FCC Test Report
(WLAN)

Report No.: RF200616D06-1 R1

FCC ID: C3K1942

Test Model: 1942

Received Date: Apr. 13, 2020

Test Date: Aug. 7 to Sep. 1, 2020

Issued Date: Sep. 2, 2020

Applicant: MICROSOFT CORPORATION

Address: ONE MICROSOFT WAY REDMOND, WA 98052-6399

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

FCC Registration / Designation Number: 198487 / TW2021

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Release Control Record

Issue No.	Description	Date Issued
RF200616D06-1	Original release.	Jul. 10, 2020
RF200616D06-1 R1	Change the wireless module to 2T2R and re-test.	Sep. 2, 2020

1 Certificate of Conformity

Product: Media Dongle

Brand: MICROSOFT

Test Model: 1942

Sample Status: Engineering sample

Applicant: MICROSOFT CORPORATION

Test Date: Aug. 7 to Sep. 1, 2020

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 : Annie Chang, **Date:** Sep. 2, 2020

Annie Chang / Senior Specialist

Approved by : Rex. Lai, **Date:** Sep. 2, 2020

Rex Lai / Associate Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -13.89dB at 0.79844MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.51dB 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:
1. For 2.4GHz band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A.
2. 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 (Mode A)	150kHz ~ 30MHz	3.00 dB
Conducted Emissions at mains ports (Mode B)	150kHz ~ 30MHz	2.94 dB
Conducted Emissions	9kHz ~ 40GHz	2.63 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.61 dB
	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.42 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Media Dongle
Brand	MICROSOFT
Test Model	1942
Test software Version	rainbow2util
Status of EUT	Engineering sample
Power Supply Rating	Powered from the host monitor or display
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	2412MHz ~ 2472MHz
Number of Channel	802.11b, 802.11g, 802.11n (20MHz): 13 802.11n (40MHz): 9
Output Power	703.968mW
Antenna Type	Chip antenna with 2.17dBi gain
Antenna Connector	N/A
Accessory Device	N/A
Data Cable Supplied	Shielded HDMI cable (0.1m), Shielded USB cable (0.3m) attached on EUT

Note:

1. The EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	TX Function	RX Function
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (20MHz)	2TX	2RX
802.11n (40MHz)	2TX	2RX

2. 2.4GHz & 5GHz technologies cannot transmit at same time.
   WLAN & BT technologies cannot transmit at same time.

3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

4. For Radiated Emissions test, following modes were pre-tested:
   - EUT Powered from Adapter
   - EUT Powered from Notebook

   The worst emission level was found when the EUT was tested under **EUT Powered from Adapter** mode, therefore, only its test data was recorded in this report.

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

3.2 Description of Test Modes

13 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

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 (40MHz):

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	
A	√	√	√	√	Powered from Adapter
B	-	-	√	-	Powered from Notebook

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 **Z-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)
A	802.11b	1 to 11	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11, 12, 13	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 6, 11, 12, 13	OFDM	BPSK	6.5
	802.11n (40MHz)	3 to 9	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)
A	802.11g	1 to 11	6	OFDM	BPSK	6.0

Power Line Conducted Emission Test:

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A & B	802.11g	1 to 11	6	OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

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

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11, 12, 13	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 6, 11, 12, 13	OFDM	BPSK	6.5
	802.11n (40MHz)	3 to 9	3, 6, 9, 10, 11	OFDM	BPSK	13.5

Test Condition:

Applicable To	EUT Configure Mode	Environmental Conditions	Input Power	Tested By
RE≥1G	A	24deg. C, 63%RH	120Vac, 60Hz (Adapter)	Dalen Dai
RE<1G	A	22deg. C, 75%RH	120Vac, 60Hz (Adapter)	Ian Chang
PLC	A	25deg. C, 80%RH	120Vac, 60Hz (Adapter)	Pirar Hsieh
	B	25deg. C, 70%RH	120Vac, 60Hz (System)	Ken Lee
APCM	A	25deg. C, 76%RH	120Vac, 60Hz (Adapter)	Saxon Lee

3.3 Duty Cycle of Test Signal

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

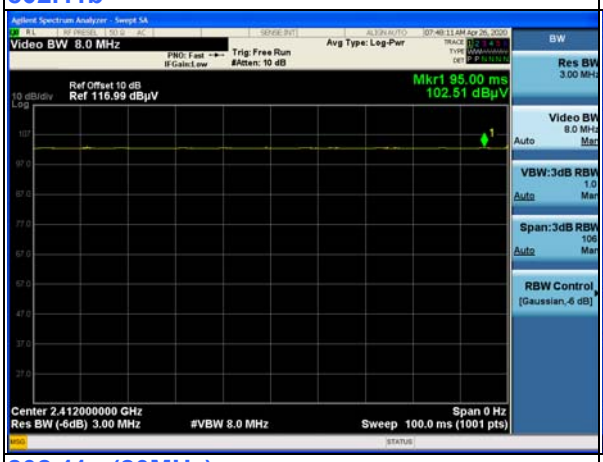
802.11b: Duty cycle = 100%

802.11g: Duty cycle = 2.035/2.05 = 0.993

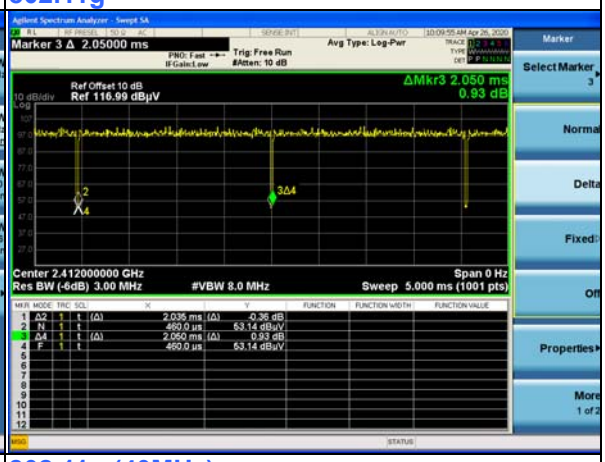
802.11n (20MHz): Duty cycle = 1.905/1.915 = 0.995

802.11n (40MHz): Duty cycle = 0.939/0.957 = 0.981

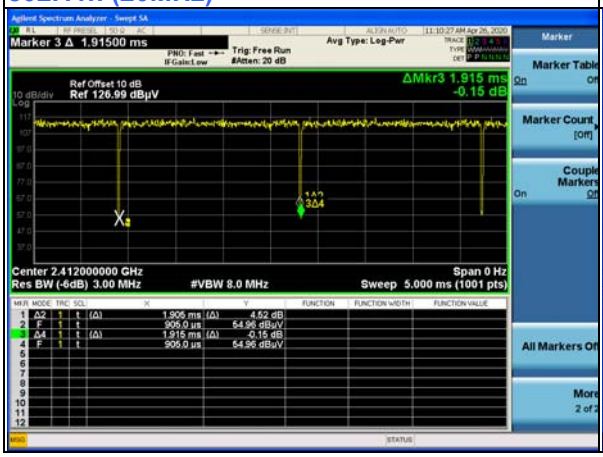
802.11b



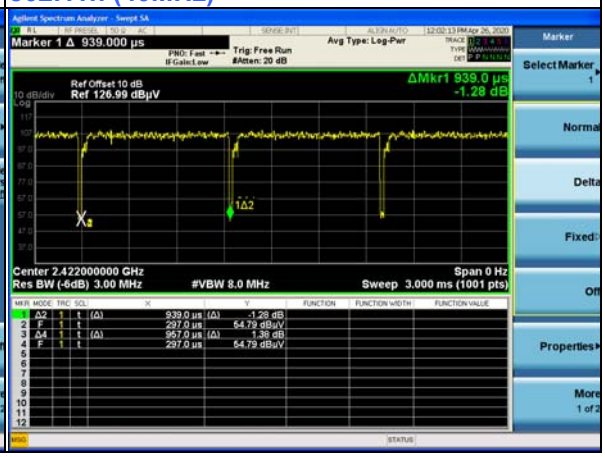
802.11g



802.11n (20MHz)



802.11n (40MHz)



3.4 Description of Support Units

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

Mode A:

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Adapter	APPLE	A1385	N/A	N/A	Provided by Lab
B.	LCD Monitor	ASUS	MG28UQ	J1LMTF114786	N/A	Provided by Lab

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	0.3	Y	0	Supplied by client
2.	HDMI cable	1	0.1	Y	0	Supplied by client

Note: The core(s) is(are) originally attached to the cable(s).

Mode B:

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	LCD MONITOR	ASUS	MG28UQ	HCLMTF053714	N/A	Provided by Lab
B.	USB Mouse	Microsoft	1113	9170515153393	FCC DOC Approved	Provided by Lab
C.	AP	D-LINK	DIR-809	RZMF2G7002838	N/A	Provided by Lab
D.	Notebook PC	Microsoft	1866	065649593853	N/A	Provided by Lab
E.	Adapter of Notebook	Microsoft	1706	N/A	N/A	Provided by Lab
F.	USB adapter	igota	N/A	N/A	N/A	Provided by Lab

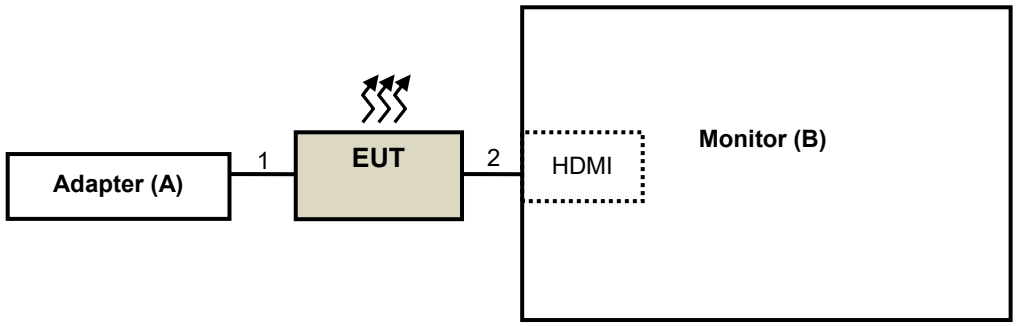
Note:
1. All power cords of the above support units are non-shielded (1.8m).
2. Item C acted as communication partners to transfer data.

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	HDMI cable attached on EUT	1	0.1	Y	0	Supplied by client
2.	USB cable attached on EUT	1	0.3	Y	0	Supplied by client
3.	USB cable	1	1.8	Y	1	Provided by Lab
4.	AC cable	1	1.0	N	0	Provided by Lab
5.	DC cable	1	1.8	N	0	Provided by Lab

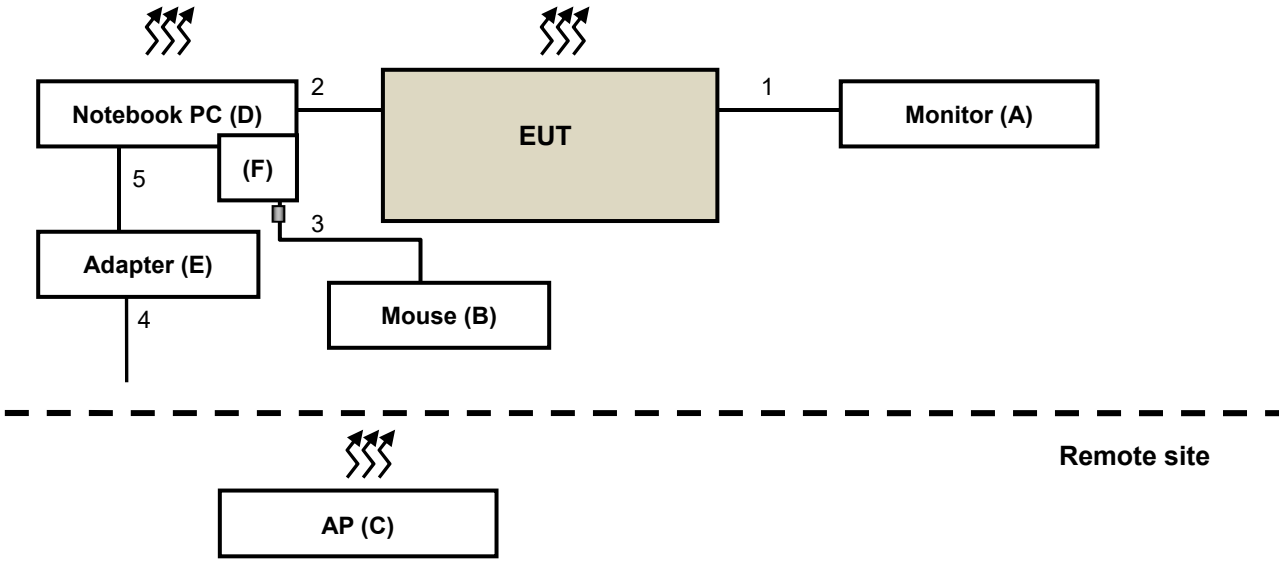
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

Mode A:



Mode B:



3.5 General Description of Applied Standards and references

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

Test standard:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013

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

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

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.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 19, 2020	Feb. 18, 2021
HP Preamplifier	8449B	3008A01201	Feb. 20, 2020	Feb. 19, 2021
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 19, 2020	Feb. 18, 2021
Agilent TEST RECEIVER	N9038A	MY51210129	Mar. 18, 2020	Mar. 17, 2021
Schwarzbeck Antenna	VULB 9168	139	Nov. 7, 2019	Nov. 6, 2020
Schwarzbeck Antenna	VHBA 9123	480	Jun. 3, 2019	Jun. 2, 2021
Schwarzbeck Horn Antenna	BBHA-9170	212	Nov. 24, 2019	Nov. 23, 2020
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Nov. 24, 2019	Nov. 23, 2020
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF102	Cable-CH6-01	Jul. 9, 2020	Jul. 8, 2021
SUHNER RF cable With 3/4dB PAD	SF102	Cable-CH8-3.6m	Jul. 9, 2020	Jul. 8, 2021
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	Jun. 16, 2020	Jun. 15, 2021
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 22, 2020	Jul. 21, 2021
Loop Antenna EMCI	LPA600	270	Aug. 23, 2019	Aug. 22, 2021
EMCO Horn Antenna	3115	00028257	Nov. 24, 2019	Nov. 23, 2020
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 23, 2019	Sep. 22, 2020
Anritsu Power Sensor	MA2411B	0738404	Apr. 13, 2020	Apr. 12, 2021
Anritsu Power Meter	ML2495A	0842014	Apr. 13, 2020	Apr. 12, 2021

NOTE:
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. Tested Date: Aug. 7 to Sep. 1, 2020

4.1.3 Test Procedures

For Radiated emission below 30MHz

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

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

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

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

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

3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz. (802.11b: RBW = 1MHz, VBW = 10Hz; 802.11g: RBW = 1MHz, VBW = 10Hz;
802.11n (20MHz): RBW = 1MHz, VBW = 10Hz; 802.11n (40MHz): RBW = 1MHz, VBW = 10Hz)

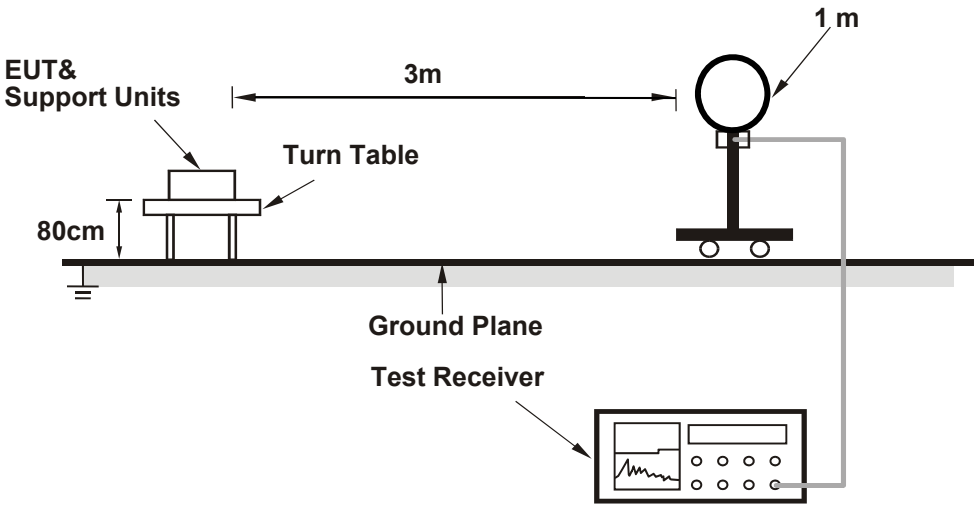
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

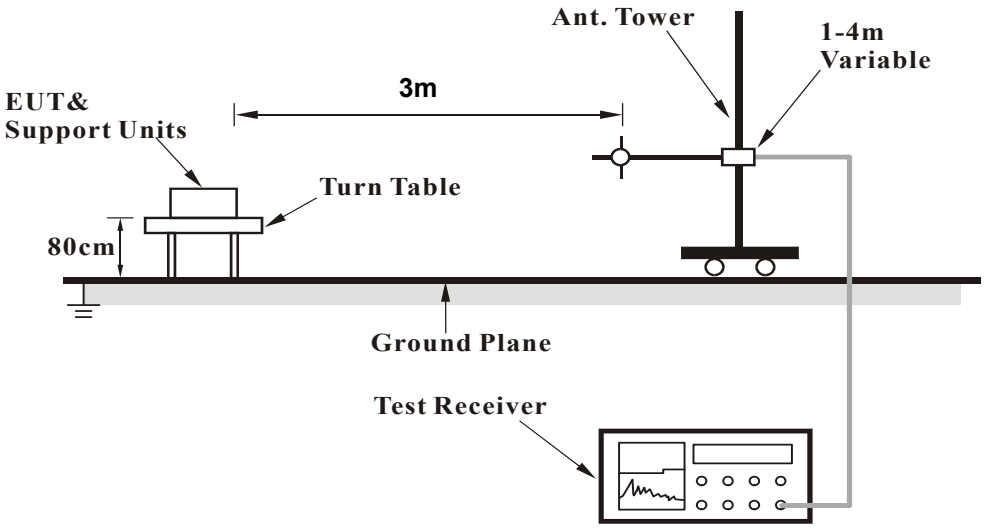
No deviation.

4.1.5 Test Setup

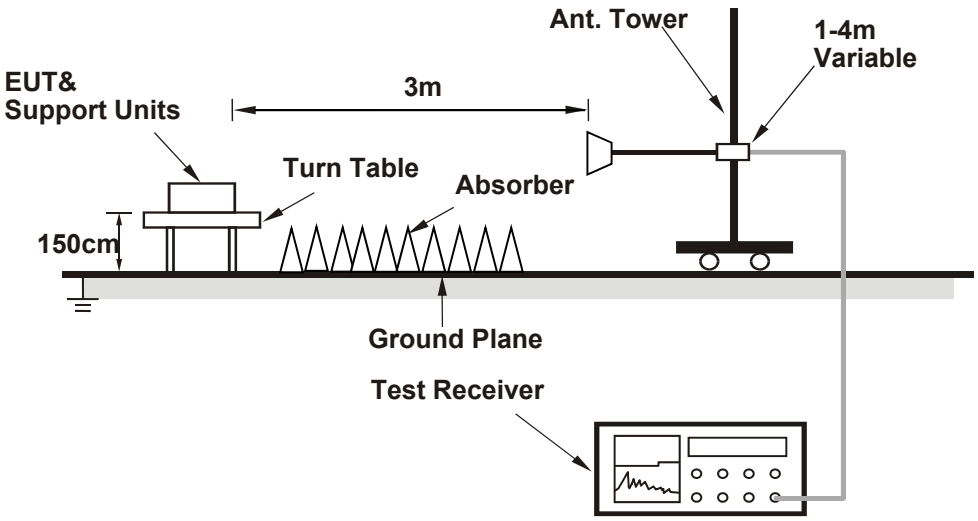
For Radiated emission below 30MHz



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

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

4.1.7 Test Results

Mode A

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	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	2390.00	57.59 PK	74.00	-16.41	1.00 H	125	56.27	1.32
2	2390.00	45.63 AV	54.00	-8.37	1.00 H	125	44.31	1.32
3	*2412.00	104.43 PK			1.00 H	125	103.03	1.40
4	*2412.00	101.71 AV			1.00 H	125	100.31	1.40
5	4824.00	50.16 PK	74.00	-23.84	1.42 H	258	40.96	9.20
6	4824.00	36.64 AV	54.00	-17.36	1.42 H	258	27.44	9.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	2390.00	58.24 PK	74.00	-15.76	3.33 V	272	56.92	1.32
2	2390.00	46.09 AV	54.00	-7.91	3.33 V	272	44.77	1.32
3	*2412.00	107.68 PK			3.33 V	272	106.28	1.40
4	*2412.00	104.94 AV			3.33 V	272	103.54	1.40
5	4824.00	50.54 PK	74.00	-23.46	2.08 V	121	41.34	9.20
6	4824.00	37.19 AV	54.00	-16.81	2.08 V	121	27.99	9.20

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	104.81 PK			1.03 H	122	103.35	1.46
2	*2437.00	102.18 AV			1.03 H	122	100.72	1.46
3	4874.00	50.22 PK	74.00	-23.78	1.38 H	254	40.98	9.24
4	4874.00	36.75 AV	54.00	-17.25	1.38 H	254	27.51	9.24
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	108.16 PK			3.34 V	275	106.70	1.46
2	*2437.00	105.43 AV			3.34 V	275	103.97	1.46
3	4874.00	50.61 PK	74.00	-23.39	2.02 V	126	41.37	9.24
4	4874.00	37.30 AV	54.00	-16.70	2.02 V	126	28.06	9.24

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	106.84 PK			1.01 H	119	105.26	1.58
2	*2462.00	104.15 AV			1.01 H	119	102.57	1.58
3	2483.50	55.48 PK	74.00	-18.52	1.01 H	119	53.77	1.71
4	2483.50	44.51 AV	54.00	-9.49	1.01 H	119	42.80	1.71
5	4924.00	50.37 PK	74.00	-23.63	1.45 H	249	41.12	9.25
6	4924.00	36.84 AV	54.00	-17.16	1.45 H	249	27.59	9.25
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	110.49 PK			2.09 V	288	108.91	1.58
2	*2462.00	107.95 AV			2.09 V	288	106.37	1.58
3	2483.50	59.58 PK	74.00	-14.42	2.09 V	288	57.87	1.71
4	2483.50	47.56 AV	54.00	-6.44	2.09 V	288	45.85	1.71
5	4924.00	50.93 PK	74.00	-23.07	2.04 V	127	41.68	9.25
6	4924.00	37.57 AV	54.00	-16.43	2.04 V	127	28.32	9.25

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	106.69 PK			1.27 H	227	105.09	1.60
2	*2467.00	104.57 AV			1.27 H	227	102.97	1.60
3	2483.50	65.51 PK	74.00	-8.49	1.27 H	227	63.80	1.71
4	2483.50	51.22 AV	54.00	-2.78	1.27 H	227	49.51	1.71
5	4934.00	49.64 PK	74.00	-24.36	1.77 H	322	40.39	9.25
6	4934.00	39.73 AV	54.00	-14.27	1.77 H	322	30.48	9.25
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	107.37 PK			2.25 V	69	105.77	1.60
2	*2467.00	105.23 AV			2.25 V	69	103.63	1.60
3	2483.50	66.56 PK	74.00	-7.44	2.25 V	69	64.85	1.71
4	2483.50	52.17 AV	54.00	-1.83	2.25 V	69	50.46	1.71
5	4934.00	51.61 PK	74.00	-22.39	2.21 V	185	42.36	9.25
6	4934.00	40.77 AV	54.00	-13.23	2.21 V	185	31.52	9.25

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	100.81 PK			1.11 H	226	99.18	1.63
2	*2472.00	98.83 AV			1.11 H	226	97.20	1.63
3	2483.50	70.61 PK	74.00	-3.39	1.11 H	226	68.90	1.71
4	2483.50	50.39 AV	54.00	-3.61	1.11 H	226	48.68	1.71
5	4944.00	49.53 PK	74.00	-24.47	1.78 H	336	40.29	9.24
6	4944.00	39.72 AV	54.00	-14.28	1.78 H	336	30.48	9.24
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	107.67 PK			1.02 V	71	106.04	1.63
2	*2472.00	105.22 AV			1.02 V	71	103.59	1.63
3	2483.50	72.43 PK	74.00	-1.57	1.02 V	71	70.72	1.71
4	2483.50	51.54 AV	54.00	-2.46	1.02 V	71	49.83	1.71
5	4944.00	50.53 PK	74.00	-23.47	1.18 V	172	41.29	9.24
6	4944.00	40.45 AV	54.00	-13.55	1.18 V	172	31.21	9.24

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

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Channel	TX Channel 1	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (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	64.95 PK	74.00	-9.05	1.50 H	232	63.63	1.32
2	2390.00	47.96 AV	54.00	-6.04	1.50 H	232	46.64	1.32
3	*2412.00	107.95 PK			1.50 H	232	106.55	1.40
4	*2412.00	98.75 AV			1.50 H	232	97.35	1.40
5	4824.00	49.83 PK	74.00	-24.17	1.37 H	262	40.63	9.20
6	4824.00	36.42 AV	54.00	-17.58	1.37 H	262	27.22	9.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.64 PK	74.00	-6.36	2.08 V	250	66.32	1.32
2	2390.00	51.85 AV	54.00	-2.15	2.08 V	250	50.53	1.32
3	*2412.00	110.05 PK			2.08 V	250	108.65	1.40
4	*2412.00	99.44 AV			2.08 V	250	98.04	1.40
5	4824.00	50.36 PK	74.00	-23.64	1.95 V	118	41.16	9.20
6	4824.00	36.84 AV	54.00	-17.16	1.95 V	118	27.64	9.20

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	110.38 PK			1.46 H	227	108.92	1.46
2	*2437.00	100.51 AV			1.46 H	227	99.05	1.46
3	4874.00	50.33 PK	74.00	-23.67	1.34 H	265	41.09	9.24
4	4874.00	36.79 AV	54.00	-17.21	1.34 H	265	27.55	9.24
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	113.33 PK			1.08 V	268	111.87	1.46
2	*2437.00	103.62 AV			1.08 V	268	102.16	1.46
3	4874.00	51.07 PK	74.00	-22.93	1.99 V	123	41.83	9.24
4	4874.00	37.18 AV	54.00	-16.82	1.99 V	123	27.94	9.24

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	107.29 PK			1.51 H	229	105.71	1.58
2	*2462.00	97.53 AV			1.51 H	229	95.95	1.58
3	2483.50	67.97 PK	74.00	-6.03	1.51 H	229	66.26	1.71
4	2483.50	46.98 AV	54.00	-7.02	1.51 H	229	45.27	1.71
5	4924.00	50.62 PK	74.00	-23.38	1.31 H	273	41.37	9.25
6	4924.00	36.85 AV	54.00	-17.15	1.31 H	273	27.60	9.25
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	111.49 PK			1.07 V	266	109.91	1.58
2	*2462.00	101.74 AV			1.07 V	266	100.16	1.58
3	2483.50	71.81 PK	74.00	-2.19	1.07 V	266	70.10	1.71
4	2483.50	51.64 AV	54.00	-2.36	1.07 V	266	49.93	1.71
5	4924.00	50.88 PK	74.00	-23.12	2.03 V	120	41.63	9.25
6	4924.00	36.91 AV	54.00	-17.09	2.03 V	120	27.66	9.25

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	103.88 PK			1.06 H	255	102.28	1.60
2	*2467.00	96.59 AV			1.06 H	255	94.99	1.60
3	2483.50	62.76 PK	74.00	-11.24	1.06 H	255	61.05	1.71
4	2483.50	51.62 AV	54.00	-2.38	1.06 H	255	49.91	1.71
5	4934.00	50.53 PK	74.00	-23.47	1.68 H	352	41.28	9.25
6	4934.00	41.10 AV	54.00	-12.90	1.68 H	352	31.85	9.25
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	108.67 PK			2.96 V	280	107.07	1.60
2	*2467.00	100.97 AV			2.96 V	280	99.37	1.60
3	2483.50	65.94 PK	74.00	-8.06	2.96 V	280	64.23	1.71
4	2483.50	52.15 AV	54.00	-1.85	2.96 V	280	50.44	1.71
5	4934.00	53.63 PK	74.00	-20.37	2.55 V	213	44.38	9.25
6	4934.00	42.80 AV	54.00	-11.20	2.55 V	213	33.55	9.25

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	104.02 PK			1.57 H	227	102.39	1.63
2	*2472.00	95.87 AV			1.57 H	227	94.24	1.63
3	2483.50	65.70 PK	74.00	-8.30	1.57 H	227	63.99	1.71
4	2483.50	51.54 AV	54.00	-2.46	1.57 H	227	49.83	1.71
5	4944.00	49.41 PK	74.00	-24.59	2.01 H	340	40.17	9.24
6	4944.00	39.63 AV	54.00	-14.37	2.01 H	340	30.39	9.24
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	103.96 PK			1.02 V	81	102.33	1.63
2	*2472.00	96.63 AV			1.02 V	81	95.00	1.63
3	2483.50	66.15 PK	74.00	-7.85	1.02 V	81	64.44	1.71
4	2483.50	52.17 AV	54.00	-1.83	1.02 V	81	50.46	1.71
5	4944.00	49.57 PK	74.00	-24.43	1.20 V	188	40.33	9.24
6	4944.00	40.88 AV	54.00	-13.12	1.20 V	188	31.64	9.24

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

802.11n (20MHz)

Channel	TX Channel 1	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.73 PK	74.00	-8.27	1.52 H	228	64.41	1.32
2	2390.00	48.18 AV	54.00	-5.82	1.52 H	228	46.86	1.32
3	*2412.00	107.47 PK			1.52 H	228	106.07	1.40
4	*2412.00	95.39 AV			1.52 H	228	93.99	1.40
5	4824.00	49.91 PK	74.00	-24.09	1.33 H	267	40.71	9.20
6	4824.00	36.38 AV	54.00	-17.62	1.33 H	267	27.18	9.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	70.08 PK	74.00	-3.92	1.08 V	269	68.76	1.32
2	2390.00	51.82 AV	54.00	-2.18	1.08 V	269	50.50	1.32
3	*2412.00	110.92 PK			1.08 V	269	109.52	1.40
4	*2412.00	98.66 AV			1.08 V	269	97.26	1.40
5	4824.00	50.50 PK	74.00	-23.50	1.93 V	125	41.30	9.20
6	4824.00	36.97 AV	54.00	-17.03	1.93 V	125	27.77	9.20

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	110.15 PK			1.48 H	231	108.69	1.46
2	*2437.00	98.33 AV			1.48 H	231	96.87	1.46
3	4874.00	50.24 PK	74.00	-23.76	1.30 H	273	41.00	9.24
4	4874.00	36.85 AV	54.00	-17.15	1.30 H	273	27.61	9.24
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	113.20 PK			1.06 V	265	111.74	1.46
2	*2437.00	101.08 AV			1.06 V	265	99.62	1.46
3	4874.00	50.94 PK	74.00	-23.06	1.98 V	120	41.70	9.24
4	4874.00	37.13 AV	54.00	-16.87	1.98 V	120	27.89	9.24

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	108.04 PK			1.52 H	233	106.46	1.58
2	*2462.00	95.88 AV			1.52 H	233	94.30	1.58
3	2483.50	67.16 PK	74.00	-6.84	1.52 H	233	65.45	1.71
4	2483.50	49.34 AV	54.00	-4.66	1.52 H	233	47.63	1.71
5	4924.00	50.06 PK	74.00	-23.94	1.35 H	277	40.81	9.25
6	4924.00	36.67 AV	54.00	-17.33	1.35 H	277	27.42	9.25
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	111.36 PK			1.07 V	274	109.78	1.58
2	*2462.00	99.12 AV			1.07 V	274	97.54	1.58
3	2483.50	71.39 PK	74.00	-2.61	1.07 V	274	69.68	1.71
4	**2483.50**	**52.49 AV**	**54.00**	**-1.51**	**1.07 V**	**274**	**50.78**	**1.71**
5	4924.00	50.72 PK	74.00	-23.28	2.03 V	125	41.47	9.25
6	4924.00	37.01 AV	54.00	-16.99	2.03 V	125	27.76	9.25

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	105.15 PK			1.56 H	226	103.55	1.60
2	*2467.00	97.95 AV			1.56 H	226	96.35	1.60
3	2483.50	64.39 PK	74.00	-9.61	1.56 H	226	62.68	1.71
4	2483.50	52.34 AV	54.00	-1.66	1.56 H	226	50.63	1.71
5	4934.00	49.36 PK	74.00	-24.64	1.96 H	330	40.11	9.25
6	4934.00	39.44 AV	54.00	-14.56	1.96 H	330	30.19	9.25
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	106.83 PK			1.17 V	66	105.23	1.60
2	*2467.00	99.75 AV			1.17 V	66	98.15	1.60
3	2483.50	63.83 PK	74.00	-10.17	1.17 V	66	62.12	1.71
4	2483.50	52.18 AV	54.00	-1.82	1.17 V	66	50.47	1.71
5	4934.00	50.02 PK	74.00	-23.98	1.29 V	166	40.78	9.24
6	4934.00	39.79 AV	54.00	-14.21	1.29 V	166	30.55	9.24

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	103.85 PK			1.10 H	225	102.22	1.63
2	*2472.00	95.31 AV			1.10 H	225	93.68	1.63
3	2483.50	64.98 PK	74.00	-9.02	1.10 H	225	63.27	1.71
4	2483.50	52.34 AV	54.00	-1.66	1.10 H	225	50.63	1.71
5	4944.00	49.41 PK	74.00	-24.59	1.80 H	334	40.17	9.24
6	4944.00	39.79 AV	54.00	-14.21	1.80 H	334	30.55	9.24
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	106.73 PK			2.99 V	278	105.10	1.63
2	*2472.00	98.03 AV			2.99 V	278	96.40	1.63
3	2483.50	67.00 PK	74.00	-7.00	2.99 V	278	65.29	1.71
4	2483.50	52.39 AV	54.00	-1.61	2.99 V	278	50.68	1.71
5	4944.00	50.57 PK	74.00	-23.43	3.95 V	355	41.33	9.24
6	4944.00	40.33 AV	54.00	-13.67	3.95 V	355	31.09	9.24

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

802.11n (40MHz)

Channel	TX Channel 3	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 25GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.67 PK	74.00	-8.33	1.47 H	0	64.35	1.32
2	2390.00	51.04 AV	54.00	-2.96	1.47 H	0	49.72	1.32
3	*2422.00	104.58 PK			1.47 H	0	103.15	1.43
4	*2422.00	95.07 AV			1.47 H	0	93.64	1.43
5	4844.00	49.87 PK	74.00	-24.13	1.32 H	259	40.66	9.21
6	4844.00	36.18 AV	54.00	-17.82	1.32 H	259	26.97	9.21
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	66.92 PK	74.00	-7.08	3.72 V	275	65.60	1.32
2	2390.00	51.88 AV	54.00	-2.12	3.72 V	275	50.56	1.32
3	*2422.00	107.51 PK			3.72 V	275	106.08	1.43
4	*2422.00	96.72 AV			3.72 V	275	95.29	1.43
5	4844.00	50.35 PK	74.00	-23.65	2.08 V	127	41.14	9.21
6	4844.00	36.54 AV	54.00	-17.46	2.08 V	127	27.33	9.21

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	107.10 PK			1.54 H	2	105.64	1.46
2	*2437.00	92.60 AV			1.54 H	2	91.14	1.46
3	4874.00	49.49 PK	74.00	-24.51	1.84 H	215	40.25	9.24
4	4874.00	35.57 AV	54.00	-18.43	1.84 H	215	26.33	9.24
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	109.63 PK			2.26 V	284	108.17	1.46
2	*2437.00	95.66 AV			2.26 V	284	94.20	1.46
3	4874.00	50.89 PK	74.00	-23.11	1.64 V	234	41.65	9.24
4	4874.00	36.90 AV	54.00	-17.10	1.64 V	234	27.66	9.24

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	105.15 PK			1.48 H	4	103.64	1.51
2	*2452.00	90.19 AV			1.48 H	4	88.68	1.51
3	2483.50	65.84 PK	74.00	-8.16	1.48 H	4	64.13	1.71
4	2483.50	48.56 AV	54.00	-5.44	1.48 H	4	46.85	1.71
5	4904.00	49.43 PK	74.00	-24.57	1.24 H	117	40.16	9.27
6	4904.00	35.63 AV	54.00	-18.37	1.24 H	117	26.36	9.27
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	108.08 PK			2.26 V	287	106.57	1.51
2	*2452.00	93.24 AV			2.26 V	287	91.73	1.51
3	2483.50	69.65 PK	74.00	-4.35	2.26 V	287	67.94	1.71
4	2483.50	51.94 AV	54.00	-2.06	2.26 V	287	50.23	1.71
5	4904.00	50.93 PK	74.00	-23.07	1.85 V	264	41.66	9.27
6	4904.00	36.56 AV	54.00	-17.44	1.85 V	264	27.29	9.27

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	103.67 PK			1.10 H	169	102.13	1.54
2	*2457.00	95.76 AV			1.10 H	169	94.22	1.54
3	2483.50	65.43 PK	74.00	-8.57	1.10 H	169	63.72	1.71
4	2483.50	52.13 AV	54.00	-1.87	1.10 H	169	50.42	1.71
5	4914.00	49.59 PK	74.00	-24.41	1.19 H	271	40.33	9.26
6	4914.00	41.00 AV	54.00	-13.00	1.19 H	271	31.74	9.26
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	103.17 PK			1.07 V	56	101.63	1.54
2	*2457.00	95.80 AV			1.07 V	56	94.26	1.54
3	2483.50	64.98 PK	74.00	-9.02	1.07 V	56	63.27	1.71
4	2483.50	52.06 AV	54.00	-1.94	1.07 V	56	50.35	1.71
5	4914.00	51.59 PK	74.00	-22.41	1.13 V	174	42.33	9.26
6	4914.00	40.84 AV	54.00	-13.16	1.13 V	174	31.58	9.26

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
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	Frequency (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	93.23 PK			1.24 H	227	91.65	1.58
2	*2462.00	85.85 AV			1.24 H	227	84.27	1.58
3	2483.50	67.78 PK	74.00	-6.22	1.24 H	227	66.07	1.71
4	2483.50	52.43 AV	54.00	-1.57	1.24 H	227	50.72	1.71
5	4924.00	49.58 PK	74.00	-24.42	1.58 H	326	40.33	9.25
6	4924.00	39.76 AV	54.00	-14.24	1.58 H	326	30.51	9.25
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (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	94.02 PK			1.15 V	55	92.44	1.58
2	*2462.00	86.73 AV			1.15 V	55	85.15	1.58
3	2483.50	67.16 PK	74.00	-6.84	1.15 V	55	65.45	1.71
4	2483.50	52.36 AV	54.00	-1.64	1.15 V	55	50.65	1.71
5	4924.00	51.37 PK	74.00	-22.63	1.10 V	162	42.12	9.25
6	4924.00	40.58 AV	54.00	-13.42	1.10 V	162	31.33	9.25

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

Below 1GHz Data:

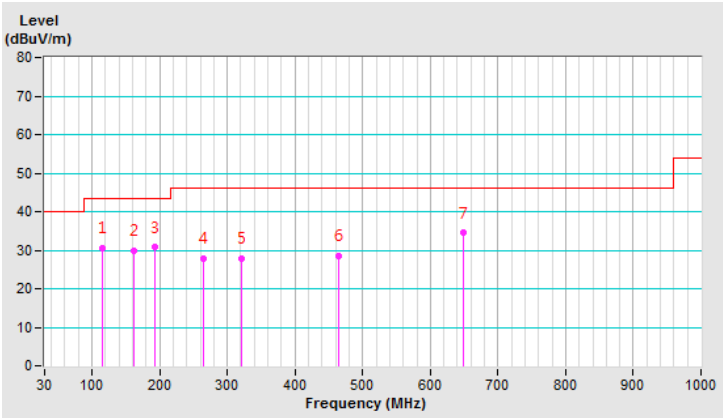
802.11g

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	115.94	30.49 QP	43.50	-13.01	1.96 H	209	39.96	-9.47
2	162.65	29.91 QP	43.50	-13.59	2.34 H	33	36.35	-6.44
3	193.30	30.76 QP	43.50	-12.74	1.87 H	358	40.05	-9.29
4	265.66	27.93 QP	46.00	-18.07	1.52 H	129	34.00	-6.07
5	320.13	27.79 QP	46.00	-18.21	1.49 H	173	31.99	-4.20
6	464.07	28.63 QP	46.00	-17.37	1.44 H	202	29.60	-0.97
7	649.68	34.43 QP	46.00	-11.57	1.00 H	235	31.57	2.86

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
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.

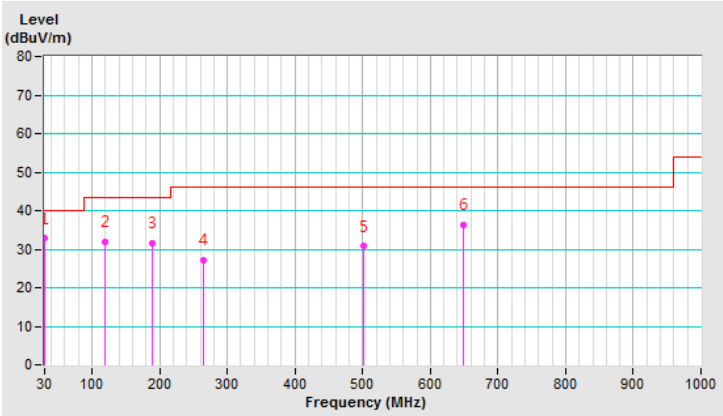


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.53	32.77 QP	40.00	-7.23	1.34 V	203	41.56	-8.79
2	118.37	31.96 QP	43.50	-11.54	1.52 V	74	41.18	-9.22
3	189.90	31.63 QP	43.50	-11.87	1.08 V	180	40.73	-9.10
4	265.56	27.14 QP	46.00	-18.86	1.94 V	69	33.22	-6.08
5	501.47	30.71 QP	46.00	-15.29	1.82 V	358	31.14	-0.43
6	649.68	36.43 QP	46.00	-9.57	1.24 V	282	33.57	2.86

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
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

Mode A

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESCS30	100276	Apr. 16, 2020	Apr. 15, 2021
SCHWARZBECK Artificial Mains Network (for EUT)	NSLK 8128	8128-244	Nov. 11, 2019	Nov. 10, 2020
LISN With Adapter (for EUT)	AD10	C05Ada-001	Nov. 11, 2019	Nov. 10, 2020
ROHDE & SCHWARZ Artificial Mains Network (for peripheral)	ESH3-Z5	100220	Nov. 18, 2019	Nov. 17, 2020
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C05.01	Jan. 30, 2020	Jan. 29, 2021
LYNICS Terminator (For R&S LISN)	0900510	E1-01-305	Feb. 17, 2020	Feb. 16, 2021

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 Shielded Room No. 5. (Conduction 5)
3. The VCCI Site Registration No. C-11093.
4. Tested Date: Aug. 7, 2020

Mode B

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESR3	102413	Feb. 17, 2020	Feb. 16, 2021
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	100104	Dec. 13, 2019	Dec. 12, 2020
LISN With Adapter (for EUT)	AD10	C09Ada-001	Dec. 13, 2019	Dec. 12, 2020
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	847265/023	Oct. 31, 2019	Oct. 30, 2020
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 14, 2020	May 13, 2021
SCHWARZBECK Artificial Mains Network (for EUT)	NNLK 8121	8121-808	Apr. 10, 2020	Apr. 9, 2021
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C09.01	Aug. 15, 2019	Aug. 14, 2020
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	May 13, 2020	May 12, 2021

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 Shielded Room No. 9. (Conduction 9)
3. The VCCI Site Registration No. C-11312.
4. Tested Date: Aug. 8, 2020

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.

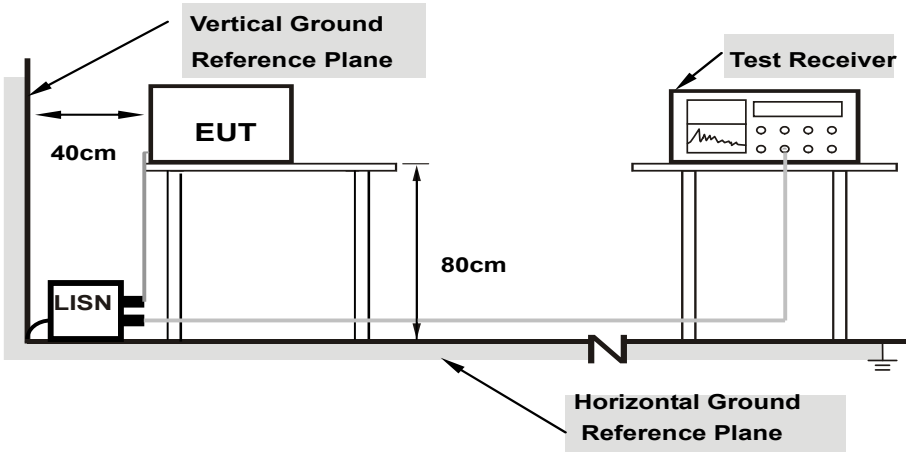
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

Connected the EUT to Adapter or Notebook.

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

4.2.7 Test Results

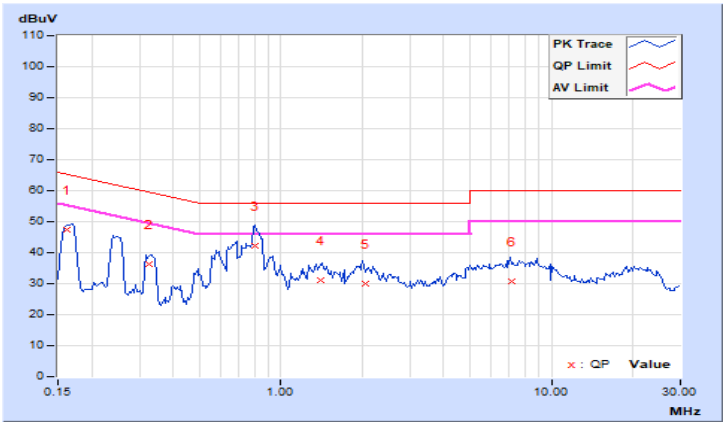
Mode A

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	9.90	37.33	23.84	47.23	33.74	65.38	55.38	-18.15	-21.64
2	0.32578	9.91	26.34	11.39	36.25	21.30	59.56	49.56	-23.31	-28.26
3	**0.79844**	**9.95**	**32.16**	**19.93**	**42.11**	**29.88**	**56.00**	**46.00**	**-13.89**	**-16.12**
4	1.40625	9.99	21.02	10.33	31.01	20.32	56.00	46.00	-24.99	-25.68
5	2.05859	10.02	20.09	11.08	30.11	21.10	56.00	46.00	-25.89	-24.90
6	7.14844	10.34	20.25	11.59	30.59	21.93	60.00	50.00	-29.41	-28.07

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.

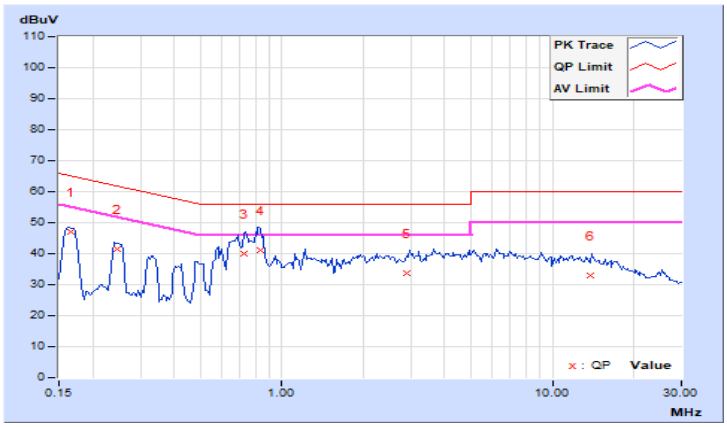


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	9.92	36.99	25.76	46.91	35.68	65.18	55.18	-18.27	-19.50
2	0.24766	9.92	31.39	21.56	41.31	31.48	61.84	51.84	-20.53	-20.36
3	0.72422	9.97	29.95	21.67	39.92	31.64	56.00	46.00	-16.08	-14.36
4	0.82969	9.98	31.12	21.58	41.10	31.56	56.00	46.00	-14.90	-14.44
5	2.91406	10.10	23.48	16.80	33.58	26.90	56.00	46.00	-22.42	-19.10
6	13.76563	10.78	22.16	14.68	32.94	25.46	60.00	50.00	-27.06	-24.54

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.



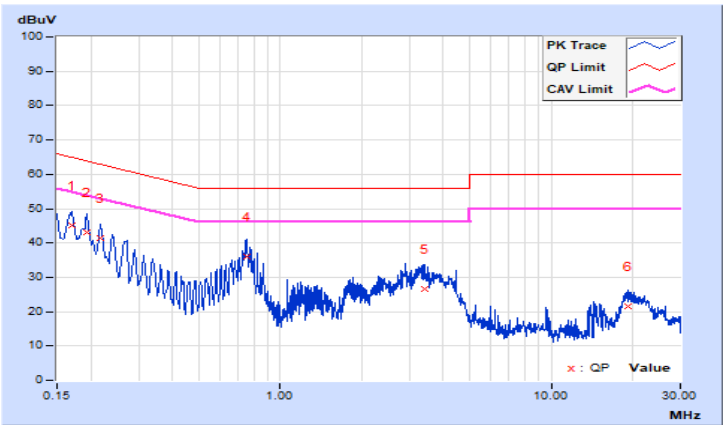
Mode B

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	10.49	34.62	24.36	45.11	34.85	64.98	54.98	-19.87	-20.13
2	0.19301	10.50	32.55	22.59	43.05	33.09	63.91	53.91	-20.86	-20.82
3	0.21647	10.50	30.97	16.35	41.47	26.85	62.95	52.95	-21.48	-26.10
4	0.74989	10.52	25.58	16.60	36.10	27.12	56.00	46.00	-19.90	-18.88
5	3.40904	10.68	15.94	7.18	26.62	17.86	56.00	46.00	-29.38	-28.14
6	19.29798	11.53	10.02	1.20	21.55	12.73	60.00	50.00	-38.45	-37.27

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

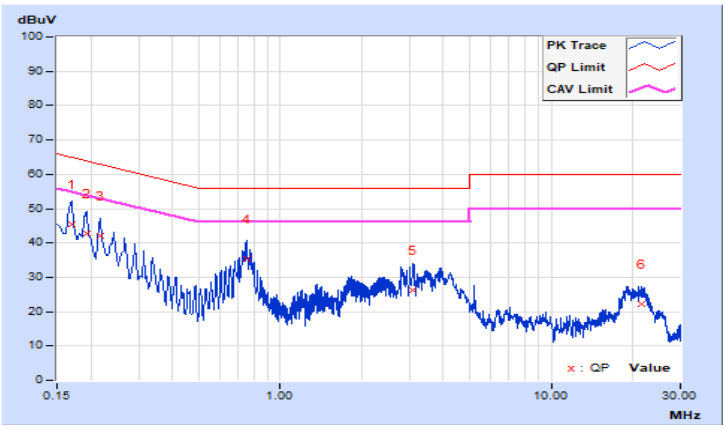


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	10.47	34.97	22.76	45.44	33.23	64.98	54.98	-19.54	-21.75
2	0.19254	10.49	32.24	21.03	42.73	31.52	63.93	53.93	-21.20	-22.41
3	0.21647	10.49	31.58	19.12	42.07	29.61	62.95	52.95	-20.88	-23.34
4	0.75024	10.51	24.96	16.21	35.47	26.72	56.00	46.00	-20.53	-19.28
5	3.07278	10.65	15.46	6.77	26.11	17.42	56.00	46.00	-29.89	-28.58
6	21.57182	11.30	11.05	4.55	22.35	15.85	60.00	50.00	-37.65	-34.15

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

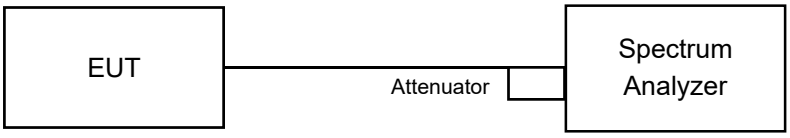


4.3 6dB Bandwidth Measurement

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

Mode A

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	10.13	10.13	0.5	Pass
6	2437	10.13	10.13	0.5	Pass
11	2462	10.13	10.13	0.5	Pass
12	2467	10.13	10.12	0.5	Pass
13	2472	10.13	10.13	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.84	15.85	0.5	Pass
6	2437	15.73	15.73	0.5	Pass
11	2462	15.86	15.85	0.5	Pass
12	2467	15.86	15.85	0.5	Pass
13	2472	16.37	16.37	0.5	Pass

802.11n (20MHz)

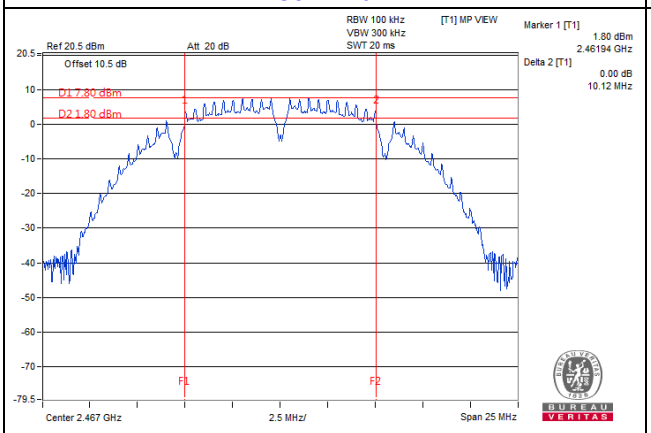
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.56	16.55	0.5	Pass
6	2437	16.31	16.29	0.5	Pass
11	2462	16.56	16.59	0.5	Pass
12	2467	16.60	16.59	0.5	Pass
13	2472	17.60	17.60	0.5	Pass

802.11n (40MHz)

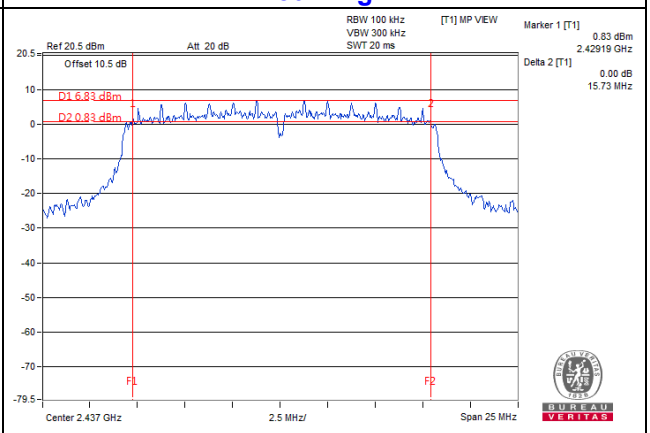
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.26	35.26	0.5	Pass
6	2437	35.24	35.26	0.5	Pass
9	2452	35.24	35.26	0.5	Pass
10	2457	35.25	35.26	0.5	Pass
11	2462	35.25	35.26	0.5	Pass

Spectrum Plot of Worst Value

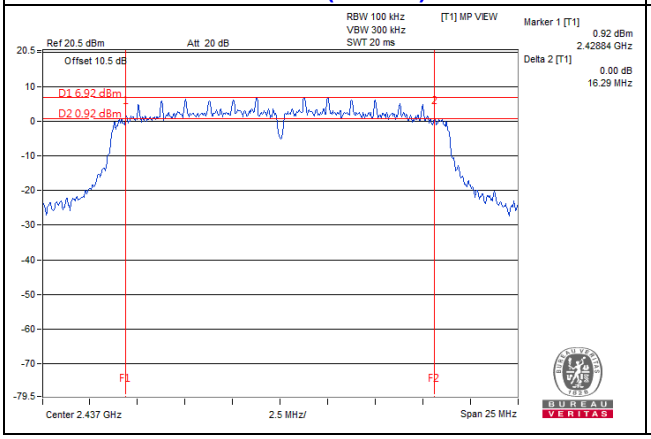
802.11b



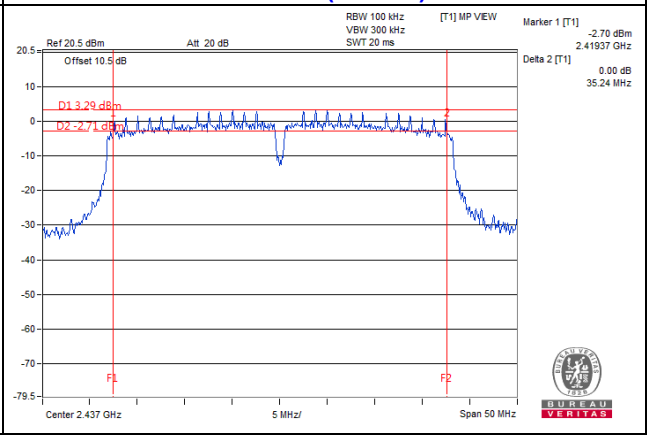
802.11g



802.11n (20MHz)



802.11n (40MHz)



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

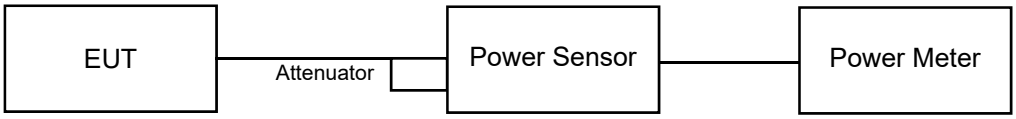
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

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.

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

Mode A

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	19.62	19.72	185.378	22.68	30	Pass
6	2437	19.77	19.89	192.341	22.84	30	Pass
11	2462	20.16	20.20	208.466	23.19	30	Pass
12	2467	19.32	19.38	172.203	22.36	30	Pass
13	2472	13.35	13.39	43.454	16.38	30	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	24.58	24.68	580.843	27.64	30	Pass
6	2437	25.06	25.14	647.215	28.11	30	Pass
11	2462	24.16	24.25	526.688	27.22	30	Pass
12	2467	21.42	21.55	281.565	24.50	30	Pass
13	2472	18.94	19.11	159.813	22.04	30	Pass

802.11n (20MHz)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.39	24.47	554.687	27.44	30	Pass
6	2437	25.42	25.51	**703.968**	28.48	30	Pass
11	2462	23.71	23.79	474.295	26.76	30	Pass
12	2467	20.56	20.63	229.374	23.61	30	Pass
13	2472	18.12	18.23	131.39	21.19	30	Pass

802.11n (40MHz)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	23.28	23.36	429.584	26.33	30	Pass
6	2437	24.52	24.57	569.557	27.56	30	Pass
9	2452	24.22	24.31	534.015	27.28	30	Pass
10	2457	20.95	20.96	249.189	23.97	30	Pass
11	2462	14.78	14.85	60.610	17.83	30	Pass

FOR AVERAGE POWER

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	17.65	17.73	117.503	20.70
6	2437	17.74	17.87	120.664	20.82
11	2462	18.21	18.24	132.903	21.24
12	2467	17.34	17.41	109.281	20.39
13	2472	11.37	11.42	27.577	14.41

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	16.04	16.12	81.105	19.09
6	2437	18.06	18.15	129.286	21.12
11	2462	16.03	16.12	81.013	19.09
12	2467	12.91	12.98	39.404	15.96
13	2472	10.42	10.53	22.313	13.49

802.11n (20MHz)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	16.77	16.84	95.840	19.82
6	2437	18.08	18.18	130.035	21.14
11	2462	16.74	16.80	95.069	19.78
12	2467	12.88	12.96	39.179	15.93
13	2472	10.45	10.55	22.442	13.51

802.11n (40MHz)

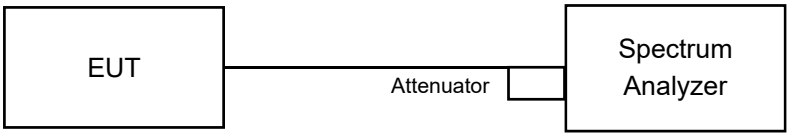
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	15.06	15.18	65.024	18.13
6	2437	17.61	17.67	116.156	20.65
9	2452	16.03	16.10	80.825	19.08
10	2457	12.69	12.72	37.285	15.72
11	2462	6.52	6.58	9.037	9.56

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz.

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

Mode A

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-5.46	3.01	-2.45	8.00	Pass
	6	2437	-5.40	3.01	-2.39	8.00	Pass
	11	2462	-5.52	3.01	-2.51	8.00	Pass
	12	2467	-6.47	3.01	-3.46	8.00	Pass
	13	2472	-12.67	3.01	-9.66	8.00	Pass
1	1	2412	-5.50	3.01	-2.49	8.00	Pass
	6	2437	-5.43	3.01	-2.42	8.00	Pass
	11	2462	-5.48	3.01	-2.47	8.00	Pass
	12	2467	-6.64	3.01	-3.63	8.00	Pass
	13	2472	-12.07	3.01	-9.06	8.00	Pass

NOTE: Directional gain = 2.17dBi + 10log(2) = 5.18dBi < 6dBi, so the power density limit is not reduced.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-9.55	3.01	-6.54	8.00	Pass
	6	2437	-7.49	3.01	-4.48	8.00	Pass
	11	2462	-9.49	3.01	-6.48	8.00	Pass
	12	2467	-12.79	3.01	-9.78	8.00	Pass
	13	2472	-15.49	3.01	-12.48	8.00	Pass
1	1	2412	-9.44	3.01	-6.43	8.00	Pass
	6	2437	-7.64	3.01	-4.63	8.00	Pass
	11	2462	-9.53	3.01	-6.52	8.00	Pass
	12	2467	-12.54	3.01	-9.53	8.00	Pass
	13	2472	-15.82	3.01	-12.81	8.00	Pass

NOTE: Directional gain = 2.17dBi + 10log(2) = 5.18dBi < 6dBi, so the power density limit is not reduced.

802.11n (20MHz)

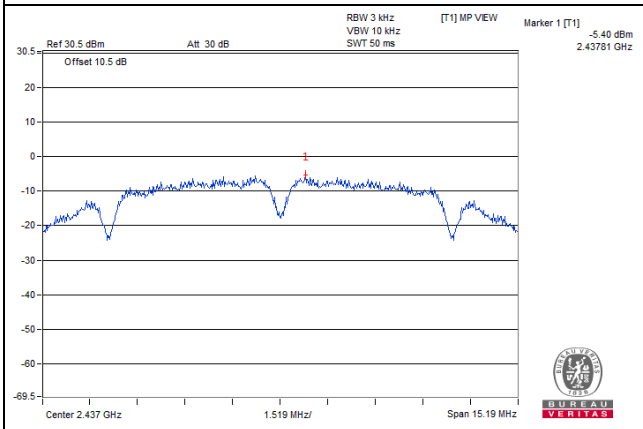
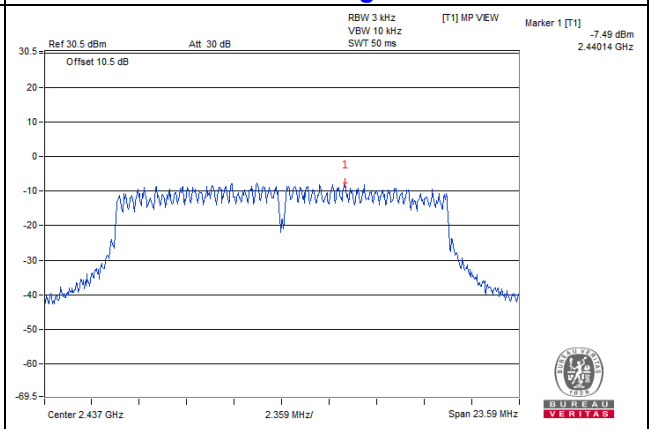
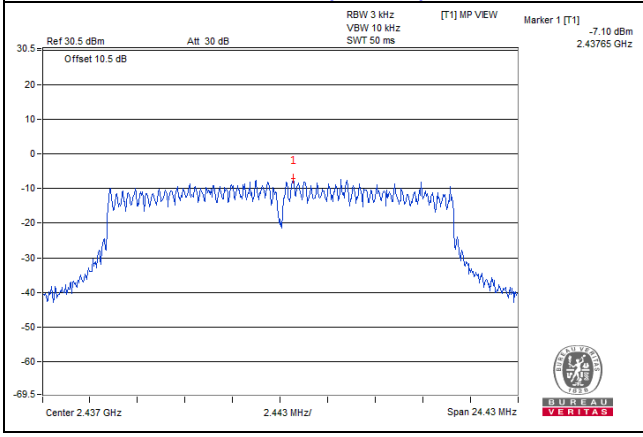
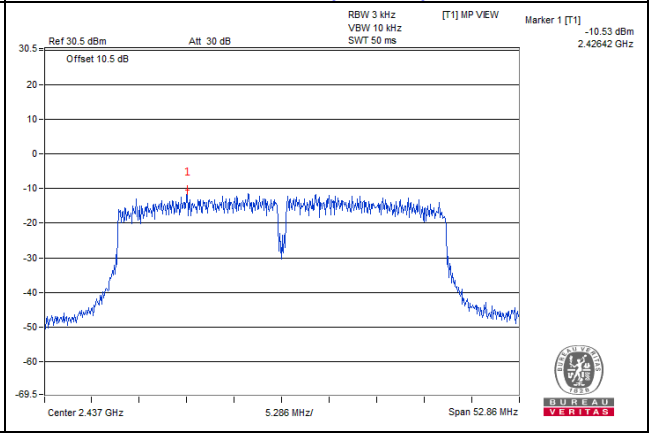
TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.81	3.01	-5.80	8.00	Pass
	6	2437	-7.12	3.01	-4.11	8.00	Pass
	11	2462	-9.14	3.01	-6.13	8.00	Pass
	12	2467	-13.40	3.01	-10.39	8.00	Pass
	13	2472	-15.92	3.01	-12.91	8.00	Pass
1	1	2412	-8.93	3.01	-5.92	8.00	Pass
	6	2437	-7.10	3.01	-4.09	8.00	Pass
	11	2462	-9.22	3.01	-6.21	8.00	Pass
	12	2467	-11.91	3.01	-8.90	8.00	Pass
	13	2472	-16.15	3.01	-13.14	8.00	Pass

NOTE: Directional gain = 2.17dBi + 10log(2) = 5.18dBi < 6dBi, so the power density limit is not reduced.

802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-13.40	3.01	-10.39	8.00	Pass
	6	2437	-10.53	3.01	-7.52	8.00	Pass
	9	2452	-12.54	3.01	-9.53	8.00	Pass
	10	2457	-16.28	3.01	-13.27	8.00	Pass
	11	2462	-22.08	3.01	-19.07	8.00	Pass
1	3	2422	-13.32	3.01	-10.31	8.00	Pass
	6	2437	-10.59	3.01	-7.58	8.00	Pass
	9	2452	-12.53	3.01	-9.52	8.00	Pass
	10	2457	-16.51	3.01	-13.50	8.00	Pass
	11	2462	-22.17	3.01	-19.16	8.00	Pass

NOTE: Directional gain = 2.17dBi + 10log(2) = 5.18dBi < 6dBi, so the power density limit is not reduced.

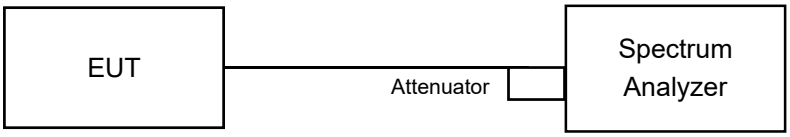
Spectrum Plot of Worst Value	
802.11b	**802.11g**
	
802.11n (20MHz)	**802.11n (40MHz)**
	

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

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as Item 4.3.6

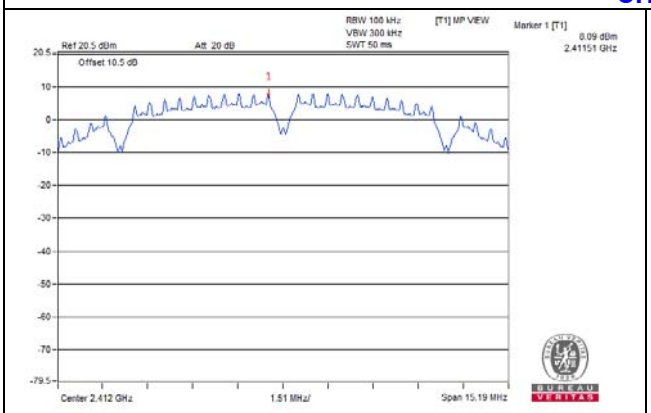
4.6.7 Test Results

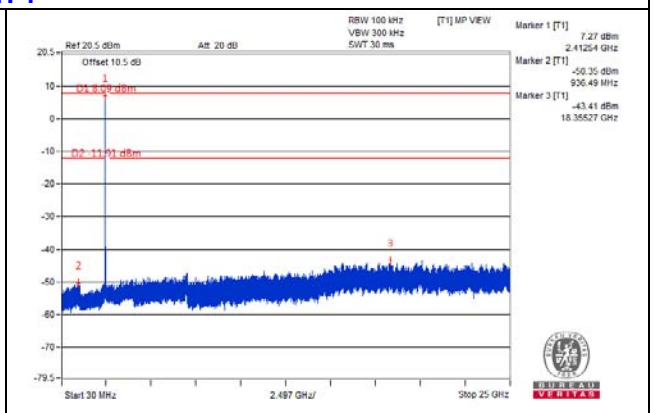
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

Mode A

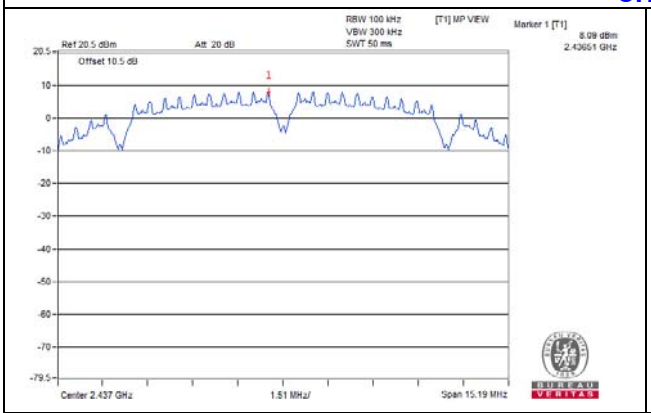
802.11b: Chain 0

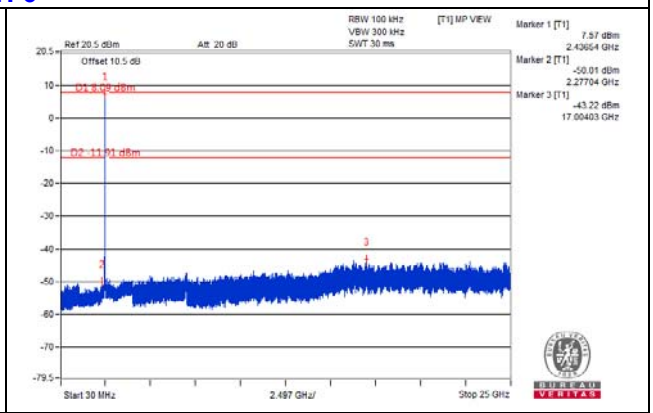
CH 1



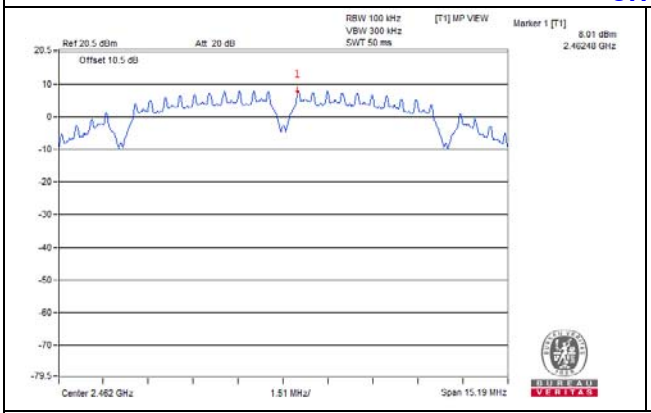


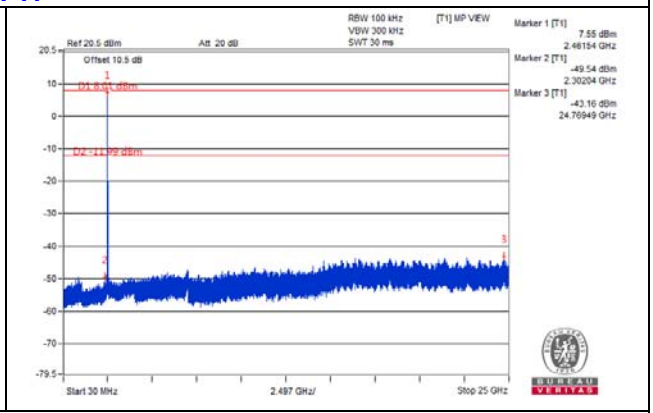
CH 6



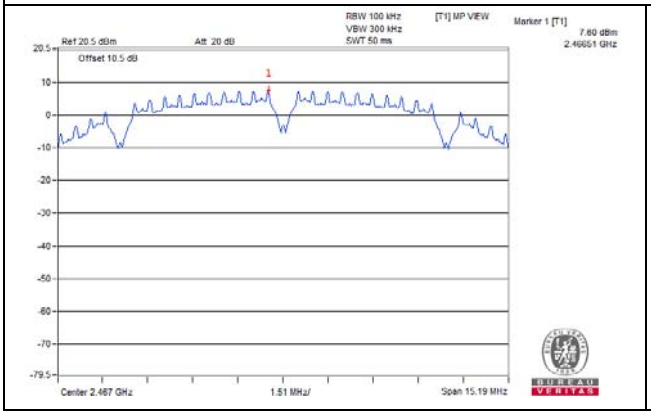


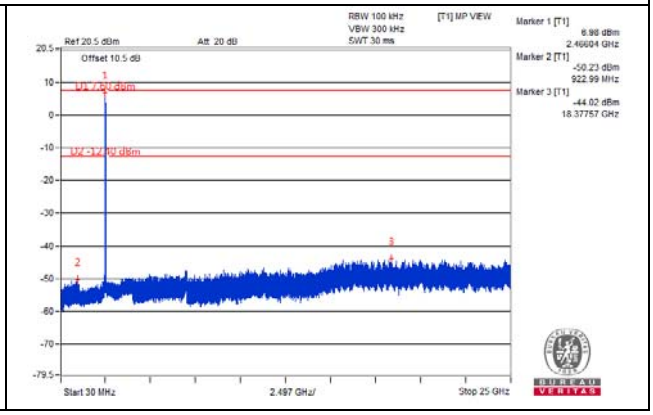
CH 11



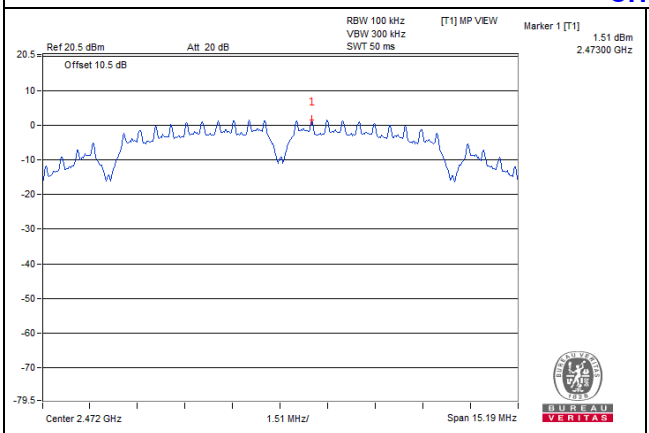


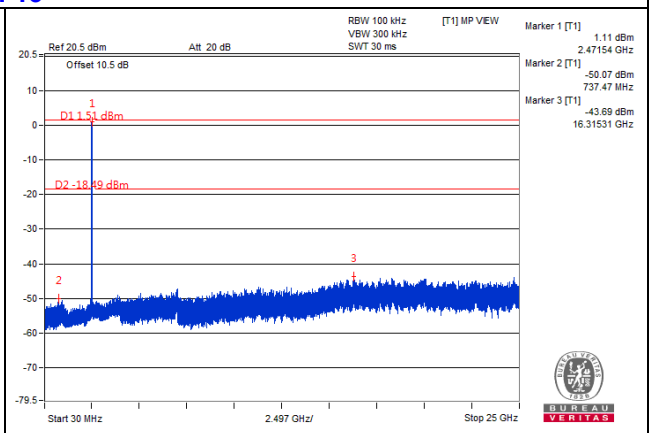
CH 12



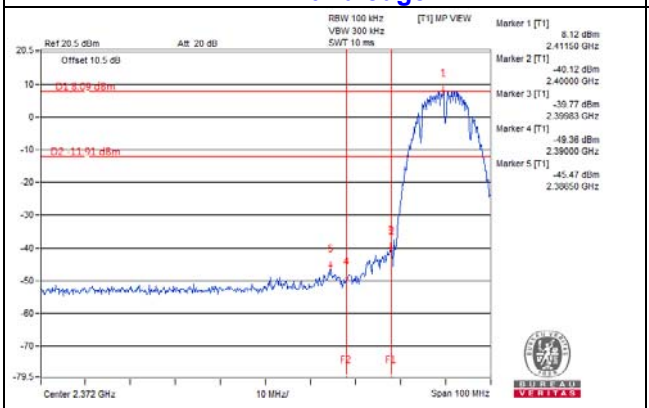


CH 13

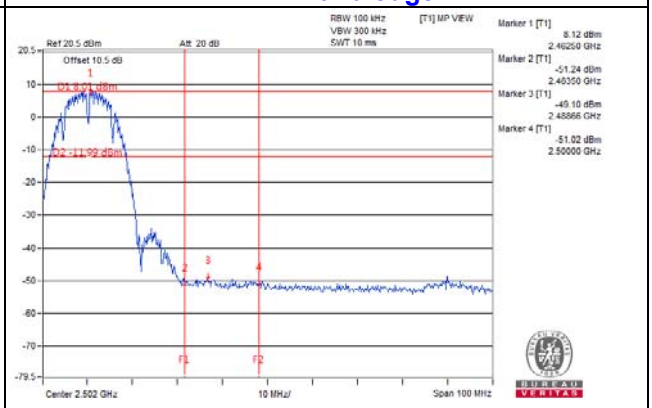




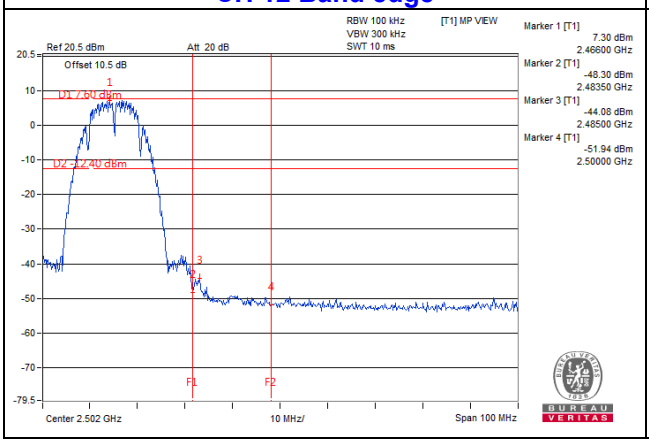
CH 1 Band edge



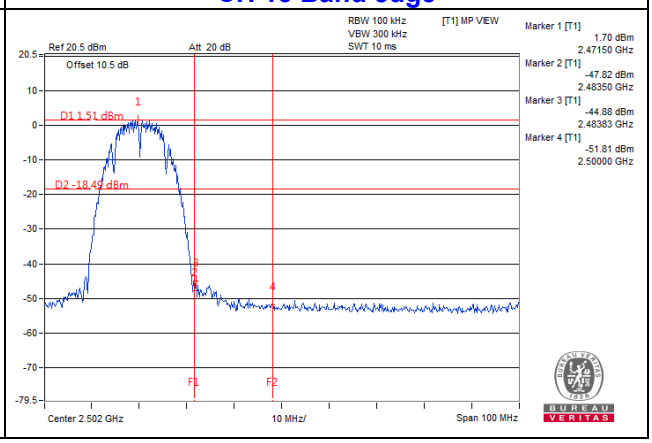
CH 11 Band edge



CH 12 Band edge

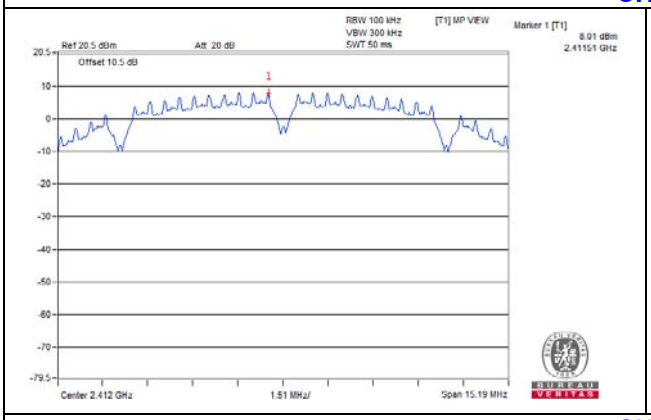


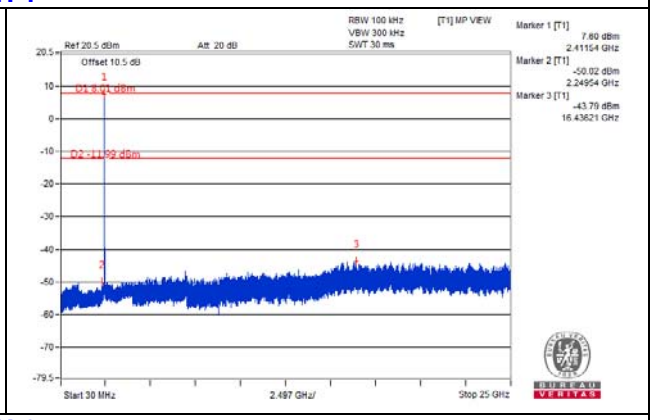
CH 13 Band edge



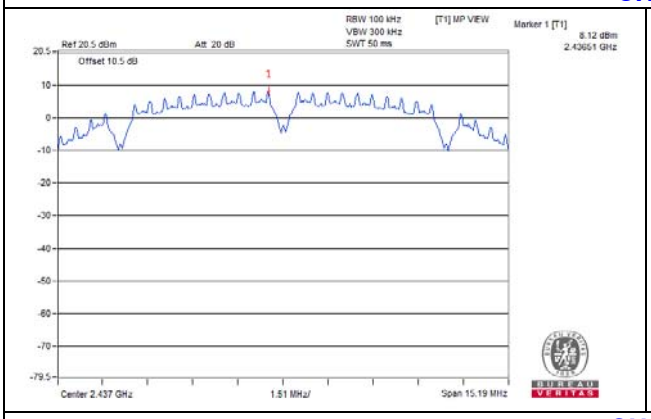
802.11b: Chain 1

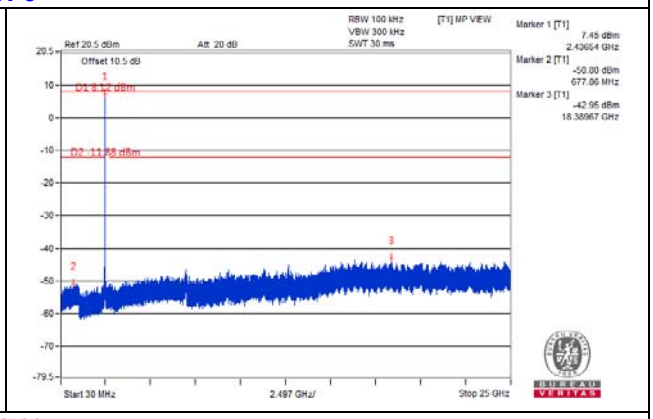
CH 1



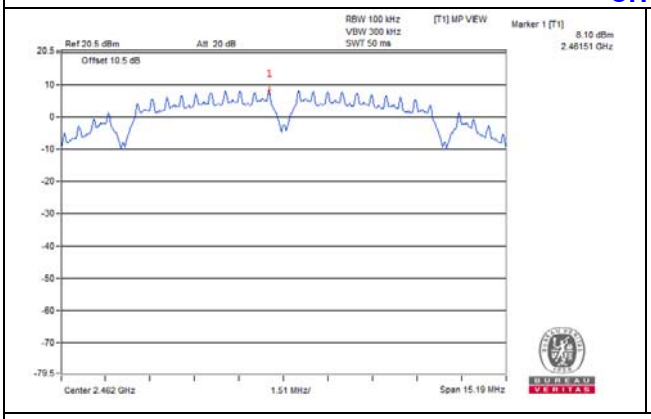


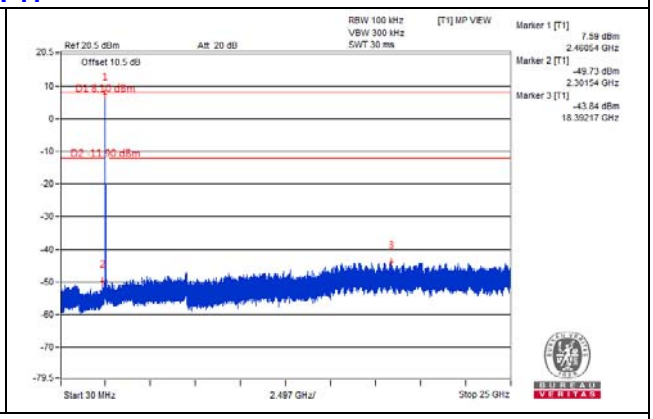
CH 6





CH 11





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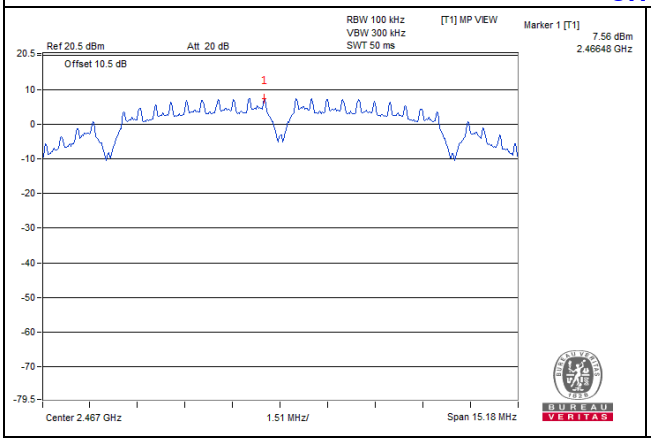

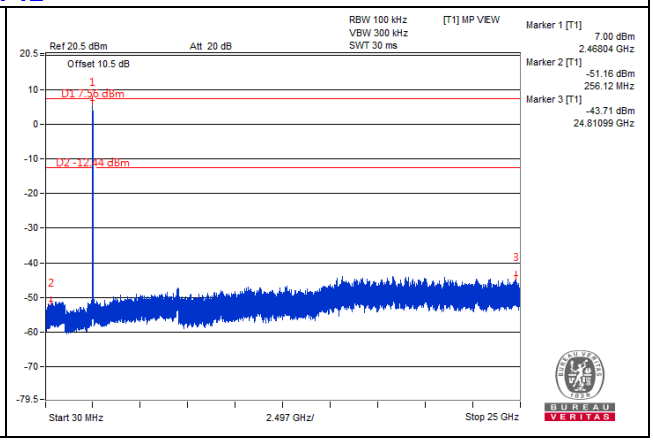

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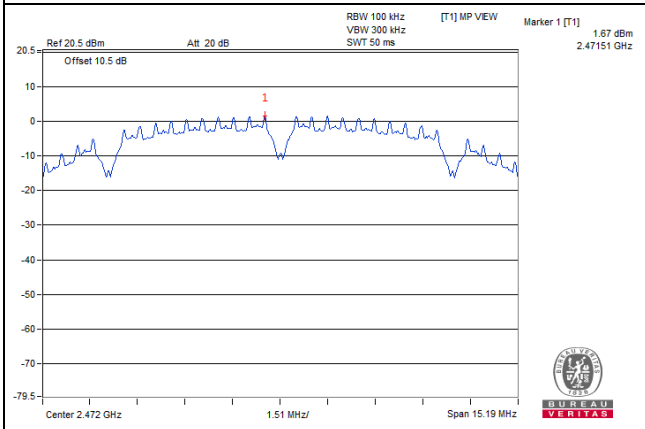
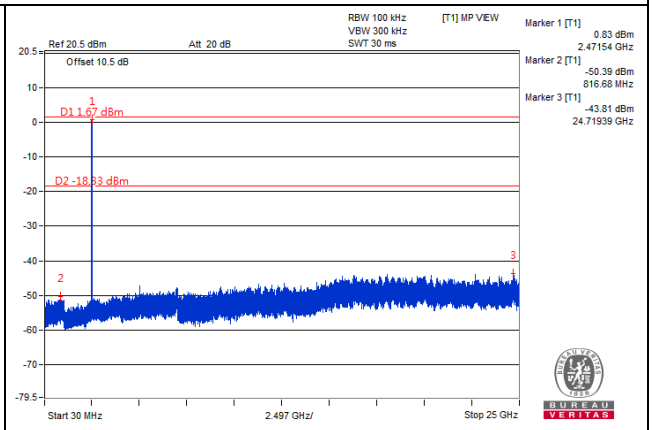
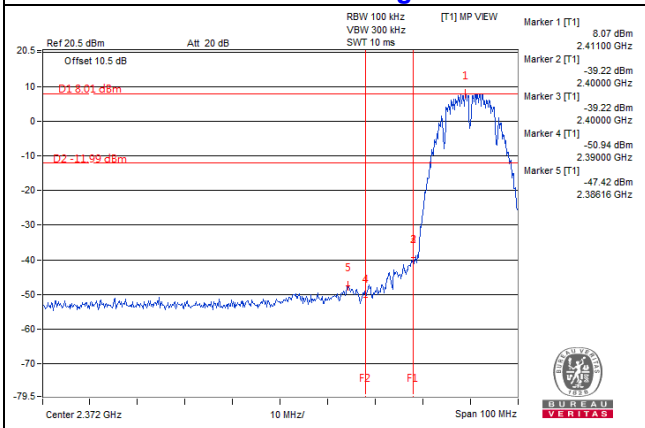
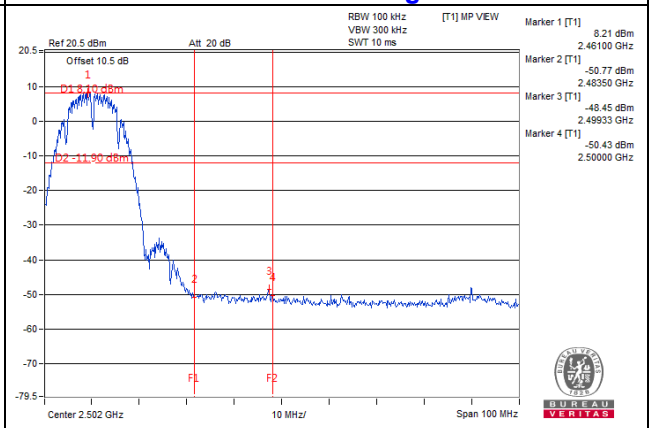




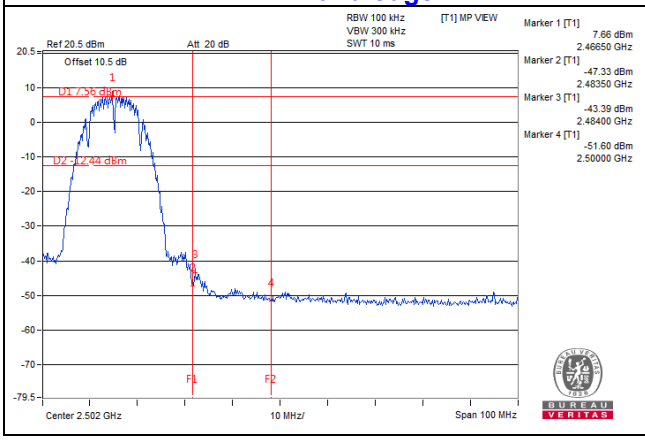
CH 1 Band edge



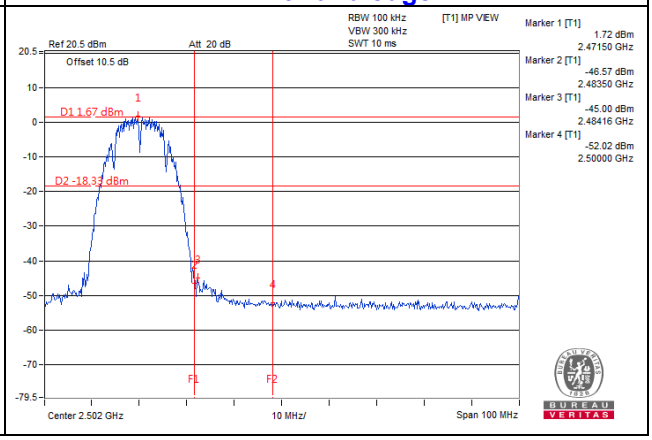
CH 11 Band edge



CH 12 Band edge

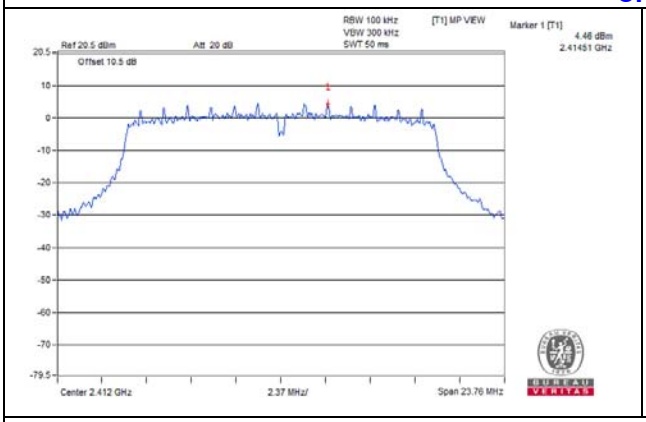


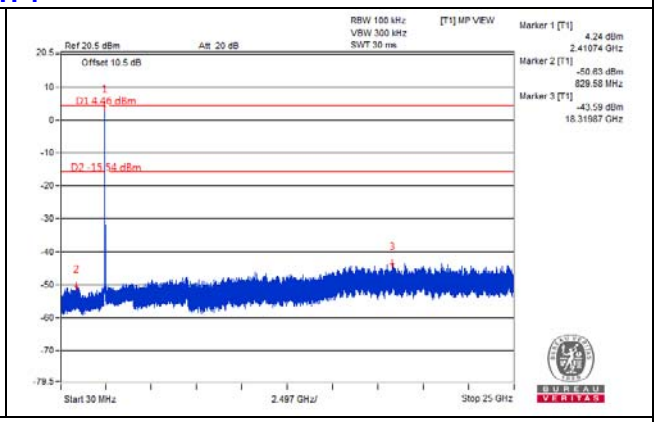
CH 13Band edge



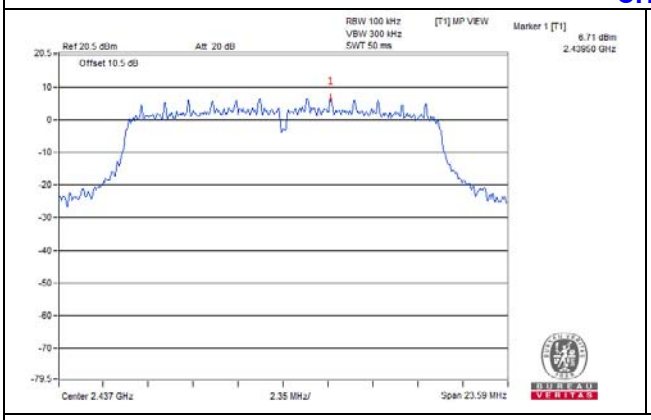
802.11g: Chain 0

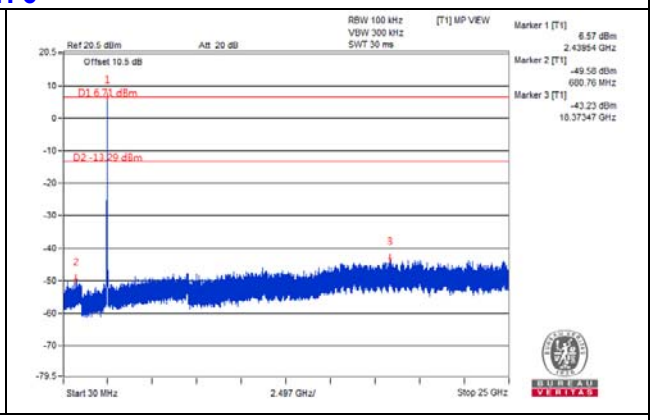
CH 1



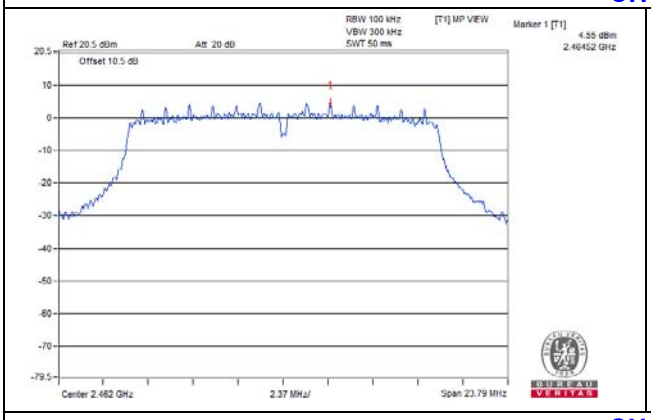


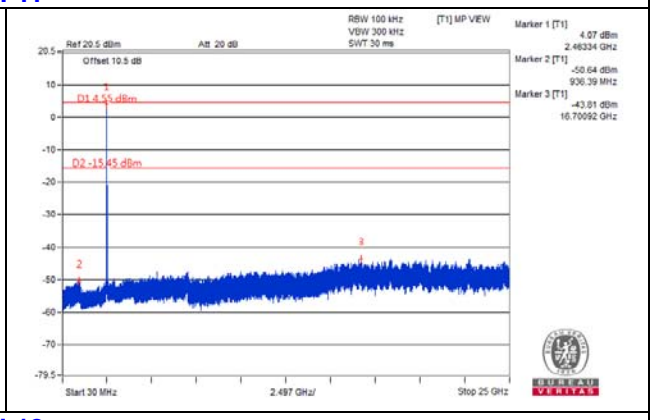
CH 6



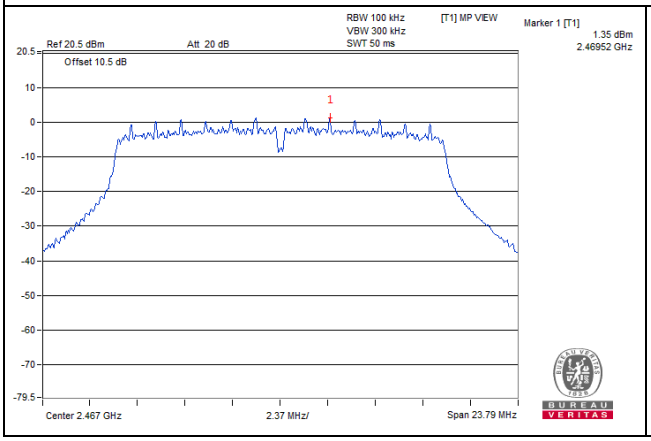


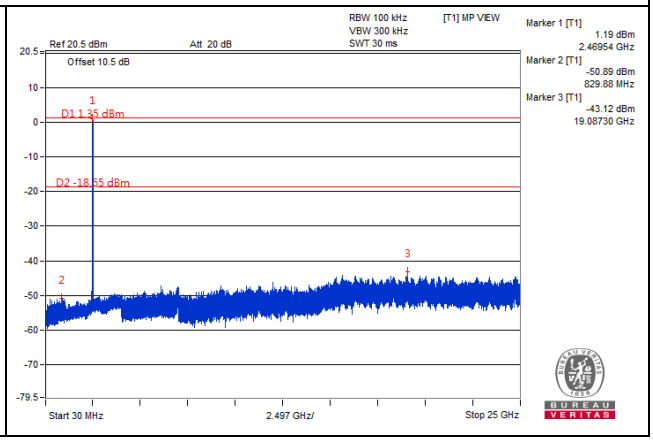
CH 11



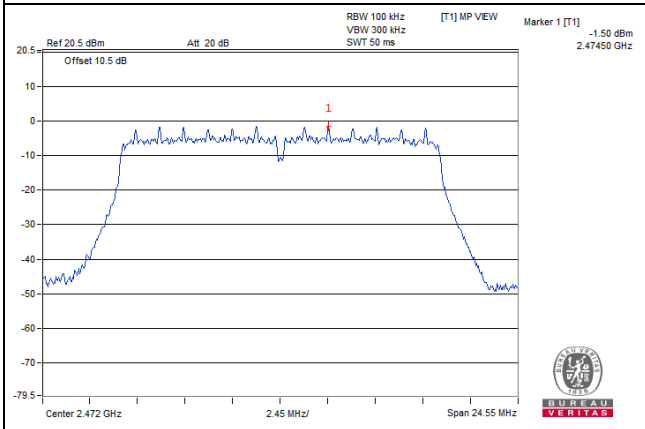


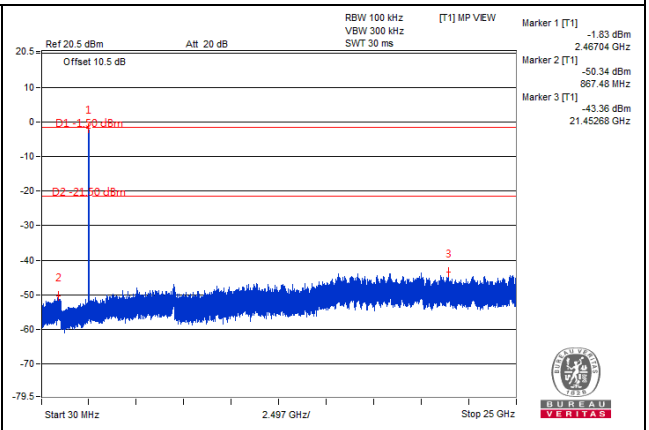
CH 12



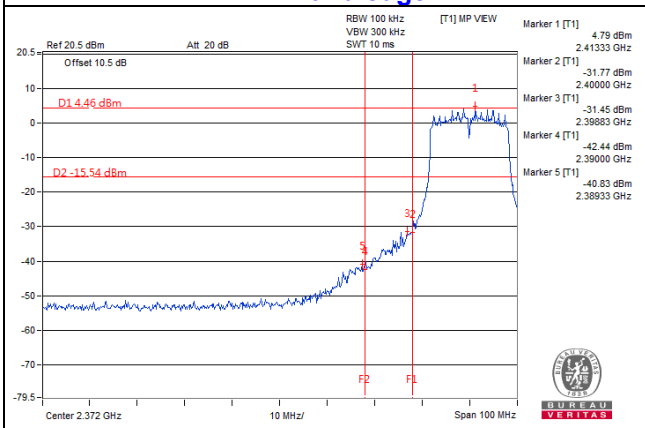


CH 13

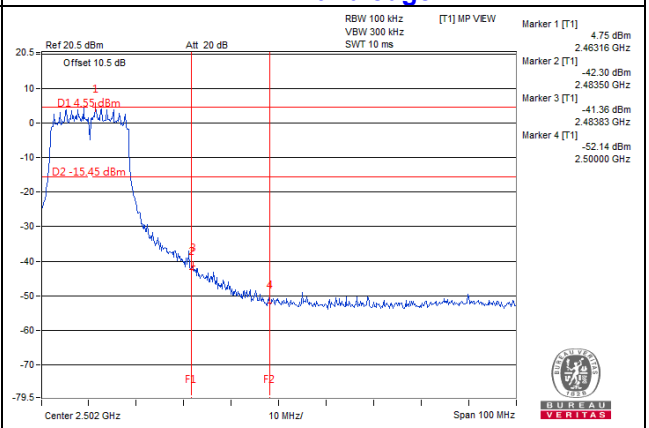




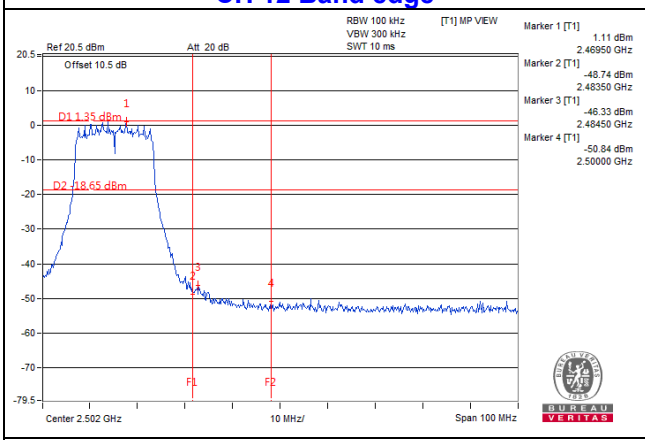
CH 1 Band edge



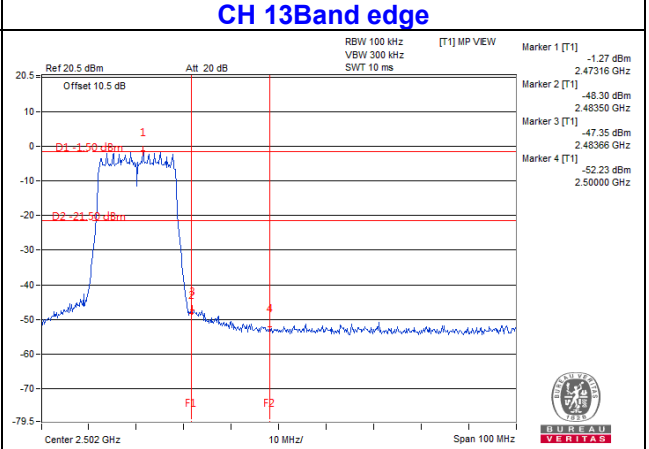
CH 11 Band edge



CH 12 Band edge

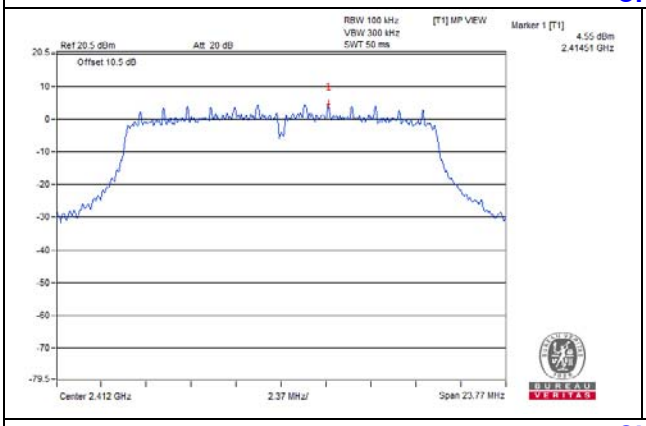


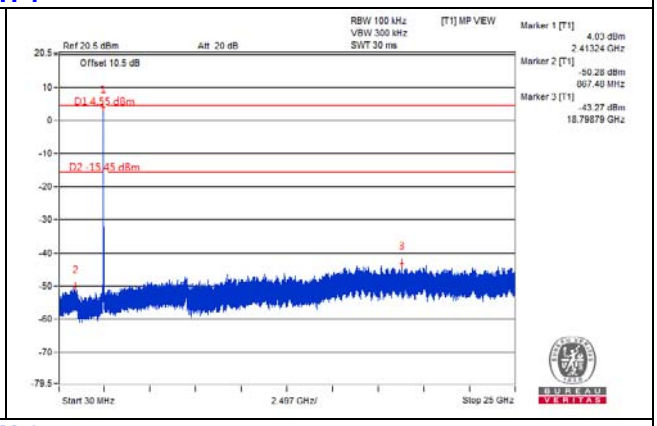
CH 13Band edge



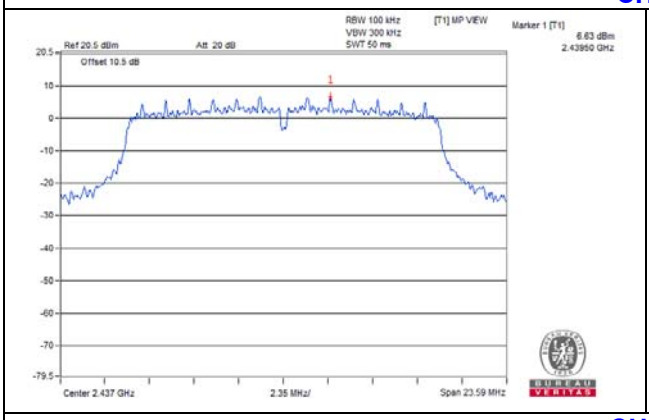
802.11g: Chain 1

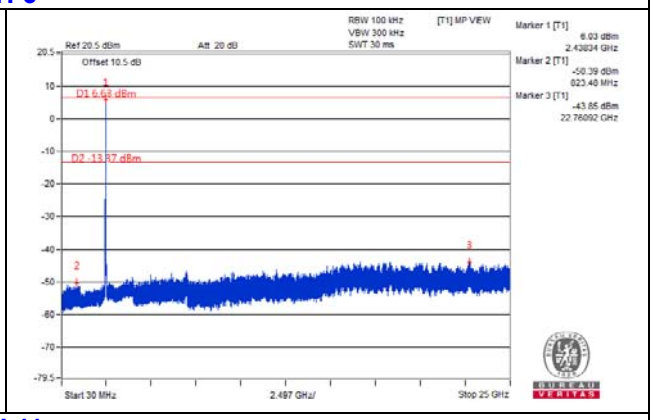
CH 1



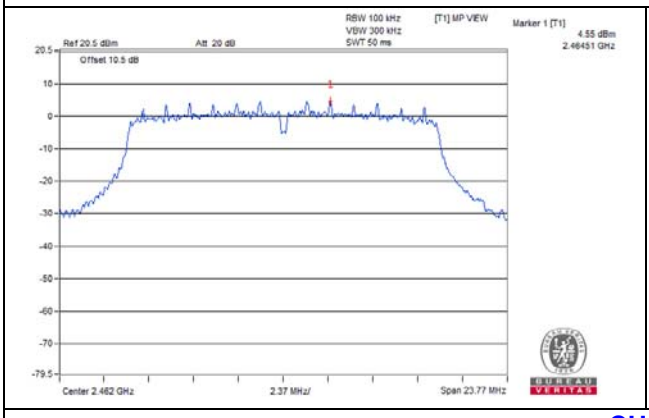


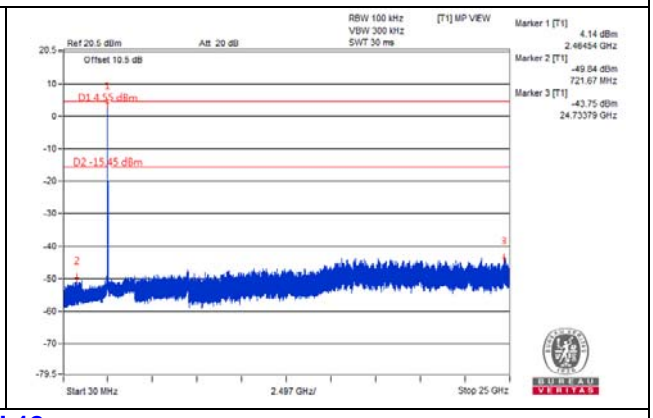
CH 6



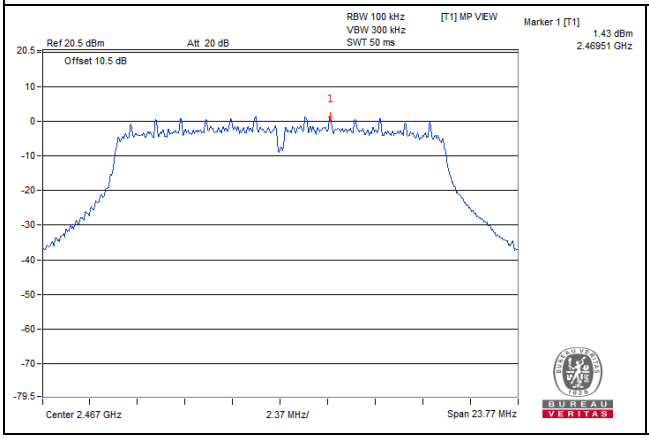


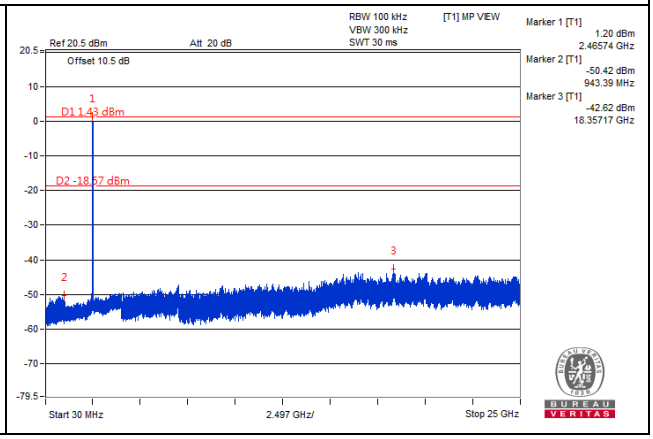
CH 11



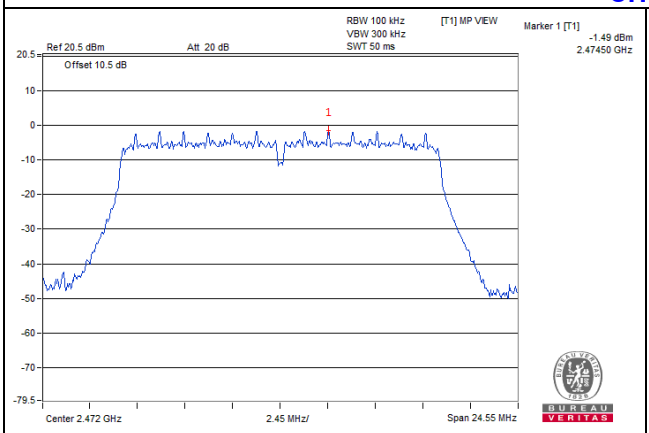


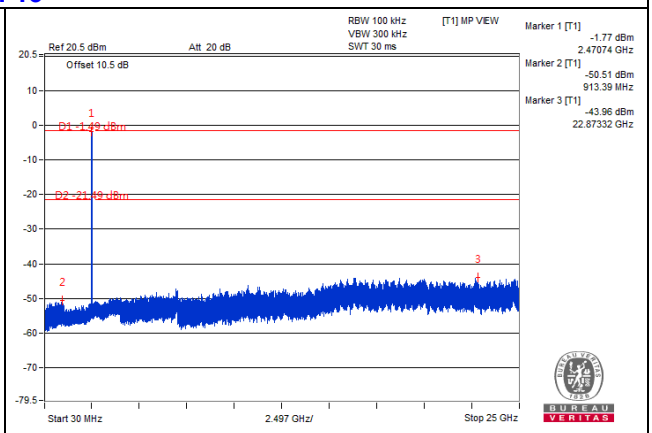
CH 12



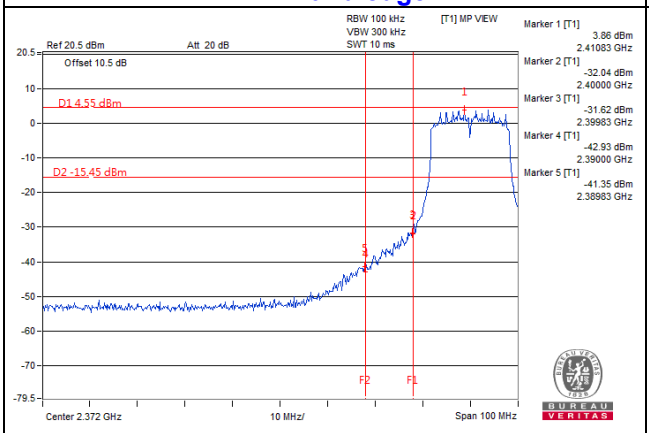


CH 13

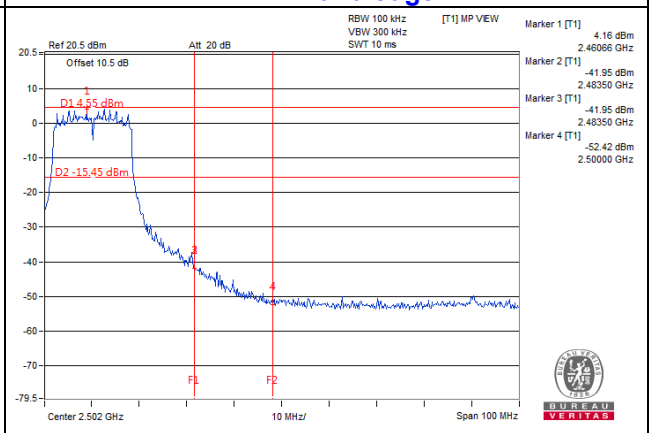




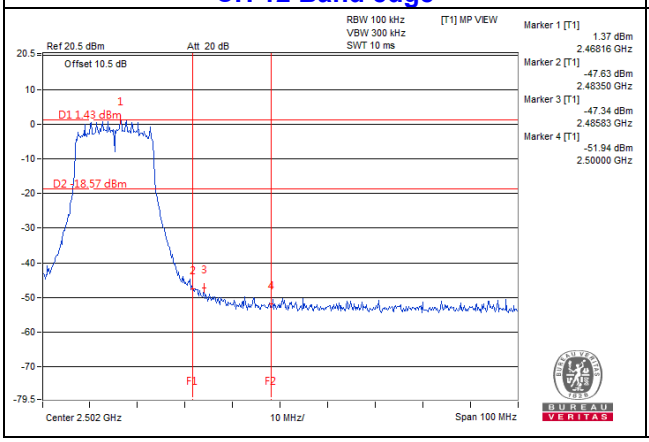
CH 1 Band edge



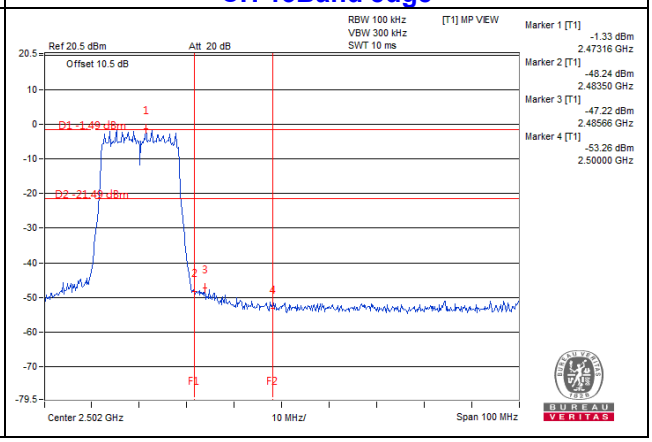
CH 11 Band edge



CH 12 Band edge

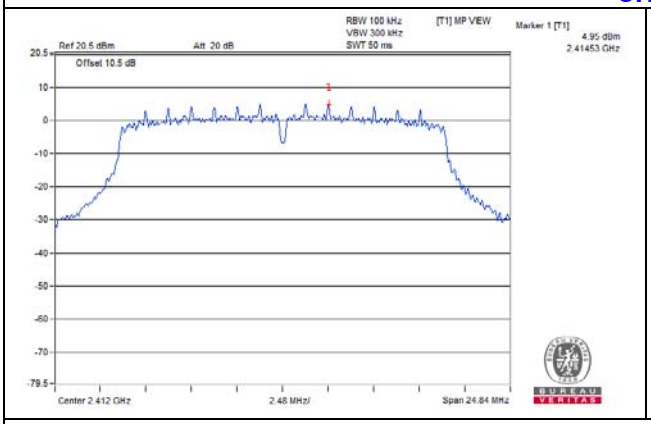


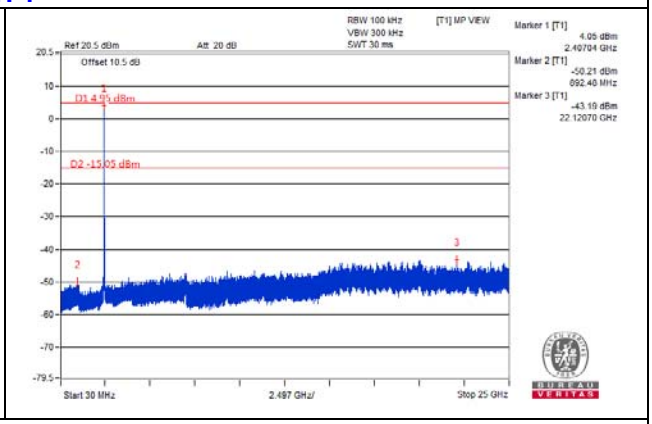
CH 13Band edge



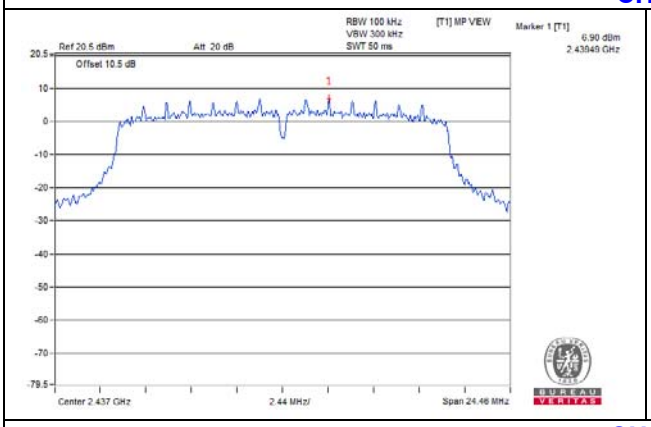
802.11n (20MHz): Chain 0

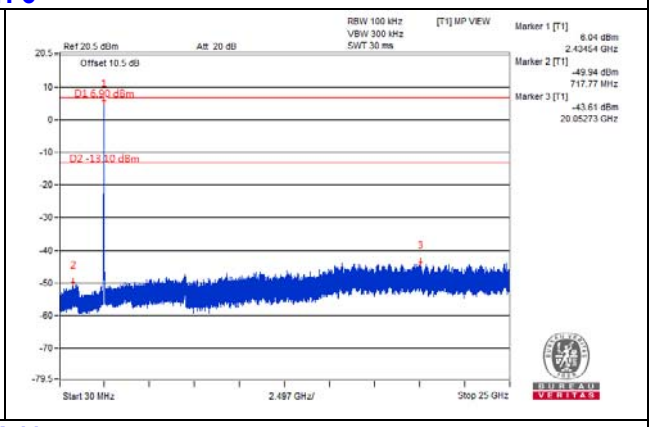
CH 1



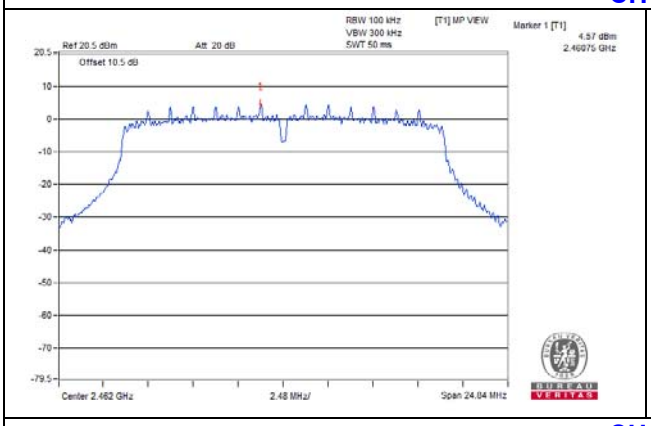


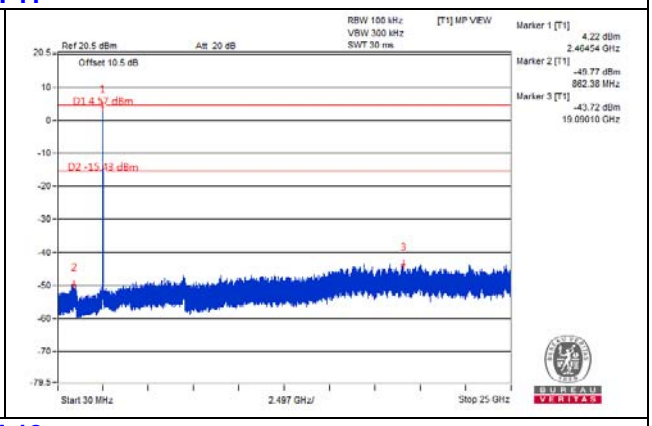
CH 6



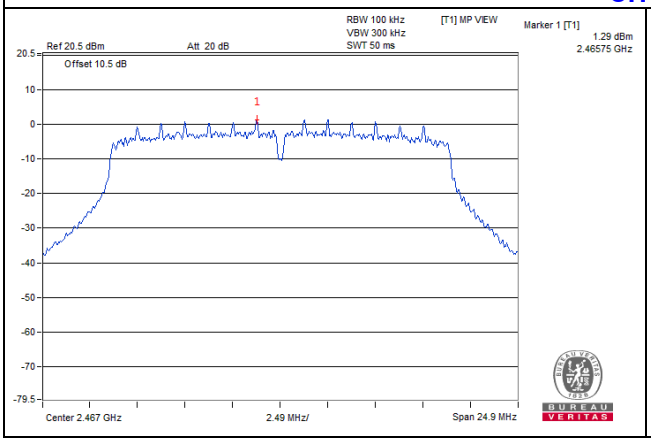


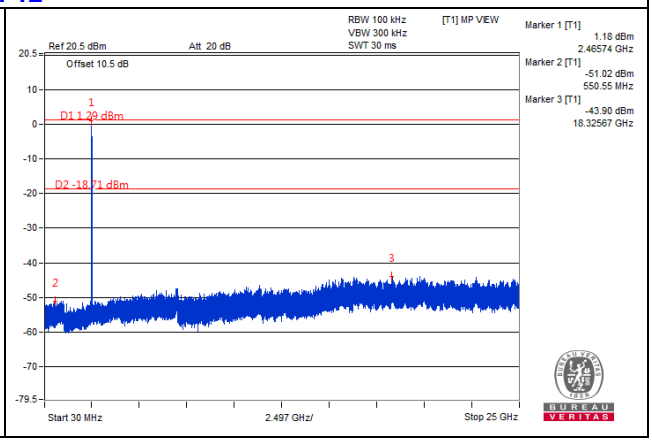
CH 11



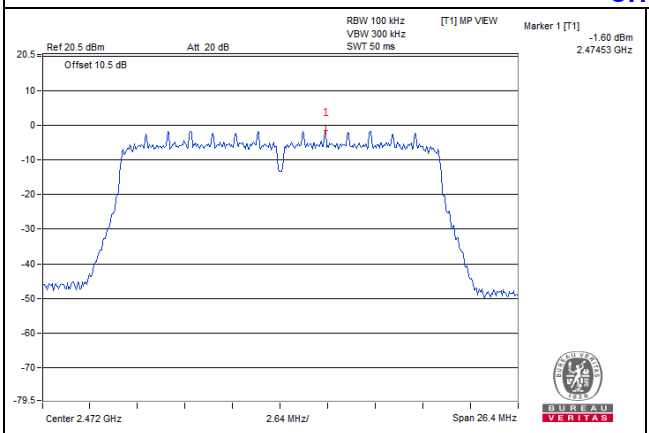


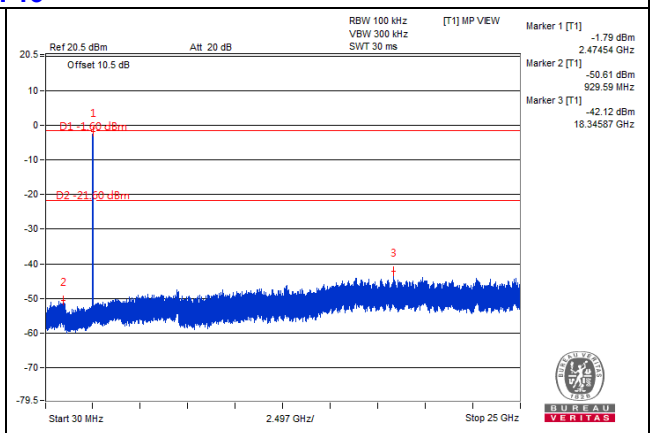
CH 12



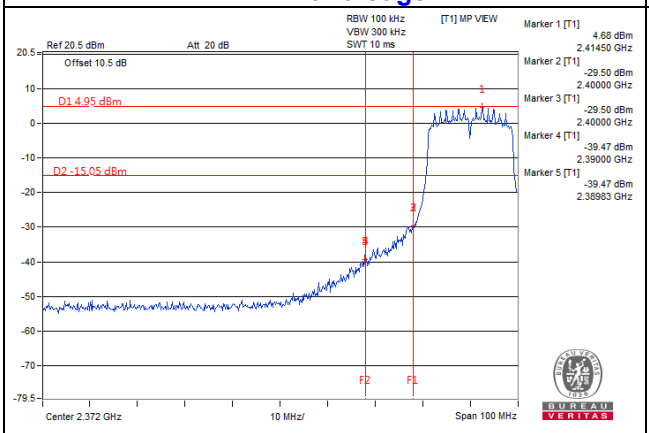


CH 13

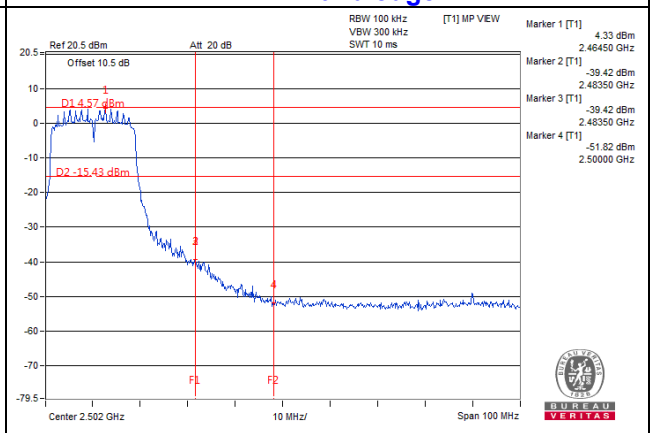




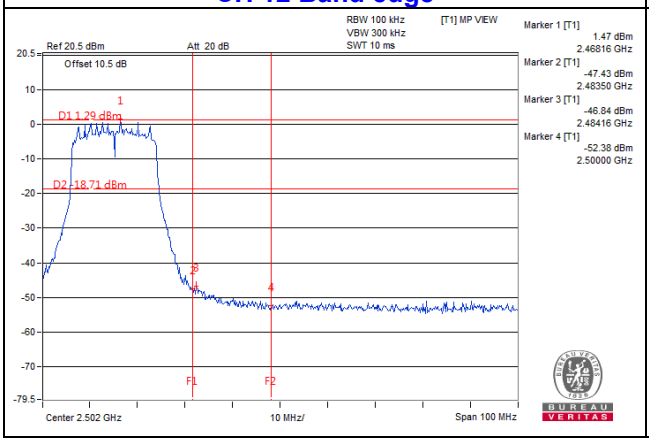
CH 1 Band edge



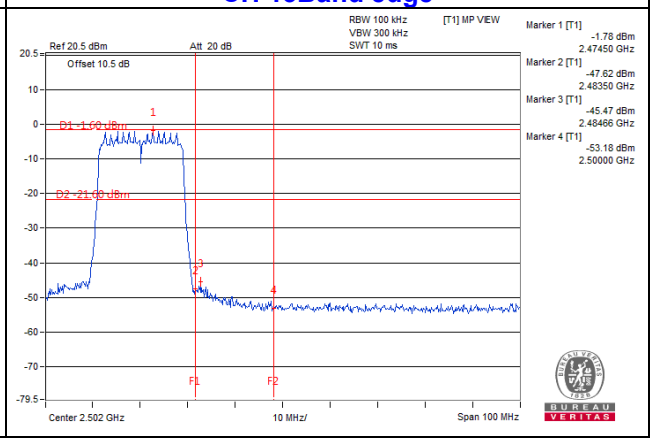
CH 11 Band edge



CH 12 Band edge

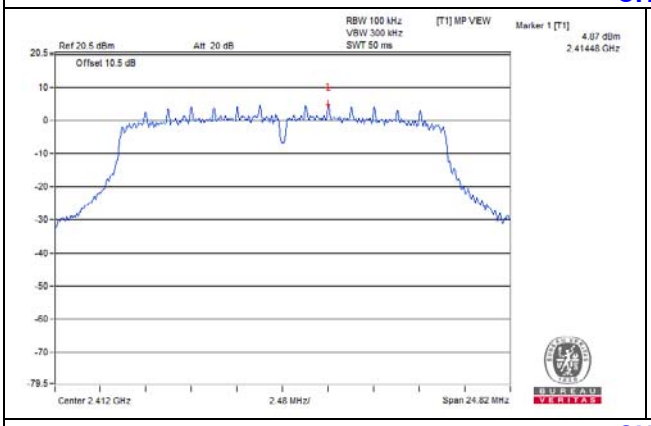


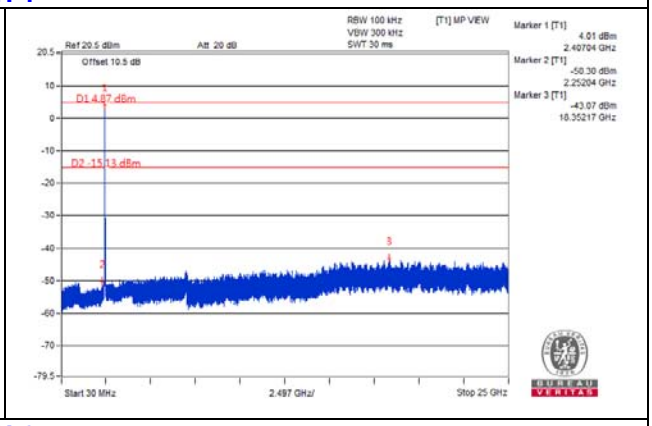
CH 13Band edge



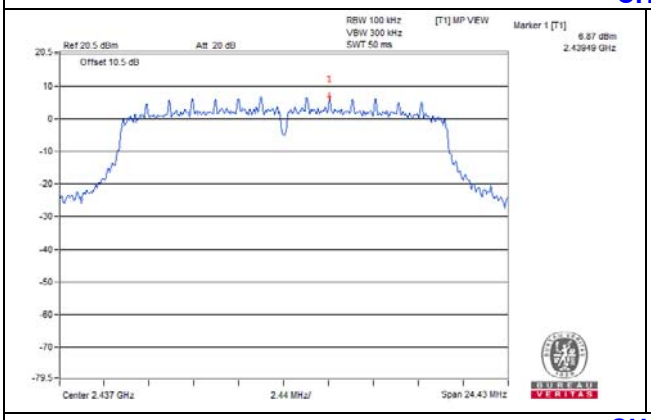
802.11n (20MHz): Chain 1

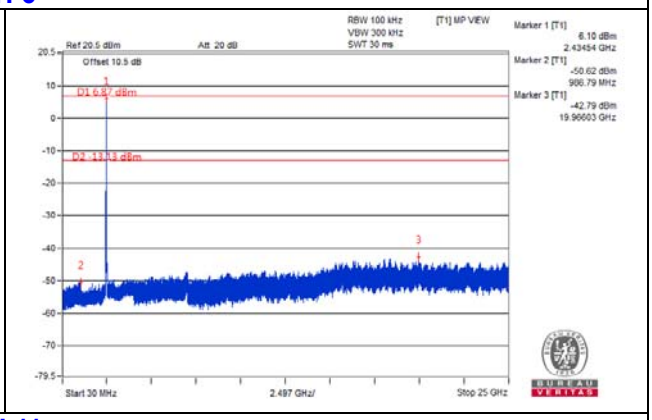
CH 1



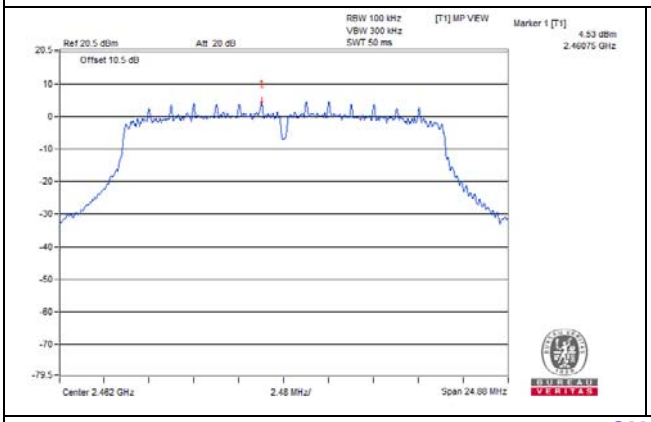


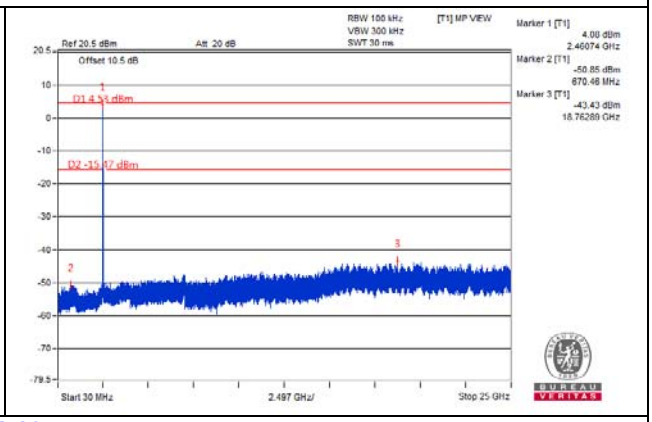
CH 6



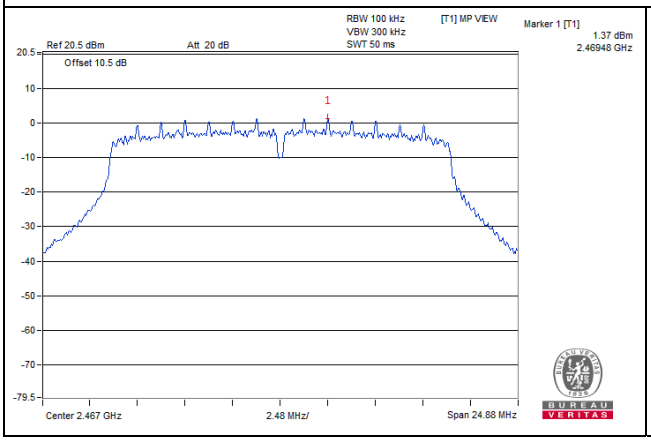


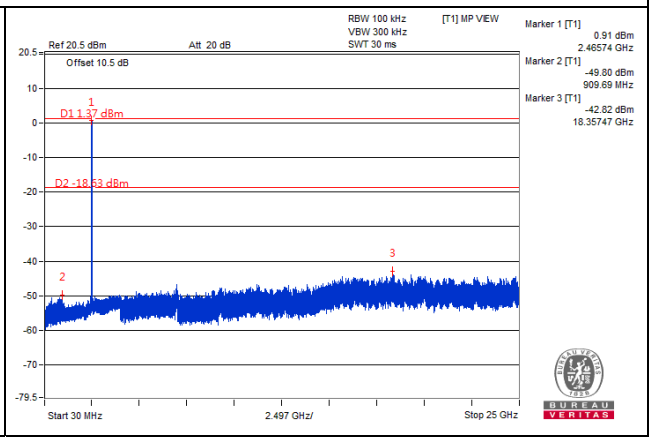
CH 11



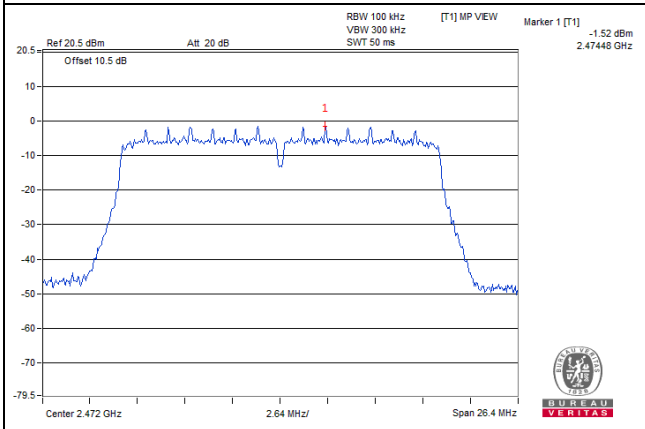


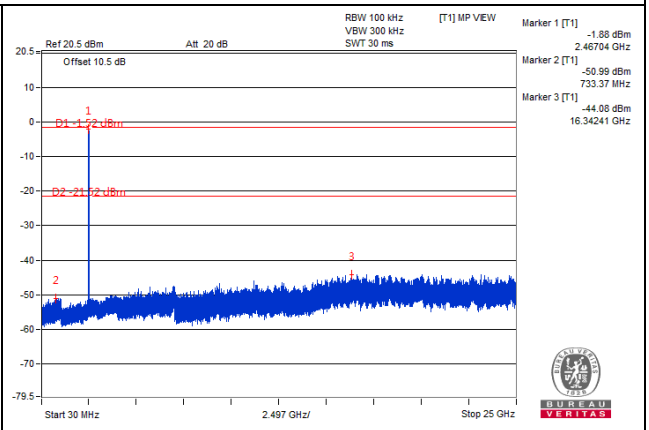
CH 12



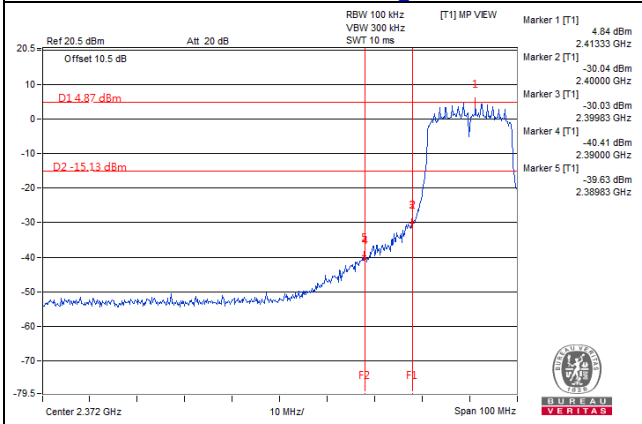


CH 13

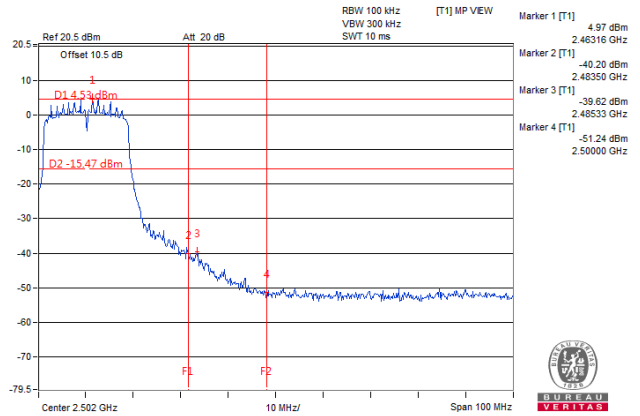




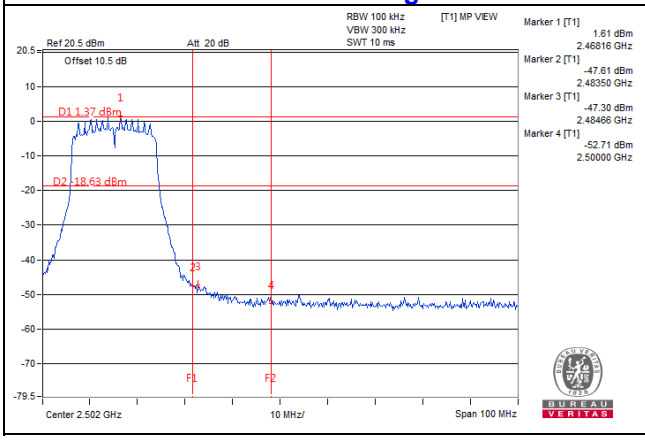
CH 1 Band edge



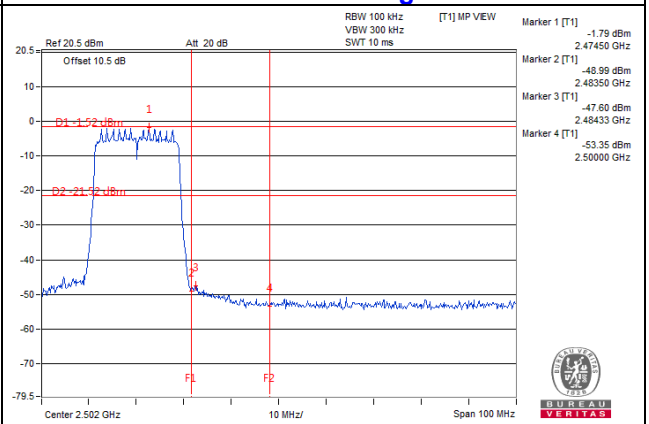
CH 11 Band edge



CH 12 Band edge

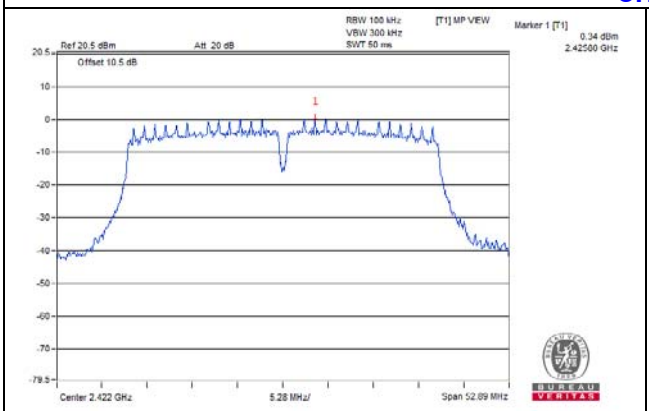


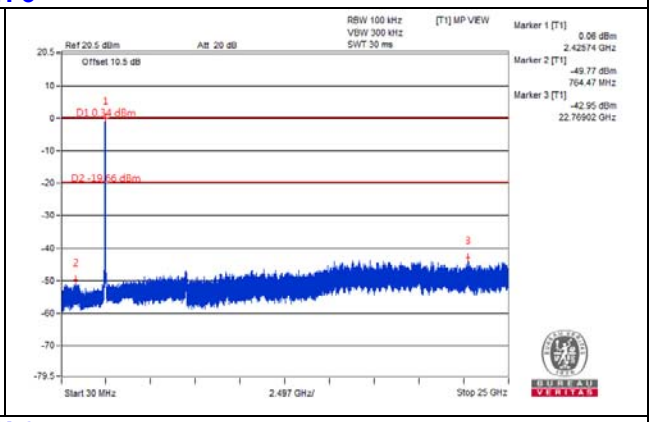
CH 13Band edge



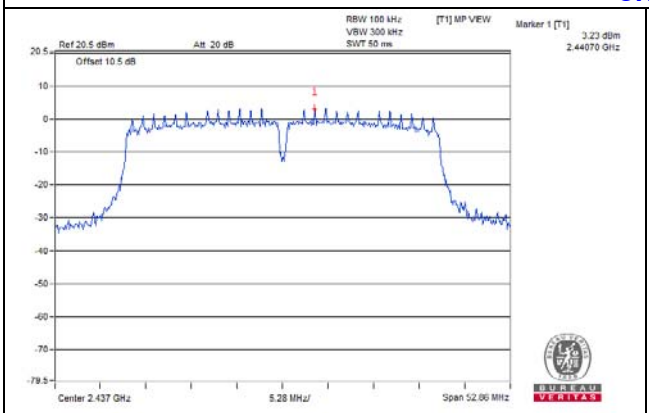
802.11n (40MHz): Chain 0

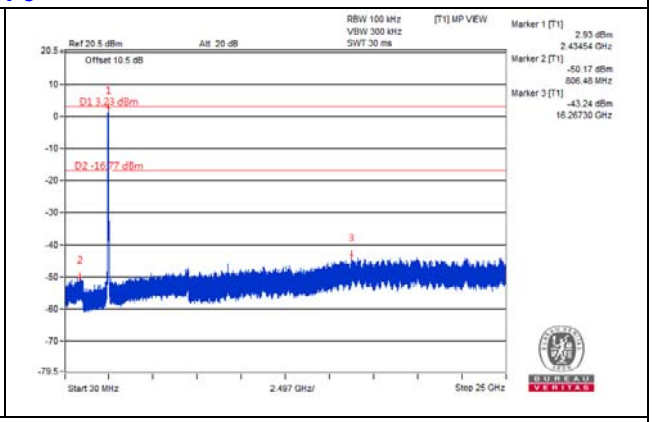
CH 3



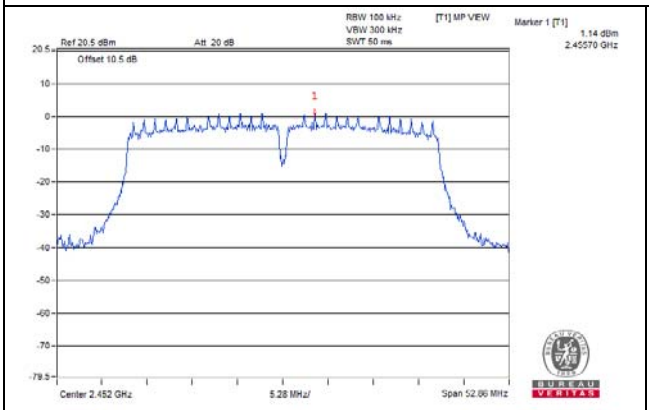


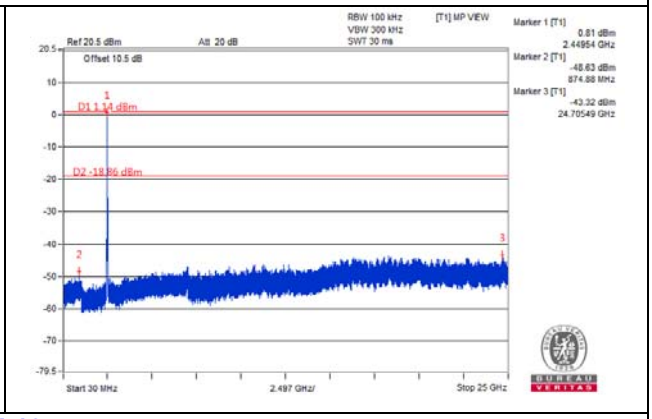
CH 6



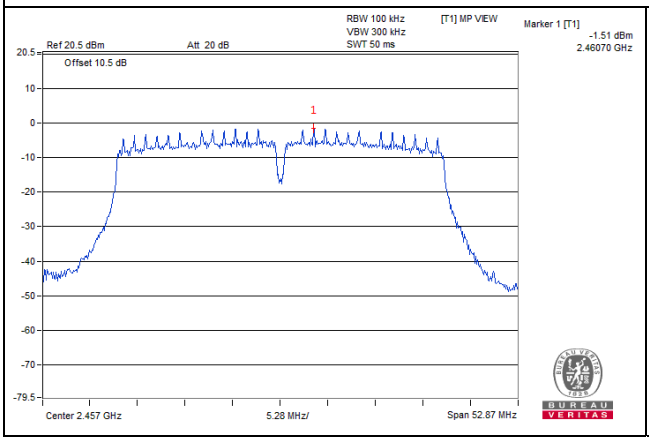


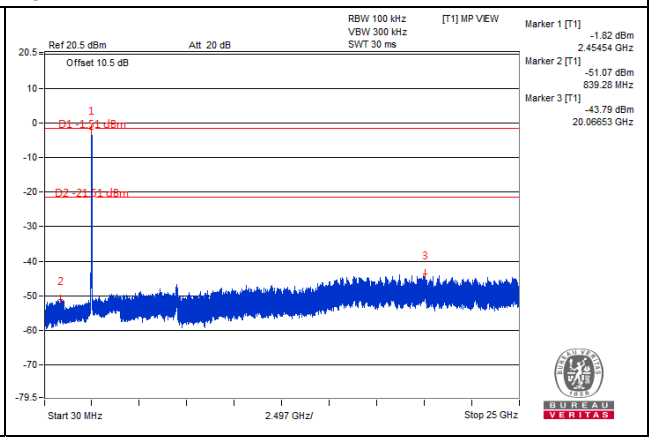
CH 9



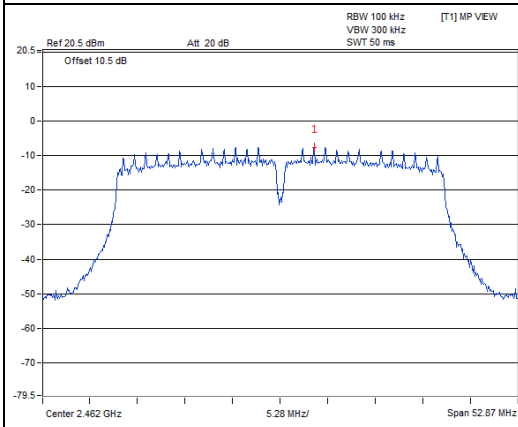


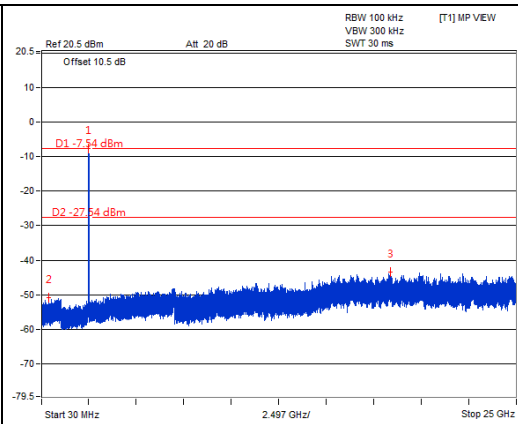
CH 10



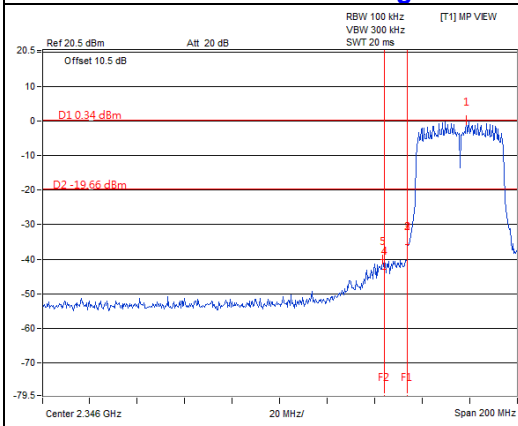


CH 11

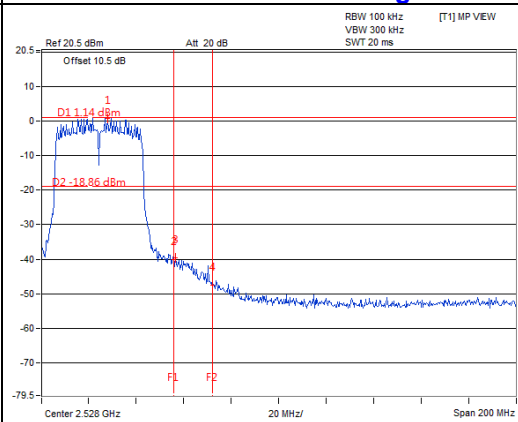




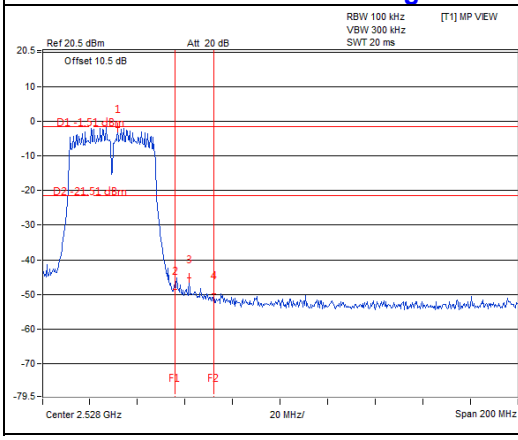
CH 3 Band edge



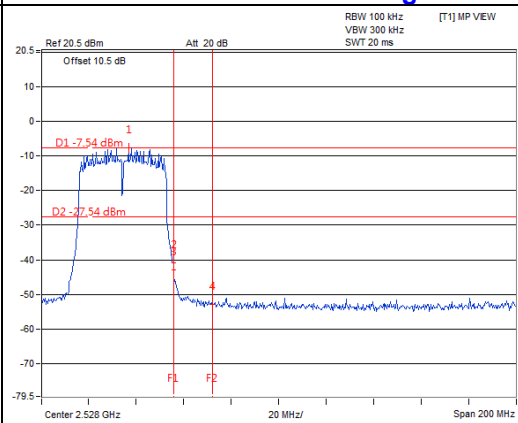
CH 9 Band edge



CH 10 Band edge

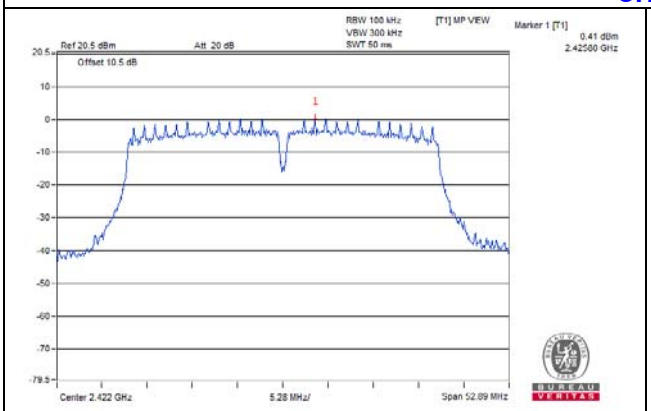


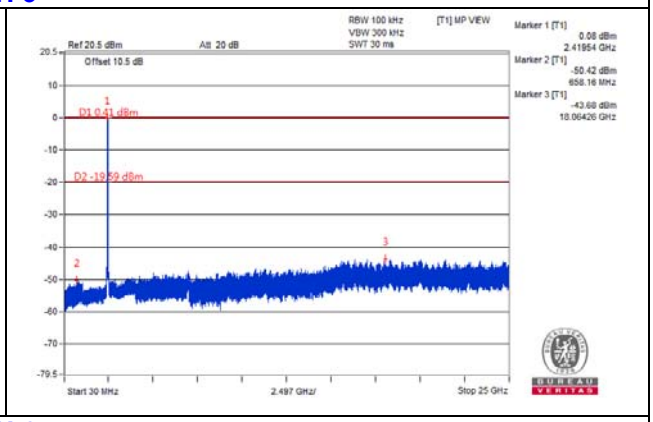
CH 11 Band edge



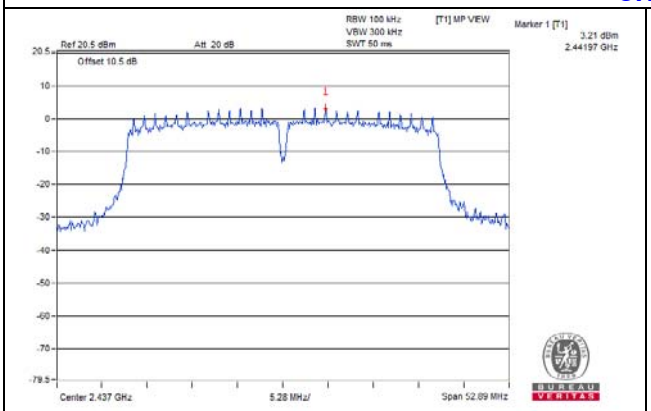
802.11n (40MHz): Chain 1

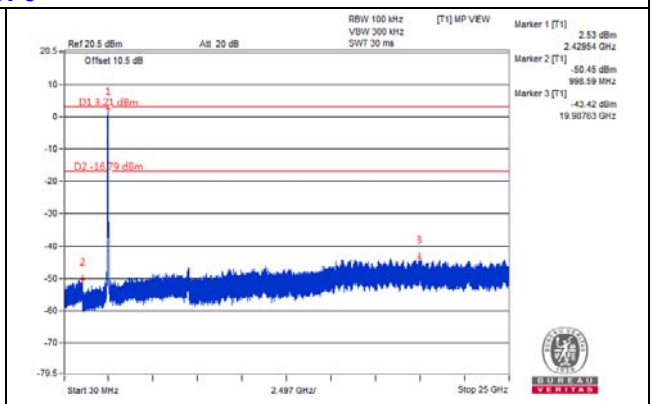
CH 3



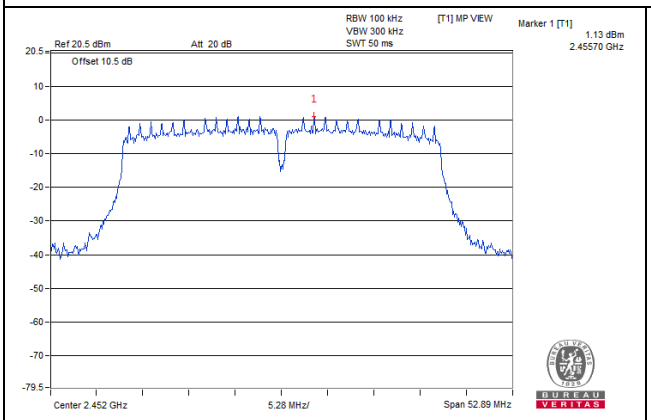


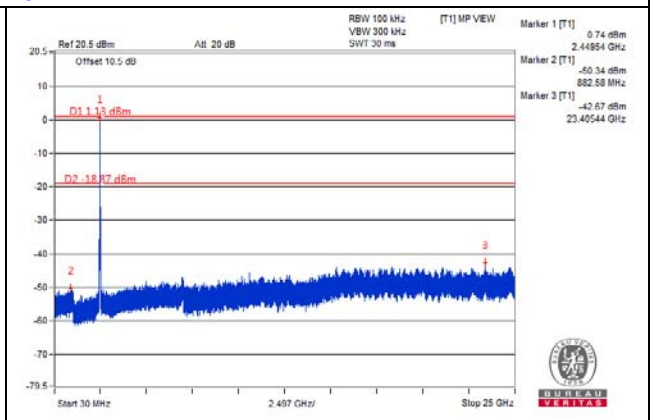
CH 6



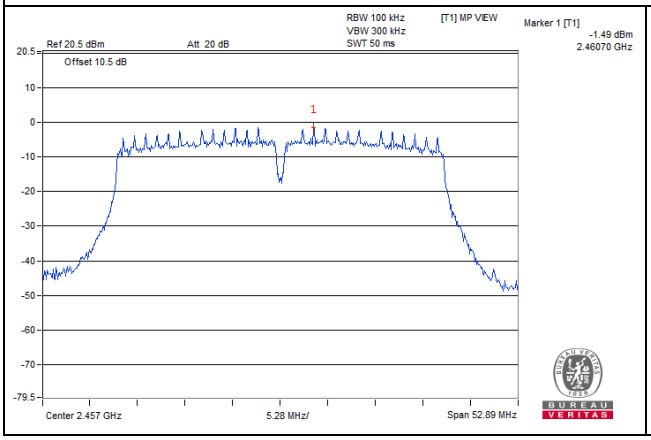


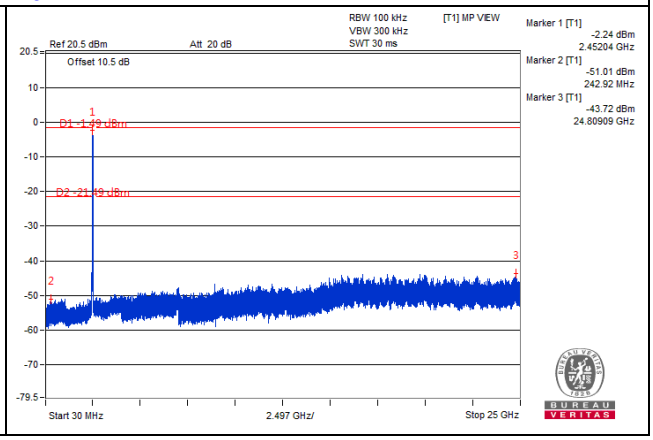
CH 9



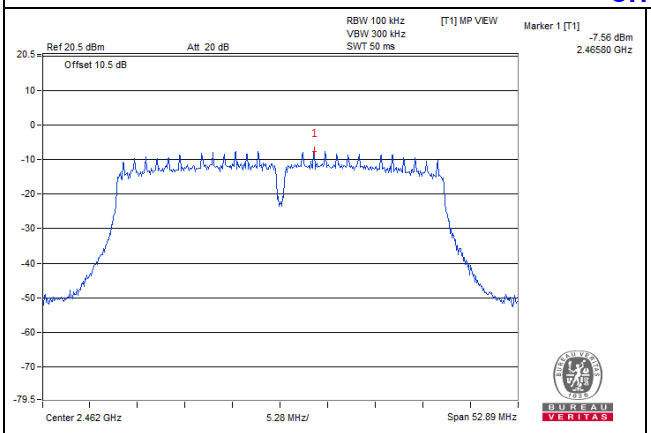


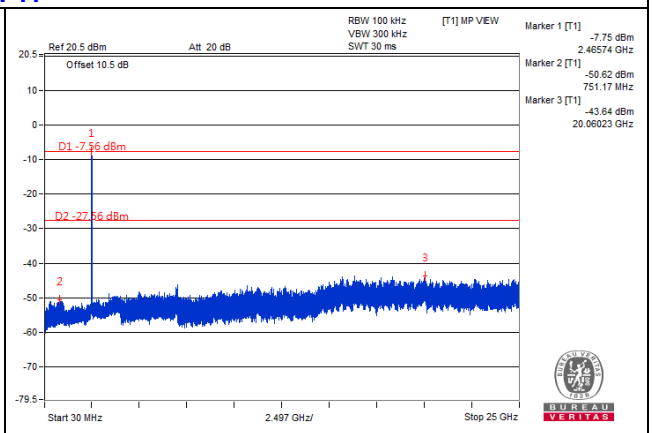
CH 10



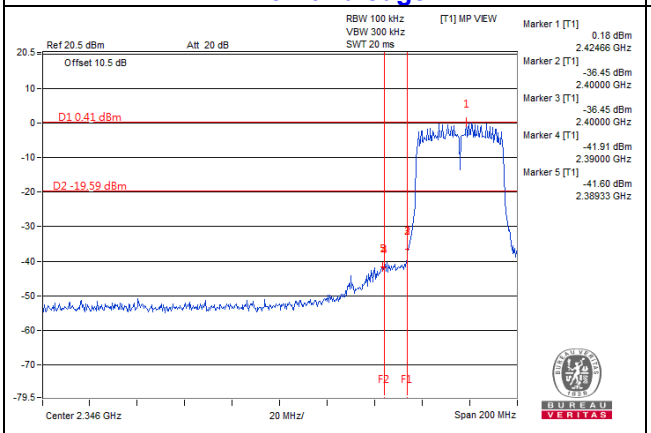


CH 11

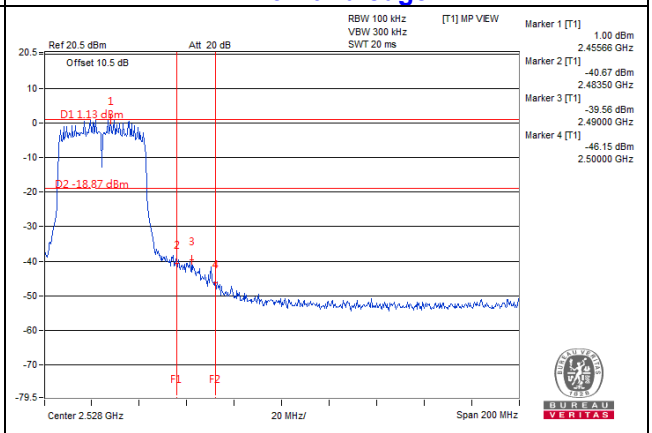




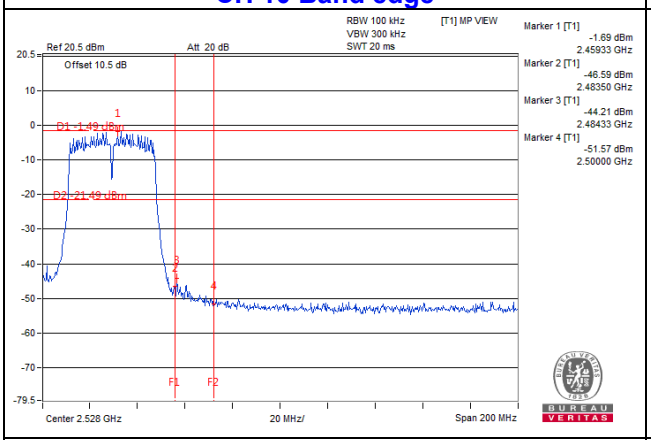
CH 3 Band edge



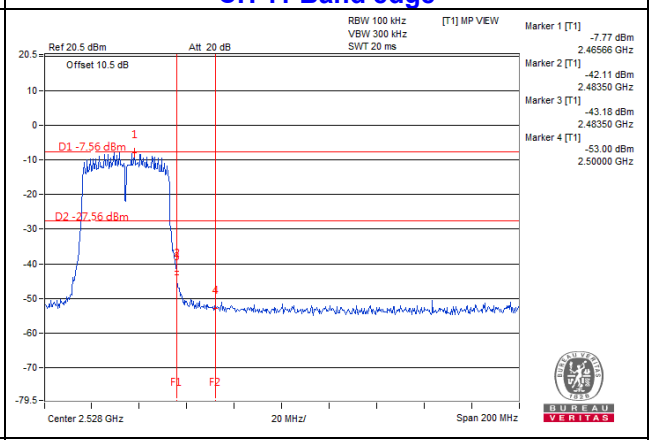
CH 9 Band edge



CH 10 Band edge



CH 11 Band edge



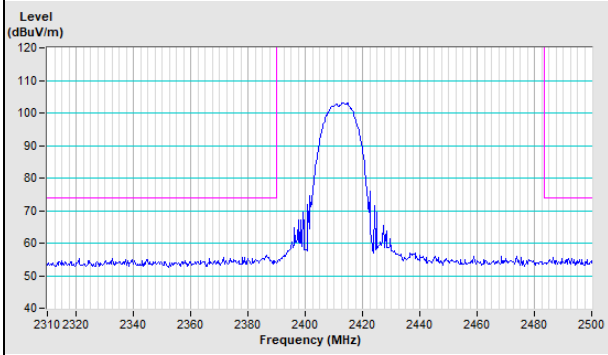
Annex A- Band Edge Measurement

Mode A

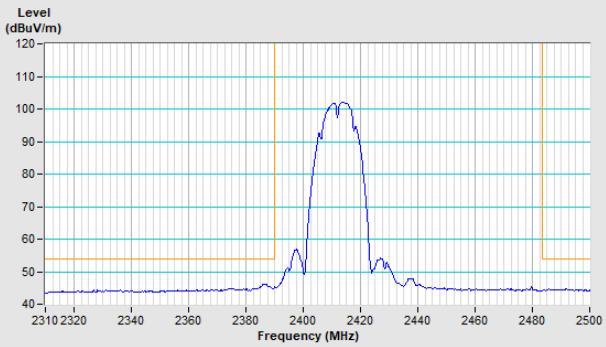
802.11b

Channel 1

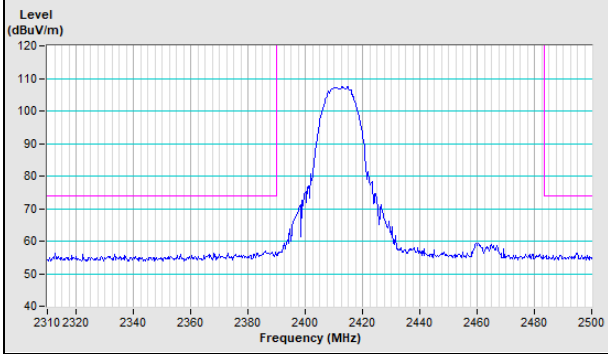
Horizontal (Peak)



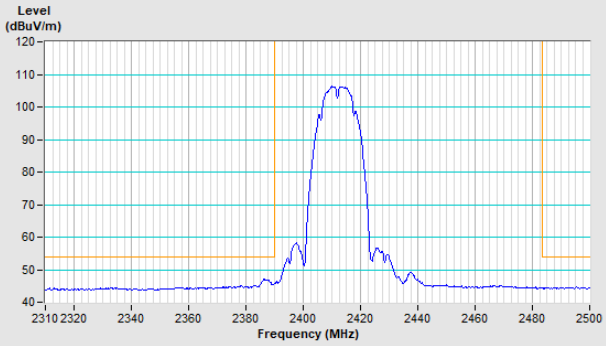
Horizontal (Average)



Vertical (Peak)

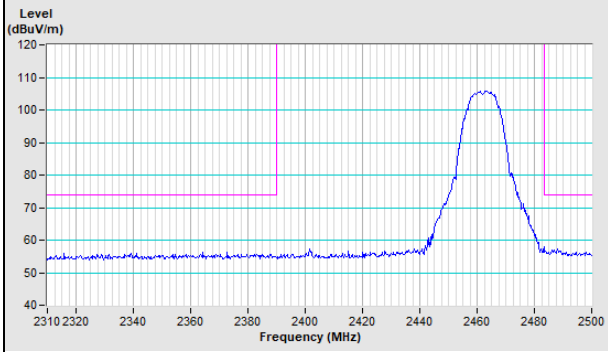


Vertical (Average)

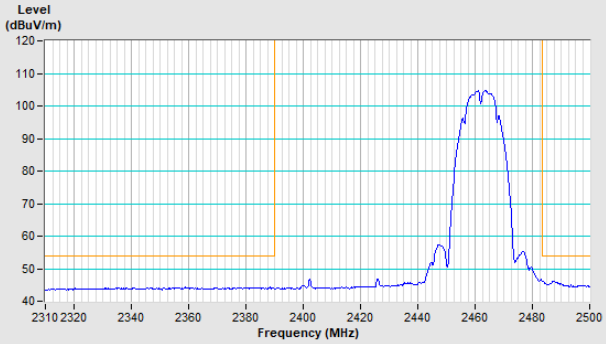


Channel 11

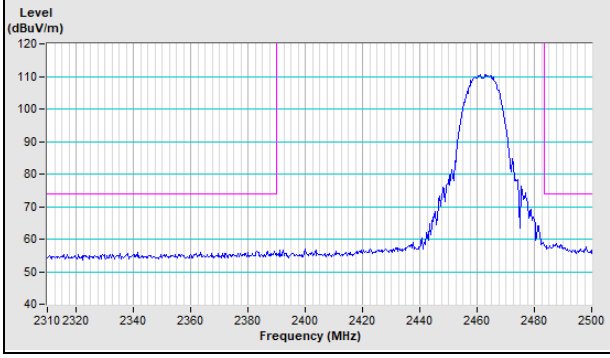
Horizontal (Peak)



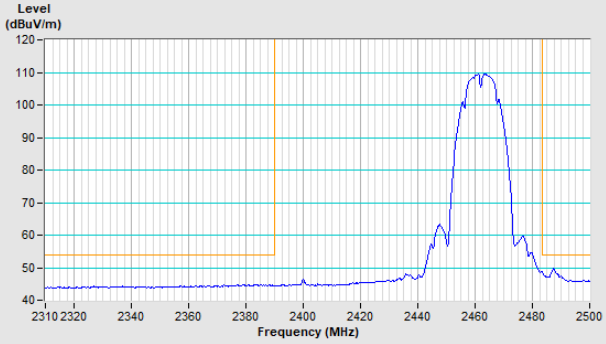
Horizontal (Average)



Vertical (Peak)

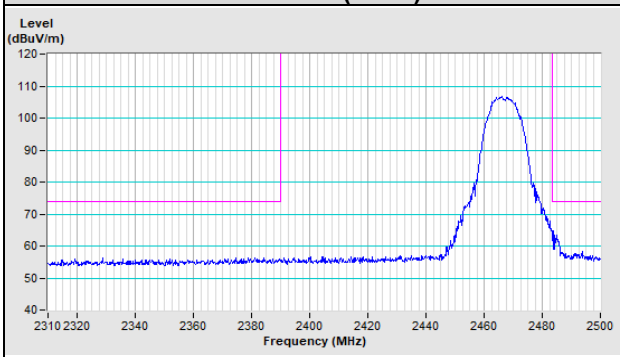


Vertical (Average)

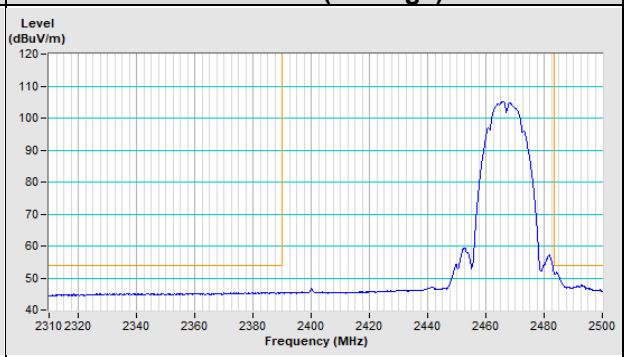


Channel 12

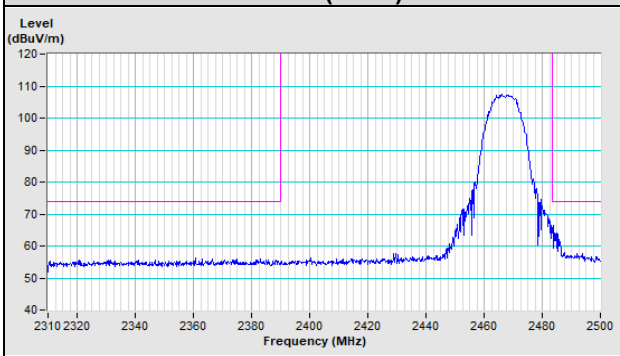
Horizontal (Peak)



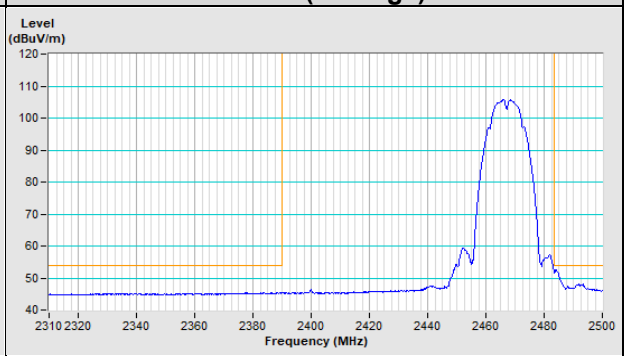
Horizontal (Average)



Vertical (Peak)

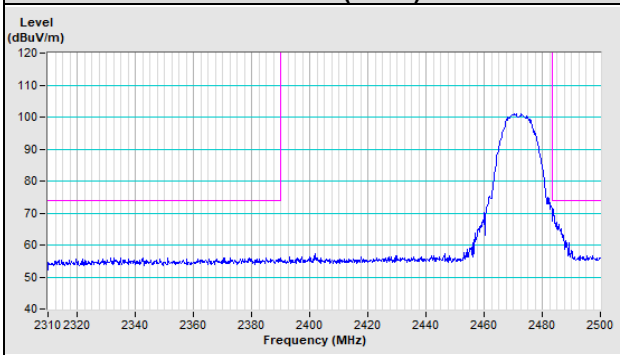


Vertical (Average)

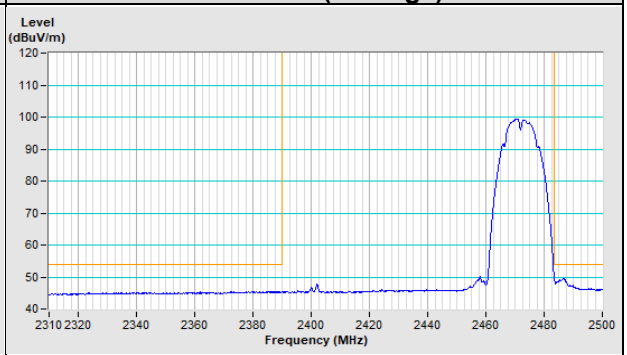


Channel 13

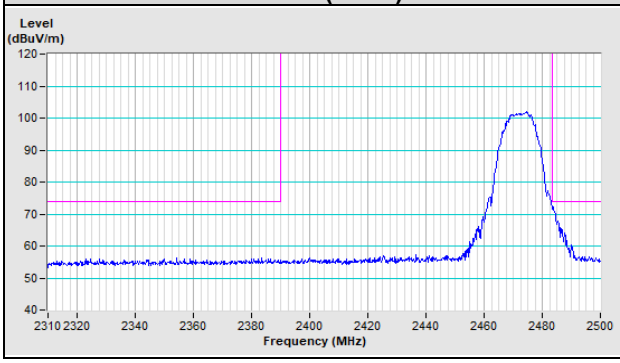
Horizontal (Peak)



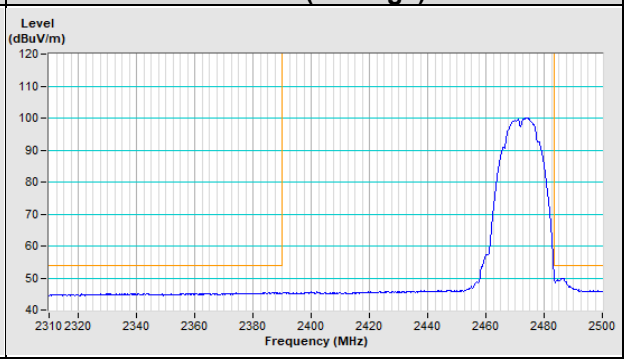
Horizontal (Average)



Vertical (Peak)



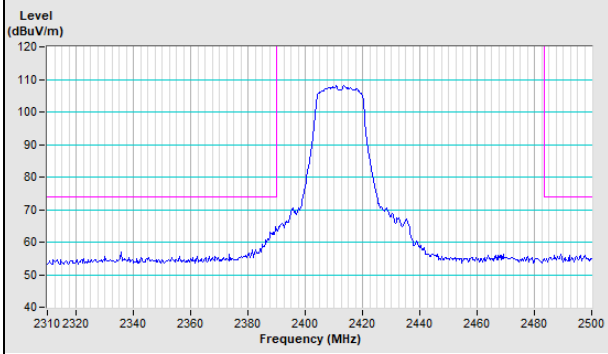
Vertical (Average)



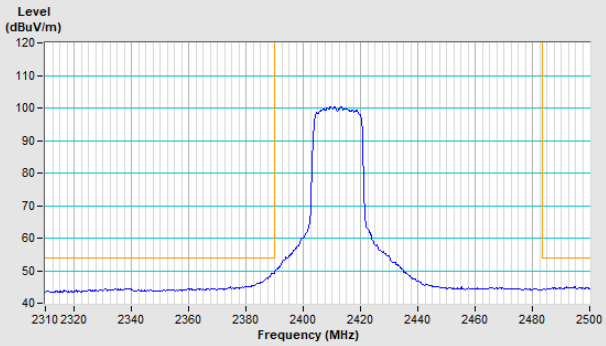
802.11g

Channel 1

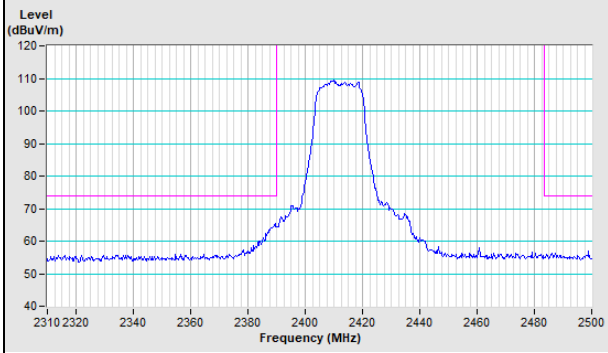
Horizontal (Peak)



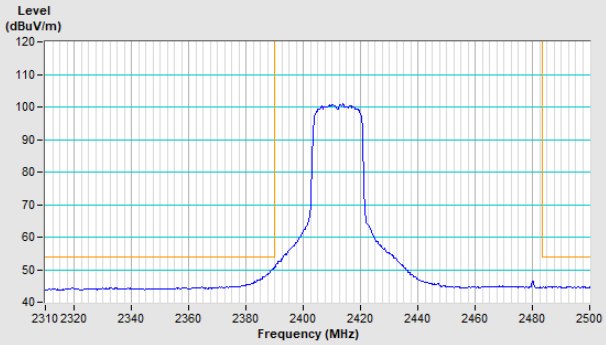
Horizontal (Average)



Vertical (Peak)

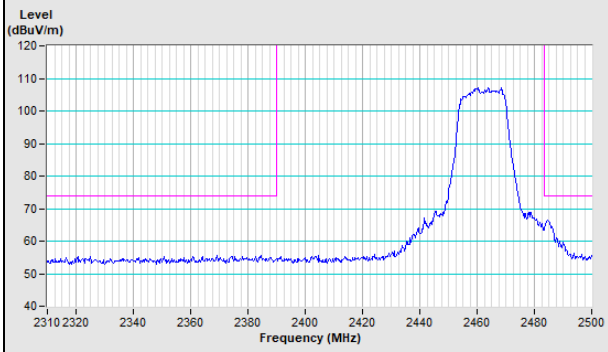


Vertical (Average)

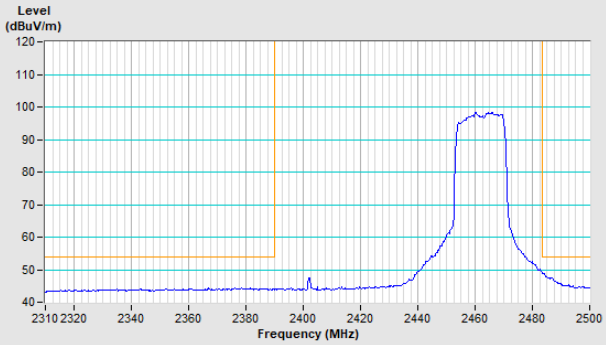


Channel 11

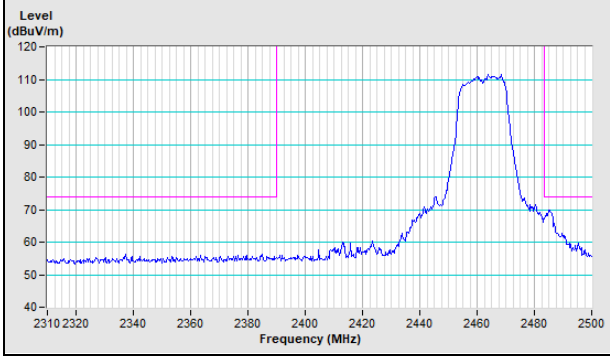
Horizontal (Peak)



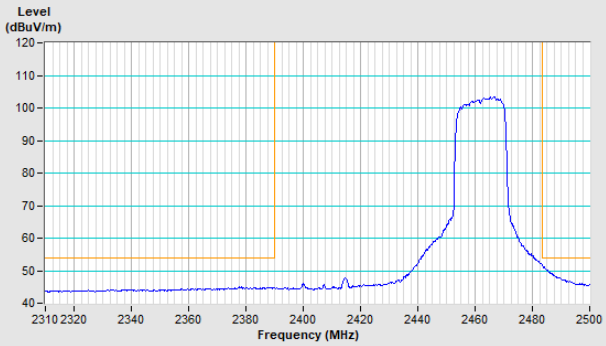
Horizontal (Average)



Vertical (Peak)

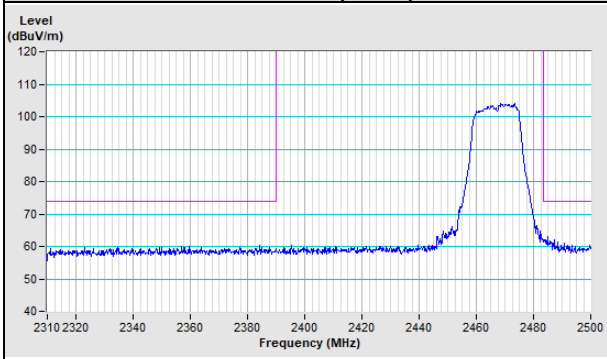


Vertical (Average)

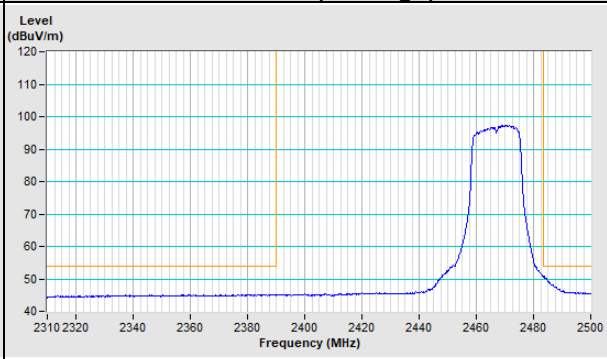


Channel 12

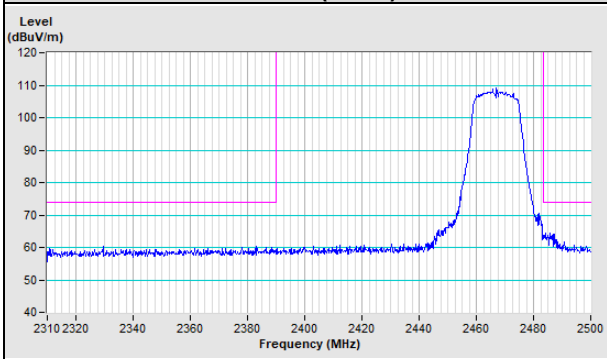
Horizontal (Peak)



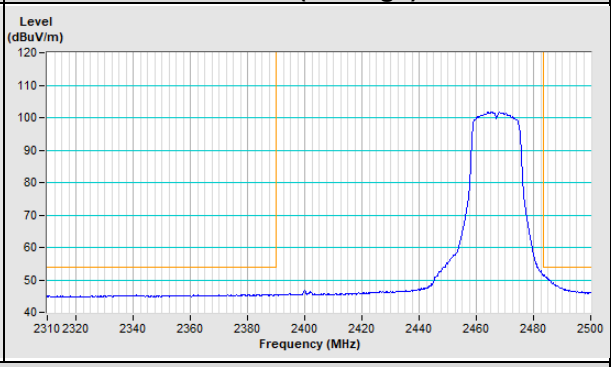
Horizontal (Average)



Vertical (Peak)

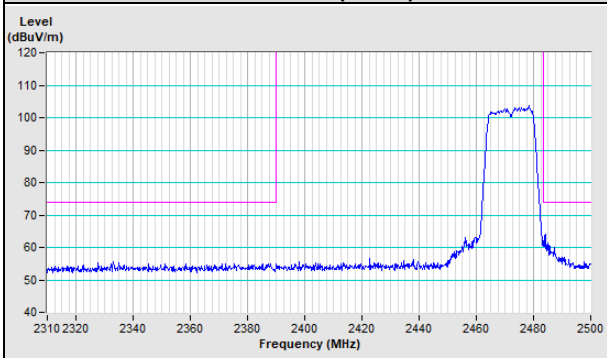


Vertical (Average)

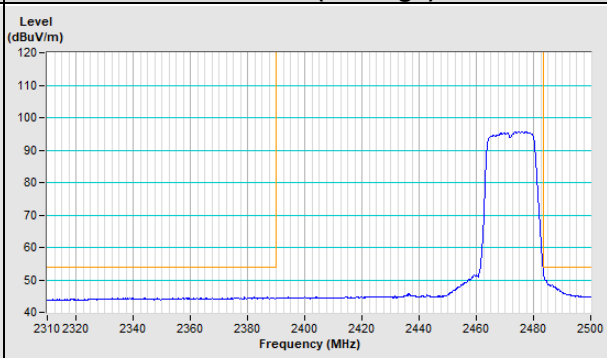


Channel 13

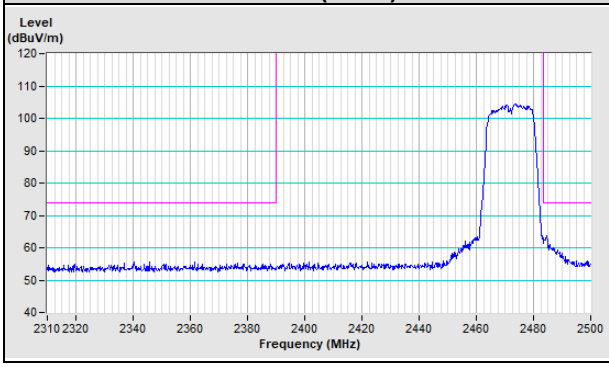
Horizontal (Peak)



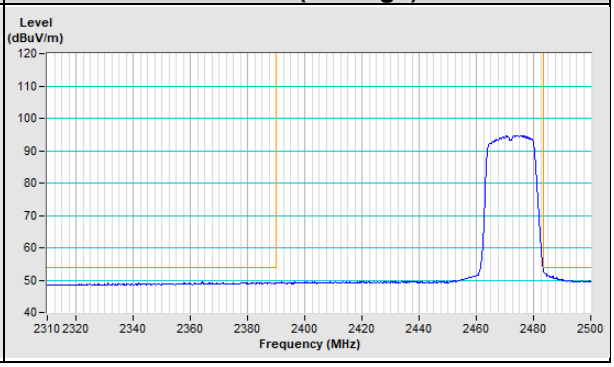
Horizontal (Average)



Vertical (Peak)



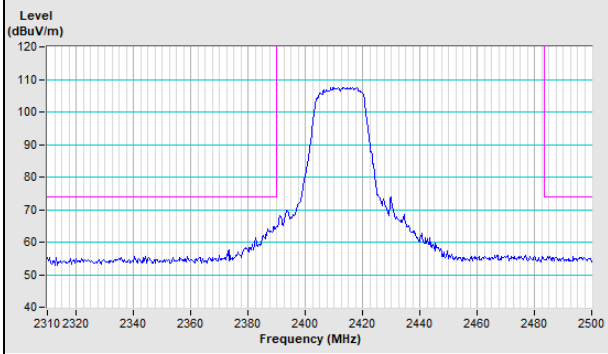
Vertical (Average)



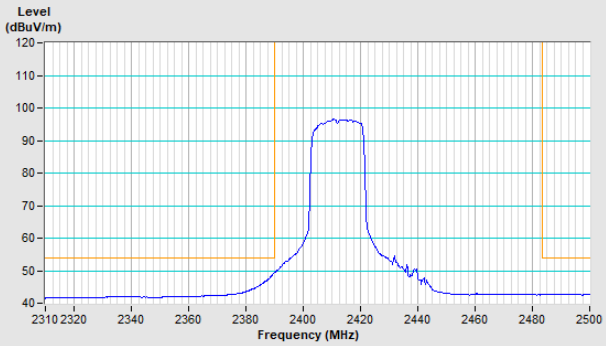
802.11n (20MHz)

Channel 1

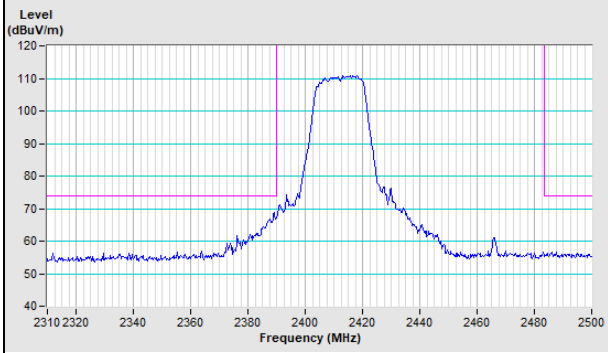
Horizontal (Peak)



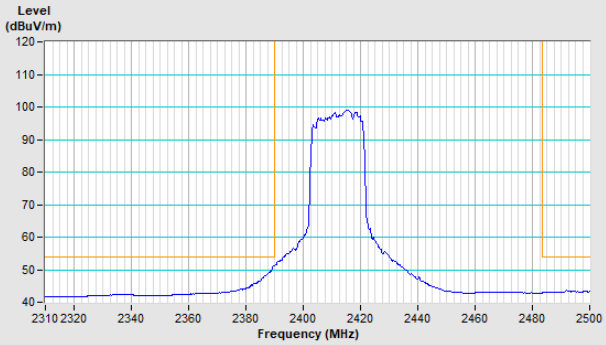
Horizontal (Average)



Vertical (Peak)

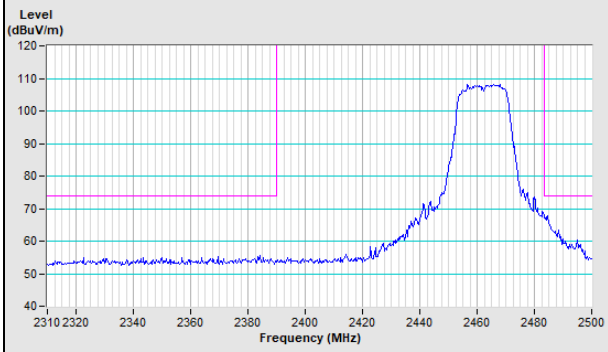


Vertical (Average)

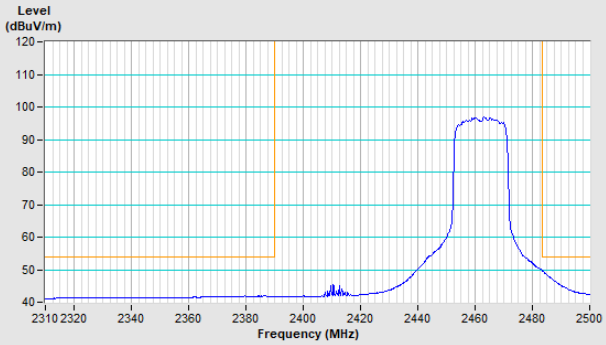


Channel 11

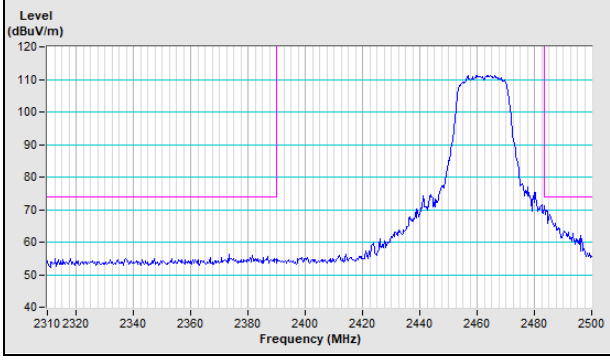
Horizontal (Peak)



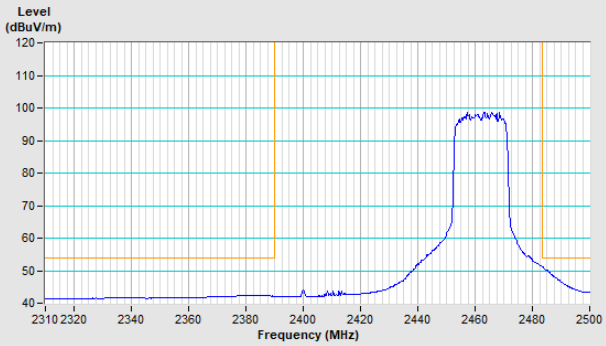
Horizontal (Average)



Vertical (Peak)

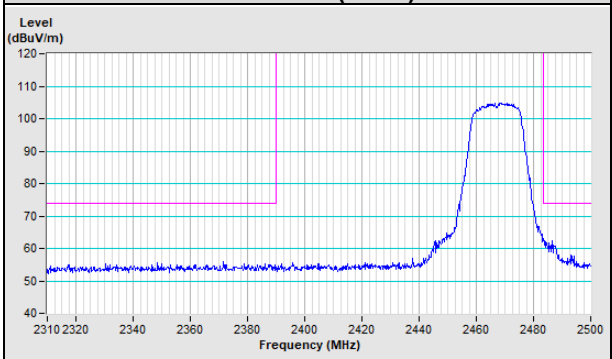


Vertical (Average)

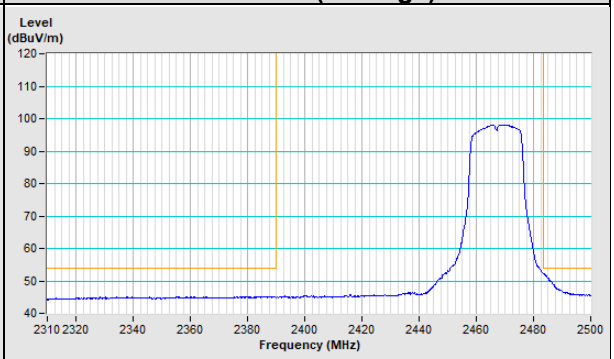


Channel 12

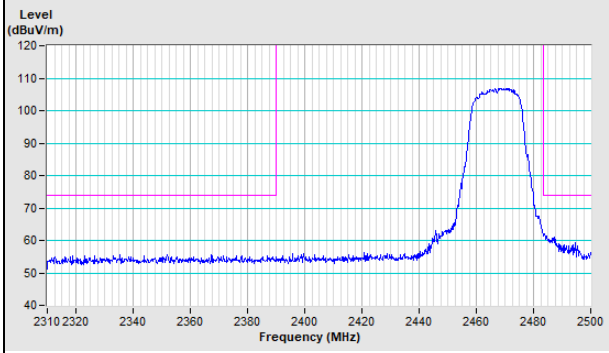
Horizontal (Peak)



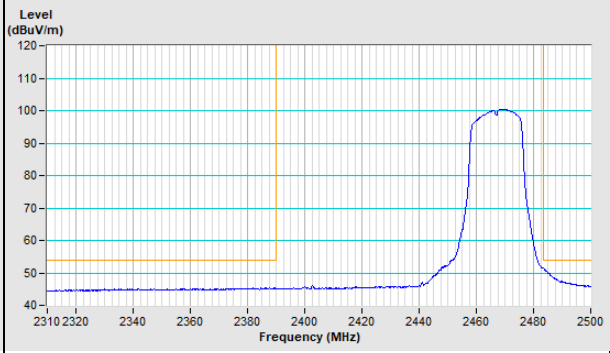
Horizontal (Average)



Vertical (Peak)

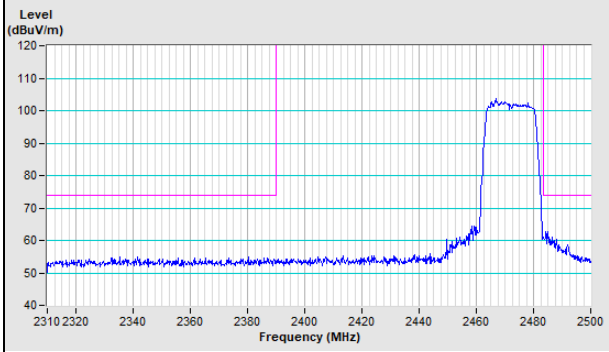


Vertical (Average)



Channel 13

Horizontal (Peak)



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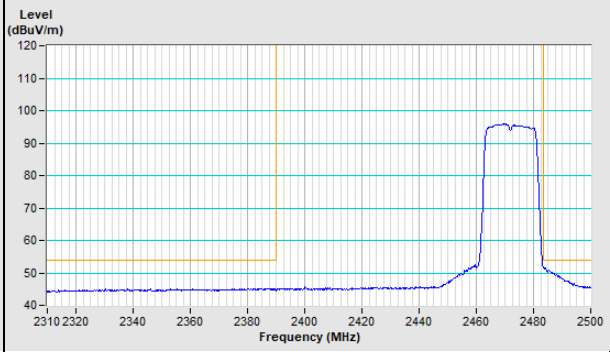
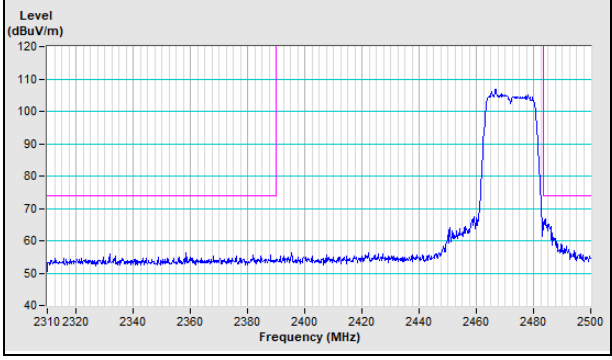


Vertical (Peak)



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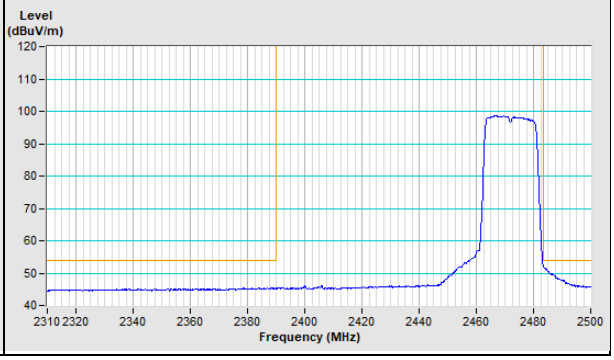
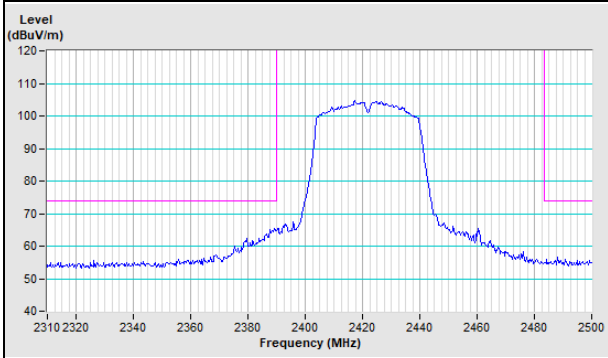


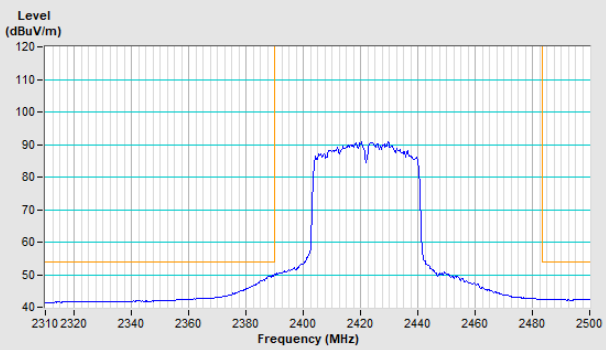
802.11n (40MHz)

Channel 3

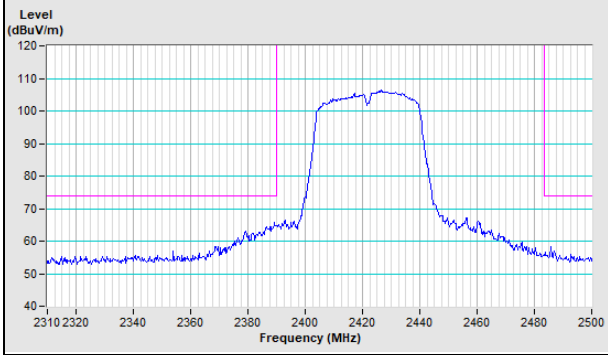
Horizontal (Peak)



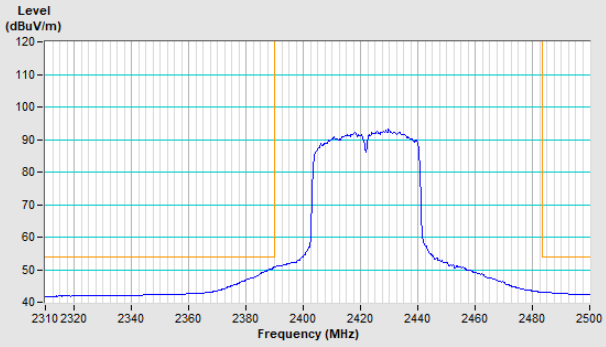
Horizontal (Average)



Vertical (Peak)

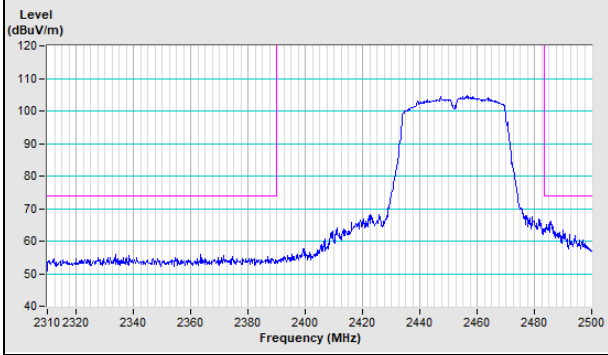


Vertical (Average)

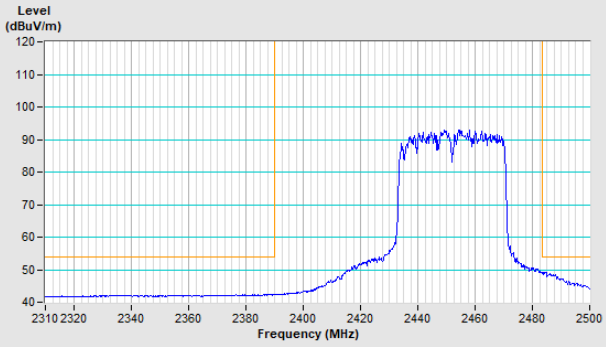


Channel 9

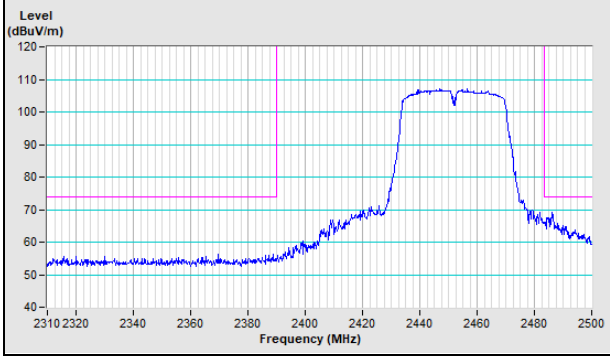
Horizontal (Peak)



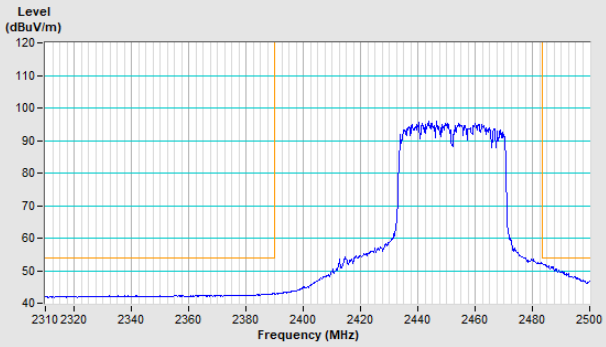
Horizontal (Average)



Vertical (Peak)

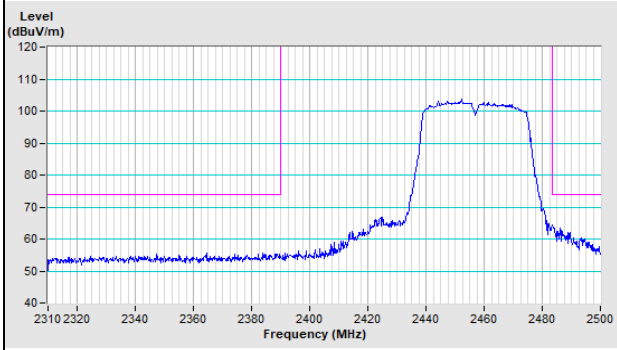


Vertical (Average)



Channel 10

Horizontal (Peak)



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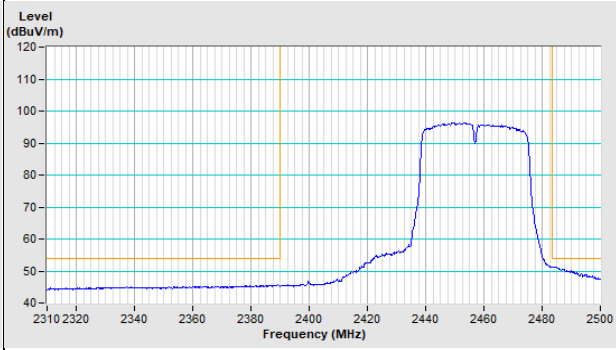
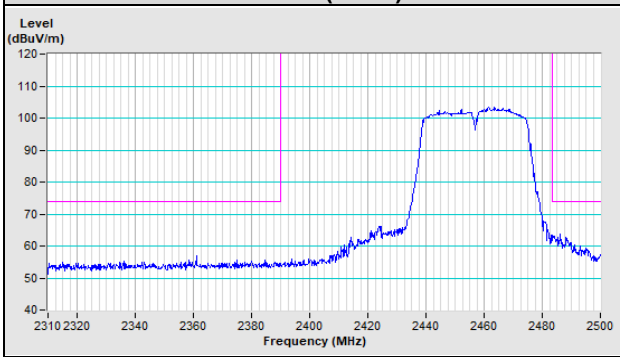
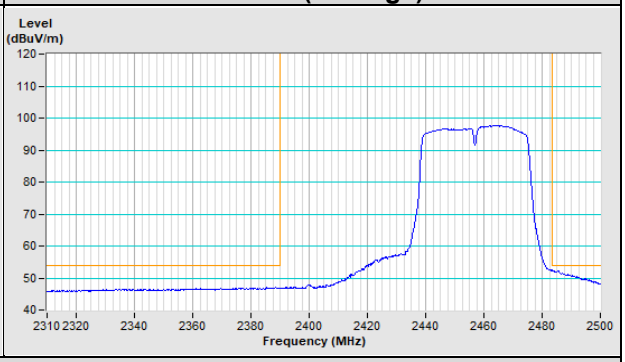


Vertical (Peak)

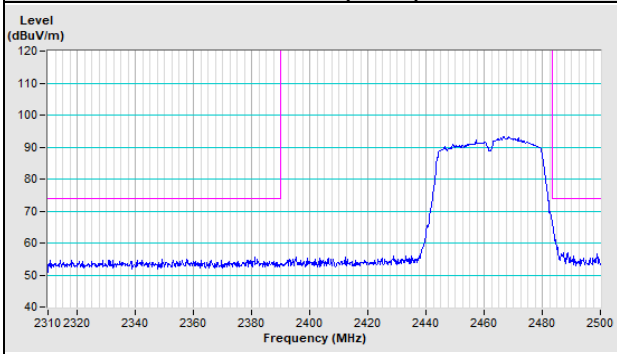


Vertical (Average)

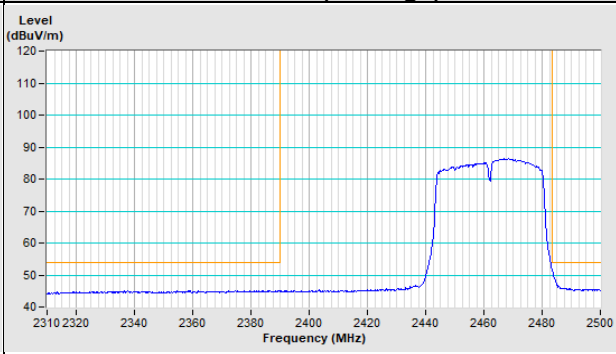


Channel 11

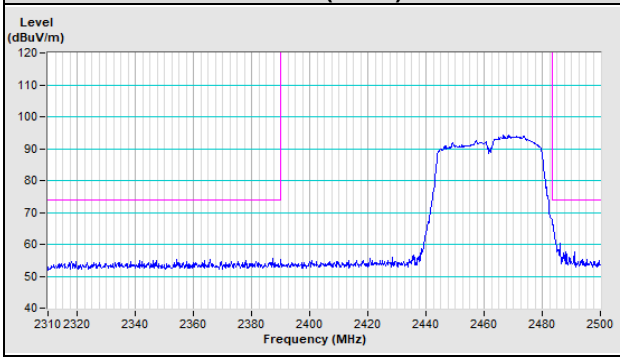
Horizontal (Peak)



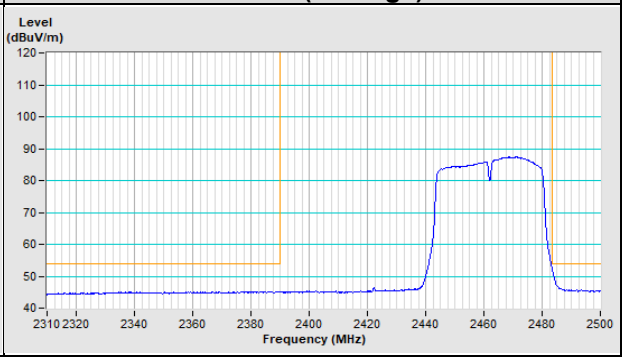
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



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 according to ISO/IEC 17025.

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

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

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

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