

FCC Test Report (WLAN)

Report No.: RF200225E06

FCC ID: NKR-LS03

Test Model: S40LR0-01

Received Date: Feb. 25, 2020

Test Date: Mar. 06 to 24, 2020

Issued Date: Apr. 15, 2020

Applicant: Wistron NeWeb Corp.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF200225E06	Original release.	Apr. 15, 2020

1 Certificate of Conformity

Product: Smart Home Hub

Brand: ADT

Test Model: S40LR0-01

Sample Status: ENGINEERING SAMPLE

Applicant: Wistron NeWeb Corp.

Test Date: Mar. 06 to 24, 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 EMC characteristics under the conditions specified in this report.

Prepared by : Joyce Kuo , **Date:** Apr. 15, 2020
Joyce Kuo / Specialist

Approved by : Clark Lin , **Date:** Apr. 15, 2020
Clark Lin / 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 -7.25dB at 0.41172MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2387.20MHz, 2483.50MHz, 2390.00MHz, 2388.70MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

Note:

- For 2.4GHz band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Conducted Emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.1 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	Smart Home Hub
Brand	ADT
Test Model	S40LR0-01
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter or 3.65Vdc from battery
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 300Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	532.18mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1, Battery x 1
Data Cable Supplied	NA

Note:

1. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3
WLAN(2.4GHz)	BT-LE	WWAN(LTE)
Radio 4	Radio 5	Radio 6
Zigbee	Z-wave	DECT

2. The EUT contains certified 3G/LTE modular which FCC ID: NKRIMQ5

3. Simultaneously transmission condition.

Condition	Technology
1	WLAN(2.4G) + BLE + Zigbee+ Z-wave + DECT + LTE

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

4. The EUT power needs to be supplied from a battery and power adapter the information is as below table:

Adapter			
No.	Brand	Model No.	Spec.
1	Frecom	F18L10-120150SPAU	Input: 100-240V, 0.6A, 50-60Hz Output: 12V, 1.5A DC Cable: Unshielded, 1.9m
Battery			
No.	Brand	Model No.	Spec.
1	Tenergy	34262 Rev B	Output: 3.65V, 2400mAh

5. The antennas provided to the EUT, please refer to the following table:

Antenna NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
WiFi 2.4GHz	6.07	2.4~2.4835GHz	PCB	i-pex(MHF)
WiFi 2.4GHz	4.67	2.4~2.4835GHz	PCB	i-pex(MHF)
BLE	5.38	2.4~2.4835GHz	PCB	i-pex(MHF)
LTE_ANT1	0.87 2.38 2.25	698 ~ 716 MHz 1710 ~ 1755 MHz 1850 ~1910 MHz	Monopole	N/A
Zigbee	4.11	2.4~2.4835GHz	PCB	i-pex(MHF)
Zwave	0.91	902 ~ 928 MHz	PIFA	N/A
ANT_DECT1	0.43	1920 ~ 1930MHz	PIFA	N/A
ANT_DECT2	0.59	1920 ~ 1930MHz	PIFA	N/A

6. The EUT incorporates a MIMO function.

2.4GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX

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

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 75%RH	120Vac, 60Hz	Kevin Ko
RE<1G	22deg. C, 68%RH	120Vac, 60Hz	Kevin Ko
PLC	25deg. C, 75%RH	120Vac, 60Hz	Kevin Ko
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

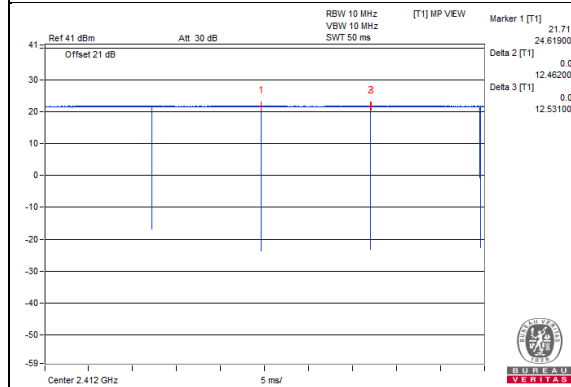
802.11b: Duty cycle = $12.462/12.531 = 0.994$.

802.11g: Duty cycle = $2.063/2.085 = 0.989$

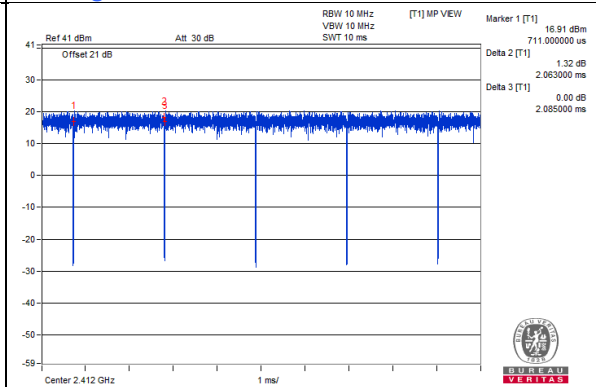
802.11n (HT20): Duty cycle = $1.917/1.937 = 0.99$

802.11n (HT40): Duty cycle = $0.941/0.971 = 0.969$, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.14$

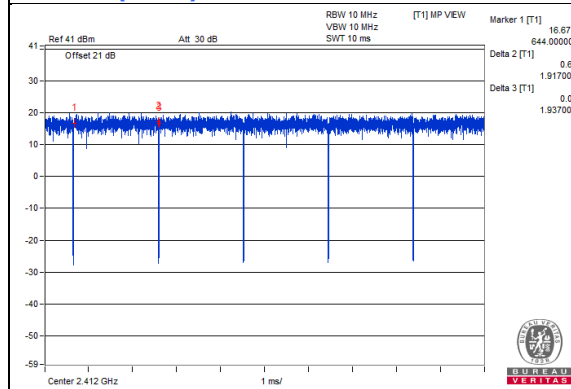
802.11b



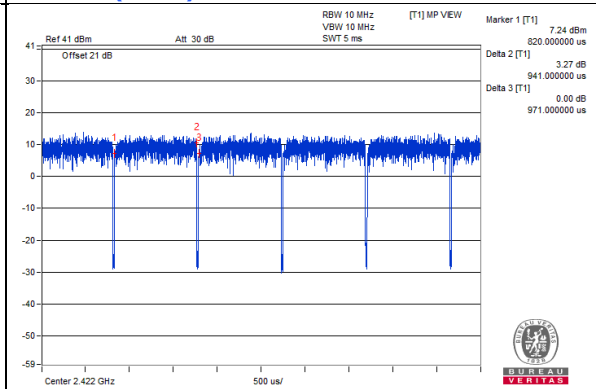
802.11g



802.11n (HT20)



802.11n (HT40)



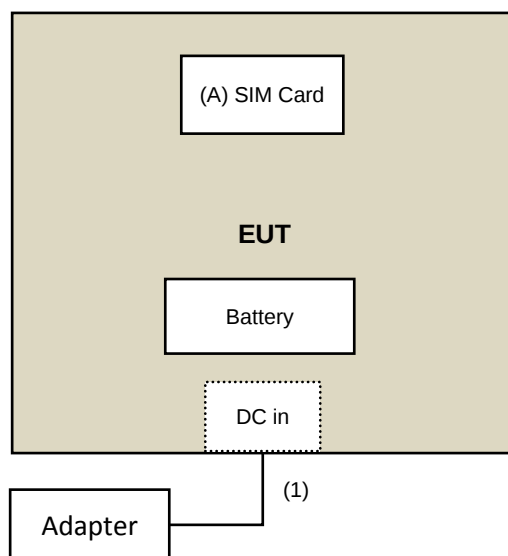
3.4 Description of Support Units

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.	SIM Card	R&S	CRT-Z3	NA	NA	Provided by Lab

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.9	No	0	Supplied by client

3.4.1 Configuration of System under Test



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

For Radiated Emission below 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 03, 2019	July 02, 2020
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-01	Oct. 23, 2019	Oct. 22, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 11, 2019	Nov. 10, 2020
RF Cable	8D	966-4-1	Mar. 19, 2019	Mar. 18, 2020
RF Cable	8D	966-4-2	Mar. 19, 2019	Mar. 18, 2020
RF Cable	8D	966-4-3	Mar. 19, 2019	Mar. 18, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 26, 2019	Sep. 25, 2020
Software	ADT_Radiated _V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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 966 Chamber No. 4.
3. Tested Date: Mar. 11, 2020

For Radiated Emission above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 13, 2019	Dec. 12, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980385	Aug. 15, 2019	Aug. 14, 2020
RF Cable	EMC104-SM-SM-1200	160923	Jan. 15, 2020	Jan. 14, 2021
RF Cable	104 RF cable	131215	Jan. 09, 2020	Jan. 08, 2021
RF Cable	EMC104-SM-SM-6000	180418	May 03, 2019	May 02, 2020
Pre-Amplifier EMCI	EMC184045S E	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated _v8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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 966 Chamber No. 4.
3. Tested Date: Mar. 20, 2020

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Power meter Anritsu	ML2495A	1014008	May 13, 2019	May 12, 2020
Power sensor Anritsu	MA2411B	0917122	May 13, 2019	May 12, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

- NOTE:**
1. The test was performed in Oven room 2.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. Tested Date: Mar. 24, 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:

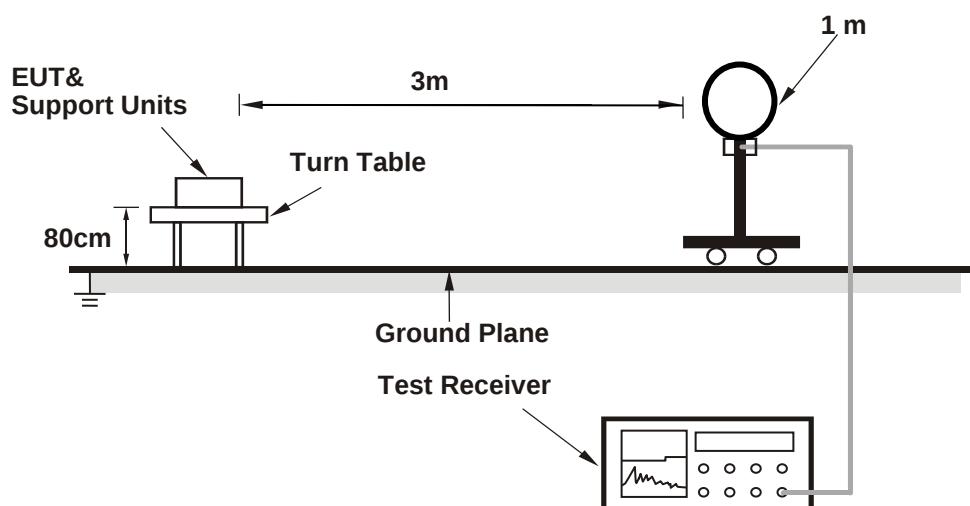
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

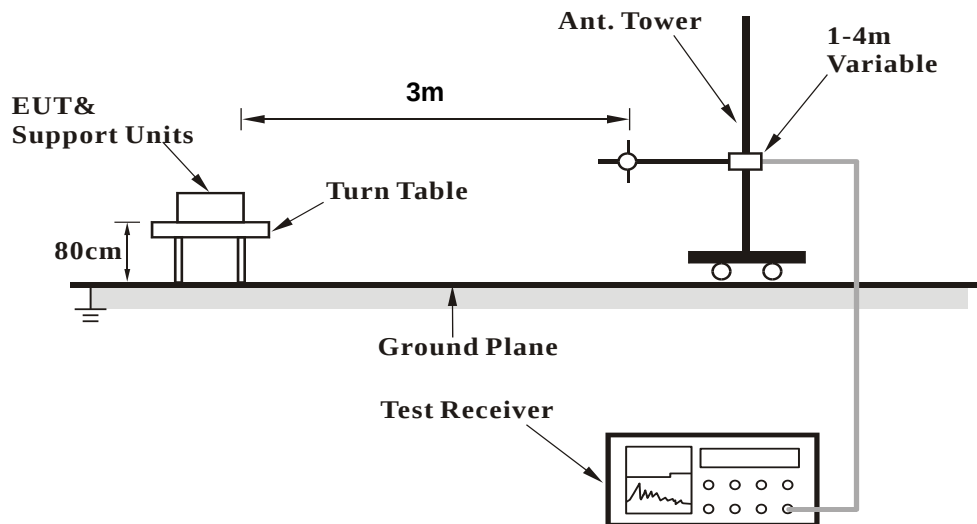
No deviation.

4.1.5 Test Setup

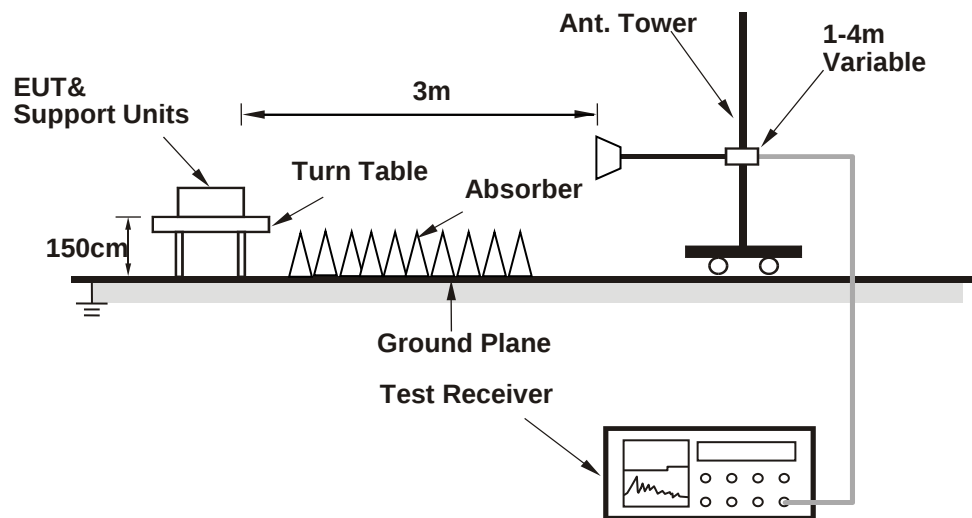
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Controlling software (Mtool 3.0.0.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

ABOVE 1GHz DATA

802.11b

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

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	2387.20	60.5 PK	74.0	-13.5	1.66 H	83	62.0	-1.5
2	2387.20	53.2 AV	54.0	-0.8	1.66 H	83	54.7	-1.5
3	2390.00	55.2 PK	74.0	-18.8	1.66 H	83	56.7	-1.5
4	2390.00	50.9 AV	54.0	-3.1	1.66 H	83	52.4	-1.5
5	*2412.00	107.8 PK			1.66 H	83	109.3	-1.5
6	*2412.00	105.5 AV			1.66 H	83	107.0	-1.5
7	4824.00	43.0 PK	74.0	-31.0	2.62 H	188	40.3	2.7
8	4824.00	32.1 AV	54.0	-21.9	2.62 H	188	29.4	2.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2387.20	60.2 PK	74.0	-13.8	3.42 V	240	61.7	-1.5
2	2387.20	53.8 AV	54.0	-0.2	3.42 V	240	55.3	-1.5
3	2390.00	57.7 PK	74.0	-16.3	3.42 V	240	59.2	-1.5
4	2390.00	51.9 AV	54.0	-2.1	3.42 V	240	53.4	-1.5
5	*2412.00	108.8 PK			3.42 V	240	110.3	-1.5
6	*2412.00	106.7 AV			3.42 V	240	108.2	-1.5
7	4824.00	43.4 PK	74.0	-30.6	2.52 V	192	40.7	2.7
8	4824.00	32.4 AV	54.0	-21.6	2.52 V	192	29.7	2.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.4 PK	74.0	-18.6	1.82 H	128	56.9	-1.5
2	2390.00	42.9 AV	54.0	-11.1	1.82 H	128	44.4	-1.5
3	*2437.00	109.8 PK			1.82 H	128	111.2	-1.4
4	*2437.00	107.6 AV			1.82 H	128	109.0	-1.4
5	2483.50	55.1 PK	74.0	-18.9	1.82 H	128	56.6	-1.5
6	2483.50	42.4 AV	54.0	-11.6	1.82 H	128	43.9	-1.5
7	4874.00	43.6 PK	74.0	-30.4	2.52 H	183	41.1	2.5
8	4874.00	32.9 AV	54.0	-21.1	2.52 H	183	30.4	2.5
9	7311.00	45.8 PK	74.0	-28.2	2.26 H	350	36.3	9.5
10	7311.00	33.7 AV	54.0	-20.3	2.26 H	350	24.2	9.5

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	55.3 PK	74.0	-18.7	2.41 V	244	56.8	-1.5
2	2390.00	42.5 AV	54.0	-11.5	2.41 V	244	44.0	-1.5
3	*2437.00	111.4 PK			2.41 V	244	112.8	-1.4
4	*2437.00	109.1 AV			2.41 V	244	110.5	-1.4
5	2483.50	54.9 PK	74.0	-19.1	2.41 V	244	56.4	-1.5
6	2483.50	42.3 AV	54.0	-11.7	2.41 V	244	43.8	-1.5
7	4874.00	43.4 PK	74.0	-30.6	2.57 V	201	40.9	2.5
8	4874.00	32.6 AV	54.0	-21.4	2.57 V	201	30.1	2.5
9	7311.00	45.9 PK	74.0	-28.1	2.24 V	346	36.4	9.5
10	7311.00	33.9 AV	54.0	-20.1	2.24 V	346	24.4	9.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	107.8 PK			1.83 H	117	109.2	-1.4
2	*2462.00	105.0 AV			1.83 H	117	106.4	-1.4
3	2483.50	57.2 PK	74.0	-16.8	1.83 H	117	58.7	-1.5
4	2483.50	50.7 AV	54.0	-3.3	1.83 H	117	52.2	-1.5
5	4924.00	42.7 PK	74.0	-31.3	2.57 H	183	39.9	2.8
6	4924.00	32.1 AV	54.0	-21.9	2.57 H	183	29.3	2.8
7	7386.00	45.8 PK	74.0	-28.2	2.21 H	359	35.8	10.0
8	7386.00	33.3 AV	54.0	-20.7	2.21 H	359	23.3	10.0
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	110.4 PK			3.22 V	246	111.8	-1.4
2	*2462.00	107.8 AV			3.22 V	246	109.2	-1.4
3	2483.50	60.5 PK	74.0	-13.5	3.22 V	246	62.0	-1.5
4	2483.50	53.8 AV	54.0	-0.2	3.22 V	246	55.3	-1.5
5	4924.00	43.2 PK	74.0	-30.8	2.56 V	187	40.4	2.8
6	4924.00	32.4 AV	54.0	-21.6	2.56 V	187	29.6	2.8
7	7386.00	45.9 PK	74.0	-28.1	2.22 V	355	35.9	10.0
8	7386.00	33.6 AV	54.0	-20.4	2.22 V	355	23.6	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) – 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.

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.7 PK	74.0	-8.3	2.58 H	89	67.2	-1.5
2	2390.00	51.2 AV	54.0	-2.8	2.58 H	89	52.7	-1.5
3	*2412.00	105.8 PK			2.58 H	89	107.3	-1.5
4	*2412.00	96.2 AV			2.58 H	89	97.7	-1.5
5	4824.00	42.8 PK	74.0	-31.2	2.51 H	175	40.1	2.7
6	4824.00	32.1 AV	54.0	-21.9	2.51 H	175	29.4	2.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.2 PK	74.0	-5.8	2.07 V	218	69.7	-1.5
2	2390.00	53.8 AV	54.0	-0.2	2.07 V	218	55.3	-1.5
3	*2412.00	110.1 PK			2.07 V	218	111.6	-1.5
4	*2412.00	99.6 AV			2.07 V	218	101.1	-1.5
5	4824.00	43.1 PK	74.0	-30.9	2.51 V	184	40.4	2.7
6	4824.00	32.4 AV	54.0	-21.6	2.51 V	184	29.7	2.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.2 PK	74.0	-9.8	1.81 H	125	65.7	-1.5
2	2390.00	48.9 AV	54.0	-5.1	1.81 H	125	50.4	-1.5
3	*2437.00	111.7 PK			1.81 H	125	113.1	-1.4
4	*2437.00	101.4 AV			1.81 H	125	102.8	-1.4
5	2483.50	62.4 PK	74.0	-11.6	1.81 H	125	63.9	-1.5
6	2483.50	48.5 AV	54.0	-5.5	1.81 H	125	50.0	-1.5
7	4874.00	43.0 PK	74.0	-31.0	2.55 H	195	40.5	2.5
8	4874.00	32.1 AV	54.0	-21.9	2.55 H	195	29.6	2.5
9	7311.00	46.0 PK	74.0	-28.0	2.20 H	360	36.5	9.5
10	7311.00	33.7 AV	54.0	-20.3	2.20 H	360	24.2	9.5

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.6 PK	74.0	-8.4	2.06 V	170	67.1	-1.5
2	2390.00	50.8 AV	54.0	-3.2	2.06 V	170	52.3	-1.5
3	*2437.00	113.5 PK			2.06 V	170	114.9	-1.4
4	*2437.00	103.0 AV			2.06 V	170	104.4	-1.4
5	2483.50	64.9 PK	74.0	-9.1	2.06 V	170	66.4	-1.5
6	2483.50	49.9 AV	54.0	-4.1	2.06 V	170	51.4	-1.5
7	4874.00	43.6 PK	74.0	-30.4	2.52 V	192	41.1	2.5
8	4874.00	32.8 AV	54.0	-21.2	2.52 V	192	30.3	2.5
9	7311.00	46.2 PK	74.0	-27.8	2.23 V	356	36.7	9.5
10	7311.00	34.1 AV	54.0	-19.9	2.23 V	356	24.6	9.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.9 PK			1.82 H	97	111.3	-1.4
2	*2462.00	100.1 AV			1.82 H	97	101.5	-1.4
3	2483.50	66.7 PK	74.0	-7.3	1.82 H	97	68.2	-1.5
4	2483.50	51.9 AV	54.0	-2.1	1.82 H	97	53.4	-1.5
5	2484.90	63.7 PK	74.0	-10.3	1.82 H	97	65.2	-1.5
6	2484.90	50.3 AV	54.0	-3.7	1.82 H	97	51.8	-1.5
7	4924.00	43.2 PK	74.0	-30.8	2.55 H	193	40.4	2.8
8	4924.00	32.2 AV	54.0	-21.8	2.55 H	193	29.4	2.8
9	7386.00	46.2 PK	74.0	-27.8	2.27 H	360	36.2	10.0
10	7386.00	33.8 AV	54.0	-20.2	2.27 H	360	23.8	10.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.2 PK			2.20 V	238	114.6	-1.4
2	*2462.00	101.8 AV			2.20 V	238	103.2	-1.4
3	2483.50	68.9 PK	74.0	-5.1	2.20 V	238	70.4	-1.5
4	2483.50	53.2 AV	54.0	-0.8	2.20 V	238	54.7	-1.5
5	2484.90	71.6 PK	74.0	-2.4	2.20 V	238	73.1	-1.5
6	2484.90	53.6 AV	54.0	-0.4	2.20 V	238	55.1	-1.5
7	4924.00	43.9 PK	74.0	-30.1	2.54 V	195	41.1	2.8
8	4924.00	32.8 AV	54.0	-21.2	2.54 V	195	30.0	2.8
9	7386.00	46.4 PK	74.0	-27.6	2.27 V	340	36.4	10.0
10	7386.00	34.0 AV	54.0	-20.0	2.27 V	340	24.0	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) – 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 (HT20)

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

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	2388.70	68.2 PK	74.0	-5.8	1.89 H	87	69.7	-1.5
2	2388.70	48.7 AV	54.0	-5.3	1.89 H	87	50.2	-1.5
3	2390.00	70.7 PK	74.0	-3.3	1.89 H	87	72.2	-1.5
4	2390.00	53.2 AV	54.0	-0.8	1.89 H	87	54.7	-1.5
5	*2412.00	105.4 PK			1.89 H	87	106.9	-1.5
6	*2412.00	95.8 AV			1.89 H	87	97.3	-1.5
7	4824.00	43.0 PK	74.0	-31.0	2.60 H	178	40.3	2.7
8	4824.00	32.0 AV	54.0	-22.0	2.60 H	178	29.3	2.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2388.70	70.7 PK	74.0	-3.3	2.11 V	218	72.2	-1.5
2	2388.70	53.8 AV	54.0	-0.2	2.11 V	218	55.3	-1.5
3	2390.00	66.6 PK	74.0	-7.4	2.11 V	218	68.1	-1.5
4	2390.00	52.1 AV	54.0	-1.9	2.11 V	218	53.6	-1.5
5	*2412.00	109.5 PK			2.11 V	218	111.0	-1.5
6	*2412.00	98.4 AV			2.11 V	218	99.9	-1.5
7	4824.00	43.6 PK	74.0	-30.4	2.62 V	192	40.9	2.7
8	4824.00	32.6 AV	54.0	-21.4	2.62 V	192	29.9	2.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.2 PK	74.0	-9.8	1.79 H	130	65.7	-1.5
2	2390.00	49.6 AV	54.0	-4.4	1.79 H	130	51.1	-1.5
3	*2437.00	111.3 PK			1.79 H	130	112.7	-1.4
4	*2437.00	99.9 AV			1.79 H	130	101.3	-1.4
5	2483.50	60.5 PK	74.0	-13.5	1.79 H	130	62.0	-1.5
6	2483.50	47.3 AV	54.0	-6.7	1.79 H	130	48.8	-1.5
7	4874.00	43.6 PK	74.0	-30.4	2.56 H	195	41.1	2.5
8	4874.00	32.7 AV	54.0	-21.3	2.56 H	195	30.2	2.5
9	7311.00	46.1 PK	74.0	-27.9	2.21 H	349	36.6	9.5
10	7311.00	33.8 AV	54.0	-20.2	2.21 H	349	24.3	9.5

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.2 PK	74.0	-8.8	2.02 V	219	66.7	-1.5
2	2390.00	50.7 AV	54.0	-3.3	2.02 V	219	52.2	-1.5
3	*2437.00	113.8 PK			2.02 V	219	115.2	-1.4
4	*2437.00	102.8 AV			2.02 V	219	104.2	-1.4
5	2483.50	62.7 PK	74.0	-11.3	2.02 V	219	64.2	-1.5
6	2483.50	49.7 AV	54.0	-4.3	2.02 V	219	51.2	-1.5
7	4874.00	43.0 PK	74.0	-31.0	2.61 V	194	40.5	2.5
8	4874.00	32.4 AV	54.0	-21.6	2.61 V	194	29.9	2.5
9	7311.00	45.3 PK	74.0	-28.7	2.27 V	340	35.8	9.5
10	7311.00	33.2 AV	54.0	-20.8	2.27 V	340	23.7	9.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	107.9 PK			2.10 H	94	109.3	-1.4
2	*2462.00	97.4 AV			2.10 H	94	98.8	-1.4
3	2483.50	66.6 PK	74.0	-7.4	2.10 H	94	68.1	-1.5
4	2483.50	51.6 AV	54.0	-2.4	2.10 H	94	53.1	-1.5
5	4924.00	43.5 PK	74.0	-30.5	2.57 H	185	40.7	2.8
6	4924.00	32.6 AV	54.0	-21.4	2.57 H	185	29.8	2.8
7	7386.00	45.3 PK	74.0	-28.7	2.22 H	360	35.3	10.0
8	7386.00	33.3 AV	54.0	-20.7	2.22 H	360	23.3	10.0
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	110.9 PK			1.92 V	237	112.3	-1.4
2	*2462.00	99.8 AV			1.92 V	237	101.2	-1.4
3	2483.50	68.7 PK	74.0	-5.3	1.92 V	237	70.2	-1.5
4	2483.50	53.6 AV	54.0	-0.4	1.92 V	237	55.1	-1.5
5	4924.00	43.1 PK	74.0	-30.9	2.51 V	188	40.3	2.8
6	4924.00	32.0 AV	54.0	-22.0	2.51 V	188	29.2	2.8
7	7386.00	46.2 PK	74.0	-27.8	2.27 V	360	36.2	10.0
8	7386.00	33.9 AV	54.0	-20.1	2.27 V	360	23.9	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) – 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 (HT40)

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

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	2388.60	65.3 PK	74.0	-8.7	1.26 H	112	66.8	-1.5
2	2388.60	52.2 AV	54.0	-1.8	1.26 H	112	53.7	-1.5
3	*2422.00	99.2 PK			1.26 H	112	100.7	-1.5
4	*2422.00	88.9 AV			1.26 H	112	90.4	-1.5
5	4844.00	43.2 PK	74.0	-30.8	2.56 H	198	40.5	2.7
6	4844.00	32.4 AV	54.0	-21.6	2.56 H	198	29.7	2.7
7	7266.00	45.6 PK	74.0	-28.4	2.21 H	356	36.3	9.3
8	7266.00	33.4 AV	54.0	-20.6	2.21 H	356	24.1	9.3
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	2388.60	68.2 PK	74.0	-5.8	1.43 V	215	69.7	-1.5
2	2388.60	53.6 AV	54.0	-0.4	1.43 V	215	55.1	-1.5
3	*2422.00	102.2 PK			1.43 V	215	103.7	-1.5
4	*2422.00	91.6 AV			1.43 V	215	93.1	-1.5
5	4844.00	42.8 PK	74.0	-31.2	2.54 V	184	40.1	2.7
6	4844.00	32.3 AV	54.0	-21.7	2.54 V	184	29.6	2.7
7	7266.00	46.4 PK	74.0	-27.6	2.21 V	344	37.1	9.3
8	7266.00	33.9 AV	54.0	-20.1	2.21 V	344	24.6	9.3

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) – 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	70.1 PK	74.0	-3.9	1.83 H	118	71.6	-1.5
2	2390.00	51.5 AV	54.0	-2.5	1.83 H	118	53.0	-1.5
3	*2437.00	103.9 PK			1.83 H	118	105.3	-1.4
4	*2437.00	93.9 AV			1.83 H	118	95.3	-1.4
5	2483.50	61.8 PK	74.0	-12.2	1.83 H	118	63.3	-1.5
6	2483.50	46.9 AV	54.0	-7.1	1.83 H	118	48.4	-1.5
7	4874.00	43.3 PK	74.0	-30.7	2.58 H	183	40.8	2.5
8	4874.00	32.3 AV	54.0	-21.7	2.58 H	183	29.8	2.5
9	7311.00	45.2 PK	74.0	-28.8	2.19 H	356	35.7	9.5
10	7311.00	33.2 AV	54.0	-20.8	2.19 H	356	23.7	9.5

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	72.1 PK	74.0	-1.9	1.29 V	174	73.6	-1.5
2	2390.00	53.7 AV	54.0	-0.3	1.29 V	174	55.2	-1.5
3	*2437.00	106.4 PK			1.29 V	174	107.8	-1.4
4	*2437.00	95.2 AV			1.29 V	174	96.6	-1.4
5	2483.50	63.4 PK	74.0	-10.6	1.29 V	174	64.9	-1.5
6	2483.50	48.6 AV	54.0	-5.4	1.29 V	174	50.1	-1.5
7	4874.00	43.0 PK	74.0	-31.0	2.55 V	196	40.5	2.5
8	4874.00	31.9 AV	54.0	-22.1	2.55 V	196	29.4	2.5
9	7311.00	45.5 PK	74.0	-28.5	2.20 V	349	36.0	9.5
10	7311.00	33.4 AV	54.0	-20.6	2.20 V	349	23.9	9.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	105.5 PK			1.33 H	89	106.9	-1.4
2	*2452.00	92.2 AV			1.33 H	89	93.6	-1.4
3	2483.50	63.7 PK	74.0	-10.3	1.33 H	89	65.2	-1.5
4	2483.50	52.8 AV	54.0	-1.2	1.33 H	89	54.3	-1.5
5	4904.00	43.5 PK	74.0	-30.5	2.55 H	199	41.0	2.5
6	4904.00	32.5 AV	54.0	-21.5	2.55 H	199	30.0	2.5
7	7356.00	45.6 PK	74.0	-28.4	2.27 H	360	35.9	9.7
8	7356.00	33.4 AV	54.0	-20.6	2.27 H	360	23.7	9.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	105.9 PK			1.42 V	245	107.3	-1.4
2	*2452.00	94.2 AV			1.42 V	245	95.6	-1.4
3	2483.50	65.4 PK	74.0	-8.6	1.42 V	245	66.9	-1.5
4	2483.50	53.7 AV	54.0	-0.3	1.42 V	245	55.2	-1.5
5	4904.00	43.3 PK	74.0	-30.7	2.62 V	180	40.8	2.5
6	4904.00	32.5 AV	54.0	-21.5	2.62 V	180	30.0	2.5
7	7356.00	45.6 PK	74.0	-28.4	2.27 V	360	35.9	9.7
8	7356.00	33.5 AV	54.0	-20.5	2.27 V	360	23.8	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) – 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:

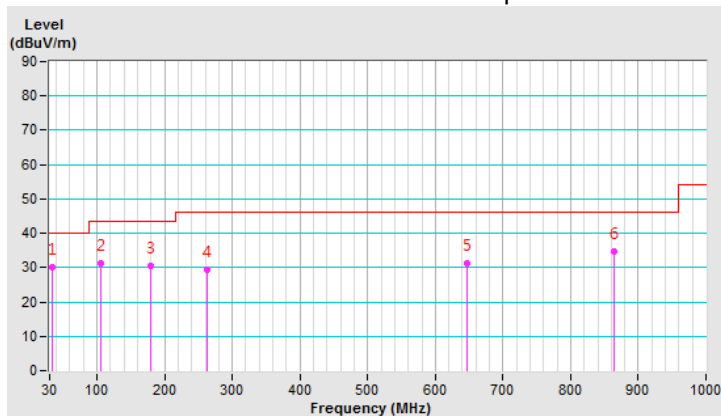
802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	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	34.15	30.0 QP	40.0	-10.0	1.50 H	360	39.3	-9.3
2	106.31	31.2 QP	43.5	-12.3	1.50 H	191	42.3	-11.1
3	178.87	30.5 QP	43.5	-13.0	1.50 H	169	39.7	-9.2
4	261.90	29.2 QP	46.0	-16.8	1.00 H	249	37.6	-8.4
5	647.87	31.4 QP	46.0	-14.6	1.50 H	341	29.7	1.7
6	864.15	34.6 QP	46.0	-11.4	1.00 H	359	29.3	5.3

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) – 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.

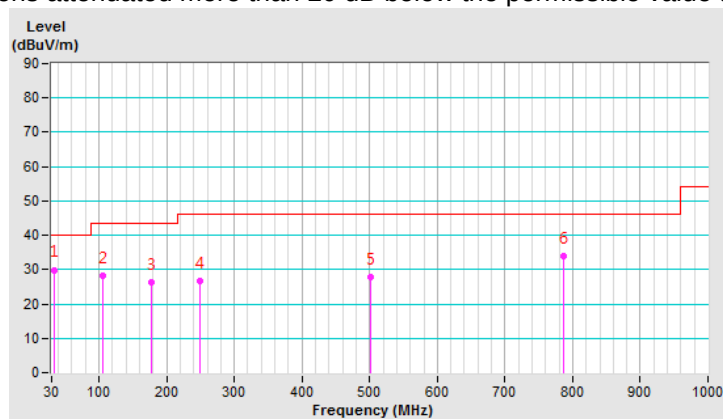


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	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	34.58	29.9 QP	40.0	-10.1	1.00 V	48	38.8	-8.9
2	106.36	28.1 QP	43.5	-15.4	2.00 V	297	39.2	-11.1
3	177.90	26.4 QP	43.5	-17.1	1.00 V	88	35.5	-9.1
4	250.00	26.8 QP	46.0	-19.2	1.00 V	360	35.5	-8.7
5	501.83	27.7 QP	46.0	-18.3	2.00 V	360	29.3	-1.6
6	785.80	34.0 QP	46.0	-12.0	2.00 V	325	29.5	4.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
50 ohms Terminator	50	3	Oct. 23, 2019	Oct. 22, 2020
RF Cable	5D-FB	COCCAB-001	Sep. 27, 2019	Sep. 26, 2020
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 14, 2019	Mar. 13, 2020
Software BVADT	BVADT_Cond_V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
- 3 Tested Date: Mar. 11, 2020

4.2.3 Test Procedures

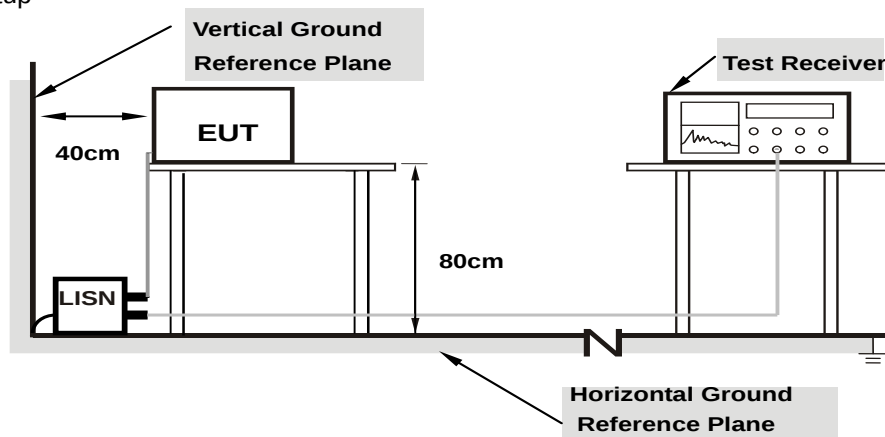
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

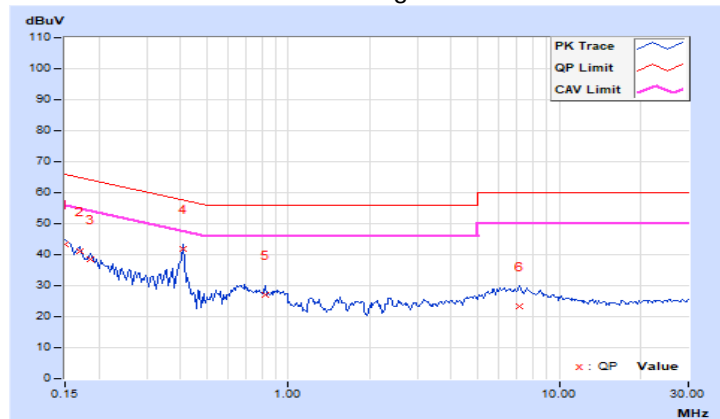
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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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	0.15000	9.99	33.17	23.36	43.16	33.35	66.00	56.00	-22.84	-22.65
2	0.16953	9.99	31.04	21.69	41.03	31.68	64.98	54.98	-23.95	-23.30
3	0.18516	9.99	28.44	19.37	38.43	29.36	64.25	54.25	-25.82	-24.89
4	0.40781	10.00	31.74	26.93	41.74	36.93	57.69	47.69	-15.95	-10.76
5	0.82188	10.04	17.04	7.72	27.08	17.76	56.00	46.00	-28.92	-28.24
6	7.16406	10.47	13.02	4.35	23.49	14.82	60.00	50.00	-36.51	-35.18

Remarks:

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



Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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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	0.15000	9.99	33.69	20.60	43.68	30.59	66.00	56.00	-22.32	-25.41
2	0.16953	9.99	31.62	17.94	41.61	27.93	64.98	54.98	-23.37	-27.05
3	0.18906	9.99	28.68	15.34	38.67	25.33	64.08	54.08	-25.41	-28.75
4	0.41172	10.01	32.97	30.35	42.98	40.36	57.61	47.61	-14.63	-7.25
5	0.67344	10.03	16.94	12.54	26.97	22.57	56.00	46.00	-29.03	-23.43
6	1.21094	10.06	15.72	11.34	25.78	21.40	56.00	46.00	-30.22	-24.60

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

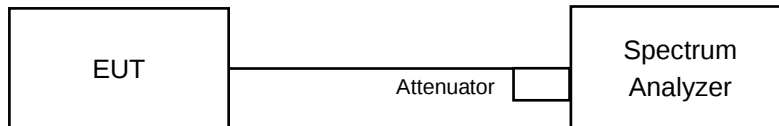


4.3 6dB Bandwidth Measurement

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) $\geq 3 \times$ 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		
1	2412	8.1	8.12	0.5	Pass
6	2437	8.11	8.1	0.5	Pass
11	2462	8.11	8.57	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.41	16.42	0.5	Pass
6	2437	16.41	16.42	0.5	Pass
11	2462	16.39	16.42	0.5	Pass

802.11n (HT20)

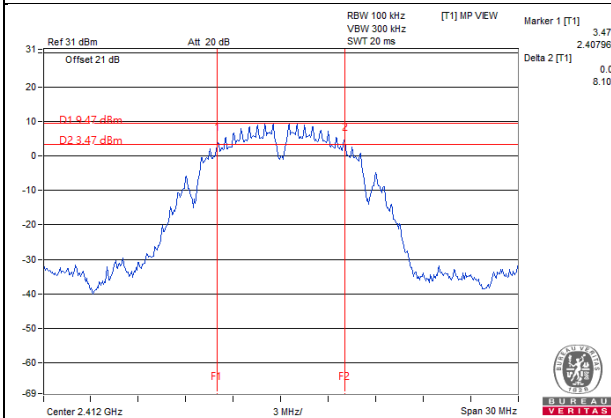
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.65	17.67	0.5	Pass
6	2437	17.68	17.69	0.5	Pass
11	2462	17.68	17.7	0.5	Pass

802.11n (HT40)

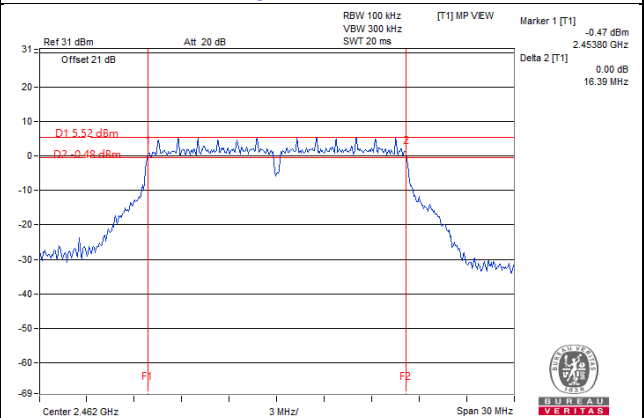
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	36.17	35.91	0.5	Pass
6	2437	36.23	36.54	0.5	Pass
9	2452	36.3	36.48	0.5	Pass

Spectrum Plot of Worst Value

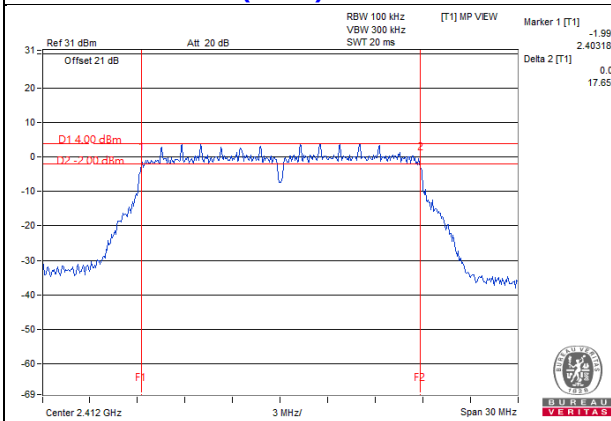
802.11b: Chain 0 / CH1



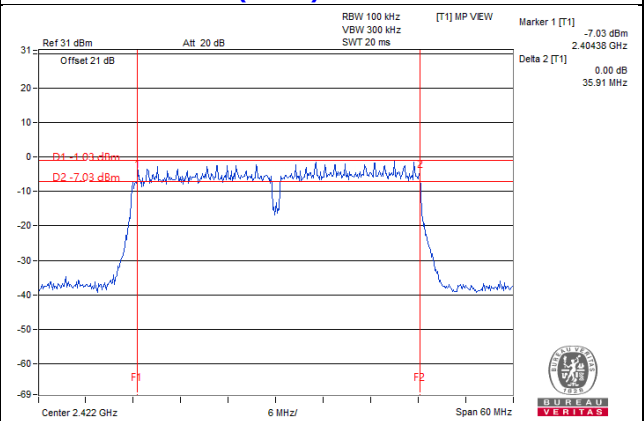
802.11g: Chain 0 / CH11



802.11n (HT20): Chain 0 / CH1



802.11n (HT40): Chain 1 / CH3



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,

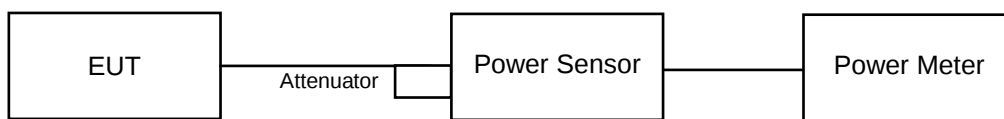
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

FOR PEAK POWER

802.11b

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.44	21.04	237.72	23.76	29.93	Pass
6	2437	21.86	22.16	317.899	25.02	29.93	Pass
11	2462	19.49	20.04	189.845	22.78	29.93	Pass

Note: 1. The antenna gain is 6.07dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to $30-(6.07-6) = 29.93\text{dBm}$.

802.11g

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.99	19.46	167.558	22.24	29.93	Pass
6	2437	24.30	24.20	532.18	27.26	29.93	Pass
11	2462	23.08	23.75	440.373	26.44	29.93	Pass

Note: 1. The antenna gain is 6.07dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to $30-(6.07-6) = 29.93\text{dBm}$.

802.11n (HT20)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.39	21.22	270.155	24.32	29.93	Pass
6	2437	24.44	24.01	529.739	27.24	29.93	Pass
11	2462	22.72	23.99	437.679	26.41	29.93	Pass

Note: 1. The antenna gain is 6.07dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to $30-(6.07-6) = 29.93\text{dBm}$.

802.11n (HT40)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.54	18.55	143.064	21.56	29.93	Pass
6	2437	22.07	22.99	360.132	25.56	29.93	Pass
9	2452	21.93	22.75	344.32	25.37	29.93	Pass

Note: 1. The antenna gain is 6.07dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to $30-(6.07-6) = 29.93\text{dBm}$.

FOR AVERAGE POWER

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	17.39	17.92	116.772	20.67
6	2437	18.79	19.05	156.036	21.93
11	2462	16.71	16.90	95.859	19.82

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	15.90	16.30	81.562	19.11
6	2437	18.94	19.04	158.511	22.00
11	2462	16.79	17.66	106.097	20.26

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	15.12	15.44	67.503	18.29
6	2437	18.87	18.96	155.795	21.93
11	2462	16.31	16.86	91.285	19.60

802.11n (HT40)

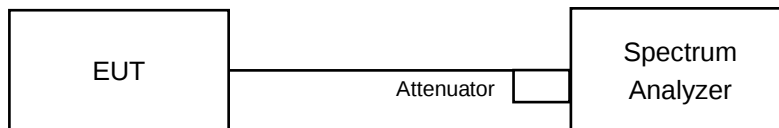
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	11.90	11.92	31.048	14.92
6	2437	15.58	16.12	77.067	18.87
9	2452	15.49	16.03	75.486	18.78

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

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1				
1	2412	-4.74	-4.42	0.6966	-1.57	5.59	PASS
6	2437	-3.78	-3.83	0.8337	-0.79	5.59	PASS
11	2462	-4.05	-4.77	0.7278	-1.38	5.59	PASS

- Note:**
1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.41\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(8.41-6) = 5.59\text{dBm}$

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1				
1	2412	-9.30	-9.49	0.2301	-6.38	5.59	PASS
6	2437	-6.92	-7.12	0.3972	-4.01	5.59	PASS
11	2462	-7.90	-8.90	0.2911	-5.36	5.59	PASS

- Note:**
1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.41\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(8.41-6) = 5.59\text{dBm}$

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1				
1	2412	-10.54	-10.53	0.17701	-7.52	5.59	PASS
6	2437	-6.90	-5.70	0.4732	-3.25	5.59	PASS
11	2462	-9.23	-9.02	0.2449	-6.11	5.59	PASS

- Note:**
- Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 - Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.41\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(8.41-6) = 5.59\text{dBm}$

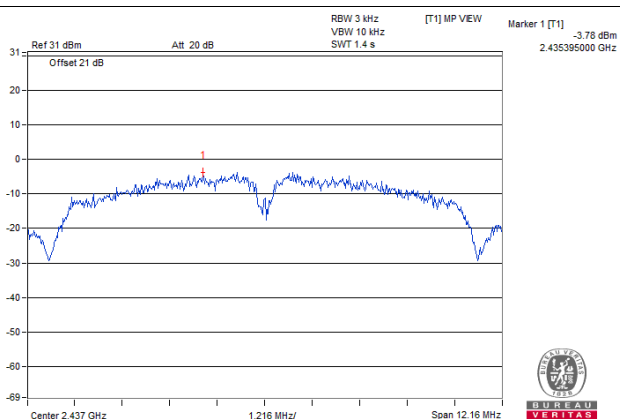
802.11n (HT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain0	Chain1				
3	2422	-16.84	-15.16	0.05117	-12.91	5.59	PASS
6	2437	-11.96	-12.09	0.1256	-9.01	5.59	PASS
9	2452	-12.37	-13.08	0.10715	-9.70	5.59	PASS

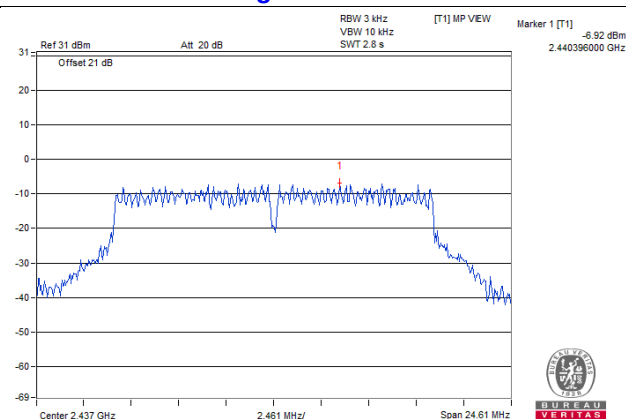
- Note:**
- Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 - Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.41\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8-(8.41-6) = 5.59\text{dBm}$

Spectrum Plot of Worst Value

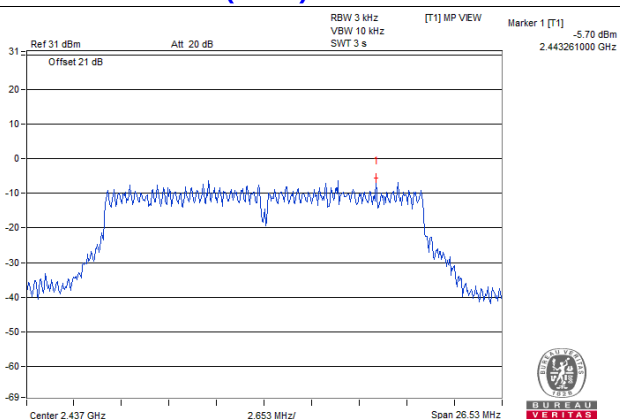
802.11b: Chain 0 / CH6



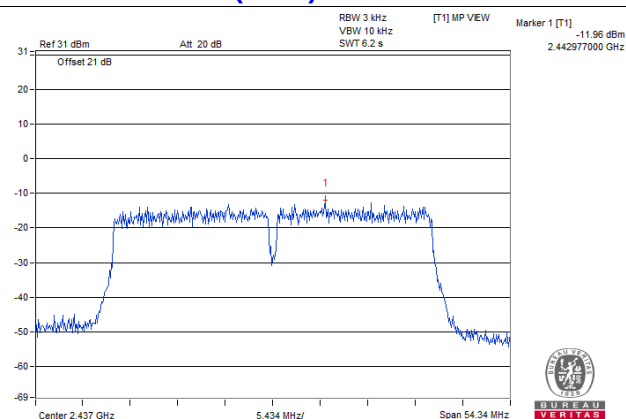
802.11g: Chain 0 / CH6



802.11n (HT20): Chain 1 / CH6



802.11n (HT40): Chain 0 / CH6

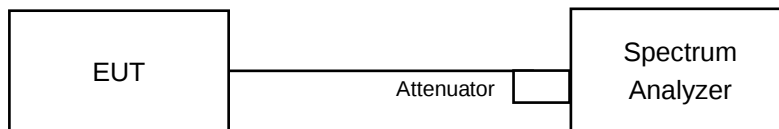


4.6 Conducted Out of Band Emission Measurement

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 $\geq$ 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 OOB

1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 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

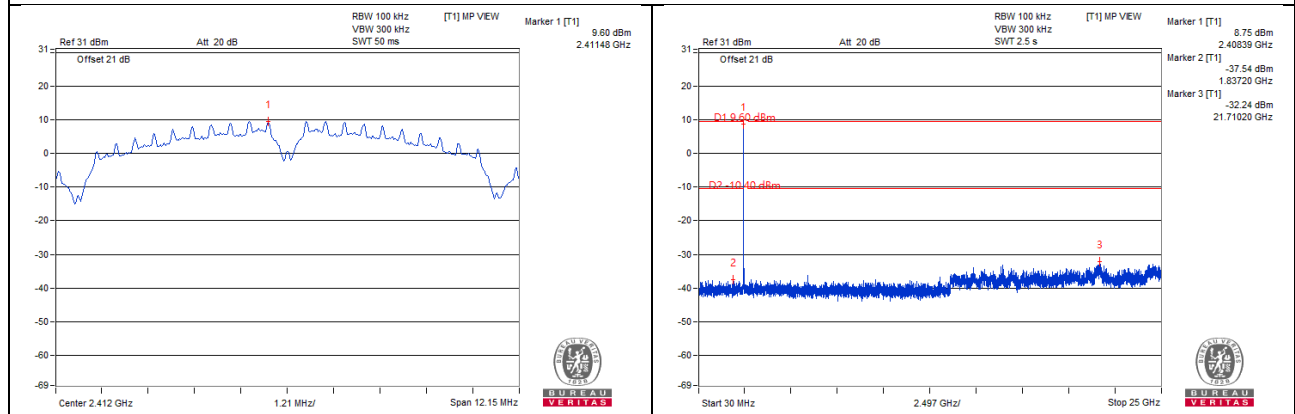
Same as Item 4.3.6

4.6.7 Test Results

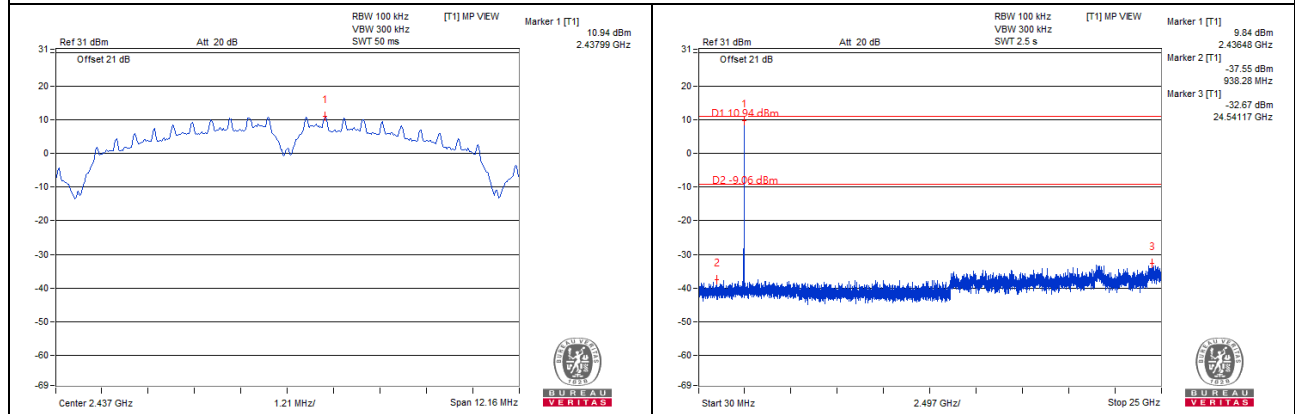
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b Chain0

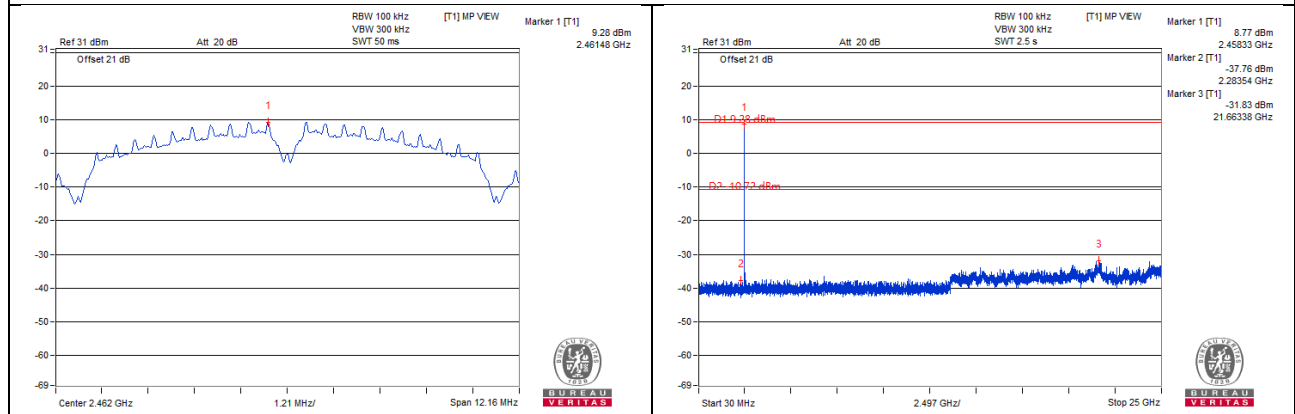
CH 1



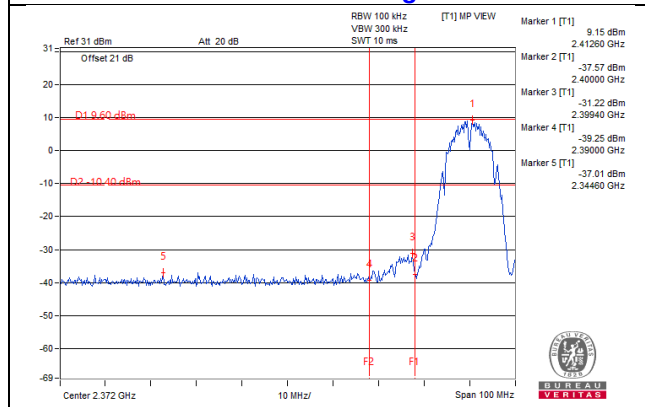
CH 6



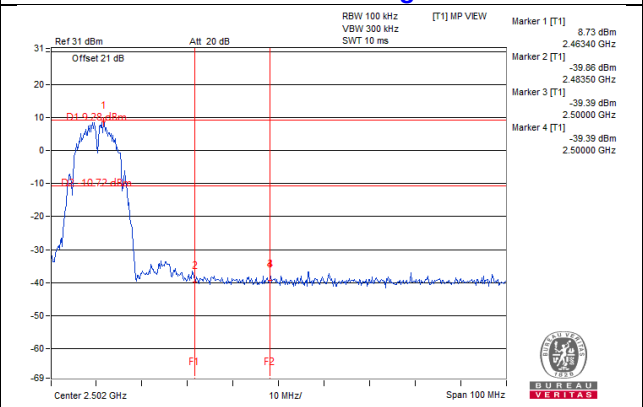
CH 11



CH 1 Band edge

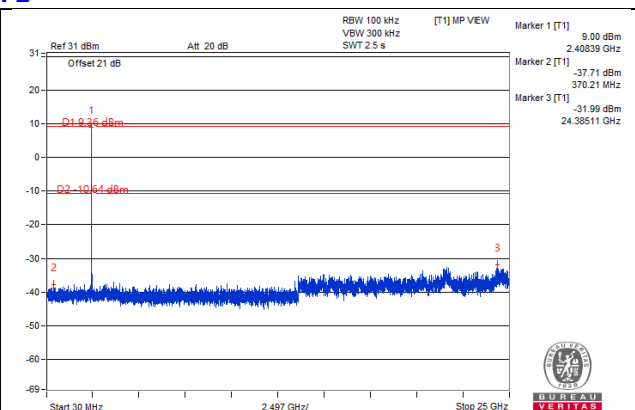
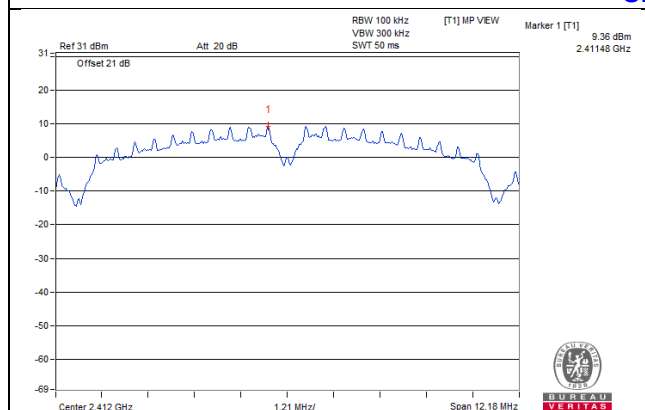


CH 11 Band edge

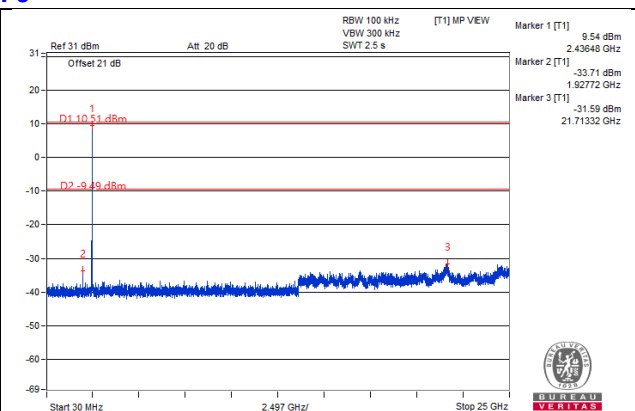
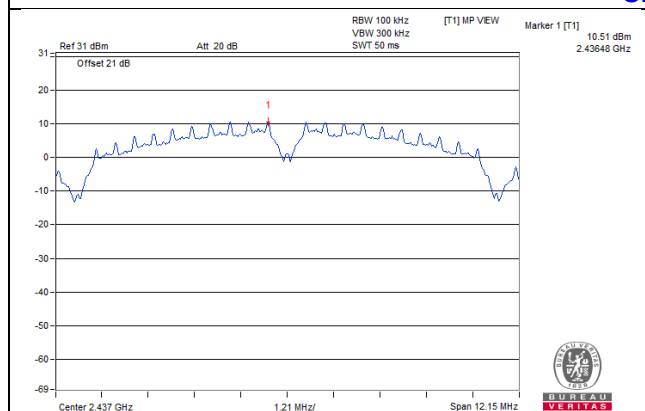


Chain1

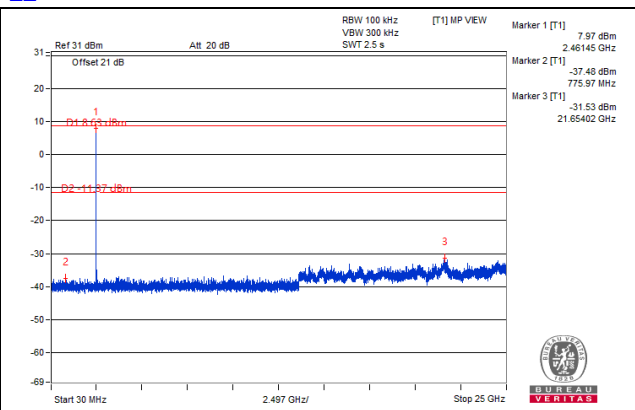
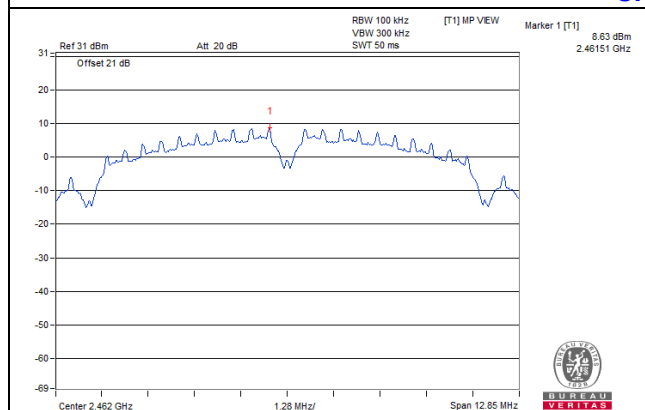
CH 1



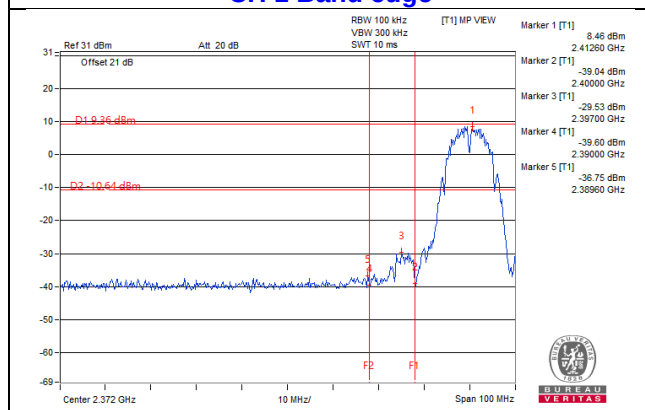
CH 6



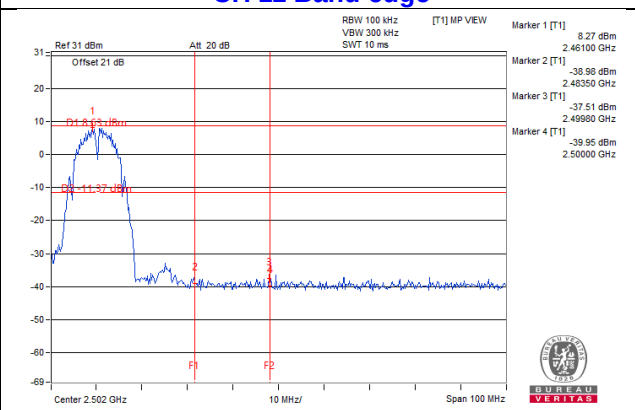
CH 11



CH 1 Band edge

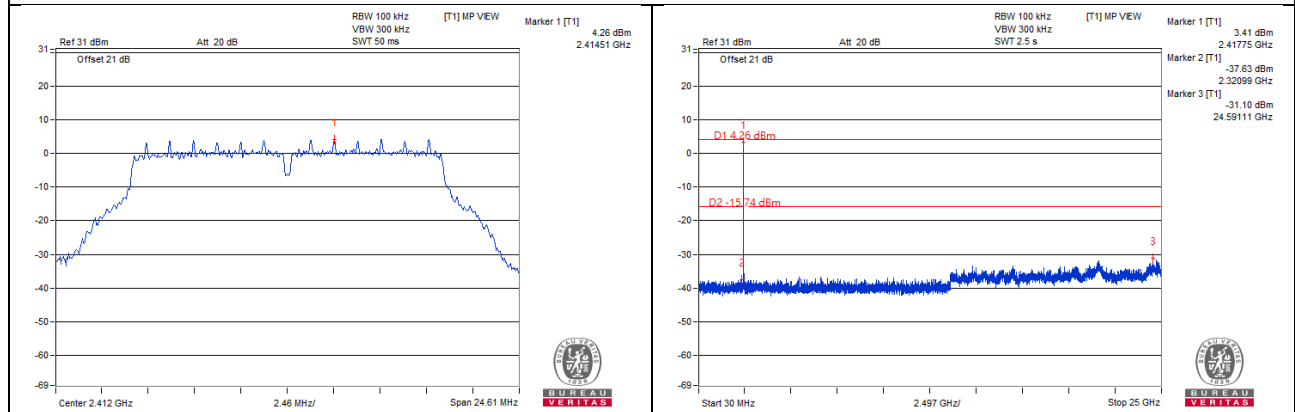


CH 11 Band edge

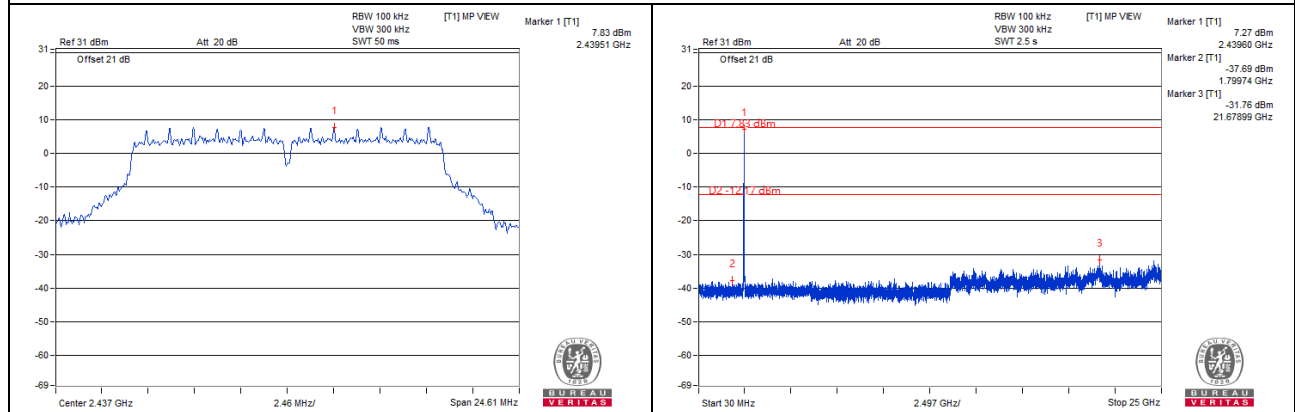


802.11g Chain0

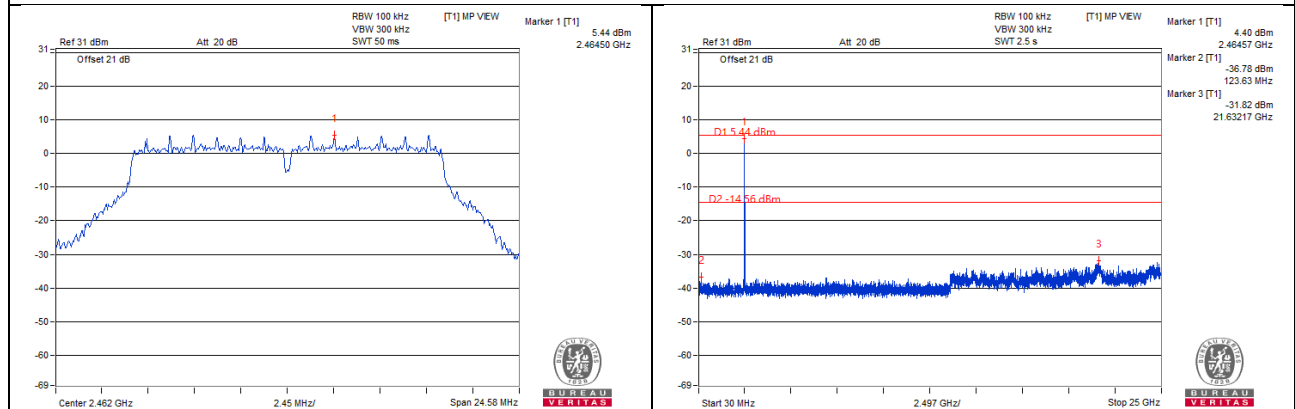
CH 1



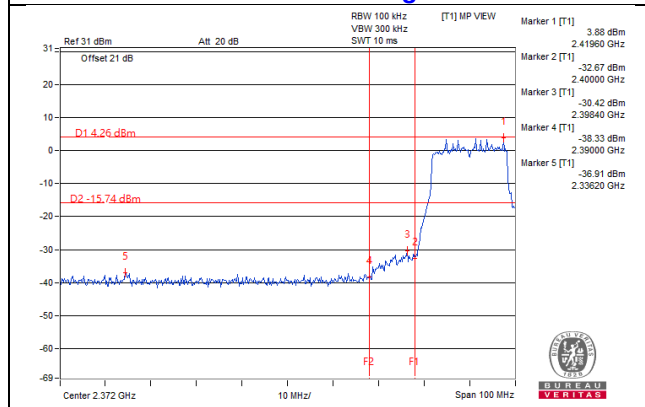
CH 6



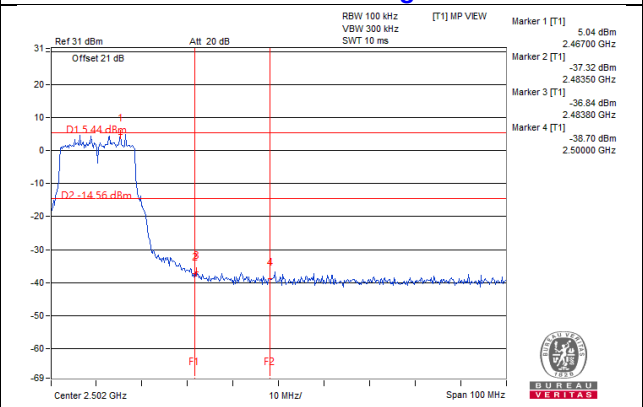
CH 11



CH 1 Band edge

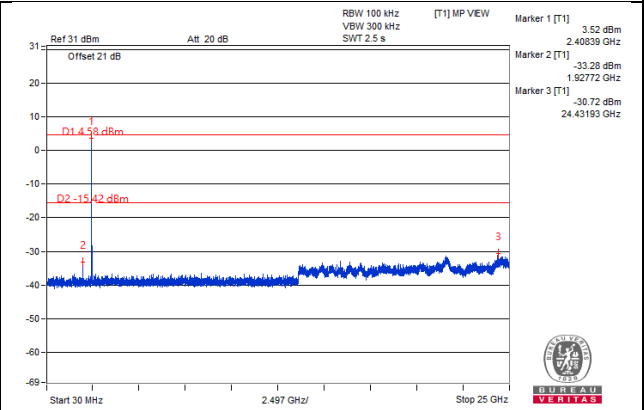
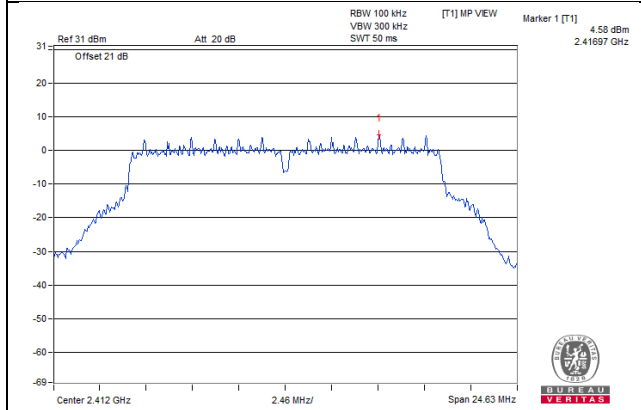


CH 11 Band edge

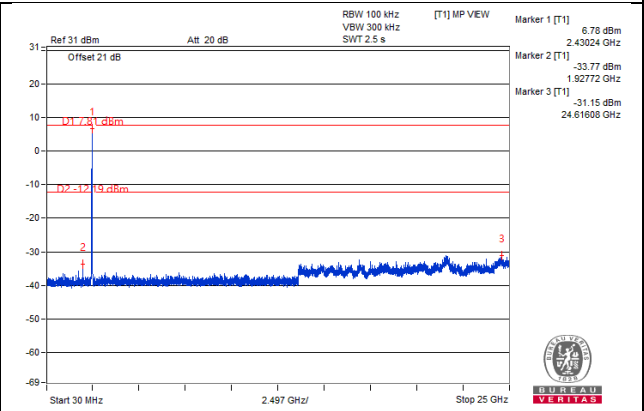
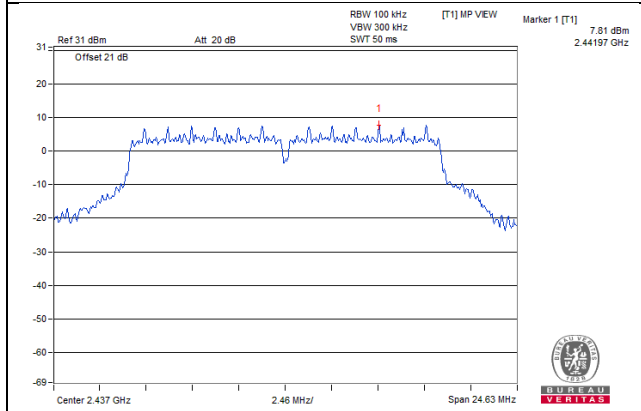


Chain1

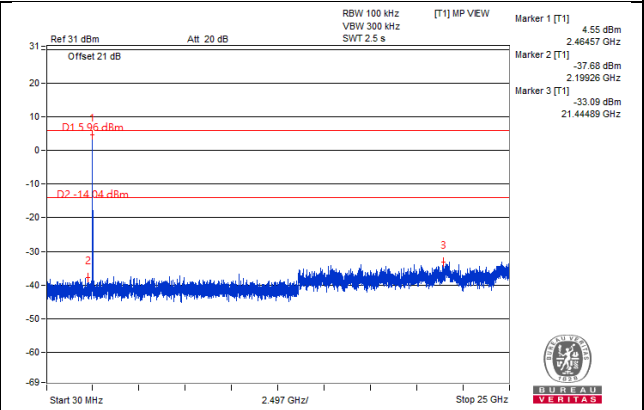
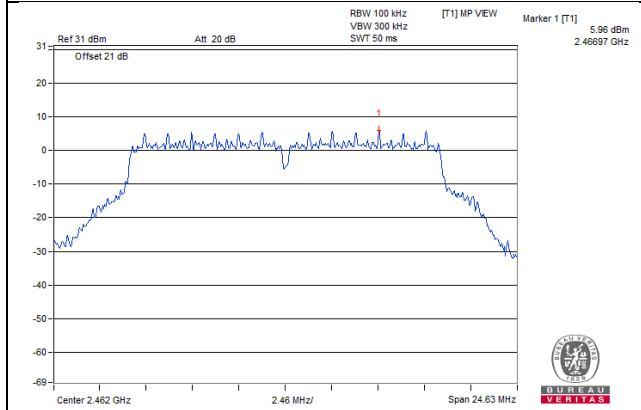
CH 1



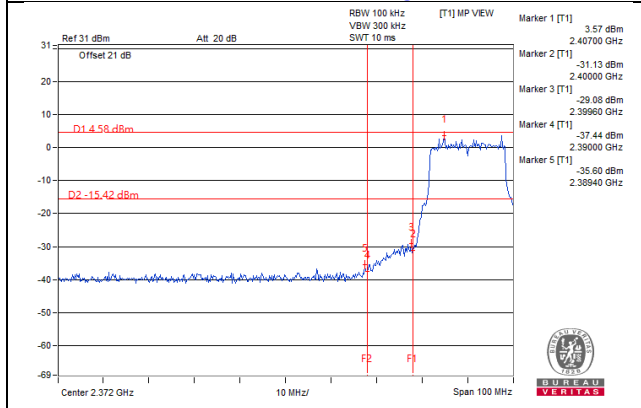
CH 6



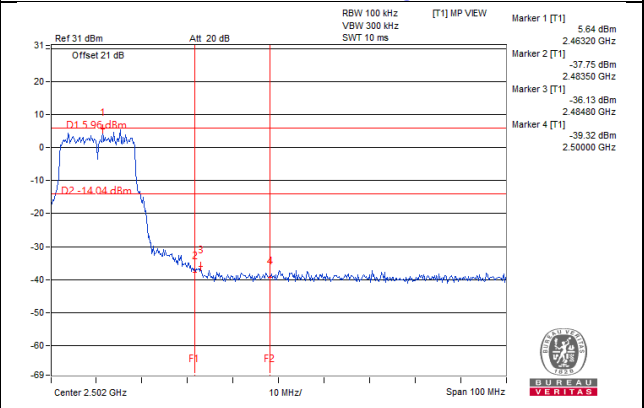
CH 11



CH 1 Band edge

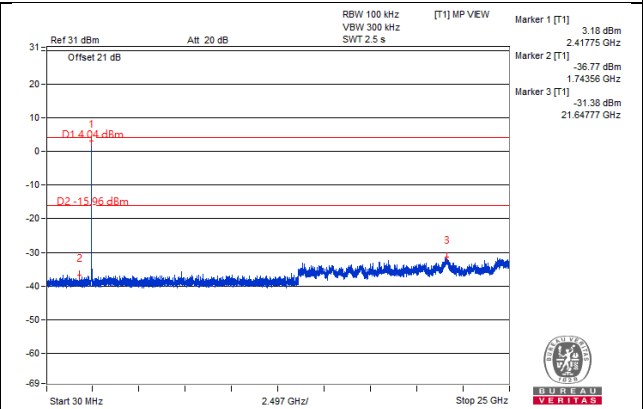
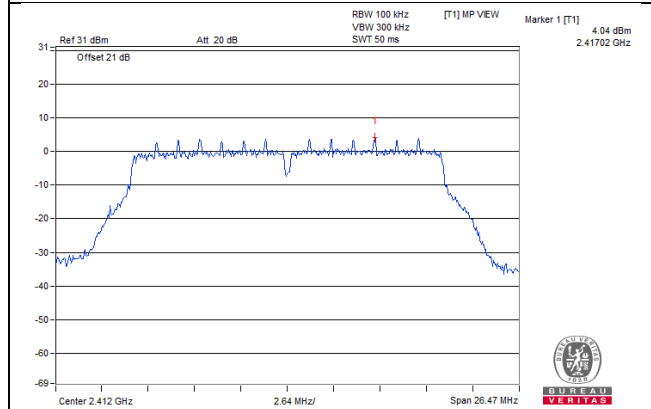


CH 11 Band edge

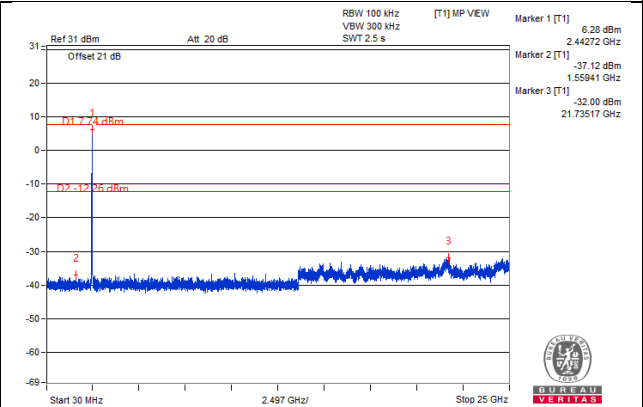
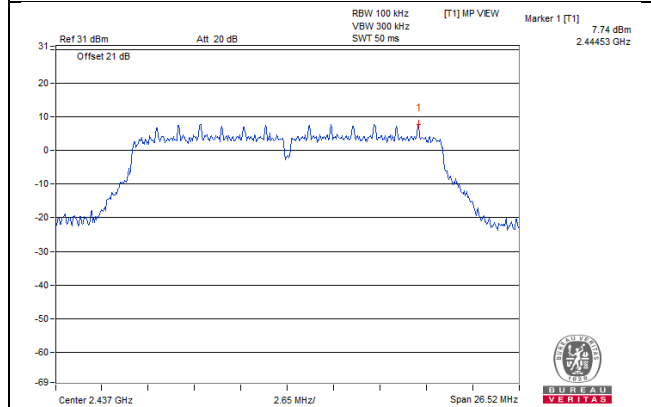


802.11n (HT20) Chain0

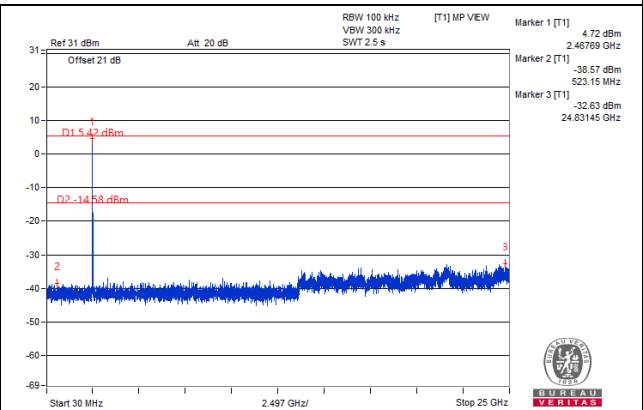
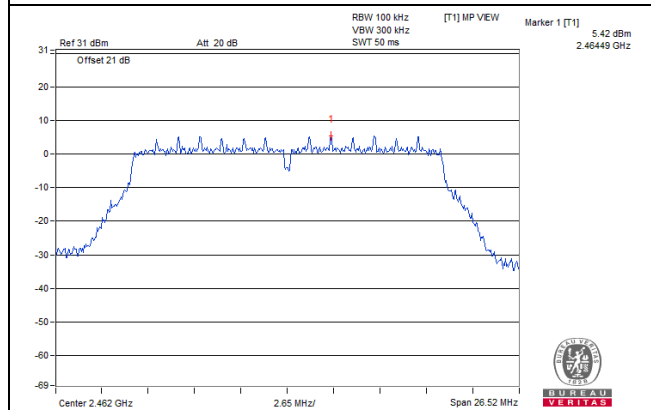
CH 1



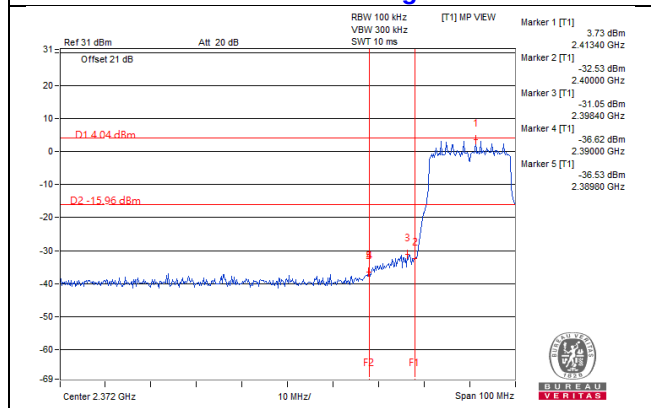
CH 6



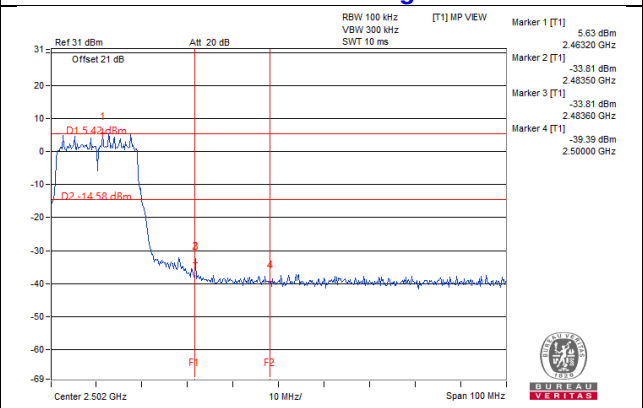
CH 11



CH 1 Band edge

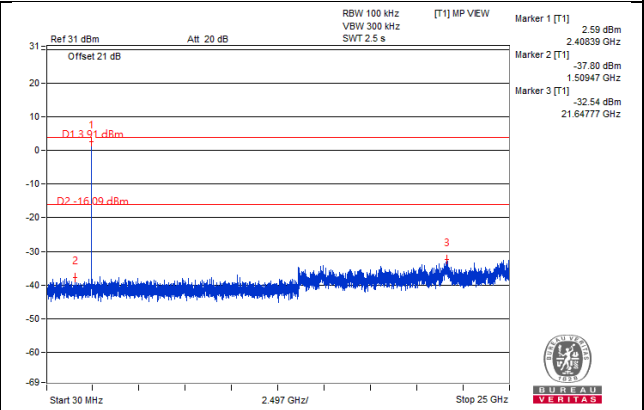
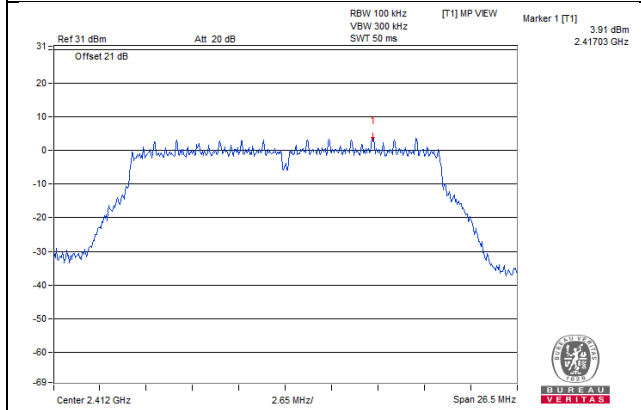


CH 11 Band edge

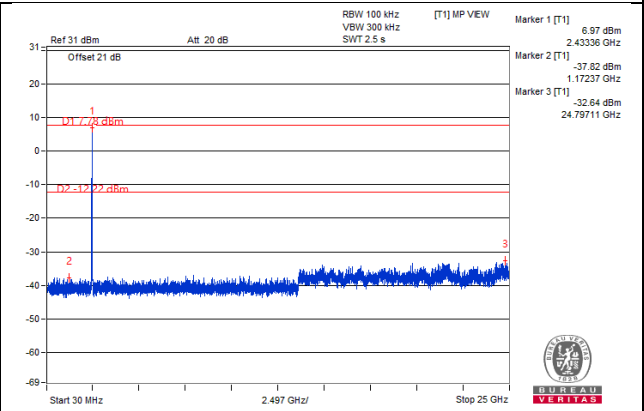
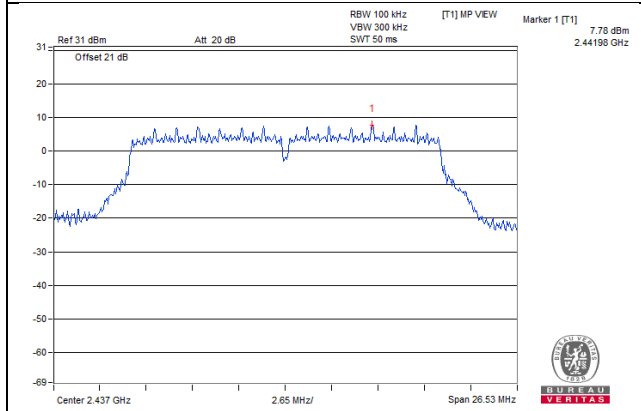


Chain1

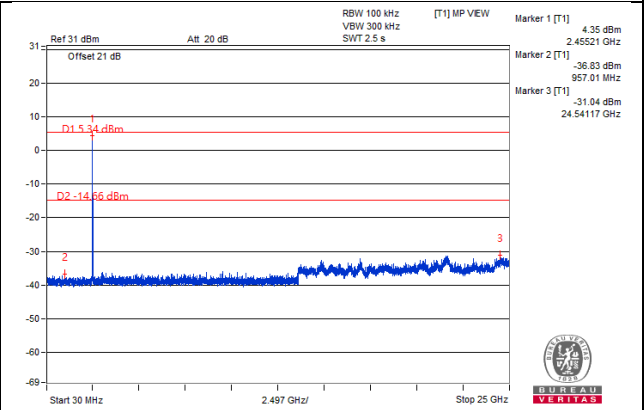
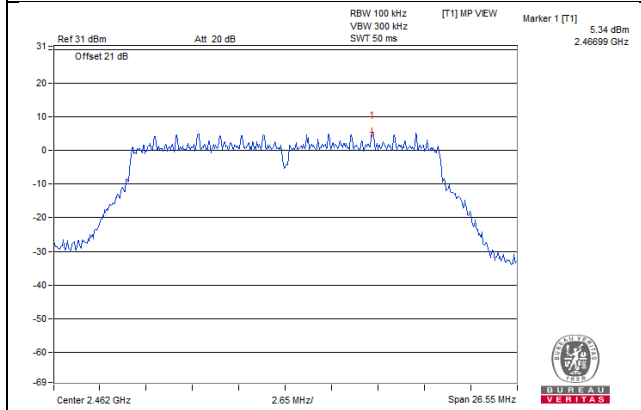
CH 1



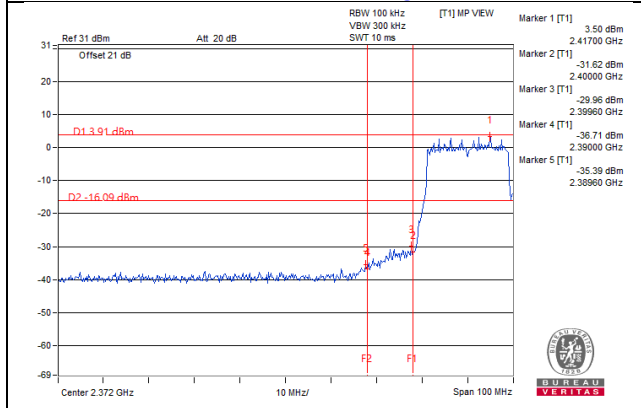
CH 6



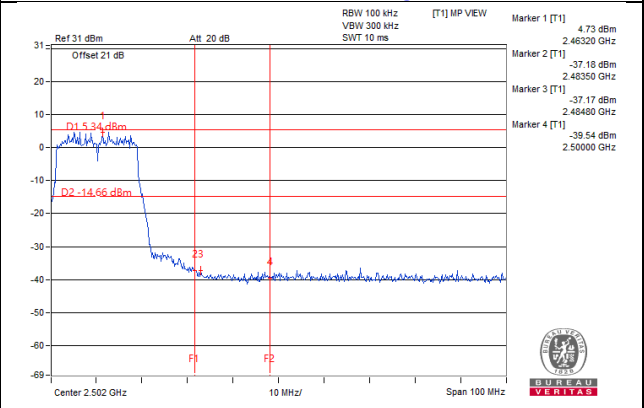
CH 11



CH 1 Band edge

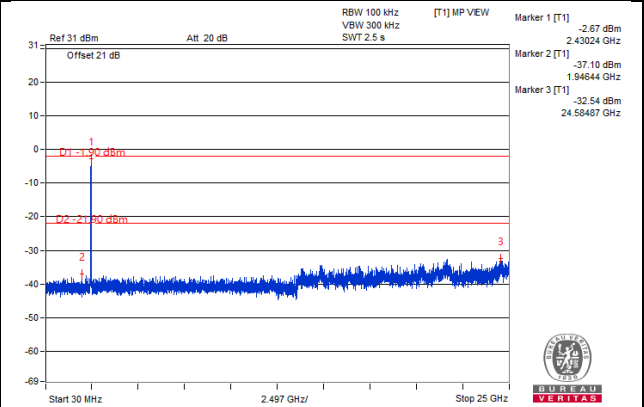
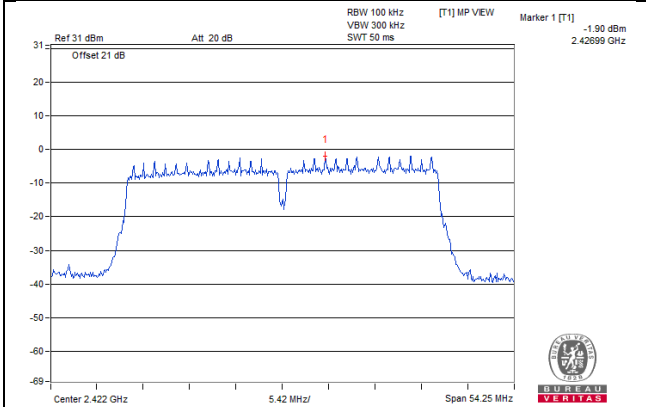


CH 11 Band edge

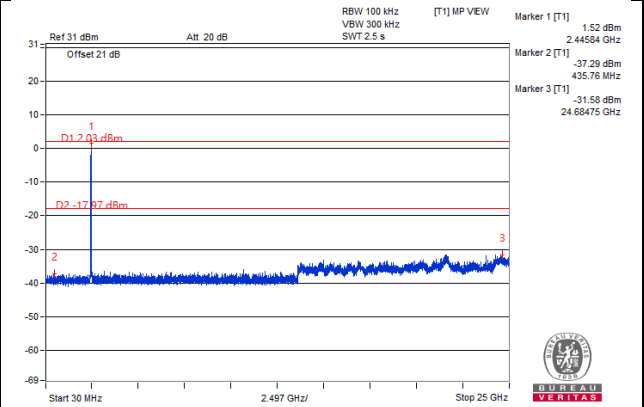
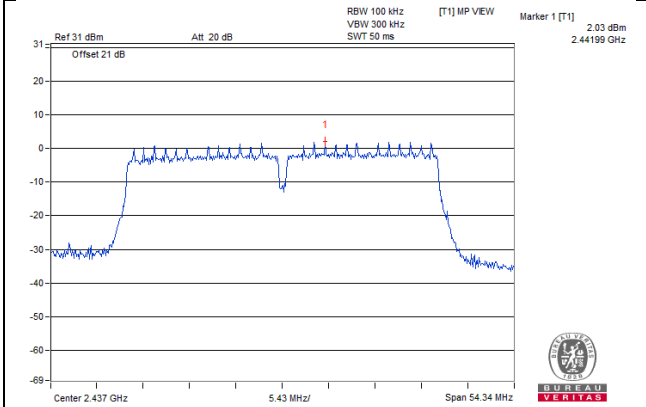


802.11n (HT40) Chain0

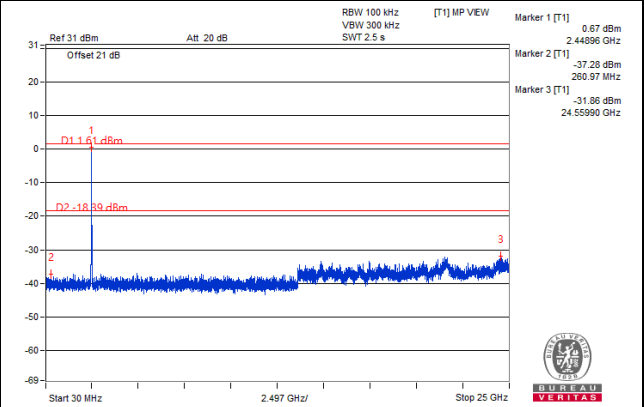
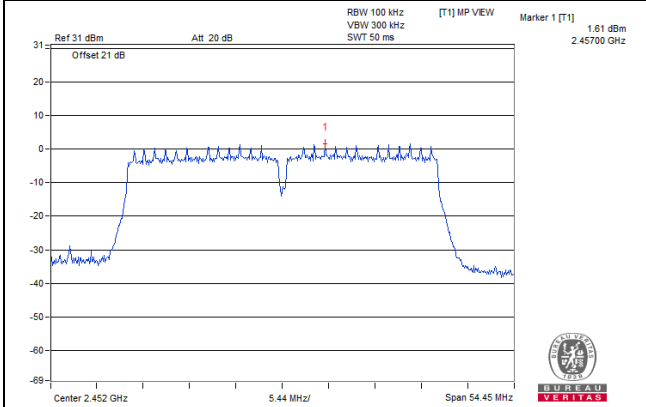
CH 3



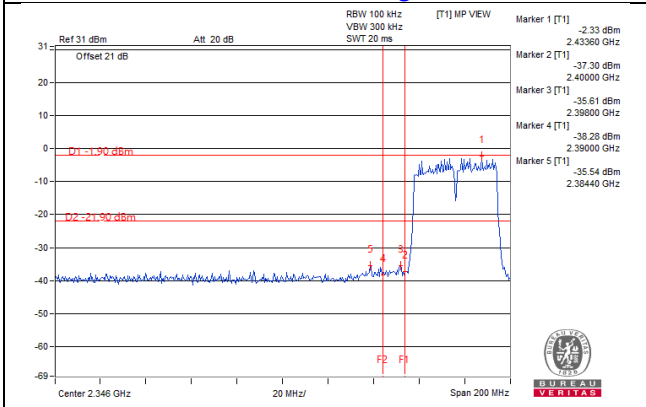
CH 6



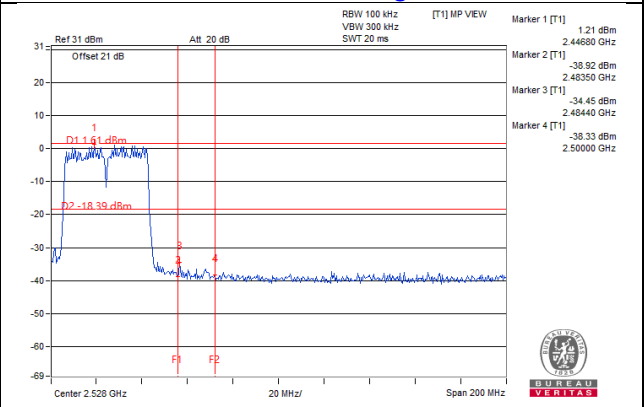
CH 9



CH 3 Band edge

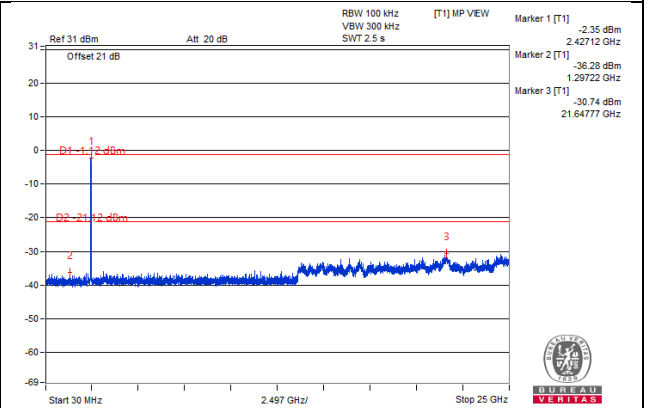
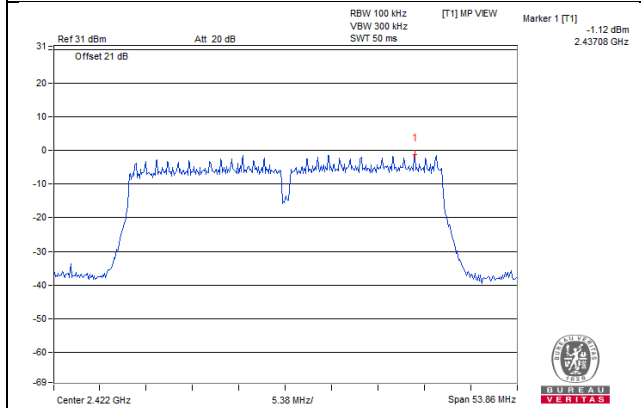


CH 9 Band edge

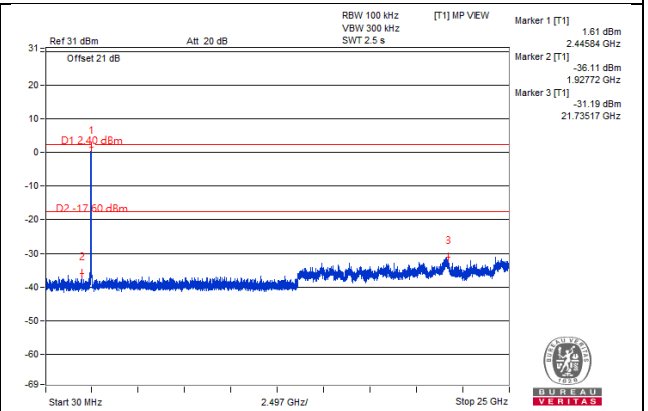
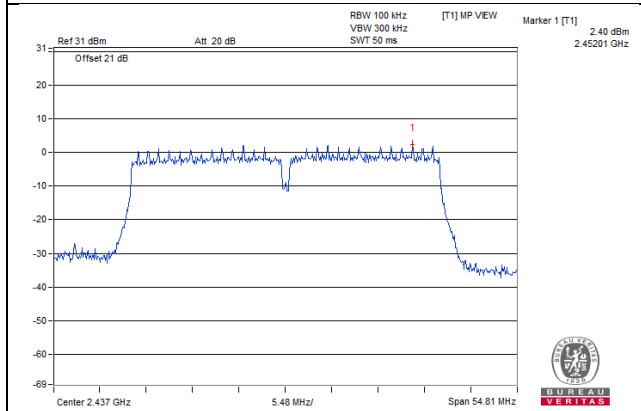


Chain 1

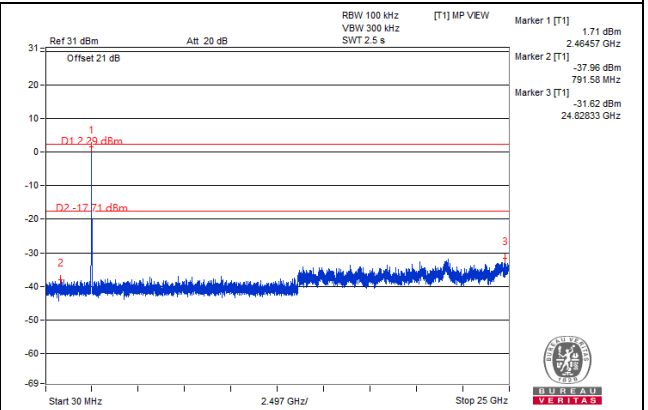
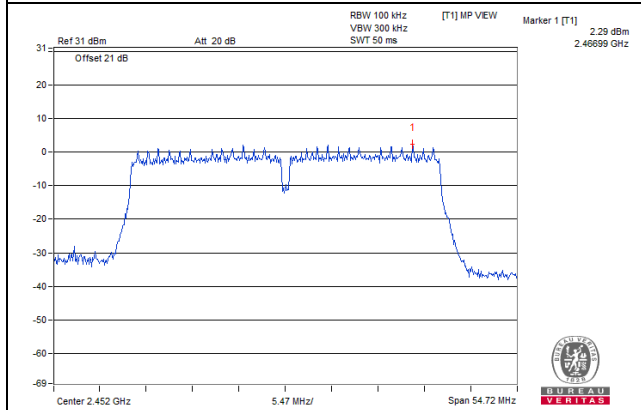
CH 3



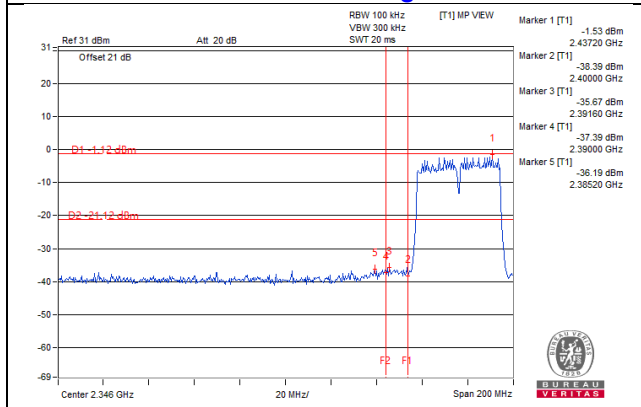
CH 6



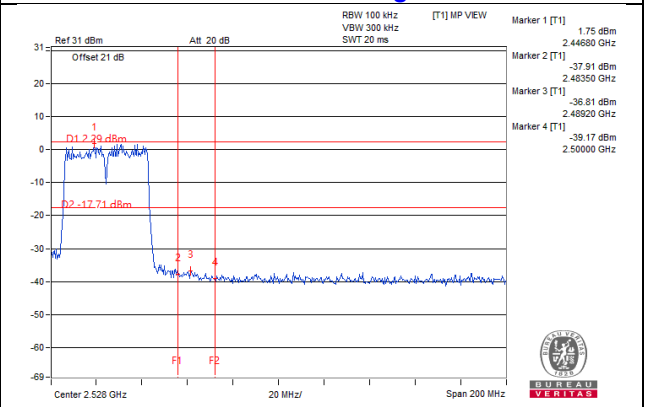
CH 9



CH 3 Band edge



CH 9 Band edge

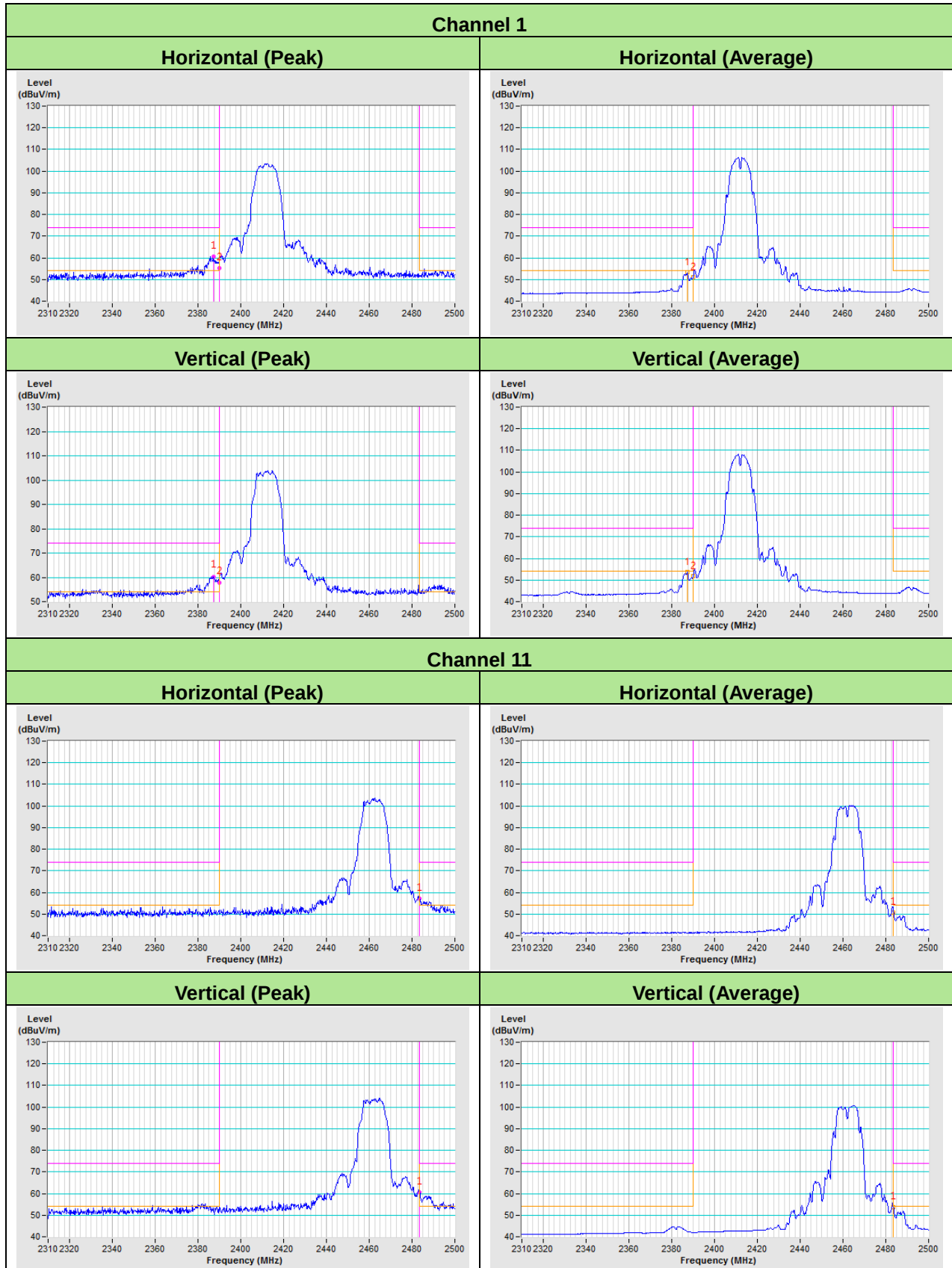


5 Pictures of Test Arrangements

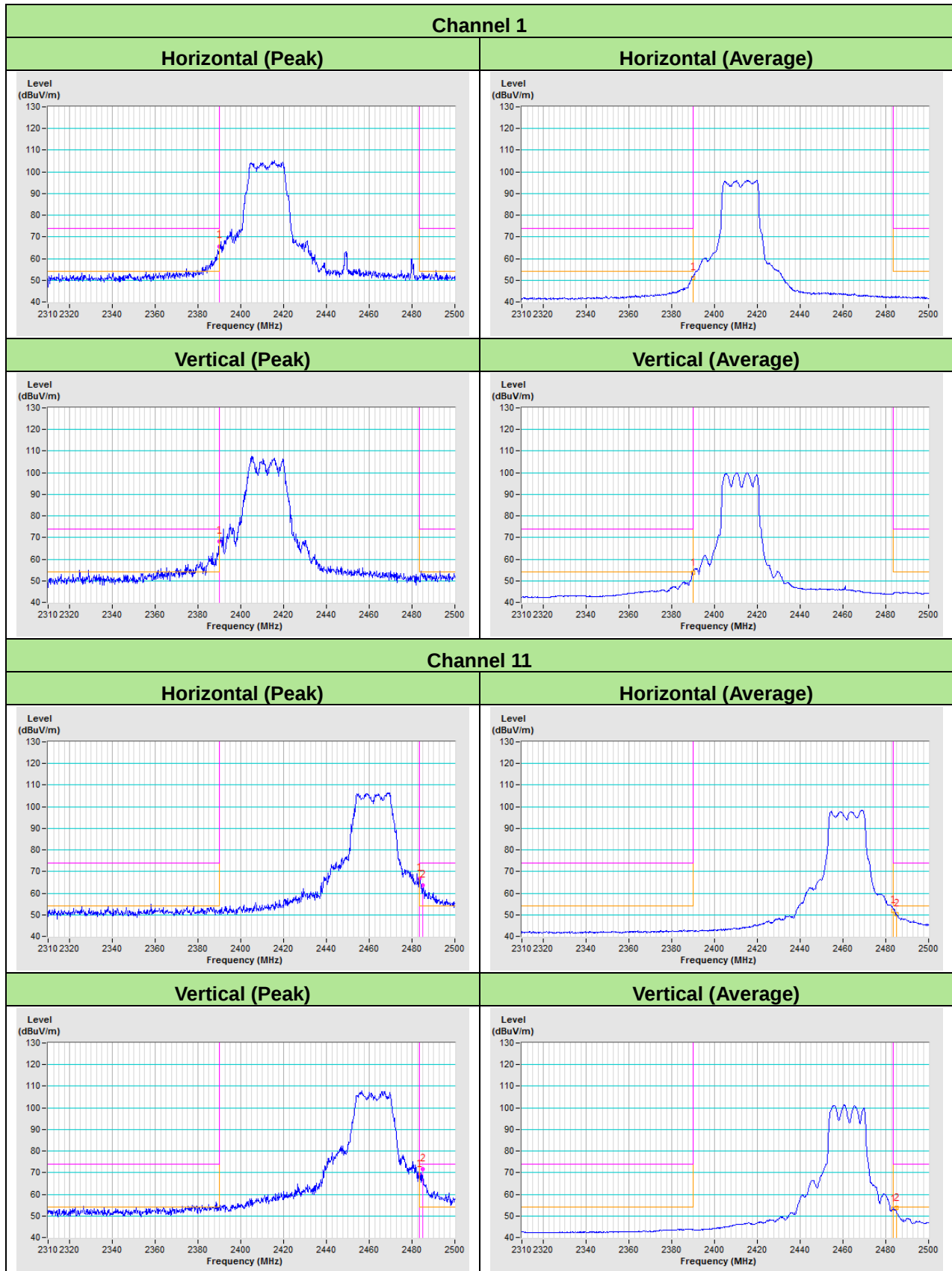
Please refer to the attached file (Test Setup Photo).

Annex A- Band-edge measurement

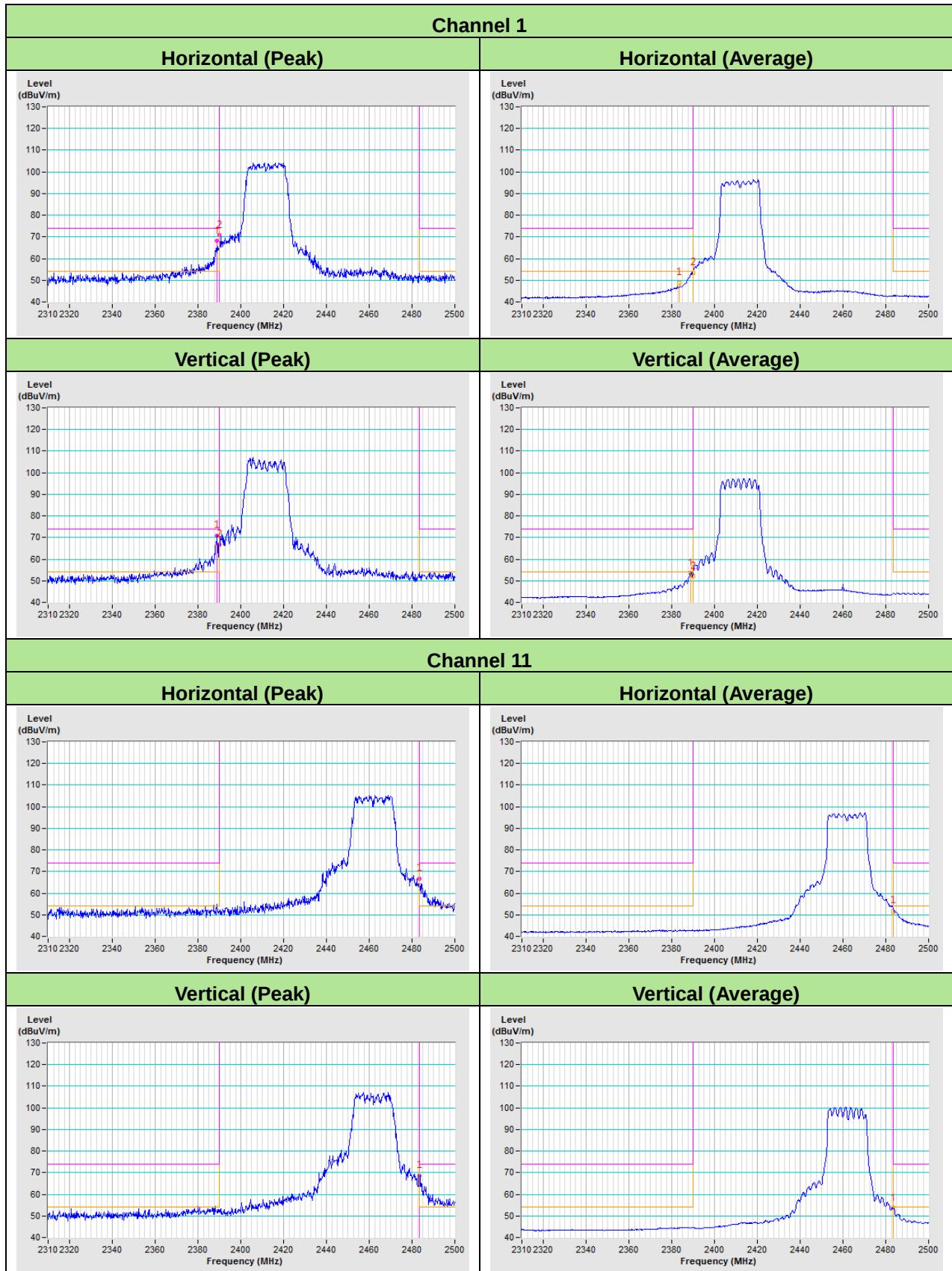
802.11b



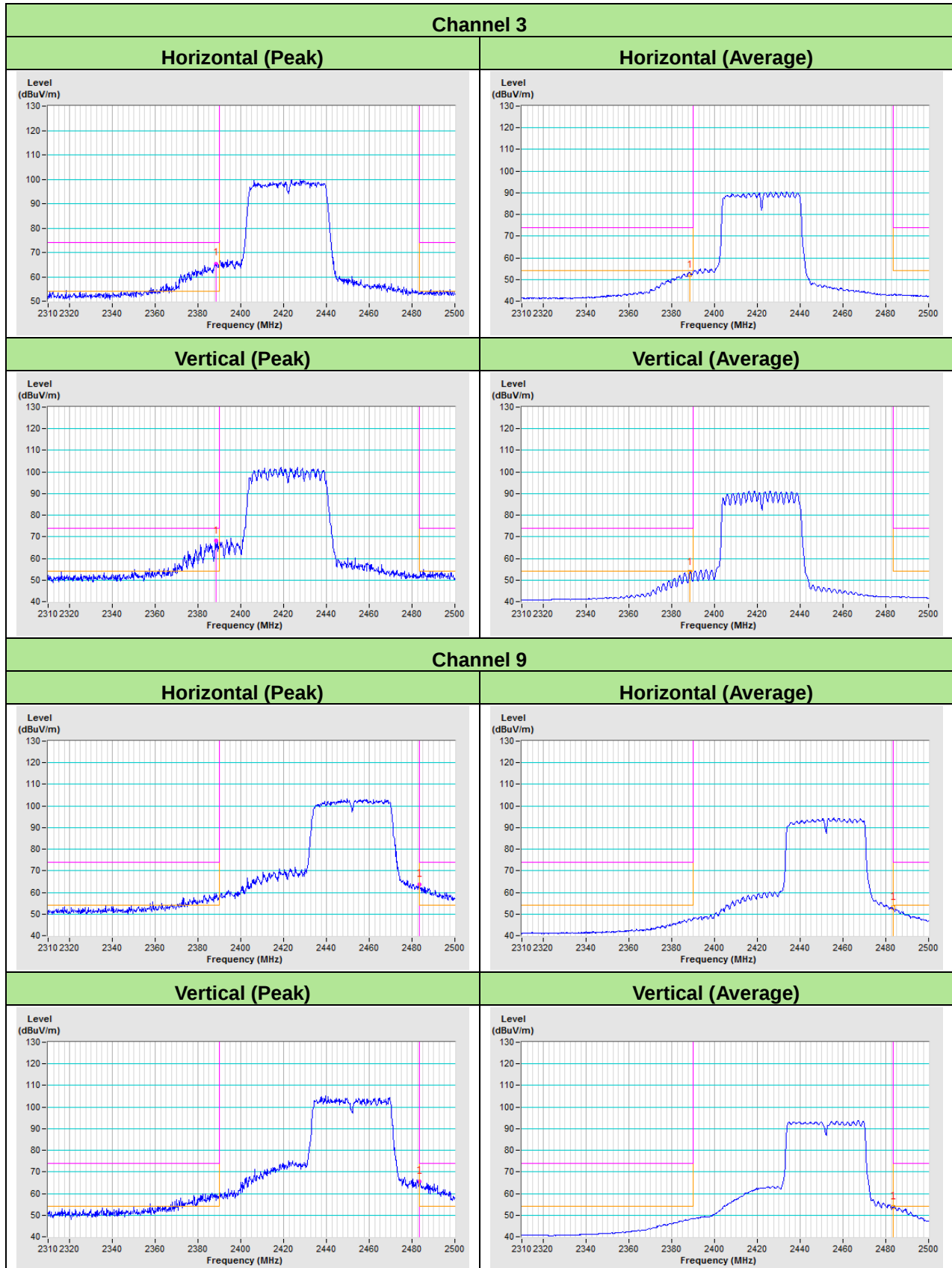
802.11g



802.11n (HT20)



802.11n (HT40)



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.

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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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