FCC Test Report

Report No.:	RF180109C12
FCC ID:	PD5-LM-WESA0440A
Test Model:	LM-WESA0440A
Received Date:	Jan. 09, 2018
Test Date:	Jan. 31 ~ Feb. 13, 2018
Issued Date:	Feb. 21, 2018
Applicant:	Delta Networks, Inc.
Address:	No. 252, Shang Ying Rd., Kuei San District, Taoyuan City 33341, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)
FCC Registration/ Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF180109C12	Original release.	Feb. 21, 2018

1 Certificate of Conformity

Product:	802.11 b/g/n/ac WIFI AP
Test Model:	LM-WESA0440A
Sample Status:	Engineering sample
Applicant:	Delta Networks, Inc.
Test Date:	Jan. 31 ~ Feb. 13, 2018
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 : _____ , **Date:** Feb. 21, 2018

Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** Feb. 21, 2018

Bruce Chen / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -6.73dB at 0.44645MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2483.50MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is I-PEX not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	802.11 b/g/n/ac WIFI AP
Test Model	LM-WESA0440A
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter 42.5Vdc-57Vdc from PoE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 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 600Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	CDD Mode: 895.996mW Beamforming Mode: 250.403mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	NA

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Band	Modulation Mode	Beamforming Mode	TX Function
2.4GHz	802.11b	Not Support	4TX
	802.11g	Not Support	4TX
	802.11n (HT20)	Support (CDD / Nss=1 / Nss=2)	4TX
	802.11n (HT40)	Support (CDD / Nss=1 / Nss=2)	4TX
5GHz	802.11a	Not Support	4TX
	802.11n (HT20)	Support (CDD / Nss=1 / Nss=2)	4TX
	802.11n (HT40)	Support (CDD / Nss=1 / Nss=2)	4TX
	802.11ac (VHT80)	Support (CDD / Nss=1 / Nss=2)	4TX
	802.11ac (VHT80+VHT80)	Support (CDD / Nss=1)	2TX+2TX

* For 802.11a/b/g, the EUT doesn't support Beamforming mode.
* The modulation and bandwidth are similar for 802.11n mode for 20MHz / 40MHz and 802.11ac mode for V20MHz / V40MHz, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)
* For 5GHz band 802.11n and 802.11ac, after pre-tested two modes (with beamforming mode Nss=1 / 2 and CDD mode) found CDD mode was the worst, therefore chosen for final test for radiated emission and power line conducted emission test and presented in the test report.

2. The EUT uses following antennas.

Antenna Type	PCB PIFA							
Antenna Connector	I-PEX							
Antenna Gain (dBi)								
	2400	2450	2500	5150	5320	5550	5700	5850
Ant. 1	3.22	3.62	3.56	3.17	3.32	3.47	3.39	3.77
Ant. 2	3.45	3.48	3.32	3.01	3.18	3.31	3.52	3.70
Ant. 3	3.15	3.38	3.08	2.97	2.91	3.36	3.55	3.68
Ant. 4	3.01	3.23	3.15	2.86	3.10	3.39	3.34	3.71

3. The EUT uses following adapter & PoE.

Adapter (Support unit)	
Brand	DELTA
Model	ADP-30HW B
Input Power	100-240Vac~50/60Hz 0.8A
Output Power	12.0Vdc / 2.5A
Power Line	1.45m DC cable without core attached on adapter

PoE (Support unit)	
Brand	ZyXEL
Model	PoE12-HP
Input Power	100-240Vac~,50/60Hz, 1.5A max
Output Power	42.5Vdc-57Vdc, 42.1 Watt max

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from PoE

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

PLC: Power Line Conducted Emission APCM: Antenna Port Conducted Measurement

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-": Means no effect.

Radiated Emission Test (Above 1GHz):

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

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Date Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	802.11n (HT40)	3 to 9	3, 6, 9	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	Date Rate (Mbps)
A, B	802.11b	1 to 11	1	DSSS	DBPSK	1.0

Power Line Conducted Emission Test:

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

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

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

Antenna Port Conducted Measurement:

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

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

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

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

Test Condition:

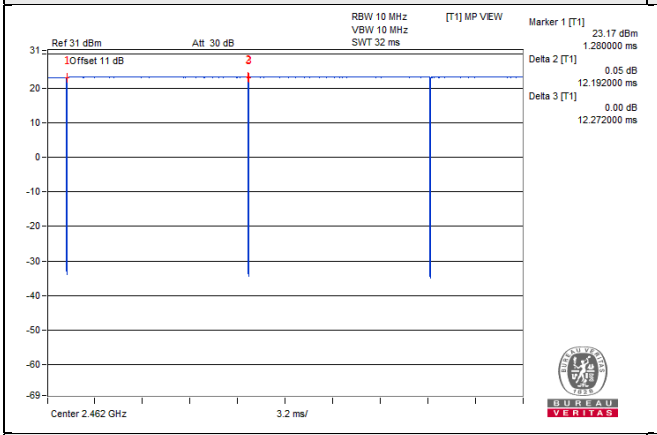
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 70% RH	120Vac, 60Hz	Luis Lee
RE<1G	21 deg. C, 66% RH	120Vac, 60Hz	Willy Cheng
PLC	19 deg. C, 67% RH	120Vac, 60Hz	Willy Cheng
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Alan Wu

3.3 Duty Cycle of Test Signal

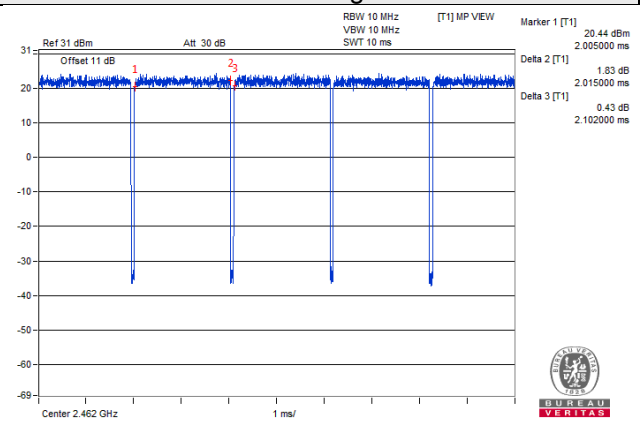
Duty cycle of test signal is ≥ 98%, duty factor is not required.
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 12.192/12.272 = 0.993
802.11g: Duty cycle = 2.015/2.102 = 0.959, Duty factor = 10 * log(1/0.959) = 0.18
802.11n (HT20): Duty cycle = 5/5.075 = 0.985
802.11n (HT40): Duty cycle = 2.422/2.497 = 0.97, Duty factor = 10 * log(1/0.97) = 0.13

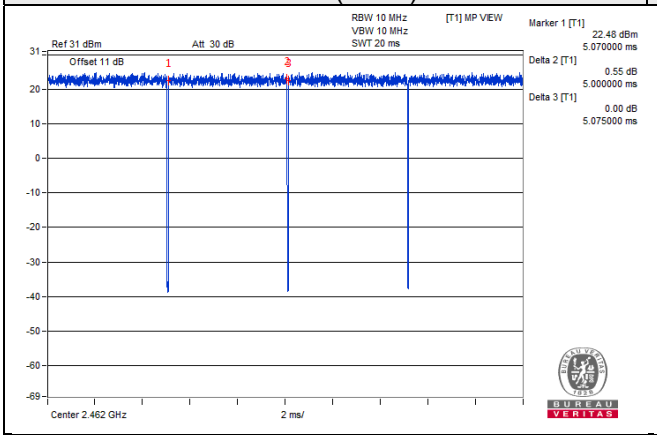
802.11b



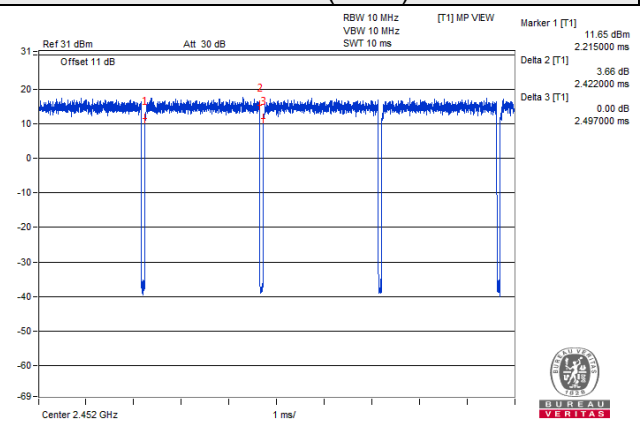
802.11g



802.11n (HT20)



802.11n (HT40)



3.4 Description of Support Units

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

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

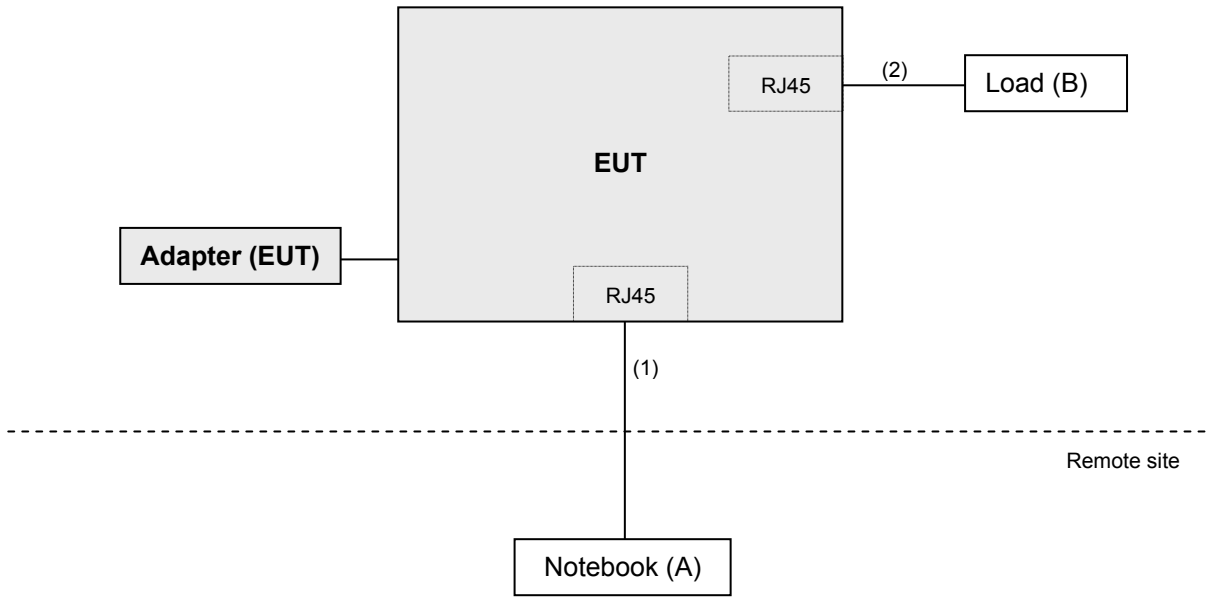
Note:

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

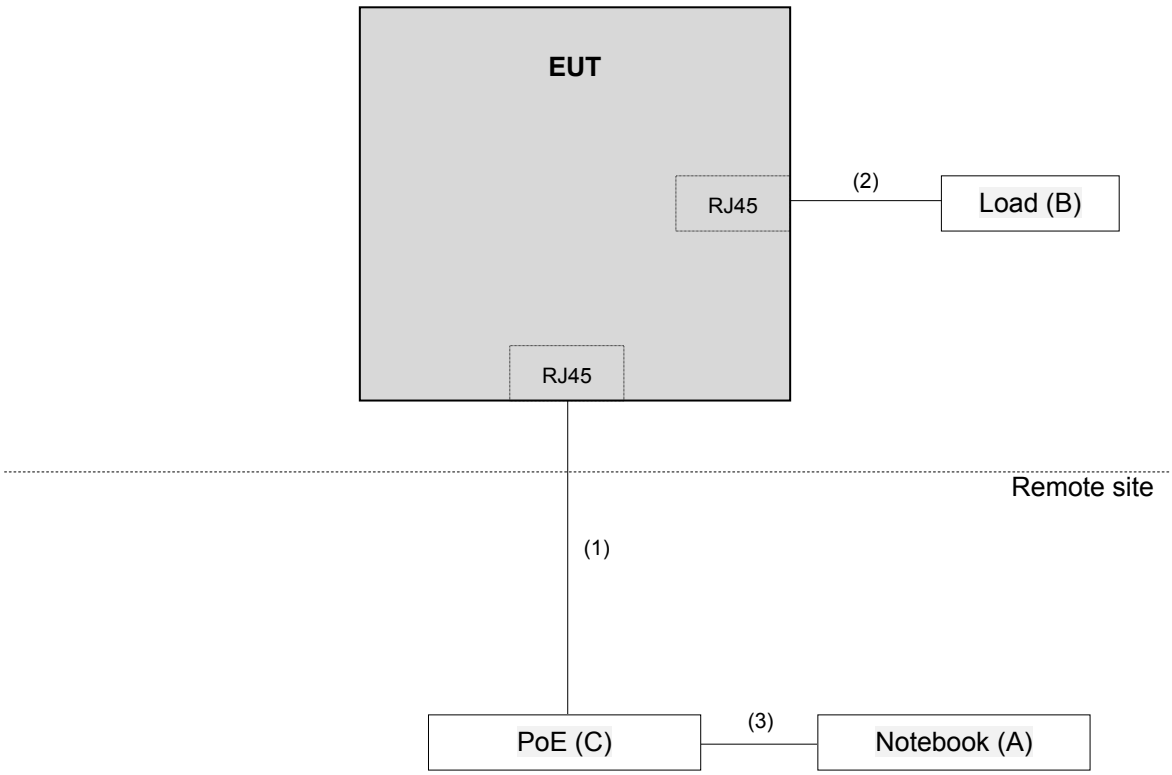
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 cable	1	10	N	0	-
2.	RJ45 cable	4	1.5	N	0	-
3.	RJ45 cable	1	1.8	N	0	-

3.4.1 Configuration of System under Test

Test Mode A



Test Mode B



3.5 General Description of Applied Standards

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

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

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 30dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 17, 2017	Oct. 16, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Aug. 18, 2017	Aug. 17, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Loop Antenna EMCI	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Aug. 08, 2017	Aug. 07, 2018
Preamplifier Agilent (Above 1GHz)	8449B	3008A01960	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Aug. 08, 2017	Aug. 07, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
High Speed Peak Power Meter	ML2495A	0824012	Aug. 18, 2017	Aug. 17, 2018
Power Sensor	MA2411B	0738171	Aug. 18, 2017	Aug. 17, 2018

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 4.
3. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
4. The IC Site Registration No. is IC 7450F-4.

4.1.3 Test Procedures

For Radiated emission below 30MHz

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

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

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

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

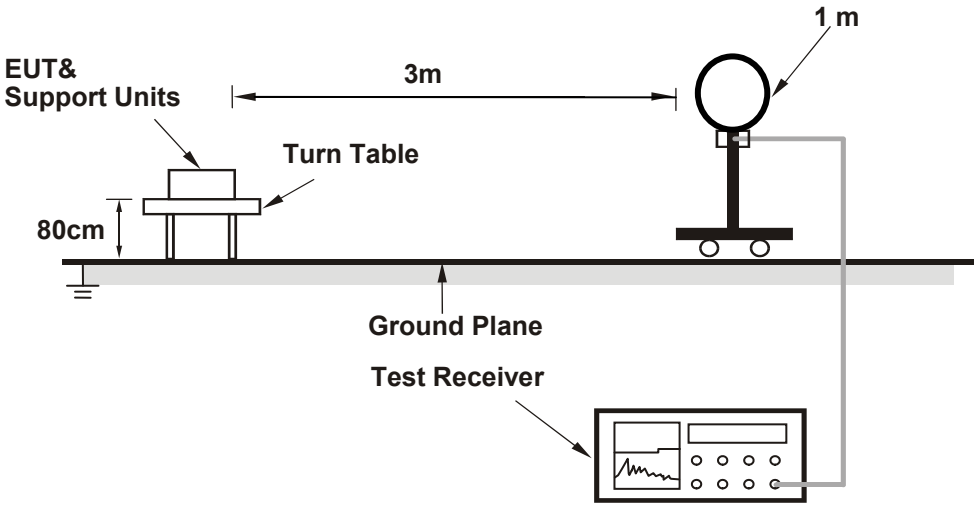
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

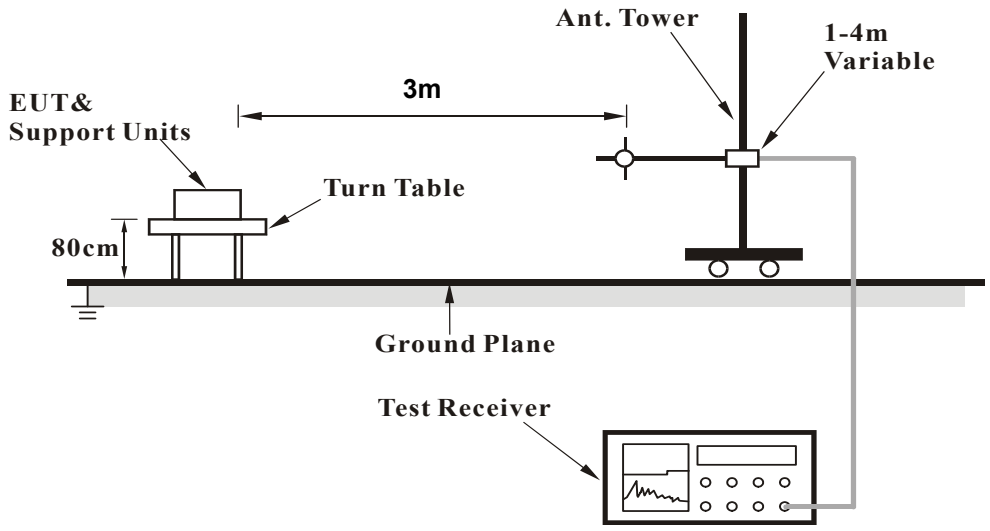
No deviation.

4.1.5 Test Set Up

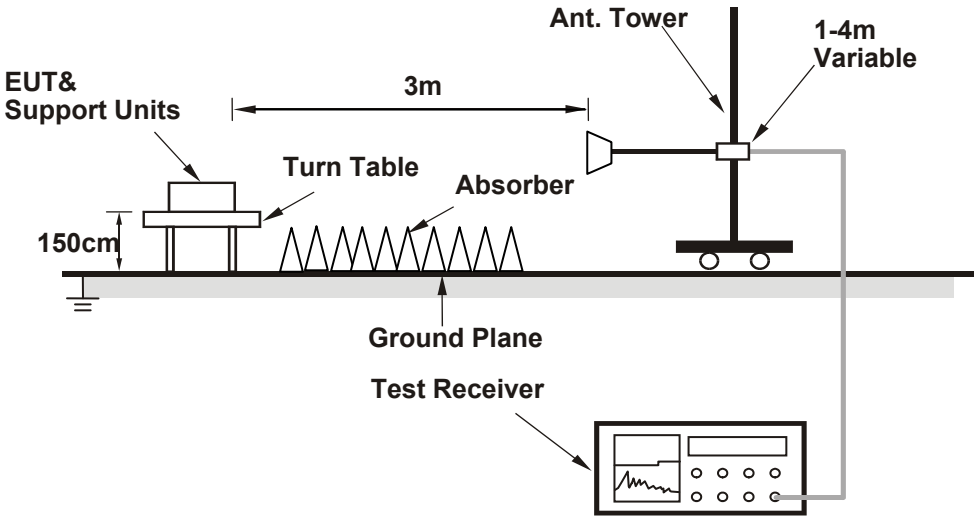
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz Worst-Case Data：

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.5 PK	74.0	-12.5	3.16 H	271	28.1	33.4
2	2390.00	53.6 AV	54.0	-0.4	3.16 H	271	20.2	33.4
3	*2412.00	117.5 PK			3.04 H	204	84.1	33.4
4	*2412.00	113.6 AV			3.04 H	204	80.2	33.4
5	4824.00	47.7 PK	74.0	-26.3	1.25 H	336	44.1	3.6
6	4824.00	35.5 AV	54.0	-18.5	1.25 H	336	31.9	3.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.5 PK	74.0	-12.5	3.89 V	146	28.1	33.4
2	2390.00	51.9 AV	54.0	-2.1	3.89 V	146	18.5	33.4
3	*2412.00	114.1 PK			3.96 V	30	80.7	33.4
4	*2412.00	110.2 AV			3.96 V	30	76.8	33.4
5	4824.00	48.1 PK	74.0	-25.9	3.22 V	191	44.5	3.6
6	4824.00	36.1 AV	54.0	-17.9	3.22 V	191	32.5	3.6

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	119.7 PK			2.97 H	189	86.3	33.4
2	*2437.00	116.0 AV			2.97 H	189	82.6	33.4
3	4874.00	48.0 PK	74.0	-26.0	1.64 H	196	44.7	3.3
4	4874.00	35.5 AV	54.0	-18.5	1.64 H	196	32.2	3.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	115.5 PK			3.88 V	230	82.1	33.4
2	*2437.00	111.6 AV			3.88 V	230	78.2	33.4
3	4874.00	48.2 PK	74.0	-25.8	3.34 V	175	44.9	3.3
4	4874.00	36.0 AV	54.0	-18.0	3.34 V	175	32.7	3.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	117.2 PK			2.49 H	189	83.7	33.5
2	*2462.00	113.2 AV			2.49 H	189	79.7	33.5
3	2483.50	62.5 PK	74.0	-11.5	3.39 H	198	29.0	33.5
4	2483.50	53.5 AV	54.0	-0.5	3.39 H	198	20.0	33.5
5	4924.00	47.8 PK	74.0	-26.2	2.06 H	215	44.5	3.3
6	4924.00	34.3 AV	54.0	-19.7	2.06 H	215	31.0	3.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.6 PK			3.89 V	53	79.1	33.5
2	*2462.00	108.4 AV			3.89 V	53	74.9	33.5
3	2483.50	60.1 PK	74.0	-13.9	3.95 V	144	26.6	33.5
4	2483.50	51.1 AV	54.0	-2.9	3.95 V	144	17.6	33.5
5	4924.00	47.9 PK	74.0	-26.1	3.34 V	202	44.6	3.3
6	4924.00	34.9 AV	54.0	-19.1	3.34 V	202	31.6	3.3

REMARKS:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.2 PK	74.0	-5.8	3.81 H	216	34.8	33.4
2	2390.00	53.7 AV	54.0	-0.3	3.81 H	216	20.3	33.4
3	*2412.00	115.2 PK			2.49 H	193	81.8	33.4
4	*2412.00	105.2 AV			2.49 H	193	71.8	33.4
5	4824.00	48.8 PK	74.0	-25.2	2.32 H	155	45.2	3.6
6	4824.00	35.7 AV	54.0	-18.3	2.32 H	155	32.1	3.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.2 PK	74.0	-11.8	3.71 V	95	28.8	33.4
2	2390.00	49.7 AV	54.0	-4.3	3.71 V	95	16.3	33.4
3	*2412.00	113.9 PK			3.91 V	147	80.5	33.4
4	*2412.00	104.2 AV			3.91 V	147	70.8	33.4
5	4824.00	47.9 PK	74.0	-26.1	2.89 V	215	44.3	3.6
6	4824.00	35.0 AV	54.0	-19.0	2.89 V	215	31.4	3.6

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.3 PK	74.0	-7.7	3.37 H	206	32.9	33.4
2	2390.00	53.6 AV	54.0	-0.4	3.37 H	206	20.2	33.4
3	*2437.00	119.8 PK			2.31 H	196	86.4	33.4
4	*2437.00	109.8 AV			2.31 H	196	76.4	33.4
5	4874.00	48.6 PK	74.0	-25.4	2.66 H	12	45.3	3.3
6	4874.00	35.6 AV	54.0	-18.4	2.66 H	12	32.3	3.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.5 PK	74.0	-10.5	3.66 V	165	30.1	33.4
2	2390.00	50.6 AV	54.0	-3.4	3.66 V	165	17.2	33.4
3	*2437.00	117.2 PK			3.77 V	142	83.8	33.4
4	*2437.00	107.1 AV			3.77 V	142	73.7	33.4
5	4874.00	47.9 PK	74.0	-26.1	2.95 V	208	44.6	3.3
6	4874.00	35.0 AV	54.0	-19.0	2.95 V	208	31.7	3.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	116.0 PK			2.52 H	191	82.5	33.5
2	*2462.00	106.0 AV			2.52 H	191	72.5	33.5
3	2483.50	67.5 PK	74.0	-6.5	2.51 H	166	34.0	33.5
4	2483.50	53.5 AV	54.0	-0.5	2.51 H	166	20.0	33.5
5	4924.00	48.5 PK	74.0	-25.5	3.11 H	125	45.2	3.3
6	4924.00	35.4 AV	54.0	-18.6	3.11 H	125	32.1	3.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.0 PK			3.78 V	144	81.5	33.5
2	*2462.00	105.1 AV			3.78 V	144	71.6	33.5
3	2483.50	63.9 PK	74.0	-10.1	3.83 V	223	30.4	33.5
4	2483.50	50.8 AV	54.0	-3.2	3.83 V	223	17.3	33.5
5	4924.00	48.2 PK	74.0	-25.8	3.00 V	194	44.9	3.3
6	4924.00	35.0 AV	54.0	-19.0	3.00 V	194	31.7	3.3

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.2 PK	74.0	-7.8	2.42 H	177	32.8	33.4
2	2390.00	53.6 AV	54.0	-0.4	2.42 H	177	20.2	33.4
3	*2412.00	115.0 PK			3.78 H	208	81.6	33.4
4	*2412.00	104.6 AV			3.78 H	208	71.2	33.4
5	4824.00	48.7 PK	74.0	-25.3	1.56 H	332	45.1	3.6
6	4824.00	35.1 AV	54.0	-18.9	1.56 H	332	31.5	3.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.0 PK	74.0	-13.0	3.93 V	132	27.6	33.4
2	2390.00	49.6 AV	54.0	-4.4	3.93 V	132	16.2	33.4
3	*2412.00	113.2 PK			3.84 V	146	79.8	33.4
4	*2412.00	102.9 AV			3.84 V	146	69.5	33.4
5	4824.00	48.2 PK	74.0	-25.8	2.86 V	230	44.6	3.6
6	4824.00	34.8 AV	54.0	-19.2	2.86 V	230	31.2	3.6

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.2 PK	74.0	-6.8	3.59 H	198	33.8	33.4
2	2390.00	53.7 AV	54.0	-0.3	3.59 H	198	20.3	33.4
3	*2437.00	120.5 PK			2.31 H	178	87.1	33.4
4	*2437.00	109.8 AV			2.31 H	178	76.4	33.4
5	4874.00	48.4 PK	74.0	-25.6	1.56 H	322	45.1	3.3
6	4874.00	34.6 AV	54.0	-19.4	1.56 H	322	31.3	3.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.2 PK	74.0	-10.8	3.85 V	130	29.8	33.4
2	2390.00	49.7 AV	54.0	-4.3	3.85 V	130	16.3	33.4
3	*2437.00	117.8 PK			3.93 V	138	84.4	33.4
4	*2437.00	107.3 AV			3.93 V	138	73.9	33.4
5	4874.00	47.9 PK	74.0	-26.1	2.94 V	268	44.6	3.3
6	4874.00	34.8 AV	54.0	-19.2	2.94 V	268	31.5	3.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	117.0 PK			3.80 H	204	83.5	33.5
2	*2462.00	106.1 AV			3.80 H	204	72.6	33.5
3	2483.50	66.5 PK	74.0	-7.5	1.37 H	296	33.0	33.5
4	2483.50	53.6 AV	54.0	-0.4	1.37 H	296	20.1	33.5
5	4924.00	48.5 PK	74.0	-25.5	1.22 H	331	45.2	3.3
6	4924.00	35.4 AV	54.0	-18.6	1.22 H	331	32.1	3.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.7 PK			3.77 V	141	82.2	33.5
2	*2462.00	105.0 AV			3.77 V	141	71.5	33.5
3	2483.50	65.4 PK	74.0	-8.6	3.81 V	225	31.9	33.5
4	2483.50	51.1 AV	54.0	-2.9	3.81 V	225	17.6	33.5
5	4924.00	48.1 PK	74.0	-25.9	3.03 V	179	44.8	3.3
6	4924.00	35.1 AV	54.0	-18.9	3.03 V	179	31.8	3.3

REMARKS:

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

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.5 PK	74.0	-7.5	2.35 H	192	33.1	33.4
2	2390.00	53.8 AV	54.0	-0.2	2.35 H	192	20.4	33.4
3	*2422.00	109.0 PK			3.11 H	196	75.6	33.4
4	*2422.00	99.0 AV			3.11 H	196	65.6	33.4
5	2483.50	57.5 PK	74.0	-16.5	1.09 H	321	24.0	33.5
6	2483.50	45.9 AV	54.0	-8.1	1.09 H	321	12.4	33.5
7	4844.00	49.1 PK	74.0	-24.9	3.66 H	125	45.6	3.5
8	4844.00	35.8 AV	54.0	-18.2	3.66 H	125	32.3	3.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.0 PK	74.0	-13.0	3.86 V	201	27.6	33.4
2	2390.00	48.6 AV	54.0	-5.4	3.86 V	201	15.2	33.4
3	*2422.00	107.0 PK			3.43 V	144	73.6	33.4
4	*2422.00	97.3 AV			3.43 V	144	63.9	33.4
5	2483.50	57.1 PK	74.0	-16.9	3.50 V	227	23.6	33.5
6	2483.50	45.2 AV	54.0	-8.8	3.50 V	227	11.7	33.5
7	4844.00	48.2 PK	74.0	-25.8	2.91 V	258	44.7	3.5
8	4844.00	35.0 AV	54.0	-19.0	2.91 V	258	31.5	3.5

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.0 PK	74.0	-10.0	2.83 H	231	30.6	33.4
2	2390.00	53.7 AV	54.0	-0.3	2.83 H	231	20.3	33.4
3	*2437.00	112.6 PK			2.87 H	153	79.2	33.4
4	*2437.00	103.2 AV			2.87 H	153	69.8	33.4
5	4874.00	48.5 PK	74.0	-25.5	1.36 H	333	45.2	3.3
6	4874.00	35.6 AV	54.0	-18.4	1.36 H	333	32.3	3.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.8 PK	74.0	-13.2	3.80 V	118	27.4	33.4
2	2390.00	49.0 AV	54.0	-5.0	3.80 V	118	15.6	33.4
3	*2437.00	109.8 PK			3.96 V	136	76.4	33.4
4	*2437.00	100.1 AV			3.96 V	136	66.7	33.4
5	4874.00	47.9 PK	74.0	-26.1	2.99 V	219	44.6	3.3
6	4874.00	35.0 AV	54.0	-19.0	2.99 V	219	31.7	3.3

REMARKS:

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

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.0 PK	74.0	-17.0	2.75 H	225	23.6	33.4
2	2390.00	46.0 AV	54.0	-8.0	2.75 H	225	12.6	33.4
3	*2452.00	109.5 PK			3.04 H	185	76.0	33.5
4	*2452.00	100.2 AV			3.04 H	185	66.7	33.5
5	2483.50	65.0 PK	74.0	-9.0	2.81 H	235	31.5	33.5
6	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**2.81 H**	**235**	**20.4**	**33.5**
7	4904.00	48.1 PK	74.0	-25.9	1.56 H	259	44.8	3.3
8	4904.00	35.2 AV	54.0	-18.8	1.56 H	259	31.9	3.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	2.48 V	91	23.2	33.4
2	2390.00	45.5 AV	54.0	-8.5	2.48 V	91	12.1	33.4
3	*2452.00	107.9 PK			3.71 V	141	74.4	33.5
4	*2452.00	98.6 AV			3.71 V	141	65.1	33.5
5	2483.50	62.1 PK	74.0	-11.9	2.84 V	164	28.6	33.5
6	2483.50	49.9 AV	54.0	-4.1	2.84 V	164	16.4	33.5
7	4904.00	47.5 PK	74.0	-26.5	3.14 V	199	44.2	3.3
8	4904.00	34.8 AV	54.0	-19.2	3.14 V	199	31.5	3.3

REMARKS:

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

Below 1GHz Worst-Case Data: 802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	27.3 QP	40.0	-12.7	2.00 H	220	41.7	-14.4
2	70.73	24.1 QP	40.0	-15.9	2.00 H	187	40.3	-16.2
3	237.94	30.8 QP	46.0	-15.2	1.01 H	307	46.1	-15.3
4	283.98	37.1 QP	46.0	-8.9	1.00 H	353	50.2	-13.1
5	477.09	36.2 QP	46.0	-9.8	2.00 H	9	45.9	-9.7
6	624.85	30.1 QP	46.0	-15.9	1.50 H	189	36.9	-6.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	72.67	29.7 QP	40.0	-10.3	1.99 V	232	46.2	-16.5
2	125.17	24.3 QP	43.5	-19.2	1.00 V	11	40.2	-15.9
3	235.99	32.5 QP	46.0	-13.5	1.00 V	241	48.1	-15.6
4	286.55	30.1 QP	46.0	-15.9	1.00 V	67	43.1	-13.0
5	374.04	28.3 QP	46.0	-17.7	1.49 V	297	39.9	-11.6
6	473.20	32.9 QP	46.0	-13.1	1.00 V	244	42.6	-9.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	24.6 QP	40.0	-15.4	1.50 H	232	39.0	-14.4
2	125.17	23.3 QP	43.5	-20.2	1.50 H	278	39.2	-15.9
3	160.17	26.3 QP	43.5	-17.2	1.50 H	235	40.1	-13.8
4	284.60	38.4 QP	46.0	-7.6	1.50 H	154	51.4	-13.0
5	475.14	33.6 QP	46.0	-12.4	1.50 H	8	43.3	-9.7
6	624.85	27.2 QP	46.0	-18.8	1.50 H	45	34.0	-6.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.84	24.9 QP	40.0	-15.1	2.00 V	152	40.9	-16.0
2	101.84	23.6 QP	43.5	-19.9	1.01 V	121	41.9	-18.3
3	162.11	22.8 QP	43.5	-20.7	1.01 V	219	36.7	-13.9
4	282.66	30.6 QP	46.0	-15.4	1.49 V	136	43.7	-13.1
5	374.04	28.3 QP	46.0	-17.7	1.01 V	304	39.9	-11.6
6	457.64	32.2 QP	46.0	-13.8	1.49 V	265	42.2	-10.0

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 23, 2017	Nov. 22, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

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

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

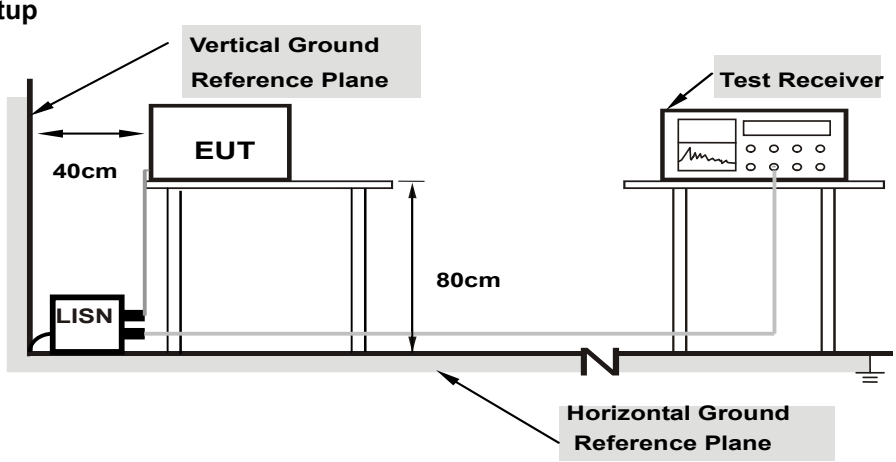
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

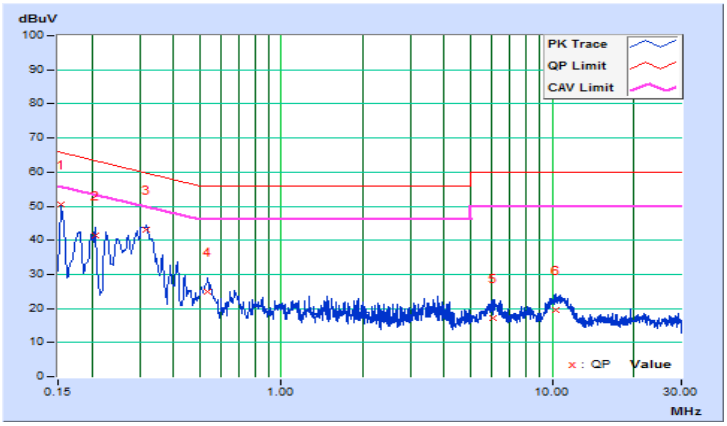
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.10	40.28	25.63	50.38	35.73	65.78	55.78	-15.40	-20.05
2	0.20600	10.10	31.43	18.17	41.53	28.27	63.37	53.37	-21.84	-25.10
3	0.31698	10.11	32.86	25.74	42.97	35.85	59.79	49.79	-16.82	-13.94
4	0.53404	10.12	14.86	8.16	24.98	18.28	56.00	46.00	-31.02	-27.72
5	6.05400	10.40	6.79	0.59	17.19	10.99	60.00	50.00	-42.81	-39.01
6	10.33400	10.64	8.81	4.09	19.45	14.73	60.00	50.00	-40.55	-35.27

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.

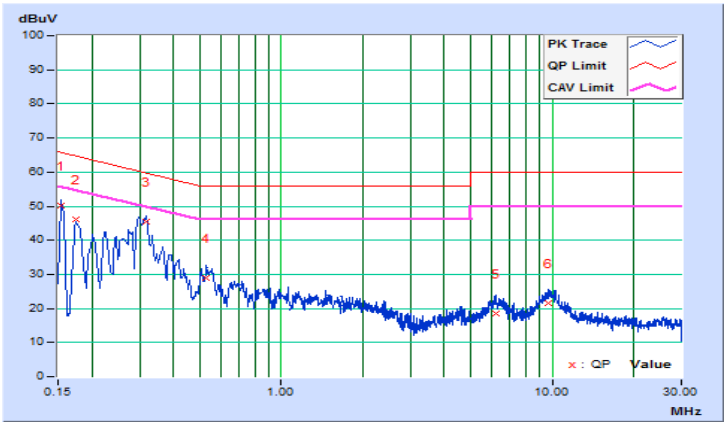


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.10	40.13	25.97	50.23	36.07	65.78	55.78	-15.55	-19.71
2	0.17430	10.10	36.11	24.00	46.21	34.10	64.75	54.75	-18.54	-20.65
3	0.31781	10.11	35.36	28.32	45.47	38.43	59.76	49.76	-14.29	-11.33
4	0.53000	10.12	18.89	13.01	29.01	23.13	56.00	46.00	-26.99	-22.87
5	6.17800	10.36	8.12	1.36	18.48	11.72	60.00	50.00	-41.52	-38.28
6	9.74200	10.51	10.97	6.21	21.48	16.72	60.00	50.00	-38.52	-33.28

REMARKS:

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

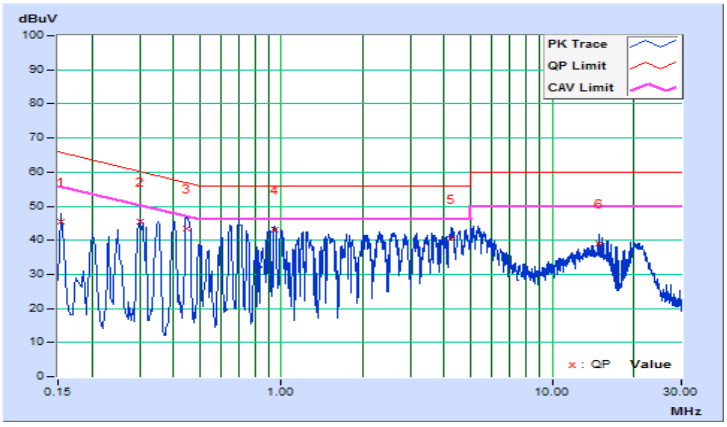


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.10	35.27	23.46	45.37	33.56	65.78	55.78	-20.41	-22.22
2	0.30150	10.11	35.31	30.23	45.42	40.34	60.20	50.20	-14.78	-9.86
3	**0.44645**	**10.12**	**33.17**	**30.09**	**43.29**	**40.21**	**56.94**	**46.94**	**-13.65**	**-6.73**
4	0.95094	10.14	32.86	24.95	43.00	35.09	56.00	46.00	-13.00	-10.91
5	4.25400	10.30	30.07	22.75	40.37	33.05	56.00	46.00	-15.63	-12.95
6	14.98600	10.92	28.09	24.97	39.01	35.89	60.00	50.00	-20.99	-14.11

REMARKS:

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

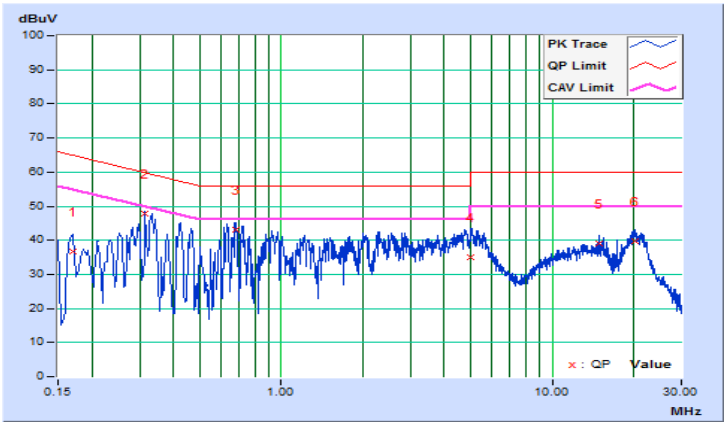


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16977	10.10	26.46	10.38	36.56	20.48	64.97	54.97	-28.41	-34.49
2	0.31400	10.11	37.78	30.06	47.89	40.17	59.86	49.86	-11.97	-9.69
3	0.67694	10.12	32.88	21.12	43.00	31.24	56.00	46.00	-13.00	-14.76
4	4.99000	10.31	24.70	16.65	35.01	26.96	56.00	46.00	-20.99	-19.04
5	14.98600	10.73	28.40	25.49	39.13	36.22	60.00	50.00	-20.87	-13.78
6	20.11400	10.94	28.64	23.23	39.58	34.17	60.00	50.00	-20.42	-15.83

REMARKS:

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

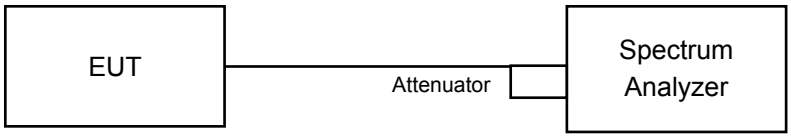


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	8.57	8.11	8.07	9.09	0.5	Pass
6	2437	8.60	8.59	8.60	9.06	0.5	Pass
11	2462	8.10	7.59	8.09	9.05	0.5	Pass

802.11g

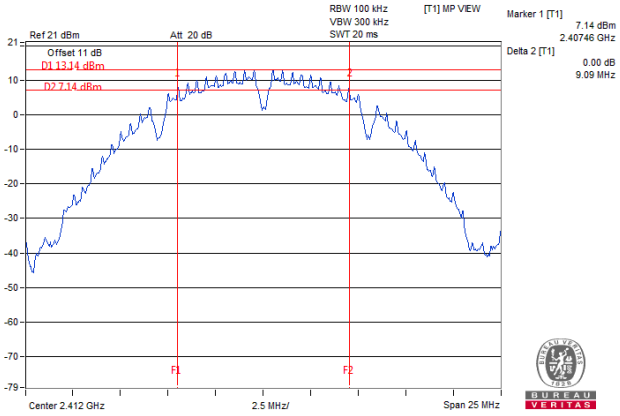
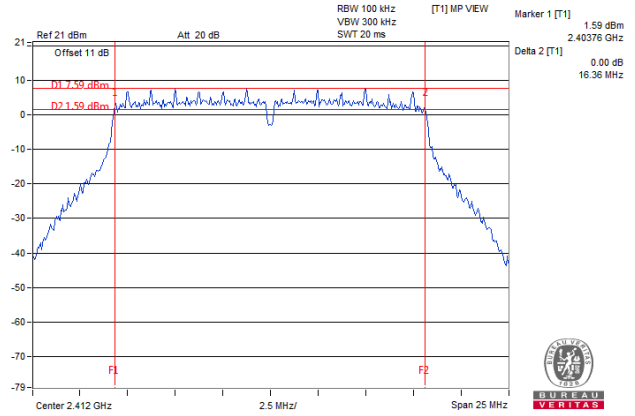
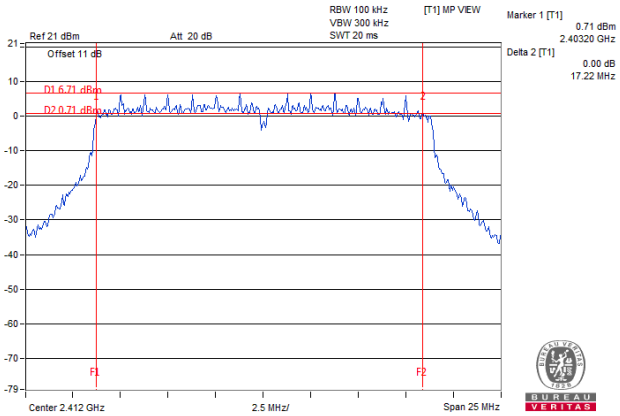
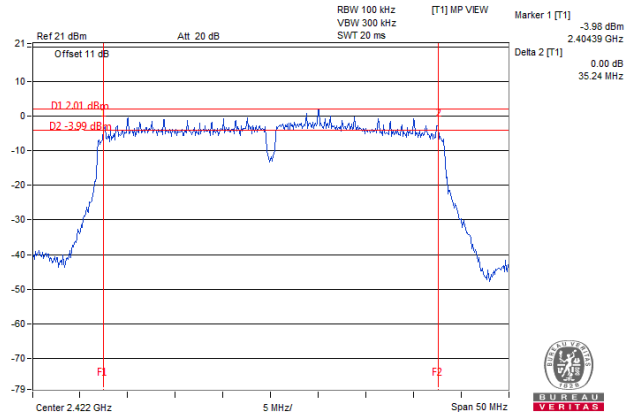
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	16.36	15.38	15.48	15.77	0.5	Pass
6	2437	16.36	16.28	16.29	16.31	0.5	Pass
11	2462	16.36	15.39	15.34	15.94	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	17.22	15.77	15.71	15.99	0.5	Pass
6	2437	16.98	16.34	16.32	15.74	0.5	Pass
11	2462	17.17	15.72	16.34	16.35	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	35.06	35.21	35.24	35.21	0.5	Pass
6	2437	35.09	35.08	35.23	35.15	0.5	Pass
9	2452	35.20	35.15	35.17	35.14	0.5	Pass

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

4.4 Conducted Output Power Measurement

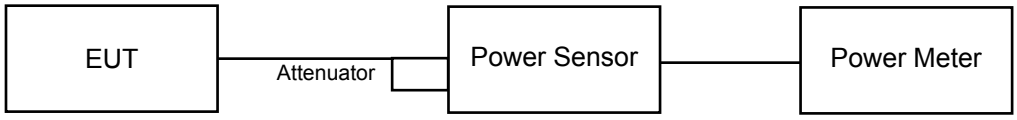
4.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)
Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices

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

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as item 4.3.6.

4.4.7 Test Results

CDD Mode

802.11b

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	21.77	21.50	21.34	21.22	560.146	27.48	30	Pass
6	2437	23.84	23.45	23.29	23.41	**895.996**	29.52	30	Pass
11	2462	21.74	21.52	21.31	21.28	560.668	27.49	30	Pass

802.11g

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	18.33	18.24	18.15	18.09	264.488	24.22	30	Pass
6	2437	22.82	22.79	22.61	22.60	745.894	28.73	30	Pass
11	2462	19.28	19.21	19.19	19.11	332.546	25.22	30	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	17.64	17.59	17.40	17.31	224.269	23.51	30	Pass
6	2437	22.68	22.56	22.37	22.24	705.733	28.49	30	Pass
11	2462	19.71	19.59	19.40	19.27	356.156	25.52	30	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	14.80	14.66	14.52	14.39	115.235	20.62	30	Pass
6	2437	17.79	17.63	17.47	17.44	229.370	23.61	30	Pass
9	2452	15.77	15.61	15.42	15.35	143.260	21.56	30	Pass

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	13.14	13.09	12.90	12.81	79.573	19.01	26.55	Pass
6	2437	18.18	18.06	17.87	17.74	**250.403**	23.99	26.55	Pass
11	2462	15.21	15.09	14.90	14.77	126.369	21.02	26.55	Pass

* Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/4$]= 9.45dBi > 6dBi, so the power limit shall be reduced to 30-(9.45-6) = 26.55dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	10.30	10.16	10.02	9.89	40.886	16.12	26.55	Pass
6	2437	13.29	13.13	12.97	12.94	81.383	19.11	26.55	Pass
9	2452	11.27	11.11	10.92	10.85	50.830	17.06	26.55	Pass

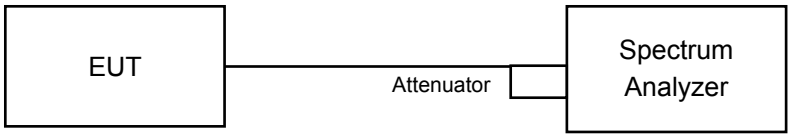
* Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/4$]= 9.45dBi > 6dBi, so the power limit shall be reduced to 30-(9.45-6) = 26.55dBm.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass/Fail
0	1	2412	-6.63	6.02	-0.61	4.55	Pass
	6	2437	-4.64	6.02	1.38	4.55	Pass
	11	2462	-6.82	6.02	-0.80	4.55	Pass
1	1	2412	-6.39	6.02	-0.37	4.55	Pass
	6	2437	-4.72	6.02	1.30	4.55	Pass
	11	2462	-6.63	6.02	-0.61	4.55	Pass
2	1	2412	-6.96	6.02	-0.94	4.55	Pass
	6	2437	-4.80	6.02	1.22	4.55	Pass
	11	2462	-6.76	6.02	-0.74	4.55	Pass
3	1	2412	-6.44	6.02	-0.42	4.55	Pass
	6	2437	-5.28	6.02	0.74	4.55	Pass
	11	2462	-7.24	6.02	-1.22	4.55	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/4$]= 9.45dBi > 6dBi, so the power density limit shall be reduced to 8-(9.45-6) = 4.55dBm.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass/Fail
0	1	2412	-12.45	6.02	0.18	-6.25	4.55	Pass
	6	2437	-7.70	6.02	0.18	-1.50	4.55	Pass
	11	2462	-11.82	6.02	0.18	-5.62	4.55	Pass
1	1	2412	-12.72	6.02	0.18	-6.52	4.55	Pass
	6	2437	-7.94	6.02	0.18	-1.74	4.55	Pass
	11	2462	-10.86	6.02	0.18	-4.66	4.55	Pass
2	1	2412	-12.79	6.02	0.18	-6.59	4.55	Pass
	6	2437	-8.25	6.02	0.18	-2.05	4.55	Pass
	11	2462	-11.38	6.02	0.18	-5.18	4.55	Pass
3	1	2412	-12.60	6.02	0.18	-6.40	4.55	Pass
	6	2437	-7.94	6.02	0.18	-1.74	4.55	Pass
	11	2462	-12.41	6.02	0.18	-6.21	4.55	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/4$]= 9.45dBi > 6dBi, so the power density limit shall be reduced to 8-(9.45-6) = 4.55dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Total PSD (dBm)	Limit (dBm)	Pass/Fail
0	1	2412	-13.67	6.02	-7.65	4.55	Pass
	6	2437	-8.86	6.02	-2.84	4.55	Pass
	11	2462	-11.86	6.02	-5.84	4.55	Pass
1	1	2412	-13.54	6.02	-7.52	4.55	Pass
	6	2437	-8.65	6.02	-2.63	4.55	Pass
	11	2462	-12.16	6.02	-6.14	4.55	Pass
2	1	2412	-13.70	6.02	-7.68	4.55	Pass
	6	2437	-9.05	6.02	-3.03	4.55	Pass
	11	2462	-12.12	6.02	-6.10	4.55	Pass
3	1	2412	-13.65	6.02	-7.63	4.55	Pass
	6	2437	-9.21	6.02	-3.19	4.55	Pass
	11	2462	-11.65	6.02	-5.63	4.55	Pass

Note:

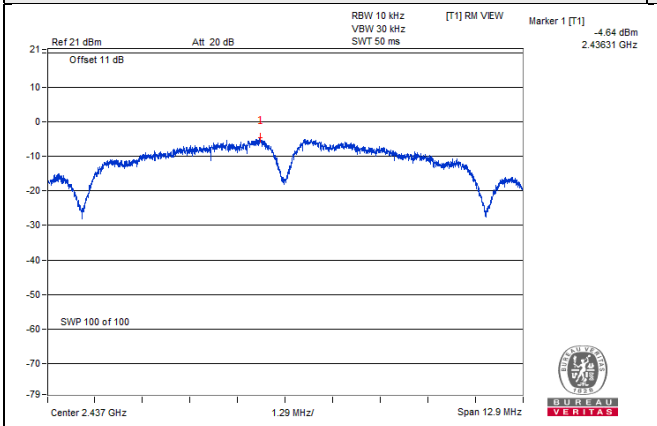
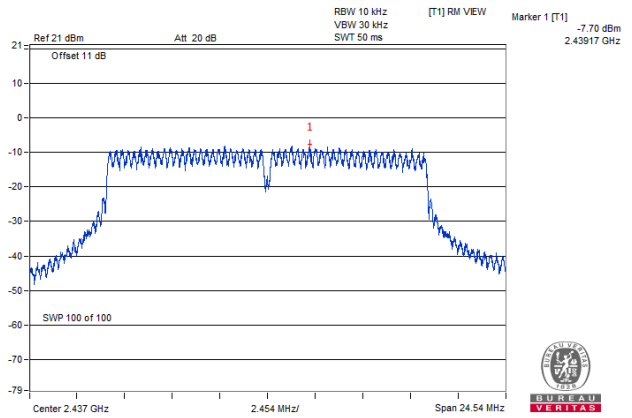
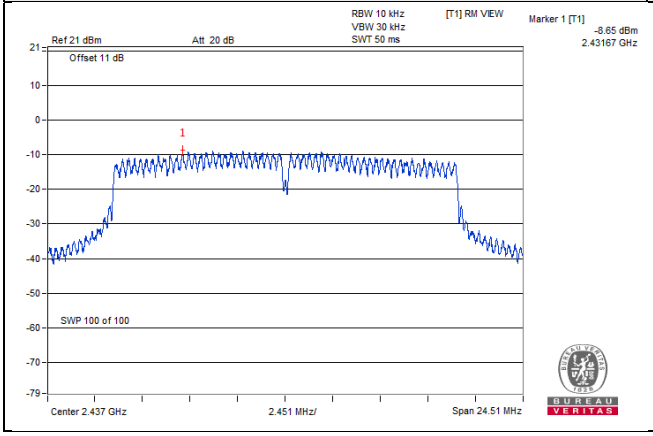
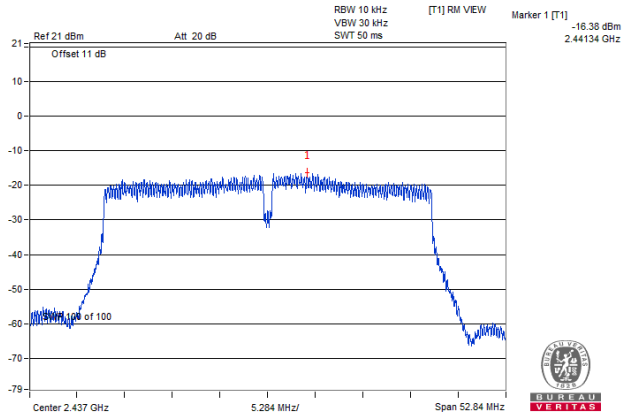
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/4$]= 9.45dBi > 6dBi, so the power density limit shall be reduced to 8-(9.45-6) = 4.55dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm)	10 log (N=4) dB	Duty Factor	Total PSD with Duty Factor (dBm)	Limit (dBm)	Pass/Fail
0	3	2422	-19.89	6.02	0.13	-13.74	4.55	Pass
	6	2437	-17.00	6.02	0.13	-10.85	4.55	Pass
	9	2452	-18.94	6.02	0.13	-12.79	4.55	Pass
1	3	2422	-19.49	6.02	0.13	-13.34	4.55	Pass
	6	2437	-16.66	6.02	0.13	-10.51	4.55	Pass
	9	2452	-18.49	6.02	0.13	-12.34	4.55	Pass
2	3	2422	-19.40	6.02	0.13	-13.25	4.55	Pass
	6	2437	-16.38	6.02	0.13	-10.23	4.55	Pass
	9	2452	-18.41	6.02	0.13	-12.26	4.55	Pass
3	3	2422	-19.92	6.02	0.13	-13.77	4.55	Pass
	6	2437	-16.91	6.02	0.13	-10.76	4.55	Pass
	9	2452	-18.71	6.02	0.13	-12.56	4.55	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/4$]= 9.45dBi > 6dBi, so the power density limit shall be reduced to 8-(9.45-6) = 4.55dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

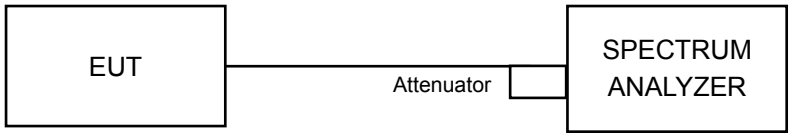
Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11n (HT20)	802.11n (HT40)
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

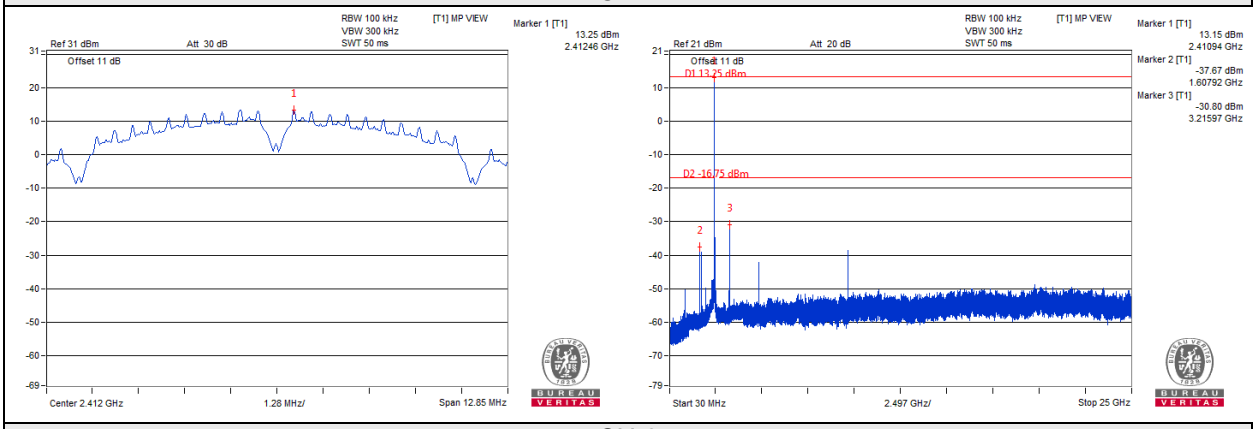
Same as item 4.3.6

4.6.7 Test Results

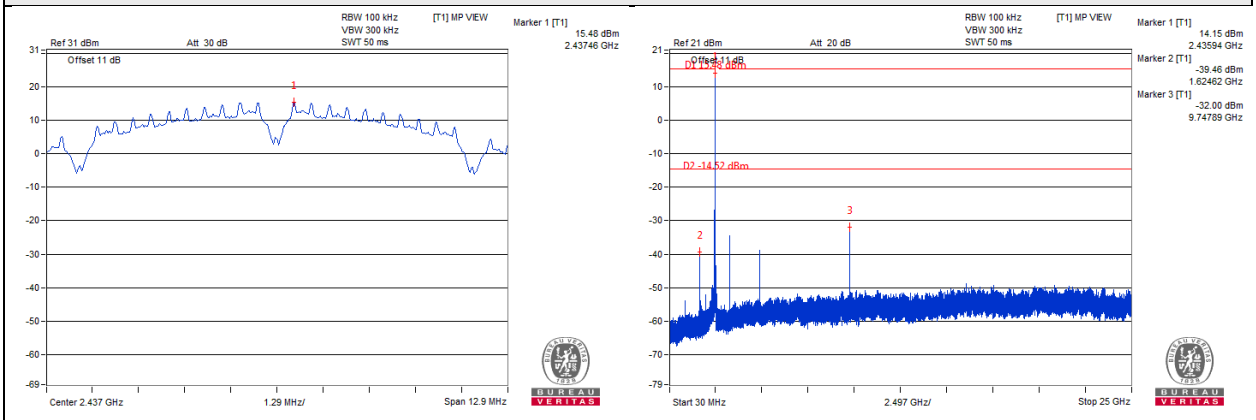
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11b_Chain 0

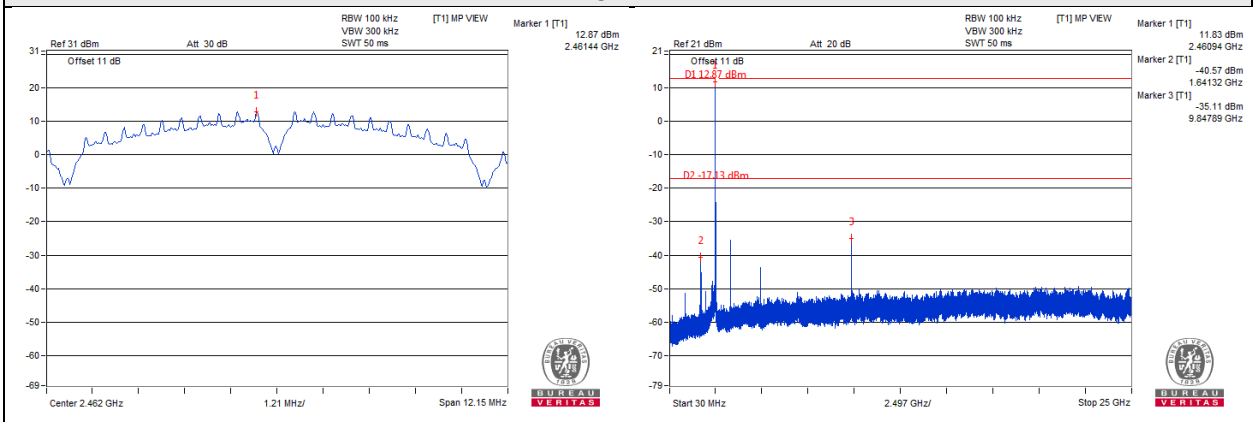
CH 1



CH 6

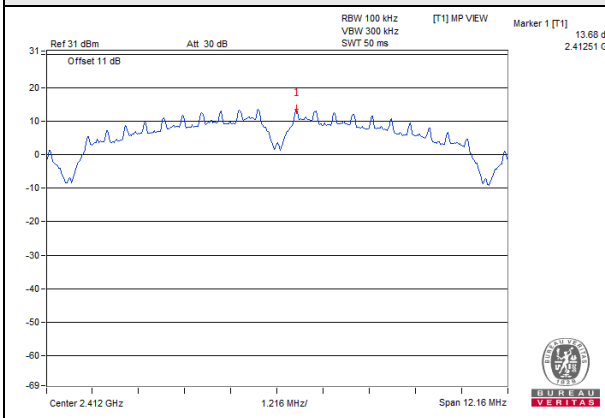


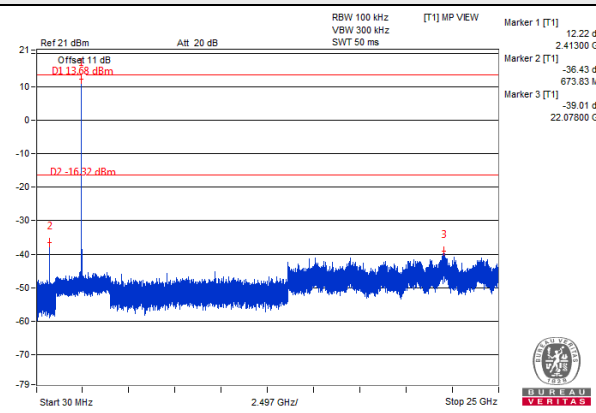
CH 11



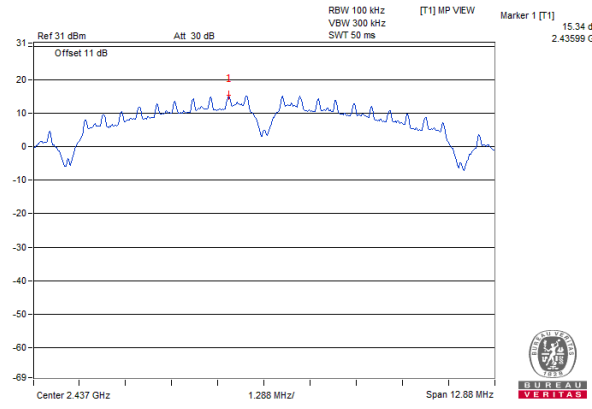
802.11b_Chain 1

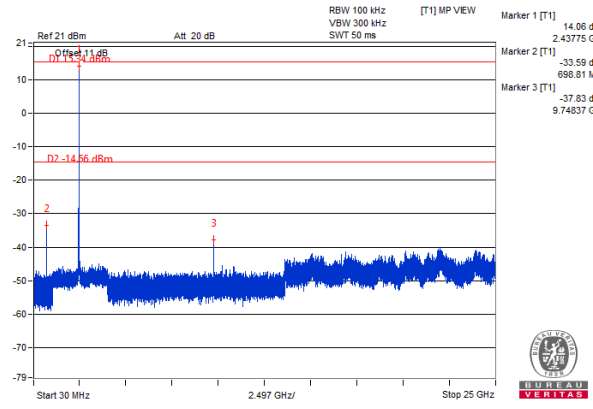
CH 1



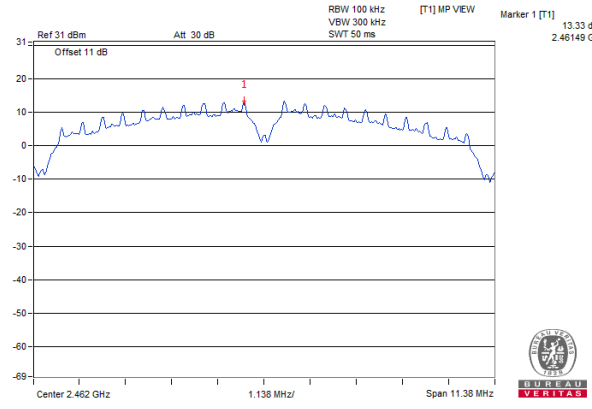


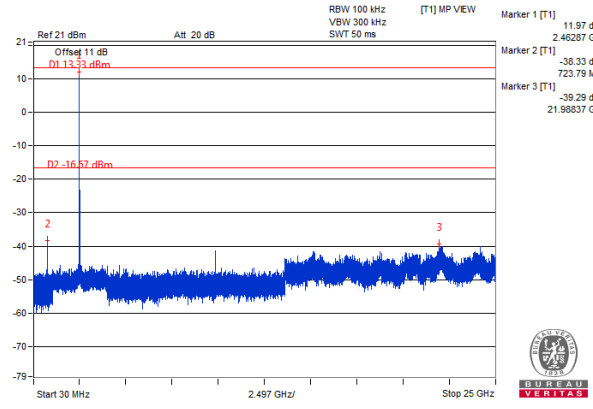
CH 6





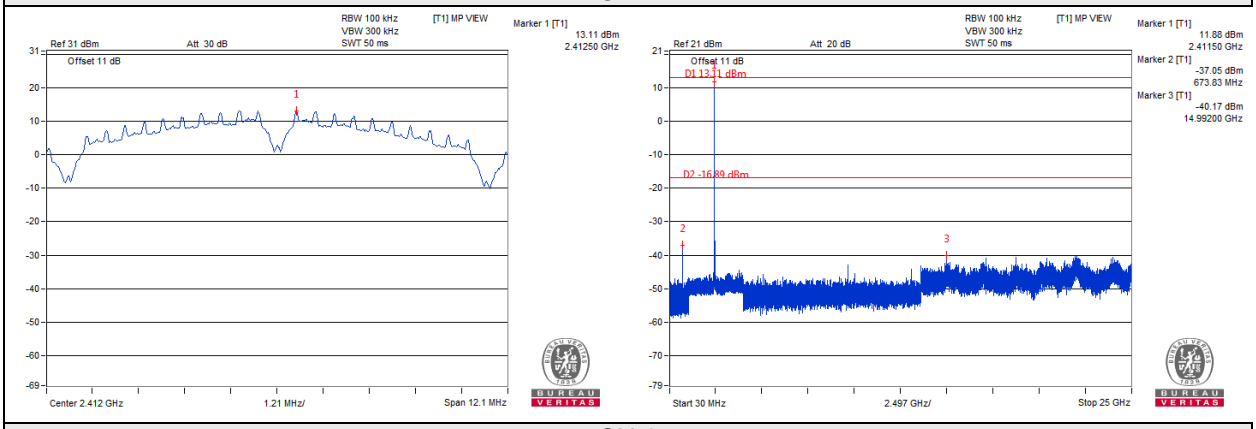
CH 11



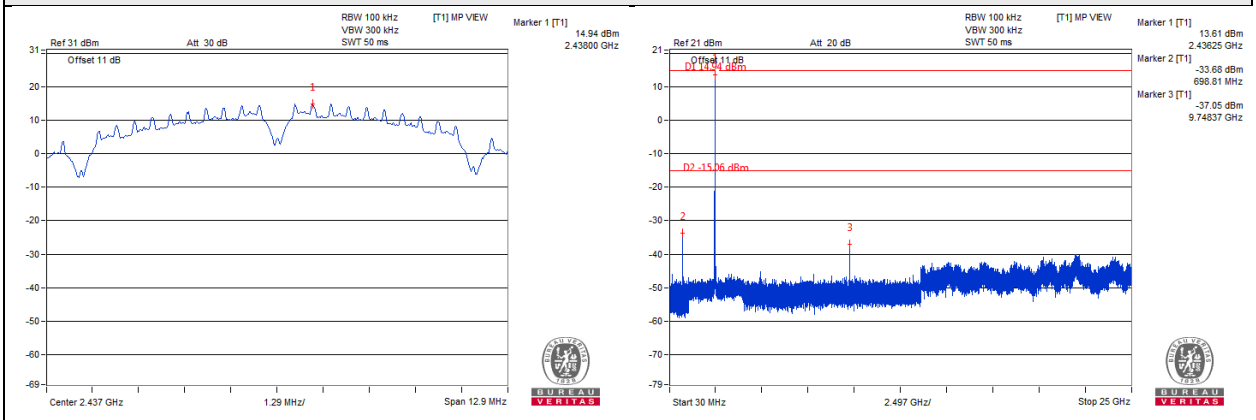


802.11b_Chain 2

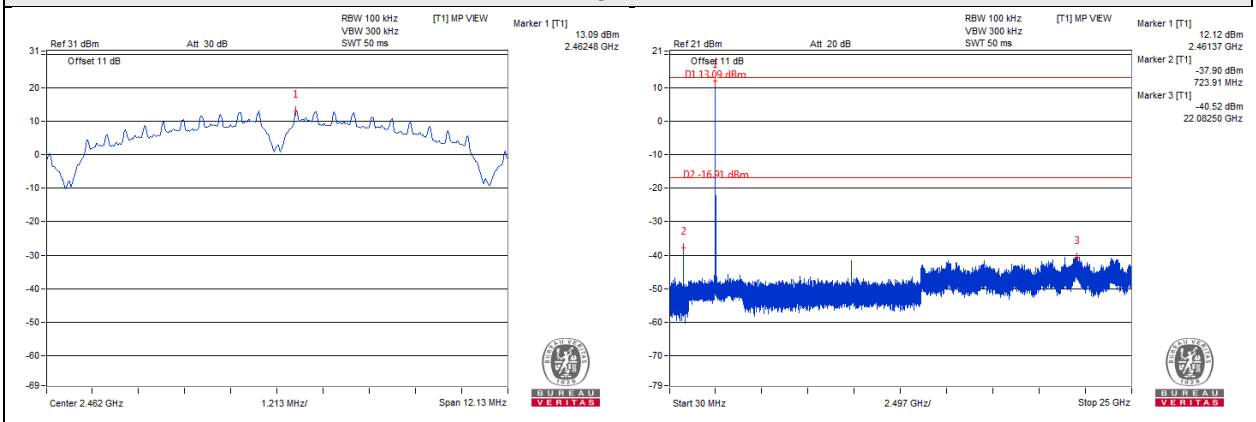
CH 1



CH 6

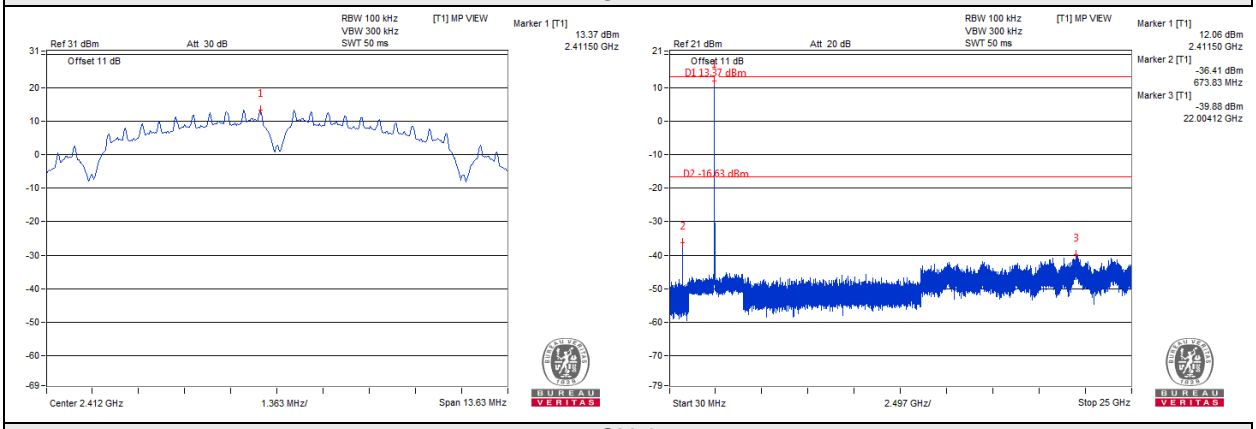


CH 11

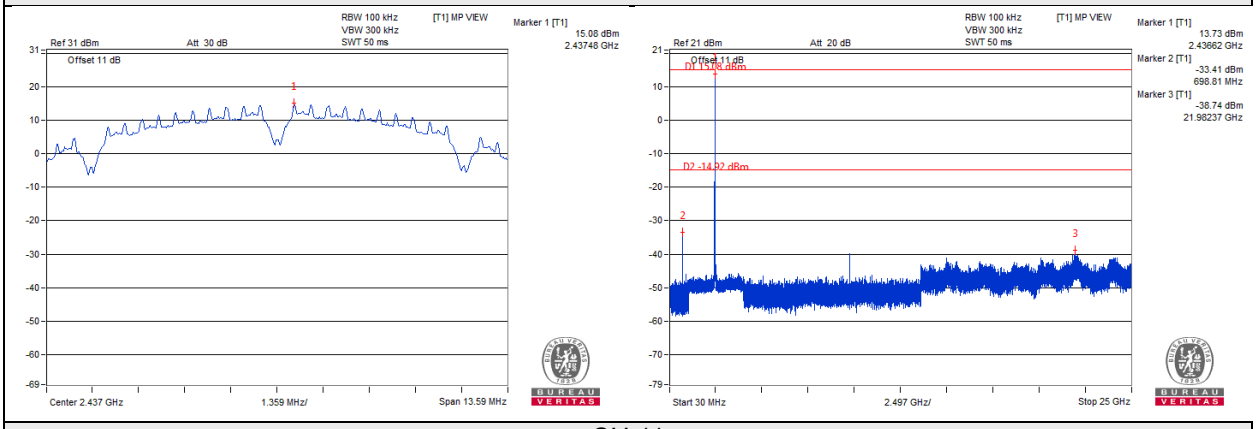


802.11b_Chain 3

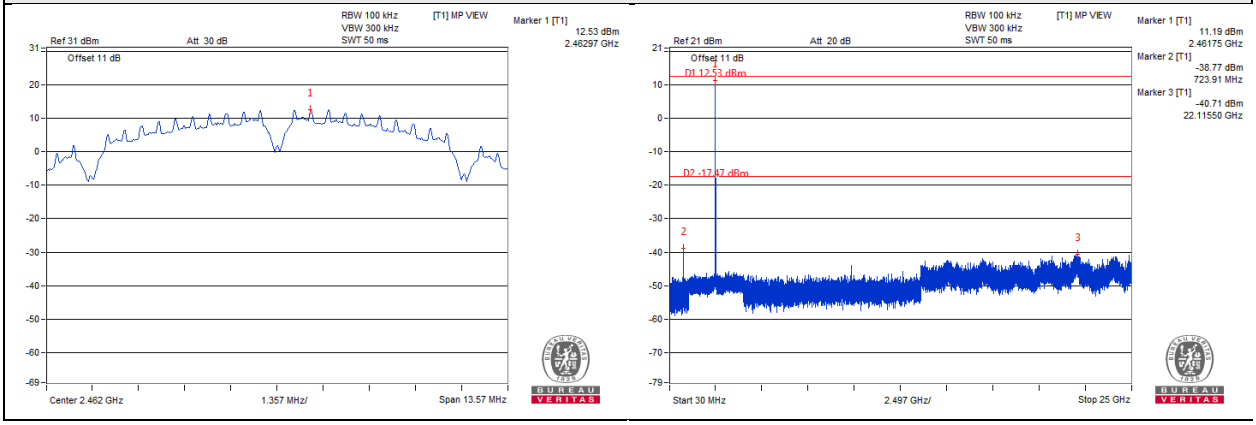
CH 1



CH 6

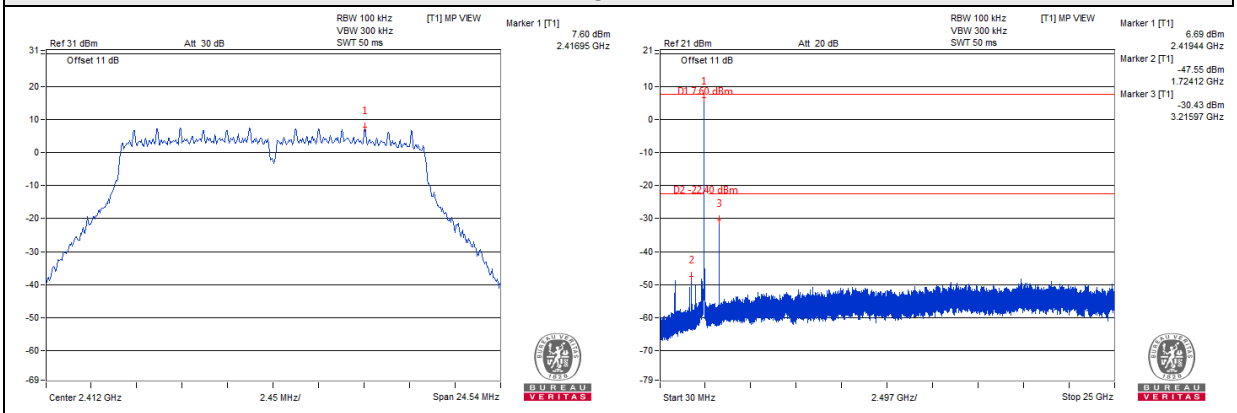


CH 11

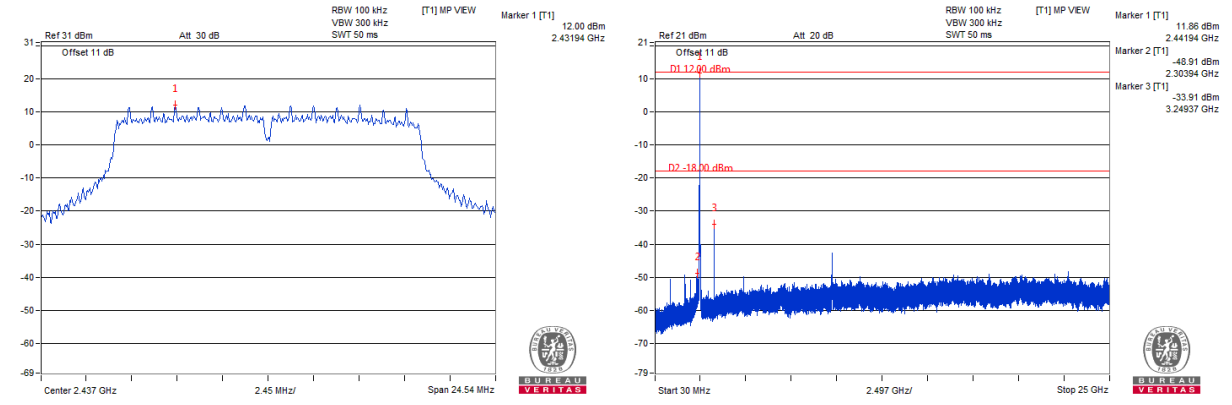


802.11g_Chain 0

CH 1



CH 6



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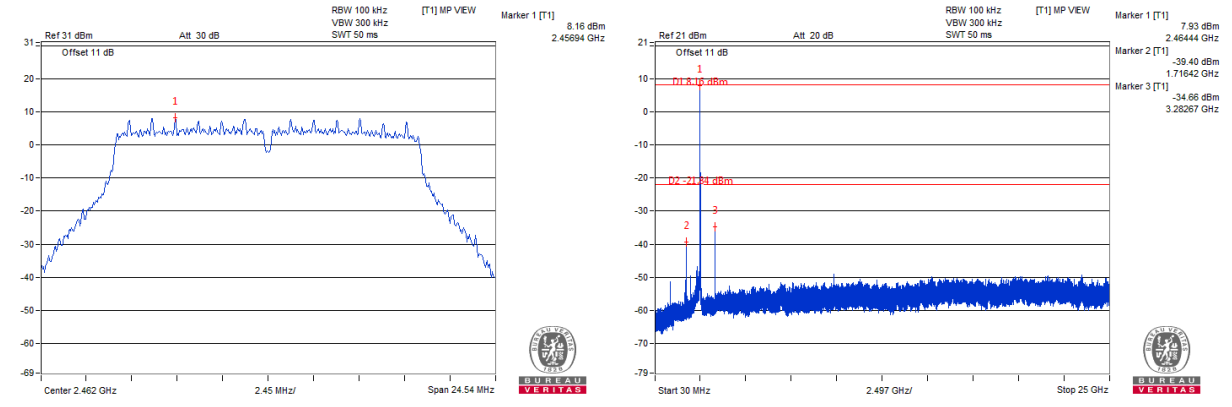
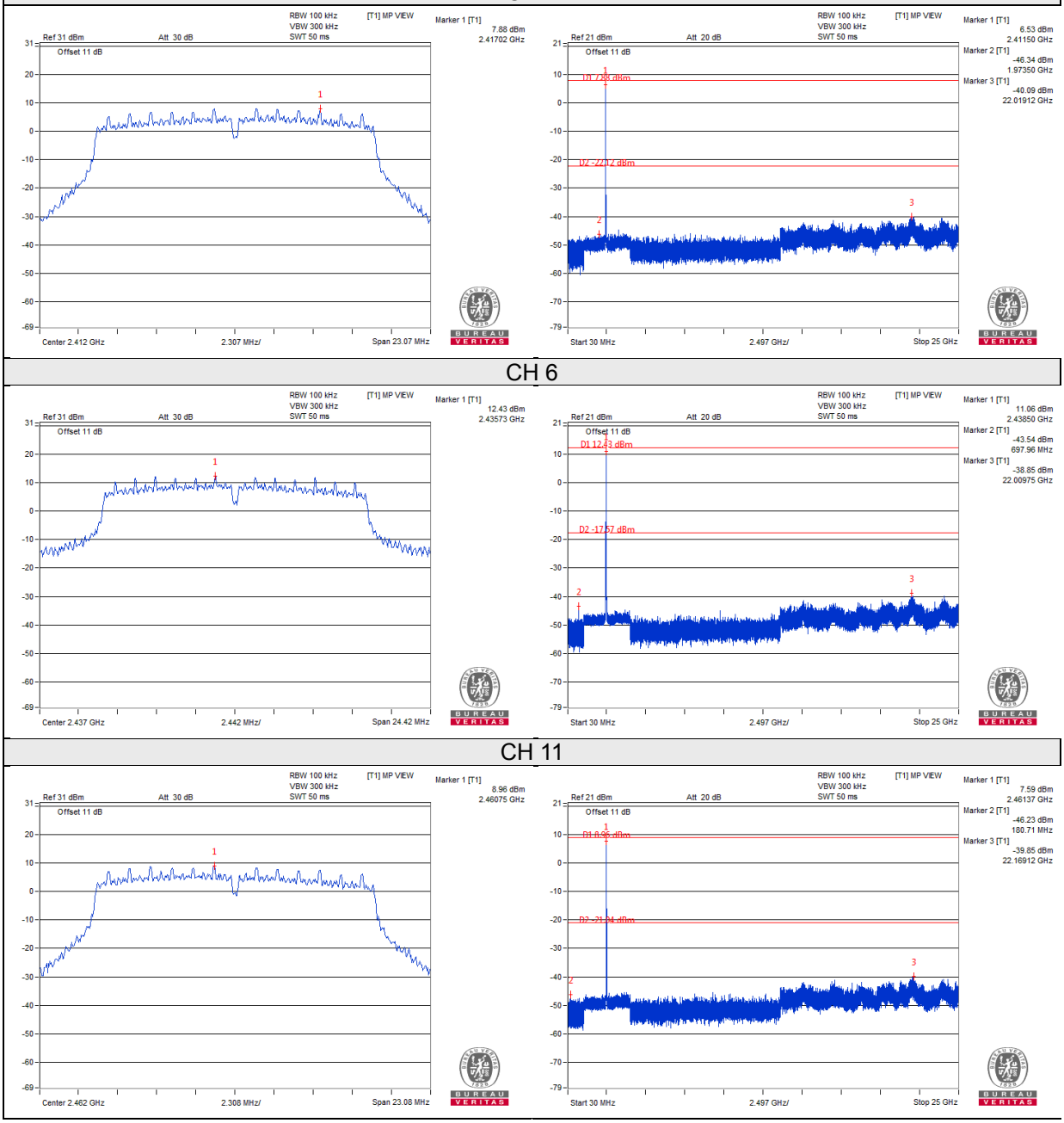


802.11g_Chain 1

CH 1

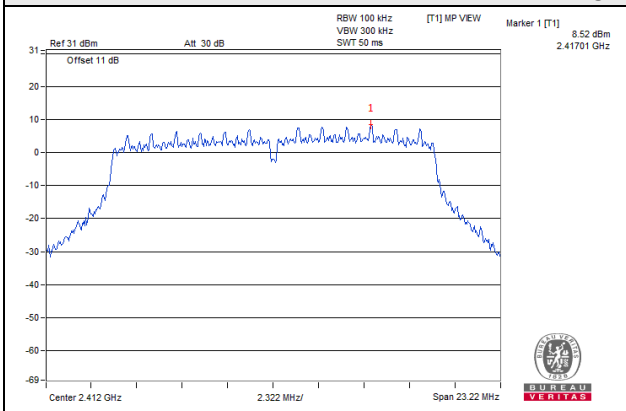


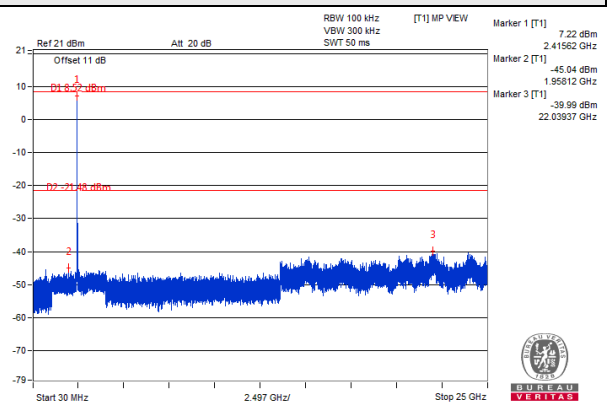
CH 6

CH 11

802.11g_Chain 2

CH 1





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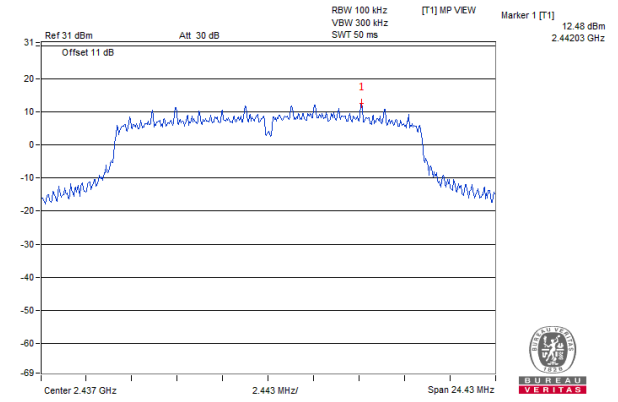

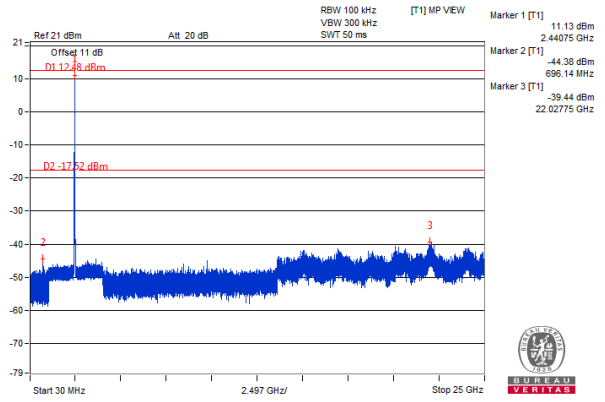

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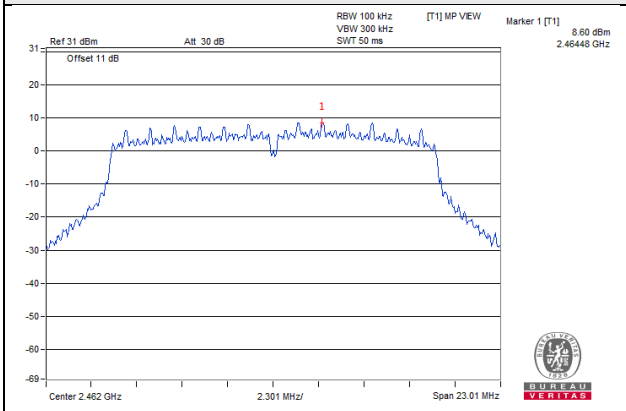
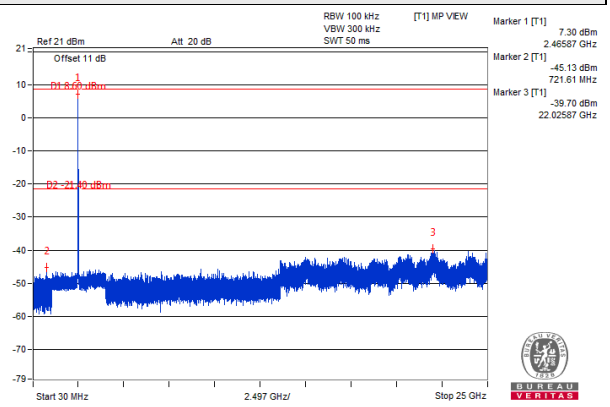
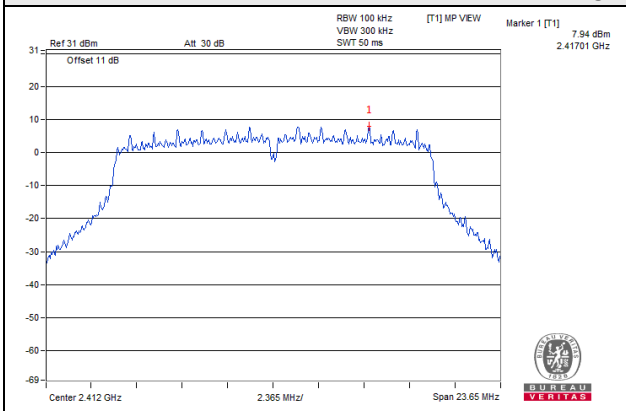
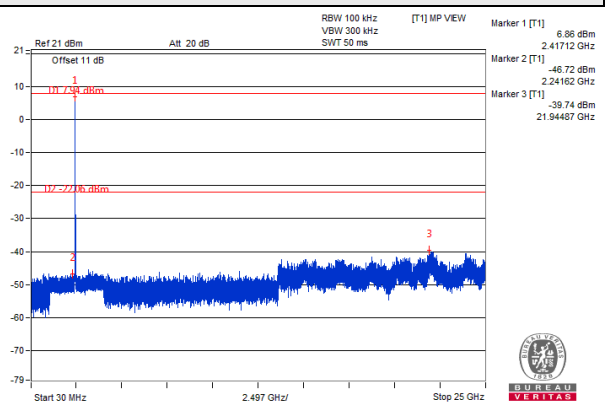




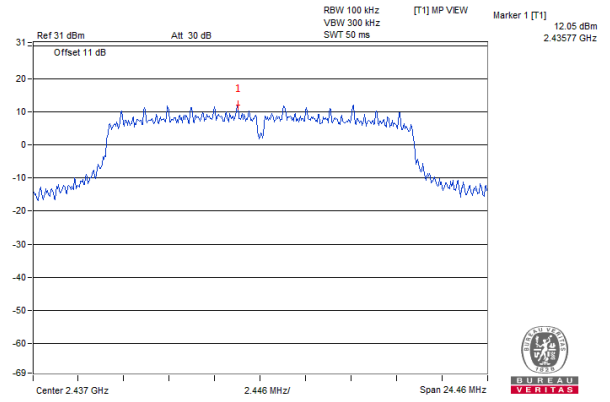
802.11g_Chain 3

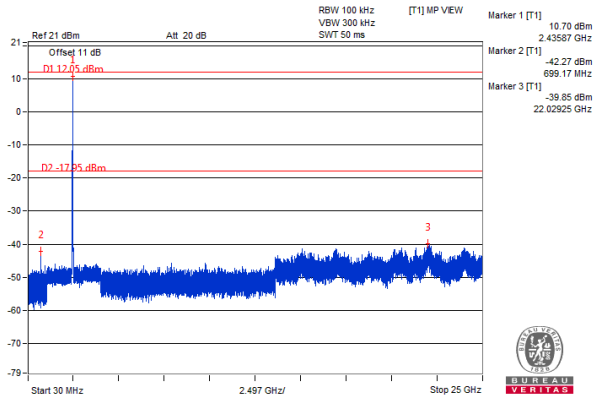
CH 1



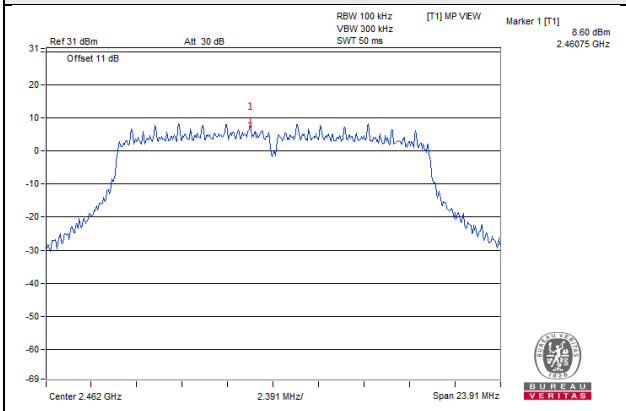


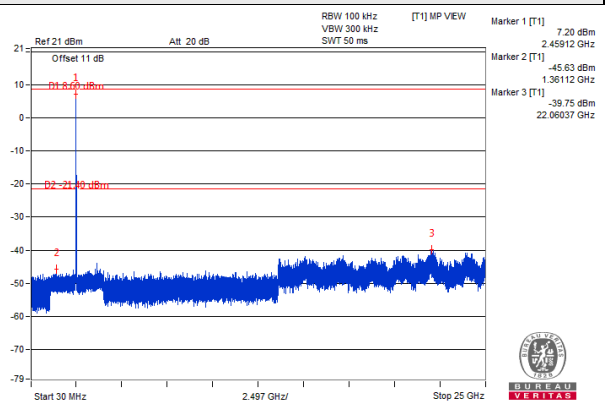
CH 6





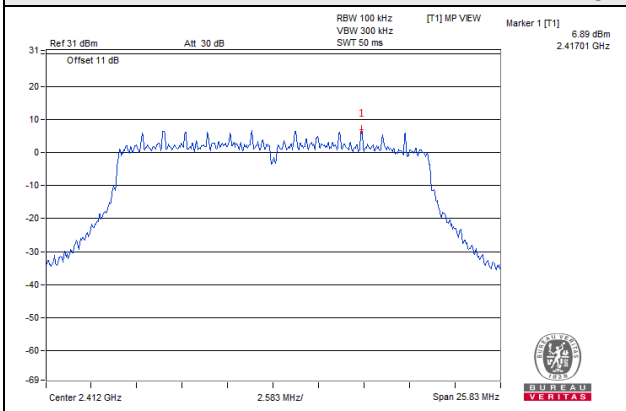
CH 11

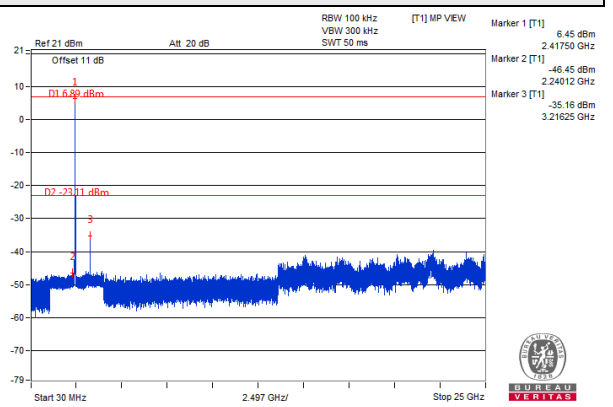




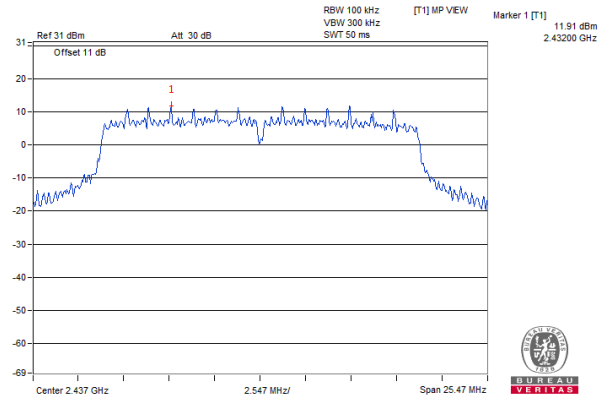
802.11n (HT20)_Chain 0

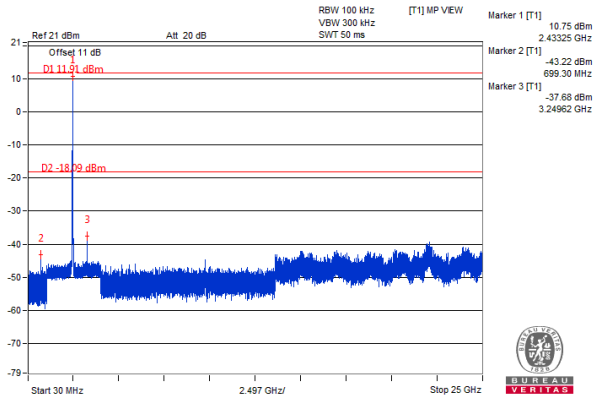
CH 1



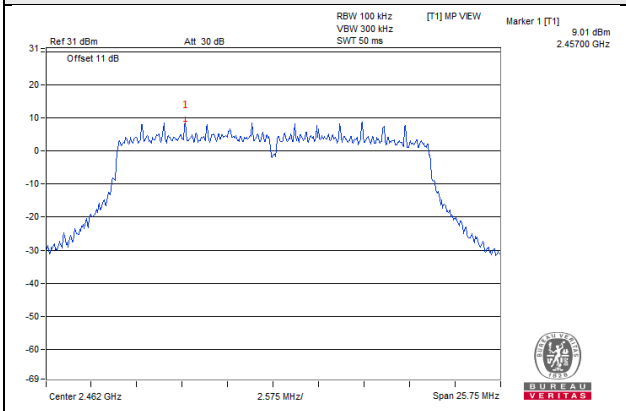


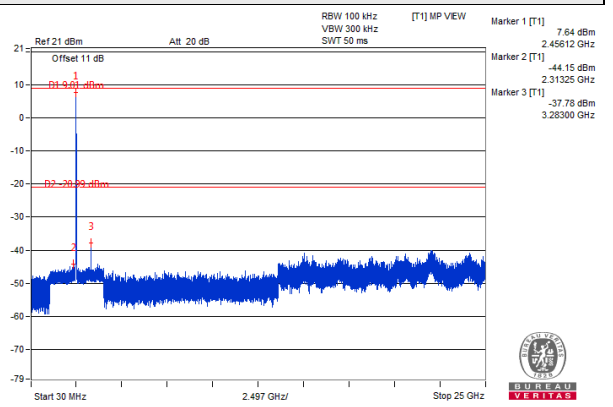
CH 6





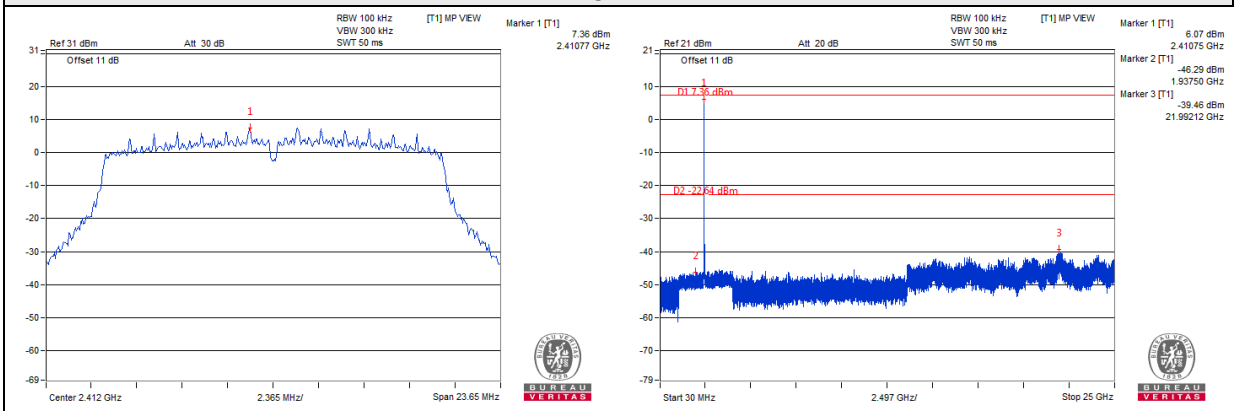
CH 11



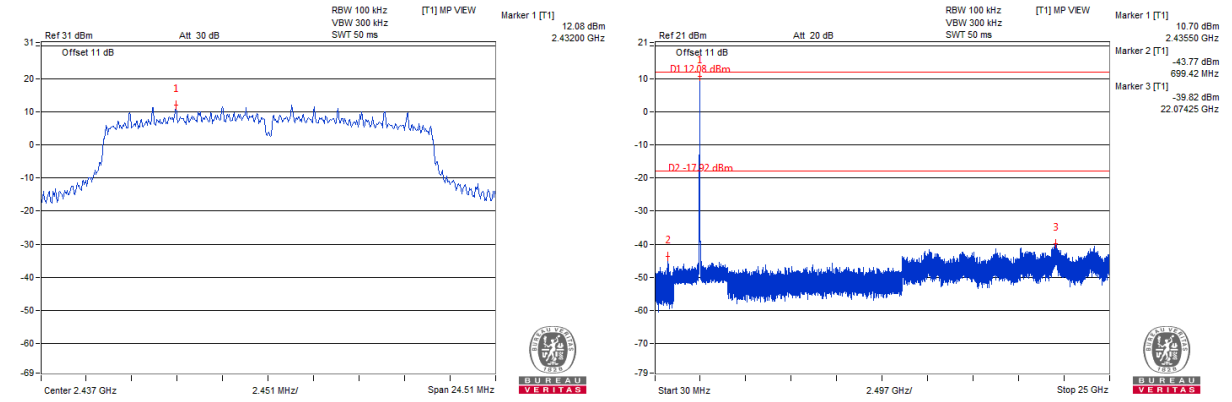


802.11n (HT20)_Chain 1

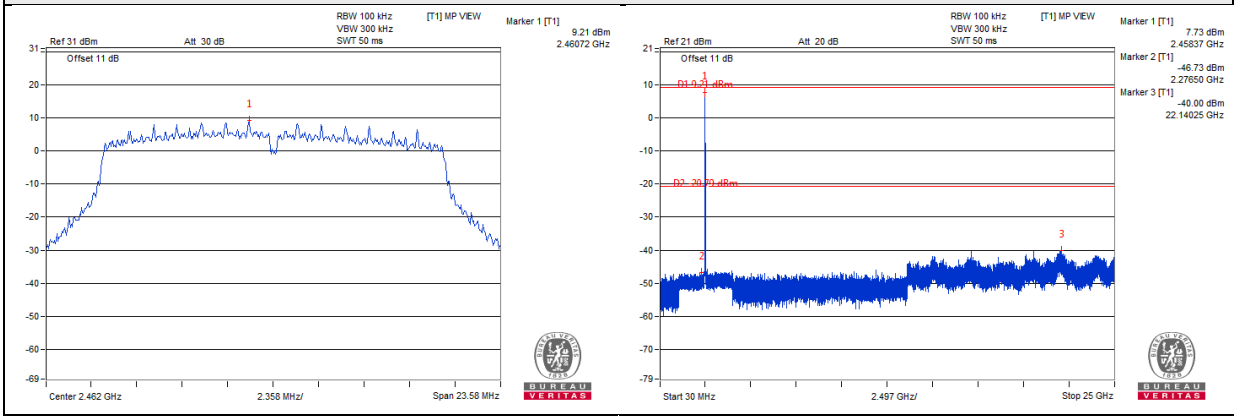
CH 1



CH 6

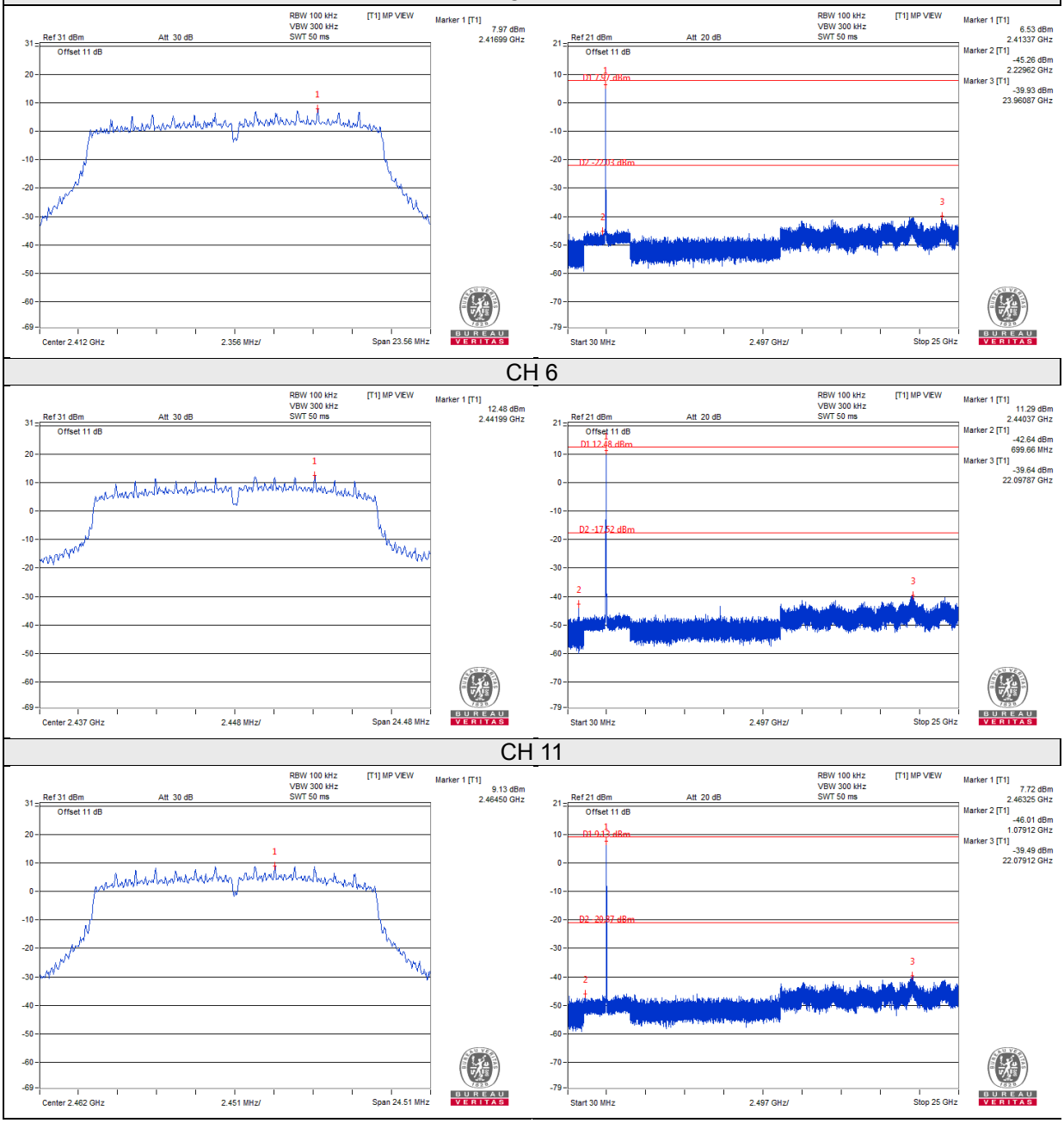


CH 11



802.11n (HT20)_Chain 2

CH 1

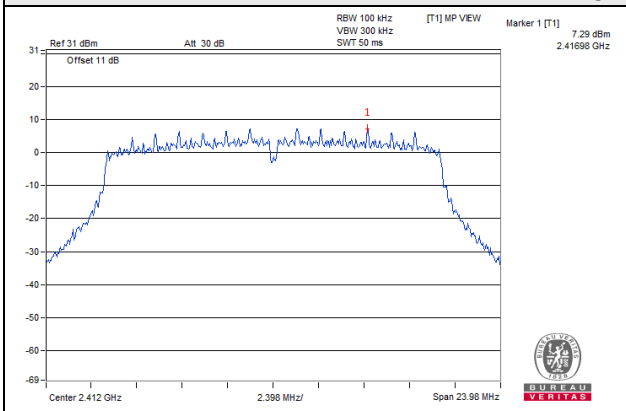


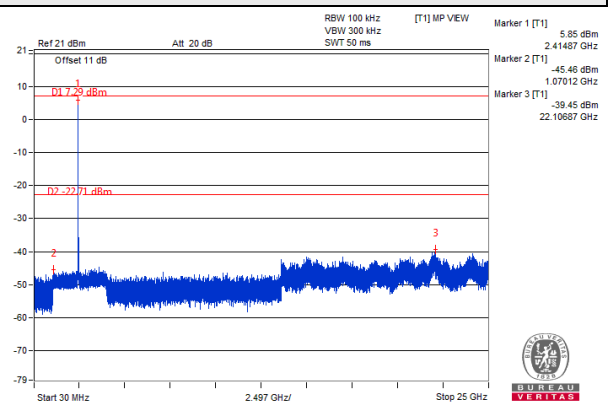
CH 6

CH 11

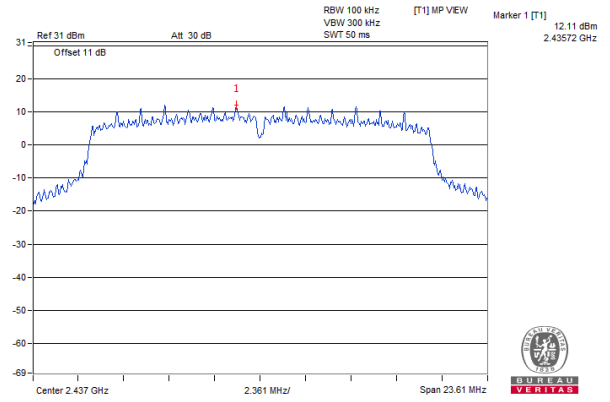
802.11n (HT20)_Chain 3

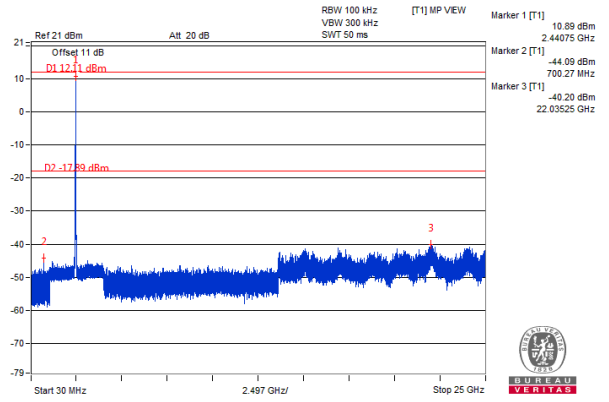
CH 1





CH 6





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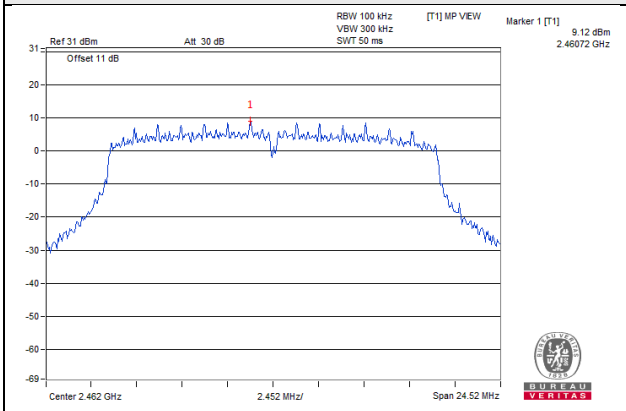
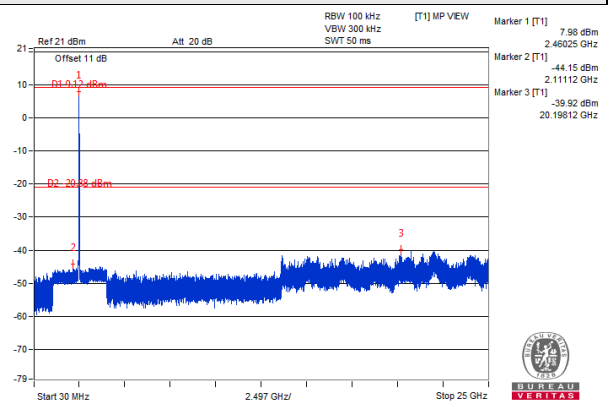
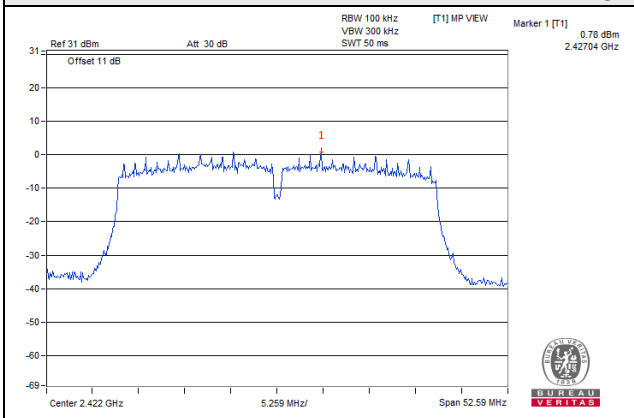
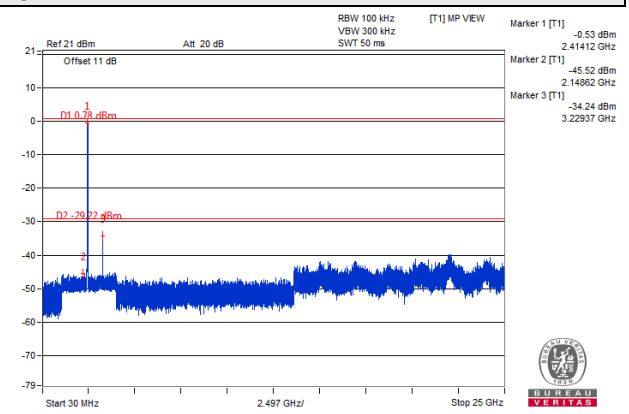




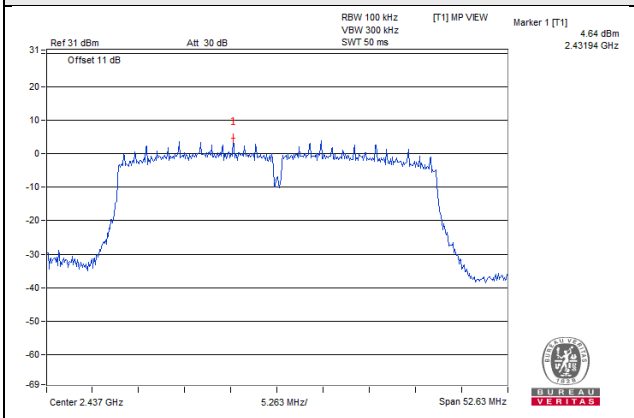
802.11n (HT40)_Chain 0

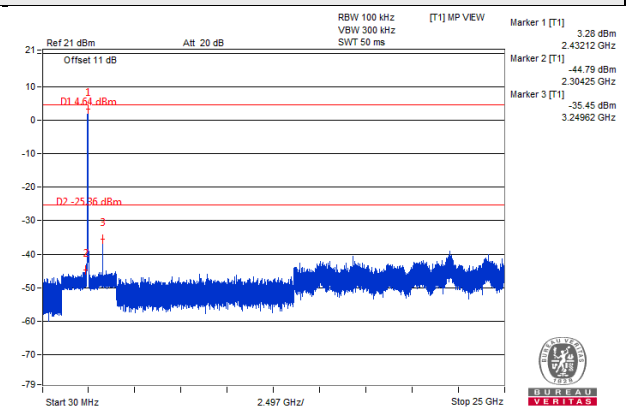
CH 3



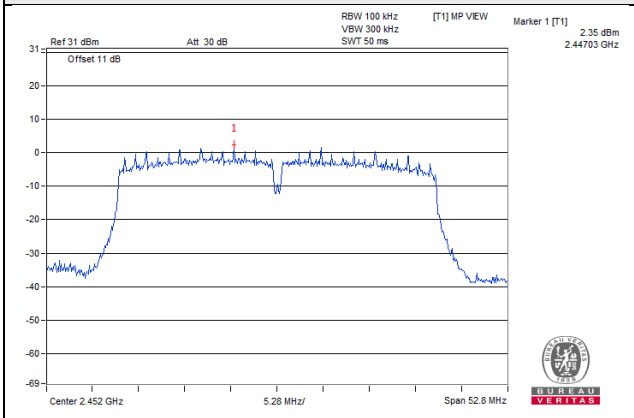


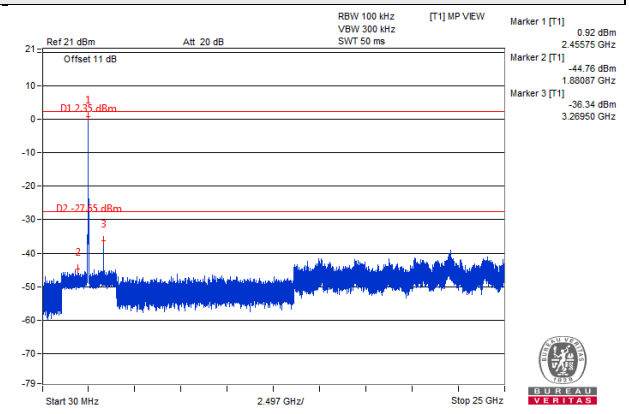
CH 6





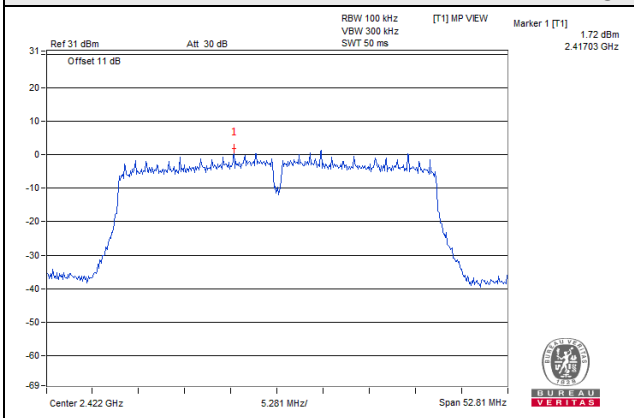
CH 9

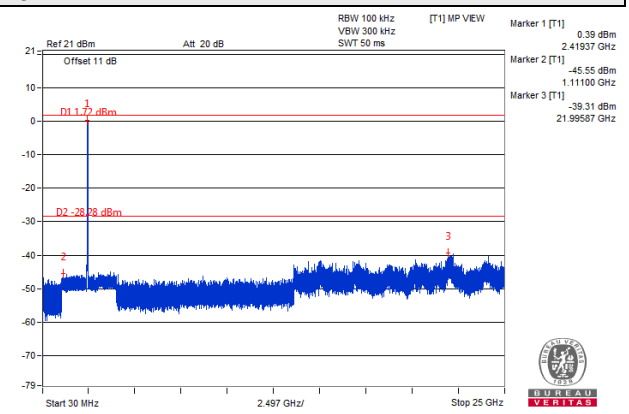




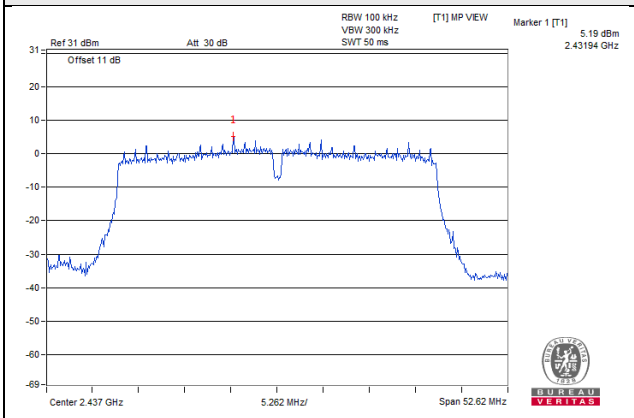
802.11n (HT40)_Chain 1

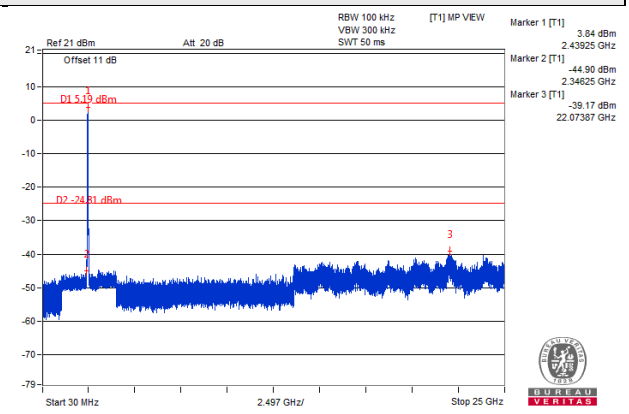
CH 3





CH 6





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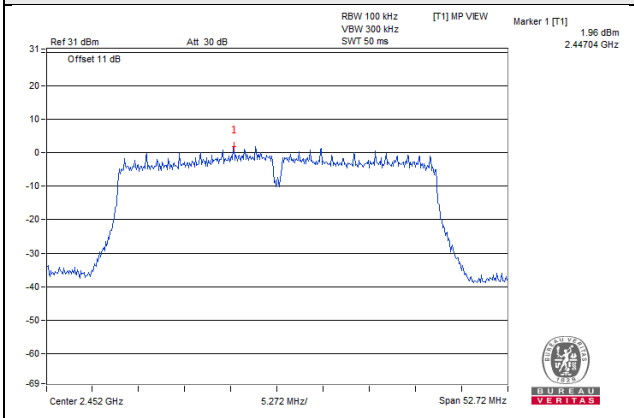
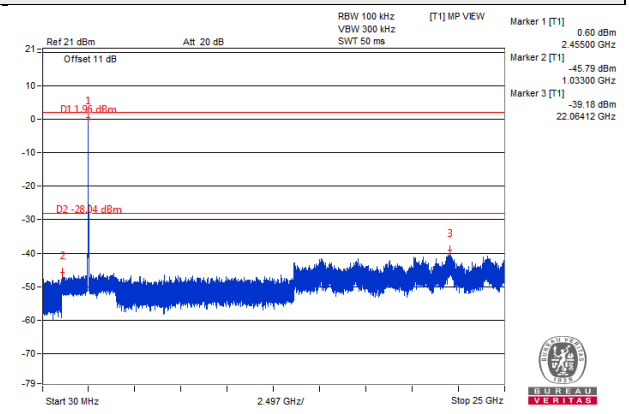
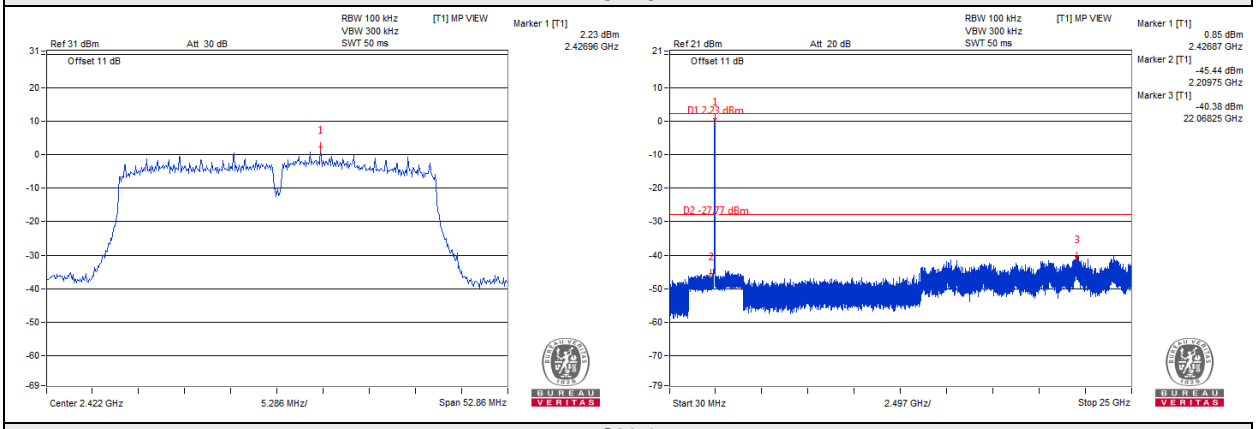




802.11n (HT40)_Chain 2

CH 3



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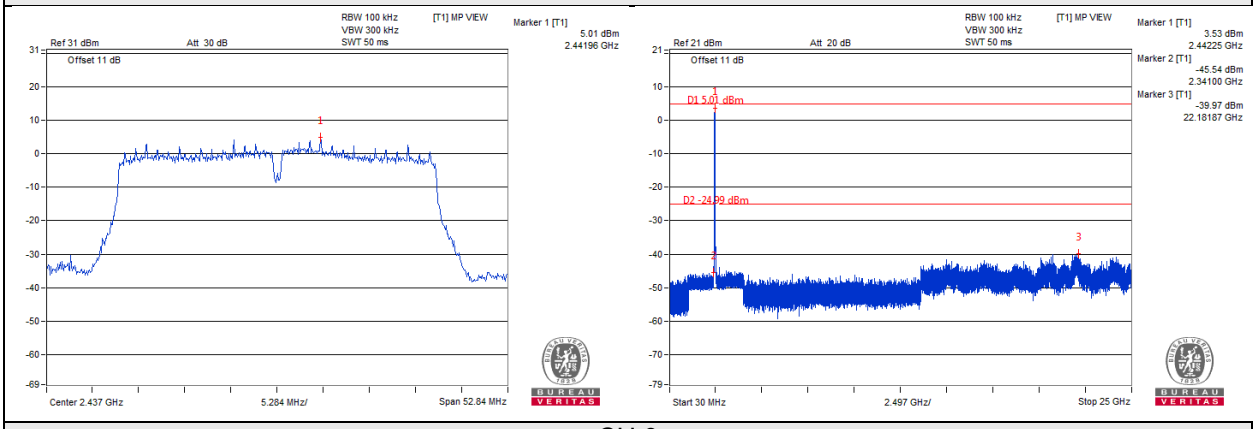

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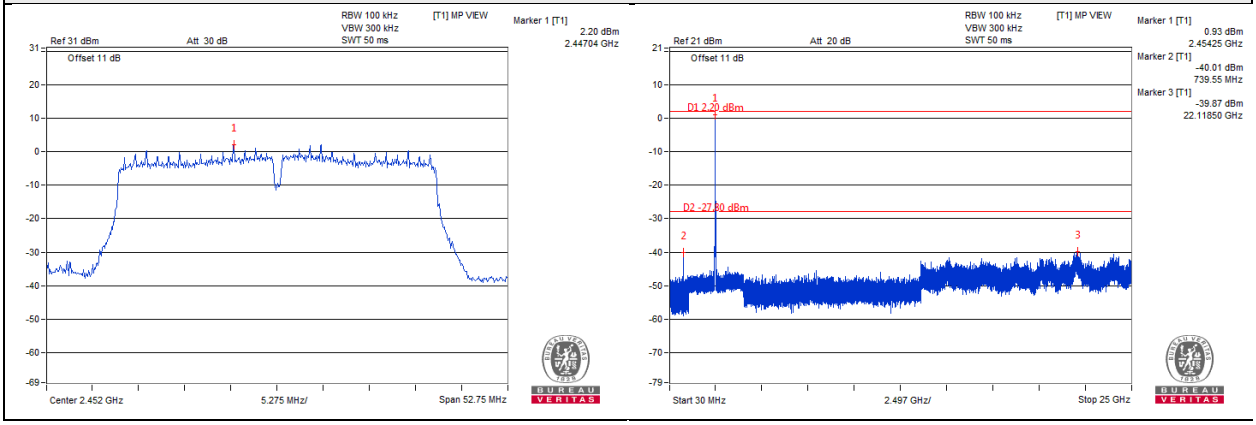
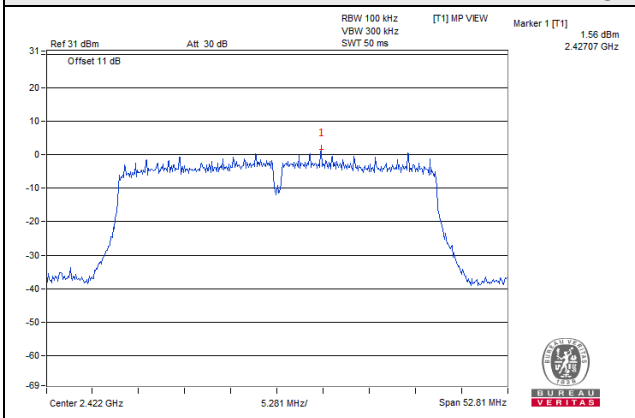
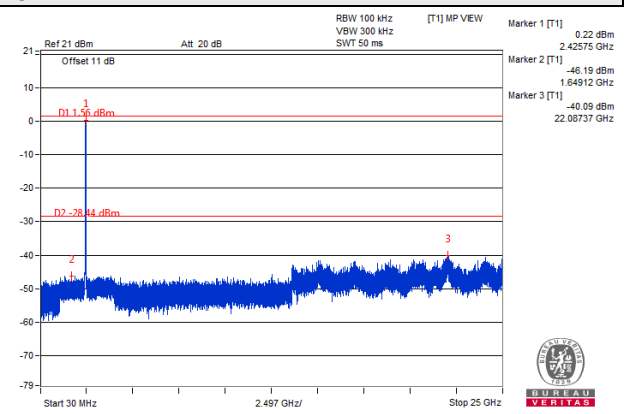


802.11n (HT40)_Chain 3

CH 3





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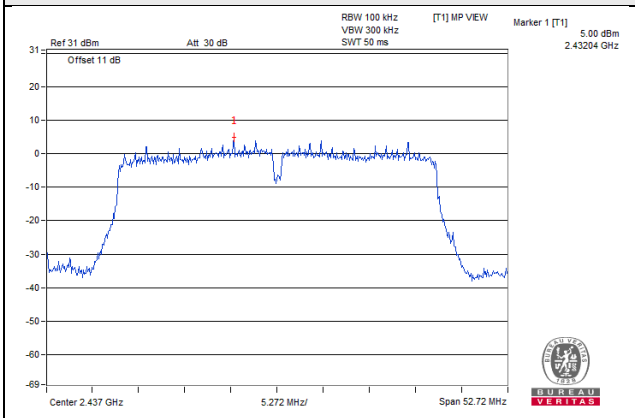

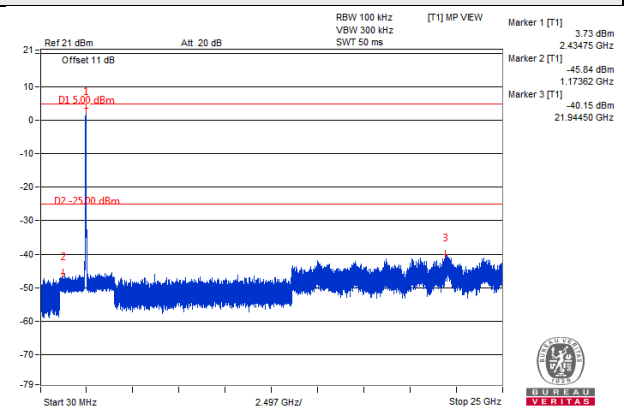

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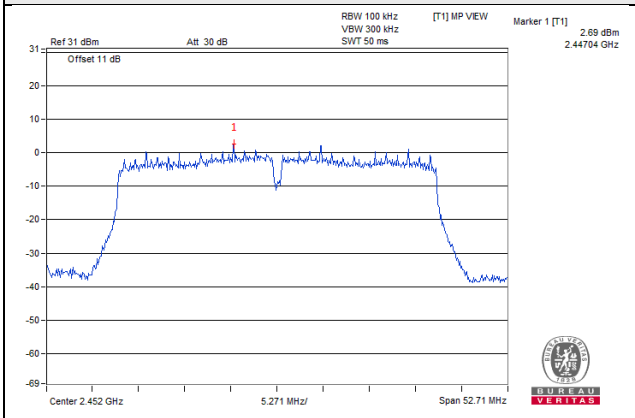

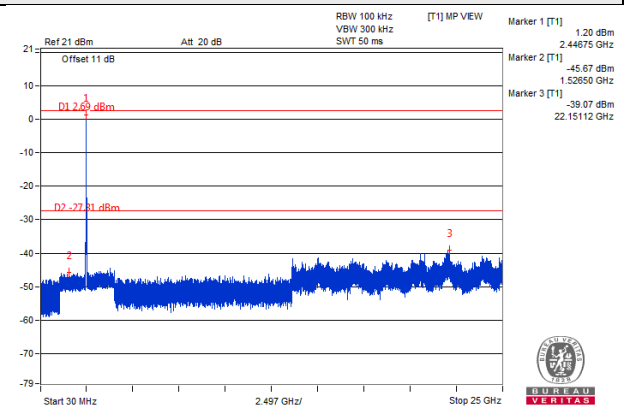

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Tel: 886-2-26052180
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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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