

FCC RF Test Report

Report No.: FCC_RF_SL21022601-HAR-284_R1 INT ER 3B_5G

FCC ID: 2AHPN-BE2861

Model: R1 INT ER 3B MY22

Received Date: 3/15/2021

Test Date: 4/15/202-7/8/2021

Issued Date: 8/11/2021

Applicant: HARMAN INTERNATIONAL

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Manufacturer: HARMAN INTERNATIONAL

Address: 30001 Cabot Drive, Novi, MI 48377, USA

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FCC Test Site Reg No.: 540430



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Release Control Record

Issue No.	Description	Date Issued
FCC_RF_SL21022601-HAR-284_5G	Original release	7/9/2021
FCC_RF_SL21022601-HAR-284_R1 INT ER 3B_5G	Update Section 4.4	8/11/2021

1 Certificate of Conformity

Product: Automotive Infotainment Unit

Brand: HARMAN

Model: R1 INT ER 3B MY22

Sample Status: Final Product

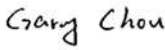
Applicant: HARMAN INTERNATIONAL

Test Date: 4/15/2021-7/8/2021

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
789033 D02 General UNII Test Procedures New Rules v02r01
ANSI C63.10:2013

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

Prepared by :  , **Date:** 08/11/2021
Jude Semana / Compliance Engineer

 , **Date:** 08/11/2021
Approved by : Gary Chou/ Engineer Reviewer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
Standard Section	Test Item	Result	Remarks
15.203	Antenna Requirement	Pass	Antenna connector is FAKRA. (The device is professionally installed)
15.407 (b)(6)	AC Power Conducted Emissions	N/A	N/A
15.407 (b)(1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit.
15.407 (a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
-	Occupied Bandwidth	Pass	Meet the requirement of limit.
15.407 (e)	6 dB Emission Bandwidth	Pass	Meet the requirement of limit. (U-NII-3 only)
15.407 (a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.

Note: The EUT is DC powered.

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	3.51dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	3.73dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.64dB
	6GHz ~ 18GHz	4.82dB
	18GHz ~ 40GHz	4.91dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Automotive Infotainment Unit
Brand	HARMAN
Test Model	R1 INT ER 3B MY22
Status of EUT	Final Product
Power Supply Rating	12Vdc
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 433Mbps
Operating Frequency	5180~5240MHz, 5745~5825MHz
Number of Channel	5180~5240MHz: 4 channels for 802.11a, 802.11n, 11ac (20MHz) 2 channels for 802.11n, 11ac (40MHz) 1 channel for 802.11ac (80MHz) 5745~5825MHz: 5 channels for 802.11a, 802.11n, 11ac (20MHz) 2 channels for 802.11n, 11ac (40MHz) 1 channel for 802.11ac (80MHz)
Antenna Type	Internal PCB Antenna 5180~5240MHz: 2.65dBi 5745~5825MHz: 1.51dBi
Antenna Connector	U.FL

Note:

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

Modulation Mode	Tx Function
802.11a	1TX
802.11n	1TX
802.11ac	1TX

3.2 Description of Operation Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac(20MHz):

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

2 channels are provided for, 802.11n (40MHz), 802.11ac (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channels are provided for, 802.11ac (80MHz):

Channel	Frequency	Channel	Frequency
38	5210 MHz	-	-

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz):

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

2 channels are provided for 802.11n (40MHz), 802.11ac(40MHz):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channels are provided for 802.11ac(80MHz):

Channel	Frequency	Channel	Frequency
155	5775MHz	--	--

Power setting is as below:

802.11a		802.11n, ac(20MHz)	
Channel	Power Setting	Channel	Power Setting
36	12	36	12
40	12	40	12
48	12	48	12
149	12	149	12
157	12	157	12
165	12	165	12
802.11n, ac(40MHz)		802.11ac(80MHz)	
Channel	Power Setting	Channel	Power Setting
38	12	38	12
46	12	155	12
151	12	48	12
159	12	-	-

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	-	√	Powered 12Vdc Battery

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz

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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK
-	802.11ac (VHT80)		42	42	OFDM	BPSK
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK
-	802.11ac (VHT80)		155	155	OFDM	BPSK

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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type
-	802.11a	5180-5320	36 to 64	40	OFDM	BPSK
-	802.11a	5745-5825	149 to 165	157	OFDM	BPSK

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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type
-	802.11a	5180-5320	36 to 64	62	OFDM	BPSK
-	802.11a	5745-5825	149 to 165	149	OFDM	BPSK

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	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK
-	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK
-	802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK
-	802.11ac (VHT80)		42	42	OFDM	BPSK
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK
-	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK
-	802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK
-	802.11ac (VHT80)		155	155	OFDM	BPSK

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	25deg. C, 65%RH	12Vdc	Jude Semana
RE<1G	25deg. C, 65%RH	12Vdc	Jude Semana
APCM	21deg. C, 60%RH	12Vdc	Jude Semana

3.3 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.	Laptop	Acer	Aspire 3	N/A	N/A	Provided by Lab

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB	1	1m	No	0	Connect from EUT to Laptop

3.3.1 Duty Cycle of Test Signal

MODULATION TYPE: BPSK

If Duty cycle of test signal is < 98 %, duty factor is required.

802.11a: Duty cycle = 73.54%

802.11n (HT20): Duty cycle = 73.51%

802.11n (HT40): Duty cycle = 60.45%

802.11ac (VHT20): Duty cycle = 74.01%

802.11ac (VHT40): Duty cycle = 61.83%

802.11ac (VHT80): Duty cycle = 50.06%



3.4 General Description of Applied Standard

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

47 CFR FCC Part 15, Subpart E (Section 15.407)

789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10:2013

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

4 Test Types and Results

4.1 Antenna Requirement

Spec	Requirement	Applicable
15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. Antenna requirement must meet at least one of the following: a) Antenna must be permanently attached to the device. b) The antenna must use a unique type of connector to attach to the device. c) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device.	☒
Remark	The EUT uses an Internal PCB antenna.	
Result	☒ PASS ☐ FAIL	

4.2 Radiated Emission and Bandedge Measurement

4.2.1 Limits of Radiated Emission 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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBµV/m)	AV:54 (dBµV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	☒ 15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK:105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK:122.2 (dBµV/m) ^{*4}
	☐ 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note:

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
EMI Receiver , Rohde and Schwarz	ESW44	1328.4100K-1016 62-MH	10/23/2020	10/23/2021
Biconilog Antenna , Sunol	JB6	A111717	9/4/2020	9/4/2021
Horn Antenna , ETS-Lindgren	3117	218554	7/24/2020	7/24/2021
Pre-Amplifier , RF-Lambda	RAMP00M50GA	18040300055	10/1/2020	10/1/2021
Spectrum Analyzer, Keysight	N9030B	MY57140100	07/22/2020	07/22/2022
Environmental Chamber, Micro Precision	Test Equity 1007H	61201	12/16/2020	12/16/2021

4.2.3 Test Procedure

For Radiated emission below 30MHz

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- 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.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

For Radiated emission above 30MHz

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- 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.
- The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets

average limit, measurement with the average detector is unnecessary.

Note:

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

For Band edge Measurement

789033 D02 General U-NII Test Procedures New Rules v02r01, II.F. Method SA-1

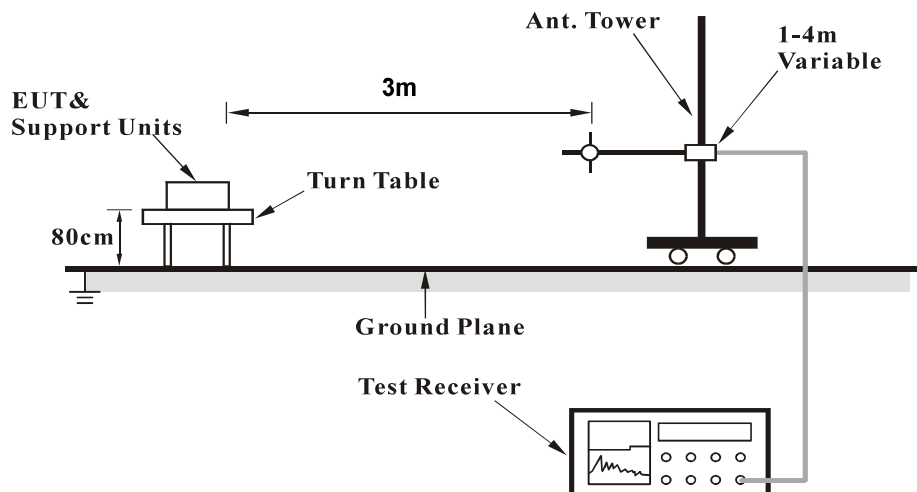
1. For average emissions measurements, follow the procedures described in section II.G.6., "Procedures for Average Unwanted Emissions Measurements above 1000 MHz", except for the following changes:
2. Set RBW=100 kHz
3. Set VBW=300 kHz
4. Perform a band-power integration across the 1 MHz bandwidth in which the band-edge emission level is to be measured.

4.2.4 Deviation from Test Standard

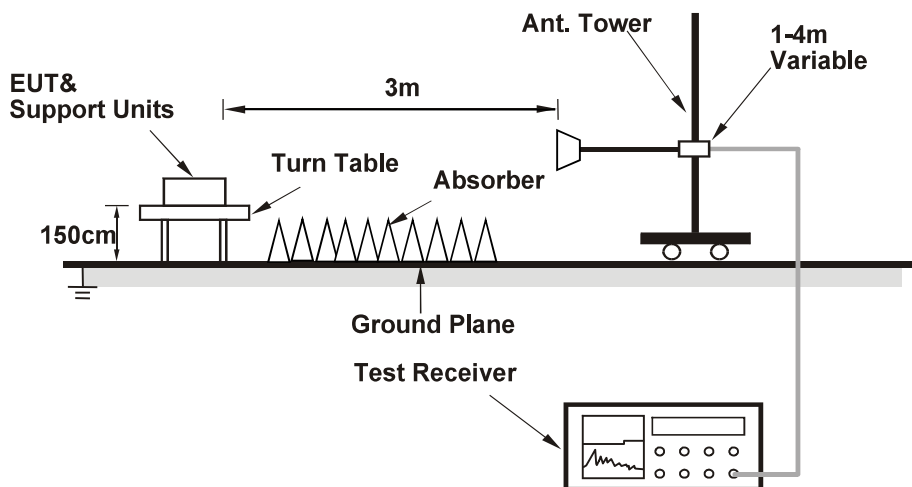
No deviation.

4.2.5 Test Setup

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).

4.2.6 EUT Operating Condition

- Placed the EUT on the testing table.
- Prepared notebooks to act as communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a USB cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the system in full functions.

4.2.7 Test Results

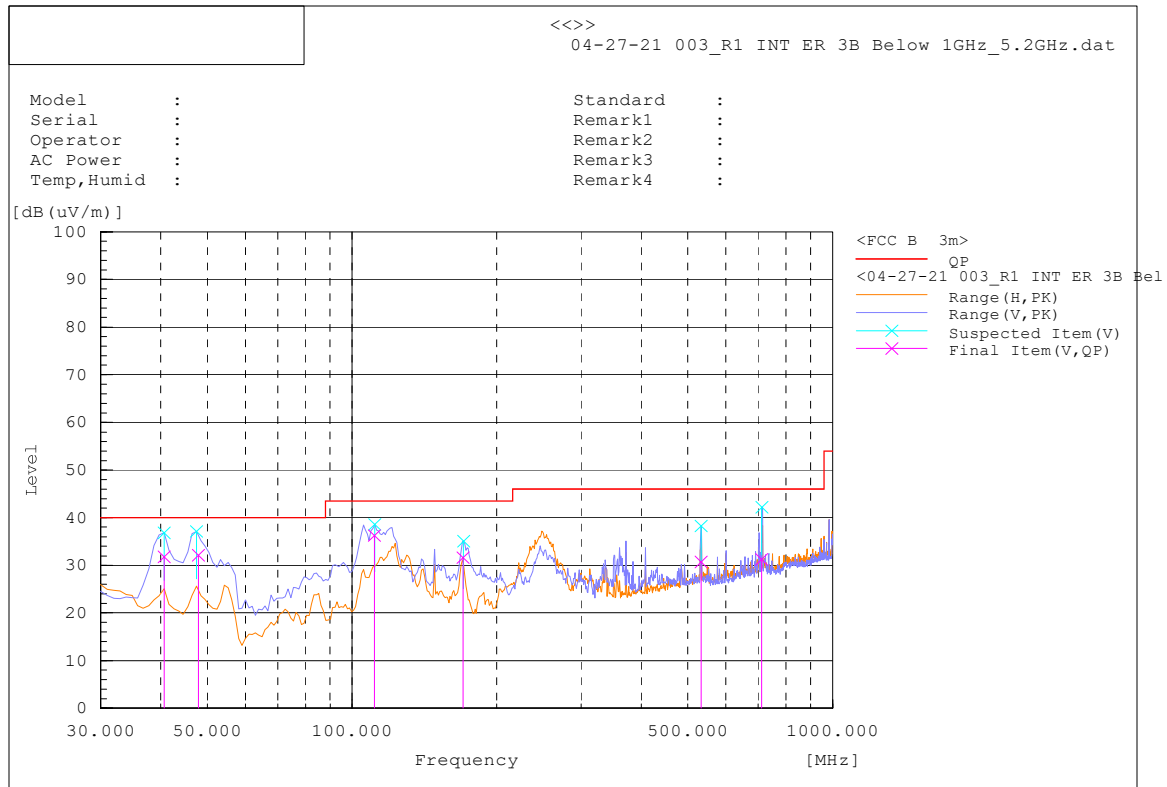
Below 1GHz Worst-Case Data:

CHANNEL	802.11a Channel 40	DETECTOR FUNCTION	Quasi Peak
FREQUENCY RANGE	30MHz – 1GHz		

Antenna Polarity & Test Distance: Vertical and Horizontal at 3m										
No.	Frequency (MHz)	Polarization (H/V)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit\QP dB(uV/m)	Margin QP [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	47.904	V	18.2	13.9	32.1	40	-7.9	114.1	209.5	Pass
2	111.37	V	17.6	18.7	36.3	43.5	-7.2	101.1	140.1	Pass
3	170.198	V	13	18.6	31.6	43.5	-11.9	100.6	338.7	Pass
4	711.89	V	3.1	28.1	31.2	46	-14.8	102.9	87.3	Pass
5	532.959	V	5.6	25.1	30.7	46	-15.3	103.1	60.8	Pass
6	40.675	V	13.8	18	31.8	40	-8.2	101.4	25.9	Pass

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Cable Loss (dB) + AF (dB)
2. AF (dB/m) = Antenna Factor (dB/m) – Preamplifier Gain (dB).
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)



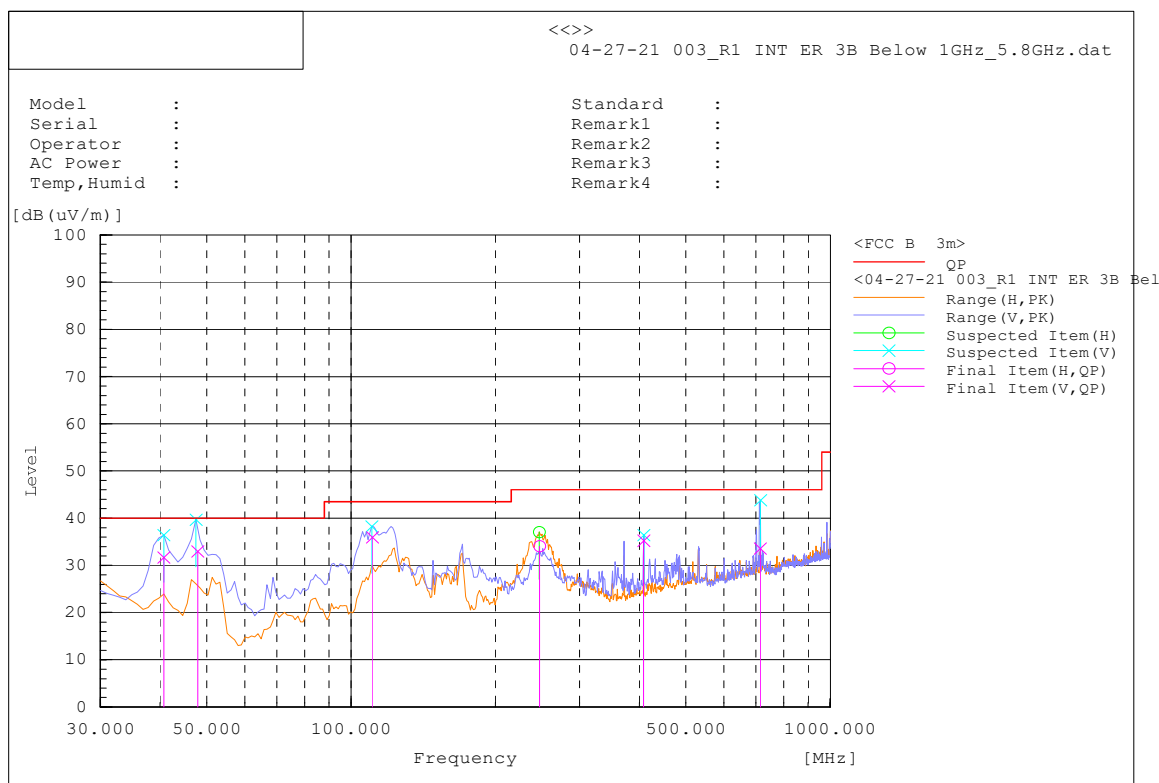
Below 1GHz Worst-Case Data:

CHANNEL	802.11a Channel 157	DETECTOR FUNCTION	Quasi Peak
FREQUENCY RANGE	30MHz – 1GHz		

Antenna Polarity & Test Distance: Vertical and Horizontal at 3m										
No.	Frequency (MHz)	Polarization (H/V)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	Limit\QP dB(uV/m)	Margin QP [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	47.867	V	19.1	13.9	33	40	-7	100.8	180.7	Pass
2	40.679	V	13.7	18	31.7	40	-8.3	112	7	Pass
3	110.816	V	17.4	18.6	36	43.5	-7.5	100.5	145.7	Pass
4	714.353	V	5.4	28.2	33.6	46	-12.4	104	0	Pass
5	247.678	H	15.7	18.3	34	46	-12	130.1	49.2	Pass
6	408.005	V	12.5	22.8	35.3	46	-10.7	100.3	357.1	Pass

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Cable Loss (dB) + AF (dB)
2. AF (dB/m) = Antenna Factor (dB/m) – Preamplifier Gain (dB).
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)



Above 1GHz Test Data:

1GHz-40GHz – 802.11a – 5180MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10361.97	V	41.9	5.1	Average	47	54	-7	100.5	126.1
3187.561	V	38.5	-9.4	Average	29.1	54	-24.9	106	207.9
6994.373	V	31.7	-1.3	Average	30.4	54	-23.6	200	65.5
10361.97	V	57.1	5.1	Peak	62.2	74	-11.8	100.5	126.1
3187.561	V	53	-9.4	Peak	43.6	74	-30.4	106	207.9
6994.373	V	43.5	-1.3	Peak	42.2	74	-31.8	200	65.5

1GHz-40GHz – 802.11a – 5200MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10399.59	H	43.4	5.2	Average	48.6	54	-5.4	200	96.2
3186.748	V	38.8	-9.4	Average	29.4	54	-24.6	109	189.6
6983.042	V	33	-1.3	Average	31.7	54	-22.3	127.1	38.2
10399.59	H	54.6	5.2	Peak	59.8	74	-14.2	200	96.2
3186.748	V	53.4	-9.4	Peak	44	74	-30	109	189.6
6983.042	V	43.7	-1.3	Peak	42.4	74	-31.6	127.1	38.2

1GHz-40GHz – 802.11a – 5240MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10482.02	V	45.3	5.3	Average	50.6	54	-3.4	100.1	40.4
2986.997	H	38.5	-10.3	Average	28.2	54	-25.8	135.6	165.1
6987.978	V	32.6	-1.3	Average	31.3	54	-22.7	200	51.5
10482.02	V	58.1	5.3	Peak	63.4	74	-10.6	100.1	40.4
2986.997	H	52.4	-10.3	Peak	42.1	74	-31.9	135.6	165.1
6987.978	V	43.5	-1.3	Peak	42.2	74	-31.8	200	51.5

1GHz-40GHz – 802.11n(HT20) – 5180MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10361.35	H	42.1	5.1	Average	47.2	54	-6.8	100.4	114.1
3193.364	V	39.1	-9.4	Average	29.7	54	-24.3	109.5	348.9
6969.093	V	32.5	-1.3	Average	31.2	54	-22.8	127	326.5
10361.35	H	54.8	5.1	Peak	59.9	74	-14.1	100.4	114.1
3193.364	V	51.8	-9.4	Peak	42.4	74	-31.6	109.5	348.9
6969.093	V	44	-1.3	Peak	42.7	74	-31.3	127	326.5

1GHz-40GHz – 802.11n(HT20) – 5200MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10395.85	H	42.6	5.2	Average	47.8	54	-6.2	119.7	81
3195.896	V	38.9	-9.4	Average	29.5	54	-24.5	145.1	192.6
5205.156	V	47.1	-5.6	Average	41.5	54	-12.5	105.3	356.9
10395.85	H	56.5	5.2	Peak	61.7	74	-12.3	119.7	81
3195.896	V	58.7	-9.4	Peak	49.3	74	-24.7	145.1	192.6
5205.156	V	57.8	-5.6	Peak	52.2	74	-21.8	105.3	356.9

1GHz-40GHz – 802.11n(HT20) – 5240MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10484.49	H	42.4	5.3	Average	47.7	54	-6.3	113.9	31.6
3199.715	V	38.6	-9.4	Average	29.2	54	-24.8	105.8	176.7
1757.838	V	43.2	-14.4	Average	28.8	54	-25.2	154.3	20.8
10484.49	H	56.6	5.3	Peak	61.9	74	-12.1	113.9	31.6
3199.715	V	52.9	-9.4	Peak	43.5	74	-30.5	105.8	176.7
1757.838	V	61.7	-14.4	Peak	47.3	74	-26.7	154.3	20.8

1GHz-40GHz – 802.11ac(VHT20) – 5180MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10366.09	H	39.2	5.1	Average	44.3	54	-9.7	154.8	314.7
2989.319	V	38.4	-10.3	Average	28.1	54	-25.9	105.2	68.4
3197.645	V	39.7	-9.4	Average	30.3	54	-23.7	120.4	236.9
10366.09	H	53.1	5.1	Peak	58.2	74	-15.8	154.8	314.7
2989.319	V	56	-10.3	Peak	45.7	74	-28.3	105.2	68.4
3197.645	V	53.3	-9.4	Peak	43.9	74	-30.1	120.4	236.9

1GHz-40GHz – 802.11ac(VHT20) – 5200MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10398.59	H	43	5.2	Average	48.2	54	-5.8	155.5	111.1
2997.422	V	39.7	-10.3	Average	29.4	54	-24.6	105.6	181.2
5201.332	V	43.6	-5.6	Average	38	54	-16	199	349.4
10398.59	H	56	5.2	Peak	61.2	74	-12.8	155.5	111.1
2997.422	V	64	-10.3	Peak	53.7	74	-20.3	105.6	181.2
5201.332	V	56.3	-5.6	Peak	50.7	74	-23.3	199	349.4

1GHz-40GHz – 802.11ac(VHT20) – 5240MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10476.74	H	42.6	5.3	Average	47.9	54	-6.1	100.6	80.9
5232.662	V	50.7	-5.5	Average	45.2	54	-8.8	100	1.9
2988.36	V	39.7	-10.3	Average	29.4	54	-24.6	163.3	0
10476.74	H	57.3	5.3	Peak	62.6	74	-11.4	100.6	80.9
5232.662	V	60.9	-5.5	Peak	55.4	74	-18.6	100	1.9
2988.36	V	59.5	-10.3	Peak	49.2	74	-24.8	163.3	0

1GHz-40GHz – 802.11n(HT40) – 5190MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10387.46	H	37.5	5.1	Average	42.6	54	-11.4	105.3	128.5
3191.437	V	39	-9.4	Average	29.6	54	-24.4	100	163.2
2131.22	V	41.4	-12.5	Average	28.9	54	-25.1	135.4	10.6
10387.46	H	50.1	5.1	Peak	55.2	74	-18.8	105.3	128.5
3191.437	V	51.3	-9.4	Peak	41.9	74	-32.1	100	163.2
2131.22	V	59.9	-12.5	Peak	47.4	74	-26.6	135.4	10.6

1GHz-40GHz – 802.11n(HT40) – 5230MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10467.5	H	37.3	5.3	Average	42.6	54	-11.4	108.7	315.5
5227.493	V	36.2	-5.5	Average	30.7	54	-23.3	200	139.9
1757.102	V	41.5	-14.4	Average	27.1	54	-26.9	121.9	295.9
10467.5	H	52	5.3	Peak	57.3	74	-16.7	108.7	315.5
5227.493	V	47.9	-5.5	Peak	42.4	74	-31.6	200	139.9
1757.102	V	57.8	-14.4	Peak	43.4	74	-30.6	121.9	295.9

1GHz-40GHz – 802.11ac(VHT40) – 5190MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10378.7	H	40.1	5.1	Average	45.2	54	-8.8	102.2	40.9
2988.238	V	38.6	-10.3	Average	28.3	54	-25.7	120.3	267.6
3200.157	H	37.7	-9.4	Average	28.3	54	-25.7	197.5	161.4
10378.7	H	51.6	5.1	Peak	56.7	74	-17.3	102.2	40.9
2988.238	V	51.1	-10.3	Peak	40.8	74	-33.2	120.3	267.6
3200.157	H	56.2	-9.4	Peak	46.8	74	-27.2	197.5	161.4

1GHz-40GHz – 802.11ac(VHT40) – 5230MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10458.33	H	38.7	5.3	Average	44	54	-10	199	109.8
2988.217	V	38.8	-10.3	Average	28.5	54	-25.5	102.2	252
5226.132	V	42	-5.5	Average	36.5	54	-17.5	126.8	63.5
10458.33	H	49.3	5.3	Peak	54.6	74	-19.4	199	109.8
2988.217	V	56.3	-10.3	Peak	46	74	-28	102.2	252
5226.132	V	55.7	-5.5	Peak	50.2	74	-23.8	126.8	63.5

1GHz-40GHz – 802.11ac(VHT80) – 5210MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
10436.15	H	35.6	5.3	Average	40.9	54	-13.1	119.6	86.1
3192.624	V	39.3	-9.4	Average	29.9	54	-24.1	164	258.2
2124.851	V	43.8	-12.5	Average	31.3	54	-22.7	190	201.3
10436.15	H	50.8	5.3	Peak	56.1	74	-17.9	119.6	86.1
3192.624	V	58.4	-9.4	Peak	49	74	-25	164	258.2
2124.851	V	61.6	-12.5	Peak	49.1	74	-24.9	190	201.3

1GHz-40GHz – 802.11a – 5745MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11490.11	H	42.9	6.1	Average	49	54	-5	102	80.7
5748.138	H	49.3	-4.2	Average	45.1	54	-8.9	102.1	64.4
2127.93	V	43.7	-12.5	Average	31.2	54	-22.8	174.1	4.2
11490.11	H	55.7	6.1	Peak	61.8	74	-12.2	102	80.7
5748.138	H	59.1	-4.2	Peak	54.9	74	-19.1	102.1	64.4
2127.93	V	64.8	-12.5	Peak	52.3	74	-21.7	174.1	4.2

1GHz-40GHz – 802.11a – 5785MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
5782.769	H	53.6	-4.1	Average	49.5	54	-4.5	152.1	48.8
11572.21	H	41.3	6.2	Average	47.5	54	-6.5	107.6	326.8
2987.946	V	39.6	-10.3	Average	29.3	54	-24.7	196.7	264.2
5782.769	H	63.5	-4.1	Peak	59.4	74	-14.6	152.1	48.8
11572.21	H	55.1	6.2	Peak	61.3	74	-12.7	107.6	326.8
2987.946	V	53.6	-10.3	Peak	43.3	74	-30.7	196.7	264.2

1GHz-40GHz – 802.11a – 5825MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11648.11	H	41.6	6.2	Average	47.8	54	-6.2	104.3	77.2
5823.315	H	52.5	-4	Average	48.5	54	-5.5	144	49
2989.76	H	38.7	-10.3	Average	28.4	54	-25.6	152.4	63.8
11648.11	H	55.3	6.2	Peak	61.5	74	-12.5	104.3	77.2
5823.315	H	62.3	-4	Peak	58.3	74	-15.7	144	49
2989.76	H	57.3	-10.3	Peak	47	74	-27	152.4	63.8

1GHz-40GHz – 802.11n(HT20) – 5745MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
2991.067	H	39	-10.3	Average	28.7	54	-25.3	153.8	264
5742.692	H	42.9	-4.2	Average	38.7	54	-15.3	200	0
11488.02	H	38.4	6.1	Average	44.5	54	-9.5	116.4	324.2
2991.067	H	56	-10.3	Peak	45.7	74	-28.3	153.8	264
5742.692	H	54.8	-4.2	Peak	50.6	74	-23.4	200	0
11488.02	H	52.5	6.1	Peak	58.6	74	-15.4	116.4	324.2

1GHz-40GHz – 802.11n(HT20) – 5785MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11567.16	H	39.5	6.2	Average	45.7	54	-8.3	100.7	319.6
1758.477	V	42.2	-14.4	Average	27.8	54	-26.2	107.7	0
2123.699	V	43.2	-12.5	Average	30.7	54	-23.3	154.7	347.7
11567.16	H	52.7	6.2	Peak	58.9	74	-15.1	100.7	319.6
1758.477	V	63.5	-14.4	Peak	49.1	74	-24.9	107.7	0
2123.699	V	58.8	-12.5	Peak	46.3	74	-27.7	154.7	347.7

1GHz-40GHz – 802.11n(HT20) – 5825MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11651.27	V	36.7	6.2	Average	42.9	54	-11.1	128.8	11.8
2130.569	V	45.5	-12.5	Average	33	54	-21	173.3	217.7
2994.034	V	38	-10.3	Average	27.7	54	-26.3	195.6	338.5
11651.27	V	49.1	6.2	Peak	55.3	74	-18.7	128.8	11.8
2130.569	V	62.7	-12.5	Peak	50.2	74	-23.8	173.3	217.7
2994.034	V	52.9	-10.3	Peak	42.6	74	-31.4	195.6	338.5

1GHz-40GHz – 802.11ac(VHT20) – 5745MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11491.25	V	37.2	6.1	Average	43.3	54	-10.7	128.9	47.5
2130.262	V	47.1	-12.5	Average	34.6	54	-19.4	195.4	176.1
1757.599	V	41.5	-14.4	Average	27.1	54	-26.9	112.4	321.8
11491.25	V	50	6.1	Peak	56.1	74	-17.9	128.9	47.5
2130.262	V	66.7	-12.5	Peak	54.2	74	-19.8	195.4	176.1
1757.599	V	53.5	-14.4	Peak	39.1	74	-34.9	112.4	321.8

1GHz-40GHz – 802.11ac(VHT20) – 5785MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11568.47	V	38	6.2	Average	44.2	54	-9.8	107.6	40.3
1758.594	V	42	-14.4	Average	27.6	54	-26.4	102.1	0
2446.911	H	41.9	-11.4	Average	30.5	54	-23.5	116.4	341.2
11568.47	V	51.4	6.2	Peak	57.6	74	-16.4	107.6	40.3
1758.594	V	65.5	-14.4	Peak	51.1	74	-22.9	102.1	0
2446.911	H	54	-11.4	Peak	42.6	74	-31.4	116.4	341.2

1GHz-40GHz – 802.11ac(VHT20) – 5825MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11648.75	H	38.8	6.2	Average	45	54	-9	116.5	323.5
2990.595	V	39.2	-10.3	Average	28.9	54	-25.1	170.5	11.9
2444.181	H	43.9	-11.4	Average	32.5	54	-21.5	138.3	174.2
11648.75	H	52.5	6.2	Peak	58.7	74	-15.3	116.5	323.5
2990.595	V	59.6	-10.3	Peak	49.3	74	-24.7	170.5	11.9
2444.181	H	54	-11.4	Peak	42.6	74	-31.4	138.3	174.2

1GHz-40GHz – 802.11n(HT40) – 5755MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11508.54	H	35	6.1	Average	41.1	54	-12.9	104.4	298.7
1757.704	V	41.4	-14.4	Average	27	54	-27	111.8	41
2124.075	V	44.6	-12.5	Average	32.1	54	-21.9	102.3	194.2
11508.54	H	48.2	6.1	Peak	54.3	74	-19.7	104.4	298.7
1757.704	V	64.2	-14.4	Peak	49.8	74	-24.2	111.8	41
2124.075	V	63.7	-12.5	Peak	51.2	74	-22.8	102.3	194.2

1GHz-40GHz – 802.11n(HT40)– 5795MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11588.77	H	37.1	6.2	Average	43.3	54	-10.7	136.1	81.5
1758.355	V	42.9	-14.4	Average	28.5	54	-25.5	122.3	26.3
2402.3	H	41.6	-11.6	Average	30	54	-24	192.2	0
11588.77	H	48	6.2	Peak	54.2	74	-19.8	136.1	81.5
1758.355	V	66.8	-14.4	Peak	52.4	74	-21.6	122.3	26.3
2402.3	H	62.4	-11.6	Peak	50.8	74	-23.2	192.2	0

1GHz-40GHz – 802.11ac(VHT40) – 5755MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11508.71	V	37	6.1	Average	43.1	54	-10.9	100	42.3
2456.408	H	42.4	-11.3	Average	31.1	54	-22.9	194.8	287.1
2988.544	H	38.4	-10.3	Average	28.1	54	-25.9	107.9	123.2
11508.71	V	49.3	6.1	Peak	55.4	74	-18.6	100	42.3
2456.408	H	71.2	-11.3	Peak	59.9	74	-14.1	194.8	287.1
2988.544	H	58	-10.3	Peak	47.7	74	-26.3	107.9	123.2

1GHz-40GHz – 802.11ac(VHT40) – 5795MHz

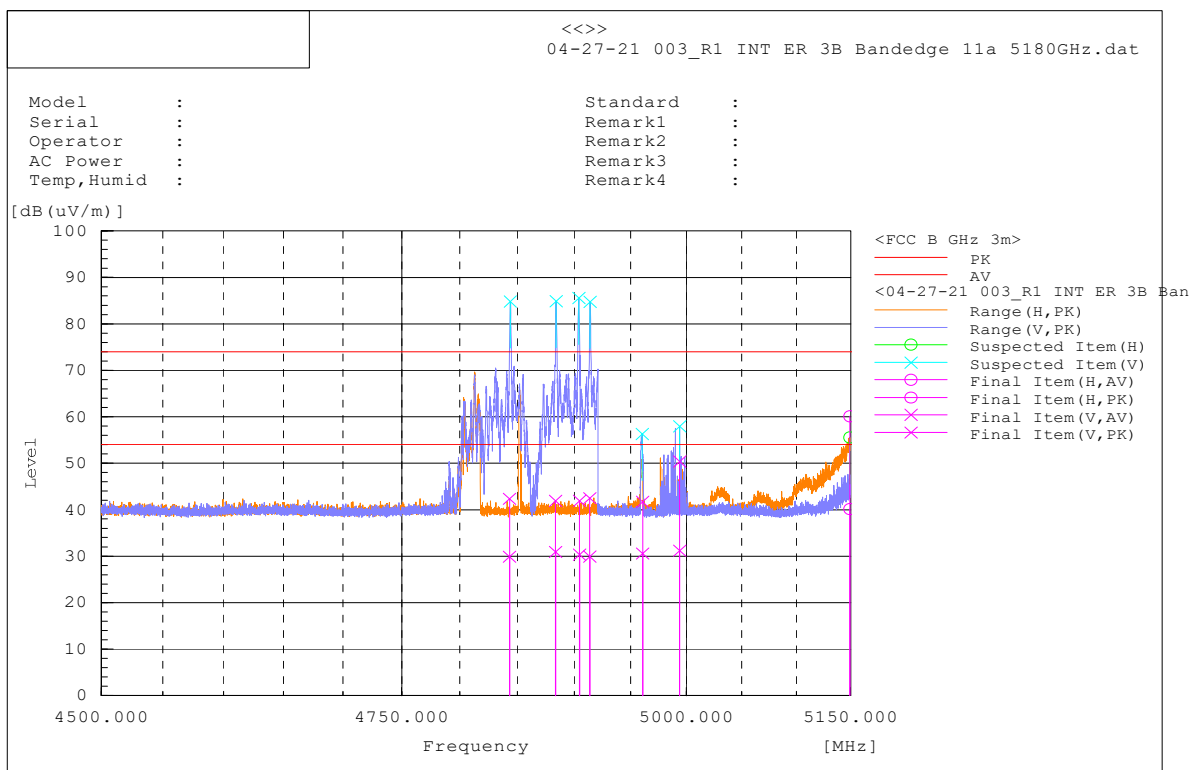
ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11601.24	V	34.8	6.2	Average	41	54	-13	100.1	57.1
1757.479	V	42.3	-14.4	Average	27.9	54	-26.1	104.3	138.8
2401.373	H	38.5	-11.6	Average	26.9	54	-27.1	108.5	232.7
11601.24	V	47.6	6.2	Peak	53.8	74	-20.2	100.1	57.1
1757.479	V	62	-14.4	Peak	47.6	74	-26.4	104.3	138.8
2401.373	H	63.7	-11.6	Peak	52.1	74	-21.9	108.5	232.7

1GHz-40GHz – 802.11ac(VHT80) – 5775MHz

ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
11566.79	H	30.9	6.2	Average	37.1	54	-16.9	107.3	36.5
2401.299	H	39.6	-11.6	Average	28	54	-26	100.4	146.8
2986.712	H	39.1	-10.3	Average	28.8	54	-25.2	104.5	31.8
11566.79	H	45.7	6.2	Peak	51.9	74	-22.1	107.3	36.5
2401.299	H	51.6	-11.6	Peak	40	74	-34	100.4	146.8
2986.712	H	58.3	-10.3	Peak	48	74	-26	104.5	31.8

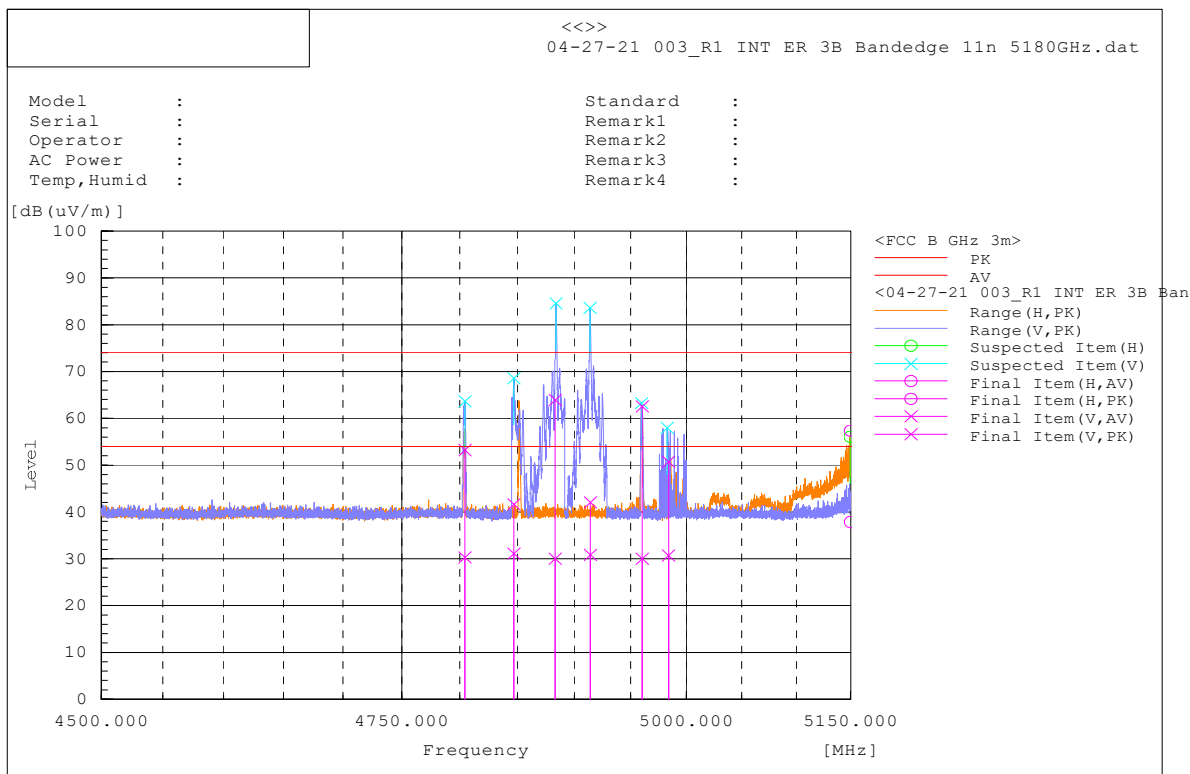
RESTRICTED BAND Test Plots

802.11a – 5180MHz



ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
4843.388	V	35.9	-6	Average	29.9	54	-24.1	100.5	342.1
4883.53	V	36.9	-6	Average	30.9	54	-23.1	138.5	204.2
4904.762	V	36.4	-6	Average	30.4	54	-23.6	115.7	348.3
4913.778	V	35.9	-5.9	Average	30	54	-24	195.2	186.5
5149.329	H	45.9	-5.7	Average	40.2	54	-13.8	143.8	20.7
4960.845	V	36.5	-5.9	Average	30.6	54	-23.4	137.6	297.8
4994.052	V	37.1	-5.8	Average	31.3	54	-22.7	128.9	154.5
4843.388	V	48.4	-6	Peak	42.4	74	-31.6	100.5	342.1
4883.53	V	47.9	-6	Peak	41.9	74	-32.1	138.5	204.2
4904.762	V	47.9	-6	Peak	41.9	74	-32.1	115.7	348.3
4913.778	V	48.4	-5.9	Peak	42.5	74	-31.5	195.2	186.5
5149.329	H	65.8	-5.7	Peak	60.1	74	-13.9	143.8	20.7
4960.845	V	47.6	-5.9	Peak	41.7	74	-32.3	137.6	297.8
4994.052	V	56.2	-5.8	Peak	50.4	74	-23.6	128.9	154.5

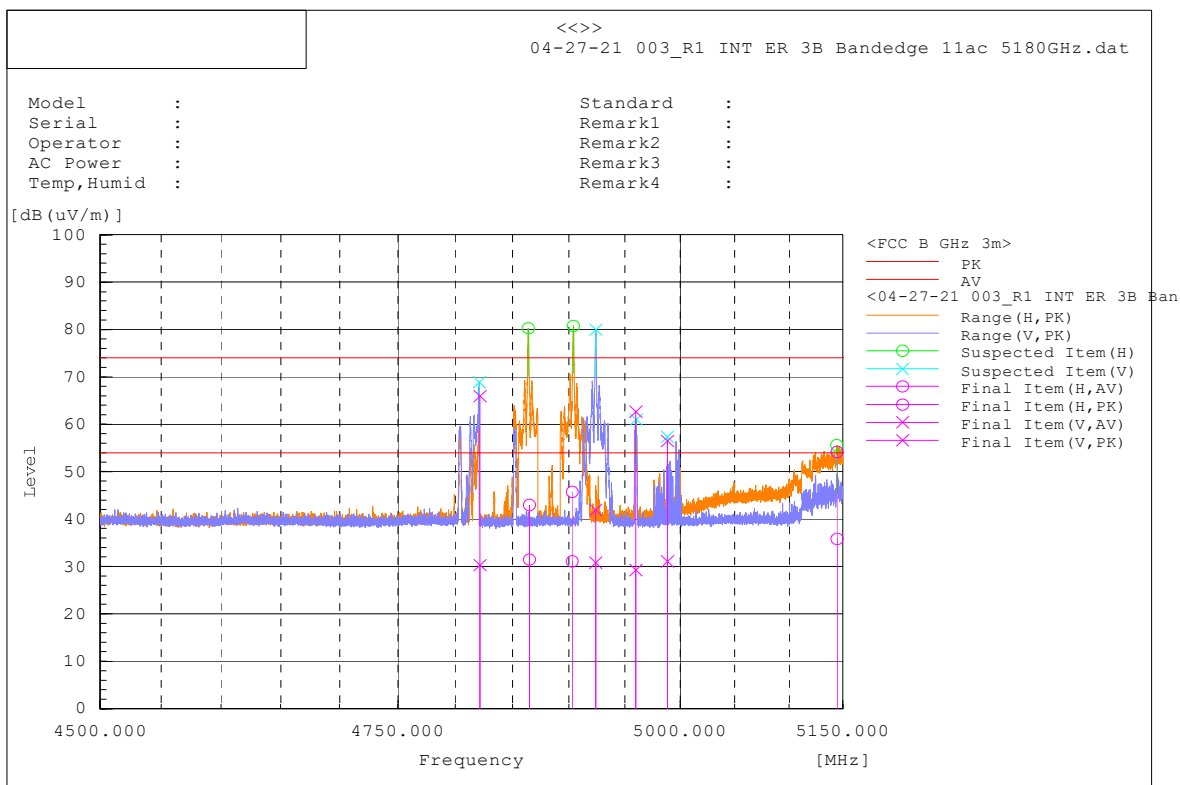
RESTRICTED BAND 802.11n(HT20) – 5180MHz



ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
5149.966	H	43.6	-5.7	Average	37.9	54	-16.1	118.3	358.2
4804.367	V	36.3	-6	Average	30.3	54	-23.7	195.2	33.1
4847.001	V	37.1	-6	Average	31.1	54	-22.9	128.5	332.5
4883.009	V	36	-6	Average	30	54	-24	130.9	158.5
4914.231	V	36.8	-5.9	Average	30.9	54	-23.1	112.9	173.6
4960.305	V	35.9	-5.9	Average	30	54	-24	146.9	288.4
4983.871	V	36.5	-5.8	Average	30.7	54	-23.3	195.1	128.1
5149.966	H	63.1	-5.7	Peak	57.4	74	-16.6	118.3	358.2
4804.367	V	59.3	-6	Peak	53.3	74	-20.7	195.2	33.1
4847.001	V	47.7	-6	Peak	41.7	74	-32.3	128.5	332.5
4883.009	V	70	-6	Peak	64	74	-10	130.9	158.5
4914.231	V	48	-5.9	Peak	42.1	74	-31.9	112.9	173.6
4960.305	V	68.5	-5.9	Peak	62.6	74	-11.4	146.9	288.4
4983.871	V	56.6	-5.8	Peak	50.8	74	-23.2	195.1	128.1

RESTRICTED BAND

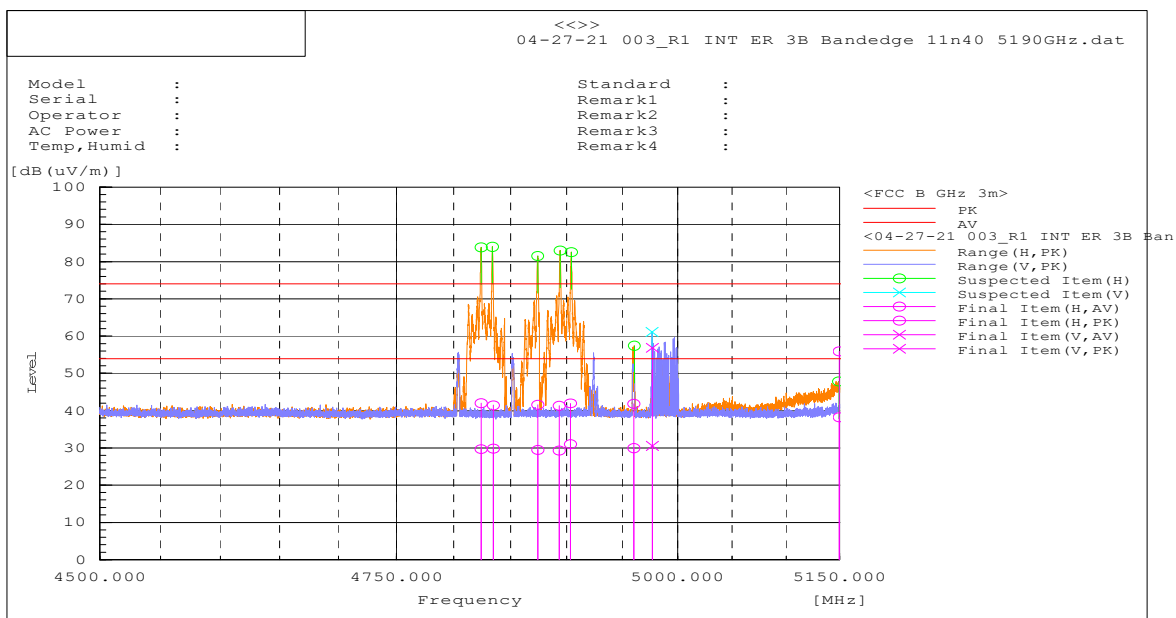
802.11ac(VHT20) – 5180MHz



ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
4821.393	V	36.3	-6	Average	30.3	54	-23.7	144.1	317
4923.885	V	36.7	-5.9	Average	30.8	54	-23.2	214.9	140.5
4959.945	V	35.1	-5.9	Average	29.2	54	-24.8	192.3	262.8
4988.448	V	36.9	-5.8	Average	31.1	54	-22.9	116.4	193.4
4864.954	H	37.4	-6	Average	31.4	54	-22.6	105.1	326.7
4902.895	H	37.1	-6	Average	31.1	54	-22.9	195.3	348.5
5144.641	H	41.5	-5.7	Average	35.8	54	-18.2	135.9	326.8
4821.393	V	71.9	-6	Peak	65.9	74	-8.1	144.1	317
4923.885	V	47.8	-5.9	Peak	41.9	74	-32.1	214.9	140.5
4959.945	V	68.6	-5.9	Peak	62.7	74	-11.3	192.3	262.8
4988.448	V	62.3	-5.8	Peak	56.5	74	-17.5	116.4	193.4
4864.954	H	49	-6	Peak	43	74	-31	105.1	326.7
4902.895	H	51.7	-6	Peak	45.7	74	-28.3	195.3	348.5
5144.641	H	59.9	-5.7	Peak	54.2	74	-19.8	135.9	326.8

RESTRICTED BAND

802.11n(HT40) – 5190MHz

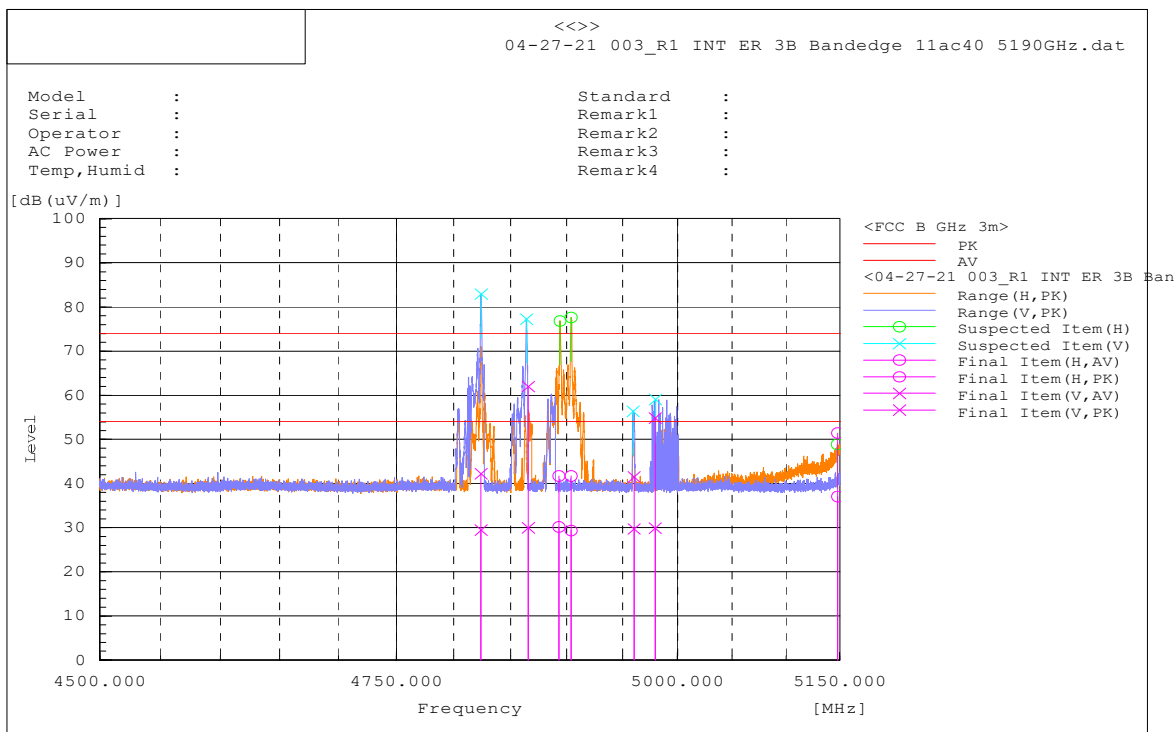


ANTENNA POLARITY & test distance: HORIZONTAL & Vertical at 3 m

Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
4824.056	H	35.7	-6	Average	29.7	54	-24.3	100	10.6
4834.865	H	35.9	-6	Average	29.9	54	-24.1	184.7	311.3
4874.198	H	35.5	-6	Average	29.5	54	-24.5	163.3	353.3
4893.23	H	35.3	-6	Average	29.3	54	-24.7	214.9	85.9
4903.386	H	37	-6	Average	31	54	-23	111.5	158.4
4960.262	H	35.8	-5.9	Average	29.9	54	-24.1	155.2	271.6
4977.106	V	36.5	-5.9	Average	30.6	54	-23.4	100	289
5149.5	H	43.9	-5.7	Peak	38.2	54	-15.8	173.8	144.1
4824.056	H	48	-6	Peak	42	74	-32	100	10.6
4834.865	H	47.5	-6	Peak	41.5	74	-32.5	184.7	311.3
4874.198	H	47.6	-6	Peak	41.6	74	-32.4	163.3	353.3
4893.23	H	47.3	-6	Peak	41.3	74	-32.7	214.9	85.9
4903.386	H	48	-6	Peak	42	74	-32	111.5	158.4
4960.262	H	47.8	-5.9	Peak	41.9	74	-32.1	155.2	271.6

RESTRICTED BAND

802.11ac(VHT40) – 5190MHz

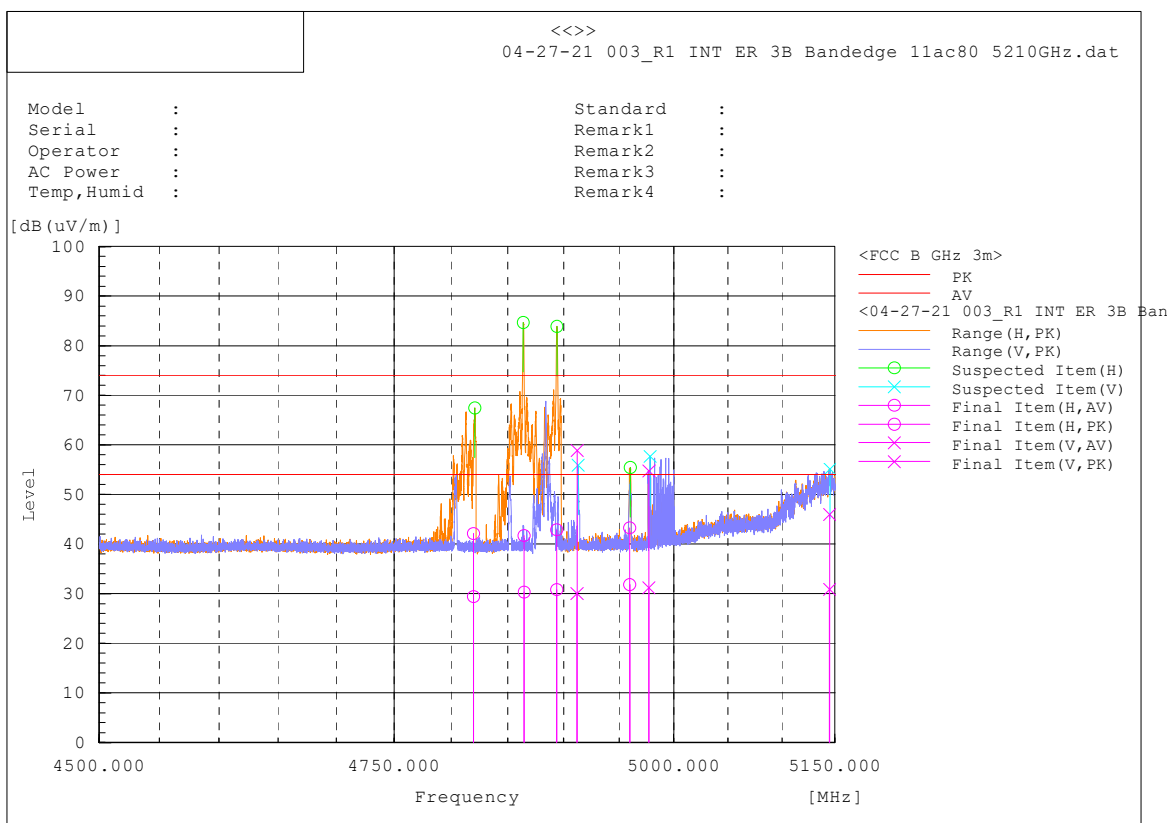


ANTENNA POLARITY & test distance: HORIZONTAL & Vertical at 3 m

Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
4893.007	H	36.2	-6	Average	30.2	54	-23.8	146	294.1
4904.035	H	35.3	-6	Average	29.3	54	-24.7	137.9	0
5148.001	H	42.7	-5.7	Average	37	54	-17	100	181.4
4823.763	V	35.4	-6	Average	29.4	54	-24.6	162.3	278.2
4865.593	V	36	-6	Average	30	54	-24	188.3	260.2
4960.283	V	35.6	-5.9	Average	29.7	54	-24.3	400	14.6
4979.464	V	35.8	-5.9	Average	29.9	54	-24.1	113.1	91.3
4893.007	H	47.7	-6	Peak	41.7	74	-32.3	146	294.1
4904.035	H	47.7	-6	Peak	41.7	74	-32.3	137.9	0
5148.001	H	57.1	-5.7	Peak	51.4	74	-22.6	100	181.4
4823.763	V	48.2	-6	Peak	42.2	74	-31.8	162.3	278.2
4865.593	V	68	-6	Peak	62	74	-12	188.3	260.2
4960.283	V	47.4	-5.9	Peak	41.5	74	-32.5	400	14.6
4979.464	V	60.8	-5.9	Peak	54.9	74	-19.1	113.1	91.3

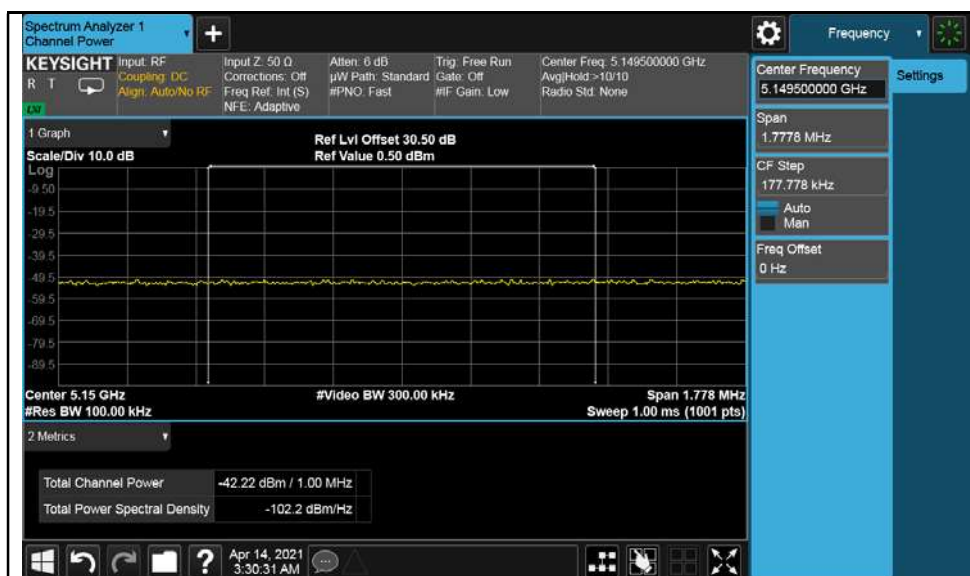
RESTRICTED BAND

802.11n(VHT80) – 5210MHz

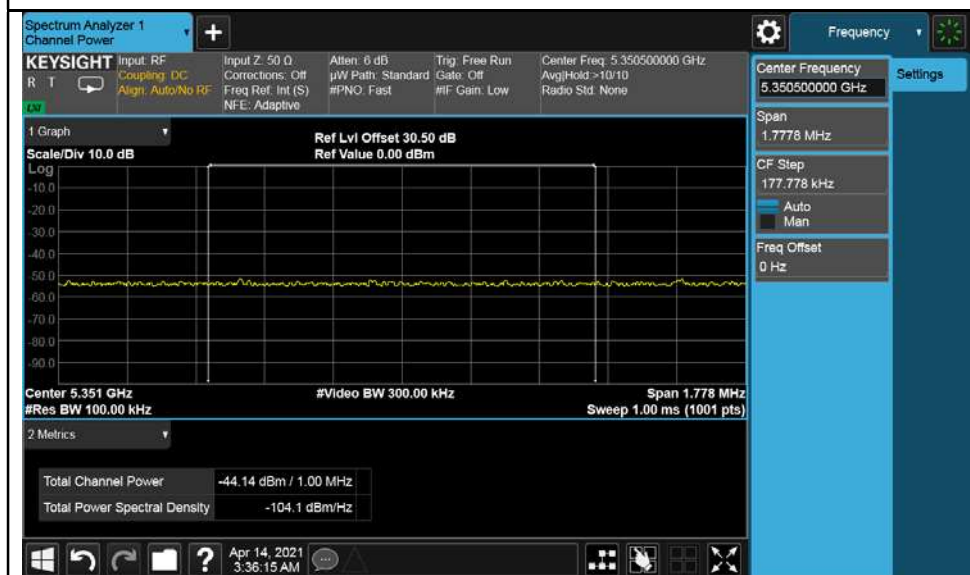


ANTENNA POLARITY & test distance: HORIZONTAL& Vertical at 3 m									
Frequency [MHz]	Pol	Reading [dB(uV)]	Factor [dB(1/m)]	Measurement Type	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]
4819.637	H	35.4	-6	Average	29.4	54	-24.6	107.7	313.7
4864.653	H	36.3	-6	Average	30.3	54	-23.7	102	60.7
4893.849	H	36.8	-6	Average	30.8	54	-23.2	114.5	167.4
4959.7	H	37.7	-5.9	Average	31.8	54	-22.2	143.9	153.5
4912.009	V	35.9	-5.9	Average	30	54	-24	213.6	224.6
4977.081	V	37.1	-5.9	Average	31.2	54	-22.8	111.4	329
5144.819	V	36.6	-5.7	Average	30.9	54	-23.1	214.2	218
4819.637	H	48.1	-6	Peak	42.1	74	-31.9	107.7	313.7
4864.653	H	47.7	-6	Peak	41.7	74	-32.3	102	60.7
4893.849	H	48.9	-6	Peak	42.9	74	-31.1	114.5	167.4
4959.7	H	49.1	-5.9	Peak	43.2	74	-30.8	143.9	153.5
4912.009	V	64.7	-5.9	Peak	58.8	74	-15.2	213.6	224.6
4977.081	V	60.6	-5.9	Peak	54.7	74	-19.3	111.4	329
5144.819	V	51.7	-5.7	Peak	46	74	-28	214.2	218

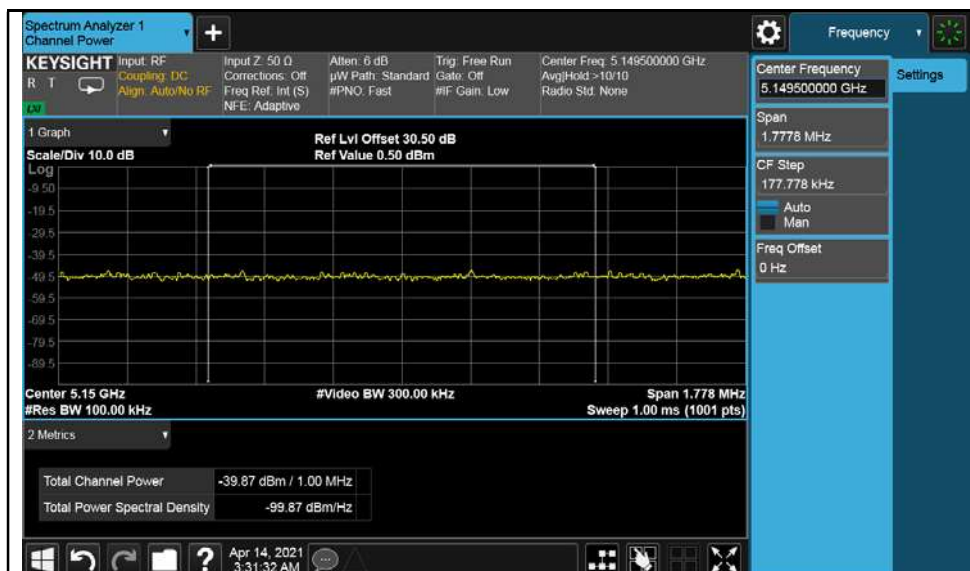
Band Edge Test Plots for U-NII-1 Band:



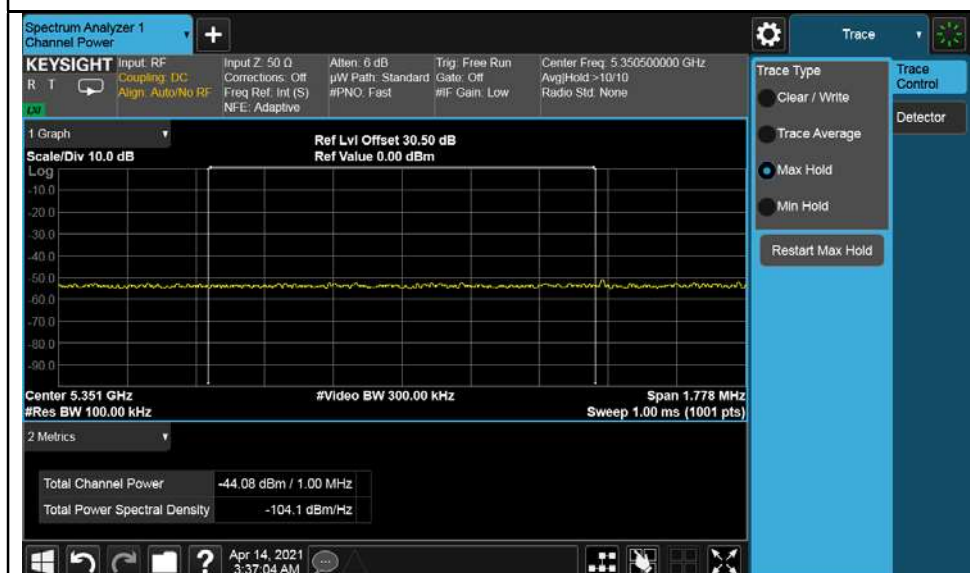
802.11a-5180MHz



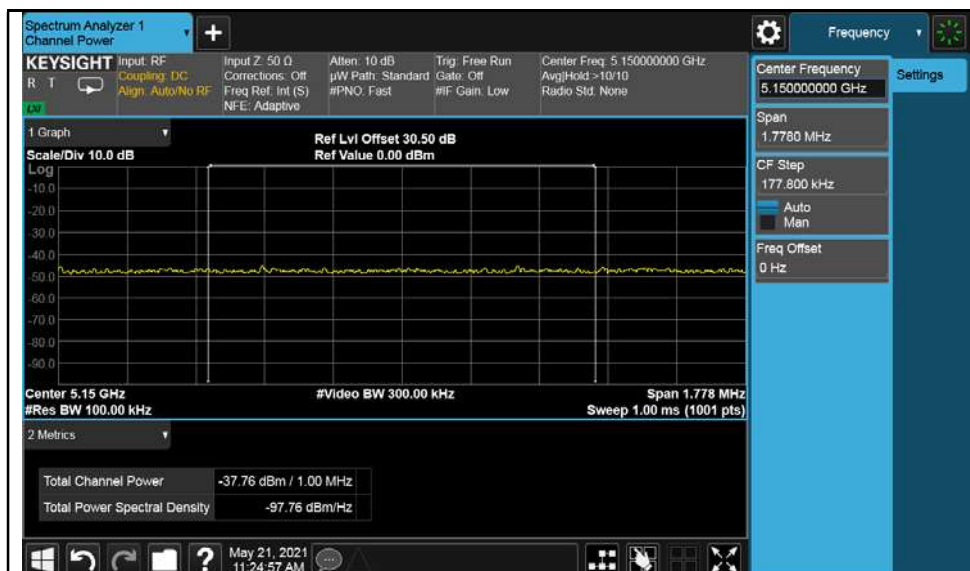
802.11a-5240MHz



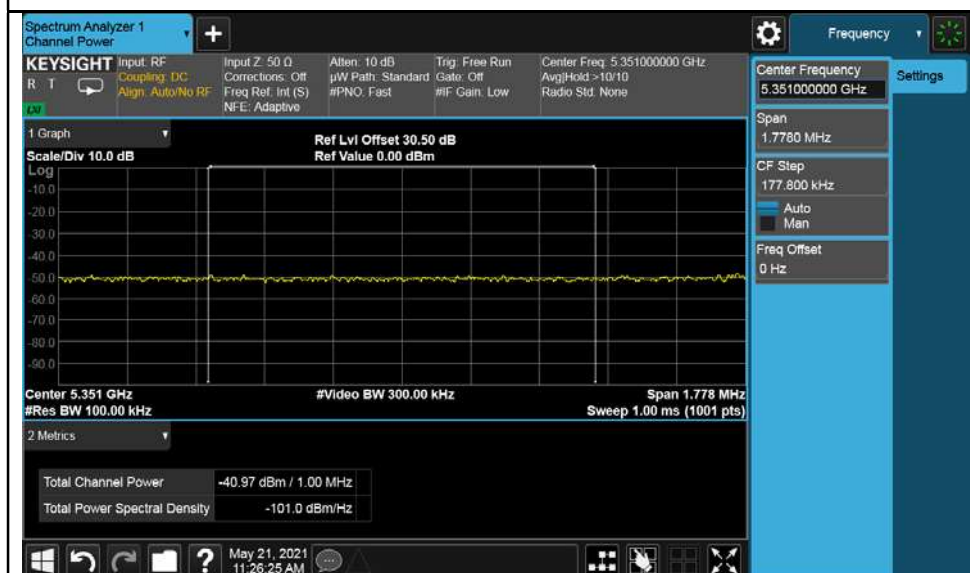
802.11n(HT20)-5180MHz



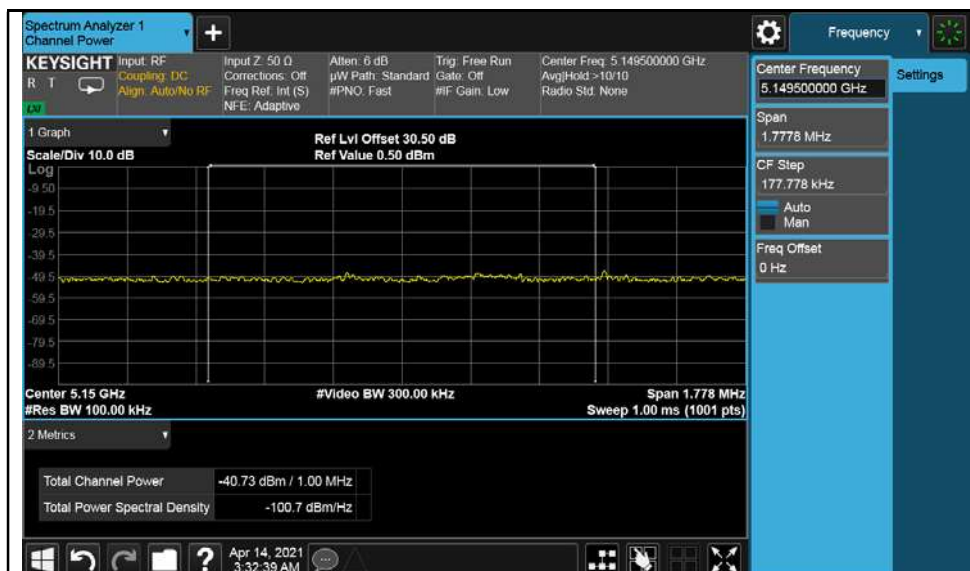
802.11n(HT20)-5240MHz



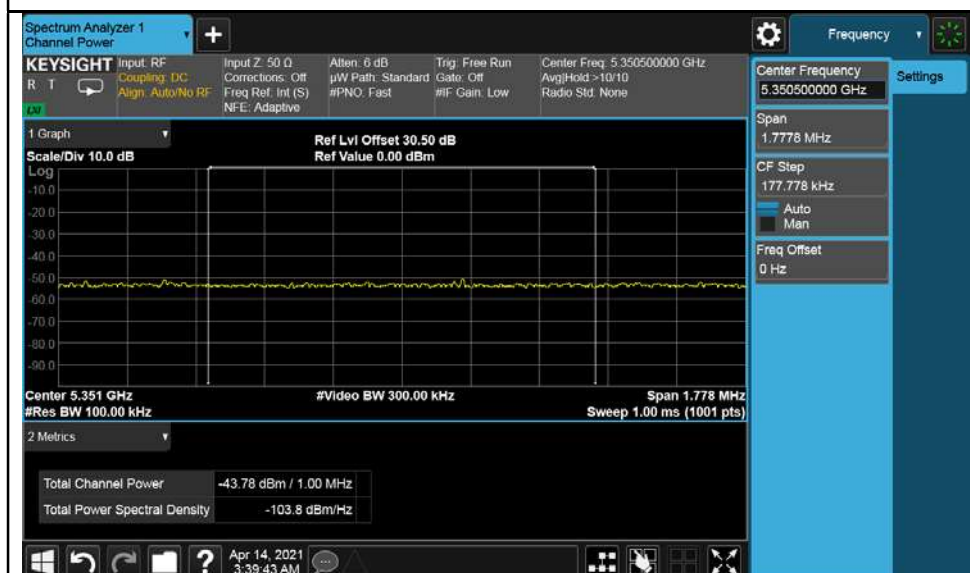
802.11ac(VHT20)-5180MHz



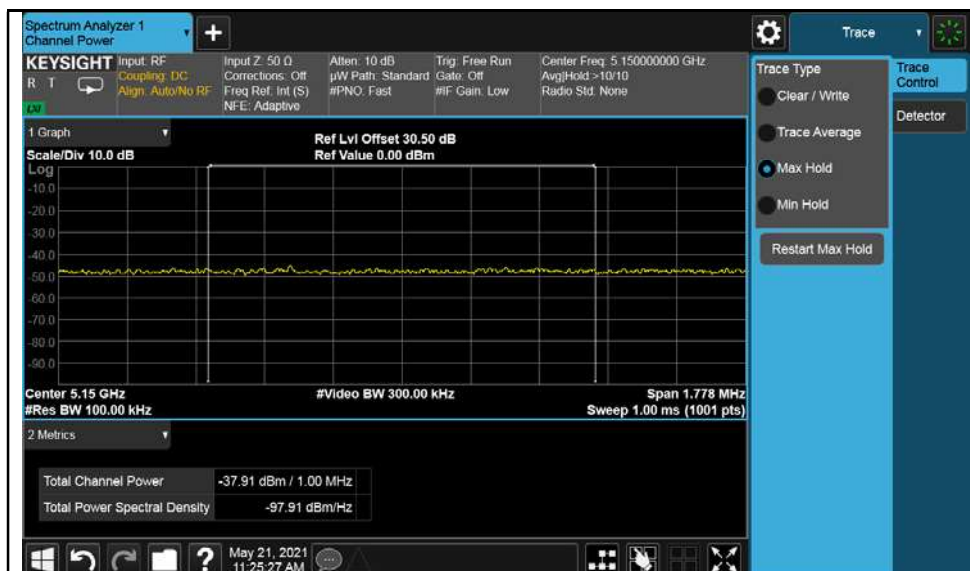
802.11ac(VHT20)-5240MHz



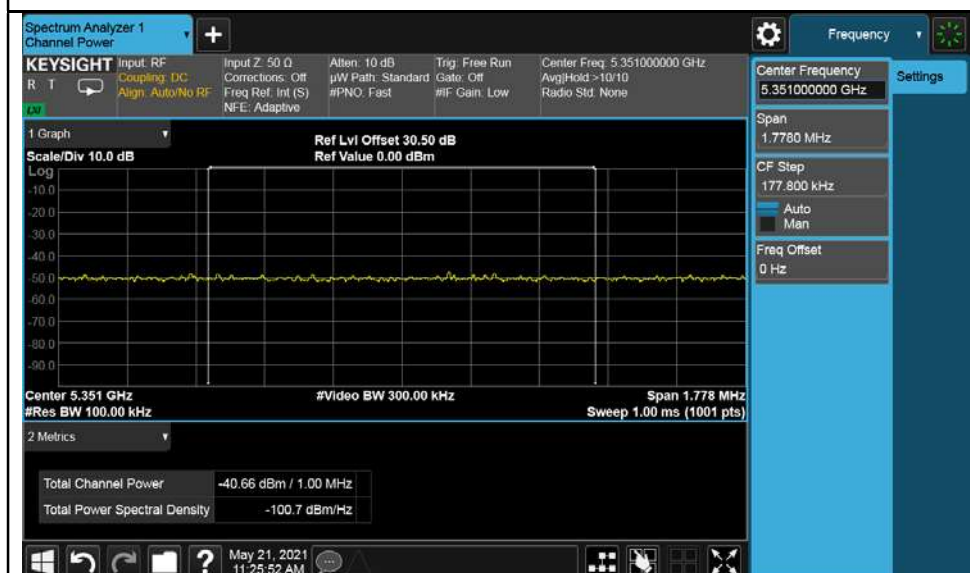
802.11n(HT40)-5190MHz



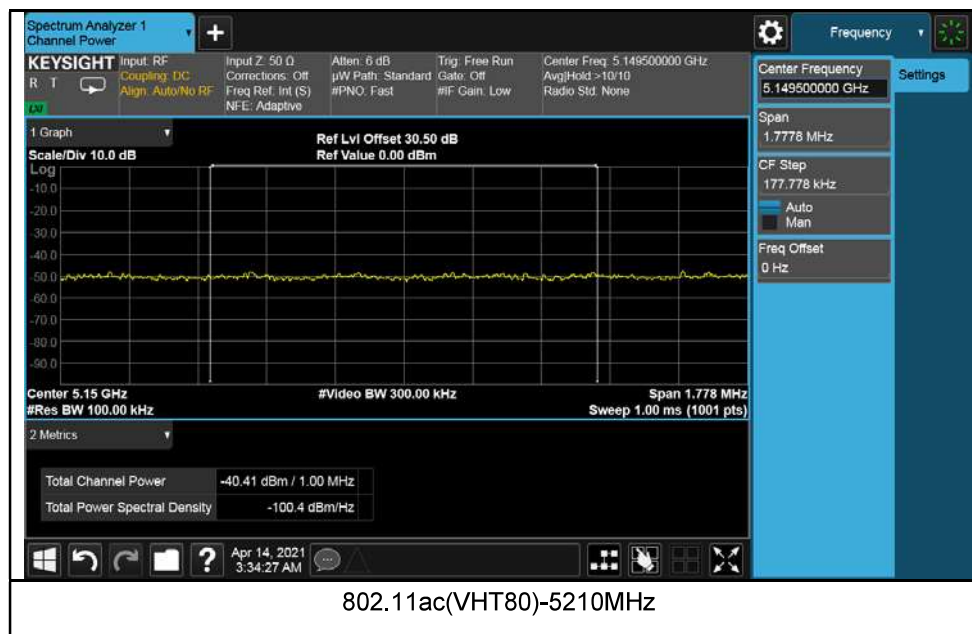
802.11n(HT40)-5230MHz



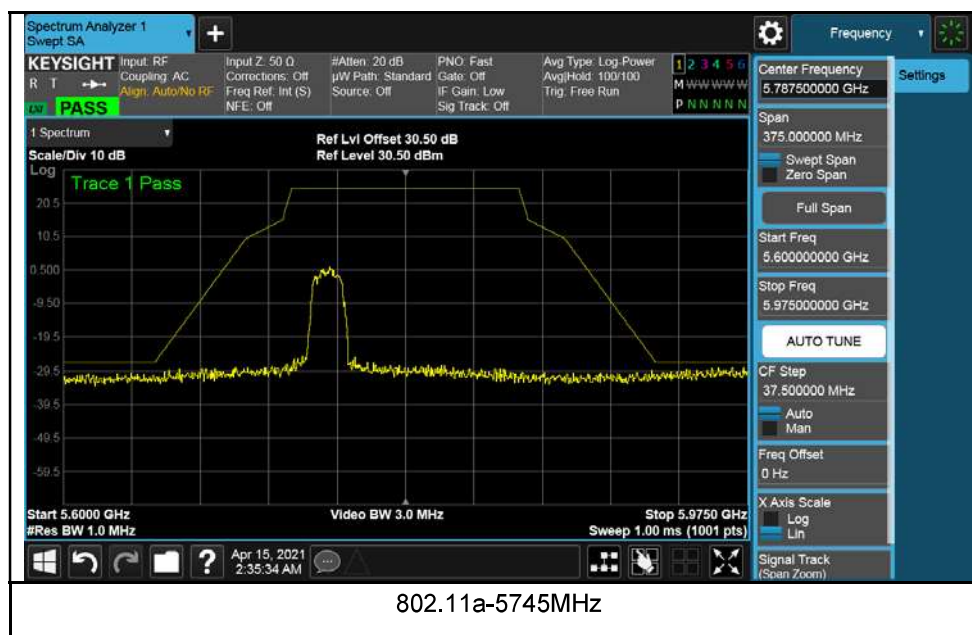
802.11ac(VHT40)-5190MHz



802.11ac(VHT40)-5230MHz

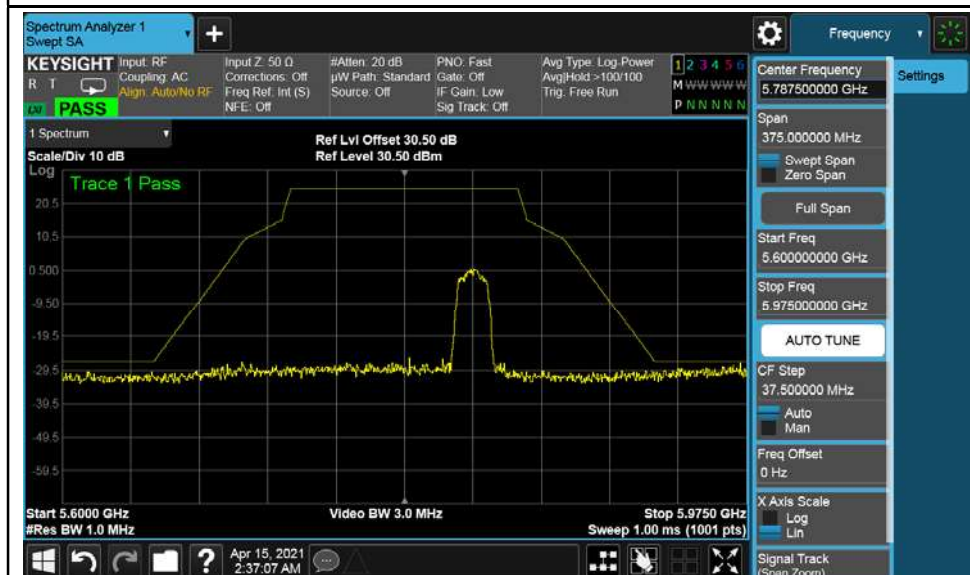


Test Plots for U-NII-3 Band:

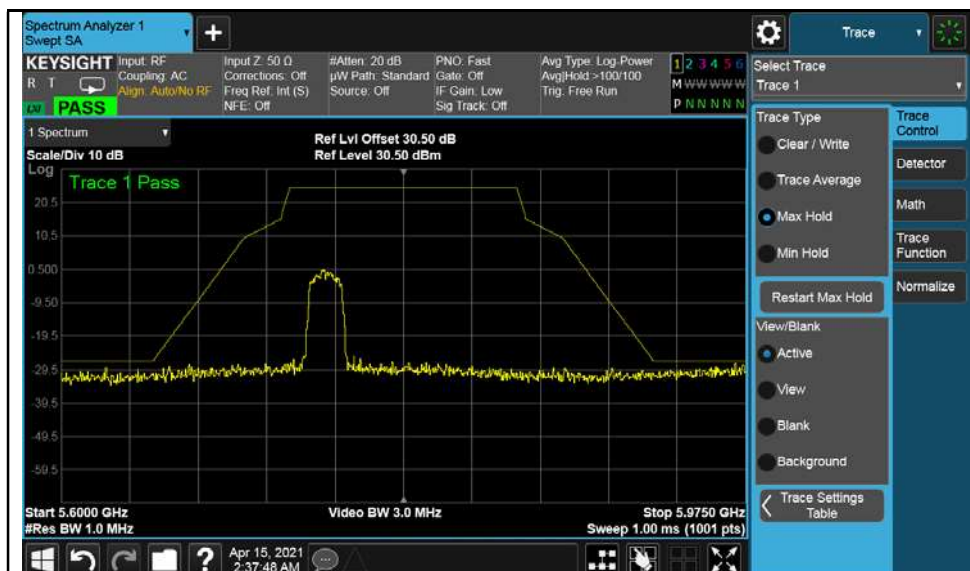




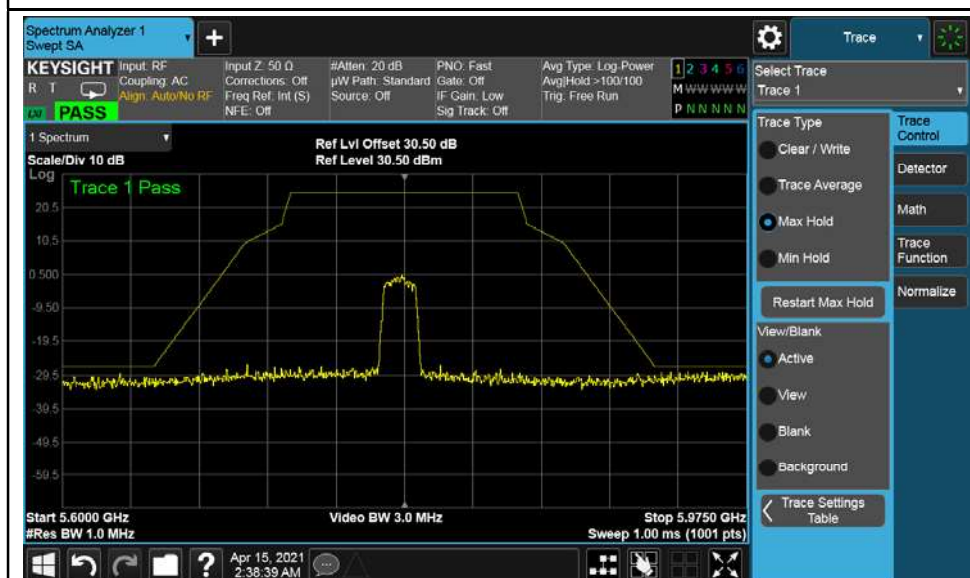
802.11a-5785MHz



802.11a-5825MHz



802.11n(HT20)-5745MHz



802.11n(HT20)-5785MHz