

FCC Test Report (WLAN)

Report No.: RF200527E06

FCC ID: MQT-XC60E

Test Model: XC60-E

Received Date: May 27, 2020

Test Date: June 10 to 16, 2020

Issued Date: June 22, 2020

Applicant: XAC AUTOMATION CORP.

Address: 4F, No. 30, INDUSTRY E. RD. IX, SCIENCE-BASED INDUSTRIAL
PARK, HSINCHU, TAIWAN

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

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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
RF200527E06	Original release.	June 22, 2020

1 Certificate of Conformity

Product: Cradle

Brand: XAC

Test Model: XC60-E

Sample Status: ENGINEERING SAMPLE

Applicant: XAC AUTOMATION CORP.

Test Date: June 10 to 16, 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 :  , **Date:** June 22, 2020
Claire Kuan / Specialist

Approved by :  , **Date:** June 22, 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 -16.78dB at 0.35313MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.3dB at 2390.00MHz.
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 i-pex(MHF) not a standard connector.

Note:

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Conducted Emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.1 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	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	Cradle
Brand	XAC
Test Model	XC60-E
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc
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 150Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	427.563mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

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

Brand	Model	Antenna Gain including cable loss (dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
AWAN	AYP6P-100015	0.97	2.4~2.5	PIFA	i-pex(MHF)	50

2. The EUT incorporates a SISO function:

2.4GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11b	1TX	1RX
802.11g	1TX	1RX
802.11n (HT20)	1TX	1RX
802.11n (HT40)	1TX	1RX

3. 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.

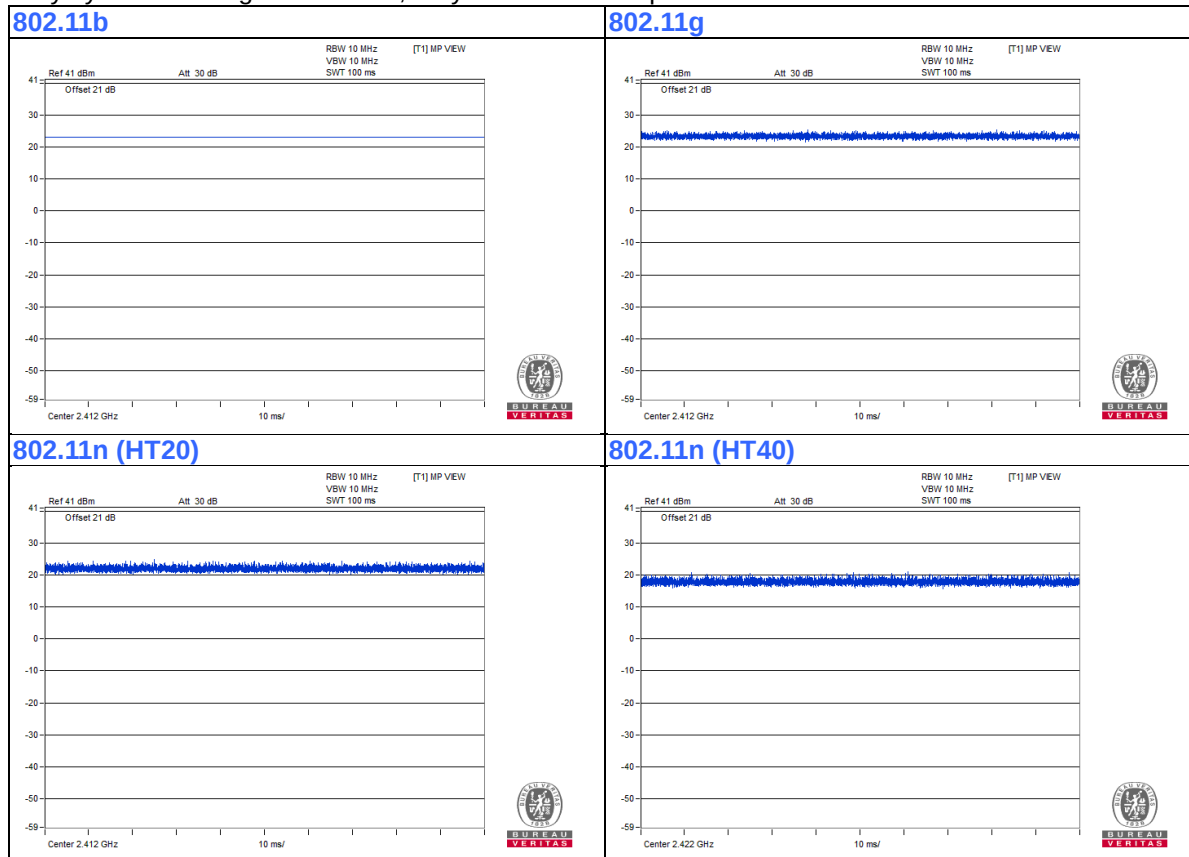
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (System)	TESTED BY
RE $\geq$ 1G	25deg. C, 75%RH	120Vac, 60Hz	Nelson Teng
RE $<$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
PLC	23deg. C, 68%RH	120Vac, 60Hz	Nick Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is 100 %, duty factor is not required.



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	DVE	DSA-36PFN-12 FCA 120300	NA	NA	Supplied by client
B.	iPod	Apple	MD778TA/A	CC4JL03FF4T1	NA	Provided by Lab
C.	iPod	Apple	MC749TA/A	CC4DN25WDFDM	NA	Provided by Lab
D.	Laptop	DELL	E5430	DM1SKV1	DoC	Provided by Lab
E.	Terminal	XAC	xCL_AT-150-R3-1 8U	NA	NA	Supplied by client

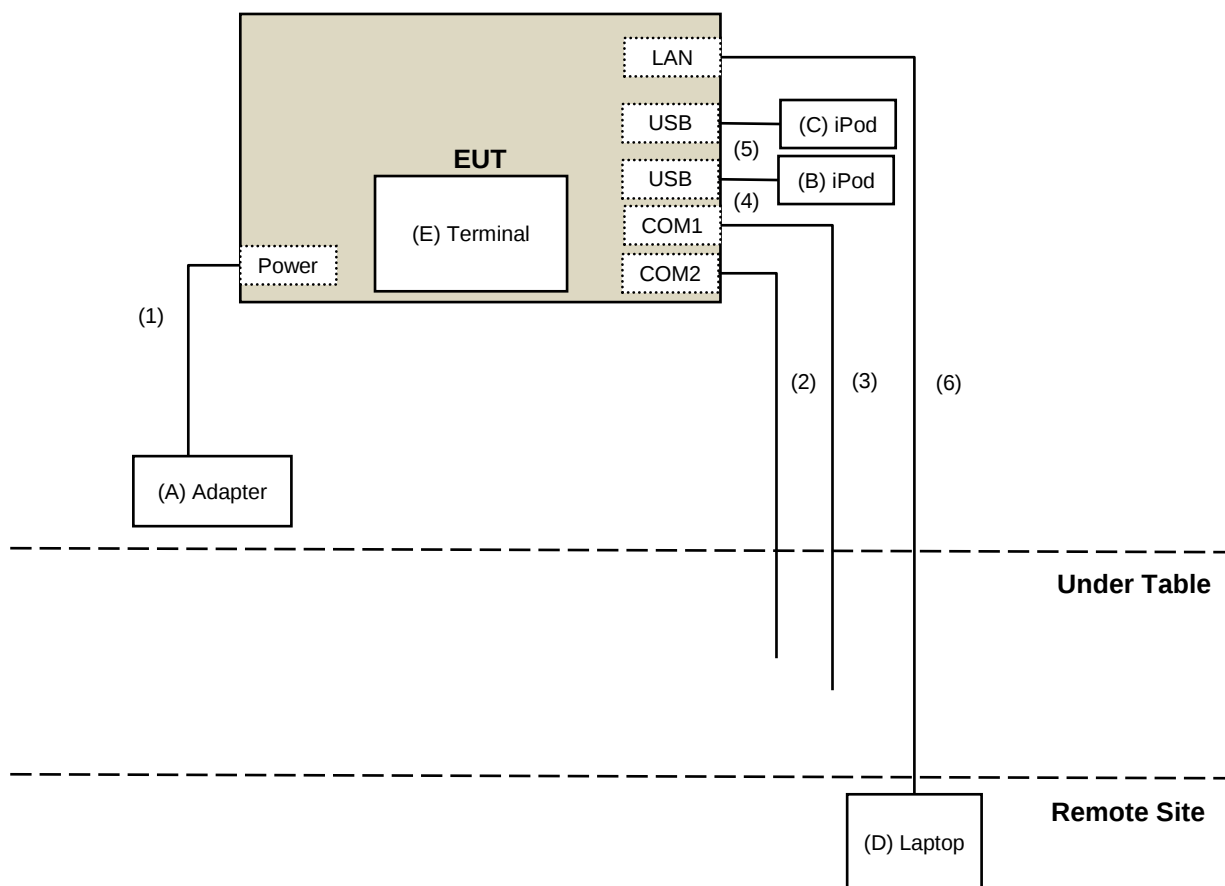
Note:

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

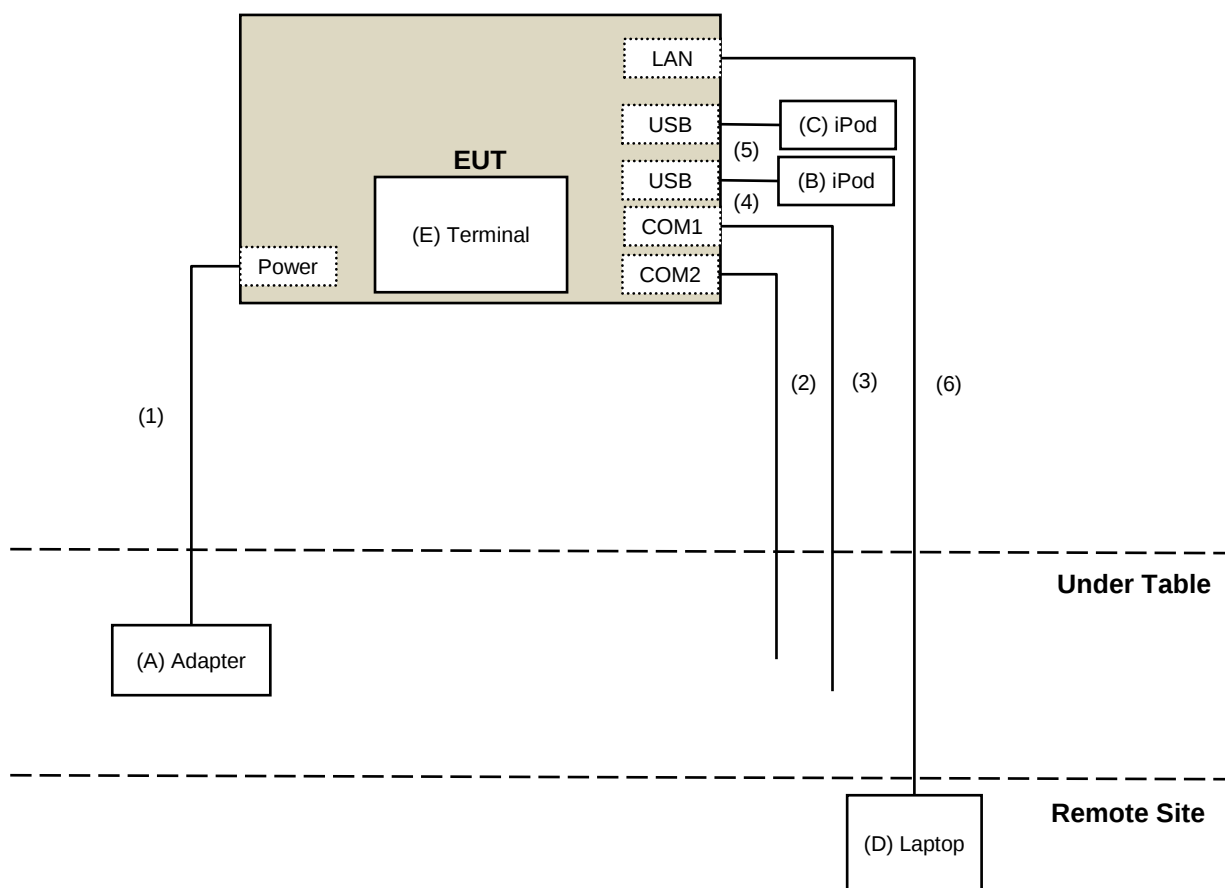
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.6	No	0	Supplied by client
2.	RJ-12 Cable	1	1.25	No	0	Supplied by client
3.	RJ-12 Cable	1	1.25	No	0	Supplied by client
4.	USB Cable	1	0.1	Yes	0	Provided by Lab
5.	USB Cable	1	0.1	Yes	0	Provided by Lab
6.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test

For conducted emission test:



For other test items:



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. 08, 2019	Nov. 07, 2020
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. 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: June 10 to 16, 2020

For other test items:

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 26, 2019	July 25, 2020
Power sensor Anritsu	MA2411B	1339443	July 26, 2019	July 25, 2020
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: June 16, 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:

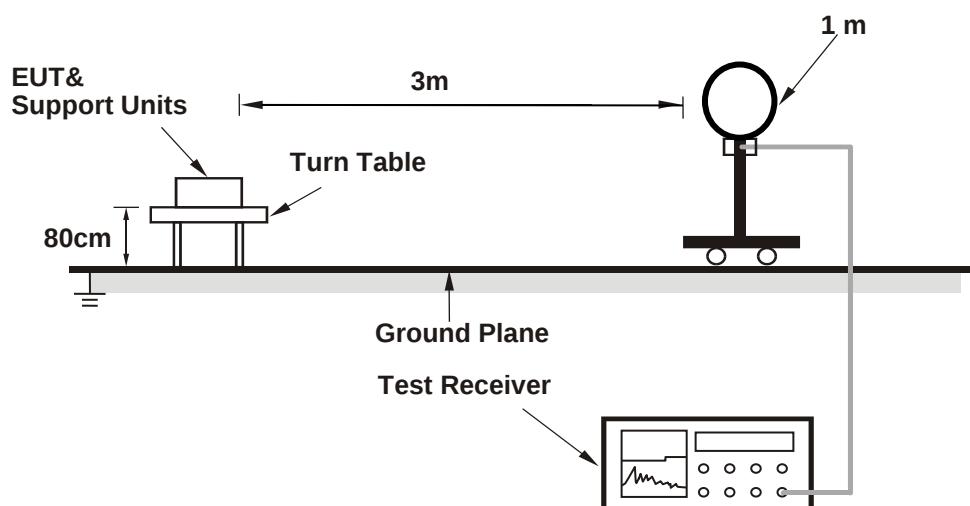
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

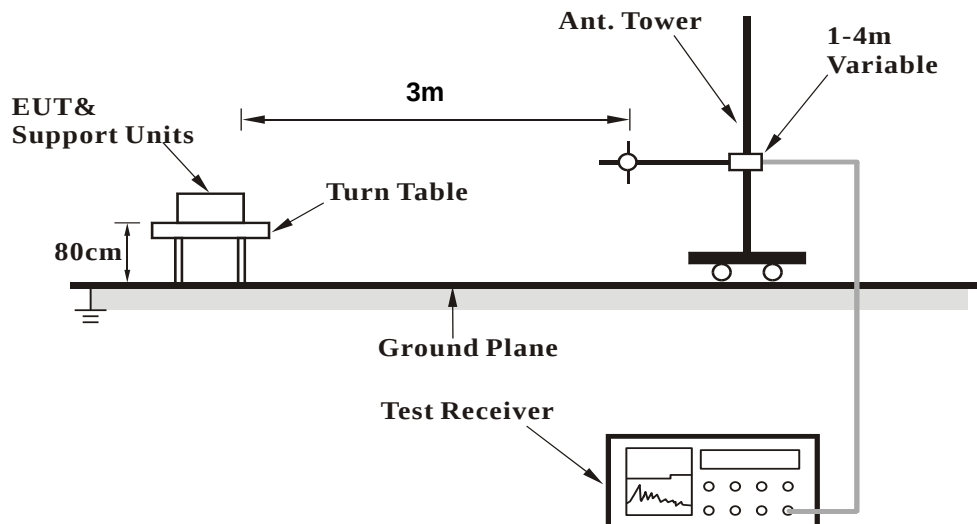
No deviation.

4.1.5 Test Setup

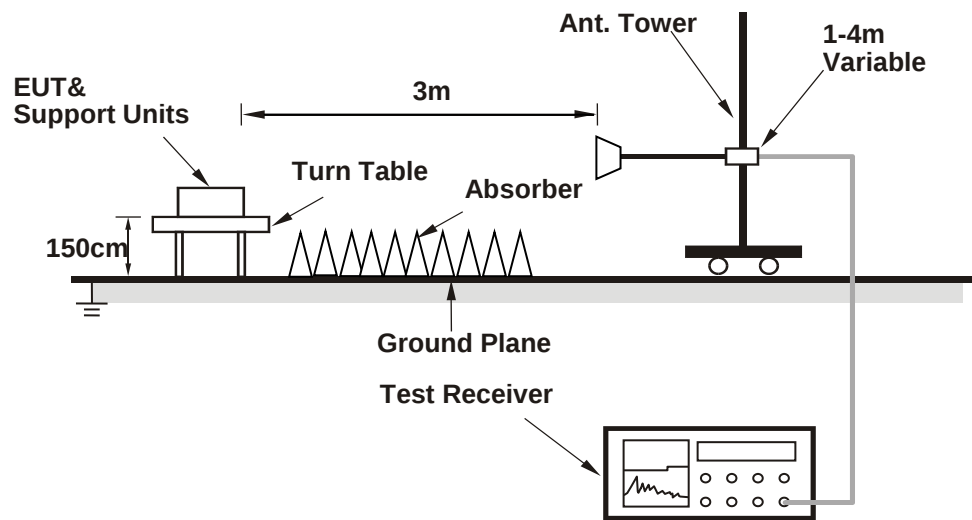
For Radiated emission below 30MHz



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 (HyperTerminal paste XC60_RF mode command.txt command) 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	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	2387.20	60.0 PK	74.0	-14.0	1.19 H	104	63.1	-3.1
2	2387.20	53.0 AV	54.0	-1.0	1.19 H	104	56.1	-3.1
3	*2412.00	108.9 PK			1.19 H	104	111.9	-3.0
4	*2412.00	106.6 AV			1.19 H	104	109.6	-3.0
5	4824.00	47.2 PK	74.0	-26.8	1.48 H	60	46.2	1.0
6	4824.00	45.3 AV	54.0	-8.7	1.48 H	60	44.3	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	2387.69	56.6 PK	74.0	-17.4	3.82 V	316	59.7	-3.1
2	2387.69	44.3 AV	54.0	-9.7	3.82 V	316	47.4	-3.1
3	*2412.00	103.8 PK			3.82 V	316	106.8	-3.0
4	*2412.00	101.4 AV			3.82 V	316	104.4	-3.0
5	4824.00	49.2 PK	74.0	-24.8	2.83 V	43	48.2	1.0
6	4824.00	46.6 AV	54.0	-7.4	2.83 V	43	45.6	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.

Channel	TX Channel 6	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 25GHz		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	*2437.00	109.4 PK			1.19 H	72	112.4	-3.0
2	*2437.00	107.3 AV			1.19 H	72	110.3	-3.0
3	4874.00	47.8 PK	74.0	-26.2	1.53 H	83	46.9	0.9
4	4874.00	45.7 AV	54.0	-8.3	1.53 H	83	44.8	0.9
5	7311.00	43.8 PK	74.0	-30.2	1.80 H	253	36.8	7.0
6	7311.00	31.2 AV	54.0	-22.8	1.80 H	253	24.2	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	*2437.00	100.1 PK			1.35 V	313	103.1	-3.0
2	*2437.00	97.9 AV			1.35 V	313	100.9	-3.0
3	4874.00	48.6 PK	74.0	-25.4	2.85 V	26	47.7	0.9
4	4874.00	46.3 AV	54.0	-7.7	2.85 V	26	45.4	0.9
5	7311.00	43.7 PK	74.0	-30.3	1.82 V	247	36.7	7.0
6	7311.00	31.5 AV	54.0	-22.5	1.82 V	247	24.5	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.

Channel	TX Channel 11	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 25GHz		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	109.6 PK			1.21 H	72	112.7	-3.1
2	*2462.00	107.4 AV			1.21 H	72	110.5	-3.1
3	2487.75	60.3 PK	74.0	-13.7	1.21 H	72	63.4	-3.1
4	2487.75	52.0 AV	54.0	-2.0	1.21 H	72	55.1	-3.1
5	4924.00	47.5 PK	74.0	-26.5	1.50 H	68	46.5	1.0
6	4924.00	45.4 AV	54.0	-8.6	1.50 H	68	44.4	1.0
7	7386.00	44.1 PK	74.0	-29.9	1.80 H	238	37.0	7.1
8	7386.00	31.3 AV	54.0	-22.7	1.80 H	238	24.2	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	100.3 PK			1.35 V	314	103.4	-3.1
2	*2462.00	98.1 AV			1.35 V	314	101.2	-3.1
3	2486.77	57.2 PK	74.0	-16.8	1.35 V	314	60.3	-3.1
4	2486.77	45.1 AV	54.0	-8.9	1.35 V	314	48.2	-3.1
5	4924.00	48.5 PK	74.0	-25.5	2.84 V	36	47.5	1.0
6	4924.00	46.2 AV	54.0	-7.8	2.84 V	36	45.2	1.0
7	7386.00	43.9 PK	74.0	-30.1	1.88 V	244	36.8	7.1
8	7386.00	31.7 AV	54.0	-22.3	1.88 V	244	24.6	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.

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	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	68.4 PK	74.0	-5.6	1.17 H	101	71.5	-3.1
2	2390.00	53.7 AV	54.0	-0.3	1.17 H	101	56.8	-3.1
3	*2412.00	110.5 PK			1.17 H	101	113.5	-3.0
4	*2412.00	100.3 AV			1.17 H	101	103.3	-3.0
5	4824.00	47.9 PK	74.0	-26.1	1.52 H	67	46.9	1.0
6	4824.00	35.3 AV	54.0	-18.7	1.52 H	67	34.3	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	2390.00	60.9 PK	74.0	-13.1	3.83 V	318	64.0	-3.1
2	2390.00	45.7 AV	54.0	-8.3	3.83 V	318	48.8	-3.1
3	*2412.00	105.1 PK			3.83 V	318	108.1	-3.0
4	*2412.00	94.8 AV			3.83 V	318	97.8	-3.0
5	4824.00	46.8 PK	74.0	-27.2	2.83 V	19	45.8	1.0
6	4824.00	37.2 AV	54.0	-16.8	2.83 V	19	36.2	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.

Channel	TX Channel 6	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 25GHz		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	58.1 PK	74.0	-15.9	1.25 H	58	61.2	-3.1
2	2390.00	45.3 AV	54.0	-8.7	1.25 H	58	48.4	-3.1
3	*2437.00	110.8 PK			1.25 H	58	113.8	-3.0
4	*2437.00	100.0 AV			1.25 H	58	103.0	-3.0
5	2483.50	56.8 PK	74.0	-17.2	1.25 H	58	59.9	-3.1
6	2483.50	44.0 AV	54.0	-10.0	1.25 H	58	47.1	-3.1
7	4874.00	47.6 PK	74.0	-26.4	1.52 H	60	46.7	0.9
8	4874.00	35.3 AV	54.0	-18.7	1.52 H	60	34.4	0.9
9	7311.00	44.1 PK	74.0	-29.9	1.76 H	250	37.1	7.0
10	7311.00	31.1 AV	54.0	-22.9	1.76 H	250	24.1	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	56.0 PK	74.0	-18.0	3.97 V	133	59.1	-3.1
2	2390.00	43.6 AV	54.0	-10.4	3.97 V	133	46.7	-3.1
3	*2437.00	104.4 PK			3.97 V	133	107.4	-3.0
4	*2437.00	94.0 AV			3.97 V	133	97.0	-3.0
5	2483.50	55.7 PK	74.0	-18.3	3.97 V	133	58.8	-3.1
6	2483.50	42.7 AV	54.0	-11.3	3.97 V	133	45.8	-3.1
7	4874.00	46.2 PK	74.0	-27.8	2.85 V	21	45.3	0.9
8	4874.00	36.6 AV	54.0	-17.4	2.85 V	21	35.7	0.9
9	7311.00	43.5 PK	74.0	-30.5	1.83 V	229	36.5	7.0
10	7311.00	31.4 AV	54.0	-22.6	1.83 V	229	24.4	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.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 11	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 25GHz		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	110.1 PK			1.20 H	63	113.2	-3.1
2	*2462.00	100.2 AV			1.20 H	63	103.3	-3.1
3	2483.50	71.8 PK	74.0	-2.2	1.20 H	63	74.9	-3.1
4	2483.50	53.1 AV	54.0	-0.9	1.20 H	63	56.2	-3.1
5	4924.00	47.1 PK	74.0	-26.9	1.48 H	71	46.1	1.0
6	4924.00	34.9 AV	54.0	-19.1	1.48 H	71	33.9	1.0
7	7386.00	43.9 PK	74.0	-30.1	1.77 H	265	36.8	7.1
8	7386.00	30.7 AV	54.0	-23.3	1.77 H	265	23.6	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	104.9 PK			3.86 V	134	108.0	-3.1
2	*2462.00	94.2 AV			3.86 V	134	97.3	-3.1
3	2483.50	65.5 PK	74.0	-8.5	3.86 V	134	68.6	-3.1
4	2483.50	49.3 AV	54.0	-4.7	3.86 V	134	52.4	-3.1
5	4924.00	46.3 PK	74.0	-27.7	2.83 V	20	45.3	1.0
6	4924.00	36.9 AV	54.0	-17.1	2.83 V	20	35.9	1.0
7	7386.00	44.2 PK	74.0	-29.8	1.78 V	231	37.1	7.1
8	7386.00	31.9 AV	54.0	-22.1	1.78 V	231	24.8	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.

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	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	71.4 PK	74.0	-2.6	1.21 H	106	74.5	-3.1
2	2390.00	51.1 AV	54.0	-2.9	1.21 H	106	54.2	-3.1
3	*2412.00	110.6 PK			1.21 H	106	113.6	-3.0
4	*2412.00	100.5 AV			1.21 H	106	103.5	-3.0
5	4824.00	47.7 PK	74.0	-26.3	1.46 H	48	46.7	1.0
6	4824.00	35.6 AV	54.0	-18.4	1.46 H	48	34.6	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	2390.00	58.9 PK	74.0	-15.1	1.18 V	316	62.0	-3.1
2	2390.00	44.9 AV	54.0	-9.1	1.18 V	316	48.0	-3.1
3	*2412.00	100.6 PK			1.18 V	316	103.6	-3.0
4	*2412.00	91.0 AV			1.18 V	316	94.0	-3.0
5	4824.00	47.1 PK	74.0	-26.9	2.77 V	16	46.1	1.0
6	4824.00	37.4 AV	54.0	-16.6	2.77 V	16	36.4	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.

Channel	TX Channel 6	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 25GHz		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	59.1 PK	74.0	-14.9	1.01 H	64	62.2	-3.1
2	2390.00	46.6 AV	54.0	-7.4	1.01 H	64	49.7	-3.1
3	*2437.00	111.5 PK			1.01 H	64	114.5	-3.0
4	*2437.00	101.7 AV			1.01 H	64	104.7	-3.0
5	2483.50	57.3 PK	74.0	-16.7	1.01 H	64	60.4	-3.1
6	2483.50	44.4 AV	54.0	-9.6	1.01 H	64	47.5	-3.1
7	4874.00	47.7 PK	74.0	-26.3	1.53 H	53	46.8	0.9
8	4874.00	35.3 AV	54.0	-18.7	1.53 H	53	34.4	0.9
9	7311.00	44.8 PK	74.0	-29.2	1.78 H	235	37.8	7.0
10	7311.00	31.6 AV	54.0	-22.4	1.78 H	235	24.6	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	1.17 V	330	58.8	-3.1
2	2390.00	43.2 AV	54.0	-10.8	1.17 V	330	46.3	-3.1
3	*2437.00	104.3 PK			1.17 V	330	107.3	-3.0
4	*2437.00	93.9 AV			1.17 V	330	96.9	-3.0
5	2483.50	55.5 PK	74.0	-18.5	1.17 V	330	58.6	-3.1
6	2483.50	42.3 AV	54.0	-11.7	1.17 V	330	45.4	-3.1
7	4874.00	45.9 PK	74.0	-28.1	2.86 V	35	45.0	0.9
8	4874.00	36.5 AV	54.0	-17.5	2.86 V	35	35.6	0.9
9	7311.00	43.9 PK	74.0	-30.1	1.88 V	242	36.9	7.0
10	7311.00	31.8 AV	54.0	-22.2	1.88 V	242	24.8	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.

Channel	TX Channel 11	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 25GHz		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	108.6 PK			1.20 H	64	111.7	-3.1
2	*2462.00	98.3 AV			1.20 H	64	101.4	-3.1
3	2483.50	72.0 PK	74.0	-2.0	1.20 H	64	75.1	-3.1
4	2483.50	50.9 AV	54.0	-3.1	1.20 H	64	54.0	-3.1
5	4924.00	47.3 PK	74.0	-26.7	1.56 H	54	46.3	1.0
6	4924.00	35.0 AV	54.0	-19.0	1.56 H	54	34.0	1.0
7	7386.00	44.4 PK	74.0	-29.6	1.73 H	248	37.3	7.1
8	7386.00	31.4 AV	54.0	-22.6	1.73 H	248	24.3	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	101.2 PK			1.10 V	314	104.3	-3.1
2	*2462.00	91.1 AV			1.10 V	314	94.2	-3.1
3	2483.50	62.4 PK	74.0	-11.6	1.10 V	314	65.5	-3.1
4	2483.50	45.2 AV	54.0	-8.8	1.10 V	314	48.3	-3.1
5	4924.00	46.1 PK	74.0	-27.9	2.88 V	5	45.1	1.0
6	4924.00	36.7 AV	54.0	-17.3	2.88 V	5	35.7	1.0
7	7386.00	43.1 PK	74.0	-30.9	1.87 V	228	36.0	7.1
8	7386.00	31.1 AV	54.0	-22.9	1.87 V	228	24.0	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.

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	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	69.7 PK	74.0	-4.3	1.00 H	60	72.8	-3.1
2	2390.00	52.6 AV	54.0	-1.4	1.00 H	60	55.7	-3.1
3	*2422.00	103.6 PK			1.00 H	60	106.6	-3.0
4	*2422.00	93.3 AV			1.00 H	60	96.3	-3.0
5	4844.00	47.4 PK	74.0	-26.6	1.56 H	54	46.4	1.0
6	4844.00	35.2 AV	54.0	-18.8	1.56 H	54	34.2	1.0
7	7266.00	44.6 PK	74.0	-29.4	1.72 H	239	37.6	7.0
8	7266.00	31.5 AV	54.0	-22.5	1.72 H	239	24.5	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	57.4 PK	74.0	-16.6	1.13 V	313	60.5	-3.1
2	2390.00	43.4 AV	54.0	-10.6	1.13 V	313	46.5	-3.1
3	*2422.00	92.6 PK			1.13 V	313	95.6	-3.0
4	*2422.00	83.8 AV			1.13 V	313	86.8	-3.0
5	4844.00	45.9 PK	74.0	-28.1	2.91 V	22	44.9	1.0
6	4844.00	36.5 AV	54.0	-17.5	2.91 V	22	35.5	1.0
7	7266.00	43.8 PK	74.0	-30.2	1.88 V	239	36.8	7.0
8	7266.00	31.8 AV	54.0	-22.2	1.88 V	239	24.8	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.

Channel	TX Channel 6	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 25GHz		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	70.2 PK	74.0	-3.8	1.01 H	58	73.3	-3.1
2	2390.00	52.7 AV	54.0	-1.3	1.01 H	58	55.8	-3.1
3	*2437.00	108.2 PK			1.01 H	58	111.2	-3.0
4	*2437.00	97.9 AV			1.01 H	58	100.9	-3.0
5	2483.50	68.7 PK	74.0	-5.3	1.01 H	58	71.8	-3.1
6	2483.50	48.8 AV	54.0	-5.2	1.01 H	58	51.9	-3.1
7	4874.00	46.8 PK	74.0	-27.2	1.50 H	73	45.9	0.9
8	4874.00	34.8 AV	54.0	-19.2	1.50 H	73	33.9	0.9
9	7311.00	44.2 PK	74.0	-29.8	1.73 H	253	37.2	7.0
10	7311.00	31.1 AV	54.0	-22.9	1.73 H	253	24.1	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	57.6 PK	74.0	-16.4	1.04 V	288	60.7	-3.1
2	2390.00	43.8 AV	54.0	-10.2	1.04 V	288	46.9	-3.1
3	*2437.00	96.5 PK			1.04 V	288	99.5	-3.0
4	*2437.00	87.6 AV			1.04 V	288	90.6	-3.0
5	2483.50	57.5 PK	74.0	-16.5	1.04 V	288	60.6	-3.1
6	2483.50	43.9 AV	54.0	-10.1	1.04 V	288	47.0	-3.1
7	4874.00	46.0 PK	74.0	-28.0	2.93 V	17	45.1	0.9
8	4874.00	36.7 AV	54.0	-17.3	2.93 V	17	35.8	0.9
9	7311.00	43.2 PK	74.0	-30.8	1.88 V	228	36.2	7.0
10	7311.00	31.5 AV	54.0	-22.5	1.88 V	228	24.5	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.

Channel	TX Channel 9	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 25GHz		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	*2452.00	103.1 PK			1.20 H	49	106.2	-3.1
2	*2452.00	93.2 AV			1.20 H	49	96.3	-3.1
3	2483.50	69.5 PK	74.0	-4.5	1.20 H	49	72.6	-3.1
4	2483.50	53.3 AV	54.0	-0.7	1.20 H	49	56.4	-3.1
5	4904.00	47.0 PK	74.0	-27.0	1.57 H	69	46.0	1.0
6	4904.00	35.0 AV	54.0	-19.0	1.57 H	69	34.0	1.0
7	7356.00	43.8 PK	74.0	-30.2	1.81 H	264	36.7	7.1
8	7356.00	30.6 AV	54.0	-23.4	1.81 H	264	23.5	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	*2452.00	92.1 PK			1.03 V	310	95.2	-3.1
2	*2452.00	83.0 AV			1.03 V	310	86.1	-3.1
3	2483.50	57.1 PK	74.0	-16.9	1.03 V	310	60.2	-3.1
4	2483.50	43.5 AV	54.0	-10.5	1.03 V	310	46.6	-3.1
5	4904.00	46.4 PK	74.0	-27.6	2.89 V	25	45.4	1.0
6	4904.00	36.7 AV	54.0	-17.3	2.89 V	25	35.7	1.0
7	7356.00	43.4 PK	74.0	-30.6	1.84 V	239	36.3	7.1
8	7356.00	31.5 AV	54.0	-22.5	1.84 V	239	24.4	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:

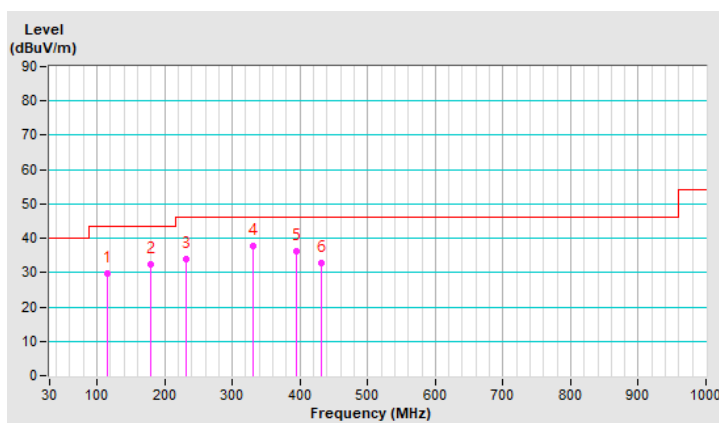
802.11g

Channel	TX Channel 6	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	115.85	29.7 QP	43.5	-13.8	3.00 H	72	44.9	-15.2
2	180.16	32.4 QP	43.5	-11.1	2.00 H	247	46.5	-14.1
3	232.35	34.0 QP	46.0	-12.0	2.00 H	101	49.0	-15.0
4	330.86	37.6 QP	46.0	-8.4	1.00 H	229	48.6	-11.0
5	393.77	36.2 QP	46.0	-9.8	1.00 H	188	45.9	-9.7
6	431.99	32.9 QP	46.0	-13.1	1.00 H	176	41.5	-8.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

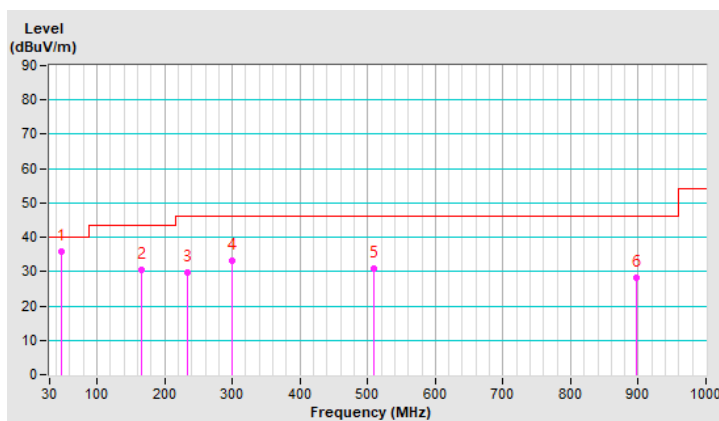


Channel	TX Channel 6	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	47.99	35.7 QP	40.0	-4.3	1.00 V	281	48.1	-12.4
2	166.24	30.4 QP	43.5	-13.1	1.00 V	217	43.2	-12.8
3	232.74	29.6 QP	46.0	-16.4	1.00 V	131	44.5	-14.9
4	298.75	33.1 QP	46.0	-12.9	2.00 V	262	45.1	-12.0
5	508.28	30.7 QP	46.0	-15.3	2.00 V	188	37.8	-7.1
6	897.03	28.2 QP	46.0	-17.8	3.00 V	9	29.2	-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 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. 19, 2020	Mar. 18, 2021
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	005	Aug. 30, 2019	Aug. 29, 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: June 10, 2020

4.2.3 Test Procedures

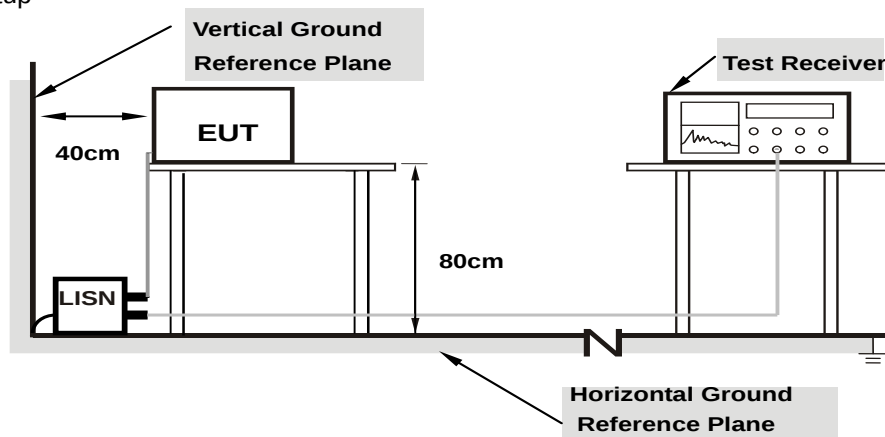
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

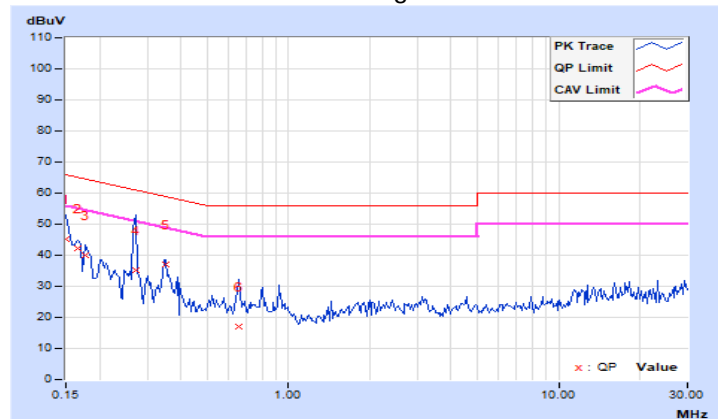
4.2.7 Test Results

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	10.03	35.32	17.50	45.35	27.53	66.00	56.00	-20.65	-28.47
2	0.16562	10.03	32.33	13.02	42.36	23.05	65.18	55.18	-22.82	-32.13
3	0.17734	10.04	30.00	11.90	40.04	21.94	64.61	54.61	-24.57	-32.67
4	0.27109	10.04	25.28	1.08	35.32	11.12	61.08	51.08	-25.76	-39.96
5	0.35313	10.05	27.03	22.06	37.08	32.11	58.89	48.89	-21.81	-16.78
6	0.65781	10.07	6.83	-2.75	16.90	7.32	56.00	46.00	-39.10	-38.68

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

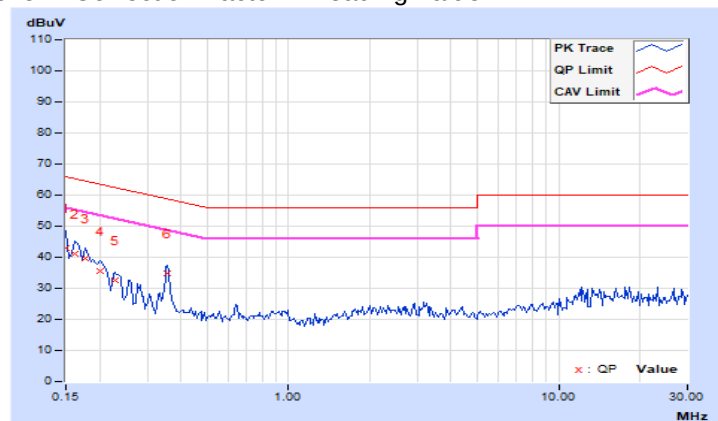


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.02	33.00	14.47	43.02	24.49	66.00	56.00	-22.98	-31.51
2	0.16172	10.02	31.16	11.67	41.18	21.69	65.38	55.38	-24.20	-33.69
3	0.17734	10.03	29.51	9.20	39.54	19.23	64.61	54.61	-25.07	-35.38
4	0.20078	10.03	25.37	5.48	35.40	15.51	63.58	53.58	-28.18	-38.07
5	0.22812	10.03	22.38	4.53	32.41	14.56	62.52	52.52	-30.11	-37.96
6	0.35703	10.04	24.93	18.54	34.97	28.58	58.80	48.80	-23.83	-20.22

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

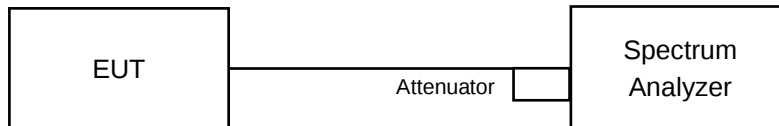


4.3 6dB Bandwidth Measurement

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	10.1	0.5	Pass
6	2437	10.09	0.5	Pass
11	2462	10.1	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.41	0.5	Pass
6	2437	16.43	0.5	Pass
11	2462	16.4	0.5	Pass

802.11n (HT20)

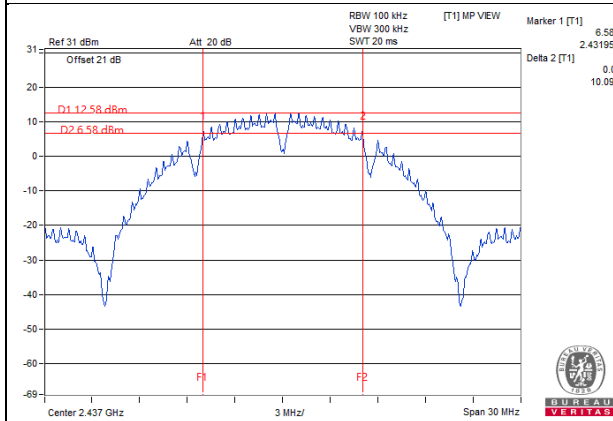
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.59	0.5	Pass
6	2437	17.62	0.5	Pass
11	2462	17.61	0.5	Pass

802.11n (HT40)

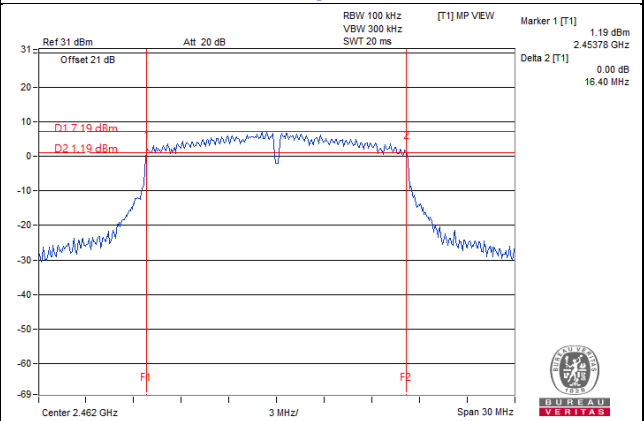
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.68	0.5	Pass
6	2437	35.86	0.5	Pass
9	2452	36.07	0.5	Pass

Spectrum Plot of Worst Value

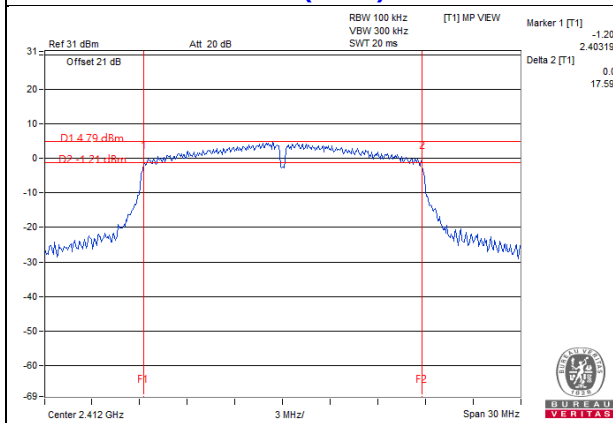
802.11b: CH6



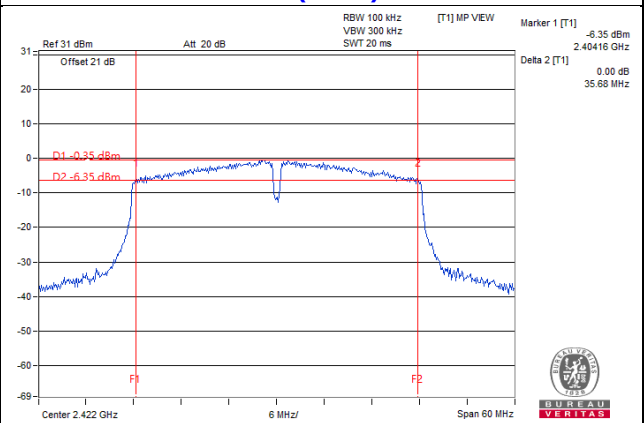
802.11g: CH11



802.11n (HT20): CH1



802.11n (HT40): CH3

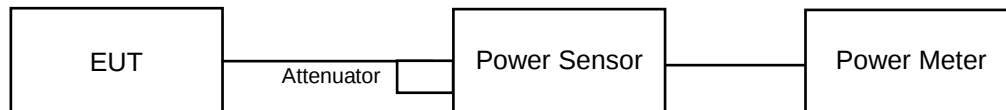


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

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	212.814	23.28	30	Pass
6	2437	221.309	23.45	30	Pass
11	2462	222.844	23.48	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	414	26.17	30	Pass
6	2437	427.563	26.31	30	Pass
11	2462	295.801	24.71	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	295.801	24.71	30	Pass
6	2437	386.367	25.87	30	Pass
11	2462	269.774	24.31	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
3	2422	177.011	22.48	30	Pass
6	2437	299.916	24.77	30	Pass
9	2452	174.582	22.42	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	146.555	21.66
6	2437	153.462	21.86
11	2462	154.17	21.88

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	70.958	18.51
6	2437	77.09	18.87
11	2462	64.121	18.07

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	53.827	17.31
6	2437	112.72	20.52
11	2462	43.853	16.42

802.11n (HT40)

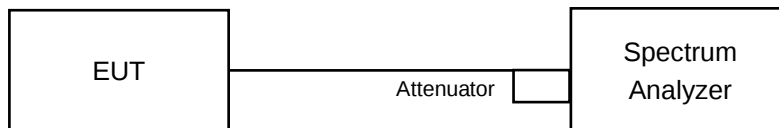
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
3	2422	30.13	14.79
6	2437	62.806	17.98
9	2452	32.734	15.15

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

Chan.	Chan. Freq. (MHz)	PSD (mW/3kHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
1	2412	0.7464	-1.27	8.00	PASS
6	2437	0.7194	-1.43	8.00	PASS
11	2462	0.7603	-1.19	8.00	PASS

802.11g

Chan.	Chan. Freq. (MHz)	PSD (mW/3kHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
1	2412	0.2786	-5.55	8.00	PASS
6	2437	0.2754	-5.60	8.00	PASS
11	2462	0.2588	-5.87	8.00	PASS

802.11n (HT20)

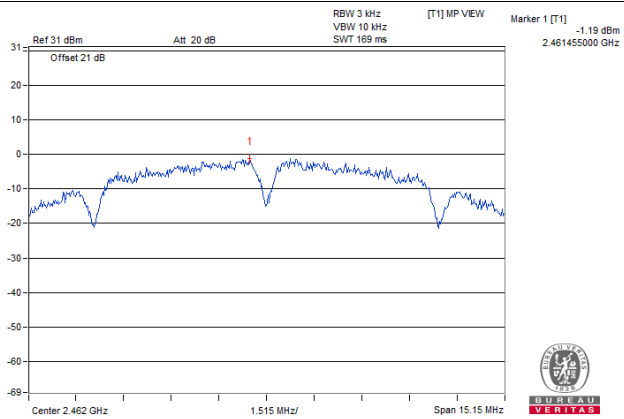
Chan.	Chan. Freq. (MHz)	PSD (mW/3kHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
1	2412	0.2208	-6.56	8.00	PASS
6	2437	0.4375	-3.59	8.00	PASS
11	2462	0.1782	-7.49	8.00	PASS

802.11n (HT40)

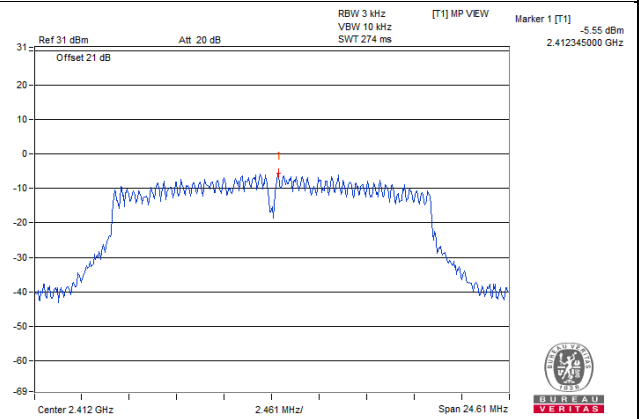
Chan.	Chan. Freq. (MHz)	PSD (mW/3kHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
3	2422	0.06138	-12.12	8.00	PASS
6	2437	0.1403	-8.53	8.00	PASS
9	2452	0.07261	-11.39	8.00	PASS

Spectrum Plot of Worst Value

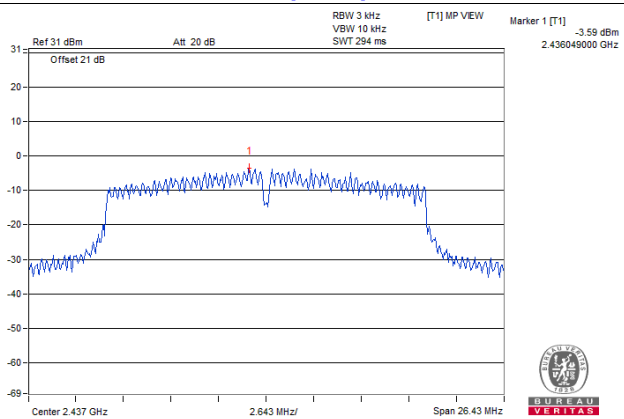
802.11b: CH11



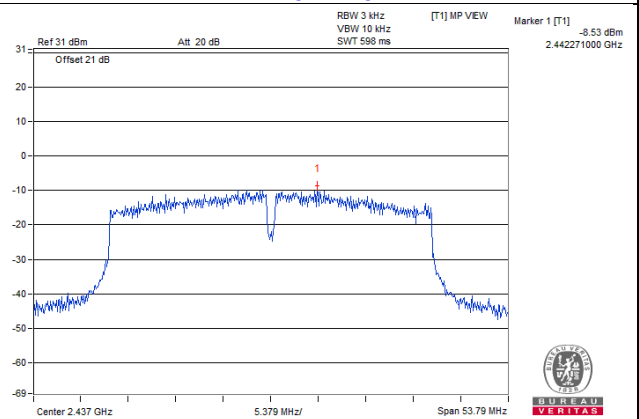
802.11g: CH1



802.11n (HT20): CH6



802.11n (HT40): CH6

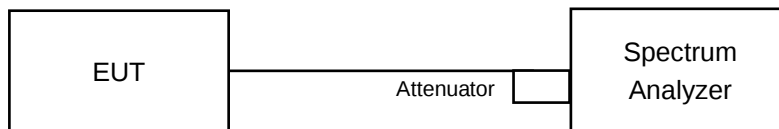


4.6 Conducted Out of Band Emission Measurement

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

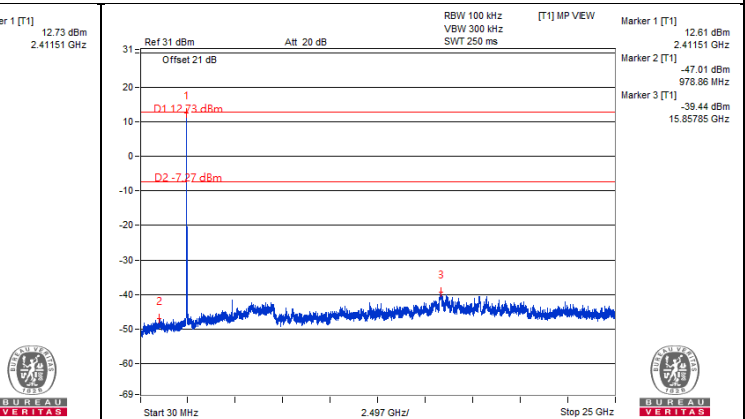
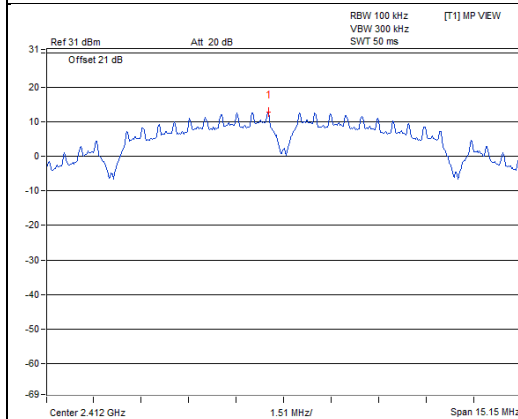
Same as Item 4.3.6

4.6.7 Test Results

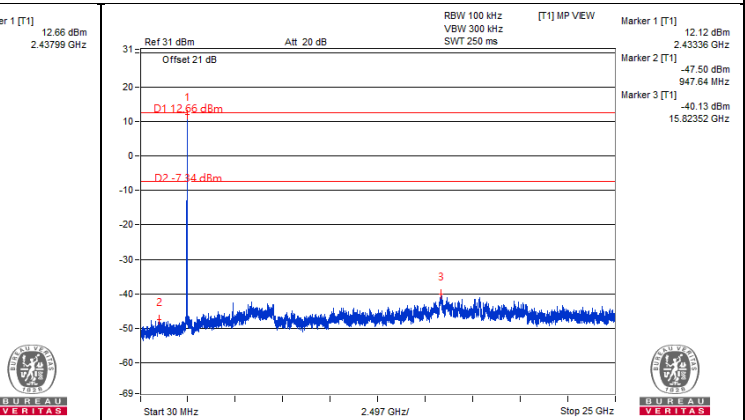
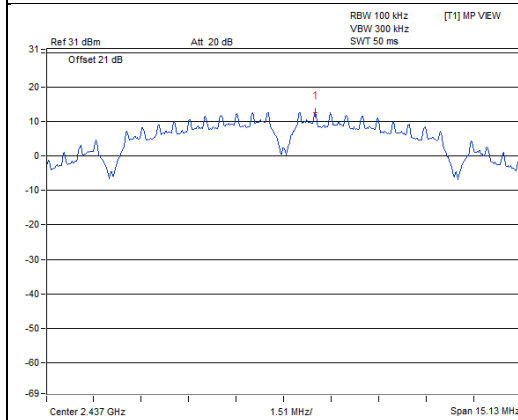
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

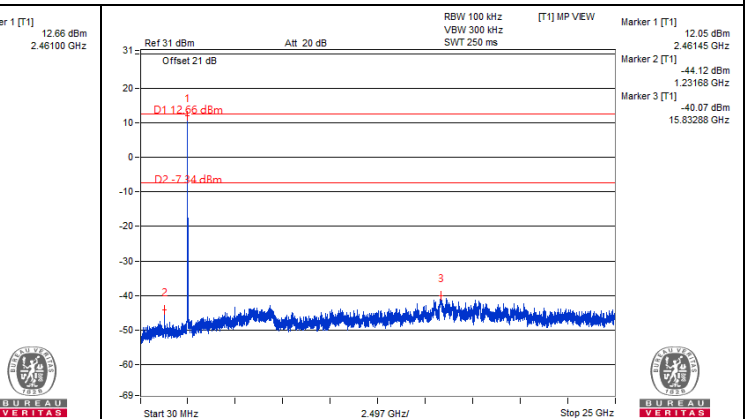
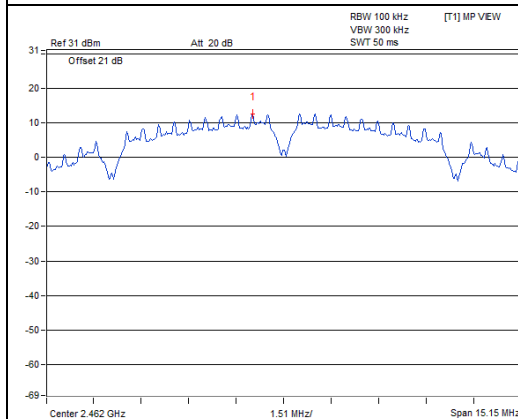
CH 1



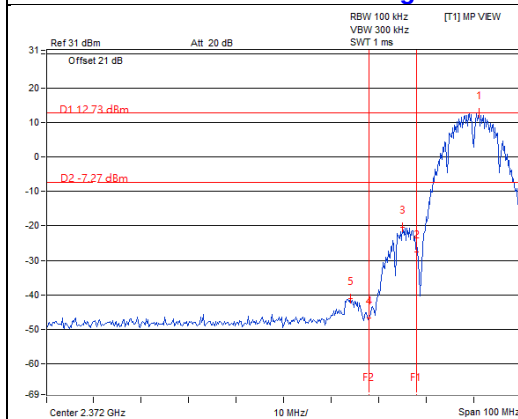
CH 6



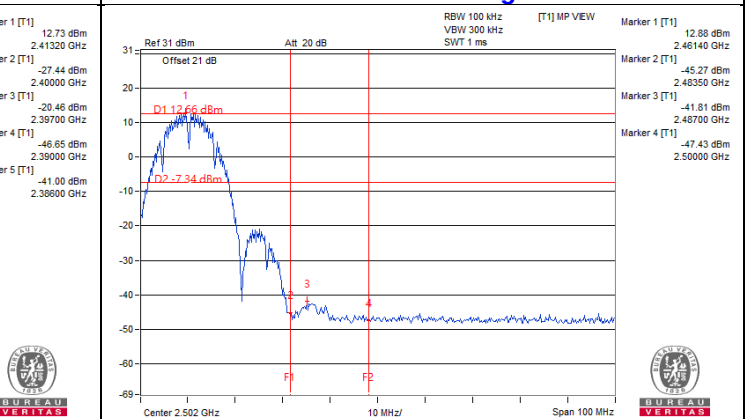
CH 11



CH 1 Band edge

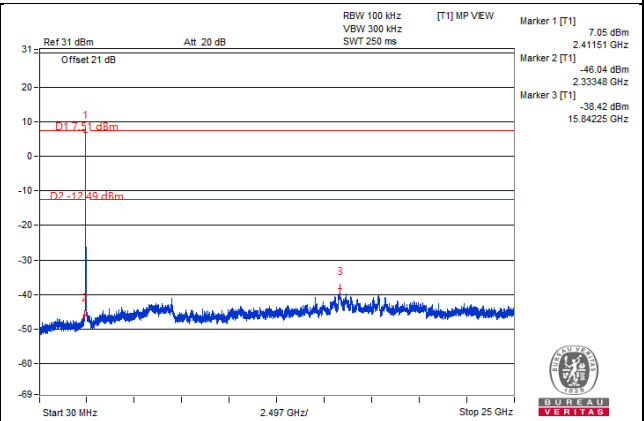
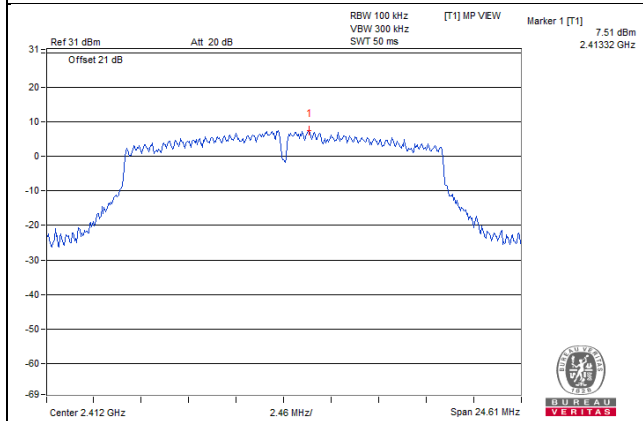


CH 11 Band edge

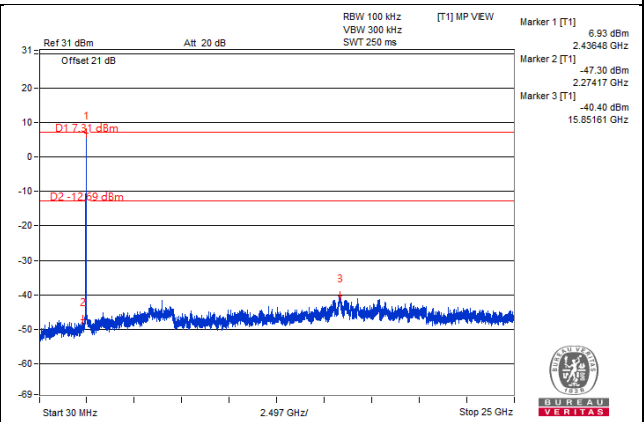
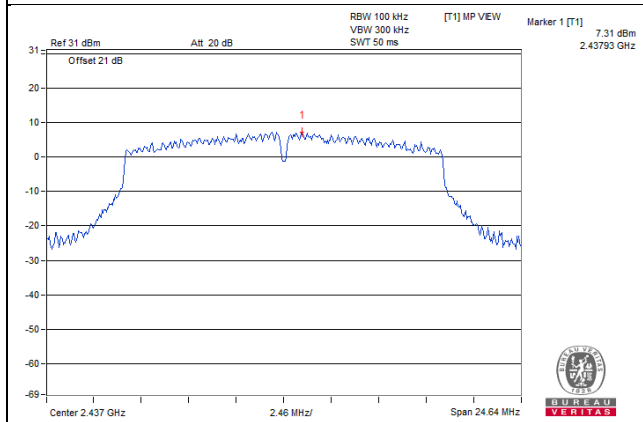


802.11g

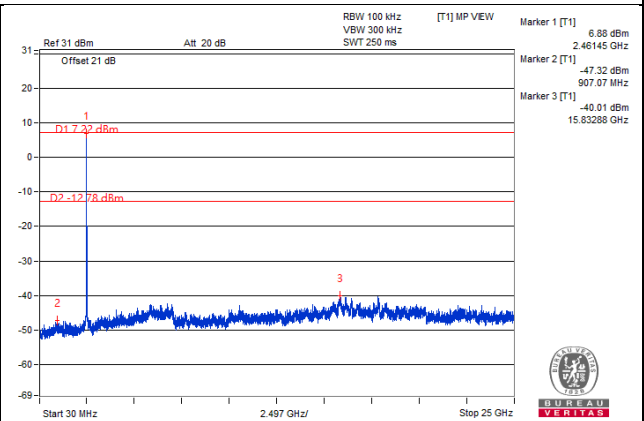
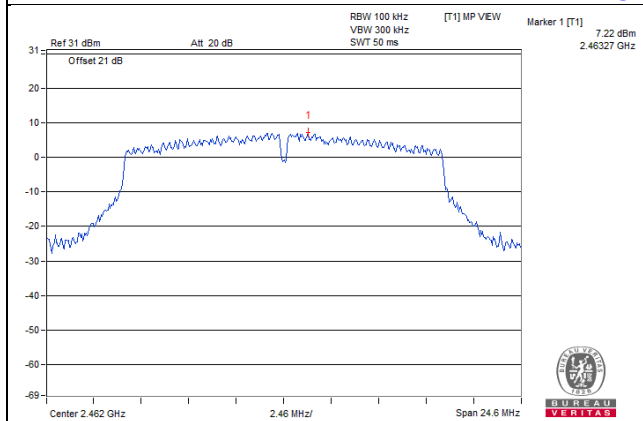
CH 1



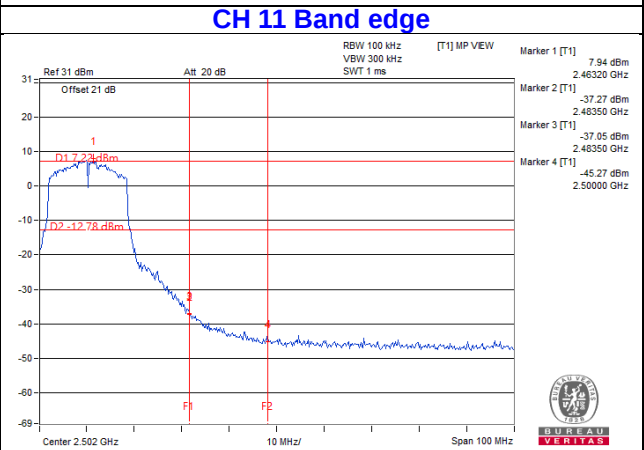
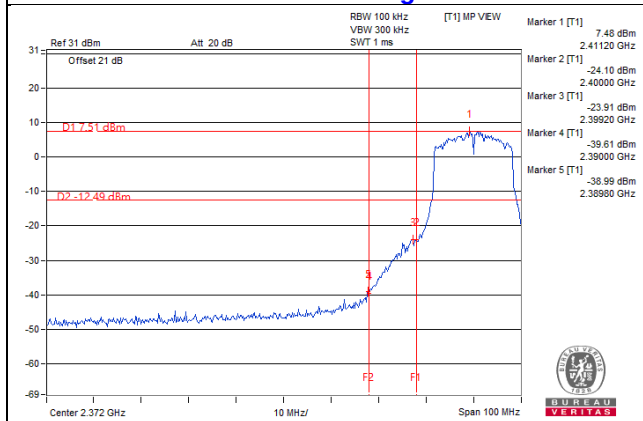
CH 6



CH 11

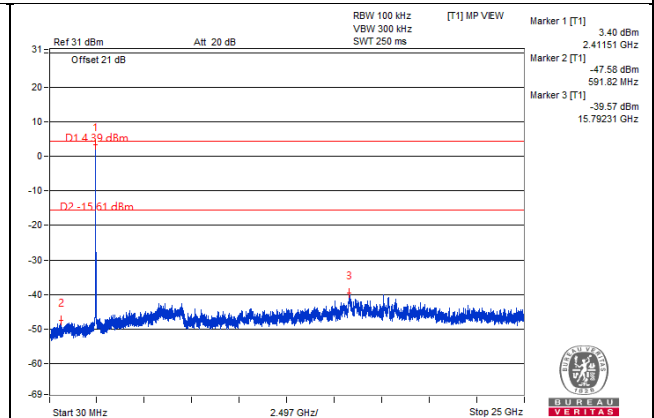
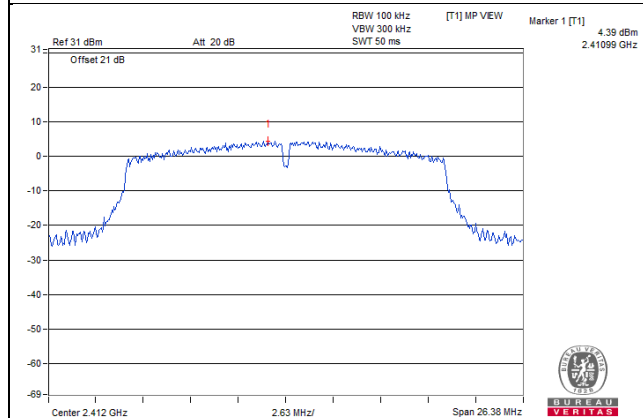


CH 1 Band edge

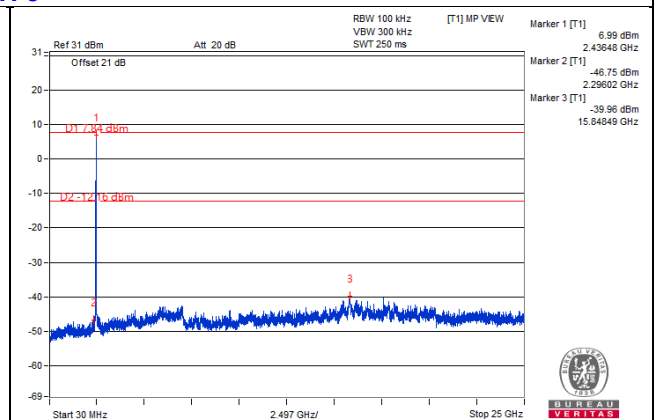
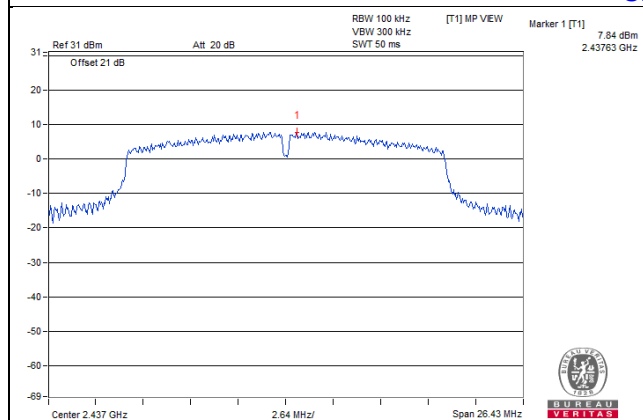


802.11n (HT20)

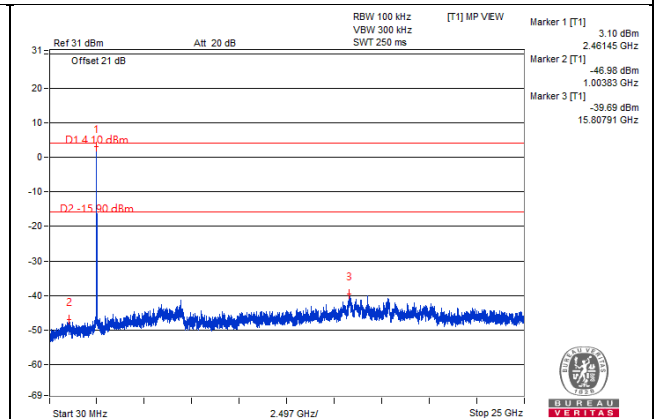
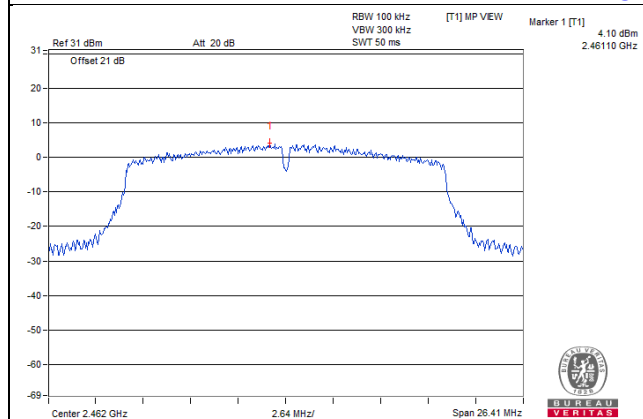
CH 1



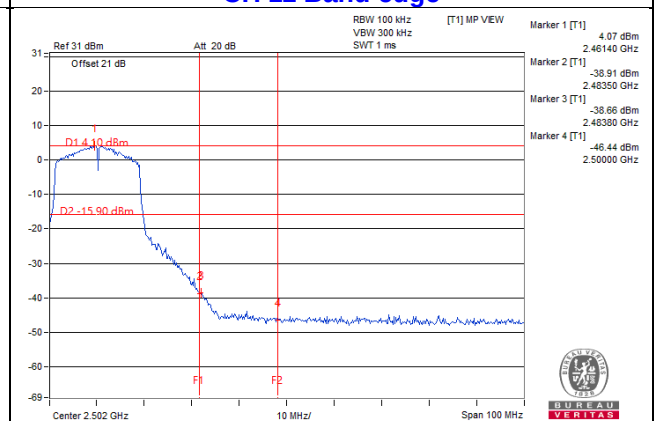
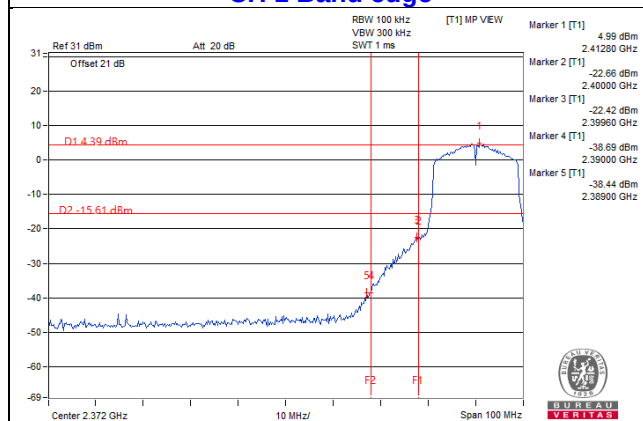
CH 6



CH 11

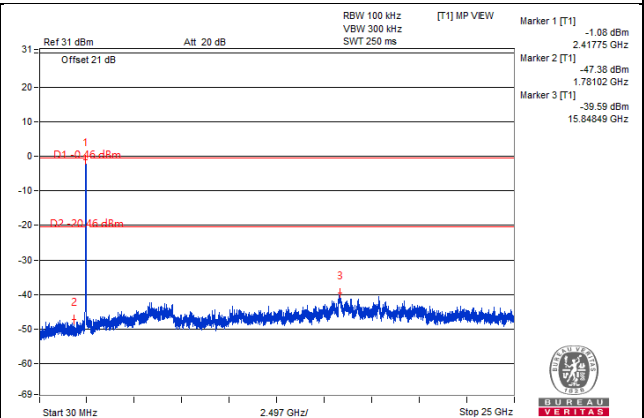
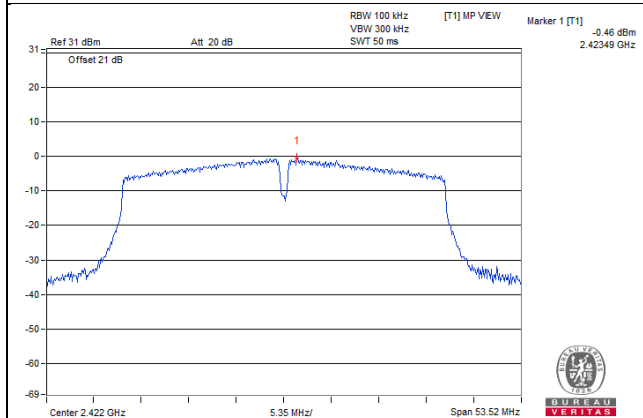


CH 1 Band edge

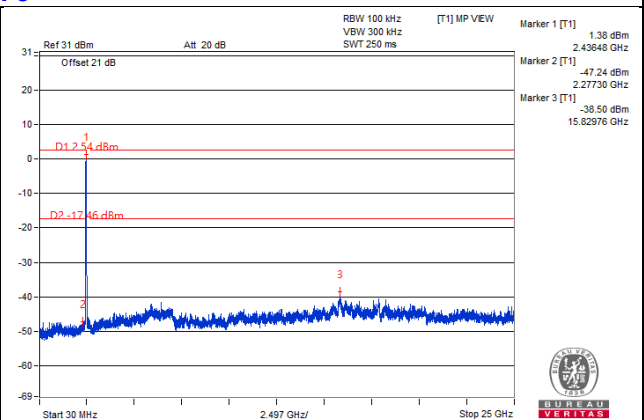
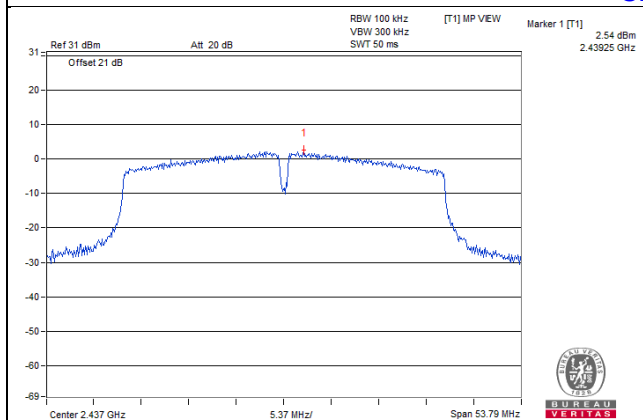


802.11n (HT40)

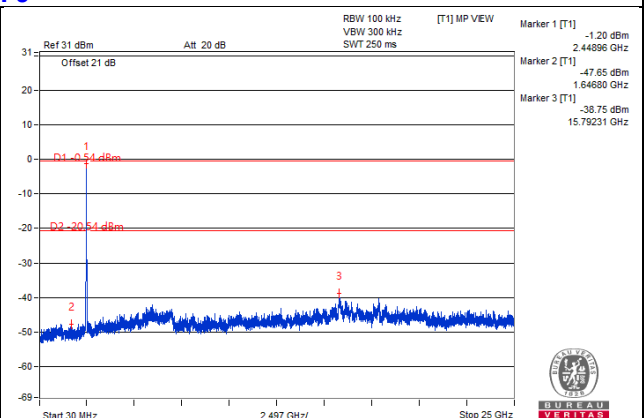
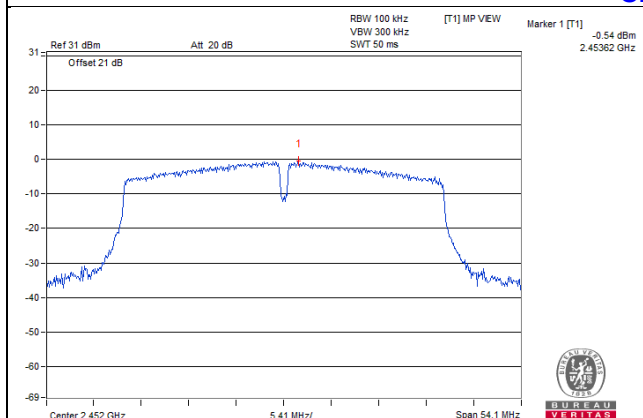
CH 3



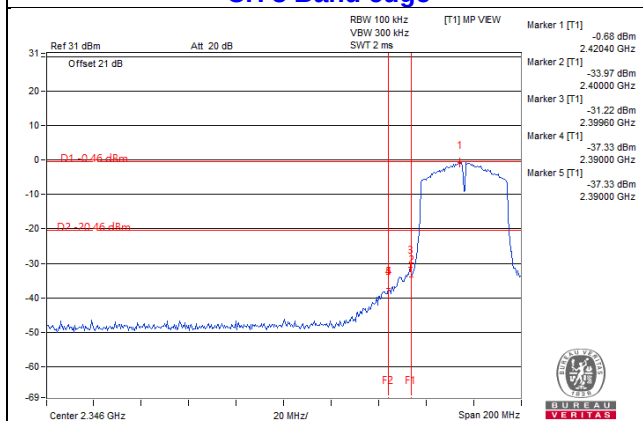
CH 6



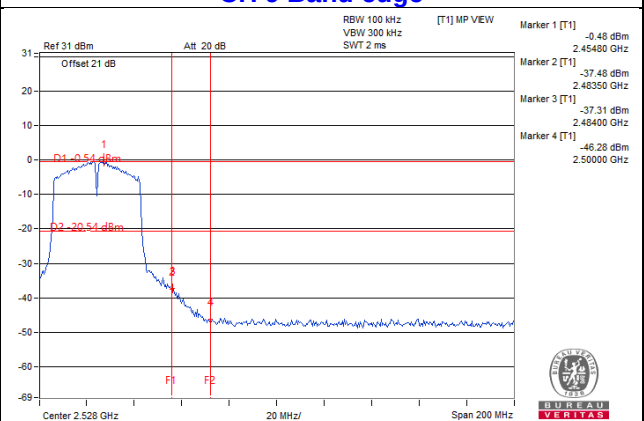
CH 9



CH 3 Band edge



CH 9 Band edge

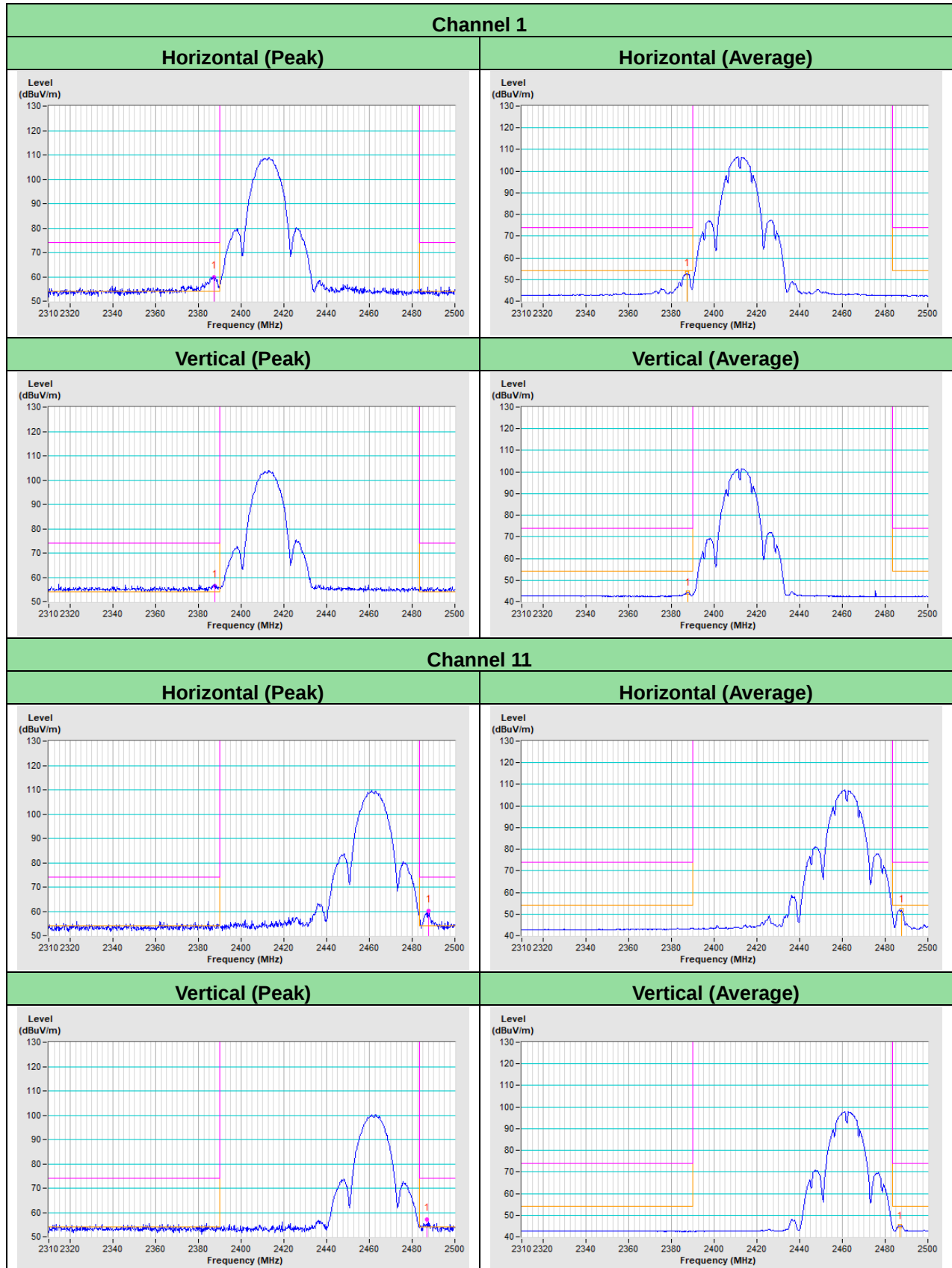


5 Pictures of Test Arrangements

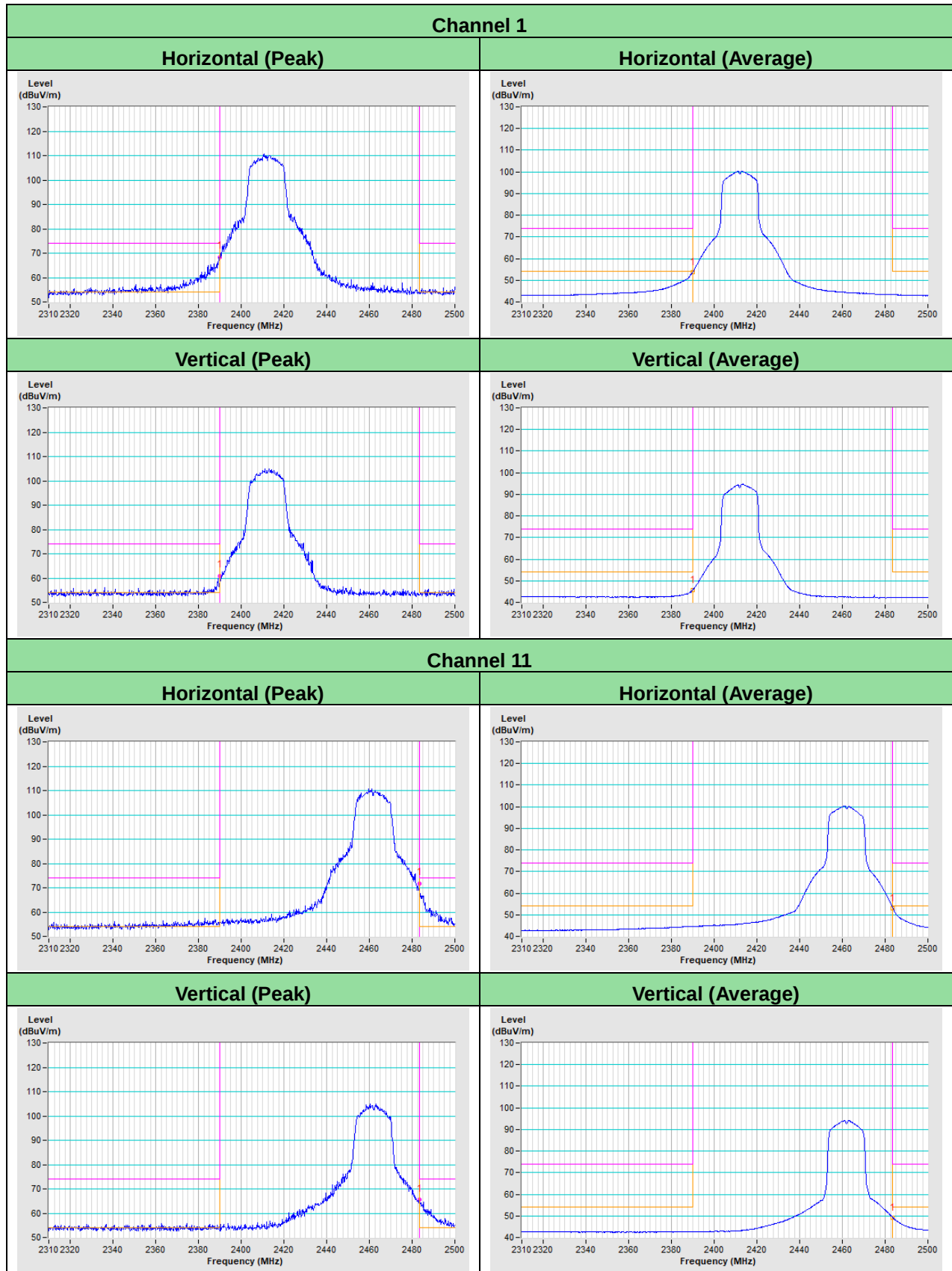
Please refer to the attached file (Test Setup Photo).

Annex A- Band-edge measurement

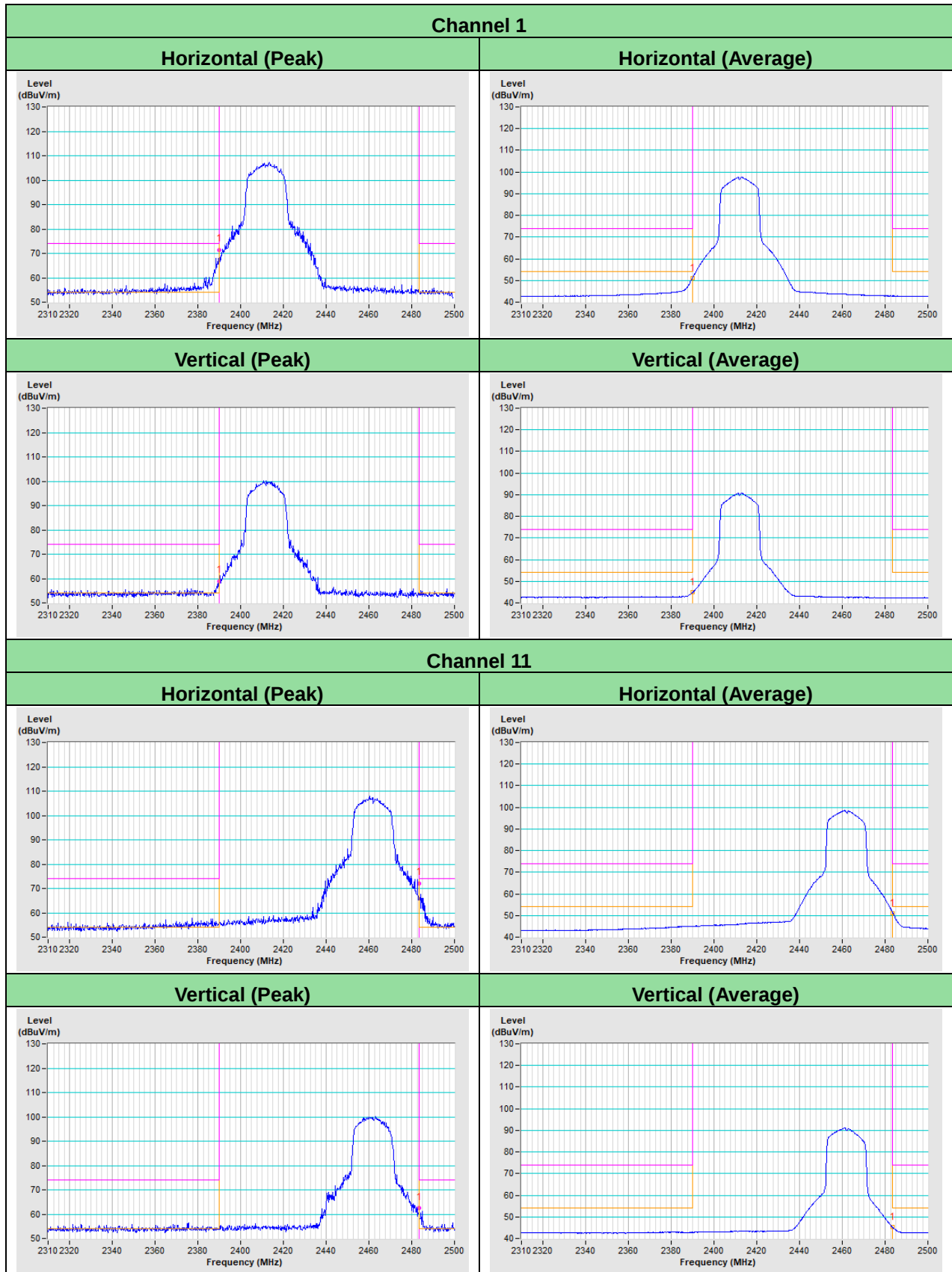
802.11b



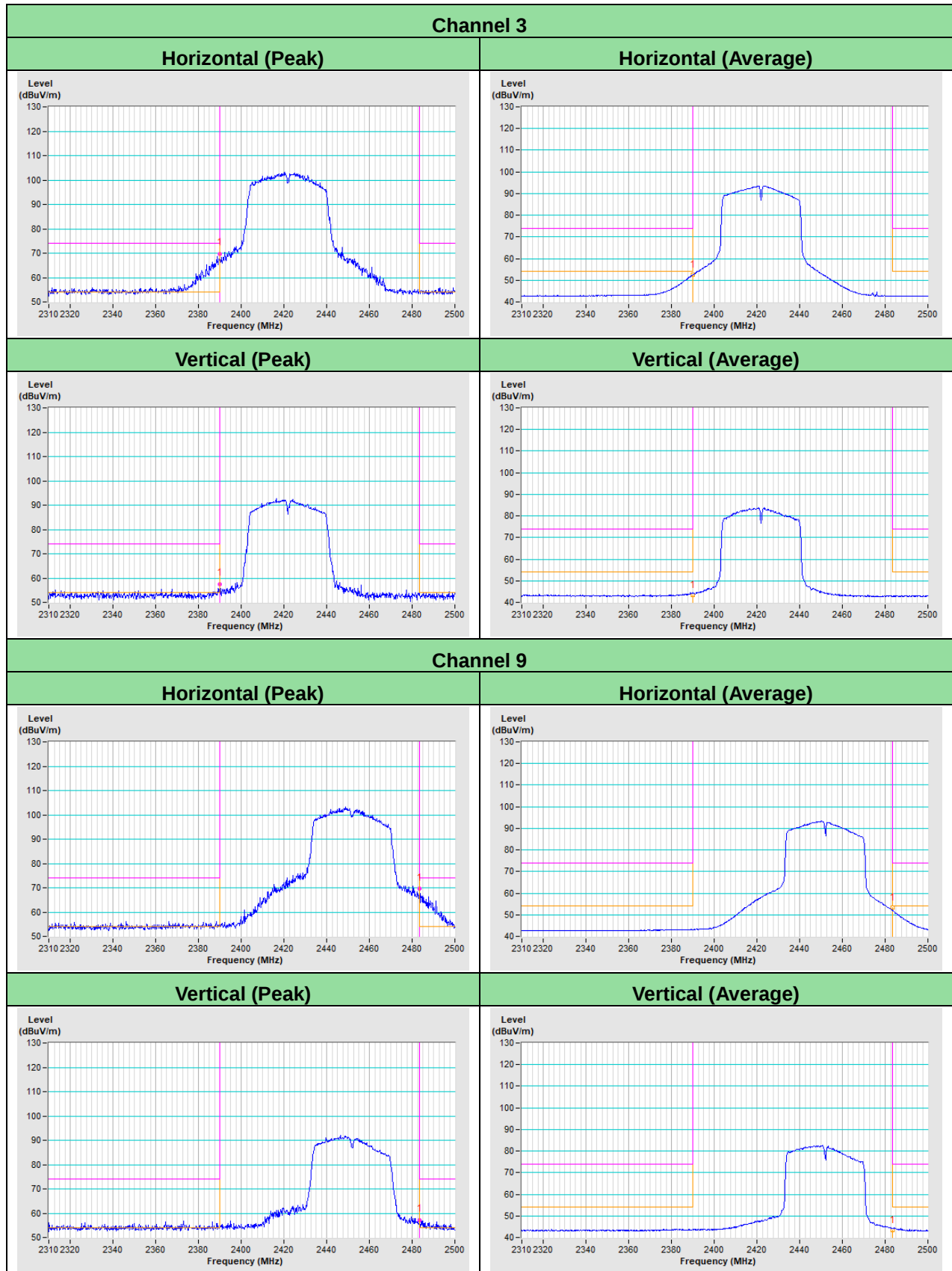
802.11g



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.

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

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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