

RF TEST REPORT

FCC ID: 2BCFYHT-178AX

According to

47 CFR FCC Part 15, Subpart C(Section 15.247)

ANSI C63.10:2013

Product description : Wireless Home Gateway
Model No. : HT-178AX
Trade Mark : HEIGHTS
Product No. : POC230808001-S001
Applicant : Heights Telecom T LTD
Ha-Sakhlav 6, Irus, 7680900, Israel
Receipt date : 2023.08.08
Test date : 2023.08.09~2023.08.29
Issued Date : 2023.09.04

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<i>Black Ding</i>	<i>Tim.zhang</i>	<i>Misue Su</i>	

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History of this test report

Original Report Issue Date: 2023.09.04

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

Attachment No.	Issue Date	Description

1. General Information

1.1 Applicant

Heights Telecom T LTD

Ha-Sakhlav 6, Irus, 7680900, Israel

1.2 Manufacturer

Heights Telecom T LTD

Ha-Sakhlav 6, Irus, 7680900, Israel

1.3 Basic Description of Equipment Under Test

Items	Description	
Equipment Name	Wireless Home Gateway	
Model Name	HT-178AX	
Model difference	N/A	
Trade Mark	HEIGHTS	
Power Supply	DC 12V from adapter	
Adapter Information	Model: SOY-1200200US-063 Input: 100-240V~ 50/60Hz 0.75A Max Output: DC 12V2A	
Operate temperature	0°C-60°C	
EUT Stage	○ Product Unit	● Final-Sample
Operating Band and Conducted Output Power (Max power)	2400MHz ~ 2483.5MHz	●IEEE 802.11ax40: 22.60dBm
Product Type	IEEE 802.11b: WLAN (SISO) IEEE 802.11g: WLAN (SISO) IEEE 802.11n: WLAN (MIMO) IEEE 802.11ax: WLAN (MIMO)	
Nominal Bandwidth	20MHz / 40MHz	
Modulation	IEEE 802.11b: DSSS (DBPSK / DQPSK / CCK) IEEE 802.11g: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ax: OFDMA (BPSK / QPSK / 16QAM / 64QAM)	
Data Rate (Mbps)	IEEE 802.11b mode: DSSS (1/2/5.5/11) IEEE 802.11g mode: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n mode: MCS0~MCS11 IEEE 802.11ax mode: MCS0~MCS11	
Antenna gain	Ant1: 3.24dBi, Ant2: 3.27dBi	
Antenna type	PCB antenna	

Eleven channels are provided for 802.11b, 802.11g, 802.11n (20MHz), 802.11ax (20MHz):

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400MHz ~ 2483.5 MHz	01	2412MHz	07	2442MHz
	02	2417MHz	08	2447MHz
	03	2422MHz	09	2452MHz
	04	2427MHz	10	2457MHz
	05	2432MHz	11	2462MHz
	06	2437MHz	/	/

Seven channels are provided for 802.11n (40MHz), 802.11ax (40MHz):

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400MHz ~ 2483.5 MHz	03	2422 MHz	07	2442MHz
	04	2427MHz	08	2447MHz
	05	2432MHz	09	2452MHz
	06	2437MHz	/	/

Note: For 802.11ax mode only support full RU mode.

1.4 Transmit Operating Mode

Transmit Operating Mode					Transmit Multiple Antennas					
☒	Operating mode 1 (single antenna)				☒	1TX				
☐	Operating mode 2 (multiple antenna, no beam forming)				☐	2TX	☐	3TX	☐	4TX
☒	Operating mode 3 (multiple antenna, with beam forming)				☒	2TX	☐	3TX	☐	4TX
☒	802.11b	Operating mode	☒	1TX	☐	2TX	☐	3TX		
☒	802.11g	Operating mode	☒	1TX	☐	2TX	☐	3TX		
☒	802.11n(20MHz)	Operating mode	☐	1TX	☒	2TX	☐	3TX		
☒	802.11n(40MHz)	Operating mode	☐	1TX	☒	2TX	☐	3TX		
☒	802.11ax(20MHz)	Operating mode	☐	1TX	☒	2TX	☐	3TX		
☒	802.11ax(40MHz)	Operating mode	☐	1TX	☒	2TX	☐	3TX		

2. Summary of Test Results

2.1 Summary of Test Items

47 CFR FCC Part 15, Subpart C (Section 15.247)			
Test item	FCC Clause	Results	Remarks
AC Power Conducted Emission	15.207	Pass	Meet the requirement of the limit
Radiated Emission and Band Edge Measurement	15.205/15.209 /15.247(d)	Pass	Meet the requirement of the limit
Spurious Emission at Antenna Port	15.247(d)	Pass	Meet the requirement of the limit
6dB Bandwidth	15.247(a)(2)	Pass	Meet the requirement of the limit
Maximum Conducted Power	15.247(b)	Pass	Meet the requirement of the limit
Power Spectral Density	15.247(e)	Pass	Meet the requirement of the limit
Antenna Requirements	15.203	Compliance	Note
Note: The EUT has 2 PCB antennas arrangement which was permanently attached.			

2.2 Application of Standard

47 CFR FCC Part 15, Subpart C (Section 15.247)

KDB 558074 D01 15.247 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

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	dsusoft	JS0806-2	21G806044 9	2023/4/23	2024/4/22
3	power supply unit	dsusoft	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	dsusoft	JS1120-3	/	/	/

2.4 Test 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	24.3°C, 51% RH	AC 120V/60Hz	Albert Fan
Radiated Emission and Band Edge Measurement	24.2°C, 55% RH	AC 120V/60Hz	Albert Fan
Spurious Emission at Antenna Port	24.2°C, 52% RH	DC 12V	Jason Huang
6dB Bandwidth	24.2°C, 52% RH	DC 12V	Jason Huang
Maximum Conducted Power	24.2°C, 52% RH	DC 12V	Jason Huang
Power Spectral Density	24.2°C, 52% RH	DC 12V	Jason Huang

Note: Adapter supply voltage AC 120V/60Hz.

The applicant declare the operating environment of EUT as below:

Normal conditions: 12V DC, 0~60°C

2.6 Duty Cycle of Test Signal

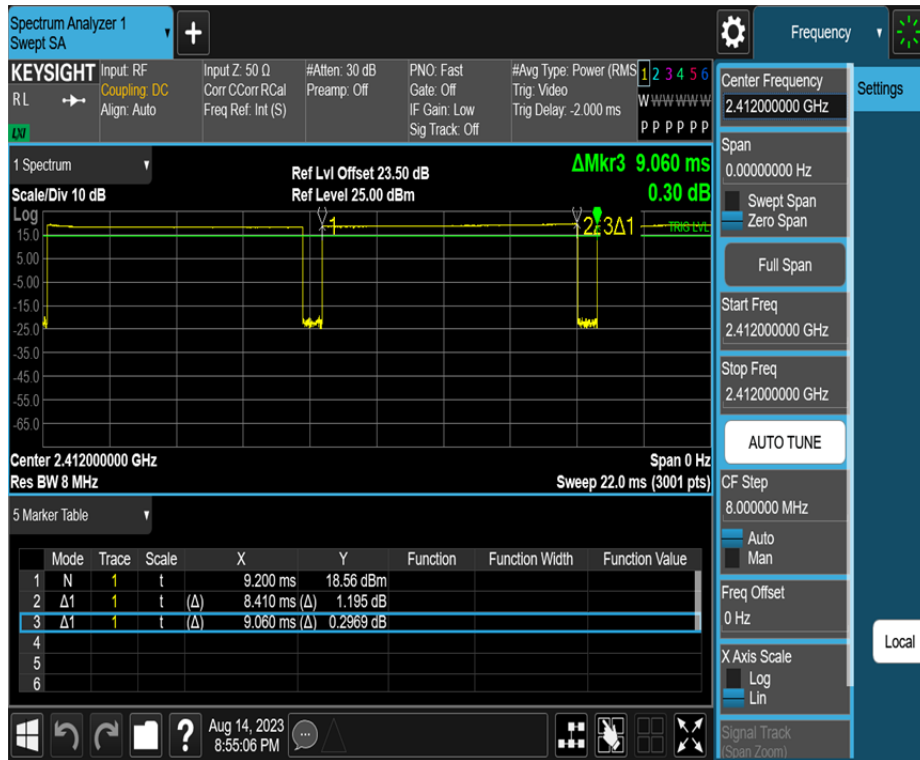
If duty cycle is $\geq 98\%$, duty factor is not required.

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

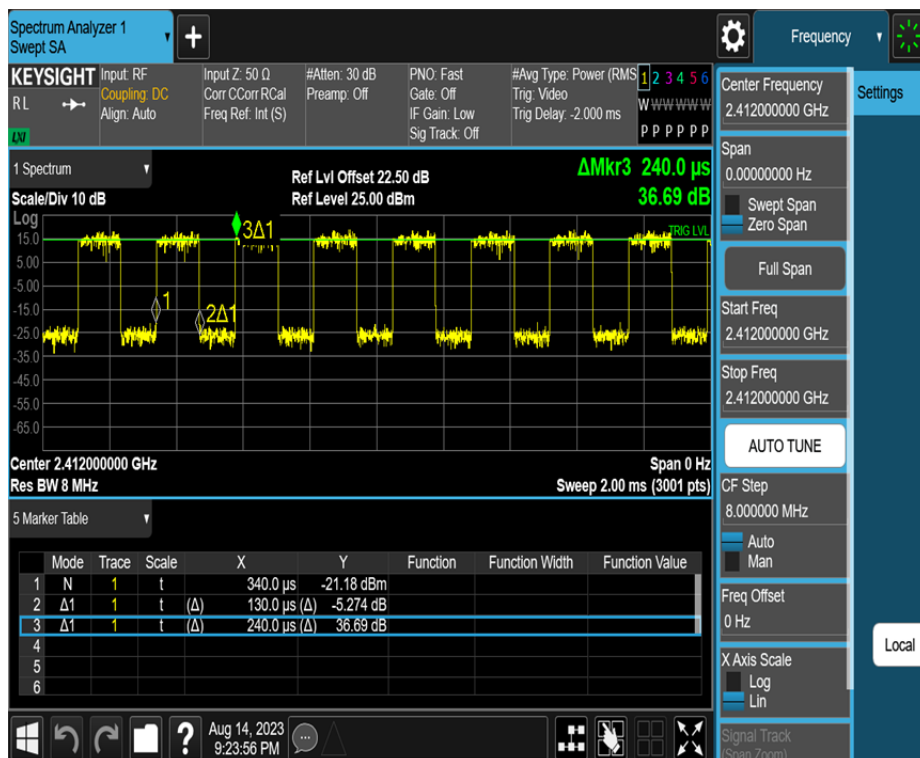
All the duty factor of other test mode have been considered.

Test Mode	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle[%]
11B	2412	8.41	9.06	92.83
11G	2412	0.13	0.24	54.17
11N20MIMO	2412	0.14	0.24	58.33
11N40MIMO	2422	0.12	0.22	54.55
11AX20MIMO	2412	0.32	0.35	91.43
11AX40MIMO	2422	0.31	0.34	91.18

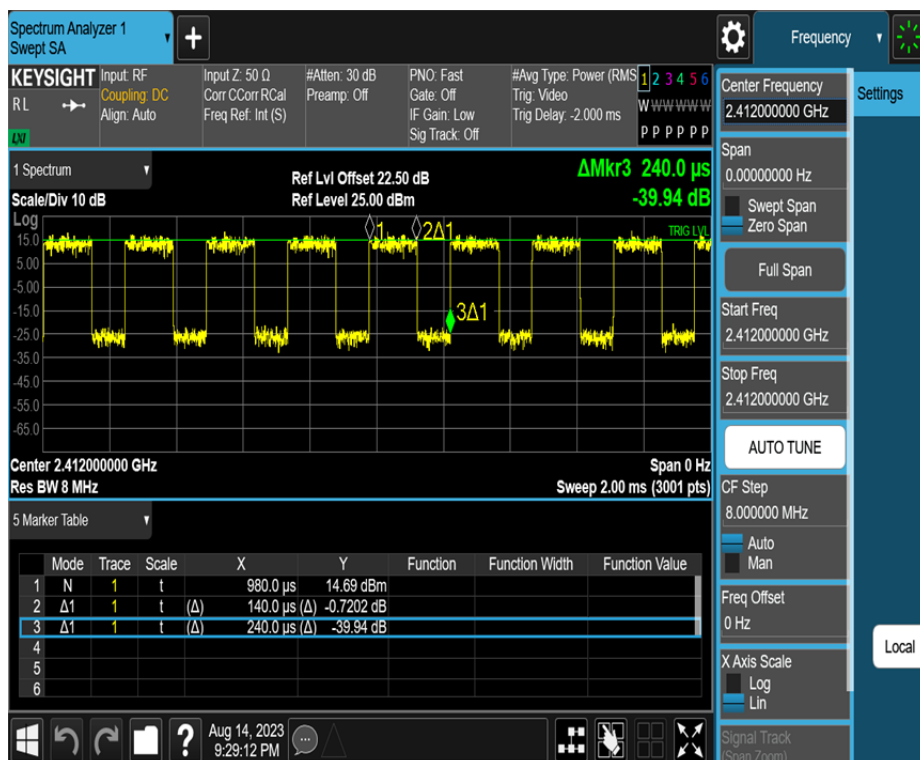
11B_2412



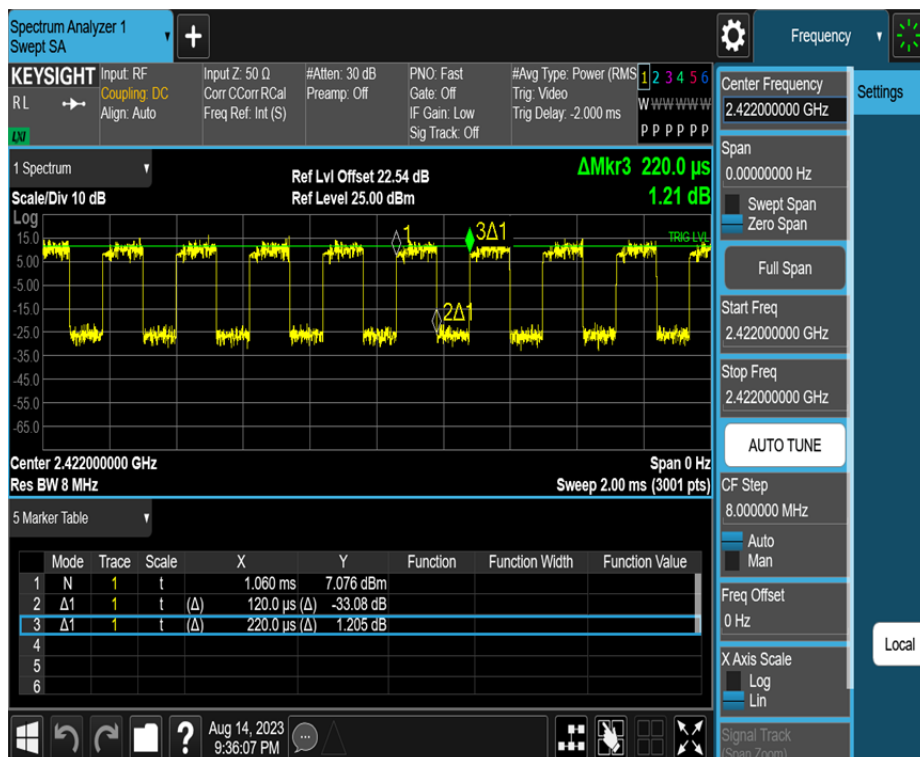
11G_2412



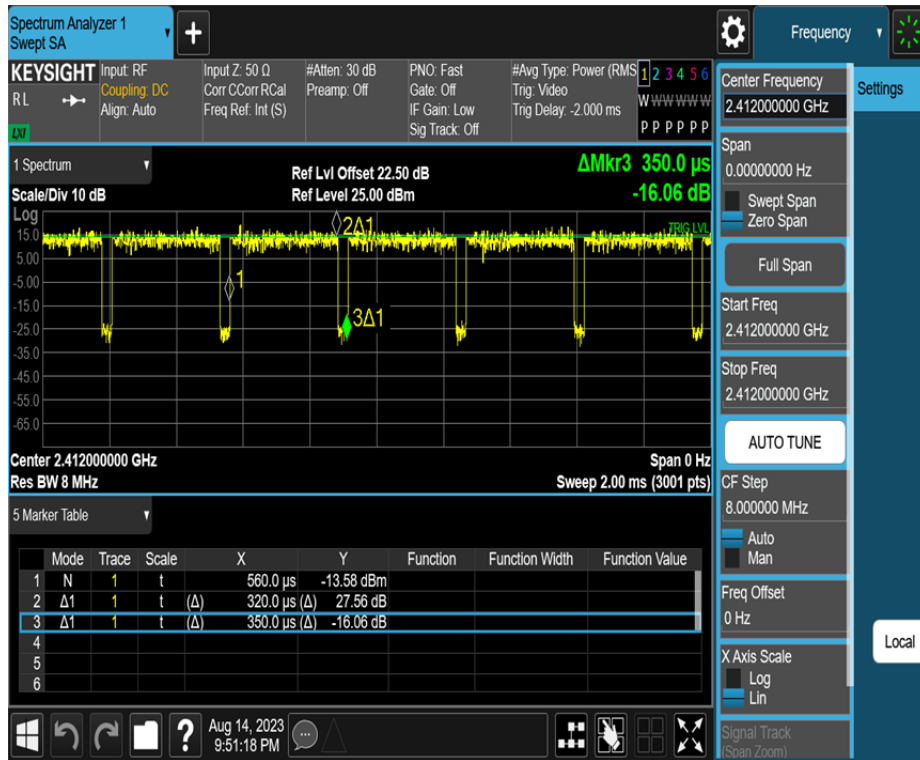
11N20MIMO_2412



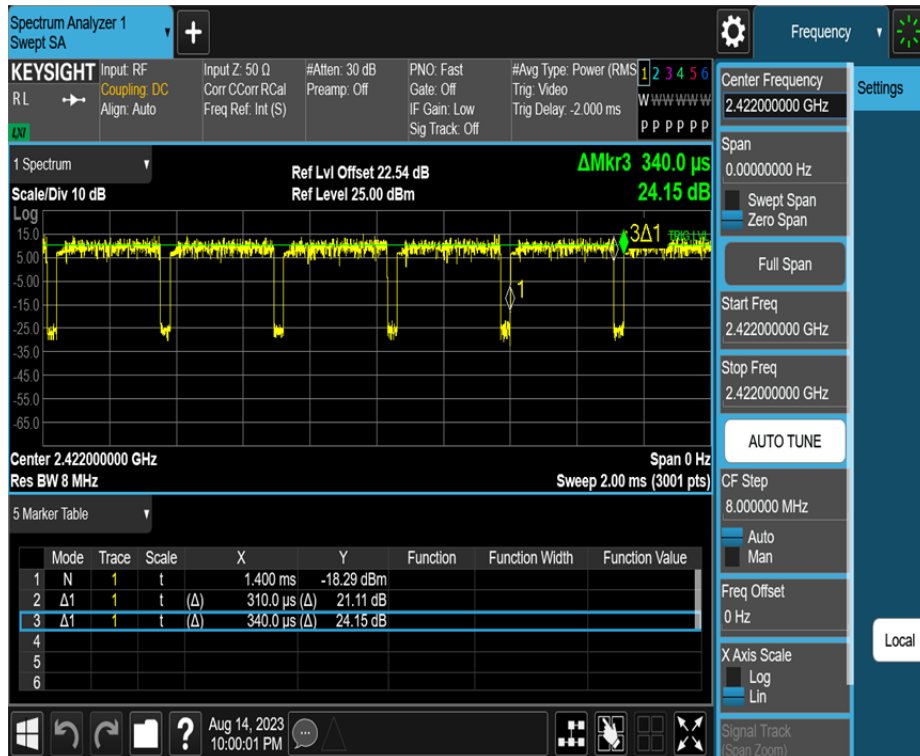
11N40MIMO_2422



11AX20MIMO_2412



11AX40MIMO_2422



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	± 143.88 kHz
Power Spectral Density	± 0.743 dB
Conducted Spurious Emission	± 1.328 dB
RF power conducted	± 0.384 dB
Conducted emission(9kHz~30MHz) AC main	± 2.72 dB
Radiated emission(9kHz~30MHz)	± 2.66 dB
Radiated emission (30MHz~1GHz)	± 4.62 dB
Radiated emission (1GHz~18GHz)	± 4.86 dB
Radiated emission (18GHz~40GHz)	± 3.80 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
A2LA Certificate Number	6823.01
Telephone:	0755-26024411

2.9 Description of Support Units

Support Equipment				
No.	Equipment	Model Name	Manufacturer	Remarks
1	Telephone 1	/	/	/
2	Telephone 2	/	/	/
3	Microcomputer	TY510S-07IAB	LENOVO	YLX2QPQJ
4	Microcomputer	TY510S-07IAB	LENOVO	YLX2QPM7
5	Notebook	L450	Think	/
6	Notebook	L450	Think	/
7	USB Disk	/	Kingston	/
8	Optical local terminal	C300	/	/

2.10 Deviation from Standards

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.

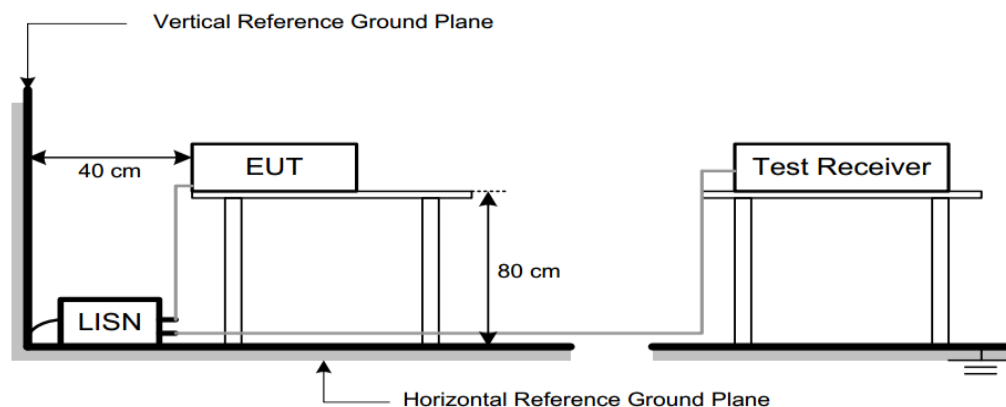
3.1.2 Test Procedure

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



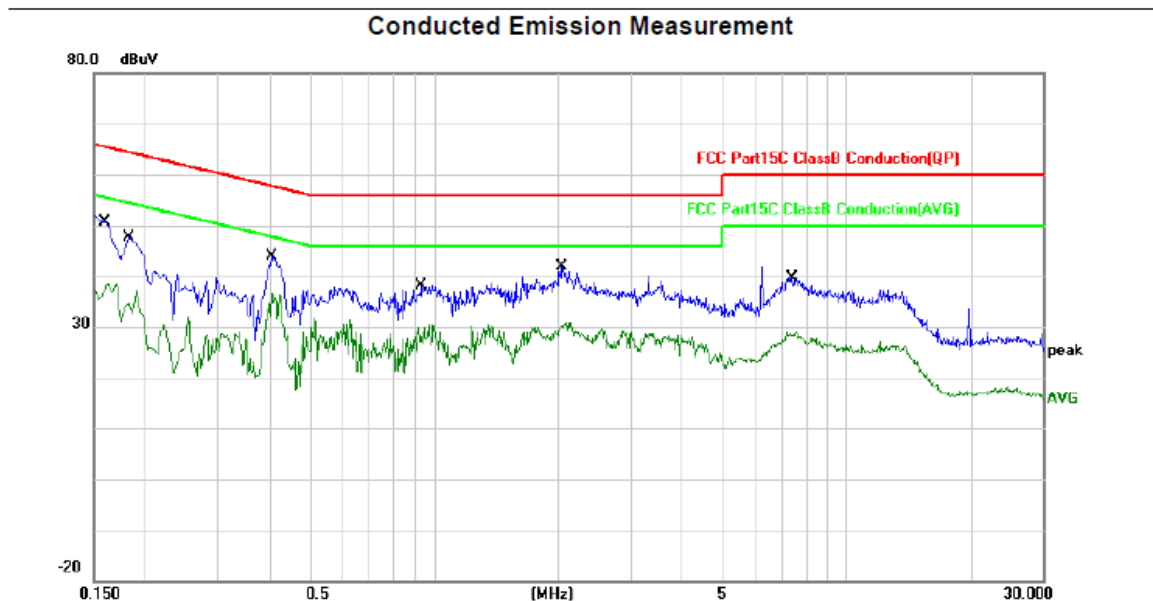
3.1.4 Test Result

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. The TX AX20MIMO Mode Channel 11 is found to be the worst case and recorded.

150kHz~30MHz	Worst Case Operating Mode: AX20MIMO Channel 11
--------------	--

Line



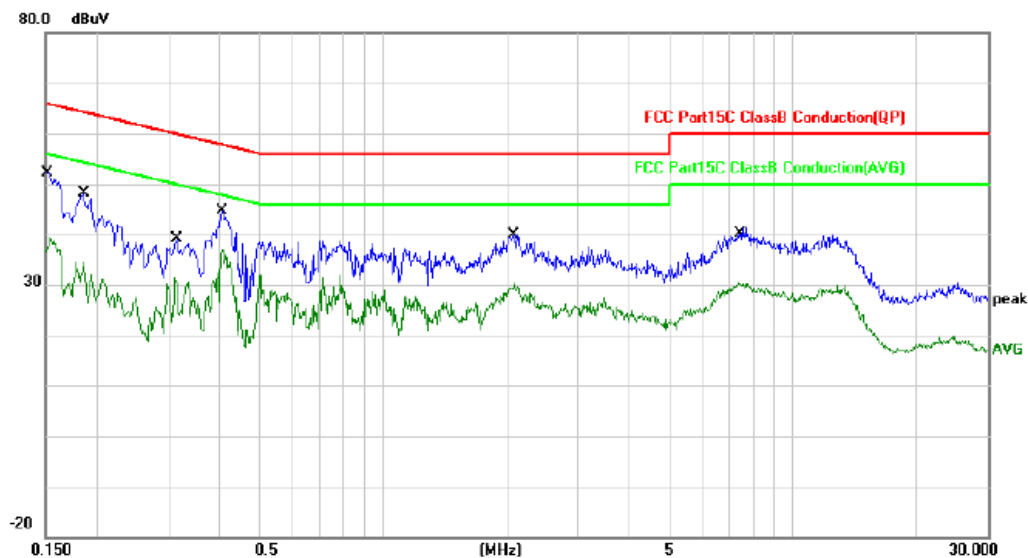
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1606	25.61	19.88	45.49	65.43	-19.94	QP	
2		0.1606	15.21	19.88	35.09	55.43	-20.34	AVG	
3		0.1820	20.19	19.88	40.07	64.39	-24.32	QP	
4		0.1820	6.46	19.88	26.34	54.39	-28.05	AVG	
5		0.4060	18.47	19.88	38.35	57.73	-19.38	QP	
6 *		0.4060	16.12	19.88	36.00	47.73	-11.73	AVG	
7		0.9340	14.82	19.89	34.71	56.00	-21.29	QP	
8		0.9340	7.31	19.89	27.20	46.00	-18.80	AVG	
9		2.0380	14.02	19.91	33.93	56.00	-22.07	QP	
10		2.0380	6.72	19.91	26.63	46.00	-19.37	AVG	
11		7.3940	12.11	19.93	32.04	60.00	-27.96	QP	
12		7.3940	5.91	19.93	25.84	50.00	-24.16	AVG	

150kHz~30MHz

Worst Case Operating Mode: AX20MIMO Channel 11

Neutral

Conducted Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1532	28.05	19.88	47.93	65.82	-17.89	QP	
2		0.1532	19.54	19.88	39.42	55.82	-16.40	AVG	
3		0.1853	25.30	19.88	45.18	64.24	-19.06	QP	
4		0.1853	14.53	19.88	34.41	54.24	-19.83	AVG	
5		0.3102	16.25	19.88	36.13	59.97	-23.84	QP	
6		0.3102	11.54	19.88	31.42	49.97	-18.55	AVG	
7		0.4044	21.70	19.88	41.58	57.76	-16.18	QP	
8 *		0.4044	16.10	19.88	35.98	47.76	-11.78	AVG	
9		2.0932	16.97	19.91	36.88	56.00	-19.12	QP	
10		2.0932	10.48	19.91	30.39	46.00	-15.61	AVG	
11		7.3576	18.63	19.93	38.56	60.00	-21.44	QP	
12		7.3576	10.54	19.93	30.47	50.00	-19.53	AVG	

3.2 Radiated Emission and Band Edge

3.2.1 Limit

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	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
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 $\mu\text{V}/\text{m}$

(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.

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	

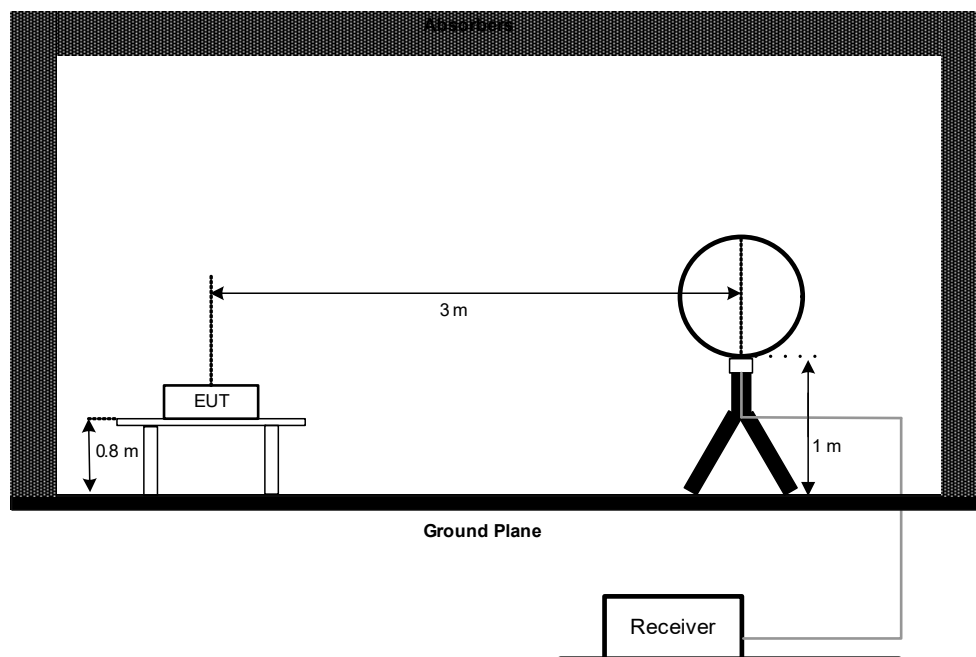
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- The measuring distance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

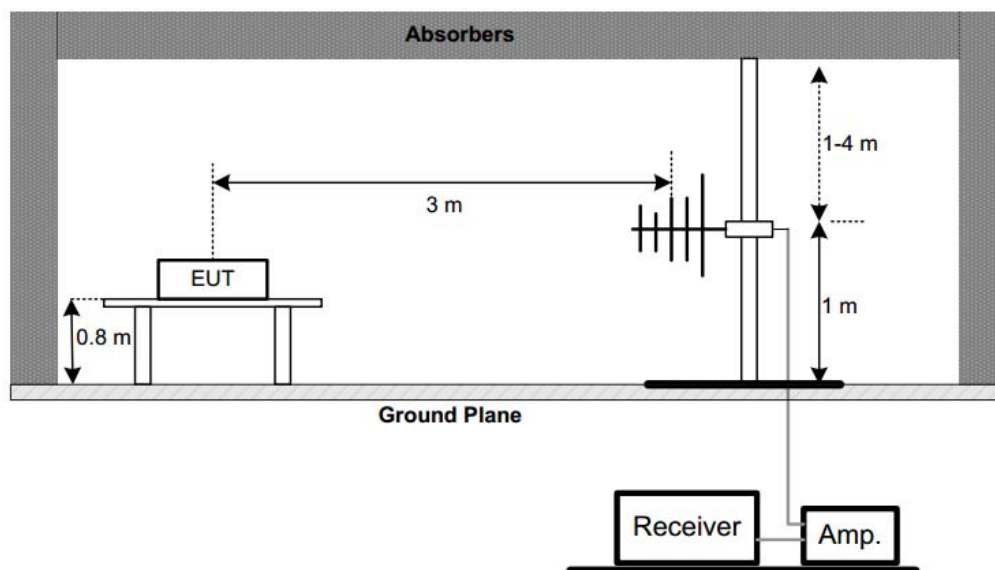
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e) The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency 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

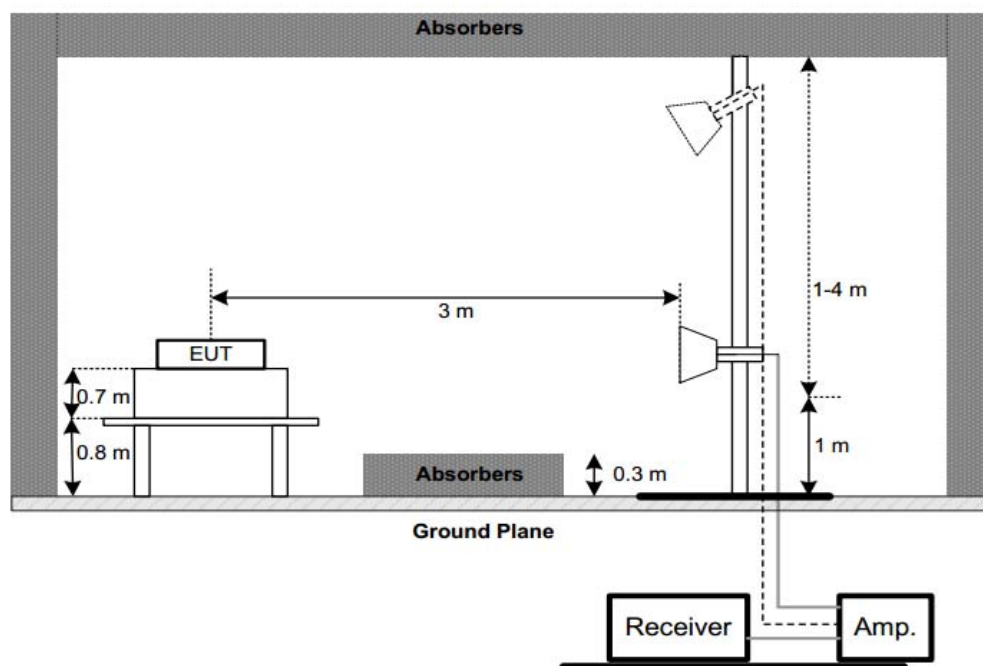
(A) Radiated Emission Test Set-Up Frequency Below 30 MHz



(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

Pre-scan beamform mode and non-beamform mode, worst case for non-beamform mode is recorded.

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

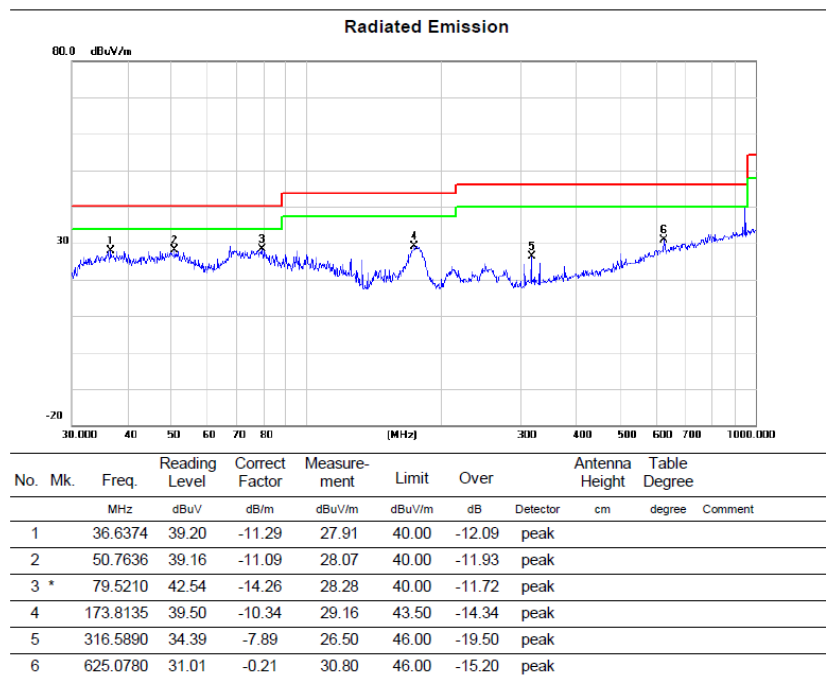
Note:

1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit
3. The TX AX20MIMO Mode Channel 11 is found to be the worst case and recorded.

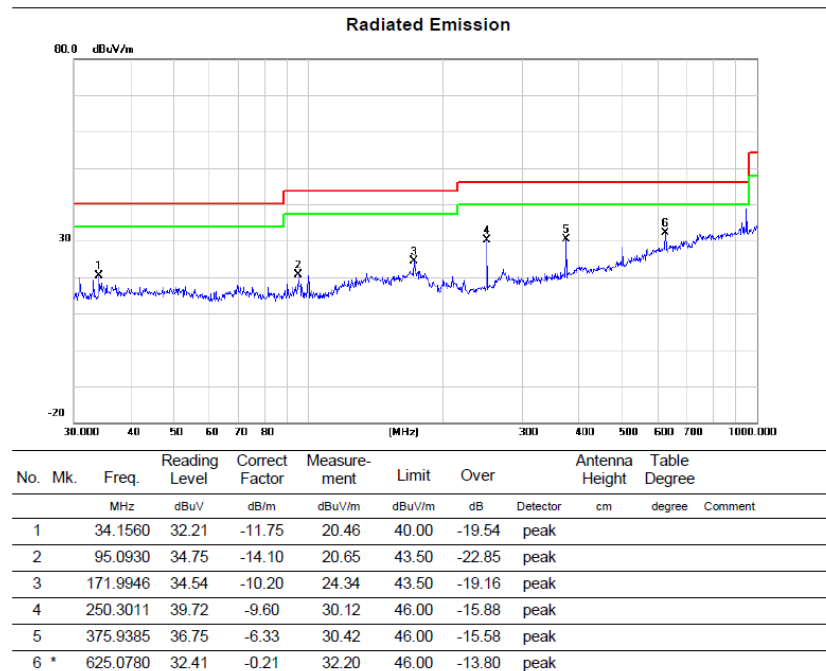
Below 1G (30MHz~1GHz)

Worst Case Operating Mode: AX20MIMO Channel 11

VERTICAL



HORIZONTAL



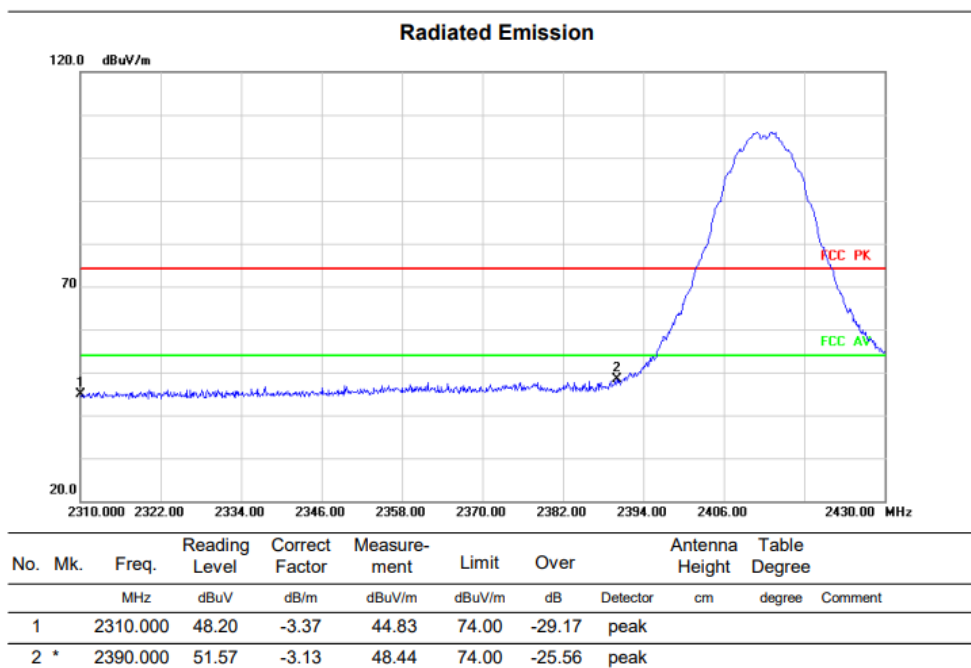
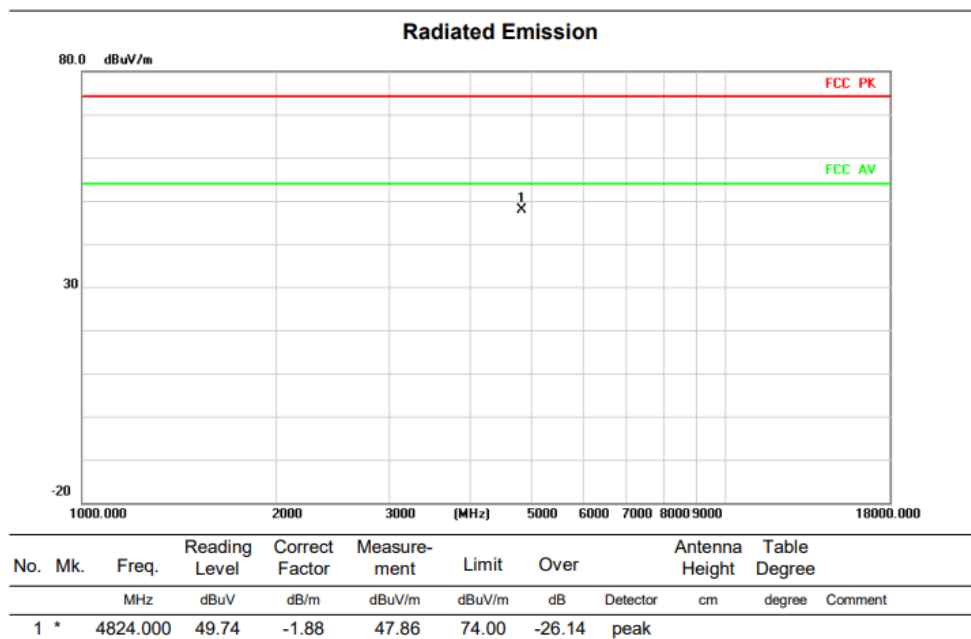
3) Radiated emission: Above 1G

Note:

1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit
3. For 11B/G mode, worst case for ant1 mode was recorded, for other mode, worst case for mimo mode was recorded.

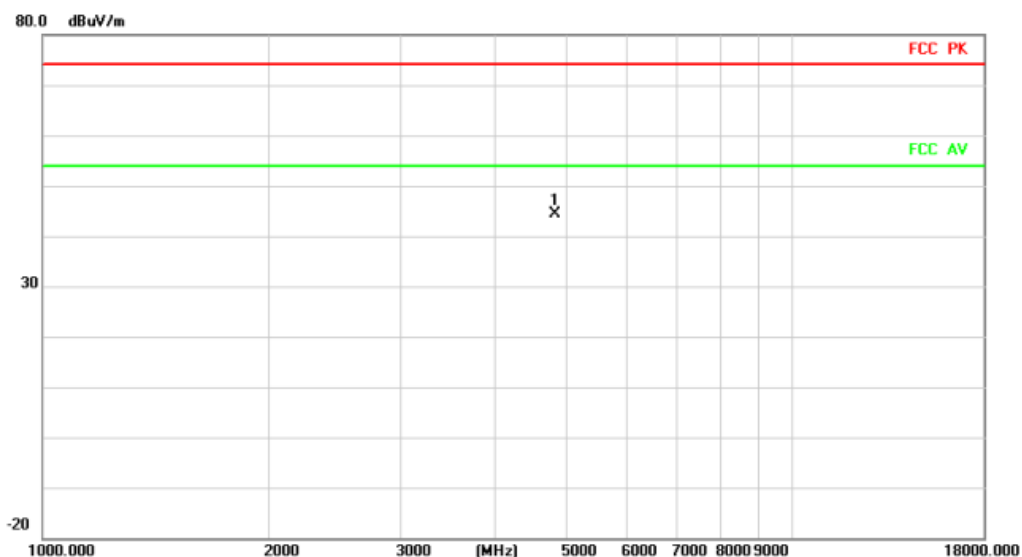
Above 1G (1GHz~18GHz)	Test mode:11B	Test Channel:1
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VERTICAL



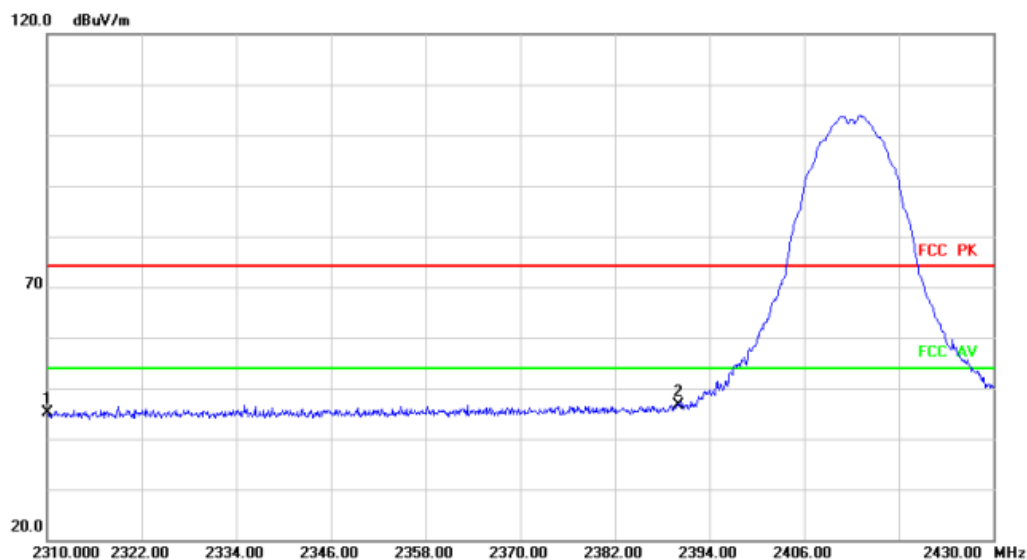
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4824.000	46.18	-1.88	44.30	74.00	-29.70	peak		

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	48.53	-3.37	45.16	74.00	-28.84	peak		
2	*	2390.000	49.82	-3.13	46.69	74.00	-27.31	peak		

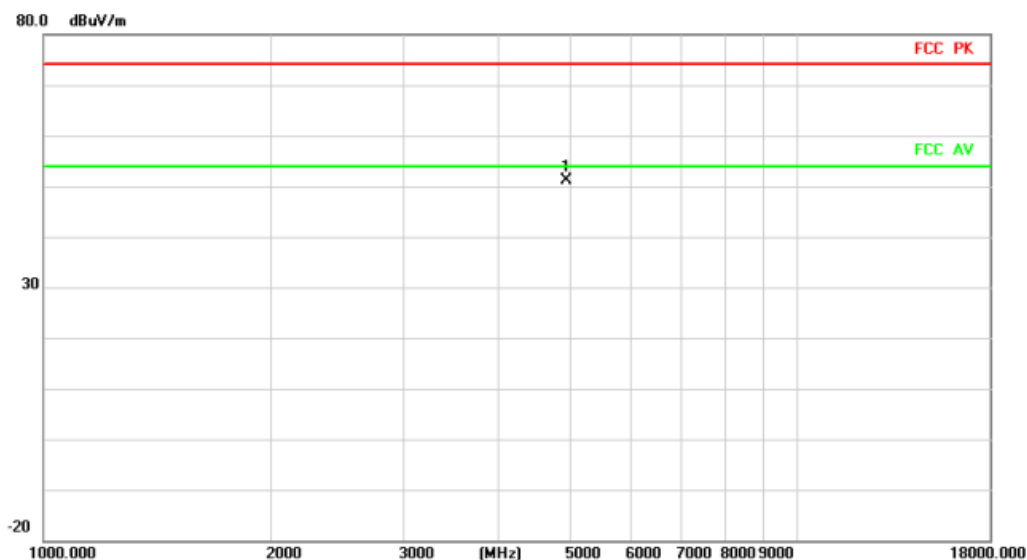
Above 1G (1GHz~18GHz)

Test mode: 11B

Test Channel:11

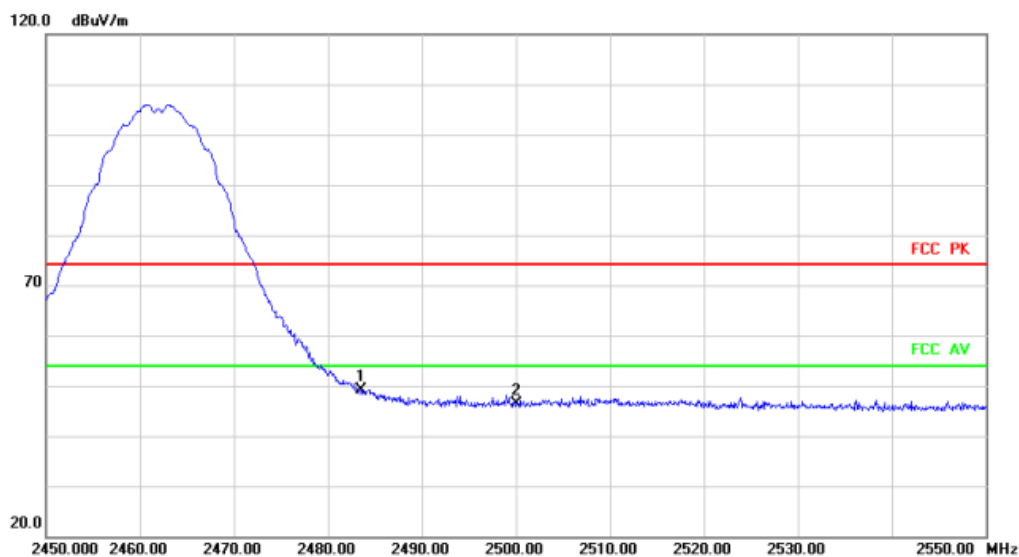
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	*	4924.000	52.48	-1.29	51.19	74.00	-22.81	peak		Comment

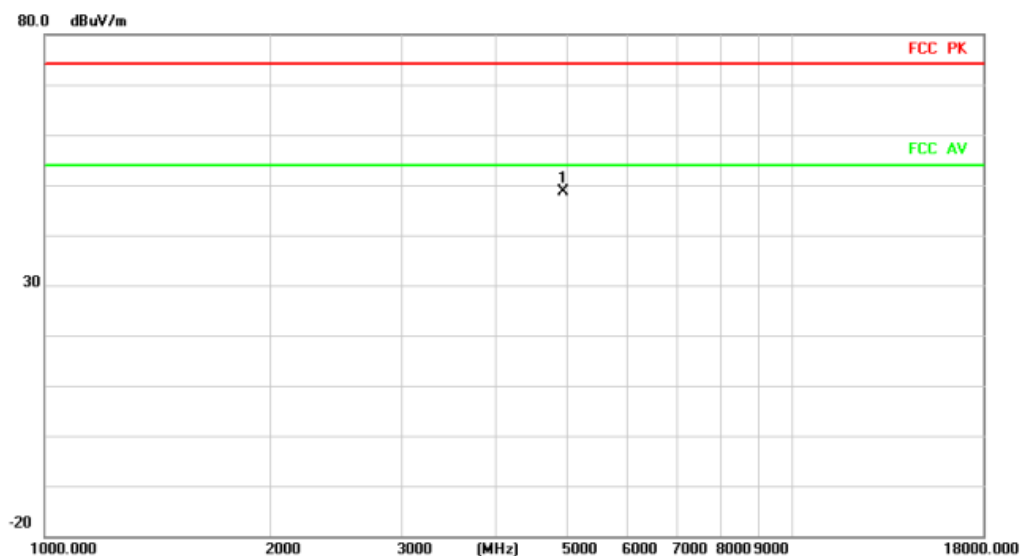
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	*	2483.500	52.08	-2.85	49.23	74.00	-24.77	peak		Comment
2		2500.000	49.21	-2.80	46.41	74.00	-27.59	peak		Comment

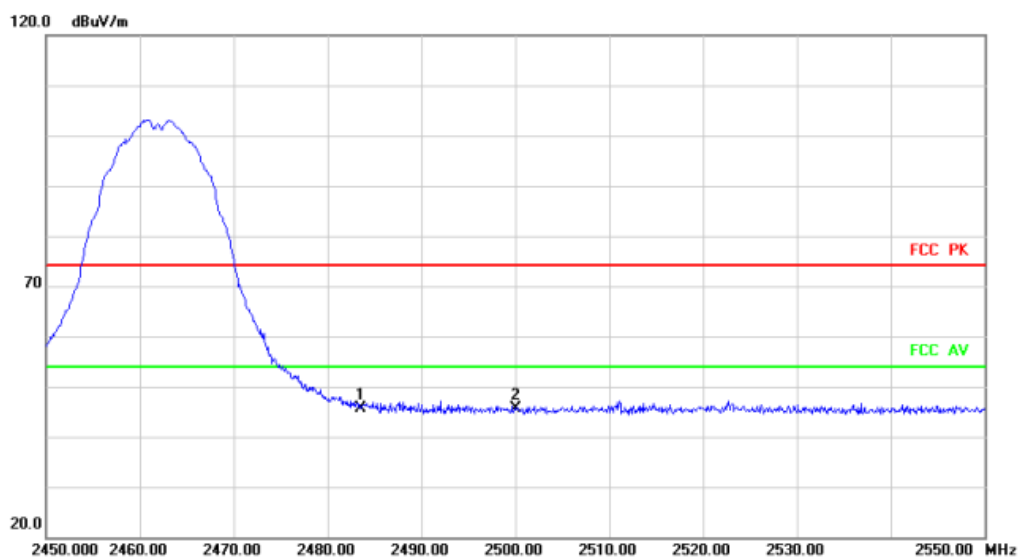
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	*	4924.000	49.99	-1.29	48.70	74.00	-25.30	peak		

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	*	2483.500	48.55	-2.85	45.70	74.00	-28.30	peak		
2		2500.000	48.33	-2.80	45.53	74.00	-28.47	peak		

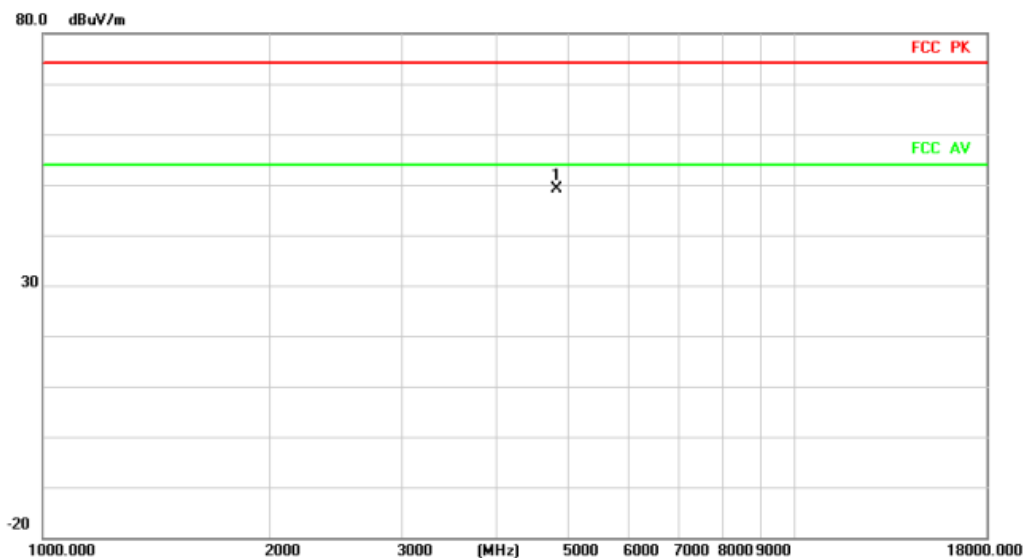
Above 1G (1GHz~18GHz)

Test mode:11G

Test Channel:1

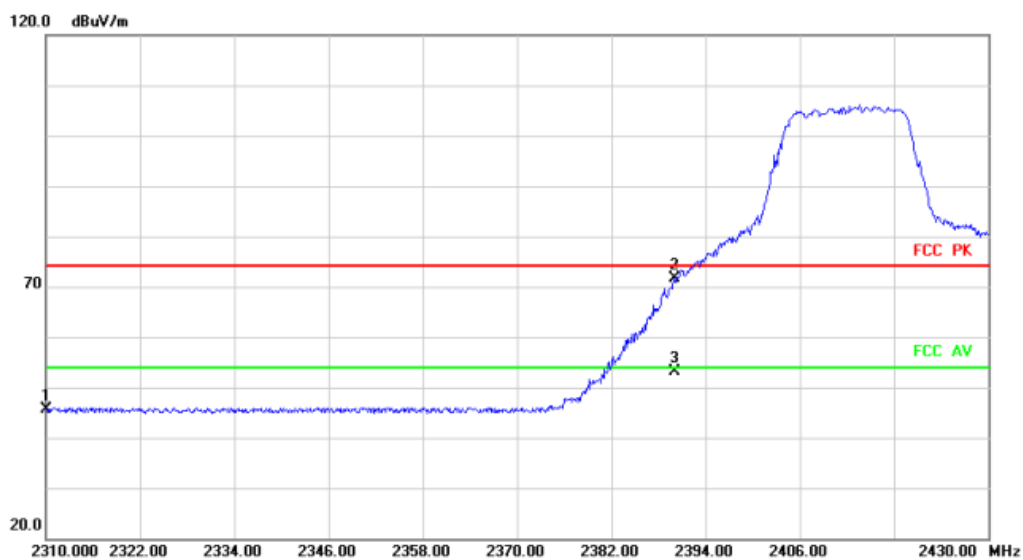
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1	*	4824.000	51.05	-1.88	49.17	74.00	-24.83	peak	

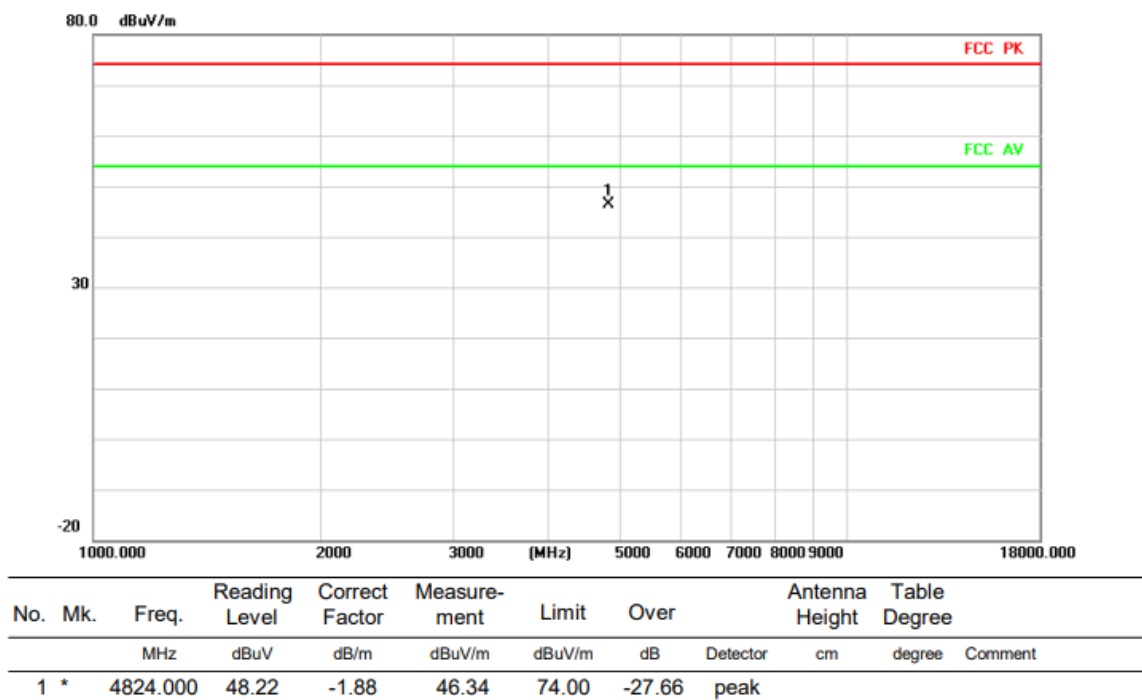
Radiated Emission



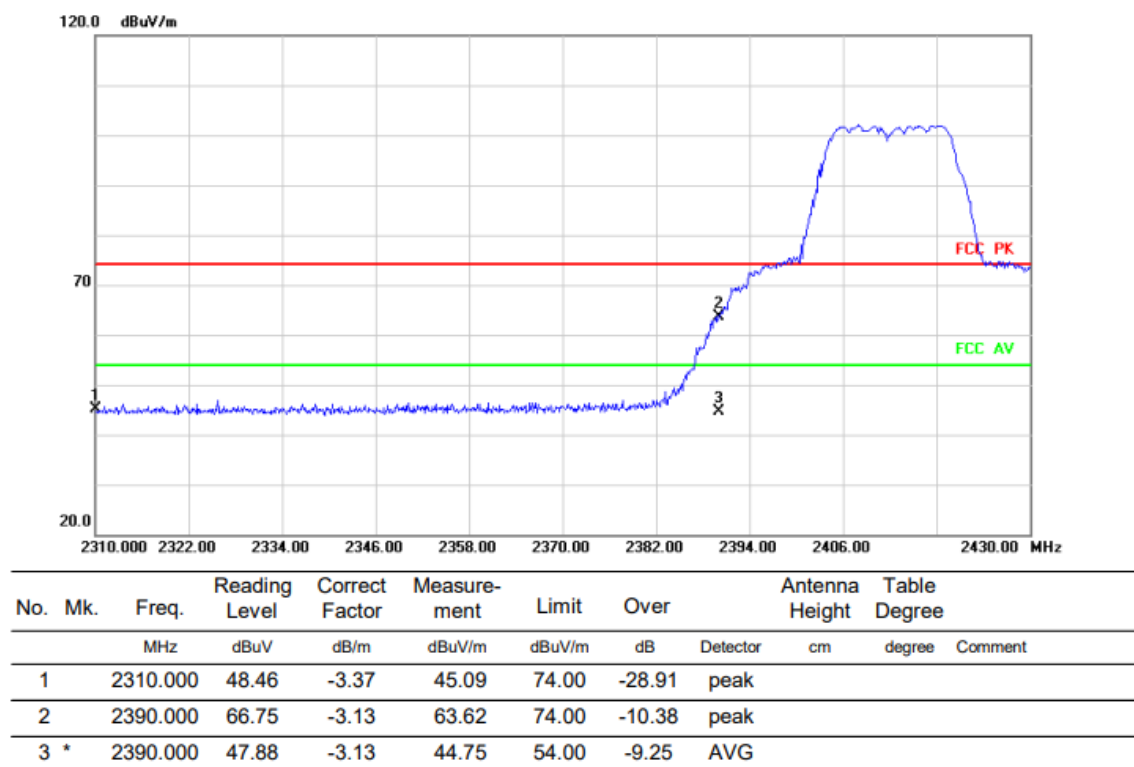
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1		2310.000	49.07	-3.37	45.70	74.00	-28.30	peak	
2		2390.000	74.82	-3.13	71.69	74.00	-2.31	peak	
3	*	2390.000	56.35	-3.13	53.22	54.00	-0.78	AVG	

HORIZONTAL

Radiated Emission



Radiated Emission



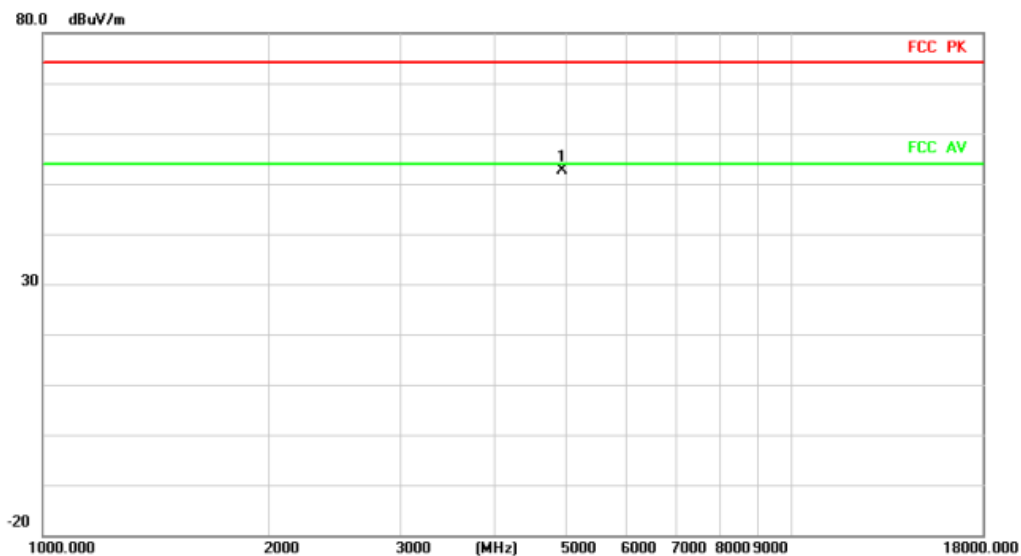
Above 1G (1GHz~18GHz)

Test mode: 11G

Test Channel:11

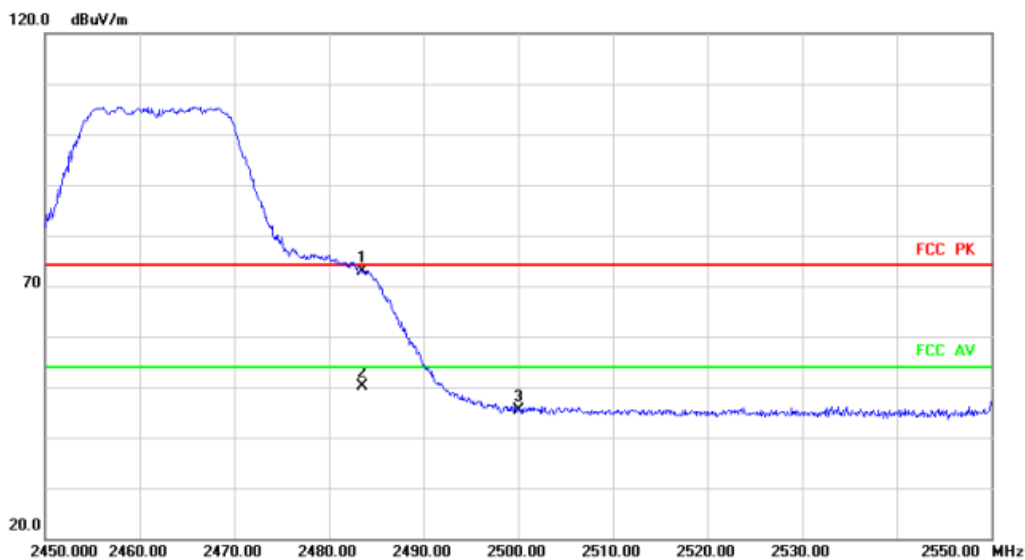
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1	*	4924.000	53.91	-1.29	52.62	74.00	-21.38	peak	

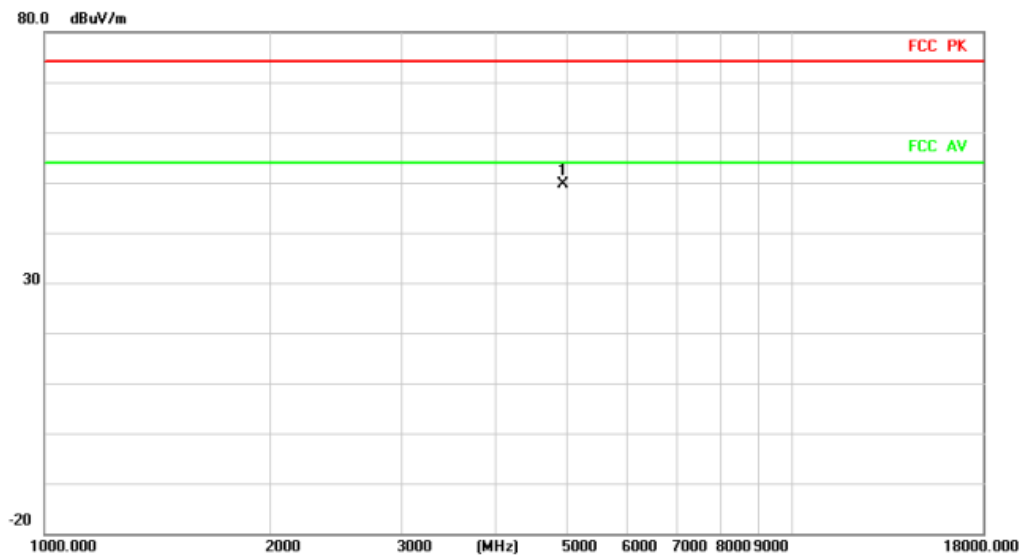
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1	*	2483.500	75.83	-2.85	72.98	74.00	-1.02	peak	
2		2483.500	53.03	-2.85	50.18	54.00	-3.82	AVG	
3		2500.000	48.19	-2.80	45.39	74.00	-28.61	peak	

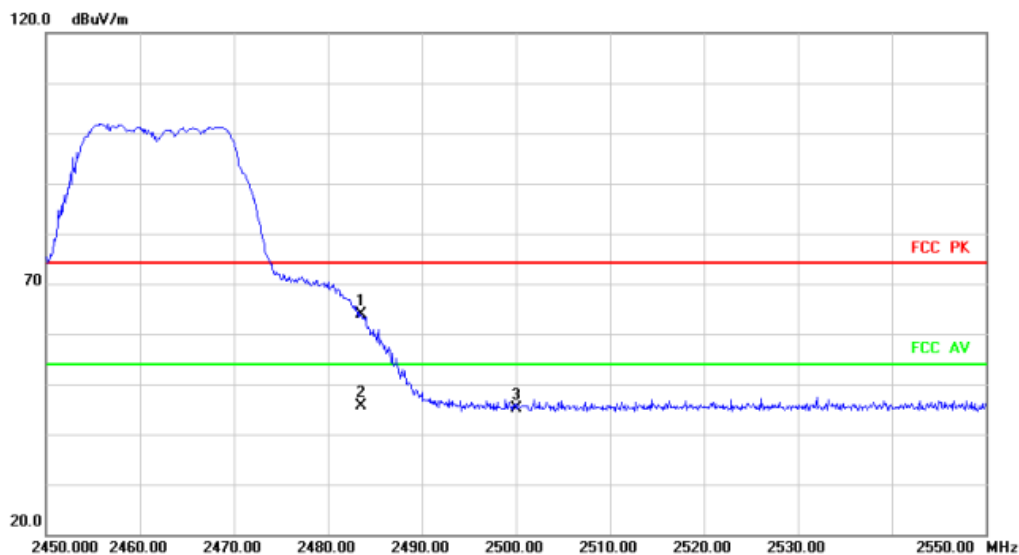
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4924.000	50.87	-1.29	49.58	74.00	-24.42	peak		

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2483.500	66.67	-2.85	63.82	74.00	-10.18	peak		
2	*	2483.500	48.36	-2.85	45.51	54.00	-8.49	AVG		
3		2500.000	47.93	-2.80	45.13	74.00	-28.87	peak		

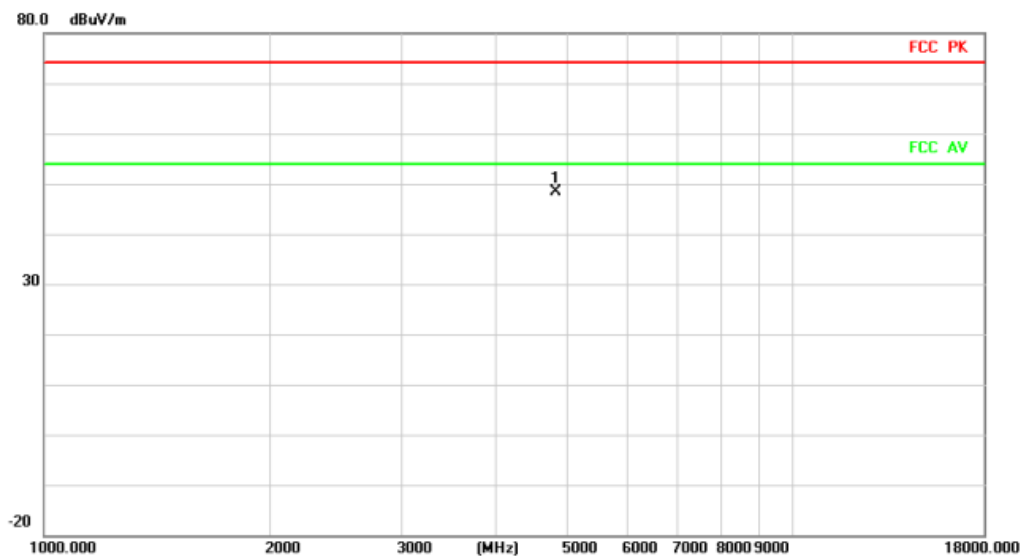
Above 1G (1GHz~18GHz)

Test mode: 11N20MIMO

Test Channel:1

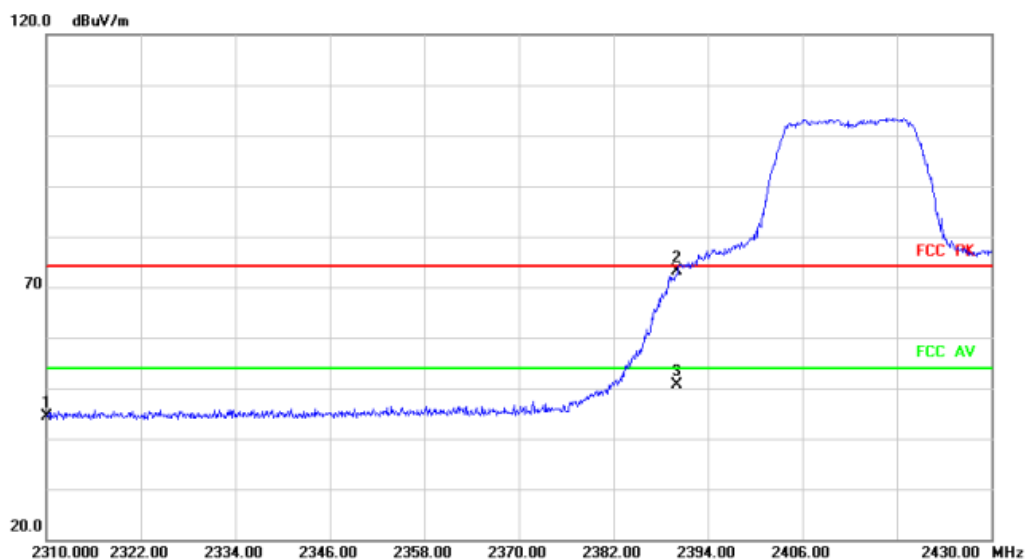
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4824.000	50.38	-1.88	48.50	74.00	-25.50	peak		

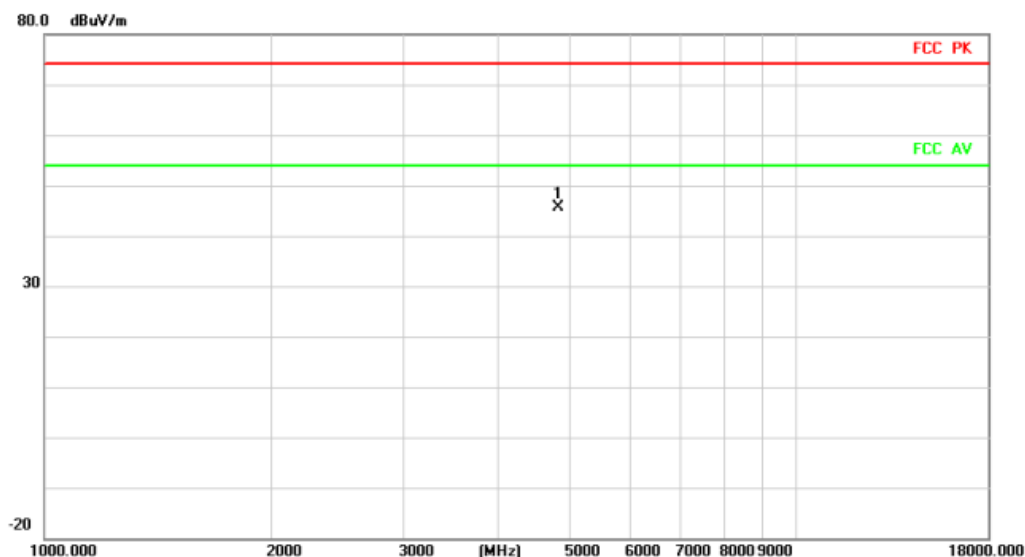
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	47.69	-3.37	44.32	74.00	-29.68	peak		
2	*	2390.000	76.20	-3.13	73.07	74.00	-0.93	peak		
3		2390.000	53.79	-3.13	50.66	54.00	-3.34	AVG		

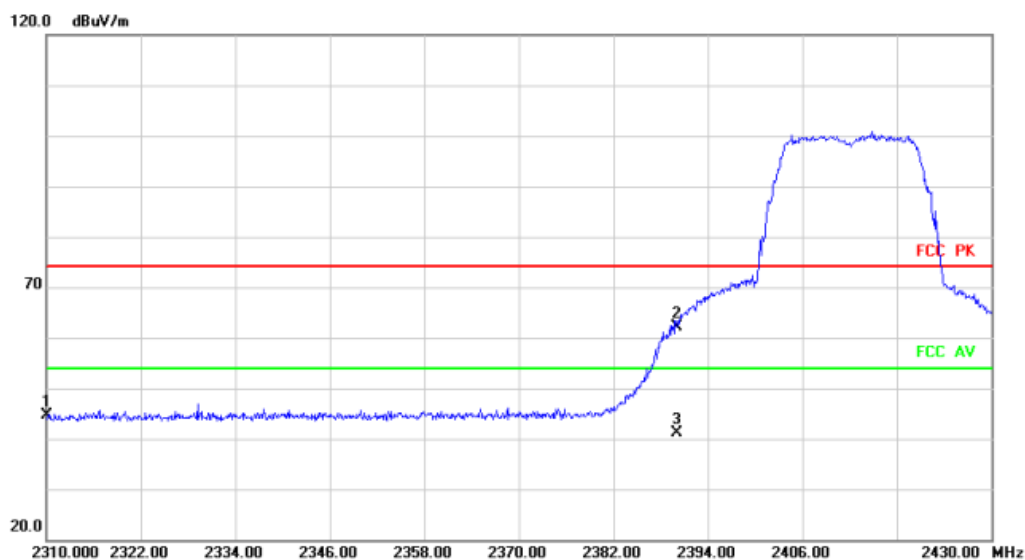
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4824.000	47.47	-1.88	45.59	74.00	-28.41	peak		

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	48.03	-3.37	44.66	74.00	-29.34	peak		
2	*	2390.000	65.30	-3.13	62.17	74.00	-11.83	peak		
3		2390.000	44.37	-3.13	41.24	54.00	-12.76	AVG		

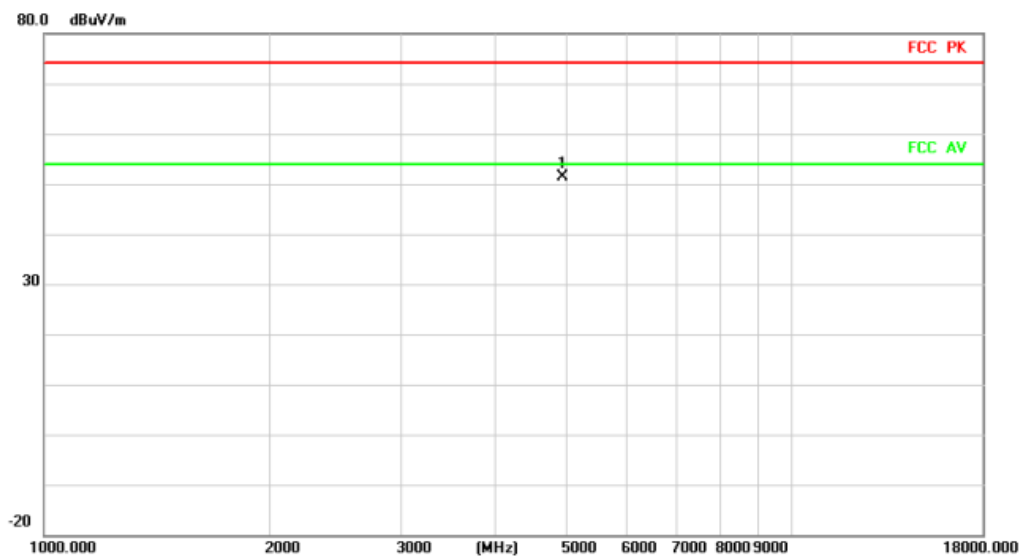
Above 1G (1GHz~18GHz)

Test mode: 11N20MIMO

Test Channel:11

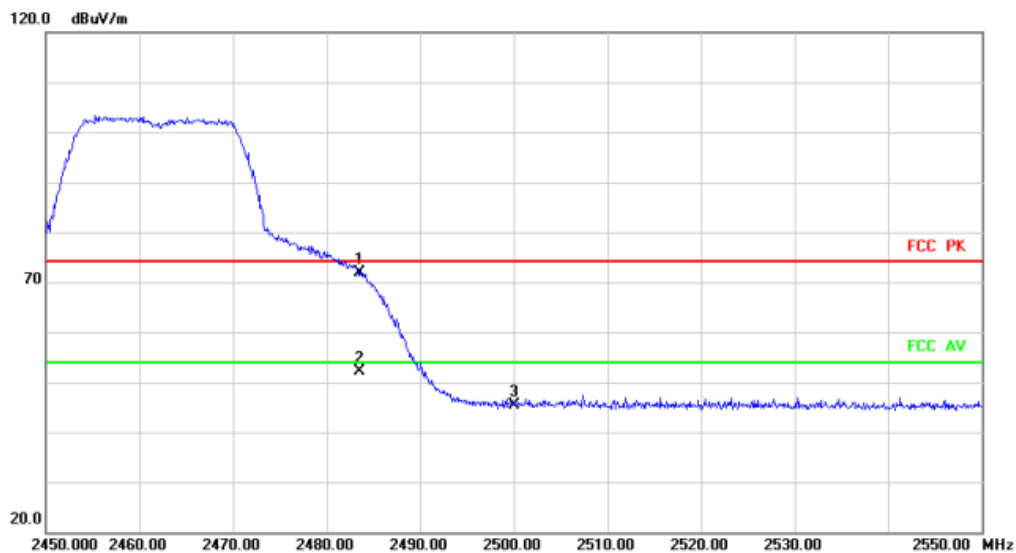
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1	*	4924.000	52.79	-1.29	51.50	74.00	-22.50	peak	

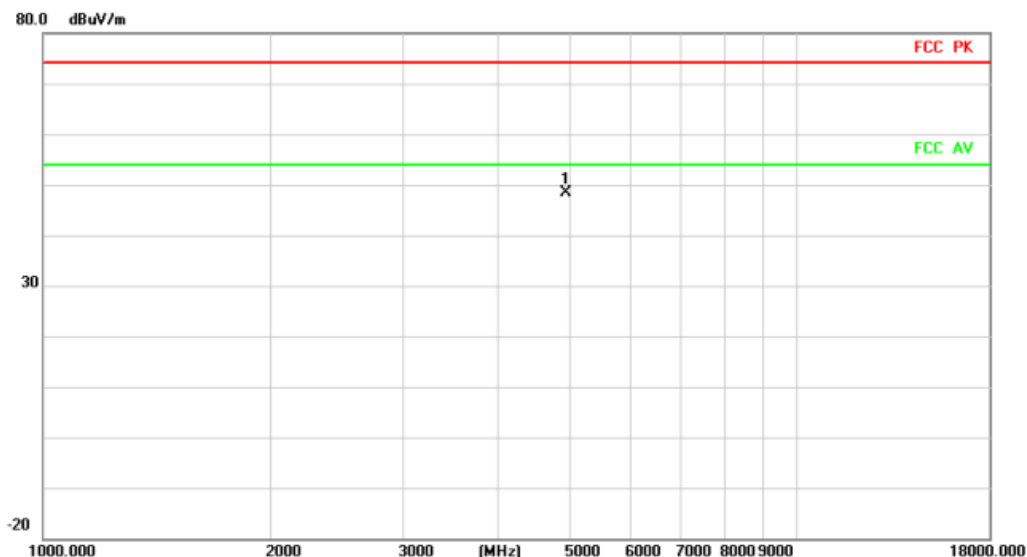
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1		2483.500	74.85	-2.85	72.00	74.00	-2.00	peak	
2	*	2483.500	54.99	-2.85	52.14	54.00	-1.86	AVG	
3		2500.000	48.22	-2.80	45.42	74.00	-28.58	peak	

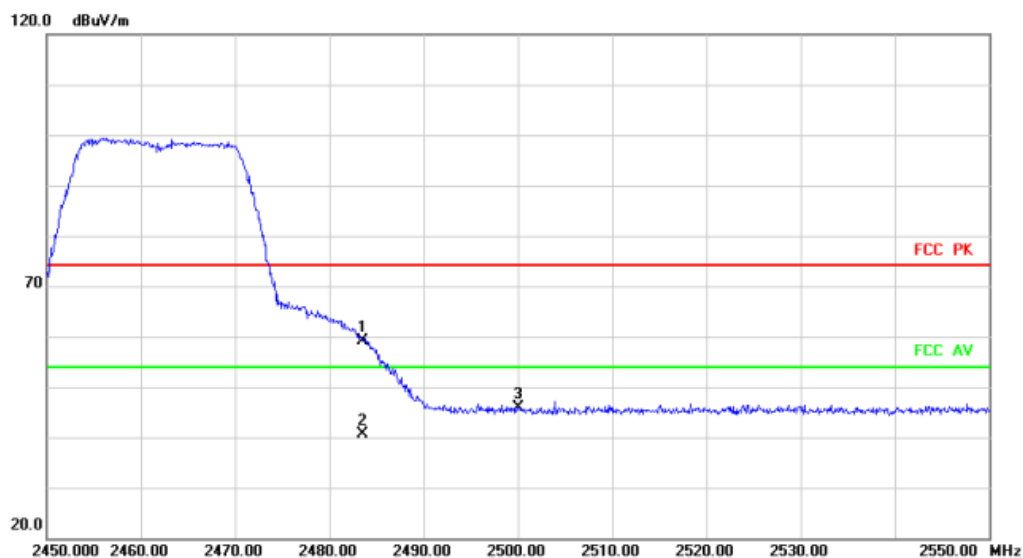
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4924.000	49.62	-1.29	48.33	74.00	-25.67	peak		

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2483.500	62.07	-2.85	59.22	74.00	-14.78	peak		
2	*	2483.500	43.42	-2.85	40.57	54.00	-13.43	AVG		
3		2500.000	48.79	-2.80	45.99	74.00	-28.01	peak		

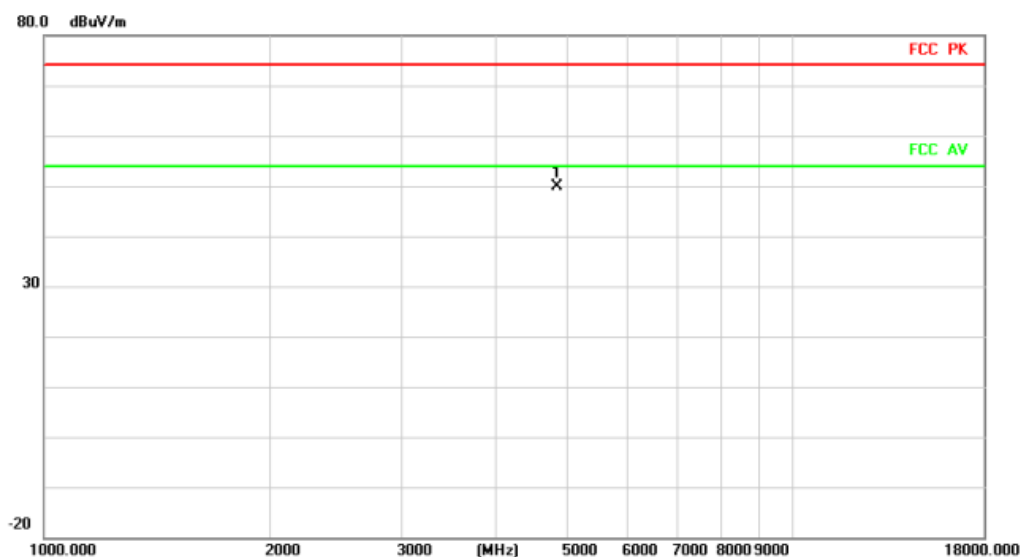
Above 1G (1GHz~18GHz)

Test mode: 11N40MIMO

Test Channel:3

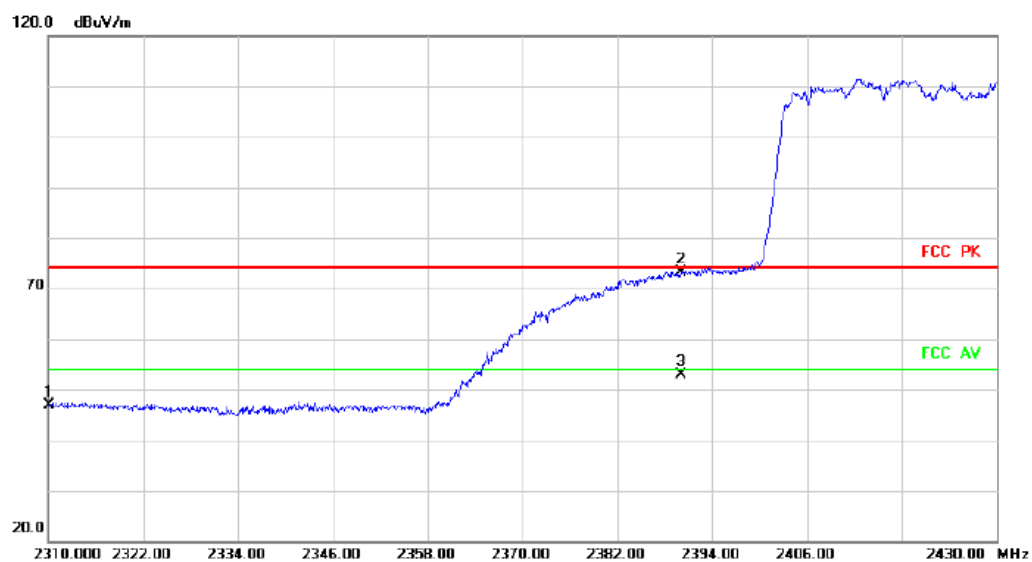
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4844.000	51.60	-1.77	49.83	74.00	-24.17	peak		

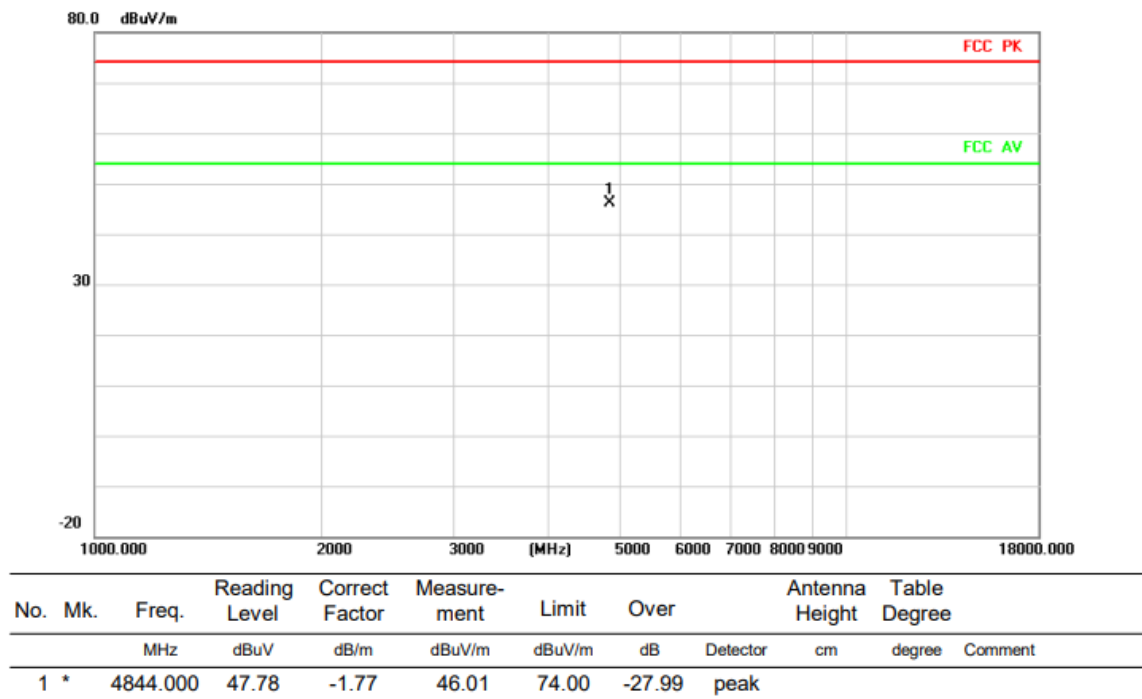
Radiated Emission



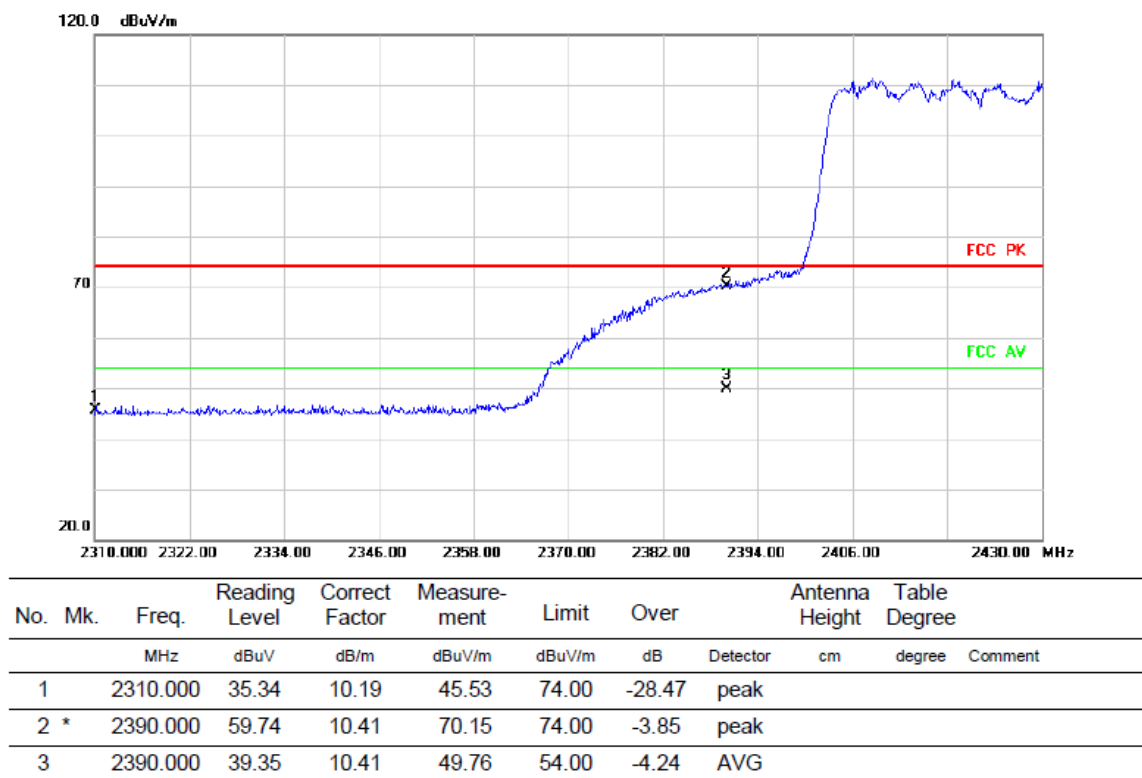
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	36.73	10.19	46.92	74.00	-27.08	peak		
2	*	2390.000	62.82	10.41	73.23	74.00	-0.77	peak		
3		2390.000	42.53	10.41	52.94	54.00	-1.06	AVG		

HORIZONTAL

Radiated Emission



Radiated Emission



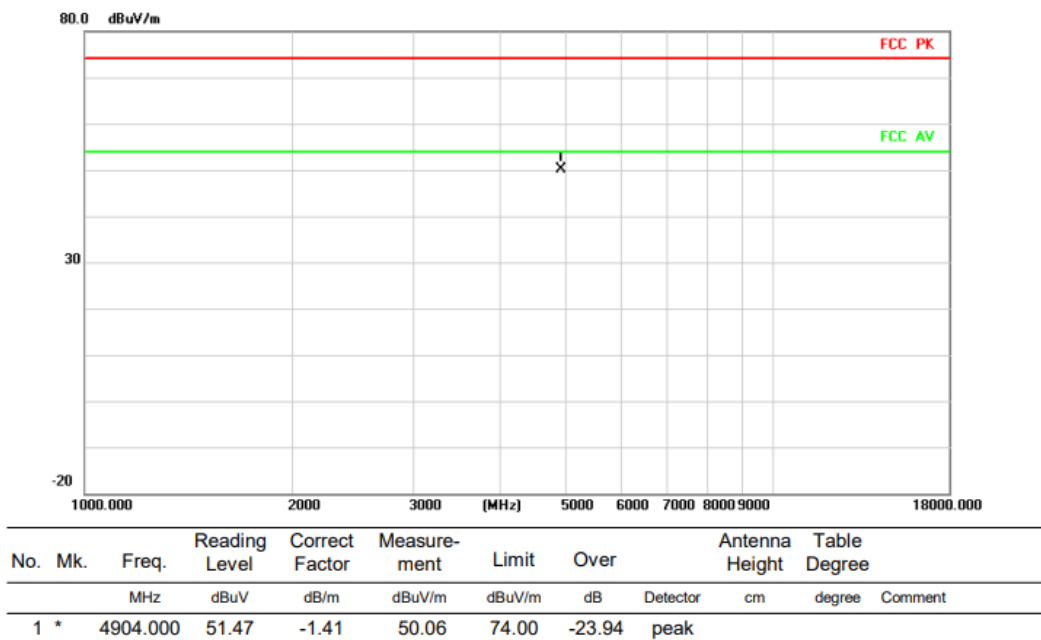
Above 1G (1GHz~18GHz)

Test mode: 11N40MIMO

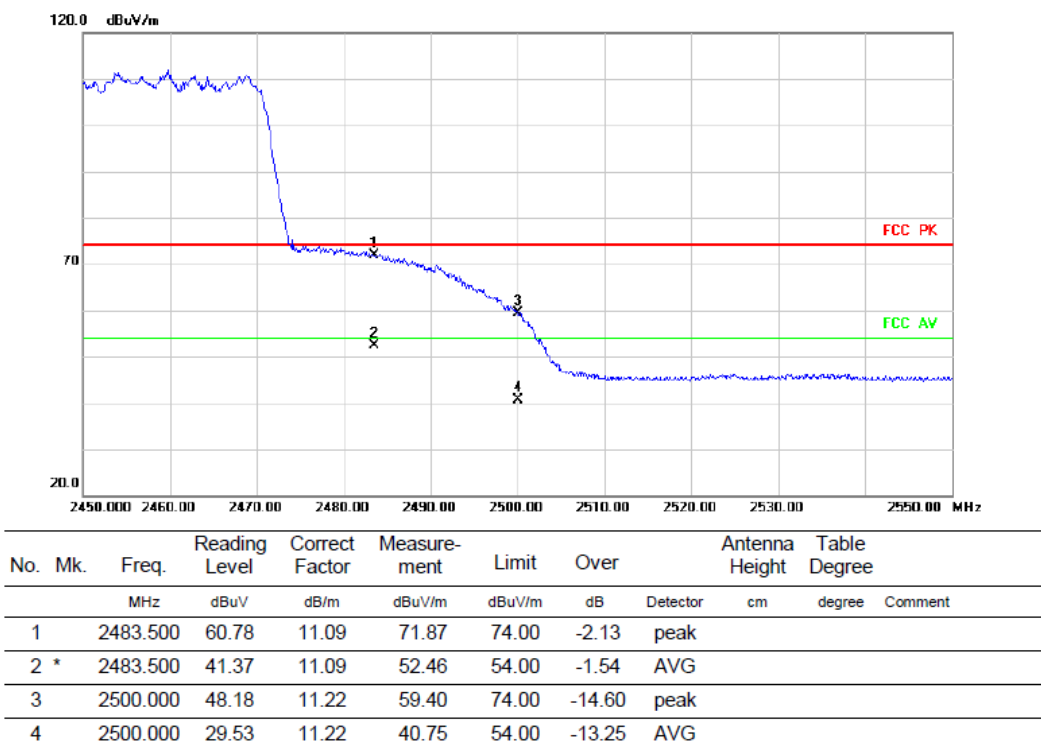
Test Channel:9

VERTICAL

Radiated Emission

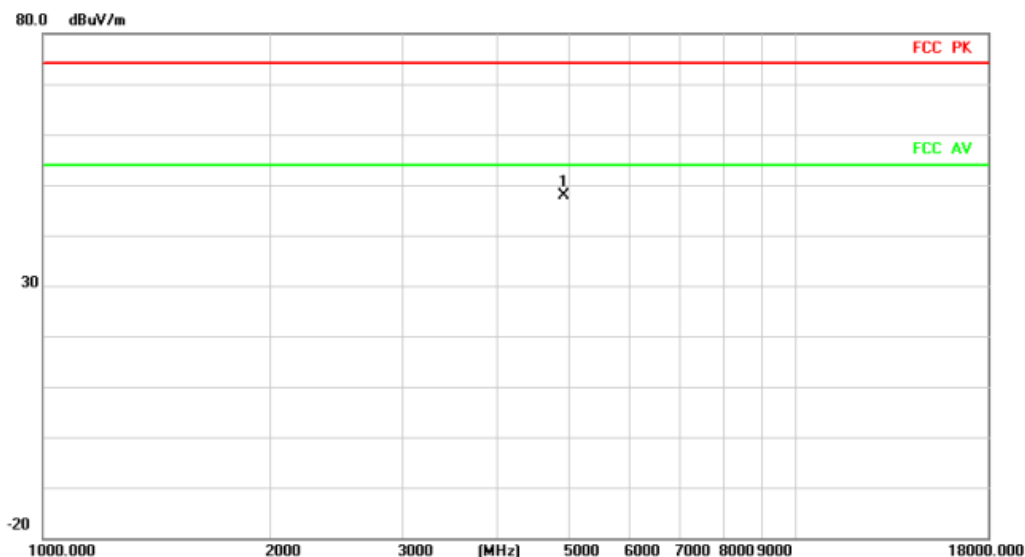


Radiated Emission



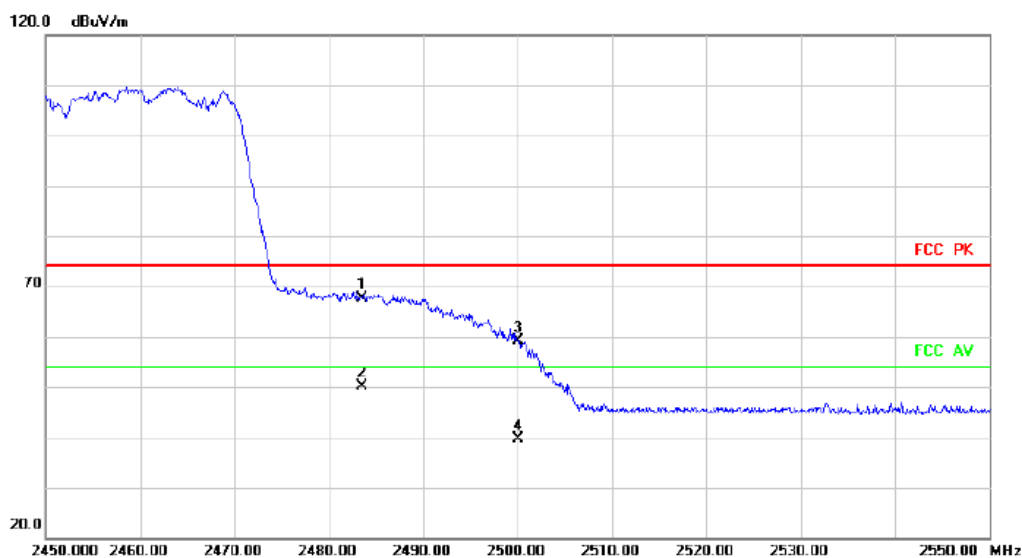
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4904.000	49.19	-1.41	47.78	74.00	-26.22	peak		

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2483.500	56.53	11.09	67.62	74.00	-6.38	peak		
2	*	2483.500	39.12	11.09	50.21	54.00	-3.79	AVG		
3		2500.000	47.88	11.22	59.10	74.00	-14.90	peak		
4		2500.000	28.30	11.22	39.52	54.00	-14.48	AVG		

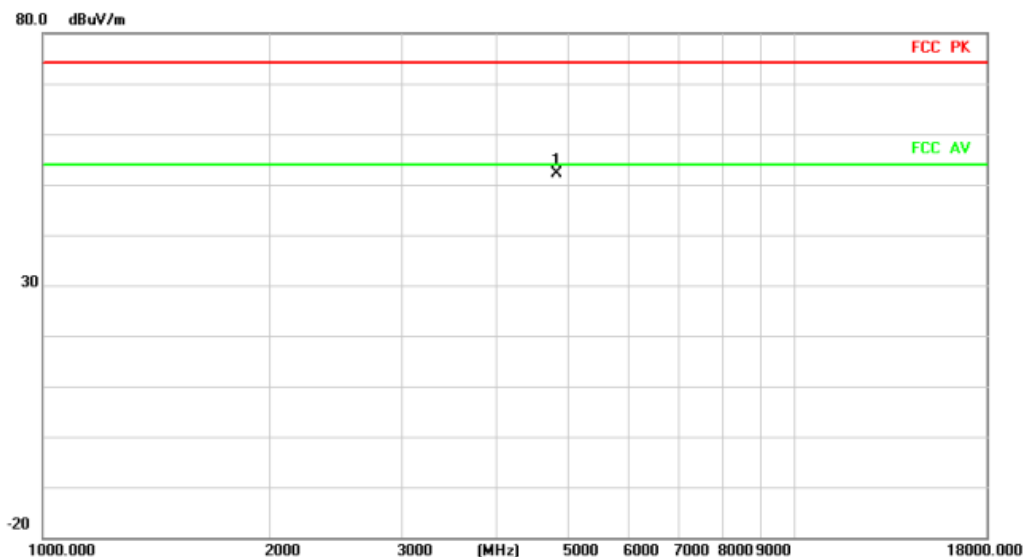
Above 1G (1GHz~18GHz)

Test mode: 11AX20MIMO

Test Channel:1

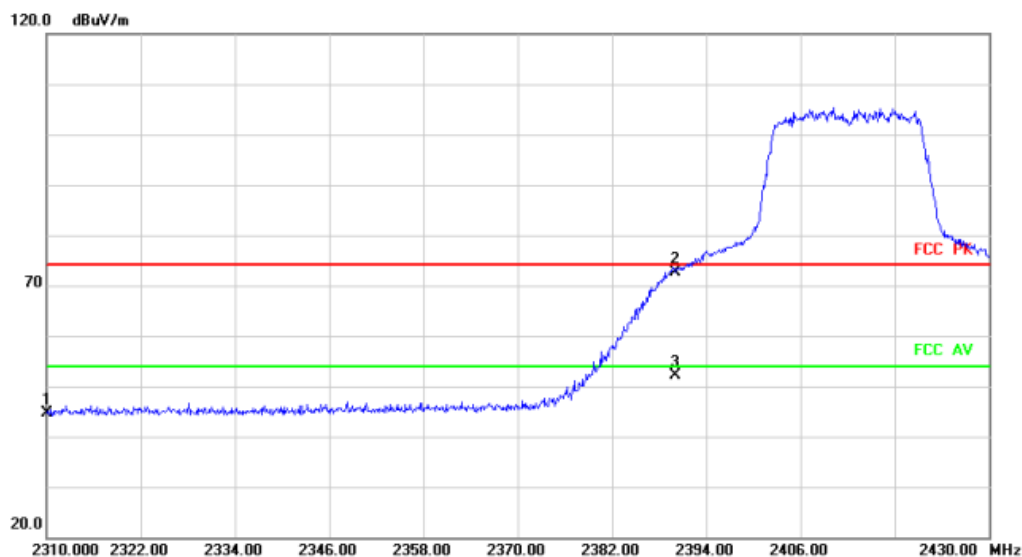
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	*	4824.000	54.07	-1.88	52.19	74.00	-21.81	peak		

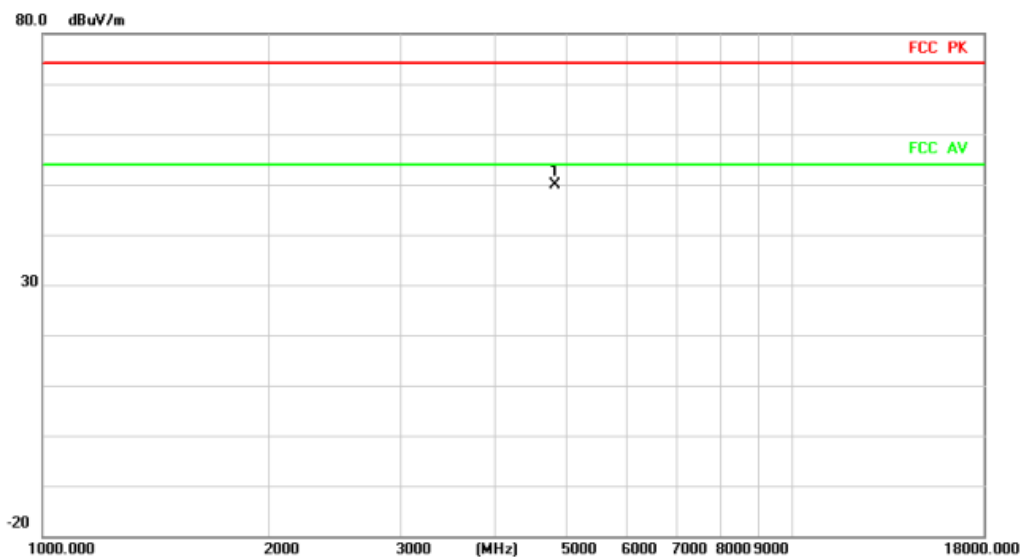
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		2310.000	48.11	-3.37	44.74	74.00	-29.26	peak		
2	*	2390.000	75.66	-3.13	72.53	74.00	-1.47	peak		
3		2390.000	55.25	-3.13	52.12	54.00	-1.88	AVG		

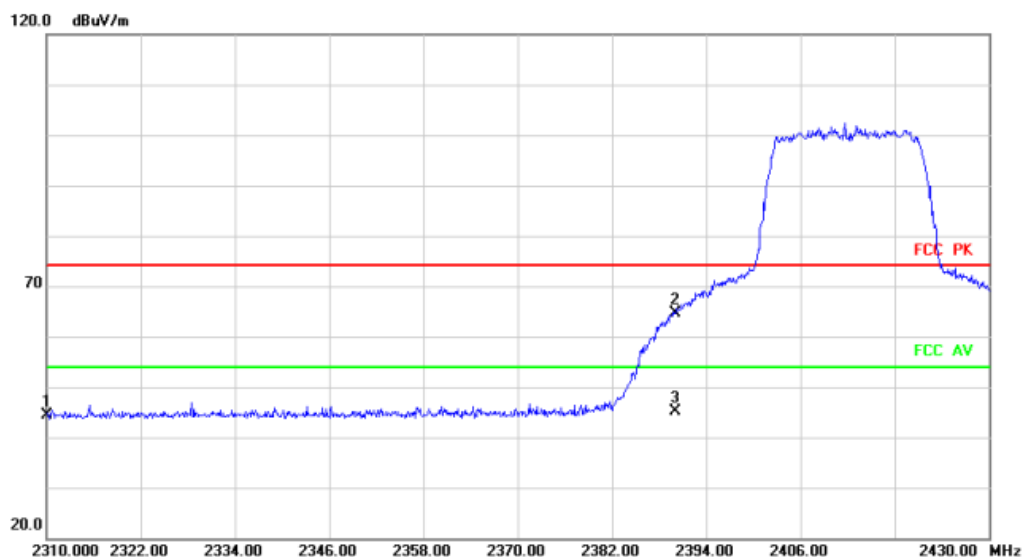
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4824.000	51.85	-1.88	49.97	74.00	-24.03	peak		

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	47.81	-3.37	44.44	74.00	-29.56	peak		
2		2390.000	67.73	-3.13	64.60	74.00	-9.40	peak		
3	*	2390.000	48.21	-3.13	45.08	54.00	-8.92	AVG		

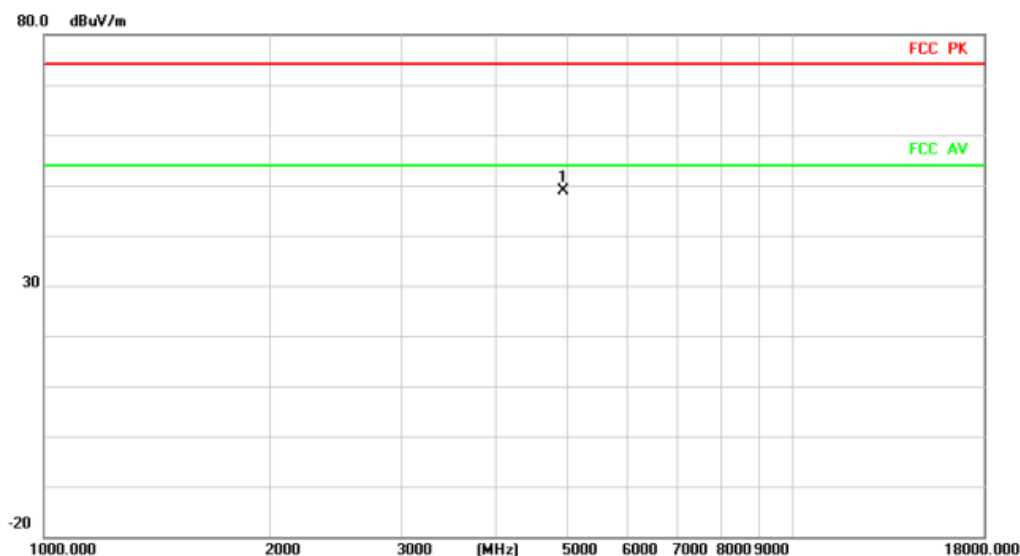
Above 1G (1GHz~18GHz)

Test mode: 11AX20MIMO

Test Channel:11

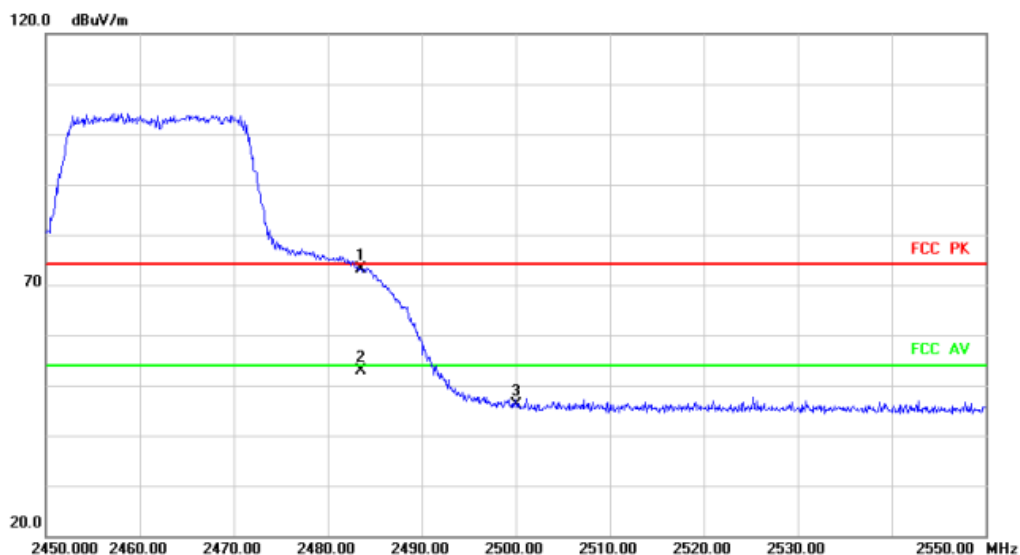
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4924.000	50.11	-1.29	48.82	74.00	-25.18	peak		

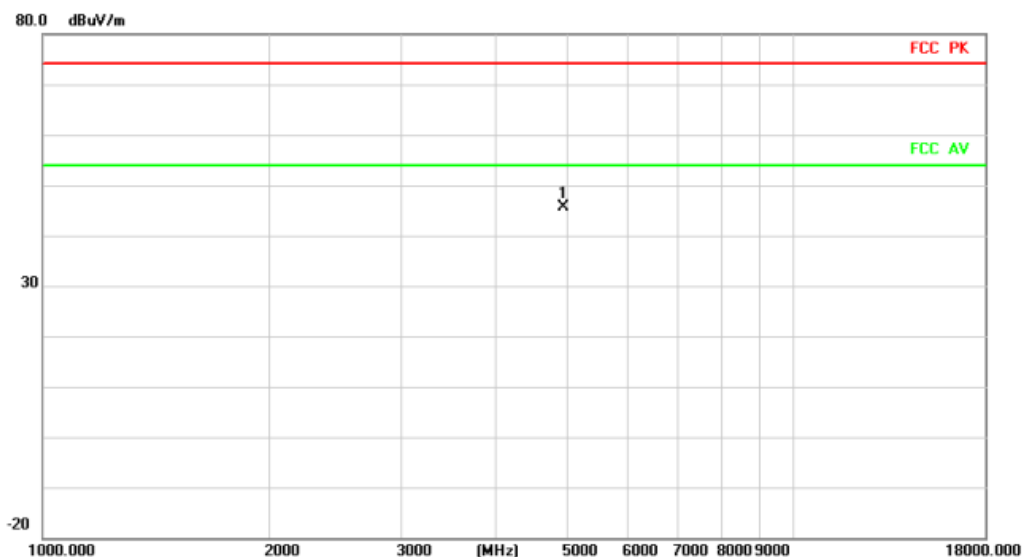
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	2483.500	75.91	-2.85	73.06	74.00	-0.94	peak		
2		2483.500	55.75	-2.85	52.90	54.00	-1.10	AVG		
3		2500.000	48.95	-2.80	46.15	74.00	-27.85	peak		

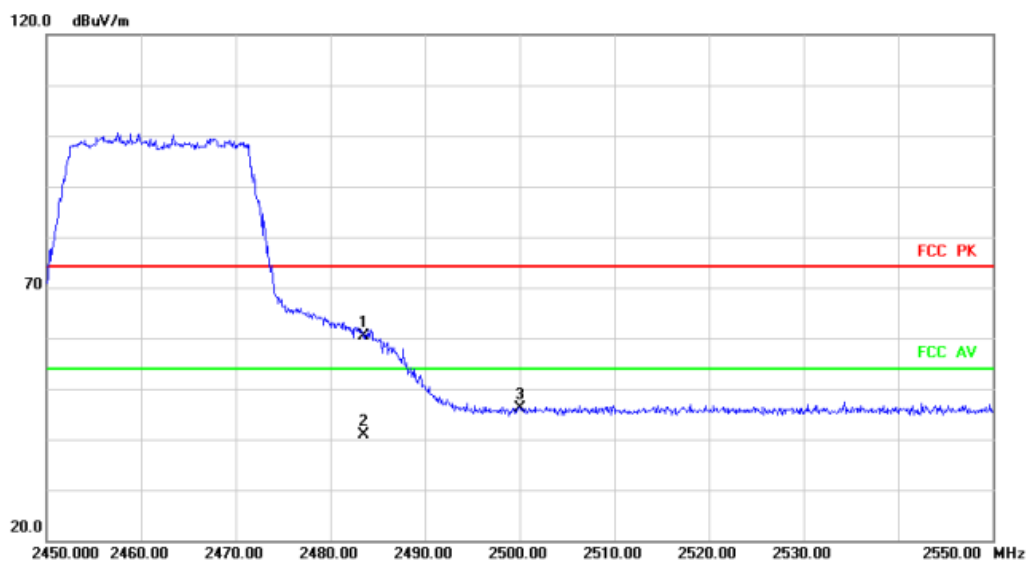
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4924.000	46.85	-1.29	45.56	74.00	-28.44	peak		

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2483.500	63.21	-2.85	60.36	74.00	-13.64	peak		
2	*	2483.500	43.69	-2.85	40.84	54.00	-13.16	AVG		
3		2500.000	48.93	-2.80	46.13	74.00	-27.87	peak		

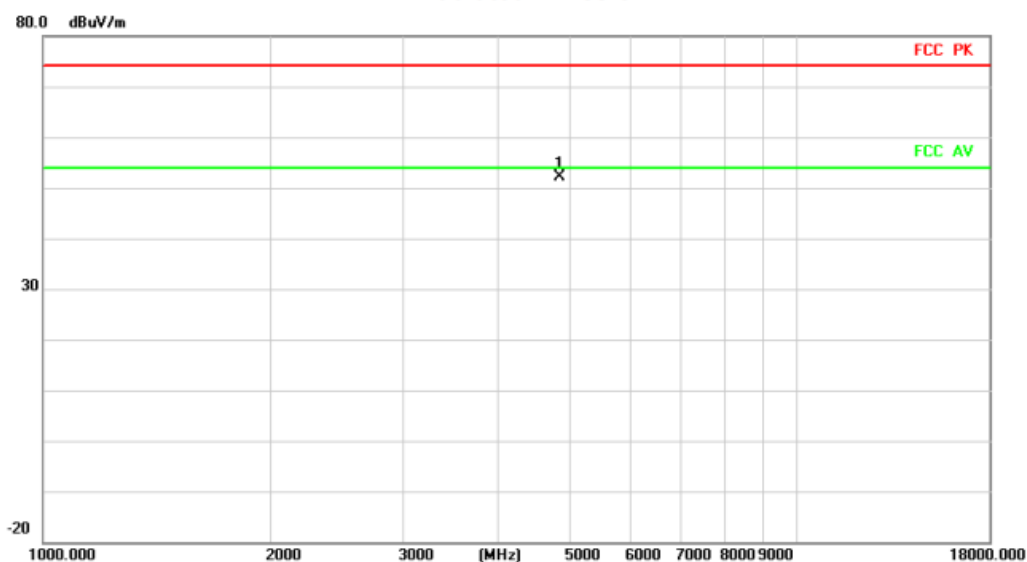
Above 1G (1GHz~18GHz)

Test mode: 11AX40MIMO

Test Channel:3

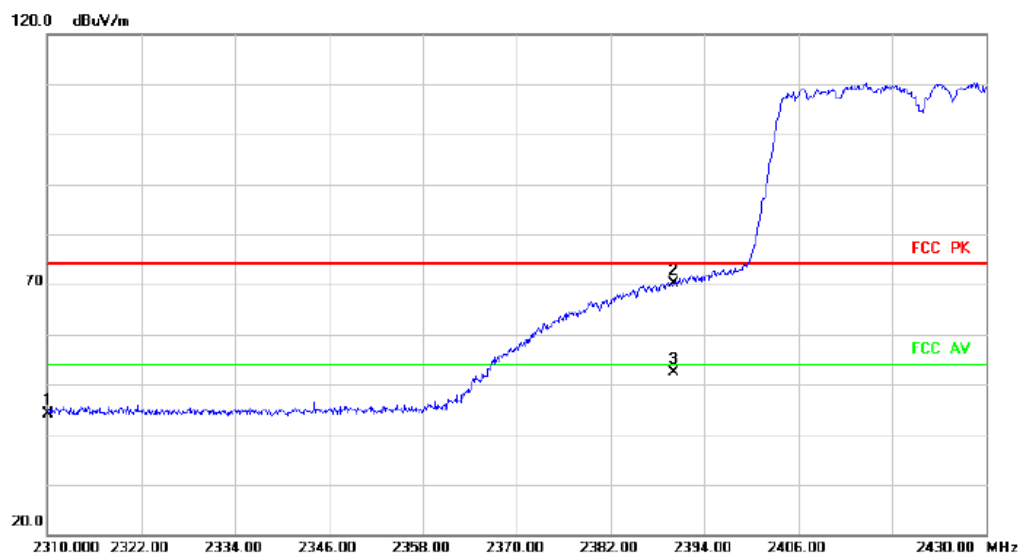
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	4844.000	53.88	-1.77	52.11	74.00	-21.89	peak		

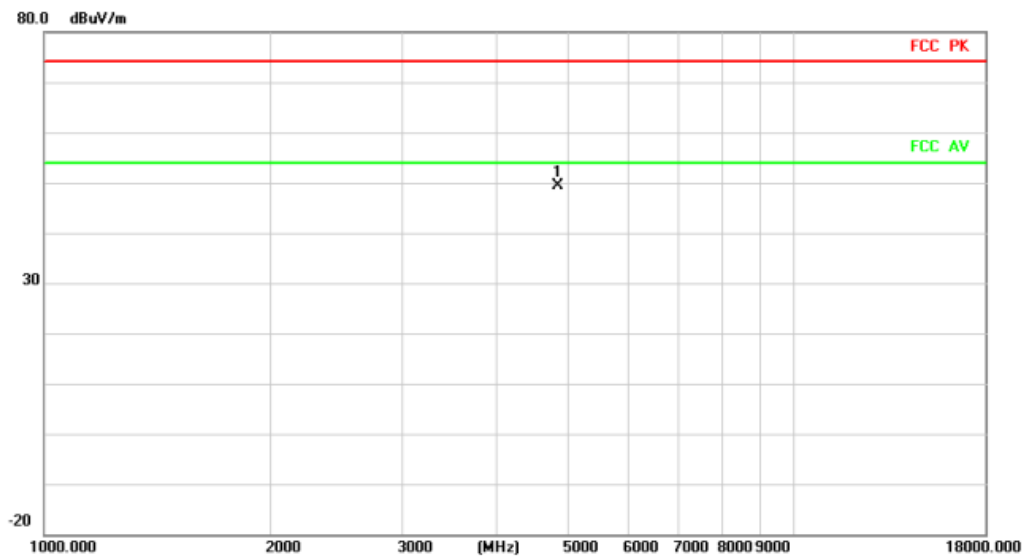
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		2310.000	34.06	10.19	44.25	74.00	-29.75	peak		
2		2390.000	59.61	10.41	70.02	74.00	-3.98	peak		
3	*	2390.000	42.04	10.41	52.45	54.00	-1.55	AVG		

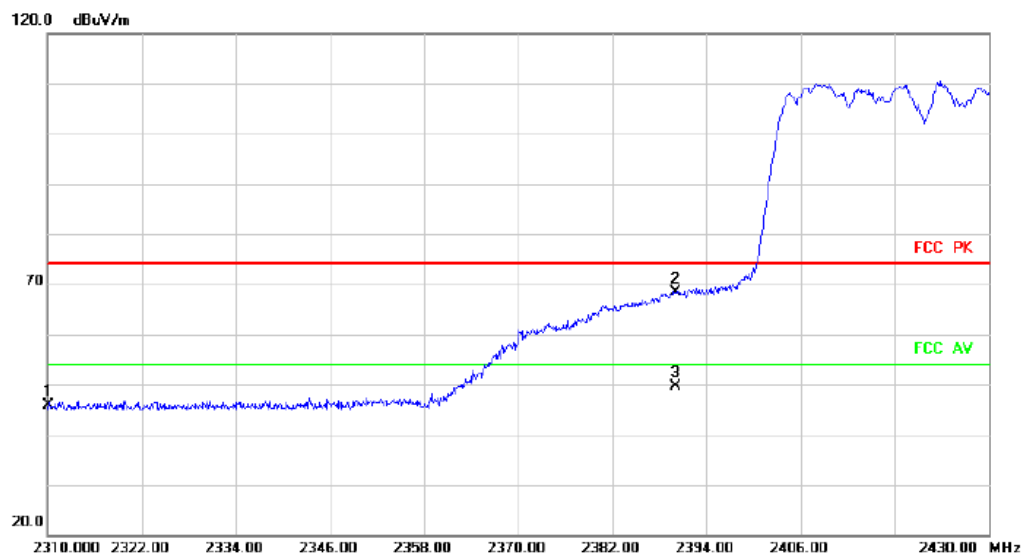
HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1	*	4844.000	51.13	-1.77	49.36	74.00	-24.64	peak	

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree
1		2310.000	35.59	10.19	45.78	74.00	-28.22	peak	
2		2390.000	57.93	10.41	68.34	74.00	-5.66	peak	
3	*	2390.000	39.29	10.41	49.70	54.00	-4.30	AVG	

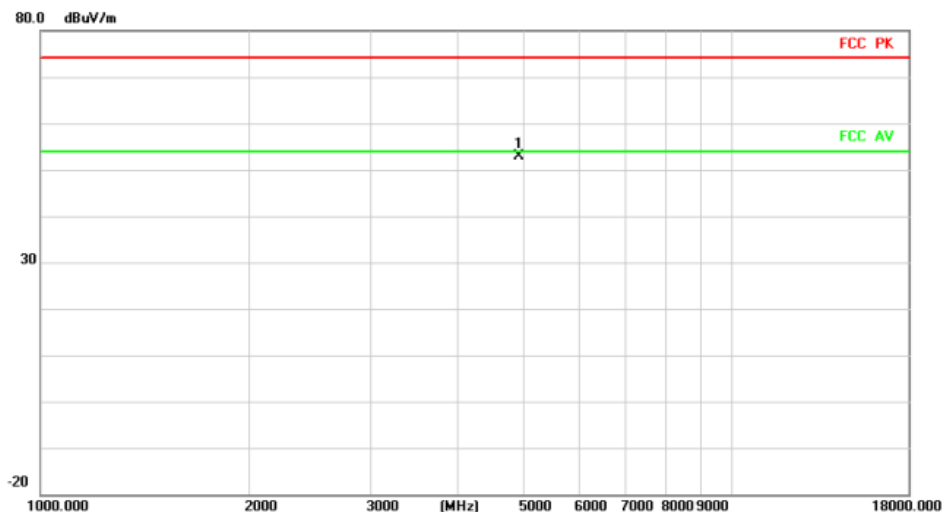
Above 1G (1GHz~18GHz)

Test mode: 11N40MIMO

Test Channel:9

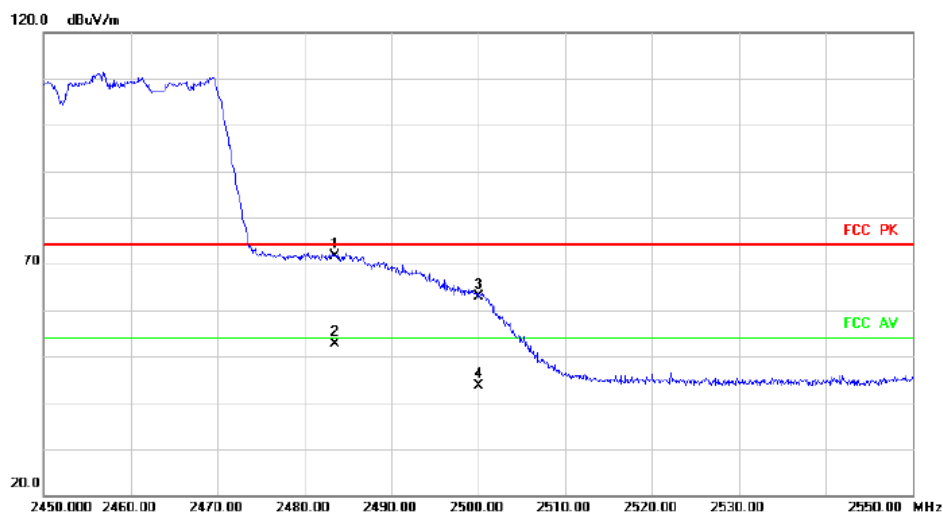
VERTICAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	*	4904.000	54.38	-1.41	52.97	74.00	-21.03	peak		

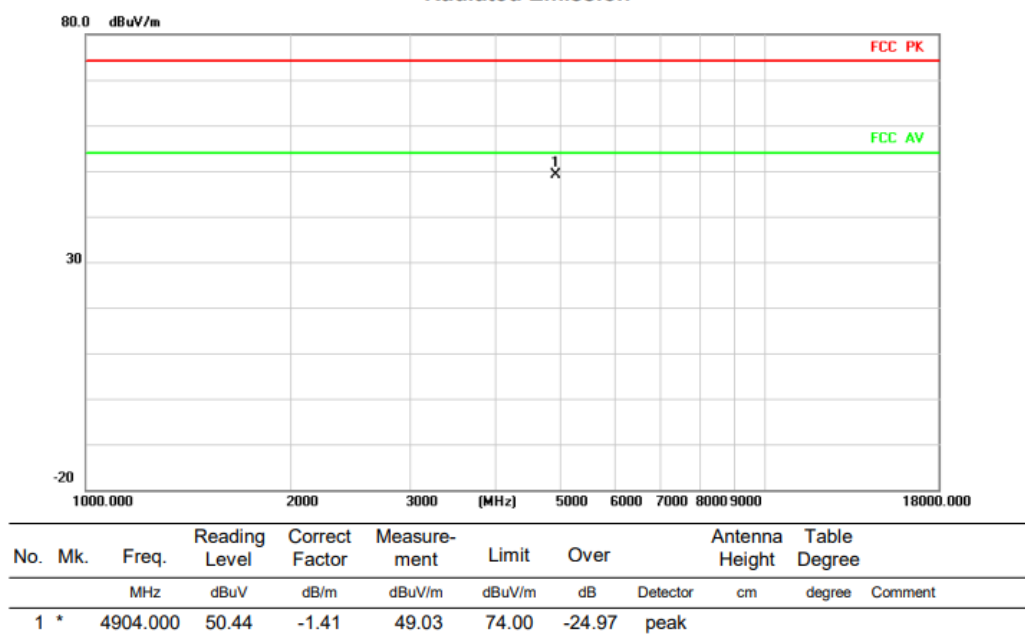
Radiated Emission



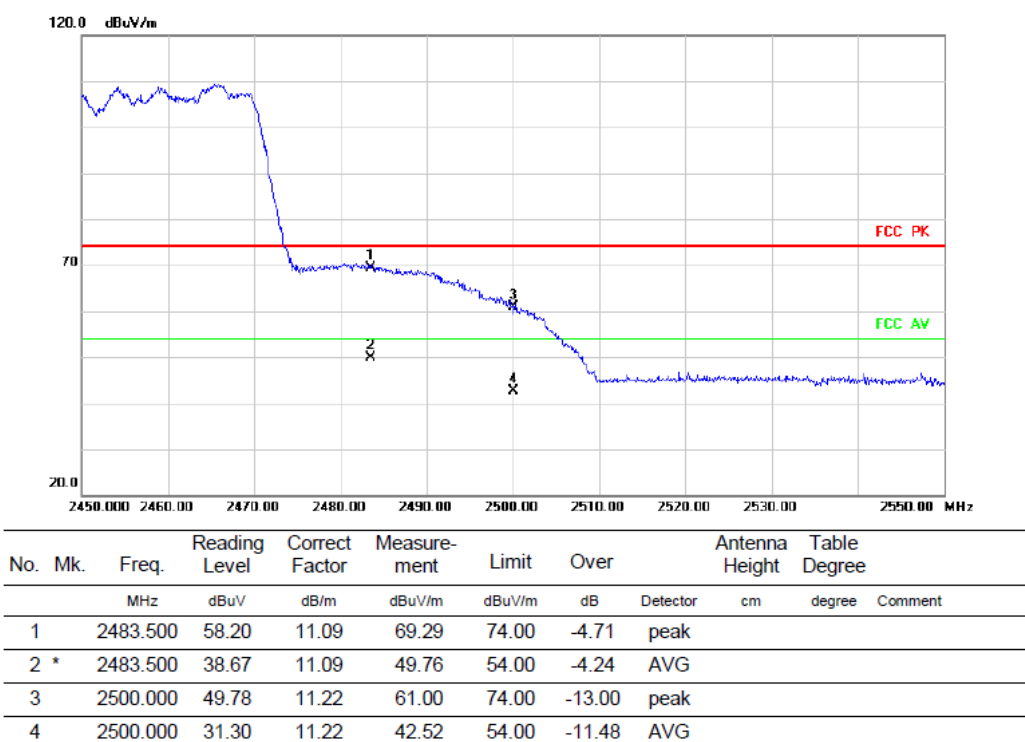
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		2483.500	60.47	11.09	71.56	74.00	-2.44	peak		
2	*	2483.500	41.54	11.09	52.63	54.00	-1.37	AVG		
3		2500.000	51.68	11.22	62.90	74.00	-11.10	peak		
4		2500.000	32.35	11.22	43.57	54.00	-10.43	AVG		

HORIZONTAL

Radiated Emission



Radiated Emission



The high frequency, which started from 18GHz to 25GHz, was pre-scanned and the result which was 20dB lower than the limit line was not recorded in this report.

3.3 Spurious Emission at Antenna Port

3.3.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

3.3.2 Test Procedure

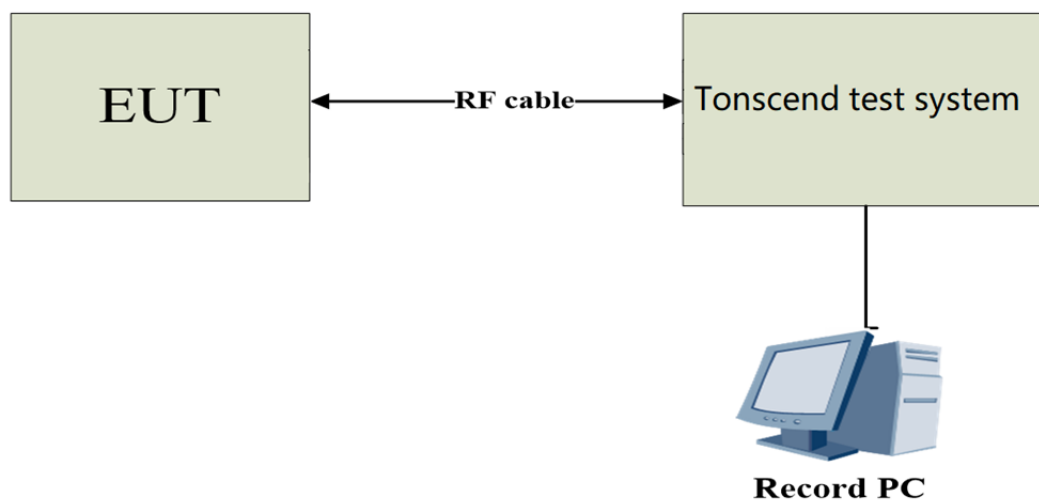
Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ☒ : Test ☐ : No Test	

a) The EUT was directly connected to the tonscond test system and antenna output port as show in the block diagram below.

b) Spectrum Setting as below:

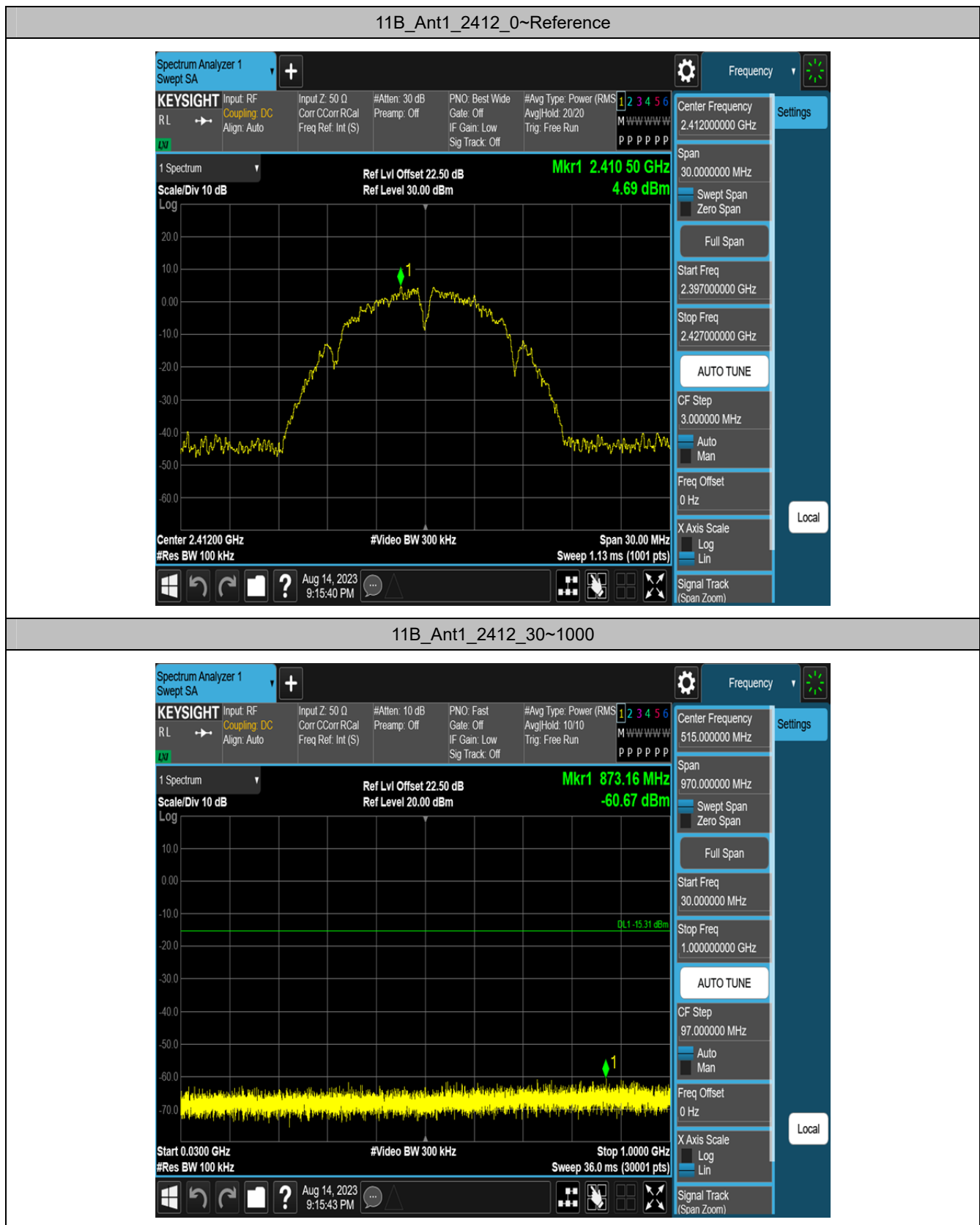
Centre Frequency	The centre frequency of the channel under test
Spectrum Parameters	Setting
Start Frequency	30 MHz
Stop Frequency	26.5 GHz
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.3.3 Test Setup

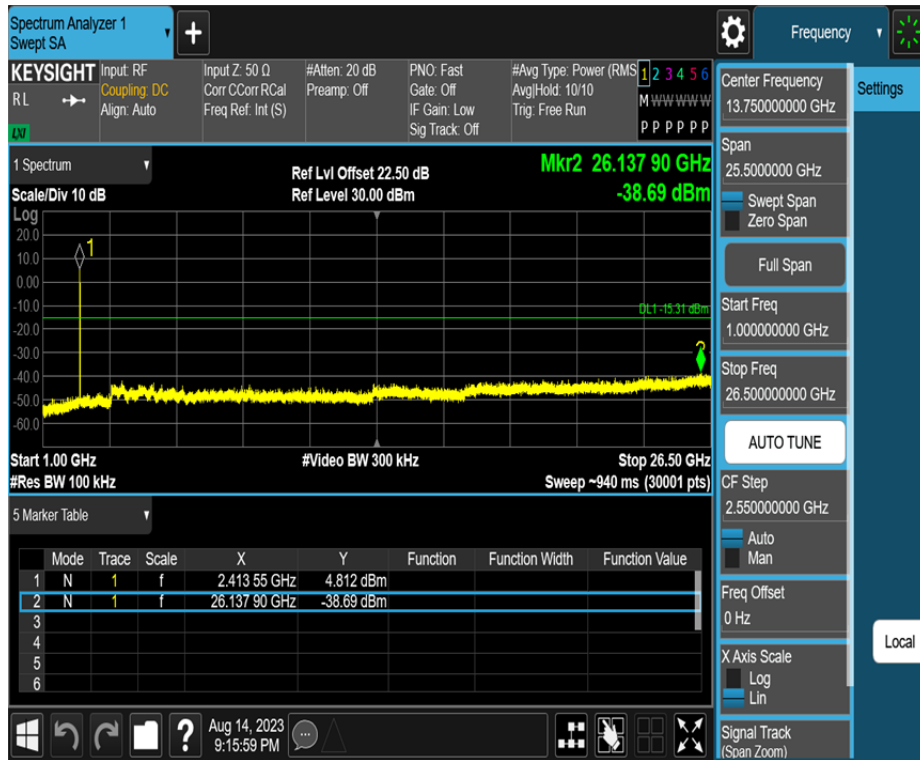


3.3.4 The Result

Conducted Spurious Emission



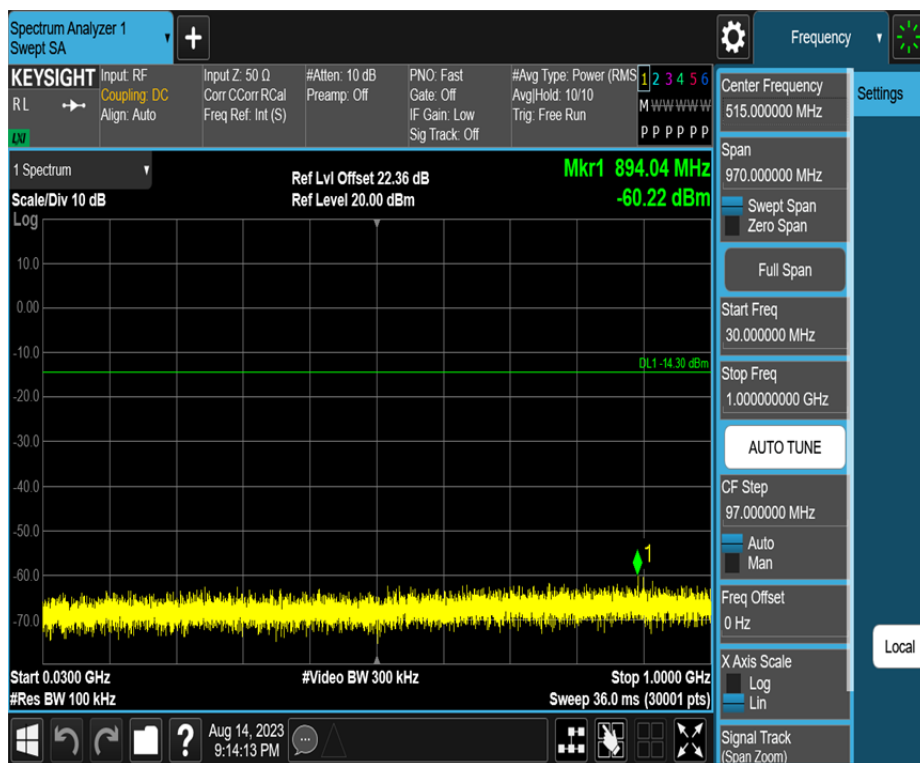
11B_Ant1_2412_1000~26500



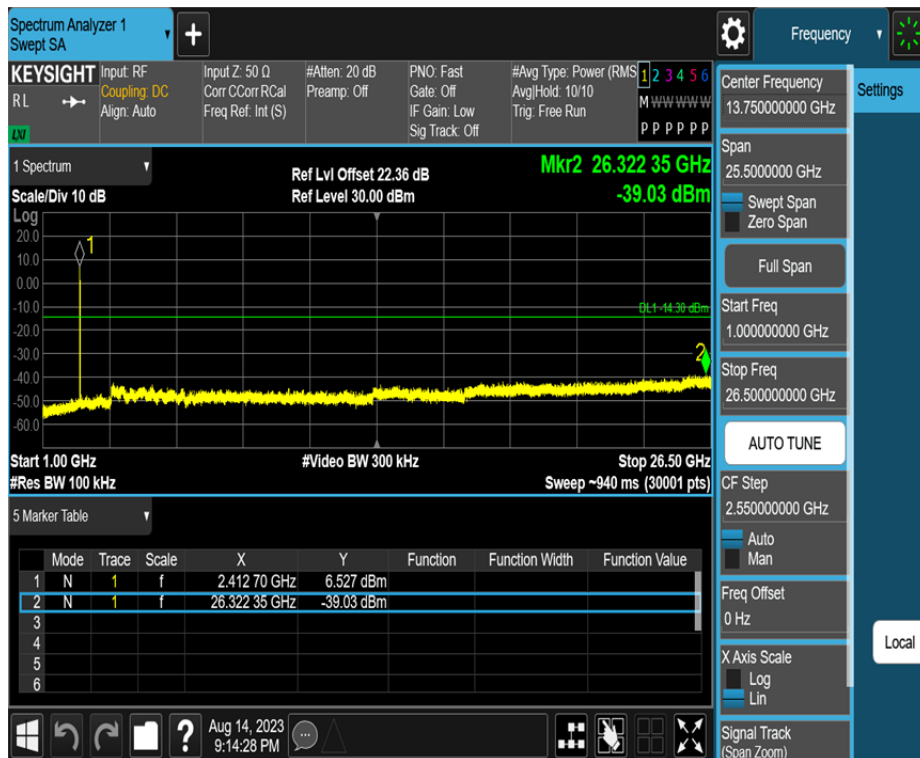
11B_Ant2_2412_0~Reference



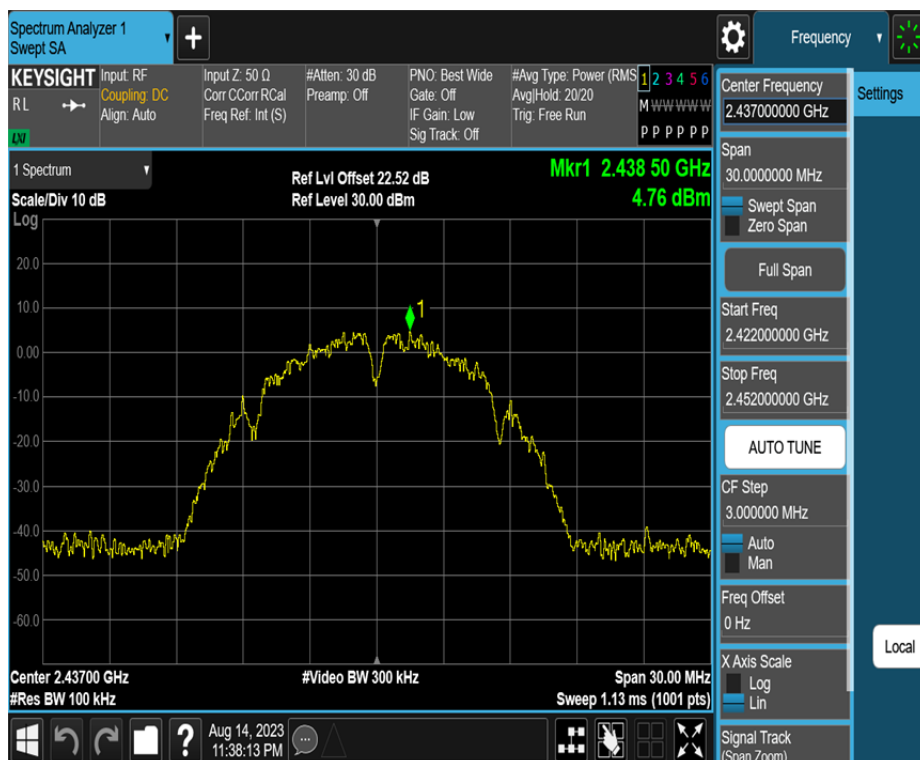
11B_Ant2_2412_30~1000



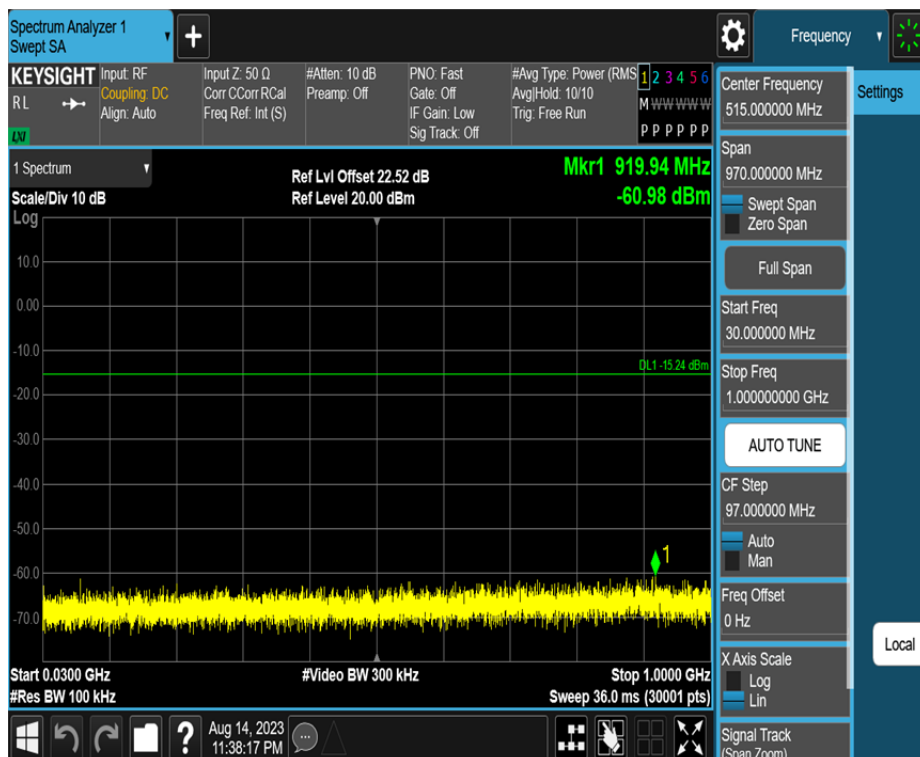
11B_Ant2_2412_1000~26500



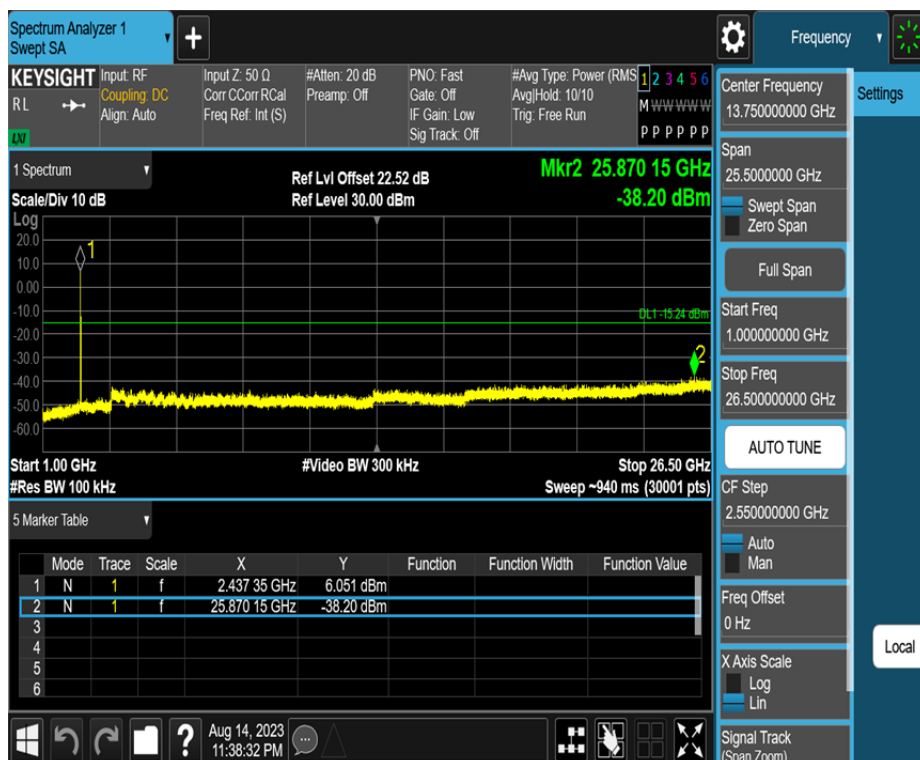
11B_Ant1_2437_0~Reference



11B_Ant1_2437_30~1000



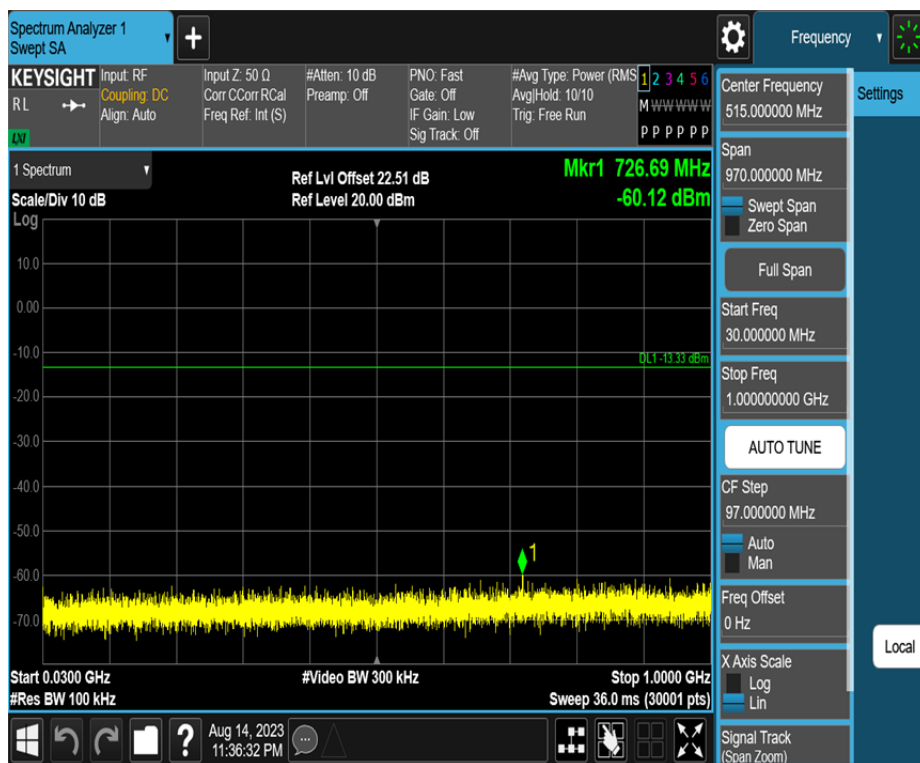
11B_Ant1_2437_1000~26500



11B_Ant2_2437_0~Reference



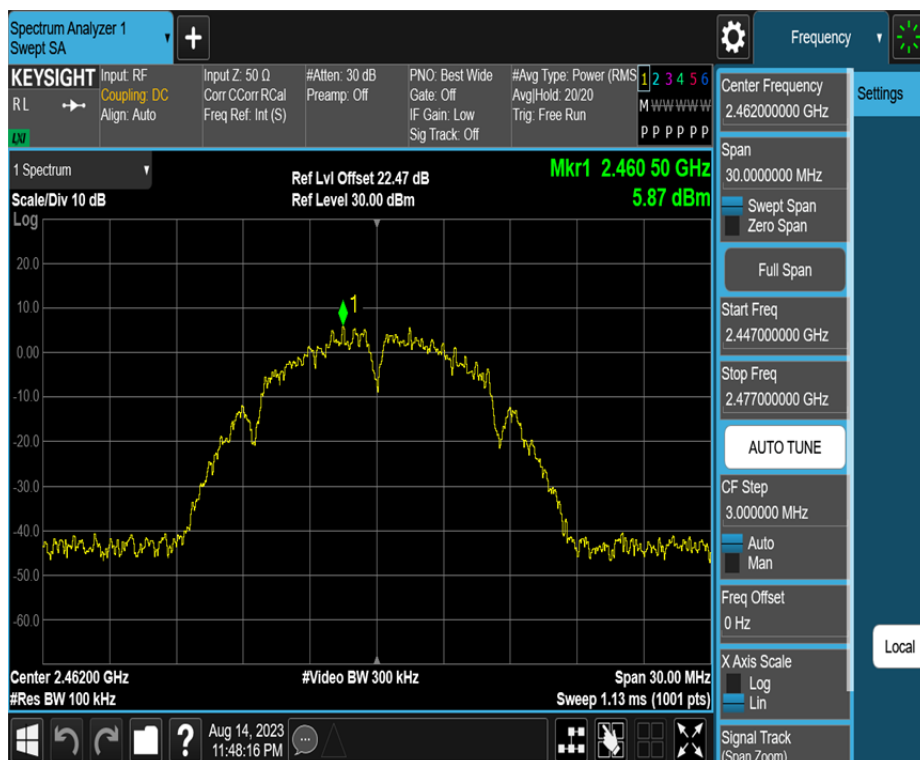
11B_Ant2_2437_30~1000



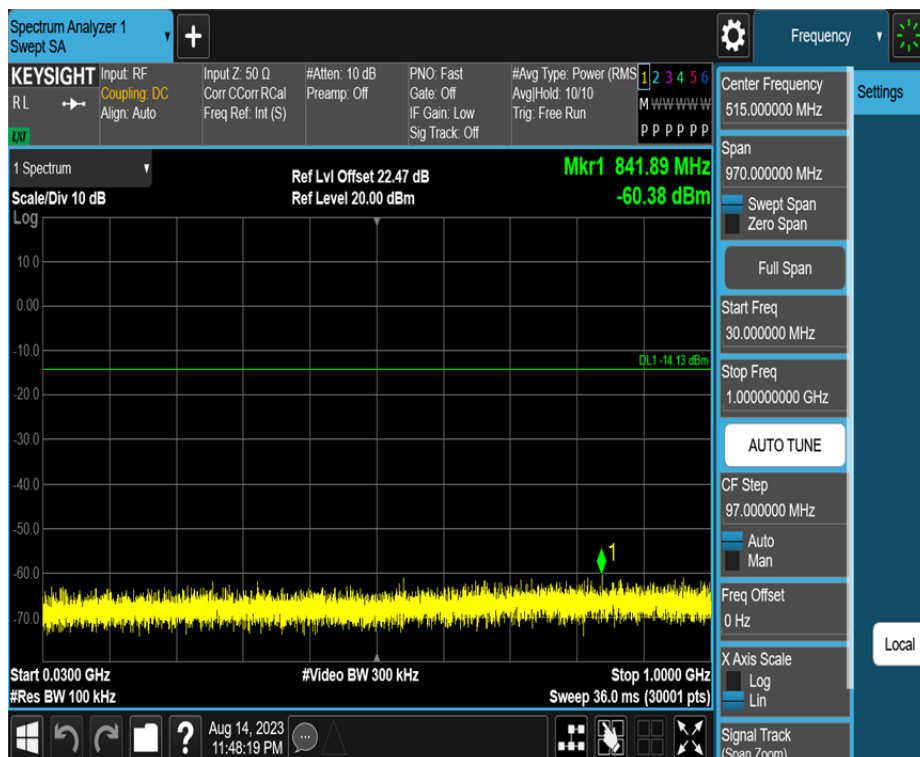
11B_Ant2_2437_1000~26500



11B_Ant1_2462_0~Reference



11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500



11B_Ant2_2462_0~Reference

