FCC Test Report

Report No.:	RF170411C19
FCC ID:	SLYWR1X22
Test Model:	WR-1
Series Model:	WR-1-1 (refer to item 3.1 for more details)
Received Date:	Apr. 11, 2017
Test Date:	Jun. 12 ~ Aug. 10, 2017
Issued Date:	Aug. 11, 2017
Applicant:	Control4 Corporation
Address:	11734 S. Election Road, Draper, UT 84020, 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.)

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF170411C19	Original release.	Aug. 11, 2017

1 Certificate of Conformity

Product:	802.11ac Dual Band Wireless Router
Brand:	pakedge
Test Model:	WR-1
Series Model:	WR-1-1 (refer to item 3.1 for more details)
Sample Status:	Engineering sample
Applicant:	Control4 Corporation
Test Date:	Jun. 12 ~ Aug. 10, 2017
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2013

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

Prepared by : _____ , **Date:** Aug. 11, 2017

Suntee Liu / Specialist

Approved by : _____ , **Date:** Aug. 11, 2017

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 -6.05dB at 0.24614MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 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	No antenna connector is used.

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	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 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	802.11ac Dual Band Wireless Router
Brand	pakedge
Test Model	WR-1
Series Model	WR-1-1
Model Difference	Refer to Note
Sample Status	Engineering sample
Power Supply Rating	12Vdc (adapter)
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 300Mbps
Operating Frequency	2412~2462MHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	CDD Mode: 376.239mW Beamforming Mode: 157.399mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Cable Supplied	NA

Note:

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

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

* For 802.11n and 802.11ac, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

2. The EUT uses following antennas.

Antenna Type	PCB			Antenna Connector			NA	
Antenna 1								
Frequency (GHz)	2.40			2.45			2.50	
Gain (dBi)	3.50			3.90			3.67	
Antenna 2								
Frequency (GHz)	2.40			2.45			2.50	
Gain (dBi)	4.03			4.18			4.59	
Antenna 3								
Frequency (GHz)	5.15	5.25	5.35	5.45	5.55	5.65	5.75	5.85
Gain (dBi)	4.37	4.31	4.96	5.28	4.42	3.99	3.92	3.97
Antenna 4								
Frequency (GHz)	5.15	5.25	5.35	5.45	5.55	5.65	5.75	5.85
Gain (dBi)	4.55	3.94	3.64	4.30	4.03	4.16	3.98	4.44

* The 4.59dBi gain with 2.4GHz max. gain is chosen for final tests.

* The 5.28dBi gain with 5GHz max. gain is chosen for final tests.

3. All models are listed as below. Model WR-1 is the representative for final test.

Brand	Model	Difference
pakedge	WR-1	Marketing requirement
	WR-1-1	

4. The EUT uses following adapters.

Adapter 1	
Brand	Powertron Electronics Corp.
Model	PA1015-120DUB150
Input Power	100-240Vac, 50-60Hz, 0.4A
Output Power	12Vdc, 1.5A, 18W Max
Power Line	1.5m DC cable without core attached on adapter

Adapter 2	
Brand	Powertron Electronics Corp.
Model	PA1015-120IB150
Input Power	100-240Vac, 50-60Hz, 0.4A
Output Power	12Vdc, 1.5A, 18W Max.
Power Line	1.5m DC cable without core attached on adapter

5. 2.4GHz and 5GHz technologies can transmit at same time.

6. Spurious emission of the simultaneous operation (2.4GHz and 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	
A	√	√	√	√	Adapter 1
B	-	√	√	-	Adapter 2

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:

1. The antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Y-plane.
2. "-": means no effect.

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	Data Rate (Mbps)	Remark
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	-
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	-
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2	-
A	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	Data Rate (Mbps)	Remark
A, B	802.11b	1 to 11	11	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	Data Rate (Mbps)	Remark
A, B	802.11b	1 to 11	11	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	Data Rate (Mbps)	Remark
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	-
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	-
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2	-
A	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0	-

Test Condition:

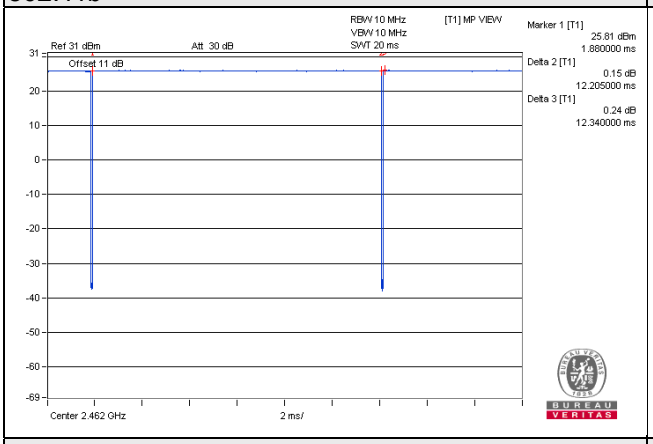
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	27 deg. C, 68% RH 25 deg. C, 66% RH 26 deg. C, 68% RH	120Vac, 60Hz	James Yang Jones Chang
RE<1G	26 deg. C, 68% RH 24 deg. C, 67% RH	120Vac, 60Hz	Jones Chang
PLC	25 deg. C, 69% RH 25 deg. C, 75% RH	120Vac, 60Hz	Jones Chang Luis Lee
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Ted Chang Edward Lin

3.3 Duty Cycle of Test Signal

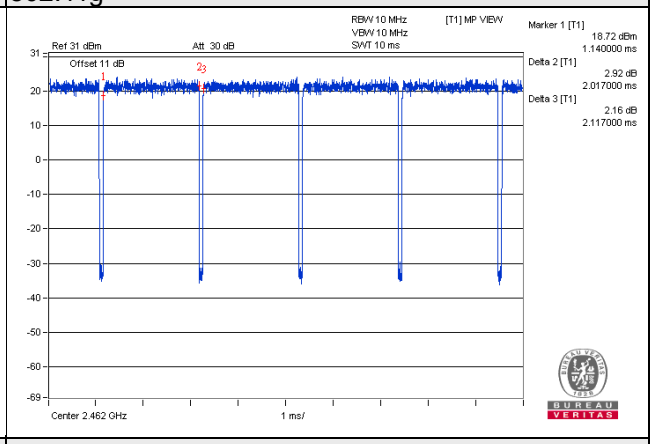
Duty cycle of test signal is ≥ 98%, duty factor is not required.
Duty cycle of test signal is < 98%, duty factor is required.

802.11b: Duty cycle = 12.205/12.34 = 0.989
802.11g: Duty cycle = 2.017/2.117 = 0.953, Duty factor = 10 * log(1/0.953) = 0.21
802.11n (HT20): Duty cycle = 4.939/5.039 = 0.980
802.11n (HT40): Duty cycle = 2.402/2.495 = 0.963, Duty factor = 10 * log(1/0.963) = 0.16

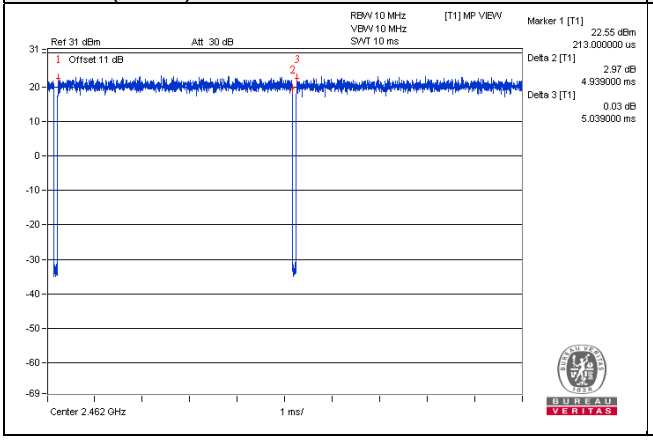
802.11b



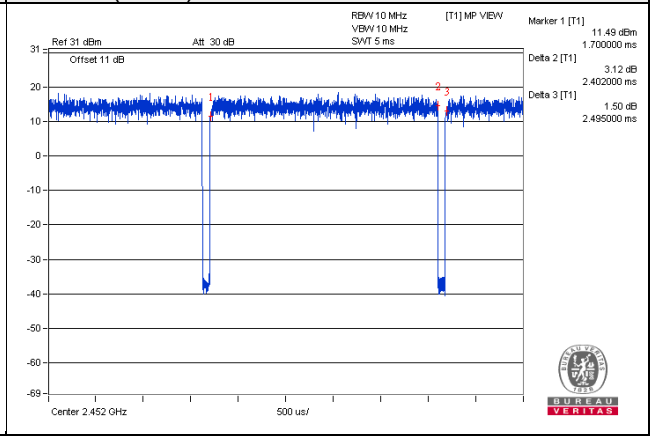
802.11g



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.

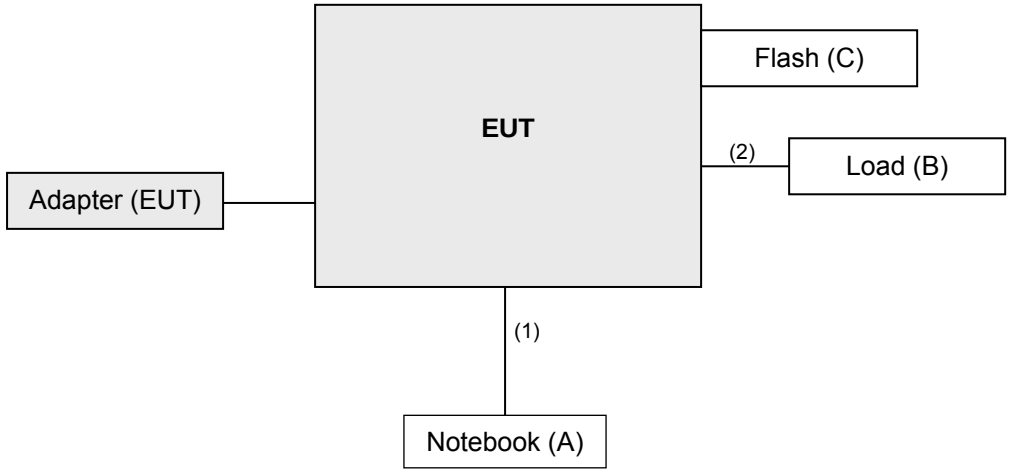
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	Load	NA	NA	NA	NA	-
C.	Flash	HP	v250W	01	NA	-

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, Cat5e	1	3	N	0	-
2.	RJ45, Cat5e	4	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 specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 DTS Meas Guidance v04
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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	ESIB7	100187	May 02, 2017	May 01, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Nov. 16, 2016	Nov. 15, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	9120D	209	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Preamplifier Agilent	8447D	2944A10738	Aug. 22, 2016	Aug. 21, 2017
Preamplifier Agilent	8449B	3008A01922	Sep. 18, 2016	Sep. 17, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (214378)	Aug. 22, 2016	Aug. 21, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 106	Cable-CH3-03 (309224+12738)	Aug. 22, 2016	Aug. 21, 2017
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
High Speed Peak Power Meter	ML2495A	0824012	Aug. 11, 2016	Aug. 10, 2017
Power Sensor	MA2411B	0738171	Aug. 11, 2016	Aug. 10, 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 3.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

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

c. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

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

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

Note:

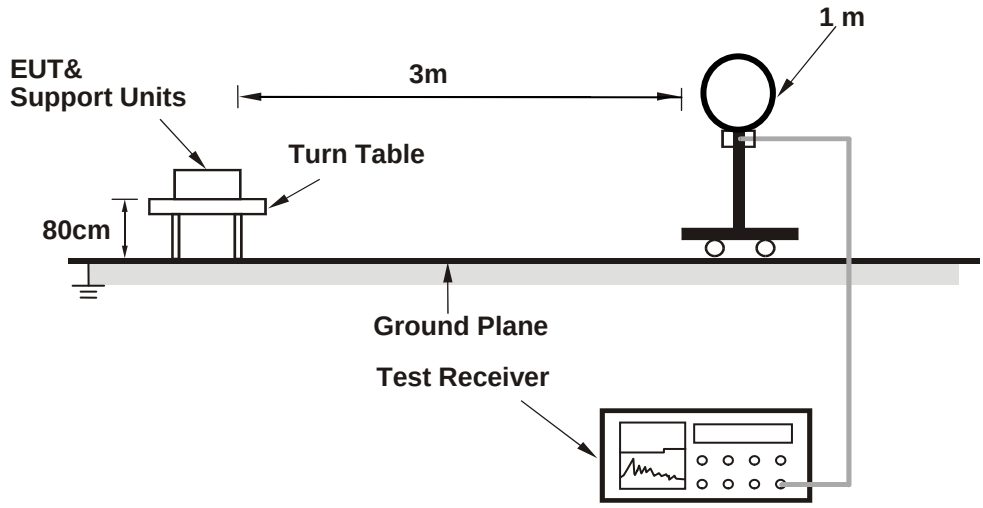
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

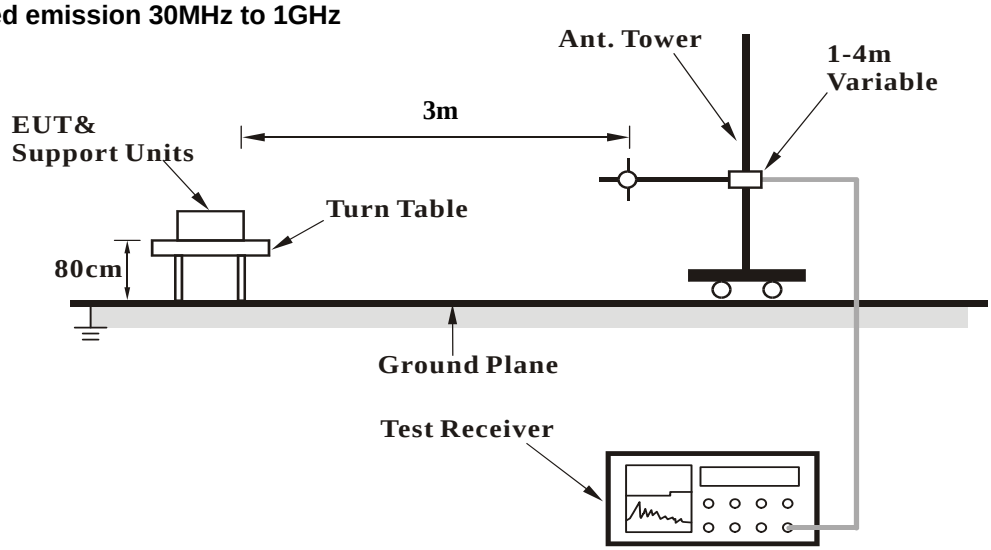
No deviation.

4.1.5 Test Setup

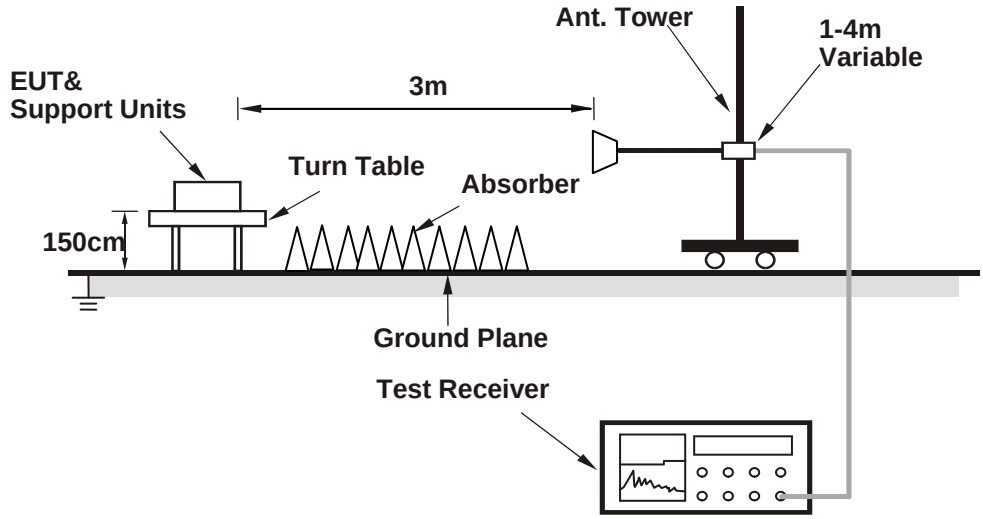
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. Prepared a PC 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".
e. The necessary accessories enable the system in full functions.

4.1.7 Test Results

Above 1GHz worst-Case 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	55.2 PK	74.0	-18.8	1.26 H	119	24.2	31.0
2	2390.00	43.8 AV	54.0	-10.2	1.26 H	119	12.8	31.0
3	*2412.00	109.4 PK			1.23 H	32	78.2	31.2
4	*2412.00	107.4 AV			1.23 H	32	76.2	31.2
5	4824.00	47.8 PK	74.0	-26.2	2.27 H	94	47.3	0.5
6	4824.00	36.6 AV	54.0	-17.4	2.27 H	94	36.1	0.5
7	14472.00	66.5 PK	74.0	-7.5	2.34 H	34	46.1	20.4
8	14472.00	52.8 AV	54.0	-1.2	2.34 H	34	32.4	20.4
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	55.7 PK	74.0	-18.3	1.39 V	77	24.7	31.0
2	2390.00	44.0 AV	54.0	-10.0	1.39 V	77	13.0	31.0
3	*2412.00	110.8 PK			1.55 V	81	79.6	31.2
4	*2412.00	108.5 AV			1.55 V	81	77.3	31.2
5	4824.00	47.0 PK	74.0	-27.0	2.02 V	7	46.5	0.5
6	4824.00	34.4 AV	54.0	-19.6	2.02 V	7	33.9	0.5
7	14472.00	66.8 PK	74.0	-7.2	1.36 V	38	46.4	20.4
8	14472.00	52.6 AV	54.0	-1.4	1.36 V	38	32.2	20.4

Remarks:

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

CHANNEL	TX Channel 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	114.4 PK			2.78 H	351	83.1	31.3
2	*2437.00	112.0 AV			2.78 H	351	80.7	31.3
3	4874.00	48.3 PK	74.0	-25.7	1.21 H	164	47.7	0.6
4	4874.00	39.8 AV	54.0	-14.2	1.21 H	164	39.2	0.6
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	*2437.00	114.6 PK			1.95 V	46	83.3	31.3
2	*2437.00	112.2 AV			1.95 V	46	80.9	31.3
3	4874.00	47.7 PK	74.0	-26.3	2.18 V	2	47.1	0.6
4	4874.00	36.1 AV	54.0	-17.9	2.18 V	2	35.5	0.6

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	115.0 PK			2.66 H	6	83.6	31.4
2	*2462.00	112.8 AV			2.66 H	6	81.4	31.4
3	2483.50	60.2 PK	74.0	-13.8	2.38 H	8	28.7	31.5
4	2483.50	51.4 AV	54.0	-2.6	2.38 H	8	19.9	31.5
5	4924.00	48.7 PK	74.0	-25.3	1.09 H	16	48.1	0.6
6	4924.00	39.6 AV	54.0	-14.4	1.09 H	16	39.0	0.6
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	113.4 PK			1.42 V	32	82.0	31.4
2	*2462.00	111.1 AV			1.42 V	32	79.7	31.4
3	2483.50	61.3 PK	74.0	-12.7	1.42 V	5	29.8	31.5
4	2483.50	52.0 AV	54.0	-2.0	1.42 V	5	20.5	31.5
5	4924.00	47.3 PK	74.0	-26.7	2.66 V	339	46.7	0.6
6	4924.00	35.4 AV	54.0	-18.6	2.66 V	339	34.8	0.6

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.

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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	65.7 PK	74.0	-8.3	1.60 H	15	34.7	31.0
2	2390.00	51.4 AV	54.0	-2.6	1.60 H	15	20.4	31.0
3	*2412.00	110.1 PK			3.17 H	357	78.9	31.2
4	*2412.00	100.6 AV			3.17 H	357	69.4	31.2
5	4824.00	48.3 PK	74.0	-25.7	2.59 H	123	47.8	0.5
6	4824.00	36.9 AV	54.0	-17.1	2.59 H	123	36.4	0.5
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	65.9 PK	74.0	-8.1	1.65 V	0	34.9	31.0
2	2390.00	52.4 AV	54.0	-1.6	1.65 V	0	21.4	31.0
3	*2412.00	112.7 PK			1.92 V	358	81.5	31.2
4	*2412.00	102.1 AV			1.92 V	358	70.9	31.2
5	4824.00	44.7 PK	74.0	-29.3	2.12 V	155	44.2	0.5
6	4824.00	33.5 AV	54.0	-20.5	2.12 V	155	33.0	0.5

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) – 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) 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	63.6 PK	74.0	-10.4	2.54 H	359	32.6	31.0
2	2390.00	49.2 AV	54.0	-4.8	2.54 H	359	18.2	31.0
3	*2437.00	115.1 PK			2.83 H	355	83.8	31.3
4	*2437.00	105.2 AV			2.83 H	355	73.9	31.3
5	4874.00	48.8 PK	74.0	-25.2	2.56 H	221	48.2	0.6
6	4874.00	38.2 AV	54.0	-15.8	2.56 H	221	37.6	0.6
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	62.7 PK	74.0	-11.3	1.65 V	0	31.7	31.0
2	2390.00	49.4 AV	54.0	-4.6	1.65 V	0	18.4	31.0
3	*2437.00	115.9 PK			1.61 V	2	84.6	31.3
4	*2437.00	106.0 AV			1.61 V	2	74.7	31.3
5	4874.00	47.7 PK	74.0	-26.3	2.36 V	294	47.1	0.6
6	4874.00	36.2 AV	54.0	-17.8	2.36 V	294	35.6	0.6

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	110.1 PK			3.23 H	5	78.7	31.4
2	*2462.00	100.0 AV			3.23 H	5	68.6	31.4
3	2483.50	66.5 PK	74.0	-7.5	3.07 H	357	35.0	31.5
4	2483.50	52.4 AV	54.0	-1.6	3.07 H	357	20.9	31.5
5	4924.00	48.1 PK	74.0	-25.9	2.50 H	207	47.5	0.6
6	4924.00	37.2 AV	54.0	-16.8	2.50 H	207	36.6	0.6
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	111.3 PK			1.74 V	8	79.9	31.4
2	*2462.00	101.7 AV			1.74 V	8	70.3	31.4
3	2483.50	67.2 PK	74.0	-6.8	1.62 V	358	35.7	31.5
4	2483.50	52.4 AV	54.0	-1.6	1.62 V	358	20.9	31.5
5	4924.00	45.0 PK	74.0	-29.0	2.04 V	168	44.4	0.6
6	4924.00	33.9 AV	54.0	-20.1	2.04 V	168	33.3	0.6

Remarks:

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

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) 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	66.3 PK	74.0	-7.7	2.31 H	358	35.3	31.0
2	2390.00	52.3 AV	54.0	-1.7	2.31 H	358	21.3	31.0
3	*2412.00	110.9 PK			2.85 H	12	79.7	31.2
4	*2412.00	100.7 AV			2.85 H	12	69.5	31.2
5	4824.00	47.4 PK	74.0	-26.6	2.34 H	203	46.9	0.5
6	4824.00	37.1 AV	54.0	-16.9	2.34 H	203	36.6	0.5
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	66.9 PK	74.0	-7.1	1.65 V	0	35.9	31.0
2	2390.00	52.6 AV	54.0	-1.4	1.65 V	0	21.6	31.0
3	*2412.00	111.4 PK			1.84 V	358	80.2	31.2
4	*2412.00	101.3 AV			1.84 V	358	70.1	31.2
5	4824.00	45.2 PK	74.0	-28.8	2.06 V	158	44.7	0.5
6	4824.00	34.1 AV	54.0	-19.9	2.06 V	158	33.6	0.5

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) – 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) 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	114.6 PK			3.03 H	354	83.3	31.3
2	*2437.00	104.5 AV			3.03 H	354	73.2	31.3
3	2483.50	60.6 PK	74.0	-13.4	2.05 H	307	29.1	31.5
4	2483.50	50.0 AV	54.0	-4.0	2.05 H	307	18.5	31.5
5	4874.00	50.3 PK	74.0	-23.7	2.33 H	279	49.7	0.6
6	4874.00	48.9 AV	54.0	-5.1	2.33 H	279	48.3	0.6
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	*2437.00	116.3 PK			1.80 V	16	85.0	31.3
2	*2437.00	105.9 AV			1.80 V	16	74.6	31.3
3	2483.50	60.9 PK	74.0	-13.1	1.70 V	18	29.4	31.5
4	2483.50	48.4 AV	54.0	-5.6	1.70 V	18	16.9	31.5
5	4874.00	47.7 PK	74.0	-26.3	2.02 V	133	47.1	0.6
6	4874.00	36.9 AV	54.0	-17.1	2.02 V	133	36.3	0.6

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	109.1 PK			3.02 H	3	77.7	31.4
2	*2462.00	99.0 AV			3.02 H	3	67.6	31.4
3	2483.50	67.3 PK	74.0	-6.7	2.68 H	2	35.8	31.5
4	2483.50	52.8 AV	54.0	-1.2	2.68 H	2	21.3	31.5
5	4924.00	49.8 PK	74.0	-24.2	2.44 H	200	49.2	0.6
6	4924.00	38.8 AV	54.0	-15.2	2.44 H	200	38.2	0.6
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	111.7 PK			2.22 V	20	80.3	31.4
2	*2462.00	100.8 AV			2.22 V	20	69.4	31.4
3	2483.50	68.3 PK	74.0	-5.7	1.84 V	13	36.8	31.5
4	2483.50	52.6 AV	54.0	-1.4	1.84 V	13	21.1	31.5
5	4924.00	46.9 PK	74.0	-27.1	2.54 V	179	46.3	0.6
6	4924.00	35.1 AV	54.0	-18.9	2.54 V	179	34.5	0.6

Remarks:

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

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) 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	64.3 PK	74.0	-9.7	1.47 H	18	33.3	31.0
2	2390.00	52.0 AV	54.0	-2.0	1.47 H	18	21.0	31.0
3	*2422.00	104.1 PK			1.00 H	22	72.9	31.2
4	*2422.00	94.8 AV			1.00 H	22	63.6	31.2
5	4844.00	46.3 PK	74.0	-27.7	1.13 H	162	45.9	0.4
6	4844.00	34.1 AV	54.0	-19.9	1.13 H	162	33.7	0.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.8 PK	74.0	-7.2	2.30 V	4	35.8	31.0
2	**2390.00**	**53.0 AV**	**54.0**	**-1.0**	**2.30 V**	**4**	**22.0**	**31.0**
3	*2422.00	105.7 PK			2.41 V	29	74.5	31.2
4	*2422.00	96.1 AV			2.41 V	29	64.9	31.2
5	4844.00	46.2 PK	74.0	-27.8	2.14 V	153	45.8	0.4
6	4844.00	32.2 AV	54.0	-21.8	2.14 V	153	31.8	0.4

Remarks:

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

CHANNEL	TX Channel 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	64.5 PK	74.0	-9.5	1.75 H	11	33.5	31.0
2	2390.00	51.6 AV	54.0	-2.4	1.75 H	11	20.6	31.0
3	*2437.00	106.9 PK			2.99 H	0	75.6	31.3
4	*2437.00	97.8 AV			2.99 H	0	66.5	31.3
5	2483.50	68.9 PK	74.0	-5.1	2.19 H	334	37.4	31.5
6	2483.50	51.0 AV	54.0	-3.0	2.19 H	334	19.5	31.5
7	4874.00	50.1 PK	74.0	-23.9	1.70 H	123	49.5	0.6
8	4874.00	39.4 AV	54.0	-14.6	1.70 H	123	38.8	0.6
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	65.3 PK	74.0	-8.7	2.34 V	2	34.3	31.0
2	2390.00	52.7 AV	54.0	-1.3	2.34 V	2	21.7	31.0
3	*2437.00	108.2 PK			1.82 V	7	76.9	31.3
4	*2437.00	99.0 AV			1.82 V	7	67.7	31.3
5	2483.50	66.1 PK	74.0	-7.9	1.81 V	3	34.6	31.5
6	2483.50	51.8 AV	54.0	-2.2	1.81 V	3	20.3	31.5
7	4874.00	48.7 PK	74.0	-25.3	2.12 V	160	48.1	0.6
8	4874.00	36.9 AV	54.0	-17.1	2.12 V	160	36.3	0.6

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 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	104.1 PK			1.19 H	17	72.7	31.4
2	*2452.00	94.8 AV			1.19 H	17	63.4	31.4
3	2483.50	65.2 PK	74.0	-8.8	3.50 H	7	33.7	31.5
4	2483.50	52.4 AV	54.0	-1.6	3.50 H	7	20.9	31.5
5	4904.00	46.4 PK	74.0	-27.6	1.39 H	163	45.9	0.5
6	4904.00	33.8 AV	54.0	-20.2	1.39 H	163	33.3	0.5
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	*2452.00	106.6 PK			1.71 V	2	75.2	31.4
2	*2452.00	97.1 AV			1.71 V	2	65.7	31.4
3	2483.50	67.3 PK	74.0	-6.7	1.33 V	3	35.8	31.5
4	2483.50	52.0 AV	54.0	-2.0	1.33 V	3	20.5	31.5
5	4904.00	46.7 PK	74.0	-27.3	1.28 V	147	46.2	0.5
6	4904.00	32.8 AV	54.0	-21.2	1.28 V	147	32.3	0.5

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) – 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 worst-case data: 802.11b

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

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	57.12	31.1 QP	40.0	-8.9	2.00 H	347	45.6	-14.5
2	115.45	32.5 QP	43.5	-11.0	1.51 H	278	49.2	-16.7
3	152.39	31.9 QP	43.5	-11.6	2.00 H	109	45.5	-13.6
4	220.44	39.3 QP	46.0	-6.7	1.01 H	128	55.3	-16.0
5	377.93	28.1 QP	46.0	-17.9	1.01 H	16	38.5	-10.4
6	477.09	25.0 QP	46.0	-21.0	1.51 H	6	33.2	-8.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	35.73	37.6 QP	40.0	-2.4	1.00 V	184	53.2	-15.6
2	99.89	34.9 QP	43.5	-8.6	1.00 V	121	53.5	-18.6
3	162.11	33.1 QP	43.5	-10.4	1.00 V	251	46.7	-13.6
4	220.44	37.1 QP	46.0	-8.9	1.99 V	189	53.1	-16.0
5	377.93	26.5 QP	46.0	-19.5	1.00 V	178	36.9	-10.4
6	480.97	27.9 QP	46.0	-18.1	1.00 V	281	36.1	-8.2

Remarks:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	57.12	27.4 QP	40.0	-12.6	1.99 H	151	42.0	-14.6
2	115.45	29.0 QP	43.5	-14.5	1.49 H	270	45.7	-16.7
3	239.05	43.6 QP	46.0	-2.4	1.48 H	84	58.2	-14.6
4	339.04	28.2 QP	46.0	-17.8	1.00 H	222	39.4	-11.2
5	480.97	28.5 QP	46.0	-17.5	1.99 H	14	36.9	-8.4
6	729.84	36.1 QP	46.0	-9.9	1.49 H	14	38.9	-2.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	49.34	36.1 QP	40.0	-3.9	1.49 V	16	50.4	-14.3
2	125.17	32.3 QP	43.5	-11.2	1.00 V	149	48.1	-15.8
3	158.22	26.9 QP	43.5	-16.6	1.00 V	203	40.5	-13.6
4	237.94	35.6 QP	46.0	-10.4	1.49 V	177	50.3	-14.7
5	477.09	28.8 QP	46.0	-17.2	1.00 V	79	37.2	-8.4
6	729.84	31.9 QP	46.0	-14.1	1.99 V	285	34.7	-2.8

Remarks:

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

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	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ENV216	101196	Apr. 20, 2017	Apr. 19, 2018
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 1.
3. The VCCI Site Registration No. is C-2040.

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.

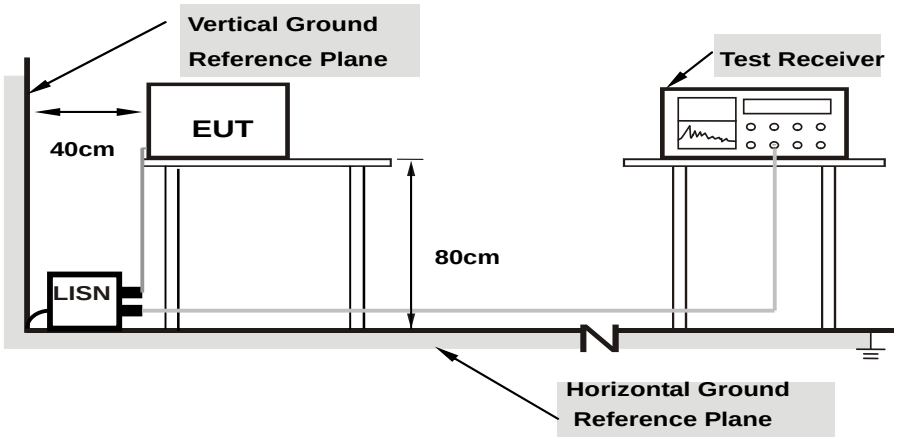
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

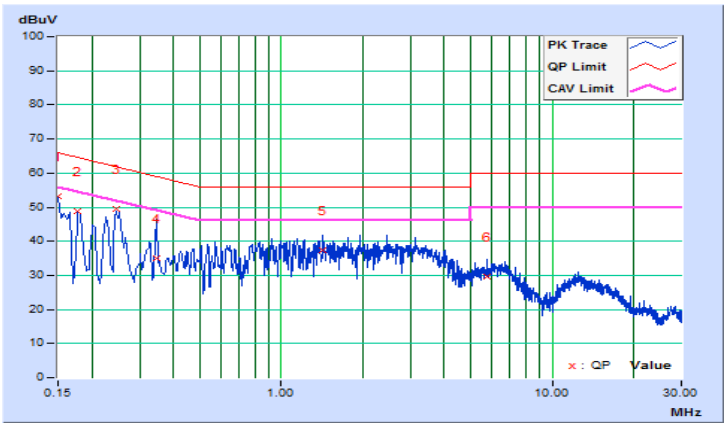
Worst-case data: 802.11b

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

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	10.40	42.74	29.02	53.14	39.42	66.00	56.00	-12.86	-16.58
2	0.17801	10.42	38.35	28.57	48.77	38.99	64.58	54.58	-15.81	-15.59
3	**0.24614**	**10.45**	**38.93**	**35.39**	**49.38**	**45.84**	**61.89**	**51.89**	**-12.51**	**-6.05**
4	0.34600	10.49	24.40	15.87	34.89	26.36	59.06	49.06	-24.17	-22.70
5	1.42200	10.49	26.80	16.98	37.29	27.47	56.00	46.00	-18.71	-18.53
6	5.74600	10.73	18.85	11.48	29.58	22.21	60.00	50.00	-30.42	-27.79

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.

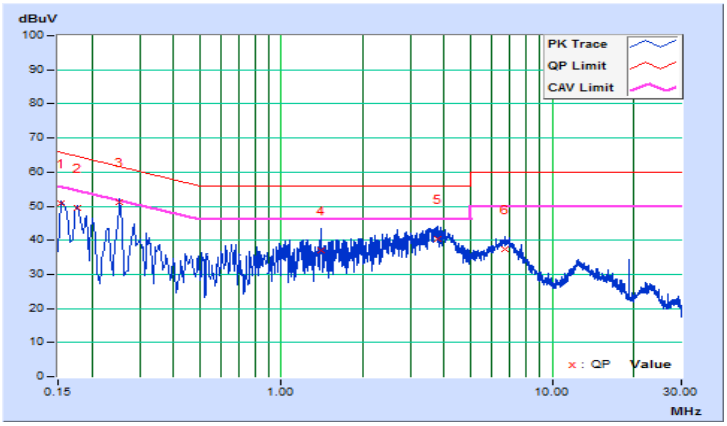


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.16	40.82	28.40	50.98	38.56	65.78	55.78	-14.80	-17.22
2	0.17661	10.18	39.18	26.40	49.36	36.58	64.64	54.64	-15.28	-18.06
3	0.25405	10.21	40.83	26.68	51.04	36.89	61.62	51.62	-10.58	-14.73
4	1.40600	10.27	26.78	15.51	37.05	25.78	56.00	46.00	-18.95	-20.22
5	3.76198	10.41	30.06	18.21	40.47	28.62	56.00	46.00	-15.53	-17.38
6	6.70600	10.52	26.72	18.56	37.24	29.08	60.00	50.00	-22.76	-20.92

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.

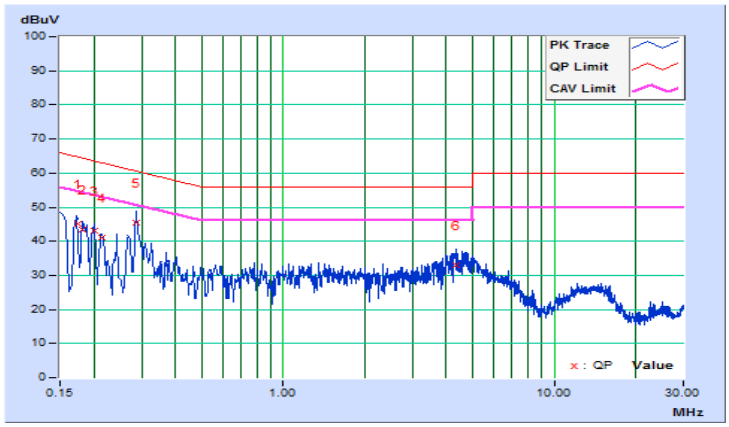


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17374	10.42	34.59	21.63	45.01	32.05	64.78	54.78	-19.77	-22.73
2	0.18075	10.42	32.88	17.73	43.30	28.15	64.45	54.45	-21.15	-26.30
3	0.19978	10.43	32.72	19.09	43.15	29.52	63.62	53.62	-20.47	-24.10
4	0.21282	10.44	30.49	16.67	40.93	27.11	63.09	53.09	-22.16	-25.98
5	0.28513	10.46	34.91	25.06	45.37	35.52	60.67	50.67	-15.30	-15.15
6	4.32588	10.67	22.27	12.11	32.94	22.78	56.00	46.00	-23.06	-23.22

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.

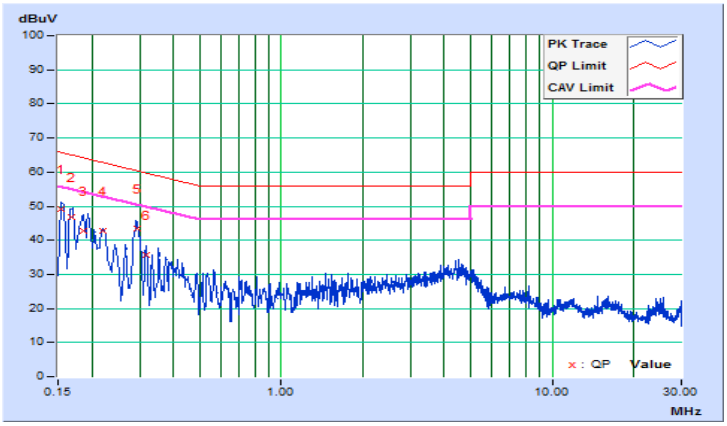


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.16	39.10	23.90	49.26	34.06	65.79	55.79	-16.53	-21.73
2	0.16745	10.17	36.50	22.48	46.67	32.65	65.09	55.09	-18.42	-22.44
3	0.18508	10.19	32.67	17.32	42.86	27.51	64.25	54.25	-21.39	-26.74
4	0.21851	10.20	32.40	21.72	42.60	31.92	62.88	52.88	-20.28	-20.96
5	0.29467	10.21	33.10	24.96	43.31	35.17	60.39	50.39	-17.08	-15.22
6	0.31599	10.22	25.53	16.15	35.75	26.37	59.81	49.81	-24.06	-23.44

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.

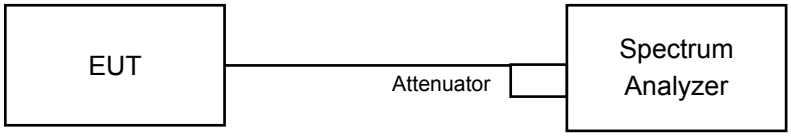


4.3 6dB Bandwidth Measurement

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 = average.
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
		Chain 0	Chain 1		
1	2412	8.07	8.09	0.5	Pass
6	2437	9.05	9.01	0.5	Pass
11	2462	9.07	7.60	0.5	Pass

802.11g

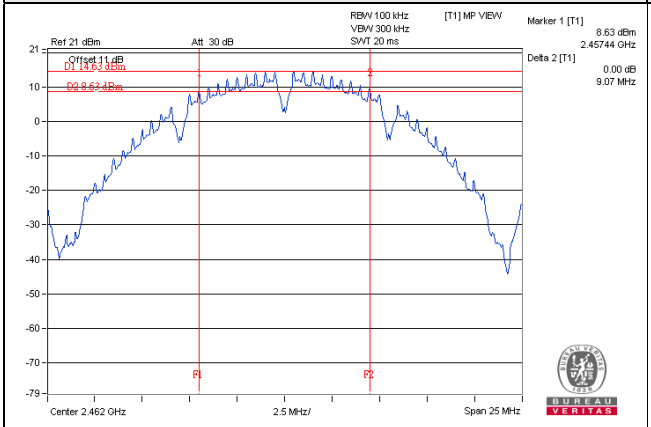
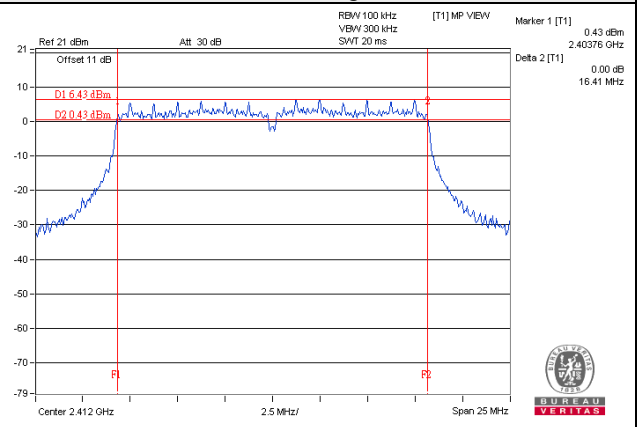
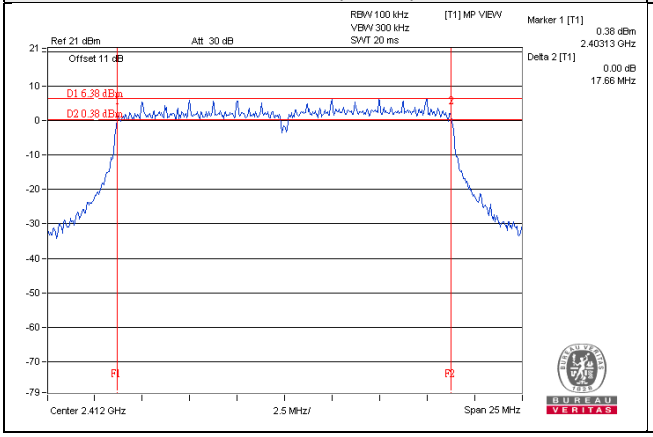
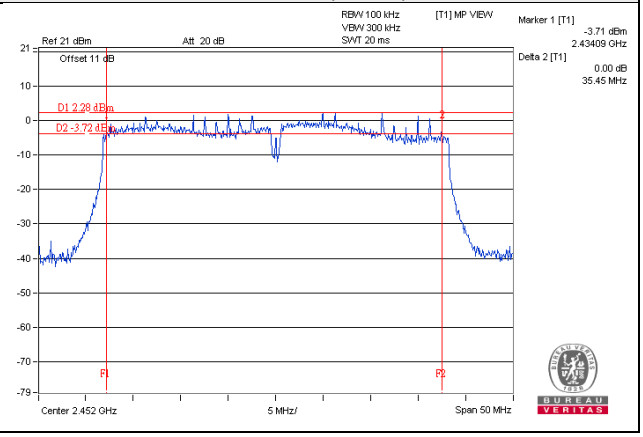
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.41	15.97	0.5	Pass
6	2437	16.40	16.32	0.5	Pass
11	2462	16.39	15.74	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.66	17.21	0.5	Pass
6	2437	17.63	17.56	0.5	Pass
11	2462	17.63	15.72	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.28	35.25	0.5	Pass
6	2437	35.28	35.22	0.5	Pass
9	2452	35.25	35.45	0.5	Pass

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

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

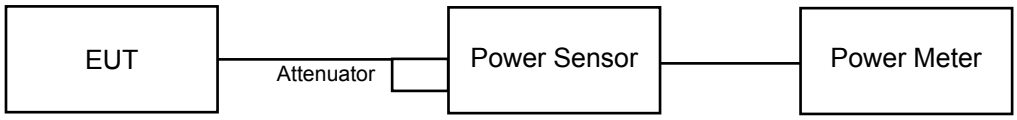
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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 $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.4.2 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

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.90	19.12	179.382	22.54	30	Pass
6	2437	22.39	22.24	340.874	25.33	30	Pass
11	2462	23.02	22.45	**376.239**	25.75	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.59	17.11	108.816	20.37	30	Pass
6	2437	21.98	21.77	308.075	24.89	30	Pass
11	2462	17.14	17.38	106.463	20.27	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.58	17.40	112.234	20.50	30	Pass
6	2437	21.96	21.98	314.797	24.98	30	Pass
11	2462	16.92	17.31	103.031	20.13	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	15.08	15.01	63.907	18.06	30	Pass
6	2437	18.15	18.07	129.434	21.12	30	Pass
9	2452	15.55	15.45	70.967	18.51	30	Pass

Beamforming Mode

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.57	14.39	56.117	17.49	28.40	Pass
6	2437	18.95	18.97	**157.399**	21.97	28.40	Pass
11	2462	13.91	14.30	51.515	17.12	28.40	Pass

Note: 2.4GHz Max. directional gain = 4.59dBi + 10log(2) = 7.6dBi > 6dBi, so the limit shall be reduced to 30-(7.6-6) = 28.4dBm.

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.07	12.00	31.953	15.05	28.40	Pass
6	2437	15.14	15.06	64.717	18.11	28.40	Pass
9	2452	12.54	12.44	35.484	15.50	28.40	Pass

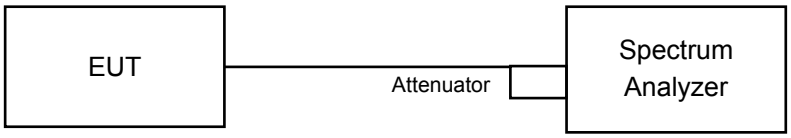
Note: 2.4GHz Max. directional gain = 4.59dBi + 10log(2) = 7.6dBi > 6dBi, so the limit shall be reduced to 30-(7.6-6) = 28.4dBm.

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 Average 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 Average 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

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.10	3.01	-5.09	6.40	Pass
	6	2437	-5.10	3.01	-2.09	6.40	Pass
	11	2462	-4.68	3.01	-1.67	6.40	Pass
1	1	2412	-8.59	3.01	-5.58	6.40	Pass
	6	2437	-5.81	3.01	-2.80	6.40	Pass
	11	2462	-5.33	3.01	-2.32	6.40	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. 2.4GHz Max. directional gain = 4.59dBi + 10log(2) = 7.6dBi > 6dBi, so the limit shall be reduced to 8-(7.6-6) = 6.4dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/10kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-9.73	3.01	0.21	-6.51	6.40	Pass
	6	2437	-8.08	3.01	0.21	-4.86	6.40	Pass
	11	2462	-9.71	3.01	0.21	-6.49	6.40	Pass
1	1	2412	-12.78	3.01	0.21	-9.56	6.40	Pass
	6	2437	-8.48	3.01	0.21	-5.26	6.40	Pass
	11	2462	-10.63	3.01	0.21	-7.41	6.40	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. 2.4GHz Max. directional gain = 4.59dBi + 10log(2) = 7.6dBi > 6dBi, so the limit shall be reduced to 8-(7.6-6) = 6.4dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

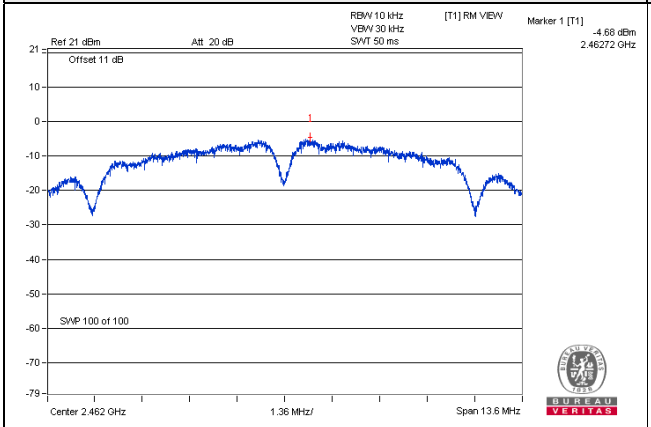
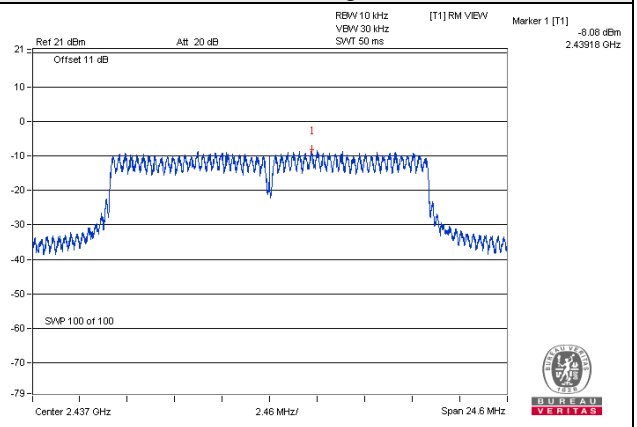
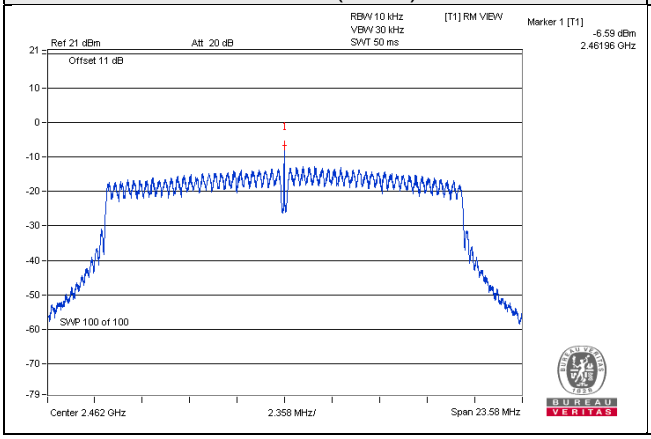
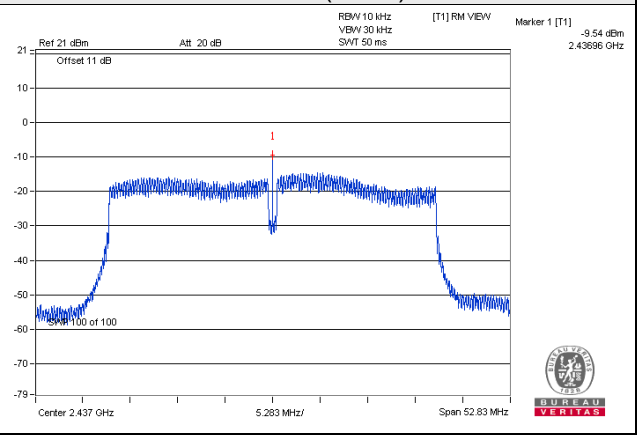
TX chain	Channel	Freq. (MHz)	PSD (dBm/10kHz)	10 log (N=2) dB	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-9.83	3.01	-6.82	6.40	Pass
	6	2437	-8.91	3.01	-5.90	6.40	Pass
	11	2462	-10.39	3.01	-7.38	6.40	Pass
1	1	2412	-13.18	3.01	-10.17	6.40	Pass
	6	2437	-8.22	3.01	-5.21	6.40	Pass
	11	2462	-6.59	3.01	-3.58	6.40	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. 2.4GHz Max. directional gain = 4.59dBi + 10log(2) = 7.6dBi > 6dBi, so the limit shall be reduced to 8-(7.6-6) = 6.4dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/10kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/10kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-16.67	3.01	0.16	-13.50	6.40	Pass
	6	2437	-9.88	3.01	0.16	-6.71	6.40	Pass
	9	2452	-17.16	3.01	0.16	-13.99	6.40	Pass
1	3	2422	-18.32	3.01	0.16	-15.15	6.40	Pass
	6	2437	-9.54	3.01	0.16	-6.37	6.40	Pass
	9	2452	-17.44	3.01	0.16	-14.27	6.40	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. 2.4GHz Max. directional gain = 4.59dBi + 10log(2) = 7.6dBi > 6dBi, so the limit shall be reduced to 8-(7.6-6) = 6.4dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

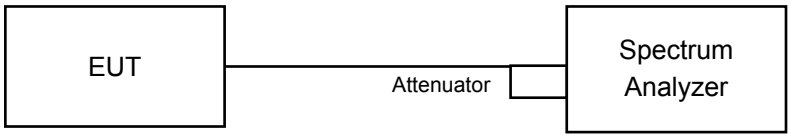
Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11n (HT20)	802.11n (HT40)
	

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

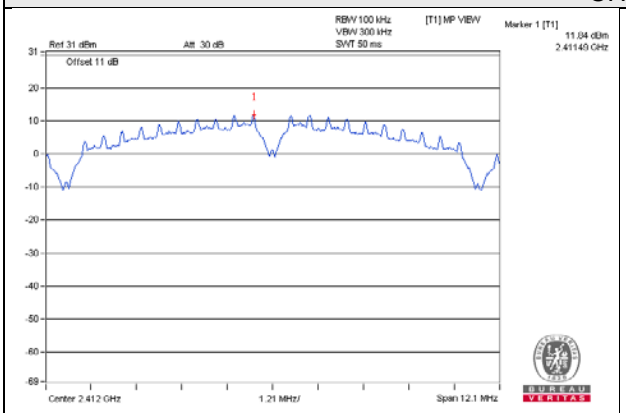
Same as item 4.3.6

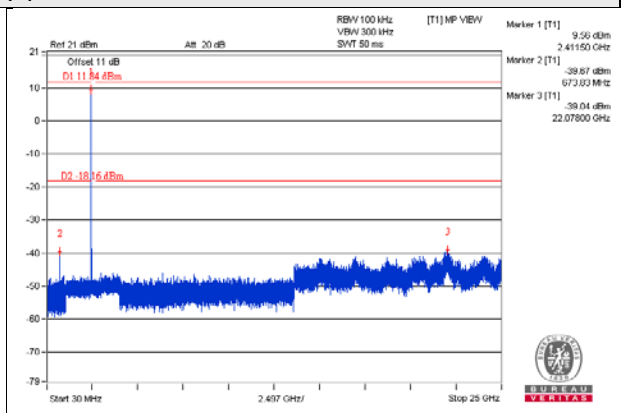
4.6.7 Test Results

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.

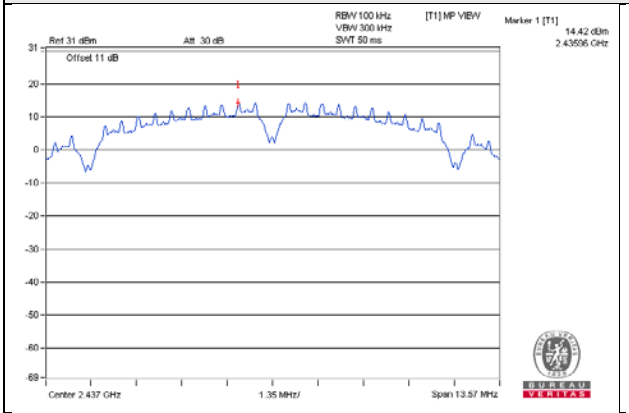
802.11b_Chain 0

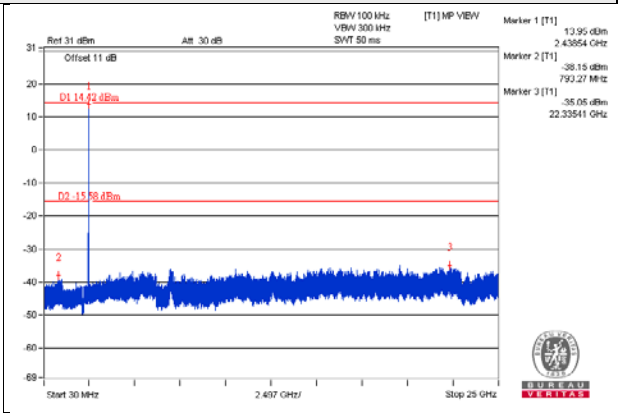
CH 1



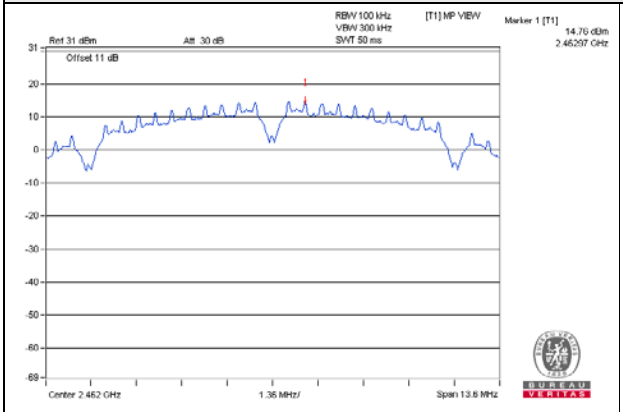


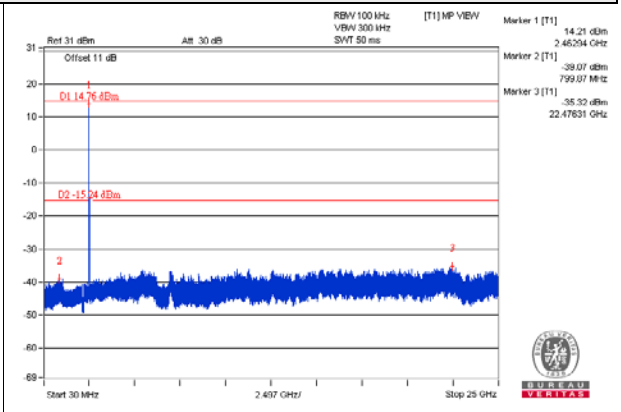
CH 6



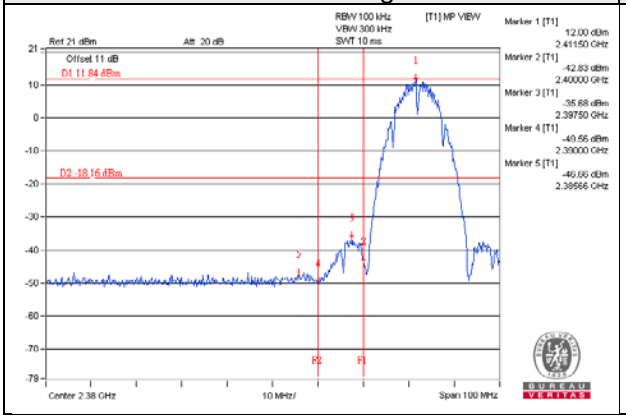


CH 11

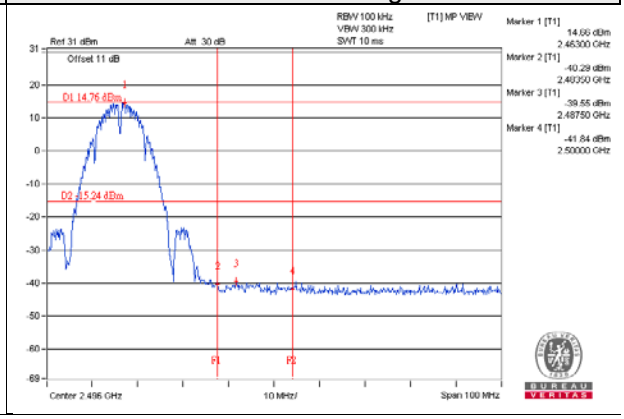




CH 1 Band edge

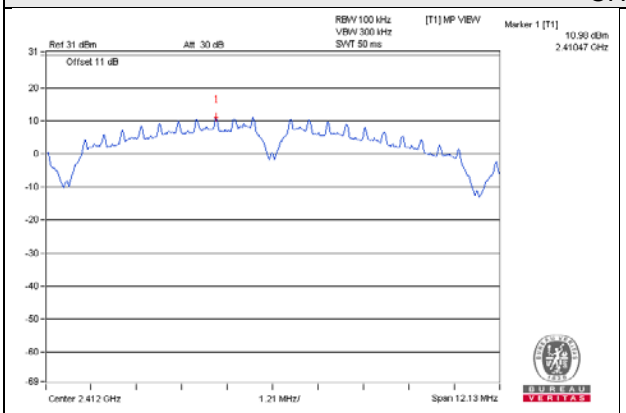


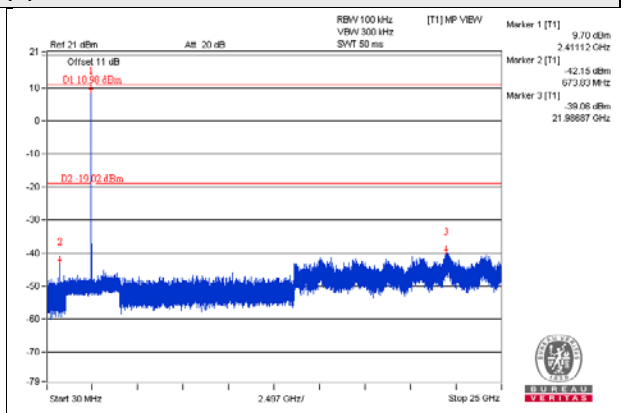
CH 11 Band edge



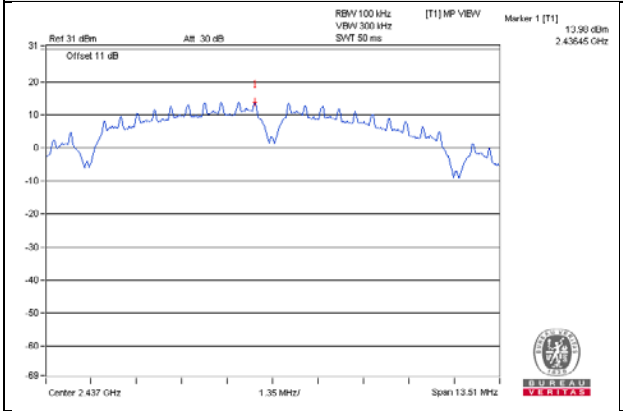
802.11b_Chain 1

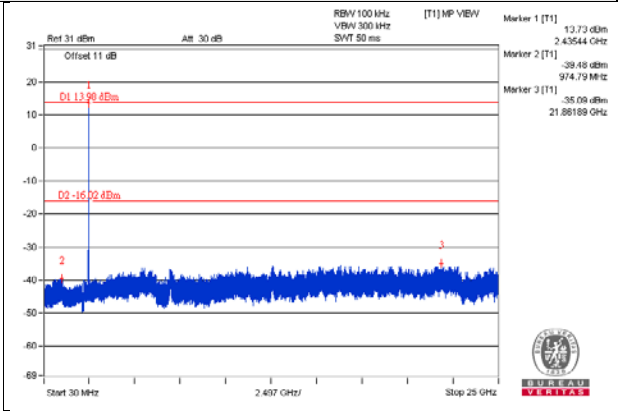
CH 1



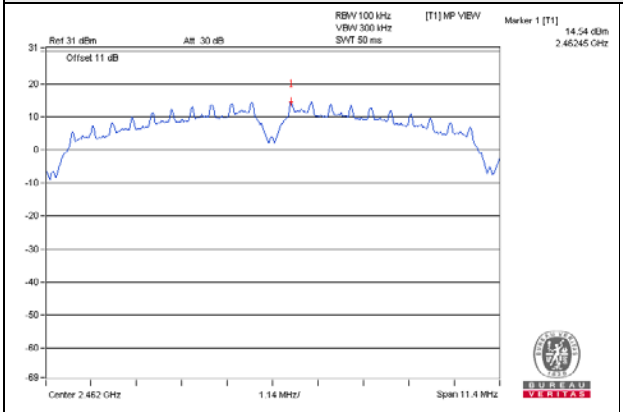


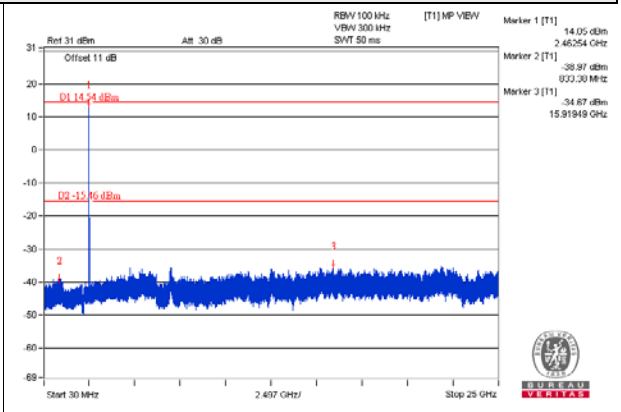
CH 6



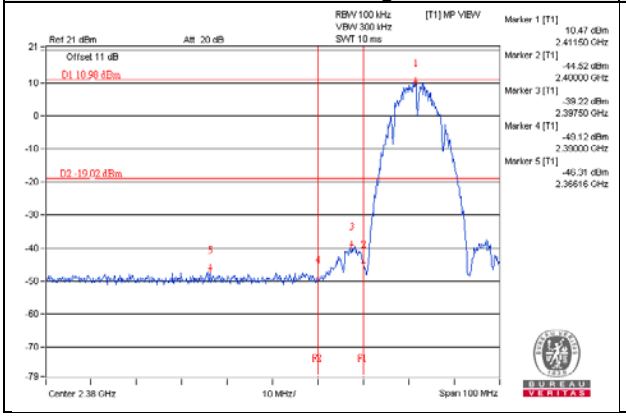


CH 11

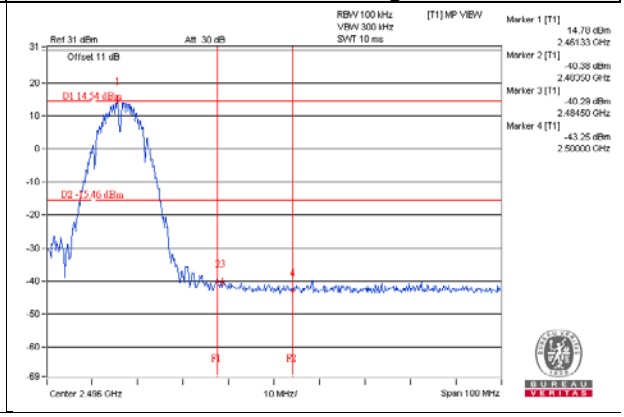




CH 1 Band edge

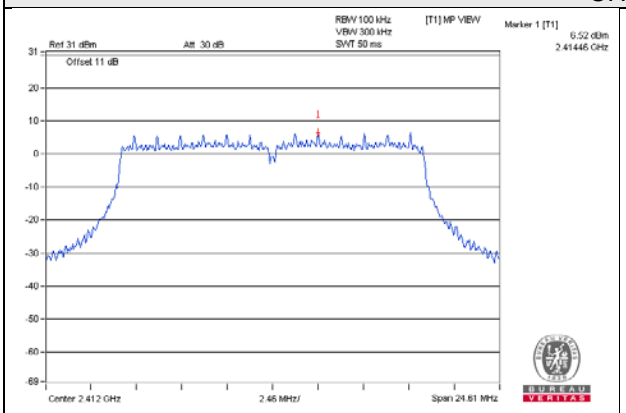


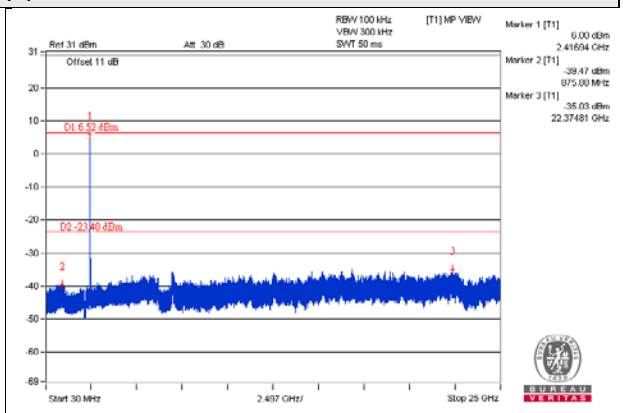
CH 11 Band edge



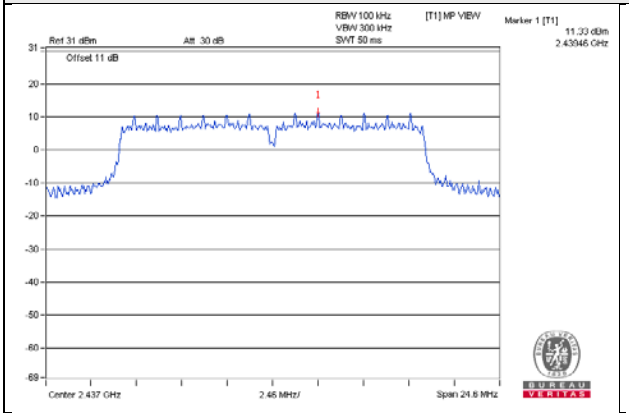
802.11g_Chain 0

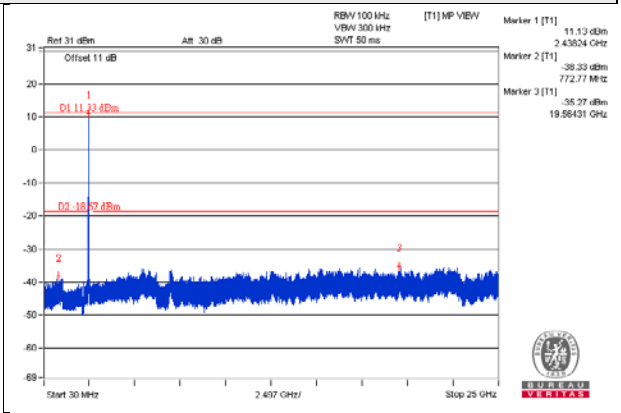
CH 1



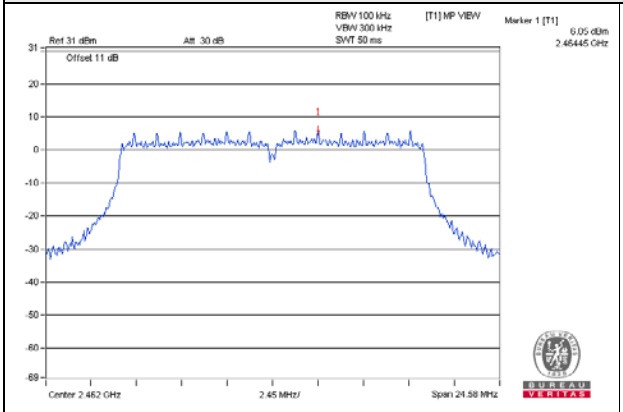


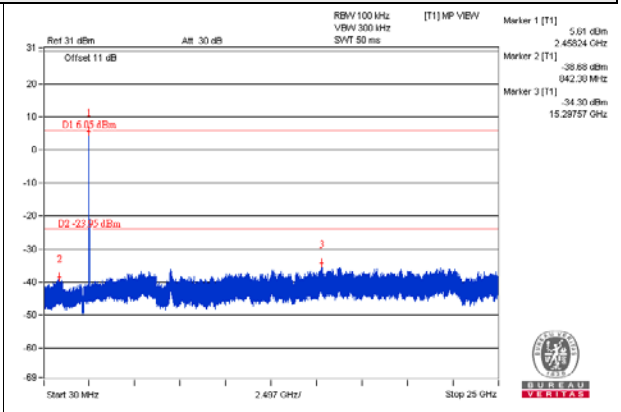
CH 6



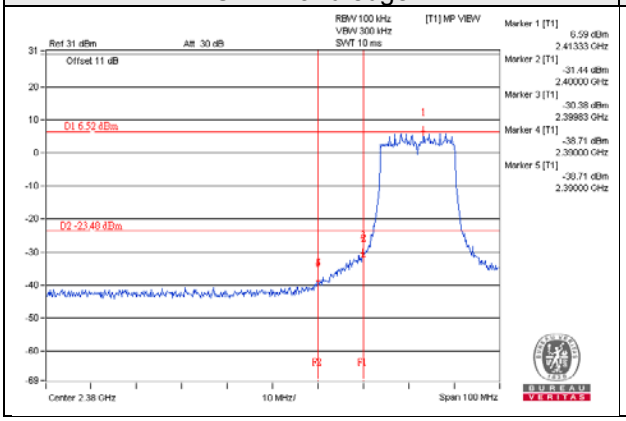


CH 11

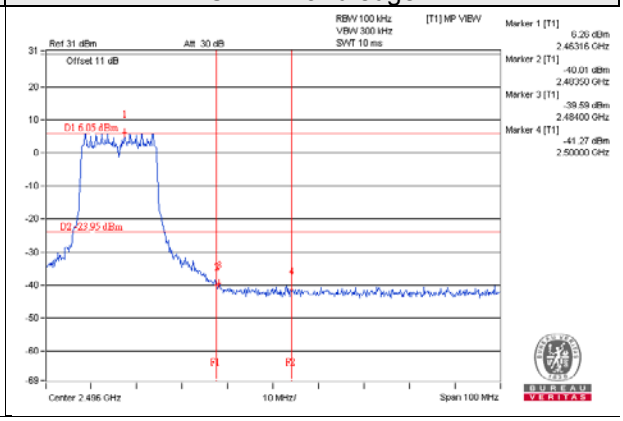




CH 1 Band edge

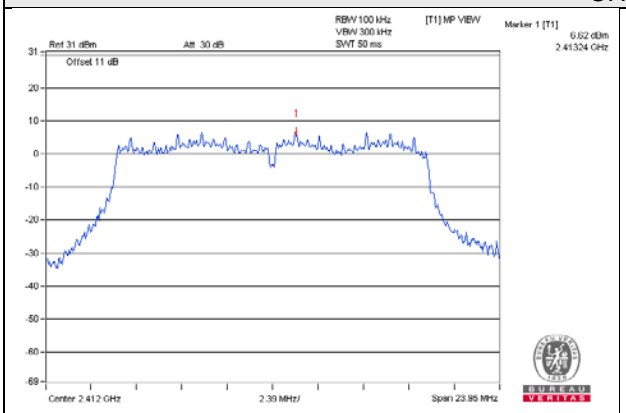


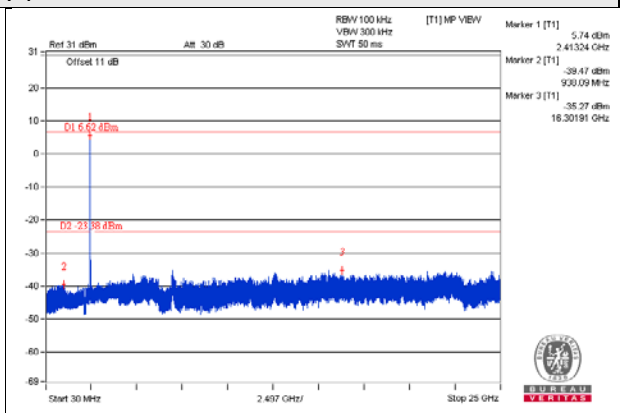
CH 11 Band edge



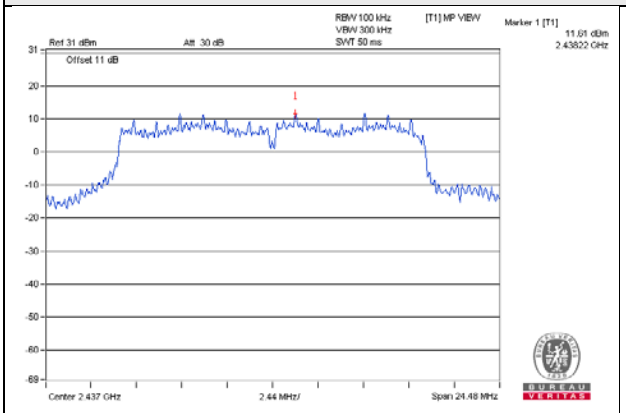
802.11g_Chain 1

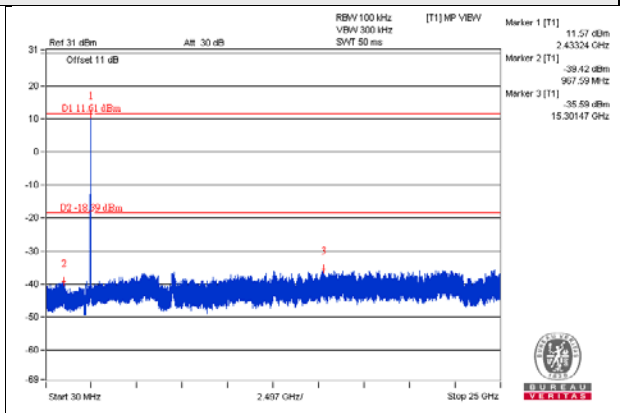
CH 1



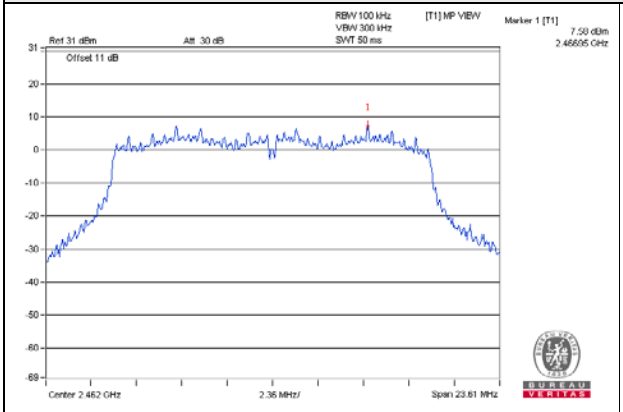


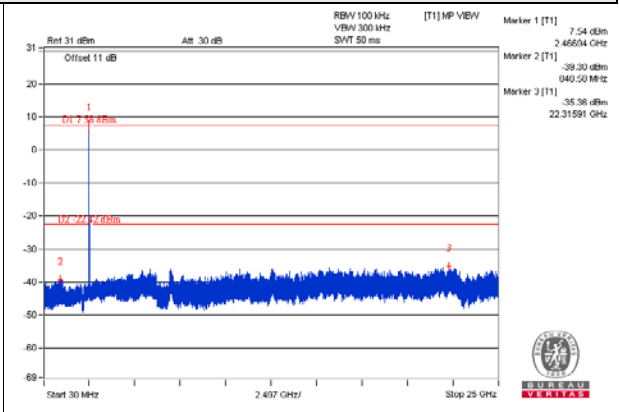
CH 6



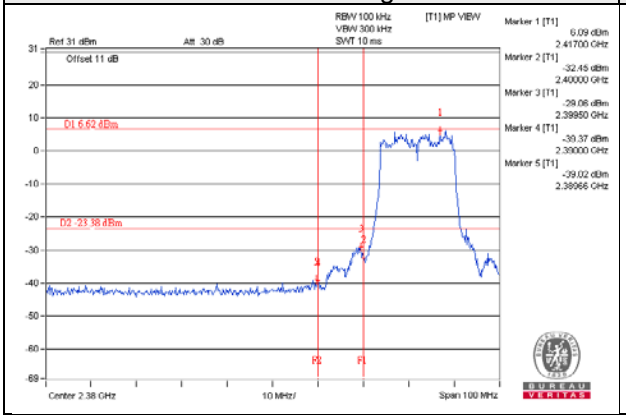


CH 11

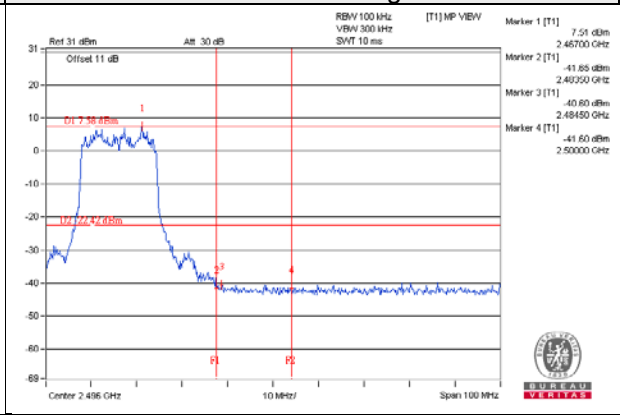




CH 1 Band edge

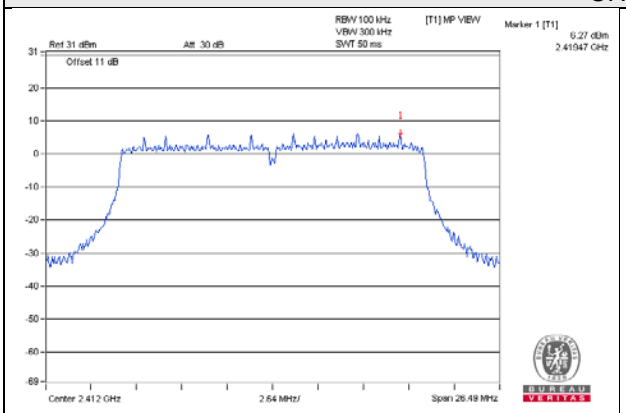


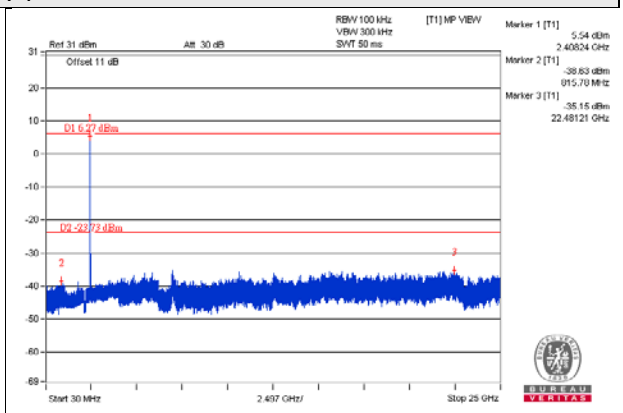
CH 11 Band edge



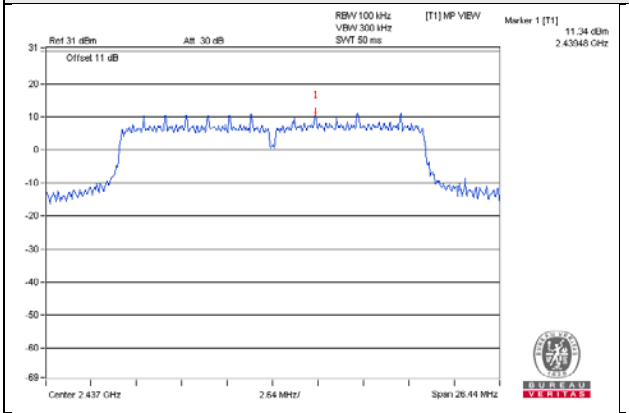
802.11n (HT20)_Chain 0

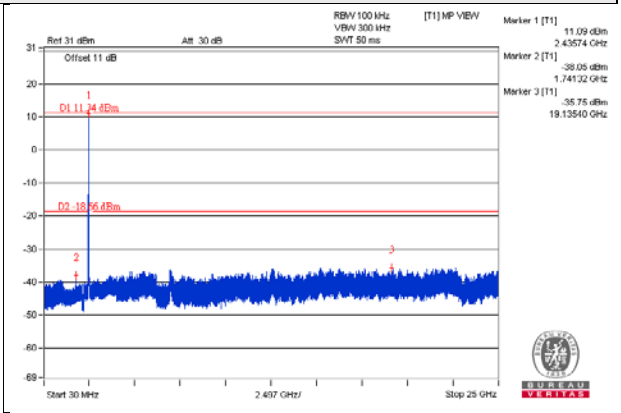
CH 1



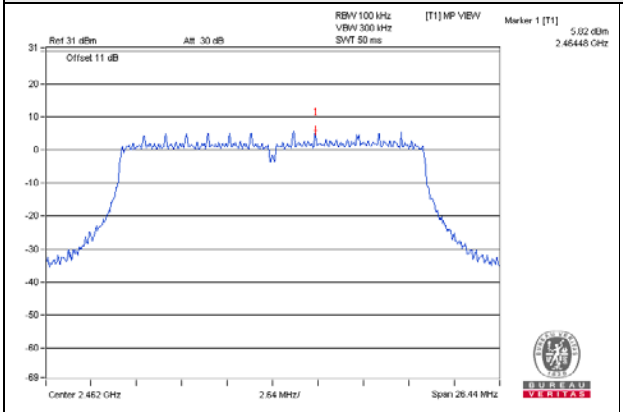


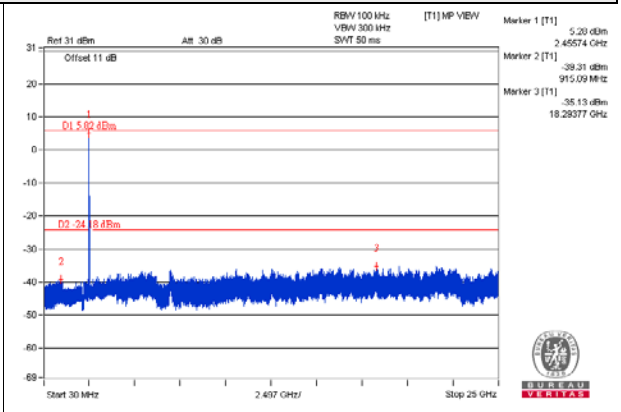
CH 6



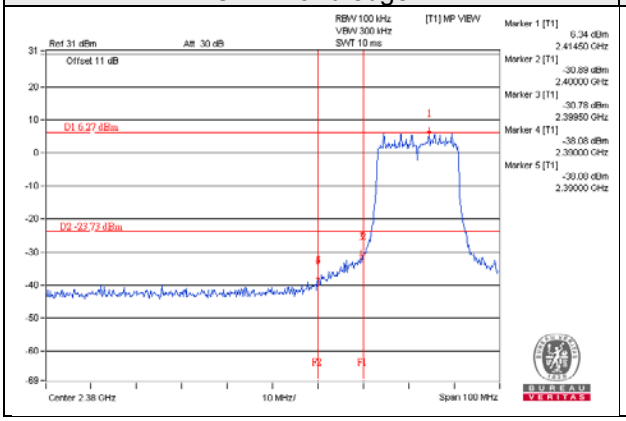


CH 11

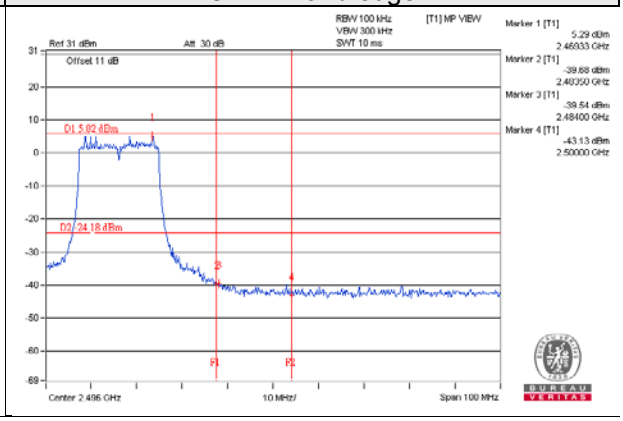




CH 1 Band edge

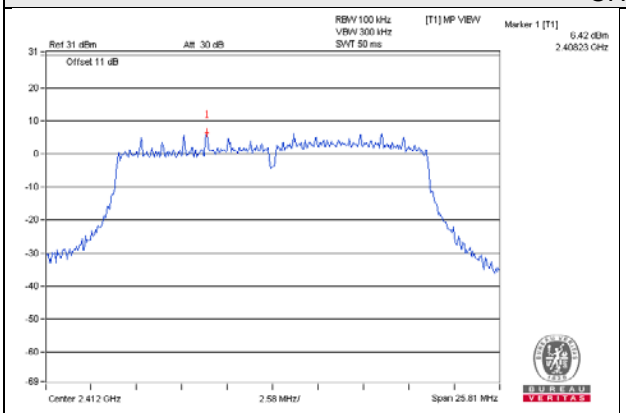


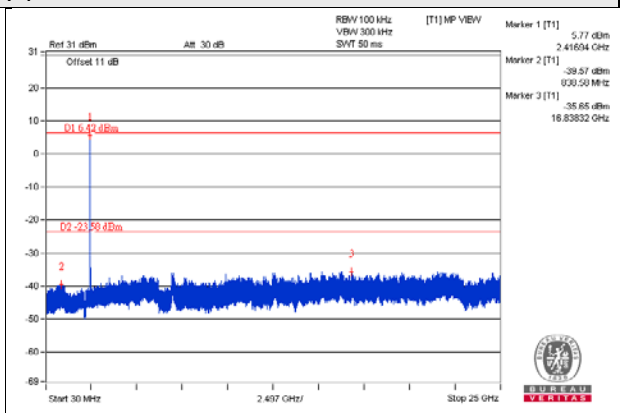
CH 11 Band edge



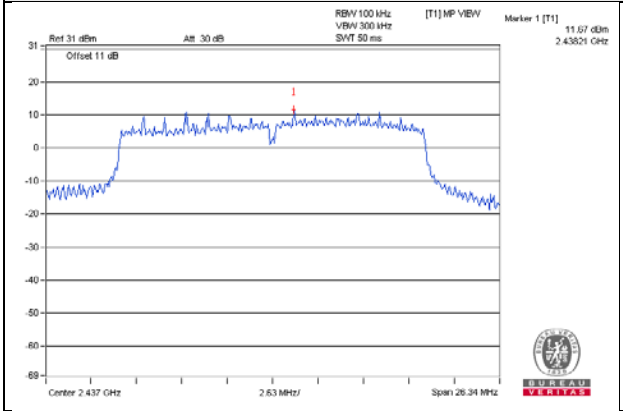
802.11n (HT20)_Chain 1

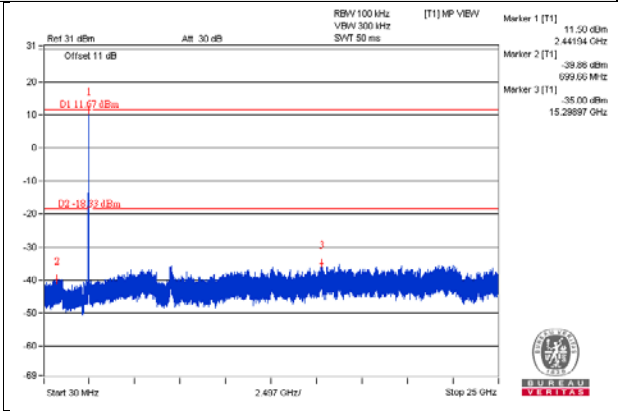
CH 1



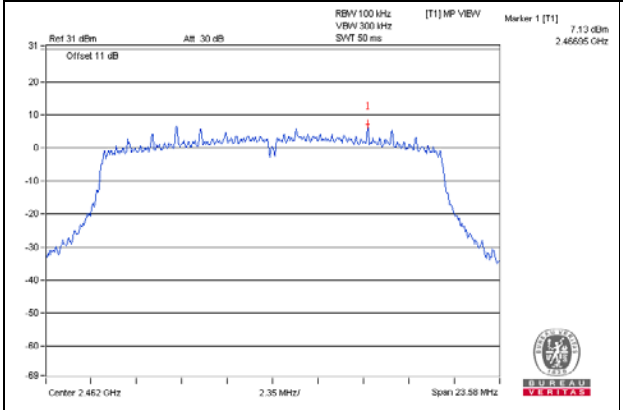


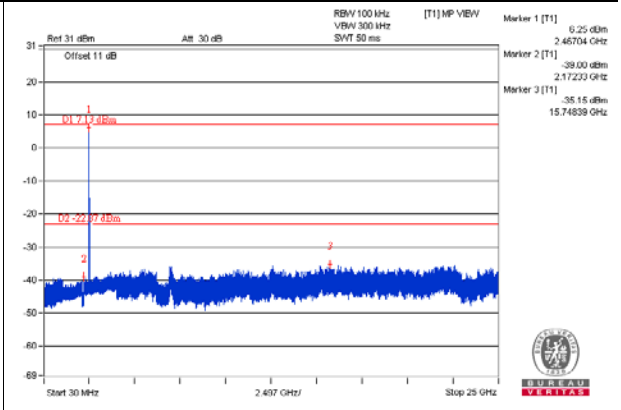
CH 6



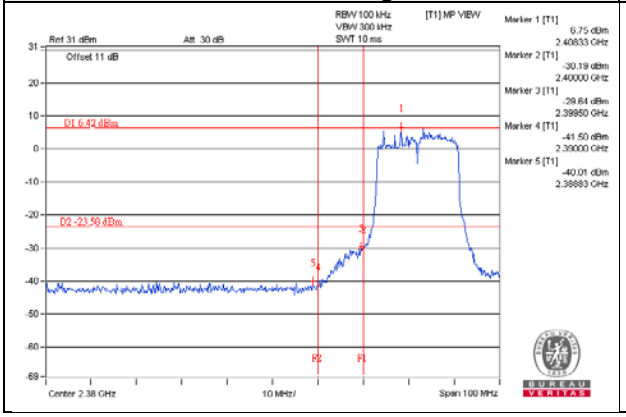


CH 11

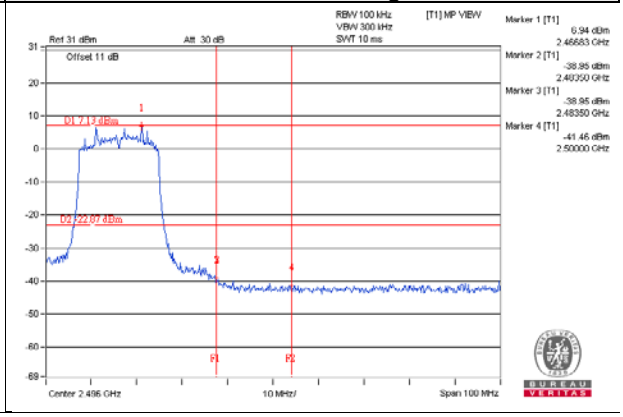




CH 1 Band edge

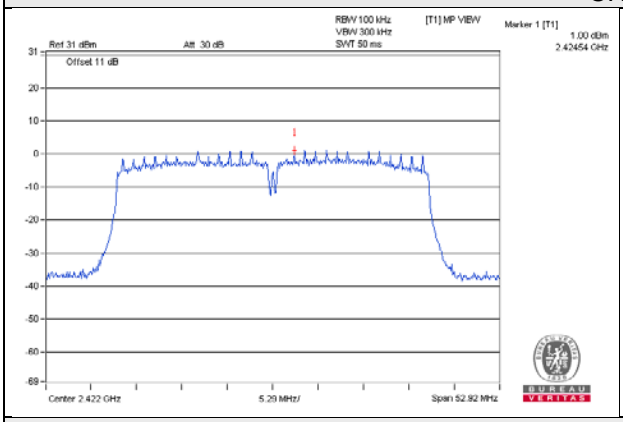


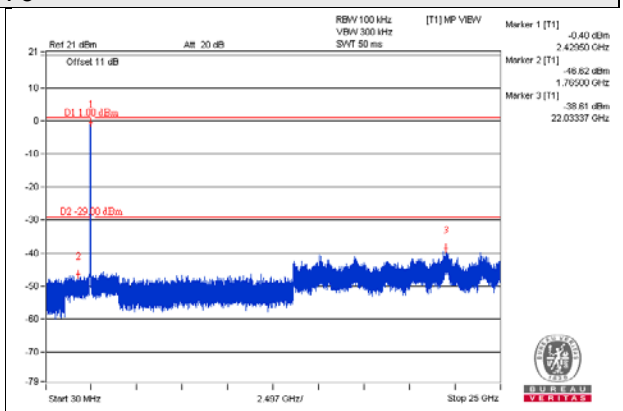
CH 11 Band edge



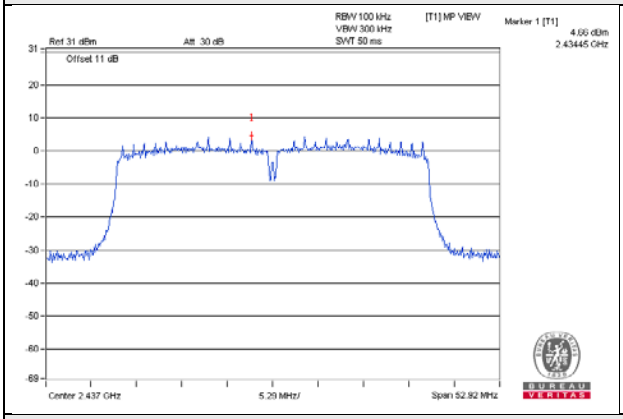
802.11n (HT40)_Chain 0

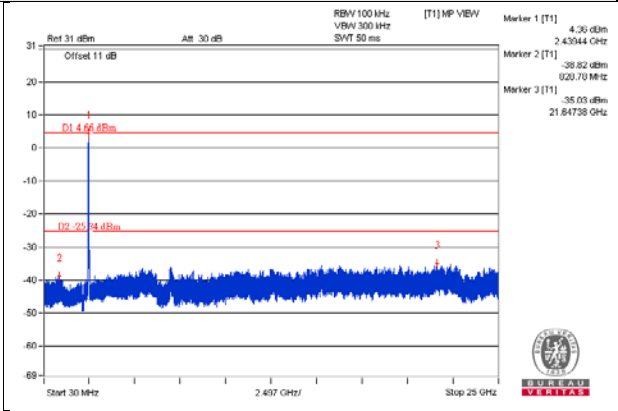
CH 3



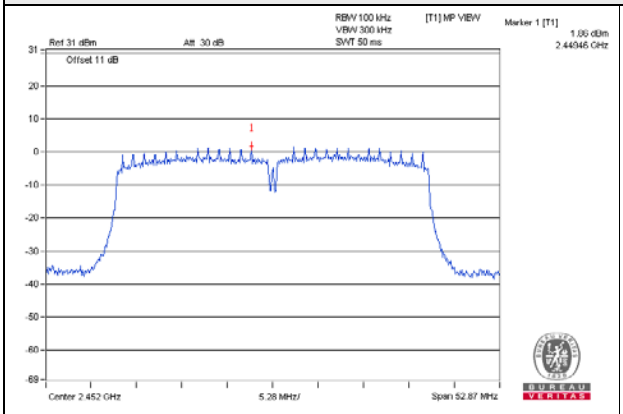


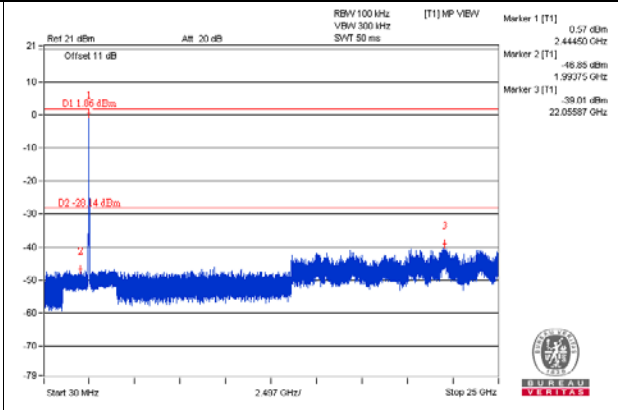
CH 6



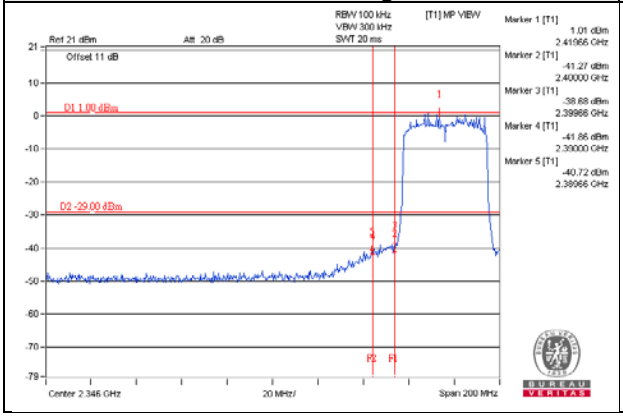


CH 9

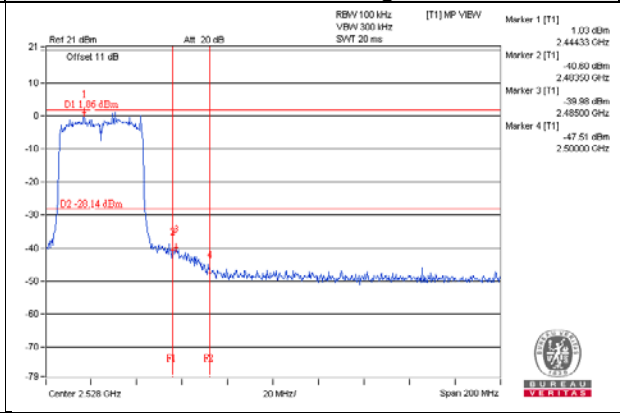




CH 3 Band edge

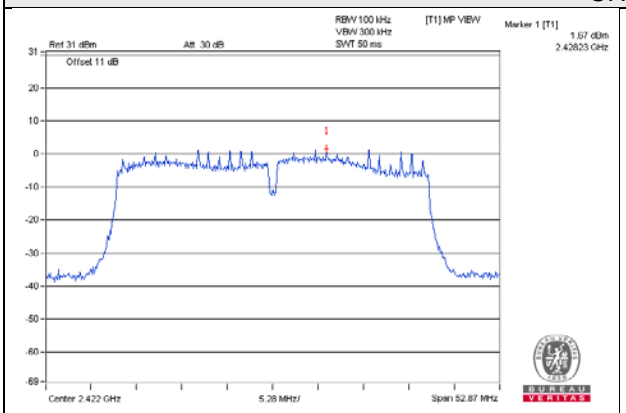


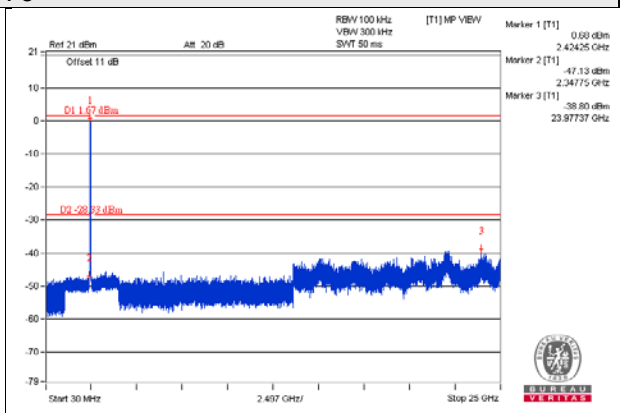
CH 9 Band edge



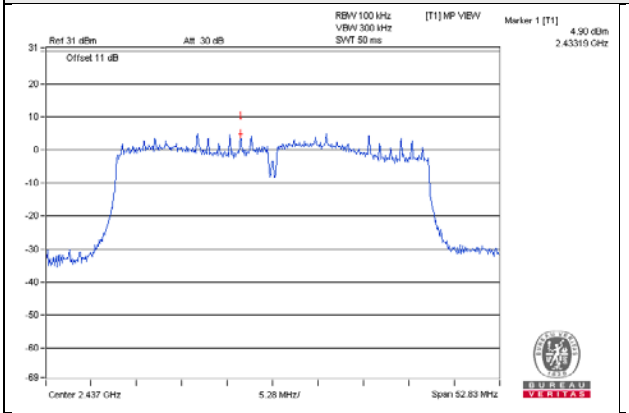
802.11n (HT40)_Chain 1

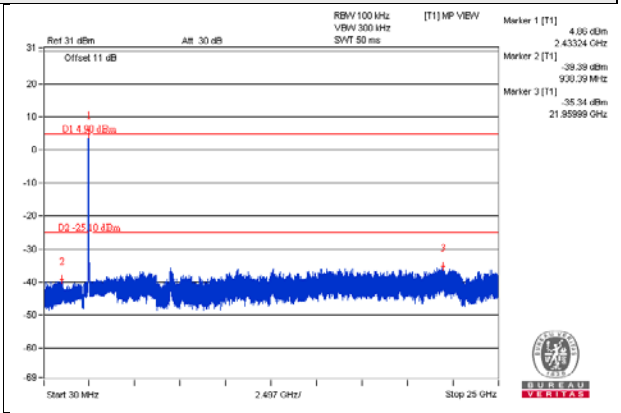
CH 3



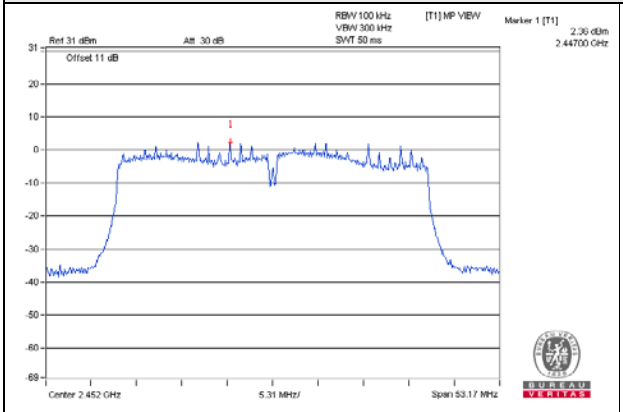


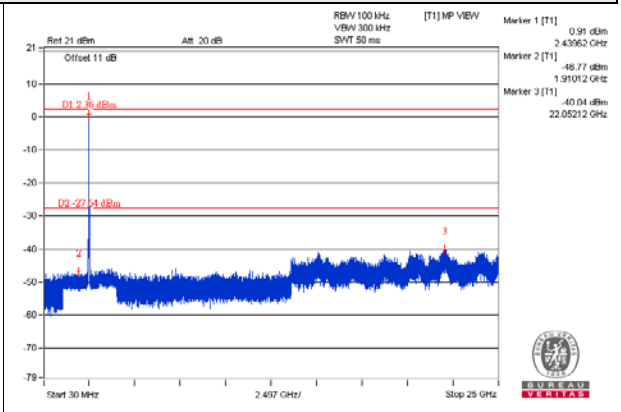
CH 6



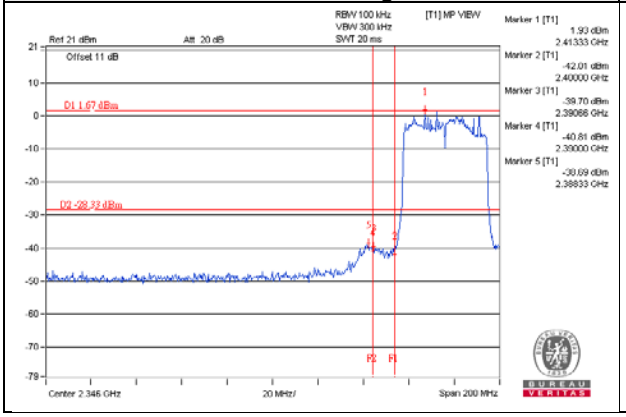


CH 9

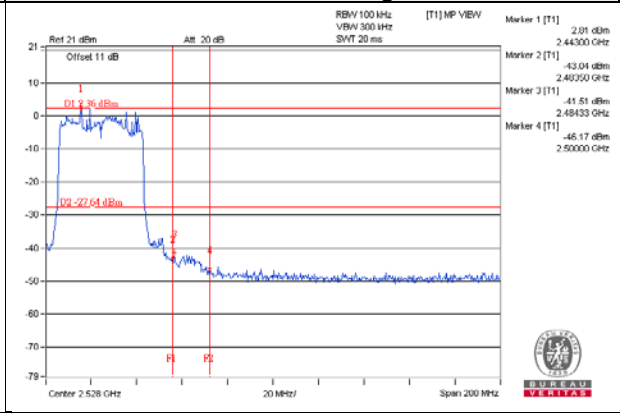




CH 3 Band edge



CH 9 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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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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