FCC Test Report

Report No.:	RF200122C13-1
FCC ID:	UK7-DW11
Test Model:	DW11M2
Series Model:	DW11F1, DW11F2, DW11M1 (Refer to section 3.1 for more details)
Received Date:	Jan. 22, 2020
Test Date:	Jul. 21 ~Sep. 10, 2020
Issued Date:	Sep. 11, 2020
Applicant:	Fossil Group, Inc.
Address:	901 S. Central Expy, Richardson, Texas, United States, 75080
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan, R.O.C.
FCC Registration / Designation Number:	788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
RF200122C13-1	Original Release	Sep. 11, 2020

1 Certificate of Conformity

Product:	Smart Watch
Test Model:	DW11M2
Series Model:	DW11F1, DW11F2, DW11M1 (Refer to section 3.1 for more details)
Sample Status:	Identical Prototype
Applicant:	Fossil Group, Inc.
Test Date:	Jul. 21 ~Sep. 10, 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 RF characteristics under the conditions specified in this report.

Prepared by : Lena Wang , **Date:** Sep. 11, 2020

Lena Wang / Specialist

Approved by : , **Date:** Sep. 11, 2020

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

<Bluetooth LE>

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	**Test Item**	**Result**	**Remarks**
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -13.85 dB at 0.17838 MHz.
15.205 & 209	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -5.14 dB at 18000 MHz.
15.247(d)	Band Edge Measurement	Pass	Meet the requirement of limit.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Reference only
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	No antenna connector is used.

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. For 2400-2483.5MHz 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.

<WLAN>

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 -24.48 dB at 0.45825 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.8 dB at 2483.5 MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Reference only
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	No antenna connector is used.

Note:

1. For 2400-2483.5MHz 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	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Smart Watch	
Test Model	DW11M2	
Series Model	DW11F1, DW11F2, DW11M1	
Model Difference	Refer to Note as below	
Status of EUT	Identical Prototype	
Power Supply Rating	3.85 Vdc (Battery) 5 Vdc (adapter)	
Modulation Type	Bluetooth LE	GFSK
	WLAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer Rate	Bluetooth LE	1 Mbps
	WLAN	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to 72. Mbps
Operating Frequency	Bluetooth LE	2402 ~ 2480 MHz
	WLAN	2412 ~ 2472 MHz
Number of Channel	Bluetooth LE	40
	WLAN	13 for 802.11b, 802.11g, 802.11n (HT20)
Output Power	Bluetooth LE	1.718 mW
	WLAN	93.325 mW
Antenna Type	Loop antenna	
Antenna Connector	N/A	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

1. The EUT provides one completed transmitter and one receiver.

Modulation Mode	Tx Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX

2. All models are listed as below. DW11M2 antenna gain is maximum as a representative for the final test.

Model	WLAN/BT Antenna Gain (dBi)	Difference
DW11F1	-6.43	The models have the same layout, circuit and components, but different in appearance, antenna gain and brand.
DW11F2	-5.95	
DW11M1	-6.10	
DW11M2	-4.99	

3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
4. The EUT accessories list refers to user manual.
5. 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

<Bluetooth LE>

40 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

<WLAN>

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

3.2.1 Test Mode Applicability and Tested Channel Detail

<Bluetooth LE>

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
Note: "-"means no effect.
Note: For radiated emission (below 1GHz) and power line conducted emission test items, the worst radiated emission (above 1GHz) mode was selected.

Radiated Emission Test (Above 1 GHz):

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

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0, 19, 39	GFSK	1

Radiated Emission Test (Below 1 GHz):

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

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0	GFSK	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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0	GFSK	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.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
-	0 to 39	0, 19, 39	GFSK	1

<WLAN>

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
NOTE: "-"means no effect.
NOTE: For radiated emission (below 1GHz) and power line conducted emission test items, the worst radiated emission (above 1GHz) mode was selected.

Radiated Emission Test (Above 1 GHz):

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5

Radiated Emission Test (Below 1 GHz):

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11g	1 to 13	13	OFDM	BPSK	6.0

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11g	1 to 13	13	OFDM	BPSK	6.0

Bandedge Measurement:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 11, 12, 13	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5

Test Condition:

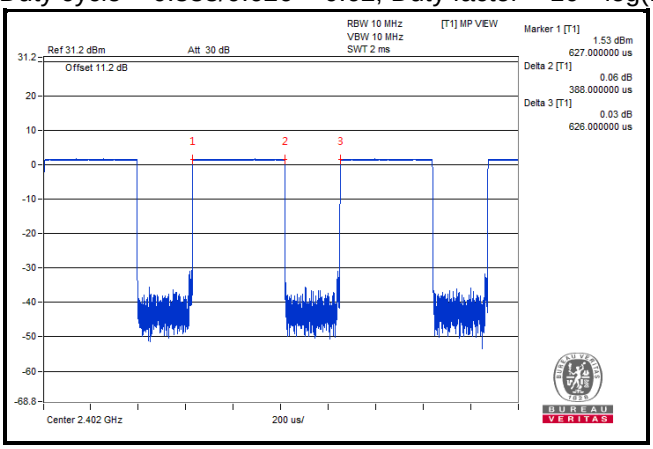
Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tim Chen, Cyril Chen
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang
APCM	25 deg. C, 65 % RH	3.85 Vdc	Wayne Lin

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor shall be considered.

<Bluetooth LE>

Duty cycle = 0.388/0.626 = 0.62, Duty factor = 10 * log(1/0.62) = 2.08



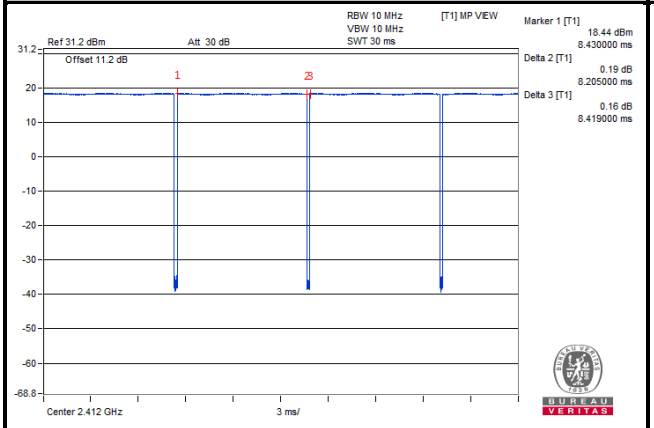
<WLAN>

802.11b: Duty cycle = 8.205/8.419 = 0.975, Duty factor = 10 * log(1/0.975) = 0.11

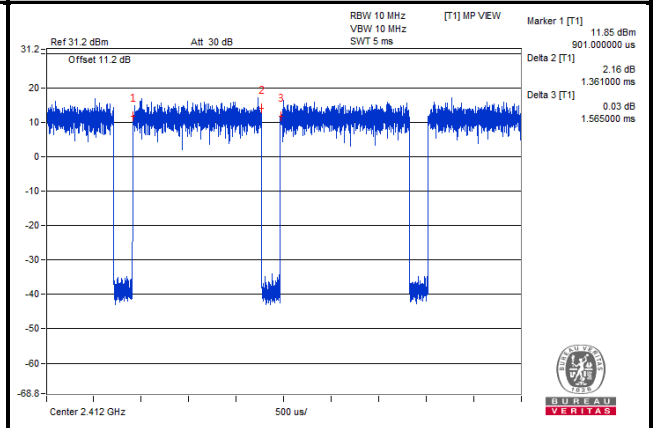
802.11g: Duty cycle = 1.361/1.565 = 0.87, Duty factor = 10 * log(1/0.87) = 0.61

802.11n (HT20): Duty cycle = 1.275/1.475 = 0.864, Duty factor = 10 * log(1/0.864) = 0.63

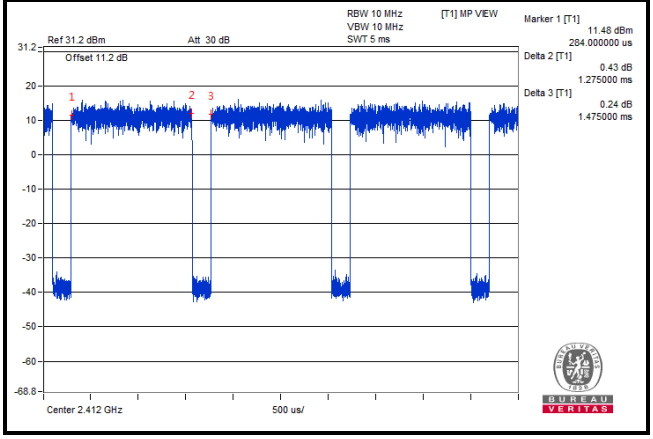
802.11b



802.11g



802.11n (HT20)



3.4 Description of Support Units

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

No.	Product	Brand	Model No.	Serial No.	FCC ID
A	Adapter	ASUS	AD827M	N/A	N/A
B	Charging Dock	Simula Technology Inc.	CB847D-6040-102	N/A	N/A

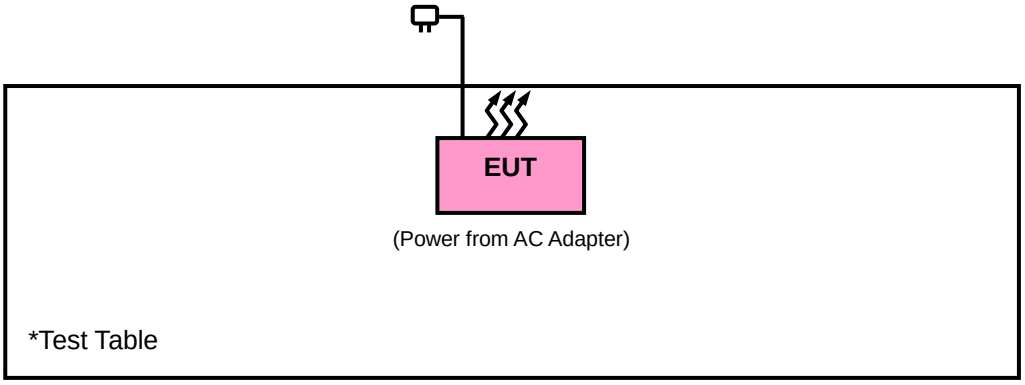
No.	Signal Cable Description Of The Above Support Units
1.	0.95m shielded cable

Note:

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

3.4.1 Configuration of System under Test

<Bluetooth LE & WLAN>



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:

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 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

<BLUETOOTH LE>

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 20 dB 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 1000 MHz, 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 20 dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Mar. 18, 2020	Mar. 17, 2021
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 12, 2019	Dec. 11, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 16, 2020	Apr. 15, 2021
Broadband Horn Antenna SCHWARZBECK	BBHA 9170	148	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Nov. 08, 2019	Nov. 07, 2020
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
Loop Antenna	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier EMCI	EMC001340	980201	Oct. 14, 2019	Oct. 13, 2020
Preamplifier EMCI	EMC 012645	980115	Oct. 08, 2019	Oct. 07, 2020
Preamplifier EMCI	EMC 184045	980116	Oct. 08, 2019	Oct. 07, 2020
Preamplifier EMCI	EMC 330H	980112	Oct. 08, 2019	Oct. 07, 2020
Power Meter Anritsu	ML2495A	1012010	Sep. 04, 2019	Sep. 03, 2020
			Sep. 01, 2020	Aug. 31, 2021
Power Sensor Anritsu	MA2411B	1315050	Sep. 04, 2019	Sep. 03, 2020
			Sep. 01, 2020	Aug. 31, 2021
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-8000&3000	140811+170717	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 08, 2019	Oct. 07, 2020
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 08, 2019	Oct. 07, 2020
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.

4.1.3 Test Procedures

For Radiated Emission below 30 MHz

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 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:

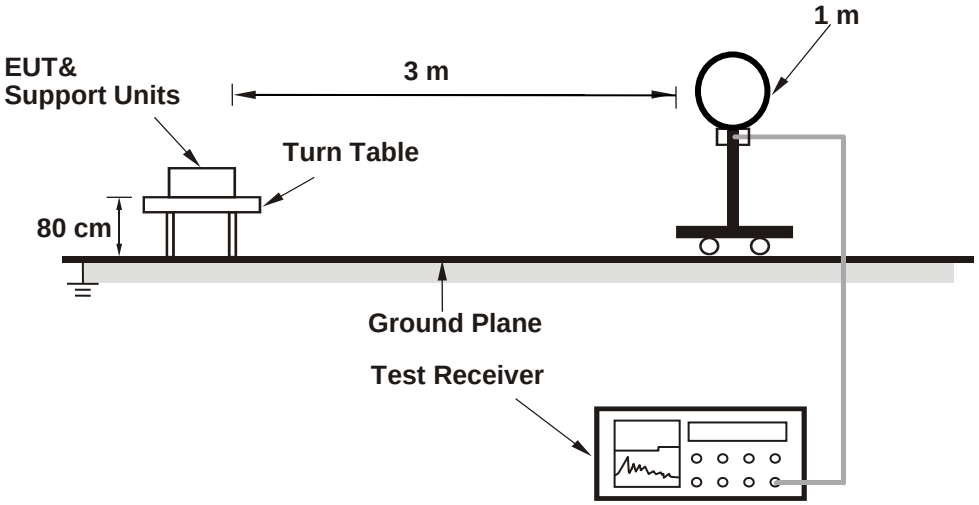
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.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

4.1.4 Deviation from Test Standard

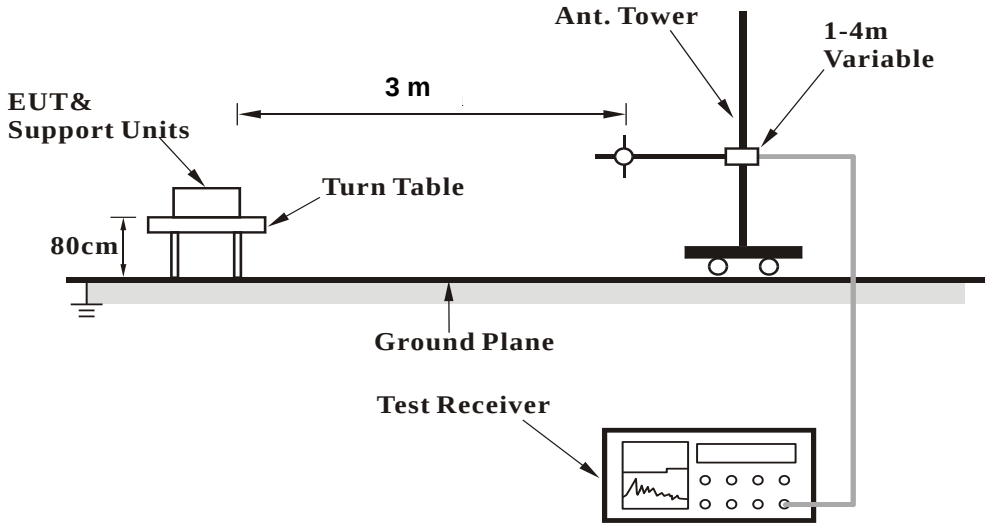
No deviation.

4.1.5 Test Set Up

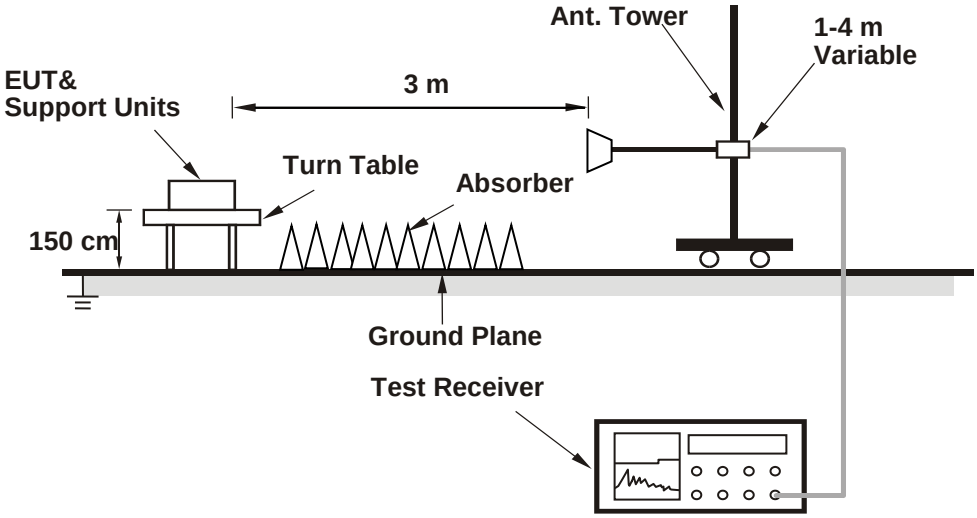
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results for Fundamental and Harmonic above 1GHz

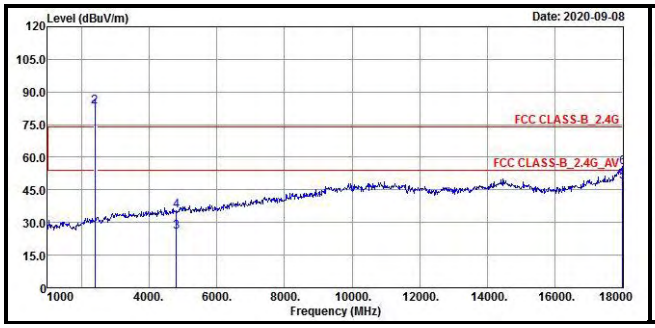
Above 1 GHz Data:

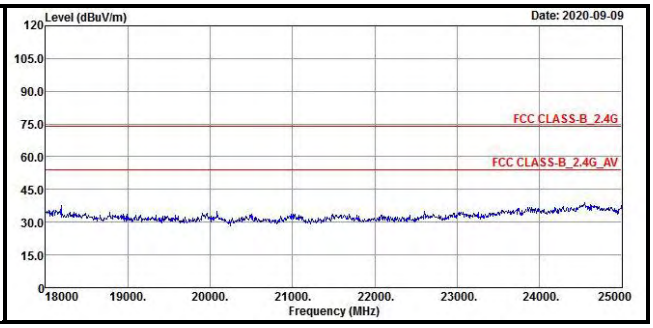
EUT Test Condition		Measurement Detail	
Channel	Channel 0	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	35.79	41.71	-5.92	54	-18.21	314	354	Average
2390	45.58	51.5	-5.92	74	-28.42	314	354	Peak
2402	81.63	87.57	-5.94	------	------	314	354	Average
2402	83.13	89.07	-5.94	------	------	314	354	Peak
4804	25.89	41.53	-15.64	54	-28.11	105	134	Average
4804	35.4	51.04	-15.64	74	-38.6	105	134	Peak
18000	48.86	39.21	9.65	54	-5.14	125	341	Average
18000	55.49	45.84	9.65	74	-18.51	125	341	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2402 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



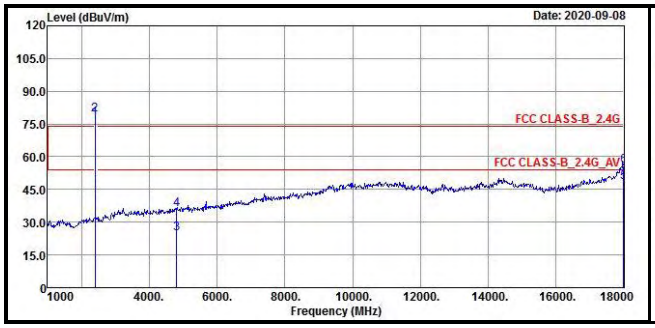


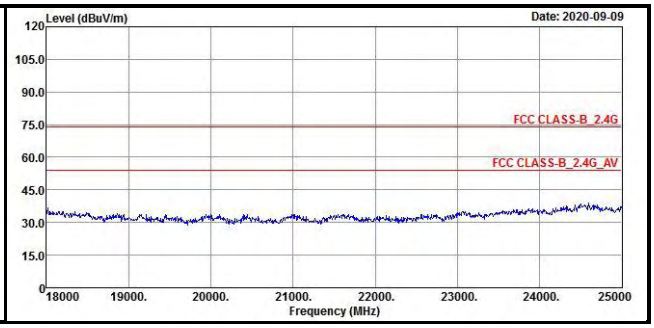
EUT Test Condition		Measurement Detail	
Channel	Channel 0	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	35.88	41.8	-5.92	54	-18.12	204	340	Average
2390	45.96	51.88	-5.92	74	-28.04	204	340	Peak
2402	77.27	83.21	-5.94	------	------	204	340	Average
2402	79.07	85.01	-5.94	------	------	204	340	Peak
4804	25	40.64	-15.64	54	-29	125	147	Average
4804	35.99	51.63	-15.64	74	-38.01	125	147	Peak
18000	48.34	38.69	9.65	54	-5.66	118	311	Average
18000	55.91	46.26	9.65	74	-18.09	118	311	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2402 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



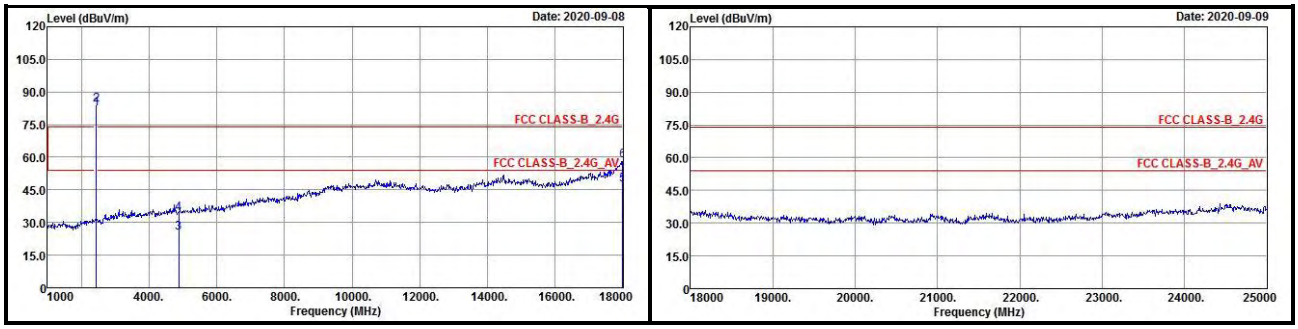


EUT Test Condition		Measurement Detail	
Channel	Channel 19	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	36.06	41.98	-5.92	54	-17.94	317	355	Average
2390	46.07	51.99	-5.92	74	-27.93	317	355	Peak
2440	82.36	88.24	-5.88	------	------	317	355	Average
2440	83.93	89.81	-5.88	------	------	317	355	Peak
2483.5	36.12	41.82	-5.7	54	-17.88	317	355	Average
2483.5	46.33	52.03	-5.7	74	-27.67	317	355	Peak
4880	25.08	40.64	-15.56	54	-28.92	124	137	Average
4880	34.06	49.62	-15.56	74	-39.94	124	137	Peak
18000	47.5	37.85	9.65	54	-6.5	136	307	Average
18000	58.4	48.75	9.65	74	-15.6	136	307	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2440 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

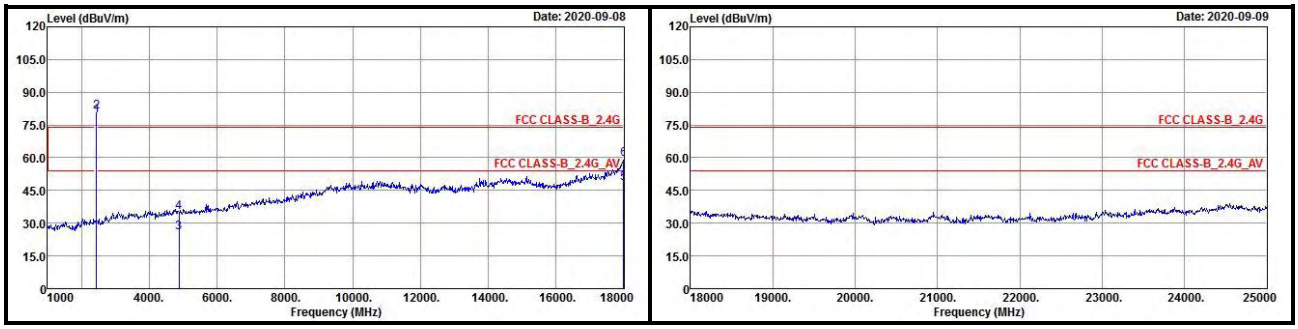


EUT Test Condition		Measurement Detail	
Channel	Channel 19	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	36.07	41.99	-5.92	54	-17.93	204	274	Average
2390	46.39	52.31	-5.92	74	-27.61	204	274	Peak
2440	79.07	84.95	-5.88	------	------	204	274	Average
2440	81.05	86.93	-5.88	------	------	204	274	Peak
2483.5	36.13	41.83	-5.7	54	-17.87	204	274	Average
2483.5	45.88	51.58	-5.7	74	-28.12	204	274	Peak
4880	25.48	41.04	-15.56	54	-28.52	124	155	Average
4880	34.99	50.55	-15.56	74	-39.01	124	155	Peak
18000	48.18	38.53	9.65	54	-5.82	121	168	Average
18000	59.21	49.56	9.65	74	-14.79	121	168	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2440 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

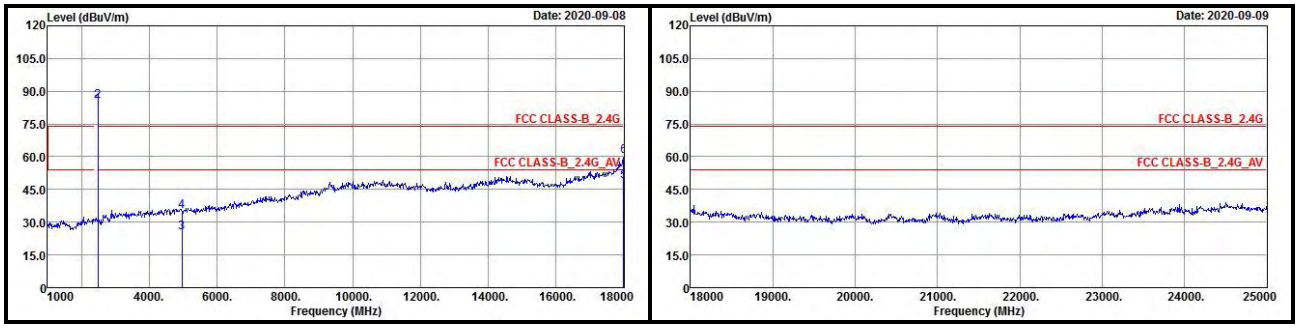


EUT Test Condition		Measurement Detail	
Channel	Channel 39	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2480	83.8	89.5	-5.7	------	------	319	352	Average
2480	85.32	91.02	-5.7	------	------	319	352	Peak
2483.5	36.23	41.93	-5.7	54	-17.77	319	352	Average
2483.5	46.17	51.87	-5.7	74	-27.83	319	352	Peak
4960	25.19	40.64	-15.45	54	-28.81	125	180	Average
4960	35.09	50.54	-15.45	74	-38.91	125	180	Peak
18000	48.69	39.04	9.65	54	-5.31	102	118	Average
18000	60.34	50.69	9.65	74	-13.66	102	118	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2480 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

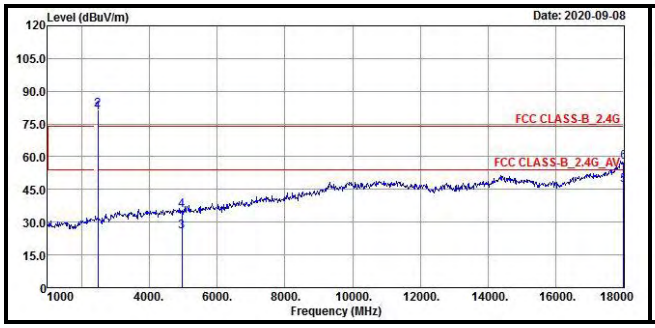


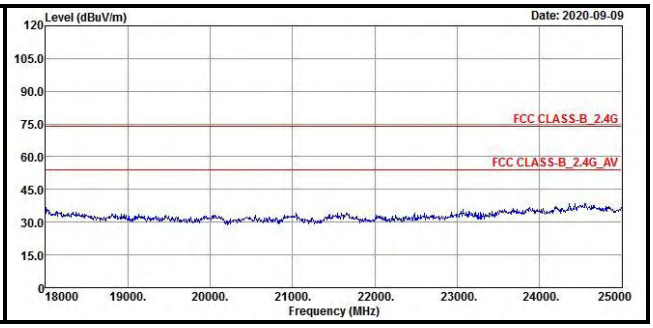
EUT Test Condition		Measurement Detail	
Channel	Channel 39	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2480	80.22	85.92	-5.7	------	------	202	279	Average
2480	81.64	87.34	-5.7	------	------	202	279	Peak
2483.5	36.1	41.8	-5.7	54	-17.9	202	279	Average
2483.5	45.96	51.66	-5.7	74	-28.04	202	279	Peak
4960	25.72	41.17	-15.45	54	-28.28	124	138	Average
4960	35.29	50.74	-15.45	74	-38.71	124	138	Peak
18000	46.92	37.27	9.65	54	-7.08	103	63	Average
18000	57.78	48.13	9.65	74	-16.22	103	63	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2480 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.





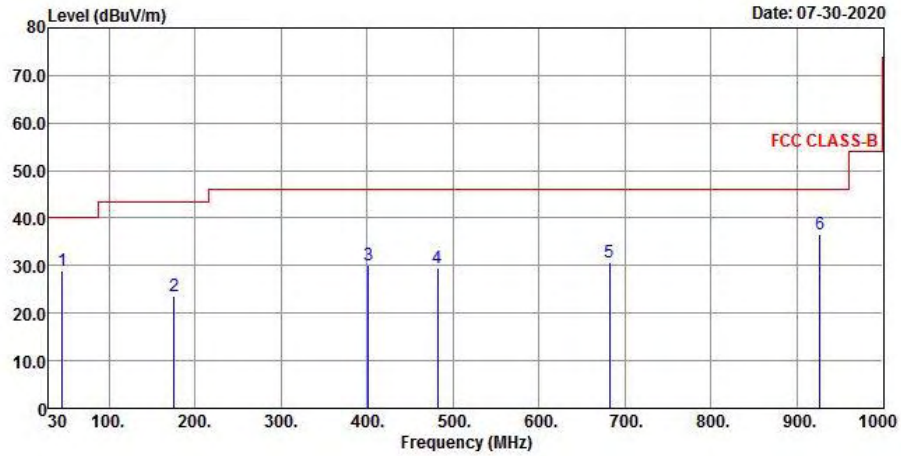
9 kHz ~ 30 MHz Data:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

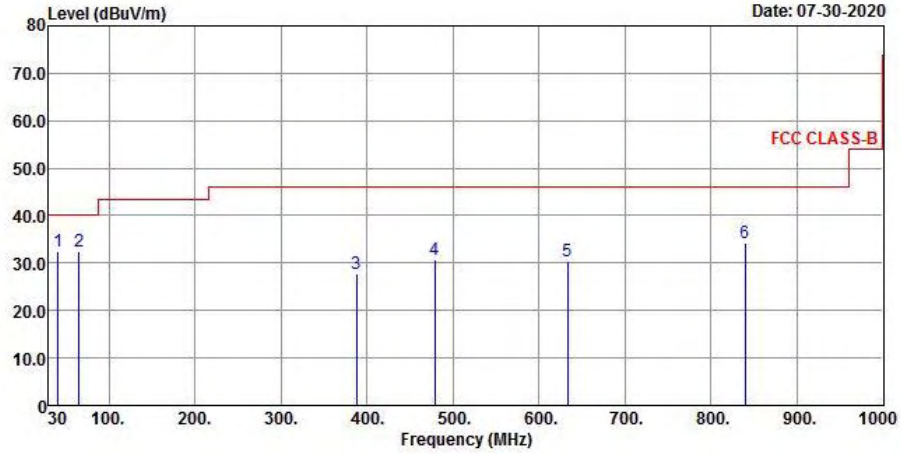
30 MHz ~ 1 GHz Worst-Case Data:

EUT Test Condition		Measurement Detail	
Channel	Channel 0	**Frequency Range**	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Horizontal



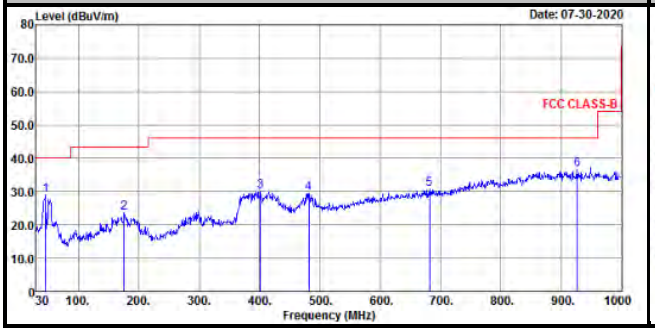
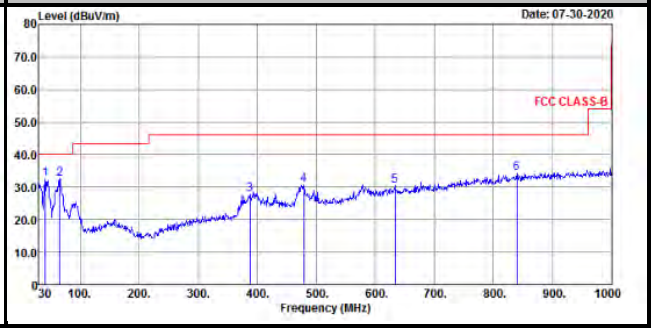
Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
45.52	28.93	40.71	-11.78	40	-11.07	165	111	QP
175.5	23.72	36.56	-12.84	43.5	-19.78	147	152	QP
401.51	30.2	38.52	-8.32	46	-15.8	195	285	QP
482.02	29.39	35.19	-5.8	46	-16.61	132	165	QP
681.84	30.61	31.6	-0.99	46	-15.39	102	285	QP
926.28	36.53	33.16	3.37	46	-9.47	147	152	QP
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
40.67	32.6	44.66	-12.06	40	-7.4	132	265	QP
64.92	32.56	45.82	-13.26	40	-7.44	147	152	QP
387.93	27.76	36.36	-8.6	46	-18.24	198	254	QP
479.11	30.74	36.57	-5.83	46	-15.26	102	231	QP
633.34	30.34	32.09	-1.75	46	-15.66	165	247	QP
839.95	34.12	31.73	2.39	46	-11.88	158	165	QP

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. The emission levels of other frequencies were very low against the limit.

Horizontal	Vertical
	

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 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESR3	102412	Feb. 17, 2020	Feb. 16, 2021
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 20, 2020	Jan. 19, 2021
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 13, 2019	Aug. 12, 2020
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2 (Conduction 2).
3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

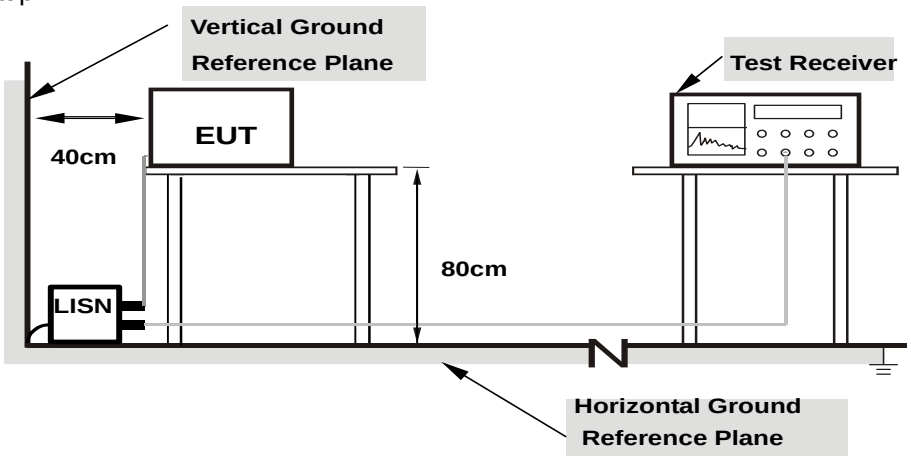
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.2.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. Set the EUT under transmission condition continuously at specific channel frequency.

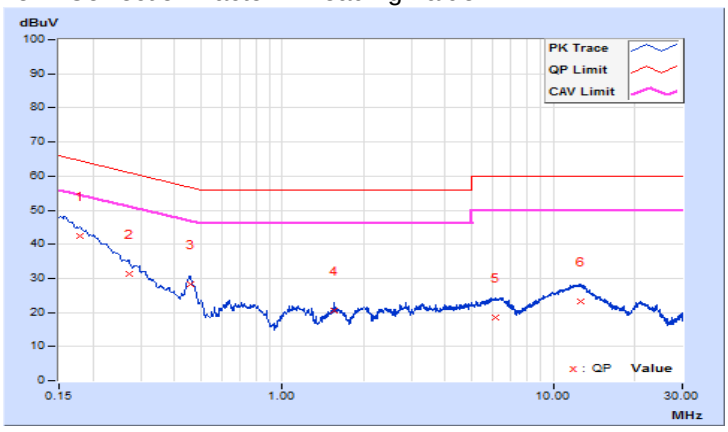
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Jisyong Wang	Test Date	2020/7/29

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	**0.17838**	**10.16**	**32.40**	**30.55**	**42.56**	**40.71**	**64.56**	**54.56**	**-22.00**	**-13.85**
2	0.27144	10.18	21.28	18.83	31.46	29.01	61.07	51.07	-29.61	-22.06
3	0.45600	10.21	18.02	11.22	28.23	21.43	56.77	46.77	-28.54	-25.34
4	1.55850	10.28	10.32	8.18	20.60	18.46	56.00	46.00	-35.40	-27.54
5	6.09000	10.42	8.04	4.74	18.46	15.16	60.00	50.00	-41.54	-34.84
6	12.57675	10.50	12.85	8.77	23.35	19.27	60.00	50.00	-36.65	-30.73

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

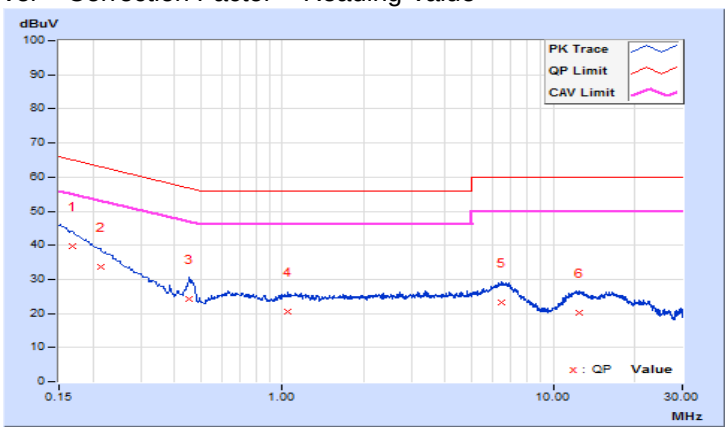


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Jisyong Wang	Test Date	2020/7/29

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	0.16743	10.12	29.68	20.75	39.80	30.87	65.09	55.09	-25.29	-24.22
2	0.21300	10.13	23.40	17.07	33.53	27.20	63.09	53.09	-29.56	-25.89
3	0.45304	10.19	13.89	6.44	24.08	16.63	56.82	46.82	-32.74	-30.19
4	1.05225	10.24	10.46	3.45	20.70	13.69	56.00	46.00	-35.30	-32.31
5	6.44775	10.46	12.71	6.88	23.17	17.34	60.00	50.00	-36.83	-32.66
6	12.43500	10.62	9.43	4.00	20.05	14.62	60.00	50.00	-39.95	-35.38

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

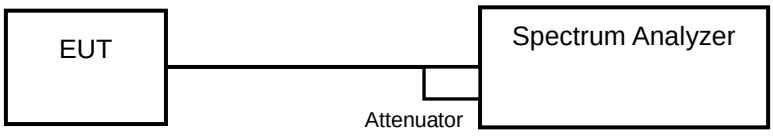


4.3 6 dB Bandwidth Measurement

4.3.1 Limits of 6 dB Bandwidth Measurement

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

4.3.5 Deviation from Test Standard

No deviation.

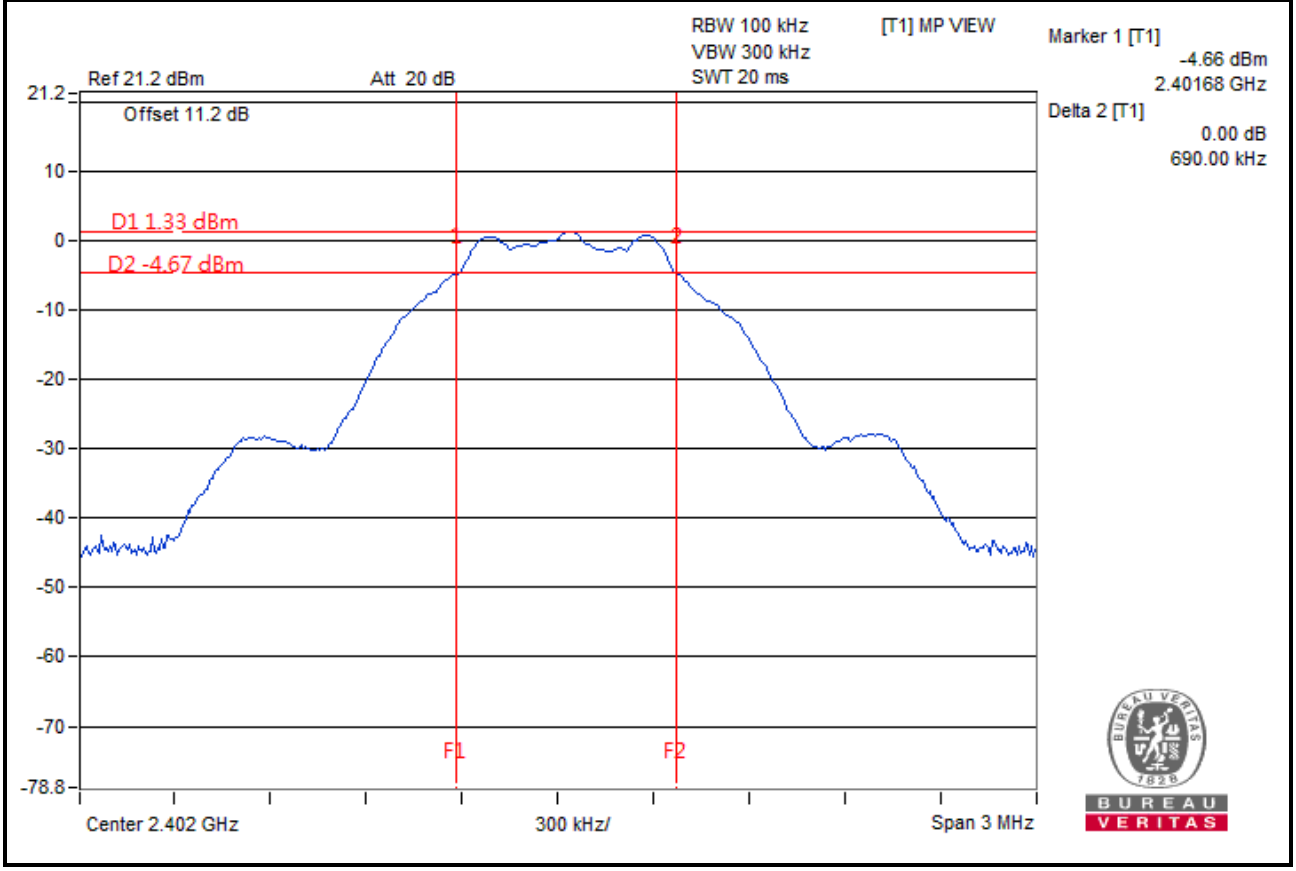
4.3.6 EUT Operating Conditions

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

4.3.7 Test Results

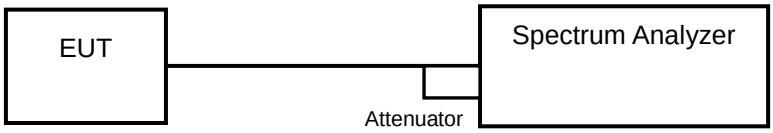
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.69	0.5	Pass
19	2440	0.69	0.5	Pass
39	2480	0.69	0.5	Pass

Spectrum Plot of Worst Value



4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 Deviation from Test Standard

No deviation.

4.4.5 EUT Operating Conditions

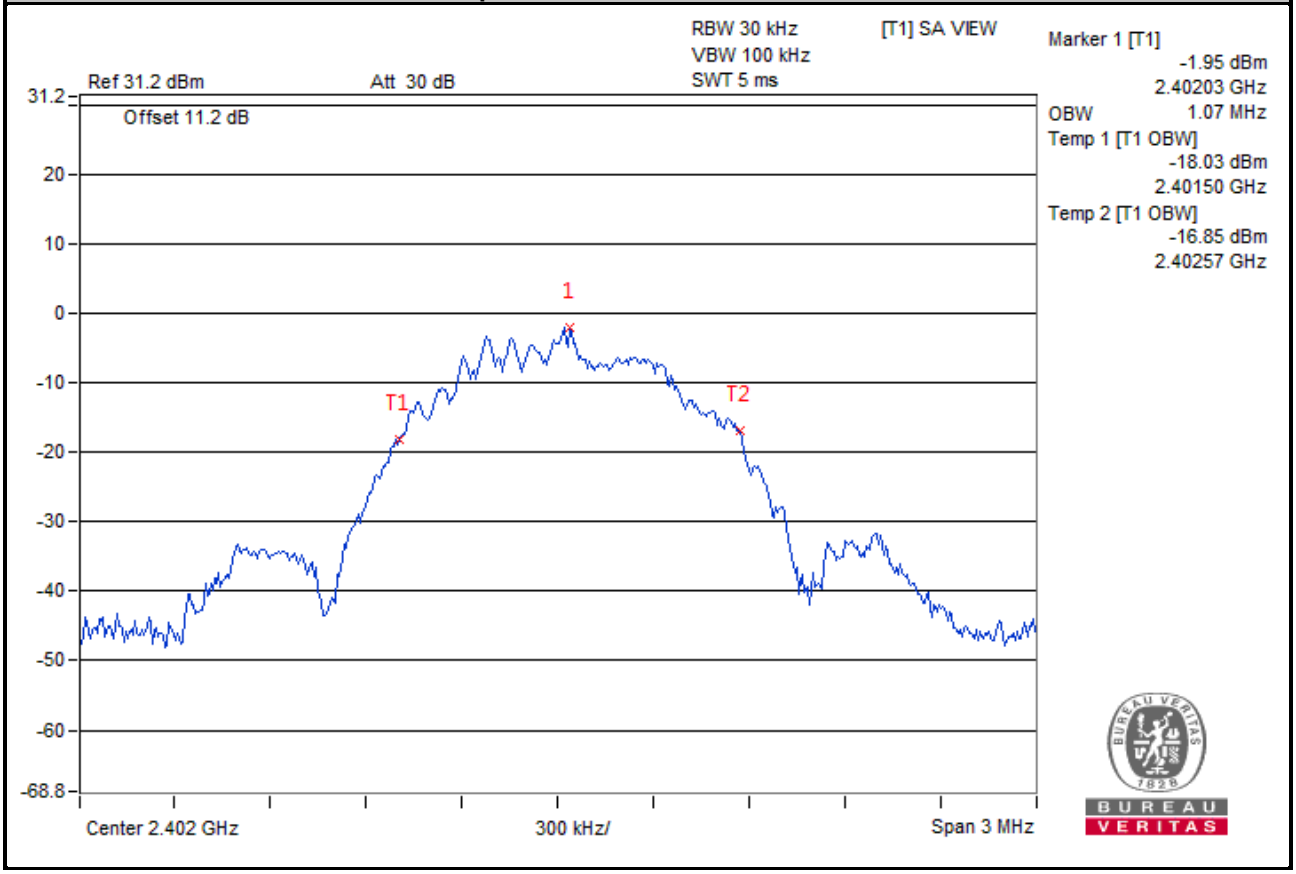
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.4.6 Test Results

<LE 4.0>

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
0	2402	1.07	Pass
19	2440	1.06	Pass
39	2480	1.06	Pass

Spectrum Plot of Worst Value

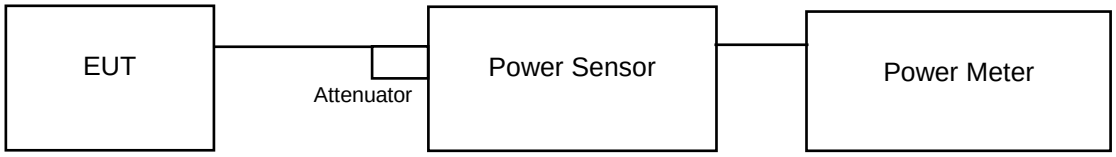


4.5 Conducted Output Power Measurement

4.5.1 Limits of Conducted Output Power Measurement

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

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 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

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

4.5.7 Test Results

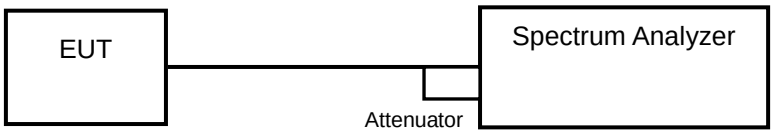
Channel	Freq. (MHz)	Peak Power		Average Power		Power Limit (mW)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
0	2402	1.702	2.31	1.542	1.88	1000	Pass
19	2440	1.718	2.35	1.567	1.95	1000	Pass
39	2480	1.629	2.12	1.496	1.75	1000	Pass

4.6 Power Spectral Density Measurement

4.6.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm / per 3kHz.

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

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 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × 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.

4.6.5 Deviation from Test Standard

No deviation.

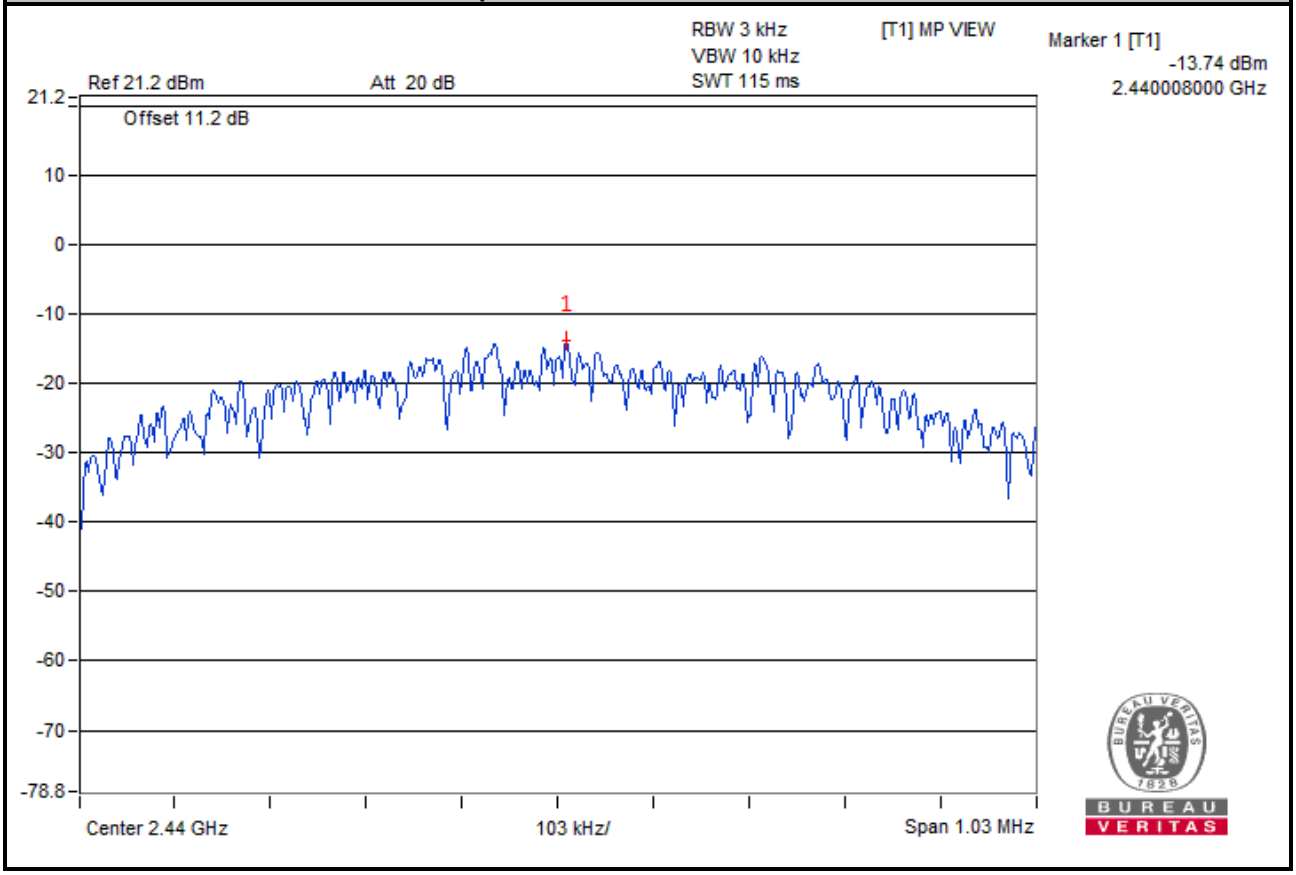
4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	2402	-13.79	8	Pass
19	2440	-13.74	8	Pass
39	2480	-14.09	8	Pass

Spectrum Plot of Worst Value

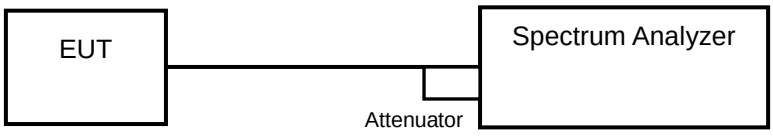


4.7 Conducted Out of Band Emission Measurement

4.7.1 Limits of Conducted Out of Band Emission Measurement

Below –20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 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 OOBE

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

4.7.5 Deviation from Test Standard

No deviation.

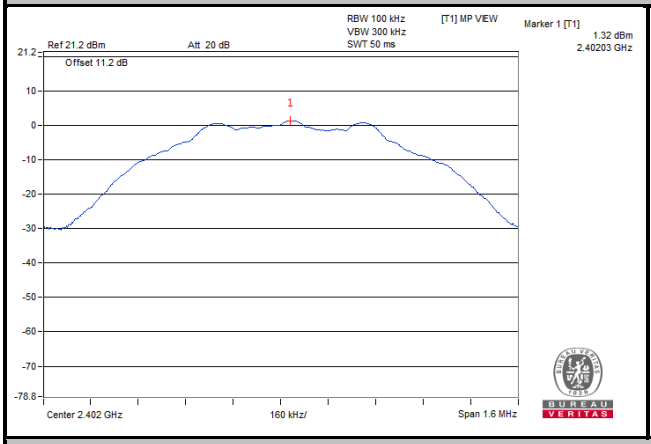
4.7.6 EUT Operating Condition

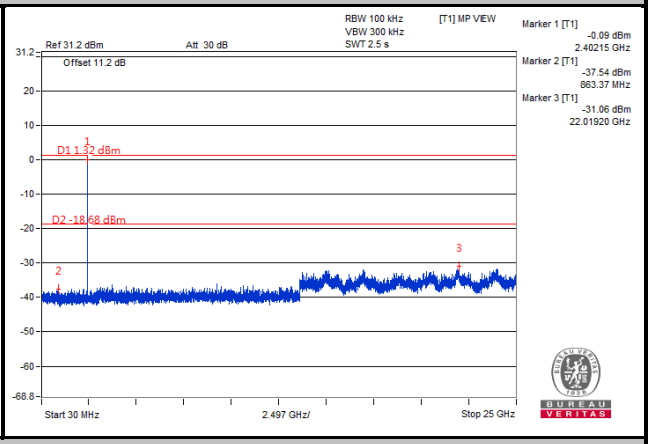
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

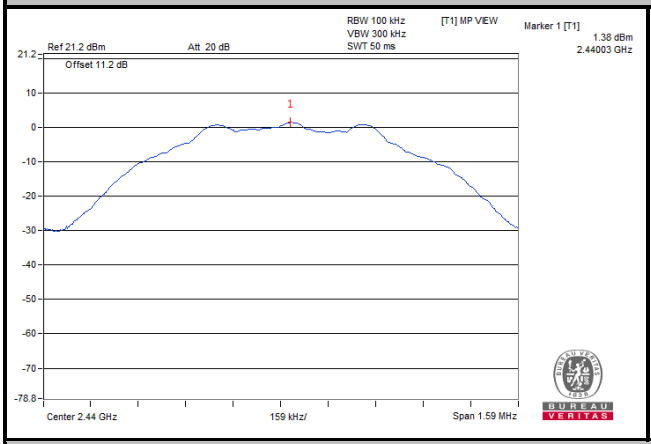
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20 dB offset below D1. It shows compliance with the requirement.

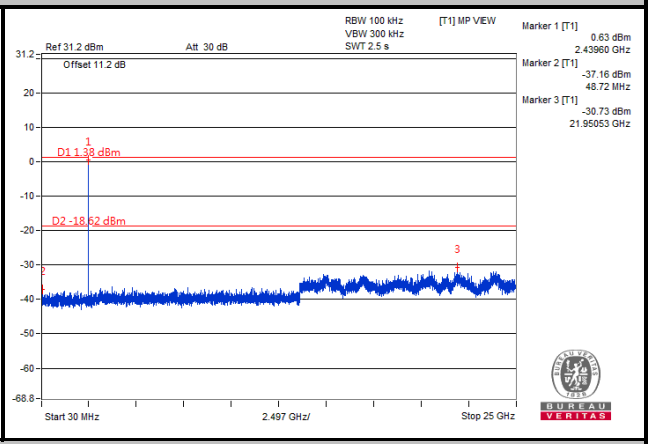
Ch 0



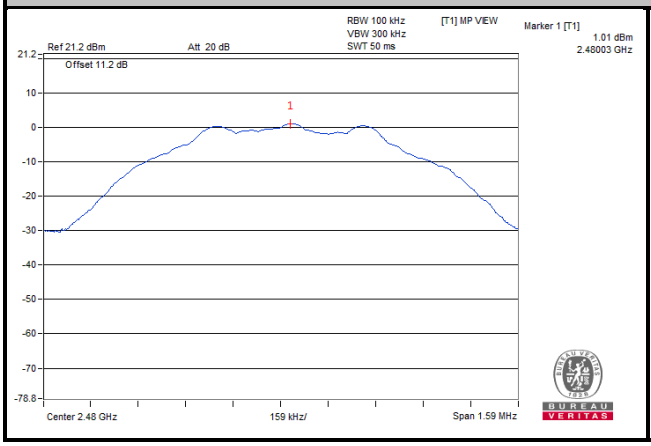


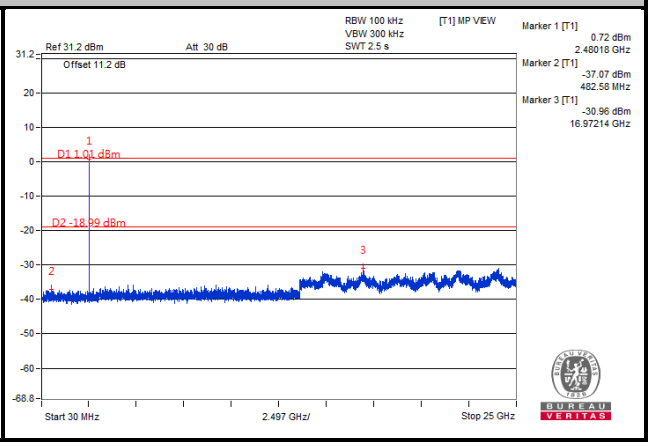
Ch 19

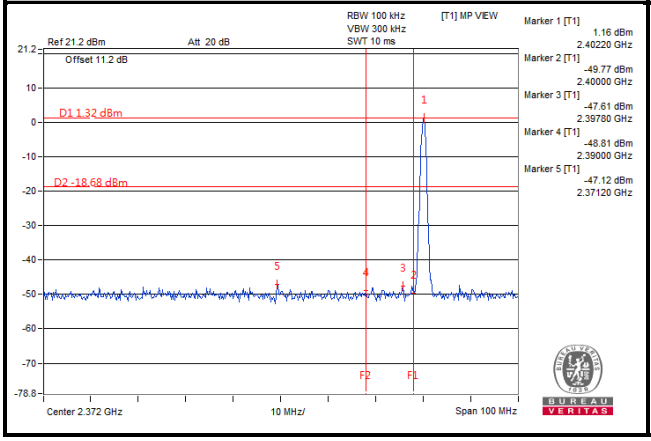
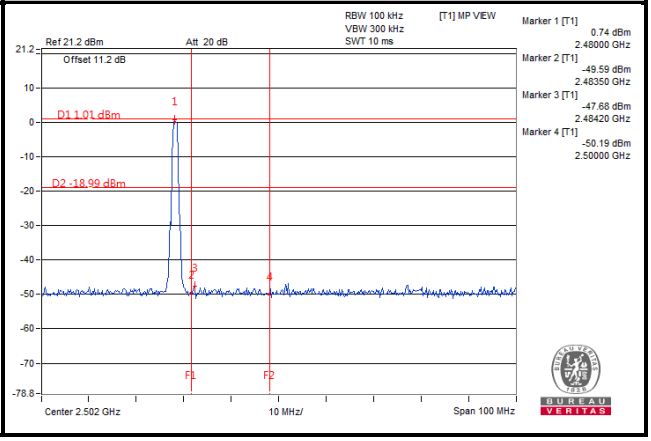




Ch 39





Ch 0 Band Edge	Ch 39 Band Edge
	

<WLAN>

4.8 Radiated Emission and Bandedge Measurement

4.8.1 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 20 dB 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 1000 MHz, 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 20 dB under any condition of modulation.

4.8.2 Test Instruments

Refer to section 4.1.2 to get information of the instrument.

4.8.3 Test Procedures

For Radiated Emission below 30 MHz

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 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:

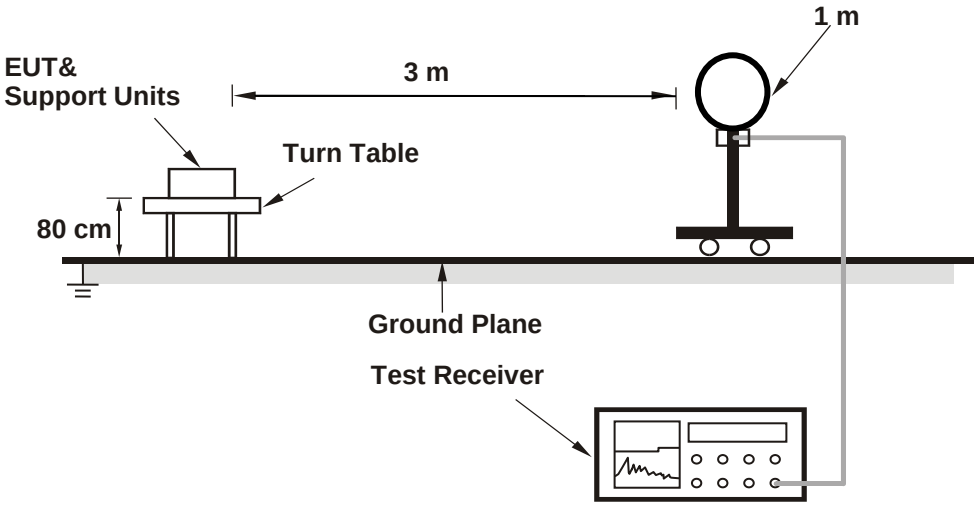
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz. (11b: RBW = 1 MHz, VBW = 200 Hz ; 11g: RBW = 1 MHz, VBW = 1 kHz ;
   11n (HT20): RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.8.4 Deviation from Test Standard

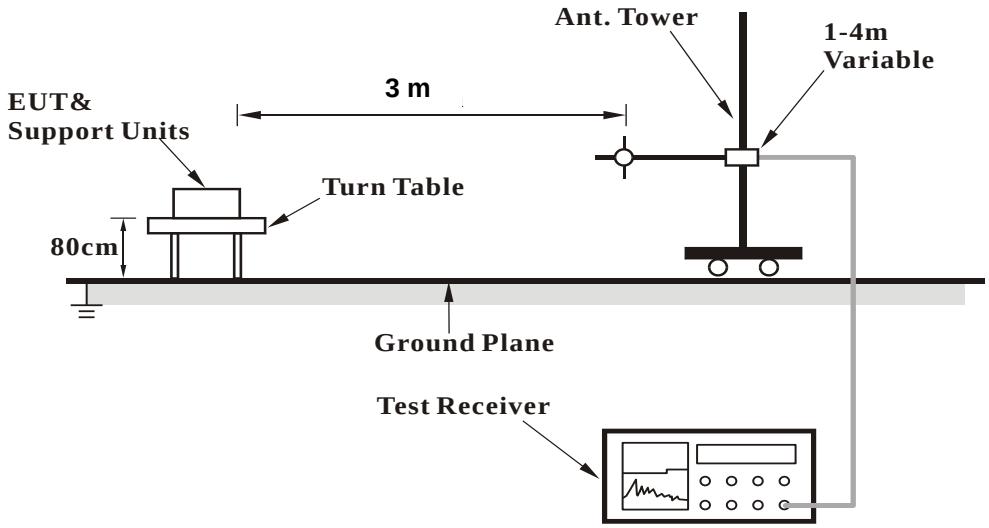
No deviation.

4.8.5 Test Set Up

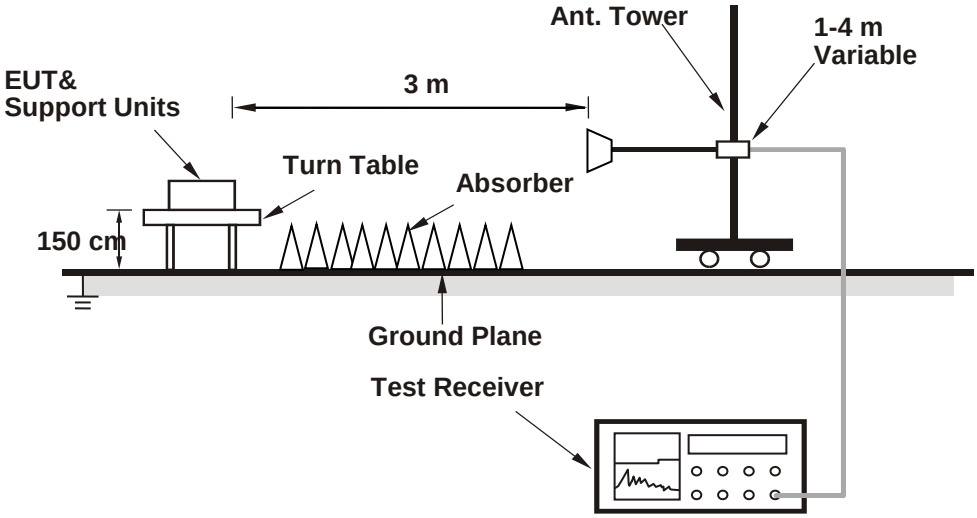
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.8.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.8.7 Test Results for Fundamental and Harmonic above 1GHz

Above 1 GHz Data：

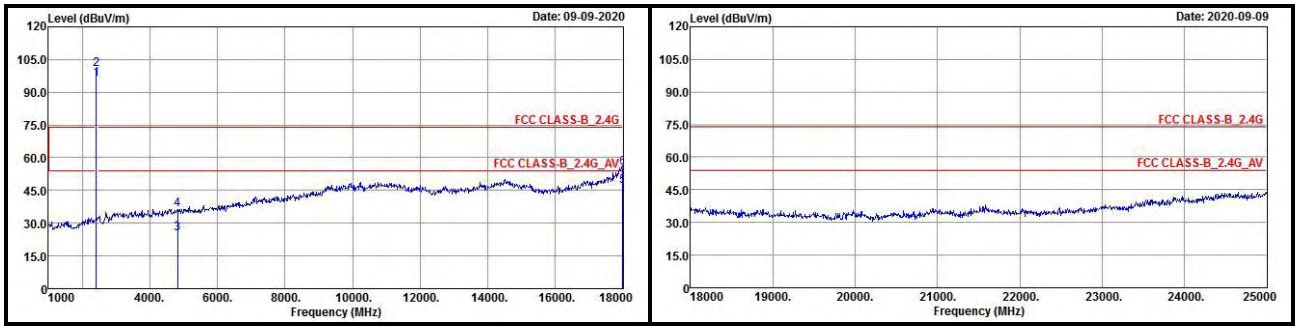
802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	37.35	43.27	-5.92	54	-16.65	102	353	Average
2390	46.23	52.15	-5.92	74	-27.77	102	353	Peak
2412	96.02	101.97	-5.95	------	------	102	353	Average
2412	100.34	106.29	-5.95	------	------	102	353	Peak
4824	25.4	41.02	-15.62	54	-28.6	154	253	Average
4824	36.33	51.95	-15.62	74	-37.67	154	253	Peak
18000	46.8	37.15	9.65	54	-7.2	174	231	Average
18000	55.5	45.85	9.65	74	-18.5	174	231	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

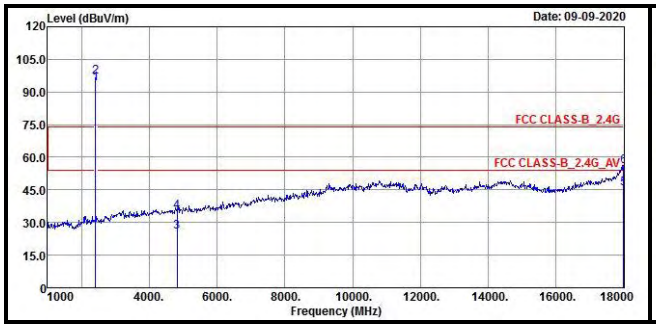


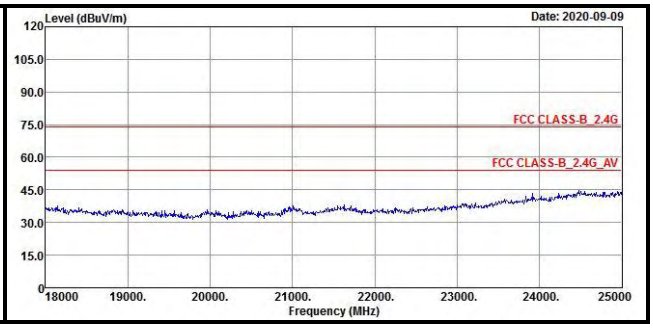
EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2387.622	37.04	42.93	-5.89	54	-16.96	262	300	Average
2387.622	47.34	53.23	-5.89	74	-26.66	262	300	Peak
2412	94.08	100.03	-5.95	------	------	262	300	Average
2412	97.19	103.14	-5.95	------	------	262	300	Peak
4824	25.54	41.16	-15.62	54	-28.46	162	285	Average
4824	34.85	50.47	-15.62	74	-39.15	162	285	Peak
18000	45.49	35.84	9.65	54	-8.51	155	264	Average
18000	55.66	46.01	9.65	74	-18.34	155	264	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



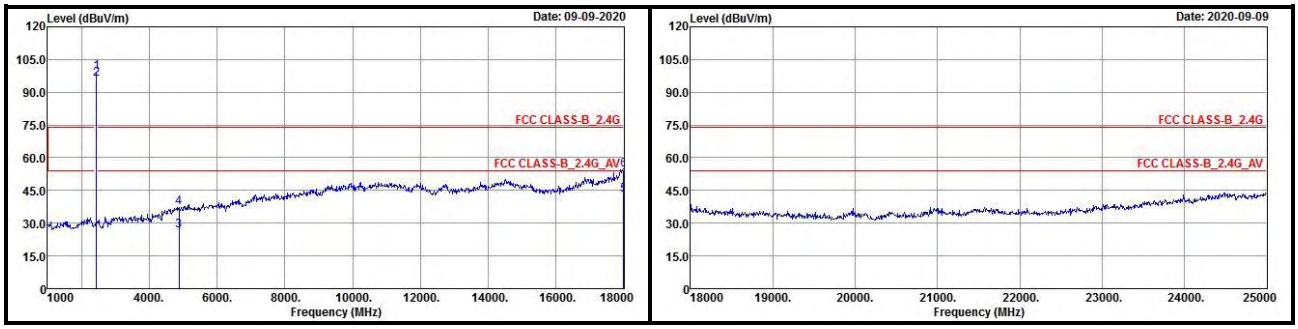


EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	37.07	42.99	-5.92	54	-16.93	101	352	Average
2390	46.66	52.58	-5.92	74	-27.34	101	352	Peak
2437	96.15	102.04	-5.89	------	------	101	352	Average
2437	99.02	104.91	-5.89	------	------	101	352	Peak
2483.5	38.08	43.78	-5.7	54	-15.92	101	352	Average
2483.5	47.06	52.76	-5.7	74	-26.94	101	352	Peak
4874	26.45	42.01	-15.56	54	-27.55	192	264	Average
4874	37.37	52.93	-15.56	74	-36.63	192	264	Peak
18000	42.8	33.15	9.65	54	-11.2	174	135	Average
18000	54.5	44.85	9.65	74	-19.5	174	135	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

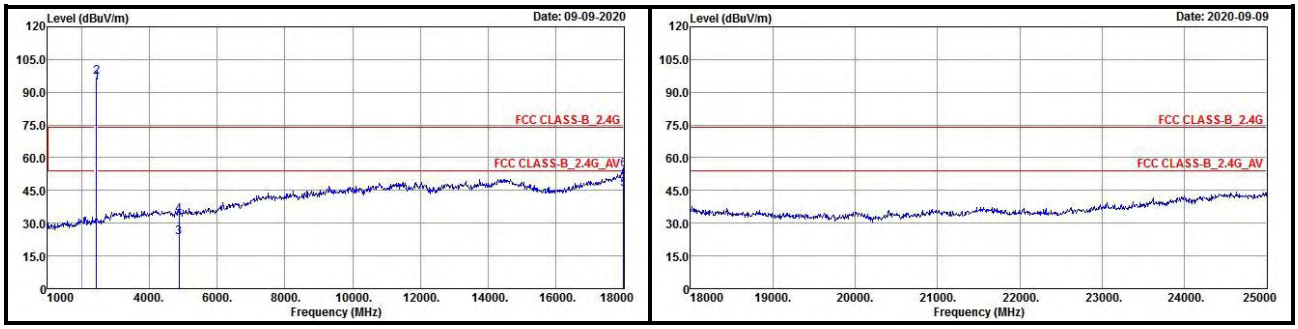


EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2361.11	36.62	42.45	-5.83	54	-17.38	263	326	Average
2361.11	46.41	52.24	-5.83	74	-27.59	263	326	Peak
2437	94.45	100.34	-5.89	------	------	263	326	Average
2437	97.05	102.94	-5.89	------	------	263	326	Peak
2483.5	37.12	42.82	-5.7	54	-16.88	263	326	Average
2483.5	47.21	52.91	-5.7	74	-26.79	263	326	Peak
4874	23.59	39.15	-15.56	54	-30.41	162	151	Average
4874	33.58	49.14	-15.56	74	-40.42	162	151	Peak
18000	45.8	36.15	9.65	54	-8.2	115	293	Average
18000	54.66	45.01	9.65	74	-19.34	115	293	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

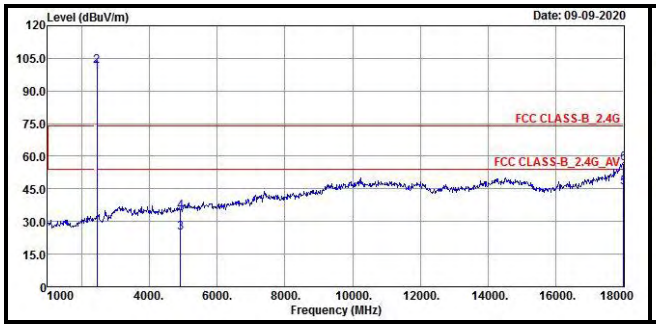


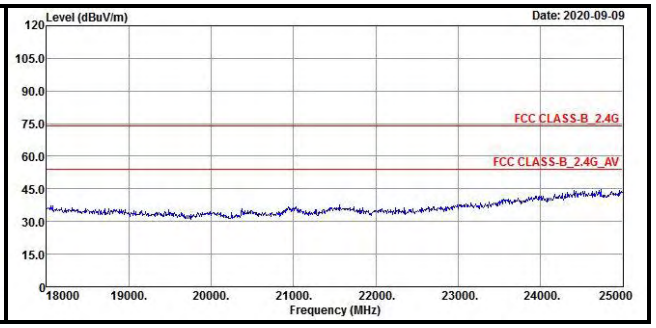
EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2462	98.58	104.39	-5.81	------	------	118	350	Average
2462	101.37	107.18	-5.81	------	------	118	350	Peak
2487.422	39.43	45.13	-5.7	54	-14.57	118	350	Average
2487.422	48.08	53.78	-5.7	74	-25.92	118	350	Peak
4924	24.64	40.15	-15.51	54	-29.36	132	162	Average
4924	34.73	50.24	-15.51	74	-39.27	132	162	Peak
18000	45.81	36.16	9.65	54	-8.19	134	115	Average
18000	56.5	46.85	9.65	74	-17.5	134	115	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



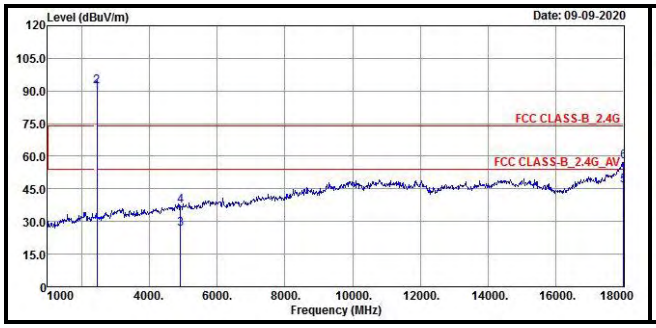


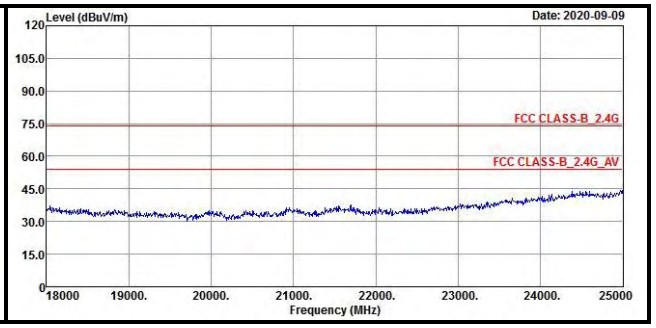
EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2462	89.32	95.13	-5.81	------	------	258	337	Average
2462	91.94	97.75	-5.81	------	------	258	337	Peak
2483.5	36.71	42.41	-5.7	54	-17.29	258	337	Average
2483.5	47.12	52.82	-5.7	74	-26.88	258	337	Peak
4924	26.64	42.15	-15.51	54	-27.36	147	132	Average
4924	37	52.51	-15.51	74	-37	147	132	Peak
18000	46.7	37.05	9.65	54	-7.3	174	165	Average
18000	57.66	48.01	9.65	74	-16.34	174	165	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



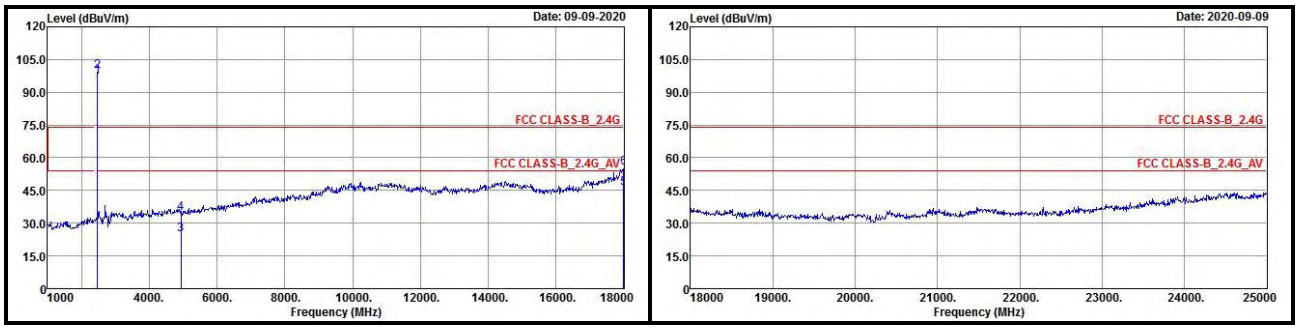


EUT Test Condition		Measurement Detail	
Channel	Channel 12	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2467	96.89	102.61	-5.72	------	------	119	353	Average
2467	99.75	105.47	-5.72	------	------	119	353	Peak
2483.5	46.18	51.88	-5.7	54	-7.82	119	353	Average
2483.5	53.16	58.86	-5.7	74	-20.84	119	353	Peak
4934	24.65	40.16	-15.51	54	-29.35	105	132	Average
4934	34.73	50.24	-15.51	74	-39.27	105	132	Peak
18000	46.07	36.42	9.65	54	-7.93	154	135	Average
18000	55.2	45.55	9.65	74	-18.8	154	135	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

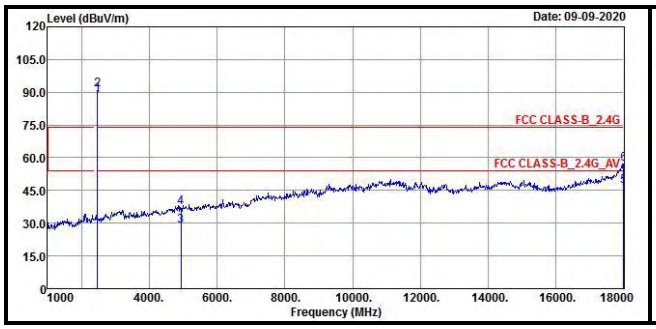


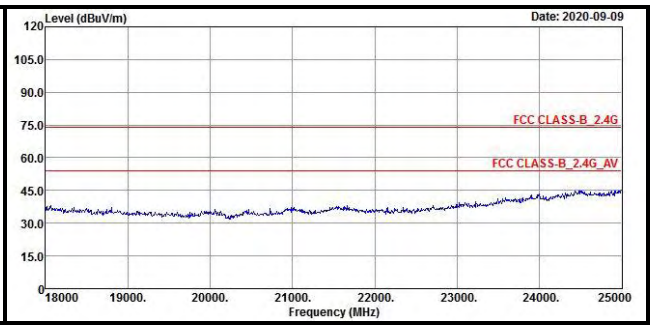
EUT Test Condition		Measurement Detail	
Channel	Channel 12	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2467	88.53	94.25	-5.72	------	------	254	334	Average
2467	91.03	96.75	-5.72	------	------	254	334	Peak
2483.5	39.9	45.6	-5.7	54	-14.1	254	334	Average
2483.5	47.89	53.59	-5.7	74	-26.11	254	334	Peak
4934	28.64	44.15	-15.51	54	-25.36	147	162	Average
4934	37	52.51	-15.51	74	-37	147	162	Peak
18000	46.8	37.15	9.65	54	-7.2	151	174	Average
18000	56.91	47.26	9.65	74	-17.09	151	174	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



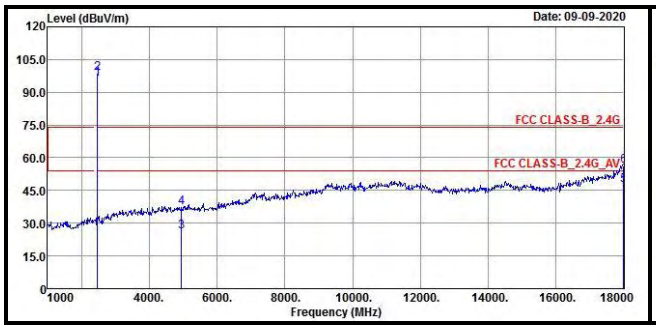


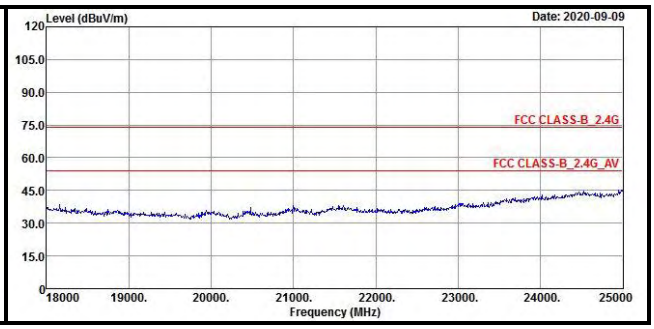
EUT Test Condition		Measurement Detail	
Channel	Channel 13	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2472	96.21	101.92	-5.71	------	------	117	351	Average
2472	98.78	104.49	-5.71	------	------	117	351	Peak
2486.738	51.18	56.88	-5.7	54	-2.82	117	351	Average
2486.738	55.14	60.84	-5.7	74	-18.86	117	351	Peak
4944	26.05	41.54	-15.49	54	-27.95	145	152	Average
4944	37.38	52.87	-15.49	74	-36.62	145	152	Peak
18000	47.3	37.65	9.65	54	-6.7	134	214	Average
18000	56.2	46.55	9.65	74	-17.8	134	214	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



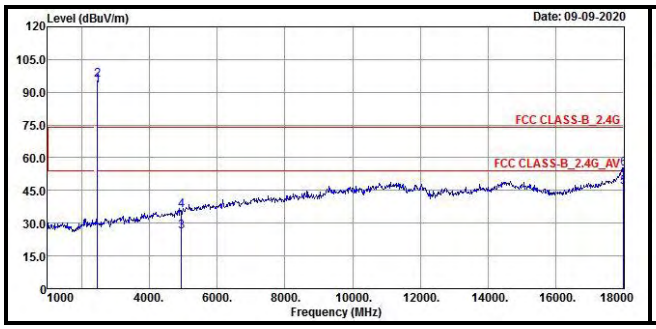


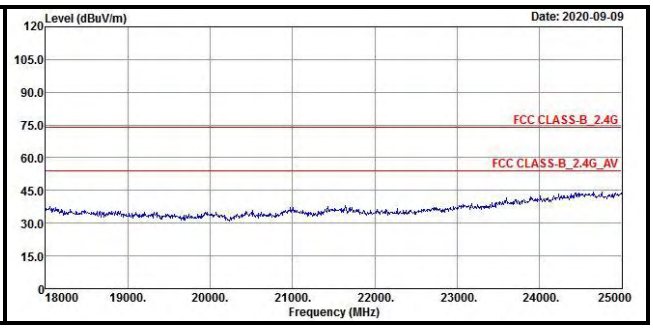
EUT Test Condition		Measurement Detail	
Channel	Channel 13	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2472	92.91	98.62	-5.71	------	------	253	336	Average
2472	95.61	101.32	-5.71	------	------	253	336	Peak
2486.51	47.96	53.66	-5.7	54	-6.04	253	336	Average
2486.51	52.81	58.51	-5.7	74	-21.19	253	336	Peak
4944	26.04	41.53	-15.49	54	-27.96	132	265	Average
4944	35.65	51.14	-15.49	74	-38.35	132	265	Peak
18000	46.67	37.02	9.65	54	-7.33	142	120	Average
18000	54.7	45.05	9.65	74	-19.3	142	120	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.





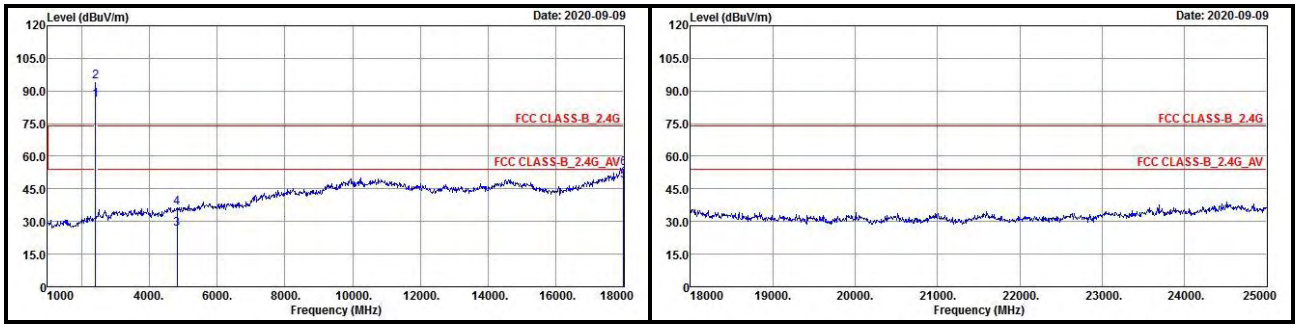
802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	36.77	42.69	-5.92	54	-17.23	301	8	Average
2390	46.33	52.25	-5.92	74	-27.67	301	8	Peak
2412	85.97	91.92	-5.95	------	------	301	8	Average
2412	94.14	100.09	-5.95	------	------	301	8	Peak
4824	26.45	42.07	-15.62	54	-27.55	103	121	Average
4824	36.33	51.95	-15.62	74	-37.67	103	121	Peak
18000	48.58	38.93	9.65	54	-5.42	113	102	Average
18000	54.5	44.85	9.65	74	-19.5	113	102	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

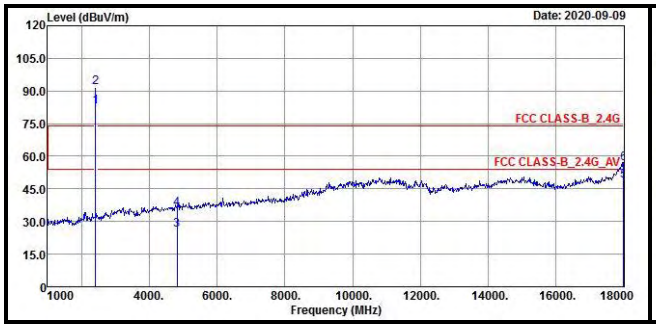


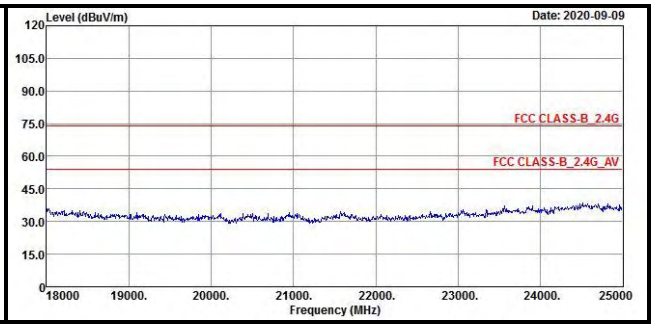
EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	36.49	42.41	-5.92	54	-17.51	118	284	Average
2390	46.23	52.15	-5.92	74	-27.77	118	284	Peak
2412	83.01	88.96	-5.95	------	------	118	284	Average
2412	91.79	97.74	-5.95	------	------	118	284	Peak
4825	26.16	41.77	-15.61	54	-27.84	163	247	Average
4825	35.85	51.46	-15.61	74	-38.15	163	247	Peak
18000	48.82	39.17	9.65	54	-5.18	106	188	Average
18000	56.66	47.01	9.65	74	-17.34	106	188	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



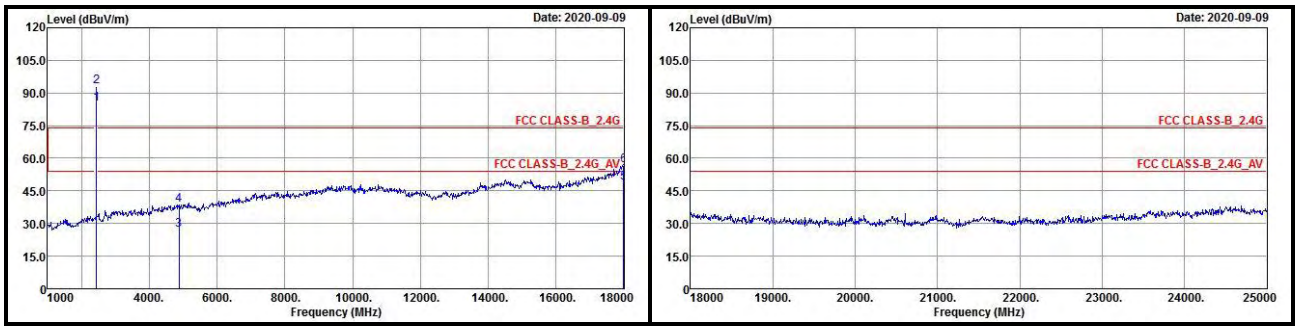


EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	36.7	42.62	-5.92	54	-17.3	241	9	Average
2390	46.66	52.58	-5.92	74	-27.34	241	9	Peak
2437	85.09	90.98	-5.89	------	------	241	9	Average
2437	93.1	98.99	-5.89	------	------	241	9	Peak
2483.5	37.47	43.17	-5.7	54	-16.53	241	9	Average
2483.5	46.52	52.22	-5.7	74	-27.48	241	9	Peak
4874	26.83	42.39	-15.56	54	-27.17	115	121	Average
4874	38.37	53.93	-15.56	74	-35.63	115	121	Peak
18000	48.73	39.08	9.65	54	-5.27	163	307	Average
18000	56.5	46.85	9.65	74	-17.5	163	307	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

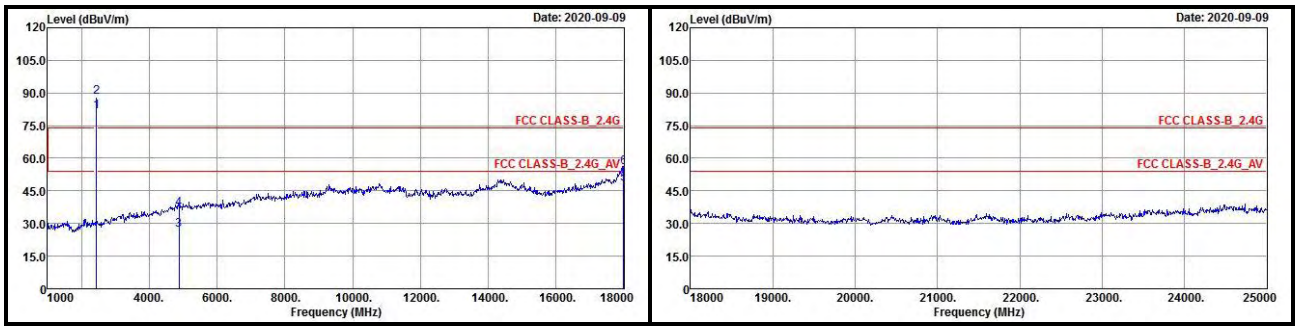


EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	36.6	42.52	-5.92	54	-17.4	110	281	Average
2390	46.16	52.08	-5.92	74	-27.84	110	281	Peak
2437	81.44	87.33	-5.89	------	------	110	281	Average
2437	88.13	94.02	-5.89	------	------	110	281	Peak
2483.5	36.51	42.21	-5.7	54	-17.49	110	281	Average
2483.5	45.57	51.27	-5.7	74	-28.43	110	281	Peak
4874	26.98	42.54	-15.56	54	-27.02	102	109	Average
4874	36.58	52.14	-15.56	74	-37.42	102	109	Peak
18000	48.28	38.63	9.65	54	-5.72	101	37	Average
18000	55.66	46.01	9.65	74	-18.34	101	37	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

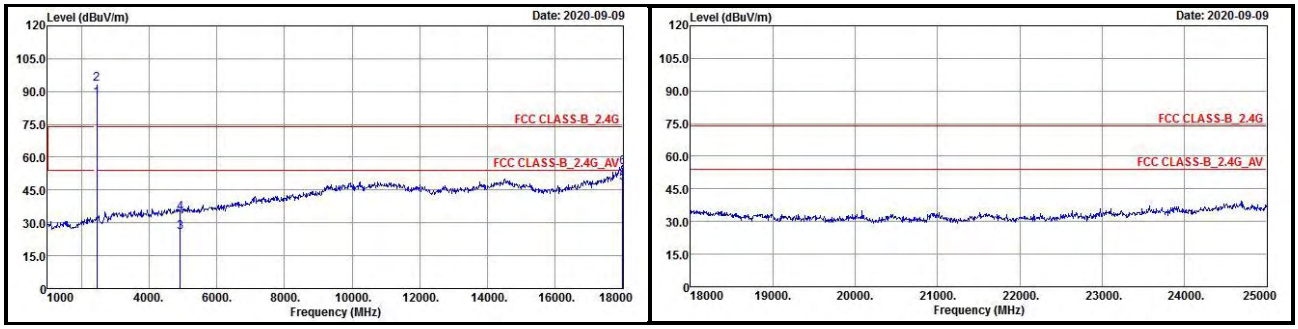


EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2462	86.66	92.47	-5.81	------	------	265	5	Average
2462	93.56	99.37	-5.81	------	------	265	5	Peak
2483.5	38.95	44.65	-5.7	54	-15.05	265	5	Average
2483.5	51.56	57.26	-5.7	74	-22.44	265	5	Peak
4924	25.56	41.07	-15.51	54	-28.44	118	163	Average
4924	34.73	50.24	-15.51	74	-39.27	118	163	Peak
18000	48.41	38.76	9.65	54	-5.59	133	166	Average
18000	55.5	45.85	9.65	74	-18.5	133	166	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

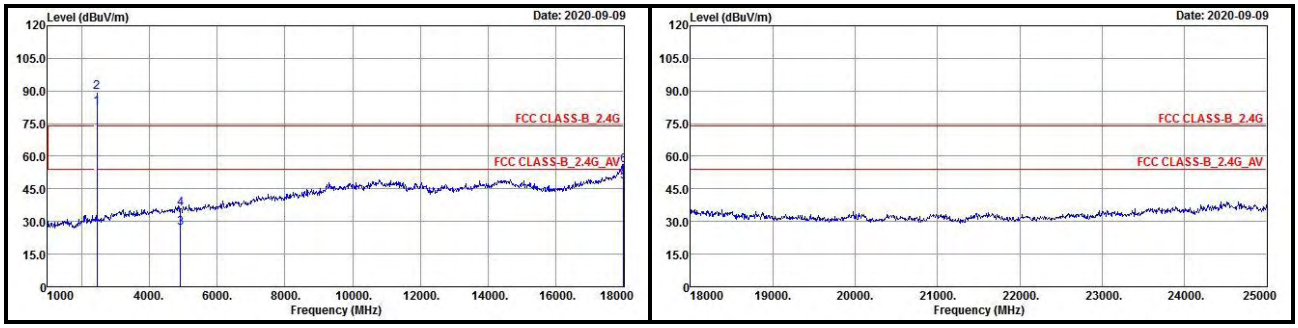


EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2462	82.16	87.97	-5.81	------	------	145	290	Average
2462	89.48	95.29	-5.81	------	------	145	290	Peak
2483.5	36.91	42.61	-5.7	54	-17.09	145	290	Average
2483.5	48.14	53.84	-5.7	74	-25.86	145	290	Peak
4924	26.94	42.45	-15.51	54	-27.06	104	63	Average
4924	36	51.51	-15.51	74	-38	104	63	Peak
18000	48.36	38.71	9.65	54	-5.64	211	158	Average
18000	55.66	46.01	9.65	74	-18.34	211	158	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

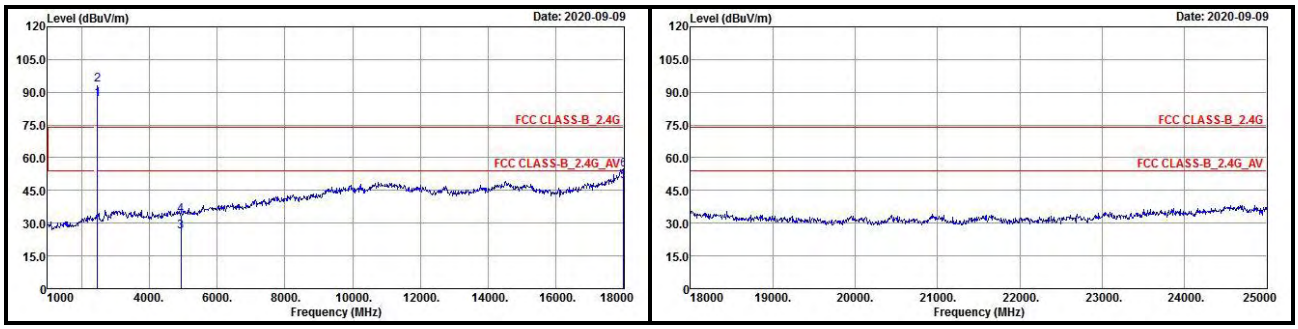


EUT Test Condition		Measurement Detail	
Channel	Channel 12	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2467	86.65	92.37	-5.72	------	------	165	6	Average
2467	93.22	98.94	-5.72	------	------	165	6	Peak
2483.5	44.63	50.33	-5.7	54	-9.37	165	6	Average
2483.5	59.21	64.91	-5.7	74	-14.79	165	6	Peak
4934	26.06	41.57	-15.51	54	-27.94	138	12	Average
4934	33.73	49.24	-15.51	74	-40.27	138	12	Peak
18000	49.29	39.64	9.65	54	-4.71	100	166	Average
18000	54.5	44.85	9.65	74	-19.5	100	166	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

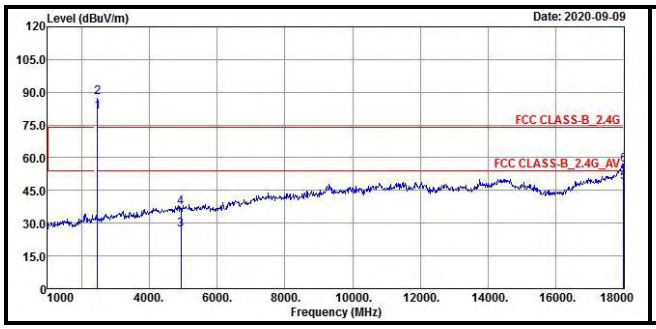


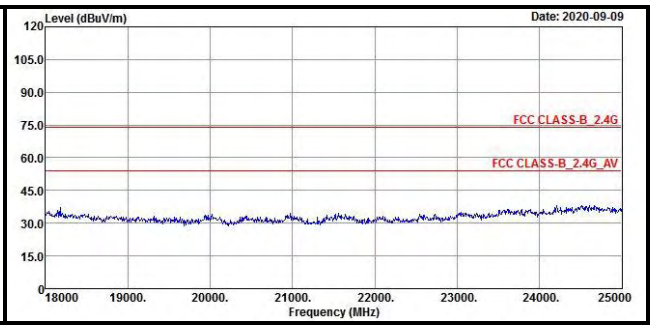
EUT Test Condition		Measurement Detail	
Channel	Channel 12	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2467	81.16	86.88	-5.72	------	------	126	290	Average
2467	87.71	93.43	-5.72	------	------	126	290	Peak
2483.5	40	45.7	-5.7	54	-14	126	290	Average
2483.5	55.37	61.07	-5.7	74	-18.63	126	290	Peak
4934	27.08	42.59	-15.51	54	-26.92	126	301	Average
4934	37	52.51	-15.51	74	-37	126	301	Peak
18000	48.72	39.07	9.65	54	-5.28	101	322	Average
18000	56.66	47.01	9.65	74	-17.34	101	322	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



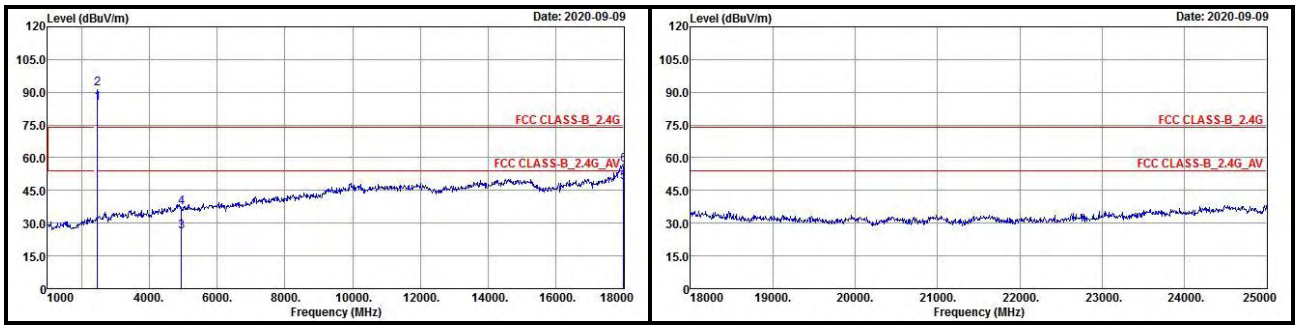


EUT Test Condition		Measurement Detail	
Channel	Channel 13	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2472	84.97	90.68	-5.71	------	------	325	8	Average
2472	91.62	97.33	-5.71	------	------	325	8	Peak
2483.5	53.2	58.9	-5.7	54	-0.8	325	8	Average
2483.5	67.11	72.81	-5.7	74	-6.89	325	8	Peak
4944	25.94	41.43	-15.49	54	-28.06	100	139	Average
4944	37.38	52.87	-15.49	74	-36.62	100	139	Peak
18000	48.86	39.21	9.65	54	-5.14	101	173	Average
18000	56.5	46.85	9.65	74	-17.5	101	173	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

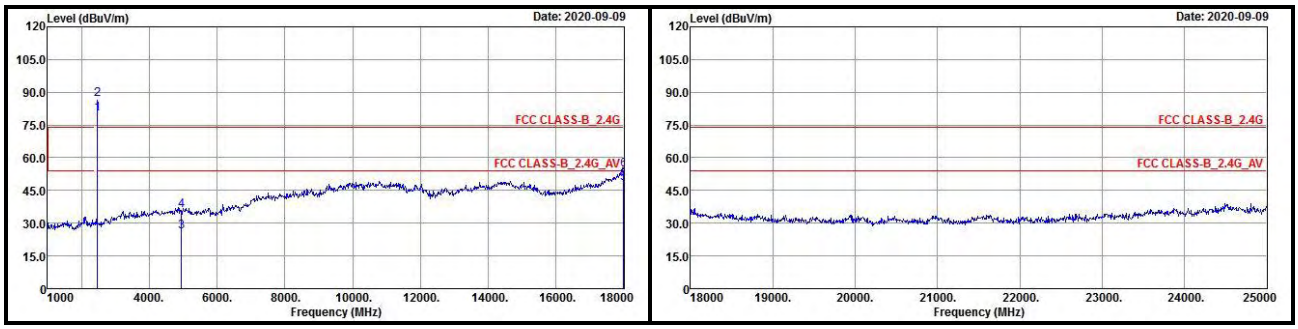


EUT Test Condition		Measurement Detail	
Channel	Channel 13	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2472	80.23	85.94	-5.71	------	------	127	290	Average
2472	86.88	92.59	-5.71	------	------	127	290	Peak
2483.5	48.07	53.77	-5.7	54	-5.93	127	290	Average
2483.5	61.09	66.79	-5.7	74	-12.91	127	290	Peak
4944	26.04	41.53	-15.49	54	-27.96	115	209	Average
4944	35.65	51.14	-15.49	74	-38.35	115	209	Peak
18000	48.41	38.76	9.65	54	-5.59	101	194	Average
18000	54.66	45.01	9.65	74	-19.34	101	194	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



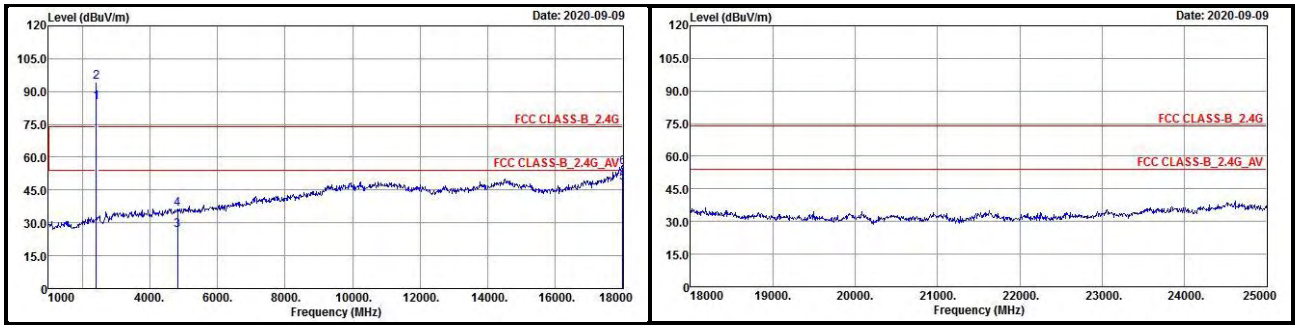
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	35.64	41.56	-5.92	54	-18.36	194	38	Average
2390	51.82	57.74	-5.92	74	-22.18	194	38	Peak
2412	84.89	90.84	-5.95	------	------	194	38	Average
2412	94.49	100.44	-5.95	------	------	194	38	Peak
4824	26.57	42.19	-15.62	54	-27.43	109	78	Average
4824	36.33	51.95	-15.62	74	-37.67	109	78	Peak
18000	48.37	38.72	9.65	54	-5.63	112	136	Average
18000	55.5	45.85	9.65	74	-18.5	112	136	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

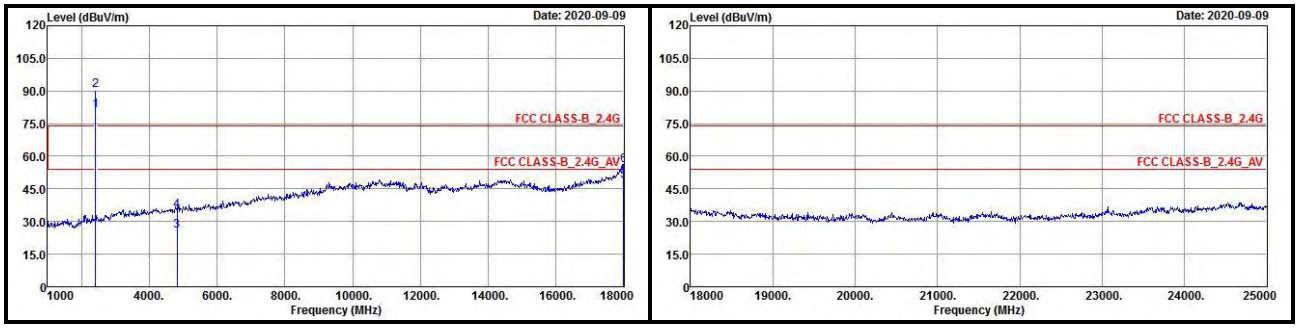


EUT Test Condition		Measurement Detail	
Channel	Channel 1	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	34.67	40.59	-5.92	54	-19.33	117	285	Average
2390	48.36	54.28	-5.92	74	-25.64	117	285	Peak
2412	80.88	86.83	-5.95	------	------	117	285	Average
2412	90.37	96.32	-5.95	------	------	117	285	Peak
4824	25.49	41.11	-15.62	54	-28.51	122	163	Average
4824	34.85	50.47	-15.62	74	-39.15	122	163	Peak
18000	48.56	38.91	9.65	54	-5.44	136	245	Average
18000	55.66	46.01	9.65	74	-18.34	136	245	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

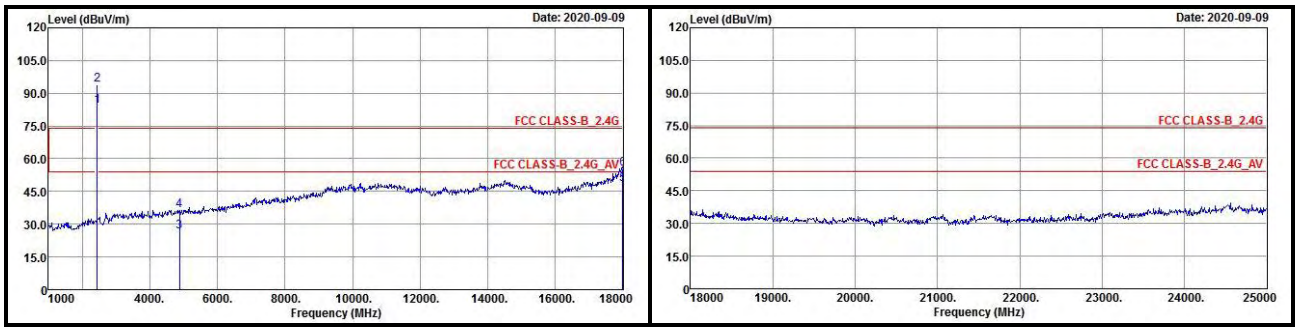


EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	35	40.92	-5.92	54	-19	224	36	Average
2390	46.59	52.51	-5.92	74	-27.41	224	36	Peak
2437	84.23	90.12	-5.89	------	------	224	36	Average
2437	94.05	99.94	-5.89	------	------	224	36	Peak
2483.5	36.49	42.19	-5.7	54	-17.51	224	36	Average
2483.5	47.46	53.16	-5.7	74	-26.54	224	36	Peak
4874	26.56	42.12	-15.56	54	-27.44	154	126	Average
4874	36.37	51.93	-15.56	74	-37.63	154	126	Peak
18000	48.32	38.67	9.65	54	-5.68	139	202	Average
18000	55.5	45.85	9.65	74	-18.5	139	202	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

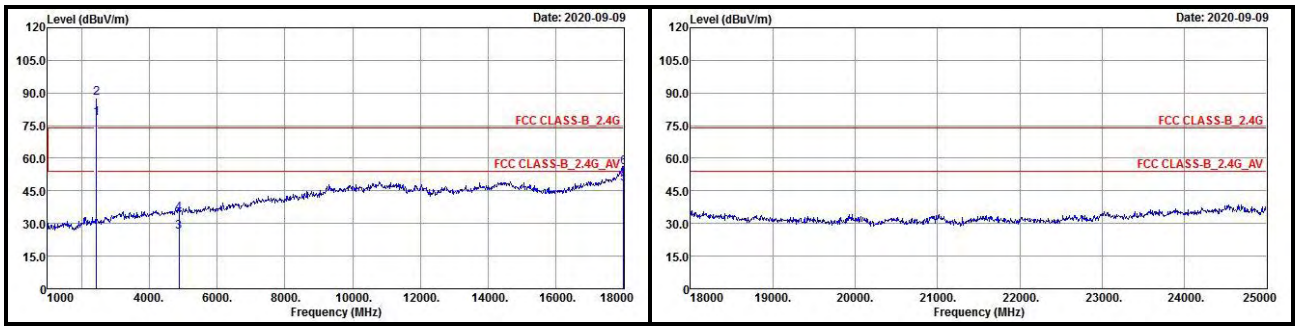


EUT Test Condition		Measurement Detail	
Channel	Channel 6	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2390	33.94	39.86	-5.92	54	-20.06	105	284	Average
2390	46.02	51.94	-5.92	74	-27.98	105	284	Peak
2437	78.29	84.18	-5.89	------	------	105	284	Average
2437	87.62	93.51	-5.89	------	------	105	284	Peak
2483.5	34.32	40.02	-5.7	54	-19.68	105	284	Average
2483.5	45.88	51.58	-5.7	74	-28.12	105	284	Peak
4874	26.13	41.69	-15.56	54	-27.87	105	24	Average
4874	34.58	50.14	-15.56	74	-39.42	105	24	Peak
18000	48.31	38.66	9.65	54	-5.69	131	165	Average
18000	55.66	46.01	9.65	74	-18.34	131	165	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

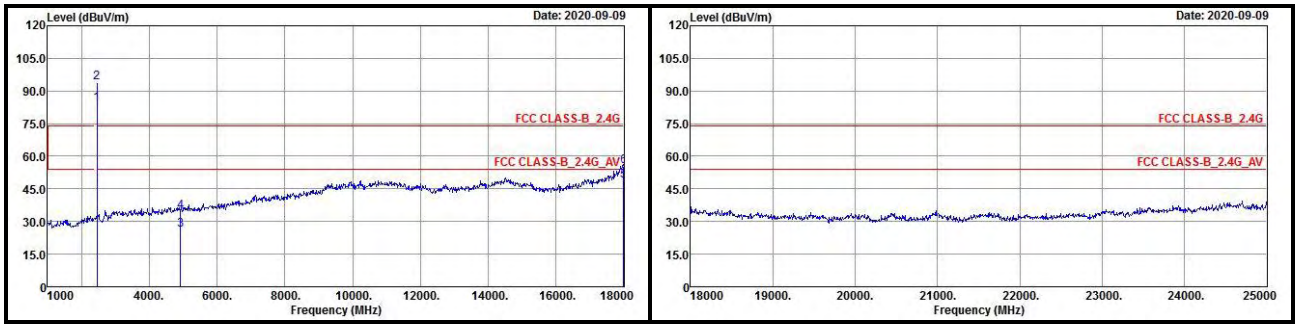


EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2462	84.08	89.89	-5.81	------	------	189	36	Average
2462	93.81	99.62	-5.81	------	------	189	36	Peak
2483.5	37.1	42.8	-5.7	54	-16.9	189	36	Average
2483.5	55.58	61.28	-5.7	74	-18.42	189	36	Peak
4924	26.01	41.52	-15.51	54	-27.99	106	358	Average
4924	34.73	50.24	-15.51	74	-39.27	106	358	Peak
18000	48.78	39.13	9.65	54	-5.22	100	42	Average
18000	55.5	45.85	9.65	74	-18.5	100	42	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

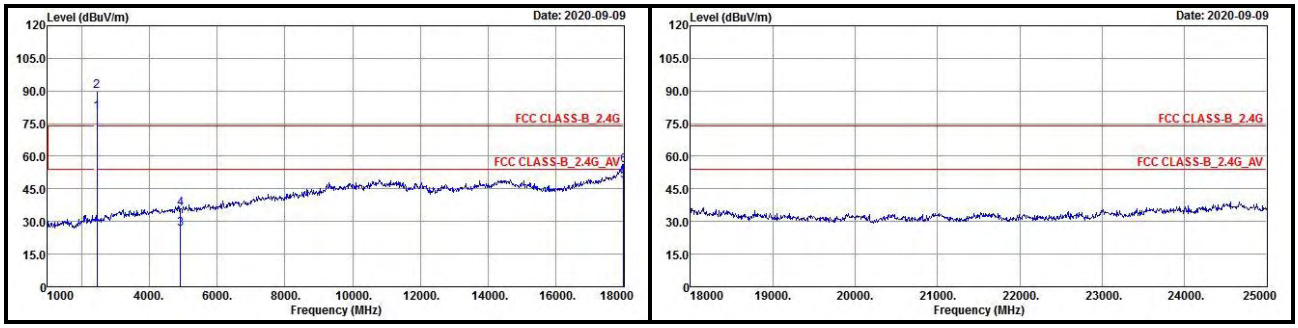


EUT Test Condition		Measurement Detail	
Channel	Channel 11	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2462	79.97	85.78	-5.81	------	------	140	289	Average
2462	89.96	95.77	-5.81	------	------	140	289	Peak
2483.5	34.9	40.6	-5.7	54	-19.1	140	289	Average
2483.5	50.21	55.91	-5.7	74	-23.79	140	289	Peak
4924	26.79	42.3	-15.51	54	-27.21	164	182	Average
4924	36	51.51	-15.51	74	-38	164	182	Peak
18000	48.63	38.98	9.65	54	-5.37	116	237	Average
18000	55.66	46.01	9.65	74	-18.34	116	237	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

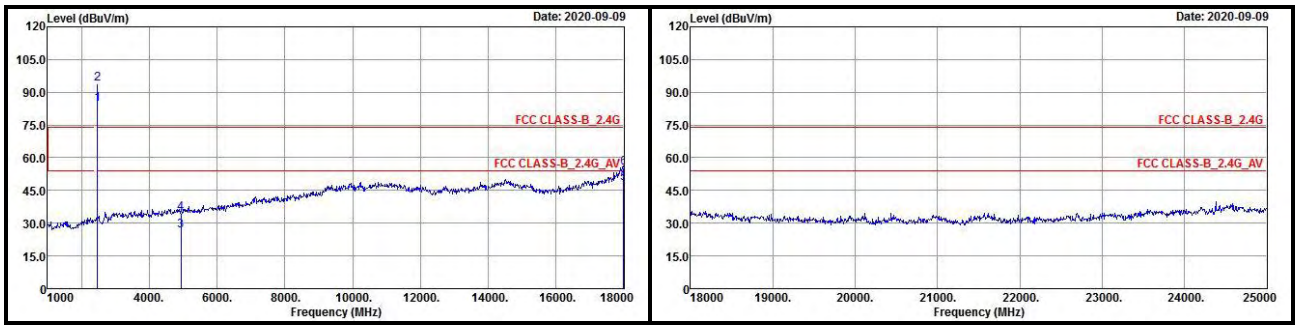


EUT Test Condition		Measurement Detail	
Channel	Channel 12	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2467	84.68	90.4	-5.72	------	------	166	5	Average
2467	93.81	99.53	-5.72	------	------	166	5	Peak
2483.5	42.33	48.03	-5.7	54	-11.67	166	5	Average
2483.5	60.14	65.84	-5.7	74	-13.86	166	5	Peak
4934	26.46	41.97	-15.51	54	-27.54	121	279	Average
4934	34.73	50.24	-15.51	74	-39.27	121	279	Peak
18000	48.42	38.77	9.65	54	-5.58	101	13	Average
18000	55.5	45.85	9.65	74	-18.5	101	13	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

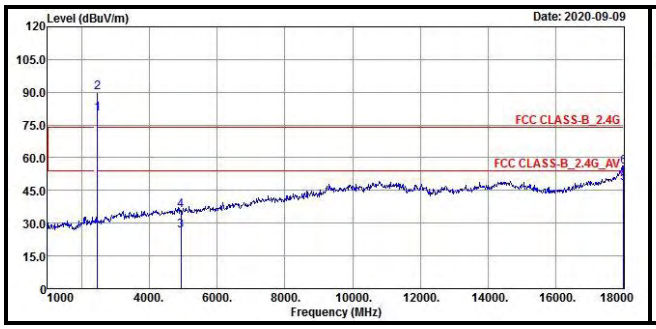


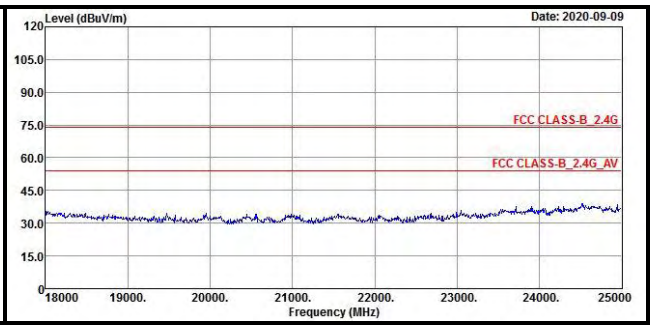
EUT Test Condition		Measurement Detail	
Channel	Channel 12	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2467	80.11	85.83	-5.72	------	------	124	286	Average
2467	89.74	95.46	-5.72	------	------	124	286	Peak
2483.5	38.21	43.91	-5.7	54	-15.79	124	286	Average
2483.5	56.21	61.91	-5.7	74	-17.79	124	286	Peak
4934	26.56	42.07	-15.51	54	-27.44	107	255	Average
4934	36	51.51	-15.51	74	-38	107	255	Peak
18000	48.34	38.69	9.65	54	-5.66	107	139	Average
18000	55.66	46.01	9.65	74	-18.34	107	139	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



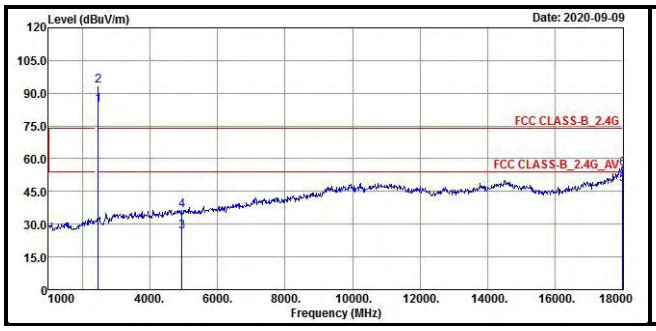


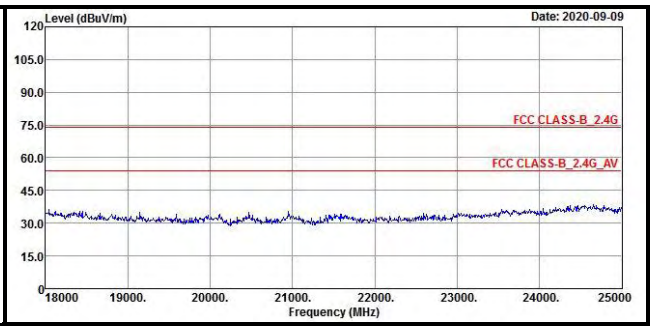
EUT Test Condition		Measurement Detail	
Channel	Channel 13	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2472	84.42	90.13	-5.71	------	------	162	38	Average
2472	93.54	99.25	-5.71	------	------	162	38	Peak
2483.5	48.14	53.84	-5.7	54	-5.86	162	38	Average
2483.5	70.44	76.14	-5.7	74	-3.56	162	38	Peak
4944	26.6	42.09	-15.49	54	-27.4	145	162	Average
4944	36.38	51.87	-15.49	74	-37.62	145	162	Peak
18000	48.3	38.65	9.65	54	-5.7	218	301	Average
18000	55.5	45.85	9.65	74	-18.5	218	301	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.



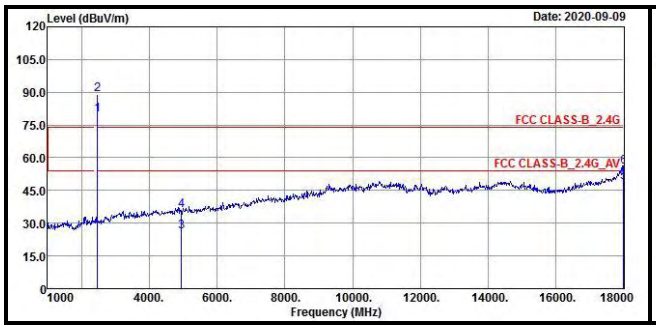


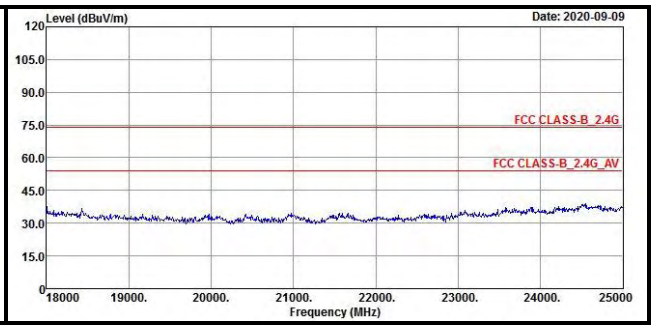
EUT Test Condition		Measurement Detail	
Channel	Channel 13	**Frequency Range**	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Cyril Chen

Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
2472	79.71	85.42	-5.71	------	------	125	292	Average
2472	89.13	94.84	-5.71	------	------	125	292	Peak
2483.5	43.95	49.65	-5.7	54	-10.05	125	292	Average
2483.5	65.49	71.19	-5.7	74	-8.51	125	292	Peak
4944	26.29	41.78	-15.49	54	-27.71	137	161	Average
4944	35.65	51.14	-15.49	74	-38.35	137	161	Peak
18000	48.68	39.03	9.65	54	-5.32	102	11	Average
18000	55.66	46.01	9.65	74	-18.34	102	11	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.





9 kHz ~ 30 MHz Data:

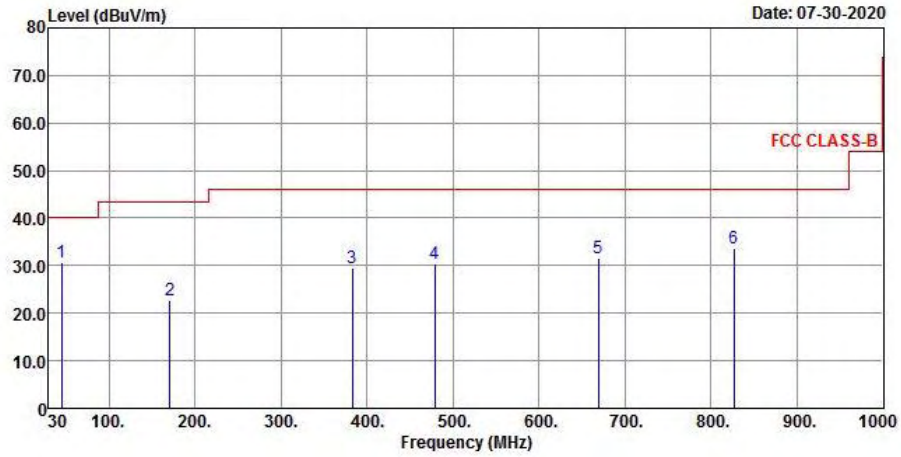
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

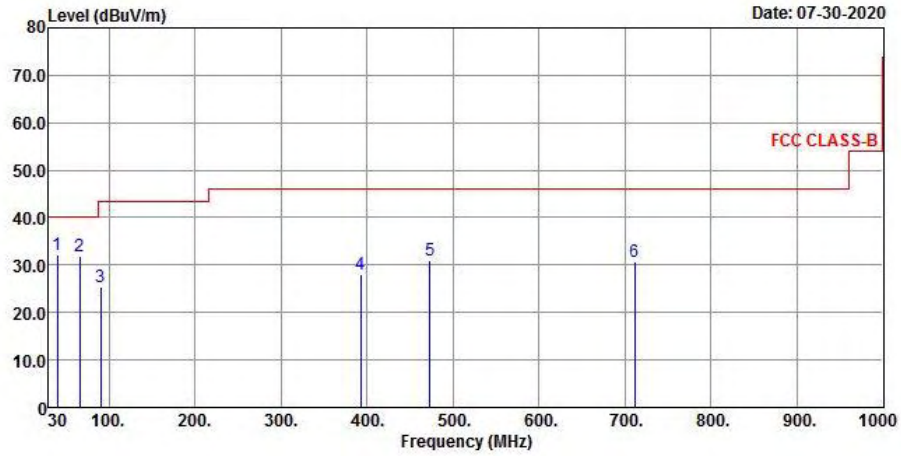
802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 13	**Frequency Range**	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

Horizontal



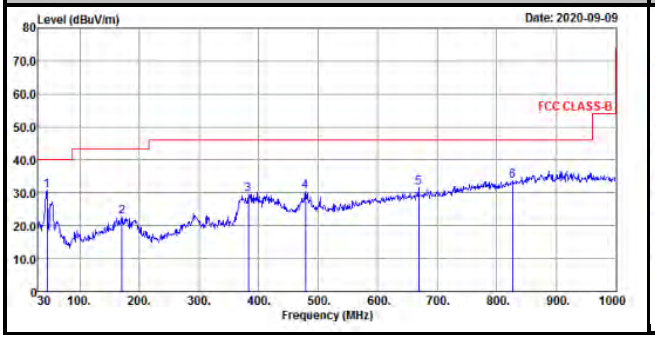
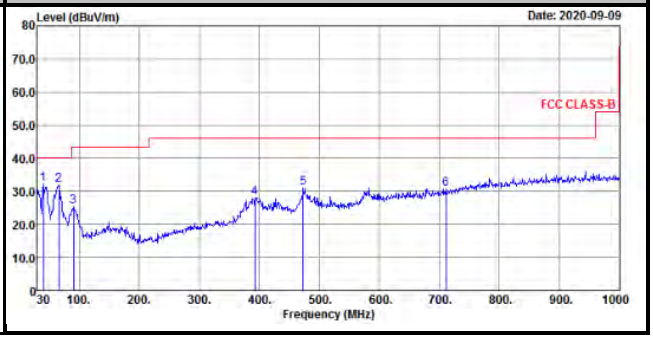
Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
44.55	30.65	42.52	-11.87	40	-9.35	165	231	QP
170.65	22.62	34.96	-12.34	43.5	-20.88	147	185	QP
383.08	29.39	38.07	-8.68	46	-16.61	194	165	QP
479.11	30.49	36.32	-5.83	46	-15.51	102	245	QP
669.23	31.45	32.76	-1.31	46	-14.55	165	231	QP
826.37	33.76	31.54	2.22	46	-12.24	145	185	QP
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
39.7	32.2	44.45	-12.25	40	-7.8	165	231	QP
65.89	31.99	45.37	-13.38	40	-8.01	154	184	QP
90.14	25.32	42.85	-17.53	43.5	-18.18	102	295	QP
392.78	28.16	36.68	-8.52	46	-17.84	147	162	QP
473.29	30.94	36.87	-5.93	46	-15.06	132	165	QP
710.94	30.79	31.24	-0.45	46	-15.21	147	152	QP

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value.
2. The emission levels of other frequencies were very low against the limit.

Horizontal	Vertical
	

4.9 Conducted Emission Measurement

4.9.1 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 0.50 MHz.

4.9.2 Test Instruments

Refer to section 4.2.2 to get information of the instrument.

4.9.3 Test Procedures

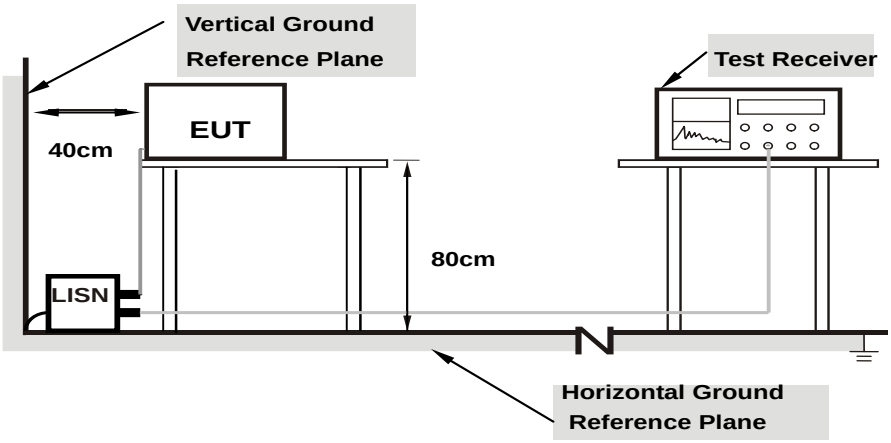
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling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

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

4.9.4 Deviation from Test Standard

No deviation.

4.9.5 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).

4.9.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

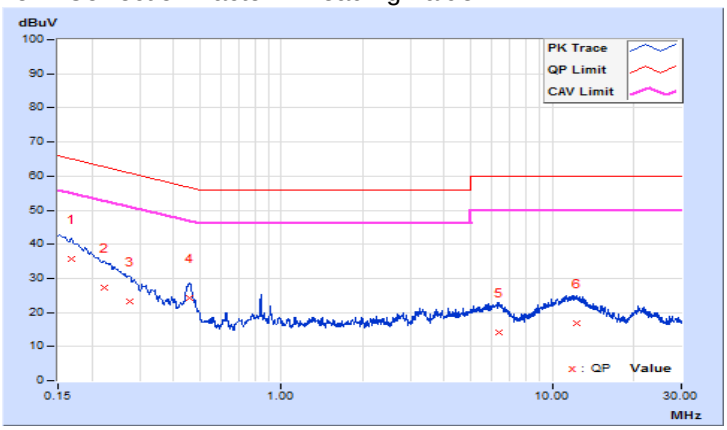
4.9.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Jisyong Wang	Test Date	2020/7/29

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	0.16787	10.16	25.52	20.06	35.68	30.22	65.07	55.07	-29.39	-24.85
2	0.22151	10.17	17.24	15.12	27.41	25.29	62.76	52.76	-35.35	-27.47
3	0.27600	10.18	13.16	10.30	23.34	20.48	60.94	50.94	-37.60	-30.46
4	**0.45825**	**10.21**	**14.12**	**12.03**	**24.33**	**22.24**	**56.72**	**46.72**	**-32.39**	**-24.48**
5	6.36675	10.43	3.81	2.23	14.24	12.66	60.00	50.00	-45.76	-37.34
6	12.37875	10.50	6.24	5.76	16.74	16.26	60.00	50.00	-43.26	-33.74

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

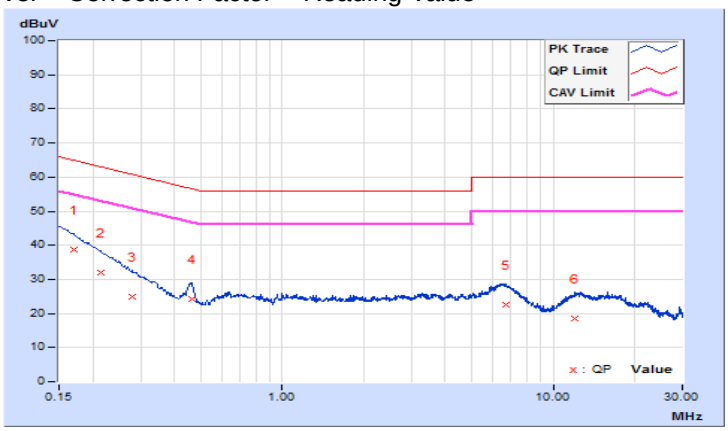


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Jisyong Wang	Test Date	2020/7/29

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	0.16966	10.12	28.44	20.32	38.56	30.44	64.98	54.98	-26.42	-24.54
2	0.21291	10.13	21.75	15.70	31.88	25.83	63.09	53.09	-31.21	-27.26
3	0.27797	10.15	14.67	10.20	24.82	20.35	60.88	50.88	-36.06	-30.53
4	0.46500	10.19	13.94	10.79	24.13	20.98	56.60	46.60	-32.47	-25.62
5	6.70425	10.47	12.16	7.27	22.63	17.74	60.00	50.00	-37.37	-32.26
6	12.06825	10.61	7.87	3.96	18.48	14.57	60.00	50.00	-41.52	-35.43

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

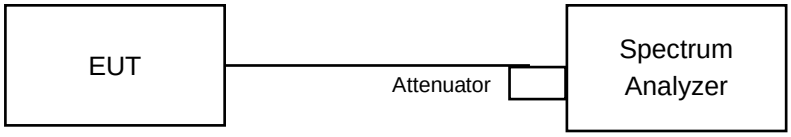


4.10 6 dB Bandwidth Measurement

4.10.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.10.2 Test Setup



4.10.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.10.4 Test Procedure

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

4.10.5 Deviation from Test Standard

No deviation.

4.10.6 EUT Operating Conditions

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

4.10.7 Test Results

802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.12	0.5	Pass
6	2437	8.13	0.5	Pass
11	2462	8.14	0.5	Pass
12	2467	8.59	0.5	Pass
13	2472	8.13	0.5	Pass

802.11g

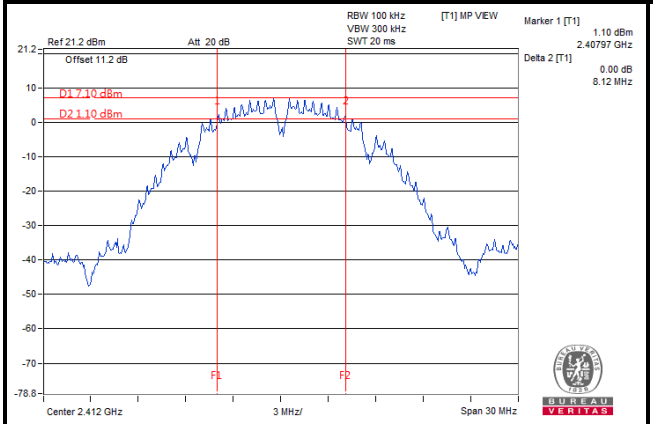
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.45	0.5	Pass
6	2437	16.46	0.5	Pass
11	2462	16.44	0.5	Pass
12	2467	16.45	0.5	Pass
13	2472	16.42	0.5	Pass

802.11n (HT20)

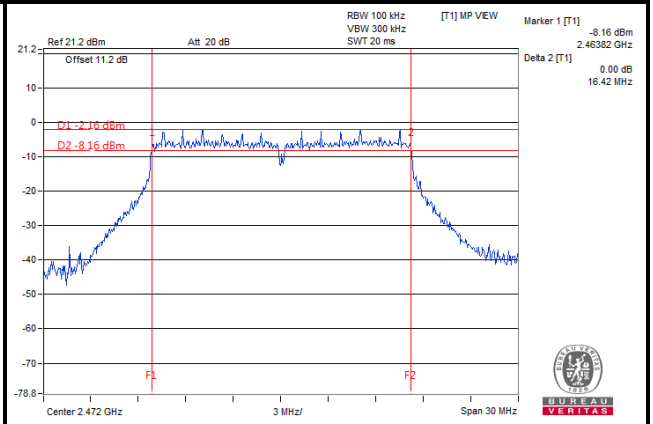
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.64	0.5	Pass
6	2437	17.65	0.5	Pass
11	2462	17.66	0.5	Pass
12	2467	17.65	0.5	Pass
13	2472	17.64	0.5	Pass

Spectrum Plot of Worst Value

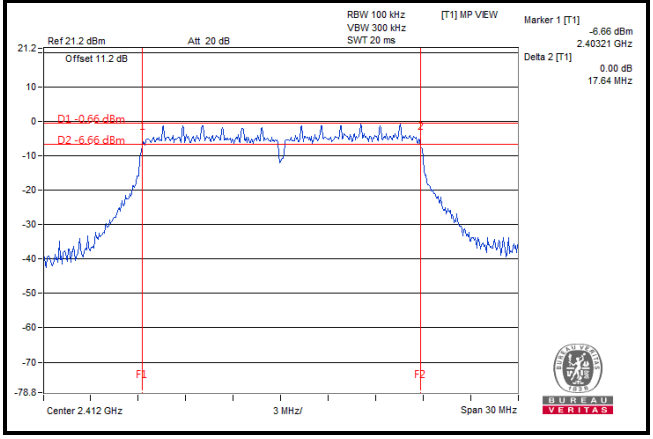
802.11b



802.11g

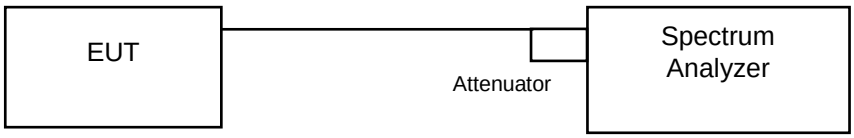


802.11n (HT20)



4.11 Occupied Bandwidth Measurement

4.11.1 Test Setup



4.11.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.11.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.11.4 Deviation from Test Standard

No deviation.

4.11.5 EUT Operating Conditions

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

4.11.6 Test Results

802.11b

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2412	13.32	Pass
6	2437	13.56	Pass
11	2462	13.44	Pass
12	2467	13.44	Pass
13	2472	13.32	Pass

802.11g

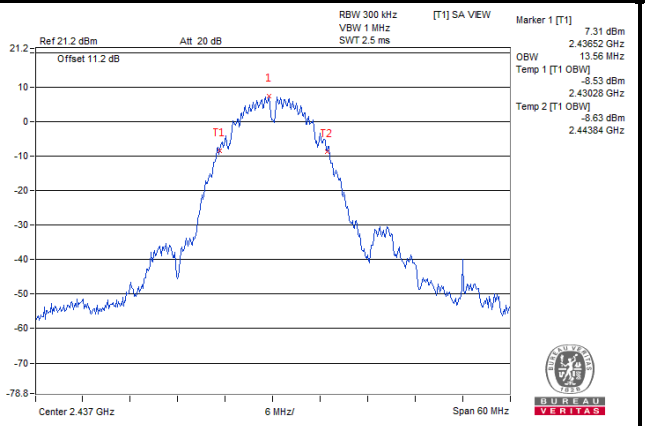
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2412	17.04	Pass
6	2437	17.04	Pass
11	2462	17.16	Pass
12	2467	17.04	Pass
13	2472	17.02	Pass

802.11n (HT20)

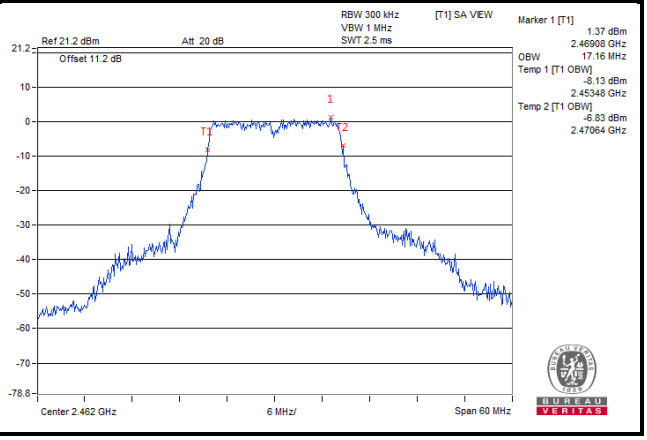
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2412	18.00	Pass
6	2437	18.12	Pass
11	2462	18.00	Pass
12	2467	18.00	Pass
13	2472	18.00	Pass

Spectrum Plot of Worst Value

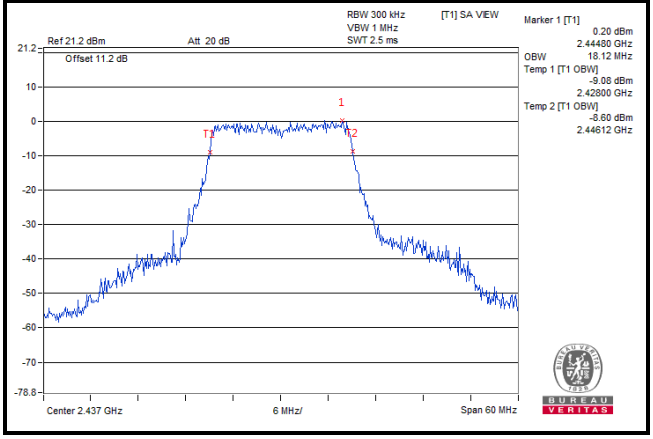
802.11b



802.11g



802.11n (HT20)

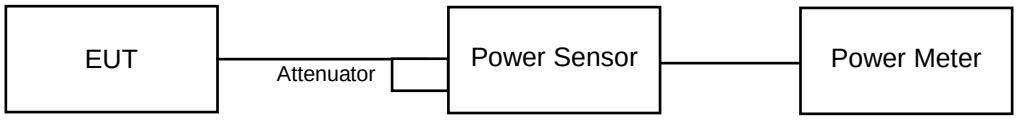


4.12 Conducted Output Power Measurement

4.12.1 Limits of Conducted Output Power Measurement

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

4.12.2 Test Setup



4.12.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.12.4 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.

4.12.5 Deviation from Test Standard

No deviation.

4.12.6 EUT Operating Conditions

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

4.12.7 Test Results

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	71.45	18.54	38.459	15.85	30	Pass
6	2437	76.384	18.83	39.264	15.94	30	Pass
11	2462	67.453	18.29	36.813	15.66	30	Pass
12	2467	72.778	18.62	39.264	15.94	30	Pass
13	2472	66.222	18.21	35.563	15.51	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	87.498	19.42	12.417	10.94	30	Pass
6	2437	85.507	19.32	11.324	10.54	30	Pass
11	2462	88.105	19.45	12.331	10.91	30	Pass
12	2467	93.325	19.70	12.388	10.93	30	Pass
13	2472	63.241	18.01	9.226	9.65	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	86.896	19.39	11.722	10.69	30	Pass
6	2437	83.56	19.22	11.429	10.58	30	Pass
11	2462	91.622	19.62	12.417	10.94	30	Pass
12	2467	89.536	19.52	12.503	10.97	30	Pass
13	2472	84.333	19.26	12.218	10.87	30	Pass

4.13 Power Spectral Density Measurement

4.13.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm / per 3kHz.

4.13.2 Test Setup

4.13.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.13.4 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 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × 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.

4.13.5 Deviation from Test Standard

No deviation.

4.13.6 EUT Operating Condition

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

4.13.7 Test Results

802.11b

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2412	-7.94	8	Pass
6	2437	-7.44	8	Pass
11	2462	-7.69	8	Pass
12	2467	-7.96	8	Pass
13	2472	-7.75	8	Pass

802.11g

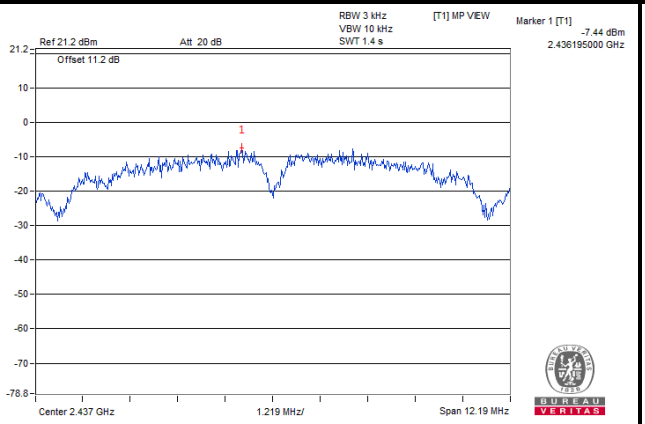
Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2412	-15.45	8	Pass
6	2437	-15.17	8	Pass
11	2462	-15.55	8	Pass
12	2467	-15.55	8	Pass
13	2472	-16.66	8	Pass

802.11n (HT20)

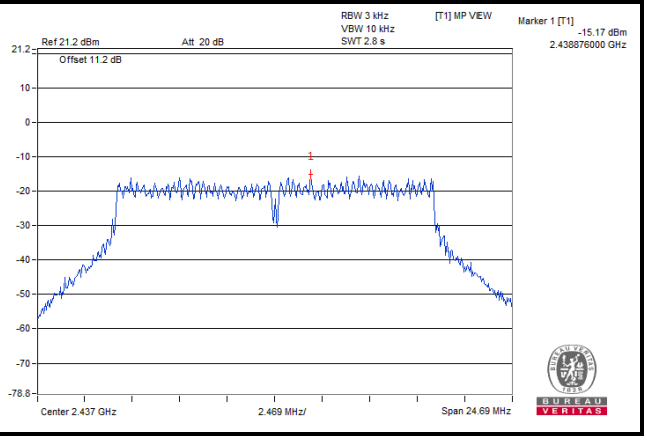
Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2412	-15.24	8	Pass
6	2437	-15.68	8	Pass
11	2462	-15.33	8	Pass
12	2467	-15.11	8	Pass
13	2472	-15.59	8	Pass

Spectrum Plot of Worst Value

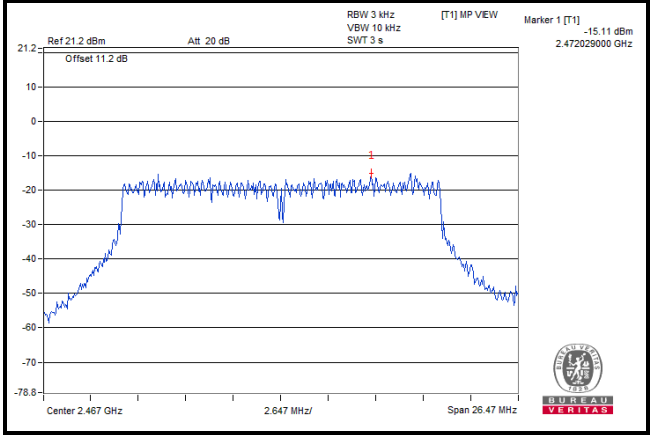
802.11b



802.11g



802.11n (HT20)

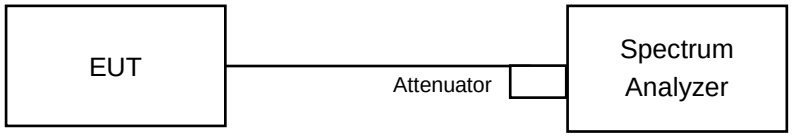


4.14 Conducted Out of Band Emission Measurement

4.14.1 Limits of Conducted Out of Band Emission Measurement

Below -20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

4.14.2 Test Setup



4.14.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.14.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 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 OOBE

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

4.14.5 Deviation from Test Standard

No deviation.

4.14.6 EUT Operating Condition

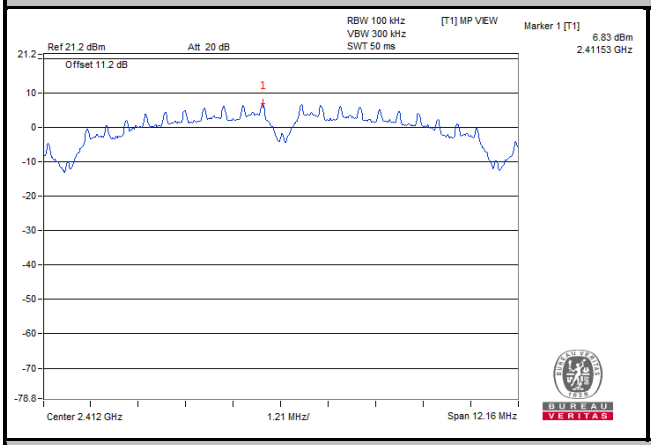
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

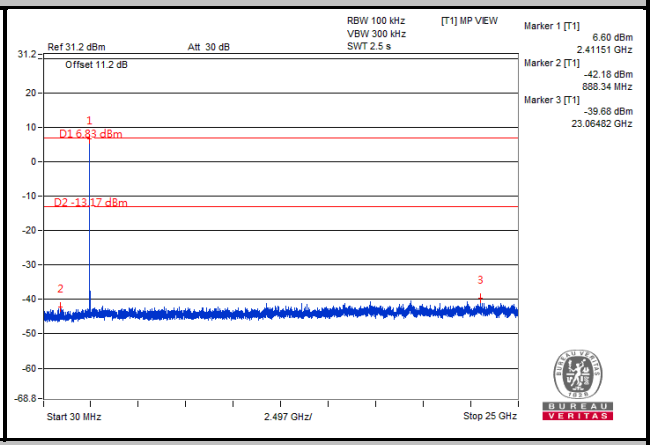
4.14.7 Test Results

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

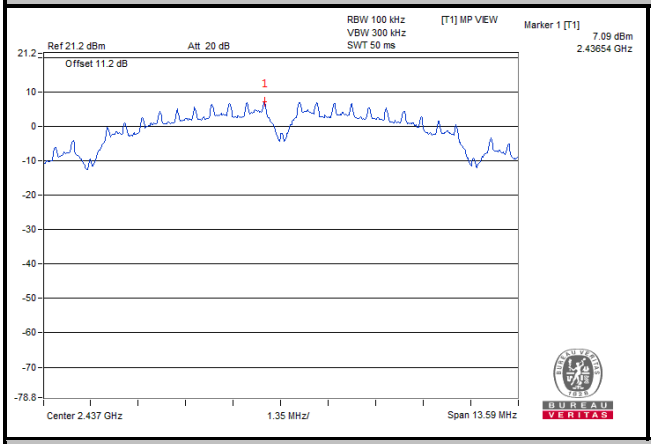
802.11b

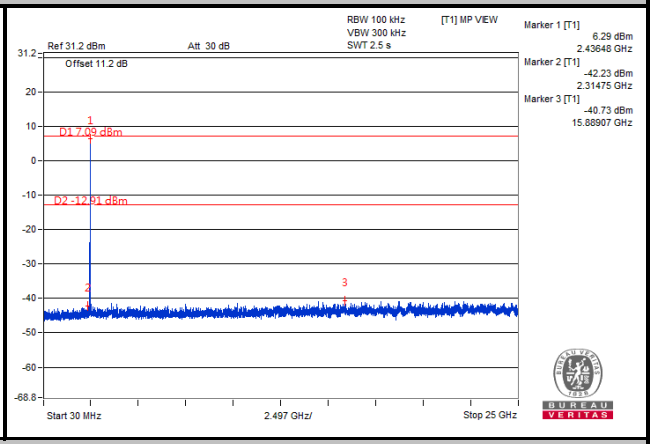
Ch 1



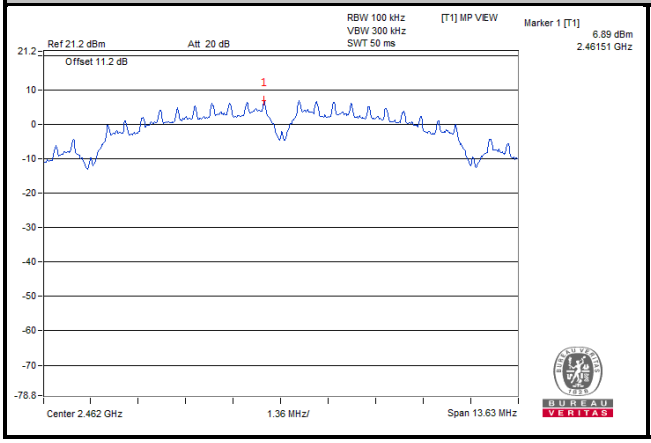


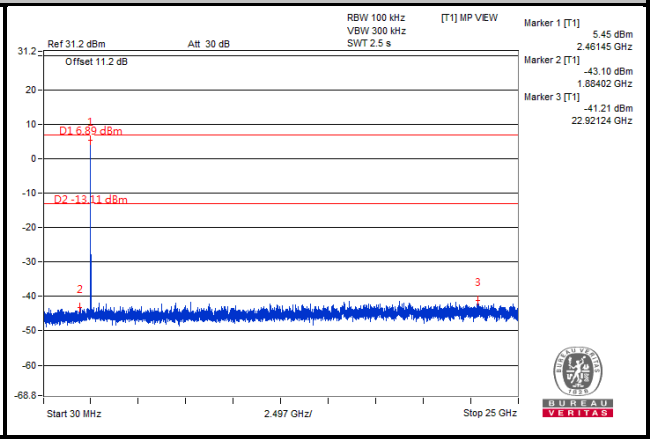
Ch 6



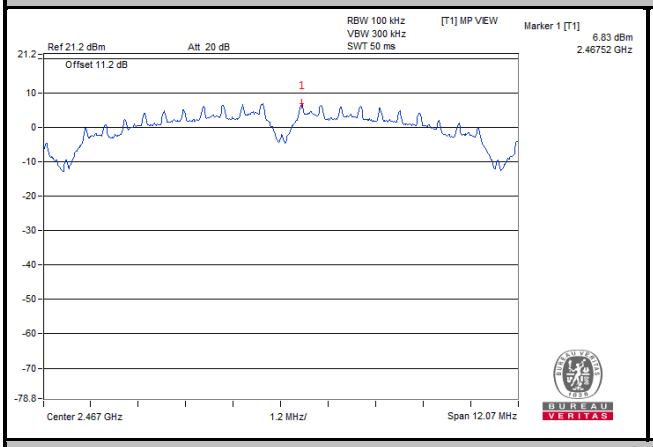


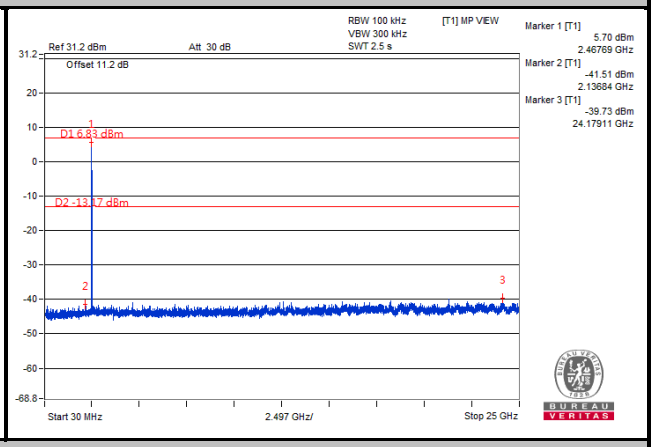
Ch 11



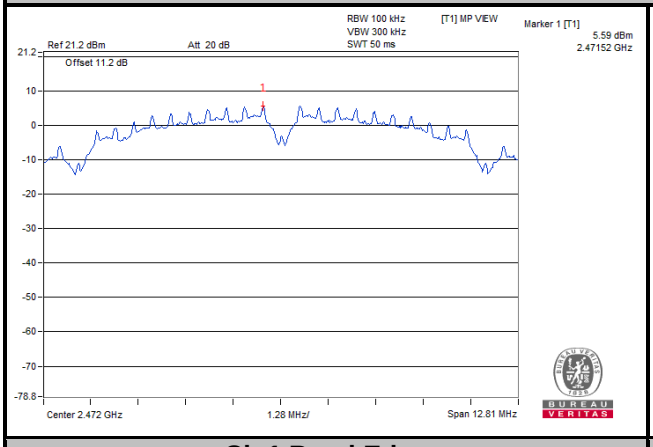


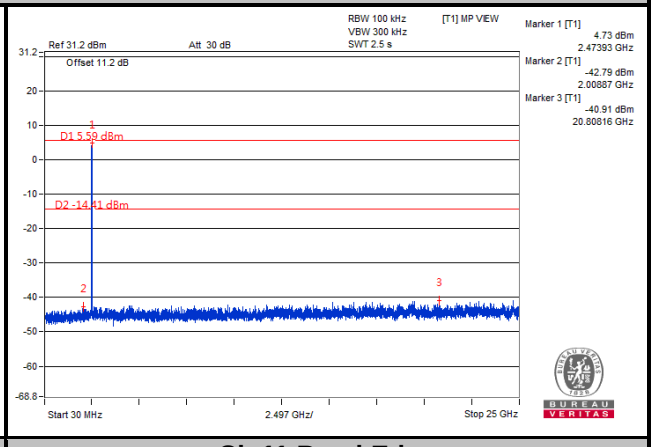
Ch 12



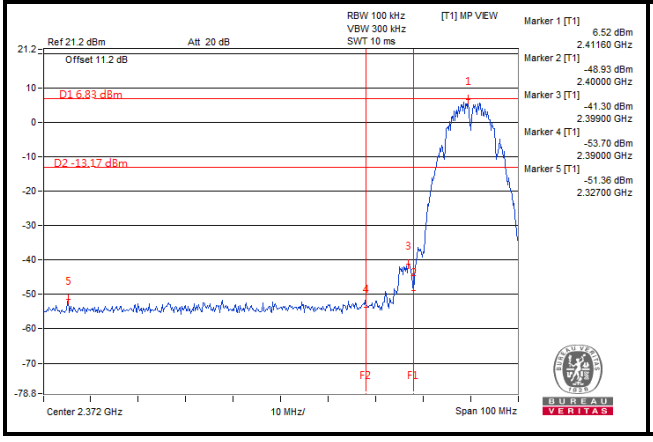


Ch 13

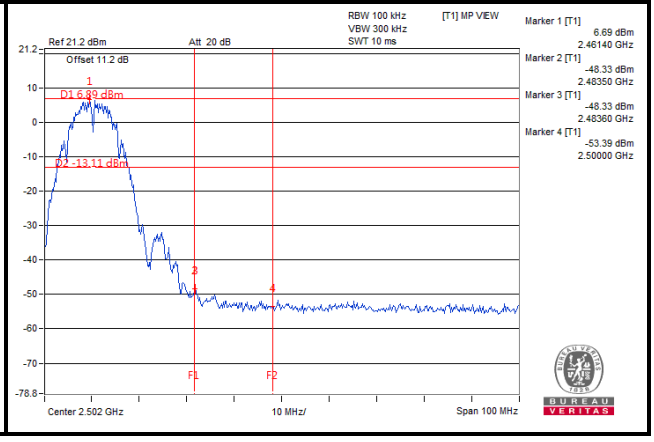


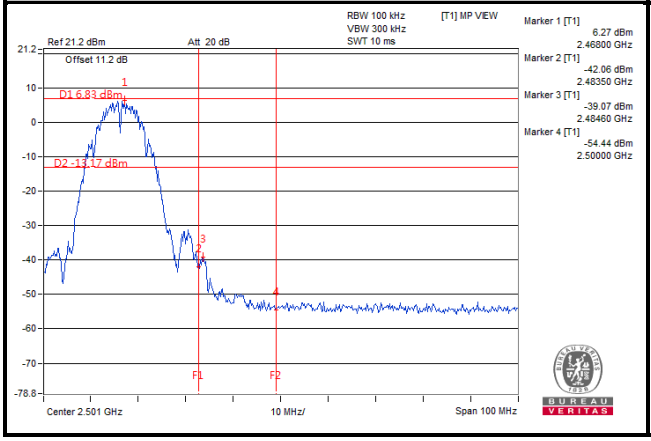
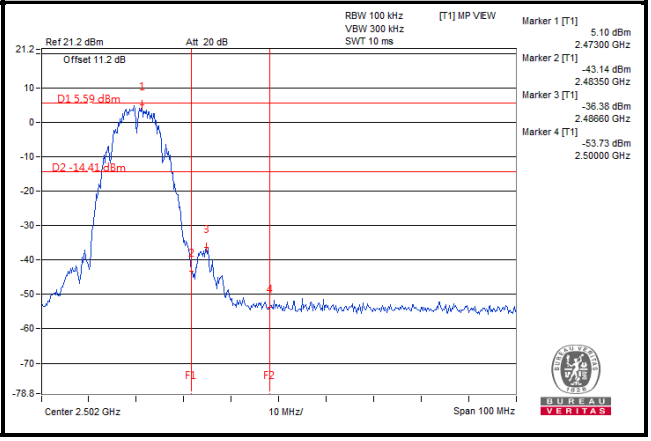


Ch 1 Band Edge



Ch 11 Band Edge



Ch 12 Band Edge	Ch 13 Band Edge
	

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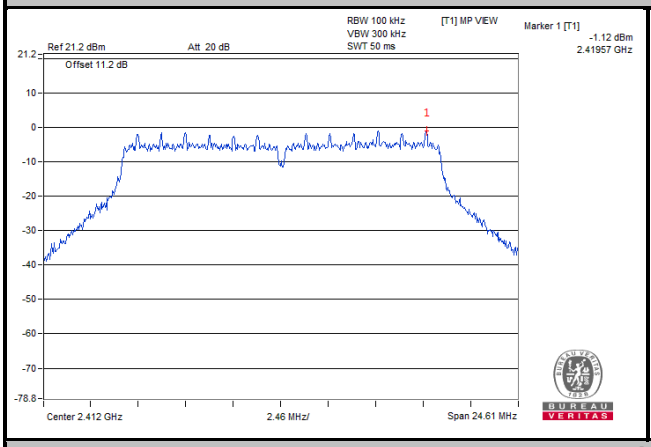
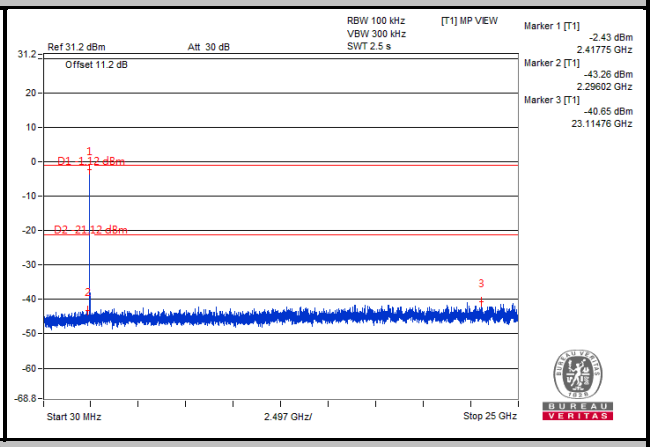
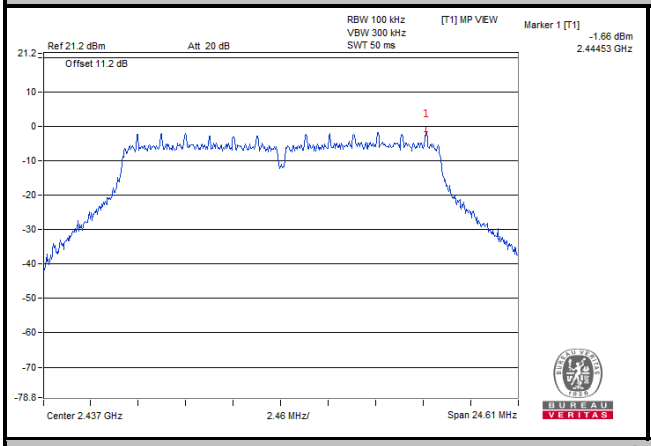
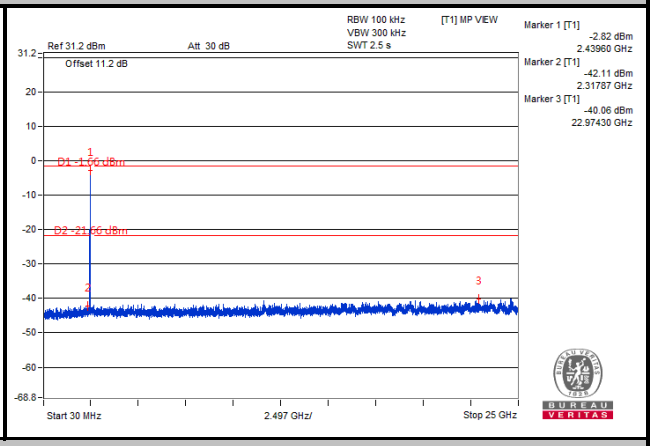
Ch 1



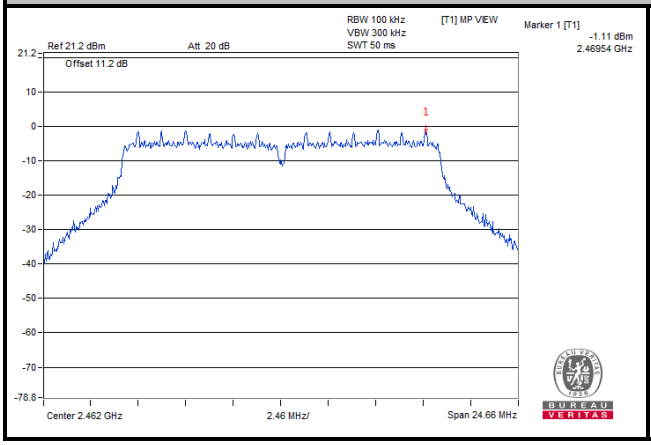


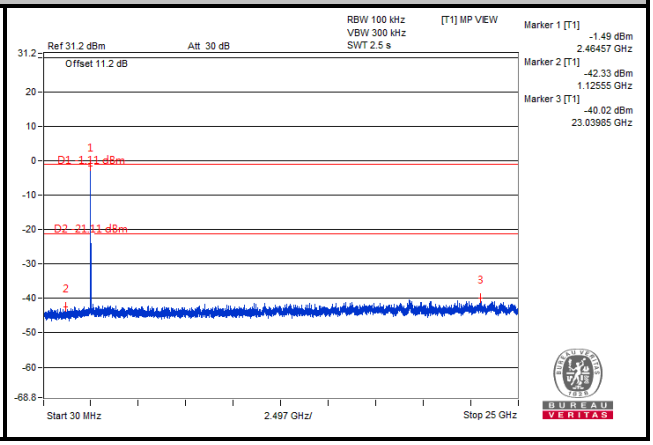
Ch 6



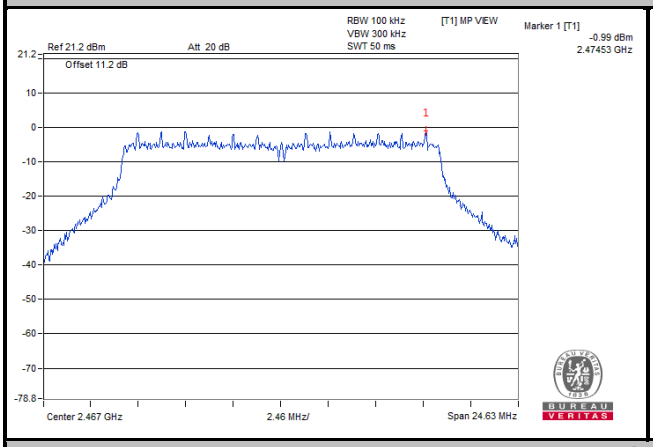


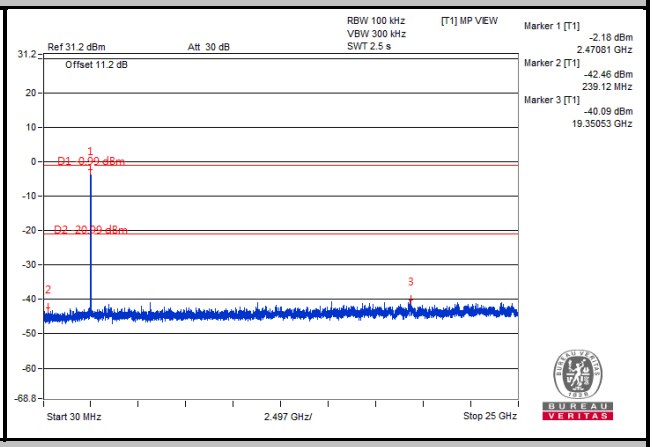
Ch 11



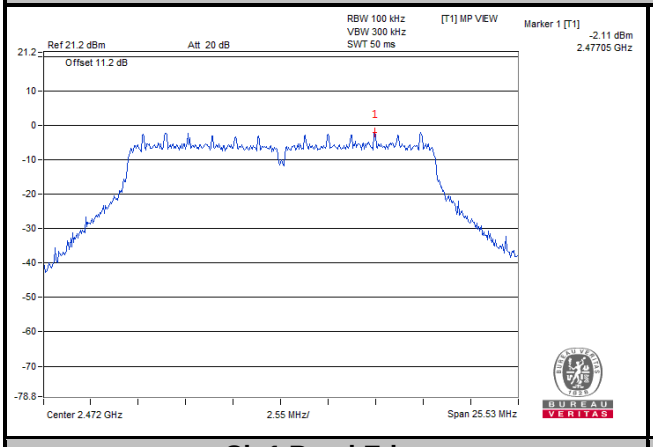


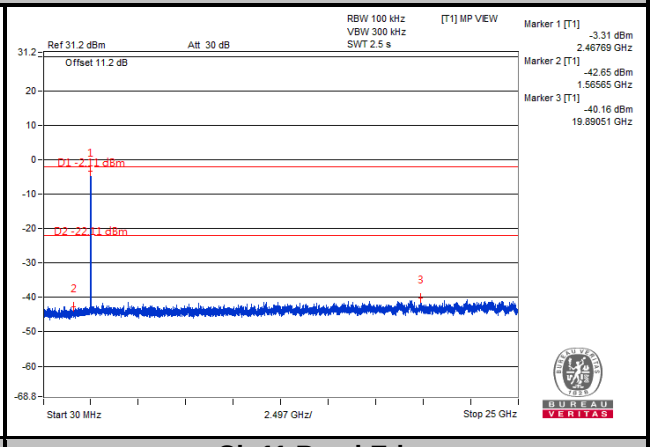
Ch 12



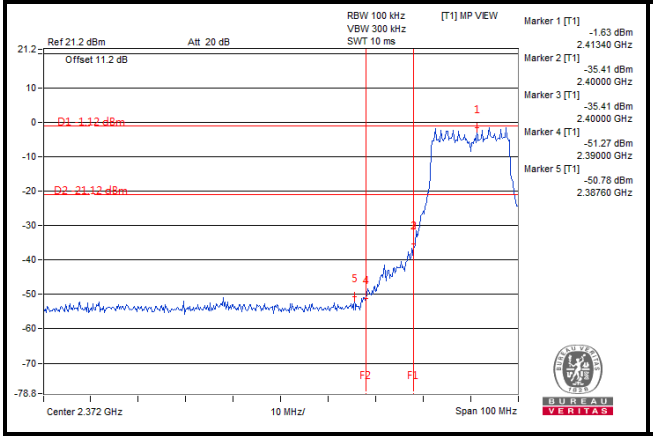


Ch 13

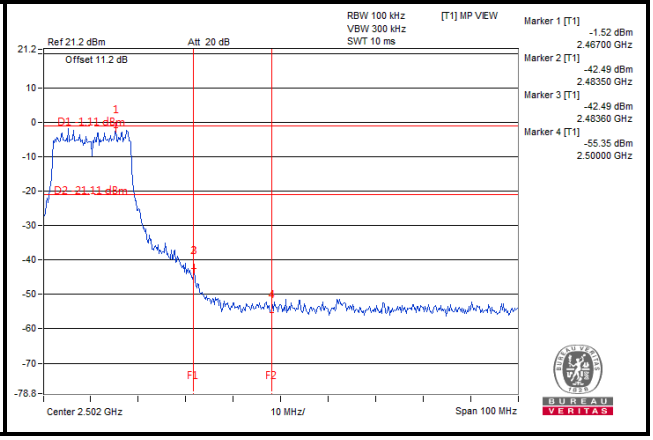


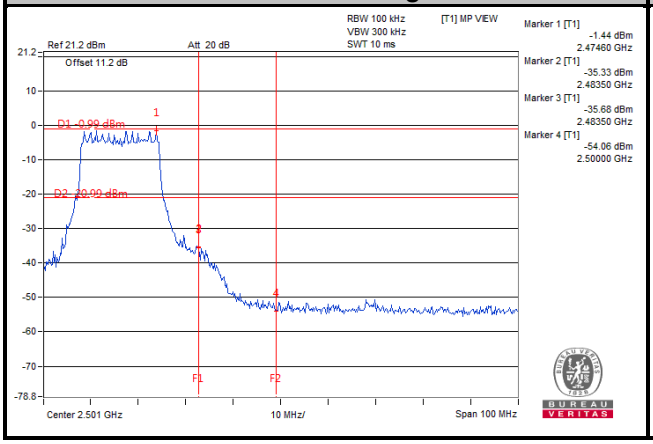
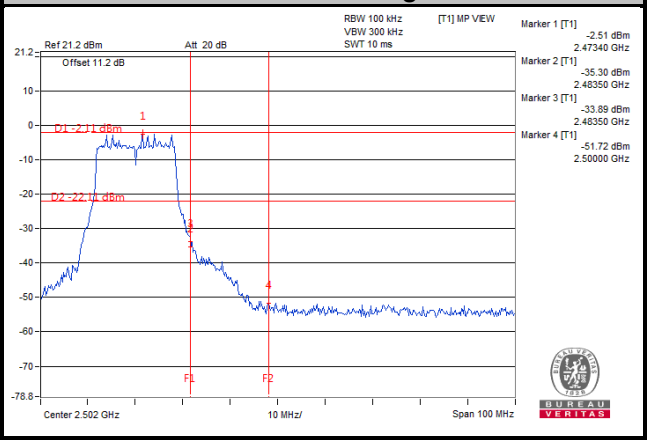


Ch 1 Band Edge



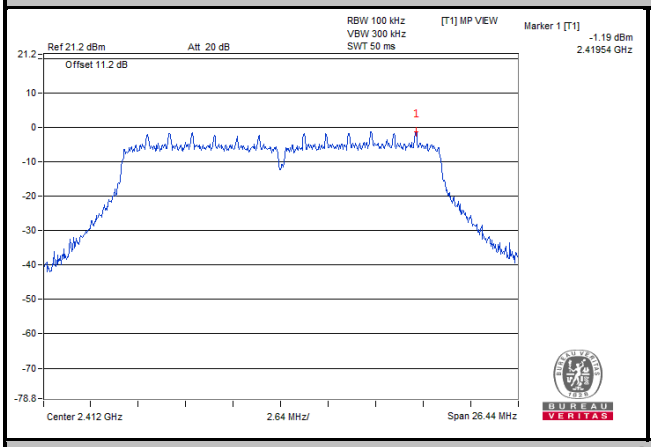
Ch 11 Band Edge

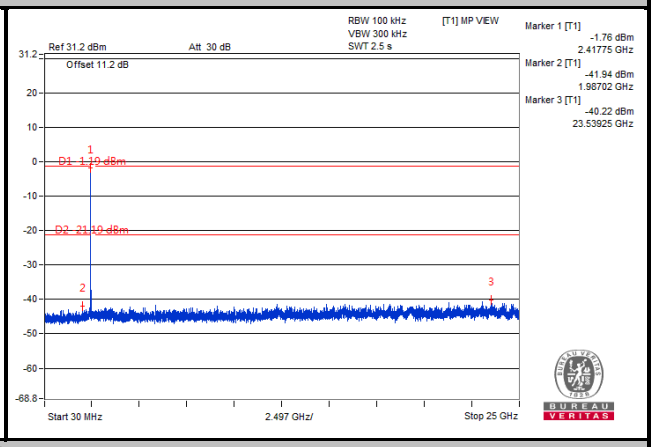


Ch 12 Band Edge	Ch 13 Band Edge
	

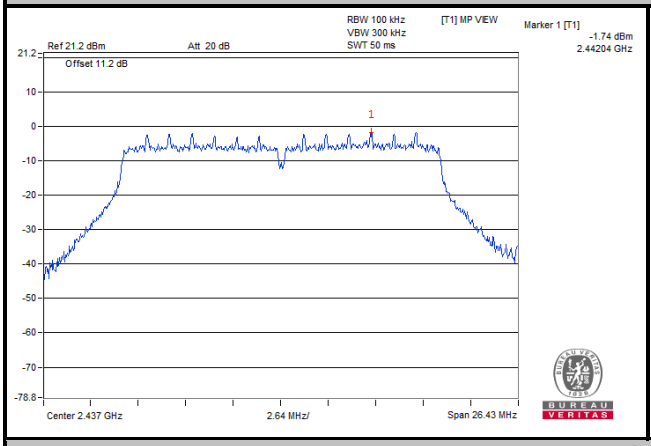
802.11n (HT20)

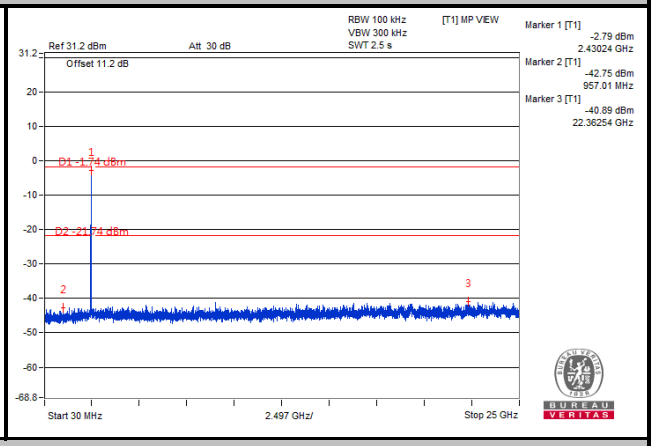
Ch 1



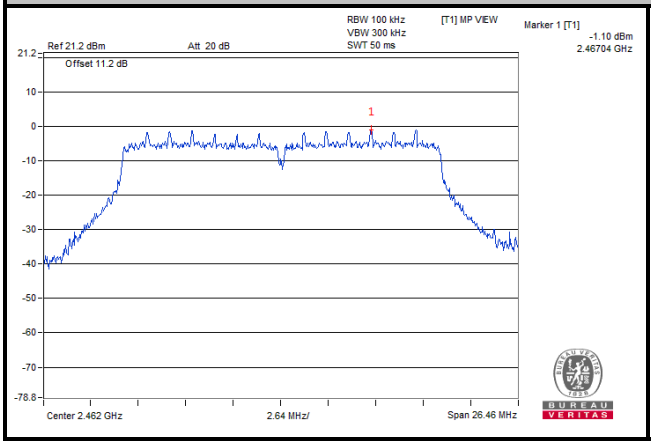


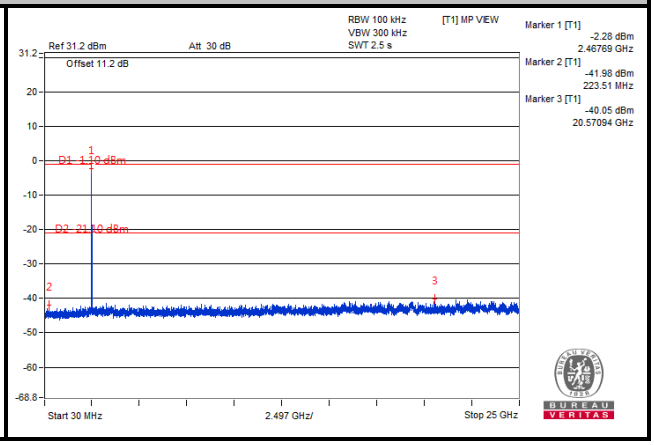
Ch 6



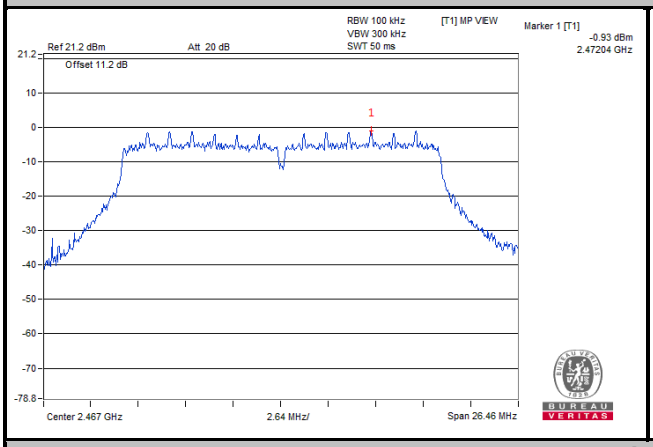


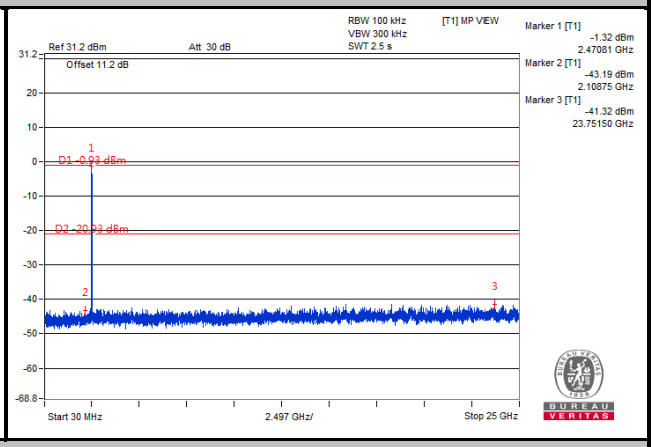
Ch 11



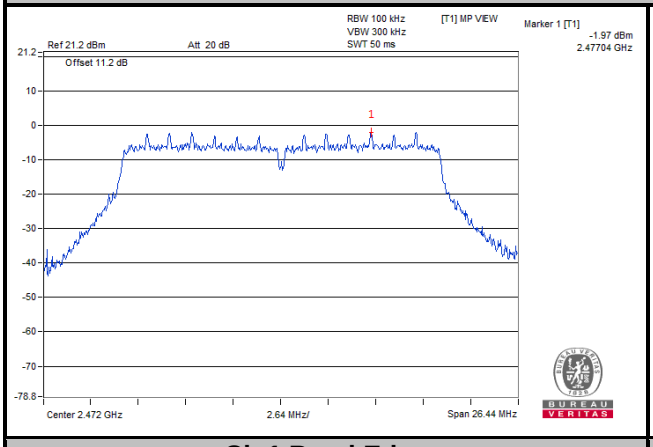


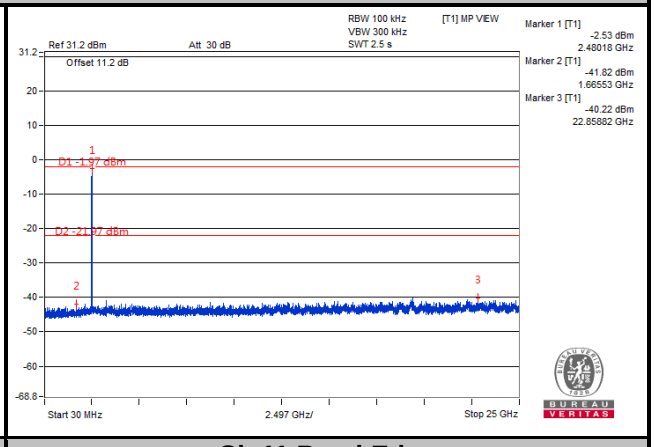
Ch 12



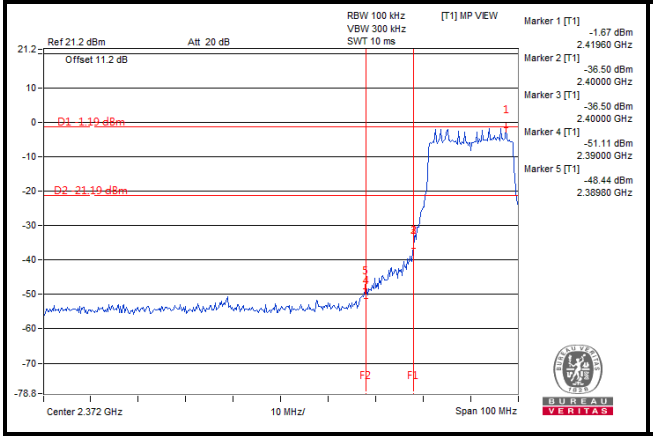


Ch 13

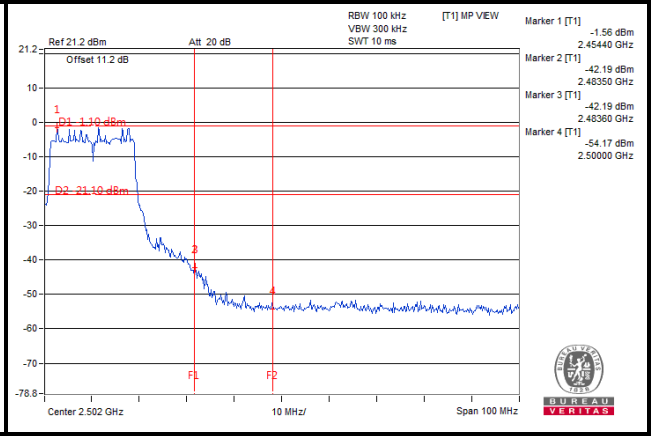


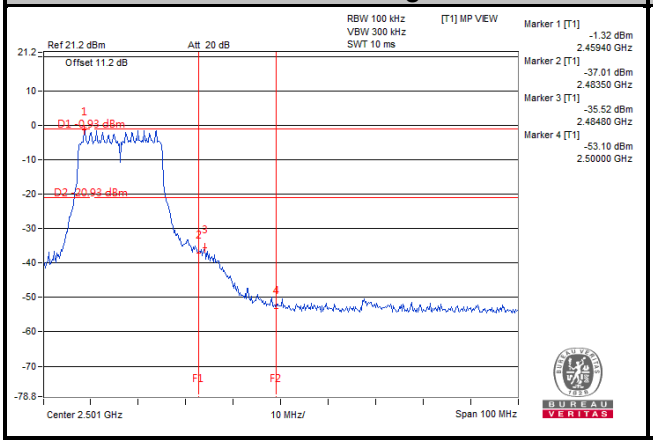
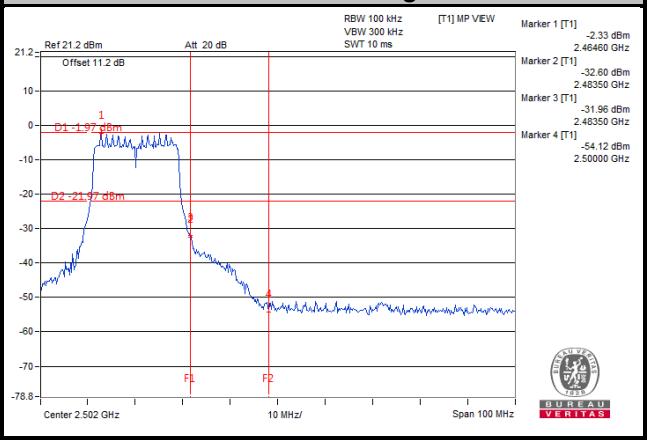


Ch 1 Band Edge



Ch 11 Band Edge



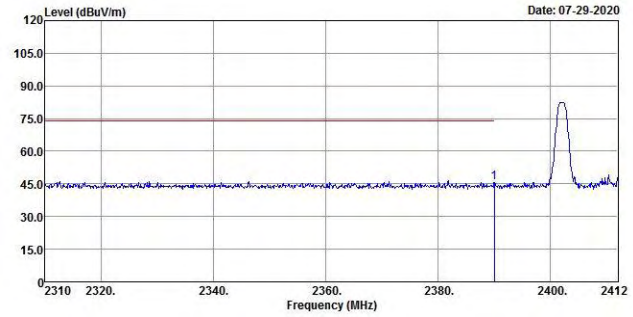
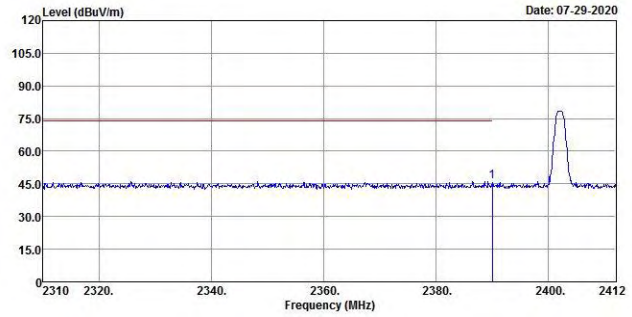
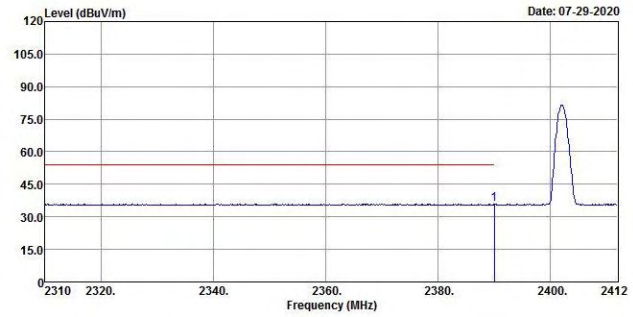
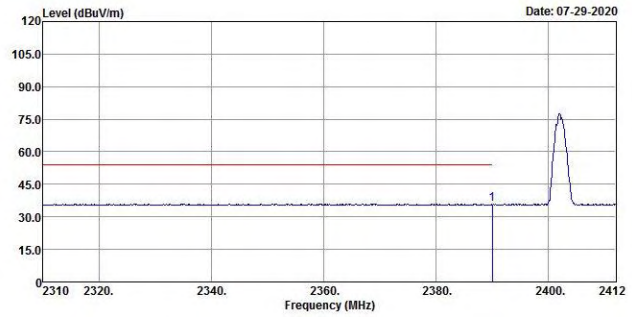
Ch 12 Band Edge	Ch 13 Band Edge
	

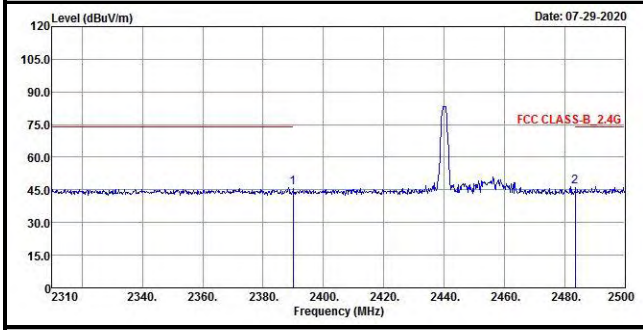
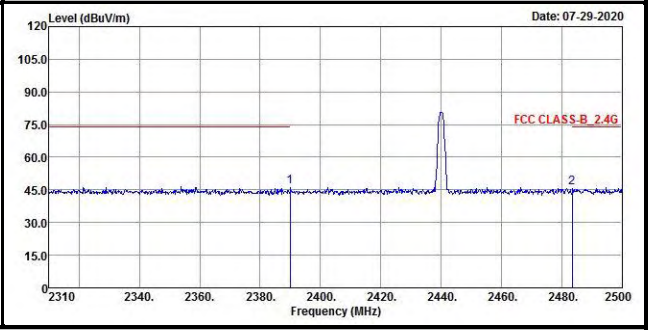
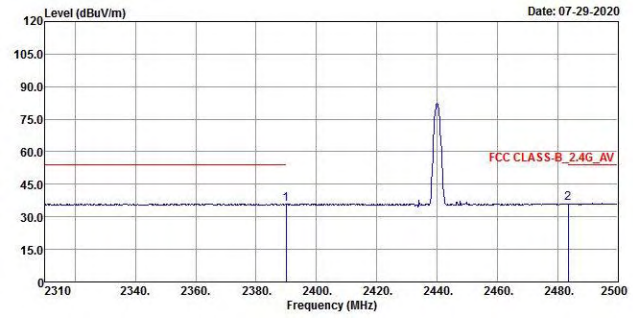
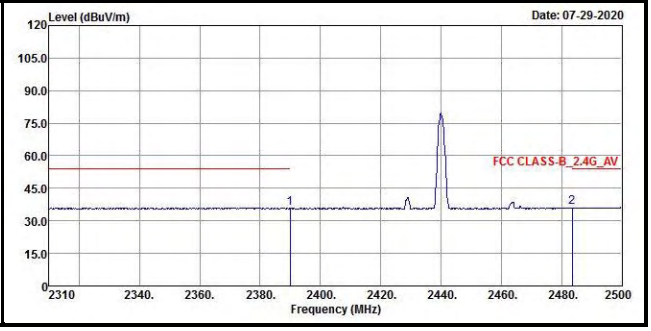
5 Pictures of Test Arrangements

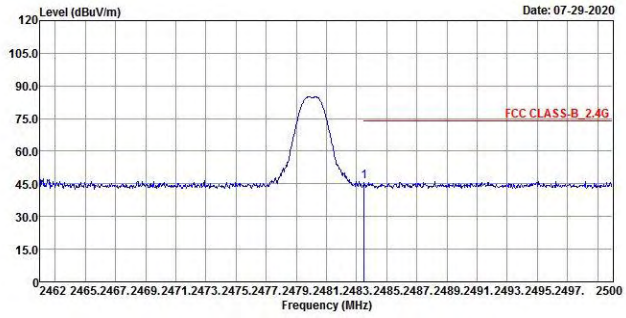
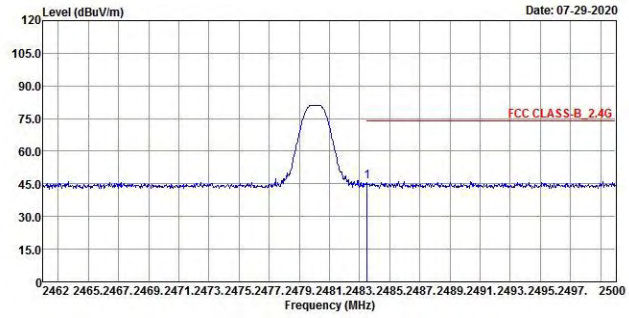
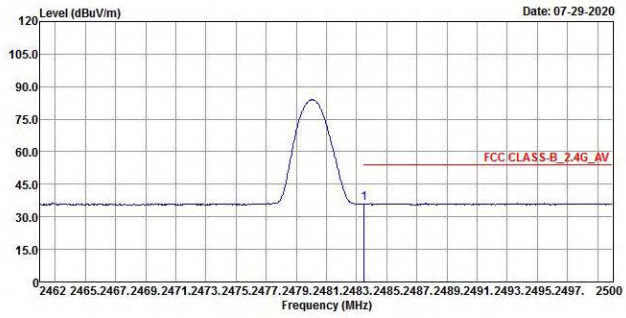
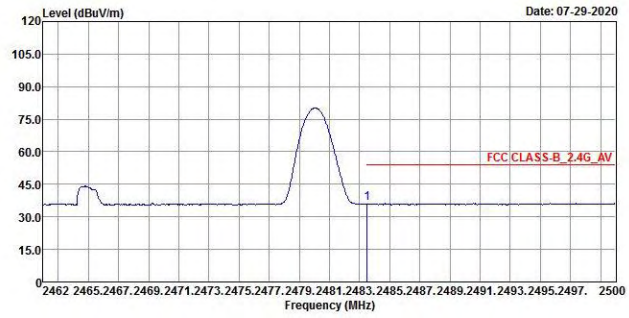
Please refer to the attached file (Test Setup Photo).

Annex A- Band Edge Measurement

<Bluetooth LE>

Ch 0	
Peak	
Horizontal	**Vertical**
	
Average	
Horizontal	**Vertical**
	

Ch 19	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

Ch 39	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

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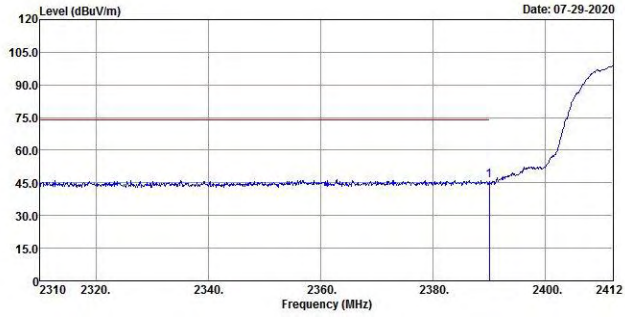
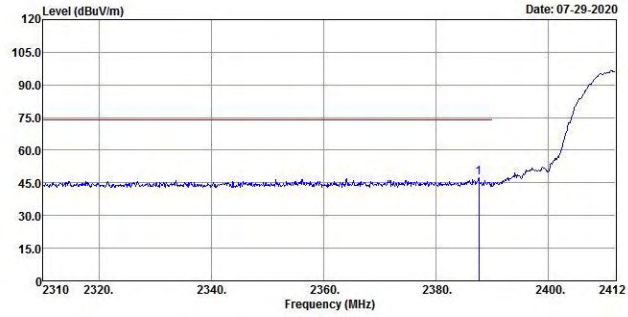
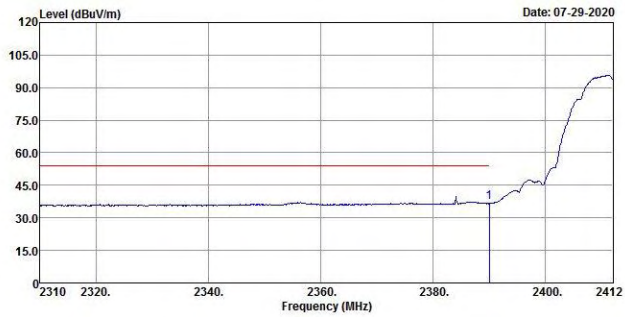
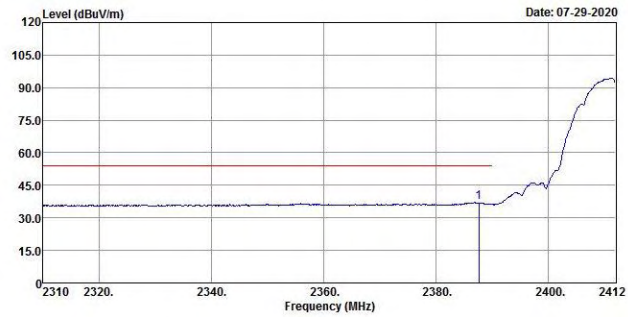
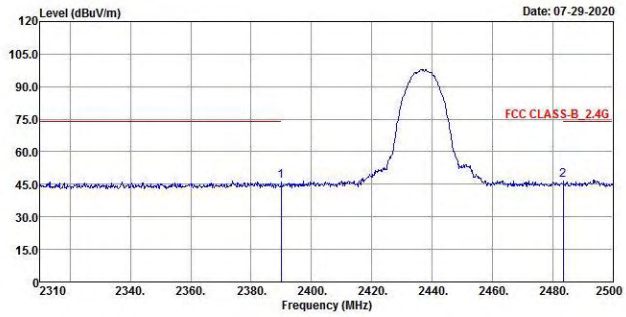
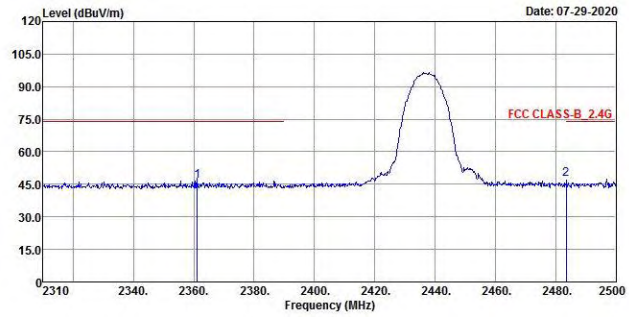
Ch 1	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	
Ch 6	
Peak	
Horizontal	Vertical
	
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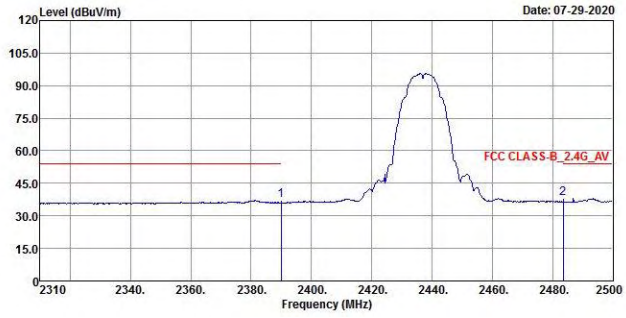
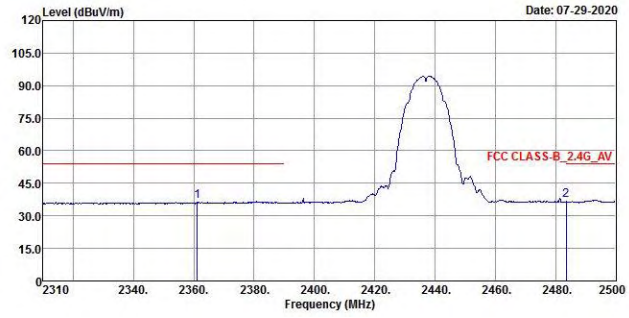
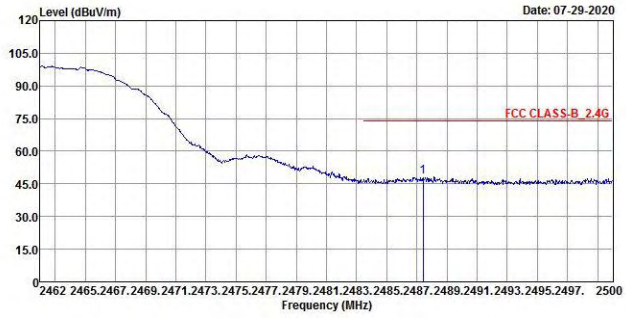
Horizontal	Vertical
	

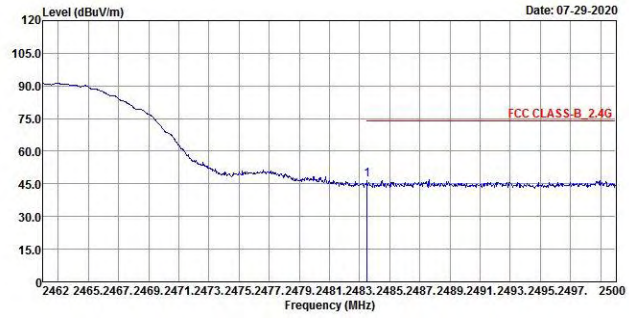
Ch 11

Peak

Horizontal

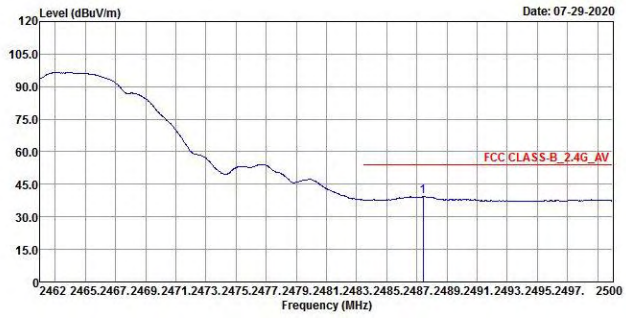


Vertical

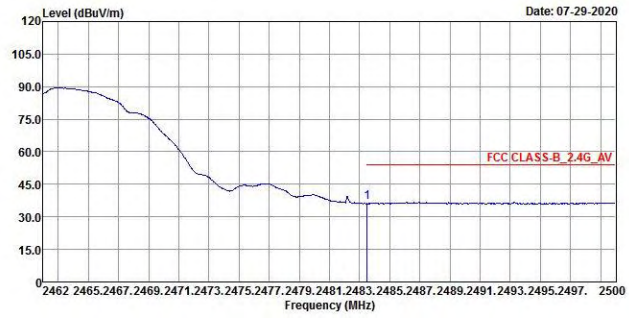


Average

Horizontal



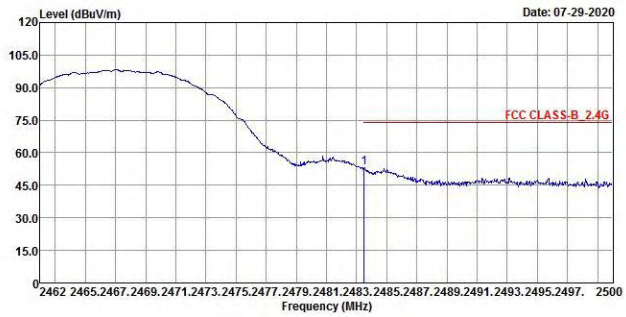
Vertical



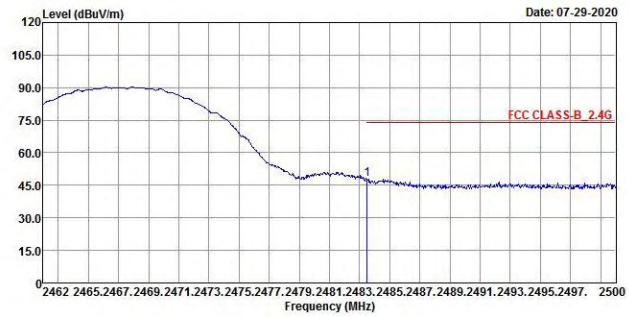
Ch 12

Peak

Horizontal



Vertical



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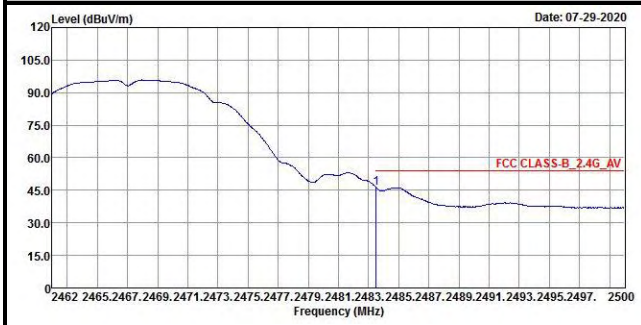
Horizontal



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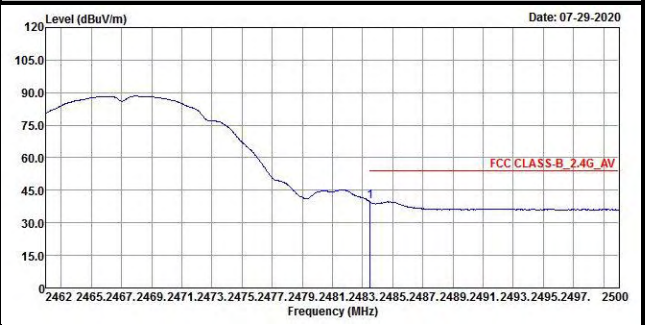
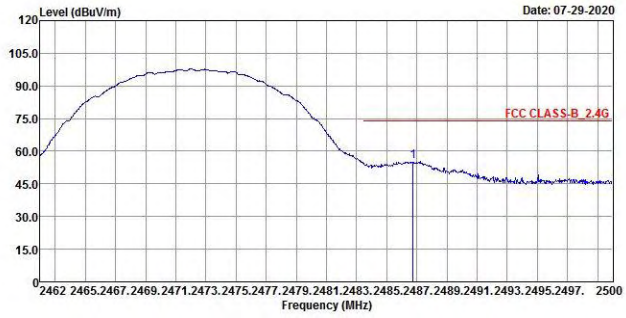
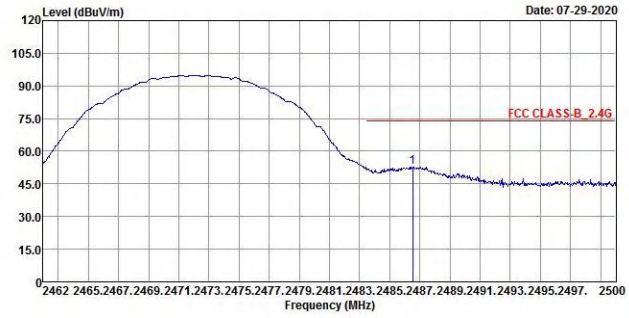


Ch 13	
Peak	
Horizontal	Vertical
	
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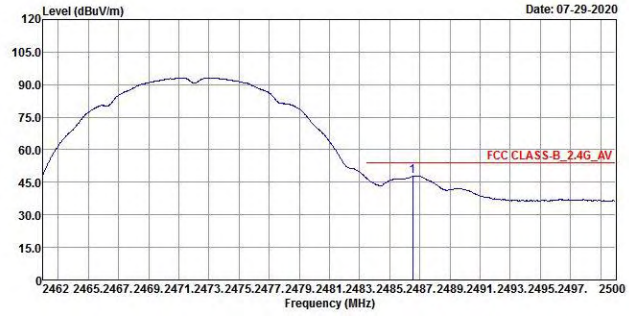
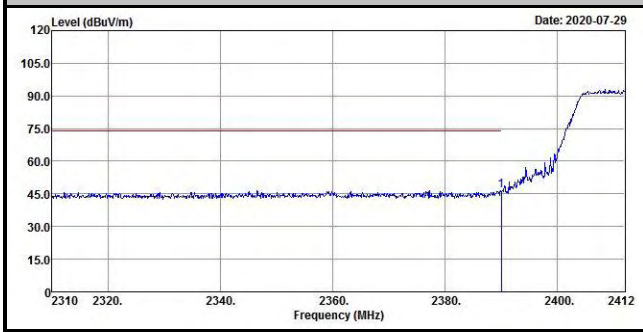
Horizontal	Vertical
	

802.11g

Ch 1

Peak

Horizontal



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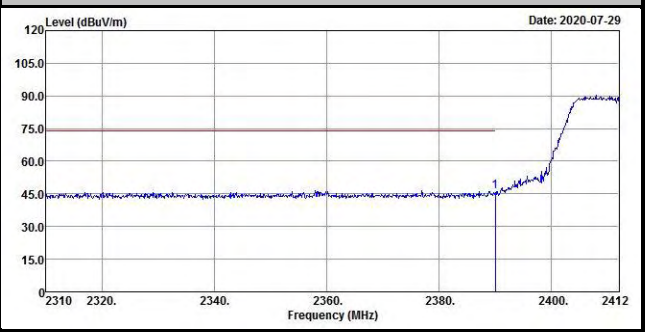
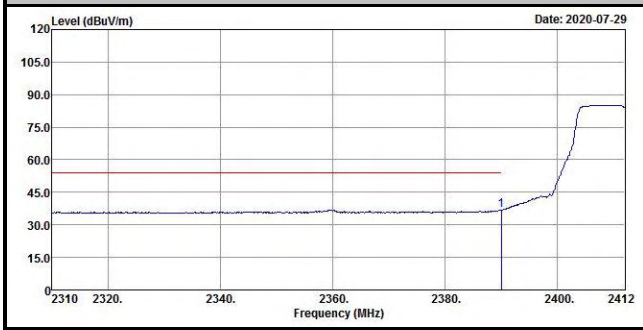
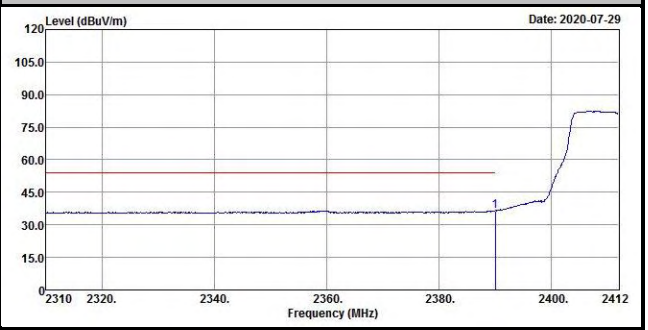


Average

Horizontal



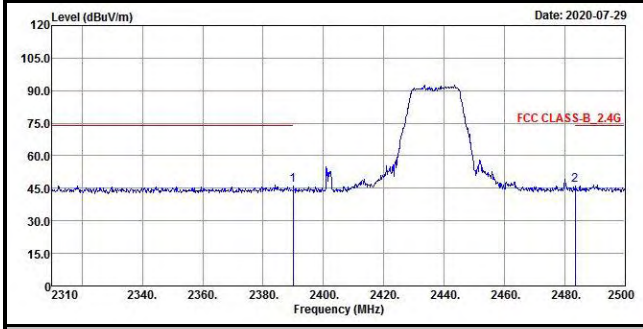
Vertical



Ch 6

Peak

Horizontal



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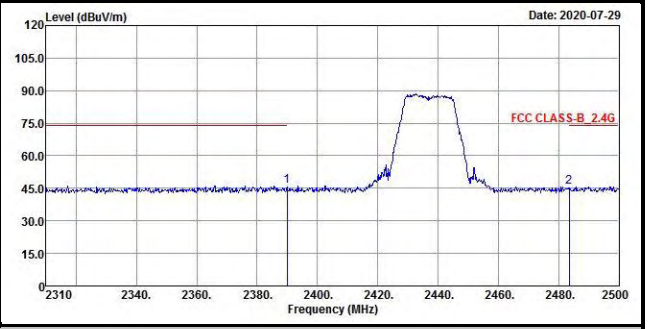
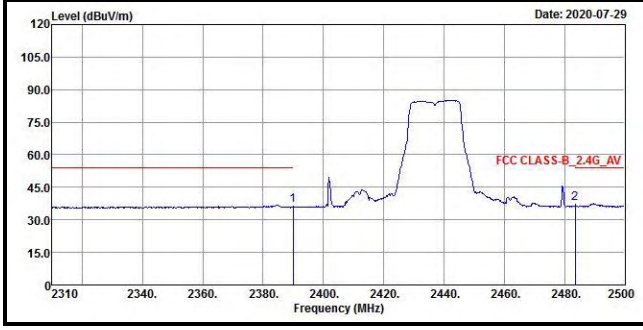


Average

Horizontal



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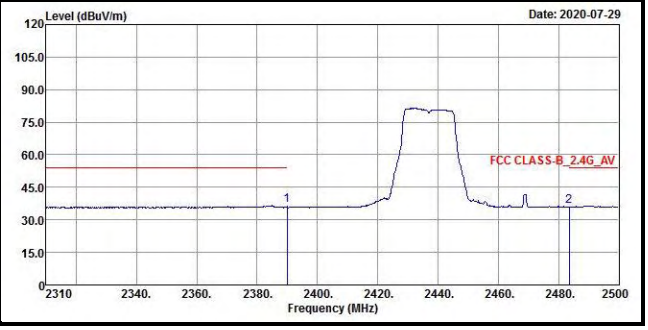
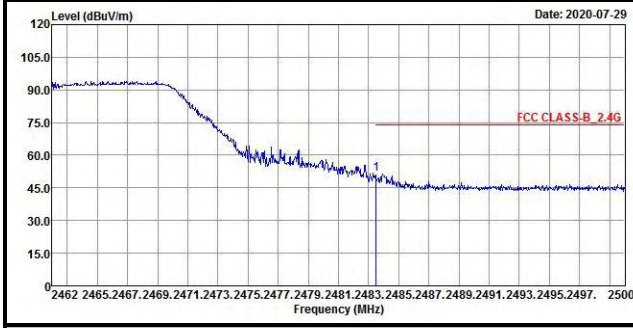


Ch 11

Peak

Horizontal



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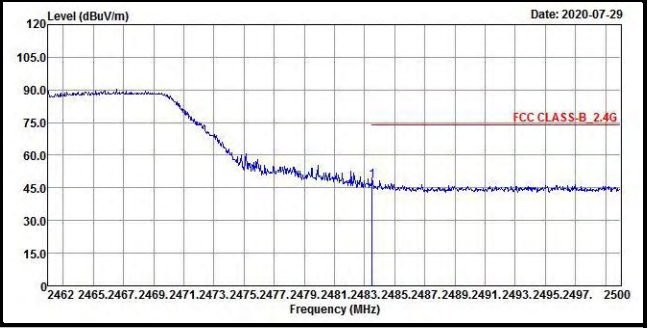
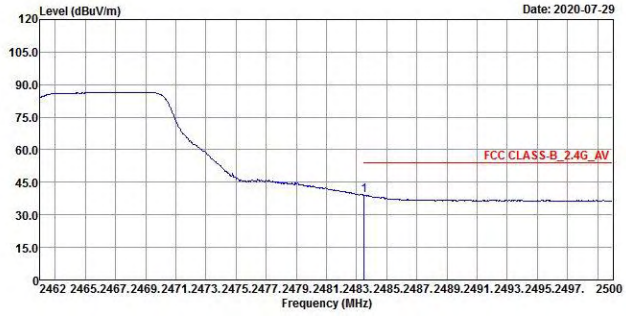
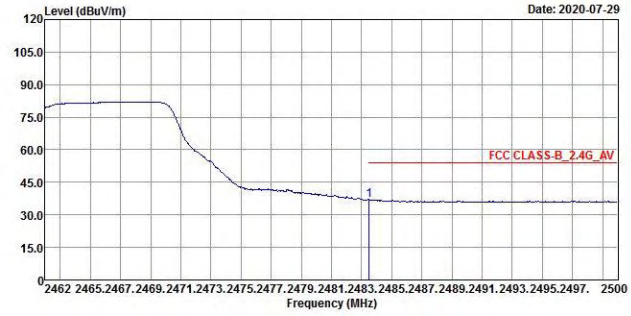


Average

Horizontal



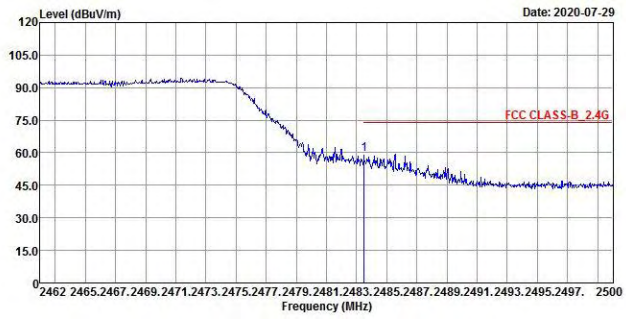
Vertical



Ch 12

Peak

Horizontal



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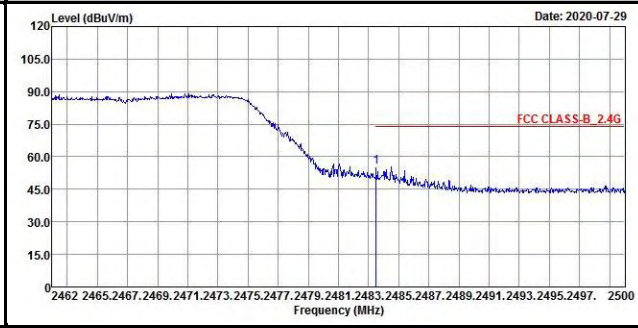
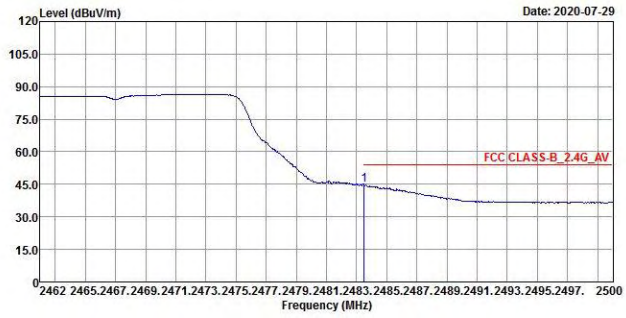
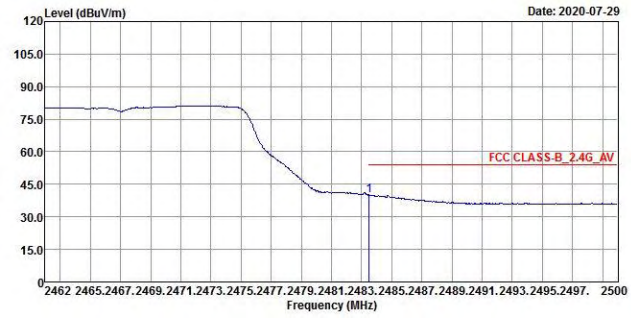


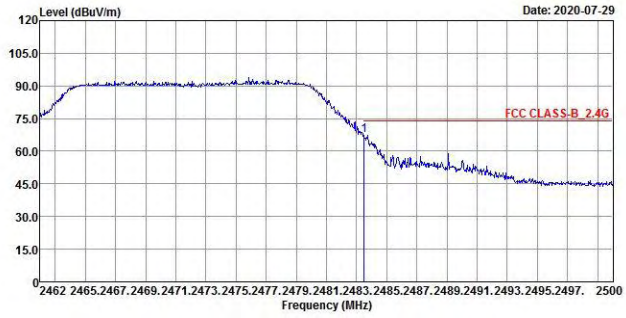
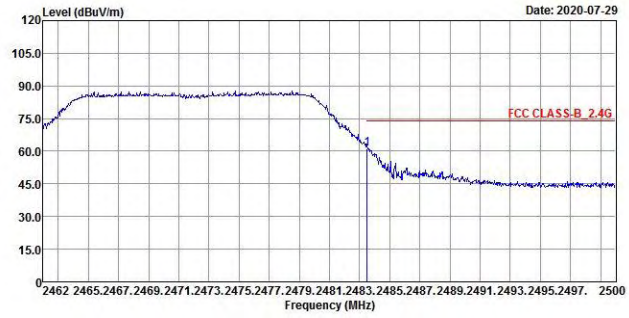
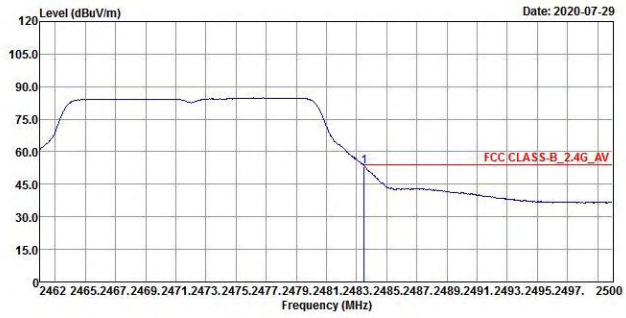
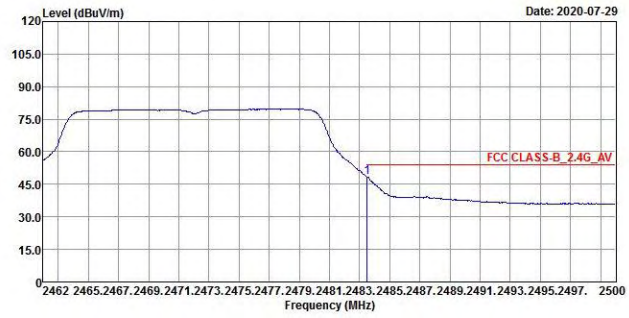
Average

Horizontal



Vertical



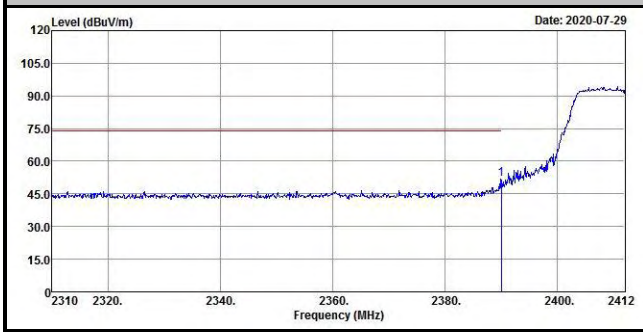
Ch 13	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

802.11n (HT20)

Ch 1

Peak

Horizontal



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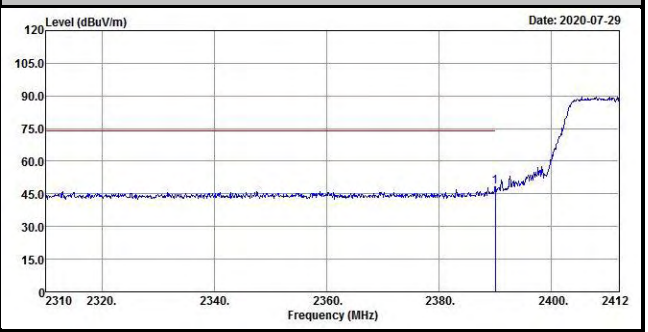
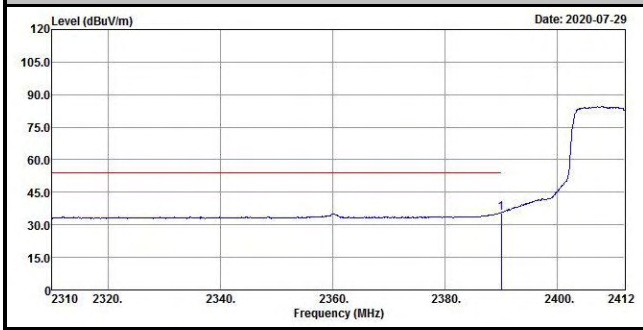


Average

Horizontal



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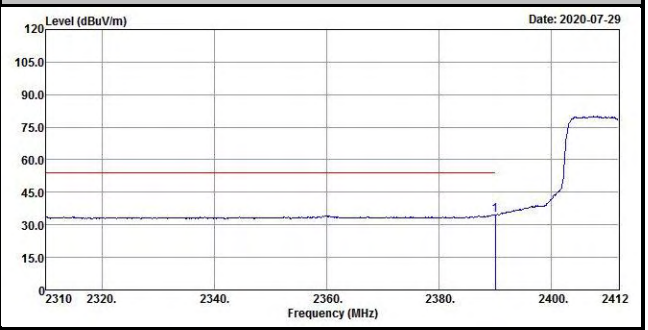
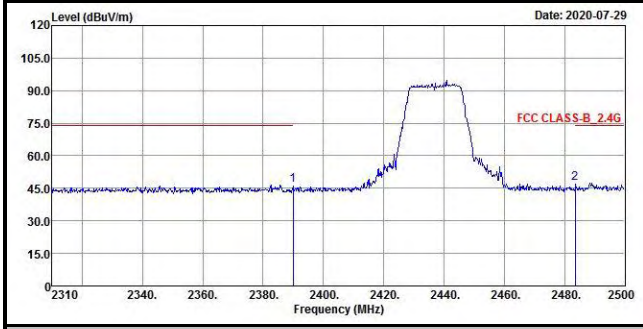


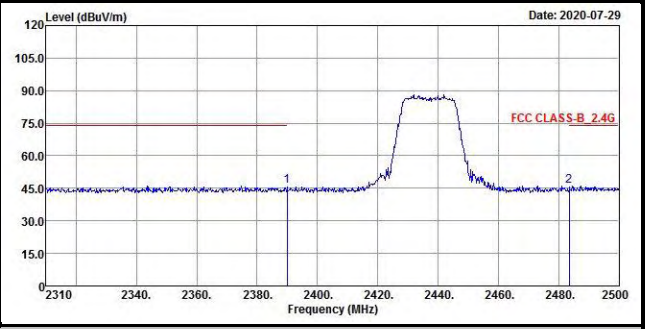
Ch 6

Peak

Horizontal

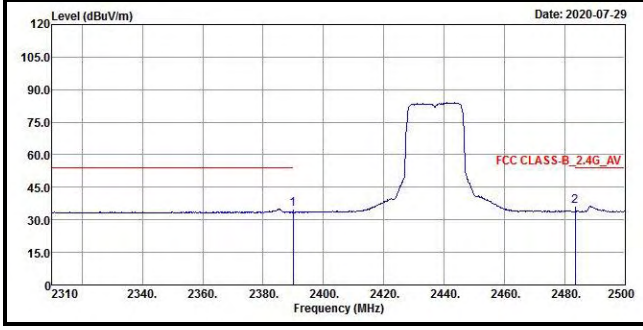


Vertical

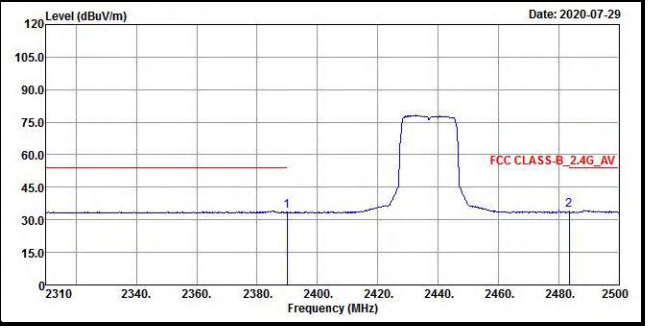


Average

Horizontal



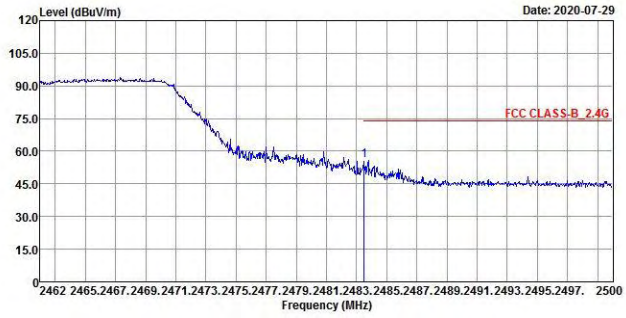
Vertical



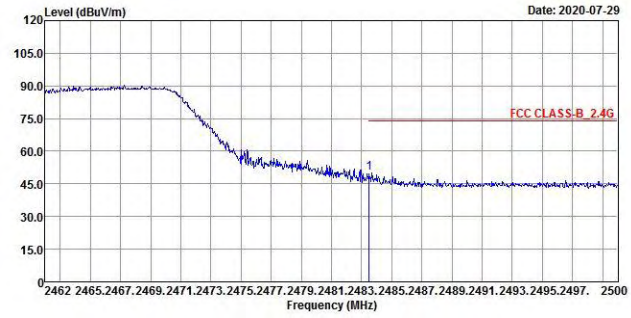
Ch 11

Peak

Horizontal

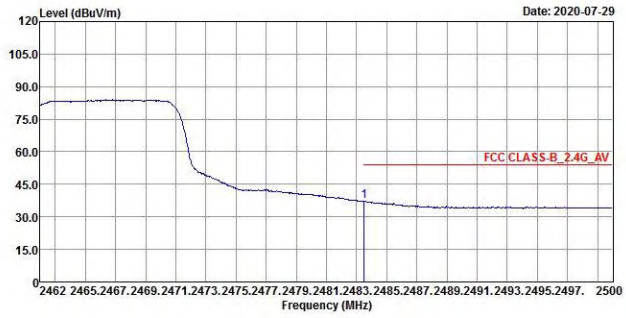


Vertical

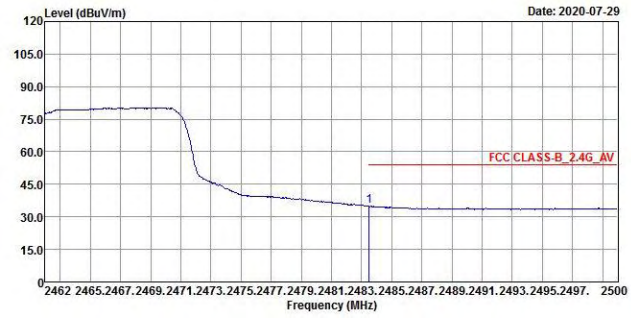


Average

Horizontal



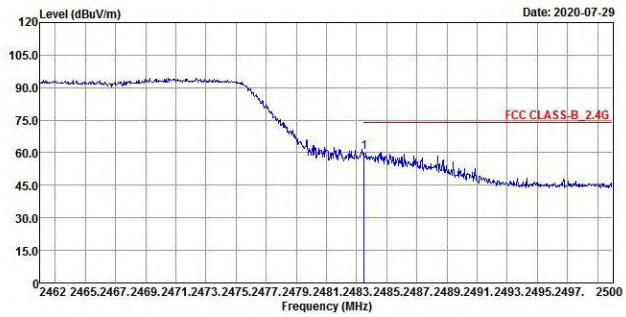
Vertical



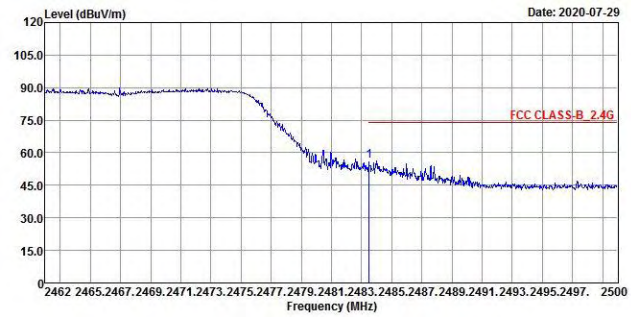
Ch 12

Peak

Horizontal

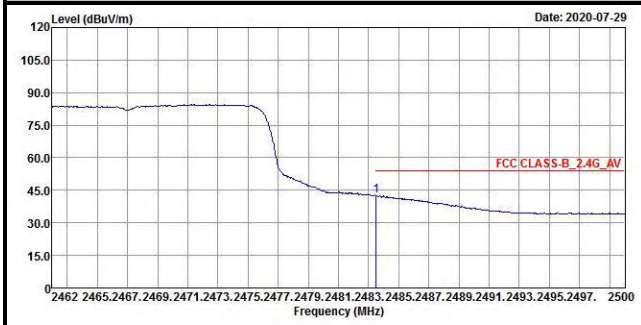


Vertical

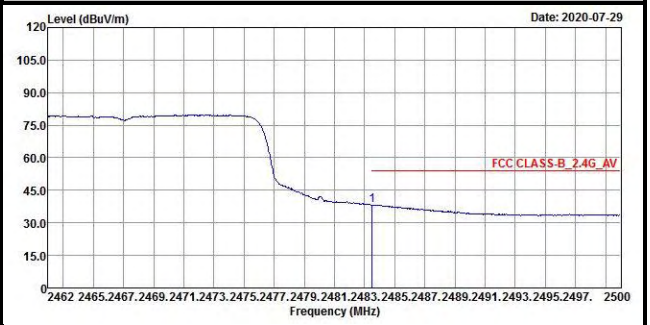


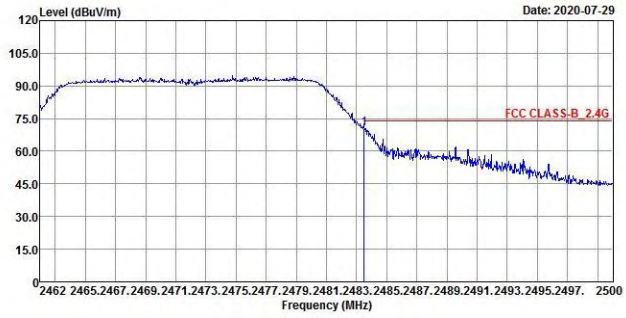
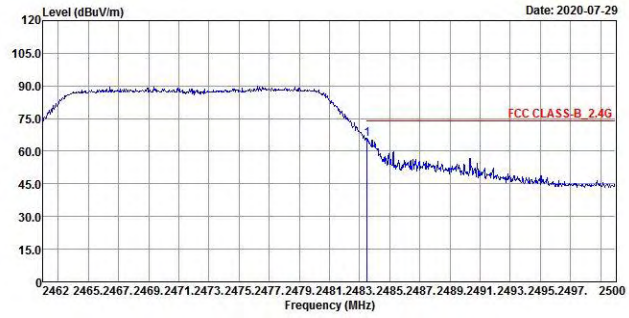
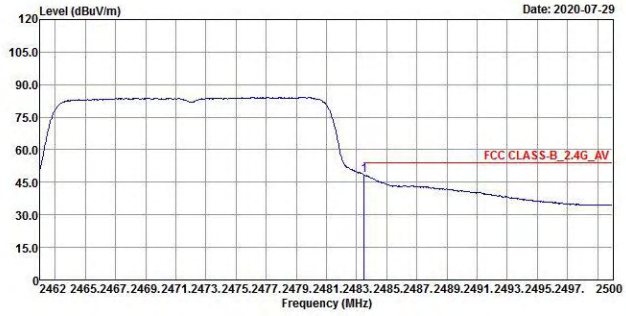
Average

Horizontal



Vertical



Ch 13	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

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:

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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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