

**ELECTROMAGNETIC EMISSIONS  
COMPLIANCE REPORT**

**Applicant:** FIH CO., LTD.  
No.4, Minsheng St., Tu-Cheng Dist., New Taipei City 23679,  
Taiwan

**Manufacturer:** FIH CO., LTD.  
No.4, Minsheng St., Tu-Cheng Dist., New Taipei City 23679,  
Taiwan

**Product Name:** Internet Gateway

**Brand Name:** FIH

**Model No.:** FSNO21VA

**Model Difference:** N/A

**Report Number:** E2/2022/30058

**FCC ID** RYQFSNO21VA

**Date of EUT Received:** March 30, 2022

**Date of Test:** April 27, 2022~June 29, 2022

**Issue Date:** July 04, 2022

**Approved By****Jay Lin****We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.407.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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## Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
E2/2022/30058	00	Original.	June 22, 2022	Yami Kuo	*
E2/2022/30058	01	Added TPC power results.	June 30, 2022	Yami Kuo	*
E2/2022/30058	02	Revised chapter 1.1 & 14.	July 04, 2022	Yami Kuo	*

**Note:**

- 1、The remark "\*" indicates modification of the report upon requests from certification body.

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## 1 GENERAL INFORMATION

### 1.1 Product Description

Product Name:	Internet Gateway
Brand Name:	FIH
Model No.:	FSNO21VA
Model Difference:	N/A
Hardware Version:	1.0
Firmware Version:	V0.15A_1KUS
Communication Mode	IP Based (Load Based)
EUT Series No.:	PJ223099110
Power Supply:	12Vdc from AC/DC Adapter

### 1.2 DFS Firmware version:

```
root@OpenWrt:/# versions
model=NIS
software version=NIS-0150-0-1KUS-801
SH model=1KUS
build number=801
hardware version=3.0
eMMC Info=SAMSUNG eMMC 8GB
Error Message= Non
API status=OK
```

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### 1.3 FCC WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Avg. Power (dBm)	Modulation Technology
a/ n_HT/ ac_VHT/ ax_HE 20M	5180~5240	4	26.03	OFDM
	5260~5320	4	22.47	OFDMA
	5500~5720	12	21.93	OFDMA
	5745~5850	5	29.94	OFDM
n_HT ac_VHT/ ax_HE 40M	5190~5230	2	25.32	OFDMA
	5270~5310	2	23.94	OFDM
	5510~5710	6	23.92	OFDM
	5755~5795	2	25.32	OFDMA
ac_VHT/ ax_HE 80M	5210	1	23.89	OFDMA
	5290	1	23.91	OFDMA
	5530~5690	3	23.95	OFDMA
	5775	1	21.92	OFDM
ac_VHT/ ax_HE 160M	5250	1	23.94	OFDM
	5570	1	21.85	OFDMA

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### 1.3.1 TPC Power Results

802.11a\_ch1

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)				TOTAL POWER (dBm)
			Ch0	Ch1	Ch2	Ch3	
36	5180	6	12.8	13.34	12.77	13.13	19.30
44	5220	6	12.87	13.44	12.79	13.16	19.36
48	5240	6	12.83	13.37	12.7	13.05	19.28
52	5260	6	8.86	9.35	8.75	9.12	15.31
60	5300	6	8.37	8.95	8.01	8.63	14.79
64	5320	6	9.28	9.99	8.99	9.74	15.80
100	5500	6	7.98	8.42	7.56	8.08	14.31
116	5580	6	7.94	8.34	7.7	8.15	14.32
140	5700	6	8.43	8.78	8.19	8.49	14.76
144	5720(U-NII 2C)	6	7.13	7.59	6.98	7.36	13.55
144	5720 (U-NII 3)	6	2.33	2.63	2.14	2.70	8.73
149	5745	6	17.29	17.75	17.09	17.61	23.73
157	5785	6	17.36	17.86	17.16	17.68	23.81
165	5825	6	17.42	17.86	17.27	17.7	23.85
169	5845	6	17.37	17.81	17.26	17.69	23.82
173	5865	6	17.3	17.72	17.23	17.64	23.76
177	5885	6	17.41	17.84	17.2	17.67	23.82

802.11n\_HT20\_MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)				TOTAL POWER (dBm)
			Ch0	Ch1	Ch2	Ch3	
36	5180	MCS24	11.97	12.44	11.73	12.19	18.19
44	5220	MCS24	13.46	14.01	13.28	13.74	19.73
48	5240	MCS24	13.22	13.83	13.11	13.52	19.53
52	5260	MCS24	9.65	10.07	9.18	9.81	15.79
60	5300	MCS24	9.06	9.55	8.64	9.22	15.23
64	5320	MCS24	9.48	10.02	9.19	9.76	15.72
100	5500	MCS24	8.34	9.1	8.25	8.71	14.71
116	5580	MCS24	9.05	9.46	8.63	9.18	15.19
140	5700	MCS24	8.99	9.44	8.75	9.27	15.22
144	5720(U-NII 2C)	MCS24	7.81	8.28	7.43	8.05	14.01
144	5720 (U-NII 3)	MCS24	3.23	3.83	2.93	3.47	9.48
149	5745	MCS24	13.37	13.94	13.25	13.8	19.70
157	5785	MCS24	13.38	13.99	13.25	13.77	19.71
165	5825	MCS24	13.51	14.02	13.26	13.83	19.76
169	5845	MCS0	17.42	17.91	17.18	17.61	23.64
173	5865	MCS0	17.46	17.91	17.19	17.68	23.67
177	5885	MCS0	17.39	17.86	17.1	17.58	23.59

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## 802.11ac VHT20 MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)				TOTAL POWER (dBm)
			Ch0	Ch1	Ch2	Ch3	
36	5180	MCS0	11.88	12.54	11.7	12.27	18.21
44	5220	MCS0	13.6	14.17	13.27	13.7	19.80
48	5240	MCS0	13.68	14.36	13.37	13.87	19.93
52	5260	MCS0	9.76	10.17	9.24	9.88	15.87
60	5300	MCS0	9.05	9.63	8.79	9.36	15.32
64	5320	MCS0	9.63	10.11	9.2	9.79	15.79
100	5500	MCS0	8.43	9.14	8.29	8.88	14.80
116	5580	MCS0	9.05	9.48	8.73	9.29	15.25
140	5700	MCS0	9.03	9.57	8.81	9.36	15.30
144	5720(U-NII 2C)	MCS0	7.85	8.36	7.61	8.08	14.09
144	5720 (U-NII 3)	MCS0	3.21	3.98	2.99	3.55	9.56
149	5745	MCS0	13.4	14.13	13.3	13.89	19.79
157	5785	MCS0	13.5	14.17	13.27	13.86	19.81
165	5825	MCS0	13.53	14.18	13.33	13.93	19.85
169	5845	MCS0	17.53	18.07	17.27	17.73	23.76
173	5865	MCS0	17.62	18.08	17.41	17.78	23.83
177	5885	MCS0	17.49	18.02	17.25	17.7	23.72

## 802.11n HT40 MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)				TOTAL POWER (dBm)
			Ch0	Ch1	Ch2	Ch3	
38	5190	MCS24	9.15	9.51	8.92	9.35	15.40
46	5230	MCS24	12.58	13.26	12.38	12.97	18.97
54	5270	MCS24	11.44	12.02	11.3	11.69	17.78
62	5310	MCS24	11.36	11.94	11.27	11.68	17.73
102	5510	MCS24	8.92	9.54	8.79	9.21	15.29
110	5550	MCS24	11.34	11.89	11.16	11.63	17.68
134	5670	MCS24	11.4	12.04	11.28	11.71	17.78
142	5710(U-NII 2C)	MCS24	11.38	11.98	11.28	11.74	17.76
142	5710 (U-NII 3)	MCS24	2.80	3.11	2.42	2.79	8.95
151	5755	MCS24	12.44	12.9	12.34	12.79	18.79
159	5795	MCS24	12.48	12.87	12.31	12.77	18.78
167	5835	MCS24	16.4	16.8	16.4	16.59	22.71
175	5875	MCS24	16.42	16.78	16.29	16.62	22.69

## 802.11ac VHT40 MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)				TOTAL POWER (dBm)
			Ch0	Ch1	Ch2	Ch3	
38	5190	MCS0	9.28	9.85	9.04	9.54	15.60
46	5230	MCS0	12.73	13.39	12.47	13	19.07
54	5270	MCS0	11.48	12.1	11.28	11.82	17.84
62	5310	MCS0	11.47	12.02	11.07	11.74	17.75
102	5510	MCS0	9.12	9.73	8.76	9.4	15.43
110	5550	MCS0	11.44	11.96	11.14	11.72	17.74
134	5670	MCS0	11.57	12.05	11.25	11.72	17.82
142	5710(U-NII 2C)	MCS0	11.43	12.04	11.31	11.70	17.71
142	5710 (U-NII 3)	MCS0	2.71	3.25	2.54	2.94	8.95
151	5755	MCS0	12.64	13.28	12.59	13.03	19.06
159	5795	MCS0	12.68	13.34	12.45	12.98	19.04
167	5835	MCS24	16.42	17.01	16.26	16.65	22.76
175	5875	MCS24	16.47	17.03	16.3	16.76	22.81

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## 802.11ac VHT80 MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)				TOTAL POWER (dBm)
			Ch0	Ch1	Ch2	Ch3	
42	5210	MCS0	10.47	11.09	10.19	10.68	16.78
58	5290	MCS0	11.43	12.09	11.35	11.68	17.81
106	5530	MCS0	9.98	10.62	9.87	10.23	16.35
122	5610	MCS0	11.36	11.86	11.22	11.68	17.70
138	5690(U-NII 2C)	MCS0	11.18	11.79	11.13	11.44	17.55
138	5690 (U-NII 3)	MCS0	-0.04	0.35	-0.45	-0.13	6.10
155	5775	MCS0	9.48	10.06	9.3	9.8	15.83
171	5855	MCS0	13.98	14.65	13.77	14.32	20.36

## 802.11ac VHT160 MIMO

CH	Frequency (MHz)	Data Rate	Avg. POWER (dBm)				TOTAL POWER (dBm)
			Ch0	Ch1	Ch2	Ch3	
50	5250	MCS0	11.56	12.22	11.32	11.75	17.81
114	5570	MCS0	6.72	7.38	6.34	7.06	12.98
161	5815	MCS0	11.45	12.14	11.26	11.63	17.72

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## 802.11ax HE20 MIMO

CH	Frequency (MHz)	Data Rate	RU config.	Avg. POWER (dBm)				TOTAL POWER (dBm)
				Ch0	Ch1	Ch2	Ch3	
36	5180	MCS0	full	12.79	13.58	12.65	13.11	19.16
		MCS0	26/0	10.04	10.79	9.8	10.4	16.38
		MCS0	52/37	12.49	13.07	12.28	12.8	18.78
		MCS0	106/53	11.96	12.58	11.65	12.22	18.22
44	5220	MCS0	full	12.88	13.47	12.65	13.25	19.18
48	5240	MCS0	full	12.79	13.47	12.69	13.18	19.15
52	5260	MCS0	full	9.96	10.6	9.71	10.32	16.27
60	5300	MCS0	full	9.49	10.17	9.34	9.8	15.82
64	5320	MCS0	full	9.97	10.8	9.8	10.32	16.35
		MCS0	26/8	5.43	6	5.28	5.64	11.70
		MCS0	52/40	5.51	6.03	5.35	5.65	11.75
		MCS0	106/54	7.44	8.12	7.29	7.67	13.75
100	5500	MCS0	full	8.94	9.49	8.76	9.24	15.22
		MCS0	26/0	3.98	4.42	3.68	4.13	10.17
		MCS0	52/37	3.81	4.37	3.53	4.03	10.05
		MCS0	106/53	6.37	6.86	6.23	6.61	12.63
116	5580	MCS0	full	8.92	9.54	8.77	9.28	15.25
140	5700	MCS0	full	9.53	10.13	9.38	9.8	15.83
		MCS0	26/8	3.95	4.53	3.84	4.15	10.23
		MCS0	52/40	3.94	4.44	3.72	4.09	10.16
		MCS0	106/54	7.58	8.07	7.41	7.81	13.83
144	5720(U-NII 2C)	MCS0	full	7.95	8.55	7.87	8.41	14.31
144	5720 (U-NII 3)	MCS0	full	3.61	4.09	3.45389	3.96582	9.90
149	5745	MCS0	full	13.03	13.7	12.81	13.34	19.34
		MCS0	26/0	13	13.68	12.78	13.3	19.31
		MCS0	52/37	12.87	13.64	12.68	13.25	19.23
		MCS0	106/53	12.94	13.62	12.76	13.29	19.27
157	5785	MCS0	full	13.08	13.6	12.86	13.35	19.34
165	5825	MCS0	full	12.83	13.44	12.66	13.28	19.17
		MCS0	26/8	12.74	13.45	12.68	13.2	19.14
		MCS0	52/40	12.71	13.4	12.63	13.24	19.12
		MCS0	106/54	12.69	13.36	12.64	13.14	19.08
169	5845	MCS0	full	17.59	18.1	17.46	17.79	23.85
		MCS0	26/0	17.5	18.05	17.43	17.77	23.80
		MCS0	52/37	17.49	17.93	17.31	17.6	23.70
		MCS0	106/53	17.49	17.95	17.3	17.69	23.72
173	5865	MCS0	full	17.56	18.01	17.3	17.71	23.76
177	5885	MCS0	full	17.5	18.04	17.36	17.76	23.78
		MCS0	26/8	17.44	17.9	17.3	17.68	23.69
		MCS0	52/40	17.39	17.81	17.24	17.64	23.63
		MCS0	106/54	17.39	17.93	17.32	17.66	23.69

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## 802.11ax HE40\_MIMO

CH	Frequency (MHz)	Data Rate	RU config.	Avg. POWER (dBm)				TOTAL POWER (dBm)
				Ch0	Ch1	Ch2	Ch3	
38	5190	MCS0	full	10.57	11.2	10.23	10.75	16.77
		MCS0	242/61	10.2	10.87	9.9	10.41	16.43
46	5230	MCS0	full	12.82	13.71	12.76	13.26	19.22
54	5270	MCS0	full	11.49	12.3	11.3	11.73	17.79
62	5310	MCS0	full	11.5	12.24	11.33	11.83	17.81
		MCS0	242/62	11.3	12.21	11.2	11.67	17.68
102	5510	MCS0	full	9.3	9.88	9	9.58	15.52
		MCS0	242/61	6.1	6.72	5.88	6.41	12.36
110	5550	MCS0	full	11.49	12.14	11.38	11.55	17.72
134	5670	MCS0	full	11.59	12.12	11.36	11.73	17.78
		MCS0	242/62	8.56	9.17	8.37	8.79	14.80
142	5710(U-NII 2C)	MCS0	full	11.51	12.20	11.31	11.74	17.77
142	5710 (U-NII 3)	MCS0	full	3.11	3.65	2.96	3.28	9.33
151	5755	MCS0	full	12.96	13.72	12.67	13.2	19.22
		MCS0	242/61	13	13.57	12.76	13.07	19.18
159	5795	MCS0	full	12.84	13.79	12.72	13.18	19.22
		MCS0	242/62	12.77	13.78	12.64	13.15	19.18
167	5835	MCS0	full	16.68	16.24	16.45	16.83	22.62
		MCS0	242/61	16.57	16.19	16.34	16.72	22.53
175	5775	MCS0	full	16.6	17.18	16.44	16.71	22.81
		MCS0	242/62	16.56	17.07	16.36	16.69	22.75

## 802.11ax HE80\_MIMO

CH	Frequency (MHz)	Data Rate	RU config.	Avg. POWER (dBm)				TOTAL POWER (dBm)
				Ch0	Ch1	Ch2	Ch3	
42	5210	MCS0	full	11.39	12.2	11.2	11.75	17.76
		MCS0	484/65	7.54	8.15	7.27	7.69	13.78
58	5290	MCS0	full	11.61	12.2	11.33	11.76	17.84
		MCS0	484/66	11.45	12	11.24	11.69	17.71
106	5530	MCS0	full	9.64	10.24	9.42	10.08	15.96
		MCS0	484/65	5.6	6.14	5.28	5.69	11.79
122	5610	MCS0	full	11.57	12.14	11.43	11.84	17.86
		MCS0	484/66	11.47	12.06	11.26	11.64	17.72
138	5690(U-NII 2C)	MCS0	full	11.21	11.81	11.06	11.40	17.48
138	5690 (U-NII 3)	MCS0	full	-0.07	0.61	-0.26	0.16	6.22
155	5775	MCS0	full	9.45	10.03	9.24	9.64	15.71
		MCS0	484/65	9.43	10.02	9.23	9.57	15.68
		MCS0	484/66	9.48	10.08	9.23	9.69	15.74
171	5855	MCS0	full	16.56	17.13	16.29	16.73	22.79
		MCS0	484/65	16.48	17.11	16.27	16.64	22.74
		MCS0	484/66	16.46	17.01	16.24	16.61	22.69

## 802.11ax HE160\_MIMO

CH	Frequency (MHz)	Data Rate	RU config.	Avg. POWER (dBm)				TOTAL POWER (dBm)
				Ch0	Ch1	Ch2	Ch3	
50	5250	MCS0	full	11.54	12.02	11.46	11.64	17.86
		MCS0	996/67	5.96	6.5	5.78	6.21	12.31
		MCS0	996/S67	5.88	6.43	5.78	6.2	12.27
114	5570	MCS0	full	9.33	10.01	9.13	9.68	15.74
		MCS0	996/67	4.48	4.81	4.43	4.57	10.77
		MCS0	996/S67	4.98	5.4	4.73	5.12	11.26
163	5815	MCS0	full	11.1	11.57	10.93	11.21	17.40
		MCS0	996/67	6.09	6.44	5.93	6.18	12.36
		MCS0	996/S67	6	6.39	5.93	6.14	12.31

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## 1.4 Antenna Designation

Antenna Type	Freq. (MHz)	Peak Antenna Gain (dBi)	Directional Gain (dBi)
Dipole	5150~5250	-1.04	4.29
	5250~5350	-1.10	4.73
	5475~5725	-1.44	4.99
	5725~5850	-1.35	4.88
Dipole	5150~5250	-2.84	4.29
	5250~5350	-1.34	4.73
	5475~5725	-0.72	4.99
	5725~5850	-1.31	4.88
Dipole	5150~5250	-1.68	4.29
	5250~5350	-1.49	4.73
	5475~5725	-1.54	4.99
	5725~5850	-1.59	4.88
Dipole	5150~5250	-1.46	4.29
	5250~5350	-1.22	4.73
	5475~5725	-0.47	4.99
	5725~5850	-0.36	4.88

## Note:

1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the lowest gain as worst case scenarios.
2. Antenna information is provided by the applicant.

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## 1.5 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

## 1.6 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	TW3702
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		

**Note:** Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

## 1.7 Special Accessories

There are no special accessories used while test was conducted.

## 1.8 Equipment Modifications

There was no modification incorporated into the EUT.

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## 2 SUMMARY OF TEST RESULT

FCC and ISED Rules	Description Of Test	Result
§15.407(h) FCC KDB 905462 D02	TPC and DFS Measurement	Compliant

## 3 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
TPC and DFS Measurement	+/- 0.88 Hz
Temperature	+/- 0.4 °C
Humidity	+/- 3.5 %
DC / AC Power Source	+/- 1 %

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

The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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## 4 TPC AND DFS MEASUREMENT

### 4.1 TPC Requirements

According to Part 15.407 (h)(1) Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

Result:

Yes, The EUT equipped with TPC function.

### 4.2 DFS: Standard Applicable

According to §15.407(h)(2) and FCC KDB 905462 D02 , Radar Detection Function of Dynamic Frequency Selection (DFS).

Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is -64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is -62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

- (i) Operational Modes. The DFS requirement applies to the following operational modes:
  - (a) The requirement for channel availability check time applies in the master operational mode.
  - (b) The requirement for channel move time applies in both the master and slave operational modes.
- (ii) Channel Availability Check Time. A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar signal with a power level greater than the interference threshold values listed in paragraph (h)(2) of this section, is detected within 60 seconds.
- (iii) Channel Move Time. After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

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Non-occupancy Period. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

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## 5 APPLICABLE STANDARDS

**Table 1: Applicability of DFS requirements prior to use of a channel**

Requirement	Operational Mode		
	Master	Client(without radar detection)	Client(with radar detection)
Non-occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Band-width	Yes	Not required	Yes

**Table 2: Applicability of DFS requirements during normal operation**

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission time	Yes	Yes
Channel Move time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

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Additional requirements for devices with multiple bandwidth mode	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
<b>Note:</b> Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

**Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring**

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP $\geq$ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
<b>Note 1:</b> This is the level at the input of the receiver assuming a 0 dBi receive antenna. <b>Note 2:</b> Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. <b>Note3:</b> EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

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Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
<p><b>Note 1:</b> Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.</p> <p><b>Note 2:</b> The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.</p> <p><b>Note 3:</b> During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.</p>	

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**Table 5: Radar Test Waveforms**  
**Short Pulse Radar**

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A	Roundup $\left\lceil \left( \frac{1}{360} \right) \cdot \left( \frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\rceil$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
<b>Note 1:</b> Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

### Long Pulse Radar

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

### Frequency Hopping Radar

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

**The applicant of this given application confirms that information regarding the parameters of the detected Radar Waveforms is not available to the end user.**

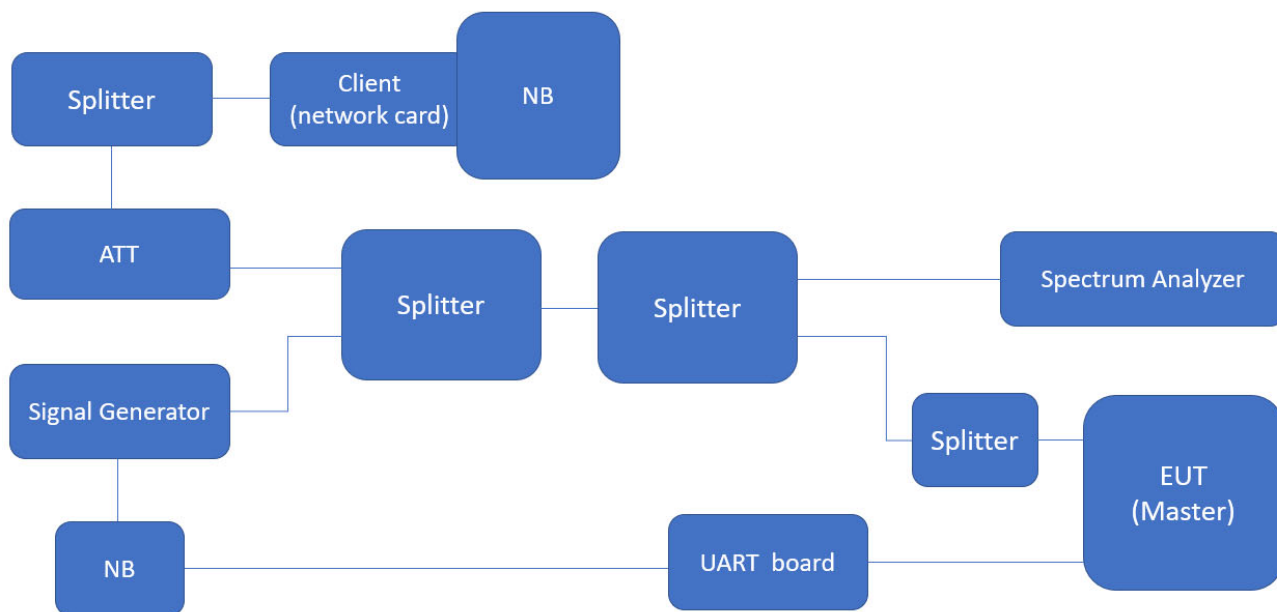
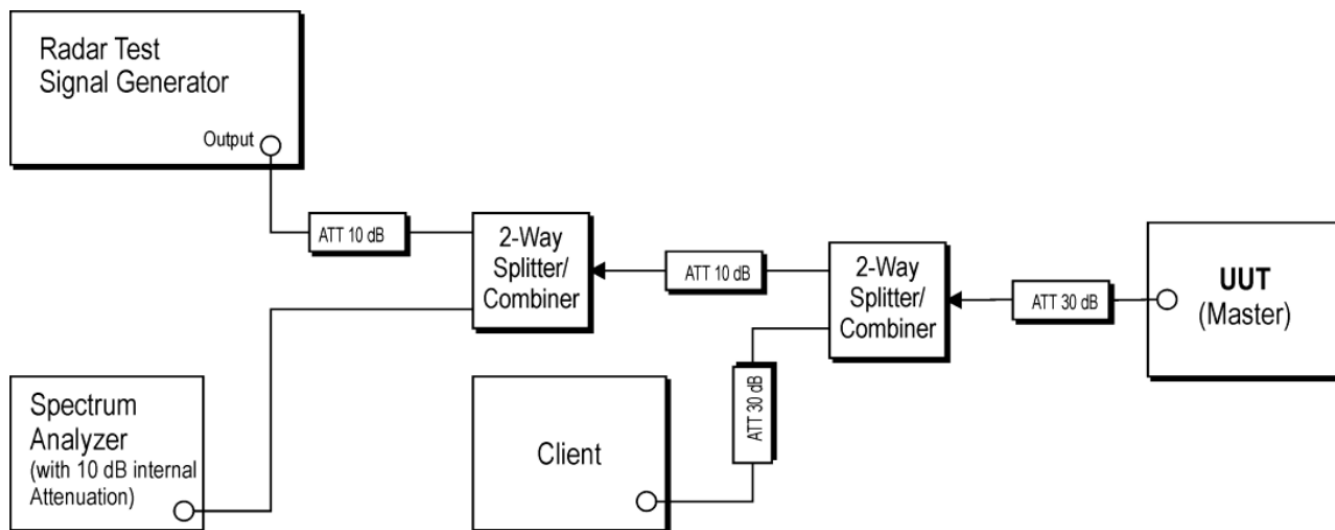
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## 6 TEST SETUP

### Setup for Master with injection at the Master



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## 7 TEST EQUIPMENT USED:

Conducted Emission Test Site: Conducted A					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Signal Generator	KEYSIGHT	N5182B	MY59100873	03/01/2022	02/28/2023
Spectrum Analyzer	Keysight	N9010B	MY60240548	01/26/2022	01/25/2023
Test Software	SGS Taiwan	Dynamic Frequency Selection Test	Ver. 21	N.C.R	N.C.R
Test Software	Keysight	N7607C Signal Studio for DFS Radar profiles	Ver. 2.2.0.0	N.C.R	N.C.R
Attenuator	Woken	WRF53AYM2B7	RF08	11/18/2021	11/17/2022
DC Block	PASTERNAK	PE8210	RF152	11/18/2021	11/17/2022
Power Divider Splitter	Titan	T0510E2W118Q	22015159	03/30/2022	03/29/2023
Power Divider Splitter	Titan	T0510E2W118Q	22015160	03/30/2022	03/29/2023
Power Divider Splitter	Titan	T0510E2W118Q	22015161	03/30/2022	03/29/2023
Power Divider Splitter	Titan	T0510E4W118Q	22015175	03/30/2022	03/29/2023

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## 8 DESCRIPTION OF EUT:

EUT operates over below frequency ranges.

UNII-Band	
<input checked="" type="checkbox"/>	UNII-2A (5250-5350 MHz)
<input checked="" type="checkbox"/>	UNII-2C (5470-5725 MHz)

And is a Master device with radar detection and DFS capability

The EUT utilizes below architecture and nominal channel bandwidths.

802.11	20M	40M	80M	160M
a	<input checked="" type="checkbox"/>	N/A	N/A	N/A
n	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A
ac	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ax	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Timing plots are required with calculations demonstrating a minimum channel loading of approximately 17% or greater.

The rated output power of the master unit is  $\geq 23\text{dBm}$ (EIRP).therefore the required interference threshold level is  $-64\text{dBm}$ .after correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is  $-64\text{dBm}$ .

The rated output power of the master unit is  $< 23\text{ dBm}$ (EIRP).therefore the required interference threshold level is  $-62\text{dBm}$ .after correction for antenna gain and procedural adjustments, the required threshold at the antenna port is  $-62\text{dBm}$ .

DFS Detection Threshold (dBm) =  $-64 + G\text{ (dBi)}$ , for conducted test.

DFS Detection Threshold (dBm)	Minimum of Peak Antenna Gain (dBi)	Threshold for test (dBm)
-64	-1.54	-65.54

While calibrate the path on antenna port of DFS test equipment (master), measurements equipments (spectrum) is ensured to be 50 Ohms, and therefore verification on antenna gain measurement can be ignored.

The EUT uses one transmitter/receiver chains and one receive only chain, each connected to an antenna to perform radiated tests.

The Slave device associated with the EUT during these tests does not have radar detection capability.

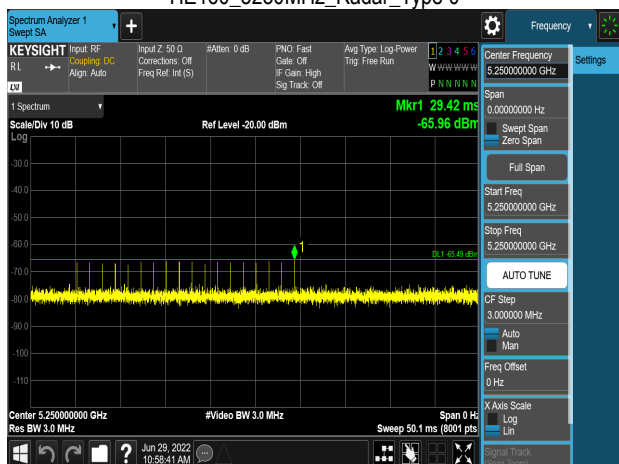
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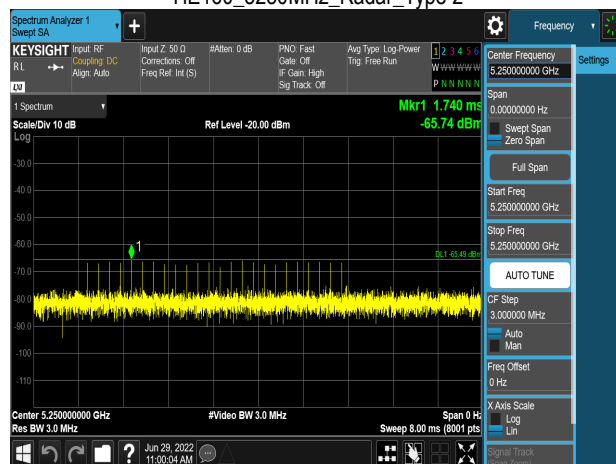
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## 9 RADAR TYPE WAVEFORM CALIBRATION AT DFS DETECTION THRESHOLD

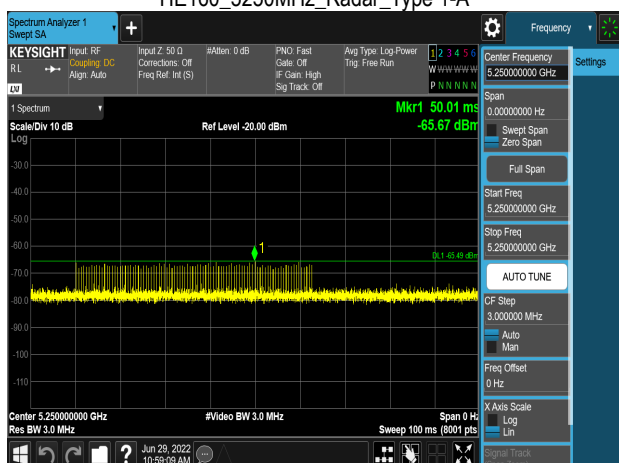
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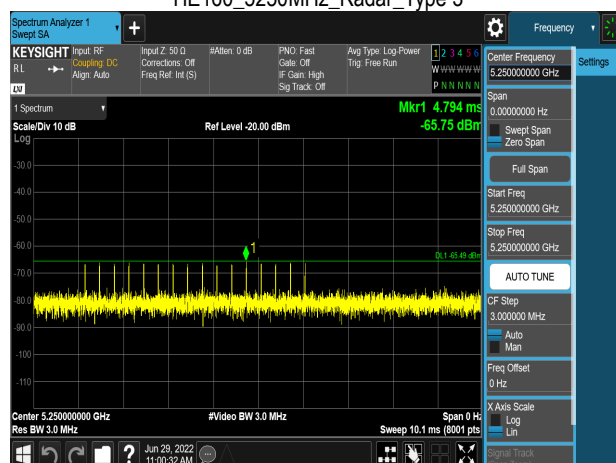
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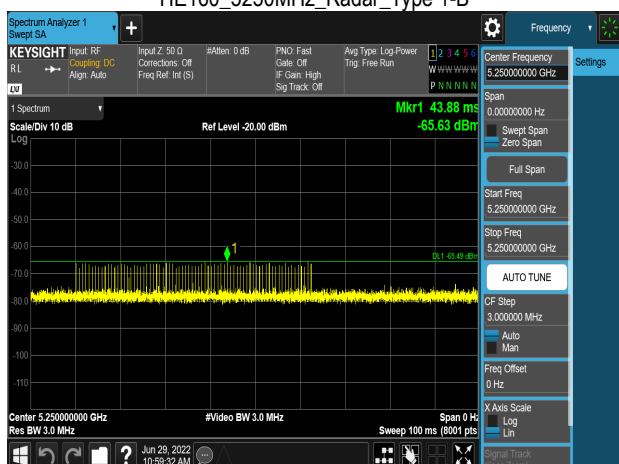
HE160\_5250MHz\_Radar\_Type 1-A



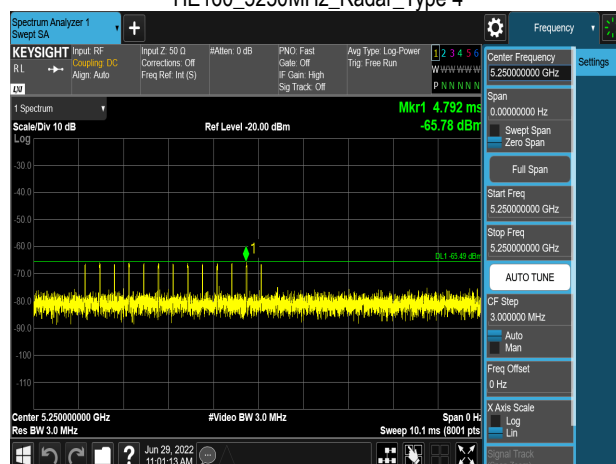
HE160\_5250MHz\_Radar\_Type 3



HE160\_5250MHz\_Radar\_Type 1-B



HE160\_5250MHz\_Radar\_Type 4



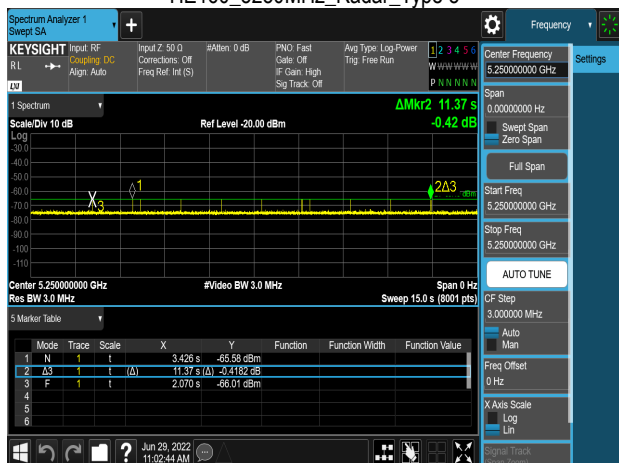
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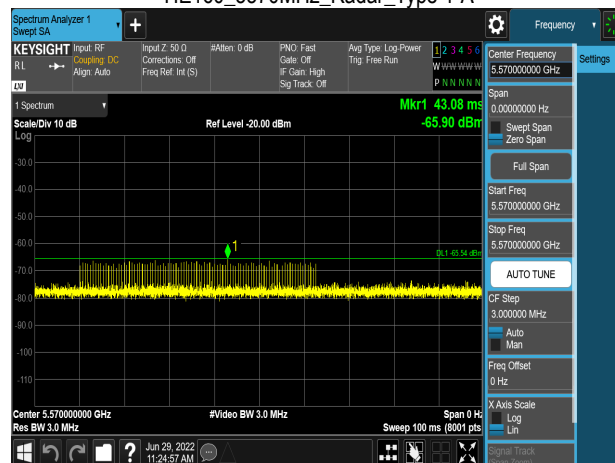
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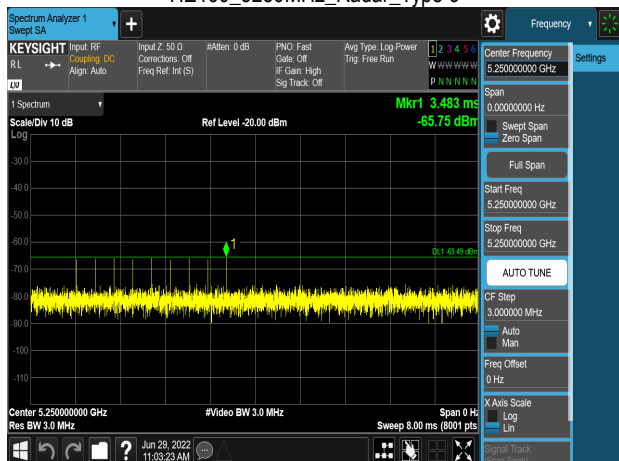
HE160\_5250MHz\_Radar\_Type 5



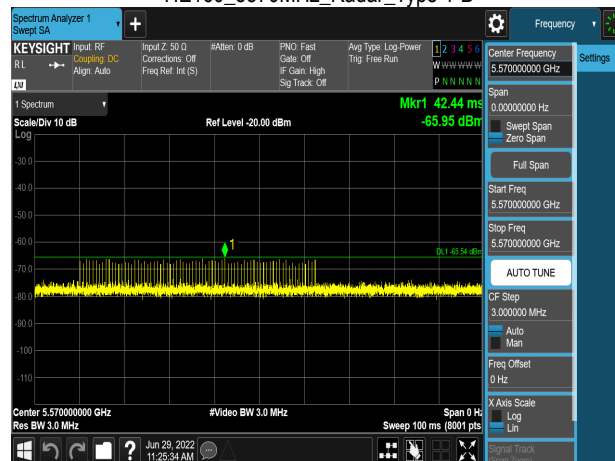
HE160\_5570MHz\_Radar\_Type 1-A



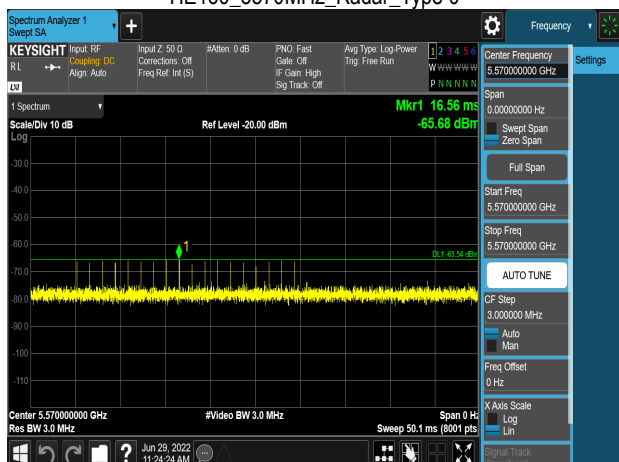
HE160\_5250MHz\_Radar\_Type 6



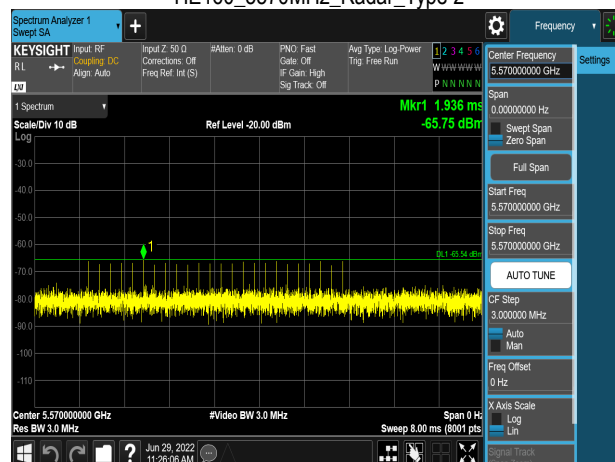
HE160\_5570MHz\_Radar\_Type 1-B



HE160\_5570MHz\_Radar\_Type 0



HE160\_5570MHz\_Radar\_Type 2



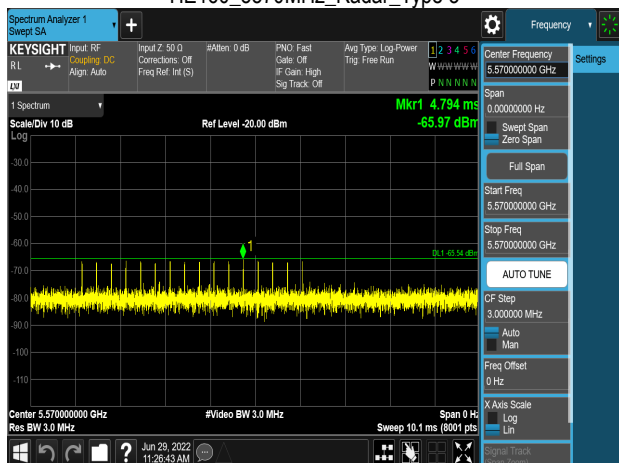
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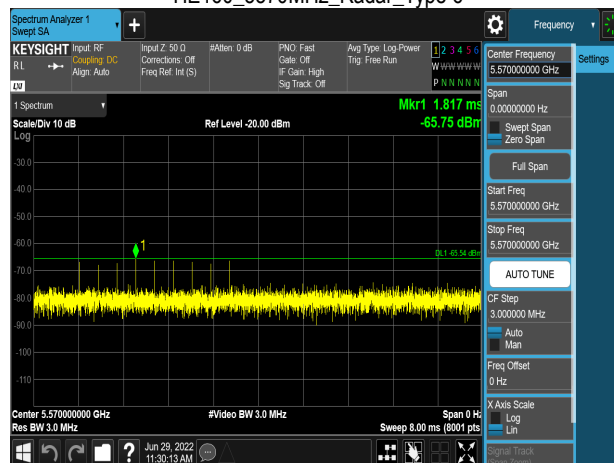
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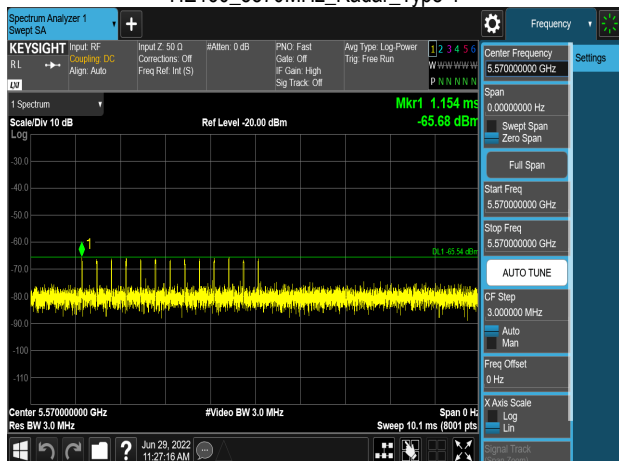
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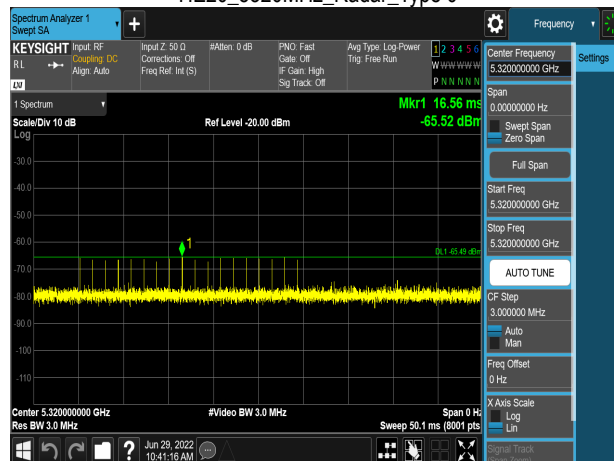
HE160\_5570MHz\_Radar\_Type 6



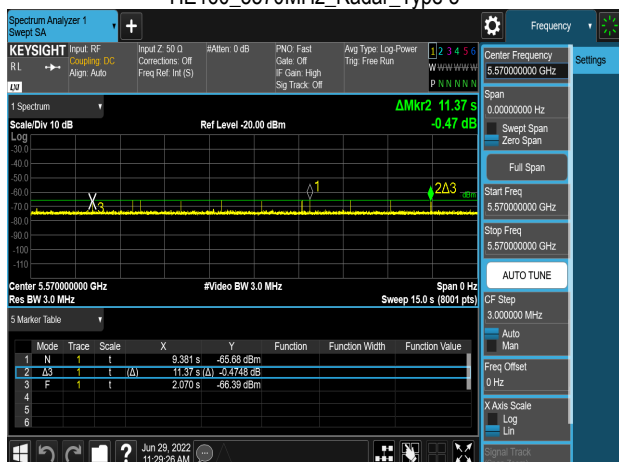
HE160\_5570MHz\_Radar\_Type 4



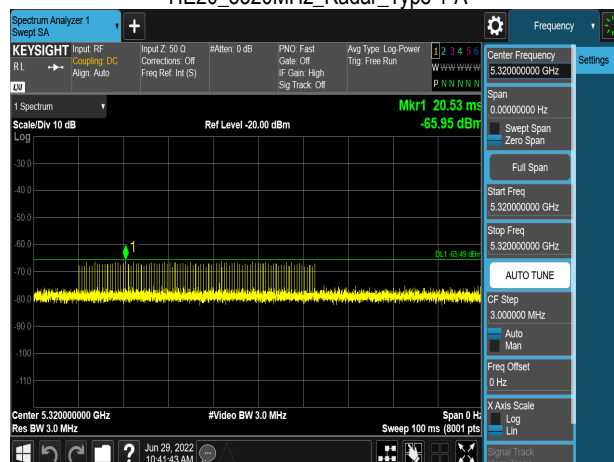
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HE160\_5570MHz\_Radar\_Type 5



HE20\_5320MHz\_Radar\_Type 1-A

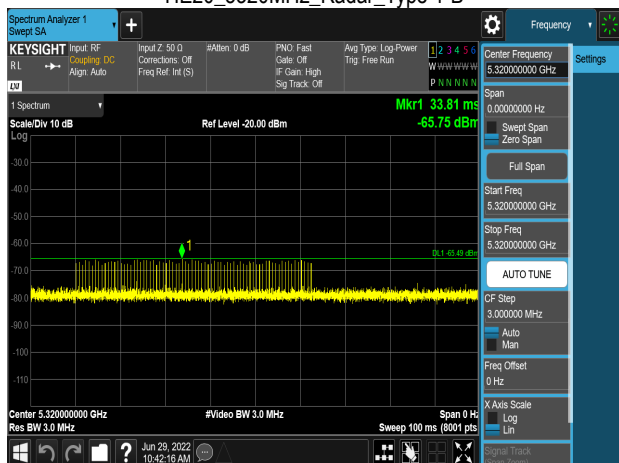


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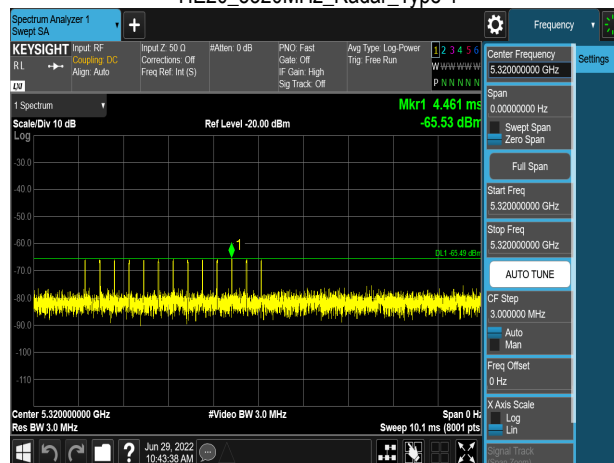
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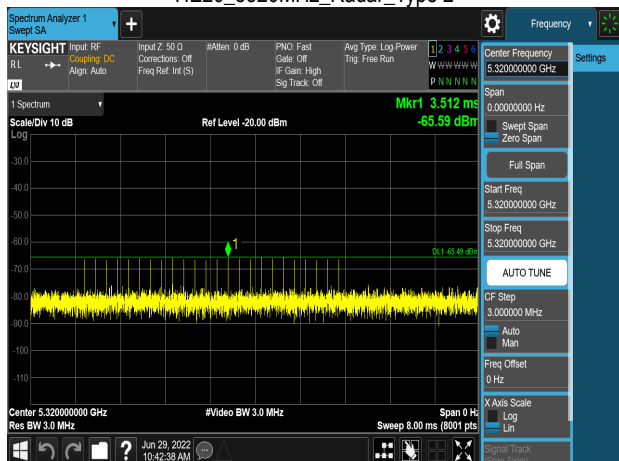
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HE20\_5320MHz\_Radar\_Type 4



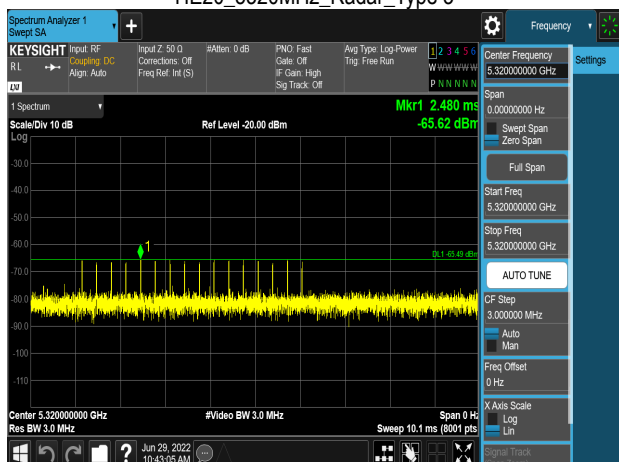
HE20\_5320MHz\_Radar\_Type 2



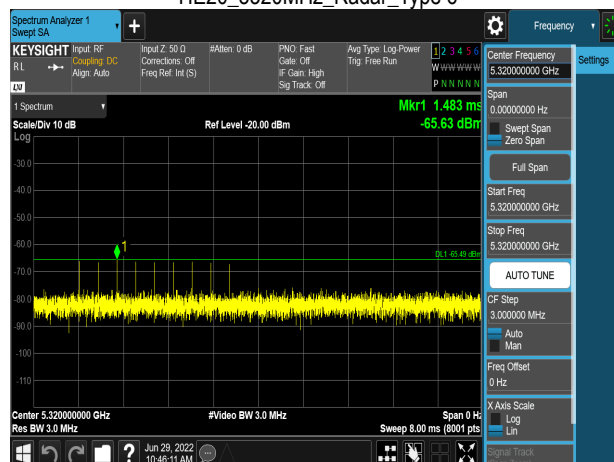
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HE20\_5320MHz\_Radar\_Type 3



HE20\_5320MHz\_Radar\_Type 6

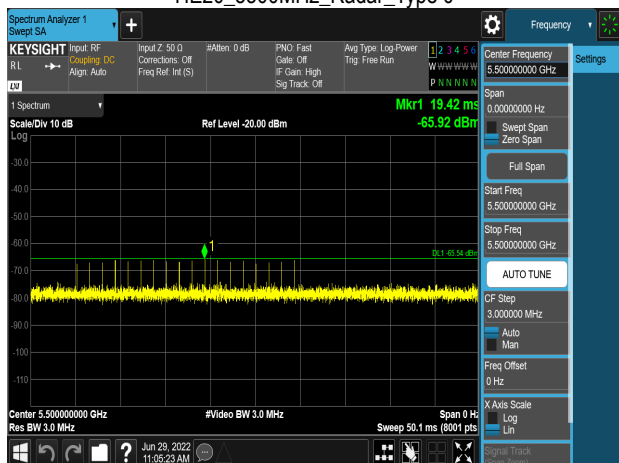


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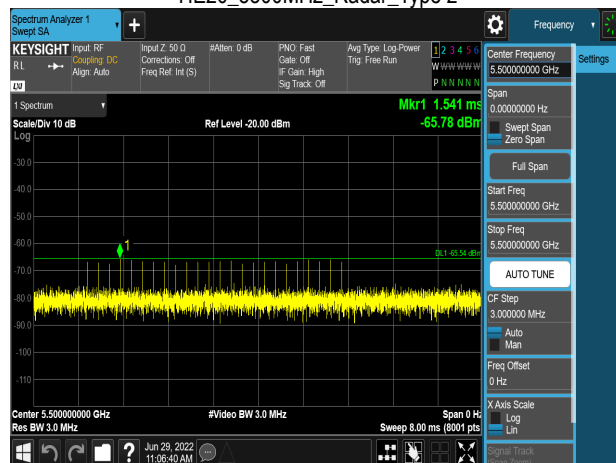
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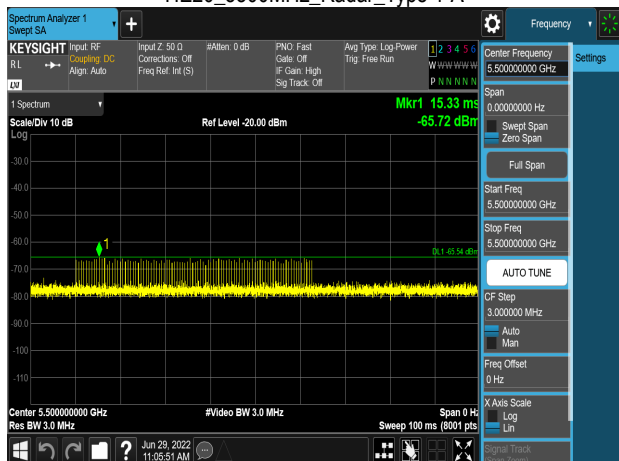
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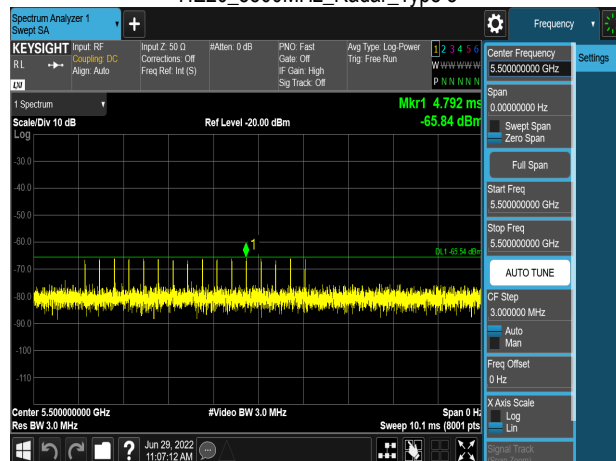
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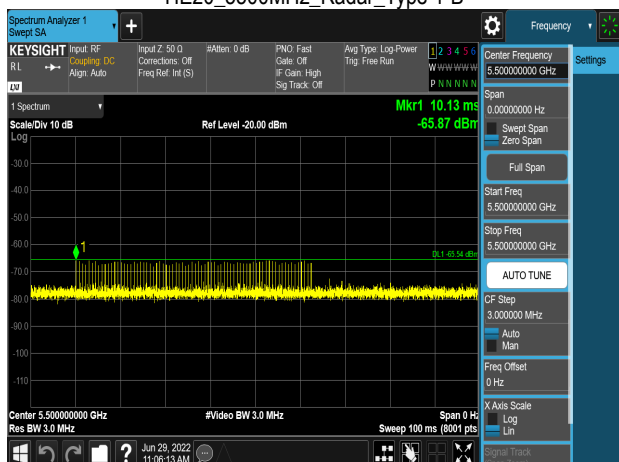
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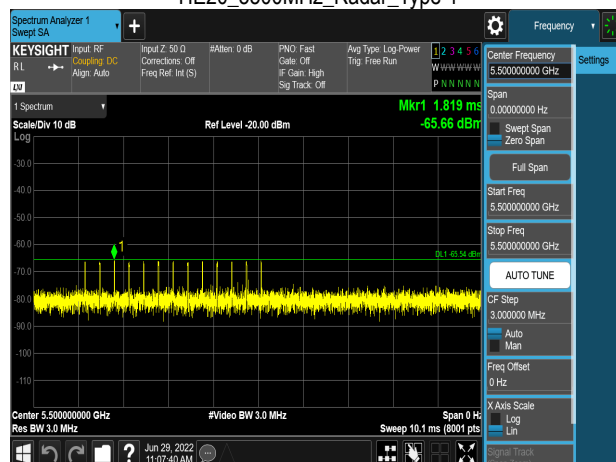
HE20\_5500MHz\_Radar\_Type 3



HE20\_5500MHz\_Radar\_Type 1-B



HE20\_5500MHz\_Radar\_Type 4

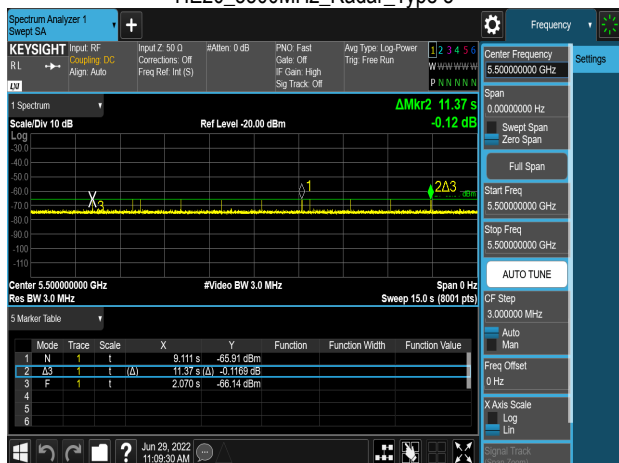


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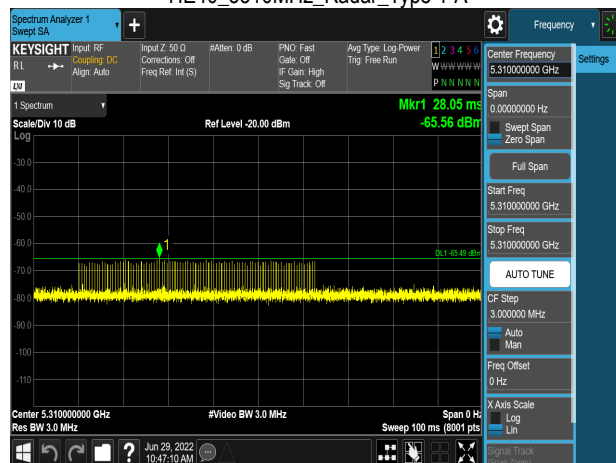
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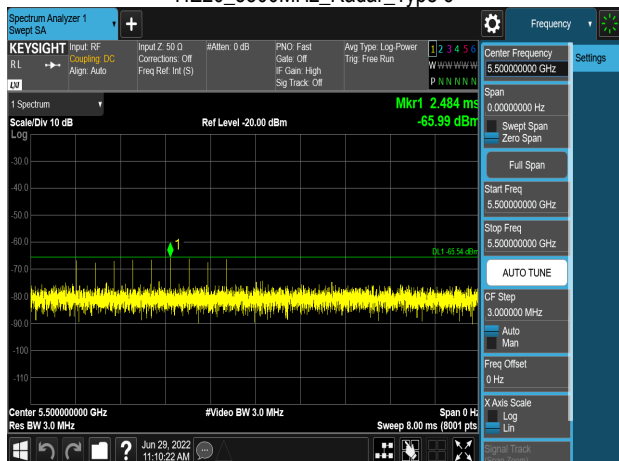
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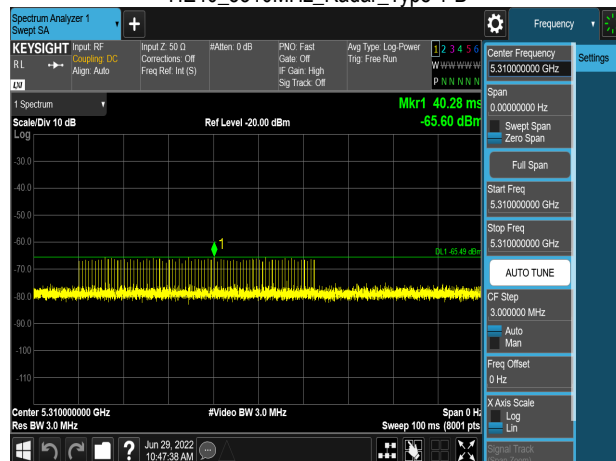
HE40\_5310MHz\_Radar\_Type 1-A



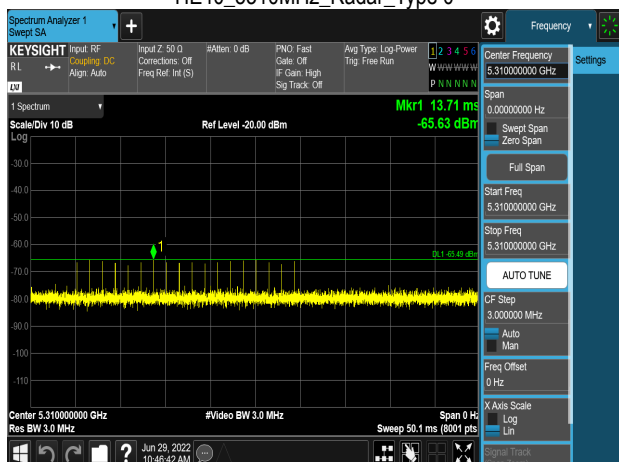
HE20\_5500MHz\_Radar\_Type 6



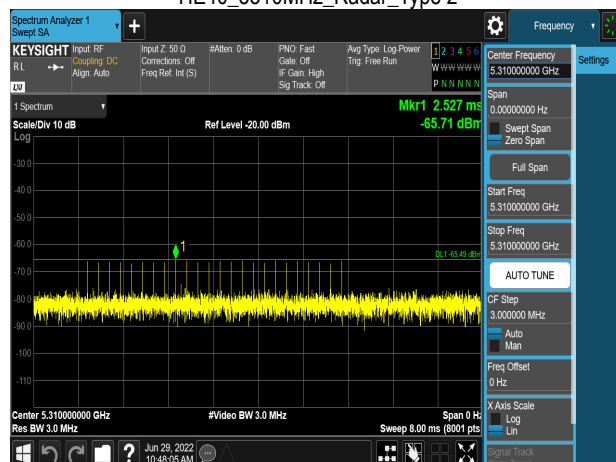
HE40\_5310MHz\_Radar\_Type 1-B



HE40\_5310MHz\_Radar\_Type 0



HE40\_5310MHz\_Radar\_Type 2

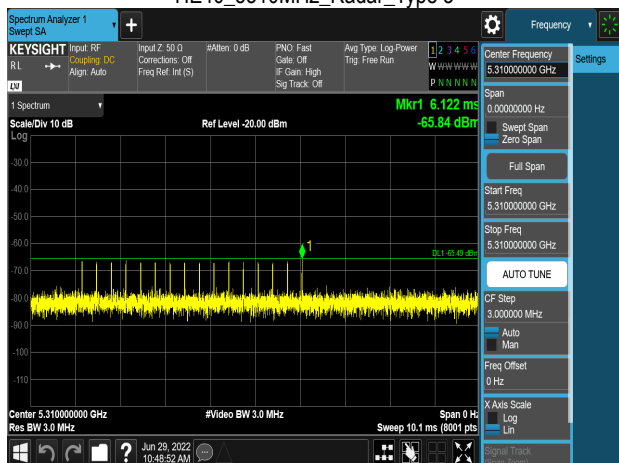


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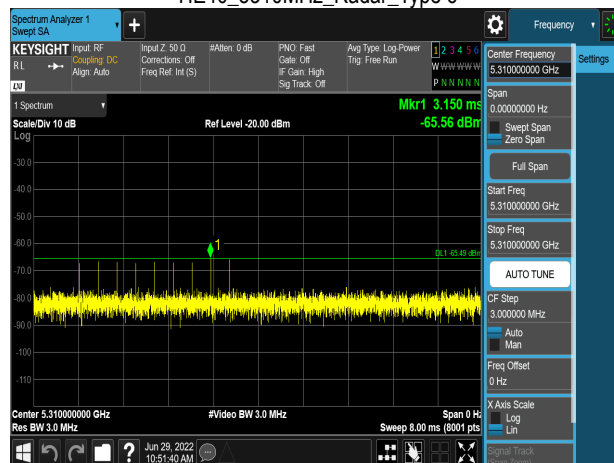
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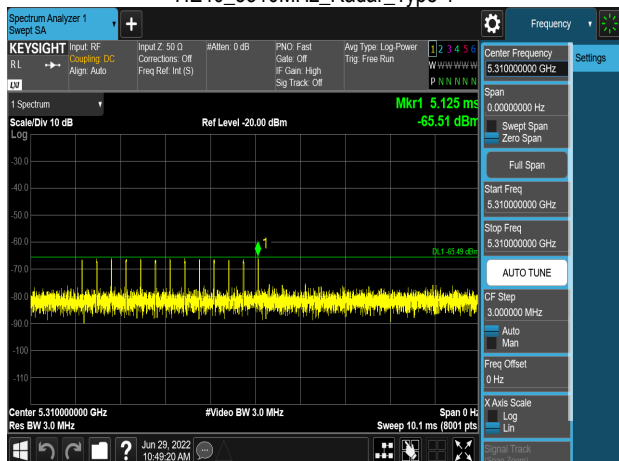
HE40\_5310MHz\_Radar\_Type 3



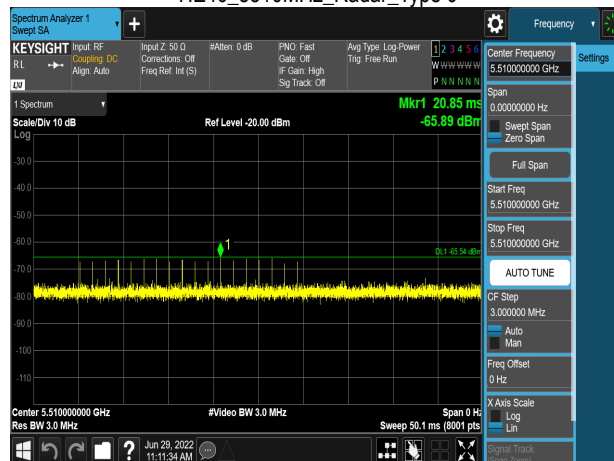
HE40\_5310MHz\_Radar\_Type 6



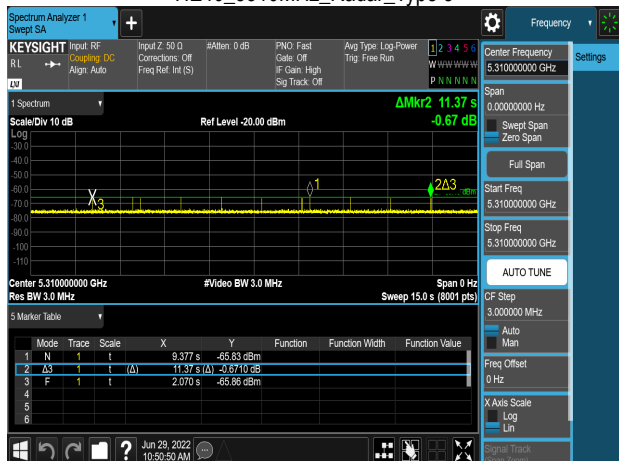
HE40\_5310MHz\_Radar\_Type 4



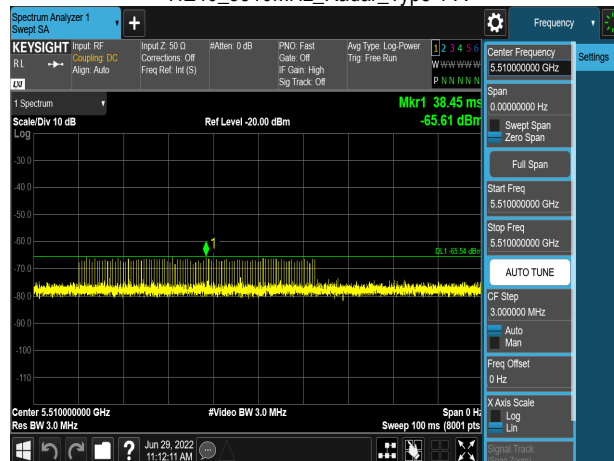
HE40\_5510MHz\_Radar\_Type 0



HE40\_5310MHz\_Radar\_Type 5



HE40\_5510MHz\_Radar\_Type 1-A

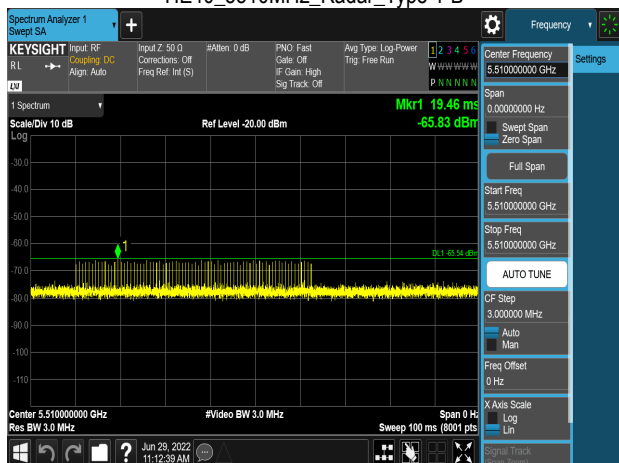


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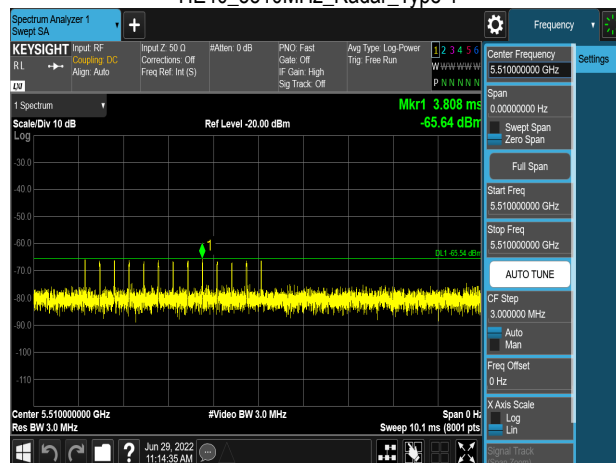
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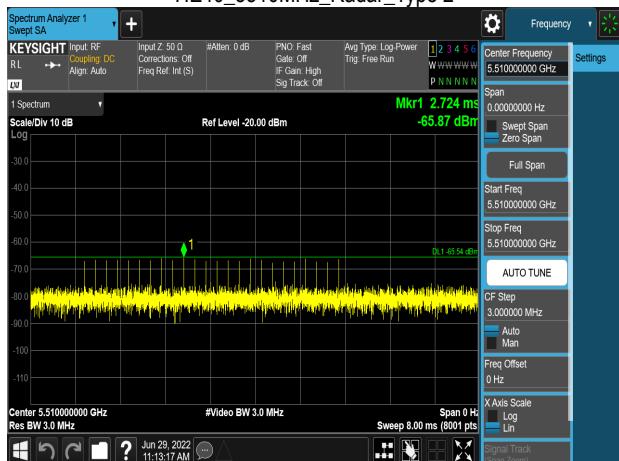
HE40\_5510MHz\_Radar\_Type 1-B



HE40\_5510MHz\_Radar\_Type 4



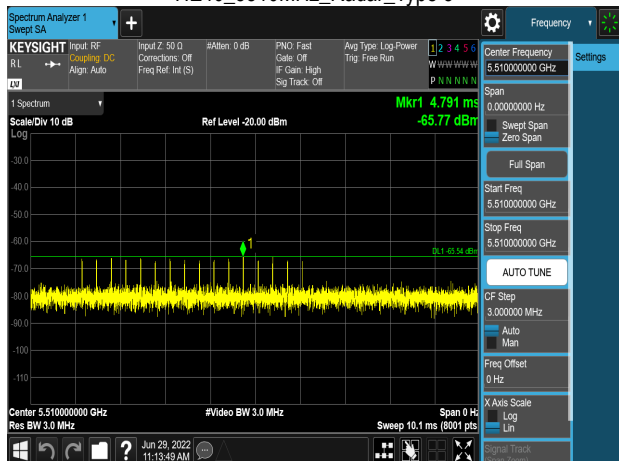
HE40\_5510MHz\_Radar\_Type 2



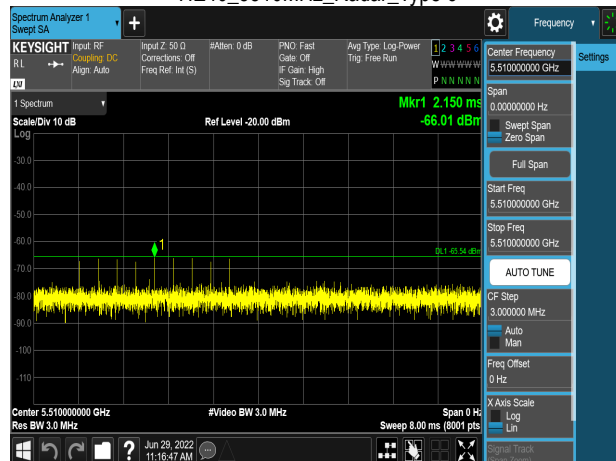
HE40\_5510MHz\_Radar\_Type 5



HE40\_5510MHz\_Radar\_Type 3



HE40\_5510MHz\_Radar\_Type 6

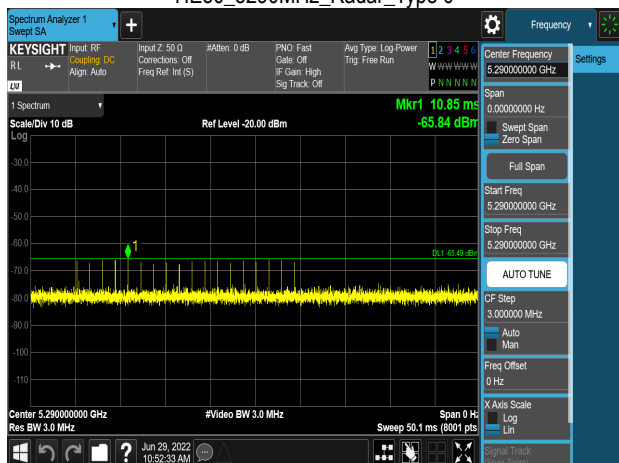


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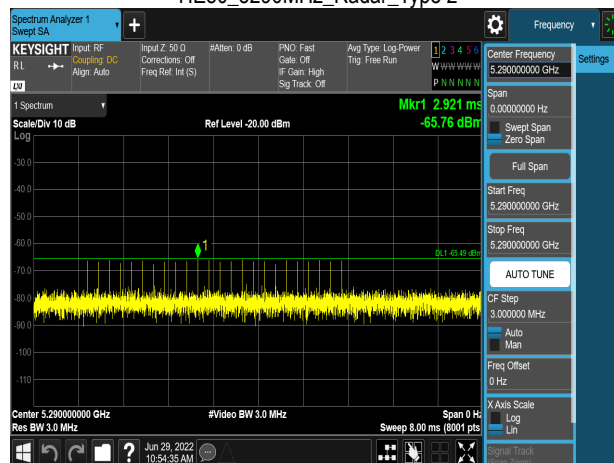
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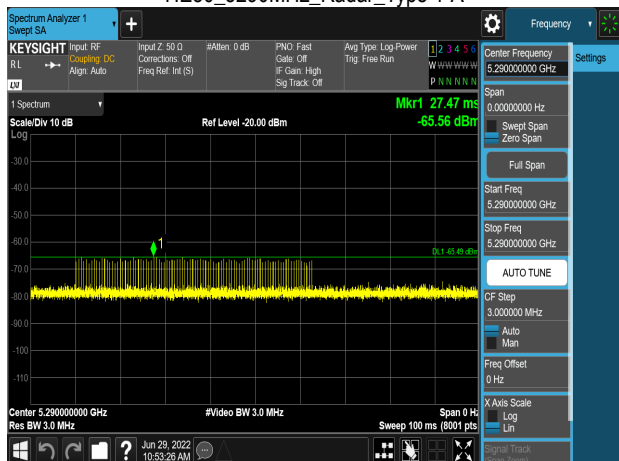
HE80\_5290MHz\_Radar\_Type 0



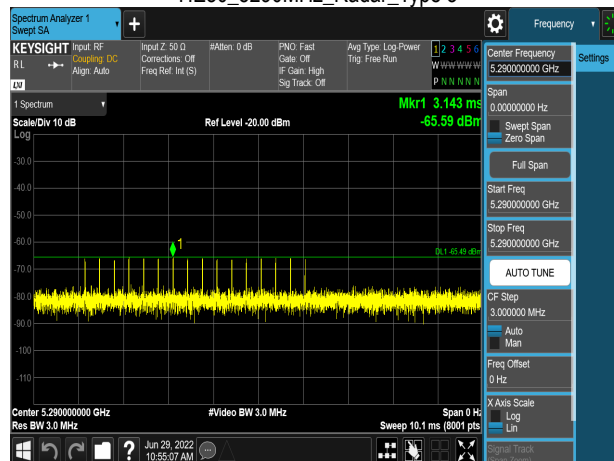
HE80\_5290MHz\_Radar\_Type 2



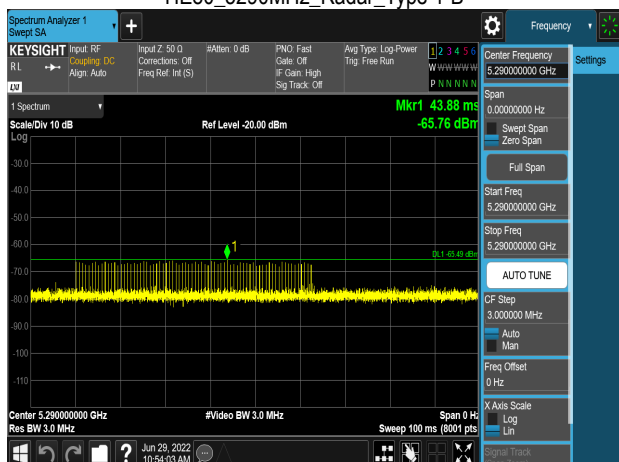
HE80\_5290MHz\_Radar\_Type 1-A



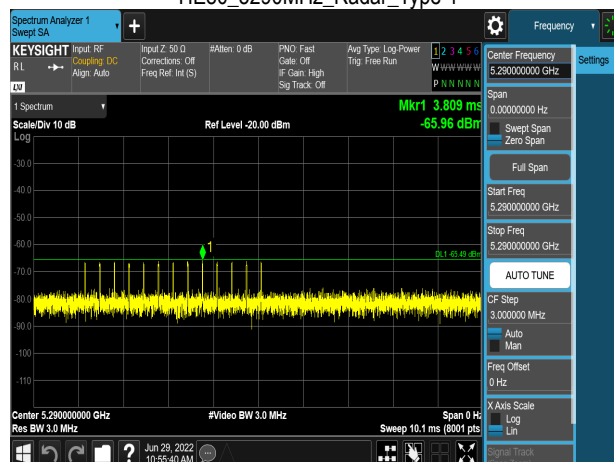
HE80\_5290MHz\_Radar\_Type 3



HE80\_5290MHz\_Radar\_Type 1-B



HE80\_5290MHz\_Radar\_Type 4



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