

FCC Test Report (WLAN)

Report No.: RF200203E03A

FCC ID: NOIKBE60P22

Test Model: E60P22

Received Date: Feb. 18, 2020

Test Date: Nov. 04 to Dec. 14, 2020

Issued Date: Dec. 29, 2020

Applicant: NETRONIX, INC.

Address: No. 945, Boai St., Jubei City, Hsin-Chu, 302, Taiwan, R.O.C.

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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Taiwan

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan

**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF200203E03A	Original release.	Dec. 29, 2020

1 Certificate of Conformity

Product: 6.8" E Ink Digital Notepad

Brand: MobiScribe

Test Model: E60P22

Sample Status: Engineering sample

Applicant: NETRONIX, INC.

Test Date: Nov. 04 to Dec. 14, 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 : Vivian Huang , **Date:** Dec. 29, 2020
Vivian Huang / Specialist

Approved by : Clark Lin , **Date:** Dec. 29, 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 -13.55dB at 0.17344MHz.
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 7386.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is soldering terminal 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) ($\pm$)
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	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 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	6.8" E Ink Digital Notepad
Brand	MobiScribe
Test Model	E60P22
Status of EUT	Engineering sample
Power Supply Rating	Refer to note
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 72.2Mbps
Operating Frequency	2.412 ~ 2.462 GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11
Output Power	148.594 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Digitizer Stylus x 1 (Brand: Wacom, Model: CP-903E-12B-2) USB to Type C USB Cable x 1 (Brand: Yih Fone, Model: SH-0350, shielded, 1.0m)
Cable Supplied	NA

Note:

1. The EUT must be supplied with a battery as following table:

No.	Brand	Model No.	Spec.
1	Guangdong Pow-Tech New Power Co.,Ltd.	PT286090	Output: 3.8V, 2050mAh, 7.79Wh

2. The antenna provided to the EUT, please refer to the following table:

Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
Walsin Technology Corporation	RFECA3216060AAT	2	2.4~2.4835GHz	Ceramic antenna	soldering terminal

3. The EUT could be supplied with eMMC, please refer to the following table:

Brand	Model No.	Capacity
Samsung	KLMBG2JETD-B041	32G Byte

4. The EUT provided RAM as following table.

Brand	Model No.	Capacity
Nanya	NT6CL512T32AM-H1	2G Byte
Samsung	K4E6E304ED-EGCG	2G Byte

5. The EUT was pre-tested for radiated emission test under following test modes:

Item	Test Mode	Description
RSE below 1GHz	Mode A	Samsung (eMMC) + Samsung (RAM) , X-Y , Adapter
RSE below 1GHz	Mode B	Samsung (eMMC) + Samsung (RAM) , Y-Z , Adapter
RSE below 1GHz	Mode C	Samsung (eMMC) + Samsung (RAM) , X-Z , Adapter
RSE below 1GHz	Mode D	Samsung (eMMC) + Samsung (RAM) , X-Z , Battery
RSE below 1GHz	Mode E	Samsung (eMMC) +Nanya (RAM), X-Y , Adapter
RSE below 1GHz	Mode F	Samsung (eMMC) +Nanya (RAM), Y-Z , Adapter
RSE below 1GHz	Mode G	Samsung (eMMC) +Nanya (RAM), X-Z , Adapter
RSE below 1GHz	Mode H	Samsung (eMMC) +Nanya (RAM), X-Z , Battery
RSE above 1GHz	Mode I	Samsung (eMMC) + Samsung (RAM) , X-Y , Adapter
RSE above 1GHz	Mode J	Samsung (eMMC) + Samsung (RAM) , Y-Z , Adapter
RSE above 1GHz	Mode K	Samsung (eMMC) + Samsung (RAM) , X-Z , Adapter

Note:

1. From the above modes, the Radiated Emission (below 1GHz) worst case was found in **Mode C and G**. Therefore only the test data of the mode was recorded in this report.
2. From the above modes, the Radiated Emission (Above 1GHz) worst case was found in **Mode K**. Therefore only the test data of the mode was recorded in this report.

6. The EUT was pre-tested for conducted emission test under following test modes:

Test Mode	Description
Mode A	Samsung (eMMC) + Samsung (RAM), Power from adapter
Mode B	Samsung (eMMC) + Samsung (RAM), Power from Laptop

Note: From the above modes, the worse case was found in **Mode A**. Therefore only the test data of the mode was recorded in this report.

7. The EUT incorporates a SISO function.

MODULATION MODE	TX & RX CONFIGURATION	
802.11b	1TX diversity	1RX
802.11g	1TX diversity	1RX
802.11n (HT20)	1TX diversity	1RX

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

3.2 Description of Test Modes

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE≥1G**: Radiated Emission above 1GHz & Bandedge Measurement
RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Z-plane.

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

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

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)
802.11b	1 to 11	6	DSSS	DBPSK	1

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)
802.11b	1 to 11	6	DSSS	DBPSK	1

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (System)	TESTED BY
RE $\geq$ 1G	25deg. C, 75%RH	120Vac, 60Hz	Carter Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Carter Lin
PLC	25deg. C, 72%RH	120Vac, 60Hz	Sampon Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Eric Peng

3.3 Duty Cycle of Test Signal

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

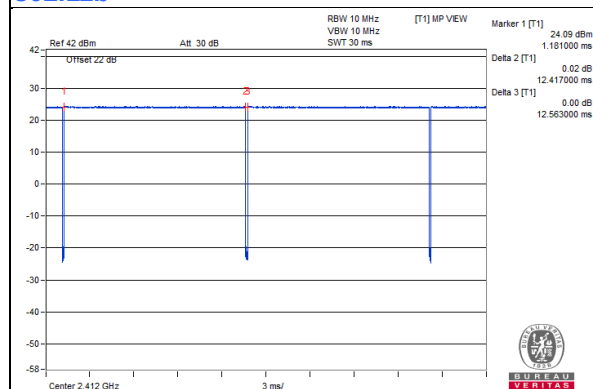
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = $12.417 \text{ ms} / 12.563 \text{ ms} = 0.988$

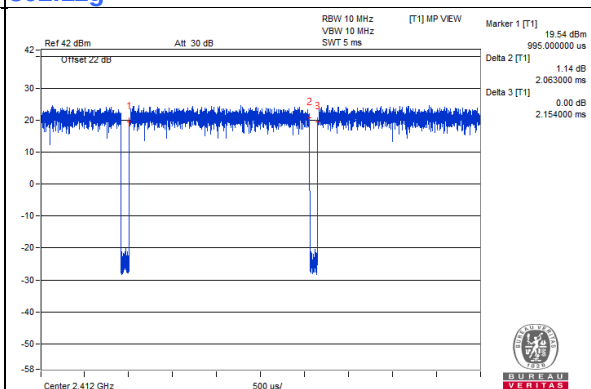
802.11g: Duty cycle = $2.063 \text{ ms} / 2.154 \text{ ms} = 0.958$, Duty factor = $10 * \log (1/\text{Duty cycle}) = 0.19$

802.11n (HT20): Duty cycle = $1.919 \text{ ms} / 1.984 \text{ ms} = 0.967$, Duty factor = $10 * \log (1/\text{Duty cycle}) = 0.14$

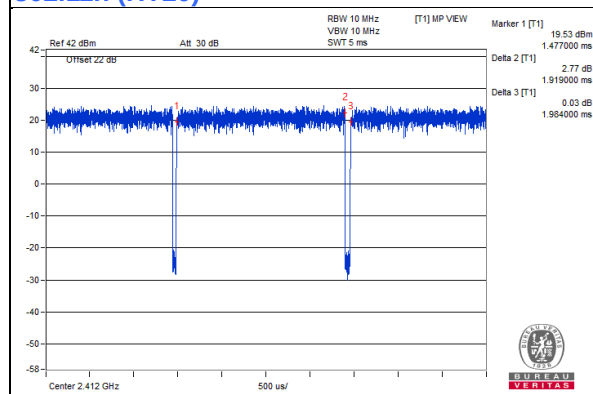
802.11b



802.11g



802.11n (HT20)



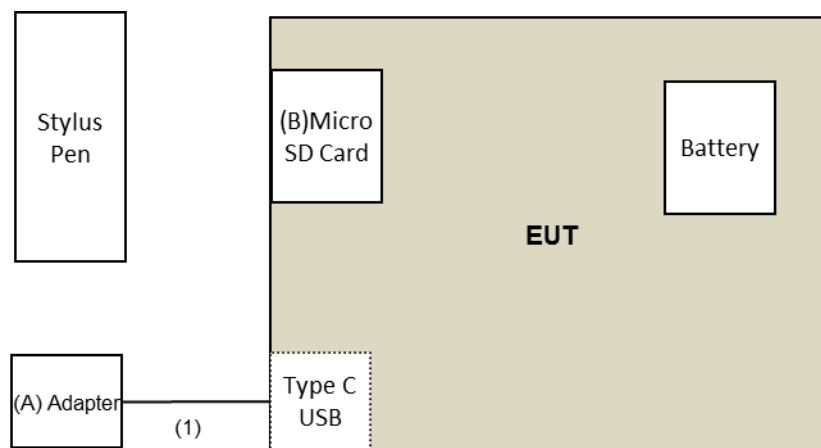
3.4 Description of Support Units

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.	Adapter	ASUS	EXA1205UA	NA	NA	Provided by Lab
B.	Micro SD Card	Kingston	SDCS/16GB	NA	NA	Provided by Lab

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Type C to USB Cable	1	1	Yes	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

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 test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESR7	102026	Apr. 22, 2020	Apr. 21, 2021
Spectrum Analyzer Keysight	N9030B	MY57141948	May 22, 2020	May 21, 2021
Pre-Amplifier EMCi	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier EMCi	EMC330N	980538	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB9168	9168-0842	Nov. 03, 2020	Nov. 02, 2021
RF Cable	8D	966-5-1	Apr. 29, 2020	Apr. 28, 2021
RF Cable	8D	966-5-2	Apr. 29, 2020	Apr. 28, 2021
RF Cable	8D	966-5-3	Apr. 29, 2020	Apr. 28, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	Jan. 14, 2020	Jan. 13, 2021
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCi	EMC12630SE	980509	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-1500	180503	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-2000	180501	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-6000	180506	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCi	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
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. 5.
3. Tested Date: Nov. 26 to 27, 2020

For Bandedge test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESR7	102026	Apr. 22, 2020	Apr. 21, 2021
Spectrum Analyzer Keysight	N9030B	MY57141948	May 22, 2020	May 21, 2021
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCi	EMC12630SE	980509	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-1500	180503	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-2000	180501	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCi	EMC104-SM-SM-6000	180506	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCi	EMC184045SE	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. 5.
3. Tested Date: Nov. 04, 2020

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
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: Dec. 14, 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:

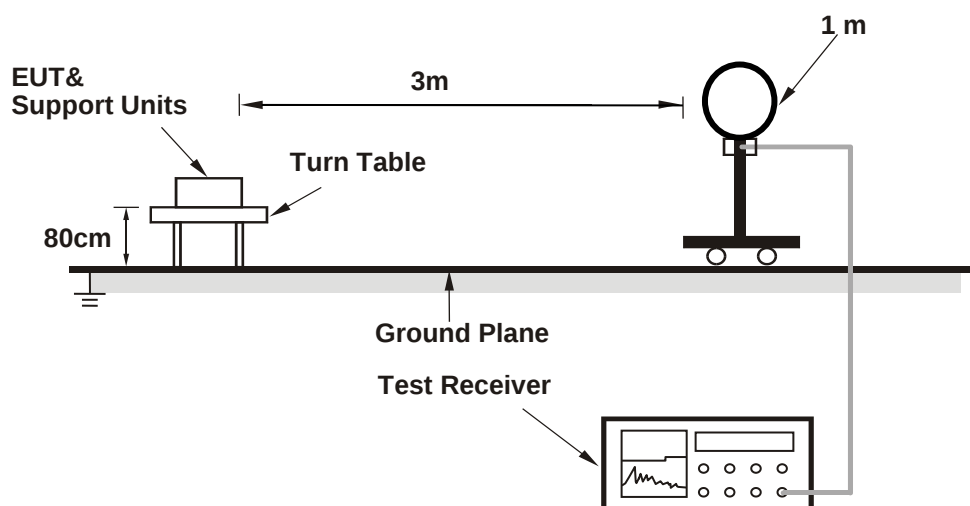
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

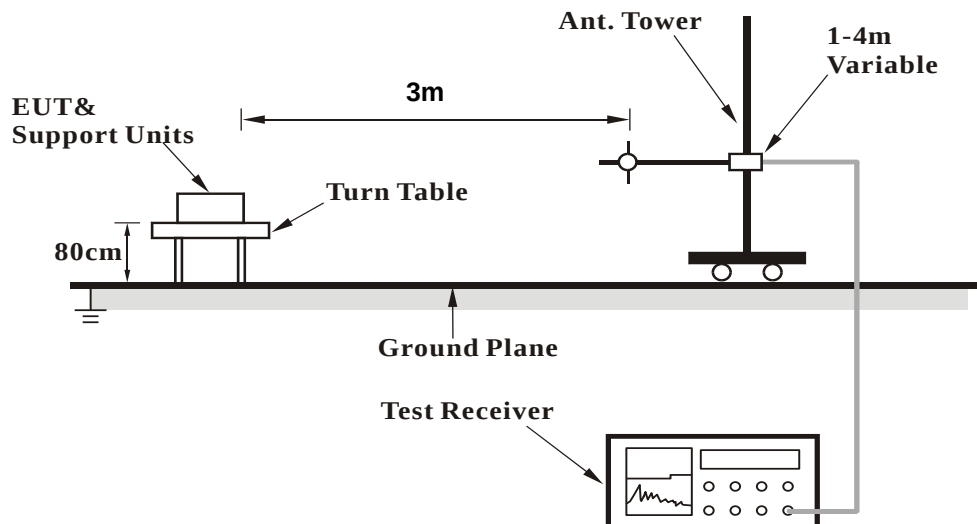
No deviation.

4.1.5 Test Setup

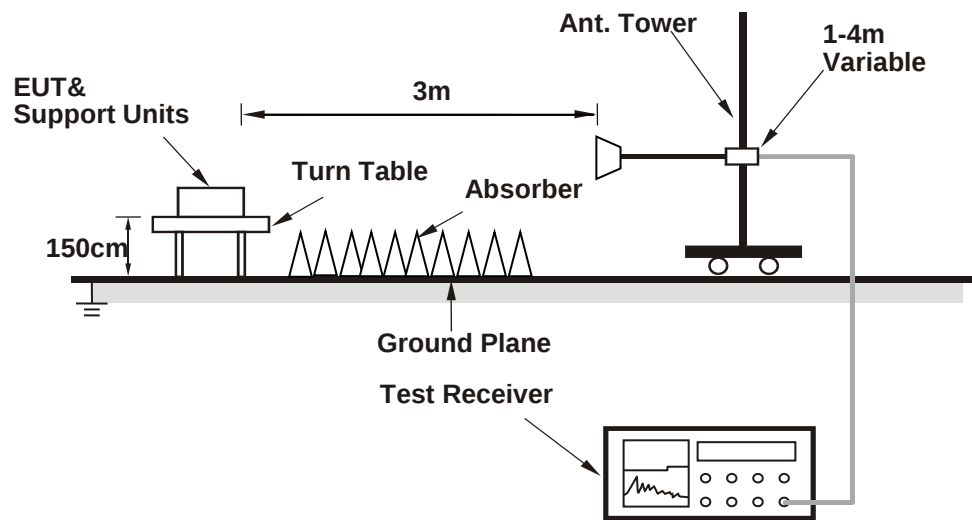
For Radiated emission below 30MHz



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 (Teraterm hyerterminal.paste command.txt) has been activated to set the EUT under transmission condition continuously.

4.1.7 Test Results

ABOVE 1GHz DATA

RF Mode	TX 802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2376.04	55.7 PK	74.0	-18.3	3.59 H	128	58.8	-3.1
2	2376.04	43.2 AV	54.0	-10.8	3.59 H	128	46.3	-3.1
3	*2412.00	102.7 PK			3.59 H	128	105.7	-3.0
4	*2412.00	100.0 AV			3.59 H	128	103.0	-3.0
5	4824.00	55.4 PK	74.0	-18.6	2.90 H	32	54.4	1.0
6	4824.00	53.1 AV	54.0	-0.9	2.90 H	32	52.1	1.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2375.96	57.5 PK	74.0	-16.5	2.69 V	276	60.6	-3.1
2	2375.96	45.4 AV	54.0	-8.6	2.69 V	276	48.5	-3.1
3	*2412.00	109.2 PK			2.69 V	276	112.2	-3.0
4	*2412.00	105.0 AV			2.69 V	276	108.0	-3.0
5	4824.00	54.4 PK	74.0	-19.6	2.45 V	40	53.4	1.0
6	4824.00	52.5 AV	54.0	-1.5	2.45 V	40	51.5	1.0

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.

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.2 PK	74.0	-18.8	1.27 H	37	58.3	-3.1
2	2390.00	42.7 AV	54.0	-11.3	1.27 H	37	45.8	-3.1
3	*2437.00	101.3 PK			1.27 H	37	104.3	-3.0
4	*2437.00	98.5 AV			1.27 H	37	101.5	-3.0
5	2483.50	55.8 PK	74.0	-18.2	1.27 H	37	58.9	-3.1
6	2483.50	42.6 AV	54.0	-11.4	1.27 H	37	45.7	-3.1
7	4874.00	55.2 PK	74.0	-18.8	2.92 H	30	54.3	0.9
8	4874.00	53.0 AV	54.0	-1.0	2.92 H	30	52.1	0.9
9	7311.00	58.5 PK	74.0	-15.5	1.81 H	350	51.5	7.0
10	7311.00	53.8 AV	54.0	-0.2	1.81 H	350	46.8	7.0

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.8 PK	74.0	-18.2	3.21 V	296	58.9	-3.1
2	2390.00	42.8 AV	54.0	-11.2	3.21 V	296	45.9	-3.1
3	*2437.00	107.8 PK			3.21 V	296	110.8	-3.0
4	*2437.00	105.2 AV			3.21 V	296	108.2	-3.0
5	2483.50	56.2 PK	74.0	-17.8	3.21 V	296	59.3	-3.1
6	2483.50	43.0 AV	54.0	-11.0	3.21 V	296	46.1	-3.1
7	4874.00	50.1 PK	74.0	-23.9	2.47 V	39	49.2	0.9
8	4874.00	48.1 AV	54.0	-5.9	2.47 V	39	47.2	0.9
9	7311.00	53.6 PK	74.0	-20.4	2.35 V	338	46.6	7.0
10	7311.00	47.8 AV	54.0	-6.2	2.35 V	338	40.8	7.0

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.

RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	103.0 PK			1.24 H	354	106.1	-3.1
2	*2462.00	99.8 AV			1.24 H	354	102.9	-3.1
3	2487.24	55.6 PK	74.0	-18.4	1.24 H	354	58.7	-3.1
4	2487.24	44.5 AV	54.0	-9.5	1.24 H	354	47.6	-3.1
5	4924.00	51.2 PK	74.0	-22.8	1.86 H	291	50.2	1.0
6	4924.00	48.7 AV	54.0	-5.3	1.86 H	291	47.7	1.0
7	7386.00	58.1 PK	74.0	-15.9	1.63 H	350	51.0	7.1
8	7386.00	53.9 AV	54.0	-0.1	1.63 H	350	46.8	7.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	110.9 PK			3.03 V	270	114.0	-3.1
2	*2462.00	106.7 AV			3.03 V	270	109.8	-3.1
3	2487.30	59.4 PK	74.0	-14.6	3.03 V	270	62.5	-3.1
4	2487.30	50.3 AV	54.0	-3.7	3.03 V	270	53.4	-3.1
5	4924.00	53.8 PK	74.0	-20.2	2.15 V	53	52.8	1.0
6	4924.00	51.3 AV	54.0	-2.7	2.15 V	53	50.3	1.0
7	7386.00	56.6 PK	74.0	-17.4	1.00 V	213	49.5	7.1
8	7386.00	52.3 AV	54.0	-1.7	1.00 V	213	45.2	7.1

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.91	59.3 PK	74.0	-14.7	1.88 H	32	62.4	-3.1
2	2389.91	44.9 AV	54.0	-9.1	1.88 H	32	48.0	-3.1
3	*2412.00	101.0 PK			1.88 H	32	104.0	-3.0
4	*2412.00	91.4 AV			1.88 H	32	94.4	-3.0
5	4824.00	51.4 PK	74.0	-22.6	1.00 H	358	50.4	1.0
6	4824.00	38.0 AV	54.0	-16.0	1.00 H	358	37.0	1.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.93	69.3 PK	74.0	-4.7	1.00 V	264	72.4	-3.1
2	2389.93	49.2 AV	54.0	-4.8	1.00 V	264	52.3	-3.1
3	*2412.00	108.4 PK			1.00 V	264	111.4	-3.0
4	*2412.00	98.1 AV			1.00 V	264	101.1	-3.0
5	4824.00	48.4 PK	74.0	-25.6	2.60 V	36	47.4	1.0
6	4824.00	35.9 AV	54.0	-18.1	2.60 V	36	34.9	1.0

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.

RF Mode	TX 802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.4 PK	74.0	-18.6	1.82 H	33	58.5	-3.1
2	2390.00	43.4 AV	54.0	-10.6	1.82 H	33	46.5	-3.1
3	*2437.00	101.7 PK			1.82 H	33	104.7	-3.0
4	*2437.00	91.8 AV			1.82 H	33	94.8	-3.0
5	2483.50	55.7 PK	74.0	-18.3	1.82 H	33	58.8	-3.1
6	2483.50	43.3 AV	54.0	-10.7	1.82 H	33	46.4	-3.1
7	4874.00	52.3 PK	74.0	-21.7	2.86 H	36	51.4	0.9
8	4874.00	38.6 AV	54.0	-15.4	2.86 H	36	37.7	0.9
9	7311.00	58.0 PK	74.0	-16.0	1.57 H	350	51.0	7.0
10	7311.00	43.5 AV	54.0	-10.5	1.57 H	350	36.5	7.0

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.2 PK	74.0	-17.8	3.12 V	275	59.3	-3.1
2	2390.00	43.1 AV	54.0	-10.9	3.12 V	275	46.2	-3.1
3	*2437.00	108.8 PK			3.12 V	275	111.8	-3.0
4	*2437.00	99.1 AV			3.12 V	275	102.1	-3.0
5	2483.50	58.6 PK	74.0	-15.4	3.12 V	275	61.7	-3.1
6	2483.50	43.6 AV	54.0	-10.4	3.12 V	275	46.7	-3.1
7	4874.00	47.6 PK	74.0	-26.4	2.09 V	15	46.7	0.9
8	4874.00	34.5 AV	54.0	-19.5	2.09 V	15	33.6	0.9
9	7311.00	53.6 PK	74.0	-20.4	2.19 V	353	46.6	7.0
10	7311.00	40.2 AV	54.0	-13.8	2.19 V	353	33.2	7.0

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.

RF Mode	TX 802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	100.3 PK			1.73 H	35	103.4	-3.1
2	*2462.00	91.1 AV			1.73 H	35	94.2	-3.1
3	2483.64	63.3 PK	74.0	-10.7	1.73 H	35	66.4	-3.1
4	2483.64	47.4 AV	54.0	-6.6	1.73 H	35	50.5	-3.1
5	4924.00	47.9 PK	74.0	-26.1	2.20 H	330	46.9	1.0
6	4924.00	35.2 AV	54.0	-18.8	2.20 H	330	34.2	1.0
7	7386.00	56.6 PK	74.0	-17.4	2.77 H	354	49.5	7.1
8	7386.00	40.9 AV	54.0	-13.1	2.77 H	354	33.8	7.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	108.1 PK			3.04 V	278	111.2	-3.1
2	*2462.00	97.3 AV			3.04 V	278	100.4	-3.1
3	2483.95	70.4 PK	74.0	-3.6	3.04 V	278	73.5	-3.1
4	2483.95	53.1 AV	54.0	-0.9	3.04 V	278	56.2	-3.1
5	4924.00	46.9 PK	74.0	-27.1	2.17 V	40	45.9	1.0
6	4924.00	33.9 AV	54.0	-20.1	2.17 V	40	32.9	1.0
7	7386.00	51.4 PK	74.0	-22.6	2.47 V	346	44.3	7.1
8	7386.00	37.1 AV	54.0	-16.9	2.47 V	346	30.0	7.1

Remarks:

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

RF Mode	TX 802.11n (HT20)	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.90	62.7 PK	74.0	-11.3	1.70 H	29	65.8	-3.1
2	2389.90	47.1 AV	54.0	-6.9	1.70 H	29	50.2	-3.1
3	*2412.00	101.9 PK			1.70 H	29	104.9	-3.0
4	*2412.00	91.9 AV			1.70 H	29	94.9	-3.0
5	4824.00	50.7 PK	74.0	-23.3	2.97 H	37	49.7	1.0
6	4824.00	38.5 AV	54.0	-15.5	2.97 H	37	37.5	1.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.91	70.6 PK	74.0	-3.4	2.61 V	268	73.7	-3.1
2	2389.91	51.4 AV	54.0	-2.6	2.61 V	268	54.5	-3.1
3	*2412.00	108.3 PK			2.61 V	268	111.3	-3.0
4	*2412.00	98.6 AV			2.61 V	268	101.6	-3.0
5	4824.00	47.3 PK	74.0	-26.7	3.14 V	20	46.3	1.0
6	4824.00	34.7 AV	54.0	-19.3	3.14 V	20	33.7	1.0

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.

RF Mode	TX 802.11n (HT20)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.5 PK	74.0	-18.5	1.32 H	37	58.6	-3.1
2	2390.00	43.7 AV	54.0	-10.3	1.32 H	37	46.8	-3.1
3	*2437.00	101.7 PK			1.32 H	37	104.7	-3.0
4	*2437.00	92.3 AV			1.32 H	37	95.3	-3.0
5	2483.50	56.7 PK	74.0	-17.3	1.32 H	37	59.8	-3.1
6	2483.50	43.5 AV	54.0	-10.5	1.32 H	37	46.6	-3.1
7	4874.00	53.3 PK	74.0	-20.7	2.84 H	55	52.4	0.9
8	4874.00	40.3 AV	54.0	-13.7	2.84 H	55	39.4	0.9
9	7311.00	59.0 PK	74.0	-15.0	1.75 H	16	52.0	7.0
10	7311.00	44.9 AV	54.0	-9.1	1.75 H	16	37.9	7.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.7 PK	74.0	-18.3	3.22 V	291	58.8	-3.1
2	2390.00	43.8 AV	54.0	-10.2	3.22 V	291	46.9	-3.1
3	*2437.00	107.7 PK			3.22 V	291	110.7	-3.0
4	*2437.00	98.1 AV			3.22 V	291	101.1	-3.0
5	2483.50	59.2 PK	74.0	-14.8	3.22 V	291	62.3	-3.1
6	2483.50	43.9 AV	54.0	-10.1	3.22 V	291	47.0	-3.1
7	4874.00	45.9 PK	74.0	-28.1	1.00 V	63	45.0	0.9
8	4874.00	35.2 AV	54.0	-18.8	1.00 V	63	34.3	0.9
9	7311.00	52.3 PK	74.0	-21.7	3.16 V	352	45.3	7.0
10	7311.00	39.0 AV	54.0	-15.0	3.16 V	352	32.0	7.0

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.

RF Mode	TX 802.11n (HT20)	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	101.2 PK			1.27 H	23	104.3	-3.1
2	*2462.00	91.6 AV			1.27 H	23	94.7	-3.1
3	2485.35	65.5 PK	74.0	-8.5	1.27 H	23	68.6	-3.1
4	2485.35	48.1 AV	54.0	-5.9	1.27 H	23	51.2	-3.1
5	4924.00	47.9 PK	74.0	-26.1	2.77 H	29	46.9	1.0
6	4924.00	35.5 AV	54.0	-18.5	2.77 H	29	34.5	1.0
7	7386.00	57.0 PK	74.0	-17.0	1.90 H	352	49.9	7.1
8	7386.00	43.2 AV	54.0	-10.8	1.90 H	352	36.1	7.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	107.4 PK			2.90 V	222	110.5	-3.1
2	*2462.00	97.9 AV			2.90 V	222	101.0	-3.1
3	2483.50	72.9 PK	74.0	-1.1	2.90 V	222	76.0	-3.1
4	2483.50	53.4 AV	54.0	-0.6	2.90 V	222	56.5	-3.1
5	4924.00	44.7 PK	74.0	-29.3	2.67 V	29	43.7	1.0
6	4924.00	32.6 AV	54.0	-21.4	2.67 V	29	31.6	1.0
7	7386.00	52.0 PK	74.0	-22.0	2.92 V	32	44.9	7.1
8	7386.00	38.9 AV	54.0	-15.1	2.92 V	32	31.8	7.1

Remarks:

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

Below 1GHz Data:

Mode C

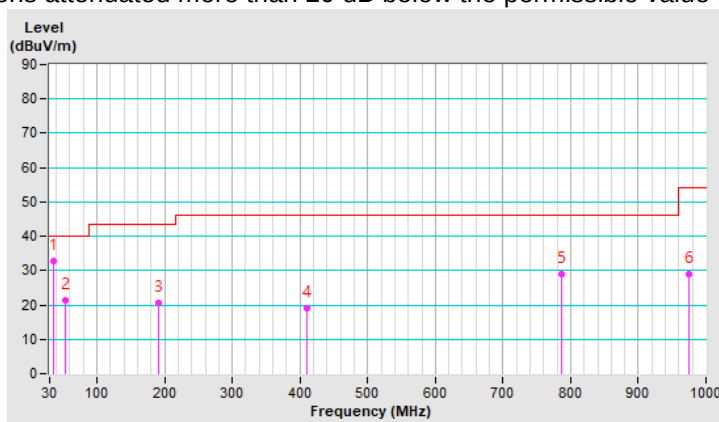
802.11b

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.67	32.7 QP	40.0	-7.3	1.00 H	356	46.3	-13.6
2	53.57	21.2 QP	40.0	-18.8	1.00 H	0	34.0	-12.8
3	190.88	20.5 QP	43.5	-23.0	1.00 H	111	36.0	-15.5
4	410.99	19.0 QP	46.0	-27.0	1.00 H	69	28.5	-9.5
5	786.44	29.0 QP	46.0	-17.0	1.00 H	68	31.4	-2.4
6	974.88	28.9 QP	54.0	-25.1	1.00 H	6	29.3	-0.4

Remarks:

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

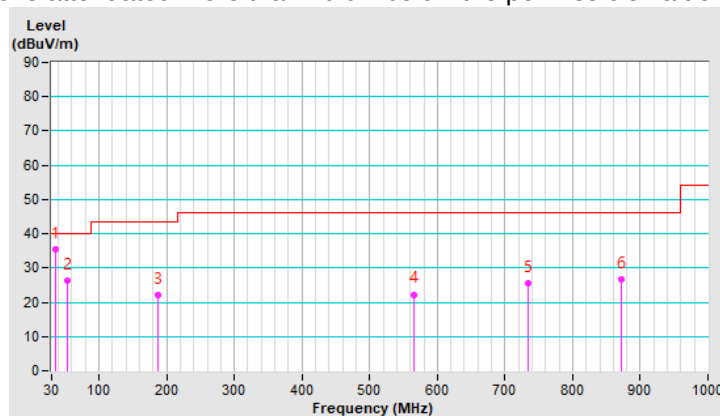


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.87	35.6 QP	40.0	-4.4	1.50 V	360	49.1	-13.5
2	53.67	26.3 QP	40.0	-13.7	2.00 V	357	39.1	-12.8
3	187.63	22.1 QP	43.5	-21.4	1.00 V	22	37.3	-15.2
4	565.42	22.3 QP	46.0	-23.7	1.50 V	1	28.5	-6.2
5	733.92	25.4 QP	46.0	-20.6	1.00 V	158	28.5	-3.1
6	871.61	26.6 QP	46.0	-19.4	1.00 V	313	28.1	-1.5

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.



Mode G

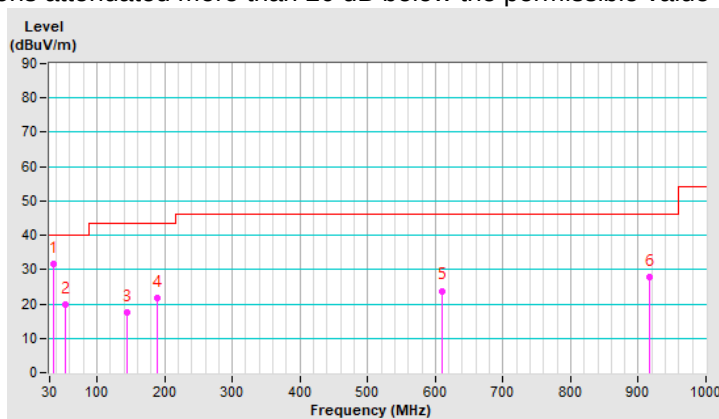
802.11b

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.53	31.7 QP	40.0	-8.3	1.00 H	225	45.3	-13.6
2	53.77	19.9 QP	40.0	-20.1	1.50 H	217	32.7	-12.8
3	144.81	17.5 QP	43.5	-26.0	1.00 H	336	30.2	-12.7
4	189.04	21.8 QP	43.5	-21.7	1.50 H	88	37.2	-15.4
5	609.46	23.8 QP	46.0	-22.2	1.00 H	71	28.6	-4.8
6	917.45	27.9 QP	46.0	-18.1	1.00 H	15	28.7	-0.8

Remarks:

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

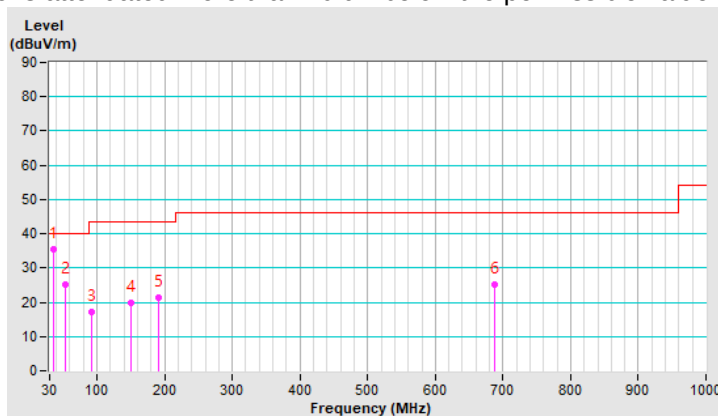


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.97	35.4 QP	40.0	-4.6	1.00 V	89	48.9	-13.5
2	53.57	25.2 QP	40.0	-14.8	1.50 V	160	38.0	-12.8
3	92.33	17.1 QP	43.5	-26.4	1.50 V	292	35.4	-18.3
4	149.95	19.9 QP	43.5	-23.6	1.50 V	52	32.4	-12.5
5	191.03	21.5 QP	43.5	-22.0	1.00 V	334	37.0	-15.5
6	688.52	25.3 QP	46.0	-20.7	1.00 V	107	29.1	-3.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
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: Nov. 27, 2020

4.2.3 Test Procedures

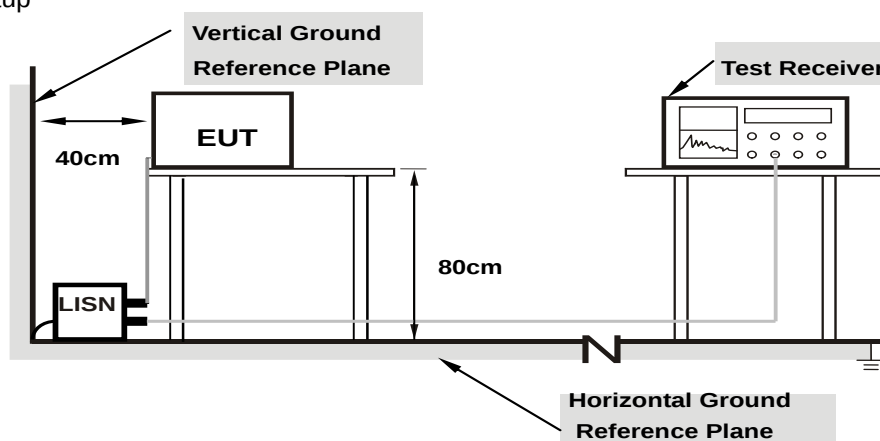
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

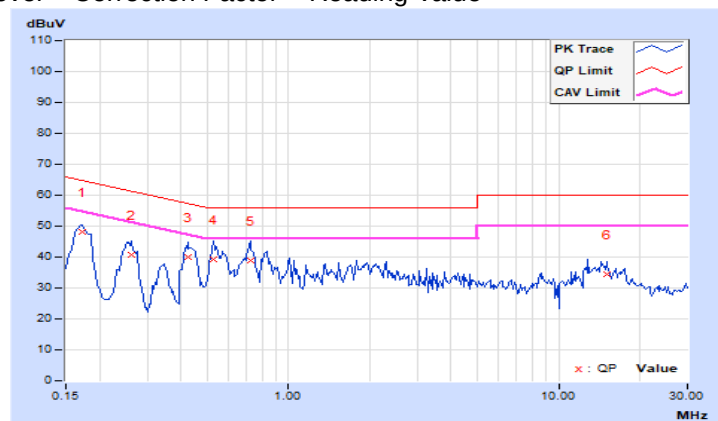
4.2.7 Test Results

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	0.17344	9.97	38.15	31.27	48.12	41.24	64.79	54.79	-16.67	-13.55
2	0.26328	10.00	30.62	23.64	40.62	33.64	61.33	51.33	-20.71	-17.69
3	0.42344	10.02	29.90	20.38	39.92	30.40	57.38	47.38	-17.46	-16.98
4	0.52500	10.03	29.23	20.52	39.26	30.55	56.00	46.00	-16.74	-15.45
5	0.72422	10.04	28.91	17.84	38.95	27.88	56.00	46.00	-17.05	-18.12
6	15.04688	11.10	23.16	15.96	34.26	27.06	60.00	50.00	-25.74	-22.94

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

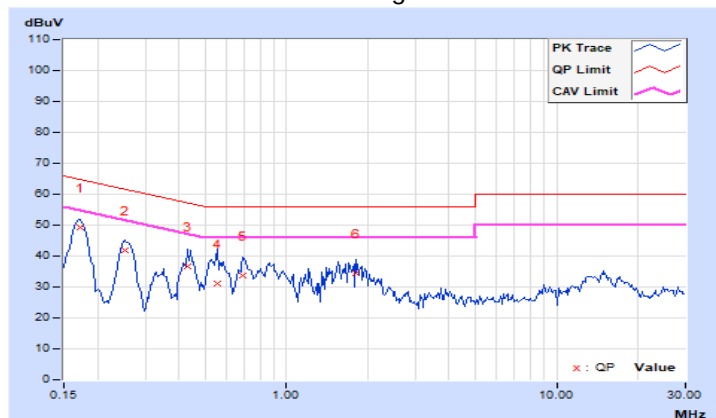


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	9.96	39.24	27.34	49.20	37.30	64.79	54.79	-15.59	-17.49
2	0.25156	9.99	31.68	22.10	41.67	32.09	61.71	51.71	-20.04	-19.62
3	0.43125	10.01	26.53	18.07	36.54	28.08	57.23	47.23	-20.69	-19.15
4	0.55234	10.03	20.93	10.34	30.96	20.37	56.00	46.00	-25.04	-25.63
5	0.68906	10.04	23.48	13.68	33.52	23.72	56.00	46.00	-22.48	-22.28
6	1.81641	10.13	24.48	14.51	34.61	24.64	56.00	46.00	-21.39	-21.36

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

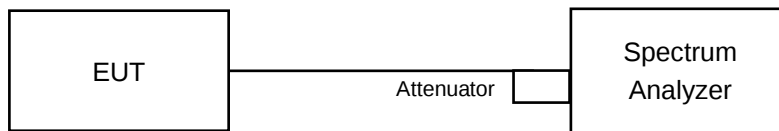


4.3 6dB Bandwidth Measurement

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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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
1	2412	9.03	0.5	Pass
6	2437	9.1	0.5	Pass
11	2462	9.04	0.5	Pass

802.11g

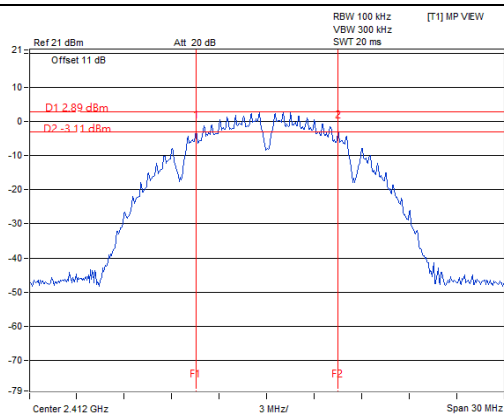
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.42	0.5	Pass
6	2437	16.4	0.5	Pass
11	2462	16.39	0.5	Pass

802.11n (HT20)

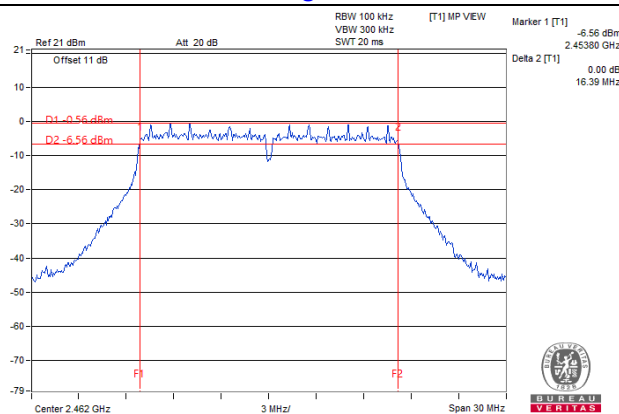
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.59	0.5	Pass
6	2437	17.64	0.5	Pass
11	2462	17.63	0.5	Pass

Spectrum Plot of Worst Value

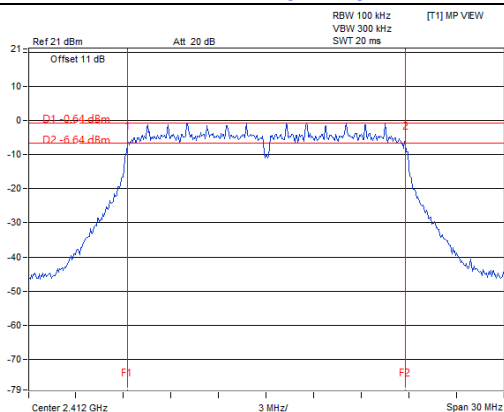
802.11b / CH1



802.11g / CH11



802.11n (HT20) / CH1

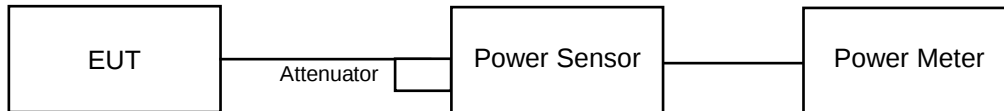


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	31.55	14.99	30	Pass
6	2437	29.107	14.64	30	Pass
11	2462	31.117	14.93	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	148.594	21.72	30	Pass
6	2437	134.276	21.28	30	Pass
11	2462	127.057	21.04	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	139.637	21.45	30	Pass
6	2437	121.899	20.86	30	Pass
11	2462	144.877	21.61	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	17.66	12.47
6	2437	16.218	12.10
11	2462	17.62	12.46

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	15.959	12.03
6	2437	15.668	11.95
11	2462	15.56	11.92

802.11n (HT20)

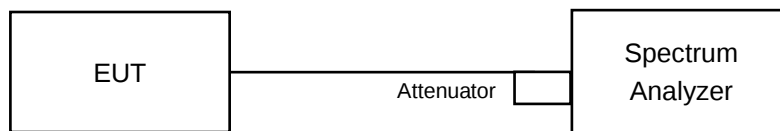
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	15.74	11.97
6	2437	15.417	11.88
11	2462	15.885	12.01

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-10.51	8	Pass
6	2437	-11.96	8	Pass
11	2462	-11.64	8	Pass

802.11g

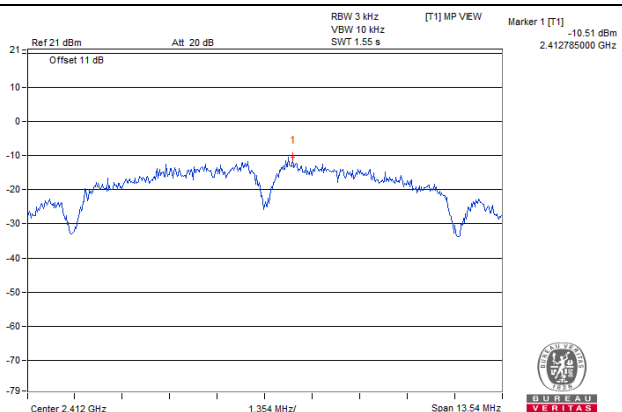
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-14.87	8	Pass
6	2437	-13.54	8	Pass
11	2462	-14.75	8	Pass

802.11n (HT20)

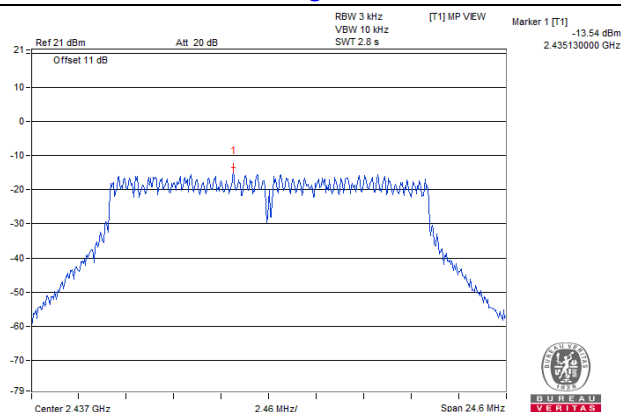
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-15.17	8	Pass
6	2437	-15.50	8	Pass
11	2462	-14.18	8	Pass

Spectrum Plot of Worst Value

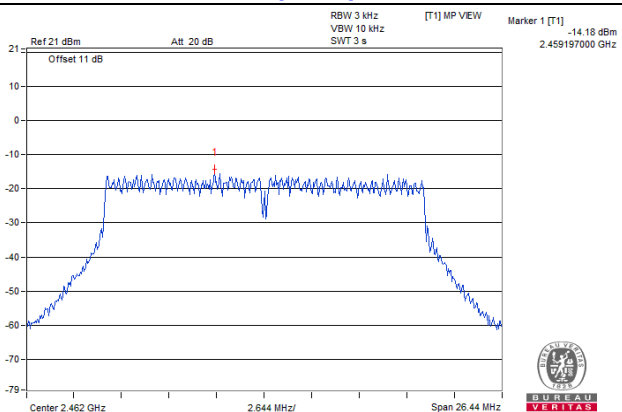
802.11b / CH1



802.11g / CH6



802.11n (HT20) / CH11

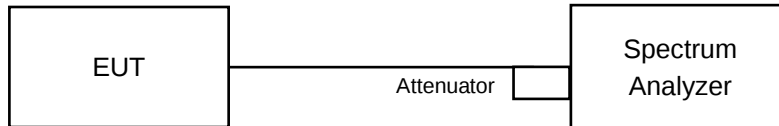


4.6 Conducted Out of Band Emission Measurement

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

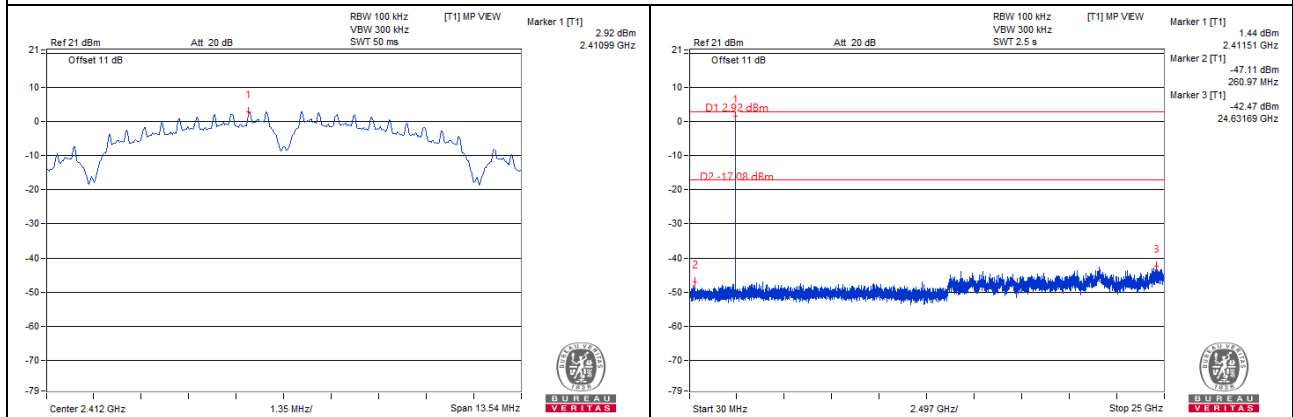
Same as Item 4.3.6

4.6.7 Test Results

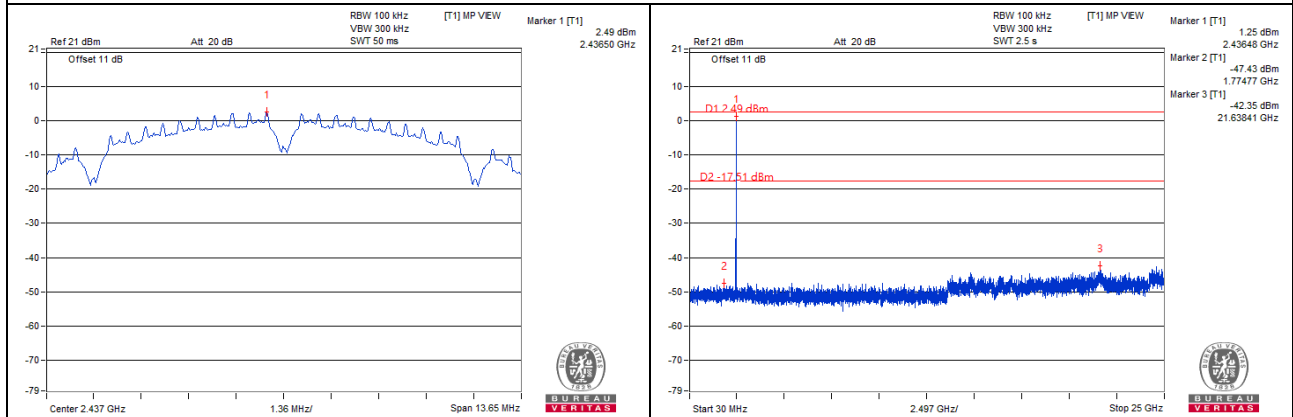
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

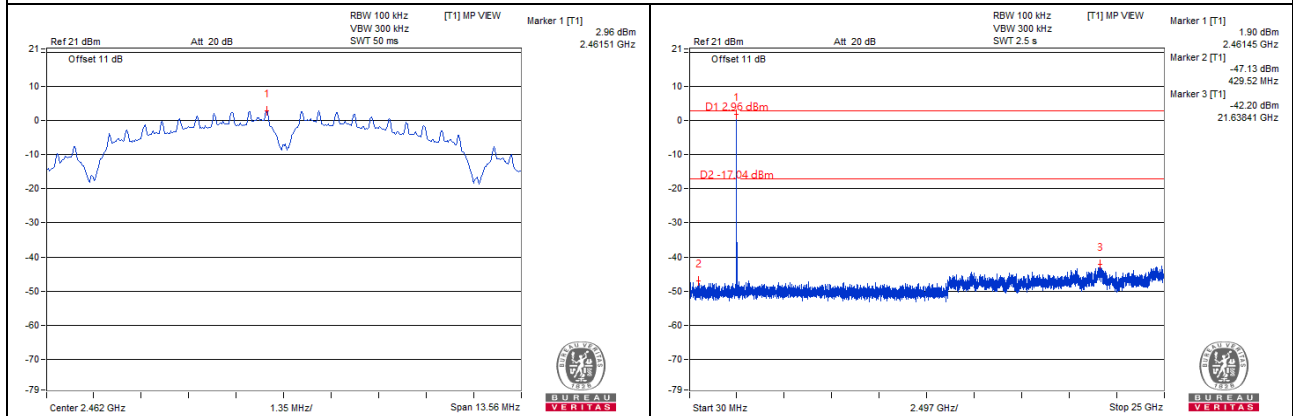
CH 1



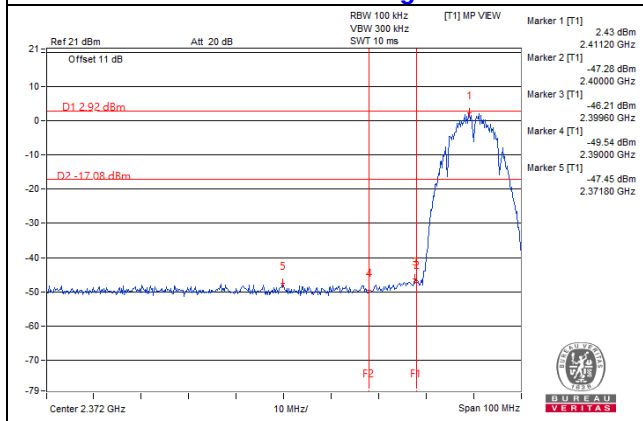
CH 6



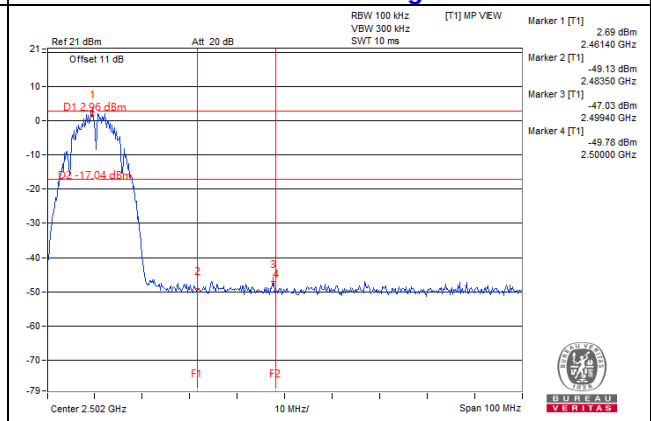
CH 11



CH 1 Band edge

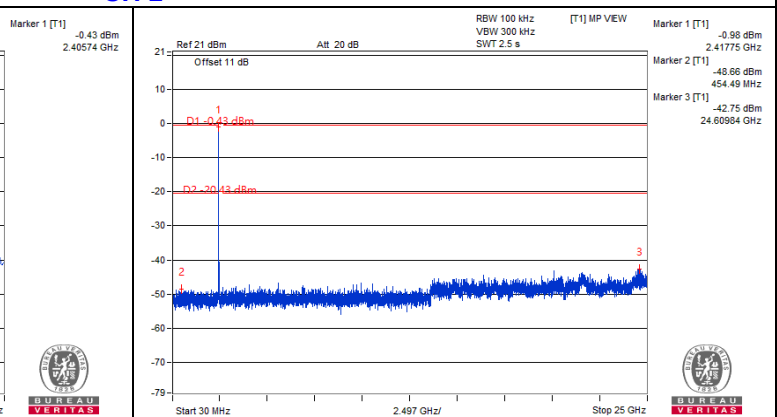
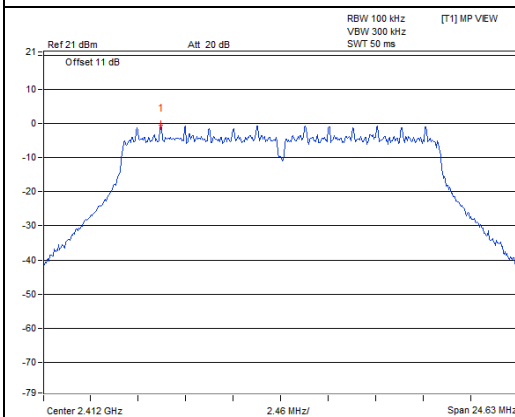


CH 11 Band edge

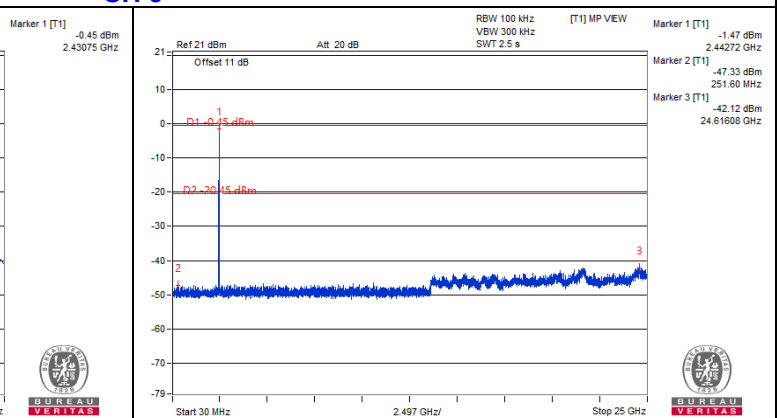
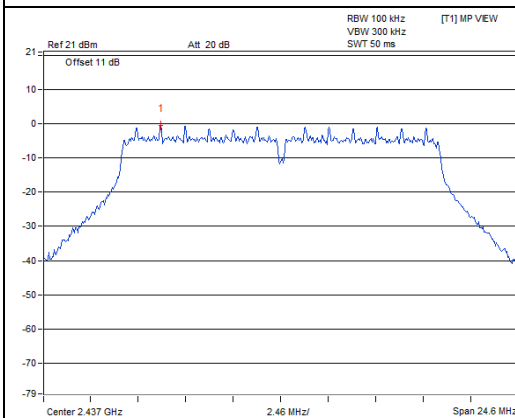


802.11g

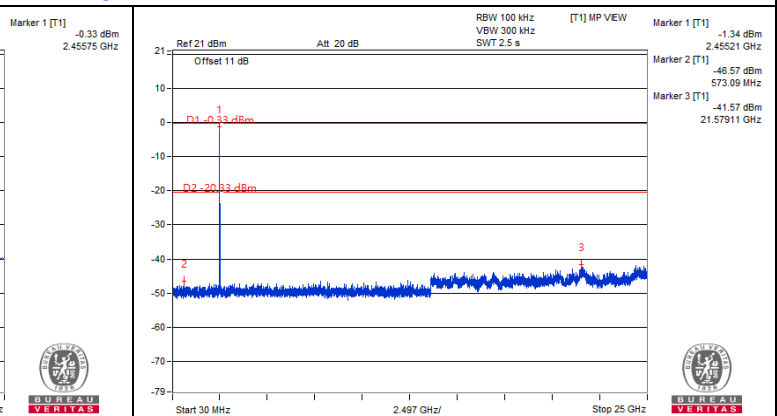
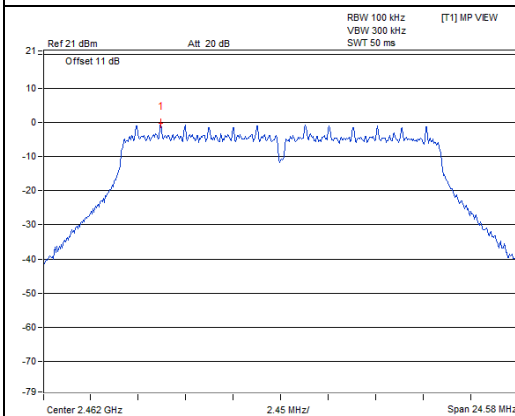
CH 1



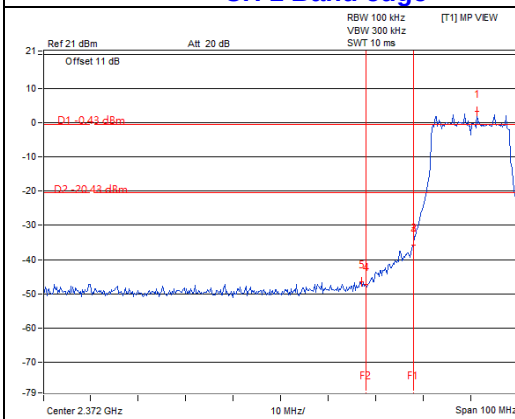
CH 6



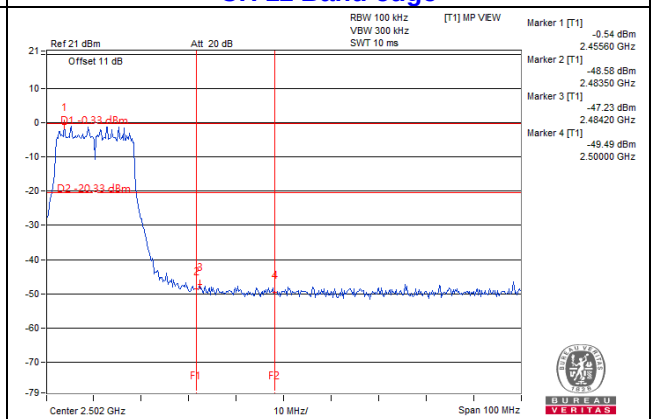
CH 11



CH 1 Band edge

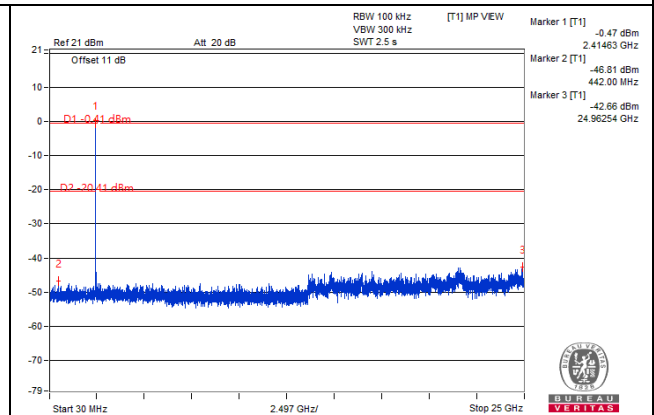
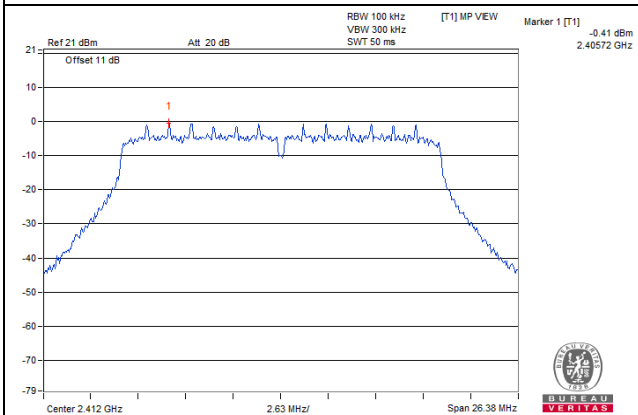


CH 11 Band edge

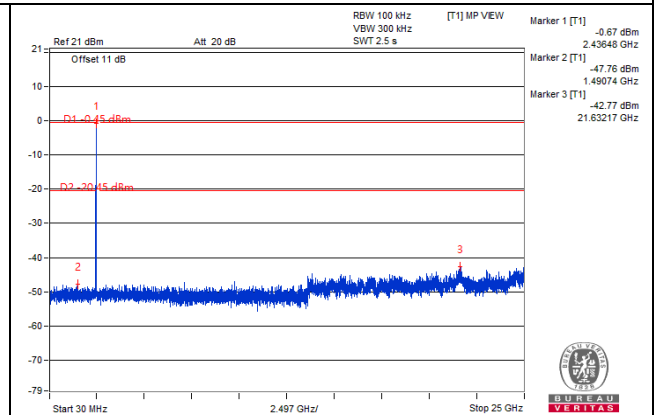
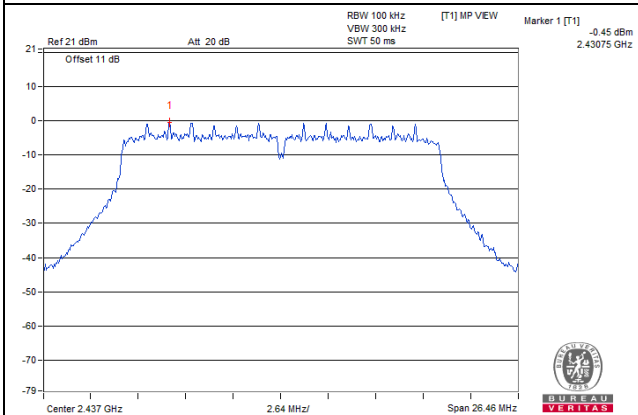


802.11n (HT20)

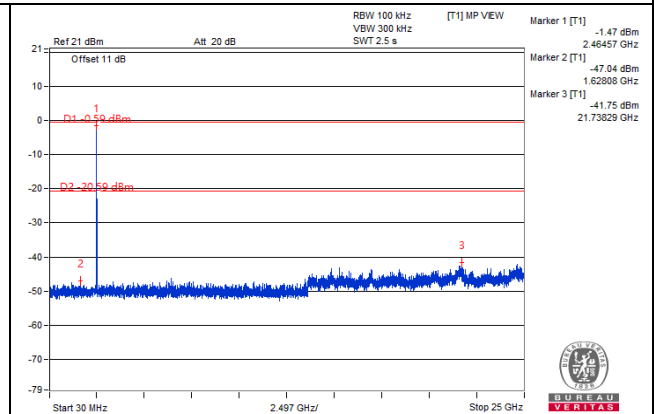
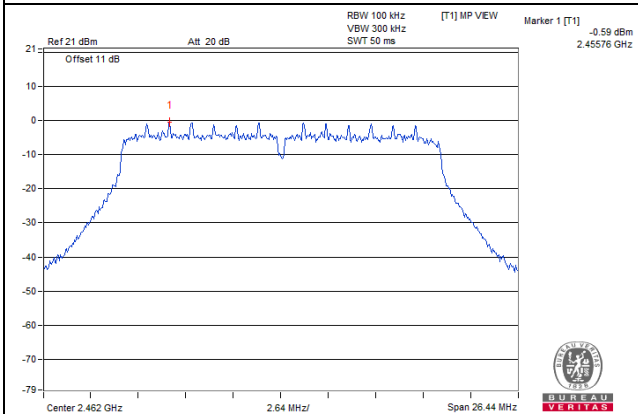
CH 1



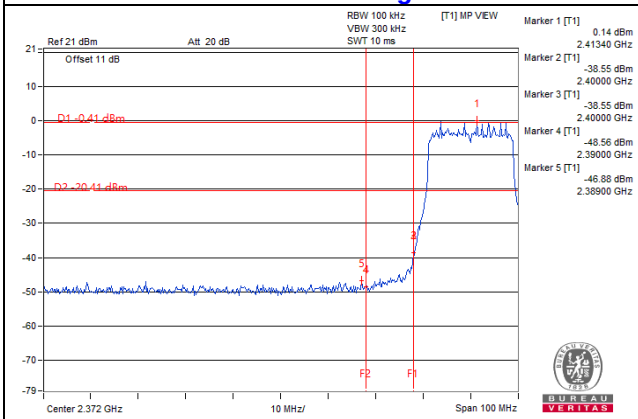
CH 6



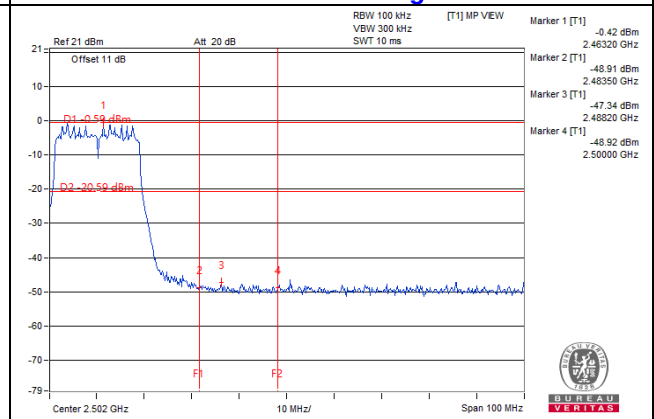
CH 11



CH 1 Band edge



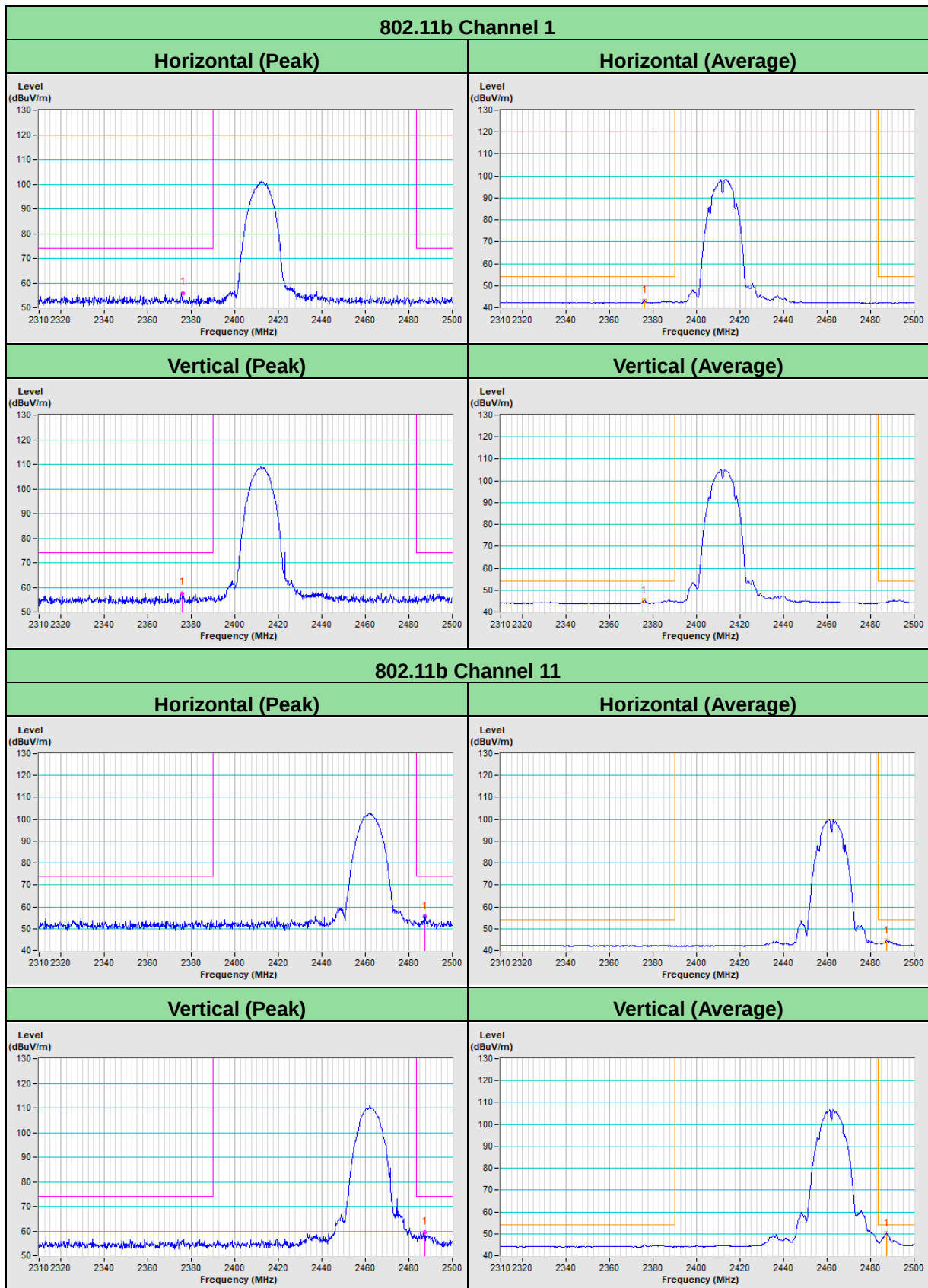
CH 11 Band edge

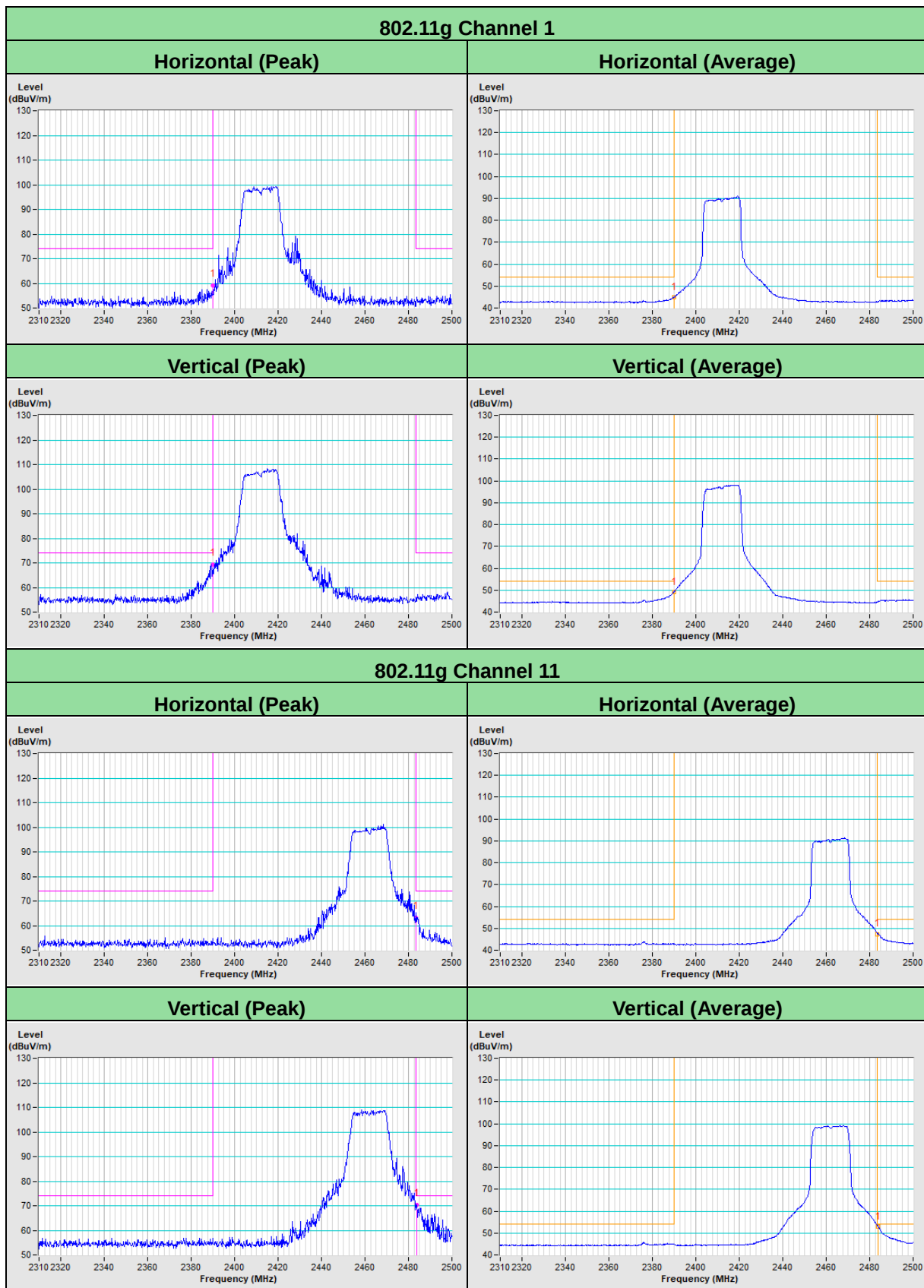


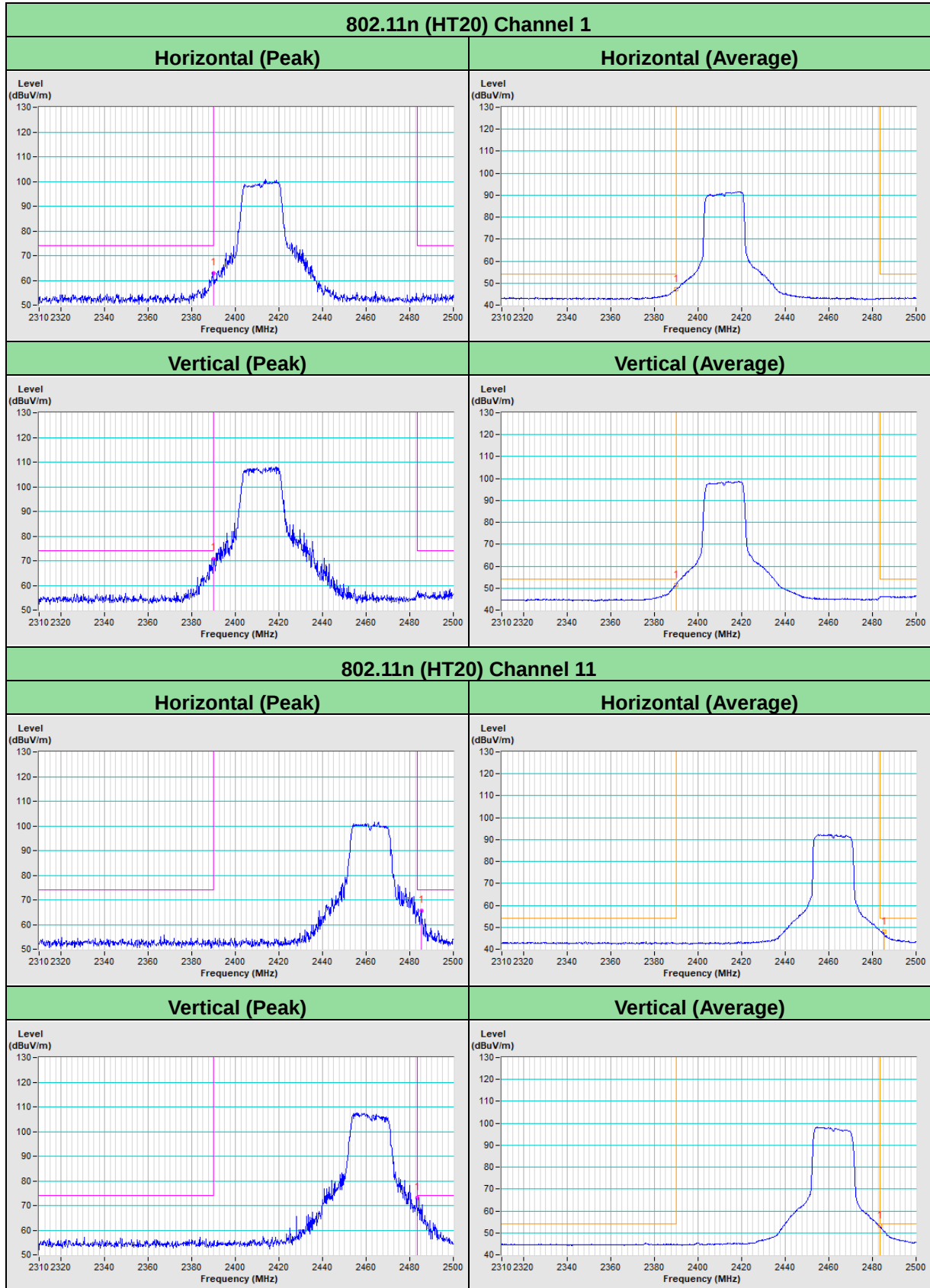
5 Pictures of Test Arrangements

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

Annex A - Band-Edge Measurement







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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