

FCC Test Report

Report No.: RF200527E07

FCC ID: MQT-XC70E

Test Model: XC70-E

Received Date: May 27, 2020

Test Date: June 12 to 22, 2020

Issued Date: July 02, 2020

Applicant: XAC AUTOMATION CORP.

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PARK,HSINCHU,TAIWAN

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



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Release Control Record

Issue No.	Description	Date Issued
RF200527E07	Original release.	July 02, 2020

1 Certificate of Conformity

Product: Cradle

Brand: XAC

Test Model: XC70-E

Sample Status: ENGINEERING SAMPLE

Applicant: XAC AUTOMATION CORP.

Test Date: June 12 to 22, 2020

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :



Joyce Kuo / Specialist

Date:

July 02, 2020

Approved by :



Clark Lin / Technical Manager

Date:

July 02, 2020

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 -12.53dB at 0.34141MHz.
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 2386.22MHz, 4824.00MHz, 2488.69MHz, 2483.50MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

Note:

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (\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	5.1 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

Product	Cradle
Brand	XAC
Test Model	XC70-E
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
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 ~ 2.462GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	339.625 mW
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 (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 refer 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 (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		

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE \geq 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)
802.11b	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.

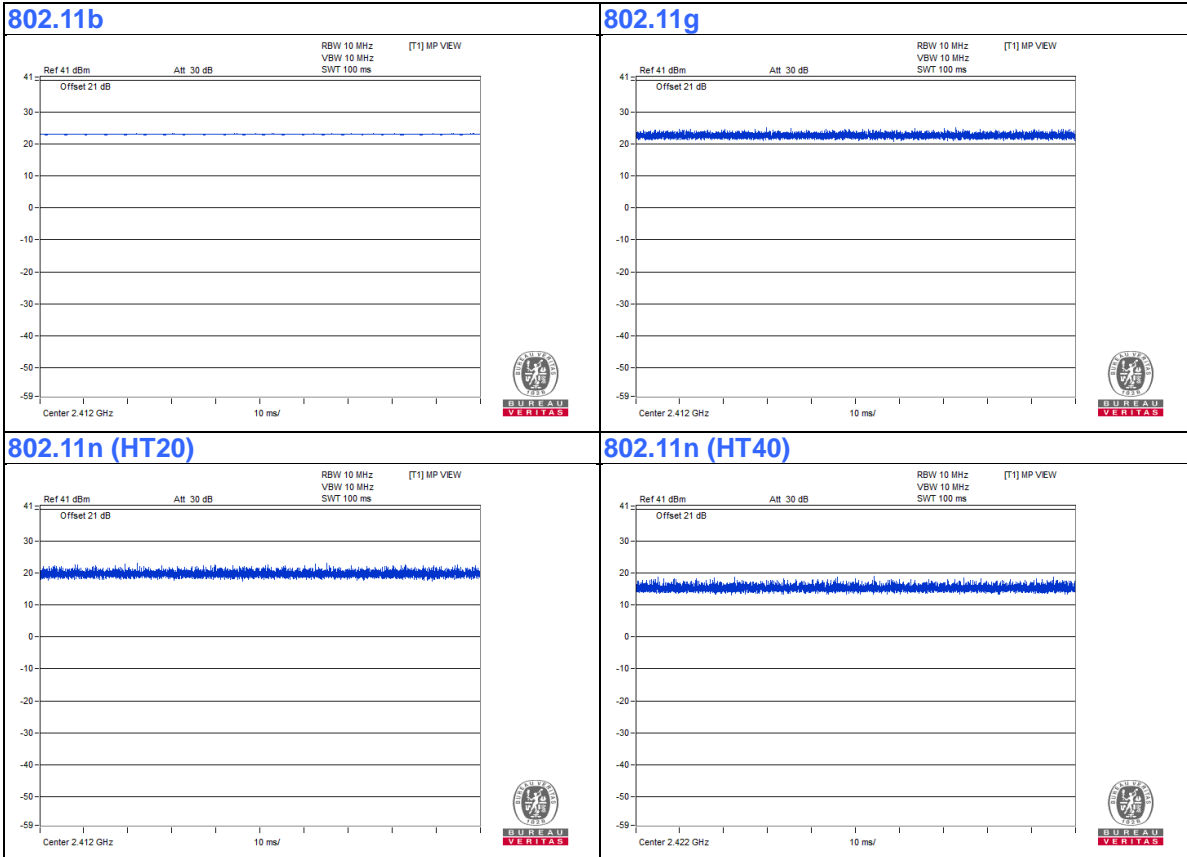
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (System)	TESTED BY
RE \geq 1G	25deg. C, 65%RH	120Vac, 60Hz	Ryan Du
RE<1G	23deg. C, 67%RH	120Vac, 60Hz	Ryan Du
PLC	25deg. C, 75%RH	120Vac, 60Hz	Ryan Du
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	MOSO	MSA-C2000IC12.0-24P-US	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	FCC DoC	Provided by Lab
E.	Terminal	XAC	xCL_AT-170-R-18U	NA	MQT-AT170R18U	Supplied by client

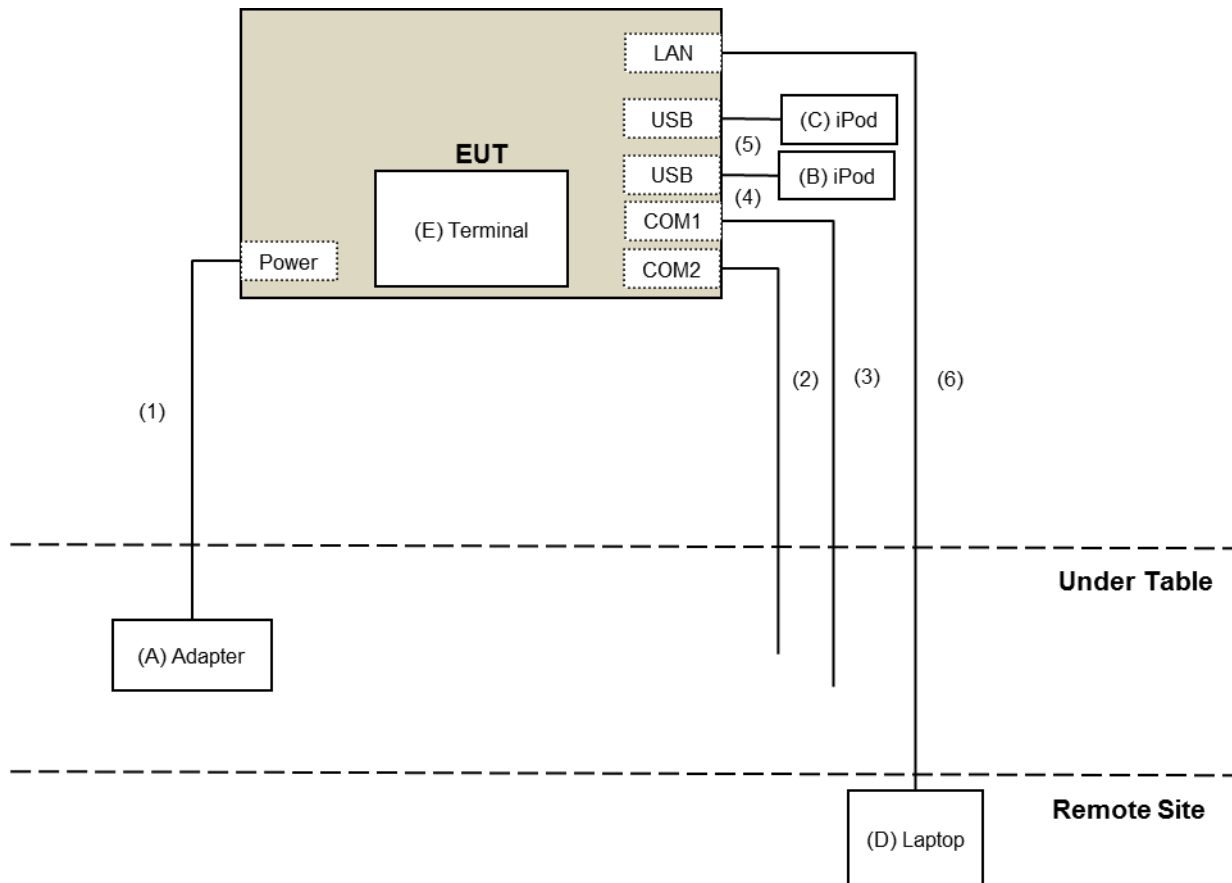
Note:

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

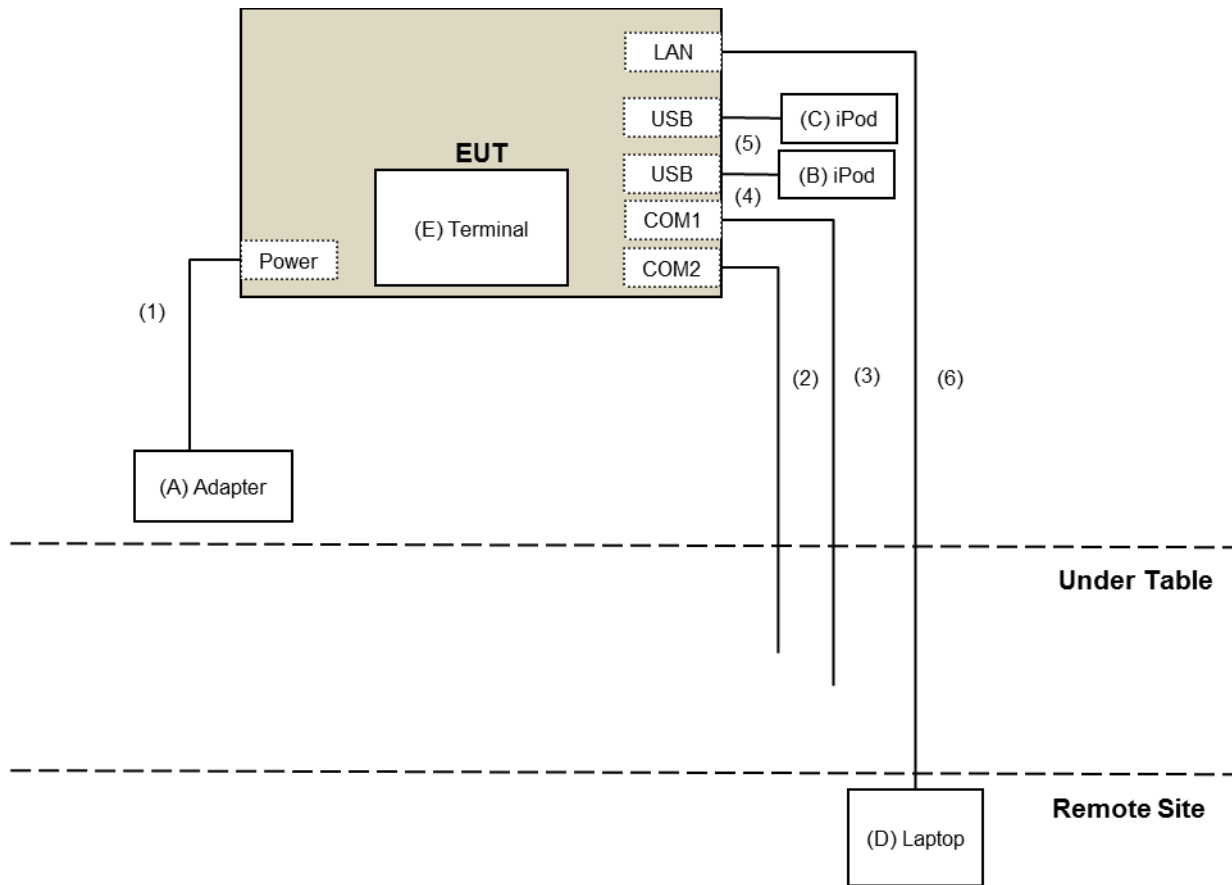
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.6	No	0	Supplied by client
2.	Y-Cable	1	1.25	Yes	0	Supplied by client
3.	Y-Cable	1	1.25	Yes	0	Supplied by client
4.	USB Cable	1	0.1	Yes	0	Provided by Lab
5.	USB Cable	1	0.1	Yes	0	Provided by Lab
6.	RJ-45 Cable	1	10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

3.4.1 Configuration of System under Test

For Radiation



For Conduction



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 12 to 20, 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
Spectrum Analyzer Keysight	N9030A	MY54490679	July 17, 2019	July 16, 2020
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
Mech Switch Absorptive Mini-Circuits	MSP4TA-18+	0140	Feb. 10, 2020	Feb. 09, 2021
FXD ATTEN Mini-Circuits	BW-S3W2+	MN71981	Feb. 10, 2020	Feb. 09, 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 22, 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:

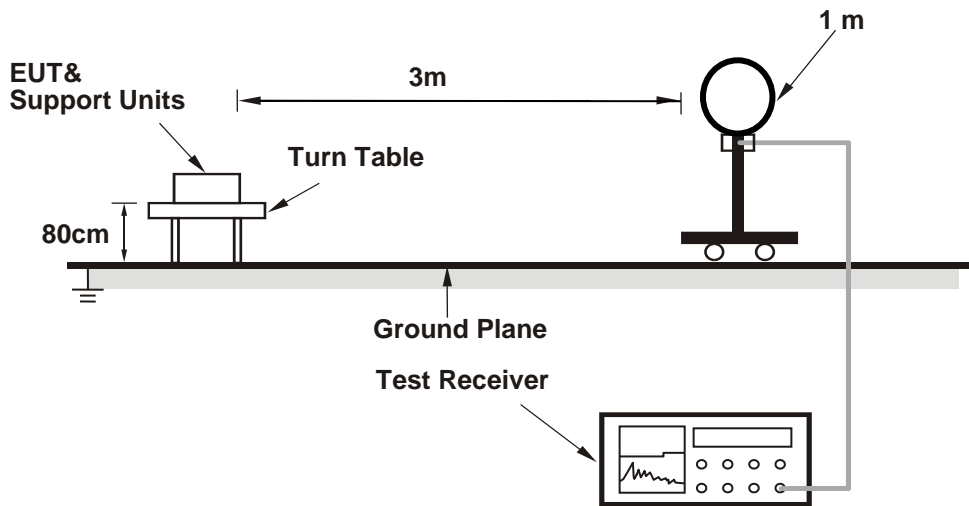
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

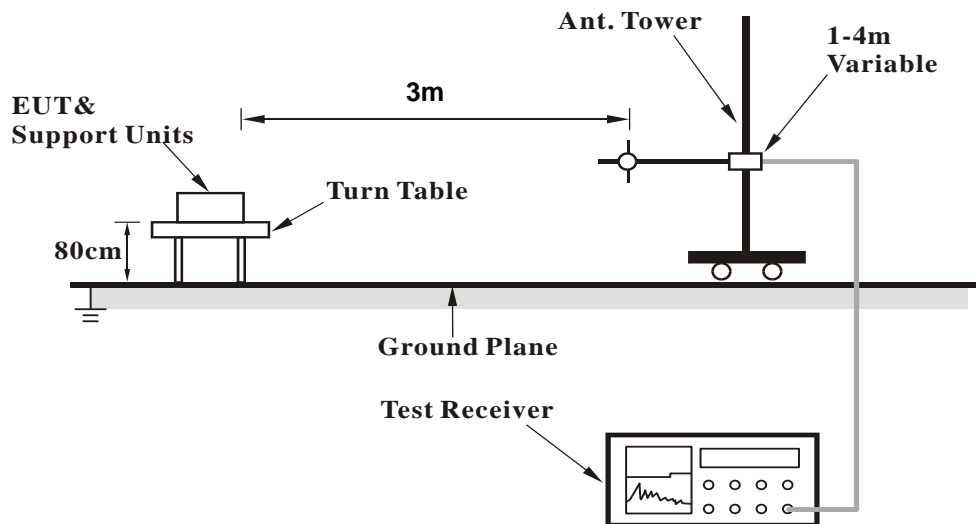
No deviation.

4.1.5 Test Setup

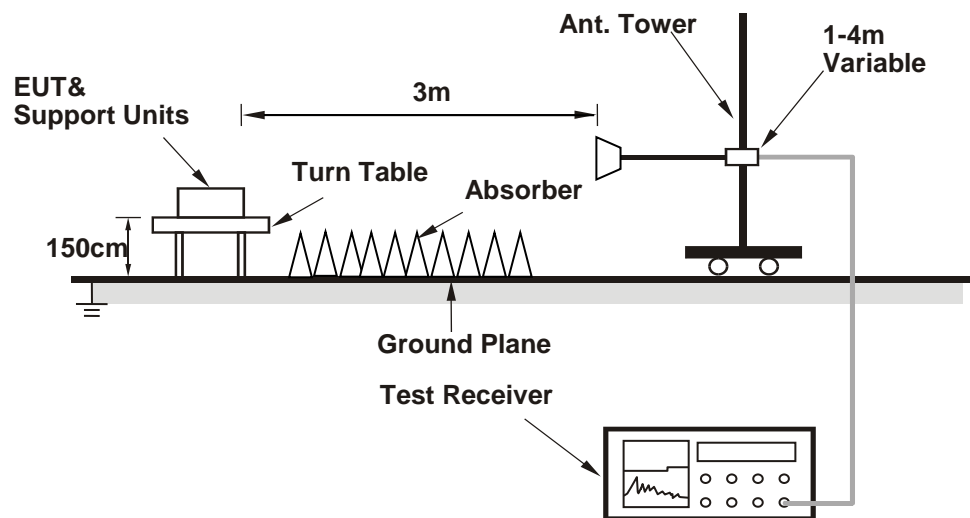
For Radiated emission below 30MHz



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

- Connected the EUT with the Laptop which is placed on remote site.
- Controlling software (HyperTerminal paste XC70_RF mode command.txt command) has been activated to set the EUT under transmission condition continuously.

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	2386.22	61.7 PK	74.0	-12.3	1.16 H	300	64.8	-3.1
2	2386.22	53.7 AV	54.0	-0.3	1.16 H	300	56.8	-3.1
3	*2412.00	109.2 PK			1.16 H	300	112.2	-3.0
4	*2412.00	107.0 AV			1.16 H	300	110.0	-3.0
5	4824.00	55.1 PK	74.0	-18.9	3.10 H	290	54.1	1.0
6	4824.00	53.7 AV	54.0	-0.3	3.10 H	290	52.7	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	2386.22	59.0 PK	74.0	-15.0	1.20 V	148	62.1	-3.1
2	2386.22	47.9 AV	54.0	-6.1	1.20 V	148	51.0	-3.1
3	*2412.00	104.3 PK			1.20 V	148	107.3	-3.0
4	*2412.00	102.1 AV			1.20 V	148	105.1	-3.0
5	4824.00	49.6 PK	74.0	-24.4	1.00 V	122	48.6	1.0
6	4824.00	47.8 AV	54.0	-6.2	1.00 V	122	46.8	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	2388.23	56.8 PK	74.0	-17.2	1.08 H	298	59.9	-3.1
2	2388.23	46.7 AV	54.0	-7.3	1.08 H	298	49.8	-3.1
3	*2437.00	111.6 PK			1.08 H	298	114.6	-3.0
4	*2437.00	109.4 AV			1.08 H	298	112.4	-3.0
5	2485.81	58.2 PK	74.0	-15.8	1.08 H	298	61.3	-3.1
6	2485.81	47.1 AV	54.0	-6.9	1.08 H	298	50.2	-3.1
7	4874.00	53.1 PK	74.0	-20.9	2.85 H	291	52.2	0.9
8	4874.00	52.1 AV	54.0	-1.9	2.85 H	291	51.2	0.9
9	7311.00	45.0 PK	74.0	-29.0	2.85 H	291	38.0	7.0
10	7311.00	31.8 AV	54.0	-22.2	2.85 H	291	24.8	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	56.7 PK	74.0	-17.3	1.04 V	150	59.8	-3.1
2	2390.00	43.9 AV	54.0	-10.1	1.04 V	150	47.0	-3.1
3	*2437.00	105.4 PK			1.04 V	150	108.4	-3.0
4	*2437.00	103.4 AV			1.04 V	150	106.4	-3.0
5	2483.50	56.3 PK	74.0	-17.7	1.04 V	150	59.4	-3.1
6	2483.50	44.0 AV	54.0	-10.0	1.04 V	150	47.1	-3.1
7	4874.00	48.2 PK	74.0	-25.8	1.08 V	124	47.3	0.9
8	4874.00	46.4 AV	54.0	-7.6	1.08 V	124	45.5	0.9
9	7311.00	43.8 PK	74.0	-30.2	1.08 V	124	36.8	7.0
10	7311.00	30.4 AV	54.0	-23.6	1.08 V	124	23.4	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.

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	109.7 PK			1.13 H	296	112.8	-3.1
2	*2462.00	107.5 AV			1.13 H	296	110.6	-3.1
3	2488.69	60.8 PK	74.0	-13.2	1.13 H	296	63.9	-3.1
4	2488.69	53.7 AV	54.0	-0.3	1.13 H	296	56.8	-3.1
5	4924.00	49.1 PK	74.0	-24.9	2.55 H	280	48.1	1.0
6	4924.00	47.0 AV	54.0	-7.0	2.55 H	280	46.0	1.0
7	7386.00	45.6 PK	74.0	-28.4	2.55 H	280	38.5	7.1
8	7386.00	30.9 AV	54.0	-23.1	2.55 H	280	23.8	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	105.6 PK			1.35 V	135	108.7	-3.1
2	*2462.00	103.4 AV			1.35 V	135	106.5	-3.1
3	2488.69	58.1 PK	74.0	-15.9	1.35 V	135	61.2	-3.1
4	2488.69	47.8 AV	54.0	-6.2	1.35 V	135	50.9	-3.1
5	4924.00	46.2 PK	74.0	-27.8	1.03 V	127	45.2	1.0
6	4924.00	43.8 AV	54.0	-10.2	1.03 V	127	42.8	1.0
7	7386.00	44.1 PK	74.0	-29.9	2.69 V	68	37.0	7.1
8	7386.00	30.8 AV	54.0	-23.2	2.69 V	68	23.7	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	72.3 PK	74.0	-1.7	1.10 H	307	75.4	-3.1
2	2390.00	53.6 AV	54.0	-0.4	1.10 H	307	56.7	-3.1
3	*2412.00	111.9 PK			1.10 H	307	114.9	-3.0
4	*2412.00	100.8 AV			1.10 H	307	103.8	-3.0
5	4824.00	48.7 PK	74.0	-25.3	2.70 H	274	47.7	1.0
6	4824.00	37.0 AV	54.0	-17.0	2.70 H	274	36.0	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	2390.00	62.7 PK	74.0	-11.3	1.04 V	136	65.8	-3.1
2	2390.00	49.8 AV	54.0	-4.2	1.04 V	136	52.9	-3.1
3	*2412.00	106.8 PK			1.04 V	136	109.8	-3.0
4	*2412.00	97.0 AV			1.04 V	136	100.0	-3.0
5	4824.00	44.9 PK	74.0	-29.1	1.00 V	123	43.9	1.0
6	4824.00	32.5 AV	54.0	-21.5	1.00 V	123	31.5	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.

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	62.6 PK	74.0	-11.4	1.08 H	302	65.7	-3.1
2	2390.00	47.7 AV	54.0	-6.3	1.08 H	302	50.8	-3.1
3	*2437.00	113.6 PK			1.08 H	302	116.6	-3.0
4	*2437.00	103.2 AV			1.08 H	302	106.2	-3.0
5	2483.50	67.4 PK	74.0	-6.6	1.08 H	302	70.5	-3.1
6	2483.50	49.5 AV	54.0	-4.5	1.08 H	302	52.6	-3.1
7	4874.00	47.2 PK	74.0	-26.8	2.73 H	271	46.3	0.9
8	4874.00	35.1 AV	54.0	-18.9	2.73 H	271	34.2	0.9
9	7311.00	44.2 PK	74.0	-29.8	2.73 H	271	37.2	7.0
10	7311.00	31.8 AV	54.0	-22.2	2.73 H	271	24.8	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	56.8 PK	74.0	-17.2	1.02 V	152	59.9	-3.1
2	2390.00	44.6 AV	54.0	-9.4	1.02 V	152	47.7	-3.1
3	*2437.00	109.8 PK			1.02 V	152	112.8	-3.0
4	*2437.00	100.0 AV			1.02 V	152	103.0	-3.0
5	2483.50	58.9 PK	74.0	-15.1	1.02 V	152	62.0	-3.1
6	2483.50	45.6 AV	54.0	-8.4	1.02 V	152	48.7	-3.1
7	4874.00	44.0 PK	74.0	-30.0	1.00 V	123	43.1	0.9
8	4874.00	31.7 AV	54.0	-22.3	1.00 V	123	30.8	0.9
9	7311.00	43.8 PK	74.0	-30.2	1.00 V	123	36.8	7.0
10	7311.00	30.5 AV	54.0	-23.5	1.00 V	123	23.5	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	112.8 PK			1.08 H	288	115.9	-3.1
2	*2462.00	101.5 AV			1.08 H	288	104.6	-3.1
3	2483.50	68.0 PK	74.0	-6.0	1.08 H	288	71.1	-3.1
4	2483.50	52.2 AV	54.0	-1.8	1.08 H	288	55.3	-3.1
5	4924.00	43.1 PK	74.0	-30.9	2.55 H	282	42.1	1.0
6	4924.00	29.4 AV	54.0	-24.6	2.55 H	282	28.4	1.0
7	7386.00	44.9 PK	74.0	-29.1	2.55 H	282	37.8	7.1
8	7386.00	31.9 AV	54.0	-22.1	2.55 H	282	24.8	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	106.2 PK			1.00 V	62	109.3	-3.1
2	*2462.00	96.5 AV			1.00 V	62	99.6	-3.1
3	2483.50	63.5 PK	74.0	-10.5	1.00 V	62	66.6	-3.1
4	2483.50	49.2 AV	54.0	-4.8	1.00 V	62	52.3	-3.1
5	4924.00	40.0 PK	74.0	-34.0	1.00 V	126	39.0	1.0
6	4924.00	27.7 AV	54.0	-26.3	1.00 V	126	26.7	1.0
7	7386.00	42.6 PK	74.0	-31.4	1.00 V	126	35.5	7.1
8	7386.00	30.7 AV	54.0	-23.3	1.00 V	126	23.6	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.

802.11n (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	67.7 PK	74.0	-6.3	1.10 H	291	70.8	-3.1
2	2390.00	52.3 AV	54.0	-1.7	1.10 H	291	55.4	-3.1
3	*2412.00	109.6 PK			1.10 H	291	112.6	-3.0
4	*2412.00	99.3 AV			1.10 H	291	102.3	-3.0
5	4824.00	47.8 PK	74.0	-26.2	2.55 H	282	46.8	1.0
6	4824.00	33.6 AV	54.0	-20.4	2.55 H	282	32.6	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	62.5 PK	74.0	-11.5	1.02 V	61	65.6	-3.1
2	2390.00	48.1 AV	54.0	-5.9	1.02 V	61	51.2	-3.1
3	*2412.00	102.8 PK			1.02 V	61	105.8	-3.0
4	*2412.00	94.2 AV			1.02 V	61	97.2	-3.0
5	4824.00	41.8 PK	74.0	-32.2	1.00 V	124	40.8	1.0
6	4824.00	29.0 AV	54.0	-25.0	1.00 V	124	28.0	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	57.5 PK	74.0	-16.5	1.18 H	287	60.6	-3.1
2	2390.00	45.8 AV	54.0	-8.2	1.18 H	287	48.9	-3.1
3	*2437.00	115.1 PK			1.18 H	287	118.1	-3.0
4	*2437.00	105.3 AV			1.18 H	287	108.3	-3.0
5	2483.50	63.5 PK	74.0	-10.5	1.18 H	287	66.6	-3.1
6	2483.50	47.5 AV	54.0	-6.5	1.18 H	287	50.6	-3.1
7	4874.00	48.1 PK	74.0	-25.9	2.70 H	269	47.2	0.9
8	4874.00	35.4 AV	54.0	-18.6	2.70 H	269	34.5	0.9
9	7311.00	44.4 PK	74.0	-29.6	2.55 H	284	37.4	7.0
10	7311.00	31.7 AV	54.0	-22.3	2.55 H	284	24.7	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	63.1 PK	74.0	-10.9	1.05 V	152	66.2	-3.1
2	2390.00	45.1 AV	54.0	-8.9	1.05 V	152	48.2	-3.1
3	*2437.00	109.5 PK			1.05 V	152	112.5	-3.0
4	*2437.00	100.9 AV			1.05 V	152	103.9	-3.0
5	2483.50	63.0 PK	74.0	-11.0	1.05 V	152	66.1	-3.1
6	2483.50	45.8 AV	54.0	-8.2	1.05 V	152	48.9	-3.1
7	4874.00	44.4 PK	74.0	-29.6	1.04 V	125	43.5	0.9
8	4874.00	32.6 AV	54.0	-21.4	1.04 V	125	31.7	0.9
9	7311.00	43.9 PK	74.0	-30.1	1.04 V	125	36.9	7.0
10	7311.00	30.5 AV	54.0	-23.5	1.04 V	125	23.5	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	109.7 PK			1.17 H	286	112.8	-3.1
2	*2462.00	100.1 AV			1.17 H	286	103.2	-3.1
3	2483.50	73.4 PK	74.0	-0.6	1.17 H	286	76.5	-3.1
4	2483.50	53.7 AV	54.0	-0.3	1.17 H	286	56.8	-3.1
5	4924.00	41.7 PK	74.0	-32.3	2.51 H	299	40.7	1.0
6	4924.00	28.9 AV	54.0	-25.1	2.51 H	299	27.9	1.0
7	7386.00	45.5 PK	74.0	-28.5	2.51 H	299	38.4	7.1
8	7386.00	31.9 AV	54.0	-22.1	2.51 H	299	24.8	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	105.0 PK			1.00 V	153	108.1	-3.1
2	*2462.00	96.8 AV			1.00 V	153	99.9	-3.1
3	2483.50	71.6 PK	74.0	-2.4	1.00 V	153	74.7	-3.1
4	2483.50	52.0 AV	54.0	-2.0	1.00 V	153	55.1	-3.1
5	4924.00	39.9 PK	74.0	-34.1	1.00 V	123	38.9	1.0
6	4924.00	26.8 AV	54.0	-27.2	1.00 V	123	25.8	1.0
7	7386.00	42.8 PK	74.0	-31.2	1.00 V	123	35.7	7.1
8	7386.00	30.7 AV	54.0	-23.3	1.00 V	123	23.6	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.

802.11n (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	70.2 PK	74.0	-3.8	1.02 H	293	73.3	-3.1
2	2390.00	53.3 AV	54.0	-0.7	1.02 H	293	56.4	-3.1
3	*2422.00	105.0 PK			1.02 H	293	108.0	-3.0
4	*2422.00	94.3 AV			1.02 H	293	97.3	-3.0
5	4844.00	41.6 PK	74.0	-32.4	2.55 H	300	40.6	1.0
6	4844.00	28.7 AV	54.0	-25.3	2.55 H	300	27.7	1.0
7	7266.00	45.6 PK	74.0	-28.4	2.55 H	300	38.6	7.0
8	7266.00	31.9 AV	54.0	-22.1	2.55 H	300	24.9	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	62.6 PK	74.0	-11.4	1.29 V	53	65.7	-3.1
2	2390.00	50.5 AV	54.0	-3.5	1.29 V	53	53.6	-3.1
3	*2422.00	98.8 PK			1.29 V	53	101.8	-3.0
4	*2422.00	90.0 AV			1.29 V	53	93.0	-3.0
5	4844.00	37.9 PK	74.0	-36.1	1.00 V	184	36.9	1.0
6	4844.00	25.2 AV	54.0	-28.8	1.00 V	184	24.2	1.0
7	7266.00	43.7 PK	74.0	-30.3	1.00 V	184	36.7	7.0
8	7266.00	30.5 AV	54.0	-23.5	1.00 V	184	23.5	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 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	68.7 PK	74.0	-5.3	1.01 H	308	71.8	-3.1
2	2390.00	53.3 AV	54.0	-0.7	1.01 H	308	56.4	-3.1
3	*2437.00	108.6 PK			1.01 H	308	111.6	-3.0
4	*2437.00	100.5 AV			1.01 H	308	103.5	-3.0
5	2483.50	71.5 PK	74.0	-2.5	1.01 H	308	74.6	-3.1
6	2483.50	53.7 AV	54.0	-0.3	1.01 H	308	56.8	-3.1
7	4874.00	41.7 PK	74.0	-32.3	1.00 H	292	40.8	0.9
8	4874.00	28.6 AV	54.0	-25.4	1.00 H	292	27.7	0.9
9	7311.00	44.8 PK	74.0	-29.2	1.00 H	292	37.8	7.0
10	7311.00	31.9 AV	54.0	-22.1	1.00 H	292	24.9	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	59.0 PK	74.0	-15.0	3.53 V	60	62.1	-3.1
2	2390.00	44.5 AV	54.0	-9.5	3.53 V	60	47.6	-3.1
3	*2437.00	104.0 PK			3.53 V	60	107.0	-3.0
4	*2437.00	93.2 AV			3.53 V	60	96.2	-3.0
5	2483.50	62.4 PK	74.0	-11.6	3.53 V	60	65.5	-3.1
6	2483.50	46.8 AV	54.0	-7.2	3.53 V	60	49.9	-3.1
7	4874.00	37.6 PK	74.0	-36.4	1.00 V	132	36.7	0.9
8	4874.00	25.5 AV	54.0	-28.5	1.00 V	132	24.6	0.9
9	7311.00	43.2 PK	74.0	-30.8	1.00 V	132	36.2	7.0
10	7311.00	30.5 AV	54.0	-23.5	1.00 V	132	23.5	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	102.0 PK			1.03 H	292	105.1	-3.1
2	*2452.00	92.0 AV			1.03 H	292	95.1	-3.1
3	2483.50	71.2 PK	74.0	-2.8	1.03 H	292	74.3	-3.1
4	2483.50	53.3 AV	54.0	-0.7	1.03 H	292	56.4	-3.1
5	4904.00	40.1 PK	74.0	-33.9	2.57 H	300	39.1	1.0
6	4904.00	27.1 AV	54.0	-26.9	2.57 H	300	26.1	1.0
7	7356.00	44.5 PK	74.0	-29.5	2.57 H	300	37.4	7.1
8	7356.00	32.4 AV	54.0	-21.6	2.57 H	300	25.3	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	*2452.00	99.0 PK			3.56 V	66	102.1	-3.1
2	*2452.00	88.6 AV			3.56 V	66	91.7	-3.1
3	2483.50	62.4 PK	74.0	-11.6	3.56 V	66	65.5	-3.1
4	2483.50	47.5 AV	54.0	-6.5	3.56 V	66	50.6	-3.1
5	4904.00	38.3 PK	74.0	-35.7	1.02 V	113	37.3	1.0
6	4904.00	25.7 AV	54.0	-28.3	1.02 V	113	24.7	1.0
7	7356.00	43.7 PK	74.0	-30.3	1.02 V	113	36.6	7.1
8	7356.00	30.6 AV	54.0	-23.4	1.02 V	113	23.5	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:

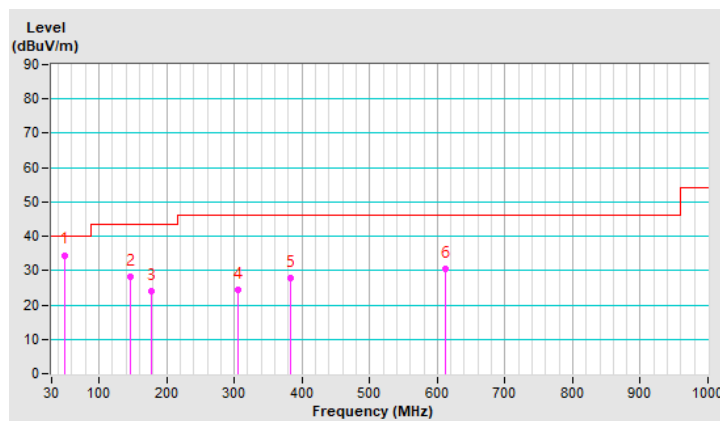
802.11b

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	49.98	34.5 QP	40.0	-5.5	2.00 H	262	47.0	-12.5
2	146.36	28.3 QP	43.5	-15.2	3.00 H	8	40.8	-12.5
3	177.98	24.0 QP	43.5	-19.5	1.00 H	105	37.9	-13.9
4	305.06	24.5 QP	46.0	-21.5	1.00 H	151	36.3	-11.8
5	384.02	27.7 QP	46.0	-18.3	1.00 H	73	37.6	-9.9
6	611.20	30.4 QP	46.0	-15.6	1.00 H	254	34.9	-4.5

Remarks:

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



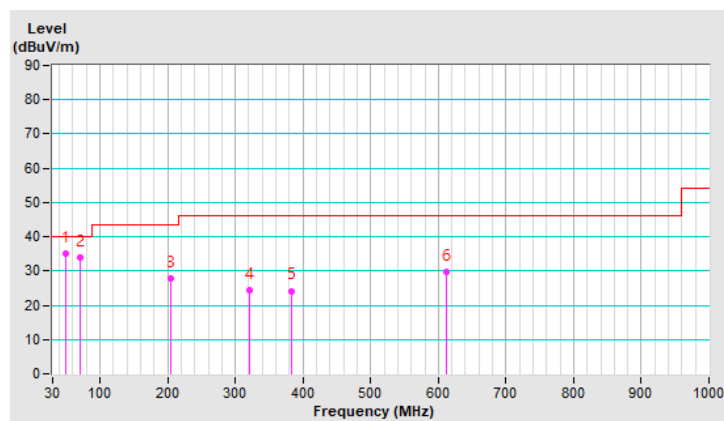
CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	49.98	35.0 QP	40.0	-5.0	1.00 V	121	47.5	-12.5
2	69.97	34.0 QP	40.0	-6.0	2.00 V	360	48.7	-14.7
3	203.74	27.8 QP	43.5	-15.7	1.00 V	0	43.9	-16.1
4	321.69	24.4 QP	46.0	-21.6	1.00 V	263	35.7	-11.3
5	384.02	24.2 QP	46.0	-21.8	2.00 V	360	34.1	-9.9
6	611.20	29.6 QP	46.0	-16.4	2.00 V	360	34.1	-4.5

Remarks:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 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 20, 2020

4.2.3 Test Procedures

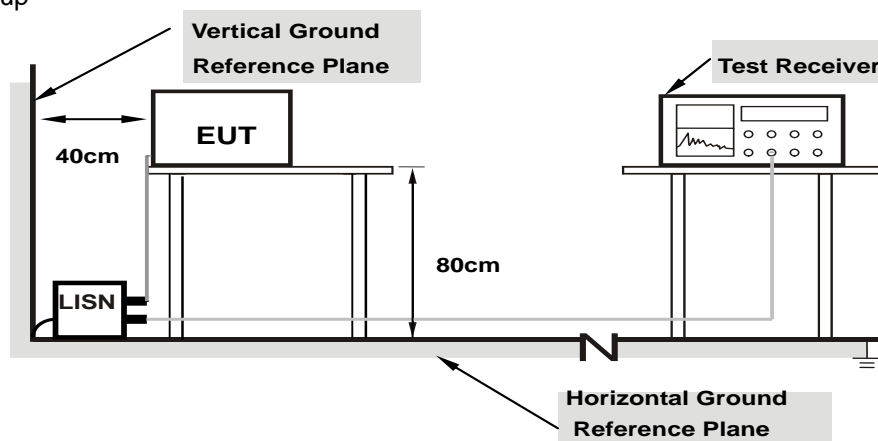
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

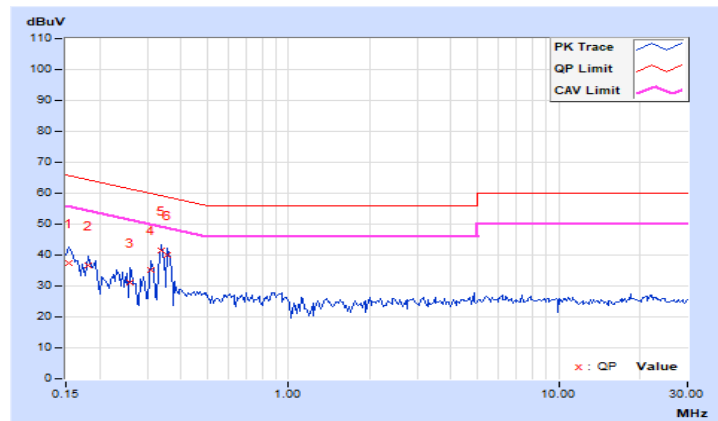
4.2.7 Test Results

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	0.15391	10.03	27.32	10.83	37.35	20.86	65.79	55.79	-28.44	-34.93
2	0.18125	10.04	26.51	8.87	36.55	18.91	64.43	54.43	-27.88	-35.52
3	0.25938	10.04	21.16	9.03	31.20	19.07	61.45	51.45	-30.25	-32.38
4	0.31016	10.05	25.03	16.51	35.08	26.56	59.97	49.97	-24.89	-23.41
5	0.33750	10.05	31.45	26.00	41.50	36.05	59.26	49.26	-17.76	-13.21
6	0.35703	10.05	29.88	21.91	39.93	31.96	58.80	48.80	-18.87	-16.84

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

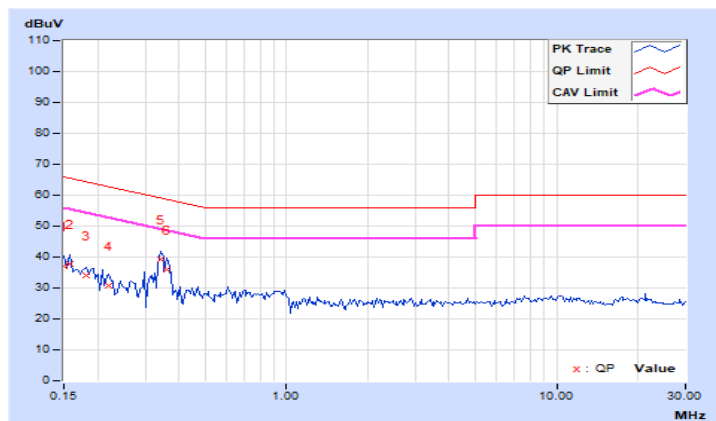


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.02	27.03	9.35	37.05	19.37	66.00	56.00	-28.95	-36.63
2	0.15781	10.02	27.84	9.41	37.86	19.43	65.58	55.58	-27.72	-36.15
3	0.18125	10.03	24.10	6.93	34.13	16.96	64.43	54.43	-30.30	-37.47
4	0.22031	10.03	20.63	6.78	30.66	16.81	62.81	52.81	-32.15	-36.00
5	0.34141	10.04	29.09	26.60	39.13	36.64	59.17	49.17	-20.04	-12.53
6	0.36094	10.04	25.74	20.68	35.78	30.72	58.71	48.71	-22.93	-17.99

Remarks:

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

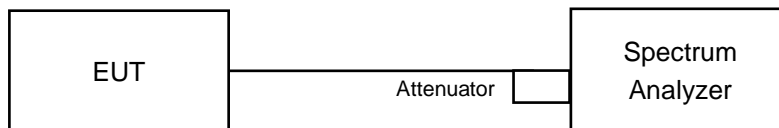


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	10.09	0.5	Pass
6	2437	10.1	0.5	Pass
11	2462	9.16	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	16.33	0.5	Pass
11	2462	16.35	0.5	Pass

802.11n (HT20)

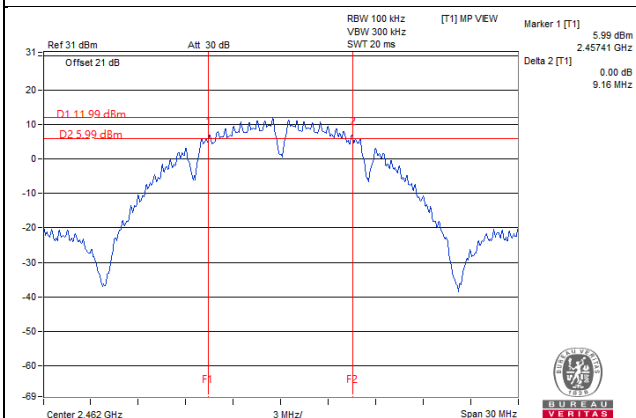
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.63	0.5	Pass
6	2437	17.61	0.5	Pass
11	2462	17.66	0.5	Pass

802.11n (HT40)

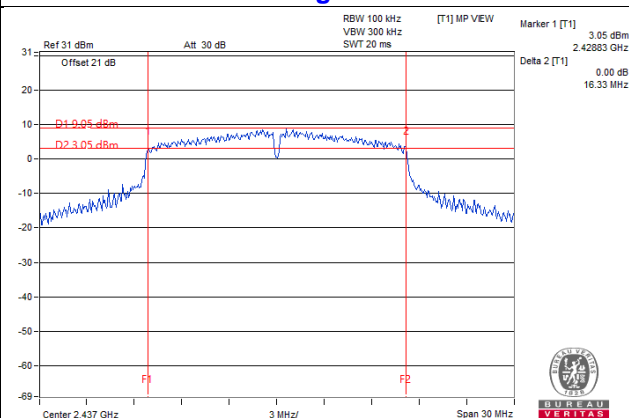
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	36.14	0.5	Pass
6	2437	36.25	0.5	Pass
9	2452	35.74	0.5	Pass

Spectrum Plot of Worst Value

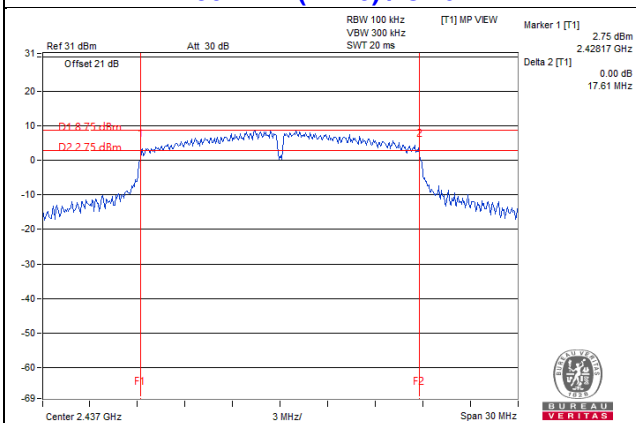
802.11b / CH11



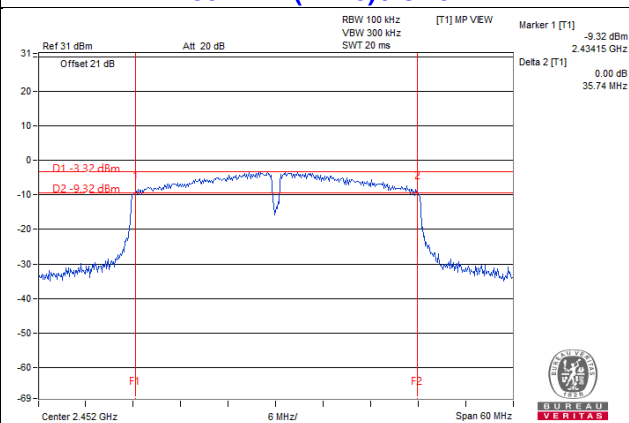
802.11g / CH6



802.11n (HT20) / CH6



802.11n (HT40) / CH9

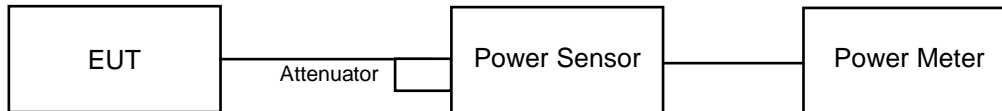


4.4 Conducted Output Power Measurement

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	148.936	21.73	30	Pass
6	2437	245.471	23.90	30	Pass
11	2462	192.309	22.84	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	263.633	24.21	30	Pass
6	2437	339.625	25.31	30	Pass
11	2462	260.016	24.15	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	156.315	21.94	30	Pass
6	2437	326.588	25.14	30	Pass
11	2462	213.796	23.30	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
3	2422	89.331	19.51	30	Pass
6	2437	184.077	22.65	30	Pass
9	2452	118.304	20.73	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	100.925	20.04
6	2437	173.78	22.40
11	2462	133.352	21.25

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	73.621	18.67
6	2437	129.42	21.12
11	2462	62.517	17.96

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	30.903	14.90
6	2437	127.938	21.07
11	2462	38.994	15.91

802.11n (HT40)

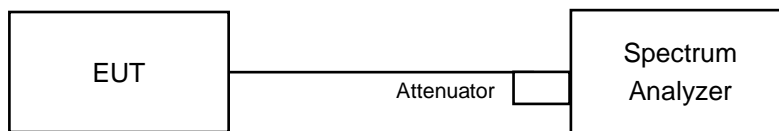
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
3	2422	16.255	12.11
6	2437	41.879	16.22
9	2452	18.621	12.70

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 (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
1	2412	-3.33	8.00	PASS
6	2437	-0.49	8.00	PASS
11	2462	-1.32	8.00	PASS

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
1	2412	-5.62	8.00	PASS
6	2437	-4.20	8.00	PASS
11	2462	-6.65	8.00	PASS

802.11n (HT20)

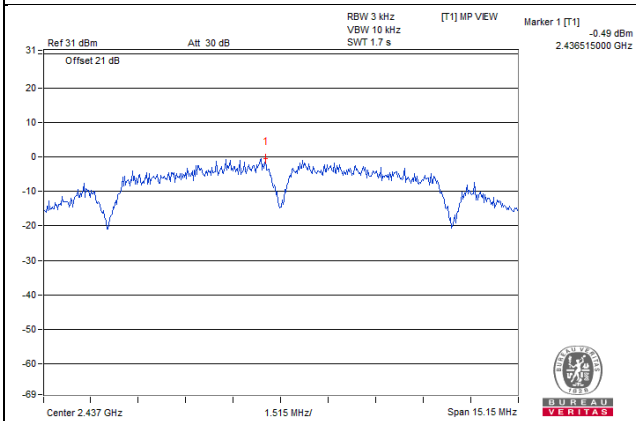
Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
1	2412	-8.81	8.00	PASS
6	2437	-3.57	8.00	PASS
11	2462	-7.15	8.00	PASS

802.11n (HT40)

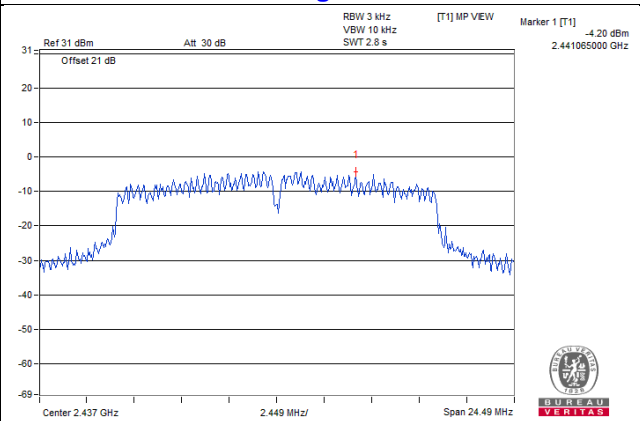
Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
3	2422	-14.43	8.00	PASS
6	2437	-10.83	8.00	PASS
9	2452	-14.79	8.00	PASS

Spectrum Plot of Worst Value

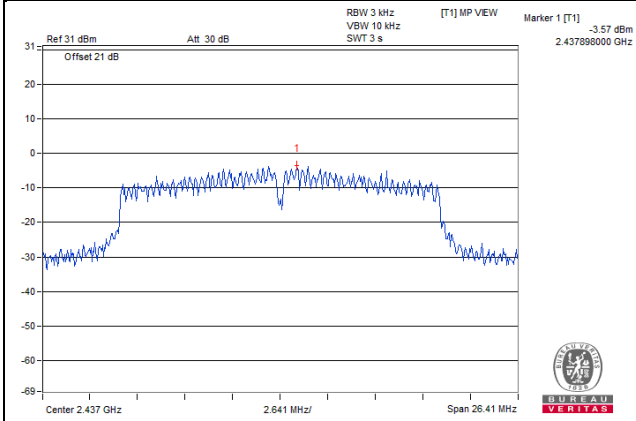
802.11b / CH6



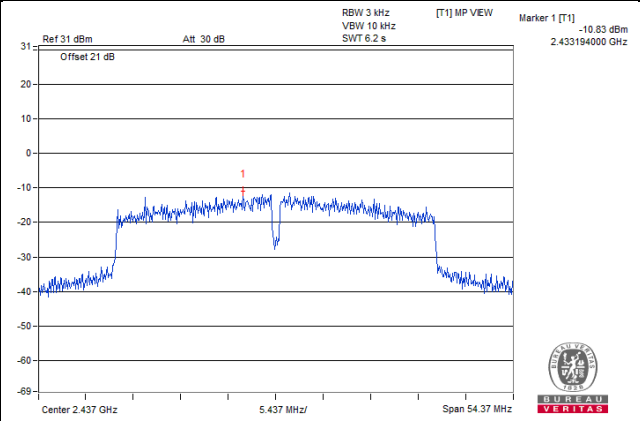
802.11g / CH6



802.11n (HT20) / CH6



802.11n (HT40) / CH6

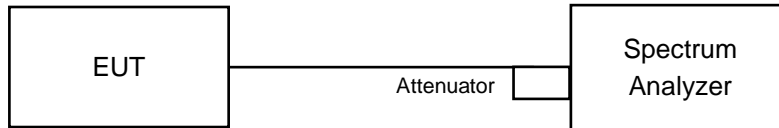


4.6 Conducted Out of Band Emission Measurement

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

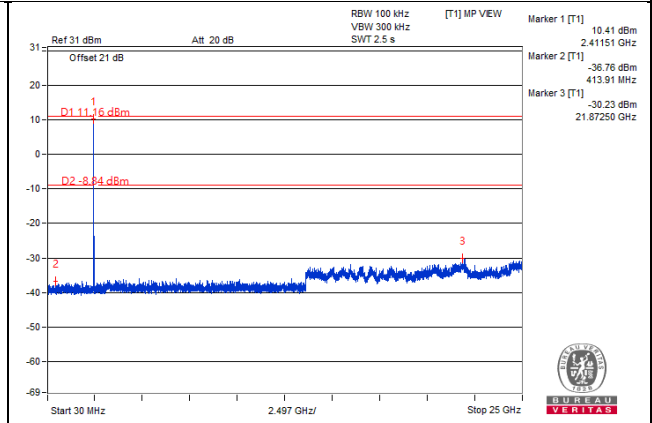
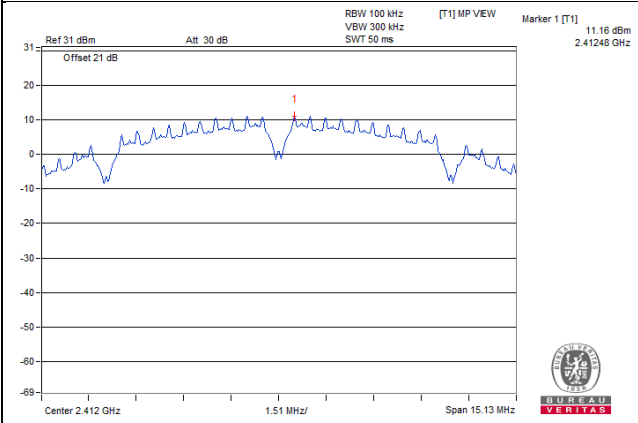
Same as Item 4.3.6

4.6.7 Test Results

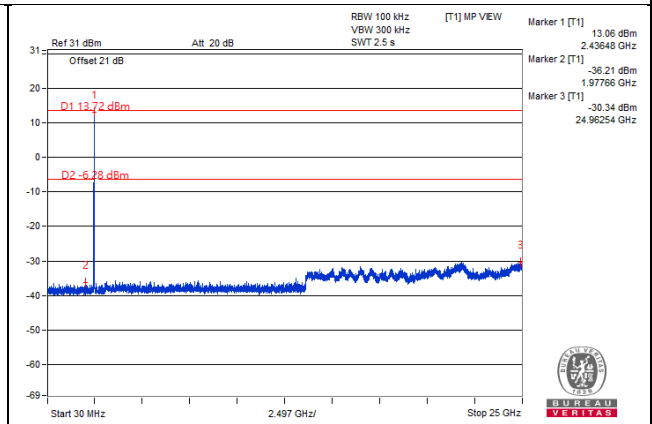
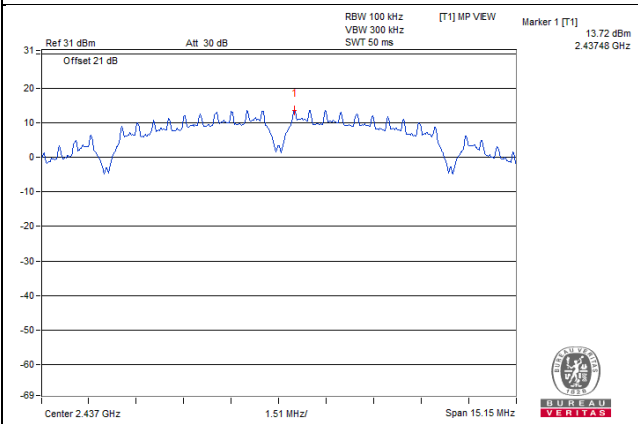
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

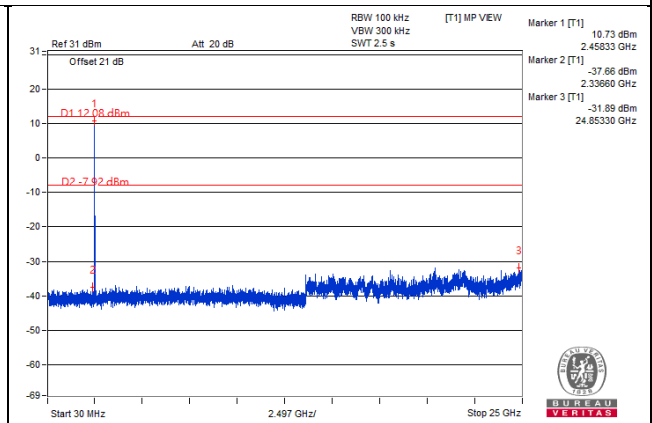
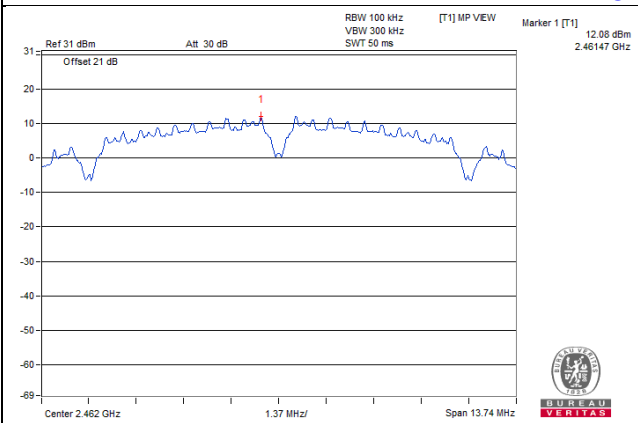
CH 1



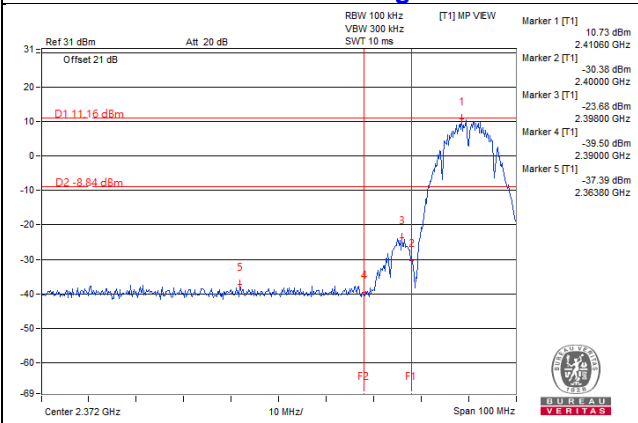
CH 6



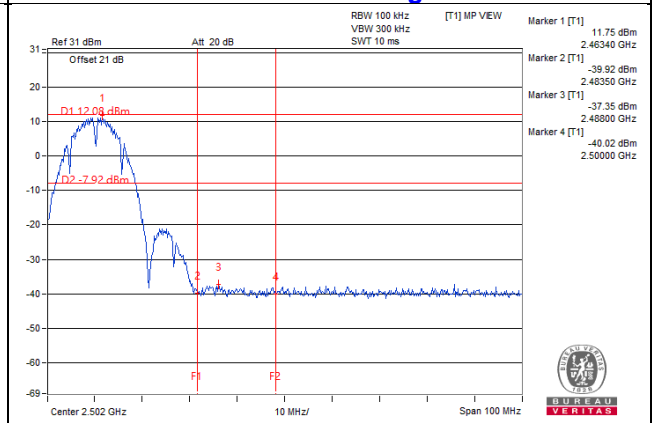
CH 11



CH 1 Band edge

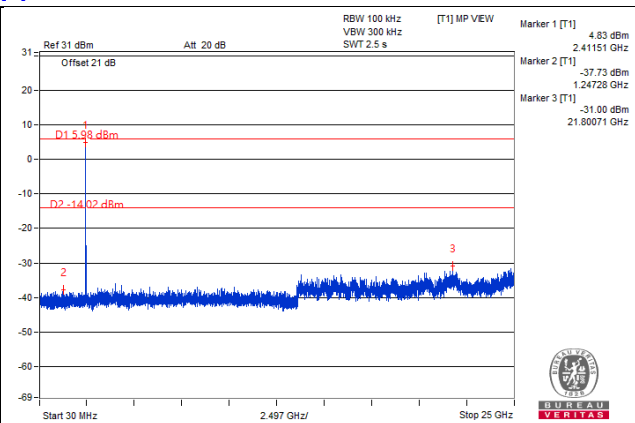
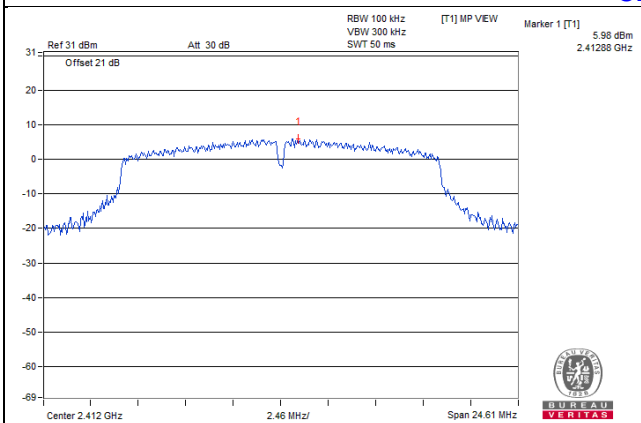


CH 11 Band edge

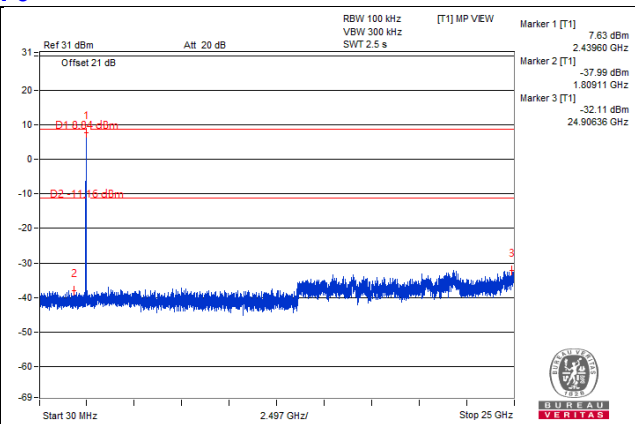
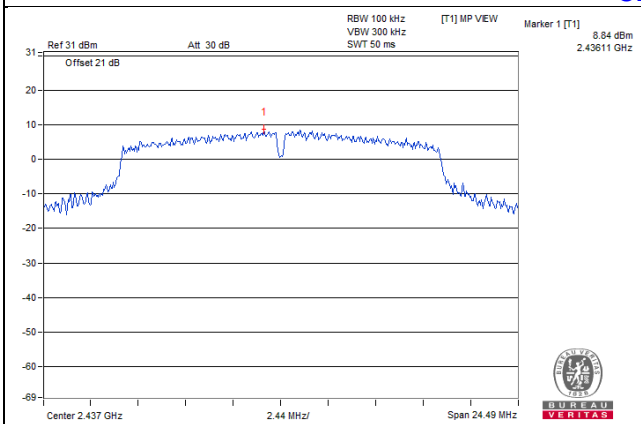


802.11g

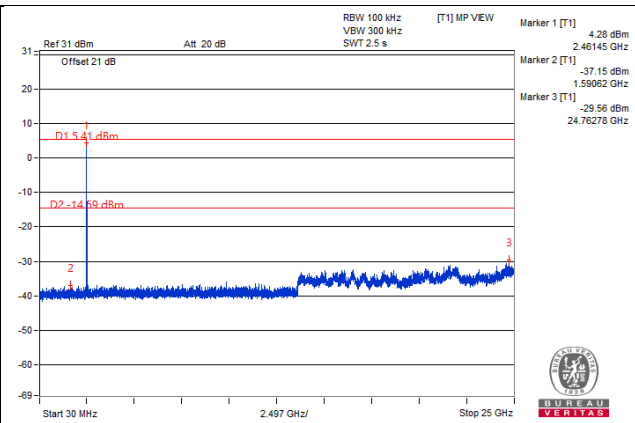
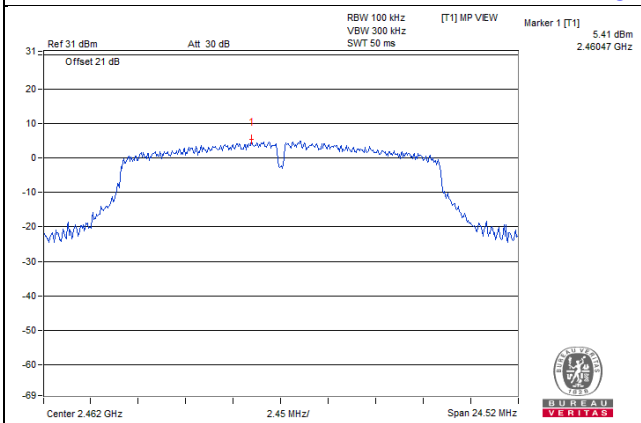
CH 1



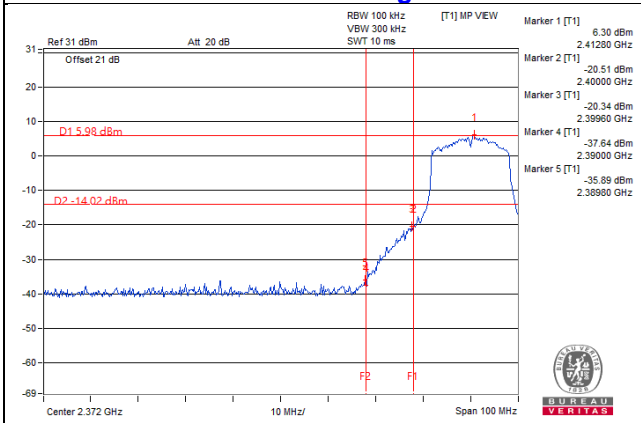
CH 6



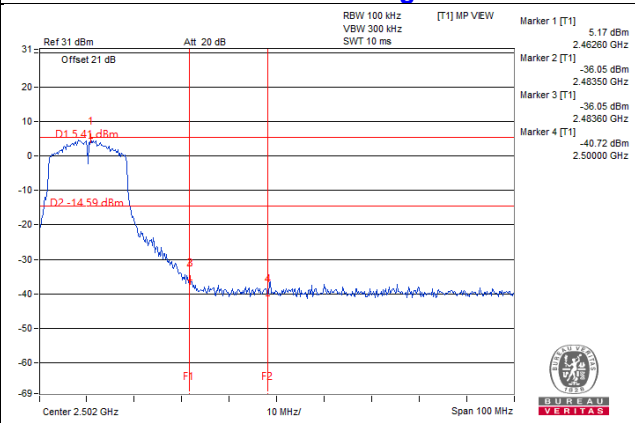
CH 11



CH 1 Band edge

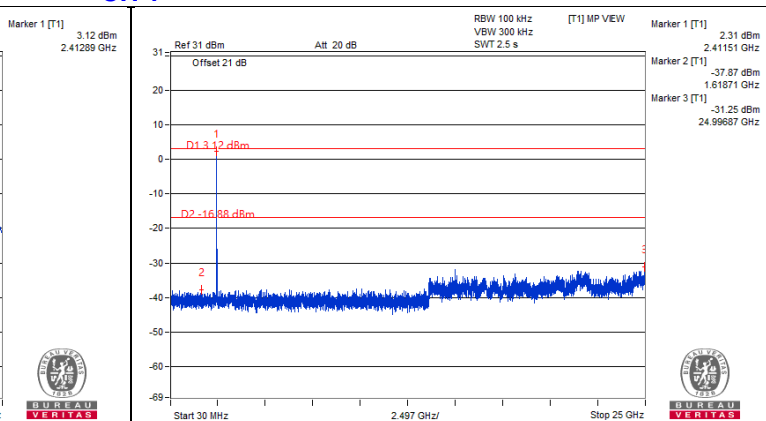
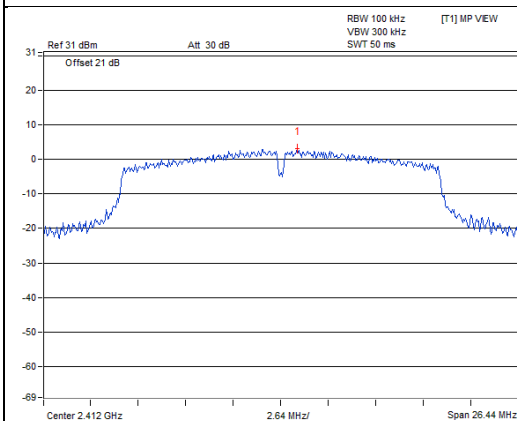


CH 11 Band edge

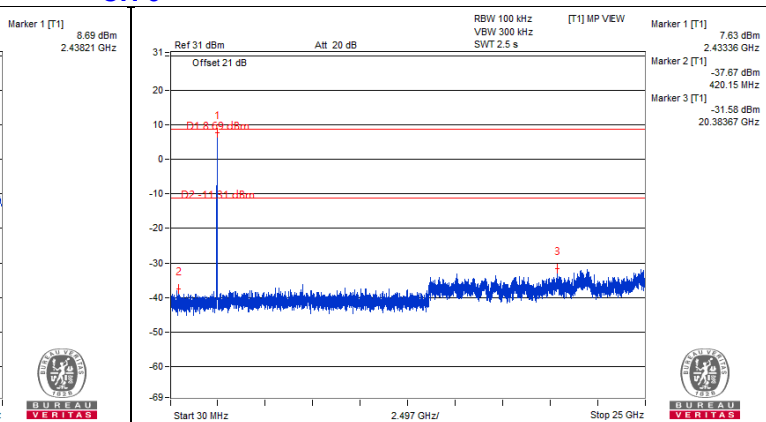
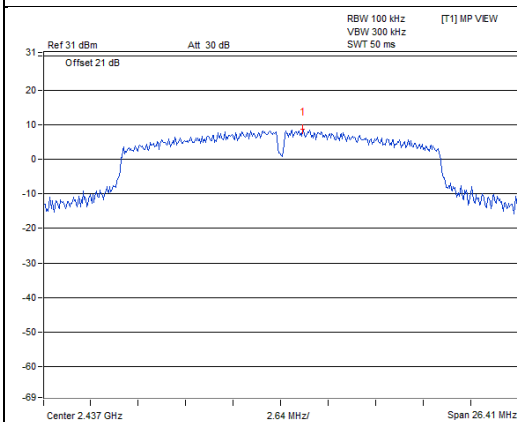


802.11n (HT20)

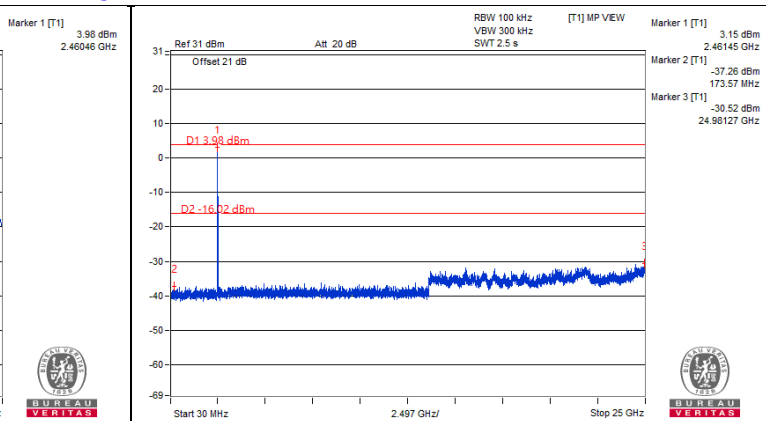
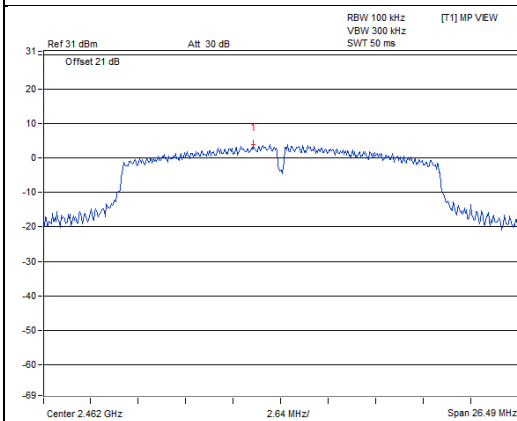
CH 1



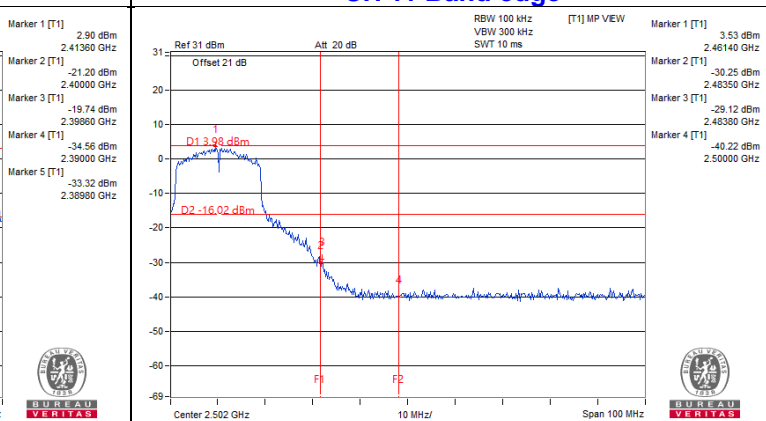
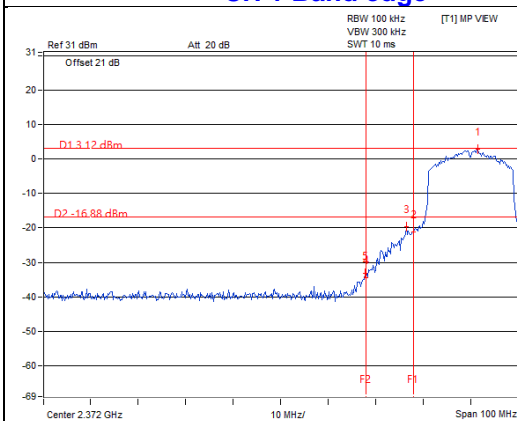
CH 6



CH 11

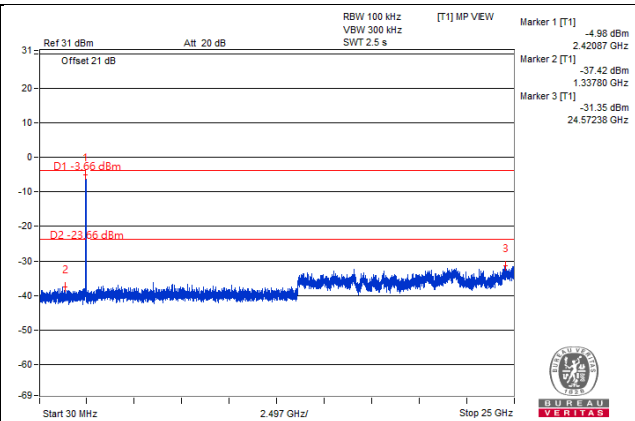
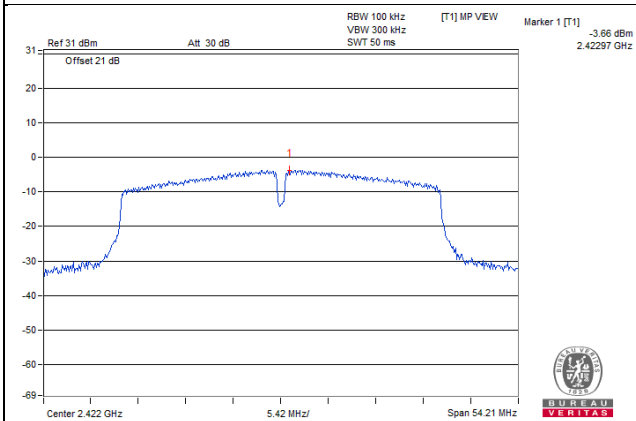


CH 1 Band edge

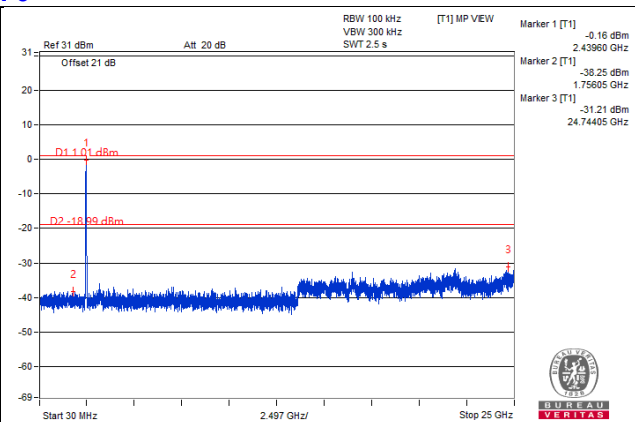
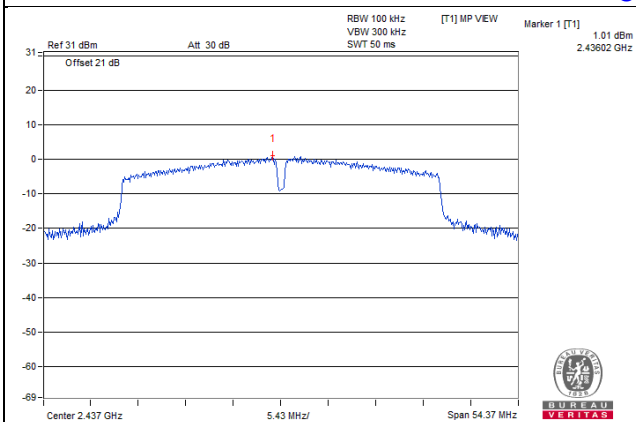


802.11n (HT40)

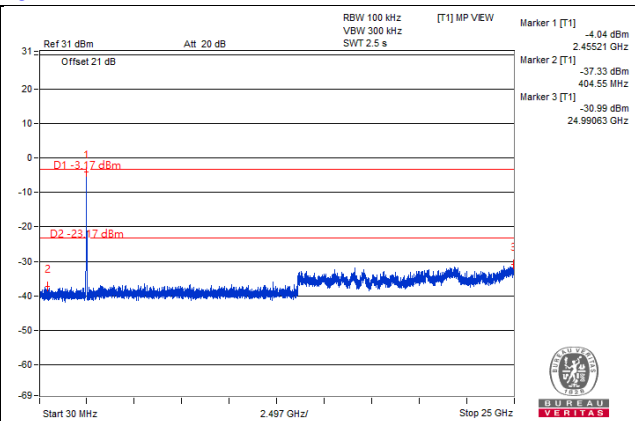
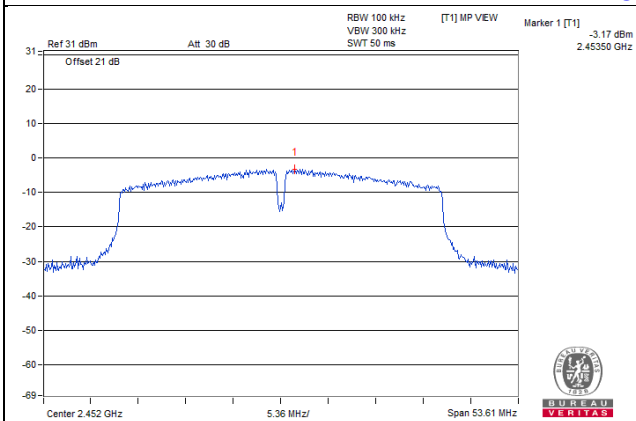
CH 3



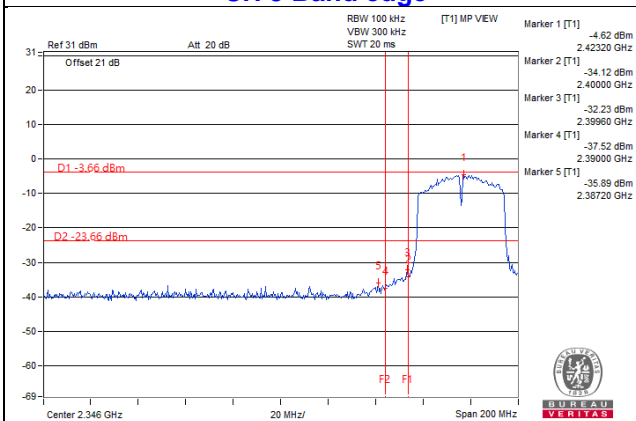
CH 6



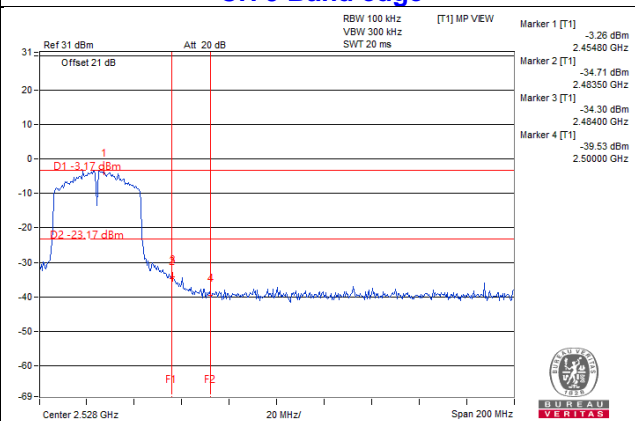
CH 9



CH 3 Band edge



CH 9 Band edge

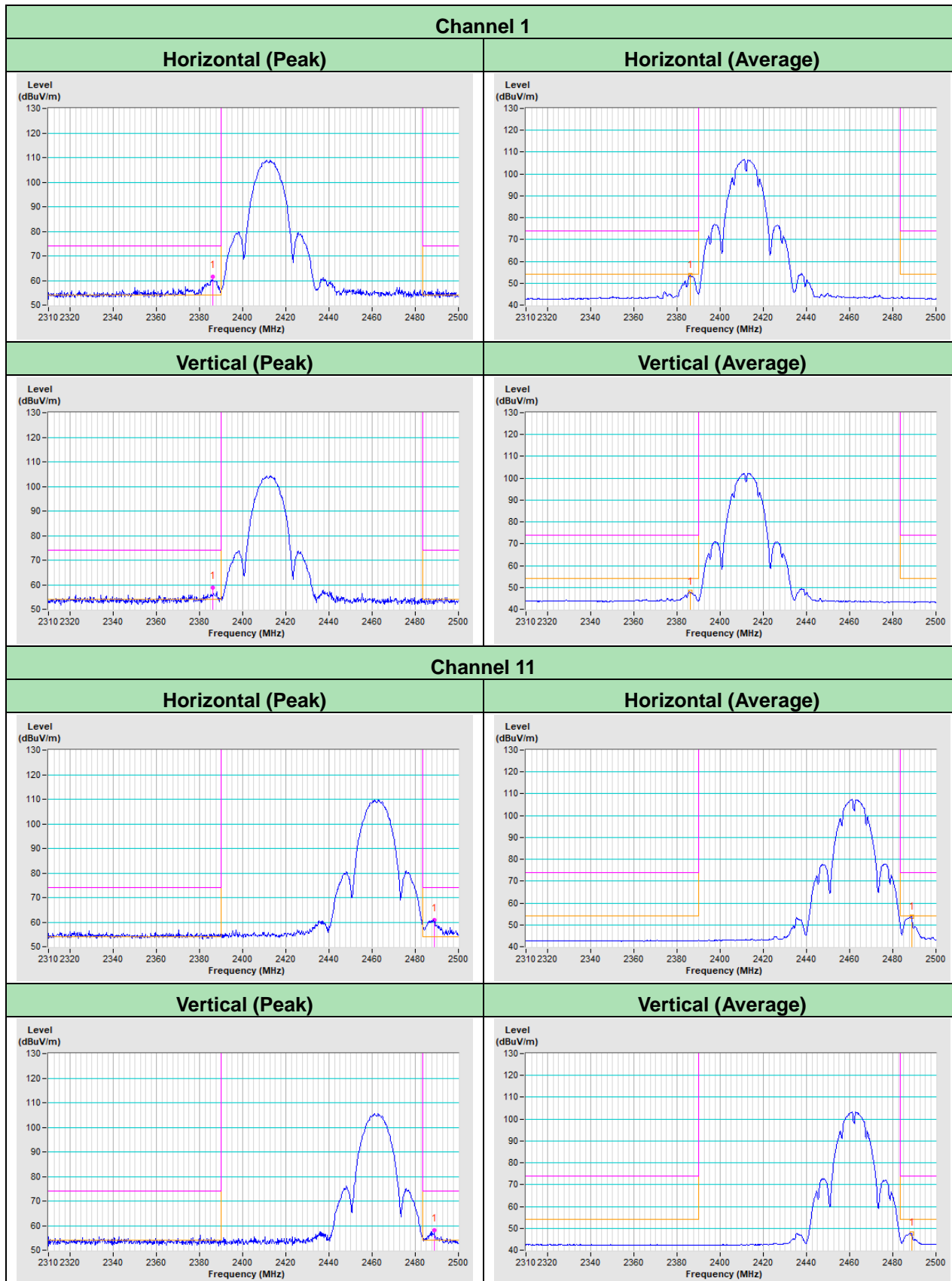


5 Pictures of Test Arrangements

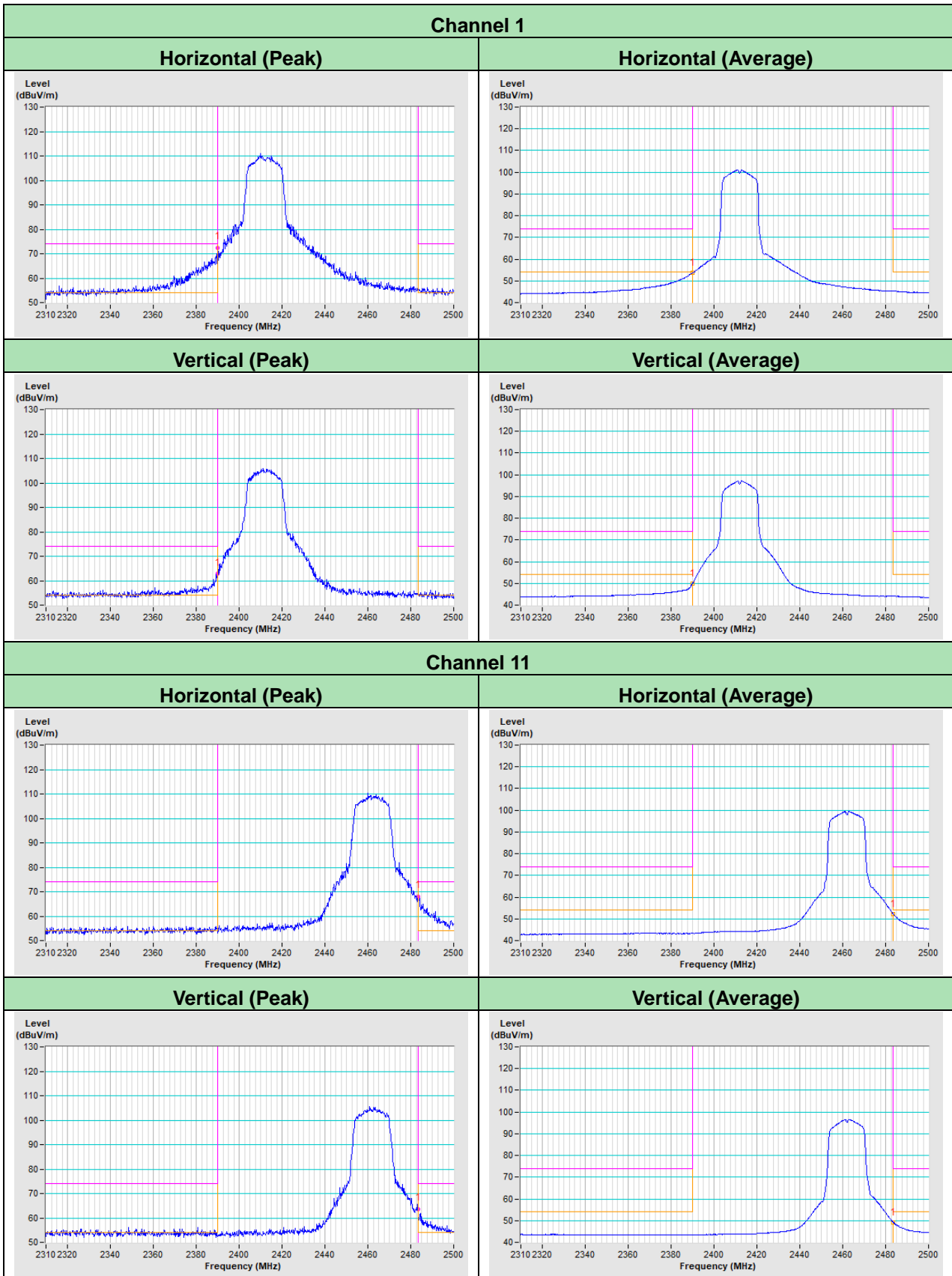
Please refer to the attached file (Test Setup Photo).

Annex A - Band-Edge Measurement

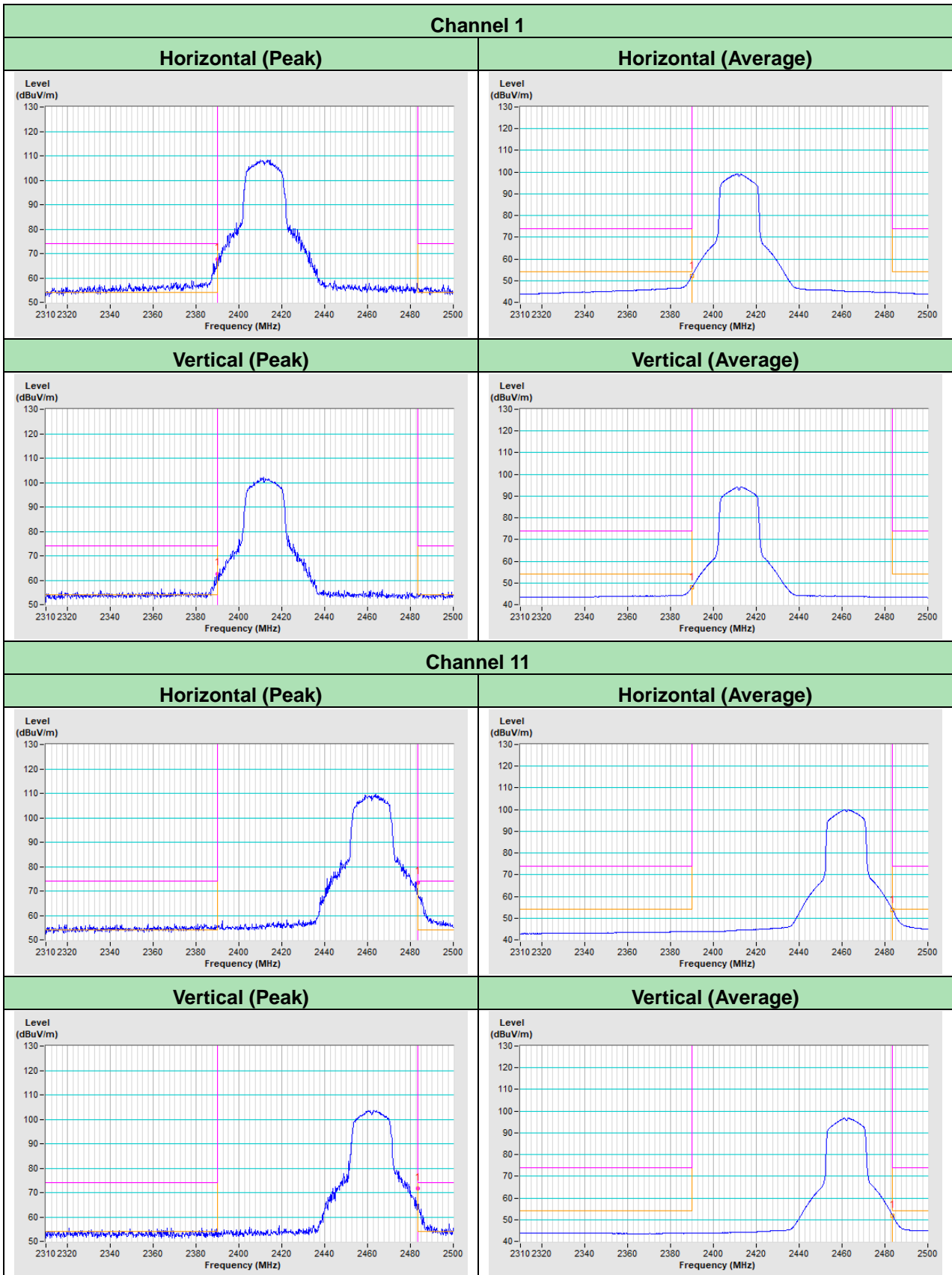
802.11b



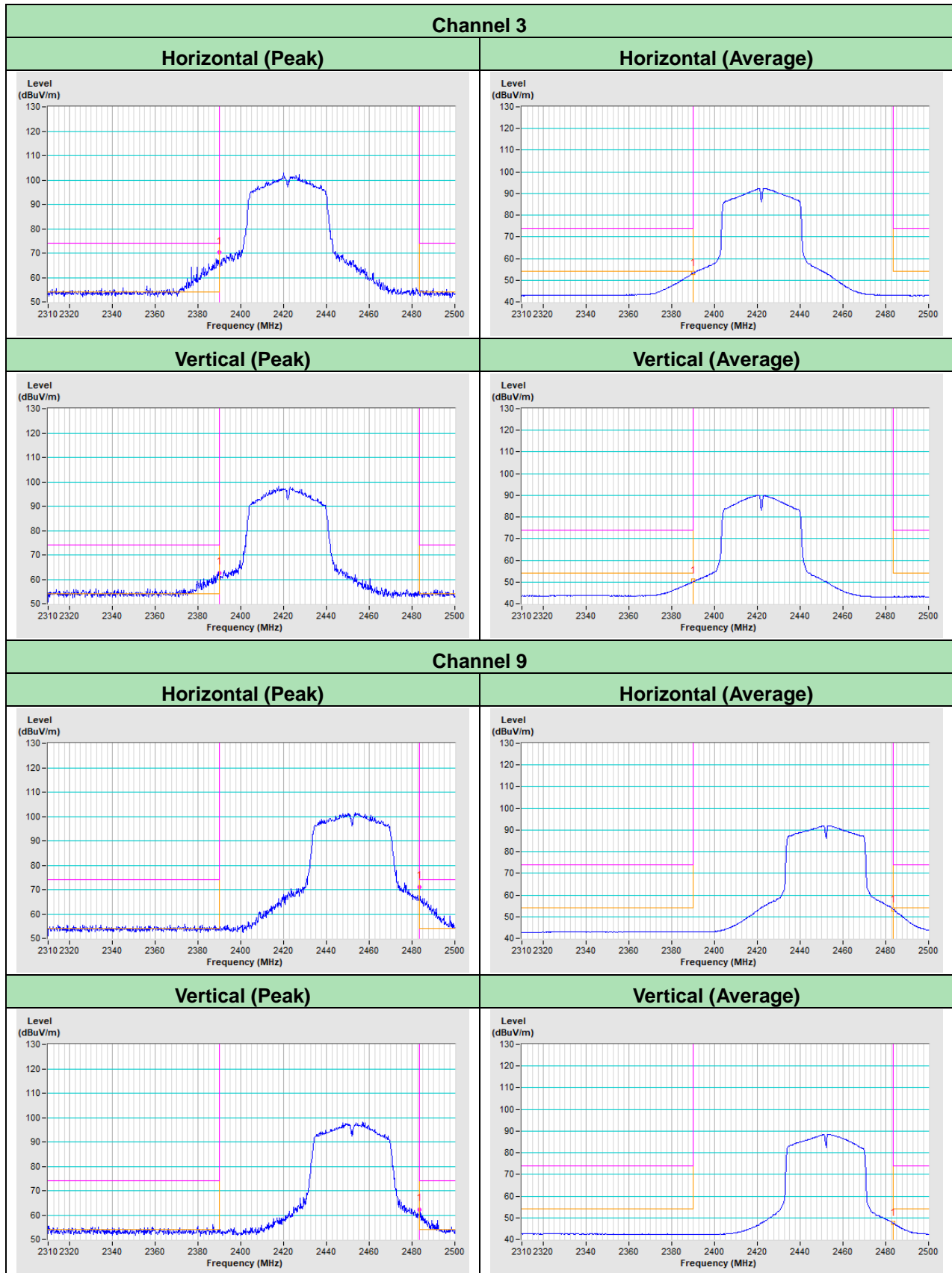
802.11g



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.

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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