

Product Name: AX1800 USB3.0 WiFi6 Adapter	Report No: FCC022022-05258RF3
Product Model: D1-X18	Security Classification: Open
Version: V1.0	Total Page: 138

TIRT Testing Report

Prepared By:	Checked By:	Approved By:	
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RF TEST REPORT

FCC ID: 2A22E-WWYLD1-X18

According to

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

ANSI C63.10:2013

Equipment : AX1800 USB3.0 WiFi6 Adapter
Model No. : D1-X18
Trademark : N/A
Product No. : 20220929017481
Micronet Union Technology(Chengdu) Co., Ltd
Applicant : Room 502, Building 5, N.O. 528, Yuefei Road, Shibantan Street, Xindu
District, Chengdu, Sichuan, China

- The test result referred exclusively to the presented test model /sample.
- Without written approval of TIRT Inc. the test report shall not reproduced except in full.
- Test Date: 2022.10.09-2022.11.09

Lab: Beijing TIRT Technology Service Co.,Ltd Shenzhen
Add: 101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan
District, Shenzhen, China
TEL: +86-0755-27087573

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History of this test report

Original Report Issue Date: 2022.11.14

- ☒ No additional attachment
- ☐ Additional attachments were issued following record

Attachment No.	Issue Date	Description

1. General Information

1.1 Applicant

Micronet Union Technology(Chengdu) Co., Ltd

Room 502, Building 5, N.O. 528, Yuefei Road, Shibantan Street, Xindu District, Chengdu, Sichuan, China

1.2 Manufacturer

Micronet Union Technology(Chengdu) Co., Ltd

Room 502, Building 5, N.O. 528, Yuefei Road, Shibantan Street, Xindu District, Chengdu, Sichuan, China

1.3 Factory

Micronet Union Technology(Chengdu) Co., Ltd

Room 502, Building 5, N.O. 528, Yuefei Road, Shibantan Street, Xindu District, Chengdu, Sichuan, China

1.4 Basic Description of Equipment Under Test

Items	Description			
Equipment Name	AX1800 USB3.0 WiFi6 Adapter			
Model Number	D1-X18			
Trademark	N/A			
Power Supply	5Vdc			
Operating Temperature	0℃-40℃			
EUT Stage	☐ Product Unit		☒ Final-Sample	
Operating Band	5725MHz ~5850MHz	☒ IEEE 802.11a/n/ac/ax(20MHz)		
		☒ IEEE 802.11n/ac/ax(40MHz)		
		☒ IEEE 802.11ac/ax(80MHz)		
Product Type	IEEE 802.11a: WLAN (2TX, 2RX) IEEE 802.11n: WLAN (2TX, 2RX) IEEE 802.11ac: WLAN (2TX, 2RX) IEEE 802.11ax: WLAN (2TX, 2RX)			
Nominal Bandwidth	20MHz / 40MHz / 80MHz			
Modulation	IEEE 802.11a: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11n: (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: (BPSK / QPSK / 16QAM / 64QAM / 256QAM) IEEE 802.11ax: (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024-QAM)			
Data Rate (Mbps)	IEEE 11a mode : OFDM (6/9/12/18/24/36/48/54) IEEE 11n mode : MCS0~MCS15 IEEE 11ac mode : MCS0~MCS15 IEEE 11ax mode : MCS0~MCS15			
Type of Device	Client device without Radar detection			
TPC Function	☐	With TPC	☒	Without TPC
Beamforming Function	☐	With Beamforming	☒	Without Beamforming
Antenna Type:	ANT 1	PCB Antenna		
	ANT 2	PCB Antenna		
Antenna Gain:	ANT 1	2.91 dBi		
	ANT 2	2.89 dBi		

Channel Information			
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5725-5850	802.11a /n /ac /ax (20MHz)	5745-5825	149-165
5725-5850	802.11n /ac /ax (40MHz)	5755-5795	151-159
5725-5850	802.11ac /ax (80MHz)	5775	155

1.5 Description Of Support Units

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

No.	Equipment	Model	Series No	Brand	FCC ID	Supplied by
1	Notebook	L450	/	Lenovo	Doc	/
2	Notebook adapter	ADLX90NCC3A	/	Lenovo	Doc	/

2. Summary of Test Results

2.1 Summary of Test Items

47 CFR FCC Part 15, Subpart E			
Test item	FCC Clause	Results	Remarks
AC Power Conducted Emission	15.207 15.407(b)	Pass	Meet the requirement of the limit
Radiated Emission	15.205(a) 15.209(a) 15.407(b)	Pass	Meet the requirement of the limit
Antenna Requirements	15.203	Compliance	The EUT has 2 internal PCB antennas arrangement which was permanently attached
Transmission in the Absence of Data	15.407 (c)	Compliance	The applicant explains how to meet this requirement in their device authorization application.
Spectrum Bandwidth	15.407(a) 15.407(e)	Pass	Meet the requirement of the limit
Conducted Power	15.407(a)	Pass	Meet the requirement of the limit
Power Spectral Density	15.407(a)	Pass	Meet the requirement of the limit
Frequency Stability	15.407(g)	Pass	The manufacturer states that the frequency stability is in compliance with 15.407(g)
Note: N/A denotes Not Applicable in this part			

2.2 Application of Standard

47 CFR FCC Part 15, Subpart E

KDB 662911 D01 Multiple Transmitter Output v02r01

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10:2013

2.3 Test Instruments

No.	Equipment	Manufacturer	Type No.	Serial No.	Cal. date (yyyy/mm/dd)	Cal. Due date (yyyy/mm/dd)
1	EMI Receiver	Rohde&Schwarz	ESCI	100718	2021/11/10	2022/11/09
					2022/10/15	2023/10/14
2	AMN	Rohde&Schwarz	ENV216	100075	2021/11/10	2022/11/09
					2022/10/15	2023/10/14
3	AMN	Schwarzbeck	NSLK8127	#829	2021/11/10	2022/11/09
					2022/10/15	2023/10/14
4	ECSI RF IN RF Cable	Rohde&Schwarz	RP-X1	\	2021/11/10	2022/11/09
					2022/10/15	2023/10/14
5	ECSI RF IN RF Cable	Rohde&Schwarz	Sapre sm	\	2021/11/10	2022/11/09
					2022/10/15	2023/10/14
6	EMI Receiver	Rohde&Schwarz	ESR7	102013	2021/11/10	2022/11/09
					2022/10/15	2023/10/14
7	Spectrum analyzer	Rohde&Schwarz	FSV30	103741	2021/11/10	2022/11/09
					2022/10/18	2023/10/17
8	Spectrum analyzer	KEYSIGHT	N9010A	MY51440158	2021/11/10	2022/11/09
					2022/10/18	2023/10/17
9	Integral Antenna	Schwarzbeck	VULB9163	9163-868	2021/12/26	2022/12/25
					2022/10/21	2023/10/20
10	Integral Antenna	Schwarzbeck	BBHA 9120D	BBHA 9120D 1201	2021/11/10	2022/11/09
					2022/10/16	2023/10/15
11	Integral Antenna	Schwarzbeck	BBHA 9170	9170#685	2021/11/07	2022/11/06
					2022/10/15	2023/10/14
12	Preamplifier	CD Systems Inc	PAP-0303 6-30	85060000	2021/11/10	2022/11/09
					2022/10/16	2023/10/15
13	Preamplifier	Schwarzbeck	BBV9721	9721-019	2021/11/10	2022/11/09
					2022/10/16	2023/10/15
14	Preamplifier	emci	EMC0126 45SE	980417	2021/11/10	2022/11/09
					2022/10/17	2023/10/16
15	ECSI RF IN RF Cable	Rohde&Schwarz	AP-X1	\	2021/11/10	2022/11/09
					2022/10/17	2023/10/16
16	Spectrum Analyzer	Agilent	N9010A	MY52221119	2021/11/10	2022/11/09
					2022/10/18	2023/10/17
17	Power Collection Unit	Tonscend	JS0806-2	188060134	2021/09/13	2022/09/12
					2022/10/17	2023/10/16
18	Tonscend Test System	Tonscend	2.6.77.051 8	NA	NA	NA
19	Power Sensor	Agilent	U2021XA	MY54250019	2021/09/13	2022/09/12
					2022/10/18	2023/10/17

20	Power Sensor	Agilent	U2021XA	MY54250021	2021/09/13	2022/09/12
					2022/10/18	2023/10/17
21	Power Sensor	Agilent	U2021XA	MY54210040	2021/09/13	2022/09/12
					2022/10/18	2023/10/17
22	Power Sensor	Agilent	U2021XA	MY54260021	2021/09/13	2022/09/12
					2022/10/18	2023/10/17
23	Temp&Humidity Recorder	Anymetre	JR900	NA	2021/11/04	2022/11/03
					2022/10/17	2023/10/16
24	Temp&Humidity Chamber	ETOMA	NTH1100-30A	16080628	2021/09/02	2022/09/01
					2022/10/17	2023/10/16

2.4 Operation Mode

The EUT was supplied by and it was run in TX mode that was controlled by client provided RF testing program.

The EUT was transmitted continuously during the test. The worst case test result was showed in the report.

802.11ax mode only support full resource unit size.

2.5 Test Condition

Applicable to	Environmental conditions	Input Power	Tested by
AC Power Conducted Emission	25 °C, 52 % RH	DC 5V	Stone Tang
Radiated Emission	23 °C, 55 % RH	DC 5V	Stone Tang
Spectrum Bandwidth	24.6°C, 55 % RH	DC 5V	Stone Tang
Conducted Power	24.3 °C, 53 % RH	DC 5V	Stone Tang
Power Spectral Density	24.3 °C, 53 % RH	DC 5V	Stone Tang

The applicant declare the operating environment of EUT as below:

Normal conditions: DC 5V, 15~35°C

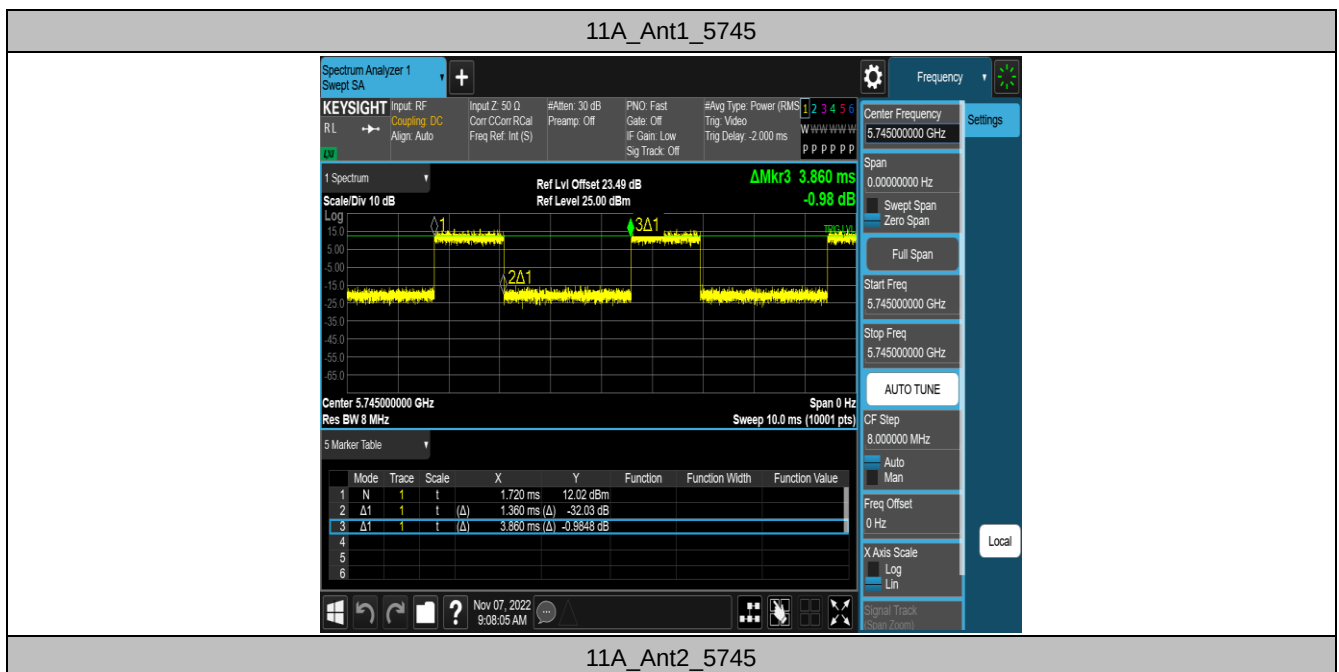
2.6 Duty Cycle of Test Signal

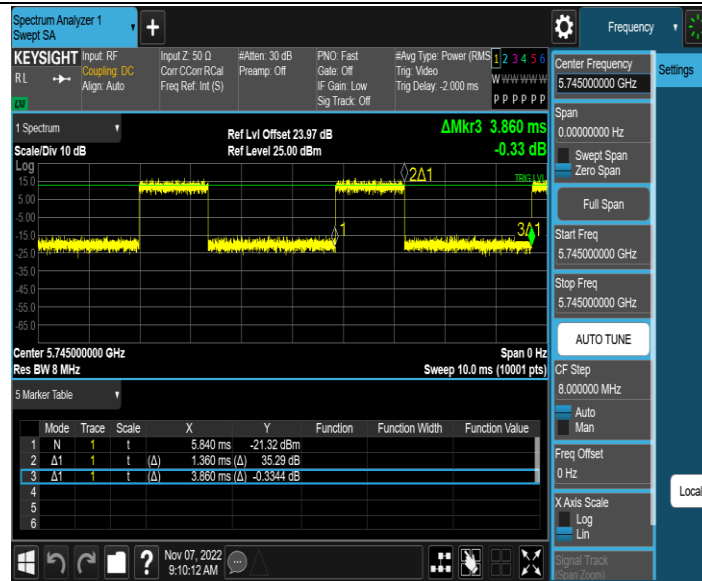
If duty cycle is $\geq 98\%$, duty factor is not required.

If duty cycle is $< 98\%$, duty factor shall be considered.

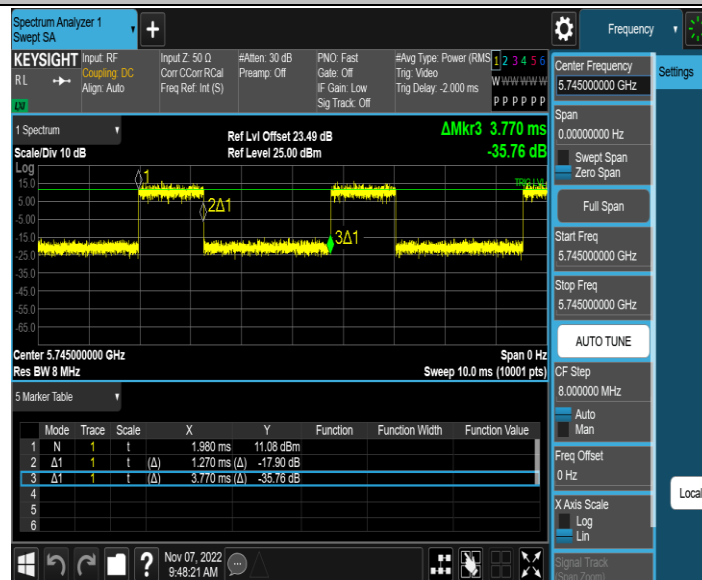
All the duty factor of other test mode have been considered.

Test Mode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty Factor
11A	Ant1	5745	1.36	3.86	35.23	4.53
	Ant2	5745	1.36	3.86	35.23	4.53
11N20MIMO	Ant1	5745	1.27	3.77	33.69	4.73
	Ant2	5745	1.27	3.78	33.60	4.74
11N40MIMO	Ant1	5755	0.63	3.14	20.06	6.98
	Ant2	5755	0.63	3.13	20.13	6.96
11AC20MIMO	Ant1	5745	1.28	3.78	33.86	4.70
	Ant2	5745	1.28	3.78	33.86	4.70
11AC40MIMO	Ant1	5755	0.63	3.13	20.13	6.96
	Ant2	5755	0.64	3.14	20.38	6.91
11AC80MIMO	Ant1	5775	0.31	2.82	10.99	9.59
	Ant2	5775	0.32	2.82	11.35	9.45
11AX20MIMO	Ant1	5745	1.17	3.67	31.88	4.96
	Ant2	5745	1.16	3.67	31.61	5.00
11AX40MIMO	Ant1	5755	0.62	3.12	19.87	7.02
	Ant2	5755	0.61	3.12	19.55	7.09
11AX80MIMO	Ant1	5775	0.34	2.84	11.97	9.22
	Ant2	5775	0.34	2.84	11.97	9.22

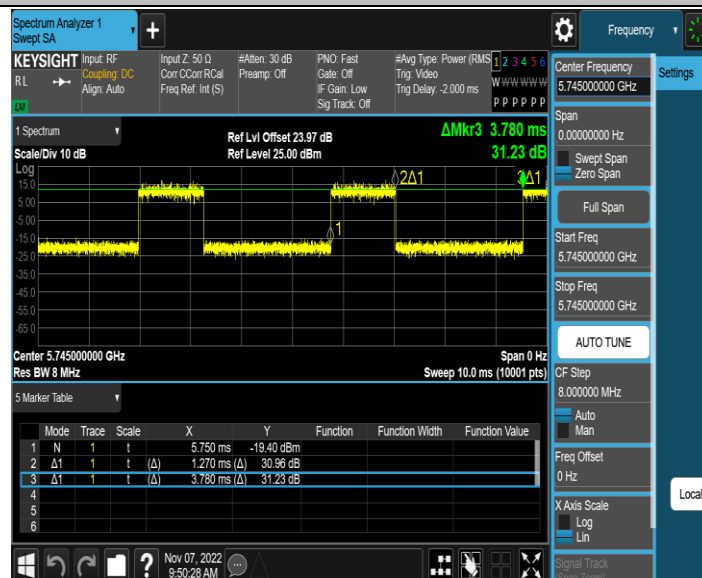




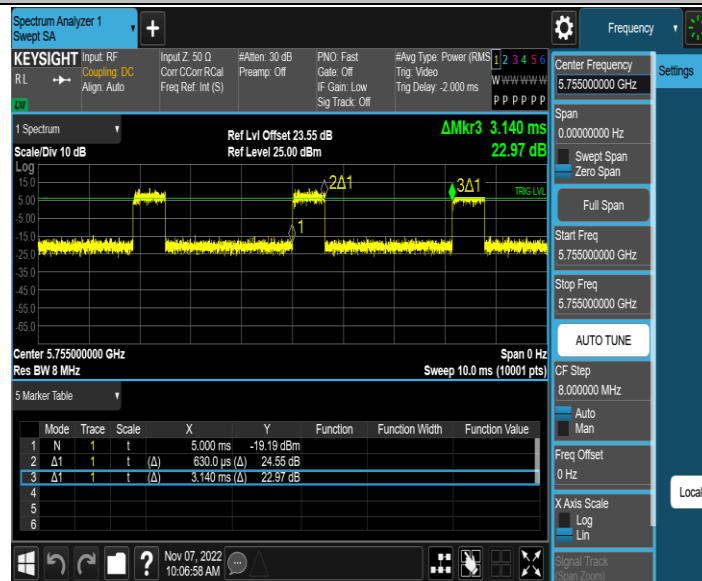
11N20MIMO_Ant1_5745



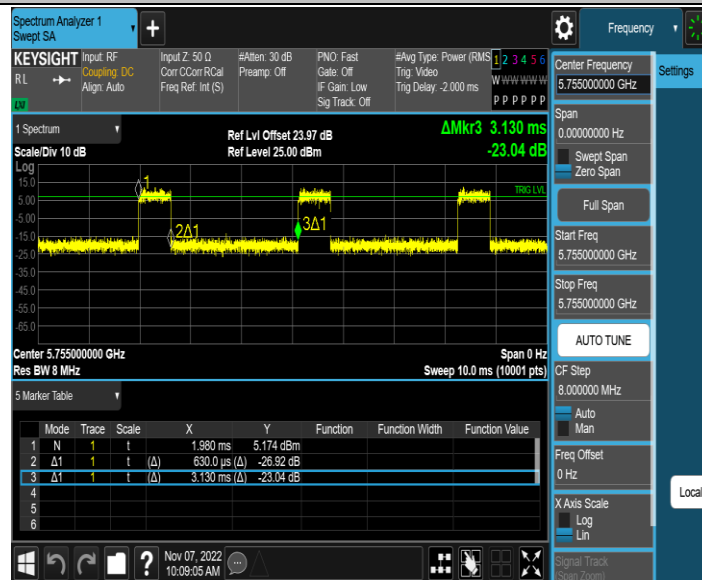
11N20MIMO_Ant2_5745



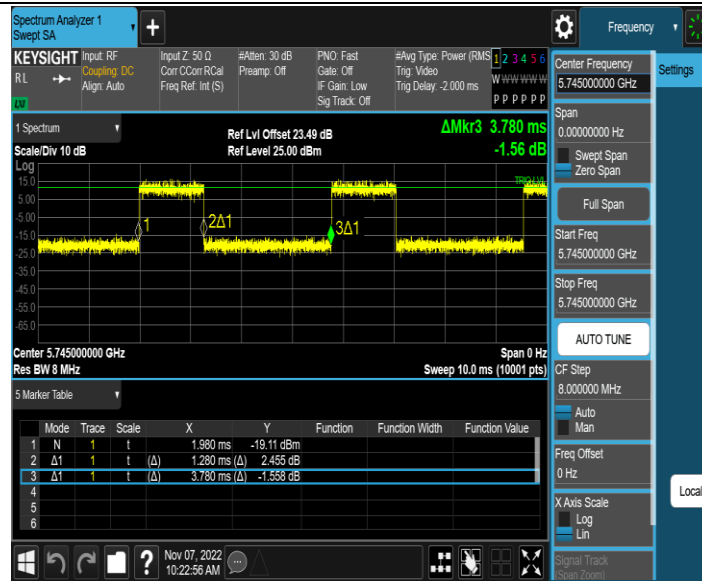
11N40MIMO_Ant1_5755



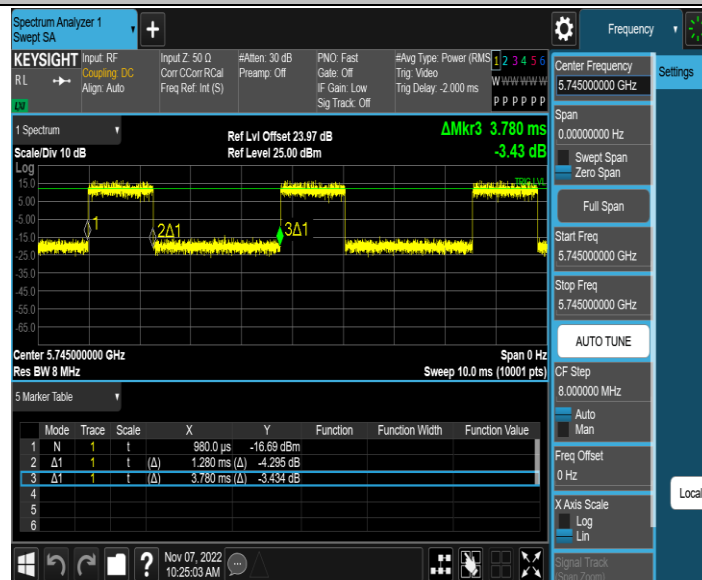
11N40MIMO_Ant2_5755



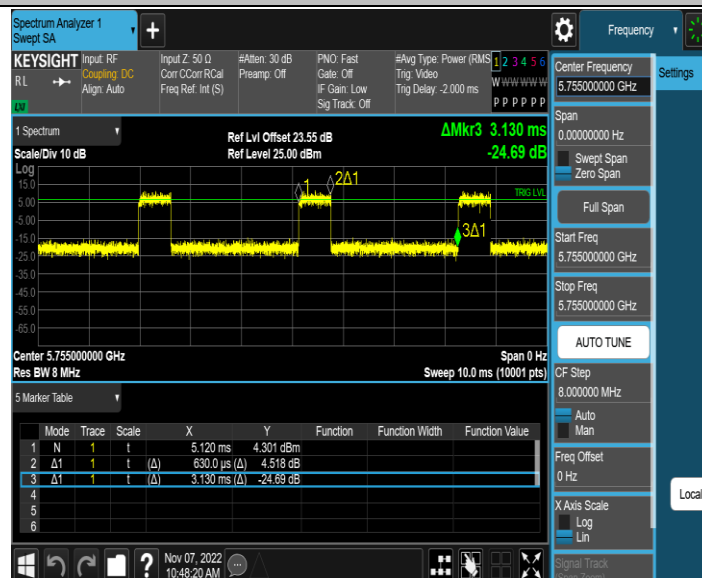
11AC20MIMO_Ant1_5745



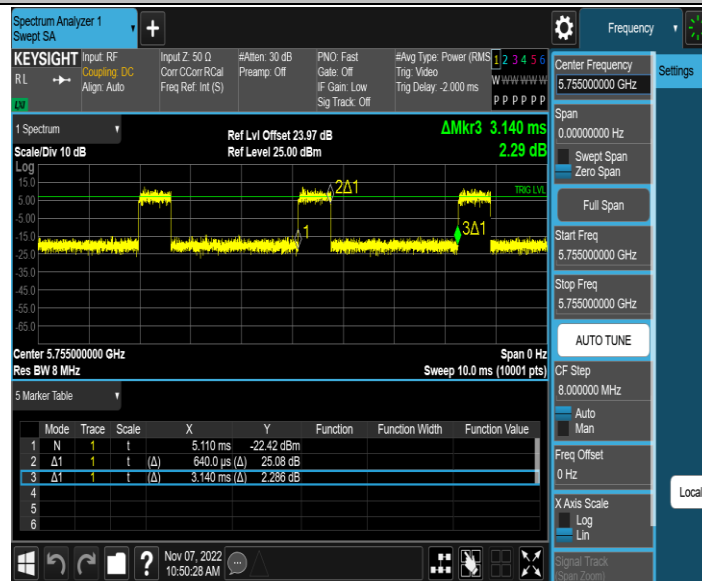
11AC20MIMO_Ant2_5745



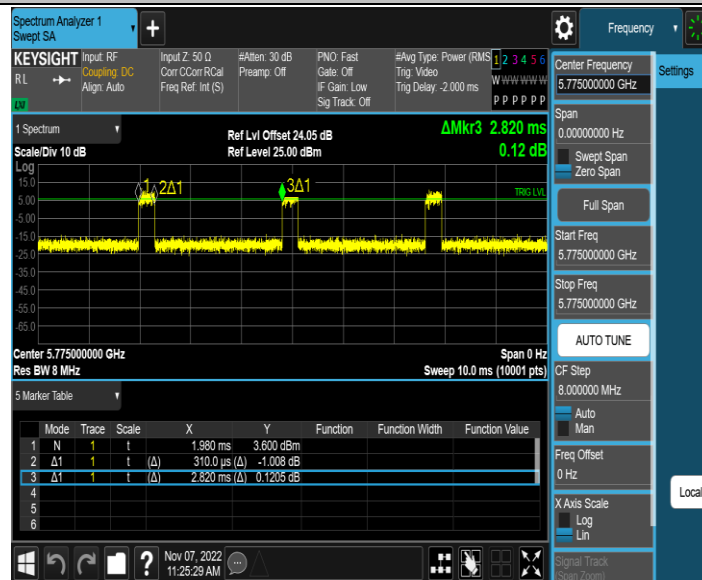
11AC40MIMO_Ant1_5755



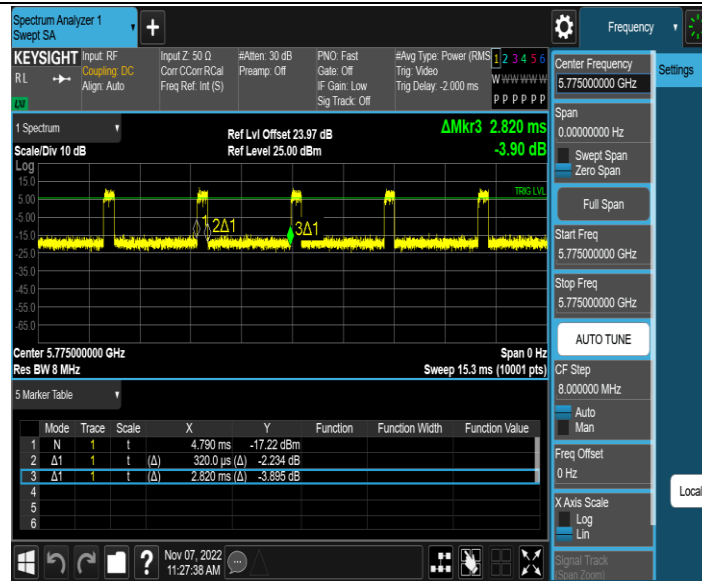
11AC40MIMO_Ant2_5755



11AC80MIMO_Ant1_5775



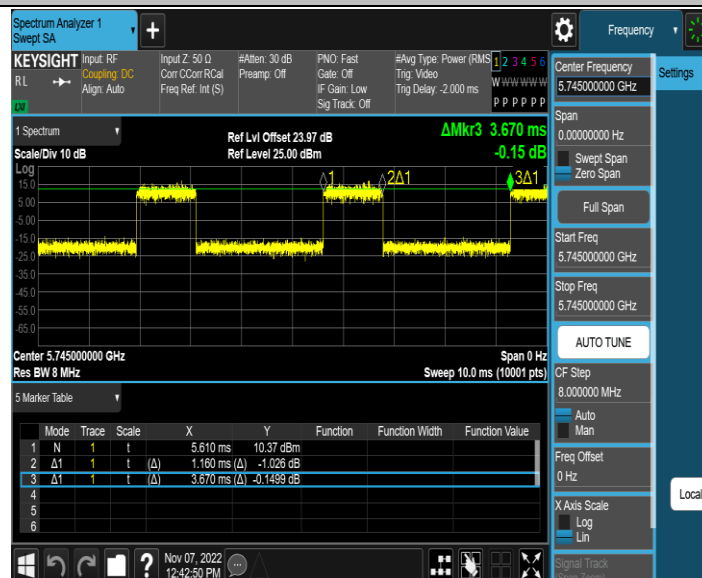
11AC80MIMO_Ant2_5775



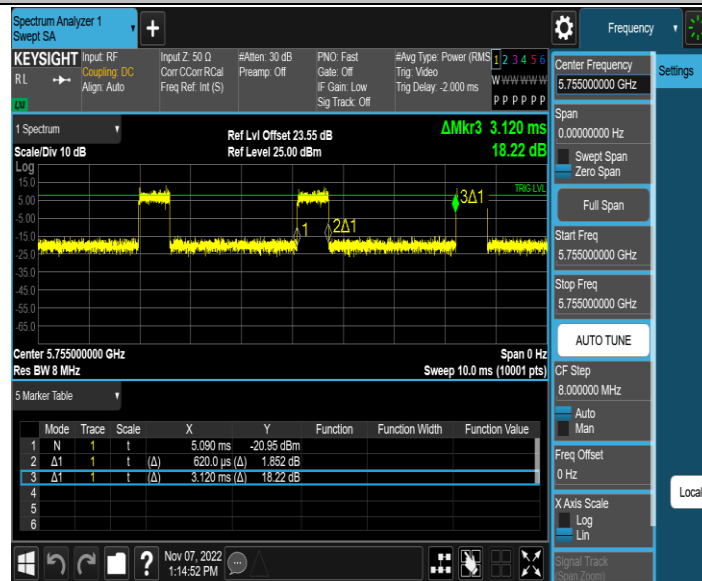
11AX20MIMO_Ant1_5745



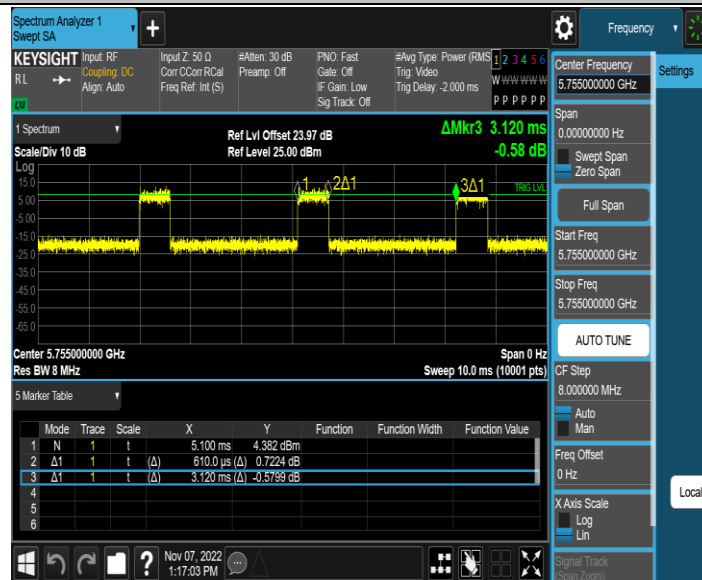
11AX20MIMO_Ant2_5745



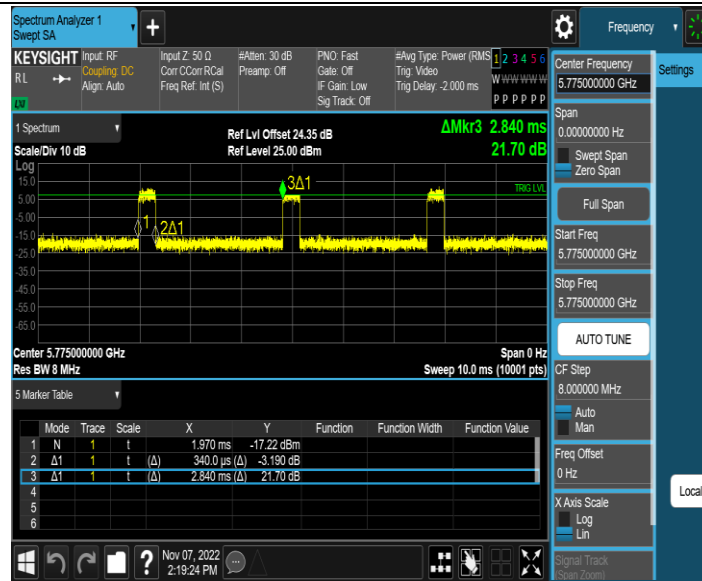
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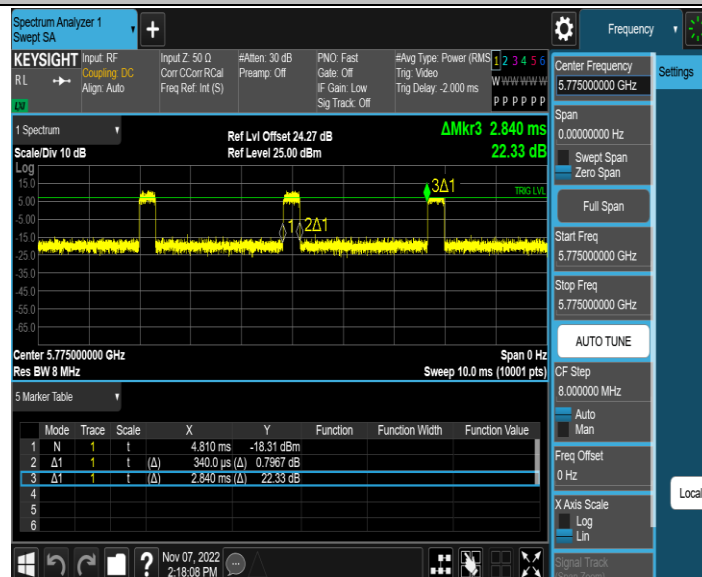
11AX40MIMO_Ant2_5755



11AX80MIMO_Ant1_5775



11AX80MIMO_Ant2_5775



2.7 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	± 142.12 KHz
RF power conducted	± 0.74 dB
RF power radiated	± 3.25 dB
Spurious emissions, conducted	± 1.78 dB
Spurious emissions, radiated (9KHz~30MHz)	± 2.56 dB
Spurious emissions, radiated (30MHz~1GHz)	± 4.6 dB
Spurious emissions, radiated (Above 1GHz)	± 4.9 dB
Conduction Emissions(150kHz~30MHz)	± 3.1 dB
Humidity	$\pm 4.6\%$
Temperature	$\pm 0.7^{\circ}\text{C}$
Time	$\pm 1.25\%$

2.8 Test Location

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Designation Number:	CN1309
Test Firm Registration Number:	825524
Telephone:	+86-0755-27087573

2.9 Deviation from Standards

None

2.10 Abnormalities from Standard Conditions

None

3. Test Procedure And Results

3.1 AC Power Line Conducted Emission

3.1.1 Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.1.2 Test Peripherals

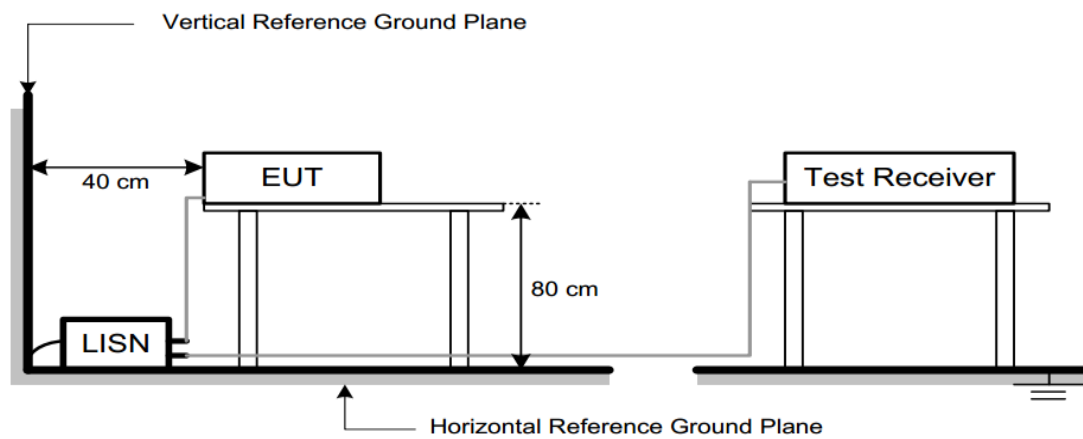
Support Equipment				
No.	Equipment	Brand Name	Model Name	Remarks
1	Record PC	Lenovo	M4500T	NA
2	Control PC	Lenovo	M4500T	NA

3.1.3 Test Procedure

Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☐ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ● : Test ○ : No Test	

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

3.1.4 Test Setup



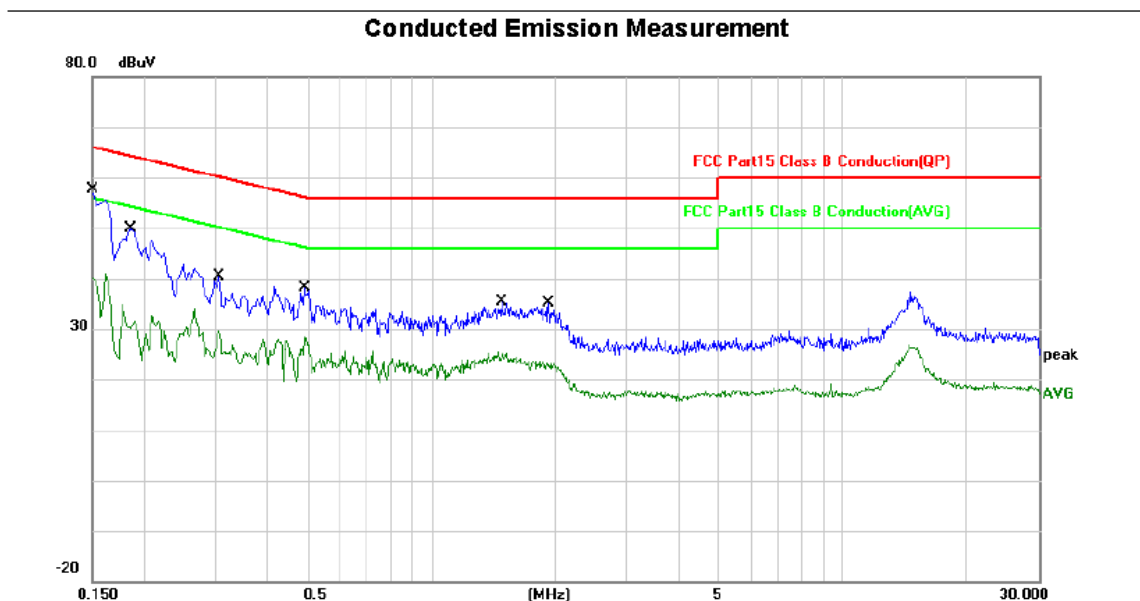
3.1.5 Test Result

Note:

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Measurement = Reading + Correct Factor.
3. Over = Measurement - Limit

150kHz~30MHz	Worst Case Operating Mode: Simultaneous transmission
--------------	--

Line



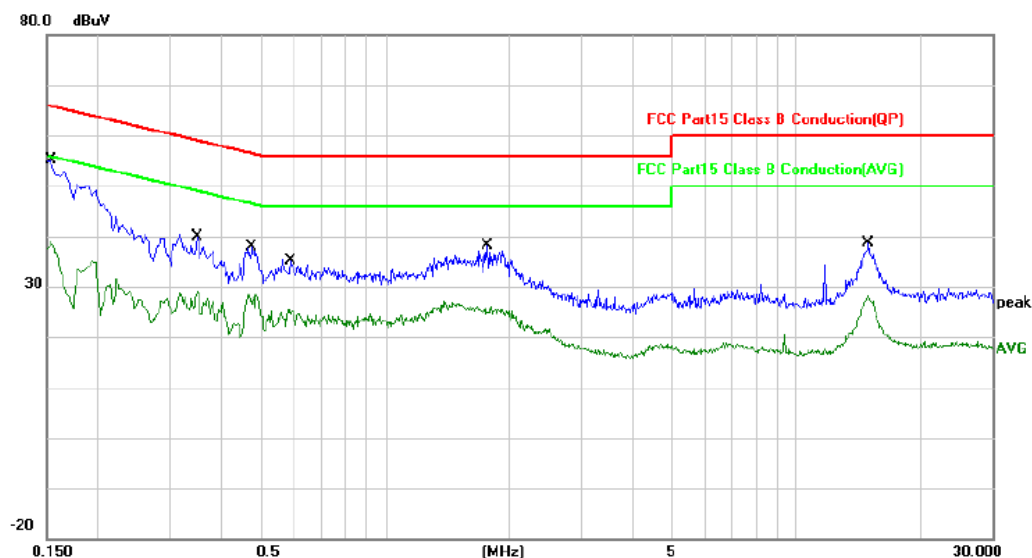
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	33.84	19.49	53.33	66.00	-12.67	QP	
2		0.1500	17.87	19.49	37.36	56.00	-18.64	AVG	
3		0.1860	27.53	19.53	47.06	64.21	-17.15	QP	
4		0.1860	12.98	19.53	32.51	54.21	-21.70	AVG	
5		0.3080	15.53	19.52	35.05	60.08	-25.03	QP	
6		0.3080	8.85	19.52	28.37	50.08	-21.71	AVG	
7		0.4940	14.12	19.53	33.65	56.10	-22.45	QP	
8		0.4940	7.85	19.53	27.38	46.10	-18.72	AVG	
9		1.4860	9.71	19.80	29.51	56.00	-26.49	QP	
10		1.4860	4.78	19.80	24.58	46.00	-21.42	AVG	
11		1.9300	7.89	20.03	27.92	56.00	-28.08	QP	
12		1.9300	2.42	20.03	22.45	46.00	-23.55	AVG	

150kHz~30MHz

Worst Case Operating Mode: Simultaneous transmission

Neutral

Conducted Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1540	33.37	19.70	53.07	65.78	-12.71	QP	
2		0.1540	18.35	19.70	38.05	55.78	-17.73	AVG	
3		0.3500	13.94	19.70	33.64	58.96	-25.32	QP	
4		0.3500	5.42	19.70	25.12	48.96	-23.84	AVG	
5		0.4740	14.92	19.73	34.65	56.44	-21.79	QP	
6		0.4740	7.85	19.73	27.58	46.44	-18.86	AVG	
7		0.5900	10.69	19.76	30.45	56.00	-25.55	QP	
8		0.5900	4.34	19.76	24.10	46.00	-21.90	AVG	
9		1.7780	10.20	20.18	30.38	56.00	-25.62	QP	
10		1.7780	4.02	20.18	24.20	46.00	-21.80	AVG	
11		15.0580	10.47	21.66	32.13	60.00	-27.87	QP	
12		15.0580	5.21	21.66	26.87	50.00	-23.13	AVG	

3.2 Radiated Emission

3.2.1 Limit

1) Limit of radiated emission measurement:

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequency (MHz)	Distance Meters(m)	Field Strength Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 – 0.49	300	$2400/F(\text{kHz})$	-
0.490 – 1.705	30	$24000/F(\text{kHz})$	-
1.705 – 30	30	30	-
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Note: (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ Emission level $\mu\text{V/m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

2) Limit of unwanted emission out of the restricted bands:

FREQUENCY/ MHz	EIRP Limit (dBm/MHz)	Equivalent Field Strength at 3m ($\text{dB}\mu\text{V/m}$)
5150-5250	-27	68.3
5250-5350	-27	68.3
5470-5725	-27	68.3
5725-5850	-27 NOTE (2)	68.3
	10 NOTE (2)	105.3
	15.6 NOTE (2)	110.9
	27 NOTE (2)	122.3

Note: (1) The following formula is used to convert the equipment isotropic radiated power (eirp) to

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

field strength:

- (2) According to 15.407(b)(4)(i), all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5

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

3.2.2 Test Peripherals

Support Equipment				
No.	Equipment	Brand Name	Model Name	Remarks
1	Record PC	Lenovo	M4500T	NA
2	Control PC	Lenovo	M4500T	NA

3.2.3 Test Procedure

Test Method	
☐ Conducted Measurement	☒ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ☒ : Test ☐ : No Test	

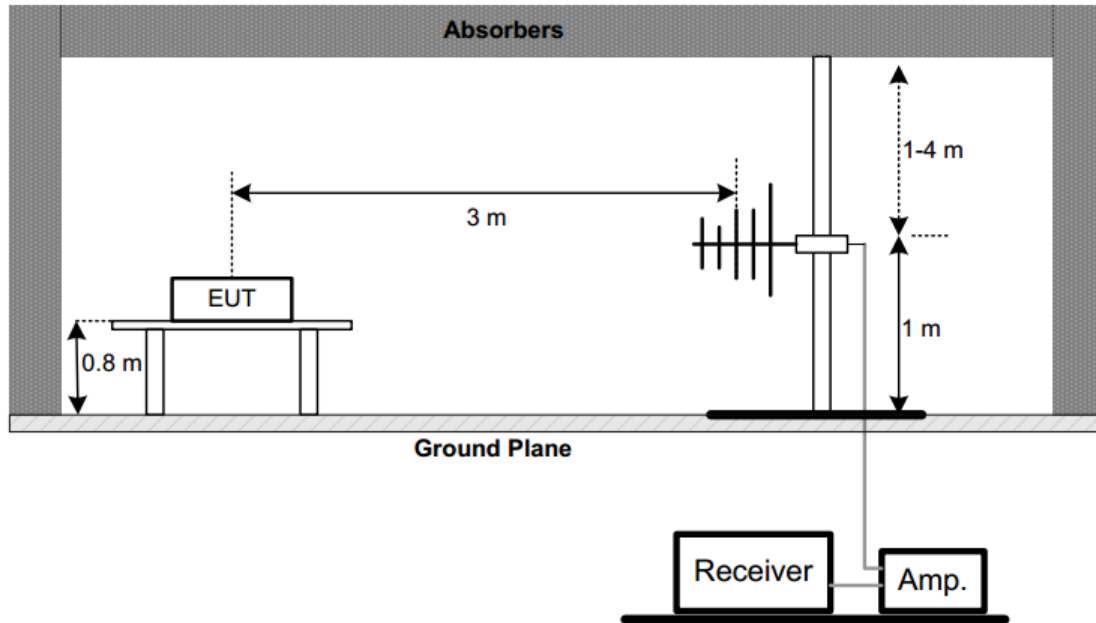
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- The measuring distance of 3 m or 1.5m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. 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 find the maximum reading (used Bore sight function).
- The 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.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured,

but AVG Mode didn't perform. (above 1 GHz)

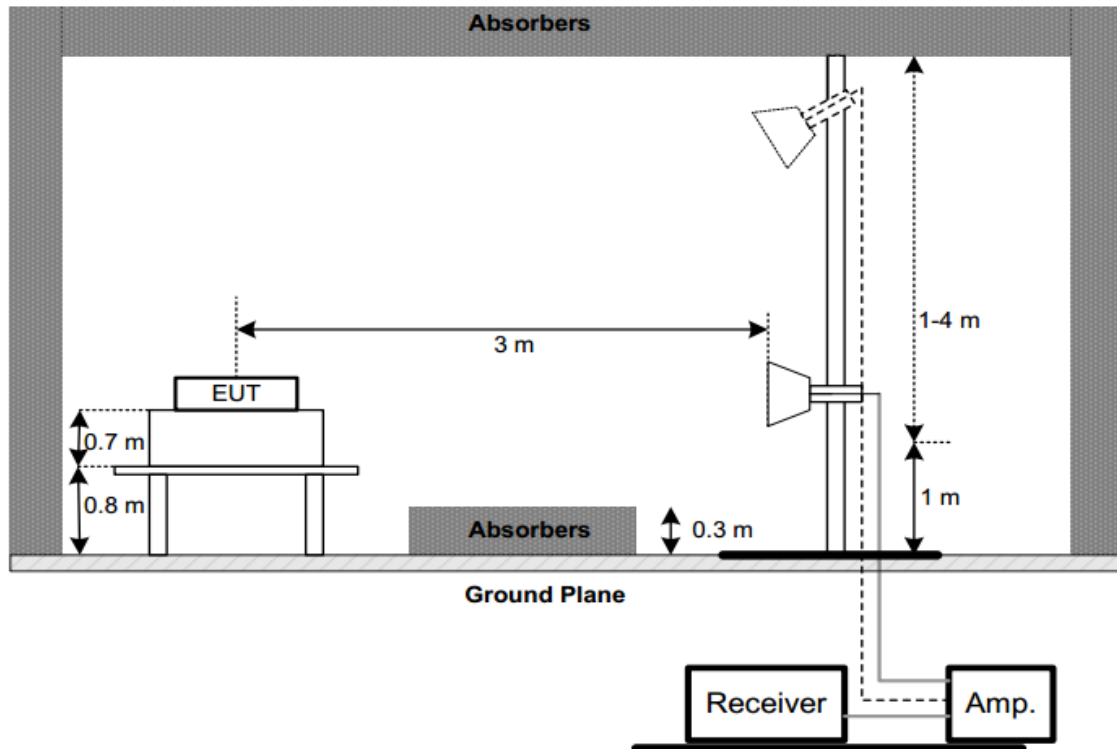
i) For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.2.4 Test Setup

(A) Radiated Emission Test Set-Up Frequency 30 MHz-1000 MHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



3.2.5 Test Result

1) Radiated emission: 9KHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

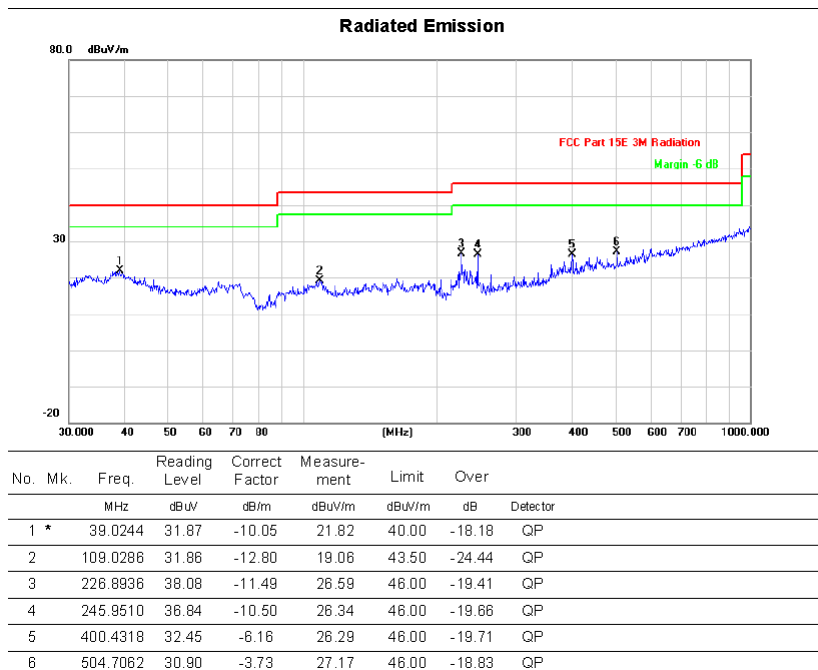
2) Radiated emission: 30MHz-1G

Note:

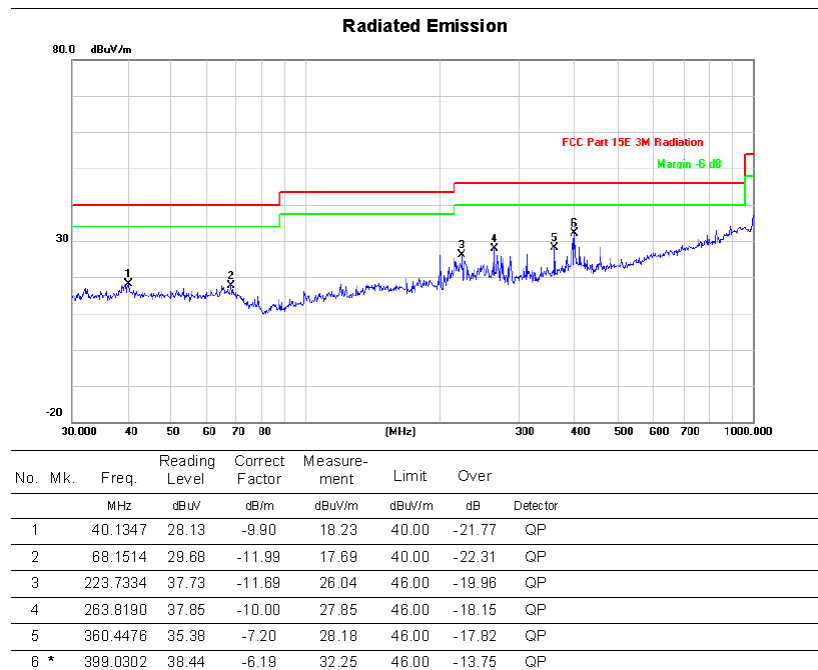
1. Measurement = Reading + Correct Factor.
2. Over = Measurement - Limit

Below 1G (30MHz~1GHz)	Test mode: 11AC80MIMO	Test Channel: 155
-----------------------	-----------------------	-------------------

VERTICAL



HORIZONTAL



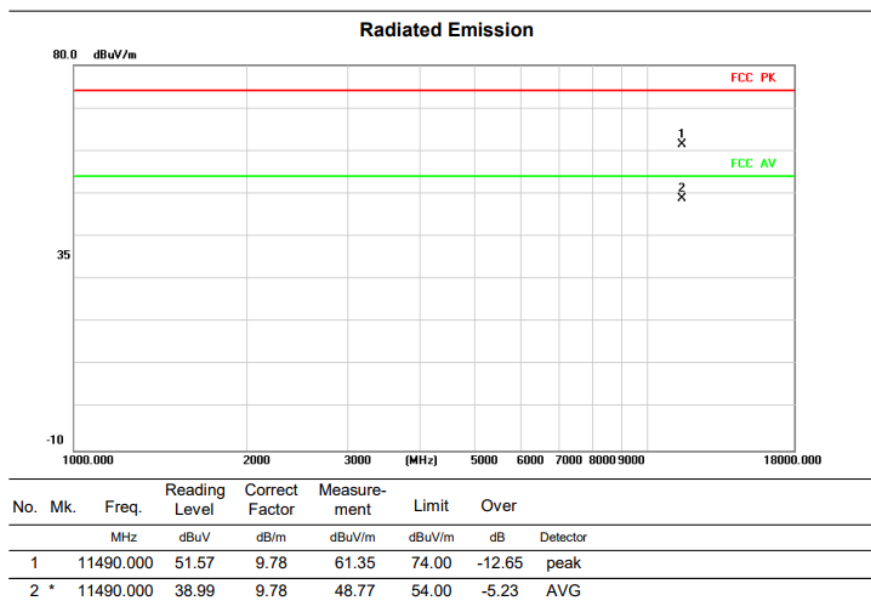
3) Radiated emission: Above 1G

Note:

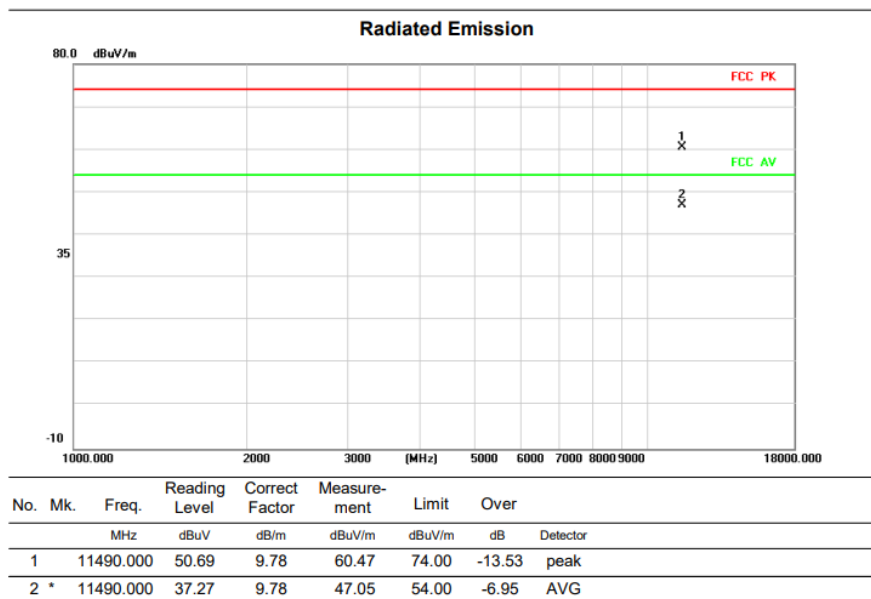
1. Measurement = Reading + Correct Factor.
2. Over = Measurement - Limit.
3. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report at 18GHz ~ 40GHz.
4. We evaluated data for all modes, and then AC20/40 and N20/40 modulations were similar, and only the worst-mode data were reported.

Above 1G (1GHz~40GHz)	Test mode:11A_ANT1+ANT2	Test Channel:149
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VERTICAL



HORIZONTAL



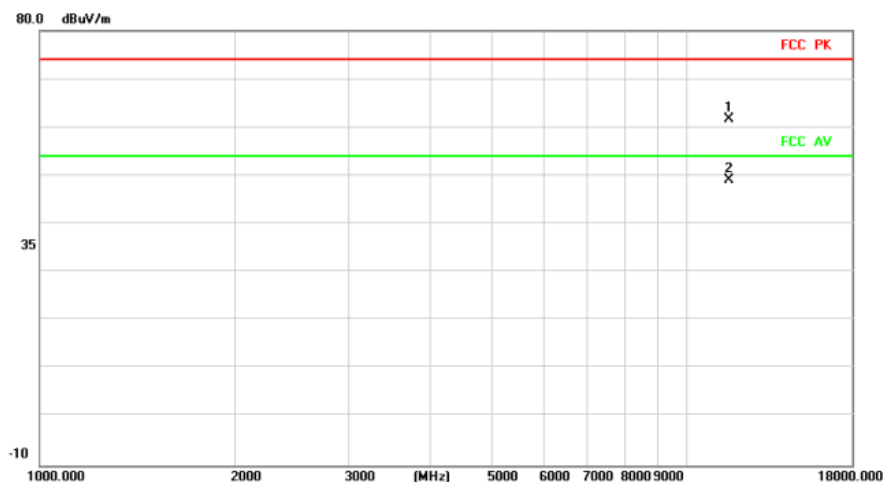
Above 1G (1GHz~40GHz)

Test mode: 11A_ANT1+ANT2

Test Channel:157

VERTICAL

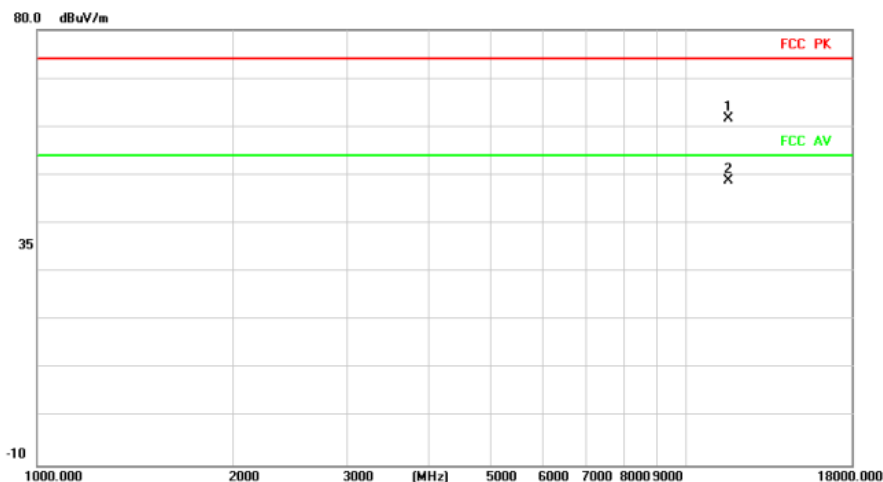
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11570.000	51.63	10.01	61.64	74.00	-12.36 peak
2 *		11570.000	39.09	10.01	49.10	54.00	-4.90 AVG

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11570.000	51.76	10.01	61.77	74.00	-12.23 peak
2 *		11570.000	38.72	10.01	48.73	54.00	-5.27 AVG

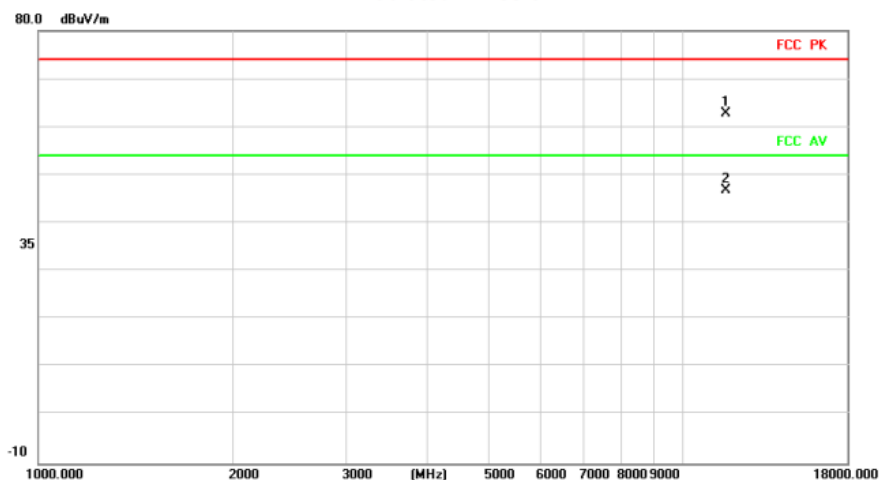
Above 1G (1GHz~40GHz)

Test mode: 11A_ANT1+ANT2

Test Channel:165

VERTICAL

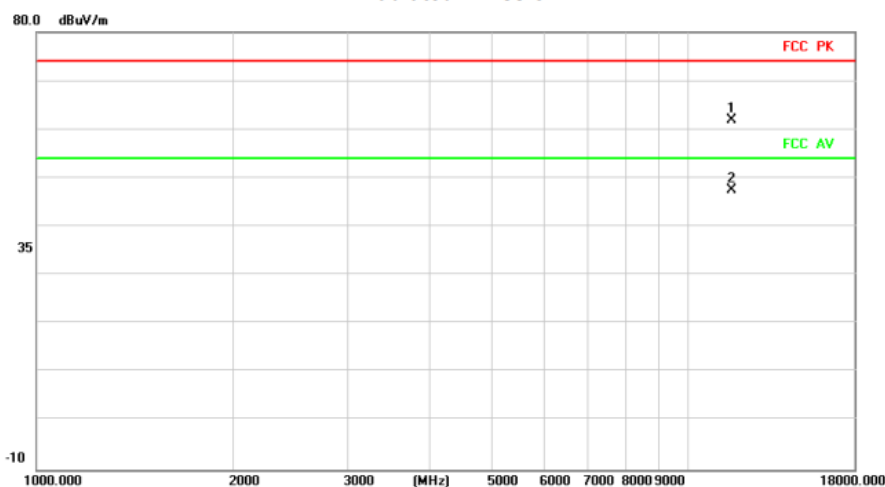
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11650.000	52.53	10.24	62.77	74.00	-11.23 peak
2 *		11650.000	36.67	10.24	46.91	54.00	-7.09 AVG

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11650.000	51.74	10.24	61.98	74.00	-12.02 peak
2 *		11650.000	37.28	10.24	47.52	54.00	-6.48 AVG

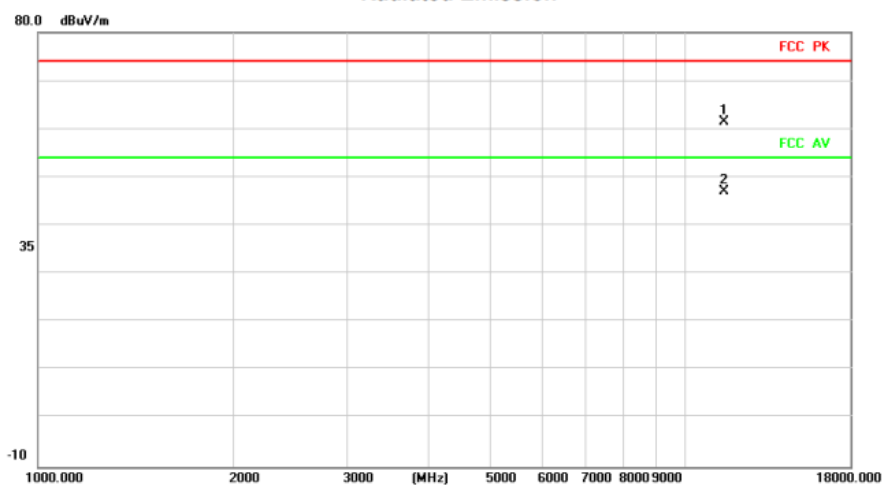
Above 1G (1GHz~40GHz)

Test mode:11N20MIMO

Test Channel:149

VERTICAL

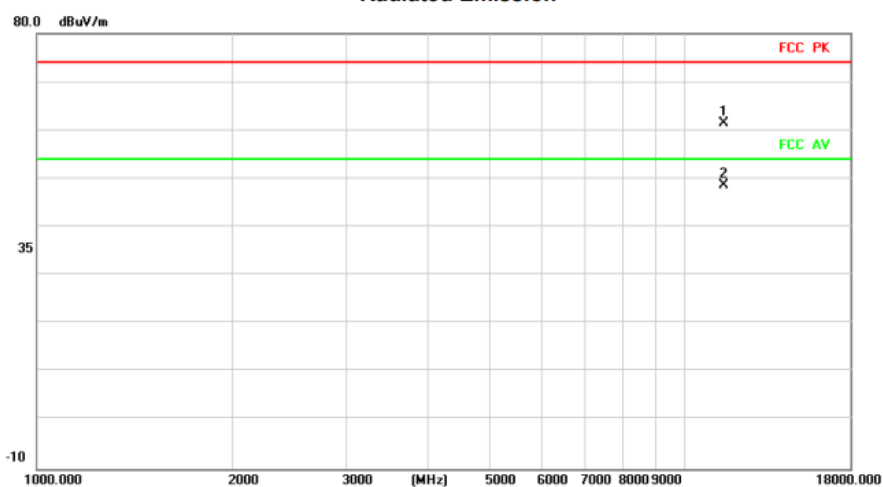
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11490.000	51.60	9.78	61.38	74.00	-12.62 peak
2 *		11490.000	37.33	9.78	47.11	54.00	-6.89 AVG

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11490.000	51.69	9.78	61.47	74.00	-12.53 peak
2 *		11490.000	38.82	9.78	48.60	54.00	-5.40 AVG

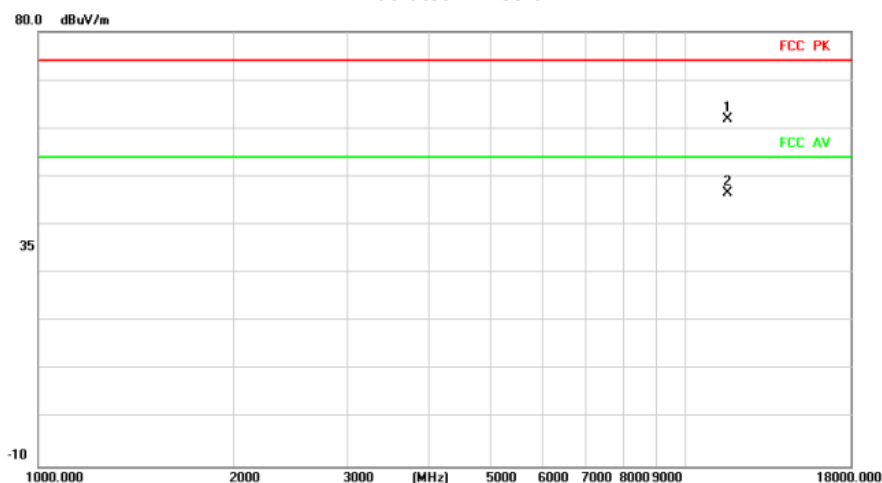
Above 1G (1GHz~40GHz)

Test mode:11N20MIMO

Test Channel:157

VERTICAL

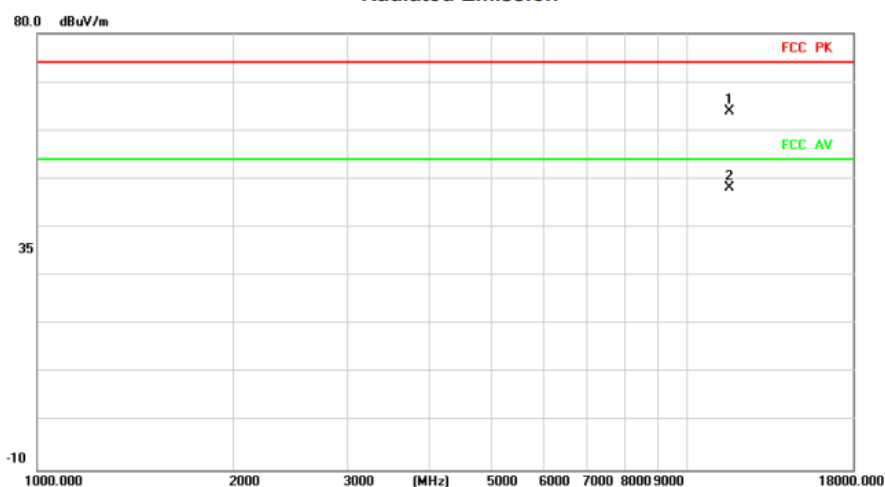
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11570.000	51.78	10.01	61.79	74.00	-12.21 peak
2 *		11570.000	36.65	10.01	46.66	54.00	-7.34 AVG

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11570.000	53.96	10.01	63.97	74.00	-10.03 peak
2 *		11570.000	38.20	10.01	48.21	54.00	-5.79 AVG

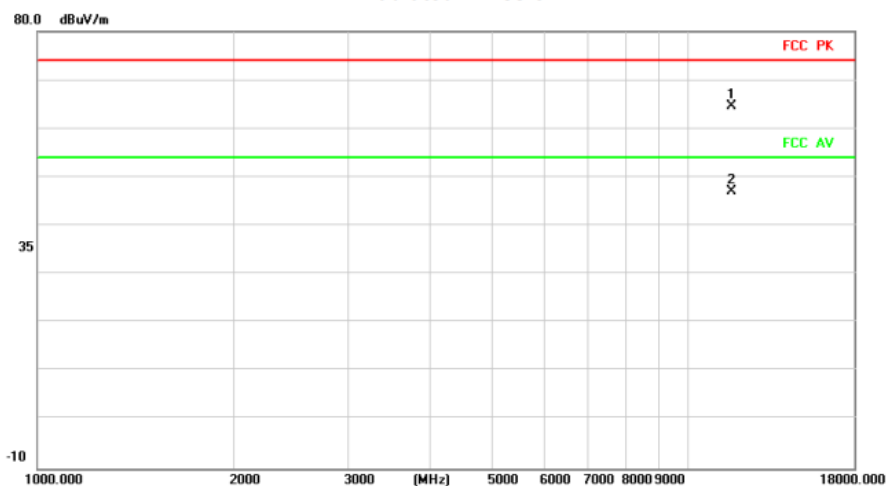
Above 1G (1GHz~40GHz)

Test mode:11N20MIMO

Test Channel:165

VERTICAL

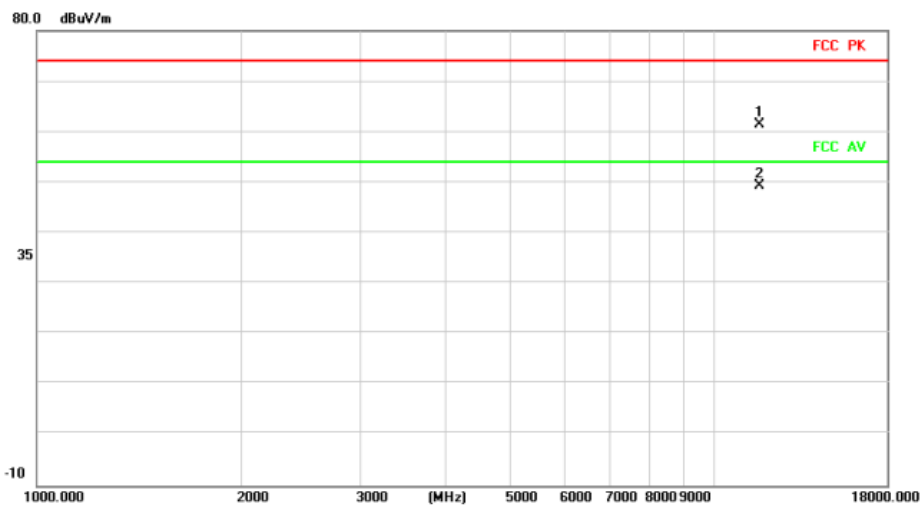
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11650.000	54.28	10.24	64.52	74.00	-9.48 peak
2 *		11650.000	36.83	10.24	47.07	54.00	-6.93 AVG

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11650.000	51.09	10.24	61.33	74.00	-12.67 peak
2 *		11650.000	39.08	10.24	49.32	54.00	-4.68 AVG

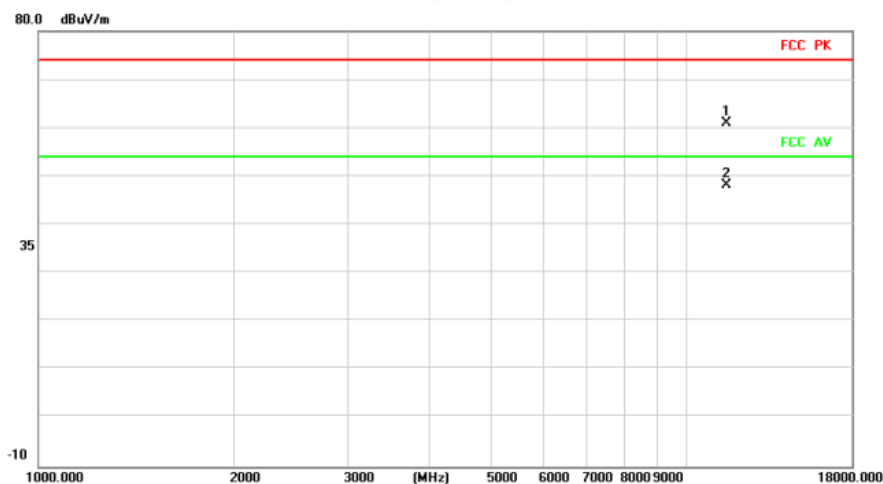
Above 1G (1GHz~40GHz)

Test mode:11N40MIMO

Test Channel:151

VERTICAL

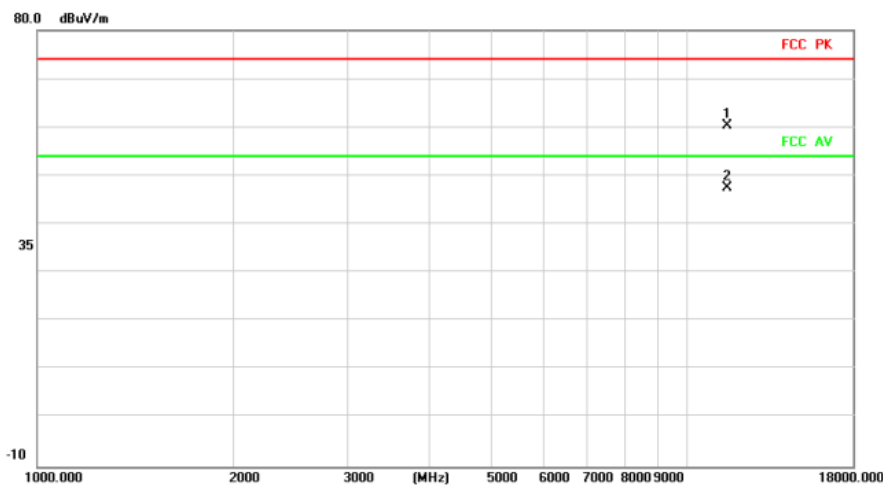
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11510.000	51.10	9.83	60.93	74.00	-13.07 peak
2 *		11510.000	38.42	9.83	48.25	54.00	-5.75 AVG

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11510.000	50.53	9.83	60.36	74.00	-13.64 peak
2 *		11510.000	37.67	9.83	47.50	54.00	-6.50 AVG

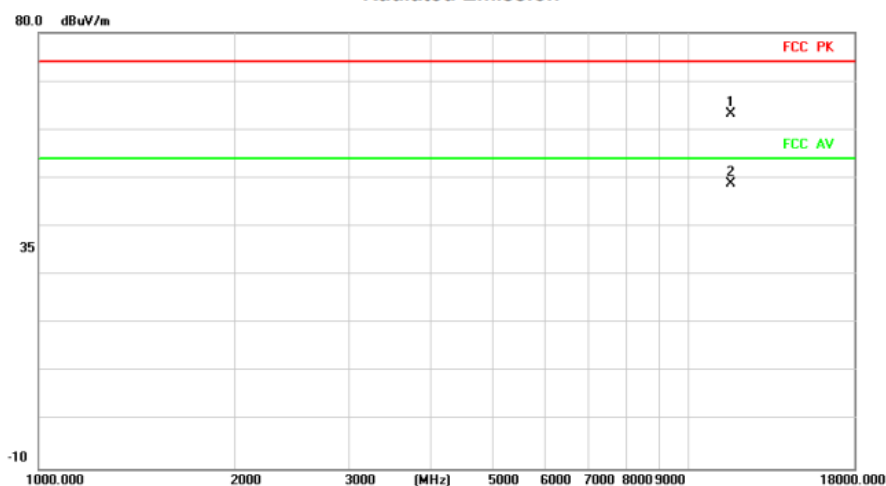
Above 1G (1GHz~40GHz)

Test mode:11N40MIMO

Test Channel:159

VERTICAL

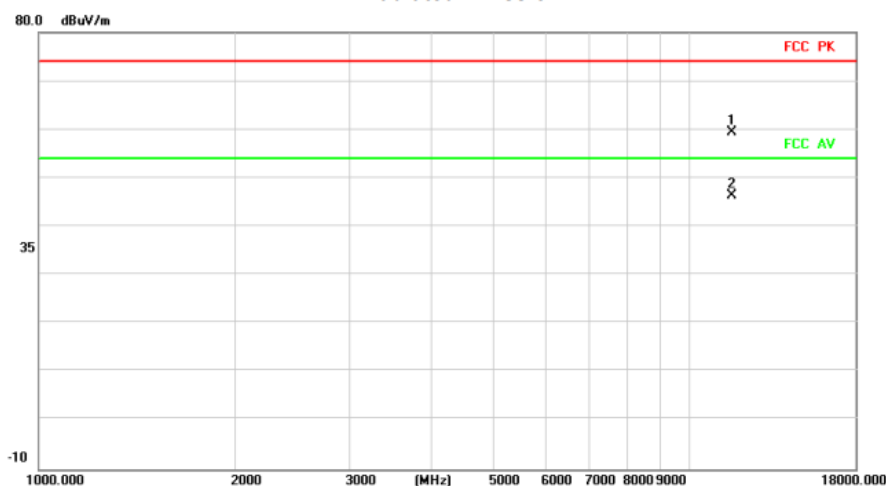
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11590.000	53.13	10.06	63.19	74.00	-10.81 peak
2 *		11590.000	38.81	10.06	48.87	54.00	-5.13 AVG

HORIZONTAL

Radiated Emission



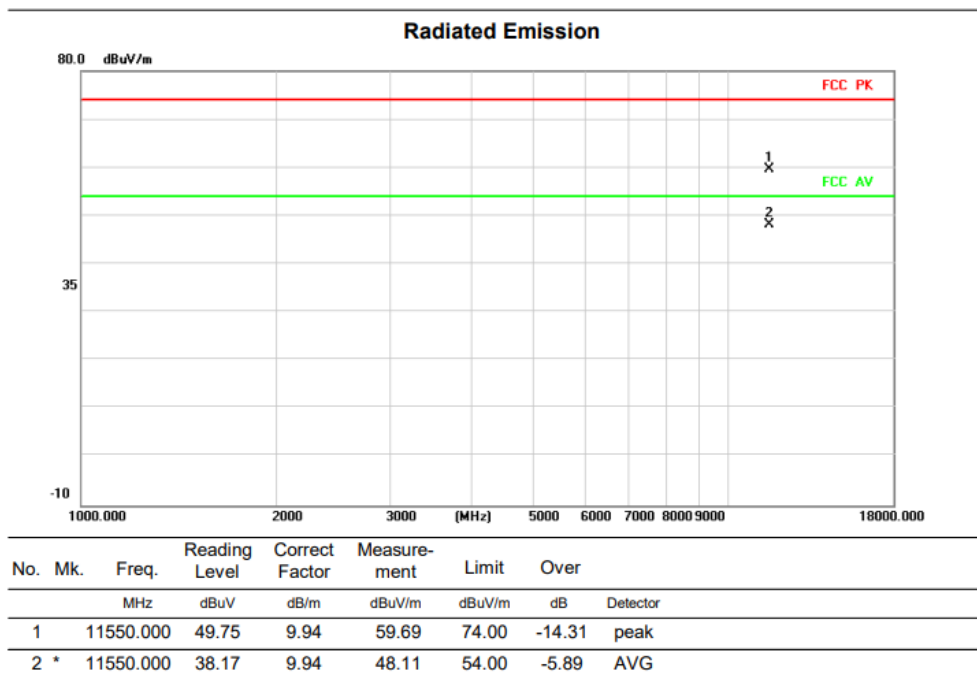
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		11590.000	49.45	10.06	59.51	74.00	-14.49 peak
2 *		11590.000	36.21	10.06	46.27	54.00	-7.73 AVG

Above 1G (1GHz~40GHz)

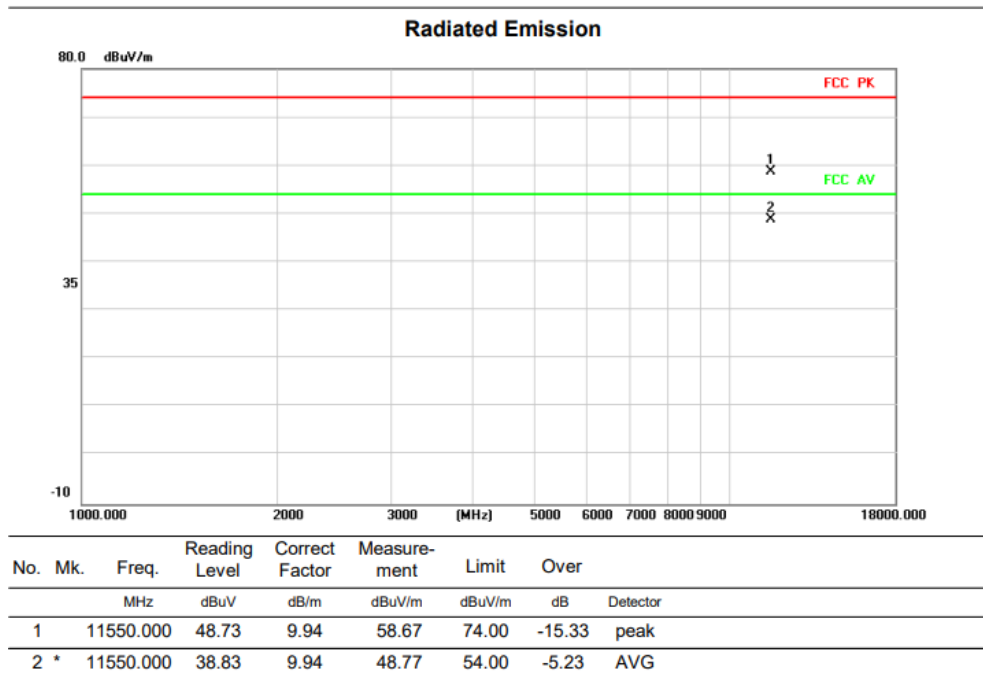
Test mode:11AC80MIMO

Test Channel:155

VERTICAL



HORIZONTAL



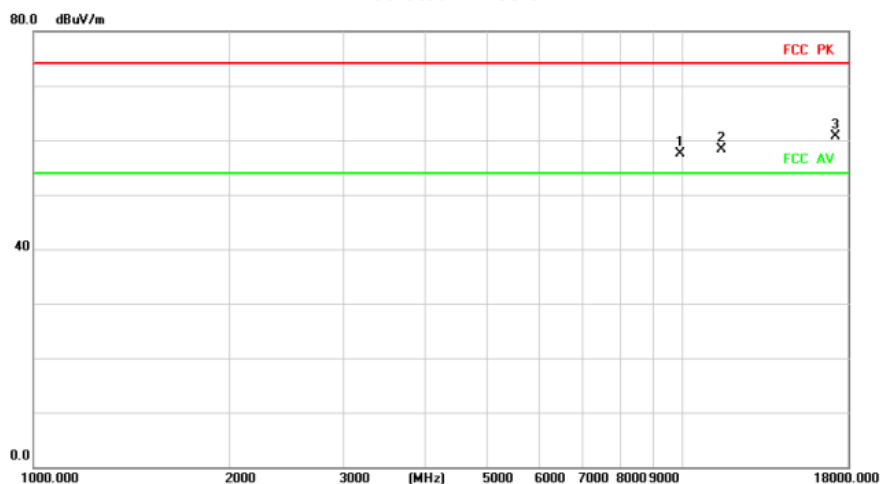
Above 1G (1GHz~40GHz)

Test mode:11AX20MIMO

Test Channel:149

VERTICAL

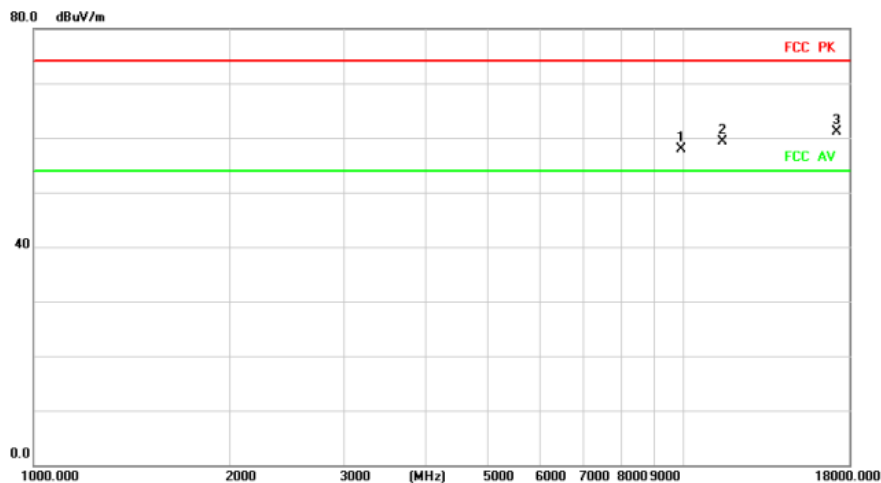
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		9895.349	49.65	7.86	57.51	74.00	-16.49 peak
2		11490.000	48.57	9.78	58.35	74.00	-15.65 peak
3 *		17235.000	49.02	11.71	60.73	74.00	-13.27 peak

HORIZONTAL

Radiated Emission



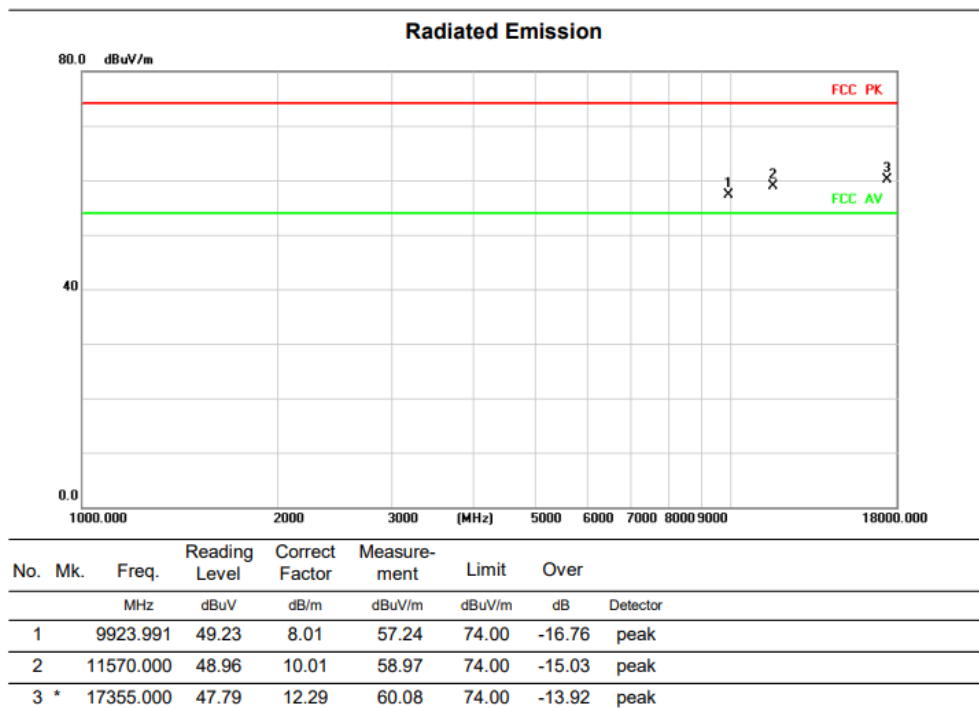
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		9923.991	49.82	8.01	57.83	74.00	-16.17 peak
2		11490.000	49.48	9.78	59.26	74.00	-14.74 peak
3 *		17235.000	49.48	11.71	61.19	74.00	-12.81 peak

Above 1G (1GHz~40GHz)

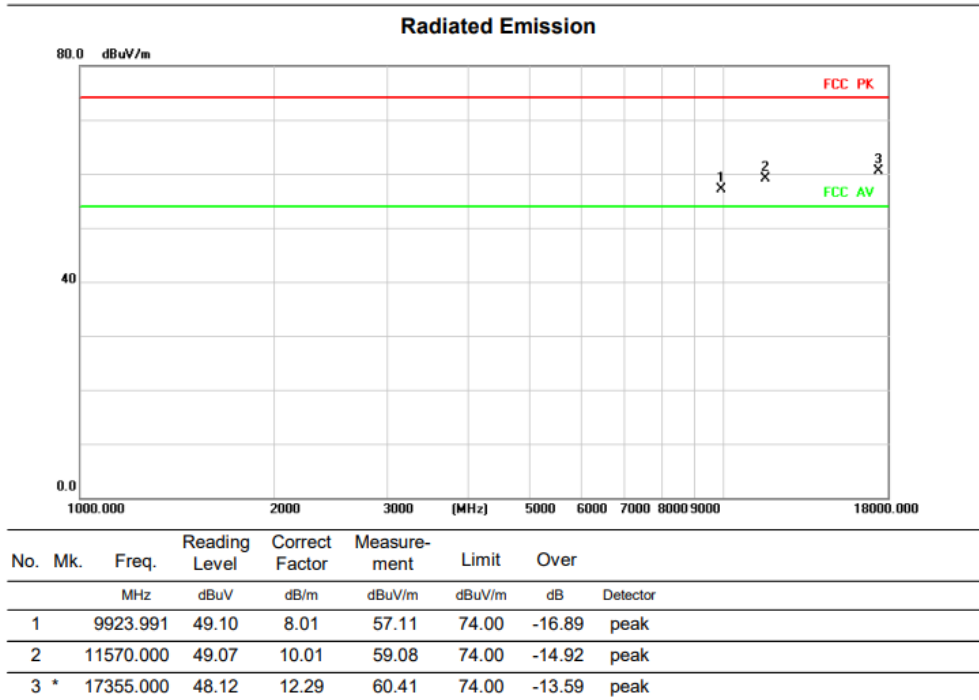
Test mode:11AX20MIMO

Test Channel:157

VERTICAL



HORIZONTAL

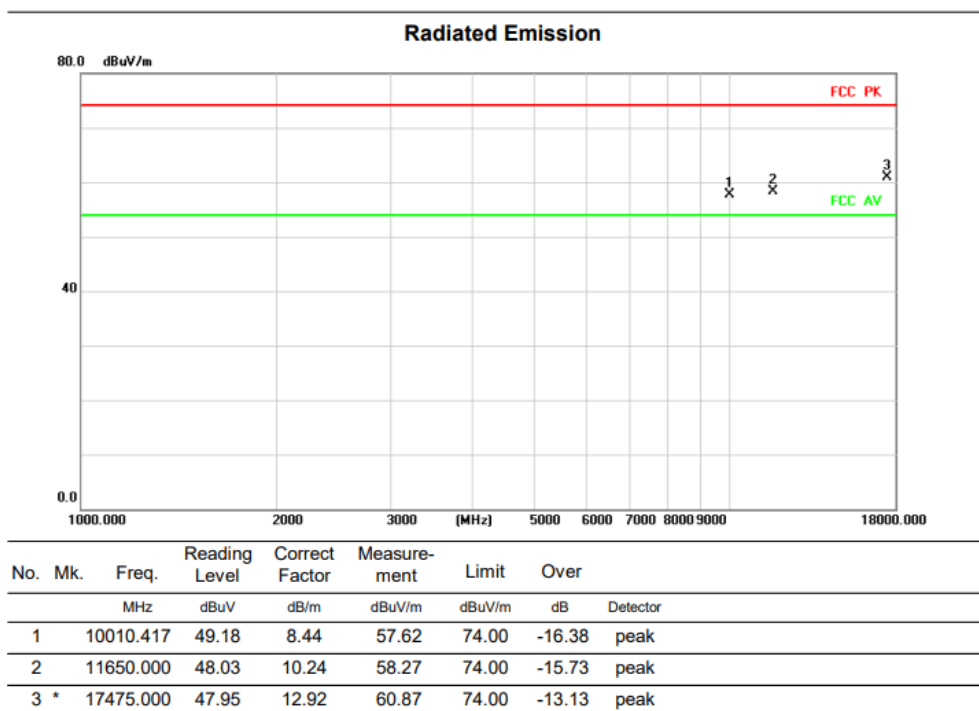


Above 1G (1GHz~40GHz)

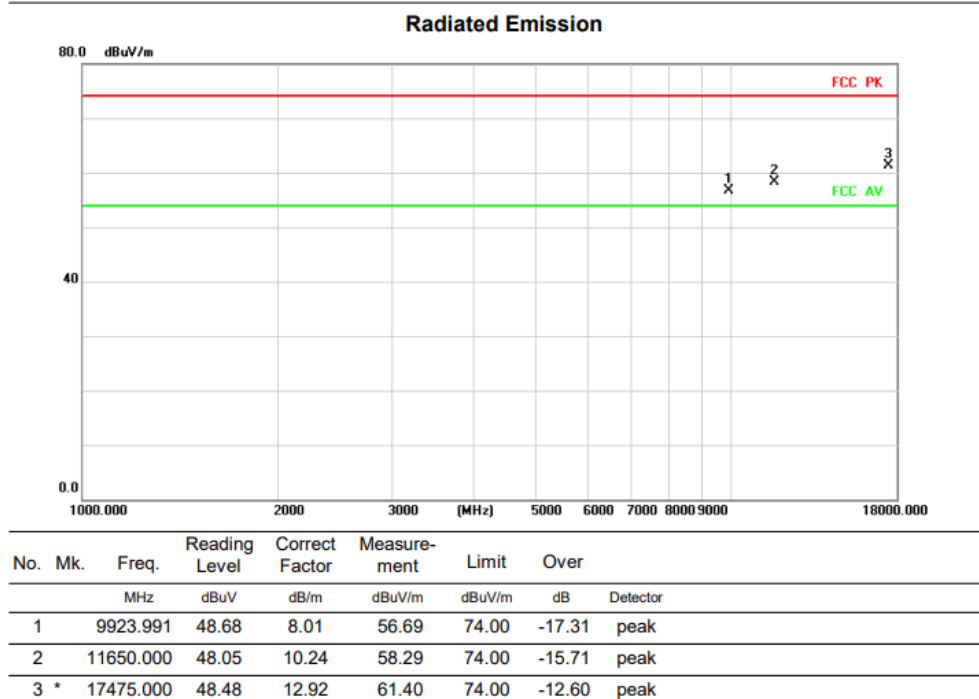
Test mode:11AX20MIMO

Test Channel:165

VERTICAL



HORIZONTAL

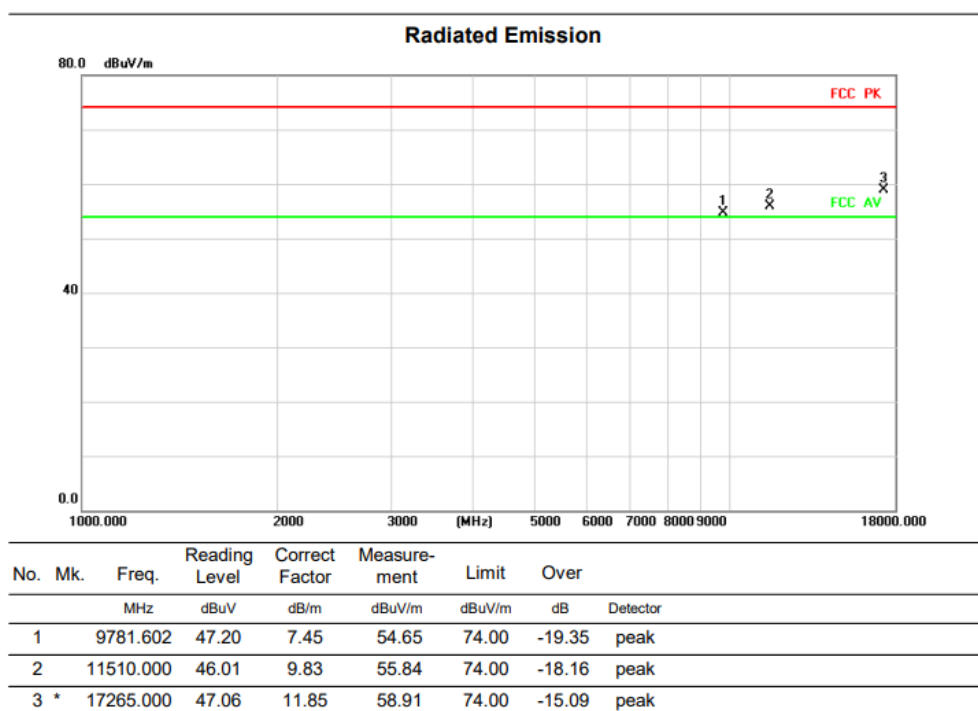


Above 1G (1GHz~40GHz)

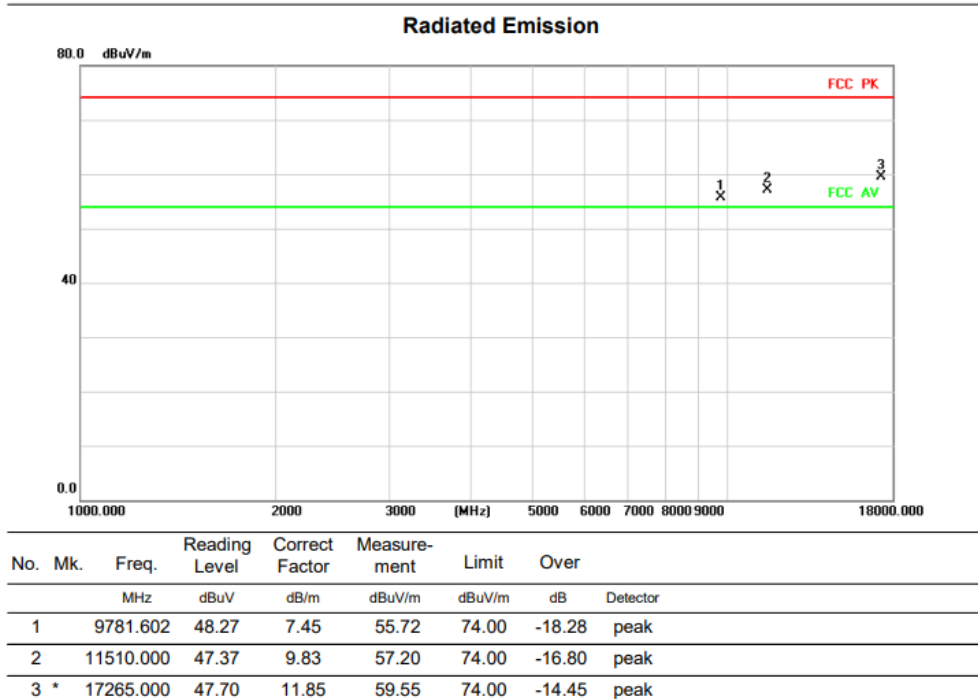
Test mode:11AX40MIMO

Test Channel:151

VERTICAL



HORIZONTAL

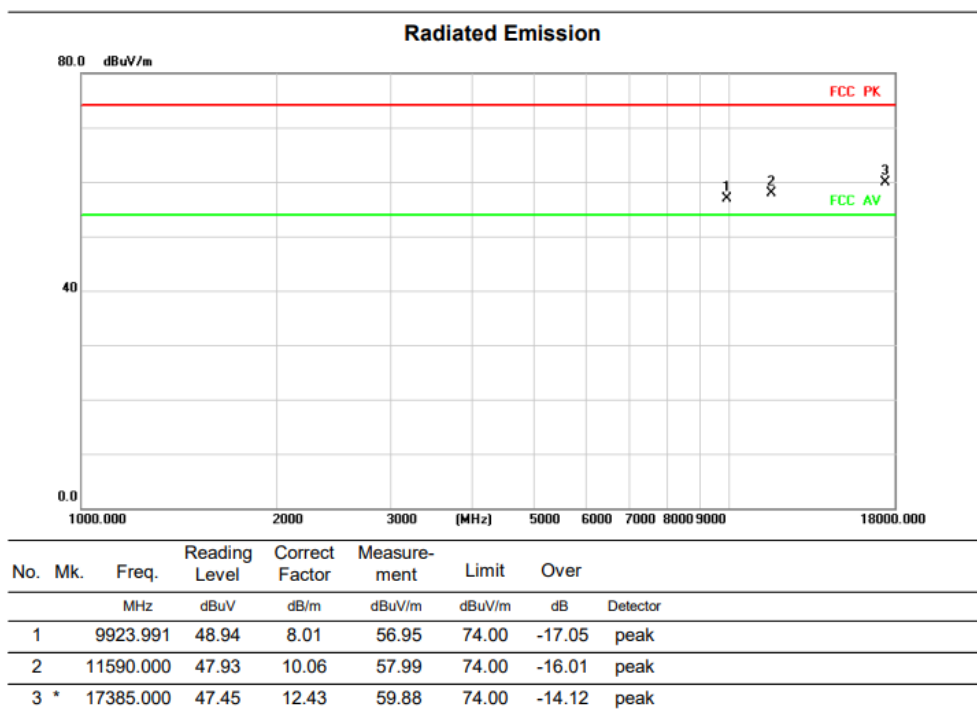


Above 1G (1GHz~40GHz)

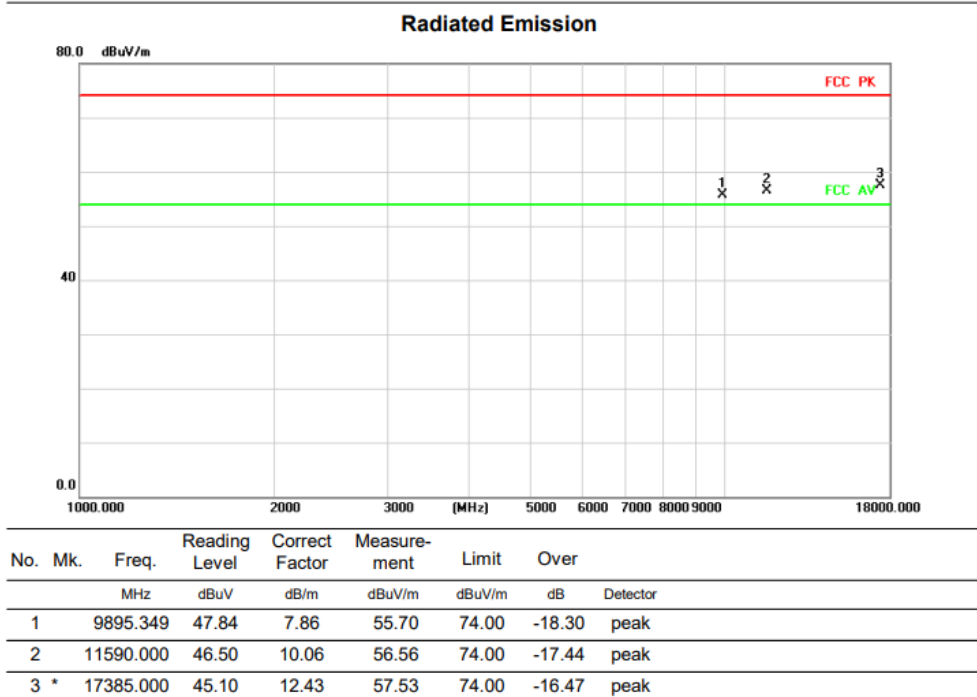
Test mode:11AX40MIMO

Test Channel:159

VERTICAL



HORIZONTAL

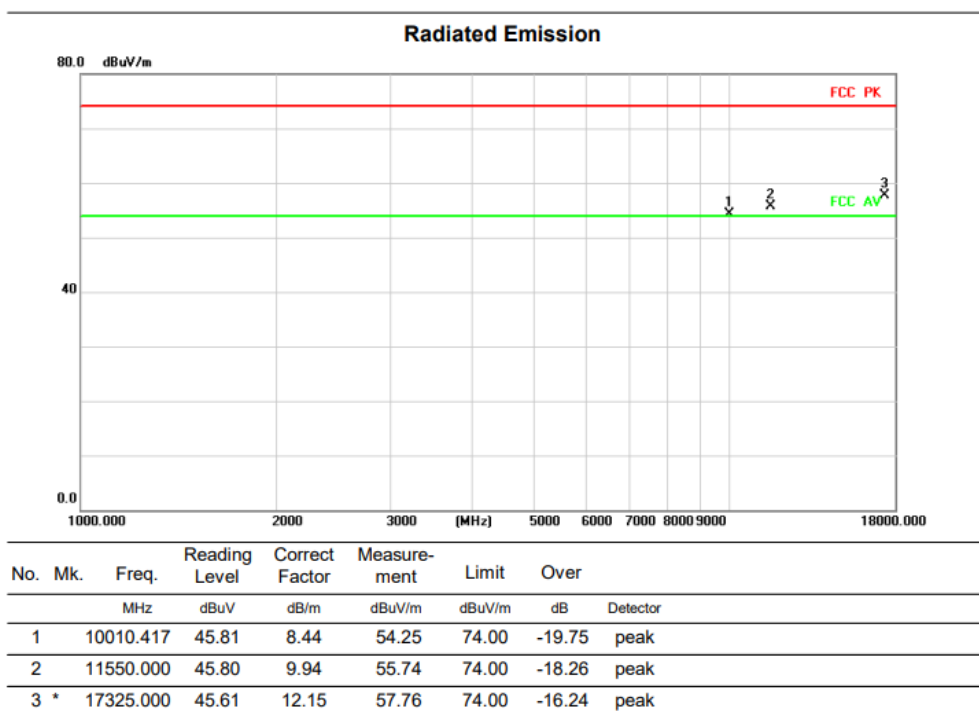


Above 1G (1GHz~40GHz)

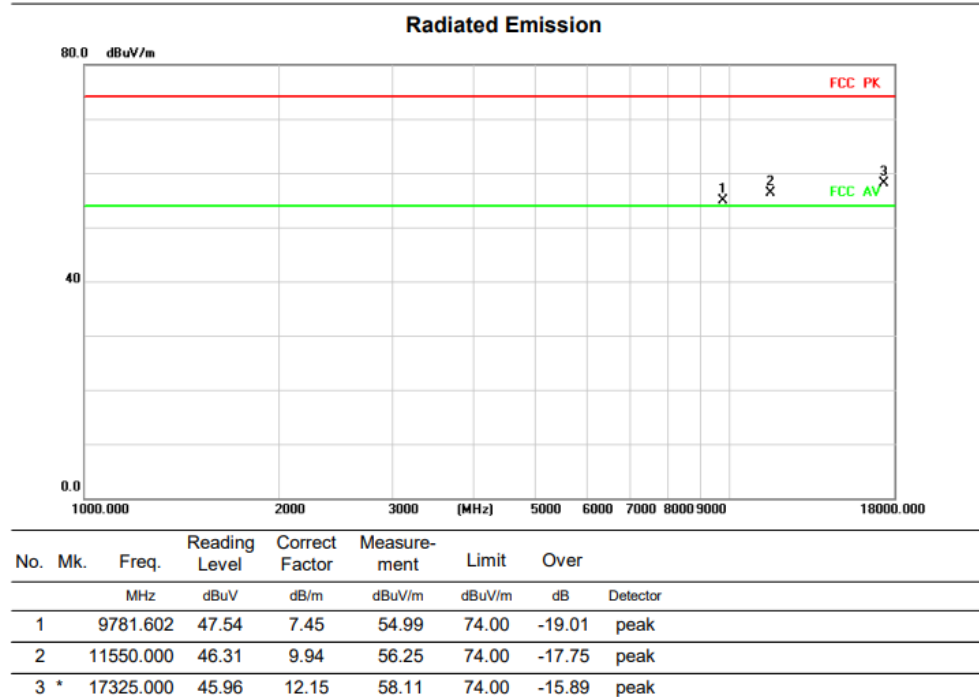
Test mode:11AX80MIMO

Test Channel:155

VERTICAL



HORIZONTAL



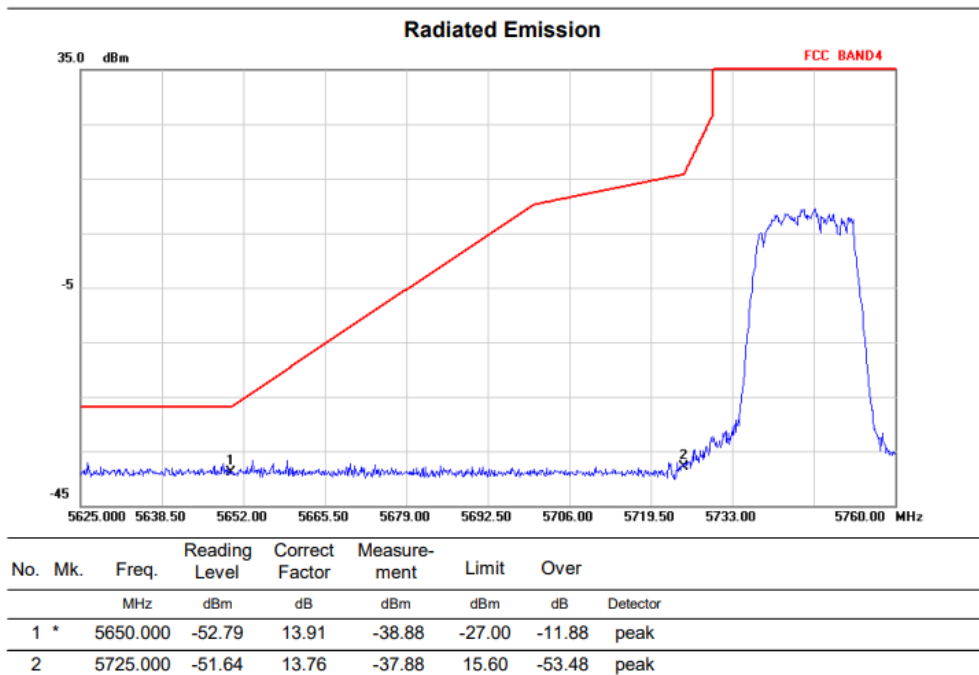
4) Radiated Band Edge

Above 1G (1GHz~40GHz)

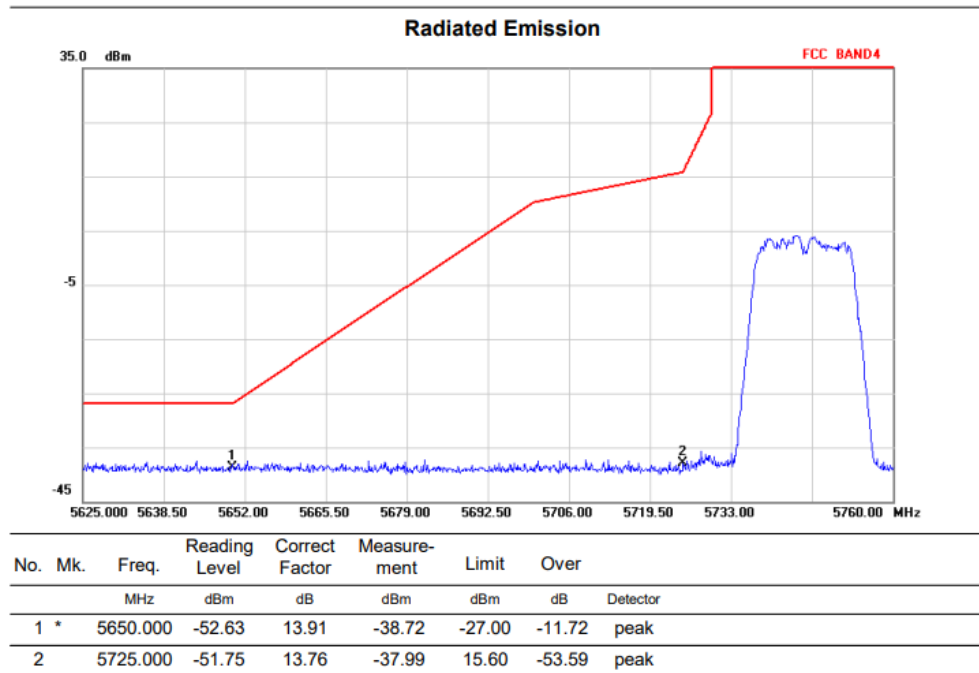
Test mode: 11A_ANT1+ANT2

Test Channel:149

VERTICAL



HORIZONTAL



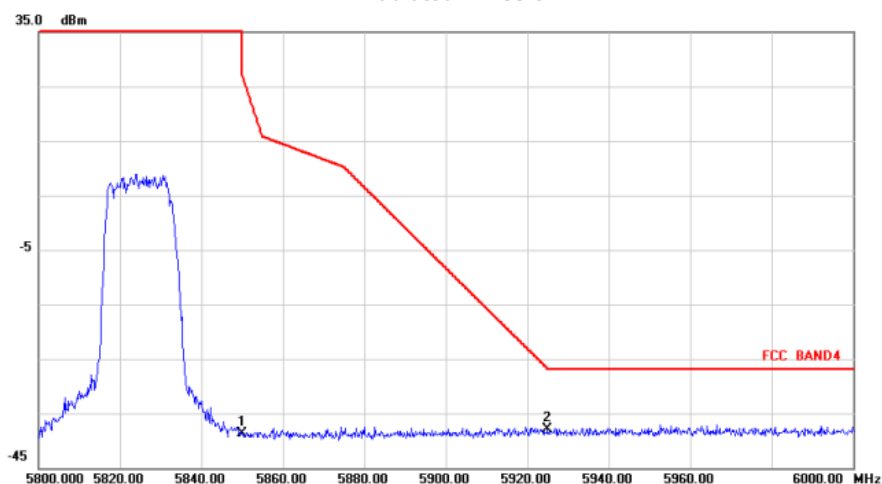
Above 1G (1GHz~40GHz)

Test mode: 11A_ANT1+ANT2

Test Channel:165

VERTICAL

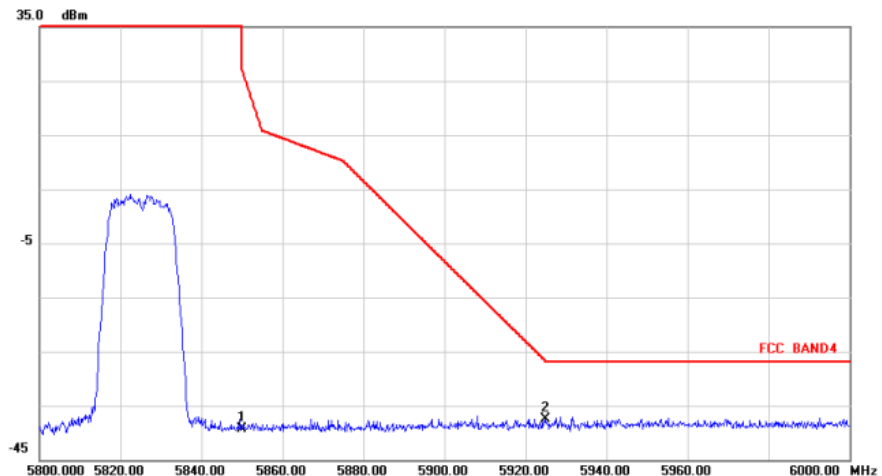
Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	dBm	Factor	ment			Detector
1		5850.000	-52.69	13.93	-38.76	27.00	-65.76	peak
2 *		5925.000	-52.31	14.41	-37.90	-27.00	-10.90	peak

HORIZONTAL

Radiated Emission



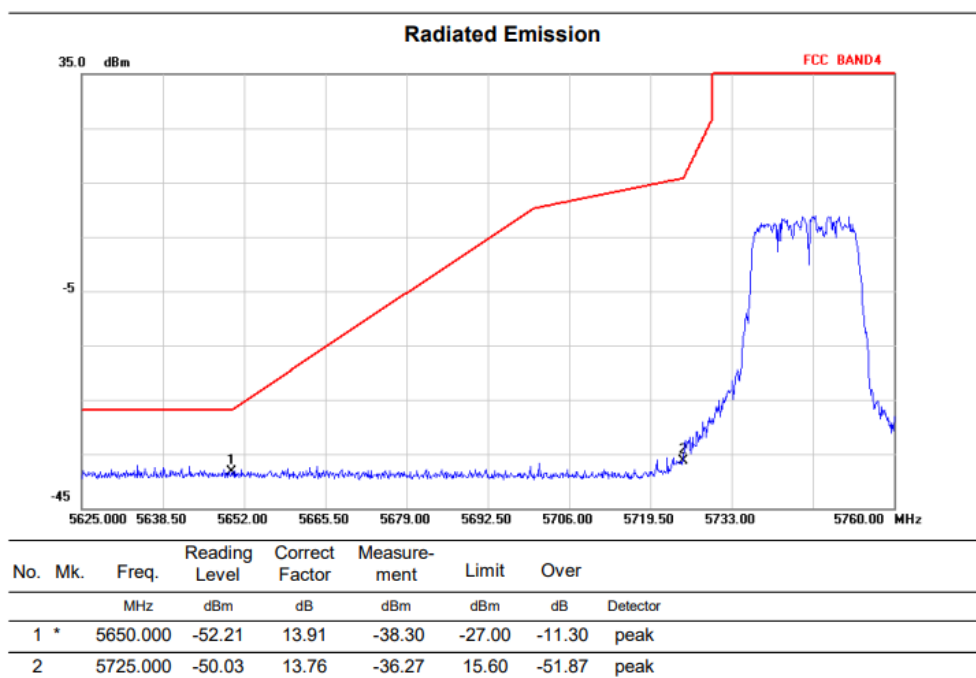
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	dBm	Factor	ment			Detector
1		5850.000	-53.16	13.93	-39.23	27.00	-66.23	peak
2 *		5925.000	-51.82	14.41	-37.41	-27.00	-10.41	peak

Above 1G (1GHz~40GHz)

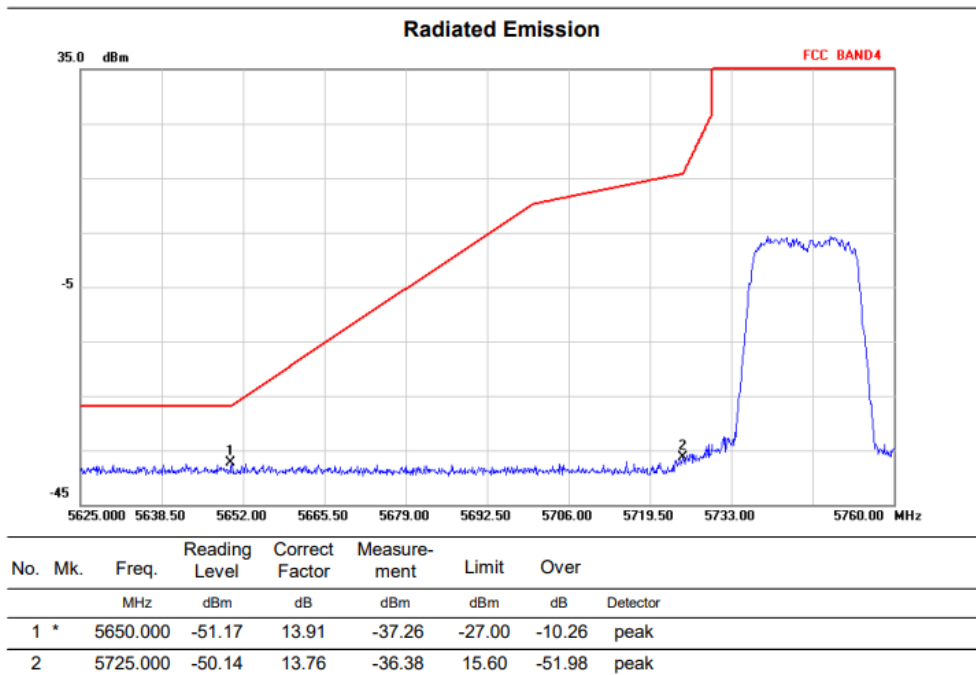
Test mode:11N20MIMO

Test Channel:149

VERTICAL



HORIZONTAL



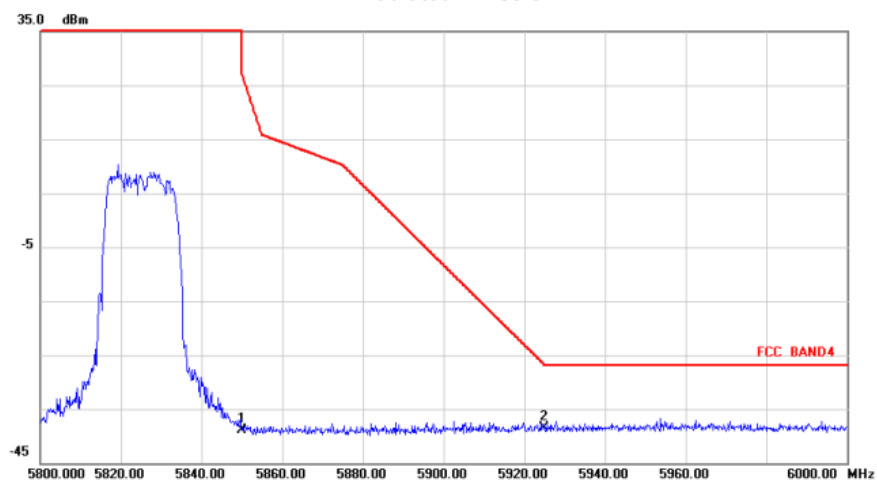
Above 1G (1GHz~40GHz)

Test mode:11N20MIMO

Test Channel:165

VERTICAL

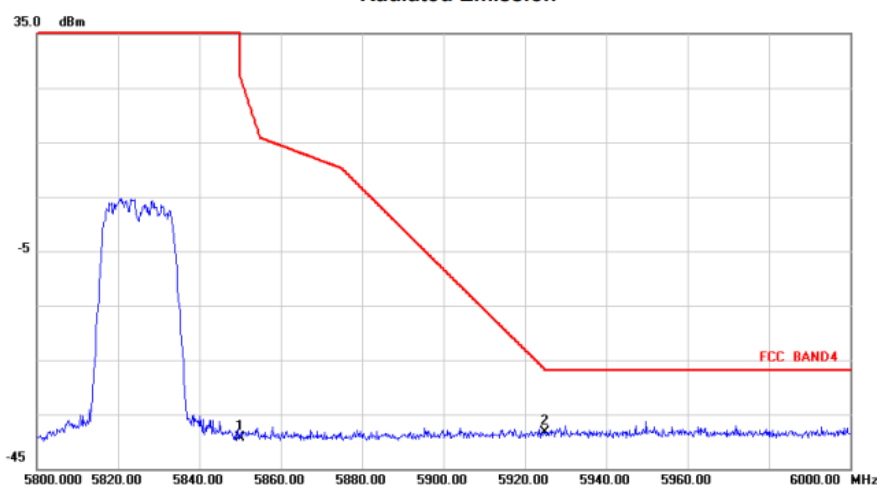
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	Detector
1		5850.000	-52.82	13.93	-38.89	27.00	-65.89 peak
2 *		5925.000	-52.95	14.41	-38.54	-27.00	-11.54 peak

HORIZONTAL

Radiated Emission



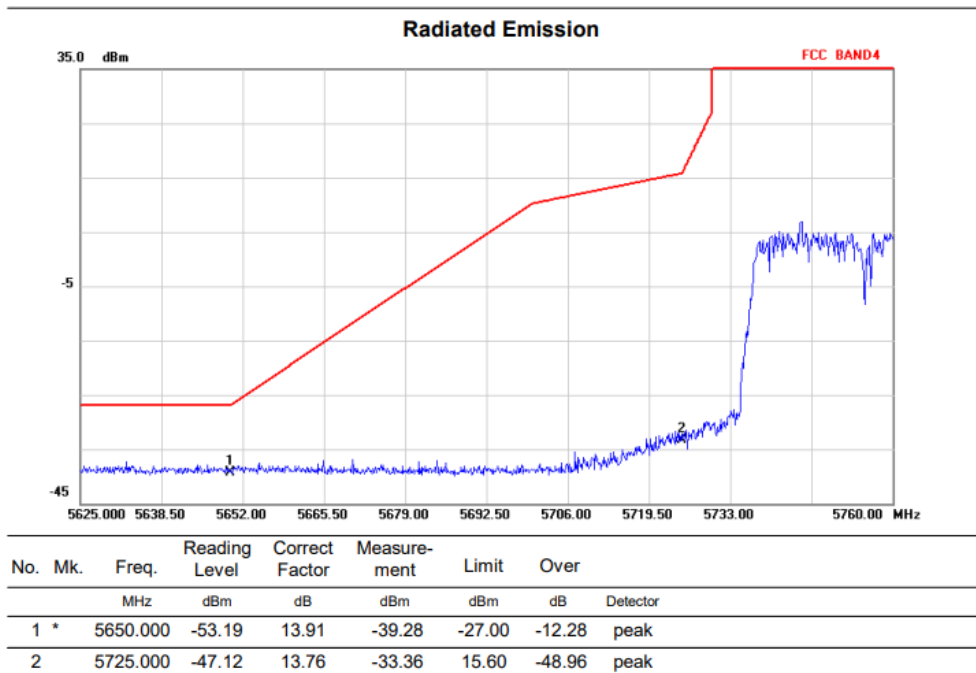
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	Detector
1		5850.000	-53.29	13.93	-39.36	27.00	-66.36 peak
2 *		5925.000	-52.64	14.41	-38.23	-27.00	-11.23 peak

Above 1G (1GHz~40GHz)

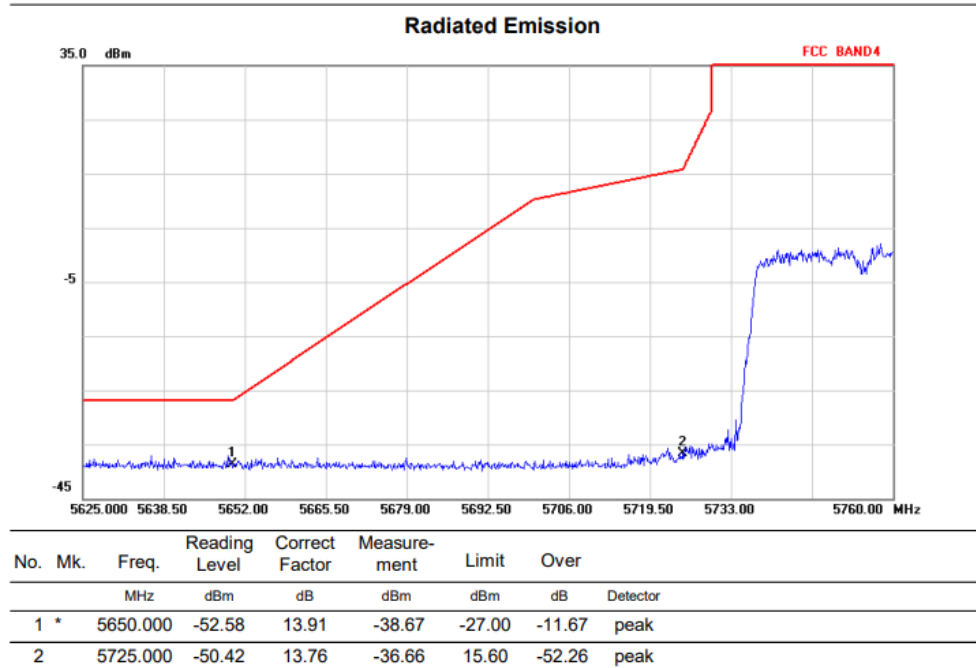
Test mode:11N40MIMO

Test Channel:151

VERTICAL



HORIZONTAL



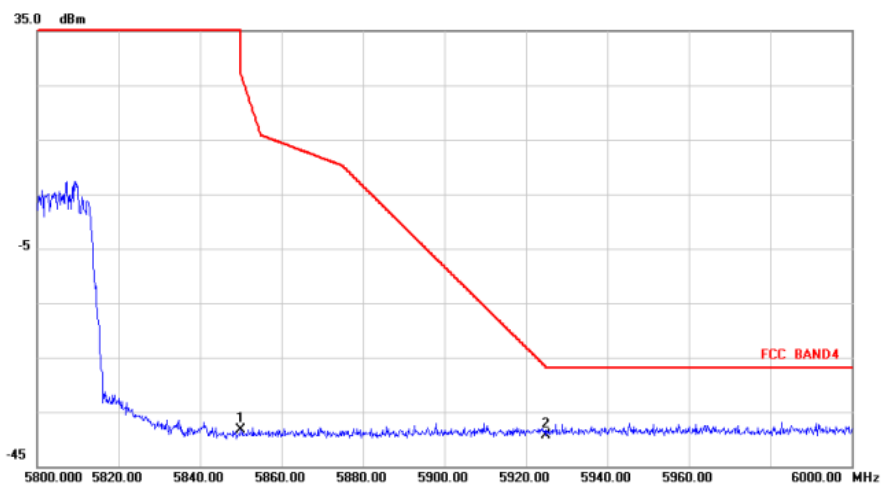
Above 1G (1GHz~40GHz)

Test mode:11N40MIMO

Test Channel:159

VERTICAL

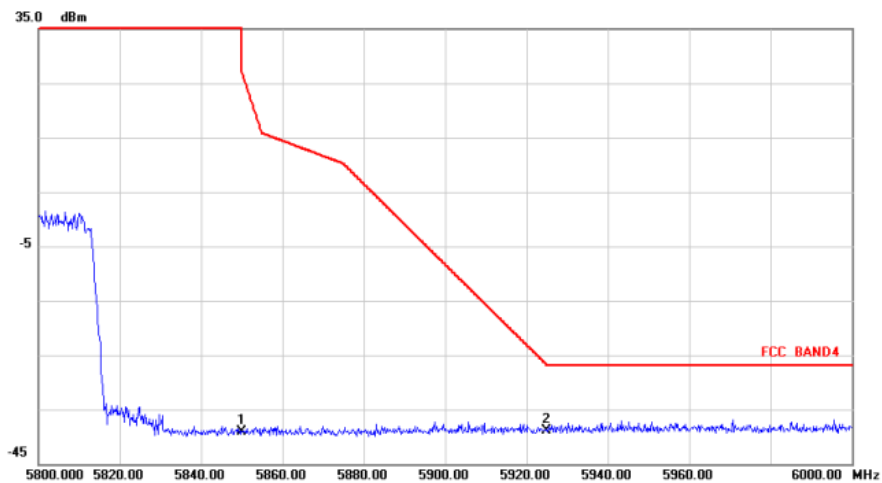
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBm	dB	dBm	dBm	dB	
1		5850.000	-52.26	13.93	-38.33	27.00	-65.33	peak
2	*	5925.000	-53.80	14.41	-39.39	-27.00	-12.39	peak

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBm	dB	dBm	dBm	dB	
1		5850.000	-53.04	13.93	-39.11	27.00	-66.11	peak
2	*	5925.000	-53.30	14.41	-38.89	-27.00	-11.89	peak

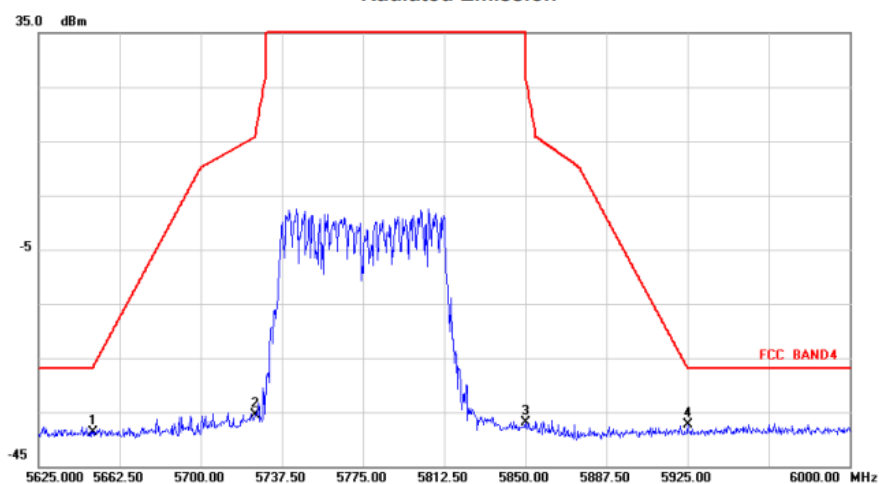
Above 1G (1GHz~40GHz)

Test mode:11AC80MIMO

Test Channel:155

VERTICAL

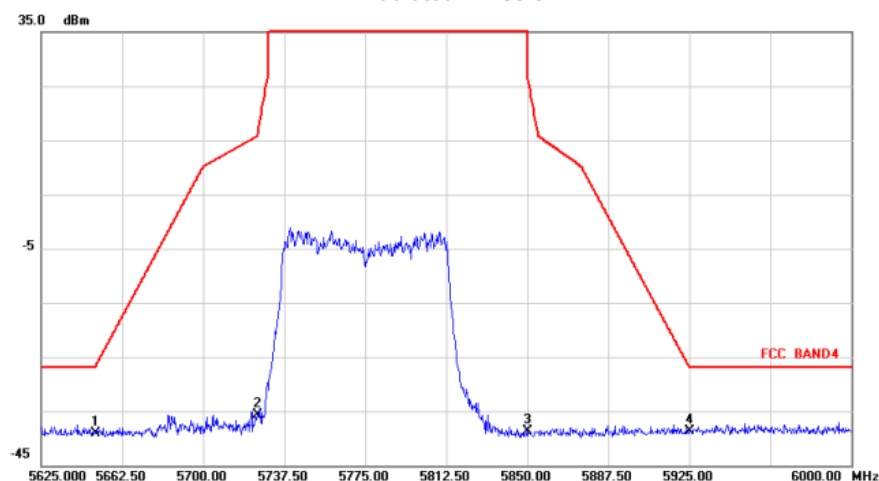
Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBm	dB	dBm	dBm	dB	
1		5650.000	-52.65	13.91	-38.74	-27.00	-11.74	peak
2		5725.000	-49.31	13.76	-35.55	15.60	-51.15	peak
3		5850.000	-50.76	13.93	-36.83	27.00	-63.83	peak
4 *		5925.000	-51.64	14.41	-37.23	-27.00	-10.23	peak

HORIZONTAL

Radiated Emission



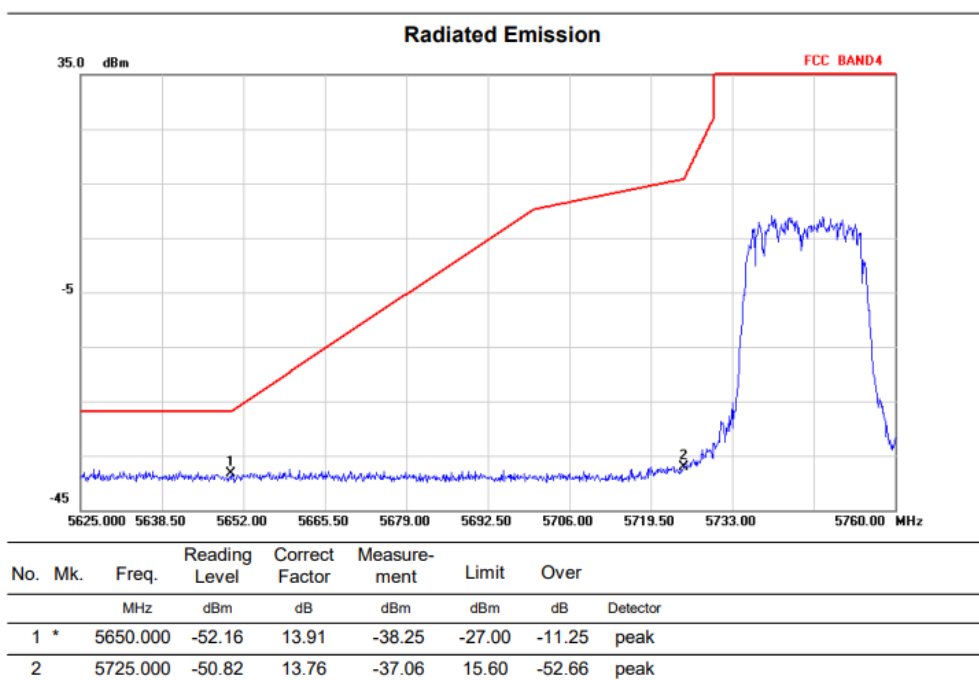
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBm	dB	dBm	dBm	dB	
1		5650.000	-53.09	13.91	-39.18	-27.00	-12.18	peak
2		5725.000	-49.39	13.76	-35.63	15.60	-51.23	peak
3		5850.000	-52.56	13.93	-38.63	27.00	-65.63	peak
4 *		5925.000	-53.04	14.41	-38.63	-27.00	-11.63	peak

Above 1G (1GHz~40GHz)

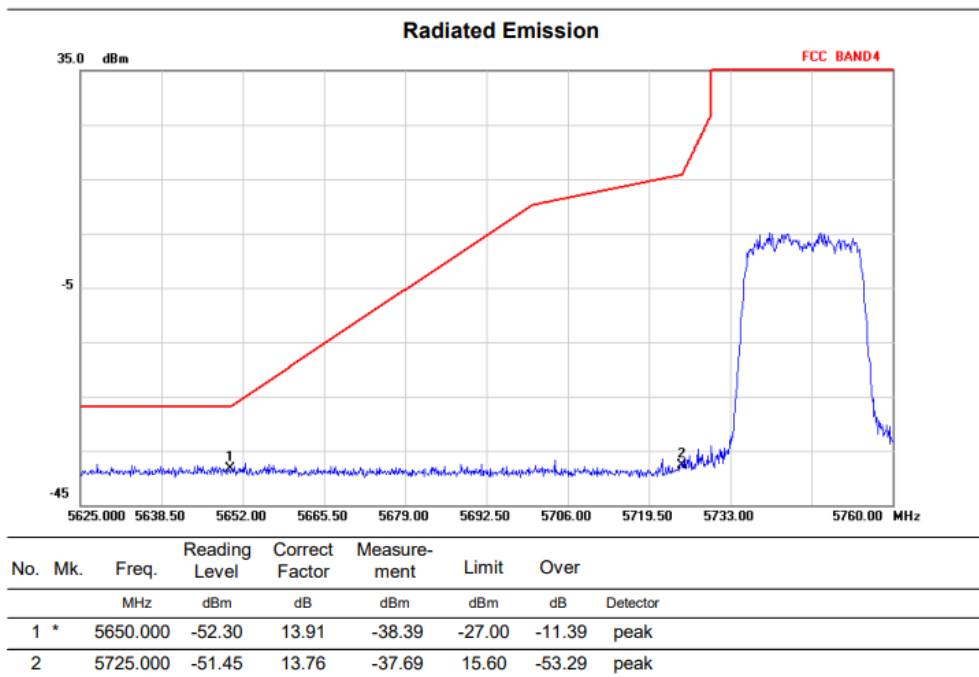
Test mode:11AX20MIMO

Test Channel:149

VERTICAL



HORIZONTAL



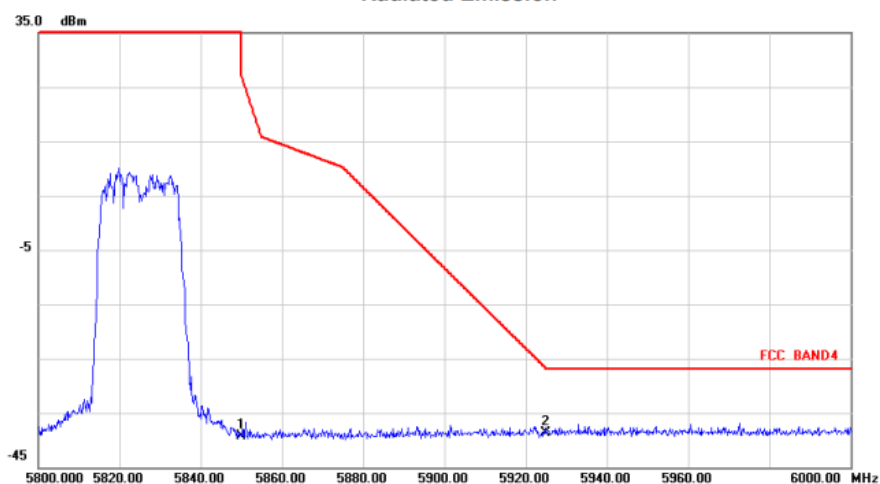
Above 1G (1GHz~40GHz)

Test mode:11AX20MIMO

Test Channel:165

VERTICAL

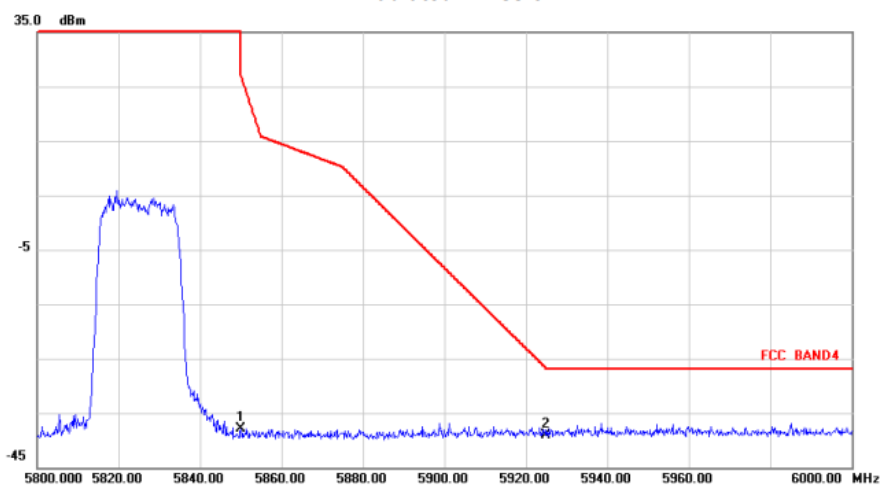
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB Detector
1		5850.000	-53.29	13.93	-39.36	27.00	-66.36 peak
2 *		5925.000	-53.01	14.41	-38.60	-27.00	-11.60 peak

HORIZONTAL

Radiated Emission



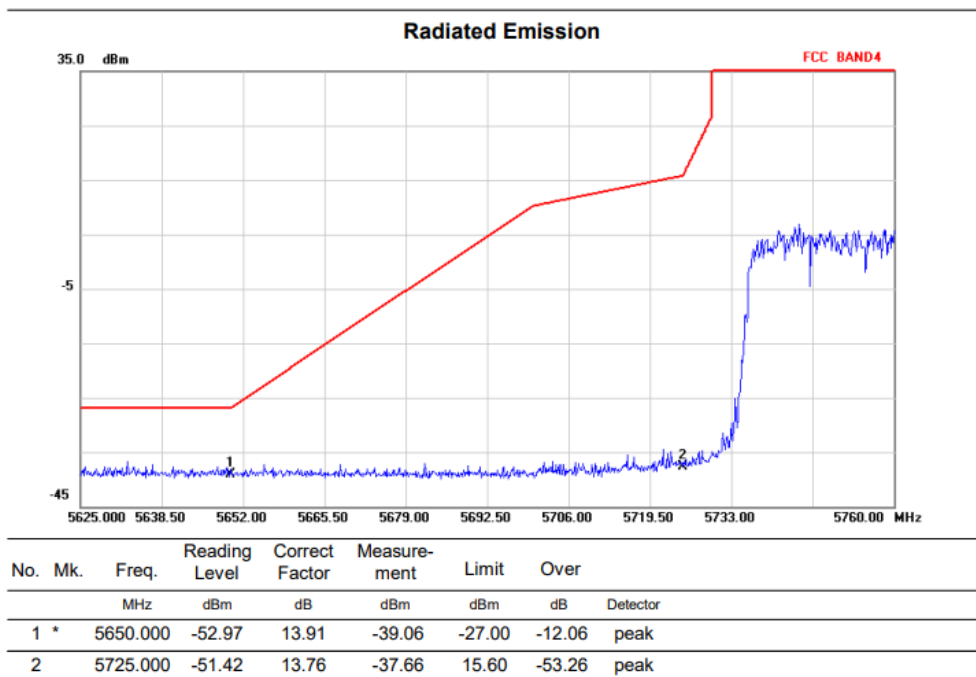
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBm	dB	dBm	dBm	dB Detector
1		5850.000	-51.82	13.93	-37.89	27.00	-64.89 peak
2 *		5925.000	-53.41	14.41	-39.00	-27.00	-12.00 peak

Above 1G (1GHz~40GHz)

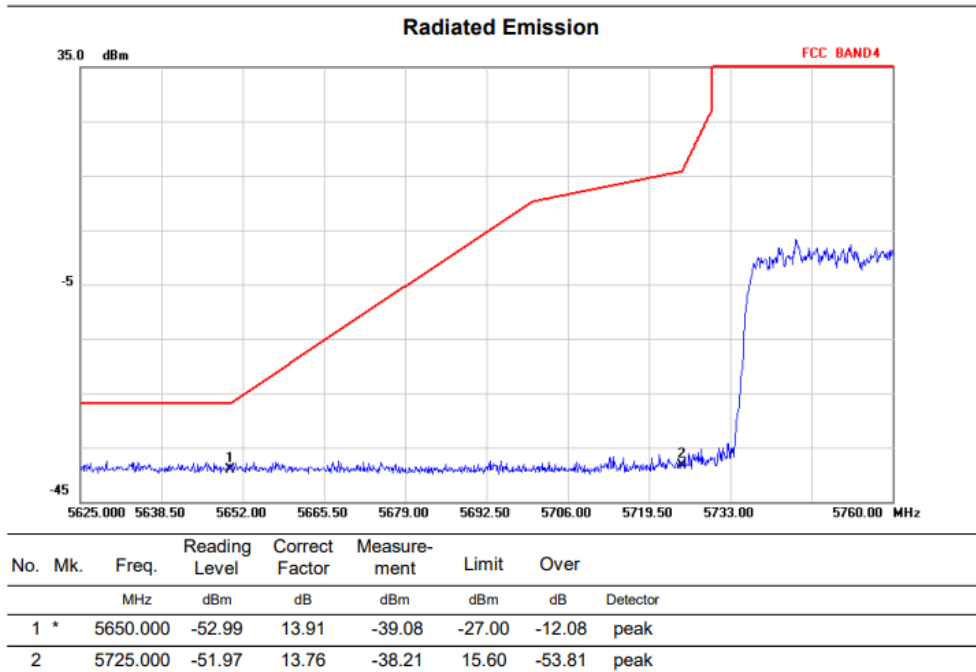
Test mode:11AX40MIMO

Test Channel:151

VERTICAL



HORIZONTAL



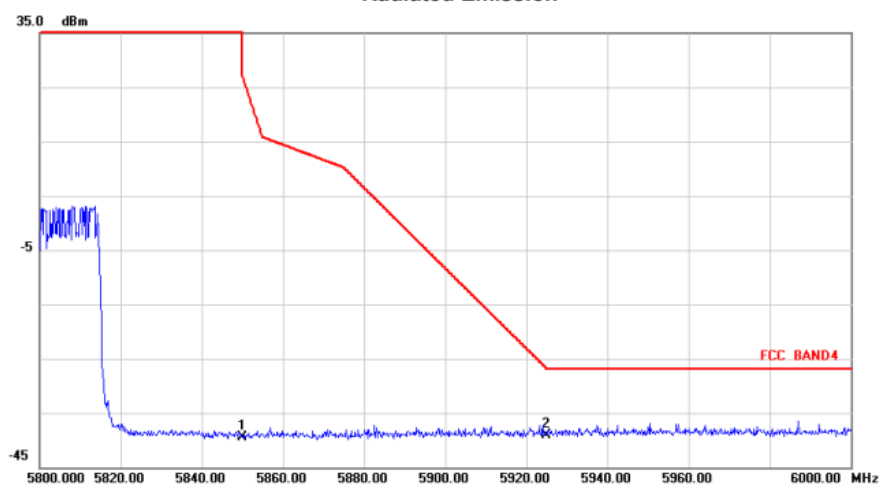
Above 1G (1GHz~40GHz)

Test mode:11AX40MIMO

Test Channel:159

VERTICAL

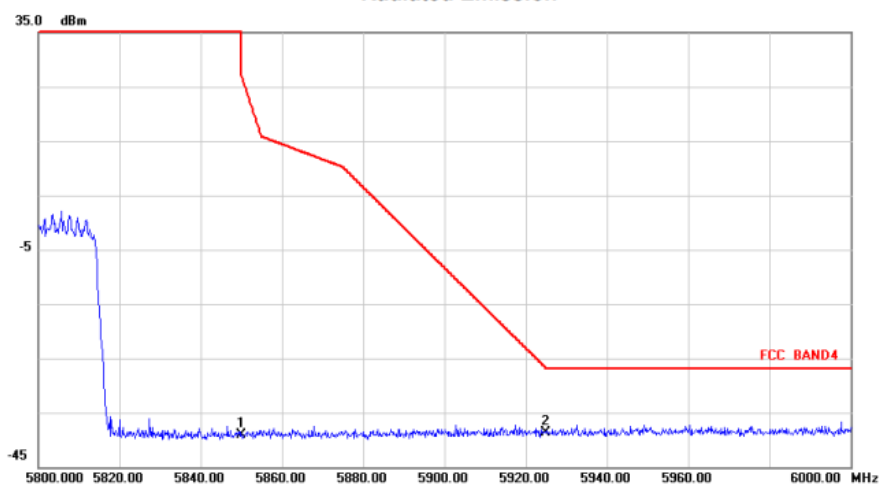
Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	dBm	Factor	ment	dBm	dB	Detector
1		5850.000	-53.35	13.93	-39.42	27.00	-66.42	peak
2 *		5925.000	-53.56	14.41	-39.15	-27.00	-12.15	peak

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	dBm	Factor	ment	dBm	dB	Detector
1		5850.000	-52.99	13.93	-39.06	27.00	-66.06	peak
2 *		5925.000	-53.13	14.41	-38.72	-27.00	-11.72	peak

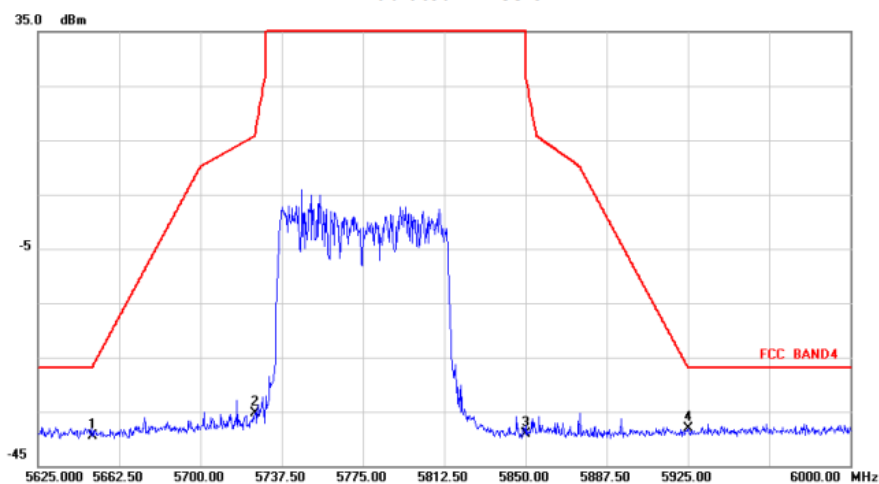
Above 1G (1GHz~40GHz)

Test mode:11AX80MIMO

Test Channel:155

VERTICAL

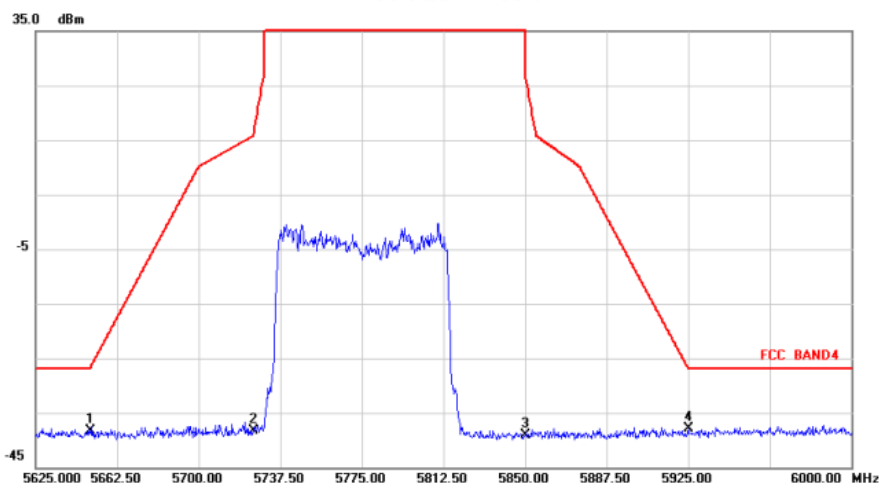
Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBm	dB	dBm	dBm	dB	
1		5650.000	-53.35	13.91	-39.44	-27.00	-12.44	peak
2		5725.000	-48.98	13.76	-35.22	15.60	-50.82	peak
3		5850.000	-52.94	13.93	-39.01	27.00	-66.01	peak
4 *		5925.000	-52.44	14.41	-38.03	-27.00	-11.03	peak

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBm	dB	dBm	dBm	dB	
1		5650.000	-52.27	13.91	-38.36	-27.00	-11.36	peak
2		5725.000	-52.06	13.76	-38.30	15.60	-53.90	peak
3		5850.000	-53.08	13.93	-39.15	27.00	-66.15	peak
4 *		5925.000	-52.35	14.41	-37.94	-27.00	-10.94	peak

3.3 Spectrum Bandwidth

3.3.1 Limit

FCC Part15, Subpart E (15.407)			
Section	Test Item	Limit	Frequency Range (MHz)
15.407(a)	26 dB Bandwidth	-	5150-5250
	26 dB Bandwidth	-	5250-5350
15.407(e)	26 dB Bandwidth	-	5470-5725
	6 dB Bandwidth	Minimum 500 kHz	5725-5850

3.3.2 Test Peripherals

Support Equipment				
No.	Equipment	Brand Name	Model Name	Remarks
1	Type-C Cable	AWM	E101344	0.9m, No Shielding
2	Record PC	Lenovo	M4500T	NA

3.3.3 Test Procedure

Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ● : Test ○ : No Test	

a) The EUT shall be connected to the spectrum analyser, and the spectrum analyser is set as follow:
For 26 dB Bandwidth

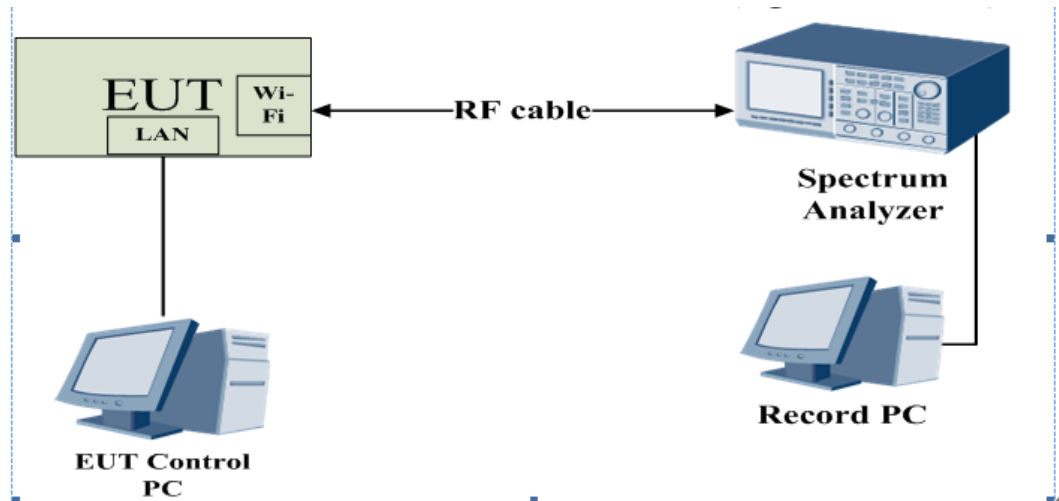
Centre Frequency	The centre frequency of the channel under test
RBW	$\geq 1\% \times \text{Nomina Channel Bandwidth}$
VBW	$\geq 3 \times \text{RBW}$
Frequency span	2 x Nominal Channel Bandwidth
Detector Mode	Peak
Trace Mode	Max Hold
Sweep Time	Auto Couple

For 6 dB Bandwidth

Centre Frequency	The centre frequency of the channel under test
RBW	100 kHz
VBW	300 kHz
Frequency span	2 x Nominal Channel Bandwidth
Detector Mode	Peak
Trace Mode	Max Hold
Sweep Time	Auto Couple

- b) Wait for the trace to stabilize then find the peak value of the trace and place the analyser marker on this peak.
- c) Use the -26/-6dB bandwidth function of the spectrum analyser to measure the -26/-6dB Bandwidth of the EUT. This value shall be recorded.
- d) Make sure that the power envelope is sufficiently above the noise floor of the analyser to avoid the noise signals left and right from the power envelope being taken into account by this measurement.

3.3.4 Test Setup



3.3.5 Test Result

3.3.5.1 26 dB Bandwidth

Test Mode	Antenna	Frequency [MHz]	26db EBW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11A-CDD	Ant1	5745	18.280	5736.040	5754.320	---	---
	Ant2	5745	18.160	5736.120	5754.280	---	---
	Ant1	5785	18.240	5776.040	5794.280	---	---
	Ant2	5785	18.080	5776.160	5794.240	---	---
	Ant1	5825	18.320	5815.960	5834.280	---	---
	Ant2	5825	18.440	5815.960	5834.400	---	---
11N20MIMO	Ant1	5745	19.240	5735.520	5754.760	---	---
	Ant2	5745	19.600	5735.320	5754.920	---	---
	Ant1	5785	19.320	5775.440	5794.760	---	---
	Ant2	5785	19.040	5775.560	5794.600	---	---
	Ant1	5825	19.400	5815.480	5834.880	---	---
	Ant2	5825	19.400	5815.400	5834.800	---	---
11N40MIMO	Ant1	5755	38.800	5735.800	5774.600	---	---
	Ant2	5755	38.880	5735.640	5774.520	---	---
	Ant1	5795	38.720	5775.720	5814.440	---	---
	Ant2	5795	39.040	5775.560	5814.600	---	---
11AC20MIMO	Ant1	5745	19.520	5735.320	5754.840	---	---
	Ant2	5745	19.440	5735.400	5754.840	---	---
	Ant1	5785	19.280	5775.480	5794.760	---	---
	Ant2	5785	19.120	5775.560	5794.680	---	---
	Ant1	5825	19.600	5815.360	5834.960	---	---
	Ant2	5825	19.400	5815.480	5834.880	---	---
11AC40MIMO	Ant1	5755	38.720	5735.960	5774.680	---	---
	Ant2	5755	38.320	5736.040	5774.360	---	---
	Ant1	5795	38.880	5775.640	5814.520	---	---
	Ant2	5795	38.880	5775.800	5814.680	---	---
11AC80MIMO	Ant1	5775	82.560	5734.040	5816.600	---	---
	Ant2	5775	84.640	5733.560	5818.200	---	---
11AX20MIMO	Ant1	5745	20.400	5735.000	5755.400	---	---
	Ant2	5745	20.280	5735.080	5755.360	---	---
	Ant1	5785	20.280	5774.960	5795.240	---	---
	Ant2	5785	20.200	5774.960	5795.160	---	---
	Ant1	5825	20.280	5815.120	5835.400	---	---
	Ant2	5825	20.360	5815.080	5835.440	---	---
11AX40MIMO	Ant1	5755	39.760	5735.240	5775.000	---	---
	Ant2	5755	39.520	5735.400	5774.920	---	---
	Ant1	5795	39.520	5775.160	5814.680	---	---
	Ant2	5795	39.680	5775.400	5815.080	---	---

11AX80MIMO	Ant1	5775	80.320	5734.840	5815.160	---	---
	Ant2	5775	80.160	5735.160	5815.320	---	---

11A-CDD_Ant1_5745



11A-CDD_Ant2_5745



11A-CDD_Ant1_5785



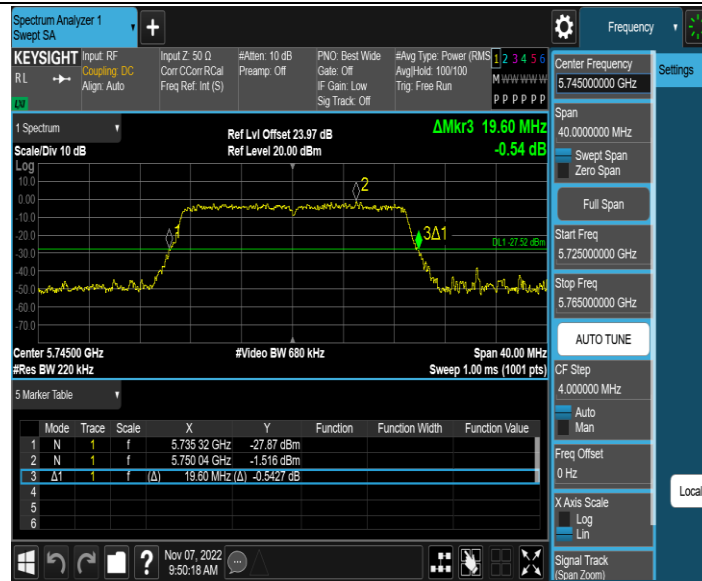
11A-CDD_Ant2_5825



11N20MIMO_Ant1_5745



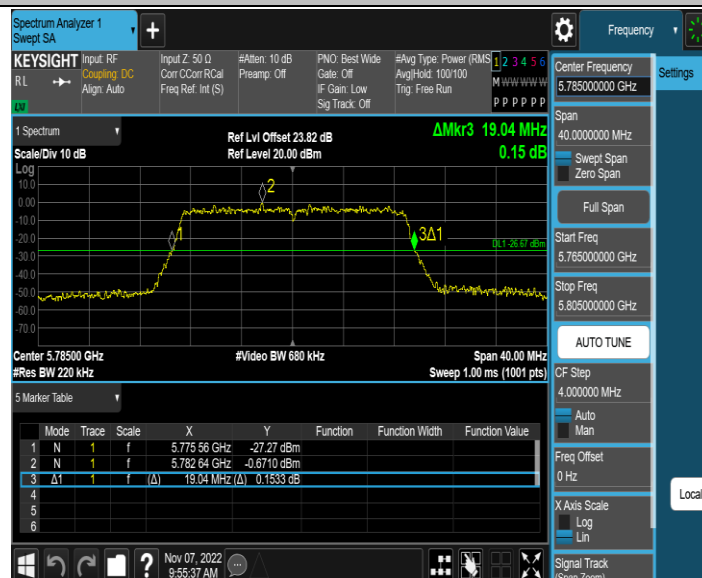
11N20MIMO_Ant2_5745



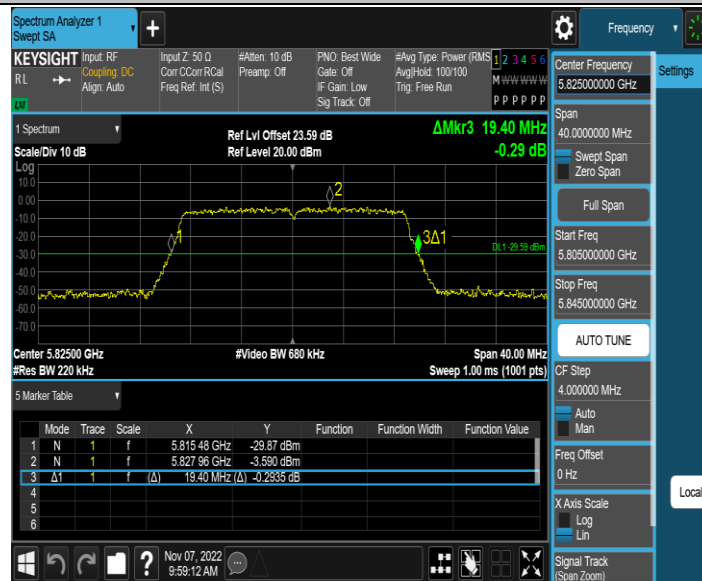
11N20MIMO_Ant1_5785



11N20MIMO Ant2 5785



11N20MIMO_Ant1_5825



11N20MIMO_Ant2_5825



11N40MIMO_Ant1_5755