FCC Test Report

Report No.:	RF160719C19
FCC ID:	PY316100333
Test Model:	EX6100v2
Received Date:	Jul. 11, 2016
Test Date:	Jul. 25 ~ Aug. 11, 2016
Issued Date:	Aug. 23, 2016
Applicant:	Netgear, Inc.
Address:	350 E. Plumeria Drive, San Jose CA 95134, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.
The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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Release Control Record

Issue No.	Description	Date Issued
RF160719C19	Original release.	Aug. 23, 2016

1 Certificate of Conformity

Product:	WiFi Range Extender
Brand:	Netgear
Test Model:	EX6100v2
Sample Status:	Engineering sample
Applicant:	Netgear, Inc.
Test Date:	Jul. 25 ~ Aug. 11, 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. 23, 2016

Suntee Liu / Specialist

Approved by : _____ , **Date:** Aug. 23, 2016

Ken Liu / Senior 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 -15.09dB at 0.52500MHz.
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 2483.50, 2390.00MHz.
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	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WiFi Range Extender
Brand	Netgear
Test Model	EX6100v2
Sample Status	Engineering sample
Power Supply Rating	100-240Vac
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 400Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	CDD Mode: 393.131mW Beamforming Mode: 388.645mW
Antenna Type	Ant. 1: Dipole antenna with 2.22dBi gain Ant. 2: Dipole antenna with 1.65dBi gain
Antenna Connector	i-pex(MHF)
Accessory Device	NA
Cable Supplied	NA

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Band	Modulation Mode	Beamforming Mode	TX Function
2.4GHz	802.11b	Not Support	2TX
	802.11g	Not Support	2TX
	802.11n (HT20)	Support	2TX
	802.11n (HT40)	Support	2TX
5GHz	802.11a	Not Support	1TX
	802.11n (HT20)	Not Support	1TX
	802.11n (HT40)	Not Support	1TX
	802.11ac (VHT20)	Not Support	1TX
	802.11ac (VHT40)	Not Support	1TX
	802.11ac (VHT80)	Not Support	1TX

* For 2.4GHz band, CDD mode is the worst case for final radiated emission and power line conducted emission tests after pretesting CDD mode and beamforming mode.

2. WLAN 2.4GHz and WLAN 5GHz technologies can transmit at same time.
3. Spurious emission of the simultaneous operation (WLAN 2.4GHz and WLAN 5GHz) has been evaluated and no non-compliance was found.

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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 3 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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
-	802.11b	1 to 11	1	DSSS	DBPSK	1.0

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
-	802.11b	1 to 11	1	DSSS	DBPSK	1.0

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	26 deg. C, 64% RH 23 deg. C, 64% RH	120Vac, 60Hz	Alan Wu Chris Lin
RE<1G	23 deg. C, 70% RH	120Vac, 60Hz	Matthew Yang
PLC	25 deg. C, 70% RH	120Vac, 60Hz	Matthew Yang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Ted Chang

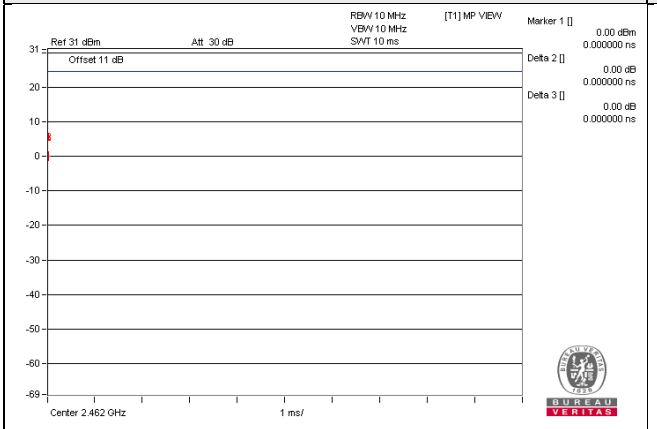
3.3 Duty Cycle of Test Signal

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

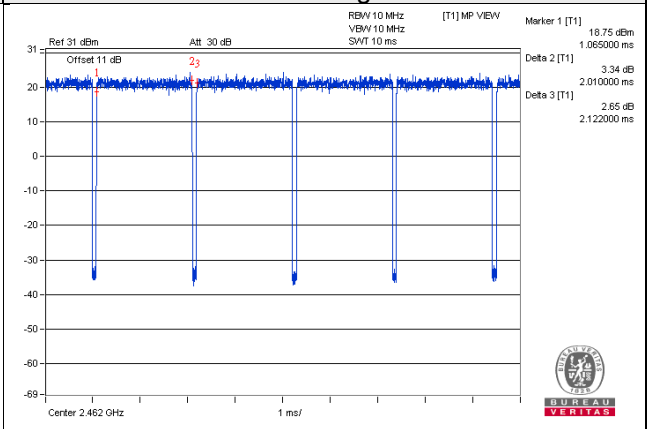
CDD Mode

802.11b: Duty cycle = 100%
802.11g: Duty cycle = 2.01/2.122 = 0.947, Duty factor = 10 * log(1/0.947) = 0.24
802.11n (HT20): Duty cycle = 4.955/5.057 = 0.979, Duty factor = 10 * log(1/0.979) = 0.09
802.11n (HT40): Duty cycle = 2.4/2.507 = 0.957, Duty factor = 10 * log(1/0.957) = 0.19

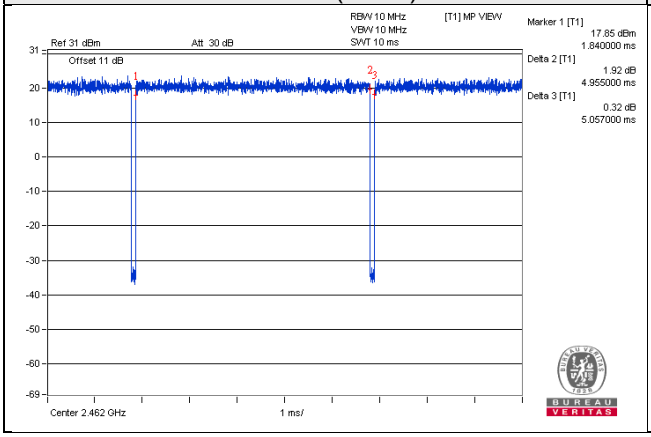
802.11b



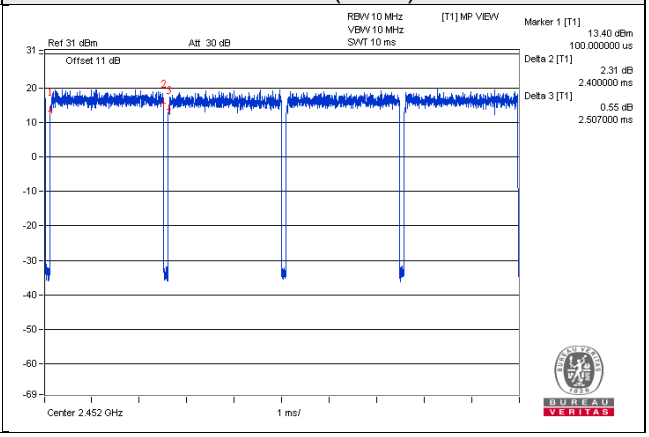
802.11g



802.11n (HT20)



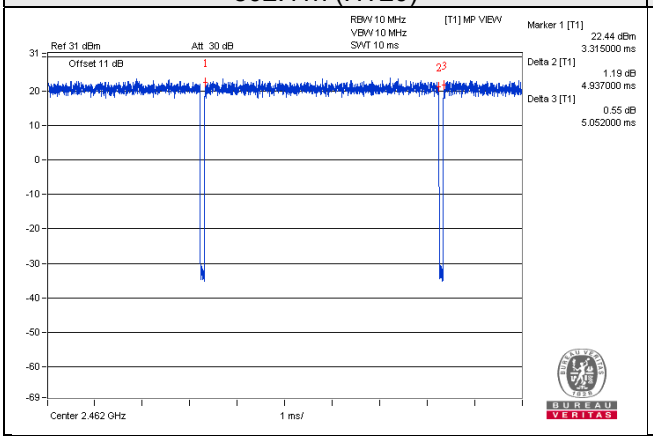
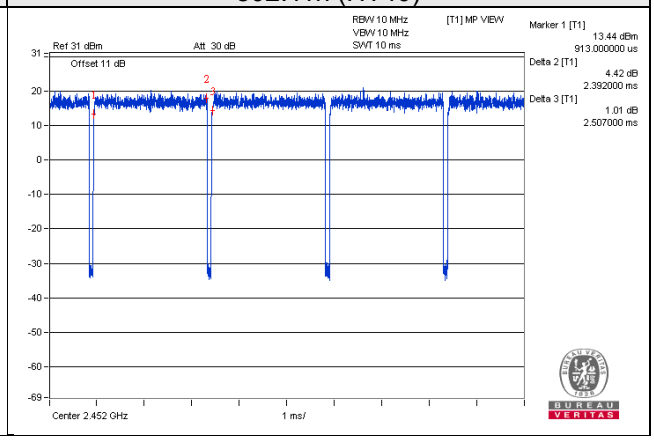
802.11n (HT40)



Beamforming Mode

802.11n (HT20): Duty cycle = 4.937/5.052 = 0.977, Duty factor = 10 * log(1/0.977) = 0.10

802.11n (HT40): Duty cycle = 2.392/2.507 = 0.954, Duty factor = 10 * log(1/0.954) = 0.20

802.11n (HT20)	802.11n (HT40)
	

3.4 Description of Support Units

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

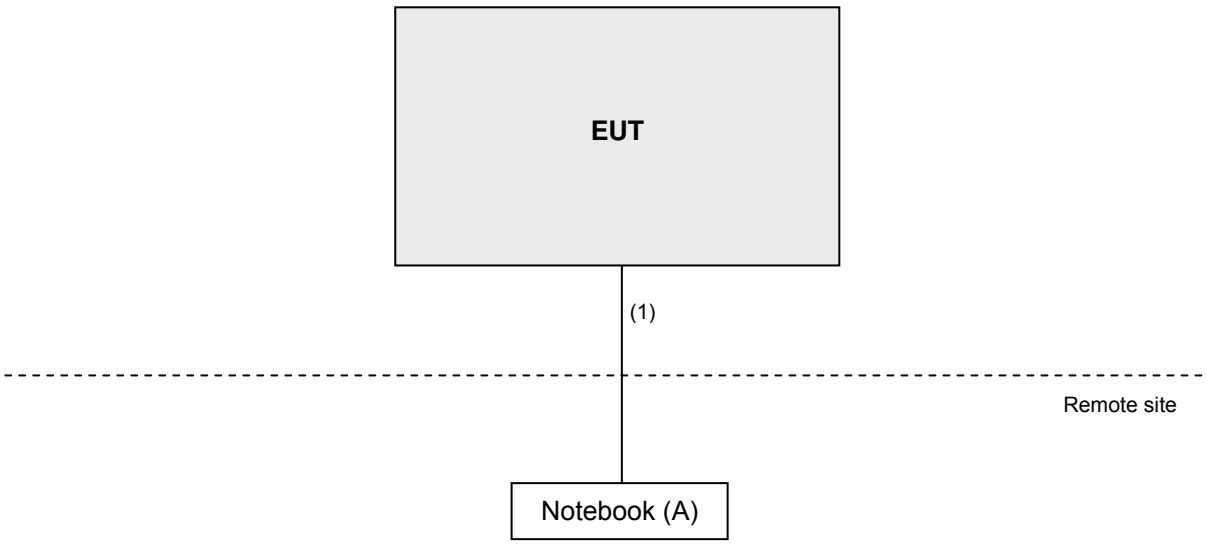
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45	1	3	N	0	-

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specification of the EUT declared by the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)
558074 D01 DTS Meas Guidance v03r05
662911 D01 Multiple Transmitter Output v02r01
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 30dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 12, 2015	Oct. 11, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Sep. 02, 2015	Sep. 01, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Jan. 08, 2016	Jan. 07, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Jan. 18, 2016	Jan. 17, 2017
Preamplifier Agilent	8449B	3008A01887	Feb. 26, 2016	Feb. 25, 2017
Preamplifier Agilent	8447D	2944A10640	May 18, 2016	May 17, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Aug. 09, 2015	Aug. 08, 2016
			Aug. 09, 2016	Aug. 08, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03(250724)	Aug. 09, 2015	Aug. 08, 2016
			Aug. 09, 2016	Aug. 08, 2017
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021703	NA	NA
High Speed Peak Power Meter	ML2495A	1145013	Mar. 22, 2016	Mar. 21, 2017
Power Sensor	MA2411B	1126085	Mar. 22, 2016	Mar. 21, 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 test was performed in HwaYa Chamber 4.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC7450F-4.

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:

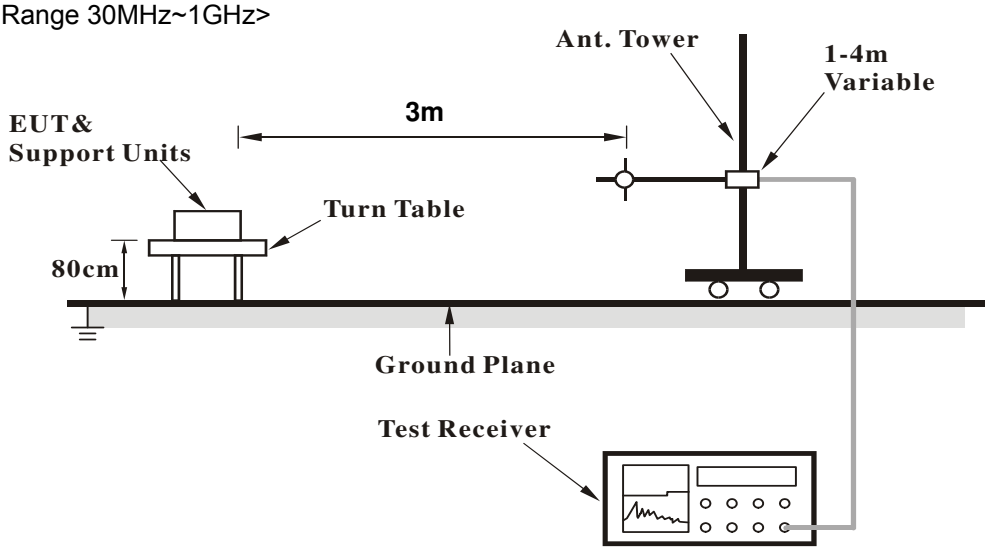
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

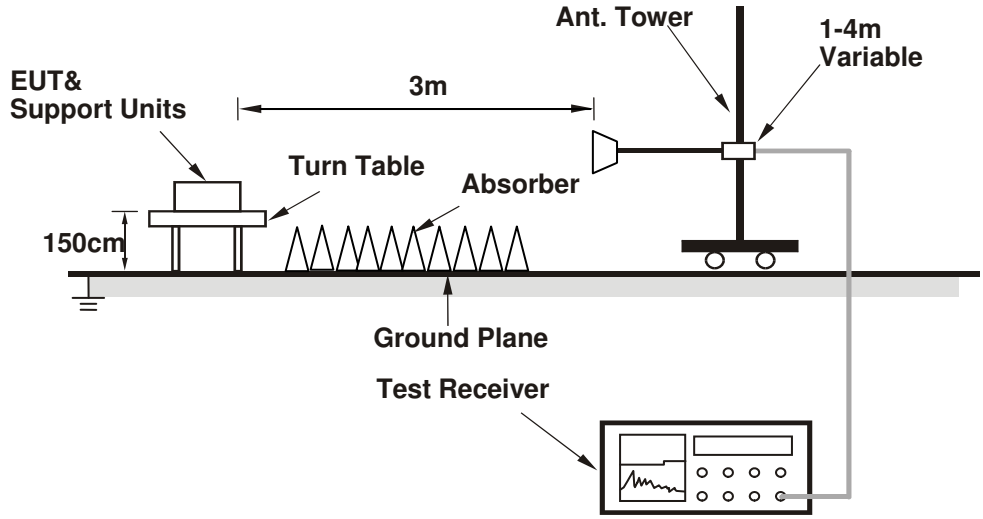
No deviation.

4.1.5 Test Set Up

<Frequency Range 30MHz~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. Placed the EUT on the testing table.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

CDD Mode

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	61.0 PK	74.0	-13.0	1.04 H	278	28.8	32.2
2	2390.00	51.6 AV	54.0	-2.4	1.04 H	278	19.4	32.2
3	*2412.00	113.4 PK			1.04 H	278	81.0	32.4
4	*2412.00	109.6 AV			1.04 H	278	77.2	32.4
5	4824.00	54.2 PK	74.0	-19.8	1.05 H	105	47.8	6.4
6	4824.00	48.1 AV	54.0	-5.9	1.05 H	105	41.7	6.4
7	12060.00	61.5 PK	74.0	-12.5	1.90 H	225	44.2	17.3
8	12060.00	51.1 AV	54.0	-2.9	1.90 H	225	33.8	17.3
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	59.6 PK	74.0	-14.4	1.24 V	242	27.4	32.2
2	2390.00	52.4 AV	54.0	-1.6	1.24 V	242	20.2	32.2
3	*2412.00	118.1 PK			1.24 V	242	85.7	32.4
4	*2412.00	114.2 AV			1.24 V	242	81.8	32.4
5	4824.00	57.5 PK	74.0	-16.5	1.52 V	90	51.1	6.4
6	4824.00	53.8 AV	54.0	-0.2	1.52 V	90	47.4	6.4
7	12060.00	63.4 PK	74.0	-10.6	1.46 V	76	46.1	17.3
8	12060.00	53.7 AV	54.0	-0.3	1.46 V	76	36.4	17.3

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)
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) 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	*2437.00	113.6 PK			1.03 H	256	81.1	32.5
2	*2437.00	109.7 AV			1.03 H	256	77.2	32.5
3	4874.00	53.9 PK	74.0	-20.1	1.08 H	102	47.3	6.6
4	4874.00	47.5 AV	54.0	-6.5	1.08 H	102	40.9	6.6
5	12185.00	60.9 PK	74.0	-13.1	1.91 H	229	43.6	17.3
6	12185.00	50.9 AV	54.0	-3.1	1.91 H	229	33.6	17.3
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	*2437.00	119.5 PK			1.07 V	275	87.0	32.5
2	*2437.00	115.6 AV			1.07 V	275	83.1	32.5
3	4874.00	58.1 PK	74.0	-15.9	1.58 V	93	51.5	6.6
4	4874.00	53.7 AV	54.0	-0.3	1.58 V	93	47.1	6.6
5	12185.00	63.0 PK	74.0	-11.0	1.51 V	98	45.7	17.3
6	12185.00	53.3 AV	54.0	-0.7	1.51 V	98	36.0	17.3

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)
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	114.1 PK			1.30 H	73	81.5	32.6
2	*2462.00	110.4 AV			1.30 H	73	77.8	32.6
3	2483.50	59.7 PK	74.0	-14.3	1.30 H	73	27.0	32.7
4	2483.50	50.3 AV	54.0	-3.7	1.30 H	73	17.6	32.7
5	4924.00	54.1 PK	74.0	-19.9	2.03 H	269	47.5	6.6
6	4924.00	49.0 AV	54.0	-5.0	2.03 H	269	42.4	6.6
7	12310.00	57.8 PK	74.0	-16.2	1.06 H	96	40.3	17.5
8	12310.00	48.4 AV	54.0	-5.6	1.06 H	96	30.9	17.5
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	*2462.00	118.3 PK			2.23 V	277	85.7	32.6
2	*2462.00	114.5 AV			2.23 V	277	81.9	32.6
3	2483.50	61.2 PK	74.0	-12.8	2.23 V	277	28.5	32.7
4	2483.50	53.5 AV	54.0	-0.5	2.23 V	277	20.8	32.7
5	4924.00	57.4 PK	74.0	-16.6	1.66 V	255	50.8	6.6
6	4924.00	53.6 AV	54.0	-0.4	1.66 V	255	47.0	6.6
7	12310.00	59.9 PK	74.0	-14.1	1.13 V	353	42.4	17.5
8	12310.00	50.4 AV	54.0	-3.6	1.13 V	353	32.9	17.5

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) 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	65.8 PK	74.0	-8.2	1.02 H	63	33.6	32.2
2	2390.00	50.2 AV	54.0	-3.8	1.02 H	63	18.0	32.2
3	*2412.00	107.9 PK			1.02 H	63	75.5	32.4
4	*2412.00	98.5 AV			1.02 H	63	66.1	32.4
5	4824.00	47.1 PK	74.0	-26.9	1.08 H	55	40.7	6.4
6	4824.00	35.2 AV	54.0	-18.8	1.08 H	55	28.8	6.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.5 PK	74.0	-6.5	1.59 V	203	35.3	32.2
2	2390.00	53.7 AV	54.0	-0.3	1.59 V	203	21.5	32.2
3	*2412.00	112.4 PK			1.59 V	203	80.0	32.4
4	*2412.00	102.7 AV			1.59 V	203	70.3	32.4
5	4824.00	48.0 PK	74.0	-26.0	1.05 V	353	41.6	6.4
6	4824.00	37.2 AV	54.0	-16.8	1.05 V	353	30.8	6.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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) 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	62.0 PK	74.0	-12.0	1.67 H	270	29.8	32.2
2	2390.00	48.5 AV	54.0	-5.5	1.67 H	270	16.3	32.2
3	*2437.00	114.7 PK			1.67 H	270	82.2	32.5
4	*2437.00	106.1 AV			1.67 H	270	73.6	32.5
5	4874.00	47.5 PK	74.0	-26.5	1.36 H	97	40.9	6.6
6	4874.00	35.3 AV	54.0	-18.7	1.36 H	97	28.7	6.6
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	64.5 PK	74.0	-9.5	1.41 V	173	32.3	32.2
2	2390.00	51.5 AV	54.0	-2.5	1.41 V	173	19.3	32.2
3	*2437.00	117.4 PK			1.41 V	173	84.9	32.5
4	*2437.00	106.9 AV			1.41 V	173	74.4	32.5
5	4874.00	48.2 PK	74.0	-25.8	1.47 V	85	41.6	6.6
6	4874.00	37.0 AV	54.0	-17.0	1.47 V	85	30.4	6.6

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)
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	109.7 PK			1.65 H	270	77.1	32.6
2	*2462.00	100.8 AV			1.65 H	270	68.2	32.6
3	2483.50	65.9 PK	74.0	-8.1	1.65 H	270	33.2	32.7
4	2483.50	49.2 AV	54.0	-4.8	1.65 H	270	16.5	32.7
5	4924.00	46.7 PK	74.0	-27.3	1.17 H	41	40.1	6.6
6	4924.00	35.3 AV	54.0	-18.7	1.17 H	41	28.7	6.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.3 PK			1.20 V	298	81.7	32.6
2	*2462.00	104.3 AV			1.20 V	298	71.7	32.6
3	2483.50	73.7 PK	74.0	-0.3	1.20 V	298	41.0	32.7
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.20 V**	**298**	**21.2**	**32.7**
5	4924.00	48.5 PK	74.0	-25.5	1.28 V	54	41.9	6.6
6	4924.00	37.0 AV	54.0	-17.0	1.28 V	54	30.4	6.6

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)
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	59.4 PK	74.0	-14.6	1.20 H	66	27.2	32.2
2	2390.00	46.1 AV	54.0	-7.9	1.20 H	66	13.9	32.2
3	*2412.00	105.9 PK			1.20 H	66	73.5	32.4
4	*2412.00	96.8 AV			1.20 H	66	64.4	32.4
5	4824.00	47.0 PK	74.0	-27.0	1.56 H	205	40.6	6.4
6	4824.00	35.1 AV	54.0	-18.9	1.56 H	205	28.7	6.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.5 PK	74.0	-0.5	1.54 V	304	41.3	32.2
2	2390.00	52.2 AV	54.0	-1.8	1.54 V	304	20.0	32.2
3	*2412.00	112.9 PK			1.54 V	304	80.5	32.4
4	*2412.00	103.7 AV			1.54 V	304	71.3	32.4
5	4824.00	49.2 PK	74.0	-24.8	1.38 V	64	42.8	6.4
6	4824.00	36.8 AV	54.0	-17.2	1.38 V	64	30.4	6.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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) 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	64.2 PK	74.0	-9.8	1.36 H	271	32.0	32.2
2	2390.00	50.2 AV	54.0	-3.8	1.36 H	271	18.0	32.2
3	*2437.00	114.7 PK			1.36 H	271	82.2	32.5
4	*2437.00	105.5 AV			1.36 H	271	73.0	32.5
5	4874.00	47.1 PK	74.0	-26.9	1.06 H	31	40.5	6.6
6	4874.00	34.7 AV	54.0	-19.3	1.06 H	31	28.1	6.6
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	63.1 PK	74.0	-10.9	2.27 V	202	30.9	32.2
2	2390.00	50.3 AV	54.0	-3.7	2.27 V	202	18.1	32.2
3	*2437.00	116.5 PK			2.27 V	202	84.0	32.5
4	*2437.00	106.5 AV			2.27 V	202	74.0	32.5
5	4874.00	49.2 PK	74.0	-24.8	1.05 V	117	42.6	6.6
6	4874.00	36.8 AV	54.0	-17.2	1.05 V	117	30.2	6.6

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)
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	110.1 PK			1.64 H	270	77.5	32.6
2	*2462.00	99.7 AV			1.64 H	270	67.1	32.6
3	2483.50	71.2 PK	74.0	-2.8	1.64 H	270	38.5	32.7
4	2483.50	53.0 AV	54.0	-1.0	1.64 H	270	20.3	32.7
5	4924.00	47.2 PK	74.0	-26.8	1.17 H	85	40.6	6.6
6	4924.00	35.3 AV	54.0	-18.7	1.17 H	85	28.7	6.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.1 PK			1.51 V	298	82.5	32.6
2	*2462.00	104.9 AV			1.51 V	298	72.3	32.6
3	2483.50	71.6 PK	74.0	-2.4	1.51 V	298	38.9	32.7
4	2483.50	53.8 AV	54.0	-0.2	1.51 V	298	21.1	32.7
5	4924.00	49.2 PK	74.0	-24.8	1.25 V	96	42.6	6.6
6	4924.00	37.0 AV	54.0	-17.0	1.25 V	96	30.4	6.6

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) 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	68.8 PK	74.0	-5.2	1.04 H	270	36.6	32.2
2	2390.00	51.0 AV	54.0	-3.0	1.04 H	270	18.8	32.2
3	*2422.00	106.1 PK			1.04 H	270	73.7	32.4
4	*2422.00	96.9 AV			1.04 H	270	64.5	32.4
5	4844.00	46.8 PK	74.0	-27.2	1.17 H	41	40.3	6.5
6	4844.00	34.9 AV	54.0	-19.1	1.17 H	41	28.4	6.5
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	2390.00	69.3 PK	74.0	-4.7	1.62 V	199	37.1	32.2
2	2390.00	53.8 AV	54.0	-0.2	1.62 V	199	21.6	32.2
3	*2422.00	107.6 PK			1.62 V	199	75.2	32.4
4	*2422.00	98.4 AV			1.62 V	199	66.0	32.4
5	4844.00	48.0 PK	74.0	-26.0	1.20 V	85	41.5	6.5
6	4844.00	36.7 AV	54.0	-17.3	1.20 V	85	30.2	6.5

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)
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) 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	68.1 PK	74.0	-5.9	1.05 H	268	35.9	32.2
2	2390.00	53.4 AV	54.0	-0.6	1.05 H	268	21.2	32.2
3	*2437.00	108.3 PK			1.05 H	268	75.8	32.5
4	*2437.00	98.9 AV			1.05 H	268	66.4	32.5
5	4874.00	47.1 PK	74.0	-26.9	1.06 H	31	40.5	6.6
6	4874.00	34.7 AV	54.0	-19.3	1.06 H	31	28.1	6.6
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	66.7 PK	74.0	-7.3	2.13 V	200	34.5	32.2
2	2390.00	53.5 AV	54.0	-0.5	2.13 V	200	21.3	32.2
3	*2437.00	109.3 PK			2.13 V	200	76.8	32.5
4	*2437.00	100.2 AV			2.13 V	200	67.7	32.5
5	4874.00	48.2 PK	74.0	-25.8	1.55 V	204	41.6	6.6
6	4874.00	36.7 AV	54.0	-17.3	1.55 V	204	30.1	6.6

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)
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) 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	*2452.00	105.0 PK			1.66 H	273	72.4	32.6
2	*2452.00	96.1 AV			1.66 H	273	63.5	32.6
3	2483.50	68.7 PK	74.0	-5.3	1.66 H	273	36.0	32.7
4	2483.50	50.5 AV	54.0	-3.5	1.66 H	273	17.8	32.7
5	4904.00	47.3 PK	74.0	-26.7	1.08 H	63	40.6	6.7
6	4904.00	34.8 AV	54.0	-19.2	1.08 H	63	28.1	6.7
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	108.6 PK			1.52 V	299	76.0	32.6
2	*2452.00	99.9 AV			1.52 V	299	67.3	32.6
3	2483.50	73.4 PK	74.0	-0.6	1.52 V	299	40.7	32.7
4	2483.50	53.5 AV	54.0	-0.5	1.52 V	299	20.8	32.7
5	4904.00	49.3 PK	74.0	-24.7	1.23 V	64	42.6	6.7
6	4904.00	36.8 AV	54.0	-17.2	1.23 V	64	30.1	6.7

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Beamforming Mode

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	63.8 PK	74.0	-10.2	1.03 H	282	31.6	32.2
2	2390.00	47.8 AV	54.0	-6.2	1.03 H	282	15.6	32.2
3	*2412.00	107.0 PK			1.03 H	282	74.6	32.4
4	*2412.00	97.5 AV			1.03 H	282	65.1	32.4
5	4824.00	47.0 PK	74.0	-27.0	1.00 H	201	40.6	6.4
6	4824.00	34.2 AV	54.0	-19.8	1.00 H	201	27.8	6.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.1 PK	74.0	-0.9	1.55 V	281	40.9	32.2
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.55 V**	**281**	**21.7**	**32.2**
3	*2412.00	114.3 PK			1.55 V	281	81.9	32.4
4	*2412.00	104.6 AV			1.55 V	281	72.2	32.4
5	4824.00	49.0 PK	74.0	-25.0	1.30 V	60	42.6	6.4
6	4824.00	36.4 AV	54.0	-17.6	1.30 V	60	30.0	6.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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) 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	57.8 PK	74.0	-16.2	1.04 H	280	25.6	32.2
2	2390.00	44.6 AV	54.0	-9.4	1.04 H	280	12.4	32.2
3	*2437.00	113.7 PK			1.04 H	280	81.2	32.5
4	*2437.00	103.5 AV			1.04 H	280	71.0	32.5
5	4874.00	47.3 PK	74.0	-26.7	1.00 H	33	40.7	6.6
6	4874.00	34.8 AV	54.0	-19.2	1.00 H	33	28.2	6.6
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	61.8 PK	74.0	-12.2	2.24 V	275	29.6	32.2
2	2390.00	47.4 AV	54.0	-6.6	2.24 V	275	15.2	32.2
3	*2437.00	116.7 PK			2.24 V	275	84.2	32.5
4	*2437.00	107.1 AV			2.24 V	275	74.6	32.5
5	4874.00	49.3 PK	74.0	-24.7	1.01 V	119	42.7	6.6
6	4874.00	37.0 AV	54.0	-17.0	1.01 V	119	30.4	6.6

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)
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	111.0 PK			1.46 H	257	78.4	32.6
2	*2462.00	100.5 AV			1.46 H	257	67.9	32.6
3	2483.50	65.8 PK	74.0	-8.2	1.46 H	257	33.1	32.7
4	2483.50	48.2 AV	54.0	-5.8	1.46 H	257	15.5	32.7
5	4924.00	47.1 PK	74.0	-26.9	1.00 H	84	40.5	6.6
6	4924.00	34.6 AV	54.0	-19.4	1.00 H	84	28.0	6.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.2 PK			1.34 V	279	82.6	32.6
2	*2462.00	105.8 AV			1.34 V	279	73.2	32.6
3	2483.50	73.2 PK	74.0	-0.8	1.34 V	279	40.5	32.7
4	2483.50	53.7 AV	54.0	-0.3	1.34 V	279	21.0	32.7
5	4924.00	48.8 PK	74.0	-25.2	1.21 V	93	42.2	6.6
6	4924.00	36.5 AV	54.0	-17.5	1.21 V	93	29.9	6.6

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) 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	62.6 PK	74.0	-11.4	1.87 H	279	30.4	32.2
2	2390.00	46.9 AV	54.0	-7.1	1.87 H	279	14.7	32.2
3	*2422.00	106.5 PK			1.87 H	279	74.1	32.4
4	*2422.00	97.4 AV			1.87 H	279	65.0	32.4
5	4844.00	46.6 PK	74.0	-27.4	1.00 H	44	40.1	6.5
6	4844.00	34.1 AV	54.0	-19.9	1.00 H	44	27.6	6.5
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	2390.00	70.3 PK	74.0	-3.7	1.53 V	275	38.1	32.2
2	**2390.00**	**53.9 AV**	**54.0**	**-0.1**	**1.53 V**	**275**	**21.7**	**32.2**
3	*2422.00	108.3 PK			1.53 V	275	75.9	32.4
4	*2422.00	98.5 AV			1.53 V	275	66.1	32.4
5	4844.00	48.4 PK	74.0	-25.6	1.24 V	86	41.9	6.5
6	4844.00	35.7 AV	54.0	-18.3	1.24 V	86	29.2	6.5

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)
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) 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	62.0 PK	74.0	-12.0	1.03 H	279	29.8	32.2
2	2390.00	46.8 AV	54.0	-7.2	1.03 H	279	14.6	32.2
3	*2437.00	109.1 PK			1.03 H	279	76.6	32.5
4	*2437.00	99.5 AV			1.03 H	279	67.0	32.5
5	4874.00	47.0 PK	74.0	-27.0	1.00 H	36	40.4	6.6
6	4874.00	34.5 AV	54.0	-19.5	1.00 H	36	27.9	6.6
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	71.2 PK	74.0	-2.8	2.05 V	283	39.0	32.2
2	2390.00	53.7 AV	54.0	-0.3	2.05 V	283	21.5	32.2
3	*2437.00	109.9 PK			2.05 V	283	77.4	32.5
4	*2437.00	101.0 AV			2.05 V	283	68.5	32.5
5	4874.00	49.1 PK	74.0	-24.9	1.57 V	205	42.5	6.6
6	4874.00	36.5 AV	54.0	-17.5	1.57 V	205	29.9	6.6

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)
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) 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	*2452.00	104.4 PK			1.63 H	286	71.8	32.6
2	*2452.00	95.3 AV			1.63 H	286	62.7	32.6
3	2483.50	64.3 PK	74.0	-9.7	1.63 H	286	31.6	32.7
4	2483.50	50.9 AV	54.0	-3.1	1.63 H	286	18.2	32.7
5	4904.00	46.9 PK	74.0	-27.1	1.00 H	61	40.2	6.7
6	4904.00	34.0 AV	54.0	-20.0	1.00 H	61	27.3	6.7
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	107.9 PK			1.54 V	283	75.3	32.6
2	*2452.00	99.5 AV			1.54 V	283	66.9	32.6
3	2483.50	67.9 PK	74.0	-6.1	1.54 V	283	35.2	32.7
4	2483.50	53.5 AV	54.0	-0.5	1.54 V	283	20.8	32.7
5	4904.00	48.6 PK	74.0	-25.4	1.22 V	64	41.9	6.7
6	4904.00	35.5 AV	54.0	-18.5	1.22 V	64	28.8	6.7

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Worst-Case Data: 802.11b

CHANNEL	TX Channel 1	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	37.66	31.6 QP	40.0	-8.4	1.50 H	50	46.3	-14.7
2	130.80	32.9 QP	43.5	-10.6	2.00 H	94	48.0	-15.1
3	297.68	21.0 QP	46.0	-25.0	1.25 H	193	33.9	-12.9
4	532.46	33.1 QP	46.0	-12.9	1.50 H	208	42.1	-9.0
5	608.14	41.8 QP	46.0	-4.2	1.25 H	193	48.6	-6.8
6	796.36	29.2 QP	46.0	-16.8	1.00 H	181	32.4	-3.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.50	32.5 QP	40.0	-7.5	1.00 V	253	47.2	-14.7
2	130.80	29.5 QP	43.5	-14.0	1.00 V	304	44.6	-15.1
3	272.45	19.5 QP	46.0	-26.5	1.00 V	19	32.9	-13.4
4	532.46	31.0 QP	46.0	-15.0	1.00 V	202	40.0	-9.0
5	610.08	37.8 QP	46.0	-8.2	1.00 V	108	44.6	-6.8
6	899.20	27.3 QP	46.0	-18.7	1.00 V	39	29.0	-1.7

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)
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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 23, 2015	Dec. 22, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 11, 2016	Jan. 10, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 26, 2016	Jul. 25, 2017
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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 test was performed in HwaYa Shielded Room 2.
3. The VCCI Site Registration No. is C-2047.

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.

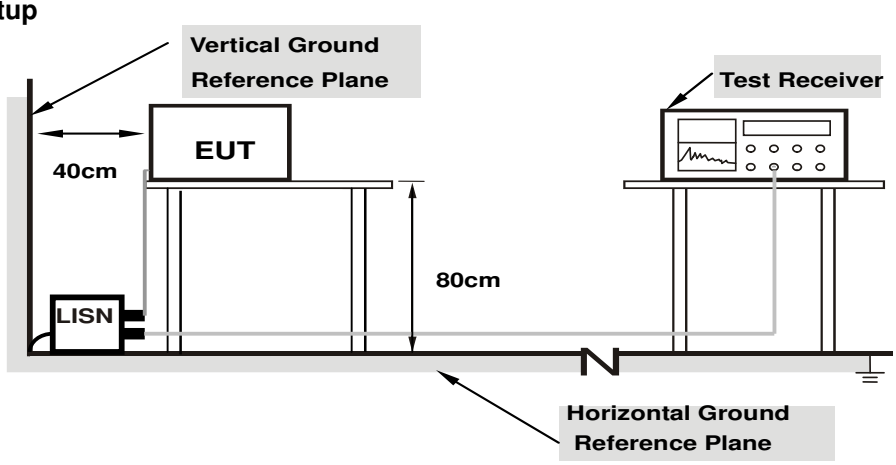
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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.

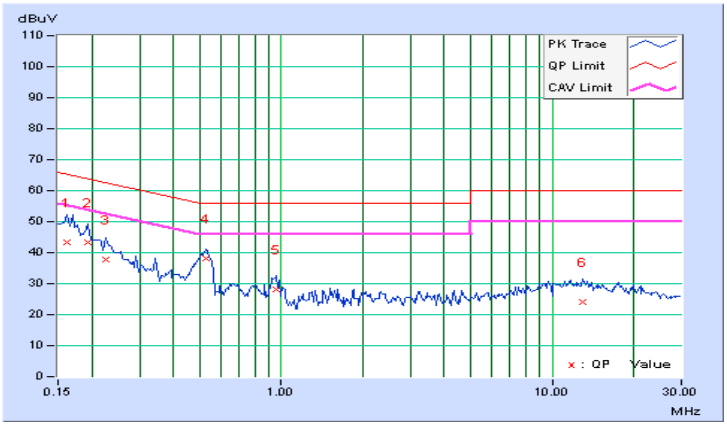
4.2.7 Test Results

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	10.19	33.15	16.96	43.34	27.15	65.38	55.38	-22.04	-28.23
2	0.19297	10.21	33.12	22.43	43.33	32.64	63.91	53.91	-20.58	-21.27
3	0.22422	10.21	27.64	14.41	37.85	24.62	62.66	52.66	-24.81	-28.04
4	**0.52500**	**10.25**	**27.79**	**20.66**	**38.04**	**30.91**	**56.00**	**46.00**	**-17.96**	**-15.09**
5	0.95469	10.30	17.75	9.92	28.05	20.22	56.00	46.00	-27.95	-25.78
6	12.95313	10.56	13.58	6.26	24.14	16.82	60.00	50.00	-35.86	-33.18

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.

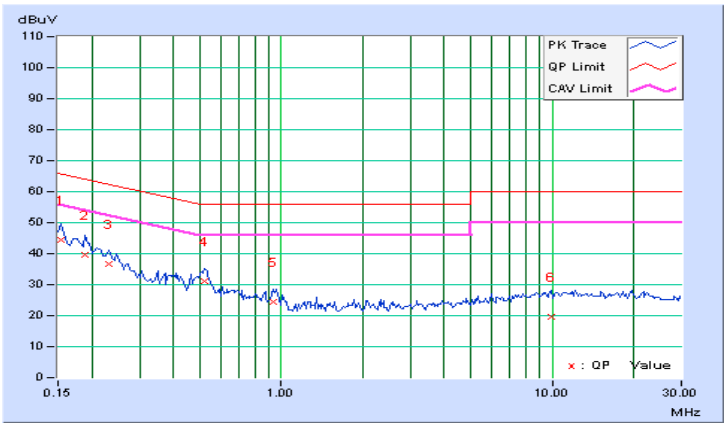


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	34.19	21.38	44.38	31.57	65.79	55.79	-21.41	-24.22
2	0.18906	10.20	29.28	15.88	39.48	26.08	64.08	54.08	-24.60	-28.00
3	0.23203	10.22	26.53	13.59	36.75	23.81	62.38	52.38	-25.63	-28.57
4	0.52109	10.30	20.83	11.87	31.13	22.17	56.00	46.00	-24.87	-23.83
5	0.93125	10.29	14.01	6.31	24.30	16.60	56.00	46.00	-31.70	-29.40
6	9.93750	10.61	9.07	3.38	19.68	13.99	60.00	50.00	-40.32	-36.01

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.

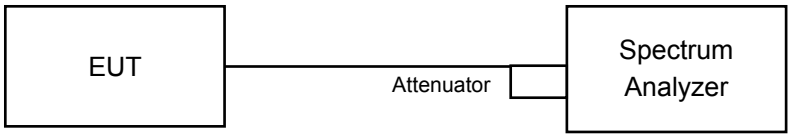


4.3 6dB Bandwidth Measurement

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 from Test 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

CDD Mode

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	9.04	9.04	0.5	Pass
6	2437	9.08	9.06	0.5	Pass
11	2462	9.07	9.04	0.5	Pass

802.11g

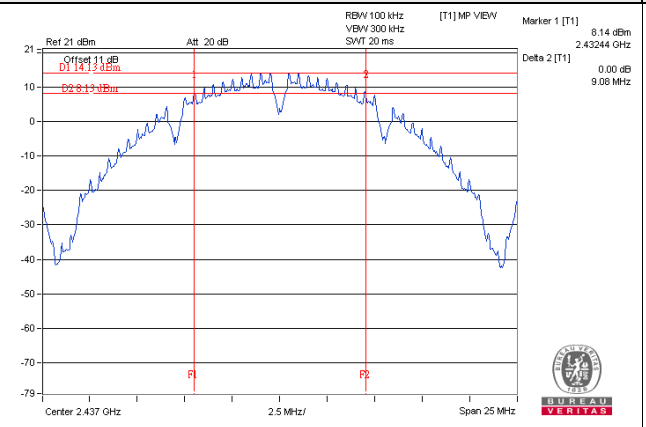
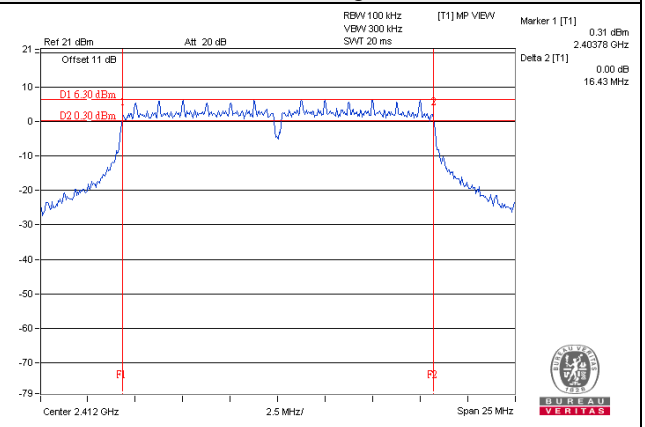
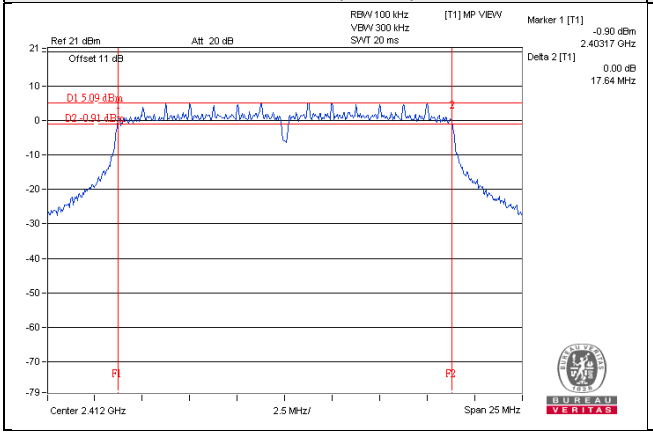
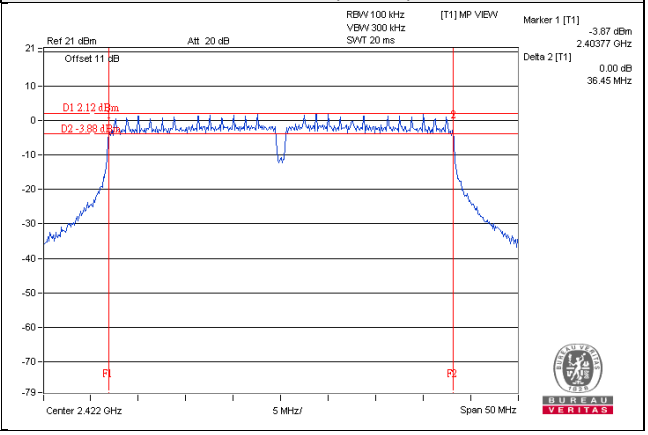
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.43	16.40	0.5	Pass
6	2437	16.39	16.37	0.5	Pass
11	2462	16.38	16.39	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.64	17.62	0.5	Pass
6	2437	17.62	17.60	0.5	Pass
11	2462	17.63	17.64	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	36.43	36.45	0.5	Pass
6	2437	36.36	36.39	0.5	Pass
9	2452	36.39	36.36	0.5	Pass

Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11n (HT20)	802.11n (HT40)
	

Beamforming Mode

802.11n (HT20)

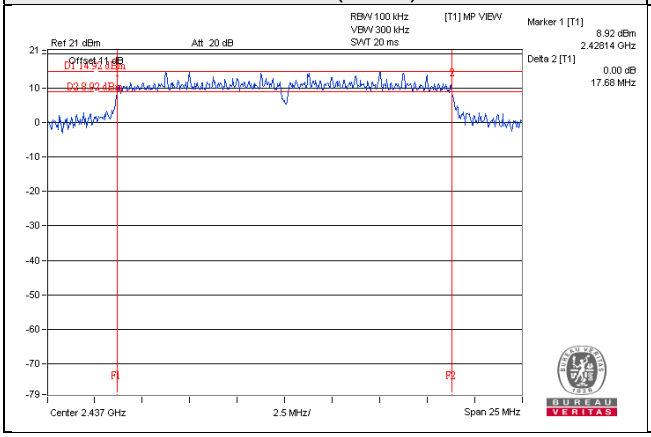
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.60	17.62	0.5	Pass
6	2437	17.62	17.68	0.5	Pass
11	2462	17.63	17.64	0.5	Pass

802.11n (HT40)

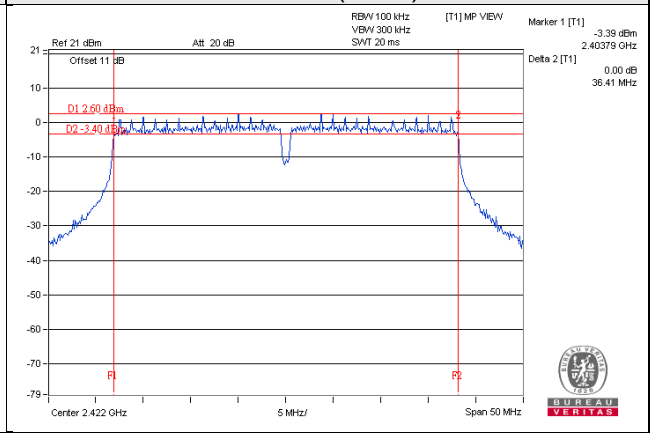
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	36.41	36.40	0.5	Pass
6	2437	36.38	36.37	0.5	Pass
9	2452	36.37	36.38	0.5	Pass

Spectrum Plot of Worst Value

802.11n (HT20)



802.11n (HT40)



4.4 Conducted Output Power Measurement

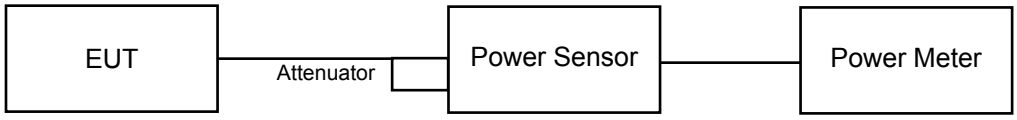
4.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)
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 NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

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

CDD Mode

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.18	22.40	338.976	25.30	30	Pass
6	2437	22.91	22.69	381.214	25.81	30	Pass
11	2462	22.38	22.66	357.484	25.53	30	Pass

802.11g

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.07	18.16	129.585	21.13	30	Pass
6	2437	22.86	22.67	378.124	25.78	30	Pass
11	2462	17.48	17.73	115.269	20.62	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.46	18.68	143.936	21.58	30	Pass
6	2437	22.96	22.91	**393.131**	25.95	30	Pass
11	2462	18.02	18.17	129.002	21.11	30	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	16.04	16.23	82.155	19.15	30	Pass
6	2437	18.04	18.10	128.245	21.08	30	Pass
9	2452	15.61	15.84	74.763	18.74	30	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.49	18.71	144.934	21.61	30	Pass
6	2437	22.93	22.84	**388.645**	25.90	30	Pass
11	2462	18.05	18.26	130.814	21.17	30	Pass

Note: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 4.95dBi < 6dBi, so the limit no need to reduced.

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	15.94	16.15	80.474	19.06	30	Pass
6	2437	18.44	18.11	134.537	21.29	30	Pass
9	2452	15.67	15.92	75.982	18.81	30	Pass

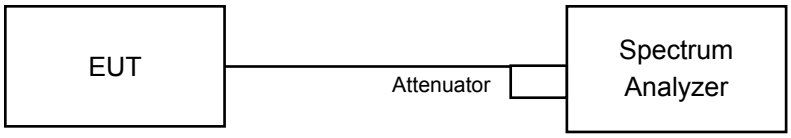
Note: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 4.95dBi < 6dBi, so the limit no need to reduced.

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

For AVG. power (duty cycle ≥ 98%)
a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

For AVG. power (duty cycle < 98%)
a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

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

CDD Mode

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Total PSD (dBm)	Limit (dBm)	Pass/Fail
0	1	2412	-0.74	3.01	2.27	8	Pass
	6	2437	-0.57	3.01	2.44	8	Pass
	11	2462	-0.75	3.01	2.26	8	Pass
1	1	2412	-0.89	3.01	2.12	8	Pass
	6	2437	-0.50	3.01	2.51	8	Pass
	11	2462	-0.21	3.01	2.80	8	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2$/N] = 4.95dBi < 6dBi, so the limit no need to reduced.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass/Fail
0	1	2412	-9.36	3.01	0.24	-6.11	8	Pass
	6	2437	-1.35	3.01	0.24	1.90	8	Pass
	11	2462	-8.75	3.01	0.24	-5.50	8	Pass
1	1	2412	-9.36	3.01	0.24	-6.11	8	Pass
	6	2437	-2.54	3.01	0.24	0.71	8	Pass
	11	2462	-9.11	3.01	0.24	-5.86	8	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2$/N] = 4.95dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

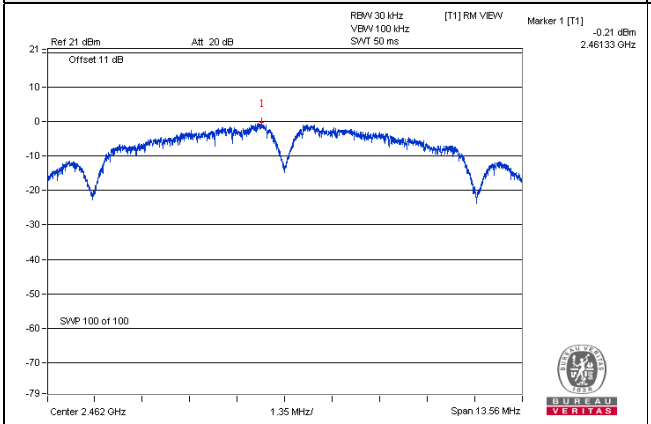
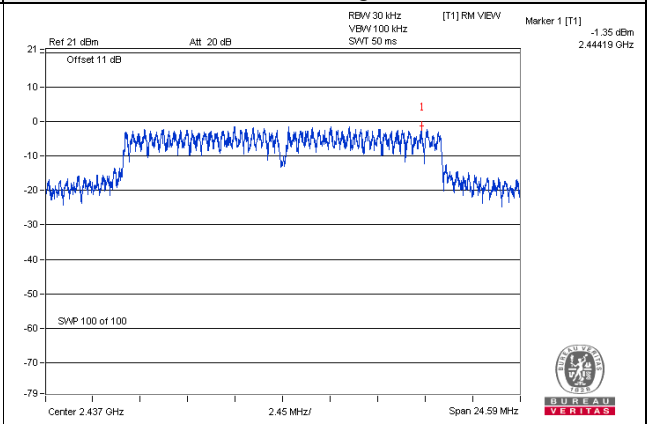
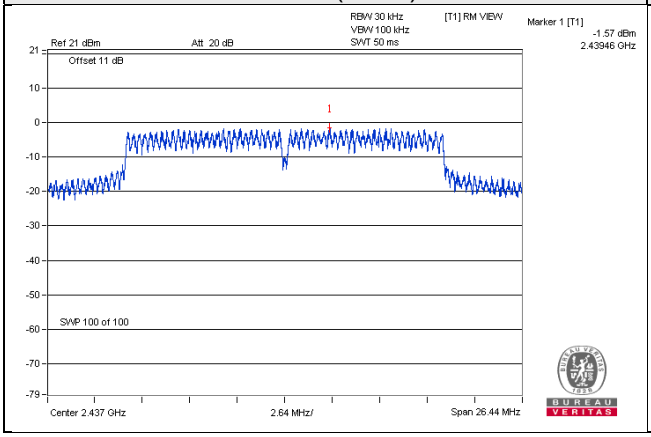
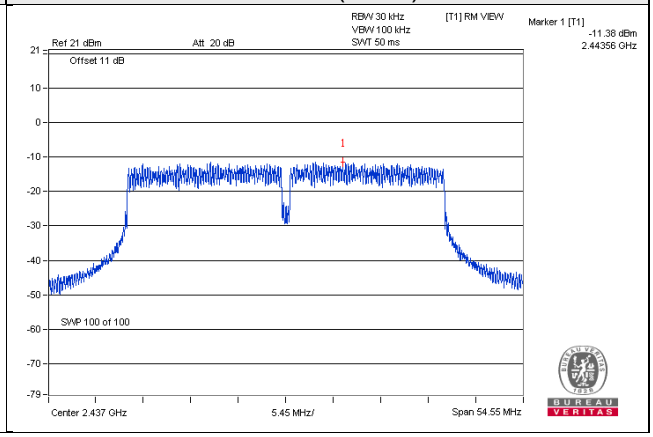
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass/Fail
0	1	2412	-9.75	3.01	0.09	-6.65	8	Pass
	6	2437	-1.57	3.01	0.09	1.53	8	Pass
	11	2462	-9.67	3.01	0.09	-6.57	8	Pass
1	1	2412	-10.21	3.01	0.09	-7.11	8	Pass
	6	2437	-3.09	3.01	0.09	0.01	8	Pass
	11	2462	-9.61	3.01	0.09	-6.51	8	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2$/N] = 4.95dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass/Fail
0	3	2422	-13.45	3.01	0.19	-10.25	8	Pass
	6	2437	-11.38	3.01	0.19	-8.18	8	Pass
	9	2452	-13.87	3.01	0.19	-10.67	8	Pass
1	3	2422	-13.49	3.01	0.19	-10.29	8	Pass
	6	2437	-11.63	3.01	0.19	-8.43	8	Pass
	9	2452	-14.09	3.01	0.19	-10.89	8	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2$/N] = 4.95dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11n (HT20)	802.11n (HT40)
	

Beamforming Mode

802.11n (HT20)

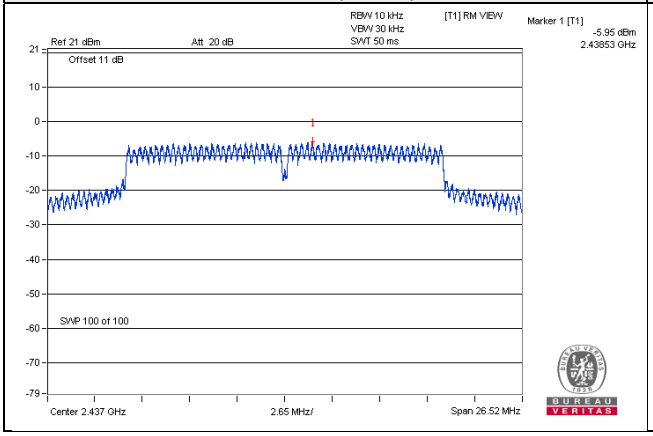
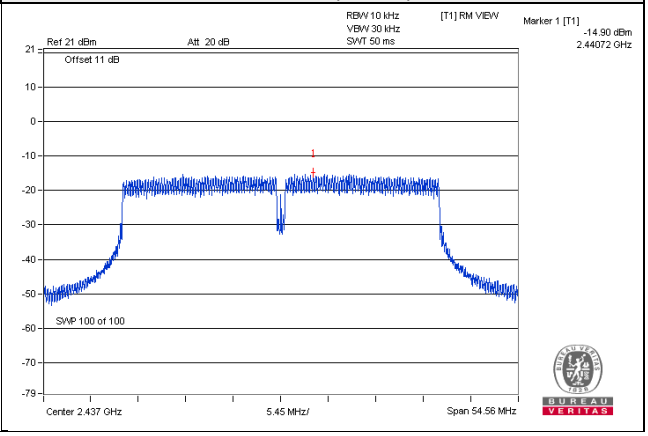
TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass/Fail
0	1	2412	-14.45	3.01	0.10	-11.34	8	Pass
	6	2437	-7.43	3.01	0.10	-4.32	8	Pass
	11	2462	-14.00	3.01	0.10	-10.89	8	Pass
1	1	2412	-13.88	3.01	0.10	-10.77	8	Pass
	6	2437	-5.95	3.01	0.10	-2.84	8	Pass
	11	2462	-13.54	3.01	0.10	-10.43	8	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2$/N] = 4.95dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=2) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass/Fail
0	3	2422	-17.13	3.01	0.20	-13.92	8	Pass
	6	2437	-15.65	3.01	0.20	-12.44	8	Pass
	9	2452	-17.93	3.01	0.20	-14.72	8	Pass
1	3	2422	-16.89	3.01	0.20	-13.68	8	Pass
	6	2437	-14.90	3.01	0.20	-11.69	8	Pass
	9	2452	-17.78	3.01	0.20	-14.57	8	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2$/N] = 4.95dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

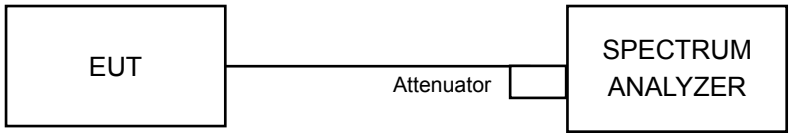
Spectrum Plot of Worst Value	
802.11n (HT20)	802.11n (HT40)
	

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

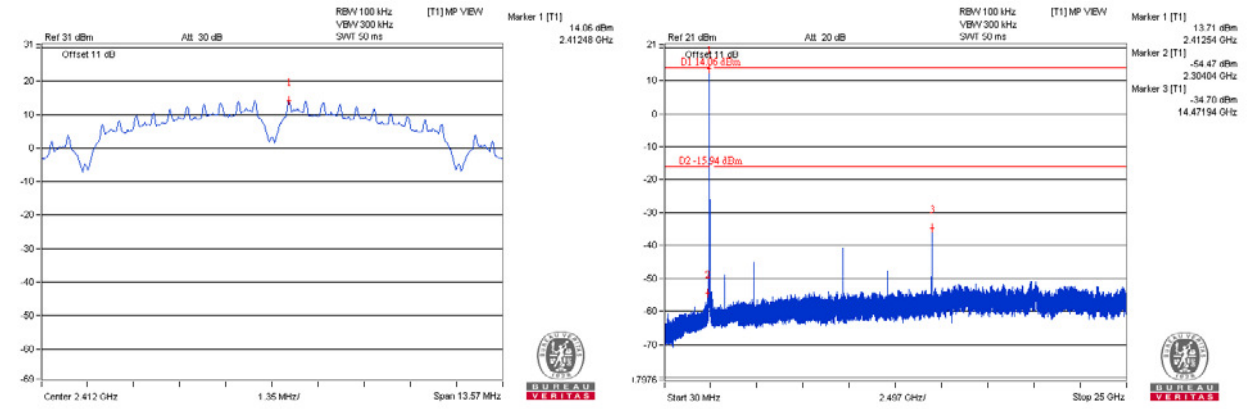
4.6.7 Test Results

The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
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.

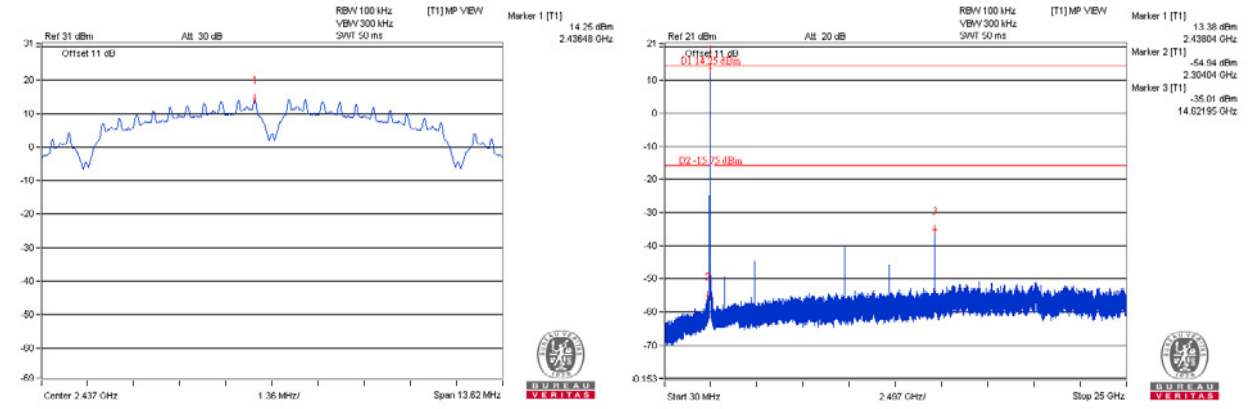
CDD Mode

802.11b_Chain 0

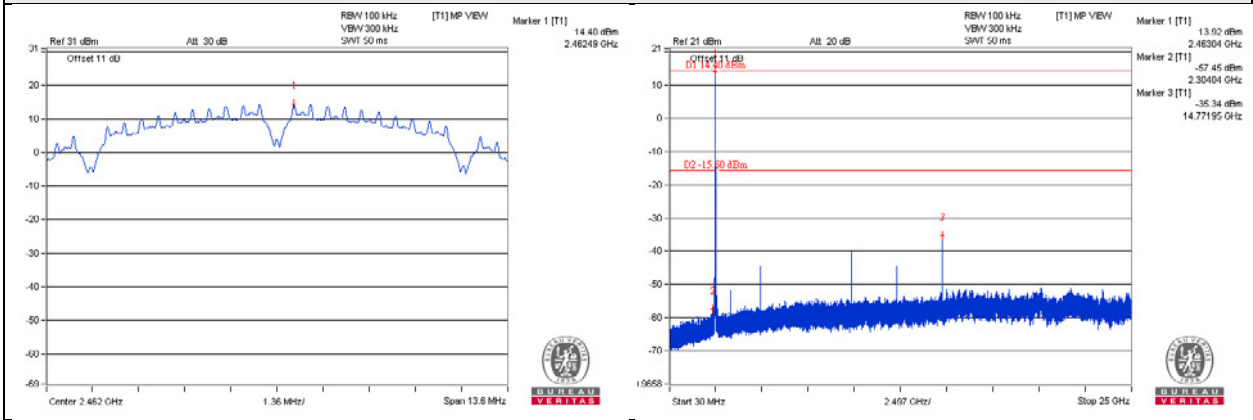
CH 1



CH 6

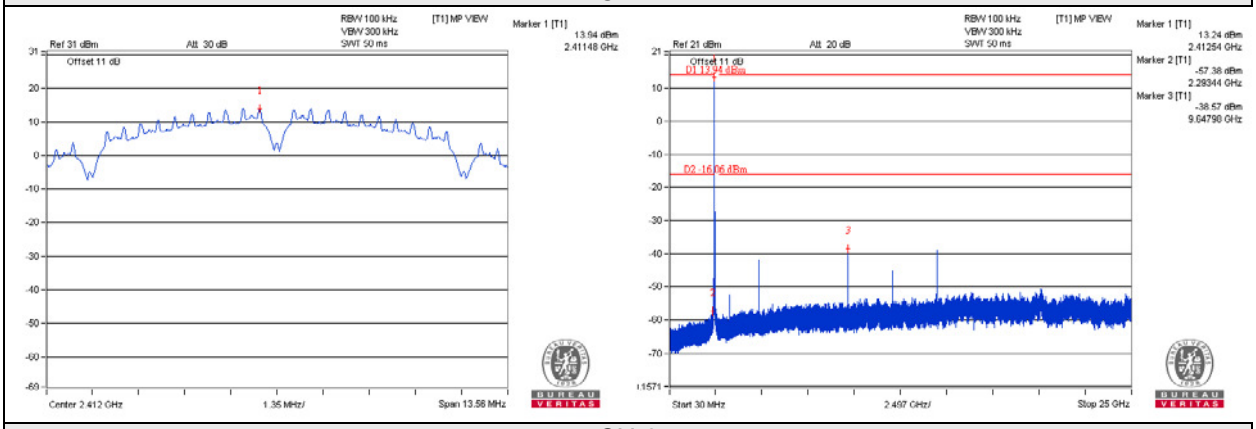


CH 11

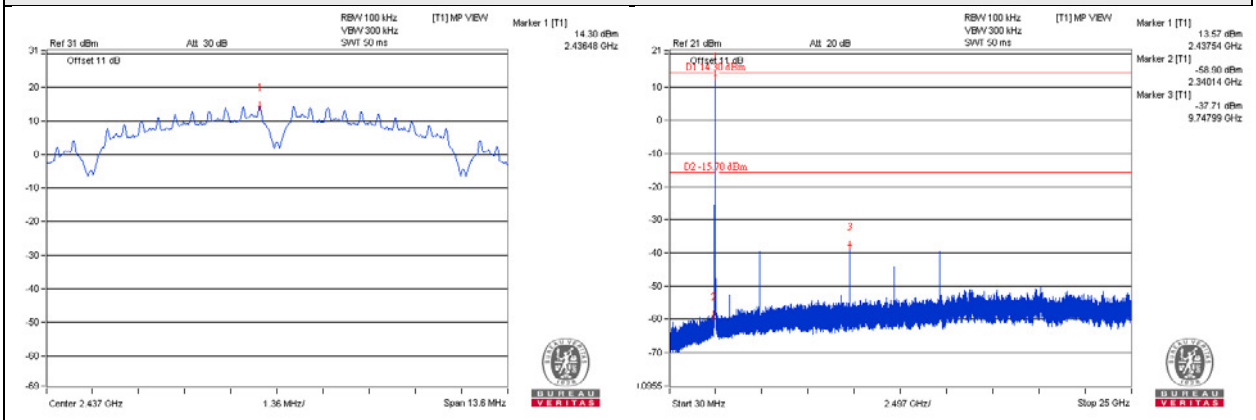


802.11b_Chain 1

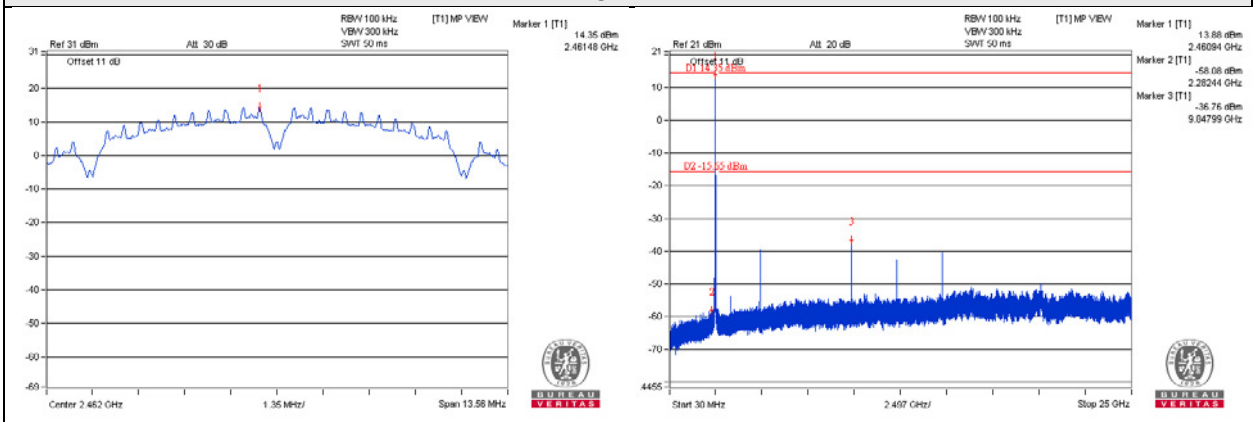
CH 1



CH 6

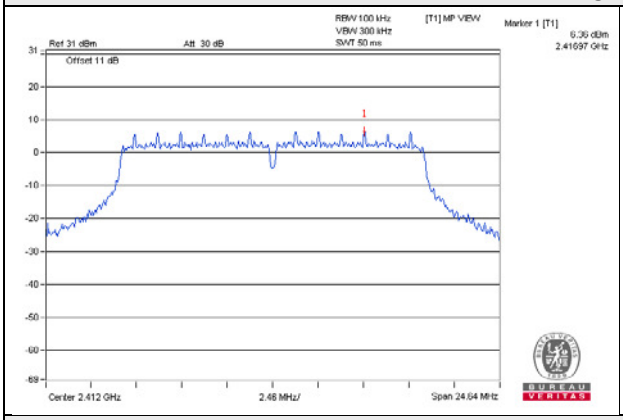


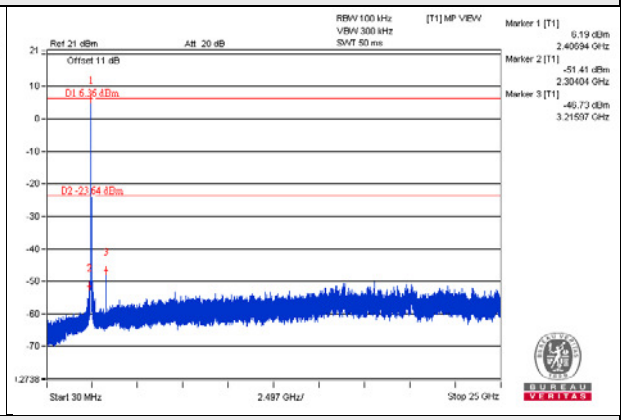
CH 11



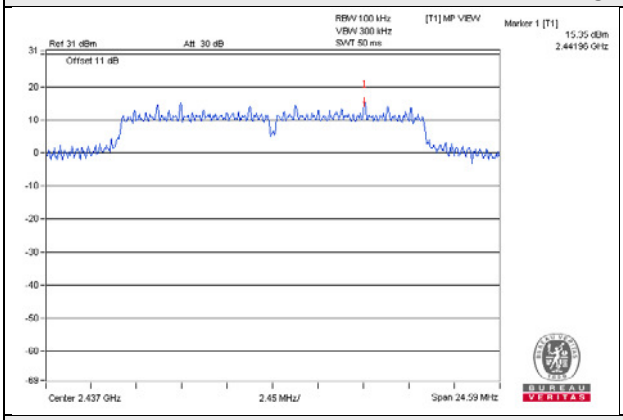
802.11g_Chain 0

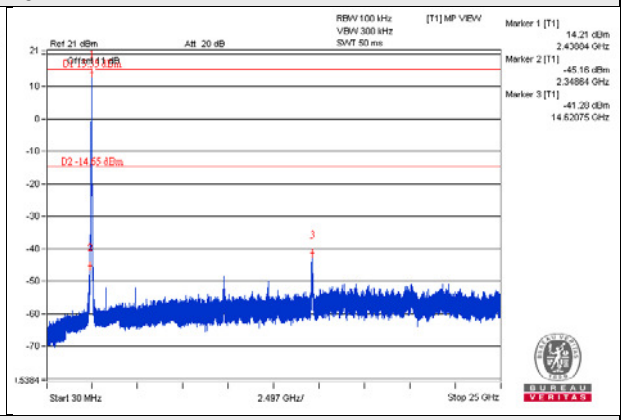
CH 1



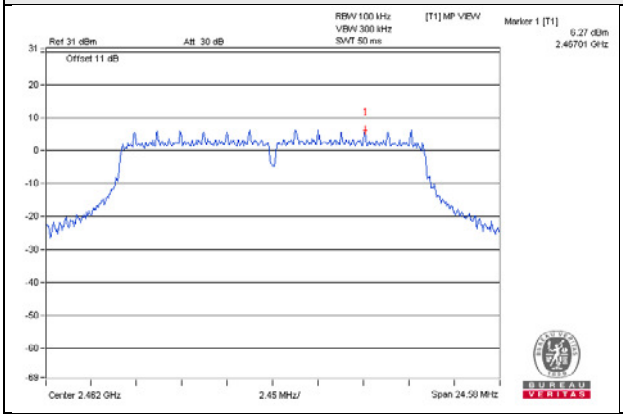


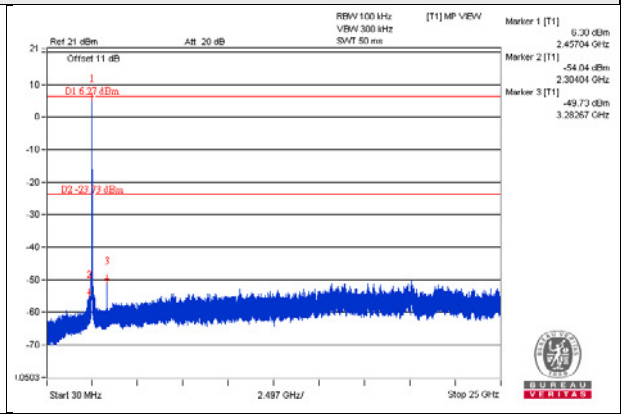
CH 6





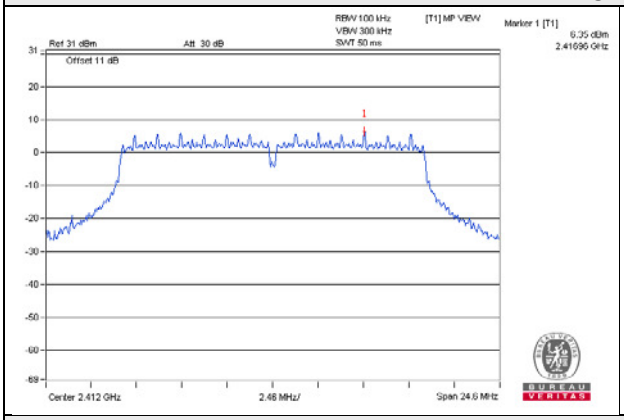
CH 11

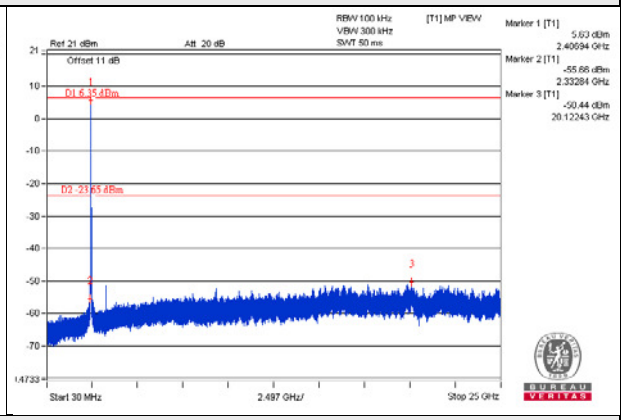




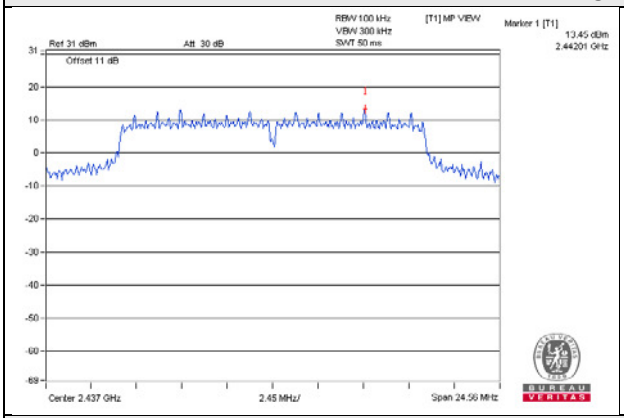
802.11g_Chain 1

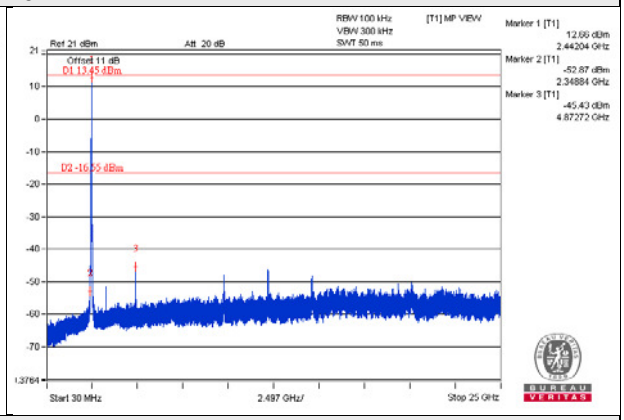
CH 1



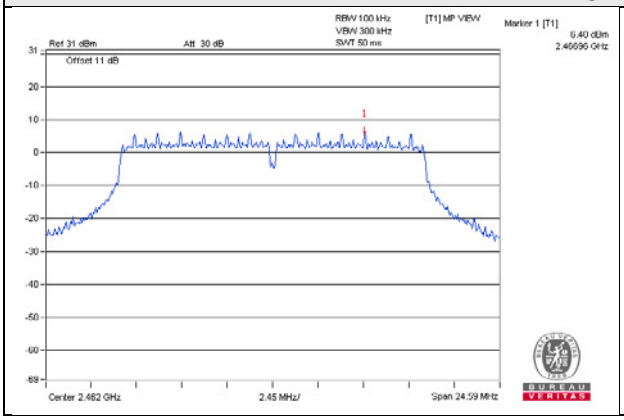


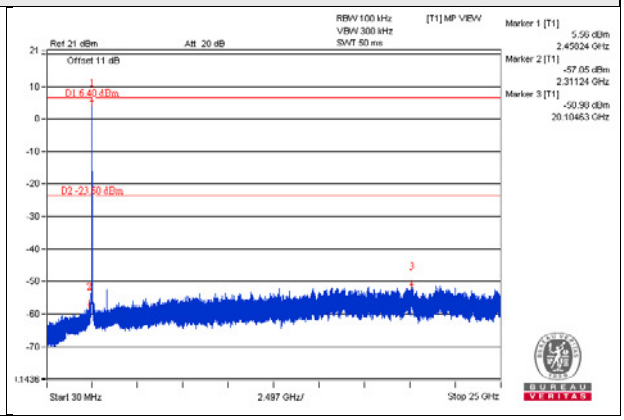
CH 6





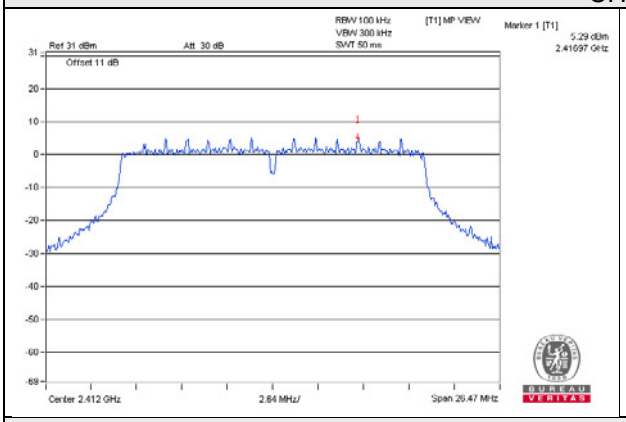
CH 11

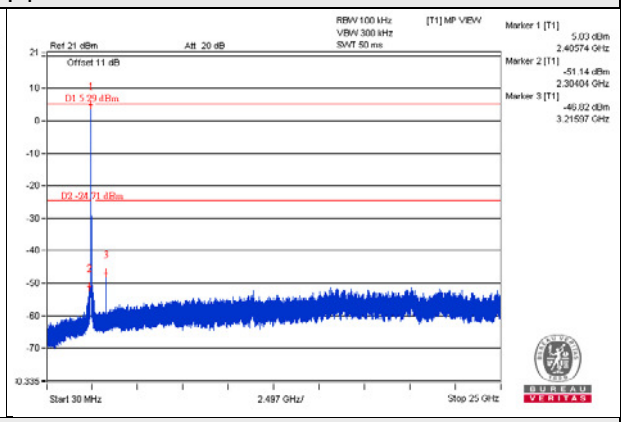




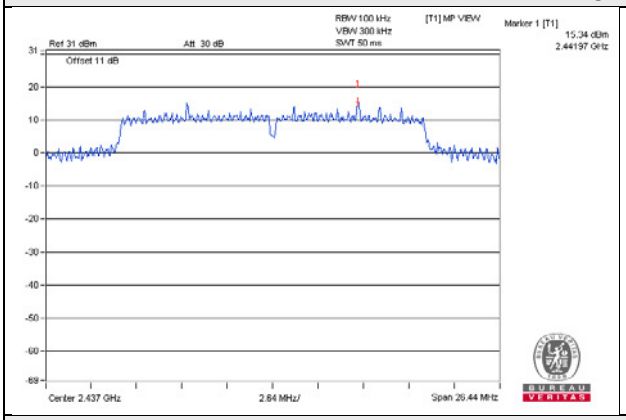
802.11n (HT20)_Chain 0

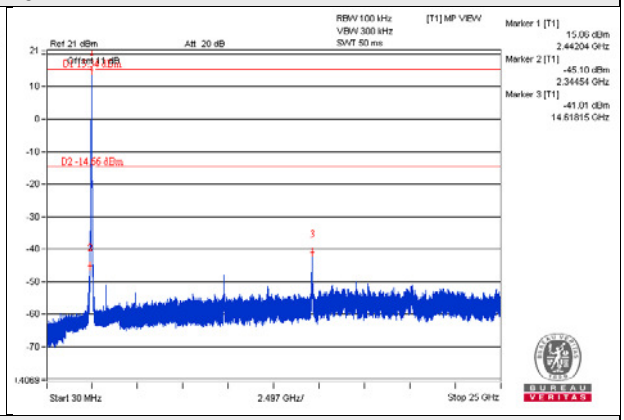
CH 1





CH 6





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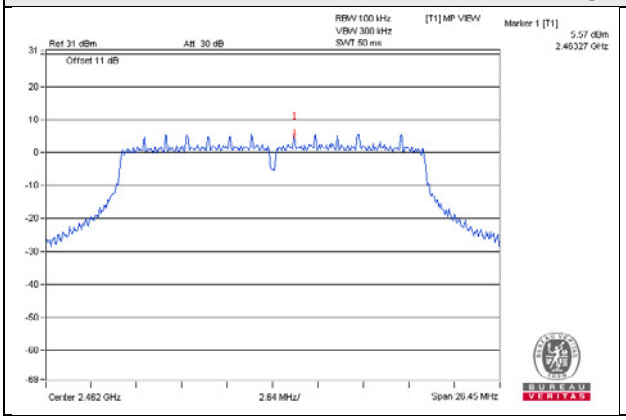
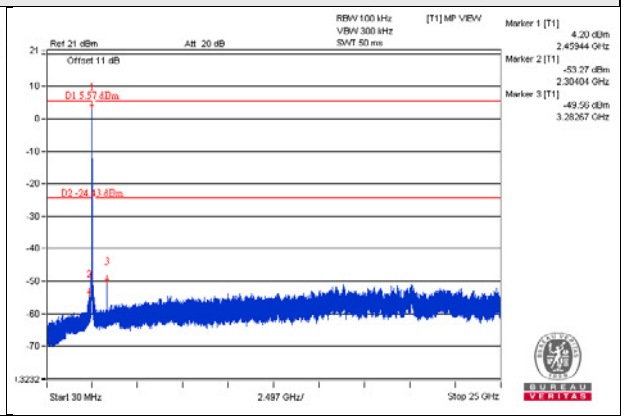
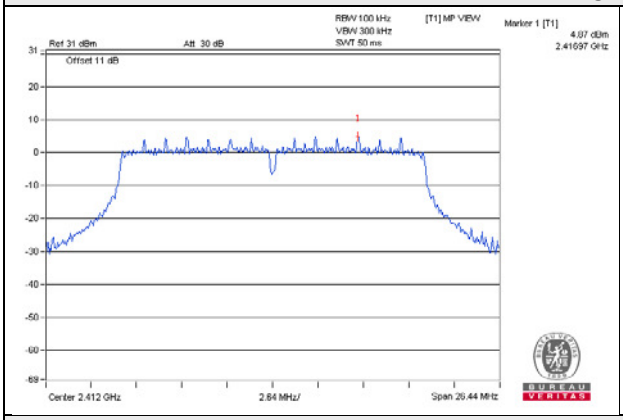
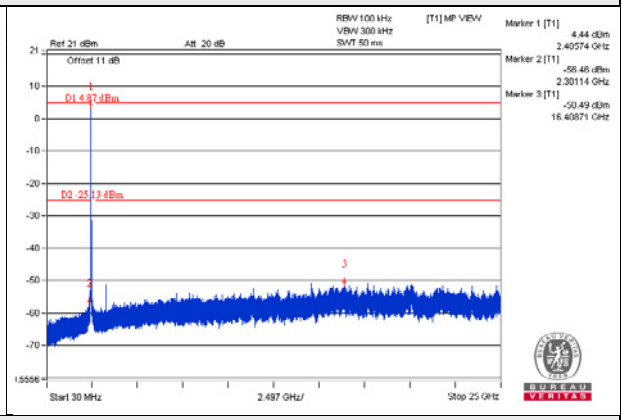




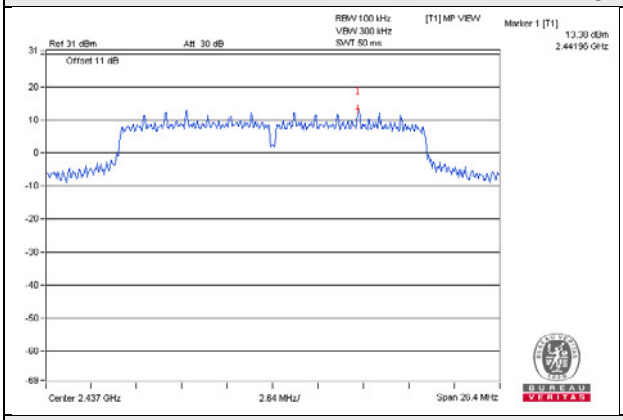
802.11n (HT20)_Chain 1

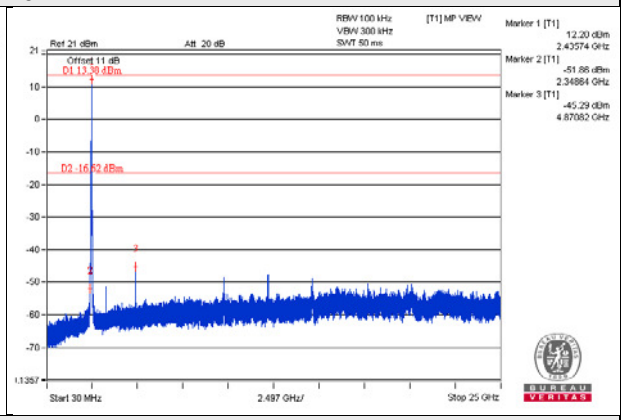
CH 1



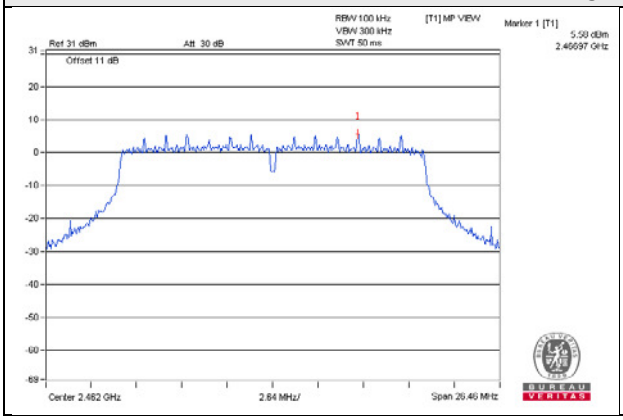


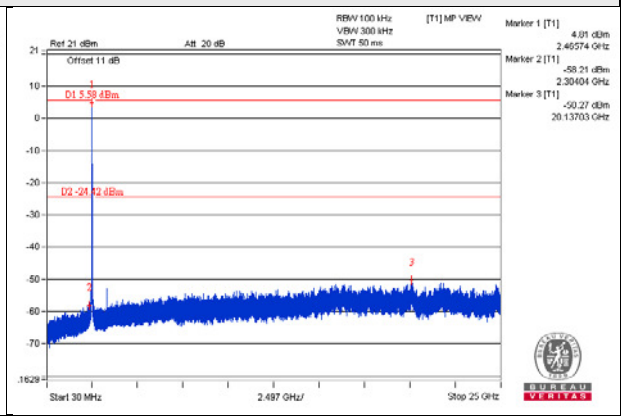
CH 6





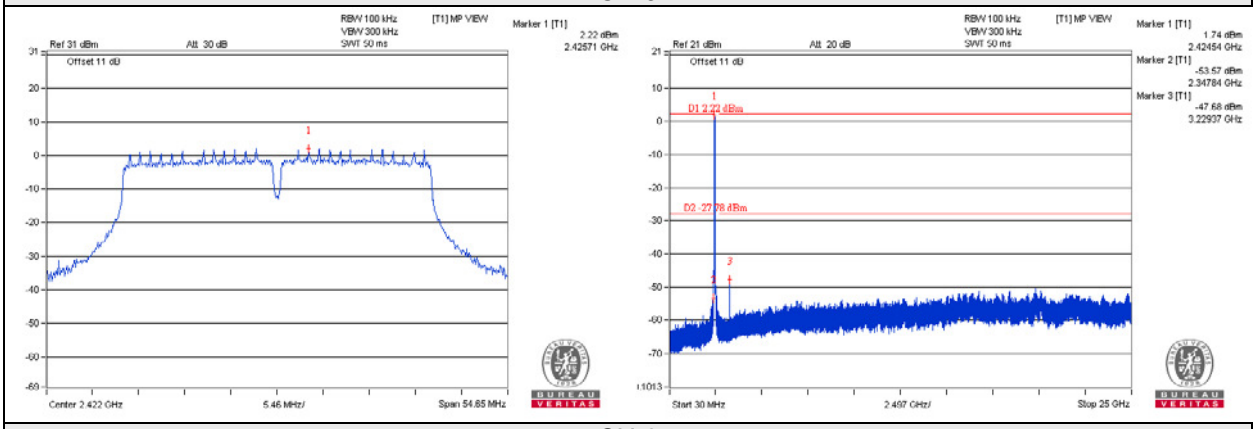
CH 11



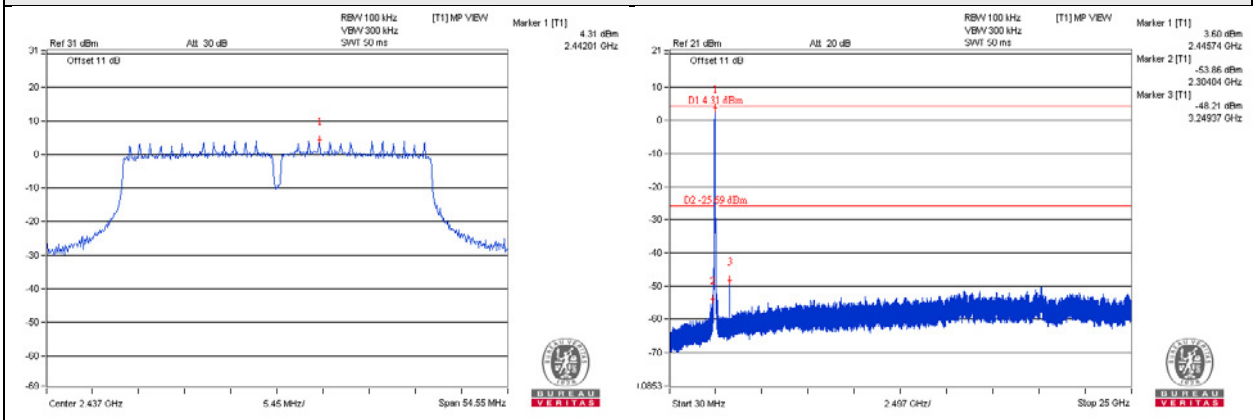


802.11n (HT40)_Chain 0

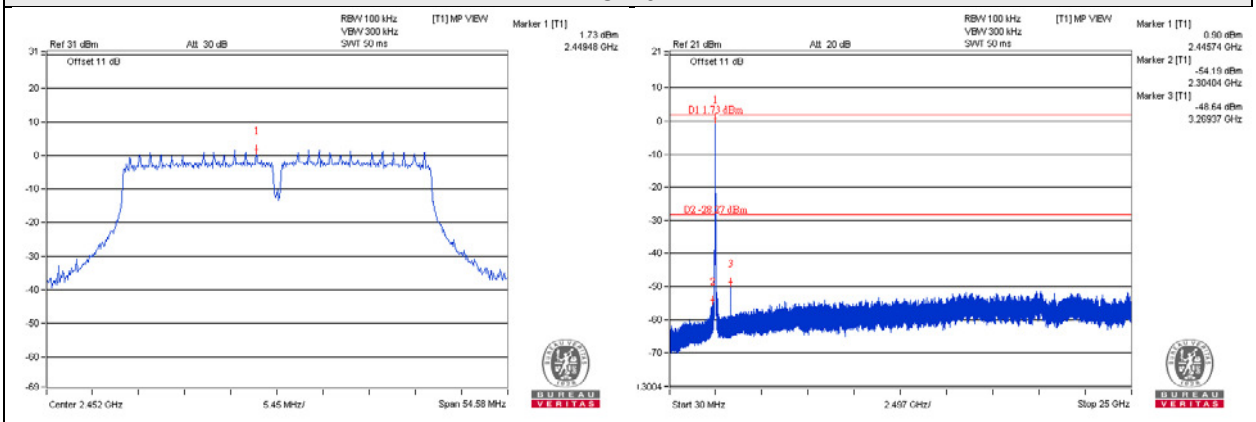
CH 3



CH 6

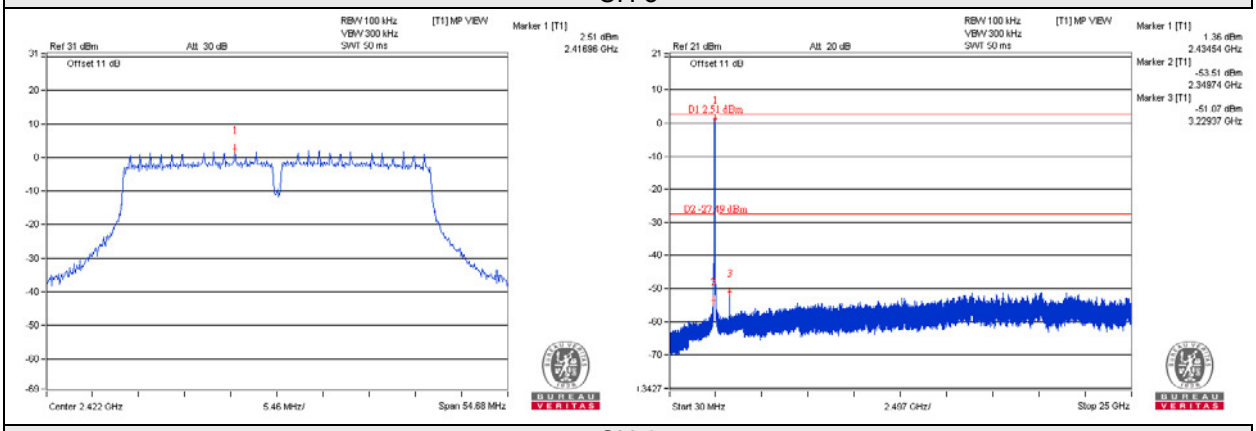


CH 9



802.11n (HT40)_Chain 1

CH 3



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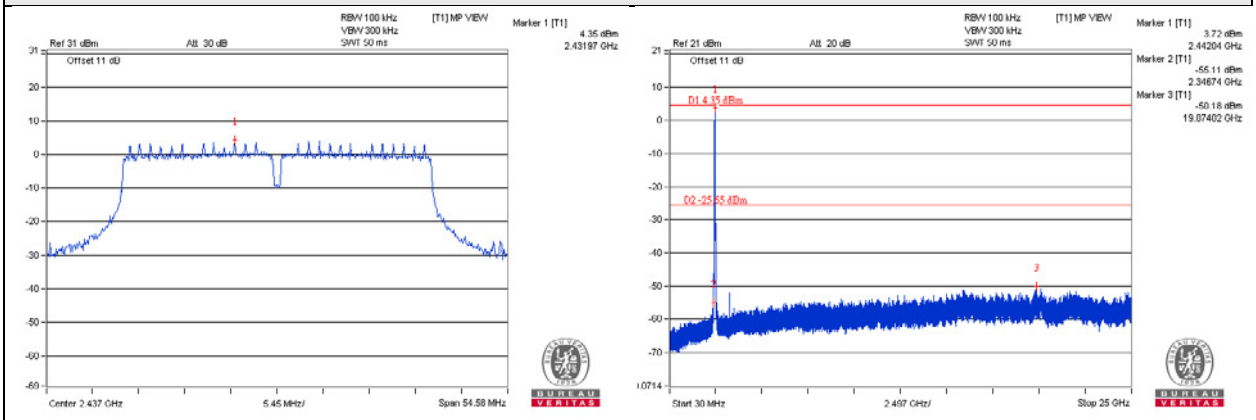

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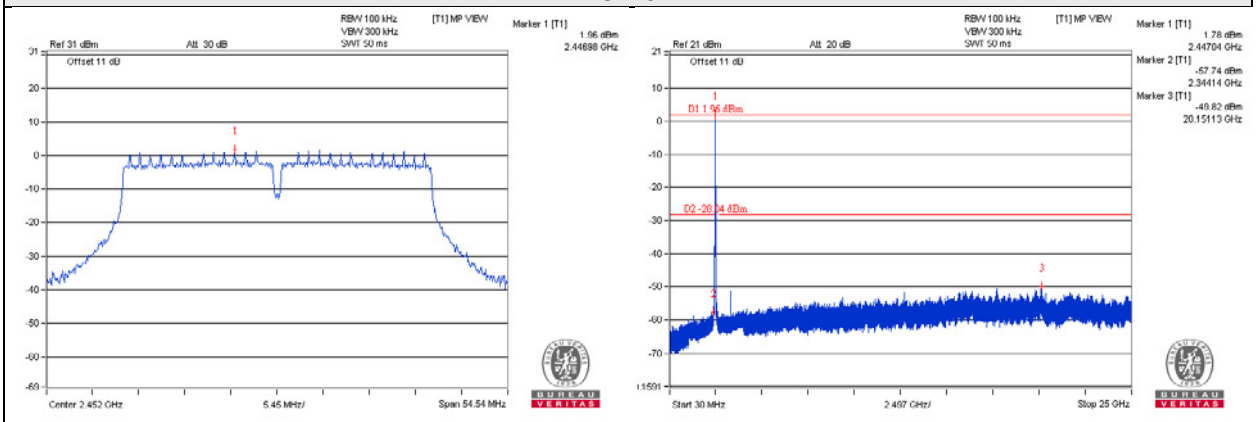
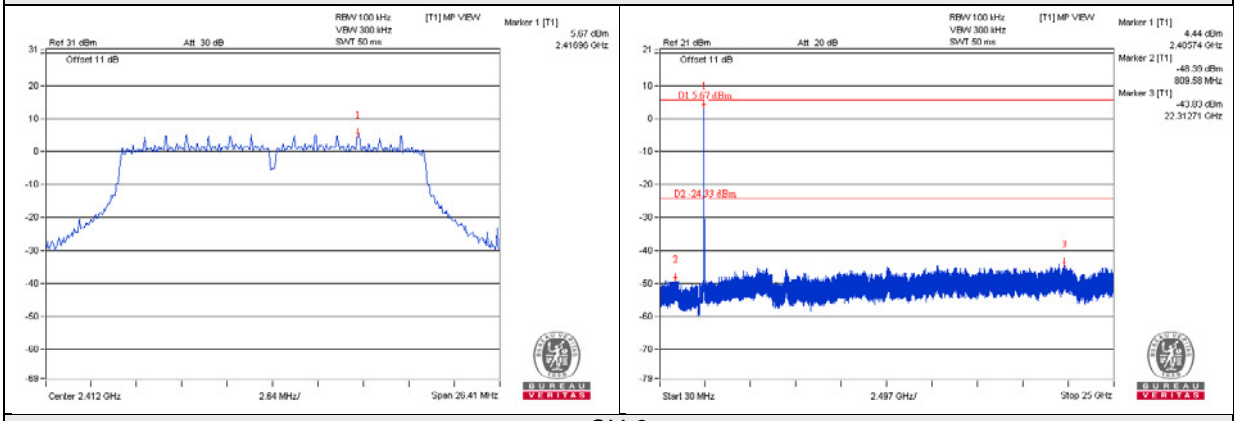


Beamforming Mode

802.11n (HT20)_Chain 0

CH 1



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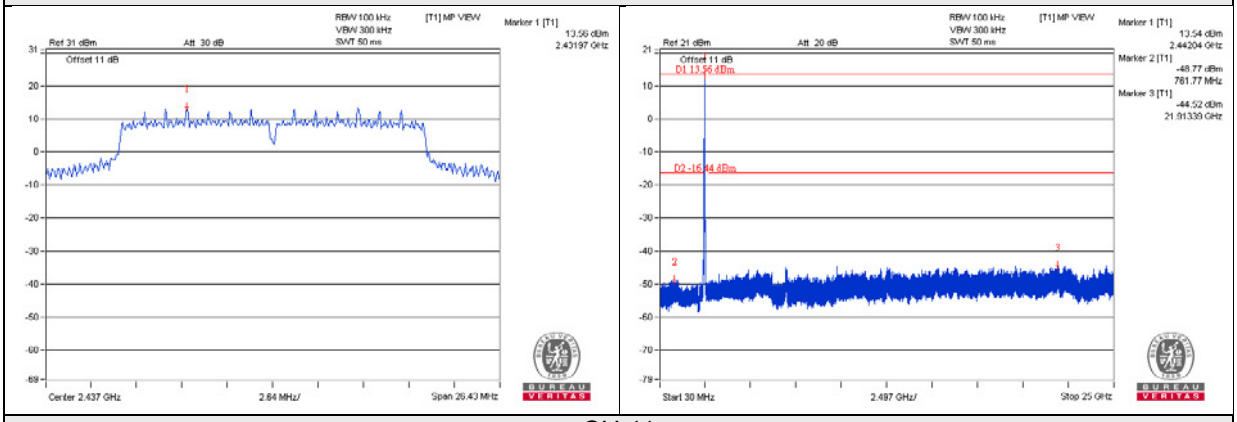

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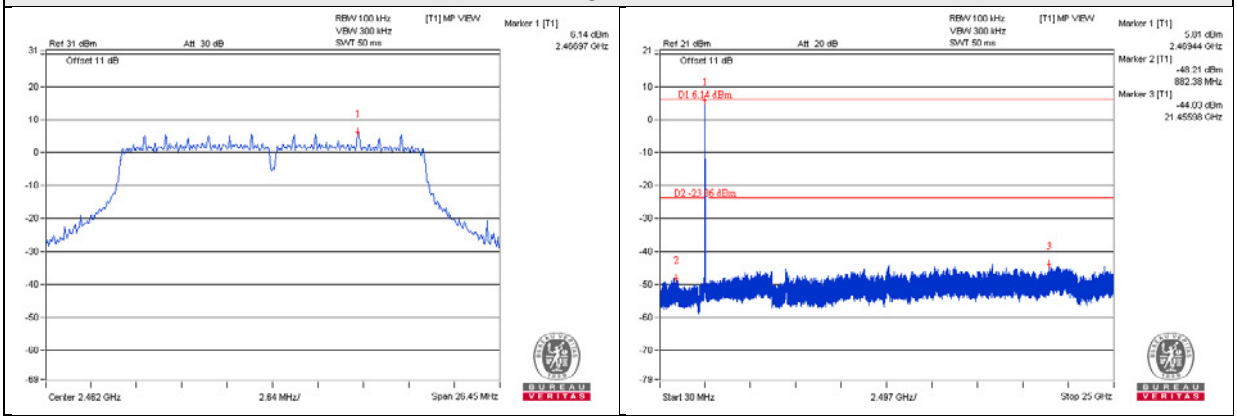
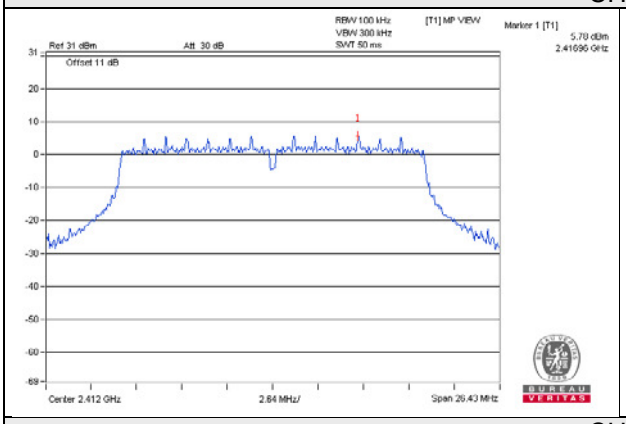
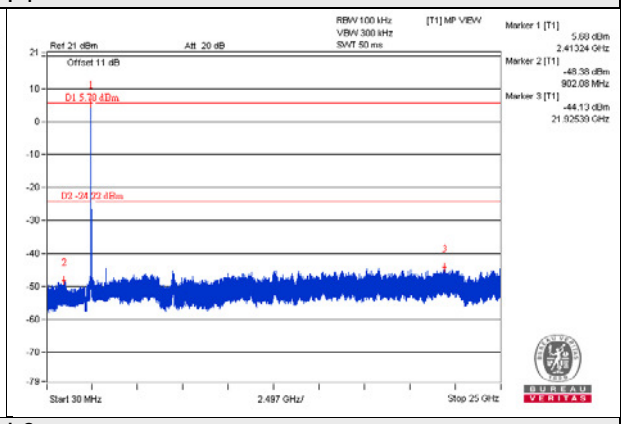


802.11n (HT20)_Chain 1

CH 1





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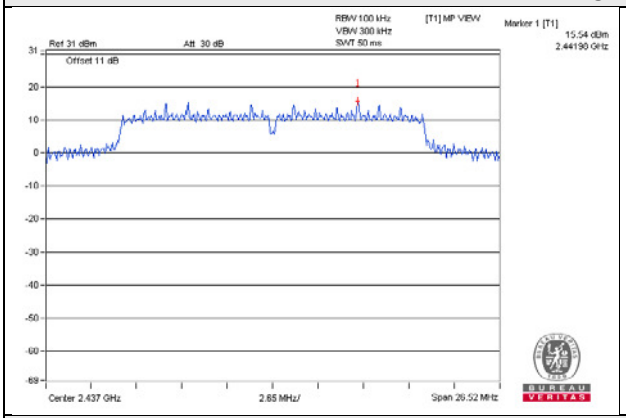

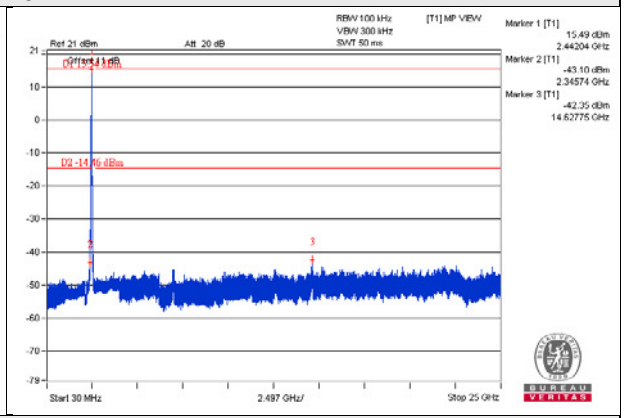

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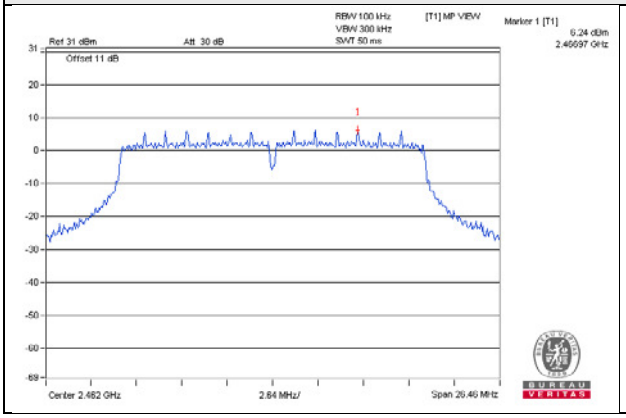
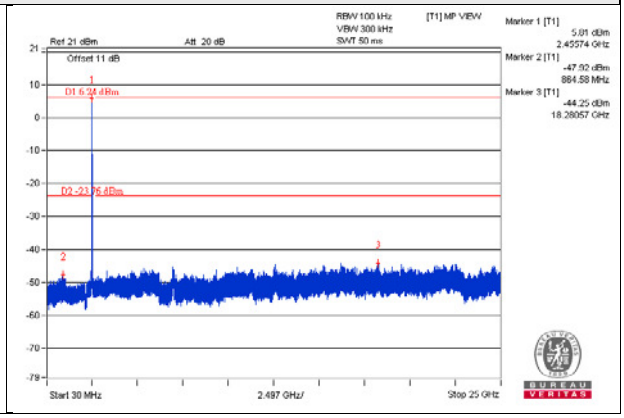
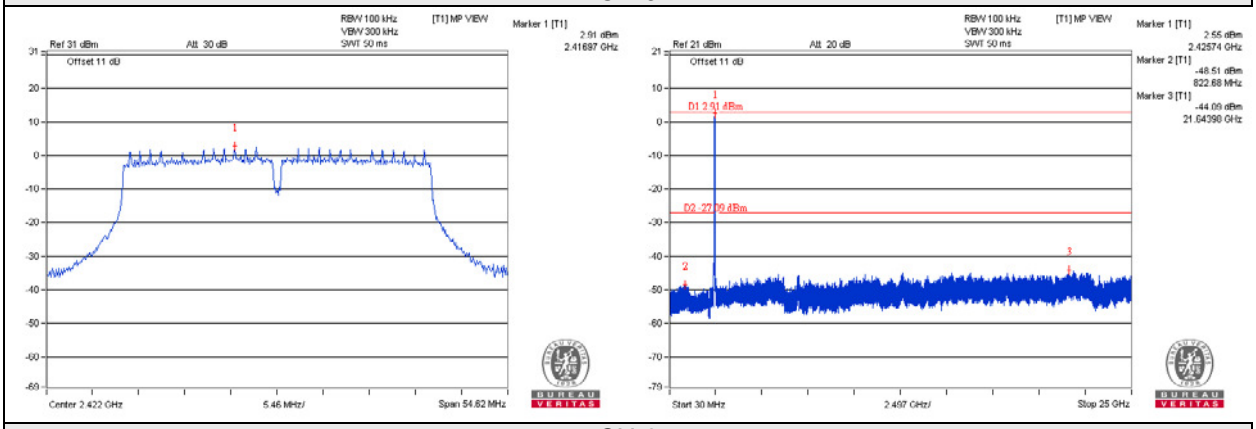




802.11n (HT40)_Chain 0

CH 3



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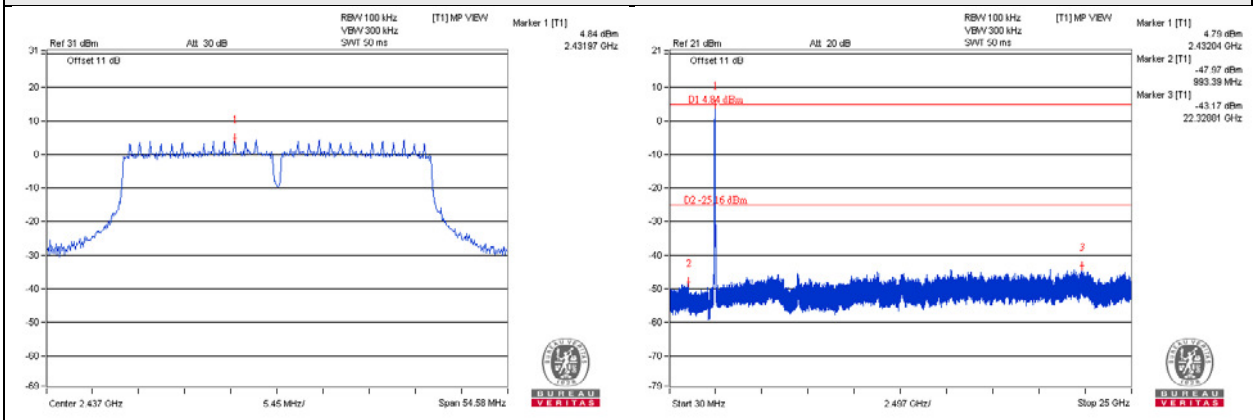
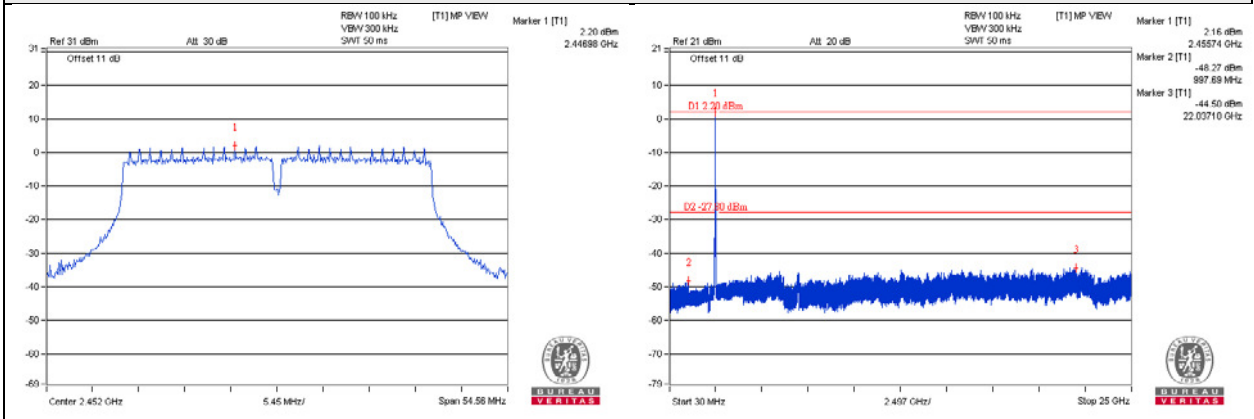
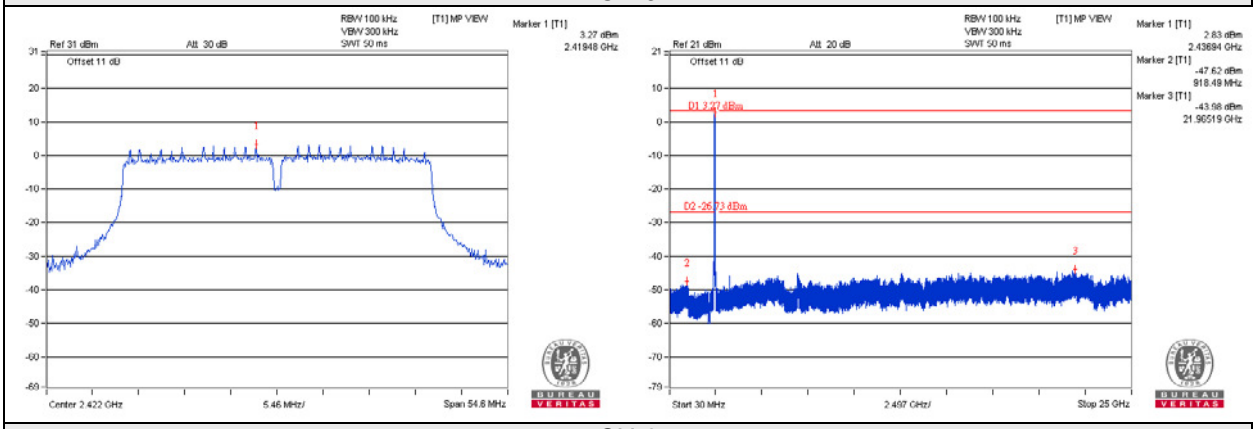


CH 9



802.11n (HT40)_Chain 1

CH 3



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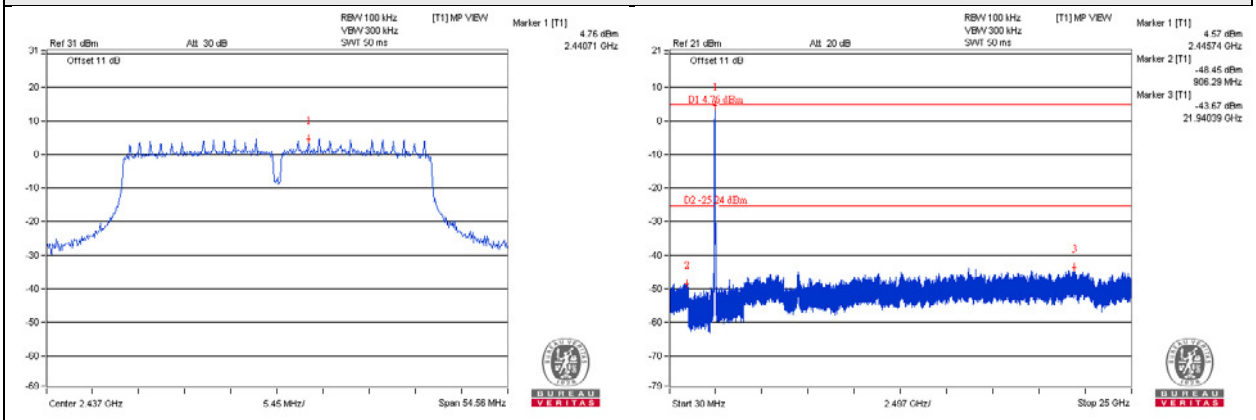

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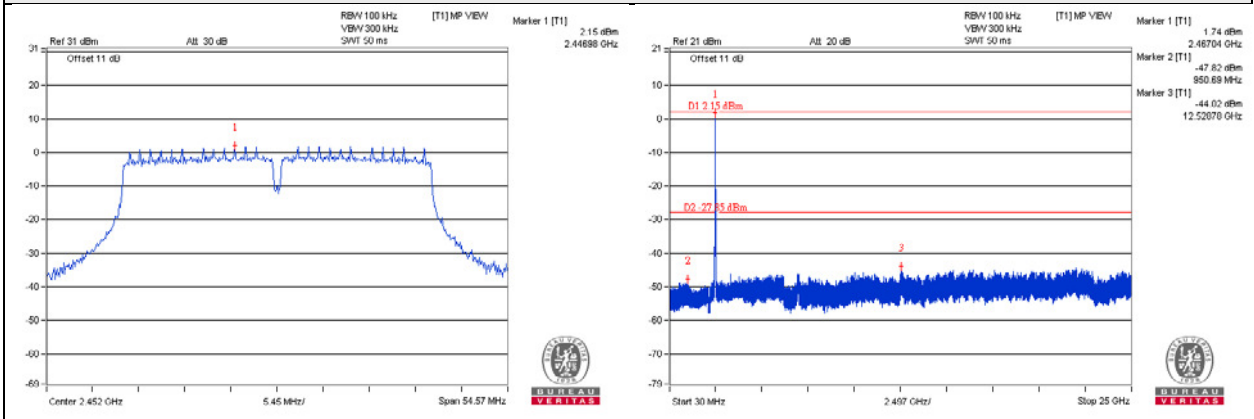

5 Pictures of Test Arrangements

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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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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