

RF TEST REPORT

FCC ID: 2BBK2-S1

According to

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

ANSI C63.10:2013

Product description : Projector

Model No. : S1,W01,W02,W03,W05,W06,W08,W09,W10,W13,W15,W16,W18,W19,W21,W22,W23,W25,W26,W28,W29,W30,W31,W32,W35,W50,W80,W70,W80,W90,M01,M02,M03,M04,M05,M06,M08,M09,M10,M11,M12,M13,M15,M16,M18,M19,M20,M21,M22,M23,M25,M26,M28,M29,M30,M8,A11,A12,A13,A14,A15,A16,A17,A18,A19,A20,A21,A22,A23,A25,A28,A29,A30,A31,A32,A33,A35,A36,A38,A39,A50,A51,A52,A53,A55,A56,A58,A59,A60,V2,V6,V11,V12,V13,V14,V15,K2,K5,K7,K9,K10,K11,K12,K13,K8,X3,X5,X6,G01,G02,G03,G05,G06,G08,G09,G10,G12,G86,G08H,G04,G11,G14,G15,G16,G17,G18,G19,G20,A11H,A13H,M01H,M02H,M03H,M05H,M06H,M07H,M23H,M7H,W16H,W19H,W80H,W10H,W13H,W18H,K8-1,M8-F,S2,S3,ML066,ML067,Rnk480,AU-1,XU-1,AK-1,XP-1,EP-1,VP-1,VI-1

Trade Mark : N/A

Product No. : POC230529021-S001

Applicant : Shenzhen Youyoule Technology.Co., Ltd
6th Floor, Building E, Zhongnangang Industrial City, No. 1323, Liguang Xinwei, Guanlan Street, Longhua New District, Shenzhen, China

Receipt date : 2023.05.29

Test date : 2023.07.26~2023.08.08

Issued Date : 2023.08.09

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History of this test report

Original Report Issue Date: 2023.08.09

- No additional attachment
- Additional attachments were issued following record

Attachment No.	Issue Date	Description

1. General Information

1.1 Applicant

Shenzhen Youyoule Technology.Co., Ltd

6th Floor, Building E, Zhongnangang Industrial City, No. 1323, Liguang Xinwei, Guanlan Street, Longhua New District, Shenzhen, China

1.2 Manufacturer

Shenzhen Youyoule Technology.Co., Ltd

6th Floor, Building E, Zhongnangang Industrial City, No. 1323, Liguang Xinwei, Guanlan Street, Longhua New District, Shenzhen, China

1.3 Basic Description of Equipment Under Test

Items	Description
Equipment Name	Projector
Model Number	S1,W01,W02,W03,W05,W06,W08,W09,W10,W13,W15,W16,W18,W19,W21,W22,W23,W25,W26,W28,W29,W30,W31,W32,W35,W50,W80,W70,W80,W90,M01,M02,M03,M04,M05,M06,M08,M09,M10,M11,M12,M13,M15,M16,M18,M19,M20,M21,M22,M23,M25,M26,M28,M29,M30,M8,A11,A12,A13,A14,A15,A16,A17,A18,A19,A20,A21,A22,A23,A25,A28,A29,A30,A31,A32,A33,A35,A36,A38,A39,A50,A51,A52,A53,A55,A56,A58,A59,A60,V2,V6,V11,V12,V13,V14,V15,K2,K5,K7,K9,K10,K11,K12,K13,K8,X3,X5,X6,G01,G02,G03,G05,G06,G08,G09,G10,G12,G86,G08H,G04,G11,G14,G15,G16,G17,G18,G19,G20,A11H,A13H,M01H,M02H,M03H,M05H,M06H,M07H,M23H,M7H,W16H,W19H,W80H,W10H,W13H,W18H,K8-1,M8-F,S2,S3,ML066,ML067,Rnk480,AU-1,XU-1,AK-1,XP-1,EP-1,VP-1,VI-1
Model differences	Only the model name is different
Trademark	N/A
Power Supply	AC 100-240V~, 50/60Hz
Operating Temperature	5°C -35°C
EUT Stage	○ Product Unit ● Final-Sample
Operating Band	5150MHz ~5250MHz ● IEEE 802.11a/n/ac (20MHz) ● IEEE 802.11n/ac (40MHz) ● IEEE 802.11ac (80MHz)
Product Type	IEEE 802.11a: WLAN (MIMO) IEEE 802.11n: WLAN (MIMO) IEEE 802.11ac: WLAN (MIMO)
Nominal Bandwidth	20MHz / 40MHz / 80MHz
Modulation	OFDM
Data Rate (Mbps)	IEEE 11a mode : 6/9/12/18/24/36/48/54 IEEE 11n mode : MCS0~MCS15

	IEEE 11ac mode : MCS0~MCS9		
Antenna gain	Ant1: 4.72dBi, Ant2: 4.26dBi		
Channel Information			
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5150-5250	802.11a /n /ac (20MHz)	5180-5240	36-48
5150-5250	802.11n /ac (40MHz)	5190-5230	38-46
5150-5250	802.11ac (80MHz)	5210	42

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	B&T _{note3}	BAT-MT926-WiFi	FPC	Ant	4.72
2	B&T _{note3}	BAT-MT926-WiFi	FPC	Ant	4.26

Note:

1. The antenna gain is provided by the manufacturer.
2. The antenna is for testing purposes only.
3. The antenna manufacture is Shenzhen Boantong Technology Co., Ltd.

2. Summary of Test Results

2.1 Summary of Test Items

47 CFR FCC Part 15, Subpart E (Section 15.407)			
Test item	Standard	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	Note
Spectrum Bandwidth	15.407(a) 15.407(e)	Pass	Meet the requirement of the limit
Maximum EIRP	15.407(a)	Pass	Meet the requirement of the limit
Power Spectral Density	15.407(a)	Pass	Meet the requirement of the limit
Note: The EUT has two internal antennas, the antenna 1 gain is 4.72dBi and the antenna 2 gain is 4.26dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement.			

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

KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

ANSI C63.10:2013

2.3 Test Instruments

Radiated Emissions						
No.	Equipment	Manufacturer	Type No.	Serial No.	Cal. date (yyyy/mm/dd)	Cal. Due date (yyyy/mm/dd)
1	Test receiver	Rohde&Schwarz	ESU	100184	2023/5/3	2024/5/2
2	Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-127 3	2023/4/23	2024/4/22
3	Low frequency amplifier	Unknown	LNA 0920N	2014	2023/5/3	2024/5/2
4	High frequency amplifier	Schwarzbeck	BBV 9718	284	2023/5/3	2024/5/2
5	Loop Antenna	Schwarzbeck	FMZB1519 B	00029	2022/7/4	2025/7/3
6	Log periodic antenna	Schwarzbeck	VULB 9168	1151	2023/4/23	2024/4/22
7	Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-127 3	2022/5/5	2025/5/4
8	Horn Antenna	Schwarzbeck	BBHA 9170	9170#685	2022/7/4	2025/7/3
9	Temp&Humidity Recorder	Meideshi	JR900	/	2023/5/3	2024/5/2
10	RF cable(966 chamber)9kHz-1 GHz	Unknown	Unknown	Unknown	2023/5/3	2024/5/2
11	RF cable(966 chamber)1GHz- 18GHz	Unknown	Unknown	Unknown	2023/5/3	2024/5/2
12	RF cable(966 chamber)18GHz -40GHz	Unknown	Unknown	Unknown	2023/5/3	2024/5/2
13	Test software	Farad Technology Co., Ltd	EZ-EMC	/	/	/
Conducted Emission						
1	Test receiver	Rohde&Schwarz	ESCI	100718	2023/5/3	2024/5/2
2	LISN	Rohde&Schwarz	ENV216	100075	2023/5/3	2024/5/2
3	Pulse limiter	Rohde&Schwarz	ESH3-Z2	102299	2023/5/3	2024/5/2
4	RF cable (9kHz-30MHz)	Unknown	Unknown	Unknown	2023/5/3	2024/5/2
5	Test software	Farad Technology Co., Ltd	EZ-EMC	/	/	/
RF Conducted Emission						
1	MXA Signal Analyzer	Keysight	N9021B	MY600801 69	2023/4/23	2024/4/22
2	RF Control Unit	dsuoft	JS0806-2	21G806044 9	2023/4/23	2024/4/22
3	power supply unit	dsuoft	JS0806-4A DC	N/A	2023/4/23	2024/4/22
4	VXG Signal Generator	Keysight	M9384B	MY612707 87	2023/4/23	2024/4/22
5	EXG Analog Signal Generator	Keysight	N5173B	MY591012 82	2023/4/23	2024/4/22
6	Test software	dsuoft	JS1120-3	/	/	/

2.4 Operation Mode

The EUT was supplied by and it was run in TX mode that was controlled by Master provided RF testing program. The worst case test result was showed in the report.

2.5 Test Condition

Applicable to	Environmental conditions	Input Power	Tested by
AC Power Conducted Emission	25°C, 53% RH	AC 120V/60Hz	Albert Fan
Radiated Emission	24°C, 51% RH	AC 120V/60Hz	Albert Fan
Spectrum Bandwidth	24.4°C, 53% RH	AC 120V/60Hz	Jason Huang
Conducted Power	24.4°C, 53% RH	AC 120V/60Hz	Jason Huang
Power Spectral Density	24.4°C, 53% RH	AC 120V/60Hz	Jason Huang

The applicant declare the operating environment of EUT as below:

Normal conditions: 120V AC, 5°C~35°C

2.6 Duty Cycle of Test Signal

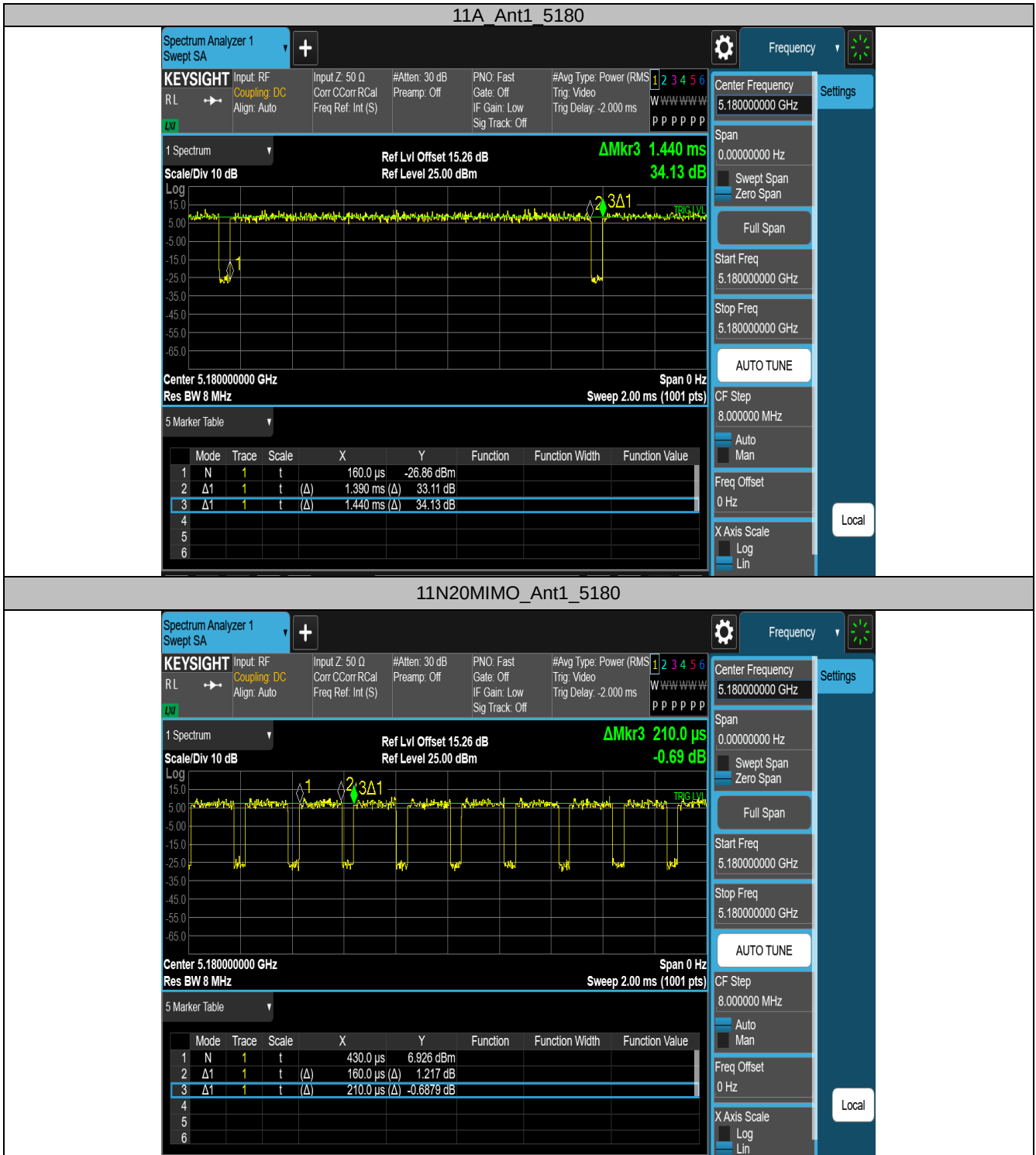
If duty cycle is $\geq 98\%$, duty factor is not required.

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

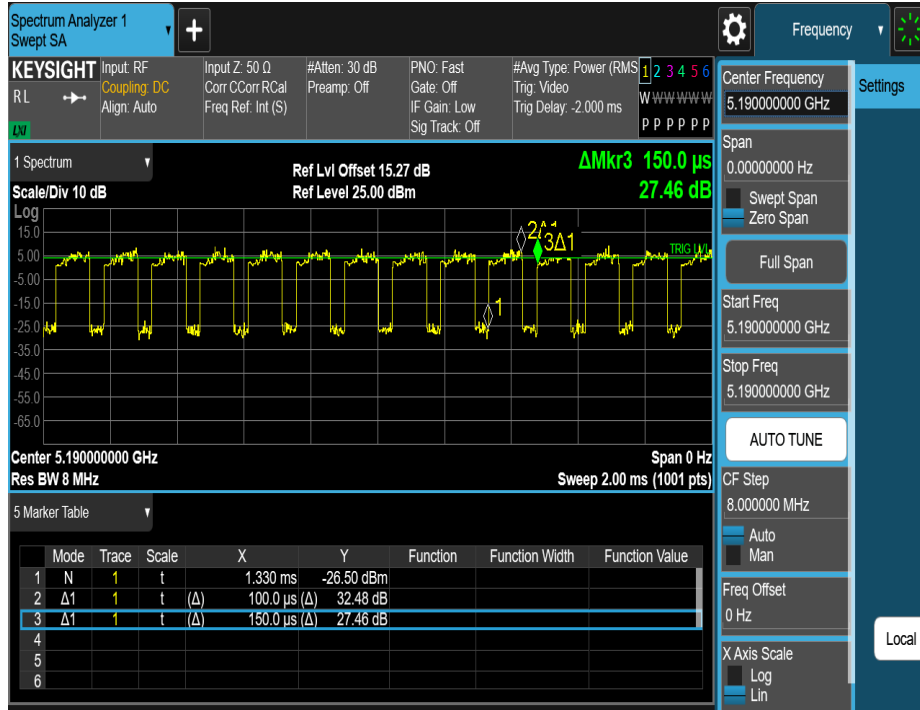
All the duty factor of other test mode have been considered.

Test Mode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	Ant1	5180	1.39	1.44	96.53
11N20MIMO	Ant1	5180	0.16	0.21	76.19
11N40MIMO	Ant1	5190	0.10	0.15	66.67
11AC20MIMO	Ant1	5180	0.17	0.22	77.27
11AC40MIMO	Ant1	5190	0.10	0.15	66.67
11AC80MIMO	Ant1	5210	0.07	0.12	58.33

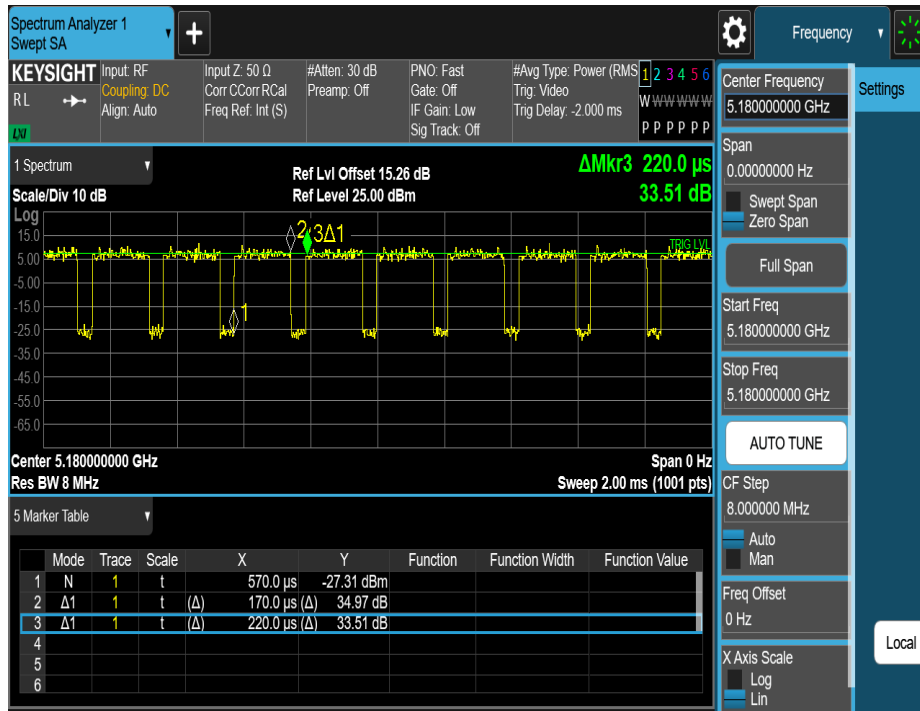
Test Graphs



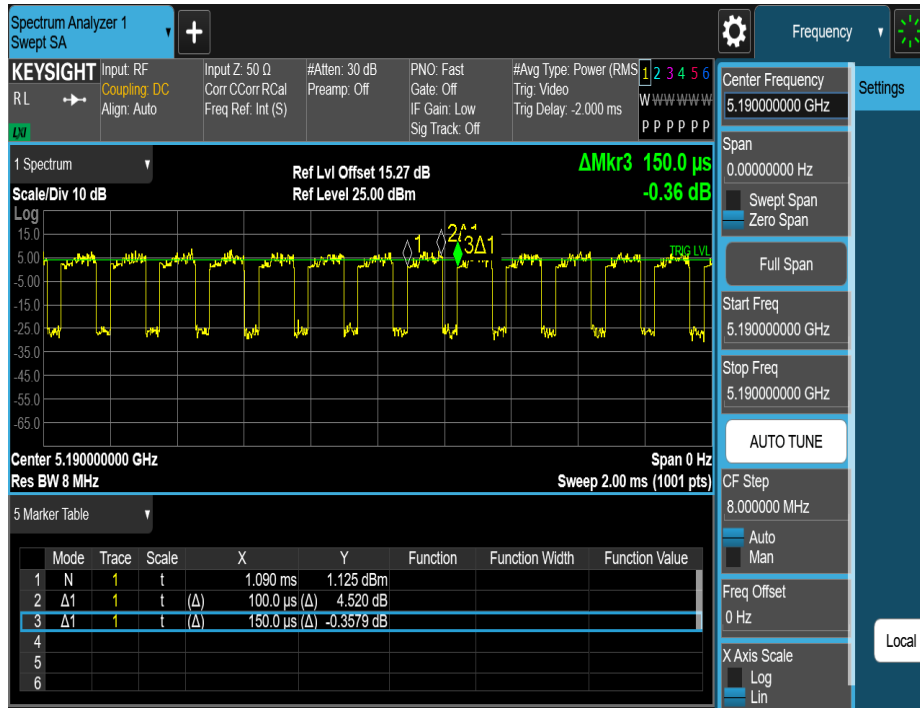
11N40MIMO_Ant1_5190



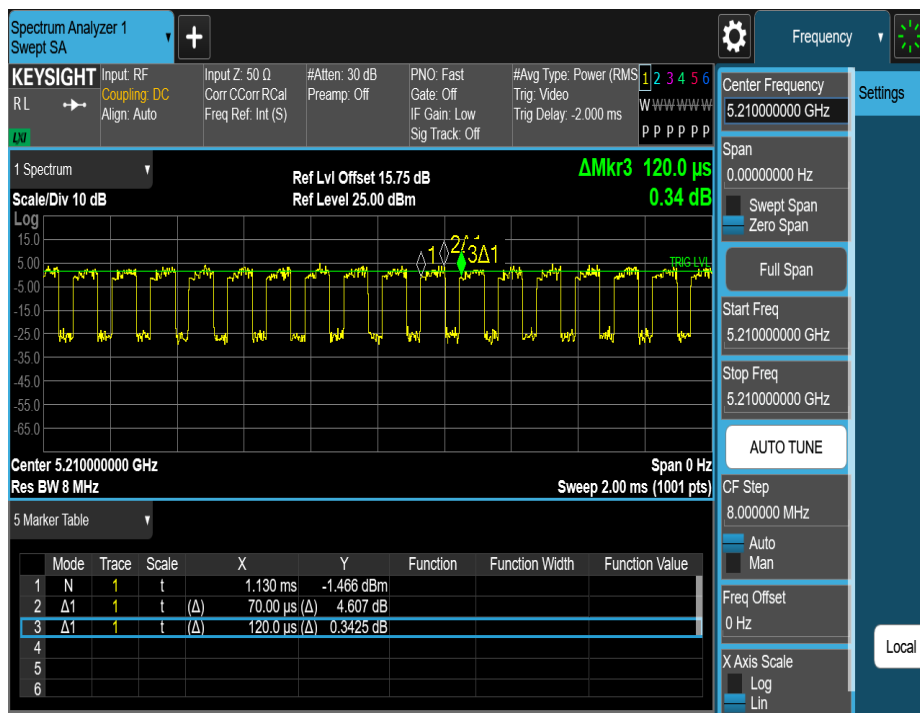
11AC20MIMO_Ant1_5180



11AC40MIMO_Ant1_5190



11AC80MIMO_Ant1_5210



2.7 Measurement Uncertainty

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

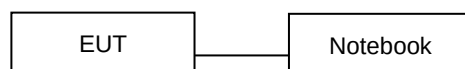
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 143.88\text{kHz}$
Power Spectral Density	$\pm 0.743\text{dB}$
Conducted Spurious Emission	$\pm 1.328\text{dB}$
RF power conducted	$\pm 0.384\text{dB}$
Conducted emission(9kHz~30MHz) AC main	$\pm 2.72\text{dB}$
Radiated emission(9kHz~30MHz)	$\pm 2.66\text{dB}$
Radiated emission (30MHz~1GHz)	$\pm 4.62\text{dB}$
Radiated emission (1GHz~18GHz)	$\pm 4.86\text{dB}$
Radiated emission (18GHz~40GHz)	$\pm 3.80\text{dB}$

2.8 Test Location

Company:	Shenzhen Haiyun Standard Technical CO., Ltd.
Address:	No. 110-113, 115, 116, Block B, Jinyuan Business Building, Bao'an District, Shenzhen, China
CNAS Registration Number:	CNAS L18252
CAB identifier:	CN0145
Company Number:	30427
A2LA Certificate Number:	6823.01
FCC Designation Number:	CN1340
Test Firm Registration Number.	457288
Telephone:	0755-26024411

2.9 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.10 SUPPORT UNITS

Support Equipment				
No.	Equipment	Brand Name	Model Name	Remarks
1	Notebook	Lenovo	Thinkbook 15	/
2	USB Disk	Kingston	/	/
3	Earphone	Huawei	/	/

2.11 Deviation from Standards

None

2.12 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(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

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

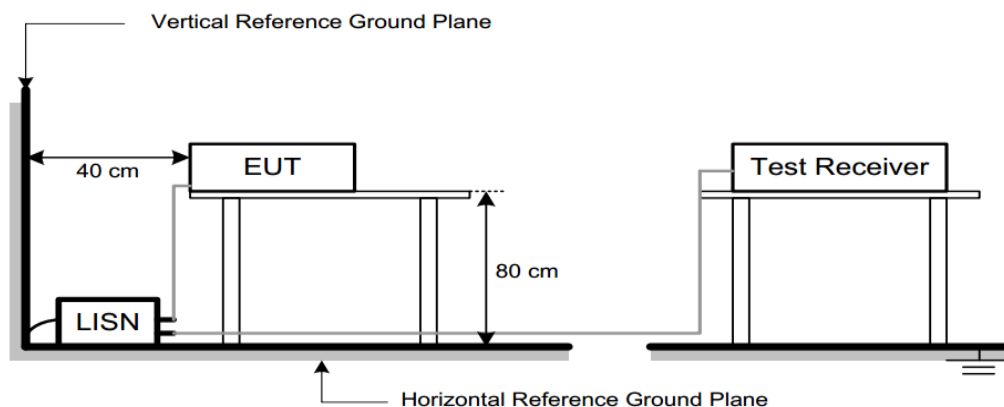
2. The lower limit shall apply at the transition frequencies.

3.1.2 Test 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.

3.1.3 Test Setup

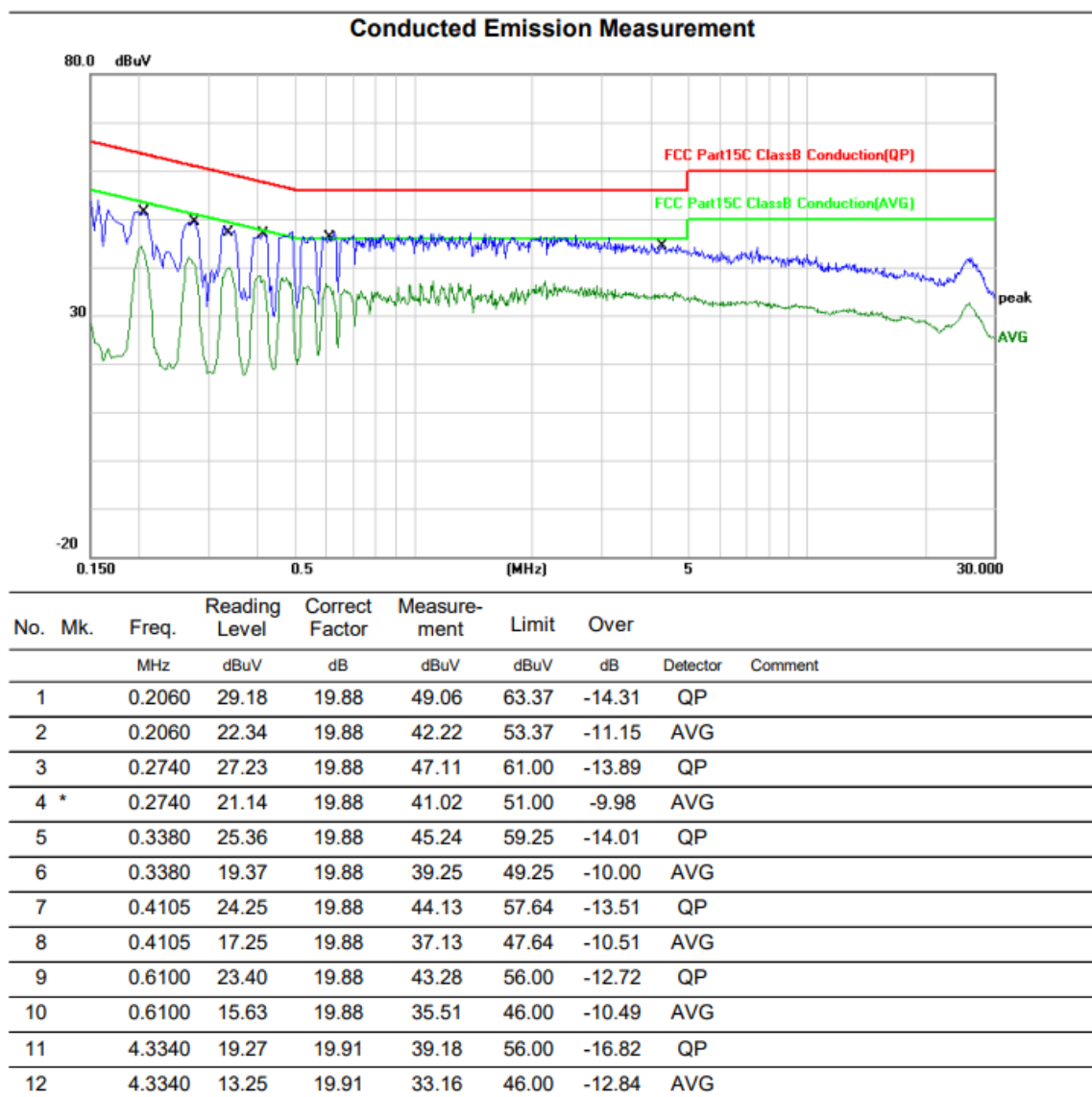


3.1.4 Test Result

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
4. Simultaneous transmitting: 2.4G Wifi transmitting + 5G Wifi transmitting.

150kHz~30MHz	Worst Case Operating Mode: Simultaneous transmitting
Line	

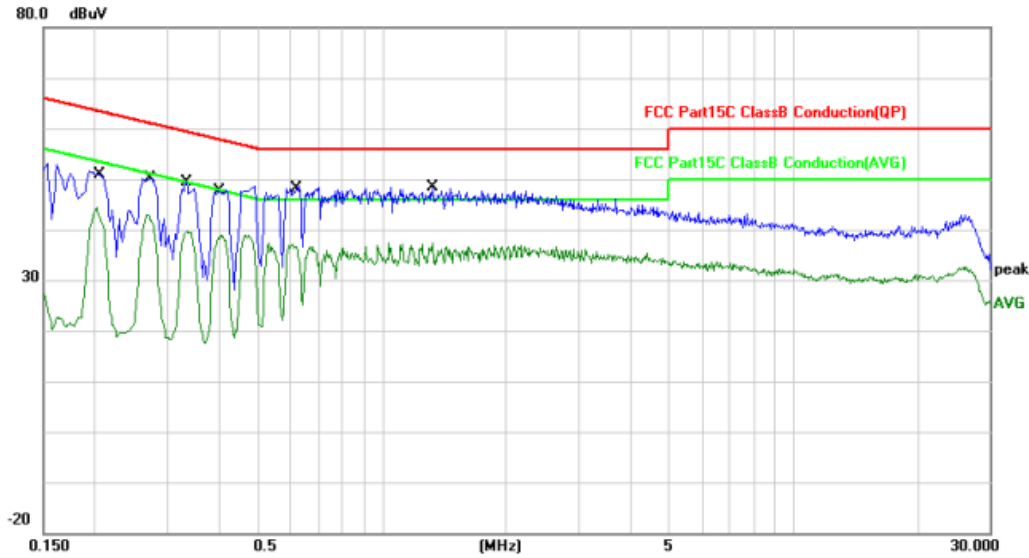


150kHz~30MHz

Worst Case Operating Mode: Simultaneous transmitting

Neutral

Conducted Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2040	29.14	19.88	49.02	63.45	-14.43	QP	
2		0.2040	23.32	19.88	43.20	53.45	-10.25	AVG	
3		0.2700	27.76	19.88	47.64	61.12	-13.48	QP	
4 *		0.2700	22.51	19.88	42.39	51.12	-8.73	AVG	
5		0.3340	25.26	19.88	45.14	59.35	-14.21	QP	
6		0.3340	19.50	19.88	39.38	49.35	-9.97	AVG	
7		0.4020	24.85	19.88	44.73	57.81	-13.08	QP	
8		0.4020	18.49	19.88	38.37	47.81	-9.44	AVG	
9		0.6108	24.72	19.88	44.60	56.00	-11.40	QP	
10		0.6108	16.58	19.88	36.46	46.00	-9.54	AVG	
11		1.3300	26.07	19.89	45.96	56.00	-10.04	QP	
12		1.3300	17.17	19.89	37.06	46.00	-8.94	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(kHz)	-
0.490 – 1.705	30	24000/F(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	68.2
5250-5350	-27	68.2
5470-5725	-27	68.2
5725-5850	-27 NOTE (2)	68.2
	10 NOTE (2)	105.2
	15.6 NOTE (2)	110.8
	27 NOTE (2)	122.2

Note: (1) The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength: $E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2$, for $d=3\text{m}$

(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.

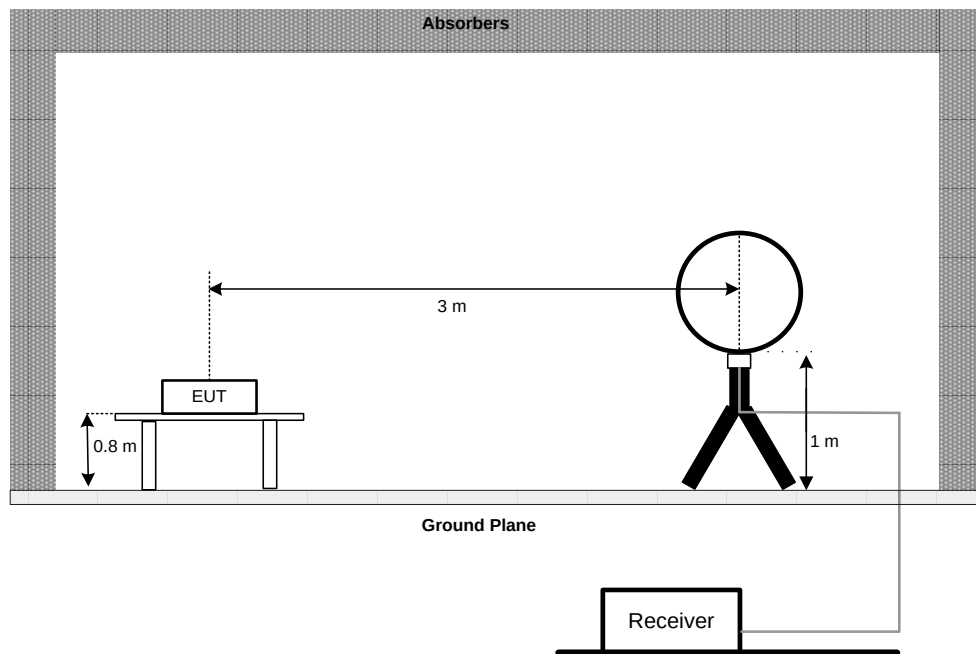
3.2.2 Test Procedure

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	

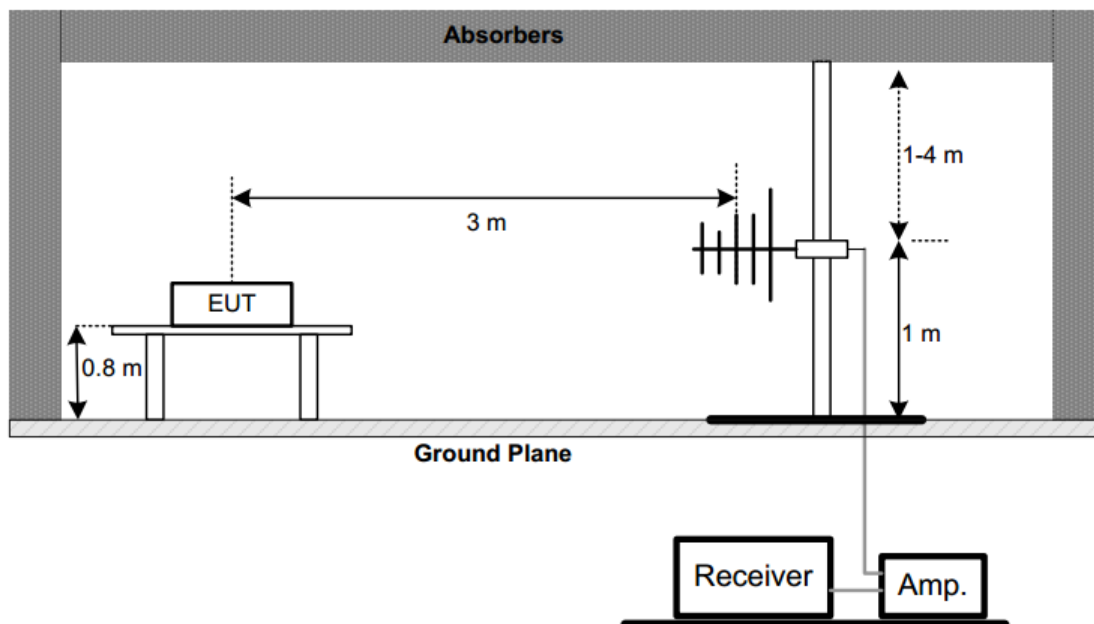
- a) The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- b) The measuring distance 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)
- c) 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.
- d) 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).
- e) 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.
- f) 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.
- g) 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)
- h) 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.

3.2.3 Test Setup

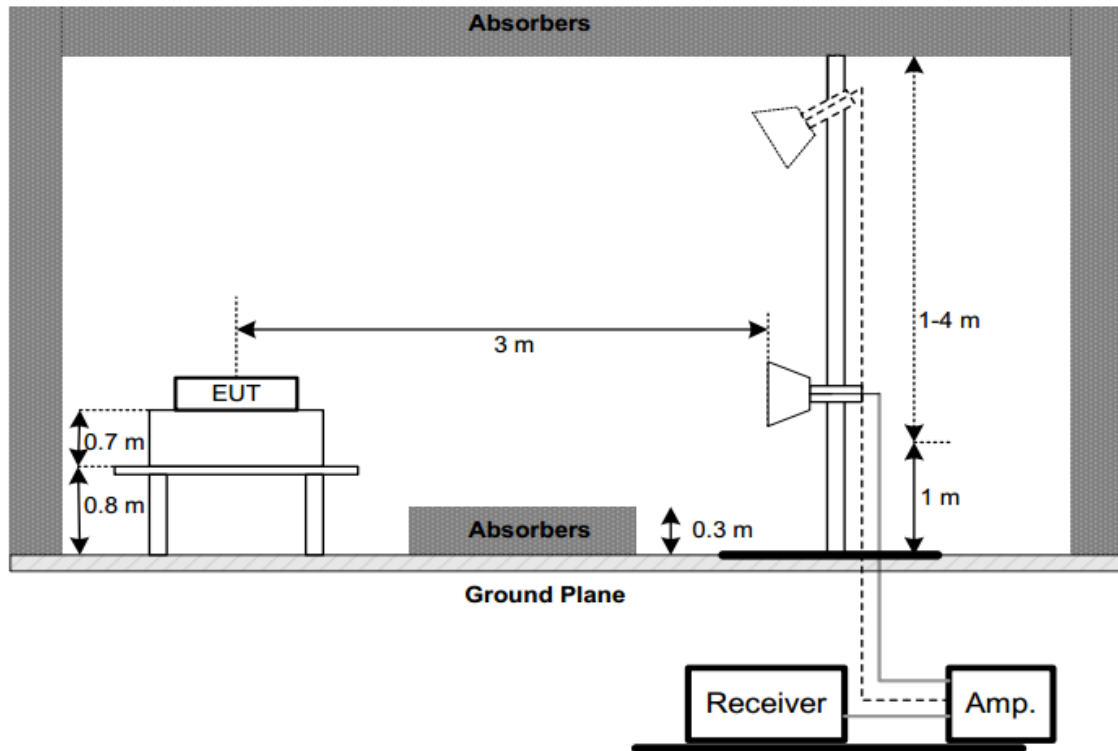
(A) Radiated Emission Test Set-Up Frequency Below 30 MHz



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



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



3.2.4 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 recorded in this report.

2) Radiated emission: 30MHz-1G

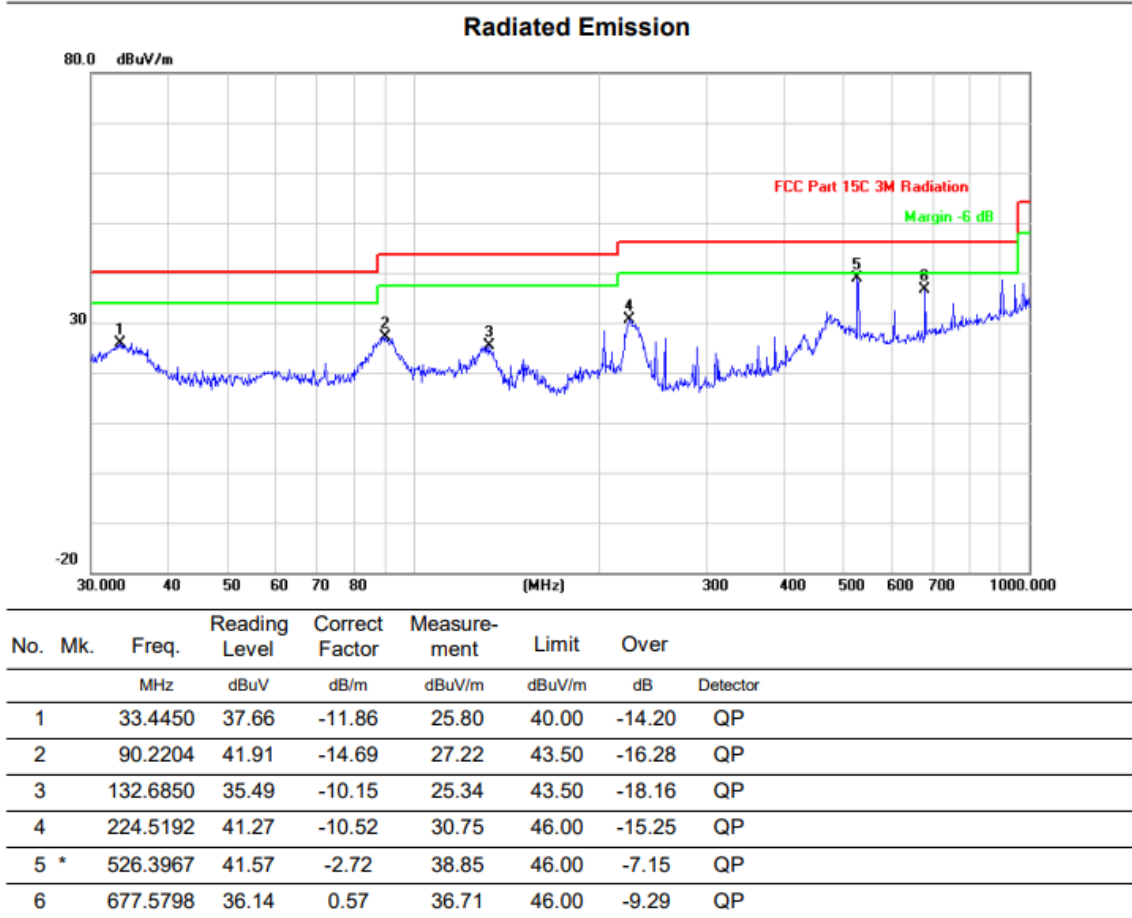
Note:

1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit
3. Simultaneous transmitting: 2.4G Wifi transmitting + 5G Wifi transmitting is found to be the worst case and recorded.

Below 1G (30MHz~1GHz)

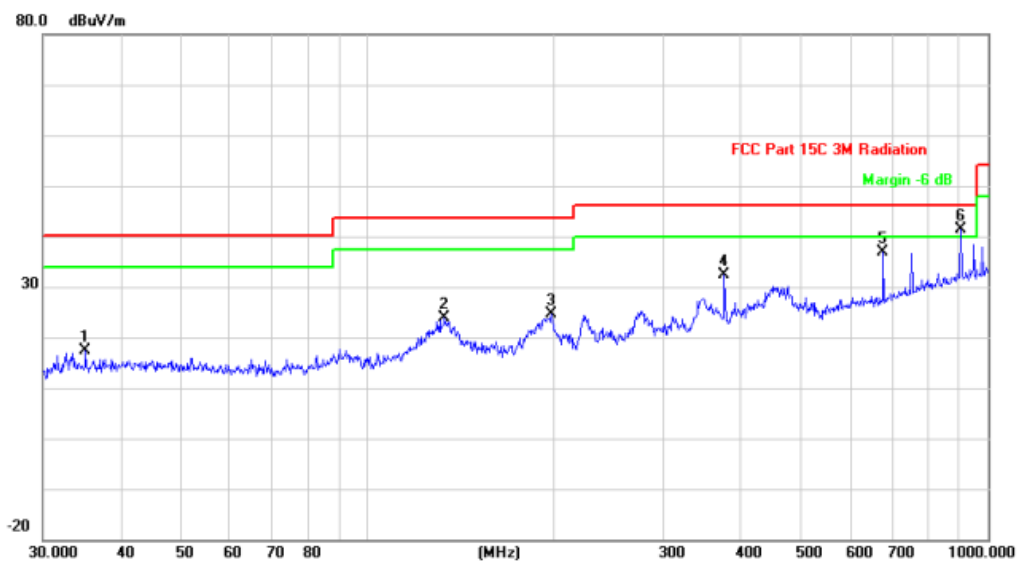
Worst Case Operating Mode: Simultaneous transmitting

VERTICAL



HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		35.1278	29.09	-11.61	17.48	40.00	-22.52	QP
2		133.1511	33.92	-10.12	23.80	43.50	-19.70	QP
3		197.8928	36.34	-11.59	24.75	43.50	-18.75	QP
4		375.9385	38.68	-6.33	32.35	46.00	-13.65	QP
5		677.5798	36.42	0.57	36.99	46.00	-9.01	QP
6 *		903.3094	36.95	4.31	41.26	46.00	-4.74	QP

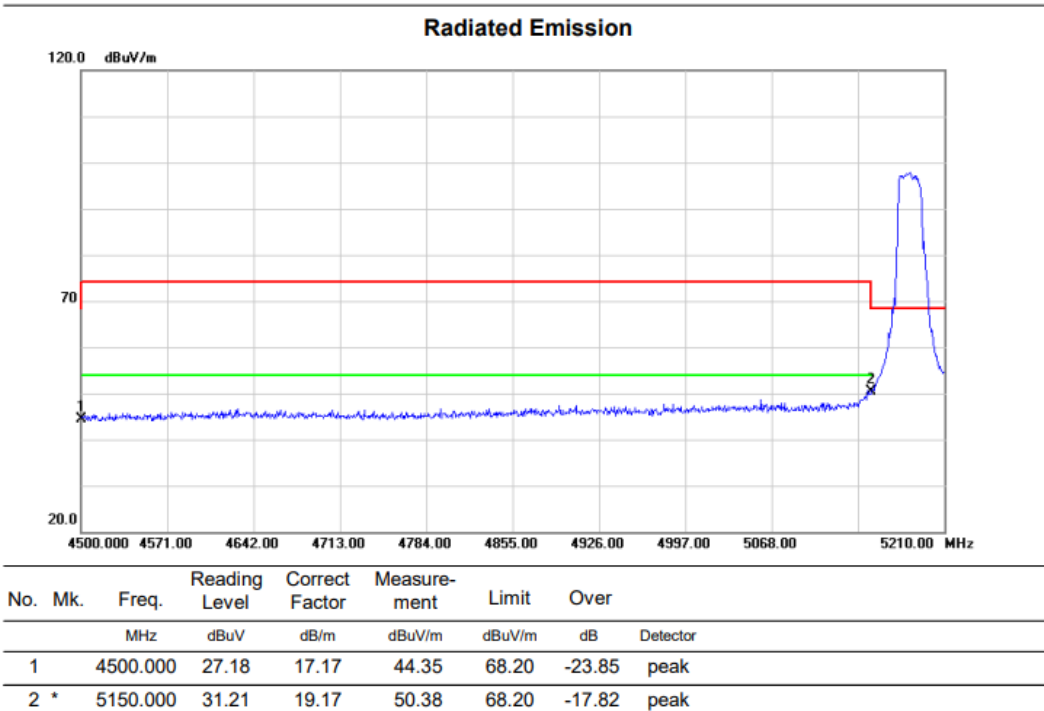
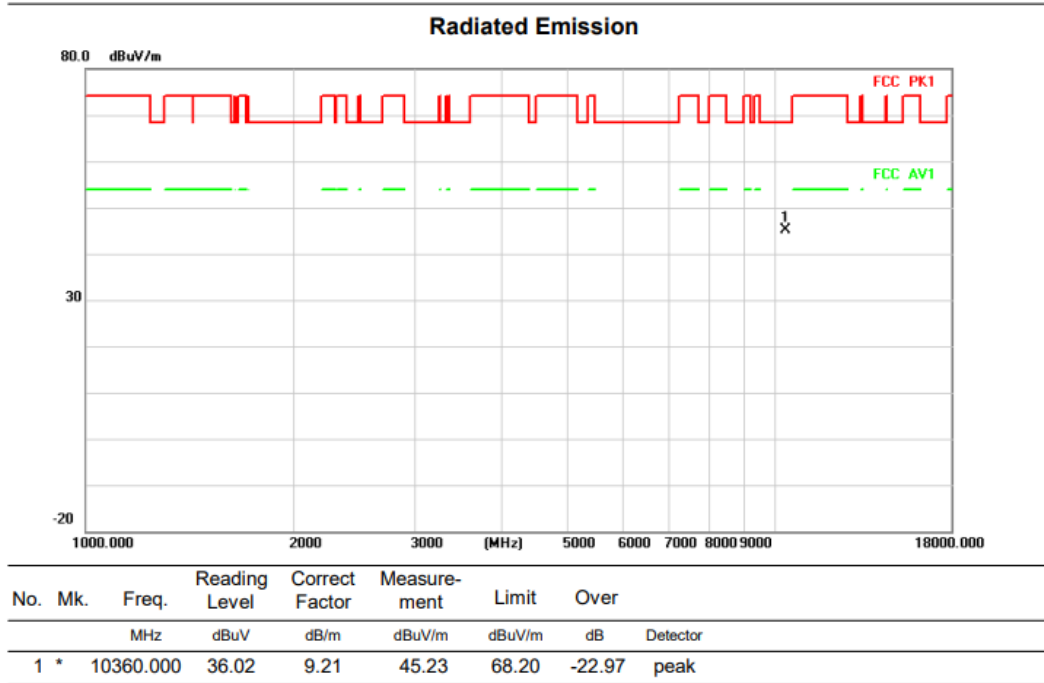
3) Radiated emission: Above 1G

Note:

1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit
3. Of all the modes of 11A, 11A_MIMO is the worst case, and the report only reflects these data.

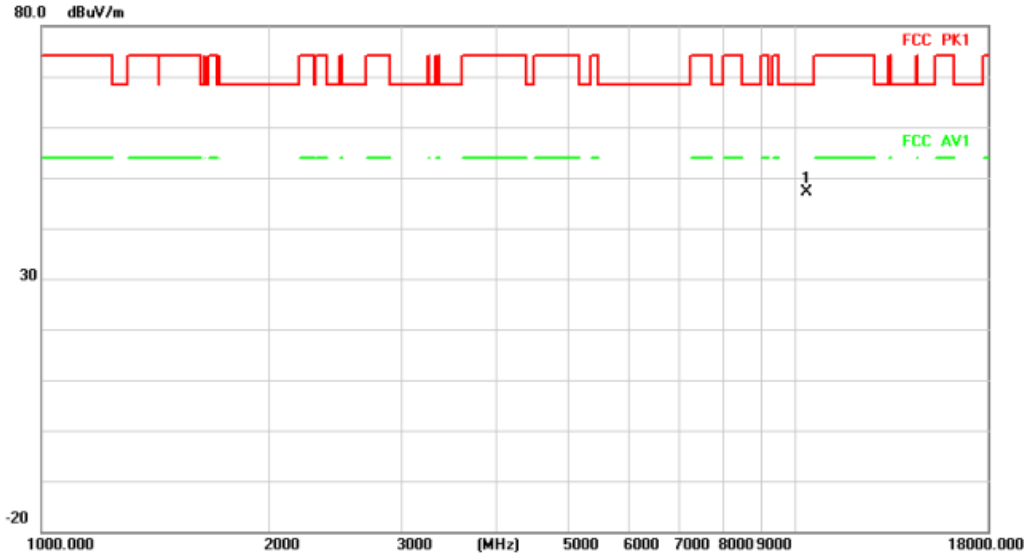
Above 1G (1GHz~18GHz)	Test mode:11A_MIMO	Test Channel:36
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VERTICAL



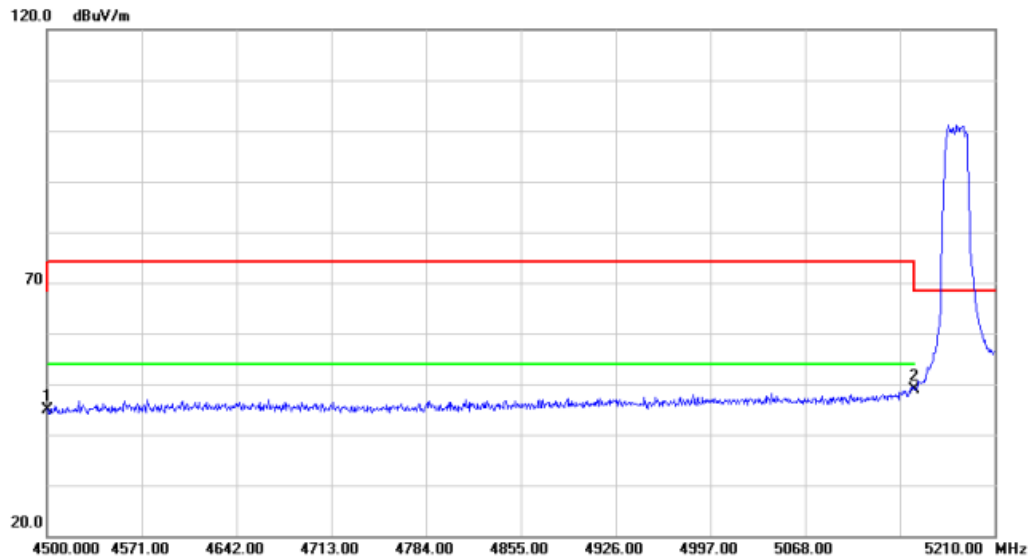
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10360.000	38.03	9.21	47.24	68.20	-20.96	peak

Radiated Emission



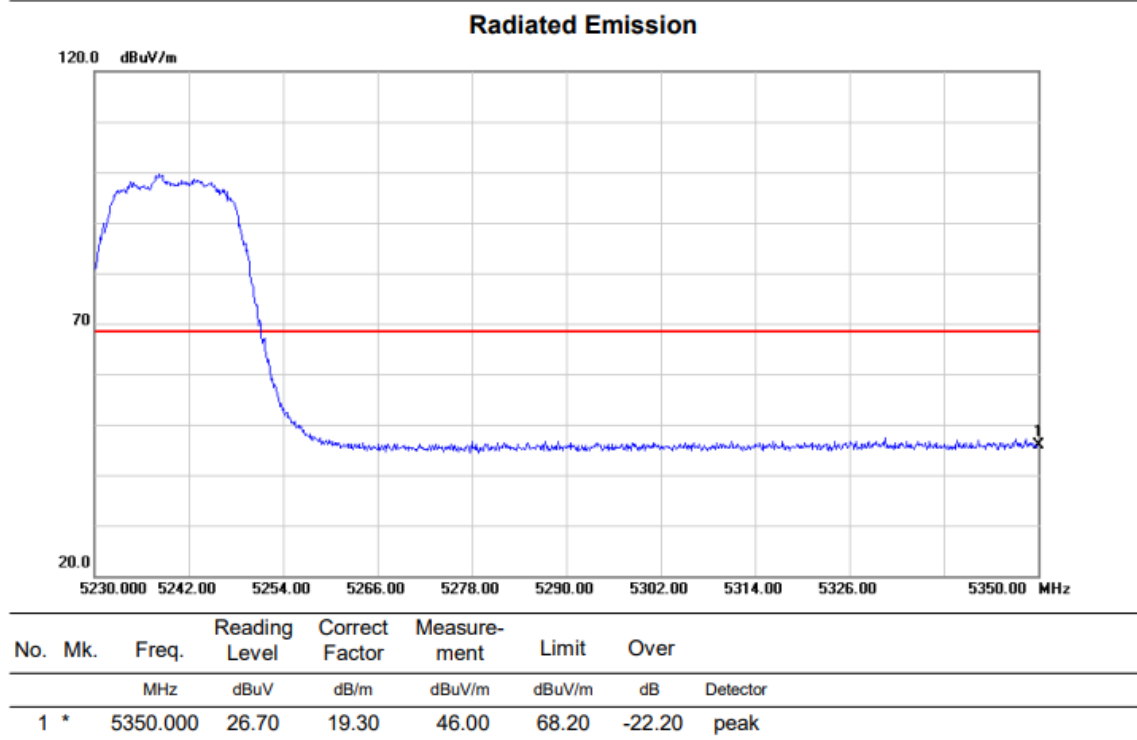
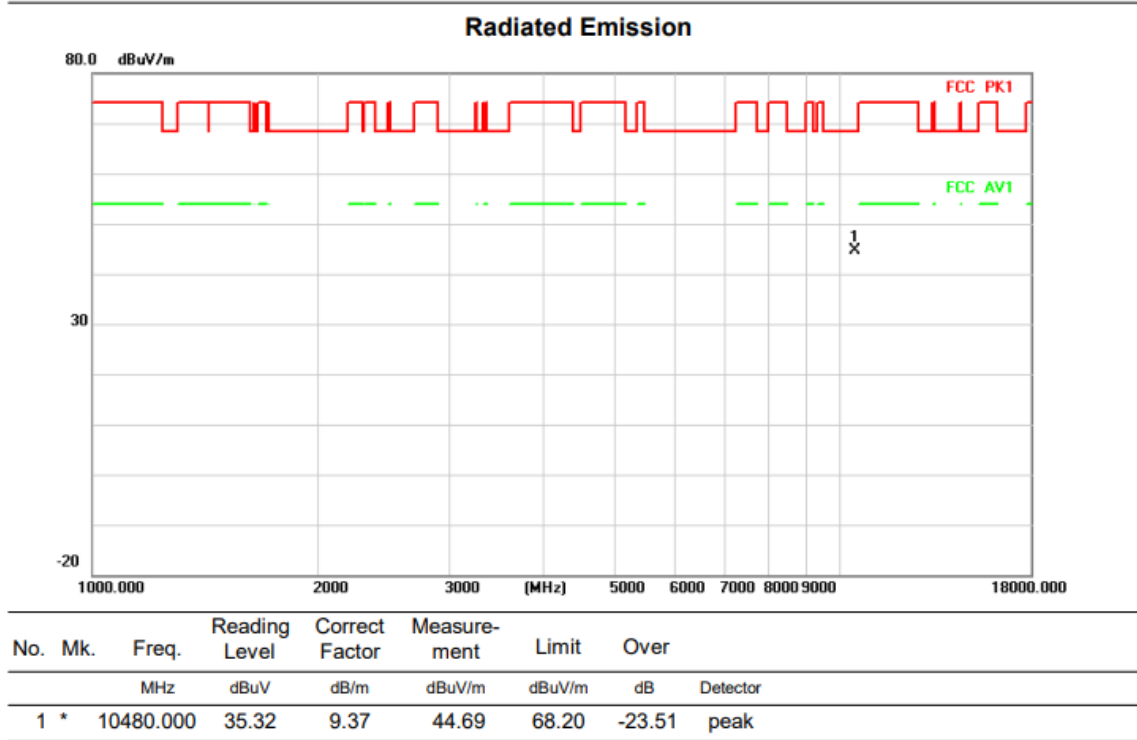
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	27.72	17.17	44.89	68.20	-23.31	peak
2	*	5150.000	29.60	19.17	48.77	68.20	-19.43	peak

Above 1G (1GHz~18GHz)

Test mode: 11A_MIMO

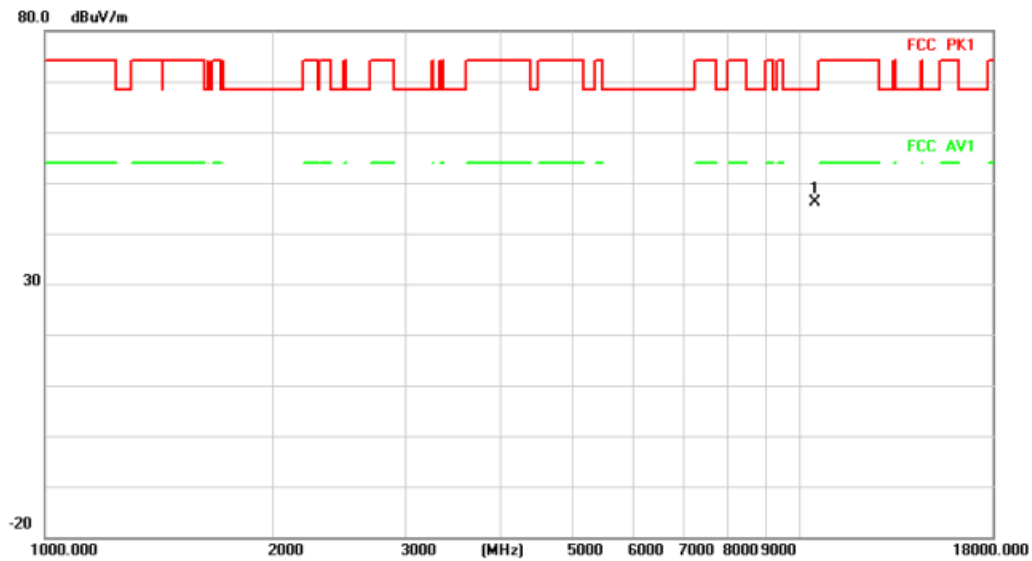
Test Channel:48

VERTICAL



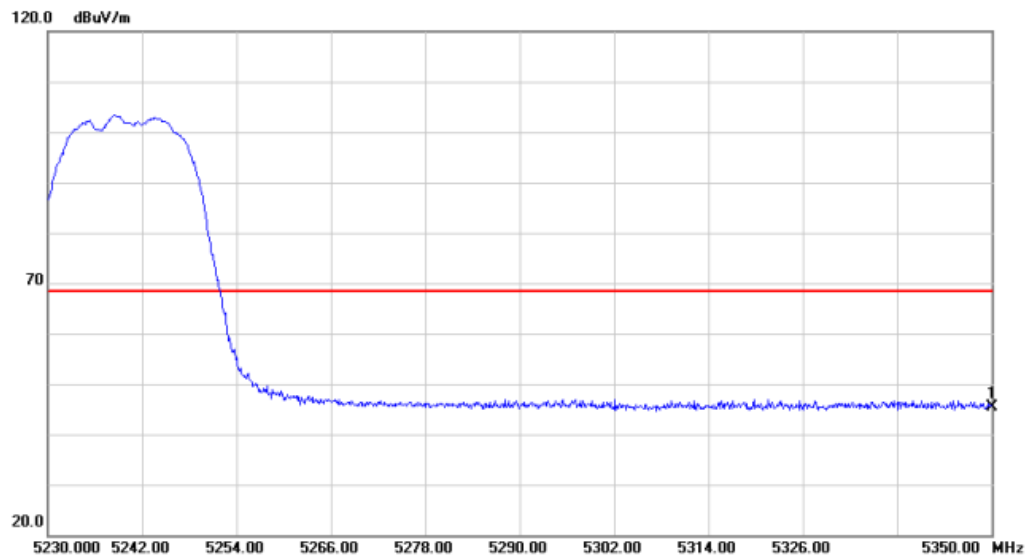
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	10480.000	36.73	9.37	46.10	68.20	-22.10 peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	5350.000	26.17	19.30	45.47	68.20	-22.73 peak

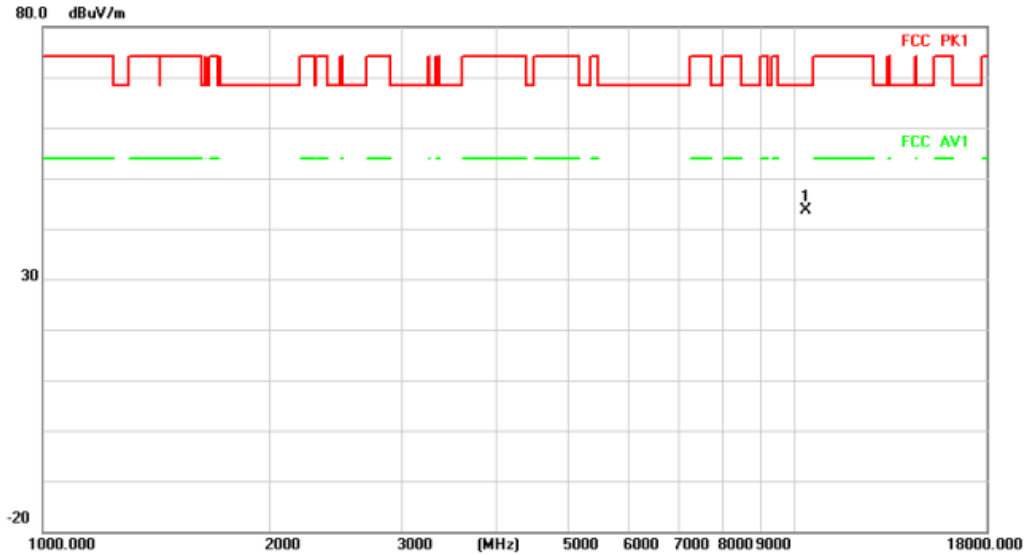
Above 1G (1GHz~18GHz)

Test mode: 11N20MIMO

Test Channel:36

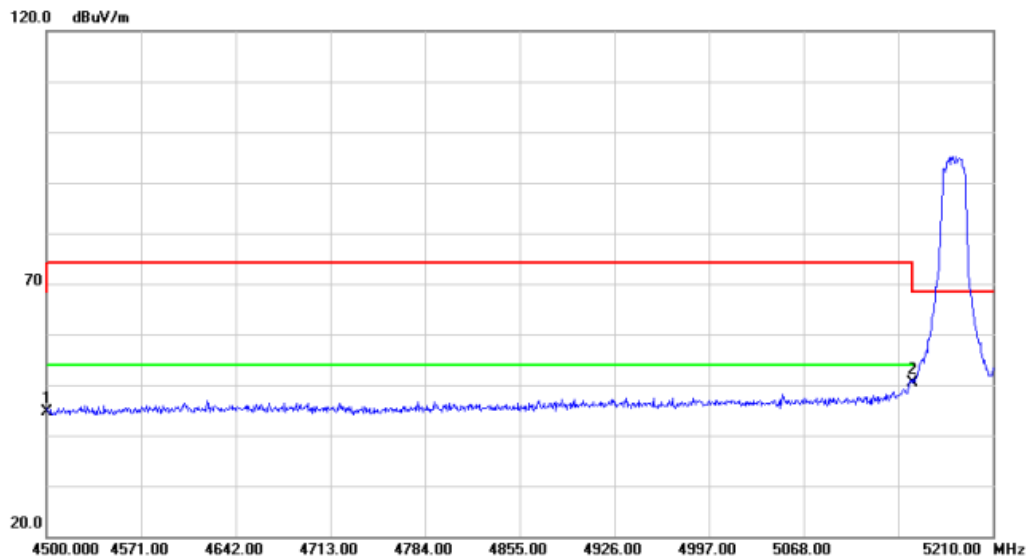
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10360.000	34.44	9.21	43.65	68.20	-24.55	peak

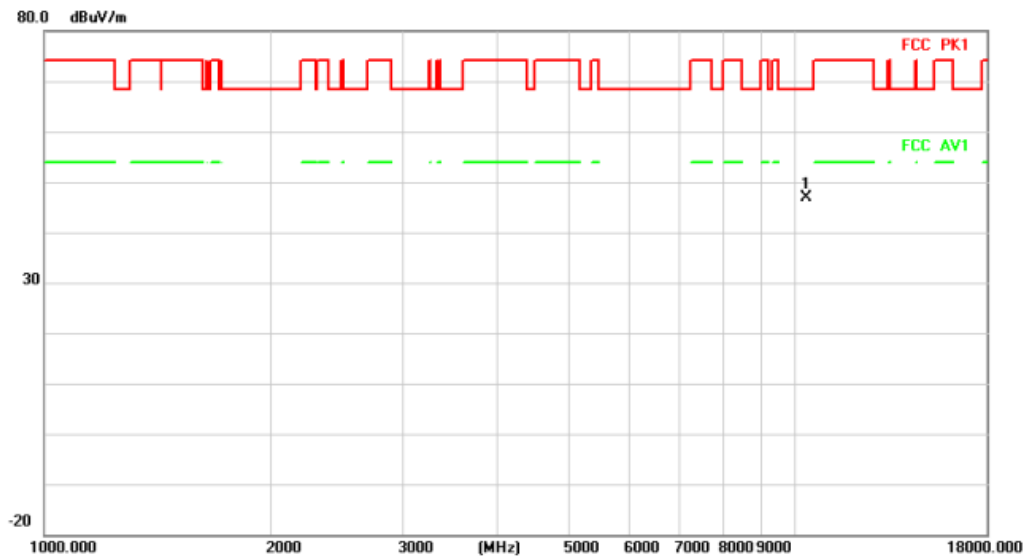
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	27.39	17.17	44.56	68.20	-23.64	peak
2	*	5150.000	31.32	19.17	50.49	68.20	-17.71	peak

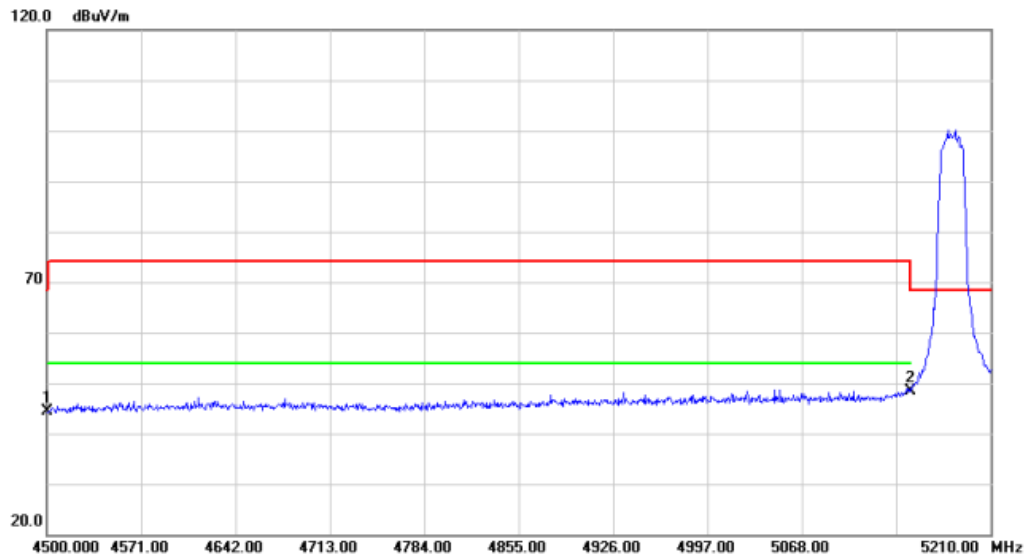
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10360.000	37.69	9.21	46.90	68.20	-21.30	peak

Radiated Emission



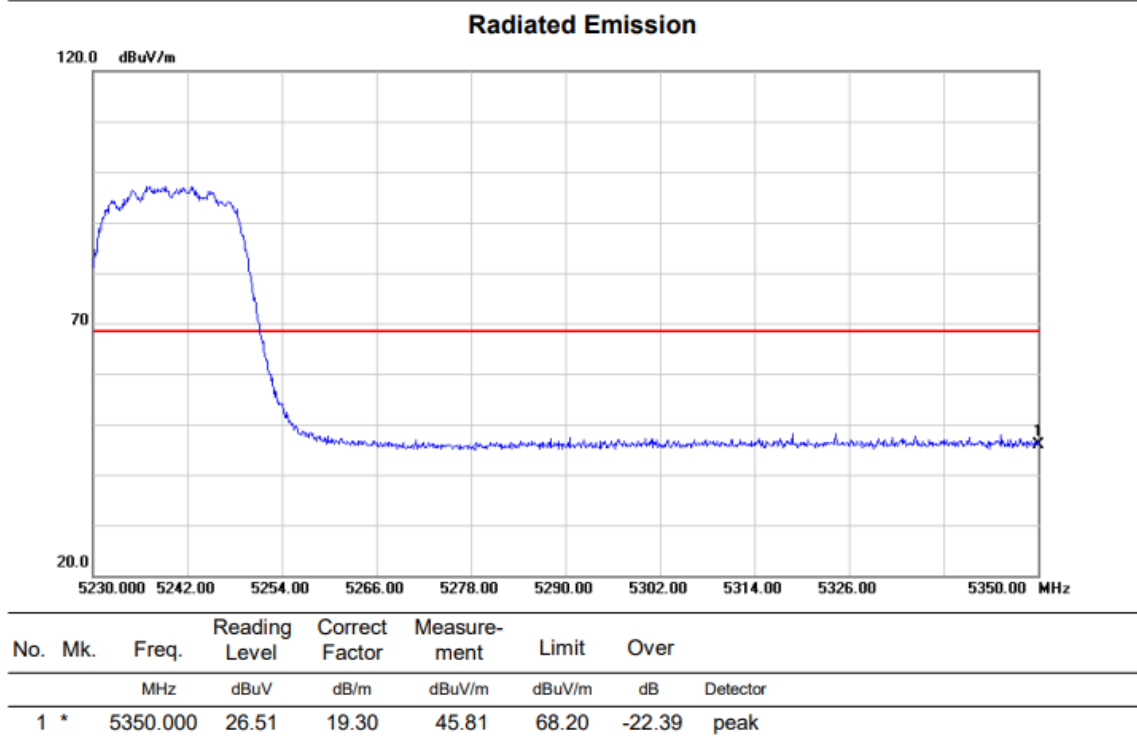
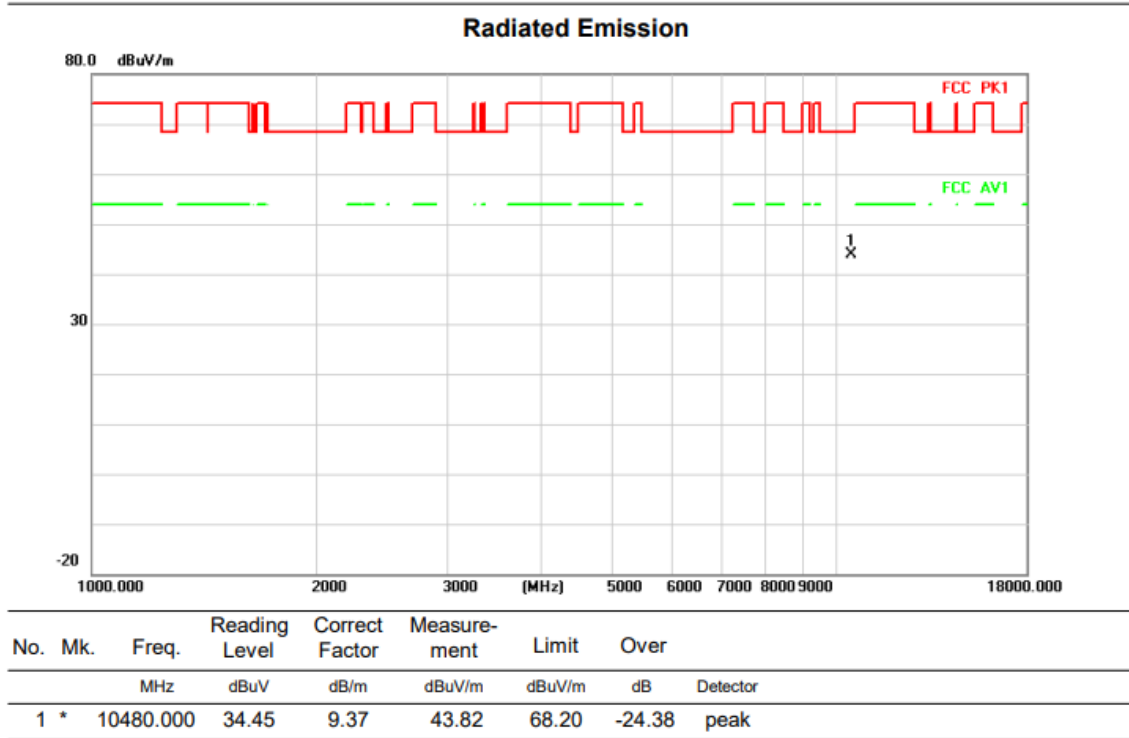
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	27.14	17.17	44.31	68.20	-23.89	peak
2	*	5150.000	29.23	19.17	48.40	68.20	-19.80	peak

Above 1G (1GHz~18GHz)

Test mode: 11N20MIMO

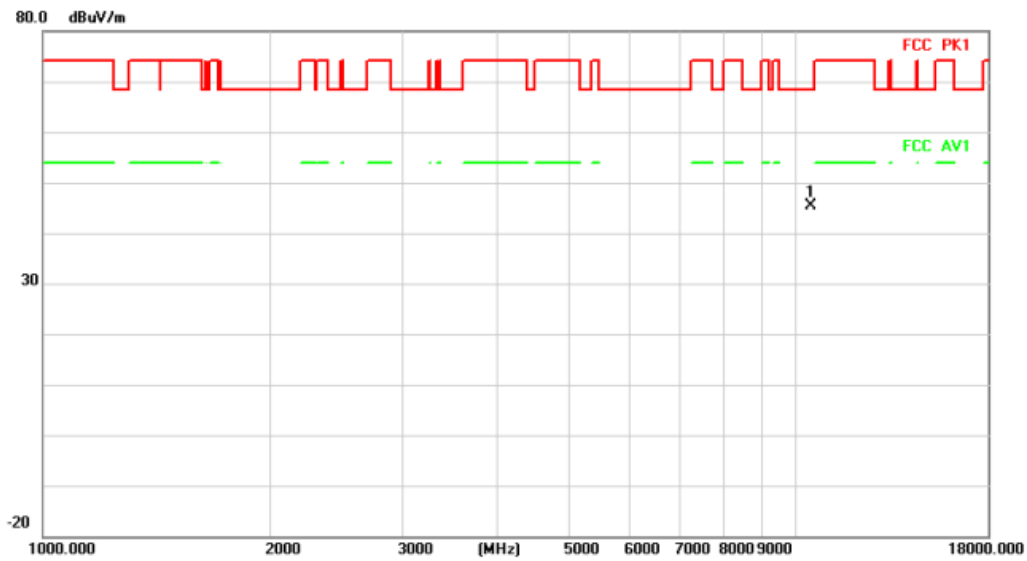
Test Channel:48

VERTICAL



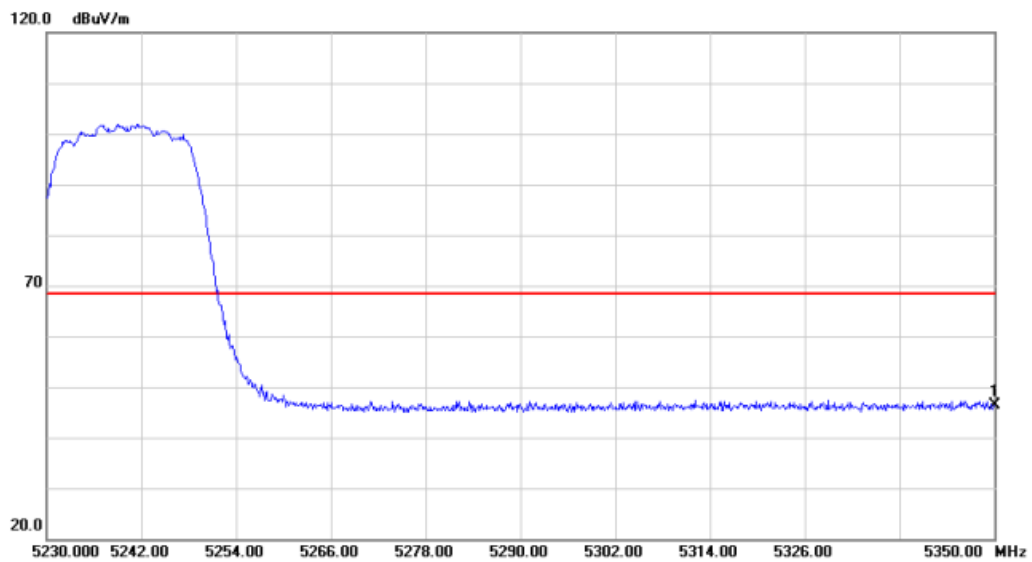
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10480.000	35.97	9.37	45.34	68.20	-22.86	peak

Radiated Emission



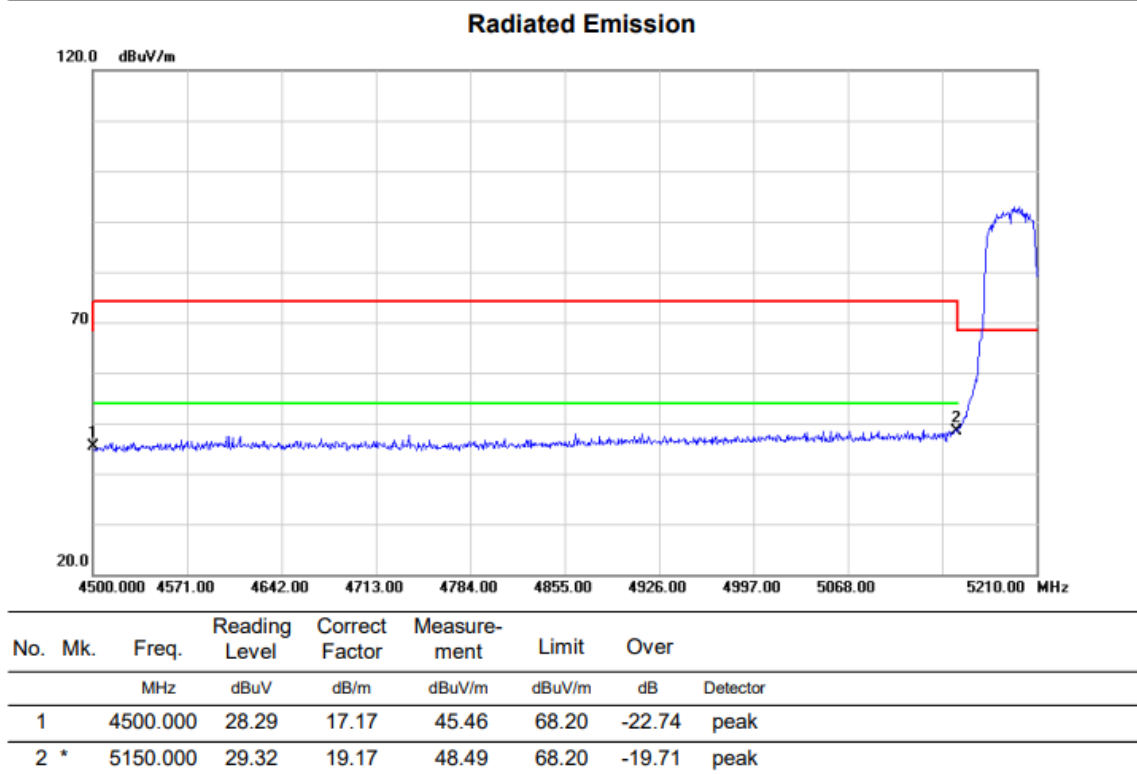
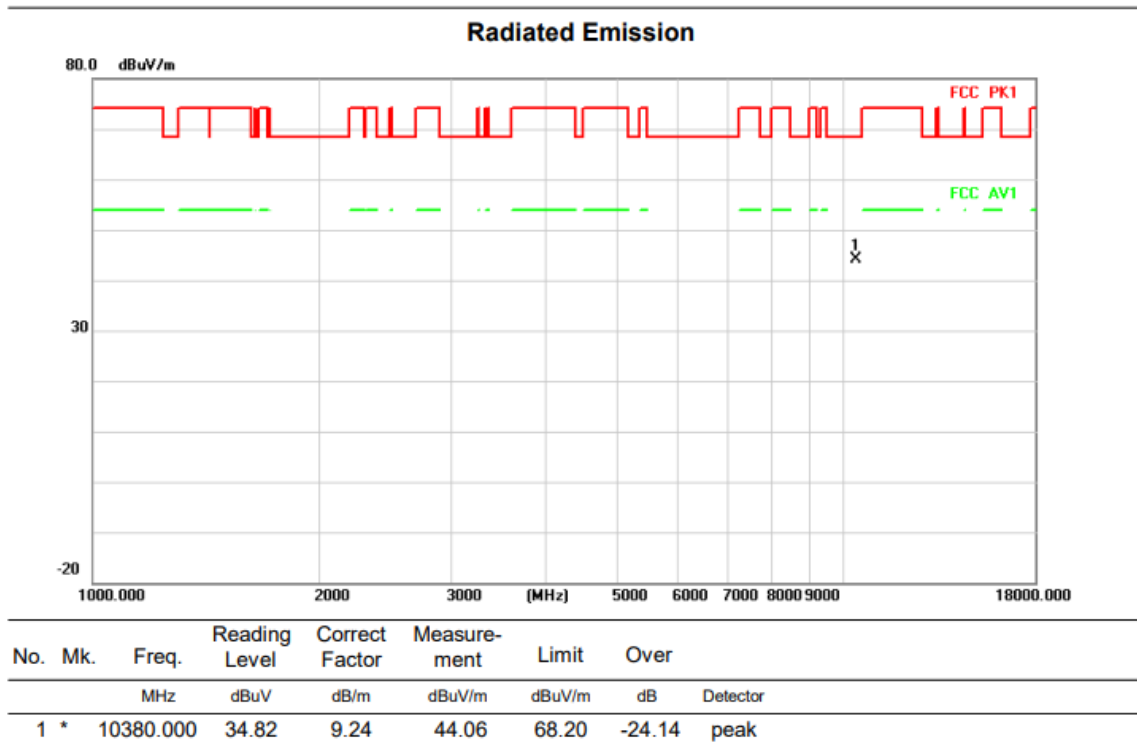
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	5350.000	27.13	19.30	46.43	68.20	-21.77	peak

Above 1G (1GHz~18GHz)

Test mode: 11N40MIMO

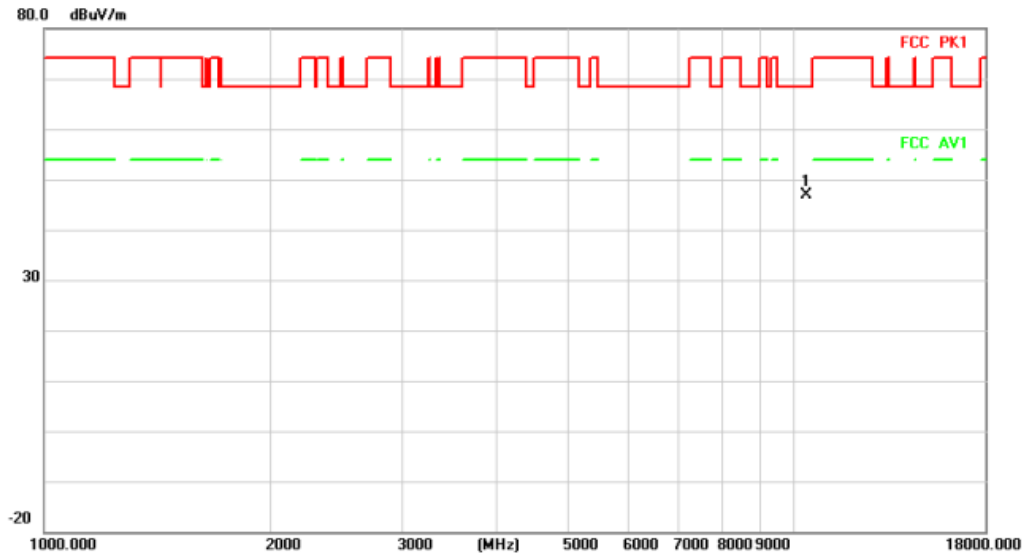
Test Channel:38

VERTICAL



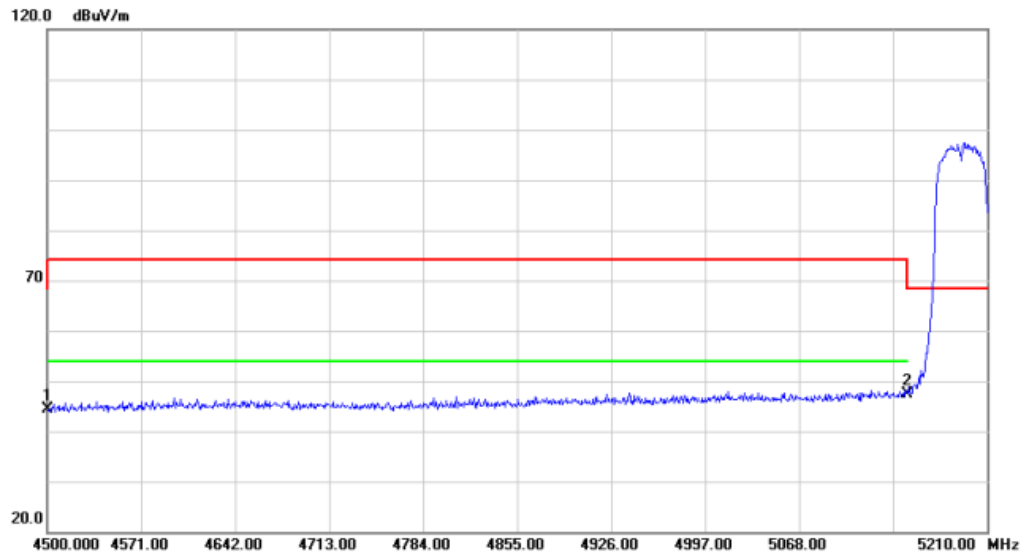
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10380.000	37.53	9.24	46.77	68.20	-21.43	peak

Radiated Emission



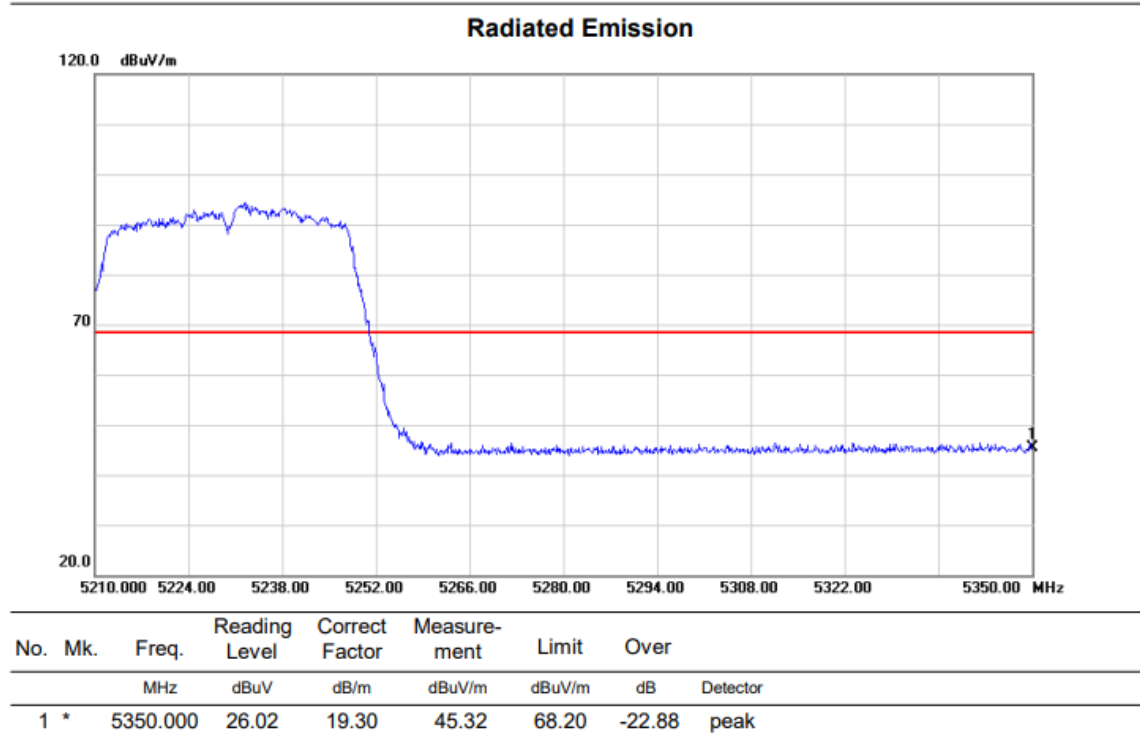
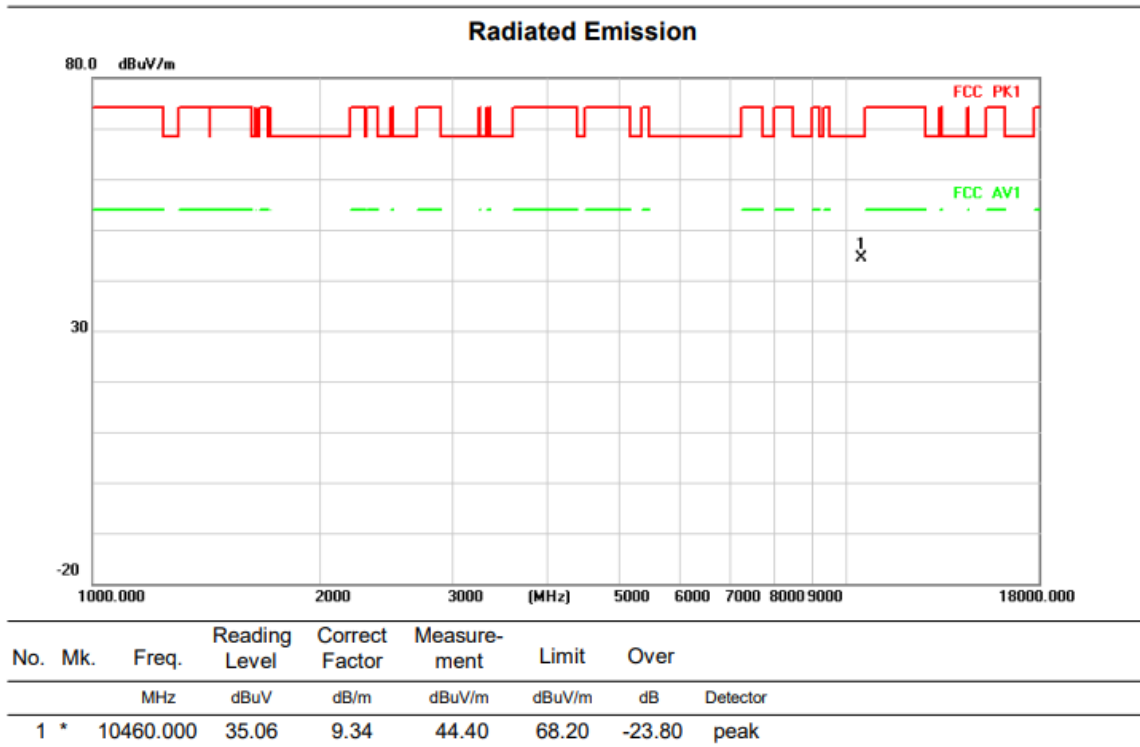
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	27.17	17.17	44.34	68.20	-23.86	peak
2	*	5150.000	28.23	19.17	47.40	68.20	-20.80	peak

Above 1G (1GHz~18GHz)

Test mode: 11N40MIMO

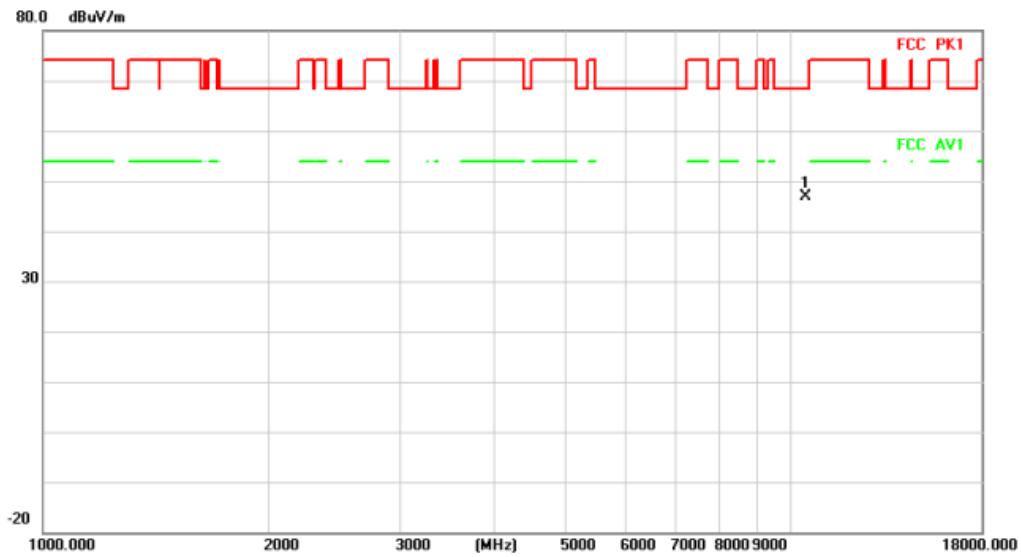
Test Channel:46

VERTICAL



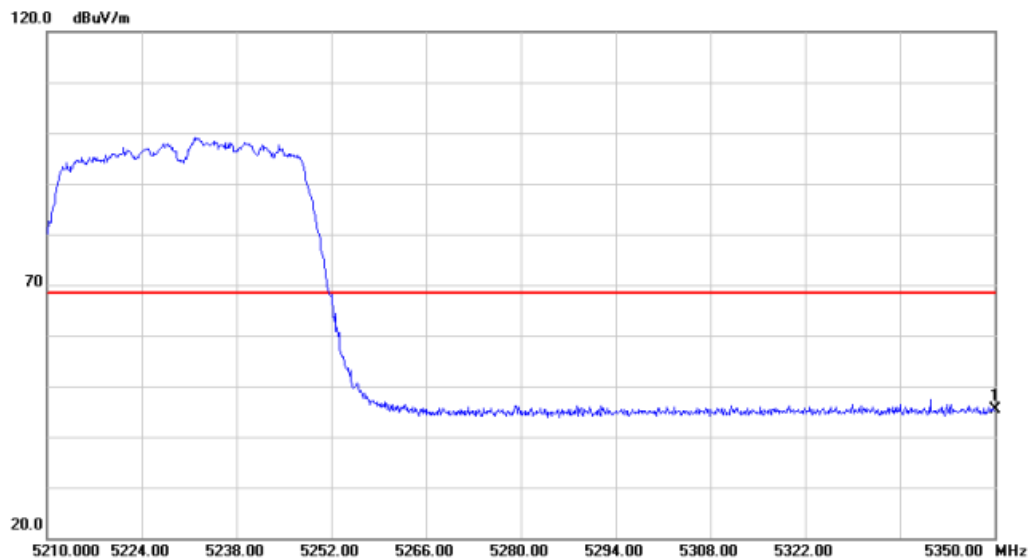
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	10460.000	37.49	9.34	46.83	68.20	-21.37	peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	5350.000	26.09	19.30	45.39	68.20	-22.81	peak

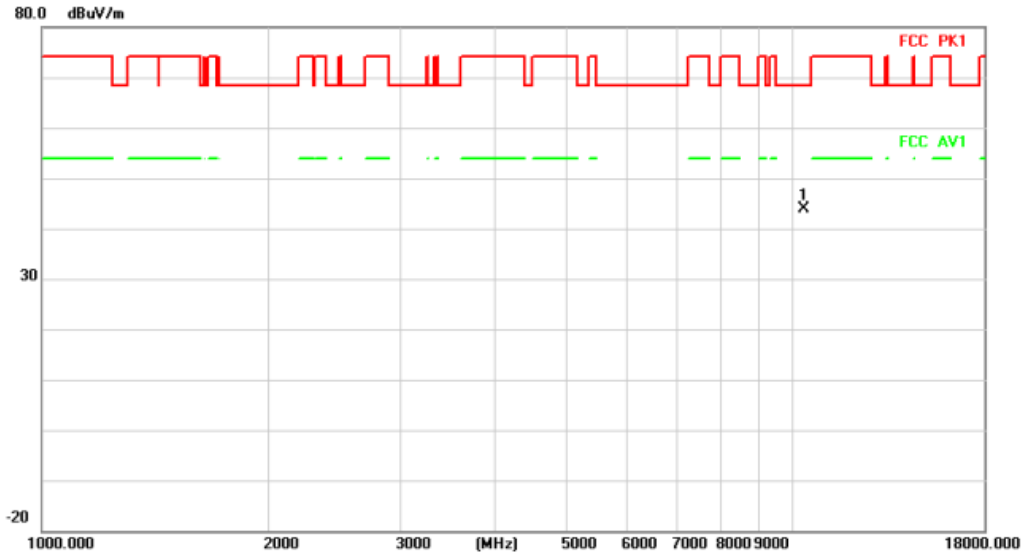
Above 1G (1GHz~18GHz)

Test mode: 11AC20MIMO

Test Channel:36

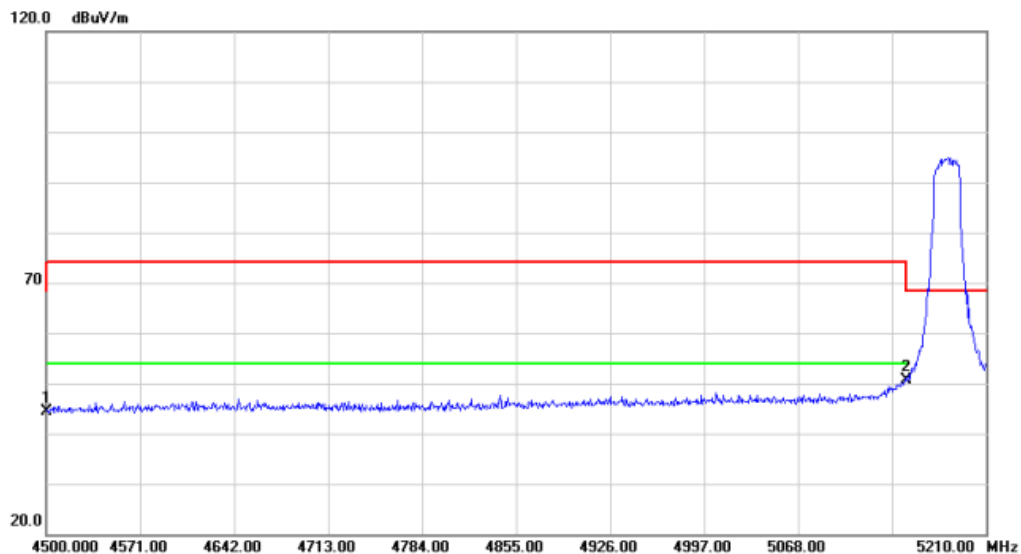
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10360.000	34.60	9.21	43.81	68.20	-24.39	peak

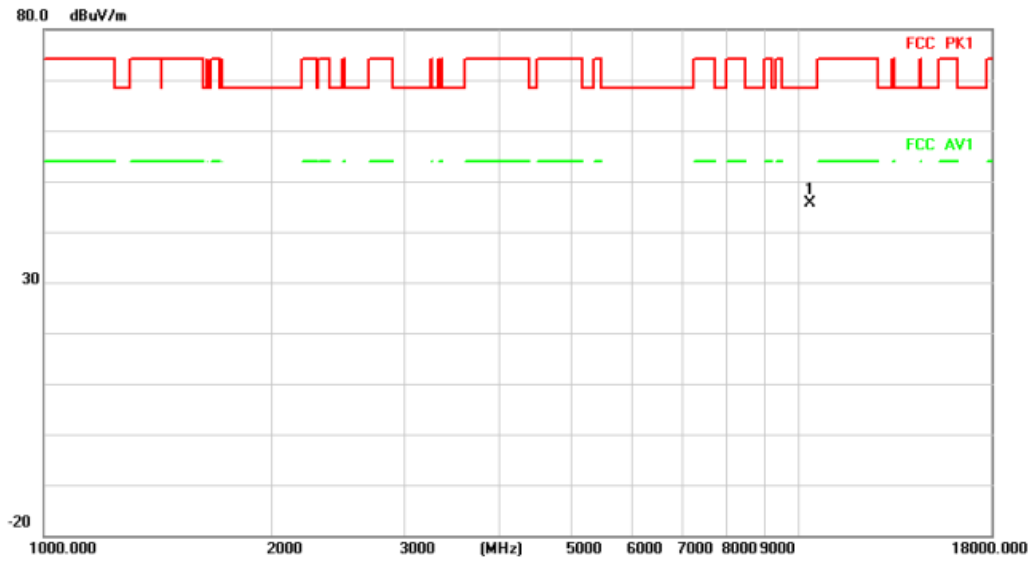
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	27.19	17.17	44.36	68.20	-23.84	peak
2	*	5150.000	31.50	19.17	50.67	68.20	-17.53	peak

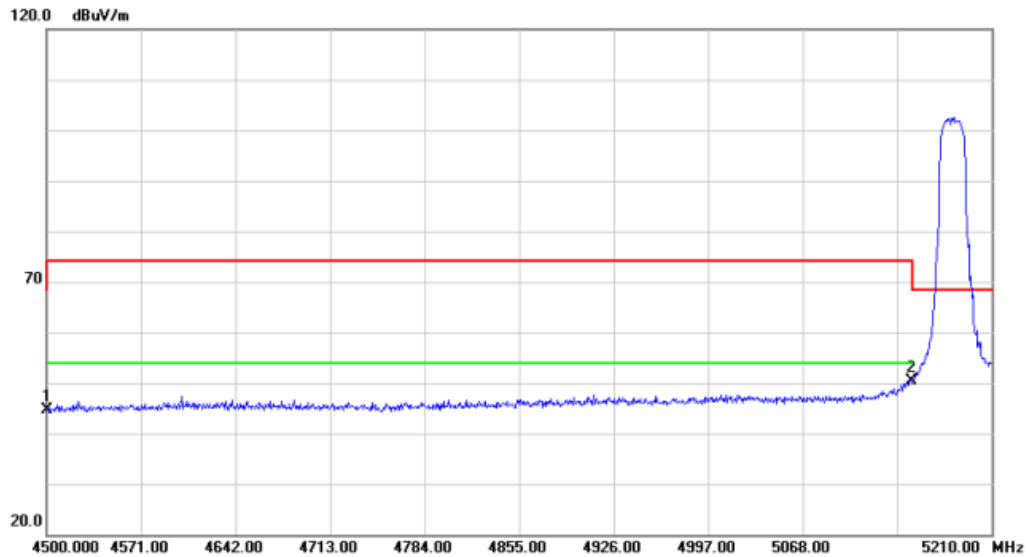
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10360.000	36.38	9.21	45.59	68.20	-22.61	peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	27.48	17.17	44.65	68.20	-23.55	peak
2	*	5150.000	31.22	19.17	50.39	68.20	-17.81	peak

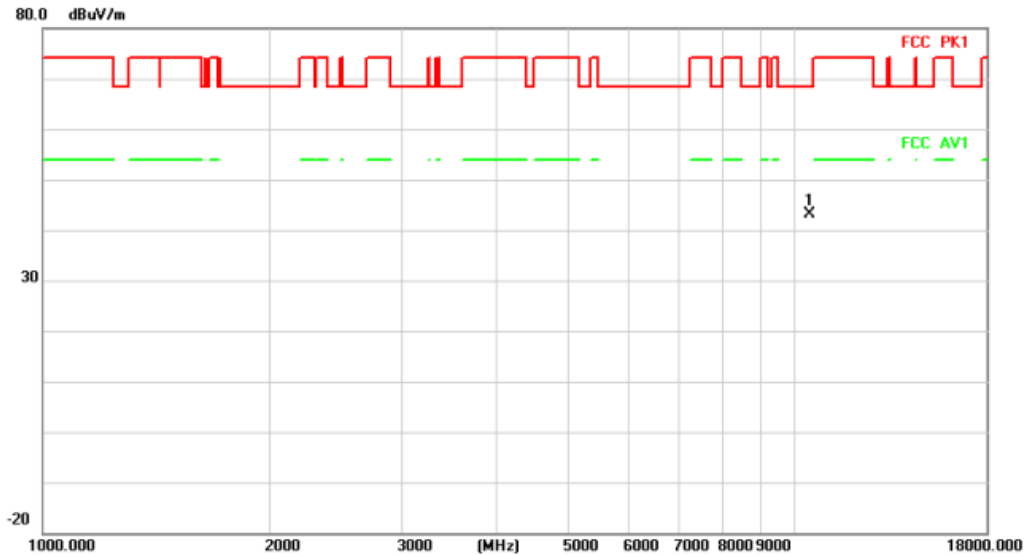
Above 1G (1GHz~18GHz)

Test mode: 11AC20MIMO

Test Channel:48

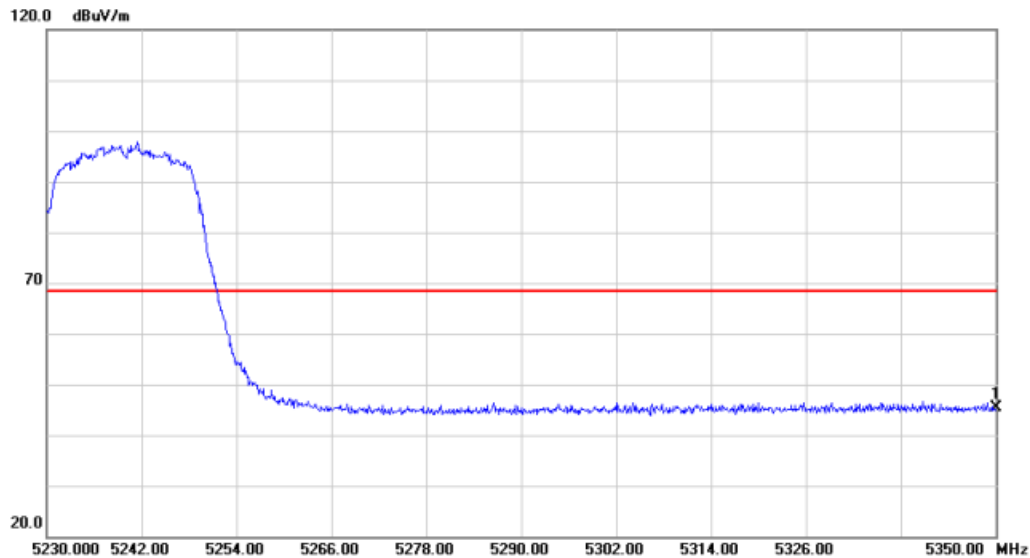
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10480.000	33.70	9.37	43.07	68.20	-25.13	peak

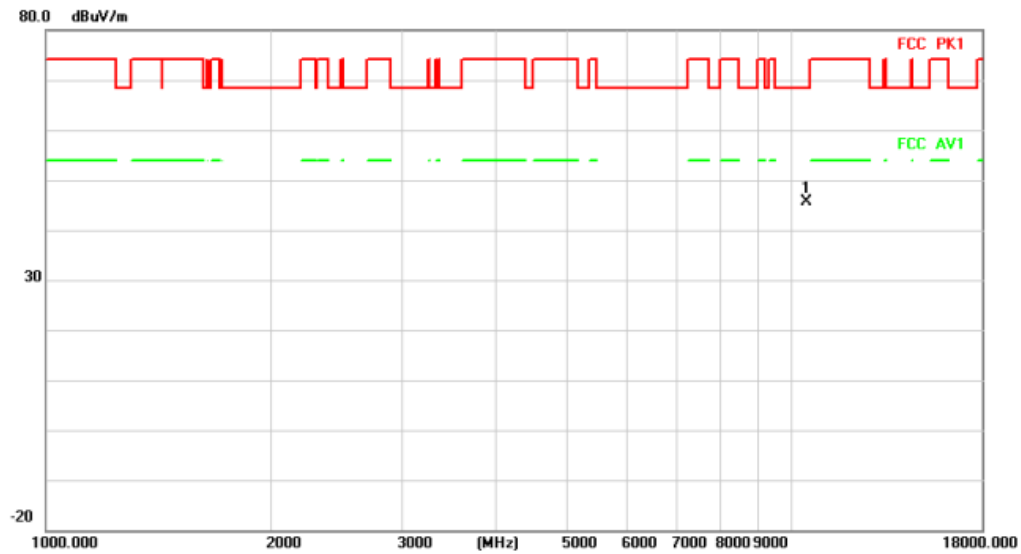
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	5350.000	26.00	19.30	45.30	68.20	-22.90	peak

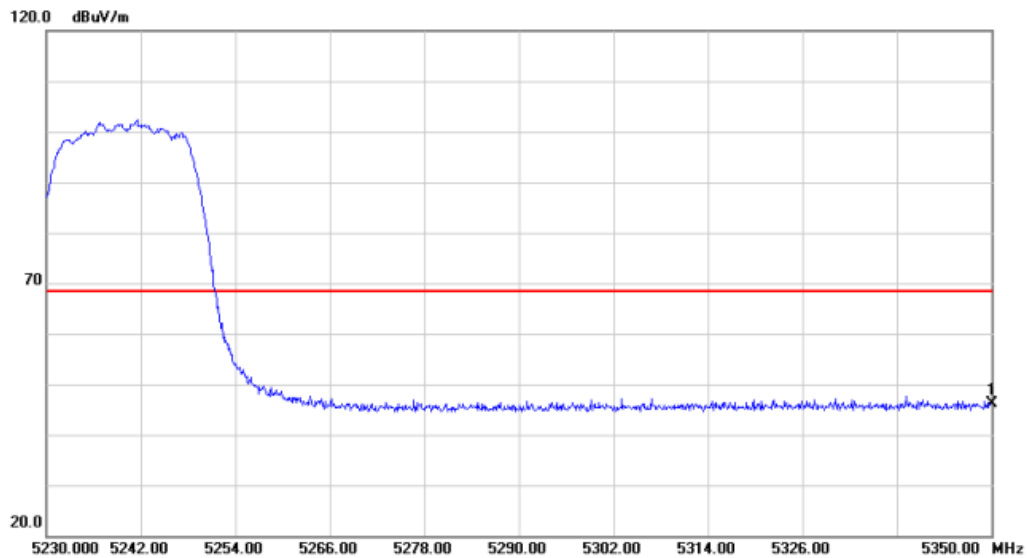
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	10480.000	36.22	9.37	45.59	68.20	-22.61 peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	5350.000	26.90	19.30	46.20	68.20	-22.00 peak

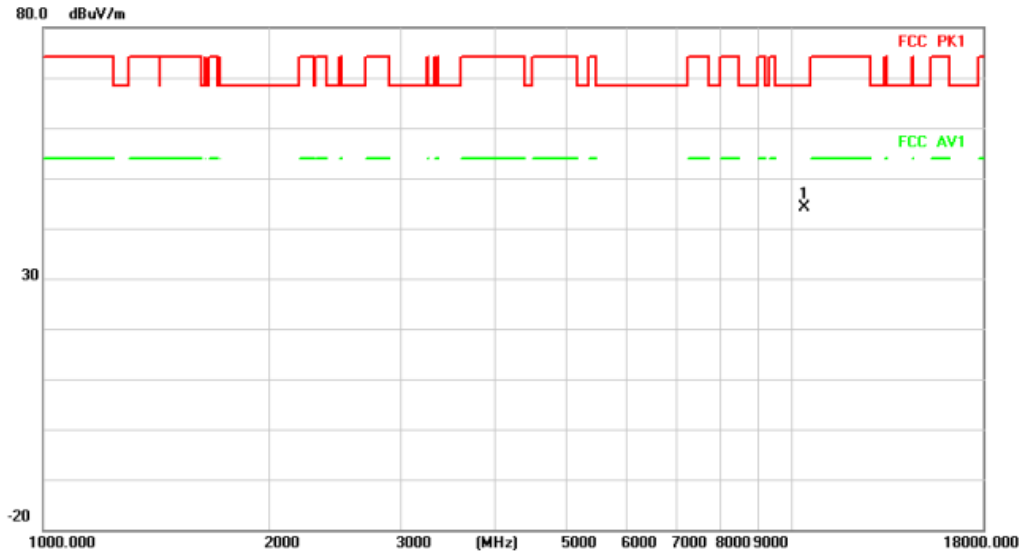
Above 1G (1GHz~18GHz)

Test mode: 11AC40MIMO

Test Channel:38

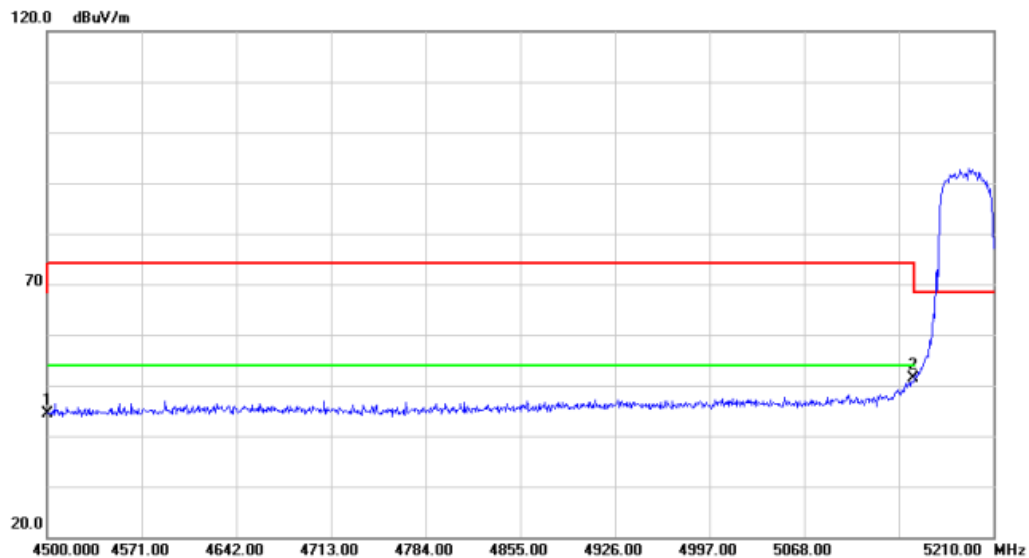
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1	*	10380.000	34.97	9.24	44.21	68.20	-23.99 peak

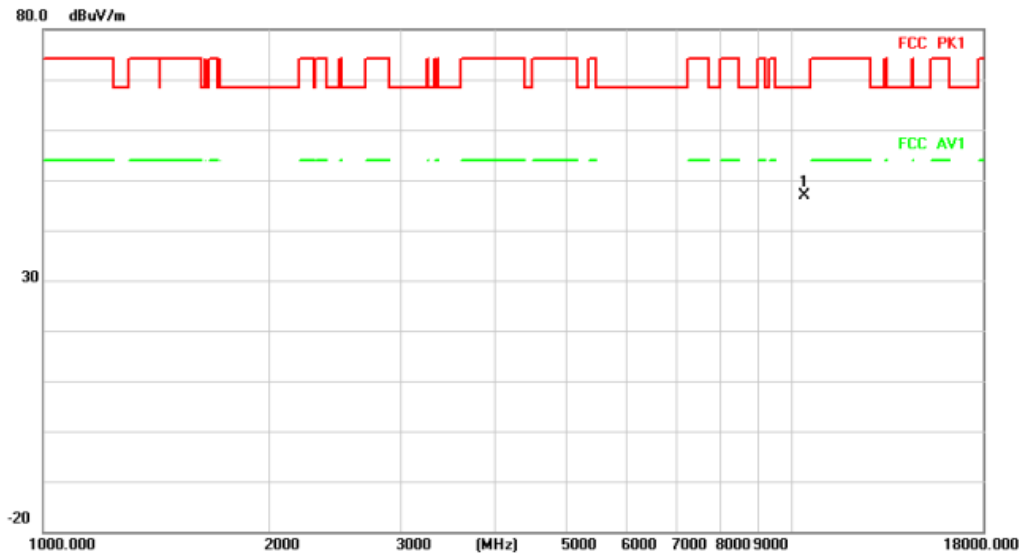
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB Detector
1		4500.000	27.28	17.17	44.45	68.20	-23.75 peak
2	*	5150.000	32.31	19.17	51.48	68.20	-16.72 peak

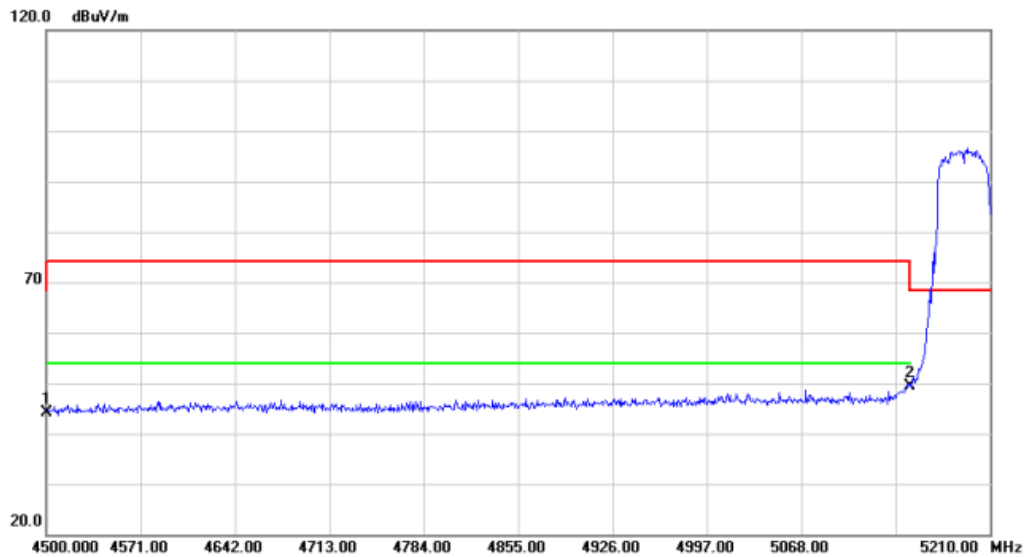
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10380.000	37.69	9.24	46.93	68.20	-21.27	peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	26.92	17.17	44.09	68.20	-24.11	peak
2	*	5150.000	30.28	19.17	49.45	68.20	-18.75	peak

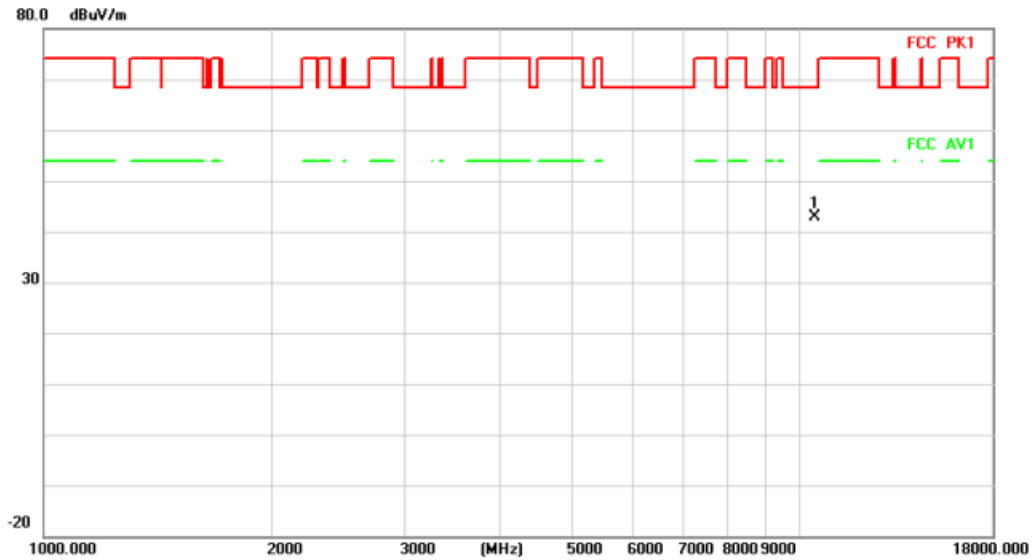
Above 1G (1GHz~18GHz)

Test mode: 11AC40MIMO

Test Channel:46

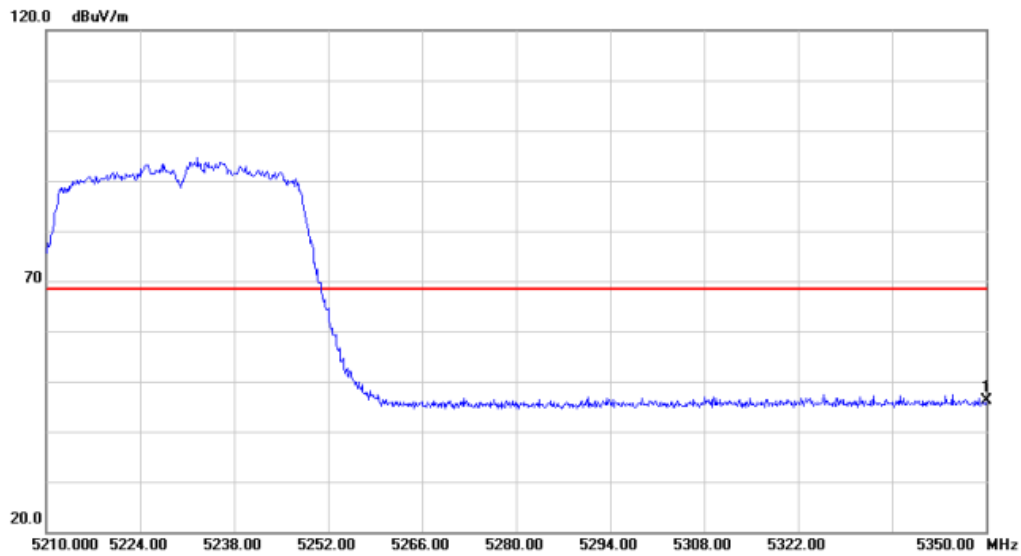
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	10460.000	33.43	9.34	42.77	68.20	-25.43 peak

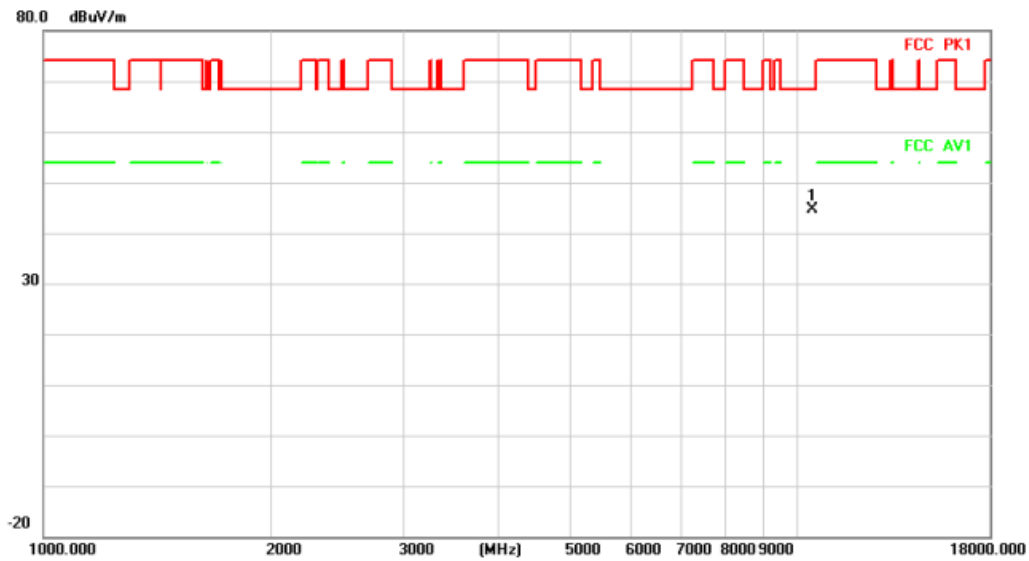
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	5350.000	26.74	19.30	46.04	68.20	-22.16 peak

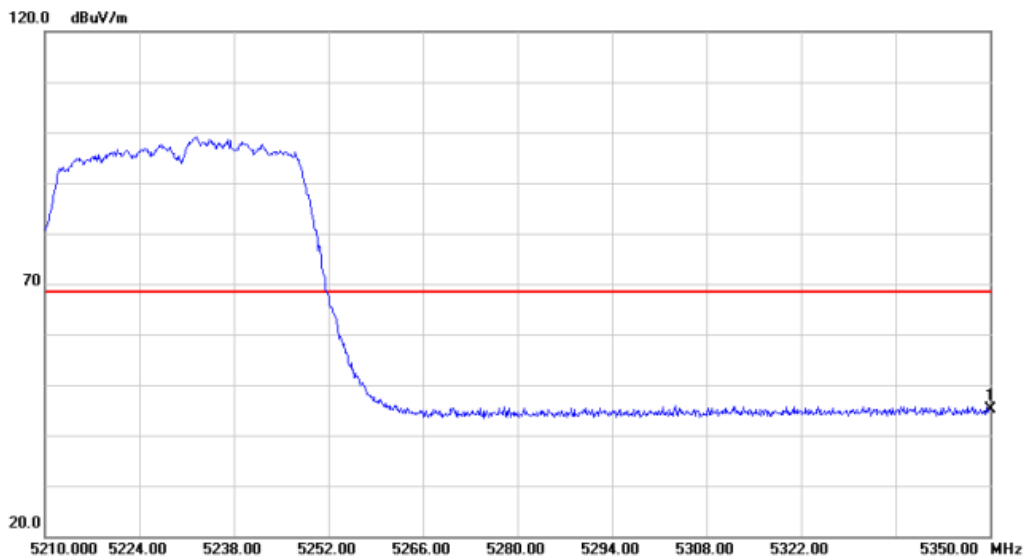
HORIZONTALA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	10460.000	35.26	9.34	44.60	68.20	-23.60 peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	*	5350.000	25.87	19.30	45.17	68.20	-23.03 peak

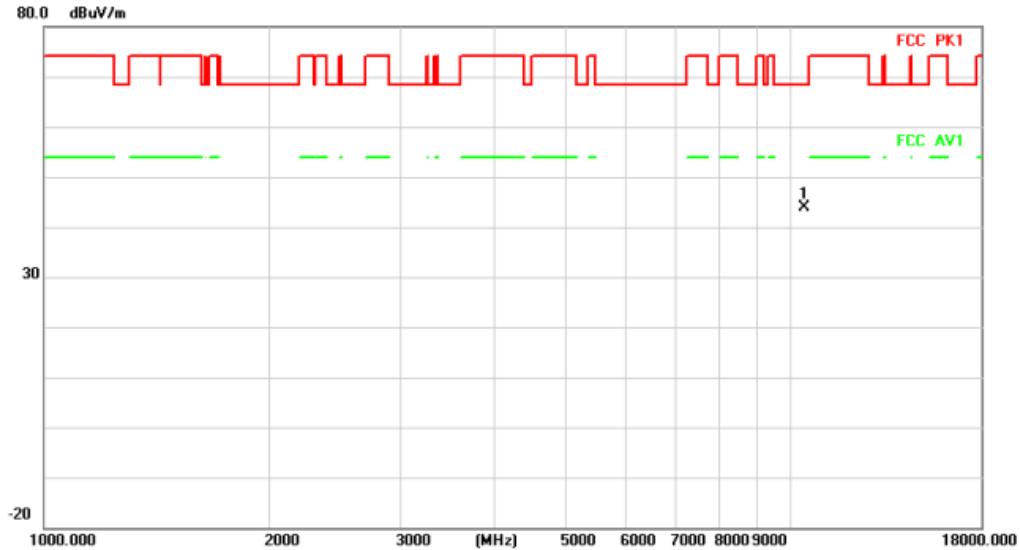
Above 1G (1GHz~18GHz)

Test mode: 11AC80MIMO

Test Channel:42

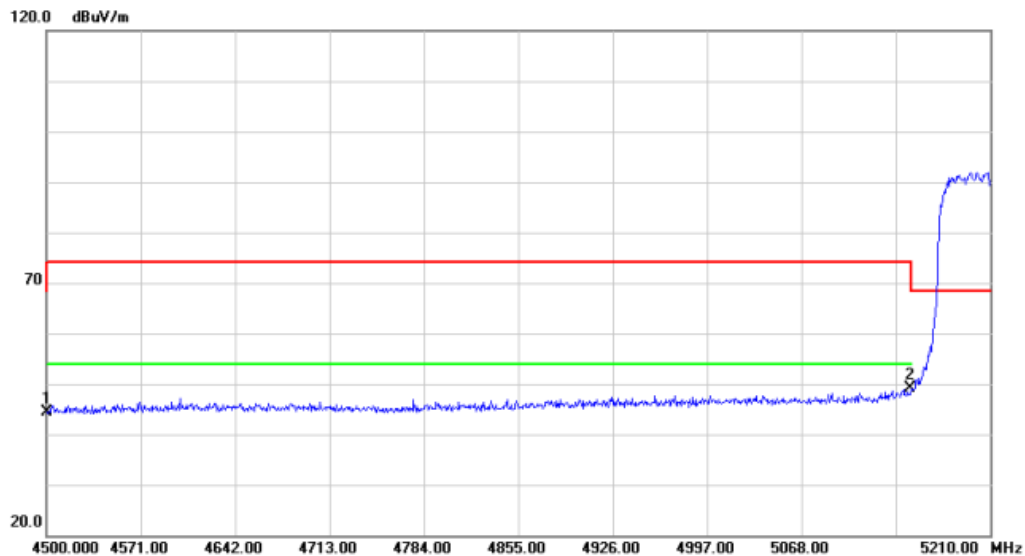
VERTICAL

Radiated Emission



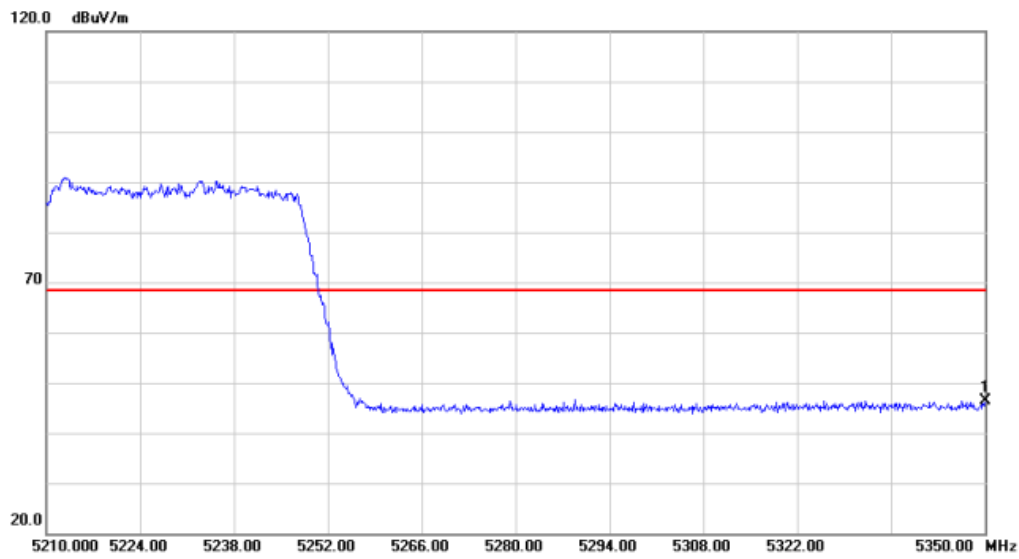
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10420.000	34.53	9.28	43.81	68.20	-24.39	peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	27.25	17.17	44.42	68.20	-23.78	peak
2	*	5150.000	29.94	19.17	49.11	68.20	-19.09	peak

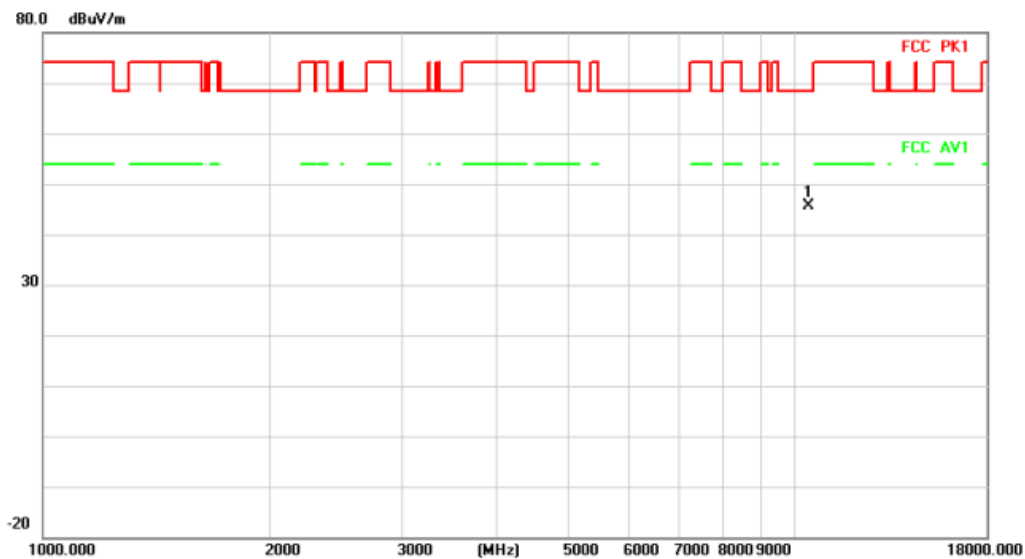
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	5350.000	27.06	19.30	46.36	68.20	-21.84	peak

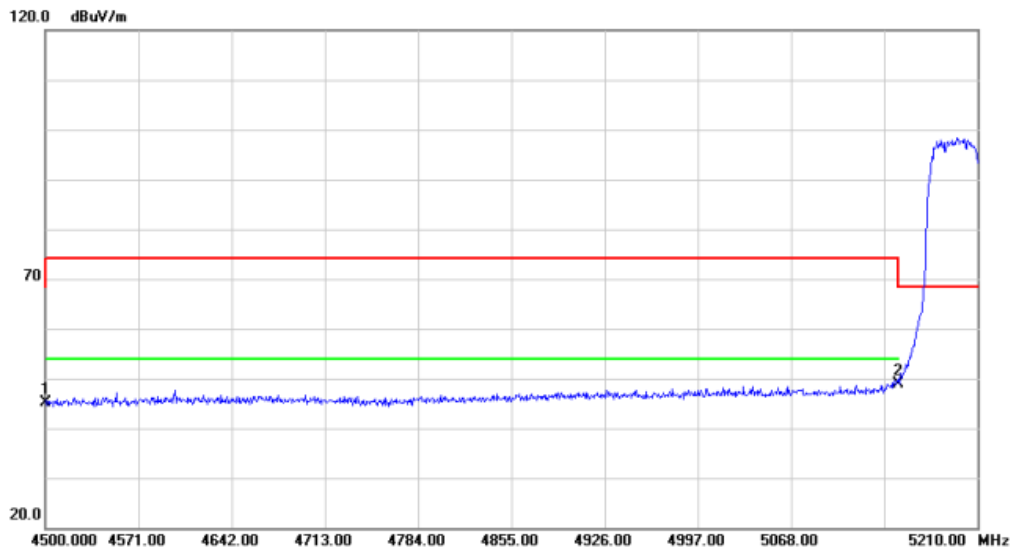
HORIZONTALA

Radiated Emission



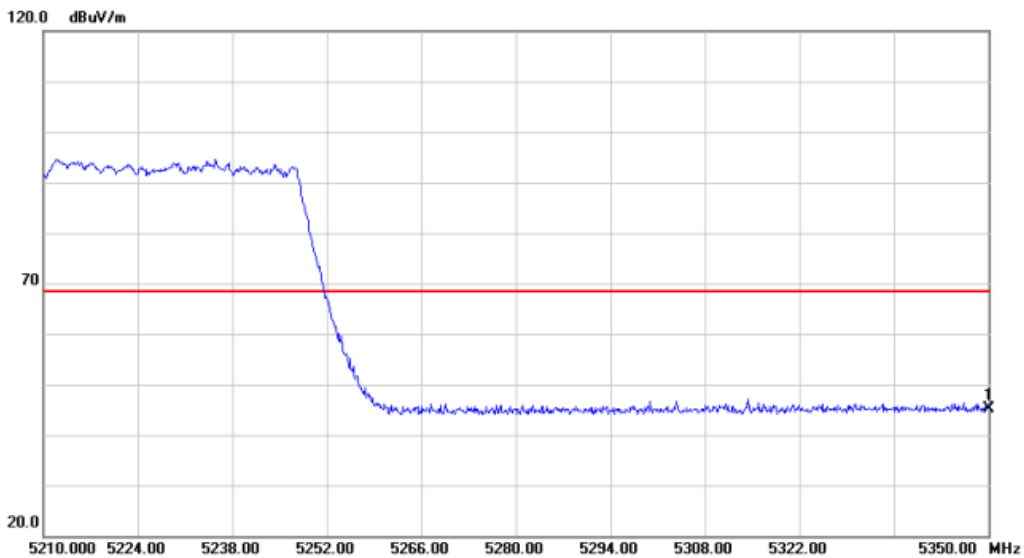
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	10420.000	36.38	9.28	45.66	68.20	-22.54	peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4500.000	28.02	17.17	45.19	68.20	-23.01	peak
2	*	5150.000	29.82	19.17	48.99	68.20	-19.21	peak

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	5350.000	25.83	19.30	45.13	68.20	-23.07	peak

The high frequency, which started from 18GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit line was not recorded in this report.

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
	26 dB Bandwidth	-	5725-5850
	6 dB Bandwidth	Minimum 500 kHz	5725-5850

3.3.2 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 was directly connected to the tonscond test system and antenna output port as show in the block diagram below.

b) the spectrum analyser is set as follow:

For 26 dB Bandwidth

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

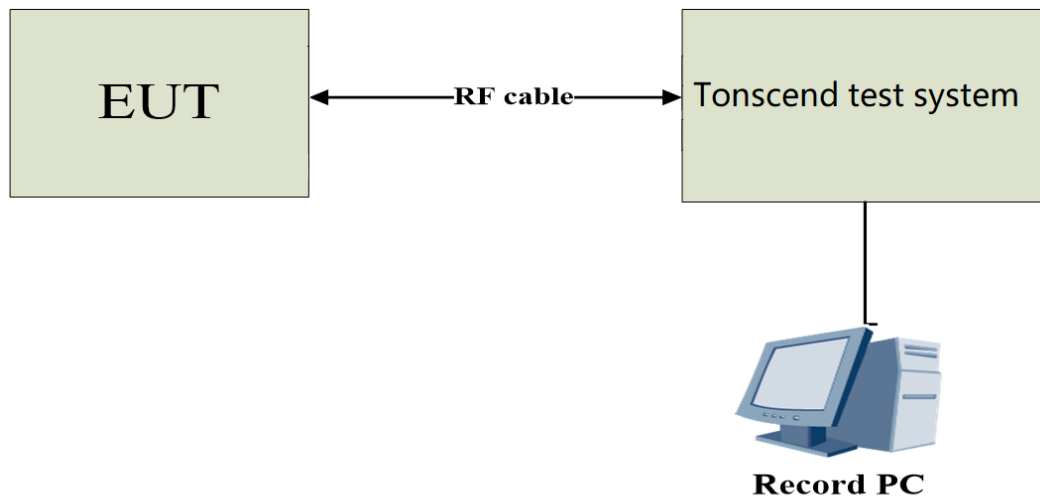
c) Wait for the trace to stabilize then find the peak value of the trace and place the analyser marker

on this peak.

d) Use the -26/-6dB bandwidth function of the spectrum analyser to measure the -26/-6dB Bandwidth of the EUT. This value shall be recorded.

e) 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.

3.3.3 Test Setup



3.3.4 Test Result

3.3.5.1 26 dB Bandwidth

Test Mode	Antenna	Freq(MHz)	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant1	5180	19.400	5170.400	5189.800	---	---
	Ant2	5180	19.400	5170.120	5189.520	---	---
	Ant1	5200	19.400	5189.840	5209.240	---	---
	Ant2	5200	19.080	5190.440	5209.520	---	---
	Ant1	5240	19.760	5230.160	5249.920	---	---
	Ant2	5240	19.320	5230.160	5249.480	---	---
11N20MIMO	Ant1	5180	19.600	5170.080	5189.680	---	---
	Ant2	5180	19.480	5170.160	5189.640	---	---
	Ant1	5200	19.600	5189.760	5209.360	---	---
	Ant2	5200	19.520	5190.120	5209.640	---	---
	Ant1	5240	19.480	5230.240	5249.720	---	---
	Ant2	5240	19.480	5230.120	5249.600	---	---
11N40MIMO	Ant1	5190	38.880	5170.320	5209.200	---	---
	Ant2	5190	39.280	5170.160	5209.440	---	---
	Ant1	5230	39.680	5209.840	5249.520	---	---
	Ant2	5230	39.920	5209.600	5249.520	---	---
11AC20MIMO	Ant1	5180	19.360	5170.200	5189.560	---	---
	Ant2	5180	19.520	5170.240	5189.760	---	---
	Ant1	5200	19.560	5189.880	5209.440	---	---
	Ant2	5200	19.520	5190.280	5209.800	---	---
	Ant1	5240	19.600	5230.240	5249.840	---	---
	Ant2	5240	19.880	5229.920	5249.800	---	---
11AC40MIMO	Ant1	5190	39.120	5170.400	5209.520	---	---
	Ant2	5190	39.040	5170.400	5209.440	---	---
	Ant1	5230	39.520	5210.480	5250.000	---	---
	Ant2	5230	39.360	5210.400	5249.760	---	---
11AC80MIMO	Ant1	5210	80.640	5169.200	5249.840	---	---
	Ant2	5210	78.880	5170.640	5249.520	---	---

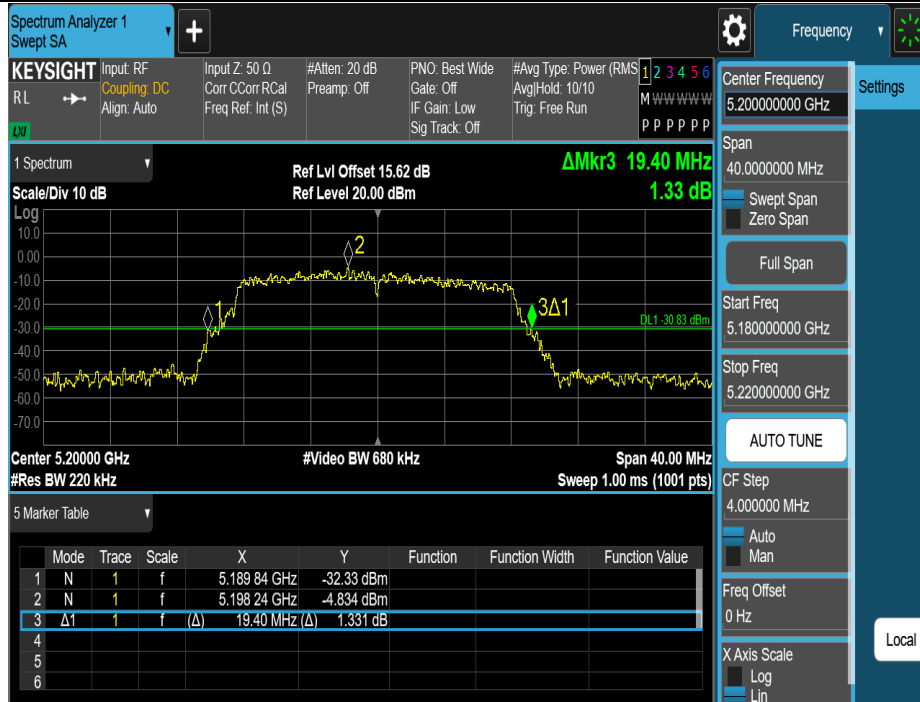
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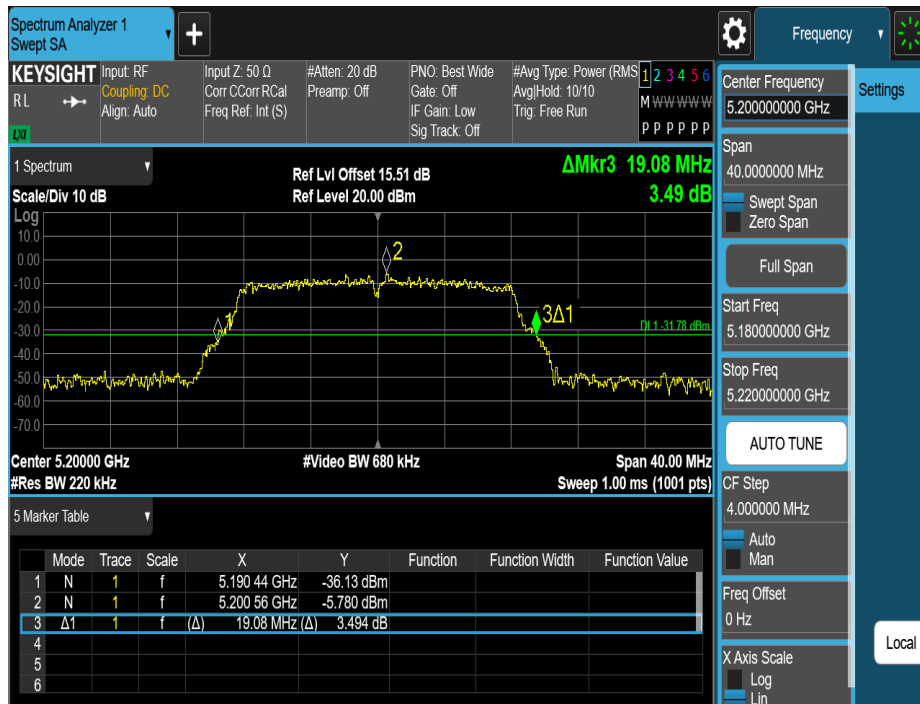
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11A-CDD_Ant1_5200



11A-CDD_Ant2_5200



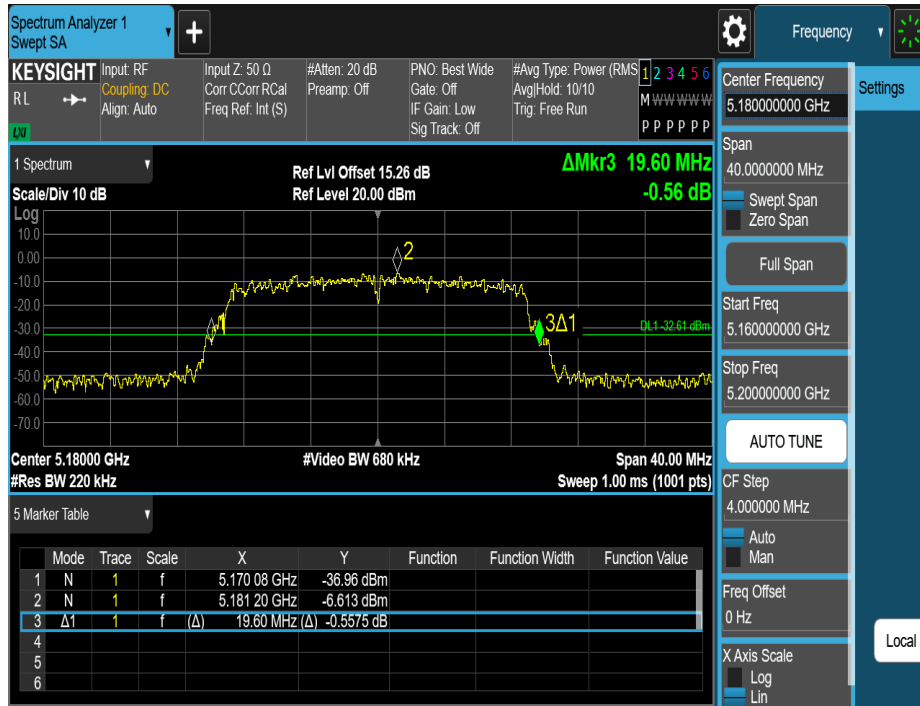
11A-CDD_Ant1_5240



11A-CDD_Ant2_5240



11N20MIMO_Ant1_5180



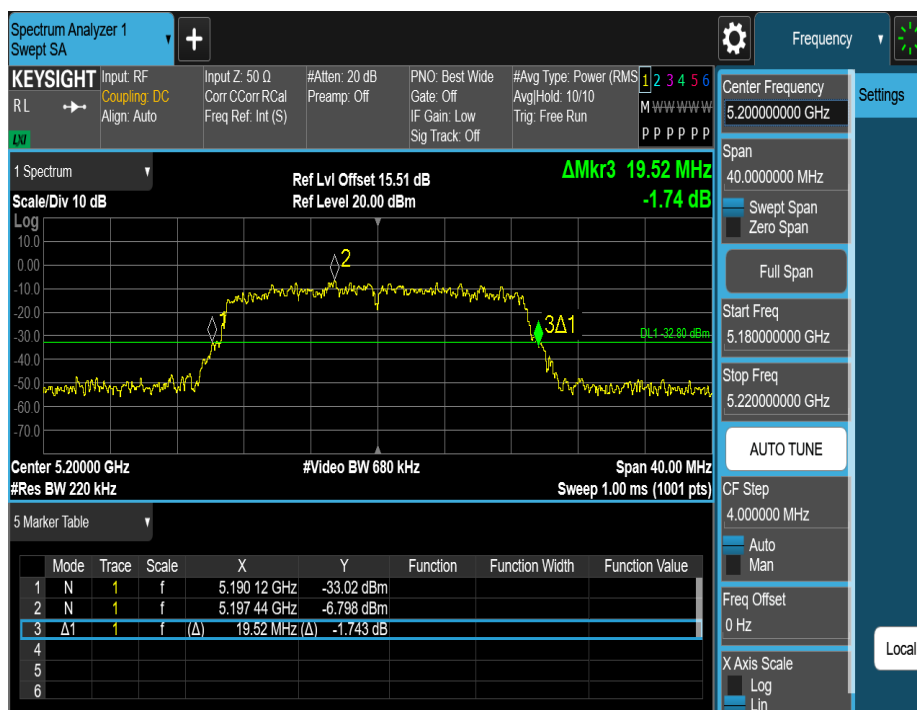
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11N20MIMO_Ant1_5200



11N20MIMO_Ant2_5200

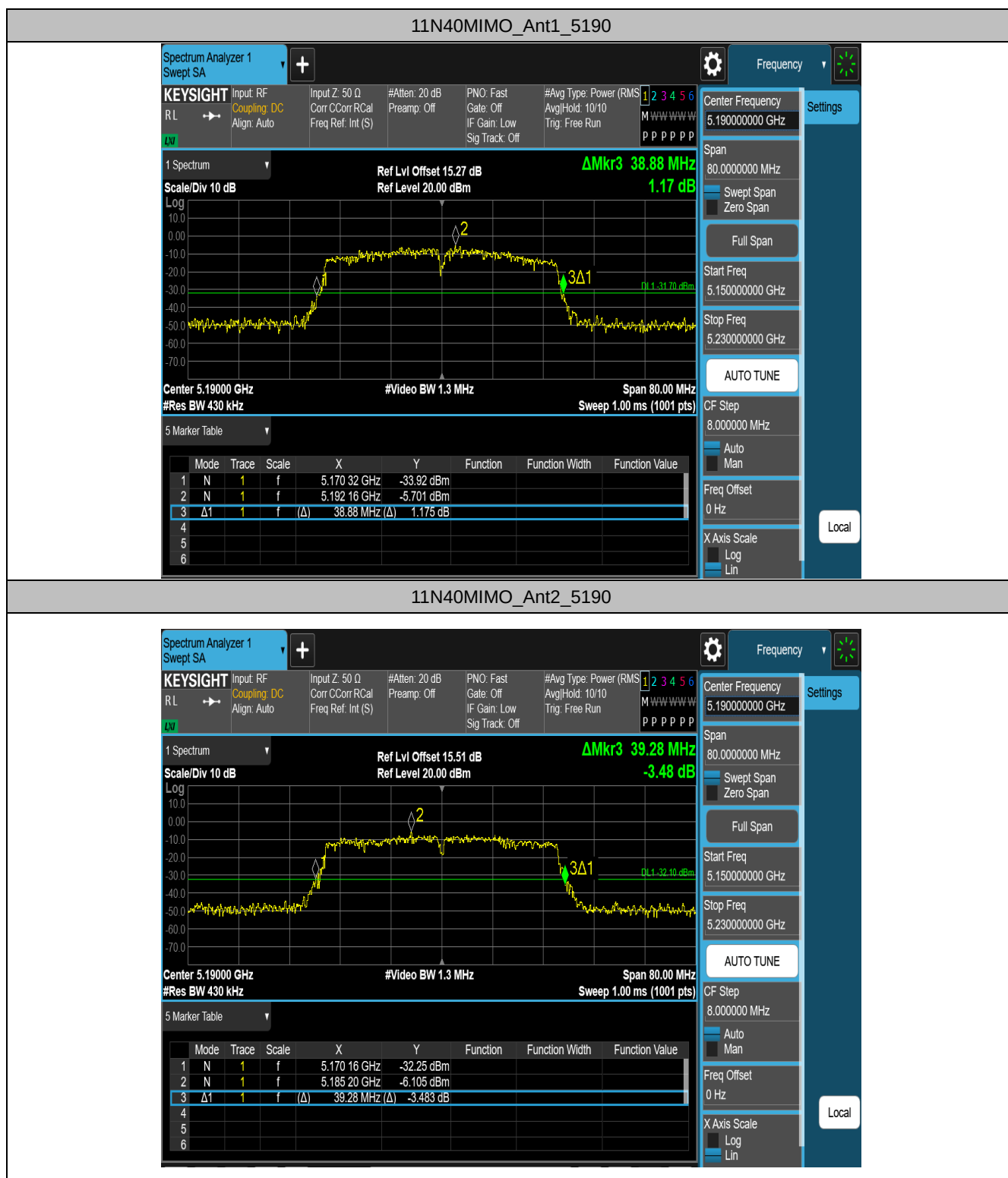


11N20MIMO_Ant1_5240

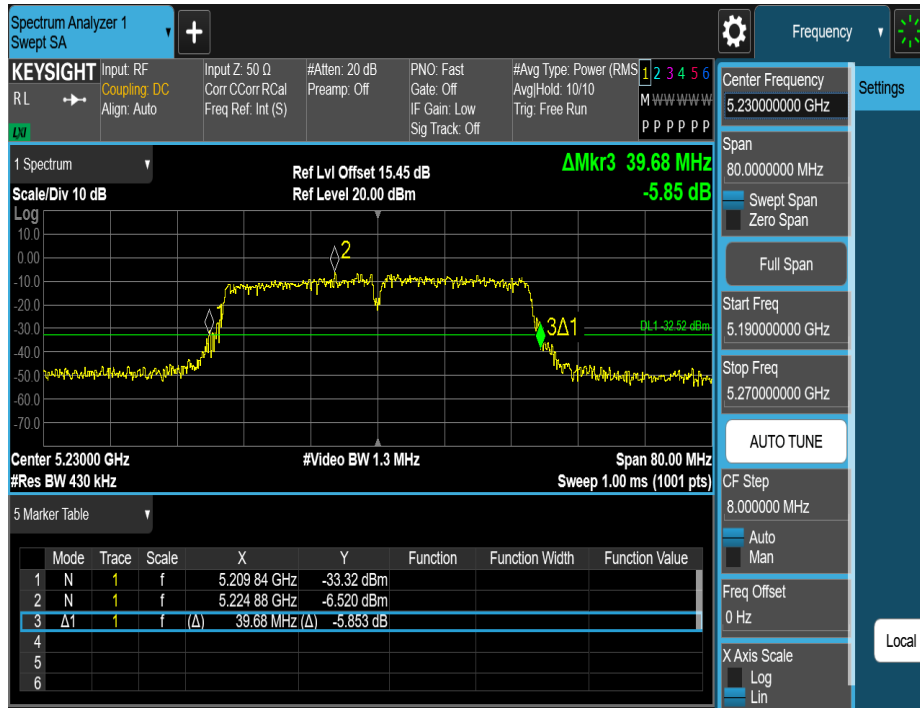


11N20MIMO_Ant2_5240





11N40MIMO_Ant1_5230



11N40MIMO_Ant2_5230



11AC20MIMO_Ant1_5180



11AC20MIMO_Ant2_5180



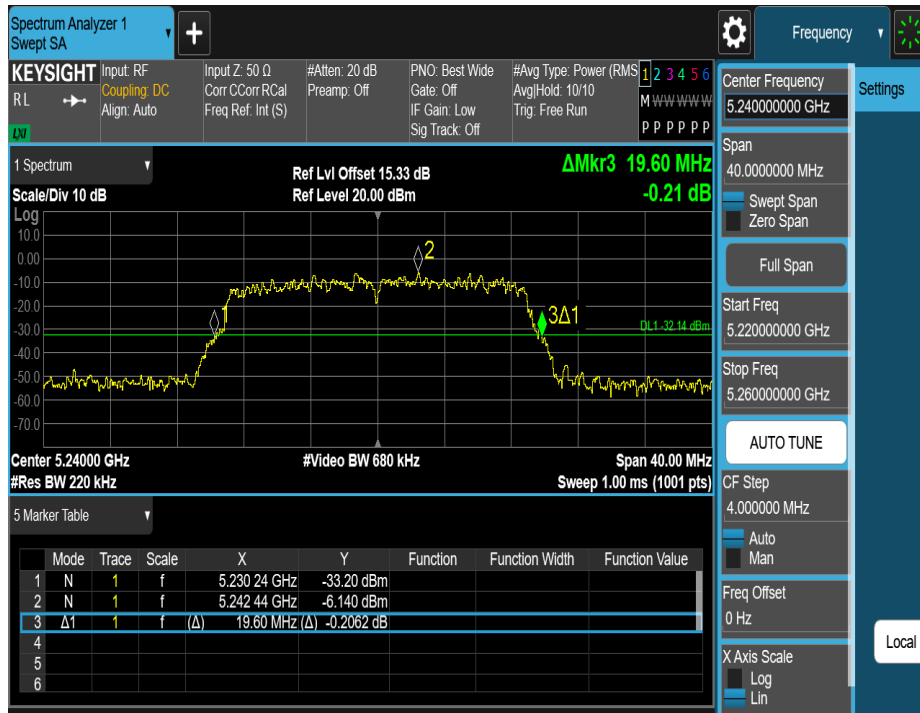
11AC20MIMO_Ant1_5200



11AC20MIMO_Ant2_5200



11AC20MIMO_Ant1_5240



11AC20MIMO_Ant2_5240



11AC40MIMO_Ant1_5190



11AC40MIMO_Ant2_5190



11AC40MIMO_Ant1_5230



11AC40MIMO_Ant2_5230



11AC80MIMO_Ant1_5210



11AC80MIMO_Ant2_5210



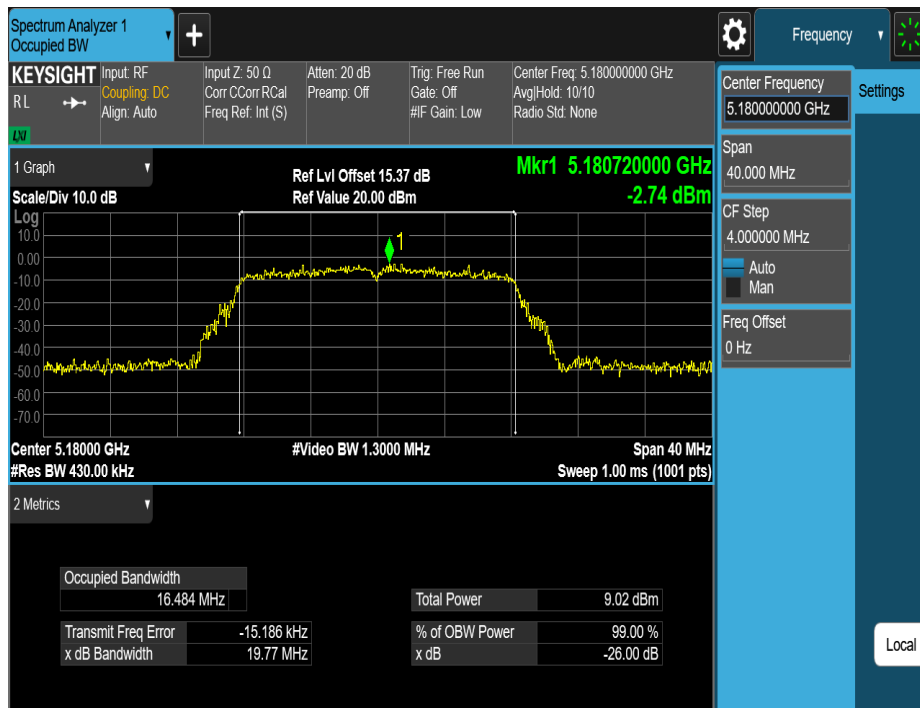
3.3.5.2 Occupied channel bandwidth

Test Mode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant1	5180	16.507	5171.7566	5188.2636	---	---
	Ant2	5180	16.484	5171.7428	5188.2268	---	---
	Ant1	5200	16.461	5191.5963	5208.0573	---	---
	Ant2	5200	16.489	5191.7245	5208.2135	---	---
	Ant1	5240	16.420	5231.8032	5248.2232	---	---
	Ant2	5240	16.547	5231.6743	5248.2213	---	---
11N20MIMO	Ant1	5180	17.688	5171.0745	5188.7625	---	---
	Ant2	5180	17.533	5171.2081	5188.7411	---	---
	Ant1	5200	17.591	5191.0085	5208.5995	---	---
	Ant2	5200	17.626	5191.1062	5208.7322	---	---
	Ant1	5240	17.603	5231.1869	5248.7899	---	---
	Ant2	5240	17.574	5231.1724	5248.7464	---	---
11N40MIMO	Ant1	5190	35.776	5171.9176	5207.6936	---	---
	Ant2	5190	36.035	5171.8794	5207.9144	---	---
	Ant1	5230	36.223	5211.8619	5248.0849	---	---
	Ant2	5230	35.871	5212.0447	5247.9157	---	---
11AC20MIMO	Ant1	5180	17.571	5171.0823	5188.6533	---	---
	Ant2	5180	17.556	5171.2311	5188.7871	---	---
	Ant1	5200	17.575	5191.0225	5208.5975	---	---
	Ant2	5200	17.608	5191.1285	5208.7365	---	---
	Ant1	5240	17.533	5231.2610	5248.7940	---	---
	Ant2	5240	17.585	5231.1171	5248.7021	---	---
11AC40MIMO	Ant1	5190	35.643	5171.9973	5207.6403	---	---
	Ant2	5190	35.978	5171.9556	5207.9336	---	---
	Ant1	5230	36.119	5212.0055	5248.1245	---	---
	Ant2	5230	36.034	5211.8728	5247.9068	---	---
11AC80MIMO	Ant1	5210	75.895	5171.9145	5247.8095	---	---
	Ant2	5210	75.438	5172.2153	5247.6533	---	---

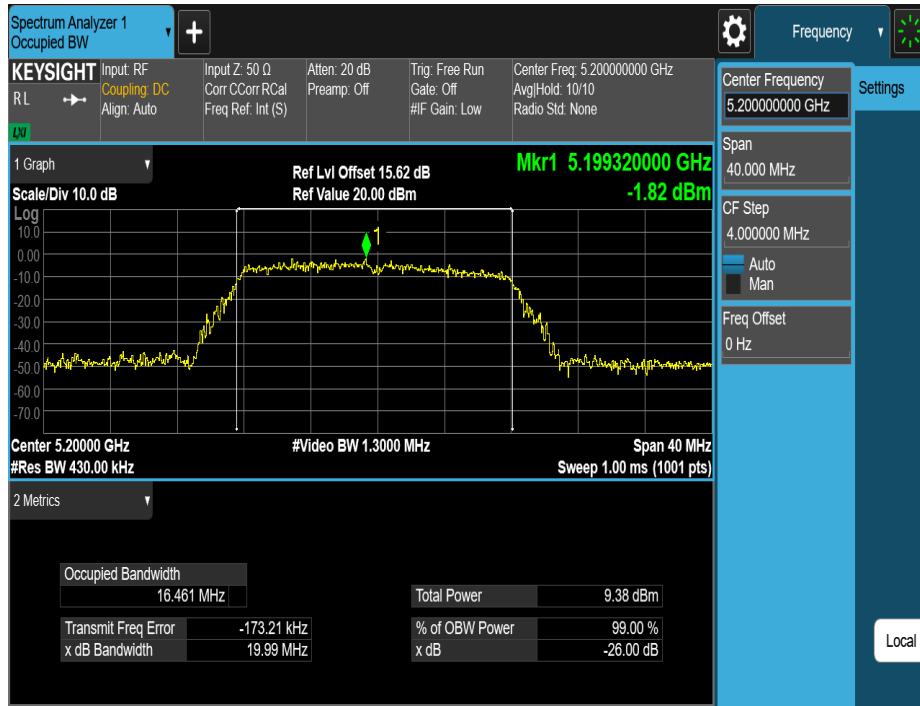
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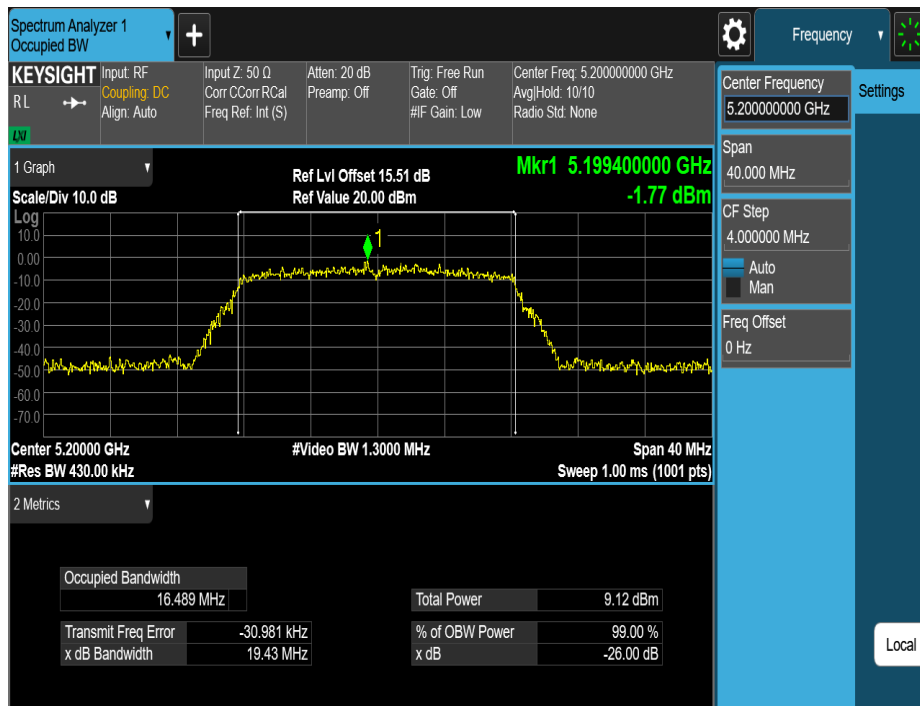
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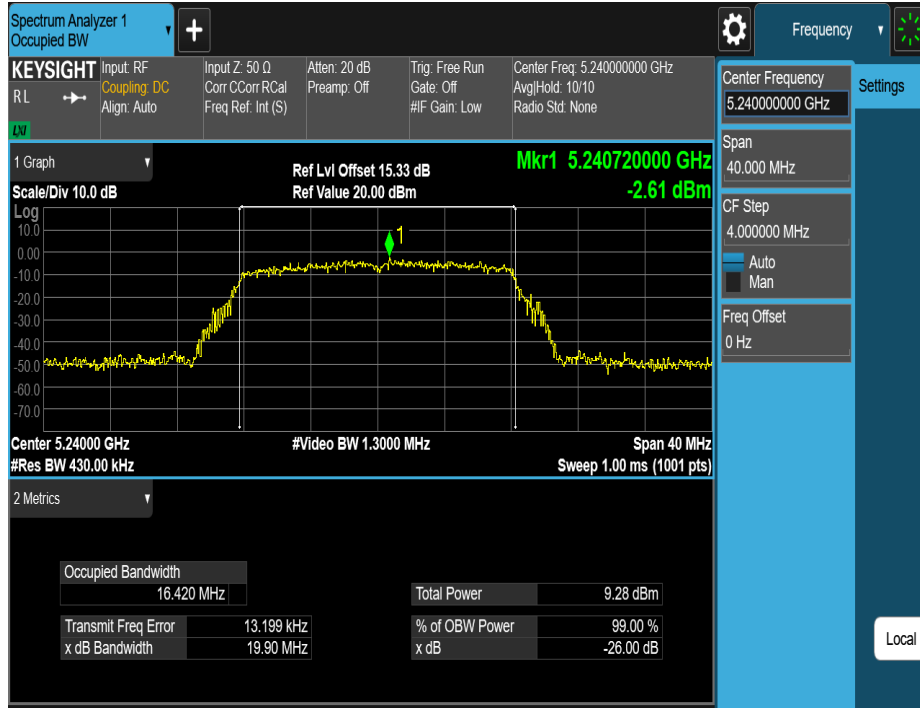
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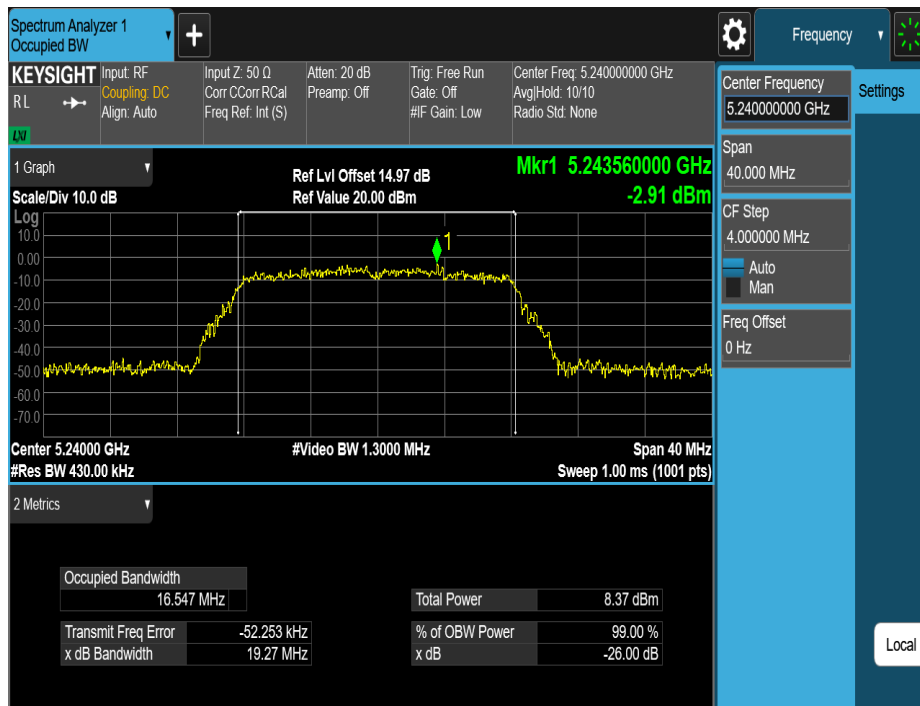
11A-CDD_Ant2_5200



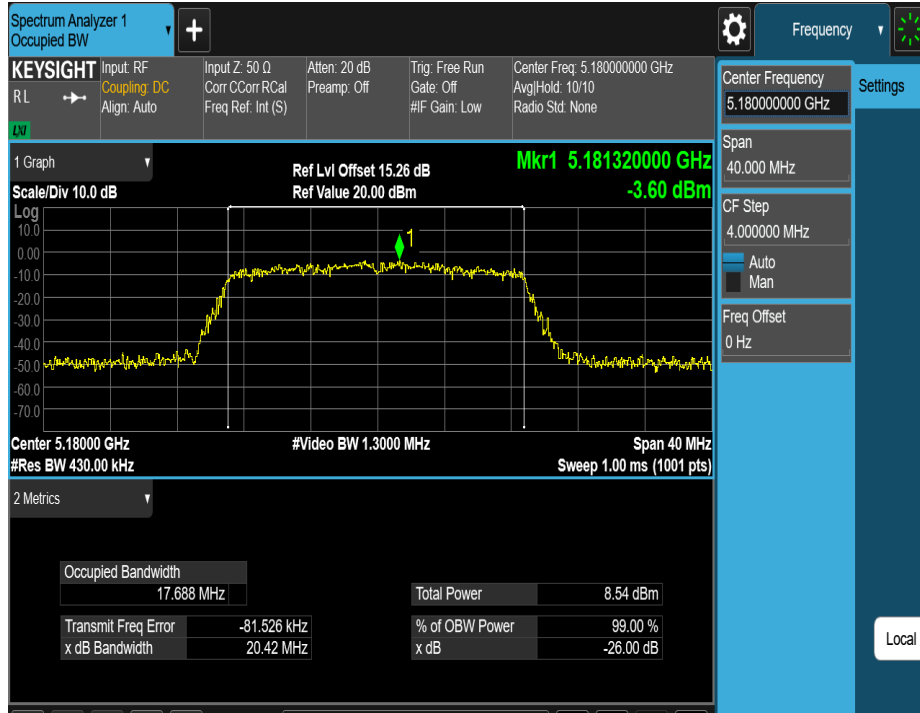
11A-CDD_Ant1_5240



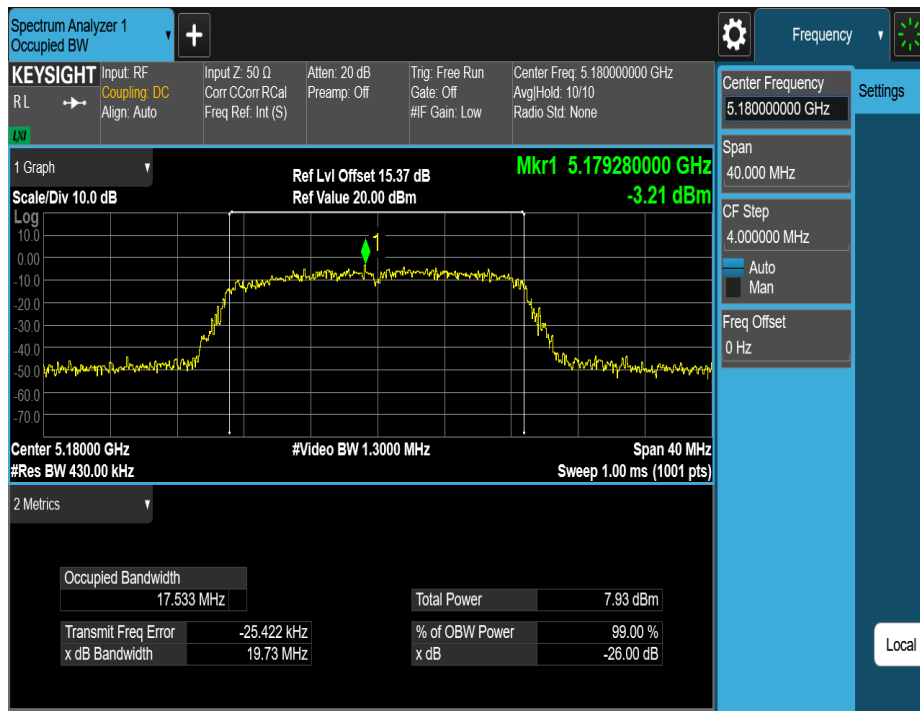
11A-CDD_Ant2_5240



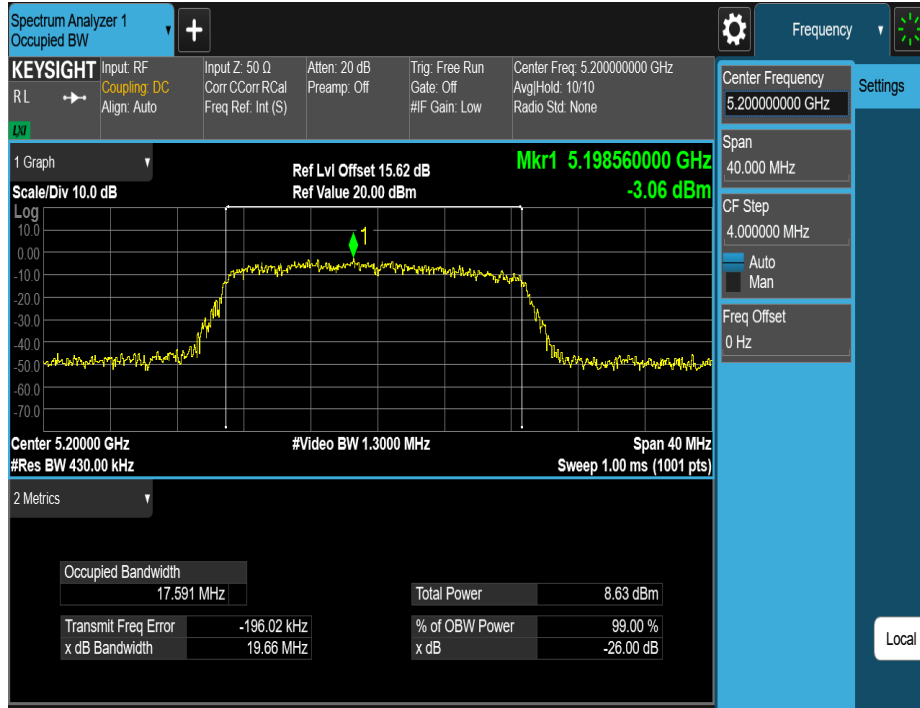
11N20MIMO_Ant1_5180



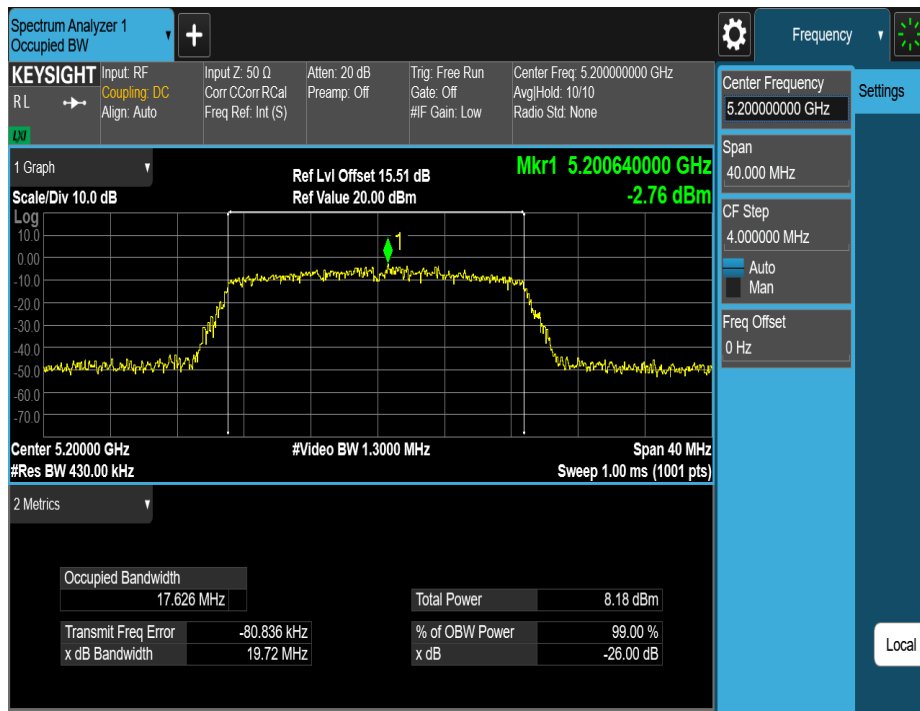
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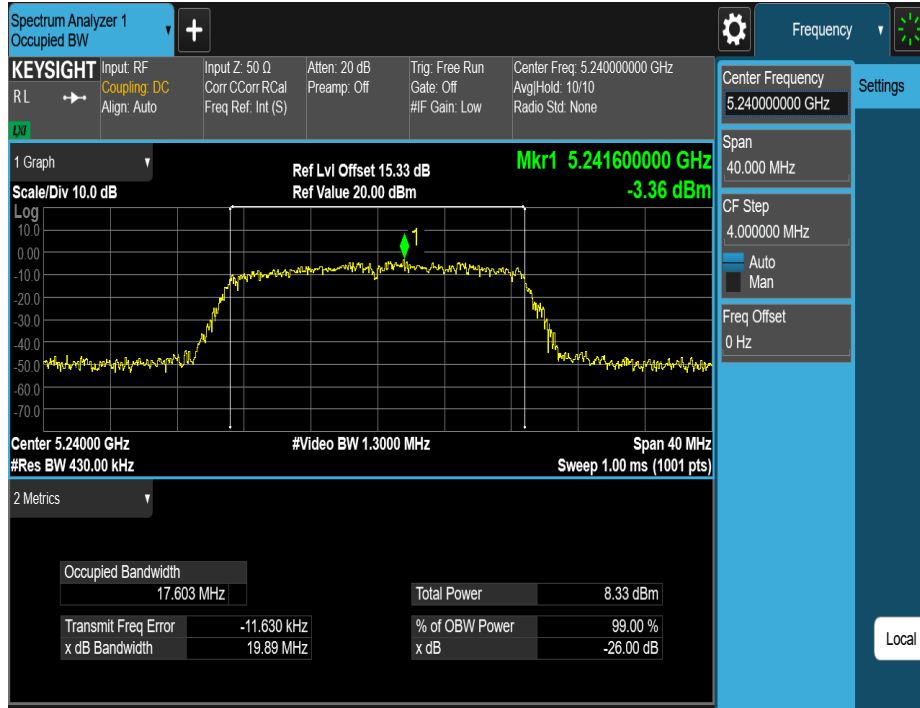
11N20MIMO_Ant1_5200



11N20MIMO_Ant2_5200



11N20MIMO_Ant1_5240



11N20MIMO_Ant2_5240

