FCC Test Report

Report No.:	RF200204C24-3
FCC ID:	A4R-G4CVZ
Test Model:	G4CVZ
Received Date:	Feb. 04, 2020
Test Date:	Feb. 26 ~ Apr. 27, 2020
Issued Date:	Apr. 28, 2020
Applicant:	Google LLC
Address:	1600 Amphitheatre Parkway, Mountain View, CA 94043, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF200204C24-3	Original Release	Apr. 28, 2020

1 Certificate of Conformity

Product:	Thermostat
Test Model:	G4CVZ
Sample Status:	Engineering Sample
Applicant:	Google LLC
Test Date:	Feb. 26 ~ Apr. 27, 2020
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) 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 : Gina Liu , **Date:** Apr. 28, 2020

Gina Liu / Specialist

Approved by : , **Date:** Apr. 28, 2020

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	**Test Item**	**Result**	**Remarks**
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -19.22 dB at 0.174 MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.51 dB at 5470 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6 dB Bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

Note:

1. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.
2. For U-NII-1, U-NII-2A, U-NII-2C band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex B. Test Procedures refer to report 4.1.3.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	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	Thermostat
Test Model	G4CVZ
Status of EUT	Engineering Sample
Power Supply Rating	3.3Vdc (Power Supply)
Modulation Type	64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps 802.11n: up to 72.2 Mbps
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5700 MHz, 5745 ~ 5825 MHz
Number of Channel	5180 ~ 5240 MHz: 4 for 802.11a, 802.11n (HT20) 5260 ~ 5320 MHz: 4 for 802.11a, 802.11n (HT20) 5500 ~ 5700 MHz: 11 for 802.11a, 802.11n (HT20) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20)
Output Power (Measured Max. Average)	104.713 mW for 5180 ~ 5240 MHz 137.088 mW for 5260 ~ 5320 MHz 149.279 mW for 5500 ~ 5700 MHz 96.605 mW for 5745 ~ 5825 MHz
Antenna Type	PIFA antenna with 3.20 dBi gain (5180 ~ 5240 MHz) PIFA antenna with 1.96 dBi gain (5260 ~ 5320 MHz) PIFA antenna with 1.30 dBi gain (5500 ~ 5700 MHz) PIFA antenna with 1.95 dBi gain (5745 ~ 5825 MHz)
Antenna Connector	N/A
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

Modulation Mode	Tx Function
802.11a	1TX
802.11n (HT20)	1TX

2. 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

For 5180 ~ 5240 MHz

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

For 5260 ~ 5320 MHz

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
56	5280	64	5320

For 5500 ~ 5700 MHz

11 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	124	5620
104	5520	128	5640
108	5540	132	5660
112	5560	136	5680
116	5580	140	5700
120	5600		

For 5745 ~ 5825 MHz:

5 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	161	5805
153	5765	165	5825
157	5785		

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

Note:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 60, 64	OFDM	BPSK	6.5
-	5500-5700	802.11a	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 140	100, 116, 140	OFDM	BPSK	6.5
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36	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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36	OFDM	BPSK	6.0

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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 40, 48	OFDM	BPSK	6.5
-	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 60, 64	OFDM	BPSK	6.5
-	5500-5700	802.11a	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 140	100, 116, 140	OFDM	BPSK	6.5
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	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, Jisyong Wang, Getaz Yang
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Tim Chen
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
APCM	25 deg. C, 65 % RH	3.3 Vdc	Gavin Wu

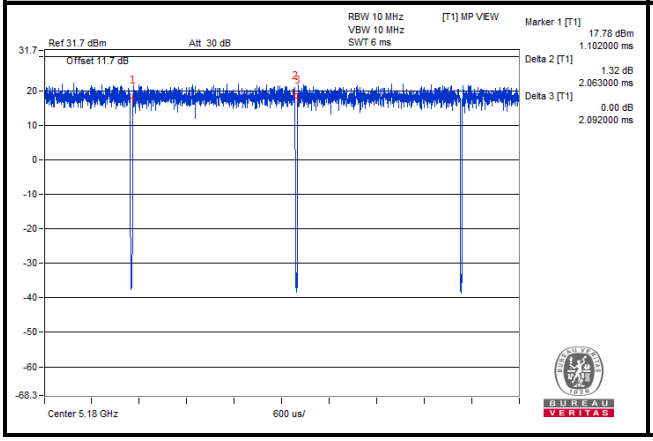
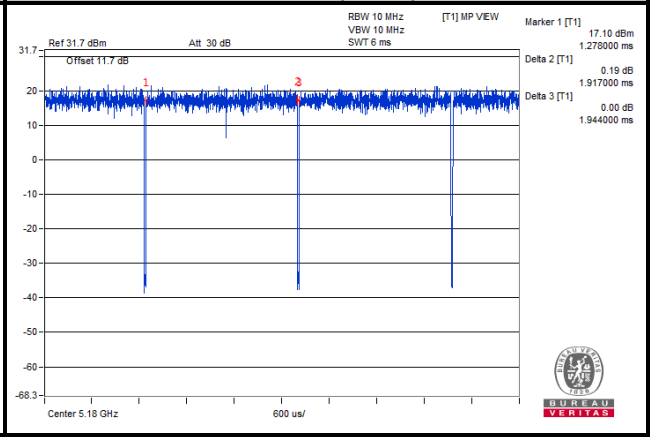
3.3 Duty Cycle of Test Signal

MODULATION TYPE: BPSK

Duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11a: 2.063/2.092 = 0.986, Duty factor = 10 * log(1/0.986) = 0.06

802.11n (HT20): 1.917/1.944 = 0.986, Duty factor = 10 * log(1/0.986) = 0.06

802.11a	802.11n (HT20)
	

3.4 Description of Support Units

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

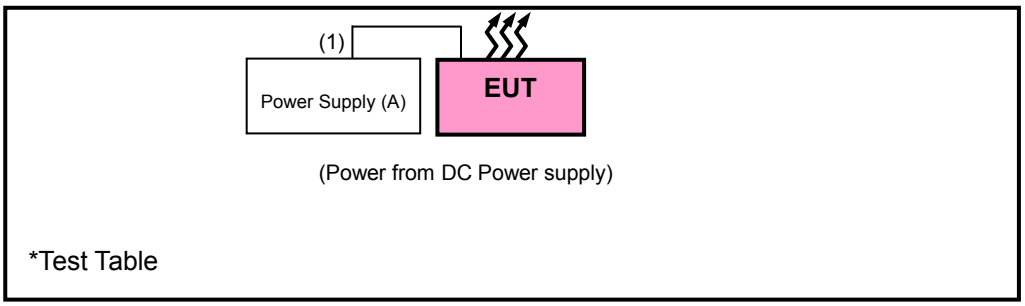
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
1.	DC Power Supply	Topward	33010D	807748	N/A	Provided by Lab

Note:

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	2	N	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test Standard:

FCC Part 15, Subpart E (15.407)
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

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.

Limits of Unwanted Emission Out of the Restricted Bands

Applicable To			Limit	
789033 D02 General UNII Test Procedures New Rules v02r01			Field Strength at 3 m	
			PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Frequency Band	**Applicable To**		**EIRP Limit**	**Equivalent Field Strength at 3 m**
5150~5250 MHz	15.407(b)(1)		PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☒	15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2 (dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8 (dBμV/m) *3 PK:122.2 (dBμV/m) *4
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

*1 beyond 75 MHz or more above of the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts).

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Mar. 20, 2019	Mar. 19, 2020
			Mar. 18, 2020	Mar. 17, 2021
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 12, 2019	Dec. 11, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020
			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 WORKEN	MDCS18N-10	MDCS18N-10-01	Apr. 17, 2019	Apr. 16, 2020
			Apr. 14, 2020	Apr. 13, 2021
Loop Antenna	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
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
Power Sensor Anritsu	MA2411B	1315050	Sep. 04, 2019	Sep. 03, 2020
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 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:

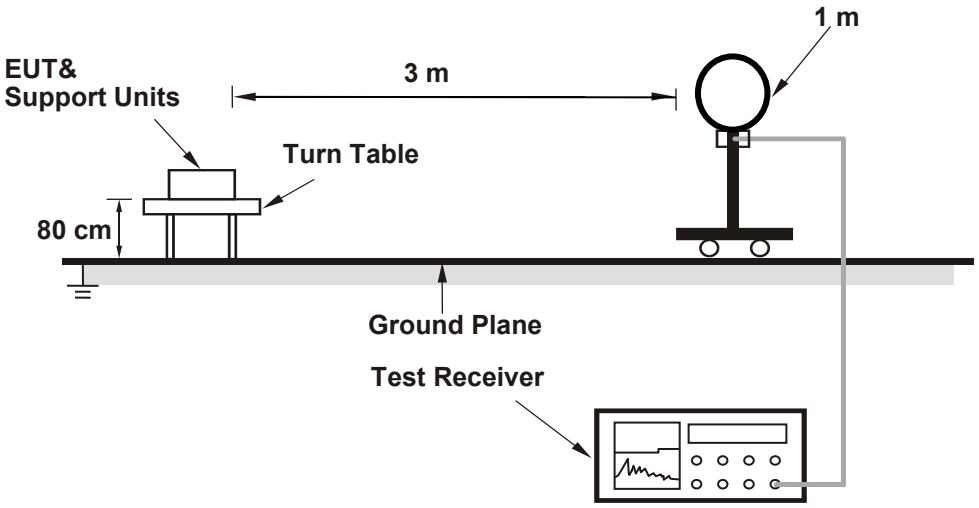
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK)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

4.1.4 Deviation from Test Standard

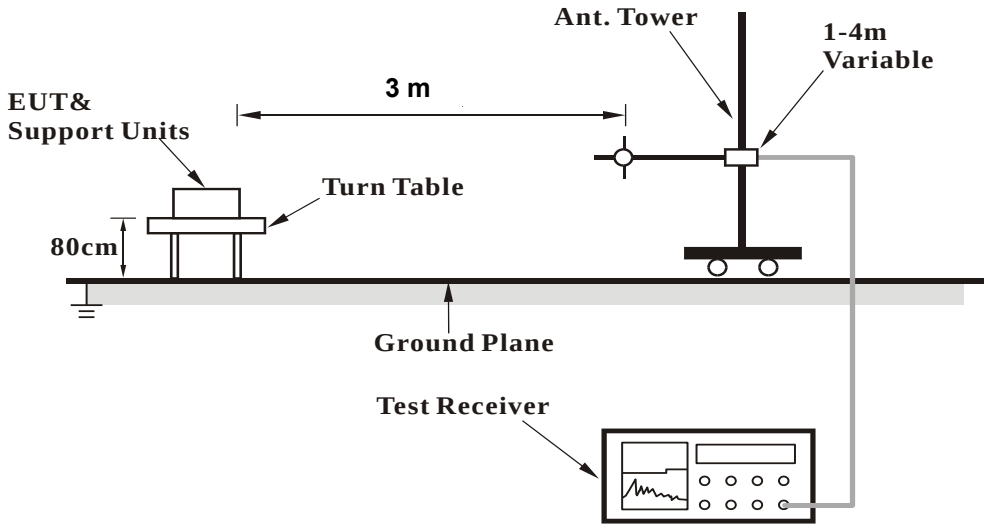
No deviation.

4.1.5 Test Setup

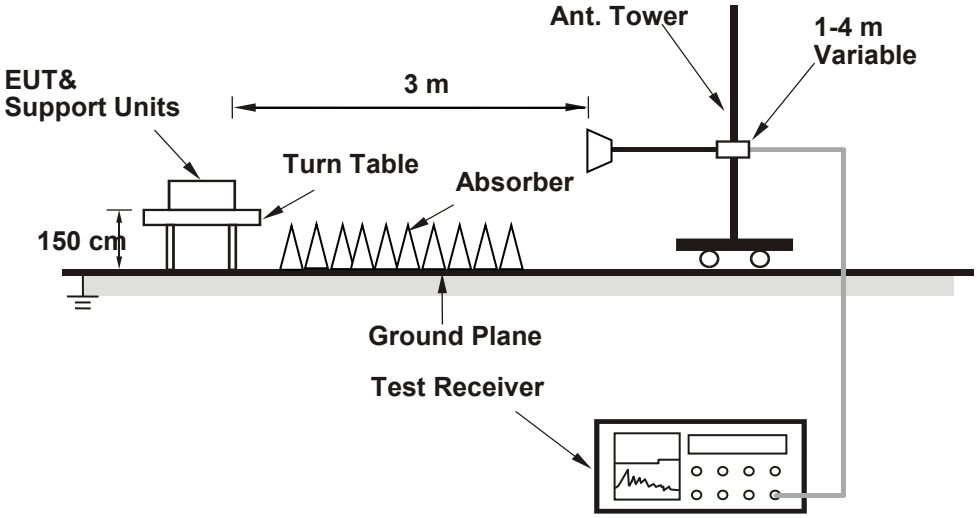
<Radiated Emission below 30 MHz>



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

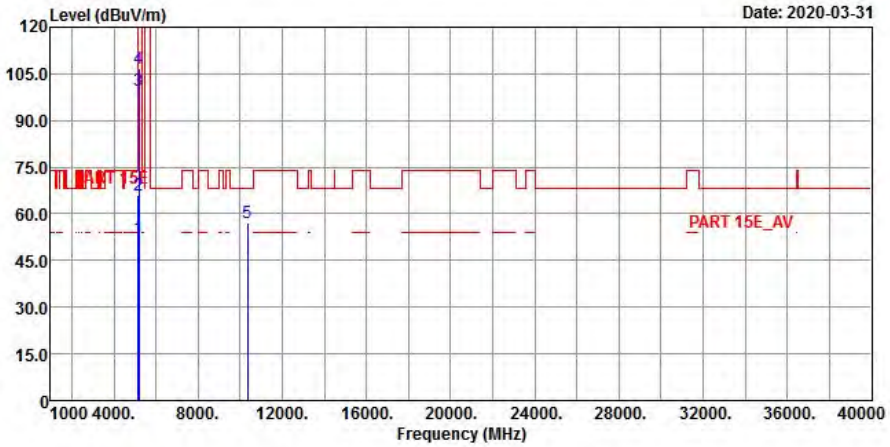
4.1.7 Test Results

Above 1 GHz Data：

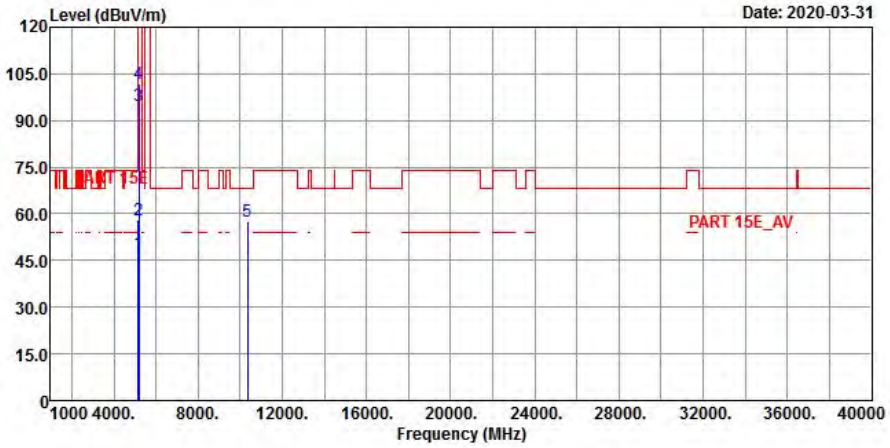
802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 36	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



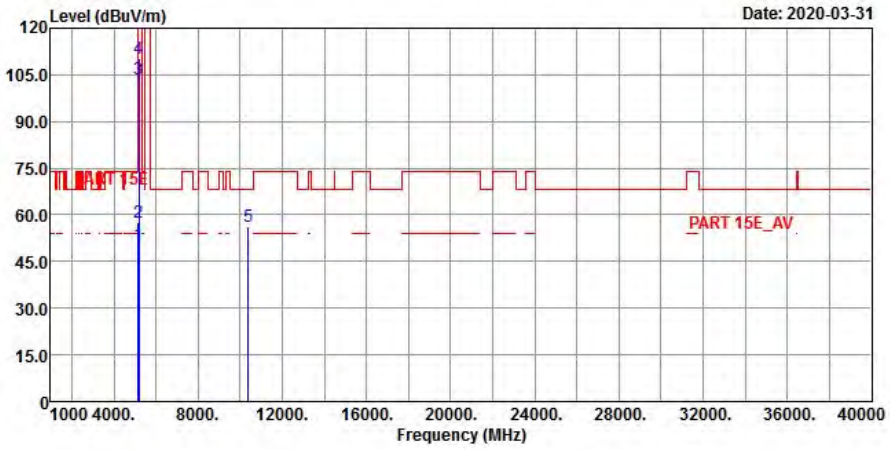
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5150	52.31	51.27	1.04	54	-1.69	111	113	Average
5150	66.13	65.09	1.04	74	-7.87	111	113	Peak
5180	99.85	98.96	0.89	------	------	111	113	Average
5180	106.51	105.62	0.89	------	------	111	113	Peak
10360	57.13	57.69	-0.56	68.2	-11.07	133	207	Peak
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**
5150	47.17	46.13	1.04	54	-6.83	119	180	Average
5150	58.01	56.97	1.04	74	-15.99	119	180	Peak
5180	94.87	93.98	0.89	------	------	119	180	Average
5180	101.64	100.75	0.89	------	------	119	180	Peak
10360	57.49	58.05	-0.56	68.2	-10.71	131	166	Peak

Remarks:

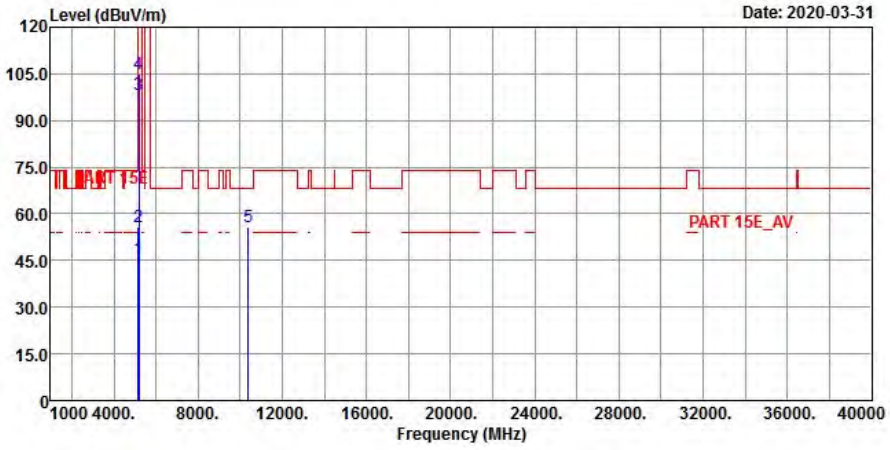
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5180 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 40	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



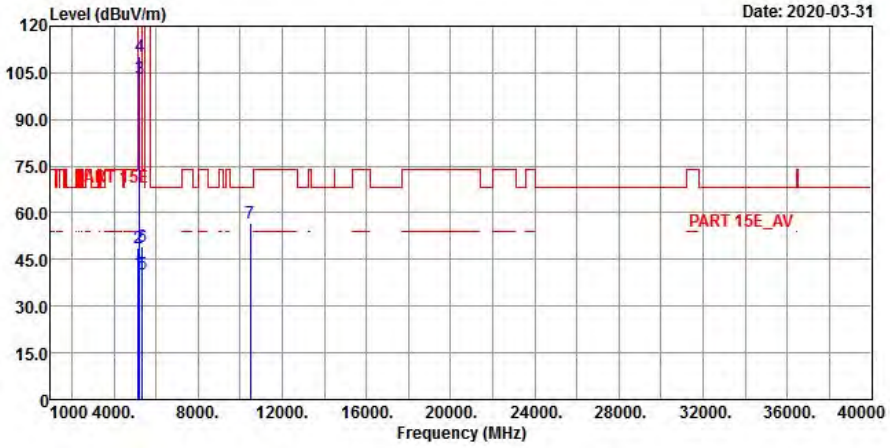
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	50.28	49.24	1.04	54	-3.72	100	110	Average
5150	57.59	56.55	1.04	74	-16.41	100	110	Peak
5200	103.48	102.7	0.78	------	------	100	110	Average
5200	110.22	109.44	0.78	------	------	100	110	Peak
10400	56.23	56.65	-0.42	68.2	-11.97	112	49	Peak
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
5150	45.57	44.53	1.04	54	-8.43	103	181	Average
5150	55.94	54.9	1.04	74	-18.06	103	181	Peak
5200	98.08	97.3	0.78	------	------	103	181	Average
5200	104.91	104.13	0.78	------	------	103	181	Peak
10400	55.75	56.17	-0.42	68.2	-12.45	193	308	Peak

Remarks:

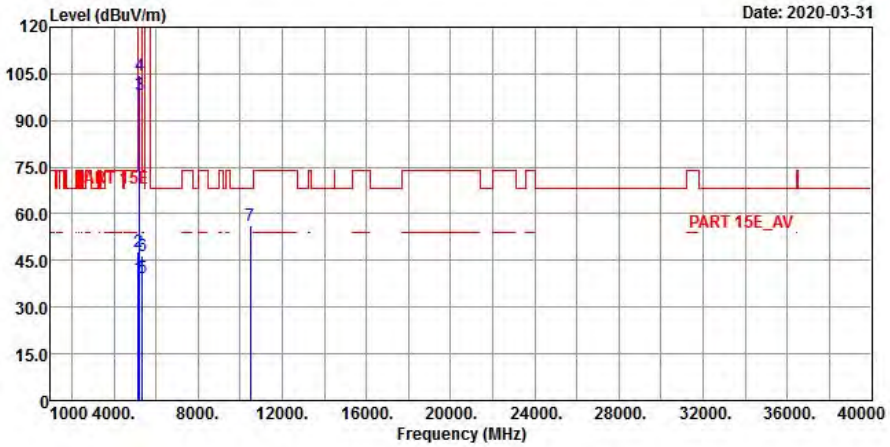
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5200 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 48	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



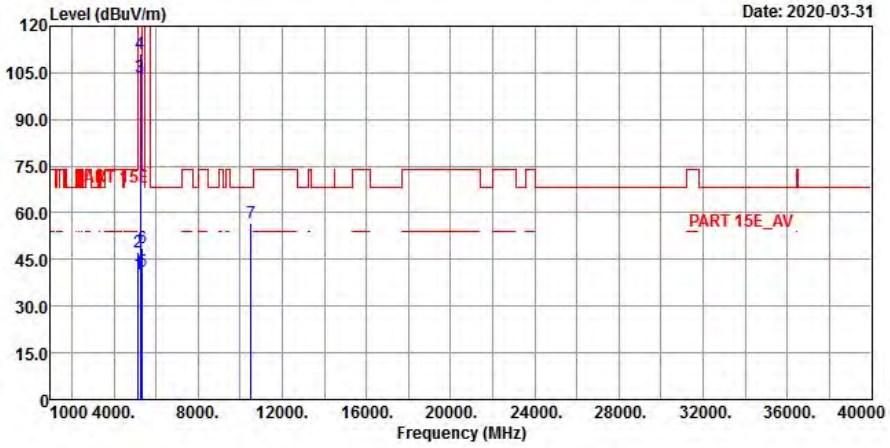
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	40.71	39.67	1.04	54	-13.29	118	112	Average
5150	48.52	47.48	1.04	74	-25.48	118	112	Peak
5240	103.33	102.46	0.87	------	------	118	112	Average
5240	110.34	109.47	0.87	------	------	118	112	Peak
5350	40.25	38.96	1.29	54	-13.75	118	112	Average
5350	49.02	47.73	1.29	74	-24.98	118	112	Peak
10480	56.71	56.83	-0.12	68.2	-11.49	152	203	Peak
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
5150	39.6	38.56	1.04	54	-14.4	118	183	Average
5150	47.99	46.95	1.04	74	-26.01	118	183	Peak
5240	98.23	97.36	0.87	------	------	118	183	Average
5240	104.69	103.82	0.87	------	------	118	183	Peak
5350	39.44	38.15	1.29	54	-14.56	118	183	Average
5350	46.63	45.34	1.29	74	-27.37	118	183	Peak
10480	56.23	56.35	-0.12	68.2	-11.97	129	105	Peak

Remarks:

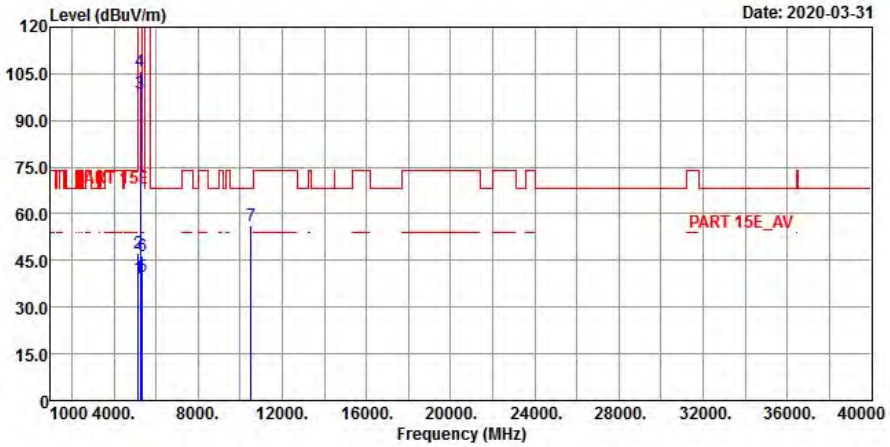
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 52	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



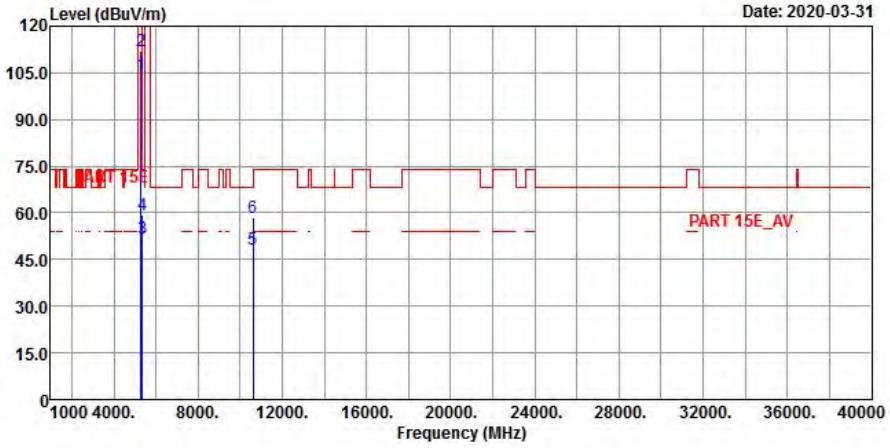
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5150	40.17	39.13	1.04	54	-13.83	116	112	Average
5150	47.56	46.52	1.04	74	-26.44	116	112	Peak
5260	103.74	102.76	0.98	------	------	116	112	Average
5260	111.19	110.21	0.98	------	------	116	112	Peak
5350	40.98	39.69	1.29	54	-13.02	116	112	Average
5350	48.73	47.44	1.29	74	-25.27	116	112	Peak
10520	56.68	56.72	-0.04	68.2	-11.52	106	37	Peak
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**
5150	39.55	38.51	1.04	54	-14.45	100	200	Average
5150	47.39	46.35	1.04	74	-26.61	100	200	Peak
5260	98.53	97.55	0.98	------	------	100	200	Average
5260	105.65	104.67	0.98	------	------	100	200	Peak
5350	39.66	38.37	1.29	54	-14.34	100	200	Average
5350	46.67	45.38	1.29	74	-27.33	100	200	Peak
10520	56.35	56.39	-0.04	68.2	-11.85	176	302	Peak

Remarks:

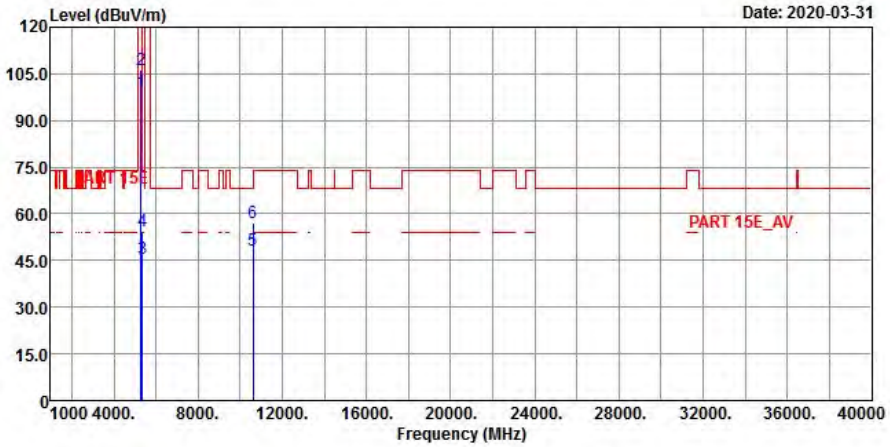
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 60	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



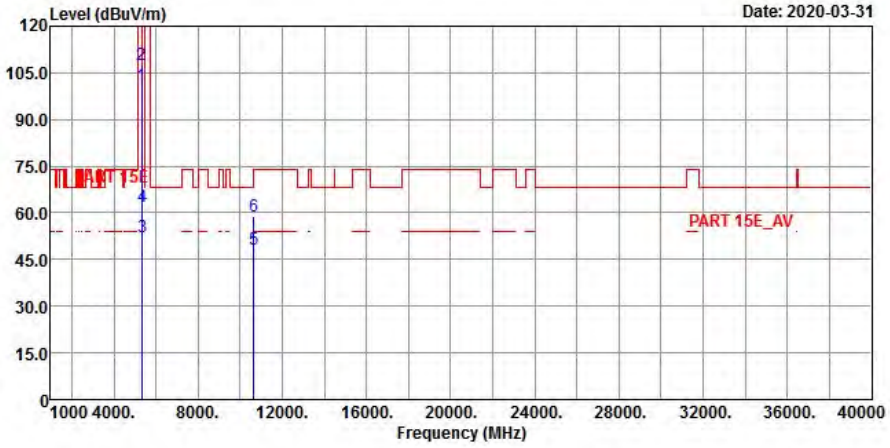
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5300	104.33	103.14	1.19	------	------	123	114	Average
5300	111.95	110.76	1.19	------	------	123	114	Peak
5350	51.74	50.45	1.29	54	-2.26	123	114	Average
5350	59.55	58.26	1.29	74	-14.45	123	114	Peak
10600	48.34	48.36	-0.02	54	-5.66	133	193	Average
10600	58.46	58.48	-0.02	74	-15.54	133	193	Peak
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**
5300	99.14	97.95	1.19	------	------	100	206	Average
5300	106.2	105.01	1.19	------	------	100	206	Peak
5350	45.72	44.43	1.29	54	-8.28	100	206	Average
5350	54.37	53.08	1.29	74	-19.63	100	206	Peak
10600	48.42	48.44	-0.02	54	-5.58	151	133	Average
10600	57.1	57.12	-0.02	74	-16.9	151	133	Peak

Remarks:

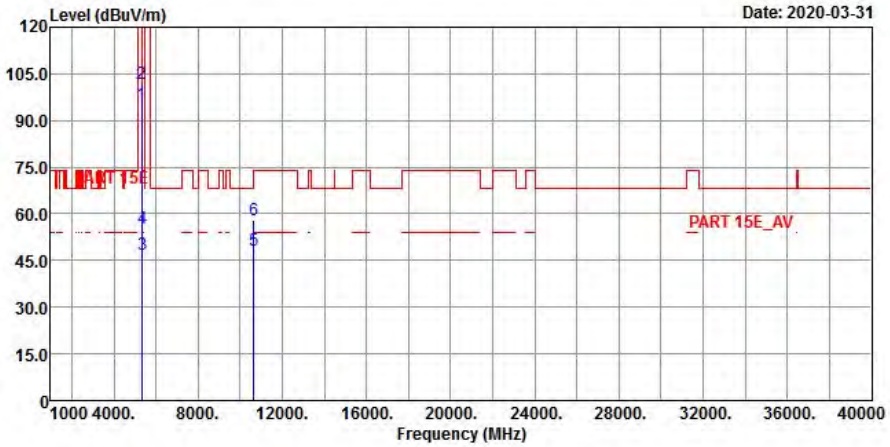
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 64	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



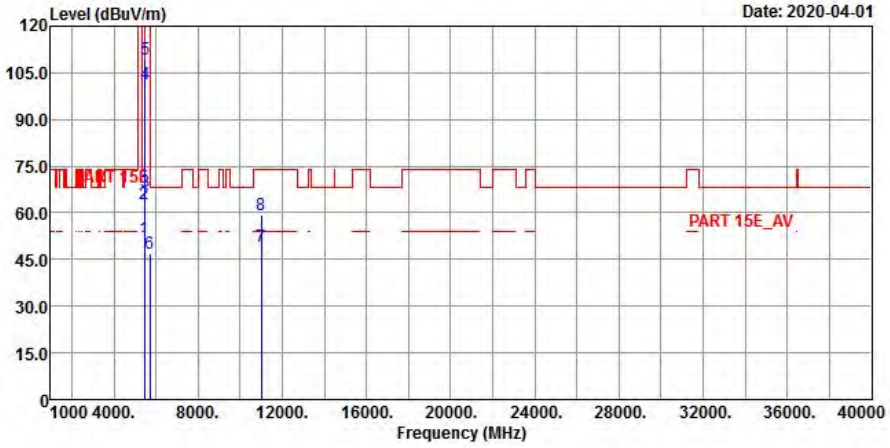
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	101.01	99.78	1.23	------	------	112	115	Average
5320	107.76	106.53	1.23	------	------	112	115	Peak
5350	52.29	51	1.29	54	-1.71	112	115	Average
5350	62.18	60.89	1.29	74	-11.82	112	115	Peak
10640	48.32	48.13	0.19	54	-5.68	124	137	Average
10640	59.08	58.89	0.19	74	-14.92	127	137	Peak
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**
5320	95.24	94.01	1.23	------	------	100	207	Average
5320	101.79	100.56	1.23	------	------	100	207	Peak
5350	47	45.71	1.29	54	-7	100	207	Average
5350	55.18	53.89	1.29	74	-18.82	100	207	Peak
10640	48.43	48.24	0.19	54	-5.57	189	314	Average
10640	57.98	57.79	0.19	74	-16.02	189	314	Peak

Remarks:

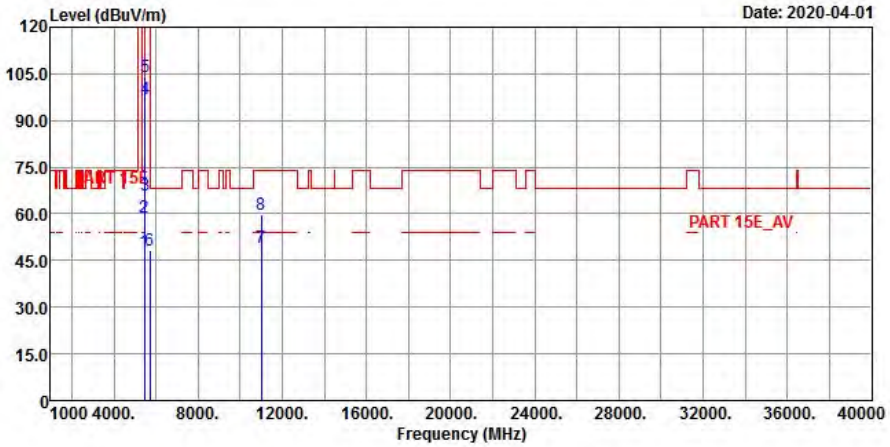
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 100	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



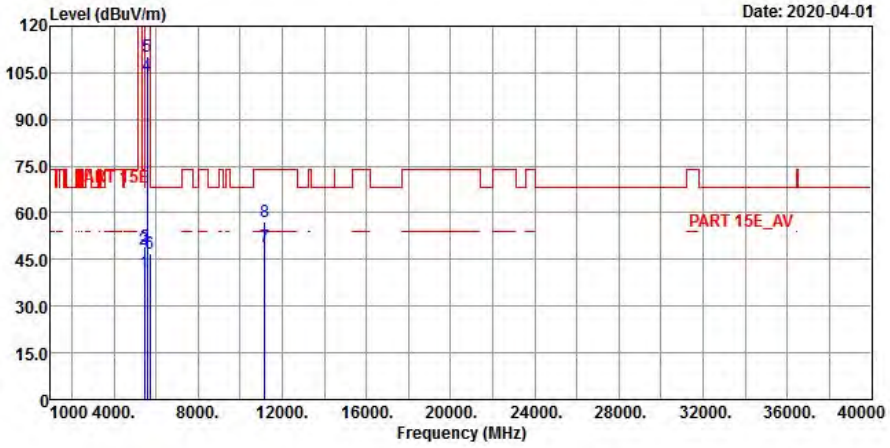
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5460	51.66	50.02	1.64	54	-2.34	116	100	Average
5460	62.71	61.07	1.64	74	-11.29	116	100	Peak
5470	66.69	65.04	1.65	68.2	-1.51	116	100	Peak
5500	101.46	99.72	1.74	------	------	116	100	Average
5500	109.32	107.58	1.74	------	------	116	100	Peak
5725	46.91	45.28	1.63	68.2	-21.29	116	100	Peak
11000	49.33	48.37	0.96	54	-4.67	127	191	Average
11000	59.37	58.41	0.96	74	-14.63	127	191	Peak
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**
5460	47.72	46.08	1.64	54	-6.28	100	316	Average
5460	58.78	57.14	1.64	74	-15.22	100	316	Peak
5470	65.92	64.27	1.65	68.2	-2.28	100	316	Peak
5500	96.8	95.06	1.74	------	------	100	316	Average
5500	104.19	102.45	1.74	------	------	100	316	Peak
5725	48.47	46.84	1.63	68.2	-19.73	100	316	Peak
11000	49.07	48.11	0.96	54	-4.93	123	171	Average
11000	59.67	58.71	0.96	74	-14.33	123	171	Peak

Remarks:

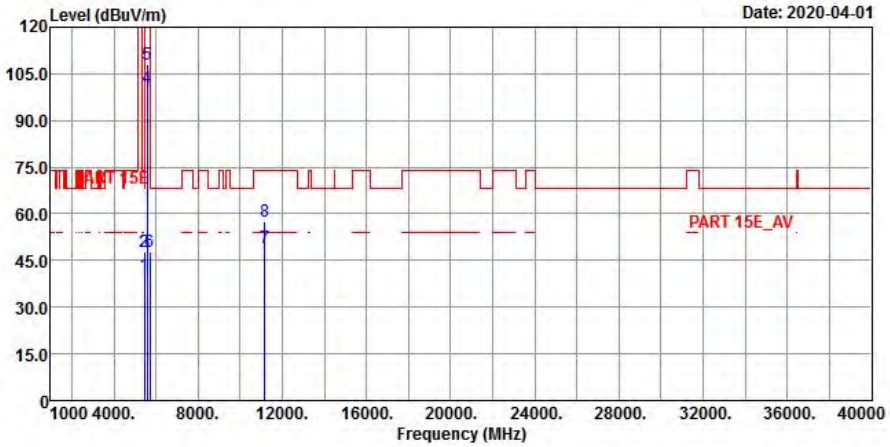
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 116	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



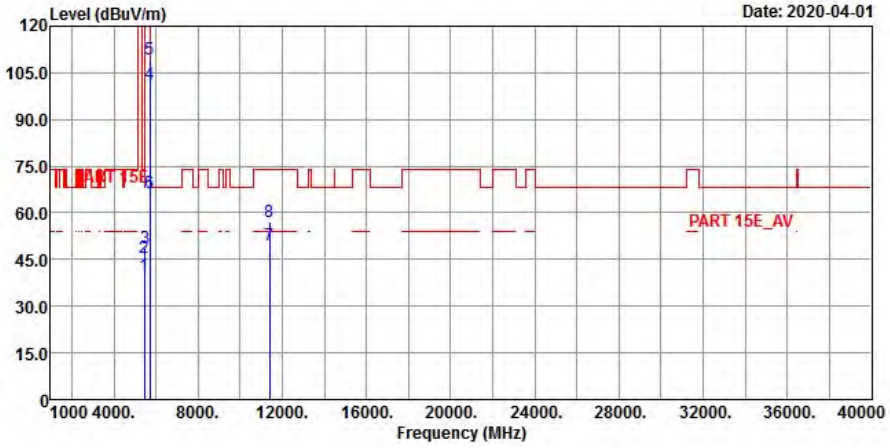
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	40.62	38.98	1.64	54	-13.38	111	99	Average
5460	48.28	46.64	1.64	74	-25.72	111	99	Peak
5470	49.32	47.67	1.65	68.2	-18.88	111	99	Peak
5580	104.05	102.47	1.58	------	------	111	99	Average
5580	110.43	108.85	1.58	------	------	111	99	Peak
5725	46.96	45.33	1.63	68.2	-21.24	111	99	Peak
11160	49.33	48.51	0.82	54	-4.67	145	178	Average
11160	56.97	56.15	0.82	74	-17.03	145	178	Peak
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
5460	40.18	38.54	1.64	54	-13.82	102	320	Average
5460	47.72	46.08	1.64	74	-26.28	102	320	Peak
5470	47.73	46.08	1.65	68.2	-20.47	102	320	Peak
5580	100.51	98.93	1.58	------	------	102	320	Average
5580	107.94	106.36	1.58	------	------	102	320	Peak
5725	48.02	46.39	1.63	68.2	-20.18	102	320	Peak
11160	49.11	48.29	0.82	54	-4.89	186	307	Average
11160	57.36	56.54	0.82	74	-16.64	186	307	Peak

Remarks:

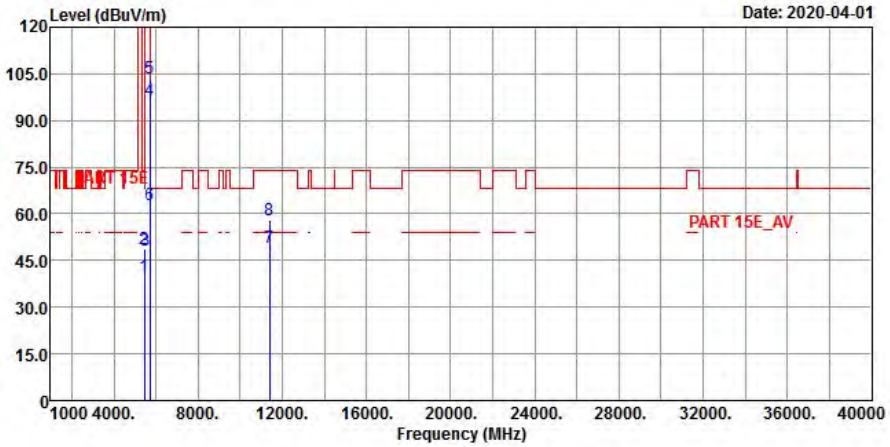
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 140	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



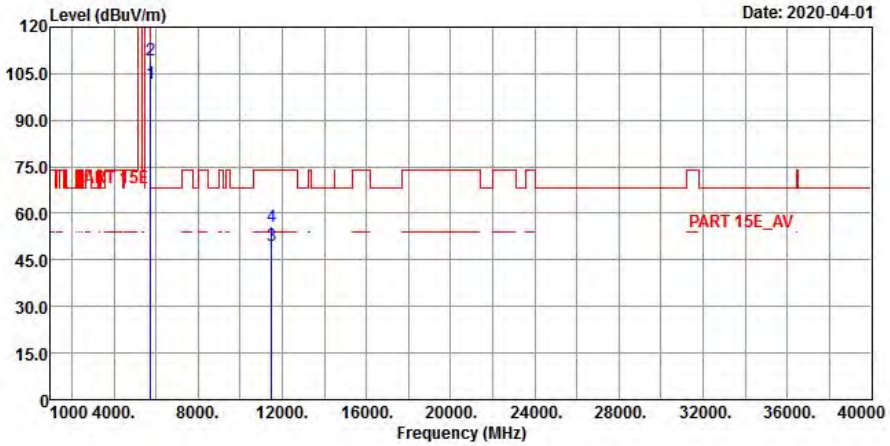
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	39.88	38.24	1.64	54	-14.12	119	99	Average
5460	45.64	44	1.64	74	-28.36	119	99	Peak
5470	48.85	47.2	1.65	68.2	-19.35	119	99	Peak
5700	101.44	99.86	1.58	------	------	119	99	Average
5700	109.32	107.74	1.58	------	------	119	99	Peak
5725	66.44	64.81	1.63	68.2	-1.76	119	99	Peak
11400	49.41	48.4	1.01	54	-4.59	193	24	Average
11400	57.25	56.24	1.01	74	-16.75	193	24	Peak
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
5460	39.94	38.3	1.64	54	-14.06	100	319	Average
5460	48.71	47.07	1.64	74	-25.29	100	319	Peak
5470	48.05	46.4	1.65	68.2	-20.15	100	319	Peak
5700	96.59	95.01	1.58	------	------	100	319	Average
5700	103.45	101.87	1.58	------	------	100	319	Peak
5725	62.88	61.25	1.63	68.2	-5.32	100	319	Peak
11400	49.18	48.17	1.01	54	-4.82	186	313	Average
11400	57.89	56.88	1.01	74	-16.11	186	313	Peak

Remarks:

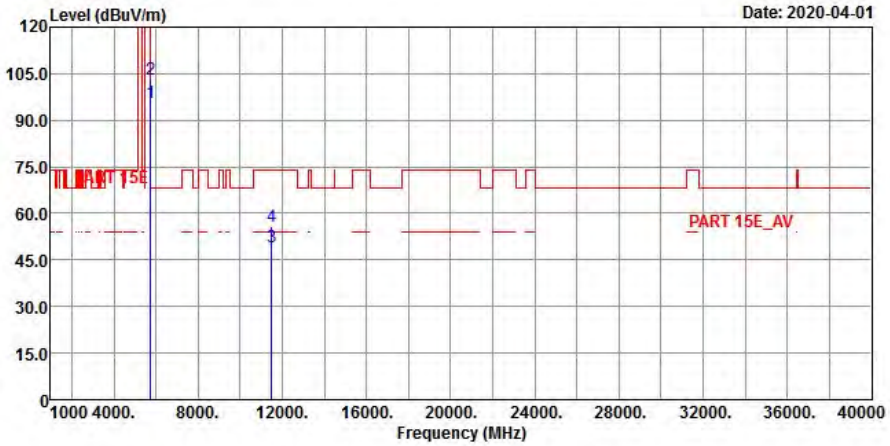
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 149	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

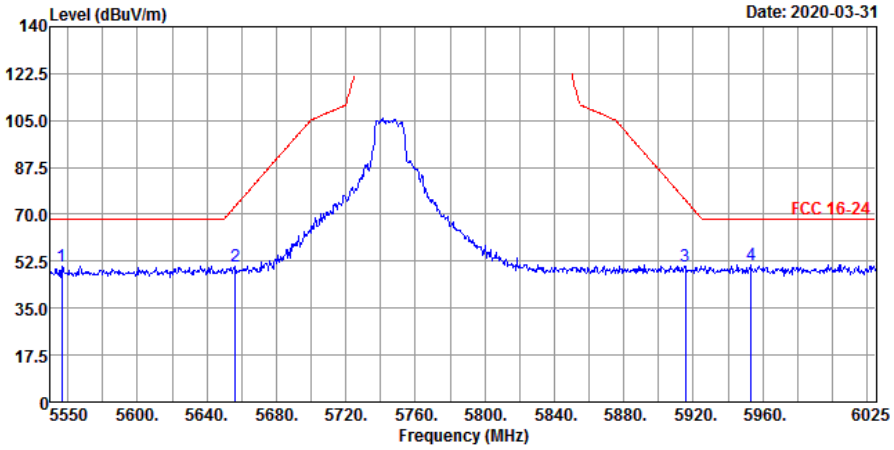
<Spurious Emission>
Horizontal



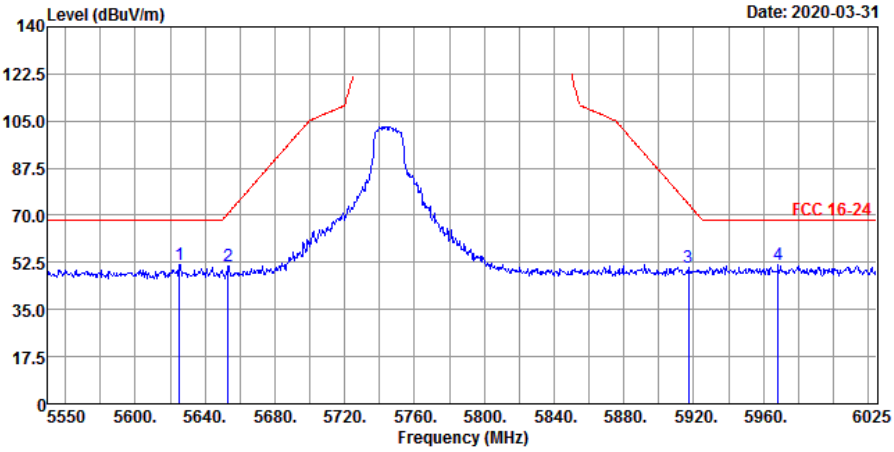
Vertical



<Out of Band Emission (OOBE)>
Horizontal



Vertical



<Spurious Emission>

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
5745	102.04	100.37	1.67	------	------	120	110	Average
5745	109.2	107.53	1.67	------	------	120	110	Peak
11490	49.6	48.52	1.08	54	-4.4	105	38	Average
11490	56	54.92	1.08	74	-18	105	38	Peak
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
5745	95.7	94.03	1.67	------	------	106	111	Average
5745	103.32	101.65	1.67	------	------	106	111	Peak
11490	49.35	48.27	1.08	54	-4.65	175	300	Average
11490	55.66	54.58	1.08	74	-18.34	175	300	Peak

<Out of Band Emission (OOBE)>

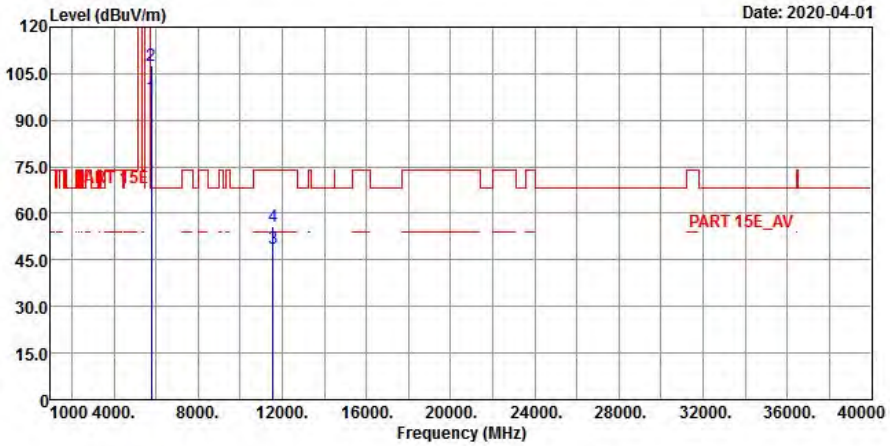
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5556.65	50.66	49.01	1.65	68.2	-17.54	120	110	Peak
5656.4	50.41	49.01	1.4	72.95	-22.54	120	110	Peak
5915.275	50.42	48.08	2.34	75.37	-24.95	120	110	Peak
5953.275	51.38	48.94	2.44	68.2	-16.82	120	110	Peak
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
5625.525	51.52	50.03	1.49	68.2	-16.68	106	111	Peak
5653.075	50.9	49.45	1.45	70.49	-19.59	106	111	Peak
5917.175	50.5	48.16	2.34	73.97	-23.47	106	111	Peak
5968.475	51.48	48.99	2.49	68.2	-16.72	106	111	Peak

Remarks:

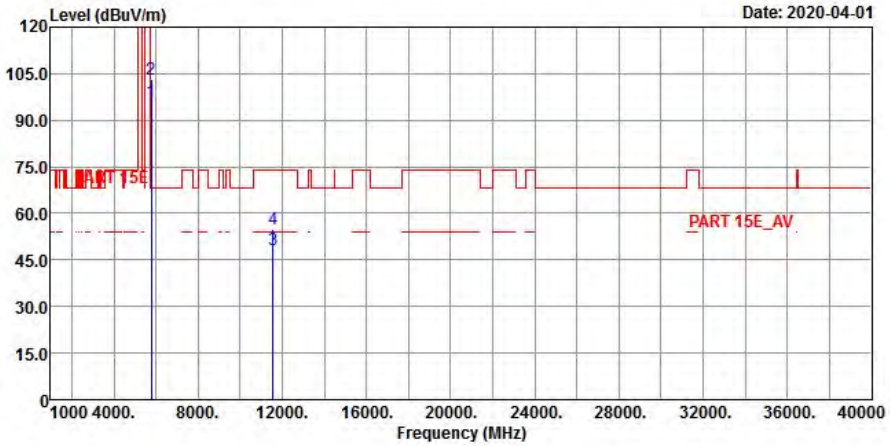
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 157	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

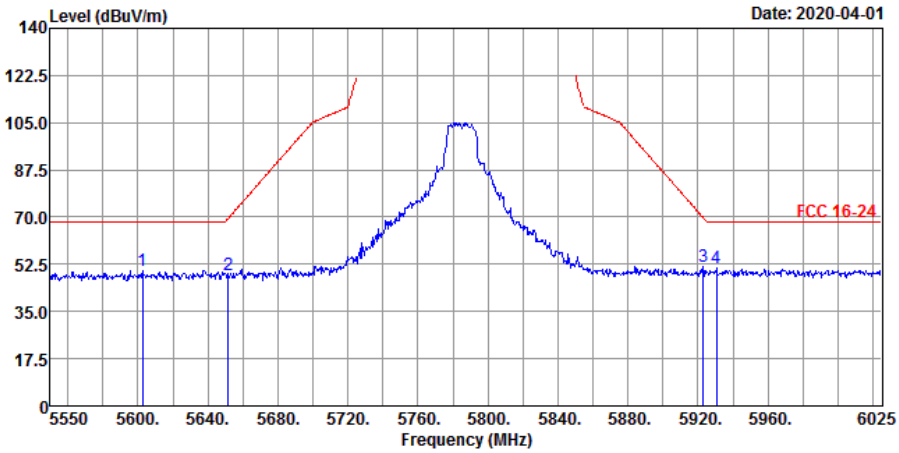
<Spurious Emission>
Horizontal



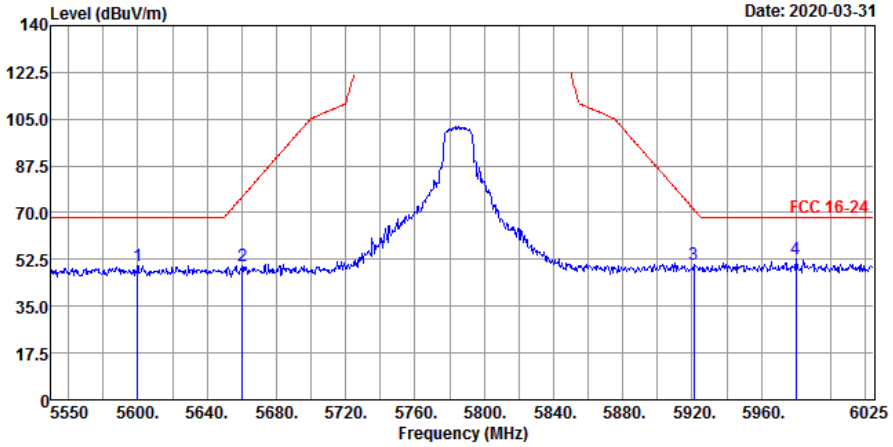
Vertical



<Out of Band Emission (OOBE)>
Horizontal



Vertical



<Spurious Emission>

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
5785	97.55	95.8	1.75	------	------	101	110	Average
5785	107.75	106	1.75	------	------	101	110	Peak
11570	48.75	47.91	0.84	54	-5.25	103	39	Average
11570	56	55.16	0.84	74	-18	103	39	Peak
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
5785	96.06	94.31	1.75	------	------	101	111	Average
5785	103.01	101.26	1.75	------	------	101	111	Peak
11570	48.46	47.62	0.84	54	-5.54	177	289	Average
11570	55.12	54.28	0.84	74	-18.88	177	289	Peak

<Out of Band Emission (OOBE)>

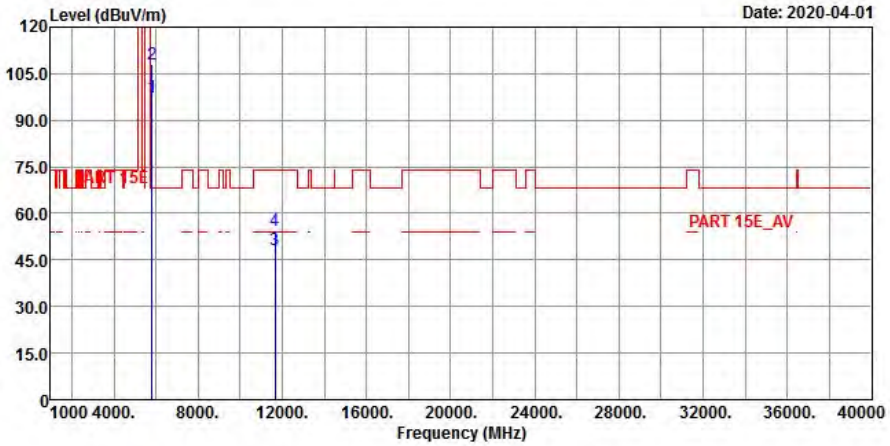
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5602.725	49.98	48.42	1.56	68.2	-18.22	101	110	Peak
5651.65	48.6	47.16	1.44	69.43	-20.83	101	110	Peak
5922.875	51.69	49.33	2.36	69.77	-18.08	101	110	Peak
5930.475	50.91	48.53	2.38	68.2	-17.29	101	110	Peak
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
5599.875	50.09	48.53	1.56	68.2	-18.11	101	111	Peak
5660.2	50.23	48.81	1.42	75.77	-25.54	101	111	Peak
5920.975	50.48	48.13	2.35	71.17	-20.69	101	111	Peak
5979.875	52.71	50.18	2.53	68.2	-15.49	101	111	Peak

Remarks:

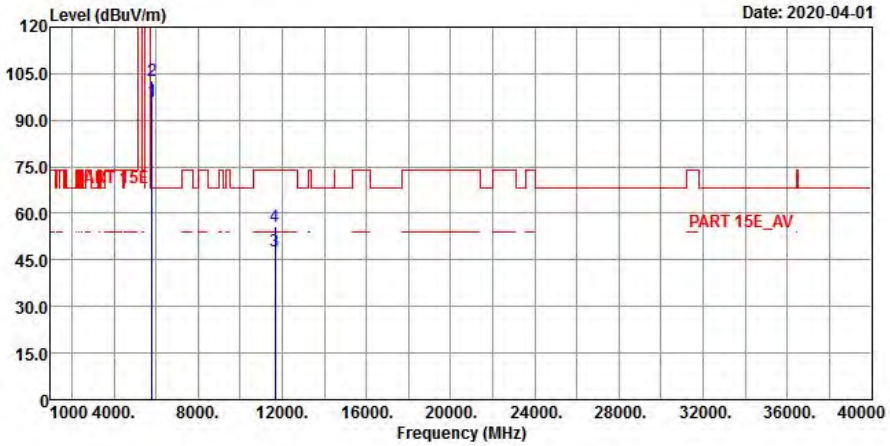
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 165	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Jisyong Wang

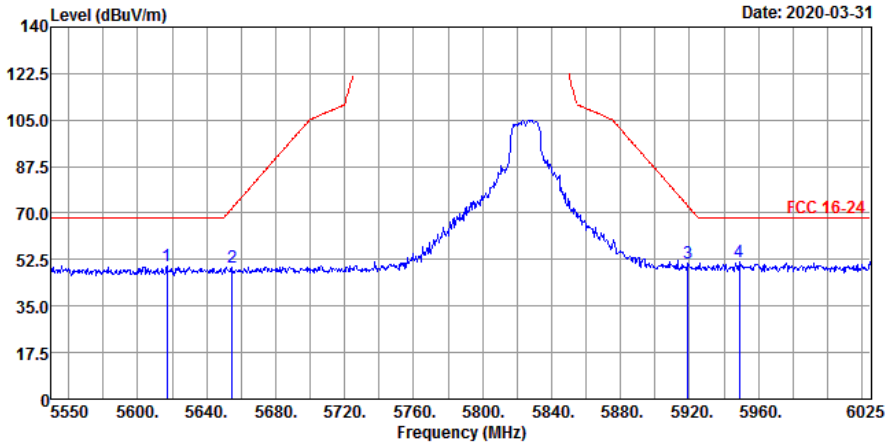
<Spurious Emission>
Horizontal



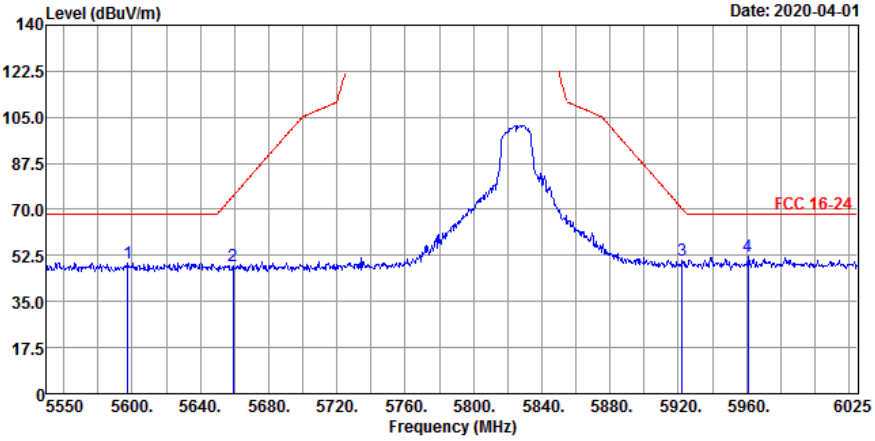
Vertical



<Out of Band Emission (OOBE)>
Horizontal



Vertical



<Spurious Emission>

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
5825	97.4	95.45	1.95	------	------	124	108	Average
5825	107.86	105.91	1.95	------	------	124	108	Peak
11650	48.45	47.97	0.48	54	-5.55	103	32	Average
11650	54.47	53.99	0.48	74	-19.53	103	32	Peak
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
5825	96.23	94.28	1.95	------	------	100	28	Average
5825	102.92	100.97	1.95	------	------	100	28	Peak
11650	48.04	47.56	0.48	54	-5.96	182	295	Average
11650	55.85	55.37	0.48	74	-18.15	182	295	Peak

<Out of Band Emission (OOBE)>

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
5616.975	50.34	48.84	1.5	68.2	-17.86	124	108	Peak
5654.975	49.6	48.21	1.39	71.9	-22.3	124	108	Peak
5919.075	51.11	48.76	2.35	72.57	-21.46	124	108	Peak
5949	51.76	49.33	2.43	68.2	-16.44	124	108	Peak
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
5597.5	49.83	48.27	1.56	68.2	-18.37	100	28	Peak
5659.25	48.56	47.14	1.42	75.07	-26.51	100	28	Peak
5922.4	50.55	48.19	2.36	70.12	-19.57	100	28	Peak
5960.875	52.05	49.59	2.46	68.2	-16.15	100	28	Peak

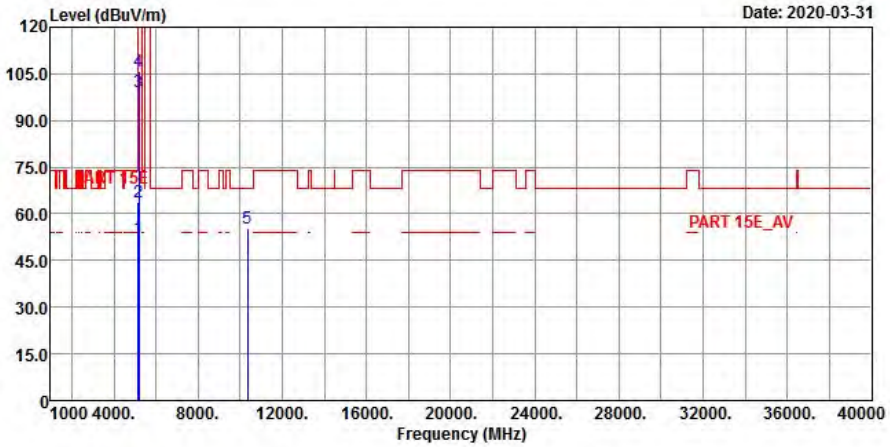
Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

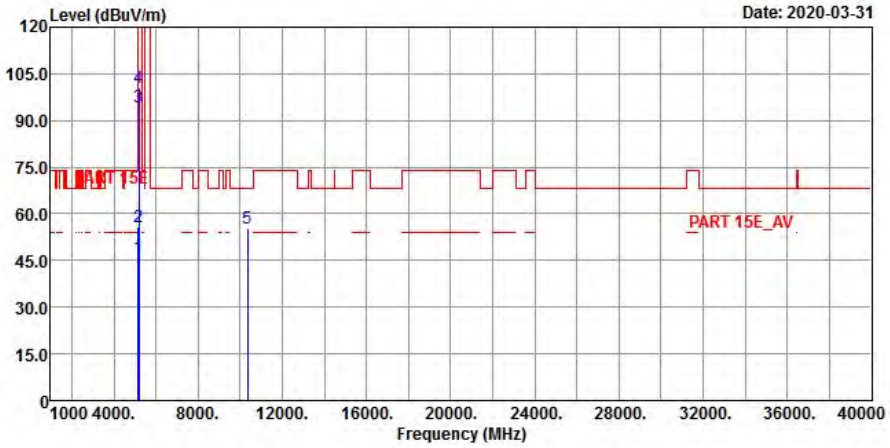
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 36	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



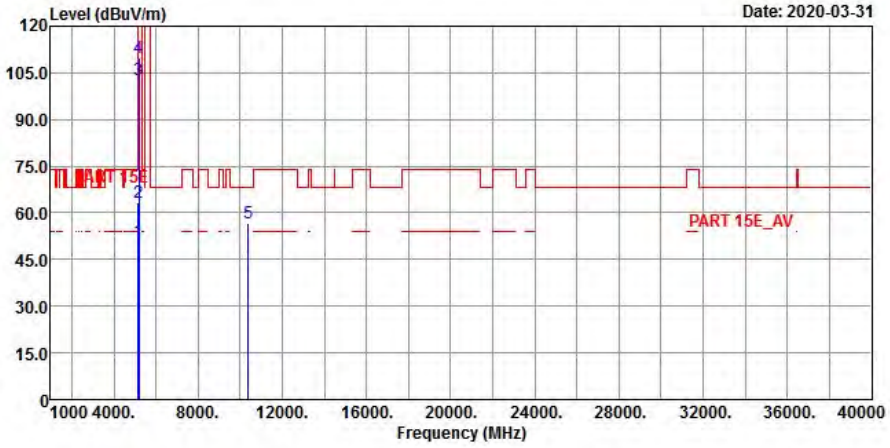
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5150	52.27	51.23	1.04	54	-1.73	123	114	Average
5150	63.91	62.87	1.04	74	-10.09	123	114	Peak
5180	99.27	98.38	0.89	------	------	123	114	Average
5180	105.62	104.73	0.89	------	------	123	114	Peak
10360	55.36	55.92	-0.56	68.2	-12.84	129	331	Peak
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**
5150	46.15	45.11	1.04	54	-7.85	119	179	Average
5150	55.9	54.86	1.04	74	-18.1	119	179	Peak
5180	94.26	93.37	0.89	------	------	119	179	Average
5180	100.7	99.81	0.89	------	------	119	179	Peak
10360	55.23	55.79	-0.56	68.2	-12.97	163	217	Peak

Remarks:

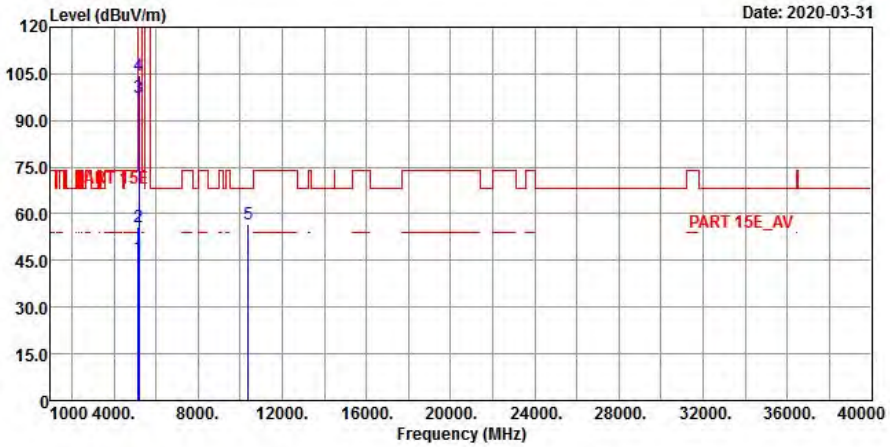
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5180 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 40	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



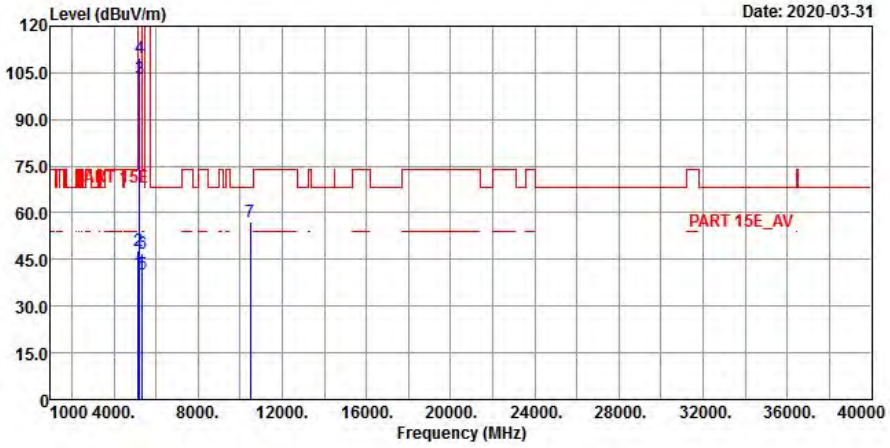
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5150	50.86	49.82	1.04	54	-3.14	111	112	Average
5150	63.51	62.47	1.04	74	-10.49	111	112	Peak
5200	102.89	102.11	0.78	------	------	111	112	Average
5200	109.63	108.85	0.78	------	------	111	112	Peak
10400	56.74	57.16	-0.42	68.2	-11.46	126	347	Peak
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**
5150	46.26	45.22	1.04	54	-7.74	100	179	Average
5150	55.75	54.71	1.04	74	-18.25	100	179	Peak
5200	97.27	96.49	0.78	------	------	100	179	Average
5200	104.29	103.51	0.78	------	------	100	179	Peak
10400	56.48	56.9	-0.42	68.2	-11.72	133	204	Peak

Remarks:

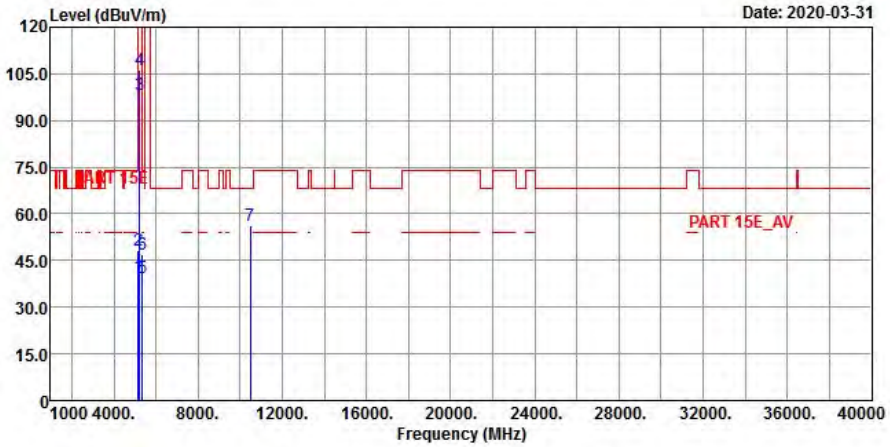
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5200 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 48	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



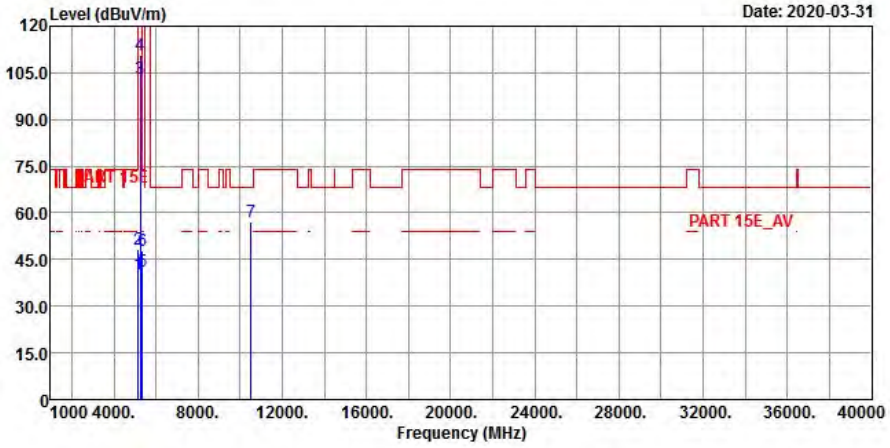
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	40.89	39.85	1.04	54	-13.11	128	110	Average
5150	47.94	46.9	1.04	74	-26.06	128	110	Peak
5240	103.14	102.27	0.87	------	------	128	110	Average
5240	109.91	109.04	0.87	------	------	128	110	Peak
5350	40.29	39	1.29	54	-13.71	128	110	Average
5350	46.91	45.62	1.29	74	-27.09	128	110	Peak
10480	57.19	57.31	-0.12	68.2	-11.01	112	96	Peak
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
5150	39.78	38.74	1.04	54	-14.22	119	182	Average
5150	48.34	47.3	1.04	74	-25.66	119	182	Peak
5240	98.39	97.52	0.87	------	------	119	182	Average
5240	106.2	105.33	0.87	------	------	119	182	Peak
5350	39.43	38.14	1.29	54	-14.57	119	182	Average
5350	47.15	45.86	1.29	74	-26.85	119	182	Peak
10480	56.35	56.47	-0.12	68.2	-11.85	161	188	Peak

Remarks:

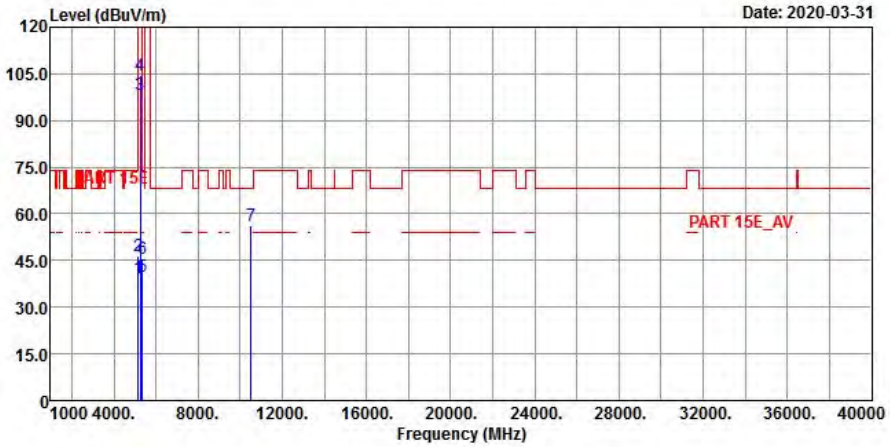
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 52	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



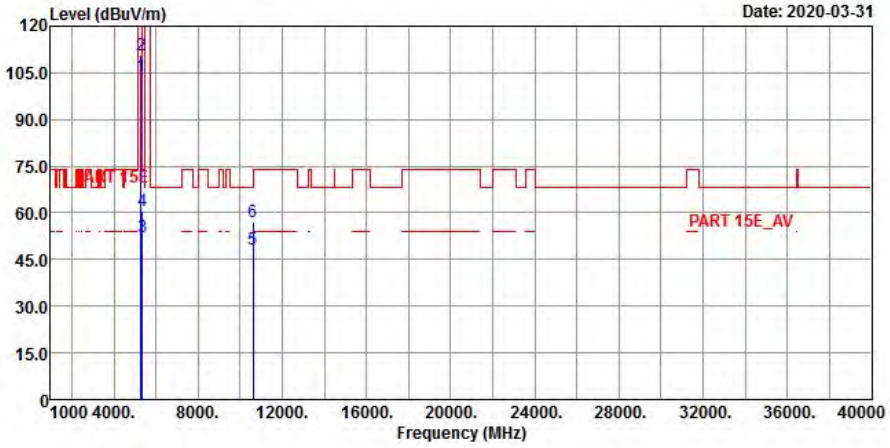
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	40.27	39.23	1.04	54	-13.73	112	113	Average
5150	48.2	47.16	1.04	74	-25.8	112	113	Peak
5260	103.39	102.41	0.98	------	------	112	113	Average
5260	110.73	109.75	0.98	------	------	112	113	Peak
5350	41.2	39.91	1.29	54	-12.8	112	113	Average
5350	47.79	46.5	1.29	74	-26.21	112	113	Peak
10520	57.14	57.18	-0.04	68.2	-11.06	111	203	Peak
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
5150	39.56	38.52	1.04	54	-14.44	100	200	Average
5150	46.7	45.66	1.04	74	-27.3	100	200	Peak
5260	98.42	97.44	0.98	------	------	100	200	Average
5260	104.62	103.64	0.98	------	------	100	200	Peak
5350	39.72	38.43	1.29	54	-14.28	100	200	Average
5350	45.55	44.26	1.29	74	-28.45	100	200	Peak
10520	56.43	56.47	-0.04	68.2	-11.77	101	106	Peak

Remarks:

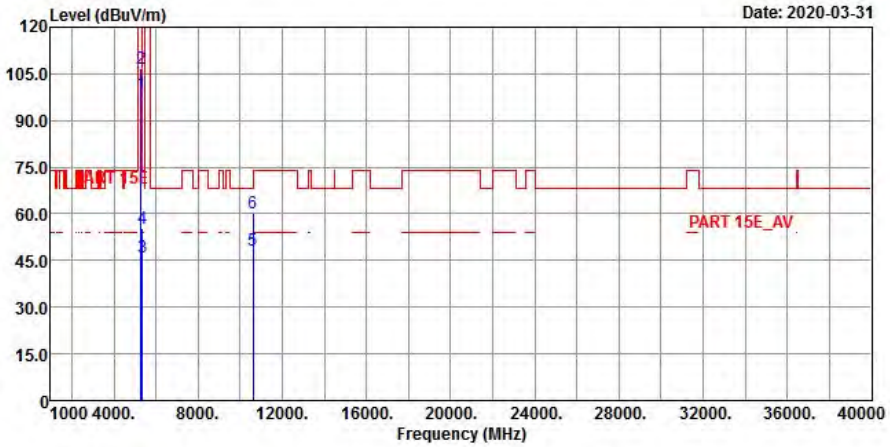
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 60	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



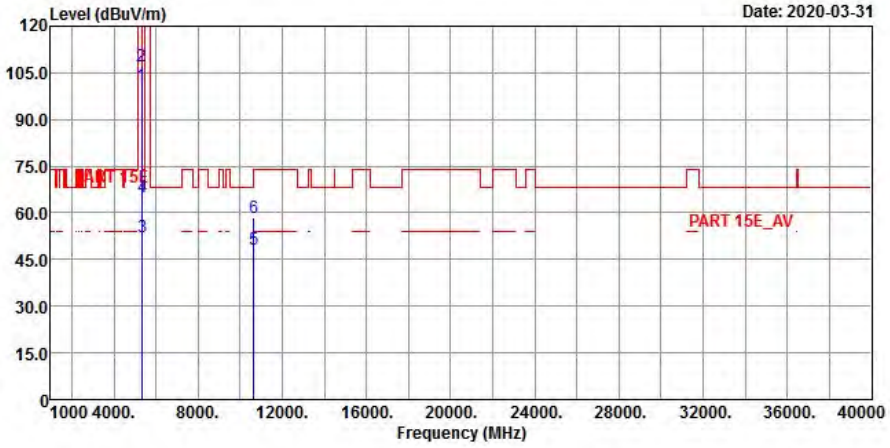
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5300	104.09	102.9	1.19	------	------	122	114	Average
5300	110.58	109.39	1.19	------	------	122	114	Peak
5350	52.17	50.88	1.29	54	-1.83	122	114	Average
5350	60.55	59.26	1.29	74	-13.45	122	114	Peak
10600	48.21	48.23	-0.02	54	-5.79	120	155	Average
10600	57.12	57.14	-0.02	74	-16.88	120	155	Peak
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
5300	98.74	97.55	1.19	------	------	100	205	Average
5300	106.72	105.53	1.19	------	------	100	205	Peak
5350	45.88	44.59	1.29	54	-8.12	100	205	Average
5350	55.52	54.23	1.29	74	-18.48	100	205	Peak
10600	48.47	48.49	-0.02	54	-5.53	176	305	Average
10600	60.1	60.12	-0.02	74	-13.9	176	305	Peak

Remarks:

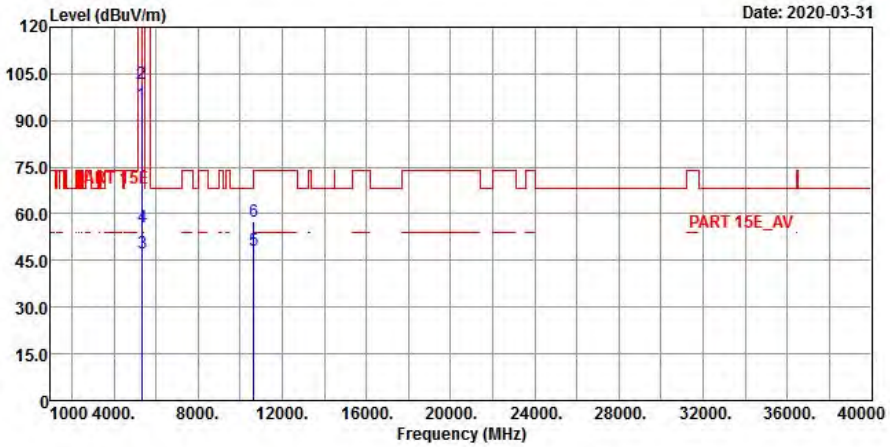
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 64	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



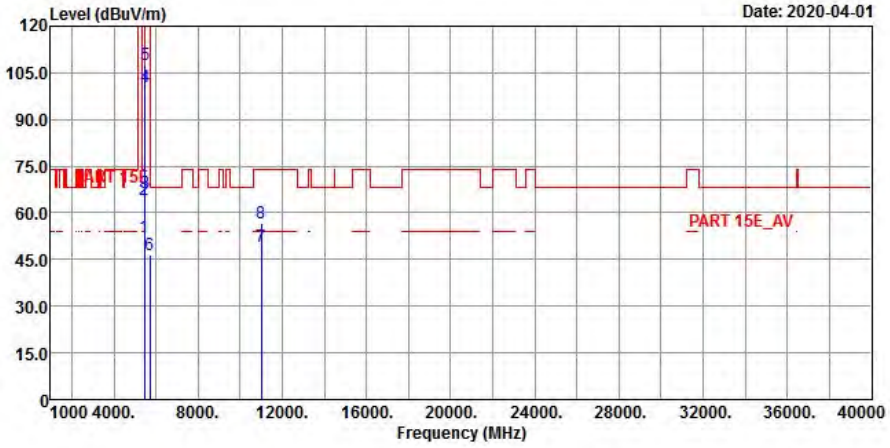
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5320	100.93	99.7	1.23	------	------	113	115	Average
5320	107.18	105.95	1.23	------	------	113	115	Peak
5350	52.47	51.18	1.29	54	-1.53	113	115	Average
5350	65.28	63.99	1.29	74	-8.72	113	115	Peak
10640	48.36	48.17	0.19	54	-5.64	125	104	Average
10640	58.44	58.25	0.19	74	-15.56	125	104	Peak
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**
5320	95.38	94.15	1.23	------	------	100	207	Average
5320	101.79	100.56	1.23	------	------	100	207	Peak
5350	47.58	46.29	1.29	54	-6.42	100	207	Average
5350	55.72	54.43	1.29	74	-18.28	100	207	Peak
10640	48.19	48	0.19	54	-5.81	164	213	Average
10640	57.55	57.36	0.19	74	-16.45	164	213	Peak

Remarks:

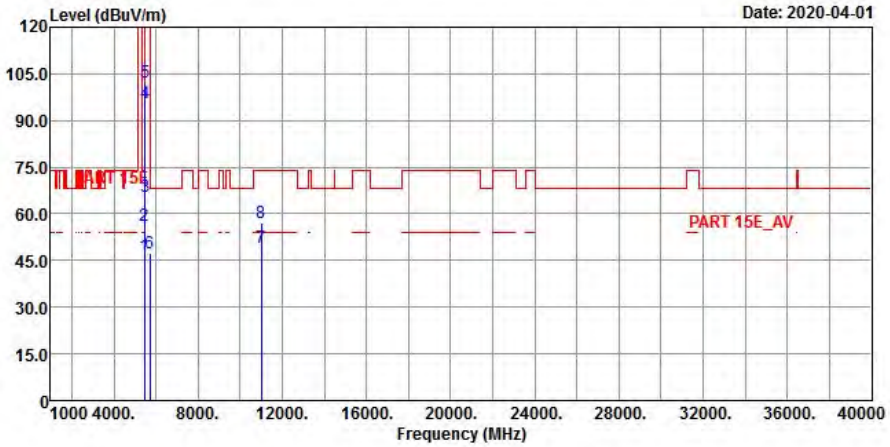
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 100	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



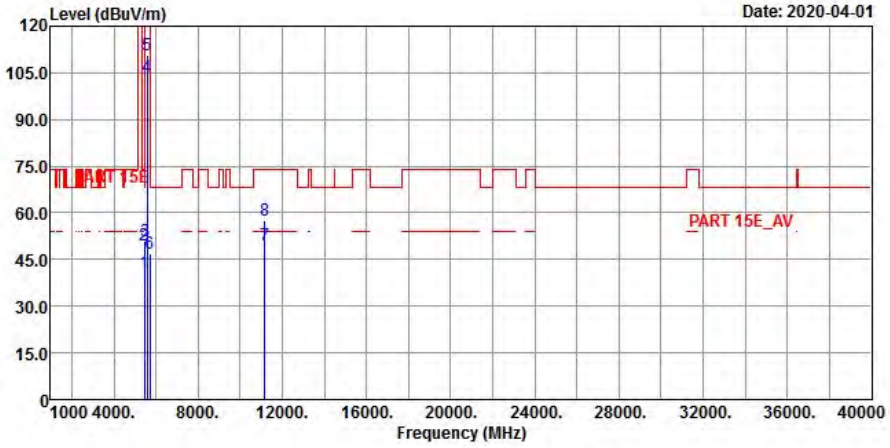
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5460	52.27	50.63	1.64	54	-1.73	117	99	Average
5460	64.18	62.54	1.64	74	-9.82	117	99	Peak
5470	66.35	64.7	1.65	68.2	-1.85	117	99	Peak
5500	100.53	98.79	1.74	------	------	117	99	Average
5500	107.45	105.71	1.74	------	------	117	99	Peak
5725	46.56	44.93	1.63	68.2	-21.64	117	99	Peak
11000	49.33	48.37	0.96	54	-4.67	182	13	Average
11000	56.89	55.93	0.96	74	-17.11	182	13	Peak
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**
5460	46.5	44.86	1.64	54	-7.5	100	316	Average
5460	56.27	54.63	1.64	74	-17.73	100	316	Peak
5470	65.7	64.05	1.65	68.2	-2.5	100	316	Peak
5500	95.68	93.94	1.74	------	------	100	316	Average
5500	102.26	100.52	1.74	------	------	100	316	Peak
5725	47.25	45.62	1.63	68.2	-20.95	100	316	Peak
11000	49.17	48.21	0.96	54	-4.83	203	194	Average
11000	57.18	56.22	0.96	74	-16.82	203	194	Peak

Remarks:

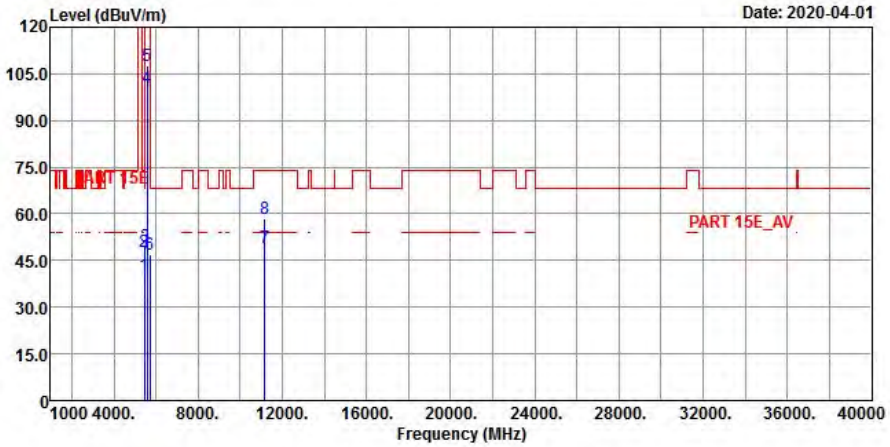
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 116	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



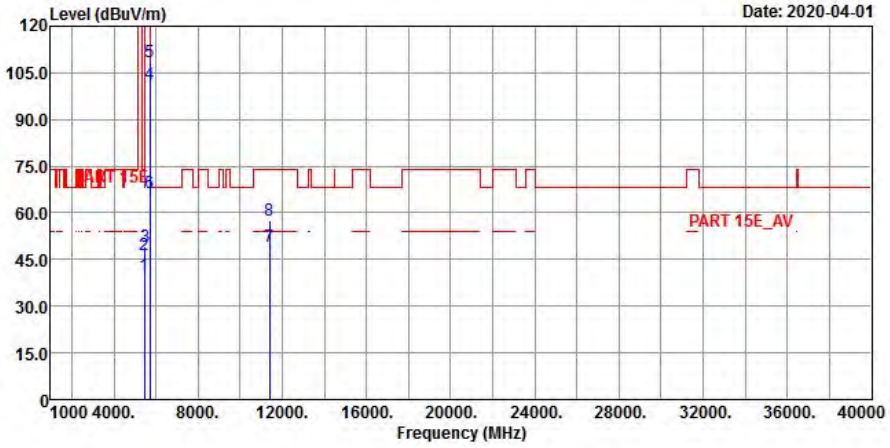
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460	40.56	38.92	1.64	54	-13.44	110	98	Average
5460	49.5	47.86	1.64	74	-24.5	110	98	Peak
5470	50.94	49.29	1.65	68.2	-17.26	110	98	Peak
5580	103.69	102.11	1.58	------	------	110	98	Average
5580	110.67	109.09	1.58	------	------	110	98	Peak
5725	47.1	45.47	1.63	68.2	-21.1	110	98	Peak
11160	49.56	48.74	0.82	54	-4.44	189	227	Average
11160	57.35	56.53	0.82	74	-16.65	189	227	Peak
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
5460	40.11	38.47	1.64	54	-13.89	102	320	Average
5460	48.03	46.39	1.64	74	-25.97	102	320	Peak
5470	49.57	47.92	1.65	68.2	-18.63	102	320	Peak
5580	100.35	98.77	1.58	------	------	102	320	Average
5580	107.81	106.23	1.58	------	------	102	320	Peak
5725	47.04	45.41	1.63	68.2	-21.16	102	320	Peak
11160	49.11	48.29	0.82	54	-4.89	137	158	Average
11160	58.46	57.64	0.82	74	-15.54	137	158	Peak

Remarks:

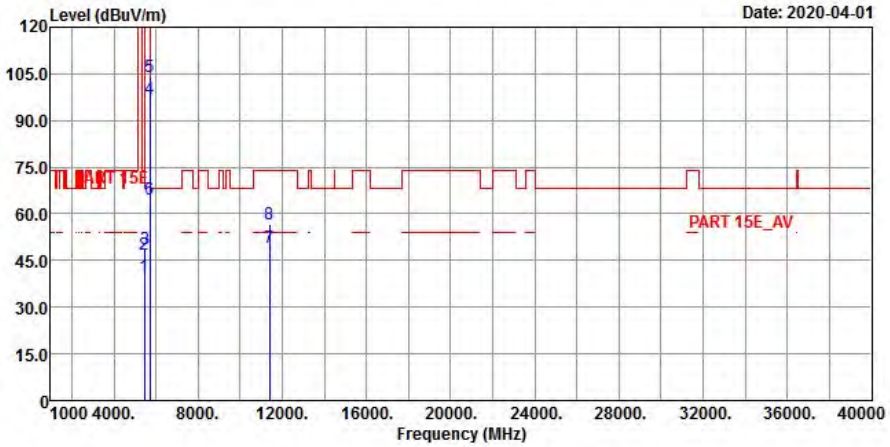
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 140	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



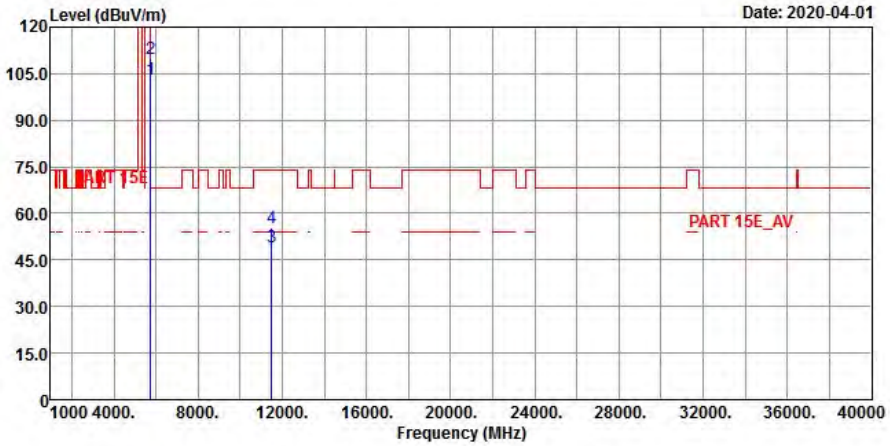
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5460	39.82	38.18	1.64	54	-14.18	123	101	Average
5460	46.65	45.01	1.64	74	-27.35	123	101	Peak
5470	49.27	47.62	1.65	68.2	-18.93	123	101	Peak
5700	101.48	99.9	1.58	------	------	123	101	Average
5700	108.44	106.86	1.58	------	------	123	101	Peak
5725	66.42	64.79	1.63	68.2	-1.78	123	101	Peak
11400	49.19	48.18	1.01	54	-4.81	179	294	Average
11400	57.62	56.61	1.01	74	-16.38	179	294	Peak
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**
5460	39.88	38.24	1.64	54	-14.12	100	324	Average
5460	46.76	45.12	1.64	74	-27.24	100	324	Peak
5470	48.87	47.22	1.65	68.2	-19.33	100	324	Peak
5700	96.75	95.17	1.58	------	------	100	324	Average
5700	104.12	102.54	1.58	------	------	100	324	Peak
5725	64.79	63.16	1.63	68.2	-3.41	100	324	Peak
11400	49.13	48.12	1.01	54	-4.87	201	137	Average
11400	56.9	55.89	1.01	74	-17.1	201	137	Peak

Remarks:

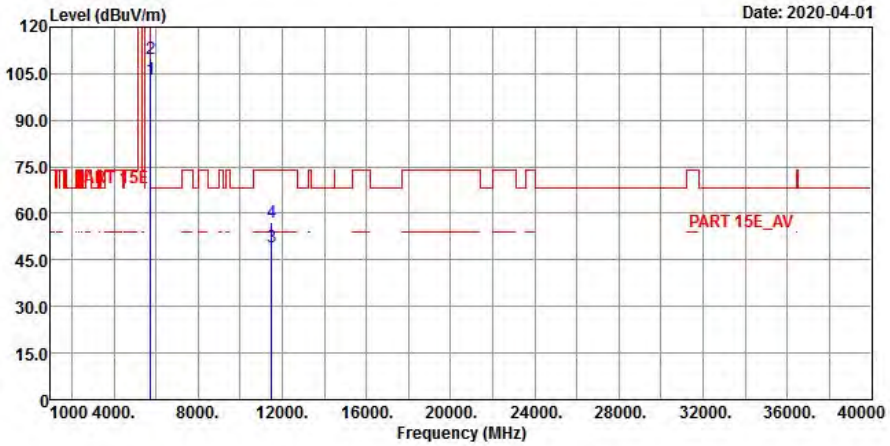
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 149	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Getaz Yang

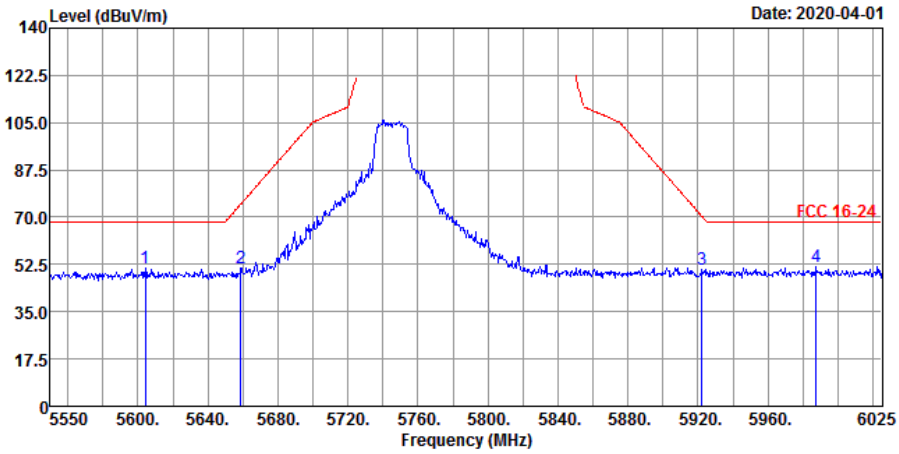
<Spurious Emission>
Horizontal



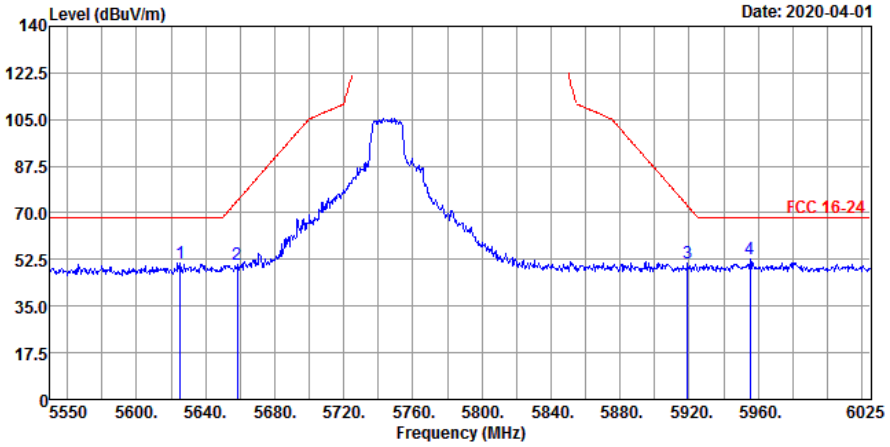
Vertical



<Out of Band Emission (OOBE)>
Horizontal



Vertical



<Spurious Emission>

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
5745	103.05	101.38	1.67	------	------	112	105	Average
5745	109.9	108.23	1.67	------	------	112	105	Peak
11490	49.1	48.02	1.08	54	-4.9	107	39	Average
11490	55.51	54.43	1.08	74	-18.49	107	39	Peak
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
5745	103.16	101.49	1.67	------	------	352	36	Average
5745	109.87	108.2	1.67	------	------	352	36	Peak
11490	48.95	47.87	1.08	54	-5.05	182	305	Average
11490	56.97	55.89	1.08	74	-17.03	182	305	Peak

<Out of Band Emission (OOBE)>

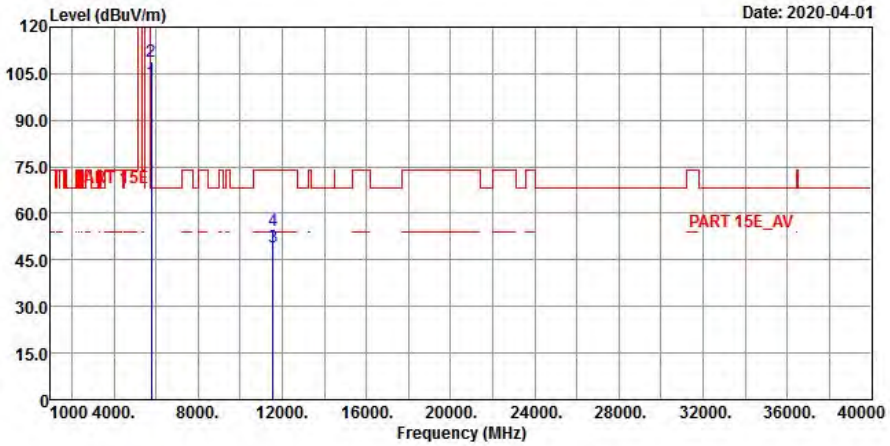
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5604.15	51.04	49.54	1.5	68.2	-17.16	112	105	Peak
5658.775	51.29	49.88	1.41	74.72	-23.43	112	105	Peak
5922.4	50.44	48.08	2.36	70.12	-19.68	112	105	Peak
5987.475	51.67	49.11	2.56	68.2	-16.53	112	105	Peak
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
5625.525	51.35	49.86	1.49	68.2	-16.85	352	36	Peak
5658.3	50.5	49.09	1.41	74.36	-23.86	352	36	Peak
5919.075	51.08	48.73	2.35	72.57	-21.49	352	36	Peak
5955.175	52.59	50.13	2.46	68.2	-15.61	352	36	Peak

Remarks:

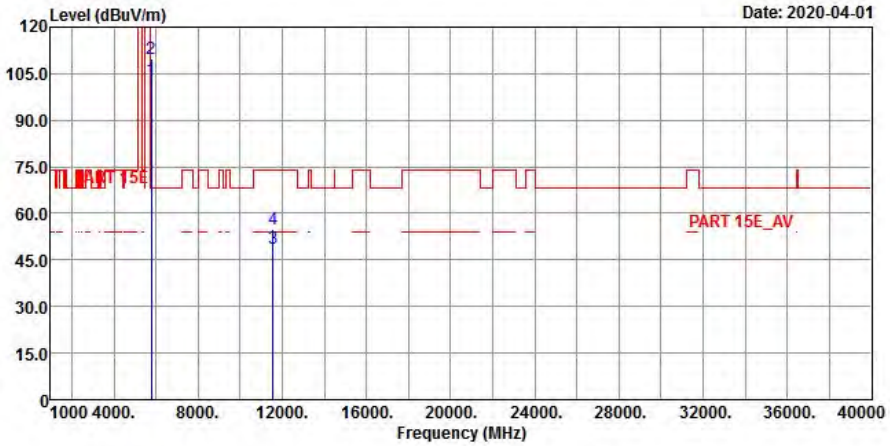
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 157	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Getaz Yang

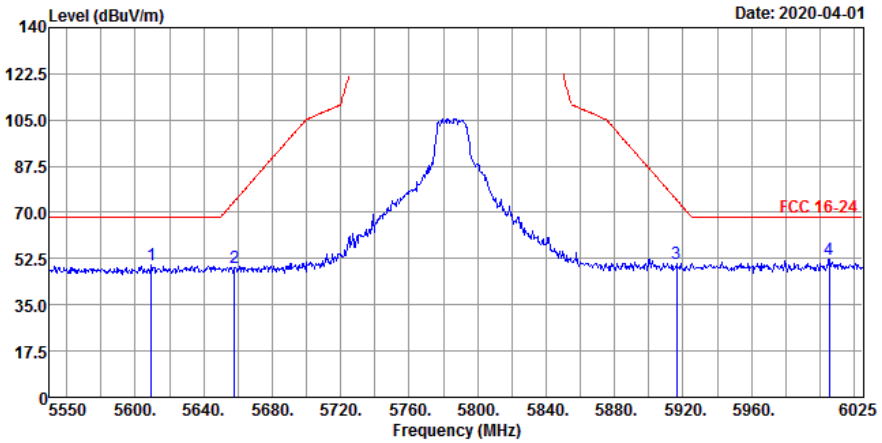
<Spurious Emission>
Horizontal



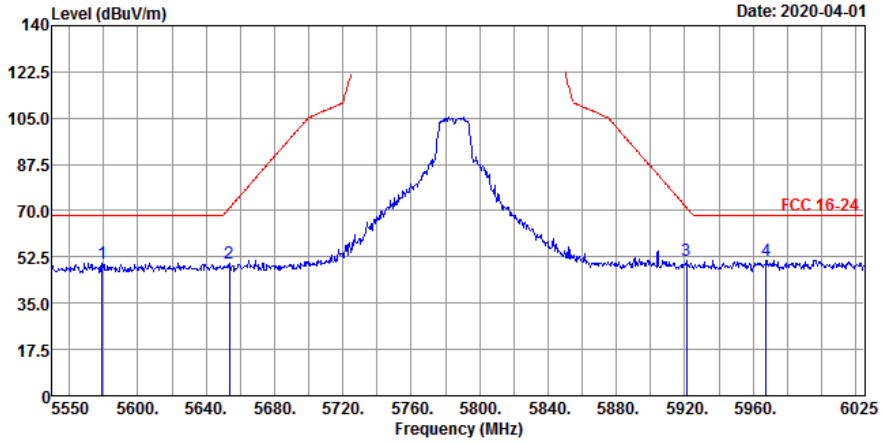
Vertical



<Out of Band Emission (OOBE)>
Horizontal



Vertical



<Spurious Emission>

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
5785	102.34	100.59	1.75	------	------	123	105	Average
5785	109.11	107.36	1.75	------	------	123	105	Peak
11570	48.96	48.12	0.84	54	-5.04	112	43	Average
11570	54.58	53.74	0.84	74	-19.42	112	43	Peak
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
5785	103.08	101.33	1.75	------	------	335	35	Average
5785	109.62	107.87	1.75	------	------	335	35	Peak
11570	48.58	47.74	0.84	54	-5.42	172	298	Average
11570	54.9	54.06	0.84	74	-19.1	172	298	Peak

<Out of Band Emission (OOBE)>

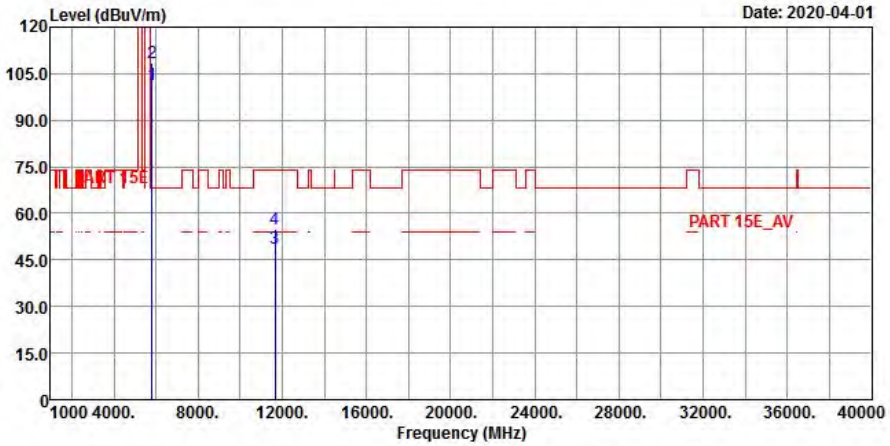
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5609.375	49.88	48.39	1.49	68.2	-18.32	123	105	Peak
5657.825	49.18	47.77	1.41	74.01	-24.83	123	105	Peak
5916.225	50.45	48.11	2.34	74.67	-24.22	123	105	Peak
6005.525	52.16	49.55	2.61	68.2	-16.04	123	105	Peak
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
5578.975	50.01	48.43	1.58	68.2	-18.19	335	35	Peak
5653.55	50.06	48.61	1.45	70.84	-20.78	335	35	Peak
5920.975	50.95	48.6	2.35	71.17	-20.22	335	35	Peak
5967.525	51.1	48.61	2.49	68.2	-17.1	335	35	Peak

Remarks:

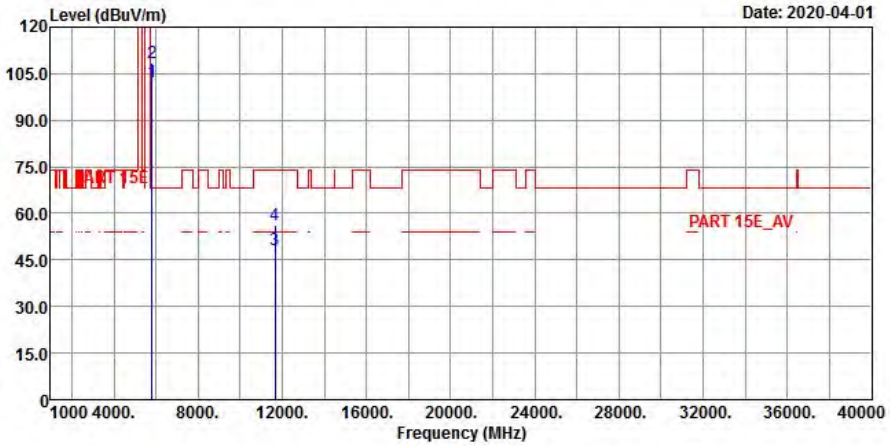
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 165	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Getaz Yang

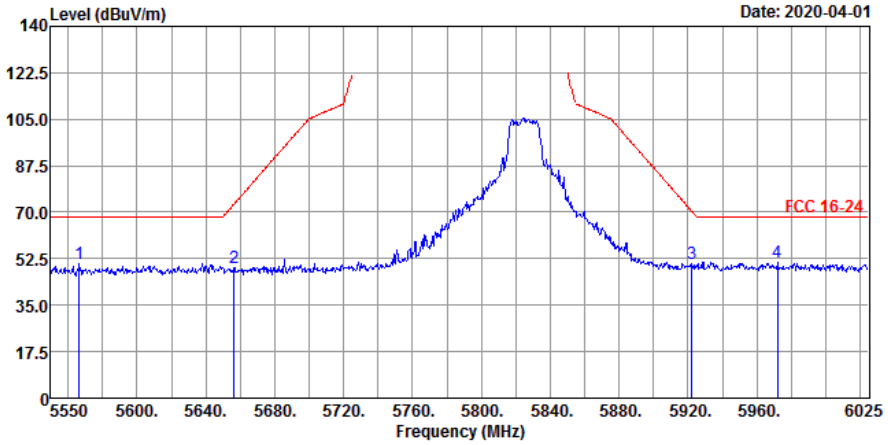
<Spurious Emission>
Horizontal



Vertical



<Out of Band Emission (OOBE)>
Horizontal



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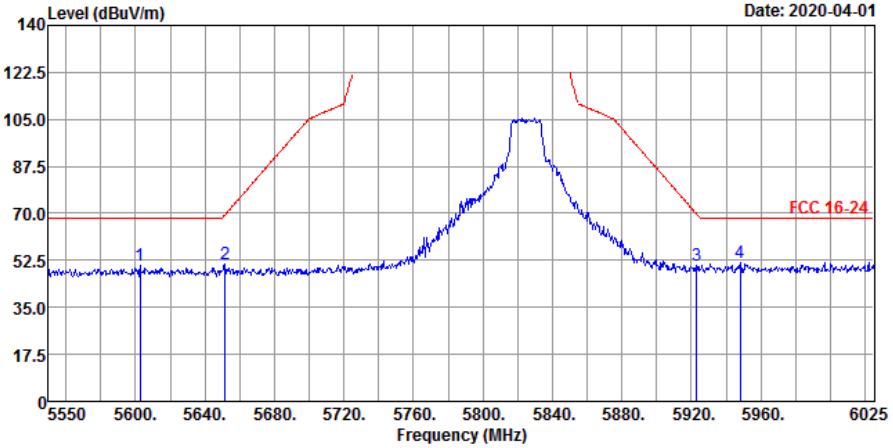


<Spurious Emission>

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
5825	101.57	99.62	1.95	------	------	116	105	Average
5825	108.38	106.43	1.95	------	------	116	105	Peak
11650	48.53	48.05	0.48	54	-5.47	108	39	Average
11650	54.87	54.39	0.48	74	-19.13	108	39	Peak
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
5825	102.2	100.25	1.95	------	------	338	30	Average
5825	108.56	106.61	1.95	------	------	338	30	Peak
11650	48.31	47.83	0.48	54	-5.69	183	294	Average
11650	56.25	55.77	0.48	74	-17.75	183	294	Peak

<Out of Band Emission (OOBE)>

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
5566.625	50.82	49.19	1.63	68.2	-17.38	116	105	Peak
5656.4	49.14	47.74	1.4	72.95	-23.81	116	105	Peak
5922.4	50.71	48.35	2.36	70.12	-19.41	116	105	Peak
5971.8	51.3	48.8	2.5	68.2	-16.9	116	105	Peak
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
5602.725	50.5	48.94	1.56	68.2	-17.7	338	30	Peak
5651.65	50.99	49.55	1.44	69.43	-18.44	338	30	Peak
5922.875	50.74	48.38	2.36	69.77	-19.03	338	30	Peak
5948.05	51.52	49.09	2.43	68.2	-16.68	338	30	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

9 kHz ~ 30 MHz Data:

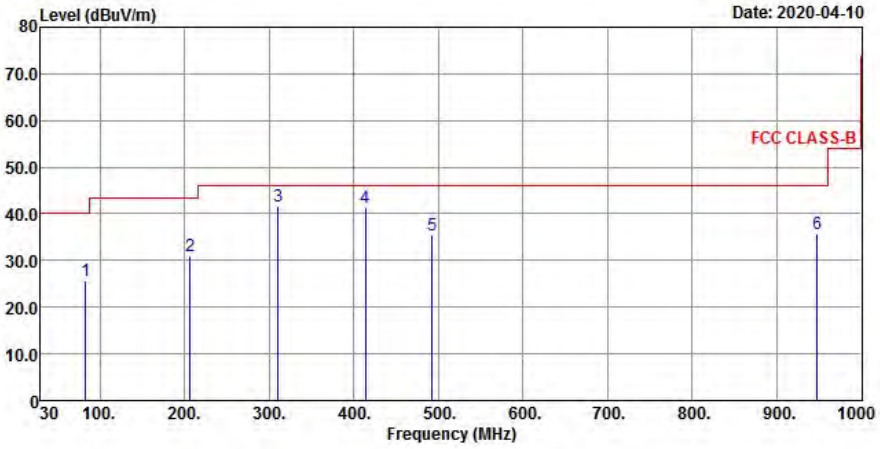
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

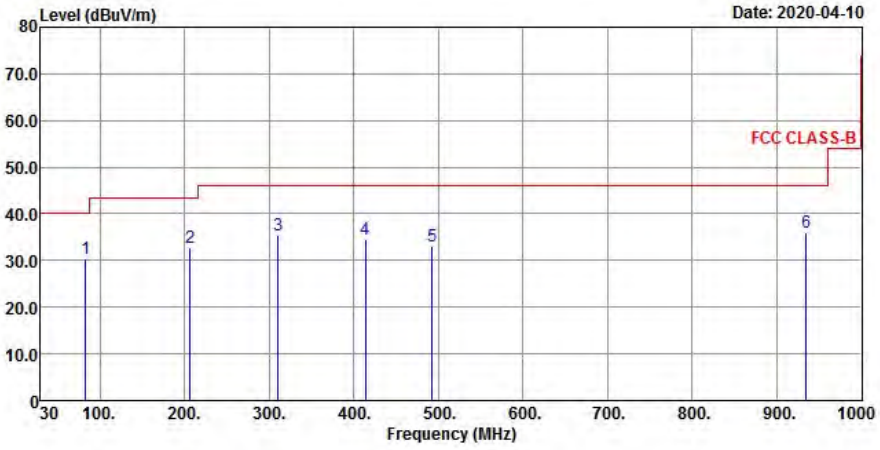
802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 36	**Frequency Range**	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

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
83.35	25.71	42.87	-17.16	40	-14.29	168	266	Peak
206.54	30.89	46.02	-15.13	43.5	-12.61	127	134	Peak
310.33	41.69	52.46	-10.77	46	-4.31	122	100	Peak
414.12	41.44	49.32	-7.88	46	-4.56	104	63	Peak
492.69	35.47	41.1	-5.63	46	-10.53	168	292	Peak
947.62	35.61	31.94	3.67	46	-10.39	188	64	Peak
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
83.35	30.4	47.56	-17.16	40	-9.6	205	49	Peak
206.54	32.81	47.94	-15.13	43.5	-10.69	192	9	Peak
310.33	35.35	46.12	-10.77	46	-10.65	122	146	Peak
414.12	34.67	42.55	-7.88	46	-11.33	109	106	Peak
492.69	33.06	38.69	-5.63	46	-12.94	157	111	Peak
935.01	35.89	32.46	3.43	46	-10.11	103	344	Peak

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

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.
3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

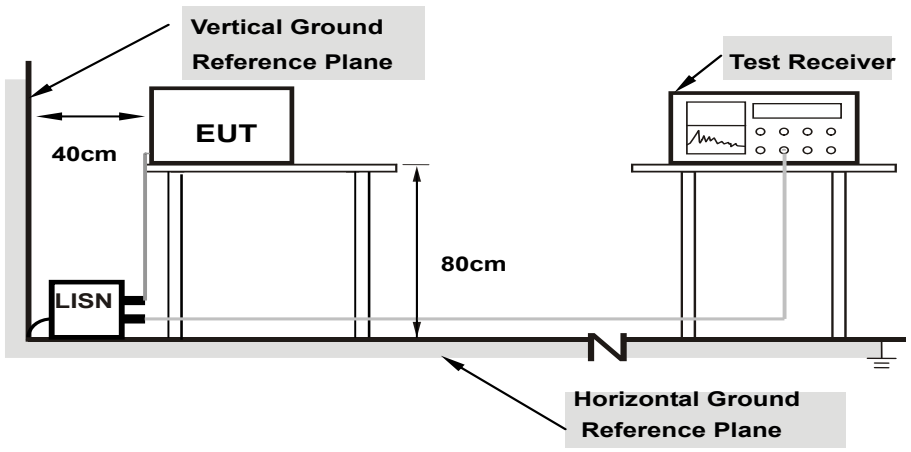
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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: All modes of operation were investigated and the worst-case emissions are reported.

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

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

4.2.6 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.

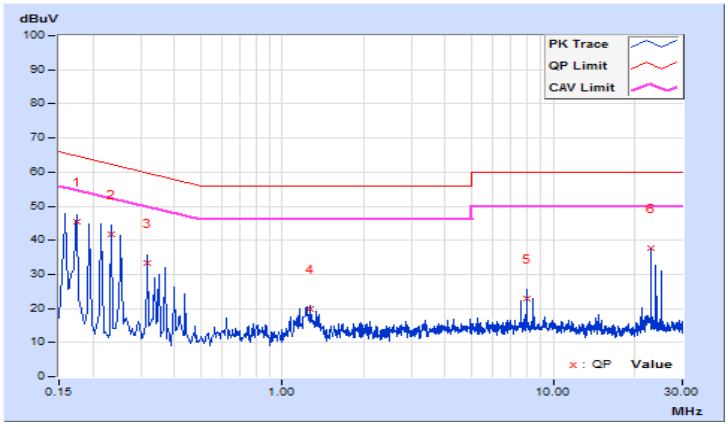
4.2.7 Test Results

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	Getaz Yang	Test Date	2020/4/27

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	**0.17400**	**10.16**	**35.39**	**10.53**	**45.55**	**20.69**	**64.77**	**54.77**	**-19.22**	**-34.08**
2	0.23400	10.18	31.52	9.18	41.70	19.36	62.31	52.31	-20.61	-32.95
3	0.31800	10.19	23.03	6.46	33.22	16.65	59.76	49.76	-26.54	-33.11
4	1.27396	10.27	9.55	1.58	19.82	11.85	56.00	46.00	-36.18	-34.15
5	7.99400	10.45	12.30	3.18	22.75	13.63	60.00	50.00	-37.25	-36.37
6	22.90200	10.54	27.09	15.98	37.63	26.52	60.00	50.00	-22.37	-23.48

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

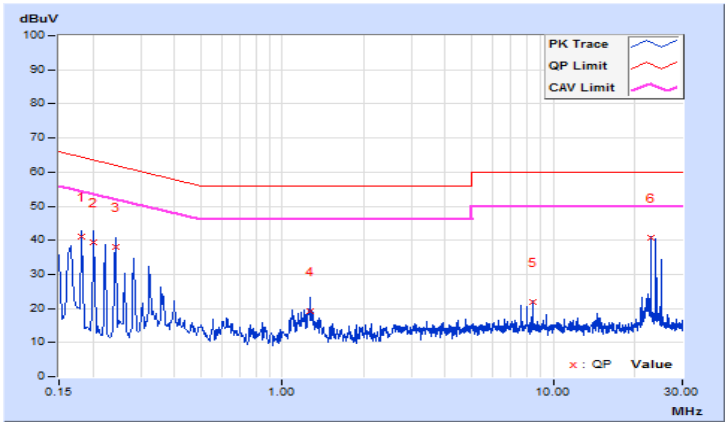


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Getaz Yang	Test Date	2020/4/27

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	0.18200	10.13	30.95	12.20	41.08	22.33	64.39	54.39	-23.31	-32.06
2	0.20200	10.13	29.16	10.75	39.29	20.88	63.53	53.53	-24.24	-32.65
3	0.24200	10.14	27.98	8.57	38.12	18.71	62.03	52.03	-23.91	-33.32
4	1.26600	10.25	8.85	1.53	19.10	11.78	56.00	46.00	-36.90	-34.22
5	8.39400	10.52	11.22	2.24	21.74	12.76	60.00	50.00	-38.26	-37.24
6	22.90200	10.72	29.87	19.83	40.59	30.55	60.00	50.00	-19.41	-19.45

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 Transmit Power Measurement

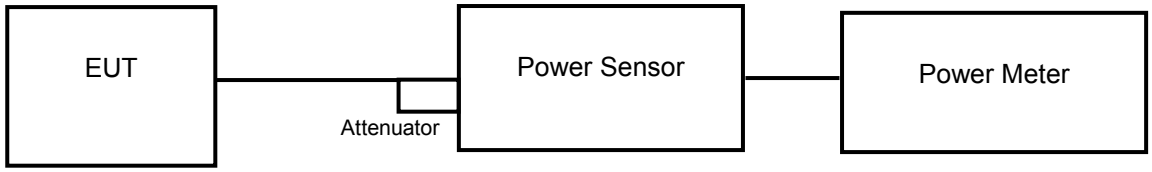
4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125 mW (21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Mobile and Portable client device	250 mW (24 dBm)
U-NII-2A	√		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-2C	√		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-3	√		1 Watt (30 dBm)

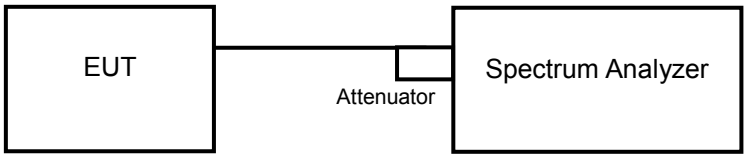
*B is the 26 dB emission bandwidth in megahertz

4.3.2 Test Setup

<Power Output Measurement>



<26 dB Bandwidth>



4.3.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.3.4 Test Procedure

Average Power Measurement

Method PM is 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.

26 dB Bandwidth

a. Set RBW = approximately 1 % of the emission bandwidth.
b. Set the VBW > RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

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

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	43.251	16.36	24	Pass
40	5200	101.158	20.05	24	Pass
48	5240	104.713	20.20	24	Pass
52	5260	137.088	21.37	24	Pass
60	5300	121.339	20.84	24	Pass
64	5320	45.186	16.55	24	Pass
100	5500	43.853	16.42	24	Pass
116	5580	149.279	21.74	24	Pass
140	5700	47.424	16.76	24	Pass
149	5745	96.605	19.85	30	Pass
157	5785	95.719	19.81	30	Pass
165	5825	96.161	19.83	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

1. 5260MHz: 11 dBm + 10log (36.91) = 26.67dBm>24 dBm, where b is 26dB BW.
2. 5300MHz: 11 dBm + 10log (38.32) = 26.83dBm>24 dBm, where b is 26dB BW.
3. 5320MHz: 11 dBm + 10log (21.19) = 24.26dBm>24 dBm, where b is 26dB BW.
4. 5500MHz: 11 dBm + 10log (25.93) = 25.14dBm>24 dBm, where b is 26dB BW.
5. 5580MHz: 11 dBm + 10log (39.63) = 26.98dBm>24 dBm, where b is 26dB BW.
6. 5700MHz: 11 dBm + 10log (30.08) = 25.78dBm>24 dBm, where b is 26dB BW.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	38.282	15.83	24	Pass
40	5200	96.161	19.83	24	Pass
48	5240	95.28	19.79	24	Pass
52	5260	99.77	19.99	24	Pass
60	5300	100.925	20.04	24	Pass
64	5320	44.566	16.49	24	Pass
100	5500	39.084	15.92	24	Pass
116	5580	146.555	21.66	24	Pass
140	5700	48.865	16.89	24	Pass
149	5745	89.125	19.50	30	Pass
157	5785	86.696	19.38	30	Pass
165	5825	87.498	19.42	30	Pass

Note: Note:

For U-NII-2A, U-NII-2C Band:

1. 5260MHz: 11 dBm + 10log (41.68) = 27.20 dBm > 24 dBm, where b is 26dB BW.
2. 5300MHz: 11 dBm + 10log (38.59) = 26.86 dBm > 24 dBm, where b is 26dB BW.
3. 5320MHz: 11 dBm + 10log (22.61) = 24.54 dBm > 24 dBm, where b is 26dB BW.
4. 5500MHz: 11 dBm + 10log (24.42) = 24.88 dBm > 24 dBm, where b is 26dB BW.
5. 5580MHz: 11 dBm + 10log (45.06) = 27.54 dBm > 24 dBm, where b is 26dB BW.
6. 5700MHz: 11 dBm + 10log (31.97) = 26.05 dBm > 24 dBm, where b is 26dB BW.

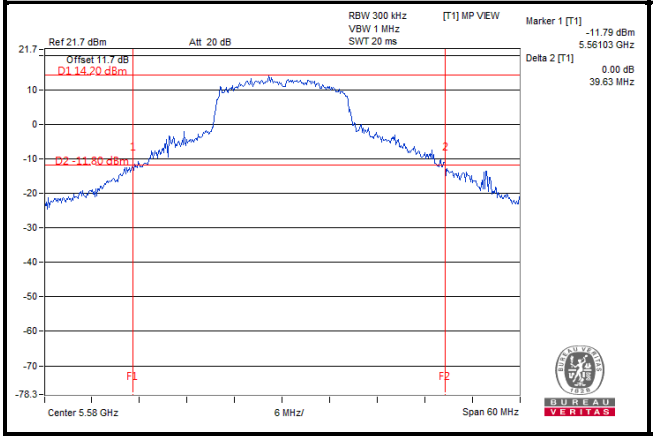
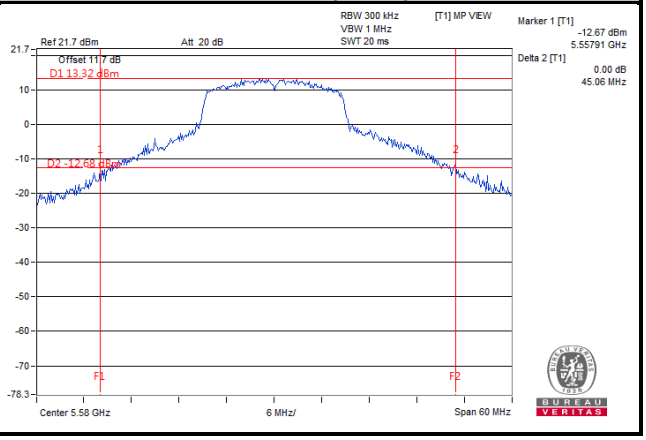
26 dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	21.05
40	5200	34.30
48	5240	34.15
52	5260	36.91
60	5300	38.32
64	5320	21.19
100	5500	25.93
116	5580	39.63
140	5700	30.08

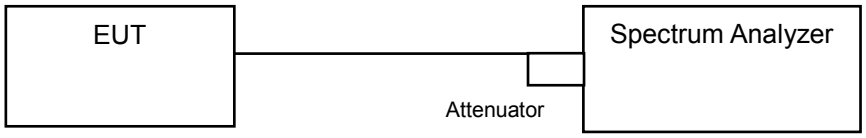
802.11n (HT20)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	21.73
40	5200	37.06
48	5240	37.73
52	5260	41.68
60	5300	38.59
64	5320	22.61
100	5500	24.42
116	5580	45.06
140	5700	31.97

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.3 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 SAMPLE. 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 Test Results

802.11a

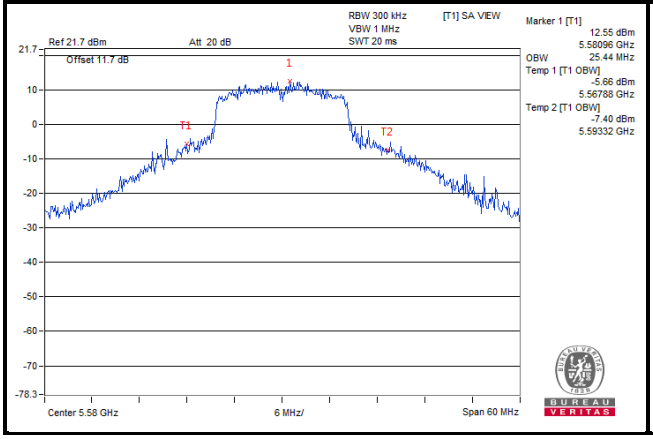
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	16.68
40	5200	18.72
48	5240	18.24
52	5260	21.72
60	5300	22.56
64	5320	16.56
100	5500	16.68
116	5580	25.44
140	5700	16.92
149	5745	19.62
157	5785	19.71
165	5825	20.16

802.11n (HT20)

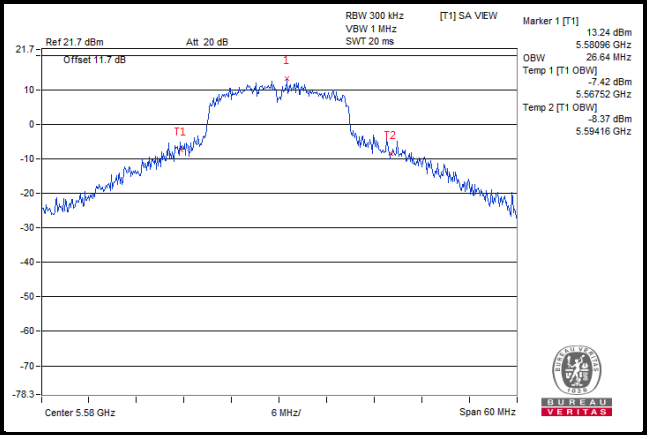
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.76
40	5200	18.72
48	5240	19.20
52	5260	22.80
60	5300	21.96
64	5320	17.76
100	5500	17.88
116	5580	26.64
140	5700	18.12
149	5745	19.91
157	5785	19.91
165	5825	20.00

Spectrum Plot of Worst Value

802.11a



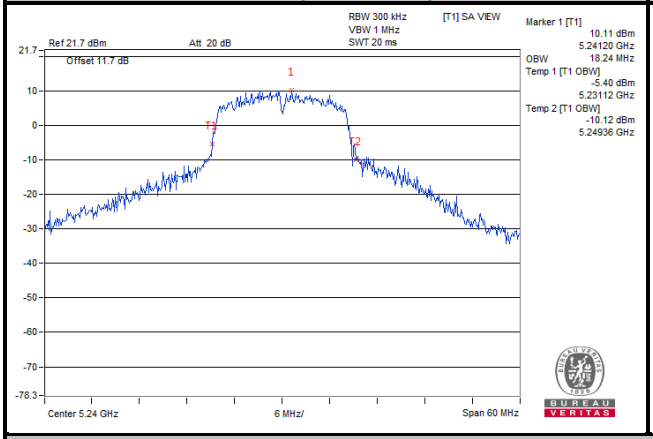
802.11n (HT20)



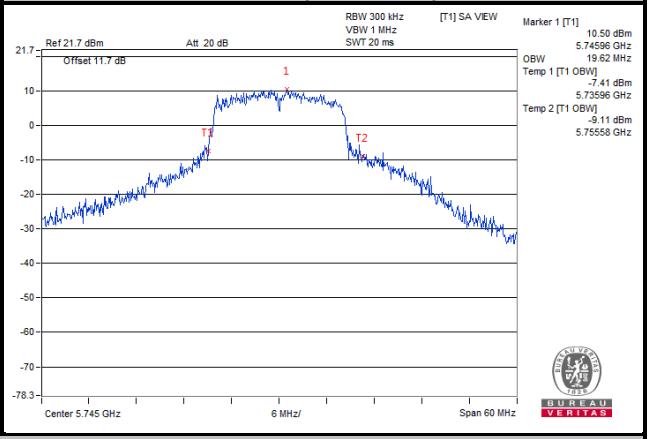
Spectrum Plot for Nearby DFS Band

802.11a

Ch 48 (5240 MHz)

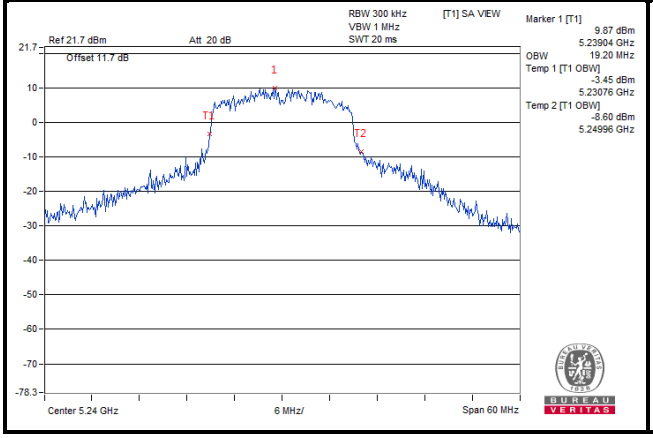


Ch 149 (5745 MHz)

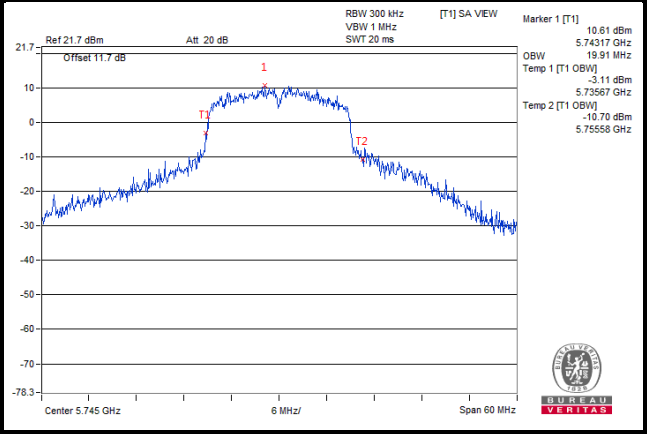


802.11n (HT20)

Ch 48 (5240 MHz)



Ch 149 (5745 MHz)

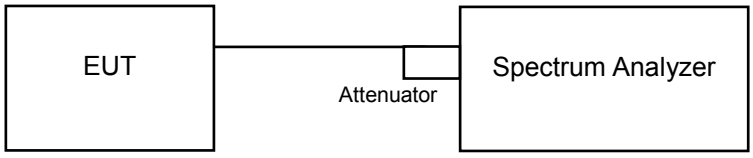


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17 dBm/MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Mobile and Portable client device	11 dBm/MHz
U-NII-2A	√		11 dBm/MHz
U-NII-2C	√		11 dBm/MHz
U-NII-3	√		30 dBm/500 kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

※For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz / 300 kHz).
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max 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

For U-NII-1, U-NII-2A, U-NII-2C Band

802.11a

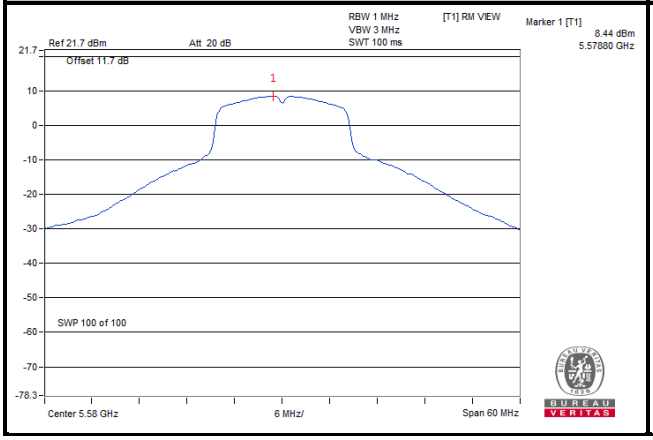
Channel	Frequency (MHz)	PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
36	5180	3.43	11	Pass
40	5200	6.72	11	Pass
48	5240	6.26	11	Pass
52	5260	7.09	11	Pass
60	5300	7.52	11	Pass
64	5320	3.30	11	Pass
100	5500	3.62	11	Pass
116	5580	8.44	11	Pass
140	5700	4.18	11	Pass

802.11n (HT20)

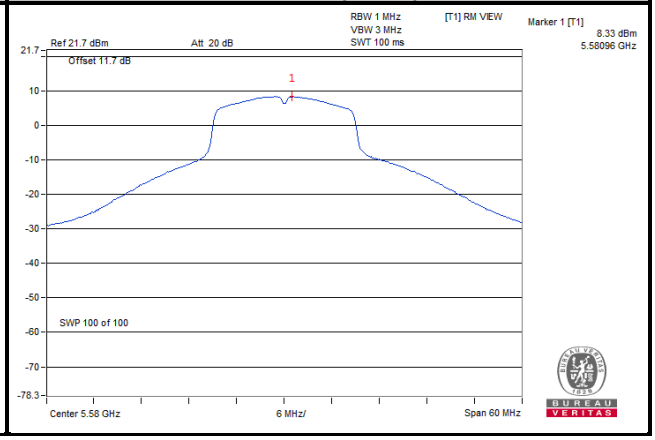
Channel	Frequency (MHz)	PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
36	5180	2.26	11	Pass
40	5200	6.34	11	Pass
48	5240	6.01	11	Pass
52	5260	6.89	11	Pass
60	5300	7.05	11	Pass
64	5320	3.62	11	Pass
100	5500	3.51	11	Pass
116	5580	8.33	11	Pass
140	5700	4.31	11	Pass

Spectrum Plot of Worst Value

802.11a



802.11n (HT20)



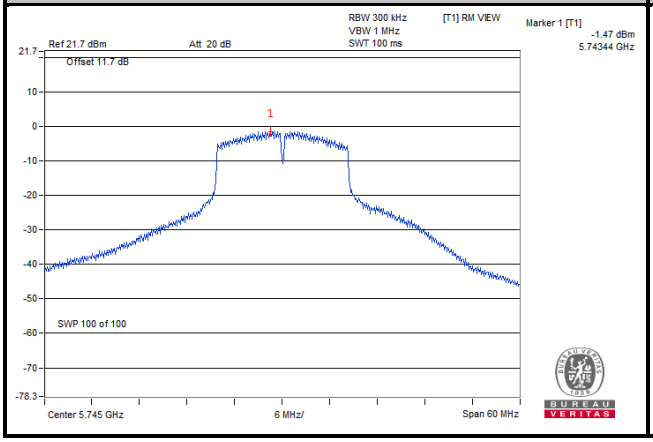
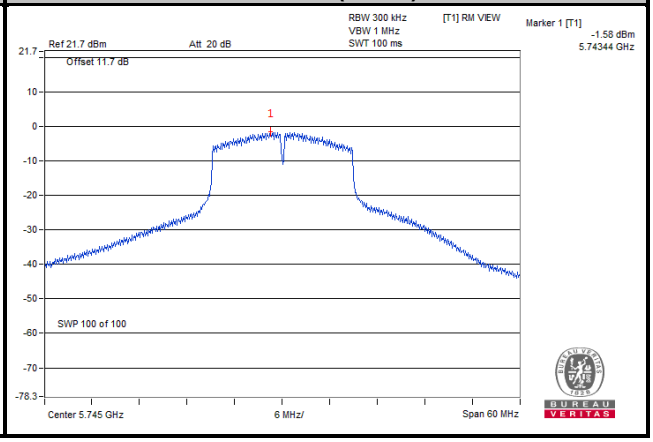
For U-NII-3 Band

802.11a

Channel	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
149	5745	-1.47	0.75	30	Pass
157	5785	-1.59	0.63	30	Pass
165	5825	-2.16	0.06	30	Pass

802.11n (HT20)

Channel	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
149	5745	-1.58	0.64	30	Pass
157	5785	-2.04	0.18	30	Pass
165	5825	-2.43	-0.21	30	Pass

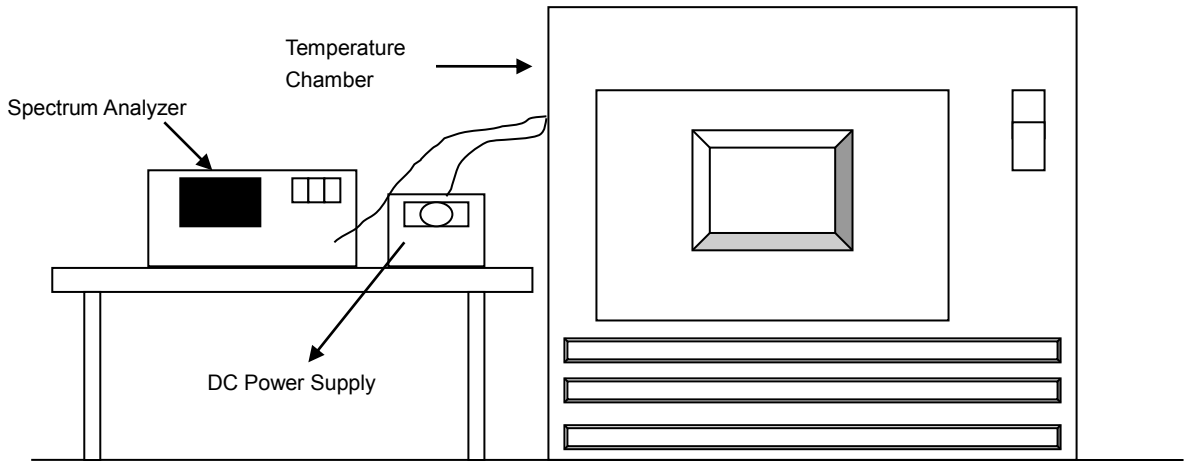
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	

4.6 Frequency Stability

4.6.1 Limit of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
e. Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
40	3.3	5180.0238	PASS	5180.0212	PASS	5180.0241	PASS	5180.0235	PASS
30	3.3	5179.995	PASS	5179.9957	PASS	5179.9973	PASS	5179.9963	PASS
20	3.3	5179.974	PASS	5179.9786	PASS	5179.9748	PASS	5179.9775	PASS
10	3.3	5180.0146	PASS	5180.011	PASS	5180.0135	PASS	5180.0125	PASS
0	3.3	5180.0155	PASS	5180.0167	PASS	5180.0163	PASS	5180.0172	PASS

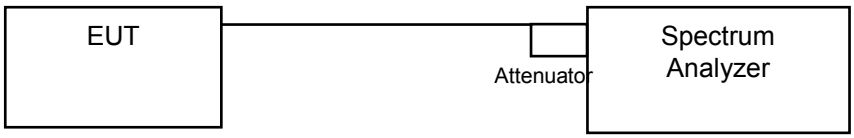
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	3.795	5179.975	PASS	5179.9778	PASS	5179.9739	PASS	5179.9775	PASS
	3.3	5179.974	PASS	5179.9786	PASS	5179.9748	PASS	5179.9775	PASS
	2.805	5179.973	PASS	5179.9795	PASS	5179.9743	PASS	5179.9783	PASS

4.7 6 dB Bandwidth Measurement

4.7.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 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

802.11a

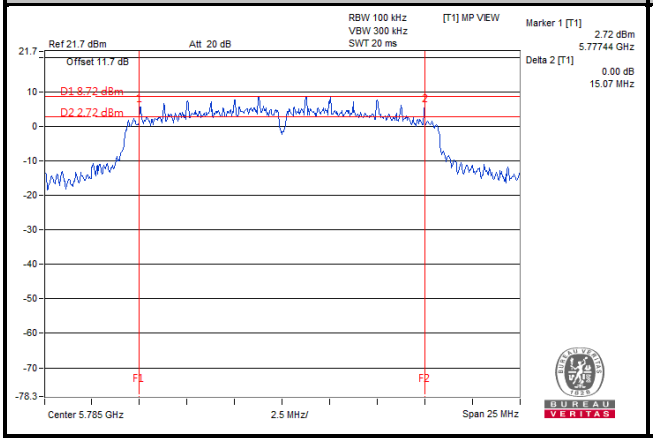
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	15.14	0.5	Pass
157	5785	15.07	0.5	Pass
165	5825	15.12	0.5	Pass

802.11n (HT20)

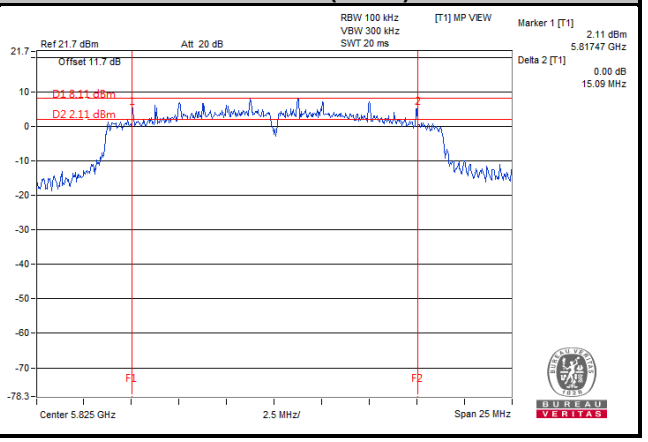
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	15.17	0.5	Pass
157	5785	15.18	0.5	Pass
165	5825	15.09	0.5	Pass

Spectrum Plot of Worst Value

802.11a



802.11n (HT20)



5 Pictures of Test Arrangements

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

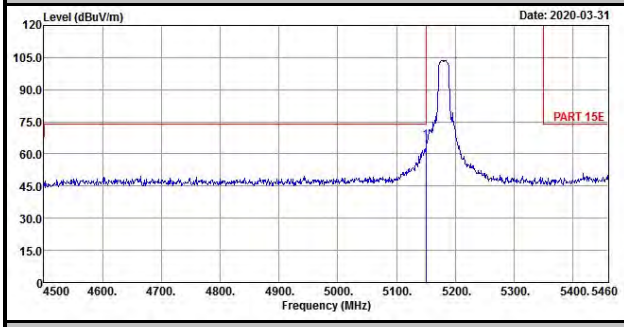
Annex A- Band-edge Measurement (U-NII-1, U-NII-2A, U-NII-2C Band)

802.11a

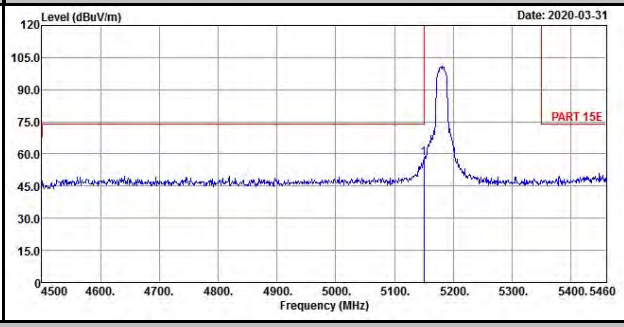
Ch 36

Peak

Horizontal

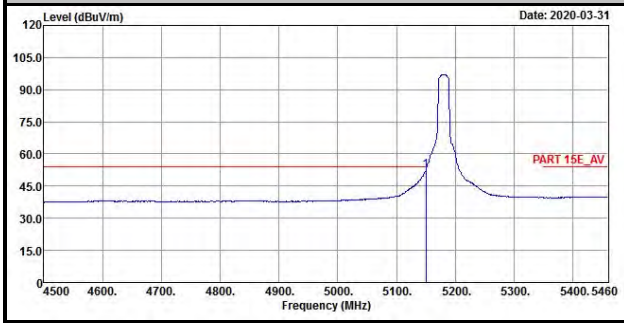


Vertical

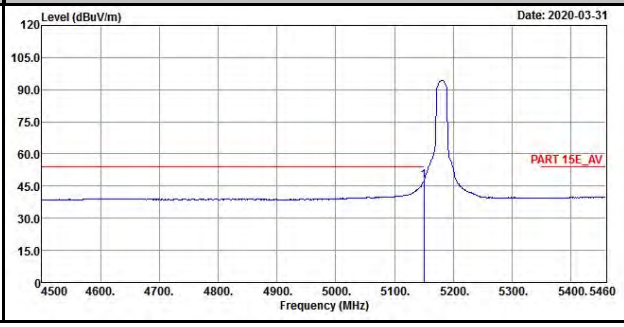


Average

Horizontal



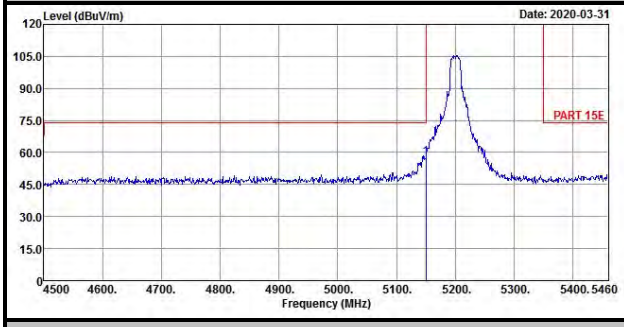
Vertical



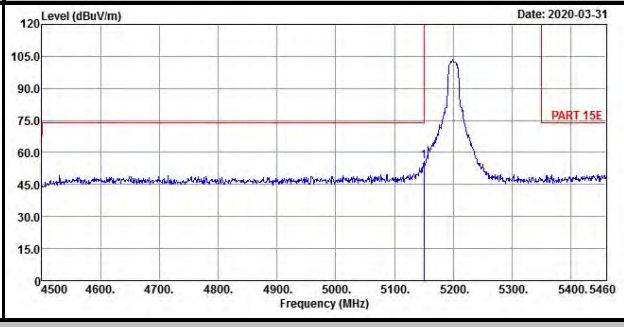
Ch 40

Peak

Horizontal

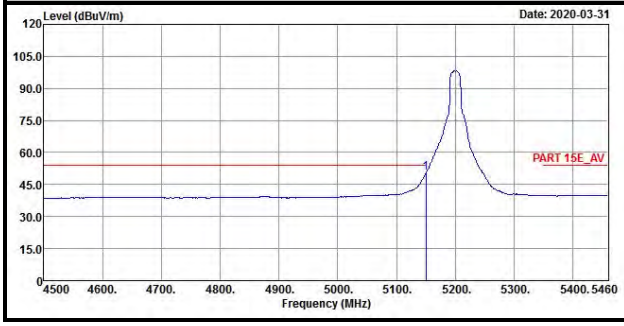


Vertical

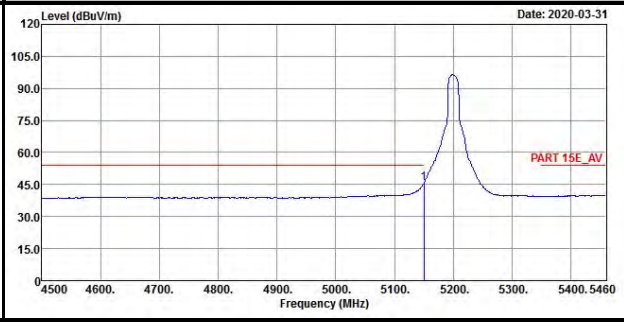


Average

Horizontal

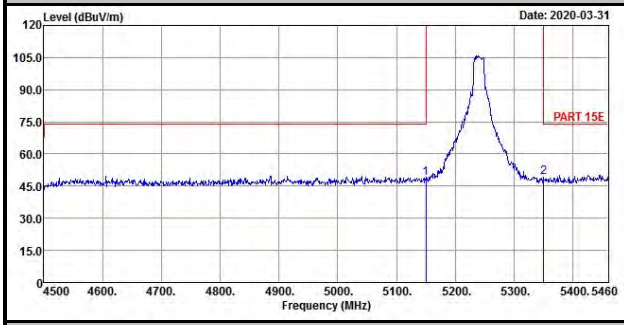
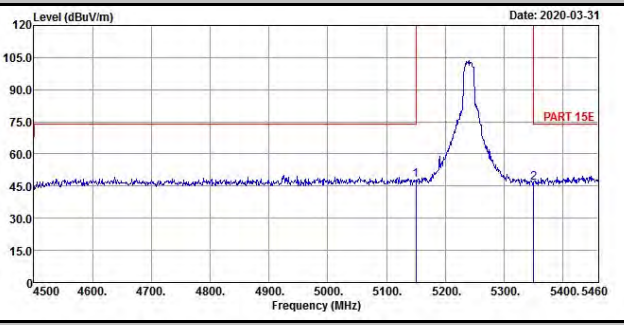


Vertical

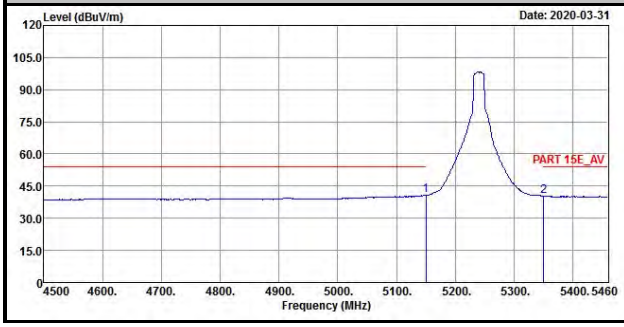
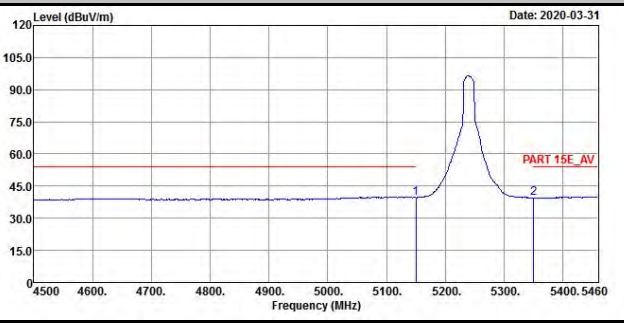


Ch 48

Peak

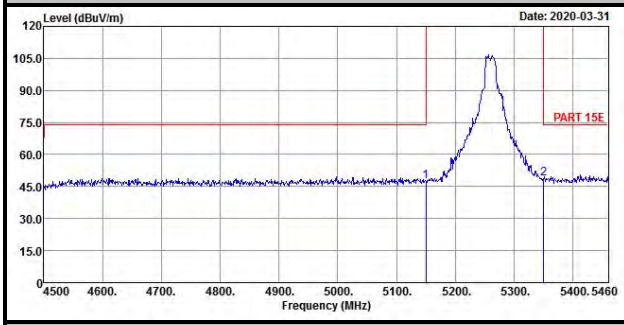
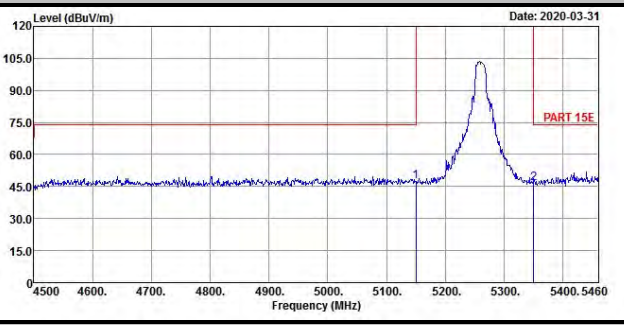
Horizontal	Vertical
	

Average

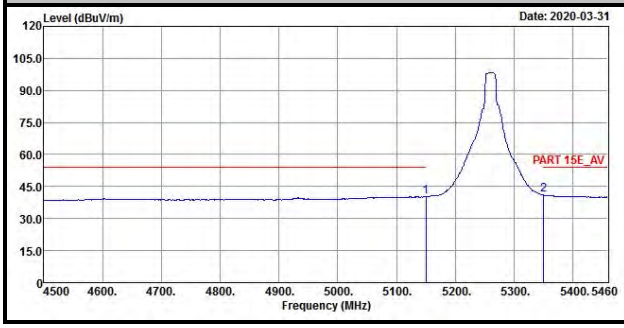
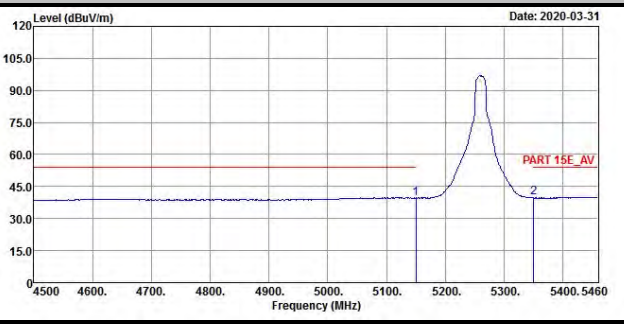
Horizontal	Vertical
	

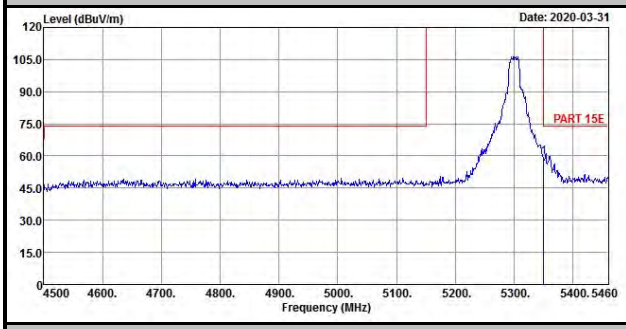
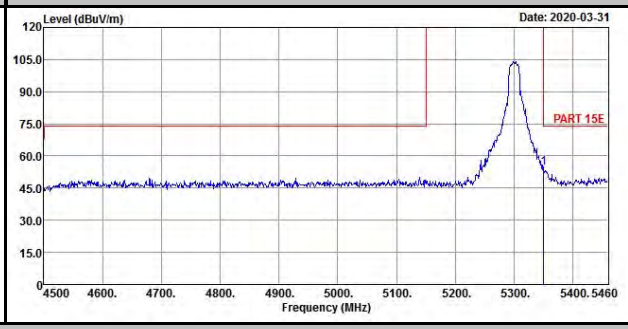
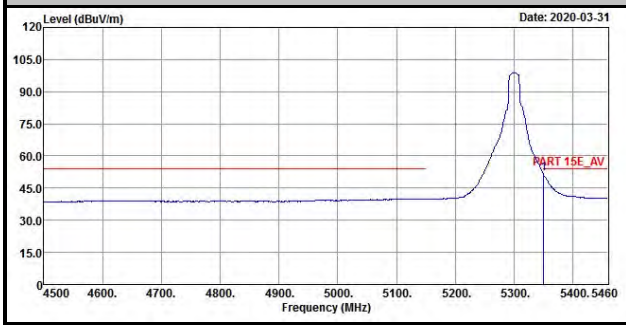
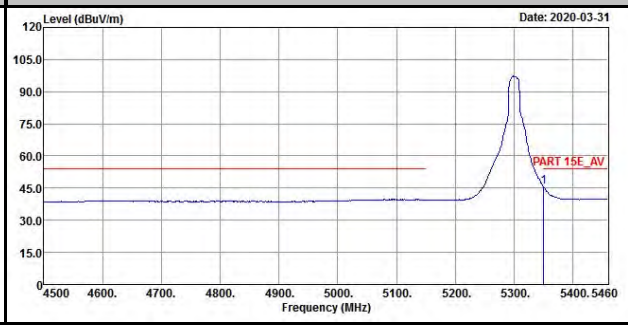
Ch 52

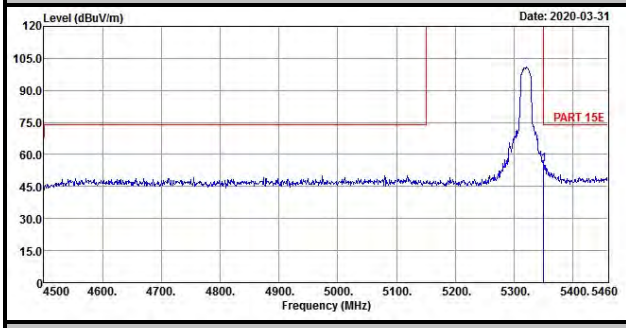
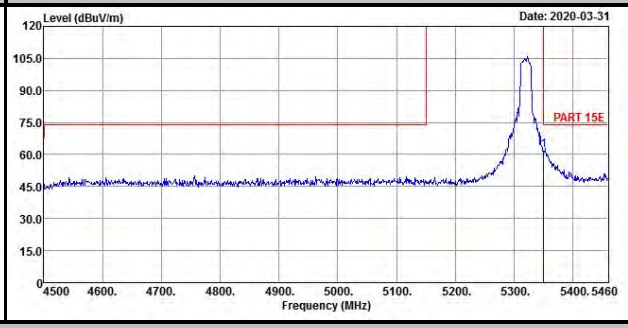
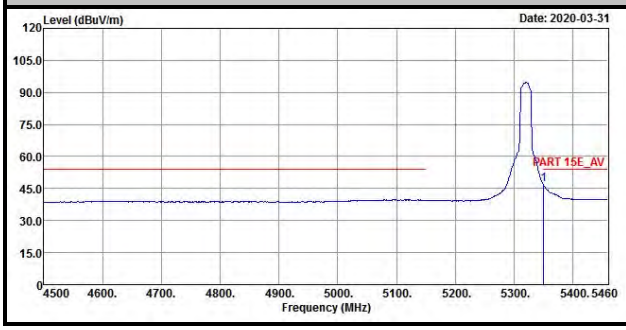
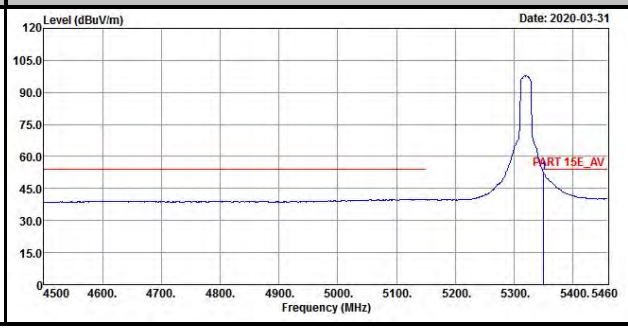
Peak

Horizontal	Vertical
	

Average

Horizontal	Vertical
	

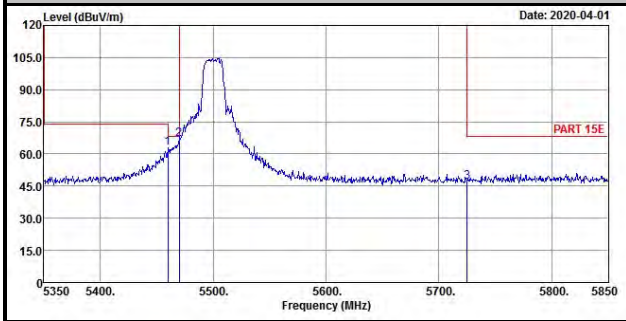
Ch 60	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

Ch 64	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

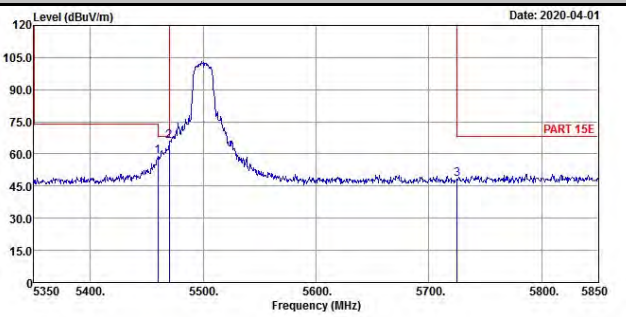
Ch 100

Peak

Horizontal

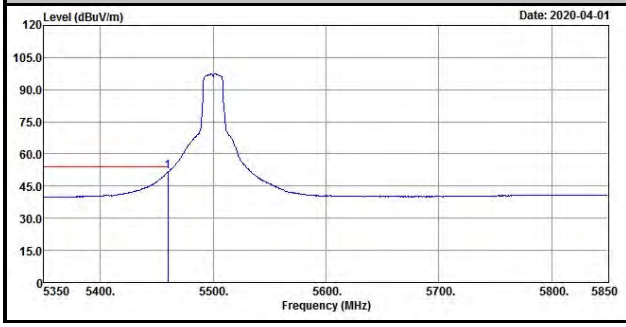


Vertical

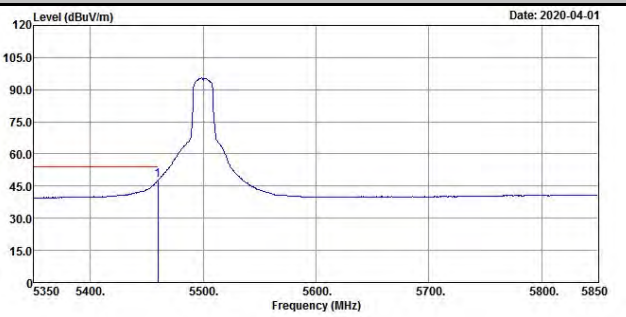


Average

Horizontal



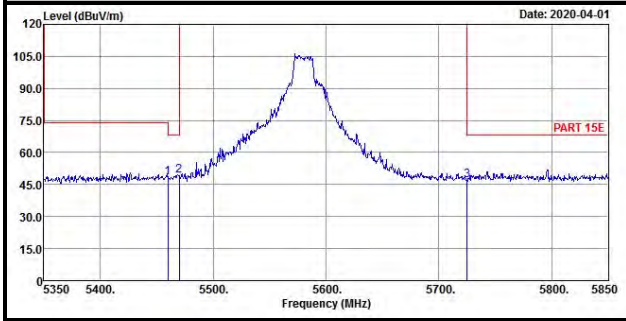
Vertical



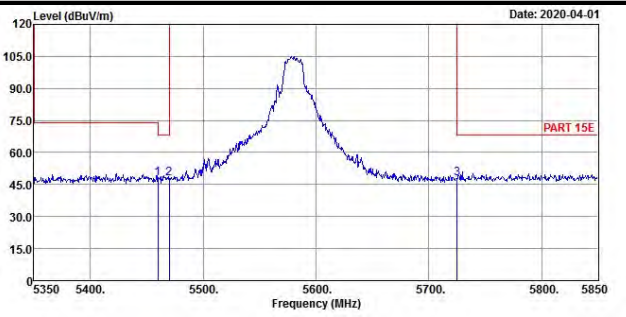
Ch 116

Peak

Horizontal

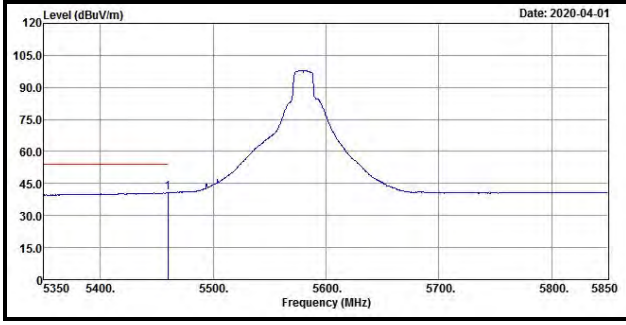


Vertical

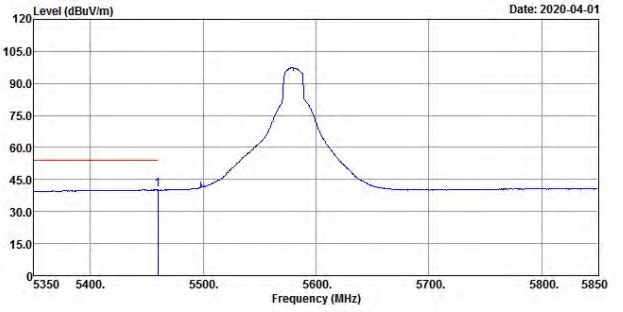


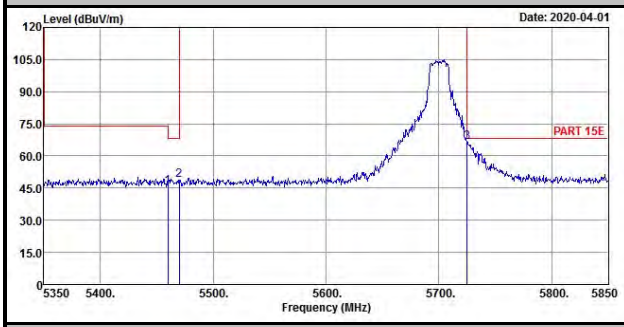
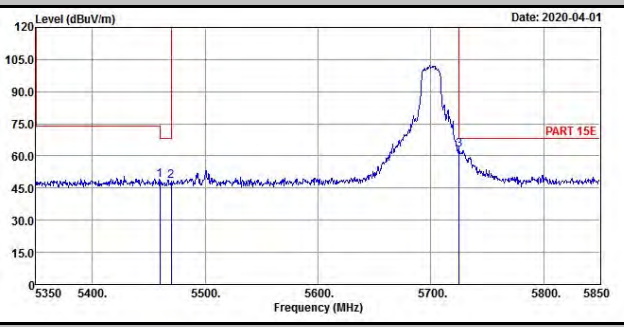
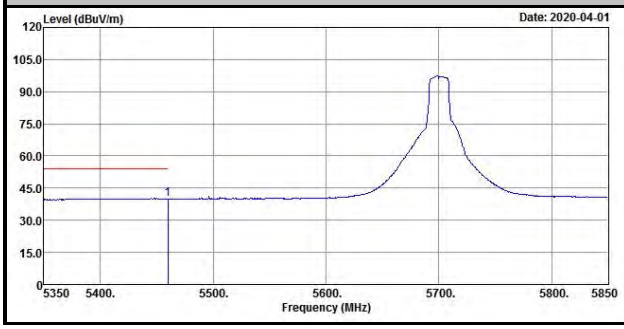
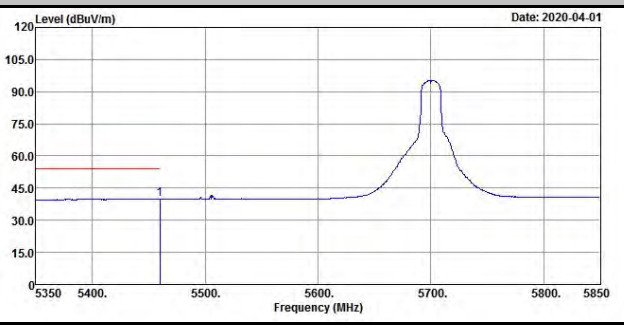
Average

Horizontal

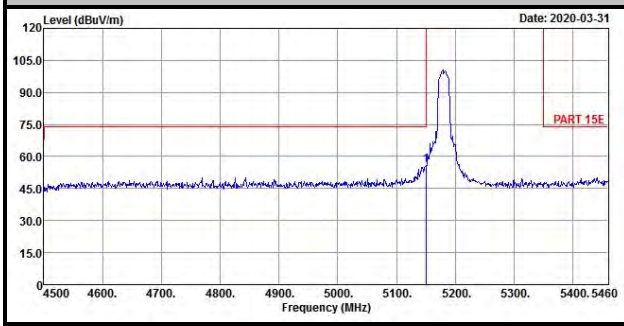
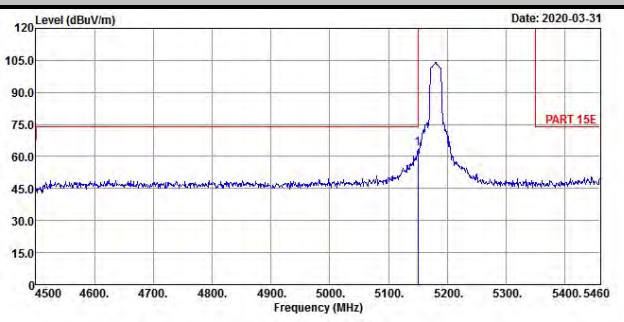
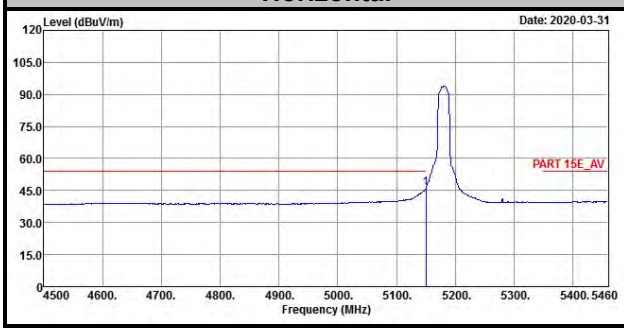
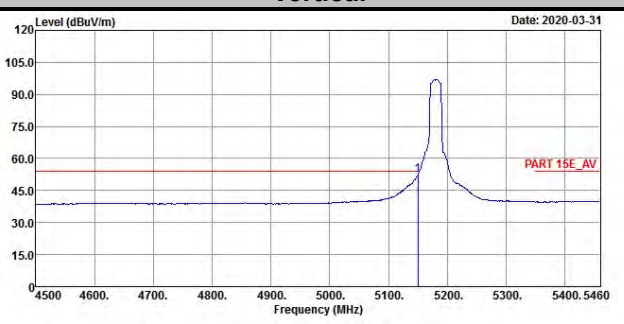


Vertical



Ch 140	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

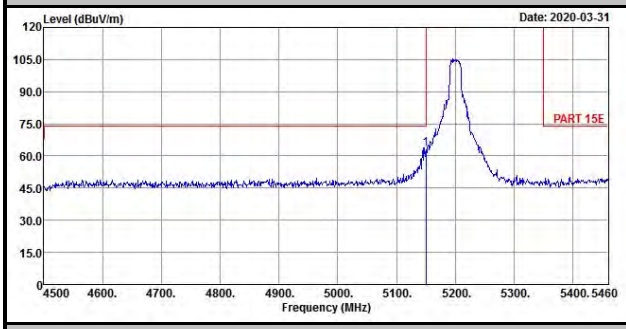
802.11n (HT20)

Ch 36	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

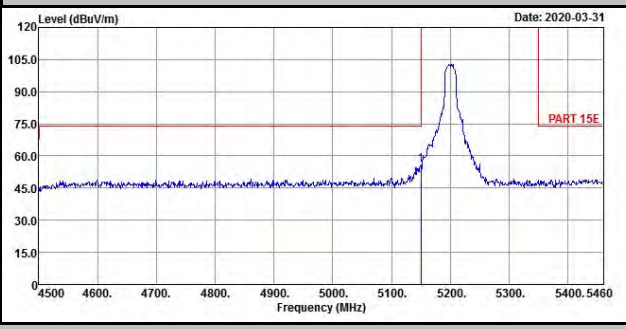
Ch 40

Peak

Horizontal

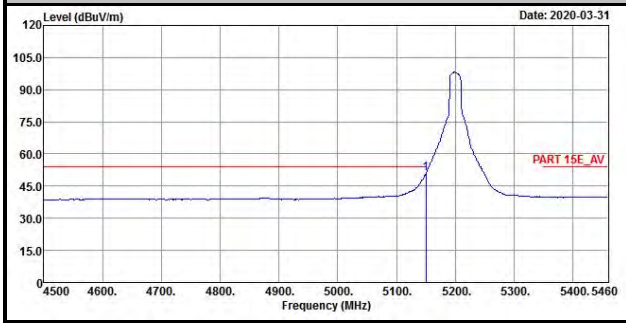


Vertical

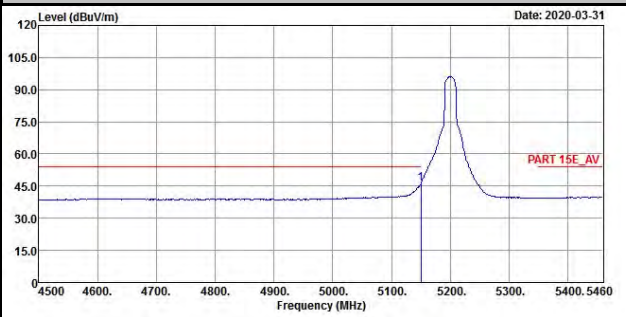


Average

Horizontal



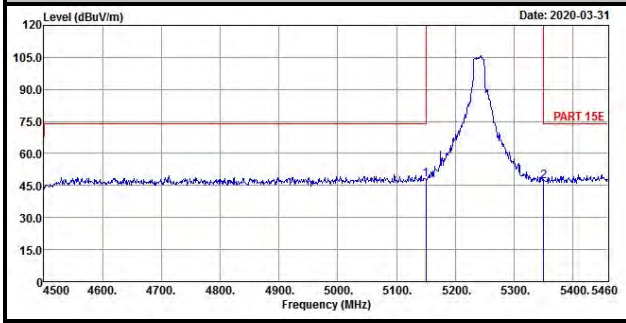
Vertical



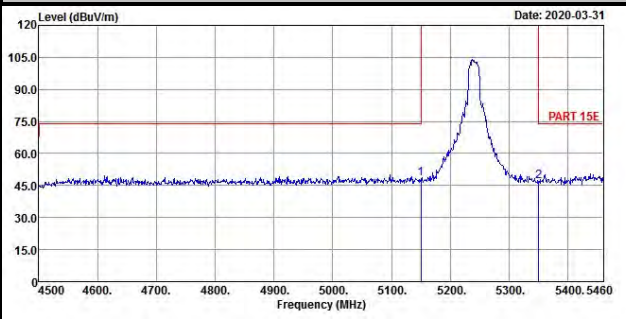
Ch 48

Peak

Horizontal

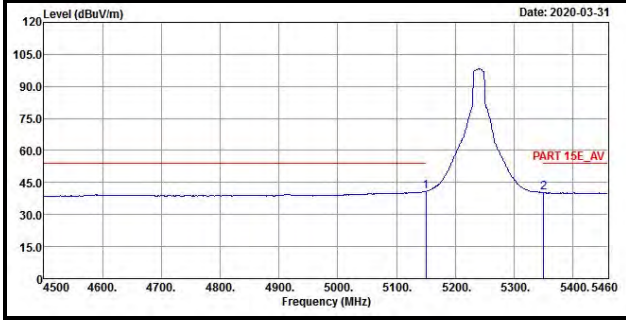


Vertical

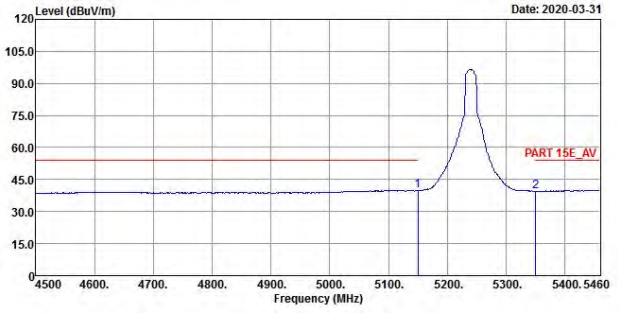


Average

Horizontal



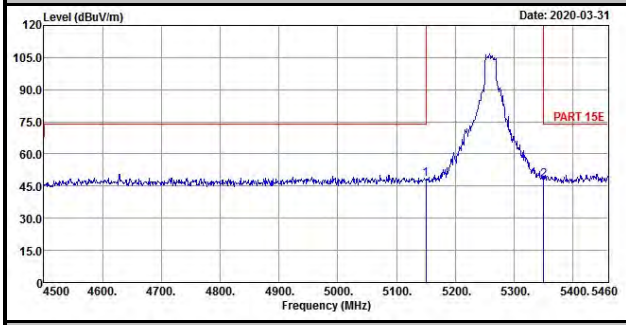
Vertical



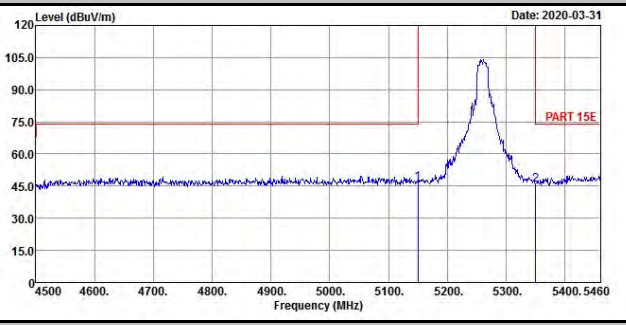
Ch 52

Peak

Horizontal

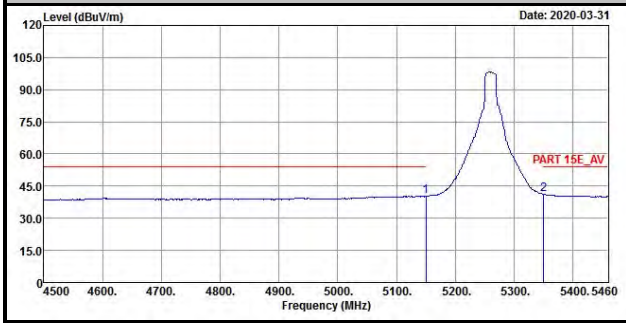


Vertical

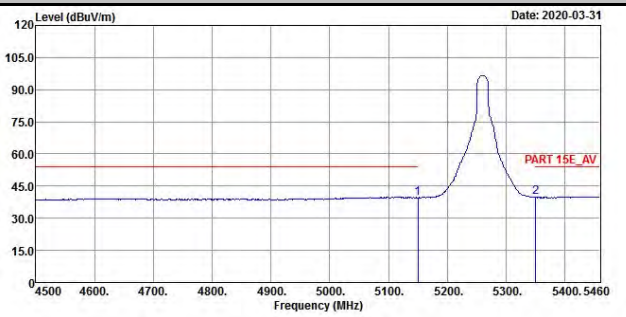


Average

Horizontal



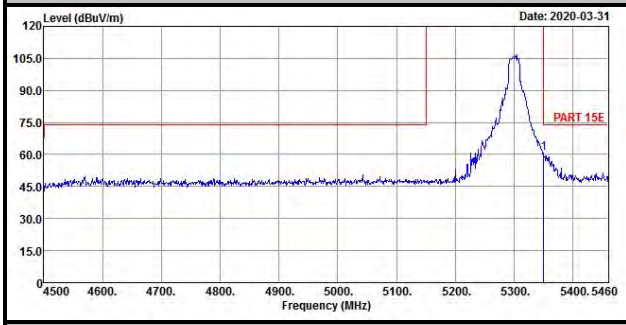
Vertical



Ch 60

Peak

Horizontal



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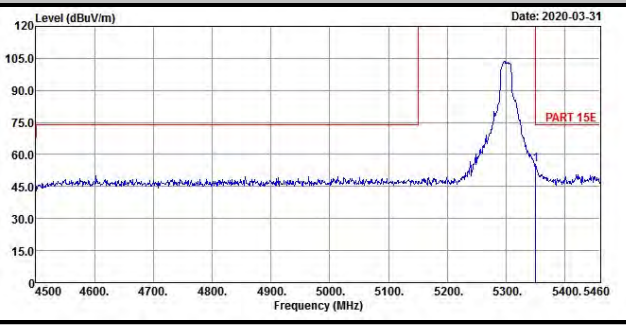
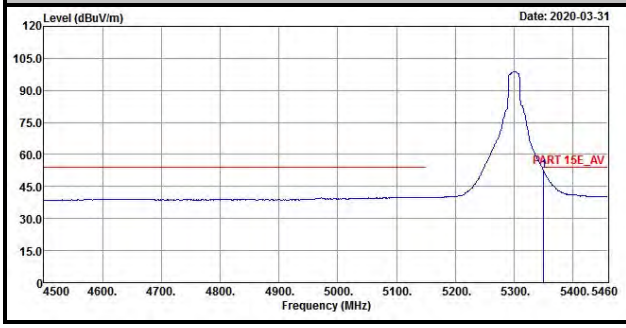
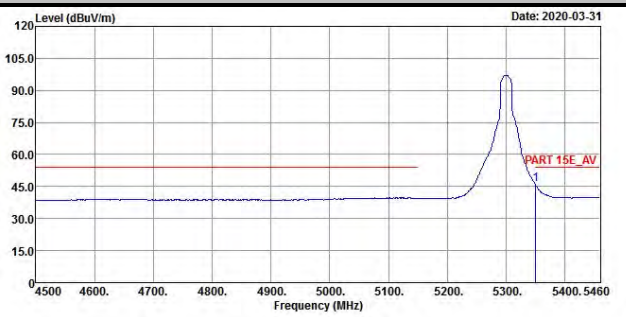


Average

Horizontal



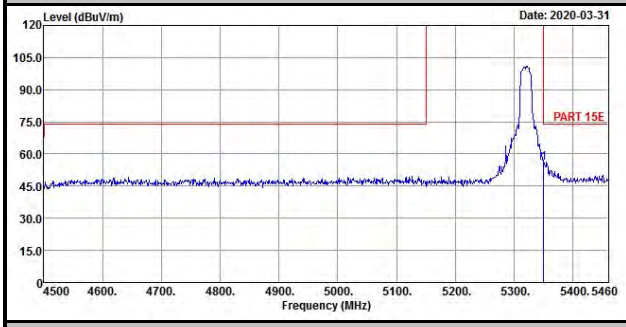
Vertical



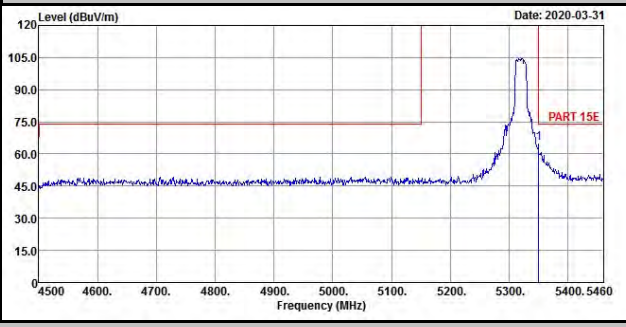
Ch 64

Peak

Horizontal

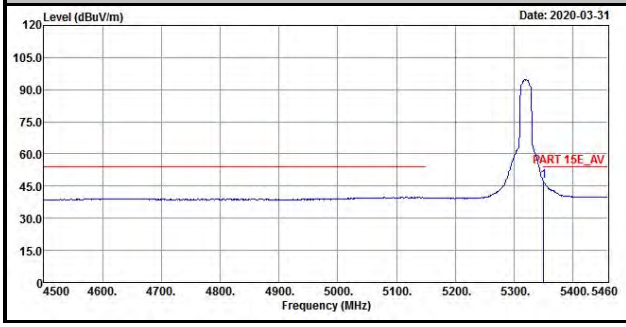


Vertical

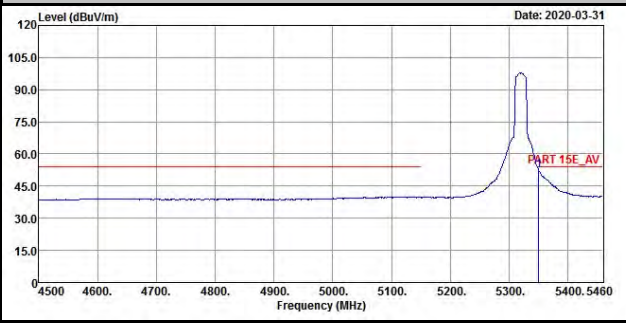


Average

Horizontal



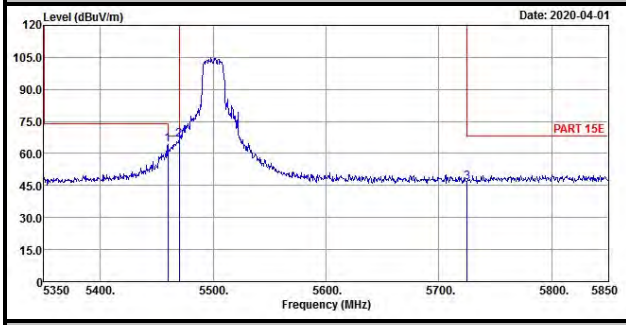
Vertical



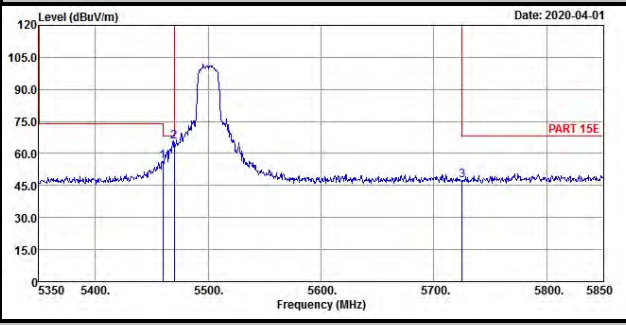
Ch 100

Peak

Horizontal

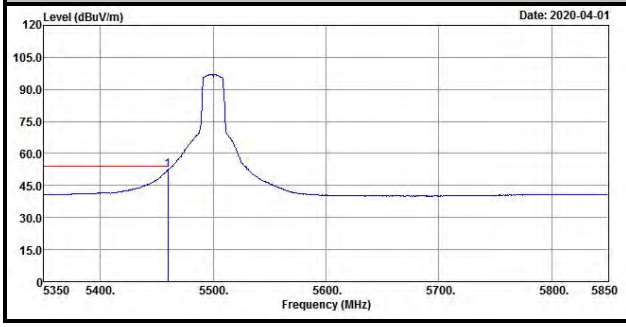


Vertical

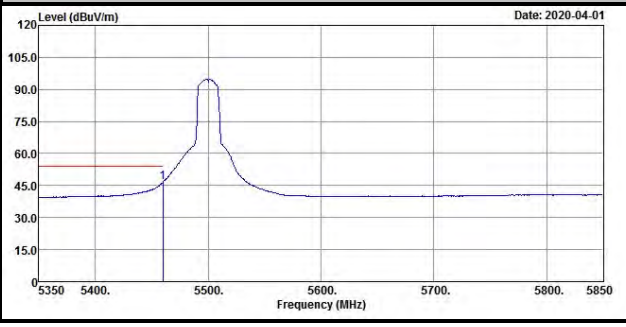


Average

Horizontal



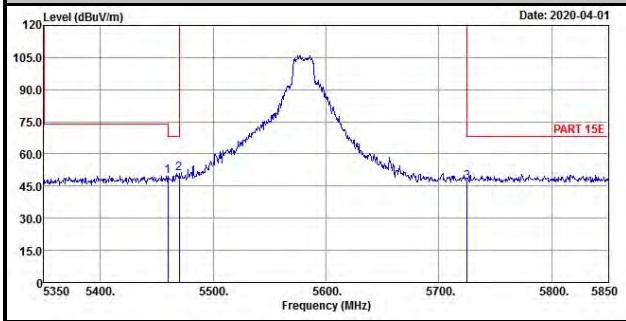
Vertical



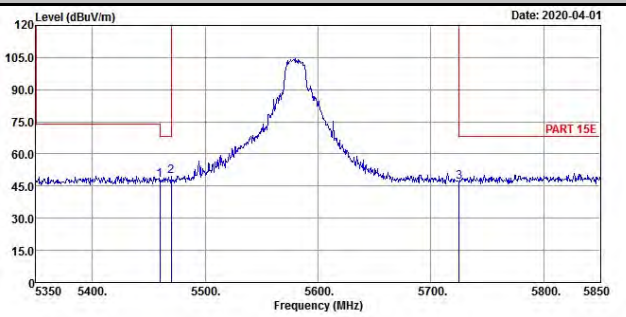
Ch 116

Peak

Horizontal

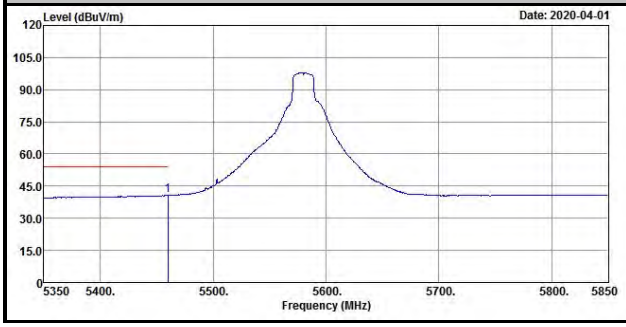


Vertical

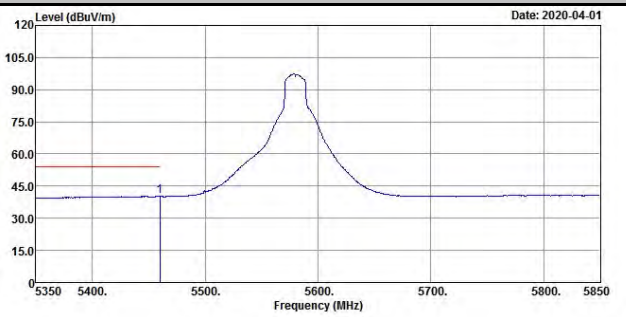


Average

Horizontal



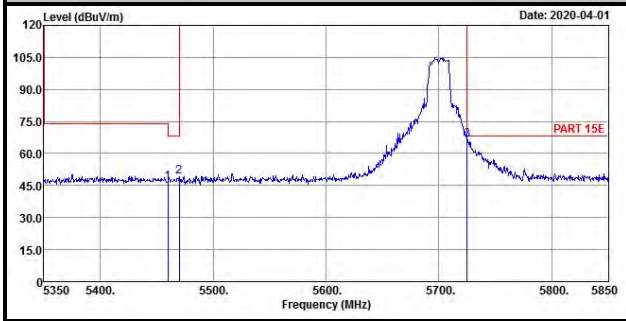
Vertical



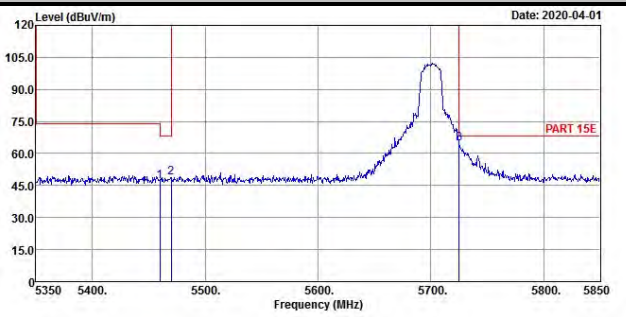
Ch 140

Peak

Horizontal

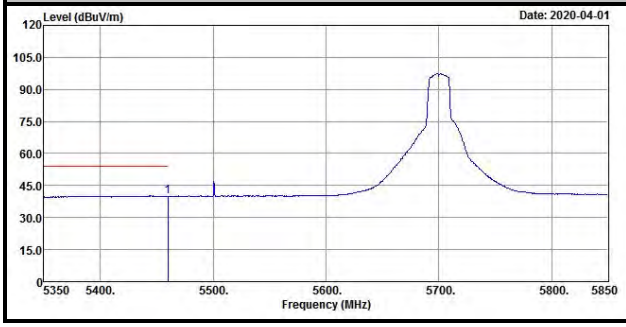


Vertical

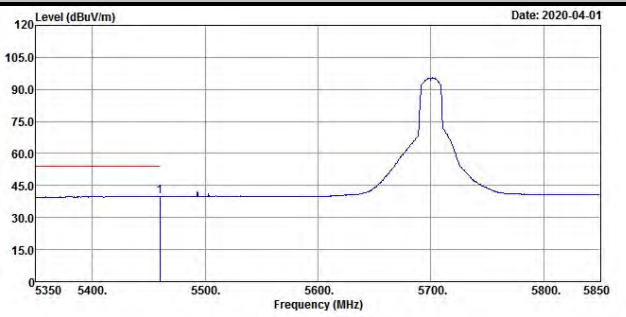


Average

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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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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