FCC Test Report

Report No.:	RFBDUI-WTW-P20110877A
FCC ID:	KA2M15A1
Test Model:	M15
Received Date:	Feb. 25, 2021
Test Date:	May 15 ~ Jul. 09, 2021 (For all tests except AC Power Conducted Emissions) Jan. 04, 2022 (For AC Power Conducted Emissions)
Issued Date:	Jan. 20, 2022
Applicant:	D-Link Corporation
Address:	14420 Myford Road Suite 100 Irvine California United States 92606
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 (1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number (1):	788550 / TW0003
Test Location (2):	B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan
FCC Registration / Designation Number (2):	427177 / TW0011

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RFBDUI-WTW-P20110877A	Original release.	Jan. 20, 2022

1 Certificate of Conformity

Product:	AX1500 Wi-Fi 6 AI Mesh Router, AX1500 Wi-Fi 6 AI Mesh System, AX1500 Mesh Router, AX1500 Mesh System
Brand:	D-Link
Test Model:	M15
Sample Status:	Engineering sample
Applicant:	D-Link Corporation
Test Date:	May 15 ~ Jul. 09, 2021 (For all tests except AC Power Conducted Emissions) Jan. 04, 2022 (For AC Power Conducted Emissions)
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 : Pettie Chen , **Date:** Jan. 20, 2022

Pettie Chen / Senior Specialist

Approved by : Jeremy Lin , **Date:** Jan. 20, 2022

Jeremy Lin / 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 -13.04dB at 0.43400MHz.
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 -1.01dB at 10640.00MHz.
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)	6dB bandwidth	N/A	Not Applicable
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	For Antenna 2G1, 5G1: Antenna connector is CCT MHF not a standard connector. For Antenna 2G2, 5G2: Antenna connector is KS-MHF not a standard connector.

Note:

1. For 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 A. Test Procedures refer to report 4.1.3.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.44 dB
	30MHz ~ 200MHz	2.0153 dB
	200MHz ~1000MHz	2.0224 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AX1500 Wi-Fi 6 AI Mesh Router, AX1500 Wi-Fi 6 AI Mesh System, AX1500 Mesh Router, AX1500 Mesh System
Brand	D-Link
Test Model	M15
Sample Status	Engineering sample
Power Supply rating	12Vdc from Adapter
Modulation Type	802.11a: BPSK, QPSK, 16QAM, 64QAM 802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM 802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps 802.11ax: up to 1201Mbps
Operating Frequency	5260 ~ 5320MHz, 5500 ~ 5700MHz
Number of Channel	5260 ~ 5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 4 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 2 802.11ac (VHT80), 802.11ax (HE80): 1 5500 ~ 5700MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 11 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 5 802.11ac (VHT80), 802.11ax (HE80): 2
Output Power	CDD Mode: 5260 ~ 5320MHz: 224.705mW 5500 ~ 5700MHz: 142.256mW Beamforming Mode: 5260 ~ 5320MHz: 112.360mW 5500 ~ 5700MHz: 71.133mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Adapter
Cable Supplied	1.0m CAT5E 24AWG CCA WHITE CABLE (Brand: Nienyi, Model: NY4710 REV.0)

Note:

1. This report is prepared for FCC class II permissive change. The differences compared with the original report (BV CPS report no.: RFBDUI-WTW-P20110877-1) are adding 5.26GHz to 5.32GHz and 5.50GHz to 5.70GHz by software.

2. The following product names and model are provided to this EUT.

Product	Model	Description
AX1500 Wi-Fi 6 AI Mesh Router	M15	For marketing purpose.
AX1500 Wi-Fi 6 AI Mesh System		
AX1500 Mesh Router		
AX1500 Mesh System		

3. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	CDD Mode	Beamforming Mode	TX Function
802.11a	Support	Not Support	2TX
802.11n (HT20)	Support	Support	2TX
802.11n (HT40)	Support	Support	2TX
802.11ac (VHT20)	Support	Support	2TX
802.11ac (VHT40)	Support	Support	2TX
802.11ac (VHT80)	Support	Support	2TX
802.11ax (HE20)	Support	Support	2TX
802.11ax (HE40)	Support	Support	2TX
802.11ax (HE80)	Support	Support	2TX

* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40/VHT80 on 802.11ac mode and HE20/HE40/HE80 on 802.11ax mode. Therefore the investigated worst case is the representative mode in test report. (Final test mode refer section 3.2.1)
* For 802.11n and 802.11ac, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.
* Scanning Radio is RX only.

4. The EUT consumes power from the following adapters.

Product	Brand	Model	Description
Adapter 1	Amigo	AMS159A-1201000F (US+UK)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A
Adapter 2	Amigo	AMS159A-1201000F (EU+UK)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A
Adapter 3	Amigo	AMS159A-1201000FU (US)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A
Adapter 4	Amigo	AMS159A-1201000FS (AU)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A
Adapter 5	Amigo	AMS159A-1201000FV (EU)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A
Adapter 6	Amigo	AMS195-1201000FY (IN)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A
Adapter 7	Amigo	AMS195-1201000FK (KR)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A
Adapter 8	Amigo	AMS159A-1201000FX (BR)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A
Adapter 9	Amigo	AMS159A-1201000FB (UK)	I/P: 100-240 Vac, 50/60 Hz, 0.5 A O/P: 12 Vdc, 1 A

*All adapters only different in plug. Therefore, use US type (adapter 3) as a representative for test.

5. The antenna information is listed as below.

Antenna Type		PIFA										
Antenna Connector		2G1, 5G1: CCT MHF, 2G2, 5G2: KS-MHF										
Brand		WHA YU										
Antenna No.	P/N	Gain (dBi)										
		2400 MHz	2450 MHz	2500 MHz	5150 MHz	5250 MHz	5350 MHz	5475 MHz	5600 MHz	5725 MHz	5750 MHz	5825 MHz
2G1	C1958-510011-A	2.29	2.31	2.27	-	-	-	-	-	-	-	-
2G2	C1958-510012-A	2.51	2.56	2.43	-	-	-	-	-	-	-	-
5G1	C1958-510013-A	-	-	-	2.19	2.37	2.44	2.29	2.38	2.24	2.36	2.23
5G2	C1958-510014-A	-	-	-	2.51	2.33	2.64	2.81	2.55	2.77	2.56	2.62

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

6. WLAN 2.4GHz & WLAN 5GHz technology can transmit at same time.

7. Spurious emission of the simultaneous operation (WLAN 2.4GHz and WLAN 5GHz) has been evaluated and no non-compliance was found.

3.2 Description of Test Modes

5260~5320MHz:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
58	5290MHz

5500~5700MHz:

11 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

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

5 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission APCM: Antenna Port Conducted Measurement

Note:
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 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
-	802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	MCS0
-	802.11ax (HE40)		54 to 62	54, 62	OFDMA	MCS0
-	802.11ax (HE80)		58	58	OFDMA	MCS0
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
-	802.11ax (HE20)		100 to 140	100, 116, 140	OFDMA	MCS0
-	802.11ax (HE40)		102 to 134	102, 110, 134	OFDMA	MCS0
-	802.11ax (HE80)		106, 122	106, 122	OFDMA	MCS0

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5260-5320	52 to 64	64	OFDM	6.0

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5260-5320	52 to 64	64	OFDM	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	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
-	802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	MCS0
-	802.11ax (HE40)		54 to 62	54, 62	OFDMA	MCS0
-	802.11ax (HE80)		58	58	OFDMA	MCS0
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
-	802.11ax (HE20)		100 to 140	100, 116, 140	OFDMA	MCS0
-	802.11ax (HE40)		102 to 134	102, 110, 134	OFDMA	MCS0
-	802.11ax (HE80)		106, 122	106, 122	OFDMA	MCS0

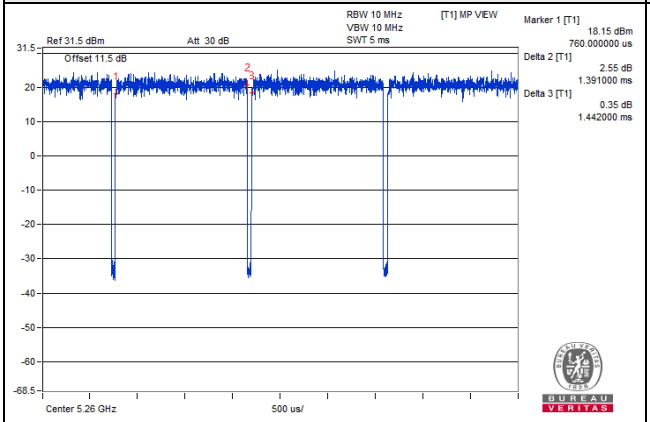
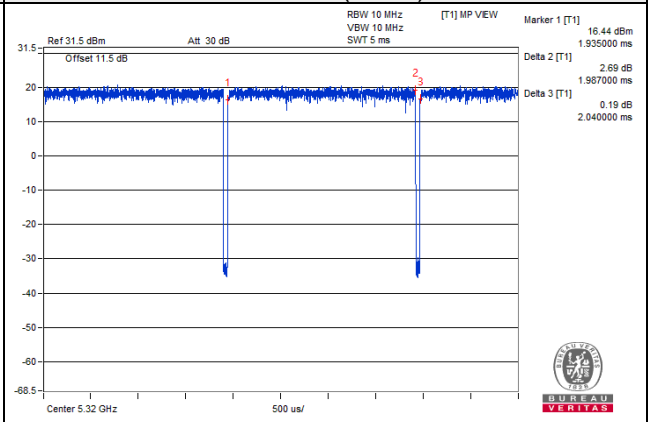
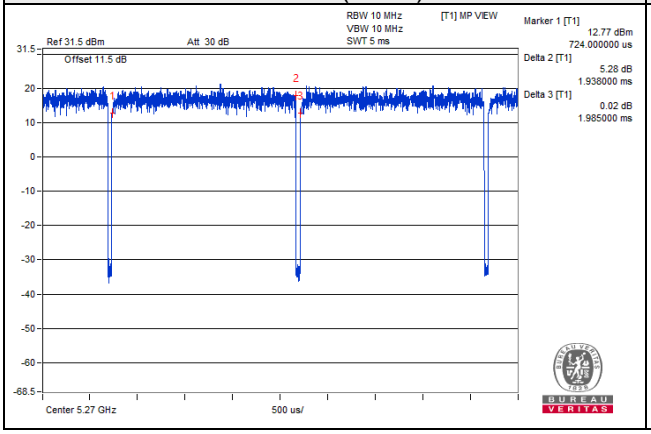
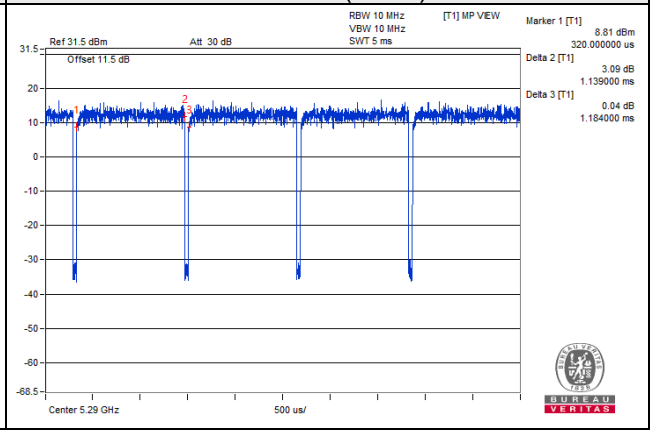
Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	23 deg. C, 67% RH	120Vac, 60Hz	Karl Lee, Charles Hsiao
RE<1G	23 deg. C, 67% RH	120Vac, 60Hz	Karl Lee
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Rex Wang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Vicent Huang

3.3 Duty Cycle of Test Signal

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

802.11a: Duty cycle = 1.391/1.442 = 0.965, Duty factor = 10 * log (1/0.965) = 0.16
802.11ax (HE20): Duty cycle = 1.987/2.04 = 0.974, Duty factor = 10 * log (1/0.974) = 0.11
802.11ax (HE40): Duty cycle = 1.938/1.985 = 0.976, Duty factor = 10 * log (1/0.976) = 0.10
802.11ax (HE80): Duty cycle = 1.139/1.184 = 0.962, Duty factor = 10 * log (1/0.962) = 0.17

802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	

3.4 Description of Support Units

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

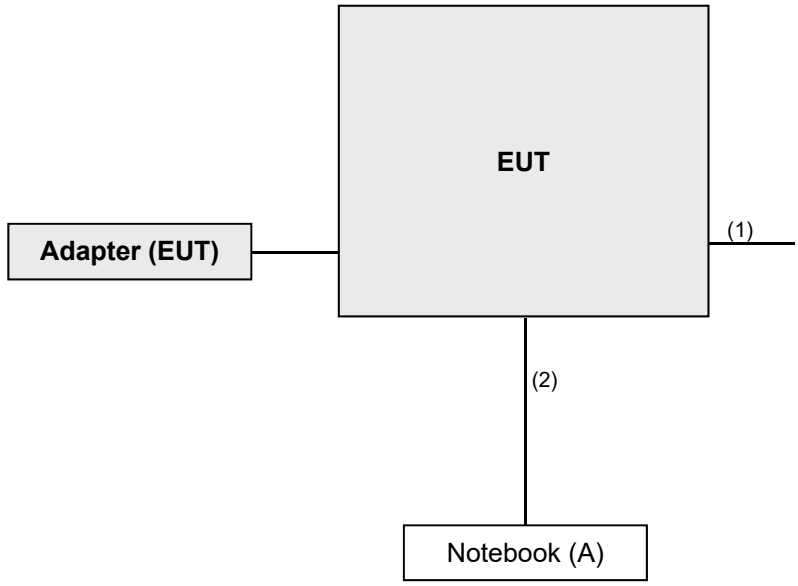
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	LATITUDE	F9MQBW1	FCC DoC Approved	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN	1	1.5	N	0	RJ45, Cat5e (provided by lab)
2.	LAN	1	1.0	N	0	RJ45, Cat5e (Accessory)

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.

KDB References Test Guidance:

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output 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 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK: 74 (dBμV/m)</td><td>AV: 54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK: -27 (dBm/MHz)</td><td rowspan="3">PK: 68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☐</td><td>15.407(b)(4)(i)</td><td>PK: -27 (dBm/MHz) *1
PK: 10 (dBm/MHz) *2
PK: 15.6 (dBm/MHz) *3
PK: 27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK: 105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK: 122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*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.</td></tr>
</table>

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.	Cal. Date	Cal. Due
Test Receiver Agilent Technologies	N9038A	MY52260177	Aug. 24, 2020	Aug. 23, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 22, 2020	Nov. 21, 2021
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 09, 2020	Nov. 08, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 22, 2020	Nov. 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
Loop Antenna	EM-6879	269	Sep. 17, 2020	Sep. 16, 2021
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2020	Nov. 24, 2021
Preamplifier Agilent	310N	187226	Jun. 17, 2020	Jun. 16, 2021
			Jun. 17, 2021	Jun. 16, 2022
Preamplifier Agilent	83017A	MY39501357	Jun. 17, 2020	Jun. 16, 2021
			Jun. 17, 2021	Jun. 16, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 07, 2020	Oct. 06, 2021
Power Meter Anritsu	ML2495A	1012010	Sep. 01, 2020	Aug. 31, 2021
Power Sensor Anritsu	MA2411B	1315050	Sep. 01, 2020	Aug. 31, 2021
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 17, 2020	Jun. 16, 2021
			Jun. 17, 2021	Jun. 16, 2022
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 17, 2020	Jun. 17, 2021
			Jun. 17, 2021	Jun. 16, 2022
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	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 Xindian Chamber 1.
3. Test Date: May 15 ~ Jul. 09, 2021

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

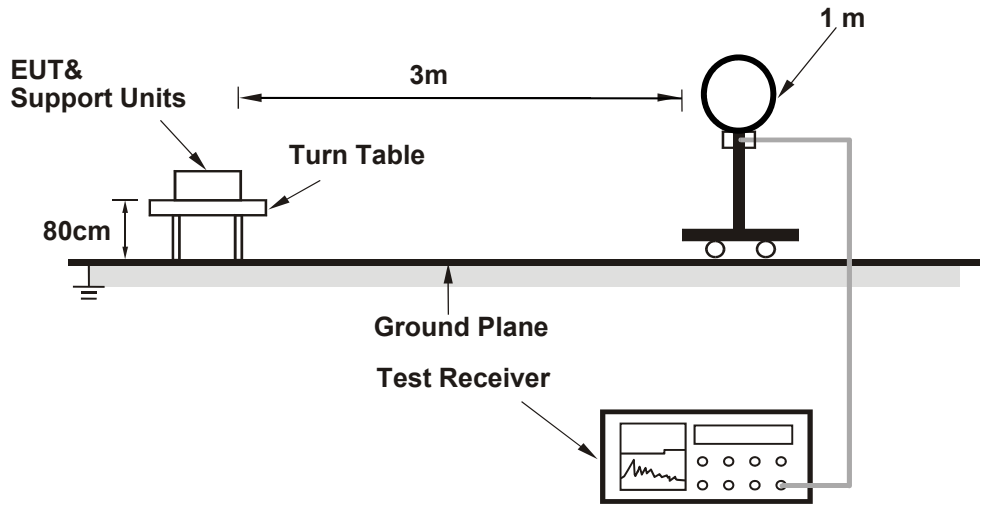
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

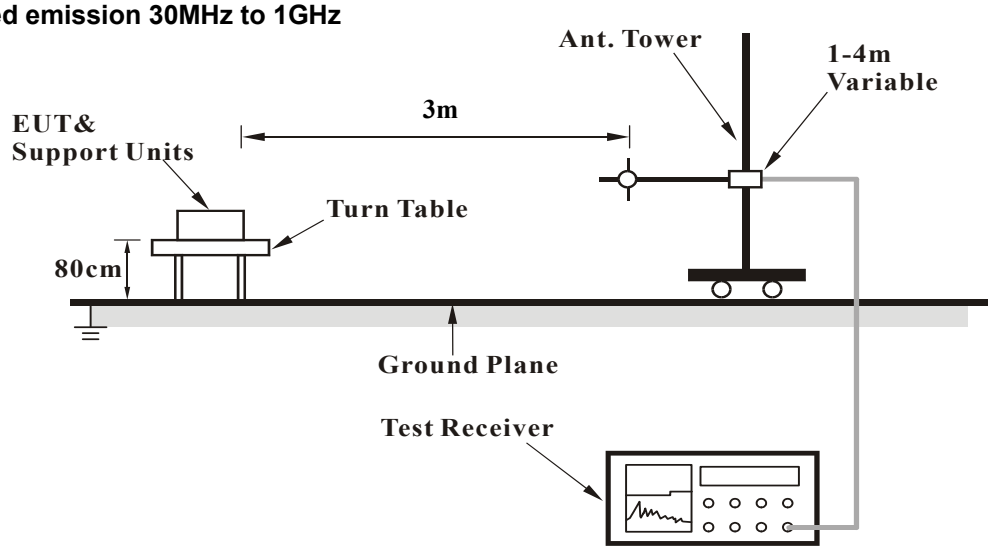
No deviation.

4.1.5 Test Setup

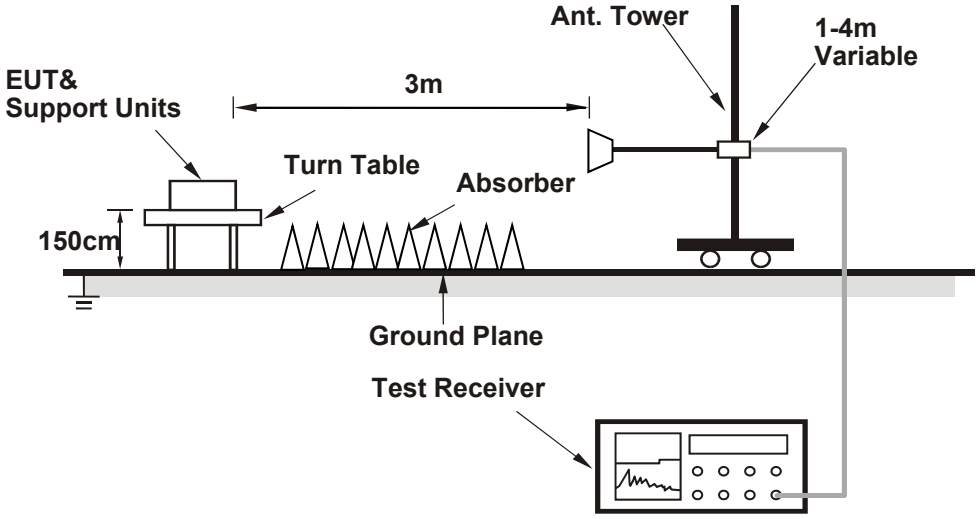
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Connected EUT with a notebook system via a RJ45 cable and placed on a testing table.

b. The notebook ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz data:

802.11a

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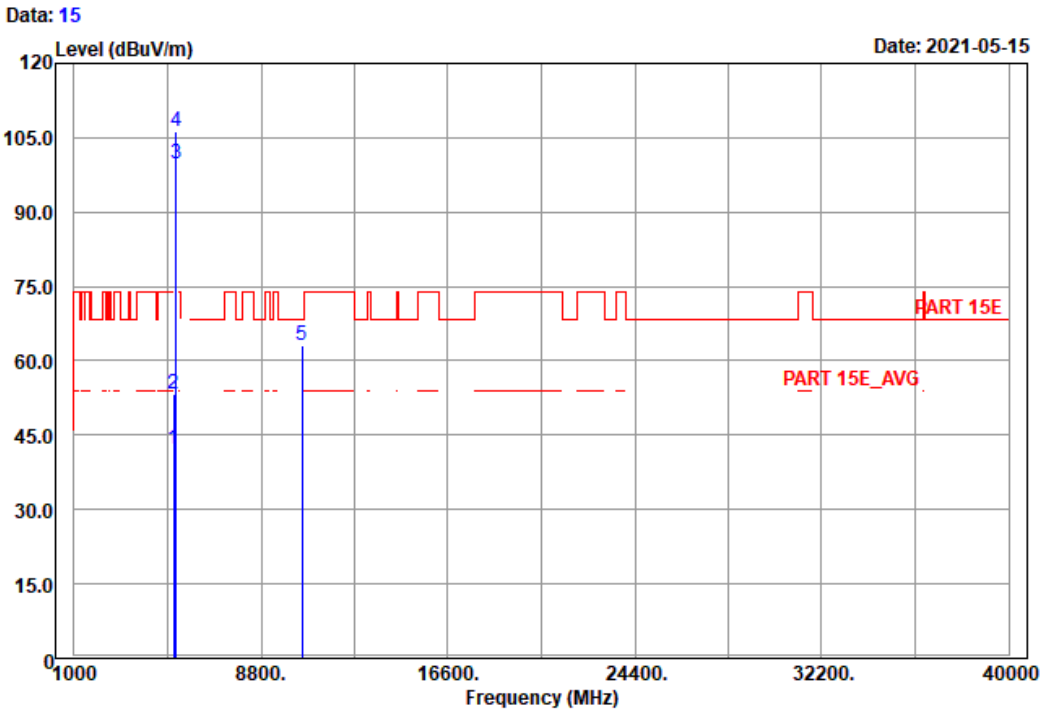
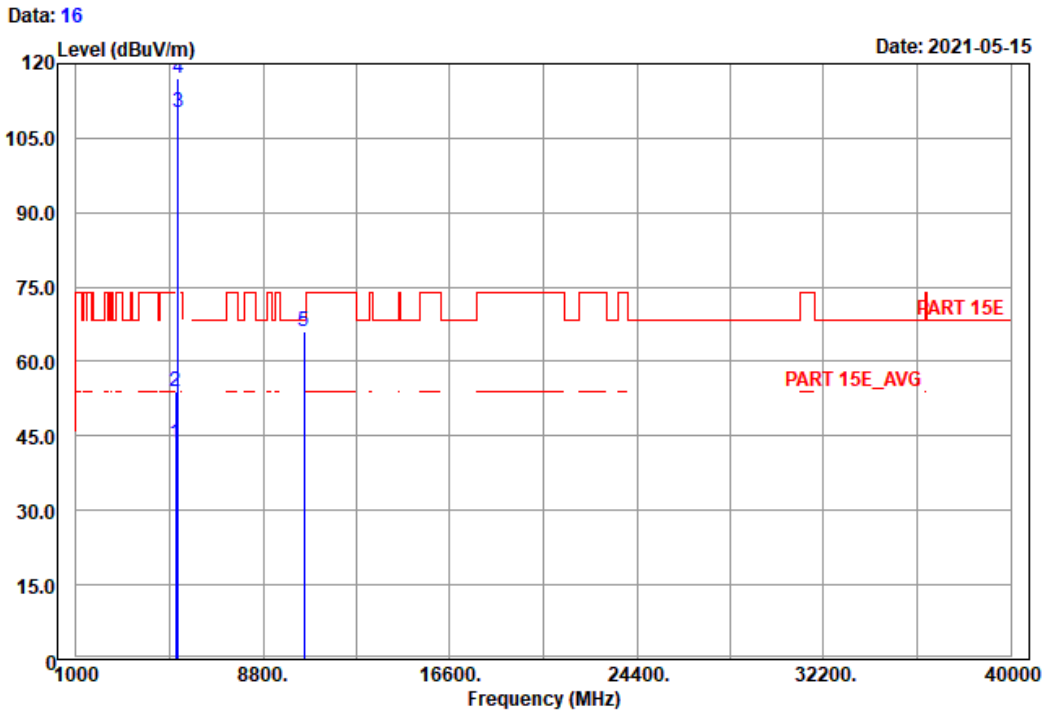


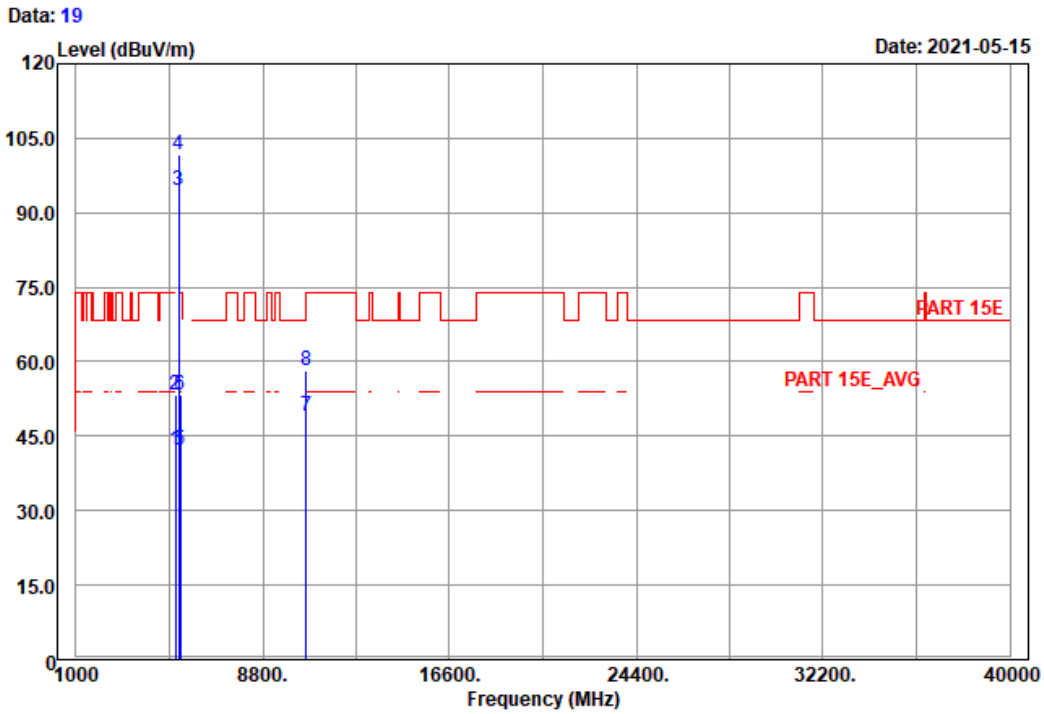
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11A_TX_CH52
Tested by: Charles Hsiao
Rate : 6M
Power : 24.5/24.5
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1 av	5150.00	42.19	32.14	10.05	54.00	-11.81	108	116	Average
2	5150.00	53.14	43.09	10.05	74.00	-20.86	108	116	Peak
3	5260.00	99.84	89.72	10.12	------	------	108	116	Average
4	5260.00	106.33	96.21	10.12	------	------	108	116	Peak
5 pp	10520.00	63.25	47.37	15.88	68.20	-4.95	212	310	Peak



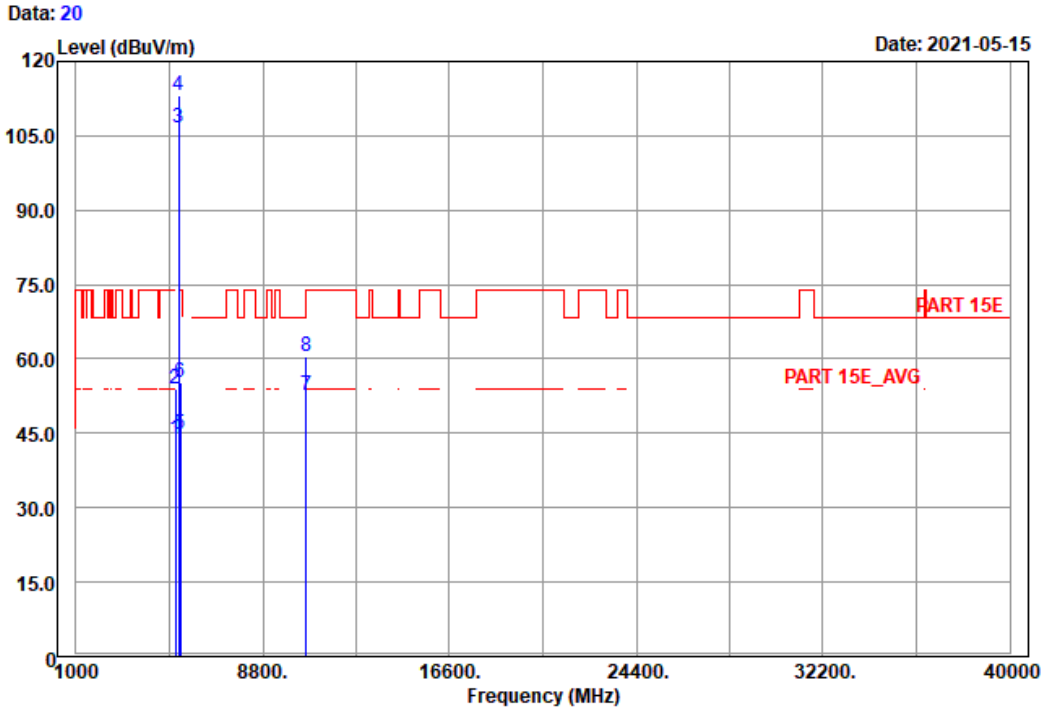
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11A_TX_CH52
Tested by: Charles Hsiao
Rate : 6M
Power : 24.5/24.5
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1 av	5150.00	43.33	33.28	10.05	54.00	-10.67	181	0	Average
2	5150.00	53.86	43.81	10.05	74.00	-20.14	181	0	Peak
3	5260.00	110.24	100.12	10.12	------	------	181	0	Average
4	5260.00	117.00	106.88	10.12	------	------	181	0	Peak
5 pp	10520.00	66.07	50.19	15.88	68.20	-2.13	230	267	Peak



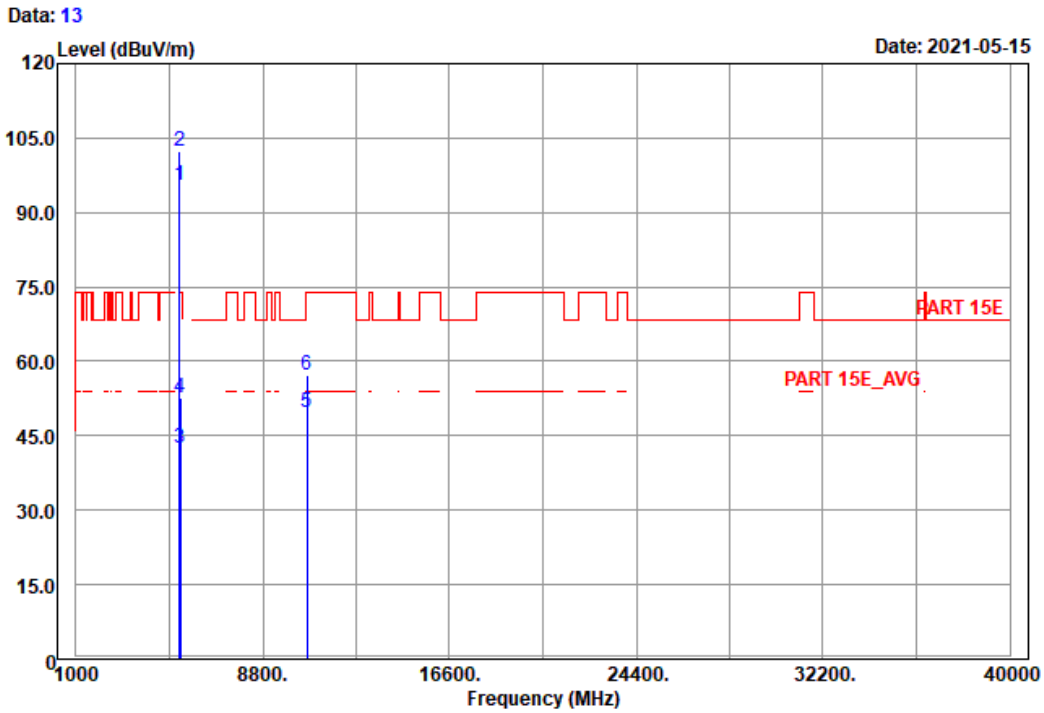
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11A_TX_CH60
Tested by: Charles Hsiao
Rate : 6M
Power : 18/18
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5150.00	42.27	32.22	10.05	54.00	-11.73	108	116	Average
2	5150.00	53.26	43.21	10.05	74.00	-20.74	108	116	Peak
3	5300.00	94.58	84.52	10.06	------	------	108	116	Average
4	5300.00	101.66	91.60	10.06	------	------	108	116	Peak
5	5350.00	42.31	32.08	10.23	54.00	-11.69	108	116	Average
6	5350.00	53.16	42.93	10.23	74.00	-20.84	108	116	Peak
7 pp	10600.00	49.11	33.35	15.76	54.00	-4.89	200	5	Average
8 pk	10600.00	58.21	42.45	15.76	74.00	-15.79	200	5	Peak



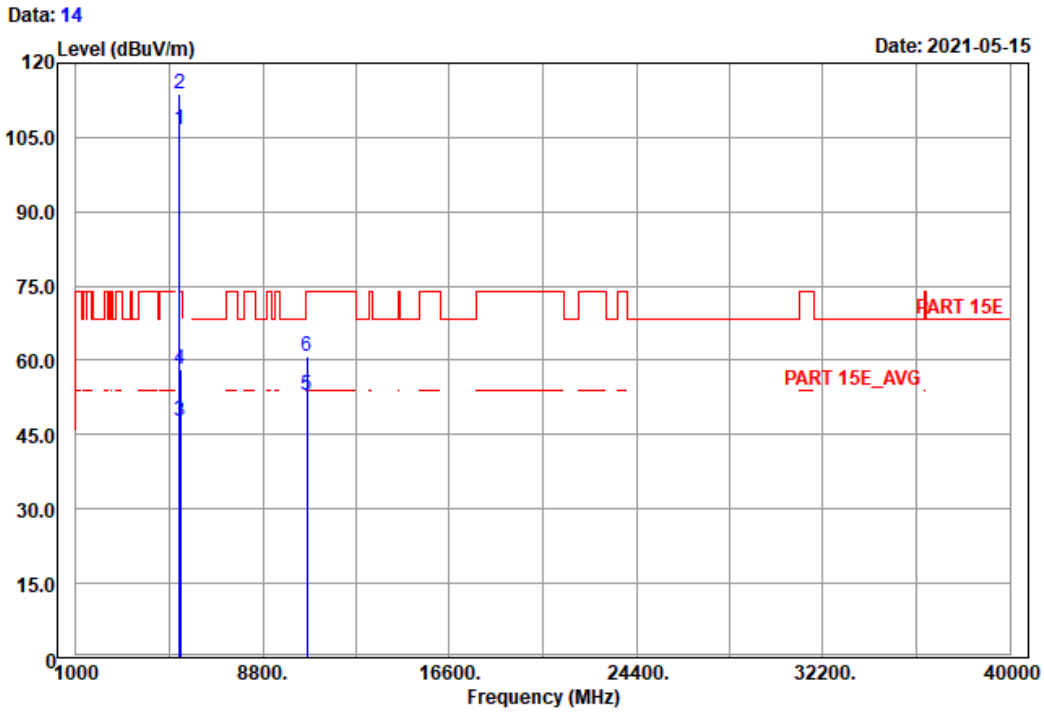
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11A_TX_CH60
Tested by: Charles Hsiao
Rate : 6M
Power : 18/18
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5150.00	43.85	33.80	10.05	54.00	-10.15	181	0	Average
2		5150.00	53.92	43.87	10.05	74.00	-20.08	181	0	Peak
3		5300.00	106.66	96.60	10.06	------	------	181	0	Average
4		5300.00	113.11	103.05	10.06	------	------	181	0	Peak
5		5350.00	44.73	34.50	10.23	54.00	-9.27	181	0	Average
6		5350.00	55.37	45.14	10.23	74.00	-18.63	181	0	Peak
7	pp	10600.00	52.78	37.02	15.76	54.00	-1.22	201	295	Average
8	pk	10600.00	60.56	44.80	15.76	74.00	-13.44	201	295	Peak



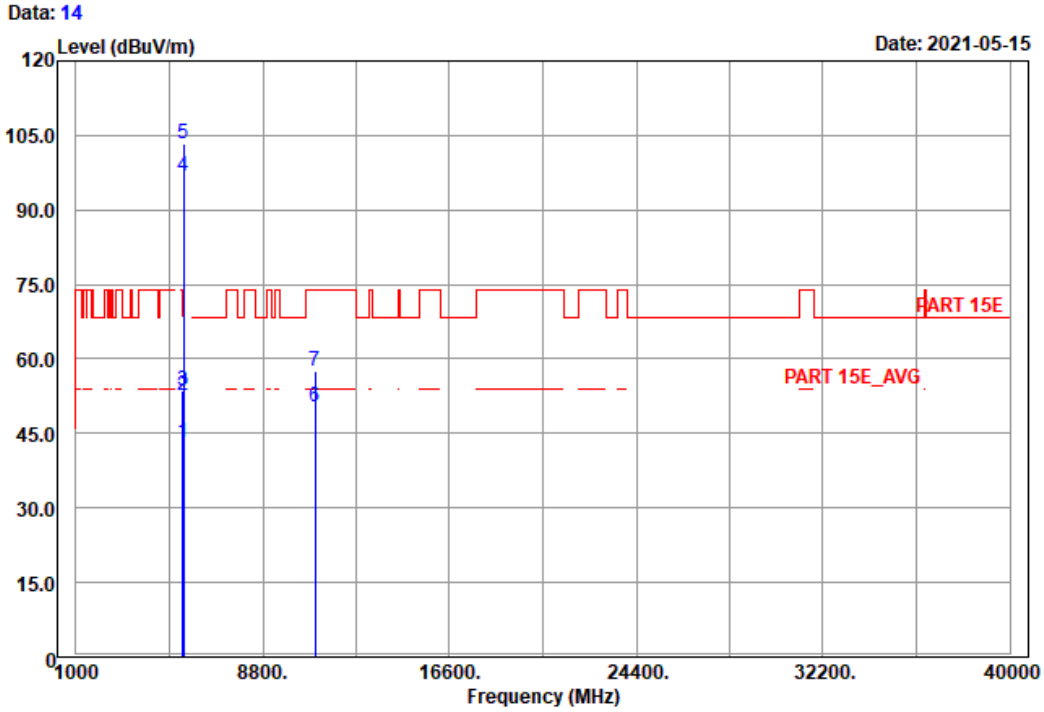
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11A_TX_CH64
Tested by: Charles Hsiao
Rate : 6M
Power : 18/18
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5320.00	95.50	85.41	10.09	------	------	100	110	Average
2	5320.00	102.36	92.27	10.09	------	------	100	110	Peak
3	5350.00	42.40	32.17	10.23	54.00	-11.60	100	110	Average
4	5350.00	52.66	42.43	10.23	74.00	-21.34	100	110	Peak
5 pp	10640.00	49.54	33.55	15.99	54.00	-4.46	200	5	Average
6 pk	10640.00	57.21	41.22	15.99	74.00	-16.79	200	5	Peak



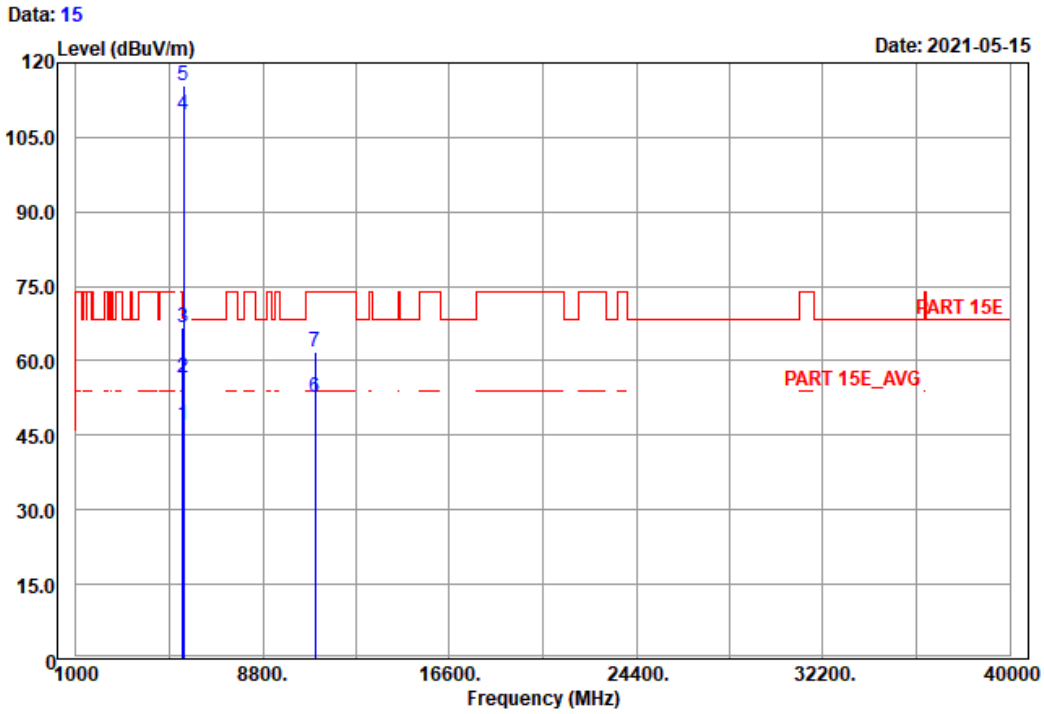
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11A_TX_CH64
Tested by: Charles Hsiao
Rate : 6M
Power : 18/18
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5320.00	106.55	96.46	10.09	------	------	181	1	Average
2	5320.00	113.90	103.81	10.09	------	------	181	1	Peak
3	5350.00	47.64	37.41	10.23	54.00	-6.36	181	1	Average
4	5350.00	58.08	47.85	10.23	74.00	-15.92	181	1	Peak
5 pp	10640.00	52.99	37.00	15.99	54.00	-1.01	201	295	Average
6 pk	10640.00	60.72	44.73	15.99	74.00	-13.28	201	295	Peak



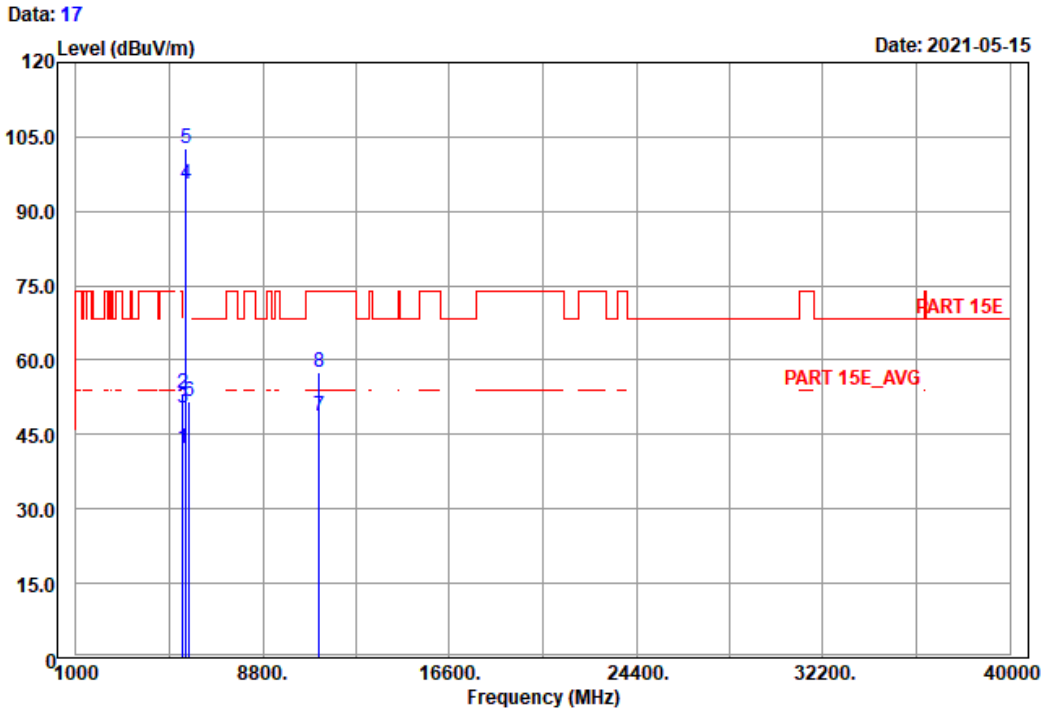
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11A_TX_CH100
Tested by: Karl Lee
Rate : 6M
Power : 18.5/18.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	43.19	32.68	10.51	54.00	-10.81	125	99	Average
2		5460.00	52.58	42.07	10.51	74.00	-21.42	125	99	Peak
3	pk	5470.00	53.76	43.23	10.53	68.20	-14.44	126	131	Peak
4		5500.00	96.80	86.20	10.60	------	------	120	110	Average
5		5500.00	103.18	92.58	10.60	------	------	120	110	Peak
6	pp	11000.00	50.40	34.27	16.13	54.00	-3.60	200	138	Average
7		11000.00	57.40	41.27	16.13	74.00	-16.60	200	138	Peak



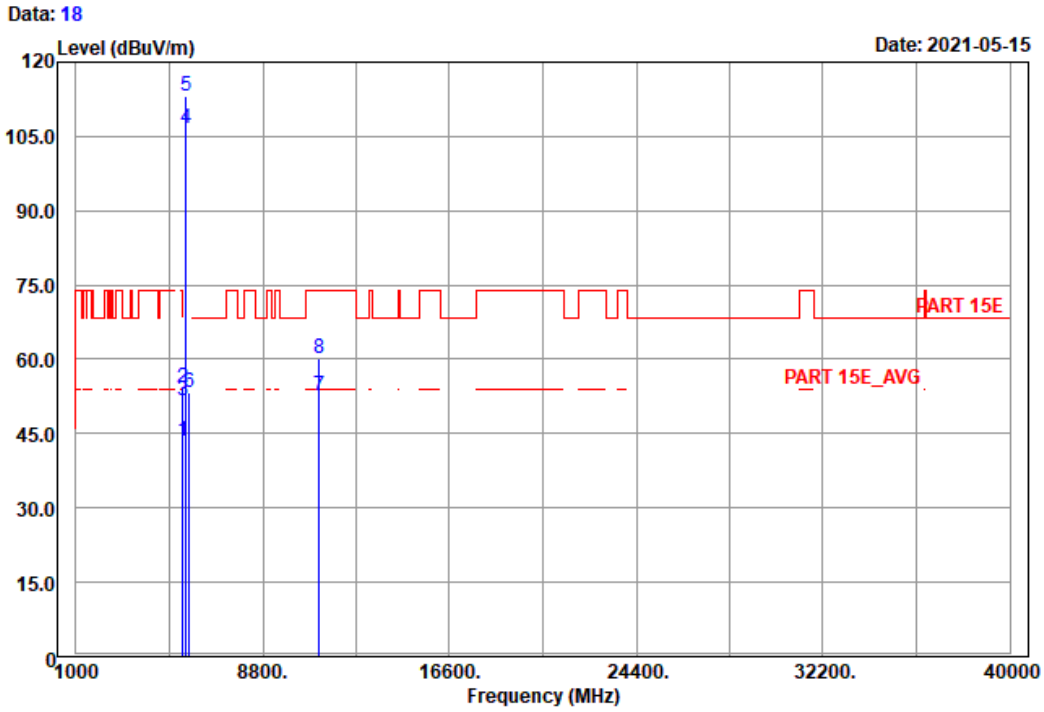
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11A_TX_CH100
Tested by: Karl Lee
Rate : 6M
Power : 18.5/18.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	46.99	36.48	10.51	54.00	-7.01	162	4	Average
2		5460.00	56.67	46.16	10.51	74.00	-17.33	162	4	Peak
3	pk	5470.00	66.58	56.05	10.53	68.20	-1.62	162	4	Peak
4		5500.00	109.48	98.88	10.60	------	------	198	4	Average
5		5500.00	115.44	104.84	10.60	------	------	198	4	Peak
6	pp	11000.00	52.74	36.61	16.13	54.00	-1.26	240	290	Average
7		11000.00	61.75	45.62	16.13	74.00	-12.25	240	290	Peak



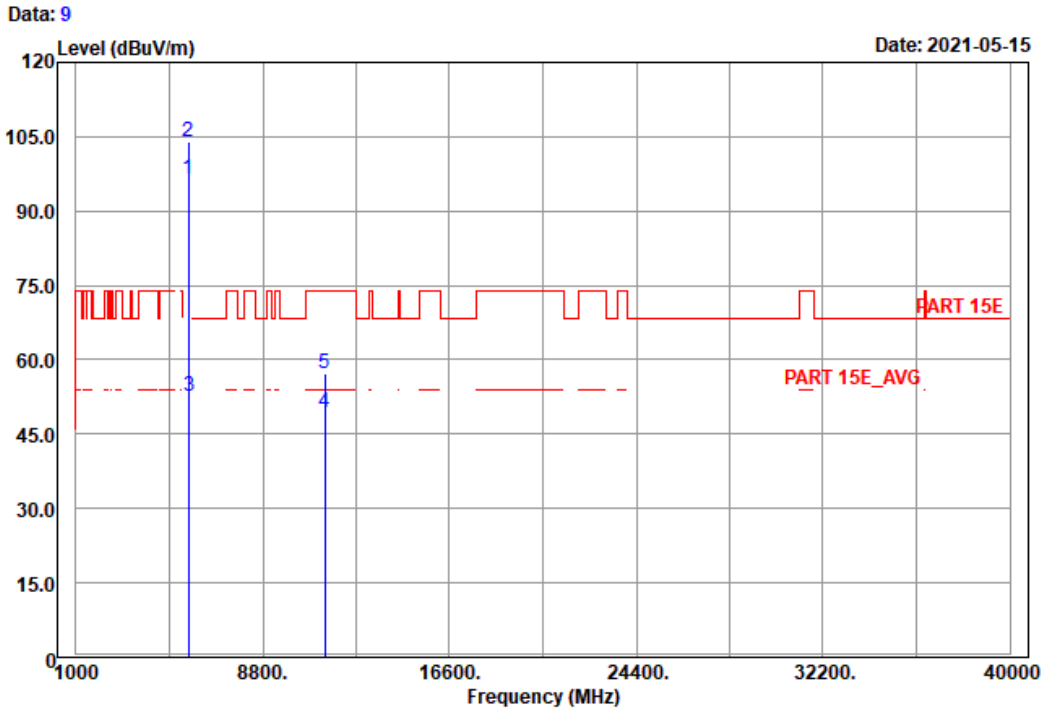
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11A_TX_CH116
Tested by: Charles Hsiao
Rate : 6M
Power : 16.5/16.5
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5460.00	42.20	31.69	10.51	54.00	-11.80	108	106	Average
2	5460.00	53.30	42.79	10.51	74.00	-20.70	108	106	Peak
3	5470.00	50.50	39.97	10.53	68.20	-17.70	108	106	Peak
4	5580.00	95.59	84.88	10.71	------	------	108	106	Average
5	5580.00	102.68	91.97	10.71	------	------	108	106	Peak
6	5725.00	51.52	40.60	10.92	68.20	-16.68	108	106	Peak
7 pp	11160.00	48.61	32.25	16.36	54.00	-5.39	200	14	Average
8 pk	11160.00	57.44	41.08	16.36	74.00	-16.56	200	14	Peak



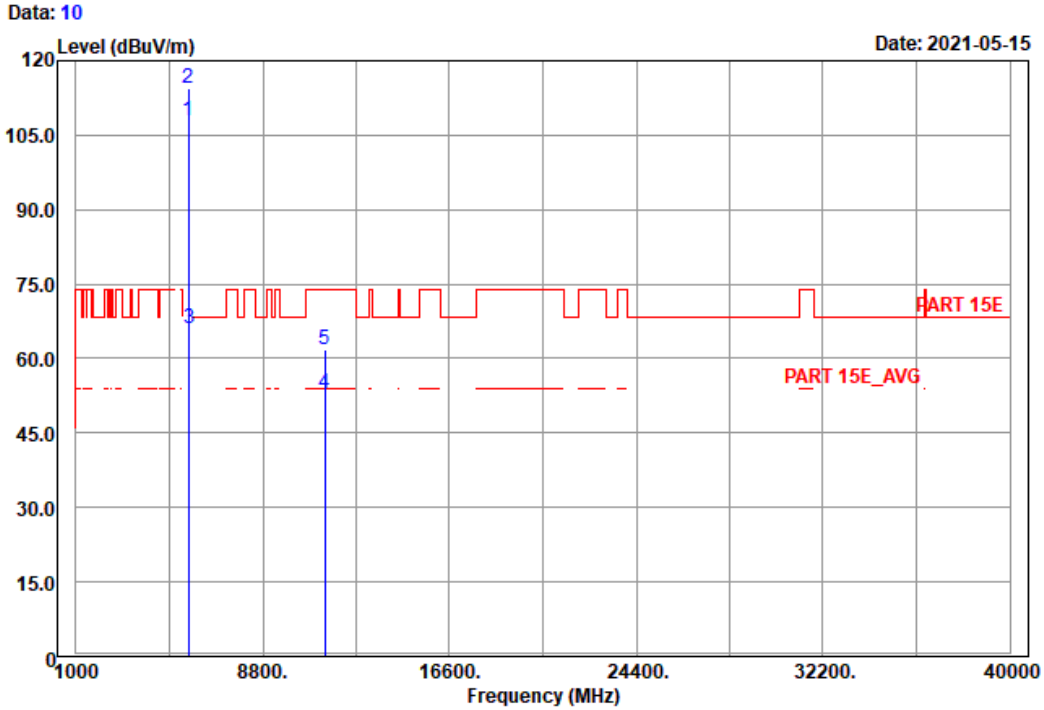
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11A_TX_CH116
Tested by: Charles Hsiao
Rate : 6M
Power : 16.5/16.5
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5460.00	43.54	33.03	10.51	54.00	-10.46	197	0	Average
2	5460.00	54.37	43.86	10.51	74.00	-19.63	197	0	Peak
3	5470.00	51.81	41.28	10.53	68.20	-16.39	197	0	Peak
4	5580.00	106.47	95.76	10.71	------	------	197	0	Average
5	5580.00	113.11	102.40	10.71	------	------	197	0	Peak
6	5725.00	53.44	42.52	10.92	68.20	-14.76	197	0	Peak
7 pp	11160.00	52.62	36.26	16.36	54.00	-1.38	240	289	Average
8 pk	11160.00	60.02	43.66	16.36	74.00	-13.98	240	289	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11A_TX_CH140
Tested by: Charles Hsiao
Rate : 6M
Power : 18/18
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5700.00	96.37	85.42	10.95	------	------	108	106	Average
2		5700.00	103.83	92.88	10.95	------	------	108	106	Peak
3	pk	5725.00	52.60	41.68	10.92	68.20	-15.60	108	106	Peak
4	pp	11400.00	49.25	33.06	16.19	54.00	-4.75	200	138	Average
5		11400.00	57.28	41.09	16.19	74.00	-16.72	200	138	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11A_TX_CH140
Tested by: Charles Hsiao
Rate : 6M
Power : 18/18
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5700.00	107.81	96.86	10.95	------	------	197	0	Average
2		5700.00	114.38	103.43	10.95	------	------	197	0	Peak
3	pk	5725.00	66.09	55.17	10.92	68.20	-2.11	177	2	Peak
4	pp	11400.00	52.89	36.70	16.19	54.00	-1.11	240	289	Average
5		11400.00	61.78	45.59	16.19	74.00	-12.22	240	289	Peak

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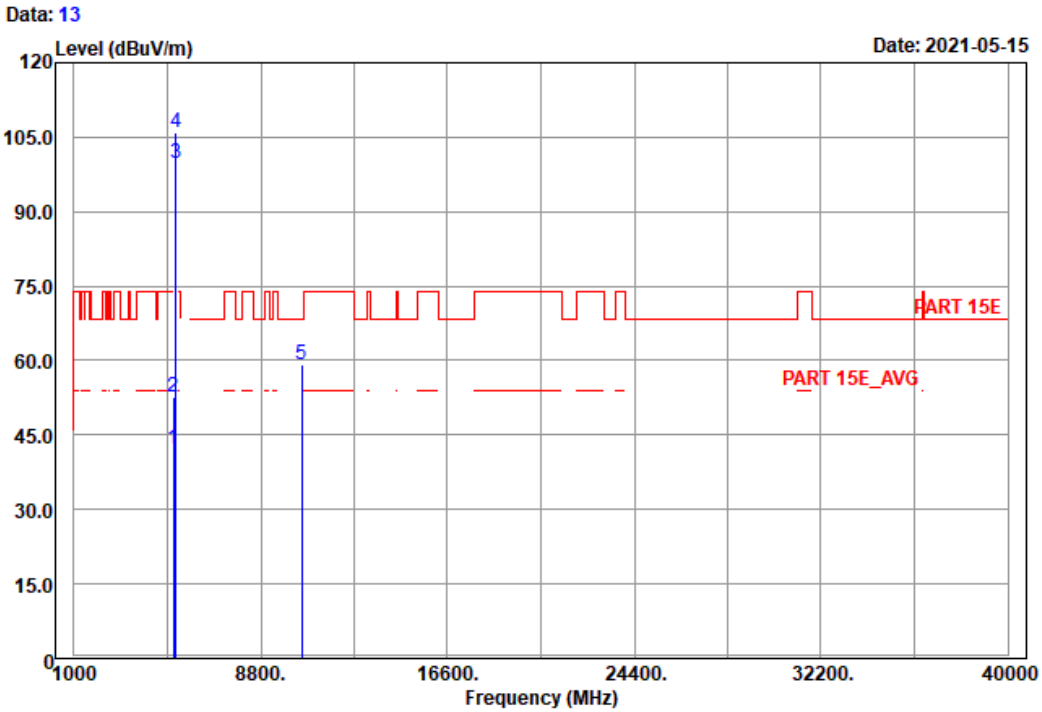
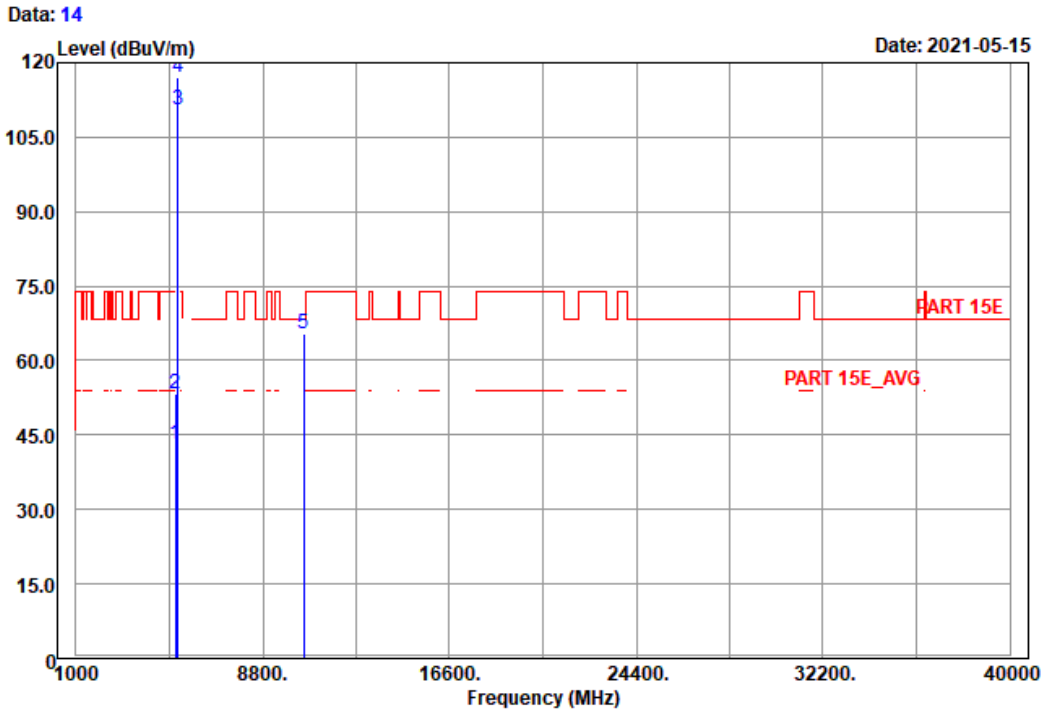


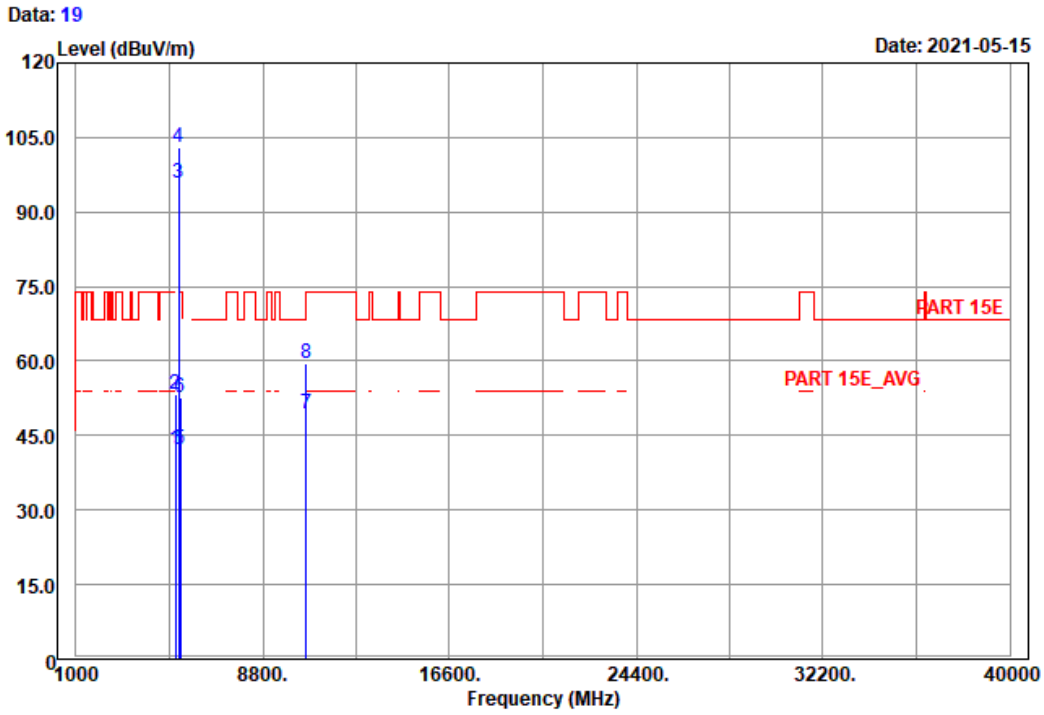
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE20_TX_CH52
Tested by: Charles Hsiao
Rate : MCS0
Power : 24.5/24.5
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1 av	5150.00	42.22	32.17	10.05	54.00	-11.78	108	116	Average
2	5150.00	52.65	42.60	10.05	74.00	-21.35	108	116	Peak
3	5260.00	99.67	89.55	10.12	------	------	108	116	Average
4	5260.00	106.02	95.90	10.12	------	------	108	116	Peak
5 pp	10520.00	59.18	43.30	15.88	68.20	-9.02	200	5	Peak



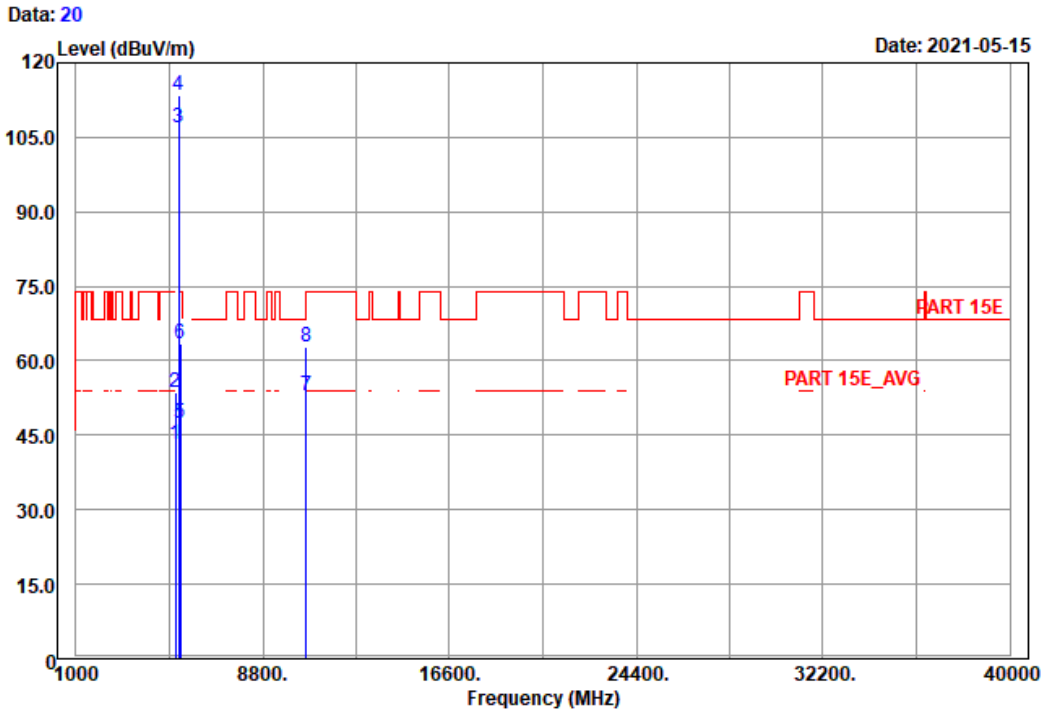
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE20_TX_CH52
Tested by: Charles Hsiao
Rate : MCS0
Power : 24.5/24.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	av	5150.00	43.24	33.19	10.05	54.00	-10.76	181	0	Average
2		5150.00	53.31	43.26	10.05	74.00	-20.69	181	0	Peak
3		5260.00	110.37	100.25	10.12	------	------	181	0	Average
4		5260.00	117.19	107.07	10.12	------	------	181	0	Peak
5	pp	10520.00	65.48	49.60	15.88	68.20	-2.72	201	289	Peak



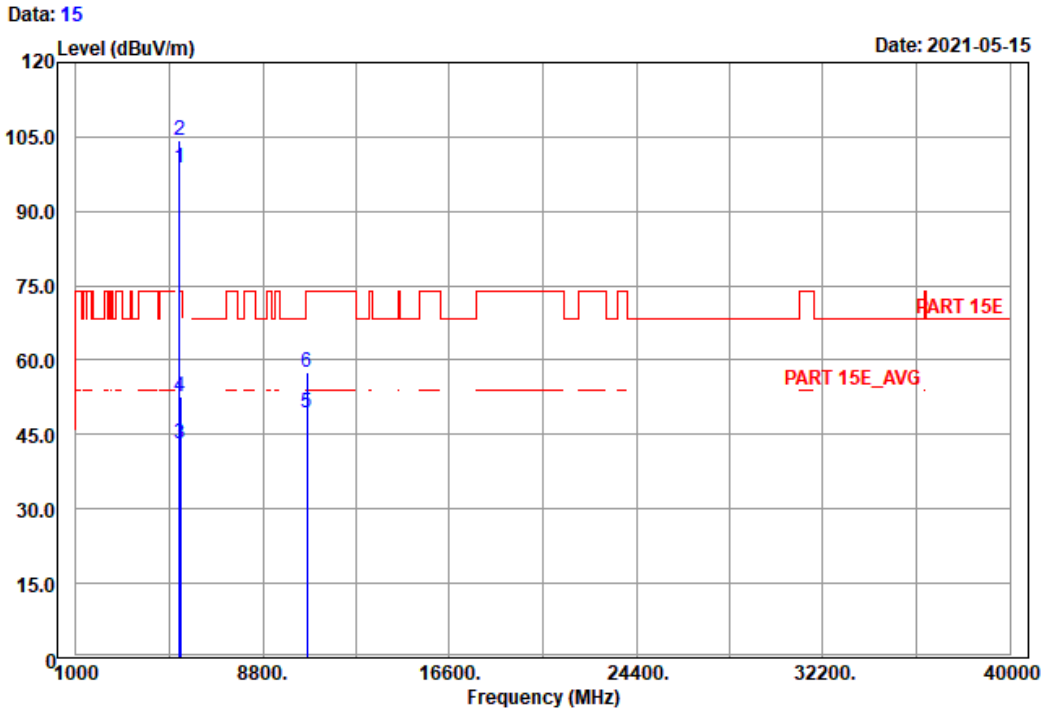
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE20_TX_CH60
Tested by: Charles Hsiao
Rate : MCS0
Power : 19.5/19.5
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5150.00	42.18	32.13	10.05	54.00	-11.82	108	116	Average
2	5150.00	53.31	43.26	10.05	74.00	-20.69	108	116	Peak
3	5300.00	95.85	85.79	10.06	------	------	108	116	Average
4	5300.00	102.87	92.81	10.06	------	------	108	116	Peak
5	5350.00	42.19	31.96	10.23	54.00	-11.81	108	116	Average
6	5350.00	52.50	42.27	10.23	74.00	-21.50	108	116	Peak
7 pp	10600.00	49.27	33.51	15.76	54.00	-4.73	200	5	Average
8 pk	10600.00	59.43	43.67	15.76	74.00	-14.57	200	5	Peak



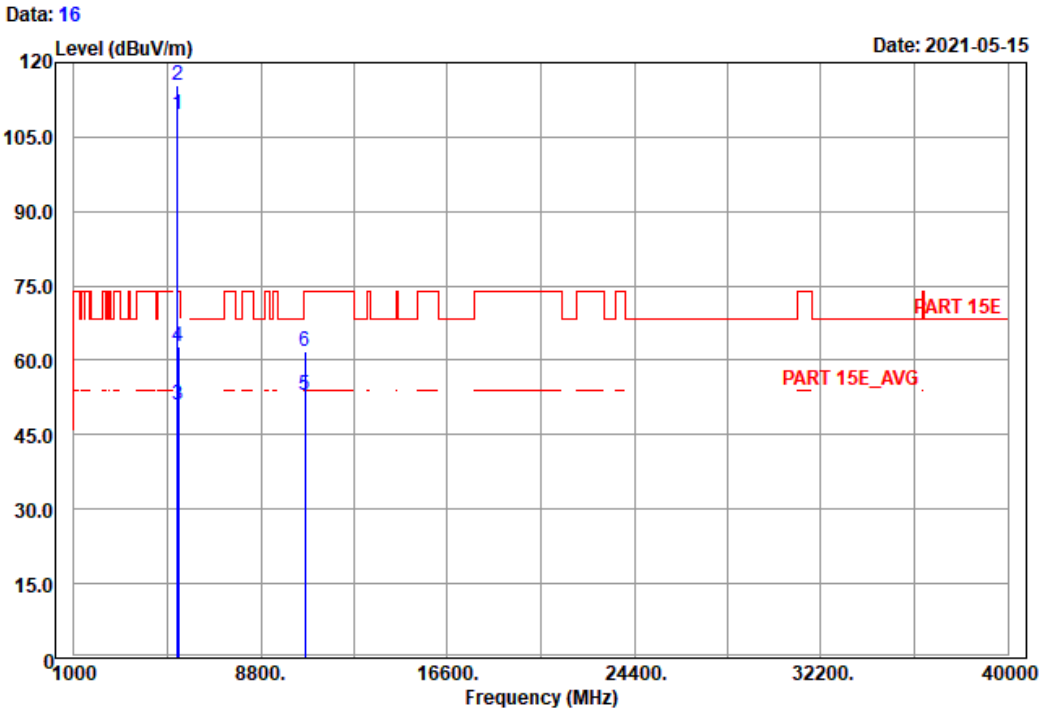
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE20_TX_CH60
Tested by: Charles Hsiao
Rate : MCS0
Power : 19.5/19.5
RB/VB : 1 MHz / 1 KHz

		Freq	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5150.00	43.30	33.25	10.05	54.00	-10.70	181	0	Average
2		5150.00	53.73	43.68	10.05	74.00	-20.27	181	0	Peak
3		5300.00	106.84	96.78	10.06	------	------	181	0	Average
4		5300.00	113.57	103.51	10.06	------	------	181	0	Peak
5		5350.00	47.32	37.09	10.23	54.00	-6.68	181	0	Average
6	pk	5350.00	63.49	53.26	10.23	74.00	-10.51	181	0	Peak
7	pp	10600.00	52.96	37.20	15.76	54.00	-1.04	201	289	Average
8		10600.00	62.70	46.94	15.76	74.00	-11.30	201	289	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE20_TX_CH64
Tested by: Karl Lee
Rate : MCS0
Power : 19/19
RB/VB : 1 MHz / 1 KHz

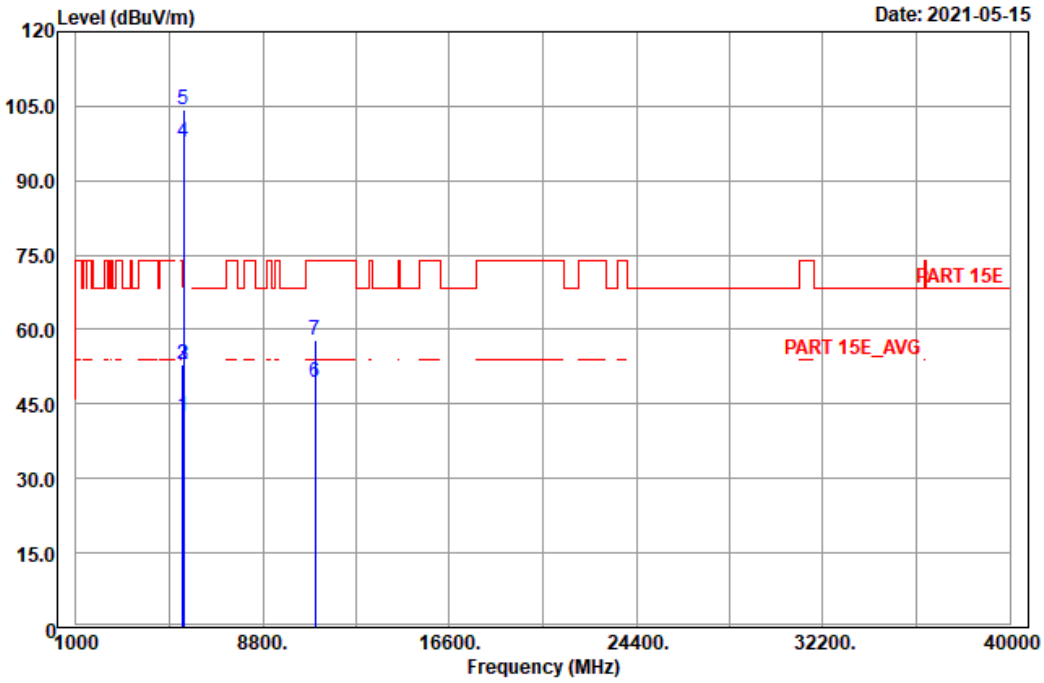
	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5320.00	98.70	88.61	10.09	------	------	101	113	Average
2	5320.00	104.40	94.31	10.09	------	------	101	113	Peak
3	5350.00	43.12	32.89	10.23	54.00	-10.88	127	104	Average
4	5350.00	52.75	42.52	10.23	74.00	-21.25	127	104	Peak
5 pp	10640.00	49.32	33.33	15.99	54.00	-4.68	200	5	Average
6 pk	10640.00	57.70	41.71	15.99	74.00	-16.30	200	5	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE20_TX_CH64
Tested by: Karl Lee
Rate : MCS0
Power : 19/19
RB/VB : 1 MHz / 1 KHz

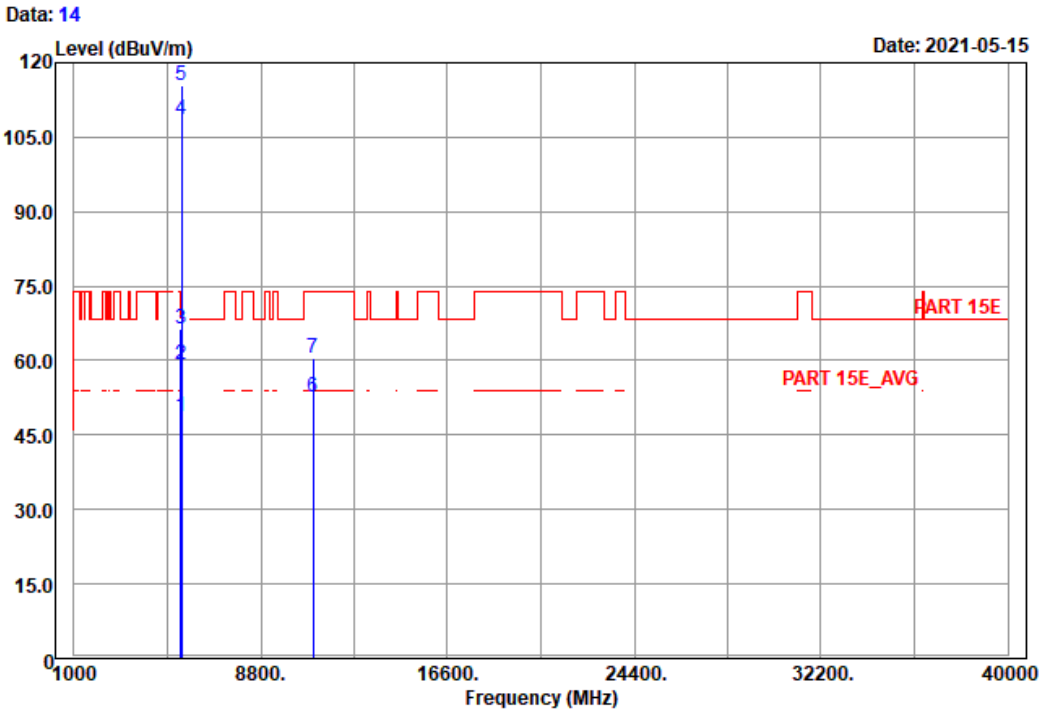
		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5320.00	109.65	99.56	10.09	------	------	181	0	Average
2		5320.00	115.40	105.31	10.09	------	------	181	0	Peak
3		5350.00	51.14	40.91	10.23	54.00	-2.86	188	0	Average
4	pk	5350.00	62.73	52.50	10.23	74.00	-11.27	188	0	Peak
5	pp	10640.00	52.87	36.88	15.99	54.00	-1.13	201	289	Average
6		10640.00	61.65	45.66	15.99	74.00	-12.35	201	289	Peak

Data: 13



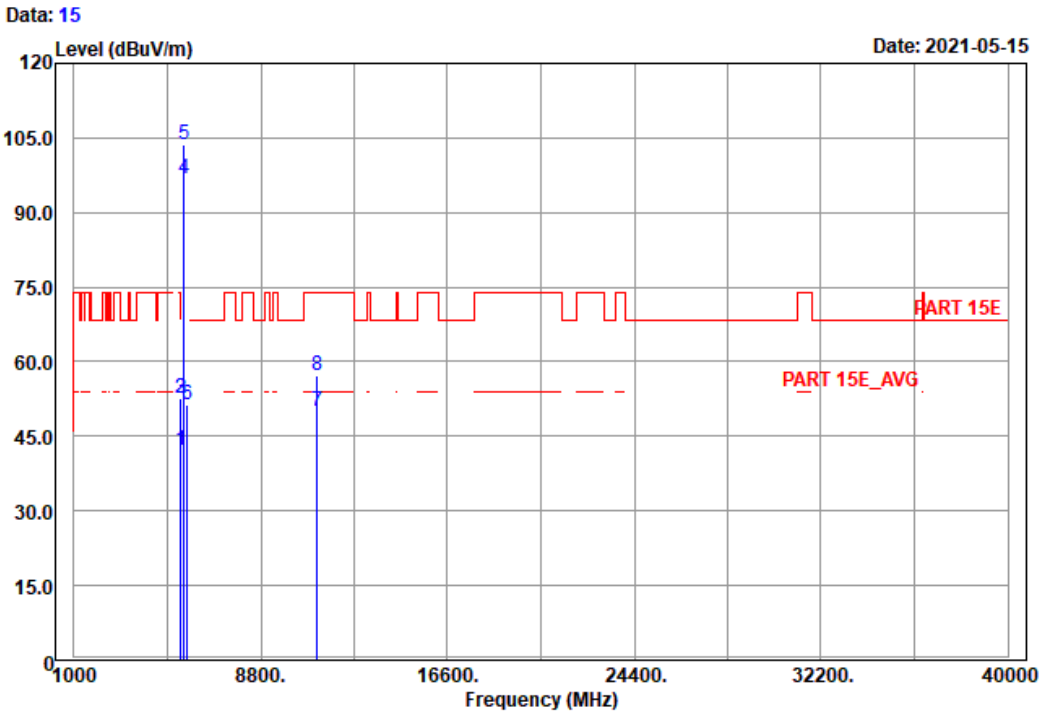
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE20_TX_CH100
Tested by: Charles Hsiao
Rate : MCS0
Power : 19.5/19.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	42.34	31.83	10.51	54.00	-11.66	108	106	Average
2		5460.00	53.03	42.52	10.51	74.00	-20.97	108	106	Peak
3	pk	5470.00	52.99	42.46	10.53	68.20	-15.21	108	106	Peak
4		5500.00	97.67	87.07	10.60	------	------	108	106	Average
5		5500.00	104.25	93.65	10.60	------	------	108	106	Peak
6	pp	11000.00	49.29	33.16	16.13	54.00	-4.71	200	138	Average
7		11000.00	57.89	41.76	16.13	74.00	-16.11	200	138	Peak



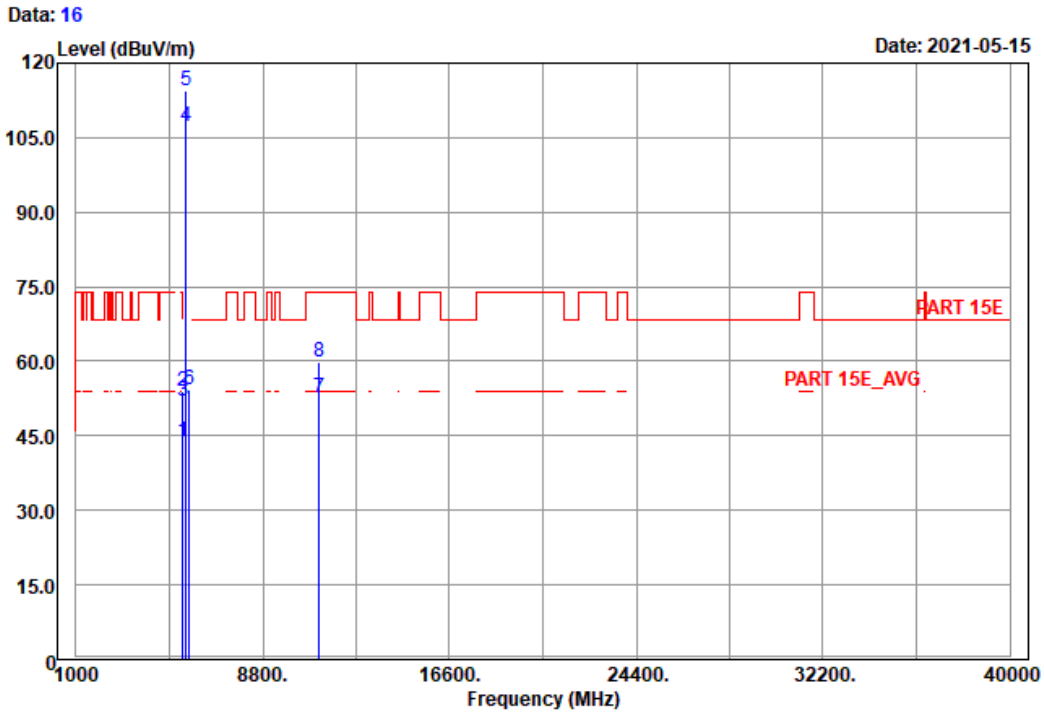
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE20_TX_CH100
Tested by: Charles Hsiao
Rate : MCS0
Power : 19.5/19.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	48.60	38.09	10.51	54.00	-5.40	197	236	Average
2		5460.00	59.22	48.71	10.51	74.00	-14.78	197	236	Peak
3	pk	5470.00	66.53	56.00	10.53	68.20	-1.67	197	236	Peak
4		5500.00	108.56	97.96	10.60	------	------	197	0	Average
5		5500.00	115.51	104.91	10.60	------	------	197	0	Peak
6	pp	11000.00	52.77	36.64	16.13	54.00	-1.23	240	289	Average
7		11000.00	60.61	44.48	16.13	74.00	-13.39	240	289	Peak



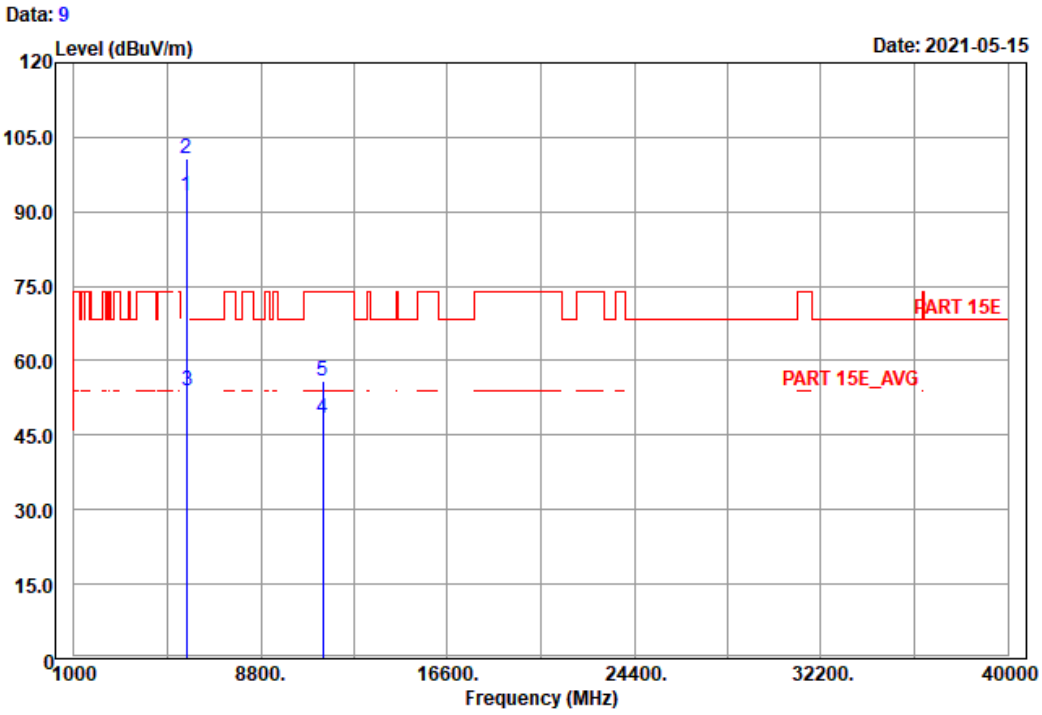
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE20_TX_CH116
Tested by: Charles Hsiao
Rate : MCS0
Power : 18/18
RB/VB : 1 MHz / 1 KHz

		Freq	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	42.16	31.65	10.51	54.00	-11.84	108	106	Average
2		5460.00	52.58	42.07	10.51	74.00	-21.42	108	106	Peak
3	pk	5470.00	52.79	42.26	10.53	68.20	-15.41	108	106	Peak
4		5580.00	96.80	86.09	10.71	------	------	108	106	Average
5		5580.00	103.77	93.06	10.71	------	------	108	106	Peak
6		5725.00	51.39	40.47	10.92	68.20	-16.81	108	106	Peak
7	pp	11160.00	49.90	33.54	16.36	54.00	-4.10	200	14	Average
8		11160.00	57.14	40.78	16.36	74.00	-16.86	200	14	Peak



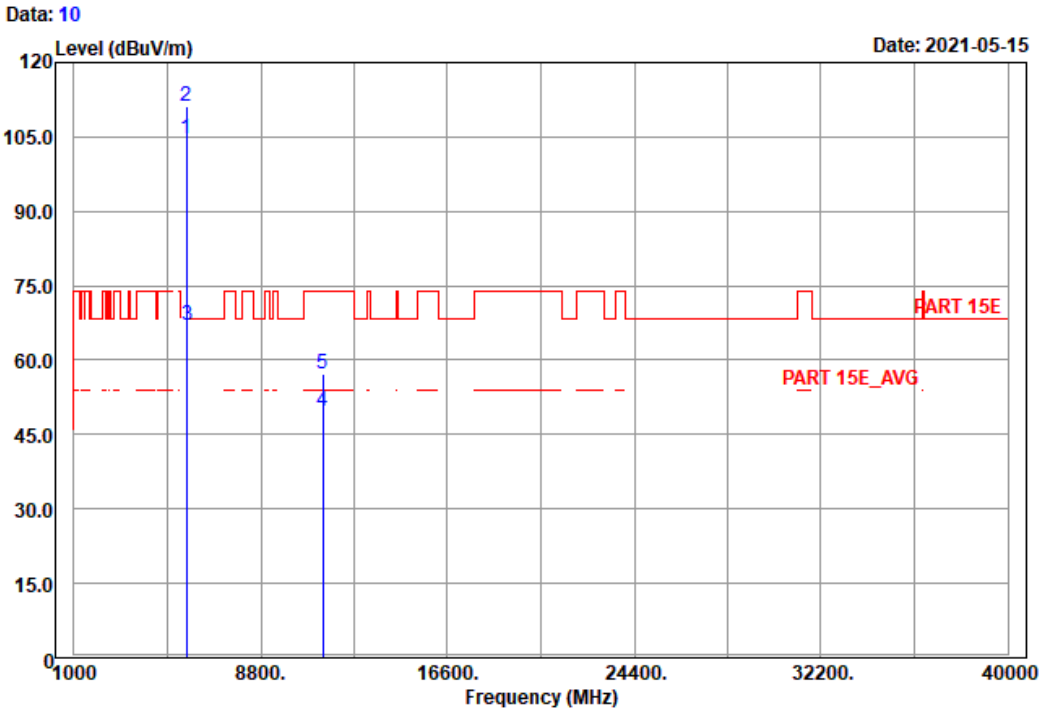
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE20_TX_CH116
Tested by: Charles Hsiao
Rate : MCS0
Power : 18/18
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	43.66	33.15	10.51	54.00	-10.34	197	0	Average
2		5460.00	53.94	43.43	10.51	74.00	-20.06	197	0	Peak
3		5470.00	52.03	41.50	10.53	68.20	-16.17	197	0	Peak
4		5580.00	107.34	96.63	10.71	------	------	197	0	Average
5		5580.00	114.42	103.71	10.71	------	------	197	0	Peak
6	pk	5725.00	54.30	43.38	10.92	68.20	-13.90	197	0	Peak
7	pp	11160.00	52.80	36.44	16.36	54.00	-1.20	240	289	Average
8		11160.00	59.90	43.54	16.36	74.00	-14.10	240	289	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE20_TX_CH140
Tested by: Charles Hsiao
Rate : MCS0
Power : 15/15
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5700.00	93.16	82.21	10.95	------	------	108	106	Average
2		5700.00	100.61	89.66	10.95	------	------	108	106	Peak
3	pk	5725.00	54.06	43.14	10.92	68.20	-14.14	108	106	Peak
4	pp	11400.00	48.44	32.25	16.19	54.00	-5.56	200	138	Average
5		11400.00	55.77	39.58	16.19	74.00	-18.23	200	138	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE20_TX_CH140
Tested by: Charles Hsiao
Rate : MCS0
Power : 15/15
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5700.00	104.57	93.62	10.95	------	------	197	0	Average
2		5700.00	111.24	100.29	10.95	------	------	197	0	Peak
3	pp	5725.00	66.88	55.96	10.92	68.20	-1.32	177	2	Peak
4	av	11400.00	49.68	33.49	16.19	54.00	-4.32	240	289	Average
5		11400.00	57.27	41.08	16.19	74.00	-16.73	240	289	Peak

802.11ax (HE40)

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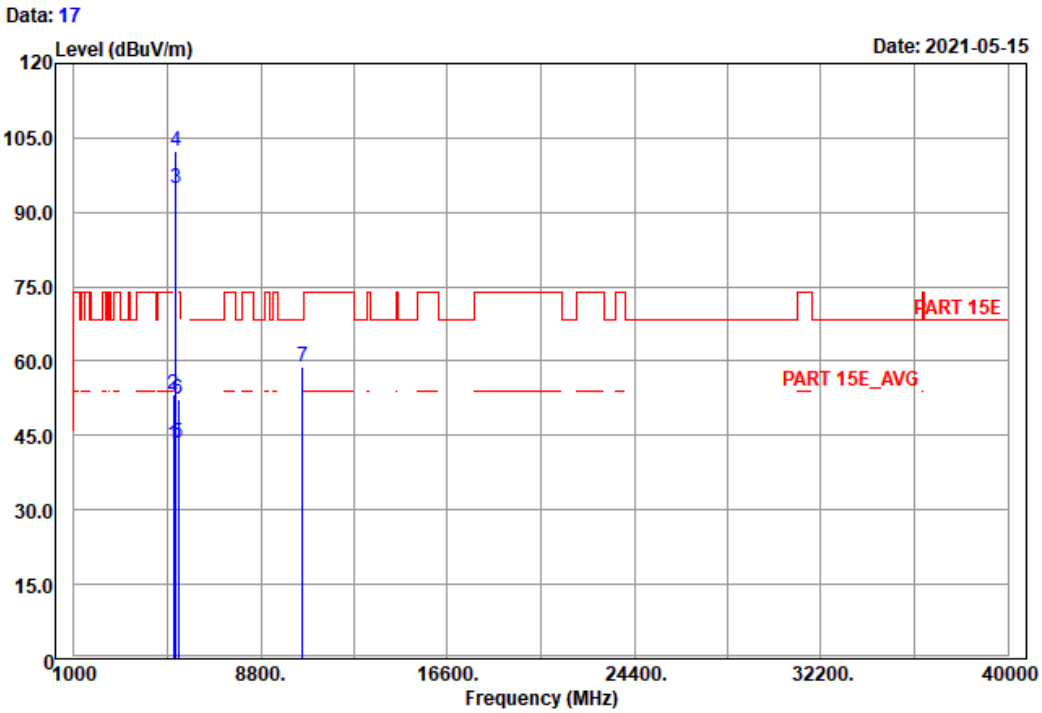
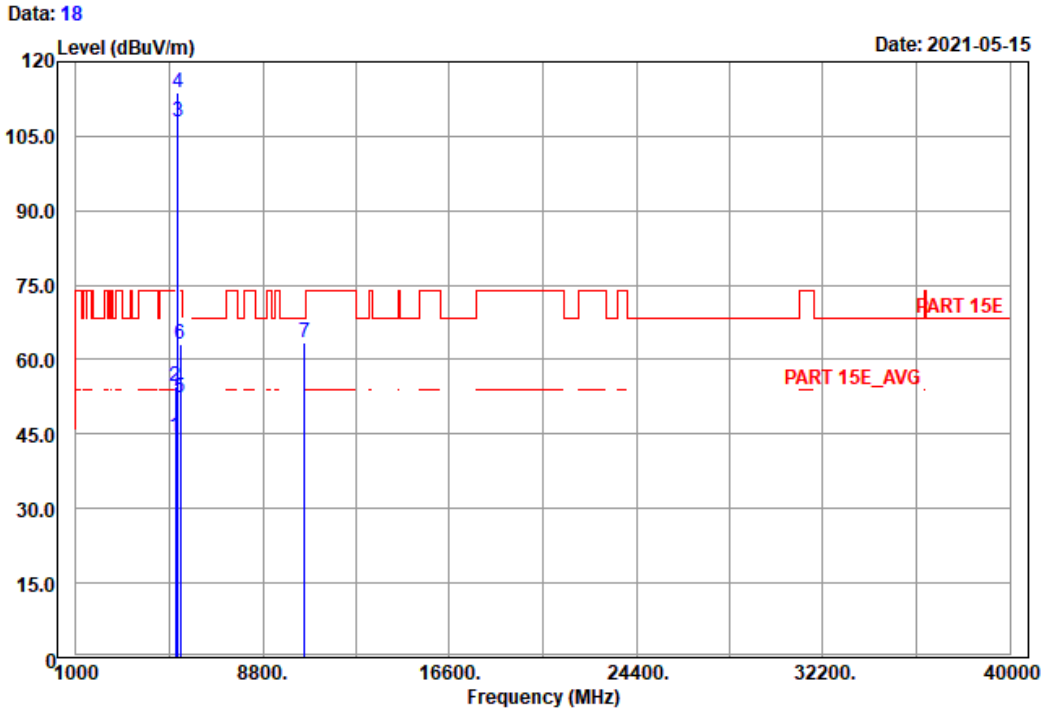


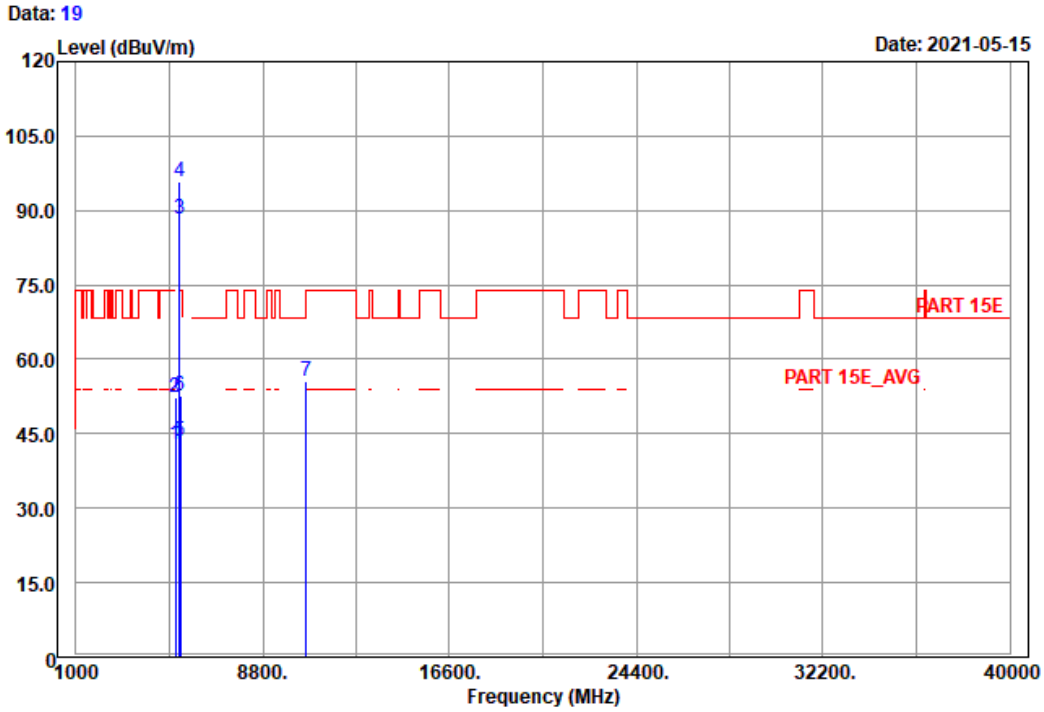
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE40_TX_CH54
Tested by: Karl Lee
Rate : MCS0
Power : 25/25
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5150.00	43.01	32.96	10.05	54.00	-10.99	108	116	Average
2		5150.00	53.23	43.18	10.05	74.00	-20.77	108	116	Peak
3		5270.00	94.69	84.57	10.12	------	------	108	116	Average
4		5270.00	102.21	92.09	10.12	------	------	108	116	Peak
5	av	5350.00	43.47	33.24	10.23	54.00	-10.53	108	116	Average
6		5350.00	52.32	42.09	10.23	74.00	-21.68	108	116	Peak
7	pp	10540.00	58.86	43.03	15.83	68.20	-9.34	200	5	Peak



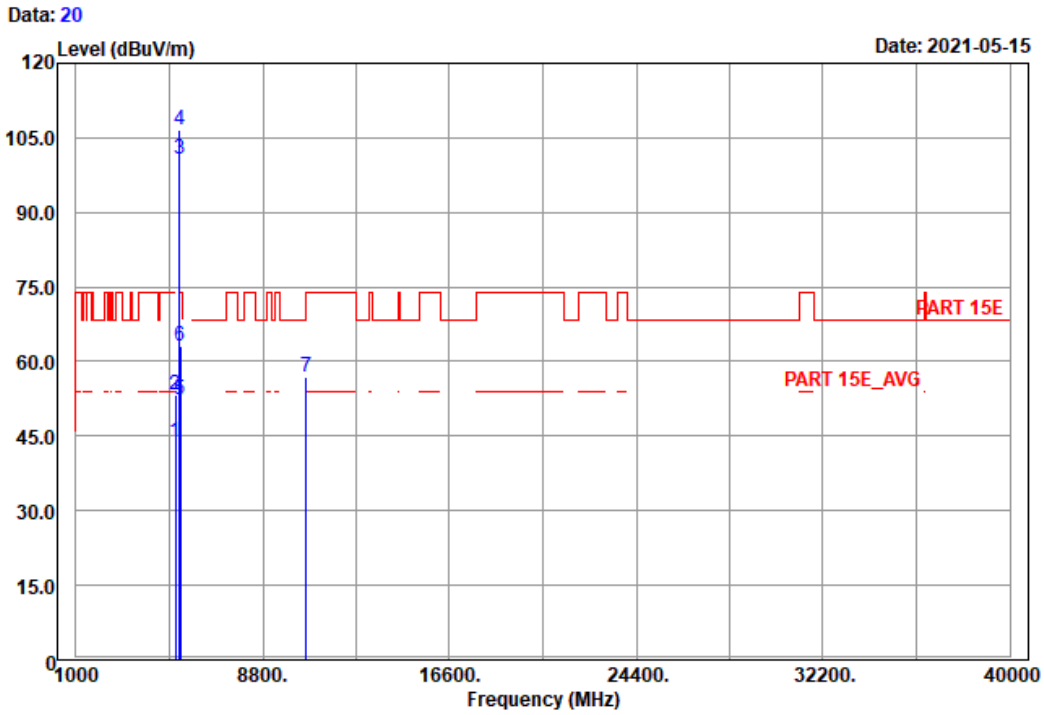
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE40_TX_CH54
Tested by: Karl Lee
Rate : MCS0
Power : 25/25
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5150.00	44.50	34.45	10.05	54.00	-9.50	194	2	Average
2		5150.00	54.53	44.48	10.05	74.00	-19.47	194	2	Peak
3		5270.00	107.95	97.83	10.12	------	------	194	2	Average
4		5270.00	113.86	103.74	10.12	------	------	194	2	Peak
5	pp	5350.00	52.21	41.98	10.23	54.00	-1.79	194	13	Average
6		5350.00	63.03	52.80	10.23	74.00	-10.97	194	13	Peak
7	pk	10540.00	63.58	47.75	15.83	68.20	-4.62	201	289	Peak



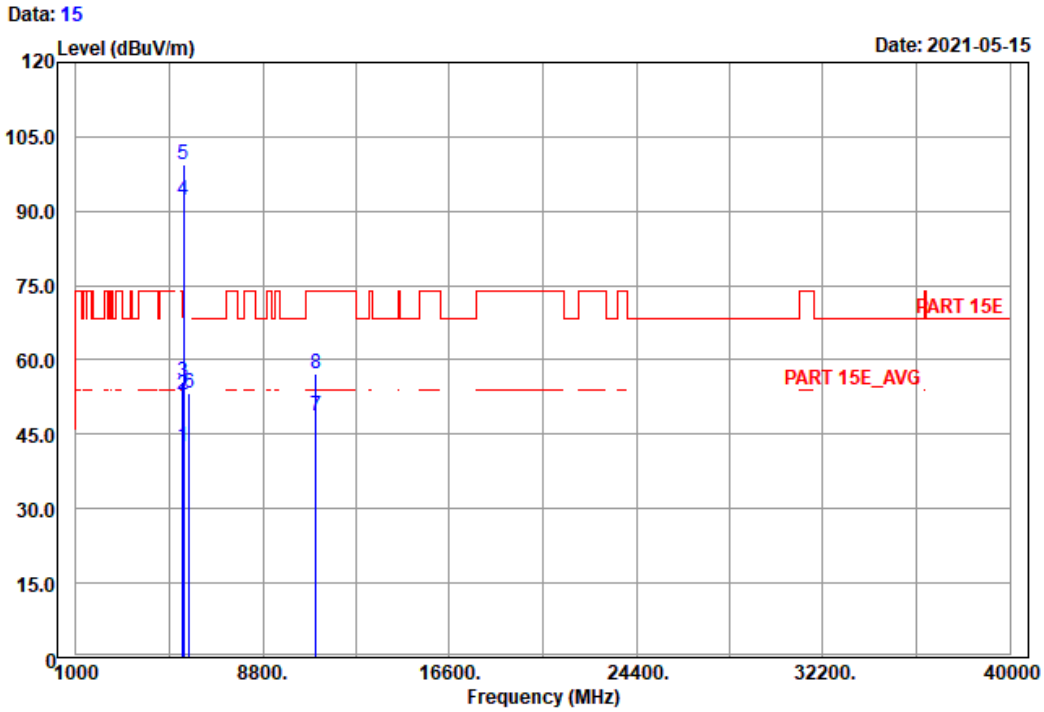
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE40_TX_CH62
Tested by: Karl Lee
Rate : MCS0
Power : 15/15
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5150.00	42.88	32.83	10.05	54.00	-11.12	108	116	Average
2		5150.00	52.48	42.43	10.05	74.00	-21.52	108	116	Peak
3		5310.00	88.24	78.15	10.09	------	------	108	116	Average
4		5310.00	95.87	85.78	10.09	------	------	108	116	Peak
5	pp	5350.00	43.46	33.23	10.23	54.00	-10.54	107	136	Average
6		5350.00	52.78	42.55	10.23	74.00	-21.22	107	136	Peak
7	pk	10620.00	55.62	39.74	15.88	74.00	-18.38	111	174	Peak



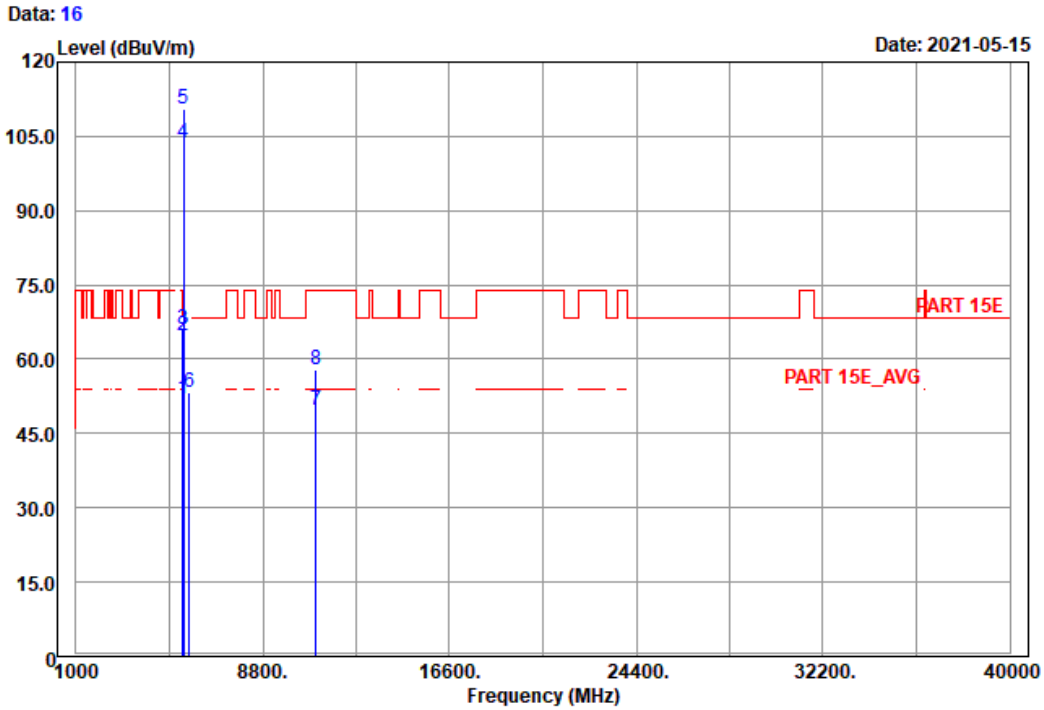
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE40_TX_CH62
Tested by: Karl Lee
Rate : MCS0
Power : 15/15
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5150.00	43.92	33.87	10.05	54.00	-10.08	201	9	Average
2	5150.00	53.34	43.29	10.05	74.00	-20.66	201	9	Peak
3	5310.00	100.56	90.47	10.09	------	------	201	9	Average
4	5310.00	106.75	96.66	10.09	------	------	201	9	Peak
5 pp	5350.00	52.24	42.01	10.23	54.00	-1.76	201	0	Average
6 pk	5350.00	63.24	53.01	10.23	74.00	-10.76	201	0	Peak
7	10620.00	57.06	41.18	15.88	74.00	-16.94	178	8	Peak



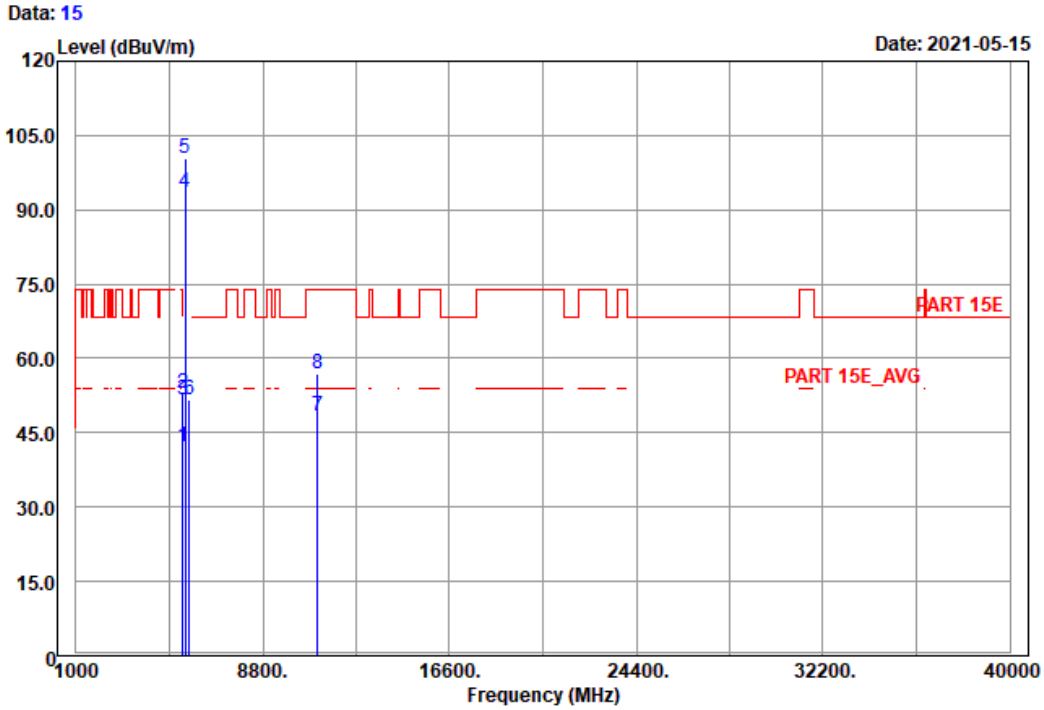
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE40_TX_CH102
Tested by: Charles Hsiao
Rate : MCS0
Power : 16.5/16.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	42.63	32.12	10.51	54.00	-11.37	108	106	Average
2		5460.00	52.87	42.36	10.51	74.00	-21.13	108	106	Peak
3	pk	5470.00	55.64	45.11	10.53	68.20	-12.56	108	106	Peak
4		5510.00	92.35	81.75	10.60	------	------	108	106	Average
5		5510.00	99.44	88.84	10.60	------	------	108	106	Peak
6		5725.00	53.44	42.52	10.92	68.20	-14.76	108	106	Peak
7	pp	11020.00	48.66	32.50	16.16	54.00	-5.34	200	138	Average
8		11020.00	57.32	41.16	16.16	74.00	-16.68	200	138	Peak



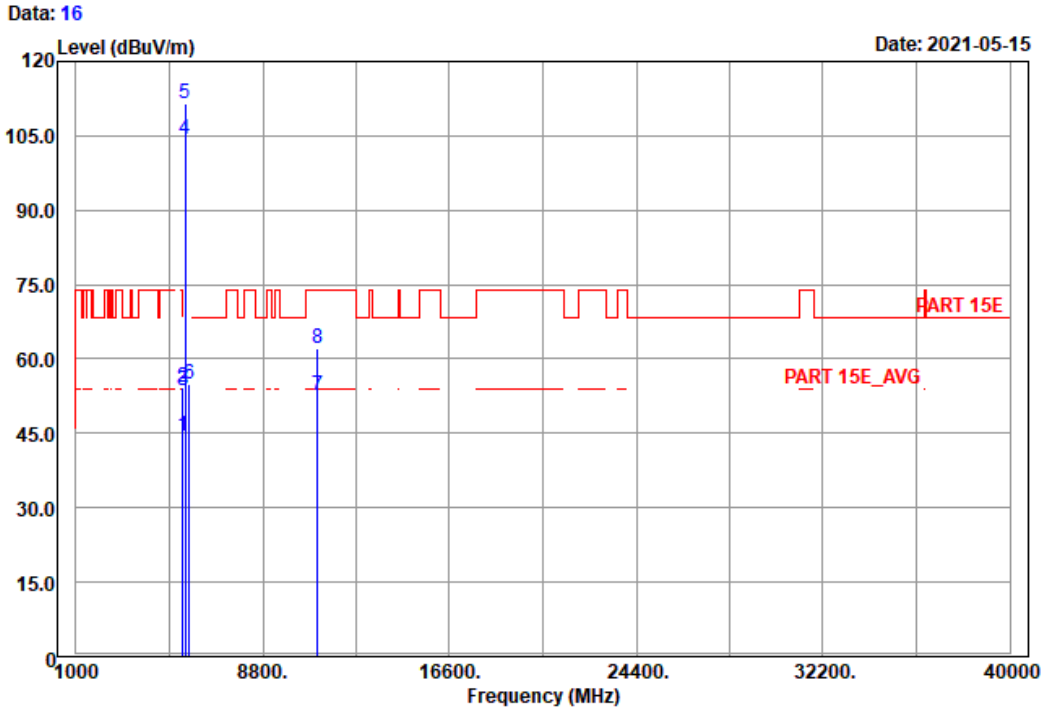
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE40_TX_CH102
Tested by: Charles Hsiao
Rate : MCS0
Power : 16.5/16.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	pp	5460.00	52.14	41.63	10.51	54.00	-1.86	197	236	Average
2		5460.00	64.69	54.18	10.51	74.00	-9.31	197	236	Peak
3	pk	5470.00	65.98	55.45	10.53	68.20	-2.22	197	236	Peak
4		5510.00	103.66	93.06	10.60	------	------	197	0	Average
5		5510.00	110.55	99.95	10.60	------	------	197	0	Peak
6		5725.00	53.38	42.46	10.92	68.20	-14.82	197	0	Peak
7		11020.00	49.60	33.44	16.16	54.00	-4.40	240	289	Average
8		11020.00	58.03	41.87	16.16	74.00	-15.97	240	289	Peak



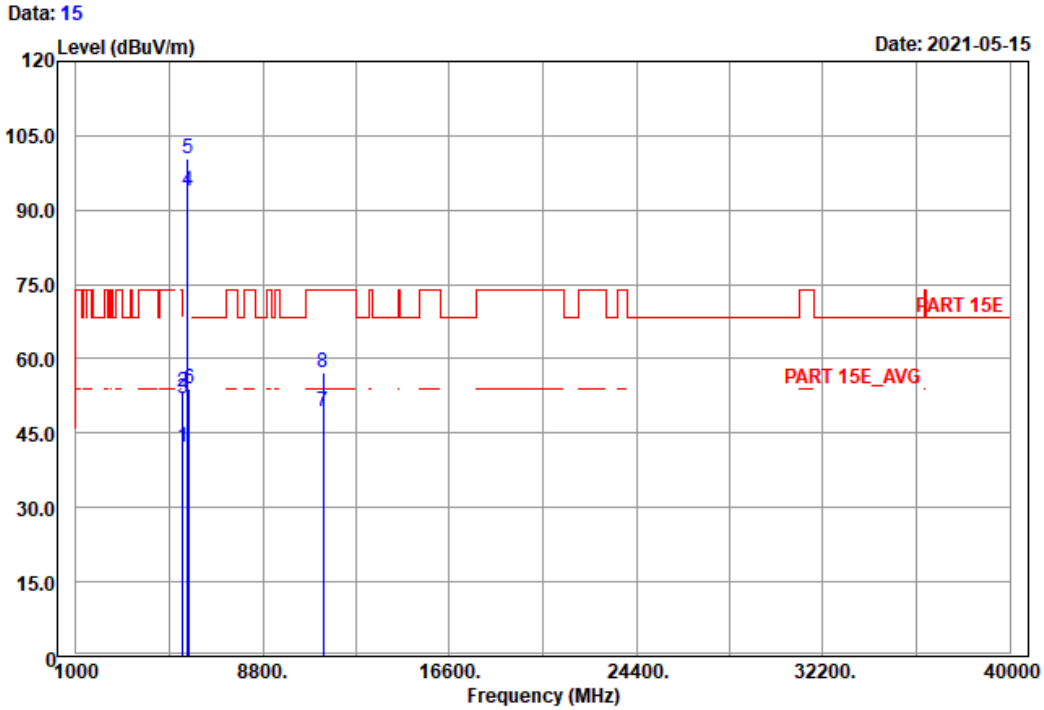
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE40_TX_CH110
Tested by: Charles Hsiao
Rate : MCS0
Power : 18.5/18.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	42.23	31.72	10.51	54.00	-11.77	108	106	Average
2		5460.00	53.13	42.62	10.51	74.00	-20.87	108	106	Peak
3	pk	5470.00	51.77	41.24	10.53	68.20	-16.43	108	106	Peak
4		5550.00	93.66	82.98	10.68	------	------	108	106	Average
5		5550.00	100.42	89.74	10.68	------	------	108	106	Peak
6		5725.00	51.67	40.75	10.92	68.20	-16.53	108	106	Peak
7	pp	11100.00	48.52	32.25	16.27	54.00	-5.48	200	138	Average
8		11100.00	57.02	40.75	16.27	74.00	-16.98	200	138	Peak



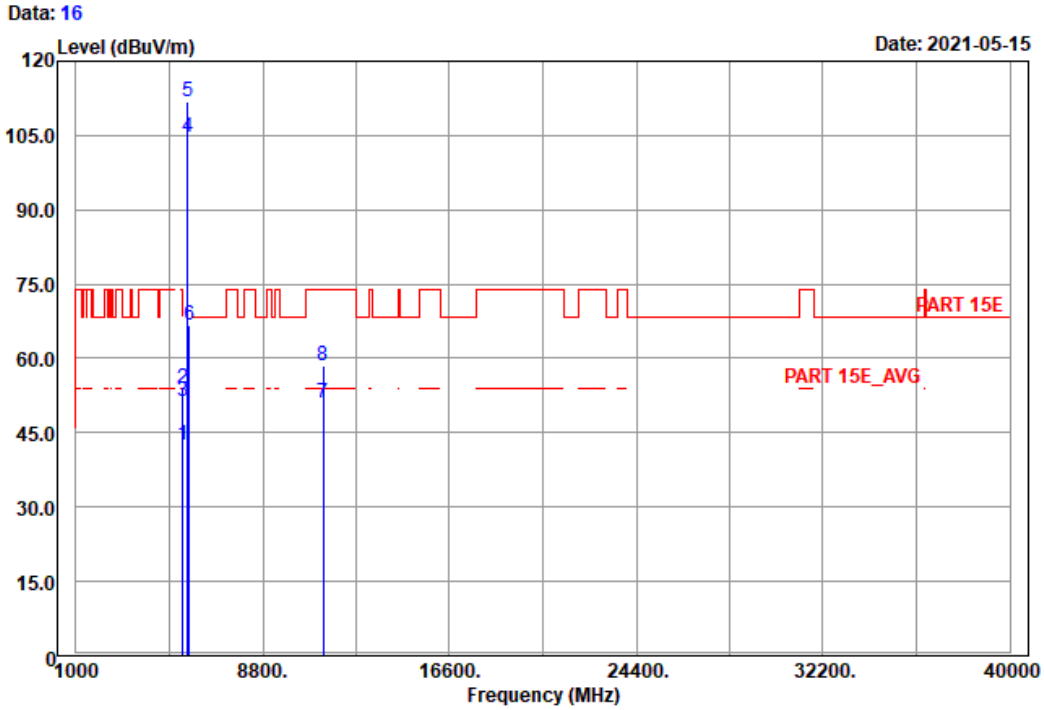
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE40_TX_CH110
Tested by: Charles Hsiao
Rate : MCS0
Power : 18.5/18.5
RB/VB : 1 MHz / 1 KHz

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5460.00	44.46	33.95	10.51	54.00	-9.54	197	0	Average
2	5460.00	54.36	43.85	10.51	74.00	-19.64	197	0	Peak
3	5470.00	53.66	43.13	10.53	68.20	-14.54	197	0	Peak
4	5550.00	104.44	93.76	10.68	------	------	197	0	Average
5	5550.00	111.46	100.78	10.68	------	------	197	0	Peak
6	5725.00	54.89	43.97	10.92	68.20	-13.31	197	0	Peak
7 pp	11100.00	52.54	36.27	16.27	54.00	-1.46	240	289	Average
8 pk	11100.00	62.00	45.73	16.27	74.00	-12.00	240	289	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE40_TX_CH134
Tested by: Charles Hsiao
Rate : MCS0
Power : 17.5/17.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	42.17	31.66	10.51	54.00	-11.83	108	106	Average
2		5460.00	53.36	42.85	10.51	74.00	-20.64	108	106	Peak
3		5470.00	51.86	41.33	10.53	68.20	-16.34	108	106	Peak
4		5670.00	93.80	82.90	10.90	------	------	108	106	Average
5		5670.00	100.51	89.61	10.90	------	------	108	106	Peak
6	pk	5725.00	53.80	42.88	10.92	68.20	-14.40	108	106	Peak
7	pp	11340.00	49.47	33.05	16.42	54.00	-4.53	200	138	Average
8		11340.00	57.21	40.79	16.42	74.00	-16.79	200	138	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE40_TX_CH134
Tested by: Charles Hsiao
Rate : MCS0
Power : 17.5/17.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	42.61	32.10	10.51	54.00	-11.39	197	0	Average
2		5460.00	53.91	43.40	10.51	74.00	-20.09	197	0	Peak
3		5470.00	51.40	40.87	10.53	68.20	-16.80	197	0	Peak
4		5670.00	104.55	93.65	10.90	------	------	197	0	Average
5		5670.00	111.72	100.82	10.90	------	------	197	0	Peak
6	pp	5725.00	66.64	55.72	10.92	68.20	-1.56	197	230	Peak
7	av	11340.00	51.10	34.68	16.42	54.00	-2.90	240	289	Average
8		11340.00	58.48	42.06	16.42	74.00	-15.52	240	289	Peak

802.11ax (HE80)

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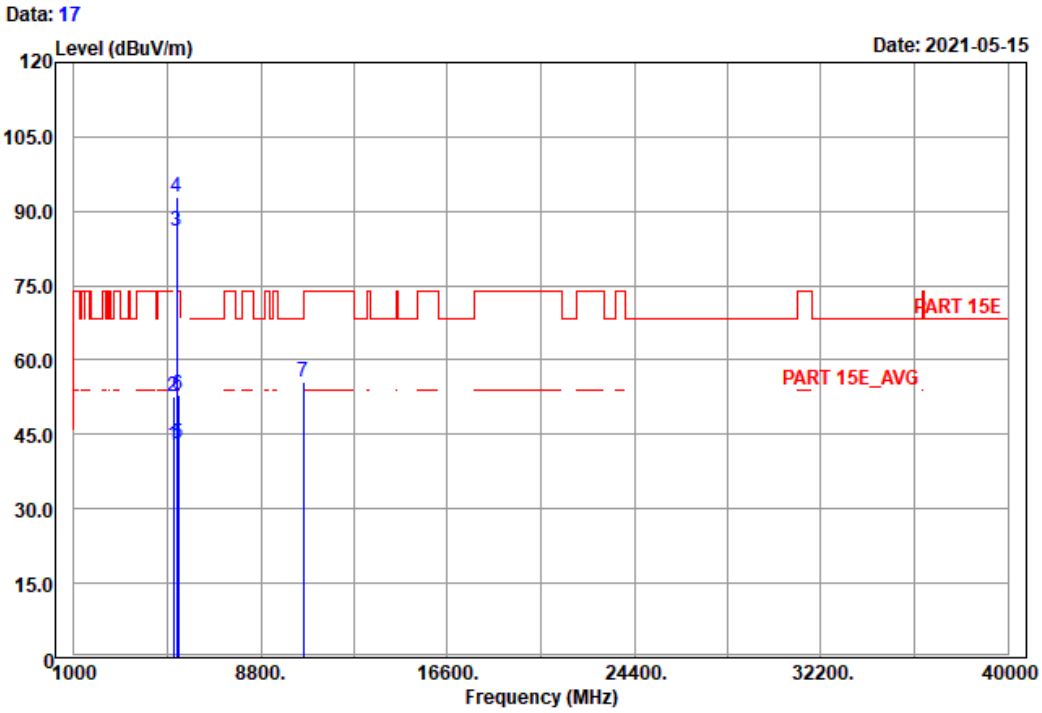
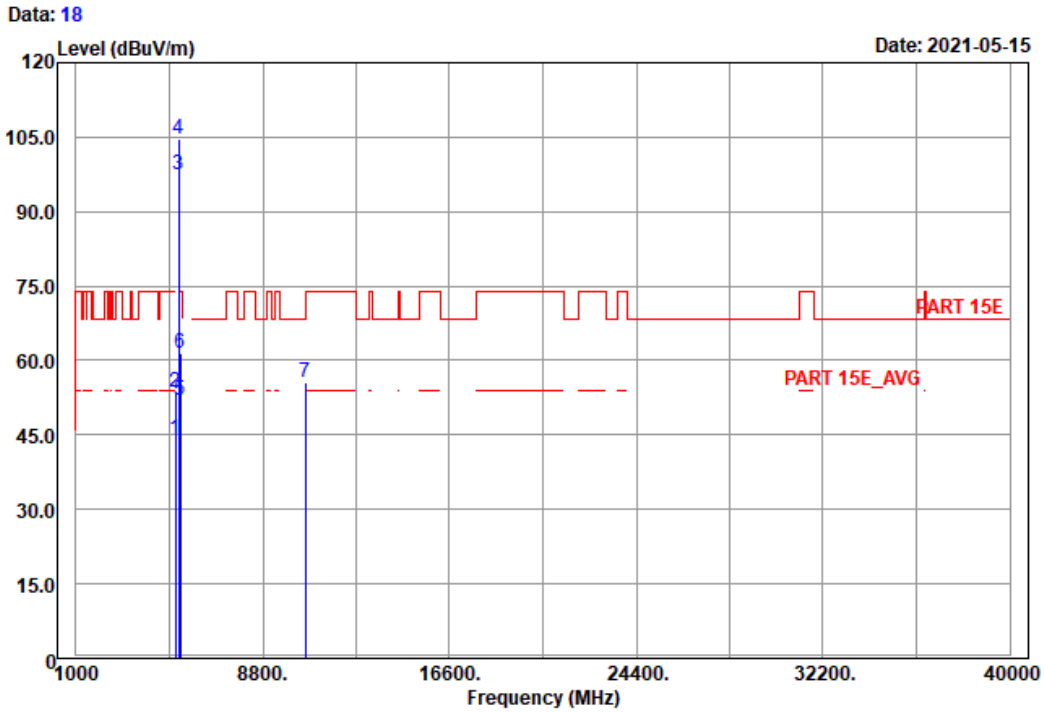


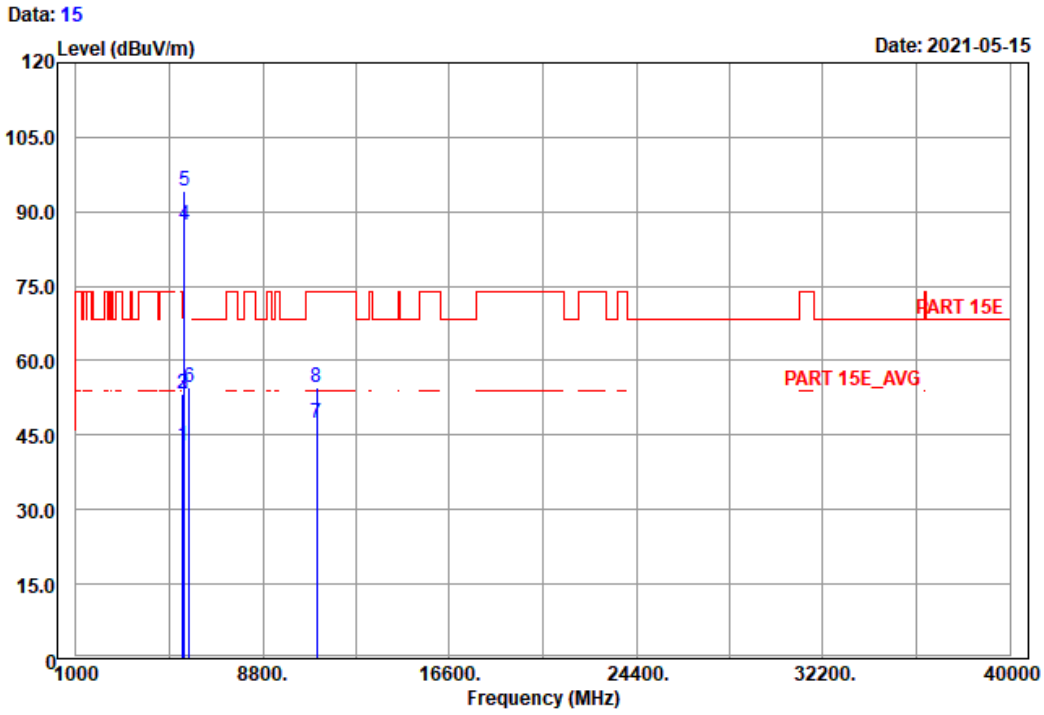
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE80_TX_CH58
Tested by: Karl Lee
Rate : MCS0
Power : 15/15
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5150.00	42.90	32.85	10.05	54.00	-11.10	108	116	Average
2		5150.00	52.76	42.71	10.05	74.00	-21.24	108	116	Peak
3		5290.00	86.12	76.02	10.10	------	------	108	116	Average
4		5290.00	92.91	82.81	10.10	------	------	108	116	Peak
5	pp	5350.00	43.14	32.91	10.23	54.00	-10.86	108	116	Average
6		5350.00	53.08	42.85	10.23	74.00	-20.92	108	116	Peak
7	pk	10580.00	55.67	39.96	15.71	68.20	-12.53	159	6	Peak



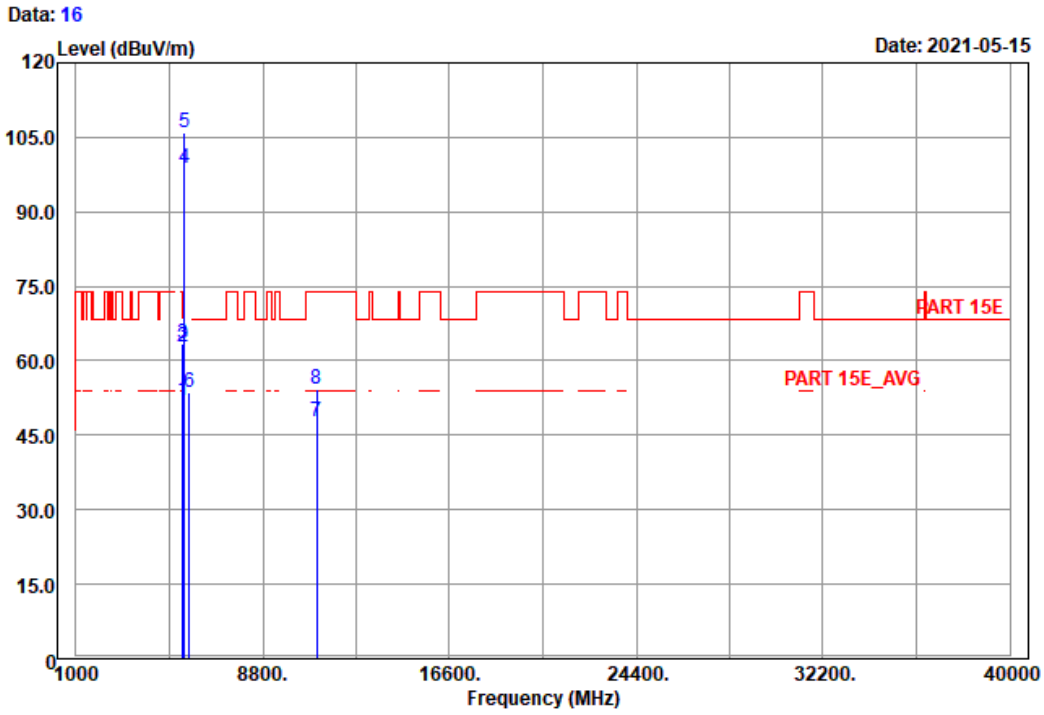
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE80_TX_CH58
Tested by: Karl Lee
Rate : MCS0
Power : 15/15
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5150.00	44.13	34.08	10.05	54.00	-9.87	220	2	Average
2		5150.00	53.62	43.57	10.05	74.00	-20.38	220	2	Peak
3		5290.00	97.29	87.19	10.10	------	------	220	2	Average
4		5290.00	104.73	94.63	10.10	------	------	220	2	Peak
5	pp	5350.00	51.83	41.60	10.23	54.00	-2.17	220	2	Average
6	pk	5350.00	61.61	51.38	10.23	74.00	-12.39	220	2	Peak
7		10580.00	55.54	39.83	15.71	68.20	-12.66	125	177	Peak



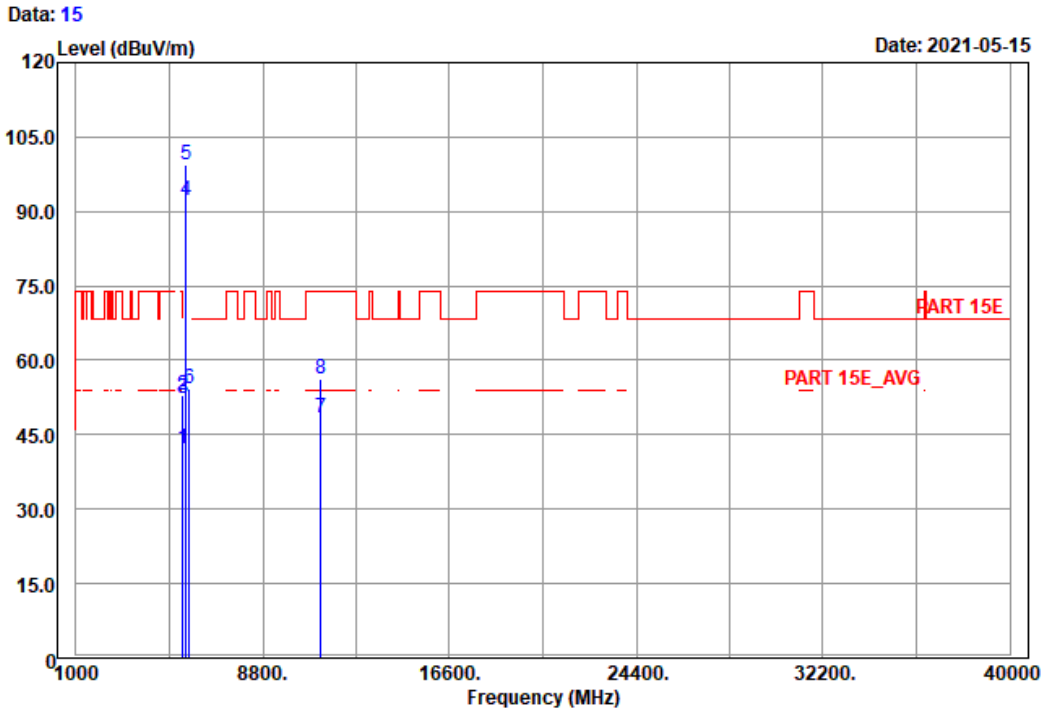
Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE80_TX_CH106
Tested by: Charles Hsiao
Rate : MCS0
Power : 14.5/14.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	42.99	32.48	10.51	54.00	-11.01	108	106	Average
2		5460.00	53.18	42.67	10.51	74.00	-20.82	108	106	Peak
3		5470.00	53.33	42.80	10.53	68.20	-14.87	108	106	Peak
4		5530.00	87.41	76.78	10.63	------	------	108	106	Average
5		5530.00	94.23	83.60	10.63	------	------	108	106	Peak
6	pk	5725.00	54.51	43.59	10.92	68.20	-13.69	108	106	Peak
7	pp	11060.00	47.48	31.25	16.23	54.00	-6.52	134	22	Average
8		11060.00	54.69	38.46	16.23	74.00	-19.31	134	22	Peak



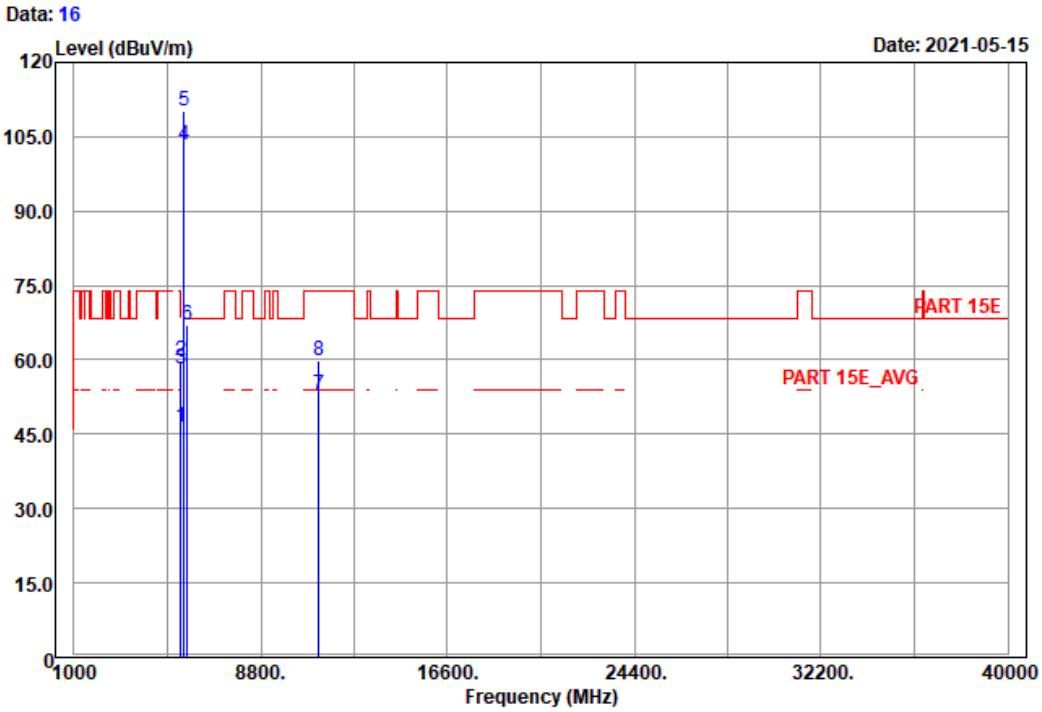
Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE80_TX_CH106
Tested by: Charles Hsiao
Rate : MCS0
Power : 14.5/14.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	pp	5460.00	51.92	41.41	10.51	54.00	-2.08	197	236	Average
2		5460.00	62.80	52.29	10.51	74.00	-11.20	197	236	Peak
3	pk	5470.00	63.40	52.87	10.53	68.20	-4.80	197	236	Peak
4		5530.00	98.84	88.21	10.63	------	------	197	0	Average
5		5530.00	105.81	95.18	10.63	------	------	197	0	Peak
6		5725.00	53.51	42.59	10.92	68.20	-14.69	197	0	Peak
7		11060.00	47.73	31.50	16.23	54.00	-6.27	144	77	Average
8		11060.00	54.19	37.96	16.23	74.00	-19.81	144	77	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Horizontal
Remark : 11AX_HE80_TX_CH122
Tested by: Charles Hsiao
Rate : MCS0
Power : 19.5/19.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	42.27	31.76	10.51	54.00	-11.73	108	106	Average
2		5460.00	53.12	42.61	10.51	74.00	-20.88	108	106	Peak
3		5470.00	52.42	41.89	10.53	68.20	-15.78	108	106	Peak
4		5610.00	92.34	81.57	10.77	------	------	108	106	Average
5		5610.00	99.32	88.55	10.77	------	------	108	106	Peak
6	pk	5725.00	54.27	43.35	10.92	68.20	-13.93	108	106	Peak
7	pp	11220.00	48.54	32.12	16.42	54.00	-5.46	200	138	Average
8		11220.00	56.16	39.74	16.42	74.00	-17.84	200	138	Peak



Site : 966 chamber 1
Condition: PART 15E 3m Vertical
Remark : 11AX_HE80_TX_CH122
Tested by: Charles Hsiao
Rate : MCS0
Power : 19.5/19.5
RB/VB : 1 MHz / 1 KHz

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1		5460.00	46.55	36.04	10.51	54.00	-7.45	197	0	Average
2		5460.00	59.73	49.22	10.51	74.00	-14.27	197	0	Peak
3		5470.00	58.32	47.79	10.53	68.20	-9.88	197	0	Peak
4		5610.00	103.44	92.67	10.77	------	------	197	0	Average
5		5610.00	110.34	99.57	10.77	------	------	197	0	Peak
6	pk	5725.00	67.03	56.11	10.92	68.20	-1.17	197	230	Peak
7	pp	11220.00	52.93	36.51	16.42	54.00	-1.07	240	289	Average
8		11220.00	59.91	43.49	16.42	74.00	-14.09	240	289	Peak

Below 1GHz Worst-Case

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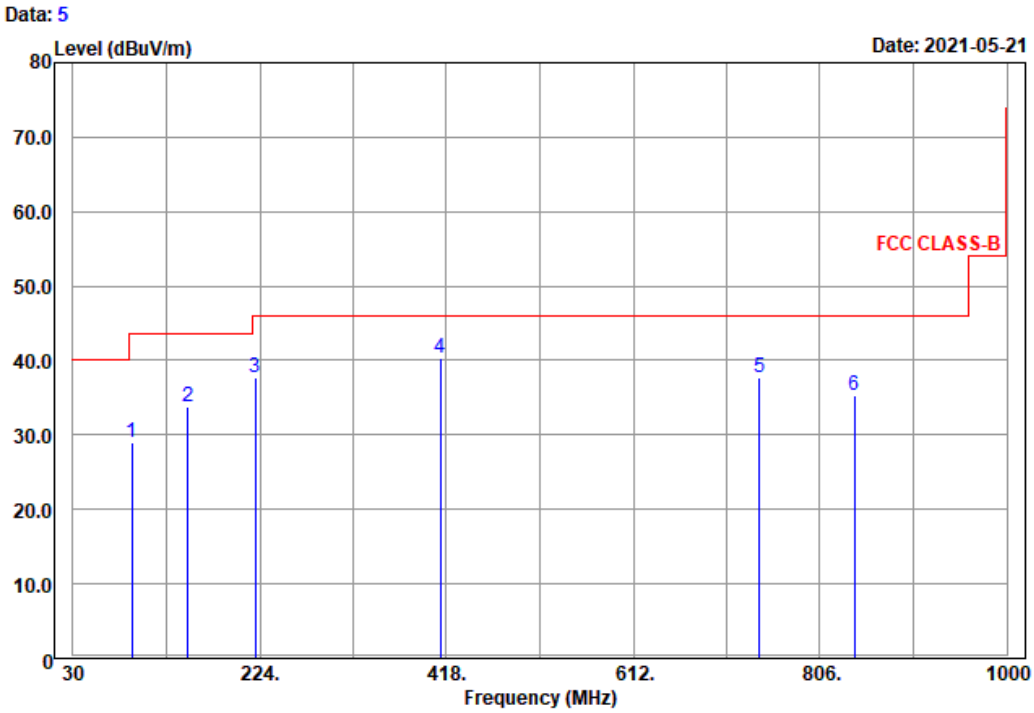
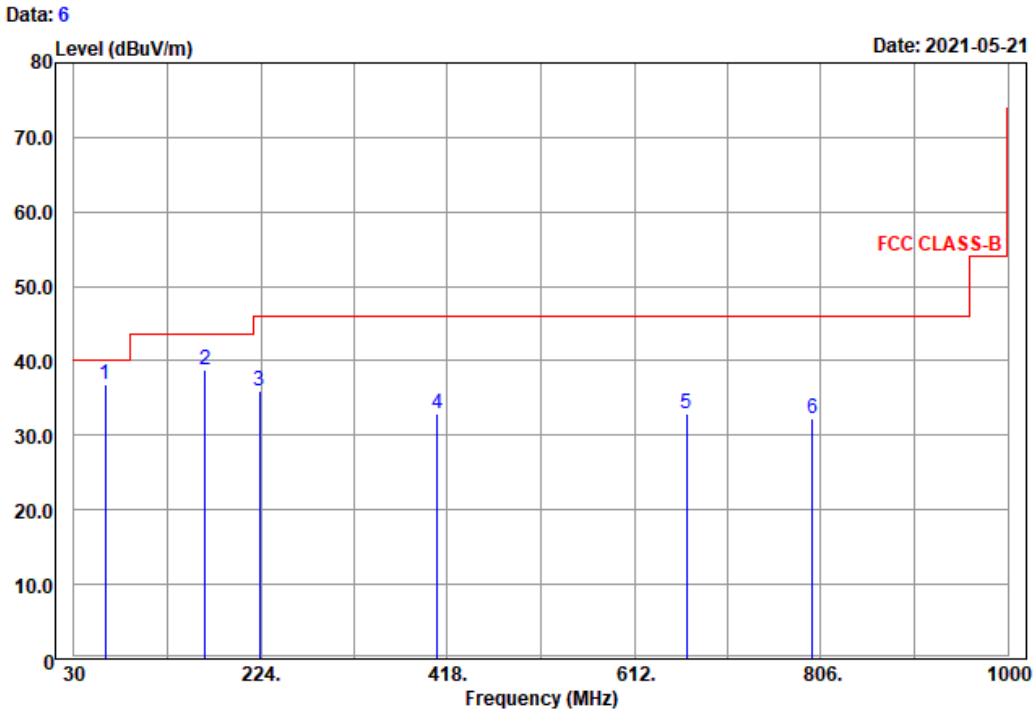


Site : 966 chamber 1
Condition: FCC CLASS-B 3m Horizontal
Remark : WIFI_5G_TX_LF
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	91.56	28.90	47.70	-18.80	43.50	-14.60	194	132	Peak
2	149.61	33.68	54.66	-20.98	43.50	-9.82	166	283	Peak
3	219.27	37.82	55.70	-17.88	46.00	-8.18	157	323	Peak
4 pp	412.00	40.43	54.15	-13.72	46.00	-5.57	274	105	Peak
5	743.10	37.77	46.31	-8.54	46.00	-8.23	194	172	Peak
6	841.80	35.41	42.34	-6.93	46.00	-10.59	160	336	Peak



Site : 966 chamber 1
Condition: FCC CLASS-B 3m Vertical
Remark : WIFI_5G_TX_LF
Tested by: Karl Lee

		Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark
		MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	pp	62.40	36.74	53.43	-16.69	40.00	-3.26	104	283	Peak
2		166.62	38.73	59.13	-20.40	43.50	-4.77	195	172	Peak
3		222.78	36.07	53.78	-17.71	46.00	-9.93	166	308	Peak
4		407.80	32.82	46.63	-13.81	46.00	-13.18	271	221	Peak
5		666.80	32.94	42.70	-9.76	46.00	-13.06	162	58	Peak
6		797.00	32.17	39.82	-7.65	46.00	-13.83	156	331	Peak

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102412	Jan. 29, 2021	Jan. 28, 2022
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2021	Sep. 03, 2022
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 28, 2021	Jan. 27, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Sep. 17, 2021	Sep. 16, 2022
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2 (Conduction 2).
3. The VCCI Site Registration No. is C-12047.
4. Test Date: Jan. 04, 2022

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.

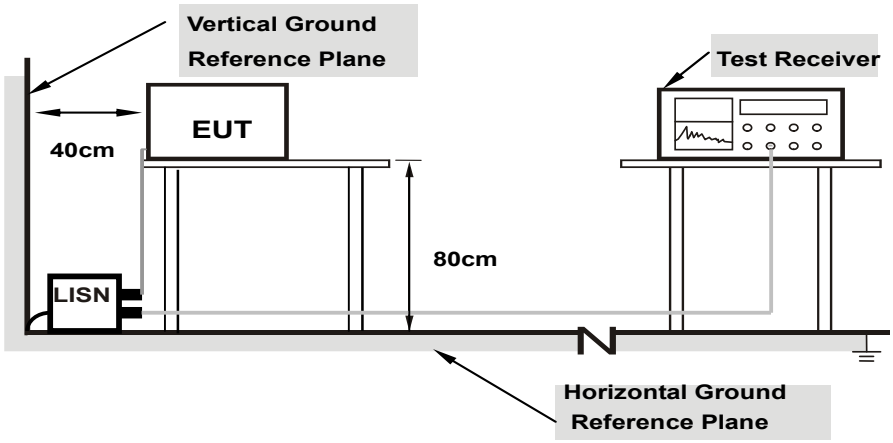
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

Worst-case data:

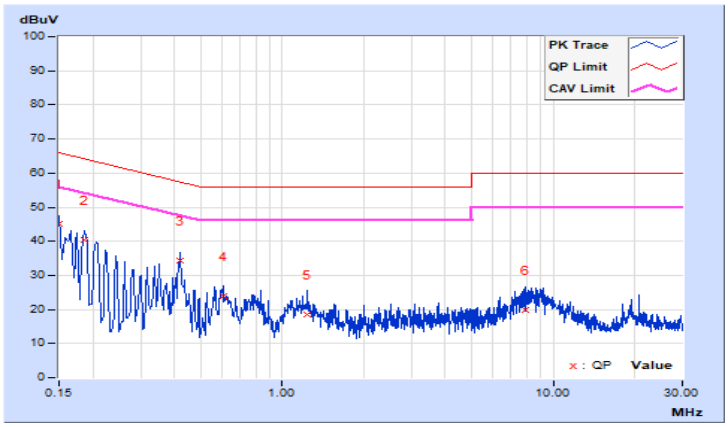
802.11a

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.12	34.88	23.36	45.00	33.48	66.00	56.00	-21.00	-22.52
2	0.18600	10.14	30.38	16.32	40.52	26.46	64.21	54.21	-23.69	-27.75
3	0.42200	10.22	24.11	11.24	34.33	21.46	57.41	47.41	-23.08	-25.95
4	0.60600	10.24	13.72	7.16	23.96	17.40	56.00	46.00	-32.04	-28.60
5	1.24200	10.30	8.08	1.48	18.38	11.78	56.00	46.00	-37.62	-34.22
6	7.92200	10.46	9.46	2.23	19.92	12.69	60.00	50.00	-40.08	-37.31

Remarks:

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

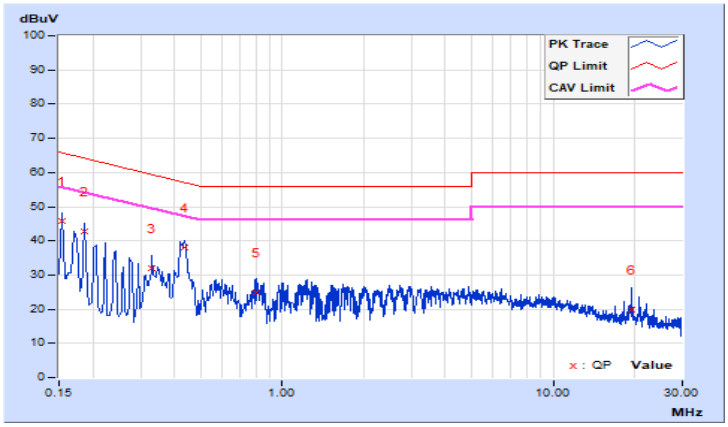


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.14	35.49	23.77	45.63	33.91	65.78	55.78	-20.15	-21.87
2	0.18600	10.16	32.53	19.42	42.69	29.58	64.21	54.21	-21.52	-24.63
3	0.33000	10.22	21.79	14.49	32.01	24.71	59.45	49.45	-27.44	-24.74
4	**0.43400**	**10.24**	**27.66**	**23.90**	**37.90**	**34.14**	**57.18**	**47.18**	**-19.28**	**-13.04**
5	0.79800	10.27	14.78	7.95	25.05	18.22	56.00	46.00	-30.95	-27.78
6	19.51000	10.86	8.94	0.40	19.80	11.26	60.00	50.00	-40.20	-38.74

Remarks:

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



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 ≦ 125mW(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	250mW (24 dBm)
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3			1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

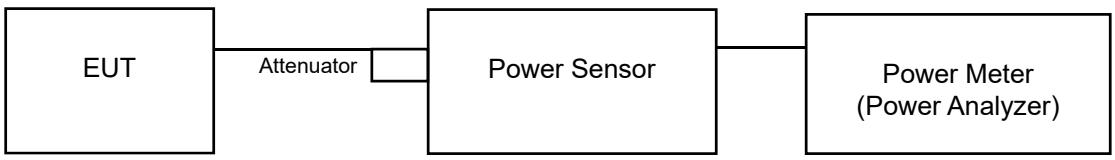
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

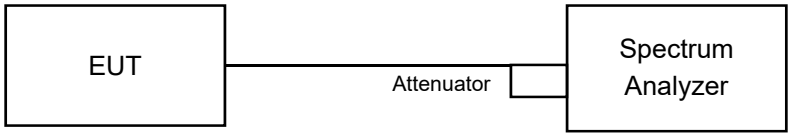
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

For Power Output



For 26dB Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For 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.

For 26dB 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 Result

Power Output:

CDD Mode

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.33	18.12	132.940	21.24	24.00	Pass
60	5300	17.01	17.46	105.953	20.25	24.00	Pass
64	5320	17.03	17.45	106.057	20.26	23.82	Pass
100	5500	17.46	16.96	105.378	20.23	24.00	Pass
116	5580	15.51	14.93	66.680	18.24	24.00	Pass
140	5700	17.04	16.53	95.560	19.80	24.00	Pass

Note:

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

Chain 0

1. 11dBm + 10log (22.13) = 24.44 > 24dBm
2. 11dBm + 10log (21.64) = 24.35 > 24dBm
3. 11dBm + 10log (21.71) = 24.36 > 24dBm
4. 11dBm + 10log (21.12) = 24.24 > 24dBm
5. 11dBm + 10log (21.87) = 24.39 > 24dBm
6. 11dBm + 10log (21.78) = 24.38 > 24dBm

Chain 1

1. 11dBm + 10log (20.25) = 24.06 > 24dBm
2. 11dBm + 10log (20.25) = 24.06 > 24dBm
3. 11dBm + 10log (19.16) = 23.82 < 24dBm
4. 11dBm + 10log (20.82) = 24.18 > 24dBm
5. 11dBm + 10log (20.06) = 24.02 > 24dBm
6. 11dBm + 10log (20.74) = 24.16 > 24dBm

802.11ax (HE20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.43	18.16	135.126	21.31	24.00	Pass
60	5300	18.23	18.71	140.829	21.49	24.00	Pass
64	5320	17.76	18.23	126.231	21.01	24.00	Pass
100	5500	18.22	17.81	126.769	21.03	24.00	Pass
116	5580	16.74	17.02	97.556	19.89	24.00	Pass
140	5700	13.82	13.53	46.641	16.69	24.00	Pass

Note:

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

Chain 0

1. 11dBm + 10log (26.95) = 25.30 > 24dBm
2. 11dBm + 10log (26.73) = 25.26 > 24dBm
3. 11dBm + 10log (23.13) = 24.64 > 24dBm
4. 11dBm + 10log (27.06) = 25.32 > 24dBm
5. 11dBm + 10log (23.13) = 24.64 > 24dBm
6. 11dBm + 10log (23.35) = 24.68 > 24dBm

Chain 1

1. 11dBm + 10log (24.40) = 24.87 > 24dBm
2. 11dBm + 10log (24.30) = 24.85 > 24dBm
3. 11dBm + 10log (21.43) = 24.31 > 24dBm
4. 11dBm + 10log (21.33) = 24.28 > 24dBm
5. 11dBm + 10log (21.26) = 24.27 > 24dBm
6. 11dBm + 10log (22.17) = 24.45 > 24dBm

802.11ax (HE40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.59	20.42	224.705	23.52	24.00	Pass
62	5310	13.82	14.14	50.041	16.99	24.00	Pass
102	5510	15.03	14.67	61.151	17.86	24.00	Pass
110	5550	17.48	17.37	110.552	20.44	24.00	Pass
134	5670	16.52	15.46	80.031	19.03	24.00	Pass

Note:

For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (77.99) = 29.92 > 24dBm
2. 11dBm + 10log (45.09) = 27.54 > 24dBm
3. 11dBm + 10log (44.41) = 27.47 > 24dBm
4. 11dBm + 10log (45.69) = 27.59 > 24dBm
5. 11dBm + 10log (45.76) = 27.60 > 24dBm

Chain 1
1. 11dBm + 10log (77.87) = 29.91 > 24dBm
2. 11dBm + 10log (45.03) = 27.53 > 24dBm
3. 11dBm + 10log (45.09) = 27.54 > 24dBm
4. 11dBm + 10log (45.60) = 27.58 > 24dBm
5. 11dBm + 10log (44.91) = 27.52 > 24dBm

802.11ax (HE80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	14.16	14.21	52.425	17.20	24.00	Pass
106	5530	13.32	13.41	43.406	16.38	24.00	Pass
122	5610	18.58	18.46	142.256	21.53	24.00	Pass

Note:

For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (81.46) = 30.10 > 24dBm
2. 11dBm + 10log (81.46) = 30.10 > 24dBm
3. 11dBm + 10log (91.43) = 30.61 > 24dBm

Chain 1
1. 11dBm + 10log (82.10) = 30.14 > 24dBm
2. 11dBm + 10log (81.59) = 30.11 > 24dBm
3. 11dBm + 10log (82.68) = 30.17 > 24dBm

Beamforming Mode

802.11ax (HE20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	15.42	15.15	67.568	18.30	24.00	Pass
60	5300	15.22	15.70	70.419	18.48	24.00	Pass
64	5320	14.75	15.22	63.120	18.00	24.00	Pass
100	5500	15.21	14.80	63.389	18.02	24.00	Pass
116	5580	13.73	14.01	48.782	16.88	24.00	Pass
140	5700	10.81	10.52	23.322	13.68	24.00	Pass

Note:

1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.55dBi < 6dBi, so the limit no need to reduced.
2. 5500-5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.61dBi < 6dBi, so the limit no need to reduced.

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

Chain 0

1. 11dBm + 10log (26.95) = 25.30 > 24dBm
2. 11dBm + 10log (26.73) = 25.26 > 24dBm
3. 11dBm + 10log (23.13) = 24.64 > 24dBm
4. 11dBm + 10log (27.06) = 25.32 > 24dBm
5. 11dBm + 10log (23.13) = 24.64 > 24dBm
6. 11dBm + 10log (23.35) = 24.68 > 24dBm

Chain 1

1. 11dBm + 10log (24.40) = 24.87 > 24dBm
2. 11dBm + 10log (24.30) = 24.85 > 24dBm
3. 11dBm + 10log (21.43) = 24.31 > 24dBm
4. 11dBm + 10log (21.33) = 24.28 > 24dBm
5. 11dBm + 10log (21.26) = 24.27 > 24dBm
6. 11dBm + 10log (22.17) = 24.45 > 24dBm

802.11ax (HE40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	17.58	17.41	112.360	20.51	24.00	Pass
62	5310	10.81	11.13	25.022	13.98	24.00	Pass
102	5510	12.02	11.66	30.578	14.85	24.00	Pass
110	5550	14.47	14.36	55.280	17.43	24.00	Pass
134	5670	13.51	12.45	40.018	16.02	24.00	Pass

Note:
1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.55dBi < 6dBi, so the limit no need to reduced.
2. 5500-5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.61dBi < 6dBi, so the limit no need to reduced.

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

Chain 0

1. 11dBm + 10log (77.99) = 29.92 > 24dBm
2. 11dBm + 10log (45.09) = 27.54 > 24dBm
3. 11dBm + 10log (44.41) = 27.47 > 24dBm
4. 11dBm + 10log (45.69) = 27.59 > 24dBm
5. 11dBm + 10log (45.76) = 27.60 > 24dBm

Chain 1

1. 11dBm + 10log (77.87) = 29.91 > 24dBm
2. 11dBm + 10log (45.03) = 27.53 > 24dBm
3. 11dBm + 10log (45.09) = 27.54 > 24dBm
4. 11dBm + 10log (45.60) = 27.58 > 24dBm
5. 11dBm + 10log (44.91) = 27.52 > 24dBm

802.11ax (HE80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	11.15	11.20	26.214	14.19	24.00	Pass
106	5530	10.31	10.40	21.705	13.37	24.00	Pass
122	5610	15.57	15.45	71.133	18.52	24.00	Pass

Note:

1. 5260-5320MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.55dBi < 6dBi, so the limit no need to reduced.
2. 5500-5700MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.61dBi < 6dBi, so the limit no need to reduced.

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

Chain 0

1. 11dBm + 10log (81.46) = 30.10 > 24dBm
2. 11dBm + 10log (81.46) = 30.10 > 24dBm
3. 11dBm + 10log (91.43) = 30.61 > 24dBm

Chain 1

1. 11dBm + 10log (82.10) = 30.14 > 24dBm
2. 11dBm + 10log (81.59) = 30.11 > 24dBm
3. 11dBm + 10log (82.68) = 30.17 > 24dBm

26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	22.13	20.25
60	5300	21.64	20.25
64	5320	21.71	19.16
100	5500	21.12	20.82
116	5580	21.87	20.06
140	5700	21.78	20.74

802.11ax (HE20)

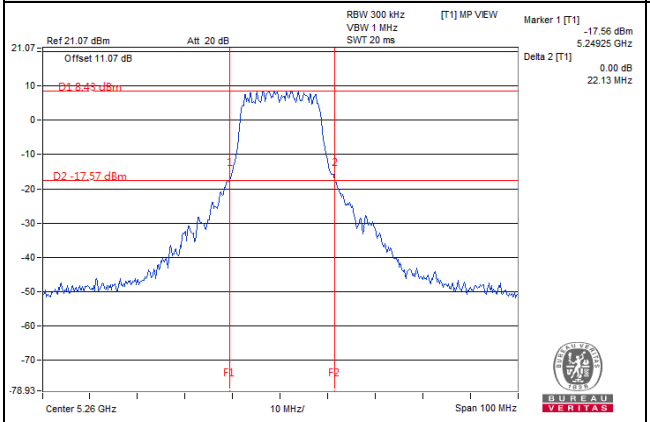
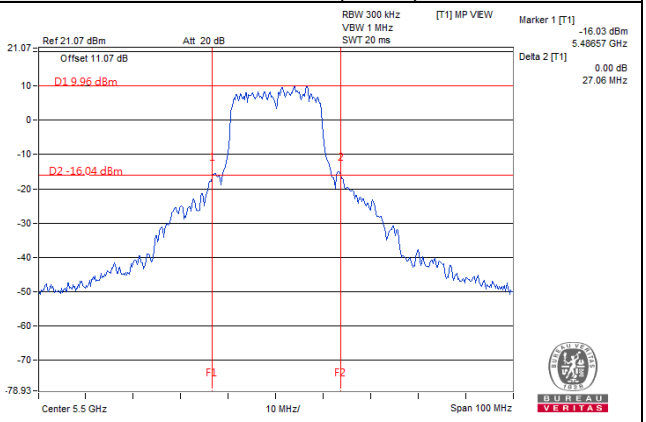
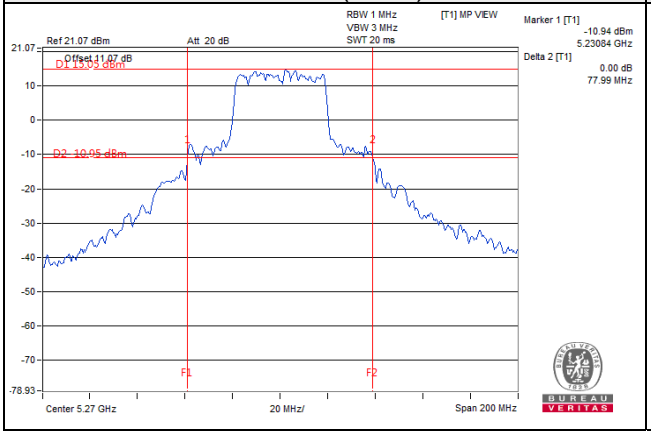
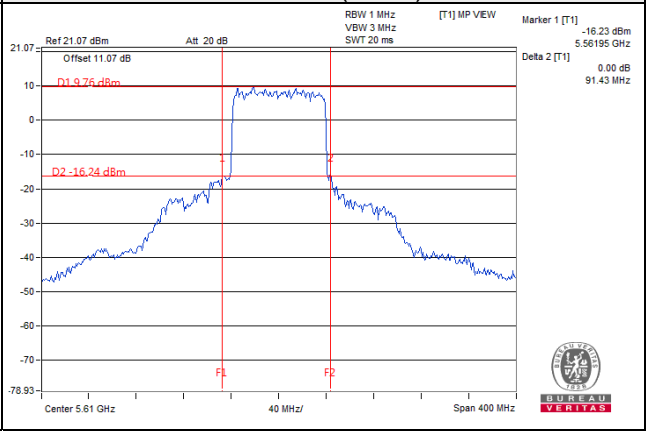
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	26.95	24.40
60	5300	26.73	24.30
64	5320	23.13	21.43
100	5500	27.06	21.33
116	5580	23.13	21.26
140	5700	23.35	22.17

802.11ax (HE40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	77.99	77.87
62	5310	45.09	45.03
102	5510	44.41	45.09
110	5550	45.69	45.60
134	5670	45.76	44.91

802.11ax (HE80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	81.46	82.10
106	5530	81.46	81.59
122	5610	91.43	82.68

Spectrum Plot of Worst Value	
802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	

EUT Maximum Conducted Power

CDD Mode

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	132.940	21.24
5470~5725	105.378	20.23

802.11ax (HE20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	140.829	21.49
5470~5725	126.769	21.03

802.11ax (HE40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	224.705	23.52
5470~5725	110.552	20.44

802.11ax (HE80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	52.425	17.20
5470~5725	142.256	21.53

Beamforming Mode

802.11ax (HE20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	70.419	18.48
5470~5725	63.389	18.02

802.11ax (HE40)

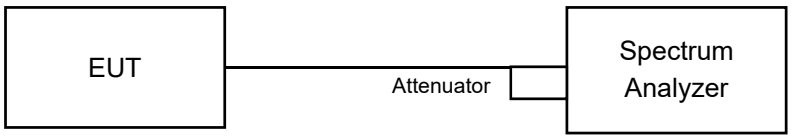
Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	112.360	20.51
5470~5725	55.280	17.43

802.11ax (HE80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	26.214	14.19
5470~5725	71.133	18.52

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Result

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.92	16.56
60	5300	16.62	16.44
64	5320	16.68	16.44
100	5500	16.62	16.44
116	5580	16.80	16.56
140	5700	16.56	16.68

802.11ax (HE20)

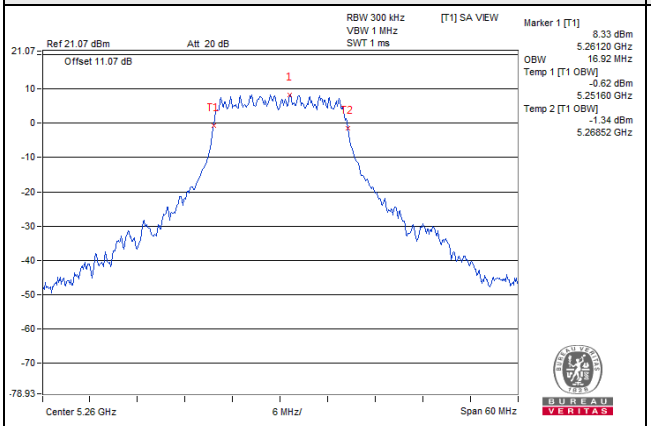
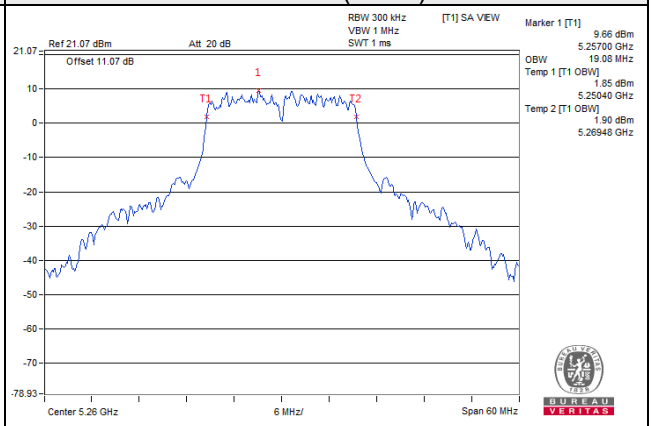
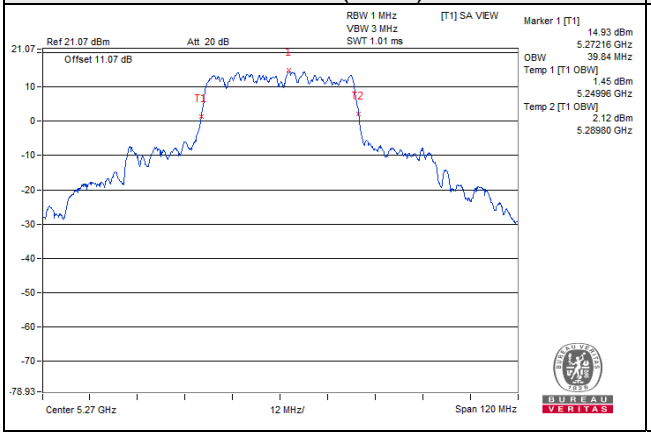
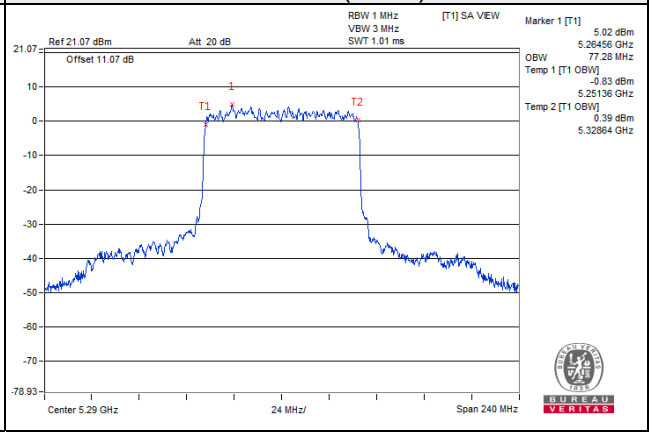
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.08	18.84
60	5300	19.08	18.96
64	5320	19.02	18.84
100	5500	19.02	18.84
116	5580	19.08	18.84
140	5700	18.96	18.84

802.11ax (HE40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	39.84	39.84
62	5310	38.28	38.16
102	5510	38.28	38.16
110	5550	38.52	38.40
134	5670	38.40	38.16

802.11ax (HE80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	77.28	77.28
106	5530	76.80	77.28
122	5610	77.28	77.28

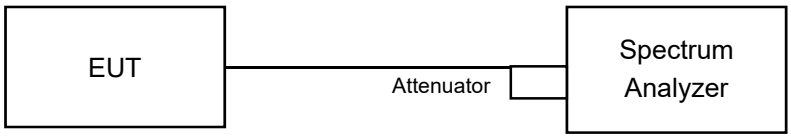
Spectrum Plot of Worst Value	
802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	

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	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3			30dBm/ 500kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

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

Duty cycle of test signal is < 98%
Using method SA-2
1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS
3) Set Channel power measure = 1MHz
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

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

802.11a

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	7.26	6.89	0.16	10.25	11.00	Pass
60	5300	5.59	6.14	0.16	9.04	11.00	Pass
64	5320	5.64	6.58	0.16	9.30	11.00	Pass
100	5500	6.26	7.00	0.16	9.81	11.00	Pass
116	5580	5.05	4.23	0.16	7.83	11.00	Pass
140	5700	6.42	6.08	0.16	9.42	11.00	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. For U-NII-2A: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/2$]=5.55dBi < 6dBi, so the limit no need to reduced.
   For U-NII-2C: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/2$]=5.61dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	7.32	7.15	0.11	10.36	11.00	Pass
60	5300	6.85	7.83	0.11	10.49	11.00	Pass
64	5320	6.42	7.34	0.11	10.03	11.00	Pass
100	5500	7.47	7.27	0.11	10.50	11.00	Pass
116	5580	5.80	6.52	0.11	9.30	11.00	Pass
140	5700	2.92	3.01	0.11	6.09	11.00	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. For U-NII-2A: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/2$]=5.55dBi < 6dBi, so the limit no need to reduced.
   For U-NII-2C: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/2$]=5.61dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

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802.11ax (HE40)

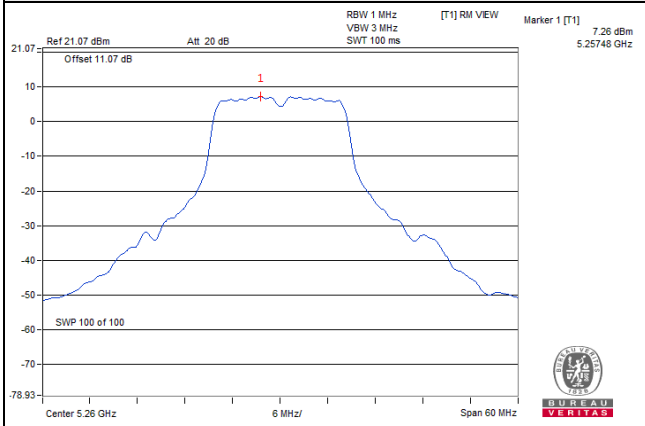
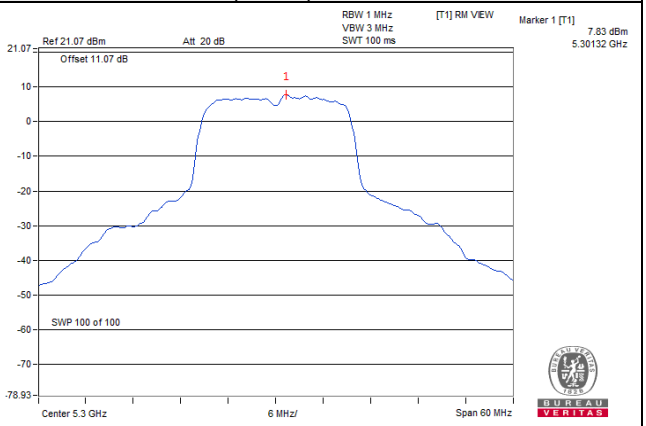
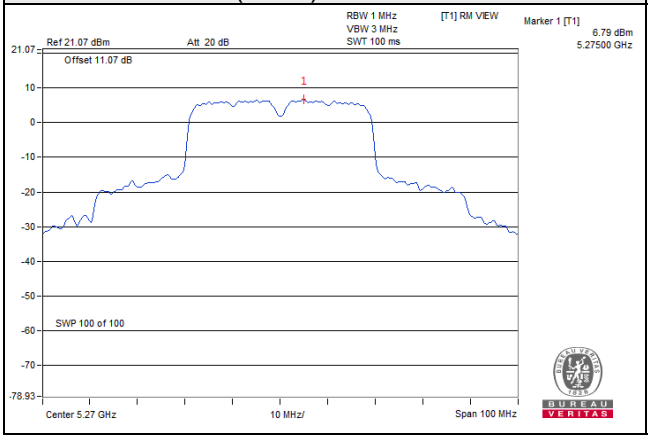
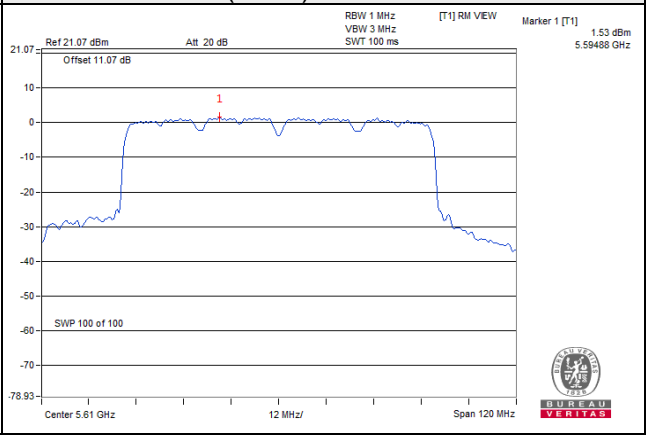
Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	6.79	6.48	0.10	9.75	11.00	Pass
62	5310	-0.82	-0.73	0.10	2.34	11.00	Pass
102	5510	0.72	0.30	0.10	3.63	11.00	Pass
110	5550	3.45	2.77	0.10	6.24	11.00	Pass
134	5670	2.42	0.58	0.10	4.71	11.00	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. For U-NII-2A: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.55dBi < 6dBi, so the limit no need to reduced.
   For U-NII-2C: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.61dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
58	5290	-3.58	-3.36	0.17	-0.29	11.00	Pass
106	5530	-3.95	-3.94	0.17	-0.77	11.00	Pass
122	5610	1.53	1.24	0.17	4.57	11.00	Pass

Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. For U-NII-2A: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.55dBi < 6dBi, so the limit no need to reduced.
   For U-NII-2C: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]=5.61dBi < 6dBi, so the limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

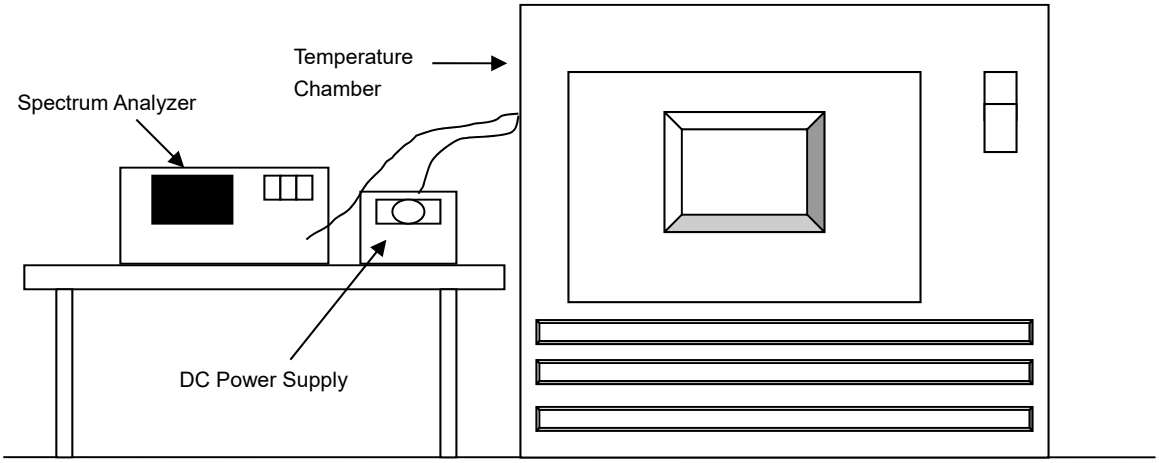
Spectrum Plot of Worst Value	
802.11a / Chain 0 / CH 52	802.11ax (HE20) / Chain 1 / CH 60
	
802.11ax (HE40) / Chain 0 / CH 54	802.11ax (HE80) / Chain 0 / CH 122
	

4.6 Frequency Stability

4.6.1 Limits 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

Test Date: Jul. 09, 2021

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 16, 2020	Sep. 15, 2021
Standard Temperature And Humidity Chamber	MHU-225AU	920842	Jun. 15, 2021	Jun. 14, 2022
Digital Multimeter Fluke	87-III	70360742	Jun. 24, 2021	Jun. 23, 2022
DC Power Supply Topward	6306A	727263	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.

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: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
40	120	5259.9734	PASS	5259.9729	PASS	5259.9732	PASS	5259.9739	PASS
30	120	5260.0161	PASS	5260.0141	PASS	5260.0174	PASS	5260.0155	PASS
20	120	5259.9754	PASS	5259.9804	PASS	5259.9797	PASS	5259.9771	PASS
10	120	5259.9787	PASS	5259.9765	PASS	5259.9785	PASS	5259.9778	PASS
0	120	5260.0010	PASS	5260.0021	PASS	5260.0005	PASS	5259.9984	PASS

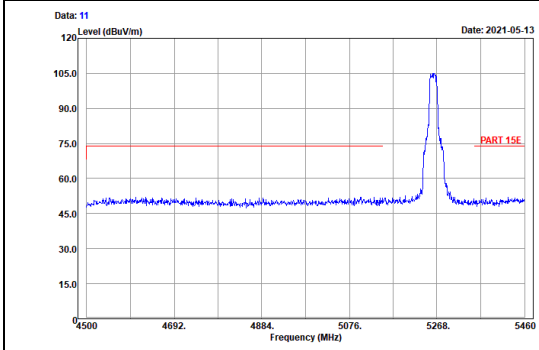
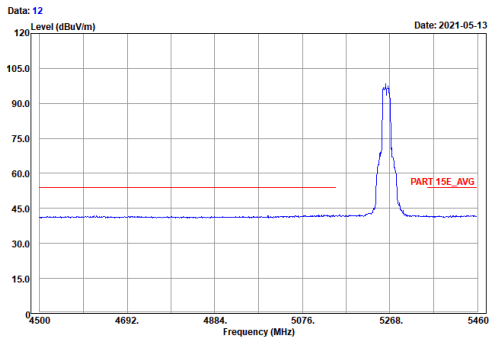
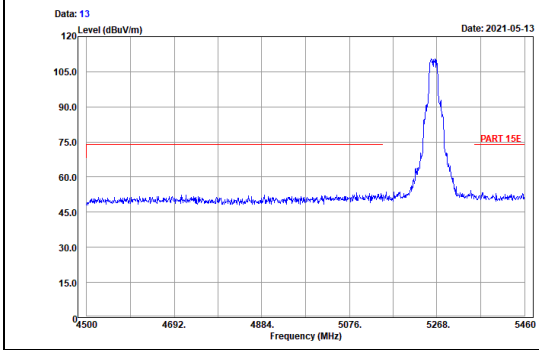
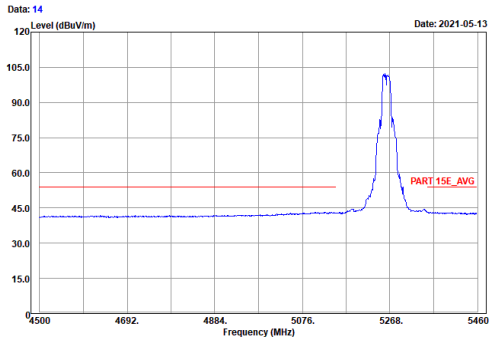
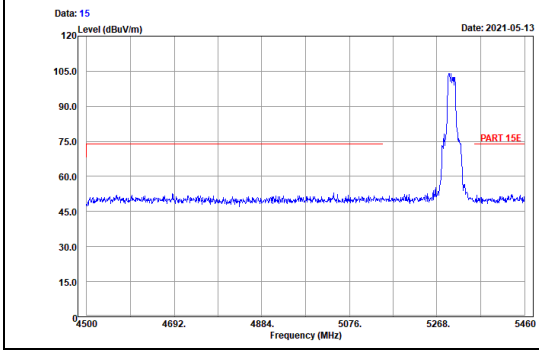
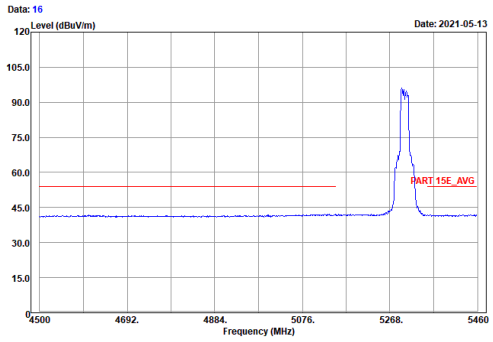
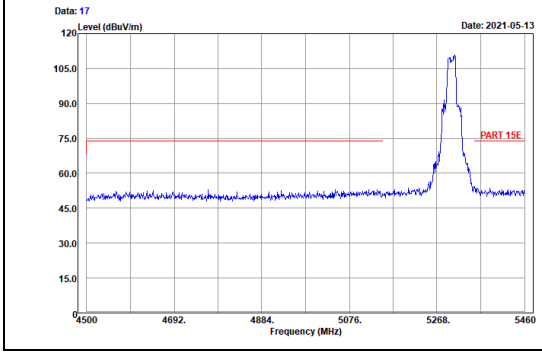
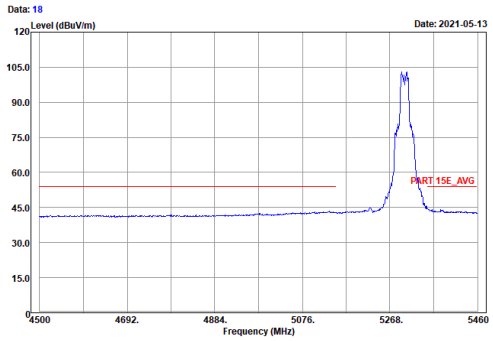
Frequency Stability Versus Voltage									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	13.8	5259.9749	PASS	5259.9806	PASS	5259.9796	PASS	5259.9764	PASS
	12	5259.9754	PASS	5259.9804	PASS	5259.9797	PASS	5259.9771	PASS
	10.2	5259.9755	PASS	5259.9800	PASS	5259.9794	PASS	5259.9775	PASS

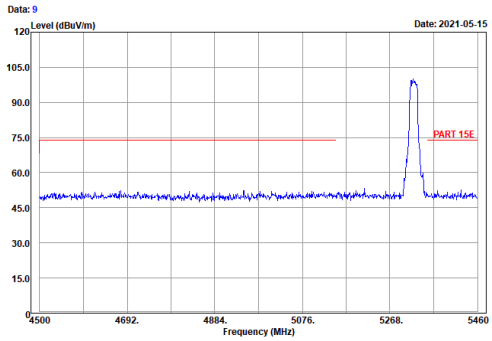
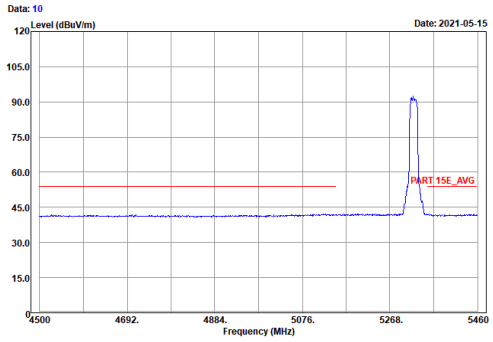
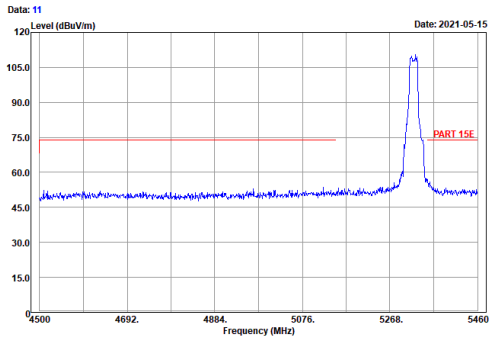
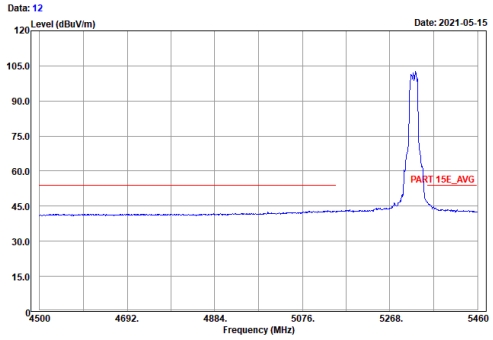
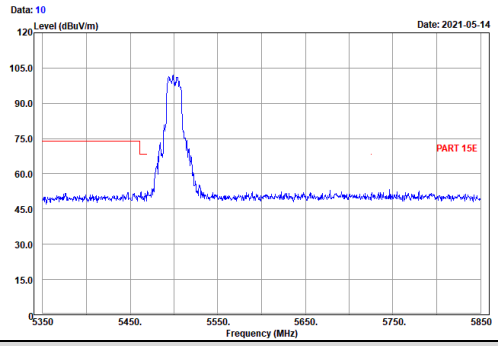
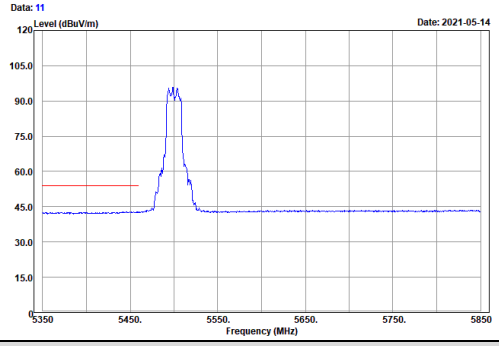
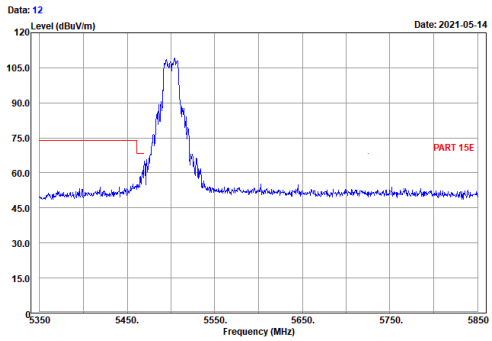
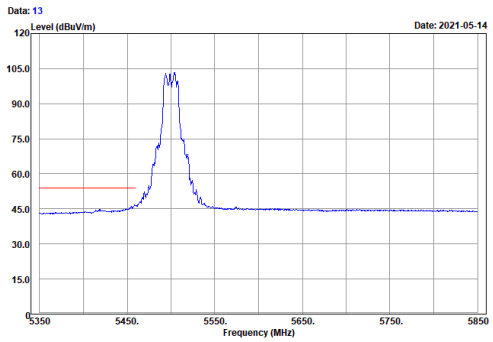
5 Pictures of Test Arrangements

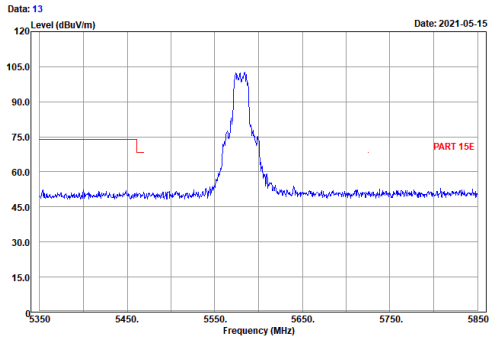
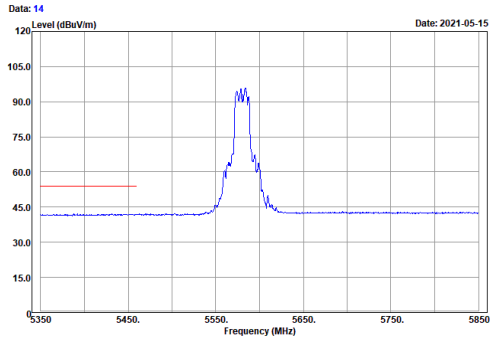
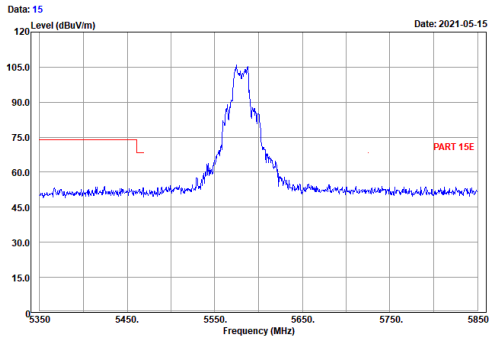
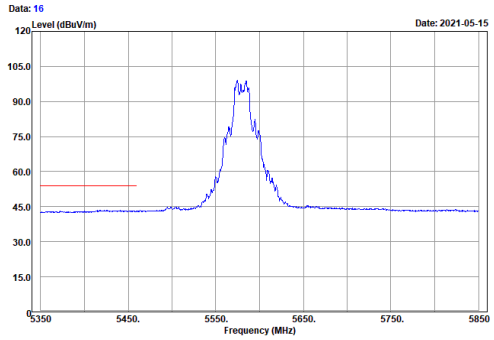
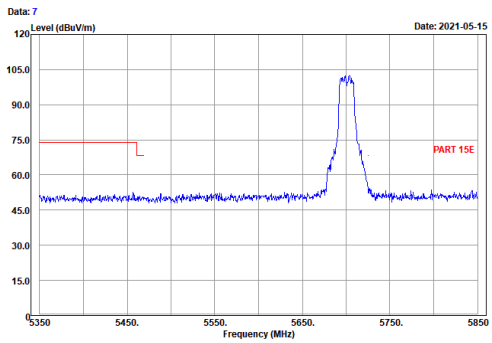
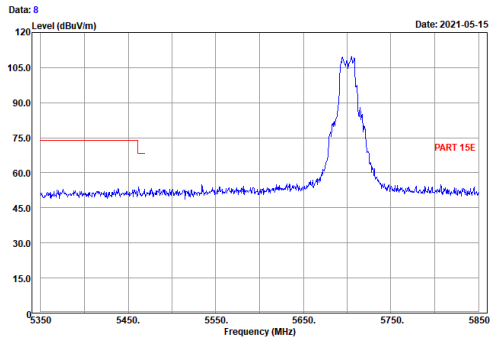
Please refer to the attached file (Test Setup Photo).

Annex A- Band Edge Measurement

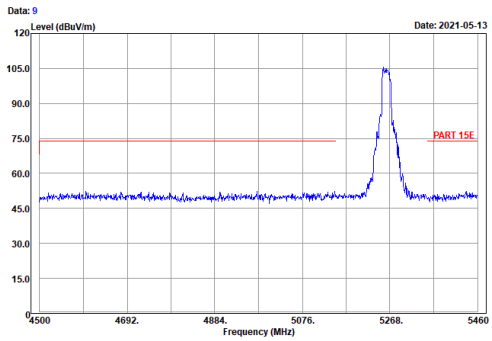
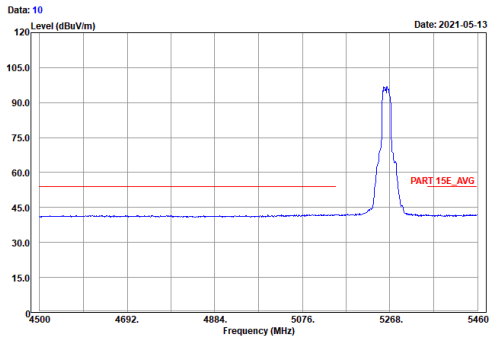
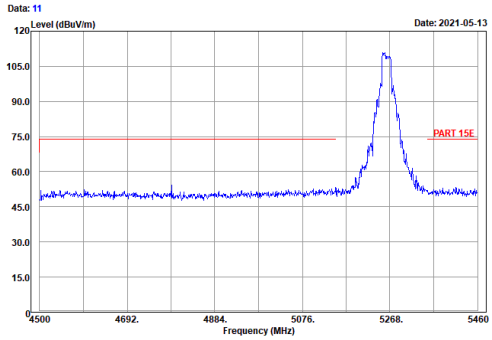
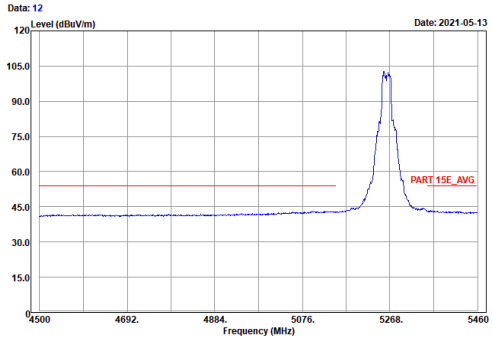
802.11a

Channel 52	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 60	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Channel 64	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Channel 116	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 140	
Horizontal (Peak)	Vertical (Peak)
	

802.11ax (HE20)

Channel 52	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
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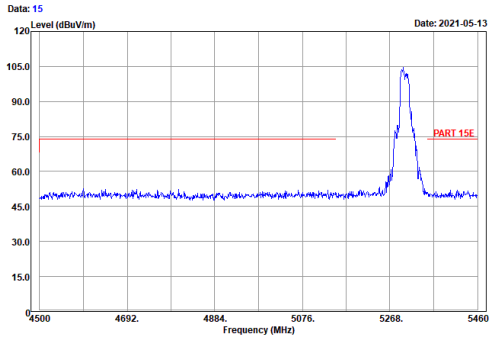
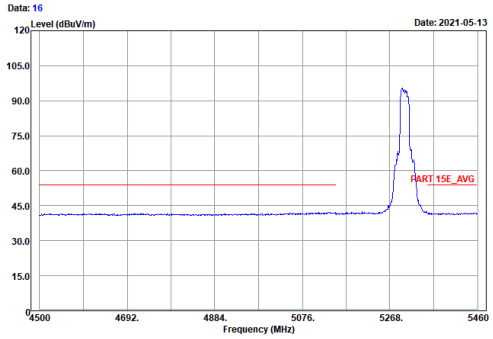
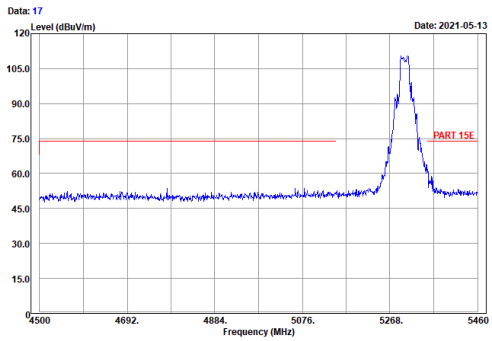
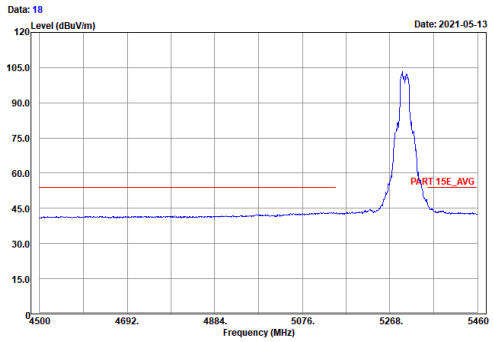
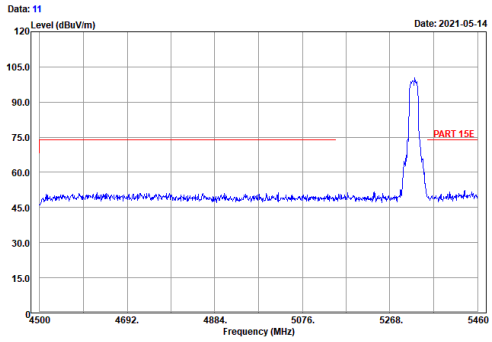
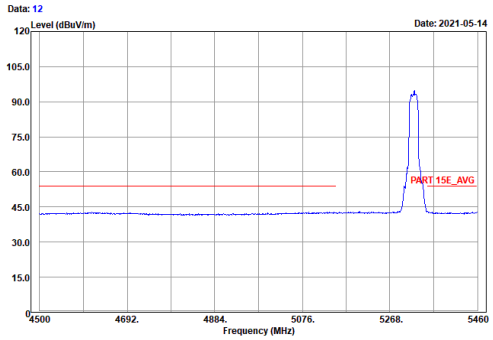
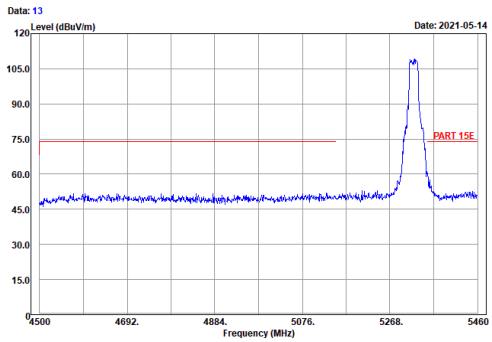
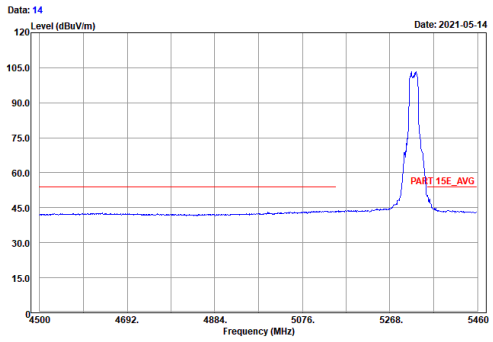
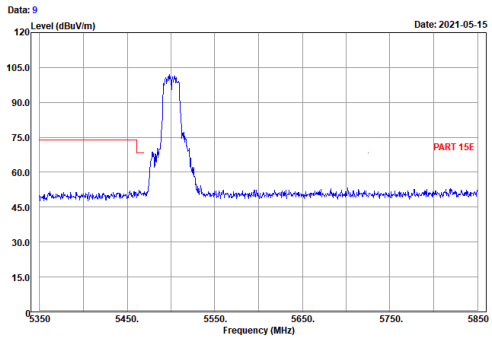
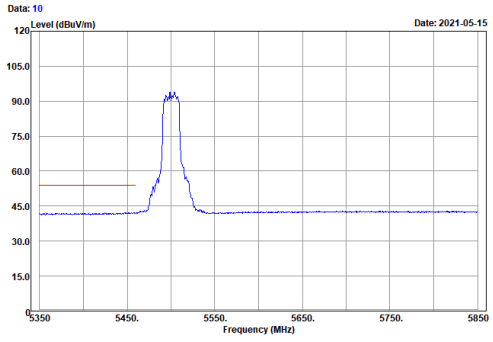
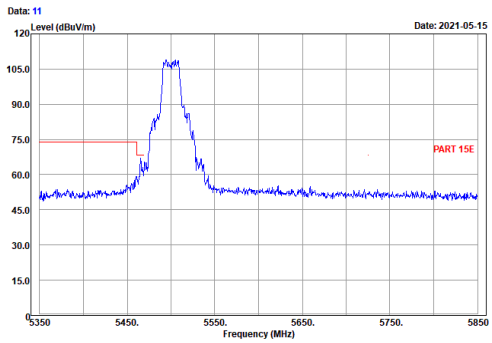
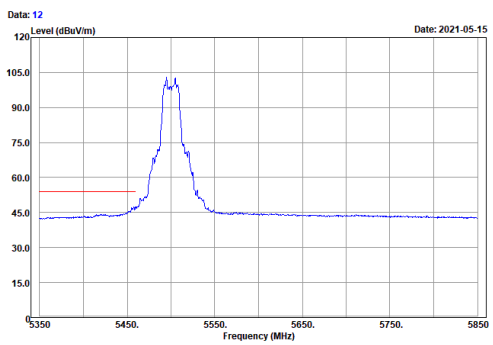
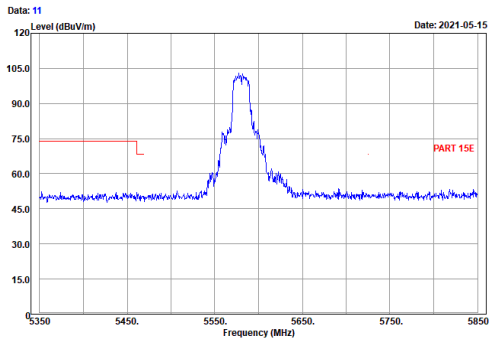
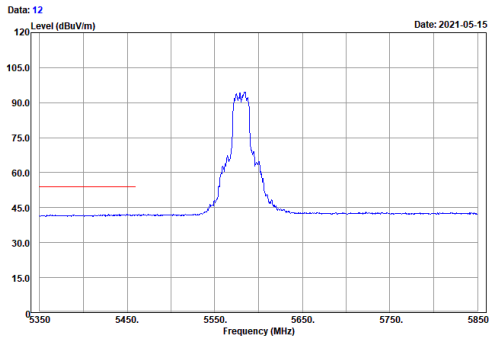
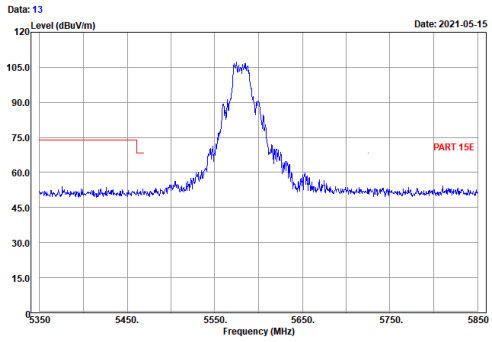
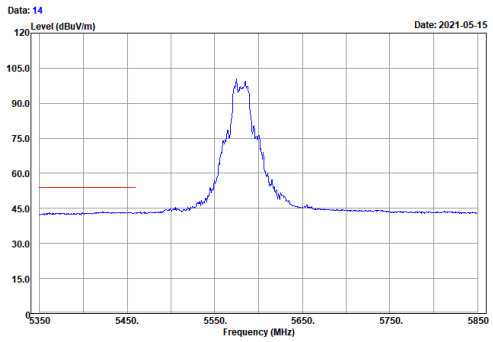
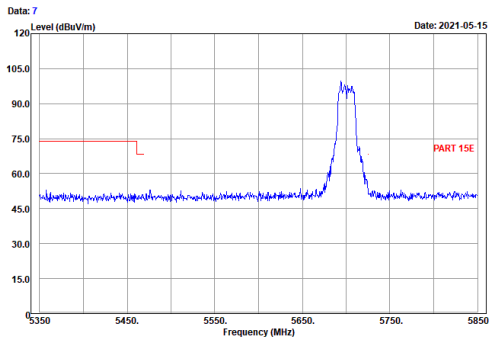
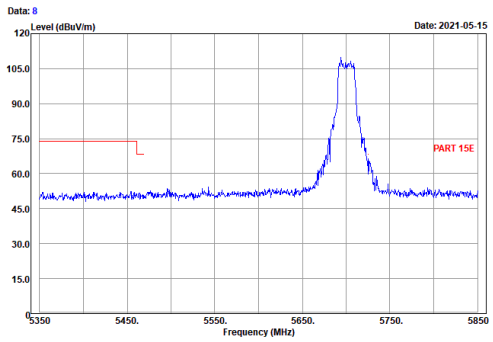
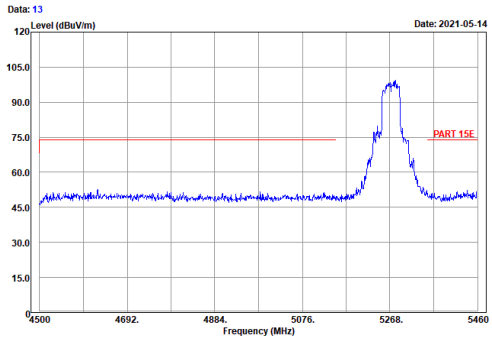
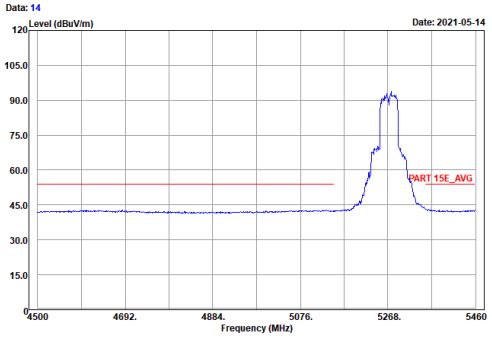
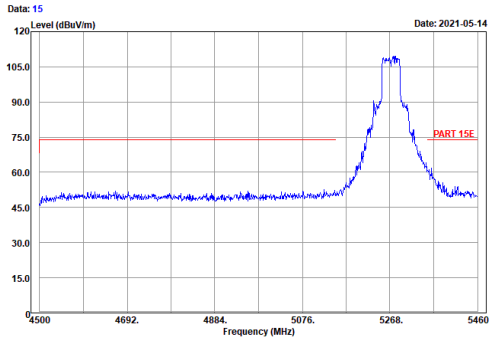
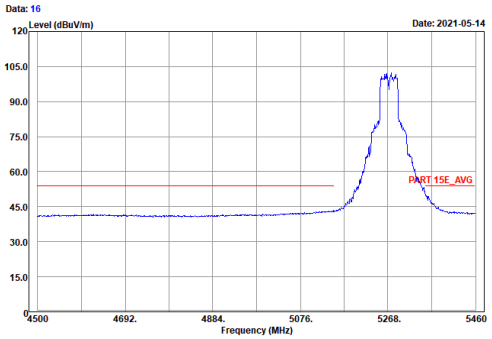
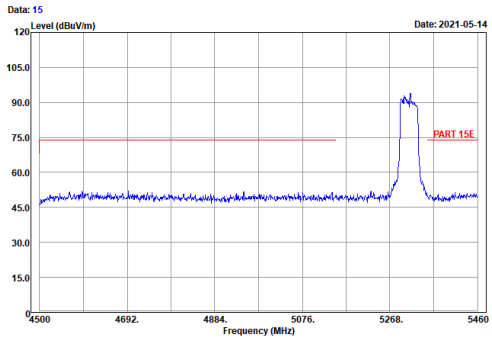
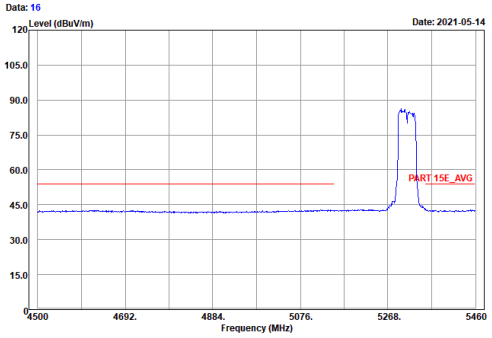
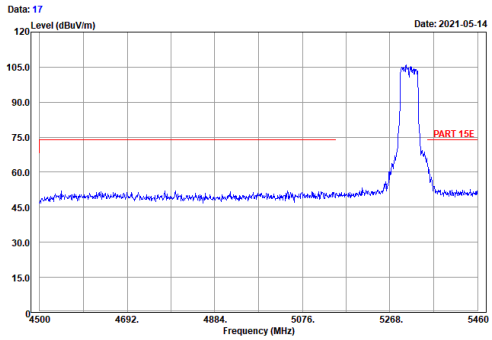
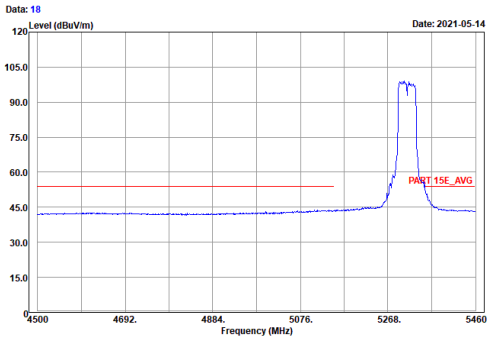
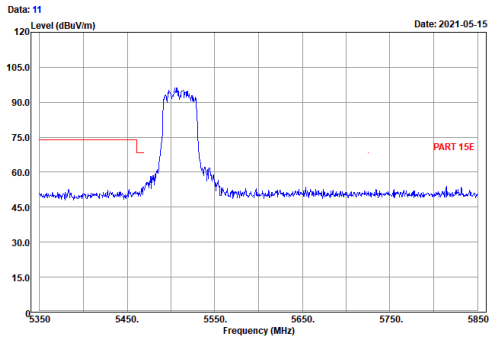
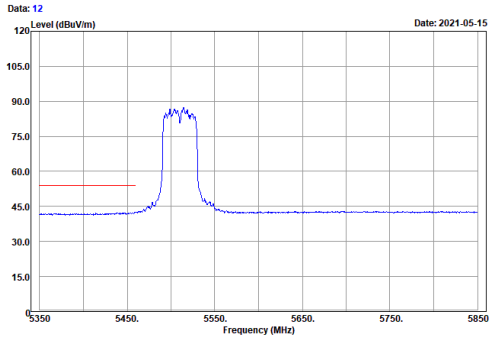
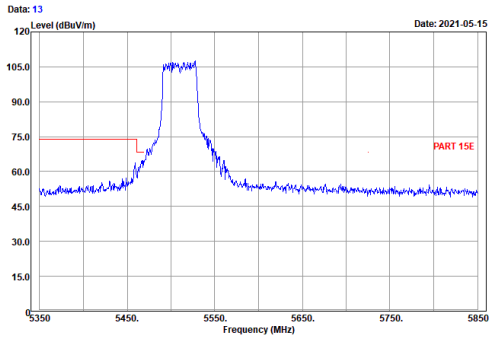
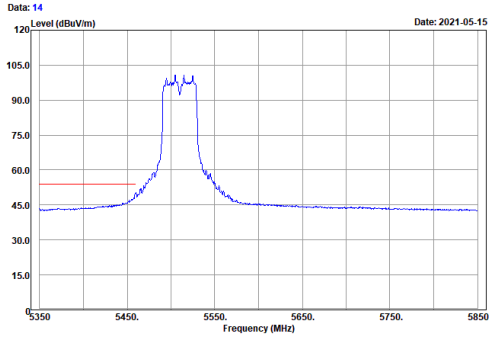
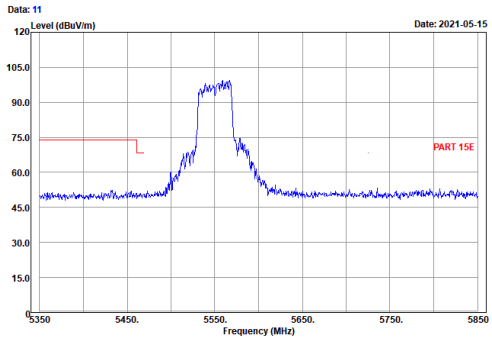
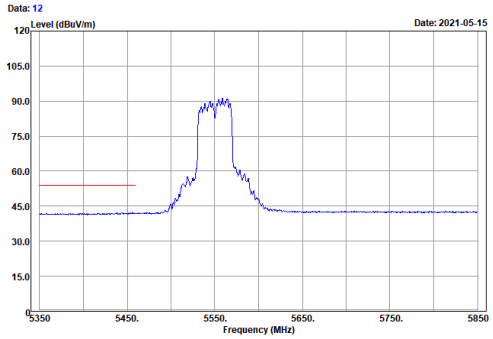
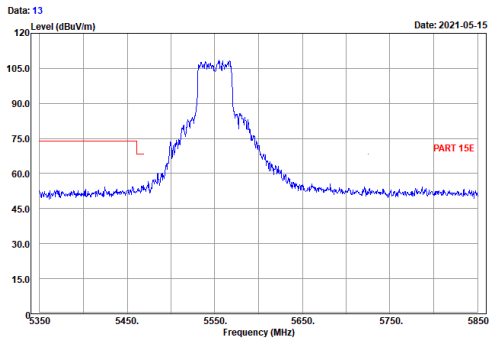
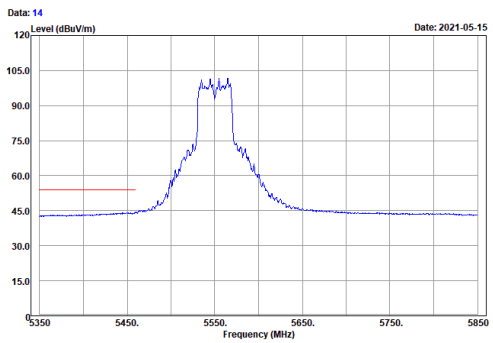
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

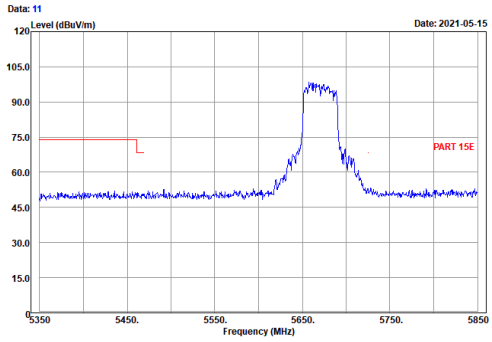
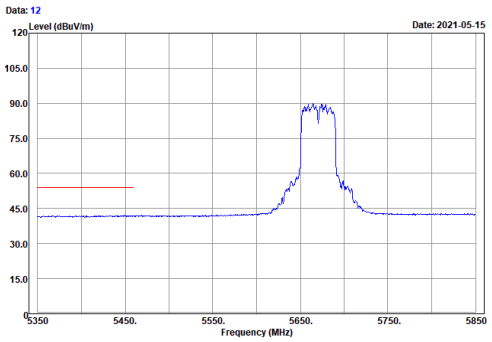
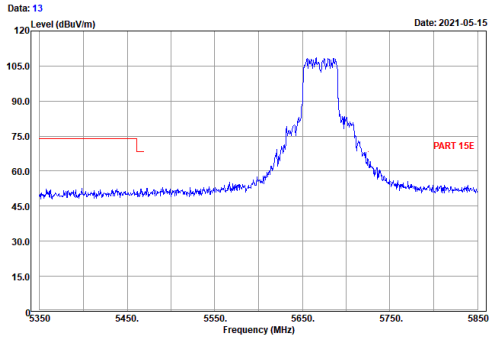
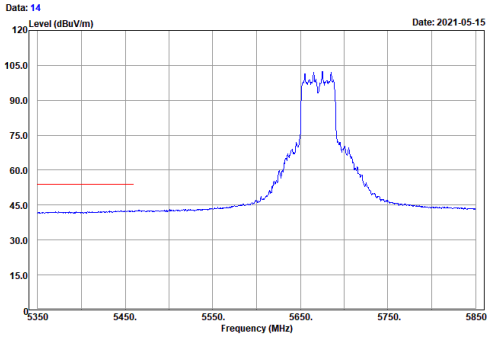
Channel 64	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 100	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Channel 116	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 140	
Horizontal (Peak)	Vertical (Peak)
	

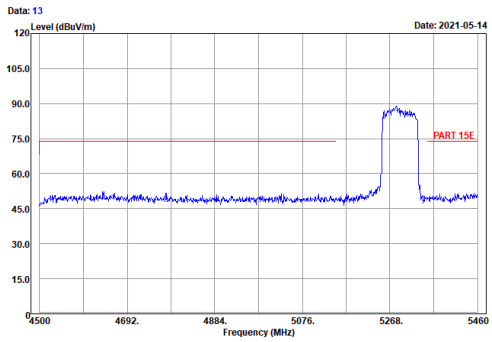
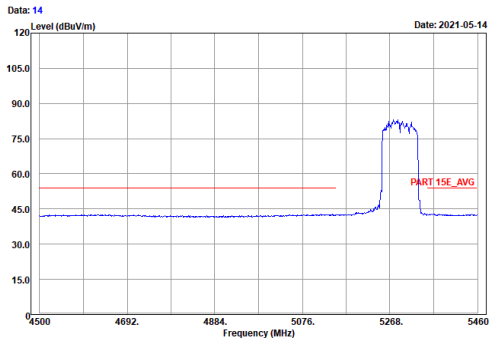
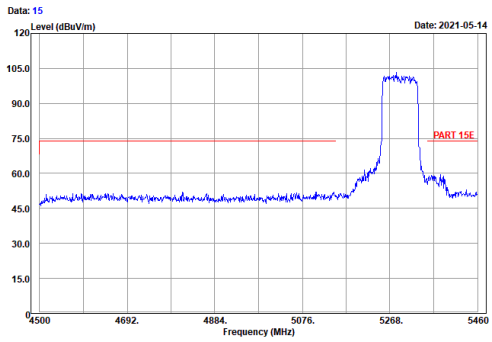
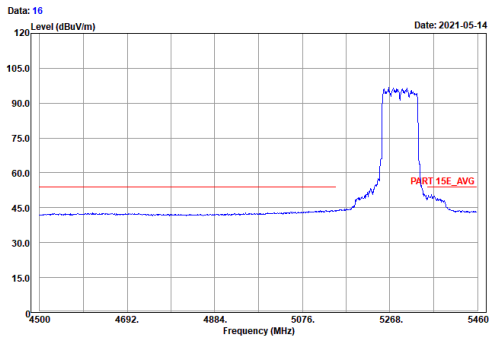
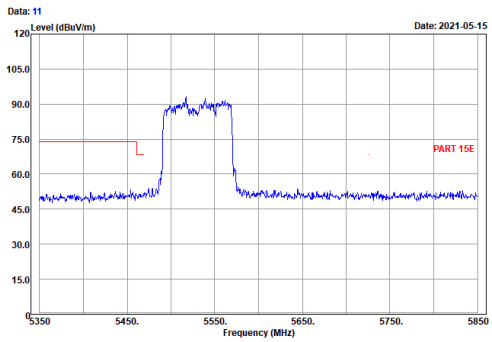
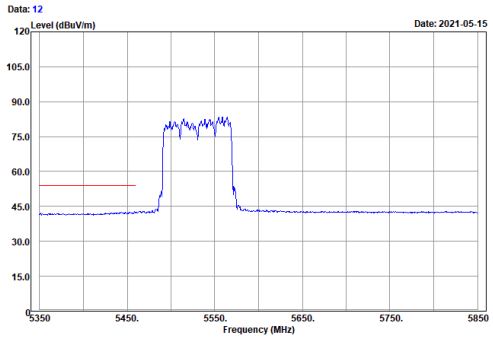
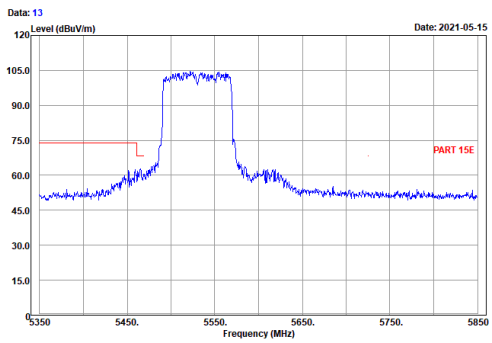
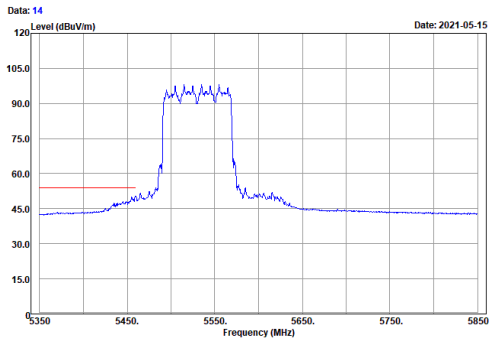
802.11ax (HE40)

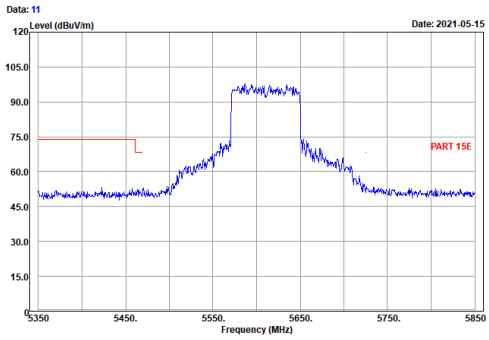
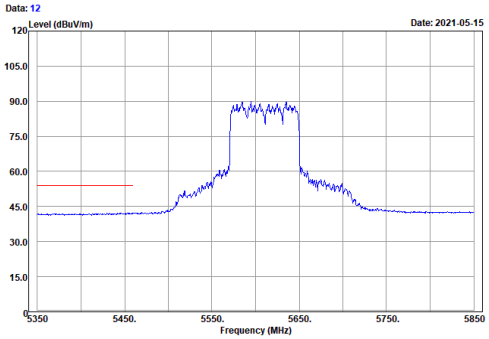
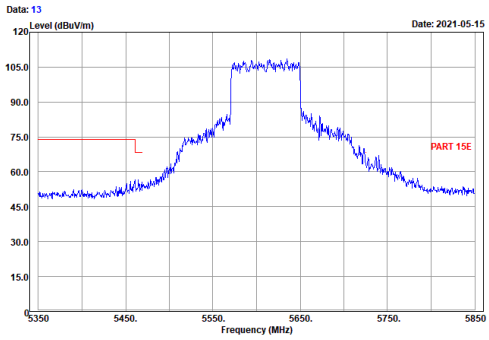
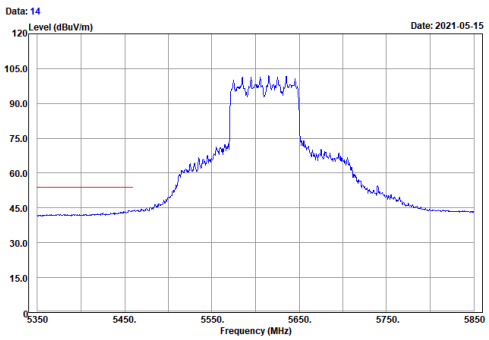
Channel 54	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 62	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Channel 102	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 110	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Channel 134	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ax (HE80)

Channel 58	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 106	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Channel 122	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

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 and approved 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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