FCC Test Report

Report No.: RF150618C17

FCC ID: P4Q-N496

Test Model: N496

Received Date: Jun. 18, 2015

Test Date: Jun. 26, 2015 ~ Aug. 20, 2015

Issued Date: Aug. 24, 2015

Applicant: MITAC International Corp.

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

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Test Location (1): No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF150618C17	Original Release	Aug. 24, 2015

1 Certificate of Conformity

Product: Tablet

Brand: MiTAC, Mio, MAGELLAN, NAVMAN, MioCARE, MioWORK

Test Model: N496

Sample Status: Production Unit

Applicant: MITAC International Corp.

Test Date: Jun. 26, 2015 ~ Aug. 20, 2015

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 : Gina Liu , **Date:** Aug. 24, 2015

Gina Liu / Specialist

Approved by : Kay Wu , **Date:** Aug. 24, 2015

Kay Wu / Supervisor

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 -5.36 dB at 0.19305 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -2.48 dB at 2484 MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB 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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Tablet
Brand	MiTAC, Mio, MAGELLAN, NAVMAN, MioCARE, MioWORK
Test Model	N496
Power Supply Rating	5.0Vdc (adapter or host equipment) 3.7Vdc (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 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
Output Power	116.95mW
Antenna Type	PIFA antenna with 2.4dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT provides one completed transmitter and one receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	TPT	MIL050200I	I/P: 110-240Vac, 50/60Hz, 0.6A O/P: 5Vdc, 2A 1.2m cable
Battery	TianYu	N496	3.7Vdc, 4000mAh
USB Cable	EMINENCE	N/A	0.9m cable
WLAN, BT Module	Jorjin	WG7833-B0	--

3. 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 (20MHz):

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 (40MHz):

Channel	Frequency	Channel	Frequency
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 1GHz **RE<1G:** Radiated Emission below 1GHz
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 **Z-plane**.
NOTE: "-"means no effect.

Radiated Emission Test (Above 1GHz):

☒ 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 (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

Radiated Emission Test (Below 1GHz):

☒ 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)
-	802.11g	1 to 11	11	OFDM	BPSK	7.2

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)
-	802.11g	1 to 11	11	OFDM	BPSK	7.2

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 11	1, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
	802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	15.0

Antenna Port Conducted Measurement:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
PLC	25deg. C, 68%RH	120Vac, 60Hz	Toby Tian
APCM	25deg. C, 68%RH	3.7Vdc	Luke Chen

3.3 Duty Cycle of Test Signal

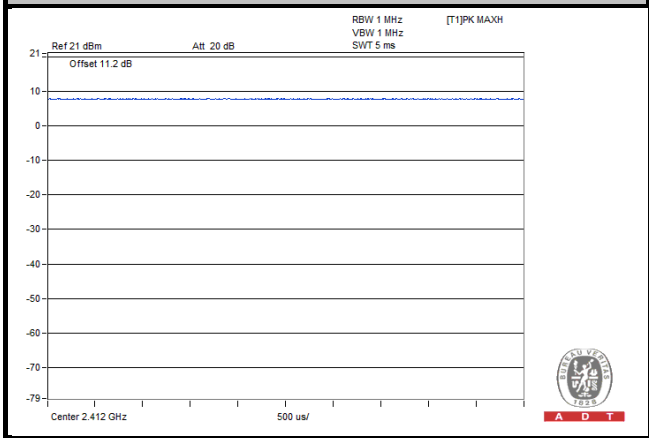
802.11b: Duty cycle of test signal is 100 %

802.11g: Duty cycle = 1.408/1.675 = 0.841, Duty factor = 10 * log(1/0.841) = 0.75

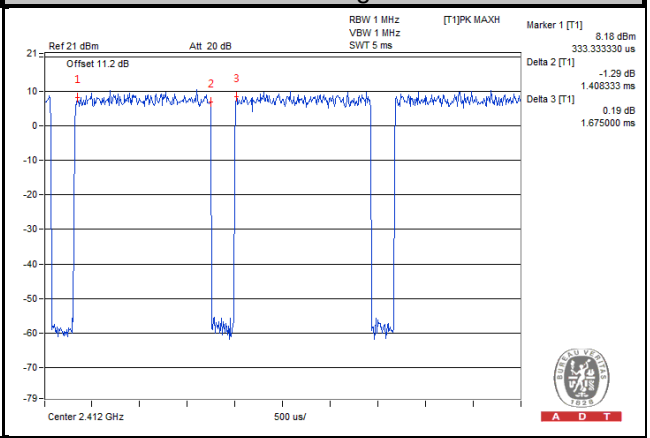
802.11n (20MHz): Duty cycle = 1.300/1.591 = 0.817, Duty factor = 10 * log(1/0.817) = 0.88

802.11n (40MHz): Duty cycle = 610.00/925.00 = 0.659, Duty factor = 10 * log(1/0.659) = 1.81

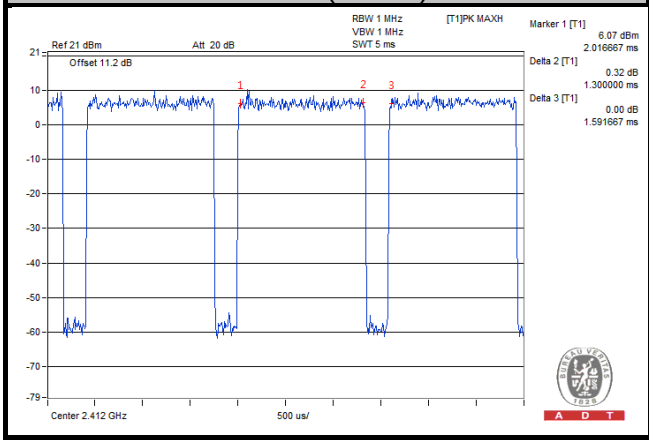
802.11b



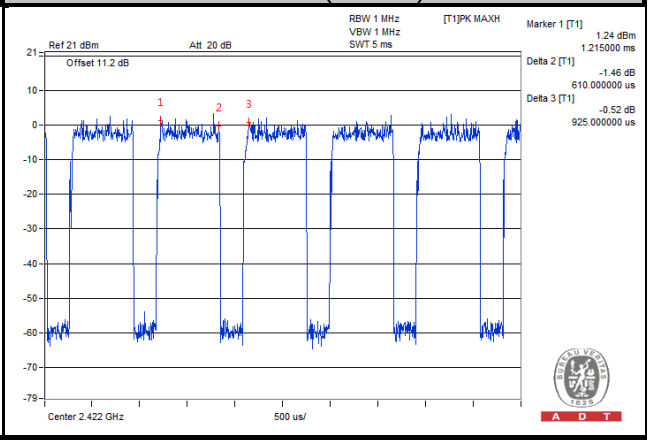
802.11g



802.11n (20MHz)



802.11n (40MHz)



3.4 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.

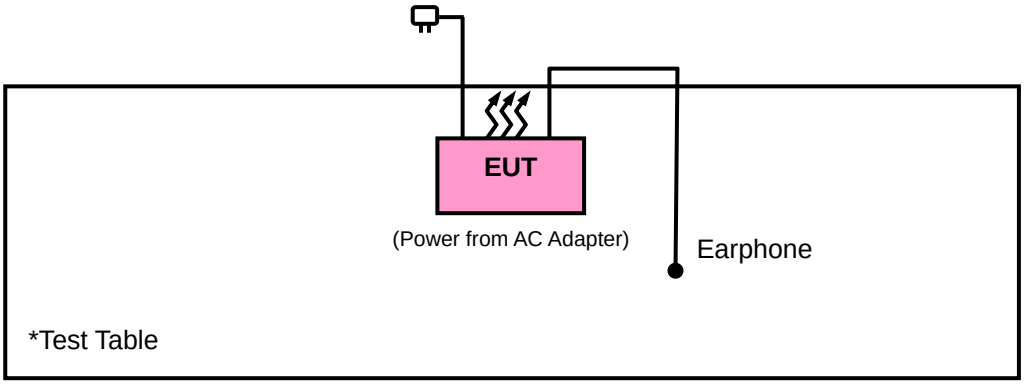
No.	Product	Brand	Model No.	Serial No.	FCC ID
A.	Earphone	N/A	N/A	N/A	N/A

Note:
1. All power cords of the above support units are non-shielded (1.8m).

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).

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 v03r03
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 20dB 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 1000MHz, 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 20dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manaufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Jan. 21, 2015	Jan. 21, 2016
Spectrum Analyzer Agilent	N9010A	MY52220314	Sep. 03, 2014	Sep. 02, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 10, 2014	Dec. 09, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 04, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 09, 2015	Feb. 09, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 04, 2015	Feb. 04, 2016
Loop Antenna R&S	HFH2-Z2	100070	Mar. 06, 2014	Mar. 05, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 12, 2014	Dec. 11, 2015
Preamplifier EMCI	EMC 184045	980116	Jan. 09, 2015	Jan. 08, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2014	Dec. 26, 2015
Power Meter Anritsu	ML2495A	1232002	Sep. 17, 2014	Sep. 16, 2015
Power Sensor Anritsu	MA2411B	1207325	Sep. 17, 2014	Sep. 16, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2014	Oct. 17, 2015
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Nov. 07, 2014	Nov. 06, 2015
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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in HwaYa Chamber 10.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 690701.
6. 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 1GHz) / 1.5 meters (for above 1GHz) 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 detect 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:

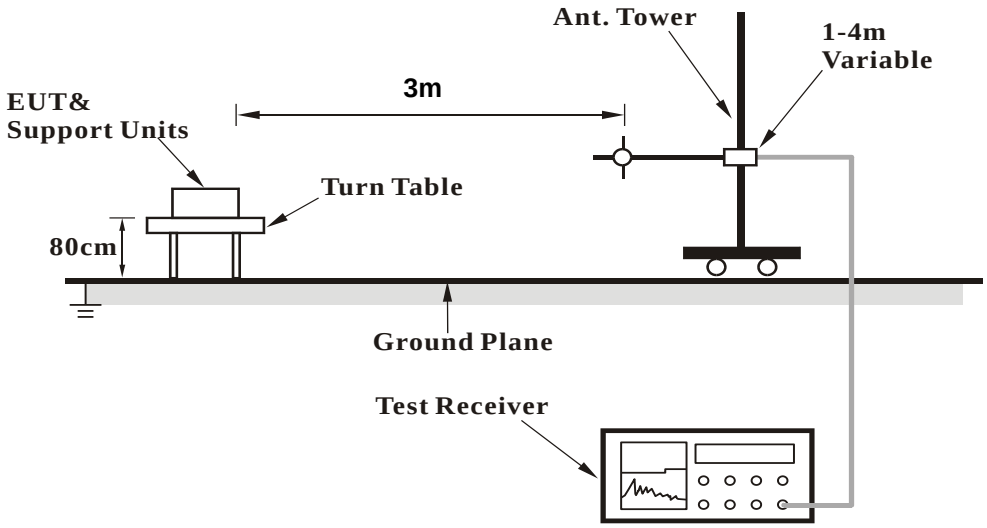
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.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

4.1.4 Deviation from Test Standard

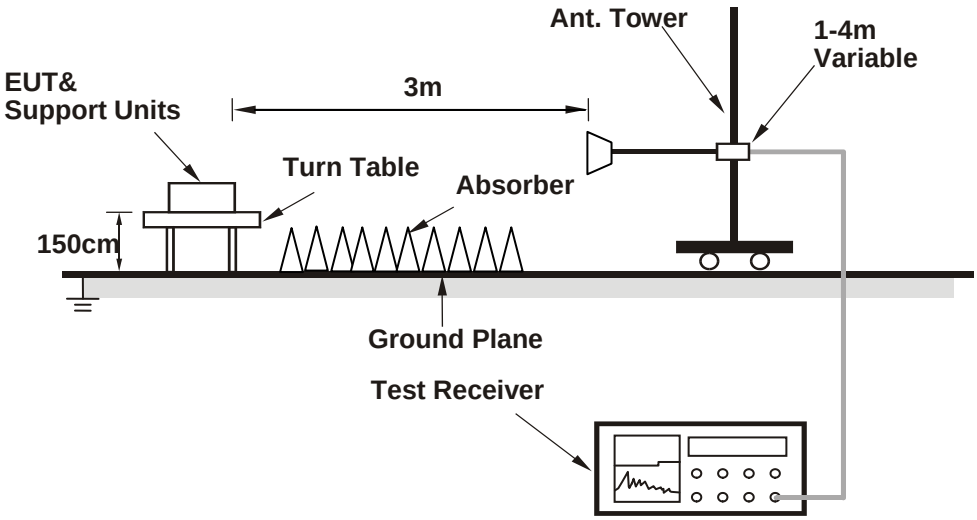
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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 1GHz Data：

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
2386	45.71	52.22	54	-8.29	26.91	4.08	37.5	149	4	Average
2386	57.53	64.04	74	-16.47	26.91	4.08	37.5	149	4	Peak
2412	101.06	107.53			26.96	4.09	37.52	149	4	Average
2412	106.21	112.68			26.96	4.09	37.52	149	4	Peak
2496	34.43	40.32	54	-19.57	27.2	4.16	37.25	149	4	Average
2496	56.69	62.58	74	-17.31	27.2	4.16	37.25	149	4	Peak
4824	47.6	62.9	54	-6.4	30.99	6.79	53.08	151	352	Average
4824	50.21	65.51	74	-23.79	30.99	6.79	53.08	151	352	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	42.59	49.1	54	-11.41	26.91	4.08	37.5	221	91	Average
2388	57.01	63.52	74	-16.99	26.91	4.08	37.5	221	91	Peak
2412	99.28	105.75			26.96	4.09	37.52	221	91	Average
2412	104.45	110.92			26.96	4.09	37.52	221	91	Peak
2494	34.36	40.25	54	-19.64	27.2	4.16	37.25	221	91	Average
2494	56.78	62.67	74	-17.22	27.2	4.16	37.25	221	91	Peak
4824	41.9	57.2	54	-12.1	30.99	6.79	53.08	123	87	Average
4824	45.91	61.21	74	-28.09	30.99	6.79	53.08	123	87	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2412MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
2358	36.45	43.08	54	-17.55	26.81	4.05	37.49	145	50	Average
2358	57.72	64.35	74	-16.28	26.81	4.05	37.49	145	50	Peak
2437	101.14	107.42			27.06	4.12	37.46	145	50	Average
2437	106.32	112.6			27.06	4.12	37.46	145	50	Peak
2484	35.62	41.64	54	-18.38	27.15	4.15	37.32	145	50	Average
2484	57.91	63.93	74	-16.09	27.15	4.15	37.32	145	50	Peak
4874	47.34	62.48	54	-6.66	31.06	6.85	53.05	166	350	Average
4874	50.04	65.18	74	-23.96	31.06	6.85	53.05	166	350	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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
2378	35.3	41.87	54	-18.7	26.86	4.07	37.5	216	87	Average
2378	57.42	63.99	74	-16.58	26.86	4.07	37.5	216	87	Peak
2437	99.49	105.77			27.06	4.12	37.46	216	87	Average
2437	104.58	110.86			27.06	4.12	37.46	216	87	Peak
2492	34.76	40.65	54	-19.24	27.2	4.16	37.25	216	87	Average
2492	57.2	63.09	74	-16.8	27.2	4.16	37.25	216	87	Peak
4874	41.14	56.28	54	-12.86	31.06	6.85	53.05	174	310	Average
4874	45.01	60.15	74	-28.99	31.06	6.85	53.05	174	310	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2437MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
2380	34.89	41.45	54	-19.11	26.86	4.08	37.5	161	34	Average
2380	57.8	64.36	74	-16.2	26.86	4.08	37.5	161	34	Peak
2462	100.96	107.12			27.1	4.13	37.39	161	34	Average
2462	106.05	112.21			27.1	4.13	37.39	161	34	Peak
2500	40.53	46.42	54	-13.47	27.2	4.16	37.25	161	34	Average
2500	58.11	64	74	-15.89	27.2	4.16	37.25	161	34	Peak
4924	47.35	62.38	54	-6.65	31.12	6.88	53.03	155	334	Average
4924	50.02	65.05	74	-23.98	31.12	6.88	53.03	155	334	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	34.76	41.33	54	-19.24	26.86	4.07	37.5	230	110	Average
2370	57.1	63.67	74	-16.9	26.86	4.07	37.5	230	110	Peak
2462	98.95	105.11			27.1	4.13	37.39	230	110	Average
2462	104.01	110.17			27.1	4.13	37.39	230	110	Peak
2492	38.79	44.68	54	-15.21	27.2	4.16	37.25	230	110	Average
2492	57.68	63.57	74	-16.32	27.2	4.16	37.25	230	110	Peak
4924	41.76	56.79	54	-12.24	31.12	6.88	53.03	171	294	Average
4924	45.31	60.34	74	-28.69	31.12	6.88	53.03	171	294	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2462MHz: Fundamental frequency.

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	51.32	57.85	54	-2.68	26.91	4.08	37.52	133	32	Average
2390	67.18	73.71	74	-6.82	26.91	4.08	37.52	133	32	Peak
2412	96.39	102.86			26.96	4.09	37.52	133	32	Average
2412	105.92	112.39			26.96	4.09	37.52	133	32	Peak
2488	35.08	41.04	54	-18.92	27.2	4.16	37.32	133	32	Average
2488	57.61	63.57	74	-16.39	27.2	4.16	37.32	133	32	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	46.34	52.87	54	-7.66	26.91	4.08	37.52	137	72	Average
2390	69.24	75.77	74	-4.76	26.91	4.08	37.52	137	72	Peak
2412	94.15	100.62			26.96	4.09	37.52	137	72	Average
2412	103.81	110.28			26.96	4.09	37.52	137	72	Peak
2484	34.49	40.51	54	-19.51	27.15	4.15	37.32	137	72	Average
2484	57.2	63.22	74	-16.8	27.15	4.15	37.32	137	72	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2412MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	38.29	44.97	54	-15.71	26.77	4.04	37.49	102	33	Average
2342	56.6	63.28	74	-17.4	26.77	4.04	37.49	102	33	Peak
2437	98.22	104.5			27.06	4.12	37.46	102	33	Average
2437	107.33	113.61			27.06	4.12	37.46	102	33	Peak
2484	39.02	45.04	54	-14.98	27.15	4.15	37.32	102	33	Average
2484	57.63	63.65	74	-16.37	27.15	4.15	37.32	102	33	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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
2382	36.74	43.3	54	-17.26	26.86	4.08	37.5	106	76	Average
2382	56.56	63.12	74	-17.44	26.86	4.08	37.5	106	76	Peak
2437	96.12	102.4			27.06	4.12	37.46	106	76	Average
2437	105.94	112.22			27.06	4.12	37.46	106	76	Peak
2498	36.56	42.45	54	-17.44	27.2	4.16	37.25	106	76	Average
2498	56.66	62.55	74	-17.34	27.2	4.16	37.25	106	76	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2437MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
2332	33.96	40.67	54	-20.04	26.72	4.04	37.47	177	38	Average
2332	57.12	63.83	74	-16.88	26.72	4.04	37.47	177	38	Peak
2462	95.92	102.08			27.1	4.13	37.39	177	38	Average
2462	106.1	112.26			27.1	4.13	37.39	177	38	Peak
2484	**51.52**	**57.54**	**54**	**-2.48**	**27.15**	**4.15**	**37.32**	**177**	**38**	**Average**
2484	68.9	74.92	74	-5.1	27.15	4.15	37.32	177	38	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	34.23	40.86	54	-19.77	26.81	4.05	37.49	120	72	Average
2352	56.12	62.75	74	-17.88	26.81	4.05	37.49	120	72	Peak
2462	93.14	99.3			27.1	4.13	37.39	120	72	Average
2462	102.53	108.69			27.1	4.13	37.39	120	72	Peak
2484	45.44	51.46	54	-8.56	27.15	4.15	37.32	120	72	Average
2484	65.12	71.14	74	-8.88	27.15	4.15	37.32	120	72	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2462MHz: Fundamental frequency.

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	50.36	56.89	54	-3.64	26.91	4.08	37.52	181	46	Average
2390	68.79	75.32	74	-5.21	26.91	4.08	37.52	181	46	Peak
2412	95.9	102.37			26.96	4.09	37.52	181	46	Average
2412	105.62	112.09			26.96	4.09	37.52	181	46	Peak
2488	34.77	40.73	54	-19.23	27.2	4.16	37.32	181	46	Average
2488	56.14	62.1	74	-17.86	27.2	4.16	37.32	181	46	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	47.9	54.43	54	-6.1	26.91	4.08	37.52	201	100	Average
2390	66.83	73.36	74	-7.17	26.91	4.08	37.52	201	100	Peak
2412	93.02	99.49			26.96	4.09	37.52	201	100	Average
2412	103.2	109.67			26.96	4.09	37.52	201	100	Peak
2498	34.39	40.28	54	-19.61	27.2	4.16	37.25	201	100	Average
2498	56.52	62.41	74	-17.48	27.2	4.16	37.25	201	100	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2412MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
2380	37.86	44.42	54	-16.14	26.86	4.08	37.5	116	47	Average
2380	57.7	64.26	74	-16.3	26.86	4.08	37.5	116	47	Peak
2437	97.76	104.04			27.06	4.12	37.46	116	47	Average
2437	107.44	113.72			27.06	4.12	37.46	116	47	Peak
2492	36.79	42.68	54	-17.21	27.2	4.16	37.25	116	47	Average
2492	56.77	62.66	74	-17.23	27.2	4.16	37.25	116	47	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	36.02	42.65	54	-17.98	26.81	4.05	37.49	199	98	Average
2360	56.79	63.42	74	-17.21	26.81	4.05	37.49	199	98	Peak
2437	95.21	101.49			27.06	4.12	37.46	199	98	Average
2437	105.16	111.44			27.06	4.12	37.46	199	98	Peak
2498	36.45	42.34	54	-17.55	27.2	4.16	37.25	199	98	Average
2498	57.39	63.28	74	-16.61	27.2	4.16	37.25	199	98	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2437MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
2324	33.95	40.67	54	-20.05	26.72	4.03	37.47	144	44	Average
2324	57.14	63.86	74	-16.86	26.72	4.03	37.47	144	44	Peak
2462	95.88	102.04			27.1	4.13	37.39	144	44	Average
2462	106.11	112.27			27.1	4.13	37.39	144	44	Peak
2484	50.77	56.79	54	-3.23	27.15	4.15	37.32	144	44	Average
2484	70.62	76.64	74	-3.38	27.15	4.15	37.32	144	44	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	33.98	40.66	54	-20.02	26.77	4.04	37.49	198	101	Average
2344	57.02	63.7	74	-16.98	26.77	4.04	37.49	198	101	Peak
2462	93.39	99.55			27.1	4.13	37.39	198	101	Average
2462	103.45	109.61			27.1	4.13	37.39	198	101	Peak
2484	46.91	52.93	54	-7.09	27.15	4.15	37.32	198	101	Average
2484	65.78	71.8	74	-8.22	27.15	4.15	37.32	198	101	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2462MHz: Fundamental frequency.

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	50.36	56.87	54	-3.64	26.91	4.08	37.5	162	43	Average
2388	70.98	77.49	74	-3.02	26.91	4.08	37.5	162	43	Peak
2422	92.06	98.4			27.01	4.11	37.46	162	43	Average
2422	101.74	108.08			27.01	4.11	37.46	162	43	Peak
2486	36.88	42.9	54	-17.12	27.15	4.15	37.32	162	43	Average
2486	57.53	63.55	74	-16.47	27.15	4.15	37.32	162	43	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	47.77	54.3	54	-6.23	26.91	4.08	37.52	200	271	Average
2390	69.6	76.13	74	-4.4	26.91	4.08	37.52	200	271	Peak
2422	90.02	96.36			27.01	4.11	37.46	200	271	Average
2422	99.65	105.99			27.01	4.11	37.46	200	271	Peak
2498	35.08	40.97	54	-18.92	27.2	4.16	37.25	200	271	Average
2498	57.38	63.27	74	-16.62	27.2	4.16	37.25	200	271	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2422MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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	47.21	53.74	54	-6.79	26.91	4.08	37.52	162	40	Average
2390	64.65	71.18	74	-9.35	26.91	4.08	37.52	162	40	Peak
2437	94.56	100.84			27.06	4.12	37.46	162	40	Average
2437	104.48	110.76			27.06	4.12	37.46	162	40	Peak
2484	49.23	55.25	54	-4.77	27.15	4.15	37.32	162	40	Average
2484	68.05	74.07	74	-5.95	27.15	4.15	37.32	162	40	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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	45.75	52.28	54	-8.25	26.91	4.08	37.52	196	96	Average
2390	66.13	72.66	74	-7.87	26.91	4.08	37.52	196	96	Peak
2437	92.25	98.53			27.06	4.12	37.46	196	96	Average
2437	102.2	108.48			27.06	4.12	37.46	196	96	Peak
2484	47.46	53.48	54	-6.54	27.15	4.15	37.32	196	96	Average
2484	65.89	71.91	74	-8.11	27.15	4.15	37.32	196	96	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
   Margin value = Emission level – Limit value
2. 2437MHz: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
2332	36.33	43.04	54	-17.67	26.72	4.04	37.47	163	41	Average
2332	57.14	63.85	74	-16.86	26.72	4.04	37.47	163	41	Peak
2452	92.14	98.34			27.06	4.13	37.39	163	41	Average
2452	101.85	108.05			27.06	4.13	37.39	163	41	Peak
2488	50.93	56.89	54	-3.07	27.2	4.16	37.32	163	41	Average
2488	70.88	76.84	74	-3.12	27.2	4.16	37.32	163	41	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (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
2378	35.68	42.25	54	-18.32	26.86	4.07	37.5	198	100	Average
2378	56.17	62.74	74	-17.83	26.86	4.07	37.5	198	100	Peak
2452	89.82	96.02			27.06	4.13	37.39	198	100	Average
2452	99.8	106			27.06	4.13	37.39	198	100	Peak
2484	48.75	54.77	54	-5.25	27.15	4.15	37.32	198	100	Average
2484	69.05	75.07	74	-4.95	27.15	4.15	37.32	198	100	Peak

REMARKS:

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

9kHz ~ 30MHz DATA:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value need not be reported

30MHz ~ 1GHz WORST-CASE DATA:

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (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
86.7	23.86	46.46	40	-16.14	8.23	0.95	31.78	130	72	Peak
130.98	26.63	45.6	43.5	-16.87	11.75	1.14	31.86	108	353	Peak
165	19.47	37.91	43.5	-24.03	12.25	1.12	31.81	122	151	Peak
548.5	21.26	32.57	46	-24.74	18.44	2.18	31.93	106	352	Peak
594	23.15	33.63	46	-22.85	19.46	2.24	32.18	140	279	Peak
696.9	24.45	33.02	46	-21.55	20.78	2.45	31.8	126	353	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
31.08	33.06	51.45	40	-6.94	12.14	0.59	31.12	105	178	Peak
40.53	31.68	48.5	40	-8.32	13.55	0.65	31.02	121	205	Peak
128.28	27.46	46.65	43.5	-16.04	11.55	1.14	31.88	123	318	Peak
638.1	21.97	31.67	46	-24.03	20.07	2.33	32.1	111	43	Peak
741.7	25.44	32.95	46	-20.56	21.41	2.52	31.44	137	313	Peak
832	25.46	31.9	46	-20.54	22.64	2.66	31.74	111	347	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 0.50MHz.

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. 11, 2014	Nov. 10, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2015	Feb. 25, 2016
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

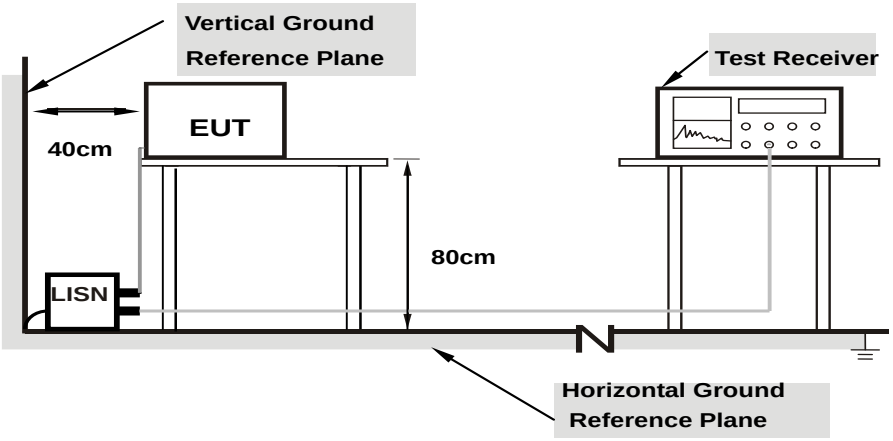
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm / 50uH of coupling 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 30MHz was searched. Emission levels under (Limit - 20dB) 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

Same as 4.1.6.

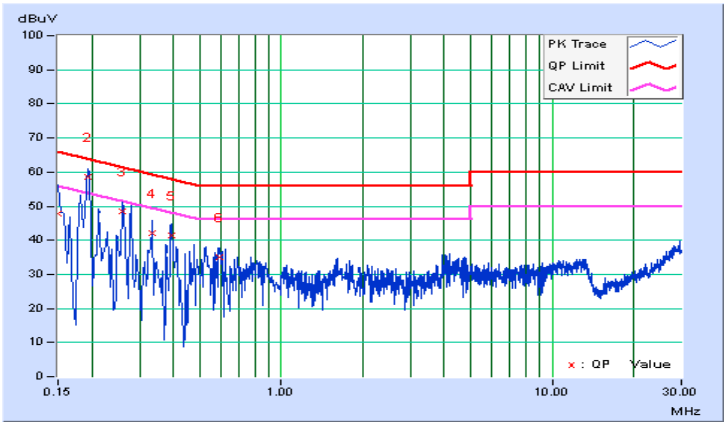
4.2.7 Test Results

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	Toby Tian	Test Date	2015/8/12

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	0.05	47.86	26.68	47.91	26.73	66.00	56.00	-18.09	-29.27
2	**0.19305**	**0.06**	**58.49**	**43.67**	**58.55**	**43.73**	**63.90**	**53.90**	**-5.36**	**-10.18**
3	0.25948	0.06	48.59	32.43	48.65	32.49	61.45	51.45	-12.80	-18.96
4	0.33377	0.06	42.12	27.93	42.18	27.99	59.36	49.36	-17.18	-21.37
5	0.39635	0.06	41.52	26.67	41.58	26.73	57.93	47.93	-16.35	-21.20
6	0.59183	0.07	35.07	21.93	35.14	22.00	56.00	46.00	-20.86	-24.00

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

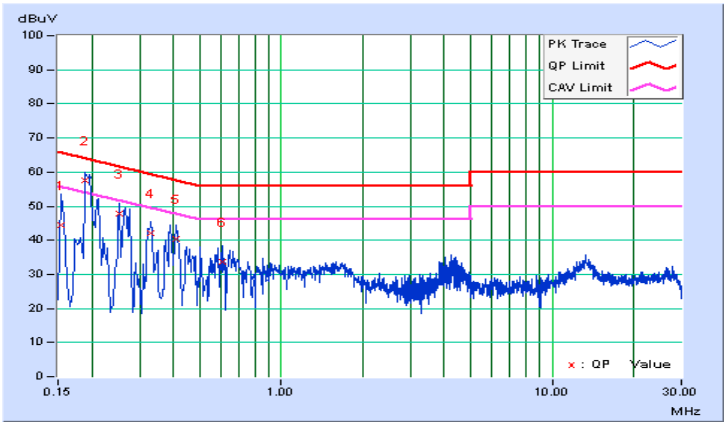


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Toby Tian	Test Date	2015/8/12

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	0.15391	0.05	44.23	25.52	44.28	25.57	65.79	55.79	-21.51	-30.22
2	0.18910	0.05	57.63	41.46	57.68	41.51	64.08	54.08	-6.40	-12.57
3	0.25166	0.05	47.89	30.66	47.94	30.71	61.70	51.70	-13.76	-20.99
4	0.32959	0.06	42.10	26.87	42.16	26.93	59.46	49.46	-17.31	-22.54
5	0.40800	0.06	40.22	24.78	40.28	24.84	57.69	47.69	-17.41	-22.85
6	0.60356	0.07	33.55	17.58	33.62	17.65	56.00	46.00	-22.38	-28.35

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

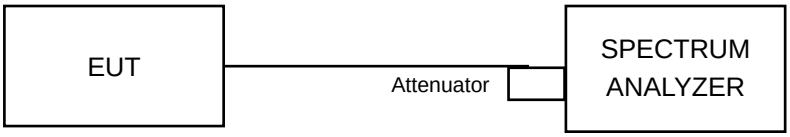


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB 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) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x 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 fromTest 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)	6db Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	10.06	0.5	Pass
6	2437	10.09	0.5	Pass
11	2462	10.10	0.5	Pass

802.11g

Channel	Frequency (MHz)	6db Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.13	0.5	Pass
6	2437	15.13	0.5	Pass
11	2462	15.14	0.5	Pass

802.11n (20MHz)

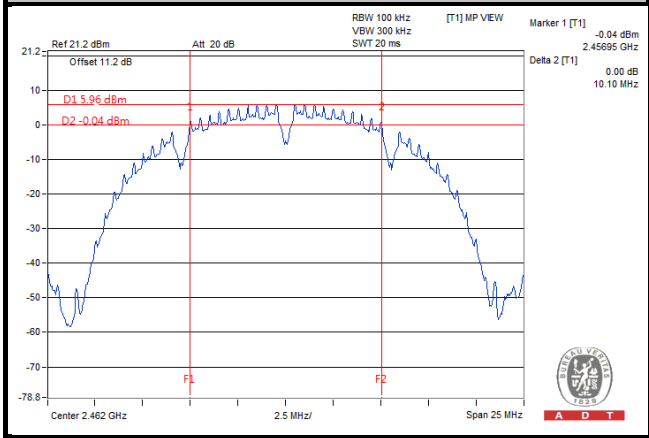
Channel	Frequency (MHz)	6db Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.12	0.5	Pass
6	2437	15.11	0.5	Pass
11	2462	15.14	0.5	Pass

802.11n (40MHz)

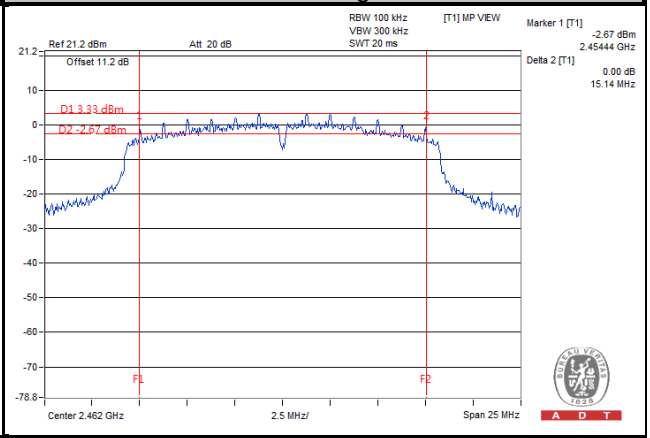
Channel	Frequency (MHz)	6db Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.13	0.5	Pass
6	2437	35.18	0.5	Pass
9	2452	35.19	0.5	Pass

Spectrum Plot of Worst Value

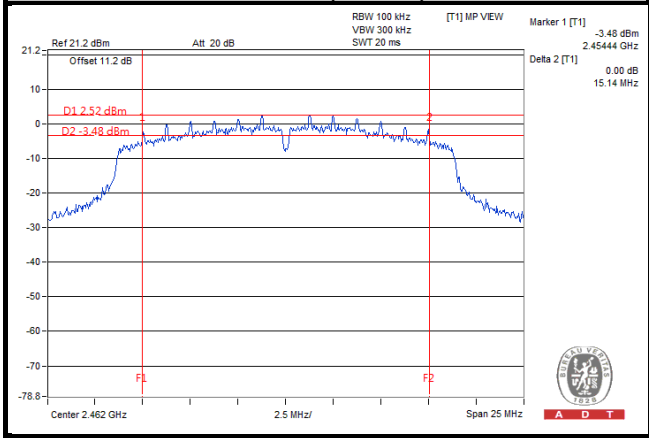
802.11b



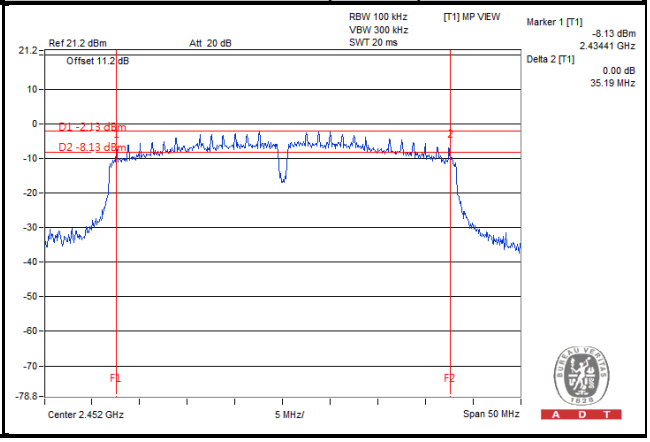
802.11g



802.11n (20MHz)



802.11n (40MHz)

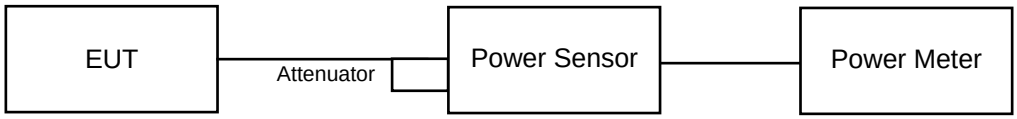


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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

Same as 4.3.6.

4.4.7 Test Results

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	62.66	17.97	30	Pass
6	2437	61.94	17.92	30	Pass
11	2462	59.98	17.78	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	109.14	20.38	30	Pass
6	2437	115.88	20.64	30	Pass
11	2462	106.66	20.28	30	Pass

802.11n (20MHz)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	104.23	20.18	30	Pass
6	2437	116.95	20.68	30	Pass
11	2462	103.51	20.15	30	Pass

802.11n (40MHz)

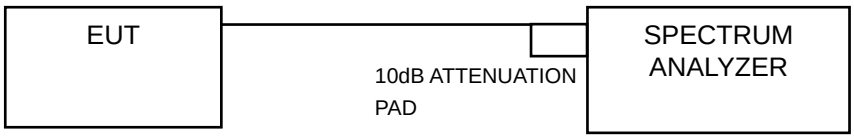
Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	98.17	19.92	30	Pass
6	2437	108.39	20.35	30	Pass
9	2452	97.50	19.89	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

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

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. 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

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-7.75	8	Pass
6	2437	-8.66	8	Pass
11	2462	-8.41	8	Pass

802.11g

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-11.97	8	Pass
6	2437	-10.27	8	Pass
11	2462	-11.64	8	Pass

802.11n (20MHz)

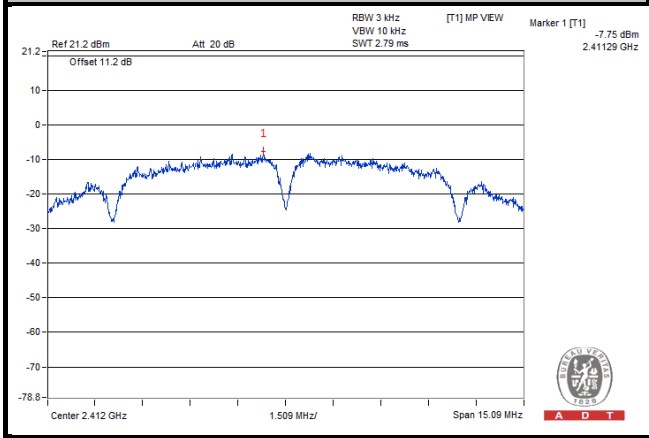
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
1	2412	-11.64	8	Pass
6	2437	-11.34	8	Pass
11	2462	-11.56	8	Pass

802.11n (40MHz)

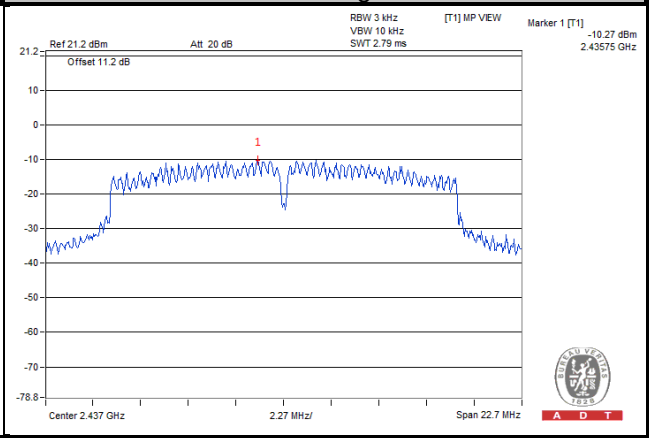
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Pass / Fail
3	2422	-17.78	8	Pass
6	2437	-14.30	8	Pass
9	2452	-17.47	8	Pass

Spectrum Plot of Worst Value

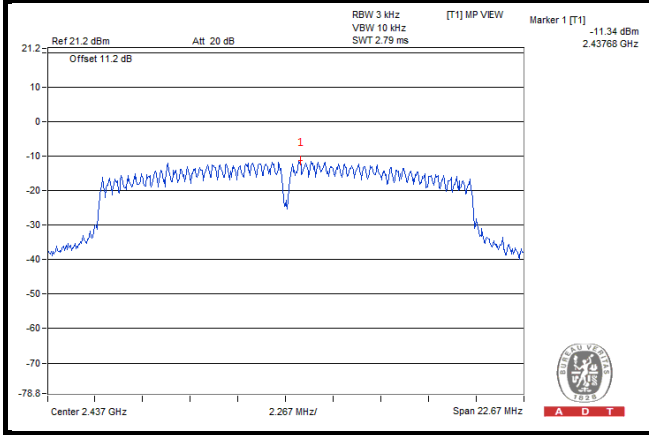
802.11b



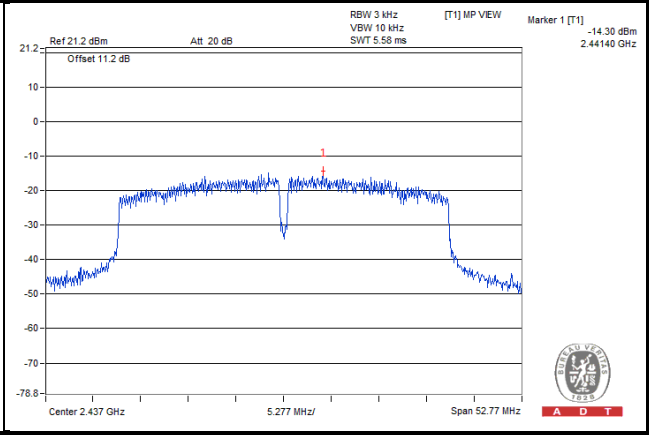
802.11g



802.11n (20MHz)



802.11n (40MHz)

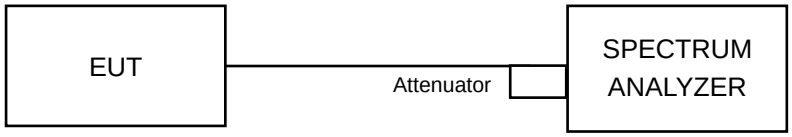


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB of the highest emission level of operating band (in 100kHz 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 ≥ 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 OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 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

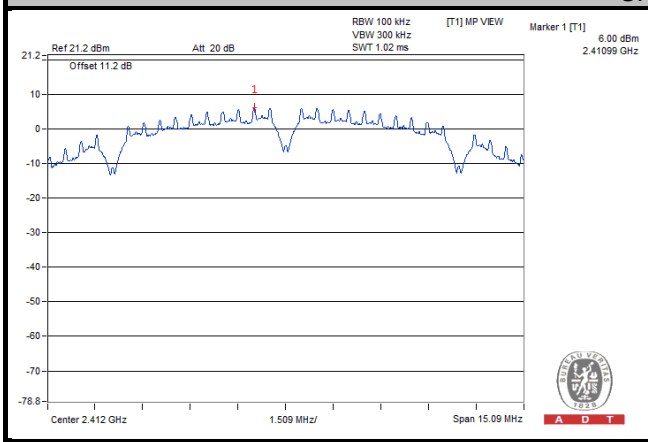
Same as Item 4.3.6

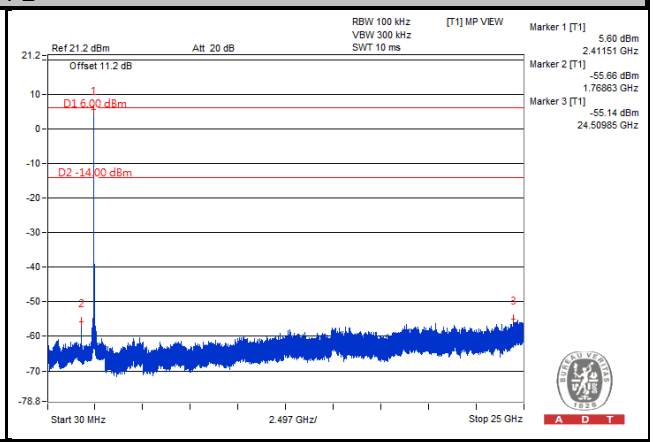
4.6.7 Test Results

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

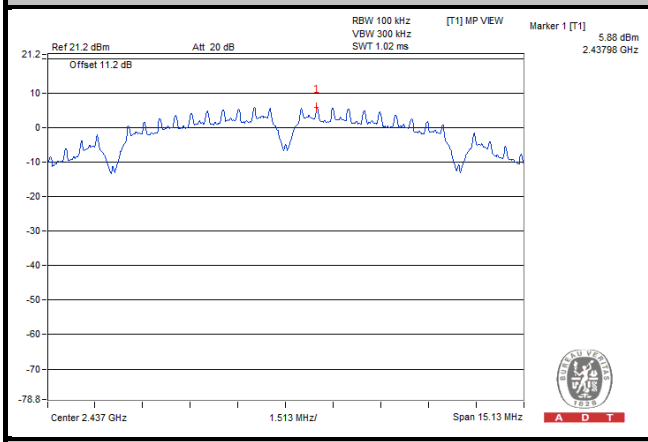
802.11b

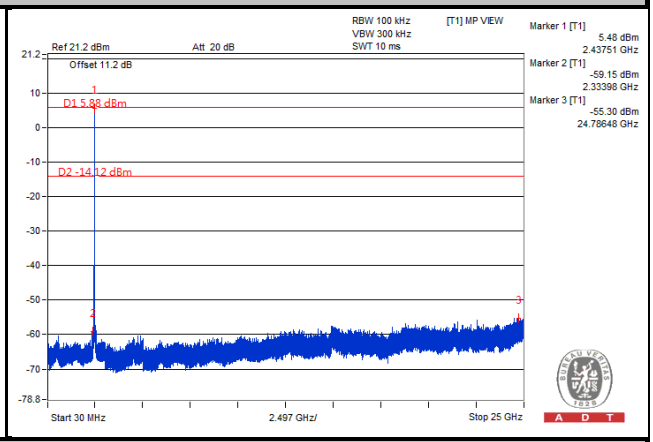
CH 1



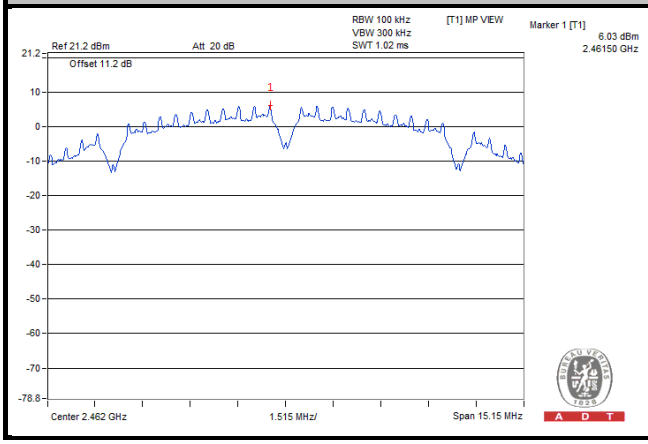


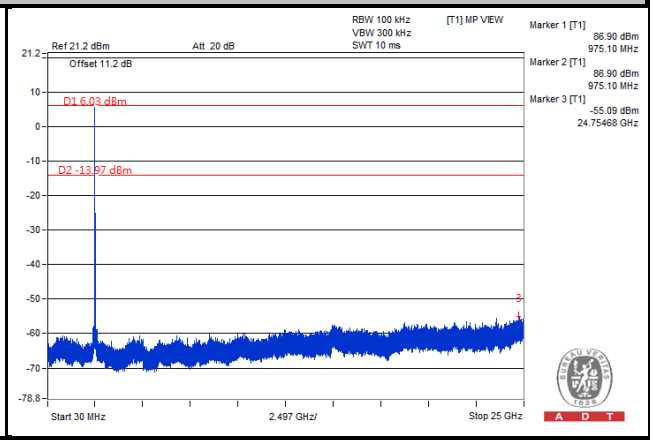
CH 6

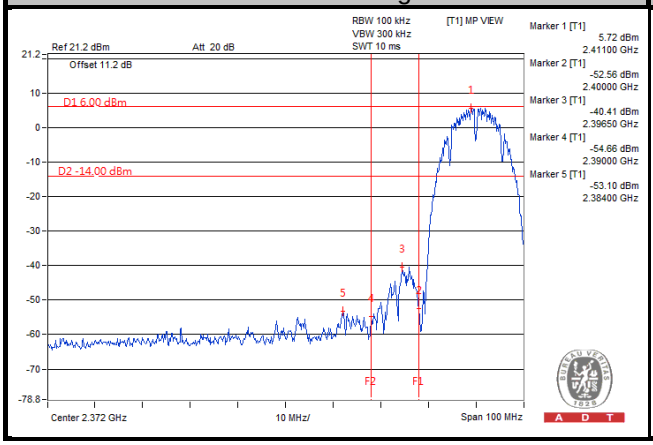
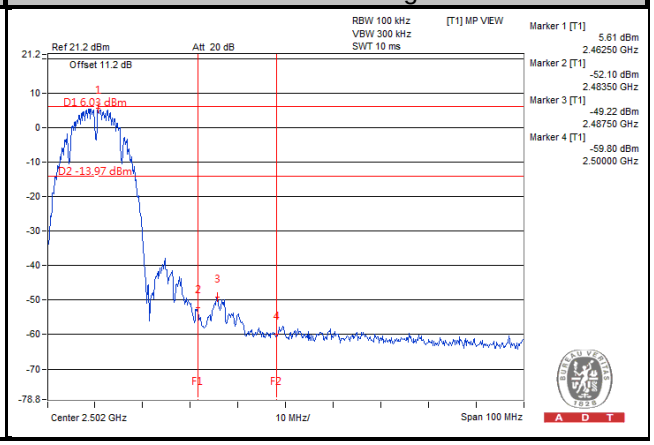




CH 11

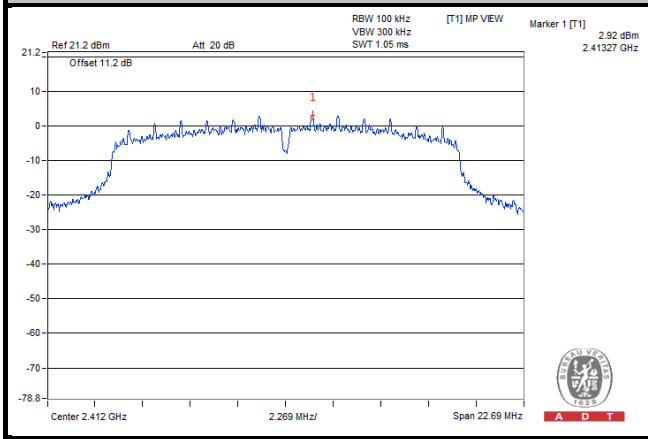


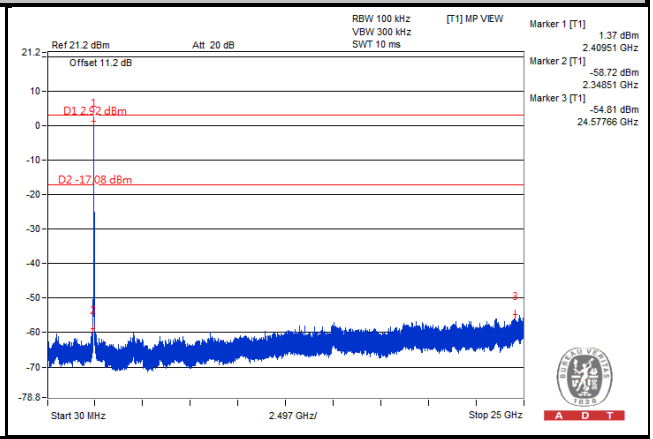


CH 1 Band Edge	CH 11 Band Edge
	

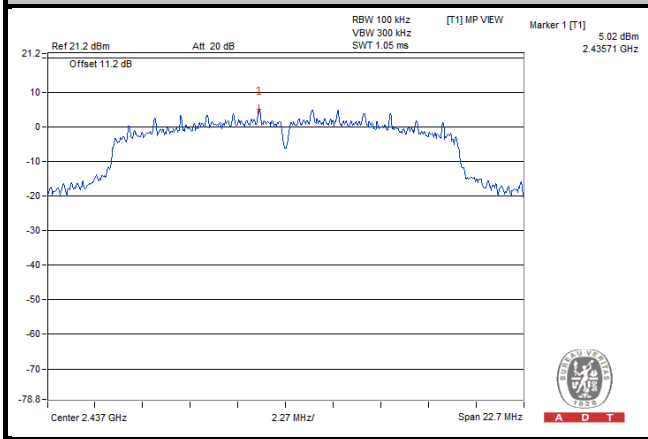
802.11g

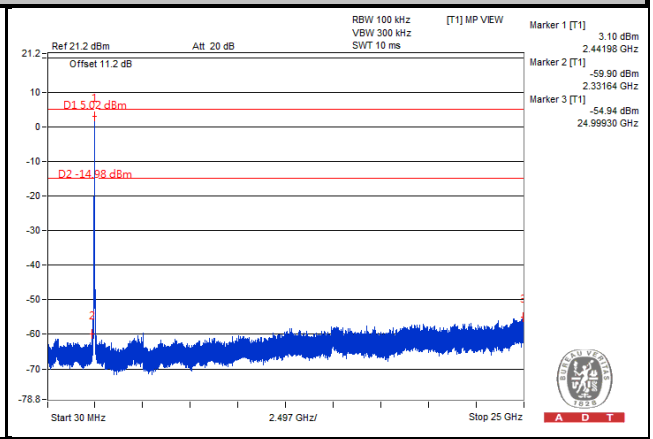
CH 1



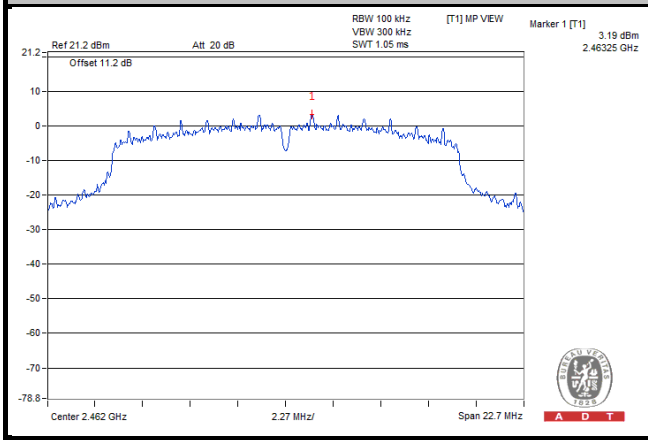


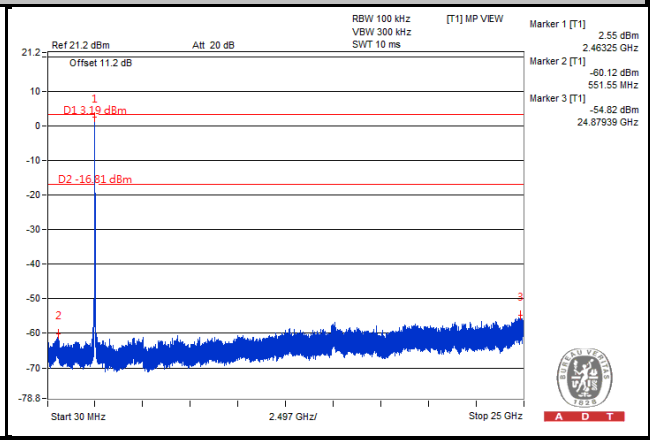
CH 6

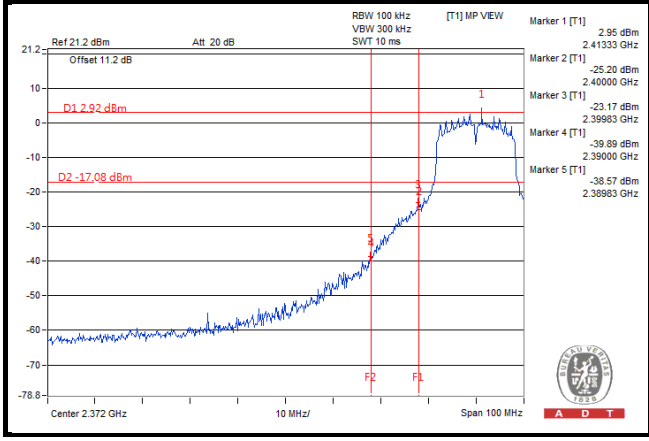
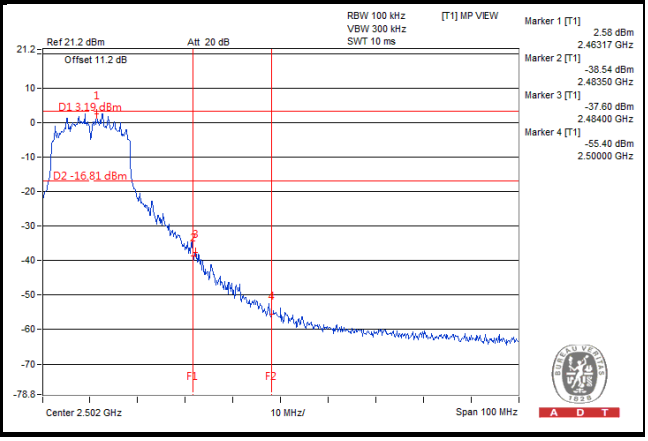




CH 11

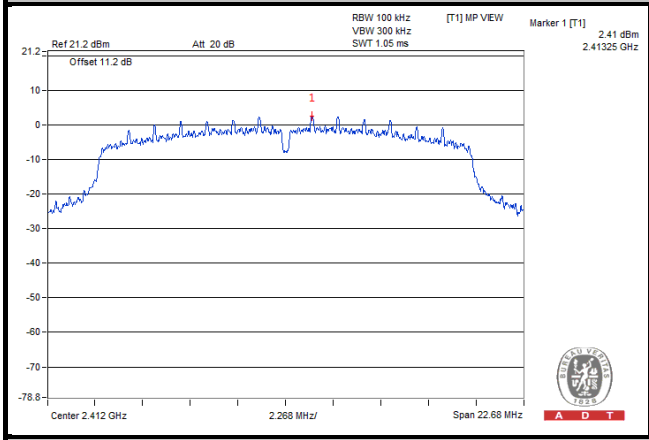


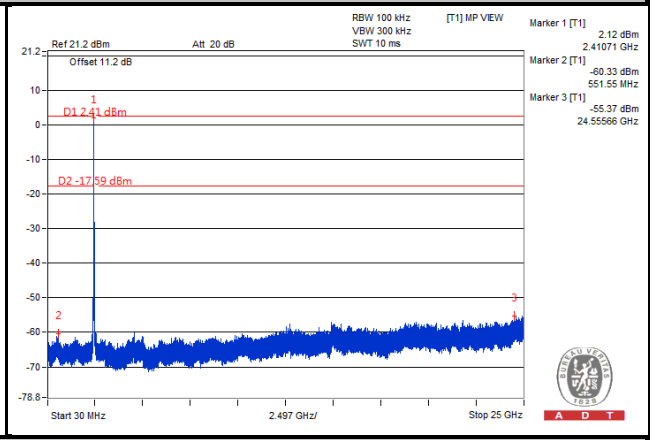


CH 1 Band Edge	CH 11 Band Edge
	

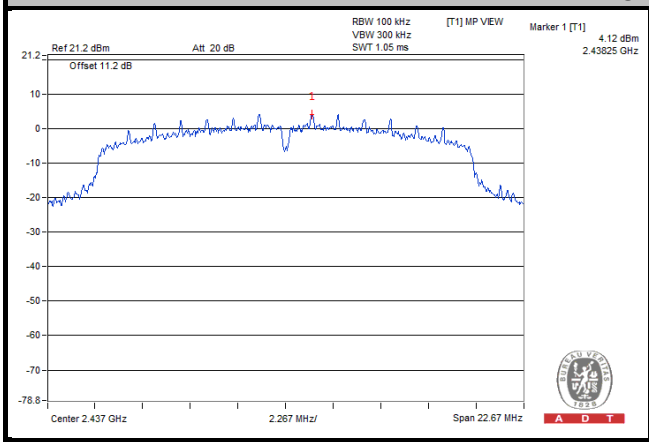
802.11n (20MHz)

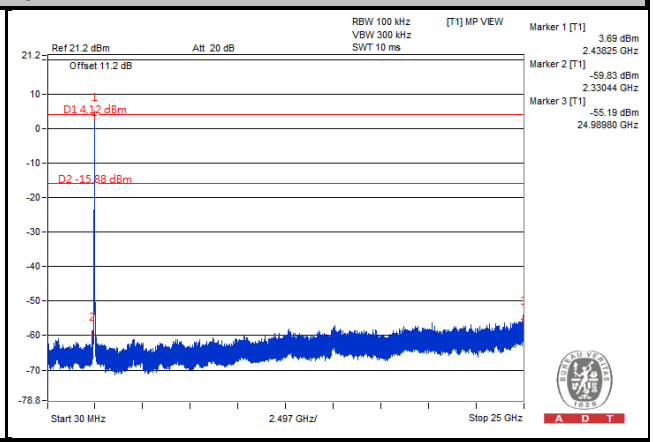
CH 1



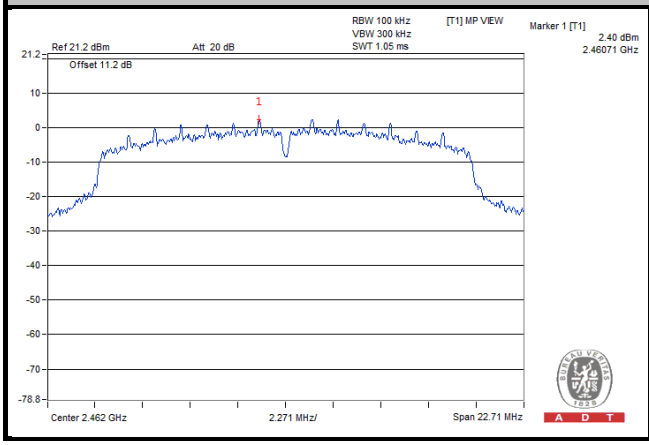


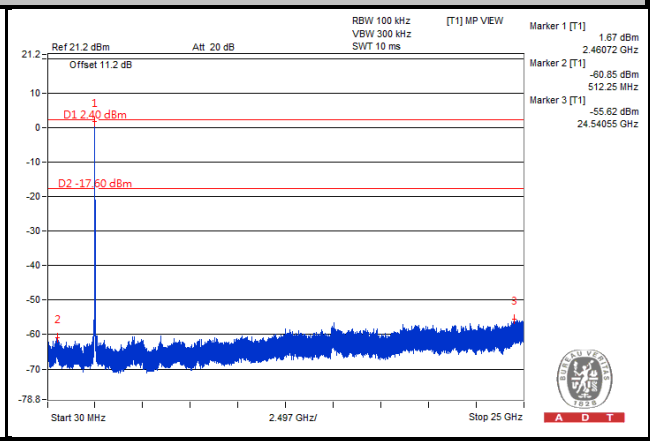
CH 6

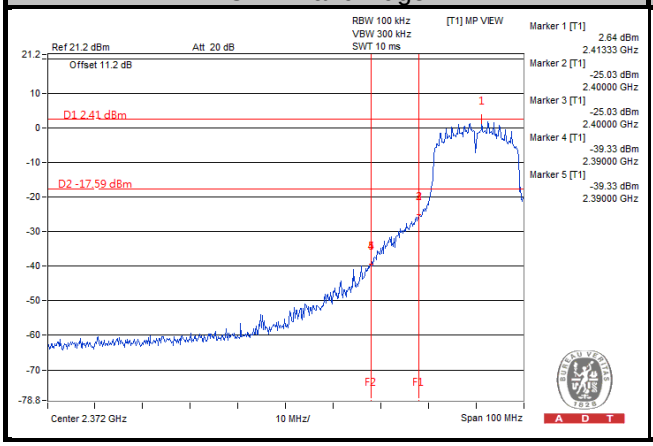
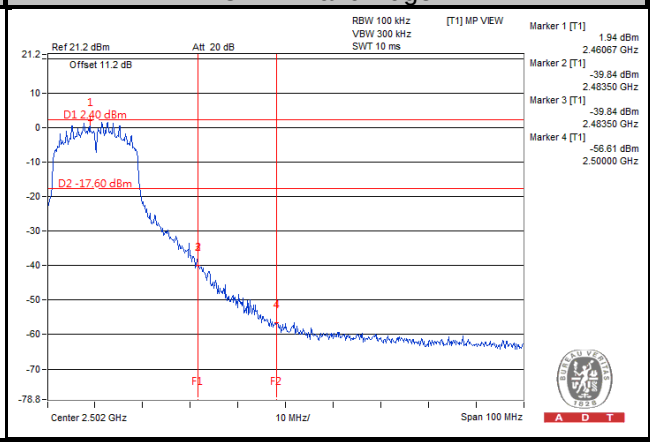




CH 11

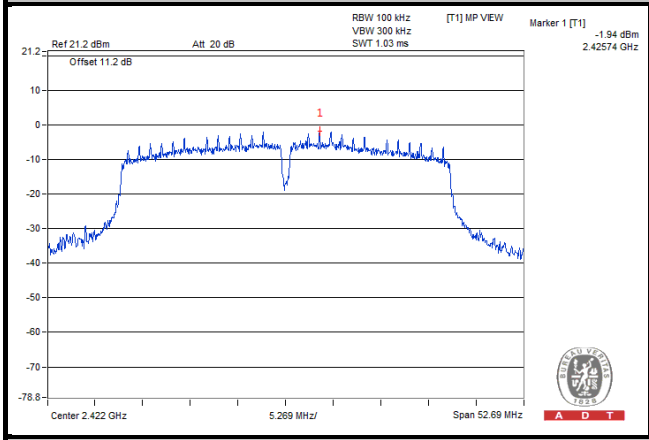


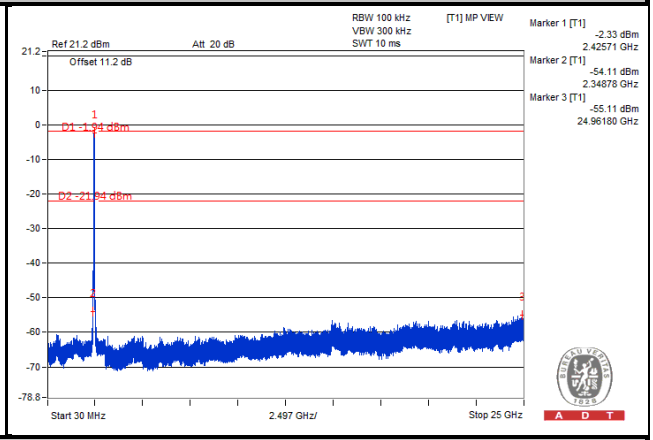


CH 1 Band Edge	CH 11 Band Edge
	

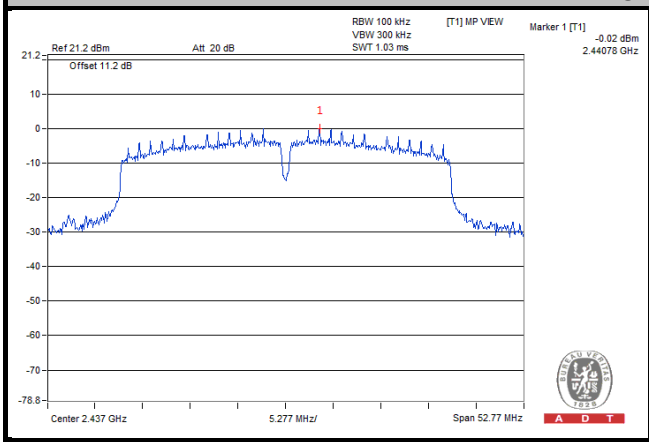
802.11n (40MHz)

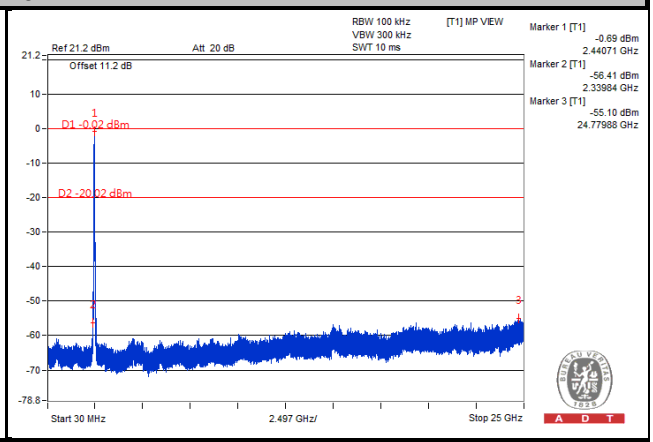
CH 3



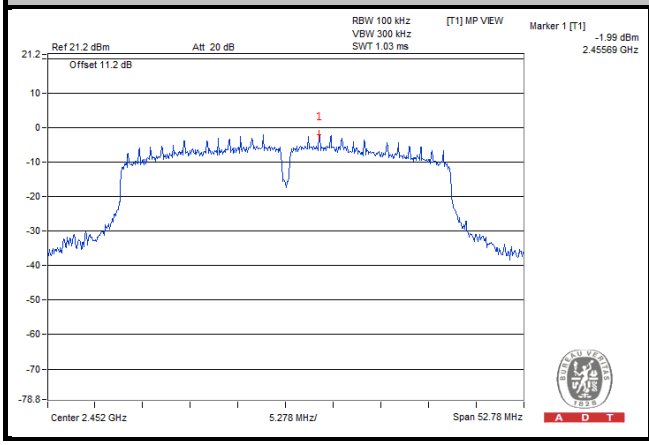


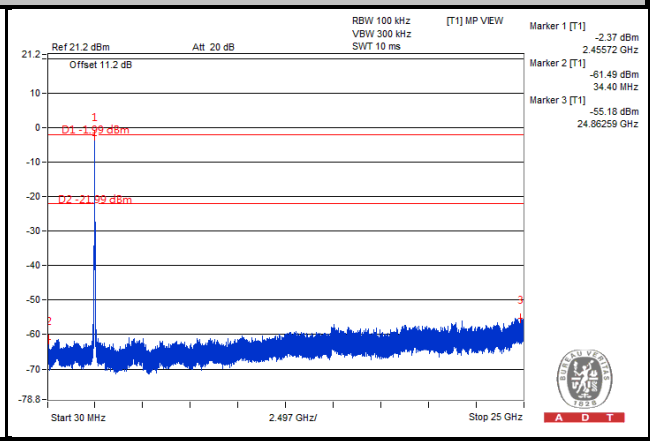
CH 6

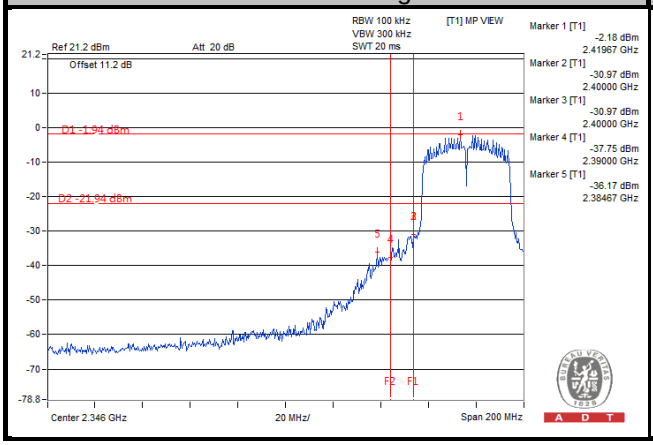
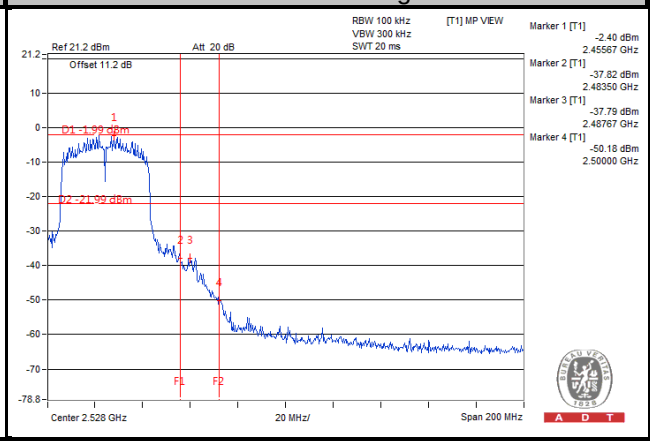




CH 9





CH 3 Band Edge	CH 9 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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Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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