

FCC Test Report

Report No.: RF150807E06A

FCC ID: PY313200233

Test Model: R7000

Received Date: Mar. 12, 2018

Test Date: Apr. 13 to 23, 2018

Issued Date: May 03, 2018

Applicant: NETGEAR, Inc.

Address: 350 East Plumeria Drive San Jose, CA 95134

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

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Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF150807E06A	Original release.	May 03, 2018

1 Certificate of Conformity

Product: AC1900 Smart WiFi Router

Brand: NETGEAR

Test Model: R7000

Sample Status: ENGINEERING SAMPLE

Applicant: NETGEAR, Inc.

Test Date: Apr. 13 to 23, 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 , **Date:** May 03, 2018
Phoenix Huang / Specialist

Approved by : May Chen , **Date:** May 03, 2018
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2390.00MHz, 2383.70MHz and 2484.90MHz.
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	5.33 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

Product	AC1900 Smart WiFi Router
Brand	NETGEAR
Test Model	R7000
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
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	802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.18~ 5.24GHz, 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): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	2.412 ~ 2.462GHz CDD Mode: 771.988 mW Beamforming Mode 746.893 mW 5.18 ~ 5.24GHz CDD Mode: 279.494 mW Beamforming Mode 221.004 mW 5.745 ~ 5.825GHz CDD Mode: 922.716 mW Beamforming Mode 952.215 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	RJ45 Cable x1 (unshielded, 1.5m)

Note:

1. This report is prepared for FCC Class II change. The differences between them are as below information:
 - ◆ Upgraded standard version.
 - ◆ Change RF 2.4G+5G PA(still pin to pin) under the same PCB
 - ◆ Change the MPE distance from 25cm to 23cm
2. According to above conditions, only Radiated Emissions and Conducted power need to be performed. And all data was verified to meet the requirements.
3. The EUT must be supplied with a power adapter and the following different models could be chosen:

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	MU42-3120350-A1	332-10762-01	AC input: 100-240V, 50/60Hz, 1.5A DC output: 12V, 3.5A DC output cable: 1.8m, unshielded
2	NETGEAR	2ABN042F NA	332-10761-01	AC input: 100-240V, 50/60Hz, 1.5A DC output: 12V, 3.5A DC output cable: 1.8m, unshielded

Note: The EUT was pre-tested with above adapters, for radiated emission test the worse case was found in **Adapter 2**. Therefore only the test data of the adapter was recorded in this report.

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

Antenna No.	Antenna Type	Antenna Gain (dBi)	Frequency range (GHz ~ GHz)	Connector Type
1	Dipole	0.6	2.4~2.4835	Re-SMA
		0.9	5.15~5.85	
2	Dipole	0.6	2.4~2.4835	Re-SMA
		0.9	5.15~5.85	
3	Dipole	0.6	2.4~2.4835	Re-SMA
		0.9	5.15~5.85	

5. 2.4GHz & 5GHz technology can transmit at same time.

6. The EUT incorporates a MIMO function with beamforming.

For 2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	3TX	3RX
802.11g	6 ~ 54Mbps	3TX	3RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
VHT20	MCS0~8 Nss= 1	3TX	3RX
	MCS0~8 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX
VHT40	MCS0~9 Nss= 1	3TX	3RX
	MCS0~9 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX
For 5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	3TX	3RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11ac (VHT20)	MCS0~8 Nss= 1	3TX	3RX
	MCS0~8 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX
802.11ac (VHT40) & 802.11ac (VHT80)	MCS0~9 Nss= 1	3TX	3RX
	MCS0~9 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX

Note:

1. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
2. All of modulation mode support beamforming function except 802.11b/g/a modulation mode.

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

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: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-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.

CDD Mode					
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
Beamforming Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	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.

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

Antenna Port Conducted Measurement:

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

CDD Mode					
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
Beamforming Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	23deg. C, 65%RH	120Vac, 60Hz	Eason Tseng
RE<1G	22deg. C, 68%RH	120Vac, 60Hz	Steven Chiang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

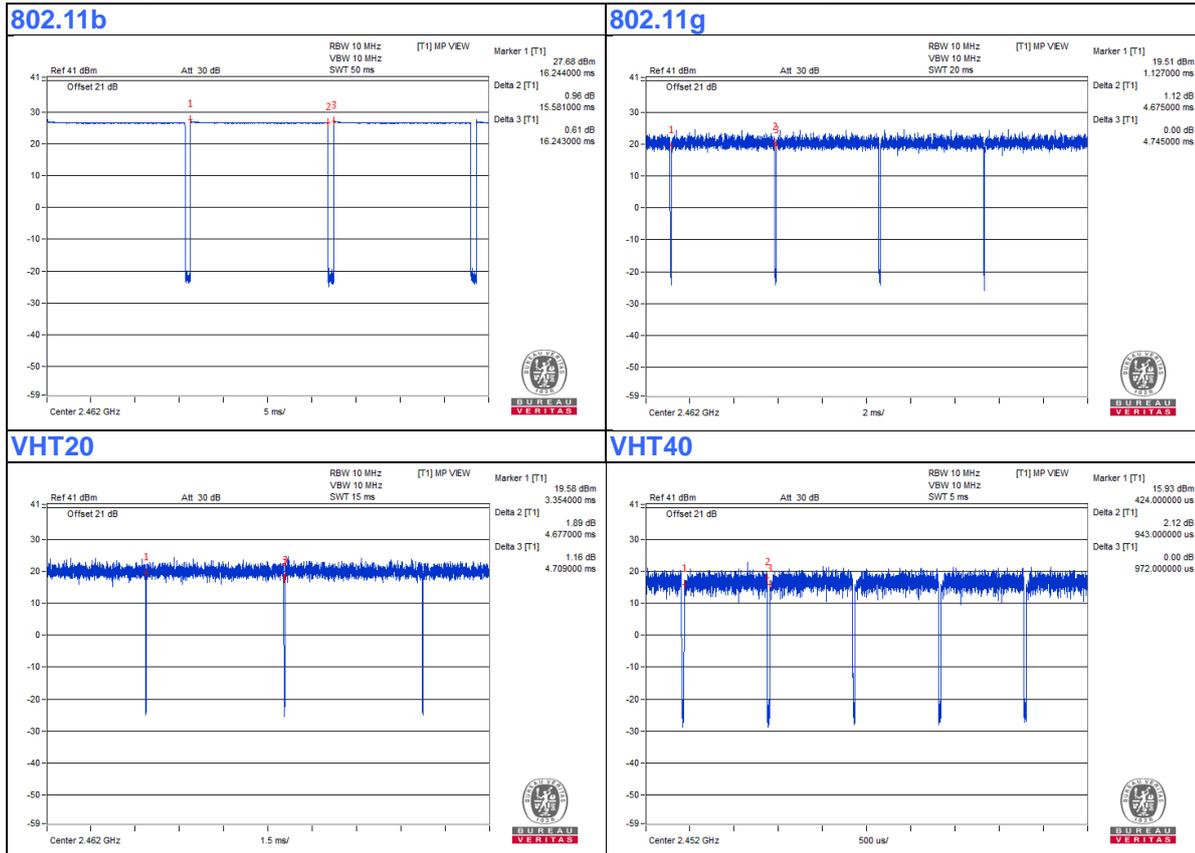
If duty cycle of test signal is $\geq 98\%$, duty factor is not required.
 If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = 15.581 ms/16.243 ms = 0.959, Duty factor = $10 * \log(1 / \text{Duty cycle}) = 0.18$

802.11g: Duty cycle = 4.675 ms/4.745 ms = 0.985

VHT20: Duty cycle = 4.677 ms/4.709 ms = 0.993

VHT40: Duty cycle = 0.943 ms/0.972 ms = 0.97, Duty factor = $10 * \log(1 / \text{Duty cycle}) = 0.13$



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.

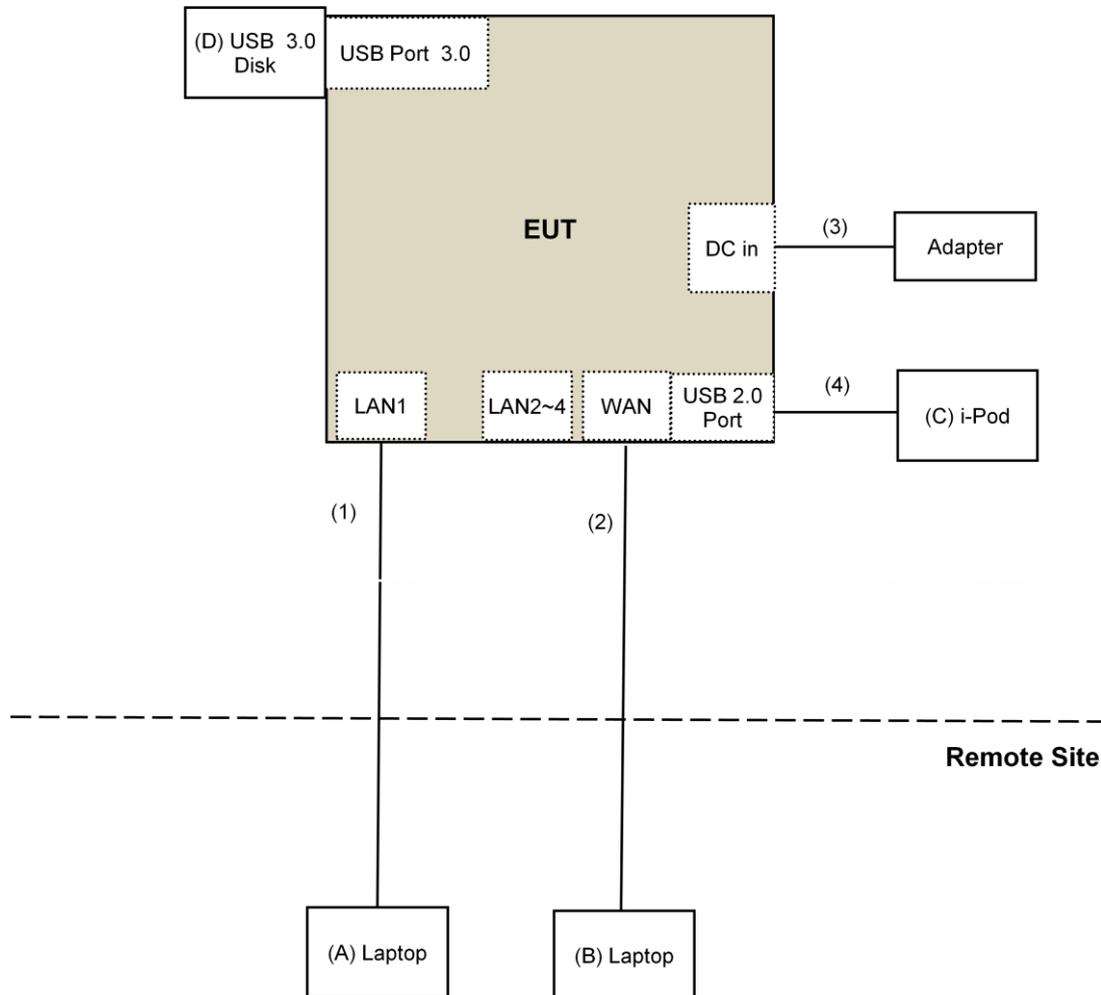
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	482T3R1	FCC DoC	Provided by Lab
B.	Laptop	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
C.	i-Pod	Apple	MD778TA/A	CC4JL03FF4T1	NA	Provided by Lab
D.	USB 3.0 Disk	Transcend	16G	NA	NA	Provided by Lab

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
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	DC Cable	1	1.8	No	0	Supplied by client
4.	USB Cable	1	0.1	Yes	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
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 30dB 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 08, 2017	July 07, 2018
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-00 1 LOOPCAB-00 2	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	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	966-4-1 966-4-2 966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980385	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM- SM-1200 EMC104-SM- SM-2000 EMC104-SM- SM-5000	160923 150318 150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045S E	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
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	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. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Apr. 13 to 23, 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:

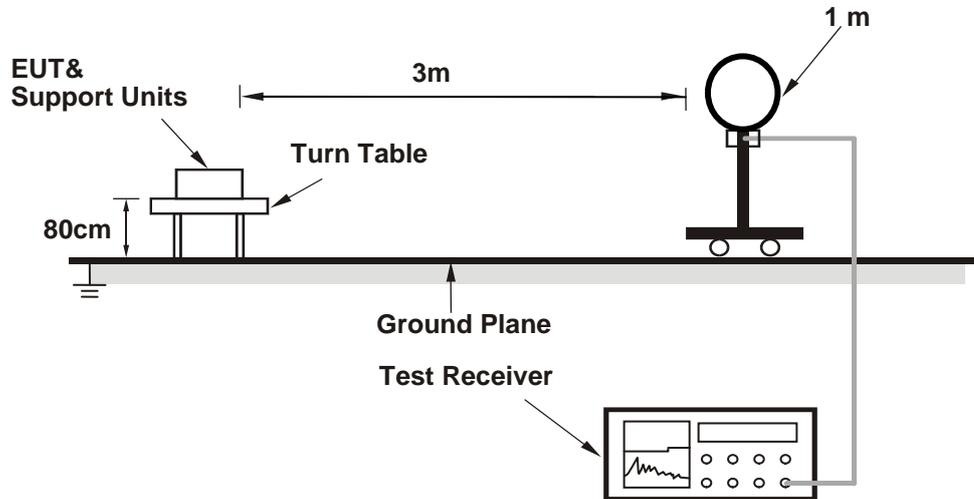
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

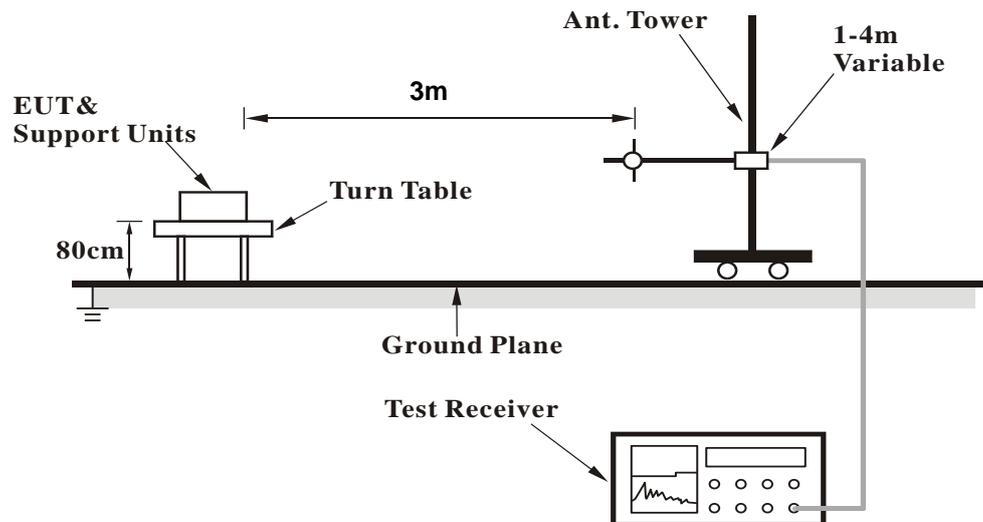
No deviation.

4.1.5 Test Setup

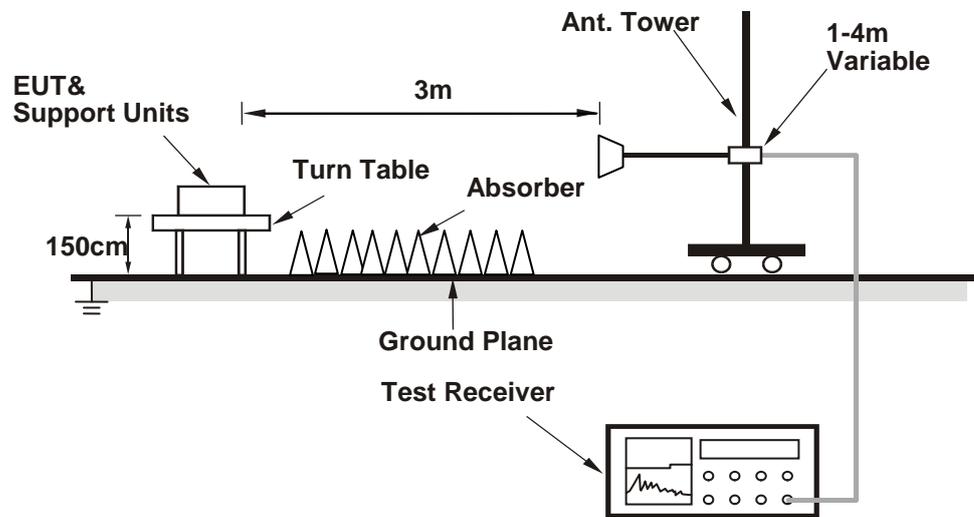
For Radiated emission below 30MHz



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 remote site.
- Controlling software (Mtool 3.0.0.6) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.7 PK	74.0	-15.3	1.67 H	350	60.7	-2.0
2	2390.00	44.2 AV	54.0	-9.8	1.67 H	350	46.2	-2.0
3	*2412.00	107.4 PK			1.67 H	350	109.5	-2.1
4	*2412.00	102.9 AV			1.67 H	350	105.0	-2.1
5	2491.20	60.2 PK	74.0	-13.8	1.67 H	350	62.4	-2.2
6	2491.20	45.1 AV	54.0	-8.9	1.67 H	350	47.3	-2.2
7	4824.00	50.9 PK	74.0	-23.1	2.52 H	56	48.2	2.7
8	4824.00	47.9 AV	54.0	-6.1	2.52 H	56	45.2	2.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.5 PK	74.0	-14.5	1.75 V	153	61.5	-2.0
2	2390.00	49.6 AV	54.0	-4.4	1.75 V	153	51.6	-2.0
3	*2412.00	120.2 PK			1.75 V	153	122.3	-2.1
4	*2412.00	114.7 AV			1.75 V	153	116.8	-2.1
5	2491.20	61.3 PK	74.0	-12.7	1.75 V	153	63.5	-2.2
6	2491.20	50.9 AV	54.0	-3.1	1.75 V	153	53.1	-2.2
7	4824.00	54.4 PK	74.0	-19.6	3.23 V	44	51.7	2.7
8	4824.00	51.0 AV	54.0	-3.0	3.23 V	44	48.3	2.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.1 PK	74.0	-18.9	1.67 H	350	57.1	-2.0
2	2390.00	41.3 AV	54.0	-12.7	1.67 H	350	43.3	-2.0
3	*2437.00	108.1 PK			1.67 H	350	110.4	-2.3
4	*2437.00	103.7 AV			1.67 H	350	106.0	-2.3
5	2483.50	54.2 PK	74.0	-19.8	1.67 H	350	56.4	-2.2
6	2483.50	40.6 AV	54.0	-13.4	1.67 H	350	42.8	-2.2
7	4874.00	50.8 PK	74.0	-23.2	2.51 H	72	47.9	2.9
8	4874.00	47.8 AV	54.0	-6.2	2.51 H	72	44.9	2.9
9	7311.00	44.7 PK	74.0	-29.3	2.29 H	100	35.4	9.3
10	7311.00	30.7 AV	54.0	-23.3	2.29 H	100	21.4	9.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.2 PK	74.0	-15.8	1.52 V	147	60.2	-2.0
2	2390.00	46.3 AV	54.0	-7.7	1.52 V	147	48.3	-2.0
3	*2437.00	120.5 PK			1.52 V	147	122.8	-2.3
4	*2437.00	114.8 AV			1.52 V	147	117.1	-2.3
5	2483.50	58.1 PK	74.0	-15.9	1.52 V	147	60.3	-2.2
6	2483.50	45.0 AV	54.0	-9.0	1.52 V	147	47.2	-2.2
7	4874.00	53.2 PK	74.0	-20.8	2.96 V	47	50.3	2.9
8	4874.00	50.3 AV	54.0	-3.7	2.96 V	47	47.4	2.9
9	7311.00	45.8 PK	74.0	-28.2	1.91 V	243	36.5	9.3
10	7311.00	31.4 AV	54.0	-22.6	1.91 V	243	22.1	9.3

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	2383.70	60.3 PK	74.0	-13.7	1.69 H	344	62.2	-1.9
2	2383.70	45.3 AV	54.0	-8.7	1.69 H	344	47.2	-1.9
3	*2462.00	107.6 PK			1.69 H	344	109.9	-2.3
4	*2462.00	103.1 AV			1.69 H	344	105.4	-2.3
5	2483.50	59.1 PK	74.0	-14.9	1.69 H	344	61.3	-2.2
6	2483.50	44.7 AV	54.0	-9.3	1.69 H	344	46.9	-2.2
7	4924.00	50.6 PK	74.0	-23.4	2.52 H	56	47.6	3.0
8	4924.00	47.6 AV	54.0	-6.4	2.52 H	56	44.6	3.0
9	7386.00	45.2 PK	74.0	-28.8	2.34 H	85	35.5	9.7
10	7386.00	31.1 AV	54.0	-22.9	2.34 H	85	21.4	9.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2383.70	63.5 PK	74.0	-10.5	1.53 V	150	65.4	-1.9
2	2383.70	53.9 AV	54.0	-0.1	1.53 V	150	55.8	-1.9
3	*2462.00	119.8 PK			1.53 V	150	122.1	-2.3
4	*2462.00	114.0 AV			1.53 V	150	116.3	-2.3
5	2483.50	59.1 PK	74.0	-14.9	1.53 V	150	61.3	-2.2
6	2483.50	47.9 AV	54.0	-6.1	1.53 V	150	50.1	-2.2
7	4924.00	52.2 PK	74.0	-21.8	2.96 V	78	49.2	3.0
8	4924.00	49.4 AV	54.0	-4.6	2.96 V	78	46.4	3.0
9	7386.00	45.9 PK	74.0	-28.1	1.86 V	245	36.2	9.7
10	7386.00	31.3 AV	54.0	-22.7	1.86 V	245	21.6	9.7

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.

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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	63.7 PK	74.0	-10.3	1.72 H	327	65.7	-2.0
2	2390.00	43.8 AV	54.0	-10.2	1.72 H	327	45.8	-2.0
3	*2412.00	105.3 PK			1.72 H	327	107.4	-2.1
4	*2412.00	93.6 AV			1.72 H	327	95.7	-2.1
5	2487.30	54.9 PK	74.0	-19.1	1.72 H	327	57.1	-2.2
6	2487.30	41.6 AV	54.0	-12.4	1.72 H	327	43.8	-2.2
7	4824.00	38.5 PK	74.0	-35.5	1.50 H	91	35.8	2.7
8	4824.00	24.2 AV	54.0	-29.8	1.50 H	91	21.5	2.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.7 PK	74.0	-8.3	1.53 V	195	67.7	-2.0
2	2390.00	48.9 AV	54.0	-5.1	1.53 V	195	50.9	-2.0
3	*2412.00	116.2 PK			1.53 V	195	118.3	-2.1
4	*2412.00	104.3 AV			1.53 V	195	106.4	-2.1
5	2487.30	55.9 PK	74.0	-18.1	1.53 V	195	58.1	-2.2
6	2487.30	46.3 AV	54.0	-7.7	1.53 V	195	48.5	-2.2
7	4824.00	38.8 PK	74.0	-35.2	2.99 V	46	36.1	2.7
8	4824.00	24.3 AV	54.0	-29.7	2.99 V	46	21.6	2.7

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	60.8 PK	74.0	-13.2	1.66 H	338	62.8	-2.0
2	2390.00	46.5 AV	54.0	-7.5	1.66 H	338	48.5	-2.0
3	*2437.00	113.5 PK			1.66 H	338	115.8	-2.3
4	*2437.00	101.2 AV			1.66 H	338	103.5	-2.3
5	2483.50	59.6 PK	74.0	-14.4	1.66 H	338	61.8	-2.2
6	2483.50	45.4 AV	54.0	-8.6	1.66 H	338	47.6	-2.2
7	4874.00	48.9 PK	74.0	-25.1	2.45 H	68	46.0	2.9
8	4874.00	33.7 AV	54.0	-20.3	2.45 H	68	30.8	2.9
9	7311.00	45.4 PK	74.0	-28.6	2.30 H	100	36.1	9.3
10	7311.00	31.0 AV	54.0	-23.0	2.30 H	100	21.7	9.3

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	63.6 PK	74.0	-10.4	1.61 V	176	65.6	-2.0
2	2390.00	51.1 AV	54.0	-2.9	1.61 V	176	53.1	-2.0
3	*2437.00	124.2 PK			1.61 V	176	126.5	-2.3
4	*2437.00	112.2 AV			1.61 V	176	114.5	-2.3
5	2483.50	62.5 PK	74.0	-11.5	1.61 V	176	64.7	-2.2
6	2483.50	46.8 AV	54.0	-7.2	1.61 V	176	49.0	-2.2
7	4874.00	50.3 PK	74.0	-23.7	2.96 V	46	47.4	2.9
8	4874.00	36.0 AV	54.0	-18.0	2.96 V	46	33.1	2.9
9	7311.00	45.6 PK	74.0	-28.4	1.82 V	253	36.3	9.3
10	7311.00	30.9 AV	54.0	-23.1	1.82 V	253	21.6	9.3

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	2386.50	55.4 PK	74.0	-18.6	1.71 H	324	57.4	-2.0
2	2386.50	42.8 AV	54.0	-11.2	1.71 H	324	44.8	-2.0
3	*2462.00	105.4 PK			1.71 H	324	107.7	-2.3
4	*2462.00	93.8 AV			1.71 H	324	96.1	-2.3
5	2483.50	64.2 PK	74.0	-9.8	1.71 H	324	66.4	-2.2
6	2483.50	44.1 AV	54.0	-9.9	1.71 H	324	46.3	-2.2
7	4924.00	37.9 PK	74.0	-36.1	1.49 H	96	34.9	3.0
8	4924.00	23.8 AV	54.0	-30.2	1.49 H	96	20.8	3.0
9	7386.00	44.8 PK	74.0	-29.2	2.32 H	70	35.1	9.7
10	7386.00	30.7 AV	54.0	-23.3	2.32 H	70	21.0	9.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.50	60.3 PK	74.0	-13.7	1.55 V	174	62.3	-2.0
2	2386.50	47.6 AV	54.0	-6.4	1.55 V	174	49.6	-2.0
3	*2462.00	116.6 PK			1.55 V	174	118.9	-2.3
4	*2462.00	104.8 AV			1.55 V	174	107.1	-2.3
5	2483.50	69.2 PK	74.0	-4.8	1.55 V	174	71.4	-2.2
6	2483.50	49.2 AV	54.0	-4.8	1.55 V	174	51.4	-2.2
7	4924.00	38.1 PK	74.0	-35.9	2.91 V	60	35.1	3.0
8	4924.00	23.9 AV	54.0	-30.1	2.91 V	60	20.9	3.0
9	7386.00	45.6 PK	74.0	-28.4	1.84 V	243	35.9	9.7
10	7386.00	30.8 AV	54.0	-23.2	1.84 V	243	21.1	9.7

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.

VHT20

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	63.7 PK	74.0	-10.3	1.72 H	314	65.7	-2.0
2	2390.00	43.8 AV	54.0	-10.2	1.72 H	314	45.8	-2.0
3	*2412.00	105.5 PK			1.73 H	320	107.6	-2.1
4	*2412.00	93.9 AV			1.73 H	320	96.0	-2.1
5	4824.00	39.0 PK	74.0	-35.0	1.41 H	87	36.3	2.7
6	4824.00	24.5 AV	54.0	-29.5	1.41 H	87	21.8	2.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.5 PK	74.0	-3.5	1.59 V	186	72.5	-2.0
2	2390.00	52.4 AV	54.0	-1.6	1.59 V	186	54.4	-2.0
3	*2412.00	117.1 PK			1.59 V	186	119.2	-2.1
4	*2412.00	107.4 AV			1.59 V	186	109.5	-2.1
5	4824.00	38.4 PK	74.0	-35.6	2.95 V	46	35.7	2.7
6	4824.00	23.9 AV	54.0	-30.1	2.95 V	46	21.2	2.7

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	60.8 PK	74.0	-13.2	1.69 H	349	62.8	-2.0
2	2390.00	46.4 AV	54.0	-7.6	1.69 H	349	48.4	-2.0
3	*2437.00	113.6 PK			1.63 H	352	115.9	-2.3
4	*2437.00	101.3 AV			1.63 H	352	103.6	-2.3
5	2483.50	57.9 PK	74.0	-16.1	1.64 H	331	60.1	-2.2
6	2483.50	43.8 AV	54.0	-10.2	1.64 H	331	46.0	-2.2
7	2484.50	59.4 PK	74.0	-14.6	1.64 H	331	61.6	-2.2
8	2484.50	45.3 AV	54.0	-8.7	1.64 H	331	47.5	-2.2
9	4874.00	49.1 PK	74.0	-24.9	2.50 H	64	46.2	2.9
10	4874.00	34.1 AV	54.0	-19.9	2.50 H	64	31.2	2.9
11	7311.00	45.0 PK	74.0	-29.0	2.31 H	89	35.7	9.3
12	7311.00	30.7 AV	54.0	-23.3	2.31 H	89	21.4	9.3

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	1.55 V	182	64.6	-2.0
2	2390.00	52.1 AV	54.0	-1.9	1.55 V	182	54.1	-2.0
3	*2437.00	123.9 PK			1.55 V	182	126.2	-2.3
4	*2437.00	112.5 AV			1.55 V	182	114.8	-2.3
5	2483.50	64.8 PK	74.0	-9.2	1.55 V	182	67.0	-2.2
6	2483.50	51.7 AV	54.0	-2.3	1.55 V	182	53.9	-2.2
7	2484.50	66.2 PK	74.0	-7.8	1.55 V	182	68.4	-2.2
8	2484.50	53.2 AV	54.0	-0.8	1.55 V	182	55.4	-2.2
9	4874.00	49.9 PK	74.0	-24.1	2.98 V	44	47.0	2.9
10	4874.00	35.8 AV	54.0	-18.2	2.98 V	44	32.9	2.9
11	7311.00	46.1 PK	74.0	-27.9	1.84 V	242	36.8	9.3
12	7311.00	31.7 AV	54.0	-22.3	1.84 V	242	22.4	9.3

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	105.3 PK			1.69 H	336	107.6	-2.3
2	*2462.00	93.7 AV			1.69 H	336	96.0	-2.3
3	2483.50	63.3 PK	74.0	-10.7	1.69 H	336	65.5	-2.2
4	2483.50	42.9 AV	54.0	-11.1	1.69 H	336	45.1	-2.2
5	2484.50	64.5 PK	74.0	-9.5	1.69 H	336	66.7	-2.2
6	2484.50	44.1 AV	54.0	-9.9	1.69 H	336	46.3	-2.2
7	4924.00	38.7 PK	74.0	-35.3	1.41 H	82	35.7	3.0
8	4924.00	24.5 AV	54.0	-29.5	1.41 H	82	21.5	3.0
9	7386.00	45.2 PK	74.0	-28.8	2.31 H	75	35.5	9.7
10	7386.00	30.9 AV	54.0	-23.1	2.31 H	75	21.2	9.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.3 PK			1.51 V	181	118.6	-2.3
2	*2462.00	105.5 AV			1.51 V	181	107.8	-2.3
3	2483.50	72.3 PK	74.0	-1.7	1.51 V	181	74.5	-2.2
4	2483.50	52.6 AV	54.0	-1.4	1.51 V	181	54.8	-2.2
5	2484.50	73.5 PK	74.0	-0.5	1.51 V	181	75.7	-2.2
6	2484.50	53.8 AV	54.0	-0.2	1.51 V	181	56.0	-2.2
7	4924.00	38.4 PK	74.0	-35.6	3.00 V	33	35.4	3.0
8	4924.00	23.7 AV	54.0	-30.3	3.00 V	33	20.7	3.0
9	7386.00	45.4 PK	74.0	-28.6	1.80 V	259	35.7	9.7
10	7386.00	30.9 AV	54.0	-23.1	1.80 V	259	21.2	9.7

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.

VHT40

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	64.2 PK	74.0	-9.8	1.61 H	345	66.2	-2.0
2	2390.00	44.4 AV	54.0	-9.6	1.61 H	345	46.4	-2.0
3	*2422.00	102.7 PK			1.61 H	345	104.9	-2.2
4	*2422.00	90.8 AV			1.61 H	345	93.0	-2.2
5	4844.00	38.4 PK	74.0	-35.6	1.49 H	83	35.7	2.7
6	4844.00	23.9 AV	54.0	-30.1	1.49 H	83	21.2	2.7
7	7266.00	45.2 PK	74.0	-28.8	2.37 H	85	36.1	9.1
8	7266.00	31.2 AV	54.0	-22.8	2.37 H	85	22.1	9.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.4 PK	74.0	-5.6	1.44 V	198	70.4	-2.0
2	2390.00	53.9 AV	54.0	-0.1	1.44 V	198	55.9	-2.0
3	*2422.00	117.1 PK			1.44 V	198	119.3	-2.2
4	*2422.00	104.6 AV			1.44 V	198	106.8	-2.2
5	4844.00	38.7 PK	74.0	-35.3	2.91 V	58	36.0	2.7
6	4844.00	24.0 AV	54.0	-30.0	2.91 V	58	21.3	2.7
7	7266.00	45.9 PK	74.0	-28.1	1.87 V	242	36.8	9.1
8	7266.00	31.4 AV	54.0	-22.6	1.87 V	242	22.3	9.1

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	51.8 PK	74.0	-22.2	1.63 H	344	53.8	-2.0
2	2390.00	47.4 AV	54.0	-6.6	1.63 H	344	49.4	-2.0
3	*2437.00	103.5 PK			1.63 H	344	105.8	-2.3
4	*2437.00	91.4 AV			1.63 H	344	93.7	-2.3
5	2484.90	50.4 PK	74.0	-23.6	1.63 H	344	52.6	-2.2
6	2484.90	46.8 AV	54.0	-7.2	1.63 H	344	49.0	-2.2
7	4874.00	38.3 PK	74.0	-35.7	1.47 H	102	35.4	2.9
8	4874.00	24.0 AV	54.0	-30.0	1.47 H	102	21.1	2.9
9	7311.00	44.6 PK	74.0	-29.4	2.39 H	80	35.3	9.3
10	7311.00	30.8 AV	54.0	-23.2	2.39 H	80	21.5	9.3

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	64.8 PK	74.0	-9.2	1.46 V	195	66.8	-2.0
2	2390.00	53.2 AV	54.0	-0.8	1.46 V	195	55.2	-2.0
3	*2437.00	117.3 PK			1.46 V	195	119.6	-2.3
4	*2437.00	105.3 AV			1.46 V	195	107.6	-2.3
5	2484.90	73.8 PK	74.0	-0.2	1.46 V	195	76.0	-2.2
6	2484.90	53.9 AV	54.0	-0.1	1.46 V	195	56.1	-2.2
7	4874.00	38.4 PK	74.0	-35.6	2.99 V	37	35.5	2.9
8	4874.00	24.0 AV	54.0	-30.0	2.99 V	37	21.1	2.9
9	7311.00	45.7 PK	74.0	-28.3	1.87 V	245	36.4	9.3
10	7311.00	31.2 AV	54.0	-22.8	1.87 V	245	21.9	9.3

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	101.4 PK			1.66 H	347	103.7	-2.3
2	*2452.00	89.9 AV			1.66 H	347	92.2	-2.3
3	2483.50	63.4 PK	74.0	-10.6	1.66 H	347	65.6	-2.2
4	2483.50	43.8 AV	54.0	-10.2	1.66 H	347	46.0	-2.2
5	4904.00	38.5 PK	74.0	-35.5	1.45 H	88	35.6	2.9
6	4904.00	24.1 AV	54.0	-29.9	1.45 H	88	21.2	2.9
7	7356.00	45.3 PK	74.0	-28.7	2.37 H	99	35.6	9.7
8	7356.00	31.3 AV	54.0	-22.7	2.37 H	99	21.6	9.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	114.8 PK			1.57 V	201	117.1	-2.3
2	*2452.00	102.7 AV			1.57 V	201	105.0	-2.3
3	2483.50	69.4 PK	74.0	-4.6	1.57 V	201	71.6	-2.2
4	2483.50	53.8 AV	54.0	-0.2	1.57 V	201	56.0	-2.2
5	4904.00	38.2 PK	74.0	-35.8	2.91 V	35	35.3	2.9
6	4904.00	23.9 AV	54.0	-30.1	2.91 V	35	21.0	2.9
7	7356.00	45.5 PK	74.0	-28.5	1.87 V	256	35.8	9.7
8	7356.00	31.0 AV	54.0	-23.0	1.87 V	256	21.3	9.7

REMARKS:

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

Below 1GHz Data:

802.11g

CHANNEL	TX Channel 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	81.12	29.3 QP	40.0	-10.7	2.00 H	245	42.0	-12.7
2	107.02	28.8 QP	43.5	-14.7	1.50 H	287	40.0	-11.2
3	383.47	27.5 QP	46.0	-18.5	1.00 H	35	32.1	-4.6
4	538.45	33.2 QP	46.0	-12.8	2.00 H	186	34.3	-1.1
5	806.17	32.9 QP	46.0	-13.1	1.00 H	351	29.0	3.9
6	907.80	35.4 QP	46.0	-10.6	1.50 H	223	29.9	5.5

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	56.51	35.9 QP	40.0	-4.1	1.00 V	78	44.0	-8.1
2	79.40	36.3 QP	40.0	-3.7	2.00 V	355	48.6	-12.3
3	524.99	30.8 QP	46.0	-15.2	1.00 V	66	32.1	-1.3
4	704.15	30.0 QP	46.0	-16.0	2.00 V	93	28.0	2.0
5	824.07	32.9 QP	46.0	-13.1	1.50 V	344	28.7	4.2
6	955.77	34.6 QP	46.0	-11.4	1.00 V	270	28.6	6.0

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

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,

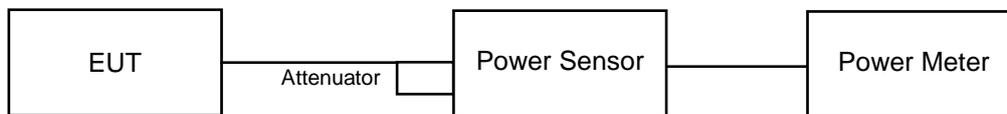
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

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

CDD Mode

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	23.31	22.93	23.39	628.898	27.99	30	Pass
6	2437	23.79	23.92	24.29	754.47	28.78	30	Pass
11	2462	23.17	22.98	23.35	622.372	27.94	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	16.81	16.48	16.75	139.751	21.45	30	Pass
6	2437	23.96	23.95	24.39	771.988	28.88	30	Pass
11	2462	16.97	16.66	16.76	143.543	21.57	30	Pass

Beamforming Mode

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
1	2412	17.14	16.48	16.92	145.428	21.63	30	Pass
6	2437	23.92	23.73	24.22	746.893	28.73	30	Pass
11	2462	16.64	16.42	16.41	133.737	21.26	30	Pass

Note: Directional gain = $0.6\text{dBi} + 10\log(3) = 5.37\text{dBi} < 6\text{dBi}$, so the power limit shall not be reduced.

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
3	2422	16.65	16.22	16.27	130.481	21.16	30	Pass
6	2437	16.99	16.95	16.86	148.077	21.70	30	Pass
9	2452	14.32	14.16	14.32	80.142	19.04	30	Pass

Note: Directional gain = $0.6\text{dBi} + 10\log(3) = 5.37\text{dBi} < 6\text{dBi}$, so the power limit shall not be reduced.

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.

If you have any comments, please feel free to contact us at the following:

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

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