Partial FCC Test Report

Report No.:	RF171212C20-5
FCC ID:	XMR201706SC20A
Test Model:	SC20-A
Received Date:	Dec. 12, 2017
Test Date:	Jan. 19, 2018 ~ Feb. 05, 2018
Issued Date:	Mar. 05, 2018
Applicant:	Quectel Wireless Solutions Co., Ltd.
Address:	7th Floor, Hongye Building, No. 1801 Hongmei Road, Xuhui District, Shanghai 200233, China
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location (1):	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF171212C20-5	Original Release	Mar. 05, 2018

1 Certificate of Conformity

Product:	LTE Module
Brand:	Quectel
Test Model:	SC20-A
Sample Status:	Identical Prototype
Applicant:	Quectel Wireless Solutions Co., Ltd.
Test Date:	Jan. 19, 2018 ~ Feb. 05, 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 : Vera Huang , **Date:** Mar. 05, 2018

Vera Huang / Specialist

Approved by : , **Date:** Mar. 05, 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 -4.49 dB at 0.51879 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.42 dB at 2483.56 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	N/A	Refer to Note
15.247(e)	Power Spectral Density	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note:
Only test item for Conducted Emissions and Radiated Emissions were performed for this report. For other test data, please refer to Sporton report No.: FR741007C for module (Brand: Quectel, Model: SC20-A).

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

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	LTE Module
Brand	Quectel
Test Model	SC20-A
Status of EUT	Identical Prototype
Power Supply Rating	5.0 Vdc (adapter) 7.26 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 -1.9 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT was installed in POS Terminal (Brand: CASTLES TECHNOLOGY, Model: SATURN1000).
2. The EUT provides one completed transmitter and one receiver.

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

   * The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Battery	CHENG UEI PRECISION INDUSTRY CO., LTD.	S1-26H	7.26 Vdc, 2600 mAh
USB Cable	TAYU	2000007X	1m shielded cable w/o core

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	-	-

Where **RE≥1G:** Radiated Emission above 1 GHz **RE<1G:** Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement
NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

Radiated Emission Test (Above 1 GHz):

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

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

Radiated Emission Test (Below 1 GHz):

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (HT20)	1 to 11	11	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)
-	802.11n (HT20)	1 to 11	11	OFDM	BPSK	MCS0

Test Condition:

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

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

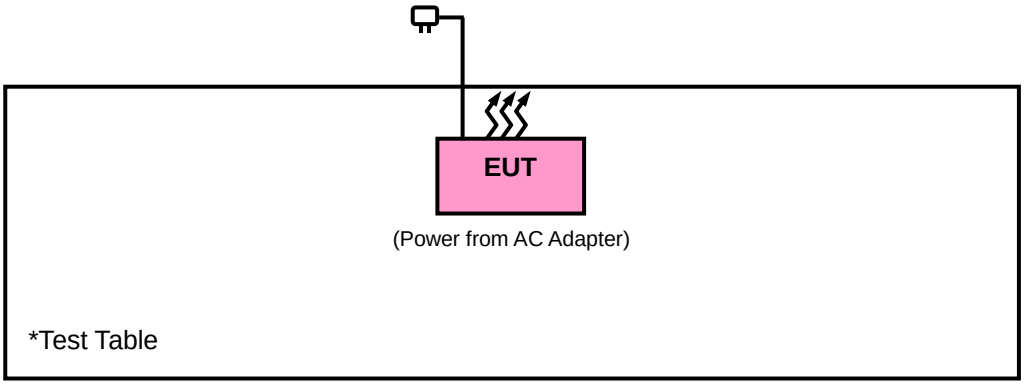
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Adapter	FSP	FSP010-FPDN	N/A	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1 was provided by client.

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 v04
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	N9038A	MY51210203	Feb. 17, 2017	Feb. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220314	Nov. 24, 2017	Nov. 23, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	100115	Nov. 23, 2017	Nov. 22, 2018
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier EMCI	EMC001340	980201	Nov. 01, 2017	Oct. 30, 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. 13, 2017	Oct. 12, 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 HUBER+SUHNNER	EMC104-SM-SM-8000&3000	140811+170717	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 20, 2017	Oct. 19, 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

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:

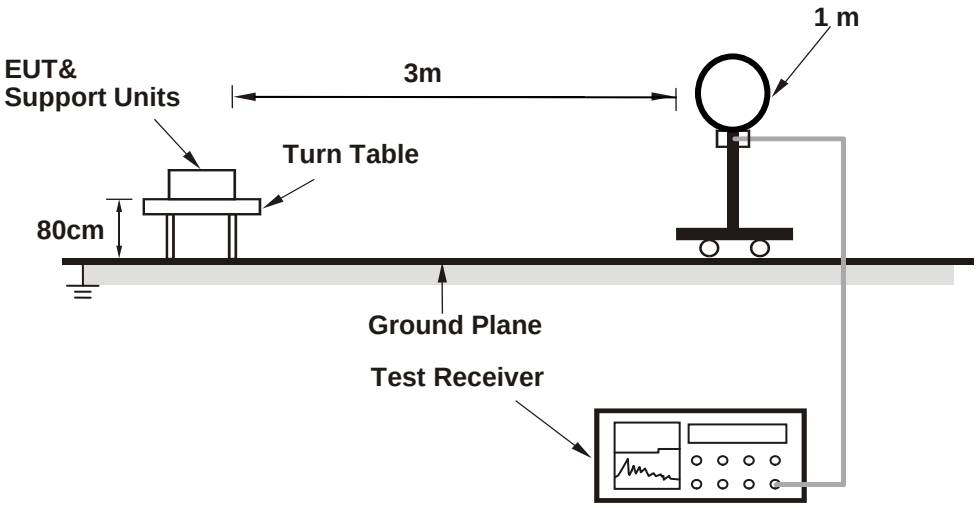
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 KHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency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

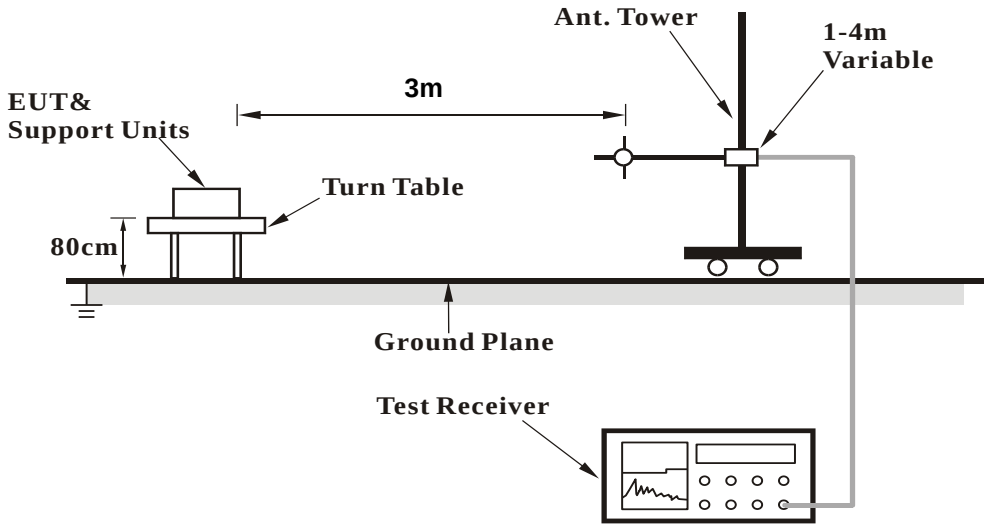
No deviation.

4.1.5 Test Set Up

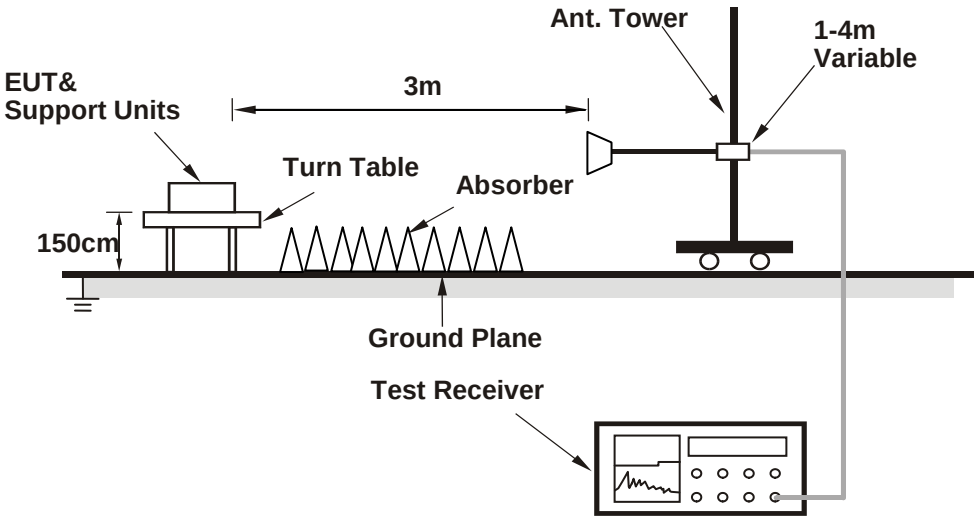
<Radiated emission below 30 MHz>



<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

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

4.1.7 Test Results

Above 1 GHz Data：

802.11b

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

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**
2389.94	39.64	45.64	54	-14.36	27.16	4.36	37.52	234	309	Average
2389.94	50.08	56.08	74	-23.92	27.16	4.36	37.52	234	309	Peak
2412	104.2	110.11			27.23	4.38	37.52	234	309	Average
2412	108.02	113.93			27.23	4.38	37.52	234	309	Peak
4824	33.61	48.52	54	-20.39	31.17	6.81	52.89	200	12	Average
4824	43.84	58.75	74	-30.16	31.17	6.81	52.89	200	12	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**
2389.94	36.1	42.1	54	-17.9	27.16	4.36	37.52	220	102	Average
2389.94	47.44	53.59	74	-26.56	27.01	4.33	37.49	220	102	Peak
2412	97.77	103.68			27.23	4.38	37.52	220	102	Average
2412	101.77	107.68			27.23	4.38	37.52	220	102	Peak
4824	33.18	48.46	54	-20.82	30.99	6.81	53.08	111	200	Average
4824	43.13	58.41	74	-30.87	30.99	6.81	53.08	111	200	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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**
2389.66	34.92	41.15	54	-19.08	26.91	4.36	37.5	230	310	Average
2389.66	47.63	53.93	74	-26.37	26.86	4.34	37.5	230	310	Peak
2437	106.21	112.21			27.06	4.4	37.46	230	310	Average
2437	109.96	115.96			27.06	4.4	37.46	230	310	Peak
2483.8	37.41	43.15	54	-16.59	27.15	4.43	37.32	230	310	Average
2483.8	50.35	56.09	74	-23.65	27.15	4.43	37.32	230	310	Peak
4874	35.9	50.65	54	-18.1	31.25	6.86	52.86	200	12	Average
4874	45.86	60.61	74	-28.14	31.25	6.86	52.86	200	12	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**
2388.68	34.53	40.51	54	-19.47	27.16	4.36	37.5	214	101	Average
2388.68	46.88	52.96	74	-27.12	27.08	4.34	37.5	214	101	Peak
2437	99.93	105.93			27.06	4.4	37.46	214	101	Average
2437	103.72	109.72			27.06	4.4	37.46	214	101	Peak
2484.08	35.69	41.05	54	-18.31	27.53	4.43	37.32	214	101	Average
2484.08	47.88	53.16	74	-26.12	27.61	4.43	37.32	214	101	Peak
4874	35.42	50.55	54	-18.58	31.06	6.86	53.05	110	201	Average
4874	45.42	60.55	74	-28.58	31.06	6.86	53.05	110	201	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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	105.64	111.16			27.46	4.41	37.39	228	310	Average
2462	109.44	114.96			27.46	4.41	37.39	228	310	Peak
2483.84	53.24	58.6	54	-0.76	27.53	4.43	37.32	228	310	Average
2483.84	58.46	63.82	74	-15.54	27.53	4.43	37.32	228	310	Peak
4924	35.57	50.23	54	-18.43	31.34	6.89	52.89	200	10	Average
4924	45.56	60.22	74	-28.44	31.34	6.89	52.89	200	10	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	99.3	104.82			27.46	4.41	37.39	231	98	Average
2462	103.1	108.62			27.46	4.41	37.39	231	98	Peak
2483.52	47.51	52.87	54	-6.49	27.53	4.43	37.32	231	98	Average
2483.52	54.82	60.18	74	-19.18	27.53	4.43	37.32	231	98	Peak
4924	33.71	48.73	54	-20.29	31.12	6.89	53.03	112	205	Average
4924	45.14	60.16	74	-28.86	31.12	6.89	53.03	112	205	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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**
2389.94	53.55	59.55	54	-0.45	27.16	4.36	37.52	234	311	Average
2389.94	71.55	77.55	74	-2.45	27.16	4.36	37.52	234	311	Peak
2412	99.26	105.17			27.23	4.38	37.52	234	311	Average
2412	108.68	114.59			27.23	4.38	37.52	234	311	Peak
4824	33.8	48.71	54	-20.2	31.17	6.81	52.89	110	15	Average
4824	44.3	59.21	74	-29.7	31.17	6.81	52.89	110	15	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**
2389.94	46.99	52.99	54	-7.01	27.16	4.36	37.52	237	102	Average
2389.94	65.24	71.22	74	-8.76	27.16	4.36	37.5	237	102	Peak
2412	93.08	98.99			27.23	4.38	37.52	237	102	Average
2412	102.85	108.76			27.23	4.38	37.52	237	102	Peak
4824	33.46	48.74	54	-20.54	30.99	6.81	53.08	109	204	Average
4824	43.32	58.6	74	-30.68	30.99	6.81	53.08	109	204	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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**
2389.94	36.72	42.72	54	-17.28	27.16	4.36	37.52	226	310	Average
2389.94	51.86	57.86	74	-22.14	27.16	4.36	37.52	226	310	Peak
2437	101.61	107.29			27.38	4.4	37.46	226	310	Average
2437	111.2	116.88			27.38	4.4	37.46	226	310	Peak
2484.04	44.93	50.21	54	-9.07	27.61	4.43	37.32	226	310	Average
2484.04	60.46	65.82	74	-13.54	27.53	4.43	37.32	226	310	Peak
4874	33.66	48.41	54	-20.34	31.25	6.86	52.86	200	123	Average
4874	44.79	59.54	74	-29.21	31.25	6.86	52.86	200	123	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**
2389.94	35.07	41.05	54	-18.93	27.16	4.36	37.5	237	102	Average
2389.94	47.21	53.21	74	-26.79	27.16	4.36	37.52	237	102	Peak
2437	95.03	100.71			27.38	4.4	37.46	237	102	Average
2437	105.03	110.71			27.38	4.4	37.46	237	102	Peak
2483.64	38.97	44.25	54	-15.03	27.61	4.43	37.32	237	102	Average
2483.64	53.69	59.05	74	-20.31	27.53	4.43	37.32	237	102	Peak
4874	33.19	48.32	54	-20.81	31.06	6.86	53.05	117	214	Average
4874	45.86	60.99	74	-28.14	31.06	6.86	53.05	117	214	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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	101.52			27.46	4.41	37.39	226	311	Average
2462	105.48	111			27.46	4.41	37.39	226	311	Peak
2483.56	52.86	58.22	54	-1.14	27.53	4.43	37.32	226	311	Average
2483.56	72.99	78.35	74	-1.01	27.53	4.43	37.32	226	311	Peak
4924	33.45	48.11	54	-20.55	31.34	6.89	52.89	205	112	Average
4924	45.55	60.21	74	-28.45	31.34	6.89	52.89	205	112	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	89.75	95.27			27.46	4.41	37.39	230	101	Average
2462	99.61	105.13			27.46	4.41	37.39	230	101	Peak
2483.52	49.96	55.32	54	-4.04	27.53	4.43	37.32	230	101	Average
2483.52	68.71	74.07	74	-5.29	27.53	4.43	37.32	230	101	Peak
4924	33.09	48.11	54	-20.91	31.12	6.89	53.03	114	201	Average
4924	45.35	60.37	74	-28.65	31.12	6.89	53.03	114	201	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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**
2389.94	52.88	58.88	54	-1.12	27.16	4.36	37.52	229	311	Average
2389.94	70.74	76.72	74	-3.26	27.16	4.36	37.5	229	311	Peak
2412	98.09	104			27.23	4.38	37.52	229	311	Average
2412	107.88	113.79			27.23	4.38	37.52	229	311	Peak
4824	33.57	48.66	54	-20.43	30.99	6.81	52.89	200	101	Average
4824	42.44	57.53	74	-31.56	30.99	6.81	52.89	200	101	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**
2389.94	46.91	52.91	54	-7.09	27.16	4.36	37.52	220	105	Average
2389.94	64.06	70.04	74	-9.94	27.16	4.36	37.5	220	105	Peak
2412	91.53	97.44			27.23	4.38	37.52	220	105	Average
2412	101.56	107.47			27.23	4.38	37.52	220	105	Peak
4824	33.08	48.36	54	-20.92	30.99	6.81	53.08	110	200	Average
4824	41.89	57.17	74	-32.11	30.99	6.81	53.08	110	200	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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**
2389.94	37	43	54	-17	27.16	4.36	37.52	232	311	Average
2389.94	50.16	56.14	74	-23.84	27.16	4.36	37.5	232	311	Peak
2437	101.23	106.91			27.38	4.4	37.46	232	311	Average
2437	110.96	116.64			27.38	4.4	37.46	232	311	Peak
2488.56	45.67	50.95	54	-8.33	27.61	4.43	37.32	232	311	Average
2488.56	59.46	64.74	74	-14.54	27.61	4.43	37.32	232	311	Peak
4874	33.2	48.14	54	-20.8	31.06	6.86	52.86	201	121	Average
4874	43	57.94	74	-31	31.06	6.86	52.86	201	121	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**
2389.94	34.93	40.93	54	-19.07	27.16	4.36	37.52	212	103	Average
2389.94	47.19	53.19	74	-26.81	27.16	4.36	37.52	212	103	Peak
2437	94.75	100.43			27.38	4.4	37.46	212	103	Average
2437	103.9	109.58			27.38	4.4	37.46	212	103	Peak
2484	39.75	45.03	54	-14.25	27.61	4.43	37.32	212	103	Average
2484	53.86	59.22	74	-20.14	27.53	4.43	37.32	212	103	Peak
4874	32.99	48.12	54	-21.01	31.06	6.86	53.05	111	201	Average
4874	42.62	57.75	74	-31.38	31.06	6.86	53.05	111	201	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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	95.21	100.73			27.46	4.41	37.39	224	310	Average
2462	105.15	110.67			27.46	4.41	37.39	224	310	Peak
2483.56	53.47	58.83	54	-0.53	27.53	4.43	37.32	224	310	Average
2483.56	73.58	78.94	74	-0.42	27.53	4.43	37.32	224	310	Peak
4924	33.24	48.12	54	-20.76	31.12	6.89	52.89	112	204	Average
4924	43.21	58.09	74	-30.79	31.12	6.89	52.89	112	204	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	88.67	94.19			27.46	4.41	37.39	235	103	Average
2462	98.33	103.85			27.46	4.41	37.39	235	103	Peak
2483.52	50.71	56.07	54	-3.29	27.53	4.43	37.32	235	103	Average
2483.52	69.56	74.92	74	-4.44	27.53	4.43	37.32	235	103	Peak
4924	33.07	48.09	54	-20.93	31.12	6.89	53.03	114	203	Average
4924	43.72	58.74	74	-30.28	31.12	6.89	53.03	114	203	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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**
2389.66	52.52	58.5	54	-1.48	27.16	4.36	37.5	239	314	Average
2389.66	69.55	75.53	74	-4.45	27.16	4.36	37.5	239	314	Peak
2422	97.06	102.82			27.31	4.39	37.46	239	314	Average
2422	106.69	112.45			27.31	4.39	37.46	239	314	Peak
2483.72	44.46	49.82	54	-9.54	27.53	4.43	37.32	239	314	Average
2483.72	62.25	67.61	74	-11.75	27.53	4.43	37.32	239	314	Peak
4844	33.63	48.67	54	-20.37	31.01	6.83	52.88	200	112	Average
4844	42.31	57.35	74	-31.69	31.01	6.83	52.88	200	112	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**
2389.94	47.57	53.57	54	-6.43	27.16	4.36	37.52	212	107	Average
2389.94	62.68	68.66	74	-11.32	27.16	4.36	37.5	212	107	Peak
2422	89.62	95.38			27.31	4.39	37.46	212	107	Average
2422	99.58	105.34			27.31	4.39	37.46	212	107	Peak
2483.52	40.79	46.15	54	-13.21	27.53	4.43	37.32	212	107	Average
2483.52	56.53	61.89	74	-17.47	27.53	4.43	37.32	212	107	Peak
4844	33.33	48.55	54	-20.67	31.01	6.83	53.06	100	205	Average
4844	42.45	57.67	74	-31.55	31.01	6.83	53.06	100	205	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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**
2389.94	46	52	54	-8	27.16	4.36	37.52	232	311	Average
2389.94	59.16	65.14	74	-14.84	27.16	4.36	37.5	232	311	Peak
2437	96.46	102.14			27.38	4.4	37.46	233	308	Average
2437	106.26	111.94			27.38	4.4	37.46	233	308	Peak
2483.6	52.34	57.7	54	-1.66	27.53	4.43	37.32	233	308	Average
2483.6	69.18	74.54	74	-4.82	27.53	4.43	37.32	233	308	Peak
4874	33.47	48.41	54	-20.53	31.06	6.86	52.86	201	147	Average
4874	43.78	58.72	74	-30.22	31.06	6.86	52.86	201	147	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**
2389.94	42.32	48.32	54	-11.68	27.16	4.36	37.52	214	104	Average
2389.94	56.87	62.85	74	-17.13	27.16	4.36	37.5	214	104	Peak
2437	90.45	96.13			27.38	4.4	37.46	214	104	Average
2437	99.97	105.65			27.38	4.4	37.46	214	104	Peak
2483.84	44.62	49.98	54	-9.38	27.53	4.43	37.32	214	104	Average
2483.84	64.25	69.61	74	-9.75	27.53	4.43	37.32	214	104	Peak
4874	32.85	47.98	54	-21.15	31.06	6.86	53.05	105	123	Average
4874	42.86	57.99	74	-31.14	31.06	6.86	53.05	105	123	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 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**	Jisyong Wang

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**
2389.94	36.23	42.23	54	-17.77	27.16	4.36	37.52	230	310	Average
2389.94	47.63	53.63	74	-26.37	27.16	4.36	37.52	230	310	Peak
2452	92.78	98.38			27.38	4.41	37.39	230	310	Average
2452	102.66	108.26			27.38	4.41	37.39	230	310	Peak
2484.12	53.07	58.43	54	-0.93	27.53	4.43	37.32	230	310	Average
2484.12	70.93	76.29	74	-3.07	27.53	4.43	37.32	230	310	Peak
4904	33.15	48.02	54	-20.85	31.1	6.88	52.85	199	110	Average
4904	43.12	57.99	74	-30.88	31.1	6.88	52.85	199	110	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**
2389.38	34.91	40.89	54	-19.09	27.16	4.36	37.5	213	98	Average
2389.38	46.84	52.91	74	-27.16	27.08	4.35	37.5	213	98	Peak
2452	86.73	92.33			27.38	4.41	37.39	213	98	Average
2452	97.01	102.61			27.38	4.41	37.39	213	98	Peak
2483.76	50.55	55.91	54	-3.45	27.53	4.43	37.32	213	98	Average
2483.76	66.24	71.6	74	-7.76	27.53	4.43	37.32	213	98	Peak
4904	33.09	48.14	54	-20.91	31.1	6.88	53.03	112	205	Average
4904	42.2	57.25	74	-31.8	31.1	6.88	53.03	112	205	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2452 MHz: Fundamental frequency.

9 kHz ~ 30 MHz Data:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 11	**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**	Jisyong Wang

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**
44.55	22.43	39.46	40	-17.57	13.6	0.51	31.14	125	201	Peak
88.2	22.66	45.56	43.5	-20.84	8.27	0.7	31.87	111	123	Peak
168.71	29.63	48.45	43.5	-13.87	11.86	1.06	31.74	111	152	Peak
523.73	25.67	36.82	46	-20.33	17.86	2.61	31.62	165	123	Peak
679.9	26.2	34.25	46	-19.8	20.57	3.22	31.84	111	152	Peak
910.76	29.31	33.71	46	-16.69	23.57	4.08	32.05	152	236	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**
30	35.52	54.24	40	-4.48	11.98	0.44	31.14	201	256	Peak
169.68	21.89	40.79	43.5	-21.61	11.76	1.07	31.73	236	251	Peak
384.05	21.36	36.37	46	-24.64	14.96	2.02	31.99	152	124	Peak
628.49	24.81	33.99	46	-21.19	19.95	3.02	32.15	165	123	Peak
768.17	29.3	35.28	46	-16.7	21.78	3.57	31.33	236	251	Peak
971.87	31.39	34.98	54	-22.61	23.91	4.34	31.84	111	185	Peak

Remarks:

1. 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 & Manaufacturer	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 (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

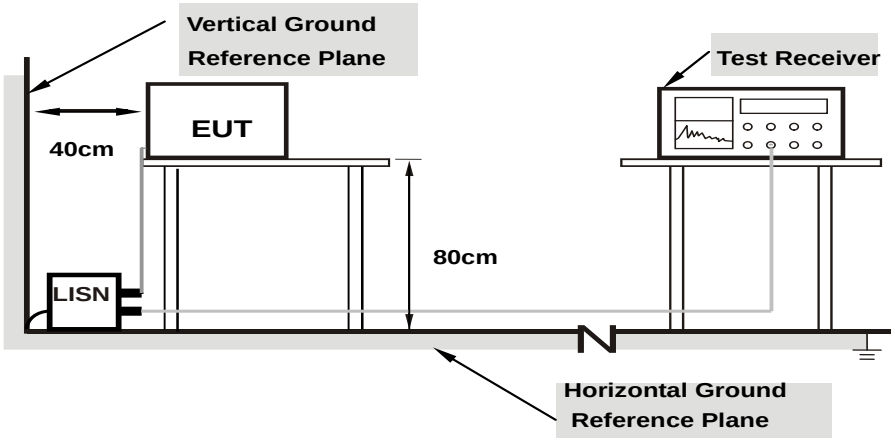
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. 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

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

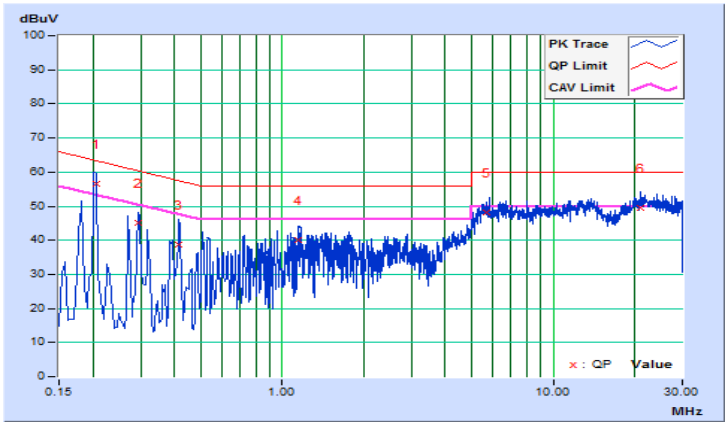
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Getaz Yang	Test Date	2018/2/5

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	0.20600	10.10	46.33	25.81	56.43	35.91	63.37	53.37	-6.94	-17.46
2	0.29444	10.11	35.09	17.46	45.20	27.57	60.40	50.40	-15.20	-22.83
3	0.41400	10.12	28.63	17.97	38.75	28.09	57.57	47.57	-18.82	-19.48
4	1.14600	10.15	29.83	17.79	39.98	27.94	56.00	46.00	-16.02	-18.06
5	5.66600	10.38	37.86	28.80	48.24	39.18	60.00	50.00	-11.76	-10.82
6	21.03400	11.23	38.26	28.07	49.49	39.30	60.00	50.00	-10.51	-10.70

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

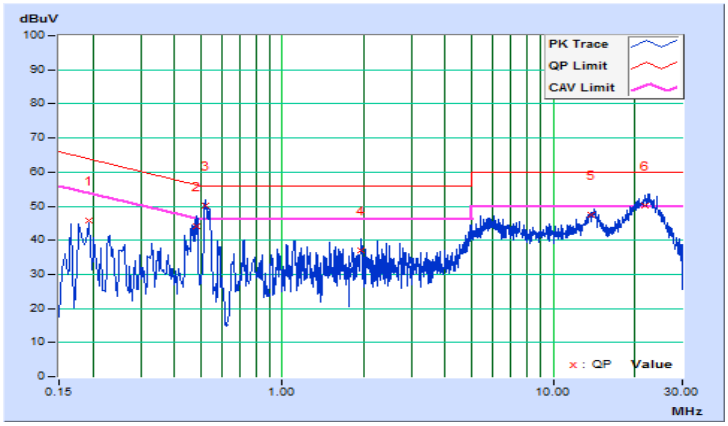


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Getaz Yang	Test Date	2018/2/5

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	0.19400	10.10	35.70	24.09	45.80	34.19	63.86	53.86	-18.06	-19.67
2	0.48200	10.12	34.00	15.00	44.12	25.12	56.30	46.30	-12.18	-21.18
3	0.51879	10.12	39.91	31.39	50.03	41.51	56.00	46.00	-5.97	-4.49
4	1.95800	10.17	26.85	15.01	37.02	25.18	56.00	46.00	-18.98	-20.82
5	13.76600	10.68	36.77	24.62	47.45	35.30	60.00	50.00	-12.55	-14.70
6	21.78600	10.97	39.20	26.32	50.17	37.29	60.00	50.00	-9.83	-12.71

Remarks:

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



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:

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

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