

Partial FCC Test Report

Report No.: RF170602C23

FCC ID: GKR-CAX00WB

Test Model: QCNFA425

Received Date: Jun. 02, 2017

Test Date: Jun. 15, 2017 ~ Jun. 22, 2017

Issued Date: Jun. 28, 2017

Applicant: COMPAL ELECTRONICS, INC.

Address: No.581,Ruiguang Rd.,Neihu District,Taipei City 11492, Taiwan, 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 Vil., Kwei Shan Dist., Taoyuan City
33383, 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.

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.....	8
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 Test Instruments	12
4.1.3 Test Procedures.....	13
4.1.4 Deviation from Test Standard	13
4.1.5 Test Set Up	14
4.1.6 EUT Operating Conditions.....	14
4.1.7 Test Results	15
4.2 Conducted Emission Measurement.....	28
4.2.1 Limits of Conducted Emission Measurement	28
4.2.2 Test Instruments	28
4.2.3 Test Procedures.....	29
4.2.4 Deviation from Test Standard	29
4.2.5 Test Setup.....	29
4.2.6 EUT Operating Conditions.....	29
4.2.7 Test Results	30
4.3 Conducted Output Power Measurement	32
4.3.1 Limits of Conducted Output Power Measurement.....	32
4.3.2 Test Setup.....	32
4.3.3 Test Instruments	32
4.3.4 Test Procedures.....	32
4.3.5 Deviation from Test Standard	32
4.3.6 EUT Operating Conditions.....	32
4.3.7 Test Results	33
5 Pictures of Test Arrangements.....	35
Appendix – Information on the Testing Laboratories	36

Release Control Record

Issue No.	Description	Date Issued
RF170602C23	Original Release	Jun. 28, 2017

1 Certificate of Conformity

Product: Single Stream 802.11a/b/g/n/ac + BT 4.1 M.2 1216 Type Card

Brand: Qualcomm Atheros

Test Model: QCNFA425

Sample Status: Identical Prototype

Applicant: COMPAL ELECTRONICS, INC.

Test Date: Jun. 15, 2017 ~ Jun. 22, 2017

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
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:** Jun. 28, 2017
Evonne Liu / Specialist

Approved by : David Huang, **Date:** Jun. 28, 2017
David Huang / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -15.09 dB at 0.50530 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.02 dB at 2483.64 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note: Test items for AC Power Conducted Emission, Radiated Emissions, and Conducted Power were performed for this report. For other test data, please refer to BV CPS Report No.: RF150401E01 for module (Brand: Qualcomm Atheros, Model: QCNFA425).

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

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

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Single Stream 802.11a/b/g/n/ac + BT 4.1 M.2 1216 Type Card
Brand	Qualcomm Atheros
Test Model	QCNFA425
Status of EUT	Identical Prototype
Power Supply Rating	5.0 Vdc (Host equipment)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
Operating Frequency	2412 ~ 2462 MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Antenna Type	Refer to BV CPS Report No.: RF150401E01
Antenna Connector	Refer to BV CPS Report No.: RF150401E01
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. Physically, the EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX
802.11n (HT40)	1TX

2. The EUT is authorized for use in specific End-product. Please refer to below for more details.

Product	Brand	Model	Antenna Type
Rugged Tablet	COMPAL	CAXA0 ; CXXXXX-CAXA0-XXXXXX-XXXX (X:0~9,A~Z)	PIFA antenna with 0.24 dBi gain

3. The End-product contains following accessory devices.

Product	Brand	Model	Description
Adapter	DELTA	ADP-65JH HB	I/P: 100-240 Vac, 1.5 A O/P: 19 Vdc, 3.42 A 0.9 m power cable
Battery	Getac	CAX00	7.2 Vdc, 3950 mAh
BT/WLAN Module	Qualcomm Atheros	QCNFA425	Chip factory: AZWAVE, AW-CM251NF

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

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

7 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442
4	2427	8	2447
5	2432	9	2452
6	2437		

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: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
-	802.11n (HT40)	3 to 9	3, 6, 9	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	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (HT40)	3 to 9	9	OFDM	BPSK	6.0

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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (HT40)	1 to 11	9	OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

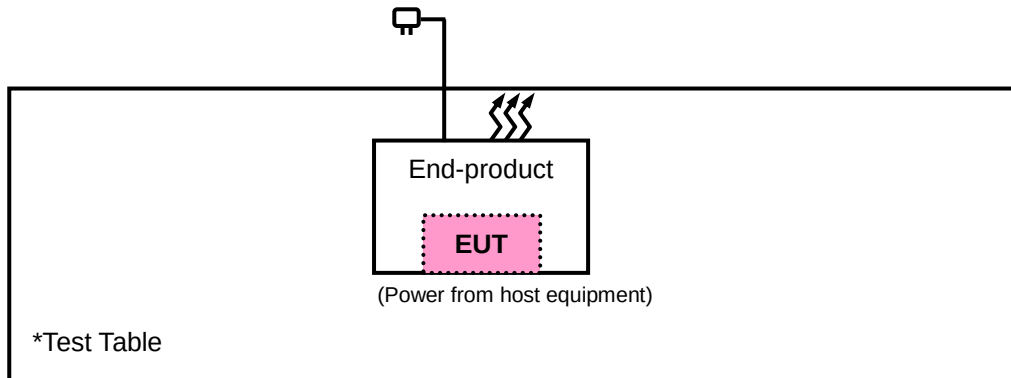
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
APCM	25 deg. C, 65 % RH	5.0 Vdc	Getaz Yang

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 C (15.247)

558074 D01 DTS Meas Guidance v03r05

ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Sep. 09, 2016	Sep. 08, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 16, 2016	Dec. 15, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Dec. 29, 2016	Dec. 28, 2017
Bluetooth Tester	CBT	100980	Apr. 19, 2017	Apr. 18, 2018
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Preamplifier Agilent	310N	187226	Jun. 24, 2016	Jun. 23, 2017
Preamplifier Agilent	83017A	MY39501357	Jun. 24, 2016	Jun. 23, 2017
Power Meter Anritsu	ML2495A	1232002	Sep. 08, 2016	Sep. 07, 2017
Power Sensor Anritsu	MA2411B	1207325	Sep. 08, 2016	Sep. 07, 2017
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 24, 2016	Jun. 23, 2017
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 24, 2016	Jun. 23, 2017
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 08, 2016	Jul. 07, 2017

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

2. The test was performed in HsinTien Chamber 1.

3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.

4. The FCC Site Registration No. is 149147.

5. The IC Site Registration No. is IC7450I-1.

4.1.3 Test Procedures

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

Note:

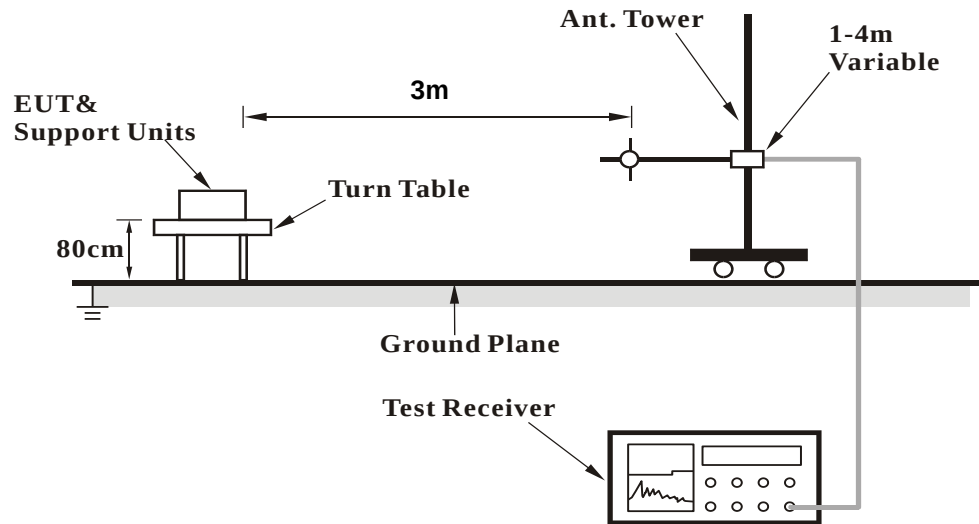
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 KHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency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

4.1.4 Deviation from Test Standard

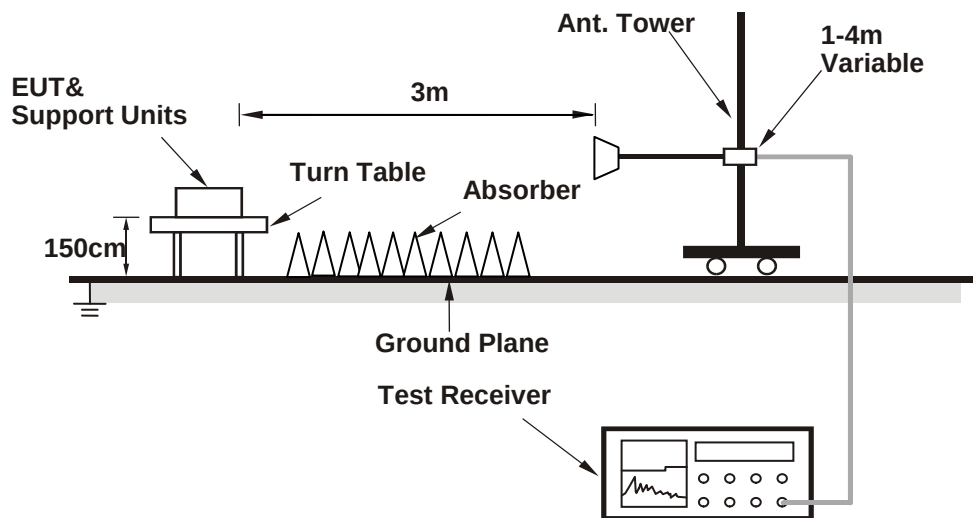
No deviation.

4.1.5 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).

4.1.6 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.

4.1.7 Test Results

Above 1 GHz Data :

802.11b

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

Antennal 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
2389.92	46.55	44.82	54	-7.45	31.8	5.4	35.47	100	280	Average
2389.92	56.47	54.74	74	-17.53	31.8	5.4	35.47	100	280	Peak
2412	107.35	105.58			31.81	5.43	35.47	100	280	Average
2412	110.09	108.32			31.81	5.43	35.47	100	280	Peak
4824	52.65	44.52	54	-1.35	33.97	8.26	34.1	107	176	Average
4824	55.71	47.58	74	-18.29	33.97	8.26	34.1	107	176	Peak
Antennal 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
2375.79	43.69	42.03	54	-10.31	31.78	5.37	35.49	112	314	Average
2375.79	54.64	52.98	74	-19.36	31.78	5.37	35.49	112	314	Peak
2412	105.77	104			31.81	5.43	35.47	112	314	Average
2412	108.57	106.8			31.81	5.43	35.47	112	314	Peak
4824	50.28	42.15	54	-3.72	33.97	8.26	34.1	115	126	Average
4824	52.75	44.62	74	-21.25	33.97	8.26	34.1	115	126	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2377.86	41.47	39.81	54	-12.53	31.78	5.37	35.49	112	314	Average
2377.86	52.78	51.12	74	-21.22	31.78	5.37	35.49	112	314	Peak
2437	105.55	103.7			31.85	5.46	35.46	112	314	Average
2437	108.33	106.48			31.85	5.46	35.46	112	314	Peak
2484.24	42.08	40.09	54	-11.92	31.88	5.53	35.42	112	314	Average
2484.24	53.15	51.16	74	-20.85	31.88	5.53	35.42	112	314	Peak
4874	51.34	43.15	54	-2.66	33.98	8.27	34.06	166	154	Average
4874	54.8	46.61	74	-19.2	33.98	8.27	34.06	166	154	Peak
Antennal 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
2388.84	43.94	42.23	54	-10.06	31.8	5.4	35.49	100	280	Average
2388.84	54.01	52.3	74	-19.99	31.8	5.4	35.49	100	280	Peak
2437	107.88	106.03			31.85	5.46	35.46	100	280	Average
2437	110.13	108.28			31.85	5.46	35.46	100	280	Peak
2483.56	44.34	42.38	54	-9.66	31.88	5.5	35.42	100	280	Average
2483.56	54.82	52.86	74	-19.18	31.88	5.5	35.42	100	280	Peak
4874	52.4	44.21	54	-1.6	33.98	8.27	34.06	188	190	Average
4874	55.52	47.33	74	-18.48	33.98	8.27	34.06	188	190	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2462	107.35	105.42			31.87	5.5	35.44	100	280	Average
2462	110.17	108.24			31.87	5.5	35.44	100	280	Peak
2484.12	46.92	44.96	54	-7.08	31.88	5.5	35.42	100	280	Average
2484.12	56.85	54.89	74	-17.15	31.88	5.5	35.42	100	280	Peak
4924	52.48	44.23	54	-1.52	33.99	8.28	34.02	110	188	Average
4924	54.71	46.46	74	-19.29	33.99	8.28	34.02	110	188	Peak
Antennal 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
2462	105.11	103.18			31.87	5.5	35.44	112	314	Average
2462	108.58	106.65			31.87	5.5	35.44	112	314	Peak
2484	43.75	41.79	54	-10.25	31.88	5.5	35.42	112	314	Average
2484	54.36	52.4	74	-19.64	31.88	5.5	35.42	112	314	Peak
4924	50.4	42.15	54	-3.6	33.99	8.28	34.02	169	147	Average
4924	52.76	44.51	74	-21.24	33.99	8.28	34.02	169	147	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11g

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

Antennal 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
2389.92	48.76	47.03	54	-5.24	31.8	5.4	35.47	112	314	Average
2389.92	61.28	59.55	74	-12.72	31.8	5.4	35.47	112	314	Peak
2412	101.33	99.56			31.81	5.43	35.47	112	314	Average
2412	109.64	107.87			31.81	5.43	35.47	112	314	Peak
4824	42.65	34.52	54	-11.35	33.97	8.26	34.1	156	142	Average
4824	49.17	41.04	74	-24.83	33.97	8.26	34.1	156	142	Peak
Antennal 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
2389.92	52.83	51.1	54	-1.17	31.8	5.4	35.47	101	280	Average
2389.92	65.62	63.89	74	-8.38	31.8	5.4	35.47	101	280	Peak
2412	103.15	101.38			31.81	5.43	35.47	101	280	Average
2412	111.2	109.43			31.81	5.43	35.47	101	280	Peak
4824	44.69	36.56	54	-9.31	33.97	8.26	34.1	156	142	Average
4824	50.81	42.68	74	-23.19	33.97	8.26	34.1	156	142	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2389.92	41.96	40.23	54	-12.04	31.8	5.4	35.47	111	314	Average
2389.92	52.47	50.74	74	-21.53	31.8	5.4	35.47	111	314	Peak
2437	102.61	100.76			31.85	5.46	35.46	111	314	Average
2437	111.06	109.21			31.85	5.46	35.46	111	314	Peak
2483.56	43.04	41.08	54	-10.96	31.88	5.5	35.42	111	314	Average
2483.56	53.92	51.96	74	-20.08	31.88	5.5	35.42	111	314	Peak
Antennal 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
2389.74	44.68	42.97	54	-9.32	31.8	5.4	35.49	100	279	Average
2389.74	55.01	53.3	74	-18.99	31.8	5.4	35.49	100	279	Peak
2437	104.42	102.57			31.85	5.46	35.46	100	279	Average
2437	112.52	110.67			31.85	5.46	35.46	100	279	Peak
2484.04	44.83	42.87	54	-9.17	31.88	5.5	35.42	100	279	Average
2484.04	55.72	53.76	74	-18.28	31.88	5.5	35.42	100	279	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2462	98.46	96.53			31.87	5.5	35.44	125	312	Average
2462	106.8	104.87			31.87	5.5	35.44	125	312	Peak
2483.52	48.64	46.68	54	-5.36	31.88	5.5	35.42	125	312	Average
2483.52	60.63	58.67	74	-13.37	31.88	5.5	35.42	125	312	Peak
4924	41.77	33.52	54	-12.23	33.99	8.28	34.02	165	142	Average
4924	49.02	40.77	74	-24.98	33.99	8.28	34.02	165	142	Peak
Antennal 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
2462	101.29	99.36			31.87	5.5	35.44	100	268	Average
2462	109.94	108.01			31.87	5.5	35.44	100	268	Peak
2483.52	52.96	51	54	-1.04	31.88	5.5	35.42	100	268	Average
2483.52	64.81	62.85	74	-9.19	31.88	5.5	35.42	100	268	Peak
4924	44.1	35.85	54	-9.9	33.99	8.28	34.02	152	142	Average
4924	50.44	42.19	74	-23.56	33.99	8.28	34.02	152	142	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11n (HT20)

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

Antennal 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
2389.83	48.46	46.73	54	-5.54	31.8	5.4	35.47	112	314	Average
2389.83	59.16	57.43	74	-14.84	31.8	5.4	35.47	112	314	Peak
2412	99.93	98.16			31.81	5.43	35.47	112	314	Average
2412	108.32	106.55			31.81	5.43	35.47	112	314	Peak
4824	39.65	31.52	54	-14.35	33.97	8.26	34.1	133	165	Average
4824	47.86	39.73	74	-26.14	33.97	8.26	34.1	133	165	Peak
Antennal 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
2389.92	52.55	50.82	54	-1.45	31.8	5.4	35.47	101	280	Average
2389.92	63.34	61.61	74	-10.66	31.8	5.4	35.47	101	280	Peak
2412	101.63	99.86			31.81	5.43	35.47	101	280	Average
2412	110.08	108.31			31.81	5.43	35.47	101	280	Peak
4824	40.25	32.12	54	-13.75	33.97	8.26	34.1	102	165	Average
4824	48.54	40.41	74	-25.46	33.97	8.26	34.1	102	165	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2389.92	42.01	40.28	54	-11.99	31.8	5.4	35.47	111	314	Average
2389.92	52.7	50.97	74	-21.3	31.8	5.4	35.47	111	314	Peak
2437	101.92	100.07			31.85	5.46	35.46	111	314	Average
2437	110.35	108.5			31.85	5.46	35.46	111	314	Peak
2483.6	42.93	40.97	54	-11.07	31.88	5.5	35.42	111	314	Average
2483.6	53.88	51.92	74	-20.12	31.88	5.5	35.42	111	314	Peak
4874	45.05	36.86	54	-8.95	33.98	8.27	34.06	165	198	Average
4874	52.27	44.08	74	-21.73	33.98	8.27	34.06	165	198	Peak
Antennal 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
2388.93	44.63	42.92	54	-9.37	31.8	5.4	35.49	100	279	Average
2388.93	55.16	53.45	74	-18.84	31.8	5.4	35.49	100	279	Peak
2437	103.75	101.9			31.85	5.46	35.46	100	279	Average
2437	111.85	110			31.85	5.46	35.46	100	279	Peak
2483.72	45.06	43.1	54	-8.94	31.88	5.5	35.42	100	279	Average
2483.72	55.38	53.42	74	-18.62	31.88	5.5	35.42	100	279	Peak
4874	43.71	35.52	54	-10.29	33.98	8.27	34.06	166	152	Average
4874	52.21	44.02	74	-21.79	33.98	8.27	34.06	166	152	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2462	97.56	95.63			31.87	5.5	35.44	125	312	Average
2462	105.89	103.96			31.87	5.5	35.44	125	312	Peak
2483.76	49.11	47.15	54	-4.89	31.88	5.5	35.42	125	312	Average
2483.76	61.7	59.74	74	-12.3	31.88	5.5	35.42	125	312	Peak
4924	38.43	30.18	54	-15.57	33.99	8.28	34.02	126	243	Average
4924	47.94	39.69	74	-26.06	33.99	8.28	34.02	126	243	Peak
Antennal 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
2462	100.54	98.61			31.87	5.5	35.44	100	268	Average
2462	108.56	106.63			31.87	5.5	35.44	100	268	Peak
2483.64	52.92	50.96	54	-1.08	31.88	5.5	35.42	100	268	Average
2483.64	65.97	64.01	74	-8.03	31.88	5.5	35.42	100	268	Peak
4924	39.52	31.27	54	-14.48	33.99	8.28	34.02	148	114	Average
4924	48.35	40.1	74	-25.65	33.99	8.28	34.02	148	114	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2389.83	47.21	45.48	54	-6.79	31.8	5.4	35.47	112	314	Average
2389.83	64.36	62.63	74	-9.64	31.8	5.4	35.47	112	314	Peak
2422	93.33	91.53			31.83	5.43	35.46	112	314	Average
2422	101.25	99.45			31.83	5.43	35.46	112	314	Peak
2483.84	41.65	39.69	54	-12.35	31.88	5.5	35.42	112	314	Average
2483.84	53.51	51.55	74	-20.49	31.88	5.5	35.42	112	314	Peak
Antennal 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
2389.92	52.12	50.39	54	-1.88	31.8	5.4	35.47	101	280	Average
2389.92	68.37	66.64	74	-5.63	31.8	5.4	35.47	101	280	Peak
2422	95.39	93.59			31.83	5.43	35.46	101	280	Average
2422	103.57	101.77			31.83	5.43	35.46	101	280	Peak
2484.2	43.94	41.95	54	-10.06	31.88	5.53	35.42	101	280	Average
2484.2	59.33	57.34	74	-14.67	31.88	5.53	35.42	101	280	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2422 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2389.65	45.02	43.31	54	-8.98	31.8	5.4	35.49	111	314	Average
2389.65	63.08	61.37	74	-10.92	31.8	5.4	35.49	111	314	Peak
2437	96.62	94.77			31.85	5.46	35.46	111	314	Average
2437	104.43	102.58			31.85	5.46	35.46	111	314	Peak
2483.8	49.7	47.74	54	-4.3	31.88	5.5	35.42	111	314	Average
2483.8	61.96	60	74	-12.04	31.88	5.5	35.42	111	314	Peak
Antennal 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
2389.29	44.42	42.71	54	-9.58	31.8	5.4	35.49	100	279	Average
2389.29	59.99	58.28	74	-14.01	31.8	5.4	35.49	100	279	Peak
2437	98.44	96.59			31.85	5.46	35.46	100	279	Average
2437	106.23	104.38			31.85	5.46	35.46	100	279	Peak
2483.64	52.98	51.02	54	-1.02	31.88	5.5	35.42	100	279	Average
2483.64	66.39	64.43	74	-7.61	31.88	5.5	35.42	100	279	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 9	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal 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
2389.11	41.46	39.75	54	-12.54	31.8	5.4	35.49	125	312	Average
2389.11	55.75	54.04	74	-18.25	31.8	5.4	35.49	125	312	Peak
2452	92.24	90.37			31.85	5.46	35.44	125	312	Average
2452	99.95	98.08			31.85	5.46	35.44	125	312	Peak
2483.72	47.73	45.77	54	-6.27	31.88	5.5	35.42	125	312	Average
2483.72	62.2	60.24	74	-11.8	31.88	5.5	35.42	125	312	Peak
Antennal 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
2389.65	44.18	42.47	54	-9.82	31.8	5.4	35.49	100	268	Average
2389.65	60.49	58.78	74	-13.51	31.8	5.4	35.49	100	268	Peak
2452	94.34	92.47			31.85	5.46	35.44	100	268	Average
2452	102.3	100.43			31.85	5.46	35.44	100	268	Peak
2483.56	52.17	50.21	54	-1.83	31.88	5.5	35.42	100	268	Average
2483.56	66.01	64.05	74	-7.99	31.88	5.5	35.42	100	268	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2452 MHz: Fundamental frequency.

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 (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 9	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	Charles Hsiao

Antennal 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
98.85	23.18	41.96	43.5	-20.32	12.15	1.28	32.21	150	185	Peak
139.08	22.52	44.93	43.5	-20.98	8.48	1.38	32.27	174	4	Peak
264.09	25.8	43.42	46	-20.2	12.55	1.94	32.11	165	210	Peak
323.8	25.84	42.21	46	-20.16	13.62	2.11	32.1	199	355	Peak
503.7	24.65	37.72	46	-21.35	16.4	2.63	32.1	163	32	Peak
918.1	26.5	32.76	46	-19.5	21.55	3.53	31.34	124	200	Peak
Antennal 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
59.97	23.64	41.6	40	-16.36	13.37	0.9	32.23	143	303	Peak
138.54	19.72	42.13	43.5	-23.78	8.48	1.38	32.27	171	310	Peak
295.14	28.2	45.34	46	-17.8	12.96	2.03	32.13	155	187	Peak
309.1	24.98	41.72	46	-21.02	13.27	2.11	32.12	170	211	Peak
499.5	28.33	41.45	46	-17.67	16.35	2.63	32.1	165	236	Peak
864.2	25.53	32.6	46	-20.47	21.19	3.44	31.7	117	155	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. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 28, 2016	Jul. 27, 2017
Software ADT	BV ADT_Conc_ 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

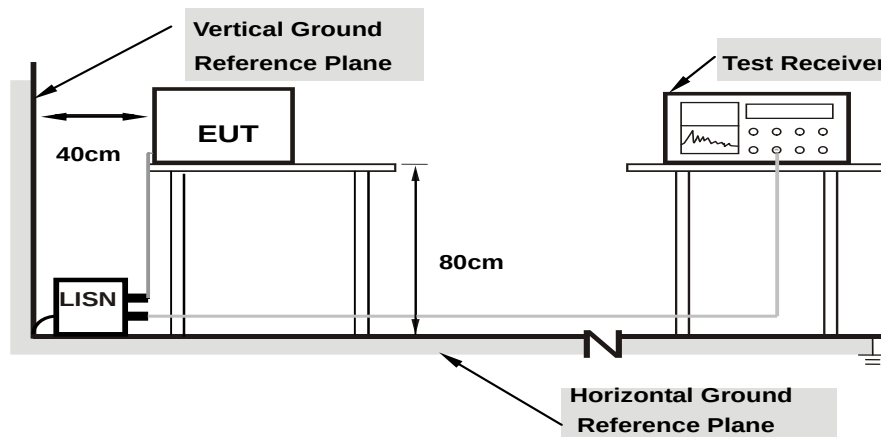
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance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

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.

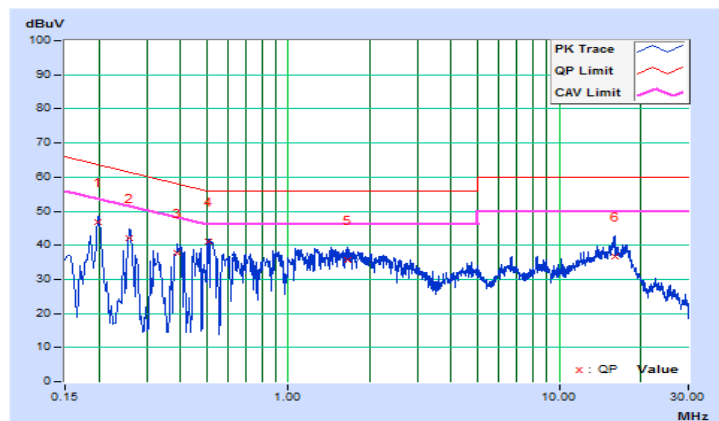
4.2.7 Test Results

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	Getaz Yang	Test Date	2017/6/20

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	0.19832	10.37	36.46	23.01	46.83	33.38	63.68	53.68	-16.85	-20.30
2	0.25810	10.38	31.62	19.02	42.00	29.40	61.49	51.49	-19.49	-22.09
3	0.39000	10.40	27.23	15.92	37.63	26.32	58.06	48.06	-20.43	-21.74
4	0.50530	10.40	30.51	17.03	40.91	27.43	56.00	46.00	-15.09	-18.57
5	1.64600	10.44	25.22	12.65	35.66	23.09	56.00	46.00	-20.34	-22.91
6	16.00200	11.14	25.49	18.66	36.63	29.80	60.00	50.00	-23.37	-20.20

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

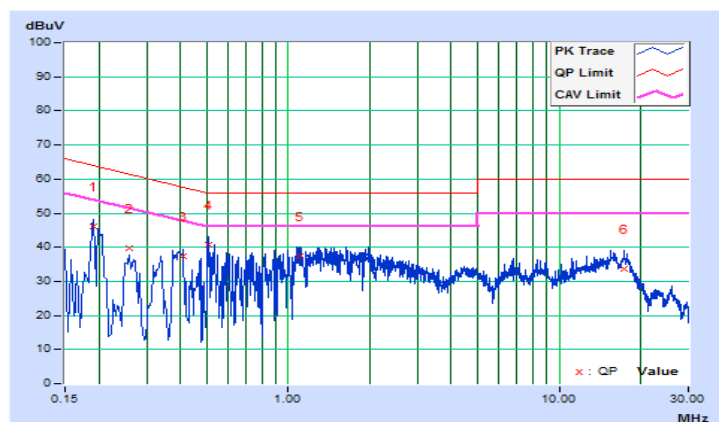


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Getaz Yang	Test Date	2017/6/20

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	0.19000	10.13	35.93	21.80	46.06	31.93	64.04	54.04	-17.98	-22.11
2	0.25800	10.15	29.73	18.04	39.88	28.19	61.50	51.50	-21.62	-23.31
3	0.41000	10.16	27.31	13.47	37.47	23.63	57.65	47.65	-20.18	-24.02
4	0.50600	10.16	30.49	16.86	40.65	27.02	56.00	46.00	-15.35	-18.98
5	1.09632	10.18	27.08	12.51	37.26	22.69	56.00	46.00	-18.74	-23.31
6	17.36600	10.85	22.95	14.55	33.80	25.40	60.00	50.00	-26.20	-24.60

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

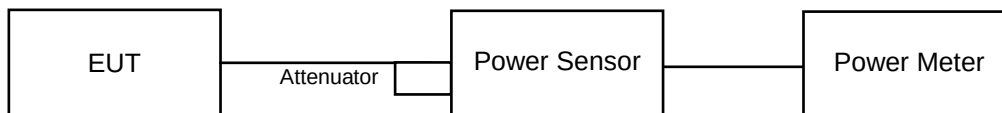


4.3 Conducted Output Power Measurement

4.3.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30 dBm)

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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 Results

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	121.899	20.86	30	Pass
6	2437	132.130	21.21	30	Pass
11	2462	121.619	20.85	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	194.089	22.88	30	Pass
6	2437	238.781	23.78	30	Pass
11	2462	132.434	21.22	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	161.808	22.09	30	Pass
6	2437	234.963	23.71	30	Pass
11	2462	131.826	21.2	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	82.414	19.16	30	Pass
6	2437	177.828	22.5	30	Pass
9	2452	70.632	18.49	30	Pass

Average Power (For Reference)

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	68.87	18.38	30	Pass
6	2437	75.86	18.8	30	Pass
11	2462	68.23	18.34	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	77.09	18.87	30	Pass
6	2437	105.68	20.24	30	Pass
11	2462	38.19	15.82	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	39.17	15.93	30	Pass
6	2437	94.19	19.74	30	Pass
11	2462	31.77	15.02	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	19.82	12.97	30	Pass
6	2437	42.07	16.24	30	Pass
9	2452	15.45	11.89	30	Pass

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 Lab

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 ---