



# **CERTIFICATION TEST REPORT**

**Report Number. :** 4789901731-FR1V2

**Applicant :** Kaonbroadband CO., LTD.  
884-3, Seongnam-daero, Bundang-gu, Seongnam-si  
Gyeonggi-do, South Korea

**Model :** AR1344P, AR1344, AR1344E, EVO6700AP

**FCC ID :** 2AXCW-AP6700

**EUT Description :** Wi-Fi Extender with DTS/UNII a/b/g/n/ac/ax

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C

**Date Of Issue:**

August 11, 2021

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**TL-637**

REPORT REVISION HISTORY

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	07/28/21	Initial issue	Robby Lee
V2	08/11/21	Updated to address about the TCB's comments	Robby Lee

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Kaonbroadband CO., LTD.  
**EUT DESCRIPTION:** Wi-Fi Extender with DTS/UNII a/b/g/n/ac/ax  
**MODEL NUMBER:** AR1344P, AR1344, AR1344E, EVO6700AP  
**SERIAL NUMBER:** Proto type (CONDUCTED)  
Proto type (RADIATED);  
**DATE TESTED:** MAY 03, 2021 – JULY 28, 2021;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For  
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Tested By:



Robby Lee  
Suwon Lab Engineer  
UL Korea, Ltd.

## 2. TEST METHODOLOGY

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 558074 D01 DTS Meas Guidance v05r02.
4. KDB 662911 D01 Multiple Transmitter Output v02r01
5. ANSI C63.10-2013.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro	
<input checked="" type="checkbox"/>	Chamber 1
<input type="checkbox"/>	Chamber 2
<input checked="" type="checkbox"/>	Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

UL Korea, Ltd. is accredited by National Radio Research Agency, Designation Number KR0161, for all testing performed within the scope of this report.

ISED CABID	ISED Company Number	FCC Registration
KR0161	2324L	644529

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$28.9 \text{ dBuV/m} = 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB}$$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.87 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.49 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.82 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.49 dB

Uncertainty figures are valid to a confidence level of 95%.

### 4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Accuracy Method specified in Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

## 5. EQUIPMENT UNDER TEST

### 5.1. EUT DESCRIPTION

The EUT is a Wi-Fi Extender with DTS/UNII a/b/g/n/ac/ax.  
 This test report addresses the DTS (WLAN) operational mode.

This report covers the models AR1344P and AR1344, AR1344E, EVO6700AP  
 The difference between these models is only the memory size.

Model	Memory size
AR1344P, EVO6700AP	256MB/512MB (FLASH MEMORY / SDRAM)
AR1344, AR1344E	128MB/256MB (FLASH MEMORY / SDRAM)

The model AR1344P was set for final test.

#### WiFi operating mode

Frequency range	Mode	ANT 1	ANT 2
2.4GHz (2412 MHz ~ 2462 MHz)	802.11b SISO	TX/RX	TX/RX
	802.11b MIMO	TX/RX	TX/RX
	802.11g SISO	TX/RX	TX/RX
	802.11g MIMO	TX/RX	TX/RX
	802.11n(HT20) SISO	TX/RX	TX/RX
	802.11n(HT20) MIMO	TX/RX	TX/RX
	802.11n(HT40) SISO	TX/RX	TX/RX
	802.11n(HT40) MIMO	TX/RX	TX/RX

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Frequency Range [MHz]	Mode	Output Power [dBm]		Output Power [mW]	
		ANT1	ANT2	ANT1	ANT2
2412 - 2462	802.11b SISO	19.93	19.12	64.86	65.31
	802.11b MIMO	21.34		136.14	
	802.11g SISO	19.33	20.30	85.7	107.15
	802.11g MIMO	22.93		196.34	
	802.11n(HT20) SISO	19.35	20.25	86.1	105.93
	802.11n(HT20) MIMO	19.96		99.08	
	802.11n(HT40) SISO	19.55	20.25	90.16	105.93
	802.11n(HT40) MIMO	22.78		189.67	



### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

**The internal antenna was Permanently attached.  
Therefore this E.U.T Complies with the requirement of §15.203.**

The radio utilizes an internal antennas, with ANT 1 & 2's maximum gain of 1.88 dBi.

The EUT uses ANT 1 and 2 as the same antenna.

### 5.4. TESTED CHANNELS LIST

Ch.	Frequency [MHz]	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
1	2 412	O	O	O	-
2	2 417	-	O	O	-
3	2 422	-	-	-	O
4	2 427	-	-	-	O
6	2 437	O	O	O	O
8	2 447	-	-	-	O
9	2 452	-	-	-	O
10	2 457	-	O	O	-
11	2 462	O	O	O	-

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## 5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/High Channels.

The EUT is used on the X axis as a fixed device.; therefore, all radiated testing was performed with the EUT in X orientation.

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps 1TX/2TX

802.11g mode: 6 Mbps 1TX/2TX

802.11n HT20 mode: MCS0 1TX/2TX

802.11n HT40 mode: MCS0 1TX/2TX

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Switching mode Power Adaptor	CHENZHOU FRECOM ELECTRONICS	F18L16-120150SPAU	N/A	N/A

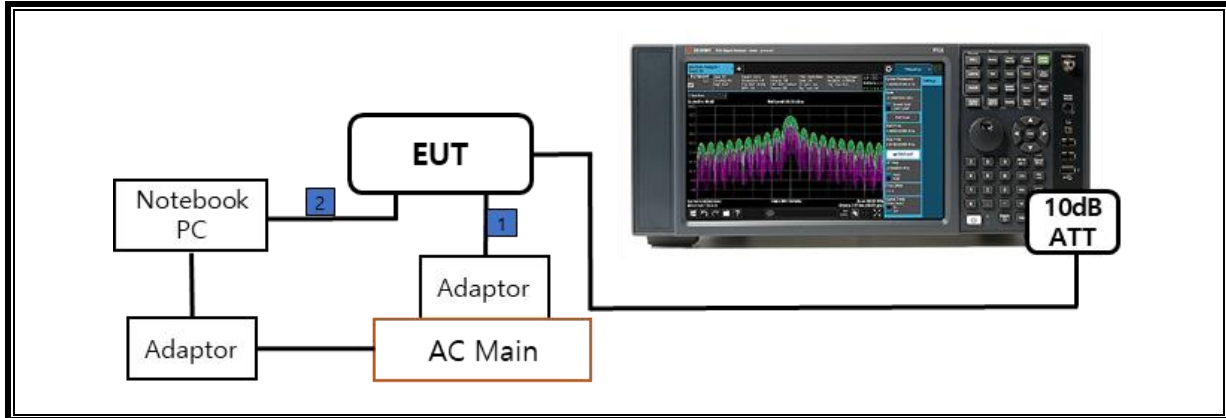
### I/O CABLE

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Pin	Shielded	1.5m	N/A
2	LAN	2	RJ-45	Shielded	2.0m	N/A

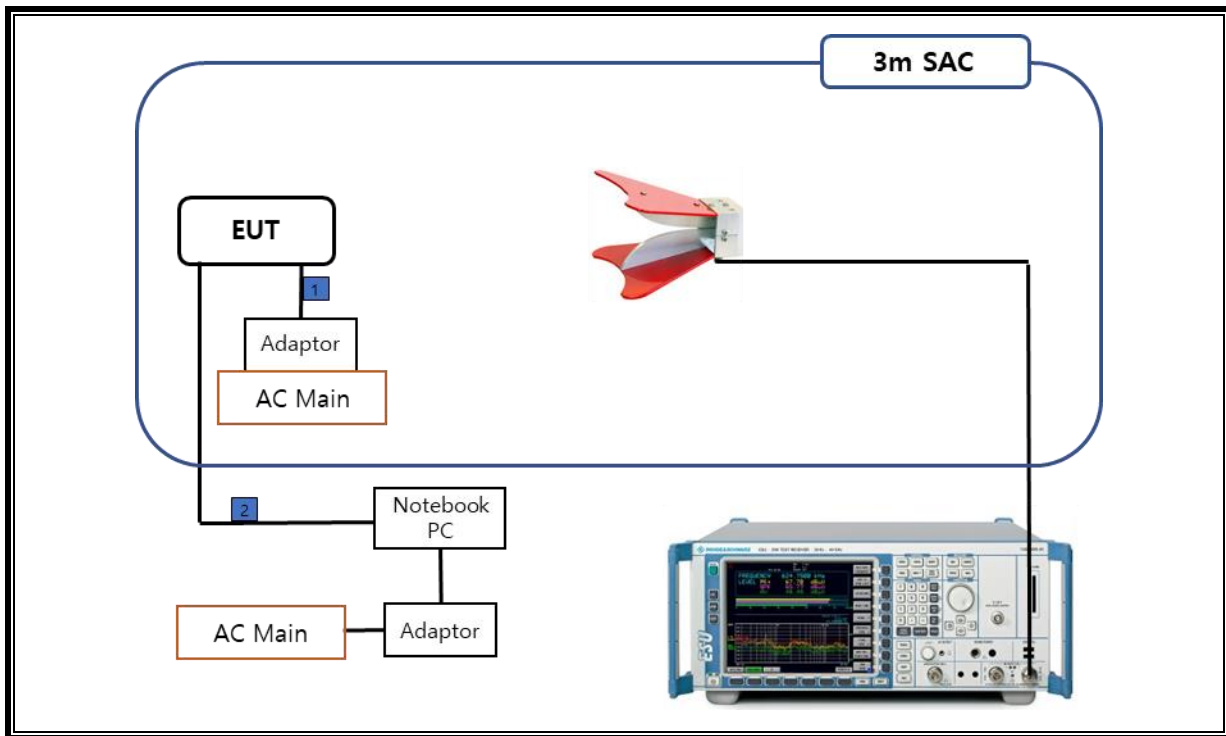
### TEST SETUP

The EUT is a stand-alone unit during the tests.  
 Test software exercised the EUT to enable DTS mode.

**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**



**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



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## 6. MEASUREMENT METHOD

6 dB BW : KDB 558074 D01 v05r02, Section 8.2

OUTPUT POWER : KDB 558074 D01 v05r02, Section 8.3.2.3.

POWER SPECTRAL DENSITY : KDB 558074 D01 v05r02, Section 8.4.

Out-of-band EMISSIONS (Conducted) : KDB 558074 D01 v05r02, Section 8.5.

Out-of-band EMISSIONS IN NON-RESTRICTED BANDS: KDB 558074 D01 v05r02, Section 8.5.

Out-of-band EMISSIONS IN RESTRICTED BANDS KDB 558074 D01 v05r02, Section 8.6.

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2.

## 7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2022-08-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2022-08-13
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2022-08-13
Antenna, Horn, 18 GHz	ETS	3115	00167211	2022-07-27
Antenna, Horn, 18 GHz	ETS	3115	00161451	2022-08-15
Antenna, Horn, 18 GHz	ETS	3117	00168724	2022-07-27
Antenna, Horn, 18 GHz	ETS	3117	00168717	2022-08-15
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2022-08-04
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2021-10-02
Preamplifier	ETS	3116C-PA	00168841	2021-08-06
Preamplifier, 1000 MHz	Sonoma	310N	341282	2021-08-03
Preamplifier, 1000 MHz	Sonoma	310N	351741	2021-08-03
Preamplifier, 1000 MHz	Sonoma	310N	370599	2021-08-06
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2021-08-03
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2021-08-03
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2021-08-04
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2021-08-05
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2021-08-05
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY60070693	2021-09-15
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143717	2022-01-13
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143652	2022-01-13
Spectrum Analyzer, 43.5 GHz	R&S	FSW43	104089	2021-08-06
Average Power Sensor	Agilent / HP	U2000	MY54270007	2021-08-05
Power Sensor	R&S	NRP-Z91	102681	2021-08-05
Attenuator	PASTERNAK	PE7087-10	A001	2021-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2021-08-03
Attenuator	PASTERNAK	PE7004-10	2	2021-08-04
Attenuator	PASTERNAK	PE7087-10	A009	2021-08-03
Attenuator	WEINSCHEL	54A-10	74560	2021-08-07
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2021-08-03
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2021-08-03
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2021-08-03
EMI Test Receive, 3 GHz	R&S	ESR3	102592	2021-08-06
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2021-08-03
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2021-08-03
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	2021-08-04
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2021-08-03
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	2021-08-03
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2021-08-04
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2021-08-03
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	2021-08-03
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	2021-08-04
LISN	R&S	ENV-216	101837	2021-08-06
LISN	R&S	ENV216	102478	2021-08-07
OPEN SWITCH AND CONTROL	R&S	OSP220	101437	N/A
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2021-10-02
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	R&S	EMC32	Ver 10.60.10	

## 8. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	Occupied Band width (6dB)	> 500kHz	Conducted	Pass
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-30dBc		Pass
15.247 (b)(3)	TX conducted output power	< 30dBm		Pass
15.247 (e)	PSD	< 8dBm		Pass
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass

# 9. ANTENNA PORT TEST RESULTS

## 9.1. ON TIME AND DUTY CYCLE

### LIMITS

None; for reporting purposes only.

Band	Mode	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2.4 GHz	802.11b	2.975	2.998	0.992	99.23	0	0.336
	802.11g	2.972	3.001	0.990	99.03	0	0.336
	802.11n(HT20)	2.972	3.002	0.990	99.00	0	0.336
	802.11n(HT40)	2.972	3.001	0.990	99.03	0	0.336

Note. Since the duty cycle of all modes is over 98%, compensation is not included.(average measurement)





## 9.2. 6 dB BANDWIDTH

### LIMITS

FCC §15.247 (a) (2)

The minimum 6 dB bandwidth shall be at least 500 kHz.

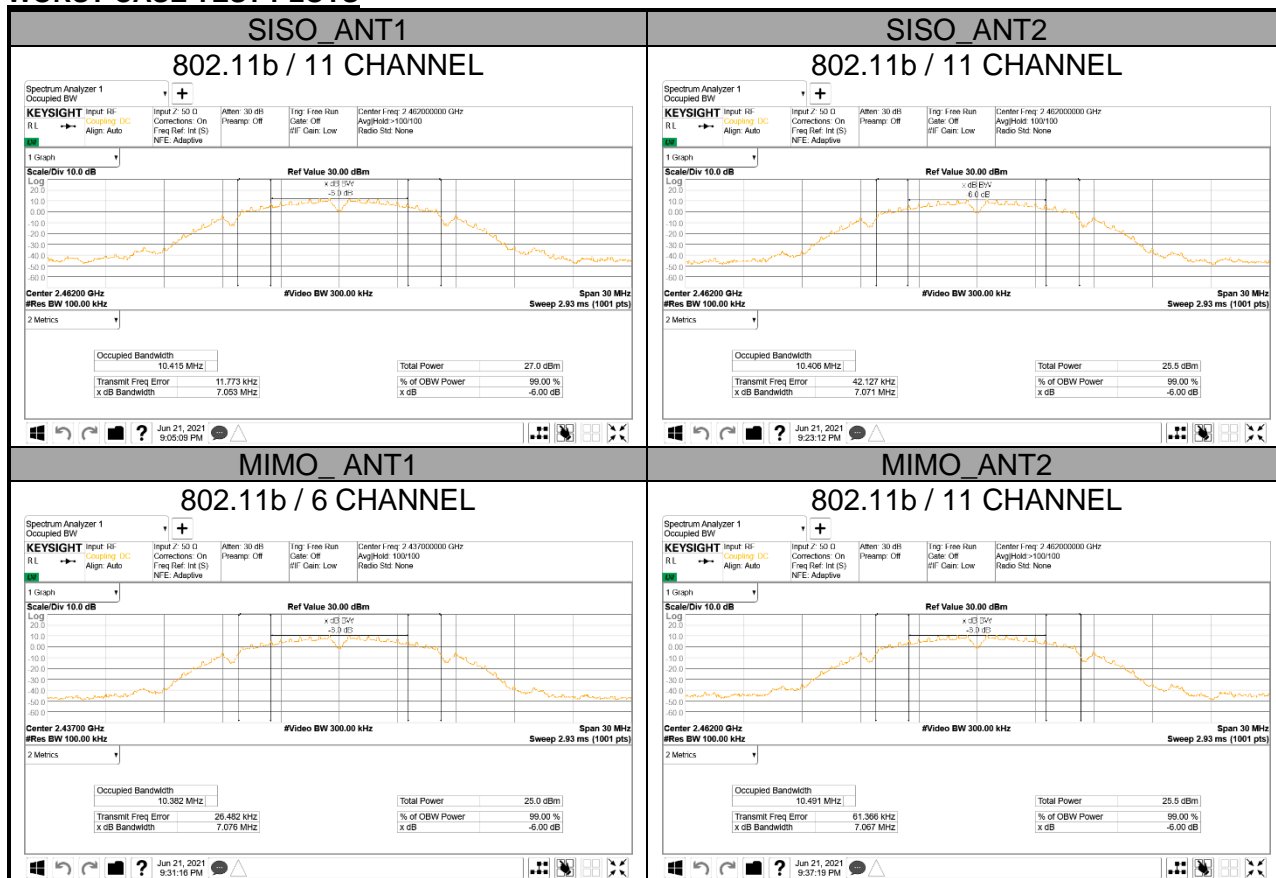
### TEST PROCEDURE

Reference to KDB 558074 D01 15.247 Meas Guidance: The transmitter output is connected to a spectrum analyzer with the RBW set to 100 kHz, the VBW  $\geq 3 \times$  RBW, peak detector and max hold.

### RESULTS

- Please refer to the next page

### WORST CASE TEST PLOTS



**9.2.1. 802.11b SISO MODE IN THE 2.4 GHz BAND**

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	7.09	7.07	0.5
6	2 437	7.10	7.08	
11	2 462	7.05	7.07	
Worst		<b>7.05</b>	<b>7.07</b>	

**9.2.2. 802.11b MIMO MODE IN THE 2.4 GHz BAND**

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	7.08	7.08	0.5
6	2 437	7.08	7.09	
11	2 462	7.08	7.07	
Worst		<b>7.08</b>	<b>7.07</b>	

**9.2.3. 802.11g SISO MODE IN THE 2.4 GHz BAND**

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	16.37	16.37	0.5
2	2 417	16.37	16.35	
6	2 437	16.37	16.38	
10	2 457	16.38	16.37	
11	2 462	16.38	16.37	
Worst		<b>16.37</b>	<b>16.35</b>	

**9.2.4. 802.11g MIMO MODE IN THE 2.4 GHz BAND**

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	16.37	16.37	0.5
2	2 417	16.36	16.38	
6	2 437	16.38	16.39	
10	2 457	16.37	16.37	
11	2 462	16.37	16.36	
Worst		<b>16.36</b>	<b>16.36</b>	

**9.2.5. 11n(HT20) SISO MODE IN THE 2.4 GHz BAND**

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	17.60	17.61	0.5
2	2 417	17.61	17.60	
6	2 437	17.61	17.61	
10	2 457	17.60	17.60	
11	2 462	17.61	17.61	
Worst		<b>17.60</b>	<b>17.60</b>	

**9.2.6. 802.11n(HT20) MIMO MODE IN THE 2.4 GHz BAND**

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	17.60	17.63	0.5
2	2 417	17.60	17.61	
6	2 437	17.60	17.61	
10	2 457	17.60	17.63	
11	2 462	17.60	17.60	
Worst		<b>17.60</b>	<b>17.60</b>	

**9.2.7. 11n(HT40) SISO MODE IN THE 2.4 GHz BAND**

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
3	2 422	36.07	36.39	0.5
4	2 427	36.15	36.08	
6	2 437	36.10	36.16	
8	2 447	35.99	36.33	
9	2 452	36.06	36.02	
Worst		<b>35.99</b>	<b>36.02</b>	

**9.2.8. 11n(HT40) MIMO MODE IN THE 2.4 GHz BAND**

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
3	2 422	36.12	36.40	0.5
4	2 427	36.09	36.41	
6	2 437	36.13	36.40	
8	2 447	36.11	36.35	
9	2 452	36.00	36.41	
Worst		<b>36.00</b>	<b>36.35</b>	

### 9.3. OUTPUT POWER

#### LIMITS

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### TEST PROCEDURE

Measurements perform using a wideband RF frame average power sensor. The cable assembly insertion loss and duty cycle correction factor was entered as an offset in the power sensor to allow for direct reading of power. Output power measurement was performed utilizing the method AVGPM under KDB558074 D01 15.247 Meas Guidance 8.3.2.3.

#### DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is equal among the chains. The directional gain is:

Bands [MHz]	ANT 1 [dBi]	ANT 2 [dBi]	Directional Gain [dBi]
2 412 – 2 462	1.88	1.88	1.88

Note: Array gain calculation for CDD

For power measurements on IEEE 802.11 devices:

- Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$
- Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any  $N_{ANT}$

### 9.3.1. 802.11b/g/n HT20 MODE TEST RESULTS

Included in Calculations of Corr'd Power			
Duty Cycle CF	802.11b SISO	-	dB
	802.11g MIMO	-	dB
	802.11n HT20 MIMO	-	dB

**Calculation of Output Power result**

Average Power = Meas. Power + Duty Cycle CF / Total Corr'd Power = ANT1's Average Power + ANT2's Average Power

**- SISO & MIMO Mode**

Mode	Channel	Frequency [MHz]	SISO Average Power [dBm]		MIMO Average Power [dBm]			Power Limit [dBm]
			ANT1	ANT2	ANT1	ANT2	Total Corr'd Power [dBm]	
802.11b	1	2 412	19.93	19.12	17.85	17.80	20.84	30
	6	2 437	19.88	18.85	17.86	17.81	20.85	
	11	2 462	19.77	18.14	18.30	18.36	21.34	
	<b>Worst Case</b>		<b>19.93</b>	<b>19.12</b>			<b>21.34</b>	
802.11g	1	2 412	15.29	15.00	13.68	14.47	17.10	30
	2	2 417	19.03	18.48	17.79	18.75	21.31	
	6	2 437	19.33	20.30	19.50	20.30	22.93	
	10	2 457	18.45	18.12	16.82	17.56	20.22	
	11	2 462	13.30	14.62	12.12	13.05	15.62	
<b>Worst Case</b>		<b>19.33</b>	<b>20.30</b>			<b>22.93</b>		
802.11n HT20	1	2 412	15.52	14.54	14.22	14.81	17.54	30
	2	2 417	18.88	18.42	17.00	18.03	20.56	
	6	2 437	19.35	20.25	19.43	20.08	22.78	
	10	2 457	17.55	17.92	16.46	17.07	19.79	
	11	2 462	12.01	14.21	11.69	12.49	15.12	
<b>Worst Case</b>		<b>19.35</b>	<b>20.25</b>			<b>22.78</b>		
802.11n HT40	3	2 422	13.04	12.18	11.41	12.11	14.78	30
	4	2 427	13.30	13.55	11.16	12.23	14.74	
	6	2 437	19.55	20.29	19.50	20.25	22.90	
	8	2 447	11.72	13.05	11.75	12.51	15.16	
	9	2 452	10.79	12.67	10.16	11.08	13.65	
<b>Worst Case</b>		<b>19.55</b>	<b>20.29</b>			<b>22.90</b>		

## 9.4. POWER SPECTRAL DENSITY

### LIMITS

FCC §15.247 (e)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### TEST PROCEDURE

Power Spectral Density was performed utilizing the method AVGPS-1 under KDB558074 D01 15.247 Meas Guidance section 8.4.

### DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is equal among the chains.  
The directional gain is:

Bands [MHz]	ANT 1 [dBi]	ANT 2 [dBi]	Directional Gain [dBi]
2 412 – 2 462	1.88	1.88	1.88

Note: Array gain calculation for CDD

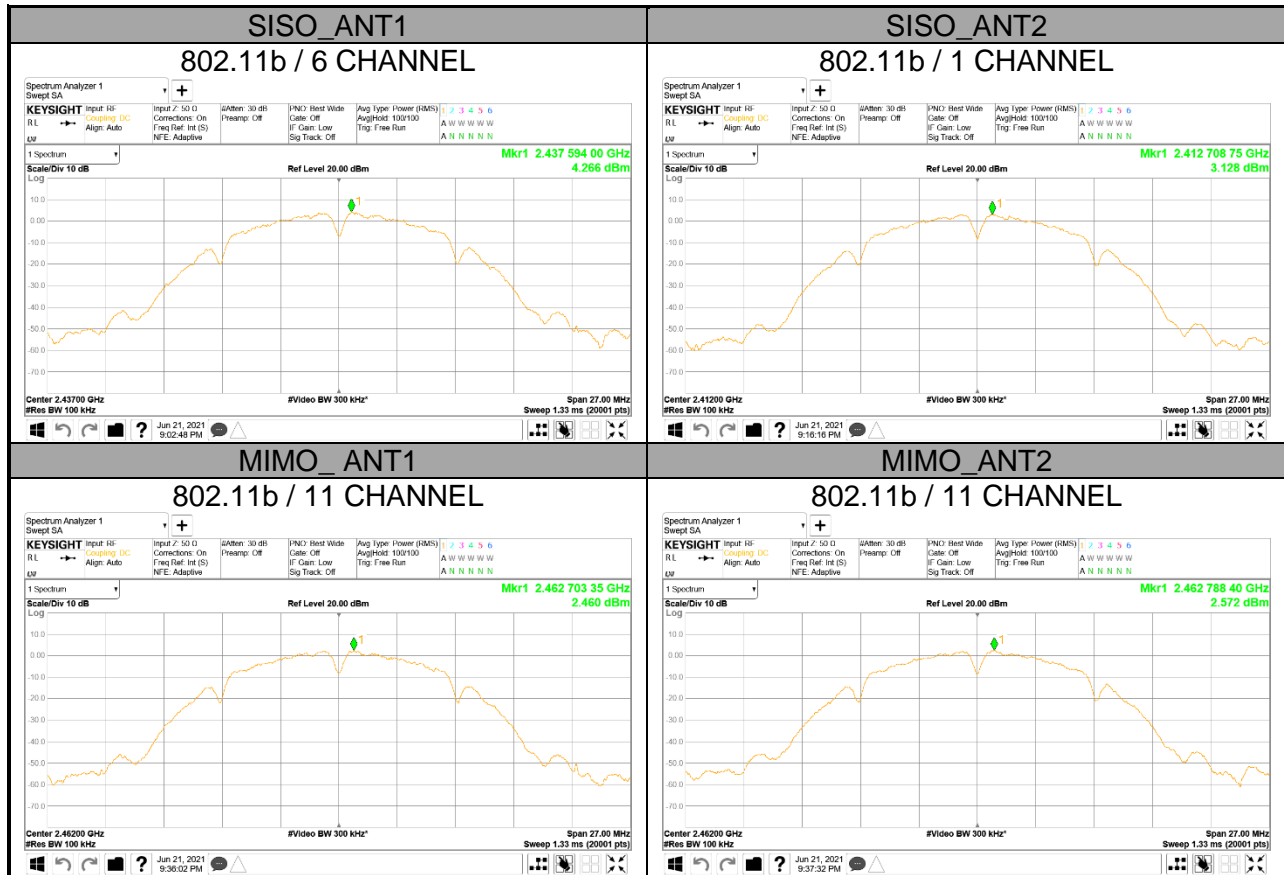
For power measurements on IEEE 802.11 devices:

- Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$
- Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any  $N_{ANT}$

**RESULTS**

- Please refer to the next page

**WORST CASE TEST PLOTS**





### 9.4.1. 802.11b/g/n HT20 MODE TEST RESULTS

Included in Calculations of Corr'd Power			
Duty Cycle CF	802.11b SISO	-	dB
	802.11g MIMO	-	dB
	802.11n HT20 MIMO	-	dB

**Calculation of Output PSD result**

- 1TX : Corr'd PSD = Meas PSD + Duty Cycle CF
- 2TX : Total PSD = ANT1 Meas PSD + ANT2 Meas PSD + Duty Cycle CF

**- SISO Mode**

Mode	Channel	Frequency [MHz]	Meas PSD [dBm/100kHz]		Corr'd PSD [dBm/100kHz]		PSD Limit [dBm/3kHz]
			ANT1	ANT2	ANT1	ANT2	
802.11b	1	2 412	3.913	3.128	3.913	3.128	8
	6	2 437	4.266	3.074	4.266	3.074	
	11	2 462	3.739	2.470	3.739	2.470	
802.11g	1	2 412	-4.680	-5.412	-4.680	-5.412	8
	2	2 417	-1.011	-1.981	-1.011	-1.981	
	6	2 437	-0.576	0.179	-0.576	0.179	
	10	2 457	-1.359	-1.999	-1.359	-1.999	
	11	2 462	-6.561	-5.485	-6.561	-5.485	
802.11n HT20	1	2 412	-4.862	-5.612	-4.862	-5.612	8
	2	2 417	-1.473	-1.425	-1.473	-1.425	
	6	2 437	-0.779	0.206	-0.779	0.206	
	10	2 457	-2.709	-2.236	-2.709	-2.236	
	11	2 462	-8.282	-6.071	-8.282	-6.071	
802.11n HT40	3	2 422	-10.106	-11.136	-10.106	-11.136	8
	4	2 427	-9.839	-10.084	-9.839	-10.084	
	6	2 437	-3.811	-3.492	-3.811	-3.492	
	8	2 447	-11.424	-10.026	-11.424	-10.026	
	9	2 452	-12.459	-10.326	-12.459	-10.326	

**- MIMO Mode**

Mode	Channel	Frequency [MHz]	Meas PSD [dBm/100kHz]		Total PSD [dBm/100kHz]	PSD Limit [dBm/3kHz]
			ANT1	ANT2		
802.11b	1	2 412	2.009	1.489	4.770	8
	6	2 437	2.034	2.063	5.060	
	11	2 462	2.460	2.572	5.530	
802.11g	1	2 412	-6.773	-5.463	-3.060	8
	2	2 417	-0.697	-1.457	1.950	
	6	2 437	-0.635	-0.167	2.620	
	10	2 457	-3.362	-2.709	-0.010	
	11	2 462	-7.713	-6.884	-4.270	
802.11n HT20	1	2 412	-6.252	-5.530	-2.870	8
	2	2 417	-3.067	-2.422	0.280	
	6	2 437	-0.799	-0.319	2.460	
	10	2 457	-3.248	-2.883	-0.050	
	11	2 462	-8.639	-7.670	-5.120	
802.11n HT40	3	2 422	-11.892	-11.091	-8.460	8
	4	2 427	-11.700	-11.176	-8.420	
	6	2 437	-3.973	-3.994	-0.970	
	8	2 447	-11.578	-10.401	-7.940	
	9	2 452	-13.225	-12.122	-9.630	

---

## 9.5. CONDUCTED SPURIOUS EMISSIONS

### LIMITS

FCC §15.247 (d)

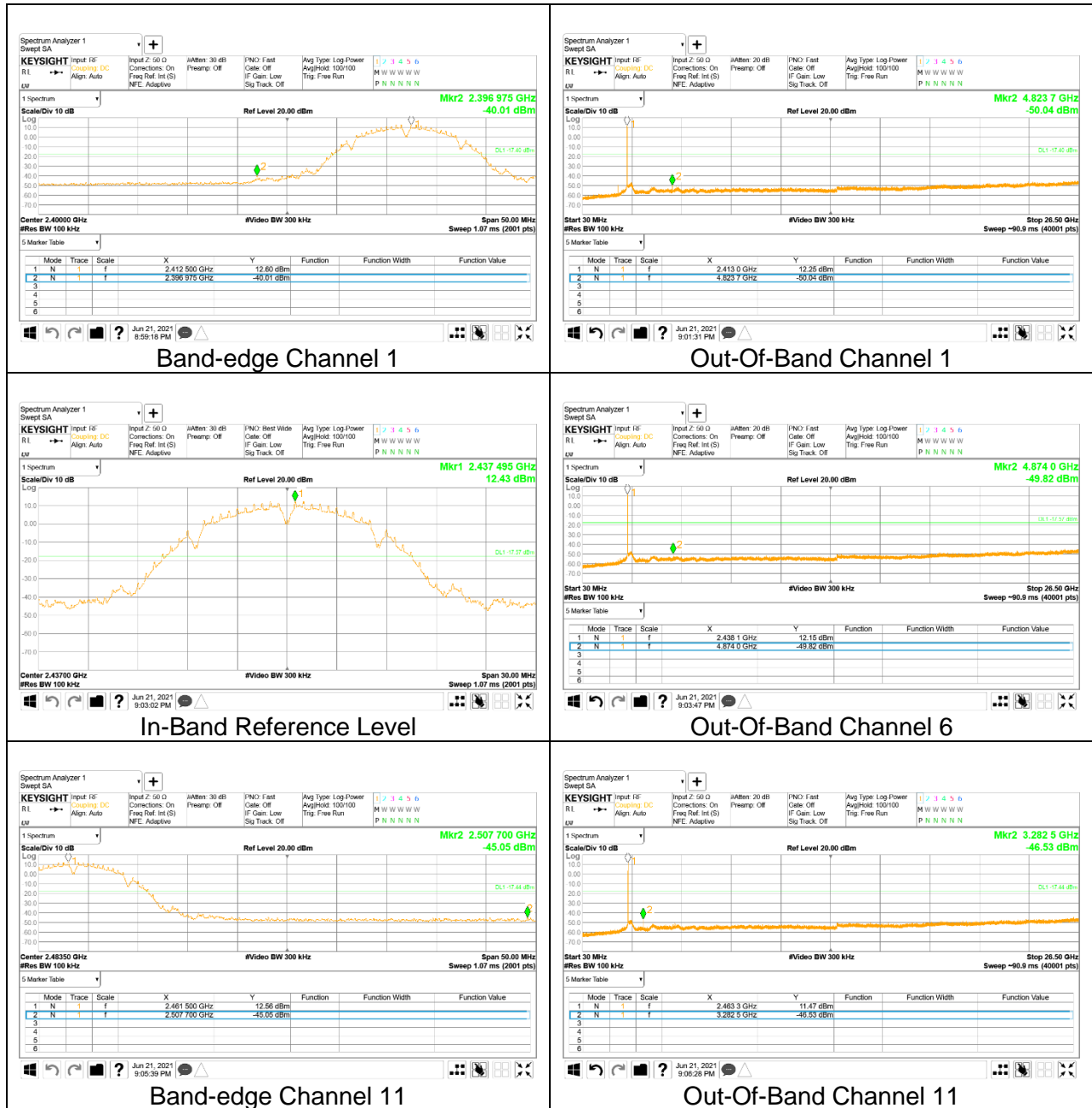
Output power was measured based on the use of average measurement, therefore the required attenuation is 30 dB.

### RESULTS

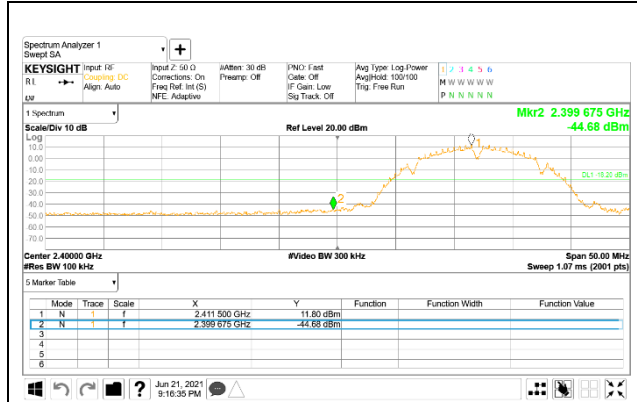
- Please refer to the next page

### 9.5.1. 802.11b MODE

#### SISO ANT 1



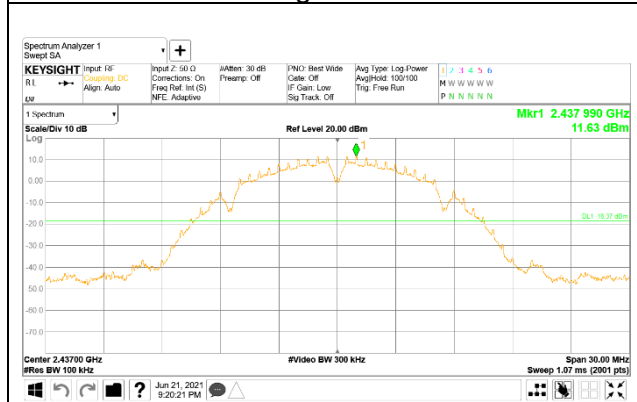
**SISO ANT 2**



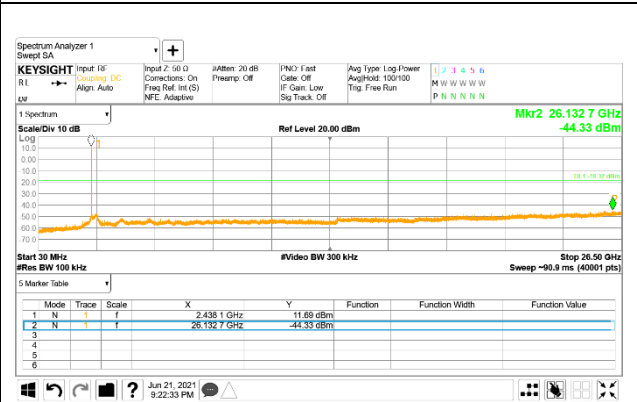
Band-edge Channel 1



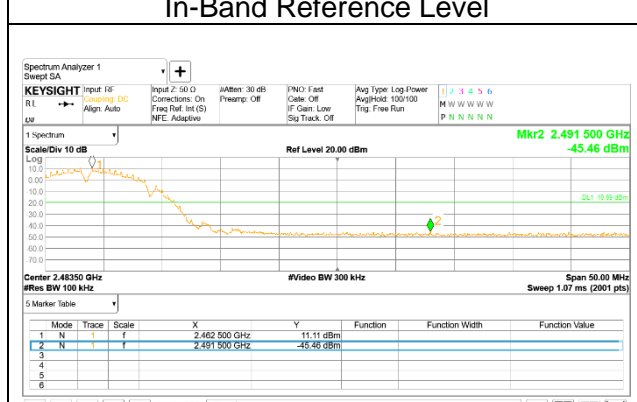
Out-Of-Band Channel 1



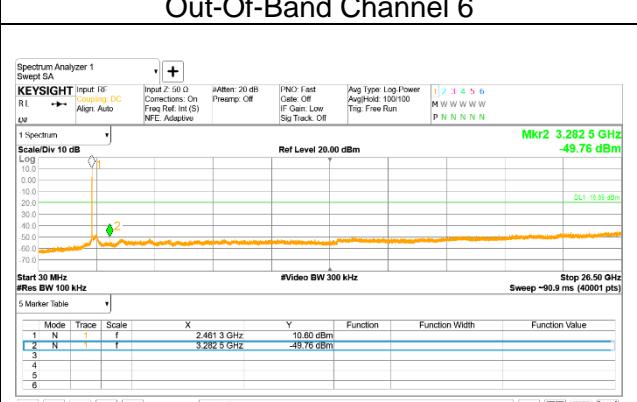
In-Band Reference Level



Out-Of-Band Channel 6

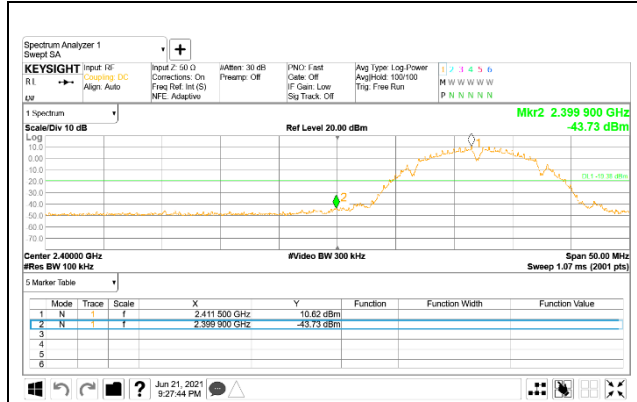


Band-edge Channel 11

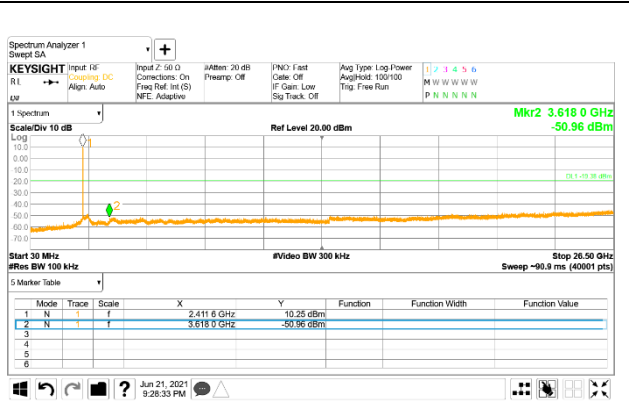


Out-Of-Band Channel 11

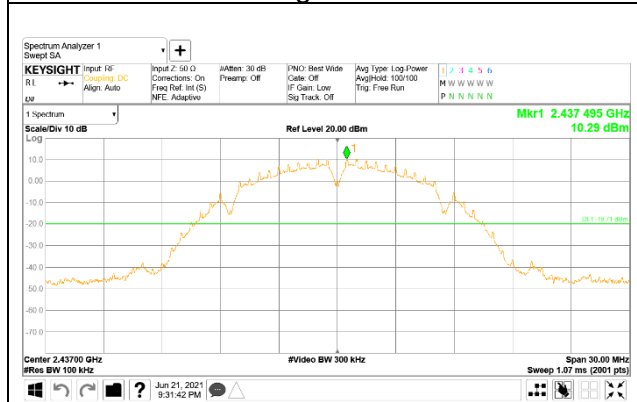
**MIMO ANT 1**



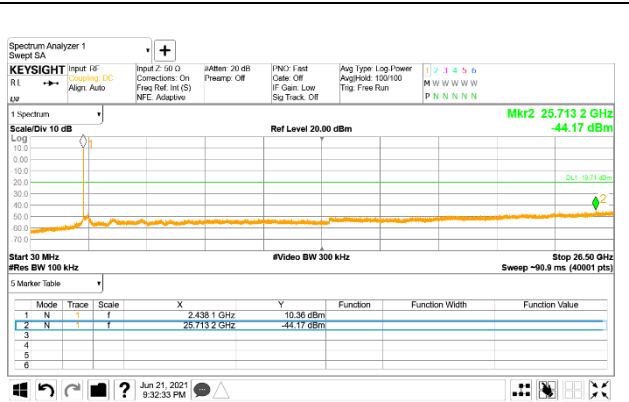
**Band-edge Channel 1**



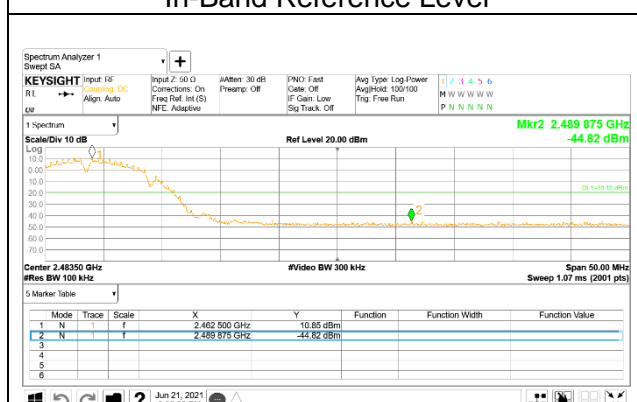
**Out-Of-Band Channel 1**



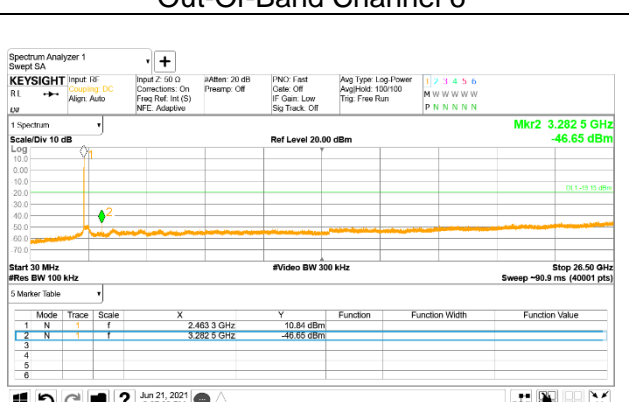
**In-Band Reference Level**



**Out-Of-Band Channel 6**

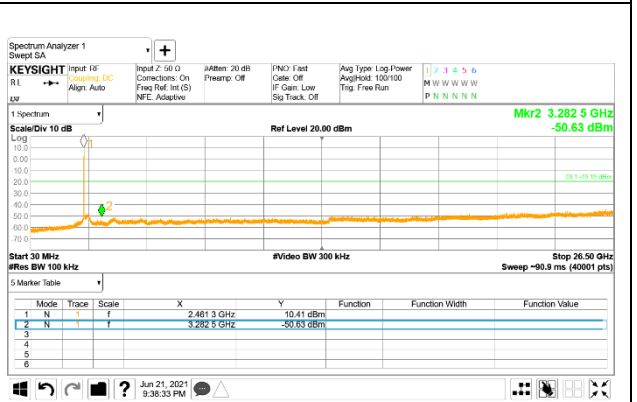
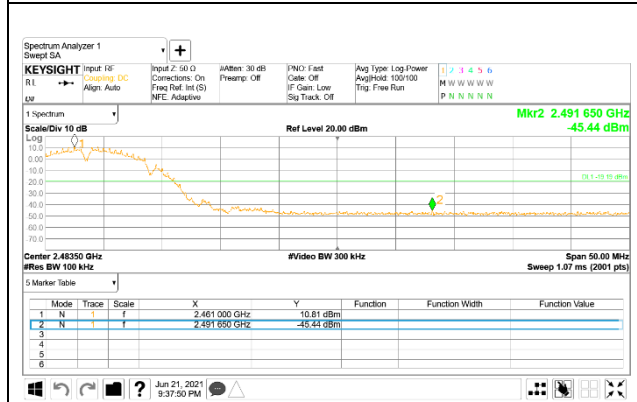
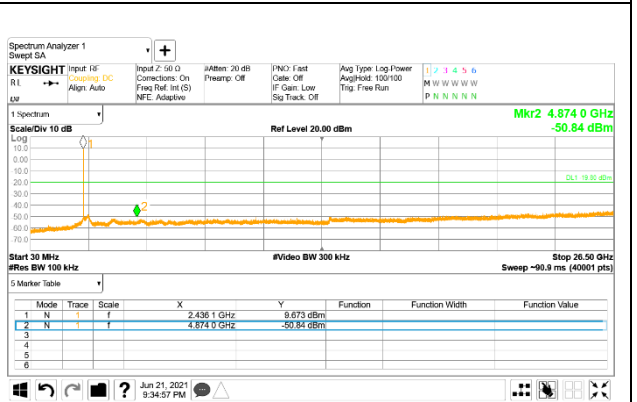
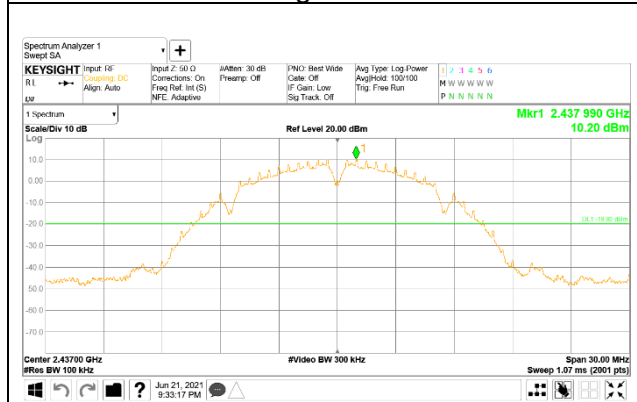
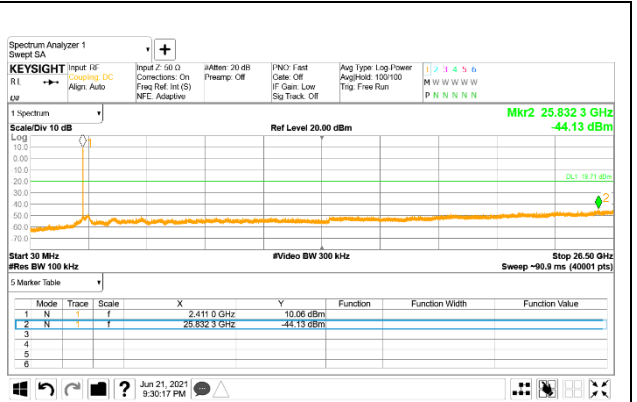
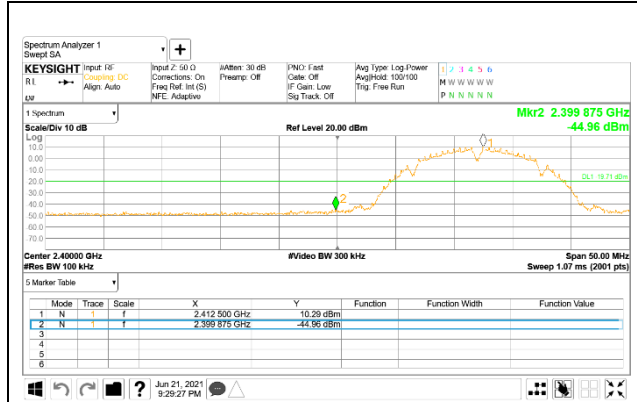


**Band-edge Channel 11**



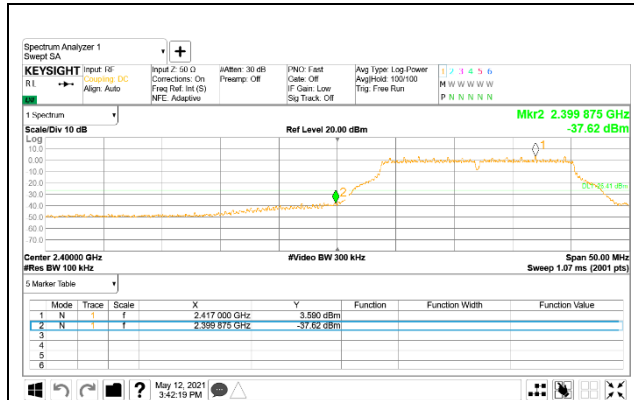
**Out-Of-Band Channel 11**

**MIMO ANT 2**

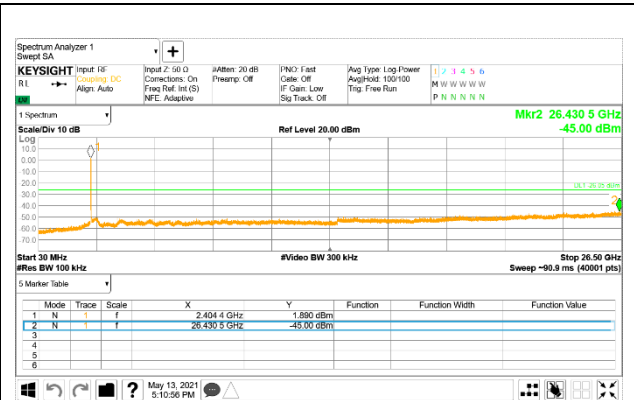


### 9.5.2. 802.11g MODE

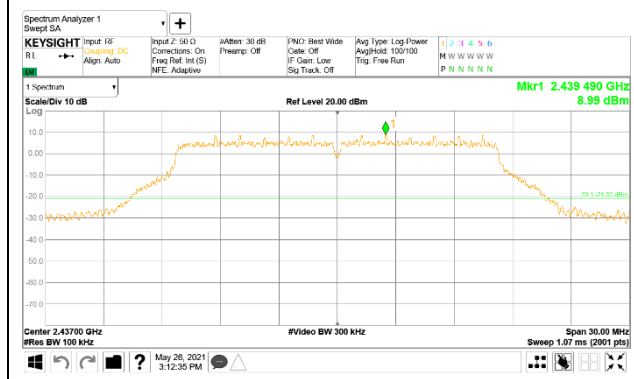
#### SISO ANT 1



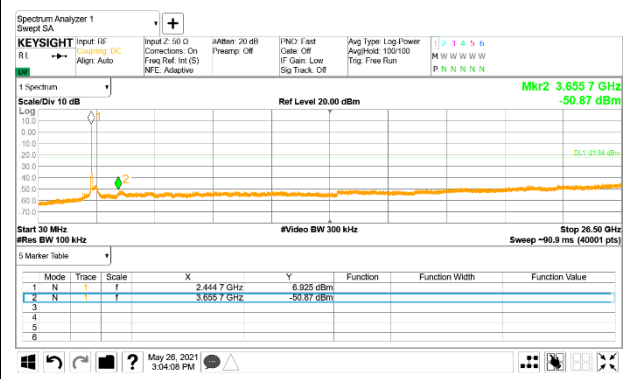
Band-edge Channel 1



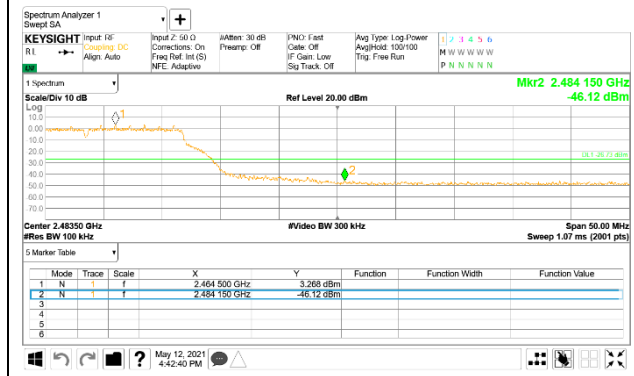
Out-Of-Band Channel 1



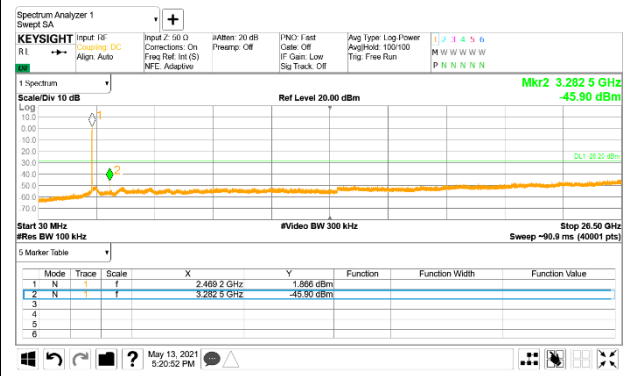
In-Band Reference Level



Out-Of-Band Channel 6

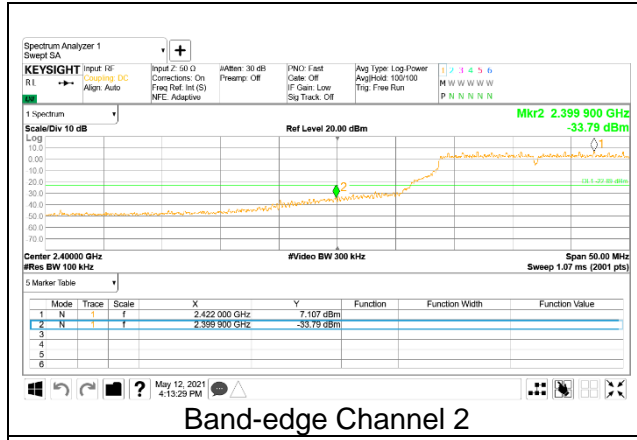


Band-edge Channel 11

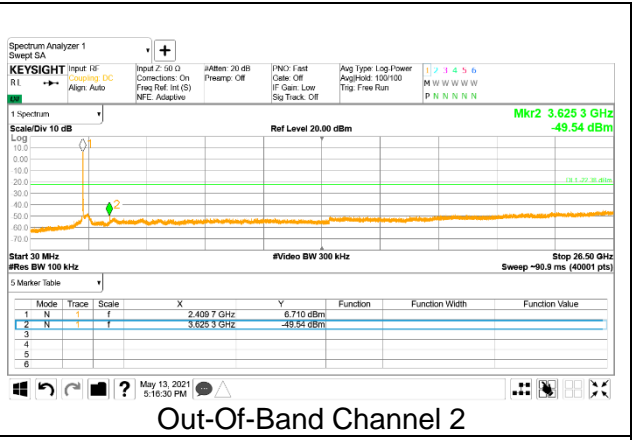


Out-Of-Band Channel 11

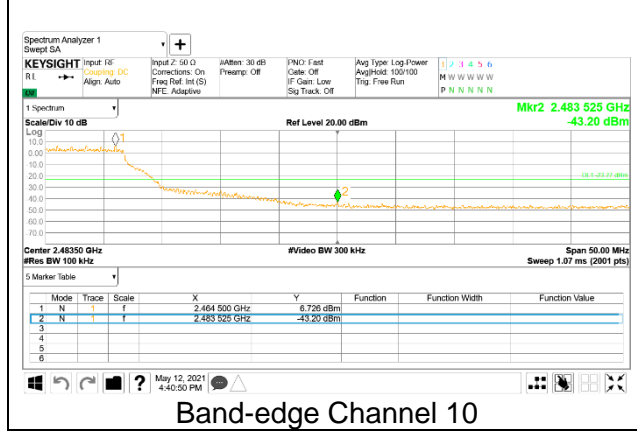




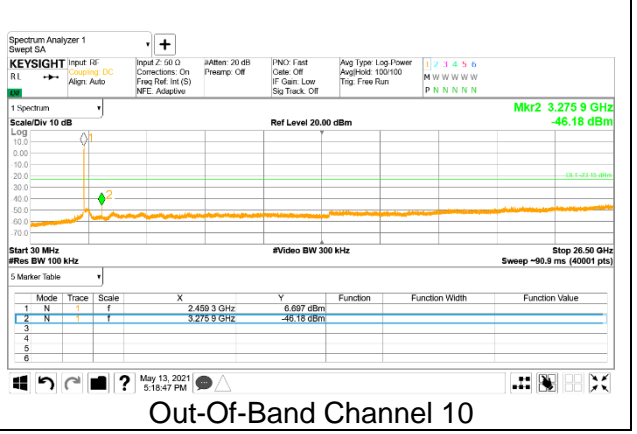
Band-edge Channel 2



Out-Of-Band Channel 2

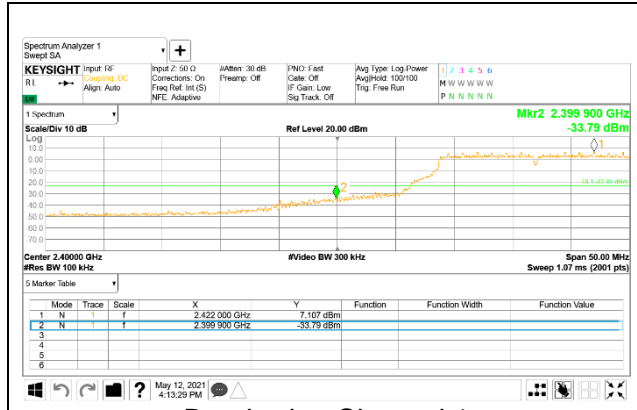


Band-edge Channel 10

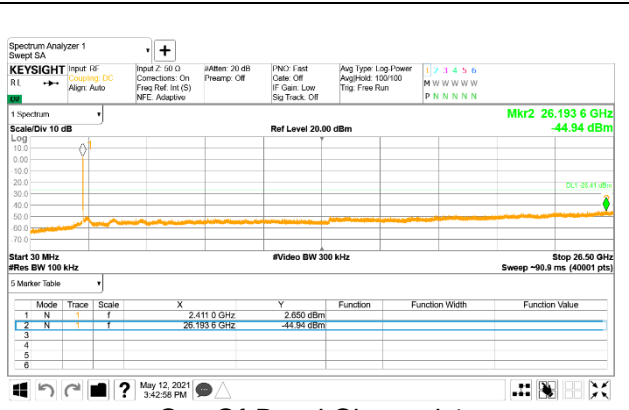


Out-Of-Band Channel 10

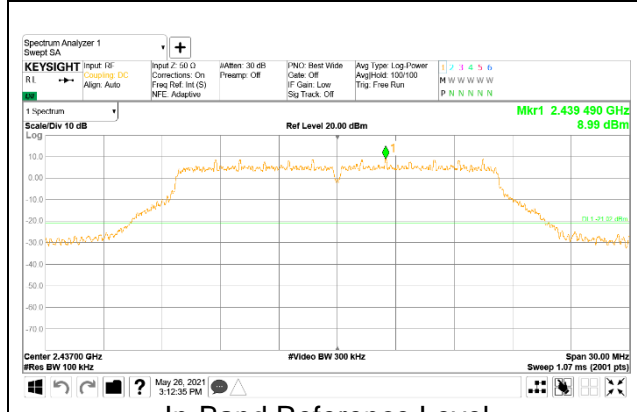
**SISO ANT 2**



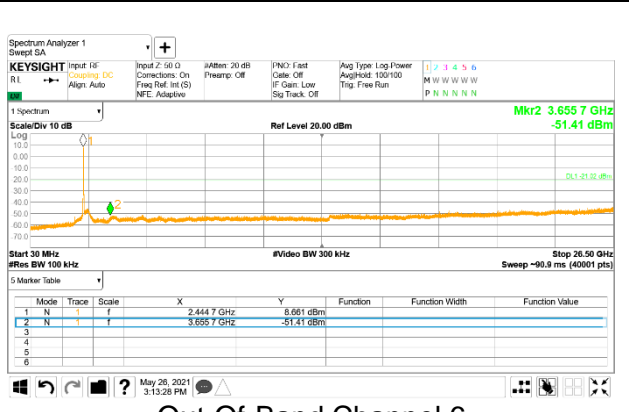
**Band-edge Channel 1**



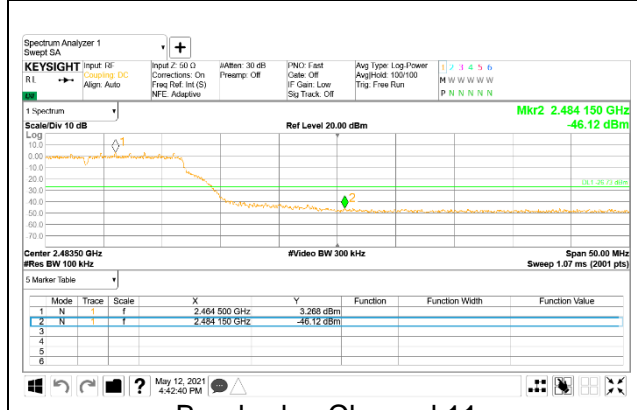
**Out-Of-Band Channel 1**



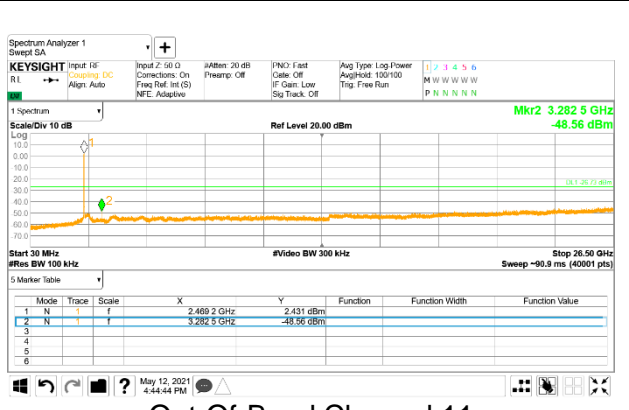
**In-Band Reference Level**



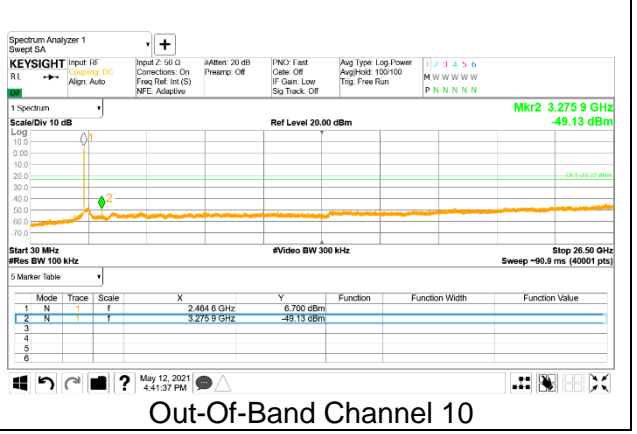
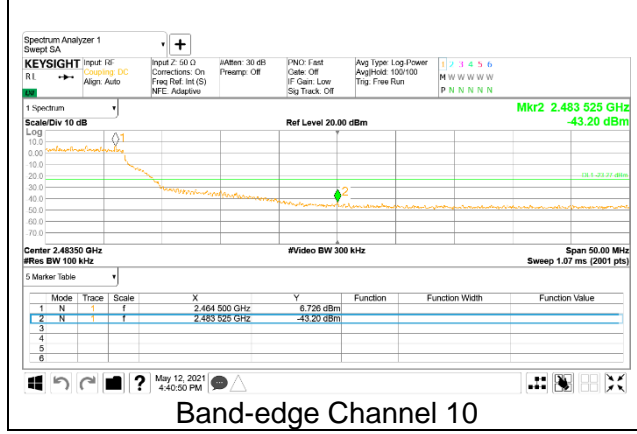
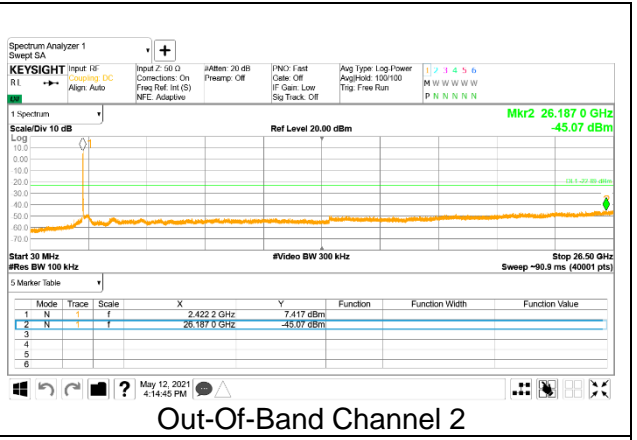
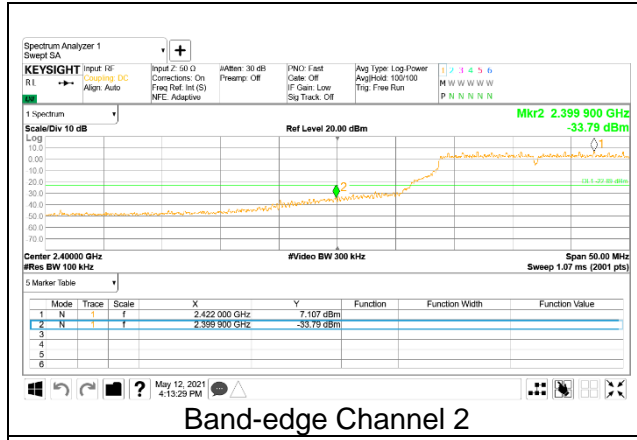
**Out-Of-Band Channel 6**



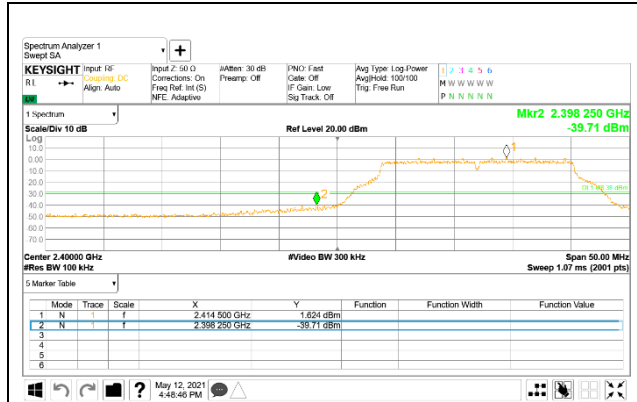
**Band-edge Channel 11**



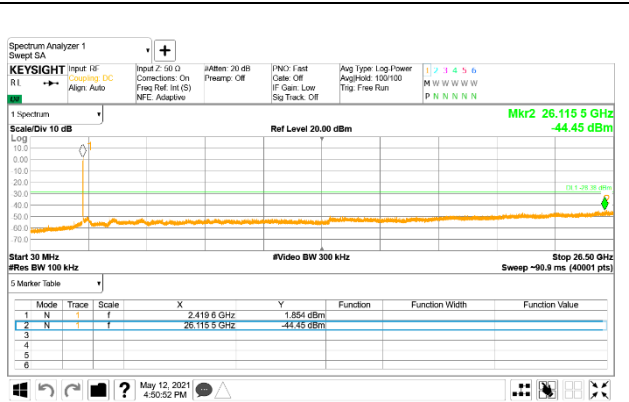
**Out-Of-Band Channel 11**



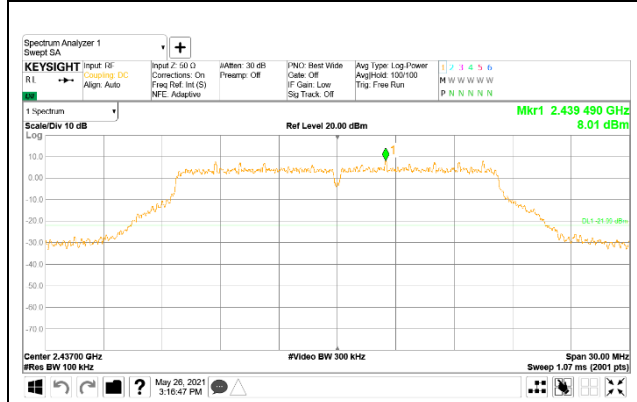
**MIMO ANT 1**



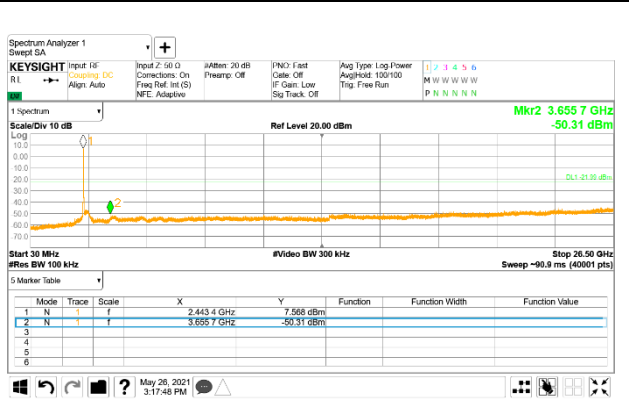
Band-edge Channel 1



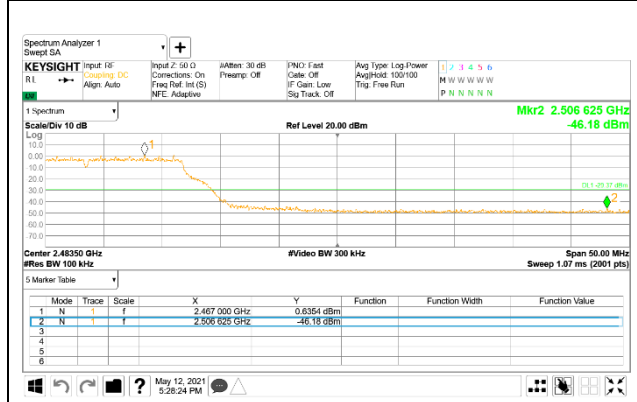
Out-Of-Band Channel 1



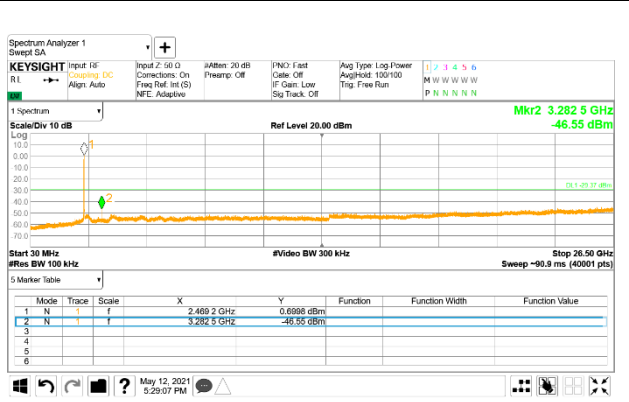
In-Band Reference Level



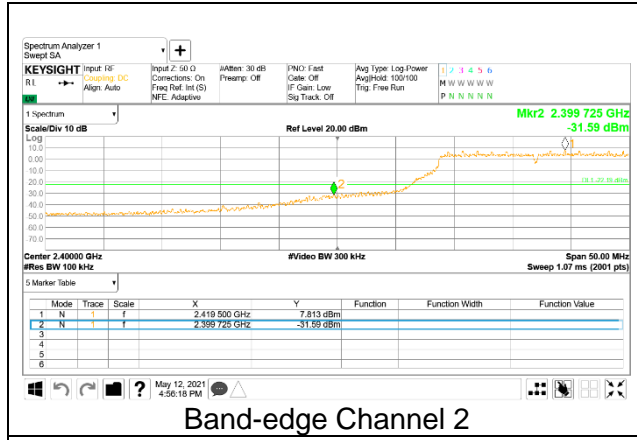
Out-Of-Band Channel 6



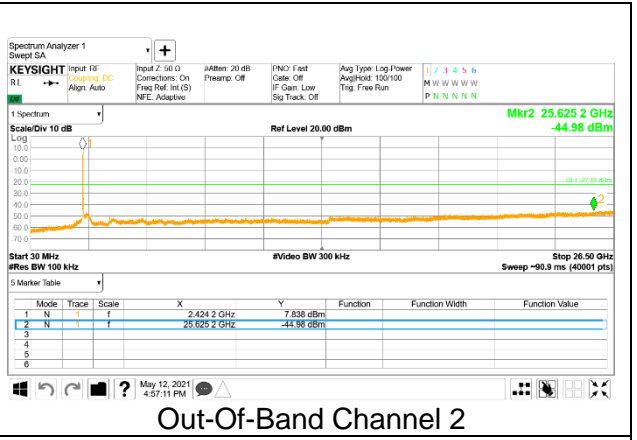
Band-edge Channel 11



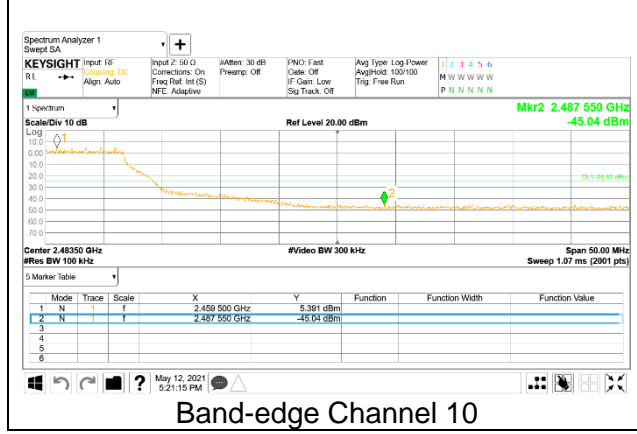
Out-Of-Band Channel 11



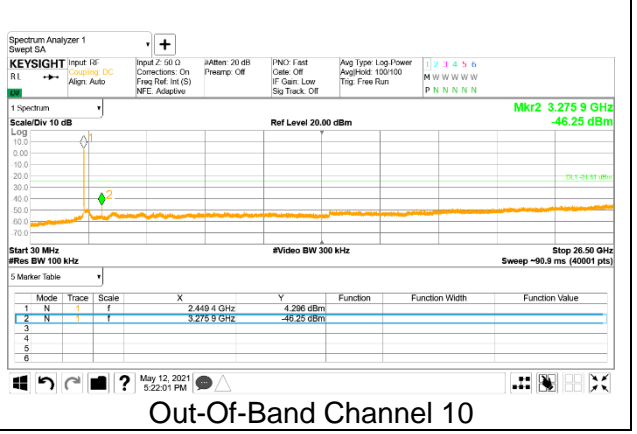
Band-edge Channel 2



Out-Of-Band Channel 2



Band-edge Channel 10

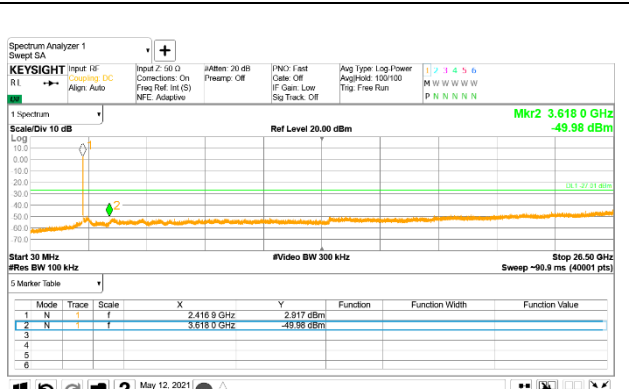


Out-Of-Band Channel 10

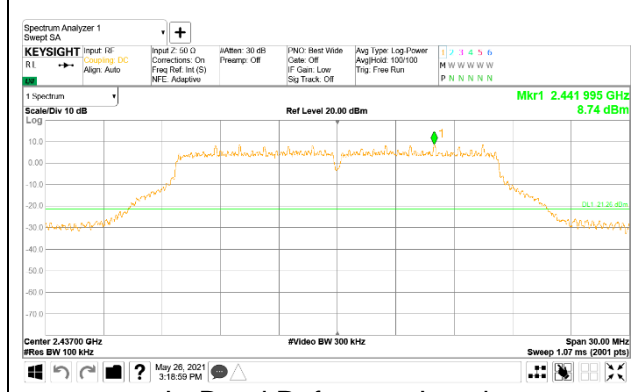
**MIMO ANT 2**



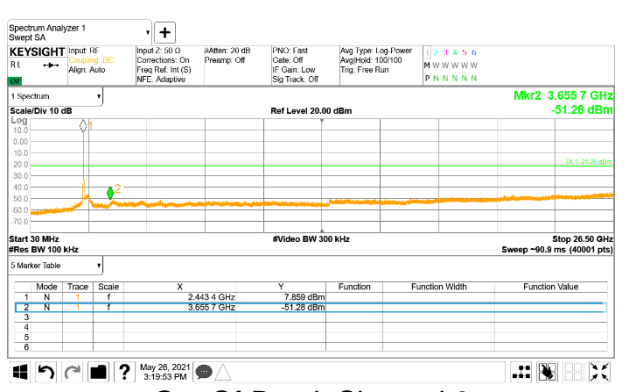
Band-Sig Channel 1



Out-Of-Band Channel 1



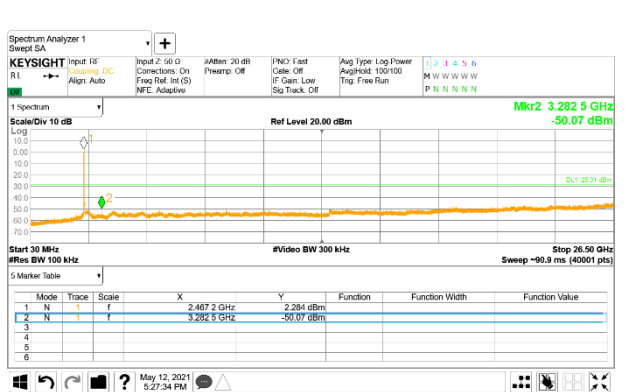
In-Band Reference Level



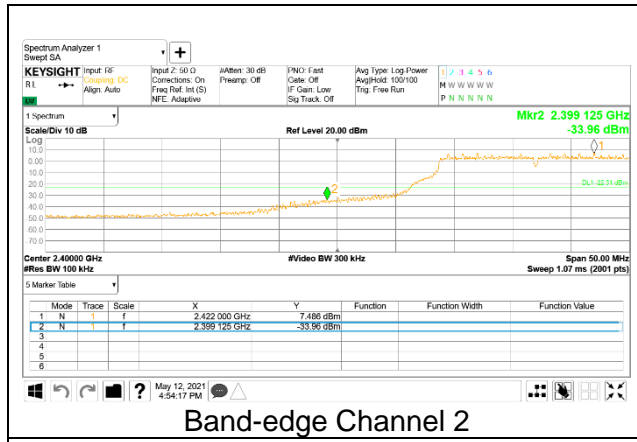
Out-Of-Band Channel 6



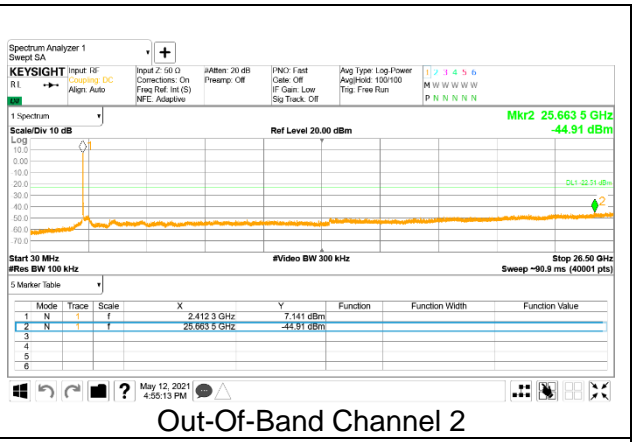
Band-edge Channel 11



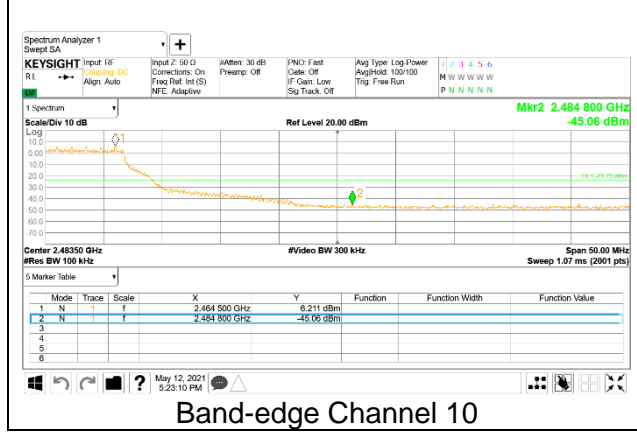
Out-Of-Band Channel 11



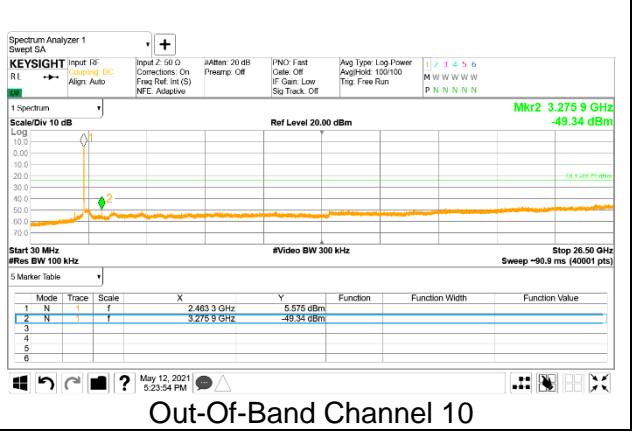
Band-edge Channel 2



Out-Of-Band Channel 2



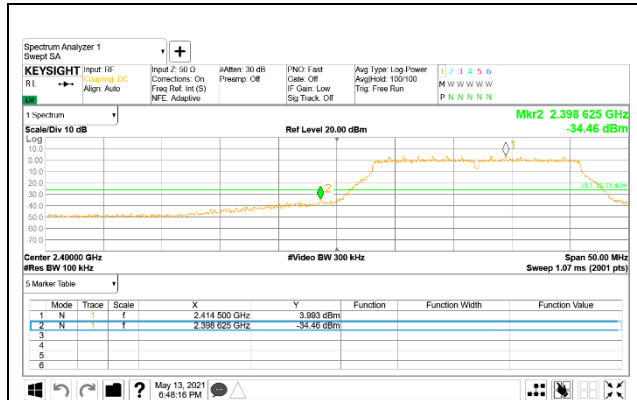
Band-edge Channel 10



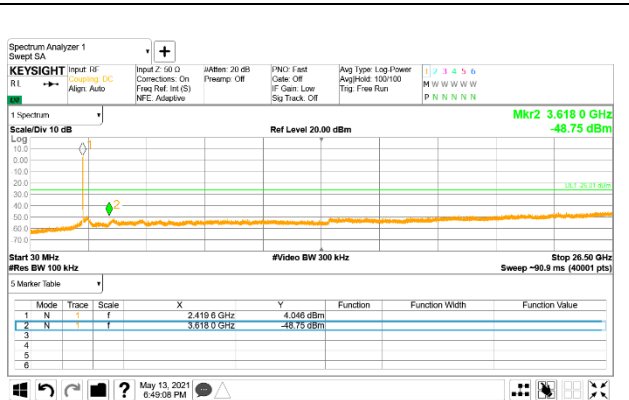
Out-Of-Band Channel 10

### 9.5.3. 802.11n HT20 MODE

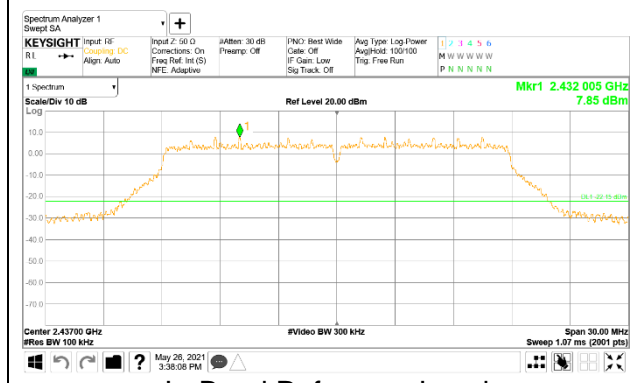
#### SISO ANT 1



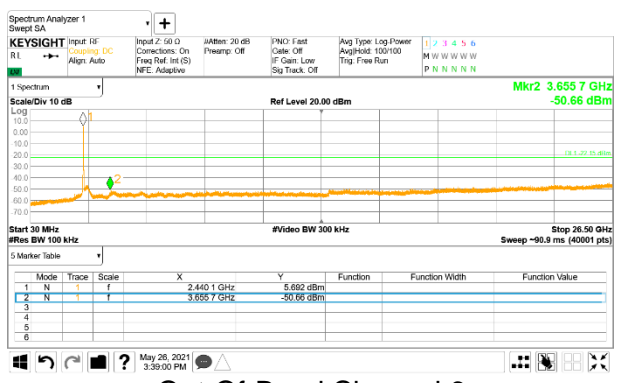
Band-edge Channel 1



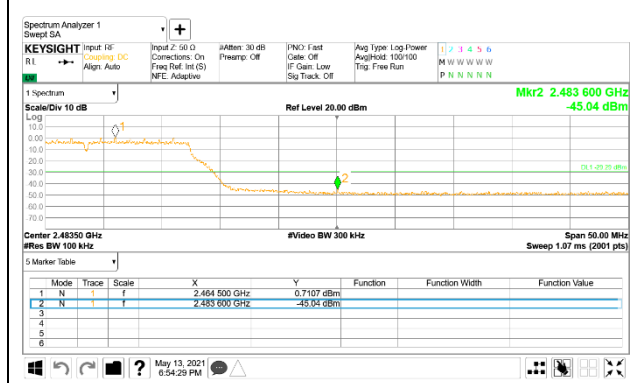
Out-Of-Band Channel 1



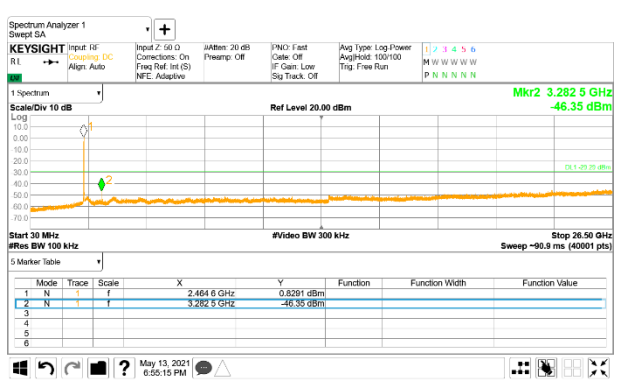
In-Band Reference Level



Out-Of-Band Channel 6

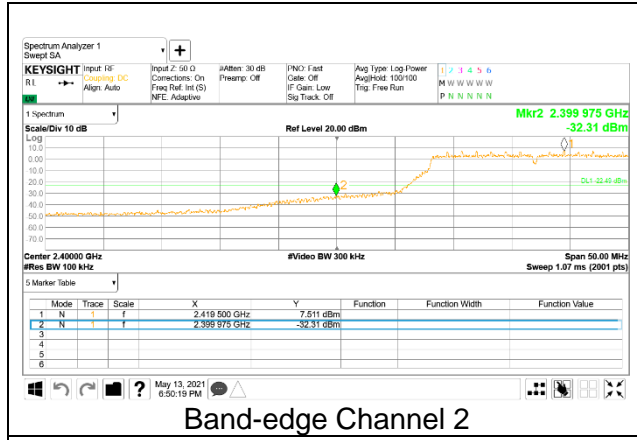


Band-edge Channel 11

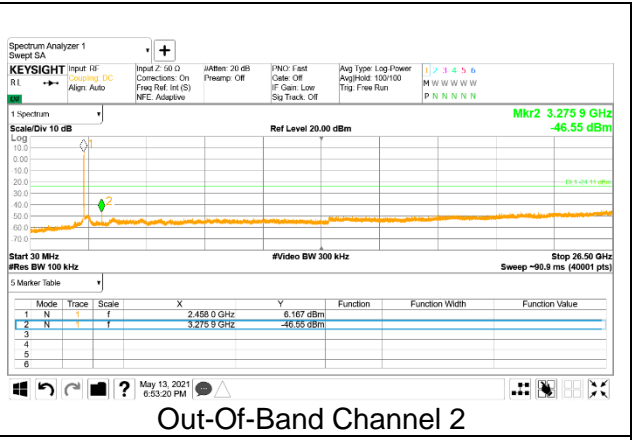


Out-Of-Band Channel 11

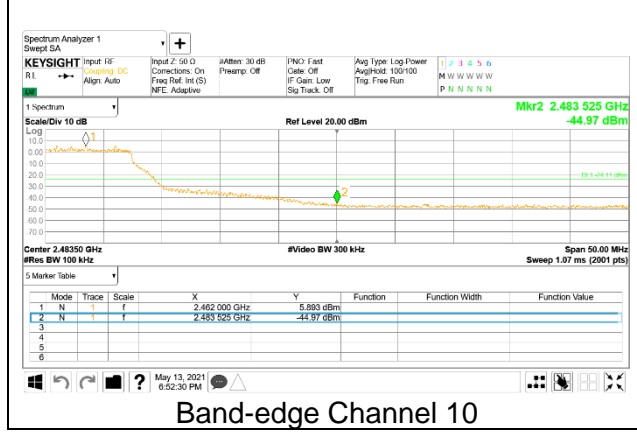




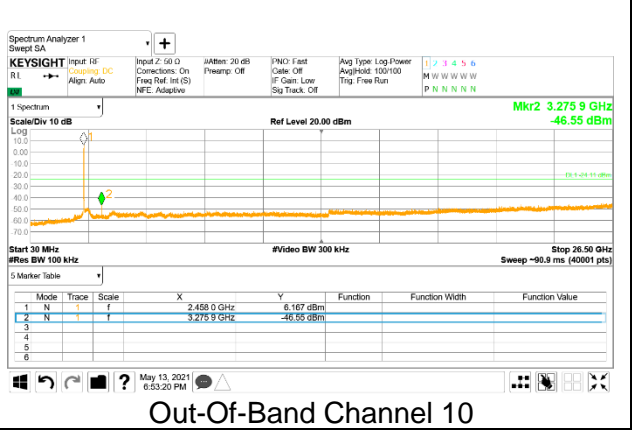
Band-edge Channel 2



Out-Of-Band Channel 2

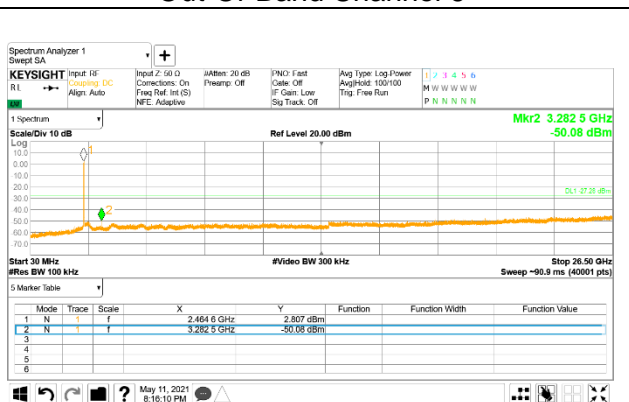
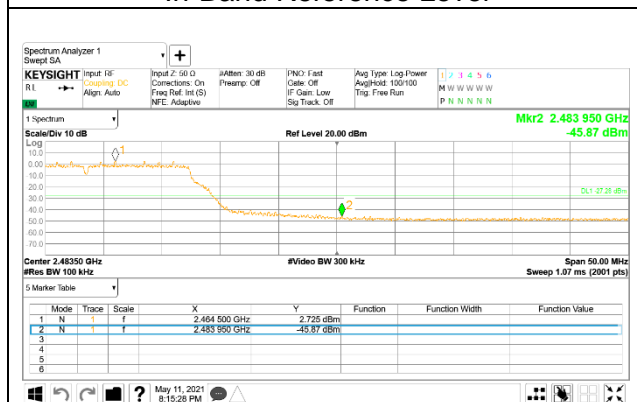
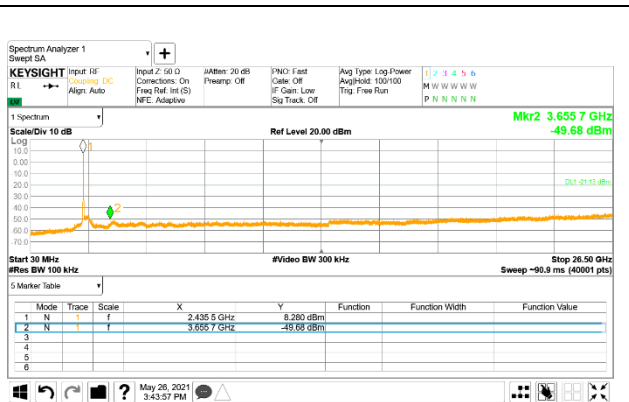
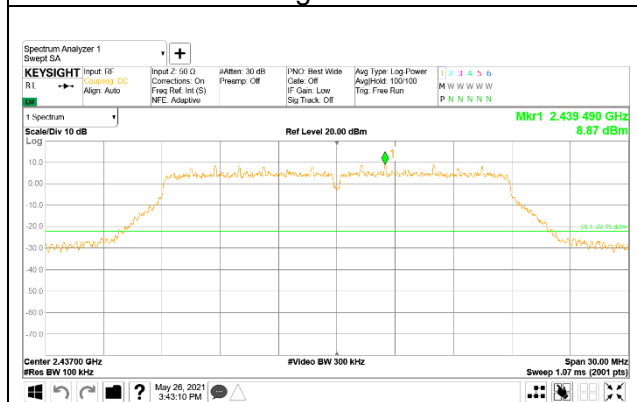
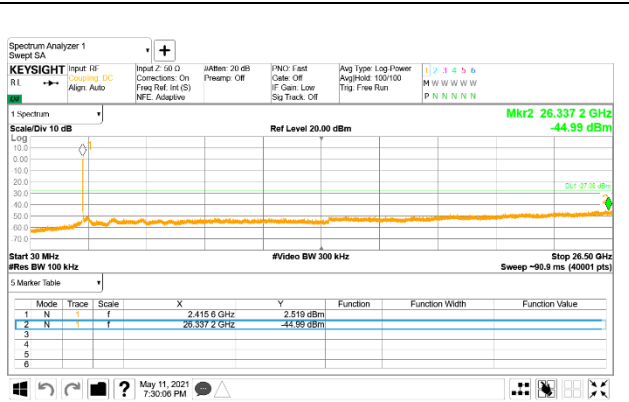
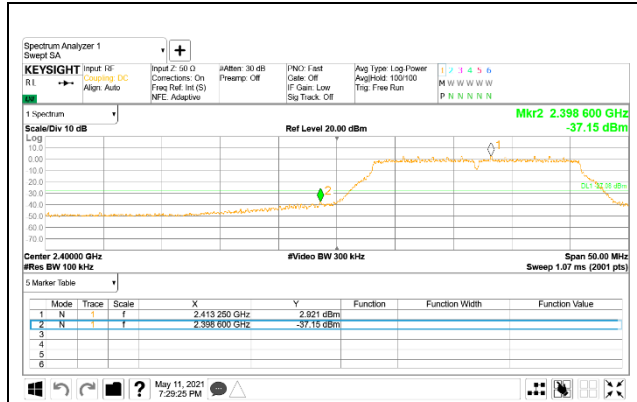


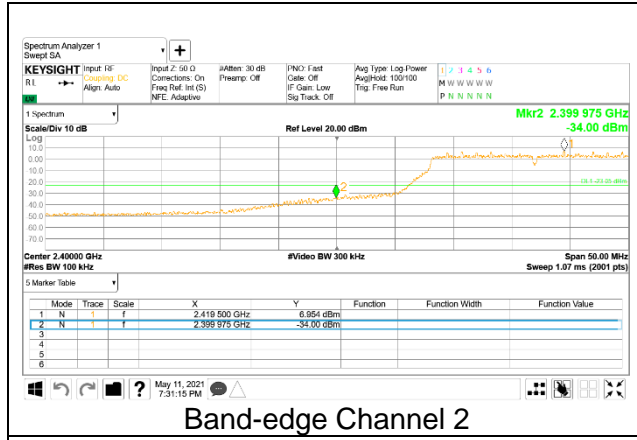
Band-edge Channel 10



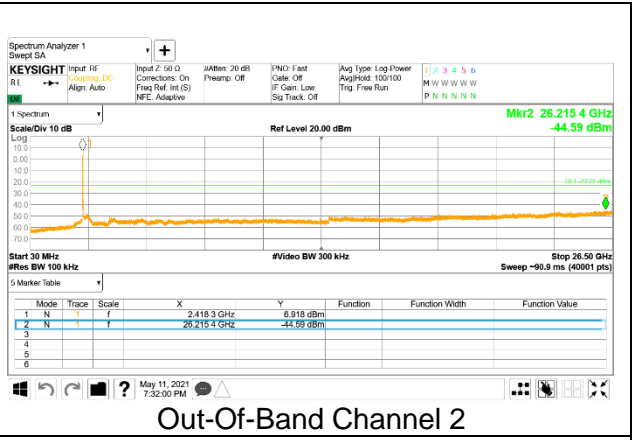
Out-Of-Band Channel 10

**SISO ANT 2**

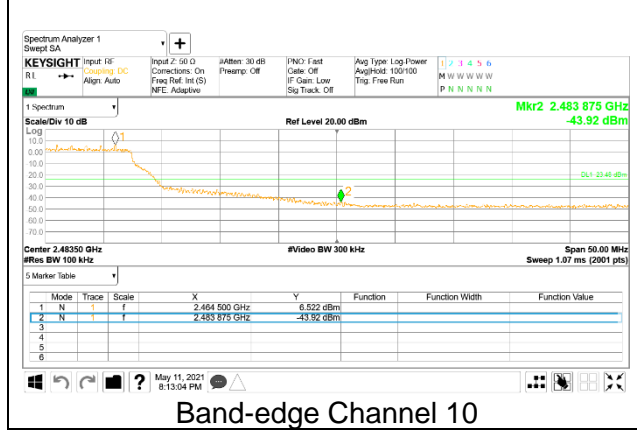




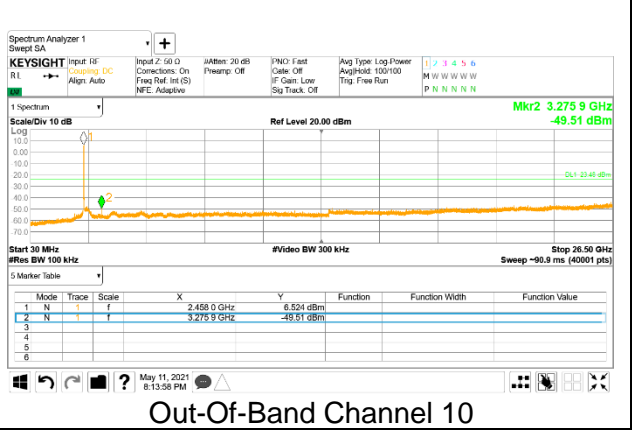
Band-edge Channel 2



Out-Of-Band Channel 2

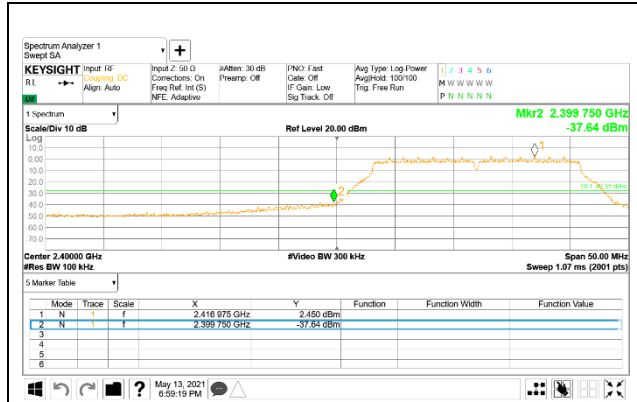


Band-edge Channel 10

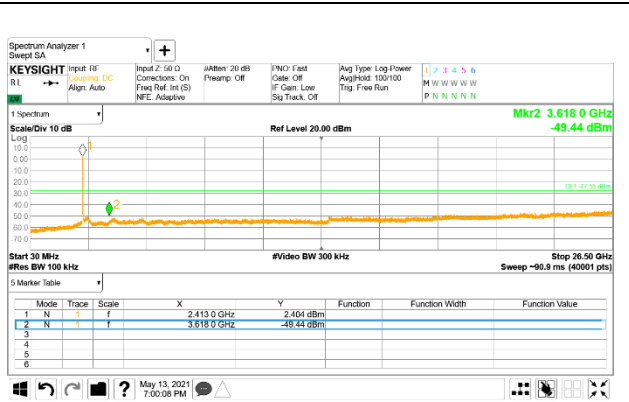


Out-Of-Band Channel 10

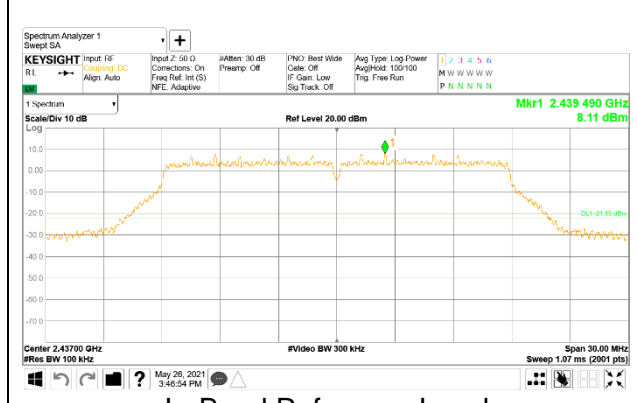
**MIMO ANT 1**



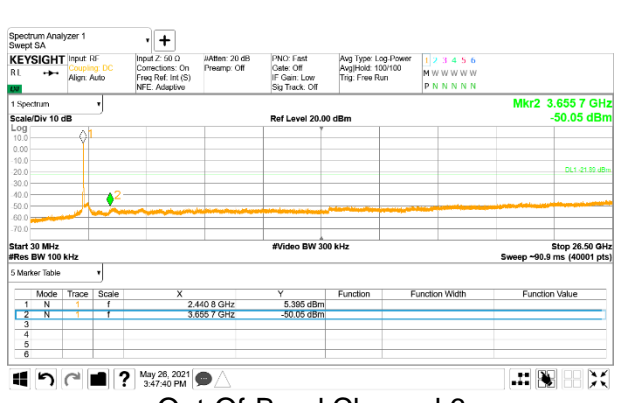
Band-edge Channel 1



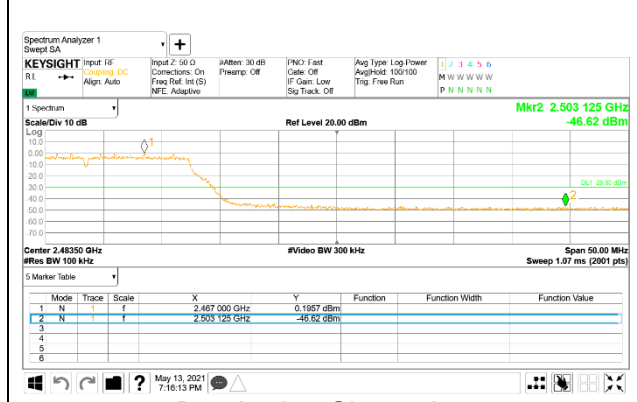
Out-Of-Band Channel 1



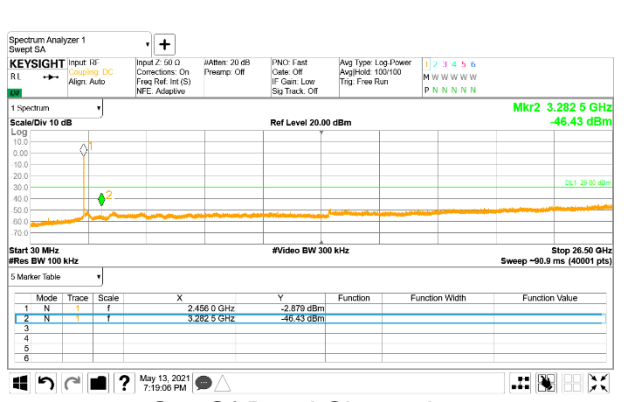
In-Band Reference Level



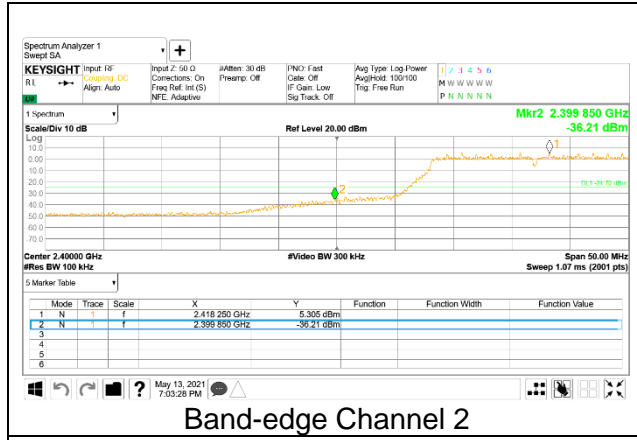
Out-Of-Band Channel 6



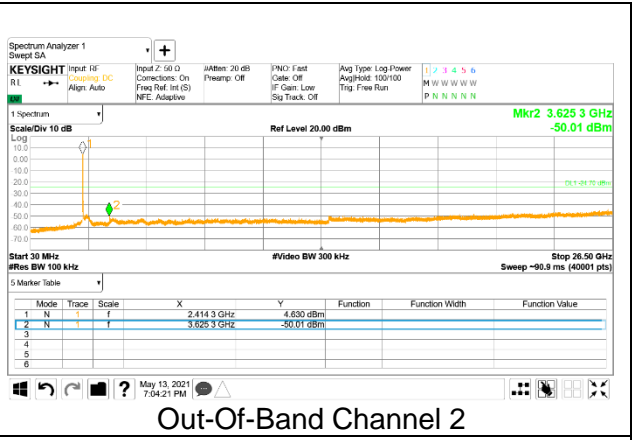
Band-edge Channel 11



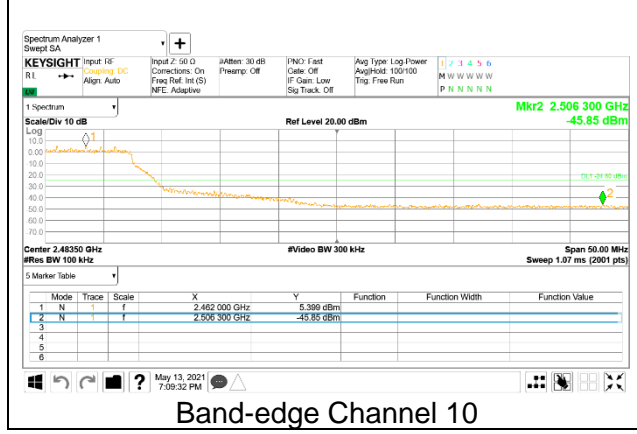
Out-Of-Band Channel 11



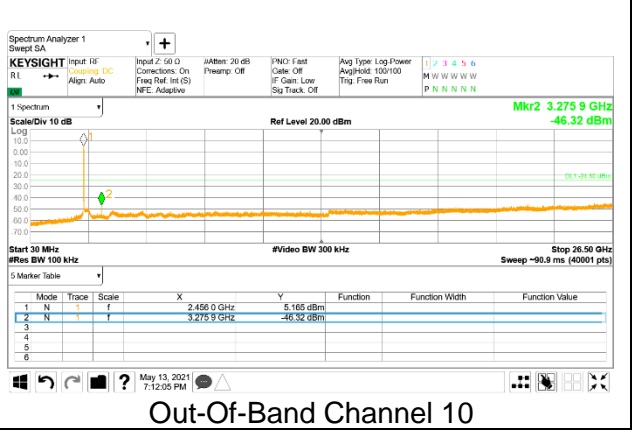
Band-edge Channel 2



Out-Of-Band Channel 2

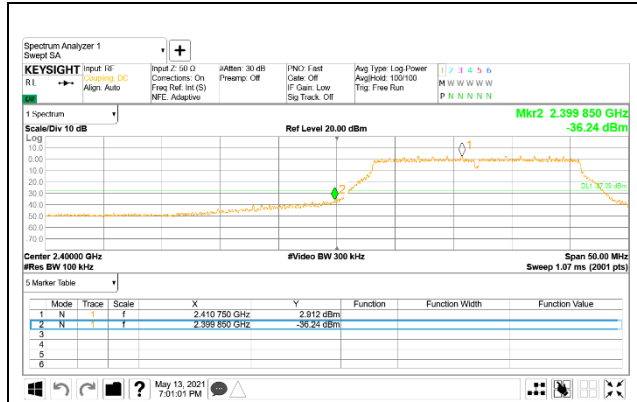


Band-edge Channel 10

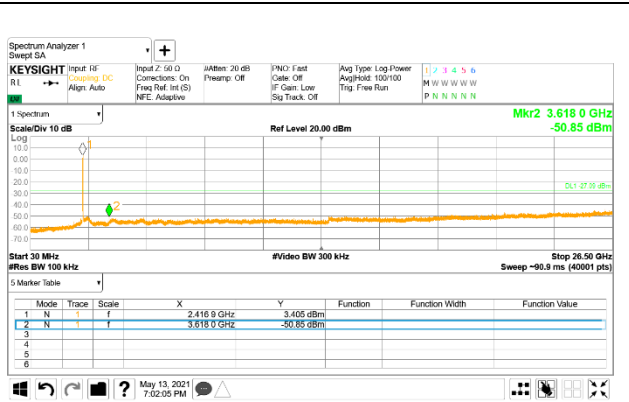


Out-Of-Band Channel 10

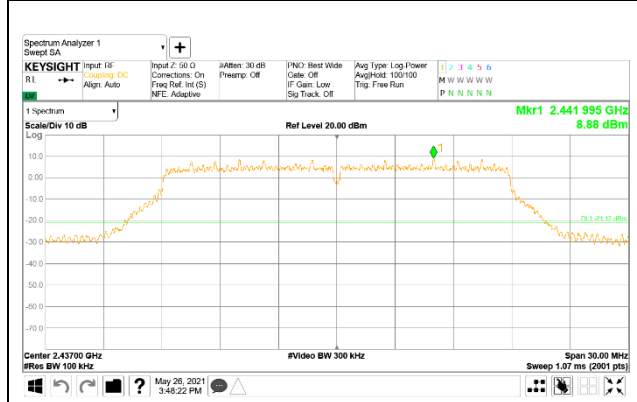
**MIMO ANT 2**



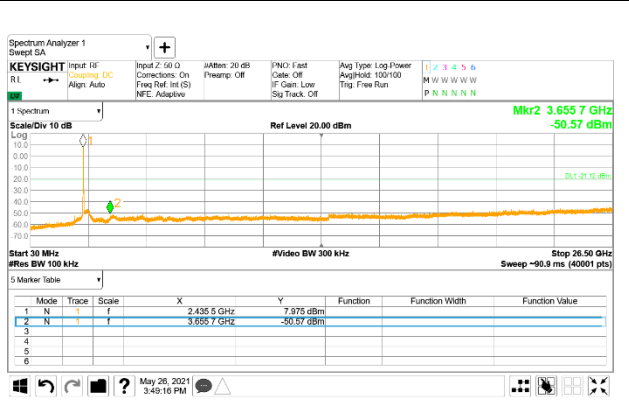
Band-edge Channel 1



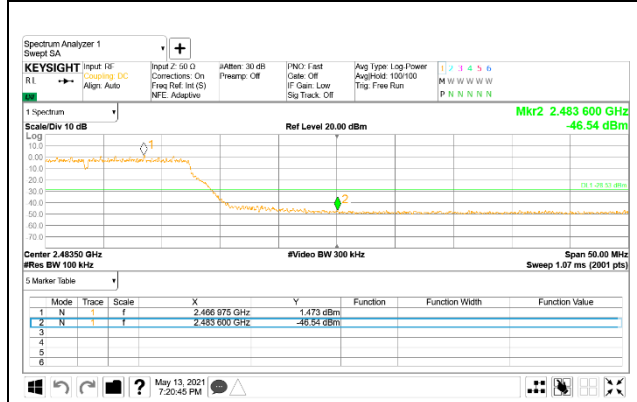
Out-Of-Band Channel 1



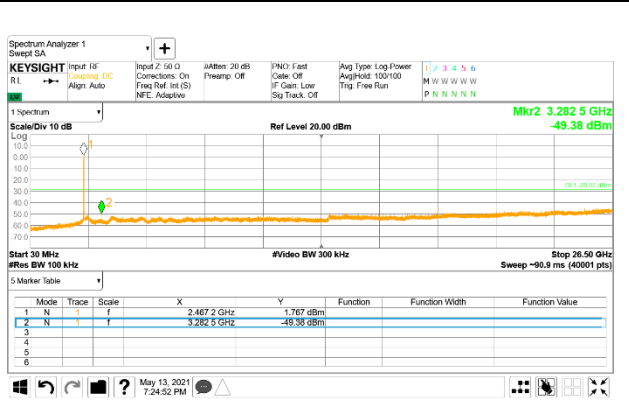
In-Band Reference Level



Out-Of-Band Channel 6



Band-edge Channel 11



Out-Of-Band Channel 11