FCC Test Report

Report No.:	RF160630E01
FCC ID:	PY316200349
Test Model:	VMC4030
Received Date:	June 30, 2016
Test Date:	July 14 to Aug. 02, 2016
Issued Date:	Aug. 19, 2016
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
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF160630E01	Original release.	Aug. 19, 2016

1 Certificate of Conformity

Product:	Arlo Pro
Brand:	NETGEAR
Test Model:	VMC4030
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, INC.
Test Date:	July 14 to Aug. 02, 2016
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Aug. 19, 2016

Wendy Wu / Specialist

Approved by : _____ , **Date:** Aug. 19, 2016

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (SECTION 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -9.04dB at 0.40391MHz.
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, 2483.50MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
	1GHz ~ 6GHz	3.43 dB
Radiated Emissions above 1 GHz	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Arlo Pro
Brand	NETGEAR
Test Model	VMC4030
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	5Vdc or 9Vdc from power adapter or 7.2Vdc from battery
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 72Mbps
Operating Frequency	2.412GHz ~ 2.462GHz
Number of Channel	11
Output Power	233.346mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	USB cable x 1 (unshielded, 2m)

Note:

1. The EUT could be supplied from a power adapter and a battery as following table:

Adapter		
Brand	Model No.	Spec.
NETGEAR	AD2085320	Input: 100-240Vac, 0.3A, 50/60Hz Output: 5V or 9V, 1.1A or 1.8A
Battery		
Brand	Model No.	Spec.
NETGEAR	A-1	7.2Vdc, 2440mAh
Note: For radiated emission test, the EUT was pre-tested with above adapter and battery, the worst case was found in adapter. Therefore only the test data of the adapter was recorded in this report.		

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

Antenna Set.	Brand	Model	Antenna Gain (dBi)	Frequency range (GHz to GHz)	Antenna Type	Connector Type	Cable Loss (db)	Cable Length (mm)
1	Master Wave	9 8P4ZMIPF000	1.24	2.4~2.4835	Metal	i-pex(MHF)	NA	31+/-5
			0.62	2.4~2.4835	Metal	i-pex(MHF)	NA	45+/-5

3. The EUT incorporates a SISO function.

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

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

3.2 Description of Test Modes

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	With adapter
2	-	-	√	-	With Notebook computer

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **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 (below 1GHz) and Y-plane (above 1GHz)**.

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

Test Condition:

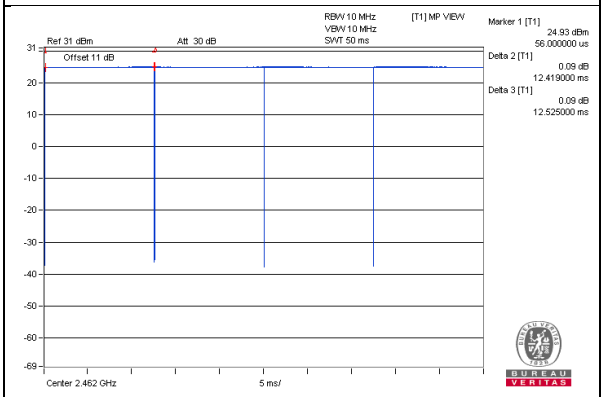
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	24deg. C, 63%RH	120Vac, 60Hz	Jyunchun Lin
RE<1G	25deg. C, 73%RH	120Vac, 60Hz	Gary Cheng
PLC	24deg. C, 62%RH	120Vac, 60Hz	Jyunchun Lin
APCM	26deg. C, 62%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

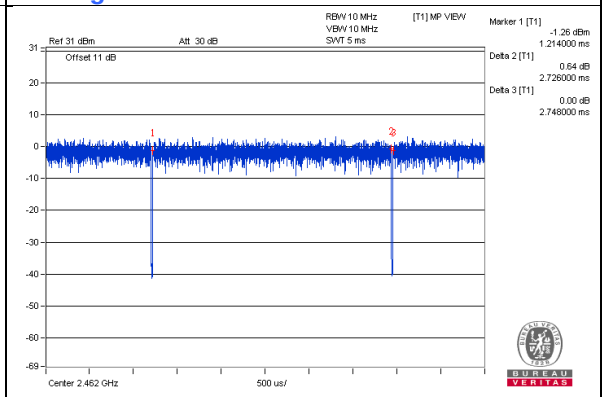
If duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11b: Duty cycle = 12.419/12.525 = 0.992
802.11g: Duty cycle = 2.726/2.748 = 0.992
802.11n (HT20): Duty cycle = 2.535/2.556 = 0.992

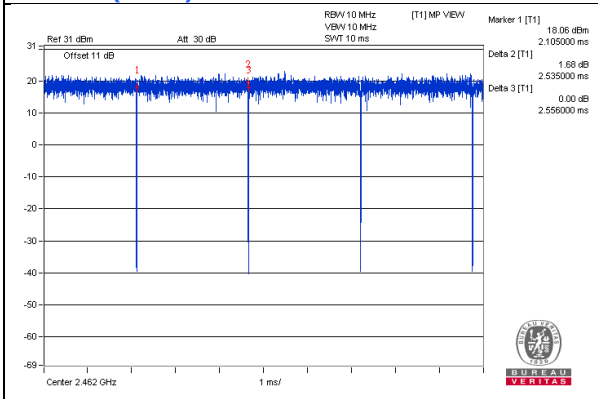
802.11b



802.11g



802.11n (HT20)



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook Computer	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab

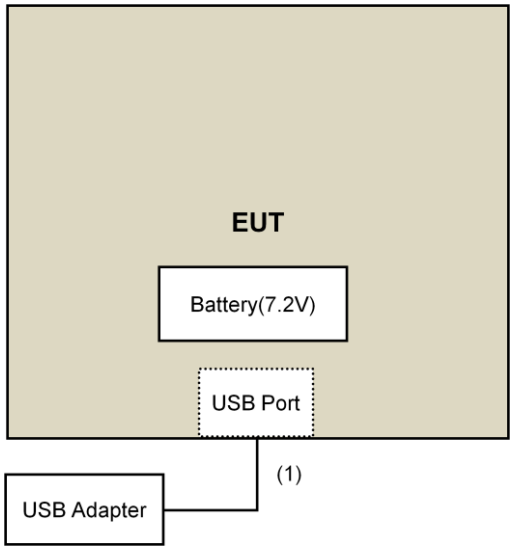
Note:

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

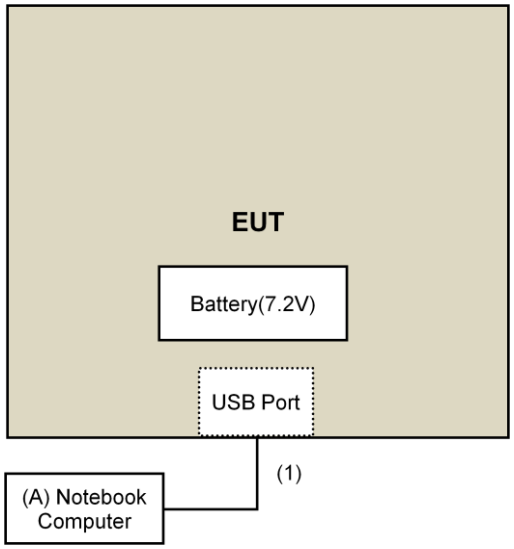
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Cable	1	2	No	0	Supplied by client

3.4.1 Configuration of System under Test

Adapter Mode:



Notebook Computer Mode:



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 v03r05
ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 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 Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	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	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 05, 2016	May 04, 2017
Power sensor Anritsu	MA2411B	0917122	May 05, 2016	May 04, 2017

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
7. Tested Date: July 14 to Aug. 02, 2016

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

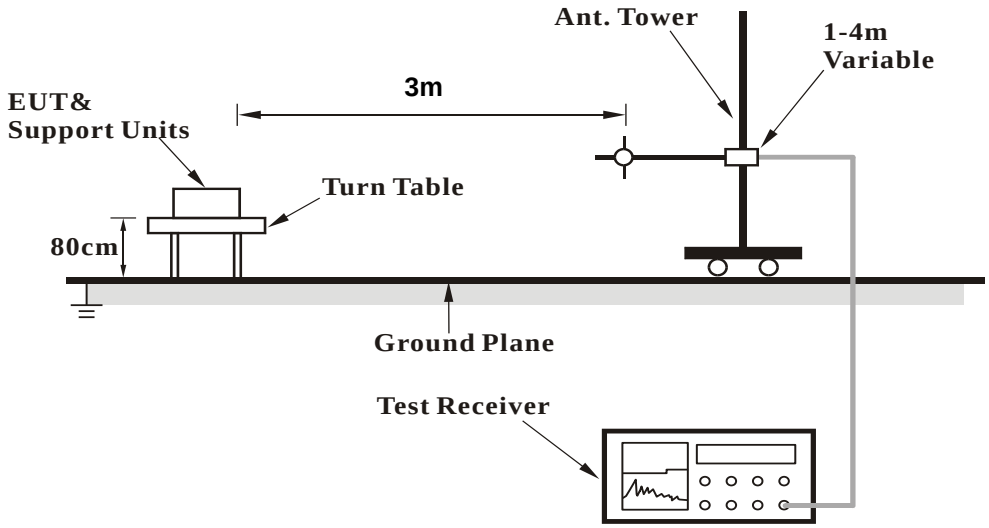
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

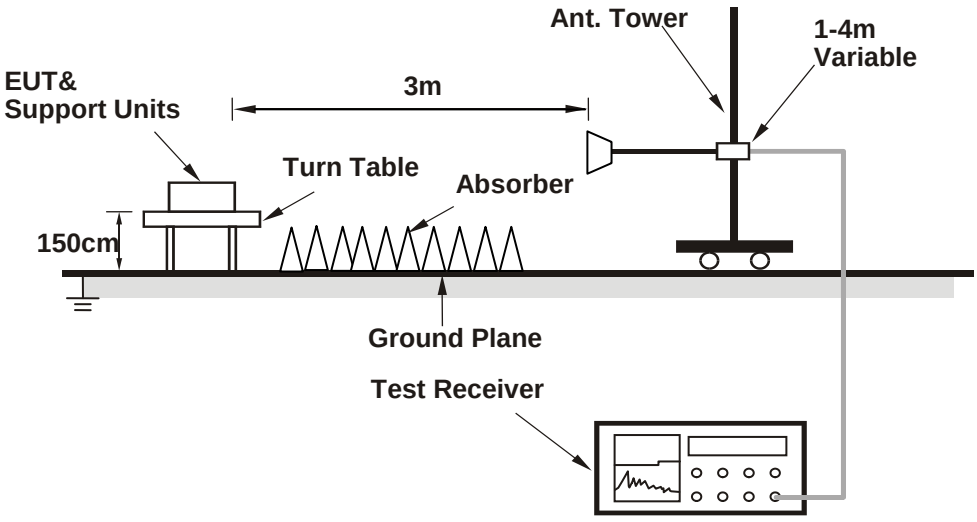
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Notebook Computer which is placed on remote site.
b. Contorlling software (PuTTY Configuration.exe) 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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.4 PK	74.0	-15.6	1.01 H	142	64.0	-5.6
2	2390.00	51.3 AV	54.0	-2.7	1.01 H	142	56.9	-5.6
3	*2412.00	105.4 PK			1.01 H	142	110.9	-5.5
4	*2412.00	103.2 AV			1.01 H	142	108.7	-5.5
5	4824.00	42.7 PK	74.0	-31.3	1.88 H	103	41.8	0.9
6	4824.00	35.6 AV	54.0	-18.4	1.88 H	103	34.7	0.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.5 PK	74.0	-13.5	1.98 V	41	66.1	-5.6
2	2390.00	53.7 AV	54.0	-0.3	1.98 V	41	59.3	-5.6
3	*2412.00	107.9 PK			1.98 V	41	113.4	-5.5
4	*2412.00	105.8 AV			1.98 V	41	111.3	-5.5
5	4824.00	43.6 PK	74.0	-30.4	2.04 V	190	42.7	0.9
6	4824.00	36.4 AV	54.0	-17.6	2.04 V	190	35.5	0.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.3 PK	74.0	-20.7	1.01 H	150	58.9	-5.6
2	2390.00	44.0 AV	54.0	-10.0	1.01 H	150	49.6	-5.6
3	*2437.00	106.1 PK			1.01 H	150	111.5	-5.4
4	*2437.00	103.8 AV			1.01 H	150	109.2	-5.4
5	2483.50	51.5 PK	74.0	-22.5	1.01 H	150	56.8	-5.3
6	2483.50	40.0 AV	54.0	-14.0	1.01 H	150	45.3	-5.3
7	4874.00	43.1 PK	74.0	-30.9	2.04 H	111	42.1	1.0
8	4874.00	36.0 AV	54.0	-18.0	2.04 H	111	35.0	1.0
9	7311.00	49.4 PK	74.0	-24.6	1.50 H	58	41.8	7.6
10	7311.00	40.3 AV	54.0	-13.7	1.50 H	58	32.7	7.6
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	2390.00	55.3 PK	74.0	-18.7	2.00 V	40	60.9	-5.6
2	2390.00	46.3 AV	54.0	-7.7	2.00 V	40	51.9	-5.6
3	*2437.00	108.6 PK			2.00 V	40	114.0	-5.4
4	*2437.00	106.3 AV			2.00 V	40	111.7	-5.4
5	2483.50	51.7 PK	74.0	-22.3	2.00 V	40	57.0	-5.3
6	2483.50	40.2 AV	54.0	-13.8	2.00 V	40	45.5	-5.3
7	4874.00	42.7 PK	74.0	-31.3	1.97 V	188	41.7	1.0
8	4874.00	35.1 AV	54.0	-18.9	1.97 V	188	34.1	1.0
9	7311.00	50.7 PK	74.0	-23.3	1.08 V	95	43.1	7.6
10	7311.00	41.5 AV	54.0	-12.5	1.08 V	95	33.9	7.6

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.2 PK			1.00 H	141	110.5	-5.3
2	*2462.00	103.1 AV			1.00 H	141	108.4	-5.3
3	2483.50	57.6 PK	74.0	-16.4	1.00 H	141	62.9	-5.3
4	2483.50	51.2 AV	54.0	-2.8	1.00 H	141	56.5	-5.3
5	4924.00	43.5 PK	74.0	-30.5	2.04 H	120	42.2	1.3
6	4924.00	36.2 AV	54.0	-17.8	2.04 H	120	34.9	1.3
7	7386.00	49.5 PK	74.0	-24.5	1.52 H	69	41.8	7.7
8	7386.00	40.1 AV	54.0	-13.9	1.52 H	69	32.4	7.7
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	107.6 PK			2.34 V	38	112.9	-5.3
2	*2462.00	105.7 AV			2.34 V	38	111.0	-5.3
3	2483.50	59.8 PK	74.0	-14.2	2.34 V	38	65.1	-5.3
4	2483.50	53.5 AV	54.0	-0.5	2.34 V	38	58.8	-5.3
5	4924.00	43.2 PK	74.0	-30.8	2.00 V	187	41.9	1.3
6	4924.00	35.7 AV	54.0	-18.3	2.00 V	187	34.4	1.3
7	7386.00	50.4 PK	74.0	-23.6	1.12 V	100	42.7	7.7
8	7386.00	40.3 AV	54.0	-13.7	1.12 V	100	32.6	7.7

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.7 PK	74.0	-2.3	1.07 H	129	77.3	-5.6
2	2390.00	50.6 AV	54.0	-3.4	1.07 H	129	56.2	-5.6
3	*2412.00	104.4 PK			1.07 H	129	109.9	-5.5
4	*2412.00	92.8 AV			1.07 H	129	98.3	-5.5
5	4824.00	42.8 PK	74.0	-31.2	2.01 H	122	41.9	0.9
6	4824.00	35.9 AV	54.0	-18.1	2.01 H	122	35.0	0.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**2390.00**	**73.9 PK**	**74.0**	**-0.1**	**2.36 V**	**51**	**79.5**	**-5.6**
2	2390.00	52.8 AV	54.0	-1.2	2.36 V	51	58.4	-5.6
3	*2412.00	106.9 PK			2.36 V	51	112.4	-5.5
4	*2412.00	95.4 AV			2.36 V	51	100.9	-5.5
5	4824.00	42.5 PK	74.0	-31.5	2.20 V	179	41.6	0.9
6	4824.00	35.3 AV	54.0	-18.7	2.20 V	179	34.4	0.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.1 PK	74.0	-8.9	1.03 H	134	70.7	-5.6
2	2390.00	46.1 AV	54.0	-7.9	1.03 H	134	51.7	-5.6
3	*2437.00	109.0 PK			1.03 H	134	114.4	-5.4
4	*2437.00	97.7 AV			1.03 H	134	103.1	-5.4
5	2483.50	64.4 PK	74.0	-9.6	1.03 H	134	69.7	-5.3
6	2483.50	41.8 AV	54.0	-12.2	1.03 H	134	47.1	-5.3
7	4874.00	44.3 PK	74.0	-29.7	2.10 H	128	43.3	1.0
8	4874.00	35.8 AV	54.0	-18.2	2.10 H	128	34.8	1.0
9	7311.00	50.2 PK	74.0	-23.8	1.45 H	62	42.6	7.6
10	7311.00	40.8 AV	54.0	-13.2	1.45 H	62	33.2	7.6
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	2390.00	67.2 PK	74.0	-6.8	2.32 V	28	72.8	-5.6
2	2390.00	48.4 AV	54.0	-5.6	2.32 V	28	54.0	-5.6
3	*2437.00	111.4 PK			2.32 V	28	116.8	-5.4
4	*2437.00	100.2 AV			2.32 V	28	105.6	-5.4
5	2483.50	66.6 PK	74.0	-7.4	2.32 V	28	71.9	-5.3
6	2483.50	43.9 AV	54.0	-10.1	2.32 V	28	49.2	-5.3
7	4874.00	42.2 PK	74.0	-31.8	2.18 V	183	41.2	1.0
8	4874.00	34.4 AV	54.0	-19.6	2.18 V	183	33.4	1.0
9	7311.00	50.3 PK	74.0	-23.7	1.19 V	96	42.7	7.6
10	7311.00	41.6 AV	54.0	-12.4	1.19 V	96	34.0	7.6

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.8 PK			1.07 H	123	108.1	-5.3
2	*2462.00	91.2 AV			1.07 H	123	96.5	-5.3
3	2483.50	71.6 PK	74.0	-2.4	1.07 H	123	76.9	-5.3
4	2483.50	49.1 AV	54.0	-4.9	1.07 H	123	54.4	-5.3
5	4924.00	43.8 PK	74.0	-30.2	1.99 H	111	42.5	1.3
6	4924.00	35.4 AV	54.0	-18.6	1.99 H	111	34.1	1.3
7	7386.00	49.5 PK	74.0	-24.5	1.52 H	83	41.8	7.7
8	7386.00	40.0 AV	54.0	-14.0	1.52 H	83	32.3	7.7
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	105.2 PK			2.31 V	33	110.5	-5.3
2	*2462.00	93.8 AV			2.31 V	33	99.1	-5.3
3	**2483.50**	**73.9 PK**	**74.0**	**-0.1**	**2.31 V**	**33**	**79.2**	**-5.3**
4	2483.50	51.4 AV	54.0	-2.6	2.31 V	33	56.7	-5.3
5	4924.00	41.8 PK	74.0	-32.2	2.22 V	188	40.5	1.3
6	4924.00	34.4 AV	54.0	-19.6	2.22 V	188	33.1	1.3
7	7386.00	50.4 PK	74.0	-23.6	1.23 V	108	42.7	7.7
8	7386.00	40.2 AV	54.0	-13.8	1.23 V	108	32.5	7.7

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.

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.6 PK	74.0	-2.4	1.04 H	145	77.2	-5.6
2	2390.00	50.2 AV	54.0	-3.8	1.04 H	145	55.8	-5.6
3	*2412.00	103.9 PK			1.04 H	145	109.4	-5.5
4	*2412.00	91.7 AV			1.04 H	145	97.2	-5.5
5	4824.00	43.9 PK	74.0	-30.1	1.94 H	102	43.0	0.9
6	4824.00	36.4 AV	54.0	-17.6	1.94 H	102	35.5	0.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.8 PK	74.0	-0.2	2.37 V	43	79.4	-5.6
2	2390.00	52.5 AV	54.0	-1.5	2.37 V	43	58.1	-5.6
3	*2412.00	106.3 PK			2.37 V	43	111.8	-5.5
4	*2412.00	94.2 AV			2.37 V	43	99.7	-5.5
5	4824.00	40.3 PK	74.0	-33.7	2.11 V	174	39.4	0.9
6	4824.00	33.2 AV	54.0	-20.8	2.11 V	174	32.3	0.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.9 PK	74.0	-6.1	1.02 H	135	73.5	-5.6
2	2390.00	48.0 AV	54.0	-6.0	1.02 H	135	53.6	-5.6
3	*2437.00	108.2 PK			1.02 H	135	113.6	-5.4
4	*2437.00	96.6 AV			1.02 H	135	102.0	-5.4
5	2483.50	67.5 PK	74.0	-6.5	1.02 H	135	72.8	-5.3
6	2483.50	44.1 AV	54.0	-9.9	1.02 H	135	49.4	-5.3
7	4874.00	43.6 PK	74.0	-30.4	1.97 H	126	42.6	1.0
8	4874.00	35.2 AV	54.0	-18.8	1.97 H	126	34.2	1.0
9	7311.00	49.6 PK	74.0	-24.4	1.56 H	99	42.0	7.6
10	7311.00	39.9 AV	54.0	-14.1	1.56 H	99	32.3	7.6
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	2390.00	70.1 PK	74.0	-3.9	2.55 V	30	75.7	-5.6
2	2390.00	50.2 AV	54.0	-3.8	2.55 V	30	55.8	-5.6
3	*2437.00	110.6 PK			2.55 V	30	116.0	-5.4
4	*2437.00	99.2 AV			2.55 V	30	104.6	-5.4
5	2483.50	69.7 PK	74.0	-4.3	2.55 V	30	75.0	-5.3
6	2483.50	46.2 AV	54.0	-7.8	2.55 V	30	51.5	-5.3
7	4874.00	41.5 PK	74.0	-32.5	2.18 V	160	40.5	1.0
8	4874.00	33.1 AV	54.0	-20.9	2.18 V	160	32.1	1.0
9	7311.00	48.6 PK	74.0	-25.4	1.35 V	92	41.0	7.6
10	7311.00	40.7 AV	54.0	-13.3	1.35 V	92	33.1	7.6

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.1 PK			1.08 H	134	107.4	-5.3
2	*2462.00	90.3 AV			1.08 H	134	95.6	-5.3
3	2483.50	71.7 PK	74.0	-2.3	1.08 H	134	77.0	-5.3
4	2483.50	48.7 AV	54.0	-5.3	1.08 H	134	54.0	-5.3
5	4924.00	43.8 PK	74.0	-30.2	1.95 H	121	42.5	1.3
6	4924.00	35.3 AV	54.0	-18.7	1.95 H	121	34.0	1.3
7	7386.00	48.9 PK	74.0	-25.1	1.50 H	75	41.2	7.7
8	7386.00	39.5 AV	54.0	-14.5	1.50 H	75	31.8	7.7
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	104.4 PK			2.44 V	39	109.7	-5.3
2	*2462.00	92.9 AV			2.44 V	39	98.2	-5.3
3	**2483.50**	**73.9 PK**	**74.0**	**-0.1**	**2.44 V**	**39**	**79.2**	**-5.3**
4	2483.50	50.9 AV	54.0	-3.1	2.44 V	39	56.2	-5.3
5	4924.00	41.2 PK	74.0	-32.8	2.09 V	146	39.9	1.3
6	4924.00	32.8 AV	54.0	-21.2	2.09 V	146	31.5	1.3
7	7386.00	48.3 PK	74.0	-25.7	1.44 V	108	40.6	7.7
8	7386.00	40.3 AV	54.0	-13.7	1.44 V	108	32.6	7.7

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	below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.05	24.9 QP	40.0	-15.1	1.10 H	123	34.4	-9.5
2	81.60	26.1 QP	40.0	-13.9	1.10 H	144	40.0	-13.9
3	145.16	23.8 QP	43.5	-19.7	1.50 H	134	32.4	-8.6
4	562.51	33.6 QP	46.0	-12.4	1.50 H	231	35.3	-1.7
5	575.99	40.2 QP	46.0	-5.8	1.50 H	240	41.5	-1.3
6	791.98	33.0 QP	46.0	-13.0	1.10 H	135	30.6	2.4
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	34.29	27.0 QP	40.0	-13.0	1.10 V	110	36.5	-9.5
2	56.46	25.8 QP	40.0	-14.2	1.10 V	340	34.8	-9.0
3	84.08	29.8 QP	40.0	-10.2	1.50 V	87	44.0	-14.2
4	141.67	23.0 QP	43.5	-20.5	1.50 V	255	31.8	-8.8
5	528.00	28.4 QP	46.0	-17.6	1.50 V	18	30.7	-2.3
6	575.99	38.1 QP	46.0	-7.9	1.50 V	6	39.4	-1.3

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 23, 2015	Oct. 22, 2016
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 28, 2015	Oct. 27, 2016
RF Cable	5D-FB	COACAB-002	Mar. 04, 2016	Mar. 03, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 20, 2016	June 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 1.
3 Tested Date: Aug. 02, 2016

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

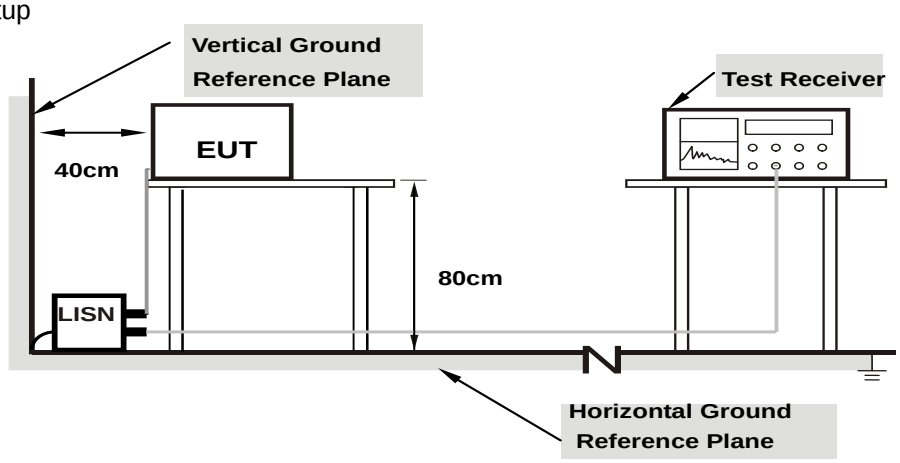
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

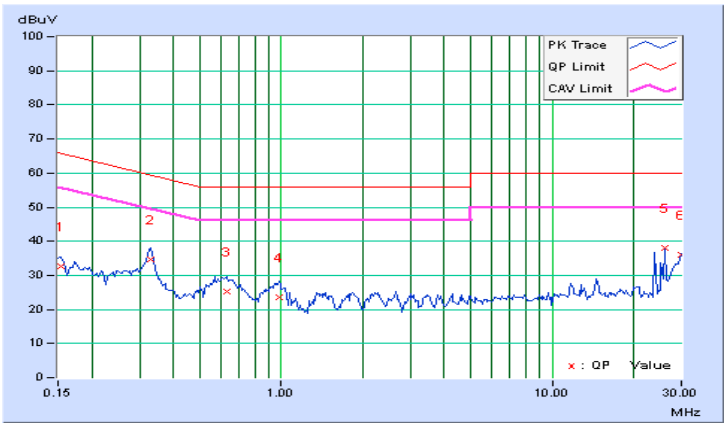
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.21	22.45	11.43	32.66	21.64	65.79	55.79	-33.13	-34.15
2	0.32969	10.22	24.52	17.41	34.74	27.63	59.46	49.46	-24.72	-21.83
3	0.62656	10.24	15.13	7.48	25.37	17.72	56.00	46.00	-30.63	-28.28
4	0.98594	10.26	13.19	6.42	23.45	16.68	56.00	46.00	-32.55	-29.32
5	26.00000	11.46	26.69	25.13	38.15	36.59	60.00	50.00	-21.85	-13.41
6	30.00000	11.53	24.38	22.02	35.91	33.55	60.00	50.00	-24.09	-16.45

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

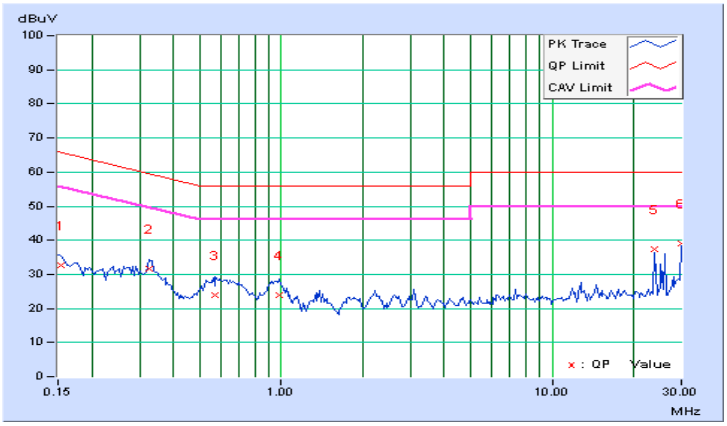


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.19	22.57	8.46	32.76	18.65	65.79	55.79	-33.02	-37.13
2	0.32578	10.20	21.55	12.16	31.75	22.36	59.56	49.56	-27.80	-27.19
3	0.57188	10.21	13.64	5.00	23.85	15.21	56.00	46.00	-32.15	-30.79
4	0.98594	10.24	13.57	5.05	23.81	15.29	56.00	46.00	-32.19	-30.71
5	24.00000	11.13	26.34	25.20	37.47	36.33	60.00	50.00	-22.53	-13.67
6	30.00000	11.13	27.90	23.08	39.03	34.21	60.00	50.00	-20.97	-15.79

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



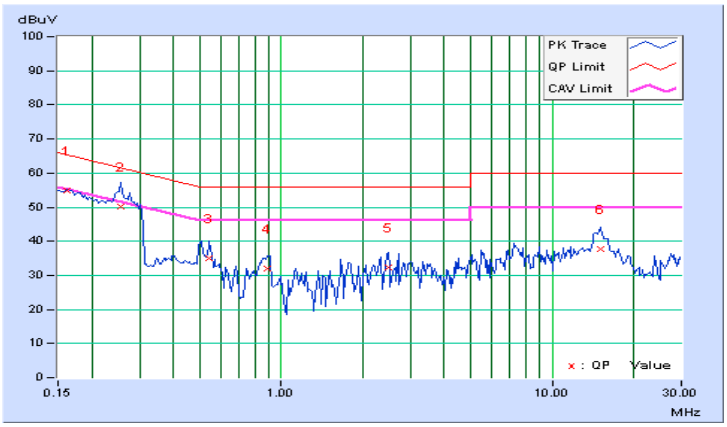
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	10.21	44.68	31.04	54.89	41.25	65.38	55.38	-10.48	-14.12
2	0.25547	10.22	40.06	30.41	50.28	40.63	61.58	51.58	-11.30	-10.95
3	0.54453	10.23	24.85	18.98	35.08	29.21	56.00	46.00	-20.92	-16.79
4	0.88438	10.25	21.61	7.04	31.86	17.29	56.00	46.00	-24.14	-28.71
5	2.47656	10.31	21.97	6.54	32.28	16.85	56.00	46.00	-23.72	-29.15
6	15.05469	11.07	26.57	19.47	37.64	30.54	60.00	50.00	-22.36	-19.46

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

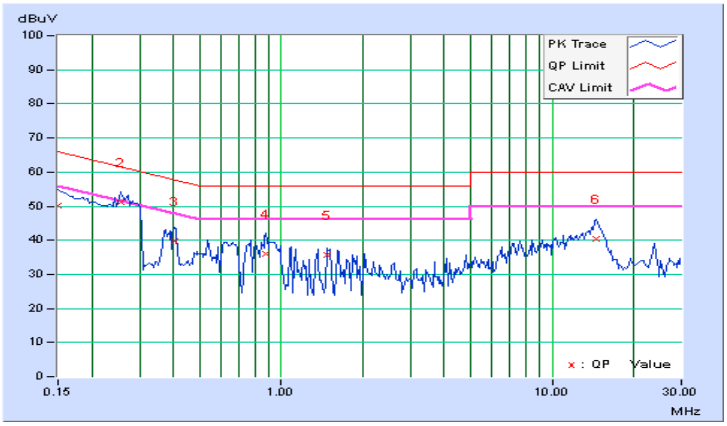


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	40.10	22.85	50.29	33.04	66.00	56.00	-15.71	-22.96
2	0.25547	10.21	40.84	30.01	51.05	40.22	61.58	51.58	-10.53	-11.36
3	**0.40391**	**10.20**	**29.44**	**28.53**	**39.64**	**38.73**	**57.77**	**47.77**	**-18.13**	**-9.04**
4	0.87656	10.23	25.71	19.01	35.94	29.24	56.00	46.00	-20.06	-16.76
5	1.48438	10.26	25.50	16.67	35.76	26.93	56.00	46.00	-20.24	-19.07
6	14.54297	10.85	29.52	22.38	40.37	33.23	60.00	50.00	-19.63	-16.77

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

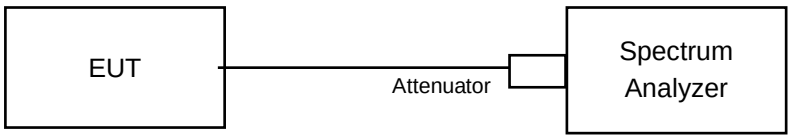


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	9.55	0.5	PASS
6	2437	10.02	0.5	PASS
11	2462	10.09	0.5	PASS

802.11g

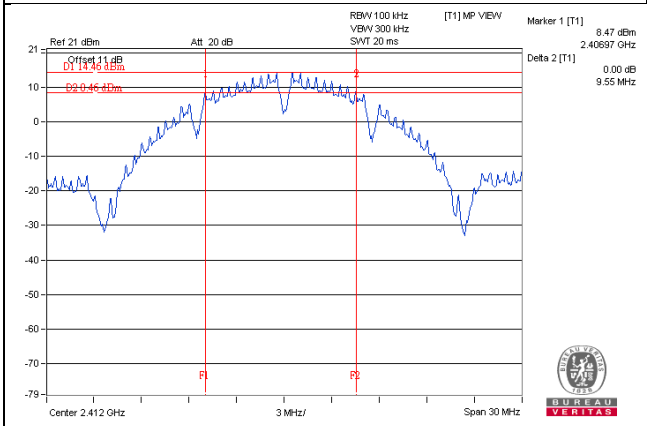
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.52	0.5	PASS
6	2437	16.56	0.5	PASS
11	2462	16.42	0.5	PASS

802.11n (HT20)

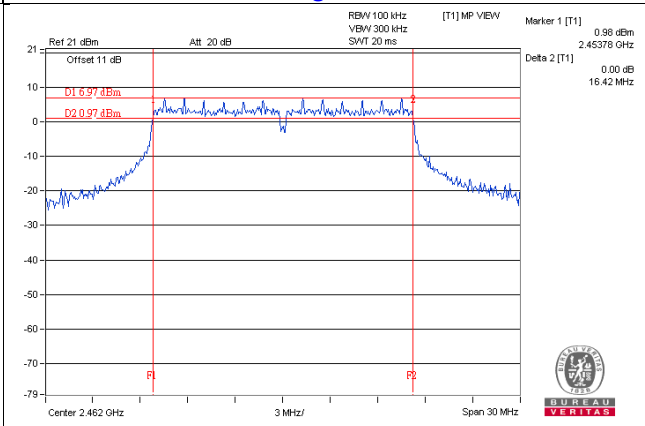
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.72	0.5	Pass
6	2437	17.71	0.5	Pass
11	2462	17.73	0.5	Pass

Spectrum Plot of Worst Value

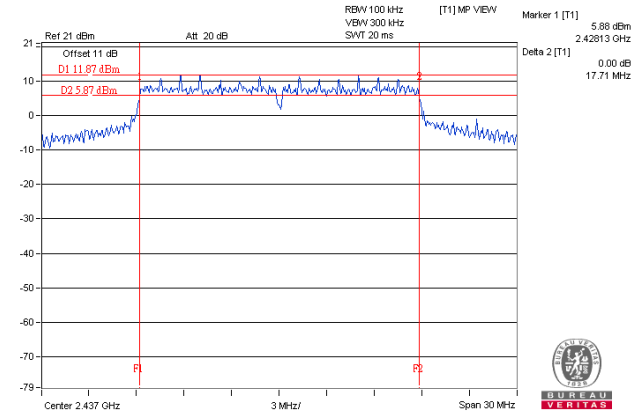
802.11b : CH1



802.11g : CH11



802.11n (HT20) : CH6

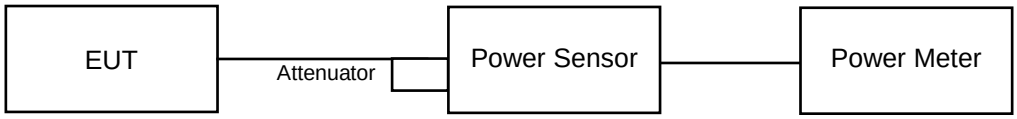


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	195.434	22.91	30	Pass
6	2437	233.346	23.68	30	Pass
11	2462	208.449	23.19	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	71.285	18.53	30	Pass
6	2437	216.77	23.36	30	Pass
11	2462	65.766	18.18	30	Pass

802.11n (HT20)

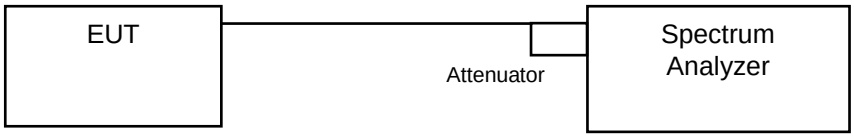
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	59.841	17.77	30	Pass
6	2437	205.116	23.12	30	Pass
11	2462	53.211	17.26	30	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

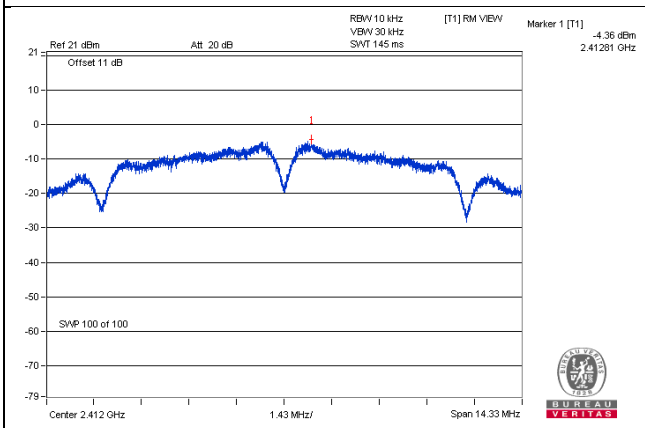
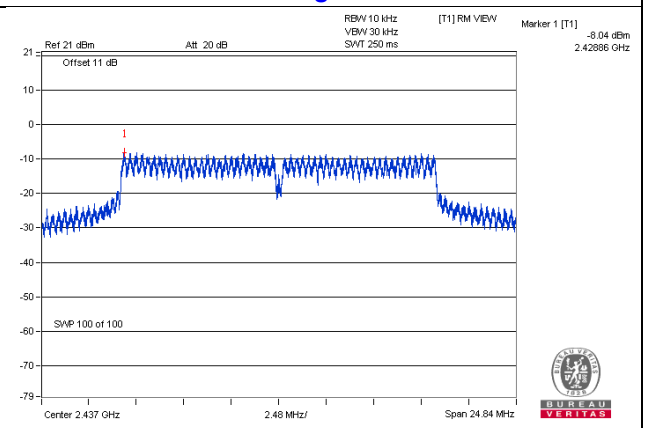
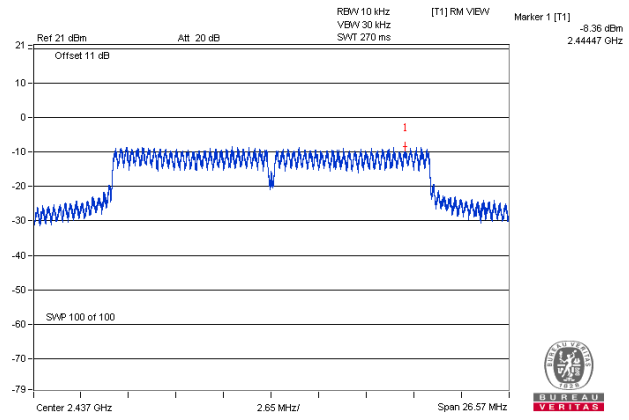
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-4.36	8	Pass
6	2437	-4.98	8	Pass
11	2462	-5.20	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-11.95	8	Pass
6	2437	-8.04	8	Pass
11	2462	-12.04	8	Pass

802.11n (HT20)

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-12.43	8	Pass
6	2437	-8.36	8	Pass
11	2462	-13.61	8	Pass

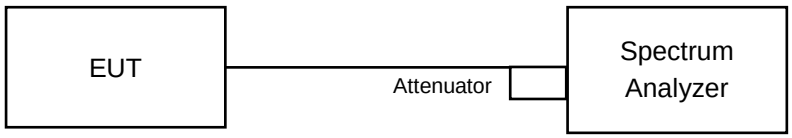
Spectrum Plot of Worst Value	
802.11b : CH1	**802.11g : CH6**
	
802.11n (HT20) : CH6	
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

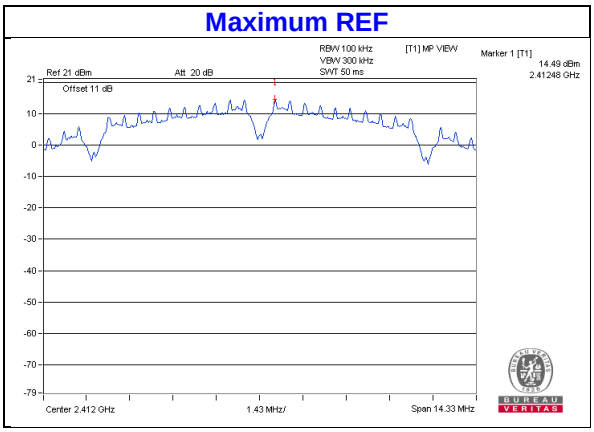
Same as Item 4.3.6

4.6.7 Test Results

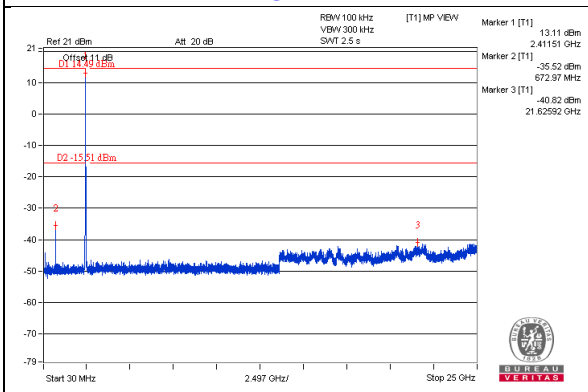
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11b

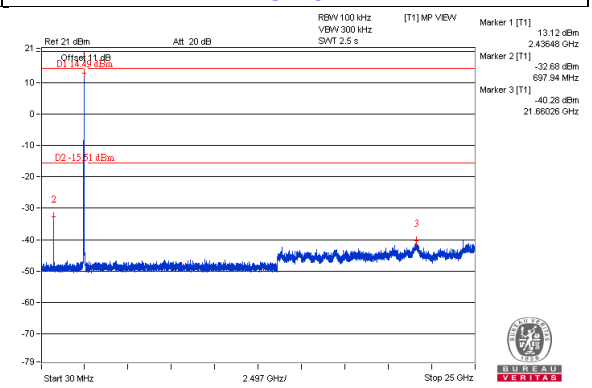
Maximum REF



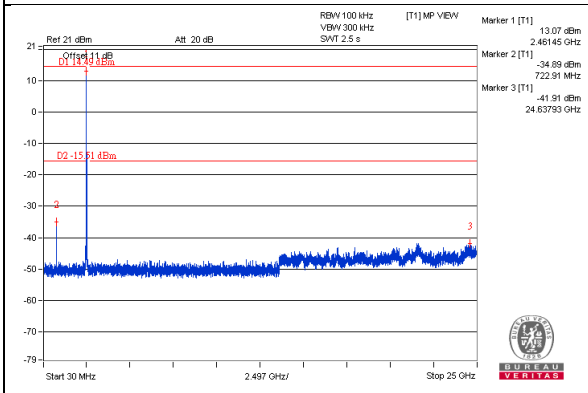
CH 1



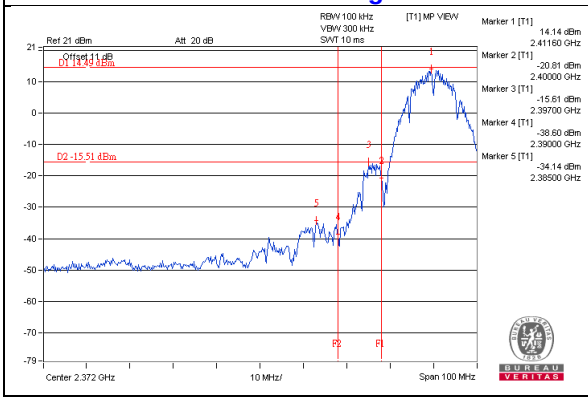
CH 6



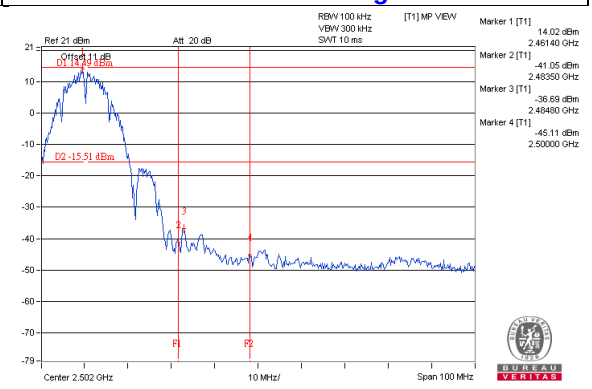
CH 11



CH 1 Band edge

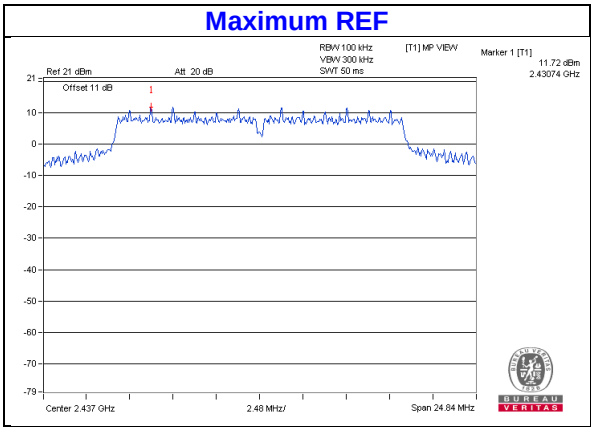


CH 11 Band edge

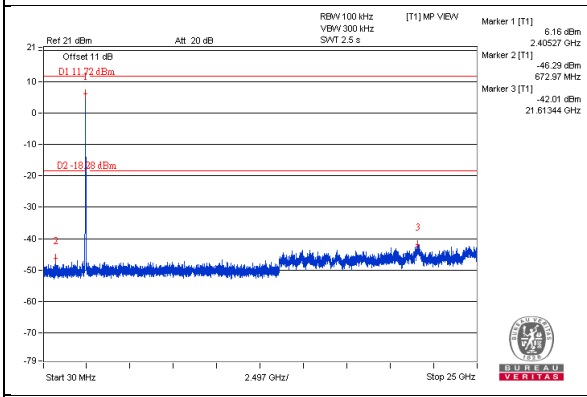


802.11g

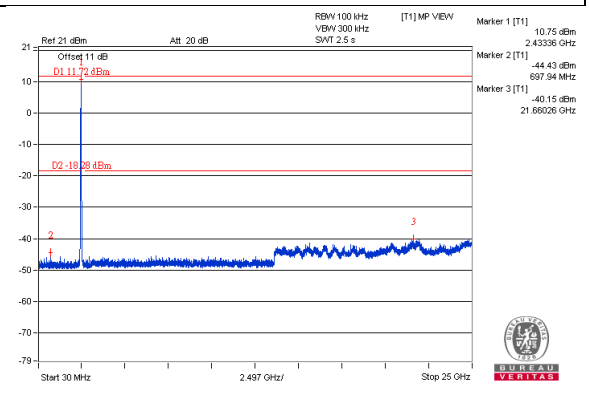
Maximum REF



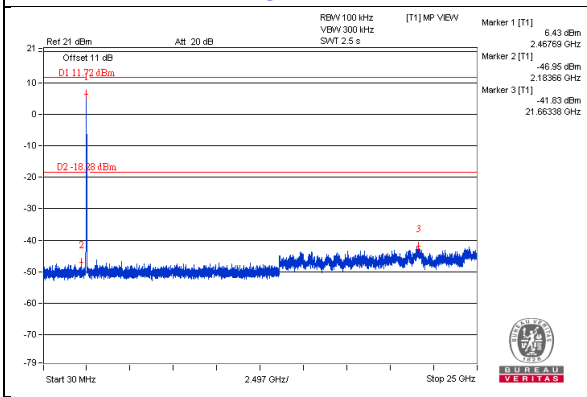
CH 1



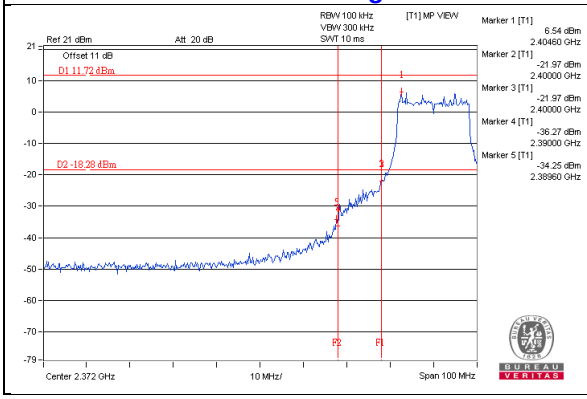
CH 6



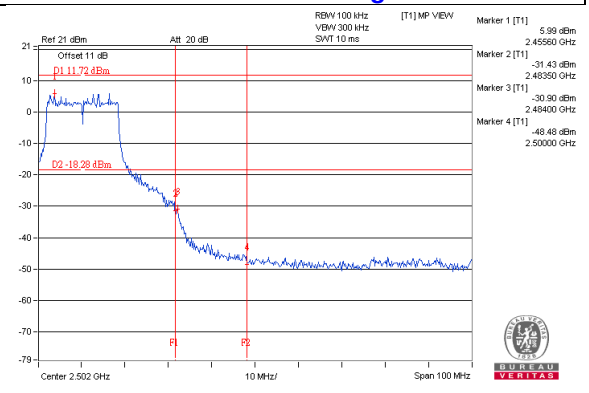
CH 11



CH 1 Band edge

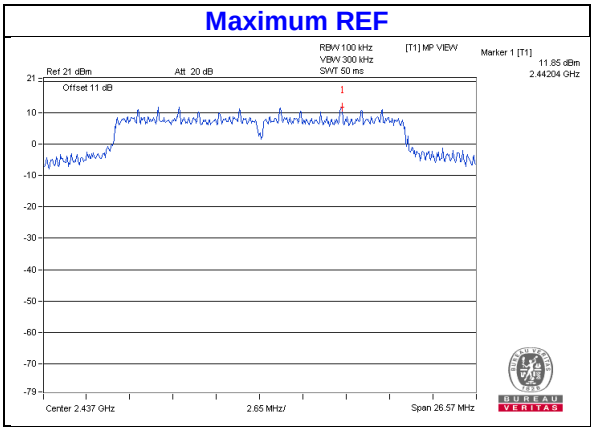


CH 11 Band edge

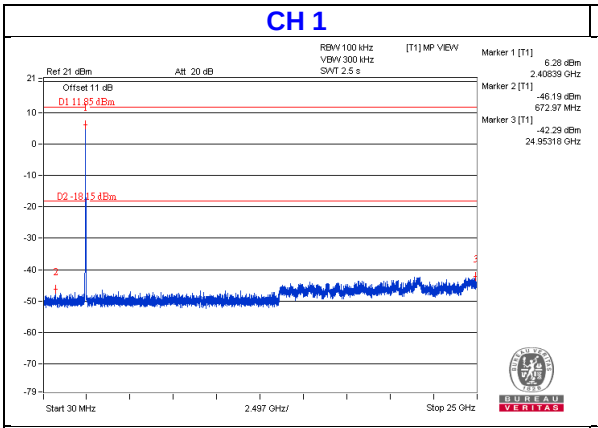


802.11n (HT20)

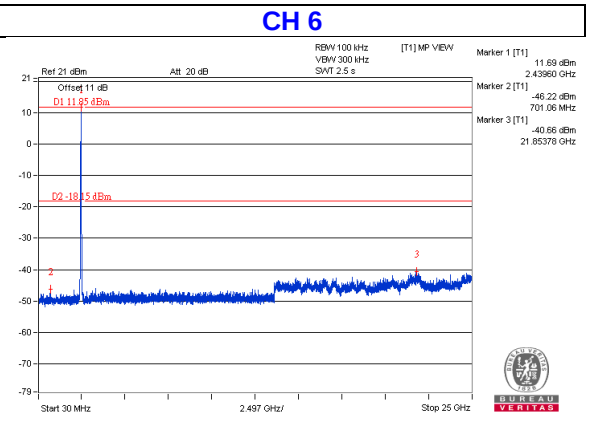
Maximum REF



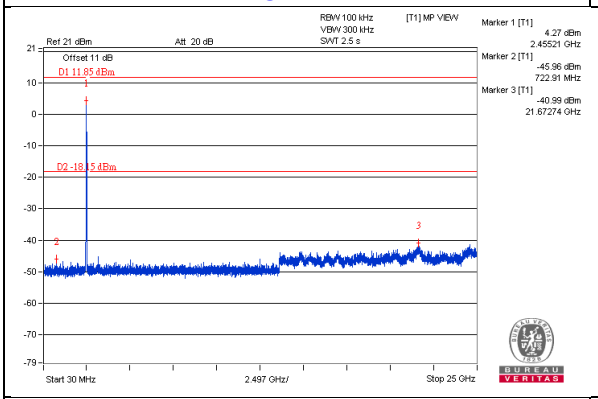
CH 1



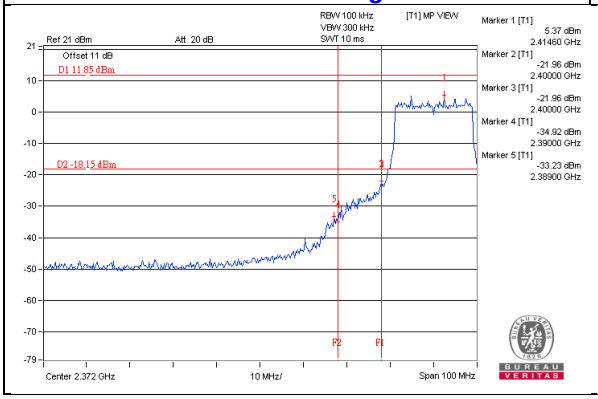
CH 6



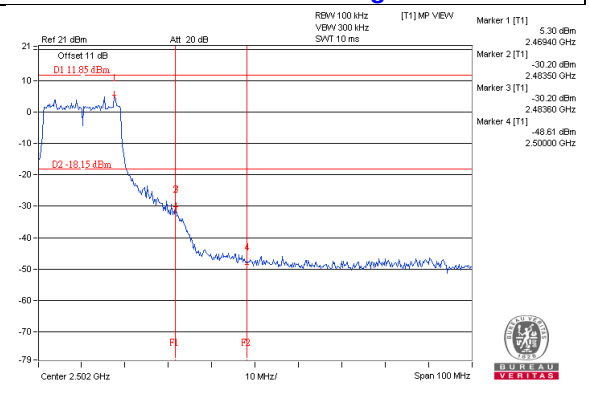
CH 11



CH 1 Band edge



CH 11 Band edge



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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

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

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