO)

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz **RE<1G**: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission

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)
A	802.11n (HT20)	5180-5240	36 to 48	36	OFDM	BPSK	MCS0
	802.11n (40MHz)	5260-5320	54 to 62	62	OFDM	BPSK	MCS0
	802.11n (HT20)	5500-5700	100 to 140	140	OFDM	BPSK	MCS0
	802.11ac (80MHz)	5745-5825	155	155	OFDM	BPSK	V0
B	802.11n (40MHz)	5180-5240	38 to 46	38	OFDM	BPSK	MCS0
	802.11n (20MHz)	5260-5320	52 to 64	64	OFDM	BPSK	MCS0
	802.11ac (80MHz)	5500-5700	106	106	OFDM	BPSK	V0
	802.11ac (80MHz)	5745-5825	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)
A	802.11n (HT20)	5180-5240	36 to 48	36	OFDM	BPSK	MCS0
	802.11n (HT40)	5260-5320	54 to 62	62	OFDM	BPSK	MCS0
	802.11n (HT20)	5500-5700	100 to 140	140	OFDM	BPSK	MCS0
	802.11ac (VHT80)	5745-5825	155	155	OFDM	BPSK	V0
B	802.11n (40MHz)	5180-5240	38 to 46	38	OFDM	BPSK	MCS0
	802.11n (20MHz)	5260-5320	52 to 64	64	OFDM	BPSK	MCS0
	802.11ac (80MHz)	5500-5700	106	106	OFDM	BPSK	V0
	802.11ac (80MHz)	5745-5825	155	155	OFDM	BPSK	V0

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 (80MHz)	5745-5825	155	155	OFDM	BPSK	V0

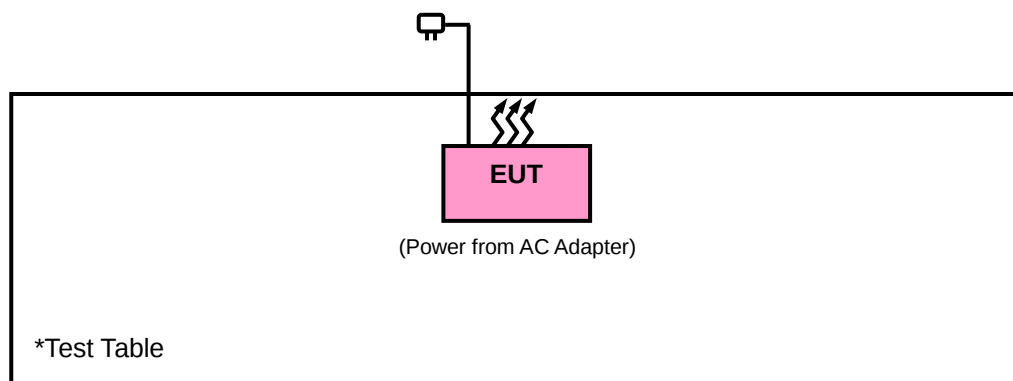
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3.1 Configuration of System under Test



3.4 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 v01r01

KDB 996369 D01 Module Certification Guide v02

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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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 v01r01	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

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	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 05, 2015	Feb. 04, 2016
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
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 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:

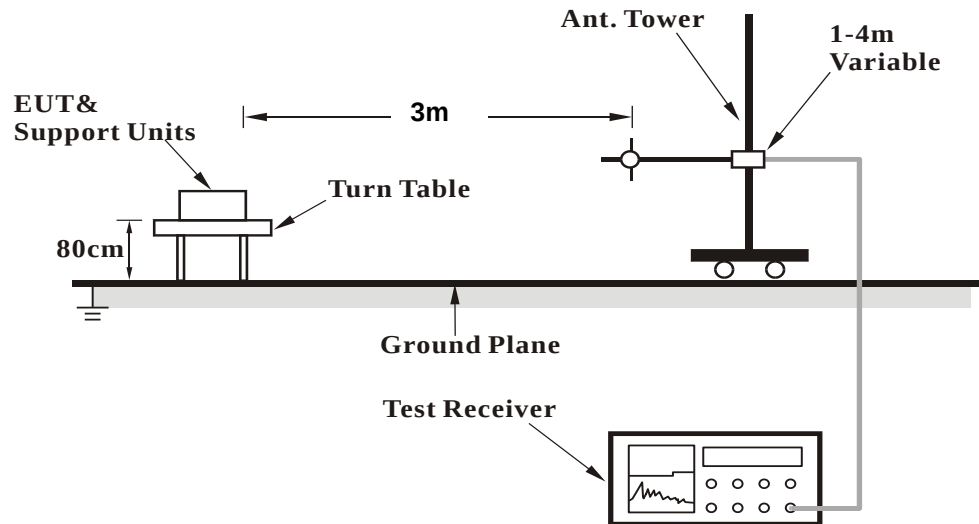
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.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

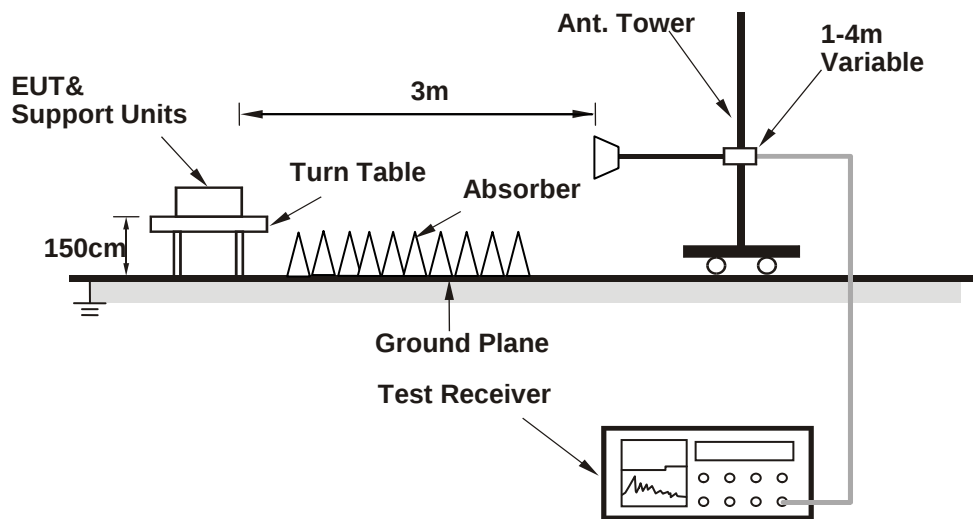
No deviation.

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 :

MODE A

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	Gavin Wu

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
5144	42.94	42.74	54	-11.06	31.32	6.2	37.32	202	182	Average
5144	60.74	60.54	74	-13.26	31.32	6.2	37.32	202	182	Peak
5180	93.65	93.42			31.35	6.22	37.34	202	182	Average
5180	102.52	102.29			31.35	6.22	37.34	202	182	Peak
5364	43.98	43.36	54	-10.02	31.49	6.31	37.18	202	182	Average
5364	60.4	59.78	74	-13.6	31.49	6.31	37.18	202	182	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	40.03	39.83	54	-13.97	31.32	6.2	37.32	198	205	Average
5150	60.91	60.71	74	-13.09	31.32	6.2	37.32	198	205	Peak
5180	91.96	91.73			31.35	6.22	37.34	198	205	Average
5180	101.57	101.34			31.35	6.22	37.34	198	205	Peak
5430	40.43	39.69	54	-13.57	31.55	6.32	37.13	198	205	Average
5430	61.08	60.34	74	-12.92	31.55	6.32	37.13	198	205	Peak

Remarks:

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

802.11n (HT40)

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	Gavin Wu

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
5018	39.59	39.47	54	-14.41	31.21	6.15	37.24	191	65	Average
5018	60.75	60.63	74	-13.25	31.21	6.15	37.24	191	65	Peak
5310	88.88	88.35			31.45	6.27	37.19	191	65	Average
5310	98.74	98.21			31.45	6.27	37.19	191	65	Peak
5408	41.93	41.27	54	-12.07	31.52	6.32	37.18	191	65	Average
5408	61.27	60.61	74	-12.73	31.52	6.32	37.18	191	65	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
5016	38.84	38.71	54	-15.16	31.21	6.15	37.23	150	360	Average
5016	60.99	60.86	74	-13.01	31.21	6.15	37.23	150	360	Peak
5310	85.54	85.01			31.45	6.27	37.19	150	360	Average
5310	95.5	94.97			31.45	6.27	37.19	150	360	Peak
5446	40.01	39.24	54	-13.99	31.56	6.34	37.13	150	360	Average
5446	61.14	60.37	74	-12.86	31.56	6.34	37.13	150	360	Peak

Remarks:

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

802.11n (HT20)

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	Gavin Wu

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
5454	40.14	39.32	54	-13.86	31.56	6.34	37.08	125	320	Average
5454	60.77	59.95	74	-13.23	31.56	6.34	37.08	125	320	Peak
5470	60.14	59.31	68.2	-8.06	31.57	6.34	37.08	125	320	Peak
5700	92.85	91.66			31.9	6.69	37.4	125	320	Average
5700	102.56	101.37			31.9	6.69	37.4	125	320	Peak
5725	63.01	61.73	68.2	-5.19	31.96	6.75	37.43	125	320	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458	39.46	38.64	54	-14.54	31.56	6.34	37.08	100	212	Average
5458	61.3	60.48	74	-12.7	31.56	6.34	37.08	100	212	Peak
5470	59.18	58.35	68.2	-9.02	31.57	6.34	37.08	100	212	Peak
5700	93.49	92.3			31.9	6.69	37.4	100	212	Average
5700	102.91	101.72			31.9	6.69	37.4	100	212	Peak
5725	60.65	59.37	68.2	-7.55	31.96	6.75	37.43	100	212	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

802.11ac (VHT80)

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	Gavin Wu

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	64.71	63.52	68.2	-3.49	31.93	6.69	37.43	173	203	Peak
*5725	67.11	65.83	78.2	-11.09	31.96	6.75	37.43	173	203	Peak
5775	89.03	87.67			32.04	6.82	37.5	173	203	Average
5775	97.98	96.62			32.04	6.82	37.5	173	203	Peak
*5850	60.71	59.19	78.2	-17.49	32.15	6.88	37.51	173	203	Peak
*5861	61.73	60.1	68.2	-6.47	32.18	6.95	37.5	173	203	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	61.75	60.56	68.2	-6.45	31.93	6.69	37.43	108	63	Peak
*5725	63.64	62.36	78.2	-14.56	31.96	6.75	37.43	108	63	Peak
5775	83.14	81.78			32.04	6.82	37.5	108	63	Average
5775	92.48	91.12			32.04	6.82	37.5	108	63	Peak
*5850	60.55	59.03	78.2	-17.65	32.15	6.88	37.51	108	63	Peak
*5861	61.76	60.13	68.2	-6.44	32.18	6.95	37.5	108	63	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

MODE B

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	Gavin Wu

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
5018	40.27	40.15	54	-13.73	31.21	6.15	37.24	198	15	Average
5018	60.37	60.25	74	-13.63	31.21	6.15	37.24	198	15	Peak
5190	87.63	87.4			31.35	6.22	37.34	198	15	Average
5190	98.79	98.56			31.35	6.22	37.34	198	15	Peak
5448	40.1	39.33	54	-13.9	31.56	6.34	37.13	198	15	Average
5448	59.71	58.94	74	-14.29	31.56	6.34	37.13	198	15	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
5126	41.61	41.4	54	-12.39	31.31	6.2	37.3	218	317	Average
5126	60.09	59.88	74	-13.91	31.31	6.2	37.3	218	317	Peak
5190	90.31	90.08			31.35	6.22	37.34	218	317	Average
5190	99.76	99.53			31.35	6.22	37.34	218	317	Peak
5436	40.59	39.85	54	-13.41	31.55	6.32	37.13	218	317	Average
5436	60.43	59.69	74	-13.57	31.55	6.32	37.13	218	317	Peak

Remarks:

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

802.11n (HT20)

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	Gavin Wu

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
5030	38.54	38.4	54	-15.46	31.23	6.15	37.24	200	69	Average
5030	60.9	60.76	74	-13.1	31.23	6.15	37.24	200	69	Peak
5320	89.7	89.15			31.45	6.29	37.19	200	69	Average
5320	99.86	99.31			31.45	6.29	37.19	200	69	Peak
5416	40.29	39.62	54	-13.71	31.53	6.32	37.18	200	69	Average
5416	60.63	59.96	74	-13.37	31.53	6.32	37.18	200	69	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	41.21	41.02	54	-12.79	31.28	6.19	37.28	172	338	Average
5096	60.33	60.14	74	-13.67	31.28	6.19	37.28	172	338	Peak
5320	93.43	92.88			31.45	6.29	37.19	172	338	Average
5320	103.46	102.91			31.45	6.29	37.19	172	338	Peak
5416	40.97	40.3	54	-13.03	31.53	6.32	37.18	172	338	Average
5416	61.03	60.36	74	-12.97	31.53	6.32	37.18	172	338	Peak

Remarks:

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

802.11ac (VHT80)

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	Gavin Wu

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
5370	40.55	39.93	54	-13.45	31.49	6.31	37.18	181	237	Average
5370	61.25	60.63	74	-12.75	31.49	6.31	37.18	181	237	Peak
*5470	61.33	60.5	68.2	-6.87	31.57	6.34	37.08	181	237	Peak
5530	83.52	82.56			31.63	6.42	37.09	181	237	Average
5530	94	93.04			31.63	6.42	37.09	181	237	Peak
*5725	60.76	59.48	68.2	-7.44	31.96	6.75	37.43	181	237	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
5428	40.61	39.89	54	-13.39	31.53	6.32	37.13	186	1	Average
5428	61.01	60.29	74	-12.99	31.53	6.32	37.13	186	1	Peak
*5470	59.78	58.95	68.2	-8.42	31.57	6.34	37.08	186	1	Peak
5530	86.38	85.42			31.63	6.42	37.09	186	1	Average
5530	97.03	96.07			31.63	6.42	37.09	186	1	Peak
*5724	60.11	58.89	68.2	-8.09	31.96	6.69	37.43	186	1	Peak

Remarks:

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

802.11ac (VHT80)

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	Gavin Wu

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	60.5	59.31	68.2	-7.7	31.93	6.69	37.43	182	240	Peak
*5725	62.16	60.88	78.2	-16.04	31.96	6.75	37.43	182	240	Peak
5775	85.03	83.67			32.04	6.82	37.5	182	240	Average
5775	95.1	93.74			32.04	6.82	37.5	182	240	Peak
*5850	61.82	60.3	78.2	-16.38	32.15	6.88	37.51	182	240	Peak
*5861	60.63	59	68.2	-7.57	32.18	6.95	37.5	182	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
*5714	62.59	61.4	68.2	-5.61	31.93	6.69	37.43	198	263	Peak
*5725	62.03	60.75	78.2	-16.17	31.96	6.75	37.43	198	263	Peak
5775	88.13	86.77			32.04	6.82	37.5	198	263	Average
5775	98.5	97.14			32.04	6.82	37.5	198	263	Peak
*5850	61.26	59.74	78.2	-16.94	32.15	6.88	37.51	198	263	Peak
*5861	59.86	58.23	68.2	-8.34	32.18	6.95	37.5	198	263	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:

802.11n (HT20)

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	Gavin Wu

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
63.95	30.05	49.28	40	-9.95	11.47	0.84	31.54	130	173	Peak
127	28.44	47.71	43.5	-15.06	11.48	1.14	31.89	123	290	Peak
218.18	36.08	56.27	46	-9.92	10.13	1.37	31.69	134	192	Peak
260.86	31.24	49.8	46	-14.76	11.79	1.52	31.87	107	313	Peak
533.43	25.39	36.86	46	-20.61	18.08	2.15	31.7	113	211	Peak
605.21	23.56	33.79	46	-22.44	19.67	2.27	32.17	115	242	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
63.95	32.64	51.87	40	-7.36	11.47	0.84	31.54	119	78	Peak
193.93	30.11	50.78	43.5	-13.39	9.77	1.27	31.71	102	106	Peak
274.44	30.06	48.23	46	-15.94	12.2	1.56	31.93	109	239	Peak
299.66	30.59	47.86	46	-15.41	12.94	1.63	31.84	127	282	Peak
441.28	20.86	34.73	46	-25.14	16.16	1.97	32	121	1	Peak
532.46	25.97	37.46	46	-20.03	18.06	2.15	31.7	128	1	Peak

Remarks:

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

802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 62	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	Gavin Wu

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
59.1	27.77	46.28	40	-12.23	12.04	0.8	31.35	123	73	Peak
189.08	35.55	55.87	43.5	-7.95	10.12	1.25	31.69	123	142	Peak
222.06	35.67	55.73	46	-10.33	10.3	1.38	31.74	114	257	Peak
274.44	28.31	46.48	46	-17.69	12.2	1.56	31.93	126	176	Peak
391.81	21.53	36.56	46	-24.47	15.14	1.89	32.06	129	86	Peak
532.46	28.03	39.52	46	-17.97	18.06	2.15	31.7	132	183	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
63.95	31.2	50.43	40	-8.8	11.47	0.84	31.54	108	23	Peak
191.02	31.17	51.6	43.5	-12.33	9.98	1.27	31.68	123	189	Peak
261.83	28.55	47.1	46	-17.45	11.82	1.52	31.89	134	287	Peak
307.42	27.33	44.47	46	-18.67	13.13	1.65	31.92	109	39	Peak
531.49	24.41	35.93	46	-21.59	18.04	2.14	31.7	108	120	Peak
629.46	23.39	33.26	46	-22.61	19.96	2.31	32.14	137	246	Peak

Remarks:

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

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 140	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	Gavin Wu

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
62.01	31.59	50.5	40	-8.41	11.71	0.83	31.45	101	337	Peak
193.93	36.73	57.4	43.5	-6.77	9.77	1.27	31.71	135	167	Peak
215.27	36.89	57.17	43.5	-6.61	10.01	1.36	31.65	100	321	Peak
276.38	28.31	46.39	46	-17.69	12.25	1.57	31.9	102	347	Peak
531.49	27.28	38.8	46	-18.72	18.04	2.14	31.7	110	258	Peak
570.29	26.14	37.09	46	-19.86	18.92	2.21	32.08	112	263	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
63.95	32.03	51.26	40	-7.97	11.47	0.84	31.54	122	348	Peak
192.96	30.47	51.06	43.5	-13.03	9.84	1.27	31.7	107	161	Peak
299.66	30.64	47.91	46	-15.36	12.94	1.63	31.84	101	111	Peak
332.64	27.34	43.7	46	-18.66	13.73	1.72	31.81	121	57	Peak
531.49	25.44	36.96	46	-20.56	18.04	2.14	31.7	101	282	Peak
577.08	22.56	33.37	46	-23.44	19.08	2.22	32.11	102	143	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	Gavin Wu

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
62.01	31.75	50.66	40	-8.25	11.71	0.83	31.45	140	308	Peak
195.87	38.4	59.21	43.5	-5.1	9.64	1.28	31.73	132	320	Peak
223.03	34.96	54.98	46	-11.04	10.34	1.39	31.75	125	17	Peak
257.95	30.4	49.05	46	-15.6	11.71	1.51	31.87	106	203	Peak
361.74	20.5	36.23	46	-25.5	14.43	1.8	31.96	120	190	Peak
531.49	24.6	36.12	46	-21.4	18.04	2.14	31.7	122	195	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
63.95	32.51	51.74	40	-7.49	11.47	0.84	31.54	130	351	Peak
191.99	30.83	51.34	43.5	-12.67	9.91	1.27	31.69	138	152	Peak
273.47	30.41	48.63	46	-15.59	12.17	1.56	31.95	119	35	Peak
380.17	28.55	43.77	46	-17.45	14.87	1.86	31.95	120	228	Peak
532.46	23.54	35.03	46	-22.46	18.06	2.15	31.7	138	117	Peak
578.05	23.63	34.42	46	-22.37	19.1	2.22	32.11	131	92	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

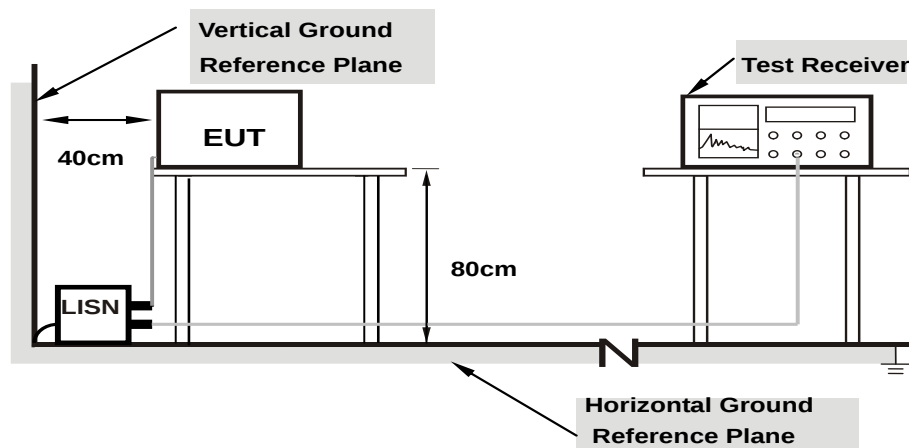
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

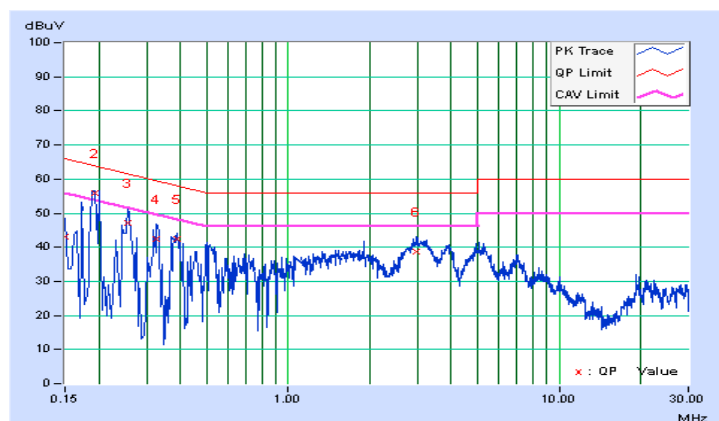
4.2.7 Test Results

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	2016/2/2

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	0.15000	10.01	33.10	21.91	43.11	31.92	66.00	56.00	-22.89	-24.08
2	0.19255	10.10	45.63	31.67	55.73	41.77	63.93	53.93	-8.19	-12.15
3	0.25557	10.12	37.12	24.41	47.24	34.53	61.57	51.57	-14.33	-17.04
4	0.32614	10.13	32.27	18.70	42.40	28.83	59.55	49.55	-17.15	-20.72
5	0.38851	10.13	32.32	19.21	42.45	29.34	58.10	48.10	-15.65	-18.76
6	2.98475	10.35	28.52	17.94	38.87	28.29	56.00	46.00	-17.13	-17.71

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

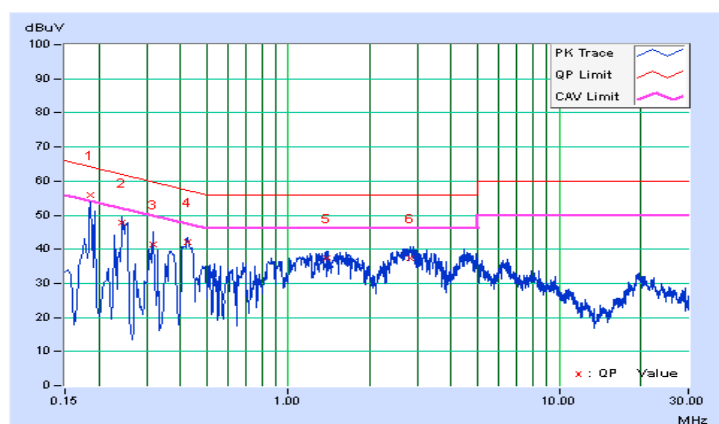


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/2/2

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	0.18519	10.03	45.76	32.64	55.79	42.67	64.25	54.25	-8.46	-11.58
2	0.24384	10.06	37.73	24.63	47.79	34.69	61.96	51.96	-14.17	-17.27
3	0.31813	10.10	31.47	16.68	41.57	26.78	59.76	49.76	-18.18	-22.97
4	0.42782	10.15	31.98	22.20	42.13	32.35	57.29	47.29	-15.16	-14.94
5	1.37774	10.25	27.05	15.70	37.30	25.95	56.00	46.00	-18.70	-20.05
6	2.82835	10.35	27.05	17.27	37.40	27.62	56.00	46.00	-18.60	-18.38

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



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:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---