

FCC Test Report

Report No.: RF151207E03

FCC ID: COFBWMNMR03

Test Model: BWM-N-MR-03

Received Date: Dec. 07, 2015

Test Date: Dec. 10 to 30, 2015

Issued Date: Jan. 07, 2016

Applicant: UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD.

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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty.....	6
2.2 Modification Record.....	6
3 General Information	7
3.1 General Description of EUT.....	7
3.2 Description of Test Modes.....	8
3.2.1 Test Mode Applicability and Tested Channel Detail.....	9
3.3 Duty Cycle of Test Signal.....	11
3.4 Description of Support Units.....	12
3.4.1 Configuration of System under Test.....	12
3.5 General Description of Applied Standards.....	13
4 Test Types and Results	14
4.1 Radiated Emission and Bandedge Measurement.....	14
4.1.1 Limits of Radiated Emission and Bandedge Measurement.....	14
4.1.2 Test Instruments.....	15
4.1.3 Test Procedures.....	16
4.1.4 Deviation from Test Standard.....	16
4.1.5 Test Setup.....	17
4.1.6 EUT Operating Conditions.....	17
4.1.7 Test Results (Mode 1).....	18
4.1.8 Test Results (Mode 2).....	28
4.2 Conducted Emission Measurement.....	38
4.2.1 Limits of Conducted Emission Measurement.....	38
4.2.2 Test Instruments.....	38
4.2.3 Test Procedures.....	39
4.2.4 Deviation from Test Standard.....	39
4.2.5 Test Setup.....	39
4.2.6 EUT Operating Conditions.....	39
4.2.7 Test Results.....	40
4.3 6dB Bandwidth Measurement.....	42
4.3.1 Limits of 6dB Bandwidth Measurement.....	42
4.3.2 Test Setup.....	42
4.3.3 Test Instruments.....	42
4.3.4 Test Procedure.....	42
4.3.5 Deviation from Test Standard.....	42
4.3.6 EUT Operating Conditions.....	42
4.3.7 Test Result.....	43
4.4 Conducted Output Power Measurement.....	45
4.4.1 Limits of Conducted Output Power Measurement.....	45
4.4.2 Test Setup.....	45
4.4.3 Test Instruments.....	45
4.4.4 Test Procedures.....	45
4.4.5 Deviation from Test Standard.....	45
4.4.6 EUT Operating Conditions.....	45
4.4.7 Test Results.....	46
4.5 Power Spectral Density Measurement.....	48
4.5.1 Limits of Power Spectral Density Measurement.....	48
4.5.2 Test Setup.....	48
4.5.3 Test Instruments.....	48
4.5.4 Test Procedure.....	48
4.5.5 Deviation from Test Standard.....	48



4.5.6 EUT Operating Condition	48
4.5.7 Test Results	49
4.6 Conducted Out of Band Emission Measurement.....	51
4.6.1 Limits of Conducted Out of Band Emission Measurement	51
4.6.2 Test Setup.....	51
4.6.3 Test Instruments	51
4.6.4 Test Procedure	51
4.6.5 Deviation from Test Standard	51
4.6.6 EUT Operating Condition	51
4.6.7 Test Results	51
5 Pictures of Test Arrangements.....	55
Appendix – Information on the Testing Laboratories	56



Release Control Record

Issue No.	Description	Date Issued
RF151207E03	Original release.	Jan. 07, 2016



1 Certificate of Conformity

Product: Wireless WICED module

Brand: USI

Test Model: BWM-N-MR-03

Sample Status: MASS-PRODUCTION

Applicant: UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD.

Test Date: Dec. 10 to 30, 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 : _____, **Date:** _____
Elsie Hsu / Specialist Jan. 07, 2016

Approved by : _____, **Date:** _____
May Chen / Manager Jan. 07, 2016

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 -22.16dB at 18.00391MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.4dB at 4874.00MHz & 4924.00MHz.
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	Antenna connector is i-pex(MHF) not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless WICED module
Brand	USI
Test Model	BWM-N-MR-03
Status of EUT	MASS-PRODUCTION
Power Supply Rating	DC5V from USB interface
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 72.2Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	11
Output Power	190.985mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The EUT has two different types could be chosen and please refer the below table:

Type	Description
Type 1	with connector for Monopole antenna
Type 2	without connector for Printed antenna

2. The antennas provided to the EUT, please refer to the following table:

Antenna No.	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connector Type	Cable Loss(dB)	Cable Length (mm)
1	1.4	2.4~2.4835	Printed	NA	NA	NA
2	2	2.4~2.4835	Monopole	i-pex(MHF)	NA	100

3. The EUT incorporates a SISO function.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1TX	1RX
802.11g	6 ~ 54Mbps	1TX	1RX
802.11n (HT20)	MCS 0~7	1TX	1RX

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

3.2 Description of Test Modes

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE $<$ 1G	PLC	APCM	
1	√	√	√	√	With Monopole antenna
2	√	√	-	-	With Printed antenna

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

NOTE 1: “-” means no effect.

NOTE 2: Antenna placement had been investigated on the positioned of each 3 axis. Following worst case were found as listed below.

Antenna	Worst position
Monopole	X-plane
Printed	Z-plane (below 1GHz), Y-plane (above 1GHz)

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	1	OFDM	BPSK	6

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	1	OFDM	BPSK	6

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.

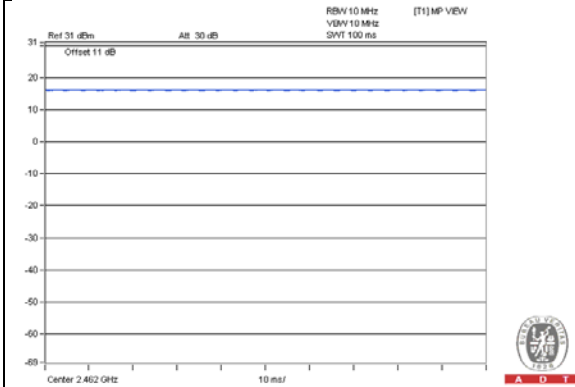
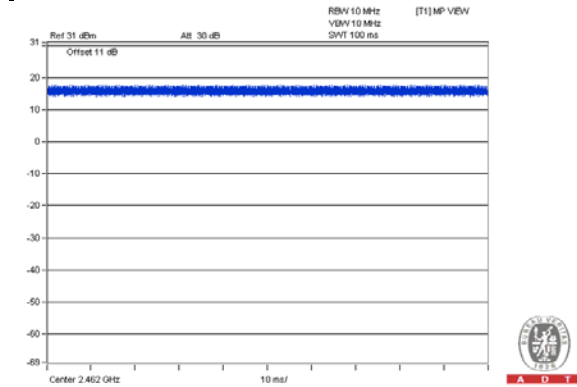
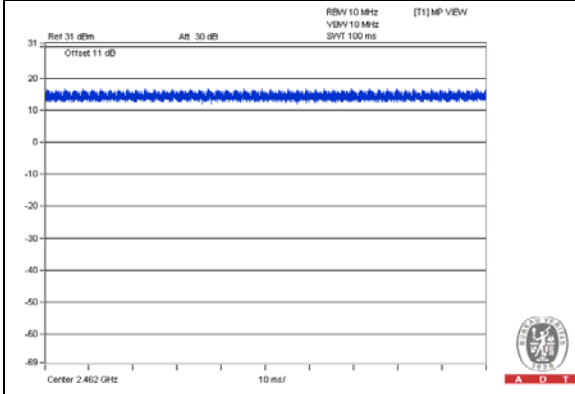
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (System)	TESTED BY
RE≥1G	25deg. C, 65%RH	230Vac, 50Hz	Nelson Teng
RE<1G	25deg. C, 65%RH	230Vac, 50Hz	Nelson Teng
PLC	26deg. C, 55%RH	230Vac, 50Hz	Mike Hsieh
APCM	25deg. C, 60%RH	230Vac, 50Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

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

802.11b**802.11g****802.11n (HT20)**

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.

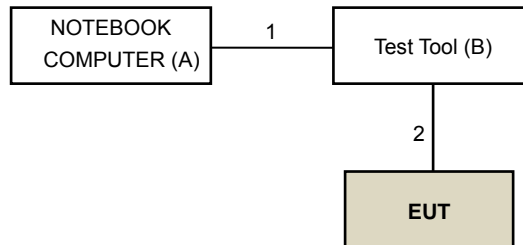
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Prodived by Lab
B.	Test Tool	NA	NA	NA	NA	Supplied by Client

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB	1	1	Yes	0	Prodived by Lab
2.	Data	1	0.2	No	0	Supplied by Client

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)
KDB 558074 D01 DTS Meas Guidance v03r04
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 & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATE D DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 13, 2014	Jan. 12, 2016
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2015	Jan. 17, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-06	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Feb. 03, 2015	Feb. 02, 2016
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Feb. 06, 2015	Feb. 05, 2016
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM- SM-2000 EMC104-SM- SM-5000 EMC104-SM- SM-5000	150318 150323 150324	Mar. 31, 2015	Mar. 30, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 16, 2015	Jan. 15, 2016
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Feb. 05, 2015	Feb. 04, 2016
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 17, 2015	Jan. 16, 2016
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Spectrum Analyzer R&S	FSP 40	100036	Jan. 22, 2015	Jan. 21, 2016
Power meter Anritsu	ML2495A	0824006	May 25, 2015	May 24, 2016
Power sensor Anritsu	MA2411B	0738172	May 25, 2015	May 24, 2016

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 above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
- 7 Tested Date: Dec. 10 to 30, 2015

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:

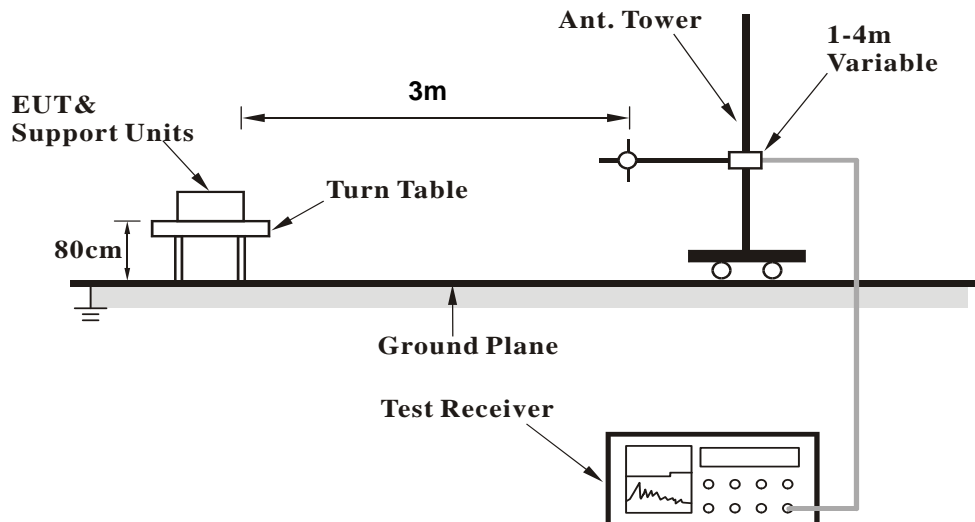
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

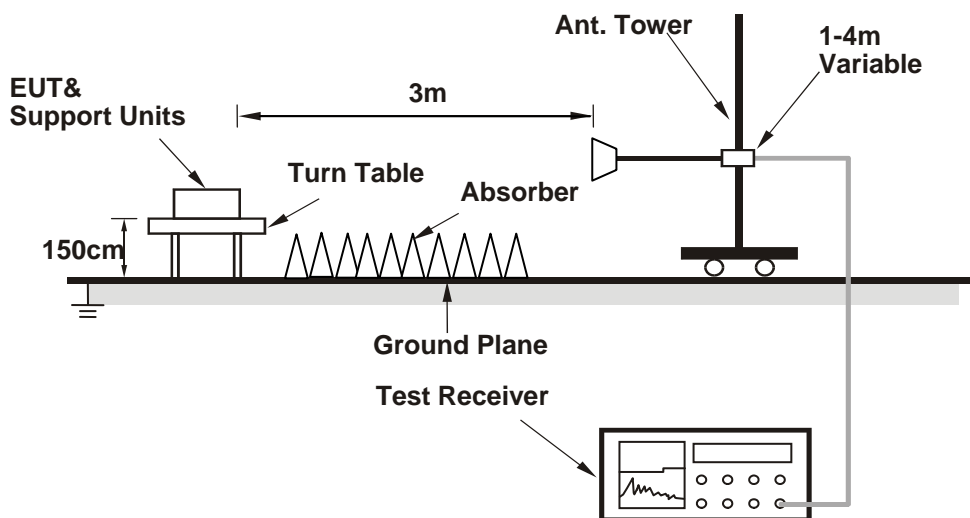
No deviation.

4.1.5 Test Setup

<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

1. Placed the EUT on testing table.
2. Controlling software (RFTest MimoBtFm BridgeUart.exe[2.0.0.89]) has been activated to set the EUT under transmission/receiving condition continuously.

4.1.7 Test Results (Mode 1)
Above 1GHz Data
802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	48.0 PK	74.0	-26.0	2.71 H	340	54.19	-6.19
2	2390.00	36.6 AV	54.0	-17.4	2.71 H	340	42.79	-6.19
3	*2412.00	100.5 PK			2.71 H	340	106.59	-6.09
4	*2412.00	98.5 AV			2.71 H	340	104.59	-6.09
5	4824.00	54.1 PK	74.0	-19.9	2.70 H	345	54.29	-0.19
6	4824.00	52.1 AV	54.0	-1.9	2.70 H	345	52.29	-0.19

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	46.8 PK	74.0	-27.2	3.63 V	257	52.99	-6.19
2	2390.00	36.0 AV	54.0	-18.0	3.63 V	257	42.19	-6.19
3	*2412.00	97.7 PK			3.63 V	257	103.79	-6.09
4	*2412.00	95.6 AV			3.63 V	257	101.69	-6.09
5	4824.00	54.0 PK	74.0	-20.0	3.04 V	26	54.19	-0.19
6	4824.00	52.1 AV	54.0	-1.9	3.04 V	26	52.29	-0.19

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	100.8 PK			2.75 H	331	106.80	-6.00
2	*2437.00	98.7 AV			2.75 H	331	104.70	-6.00
3	4874.00	54.2 PK	74.0	-19.8	3.04 H	349	54.19	0.01
4	4874.00	52.4 AV	54.0	-1.6	3.04 H	349	52.39	0.01
5	7311.00	49.2 PK	74.0	-24.8	2.02 H	309	42.89	6.31
6	7311.00	38.7 AV	54.0	-15.3	2.02 H	309	32.39	6.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	98.3 PK			3.69 V	241	104.30	-6.00
2	*2437.00	96.0 AV			3.69 V	241	102.00	-6.00
3	4874.00	53.3 PK	74.0	-20.7	3.35 V	25	53.29	0.01
4	4874.00	51.7 AV	54.0	-2.3	3.35 V	25	51.69	0.01
5	7311.00	45.8 PK	74.0	-28.2	2.35 V	251	39.49	6.31
6	7311.00	34.7 AV	54.0	-19.3	2.35 V	251	28.39	6.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.7 PK			2.66 H	331	106.61	-5.91
2	*2462.00	98.6 AV			2.66 H	331	104.51	-5.91
3	2483.50	48.0 PK	74.0	-26.0	2.66 H	331	53.82	-5.82
4	2483.50	36.5 AV	54.0	-17.5	2.66 H	331	42.32	-5.82
5	4924.00	50.5 PK	74.0	-23.5	2.99 H	352	50.36	0.14
6	4924.00	48.1 AV	54.0	-5.9	2.99 H	352	47.96	0.14
7	7386.00	49.8 PK	74.0	-24.2	1.97 H	318	43.34	6.46
8	7386.00	39.2 AV	54.0	-14.8	1.97 H	318	32.74	6.46

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	97.6 PK			3.63 V	259	103.51	-5.91
2	*2462.00	95.4 AV			3.63 V	259	101.31	-5.91
3	2483.50	47.1 PK	74.0	-26.9	3.63 V	259	52.92	-5.82
4	2483.50	36.1 AV	54.0	-17.9	3.63 V	259	41.92	-5.82
5	4924.00	50.4 PK	74.0	-23.6	3.37 V	61	50.26	0.14
6	4924.00	47.5 AV	54.0	-6.5	3.37 V	61	47.36	0.14
7	7386.00	45.9 PK	74.0	-28.1	2.40 V	252	39.44	6.46
8	7386.00	34.9 AV	54.0	-19.1	2.40 V	252	28.44	6.46

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.2 PK	74.0	-4.8	2.05 H	176	75.39	-6.19
2	2390.00	51.4 AV	54.0	-2.6	2.05 H	176	57.59	-6.19
3	*2412.00	101.6 PK			2.06 H	204	107.69	-6.09
4	*2412.00	93.6 AV			2.06 H	204	99.69	-6.09
5	4824.00	52.2 PK	74.0	-21.8	1.08 H	343	52.39	-0.19
6	4824.00	38.2 AV	54.0	-15.8	1.08 H	343	38.39	-0.19

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	2.51 V	332	62.79	-6.19
2	2390.00	41.9 AV	54.0	-12.1	2.51 V	332	48.09	-6.19
3	*2412.00	93.9 PK			2.51 V	332	99.99	-6.09
4	*2412.00	86.7 AV			2.51 V	332	92.79	-6.09
5	4824.00	52.7 PK	74.0	-21.3	3.47 V	87	52.89	-0.19
6	4824.00	38.2 AV	54.0	-15.8	3.47 V	87	38.39	-0.19

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.7 PK			1.53 H	189	110.70	-6.00
2	*2437.00	97.0 AV			1.53 H	189	103.00	-6.00
3	4874.00	52.3 PK	74.0	-21.7	1.08 H	338	52.29	0.01
4	4874.00	37.8 AV	54.0	-16.2	1.08 H	338	37.79	0.01
5	7311.00	50.2 PK	74.0	-23.8	1.05 H	310	43.89	6.31
6	7311.00	36.3 AV	54.0	-17.7	1.05 H	310	29.99	6.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	98.8 PK			2.49 V	334	104.80	-6.00
2	*2437.00	90.3 AV			2.49 V	334	96.30	-6.00
3	4874.00	52.5 PK	74.0	-21.5	3.42 V	72	52.49	0.01
4	4874.00	38.3 AV	54.0	-15.7	3.42 V	72	38.29	0.01
5	7311.00	50.0 PK	74.0	-24.0	2.41 V	251	43.69	6.31
6	7311.00	36.0 AV	54.0	-18.0	2.41 V	251	29.69	6.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.7 PK			2.09 H	16	106.61	-5.91
2	*2462.00	92.1 AV			2.09 H	16	98.01	-5.91
3	2483.50	60.1 PK	74.0	-13.9	2.09 H	16	65.92	-5.82
4	2483.50	44.5 AV	54.0	-9.5	2.09 H	16	50.32	-5.82
5	4924.00	51.9 PK	74.0	-22.1	1.14 H	354	51.76	0.14
6	4924.00	37.9 AV	54.0	-16.1	1.14 H	354	37.76	0.14
7	7386.00	50.2 PK	74.0	-23.8	1.14 H	320	43.74	6.46
8	7386.00	36.5 AV	54.0	-17.5	1.14 H	320	30.04	6.46

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	92.3 PK			2.52 V	329	98.21	-5.91
2	*2462.00	84.8 AV			2.52 V	329	90.71	-5.91
3	2483.50	52.4 PK	74.0	-21.6	2.52 V	329	58.22	-5.82
4	2483.50	38.9 AV	54.0	-15.1	2.52 V	329	44.72	-5.82
5	4924.00	52.8 PK	74.0	-21.2	3.48 V	65	52.66	0.14
6	4924.00	38.4 AV	54.0	-15.6	3.48 V	65	38.26	0.14
7	7386.00	50.5 PK	74.0	-23.5	2.38 V	257	44.04	6.46
8	7386.00	36.5 AV	54.0	-17.5	2.38 V	257	30.04	6.46

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.2 PK	74.0	-4.8	2.03 H	191	75.39	-6.19
2	2390.00	51.3 AV	54.0	-2.7	2.03 H	191	57.49	-6.19
3	*2412.00	101.9 PK			2.03 H	191	107.99	-6.09
4	*2412.00	93.8 AV			2.03 H	191	99.89	-6.09
5	4824.00	52.6 PK	74.0	-21.4	1.18 H	355	52.79	-0.19
6	4824.00	38.2 AV	54.0	-15.8	1.18 H	355	38.39	-0.19

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.1 PK	74.0	-17.9	2.49 V	323	62.29	-6.19
2	2390.00	41.5 AV	54.0	-12.5	2.49 V	323	47.69	-6.19
3	*2412.00	93.8 PK			2.49 V	323	99.89	-6.09
4	*2412.00	86.9 AV			2.49 V	323	92.99	-6.09
5	4824.00	52.1 PK	74.0	-21.9	3.47 V	84	52.29	-0.19
6	4824.00	38.0 AV	54.0	-16.0	3.47 V	84	38.19	-0.19

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	50.1 PK	74.0	-23.9	1.52 H	195	56.29	-6.19
2	2390.00	39.1 AV	54.0	-14.9	1.52 H	195	45.29	-6.19
3	*2437.00	104.4 PK			1.52 H	195	110.40	-6.00
4	*2437.00	96.8 AV			1.52 H	195	102.80	-6.00
5	2483.50	52.8 PK	74.0	-21.2	1.52 H	195	58.62	-5.82
6	2483.50	38.7 AV	54.0	-15.3	1.52 H	195	44.52	-5.82
7	4874.00	53.1 PK	74.0	-20.9	1.18 H	346	53.09	0.01
8	4874.00	38.6 AV	54.0	-15.4	1.18 H	346	38.59	0.01
9	7311.00	50.1 PK	74.0	-23.9	1.10 H	290	43.79	6.31
10	7311.00	36.4 AV	54.0	-17.6	1.10 H	290	30.09	6.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	99.1 PK			2.45 V	338	105.10	-6.00
2	*2437.00	90.4 AV			2.45 V	338	96.40	-6.00
3	4874.00	52.1 PK	74.0	-21.9	3.38 V	73	52.09	0.01
4	4874.00	38.1 AV	54.0	-15.9	3.38 V	73	38.09	0.01
5	7311.00	50.1 PK	74.0	-23.9	2.43 V	242	43.79	6.31
6	7311.00	36.3 AV	54.0	-17.7	2.43 V	242	29.99	6.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.0 PK			2.06 H	10	106.91	-5.91
2	*2462.00	92.6 AV			2.06 H	10	98.51	-5.91
3	2483.50	60.4 PK	74.0	-13.6	2.06 H	10	66.22	-5.82
4	2483.50	44.6 AV	54.0	-9.4	2.06 H	10	50.42	-5.82
5	4924.00	52.4 PK	74.0	-21.6	1.08 H	358	52.26	0.14
6	4924.00	38.5 AV	54.0	-15.5	1.08 H	358	38.36	0.14
7	7386.00	50.0 PK	74.0	-24.0	1.08 H	319	43.54	6.46
8	7386.00	36.3 AV	54.0	-17.7	1.08 H	319	29.84	6.46

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	91.2 PK			2.70 V	329	97.11	-5.91
2	*2462.00	83.5 AV			2.70 V	329	89.41	-5.91
3	2483.50	53.1 PK	74.0	-20.9	2.70 V	329	58.92	-5.82
4	2483.50	38.8 AV	54.0	-15.2	2.70 V	329	44.62	-5.82
5	4924.00	52.6 PK	74.0	-21.4	3.45 V	75	52.46	0.14
6	4924.00	38.2 AV	54.0	-15.8	3.45 V	75	38.06	0.14
7	7386.00	50.1 PK	74.0	-23.9	2.44 V	261	43.64	6.46
8	7386.00	36.0 AV	54.0	-18.0	2.44 V	261	29.54	6.46

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	166.26	34.2 QP	43.5	-9.4	1.50 H	129	49.67	-15.52
2	232.37	35.9 QP	46.0	-10.1	1.50 H	191	53.11	-17.23
3	432.02	33.1 QP	46.0	-12.9	2.00 H	70	43.68	-10.54
4	497.88	30.2 QP	46.0	-15.8	1.50 H	22	39.53	-9.37
5	665.64	32.5 QP	46.0	-13.5	1.00 H	59	38.37	-5.90
6	896.94	33.3 QP	46.0	-12.7	1.50 H	151	35.59	-2.26

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	38.75	32.4 QP	40.0	-7.6	2.00 V	39	48.28	-15.85
2	109.66	33.8 QP	43.5	-9.8	2.00 V	0	51.81	-18.06
3	166.26	32.6 QP	43.5	-10.9	1.00 V	76	48.09	-15.52
4	232.37	31.0 QP	46.0	-15.1	1.00 V	166	48.18	-17.23
5	432.02	31.4 QP	46.0	-14.6	1.00 V	36	41.91	-10.54
6	798.24	40.4 QP	46.0	-5.6	1.50 V	104	43.99	-3.58

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.1.8 Test Results (Mode 2)

Above 1GHz Data

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	47.1 PK	74.0	-26.9	3.16 H	76	53.29	-6.19
2	2390.00	35.5 AV	54.0	-18.5	3.16 H	76	41.69	-6.19
3	*2412.00	89.3 PK			3.16 H	76	95.39	-6.09
4	*2412.00	87.4 AV			3.16 H	76	93.49	-6.09
5	4824.00	50.1 PK	74.0	-23.9	1.28 H	43	50.29	-0.19
6	4824.00	47.6 AV	54.0	-6.4	1.28 H	43	47.79	-0.19

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	47.2 PK	74.0	-26.8	1.03 V	300	53.39	-6.19
2	2390.00	36.4 AV	54.0	-17.6	1.03 V	300	42.59	-6.19
3	*2412.00	94.3 PK			1.03 V	300	100.39	-6.09
4	*2412.00	91.9 AV			1.03 V	300	97.99	-6.09
5	4824.00	49.4 PK	74.0	-24.6	3.41 V	94	49.59	-0.19
6	4824.00	45.8 AV	54.0	-8.2	3.41 V	94	45.99	-0.19

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	89.2 PK			3.26 H	106	95.20	-6.00
2	*2437.00	87.2 AV			3.26 H	106	93.20	-6.00
3	4874.00	53.6 PK	74.0	-20.4	1.30 H	41	53.59	0.01
4	4874.00	51.8 AV	54.0	-2.2	1.30 H	41	51.79	0.01
5	7311.00	46.6 PK	74.0	-27.4	2.16 H	298	40.29	6.31
6	7311.00	37.1 AV	54.0	-16.9	2.16 H	298	30.79	6.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	94.5 PK			1.02 V	287	100.50	-6.00
2	*2437.00	92.3 AV			1.02 V	287	98.30	-6.00
3	4874.00	55.2 PK	74.0	-18.8	2.34 V	241	55.19	0.01
4	4874.00	53.6 AV	54.0	-0.4	2.34 V	241	53.59	0.01
5	7311.00	48.9 PK	74.0	-25.1	2.14 V	283	42.59	6.31
6	7311.00	39.6 AV	54.0	-14.4	2.14 V	283	33.29	6.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	89.4 PK			3.20 H	91	95.31	-5.91
2	*2462.00	87.3 AV			3.20 H	91	93.21	-5.91
3	2483.50	47.2 PK	74.0	-26.8	3.20 H	91	53.02	-5.82
4	2483.50	35.7 AV	54.0	-18.3	3.20 H	91	41.52	-5.82
5	4924.00	53.8 PK	74.0	-20.2	1.98 H	360	53.66	0.14
6	4924.00	52.0 AV	54.0	-2.0	1.98 H	360	51.86	0.14
7	7386.00	47.0 PK	74.0	-27.0	2.12 H	302	40.54	6.46
8	7386.00	37.4 AV	54.0	-16.6	2.12 H	302	30.94	6.46

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	94.3 PK			1.03 V	306	100.21	-5.91
2	*2462.00	92.1 AV			1.03 V	306	98.01	-5.91
3	2483.50	47.3 PK	74.0	-26.7	1.03 V	306	53.12	-5.82
4	2483.50	36.2 AV	54.0	-17.8	1.03 V	306	42.02	-5.82
5	4924.00	55.5 PK	74.0	-18.5	2.32 V	229	55.36	0.14
6	4924.00	53.6 AV	54.0	-0.4	2.32 V	229	53.46	0.14
7	7386.00	49.0 PK	74.0	-25.0	2.12 V	294	42.54	6.46
8	7386.00	39.8 AV	54.0	-14.2	2.12 V	294	33.34	6.46

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.3 PK	74.0	-21.7	3.13 H	76	58.49	-6.19
2	2390.00	38.5 AV	54.0	-15.5	3.13 H	76	44.69	-6.19
3	*2412.00	89.2 PK			3.13 H	76	95.29	-6.09
4	*2412.00	81.9 AV			3.13 H	76	87.99	-6.09
5	4824.00	56.2 PK	74.0	-17.8	2.45 H	186	56.39	-0.19
6	4824.00	46.0 AV	54.0	-8.0	2.45 H	186	46.19	-0.19

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.2 PK	74.0	-15.8	1.45 V	105	64.39	-6.19
2	2390.00	41.4 AV	54.0	-12.6	1.45 V	105	47.59	-6.19
3	*2412.00	99.0 PK			1.45 V	105	105.09	-6.09
4	*2412.00	89.7 AV			1.45 V	105	95.79	-6.09
5	4824.00	57.1 PK	74.0	-16.9	2.23 V	256	57.29	-0.19
6	4824.00	46.9 AV	54.0	-7.1	2.23 V	256	47.09	-0.19

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	95.1 PK			3.20 H	50	101.10	-6.00
2	*2437.00	87.6 AV			3.20 H	50	93.60	-6.00
3	4874.00	58.1 PK	74.0	-15.9	2.48 H	197	58.09	0.01
4	4874.00	47.8 AV	54.0	-6.2	2.48 H	197	47.79	0.01
5	7311.00	52.2 PK	74.0	-21.8	2.22 H	99	45.89	6.31
6	7311.00	40.5 AV	54.0	-13.5	2.22 H	99	34.19	6.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.1 PK	74.0	-21.9	1.41 V	117	58.29	-6.19
2	2390.00	38.3 AV	54.0	-15.7	1.41 V	117	44.49	-6.19
3	*2437.00	101.9 PK			1.41 V	117	107.90	-6.00
4	*2437.00	93.4 AV			1.41 V	117	99.40	-6.00
5	2483.50	57.5 PK	74.0	-16.5	1.41 V	117	63.32	-5.82
6	2483.50	40.1 AV	54.0	-13.9	1.41 V	117	45.92	-5.82
7	4874.00	59.5 PK	74.0	-14.5	2.30 V	243	59.49	0.01
8	4874.00	49.5 AV	54.0	-4.5	2.30 V	243	49.49	0.01
9	7311.00	52.4 PK	74.0	-21.6	2.09 V	292	46.09	6.31
10	7311.00	40.9 AV	54.0	-13.1	2.09 V	292	34.59	6.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	91.8 PK			3.11 H	53	97.71	-5.91
2	*2462.00	84.6 AV			3.11 H	53	90.51	-5.91
3	2483.50	62.8 PK	74.0	-11.2	3.11 H	53	68.62	-5.82
4	2483.50	46.8 AV	54.0	-7.2	3.11 H	53	52.62	-5.82
5	4924.00	56.3 PK	74.0	-17.7	2.44 H	196	56.16	0.14
6	4924.00	46.1 AV	54.0	-7.9	2.44 H	196	45.96	0.14
7	7386.00	50.2 PK	74.0	-23.8	2.17 H	108	43.74	6.46
8	7386.00	37.9 AV	54.0	-16.1	2.17 H	108	31.44	6.46

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	97.9 PK			1.07 V	105	103.81	-5.91
2	*2462.00	90.4 AV			1.07 V	105	96.31	-5.91
3	2483.50	64.1 PK	74.0	-9.9	1.07 V	105	69.92	-5.82
4	2483.50	52.0 AV	54.0	-2.0	1.07 V	105	57.82	-5.82
5	4924.00	56.5 PK	74.0	-17.5	2.29 V	260	56.36	0.14
6	4924.00	46.5 AV	54.0	-7.5	2.29 V	260	46.36	0.14
7	7386.00	50.3 PK	74.0	-23.7	2.20 V	280	43.84	6.46
8	7386.00	38.0 AV	54.0	-16.0	2.20 V	280	31.54	6.46

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	51.9 PK	74.0	-22.1	3.15 H	91	58.09	-6.19
2	2390.00	38.1 AV	54.0	-15.9	3.15 H	91	44.29	-6.19
3	*2412.00	89.4 PK			3.15 H	91	95.49	-6.09
4	*2412.00	81.9 AV			3.15 H	91	87.99	-6.09
5	4824.00	56.7 PK	74.0	-17.3	2.41 H	172	56.89	-0.19
6	4824.00	46.5 AV	54.0	-7.5	2.41 H	172	46.69	-0.19

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.6 PK	74.0	-12.4	1.45 V	100	67.79	-6.19
2	2390.00	43.2 AV	54.0	-10.8	1.45 V	100	49.39	-6.19
3	*2412.00	97.7 PK			1.45 V	100	103.79	-6.09
4	*2412.00	89.5 AV			1.45 V	100	95.59	-6.09
5	4824.00	56.9 PK	74.0	-17.1	2.36 V	250	57.09	-0.19
6	4824.00	46.7 AV	54.0	-7.3	2.36 V	250	46.89	-0.19

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	95.0 PK			3.18 H	58	101.00	-6.00
2	*2437.00	87.6 AV			3.18 H	58	93.60	-6.00
3	4874.00	58.2 PK	74.0	-15.8	2.50 H	184	58.19	0.01
4	4874.00	48.2 AV	54.0	-5.8	2.50 H	184	48.19	0.01
5	7311.00	52.3 PK	74.0	-21.7	2.18 H	100	45.99	6.31
6	7311.00	40.8 AV	54.0	-13.2	2.18 H	100	34.49	6.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	52.1 PK	74.0	-21.9	1.05 V	111	58.29	-6.19
2	2390.00	38.3 AV	54.0	-15.7	1.05 V	111	44.49	-6.19
3	*2437.00	101.4 PK			1.05 V	111	107.40	-6.00
4	*2437.00	93.1 AV			1.05 V	111	99.10	-6.00
5	2483.50	57.6 PK	74.0	-16.4	1.05 V	111	63.42	-5.82
6	2483.50	40.3 AV	54.0	-13.7	1.05 V	111	46.12	-5.82
7	4874.00	59.3 PK	74.0	-14.7	2.30 V	259	59.29	0.01
8	4874.00	49.5 AV	54.0	-4.5	2.30 V	259	49.49	0.01
9	7311.00	52.5 PK	74.0	-21.5	2.06 V	300	46.19	6.31
10	7311.00	41.2 AV	54.0	-12.8	2.06 V	300	34.89	6.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	91.6 PK			3.11 H	52	97.51	-5.91
2	*2462.00	84.2 AV			3.11 H	52	90.11	-5.91
3	2483.50	62.7 PK	74.0	-11.3	3.13 H	44	68.52	-5.82
4	2483.50	46.4 AV	54.0	-7.6	3.13 H	44	52.22	-5.82
5	4924.00	56.7 PK	74.0	-17.3	2.46 H	180	56.56	0.14
6	4924.00	46.6 AV	54.0	-7.4	2.46 H	180	46.46	0.14
7	7386.00	49.7 PK	74.0	-24.3	2.18 H	109	43.24	6.46
8	7386.00	37.6 AV	54.0	-16.4	2.18 H	109	31.14	6.46

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	96.3 PK			1.04 V	103	102.21	-5.91
2	*2462.00	89.2 AV			1.04 V	103	95.11	-5.91
3	2483.50	68.1 PK	74.0	-5.9	1.04 V	103	73.92	-5.82
4	2483.50	51.3 AV	54.0	-2.7	1.04 V	103	57.12	-5.82
5	4924.00	56.5 PK	74.0	-17.5	2.31 V	254	56.36	0.14
6	4924.00	46.4 AV	54.0	-7.6	2.31 V	254	46.26	0.14
7	7386.00	50.3 PK	74.0	-23.7	2.14 V	276	43.84	6.46
8	7386.00	38.0 AV	54.0	-16.0	2.14 V	276	31.54	6.46

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data
802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.27	27.5 QP	40.0	-12.5	2.00 H	132	43.60	-16.07
2	166.28	32.2 QP	43.5	-11.3	1.50 H	120	47.69	-15.53
3	232.78	37.5 QP	46.0	-8.5	1.00 H	195	54.72	-17.18
4	432.02	33.0 QP	46.0	-13.0	2.00 H	62	43.55	-10.54
5	676.60	29.8 QP	46.0	-16.2	1.00 H	51	35.62	-5.81
6	796.64	41.6 QP	46.0	-4.4	1.00 H	92	45.21	-3.62

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.17	32.4 QP	40.0	-7.6	2.00 V	204	48.26	-15.82
2	109.66	32.4 QP	43.5	-11.2	2.00 V	64	50.41	-18.06
3	166.28	32.7 QP	43.5	-10.8	1.00 V	79	48.22	-15.53
4	232.78	30.9 QP	46.0	-15.1	1.00 V	160	48.12	-17.18
5	431.99	32.0 QP	46.0	-14.0	1.50 V	44	42.56	-10.54
6	798.19	41.4 QP	46.0	-4.6	1.50 V	126	45.02	-3.58

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. 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 & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 17, 2015	Apr. 16, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-523	Oct. 02, 2015	Oct. 01, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100071	Nov. 11, 2015	Nov. 10, 2016
RF Cable	5D-FB	COACAB-001	May 25, 2015	May 24, 2016
50 ohms Terminator	50	3	Oct. 21, 2015	Oct. 20, 2016
50 ohms Terminator	N/A	EMC-04	Oct. 28, 2015	Oct. 27, 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.
4. Tested Date: Dec. 12, 2015

4.2.3 Test Procedures

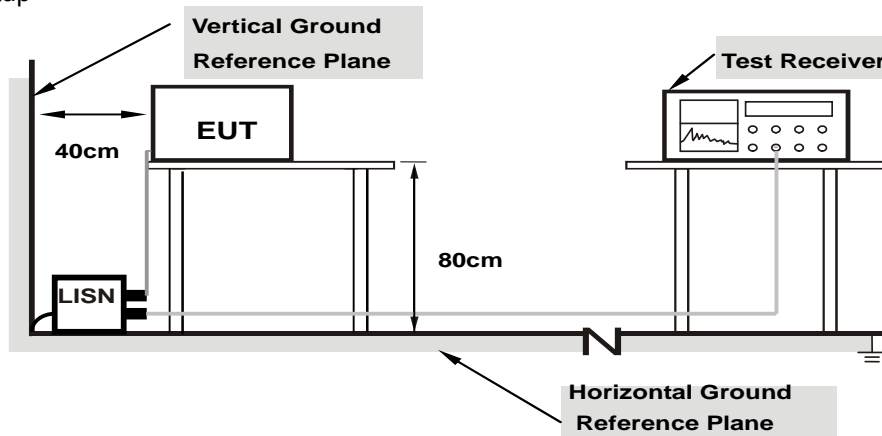
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

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.

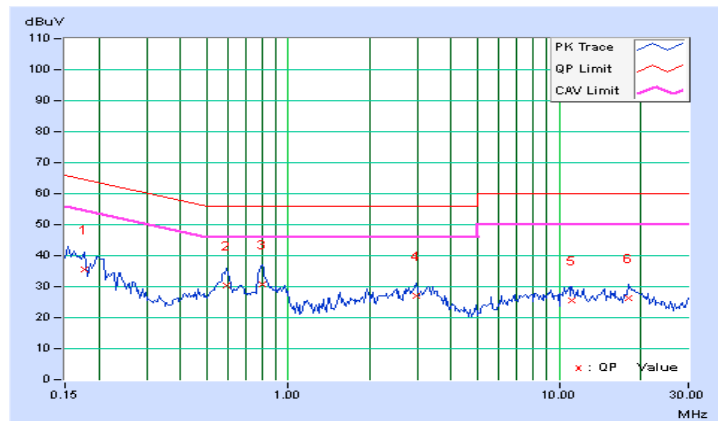
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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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	0.17734	10.22	25.22	11.52	35.44	21.74	64.61	54.61	-29.17	-32.87
2	0.59531	10.27	20.16	12.91	30.43	23.18	56.00	46.00	-25.57	-22.82
3	0.79844	10.26	20.62	9.04	30.88	19.30	56.00	46.00	-25.12	-26.70
4	2.95313	10.40	16.49	11.41	26.89	21.81	56.00	46.00	-29.11	-24.19
5	11.14453	10.67	14.88	7.67	25.55	18.34	60.00	50.00	-34.45	-31.66
6	17.99609	10.96	15.23	9.68	26.19	20.64	60.00	50.00	-33.81	-29.36

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

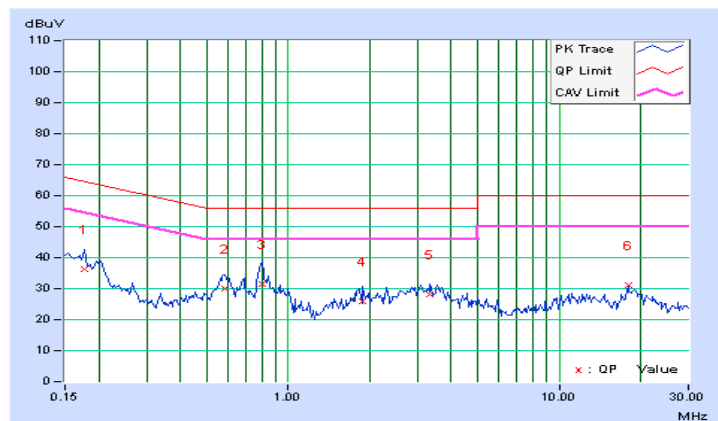


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	10.30	26.04	11.48	36.34	21.78	64.61	54.61	-28.27	-32.83
2	0.58359	10.36	19.82	11.76	30.18	22.12	56.00	46.00	-25.82	-23.88
3	0.79844	10.34	21.30	9.72	31.64	20.06	56.00	46.00	-24.36	-25.94
4	1.89063	10.38	15.60	10.10	25.98	20.48	56.00	46.00	-30.02	-25.52
5	3.32813	10.50	17.72	12.45	28.22	22.95	56.00	46.00	-27.78	-23.05
6	18.00391	10.94	20.14	16.90	31.08	27.84	60.00	50.00	-28.92	-22.16

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

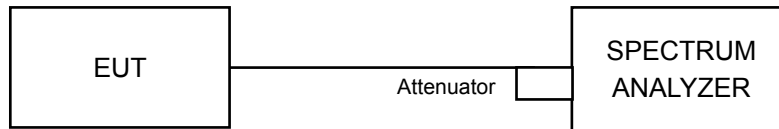


4.3 6dB Bandwidth Measurement

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) $\geq 3 \times$ 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

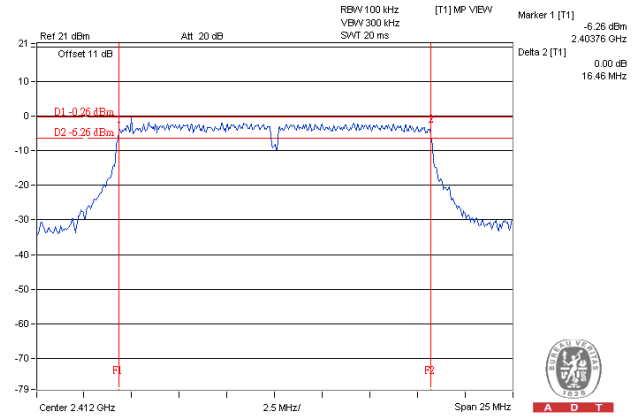
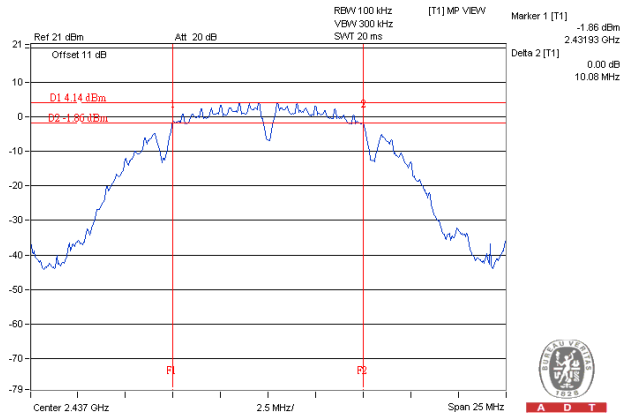
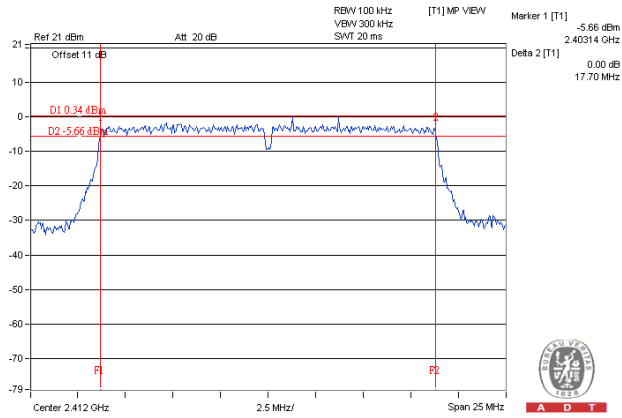
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	10.12	0.5	PASS
6	2437	10.08	0.5	PASS
11	2462	10.08	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.46	0.5	PASS
6	2437	16.62	0.5	PASS
11	2462	16.60	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.70	0.5	Pass
6	2437	17.72	0.5	Pass
11	2462	17.78	0.5	Pass

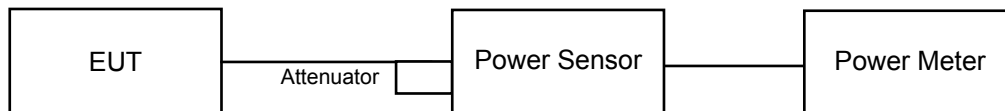
Spectrum Plot of Worst Value**802.11b / CH 6****802.11g / CH 1****802.11n (HT20) / CH 1**

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 / average power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak / average power sensor. Record the power level.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

FOR PEAK POWER**802.11b**

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	59.979	17.78	30	Pass
6	2437	57.544	17.60	30	Pass
11	2462	38.637	15.87	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	190.985	22.81	30	Pass
6	2437	171.002	22.33	30	Pass
11	2462	135.207	21.31	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	145.211	21.62	30	Pass
6	2437	139.316	21.44	30	Pass
11	2462	96.605	19.85	30	Pass

FOR AVERAGE POWER**802.11b**

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	33.037	15.19
6	2437	32.063	15.06
11	2462	25.119	14.00

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	23.55	13.72
6	2437	27.29	14.36
11	2462	17.418	12.41

802.11n (HT20)

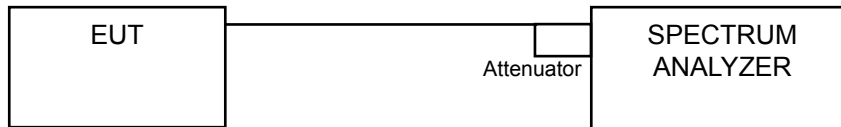
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	23.496	13.71
6	2437	21.928	13.41
11	2462	13.152	11.19

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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d. Set the VBW $\geq 3 \times \text{RBW}$.
- 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	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-14.17	8	Pass
6	2437	-14.16	8	Pass
11	2462	-16.17	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-16.47	8	Pass
6	2437	-15.60	8	Pass
11	2462	-16.96	8	Pass

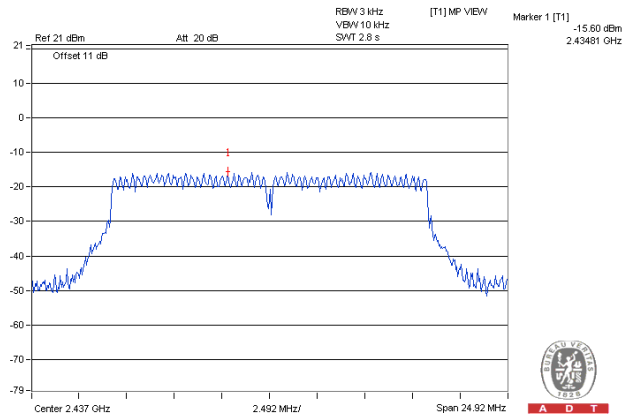
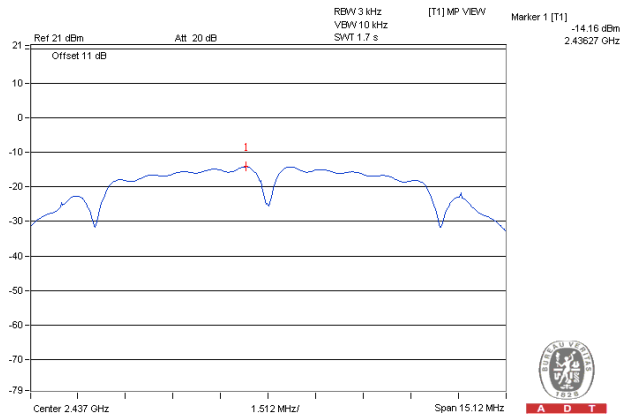
802.11n (HT20)

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-14.52	8	Pass
6	2437	-14.16	8	Pass
11	2462	-15.88	8	Pass

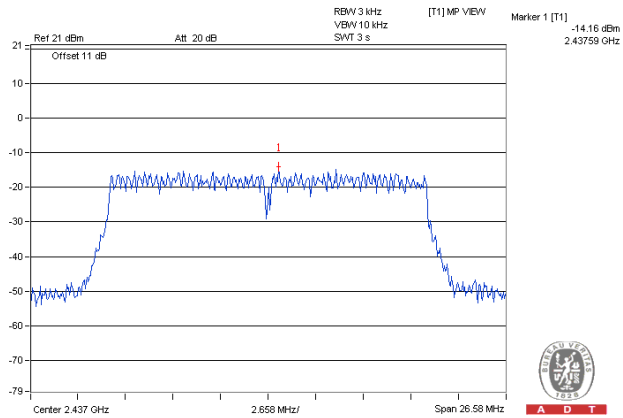
Spectrum Plot of Worst Value

802.11b / CH 6

802.11g / CH 6



802.11n (HT20) / CH 6

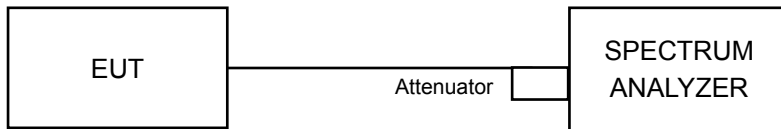


4.6 Conducted Out of Band Emission Measurement

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 OOB

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

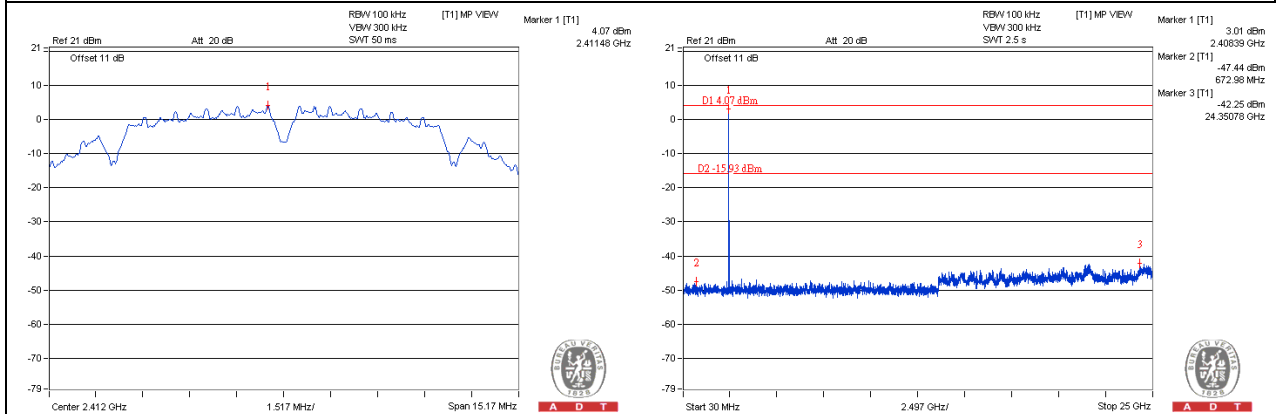
Same as Item 4.3.6

4.6.7 Test Results

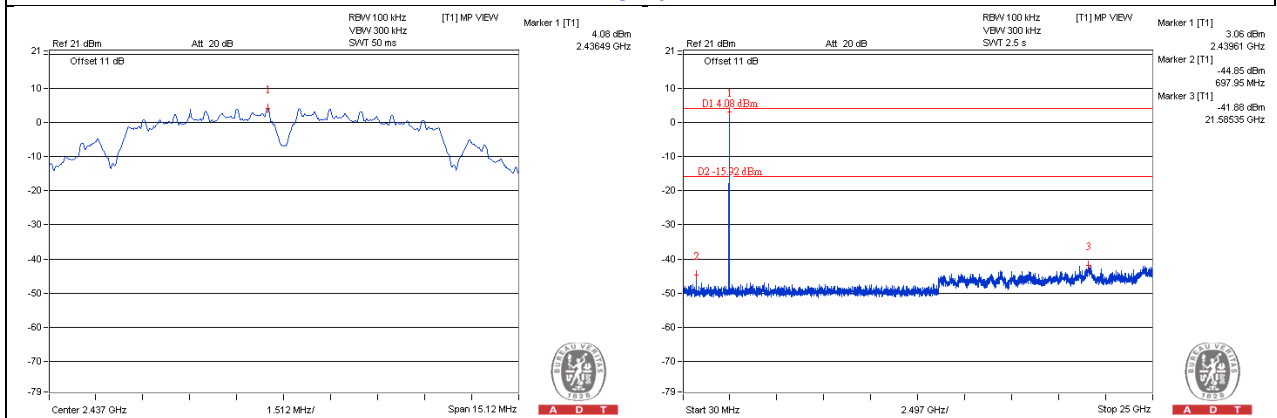
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

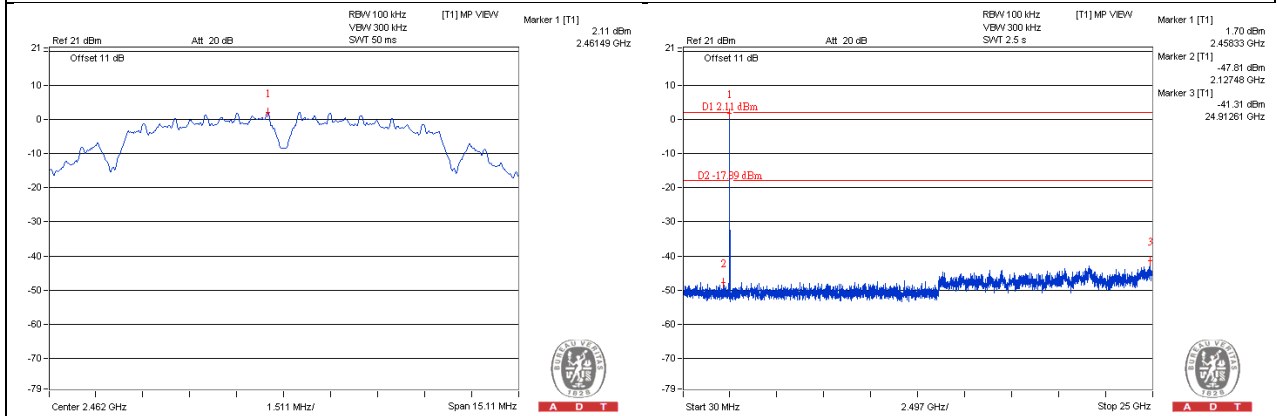
CH 1



CH 6

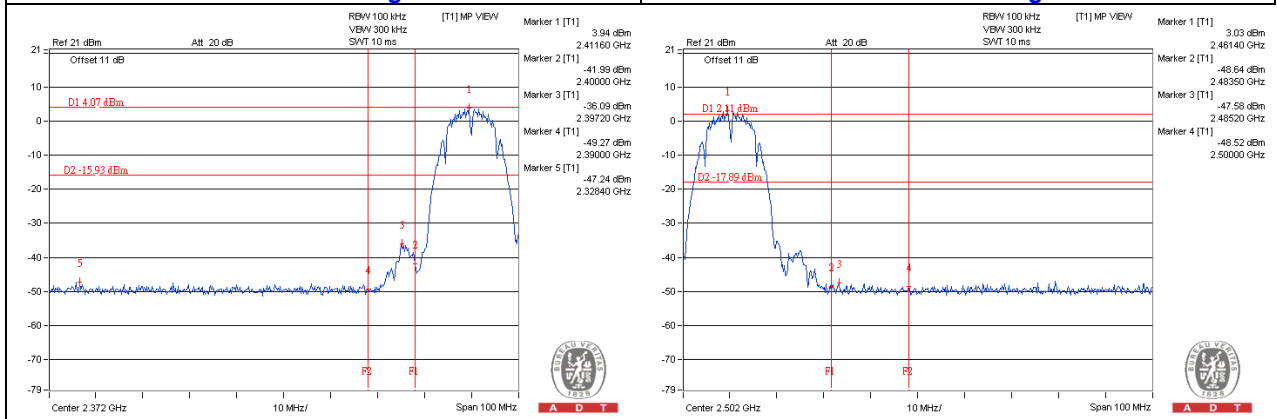


CH 11



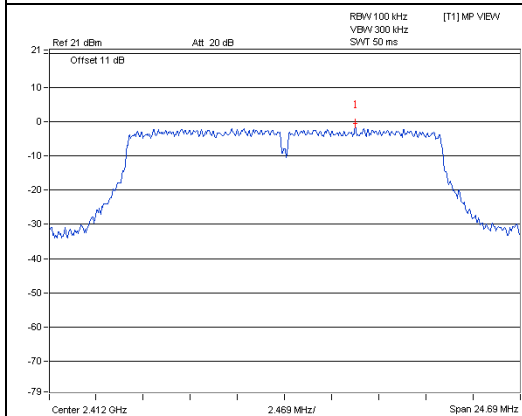
CH 1 Band edge

CH 11 Band edge

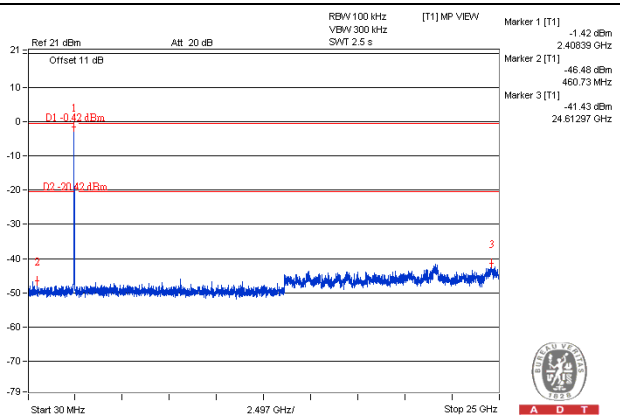


802.11g

CH 1

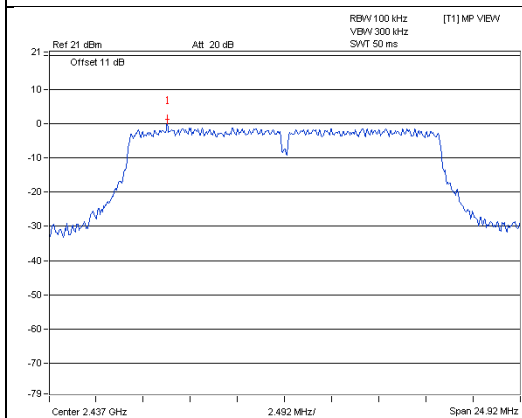


A D T

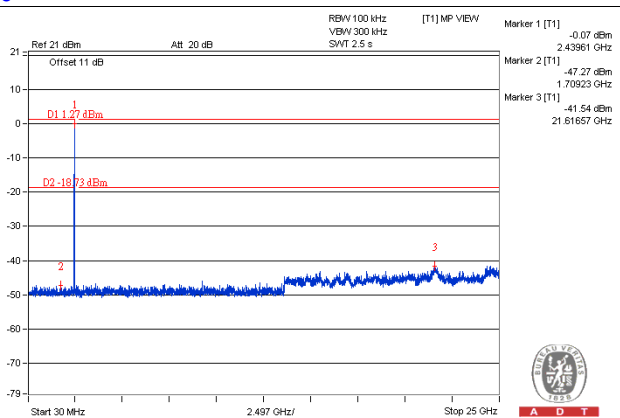


A D T

CH 6

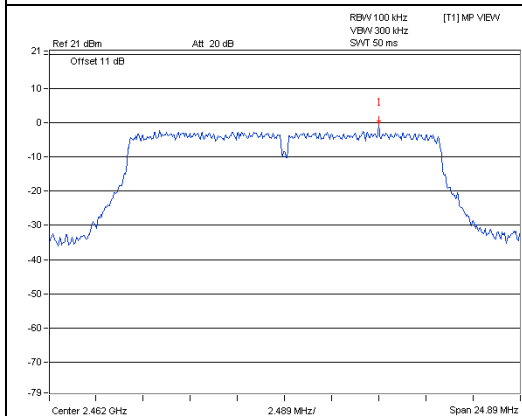


A D T

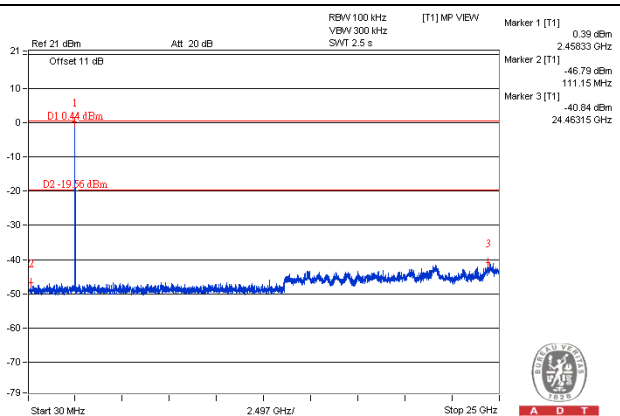


A D T

CH 11

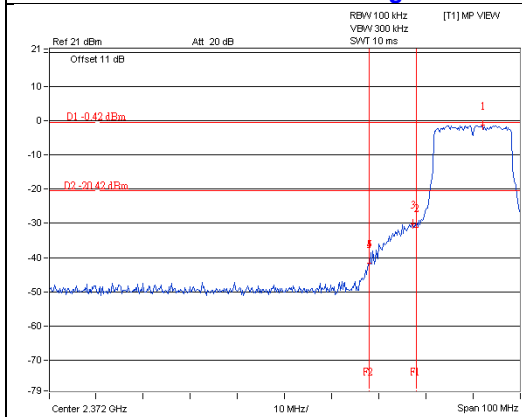


A D T



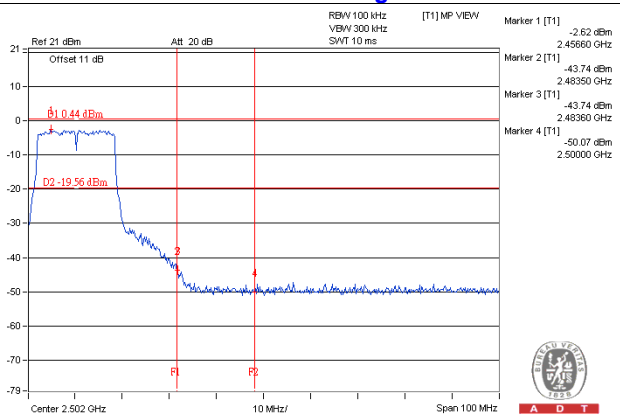
A D T

CH 1 Band edge



A D T

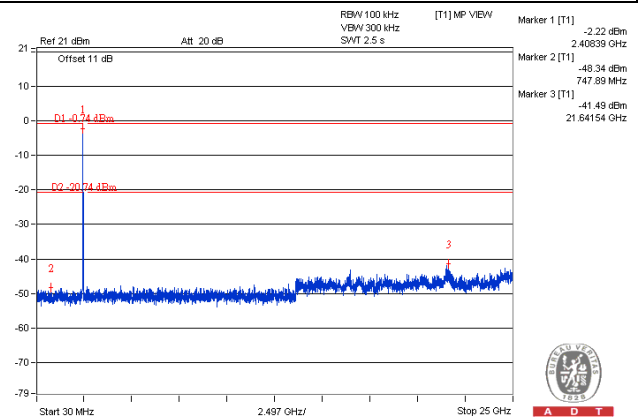
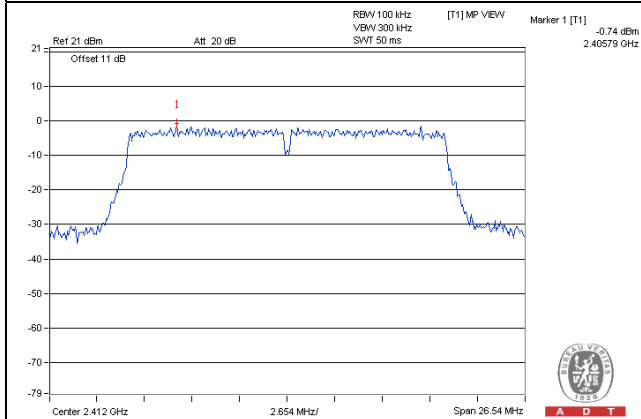
CH 11 Band edge



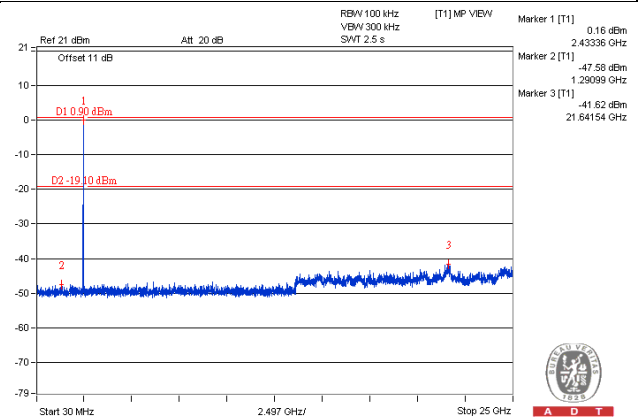
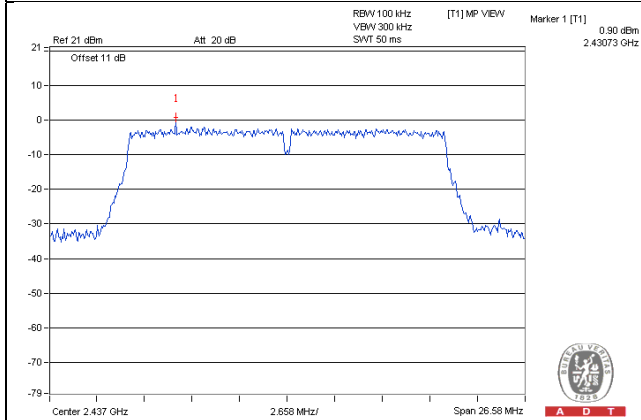
A D T

802.11n (HT20)

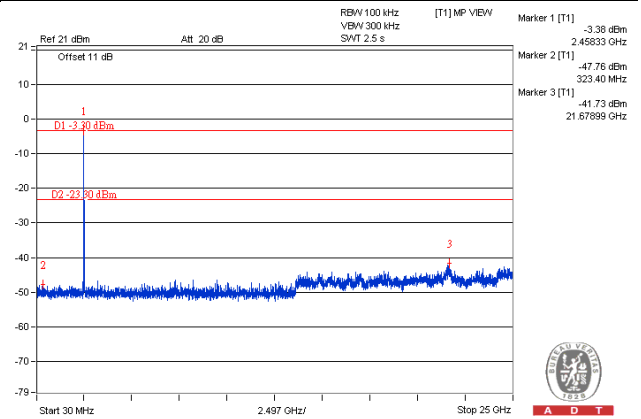
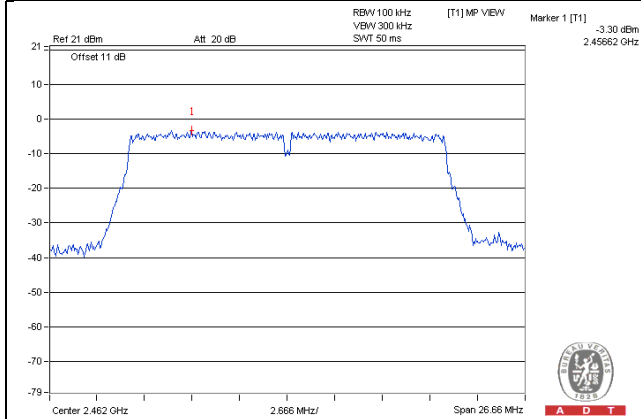
CH 1



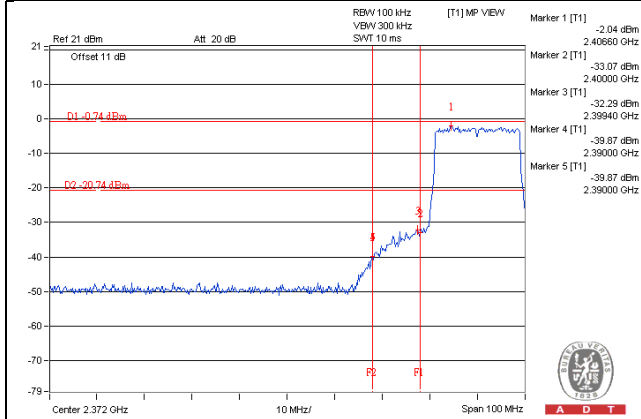
CH 6



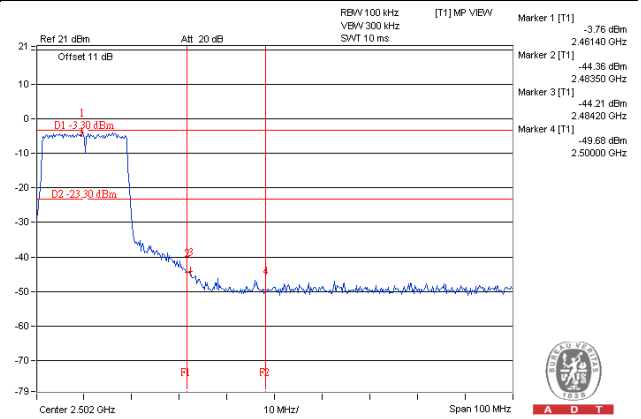
CH 11



CH 1 Band edge



CH 11 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: 886-2-26051924

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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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