RF TEST REPORT

FCC ID: 2BFBQ-GTMF-B30Y

Test Report No……..:	RF240122006-03-001
Product(s) Name……...:	Heat Pump
Model(s)……..:	GTMF-B30Y, GTHP-001UMI-SI, GTHP-003UMI-SI, GTMF-B10Y, GTHP-YTRS003, GTHP-YTRS004, GTHP-YTRS005, GTHP-YTRS006, GTMF-B110Y, GTMF-B130Y, GTMF-B200Y
Trade Mark……....:	GRAT GREATPOOL OIBATH
Applicant……..:	SICHUAN GREAT TECHNOLOGY CO., LTD.
Address……...:	1st Floor, No. 159, Section 3, Huayang Avenue, Huayang Street, Tianfu New District, Chengdu City, Sichuan Province
Receipt Date……..:	2024.02.02
Test Date……....:	2024.02.28~2024.04.11
Issued Date……..:	2024.04.12
Standards……..:	47 CFR FCC Part 15, Subpart C(Section 15.247); ANSI C63.10:2013
Testing Laboratory……:	Shenzhen Haiyun Standard Technical Co., Ltd.

Prepared By:	Checked By:	Approved By:	
Jason Huang	Tim Zhang	Misue Su	
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Table of Contents

History of this test report 4

1. General Information 5

1.1 Applicant 5
1.2 Manufacturer 5
1.3 Factory 5
1.4 Basic Description of Equipment Under Test 5
1.5 Transmit Operating Mode 6

2. Summary of Test Results 7

2.1 Summary of Test Items 7
2.2 Application of Standard 7
2.3 Test Instruments 8
2.4 Test Mode 9
2.5 Test Condition 9
2.6 Duty Cycle of Test Signal 10
2.7 Measurement Uncertainty 16
2.8 Test Location 16
2.9 Description of Support Units 16
2.10 Deviation from Standards 16

3. Test Procedure And Results 17

3.1 AC Power Line Conducted Emission 17
3.1.1 Limit 17
3.1.2 Test Procedure 17
3.1.3 Test Setup 17
3.1.4 Test Result 18
3.2 Radiated Emission and Band Edge 20
3.2.1 Limit 20
3.2.2 Test Procedure 20
3.2.3 Test Setup 21

3.2.4 Test Result 23
3.3 Spurious Emission at Antenna Port 41
3.3.1 Limit 41
3.3.2 Test Procedure 41
3.3.3 Test Setup 42
3.3.4 The Result 43
3.4 6dB Bandwidth 60
3.4.1 Limit 60
3.4.2 Test Procedure 60
3.4.3 Test Setup 60
3.4.4 Test Result 61
3.5 Maximum conducted output power 73
3.5.1 Limit 73
3.5.2 Test Procedure 73
3.5.3 Test Setup 73
3.5.4 Table of Parameters of Text Software Setting 74
3.5.5 The Result 75
3.6 Power Spectral Density 76
3.6.1 Limit 76
3.6.2 Test Procedure 76
3.6.3 Test Setup 76
3.6.4 The Result 77

History of this test report

Original Report Issue Date: 2024.04.12

● No additional attachment

○ Additional attachments were issued following record

Attachment No.	Issue Date	Description

1. General Information

1.1 Applicant

SICHUAN GREAT TECHNOLOGY CO., LTD.

1st Floor, No. 159, Section 3, Huayang Avenue, Huayang Street, Tianfu New District, Chengdu City, Sichuan Province

1.2 Manufacturer

SICHUAN GREAT TECHNOLOGY CO., LTD.

1st Floor, No. 159, Section 3, Huayang Avenue, Huayang Street, Tianfu New District, Chengdu City, Sichuan Province

1.3 Factory

Guangdong Yuanmeng Technology Co., Ltd.

Factory Building No. 9, Gongye 1st Road, Yubushagang Industrial Zone, Guanyao Village, Nanhai District, Foshan City

1.4 Basic Description of Equipment Under Test

Product No.	POC240122006-S001	
Equipment Name	Heat Pump	
Model Name	GTMF-B30Y, GTHP-001UMI-SI, GTHP-003UMI-SI, GTMF-B10Y, GTHP-YTRS003, GTHP-YTRS004, GTHP-YTRS005, GTHP-YTRS006, GTMF-B110Y, GTMF-B130Y, GTMF-B200Y	
Test Model	GTMF-B30Y	
Model difference	Due to marketing. they are the same product, and just have thedifferent model name, the rest are the same.	
Trade Mark	GRAT GREATPOOL OIBATH	
Power Supply	AC 120V/60Hz	
Operate temperature	0℃-45℃	
EUT Stage	○ Product Unit	● Final-Sample
Operating Band and Conducted Output Power (Max power)	2400MHz ~ 2483.5MHz	●IEEE 802.11b:17.77dBm(0.036W)
Product Type	IEEE 802.11b: WLAN (SISO) IEEE 802.11g: WLAN(SISO) IEEE 802.11n: WLAN(SISO)	
Nominal Bandwidth	20MHz	
Modulation	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n: OFDM	
Data Rate (Mbps)	IEEE 802.11b mode : 1/2/5.5/11 IEEE 802.11g mode : 6/9/12/18/24/36/48/54 IEEE 11n mode : up to 72.2	
Antenna gain	2.54dBi	
Antenna type	PCB antenna	

Eleven channels are provided for 802.11b, 802.11g, 802.11n (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	/	/

1.5 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				

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 a 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

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	MXA Signal Analyzer	Keysight	N9010A	MY51440158	2023/4/22	2024/4/21
3	Log periodic antenna	Schwarzbeck	VULB 9168	1151	2023/5/4	2024/5/3
4	Low frequency amplifier	/	LNA 0920N	2014	2023/5/3	2024/5/2
5	High frequency amplifier	Schwarzbeck	BBV 9718	284	2023/5/3	2024/5/2
6	Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1273	2023/5/4	2024/5/3
7	Temp&Humidity Recorder	Meideshi	JR900	/	2023/5/3	2024/5/2
8	Horn Antenna	SCHWARZBECK	BBHA 9170	9170#685	2023/7/16	2024/7/15
9	Loop Antenna	SCHWARZBECK	FMZB1519 B	00029	2023/7/16	2024/7/15
10	Broadband preamplifier	Schwarzbeck	BBV9721	9721-019	2023/5/3	2024/5/2
13	Test software	Farad Technology Co., Ltd	EZ-EMC Ver.TW-03A2			
Conducted Emission						
1	LISN	Rohde&Schwarz	ENV216	100075	2023/5/3	2024/5/2
2	ISN	Schwarzbeck	CATE 5 8158	#171	2023/5/3	2024/5/2
3	ISN	Schwarzbeck	CAT 3 8158	00187	2023/4/1	2024/3/31
4	Test receiver	Rohde&Schwarz	ESCI	100718	2023/5/3	2024/5/2
5	Pulse limiter	Rohde&Schwarz	ESH3-Z2	102299	2023/5/3	2024/5/2
6	Temp&Humidity Recorder	Meideshi	JR900	/	2023/5/3	2024/5/2
7	Test software	Farad Technology Co., Ltd	EZ-EMC Ver.TW-03A2			
RF Conducted Emission						
1	MXA Signal Analyzer	Keysight	N9021B	MY60080169	2023/4/23	2024/4/22
2	RF Control Unit	dsusoft	JS0806-2	21G8060449	2023/4/23	2024/4/22
3	power supply unit	dsusoft	JS0806-4ADC	N/A	2023/4/23	2024/4/22
4	VXG Signal Generator	Keysight	M9384B	MY61270787	2023/4/23	2024/4/22
5	EXG Analog Signal Generator	Keysight	N5173B	MY59101282	2023/4/23	2024/4/22
6	Wideband Radio Communication Tester	Rohde&Schwarz	CMW500	1201.0002K50-116064-Dt	2023/4/23	2024/4/22
7	Test software	dsusoft	JS1120-3 Ver.3.2.22.0			

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	23.6°C, 50% RH	AC 120V/60Hz	Freedom Zhuo
Radiated Emission and Band Edge Measurement	22.2°C, 51% RH	AC 120V/60Hz	Freedom Zhuo
Spurious Emission at Antenna Port	24.5°C, 54% RH	AC 120V/60Hz	Albert Fan
6dB Bandwidth	24.5°C, 54% RH	AC 120V/60Hz	Albert Fan
Maximum Conducted Power	24.5°C, 54% RH	AC 120V/60Hz	Albert Fan
Power Spectral Density	24.5°C, 54% RH	AC 120V/60Hz	Albert Fan

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

The applicant declare the operating environment of EUT as below:

Normal conditions: 120V AC, 0~45°C

2.6 Duty Cycle of Test Signal

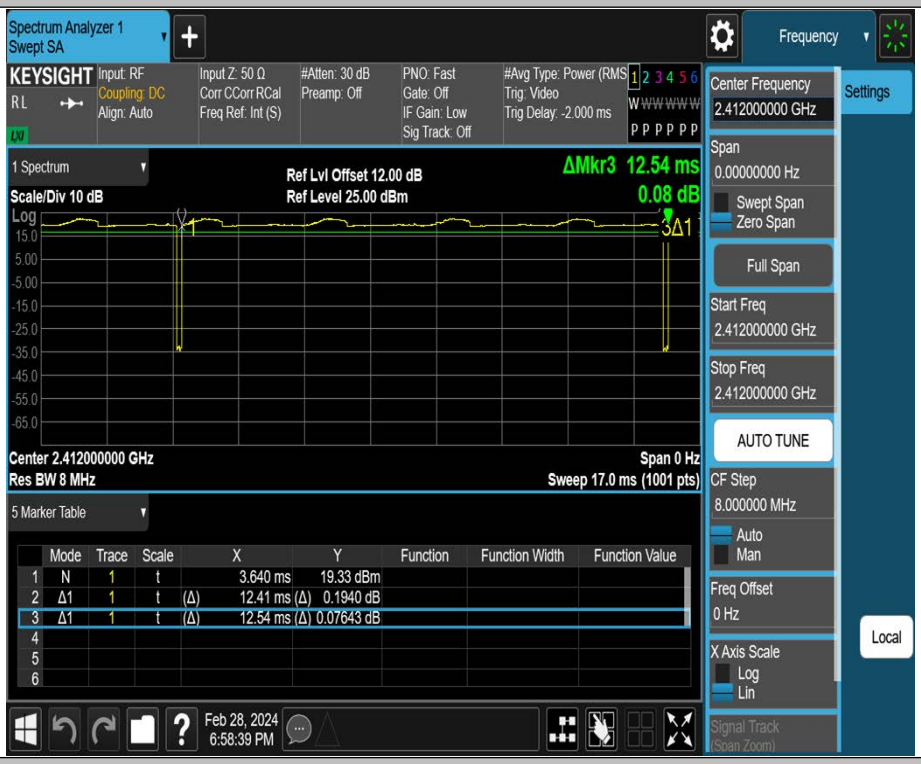
If duty cycle is ≥ 98 %, duty factor is not required.

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	12.41	12.54	98.96
11G	2412	2.06	2.19	94.06
11N20	2412	1.92	2.05	93.66

11B_Ant1_2412



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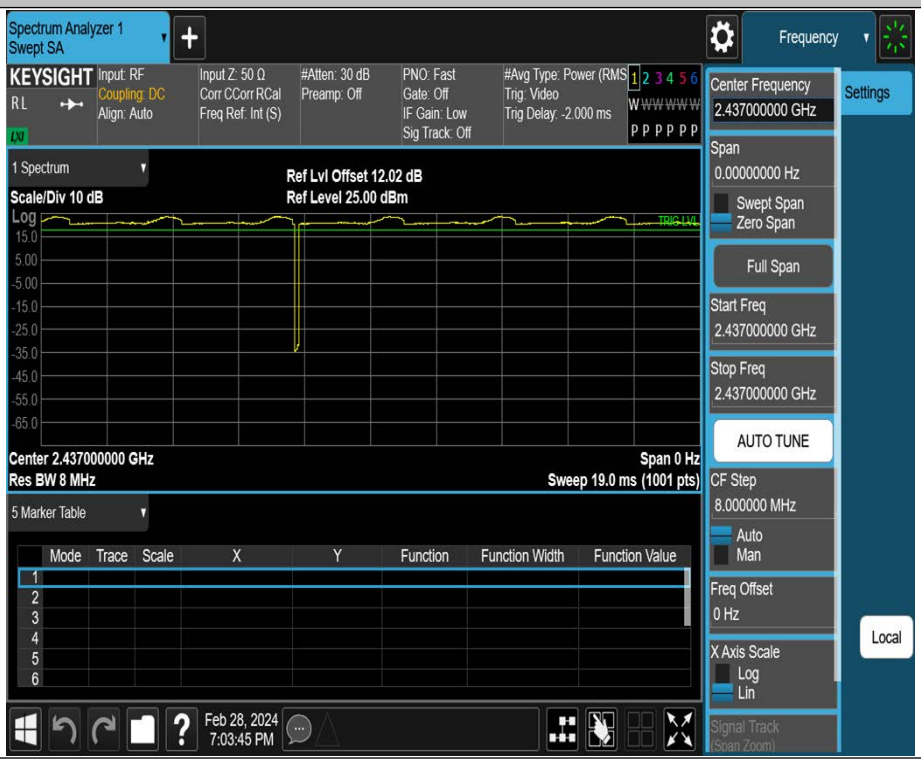

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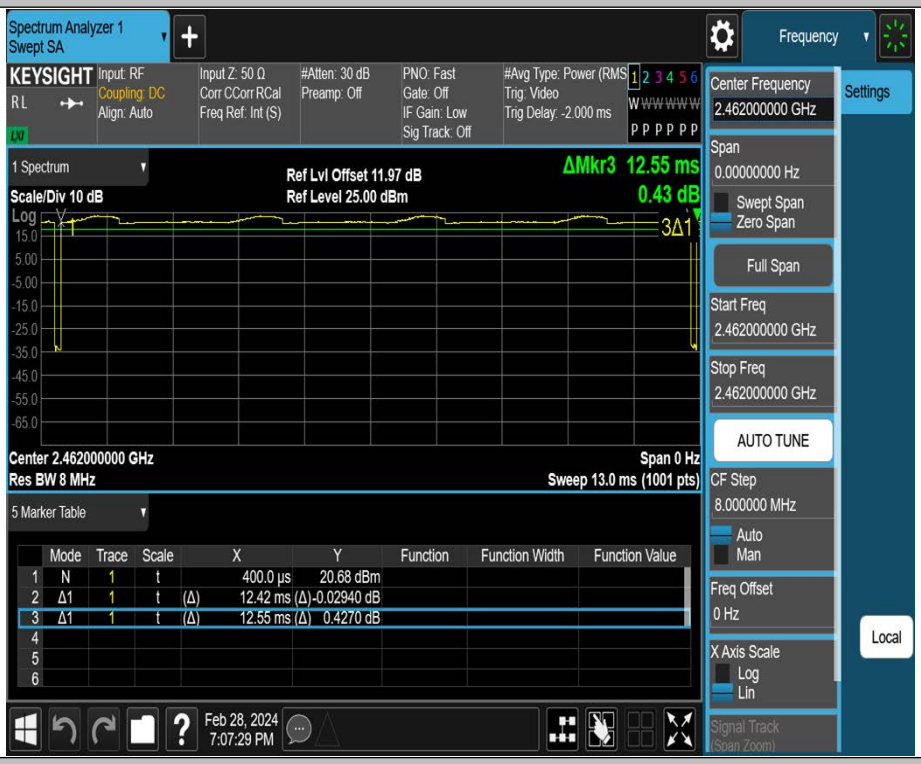

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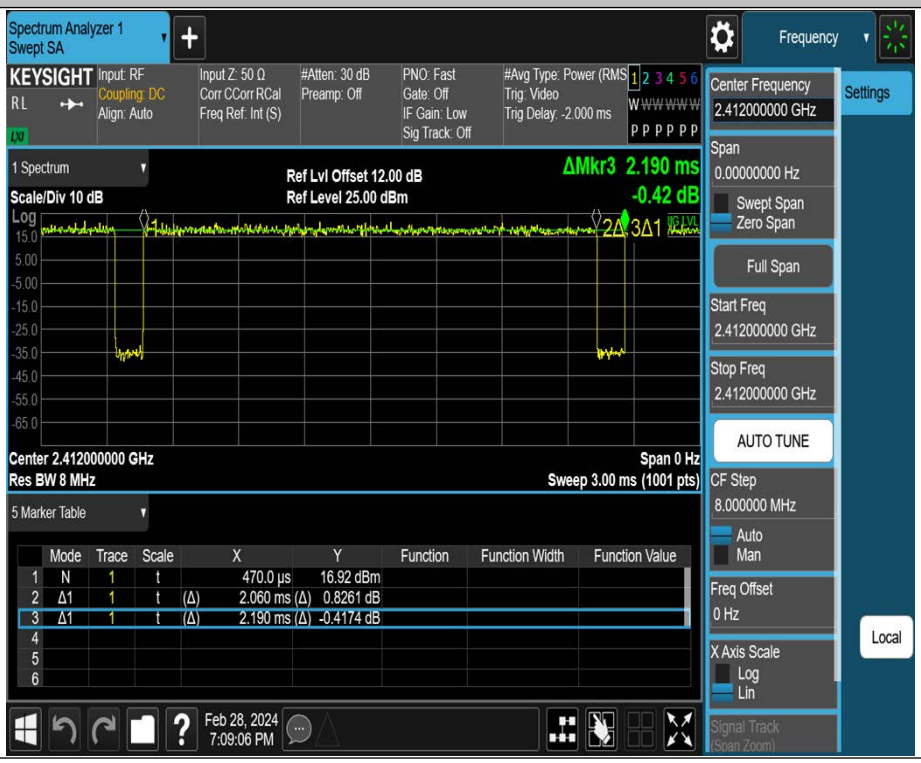

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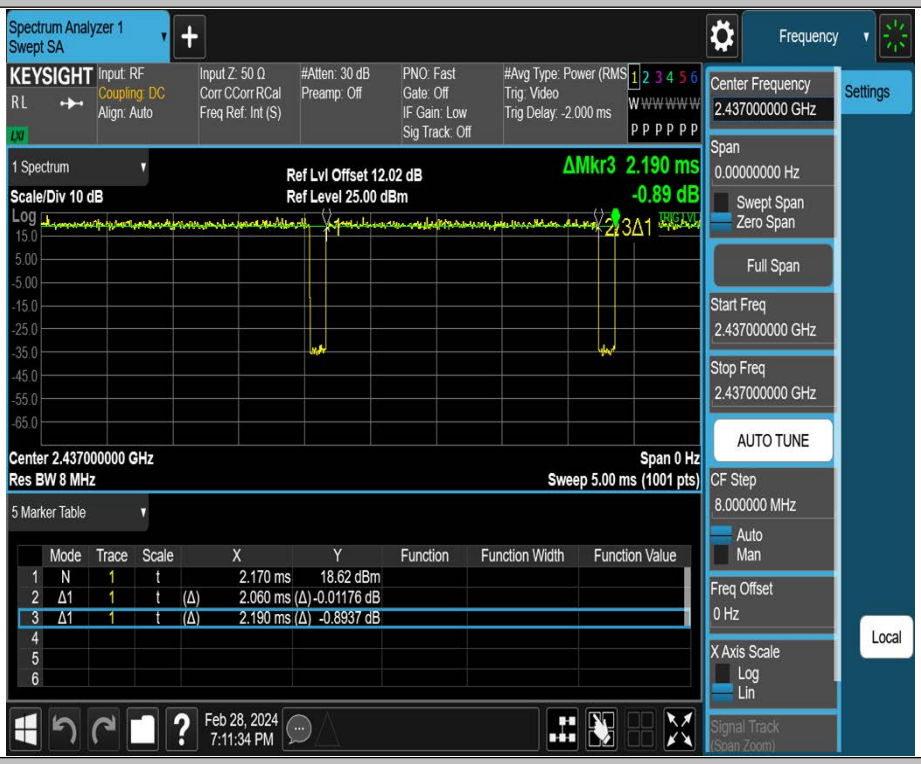

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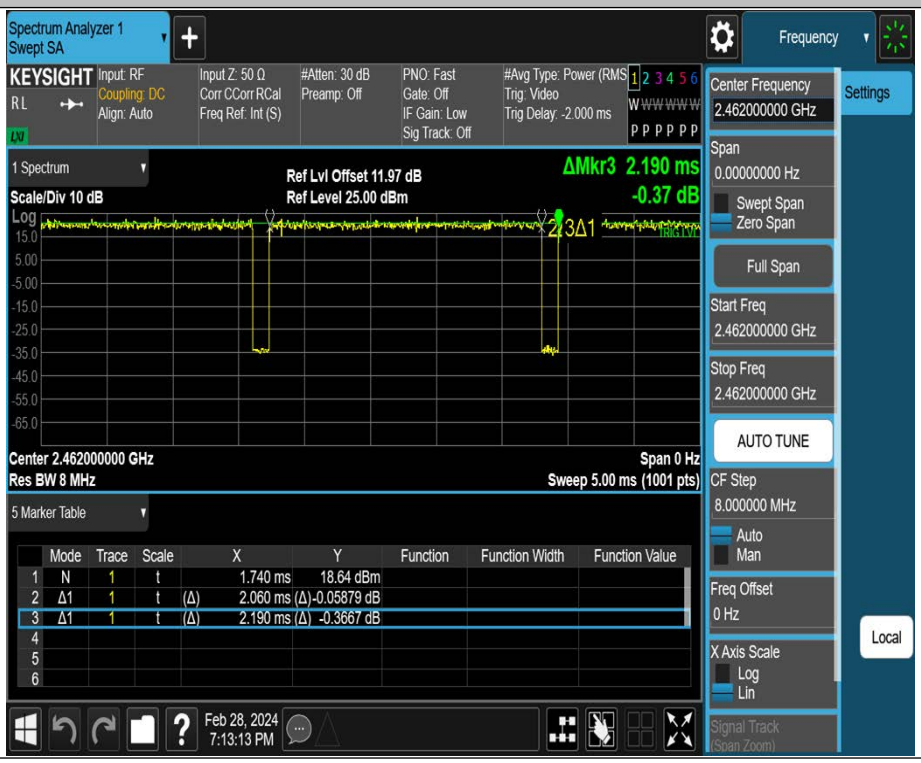

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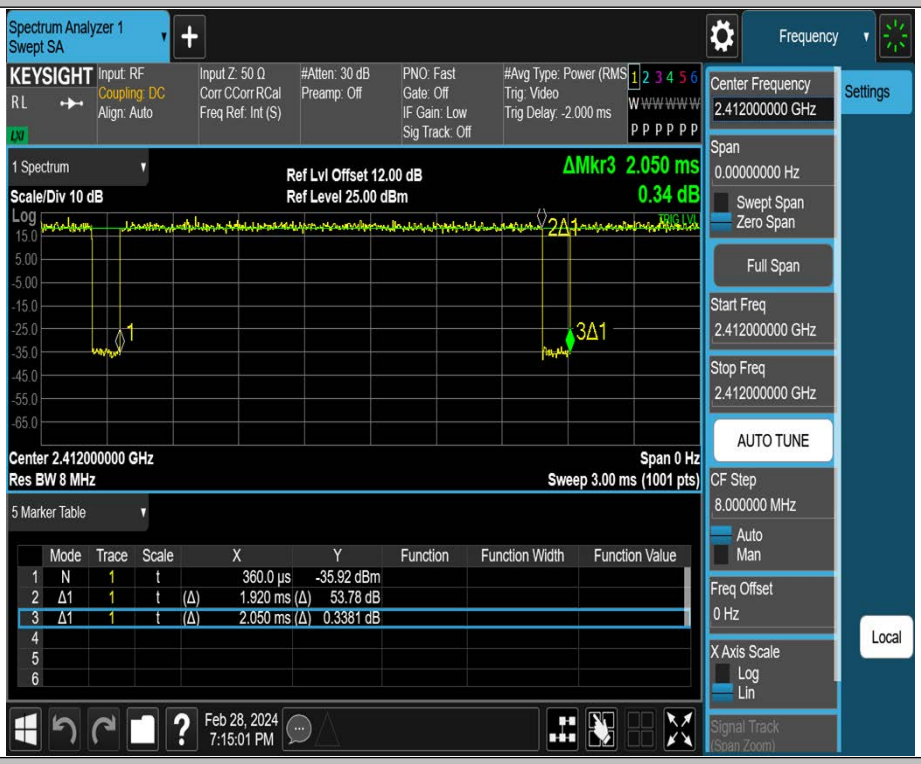

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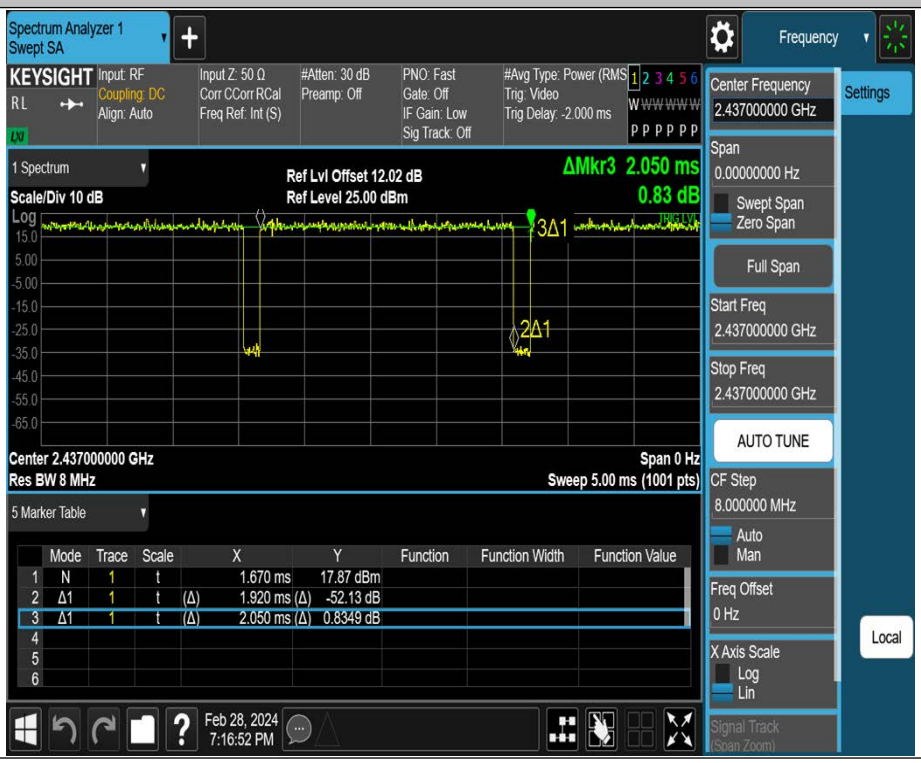

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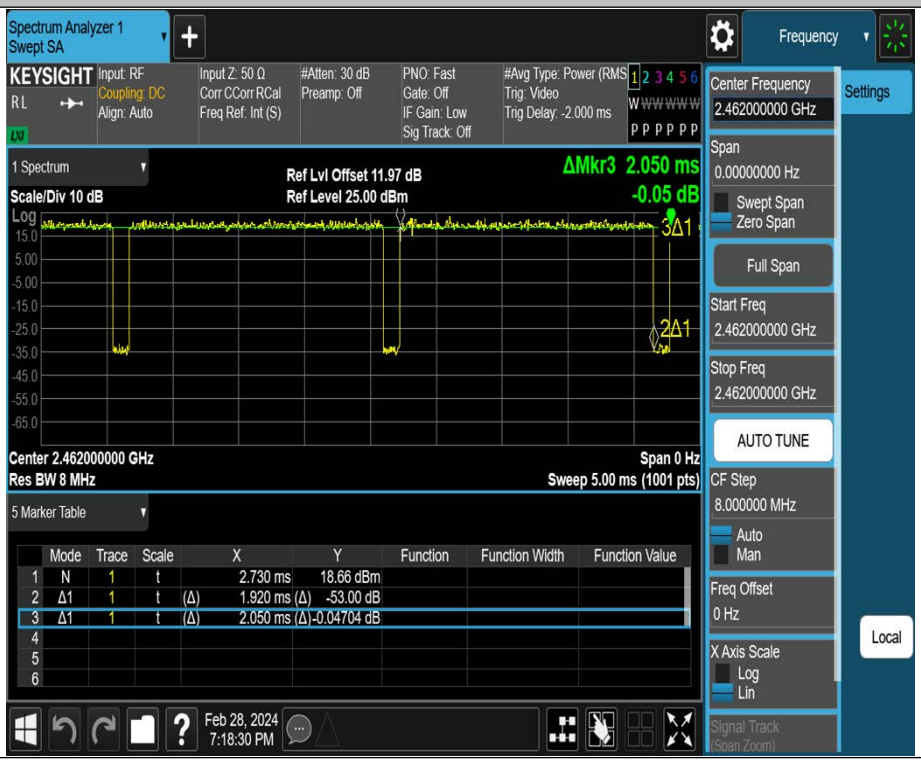


2.7 Measurement Uncertainty

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	±143.88kHz
Power Spectral Density	±0.743dB
Conducted Spurious Emission	±1.328dB
RF power conducted	±0.384dB
Conducted emission(9kHz~30MHz) AC main	±2.72dB
Radiated emission(9kHz~30MHz)	±2.66dB
Radiated emission (30MHz~1GHz)	±4.62dB
Radiated emission (1GHz~18GHz)	±4.86dB
Radiated emission (18GHz~40GHz)	±3.80dB

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

None

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(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 Procedure

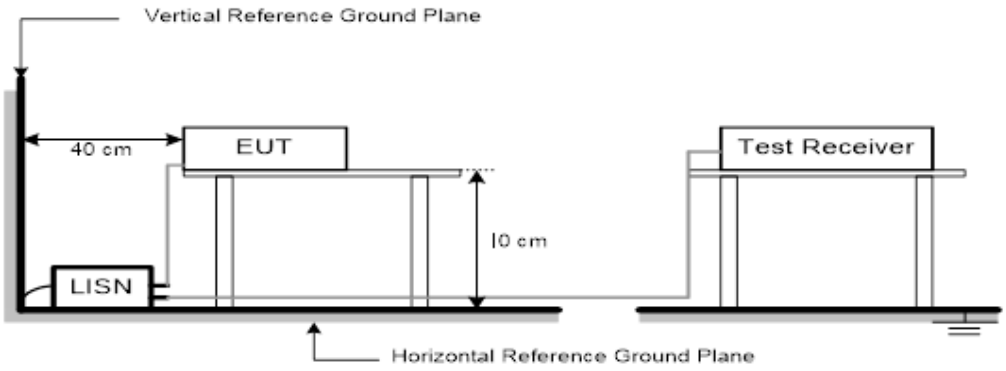
Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
○Lowest, Middle and Highest Channel	○Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

a) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

3.1.3 Test Setup



3.1.4 Test Result

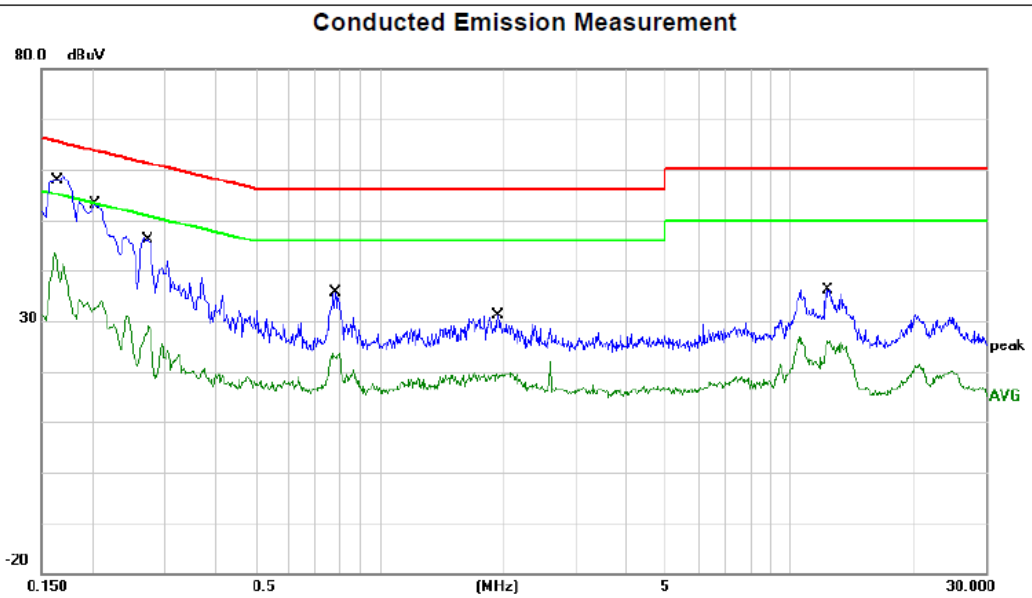
Note:

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

We only recorded the data of the worst mode. Please see the following:

150kHz~30MHz	Worst Case Operating Mode: 11B Channel 1

Line

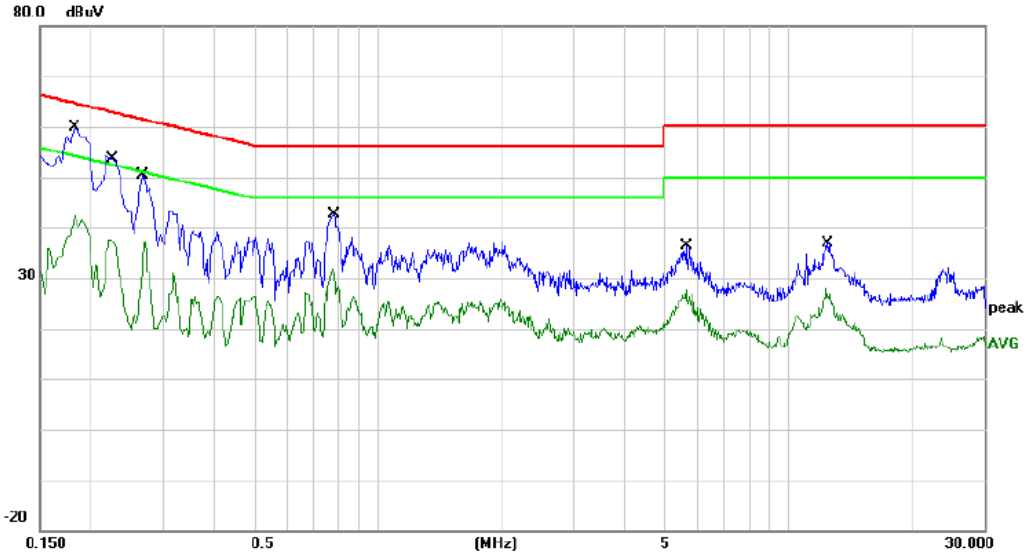


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1624	35.17	20.09	55.26	65.34	-10.08	QP	
2		0.1624	17.77	20.09	37.86	55.34	-17.48	AVG	
3		0.2030	27.30	19.99	47.29	63.49	-16.20	QP	
4		0.2030	10.13	19.99	30.12	53.49	-23.37	AVG	
5		0.2740	21.80	20.05	41.85	61.00	-19.15	QP	
6		0.2740	6.55	20.05	26.60	51.00	-24.40	AVG	
7		0.7820	9.78	20.24	30.02	56.00	-25.98	QP	
8		0.7820	2.59	20.24	22.83	46.00	-23.17	AVG	
9		1.9420	3.51	20.16	23.67	56.00	-32.33	QP	
10		1.9420	-1.11	20.16	19.05	46.00	-26.95	AVG	
11		12.4180	10.00	20.13	30.13	60.00	-29.87	QP	
12		12.4180	4.09	20.13	24.22	50.00	-25.78	AVG	

150kHz~30MHz	Worst Case Operating Mode: 11B Channel 1

Neutral

Conducted Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1820	36.79	20.06	56.85	64.39	-7.54	QP	
2		0.1820	22.31	20.06	42.37	54.39	-12.02	AVG	
3		0.2260	30.47	19.98	50.45	62.60	-12.15	QP	
4		0.2260	17.69	19.98	37.67	52.60	-14.93	AVG	
5		0.2660	27.53	20.03	47.56	61.24	-13.68	QP	
6		0.2660	17.22	20.03	37.25	51.24	-13.99	AVG	
7		0.7820	19.61	20.24	39.85	56.00	-16.15	QP	
8		0.7820	11.67	20.24	31.91	46.00	-14.09	AVG	
9		5.6380	13.45	20.00	33.45	60.00	-26.55	QP	
10		5.6380	7.57	20.00	27.57	50.00	-22.43	AVG	
11		12.4660	13.62	20.13	33.75	60.00	-26.25	QP	
12		12.4660	7.71	20.13	27.84	50.00	-22.16	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	
		μV/m	dB(μV)/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 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Note: (1) Emission level dBμV = 20 log Emission level μV/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	

a) The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.1 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 0.1 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.

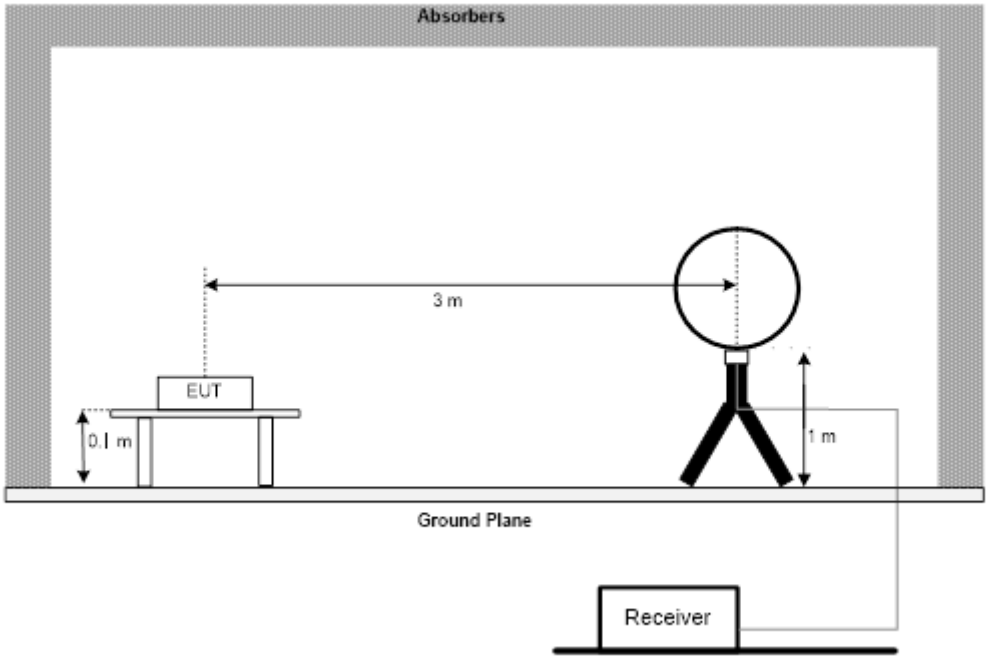
g) All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1 GHz)

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)

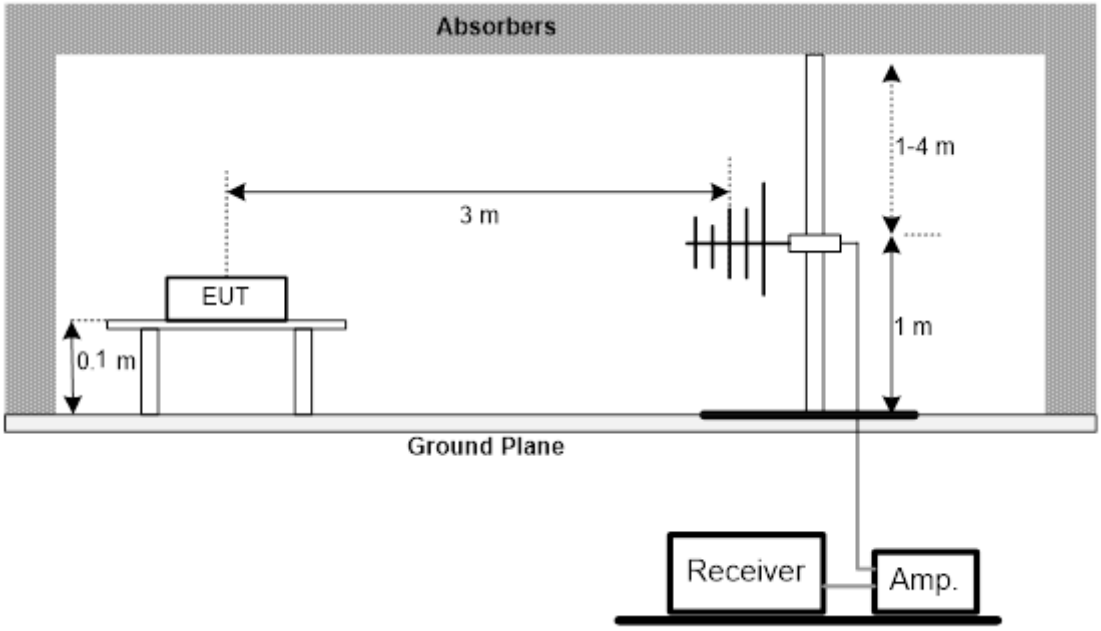
i) For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.2.3 Test Setup

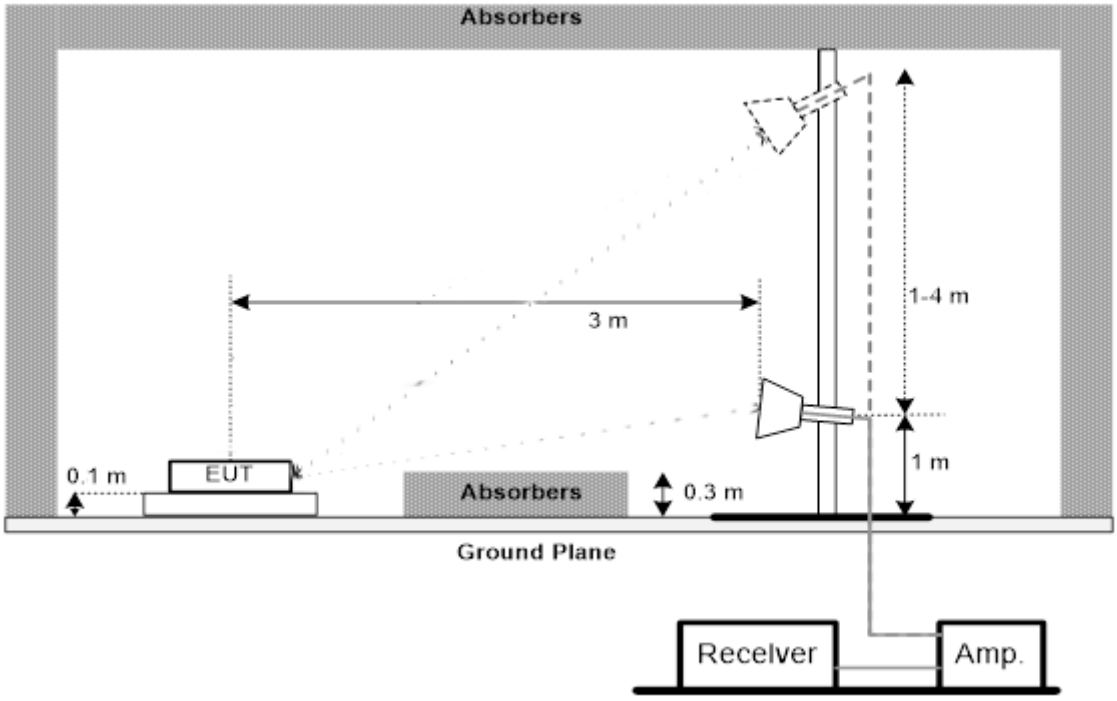
(A) Radiated Emission Test Set-Up Frequency Below 30 MHz



(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

We only recorded the data of the worst mode. Please see the following:

Below 1G (30MHz~1GHz)	Worst Case Operating Mode: 11B Channel 1

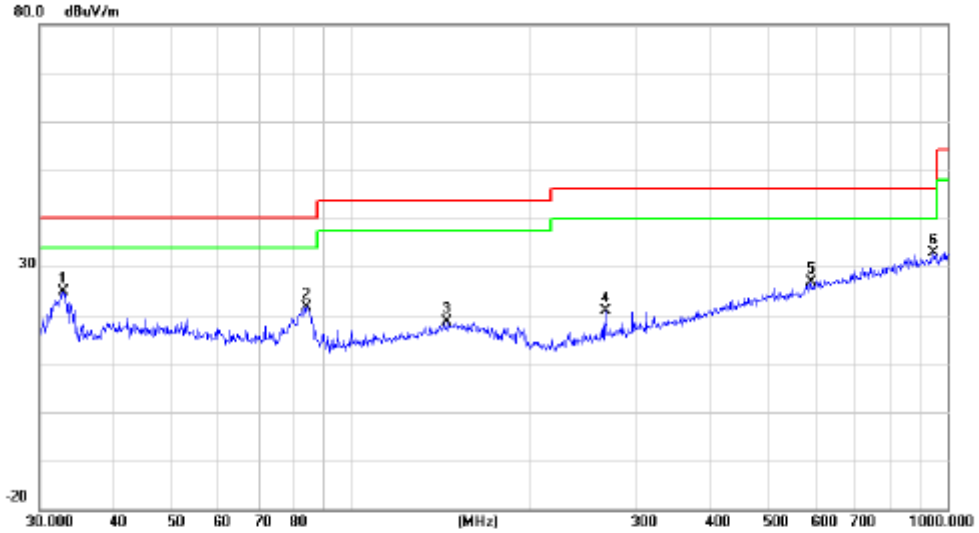
VERTICAL

Radiated Emission

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		33.7986	39.70	-10.69	29.01	40.00	-10.99	peak			
2		50.0566	38.13	-9.44	28.69	40.00	-11.31	peak			
3	*	84.4054	43.44	-13.07	30.37	40.00	-9.63	peak			
4		99.8777	40.79	-12.71	28.08	43.50	-15.42	peak			
5		254.7284	32.46	-10.66	21.80	46.00	-24.20	peak			
6		881.4067	28.98	3.22	32.20	46.00	-13.80	peak			

HORIZONTAL

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		32.8637	35.76	-10.80	24.96	40.00	-15.04	peak			
2		84.1100	34.57	-12.99	21.58	40.00	-18.42	peak			
3		144.8418	27.02	-8.39	18.63	43.50	-24.87	peak			
4		266.6090	31.24	-10.31	20.93	46.00	-25.07	peak			
5		590.9737	28.66	-1.82	26.84	46.00	-19.16	peak			
6	*	948.7610	29.08	3.83	32.91	46.00	-13.09	peak			

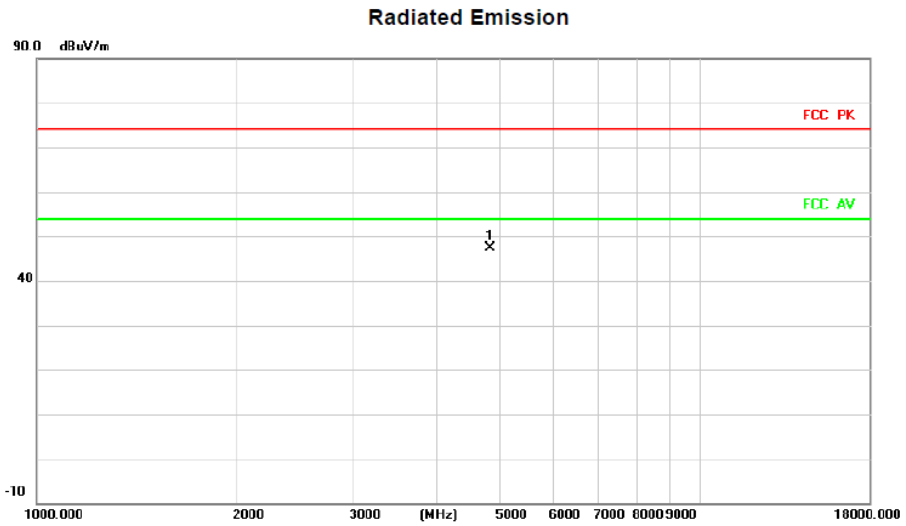
3) Radiated emission: Above 1G

Note:

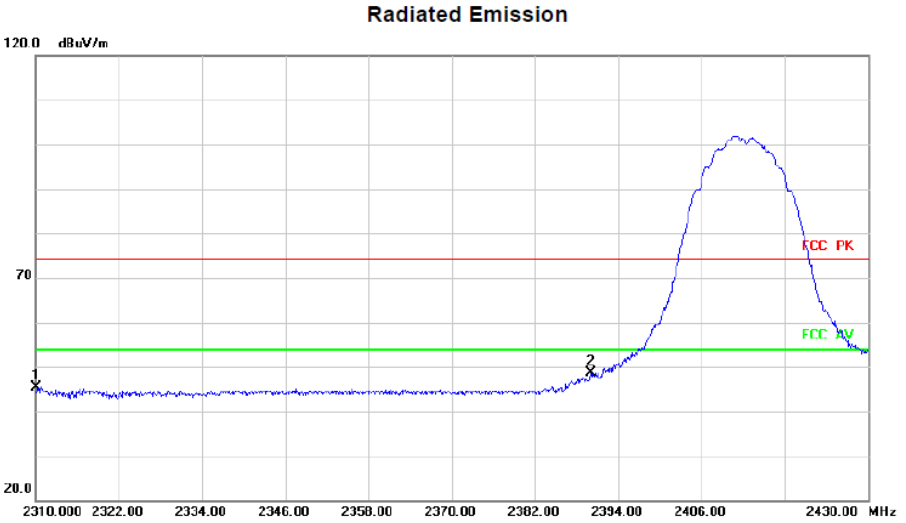
1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit

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

VERTICAL

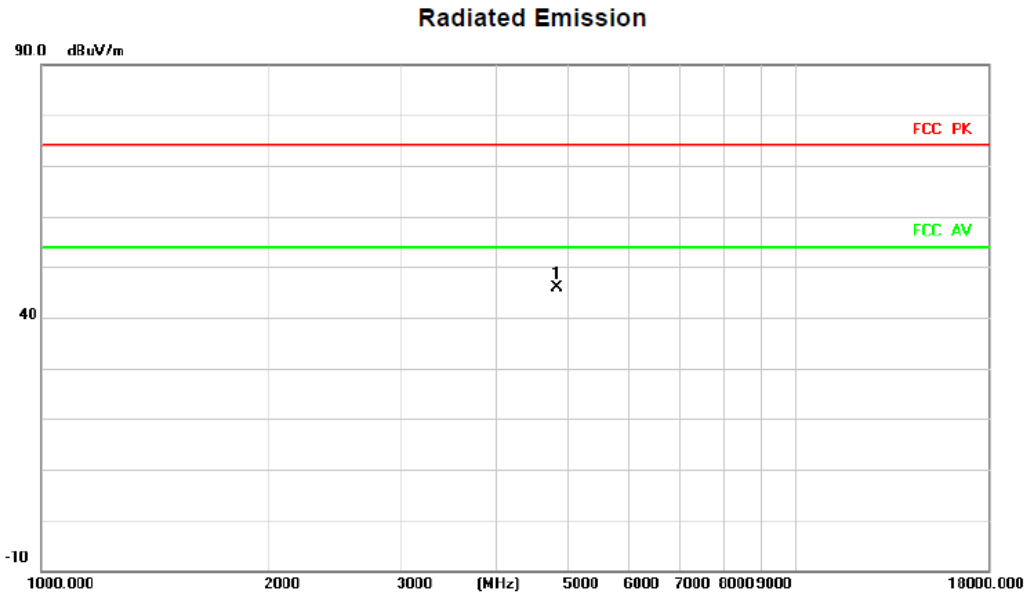


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4824.000	51.44	-4.18	47.26	74.00	-26.74	peak			

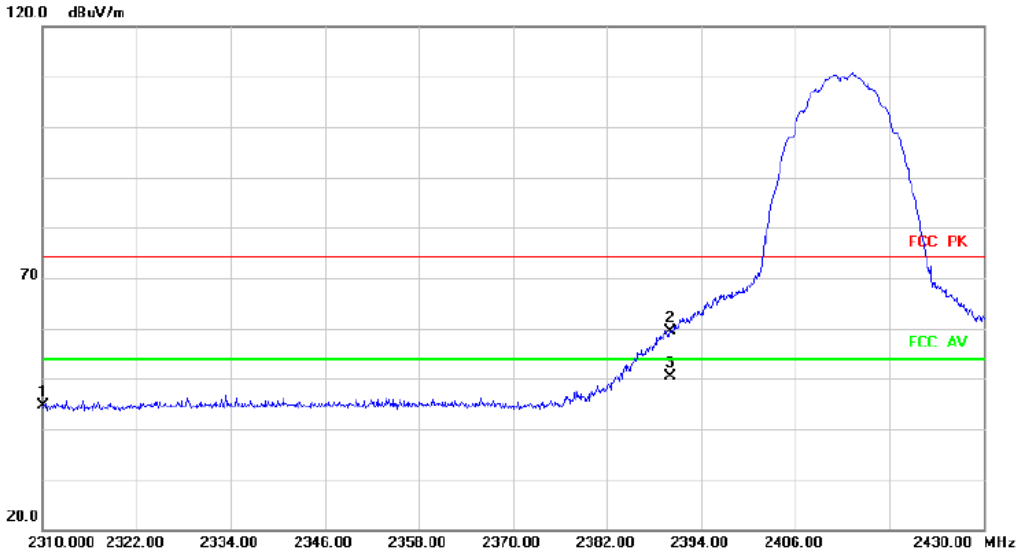


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	37.04	8.22	45.26	74.00	-28.74	peak			
2	*	2390.000	40.21	8.46	48.67	74.00	-25.33	peak			

HORIZONTA



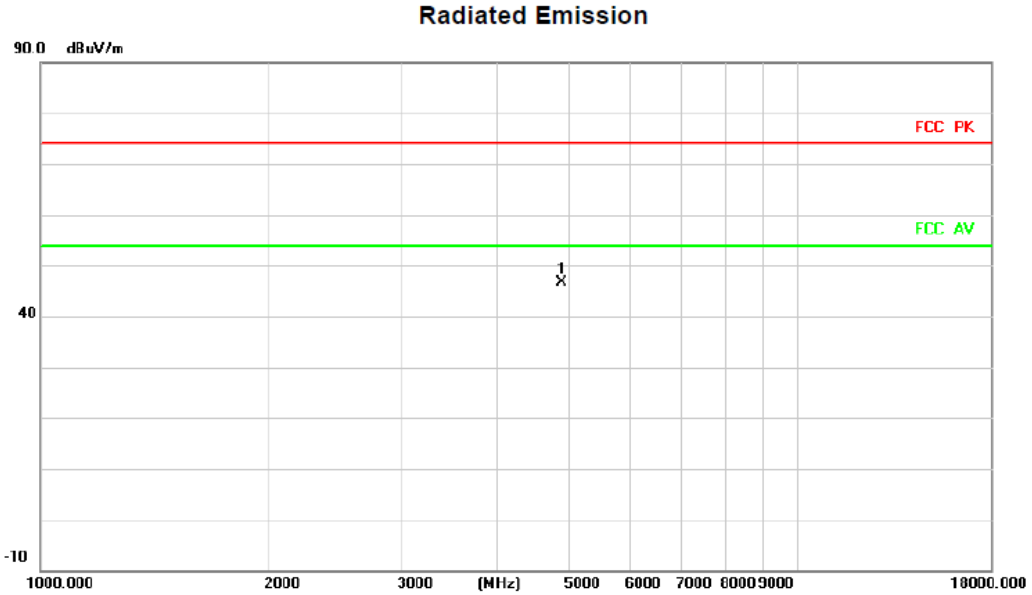
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4824.000	49.94	-4.18	45.76	74.00	-28.24	peak			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	36.46	8.22	44.68	74.00	-29.32	peak			
2		2390.000	50.85	8.46	59.31	74.00	-14.69	peak			
3	*	2390.000	42.00	8.46	50.46	54.00	-3.54	AVG			

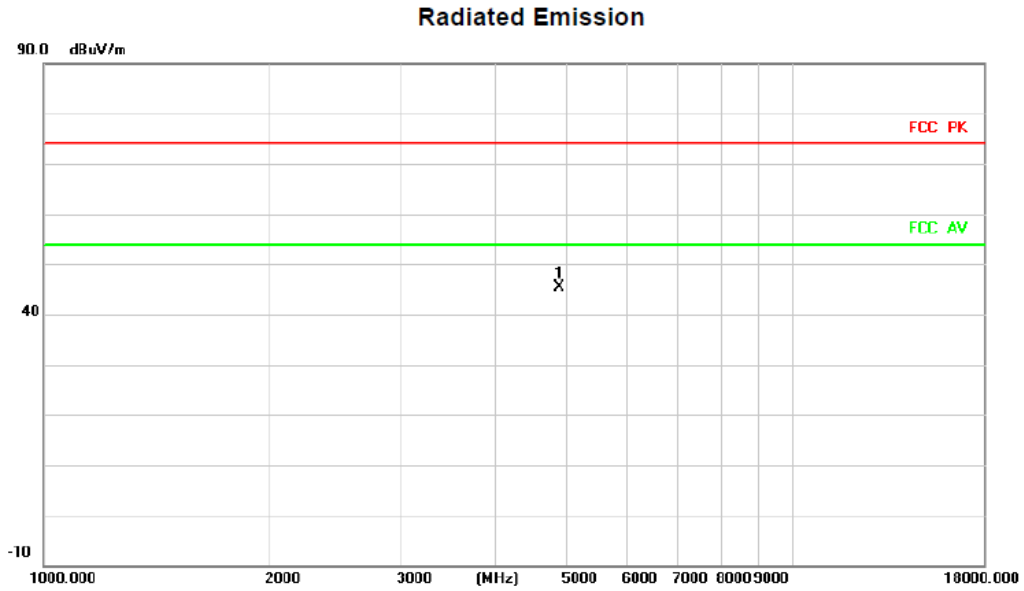
Above 1G (1GHz~18GHz)	Test mode:11B	Test Channel:6

VERTICAL



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4874.000	51.14	-4.56	46.58	74.00	-27.42	peak			

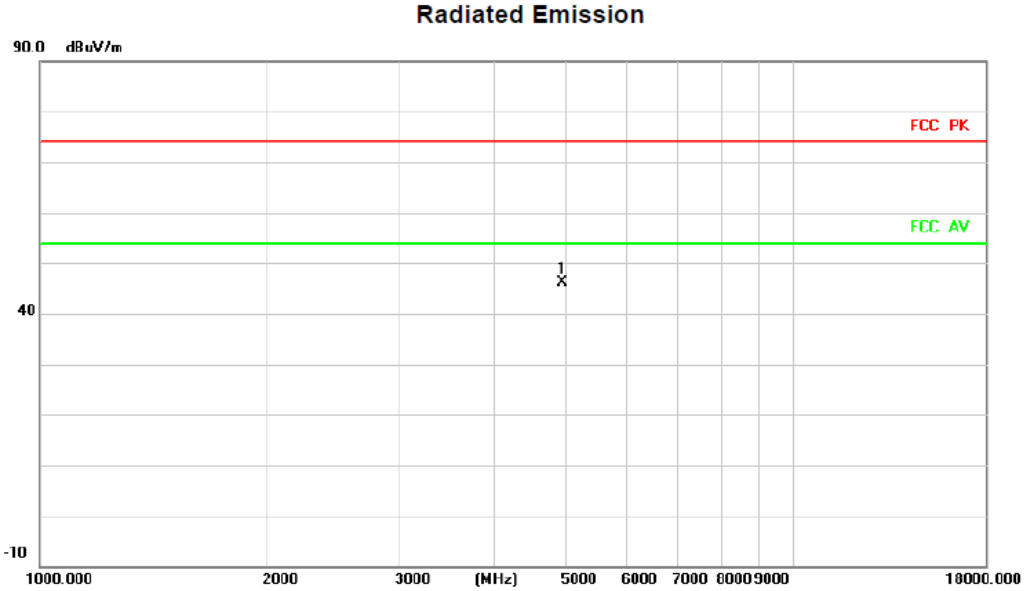
HORIZONTA



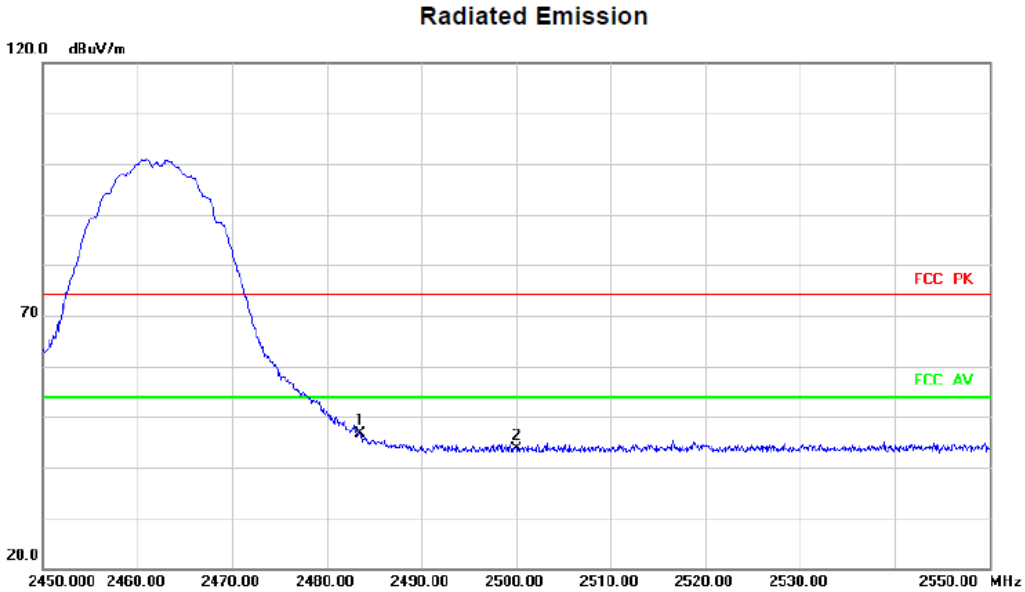
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4874.000	49.83	-4.56	45.27	74.00	-28.73	peak			

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

VERTICAL

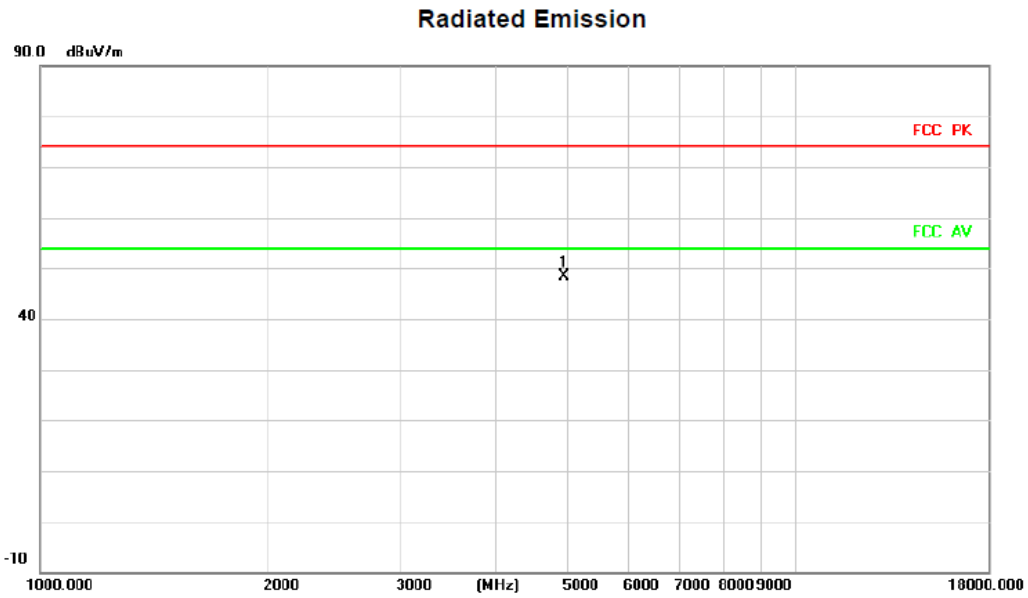


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4924.000	51.14	-4.90	46.24	74.00	-27.76	peak			

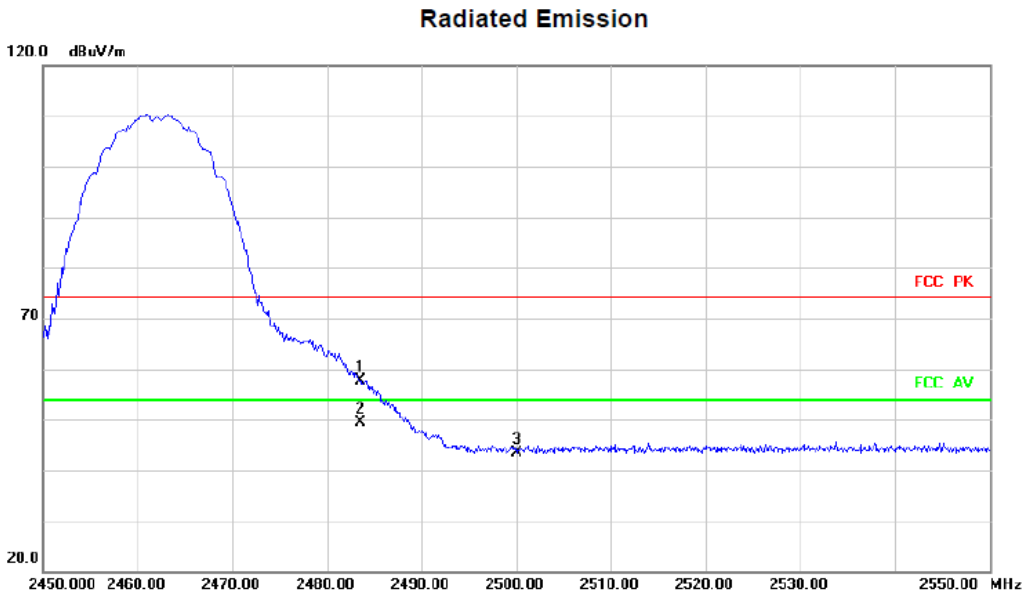


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	37.54	9.10	46.64	74.00	-27.36	peak			
2		2500.000	34.45	9.26	43.71	74.00	-30.29	peak			

HORIZONTA



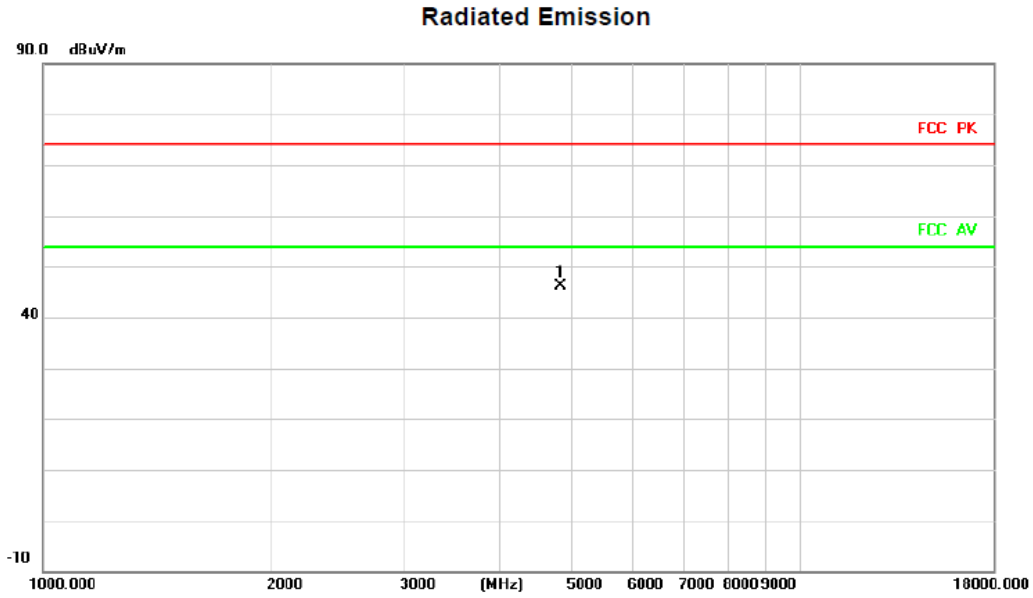
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4924.000	53.29	-4.90	48.39	74.00	-25.61	peak			



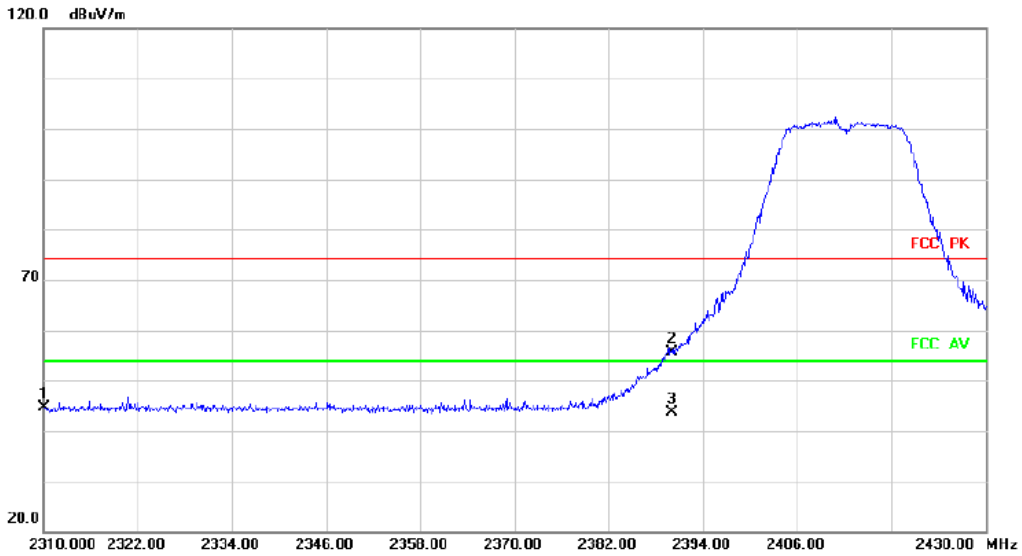
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	48.48	9.10	57.58	74.00	-16.42	peak			
2	*	2483.500	40.16	9.10	49.26	54.00	-4.74	AVG			
3		2500.000	34.13	9.26	43.39	74.00	-30.61	peak			

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

VERTICAL

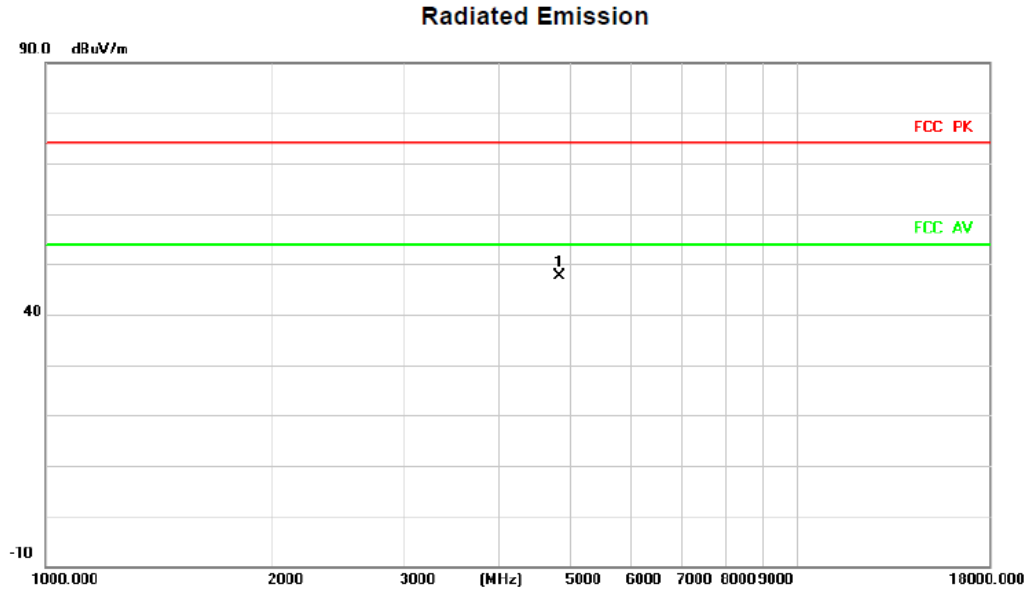


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4824.000	50.41	-4.18	46.23	74.00	-27.77	peak			

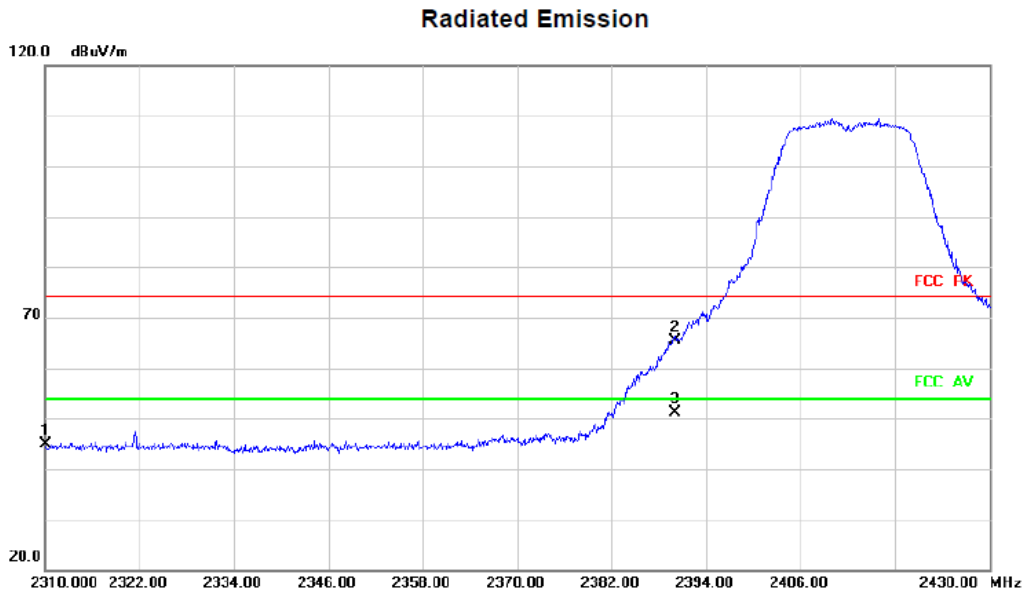


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	36.35	8.22	44.57	74.00	-29.43	peak			
2		2390.000	47.12	8.46	55.58	74.00	-18.42	peak			
3	*	2390.000	35.10	8.46	43.56	54.00	-10.44	AVG			

HORIZONTA



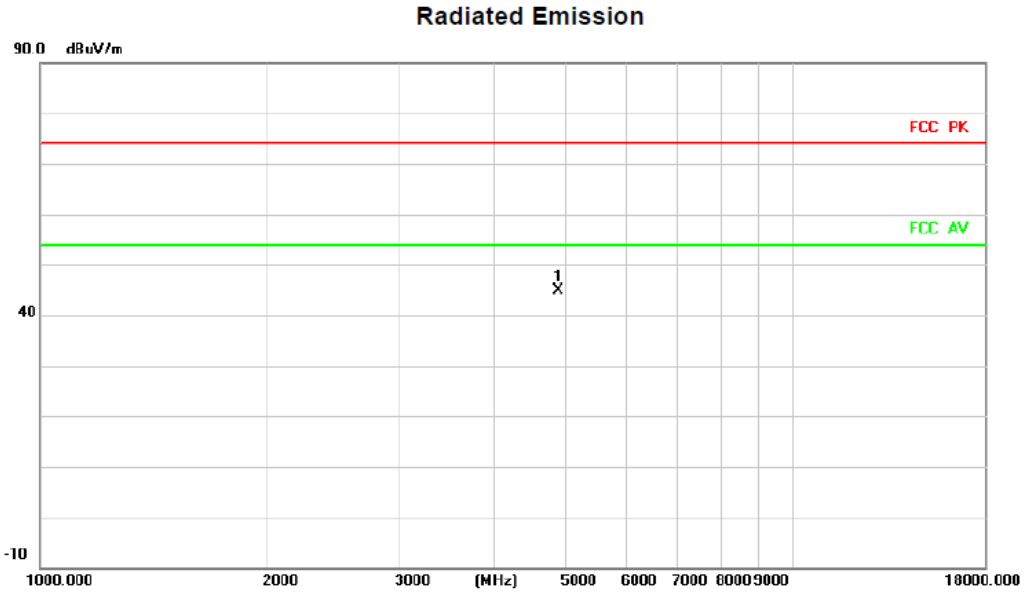
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4824.000	51.75	-4.18	47.57	74.00	-26.43	peak			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	36.74	8.22	44.96	74.00	-29.04	peak			
2		2390.000	56.87	8.46	65.33	74.00	-8.67	peak			
3	*	2390.000	42.59	8.46	51.05	54.00	-2.95	AVG			

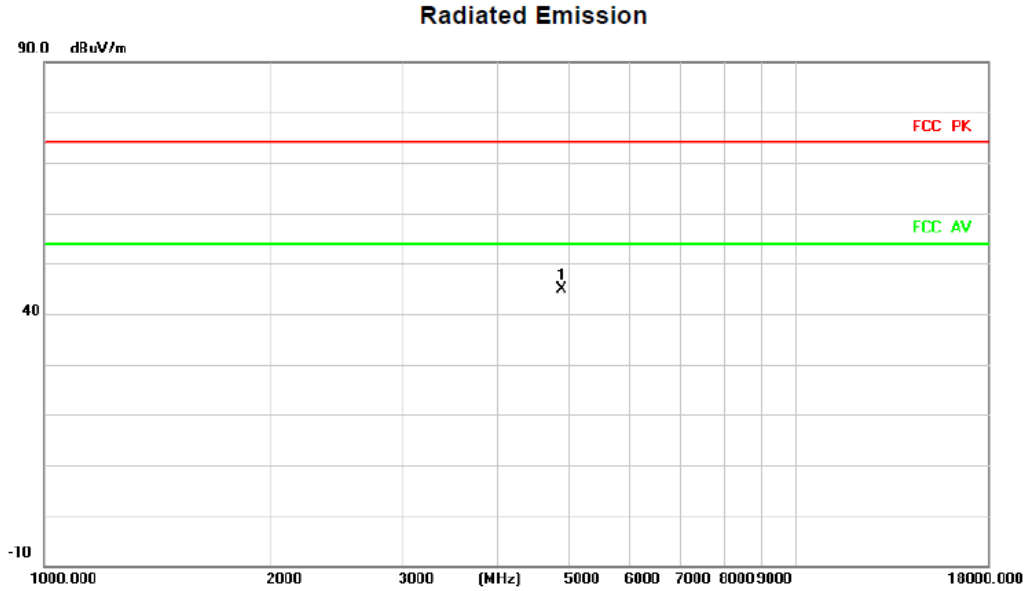
Above 1G (1GHz~18GHz)	Test mode:11G	Test Channel:6

VERTICAL



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4874.000	49.41	-4.56	44.85	74.00	-29.15	peak			

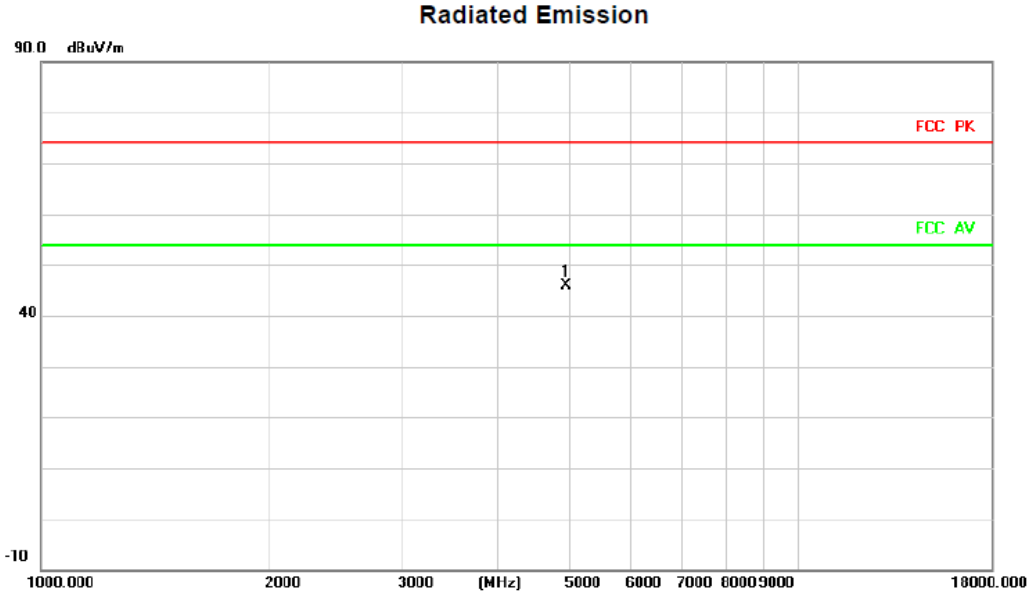
HORIZONTA



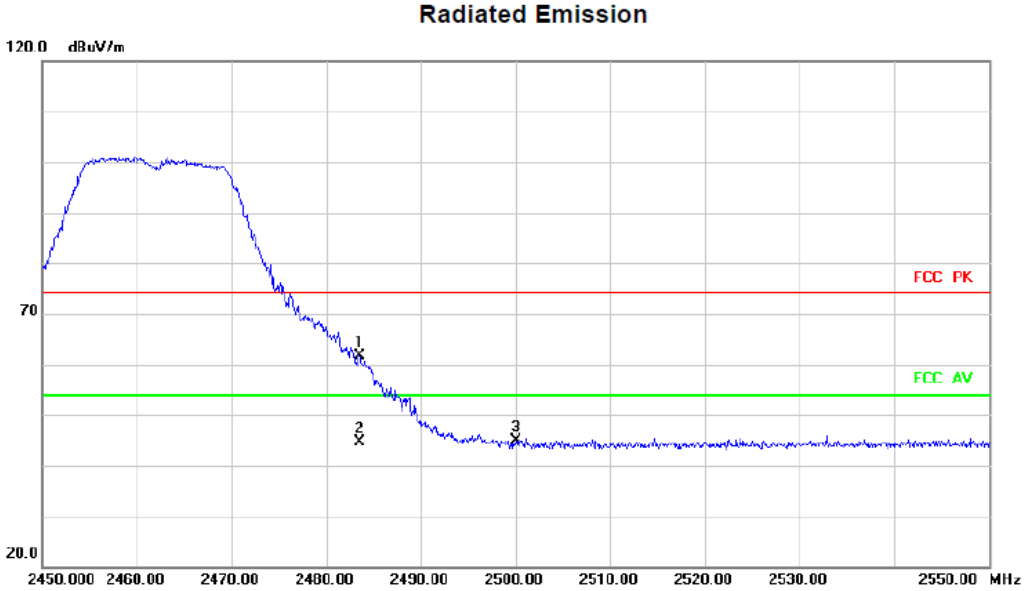
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4874.000	49.38	-4.56	44.82	74.00	-29.18	peak			

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

VERTICAL

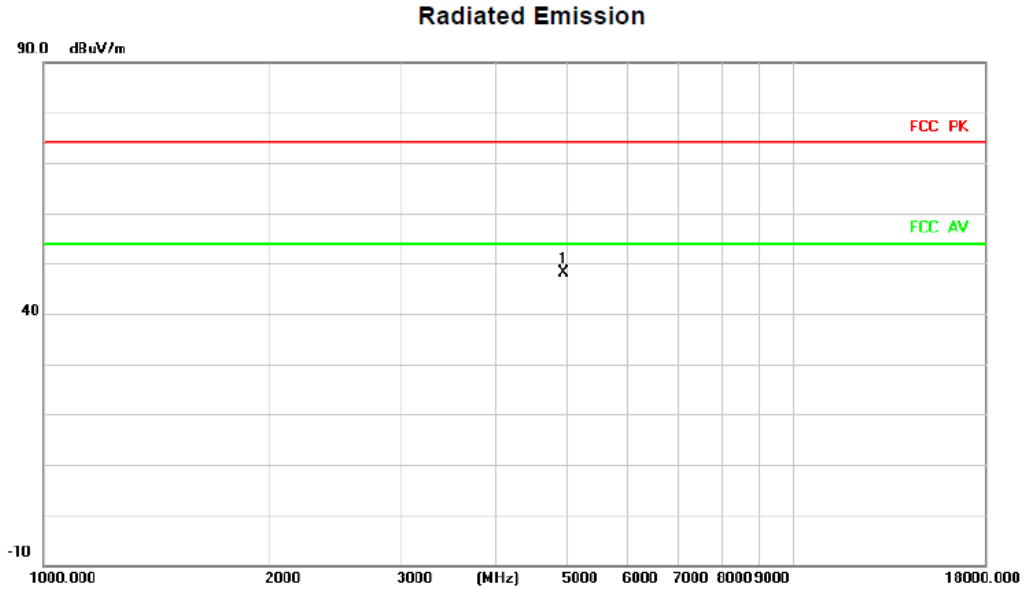


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4924.000	50.76	-4.90	45.86	74.00	-28.14	peak			

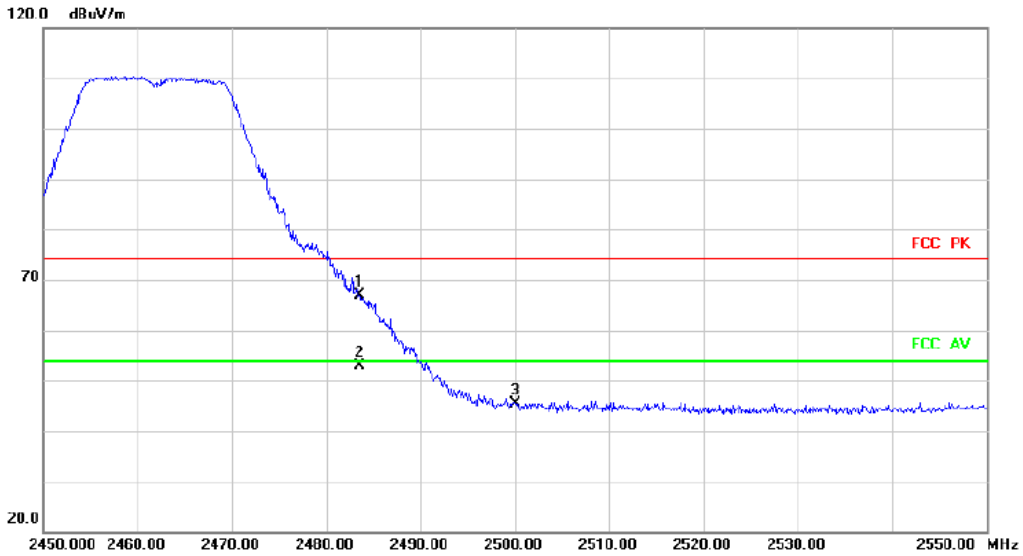


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	52.43	9.10	61.53	74.00	-12.47	peak			
2	*	2483.500	35.51	9.10	44.61	54.00	-9.39	AVG			
3		2500.000	35.66	9.26	44.92	74.00	-29.08	peak			

HORIZONTA



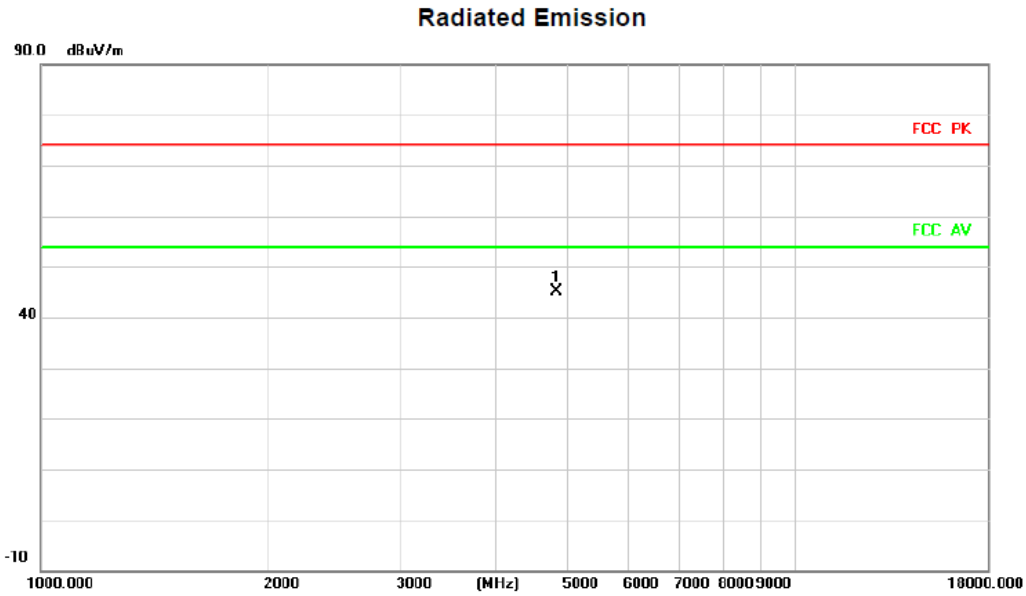
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4924.000	52.98	-4.90	48.08	74.00	-25.92	peak			



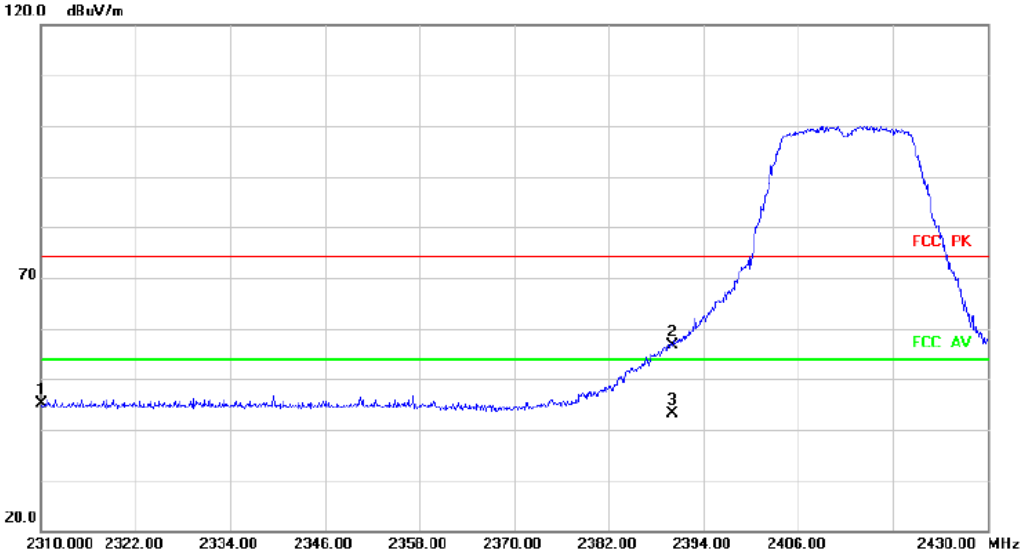
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	57.86	9.10	66.96	74.00	-7.04	peak			
2	*	2483.500	43.74	9.10	52.84	54.00	-1.16	AVG			
3		2500.000	36.18	9.26	45.44	74.00	-28.56	peak			

Above 1G (1GHz~18GHz)	Test mode: 11N20	Test Channel:1

VERTICAL



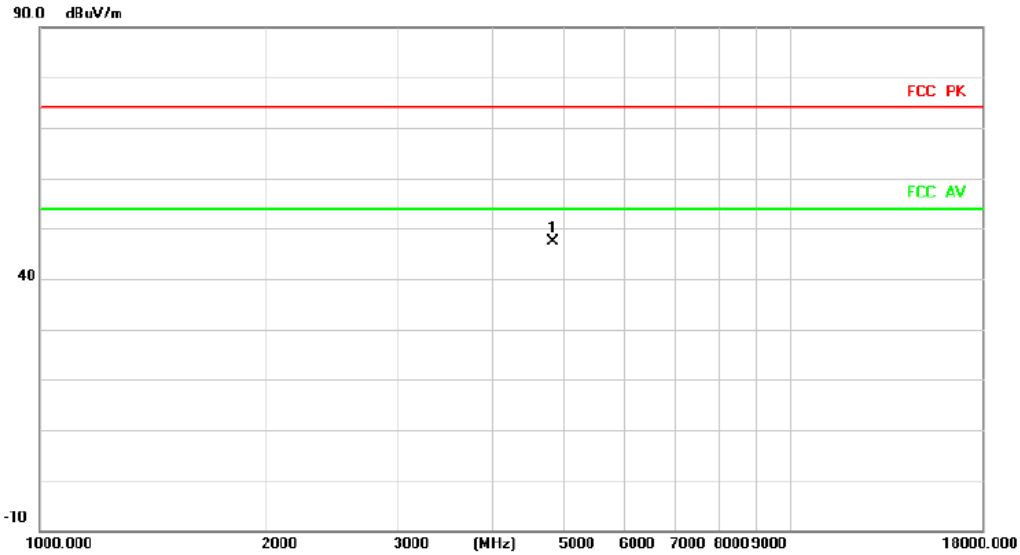
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4824.000	49.41	-4.18	45.23	74.00	-28.77	peak			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	36.88	8.22	45.10	74.00	-28.90	peak			
2		2390.000	48.07	8.46	56.53	74.00	-17.47	peak			
3	*	2390.000	34.70	8.46	43.16	54.00	-10.84	AVG			

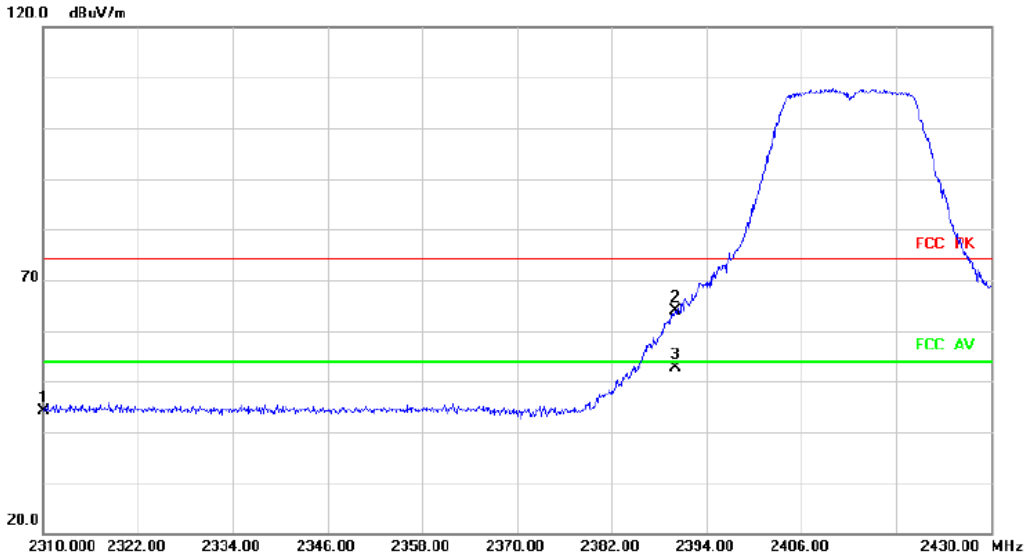
HORIZONTA

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4824.000	51.59	-4.18	47.41	74.00	-26.59	peak			

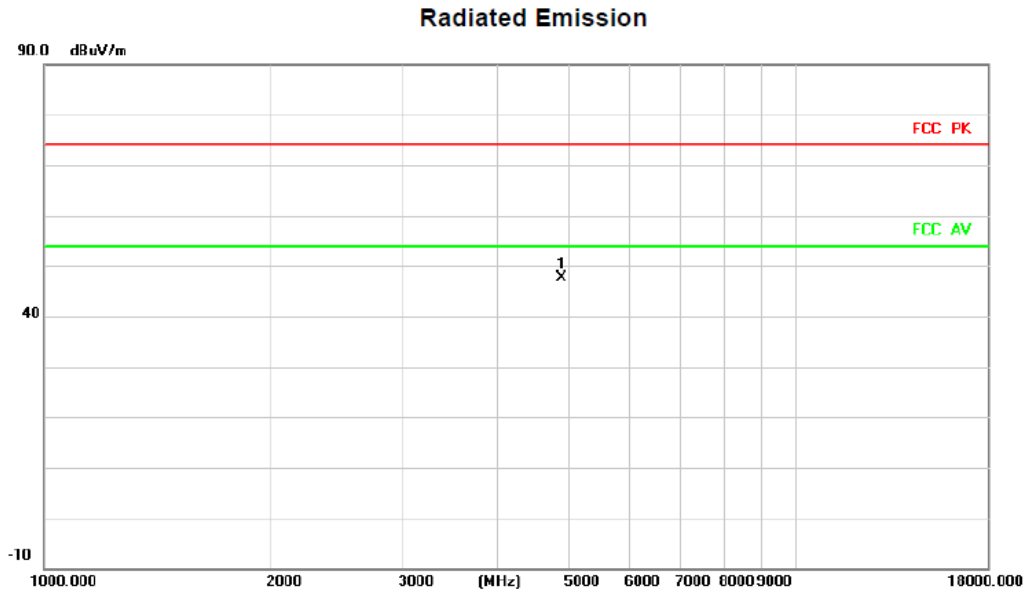
Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2310.000	35.96	8.22	44.18	74.00	-29.82	peak			
2		2390.000	55.46	8.46	63.92	74.00	-10.08	peak			
3	*	2390.000	44.06	8.46	52.52	54.00	-1.48	AVG			

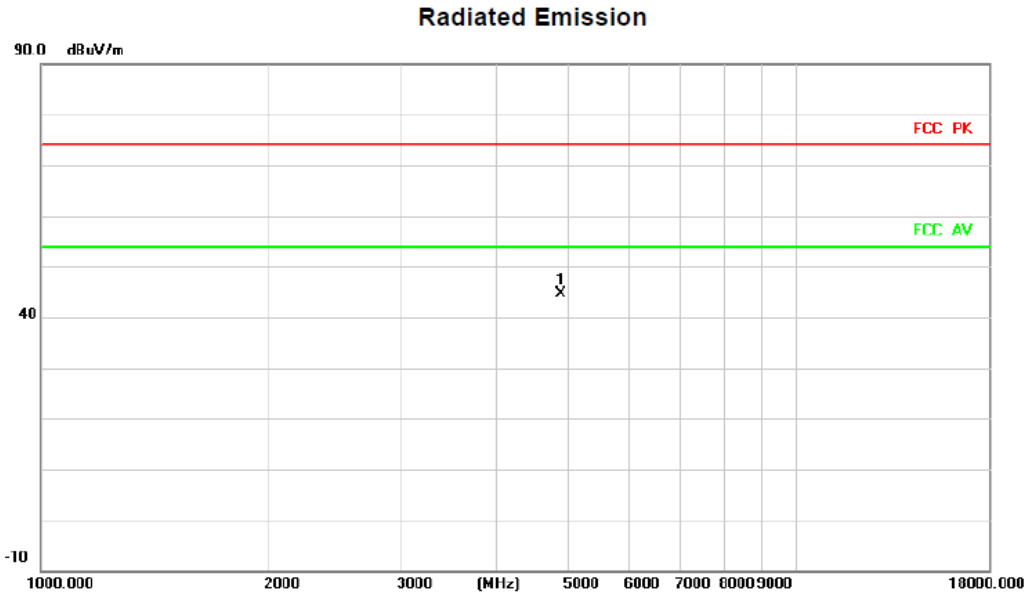
Above 1G (1GHz~18GHz)	Test mode:11N20	Test Channel:6

VERTICAL



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4874.000	52.12	-4.56	47.56	74.00	-26.44	peak			

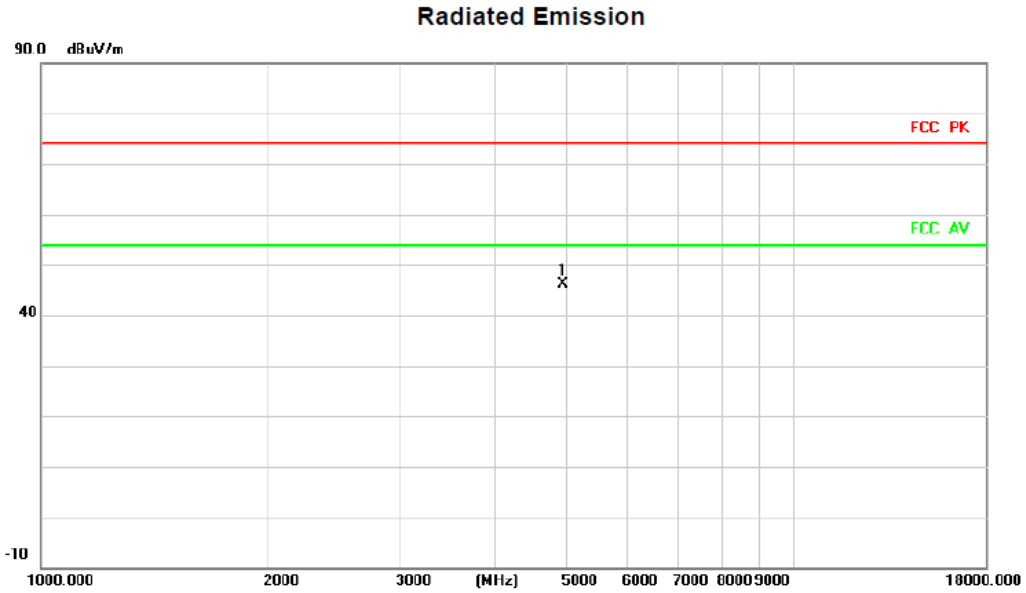
HORIZONTA



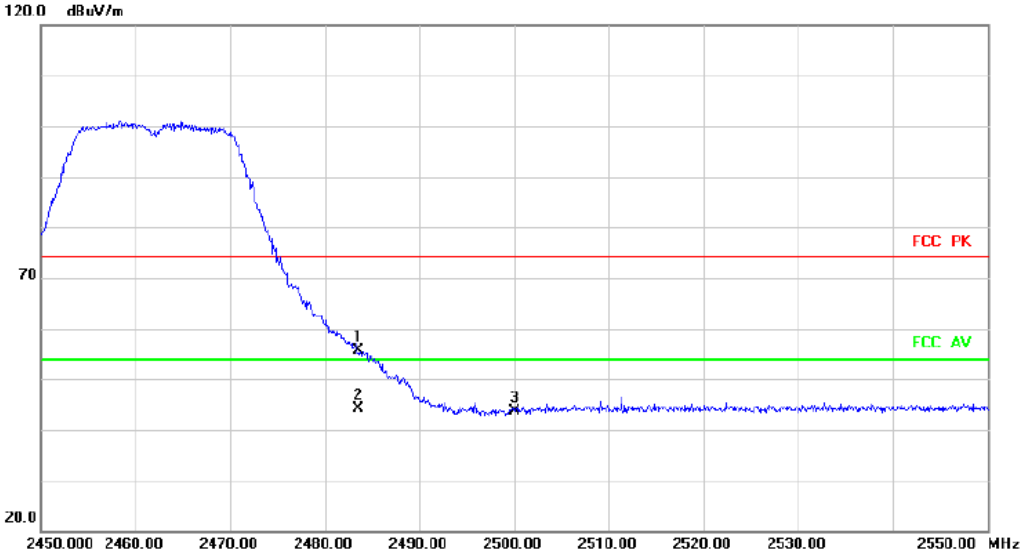
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4874.000	49.31	-4.56	44.75	74.00	-29.25	peak			

Above 1G (1GHz~18GHz)	Test mode: 11N20	Test Channel:11

VERTICAL

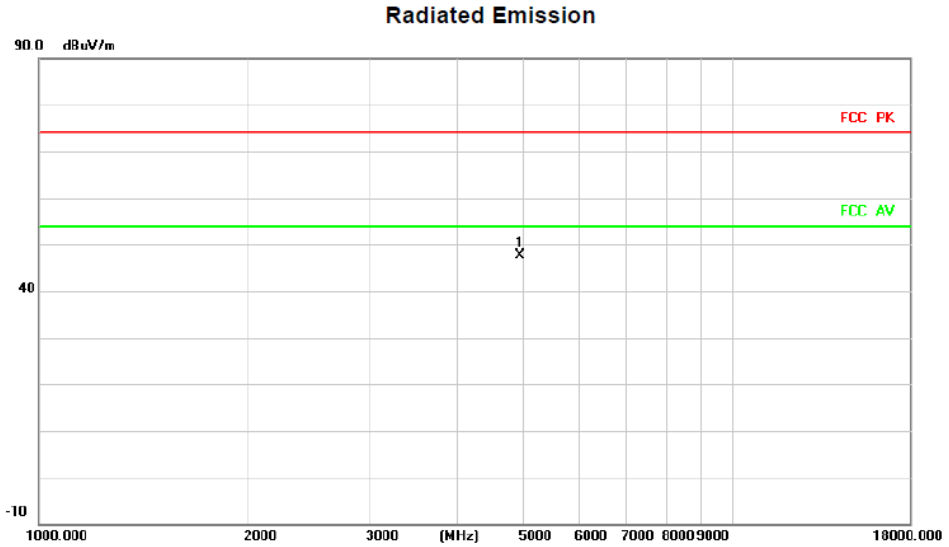


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4924.000	50.98	-4.90	46.08	74.00	-27.92	peak			

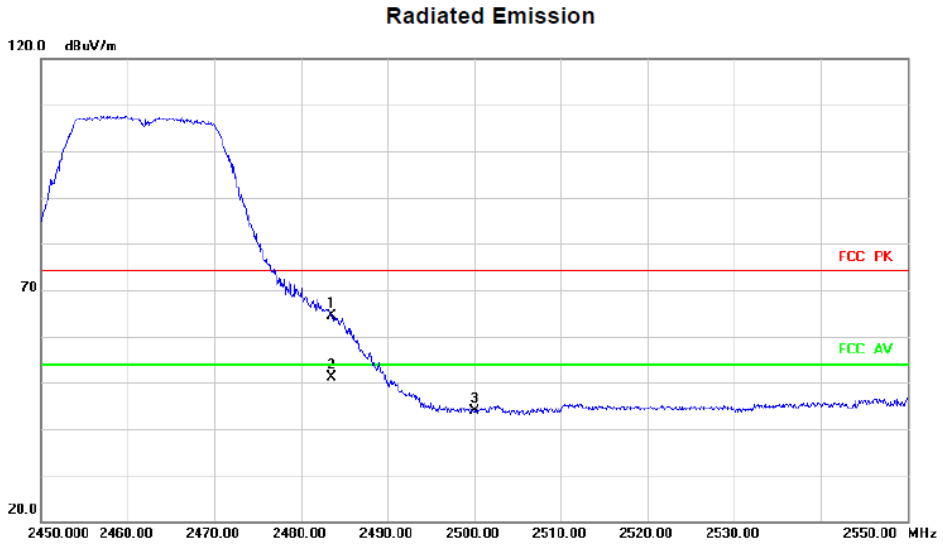


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	46.51	9.10	55.61	74.00	-18.39	peak			
2	*	2483.500	35.11	9.10	44.21	54.00	-9.79	AVG			
3		2500.000	34.34	9.26	43.60	74.00	-30.40	peak			

HORIZONTA



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	4924.000	52.53	-4.90	47.63	74.00	-26.37	peak			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		2483.500	55.21	9.10	64.31	74.00	-9.69	peak			
2	*	2483.500	42.15	9.10	51.25	54.00	-2.75	AVG			
3		2500.000	34.68	9.26	43.94	74.00	-30.06	peak			

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

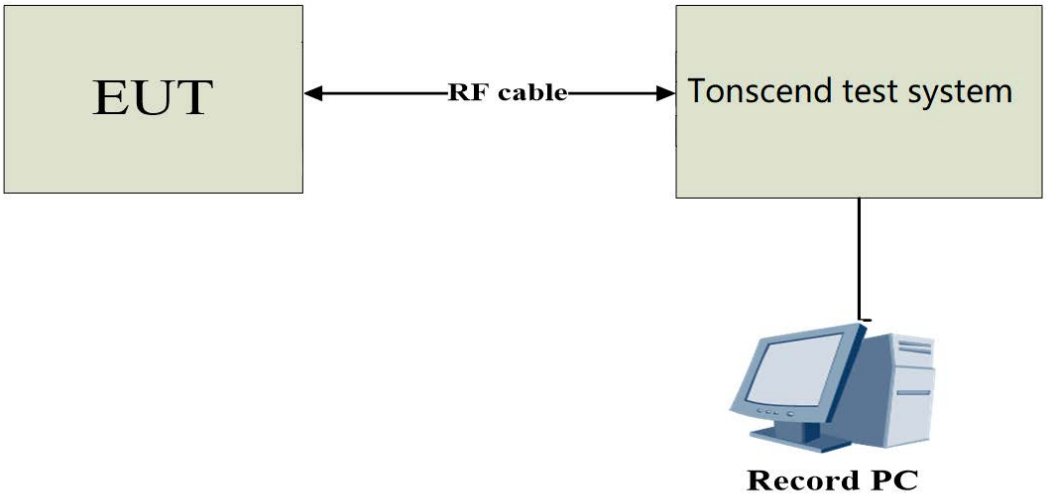
Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
● Lowest, Middle and Highest Channel	○ Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

a) The EUT was directly connected to the tonscend 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

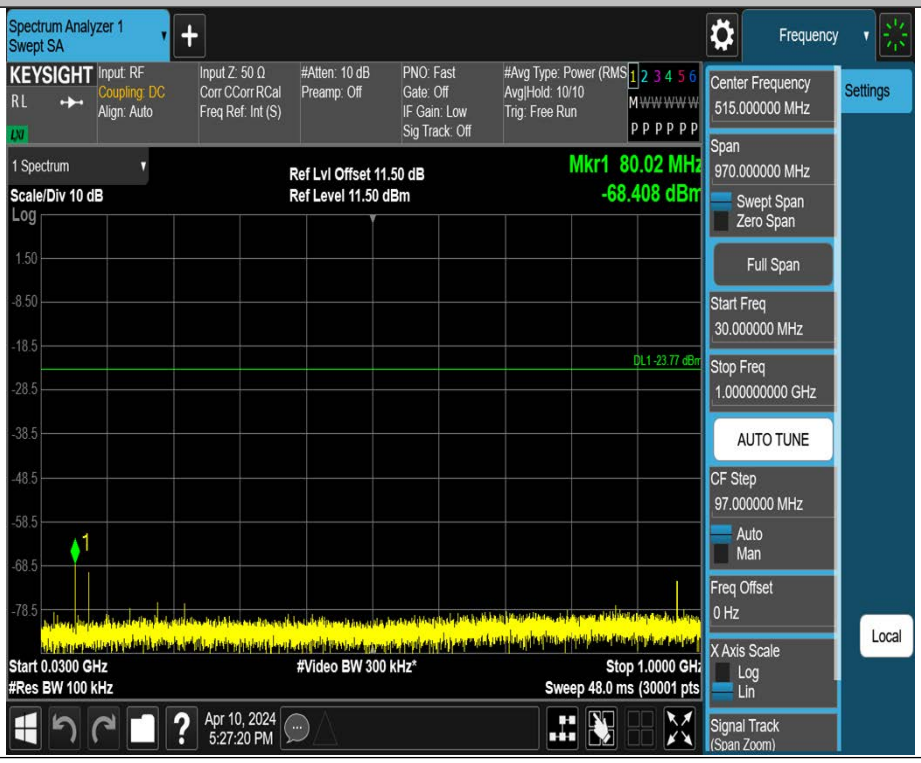


3.3.4 The Result

Conducted Spurious Emission

11B_Ant1_2412_0~Reference

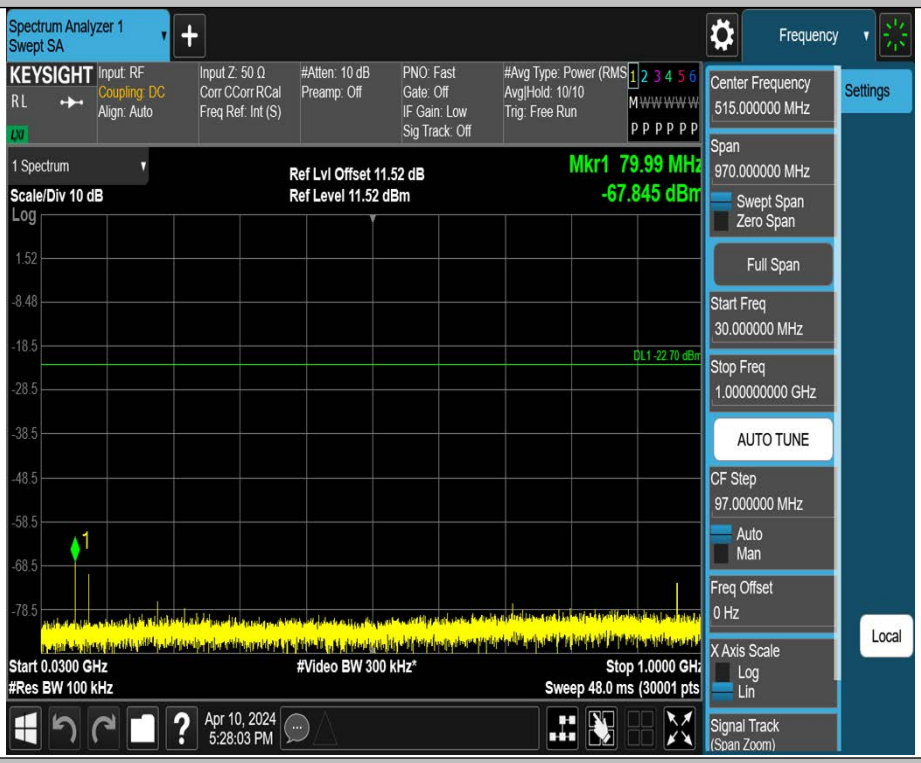
11B_Ant1_2412_30~1000



11B_Ant1_2412_1000~26500

11B_Ant1_2437_0~Reference

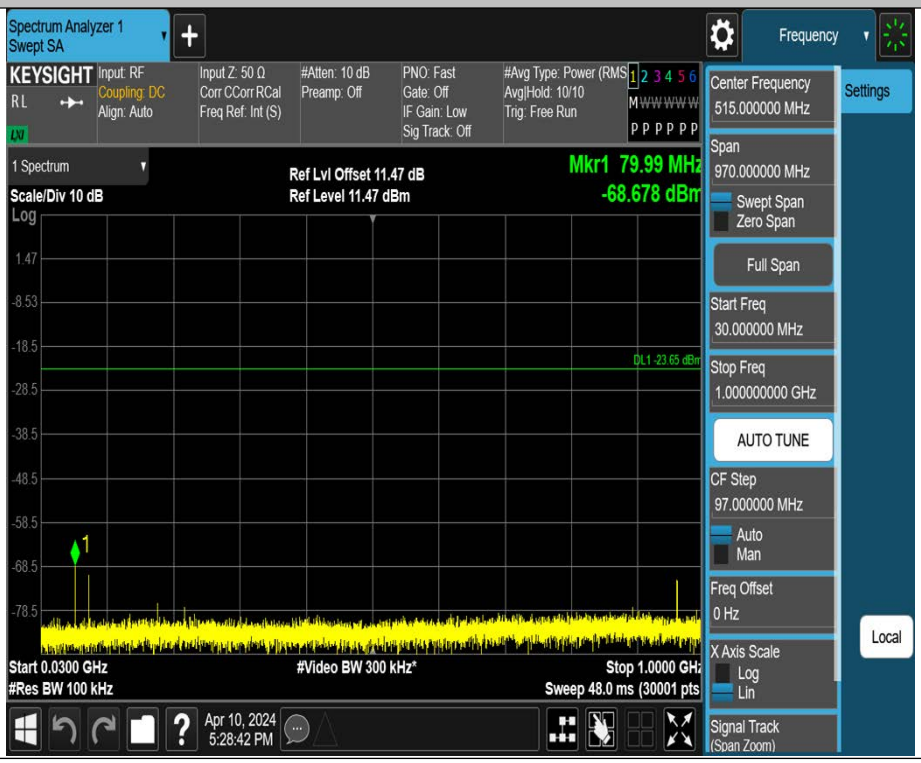
11B_Ant1_2437_30~1000



11B_Ant1_2437_1000~26500

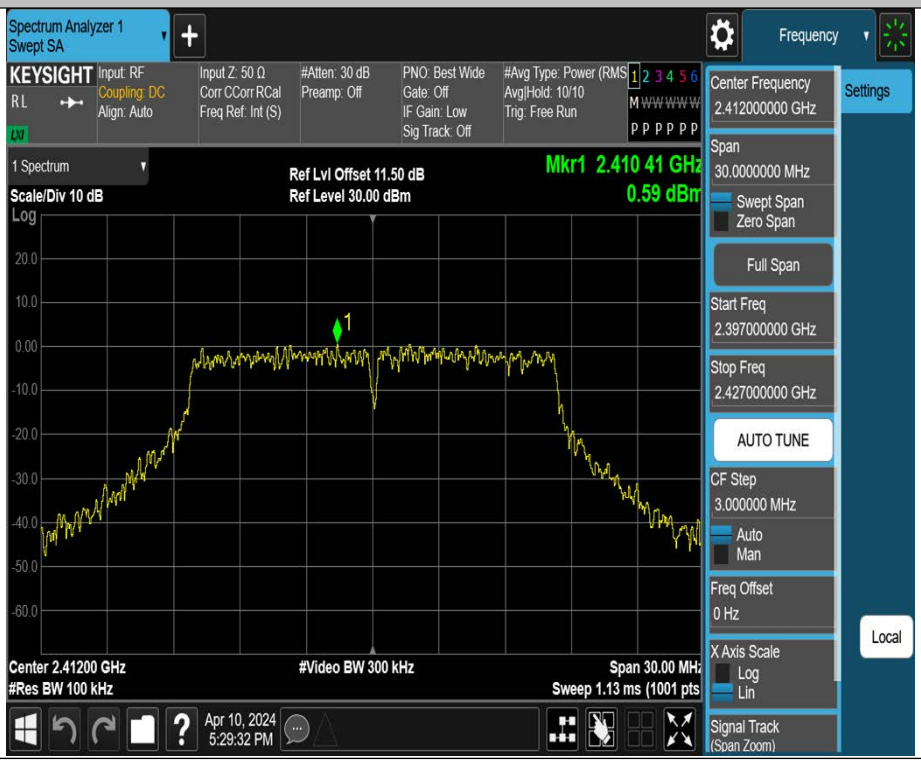
11B_Ant1_2462_0~Reference

11B_Ant1_2462_30~1000

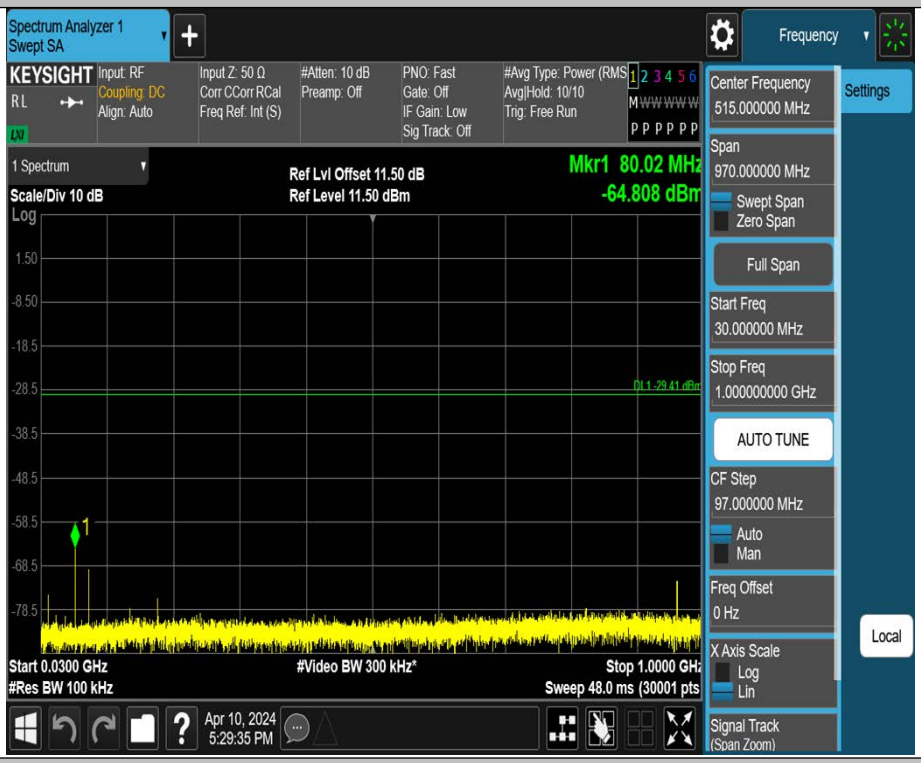


11B_Ant1_2462_1000~26500

11G_Ant1_2412_0~Reference

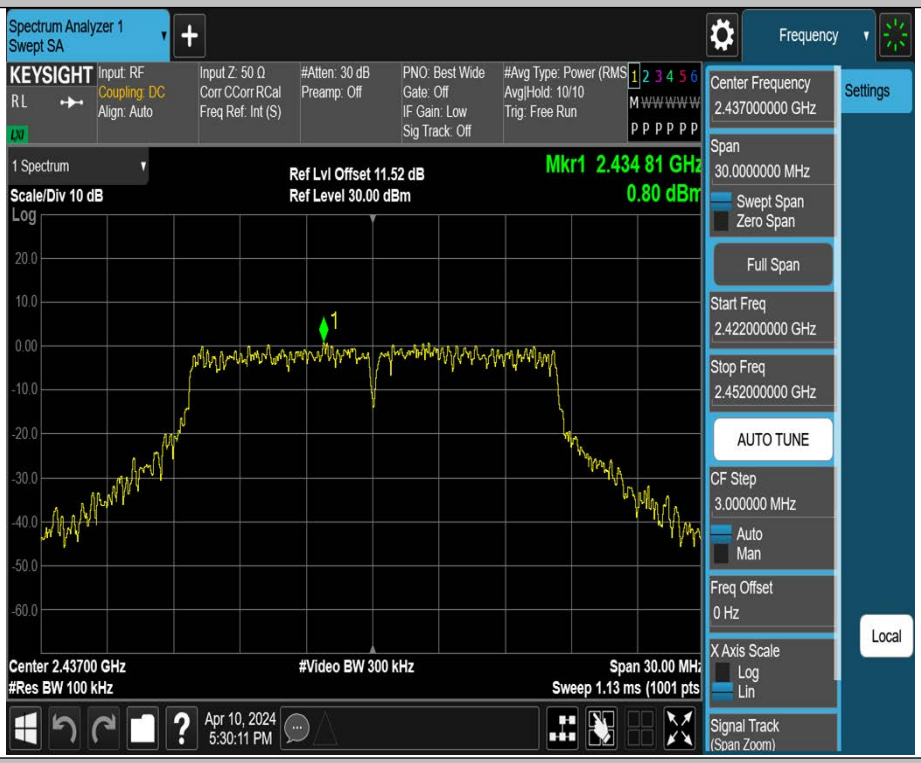


11G_Ant1_2412_30~1000

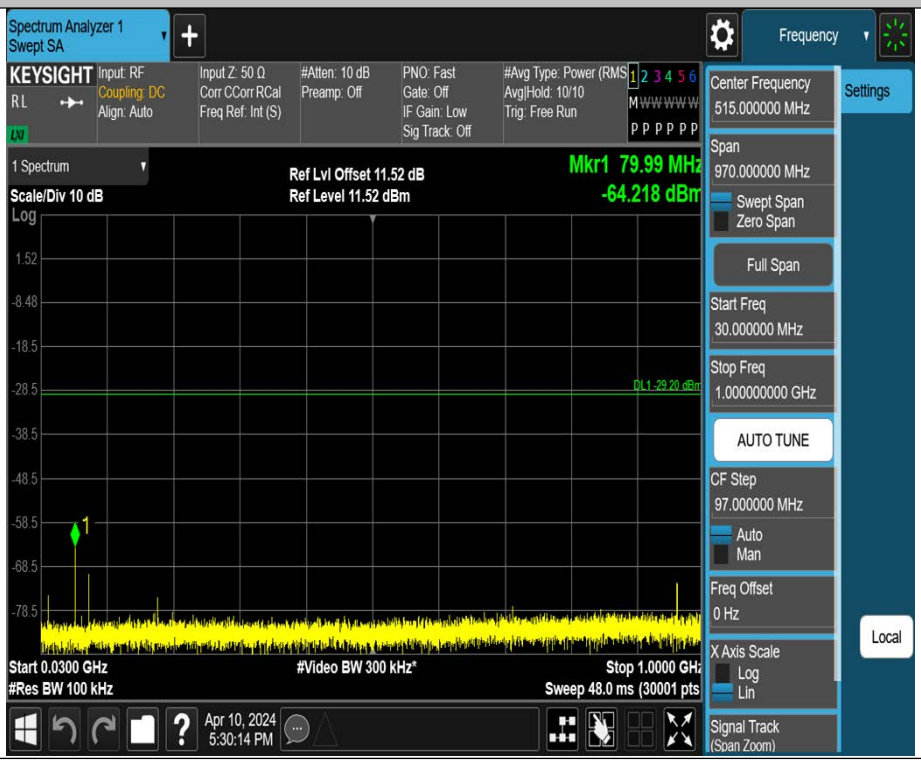


11G_Ant1_2412_1000~26500

11G_Ant1_2437_0~Reference

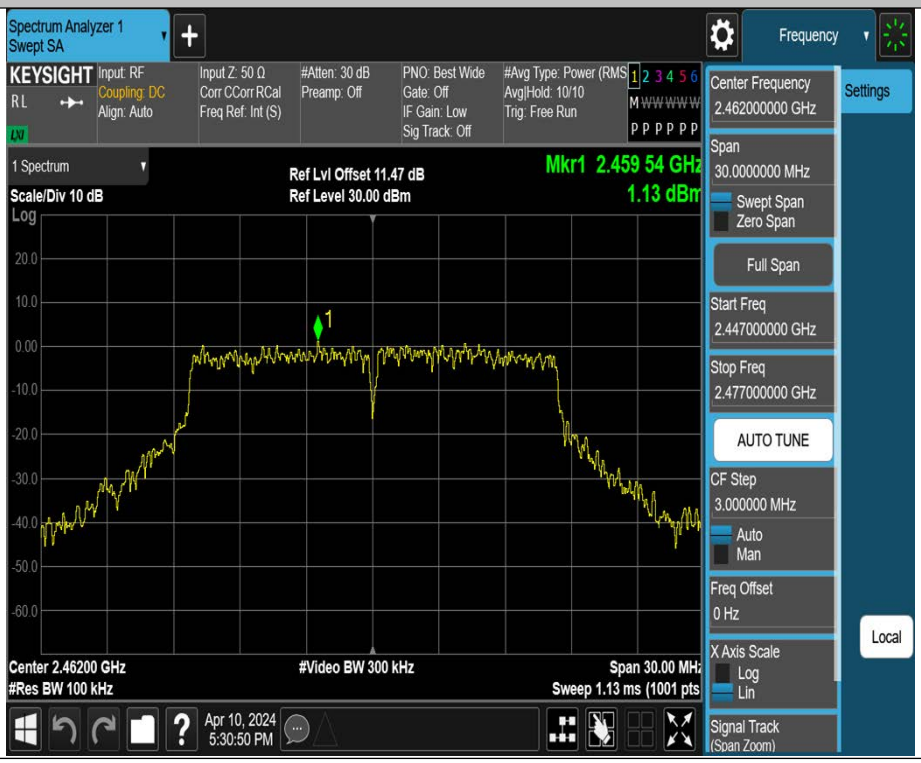


11G_Ant1_2437_30~1000

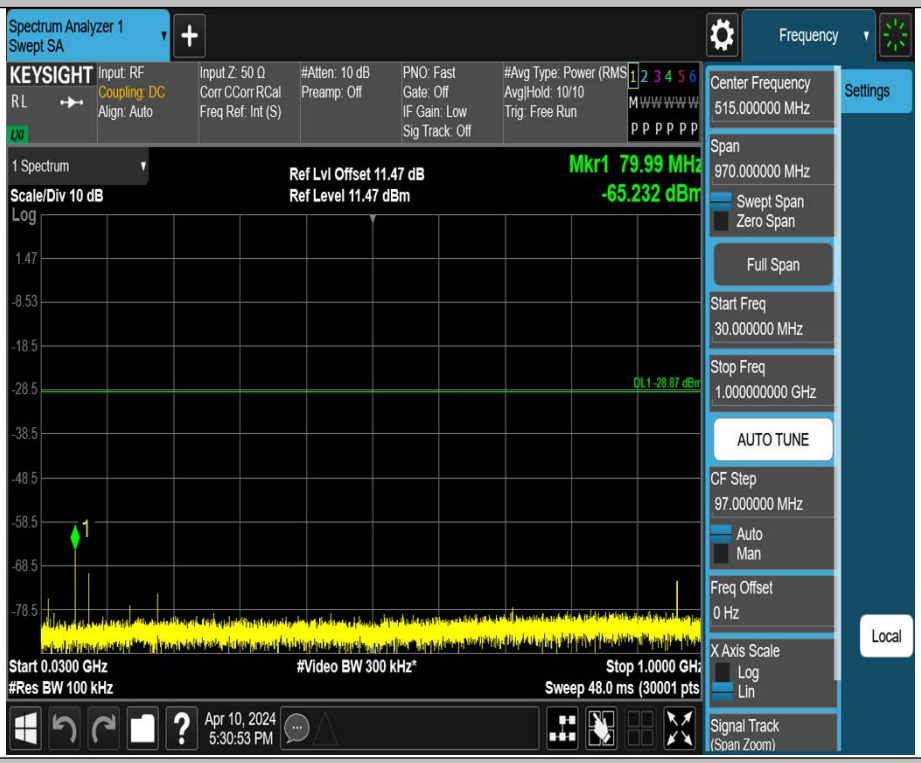


11G_Ant1_2437_1000~26500

11G_Ant1_2462_0~Reference

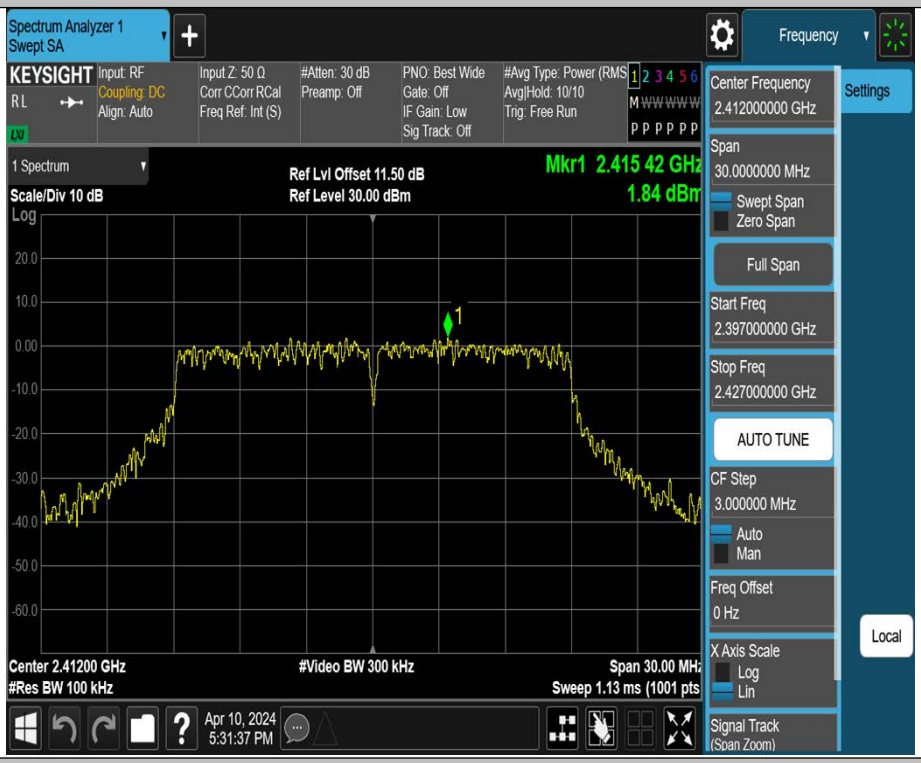


11G_Ant1_2462_30~1000

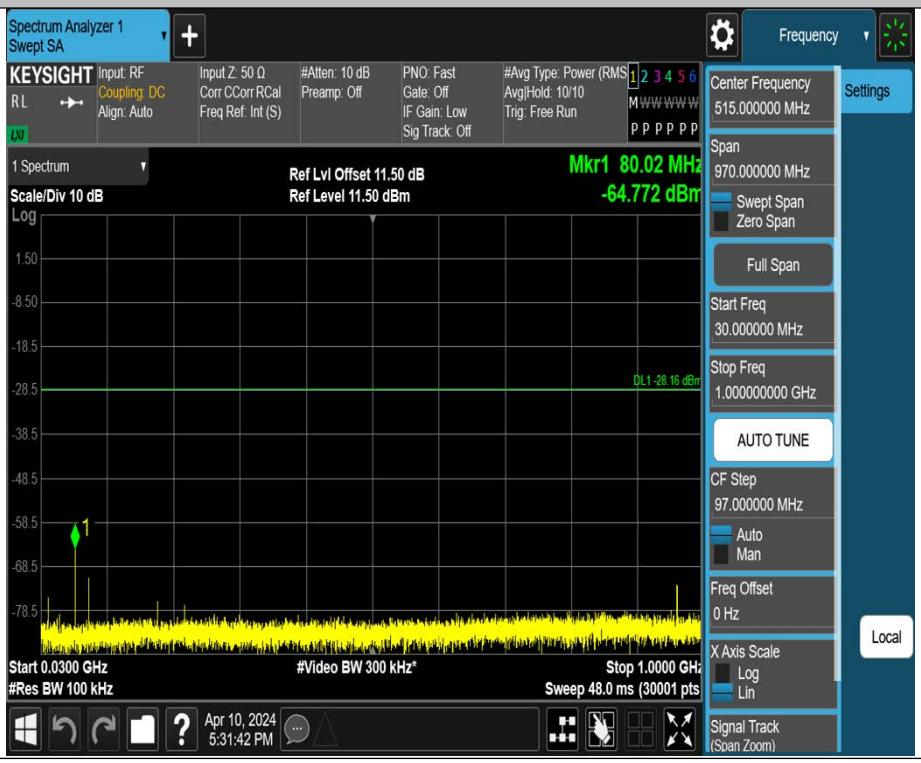


11G_Ant1_2462_1000~26500

11N20SISO_Ant1_2412_0~Reference

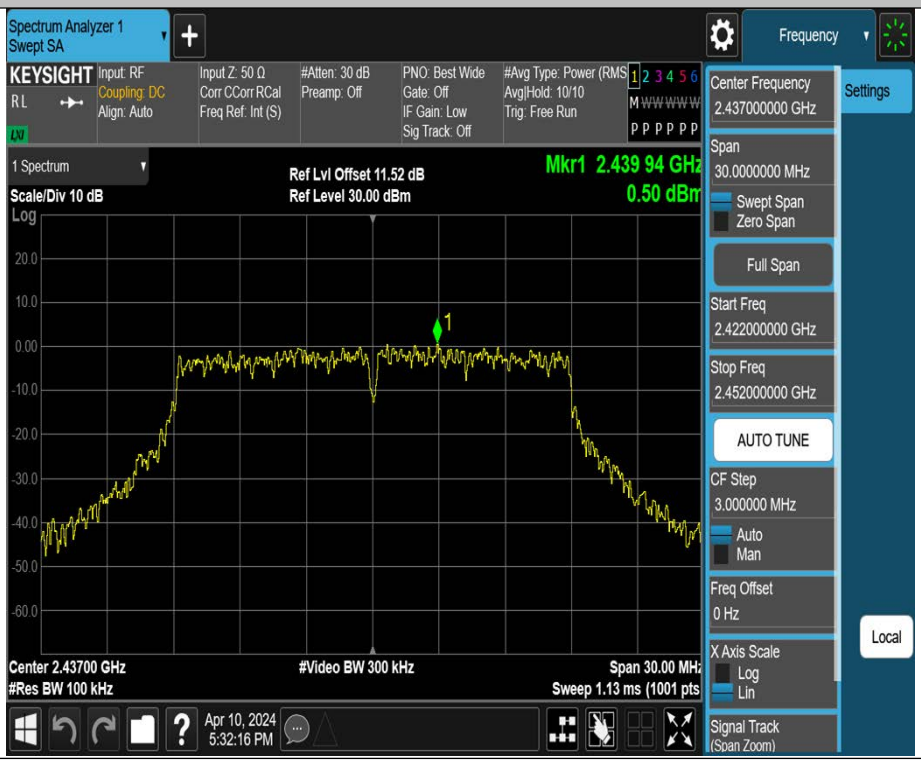


11N20SISO_Ant1_2412_30~1000

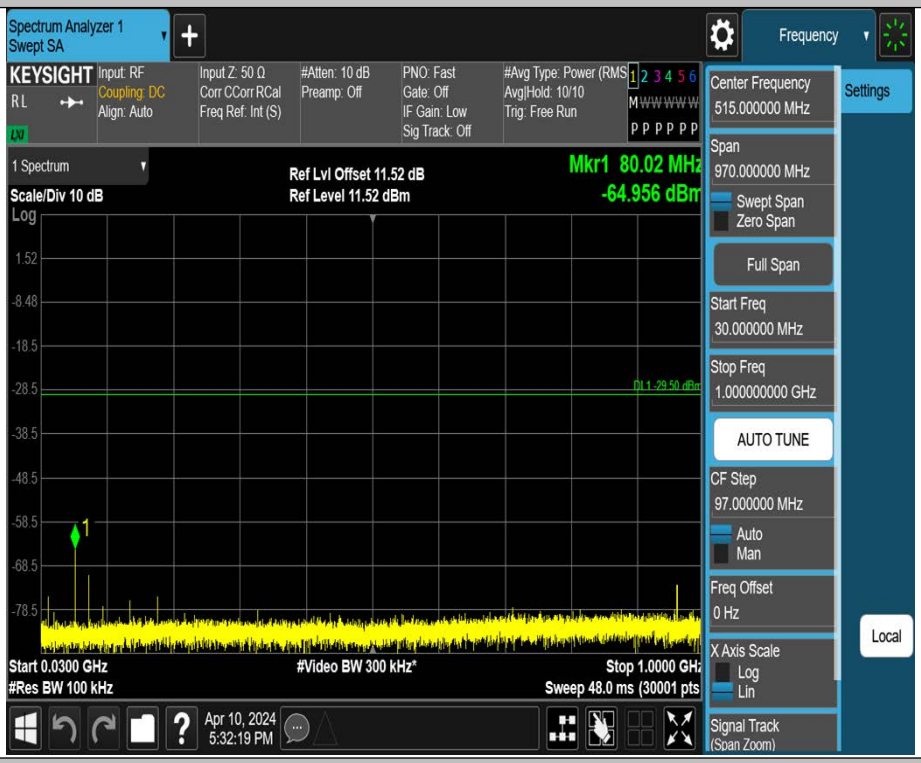


11N20SISO_Ant1_2412_1000~26500

11N20SISO_Ant1_2437_0~Reference

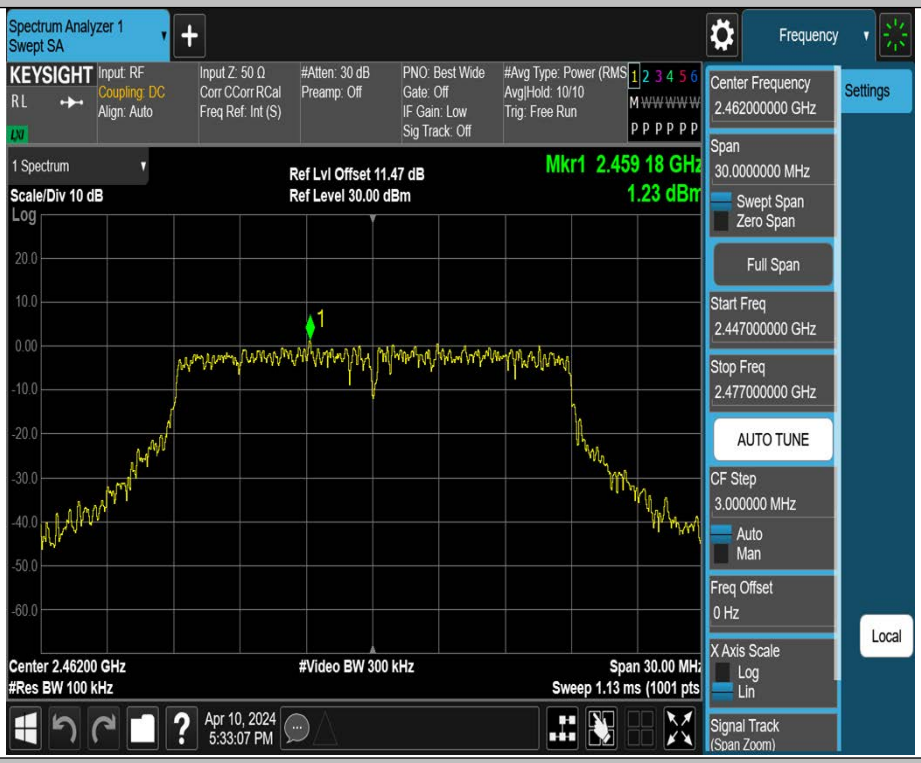


11N20SISO_Ant1_2437_30~1000

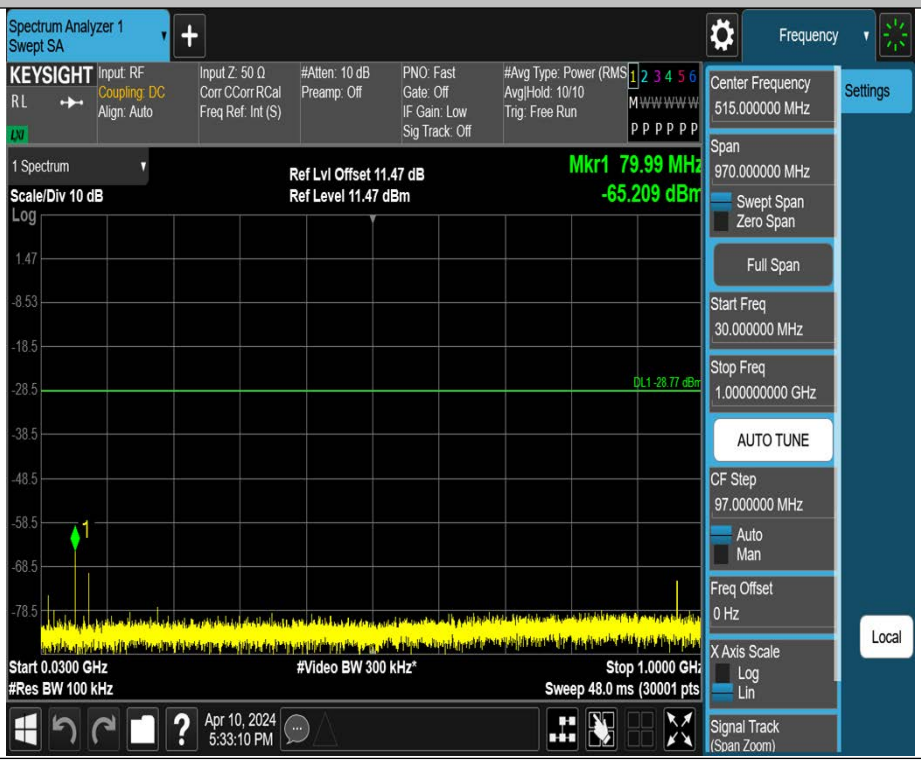


11N20SISO_Ant1_2437_1000~26500

11N20SISO_Ant1_2462_0~Reference



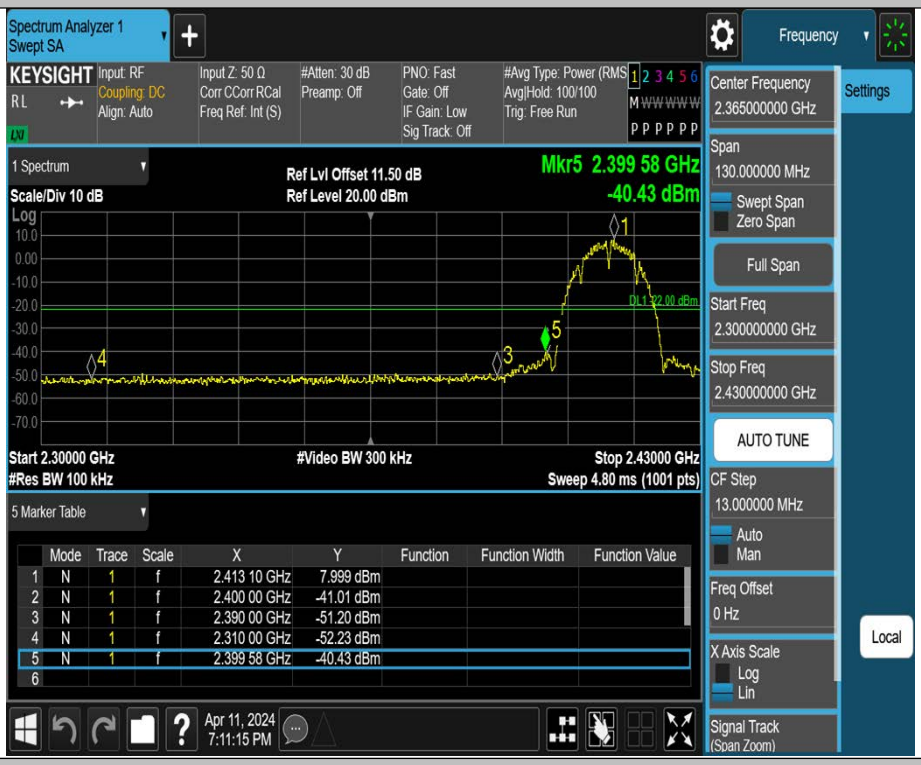
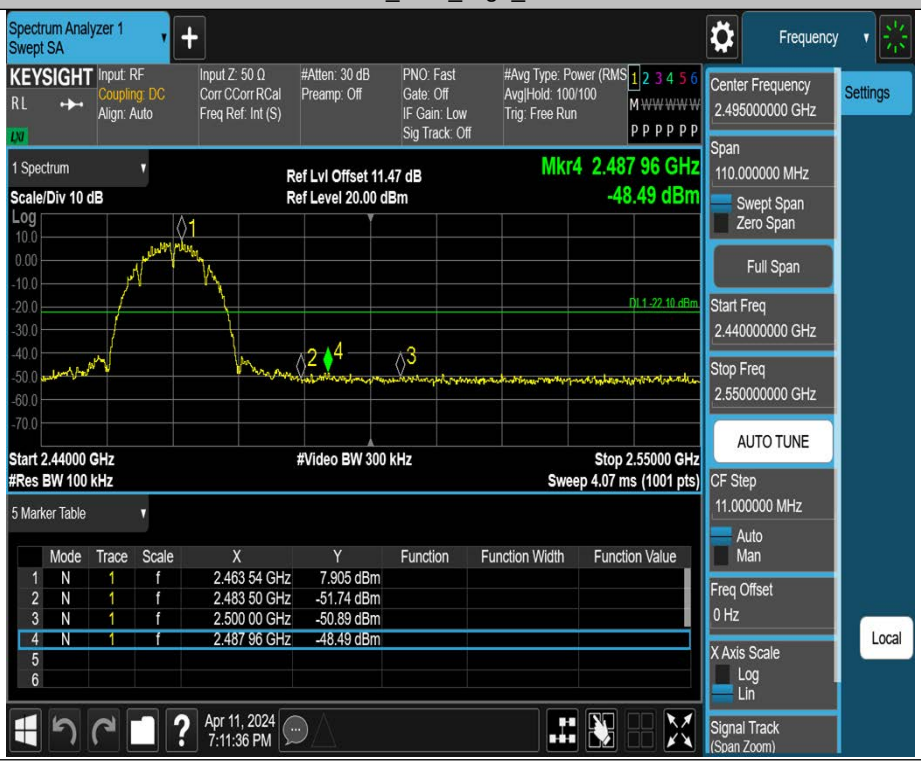
11N20SISO_Ant1_2462_30~1000



11N20SISO_Ant1_2462_1000~26500

Band edge

11B_Ant1_Low_2412



11B_Ant1_High_2462