FCC Test Report

Report No.:	RF190114C07
FCC ID:	MSQI01WD
Test Model:	ASUS_I01WD
Received Date:	Jan. 14, 2019
Test Date:	Jan. 23 ~ Feb. 01, 2019
Issued Date:	Feb. 15, 2019
Applicant:	ASUSTek COMPUTER INC.
Address:	4F, No. 150, LI-TE Rd., PEITOU, TAIPEI 112, TAIWAN
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.)
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF190114C07	Original release	Feb. 15, 2019

1 Certificate of Conformity

Product:	ASUS Phone
Brand:	ASUS
Test Model:	ASUS_I01WD
Sample Status:	Identical Prototype
Applicant:	ASUSTek COMPUTER INC.
Test Date:	Jan. 23 ~ Feb. 01, 2019
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 RF characteristics under the conditions specified in this report.

Prepared by : Celine Chou , **Date:** Feb. 15, 2019

Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Feb. 15, 2019

Bruce Chen / Project Engineer

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 -14.70dB at 0.37266MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.4dB at 2483.50MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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	ASUS Phone
Brand	ASUS
Test Model	ASUS_I01WD
Sample Status	Identical Prototype
Power Supply Rating	3.85 Vdc (Battery) 5 or 9 Vdc (Adapter) 5 Vdc (Host equipment)
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 ~ 2472MHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 13 802.11n (HT40): 9
Output Power	204.604mW
Antenna Type	Refer to Note as below
Antenna Connector	Refer to Note as below
Accessory Device	Refer to Note as below
Cable Supplied	Refer to Note as below

Note:

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

Modulation Mode	TX Function
802.11b	2TX
802.11g	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX

2. The EUT accessories list refers to EUT Photo.pdf.
3. The following antennas were provided to the EUT.

Ant. No.	Type	Connector	Gain (dBi)				
			2.4G	5.15-5.25 GHz	5.25-5.35 GHz	5.47-5.725 GHz	5.725-5.85 GHz
GPSL1/BT/WLAN Antenna-0	PIFA	NA	-3.5	-3.7	-4.7	-1.4	-2.5
GPSL5/WLAN Antenna-1	PIFA	NA	-2.3	-2.2	-1.1	-0.7	-0.4

3.2 Description of Test Modes

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

Channel	Frequency	Channel	Frequency
1	2412MHz	8	2447MHz
2	2417MHz	9	2452MHz
3	2422MHz	10	2457MHz
4	2427MHz	11	2462MHz
5	2432MHz	12	2467MHz
6	2437MHz	13	2472MHz
7	2442MHz		

9 channels are provided for 802.11n (HT40):

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

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 **Y-plane**.

Radiated Emission Test (Above 1GHz):

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5
-	802.11n (HT40)	3 to 11	3, 6, 9, 10, 11	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (HT20)	1 to 13	11	OFDM	BPSK	6.5

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)
-	802.11n (HT20)	1 to 13	11	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5
-	802.11n (HT40)	3 to 11	3, 6, 9, 10, 11	OFDM	BPSK	13.5

Test Condition:

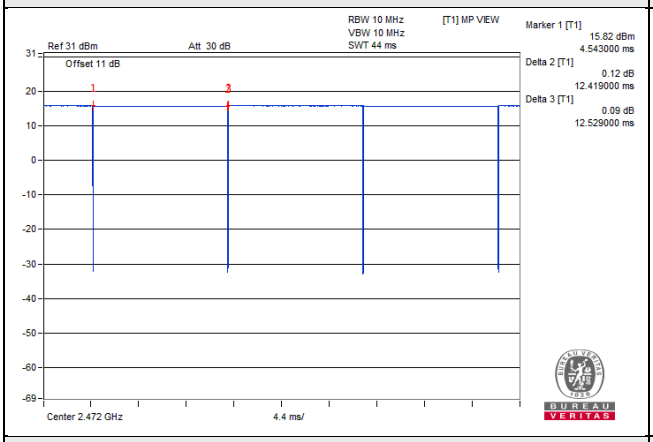
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	22 deg. C, 66% RH	120Vac, 60Hz	Willy Cheng
RE<1G	22 deg. C, 66% RH	120Vac, 60Hz	Willy Cheng
PLC	24 deg. C, 65% RH	120Vac, 60Hz	Willy Cheng
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Chris Lin

3.3 Duty Cycle of Test Signal

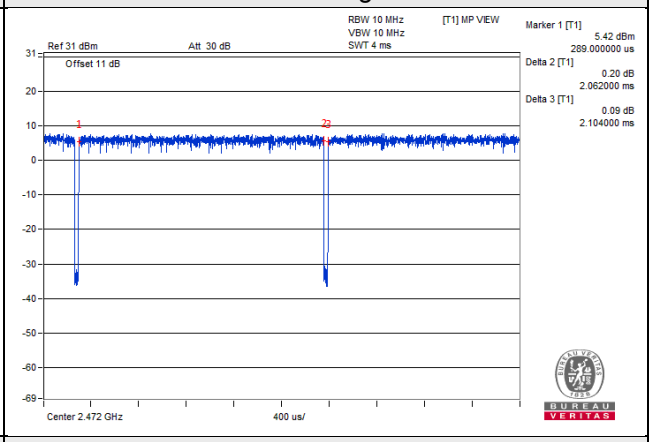
802.11b, 802.11g: Duty cycle of test signal is ≥ 98%.
802.11n (HT20), 802.11n (HT40): Duty cycle of test signal is < 98%.

802.11b: Duty cycle = 12.419/12.529 = 0.991
802.11g: Duty cycle = 2.062/2.104 = 0.980
802.11n (HT20): Duty cycle = 1.918/1.964 = 0.977, Duty factor = 10 * log (1/0.977) = 0.10
802.11n (HT40): Duty cycle = 0.945/1.016 = 0.930, Duty factor = 10 * log (1/0.930) = 0.32

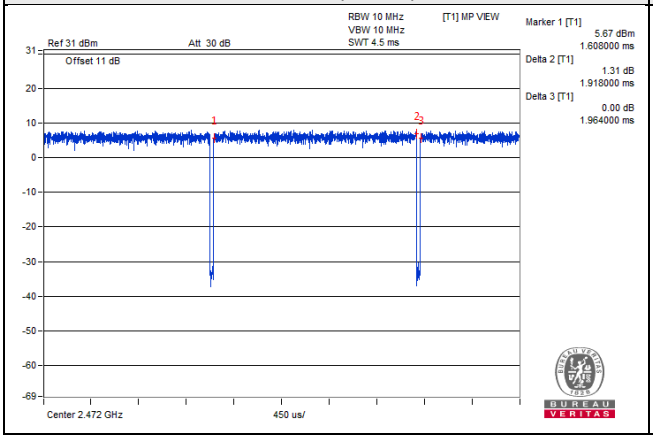
802.11b



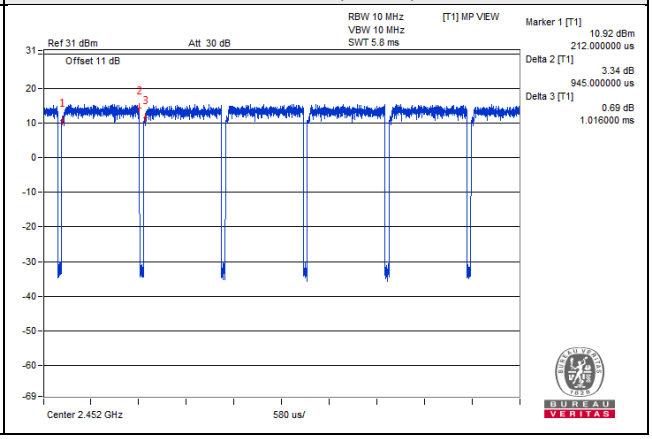
802.11g



802.11n (HT20)



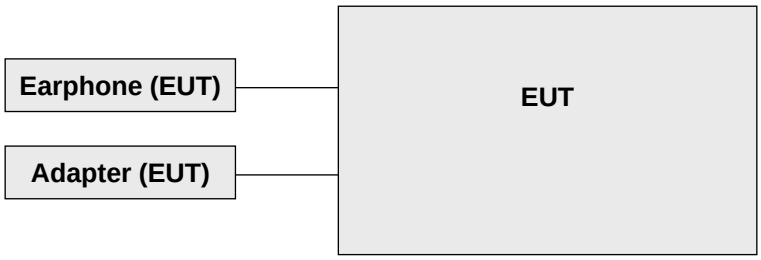
802.11n (HT40)



3.4 Description of Support Units

The EUT has been tested as an independent unit.

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)
KDB 558074 D01 15.247 Meas Guidance v05r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 29, 2018	May 28, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	100115	Jan. 21, 2019	Jan. 20, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	10980	Apr. 17, 2018	Apr. 16, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 22, 2018	Nov. 21, 2019
HORN Antenna SCHWARZBECK	9120D	209	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
Loop Antenna TESEQ	HLA 6121	45745	Jun. 14, 2018	Jun. 13, 2019
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2018	Aug. 20, 2019
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Apr. 03, 2018	Apr. 02, 2019
RF signal cable WOKEN	8D-FB	Cable-CH3-01	Aug. 21, 2018	Aug. 20, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2018	Aug. 20, 2019
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM-8000	Cable-CH3-03 (309224+170907)	Aug. 21, 2018	Aug. 20, 2019
Software BV ADT	ADT_Radiated_V7.6.15.9.5	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
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Nov. 14, 2018	Nov. 13, 2019
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	Jul. 17, 2018	Jul. 16, 2019

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The 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 FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is 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. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

f. The test-receiver system was set to peak and average 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:

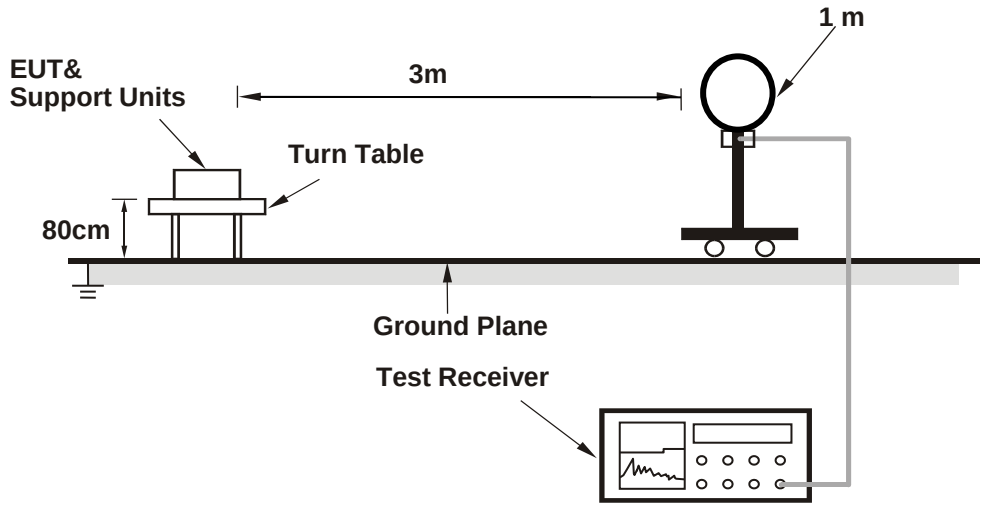
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

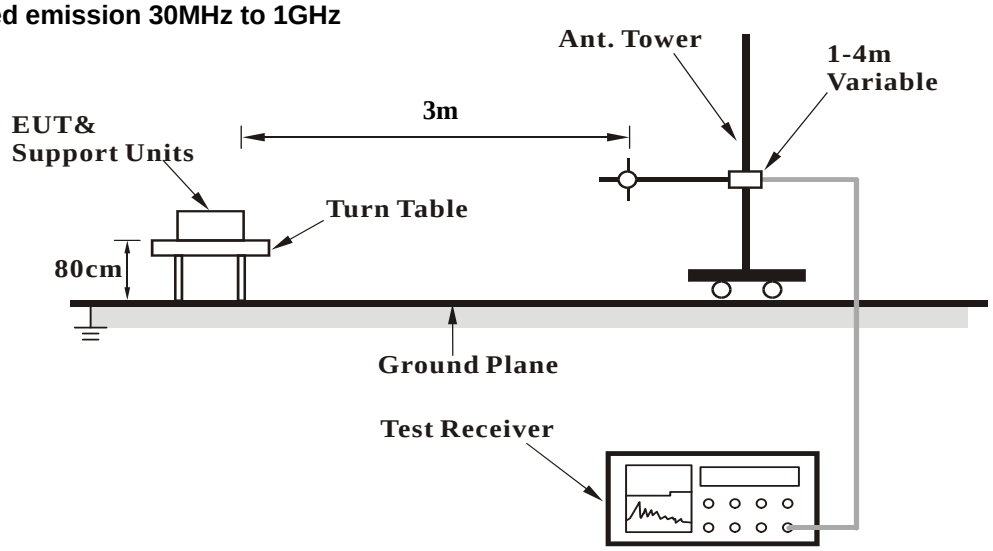
No deviation.

4.1.5 Test Setup

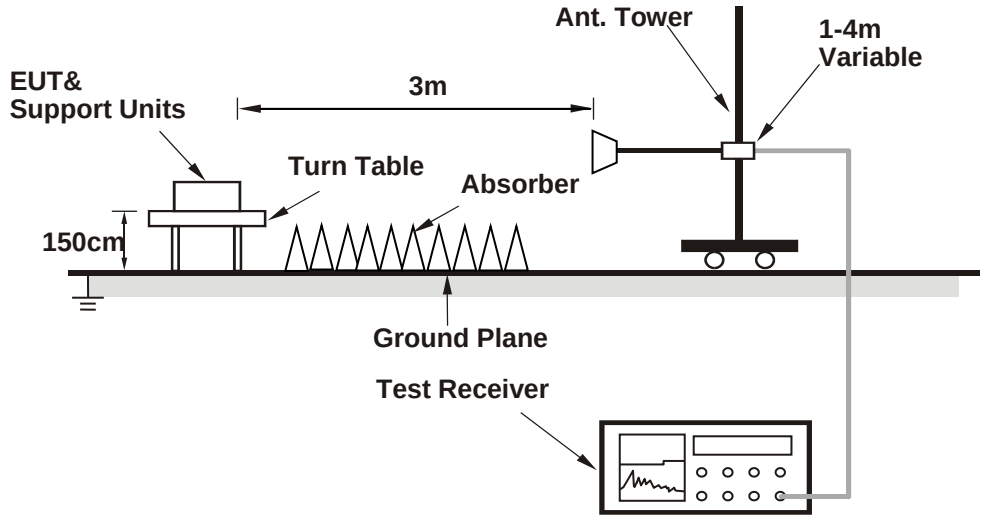
For Radiated emission below 30MHz



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. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.4 PK	74.0	-14.6	1.18 H	46	26.5	32.9
2	2390.00	47.6 AV	54.0	-6.4	1.18 H	46	14.7	32.9
3	*2412.00	99.2 PK			1.02 H	24	66.3	32.9
4	*2412.00	97.2 AV			1.02 H	24	64.3	32.9
5	4824.00	47.6 PK	74.0	-26.4	1.96 H	234	43.8	3.8
6	4824.00	33.8 AV	54.0	-20.2	1.96 H	234	30.0	3.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.2 PK	74.0	-13.8	1.42 V	271	27.3	32.9
2	2390.00	47.7 AV	54.0	-6.3	1.42 V	271	14.8	32.9
3	*2412.00	100.0 PK			1.31 V	267	67.1	32.9
4	*2412.00	96.2 AV			1.31 V	267	63.3	32.9
5	4824.00	47.1 PK	74.0	-26.9	2.53 V	251	43.3	3.8
6	4824.00	34.1 AV	54.0	-19.9	2.53 V	251	30.3	3.8

Remarks:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) 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	97.9 PK			1.02 H	33	65.0	32.9
2	*2437.00	95.0 AV			1.02 H	33	62.1	32.9
3	4874.00	48.2 PK	74.0	-25.8	2.97 H	263	44.6	3.6
4	4874.00	34.5 AV	54.0	-19.5	2.97 H	263	30.9	3.6
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	99.7 PK			1.81 V	114	66.8	32.9
2	*2437.00	95.8 AV			1.81 V	114	62.9	32.9
3	4874.00	48.3 PK	74.0	-25.7	2.24 V	135	44.7	3.6
4	4874.00	34.2 AV	54.0	-19.8	2.24 V	135	30.6	3.6

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	99.8 PK			1.04 H	33	66.9	32.9
2	*2462.00	97.3 AV			1.04 H	33	64.4	32.9
3	2483.50	59.5 PK	74.0	-14.5	1.43 H	46	26.5	33.0
4	2483.50	47.9 AV	54.0	-6.1	1.43 H	46	14.9	33.0
5	4924.00	48.1 PK	74.0	-25.9	2.21 H	164	44.6	3.5
6	4924.00	34.5 AV	54.0	-19.5	2.21 H	164	31.0	3.5
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	99.7 PK			2.61 V	90	66.8	32.9
2	*2462.00	97.7 AV			2.61 V	90	64.8	32.9
3	2483.50	59.9 PK	74.0	-14.1	2.57 V	143	26.9	33.0
4	2483.50	47.8 AV	54.0	-6.2	2.57 V	143	14.8	33.0
5	4924.00	47.5 PK	74.0	-26.5	1.86 V	231	44.0	3.5
6	4924.00	33.8 AV	54.0	-20.2	1.86 V	231	30.3	3.5

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 12	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	*2467.00	100.0 PK			1.07 H	36	67.1	32.9
2	*2467.00	96.3 AV			1.07 H	36	63.4	32.9
3	2483.50	59.8 PK	74.0	-14.2	1.38 H	51	26.8	33.0
4	2483.50	47.9 AV	54.0	-6.1	1.38 H	51	14.9	33.0
5	4934.00	48.0 PK	74.0	-26.0	2.91 H	239	44.4	3.6
6	4934.00	34.2 AV	54.0	-19.8	2.91 H	239	30.6	3.6
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	*2467.00	99.4 PK			2.36 V	87	66.5	32.9
2	*2467.00	97.3 AV			2.36 V	87	64.4	32.9
3	2483.50	59.6 PK	74.0	-14.4	2.37 V	57	26.6	33.0
4	2483.50	47.9 AV	54.0	-6.1	2.37 V	57	14.9	33.0
5	4934.00	47.6 PK	74.0	-26.4	2.06 V	117	44.0	3.6
6	4934.00	33.8 AV	54.0	-20.2	2.06 V	117	30.2	3.6

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 13	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	*2472.00	99.1 PK			1.04 H	35	66.2	32.9
2	*2472.00	97.2 AV			1.04 H	35	64.3	32.9
3	2483.50	60.7 PK	74.0	-13.3	1.54 H	32	27.7	33.0
4	2483.50	49.5 AV	54.0	-4.5	1.54 H	32	16.5	33.0
5	4944.00	48.4 PK	74.0	-25.6	1.36 H	258	44.7	3.7
6	4944.00	35.5 AV	54.0	-18.5	1.36 H	258	31.8	3.7
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	*2472.00	99.8 PK			2.43 V	83	66.9	32.9
2	*2472.00	95.9 AV			2.43 V	83	63.0	32.9
3	2483.50	60.9 PK	74.0	-13.1	2.47 V	79	27.9	33.0
4	2483.50	49.7 AV	54.0	-4.3	2.47 V	79	16.7	33.0
5	4944.00	48.0 PK	74.0	-26.0	2.08 V	176	44.3	3.7
6	4944.00	34.1 AV	54.0	-19.9	2.08 V	176	30.4	3.7

Remarks:

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

802.11g

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	63.2 PK	74.0	-10.8	2.89 H	122	30.3	32.9
2	2390.00	50.0 AV	54.0	-4.0	2.89 H	122	17.1	32.9
3	*2412.00	103.7 PK			2.93 H	124	70.8	32.9
4	*2412.00	93.1 AV			2.93 H	124	60.2	32.9
5	4824.00	46.7 PK	74.0	-27.3	1.72 H	236	42.9	3.8
6	4824.00	32.8 AV	54.0	-21.2	1.72 H	236	29.0	3.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.6 PK	74.0	-10.4	2.59 V	80	30.7	32.9
2	2390.00	50.9 AV	54.0	-3.1	2.59 V	80	18.0	32.9
3	*2412.00	104.2 PK			2.40 V	83	71.3	32.9
4	*2412.00	93.8 AV			2.40 V	83	60.9	32.9
5	4824.00	47.0 PK	74.0	-27.0	1.98 V	205	43.2	3.8
6	4824.00	32.8 AV	54.0	-21.2	1.98 V	205	29.0	3.8

Remarks:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) 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	101.4 PK			1.20 H	29	68.5	32.9
2	*2437.00	91.0 AV			1.20 H	29	58.1	32.9
3	4874.00	47.7 PK	74.0	-26.3	2.86 H	135	44.1	3.6
4	4874.00	34.1 AV	54.0	-19.9	2.86 H	135	30.5	3.6
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	102.0 PK			1.33 V	264	69.1	32.9
2	*2437.00	91.7 AV			1.33 V	264	58.8	32.9
3	4874.00	46.8 PK	74.0	-27.2	1.96 V	232	43.2	3.6
4	4874.00	33.5 AV	54.0	-20.5	1.96 V	232	29.9	3.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.1 PK			1.32 H	30	69.2	32.9
2	*2462.00	91.3 AV			1.32 H	30	58.4	32.9
3	2483.50	61.8 PK	74.0	-12.2	1.12 H	43	28.8	33.0
4	2483.50	49.3 AV	54.0	-4.7	1.12 H	43	16.3	33.0
5	4924.00	47.8 PK	74.0	-26.2	2.63 H	286	44.3	3.5
6	4924.00	34.4 AV	54.0	-19.6	2.63 H	286	30.9	3.5
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	101.8 PK			2.13 V	108	68.9	32.9
2	*2462.00	91.2 AV			2.13 V	108	58.3	32.9
3	2483.50	62.0 PK	74.0	-12.0	2.16 V	72	29.0	33.0
4	2483.50	49.7 AV	54.0	-4.3	2.16 V	72	16.7	33.0
5	4924.00	47.2 PK	74.0	-26.8	2.55 V	187	43.7	3.5
6	4924.00	34.0 AV	54.0	-20.0	2.55 V	187	30.5	3.5

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 12	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	*2467.00	101.3 PK			1.30 H	31	68.4	32.9
2	*2467.00	91.2 AV			1.30 H	31	58.3	32.9
3	2483.50	62.7 PK	74.0	-11.3	1.27 H	31	29.7	33.0
4	2483.50	50.3 AV	54.0	-3.7	1.27 H	31	17.3	33.0
5	4934.00	47.9 PK	74.0	-26.1	1.73 H	291	44.3	3.6
6	4934.00	34.0 AV	54.0	-20.0	1.73 H	291	30.4	3.6
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	*2467.00	102.1 PK			1.53 V	263	69.2	32.9
2	*2467.00	91.2 AV			1.53 V	263	58.3	32.9
3	2483.50	64.8 PK	74.0	-9.2	1.51 V	263	31.8	33.0
4	2483.50	51.9 AV	54.0	-2.1	1.51 V	263	18.9	33.0
5	4934.00	47.5 PK	74.0	-26.5	2.89 V	231	43.9	3.6
6	4934.00	33.9 AV	54.0	-20.1	2.89 V	231	30.3	3.6

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 13	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	*2472.00	92.2 PK			1.08 H	35	59.3	32.9
2	*2472.00	81.1 AV			1.08 H	35	48.2	32.9
3	2483.50	65.5 PK	74.0	-8.5	1.56 H	34	32.5	33.0
4	2483.50	51.9 AV	54.0	-2.1	1.56 H	34	18.9	33.0
5	4944.00	48.0 PK	74.0	-26.0	1.96 H	231	44.3	3.7
6	4944.00	34.1 AV	54.0	-19.9	1.96 H	231	30.4	3.7
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	*2472.00	89.5 PK			1.00 V	210	56.6	32.9
2	*2472.00	79.8 AV			1.00 V	210	46.9	32.9
3	2483.50	66.0 PK	74.0	-8.0	1.00 V	267	33.0	33.0
4	**2483.50**	**52.6 AV**	**54.0**	**-1.4**	**1.00 V**	**267**	**19.6**	**33.0**
5	4944.00	47.6 PK	74.0	-26.4	1.79 V	236	43.9	3.7
6	4944.00	33.9 AV	54.0	-20.1	1.79 V	236	30.2	3.7

Remarks:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.9 PK	74.0	-9.1	1.41 H	29	32.0	32.9
2	2390.00	50.9 AV	54.0	-3.1	1.41 H	29	18.0	32.9
3	*2412.00	102.0 PK			1.04 H	32	69.1	32.9
4	*2412.00	91.2 AV			1.04 H	32	58.3	32.9
5	4824.00	47.6 PK	74.0	-26.4	1.53 H	249	43.8	3.8
6	4824.00	34.2 AV	54.0	-19.8	1.53 H	249	30.4	3.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.5 PK	74.0	-9.5	2.52 V	91	31.6	32.9
2	2390.00	50.7 AV	54.0	-3.3	2.52 V	91	17.8	32.9
3	*2412.00	103.6 PK			2.40 V	76	70.7	32.9
4	*2412.00	93.4 AV			2.40 V	76	60.5	32.9
5	4824.00	46.6 PK	74.0	-27.4	2.93 V	158	42.8	3.8
6	4824.00	32.9 AV	54.0	-21.1	2.93 V	158	29.1	3.8

Remarks:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) 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	100.1 PK			1.22 H	29	67.2	32.9
2	*2437.00	90.1 AV			1.22 H	29	57.2	32.9
3	4874.00	47.7 PK	74.0	-26.3	1.57 H	189	44.1	3.6
4	4874.00	33.9 AV	54.0	-20.1	1.57 H	189	30.3	3.6
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	99.9 PK			2.07 V	77	67.0	32.9
2	*2437.00	89.9 AV			2.07 V	77	57.0	32.9
3	4874.00	47.4 PK	74.0	-26.6	2.84 V	251	43.8	3.6
4	4874.00	33.5 AV	54.0	-20.5	2.84 V	251	29.9	3.6

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	100.8 PK			1.70 H	29	67.9	32.9
2	*2462.00	90.2 AV			1.70 H	29	57.3	32.9
3	2483.50	60.2 PK	74.0	-13.8	1.52 H	43	27.2	33.0
4	2483.50	48.5 AV	54.0	-5.5	1.52 H	43	15.5	33.0
5	4924.00	47.8 PK	74.0	-26.2	1.87 H	263	44.3	3.5
6	4924.00	33.6 AV	54.0	-20.4	1.87 H	263	30.1	3.5
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	102.2 PK			2.54 V	79	69.3	32.9
2	*2462.00	91.9 AV			2.54 V	79	59.0	32.9
3	2483.50	64.8 PK	74.0	-9.2	2.72 V	77	31.8	33.0
4	2483.50	51.5 AV	54.0	-2.5	2.72 V	77	18.5	33.0
5	4924.00	48.0 PK	74.0	-26.0	2.23 V	186	44.5	3.5
6	4924.00	33.8 AV	54.0	-20.2	2.23 V	186	30.3	3.5

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 12	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	*2467.00	101.2 PK			1.09 H	34	68.3	32.9
2	*2467.00	90.8 AV			1.09 H	34	57.9	32.9
3	2483.50	64.4 PK	74.0	-9.6	1.26 H	33	31.4	33.0
4	2483.50	51.2 AV	54.0	-2.8	1.26 H	33	18.2	33.0
5	4934.00	47.8 PK	74.0	-26.2	1.58 H	236	44.2	3.6
6	4934.00	34.1 AV	54.0	-19.9	1.58 H	236	30.5	3.6
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	*2467.00	102.2 PK			2.56 V	78	69.3	32.9
2	*2467.00	91.9 AV			2.56 V	78	59.0	32.9
3	2483.50	65.7 PK	74.0	-8.3	2.27 V	76	32.7	33.0
4	**2483.50**	**52.6 AV**	**54.0**	**-1.4**	**2.27 V**	**76**	**19.6**	**33.0**
5	4934.00	48.5 PK	74.0	-25.5	2.55 V	159	44.9	3.6
6	4934.00	33.9 AV	54.0	-20.1	2.55 V	159	30.3	3.6

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 13	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	*2472.00	91.0 PK			1.06 H	34	58.1	32.9
2	*2472.00	80.6 AV			1.06 H	34	47.7	32.9
3	2483.50	66.7 PK	74.0	-7.3	1.54 H	35	33.7	33.0
4	2483.50	51.9 AV	54.0	-2.1	1.54 H	35	18.9	33.0
5	4944.00	47.4 PK	74.0	-26.6	1.83 H	251	43.7	3.7
6	4944.00	34.1 AV	54.0	-19.9	1.83 H	251	30.4	3.7
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	*2472.00	90.9 PK			1.53 V	260	58.0	32.9
2	*2472.00	80.9 AV			1.53 V	260	48.0	32.9
3	2483.50	66.4 PK	74.0	-7.6	1.52 V	282	33.4	33.0
4	2483.50	52.5 AV	54.0	-1.5	1.52 V	282	19.5	33.0
5	4944.00	47.2 PK	74.0	-26.8	1.83 V	262	43.5	3.7
6	4944.00	34.0 AV	54.0	-20.0	1.83 V	262	30.3	3.7

Remarks:

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

802.11n (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	63.6 PK	74.0	-10.4	1.59 H	29	30.7	32.9
2	2390.00	51.6 AV	54.0	-2.4	1.59 H	29	18.7	32.9
3	*2422.00	99.3 PK			1.52 H	25	66.5	32.8
4	*2422.00	89.4 AV			1.52 H	25	56.6	32.8
5	4844.00	46.5 PK	74.0	-27.5	1.93 H	236	42.8	3.7
6	4844.00	33.1 AV	54.0	-20.9	1.93 H	236	29.4	3.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.8 PK	74.0	-9.2	2.32 V	80	31.9	32.9
2	2390.00	52.3 AV	54.0	-1.7	2.32 V	80	19.4	32.9
3	*2422.00	100.5 PK			2.29 V	100	67.7	32.8
4	*2422.00	90.8 AV			2.29 V	100	58.0	32.8
5	4844.00	46.7 PK	74.0	-27.3	2.09 V	203	43.0	3.7
6	4844.00	33.2 AV	54.0	-20.8	2.09 V	203	29.5	3.7

Remarks:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) 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	96.0 PK			1.43 H	22	63.1	32.9
2	*2437.00	86.2 AV			1.43 H	22	53.3	32.9
3	4874.00	46.3 PK	74.0	-27.7	1.92 H	269	42.7	3.6
4	4874.00	33.2 AV	54.0	-20.8	1.92 H	269	29.6	3.6
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	100.0 PK			2.32 V	78	67.1	32.9
2	*2437.00	89.9 AV			2.32 V	78	57.0	32.9
3	4874.00	46.5 PK	74.0	-27.5	2.10 V	193	42.9	3.6
4	4874.00	33.5 AV	54.0	-20.5	2.10 V	193	29.9	3.6

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	94.8 PK			1.68 H	27	61.9	32.9
2	*2452.00	84.8 AV			1.68 H	27	51.9	32.9
3	2483.50	60.2 PK	74.0	-13.8	1.72 H	30	27.2	33.0
4	2483.50	48.3 AV	54.0	-5.7	1.72 H	30	15.3	33.0
5	4904.00	47.0 PK	74.0	-27.0	1.82 H	257	43.5	3.5
6	4904.00	33.6 AV	54.0	-20.4	1.82 H	257	30.1	3.5
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	97.7 PK			2.36 V	78	64.8	32.9
2	*2452.00	88.1 AV			2.36 V	78	55.2	32.9
3	2483.50	60.2 PK	74.0	-13.8	2.29 V	86	27.2	33.0
4	2483.50	48.5 AV	54.0	-5.5	2.29 V	86	15.5	33.0
5	4904.00	47.3 PK	74.0	-26.7	1.97 V	199	43.8	3.5
6	4904.00	33.9 AV	54.0	-20.1	1.97 V	199	30.4	3.5

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 10	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	*2457.00	96.6 PK			1.64 H	29	63.7	32.9
2	*2457.00	86.5 AV			1.64 H	29	53.6	32.9
3	2483.50	60.3 PK	74.0	-13.7	1.71 H	22	27.3	33.0
4	2483.50	48.8 AV	54.0	-5.2	1.71 H	22	15.8	33.0
5	4914.00	46.9 PK	74.0	-27.1	1.93 H	278	43.4	3.5
6	4914.00	33.5 AV	54.0	-20.5	1.93 H	278	30.0	3.5
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	*2457.00	96.9 PK			2.34 V	78	64.0	32.9
2	*2457.00	87.1 AV			2.34 V	78	54.2	32.9
3	2483.50	60.9 PK	74.0	-13.1	2.43 V	85	27.9	33.0
4	2483.50	48.9 AV	54.0	-5.1	2.43 V	85	15.9	33.0
5	4914.00	47.3 PK	74.0	-26.7	2.03 V	222	43.8	3.5
6	4914.00	33.7 AV	54.0	-20.3	2.03 V	222	30.2	3.5

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 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	93.5 PK			1.99 H	27	60.6	32.9
2	*2462.00	83.4 AV			1.99 H	27	50.5	32.9
3	2483.50	62.7 PK	74.0	-11.3	2.09 H	30	29.7	33.0
4	2483.50	49.5 AV	54.0	-4.5	2.09 H	30	16.5	33.0
5	4924.00	46.9 PK	74.0	-27.1	1.75 H	250	43.4	3.5
6	4924.00	34.0 AV	54.0	-20.0	1.75 H	250	30.5	3.5
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	94.7 PK			2.08 V	105	61.8	32.9
2	*2462.00	84.8 AV			2.08 V	105	51.9	32.9
3	2483.50	64.7 PK	74.0	-9.3	1.87 V	102	31.7	33.0
4	**2483.50**	**52.6 AV**	**54.0**	**-1.4**	**1.87 V**	**102**	**19.6**	**33.0**
5	4924.00	46.6 PK	74.0	-27.4	2.16 V	193	43.1	3.5
6	4924.00	33.7 AV	54.0	-20.3	2.16 V	193	30.2	3.5

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:

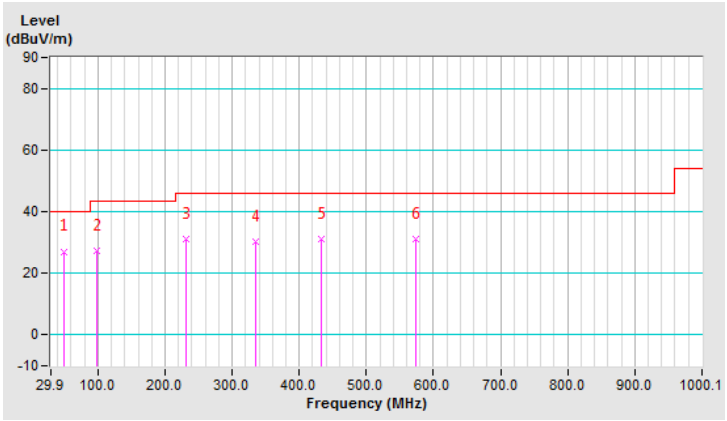
802.11n (HT20)

CHANNEL	TX Channel 11	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	49.34	27.1 QP	40.0	-12.9	2.00 H	332	36.8	-9.7
2	97.95	27.1 QP	43.5	-16.4	2.00 H	136	41.1	-14.0
3	232.11	30.9 QP	46.0	-15.1	1.00 H	91	41.1	-10.2
4	335.15	30.2 QP	46.0	-15.8	1.49 H	109	36.9	-6.7
5	432.37	30.9 QP	46.0	-15.1	2.00 H	119	35.4	-4.5
6	574.30	31.0 QP	46.0	-15.0	2.00 H	228	33.1	-2.1

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 of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report

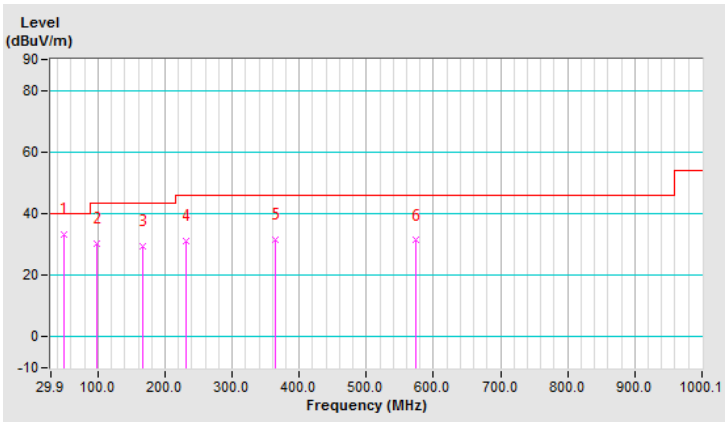


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	49.34	33.2 QP	40.0	-6.8	1.01 V	16	42.9	-9.7
2	97.95	30.4 QP	43.5	-13.1	1.01 V	196	44.4	-14.0
3	166.00	29.5 QP	43.5	-14.0	1.01 V	16	38.6	-9.1
4	232.11	31.1 QP	46.0	-14.9	1.01 V	264	41.3	-10.2
5	364.32	31.5 QP	46.0	-14.5	1.01 V	156	37.8	-6.3
6	574.30	31.3 QP	46.0	-14.7	1.51 V	291	33.4	-2.1

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 of frequency range 30MHz ~ 1000MHz
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report



4.2 Conducted 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	Dec. 10, 2018	Dec. 09, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
Software ADT	BV ADT_Cond_ V7.3.7.4	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.

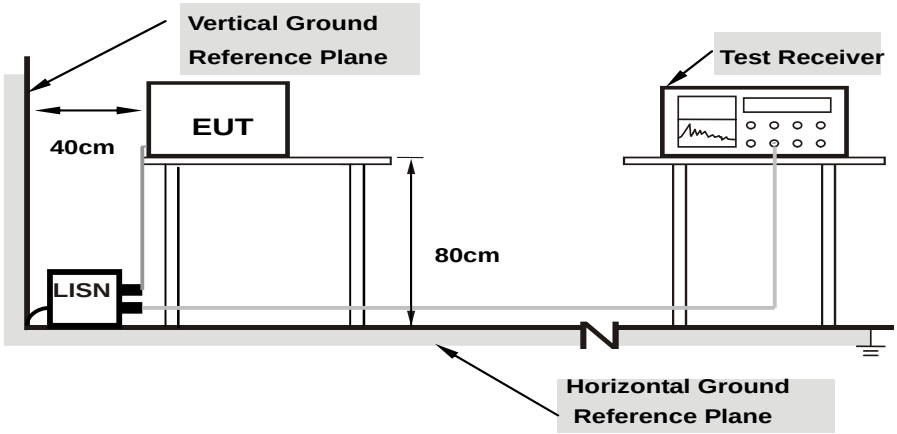
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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:

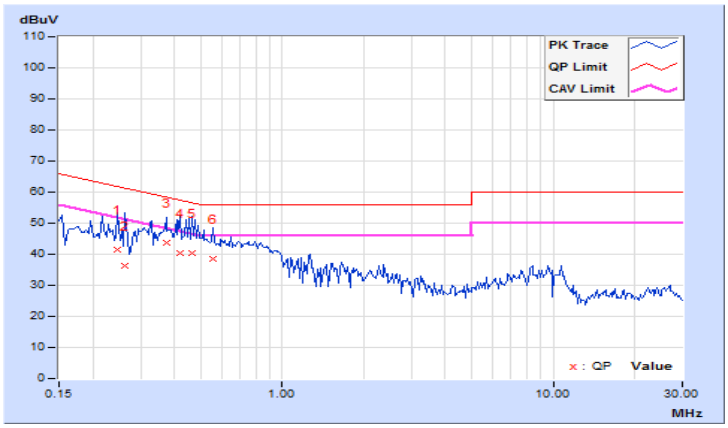
802.11n (HT20)

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

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	0.24766	9.73	31.77	17.97	41.50	27.70	61.84	51.84	-20.34	-24.14
2	0.26328	9.73	26.63	13.88	36.36	23.61	61.33	51.33	-24.97	-27.72
3	**0.37266**	**9.75**	**33.99**	**20.50**	**43.74**	**30.25**	**58.44**	**48.44**	**-14.70**	**-18.19**
4	0.41953	9.75	30.62	15.14	40.37	24.89	57.46	47.46	-17.09	-22.57
5	0.46641	9.74	30.67	17.35	40.41	27.09	56.58	46.58	-16.17	-19.49
6	0.55234	9.73	28.79	17.21	38.52	26.94	56.00	46.00	-17.48	-19.06

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.

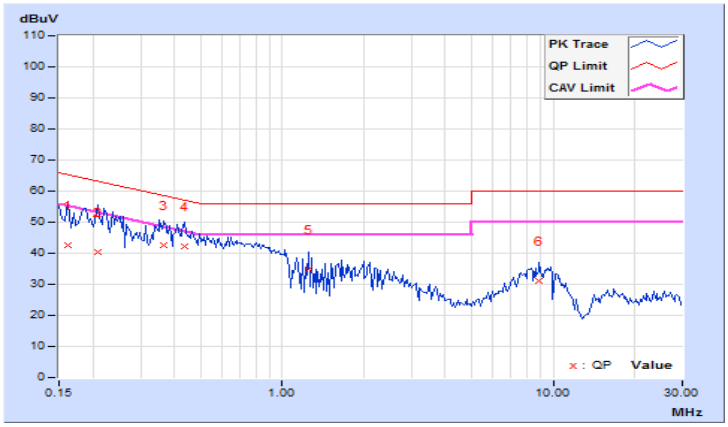


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.16172	9.72	32.85	18.64	42.57	28.36	65.38	55.38	-22.81	-27.02
2	0.20859	9.73	30.46	17.26	40.19	26.99	63.26	53.26	-23.07	-26.27
3	0.36484	9.75	32.69	19.98	42.44	29.73	58.62	48.62	-16.18	-18.89
4	0.43516	9.75	32.55	17.24	42.30	26.99	57.15	47.15	-14.85	-20.16
5	1.25391	9.72	25.05	15.18	34.77	24.90	56.00	46.00	-21.23	-21.10
6	8.89063	9.89	21.12	14.31	31.01	24.20	60.00	50.00	-28.99	-25.80

Remarks:

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

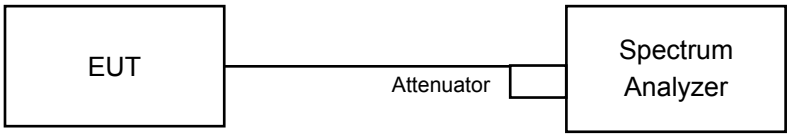


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz.

b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = peak.

c. Trace mode = max hold.

d. Sweep = auto couple.

e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.13	8.12	0.5	Pass
6	2437	9.07	8.14	0.5	Pass
11	2462	8.09	8.14	0.5	Pass
12	2467	9.10	8.03	0.5	Pass
13	2472	8.15	8.09	0.5	Pass

802.11g

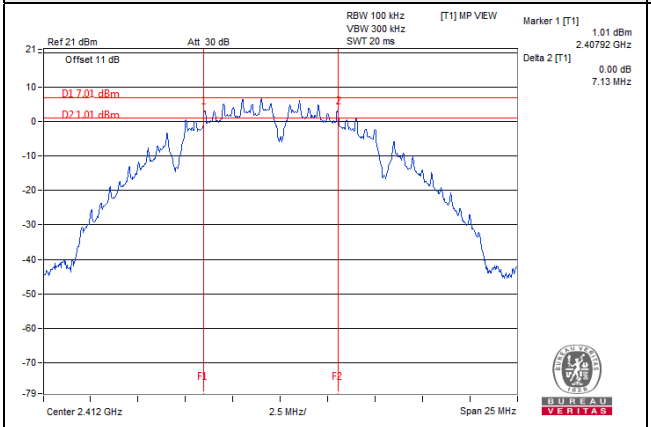
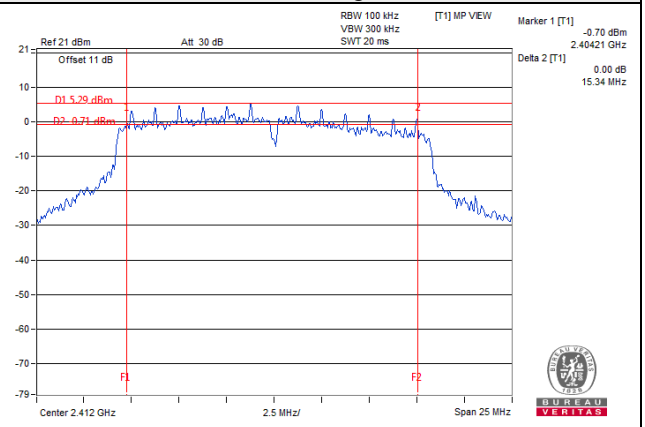
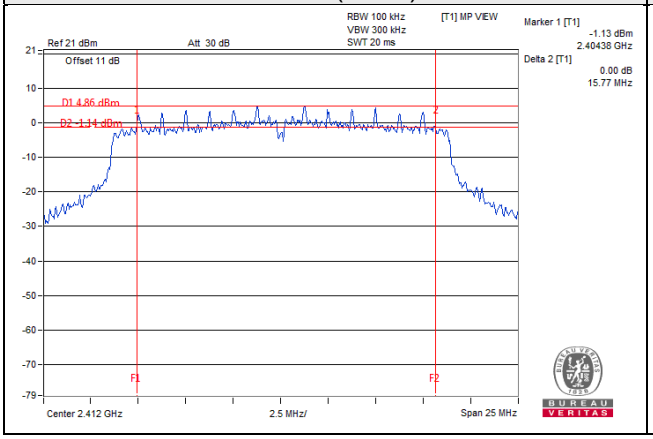
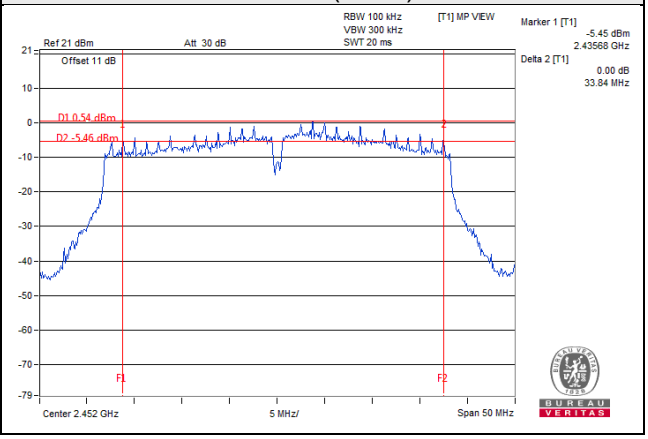
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.34	15.49	0.5	Pass
6	2437	15.95	15.42	0.5	Pass
11	2462	15.68	15.74	0.5	Pass
12	2467	15.79	15.73	0.5	Pass
13	2472	16.38	15.76	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.97	15.77	0.5	Pass
6	2437	16.92	16.02	0.5	Pass
11	2462	16.02	16.01	0.5	Pass
12	2467	16.40	16.00	0.5	Pass
13	2472	17.63	16.06	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.46	35.20	0.5	Pass
6	2437	36.46	35.84	0.5	Pass
9	2452	33.84	35.32	0.5	Pass
10	2457	35.12	35.21	0.5	Pass
11	2462	35.14	35.15	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

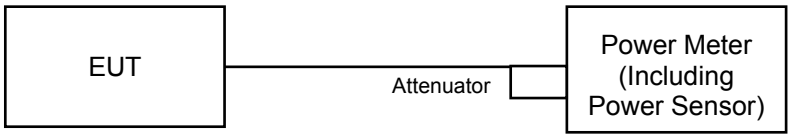
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

For Peak Power

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

For Average Power

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as item 4.3.6.

4.4.7 Test Results

For Peak Power

802.11b

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	16.32	18.21	109.077	20.38	30.00	Pass
6	2437	15.61	18.77	111.728	20.48	30.00	Pass
11	2462	16.26	18.34	110.501	20.43	30.00	Pass
12	2467	16.41	18.78	119.261	20.76	30.00	Pass
13	2472	15.49	18.71	109.702	20.40	30.00	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.45	20.49	181.928	22.60	30.00	Pass
6	2437	17.48	20.76	175.100	22.43	30.00	Pass
11	2462	18.18	20.11	168.331	22.26	30.00	Pass
12	2467	18.13	20.49	176.957	22.48	30.00	Pass
13	2472	7.87	10.83	18.230	12.61	30.00	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.55	20.77	191.013	22.81	30.00	Pass
6	2437	17.39	20.87	177.008	22.48	30.00	Pass
11	2462	19.07	20.93	**204.604**	23.11	30.00	Pass
12	2467	18.03	20.86	185.432	22.68	30.00	Pass
13	2472	7.77	10.55	17.334	12.39	30.00	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.03	18.05	143.809	21.58	30.00	Pass
6	2437	19.79	17.44	150.743	21.78	30.00	Pass
9	2452	18.51	18.67	144.579	21.60	30.00	Pass
10	2457	18.34	18.41	137.577	21.39	30.00	Pass
11	2462	15.01	14.93	62.813	17.98	30.00	Pass

For Average Power

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	14.39	16.28	69.941	18.45
6	2437	13.93	16.42	68.570	18.36
11	2462	14.71	15.92	68.664	18.37
12	2467	14.02	16.39	68.786	18.38
13	2472	13.33	16.41	65.280	18.15

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	14.18	16.28	68.644	18.37
6	2437	13.98	16.42	68.856	18.38
11	2462	14.49	16.01	68.021	18.33
12	2467	13.58	16.24	64.876	18.12
13	2472	3.36	6.21	6.3460	8.03

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	14.27	16.04	66.909	18.25
6	2437	13.57	16.38	66.202	18.21
11	2462	14.57	16.05	68.914	18.38
12	2467	13.68	16.26	65.602	18.17
13	2472	3.25	5.85	5.959	7.75

802.11n (HT40)

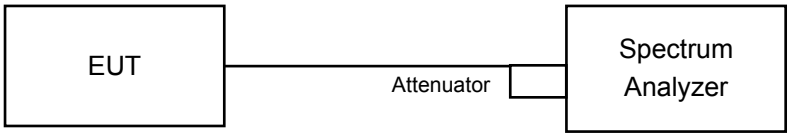
Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	13.64	13.12	43.633	16.40
6	2437	14.13	12.35	43.061	16.34
9	2452	13.26	12.87	40.548	16.08
10	2457	13.16	13.25	41.836	16.22
11	2462	9.75	9.37	18.091	12.57

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. Set analyzer center frequency to DTS channel center frequency.

b. Set the span to 1.5 times the DTS bandwidth.

c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.

d. Set the VBW ≥ 3 × RBW.

e. Detector = peak.

f. Sweep time = auto couple.

g. Trace mode = max hold.

h. Allow trace to fully stabilize.

i. Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Frequency (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-1.05	3.01	1.96	8.00	Pass
	6	2437	-1.18	3.01	1.83	8.00	Pass
	11	2462	-2.47	3.01	0.54	8.00	Pass
	12	2467	-4.38	3.01	-1.37	8.00	Pass
	13	2472	-2.51	3.01	0.50	8.00	Pass
1	1	2412	-2.35	3.01	0.66	8.00	Pass
	6	2437	-1.25	3.01	1.76	8.00	Pass
	11	2462	-3.13	3.01	-0.12	8.00	Pass
	12	2467	-2.95	3.01	0.06	8.00	Pass
	13	2472	-2.91	3.01	0.10	8.00	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 = -2.3dBi + 10log(2) = 0.71dBi < 6dBi, so the power density limit not need to reduce.

802.11g

TX chain	Channel	Frequency (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-10.26	3.01	-7.25	8.00	Pass
	6	2437	-9.97	3.01	-6.96	8.00	Pass
	11	2462	-11.05	3.01	-8.04	8.00	Pass
	12	2467	-12.08	3.01	-9.07	8.00	Pass
	13	2472	-21.89	3.01	-18.88	8.00	Pass
1	1	2412	-10.87	3.01	-7.86	8.00	Pass
	6	2437	-10.43	3.01	-7.42	8.00	Pass
	11	2462	-11.69	3.01	-8.68	8.00	Pass
	12	2467	-12.06	3.01	-9.05	8.00	Pass
	13	2472	-22.56	3.01	-19.55	8.00	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 = -2.3dBi + 10log(2) = 0.71dBi < 6dBi, so the power density limit not need to reduce.

802.11n (HT20)

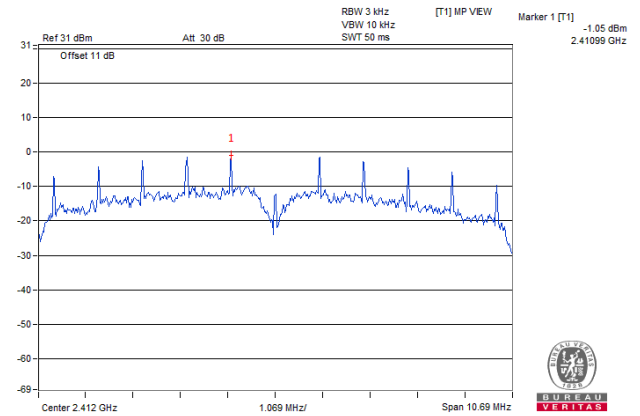
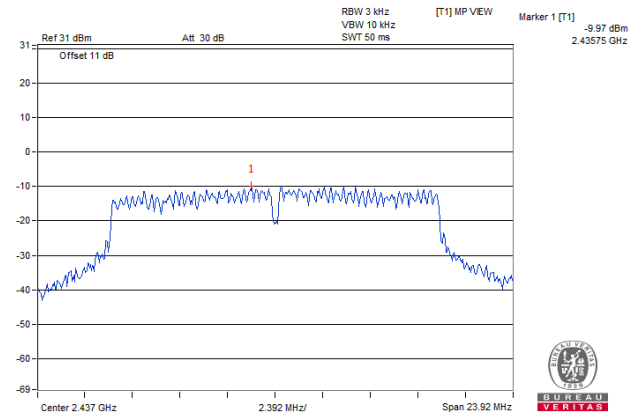
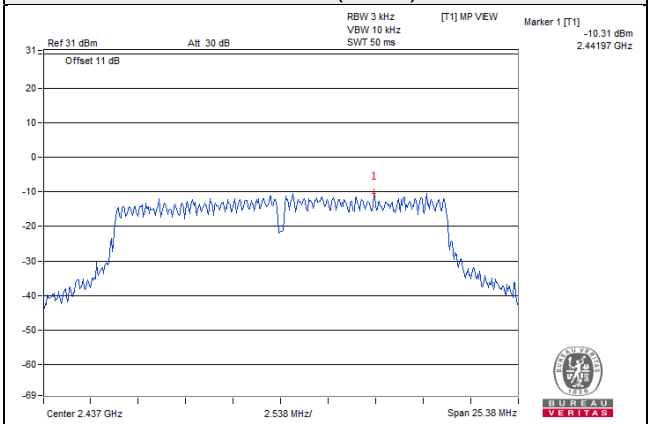
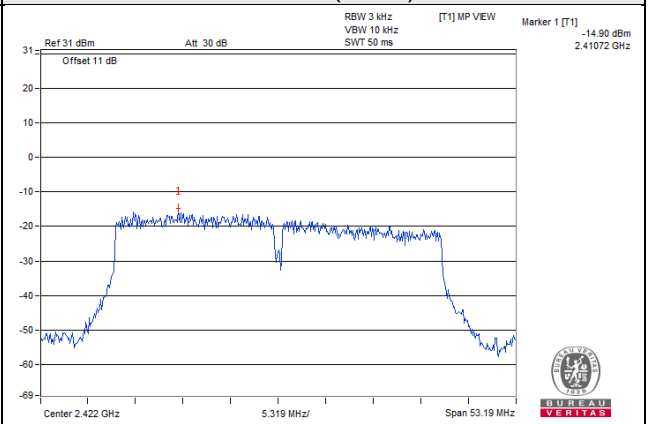
TX chain	Channel	Frequency (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-11.84	3.01	-8.83	8.00	Pass
	6	2437	-10.31	3.01	-7.30	8.00	Pass
	11	2462	-11.58	3.01	-8.57	8.00	Pass
	12	2467	-12.03	3.01	-9.02	8.00	Pass
	13	2472	-22.57	3.01	-19.56	8.00	Pass
1	1	2412	-12.01	3.01	-9.00	8.00	Pass
	6	2437	-10.33	3.01	-7.32	8.00	Pass
	11	2462	-11.15	3.01	-8.14	8.00	Pass
	12	2467	-11.96	3.01	-8.95	8.00	Pass
	13	2472	-22.74	3.01	-19.73	8.00	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 = -2.3dBi + 10log(2) = 0.71dBi < 6dBi, so the power density limit not need to reduce.

802.11n (HT40)

TX chain	Channel	Frequency (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-14.90	3.01	-11.89	8.00	Pass
	6	2437	-14.95	3.01	-11.94	8.00	Pass
	9	2452	-15.20	3.01	-12.19	8.00	Pass
	10	2457	-15.82	3.01	-12.81	8.00	Pass
	11	2462	-19.17	3.01	-16.16	8.00	Pass
1	3	2422	-16.61	3.01	-13.60	8.00	Pass
	6	2437	-17.39	3.01	-14.38	8.00	Pass
	9	2452	-16.65	3.01	-13.64	8.00	Pass
	10	2457	-16.06	3.01	-13.05	8.00	Pass
	11	2462	-19.40	3.01	-16.39	8.00	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 = -2.3dBi + 10log(2) = 0.71dBi < 6dBi, so the power density limit not need to reduce.

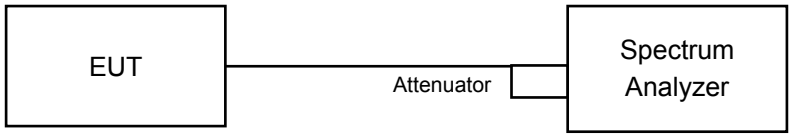
Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11n (HT20)	802.11n (HT40)
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below -20dB 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

a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep time = auto couple.
e. Trace mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

a. Set RBW = 100 kHz.
b. Set VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep = auto couple.
e. Trace Mode = max hold.
f. Allow trace to fully stabilize.
g. 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

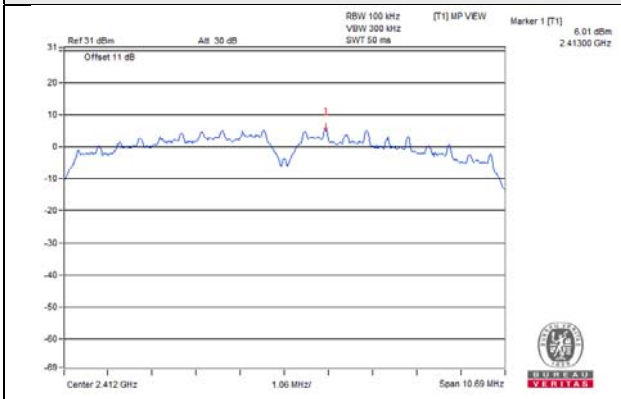
Same as item 4.3.6

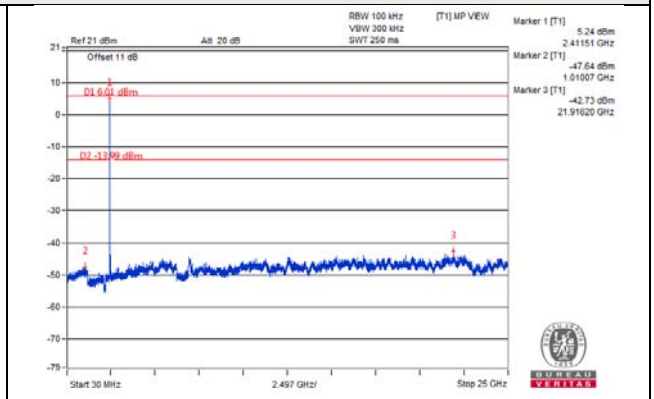
4.6.7 Test Results

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 20dB offset below D1. It shows compliance with the requirement.

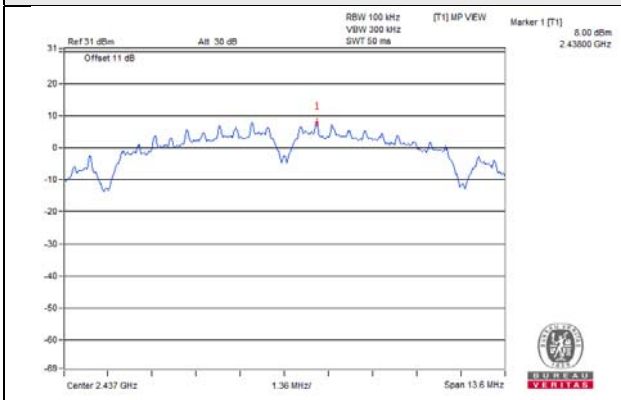
802.11b_Chain 0

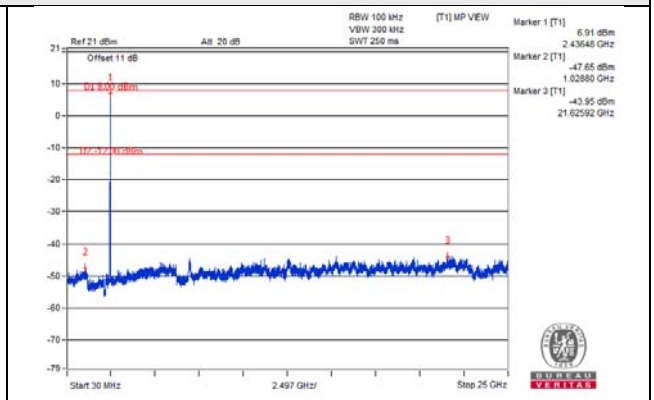
CH 1



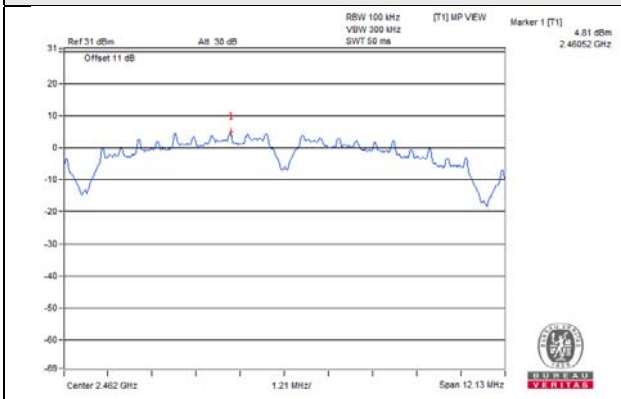


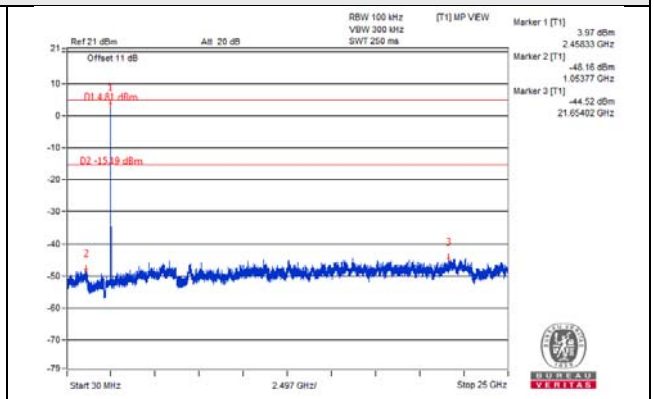
CH 6



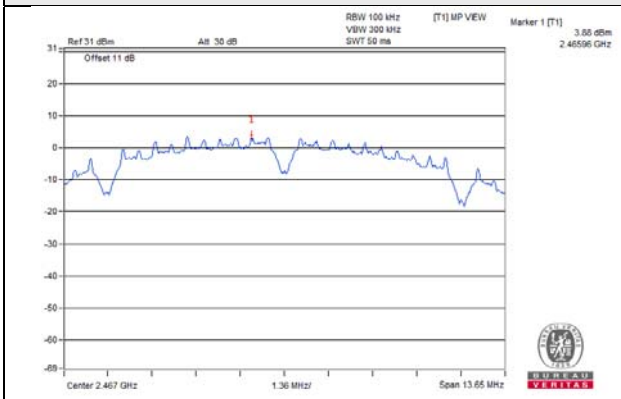


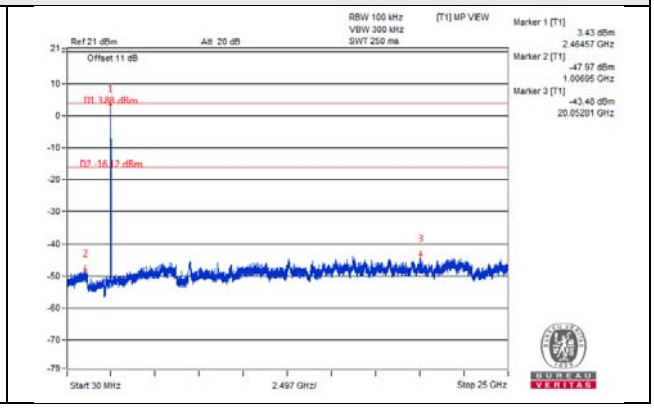
CH 11

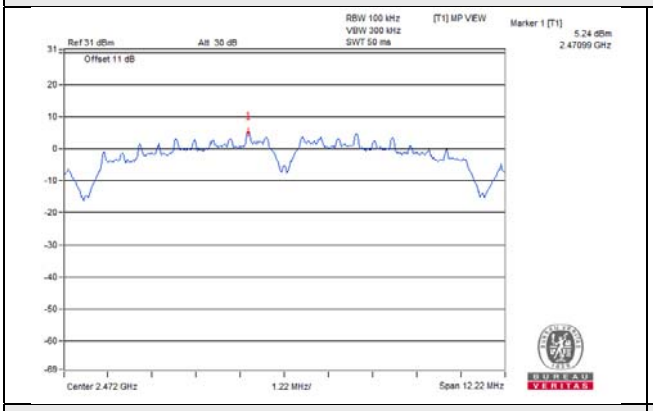
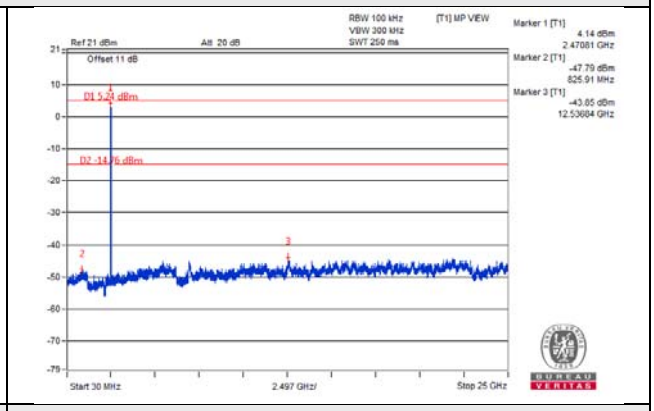
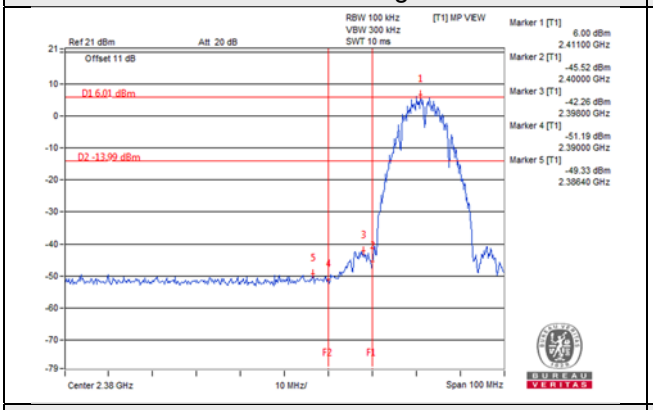
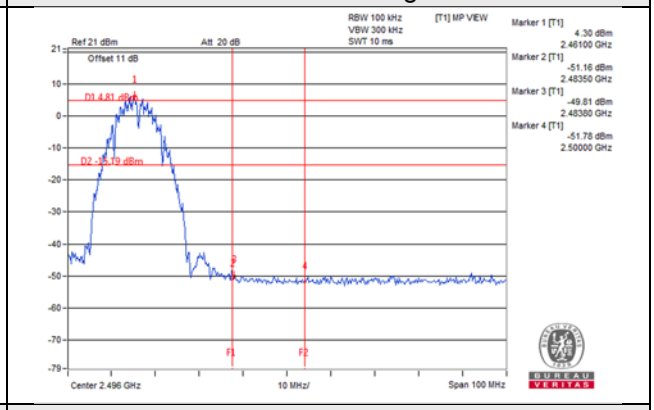
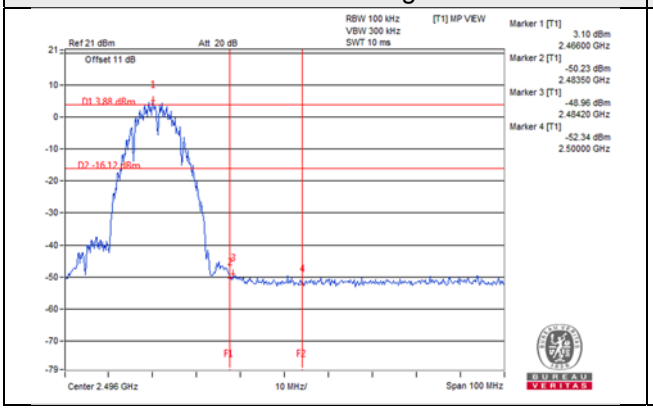
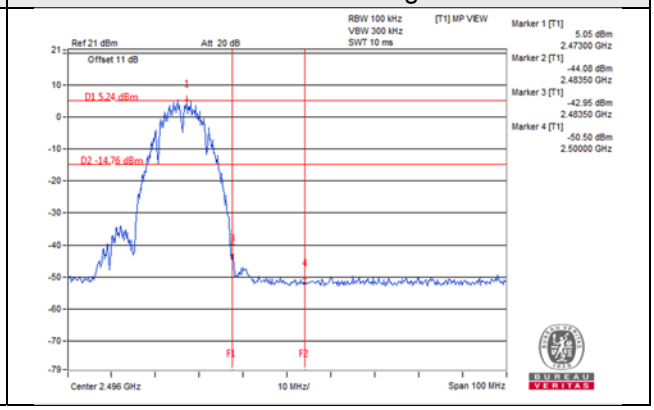




CH 12

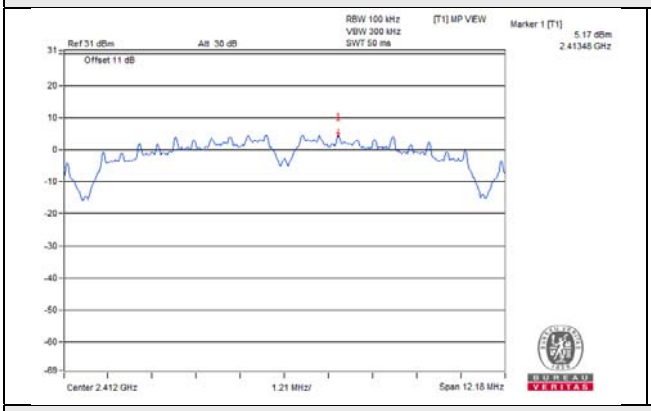


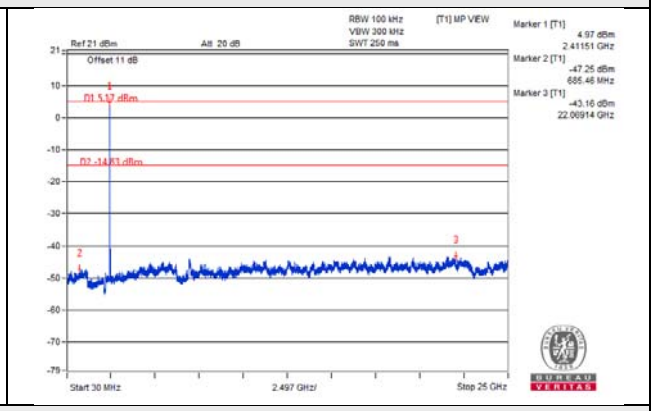


CH 13	
	
CH 1 Band edge	CH 11 Band edge
	
CH 12 Band edge	CH 13 Band edge
	

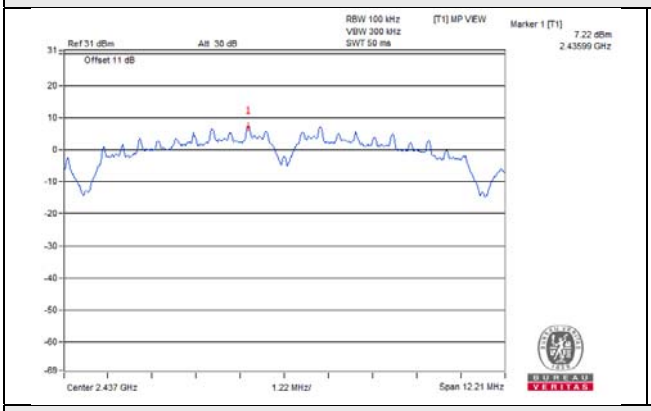
802.11b_Chain 1

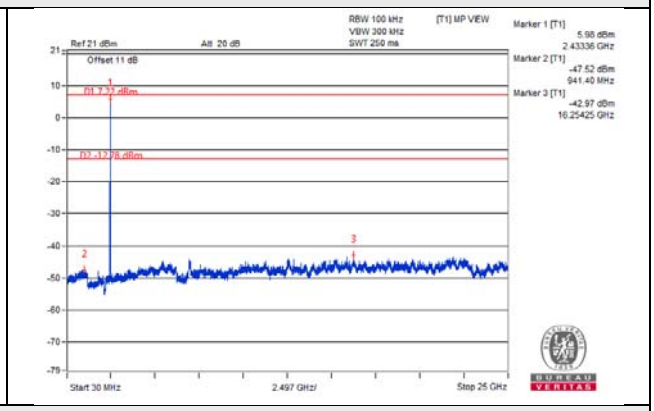
CH 1



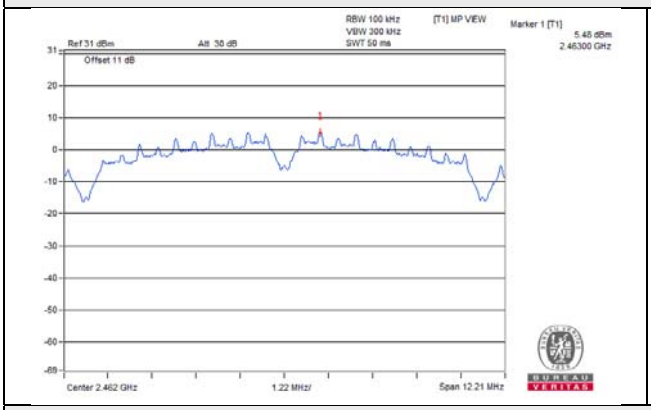


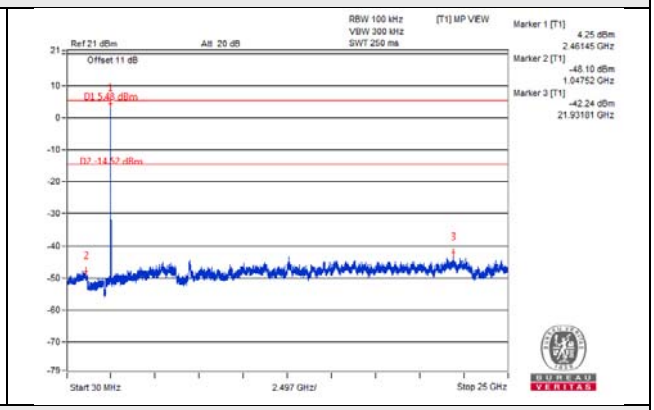
CH 6



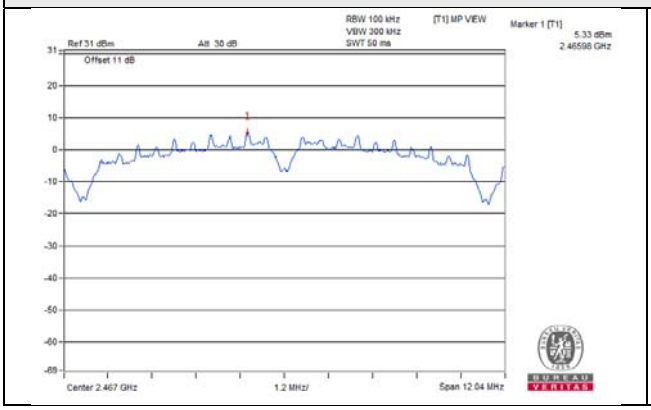


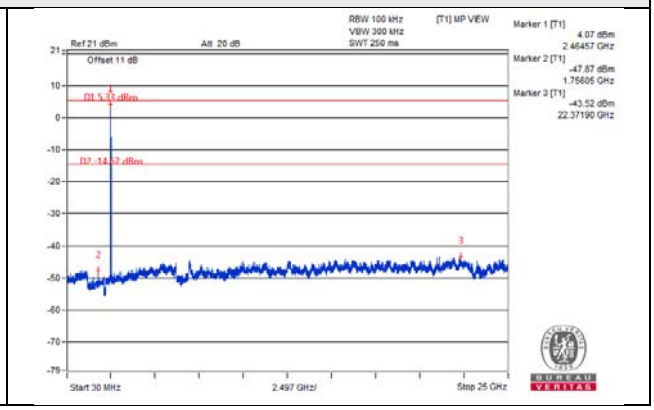
CH 11



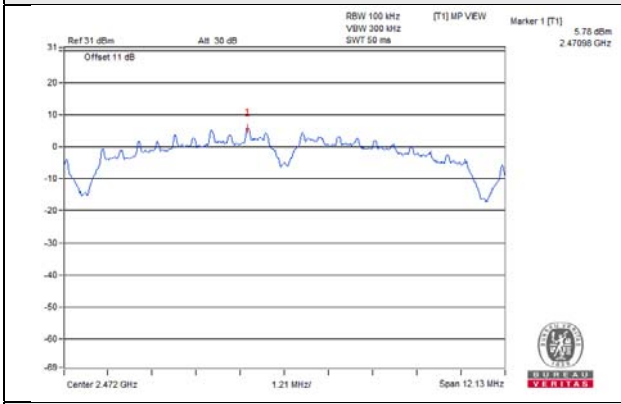


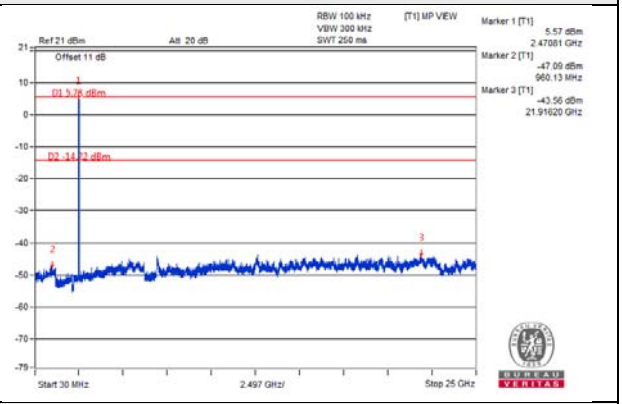
CH 12



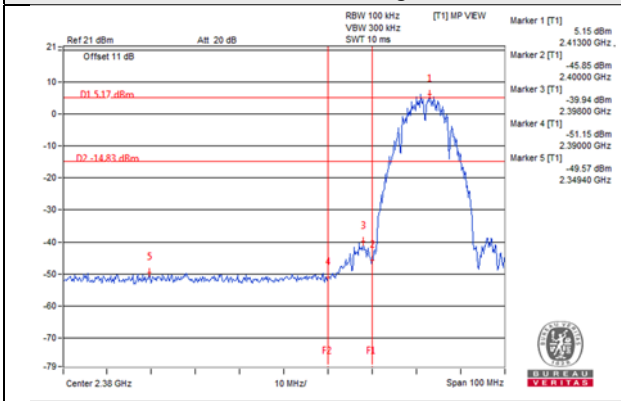


CH 13

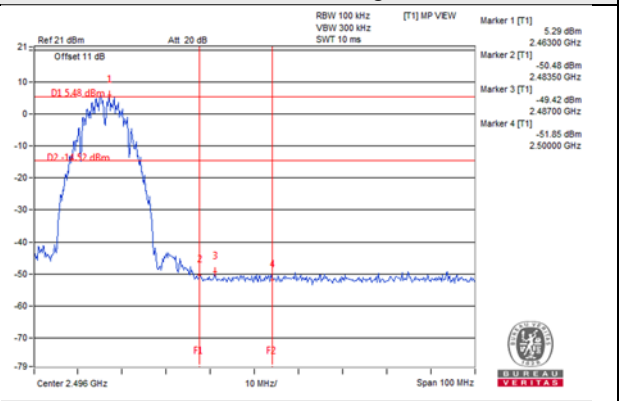




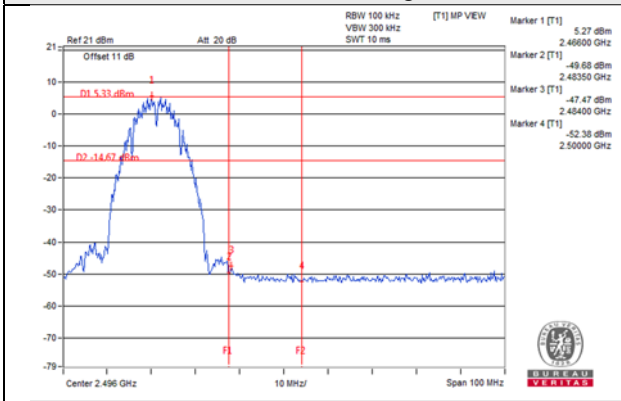
CH 1 Band edge



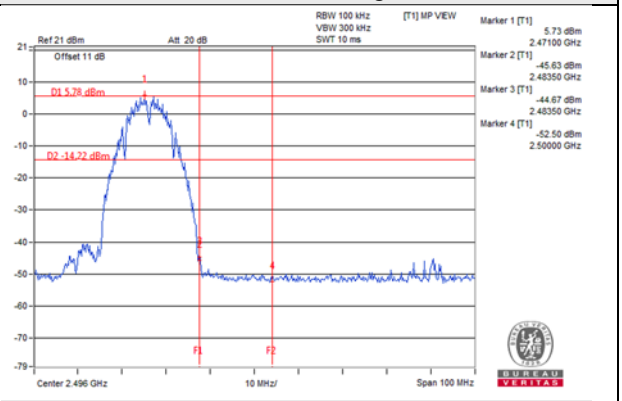
CH 11 Band edge



CH 12 Band edge

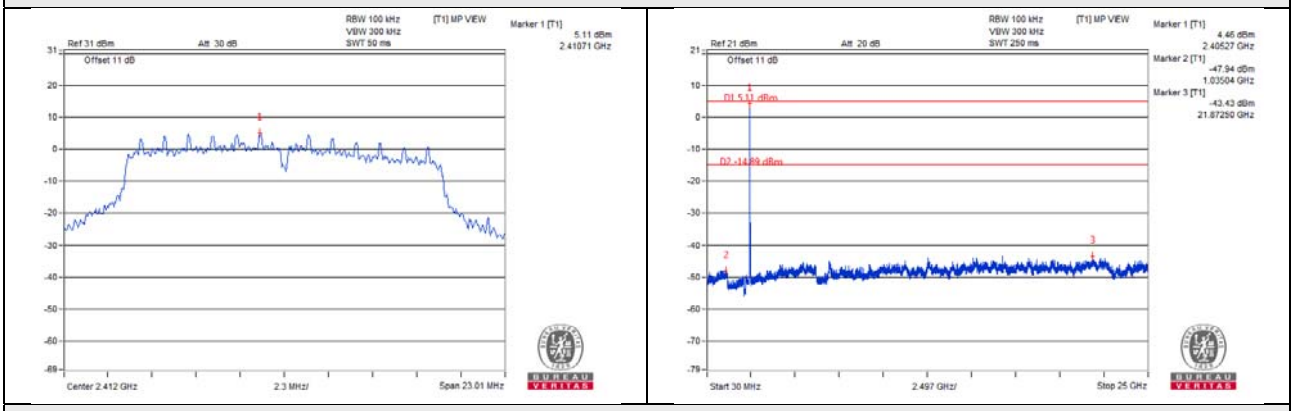


CH 13 Band edge

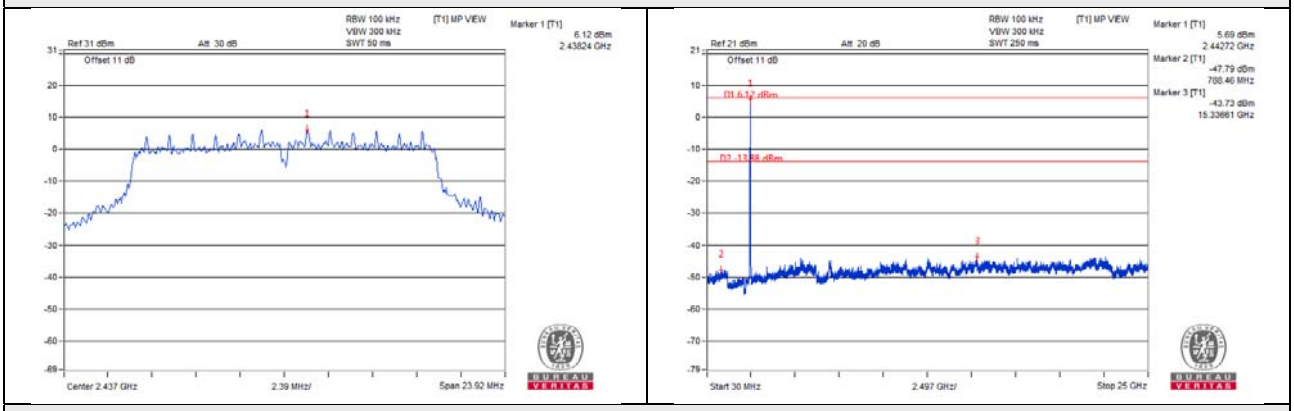


802.11g_Chain 0

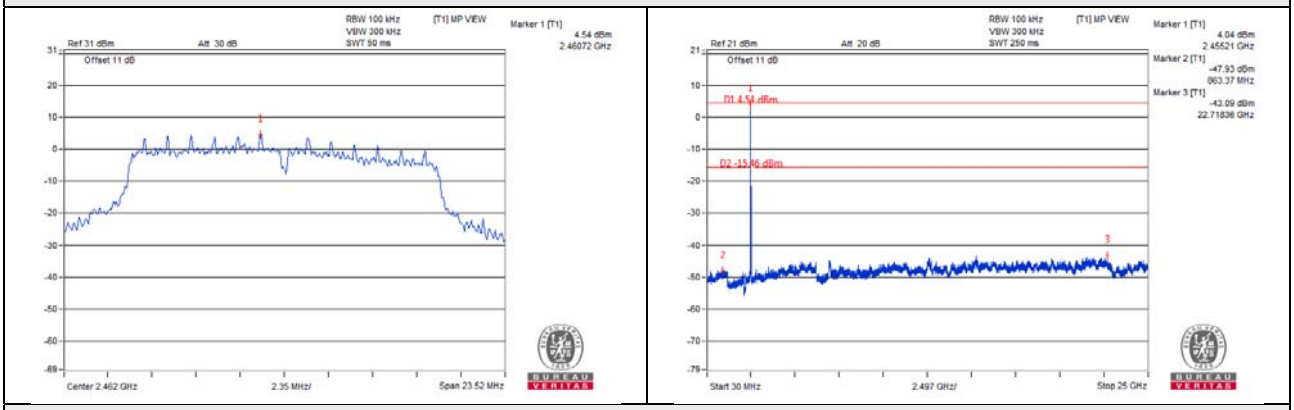
CH 1



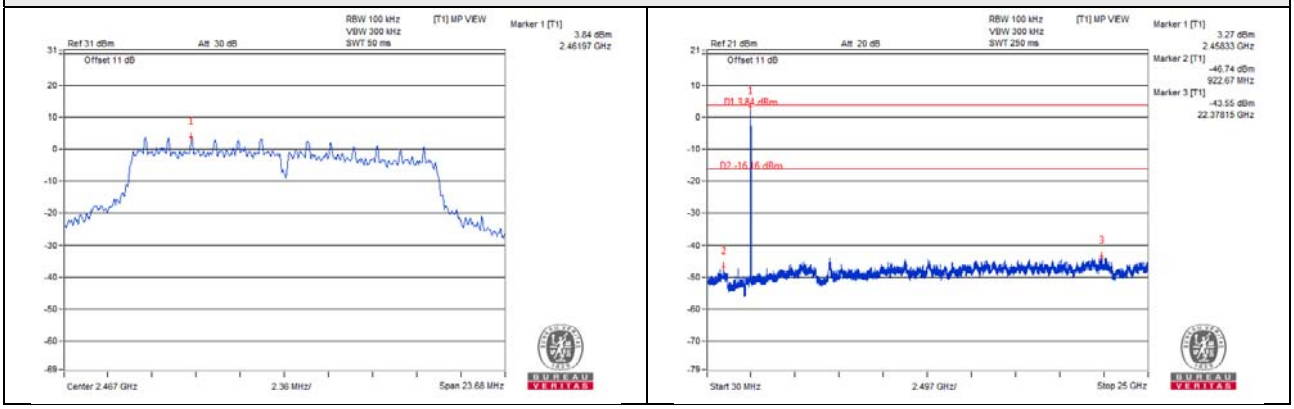
CH 6

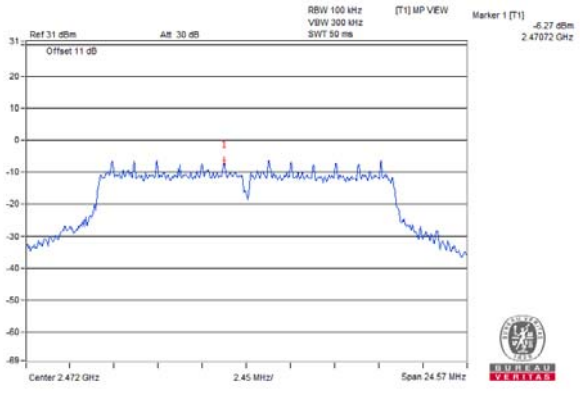
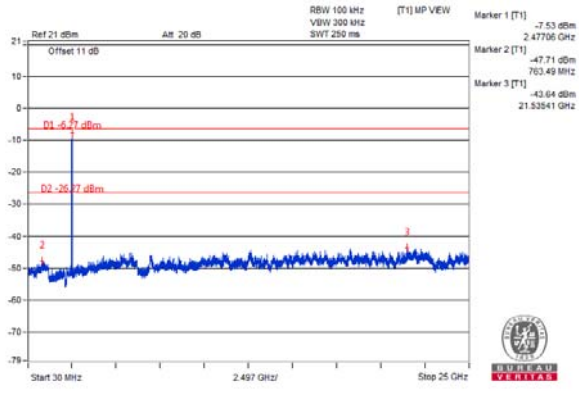
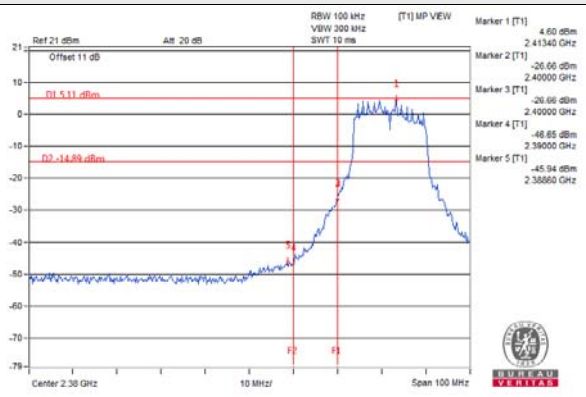
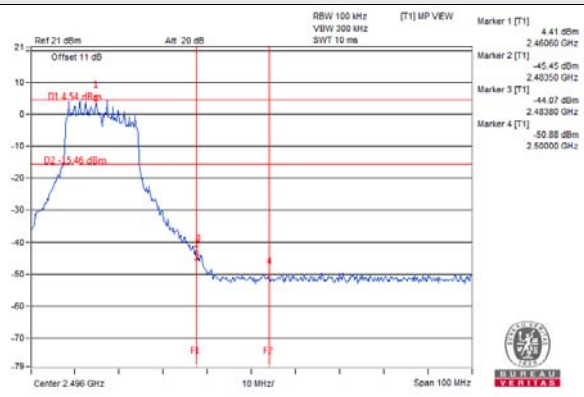
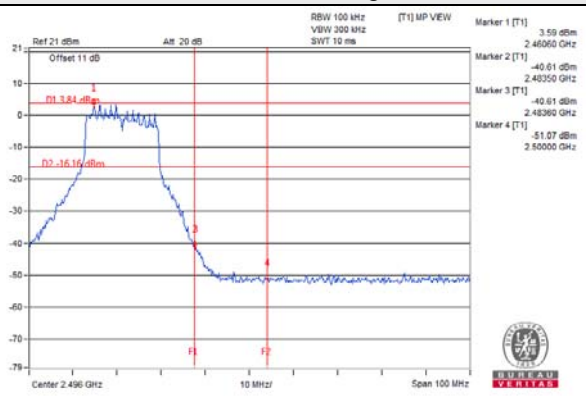
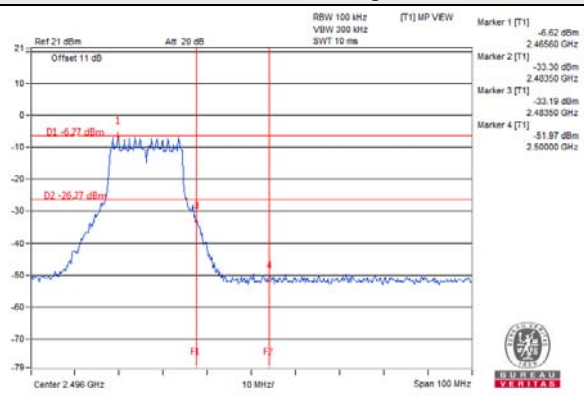


CH 11



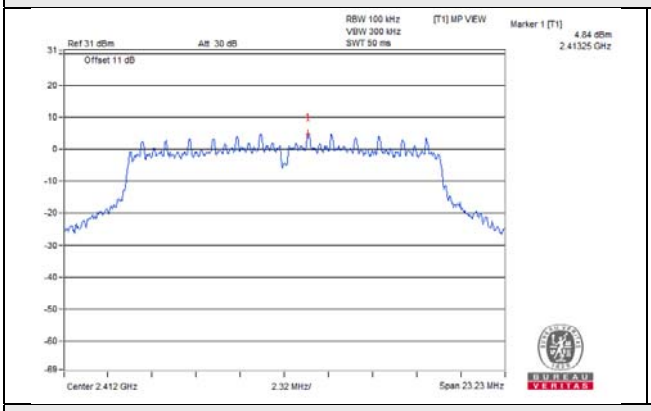
CH 12

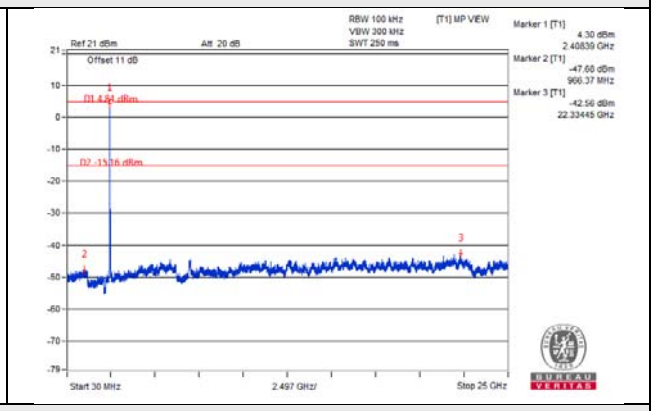


CH 13	
	
CH 1 Band edge	CH 11 Band edge
	
CH 12 Band edge	CH 13 Band edge
	

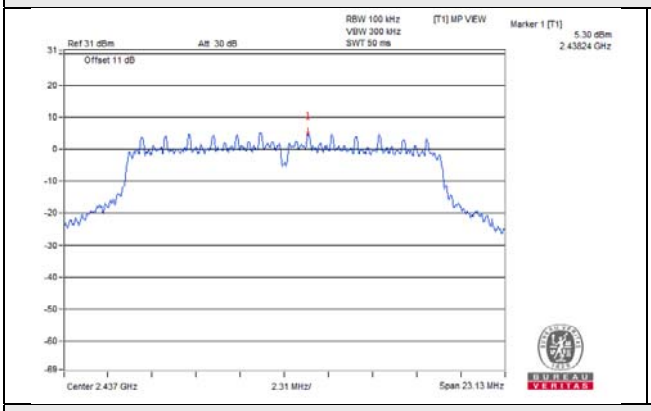
802.11g_Chain 1

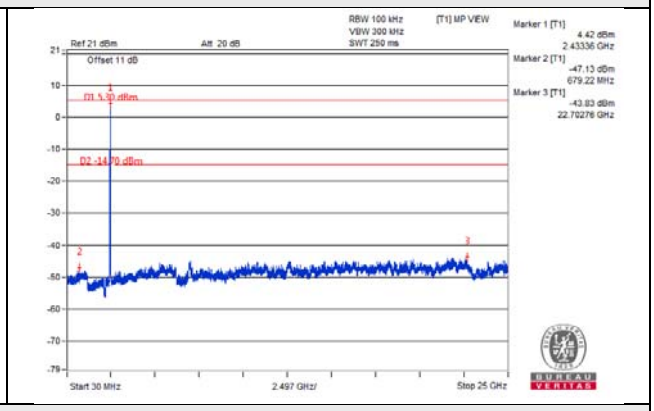
CH 1



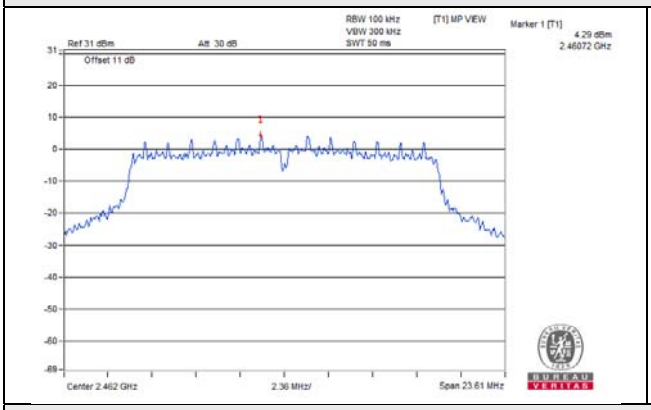


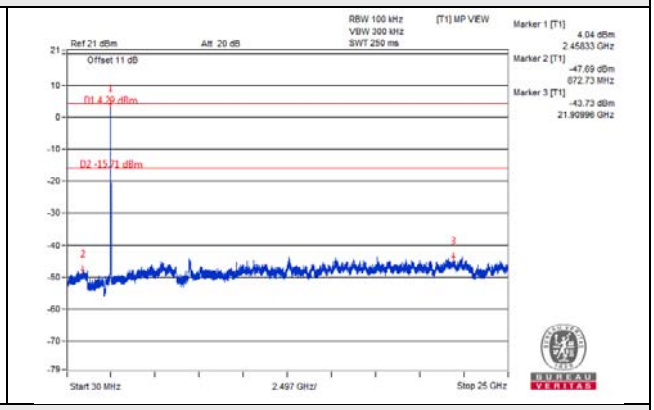
CH 6



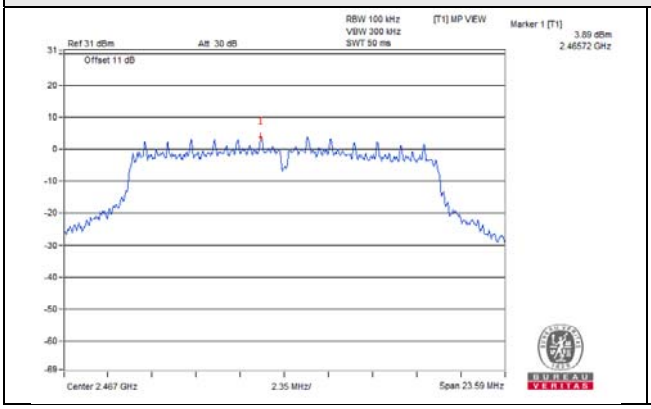


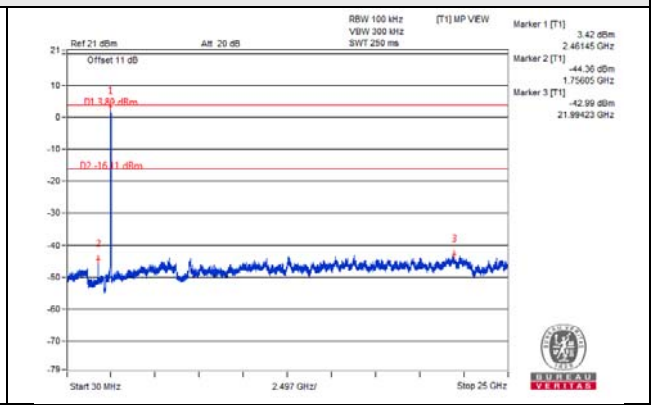
CH 11

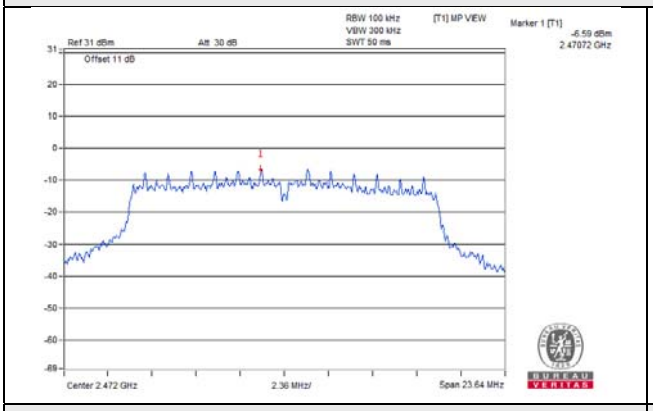
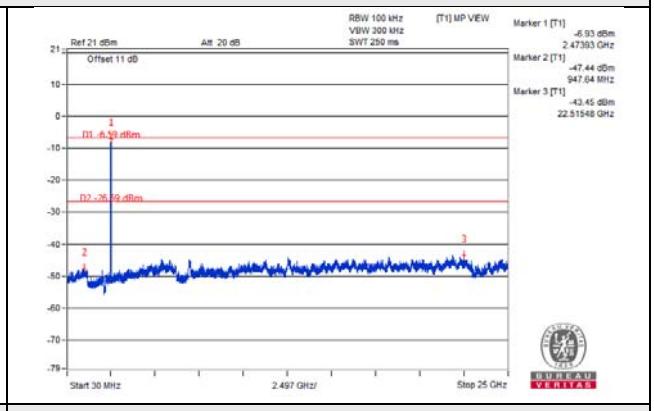
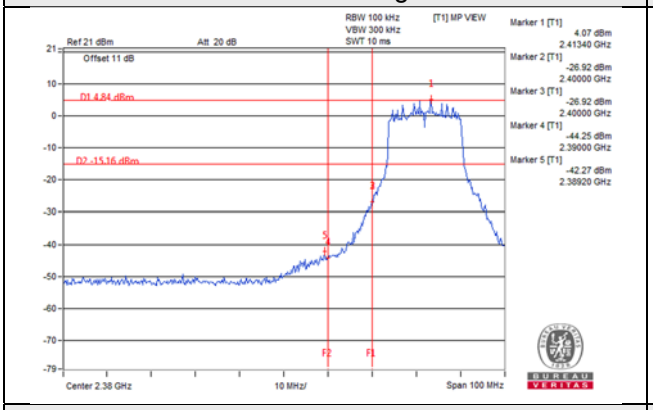
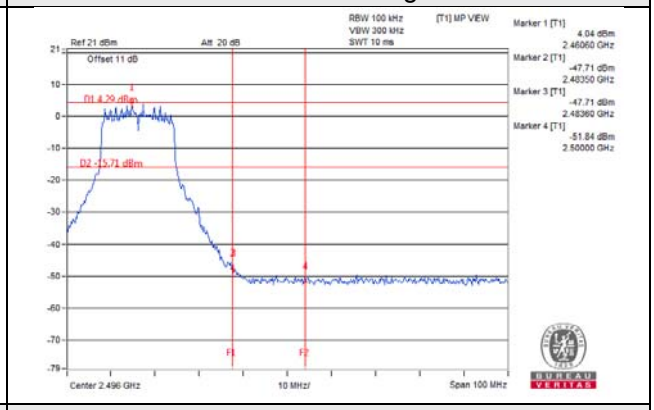
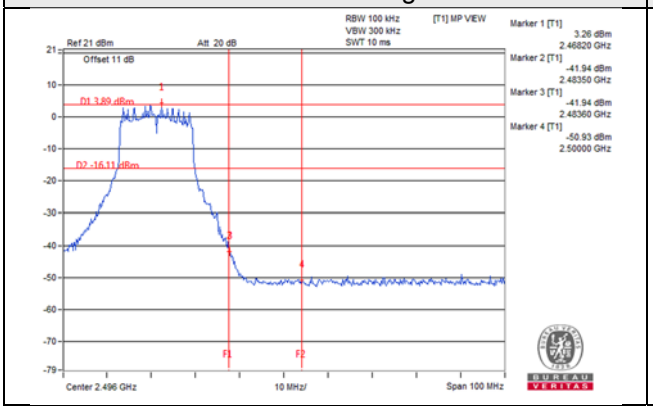
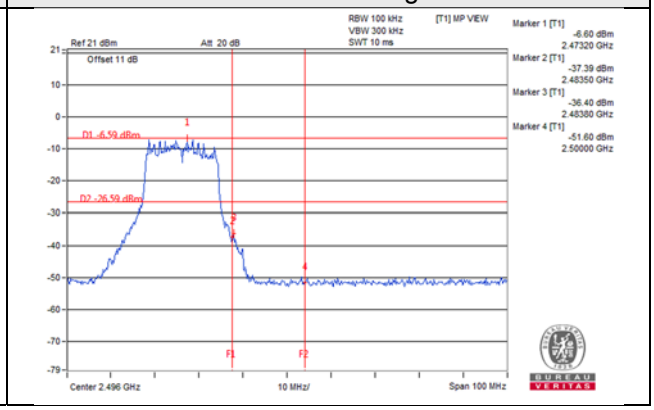




CH 12

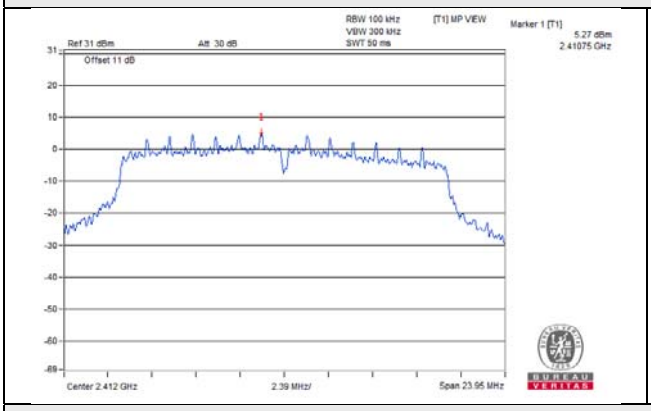


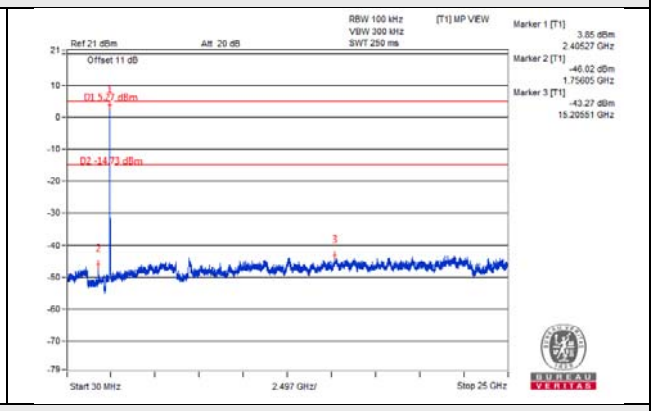


CH 13	
	
CH 1 Band edge	CH 11 Band edge
	
CH 12 Band edge	CH 13 Band edge
	

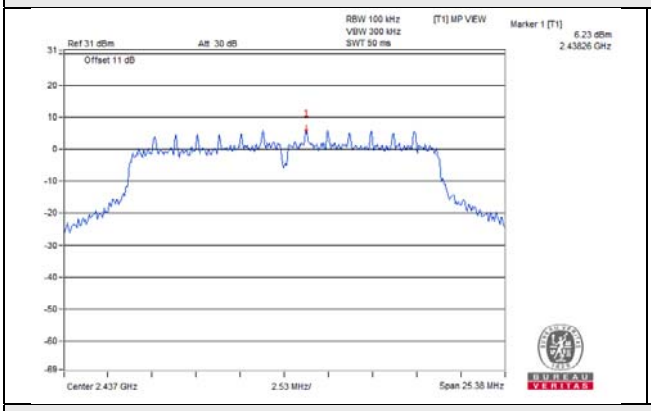
802.11n (HT20)_Chain 0

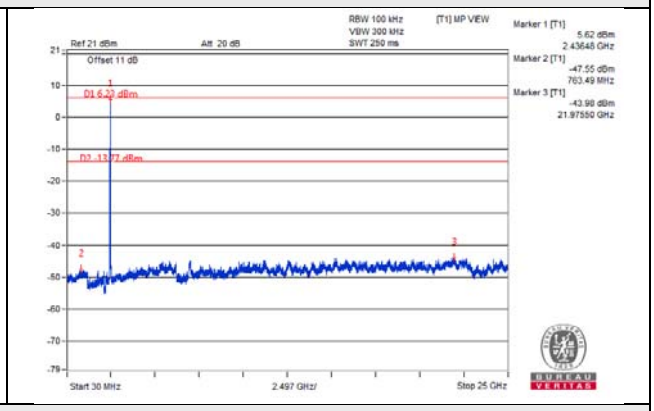
CH 1



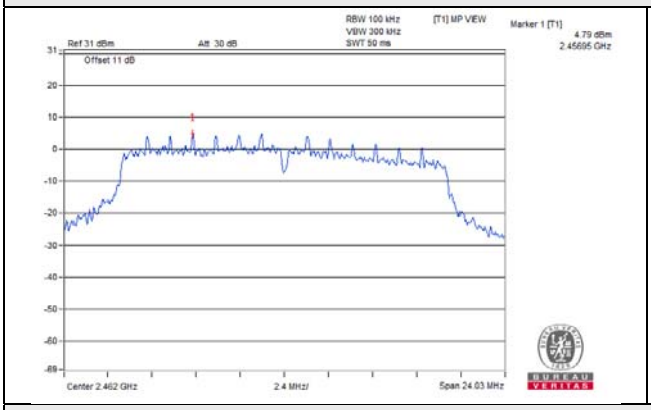


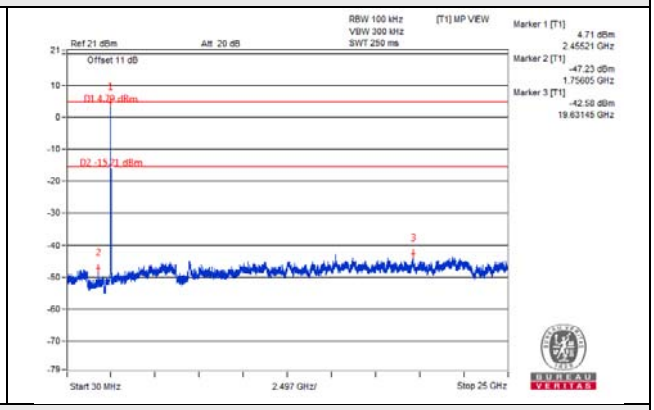
CH 6



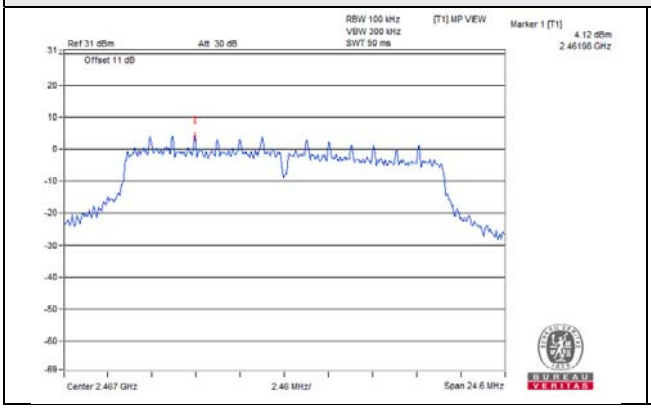


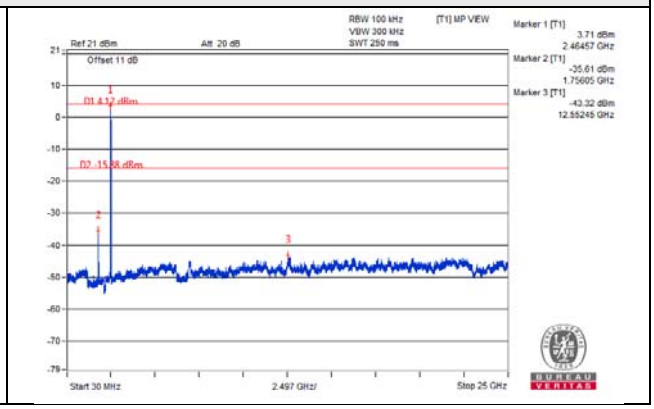
CH 11



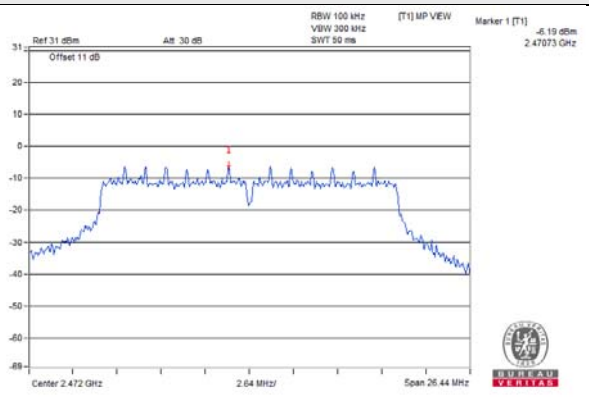


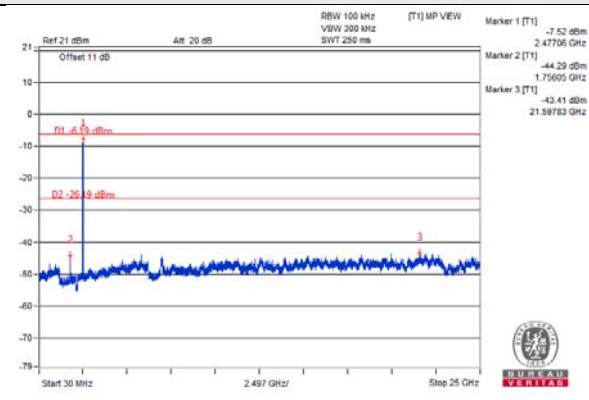
CH 12



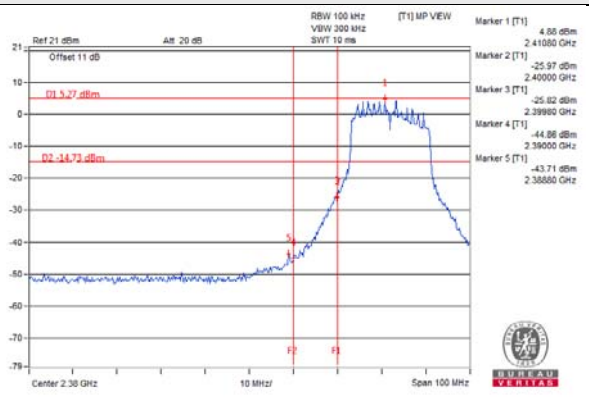


CH 13

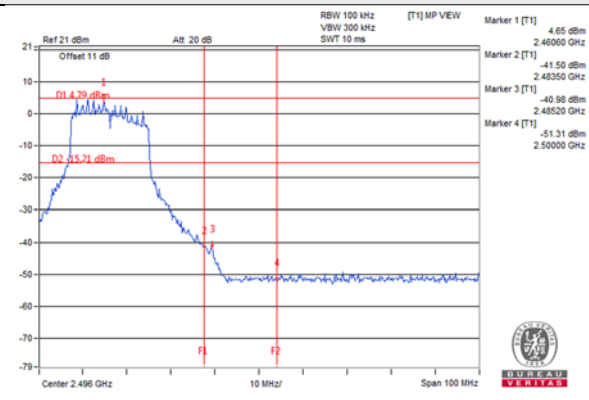




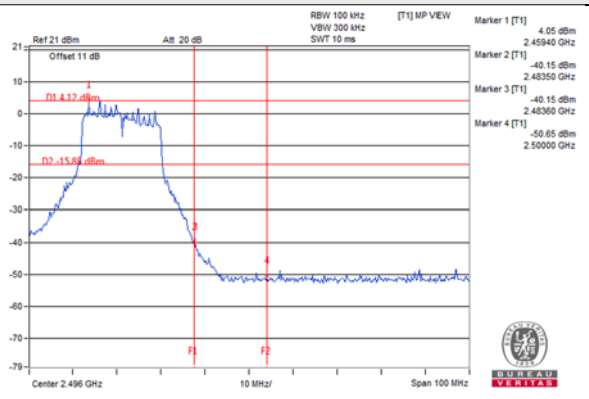
CH 1 Band edge



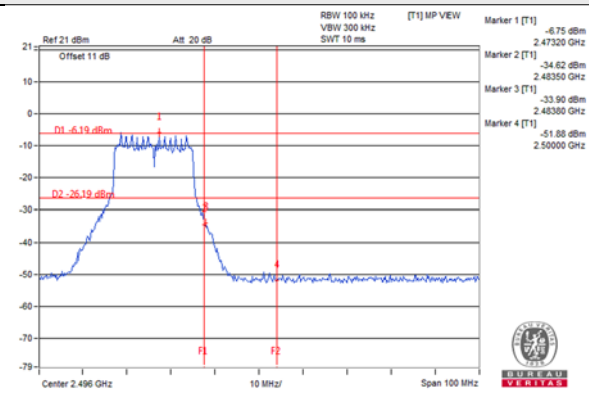
CH 11 Band edge



CH 12 Band edge

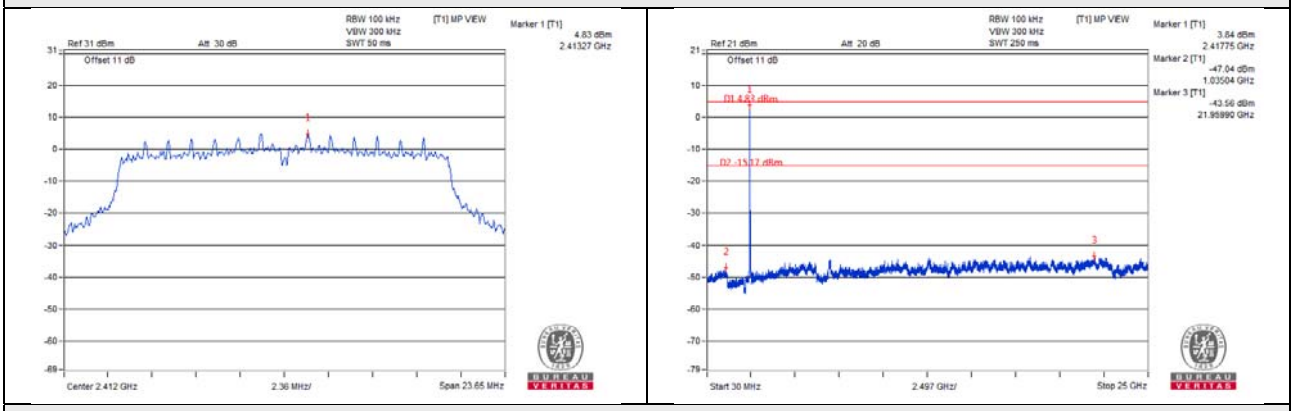


CH 13 Band edge

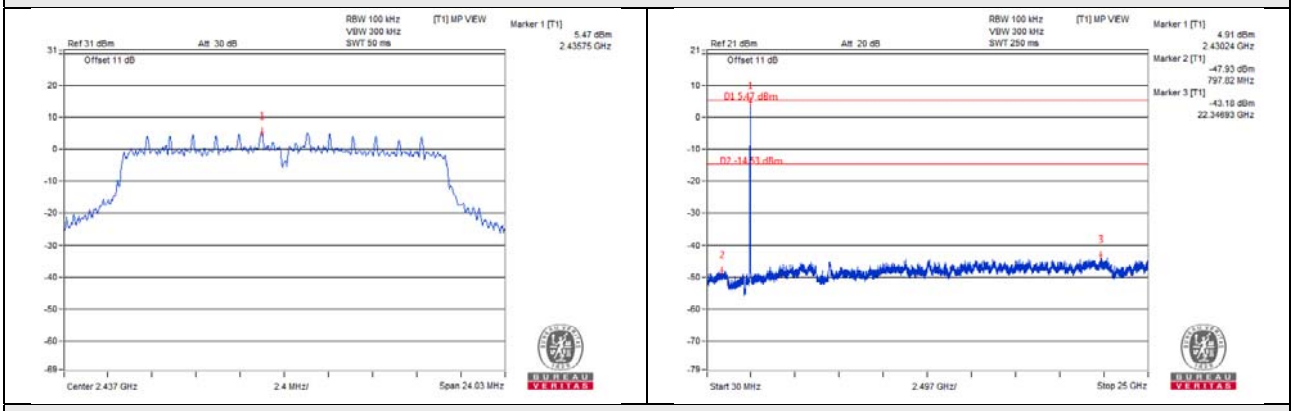


802.11n (HT20)_Chain 1

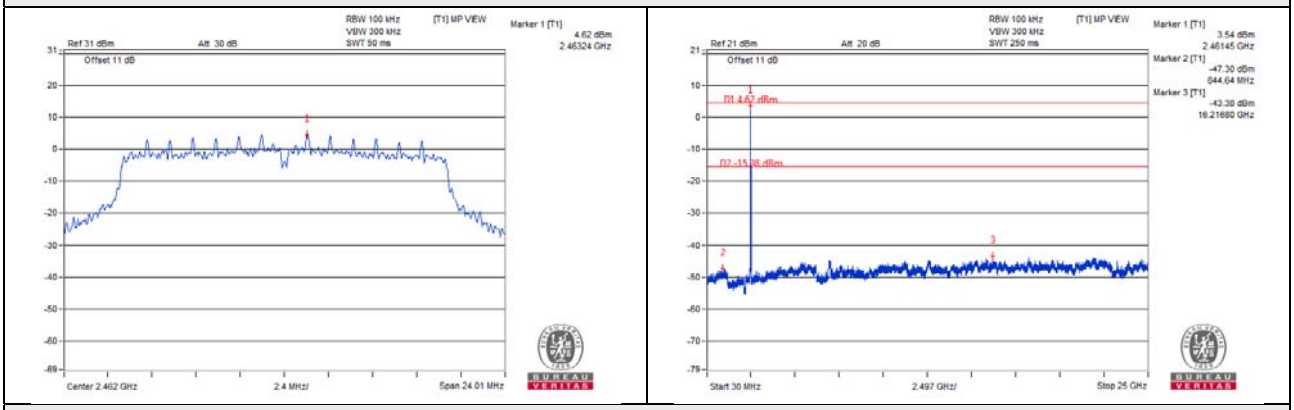
CH 1



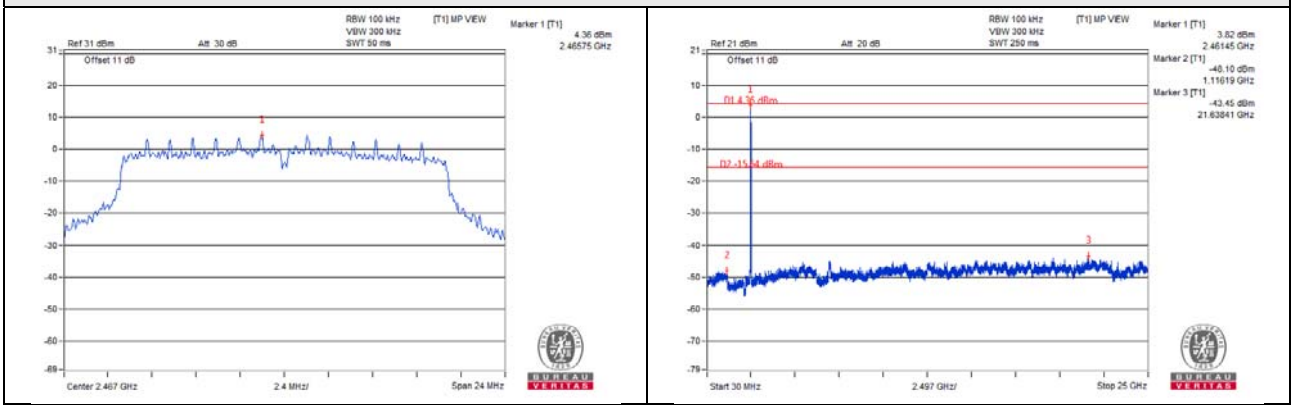
CH 6

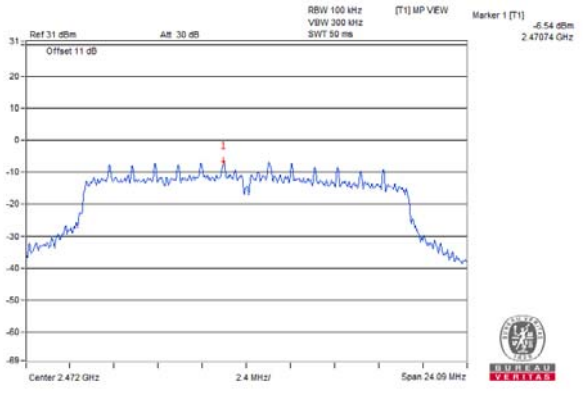
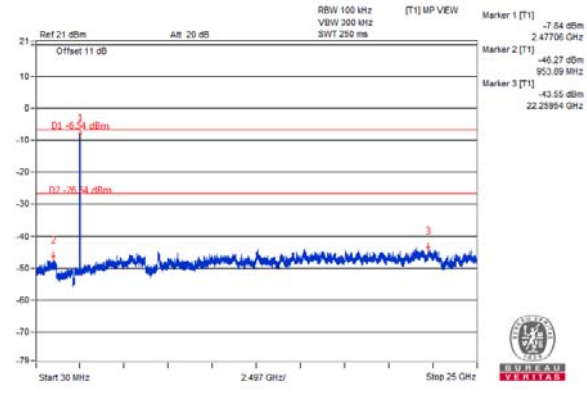
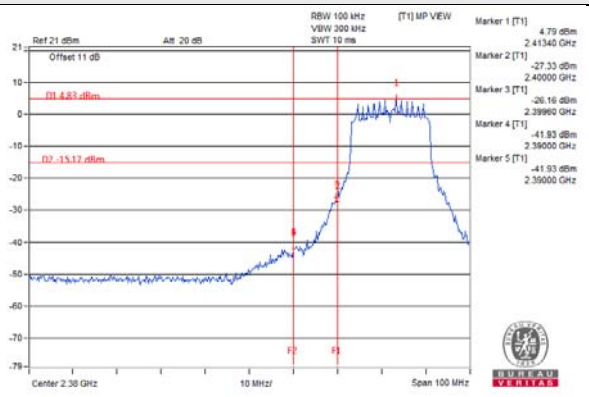
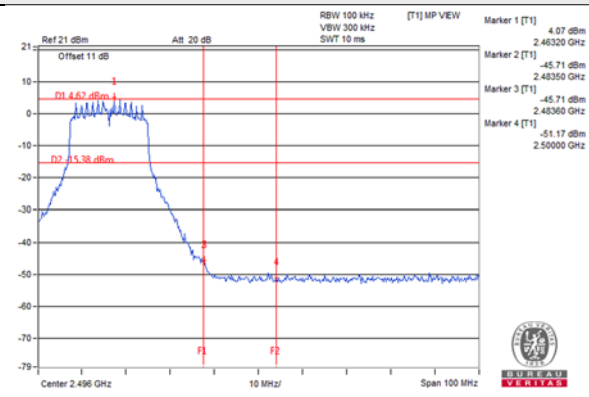
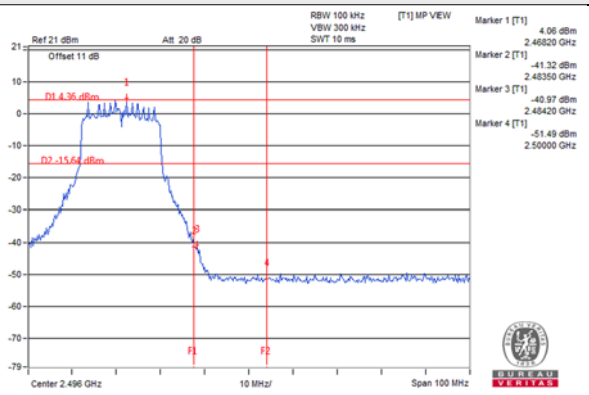
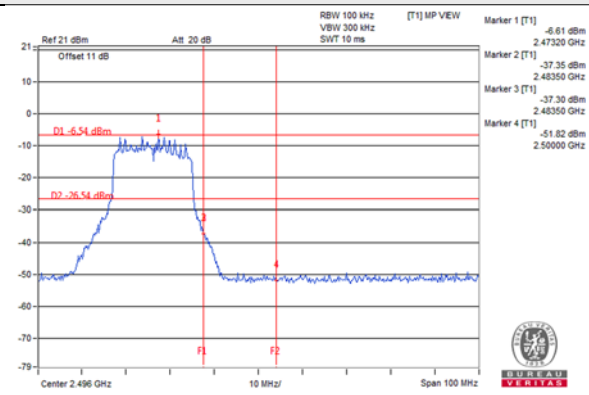


CH 11



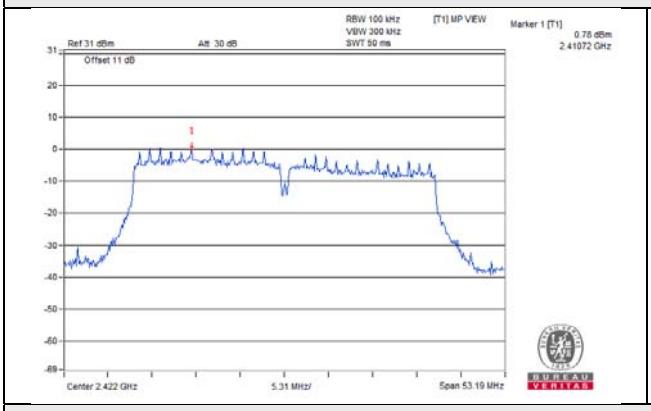
CH 12

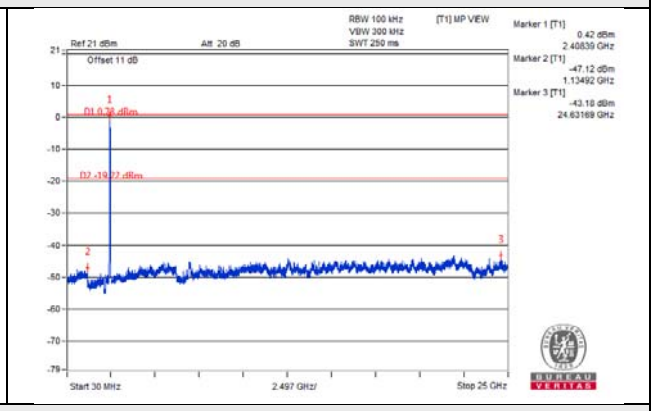


CH 13	
	
CH 1 Band edge	CH 11 Band edge
	
CH 12 Band edge	CH 13 Band edge
	

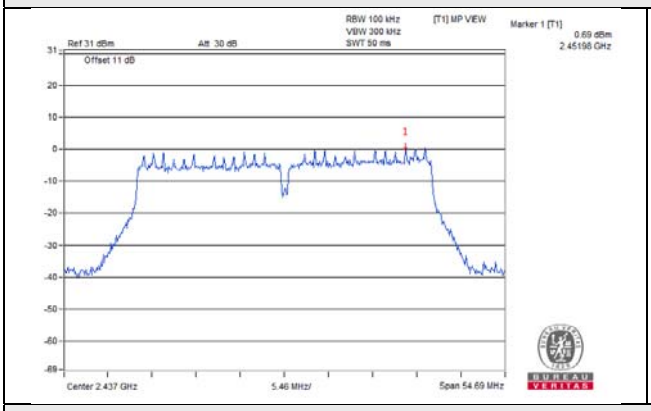
802.11n (HT40)_Chain 0

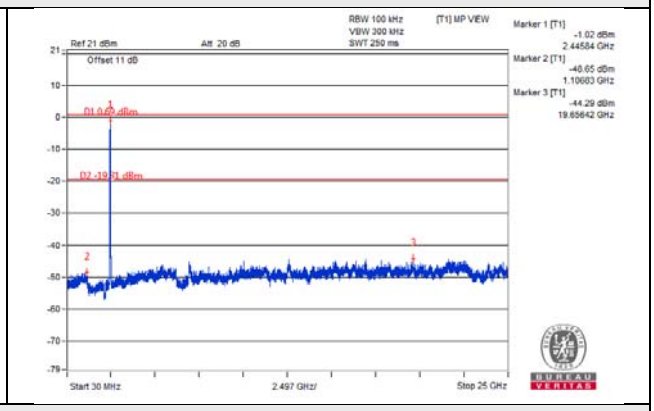
CH 3



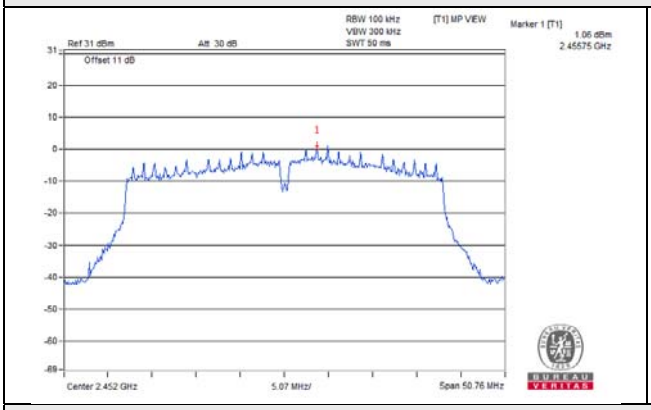


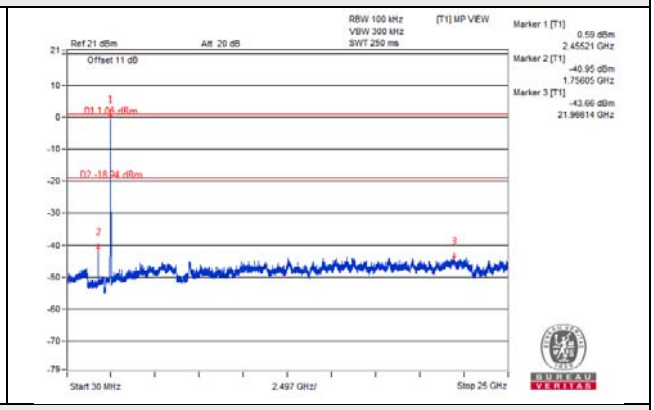
CH 6



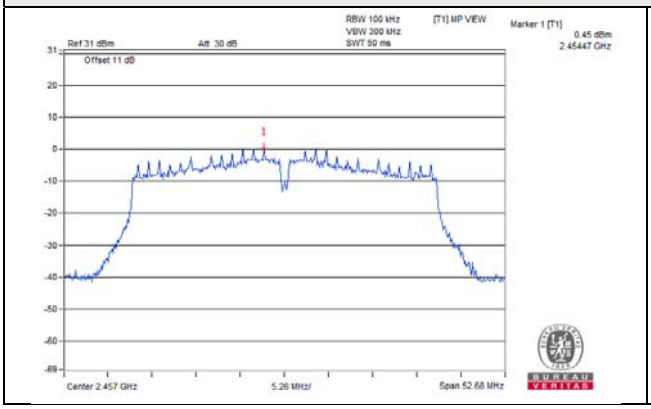


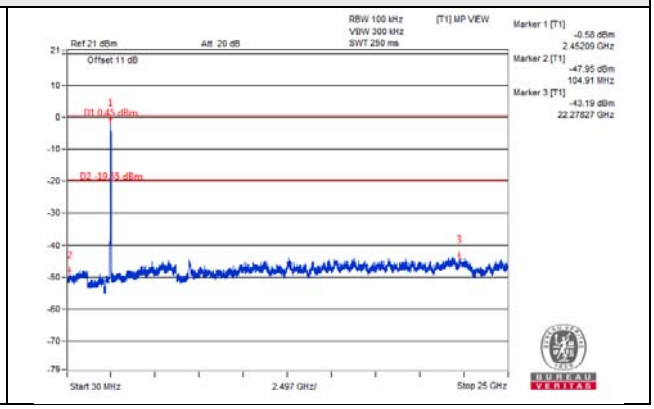
CH 9

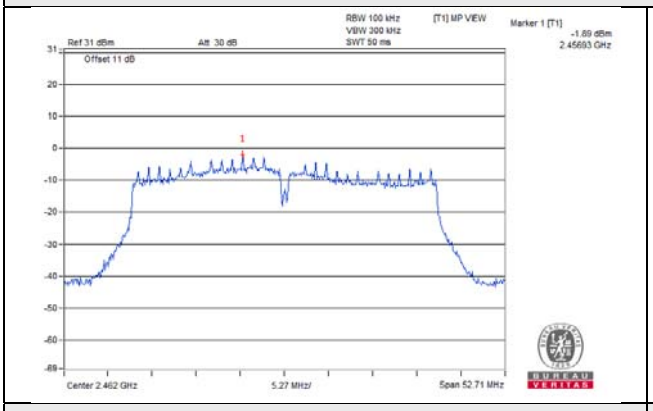
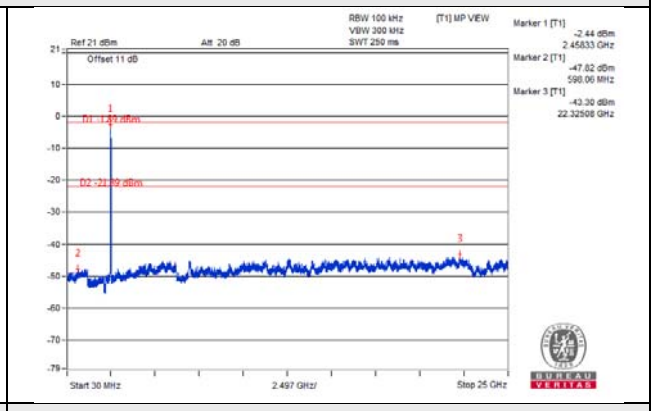
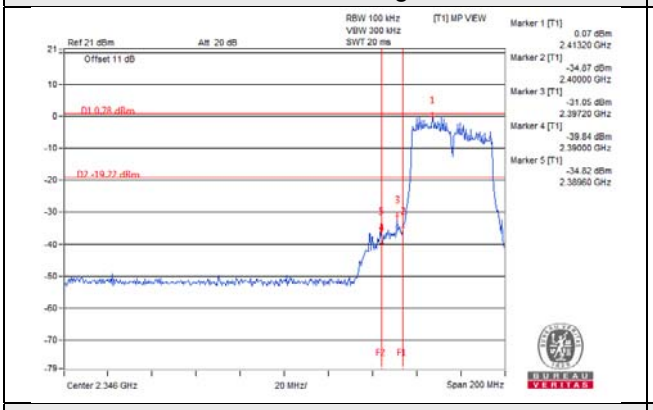
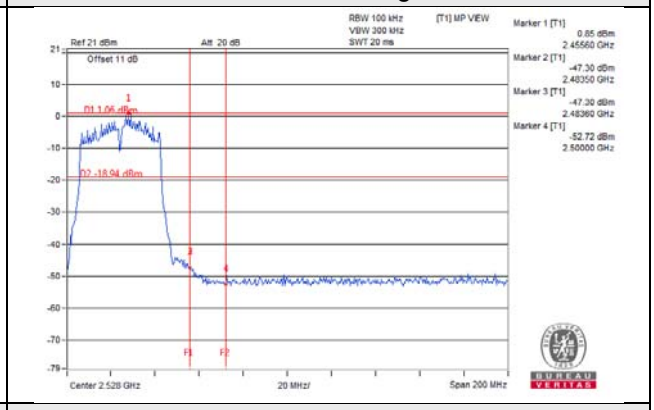
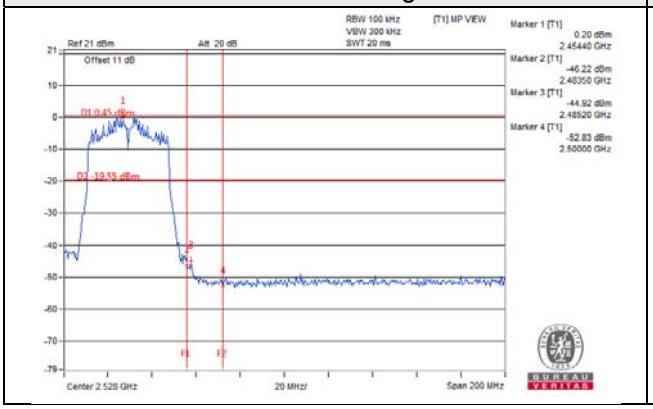
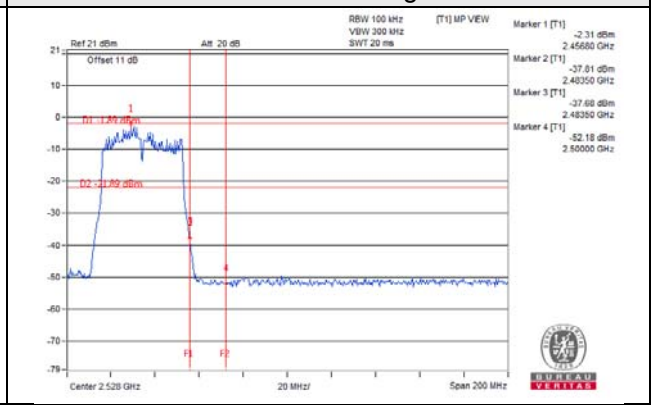




CH 10

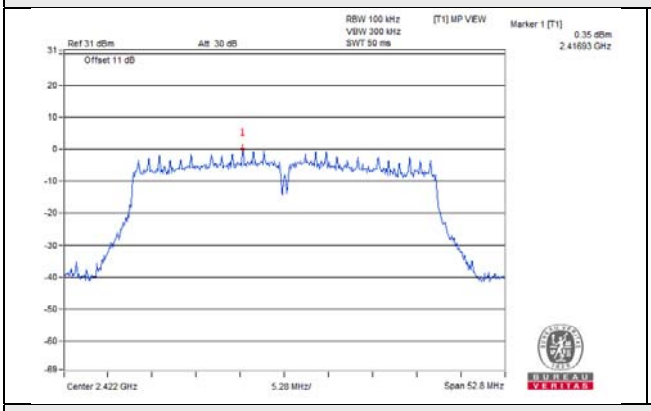


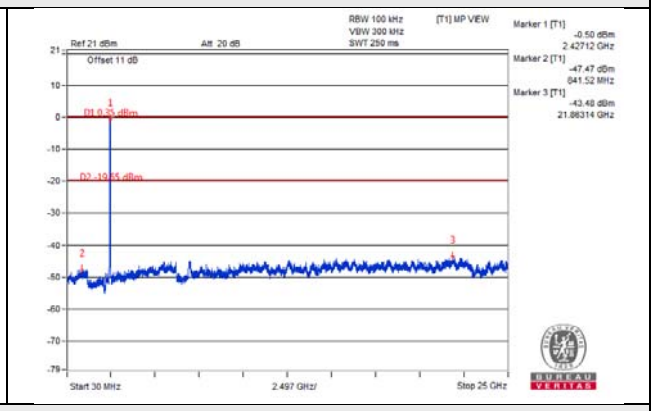


CH 11	
	
CH 3 Band edge	CH 9 Band edge
	
CH 10 Band edge	CH 11 Band edge
	

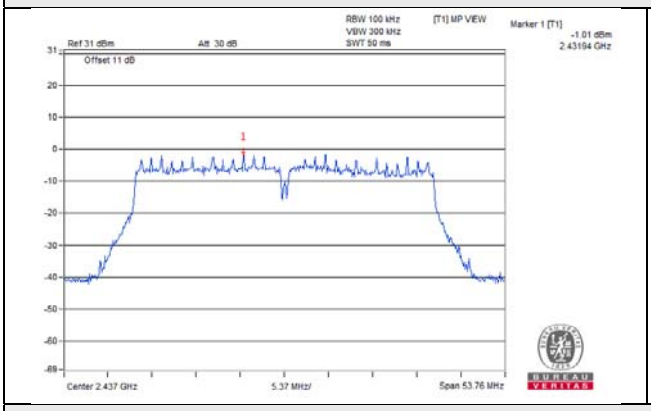
802.11n (HT40)_Chain 1

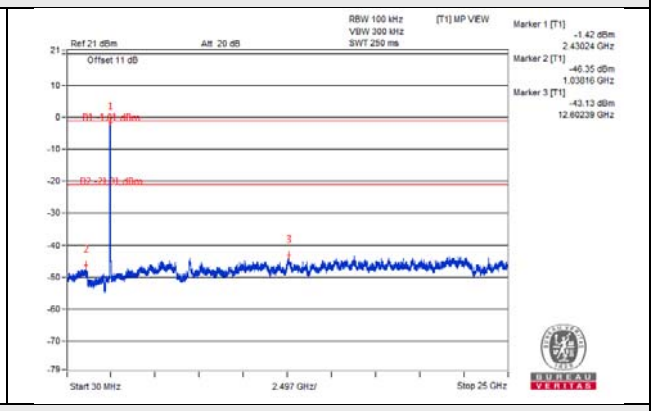
CH 3



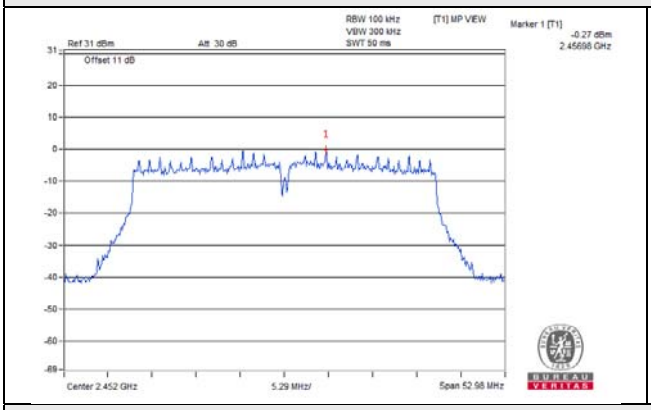


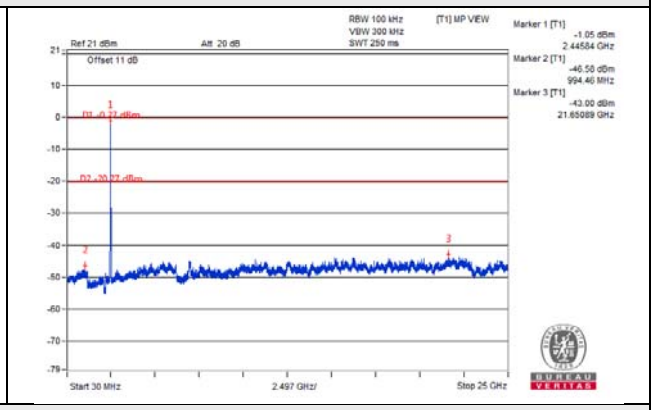
CH 6



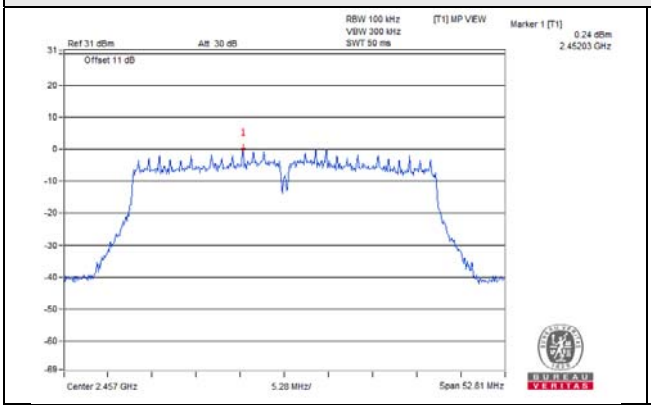


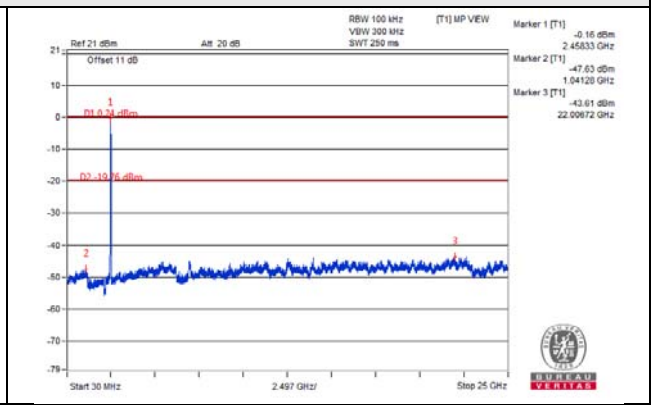
CH 9

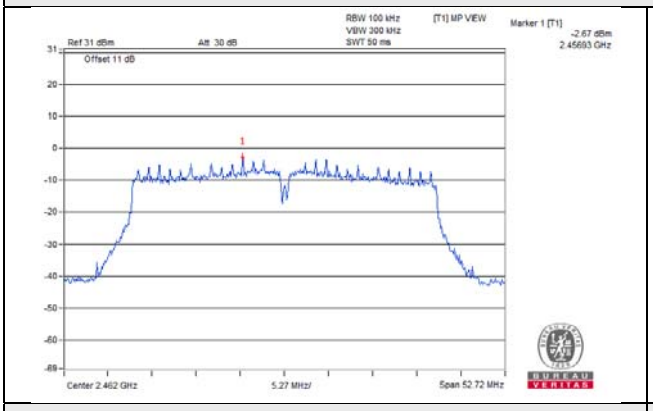
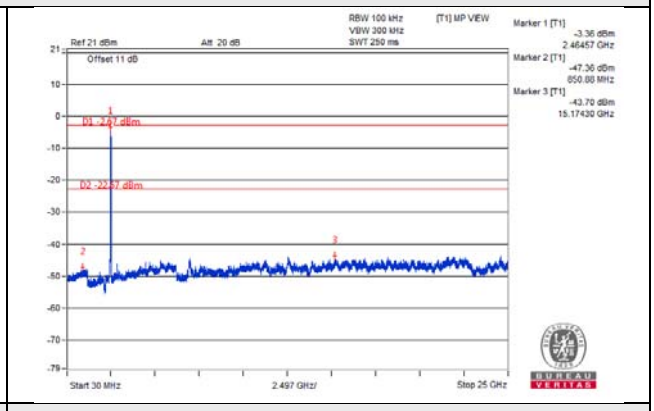
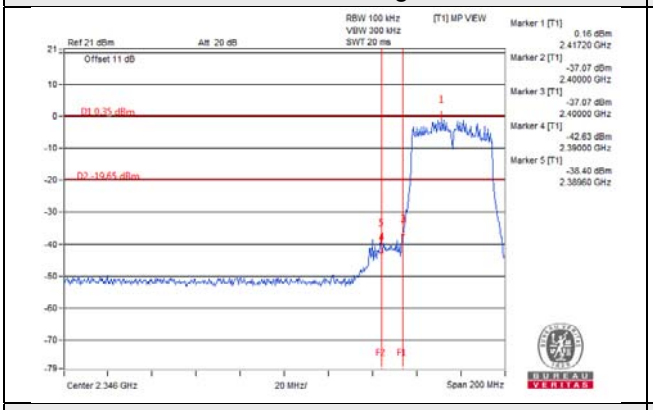
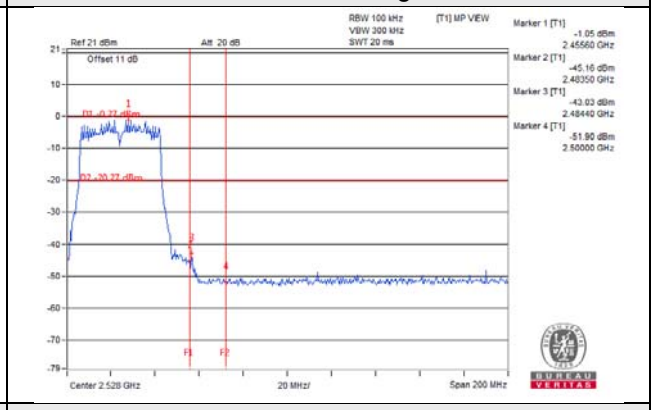
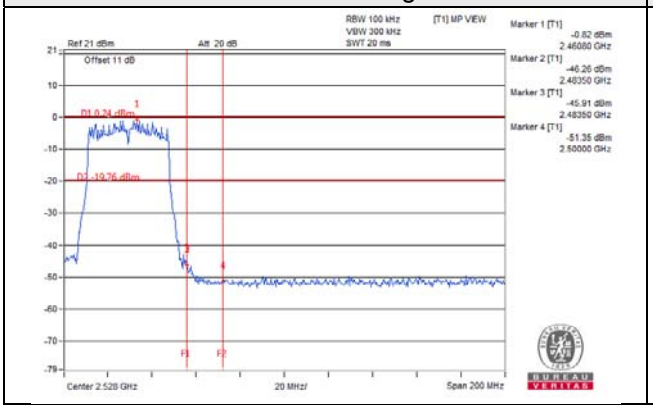
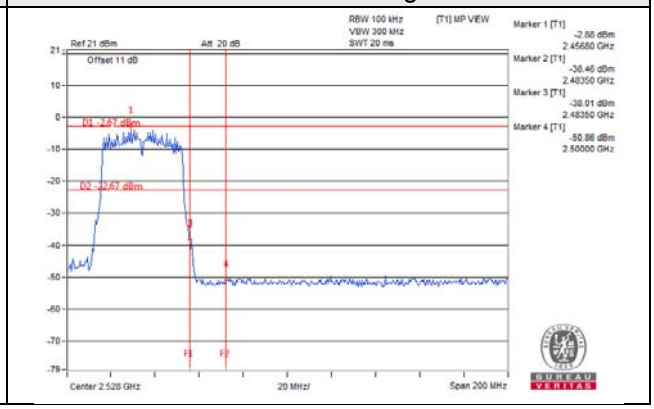




CH 10





CH 11	
	
CH 3 Band edge	CH 9 Band edge
	
CH 10 Band edge	CH 11 Band edge
	

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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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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