

FCC Test Report (WLAN)

Report No.: RF150126E05K

FCC ID: TLZ-CM2XXNF

Test Model: AW-CM195NF

Series Model: AW-CM217NF, AW-CM235NF, AW-CM240NF

Received Date: Aug. 17, 2018

Test Date: Oct. 23 to 30, 2018

Issued Date: Nov. 06, 2018

Applicant: AzureWave Technologies, Inc.

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

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Taiwan R.O.C.

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

**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF150126E05K	Original release.	Nov. 06, 2018

1 Certificate of Conformity

Product: IEEE 802.11 a/b/g/n/ac Wireless LAN and Bluetooth M.2 Combo Module

Brand: AzureWave

Test Model: AW-CM195NF

Series Model: AW-CM217NF, AW-CM235NF, AW-CM240NF

Sample Status: ENGINEERING SAMPLE

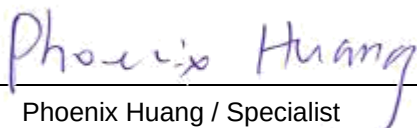
Applicant: AzureWave Technologies, Inc.

Test Date: Oct. 23 to 30, 2018

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 :


Phoenix Huang / Specialist

Date:

Nov. 06, 2018

Approved by :


May Chen / Manager

Date:

Nov. 06, 2018

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 2390.00MHz and 4924.00MHz.
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) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	IEEE 802.11 a/b/g/n/ac Wireless LAN and Bluetooth M.2 Combo Module
Brand	AzureWave
Test Model	AW-CM195NF
Series Model	AW-CM217NF, AW-CM235NF, AW-CM240NF
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 and VHT20 and VHT40 mode of 2.4GHz Band
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	2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.18~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz, 5.745 ~ 5.825GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 24 802.11n (HT40), 802.11ac (VHT40): 11 802.11ac (VHT80): 5
Output Power	2.412 ~ 2.462GHz: 430.629mW 5.18 ~ 5.24GHz: 175.268mW 5.26 ~ 5.32GHz: 173.966mW 5.5 ~ 5.7GHz: 175.508mW 5.745 ~ 5.825GHz: 164.255mW
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.: RF150126E05C as the following:

- ◆ Upgraded standard version.
- ◆ Added six sets of antennas as below table:

Original										
Antenna No	Chain No.	Brand	Model	Gain (dBi)	Antenna Type	Connector Type	Frequency range (GHz to GHz)	Cable Length (External only)		
1	Chain (0) (Aux)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	PIFA	i-pex(MHF4)	2.4~2.5	15cm		
				5.16			4.9~5.9			
	Chain (1) (Main)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	PIFA	i-pex(MHF4)	2.4~2.5	15cm		
				5.16			4.9~5.9			
2	Chain (0) (Aux)	LUXSHARE ICT	Speedy	1.43	PIFA	i-pex(MHF4)	2.4~2.5	507mm		
				-3.12			4.9~5.9			
	Chain (1) (Main)	LUXSHARE ICT	Speedy	-2.46	PIFA	i-pex(MHF4)	2.4~2.5	472mm		
				-0.02			4.9~5.9			
3	Chain (0) (Aux)	Amphenol	867-00013	-3.8	PIFA	i-pex(MHF4)	2.4~2.5	70mm		
				3.5			4.9~5.9			
	Chain (1) (Main)	Amphenol	867-00014	-5.1	PIFA	i-pex(MHF4)	2.4~2.5	220mm		
				0.2			4.9~5.9			
Newly										
Antenna Set No	Chain No.	Brand	Model	Gain (dBi) Including cable loss		Cable Loss (dBi)	Antenna Type	Connector Type	Frequency range (GHz to GHz)	Cable Length (External only)
4	Chain (0) (Aux)	TONGDA	T-543-3010450-2	-4.23		0.46	PIFA	i-pex-MFH4	2.4~2.5	79.5mm
				5.15-5.35 GHz:2.13 5.47-5.725 GHz:-1.32 5.725-5.850 GHz:-2.77		0.73			4.9~5.9	
	Chain (1) (Main)	TONGDA	T-543-3010450-1	-4.56		0.28	PIFA	i-pex-MFH4	2.4~2.5	43mm
				5.15-5.35 GHz:-3.53 5.47-5.725 GHz:-1.87 5.725-5.850 GHz:-1.87		0.44			4.9~5.9	
5	Chain (0) (Aux)	HONGLIN	260-26080	-4.39		0.46	PIFA	i-pex-MFH4	2.4~2.5	79.5mm
				5.15-5.35 GHz:1.29 5.47-5.725 GHz:0.41 5.725-5.850 GHz:-3.41		0.73			4.9~5.9	
	Chain (1) (Main)	HONGLIN	260-26079	-4.71		0.28	PIFA	i-pex-MFH4	2.4~2.5	43mm
				5.15-5.35 GHz:-3.73 5.47-5.725 GHz:-2.26 5.725-5.850 GHz:-2.23		0.44			4.9~5.9	
6	Chain 0 (Aux)	Taoglas	GW20.54.0400A.km	2.29		NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73					5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0400A.km	2.29		NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73					5150~5850	
7	Chain 0 (Aux)	Taoglas	GW20.54.0180A.km	2.47		NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62					5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0180A.km	2.47		NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62					5150~5850	
8	Chain 0 (Aux)	Taoglas	GW20.54.0180A.km	2.47		NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62					5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0400A.km	2.29		NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73					5150~5850	
9	Chain 0 (Aux)	Taoglas	GW20.54.0400A.km	2.29		NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73					5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0180A.km	2.47		NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62					5150~5850	

Note:

1. For radiated emission (below 1GHz), the Dipole (Antenna Set 7) was selected as representative adapter for the test and its data was recorded in this report.
2. For radiated emission (above 1GHz), the PIFA antenna (Antenna Set 1) and Dipole (Antenna Set 7) were selected as representative adapter for the test and its data was recorded in this report.

2. According to above condition, only Radiated Emissions and Band Edge Measurement test and Conducted power test items need to be performed. And all data were verified to meet the requirements.
3. There are Bluetooth technology and WLAN technology used for the EUT.
4. For WLAN, 2.4GHz and 5GHz technology can not transmit at same time.
5. WLAN (5GHz) and Bluetooth technology can transmit at same time.
6. The EUT has four model names which are identical to each other in all aspects except for the following table. These solutions have same RF circuit /parameter and are pin to pin compatible. (Detail information please refer declaration letter by client)

AW model name	Difference. Broadcom solution
AW-CM195NF	BCM43540
AW-CM217NF	BCM4356
AW-CM235NF	BCM4354
AW-CM240NF	BCM4356 (Change the Interface of PCIE+UART)

Note: In original report, from the above models, model: **AW-CM195NF** was selected as representative model for the test and its data was recorded in this report.

7. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1TX (Diversity)	1RX (Diversity)
802.11g	6 ~ 54Mbps	1TX (Diversity)	1RX (Diversity)
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
VHT20	MCS0~8 Nss= 1	1TX (Diversity)	1RX (Diversity)
	MCS0~8 Nss= 2	2TX	2RX
VHT40	MCS0~9 Nss= 1	1TX (Diversity)	1RX (Diversity)
	MCS0~9 Nss= 2	2TX	2RX
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	1TX (Diversity)	1RX (Diversity)
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)	MCS0~8 Nss= 1	1TX (Diversity)	1RX (Diversity)
	MCS0~8 Nss= 2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss= 1	1TX (Diversity)	1RX (Diversity)
	MCS0~9 Nss= 2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss= 1	1TX (Diversity)	1RX (Diversity)
	MCS0~9 Nss= 2	2TX	2RX

Note: The device operate with two spatial stream (Nss = 2) with different data, and two signals are not correlated.

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), VHT20:

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

7 channels are provided for 802.11n (HT40), VHT40:

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE $\geq$ 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

Note:

1. In the original report, the EUT's antenna (PIFA) had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

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	TESTED BY
RE $\geq$ 1G	21deg. C, 63%RH	120Vac, 60Hz (System)	Steven Chiang
RE<1G	23deg. C, 65%RH	120Vac, 60Hz (System)	Steven Chiang
APCM	25deg. C, 60%RH	3.3Vdc	Weiwei Lo

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

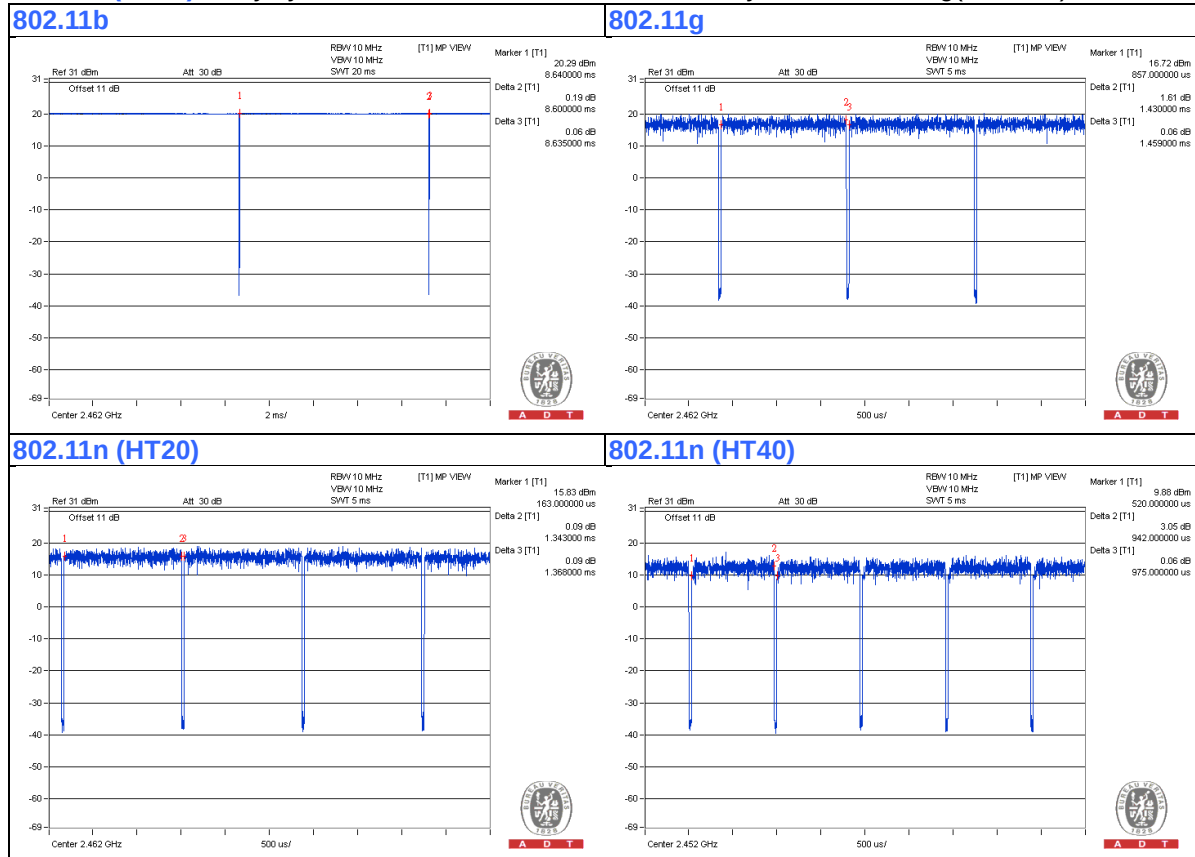
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = $8.6 \text{ ms} / 8.635 \text{ ms} = 0.996$

802.11g: Duty cycle = $1.43 \text{ ms} / 1.459 \text{ ms} = 0.98$

802.11n (HT20): Duty cycle = $1.343 \text{ ms} / 1.368 \text{ ms} = 0.982$

802.11n (HT40): Duty cycle = $0.942 \text{ ms} / 0.975 \text{ ms} = 0.966$, Duty factor = $10 * \log(1/0.966) = 0.1$



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.

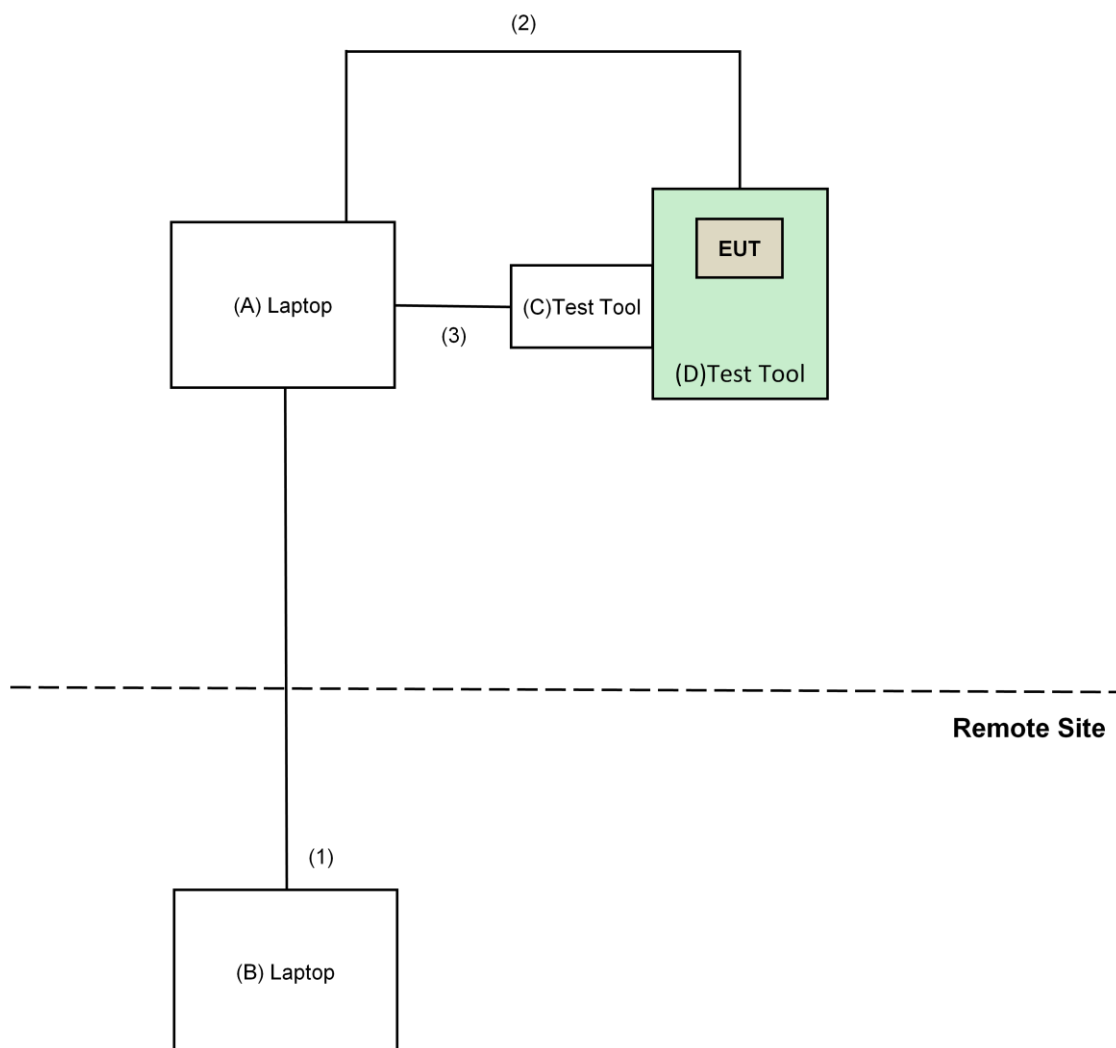
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	HP	Pavilion 14-ab023TU	5CD5340WXZ	NA	Provided by Lab
B.	Laptop	ASUS	AA2SJ.AVBoW202	NA	NA	Supplied by client
C.	Test Tool	AzureWave	9027-V01	NA	NA	Supplied by client
D.	Test Tool	AzureWave	2218-17	NA	NA	Supplied by client

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.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	USB Cable	1	1.8	No	0	Provided by Lab
3.	USB Cable	1	1	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 15.247 Meas Guidance v05

KDB 662911 D01 Multiple Transmitter Output v02r01

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 Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier Mini-Circuits	ZVA-183-S+	AMP-ZVA-03	May 10, 2018	May 09, 2019
RF Cable	EMC104-SM-SM-1200	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019

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. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Oct. 23 to 30, 2018

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. Parallel, perpendicular, and ground-parallel orientations 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 detects 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:

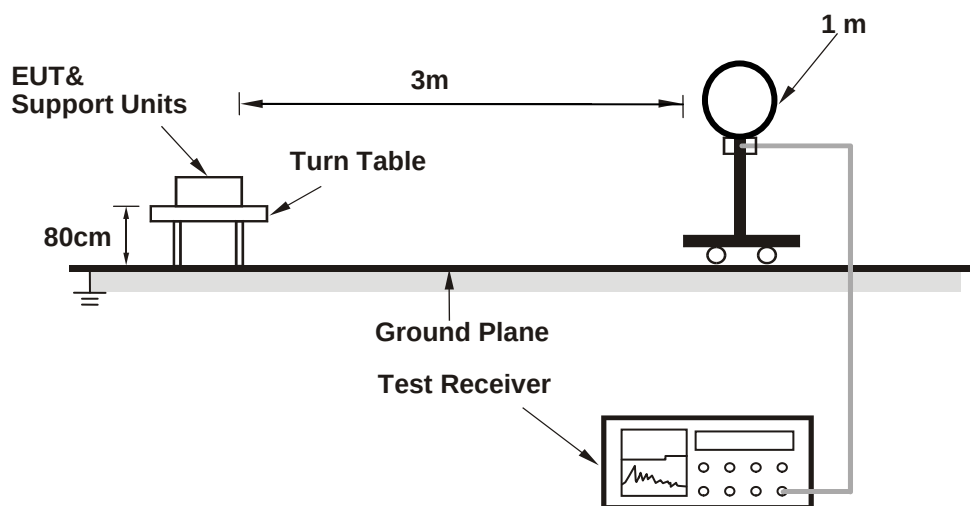
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

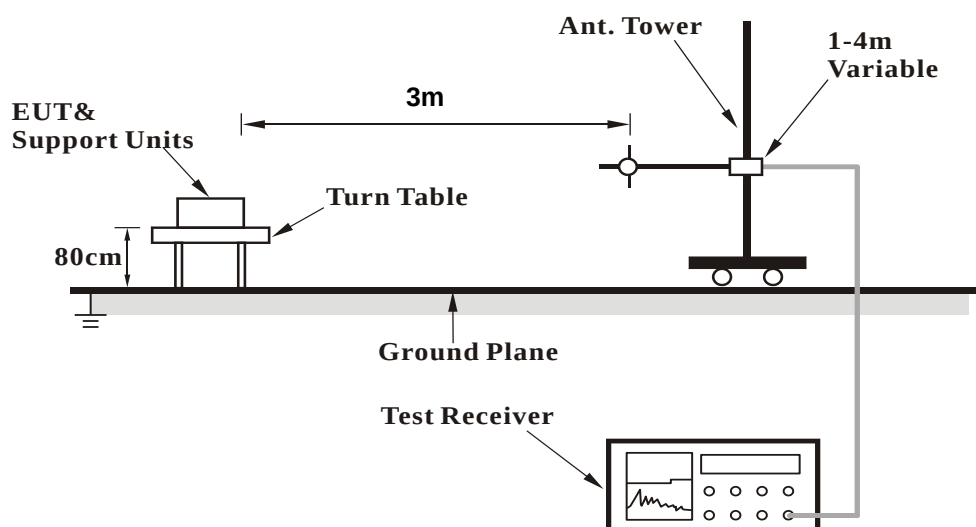
No deviation.

4.1.5 Test Setup

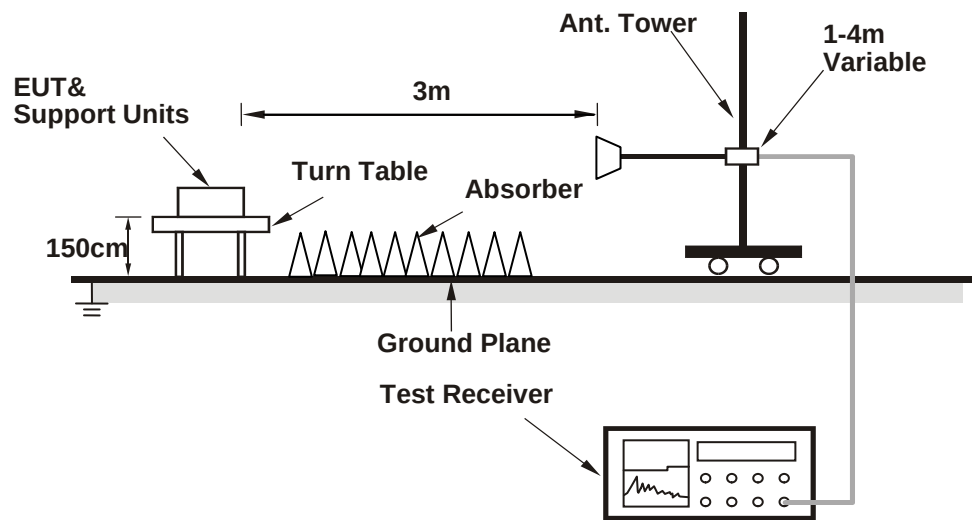
For Radiated emission below 30MHz



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

- Connected the EUT with the Laptop which is placed on the testing table.
- Controlling software (wl.exe[paste XXX.sh command]) has been activated to set the EUT on specific status.

4.1.7 Test Results (PIFA Antenna)

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	59.9 PK	74.0	-14.1	1.45 H	23	62.1	-2.2
2	2390.00	53.5 AV	54.0	-0.5	1.45 H	23	55.7	-2.2
3	*2412.00	106.1 PK			1.45 H	23	108.5	-2.4
4	*2412.00	103.7 AV			1.45 H	23	106.1	-2.4
5	4824.00	48.7 PK	74.0	-25.3	1.13 H	269	46.9	1.8
6	4824.00	40.8 AV	54.0	-13.2	1.13 H	269	39.0	1.8
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	56.5 PK	74.0	-17.5	1.45 V	301	58.7	-2.2
2	2390.00	47.7 AV	54.0	-6.3	1.45 V	301	49.9	-2.2
3	*2412.00	102.3 PK			1.45 V	301	104.7	-2.4
4	*2412.00	99.4 AV			1.45 V	301	101.8	-2.4
5	4824.00	49.9 PK	74.0	-24.1	1.02 V	342	48.1	1.8
6	4824.00	45.6 AV	54.0	-8.4	1.02 V	342	43.8	1.8

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	58.2 PK	74.0	-15.8	1.41 H	35	60.4	-2.2
2	2390.00	50.3 AV	54.0	-3.7	1.41 H	35	52.5	-2.2
3	*2437.00	110.3 PK			1.41 H	35	112.9	-2.6
4	*2437.00	108.0 AV			1.41 H	35	110.6	-2.6
5	2483.50	56.3 PK	74.0	-17.7	1.41 H	35	58.7	-2.4
6	2483.50	43.9 AV	54.0	-10.1	1.41 H	35	46.3	-2.4
7	4874.00	48.7 PK	74.0	-25.3	1.17 H	247	46.7	2.0
8	4874.00	40.7 AV	54.0	-13.3	1.17 H	247	38.7	2.0
9	7311.00	53.5 PK	74.0	-20.5	1.05 H	265	45.1	8.4
10	7311.00	43.4 AV	54.0	-10.6	1.05 H	265	35.0	8.4

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	2390.00	52.1 PK	74.0	-21.9	1.50 V	301	54.3	-2.2
2	2390.00	41.9 AV	54.0	-12.1	1.50 V	301	44.1	-2.2
3	*2437.00	106.6 PK			1.50 V	301	109.2	-2.6
4	*2437.00	103.7 AV			1.50 V	301	106.3	-2.6
5	2483.50	50.0 PK	74.0	-24.0	1.50 V	301	52.4	-2.4
6	2483.50	39.8 AV	54.0	-14.2	1.50 V	301	42.2	-2.4
7	4874.00	50.6 PK	74.0	-23.4	1.05 V	360	48.6	2.0
8	4874.00	46.1 AV	54.0	-7.9	1.05 V	360	44.1	2.0
9	7311.00	54.3 PK	74.0	-19.7	1.07 V	16	45.9	8.4
10	7311.00	45.8 AV	54.0	-8.2	1.07 V	16	37.4	8.4

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	107.1 PK			1.45 H	48	109.7	-2.6
2	*2462.00	104.9 AV			1.45 H	48	107.5	-2.6
3	2483.50	61.1 PK	74.0	-12.9	1.45 H	48	63.5	-2.4
4	2483.50	53.2 AV	54.0	-0.8	1.45 H	48	55.6	-2.4
5	4924.00	48.9 PK	74.0	-25.1	1.15 H	238	46.9	2.0
6	4924.00	40.9 AV	54.0	-13.1	1.15 H	238	38.9	2.0
7	7386.00	53.4 PK	74.0	-20.6	1.09 H	253	44.8	8.6
8	7386.00	43.1 AV	54.0	-10.9	1.09 H	253	34.5	8.6
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	104.1 PK			1.53 V	269	106.7	-2.6
2	*2462.00	100.9 AV			1.53 V	269	103.5	-2.6
3	2483.50	57.0 PK	74.0	-17.0	1.53 V	269	59.4	-2.4
4	2483.50	48.2 AV	54.0	-5.8	1.53 V	269	50.6	-2.4
5	4924.00	51.1 PK	74.0	-22.9	1.02 V	344	49.1	2.0
6	4924.00	46.7 AV	54.0	-7.3	1.02 V	344	44.7	2.0
7	7386.00	54.3 PK	74.0	-19.7	1.06 V	0	45.7	8.6
8	7386.00	45.4 AV	54.0	-8.6	1.06 V	0	36.8	8.6

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
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	67.4 PK	74.0	-6.6	1.50 H	23	69.6	-2.2
2	2390.00	53.5 AV	54.0	-0.5	1.50 H	23	55.7	-2.2
3	*2412.00	107.2 PK			1.50 H	23	109.6	-2.4
4	*2412.00	96.5 AV			1.50 H	23	98.9	-2.4
5	4824.00	48.5 PK	74.0	-25.5	1.13 H	237	46.7	1.8
6	4824.00	40.5 AV	54.0	-13.5	1.13 H	237	38.7	1.8
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	62.6 PK	74.0	-11.4	1.56 V	260	64.8	-2.2
2	2390.00	49.1 AV	54.0	-4.9	1.56 V	260	51.3	-2.2
3	*2412.00	104.1 PK			1.56 V	260	106.5	-2.4
4	*2412.00	93.5 AV			1.56 V	260	95.9	-2.4
5	4824.00	49.4 PK	74.0	-24.6	1.09 V	360	47.6	1.8
6	4824.00	40.8 AV	54.0	-13.2	1.09 V	360	39.0	1.8

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	66.5 PK	74.0	-7.5	1.48 H	24	68.7	-2.2
2	2390.00	52.9 AV	54.0	-1.1	1.48 H	24	55.1	-2.2
3	*2437.00	112.3 PK			1.48 H	24	114.9	-2.6
4	*2437.00	101.3 AV			1.48 H	24	103.9	-2.6
5	2483.50	66.9 PK	74.0	-7.1	1.48 H	24	69.3	-2.4
6	2483.50	50.1 AV	54.0	-3.9	1.48 H	24	52.5	-2.4
7	4874.00	48.3 PK	74.0	-25.7	1.13 H	265	46.3	2.0
8	4874.00	40.2 AV	54.0	-13.8	1.13 H	265	38.2	2.0
9	7311.00	53.5 PK	74.0	-20.5	1.14 H	260	45.1	8.4
10	7311.00	43.1 AV	54.0	-10.9	1.14 H	260	34.7	8.4

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	2390.00	62.4 PK	74.0	-11.6	1.58 V	268	64.6	-2.2
2	2390.00	49.0 AV	54.0	-5.0	1.58 V	268	51.2	-2.2
3	*2437.00	109.2 PK			1.58 V	268	111.8	-2.6
4	*2437.00	98.2 AV			1.58 V	268	100.8	-2.6
5	2483.50	60.2 PK	74.0	-13.8	1.58 V	268	62.6	-2.4
6	2483.50	46.7 AV	54.0	-7.3	1.58 V	268	49.1	-2.4
7	4874.00	50.2 PK	74.0	-23.8	1.02 V	360	48.2	2.0
8	4874.00	42.0 AV	54.0	-12.0	1.02 V	360	40.0	2.0
9	7311.00	54.1 PK	74.0	-19.9	1.00 V	14	45.7	8.4
10	7311.00	43.6 AV	54.0	-10.4	1.00 V	14	35.2	8.4

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	107.3 PK			1.37 H	44	109.9	-2.6
2	*2462.00	97.0 AV			1.37 H	44	99.6	-2.6
3	2483.50	68.2 PK	74.0	-5.8	1.37 H	44	70.6	-2.4
4	2483.50	53.5 AV	54.0	-0.5	1.37 H	44	55.9	-2.4
5	4924.00	48.3 PK	74.0	-25.7	1.20 H	280	46.3	2.0
6	4924.00	40.4 AV	54.0	-13.6	1.20 H	280	38.4	2.0
7	7386.00	53.8 PK	74.0	-20.2	1.16 H	252	45.2	8.6
8	7386.00	43.4 AV	54.0	-10.6	1.16 H	252	34.8	8.6
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	104.2 PK			1.46 V	279	106.8	-2.6
2	*2462.00	93.5 AV			1.46 V	279	96.1	-2.6
3	2483.50	62.3 PK	74.0	-11.7	1.46 V	279	64.7	-2.4
4	2483.50	49.1 AV	54.0	-4.9	1.46 V	279	51.5	-2.4
5	4924.00	49.3 PK	74.0	-24.7	1.02 V	352	47.3	2.0
6	4924.00	40.7 AV	54.0	-13.3	1.02 V	352	38.7	2.0
7	7386.00	53.4 PK	74.0	-20.6	1.12 V	29	44.8	8.6
8	7386.00	43.1 AV	54.0	-10.9	1.12 V	29	34.5	8.6

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
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	67.4 PK	74.0	-6.6	1.46 H	39	69.6	-2.2
2	2390.00	53.2 AV	54.0	-0.8	1.46 H	39	55.4	-2.2
3	*2412.00	106.9 PK			1.46 H	39	109.3	-2.4
4	*2412.00	96.4 AV			1.46 H	39	98.8	-2.4
5	4824.00	47.8 PK	74.0	-26.2	1.17 H	277	46.0	1.8
6	4824.00	40.3 AV	54.0	-13.7	1.17 H	277	38.5	1.8
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	62.9 PK	74.0	-11.1	1.06 V	329	65.1	-2.2
2	2390.00	49.5 AV	54.0	-4.5	1.06 V	329	51.7	-2.2
3	*2412.00	103.0 PK			1.06 V	329	105.4	-2.4
4	*2412.00	93.3 AV			1.06 V	329	95.7	-2.4
5	4824.00	49.4 PK	74.0	-24.6	1.01 V	355	47.6	1.8
6	4824.00	41.2 AV	54.0	-12.8	1.01 V	355	39.4	1.8

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	67.2 PK	74.0	-6.8	1.37 H	48	69.4	-2.2
2	2390.00	52.8 AV	54.0	-1.2	1.37 H	48	55.0	-2.2
3	*2437.00	114.0 PK			1.37 H	48	116.6	-2.6
4	*2437.00	103.1 AV			1.37 H	48	105.7	-2.6
5	2483.50	67.9 PK	74.0	-6.1	1.37 H	48	70.3	-2.4
6	2483.50	50.8 AV	54.0	-3.2	1.37 H	48	53.2	-2.4
7	4874.00	48.8 PK	74.0	-25.2	1.20 H	258	46.8	2.0
8	4874.00	40.7 AV	54.0	-13.3	1.20 H	258	38.7	2.0
9	7311.00	54.1 PK	74.0	-19.9	1.18 H	244	45.7	8.4
10	7311.00	43.9 AV	54.0	-10.1	1.18 H	244	35.5	8.4

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	2390.00	61.9 PK	74.0	-12.1	1.54 V	300	64.1	-2.2
2	2390.00	48.7 AV	54.0	-5.3	1.54 V	300	50.9	-2.2
3	*2437.00	109.0 PK			1.54 V	300	111.6	-2.6
4	*2437.00	98.0 AV			1.54 V	300	100.6	-2.6
5	2483.50	60.8 PK	74.0	-13.2	1.54 V	300	63.2	-2.4
6	2483.50	47.2 AV	54.0	-6.8	1.54 V	300	49.6	-2.4
7	4874.00	50.7 PK	74.0	-23.3	1.04 V	327	48.7	2.0
8	4874.00	42.6 AV	54.0	-11.4	1.04 V	327	40.6	2.0
9	7311.00	54.0 PK	74.0	-20.0	1.07 V	24	45.6	8.4
10	7311.00	43.9 AV	54.0	-10.1	1.07 V	24	35.5	8.4

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	108.1 PK			1.39 H	36	110.7	-2.6
2	*2462.00	97.6 AV			1.39 H	36	100.2	-2.6
3	2483.50	70.0 PK	74.0	-4.0	1.39 H	36	72.4	-2.4
4	2483.50	53.4 AV	54.0	-0.6	1.39 H	36	55.8	-2.4
5	4924.00	48.7 PK	74.0	-25.3	1.19 H	257	46.7	2.0
6	4924.00	40.8 AV	54.0	-13.2	1.19 H	257	38.8	2.0
7	7386.00	54.6 PK	74.0	-19.4	1.04 H	251	46.0	8.6
8	7386.00	44.3 AV	54.0	-9.7	1.04 H	251	35.7	8.6
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	104.7 PK			1.50 V	268	107.3	-2.6
2	*2462.00	93.5 AV			1.50 V	268	96.1	-2.6
3	2483.50	61.0 PK	74.0	-13.0	1.50 V	268	63.4	-2.4
4	2483.50	48.0 AV	54.0	-6.0	1.50 V	268	50.4	-2.4
5	4924.00	49.4 PK	74.0	-24.6	1.00 V	342	47.4	2.0
6	4924.00	41.0 AV	54.0	-13.0	1.00 V	342	39.0	2.0
7	7386.00	53.7 PK	74.0	-20.3	1.00 V	35	45.1	8.6
8	7386.00	43.0 AV	54.0	-11.0	1.00 V	35	34.4	8.6

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
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	67.0 PK	74.0	-7.0	1.44 H	38	69.2	-2.2
2	2390.00	53.5 AV	54.0	-0.5	1.44 H	38	55.7	-2.2
3	*2422.00	102.9 PK			1.44 H	38	105.4	-2.5
4	*2422.00	92.5 AV			1.44 H	38	95.0	-2.5
5	4844.00	48.8 PK	74.0	-25.2	1.16 H	275	47.0	1.8
6	4844.00	40.6 AV	54.0	-13.4	1.16 H	275	38.8	1.8
7	7266.00	54.6 PK	74.0	-19.4	1.06 H	239	46.4	8.2
8	7266.00	44.3 AV	54.0	-9.7	1.06 H	239	36.1	8.2
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	2390.00	62.5 PK	74.0	-11.5	1.51 V	271	64.7	-2.2
2	2390.00	49.0 AV	54.0	-5.0	1.51 V	271	51.2	-2.2
3	*2422.00	98.9 PK			1.51 V	271	101.4	-2.5
4	*2422.00	88.1 AV			1.51 V	271	90.6	-2.5
5	4844.00	49.1 PK	74.0	-24.9	1.01 V	341	47.3	1.8
6	4844.00	40.9 AV	54.0	-13.1	1.01 V	341	39.1	1.8
7	7266.00	53.3 PK	74.0	-20.7	1.07 V	18	45.1	8.2
8	7266.00	42.8 AV	54.0	-11.2	1.07 V	18	34.6	8.2

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.

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	69.1 PK	74.0	-4.9	1.41 H	37	71.3	-2.2
2	2390.00	53.0 AV	54.0	-1.0	1.41 H	37	55.2	-2.2
3	*2437.00	104.8 PK			1.41 H	37	107.4	-2.6
4	*2437.00	94.4 AV			1.41 H	37	97.0	-2.6
5	2483.50	64.8 PK	74.0	-9.2	1.41 H	37	67.2	-2.4
6	2483.50	48.0 AV	54.0	-6.0	1.41 H	37	50.4	-2.4
7	4874.00	48.3 PK	74.0	-25.7	1.15 H	243	46.3	2.0
8	4874.00	40.8 AV	54.0	-13.2	1.15 H	243	38.8	2.0
9	7311.00	53.6 PK	74.0	-20.4	1.10 H	271	45.2	8.4
10	7311.00	43.3 AV	54.0	-10.7	1.10 H	271	34.9	8.4

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	2390.00	61.4 PK	74.0	-12.6	1.47 V	295	63.6	-2.2
2	2390.00	48.5 AV	54.0	-5.5	1.47 V	295	50.7	-2.2
3	*2437.00	101.0 PK			1.47 V	295	103.6	-2.6
4	*2437.00	90.8 AV			1.47 V	295	93.4	-2.6
5	2483.50	60.0 PK	74.0	-14.0	1.47 V	295	62.4	-2.4
6	2483.50	46.6 AV	54.0	-7.4	1.47 V	295	49.0	-2.4
7	4874.00	48.9 PK	74.0	-25.1	1.06 V	344	46.9	2.0
8	4874.00	40.4 AV	54.0	-13.6	1.06 V	344	38.4	2.0
9	7311.00	53.0 PK	74.0	-21.0	1.03 V	15	44.6	8.4
10	7311.00	43.0 AV	54.0	-11.0	1.03 V	15	34.6	8.4

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	104.2 PK			1.33 H	47	106.8	-2.6
2	*2452.00	93.7 AV			1.33 H	47	96.3	-2.6
3	2483.50	68.4 PK	74.0	-5.6	1.33 H	47	70.8	-2.4
4	2483.50	53.4 AV	54.0	-0.6	1.33 H	47	55.8	-2.4
5	4904.00	48.5 PK	74.0	-25.5	1.13 H	290	46.5	2.0
6	4904.00	40.4 AV	54.0	-13.6	1.13 H	290	38.4	2.0
7	7356.00	54.2 PK	74.0	-19.8	1.13 H	250	45.6	8.6
8	7356.00	43.9 AV	54.0	-10.1	1.13 H	250	35.3	8.6
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	99.7 PK			1.47 V	269	102.3	-2.6
2	*2452.00	88.8 AV			1.47 V	269	91.4	-2.6
3	2483.50	62.3 PK	74.0	-11.7	1.47 V	269	64.7	-2.4
4	2483.50	48.9 AV	54.0	-5.1	1.47 V	269	51.3	-2.4
5	4904.00	48.5 PK	74.0	-25.5	1.00 V	352	46.5	2.0
6	4904.00	40.4 AV	54.0	-13.6	1.00 V	352	38.4	2.0
7	7356.00	53.3 PK	74.0	-20.7	1.05 V	38	44.7	8.6
8	7356.00	43.0 AV	54.0	-11.0	1.05 V	38	34.4	8.6

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
5. " * ": Fundamental frequency.

4.1.8 Test Results (Dipole Antenna)

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	54.4 PK	74.0	-19.6	1.35 H	25	56.6	-2.2
2	2390.00	42.2 AV	54.0	-11.8	1.35 H	25	44.4	-2.2
3	*2412.00	95.7 PK			1.35 H	25	98.1	-2.4
4	*2412.00	93.6 AV			1.35 H	25	96.0	-2.4
5	4824.00	46.0 PK	74.0	-28.0	1.15 H	143	44.2	1.8
6	4824.00	43.0 AV	54.0	-11.0	1.15 H	143	41.2	1.8
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	56.8 PK	74.0	-17.2	1.49 V	245	59.0	-2.2
2	2390.00	43.2 AV	54.0	-10.8	1.49 V	245	45.4	-2.2
3	*2412.00	104.8 PK			1.49 V	245	107.2	-2.4
4	*2412.00	102.4 AV			1.49 V	245	104.8	-2.4
5	4824.00	52.0 PK	74.0	-22.0	1.25 V	150	50.2	1.8
6	4824.00	51.0 AV	54.0	-3.0	1.25 V	150	49.2	1.8

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	100.1 PK			1.48 H	24	102.7	-2.6
2	*2437.00	97.4 AV			1.48 H	24	100.0	-2.6
3	4874.00	46.0 PK	74.0	-28.0	1.19 H	137	44.0	2.0
4	4874.00	43.2 AV	54.0	-10.8	1.19 H	137	41.2	2.0
5	7311.00	44.2 PK	74.0	-29.8	1.47 H	324	35.8	8.4
6	7311.00	31.4 AV	54.0	-22.6	1.47 H	324	23.0	8.4
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	*2437.00	108.7 PK			1.34 V	248	111.3	-2.6
2	*2437.00	106.1 AV			1.34 V	248	108.7	-2.6
3	4874.00	53.9 PK	74.0	-20.1	1.20 V	147	51.9	2.0
4	4874.00	53.0 AV	54.0	-1.0	1.20 V	147	51.0	2.0
5	7311.00	45.4 PK	74.0	-28.6	1.40 V	25	37.0	8.4
6	7311.00	32.6 AV	54.0	-21.4	1.40 V	25	24.2	8.4

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	97.8 PK			1.46 H	23	100.4	-2.6
2	*2462.00	95.0 AV			1.46 H	23	97.6	-2.6
3	2483.50	55.5 PK	74.0	-18.5	1.46 H	23	57.9	-2.4
4	2483.50	45.9 AV	54.0	-8.1	1.46 H	23	48.3	-2.4
5	4924.00	45.9 PK	74.0	-28.1	1.25 H	131	43.9	2.0
6	4924.00	43.0 AV	54.0	-11.0	1.25 H	131	41.0	2.0
7	7386.00	44.3 PK	74.0	-29.7	1.43 H	329	35.7	8.6
8	7386.00	31.4 AV	54.0	-22.6	1.43 H	329	22.8	8.6
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	106.6 PK			1.24 V	247	109.2	-2.6
2	*2462.00	103.8 AV			1.24 V	247	106.4	-2.6
3	2483.50	60.2 PK	74.0	-13.8	1.24 V	247	62.6	-2.4
4	2483.50	53.2 AV	54.0	-0.8	1.24 V	247	55.6	-2.4
5	4924.00	55.0 PK	74.0	-19.0	1.22 V	143	53.0	2.0
6	4924.00	53.9 AV	54.0	-0.1	1.22 V	143	51.9	2.0
7	7386.00	43.6 PK	74.0	-30.4	1.07 V	22	35.0	8.6
8	7386.00	31.3 AV	54.0	-22.7	1.07 V	22	22.7	8.6

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
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	57.3 PK	74.0	-16.7	1.47 H	11	59.5	-2.2
2	2390.00	44.1 AV	54.0	-9.9	1.47 H	11	46.3	-2.2
3	*2412.00	97.7 PK			1.47 H	11	100.1	-2.4
4	*2412.00	87.5 AV			1.47 H	11	89.9	-2.4
5	4824.00	46.0 PK	74.0	-28.0	1.29 H	128	44.2	1.8
6	4824.00	33.6 AV	54.0	-20.4	1.29 H	128	31.8	1.8
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	63.8 PK	74.0	-10.2	1.46 V	246	66.0	-2.2
2	2390.00	50.6 AV	54.0	-3.4	1.46 V	246	52.8	-2.2
3	*2412.00	106.8 PK			1.46 V	246	109.2	-2.4
4	*2412.00	96.2 AV			1.46 V	246	98.6	-2.4
5	4824.00	48.5 PK	74.0	-25.5	1.29 V	144	46.7	1.8
6	4824.00	36.1 AV	54.0	-17.9	1.29 V	144	34.3	1.8

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	102.6 PK			1.47 H	37	105.2	-2.6
2	*2437.00	92.3 AV			1.47 H	37	94.9	-2.6
3	4874.00	46.5 PK	74.0	-27.5	1.26 H	114	44.5	2.0
4	4874.00	34.2 AV	54.0	-19.8	1.26 H	114	32.2	2.0
5	7311.00	44.5 PK	74.0	-29.5	1.36 H	346	36.1	8.4
6	7311.00	31.6 AV	54.0	-22.4	1.36 H	346	23.2	8.4
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	*2437.00	111.7 PK			1.18 V	247	114.3	-2.6
2	*2437.00	101.0 AV			1.18 V	247	103.6	-2.6
3	4874.00	50.0 PK	74.0	-24.0	1.25 V	151	48.0	2.0
4	4874.00	37.7 AV	54.0	-16.3	1.25 V	151	35.7	2.0
5	7311.00	45.7 PK	74.0	-28.3	1.43 V	28	37.3	8.4
6	7311.00	33.1 AV	54.0	-20.9	1.43 V	28	24.7	8.4

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	98.5 PK			1.42 H	34	101.1	-2.6
2	*2462.00	88.4 AV			1.42 H	34	91.0	-2.6
3	2483.50	58.5 PK	74.0	-15.5	1.42 H	34	60.9	-2.4
4	2483.50	45.6 AV	54.0	-8.4	1.42 H	34	48.0	-2.4
5	4924.00	46.0 PK	74.0	-28.0	1.30 H	111	44.0	2.0
6	4924.00	33.9 AV	54.0	-20.1	1.30 H	111	31.9	2.0
7	7386.00	44.9 PK	74.0	-29.1	1.40 H	345	36.3	8.6
8	7386.00	31.9 AV	54.0	-22.1	1.40 H	345	23.3	8.6
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	108.1 PK			1.22 V	247	110.7	-2.6
2	*2462.00	97.3 AV			1.22 V	247	99.9	-2.6
3	2483.50	64.4 PK	74.0	-9.6	1.22 V	247	66.8	-2.4
4	2483.50	51.7 AV	54.0	-2.3	1.22 V	247	54.1	-2.4
5	4924.00	49.6 PK	74.0	-24.4	1.21 V	146	47.6	2.0
6	4924.00	36.9 AV	54.0	-17.1	1.21 V	146	34.9	2.0
7	7386.00	45.0 PK	74.0	-29.0	1.42 V	21	36.4	8.6
8	7386.00	32.4 AV	54.0	-21.6	1.42 V	21	23.8	8.6

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
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	60.2 PK	74.0	-13.8	1.45 H	28	62.4	-2.2
2	2390.00	47.3 AV	54.0	-6.7	1.45 H	28	49.5	-2.2
3	*2412.00	99.4 PK			1.45 H	28	101.8	-2.4
4	*2412.00	89.2 AV			1.45 H	28	91.6	-2.4
5	4824.00	45.2 PK	74.0	-28.8	1.33 H	127	43.4	1.8
6	4824.00	33.0 AV	54.0	-21.0	1.33 H	127	31.2	1.8
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	1.50 V	0	72.9	-2.2
2	2390.00	53.8 AV	54.0	-0.2	1.50 V	0	56.0	-2.2
3	*2412.00	108.1 PK			1.50 V	0	110.5	-2.4
4	*2412.00	98.0 AV			1.50 V	0	100.4	-2.4
5	4824.00	48.9 PK	74.0	-25.1	1.24 V	145	47.1	1.8
6	4824.00	36.7 AV	54.0	-17.3	1.24 V	145	34.9	1.8

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	58.1 PK	74.0	-15.9	1.44 H	27	60.3	-2.2
2	2390.00	45.2 AV	54.0	-8.8	1.44 H	27	47.4	-2.2
3	*2437.00	104.5 PK			1.44 H	27	107.1	-2.6
4	*2437.00	94.5 AV			1.44 H	27	97.1	-2.6
5	2483.50	56.3 PK	74.0	-17.7	1.44 H	27	58.7	-2.4
6	2483.50	43.2 AV	54.0	-10.8	1.44 H	27	45.6	-2.4
7	4874.00	46.1 PK	74.0	-27.9	1.28 H	136	44.1	2.0
8	4874.00	33.9 AV	54.0	-20.1	1.28 H	136	31.9	2.0
9	7311.00	44.4 PK	74.0	-29.6	1.39 H	339	36.0	8.4
10	7311.00	31.3 AV	54.0	-22.7	1.39 H	339	22.9	8.4

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	2390.00	65.8 PK	74.0	-8.2	1.32 V	0	68.0	-2.2
2	2390.00	51.0 AV	54.0	-3.0	1.32 V	0	53.2	-2.2
3	*2437.00	114.5 PK			1.32 V	0	117.1	-2.6
4	*2437.00	103.1 AV			1.32 V	0	105.7	-2.6
5	2483.50	62.3 PK	74.0	-11.7	1.32 V	0	64.7	-2.4
6	2483.50	48.3 AV	54.0	-5.7	1.32 V	0	50.7	-2.4
7	4874.00	50.1 PK	74.0	-23.9	1.26 V	142	48.1	2.0
8	4874.00	37.8 AV	54.0	-16.2	1.26 V	142	35.8	2.0
9	7311.00	45.6 PK	74.0	-28.4	1.41 V	14	37.2	8.4
10	7311.00	33.3 AV	54.0	-20.7	1.41 V	14	24.9	8.4

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	100.2 PK			1.43 H	39	102.8	-2.6
2	*2462.00	89.9 AV			1.43 H	39	92.5	-2.6
3	2483.50	59.4 PK	74.0	-14.6	1.43 H	39	61.8	-2.4
4	2483.50	46.8 AV	54.0	-7.2	1.43 H	39	49.2	-2.4
5	4924.00	46.4 PK	74.0	-27.6	1.35 H	109	44.4	2.0
6	4924.00	33.8 AV	54.0	-20.2	1.35 H	109	31.8	2.0
7	7386.00	44.5 PK	74.0	-29.5	1.42 H	331	35.9	8.6
8	7386.00	31.6 AV	54.0	-22.4	1.42 H	331	23.0	8.6
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	109.2 PK			1.45 V	10	111.8	-2.6
2	*2462.00	98.6 AV			1.45 V	10	101.2	-2.6
3	2483.50	66.8 PK	74.0	-7.2	1.45 V	10	69.2	-2.4
4	2483.50	53.3 AV	54.0	-0.7	1.45 V	10	55.7	-2.4
5	4924.00	50.3 PK	74.0	-23.7	1.24 V	138	48.3	2.0
6	4924.00	37.8 AV	54.0	-16.2	1.24 V	138	35.8	2.0
7	7386.00	45.2 PK	74.0	-28.8	1.42 V	26	36.6	8.6
8	7386.00	32.7 AV	54.0	-21.3	1.42 V	26	24.1	8.6

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
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	60.7 PK	74.0	-13.3	1.37 H	13	62.9	-2.2
2	2390.00	48.3 AV	54.0	-5.7	1.37 H	13	50.5	-2.2
3	*2422.00	92.9 PK			1.37 H	13	95.4	-2.5
4	*2422.00	83.5 AV			1.37 H	13	86.0	-2.5
5	4844.00	46.1 PK	74.0	-27.9	1.29 H	120	44.3	1.8
6	4844.00	33.9 AV	54.0	-20.1	1.29 H	120	32.1	1.8
7	7266.00	44.3 PK	74.0	-29.7	1.43 H	343	36.1	8.2
8	7266.00	31.2 AV	54.0	-22.8	1.43 H	343	23.0	8.2
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	2390.00	68.2 PK	74.0	-5.8	1.45 V	15	70.4	-2.2
2	2390.00	53.9 AV	54.0	-0.1	1.45 V	15	56.1	-2.2
3	*2422.00	101.8 PK			1.45 V	15	104.3	-2.5
4	*2422.00	92.7 AV			1.45 V	15	95.2	-2.5
5	4844.00	47.7 PK	74.0	-26.3	1.30 V	157	45.9	1.8
6	4844.00	35.3 AV	54.0	-18.7	1.30 V	157	33.5	1.8
7	7266.00	45.4 PK	74.0	-28.6	1.42 V	27	37.2	8.2
8	7266.00	32.9 AV	54.0	-21.1	1.42 V	27	24.7	8.2

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": 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	60.5 PK	74.0	-13.5	1.44 H	26	62.7	-2.2
2	2390.00	48.1 AV	54.0	-5.9	1.44 H	26	50.3	-2.2
3	*2437.00	94.8 PK			1.44 H	26	97.4	-2.6
4	*2437.00	85.6 AV			1.44 H	26	88.2	-2.6
5	2483.50	57.8 PK	74.0	-16.2	1.44 H	26	60.2	-2.4
6	2483.50	44.3 AV	54.0	-9.7	1.44 H	26	46.7	-2.4
7	4874.00	46.9 PK	74.0	-27.1	1.32 H	122	44.9	2.0
8	4874.00	34.6 AV	54.0	-19.4	1.32 H	122	32.6	2.0
9	7311.00	44.3 PK	74.0	-29.7	1.36 H	353	35.9	8.4
10	7311.00	31.7 AV	54.0	-22.3	1.36 H	353	23.3	8.4

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	2390.00	67.2 PK	74.0	-6.8	1.56 V	19	69.4	-2.2
2	2390.00	53.8 AV	54.0	-0.2	1.56 V	19	56.0	-2.2
3	*2437.00	103.5 PK			1.56 V	19	106.1	-2.6
4	*2437.00	94.7 AV			1.56 V	19	97.3	-2.6
5	2483.50	61.4 PK	74.0	-12.6	1.56 V	19	63.8	-2.4
6	2483.50	48.7 AV	54.0	-5.3	1.56 V	19	51.1	-2.4
7	4874.00	47.9 PK	74.0	-26.1	1.27 V	139	45.9	2.0
8	4874.00	35.8 AV	54.0	-18.2	1.27 V	139	33.8	2.0
9	7311.00	45.9 PK	74.0	-28.1	1.37 V	44	37.5	8.4
10	7311.00	33.3 AV	54.0	-20.7	1.37 V	44	24.9	8.4

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	95.2 PK			1.42 H	26	97.8	-2.6
2	*2452.00	85.8 AV			1.42 H	26	88.4	-2.6
3	2483.50	60.2 PK	74.0	-13.8	1.42 H	26	62.6	-2.4
4	2483.50	47.6 AV	54.0	-6.4	1.42 H	26	50.0	-2.4
5	4904.00	47.1 PK	74.0	-26.9	1.29 H	121	45.1	2.0
6	4904.00	34.6 AV	54.0	-19.4	1.29 H	121	32.6	2.0
7	7356.00	44.7 PK	74.0	-29.3	1.38 H	344	36.1	8.6
8	7356.00	31.7 AV	54.0	-22.3	1.38 H	344	23.1	8.6
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	104.5 PK			1.87 V	12	107.1	-2.6
2	*2452.00	95.0 AV			1.87 V	12	97.6	-2.6
3	2483.50	65.4 PK	74.0	-8.6	1.87 V	12	67.8	-2.4
4	2483.50	53.4 AV	54.0	-0.6	1.87 V	12	55.8	-2.4
5	4904.00	48.2 PK	74.0	-25.8	1.26 V	138	46.2	2.0
6	4904.00	36.0 AV	54.0	-18.0	1.26 V	138	34.0	2.0
7	7356.00	45.9 PK	74.0	-28.1	1.41 V	17	37.3	8.6
8	7356.00	33.2 AV	54.0	-20.8	1.41 V	17	24.6	8.6

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
5. " * ": Fundamental frequency.

Below 1GHz Data:

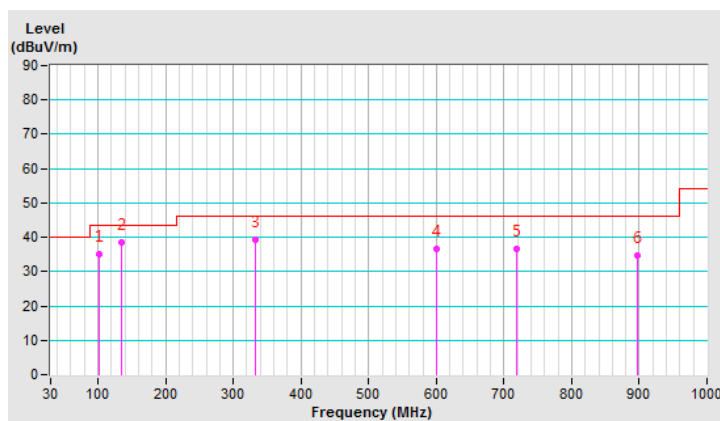
802.11n (HT20)

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	101.97	35.1 QP	43.5	-8.4	1.50 H	1	47.1	-12.0
2	135.34	38.6 QP	43.5	-4.9	2.00 H	32	47.1	-8.5
3	333.29	39.2 QP	46.0	-6.8	1.00 H	124	45.3	-6.1
4	600.02	36.5 QP	46.0	-9.5	1.50 H	33	35.7	0.8
5	718.89	36.6 QP	46.0	-9.4	1.00 H	110	34.6	2.0
6	897.08	34.7 QP	46.0	-11.3	1.50 H	106	29.3	5.4

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. Margin value = Emission Level – Limit value
4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

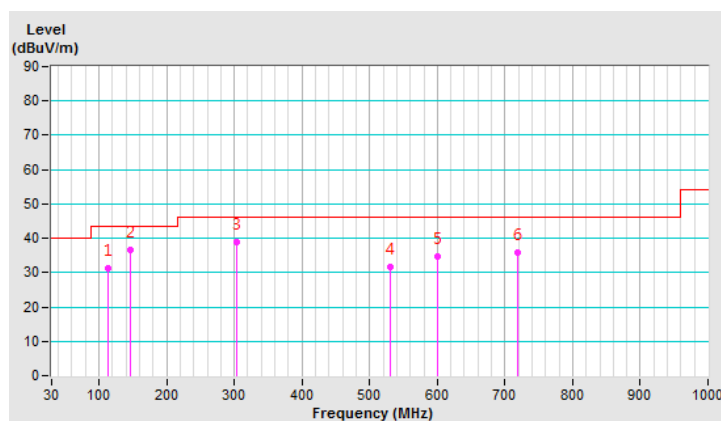


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	114.37	31.2 QP	43.5	-12.3	1.00 V	249	41.4	-10.2
2	146.50	36.7 QP	43.5	-6.8	1.50 V	360	44.5	-7.8
3	302.57	38.8 QP	46.0	-7.2	2.00 V	0	45.8	-7.0
4	530.98	31.8 QP	46.0	-14.2	1.00 V	175	32.9	-1.1
5	600.02	34.6 QP	46.0	-11.4	1.50 V	349	33.8	0.8
6	718.92	35.7 QP	46.0	-10.3	1.00 V	323	33.7	2.0

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. Margin value = Emission Level – Limit value
4. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



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)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

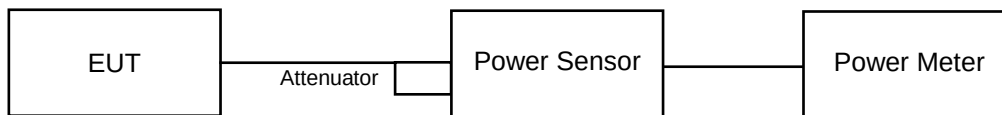
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

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

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Conditions

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

4.2.7 Test Results

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	65.163	18.14	30	Pass
6	2437	177.828	22.50	30	Pass
11	2462	118.304	20.73	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	133.968	21.27	30	Pass
6	2437	251.768	24.01	30	Pass
11	2462	166.341	22.21	30	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.95	20.06	200.246	23.02	30	Pass
6	2437	23.41	23.25	430.629	26.34	30	Pass
11	2462	20.51	20.59	227.011	23.56	30	Pass

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.37	17.30	108.279	20.35	30	Pass
6	2437	18.31	18.27	134.907	21.30	30	Pass
9	2452	19.68	19.65	185.154	22.68	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	30.269	14.81
6	2437	89.95	19.54
11	2462	58.614	17.68

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	28.907	14.61
6	2437	86.298	19.36
11	2462	36.308	15.60

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	13.53	13.45	44.673	16.50
6	2437	19.59	18.88	168.259	22.26
11	2462	14.58	14.63	57.748	17.62

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	10.49	10.43	22.235	13.47
6	2437	12.43	12.35	34.677	15.40
9	2452	12.67	12.60	36.69	15.65

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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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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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