

FCC Test Report

Report No.: RF170113C11

FCC ID: HFS-TX7

Test Model: PD132512

Received Date: Jan. 13, 2017

Test Date: Jan. 25, 2017 ~ Feb. 09, 2017

Issued Date: Feb. 18, 2017

Applicant: Quanta Computer Inc.

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

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(R.O.C)

Test Location (1): No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan
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Test Location (2): No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan,
R.O.C



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Release Control Record

Issue No.	Description	Date Issued
RF170113C11	Original Release	Feb. 18, 2017

1 Certificate of Conformity

Product: 2 in 1 notebook

Brand: Porsche Design

Test Model: PD132512

Sample Status: Identical Prototype

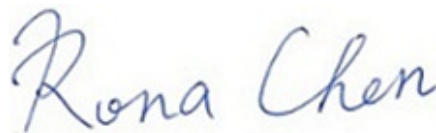
Applicant: Quanta Computer Inc.

Test Date: Jan. 25, 2017 ~ Feb. 09, 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 :



Date:

Feb. 18, 2017

Rona Chen / Specialist

Approved by :



Date:

Feb. 18, 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 -11.18 dB at 14.59375 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.18 dB at 2484.44 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	Pass	No antenna connector is used.

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 QuieTek Report No.:

1540115R-RFUSP01V00 for module (Brand: Intel, Model: 8260D2W). We had verified the conducted power of the EUT, and the power was not worse than the module report. Furthermore, the antenna type of the EUT is the same with the module, but the gain is different. Therefore, the Conducted test items can apply to the module report, and only AC Power Conducted Emission and Radiated Emissions has been re-tested.

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) (±)
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	2 in 1 notebook
Brand	Porsche Design
Test Model	PD132512
Status of EUT	Identical Prototype
Power Supply Rating	5 / 9 / 12 / 15 / 20 Vdc (Adapter) 7.6 Vdc (Li-ion battery)
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	PIFA antenna with 0.82 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

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

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX

- The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	PORSCHE DESIGN (Mfr. : FSP)	FSP060-A1UR FSP060-A1NR FSP060-A1GR FSP060-A1ER (Different models are for the difference of plug type)	I/P: 100-240 Vac, 50/60 Hz, 1.5 A O/P: 5 / 9 / 12 Vdc, 2 A or O/P: 15 / 20 Vdc, 3 A
Battery 1 - Tablet	NVT	3059C3N	7.6 Vdc, 3235 mAh
Battery 2 - Docking	NVT	494088N	15.4 Vdc, 2945 mAh
BT/WLAN Module	Intel	8260D2W	--

- The module (Intel® Dual Band Wireless-AC 8260, Brand: Intel, Model: 8260D2W) is allocated in the EUT.
- 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	
A	√	-	-	√	1Tx
B	√	√	√	√	2Tx

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 and Notebook mode. The worst case was found when positioned on **Notebook mode**.

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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
B	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)
B	802.11n (HT40)	3 to 9	09	OFDM	BPSK	MCS0

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
B	802.11n (HT40)	3 to 9	09	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	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A, B	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

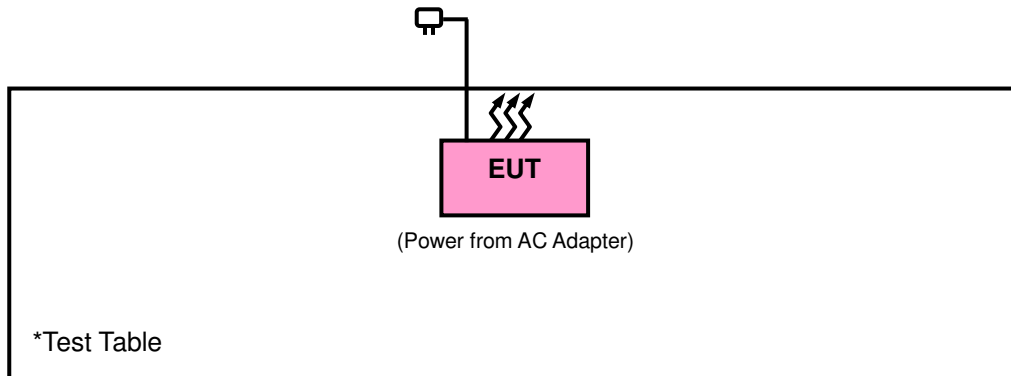
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian
APCM	25 deg. C, 68 % RH	7.6Vdc	Taylor Liu

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

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Jun. 21, 2016	Jun. 20, 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. 27, 2015	Apr. 26, 2017
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

- 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:

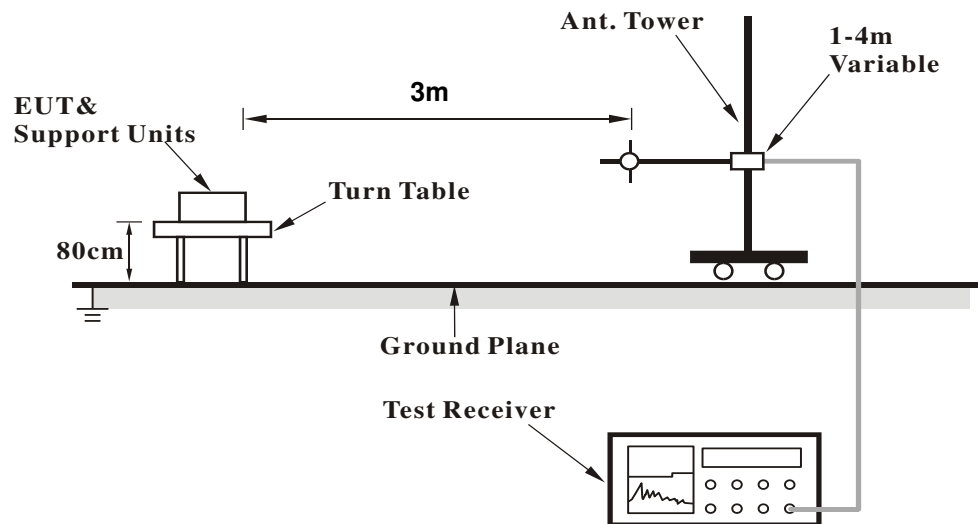
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 KHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for RMS Average (Duty cycle < 98 %) for Peak 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

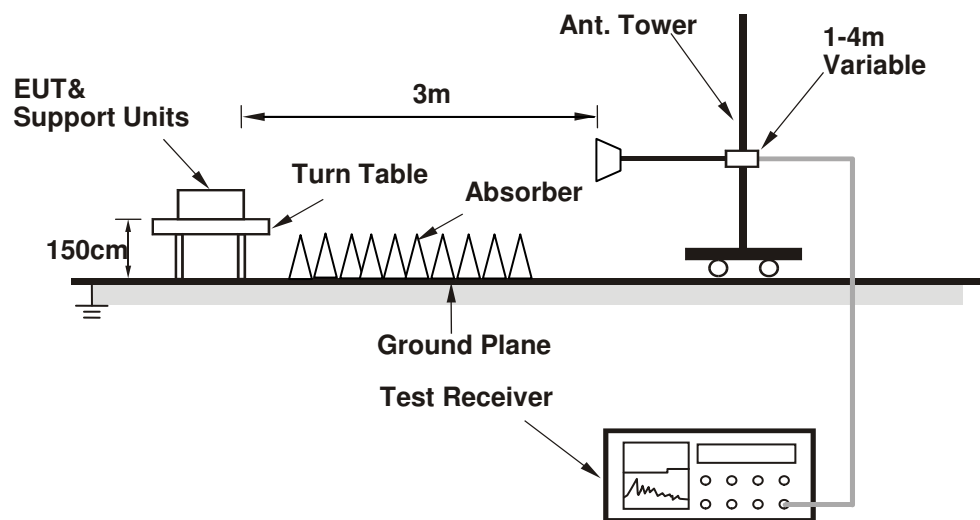
No deviation.

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 :

Mode A

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	Karl Lee

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
2389.2	52.05	50.34	74	-21.95	31.8	5.4	35.49	100	52	Peak
2389.92	42.57	40.84	54	-11.43	31.8	5.4	35.47	100	52	Average
2412	104.13	102.36			31.81	5.43	35.47	100	52	Average
2412	107.91	106.14			31.81	5.43	35.47	100	52	Peak
4824	38.59	30.46	54	-15.41	33.97	8.26	34.1	185	129	Average
4824	47.67	39.54	74	-26.33	33.97	8.26	34.1	185	129	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	41.13	39.42	54	-12.87	31.8	5.4	35.49	193	257	Average
2389.2	53.88	52.17	74	-20.12	31.8	5.4	35.49	193	257	Peak
2412	99.34	97.57			31.81	5.43	35.47	193	257	Average
2412	103.47	101.7			31.81	5.43	35.47	193	257	Peak
4824	38.28	30.15	54	-15.72	33.97	8.26	34.1	163	192	Average
4824	47.53	39.4	74	-26.47	33.97	8.26	34.1	163	192	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	Karl Lee

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
2388.3	51.54	49.83	74	-22.46	31.8	5.4	35.49	100	50	Peak
2389.92	40.4	38.67	54	-13.6	31.8	5.4	35.47	100	50	Average
2437	103.81	101.96			31.85	5.46	35.46	100	50	Average
2437	108.31	106.46			31.85	5.46	35.46	100	50	Peak
2483.52	41.95	39.99	54	-12.05	31.88	5.5	35.42	100	50	Average
2488.8	52.68	50.67	74	-21.32	31.9	5.53	35.42	100	50	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
2363.64	51.93	50.3	74	-22.07	31.76	5.37	35.5	143	108	Peak
2388.12	40.18	38.47	54	-13.82	31.8	5.4	35.49	143	108	Average
2437	99.34	97.49			31.85	5.46	35.46	143	108	Average
2437	103.67	101.82			31.85	5.46	35.46	143	108	Peak
2489.12	41.09	39.08	54	-12.91	31.9	5.53	35.42	143	108	Average
2490.16	52.02	50.01	74	-21.98	31.9	5.53	35.42	143	108	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	Karl Lee

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	104.32	102.39			31.87	5.5	35.44	110	49	Average
2462	108.47	106.54			31.87	5.5	35.44	110	49	Peak
2483.52	48.5	46.54	54	-5.5	31.88	5.5	35.42	110	49	Average
2483.56	59.82	57.86	74	-14.18	31.88	5.5	35.42	110	49	Peak
4924	38.96	30.71	54	-15.04	33.99	8.28	34.02	136	205	Average
4924	49.2	40.95	74	-24.8	33.99	8.28	34.02	136	205	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	100.21	98.28			31.87	5.5	35.44	123	242	Average
2462	104.05	102.12			31.87	5.5	35.44	123	242	Peak
2483.64	52.33	50.37	74	-21.67	31.88	5.5	35.42	123	242	Peak
2487.8	42.96	40.95	54	-11.04	31.9	5.53	35.42	123	242	Average
4924	38.72	30.47	54	-15.28	33.99	8.28	34.02	126	175	Average
4924	47.26	39.01	74	-26.74	33.99	8.28	34.02	126	175	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	Karl Lee

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	59.96	58.23	74	-14.04	31.8	5.4	35.47	100	52	Peak
2389.92	50.1	48.37	54	-3.9	31.8	5.4	35.47	100	52	Average
2412	102.98	101.21			31.81	5.43	35.47	100	52	Average
2412	111.22	109.45			31.81	5.43	35.47	100	52	Peak
4824	37.96	29.83	54	-16.04	33.97	8.26	34.1	169	75	Average
4824	46.61	38.48	74	-27.39	33.97	8.26	34.1	169	75	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	45.23	43.5	54	-8.77	31.8	5.4	35.47	193	257	Average
2389.92	56.5	54.77	74	-17.5	31.8	5.4	35.47	193	257	Peak
2412	98.6	96.83			31.81	5.43	35.47	193	257	Average
2412	106.46	104.69			31.81	5.43	35.47	193	257	Peak
4824	38.5	30.37	54	-15.5	33.97	8.26	34.1	159	225	Average
4824	47.65	39.52	74	-26.35	33.97	8.26	34.1	159	225	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	Karl Lee

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
2388.3	52.75	51.04	74	-21.25	31.8	5.4	35.49	100	50	Peak
2389.74	41.46	39.75	54	-12.54	31.8	5.4	35.49	100	50	Average
2437	102.74	100.89			31.85	5.46	35.46	100	50	Average
2437	110.37	108.52			31.85	5.46	35.46	100	50	Peak
2483.52	44.28	42.32	54	-9.72	31.88	5.5	35.42	100	50	Average
2483.68	59.13	57.17	74	-14.87	31.88	5.5	35.42	100	50	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
2359.23	51.48	49.85	74	-22.52	31.76	5.37	35.5	188	242	Peak
2389.74	40.51	38.8	54	-13.49	31.8	5.4	35.49	188	242	Average
2437	98.7	96.85			31.85	5.46	35.46	188	242	Average
2437	106.26	104.41			31.85	5.46	35.46	188	242	Peak
2483.6	42.91	40.95	54	-11.09	31.88	5.5	35.42	188	242	Average
2489.56	54.94	52.93	74	-19.06	31.9	5.53	35.42	188	242	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	Karl Lee

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	102.92	100.99			31.87	5.5	35.44	110	49	Average
2462	111.39	109.46			31.87	5.5	35.44	110	49	Peak
2483.52	52.95	50.99	54	-1.05	31.88	5.5	35.42	110	49	Average
2483.68	65.99	64.03	74	-8.01	31.88	5.5	35.42	110	49	Peak
4924	38.71	30.46	54	-15.29	33.99	8.28	34.02	150	285	Average
4924	47.58	39.33	74	-26.42	33.99	8.28	34.02	150	285	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	96.66	94.73			31.87	5.5	35.44	123	242	Average
2462	106.92	104.99			31.87	5.5	35.44	123	242	Peak
2483.52	45.61	43.65	54	-8.39	31.88	5.5	35.42	123	242	Average
2483.56	57.93	55.97	74	-16.07	31.88	5.5	35.42	123	242	Peak
4924	38.63	30.38	54	-15.37	33.99	8.28	34.02	147	189	Average
4924	47.95	39.7	74	-26.05	33.99	8.28	34.02	147	189	Peak

Remarks:

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

Mode B

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	Karl Lee

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	52.96	51.23	54	-1.04	31.8	5.4	35.47	100	22	Average
2389.92	66.32	64.59	74	-7.68	31.8	5.4	35.47	100	22	Peak
2412	102	100.23			31.81	5.43	35.47	100	22	Average
2412	110.59	108.82			31.81	5.43	35.47	100	22	Peak
4824	38.97	30.84	54	-15.03	33.97	8.26	34.1	162	94	Average
4824	48.31	40.18	74	-25.69	33.97	8.26	34.1	162	94	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	63.66	61.95	74	-10.34	31.8	5.4	35.49	124	131	Peak
2389.83	50.28	48.55	54	-3.72	31.8	5.4	35.47	124	131	Average
2412	99.41	97.64			31.81	5.43	35.47	106	147	Average
2412	107.08	105.31			31.81	5.43	35.47	106	147	Peak
4824	38.27	30.14	54	-15.73	33.97	8.26	34.1	108	326	Average
4824	47.07	38.94	74	-26.93	33.97	8.26	34.1	108	326	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	Karl Lee

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
2389.02	53.43	51.72	74	-20.57	31.8	5.4	35.49	100	36	Peak
2389.92	41.84	40.11	54	-12.16	31.8	5.4	35.47	100	36	Average
2437	104.59	102.74			31.85	5.46	35.46	112	29	Average
2437	112.35	110.5			31.85	5.46	35.46	112	29	Peak
2483.52	45.68	43.72	54	-8.32	31.88	5.5	35.42	100	36	Average
2484.32	59.59	57.6	74	-14.41	31.88	5.53	35.42	100	36	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
2322.24	52.05	50.54	74	-21.95	31.73	5.3	35.52	153	172	Peak
2389.2	40.65	38.94	54	-13.35	31.8	5.4	35.49	153	172	Average
2437	100.71	98.86			31.85	5.46	35.46	147	146	Average
2437	108.87	107.02			31.85	5.46	35.46	147	146	Peak
2483.52	43.7	41.74	54	-10.3	31.88	5.5	35.42	153	172	Average
2485.04	57.03	55.04	74	-16.97	31.88	5.53	35.42	153	172	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	Karl Lee

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	101.56	99.63			31.87	5.5	35.44	110	29	Average
2462	109.72	107.79			31.87	5.5	35.44	110	29	Peak
2483.56	52.39	50.43	54	-1.61	31.88	5.5	35.42	137	29	Average
2484.08	66.42	64.46	74	-7.58	31.88	5.5	35.42	137	29	Peak
4924	38.83	30.58	54	-15.17	33.99	8.28	34.02	135	32	Average
4924	47.41	39.16	74	-26.59	33.99	8.28	34.02	135	32	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	99.32	97.39			31.87	5.5	35.44	131	146	Average
2462	107.3	105.37			31.87	5.5	35.44	131	146	Peak
2483.56	64.29	62.33	74	-9.71	31.88	5.5	35.42	108	140	Peak
2483.6	50.28	48.32	54	-3.72	31.88	5.5	35.42	108	140	Average
4924	39.46	31.21	54	-14.54	33.99	8.28	34.02	152	237	Average
4924	48.13	39.88	74	-25.87	33.99	8.28	34.02	152	237	Peak

Remarks:

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

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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	Karl Lee

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
2389.74	53.61	51.9	54	-0.39	31.8	5.4	35.49	100	29	Average
2389.92	63.12	61.39	74	-10.88	31.8	5.4	35.47	100	29	Peak
2422	96.58	94.78			31.83	5.43	35.46	100	29	Average
2422	104.77	102.97			31.83	5.43	35.46	100	29	Peak
2483.56	42.71	40.75	54	-11.29	31.88	5.5	35.42	100	29	Average
2485.28	52.34	50.35	74	-21.66	31.88	5.53	35.42	100	29	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	46.1	44.39	54	-7.9	31.8	5.4	35.49	142	147	Average
2389.92	57.17	55.44	74	-16.83	31.8	5.4	35.47	142	147	Peak
2422	93.61	91.81			31.83	5.43	35.46	147	147	Average
2422	101.52	99.72			31.83	5.43	35.46	147	147	Peak
2483.64	41.63	39.67	54	-12.37	31.88	5.5	35.42	142	147	Average
2491.68	52.45	50.44	74	-21.55	31.9	5.53	35.42	142	147	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	Karl Lee

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
2389.38	59.9	58.19	74	-14.1	31.8	5.4	35.49	139	52	Peak
2389.92	50.25	48.52	54	-3.75	31.8	5.4	35.47	139	52	Average
2437	100.77	98.92			31.85	5.46	35.46	112	29	Average
2437	108.86	107.01			31.85	5.46	35.46	112	29	Peak
2483.56	52.89	50.93	54	-1.11	31.88	5.5	35.42	139	52	Average
2483.6	62.62	60.66	74	-11.38	31.88	5.5	35.42	139	52	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
2322.42	52.09	50.58	74	-21.91	31.73	5.3	35.52	182	140	Peak
2389.38	41.61	39.9	54	-12.39	31.8	5.4	35.49	182	140	Average
2437	97.24	95.39			31.85	5.46	35.46	147	146	Average
2437	105.47	103.62			31.85	5.46	35.46	147	146	Peak
2483.68	47.39	45.43	54	-6.61	31.88	5.5	35.42	182	140	Average
2483.68	58.17	56.21	74	-15.83	31.88	5.5	35.42	182	140	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	Karl Lee

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
2362.74	51.92	50.29	74	-22.08	31.76	5.37	35.5	152	216	Peak
2389.38	40.47	38.76	54	-13.53	31.8	5.4	35.49	152	216	Average
2452	92.24	90.37			31.85	5.46	35.44	163	146	Average
2452	100.31	98.44			31.85	5.46	35.44	163	146	Peak
2483.56	46.78	44.82	54	-7.22	31.88	5.5	35.42	152	216	Average
2483.8	56.17	54.21	74	-17.83	31.88	5.5	35.42	152	216	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
2374.71	51.54	49.88	74	-22.46	31.78	5.37	35.49	124	65	Peak
2389.2	41.05	39.34	54	-12.95	31.8	5.4	35.49	124	65	Average
2452	95.44	93.57			31.85	5.46	35.44	141	29	Average
2452	103.83	101.96			31.85	5.46	35.44	141	29	Peak
2483.72	63.32	61.36	74	-10.68	31.88	5.5	35.42	124	65	Peak
2484.44	53.82	51.83	54	-0.18	31.88	5.53	35.42	124	65	Average

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:

Mode B

802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 09	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	Karl Lee

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
93.99	31.61	53.21	43.5	-11.89	9.22	1.11	31.93	134	315	Peak
191.19	18.49	38.68	43.5	-25.01	10.46	1.61	32.26	155	288	Peak
231.42	25.42	43.55	46	-20.58	12.19	1.85	32.17	196	199	Peak
503.7	28.37	38.46	46	-17.63	19.38	2.63	32.1	195	99	Peak
720	26.6	32.24	46	-19.4	23.31	3.16	32.11	113	314	Peak
834.8	24.72	29.56	46	-21.28	23.65	3.38	31.87	154	29	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
31.89	30.71	45.9	40	-9.29	16.33	0.74	32.26	131	211	Peak
94.8	33.95	55.53	43.5	-9.55	9.3	1.11	31.99	195	196	Peak
168.24	23.52	44.09	43.5	-19.98	10.15	1.52	32.24	168	104	Peak
524.7	37.64	46.39	46	-8.36	20.7	2.7	32.15	105	307	Peak
672.4	29.25	34.92	46	-16.75	23.4	3.05	32.12	172	22	Peak
792.1	31.18	35.75	46	-14.82	24.23	3.27	32.07	124	233	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	ESCS 30	100288	Aug. 18, 2016	Aug. 17, 2017
RF signal cable Woken	5D-FB	Cable-cond2-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 17, 2017	Jan. 16, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 26, 2016	Jul. 25, 2017
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 2.

3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedures

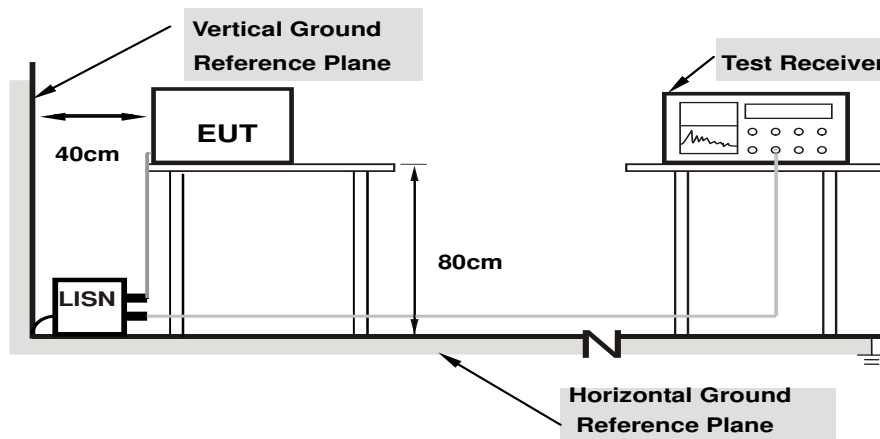
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance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

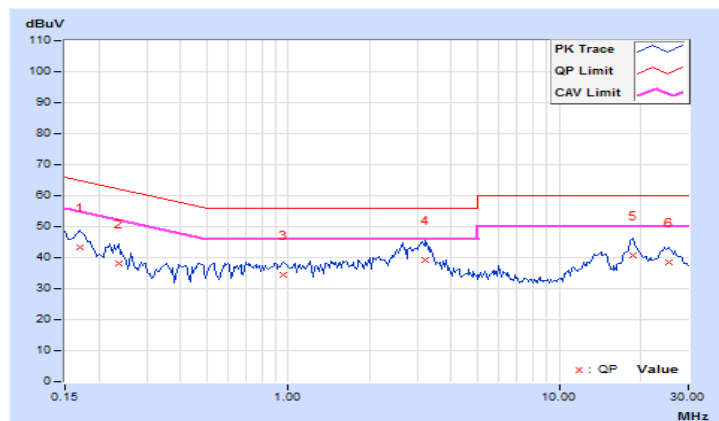
4.2.7 Test Results

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	Toby Tian	Test Date	2017/2/9

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	0.16953	10.00	33.25	21.73	43.25	31.73	64.98	54.98	-21.73	-23.25
2	0.23594	9.92	28.19	19.61	38.11	29.53	62.24	52.24	-24.13	-22.71
3	0.95859	10.00	24.43	15.80	34.43	25.80	56.00	46.00	-21.57	-20.20
4	3.21875	10.01	29.20	18.56	39.21	28.57	56.00	46.00	-16.79	-17.43
5	18.82031	10.32	30.55	25.53	40.87	35.85	60.00	50.00	-19.13	-14.15
6	25.47266	10.27	28.23	23.46	38.50	33.73	60.00	50.00	-21.50	-16.27

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

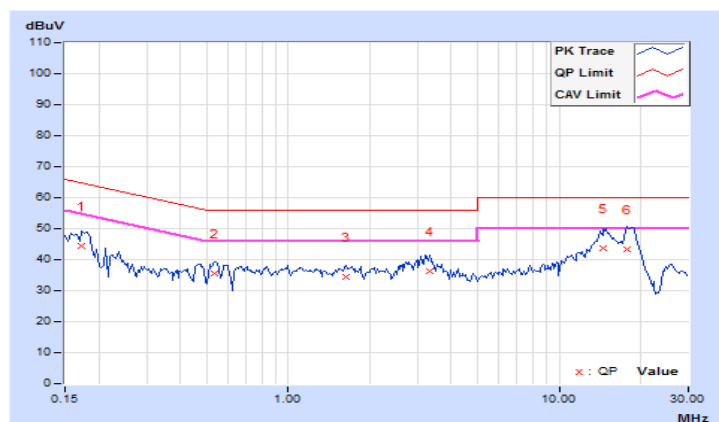


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2017/2/9

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	0.17344	9.84	34.62	23.87	44.46	33.71	64.79	54.79	-20.33	-21.08
2	0.53672	9.94	25.62	18.45	35.56	28.39	56.00	46.00	-20.44	-17.61
3	1.63281	9.96	24.31	16.37	34.27	26.33	56.00	46.00	-21.73	-19.67
4	3.33984	10.11	26.20	17.61	36.31	27.72	56.00	46.00	-19.69	-18.28
5	14.59375	10.27	33.60	28.55	43.87	38.82	60.00	50.00	-16.13	-11.18
6	17.88281	10.43	32.94	27.73	43.37	38.16	60.00	50.00	-16.63	-11.84

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)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

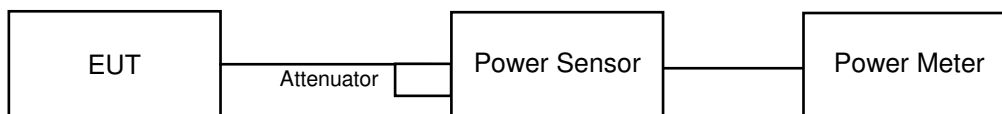
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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

Array Gain = $5 \log(NANT/NSS)$ dB or 3 dB, whichever is less for 20 MHz channel widths with $NANT \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(NANT/NSS)$ dB.

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	83.56	19.22	30	Pass
6	2437	82.04	19.14	30	Pass
11	2462	81.10	19.09	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	165.20	22.18	30	Pass
6	2437	146.55	21.66	30	Pass
11	2462	150.31	21.77	30	Pass

802.11n (HT20)

Mode A

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	163.31	22.13	30	Pass
6	2437	146.55	21.66	30	Pass
11	2462	151.71	21.81	30	Pass

Mode B

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.66	22.06	307.249	24.87	30	Pass
6	2437	21.51	21.50	282.833	24.52	30	Pass
11	2462	19.71	19.52	183.077	22.63	30	Pass

802.11n (HT40)

Mode A

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	136.14	21.34	30	Pass
6	2437	123.31	20.91	30	Pass
9	2452	128.23	21.08	30	Pass

Mode B

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.77	18.57	147.280	21.68	30	Pass
6	2437	20.48	20.49	223.630	23.50	30	Pass
9	2452	16.18	16.08	82.046	19.14	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:

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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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