

## FCC Test Report (BT-LE)

**Report No.:** RF140605E01L-3 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 17 to 18, 2017

**Issued Date:** Aug. 01, 2017

**Applicant:** AzureWave Technologies, Inc.

**Address:** 8F., No.94, Baozhong Rd. , Xindian Dist., New Taipei City , Taiwan 231

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

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (1):** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.



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### Release Control Record

Issue No.	Description	Date Issued
RF140605E01L-3	Original release.	July 26, 2017
RF140605E01L-3 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

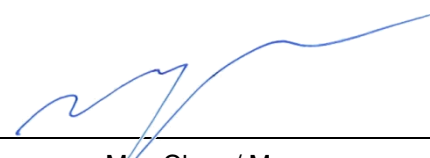
**Applicant:** AzureWave Technologies, Inc.

**Test Date:** July 17 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 & 209 & 15.247(d)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -4.5dB at 42.22MHz.
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
	1GHz ~ 6GHz	5.14 dB
Radiated Emissions above 1 GHz	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 (BT-LE)

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	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 1Mbps
Operating Frequency	2402MHz ~ 2480MHz
Number of Channel	40
Output Power	7.031mW
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-3 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	Connector 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	Connecter 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-40X001	1.5	2400~2500	Dipole	SMA Male Reverse/ SMA Female Reverse	200 +/- 3
			2.0	5150~5850			
Chain (1)	Cortec	AN2450-74L02BRS+SMASFR8-3200B-40X001	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.

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

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

40 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

### 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      **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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0, 19, 39	GFSK	1

#### 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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0	GFSK	1

#### 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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
0 to 39	0, 19, 39	GFSK	1

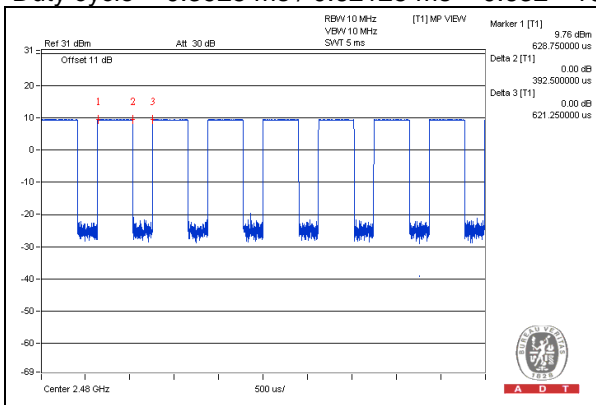
#### Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	24deg. C, 70%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

Duty cycle of test signal is < 98 %, duty factor shall be considered.

Duty cycle =  $0.3925 \text{ ms} / 0.62125 \text{ ms} = 0.632 * 100 \% = 63.2 \%$



### 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.

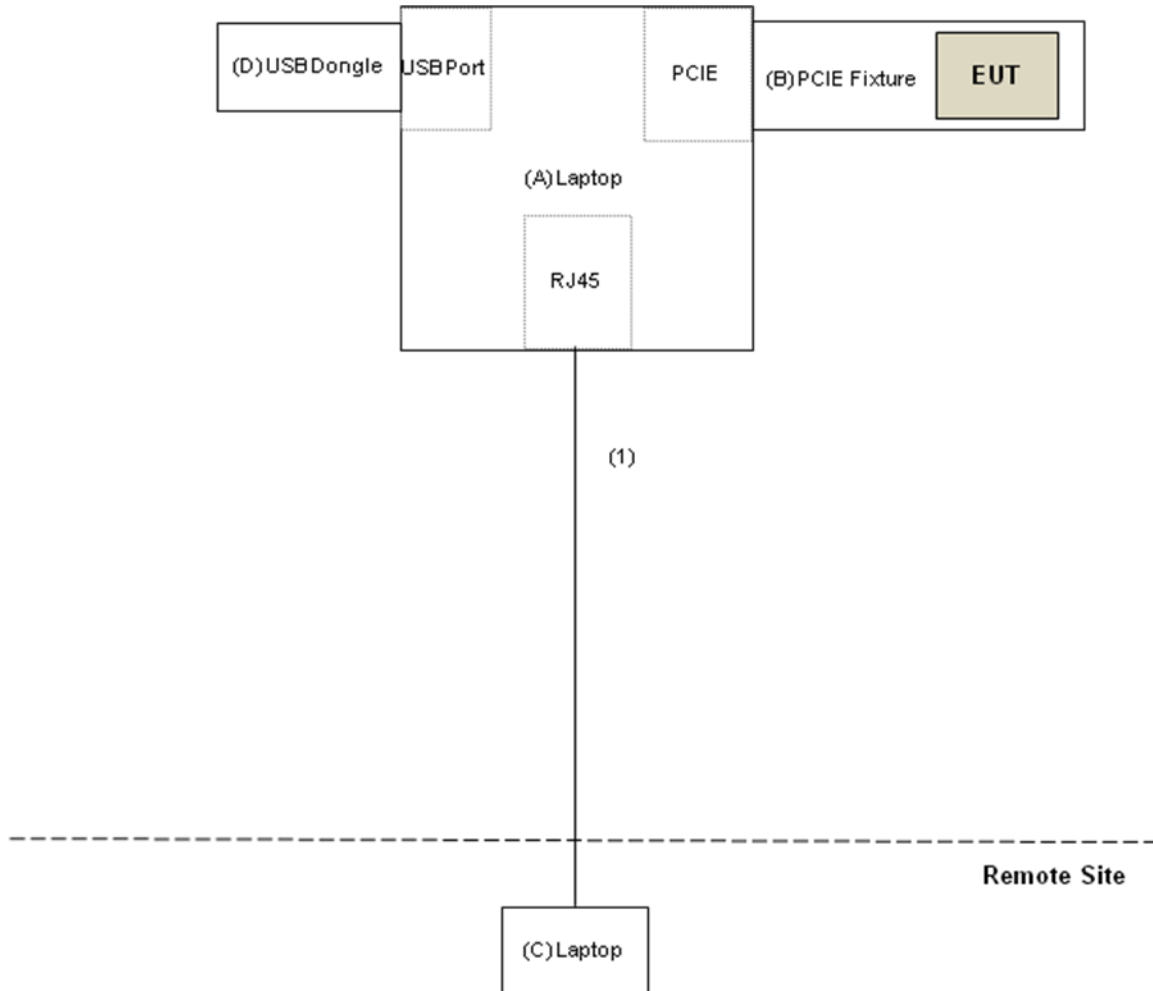
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	PCIE Fixture	NA	NA	NA	NA	Supplied by client
C.	Laptop	DELL	E6440	F9LYQ32	FCC DoC	Provided by Lab
D.	USB Dongle	NA	NA	NA	NA	Provided by Lab

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.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
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-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	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 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.
2. KDB 414788 OATS and Chamber Correlation Justification
  - Based on FCC 15.31(f)(2) : measurements may be performed at a distance closer than that specified in the regulations; however, an attempts should be made to avoid making measurements in the near field.
  - OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

##### **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:**

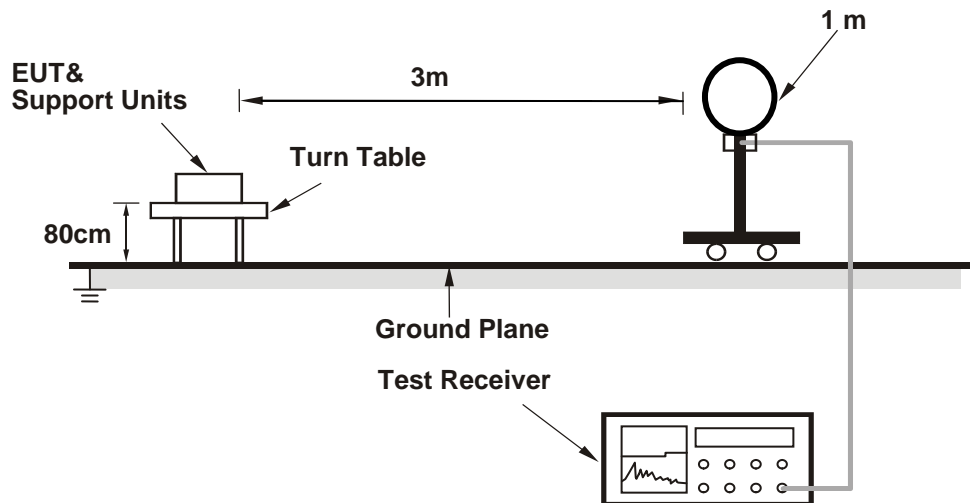
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

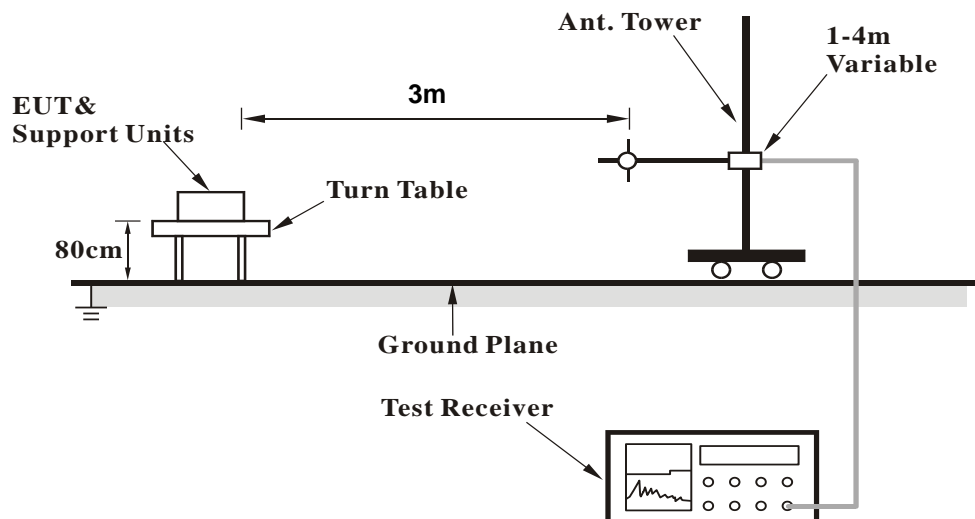
No deviation.

4.1.5 Test Setup

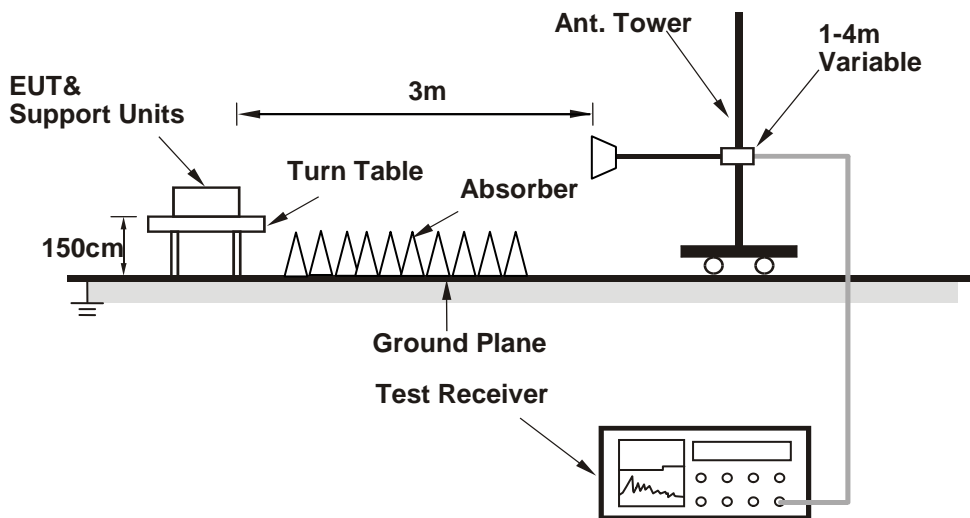
**For Radiated emission below 30MHz**



**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. Controlling 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 :

<b>CHANNEL</b>	TX Channel 0	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	59.5 PK	74.0	-14.5	1.63 H	164	61.1	-1.6
2	2390.00	46.0 AV	54.0	-8.0	1.63 H	164	47.6	-1.6
3	*2402.00	98.3 PK			1.63 H	164	99.8	-1.5
4	*2402.00	97.1 AV			1.63 H	164	98.6	-1.5
5	4804.00	38.5 PK	74.0	-35.5	1.09 H	245	35.5	3.0
6	4804.00	24.8 AV	54.0	-29.2	1.09 H	245	21.8	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	62.8 PK	74.0	-11.2	3.55 V	268	64.4	-1.6
2	2390.00	49.0 AV	54.0	-5.0	3.55 V	268	50.6	-1.6
3	*2402.00	105.7 PK			3.55 V	268	107.2	-1.5
4	*2402.00	104.5 AV			3.55 V	268	106.0	-1.5
5	4804.00	42.8 PK	74.0	-31.2	3.06 V	111	39.8	3.0
6	4804.00	29.5 AV	54.0	-24.5	3.06 V	111	26.5	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.

<b>CHANNEL</b>	TX Channel 19	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*2440.00	98.4 PK			1.59 H	167	99.9	-1.5
2	*2440.00	97.4 AV			1.59 H	167	98.9	-1.5
3	4880.00	38.0 PK	74.0	-36.0	1.16 H	229	34.8	3.2
4	4880.00	24.9 AV	54.0	-29.1	1.16 H	229	21.7	3.2
5	7320.00	54.6 PK	74.0	-19.4	1.91 H	137	45.7	8.9
6	7320.00	39.2 AV	54.0	-14.8	1.91 H	137	30.3	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	*2440.00	105.3 PK			3.53 V	267	106.8	-1.5
2	*2440.00	104.1 AV			3.53 V	267	105.6	-1.5
3	4880.00	42.4 PK	74.0	-31.6	3.05 V	118	39.2	3.2
4	4880.00	29.3 AV	54.0	-24.7	3.05 V	118	26.1	3.2
5	7320.00	50.9 PK	74.0	-23.1	2.07 V	302	42.0	8.9
6	7320.00	31.9 AV	54.0	-22.1	2.07 V	302	23.0	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.

<b>CHANNEL</b>	TX Channel 39	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*2480.00	98.3 PK			1.57 H	154	99.7	-1.4
2	*2480.00	97.2 AV			1.57 H	154	98.6	-1.4
3	2483.50	60.2 PK	74.0	-13.8	1.57 H	154	61.6	-1.4
4	2483.50	46.5 AV	54.0	-7.5	1.57 H	154	47.9	-1.4
5	4960.00	38.6 PK	74.0	-35.4	1.11 H	241	35.4	3.2
6	4960.00	25.2 AV	54.0	-28.8	1.11 H	241	22.0	3.2
7	7440.00	54.8 PK	74.0	-19.2	1.95 H	151	45.6	9.2
8	7440.00	39.1 AV	54.0	-14.9	1.95 H	151	29.9	9.2

**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	*2480.00	105.3 PK			3.58 V	254	106.7	-1.4
2	*2480.00	104.2 AV			3.58 V	254	105.6	-1.4
3	2483.50	62.9 PK	74.0	-11.1	3.58 V	254	64.3	-1.4
4	2483.50	49.2 AV	54.0	-4.8	3.58 V	254	50.6	-1.4
5	4960.00	41.6 PK	74.0	-32.4	3.07 V	121	38.4	3.2
6	4960.00	28.8 AV	54.0	-25.2	3.07 V	121	25.6	3.2
7	7440.00	50.9 PK	74.0	-23.1	2.06 V	310	41.7	9.2
8	7440.00	32.1 AV	54.0	-21.9	2.06 V	310	22.9	9.2

**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:**

<b>CHANNEL</b>	TX Channel 0	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	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	130.02	32.2 QP	43.5	-11.3	2.33 H	317	41.9	-9.7
2	204.43	30.6 QP	43.5	-12.9	1.60 H	316	42.1	-11.5
3	506.90	27.2 QP	46.0	-18.8	2.25 H	201	30.0	-2.8
4	627.31	33.1 QP	46.0	-12.9	1.84 H	26	33.6	-0.5
5	639.45	30.6 QP	46.0	-15.4	1.67 H	210	30.8	-0.2
6	719.29	33.6 QP	46.0	-12.4	1.75 H	303	33.2	0.4

**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	42.22	35.5 QP	40.0	-4.5	1.90 V	210	44.1	-8.6
2	278.54	30.5 QP	46.0	-15.5	1.96 V	294	38.7	-8.2
3	454.36	27.0 QP	46.0	-19.0	2.35 V	155	30.7	-3.7
4	507.85	29.8 QP	46.0	-16.2	2.07 V	88	32.6	-2.8
5	720.69	28.6 QP	46.0	-17.4	1.10 V	110	28.1	0.5
6	768.31	32.3 QP	46.0	-13.7	3.07 V	314	30.7	1.6

**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

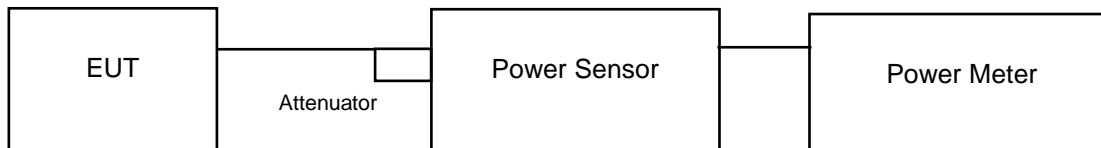


## 4.2 Conducted Output Power Measurement

### 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 4.2.6.

#### 4.2.7 Test Results

##### FOR PEAK POWER

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
0	2402	15.311	11.85	30	Pass
19	2440	14.028	11.47	30	Pass
39	2480	13.062	11.16	30	Pass

##### FOR AVERAGE POWER

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	6.887	8.38
19	2440	5.861	7.68
39	2480	5.585	7.47

## 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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**Web Site:** [www.bureauveritas-adt.com](http://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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