

FCC Test Report (WLAN)

Report No.: RF140605E01L R1

FCC ID: TLZ-CB178NF

Test Model: AW-CB178NF, AW-CB178NF(UART)

Series Model: AW-CB178NF-ZP

Received Date: June 19, 2017

Test Date: July 13 to 18, 2017

Issued Date: Aug. 01, 2017

Applicant: AzureWave Technologies, Inc.

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

Issue No.	Description	Date Issued
RF140605E01L	Original release.	July 25, 2017
RF140605E01L R1	Revised the model name of Set 6 Antenna	Aug. 01, 2017

1 Certificate of Conformity

Product: 802.11ac/a/b/g/n 2X2 MIMO WLAN & Bluetooth NGFF module

Brand: AzureWave

Test Model: AW-CB178NF, AW-CB178NF(UART)

Series Model: AW-CB178NF-ZP

Sample Status: ENGINEERING SAMPLE

Applicant: AzureWave Technologies, Inc.

Test Date: July 13 to 18, 2017

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: Aug. 01, 2017

Wendy Wu / Specialist

Approved by :



Date: Aug. 01, 2017

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2390MHz.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.

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) ($\pm$)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.32 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.14 dB
	6GHz ~ 18GHz	5.04 dB
	18GHz ~ 40GHz	5.25 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	802.11ac/a/b/g/n 2X2 MIMO WLAN & Bluetooth NGFF module
Brand	AzureWave
Test Model	AW-CB178NF, AW-CB178NF(UART)
Series Model	AW-CB178NF-ZP
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	3.3Vdc from host equipment
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n : up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	For 15.407 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.58GHz & 5.66 ~ 5.70GHz, 5.745 ~ 5.825GHz For 15.247 2.412 ~ 2.462GHz
Number of Channel	For 15.407 21 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 9 for 802.11n (HT40), 802.11ac (VHT40) 4 for 802.11ac (VHT80) For 15.247 11 for 802.11b/g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	For 15.407 802.11a: 88.452mW 802.11ac (VHT20): 95.932mW 802.11ac (VHT40): 69.218mW 802.11ac (VHT80): 14.66mW For 15.247: 802.11b: 182.395mW 802.11g: 680.997mW 802.11n (HT20): 715.475mW 802.11n (HT40): 288.679mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC Class II change. The difference compared with the Report No.: RF140605E01D design is as the following:

◆ Add two sets of new Dipole antennas (Set 5, Set 6) as below table:

Original Antenna										
Set 1 Antenna										
Transmitter Circuit	Brand	Model	Ant. Gain (dBi) < Excluding cable loss>	Cable Loss (dB)		Net. Gain (dBi)	Frequency range (MHz to MHz)	Ant. Type	Connect er Type	Cable Length (mm)
				100 mm	180 mm					
Chain (0)	Microsoft	2118433-1	2.18	1	0.54	0.64	2400~2484	PCB	R-SMA	100+180
			2.34	1.3	0.96	0.08	5150~5850			
Chain (1)	Microsoft	2118433-1	2.18	1	0.54	0.64	2400~2484	PCB	R-SMA	100+180
			2.34	1.3	0.96	0.08	5150~5850			
Set 2 Antenna										
Transmitter Circuit	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (MHz to MHz)		Ant. Type	Connector Type	Cable Length (mm)		
Chain (0)	Walsin	RFPCA310715EML B301	3.06	2400~2500		PIFA	mini - ipex	150		
			4.81	5150~5850						
Chain (1)	Walsin	RFPCA310715EML B301	3.06	2400~2500		PIFA	mini - ipex	150		
			4.81	5150~5850						
Set 3 Antenna										
Transmitter Circuit	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (MHz to MHz)		Ant. Type	Connector Type	Cable Length (mm)		
Chain (0)	Wistron NeWeb Corporation	81EAAX15.G12	1.02	2400~2484		PIFA	mini - ipex	254		
			-1.03	5150~5850						
Chain (1)	Wistron NeWeb Corporation	81EAAX15.G12	1.02	2400~2484		PIFA	mini - ipex	563		
			-1.03	5150~5850						
Set 4 Antenna										
Transmitter Circuit	Brand	Model	Antenna Gain(dBi) Including 1285mm cable loss Excluding 60mm cable loss	Cable Loss (dB)		Net. Gain (dBi)	Frequency range (MHz to MHz)	Ant. Type	Connect er Type	Cable Length (mm)
				1285 mm	60 mm					
Chain (0)	TE	2118406-3	0.38	NA	-0.35	0.03	2300~3800	PCB	R-SMA	1285 +60
			-0.18	NA	-0.73	-0.91	5150~5875			
Chain (1)	TE	2118406-3	0.38	NA	-0.35	0.03	2300~3800	PCB	R-SMA	1285 +60
			-0.18	NA	-0.73	-0.91	5150~5875			
Newly Antenna										
Set 5 Antenna										
Transmitter Circuit	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (MHz to MHz)		Ant. Type	Connector Type	Cable Length (mm)		
Chain (0)	Ventev	Main Antenna: 593861- MWAS-2382-5.50	2.4	2400~2500		Dipole	N Plug	140 +/- 10		
			3.55	4900~5825						
Chain (1)	Ventev	Aux Antenna:593861- MWAS-2382-9.00	2.4	2400~2500		Dipole	N Plug	230 +/- 10		
			3.55	4900~5825						

Set 6 Antenna

Transmitter Circuit	Brand	Model	Antenna Gain(dBi) Including Cable loss	Frequency range (MHz to MHz)	Ant. Type	Connector Type	Cable Length (mm)
Chain (0)	Cortec	AN2450-74L02BRS+ SMASFR8-3200B-40X00I	1.5	2400~2500	Dipole	SMA Male Reverse/ SMA Female Reverse	200 +/- 3
			2.0	5150~5850			
Chain (1)	Cortec	AN2450-74L02BRS+ SMASFR8-3200B-40X00I	1.5	2400~2500	Dipole	SMA Male Reverse/ SMA Female Reverse	200 +/- 3
			2.0	5150~5850			

Note: 1. From the above 1TX configuration mode, the worst case was found in transmission circuit on Chain (1).
 2. For BT mode will fix transmission on Chain (0).
 3. From the above antenna sets, Set 1, Set 2 and Set 5 Antenna were selected as representative antenna for the test and its data was recorded in this report.

2. According to above conditions, only Output Power and Radiated Emissions test items of the newly antenna need to be performed. And all data was verified to meet the requirements.

3. The EUT has three model names, which are identical to each other in all aspects except for the following:

Brand	Model	Description
AzureWave	AW-CB178NF(UART)	With UART interface
	AW-CB178NF	Without UART interface
	AW-CB178NF-ZP	With UART interface

From the model names, the radiated emission worst case was found in model No.: **AW-CB178NF**. Therefore only the test data of the mode was recorded in this report.

4. There are Bluetooth 4.0 technology and WLAN (2.4GHz and 5GHz) technology used for the EUT.

5. For WLAN: 2.4GHz and 5GHz technology cannot transmit at same time.

6. WLAN/BT coexistence mode:

Condition	Technology	
1	WLAN(2.4GHz) 1TX only	BT
2	WLAN(5GHz) 1TX only	BT

From above coexistence mode, radiated emission of the simultaneous operation has been evaluated and no non-compliance was found.

7. The EUT incorporates a MIMO function.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	1Tx (diversity)	1Rx (diversity)
		2TX(CDD)	2Rx
802.11b	1 ~ 11Mbps	1Tx (diversity)	1Rx (diversity)
		2TX(CDD)	2Rx
802.11g	6 ~ 54Mbps	1Tx (diversity)	1Rx (diversity)
		2TX(CDD)	2Rx
802.11n (HT20)	MCS 0~7	1Tx (diversity)	1Rx (diversity)
	MCS 8~15	2Tx	2Rx
802.11n (HT40)	MCS 0~7	1Tx (diversity)	1Rx (diversity)
	MCS 8~15	2Tx	2Rx
802.11ac (VHT20) (5GHz)	MCS0~8 Nss=1	1Tx (diversity)	1Rx (diversity)
	MCS0~8 Nss=2	2Tx	2Rx
802.11ac (VHT40) (5GHz)	MCS0~9 Nss=1	1Tx (diversity)	1Rx (diversity)
	MCS0~9 Nss=2	2Tx	2Rx
802.11ac (VHT80) (5GHz)	MCS0~9 Nss=1	1Tx (diversity)	1Rx (diversity)
	MCS0~9 Nss=2	2Tx	2Rx

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report.

8. 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		

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE $\geq$ 1G	RE<1G	APCM	
-	√	√	√	-

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

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
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

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)
802.11n (HT20)	1 to 11	6,	OFDM	BPSK	6.5

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
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

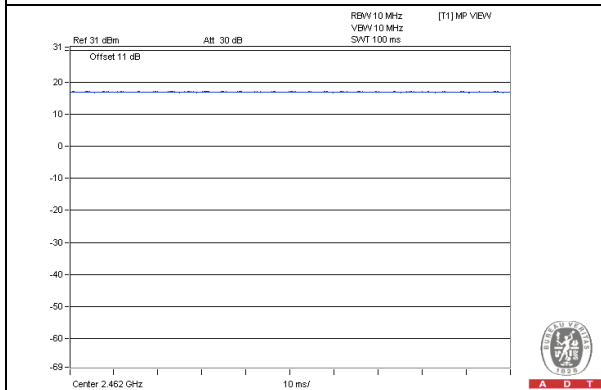
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	25deg. C, 68%RH	120Vac, 60Hz	Weiwei Lo
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Weiwei Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

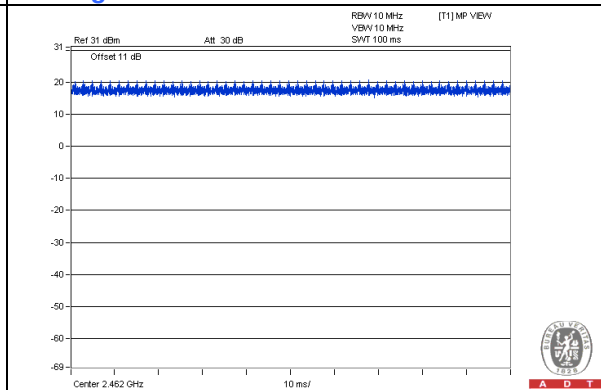
3.3 Duty Cycle of Test Signal

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

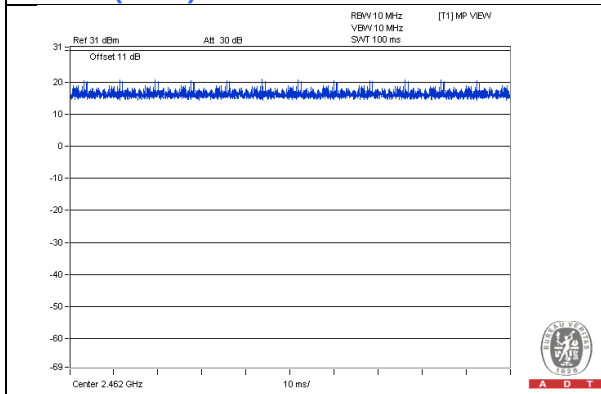
802.11b



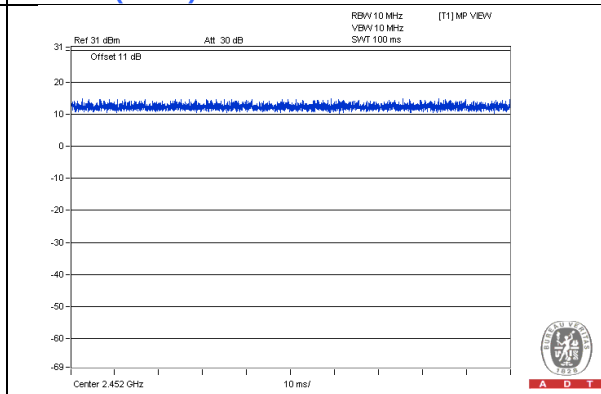
802.11g



802.11n (HT20)



802.11n (HT40)



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.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	PCIE Fixture	NA	NA	NA	NA	Supplied by client
C.	Laptop	DELL	E6440	F9LYQ32	FCC DoC	Provided by Lab
D.	USB Dongle	NA	NA	NA	NA	Provided by Lab

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.	RJ-45 Cable	1	10	No	0	Provided by Lab

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 v04
ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 18, 2016	Aug. 17, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 28, 2016	Dec. 27, 2017
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1 200 EMC104-SM-SM-2 000 EMC104-SM-SM-5 000	160922 150317 150322	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Spectrum Analyzer Keysight	N9030A	MY54490520	July 29, 2016	July 28, 2017
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8. 7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSv40	100964	July 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018

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. The test was performed in 966 Chamber No. 3.
4. The CANADA Site Registration No. is 20331-1.
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: July 13 to 17, 2017.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

For Radiated emission above 30MHz

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

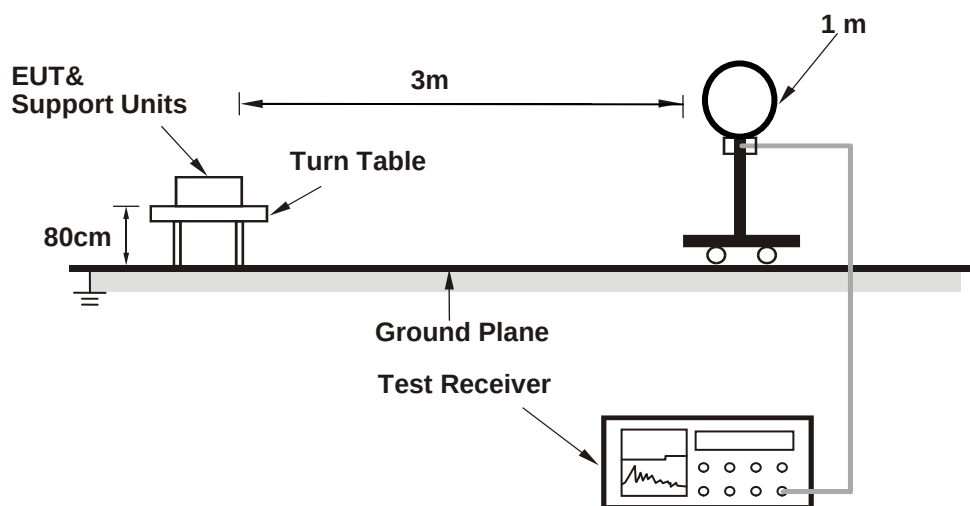
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz. If duty cycle of test signal is < 98%, the duty factor need added to measured value.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

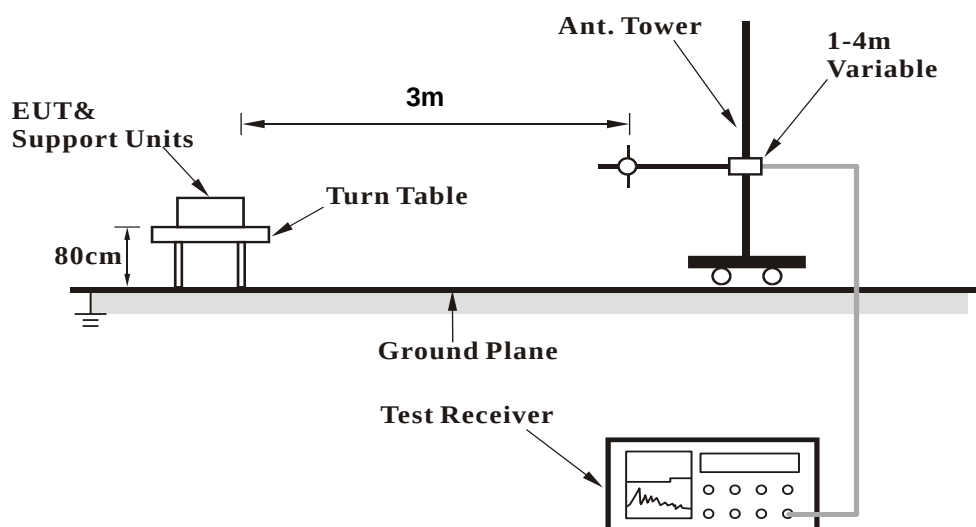
No deviation.

4.1.5 Test Setup

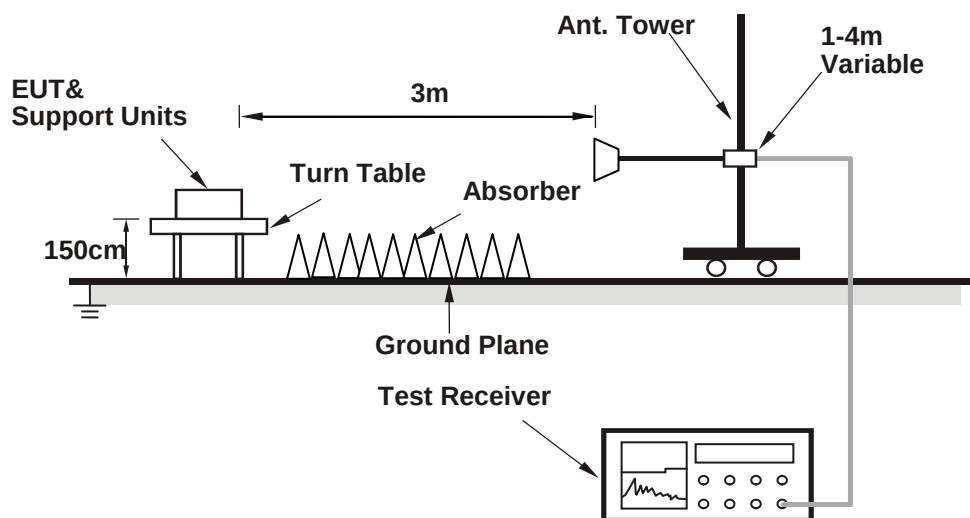
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission 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 the testing table.
- b. Contorlling software (DutApiMimoBtFmBrdigeEth.exe [Labtool v2.0.0.43]) has been activated to set the EUT on specific status.

4.1.7 Test Results

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	55.4 PK	74.0	-18.6	2.35 H	126	57.0	-1.6
2	2390.00	41.1 AV	54.0	-12.9	2.35 H	126	42.7	-1.6
3	*2412.00	96.4 PK			2.35 H	126	97.9	-1.5
4	*2412.00	94.1 AV			2.35 H	126	95.6	-1.5
5	4824.00	39.5 PK	74.0	-34.5	1.00 H	212	36.5	3.0
6	4824.00	32.5 AV	54.0	-21.5	1.00 H	212	29.5	3.0
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	55.8 PK	74.0	-18.2	2.74 V	338	57.4	-1.6
2	2390.00	44.7 AV	54.0	-9.3	2.74 V	338	46.3	-1.6
3	*2412.00	107.6 PK			2.74 V	338	109.1	-1.5
4	*2412.00	105.3 AV			2.74 V	338	106.8	-1.5
5	4824.00	48.8 PK	74.0	-25.2	3.66 V	360	45.8	3.0
6	4824.00	46.3 AV	54.0	-7.7	3.66 V	360	43.3	3.0

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	96.6 PK			2.32 H	117	98.1	-1.5
2	*2437.00	94.1 AV			2.32 H	117	95.6	-1.5
3	4874.00	40.1 PK	74.0	-33.9	1.25 H	197	36.9	3.2
4	4874.00	32.4 AV	54.0	-21.6	1.25 H	197	29.2	3.2
5	7311.00	40.3 PK	74.0	-33.7	1.66 H	211	31.4	8.9
6	7311.00	31.5 AV	54.0	-22.5	1.66 H	211	22.6	8.9

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	106.5 PK			3.31 V	329	108.0	-1.5
2	*2437.00	104.2 AV			3.31 V	329	105.7	-1.5
3	4874.00	48.8 PK	74.0	-25.2	3.21 V	280	45.6	3.2
4	4874.00	46.7 AV	54.0	-7.3	3.21 V	280	43.5	3.2
5	7311.00	43.1 PK	74.0	-30.9	1.99 V	320	34.2	8.9
6	7311.00	32.0 AV	54.0	-22.0	1.99 V	320	23.1	8.9

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	99.1 PK			2.29 H	114	100.5	-1.4
2	*2462.00	96.8 AV			2.29 H	114	98.2	-1.4
3	2483.50	55.6 PK	74.0	-18.4	2.29 H	114	57.0	-1.4
4	2483.50	41.3 AV	54.0	-12.7	2.29 H	114	42.7	-1.4
5	4924.00	39.2 PK	74.0	-34.8	1.17 H	209	35.9	3.3
6	4924.00	32.9 AV	54.0	-21.1	1.17 H	209	29.6	3.3
7	7386.00	40.8 PK	74.0	-33.2	1.69 H	200	31.7	9.1
8	7386.00	31.8 AV	54.0	-22.2	1.69 H	200	22.7	9.1
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	109.4 PK			2.66 V	336	110.8	-1.4
2	*2462.00	107.1 AV			2.66 V	336	108.5	-1.4
3	2483.50	56.1 PK	74.0	-17.9	2.66 V	336	57.5	-1.4
4	2483.50	44.1 AV	54.0	-9.9	2.66 V	336	45.5	-1.4
5	4924.00	48.7 PK	74.0	-25.3	3.23 V	277	45.4	3.3
6	4924.00	46.7 AV	54.0	-7.3	3.23 V	277	43.4	3.3
7	7386.00	42.9 PK	74.0	-31.1	2.03 V	332	33.8	9.1
8	7386.00	32.5 AV	54.0	-21.5	2.03 V	332	23.4	9.1

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	55.6 PK	74.0	-18.4	1.02 H	274	57.2	-1.6
2	2390.00	42.8 AV	54.0	-11.2	1.02 H	274	44.4	-1.6
3	*2412.00	97.3 PK			1.02 H	274	98.8	-1.5
4	*2412.00	87.5 AV			1.02 H	274	89.0	-1.5
5	4824.00	38.7 PK	74.0	-35.3	1.19 H	246	35.7	3.0
6	4824.00	25.9 AV	54.0	-28.1	1.19 H	246	22.9	3.0
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	70.7 PK	74.0	-3.3	2.52 V	354	72.3	-1.6
2	2390.00	53.9 AV	54.0	-0.1	2.52 V	354	55.5	-1.6
3	*2412.00	109.7 PK			2.52 V	354	111.2	-1.5
4	*2412.00	100.5 AV			2.52 V	354	102.0	-1.5
5	4824.00	42.6 PK	74.0	-31.4	3.03 V	16	39.6	3.0
6	4824.00	29.7 AV	54.0	-24.3	3.03 V	16	26.7	3.0

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	55.2 PK	74.0	-18.8	1.09 H	264	56.8	-1.6
2	2390.00	42.7 AV	54.0	-11.3	1.09 H	264	44.3	-1.6
3	*2437.00	100.8 PK			1.09 H	264	102.3	-1.5
4	*2437.00	90.3 AV			1.09 H	264	91.8	-1.5
5	2483.50	55.5 PK	74.0	-18.5	1.09 H	264	56.9	-1.4
6	2483.50	41.3 AV	54.0	-12.7	1.09 H	264	42.7	-1.4
7	4874.00	38.7 PK	74.0	-35.3	1.20 H	242	35.5	3.2
8	4874.00	25.6 AV	54.0	-28.4	1.20 H	242	22.4	3.2
9	7311.00	54.3 PK	74.0	-19.7	2.04 H	168	45.4	8.9
10	7311.00	38.1 AV	54.0	-15.9	2.04 H	168	29.2	8.9
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	57.3 PK	74.0	-16.7	2.50 V	360	58.9	-1.6
2	2390.00	43.0 AV	54.0	-11.0	2.50 V	360	44.6	-1.6
3	*2437.00	113.3 PK			2.50 V	360	114.8	-1.5
4	*2437.00	103.3 AV			2.50 V	360	104.8	-1.5
5	2483.50	57.8 PK	74.0	-16.2	2.50 V	360	59.2	-1.4
6	2483.50	43.1 AV	54.0	-10.9	2.50 V	360	44.5	-1.4
7	4874.00	42.2 PK	74.0	-31.8	3.01 V	29	39.0	3.2
8	4874.00	29.4 AV	54.0	-24.6	3.01 V	29	26.2	3.2
9	7311.00	51.3 PK	74.0	-22.7	2.00 V	302	42.4	8.9
10	7311.00	33.0 AV	54.0	-21.0	2.00 V	302	24.1	8.9

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	96.4 PK			1.06 H	261	97.8	-1.4
2	*2462.00	86.3 AV			1.06 H	261	87.7	-1.4
3	2483.50	55.6 PK	74.0	-18.4	1.06 H	261	57.0	-1.4
4	2483.50	41.6 AV	54.0	-12.4	1.06 H	261	43.0	-1.4
5	4924.00	38.3 PK	74.0	-35.7	1.21 H	232	35.0	3.3
6	4924.00	25.2 AV	54.0	-28.8	1.21 H	232	21.9	3.3
7	7386.00	54.6 PK	74.0	-19.4	2.02 H	178	45.5	9.1
8	7386.00	38.5 AV	54.0	-15.5	2.02 H	178	29.4	9.1
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	109.4 PK			2.65 V	360	110.8	-1.4
2	*2462.00	99.7 AV			2.65 V	360	101.1	-1.4
3	2483.50	66.8 PK	74.0	-7.2	2.65 V	360	68.2	-1.4
4	2483.50	49.2 AV	54.0	-4.8	2.65 V	360	50.6	-1.4
5	4924.00	42.2 PK	74.0	-31.8	3.07 V	24	38.9	3.3
6	4924.00	29.2 AV	54.0	-24.8	3.07 V	24	25.9	3.3
7	7386.00	51.1 PK	74.0	-22.9	2.03 V	312	42.0	9.1
8	7386.00	32.5 AV	54.0	-21.5	2.03 V	312	23.4	9.1

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	54.1 PK	74.0	-19.9	1.06 H	247	55.7	-1.6
2	2390.00	41.8 AV	54.0	-12.2	1.06 H	247	43.4	-1.6
3	*2412.00	96.0 PK			1.06 H	247	97.5	-1.5
4	*2412.00	85.4 AV			1.06 H	247	86.9	-1.5
5	4824.00	38.0 PK	74.0	-36.0	1.12 H	232	35.0	3.0
6	4824.00	24.9 AV	54.0	-29.1	1.12 H	232	21.9	3.0
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	70.9 PK	74.0	-3.1	3.01 V	360	72.5	-1.6
2	2390.00	51.1 AV	54.0	-2.9	3.01 V	360	52.7	-1.6
3	*2412.00	108.6 PK			3.01 V	360	110.1	-1.5
4	*2412.00	98.8 AV			3.01 V	360	100.3	-1.5
5	4824.00	42.5 PK	74.0	-31.5	3.07 V	4	39.5	3.0
6	4824.00	29.2 AV	54.0	-24.8	3.07 V	4	26.2	3.0

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	54.6 PK	74.0	-19.4	1.09 H	274	56.2	-1.6
2	2390.00	42.3 AV	54.0	-11.7	1.09 H	274	43.9	-1.6
3	*2437.00	100.3 PK			1.09 H	274	101.8	-1.5
4	*2437.00	90.0 AV			1.09 H	274	91.5	-1.5
5	2483.50	55.3 PK	74.0	-18.7	1.09 H	274	56.7	-1.4
6	2483.50	40.9 AV	54.0	-13.1	1.09 H	274	42.3	-1.4
7	4874.00	38.4 PK	74.0	-35.6	1.26 H	233	35.2	3.2
8	4874.00	25.3 AV	54.0	-28.7	1.26 H	233	22.1	3.2
9	7311.00	53.8 PK	74.0	-20.2	1.99 H	178	44.9	8.9
10	7311.00	37.7 AV	54.0	-16.3	1.99 H	178	28.8	8.9
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	61.7 PK	74.0	-12.3	2.75 V	360	63.3	-1.6
2	2390.00	44.0 AV	54.0	-10.0	2.75 V	360	45.6	-1.6
3	*2437.00	112.8 PK			2.75 V	360	114.3	-1.5
4	*2437.00	102.9 AV			2.75 V	360	104.4	-1.5
5	2483.50	65.8 PK	74.0	-8.2	2.75 V	360	67.2	-1.4
6	2483.50	43.7 AV	54.0	-10.3	2.75 V	360	45.1	-1.4
7	4874.00	42.3 PK	74.0	-31.7	3.06 V	28	39.1	3.2
8	4874.00	29.4 AV	54.0	-24.6	3.06 V	28	26.2	3.2
9	7311.00	50.9 PK	74.0	-23.1	2.05 V	299	42.0	8.9
10	7311.00	32.7 AV	54.0	-21.3	2.05 V	299	23.8	8.9

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	96.6 PK			1.07 H	260	98.0	-1.4
2	*2462.00	85.9 AV			1.07 H	260	87.3	-1.4
3	2483.50	54.4 PK	74.0	-19.6	1.07 H	260	55.8	-1.4
4	2483.50	41.9 AV	54.0	-12.1	1.07 H	260	43.3	-1.4
5	4924.00	38.7 PK	74.0	-35.3	1.17 H	234	35.4	3.3
6	4924.00	25.3 AV	54.0	-28.7	1.17 H	234	22.0	3.3
7	7386.00	54.6 PK	74.0	-19.4	1.98 H	170	45.5	9.1
8	7386.00	38.4 AV	54.0	-15.6	1.98 H	170	29.3	9.1
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	109.1 PK			2.65 V	360	110.5	-1.4
2	*2462.00	98.8 AV			2.65 V	360	100.2	-1.4
3	2483.50	67.3 PK	74.0	-6.7	2.65 V	360	68.7	-1.4
4	2483.50	50.5 AV	54.0	-3.5	2.65 V	360	51.9	-1.4
5	4924.00	41.8 PK	74.0	-32.2	3.03 V	12	38.5	3.3
6	4924.00	28.7 AV	54.0	-25.3	3.03 V	12	25.4	3.3
7	7386.00	50.8 PK	74.0	-23.2	2.04 V	301	41.7	9.1
8	7386.00	32.0 AV	54.0	-22.0	2.04 V	301	22.9	9.1

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 (HT40)

CHANNEL	TX Channel 3	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	55.6 PK	74.0	-18.4	1.09 H	245	57.2	-1.6
2	2390.00	43.0 AV	54.0	-11.0	1.09 H	245	44.6	-1.6
3	*2422.00	92.5 PK			1.09 H	245	94.1	-1.6
4	*2422.00	81.5 AV			1.09 H	245	83.1	-1.6
5	4844.00	38.1 PK	74.0	-35.9	1.11 H	238	35.0	3.1
6	4844.00	24.9 AV	54.0	-29.1	1.11 H	238	21.8	3.1
7	7266.00	54.6 PK	74.0	-19.4	1.95 H	157	45.7	8.9
8	7266.00	38.1 AV	54.0	-15.9	1.95 H	157	29.2	8.9

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	68.7 PK	74.0	-5.3	2.70 V	254	70.3	-1.6
2	2390.00	53.1 AV	54.0	-0.9	2.70 V	254	54.7	-1.6
3	*2422.00	103.9 PK			2.70 V	254	105.5	-1.6
4	*2422.00	93.7 AV			2.70 V	254	95.3	-1.6
5	4844.00	42.2 PK	74.0	-31.8	3.01 V	23	39.1	3.1
6	4844.00	28.9 AV	54.0	-25.1	3.01 V	23	25.8	3.1
7	7266.00	51.3 PK	74.0	-22.7	1.99 V	315	42.4	8.9
8	7266.00	32.3 AV	54.0	-21.7	1.99 V	315	23.4	8.9

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	55.1 PK	74.0	-18.9	1.07 H	236	56.7	-1.6
2	2390.00	42.7 AV	54.0	-11.3	1.07 H	236	44.3	-1.6
3	*2437.00	94.6 PK			1.07 H	236	96.1	-1.5
4	*2437.00	82.9 AV			1.07 H	236	84.4	-1.5
5	2483.50	55.1 PK	74.0	-18.9	1.07 H	236	56.5	-1.4
6	2483.50	41.0 AV	54.0	-13.0	1.07 H	236	42.4	-1.4
7	4874.00	39.0 PK	74.0	-35.0	1.23 H	218	35.8	3.2
8	4874.00	25.5 AV	54.0	-28.5	1.23 H	218	22.3	3.2
9	7311.00	54.7 PK	74.0	-19.3	1.97 H	158	45.8	8.9
10	7311.00	38.2 AV	54.0	-15.8	1.97 H	158	29.3	8.9
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	65.0 PK	74.0	-9.0	3.34 V	360	66.6	-1.6
2	2390.00	50.2 AV	54.0	-3.8	3.34 V	360	51.8	-1.6
3	*2437.00	106.1 PK			3.34 V	360	107.6	-1.5
4	*2437.00	95.2 AV			3.34 V	360	96.7	-1.5
5	2483.50	59.2 PK	74.0	-14.8	3.34 V	360	60.6	-1.4
6	2483.50	45.1 AV	54.0	-8.9	3.34 V	360	46.5	-1.4
7	4874.00	41.4 PK	74.0	-32.6	3.01 V	13	38.2	3.2
8	4874.00	28.5 AV	54.0	-25.5	3.01 V	13	25.3	3.2
9	7311.00	51.1 PK	74.0	-22.9	2.08 V	307	42.2	8.9
10	7311.00	32.1 AV	54.0	-21.9	2.08 V	307	23.2	8.9

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 9	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	*2452.00	94.2 PK			1.09 H	237	95.7	-1.5
2	*2452.00	82.6 AV			1.09 H	237	84.1	-1.5
3	2483.50	55.2 PK	74.0	-18.8	1.09 H	237	56.6	-1.4
4	2483.50	42.9 AV	54.0	-11.1	1.09 H	237	44.3	-1.4
5	4904.00	38.7 PK	74.0	-35.3	1.14 H	235	35.5	3.2
6	4904.00	25.0 AV	54.0	-29.0	1.14 H	235	21.8	3.2
7	7356.00	54.5 PK	74.0	-19.5	2.00 H	158	45.4	9.1
8	7356.00	38.6 AV	54.0	-15.4	2.00 H	158	29.5	9.1
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	*2452.00	105.8 PK			2.67 V	356	107.3	-1.5
2	*2452.00	94.9 AV			2.67 V	356	96.4	-1.5
3	2483.50	65.1 PK	74.0	-8.9	2.67 V	356	66.5	-1.4
4	2483.50	51.7 AV	54.0	-2.3	2.67 V	356	53.1	-1.4
5	4904.00	42.3 PK	74.0	-31.7	3.09 V	20	39.1	3.2
6	4904.00	29.2 AV	54.0	-24.8	3.09 V	20	26.0	3.2
7	7356.00	51.3 PK	74.0	-22.7	2.03 V	297	42.2	9.1
8	7356.00	32.4 AV	54.0	-21.6	2.03 V	297	23.3	9.1

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:

802.11n (HT20)

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz~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	100.02	32.4 QP	43.5	-11.1	2.70 H	312	45.0	-12.6
2	250.43	39.9 QP	46.0	-6.1	1.90 H	310	49.5	-9.6
3	562.90	27.2 QP	46.0	-18.8	1.20 H	271	29.0	-1.8
4	719.45	30.6 QP	46.0	-15.4	1.23 H	330	30.2	0.4
5	797.31	33.1 QP	46.0	-12.9	1.33 H	346	31.1	2.0
6	939.29	33.6 QP	46.0	-12.4	1.80 H	283	29.9	3.7
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	41.92	36.5 QP	40.0	-3.5	1.00 V	320	45.2	-8.7
2	248.54	30.5 QP	46.0	-15.5	1.50 V	294	40.1	-9.6
3	401.36	27.2 QP	46.0	-18.8	2.30 V	303	32.5	-5.3
4	537.85	29.8 QP	46.0	-16.2	1.19 V	332	32.2	-2.4
5	700.69	28.6 QP	46.0	-17.4	2.20 V	359	28.2	0.4
6	873.31	32.1 QP	46.0	-13.9	2.20 V	344	29.5	2.6

REMARKS:

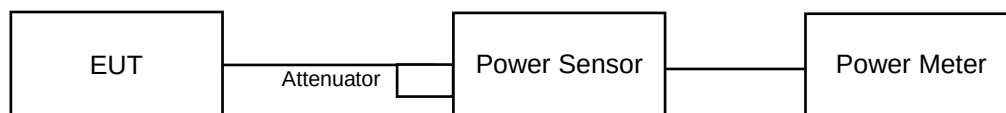
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Output Power Measurement

4.2.1 Limits of Conducted Output Power Measurement

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

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 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.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Conditions

Same as Item 4.3.6.

4.2.7 Test Results

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass /Fail
		Chain 0	Chain 1				
1	2412	17.67	17.99	121.43	20.84	30.00	Pass
6	2437	19.39	19.80	182.395	22.61	30.00	Pass
11	2462	19.39	19.74	181.085	22.58	30.00	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass /Fail
		Chain 0	Chain 1				
1	2412	16.68	17.00	96.678	19.85	30.00	Pass
6	2437	25.22	25.42	680.997	28.33	30.00	Pass
11	2462	16.99	16.50	94.671	19.76	30.00	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass /Fail
		Chain 0	Chain 1				
1	2412	20.55	22.18	278.697	24.45	30.00	Pass
6	2437	25.46	25.61	715.475	28.55	30.00	Pass
11	2462	22.10	23.15	368.719	25.67	30.00	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass /Fail
		Chain 0	Chain 1				
3	2422	19.10	20.02	181.745	22.59	30.00	Pass
6	2437	21.98	21.17	288.679	24.60	30.00	Pass
9	2452	20.33	21.64	253.776	24.04	30.00	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	14.75	14.91	60.828	17.84
6	2437	16.44	16.78	91.698	19.62
11	2462	16.68	16.66	92.904	19.68

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	13.41	14.21	48.291	16.84
6	2437	17.38	17.32	108.653	20.36
11	2462	13.44	14.00	47.199	16.74

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	12.90	13.96	44.387	16.47
6	2437	17.10	17.19	103.646	20.16
11	2462	13.22	14.01	46.166	16.64

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	10.12	11.14	23.282	13.67
6	2437	12.88	12.94	39.088	15.92
9	2452	11.49	12.12	30.386	14.83

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

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