

Partial FCC Test Report

Report No.: RF180530C08-2

FCC ID: GKR-SHC100

Test Model: QCNFA435

Received Date: May 30, 2018

Test Date: Jul. 10, 2018 ~ Jul. 18, 2018

Issued Date: Jul. 23, 2018

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FCC Registration /
Designation Number: 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
RF180530C08-2	Original Release	Jul. 23, 2018

1 Certificate of Conformity

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

Brand: Qualcomm Atheros

Test Model: QCNFA435

Sample Status: Production Unit

Applicant: COMPAL ELECTRONICS, INC.

Test Date: Jul. 10, 2018 ~ Jul. 18, 2018

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 RF characteristics under the conditions specified in this report.

Prepared by : Evonne Liu, **Date:** Jul. 23, 2018
Evonne Liu / Specialist

Approved by : Dylan Chiou, **Date:** Jul. 23, 2018
Dylan Chiou / 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 -12.74 dB at 0.17744 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 dB at 2389.47 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note
---	Occupied Bandwidth Measurement	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 Radiated Emissions and Conducted Power were performed for this report. For other test data, please refer to BV CPS Report No.: RF141008E03 R1 for module (Brand: Qualcomm Atheros, Model: QCNFA435).

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 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	Single Stream 802.11a/b/g/n/ac + BT 4.1 M.2 Type Card
Brand	Qualcomm Atheros
Test Model	QCNFA435
Status of EUT	Production Unit
Power Supply Rating	3.3 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 150.0 Mbps
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 Note as below
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

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

Product	Brand	Model
All In One Computer	Compal	SHC-100

2. 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

3. The antenna information is listed as below.

Ant. No.	Ant. Type	Vendor	Part Number	Antenna Gain (dBi)			
				BT/WLAN 2.4GHz	WLAN 5.15~5.35 GHz	WLAN 5.47~5.725 GHz	WLAN 5.725~5.85 GHz
1	PCB	Nienyi	WLAN Main Antenna: NYS3283 (DC330026I0U)	0.75	-0.76	-0.47	0.13
			WLAN Aux Antenna: NYS3284 (DC330026I1U)	0.59	-0.93	-1.01	-1.96
2	Dipole	Nienyi	WLAN Main Antenna: NYS3285+ NYS3281	1.64	0.91	1.42	0.52
			WLAN Aux Antenna: NYS3285+ NYS3282	0.81	-0.78	-0.47	0.44

4. This device has 2 configurations as below.

Mode A: EUT was chosen antenna no. 1 to test.

Mode B: EUT was chosen antenna no. 2 to test.

5. The above EUT information is declared by manufacturer and for more detailed features description, please refers 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	
A	√	√	√	-
B	√	√	√	-

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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	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	6.5
	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

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)
A, B	802.11n (HT40)	3 to 9	3	OFDM	BPSK	13.5

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)
A, B	802.11n (HT40)	3 to 9	3	OFDM	BPSK	13.5

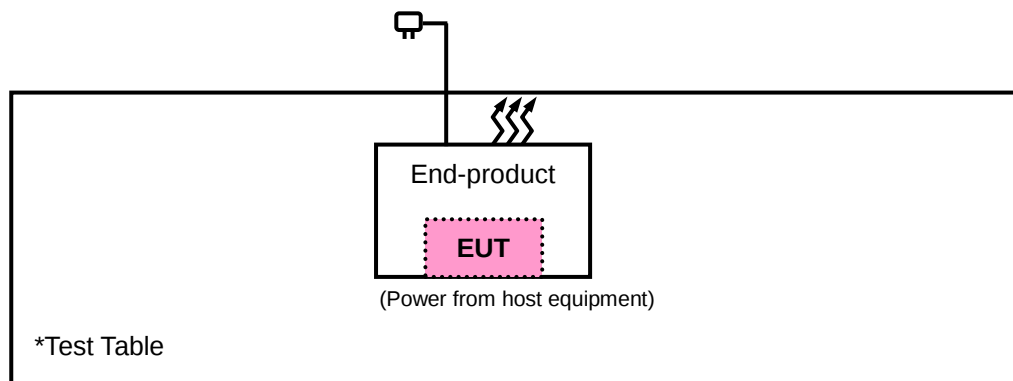
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Harry Hsueh
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang

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)

KDB 558074 D01 DTS Meas Guidance v04

ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 17, 2017	Oct. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220207	Dec. 07, 2017	Dec. 06, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	9120D	209	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Fixed Attenuator Mini-Circuits	BW-N4W5+	PAD-ATT4-01	Jan. 29, 2018	Jan. 28, 2019
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier EMCI	EMC001340	980201	Nov. 01, 2017	Oct. 31, 2018
Bluetooth Tester	CBT	100946	Jul. 29, 2016	Jul. 28, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 20, 2017	Oct. 19, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF Coaxial Cable	8D-FB	Cable-RF3-04	Oct. 19, 2017	Oct. 18, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	230129/4	Oct. 19, 2017	Oct. 18, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	250723/4	Oct. 19, 2017	Oct. 18, 2018
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 IC Site Registration No. is IC7450F-10.

4.1.3 Test Procedures

For Radiated Emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 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:

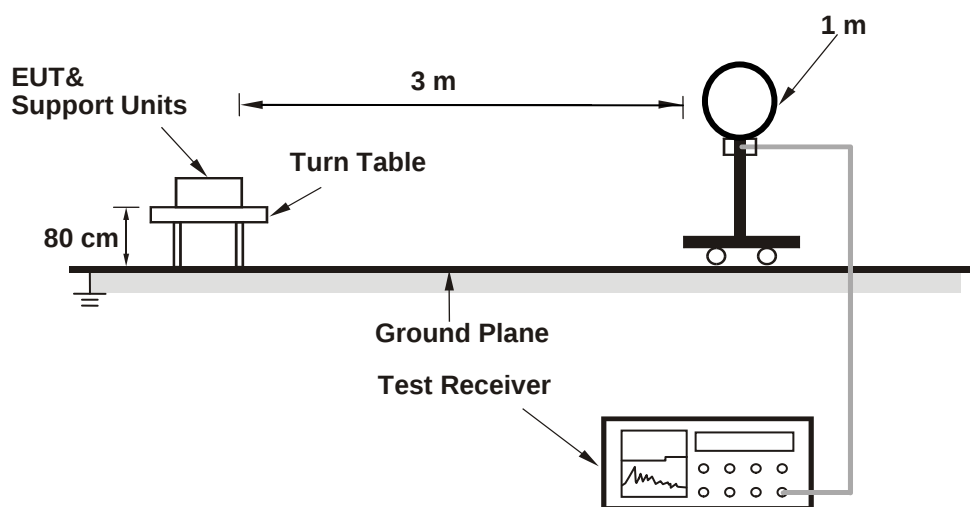
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
(11b: RBW = 1 MHz, VBW = 1 kHz ; 11g: RBW = 1 MHz, VBW = 1 kHz ;
11n (HT20): RBW = 1 MHz, VBW = 1 kHz ; 11n (HT40): RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

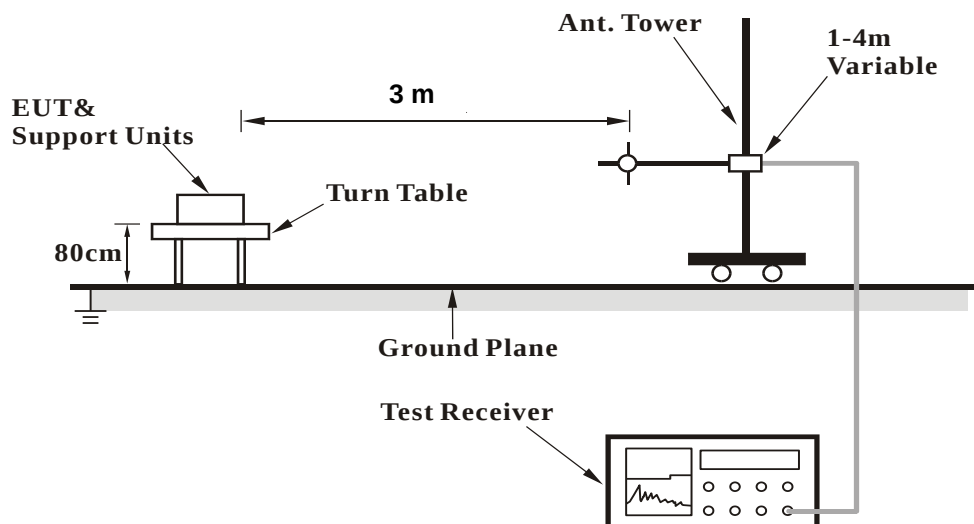
No deviation.

4.1.5 Test Set Up

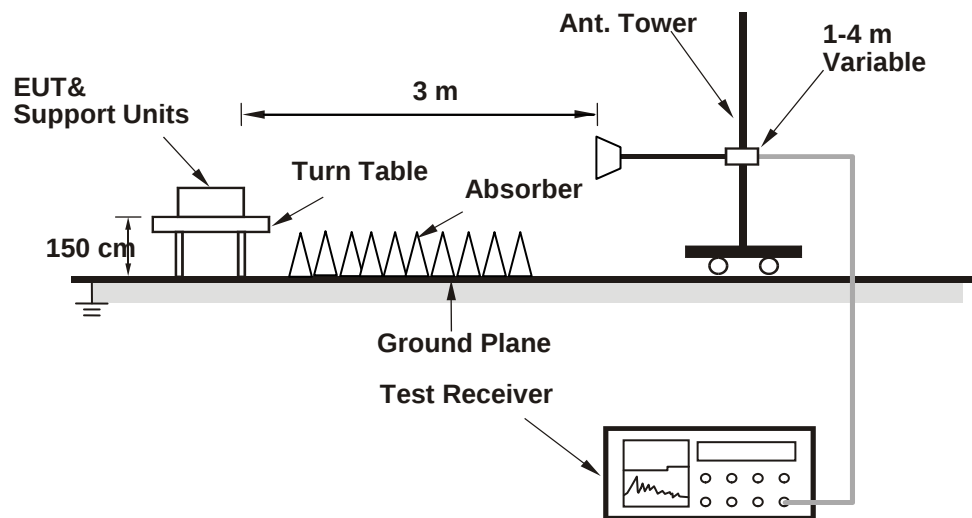
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission 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	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
2384.07	51.65	49.96	54	-2.35	31.78	5.4	35.49	100	227	Average
2384.07	58.6	56.91	74	-15.4	31.78	5.4	35.49	100	227	Peak
2412	107.49	105.72			31.81	5.43	35.47	100	227	Average
2412	110.4	108.63			31.81	5.43	35.47	100	227	Peak
4824	39.92	31.79	54	-14.08	33.97	8.26	34.1	136	205	Average
4824	47.66	39.53	74	-26.34	33.97	8.26	34.1	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
2383.8	50.26	48.57	54	-3.74	31.78	5.4	35.49	200	260	Average
2383.8	58.16	56.47	74	-15.84	31.78	5.4	35.49	200	260	Peak
2412	106.65	104.88			31.81	5.43	35.47	200	260	Average
2412	109.32	107.55			31.81	5.43	35.47	200	260	Peak
4824	39.99	31.86	54	-14.01	33.97	8.26	34.1	136	336	Average
4824	47.55	39.42	74	-26.45	33.97	8.26	34.1	136	336	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
2389.56	44.13	42.42	54	-9.87	31.8	5.4	35.49	100	227	Average
2389.56	56.32	54.61	74	-17.68	31.8	5.4	35.49	100	227	Peak
2437	107.46	105.61			31.85	5.46	35.46	100	227	Average
2437	110.76	108.91			31.85	5.46	35.46	100	227	Peak
2484.04	44.74	42.78	54	-9.26	31.88	5.5	35.42	100	227	Average
2484.04	55.99	54.03	74	-18.01	31.88	5.5	35.42	100	227	Peak
4874	39.87	31.68	54	-14.13	33.98	8.27	34.06	148	195	Average
4874	47.48	39.29	74	-26.52	33.98	8.27	34.06	148	195	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
2384.79	43.26	41.57	54	-10.74	31.78	5.4	35.49	200	260	Average
2384.79	54.33	52.64	74	-19.67	31.78	5.4	35.49	200	260	Peak
2437	106.52	104.67			31.85	5.46	35.46	200	260	Average
2437	109.58	107.73			31.85	5.46	35.46	200	260	Peak
2485.56	43.47	41.48	54	-10.53	31.88	5.53	35.42	200	260	Average
2485.56	55.05	53.06	74	-18.95	31.88	5.53	35.42	200	260	Peak
4874	40.19	32	54	-13.81	33.98	8.27	34.06	154	250	Average
4874	46.51	38.32	74	-27.49	33.98	8.27	34.06	154	250	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	107.4	105.47			31.87	5.5	35.44	100	227	Average
2462	110.46	108.53			31.87	5.5	35.44	100	227	Peak
2483.52	48.94	46.98	54	-5.06	31.88	5.5	35.42	100	227	Average
2483.52	58.12	56.16	74	-15.88	31.88	5.5	35.42	100	227	Peak
4924	39.83	31.58	54	-14.17	33.99	8.28	34.02	135	5	Average
4924	49.95	41.7	74	-24.05	33.99	8.28	34.02	135	5	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	106.36	104.43			31.87	5.5	35.44	200	260	Average
2462	109.96	108.03			31.87	5.5	35.44	200	260	Peak
2483.52	47.45	45.49	54	-6.55	31.88	5.5	35.42	200	260	Average
2483.52	56.87	54.91	74	-17.13	31.88	5.5	35.42	200	260	Peak
4924	40.13	31.88	54	-13.87	33.99	8.28	34.02	109	205	Average
4924	48.2	39.95	74	-25.8	33.99	8.28	34.02	109	205	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	51.85	50.12	54	-2.15	31.8	5.4	35.47	100	227	Average
2389.92	63.15	61.42	74	-10.85	31.8	5.4	35.47	100	227	Peak
2412	100.25	98.48			31.81	5.43	35.47	100	227	Average
2412	107.69	105.92			31.81	5.43	35.47	100	227	Peak
4824	39.92	31.79	54	-14.08	33.97	8.26	34.1	159	255	Average
4824	45.81	37.68	74	-28.19	33.97	8.26	34.1	159	255	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	50.46	48.73	54	-3.54	31.8	5.4	35.47	200	260	Average
2389.92	61.78	60.05	74	-12.22	31.8	5.4	35.47	200	260	Peak
2412	99.62	97.85			31.81	5.43	35.47	200	260	Average
2412	106.91	105.14			31.81	5.43	35.47	200	260	Peak
4824	40.13	32	54	-13.87	33.97	8.26	34.1	118	24	Average
4824	46.31	38.18	74	-27.69	33.97	8.26	34.1	118	24	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
2389.74	44.89	43.18	54	-9.11	31.8	5.4	35.49	100	227	Average
2389.74	55.67	53.96	74	-18.33	31.8	5.4	35.49	100	227	Peak
2437	102.57	100.72			31.85	5.46	35.46	100	227	Average
2437	109.33	107.48			31.85	5.46	35.46	100	227	Peak
2483.52	45.03	43.07	54	-8.97	31.88	5.5	35.42	100	227	Average
2483.52	55.72	53.76	74	-18.28	31.88	5.5	35.42	100	227	Peak
4874	40.19	32	54	-13.81	33.98	8.27	34.06	124	314	Average
4874	46.31	38.12	74	-27.69	33.98	8.27	34.06	124	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
2384.7	44.05	42.36	54	-9.95	31.78	5.4	35.49	200	260	Average
2384.7	54.7	53.01	74	-19.3	31.78	5.4	35.49	200	260	Peak
2437	101.14	99.29			31.85	5.46	35.46	200	260	Average
2437	108.49	106.64			31.85	5.46	35.46	200	260	Peak
2485.12	44.1	42.11	54	-9.9	31.88	5.53	35.42	200	260	Average
2485.12	54.99	53	74	-19.01	31.88	5.53	35.42	200	260	Peak
4874	39.88	31.69	54	-14.12	33.98	8.27	34.06	107	207	Average
4874	46.41	38.22	74	-27.59	33.98	8.27	34.06	107	207	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	98.25	96.32			31.87	5.5	35.44	100	227	Average
2462	105.16	103.23			31.87	5.5	35.44	100	227	Peak
2483.52	49.44	47.48	54	-4.56	31.88	5.5	35.42	100	227	Average
2483.52	61.01	59.05	74	-12.99	31.88	5.5	35.42	100	227	Peak
4924	40.2	31.95	54	-13.8	33.99	8.28	34.02	134	346	Average
4924	48.59	40.34	74	-25.41	33.99	8.28	34.02	134	346	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	97.77	95.84			31.87	5.5	35.44	200	260	Average
2462	104.05	102.12			31.87	5.5	35.44	200	260	Peak
2483.52	47.74	45.78	54	-6.26	31.88	5.5	35.42	200	260	Average
2483.52	58.28	56.32	74	-15.72	31.88	5.5	35.42	200	260	Peak
4924	40.02	31.77	54	-13.98	33.99	8.28	34.02	148	204	Average
4924	48.95	40.7	74	-25.05	33.99	8.28	34.02	148	204	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
2389.92	49.38	47.65	54	-4.62	31.8	5.4	35.47	100	227	Average
2389.92	60.33	58.6	74	-13.67	31.8	5.4	35.47	100	227	Peak
2412	99.95	98.18			31.81	5.43	35.47	100	227	Average
2412	106.87	105.1			31.81	5.43	35.47	100	227	Peak
4824	40.02	31.89	54	-13.98	33.97	8.26	34.1	132	225	Average
4824	47.29	39.16	74	-26.71	33.97	8.26	34.1	132	225	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	48.32	46.59	54	-5.68	31.8	5.4	35.47	200	260	Average
2389.92	59.34	57.61	74	-14.66	31.8	5.4	35.47	200	260	Peak
2412	98.58	96.81			31.81	5.43	35.47	200	260	Average
2412	105.15	103.38			31.81	5.43	35.47	200	260	Peak
4824	40.02	31.89	54	-13.98	33.97	8.26	34.1	135	246	Average
4824	46.06	37.93	74	-27.94	33.97	8.26	34.1	135	246	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
2388.84	44.82	43.11	54	-9.18	31.8	5.4	35.49	100	227	Average
2388.84	55.55	53.84	74	-18.45	31.8	5.4	35.49	100	227	Peak
2437	102.45	100.6			31.85	5.46	35.46	100	227	Average
2437	109.71	107.86			31.85	5.46	35.46	100	227	Peak
2483.88	44.83	42.87	54	-9.17	31.88	5.5	35.42	100	227	Average
2483.88	55.89	53.93	74	-18.11	31.88	5.5	35.42	100	227	Peak
4874	40.85	32.66	54	-13.15	33.98	8.27	34.06	154	166	Average
4874	46.85	38.66	74	-27.15	33.98	8.27	34.06	154	166	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
2389.56	44.1	42.39	54	-9.9	31.8	5.4	35.49	200	260	Average
2389.56	54.92	53.21	74	-19.08	31.8	5.4	35.49	200	260	Peak
2437	101.49	99.64			31.85	5.46	35.46	200	260	Average
2437	108.08	106.23			31.85	5.46	35.46	200	260	Peak
2484.72	43.83	41.84	54	-10.17	31.88	5.53	35.42	200	260	Average
2484.72	55.01	53.02	74	-18.99	31.88	5.53	35.42	200	260	Peak
4874	40.21	32.02	54	-13.79	33.98	8.27	34.06	153	155	Average
4874	46.06	37.87	74	-27.94	33.98	8.27	34.06	153	155	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	99.65	97.72			31.87	5.5	35.44	100	227	Average
2462	106.37	104.44			31.87	5.5	35.44	100	227	Peak
2483.6	49.54	47.58	54	-4.46	31.88	5.5	35.42	100	227	Average
2483.6	62.39	60.43	74	-11.61	31.88	5.5	35.42	100	227	Peak
4924	40.13	31.88	54	-13.87	33.99	8.28	34.02	124	222	Average
4924	49.58	41.33	74	-24.42	33.99	8.28	34.02	124	222	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	98.65	96.72			31.87	5.5	35.44	200	260	Average
2462	105.57	103.64			31.87	5.5	35.44	200	260	Peak
2483.8	48.16	46.2	54	-5.84	31.88	5.5	35.42	200	260	Average
2483.8	59.35	57.39	74	-14.65	31.88	5.5	35.42	200	260	Peak
4924	40.2	31.95	54	-13.8	33.99	8.28	34.02	159	9	Average
4924	48.77	40.52	74	-25.23	33.99	8.28	34.02	159	9	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
2389.47	53	51.29	54	-1	31.8	5.4	35.49	100	227	Average
2389.47	69.19	67.48	74	-4.81	31.8	5.4	35.49	100	227	Peak
2422	96.65	94.85			31.83	5.43	35.46	100	227	Average
2422	103.82	102.02			31.83	5.43	35.46	100	227	Peak
2483.68	44.41	42.45	54	-9.59	31.88	5.5	35.42	100	227	Average
2483.68	59.87	57.91	74	-14.13	31.88	5.5	35.42	100	227	Peak
4844	40.92	32.77	54	-13.08	33.97	8.26	34.08	114	202	Average
4844	47.19	39.04	74	-26.81	33.97	8.26	34.08	114	202	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
2389.11	52.85	51.14	54	-1.15	31.8	5.4	35.49	200	260	Average
2389.11	66.51	64.8	74	-7.49	31.8	5.4	35.49	200	260	Peak
2422	95.62	93.82			31.83	5.43	35.46	200	260	Average
2422	102.4	100.6			31.83	5.43	35.46	200	260	Peak
2484.68	44.12	42.13	54	-9.88	31.88	5.53	35.42	200	260	Average
2484.68	60.38	58.39	74	-13.62	31.88	5.53	35.42	200	260	Peak
4844	40.74	32.59	54	-13.26	33.97	8.26	34.08	159	99	Average
4844	46.21	38.06	74	-27.79	33.97	8.26	34.08	159	99	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
2389.83	51.22	49.49	54	-2.78	31.8	5.4	35.47	100	227	Average
2389.83	66.72	64.99	74	-7.28	31.8	5.4	35.47	100	227	Peak
2437	97.49	95.64			31.85	5.46	35.46	100	227	Average
2437	104.67	102.82			31.85	5.46	35.46	100	227	Peak
2483.52	52.61	50.65	54	-1.39	31.88	5.5	35.42	100	227	Average
2483.52	64.88	62.92	74	-9.12	31.88	5.5	35.42	100	227	Peak
4874	41.19	33	54	-12.81	33.98	8.27	34.06	195	34	Average
4874	46.95	38.76	74	-27.05	33.98	8.27	34.06	195	34	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	49.96	48.23	54	-4.04	31.8	5.4	35.47	200	260	Average
2389.92	66.22	64.49	74	-7.78	31.8	5.4	35.47	200	260	Peak
2437	96.65	94.8			31.85	5.46	35.46	200	260	Average
2437	103.75	101.9			31.85	5.46	35.46	200	260	Peak
2483.52	50.72	48.76	54	-3.28	31.88	5.5	35.42	200	260	Average
2483.52	63.07	61.11	74	-10.93	31.88	5.5	35.42	200	260	Peak
4874	41.15	32.96	54	-12.85	33.98	8.27	34.06	159	175	Average
4874	46.11	37.92	74	-27.89	33.98	8.27	34.06	159	175	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)	Preamplifier Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.65	44.34	42.63	54	-9.66	31.8	5.4	35.49	100	227	Average
2389.65	61.37	59.66	74	-12.63	31.8	5.4	35.49	100	227	Peak
2452	94.47	92.6			31.85	5.46	35.44	100	227	Average
2452	101.41	99.54			31.85	5.46	35.44	100	227	Peak
2483.64	52.68	50.72	54	-1.32	31.88	5.5	35.42	100	227	Average
2483.64	66.27	64.31	74	-7.73	31.88	5.5	35.42	100	227	Peak
4904	40.96	32.74	54	-13.04	33.98	8.28	34.04	147	285	Average
4904	47.99	39.77	74	-26.01	33.98	8.28	34.04	147	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)	Preamplifier Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2385.96	43.55	41.84	54	-10.45	31.8	5.4	35.49	200	260	Average
2385.96	61.42	59.71	74	-12.58	31.8	5.4	35.49	200	260	Peak
2452	93.65	91.78			31.85	5.46	35.44	200	260	Average
2452	100.48	98.61			31.85	5.46	35.44	200	260	Peak
2483.64	50.98	49.02	54	-3.02	31.88	5.5	35.42	200	260	Average
2483.64	64.36	62.4	74	-9.64	31.88	5.5	35.42	200	260	Peak
4904	41.08	32.86	54	-12.92	33.98	8.28	34.04	135	209	Average
4904	46.86	38.64	74	-27.14	33.98	8.28	34.04	135	209	Peak

Remarks:

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

Mode B
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
2373.9	43.05	41.39	54	-10.95	31.78	5.37	35.49	189	117	Average
2373.9	54.5	52.84	74	-19.5	31.78	5.37	35.49	189	117	Peak
2412	104.47	102.7			31.81	5.43	35.47	189	117	Average
2412	107.09	105.32			31.81	5.43	35.47	189	117	Peak
4824	37.56	29.43	54	-16.44	33.97	8.26	34.1	112	69	Average
4824	47.16	39.03	74	-26.84	33.97	8.26	34.1	112	69	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	46.6	44.87	54	-7.4	31.8	5.4	35.47	226	146	Average
2389.92	56.84	55.11	74	-17.16	31.8	5.4	35.47	226	146	Peak
2412	108.36	106.59			31.81	5.43	35.47	226	146	Average
2412	111.1	109.33			31.81	5.43	35.47	226	146	Peak
4824	36.49	28.36	54	-17.51	33.97	8.26	34.1	147	115	Average
4824	46.86	38.73	74	-27.14	33.97	8.26	34.1	147	115	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
4. 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
2387.67	41.56	39.85	54	-12.44	31.8	5.4	35.49	189	117	Average
2387.67	52.48	50.77	74	-21.52	31.8	5.4	35.49	189	117	Peak
2437	104.28	102.43			31.85	5.46	35.46	189	117	Average
2437	107.74	105.89			31.85	5.46	35.46	189	117	Peak
2485.48	42.38	40.39	54	-11.62	31.88	5.53	35.42	189	117	Average
2485.48	53.38	51.39	74	-20.62	31.88	5.53	35.42	189	117	Peak
4874	37.84	29.65	54	-16.16	33.98	8.27	34.06	166	239	Average
4874	47.65	39.46	74	-26.35	33.98	8.27	34.06	166	239	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	44.05	42.34	54	-9.95	31.8	5.4	35.49	226	146	Average
2389.65	54.53	52.82	74	-19.47	31.8	5.4	35.49	226	146	Peak
2437	108.65	106.8			31.85	5.46	35.46	226	146	Average
2437	111.47	109.62			31.85	5.46	35.46	226	146	Peak
2485.32	44.89	42.9	54	-9.11	31.88	5.53	35.42	226	146	Average
2485.32	56.12	54.13	74	-17.88	31.88	5.53	35.42	226	146	Peak
4874	36.71	28.52	54	-17.29	33.98	8.27	34.06	164	153	Average
4874	46.39	38.2	74	-27.61	33.98	8.27	34.06	164	153	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	105.66	103.73			31.87	5.5	35.44	189	117	Average
2462	108.93	107			31.87	5.5	35.44	189	117	Peak
2484.6	44.08	42.09	54	-9.92	31.88	5.53	35.42	189	117	Average
2484.6	54.43	52.44	74	-19.57	31.88	5.53	35.42	189	117	Peak
4924	39.22	30.97	54	-14.78	33.99	8.28	34.02	175	122	Average
4924	48.89	40.64	74	-25.11	33.99	8.28	34.02	175	122	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	109.62	107.69			31.87	5.5	35.44	226	146	Average
2462	112.52	110.59			31.87	5.5	35.44	226	146	Peak
2484.88	48.07	46.08	54	-5.93	31.88	5.53	35.42	226	146	Average
2484.88	58.26	56.27	74	-15.74	31.88	5.53	35.42	226	146	Peak
4924	38.01	29.76	54	-15.99	33.99	8.28	34.02	123	169	Average
4924	47.89	39.64	74	-26.11	33.99	8.28	34.02	123	169	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

4. 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	44.96	43.23	54	-9.04	31.8	5.4	35.47	189	117	Average
2389.92	55.81	54.08	74	-18.19	31.8	5.4	35.47	189	117	Peak
2412	97.49	95.72			31.81	5.43	35.47	189	117	Average
2412	104.82	103.05			31.81	5.43	35.47	189	117	Peak
4824	37.25	29.12	54	-16.75	33.97	8.26	34.1	129	307	Average
4824	46.25	38.12	74	-27.75	33.97	8.26	34.1	129	307	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	49.35	47.62	54	-4.65	31.8	5.4	35.47	226	146	Average
2389.92	61.22	59.49	74	-12.78	31.8	5.4	35.47	226	146	Peak
2412	101.49	99.72			31.81	5.43	35.47	226	146	Average
2412	108.63	106.86			31.81	5.43	35.47	226	146	Peak
4824	37.7	29.57	54	-16.3	33.97	8.26	34.1	112	326	Average
4824	47.14	39.01	74	-26.86	33.97	8.26	34.1	112	326	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

4. 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
2388.84	41.49	39.78	54	-12.51	31.8	5.4	35.49	189	117	Average
2388.84	52.73	51.02	74	-21.27	31.8	5.4	35.49	189	117	Peak
2437	99.8	97.95			31.85	5.46	35.46	189	117	Average
2437	106.92	105.07			31.85	5.46	35.46	189	117	Peak
2484.36	42.24	40.25	54	-11.76	31.88	5.53	35.42	189	117	Average
2484.36	53.58	51.59	74	-20.42	31.88	5.53	35.42	189	117	Peak
4874	37.22	29.03	54	-16.78	33.98	8.27	34.06	186	76	Average
4874	46.88	38.69	74	-27.12	33.98	8.27	34.06	186	76	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
2388.75	44.23	42.52	54	-9.77	31.8	5.4	35.49	226	146	Average
2388.75	54.5	52.79	74	-19.5	31.8	5.4	35.49	226	146	Peak
2437	103.47	101.62			31.85	5.46	35.46	226	146	Average
2437	110.07	108.22			31.85	5.46	35.46	226	146	Peak
2484.2	45.15	43.16	54	-8.85	31.88	5.53	35.42	226	146	Average
2484.2	55.63	53.64	74	-18.37	31.88	5.53	35.42	226	146	Peak
4874	36.05	27.86	54	-17.95	33.98	8.27	34.06	125	218	Average
4874	45.67	37.48	74	-28.33	33.98	8.27	34.06	125	218	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
4. 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	96.66	94.73			31.87	5.5	35.44	189	117	Average
2462	103.86	101.93			31.87	5.5	35.44	189	117	Peak
2483.52	44.94	42.98	54	-9.06	31.88	5.5	35.42	189	117	Average
2483.52	55.51	53.55	74	-18.49	31.88	5.5	35.42	189	117	Peak
4924	37.23	28.98	54	-16.77	33.99	8.28	34.02	121	90	Average
4924	46.72	38.47	74	-27.28	33.99	8.28	34.02	121	90	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	100.98	99.05			31.87	5.5	35.44	226	146	Average
2462	107.81	105.88			31.87	5.5	35.44	226	146	Peak
2483.56	49.17	47.21	54	-4.83	31.88	5.5	35.42	226	146	Average
2483.56	60.33	58.37	74	-13.67	31.88	5.5	35.42	226	146	Peak
4924	39.07	30.82	54	-14.93	33.99	8.28	34.02	193	252	Average
4924	48.66	40.41	74	-25.34	33.99	8.28	34.02	193	252	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

4. 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
2389.92	44.6	42.87	54	-9.4	31.8	5.4	35.47	189	117	Average
2389.92	55.97	54.24	74	-18.03	31.8	5.4	35.47	189	117	Peak
2412	96.75	94.98			31.81	5.43	35.47	189	117	Average
2412	103.83	102.06			31.81	5.43	35.47	189	117	Peak
4824	38.1	29.97	54	-15.9	33.97	8.26	34.1	183	224	Average
4824	47.72	39.59	74	-26.28	33.97	8.26	34.1	183	224	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	48.7	46.97	54	-5.3	31.8	5.4	35.47	226	146	Average
2389.92	59.43	57.7	74	-14.57	31.8	5.4	35.47	226	146	Peak
2412	100.24	98.47			31.81	5.43	35.47	226	146	Average
2412	107.41	105.64			31.81	5.43	35.47	226	146	Peak
4824	36.63	28.5	54	-17.37	33.97	8.26	34.1	126	143	Average
4824	46.12	37.99	74	-27.88	33.97	8.26	34.1	126	143	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

4. 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
2389.65	41.56	39.85	54	-12.44	31.8	5.4	35.49	189	117	Average
2389.65	52.35	50.64	74	-21.65	31.8	5.4	35.49	189	117	Peak
2437	100.2	98.35			31.85	5.46	35.46	189	117	Average
2437	107.23	105.38			31.85	5.46	35.46	189	117	Peak
2483.64	42.35	40.39	54	-11.65	31.88	5.5	35.42	189	117	Average
2483.64	53.5	51.54	74	-20.5	31.88	5.5	35.42	189	117	Peak
4874	37.05	28.86	54	-16.95	33.98	8.27	34.06	120	153	Average
4874	46.51	38.32	74	-27.49	33.98	8.27	34.06	120	153	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
2389.83	44.45	42.72	54	-9.55	31.8	5.4	35.47	226	146	Average
2389.83	55.03	53.3	74	-18.97	31.8	5.4	35.47	226	146	Peak
2437	104.37	102.52			31.85	5.46	35.46	226	146	Average
2437	111.86	110.01			31.85	5.46	35.46	226	146	Peak
2483.68	45.16	43.2	54	-8.84	31.88	5.5	35.42	226	146	Average
2483.68	56.19	54.23	74	-17.81	31.88	5.5	35.42	226	146	Peak
4874	36.68	28.49	54	-17.32	33.98	8.27	34.06	130	286	Average
4874	46.33	38.14	74	-27.67	33.98	8.27	34.06	130	286	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	96.62	94.69			31.87	5.5	35.44	189	117	Average
2462	103.76	101.83			31.87	5.5	35.44	189	117	Peak
2483.84	45.32	43.36	54	-8.68	31.88	5.5	35.42	189	117	Average
2483.84	56.77	54.81	74	-17.23	31.88	5.5	35.42	189	117	Peak
4924	37.61	29.36	54	-16.39	33.99	8.28	34.02	136	58	Average
4924	47.01	38.76	74	-26.99	33.99	8.28	34.02	136	58	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	100.74	98.81			31.87	5.5	35.44	226	146	Average
2462	107.4	105.47			31.87	5.5	35.44	226	146	Peak
2483.68	49.97	48.01	54	-4.03	31.88	5.5	35.42	226	146	Average
2483.68	61.46	59.5	74	-12.54	31.88	5.5	35.42	226	146	Peak
4924	37.34	29.09	54	-16.66	33.99	8.28	34.02	118	76	Average
4924	46.94	38.69	74	-27.06	33.99	8.28	34.02	118	76	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

4. 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
2389.29	48.26	46.55	54	-5.74	31.8	5.4	35.49	189	117	Average
2389.29	63.8	62.09	74	-10.2	31.8	5.4	35.49	189	117	Peak
2422	91.52	89.72			31.83	5.43	35.46	189	117	Average
2422	99.26	97.46			31.83	5.43	35.46	189	117	Peak
2483.88	43.45	41.49	54	-10.55	31.88	5.5	35.42	189	117	Average
2483.88	57.56	55.6	74	-16.44	31.88	5.5	35.42	189	117	Peak
4844	37.26	29.11	54	-16.74	33.97	8.26	34.08	108	181	Average
4844	46.61	38.46	74	-27.39	33.97	8.26	34.08	108	181	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	51.73	50	54	-2.27	31.8	5.4	35.47	220	208	Average
2389.92	66.94	65.21	74	-7.06	31.8	5.4	35.47	220	208	Peak
2422	95.15	93.35			31.83	5.43	35.46	220	202	Average
2422	102.91	101.11			31.83	5.43	35.46	220	202	Peak
2483.96	46.21	44.25	54	-7.79	31.88	5.5	35.42	220	208	Average
2483.96	60.08	58.12	74	-13.92	31.88	5.5	35.42	220	208	Peak
4844	37.54	29.39	54	-16.46	33.97	8.26	34.08	124	180	Average
4844	47.1	38.95	74	-26.9	33.97	8.26	34.08	124	180	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

4. 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
2389.92	47.12	45.39	54	-6.88	31.8	5.4	35.47	189	117	Average
2389.92	63.73	62	74	-10.27	31.8	5.4	35.47	189	117	Peak
2437	95.17	93.32			31.85	5.46	35.46	189	117	Average
2437	102.76	100.91			31.85	5.46	35.46	189	117	Peak
2483.52	50.09	48.13	54	-3.91	31.88	5.5	35.42	189	117	Average
2483.52	62.17	60.21	74	-11.83	31.88	5.5	35.42	189	117	Peak
4874	37.18	28.99	54	-16.82	33.98	8.27	34.06	175	155	Average
4874	46.5	38.31	74	-27.5	33.98	8.27	34.06	175	155	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	49.76	48.05	54	-4.24	31.8	5.4	35.49	226	146	Average
2389.74	66.83	65.12	74	-7.17	31.8	5.4	35.49	226	146	Peak
2437	96.44	94.59			31.85	5.46	35.46	226	146	Average
2437	105.31	103.46			31.85	5.46	35.46	226	146	Peak
2483.52	52.04	50.08	54	-1.96	31.88	5.5	35.42	226	146	Average
2483.52	64.48	62.52	74	-9.52	31.88	5.5	35.42	226	146	Peak
4874	36.49	28.3	54	-17.51	33.98	8.27	34.06	111	68	Average
4874	46.02	37.83	74	-27.98	33.98	8.27	34.06	111	68	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)	Preamplifier Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2374.08	41.77	40.11	54	-12.23	31.78	5.37	35.49	189	117	Average
2374.08	56.58	54.92	74	-17.42	31.78	5.37	35.49	189	117	Peak
2452	91.65	89.78			31.85	5.46	35.44	189	117	Average
2452	98.21	96.34			31.85	5.46	35.44	189	117	Peak
2483.84	46.13	44.17	54	-7.87	31.88	5.5	35.42	189	117	Average
2483.84	59.48	57.52	74	-14.52	31.88	5.5	35.42	189	117	Peak
4904	37.51	29.29	54	-16.49	33.98	8.28	34.04	138	260	Average
4904	46.97	38.75	74	-27.03	33.98	8.28	34.04	138	260	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)	Preamplifier Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2387.49	43.8	42.09	54	-10.2	31.8	5.4	35.49	226	146	Average
2387.49	61.03	59.32	74	-12.97	31.8	5.4	35.49	226	146	Peak
2452	95.55	93.68			31.85	5.46	35.44	226	146	Average
2452	102.14	100.27			31.85	5.46	35.44	226	146	Peak
2483.72	50.81	48.85	54	-3.19	31.88	5.5	35.42	226	146	Average
2483.72	65.13	63.17	74	-8.87	31.88	5.5	35.42	226	146	Peak
4904	37.25	29.03	54	-16.75	33.98	8.28	34.04	152	199	Average
4904	46.7	38.48	74	-27.3	33.98	8.28	34.04	152	199	Peak

Remarks:

3. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamplifier Factor

Margin value = Emission level – Limit value

4. 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.

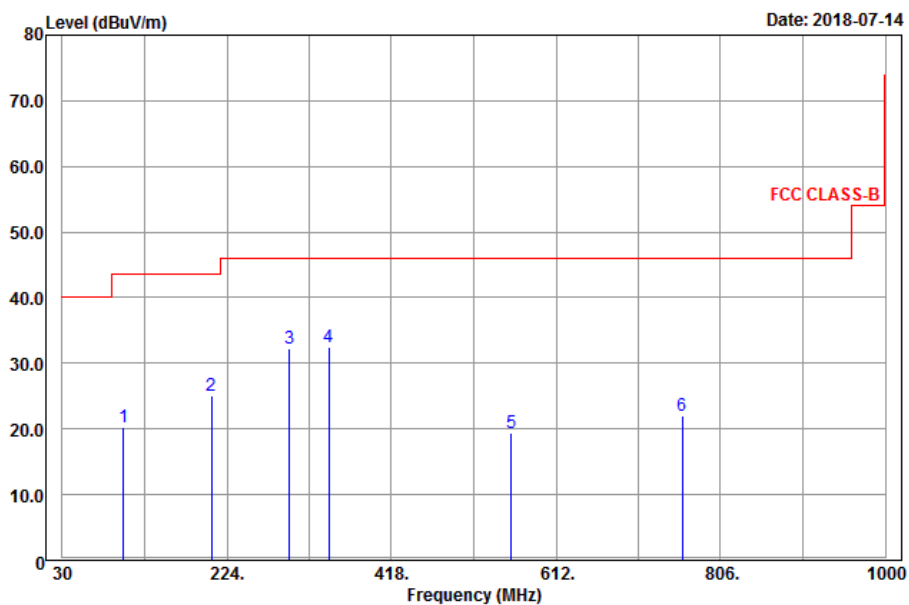
30 MHz ~ 1 GHz Worst-Case Data:

Mode A

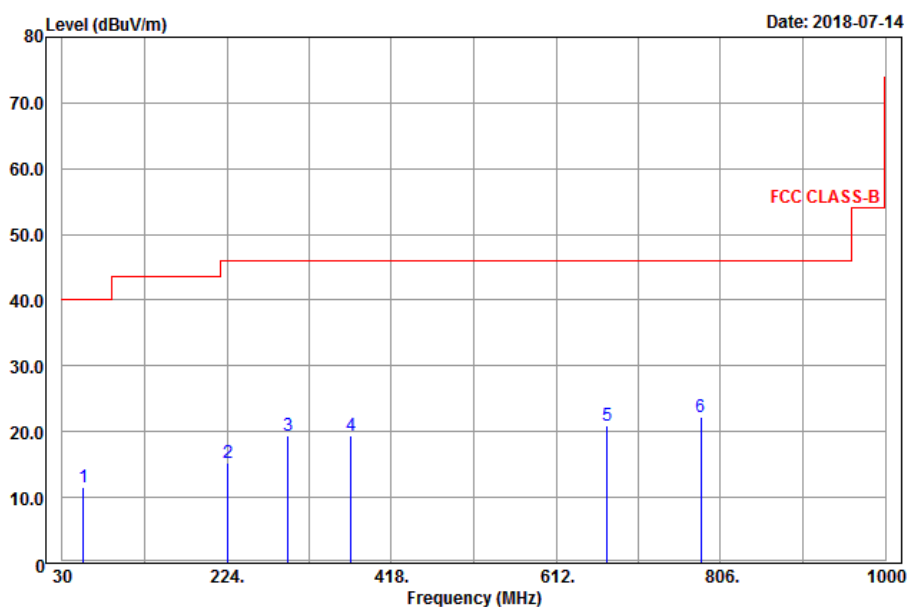
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	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

Horizontal



Vertical



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
102.36	20.36	38.98	43.5	-23.14	12.36	1.28	32.26	126	326	Peak
206.04	25.05	44.55	43.5	-18.45	11.12	1.65	32.27	146	22	Peak
297.84	32.29	49.37	46	-13.71	13.02	2.03	32.13	180	17	Peak
344.1	32.42	48.17	46	-13.58	14.13	2.19	32.07	187	147	Peak
559.7	19.39	31.55	46	-26.61	17.28	2.76	32.2	125	199	Peak
760.6	22.04	31.03	46	-23.96	19.92	3.22	32.13	176	169	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
54.84	11.49	28.68	40	-28.51	14.14	0.9	32.23	184	277	Peak
224.94	15.26	34.06	46	-30.74	11.55	1.85	32.2	154	197	Peak
296.49	19.42	36.52	46	-26.58	13	2.03	32.13	180	19	Peak
370.7	19.45	34.84	46	-26.55	14.48	2.26	32.13	187	99	Peak
672.4	21.01	31.28	46	-24.99	18.8	3.05	32.12	154	134	Peak
783	22.22	30.88	46	-23.78	20.16	3.27	32.09	124	201	Peak

Remarks:

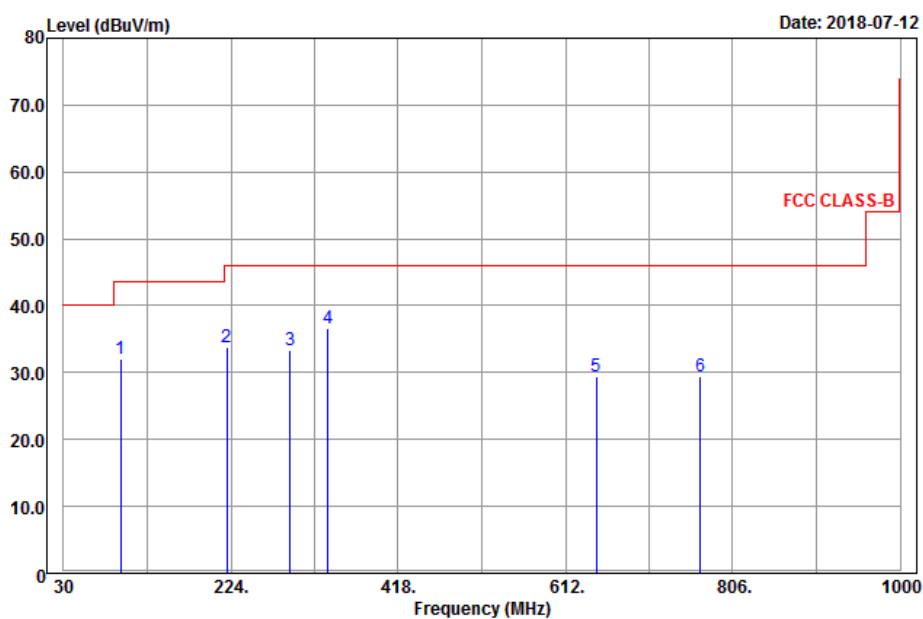
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value

Mode B

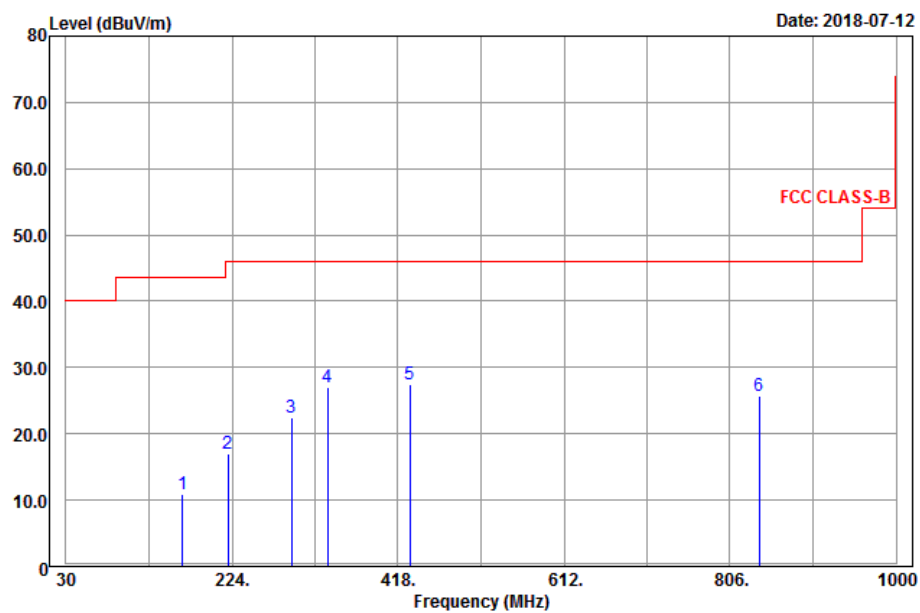
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	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

Horizontal



Vertical



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
95.88	32.09	51.1	43.5	-11.41	11.75	1.28	32.04	105	324	Peak
219	33.82	53.07	46	-12.18	11.32	1.65	32.22	113	326	Peak
292.71	33.45	50.63	46	-12.55	12.92	2.03	32.13	192	24	Peak
336.4	36.52	52.45	46	-9.48	13.97	2.19	32.09	169	95	Peak
647.9	29.33	40.08	46	-16.67	18.41	2.99	32.15	184	141	Peak
768.3	29.43	38.32	46	-16.57	20	3.22	32.11	176	255	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
166.35	10.8	32.54	43.5	-32.7	8.99	1.52	32.25	105	166	Peak
219.54	17	36.25	46	-29	11.32	1.65	32.22	194	214	Peak
293.79	22.48	39.64	46	-23.52	12.94	2.03	32.13	192	202	Peak
335.7	27.11	43.07	46	-18.89	13.94	2.19	32.09	135	266	Peak
431.6	27.57	41.99	46	-18.43	15.34	2.41	32.17	153	26	Peak
840.4	25.81	33.39	46	-20.19	20.89	3.38	31.85	194	5	Peak

Remarks:

2. 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. 23, 2017	Nov. 22, 2018
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN/AMN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.4	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

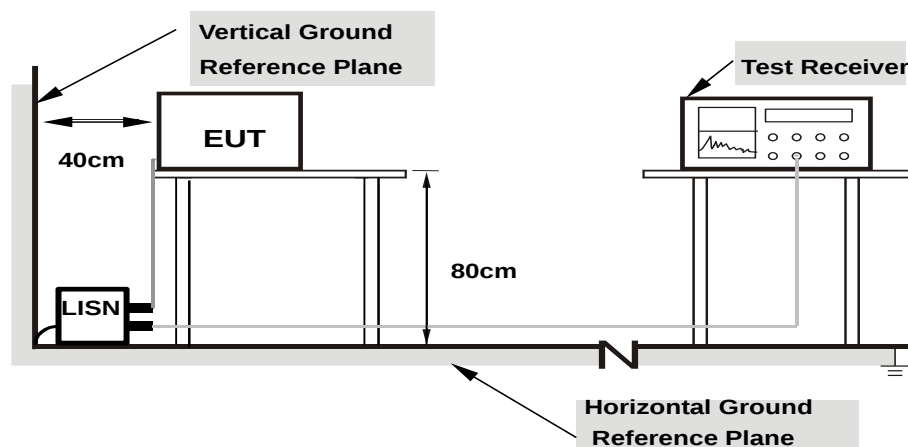
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling 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: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz - 30 MHz.

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 Condition

Set the EUT under transmission condition continuously at specific channel frequency.

4.2.7 Test Results

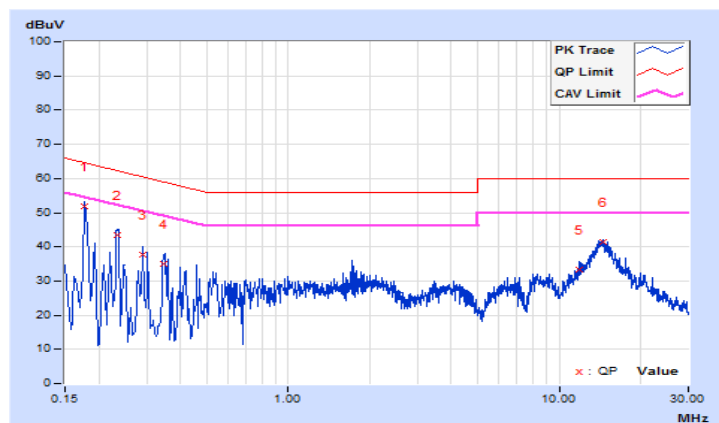
Mode A

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	Jisyong Wang	Test Date	2018/7/18

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17744	9.67	42.19	29.09	51.86	38.76	64.60	54.60	-12.74	-15.84
2	0.23277	9.67	33.62	20.42	43.29	30.09	62.35	52.35	-19.06	-22.26
3	0.29043	9.67	27.95	12.76	37.62	22.43	60.51	50.51	-22.89	-28.08
4	0.34560	9.67	25.51	11.86	35.18	21.53	59.07	49.07	-23.89	-27.54
5	11.90346	9.89	23.31	10.96	33.20	20.85	60.00	50.00	-26.80	-29.15
6	14.51534	9.91	31.62	17.24	41.53	27.15	60.00	50.00	-18.47	-22.85

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

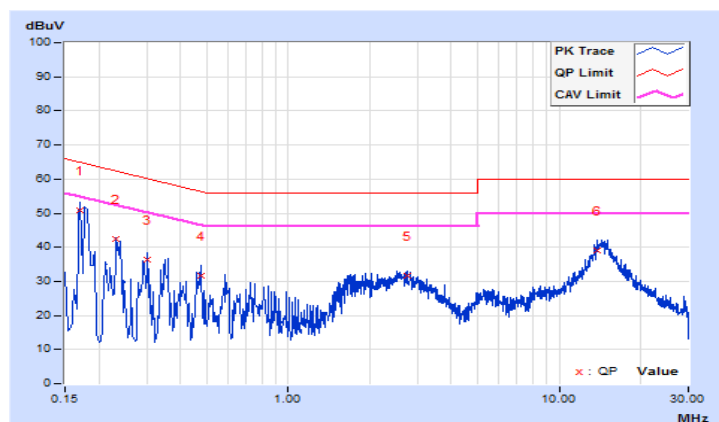


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2018/7/18

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16967	9.68	41.02	24.06	50.70	33.74	64.98	54.98	-14.28	-21.24
2	0.23216	9.68	32.75	18.73	42.43	28.41	62.37	52.37	-19.94	-23.96
3	0.30249	9.68	26.56	10.91	36.24	20.59	60.17	50.17	-23.93	-29.58
4	0.47844	9.68	21.99	8.98	31.67	18.66	56.37	46.37	-24.70	-27.71
5	2.76188	9.73	21.89	7.96	31.62	17.69	56.00	46.00	-24.38	-28.31
6	13.89365	9.95	29.20	15.79	39.15	25.74	60.00	50.00	-20.85	-24.26

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



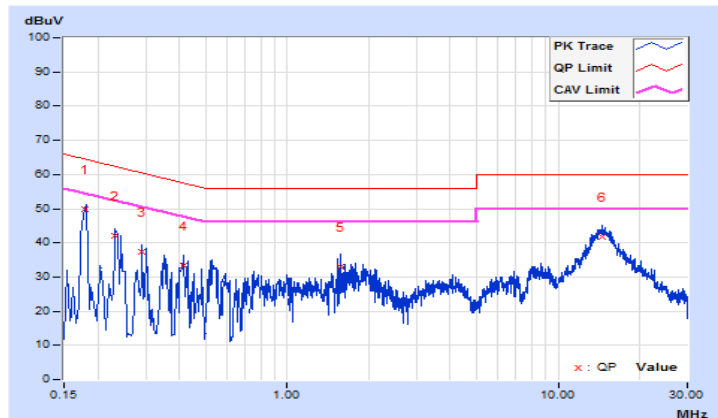
Mode B

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	Jisyong Wang	Test Date	2018/7/18

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17980	9.67	40.20	26.81	49.87	36.48	64.49	54.49	-14.62	-18.01
2	0.23216	9.67	32.48	18.81	42.15	28.48	62.37	52.37	-20.22	-23.89
3	0.29076	9.67	27.55	15.75	37.22	25.42	60.50	50.50	-23.28	-25.08
4	0.41588	9.67	23.50	8.90	33.17	18.57	57.53	47.53	-24.36	-28.96
5	1.56933	9.70	23.18	4.71	32.88	14.41	56.00	46.00	-23.12	-31.59
6	14.46451	9.91	31.71	15.50	41.62	25.41	60.00	50.00	-18.38	-24.59

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

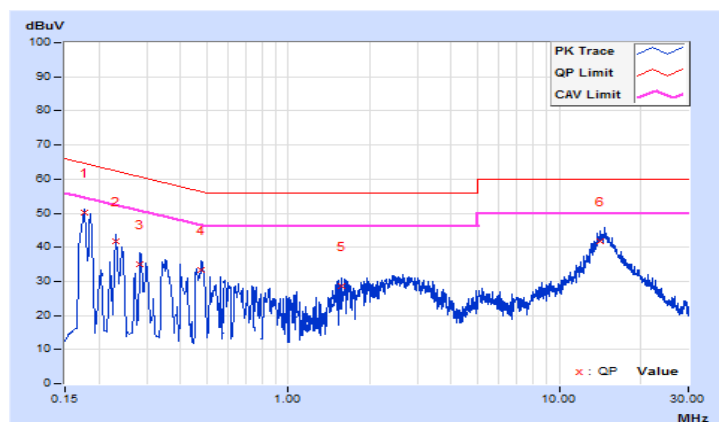


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2018/7/18

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17651	9.68	40.51	28.76	50.19	38.44	64.65	54.65	-14.46	-16.21
2	0.23211	9.68	32.10	18.52	41.78	28.20	62.37	52.37	-20.59	-24.17
3	0.28288	9.68	25.24	3.04	34.92	12.72	60.73	50.73	-25.81	-38.01
4	0.47915	9.68	23.78	10.84	33.46	20.52	56.35	46.35	-22.89	-25.83
5	1.56933	9.70	18.88	3.83	28.58	13.53	56.00	46.00	-27.42	-32.47
6	14.10088	9.95	31.72	17.29	41.67	27.24	60.00	50.00	-18.33	-22.76

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

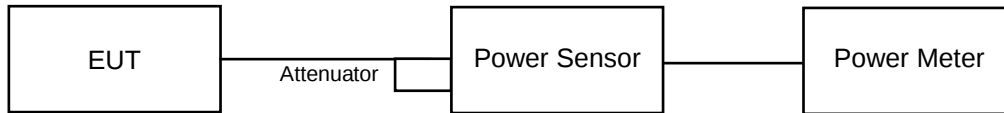


4.3 Conducted Output Power Measurement

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 (dBm)	Limit (dBm)	Pass / Fail
1	2412	23.10	30	Pass
6	2437	23.65	30	Pass
11	2462	23.53	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	22.61	30	Pass
6	2437	24.79	30	Pass
11	2462	22.10	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	22.34	30	Pass
6	2437	24.71	30	Pass
11	2462	21.42	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	20.30	30	Pass
6	2437	23.84	30	Pass
9	2452	19.31	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 FCC recognized accredited test firms and accredited 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.

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