

FCC Test Report

Report No.: RF160621C21-3

FCC ID: PY7-14784Z

Received Date: Jun. 21, 2016

Test Date: Jun. 29, 2016 ~ Jul. 08, 2016

Issued Date: Jul. 15, 2016

Applicant: Sony Mobile Communications Inc.

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

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Release Control Record

Issue No.	Description	Date Issued
RF160621C21-3	Original Release	Jul. 15, 2016

1 Certificate of Conformity

Product: Mobile Phone

Brand: Sony

Sample Status: Identical Prototype

Applicant: Sony Mobile Communications Inc.

Test Date: Jun. 29, 2016 ~ Jul. 08, 2016

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Evonne Liu , **Date:** Jul. 15, 2016
Evonne Liu / Specialist

Approved by : Stanley Wu , **Date:** Jul. 15, 2016
Stanley Wu / Assistant Manager

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 -18.80 dB at 0.20474 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -2.97 dB at 2390 MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

2.1 Measurement Uncertainty

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

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

Measurement	Frequency	Expanded Uncertainty (k=2) (\pm)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Mobile Phone
Brand	Sony
Status of EUT	Identical Prototype
Power Supply Rating	3.8Vdc (Embedded Battery) 5Vdc or 9Vdc or 12Vdc (Adapter)
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 ~ 2472 MHz
Number of Channel	13 for 802.11b, 802.11g, 802.11n (HT20)
Output Power	243.22 mW
Antenna Type	PIFA antenna with -2.5 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

- The EUT provides 1 completed transmitter and 1 receiver.

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

- The EUT contains following accessory devices.

Product	Brand	Model	Type	Description
Adapter	Sony	UCH12	AC-0051	I/P: 100- 240Vac, 400mA, 50~60 Hz, O/P: 5.0Vdc, 2700 mA / O/P: 9.0Vdc, 1800 mA / O/P: 12.0Vdc, 1350 mA
Battery	Sony	1303-8269	N/A	3.8Vdc, 2700mAh
Earphone	Sony	MH410c	AG-1100	1.5m non-shielded cable w/o core
USB Cable	Sony	UCB20	AI-0160	0.95m shielded cable w/o core

- 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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE \geq 1G**: Radiated Emission above 1 GHz **RE<1G**: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.
NOTE: “-” means no effect.

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 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	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 13	1	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 13	1	OFDM	BPSK	MCS0

Bandedge Measurement:

- 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 13	1, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 11, 12, 13	OFDM	BPSK	MCS0

Antenna Port Conducted Measurement:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	MCS0

Test Condition:

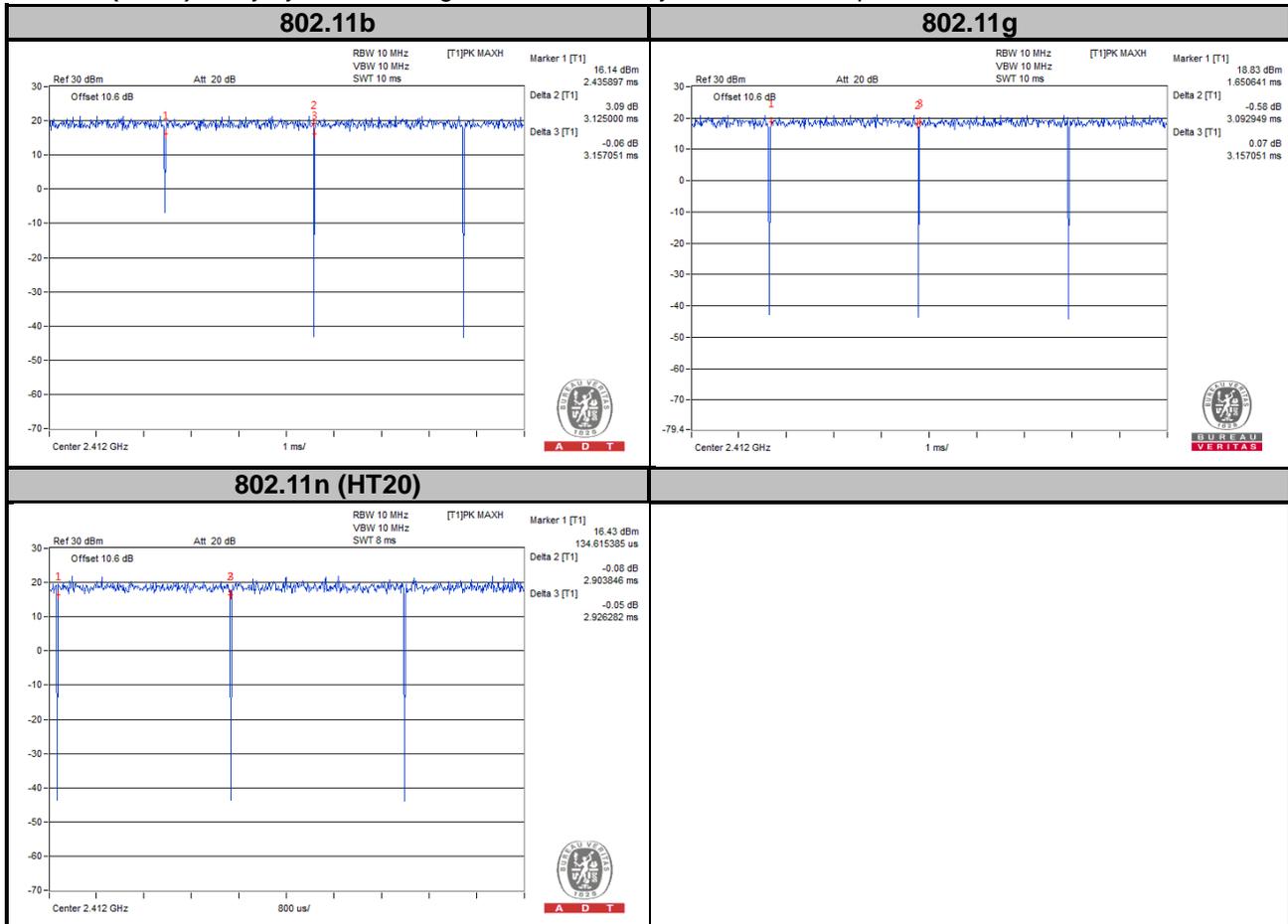
Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian
APCM	25 deg. C, 65 % RH	3.8 Vdc	Carlos Chen

3.3 Duty Cycle of Test Signal

802.11b: Duty cycle of test signal is 100 %, duty factor is not required.

802.11g: Duty cycle = $3.092/3.157 = 0.979$, Duty factor = $10 * \log(1/0.010) = 0.09$

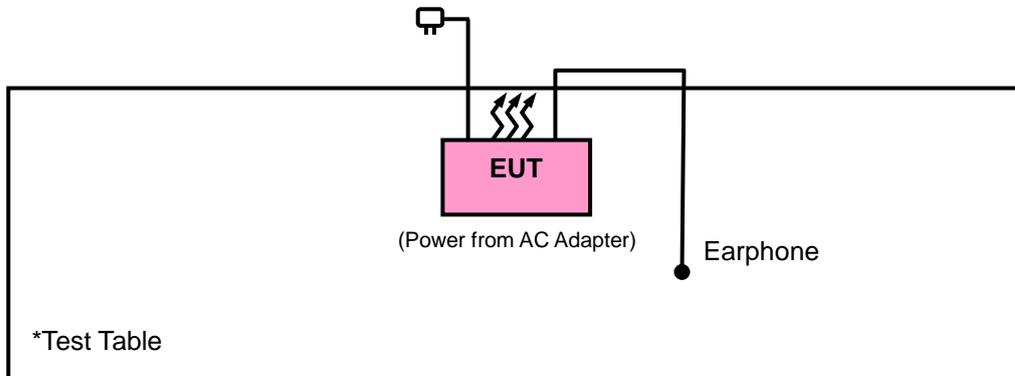
802.11n (HT20): Duty cycle of test signal is > 98 %, duty factor is not required.



3.4 Description of Support Units

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v03r05

ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY50010135	Jul. 18, 2015	Jul. 17, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Jan. 04, 2016	Jan. 03, 2017
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Preamplifier Agilent	310N	187226	Jun. 24, 2016	Jun. 23, 2017
Preamplifier Agilent	83017A	MY39501357	Jun. 24, 2016	Jun. 23, 2017
Power Meter Anritsu	ML2495A	1232002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor Anritsu	MA2411B	1207325	Sep. 21, 2015	Sep. 20, 2016
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 24, 2016	Jun. 23, 2017
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 24, 2016	Jun. 23, 2017
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Site Registration No. is 149147.
5. The IC Site Registration No. is IC7450I-1.

4.1.3 Test Procedures

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

Note:

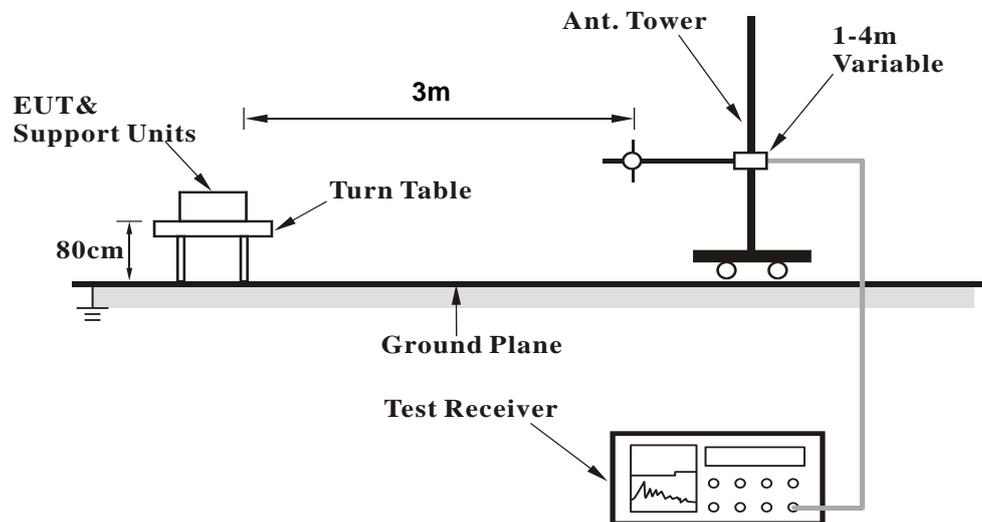
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for RMS Average (Duty cycle < 98 %) for Average detection (AV) at frequency above 1 GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10 Hz (Duty cycle \geq 98 %) for Average detection (AV) at frequency above 1 GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

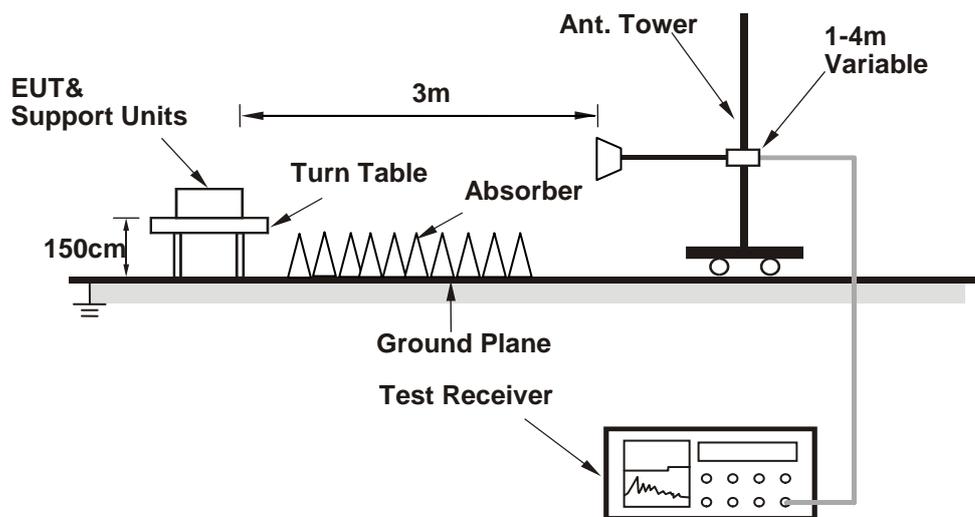
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1 GHz>



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

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

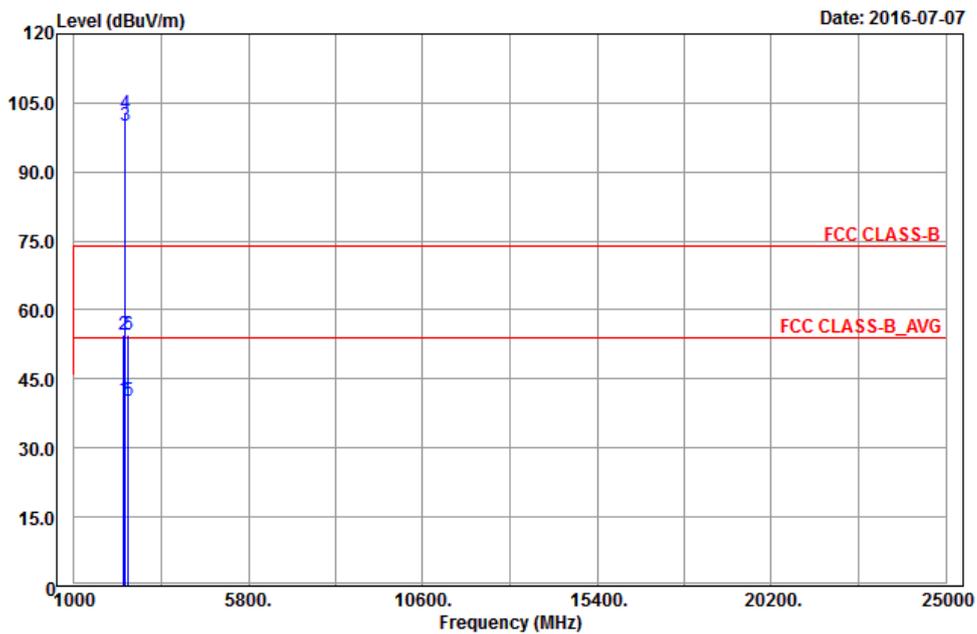
4.1.7 Test Results

Above 1 GHz Data :

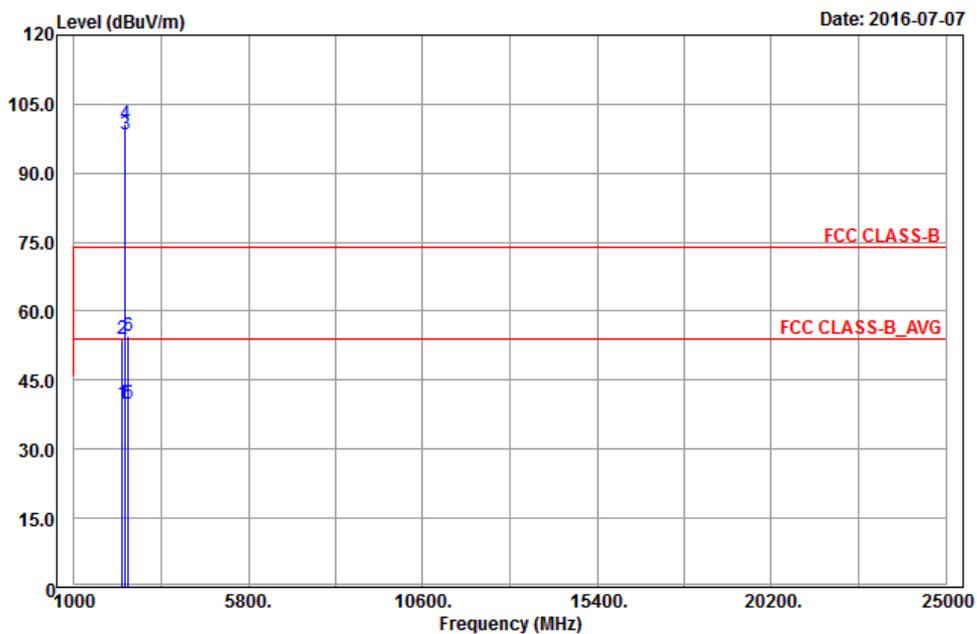
802.11b

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

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
2374	40.43	38.77	54	-13.57	31.78	5.37	35.49	142	0	Average
2374	54.66	53	74	-19.34	31.78	5.37	35.49	142	0	Peak
2412	100.08	98.31			31.81	5.43	35.47	142	0	Average
2412	102.78	101.01			31.81	5.43	35.47	142	0	Peak
2484	40.12	38.16	54	-13.88	31.88	5.5	35.42	142	0	Average
2484	54.47	52.51	74	-19.53	31.88	5.5	35.42	142	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

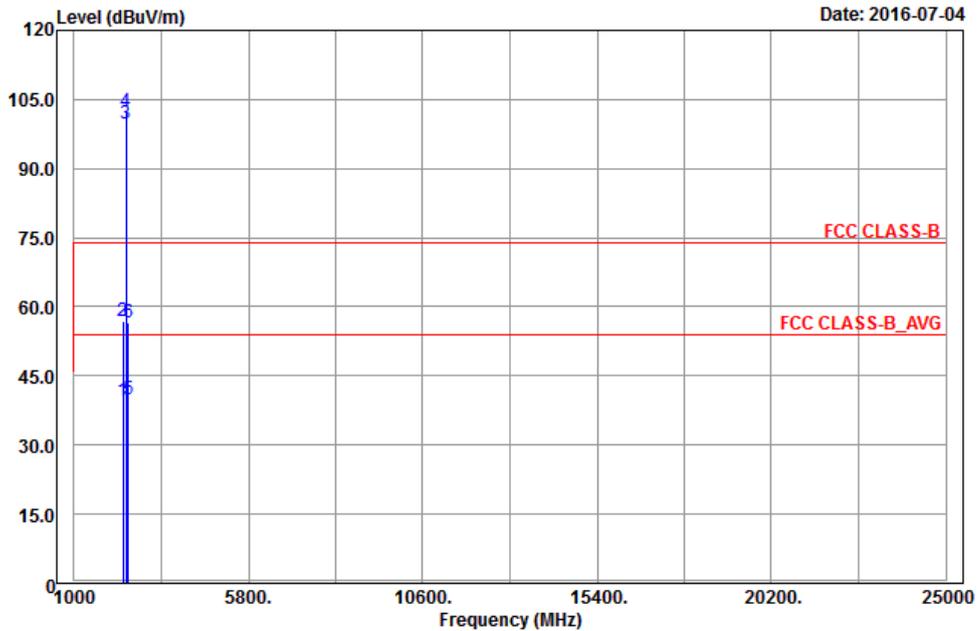
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2320	39.94	38.43	54	-14.06	31.73	5.3	35.52	173	8	Average
2320	54.1	52.59	74	-19.9	31.73	5.3	35.52	173	8	Peak
2412	98.32	96.55			31.81	5.43	35.47	173	8	Average
2412	100.86	99.09			31.81	5.43	35.47	173	8	Peak
2498	40.01	37.99	54	-13.99	31.9	5.53	35.41	173	8	Average
2498	54.64	52.62	74	-19.36	31.9	5.53	35.41	173	8	Peak

Remarks:

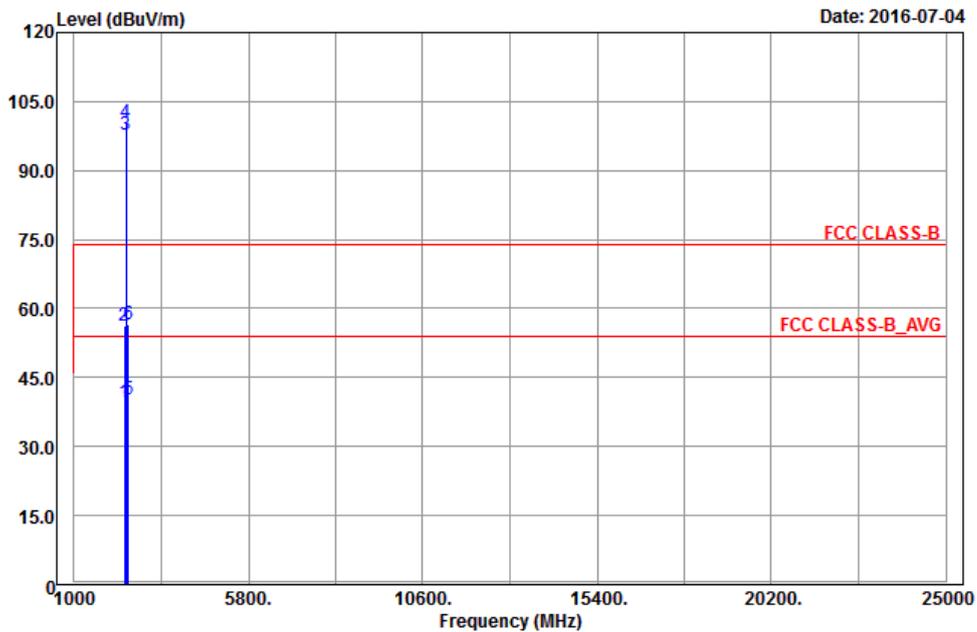
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

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

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
2348	39.46	37.89	54	-14.54	31.74	5.33	35.5	161	0	Average
2348	56.74	55.17	74	-17.26	31.74	5.33	35.5	161	0	Peak
2437	99.89	98.04			31.85	5.46	35.46	161	0	Average
2437	102.25	100.4			31.85	5.46	35.46	161	0	Peak
2490	40.01	38	54	-13.99	31.9	5.53	35.42	161	0	Average
2490	56.66	54.65	74	-17.34	31.9	5.53	35.42	161	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

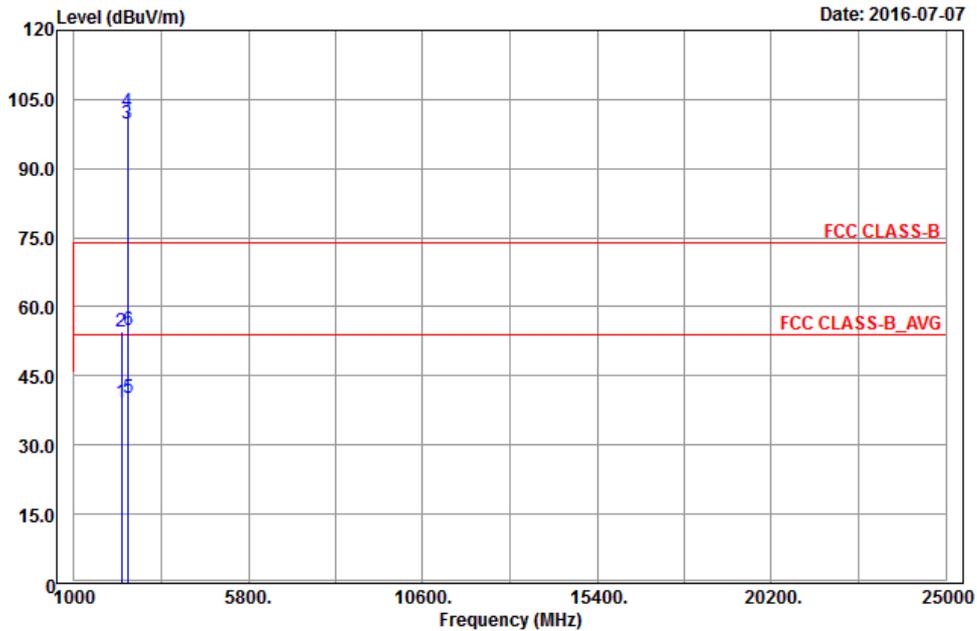
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	39.57	37.84	54	-14.43	31.8	5.4	35.47	153	12	Average
2390	56.26	54.53	74	-17.74	31.8	5.4	35.47	153	12	Peak
2437	97.8	95.95			31.85	5.46	35.46	153	12	Average
2437	100.39	98.54			31.85	5.46	35.46	153	12	Peak
2492	40.09	38.07	54	-13.91	31.9	5.53	35.41	153	12	Average
2492	56.52	54.5	74	-17.48	31.9	5.53	35.41	153	12	Peak

Remarks:

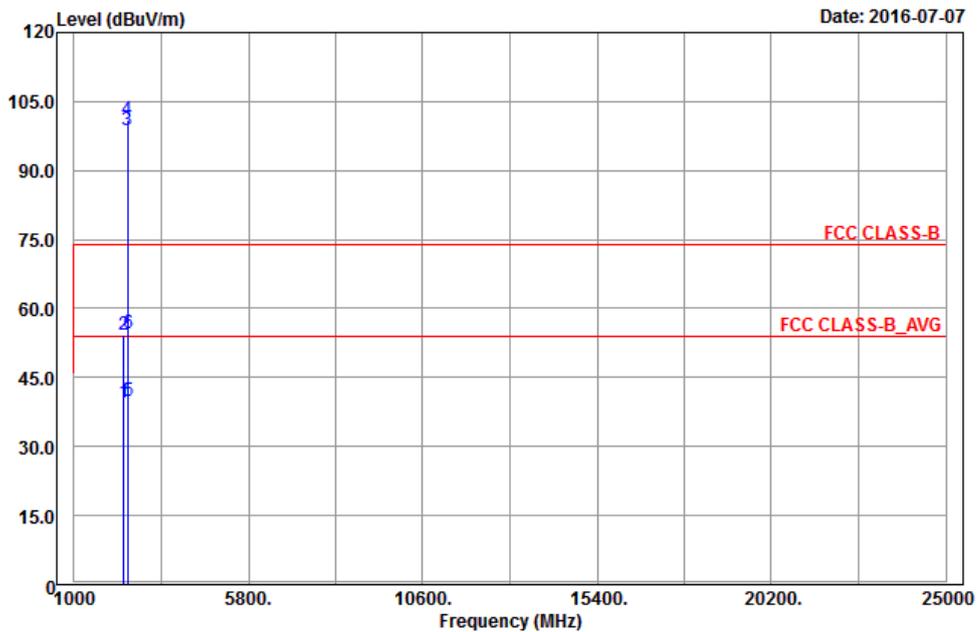
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

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

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
2310	39.37	37.89	54	-14.63	31.71	5.3	35.53	108	0	Average
2310	54.69	53.21	74	-19.31	31.71	5.3	35.53	108	0	Peak
2462	99.85	97.92			31.87	5.5	35.44	108	0	Average
2462	102.45	100.52			31.87	5.5	35.44	108	0	Peak
2488	40.27	38.26	54	-13.73	31.9	5.53	35.42	108	0	Average
2488	55.08	53.07	74	-18.92	31.9	5.53	35.42	108	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

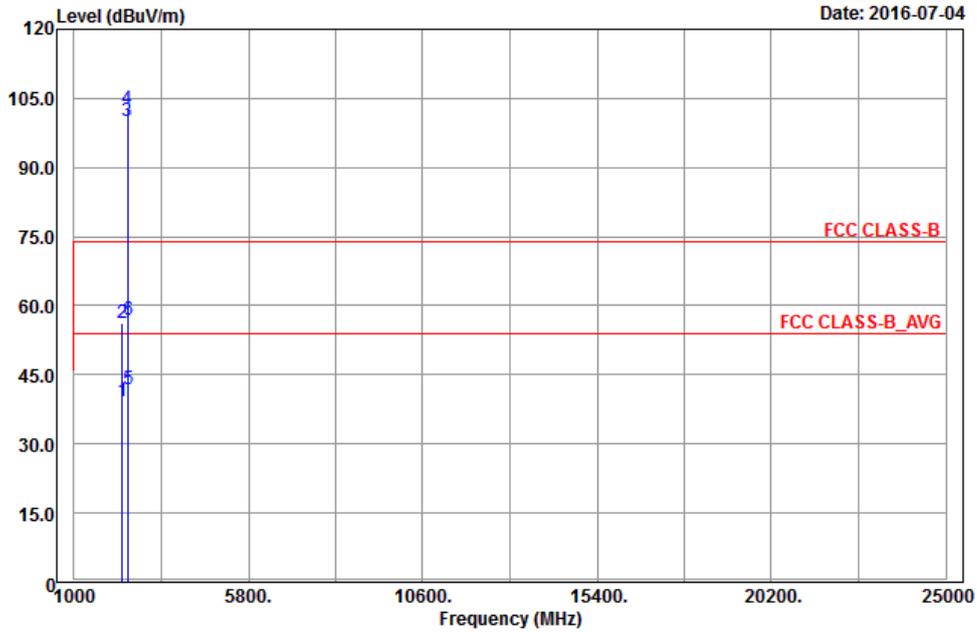
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2360	39.48	37.85	54	-14.52	31.76	5.37	35.5	168	13	Average
2360	54.32	52.69	74	-19.68	31.76	5.37	35.5	168	13	Peak
2462	98.61	96.68			31.87	5.5	35.44	168	13	Average
2462	101.11	99.18			31.87	5.5	35.44	168	13	Peak
2494	40.01	37.99	54	-13.99	31.9	5.53	35.41	168	13	Average
2494	54.63	52.61	74	-19.37	31.9	5.53	35.41	168	13	Peak

Remarks:

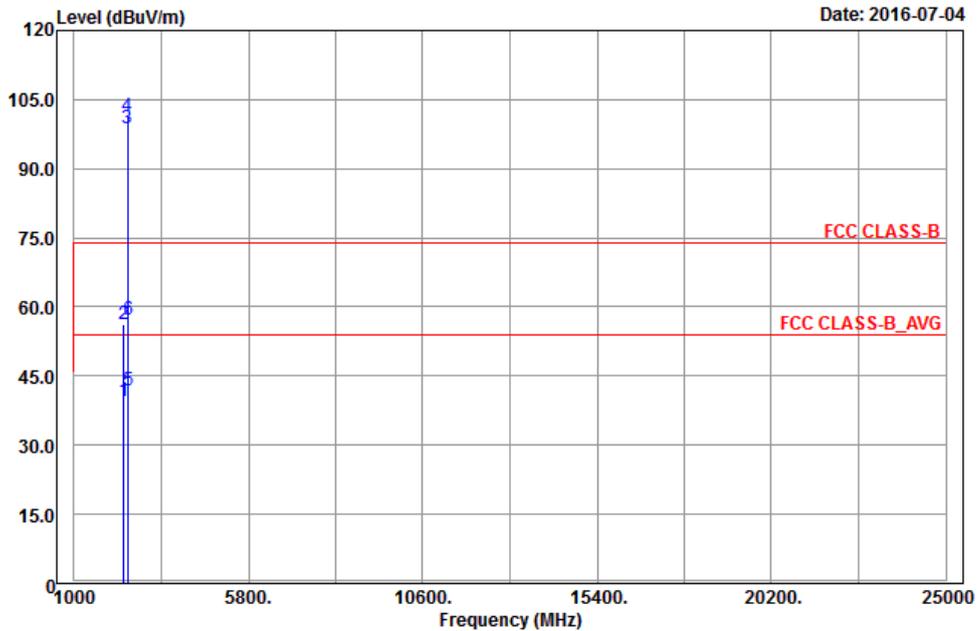
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

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
2322	39.39	37.88	54	-14.61	31.73	5.3	35.52	108	0	Average
2322	56.14	54.63	74	-17.86	31.73	5.3	35.52	108	0	Peak
2467	99.98	98.03			31.87	5.5	35.42	108	0	Average
2467	102.53	100.58			31.87	5.5	35.42	108	0	Peak
2484	41.76	39.8	54	-12.24	31.88	5.5	35.42	108	0	Average
2484	56.74	54.78	74	-17.26	31.88	5.5	35.42	108	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

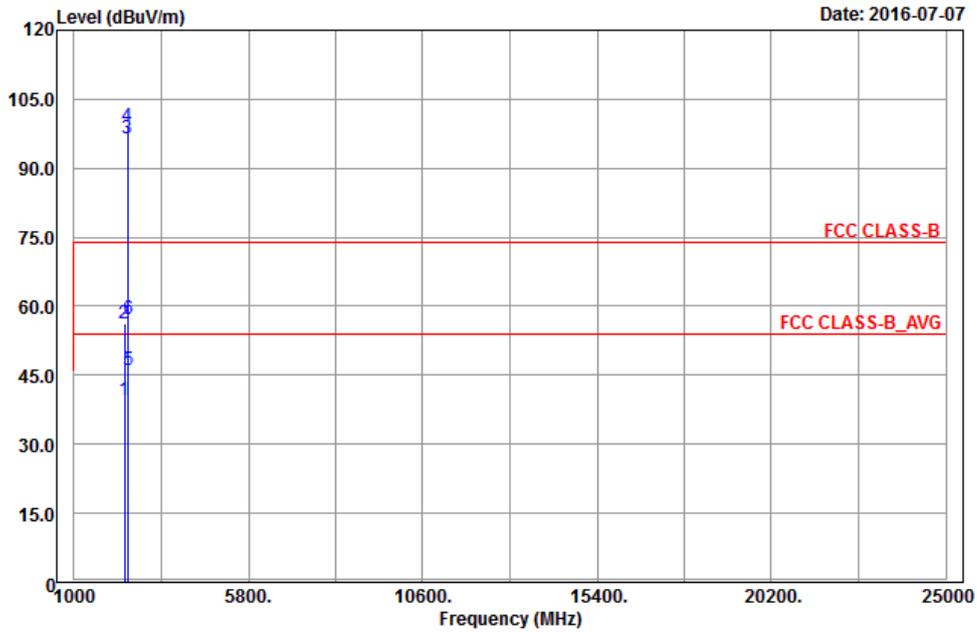
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2360	39.47	37.84	54	-14.53	31.76	5.37	35.5	168	13	Average
2360	56.26	54.63	74	-17.74	31.76	5.37	35.5	168	13	Peak
2467	98.77	96.82			31.87	5.5	35.42	168	13	Average
2467	101.29	99.34			31.87	5.5	35.42	168	13	Peak
2484	41.9	39.94	54	-12.1	31.88	5.5	35.42	168	13	Average
2484	57.14	55.18	74	-16.86	31.88	5.5	35.42	168	13	Peak

Remarks:

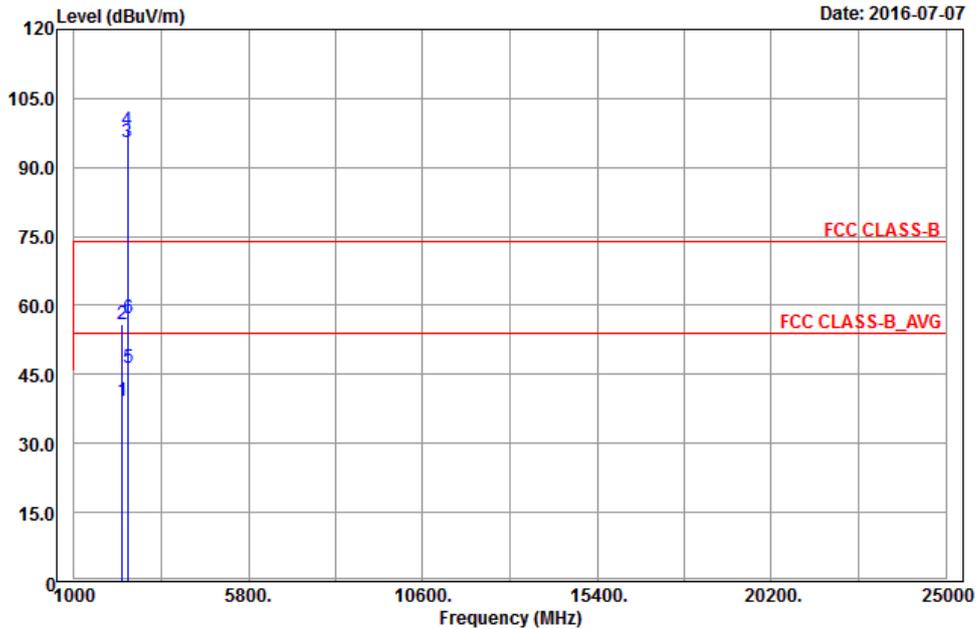
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

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
2388	39.55	37.84	54	-14.45	31.8	5.4	35.49	108	0	Average
2388	56.38	54.67	74	-17.62	31.8	5.4	35.49	108	0	Peak
2472	96.6	94.64			31.88	5.5	35.42	108	0	Average
2472	98.98	97.02			31.88	5.5	35.42	108	0	Peak
2484	46.01	44.05	54	-7.99	31.88	5.5	35.42	108	0	Average
2484	57.14	55.18	74	-16.86	31.88	5.5	35.42	108	0	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
2326	39.33	37.82	54	-14.67	31.73	5.3	35.52	168	13	Average
2326	55.96	54.45	74	-18.04	31.73	5.3	35.52	168	13	Peak
2472	95.52	93.56			31.88	5.5	35.42	168	13	Average
2472	98.03	96.07			31.88	5.5	35.42	168	13	Peak
2484	46.33	44.37	54	-7.67	31.88	5.5	35.42	168	13	Average
2484	57.36	55.4	74	-16.64	31.88	5.5	35.42	168	13	Peak

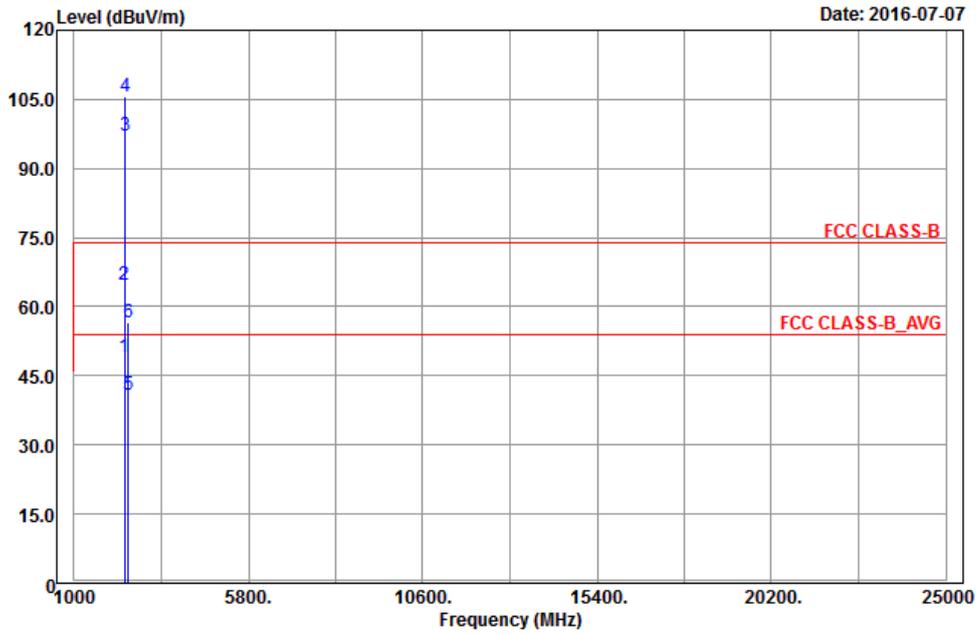
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 MHz: Fundamental frequency.

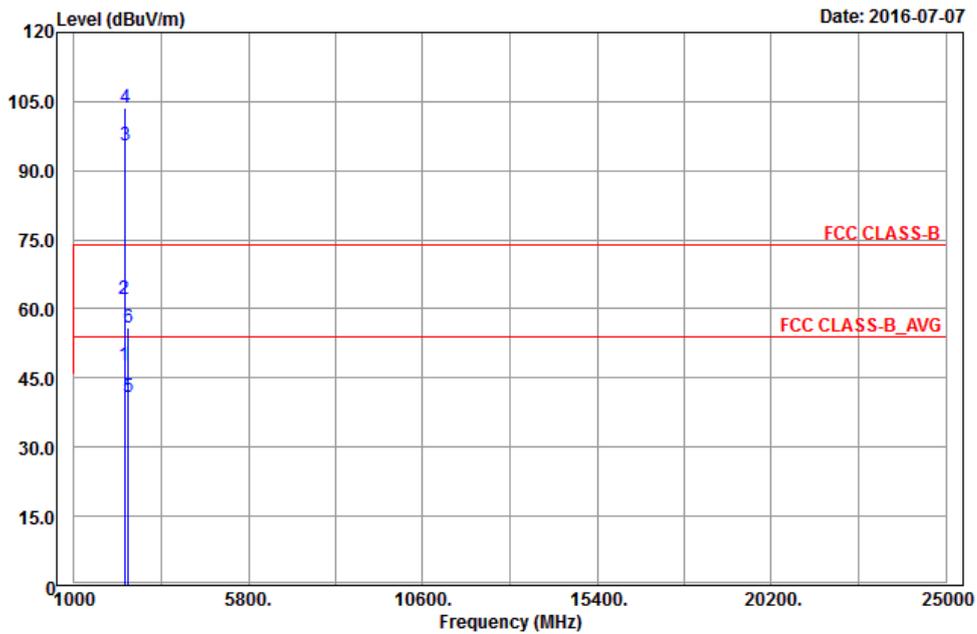
802.11g

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

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
2390	49.06	47.33	54	-4.94	31.8	5.4	35.47	142	0	Average
2390	64.8	63.07	74	-9.2	31.8	5.4	35.47	142	0	Peak
2412	97.19	95.42			31.81	5.43	35.47	142	0	Average
2412	105.68	103.91			31.81	5.43	35.47	142	0	Peak
2494	41.01	38.99	54	-12.99	31.9	5.53	35.41	142	0	Average
2494	56.63	54.61	74	-17.37	31.9	5.53	35.41	142	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

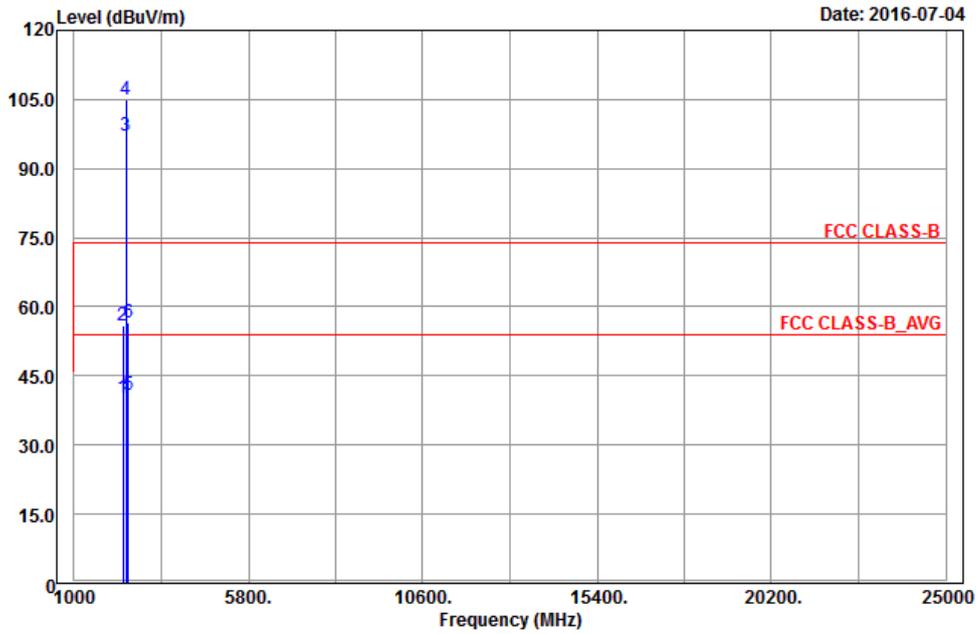
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.75	46.02	54	-6.25	31.8	5.4	35.47	173	8	Average
2390	62.17	60.44	74	-11.83	31.8	5.4	35.47	173	8	Peak
2412	95.32	93.55			31.81	5.43	35.47	173	8	Average
2412	103.62	101.85			31.81	5.43	35.47	173	8	Peak
2484	40.94	38.98	54	-13.06	31.88	5.5	35.42	173	8	Average
2484	55.97	54.01	74	-18.03	31.88	5.5	35.42	173	8	Peak

Remarks:

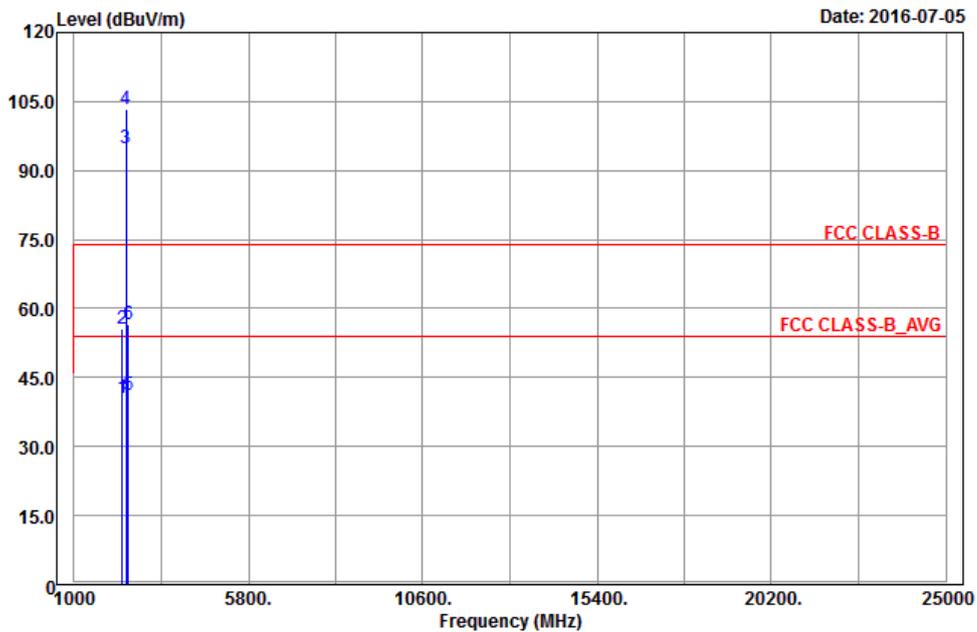
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

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

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
2338	40.36	38.81	54	-13.64	31.74	5.33	35.52	161	0	Average
2338	55.92	54.37	74	-18.08	31.74	5.33	35.52	161	0	Peak
2437	97.04	95.21			31.83	5.46	35.46	161	0	Average
2437	105.05	103.22			31.83	5.46	35.46	161	0	Peak
2494	40.92	38.9	54	-13.08	31.9	5.53	35.41	161	0	Average
2494	56.47	54.45	74	-17.53	31.9	5.53	35.41	161	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

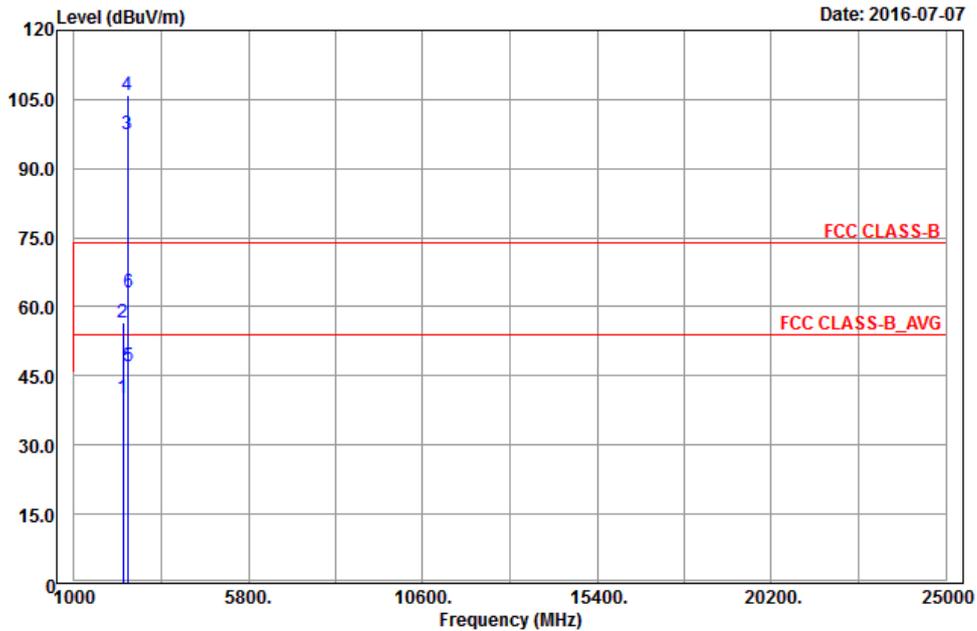
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2318	40.54	39.03	54	-13.46	31.73	5.3	35.52	153	12	Average
2318	55.73	54.22	74	-18.27	31.73	5.3	35.52	153	12	Peak
2437	94.92	93.07			31.85	5.46	35.46	153	12	Average
2437	103.23	101.38			31.85	5.46	35.46	153	12	Peak
2492	41.17	39.15	54	-12.83	31.9	5.53	35.41	153	12	Average
2492	56.64	54.62	74	-17.36	31.9	5.53	35.41	153	12	Peak

Remarks:

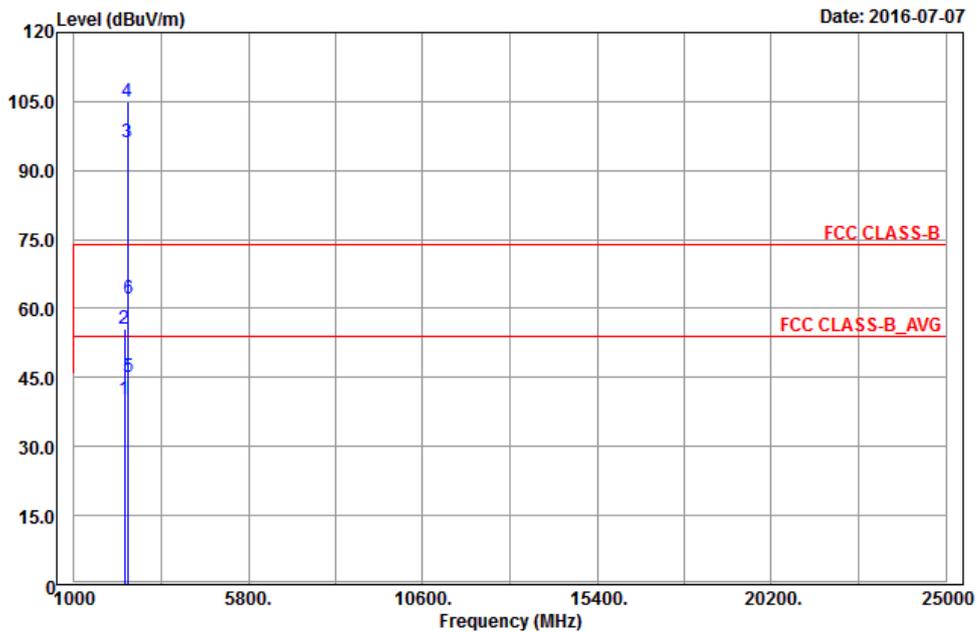
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

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

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
2354	40.19	38.6	54	-13.81	31.76	5.33	35.5	108	0	Average
2354	56.41	54.82	74	-17.59	31.76	5.33	35.5	108	0	Peak
2462	97.45	95.52			31.87	5.5	35.44	108	0	Average
2462	105.86	103.93			31.87	5.5	35.44	108	0	Peak
2484	47.19	45.23	54	-6.81	31.88	5.5	35.42	108	0	Average
2484	63.18	61.22	74	-10.82	31.88	5.5	35.42	108	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

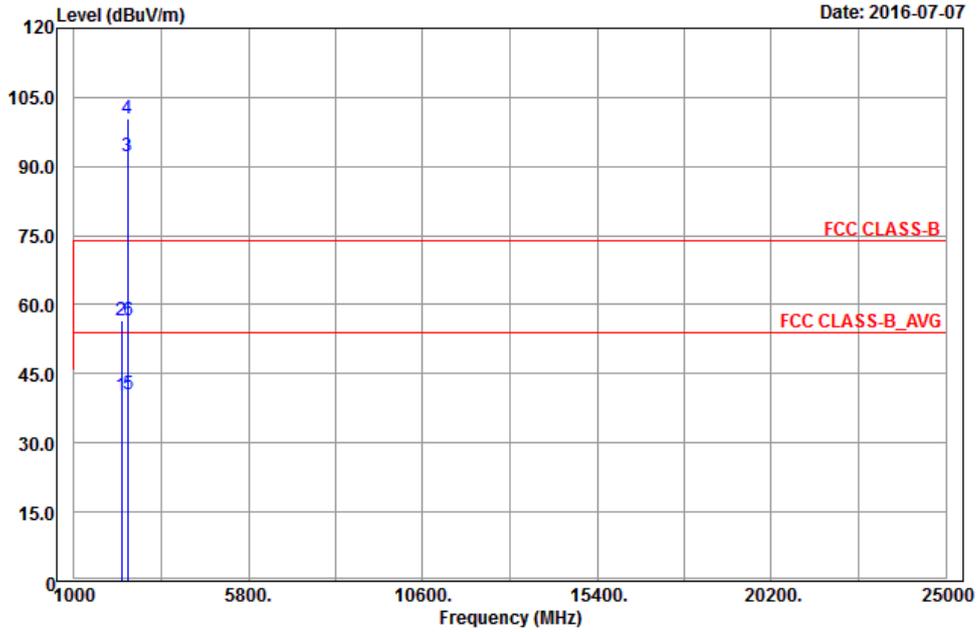
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2388	40.33	38.62	54	-13.67	31.8	5.4	35.49	168	13	Average
2388	55.65	53.94	74	-18.35	31.8	5.4	35.49	168	13	Peak
2462	96.09	94.16			31.87	5.5	35.44	168	13	Average
2462	104.81	102.88			31.87	5.5	35.44	168	13	Peak
2484	45.25	43.29	54	-8.75	31.88	5.5	35.42	168	13	Average
2484	62	60.04	74	-12	31.88	5.5	35.42	168	13	Peak

Remarks:

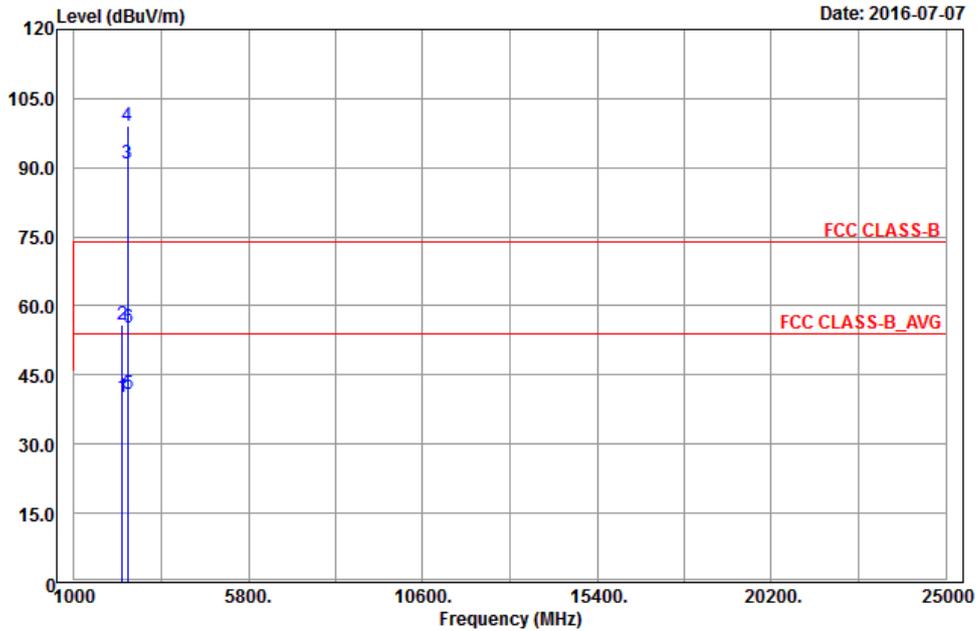
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

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
2312	40.12	38.64	54	-13.88	31.71	5.3	35.53	108	0	Average
2312	56.55	55.07	74	-17.45	31.71	5.3	35.53	108	0	Peak
2467	92.06	90.11			31.87	5.5	35.42	108	0	Average
2467	100.51	98.56			31.87	5.5	35.42	108	0	Peak
2494	40.68	38.66	54	-13.32	31.9	5.53	35.41	108	0	Average
2494	56.51	54.49	74	-17.49	31.9	5.53	35.41	108	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

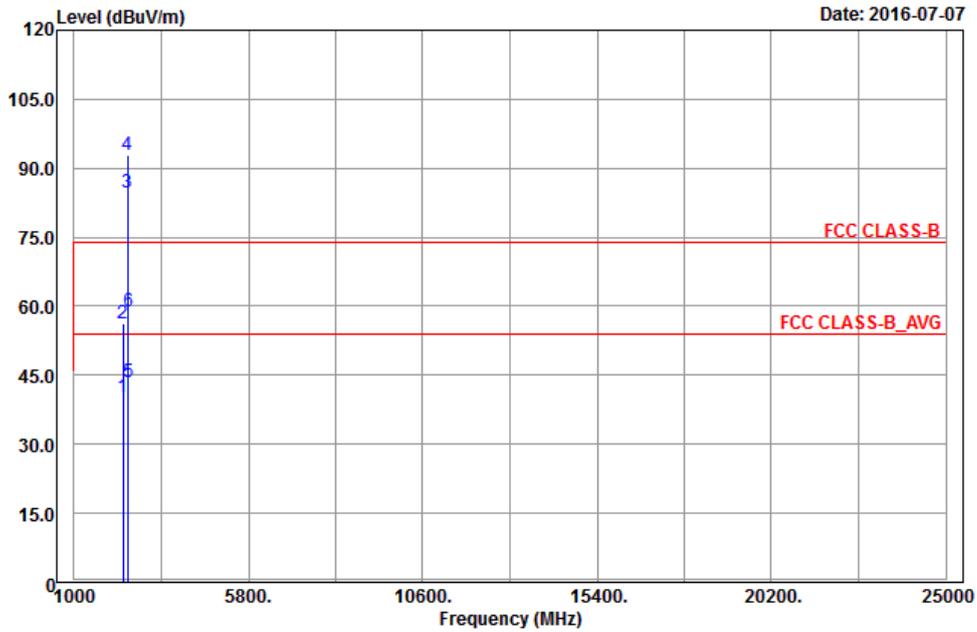
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2328	40.21	38.7	54	-13.79	31.73	5.3	35.52	168	13	Average
2328	55.9	54.39	74	-18.1	31.73	5.3	35.52	168	13	Peak
2467	90.75	88.8			31.87	5.5	35.42	168	13	Average
2467	99.17	97.22			31.87	5.5	35.42	168	13	Peak
2490	40.83	38.82	54	-13.17	31.9	5.53	35.42	168	13	Average
2490	55.25	53.24	74	-18.75	31.9	5.53	35.42	168	13	Peak

Remarks:

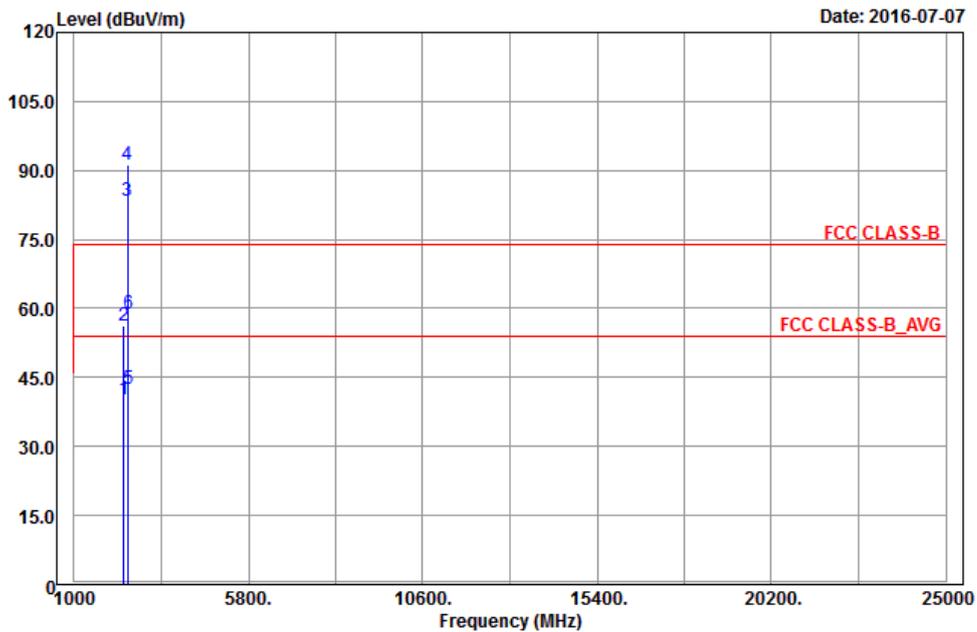
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

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
2352	40.26	38.67	54	-13.74	31.76	5.33	35.5	108	0	Average
2352	56.26	54.67	74	-17.74	31.76	5.33	35.5	108	0	Peak
2472	84.78	82.82			31.88	5.5	35.42	108	0	Average
2472	92.71	90.75			31.88	5.5	35.42	108	0	Peak
2484	43.59	41.63	54	-10.41	31.88	5.5	35.42	108	0	Average
2484	58.73	56.77	74	-15.27	31.88	5.5	35.42	108	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2374	40.26	38.6	54	-13.74	31.78	5.37	35.49	168	13	Average
2374	56.1	54.44	74	-17.9	31.78	5.37	35.49	168	13	Peak
2472	83.45	81.49			31.88	5.5	35.42	168	13	Average
2472	91.34	89.38			31.88	5.5	35.42	168	13	Peak
2484	42.51	40.55	54	-11.49	31.88	5.5	35.42	168	13	Average
2484	58.9	56.94	74	-15.1	31.88	5.5	35.42	168	13	Peak

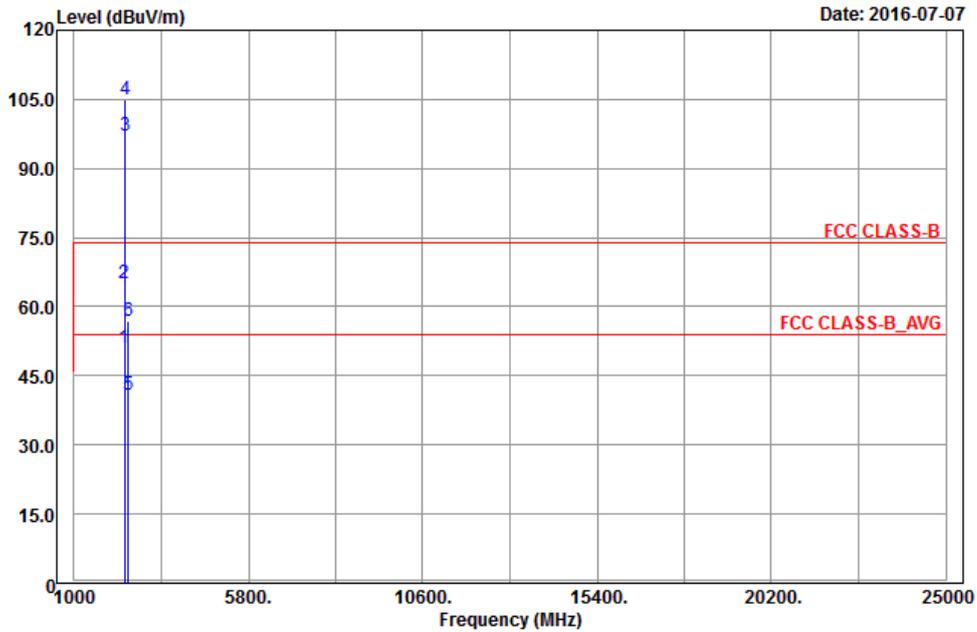
Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 MHz: Fundamental frequency.

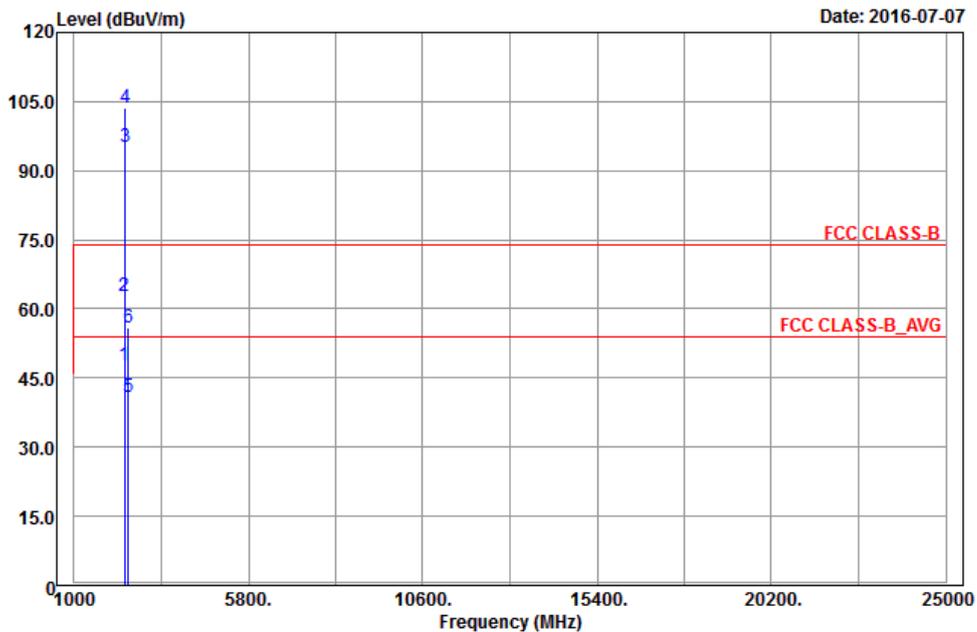
802.11n (HT20)

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	Karl Lee

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
2390	51.03	49.3	54	-2.97	31.8	5.4	35.47	142	0	Average
2390	64.92	63.19	74	-9.08	31.8	5.4	35.47	142	0	Peak
2412	97.06	95.29			31.81	5.43	35.47	142	0	Average
2412	105.04	103.27			31.81	5.43	35.47	142	0	Peak
2484	40.89	38.93	54	-13.11	31.88	5.5	35.42	142	0	Average
2484	57.01	55.05	74	-16.99	31.88	5.5	35.42	142	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

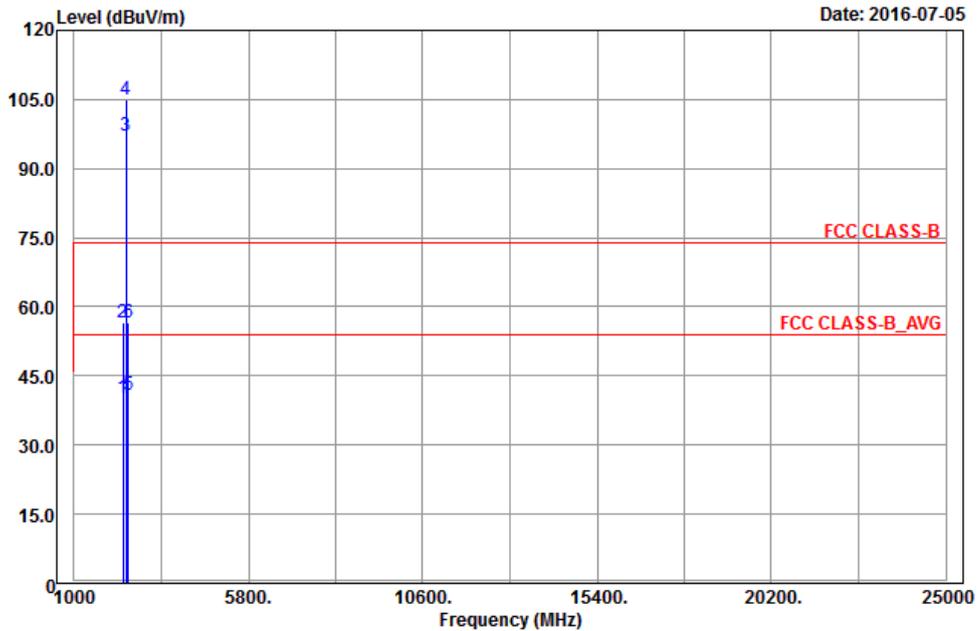
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2390	47.76	46.03	54	-6.24	31.8	5.4	35.47	173	8	Average
2390	62.69	60.96	74	-11.31	31.8	5.4	35.47	173	8	Peak
2412	95.14	93.37			31.81	5.43	35.47	173	8	Average
2412	103.57	101.8			31.81	5.43	35.47	173	8	Peak
2484	41	39.04	54	-13	31.88	5.5	35.42	173	8	Average
2484	55.9	53.94	74	-18.1	31.88	5.5	35.42	173	8	Peak

Remarks:

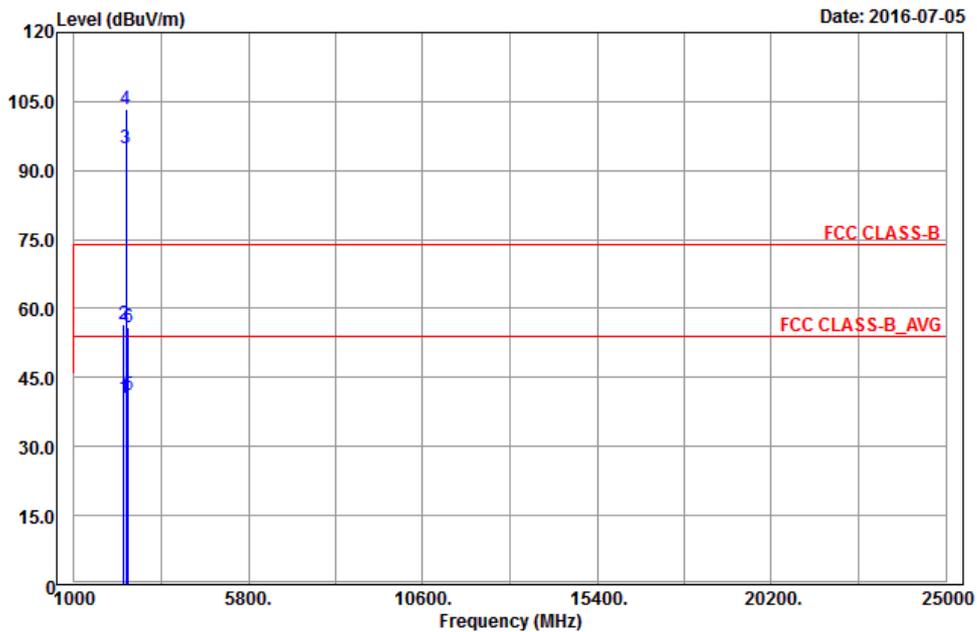
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.

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

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
2342	40.32	38.75	54	-13.68	31.74	5.33	35.5	161	0	Average
2342	56.68	55.11	74	-17.32	31.74	5.33	35.5	161	0	Peak
2437	96.96	95.11			31.85	5.46	35.46	161	0	Average
2437	105.11	103.26			31.85	5.46	35.46	161	0	Peak
2500	41	38.98	54	-13	31.9	5.53	35.41	161	0	Average
2500	56.53	54.51	74	-17.47	31.9	5.53	35.41	161	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

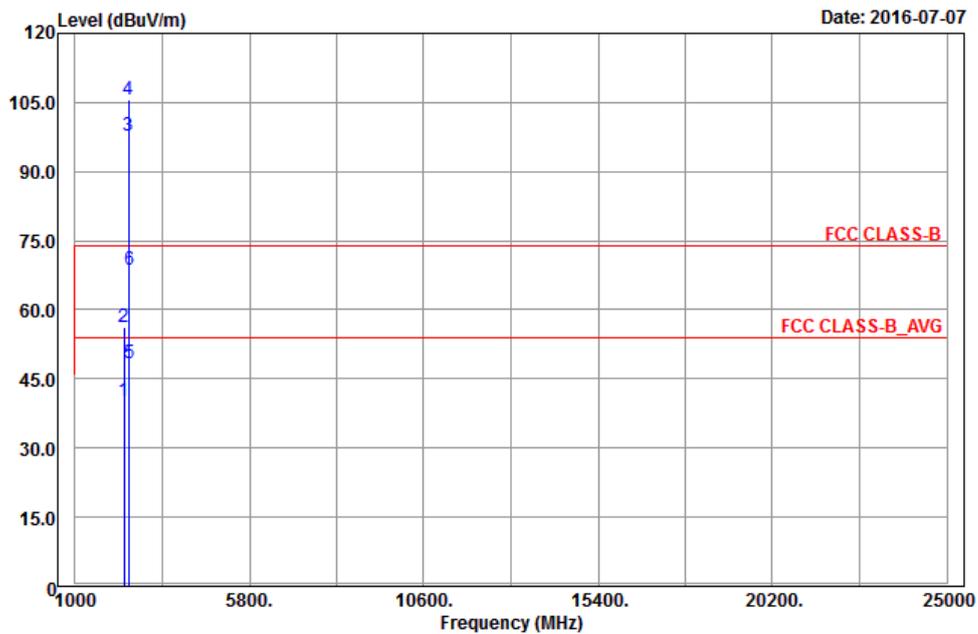
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2370	40.46	38.8	54	-13.54	31.78	5.37	35.49	153	12	Average
2370	56.71	55.05	74	-17.29	31.78	5.37	35.49	153	12	Peak
2437	94.7	92.85			31.85	5.46	35.46	153	12	Average
2437	103.17	101.32			31.85	5.46	35.46	153	12	Peak
2500	41.26	39.24	54	-12.74	31.9	5.53	35.41	153	12	Average
2500	55.8	53.78	74	-18.2	31.9	5.53	35.41	153	12	Peak

Remarks:

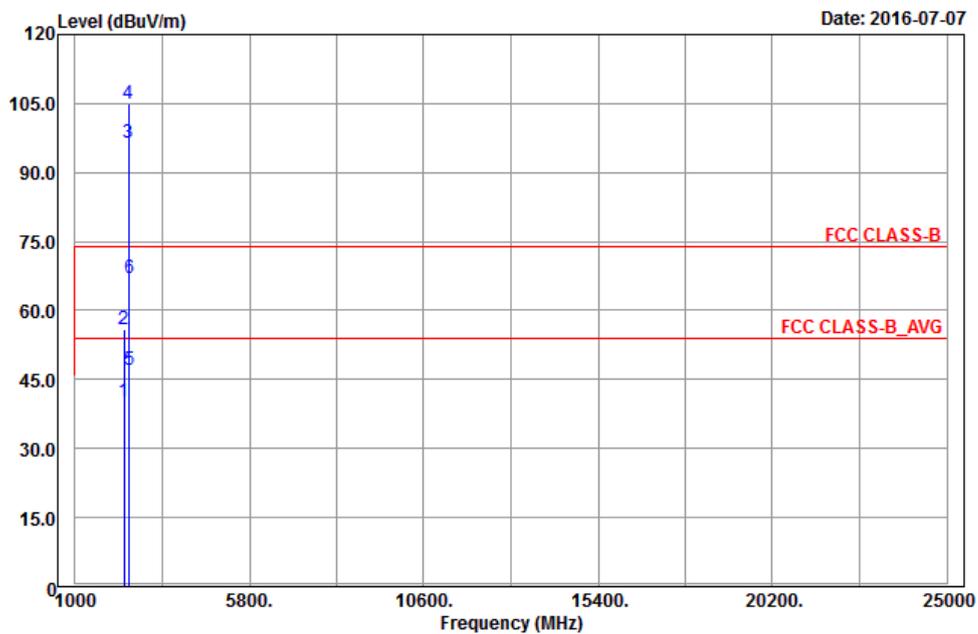
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.

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

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
2340	40.2	38.63	54	-13.8	31.74	5.33	35.5	108	0	Average
2340	56.19	54.62	74	-17.81	31.74	5.33	35.5	108	0	Peak
2462	97.72	95.79			31.87	5.5	35.44	108	0	Average
2462	105.53	103.6			31.87	5.5	35.44	108	0	Peak
2484	48.29	46.33	54	-5.71	31.88	5.5	35.42	108	0	Average
2484	68.62	66.66	74	-5.38	31.88	5.5	35.42	108	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

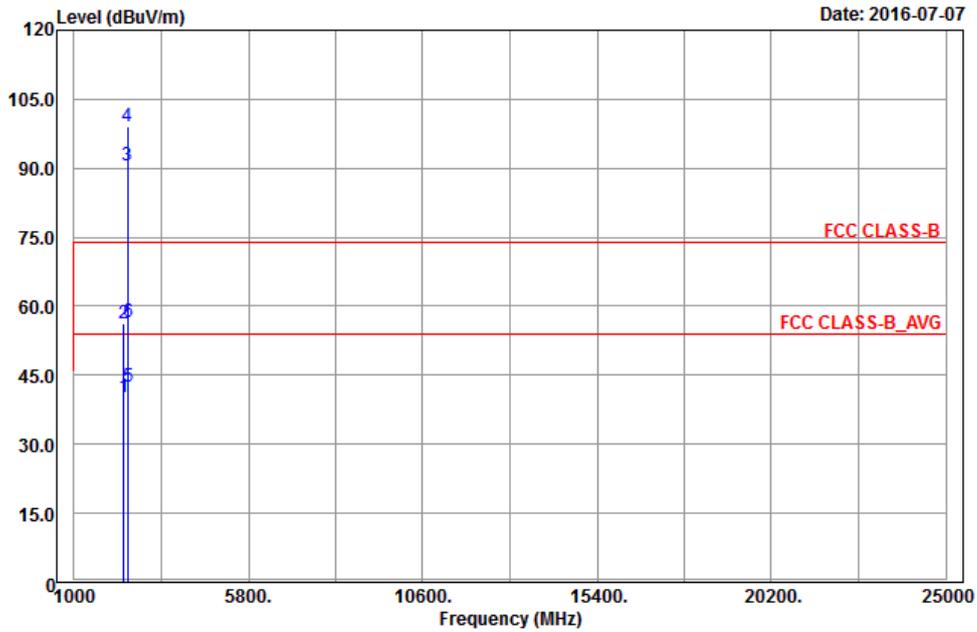
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2348	40.19	38.62	54	-13.81	31.74	5.33	35.5	168	13	Average
2348	55.94	54.37	74	-18.06	31.74	5.33	35.5	168	13	Peak
2462	96.35	94.42			31.87	5.5	35.44	168	13	Average
2462	104.82	102.89			31.87	5.5	35.44	168	13	Peak
2484	47.13	45.17	54	-6.87	31.88	5.5	35.42	168	13	Average
2484	67.01	65.05	74	-6.99	31.88	5.5	35.42	168	13	Peak

Remarks:

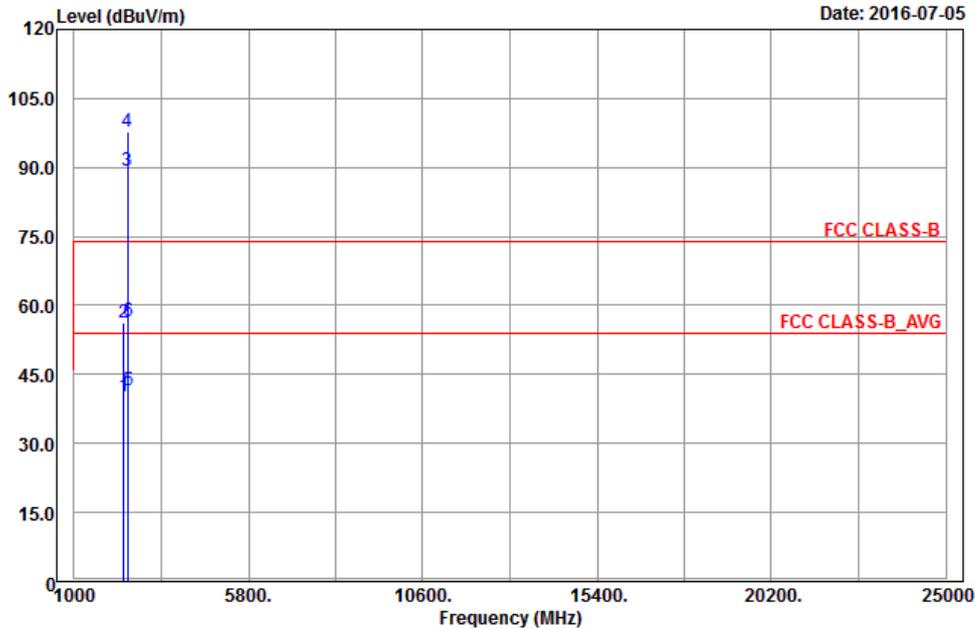
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

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
2372	40.25	38.59	54	-13.75	31.78	5.37	35.49	108	0	Average
2372	56.28	54.62	74	-17.72	31.78	5.37	35.49	108	0	Peak
2467	90.48	88.53			31.87	5.5	35.42	108	0	Average
2467	99.1	97.15			31.87	5.5	35.42	108	0	Peak
2484	42.48	40.52	54	-11.52	31.88	5.5	35.42	108	0	Average
2484	56.54	54.58	74	-17.46	31.88	5.5	35.42	108	0	Peak

Antennal Polarity & Test Distance: Vertical at 3 m

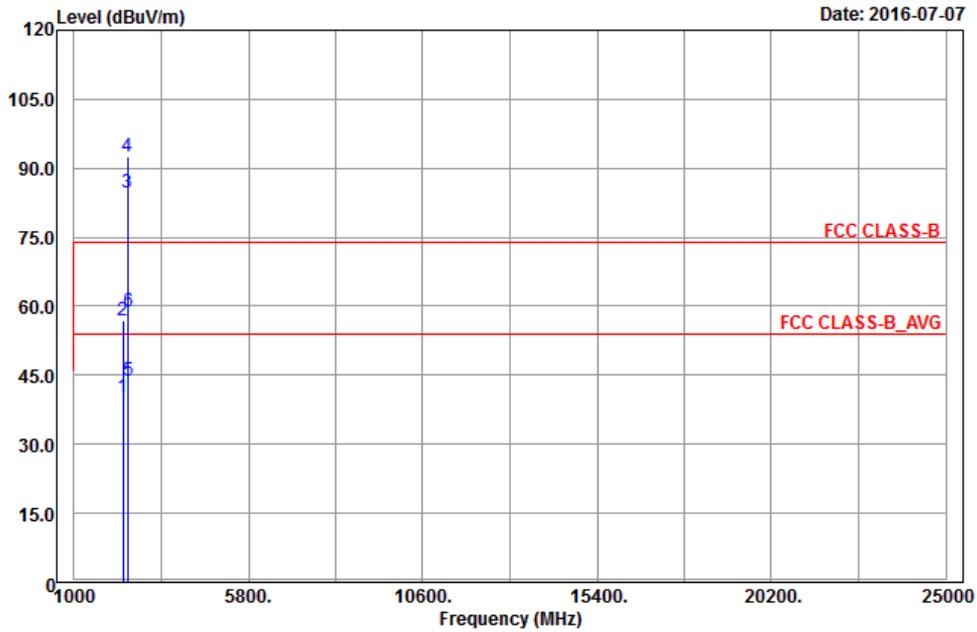
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2370	40.26	38.6	54	-13.74	31.78	5.37	35.49	168	13	Average
2370	56.16	54.5	74	-17.84	31.78	5.37	35.49	168	13	Peak
2467	89.19	87.24			31.87	5.5	35.42	168	13	Average
2467	97.84	95.89			31.87	5.5	35.42	168	13	Peak
2486	41.67	39.68	54	-12.33	31.88	5.53	35.42	168	13	Average
2486	56.72	54.73	74	-17.28	31.88	5.53	35.42	168	13	Peak

Remarks:

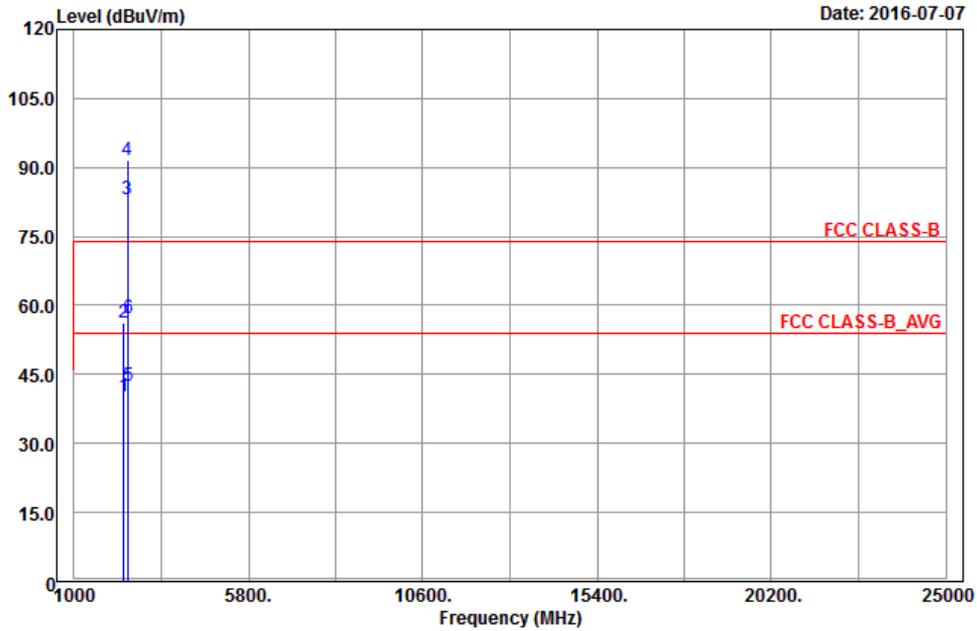
- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

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
2344	40.14	38.57	54	-13.86	31.74	5.33	35.5	108	0	Average
2344	56.83	55.26	74	-17.17	31.74	5.33	35.5	108	0	Peak
2472	84.55	82.59			31.88	5.5	35.42	108	0	Average
2472	92.53	90.57			31.88	5.5	35.42	108	0	Peak
2484	43.69	41.73	54	-10.31	31.88	5.5	35.42	108	0	Average
2484	58.72	56.76	74	-15.28	31.88	5.5	35.42	108	0	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
2370	40.18	38.52	54	-13.82	31.78	5.37	35.49	168	13	Average
2370	56.23	54.57	74	-17.77	31.78	5.37	35.49	168	13	Peak
2472	83.15	81.19			31.88	5.5	35.42	168	13	Average
2472	91.65	89.69			31.88	5.5	35.42	168	13	Peak
2484	42.66	40.7	54	-11.34	31.88	5.5	35.42	168	13	Average
2484	57.17	55.21	74	-16.83	31.88	5.5	35.42	168	13	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2472 MHz: Fundamental frequency.

9 kHz ~ 30 MHz DATA:

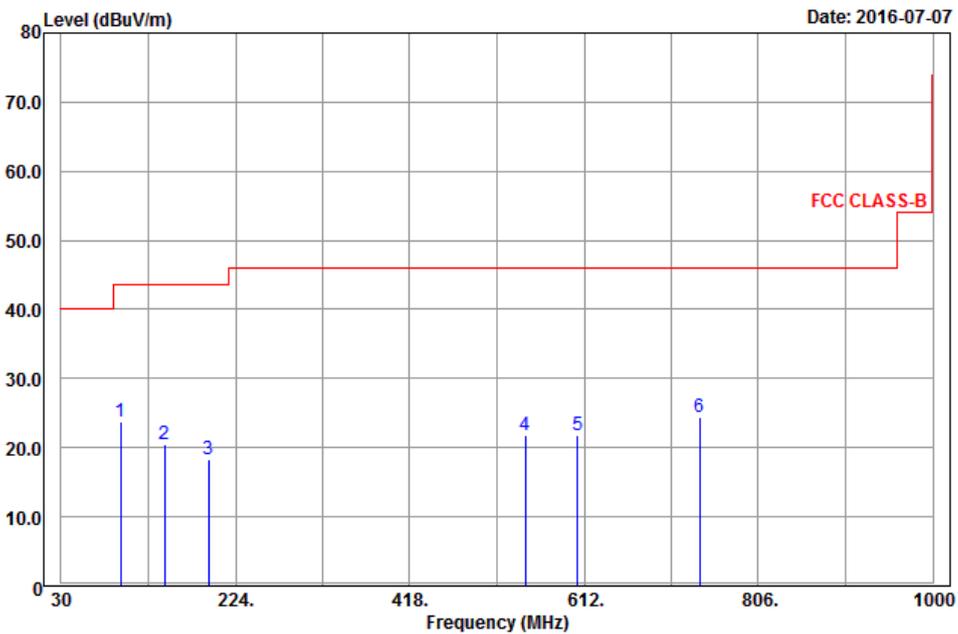
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz WORST-CASE DATA:

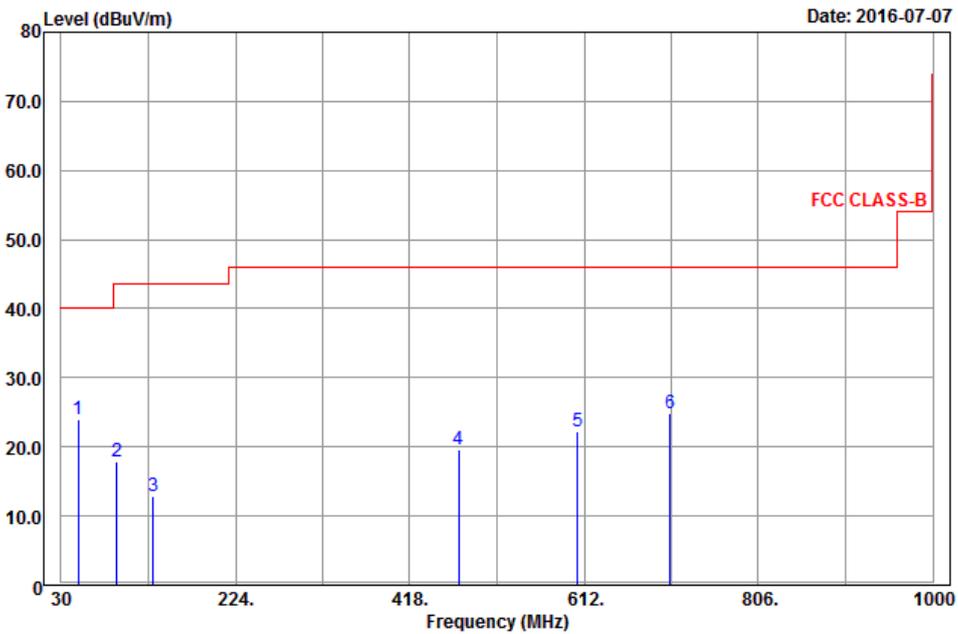
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

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
96.42	23.79	45.13	43.5	-19.71	9.42	1.28	32.04	142	211	Peak
145.02	20.45	41.61	43.5	-23.05	9.73	1.38	32.27	188	178	Peak
193.89	18.25	38.34	43.5	-25.25	10.57	1.61	32.27	190	89	Peak
546.4	21.76	30.85	46	-24.24	20.34	2.76	32.19	180	213	Peak
604.5	21.9	29.98	46	-24.1	21.24	2.87	32.19	111	113	Peak
741	24.4	30.11	46	-21.6	23.27	3.16	32.14	174	131	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
48.9	24.02	47.2	40	-15.98	8.14	0.9	32.22	148	219	Peak
91.83	17.97	39.62	43.5	-25.53	9.06	1.11	31.82	106	140	Peak
132.33	12.82	34.46	43.5	-30.68	9.22	1.38	32.24	175	263	Peak
472.2	19.61	30.36	46	-26.39	18.81	2.56	32.12	188	18	Peak
604.5	22.2	30.28	46	-23.8	21.24	2.87	32.19	195	229	Peak
707.4	24.81	30.61	46	-21.19	23.19	3.11	32.1	185	171	Peak

Remarks:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 16, 2015	Nov. 15, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2016	Feb. 25, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2015	Jul. 23, 2016
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

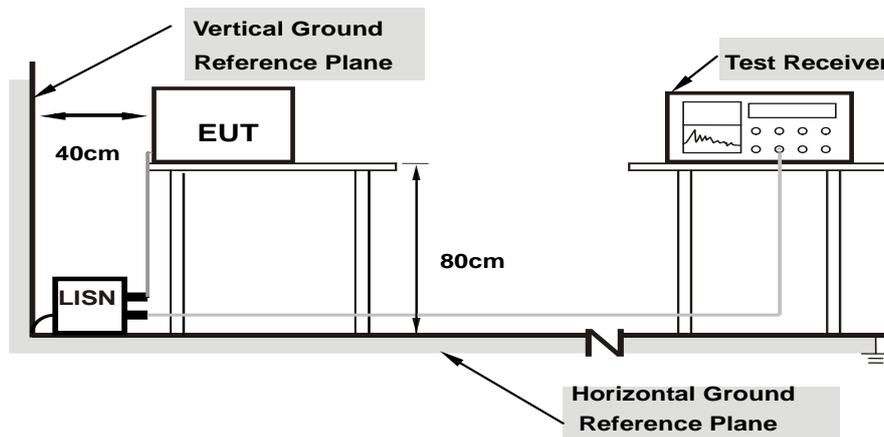
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

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

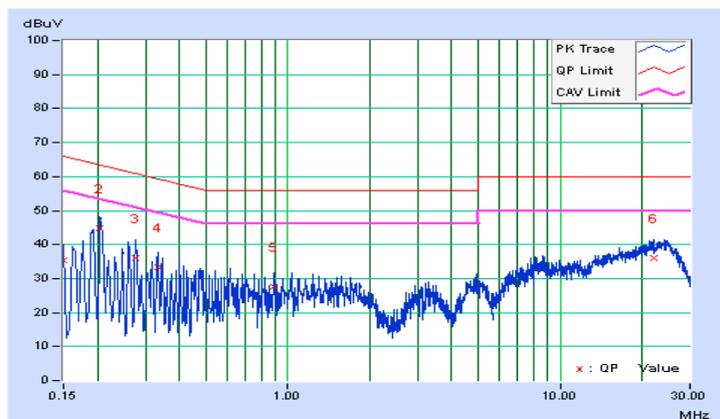
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/7/8

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.01	25.42	12.69	35.43	22.70	66.00	56.00	-30.57	-33.30
2	0.20474	10.03	34.59	22.82	44.62	32.85	63.42	53.42	-18.80	-20.57
3	0.27512	10.06	26.00	12.29	36.06	22.35	60.96	50.96	-24.90	-28.61
4	0.33377	10.09	23.29	10.75	33.38	20.84	59.36	49.36	-25.98	-28.52
5	0.89290	10.19	17.49	9.41	27.68	19.60	56.00	46.00	-28.32	-26.40
6	21.98344	11.48	24.58	14.50	36.06	25.98	60.00	50.00	-23.94	-24.02

Remarks:

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

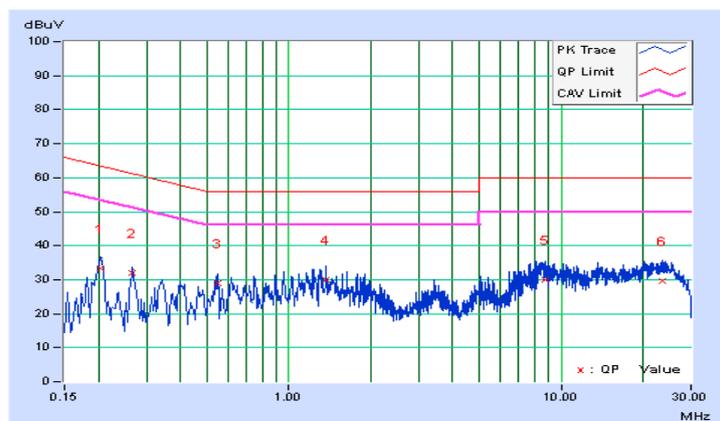


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/7/8

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	0.20458	10.04	23.16	12.87	33.20	22.91	63.42	53.42	-30.22	-30.51
2	0.26730	10.07	21.87	9.95	31.94	20.02	61.20	51.20	-29.26	-31.18
3	0.54491	10.15	18.84	10.31	28.99	20.46	56.00	46.00	-27.01	-25.54
4	1.36601	10.24	19.84	12.99	30.08	23.23	56.00	46.00	-25.92	-22.77
5	8.73636	10.72	19.38	10.34	30.10	21.06	60.00	50.00	-29.90	-28.94
6	23.44187	11.71	17.93	10.17	29.64	21.88	60.00	50.00	-30.36	-28.12

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

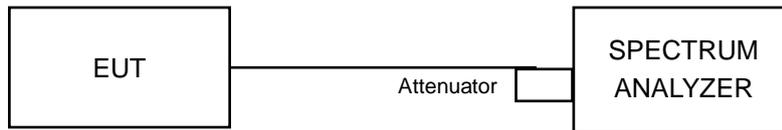


4.3 6 dB Bandwidth Measurement

4.3.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

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 Procedure

- a. Set resolution bandwidth (RBW) = 100 kHz
- b. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

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 Result

802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.58	0.5	Pass
6	2437	8.59	0.5	Pass
11	2462	9.03	0.5	Pass
12	2467	8.54	0.5	Pass
13	2472	8.09	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.32	0.5	Pass
6	2437	16.09	0.5	Pass
11	2462	16.11	0.5	Pass
12	2467	16.10	0.5	Pass
13	2472	16.05	0.5	Pass

802.11n (HT20)

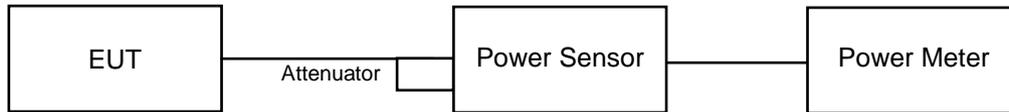
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.90	0.5	Pass
6	2437	16.31	0.5	Pass
11	2462	16.40	0.5	Pass
12	2467	16.36	0.5	Pass
13	2472	16.35	0.5	Pass

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 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.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.4.7 Test Results

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	56.75	17.54	30	Pass
6	2437	54.83	17.39	30	Pass
11	2462	56.62	17.53	30	Pass
12	2467	51.40	17.11	30	Pass
13	2472	28.58	14.56	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	238.78	23.78	30	Pass
6	2437	234.96	23.71	30	Pass
11	2462	239.33	23.79	30	Pass
12	2467	84.72	19.28	30	Pass
13	2472	20.46	13.11	30	Pass

802.11n (HT20)

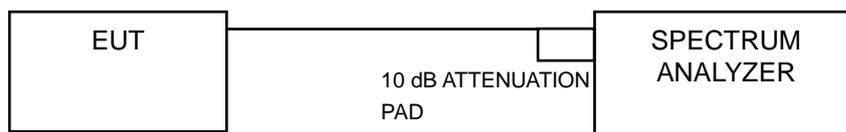
Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	243.22	23.86	30	Pass
6	2437	230.14	23.62	30	Pass
11	2462	242.10	23.84	30	Pass
12	2467	69.98	18.45	30	Pass
13	2472	26.92	14.3	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Results

802.11b

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-8.63	8	Pass
6	2437	-9.03	8	Pass
11	2462	-8.71	8	Pass
12	2467	-9.31	8	Pass
13	2472	-11.44	8	Pass

802.11g

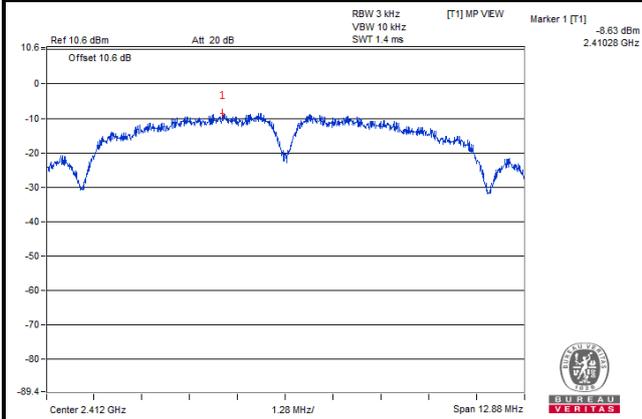
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-10.45	8	Pass
6	2437	-10.24	8	Pass
11	2462	-10.25	8	Pass
12	2467	-15.36	8	Pass
13	2472	-23.13	8	Pass

802.11n (HT20)

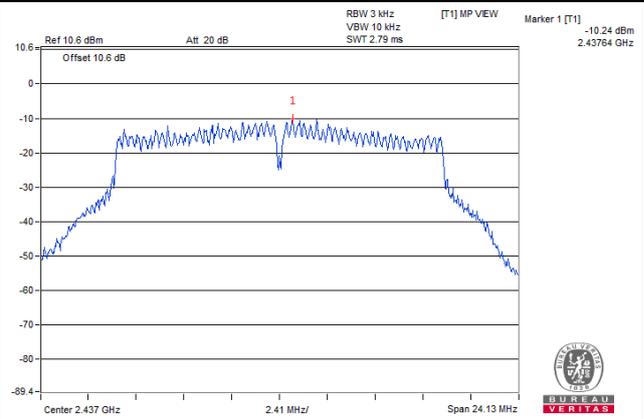
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-10.50	8	Pass
6	2437	-10.33	8	Pass
11	2462	-10.86	8	Pass
12	2467	-17.55	8	Pass
13	2472	-23.37	8	Pass

Spectrum Plot of Worst Value

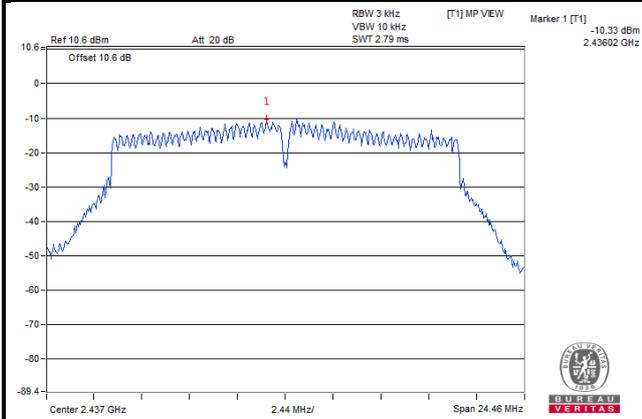
802.11b



802.11g



802.11n (HT20)

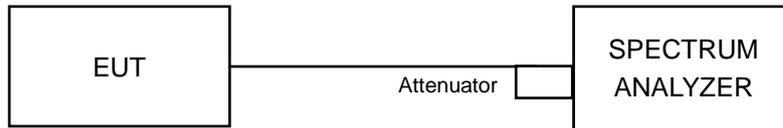


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

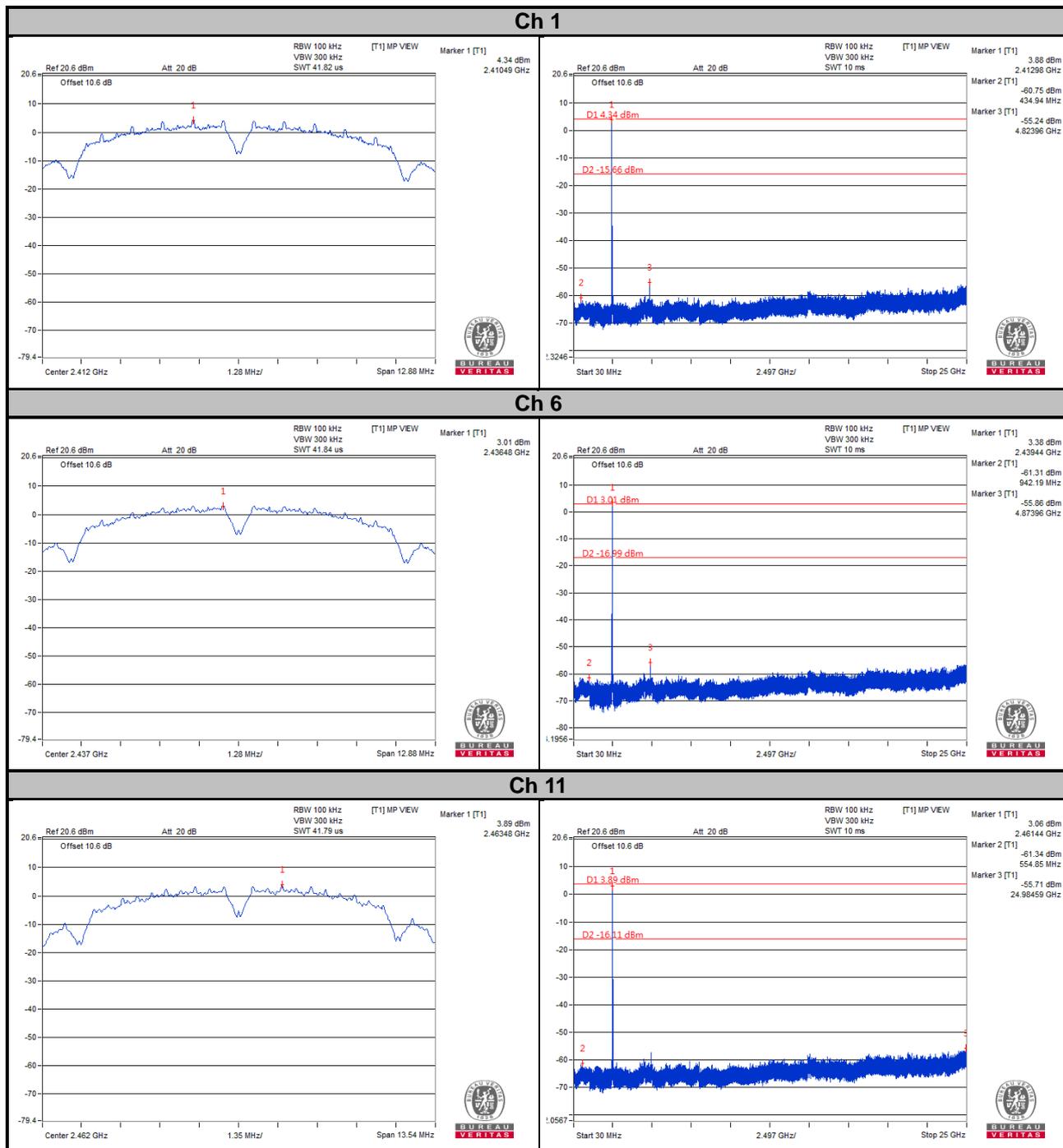
4.6.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

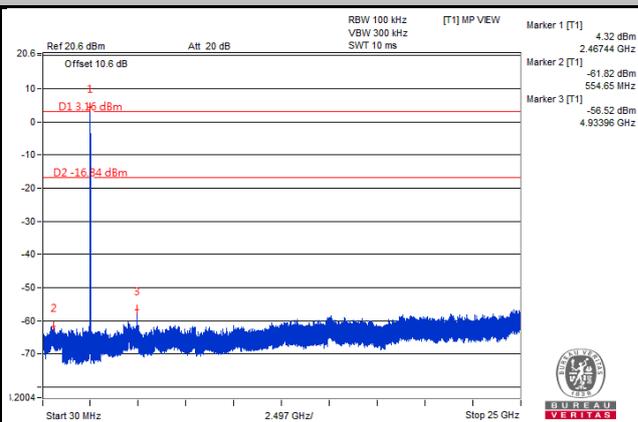
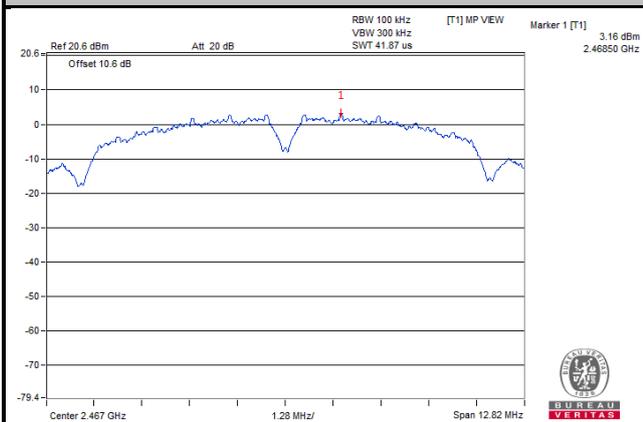
4.6.7 Test Results

The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20 dB offset below D1. It shows compliance with the requirement.

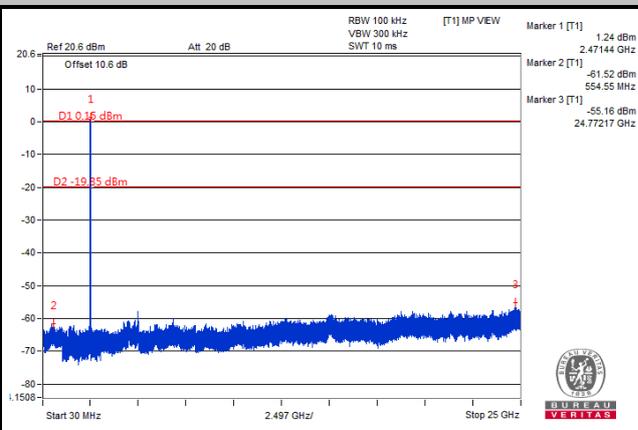
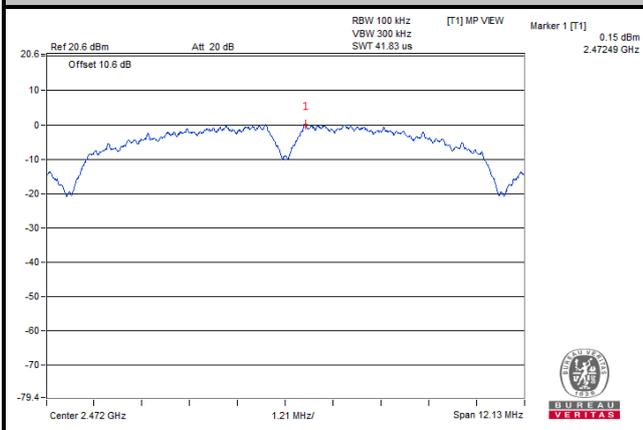
802.11b



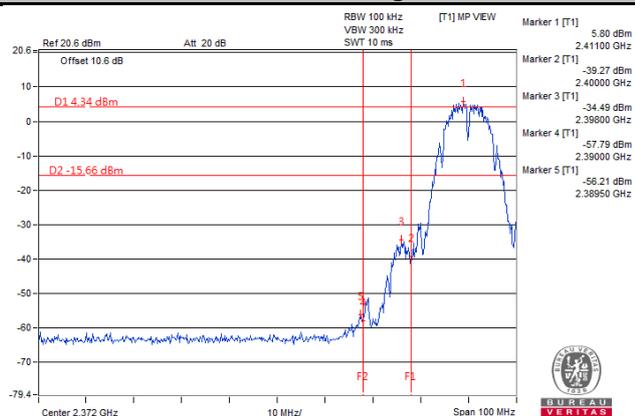
Ch 12



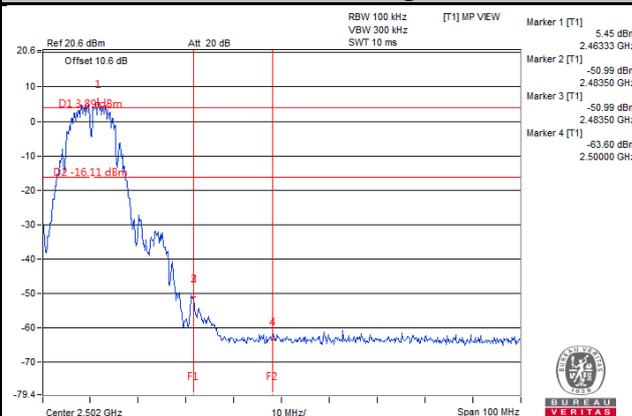
Ch 13



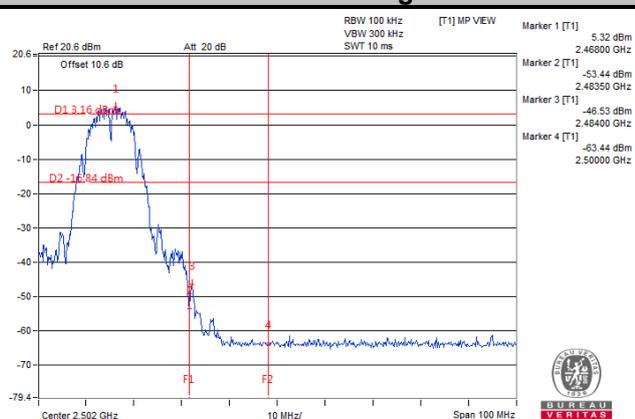
Ch 1 Band Edge



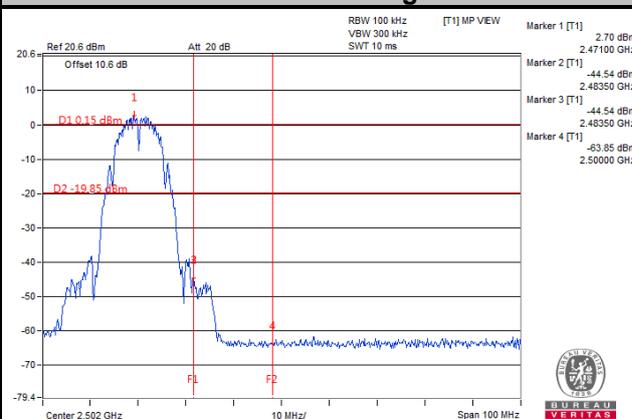
Ch 11 Band Edge



Ch 12 Band Edge

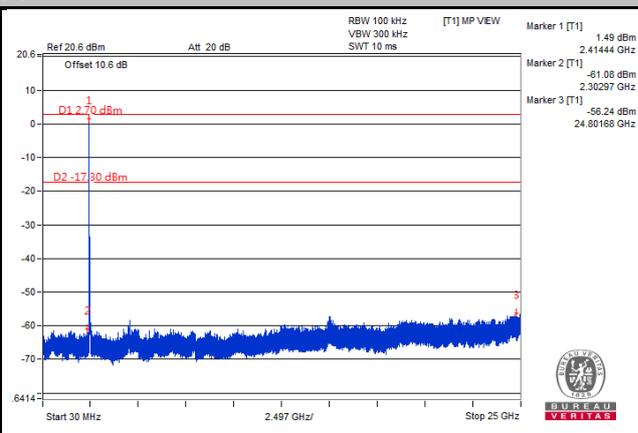
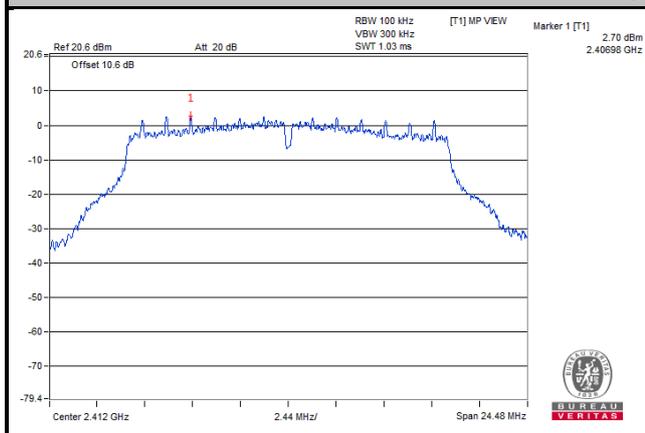


Ch 13 Band Edge

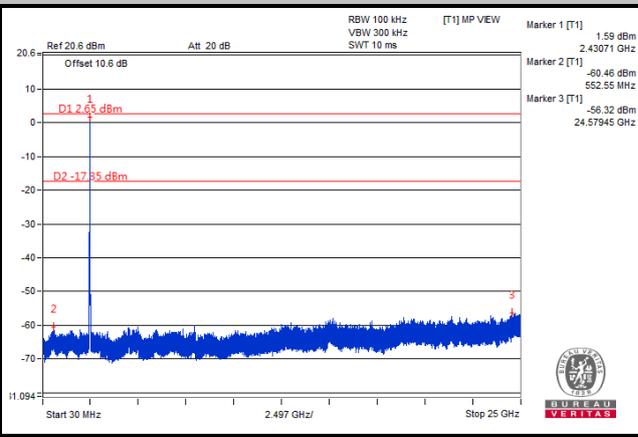
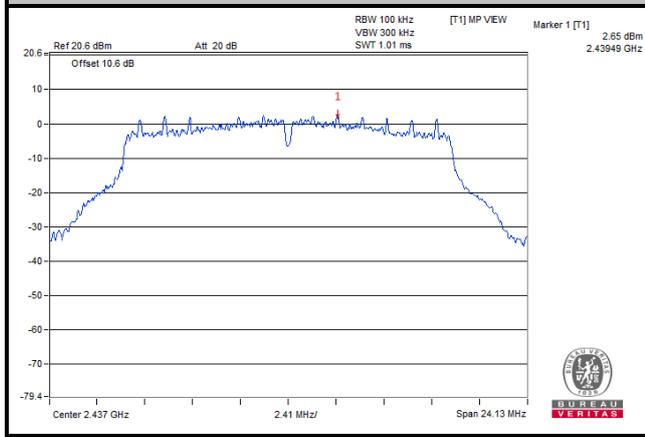


802.11g

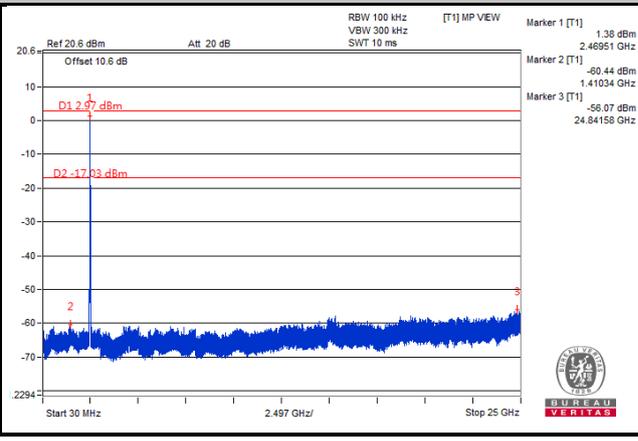
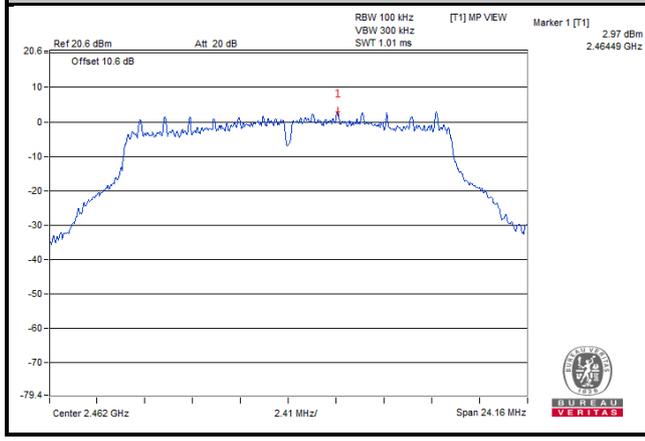
Ch 1



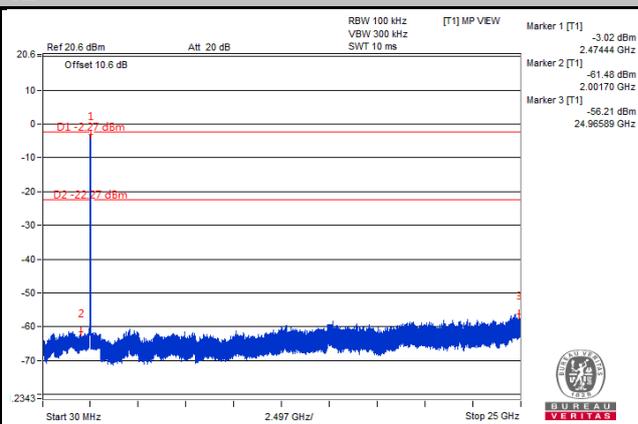
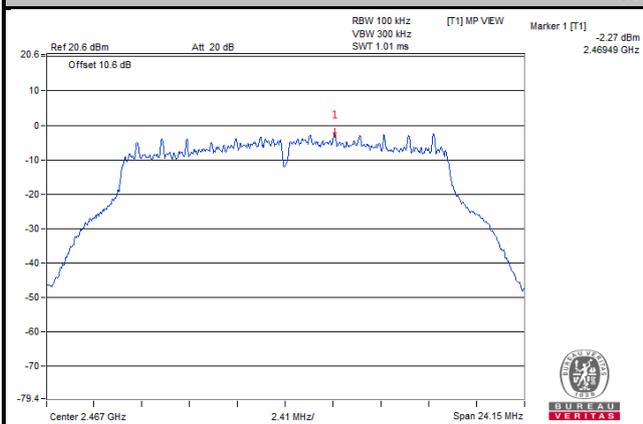
Ch 6



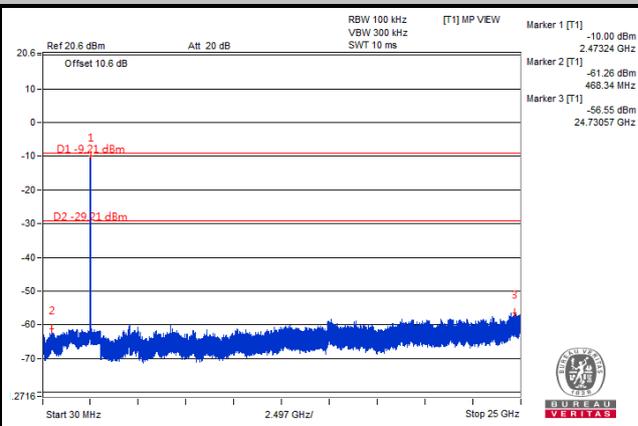
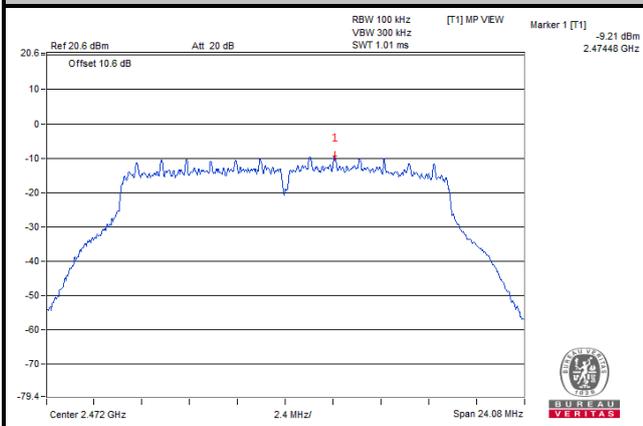
Ch 11

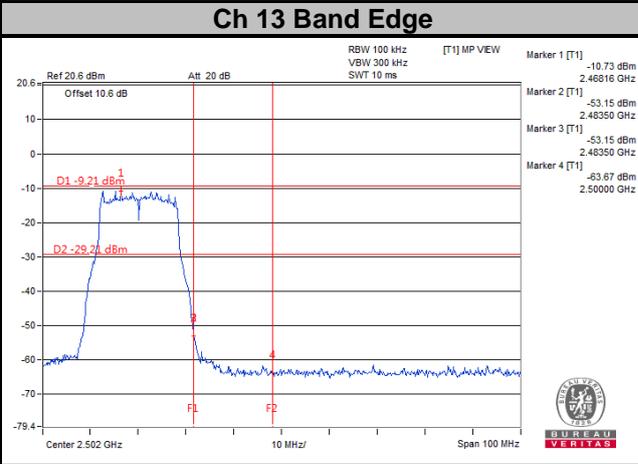
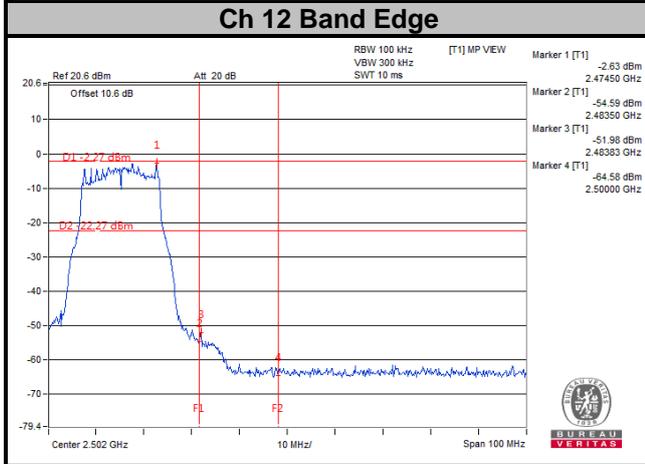
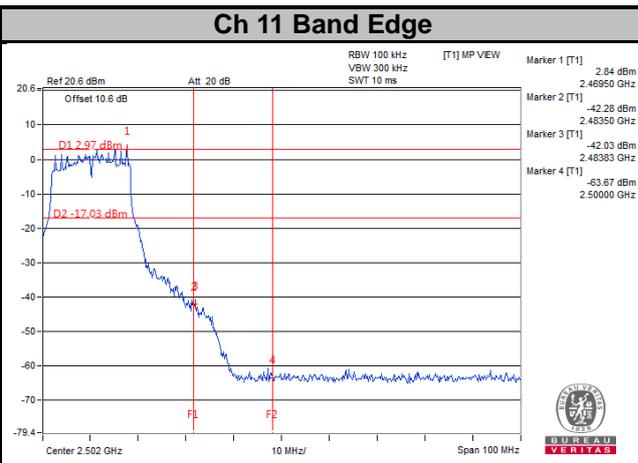
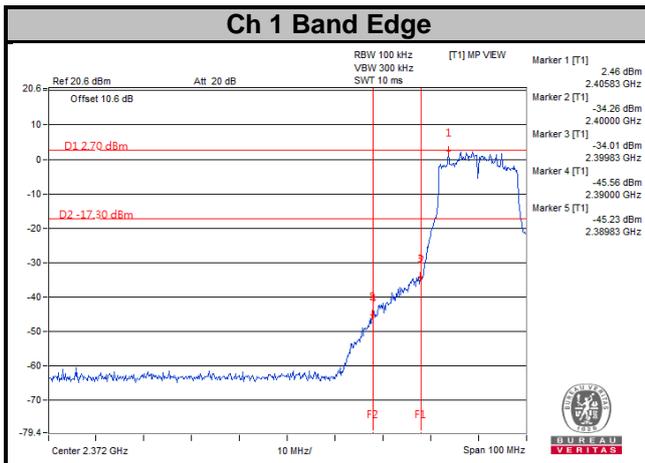


Ch 12



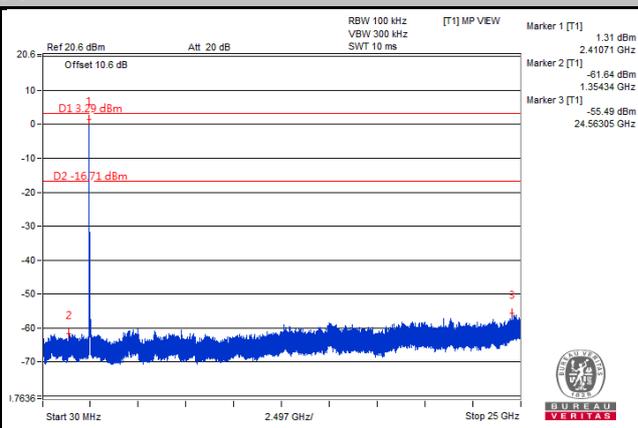
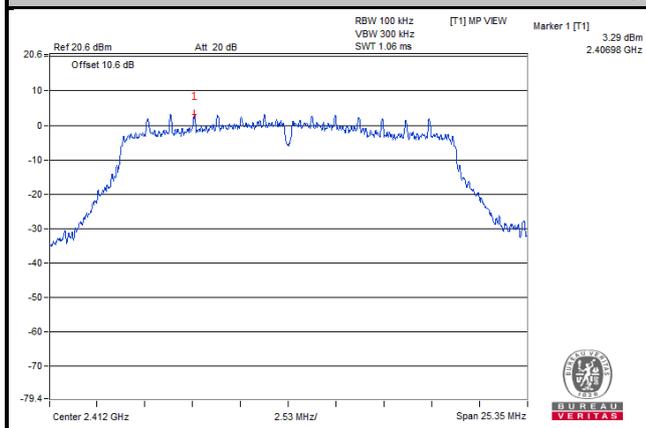
Ch 13



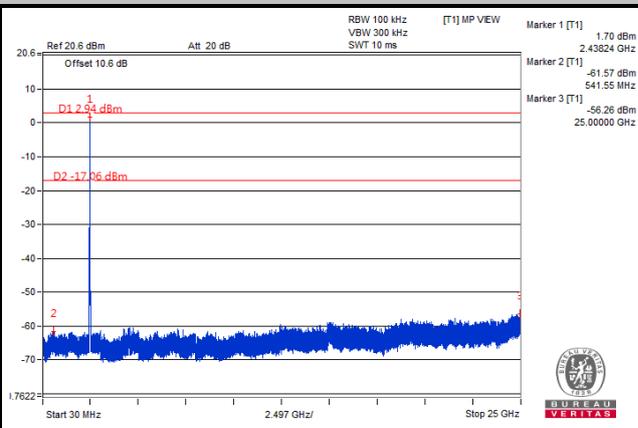
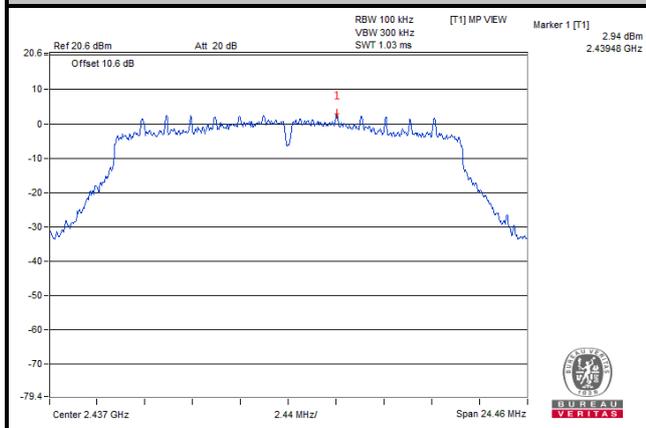


802.11n (HT20)

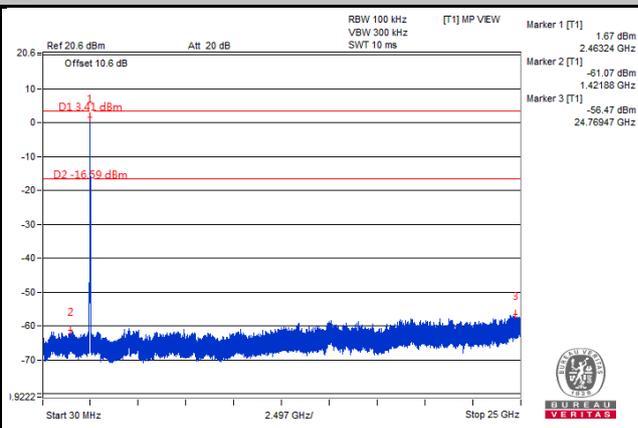
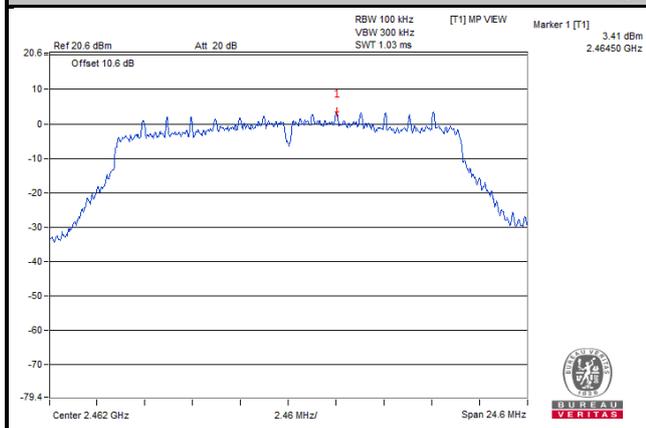
Ch 1



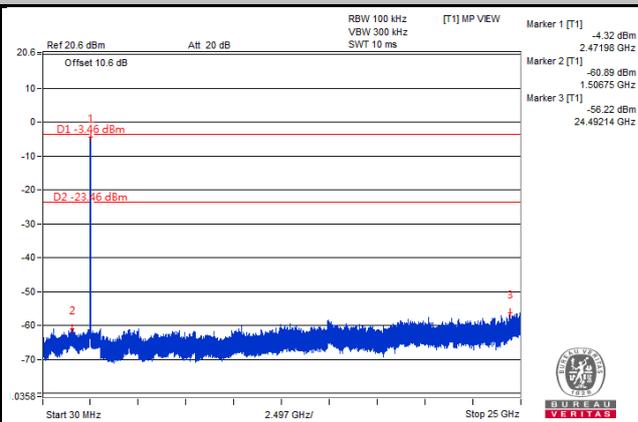
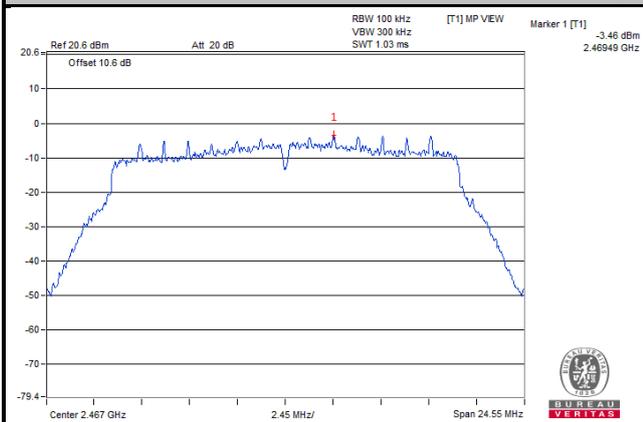
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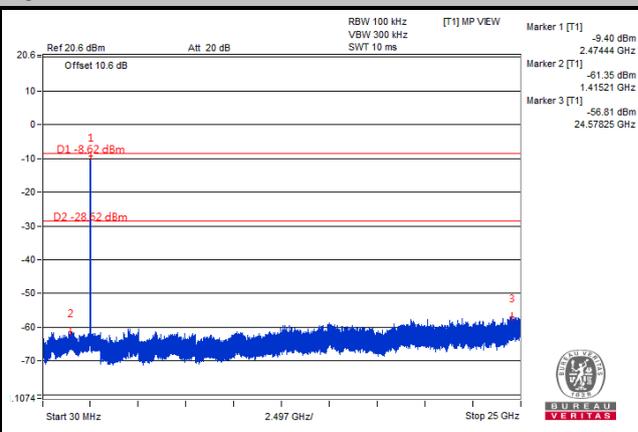
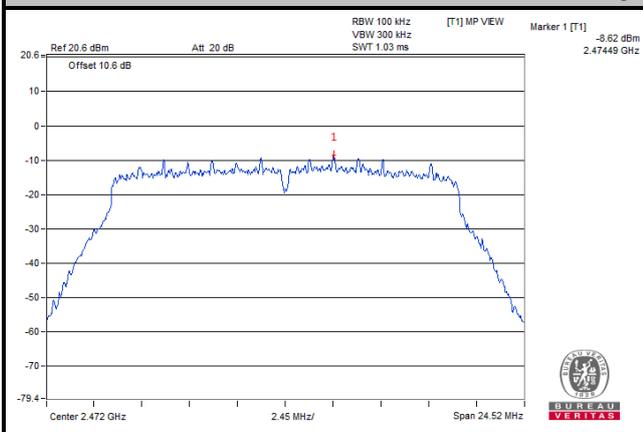
Ch 11



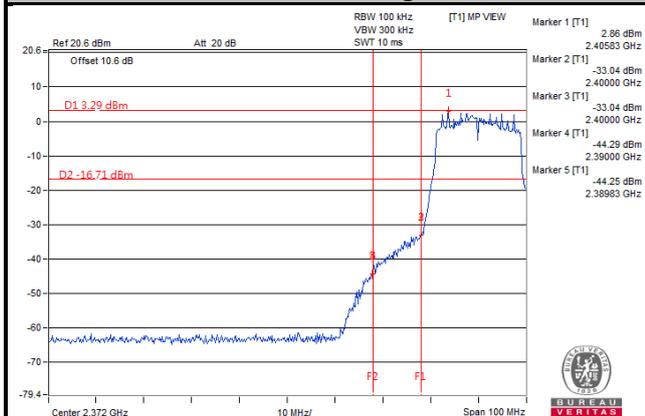
Ch 12



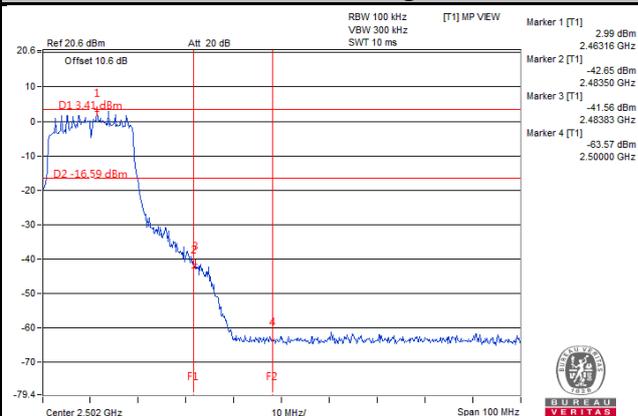
Ch 13



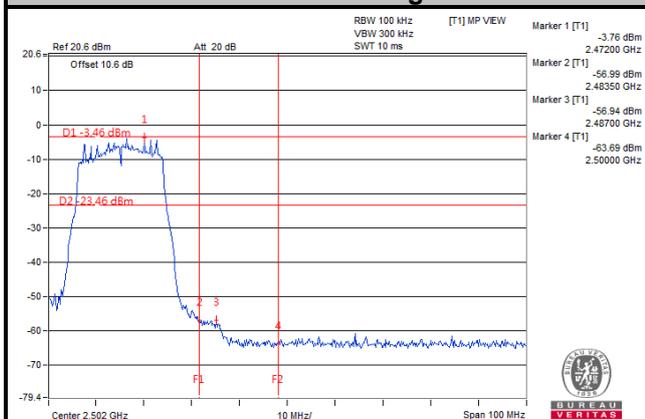
Ch 1 Band Edge



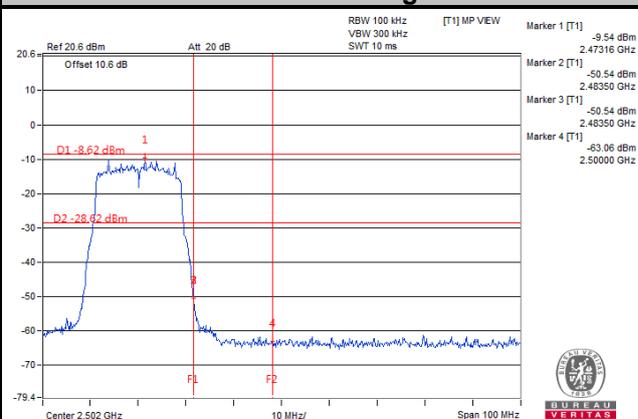
Ch 11 Band Edge



Ch 12 Band Edge



Ch 13 Band Edge



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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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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