TEST REPORT

FCC ID: 2ADYY-T16MAPRO

Product: Laptop Computer

Model No.: T16MA Pro

Trade Mark: TECNO

Report No.: WSCT-A2LA-R&E240300015A-Wi-Fi2

Issued Date: 16 April 2024

Issued for:

TECNO MOBILE LIMITED
FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET
FOTAN NT HONGKONG

Issued By:

World Standardization Certification & Testing Group(Shenzhen) Co., Ltd.
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1 Test Certification

Product:	Laptop Computer
Model No.:	T16MA Pro
Trade Mark:	TECNO
Applicant:	**TECNO MOBILE LIMITED**
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Manufacturer:	**TECNO MOBILE LIMITED**
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Date of Test:	02 April 2024 to 16 April 2024
Applicable Standards:	FCC CFR Title 47 FCC Part 15 Subpart E

The above equipment has been tested by World Standardization Certification & Testing Group(Shenzhen)Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: Wang Xiang **(Wang Xiang)**

Checked By: Chen Xu **(Chen Xu)**

Approved By: Liu Fuxin **(Liu Fuxin)**

Date: 16 April 2024

2 EUT Description

Product:	Laptop Computer
Model No.:	T16MA Pro
Trade Mark:	TECNO
Operation Frequency:	Band 1: 5180-5240 MHz Band 2: 5260-5320 MHz Band 3: 5500-5700 MHz Band 4: 5745-5825 MHz
Modulation type:	IEEE 802.11a/n/ac/ax: OFDM/OFDMA (BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM)
Antenna Type:	Integral Antenna
Antenna Gain	MAIN:2.02dBi ,AUX:2.91 dBi
Operating Voltage:	Adapter1: A879-200500C-US1 Input: 100-240V~50/60Hz 2.5A Output:PD:5V⎓3A /9V⎓3A /12V⎓3A/15V⎓3.0A /20V⎓5A PPS:3.3-11V⎓5A 55W Max 3.3-21V⎓5A 100W Max Rechargeable Li-ion Battery: N160 Nominal Voltage: 11.61V Rated Capacity: 8612mAh Rated Energy:99.99Wh Limited Charge Voltage: 13.35V
Remark:	N/A.

Configuration differences

Configuration/ Processor	Camera
T16MA Pro (i5)	KANC792
T16MA Pro (i7)	CK2B2B
Note: The prototypes of both configurations have been tested, and the T16MA Pro (i7) has the worst test result, which is the main test model reported	

3 TEST DESCRIPTION

3.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±3.2dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(<1GHz)	±4.7dB
5	All emissions, radiated(>1GHz)	±4.7dB
6	Temperature	±0.5°C
7	Humidity	±2%

3.2 TEST ENVIRONMENT AND MODE

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%)

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. For the full battery state and The output power to the maximum state.

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Mode	Description
Mode 1	802.11a
Mode 2	802.11n20
Mode 3	802.11n40
Mode 4	802.11ac20
Mode 5	802.11ac40
Mode 6	802.11ac80
Mode 7	802.11ax20
Mode 8	802.11ax40
Mode 9	802.11ax80
Mode 10	802.11ax160

Note:

(1) The measurements are performed at the highest, lowest available channels.

(2) The EUT use new battery.

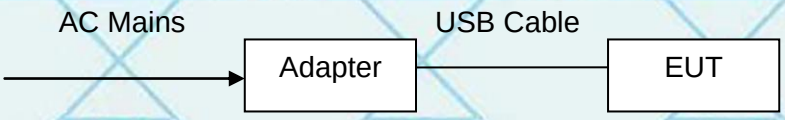
(3) Record the worst case of each test item in this report.

3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

Test program	DRTU								
Mode	Test Frequency (MHz)								
	NCB: 20MHz								
802.11a	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz	
802.11n	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz	
802.11ac	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz	
802.11ax	5180 MHz	5240 MHz	5260 MHz	5320 MHz	5500 MHz	5700 MHz	5745 MHz	5825 MHz	
NCB: 40MHz									
802.11n	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5670 MHz	5755 MHz	5795 MHz	
802.11ac	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5670 MHz	5755 MHz	5795 MHz	
802.11ax	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5670 MHz	5755 MHz	5795 MHz	
NCB: 80MHz									
802.11ac	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5775 MHz				
802.11ax	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5775 MHz				
NCB: 160MHz									
802.11ax	5250 MHz	5570 MHz							

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

3.4 CONFIGURATION OF SYSTEM UNDER TEST



(EUT: Laptop Computer)

3.5 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	Adapter	TECNO	A879-200500C-US1	/	/
2	Router	tp-link	Archer AX6000	/	FCC ID: TE7AX6000

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.
(4) The adapter supply by the applicant.

4 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 Subpart C&E			
Standard Section	Test Item	Judgment	Remark
2.1049 15.403(i)	26dB & 99% Bandwidth	PASS	Complies
15.407(e)	6dB Spectrum Bandwidth	PASS	Complies
15.407(a)	Maximum Conducted Output Power	PASS	Complies
15.407(a)	Power Spectral Density	PASS	Complies
15.407(b)	Unwanted Emissions	PASS	Complies
15.207	AC Conducted Emission	PASS	Complies
15.407(g)	Frequency Stability	PASS	Complies
15.407(c)	Automatically Discontinue Transmission	PASS	Complies
15.203 & 15.407(a)	Antenna Requirement	PASS	Complies
15.407(h)	Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS)	PASS	Complies

NOTE:

(1)" N/A" denotes test is not applicable in this test report.

5 MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibration Due.
Test software	--	EZ-EMC	CON-03A	-	-
Test software	--	MTS8310	-	-	-
EMI Test Receiver	R&S	ESCI	100005	11/05/2023	11/04/2024
LISN	AFJ	LS16	16010222119	11/05/2023	11/04/2024
LISN(EUT)	Mestec	AN3016	04/10040	11/05/2023	11/04/2024
Universal Radio Communication Tester	R&S	CMU 200	1100.0008.02	11/05/2023	11/04/2024
Coaxial cable	Megalon	LMR400	N/A	11/05/2023	11/04/2024
GPIB cable	Megalon	GPIB	N/A	11/05/2023	11/04/2024
Spectrum Analyzer	R&S	FSU	100114	11/05/2023	11/04/2024
Pre Amplifier	H.P.	HP8447E	2945A02715	11/05/2023	11/04/2024
Pre-Amplifier	CDSI	PAP-1G18-38	--	11/05/2023	11/04/2024
Bi-log Antenna	SCHWARZBECK	VULB9168	01488	11/05/2023	11/04/2024
9*6*6 Anechoic	--	--	--	11/05/2023	11/04/2024
Horn Antenna	COMPLIANCE ENGINEERING	CE18000	--	11/05/2023	11/04/2024
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-631	11/05/2023	11/04/2024
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	11/05/2023	11/04/2024
System-Controller	CCS	N/A	N/A	N.C.R	N.C.R
Turn Table	CCS	N/A	N/A	N.C.R	N.C.R
Antenna Tower	CCS	N/A	N/A	N.C.R	N.C.R
RF cable	Murata	MXHQ87WA3000	-	11/05/2023	11/04/2024
Loop Antenna	EMCO	6502	00042960	11/05/2023	11/04/2024
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	11/05/2023	11/04/2024
Power meter	Anritsu	ML2487A	6K00003613	11/05/2023	11/04/2024
Power sensor	Anritsu	MX248XD	--	11/05/2023	11/04/2024
Spectrum Analyzer	Keysight	N9010B	MY60241089	11/05/2023	11/04/2024

6 Facilities and Accreditations

6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at **Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the World Standardization Certification & Testing Group(Shenzhen) CO., LTD**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6.2 ACCREDITATIONS

CNAS - Registration Number: L3732

China National Accreditation Service for Conformity Assessment, The test firm Registration Number: L3732

FCC - Designation Number: CN1303

World Standardization Certification & Testing Group(Shenzhen) CO., LTD. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Designation Number: CN1303.

A2LA - Certificate Number: 5768.01

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA).Certification Number: 5768.01

7 Test Results and Measurement Data

7.1 CONDUCTED EMISSION MEASUREMENT

POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:
(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

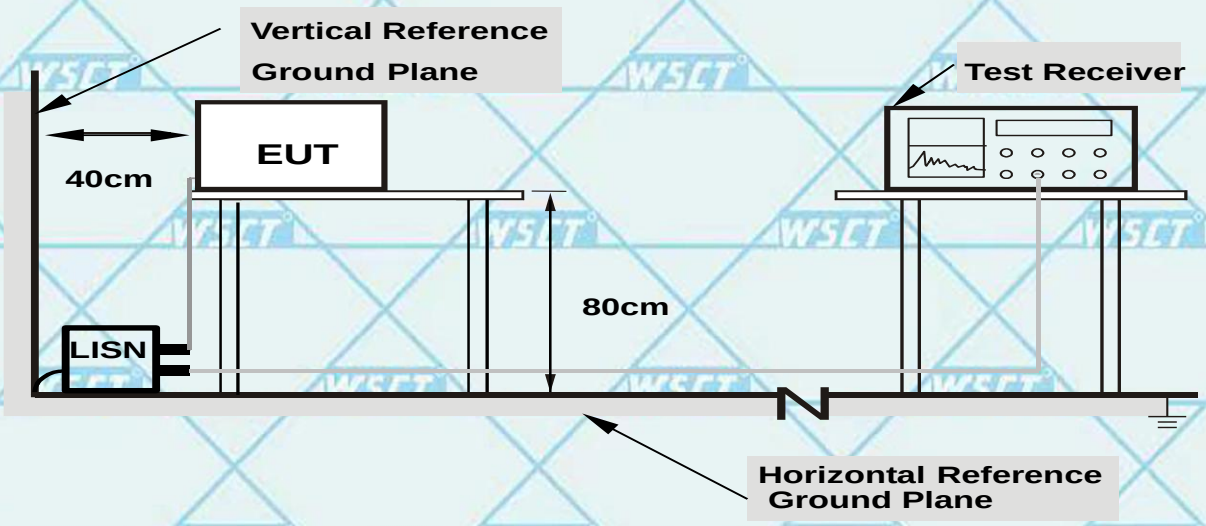
7.1.1 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

7.1.2 DEVIATION FROM TEST STANDARD

No deviation

TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

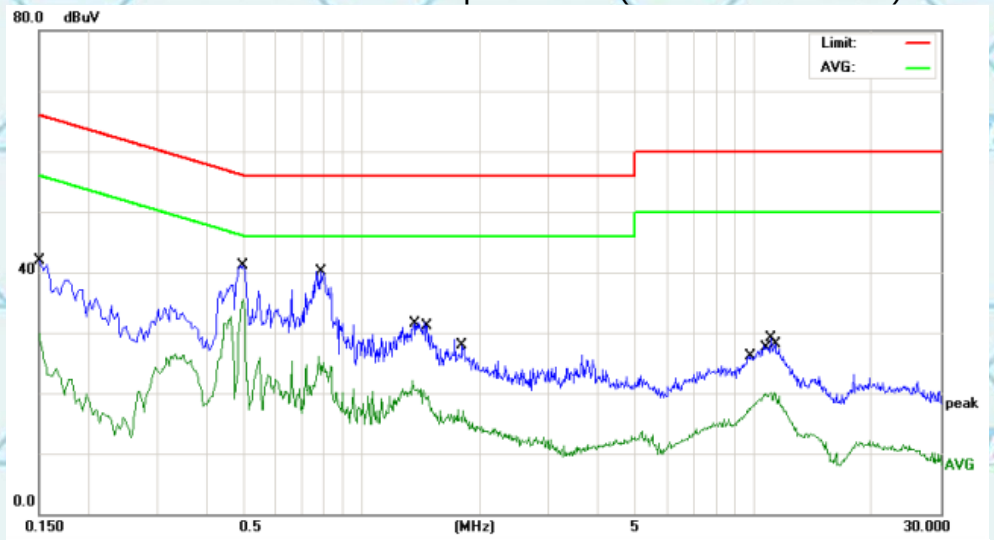
7.1.3 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

7.1.4 TEST RESULTS((WORST CASE)

The worst mode is MIMO 11ac80

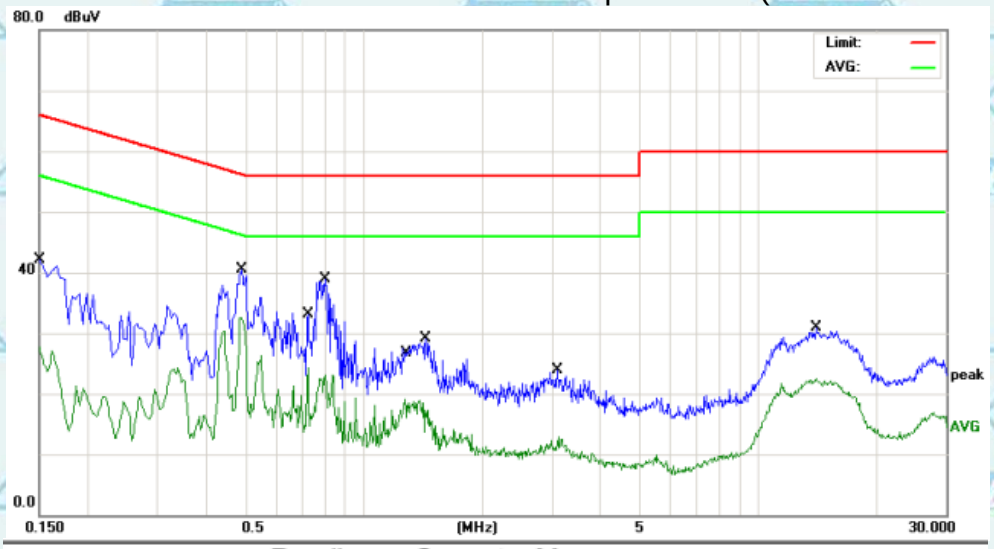
Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)-worst



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	31.53	10.41	41.94	65.99	-24.05	QP
2		0.1500	19.41	10.41	29.82	55.99	-26.17	AVG
3		0.4980	30.58	10.47	41.05	56.03	-14.98	QP
4	*	0.4980	25.03	10.47	35.50	46.03	-10.53	AVG
5		0.7860	29.63	10.49	40.12	56.00	-15.88	QP
6		1.3460	11.52	10.56	22.08	46.00	-23.92	AVG
7		1.4700	20.49	10.58	31.07	56.00	-24.93	QP
8		1.8140	6.39	10.63	17.02	46.00	-28.98	AVG
9		9.7620	15.35	10.79	26.14	60.00	-33.86	QP
10		10.7860	9.12	10.83	19.95	50.00	-30.05	AVG
11		11.0219	18.31	10.85	29.16	60.00	-30.84	QP
12		11.3100	9.14	10.86	20.00	50.00	-30.00	AVG

Remark: All the modes have been investigated, and only worst mode is presented in this report.

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1500	31.62	10.41	42.03	65.99	-23.96	QP
2		0.1500	17.29	10.41	27.70	55.99	-28.29	AVG
3	*	0.4860	22.06	10.47	32.53	46.24	-13.71	AVG
4		0.4900	29.99	10.47	40.46	56.17	-15.71	QP
5		0.7220	13.75	10.49	24.24	46.00	-21.76	AVG
6		0.7980	28.47	10.49	38.96	56.00	-17.04	QP
7		1.2740	8.58	10.55	19.13	46.00	-26.87	AVG
8		1.4340	18.57	10.58	29.15	56.00	-26.85	QP
9		3.1020	13.19	10.67	23.86	56.00	-32.14	QP
10		3.1180	2.17	10.67	12.84	46.00	-33.16	AVG
11		14.0580	19.87	11.01	30.88	60.00	-29.12	QP
12		14.0580	11.54	11.01	22.55	50.00	-27.45	AVG

Note1:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak AVG =average

** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

7.2 RADIATED EMISSION MEASUREMENT

Radiated Emission Limits(Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 1Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

7.2.1 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; 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. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

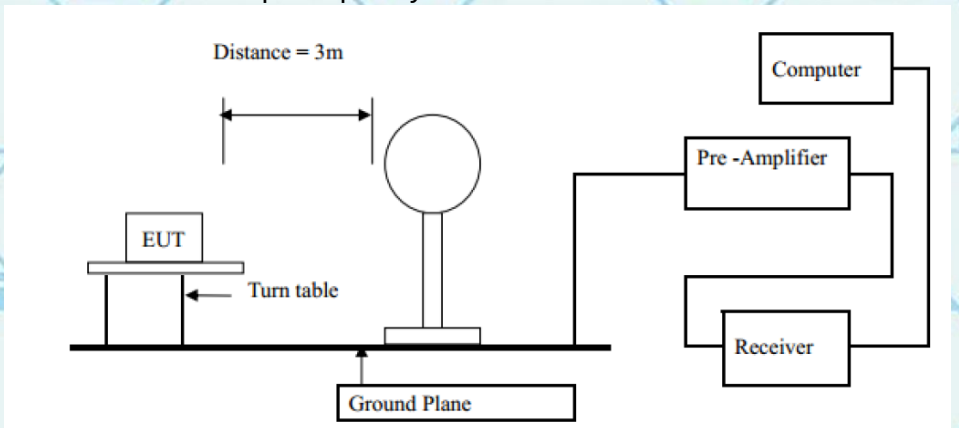
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

7.2.2 DEVIATION FROM TEST STANDARD

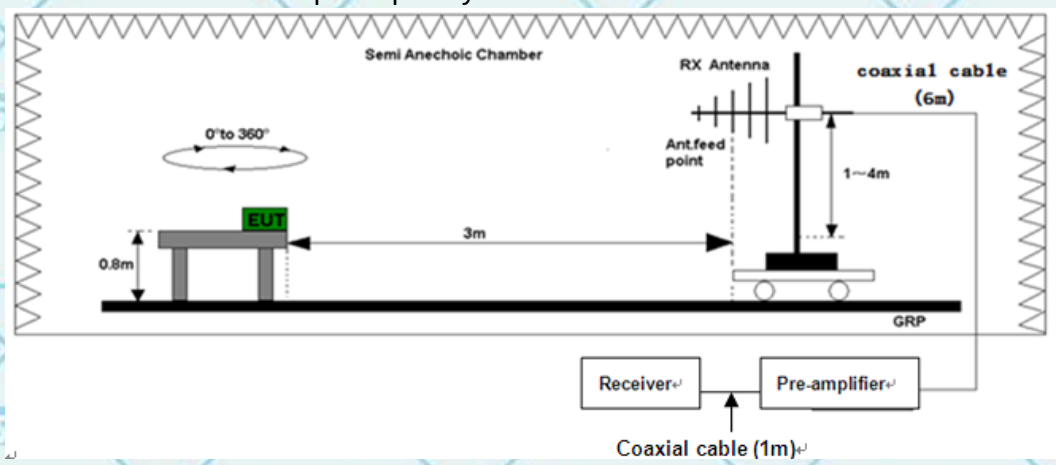
No deviation

7.2.3 TEST SETUP

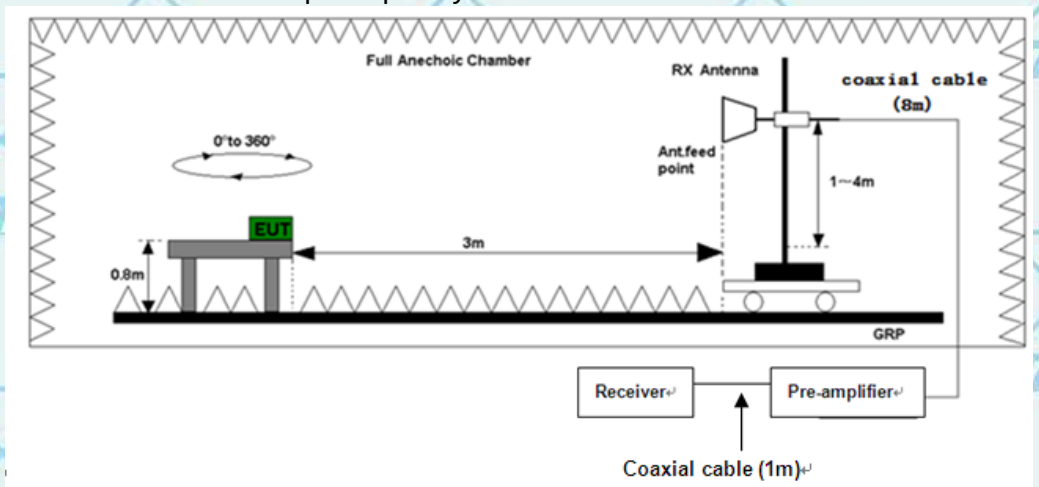
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



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



7.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.2.5 RESULTS (BELOW 30 MHZ)

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	P
--	--	--	--	P

Note:

No result in this part for margin above 20dB.

Distance extrapolation factor =20 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.

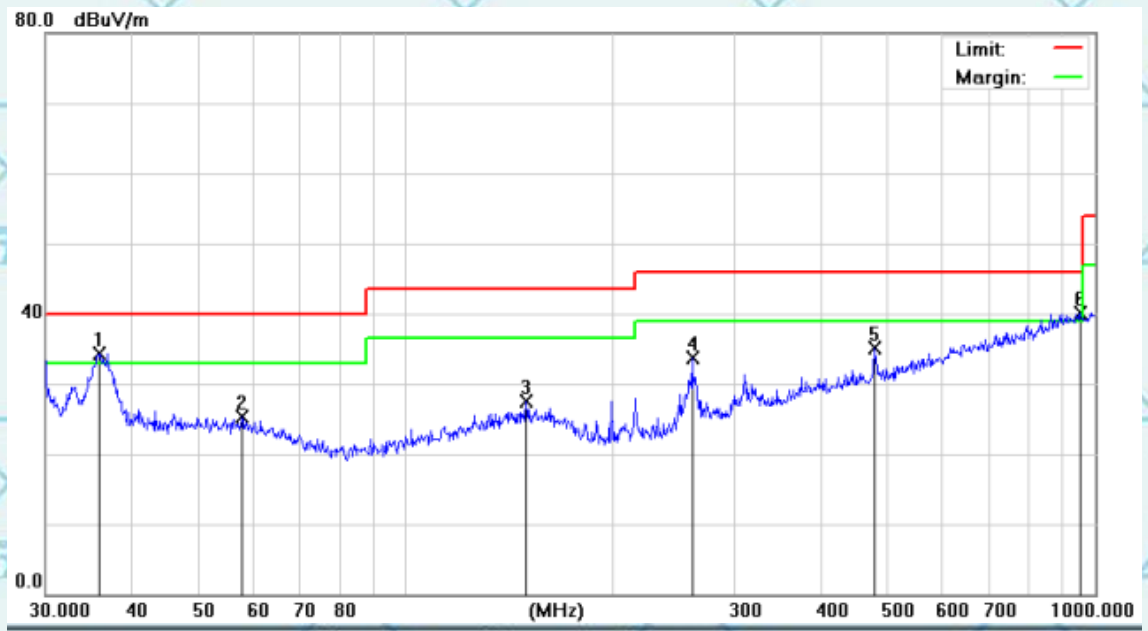
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

7.2.6 TEST RESULTS (BETWEEN 30M – 1000 MHZ)(WORST CASE)

Please refer to following diagram for individual(The worst mode is MIMO 11ac80)

Below 1GHz

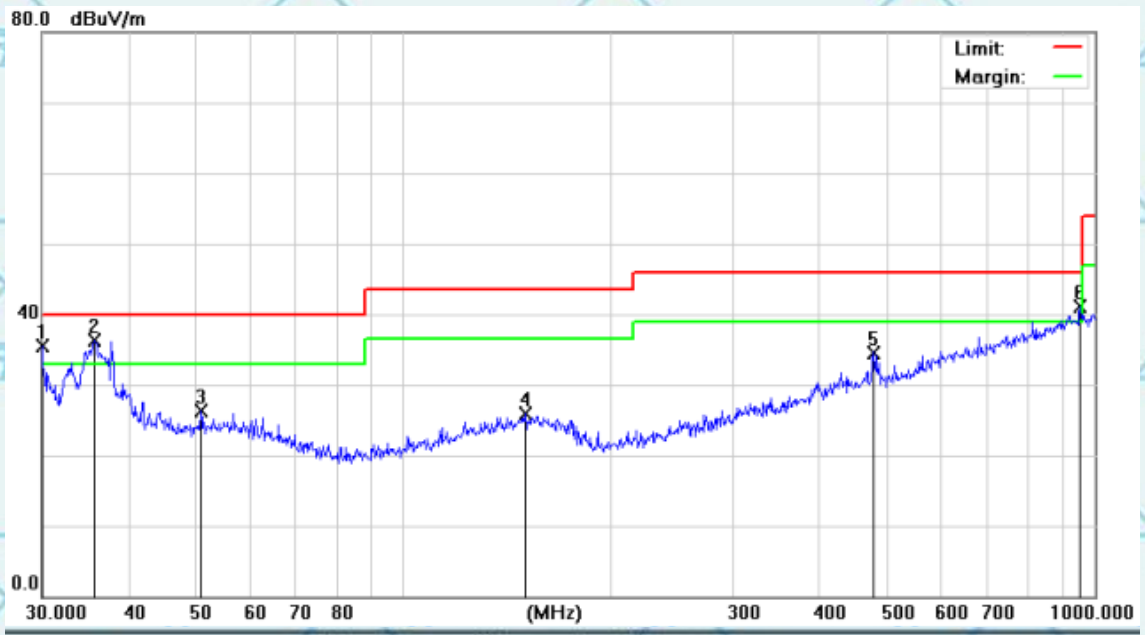
Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	35.8746	35.52	-1.16	34.36	40.00	-5.64	QP
2		57.7962	26.89	-1.59	25.30	40.00	-14.70	QP
3		149.4857	27.52	0.06	27.58	43.50	-15.92	QP
4		260.1444	35.03	-1.42	33.61	46.00	-12.39	QP
5		478.8456	30.23	4.81	35.04	46.00	-10.96	QP
6	!	952.0937	26.27	13.79	40.06	46.00	-5.94	QP

Remark: All the modes have been investigated, and only worst mode is presented in this report.

Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	!	30.0000	37.15	-1.73	35.42	40.00	-4.58	QP
2	*	35.7490	37.54	-1.21	36.33	40.00	-3.67	QP
3		50.9420	27.53	-1.19	26.34	40.00	-13.66	QP
4		150.0108	25.93	0.07	26.00	43.50	-17.50	QP
5		478.8456	29.79	4.81	34.60	46.00	-11.40	QP
6	!	952.0937	27.33	13.79	41.12	46.00	-4.88	QP

Note1:
Freq. = Emission frequency in MHz
Reading level (dBμV) = Receiver reading
Corr. Factor (dB) = Antenna factor + Cable loss - Amplifier factor.
Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)
Limit (dBμV) = Limit stated in standard
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

7.2.7 TEST RESULTS (ABOVE 1GHZ)

Note:All the mode have been tested, and only the worst case mode are in the reporte
The worst mode is MIMO 11ac80

Above 1GHz

Freq. (MHz)	Low channel: 5180MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
10360	V	58.14	41.99	74	54	-15.86	-12.01
15540	V	58.64	39.02	74	54	-15.36	-14.98
10360	H	59.09	40.82	74	54	-14.91	-13.18
15540	H	59.95	40.95	74	54	-14.05	-13.05

Freq. (MHz)	Low channel: 5260MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
10520	V	59.02	40.65	74	54	-14.98	-13.35
15780	V	59.60	40.63	74	54	-14.40	-13.37
10520	H	59.83	39.03	74	54	-14.17	-14.97
15780	H	58.28	39.28	74	54	-15.72	-14.72

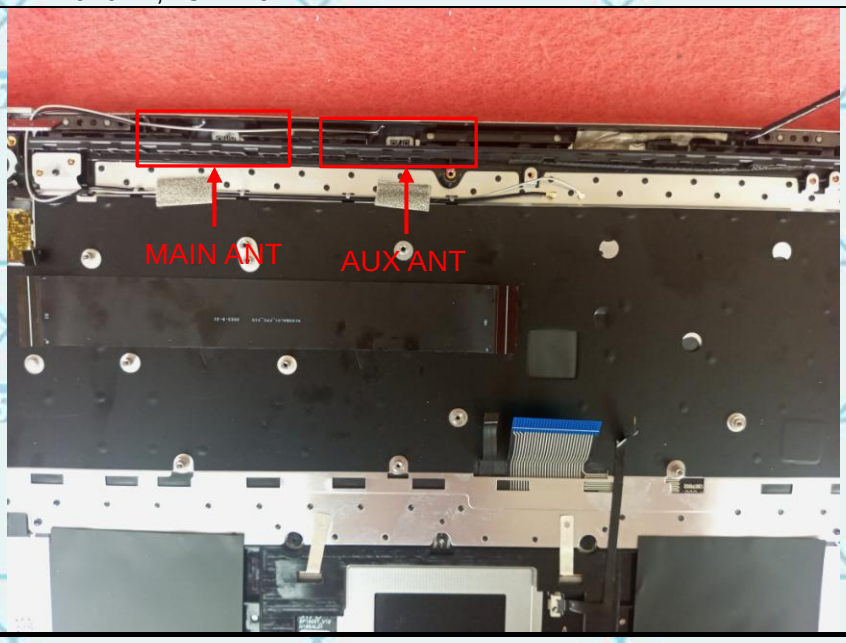
Freq. (MHz)	Low channel: 5500MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11000	V	58.28	40.59	74	54	-15.72	-13.41
16500	V	59.20	40.97	74	54	-14.80	-13.03
11000	H	58.96	40.50	74	54	-15.04	-13.50
16500	H	59.33	40.33	74	54	-14.67	-13.67

Freq. (MHz)	Low channel: 5745MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
11490	V	59.99	41.93	74	54	-14.01	-12.07
17235	V	58.42	39.92	74	54	-15.58	-14.08
11490	H	59.06	39.70	74	54	-14.94	-14.30
17235	H	59.07	40.07	74	54	-14.93	-13.93

Note:
1. All emissions not reported were more than 20dB below the specified limit or in the noise floor.
2. Emission Level= Reading Level+ Probe Factor +Cable Loss.
3. Data of measurement within this frequency range shown “--” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

7.3 ANTENNA REQUIREMENT

Standard requirement:	The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and FCC part 15C section 15.407.
FCC part 15C section 15.203 and FCC part 15C section 15.407 requirements: Systems operating in the 5150~5850MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.	
E.U.T Antenna:	
The Wi-Fi antenna is a Integral Antenna. it meets the standards, and the best case gain of the antenna is "MAIN:2.02dBi ,AUX:2.91 dBi".	



7.4 EMISSION BANDWIDTH

7.4.1 TEST EQUIPMENT

Please refer to Section 5 this report.

7.4.2 TEST PROCEDURE

-26dB Bandwidth and 99% Occupied Bandwidth:	
Test Method:	a)The transmitter was radiated to the spectrum analyzer in peak hold mode. b)Measure the maximum width of the emission that is 26 dB down from the peak of the emission Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
Test Equipment Setting – 26dB Bandwidth:	Test Equipment Setting – 99%% Bandwidth:
a)Attenuation: Auto b)Span Frequency: > 26dB Bandwidth c)RBW: Approximately 1% of the emission bandwidth d)VBW: VBW > RBW e)Detector: Peak f)Trace: Max Hold g)Sweep Time: Auto	a)Span: 1.5 times to 5.0 times the OBW b)RBW: 1 % to 5 % of the OBW c)VBW: ⩾ 3 x RBW d)Detector: Peak e)Trace: Max Hold
6 dB Bandwidth:	
Test Method:	a)The transmitter was radiated to the spectrum analyzer in peak hold mode. b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth. c)Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band. d)Measured the spectrum width with power higher than 6dB below carrier.
Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: > 6dB Bandwidth c)RBW: 100kHz d)VBW: ⩾ 3 x RBW	e)Detector: Peak f)Trace: Max Hold g)Sweep Time: Auto
Maximum Conducted Output Power Measurement:	
Test Method:	a)The transmitter output (antenna port) was connected to the power meter. b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter). c)Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band. d)When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.
Test Equipment Setting: Detector - Average	
Power Spectral Density:	
Test Method:	a)The transmitter output (antenna port) was connected RF switch to the spectrum analyzer. b)Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD). c)Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs. d)When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way. e)For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW)

	and the final result should ⩽ 30 dBm.

Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: Encompass the entire emissions bandwidth (EBW) of the signal c)RBW: 1000 kHz d)VBW: 3000 kHz	e)Detector: RMS f)Trace: AVERAGE g)Sweep Time: Auto h)Trace Average: 100 times
Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.	

Frequency Stability Measurement:	
Test Method:	a)The transmitter output (antenna port) was connected to the spectrum analyzer. b)EUT have transmitted absence of modulation signal and fixed channelize. c)Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth. d)Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings. e)fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification). f)The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value g)Extreme temperature is 0°C~40°C

Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: Entire absence of modulation emissions bandwidth c)RBW: 10 kHz d)VBW: 10 kHz	e)Sweep Time: Auto

7.4.3 CONFIGURATION OF THE EUT

Same as section 3.4 of this report

7.4.4 EUT OPERATING CONDITION

Same as section 3.5 of this report.

7.4.5 LIMIT

-26dB Bandwidth and 99% Occupied Bandwidth:	
Limit:	No restriction limits.
-6 dB Bandwidth:	
Limit:	For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.
Test Equipment Setting:	
a)Attenuation: Auto b)Span Frequency: > 6dB Bandwidth c)RBW: 100kHz d)VBW: ≥ 3 x RBW	e)Detector: Peak f)Trace: Max Hold g)Sweep Time: Auto
Maximum Conducted Output Power Measurement:	
☒5.15~5.25 GHz	
☐Limit of Outdoor access point:	☐Limit of Indoor access point:
The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☐Limit of Fixed point-to-point access points:	☒Limit of Mobile and portable client devices:
The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☒5.25-5.35 GHz & ☒5.470-5.725 GHz	
The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
☒5.725~5.85 GHz	
The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.	
Power Spectral Density	
☒5.15~5.25 GHz	
☐Limit of Outdoor access point: 17 dBm/MHz	☐Limit of Indoor access point: 17 dBm/MHz
☐Limit of Fixed point-to-point access points: 17 dBm/MHz	☒Limit of Mobile and portable client devices: 11 dBm/MHz
☐5.25-5.35 GHz	11 dBm/MHz
☐5.470-5.725 GHz	11 dBm/MHz
☒5.725~5.85 GHz	30 dBm/500kHz
Frequency Stability Measurement:	
Limit:	In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual. The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE

	802.11n specification).

7.4.6 TEST RESULT

-26dB Bandwidth and 99% Occupied Bandwidth

Product	: EUT-Sample	Test Mode	: See section 3.4
Test Item	: -26dB Bandwidth/-6dB Bandwidth and 99% Occupied Bandwidth	Temperature	: 25 ℃
Test Voltage	: DC 11.61V	Humidity	: 56%RH
Test Result	: PASS		

-26dB Bandwidth

Mode	Frequency (MHz)	-26 dB Bandwidth (MHz)	Limit -26 dB Bandwidth (MHz)	Verdict
a	5180	19.87	0.5	Pass
a	5240	20.16	0.5	Pass
a	5260	20.05	0.5	Pass
a	5320	19.13	0.5	Pass
a	5500	19.57	0.5	Pass
a	5700	19.85	0.5	Pass
n20	5180	20.10	0.5	Pass
n20	5240	20.81	0.5	Pass
n20	5260	21.13	0.5	Pass
n20	5320	20.80	0.5	Pass
n20	5500	21.39	0.5	Pass
n20	5700	20.77	0.5	Pass
n40	5190	39.59	0.5	Pass
n40	5230	39.35	0.5	Pass
n40	5270	39.44	0.5	Pass
n40	5310	40.01	0.5	Pass
n40	5510	39.69	0.5	Pass
n40	5670	40.21	0.5	Pass
ac20	5180	19.87	0.5	Pass
ac20	5240	20.62	0.5	Pass
ac20	5260	20.60	0.5	Pass
ac20	5320	21.22	0.5	Pass
ac20	5500	20.88	0.5	Pass
ac20	5700	20.03	0.5	Pass
ac40	5190	39.53	0.5	Pass
ac40	5230	40.05	0.5	Pass
ac40	5270	40.35	0.5	Pass
ac40	5310	40.02	0.5	Pass
ac40	5510	40.00	0.5	Pass
ac40	5670	40.13	0.5	Pass
ac80	5210	79.67	0.5	Pass
ac80	5290	79.60	0.5	Pass
ac80	5530	79.34	0.5	Pass
ac80	5610	79.40	0.5	Pass
ax20	5180	21.43	0.5	Pass

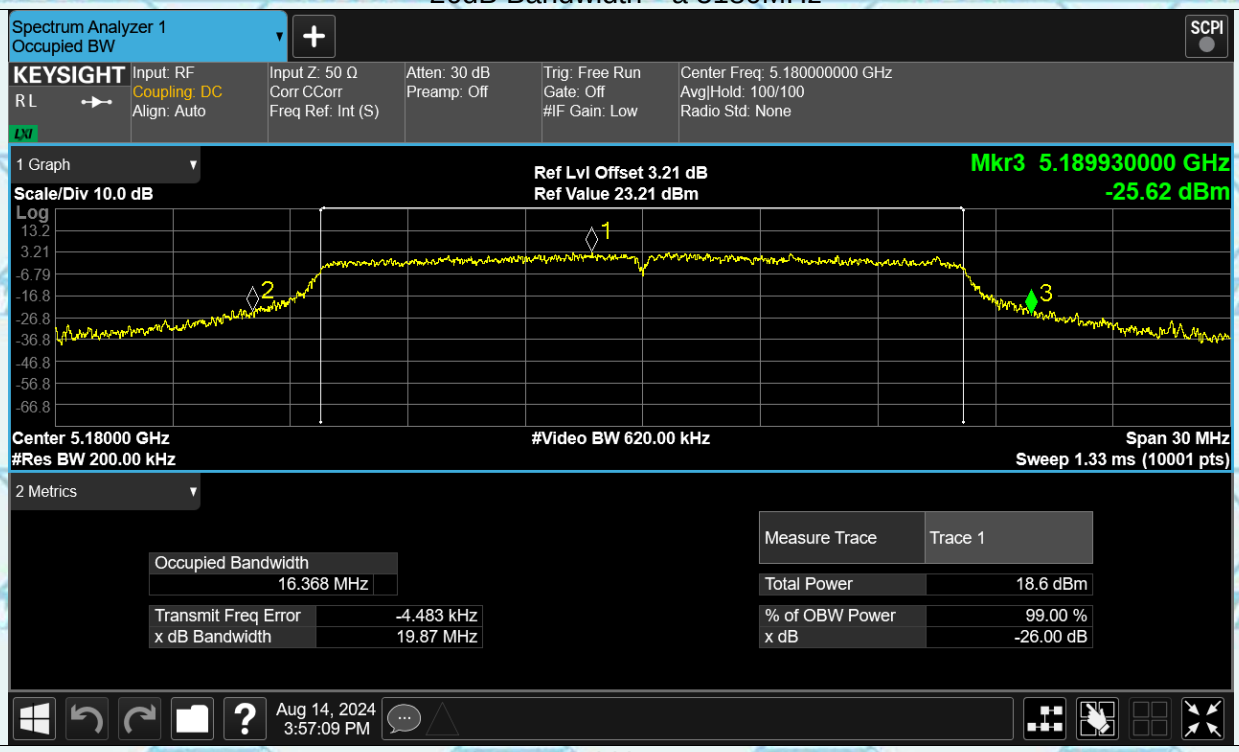
ax20	5240	20.82	0.5	Pass
ax20	5260	20.73	0.5	Pass
ax20	5320	20.76	0.5	Pass
ax20	5500	21.21	0.5	Pass
ax20	5700	20.50	0.5	Pass
ax40	5190	39.25	0.5	Pass
ax40	5230	39.35	0.5	Pass
ax40	5270	39.41	0.5	Pass
ax40	5310	39.26	0.5	Pass
ax40	5510	39.11	0.5	Pass
ax40	5670	39.09	0.5	Pass
ax80	5210	79.94	0.5	Pass
ax80	5290	79.79	0.5	Pass
ax80	5530	79.79	0.5	Pass
ax80	5610	80.07	0.5	Pass
ax160	5250	161.2	0.5	Pass
ax160	5570	161.2	0.5	Pass

-6dB Bandwidth

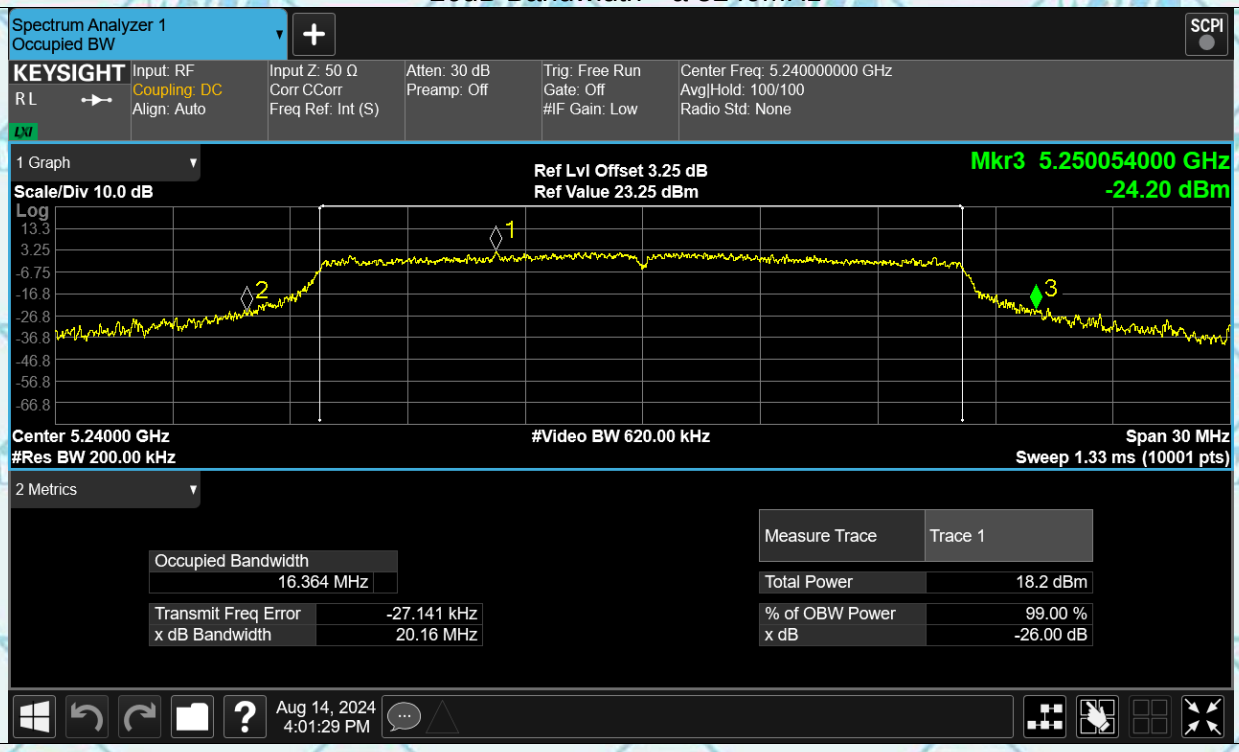
Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
a	5745	15.05	0.5	Pass
a	5825	15.33	0.5	Pass
n20	5745	14.41	0.5	Pass
n20	5825	16.31	0.5	Pass
n40	5755	35.08	0.5	Pass
n40	5795	35.11	0.5	Pass
ac20	5745	16.51	0.5	Pass
ac20	5825	13.81	0.5	Pass
ac40	5755	35.07	0.5	Pass
ac40	5795	35.02	0.5	Pass
ac80	5775	75.70	0.5	Pass
ax20	5745	15.18	0.5	Pass
ax20	5825	16.34	0.5	Pass
ax40	5755	34.06	0.5	Pass
ax40	5795	35.05	0.5	Pass
ax80	5775	77.64	0.5	Pass

Test Graphs

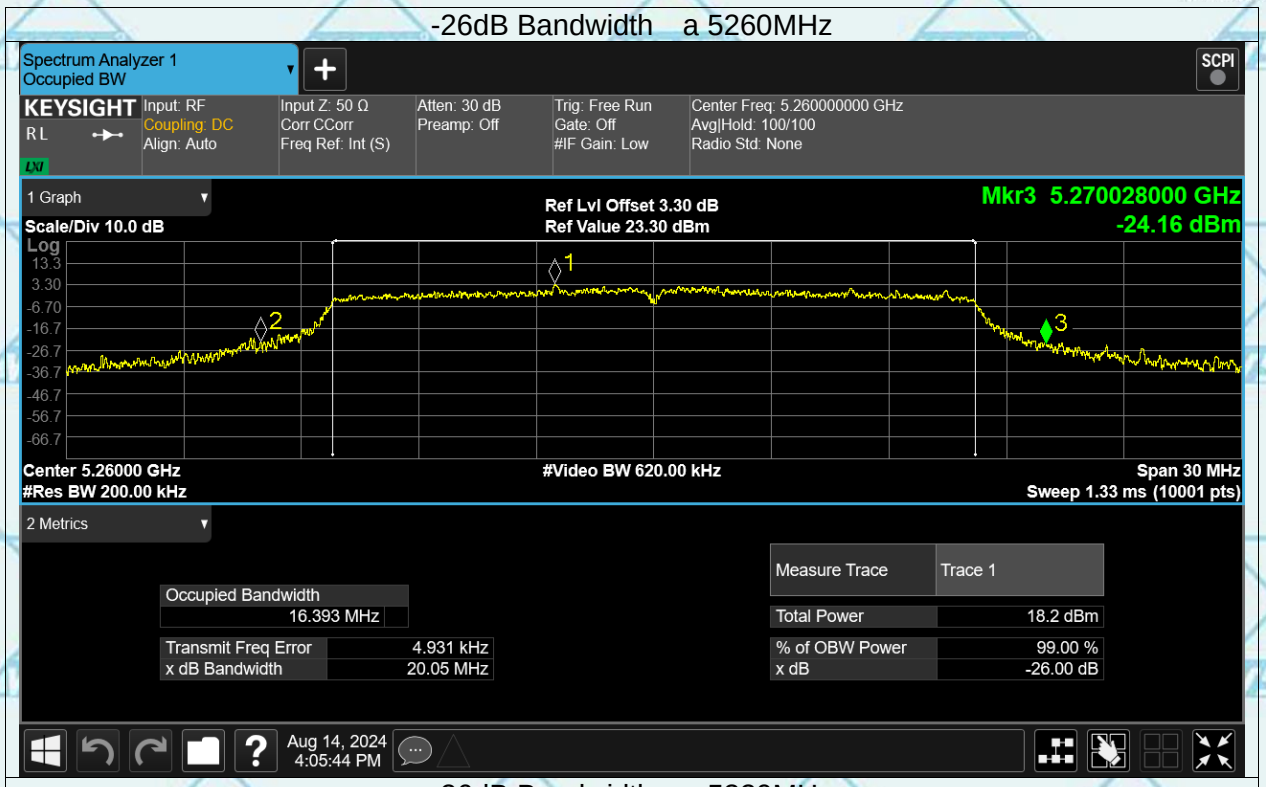
-26dB Bandwidth a 5180MHz



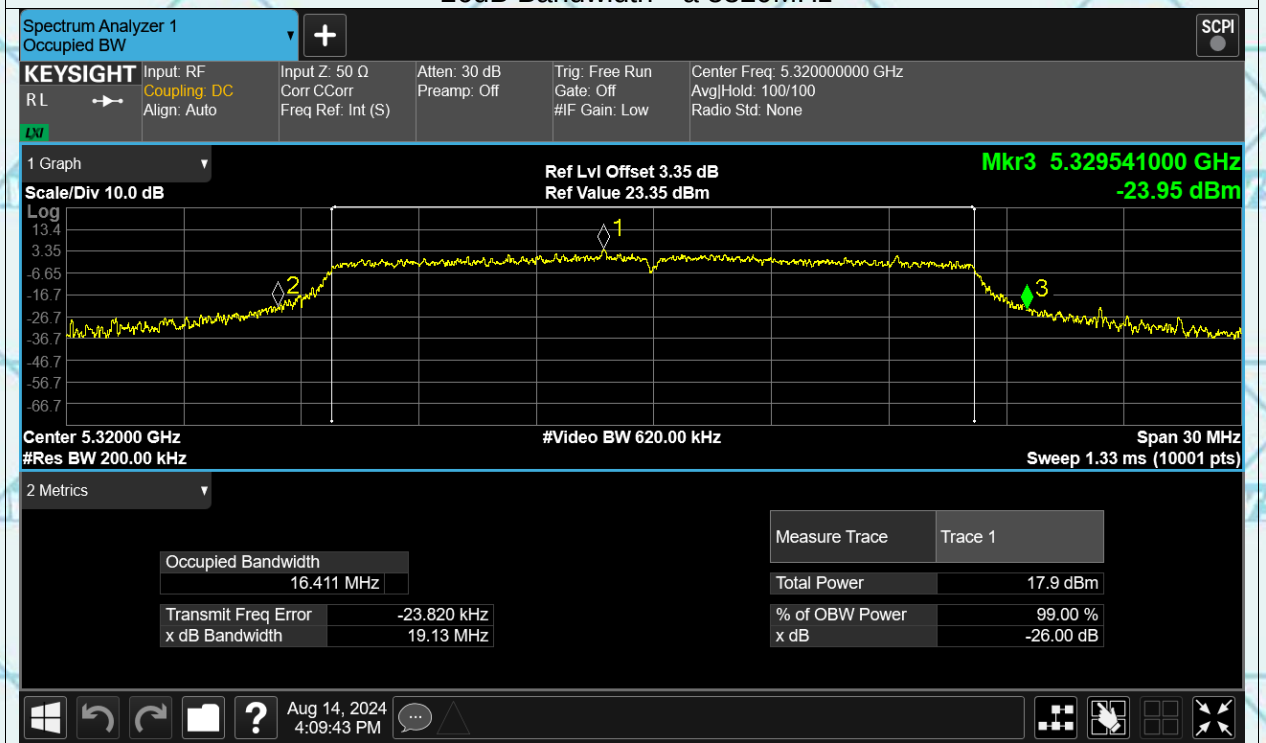
-26dB Bandwidth a 5240MHz



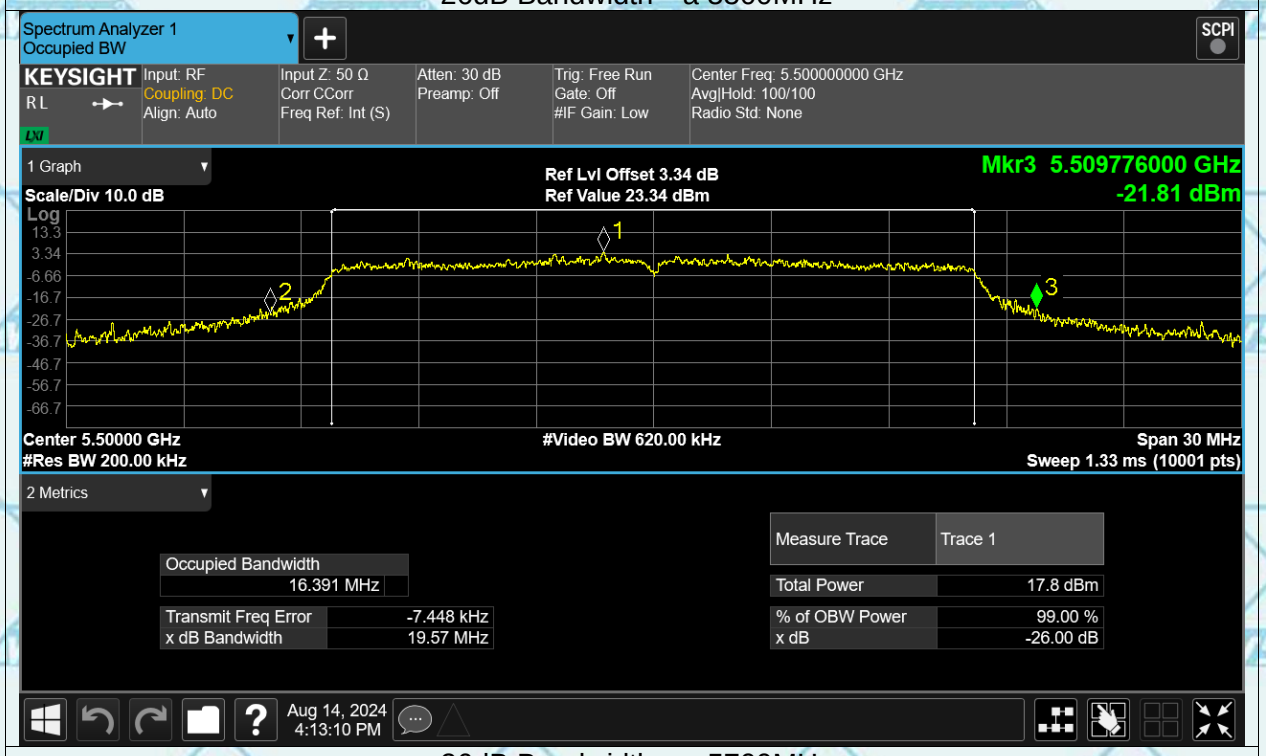
-26dB Bandwidth a 5260MHz



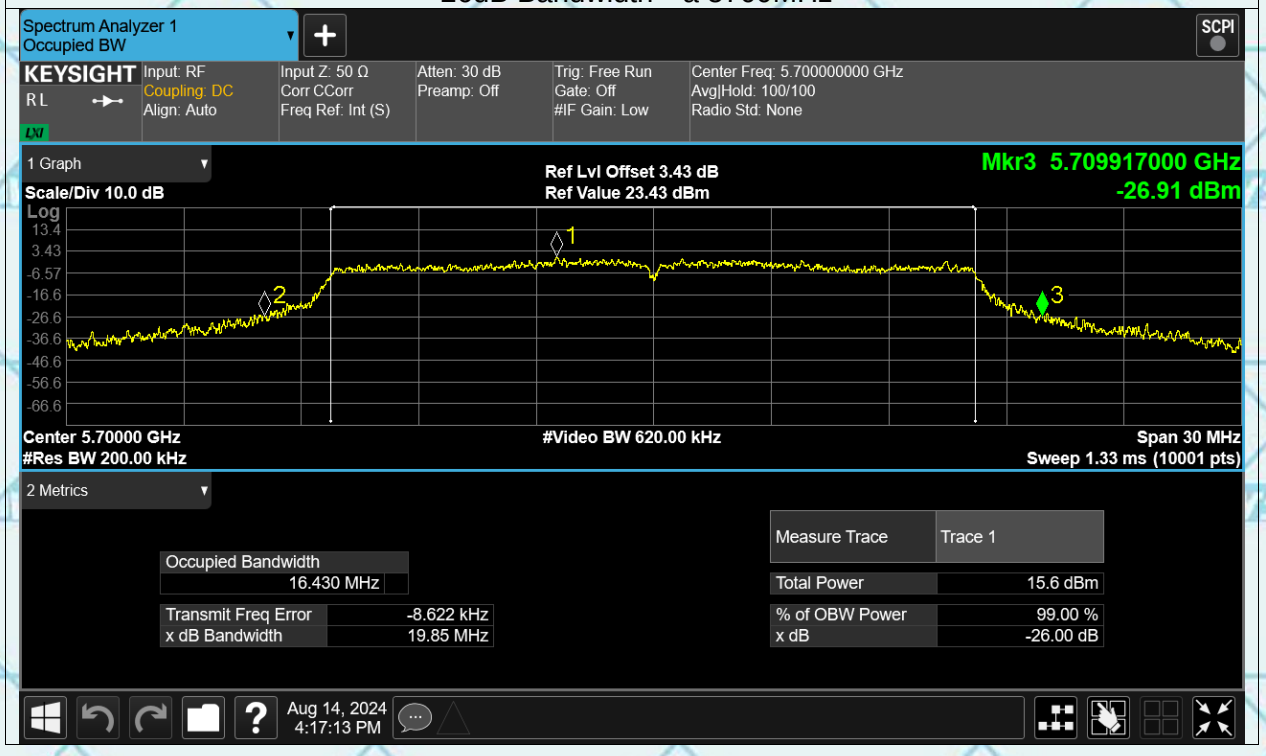
-26dB Bandwidth a 5320MHz



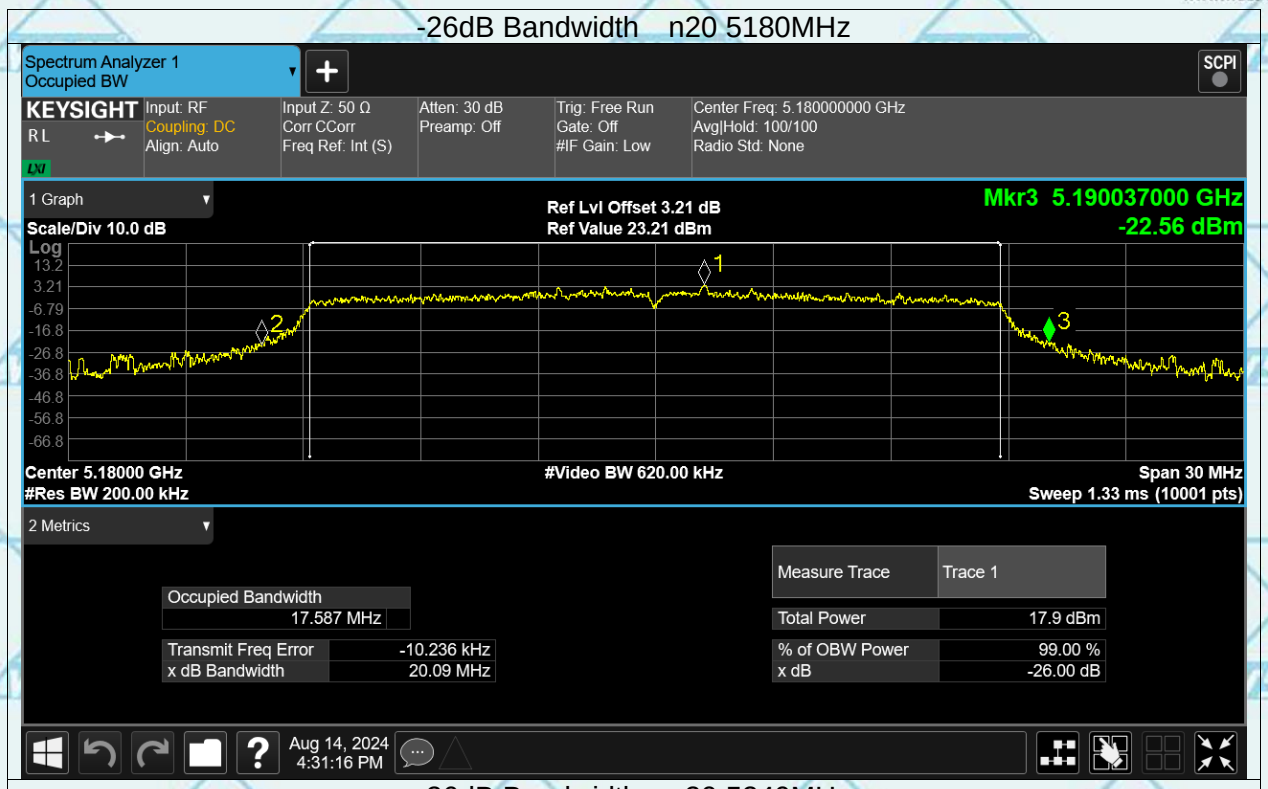
-26dB Bandwidth a 5500MHz



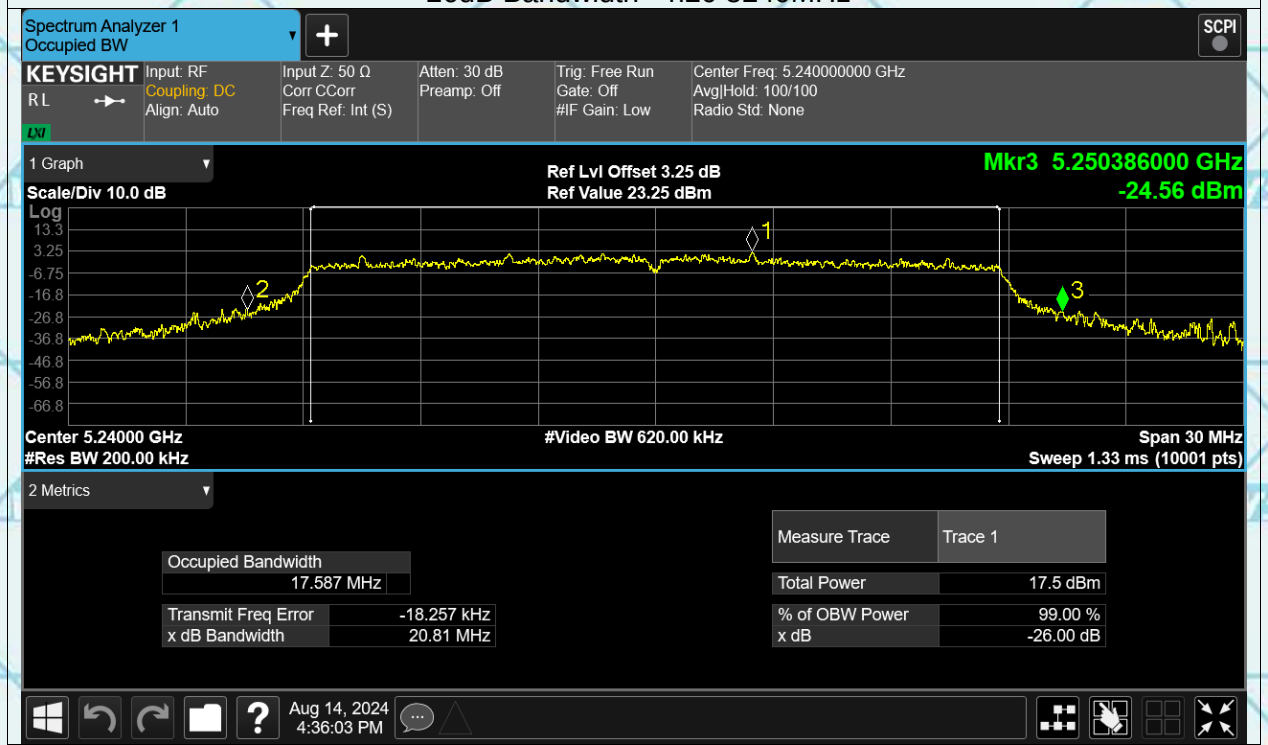
-26dB Bandwidth a 5700MHz



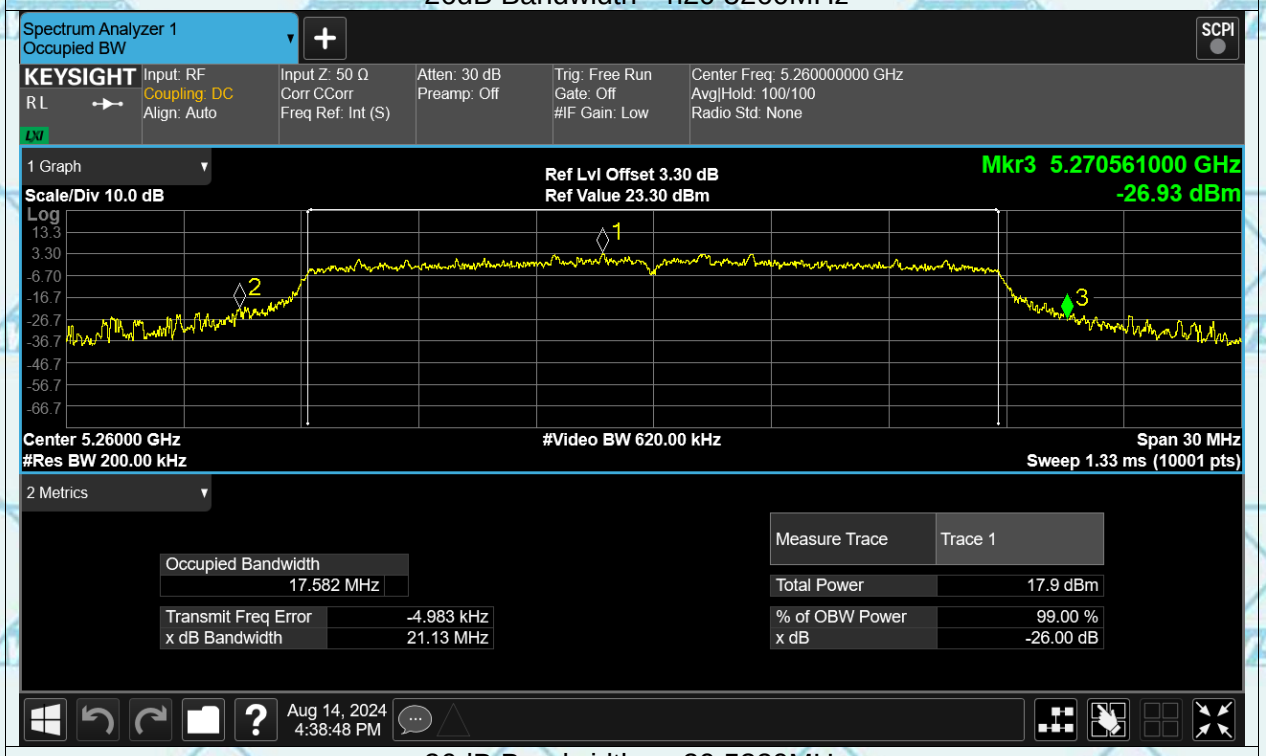
-26dB Bandwidth n20 5180MHz



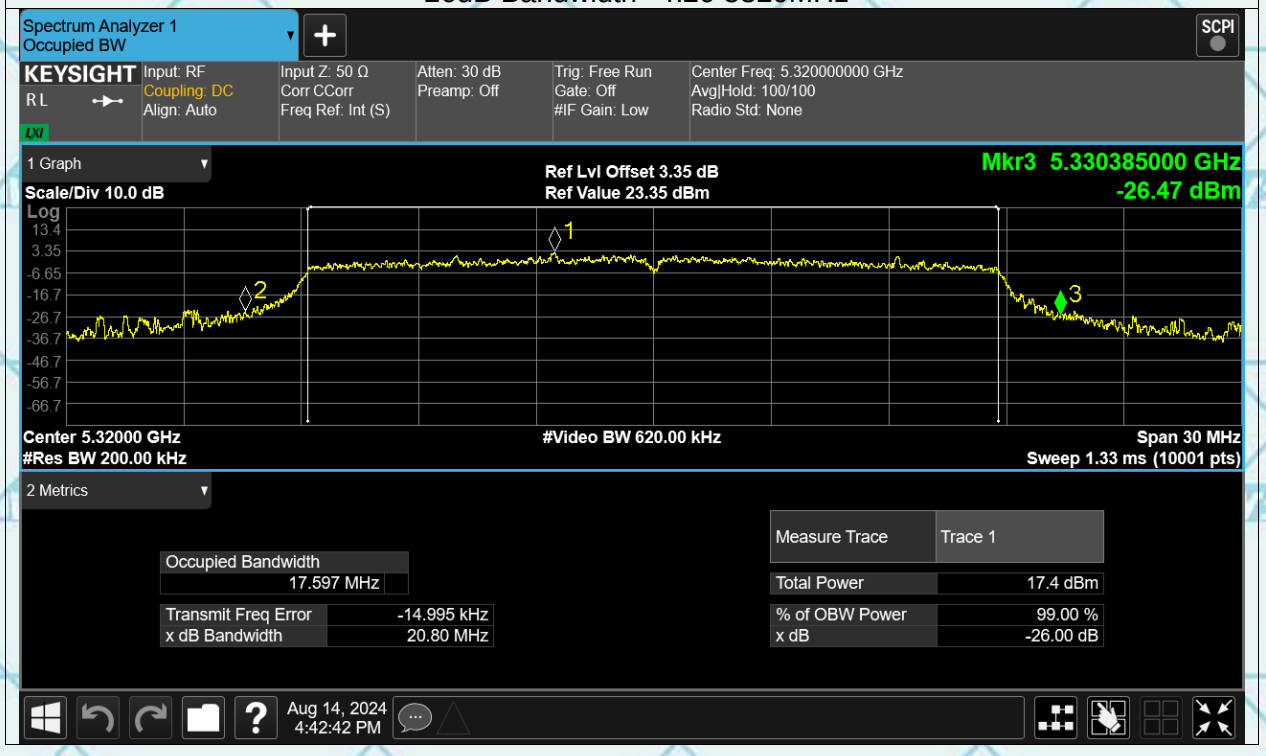
-26dB Bandwidth n20 5240MHz



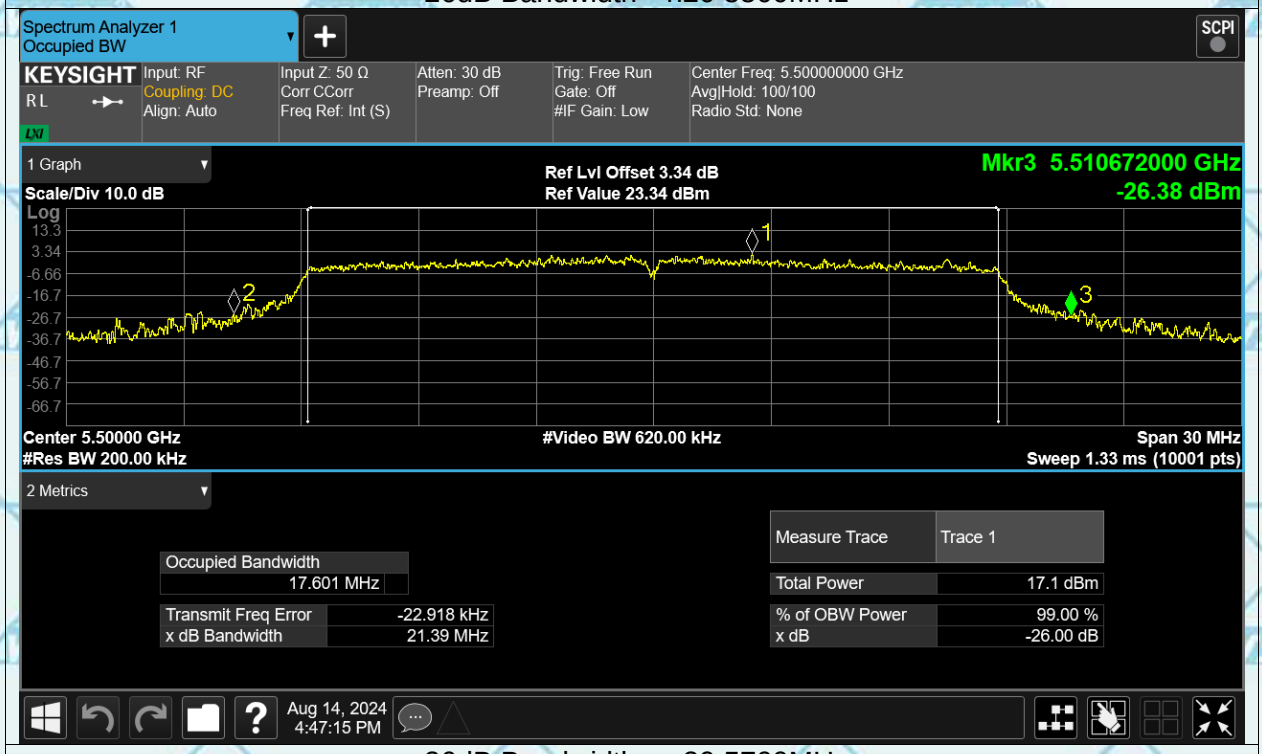
-26dB Bandwidth n20 5260MHz



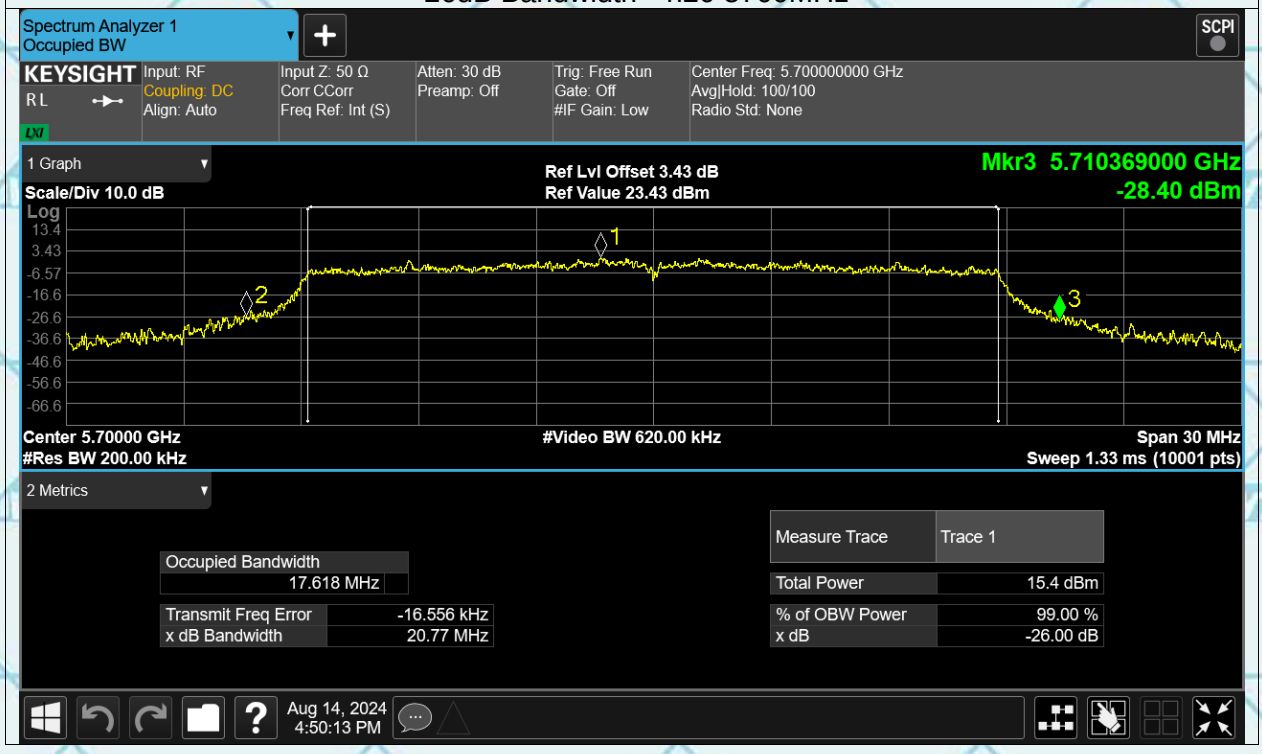
-26dB Bandwidth n20 5320MHz



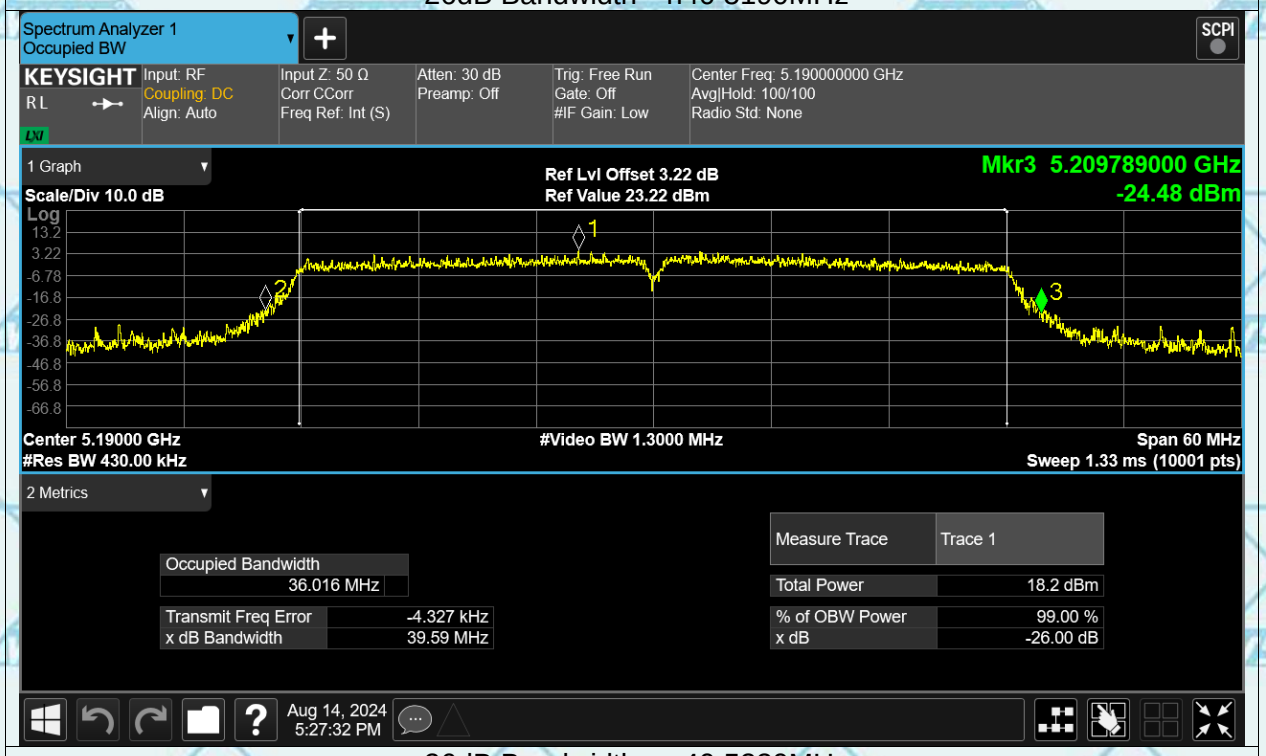
-26dB Bandwidth n20 5500MHz



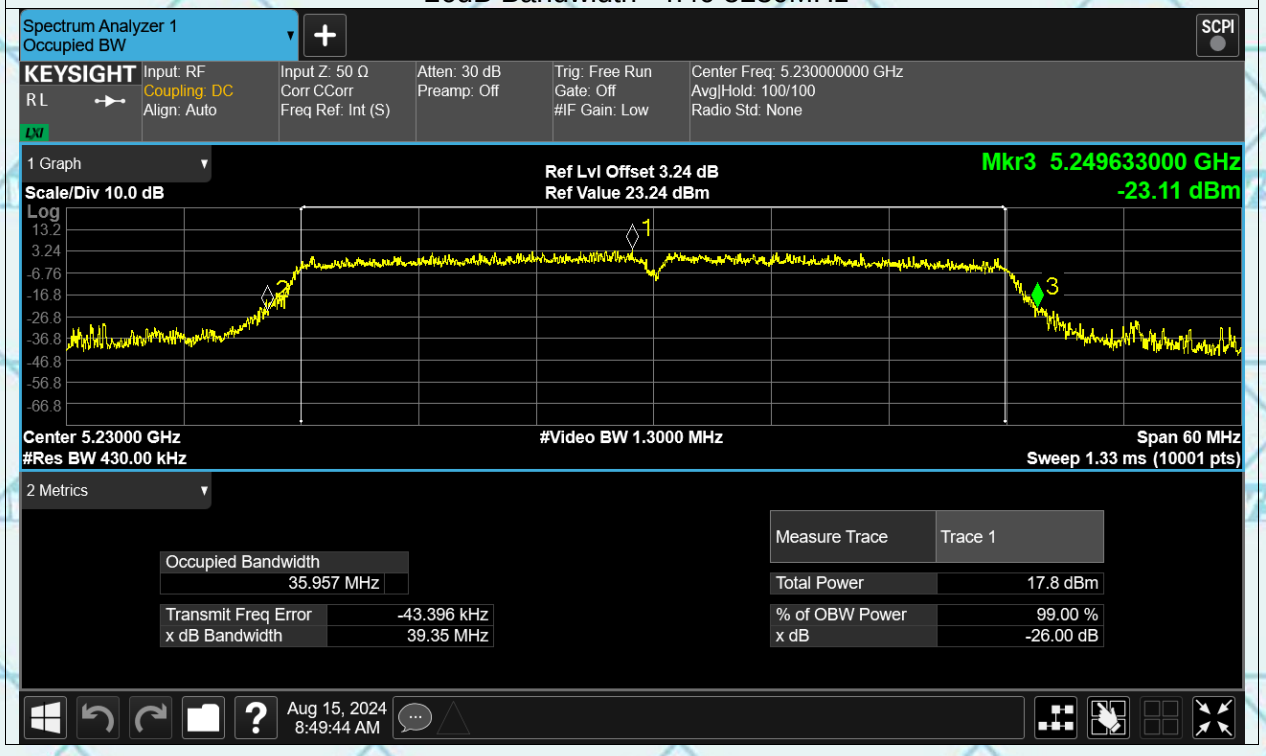
-26dB Bandwidth n20 5700MHz



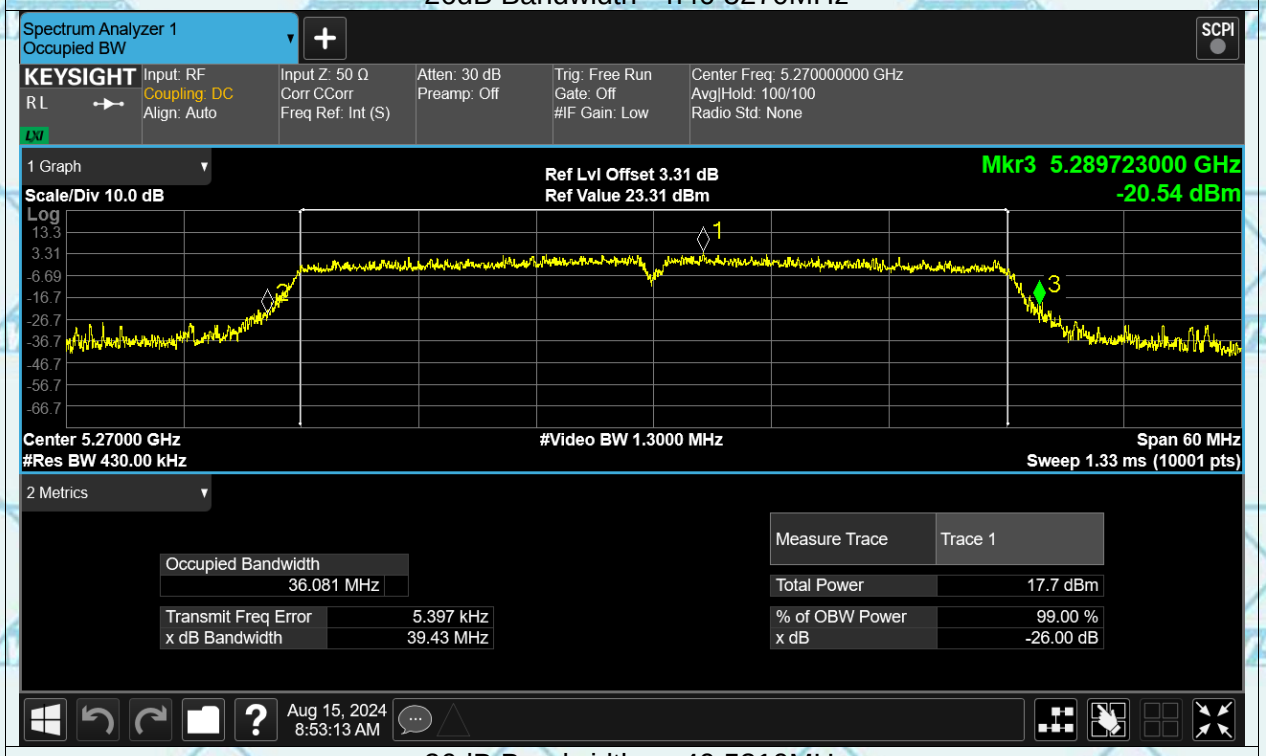
-26dB Bandwidth n40 5190MHz



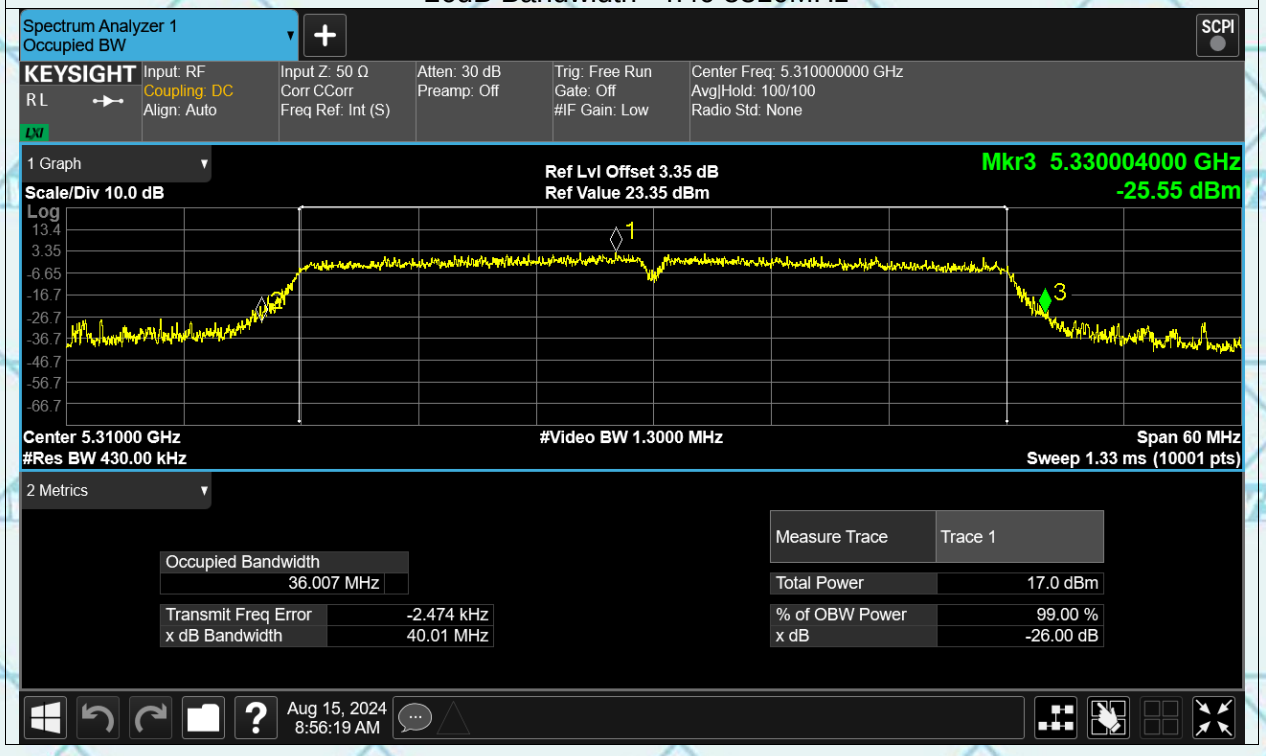
-26dB Bandwidth n40 5230MHz



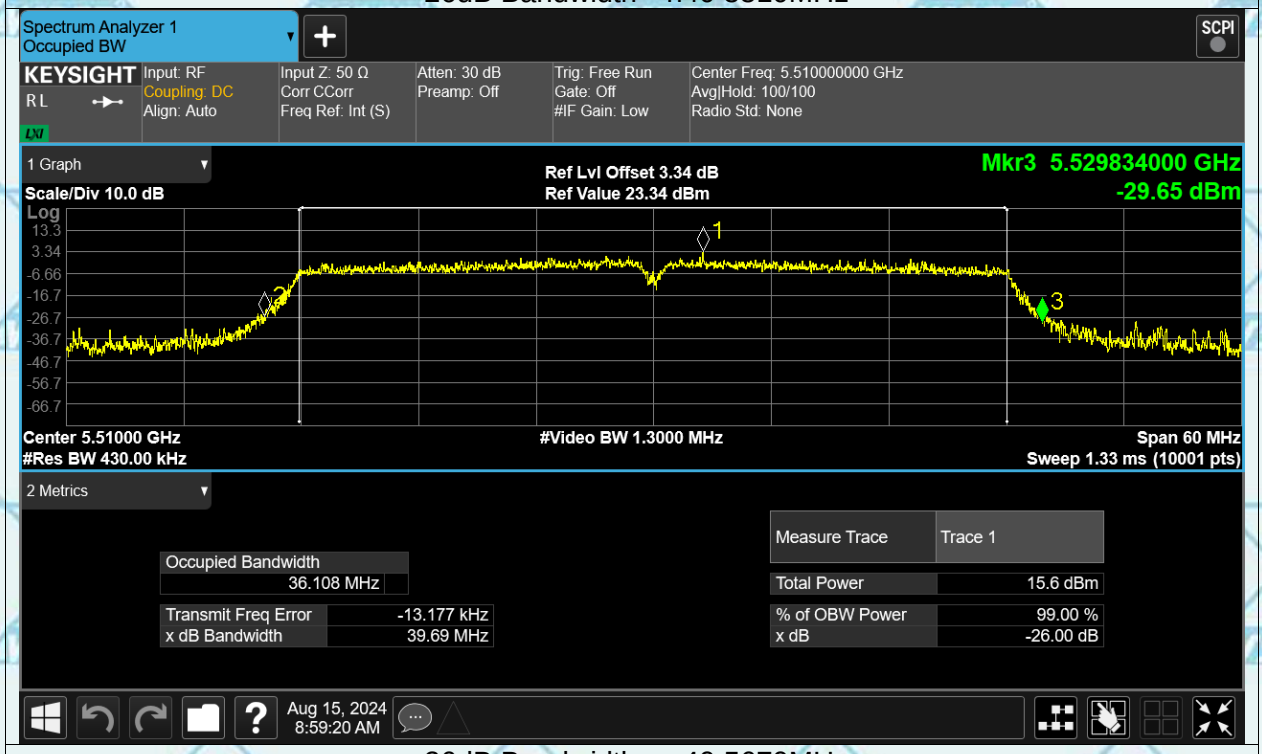
-26dB Bandwidth n40 5270MHz



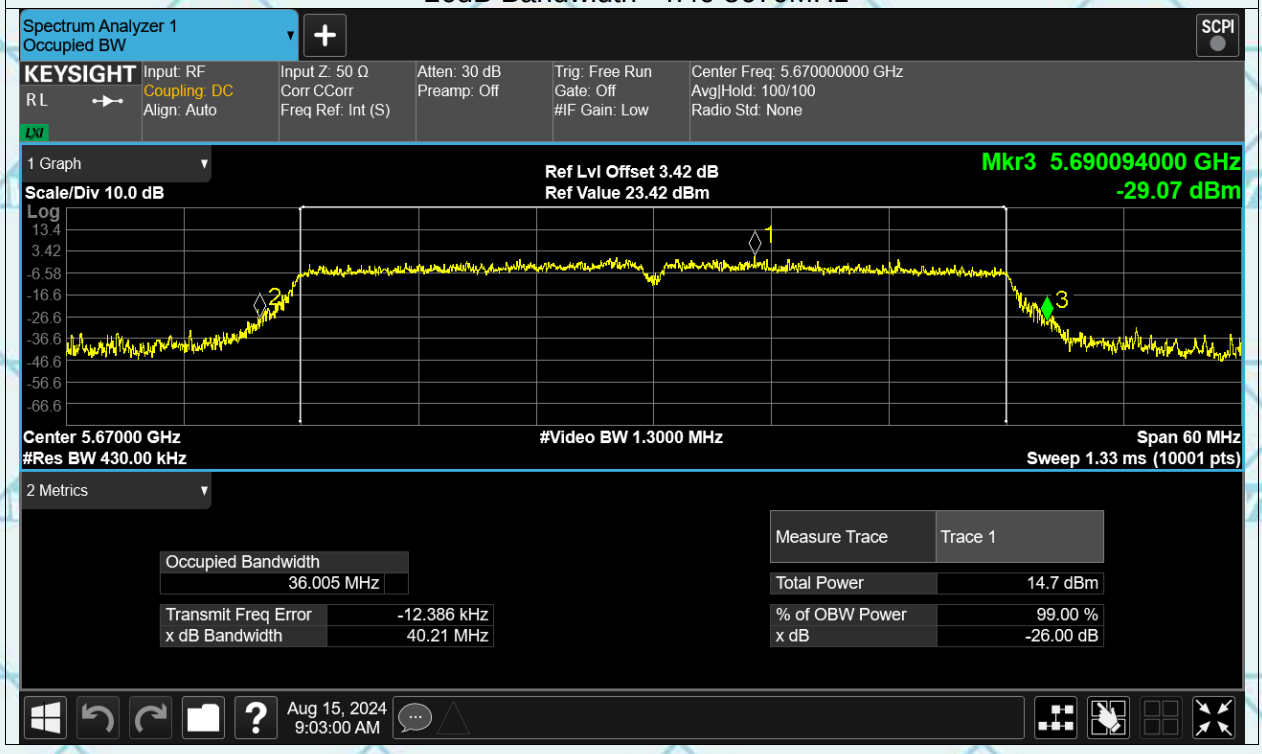
-26dB Bandwidth n40 5310MHz



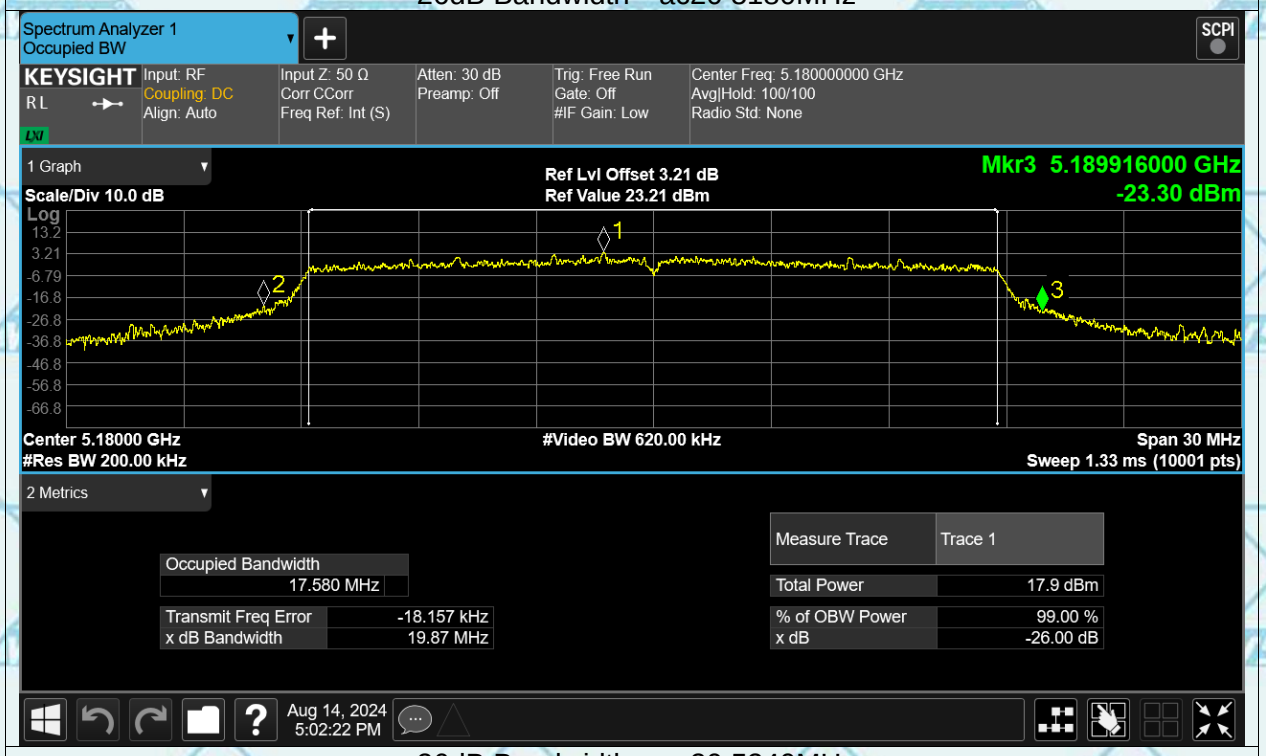
-26dB Bandwidth n40 5510MHz



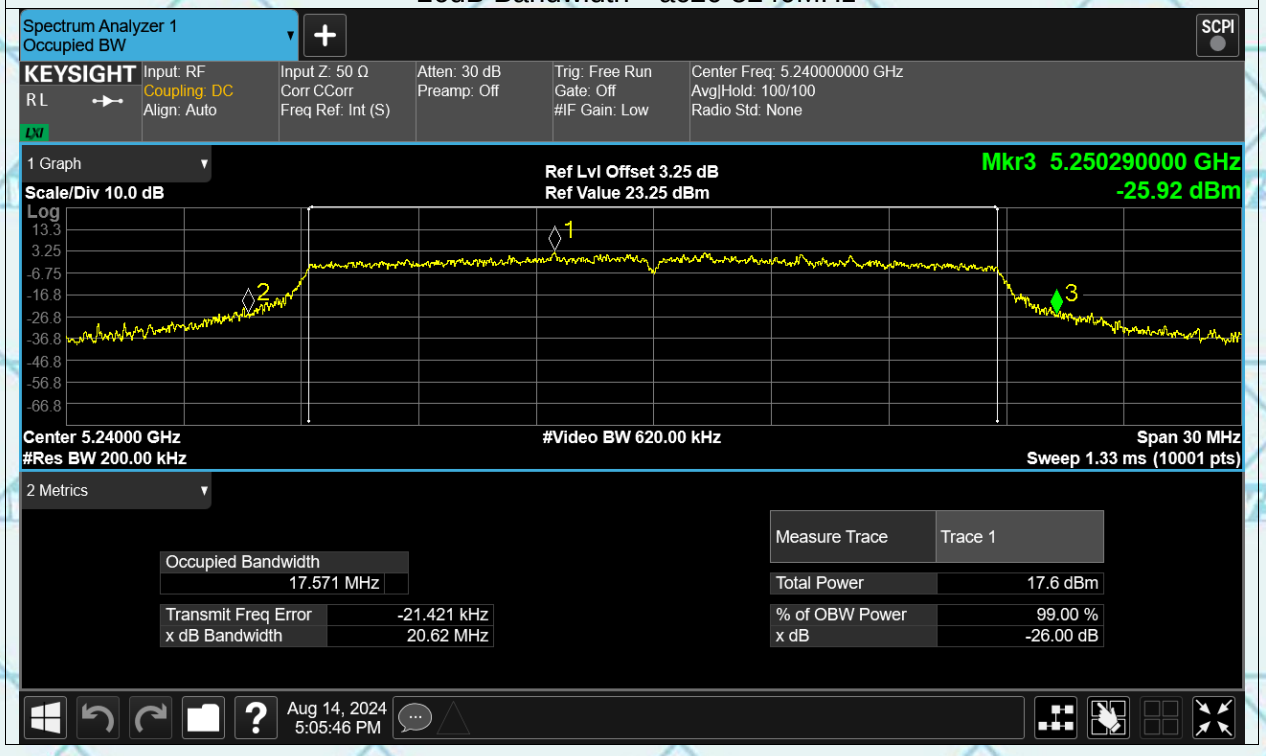
-26dB Bandwidth n40 5670MHz



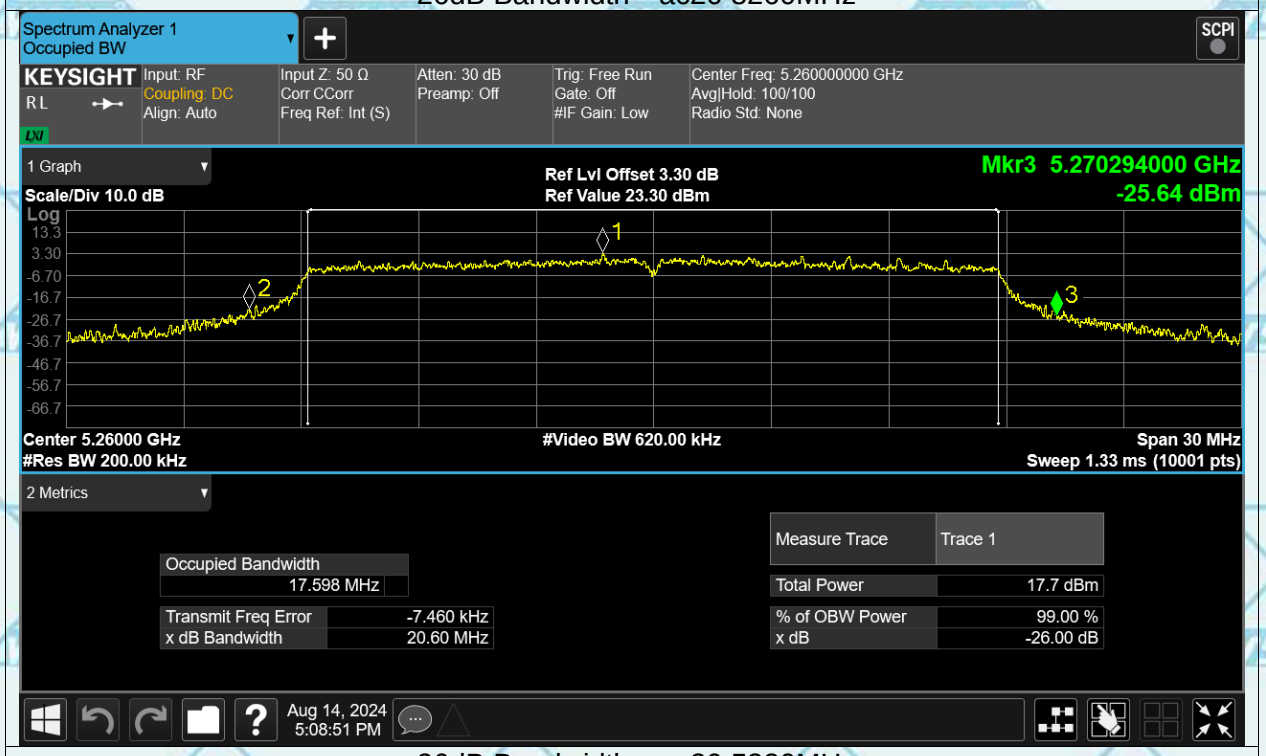
-26dB Bandwidth ac20 5180MHz



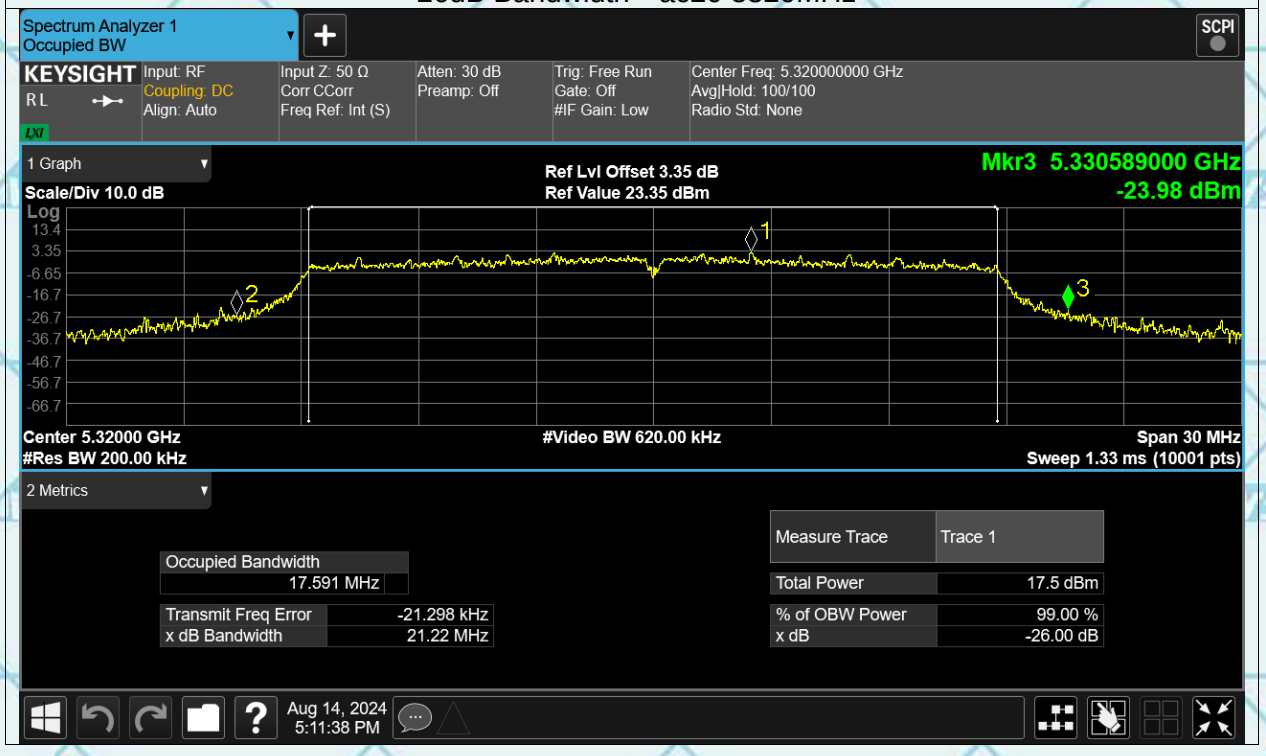
-26dB Bandwidth ac20 5240MHz



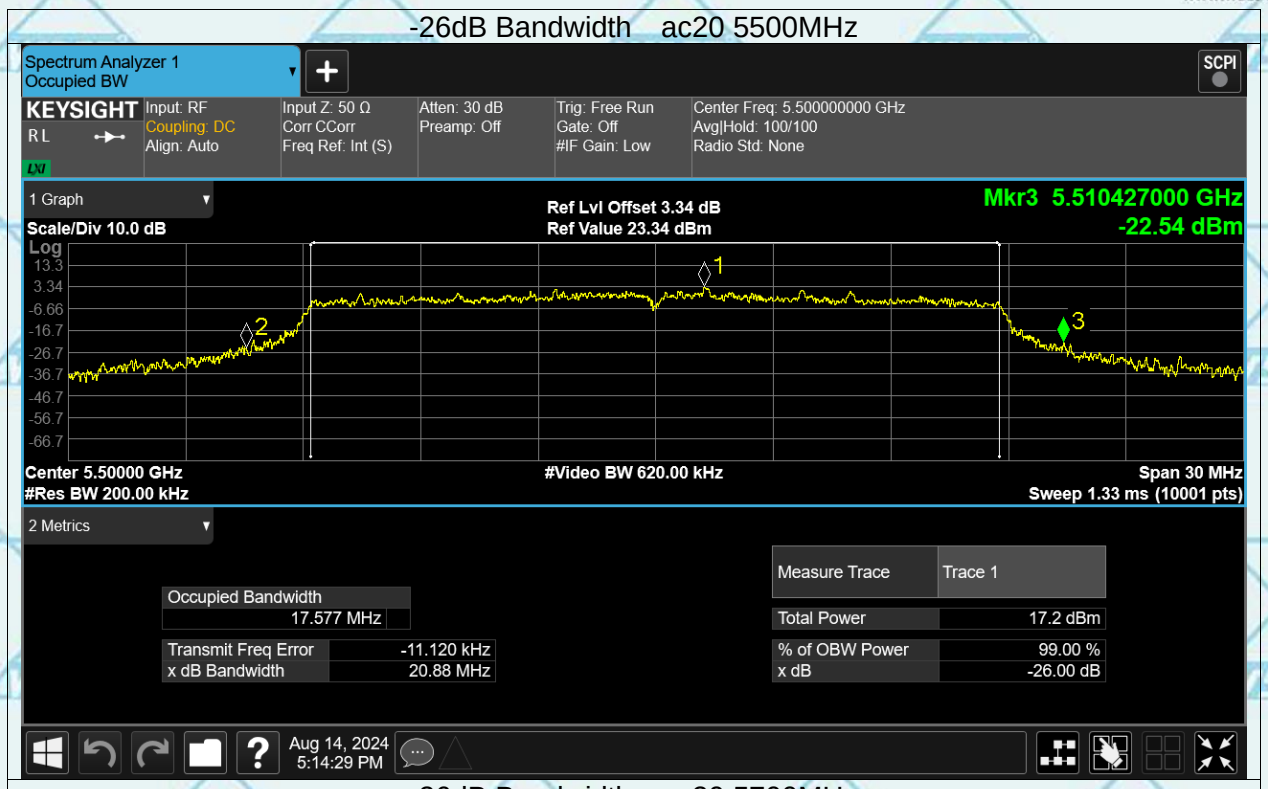
-26dB Bandwidth ac20 5260MHz



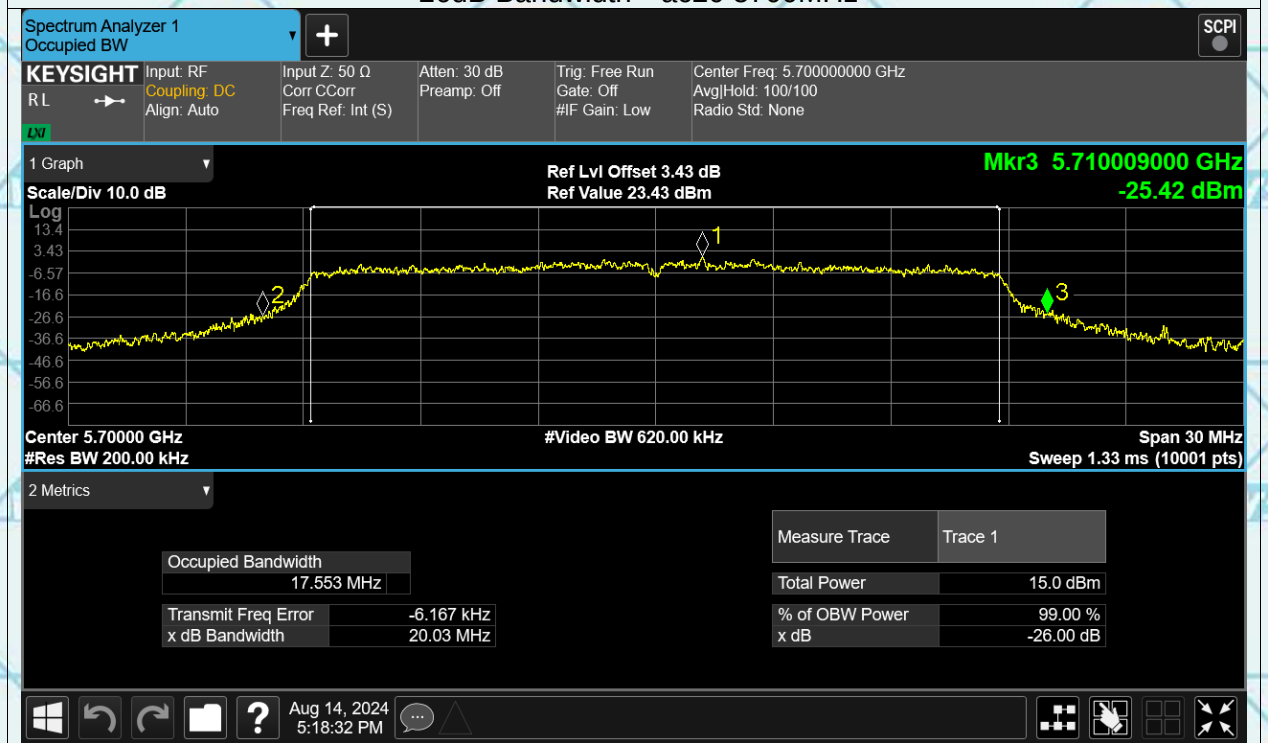
-26dB Bandwidth ac20 5320MHz



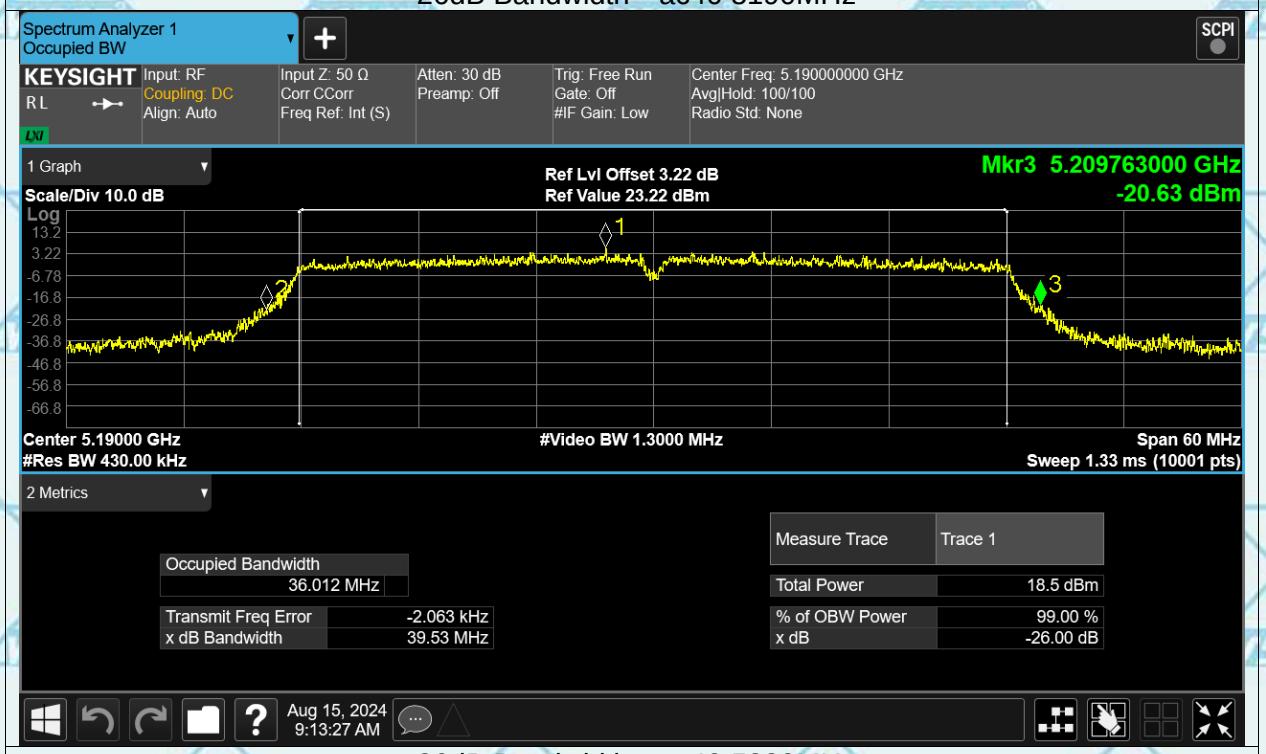
-26dB Bandwidth ac20 5500MHz



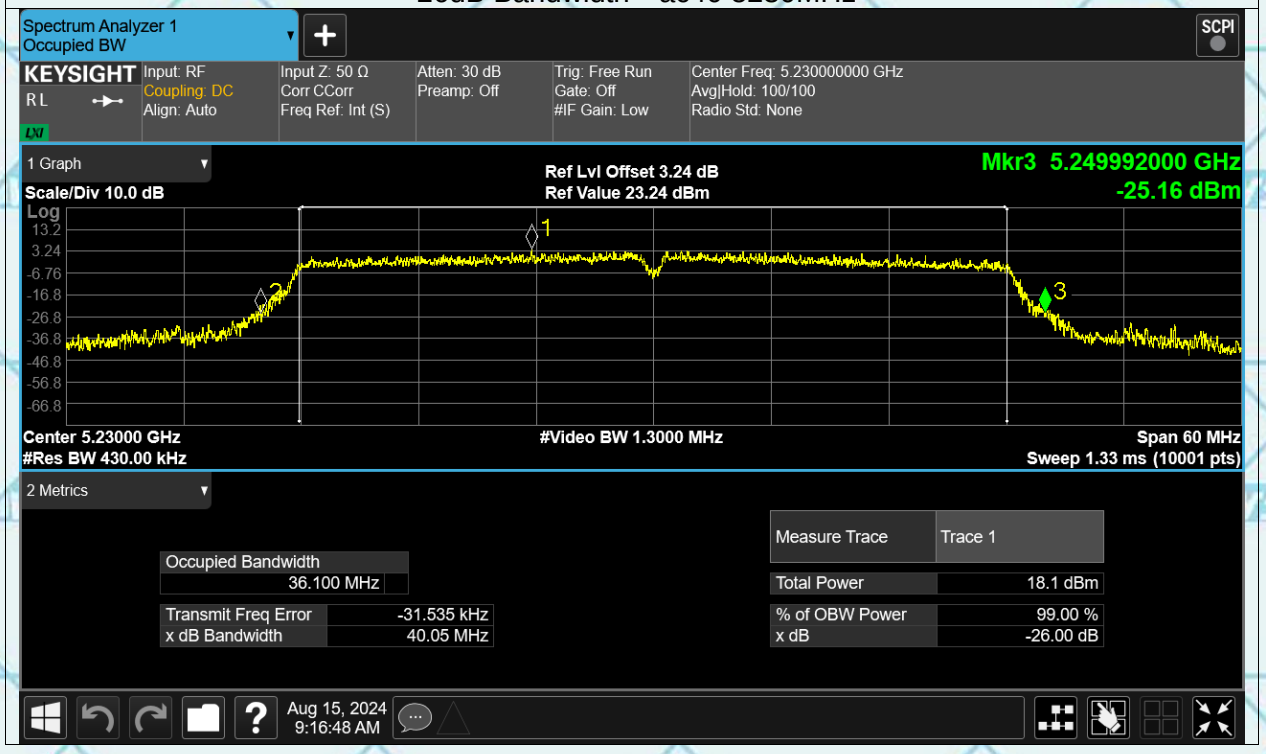
-26dB Bandwidth ac20 5700MHz



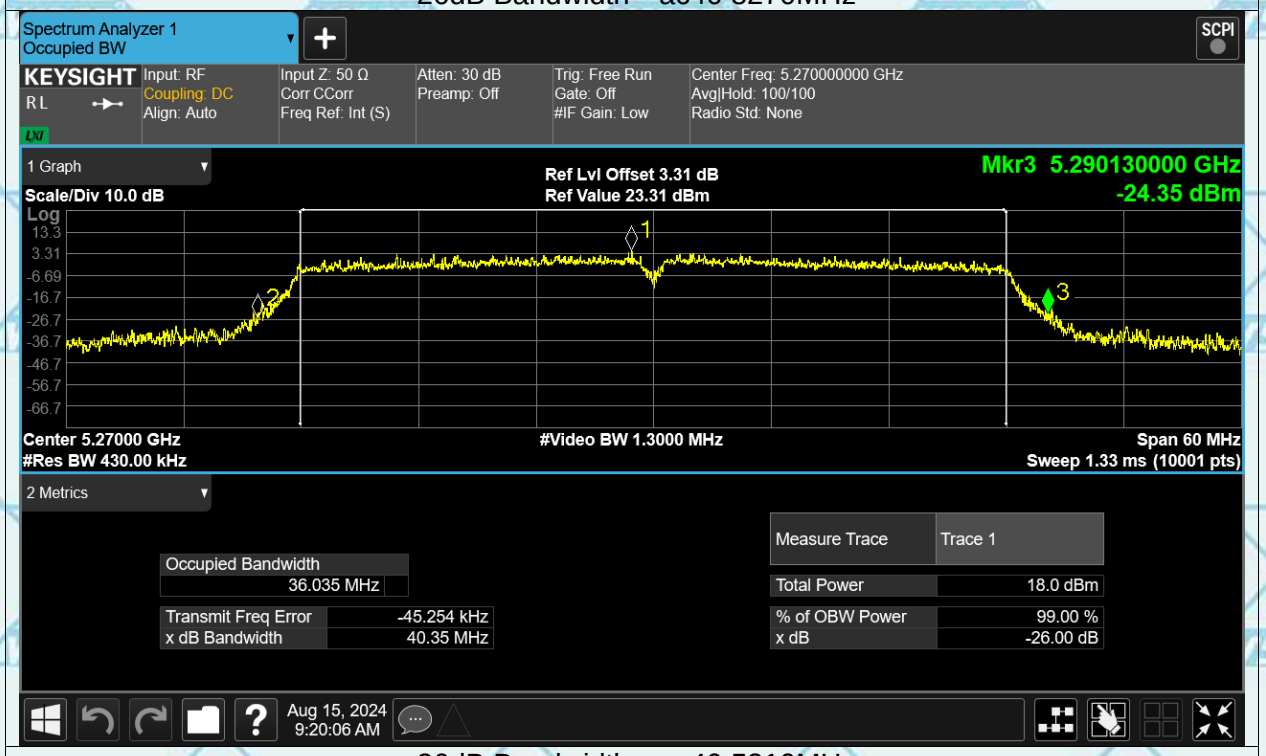
-26dB Bandwidth ac40 5190MHz



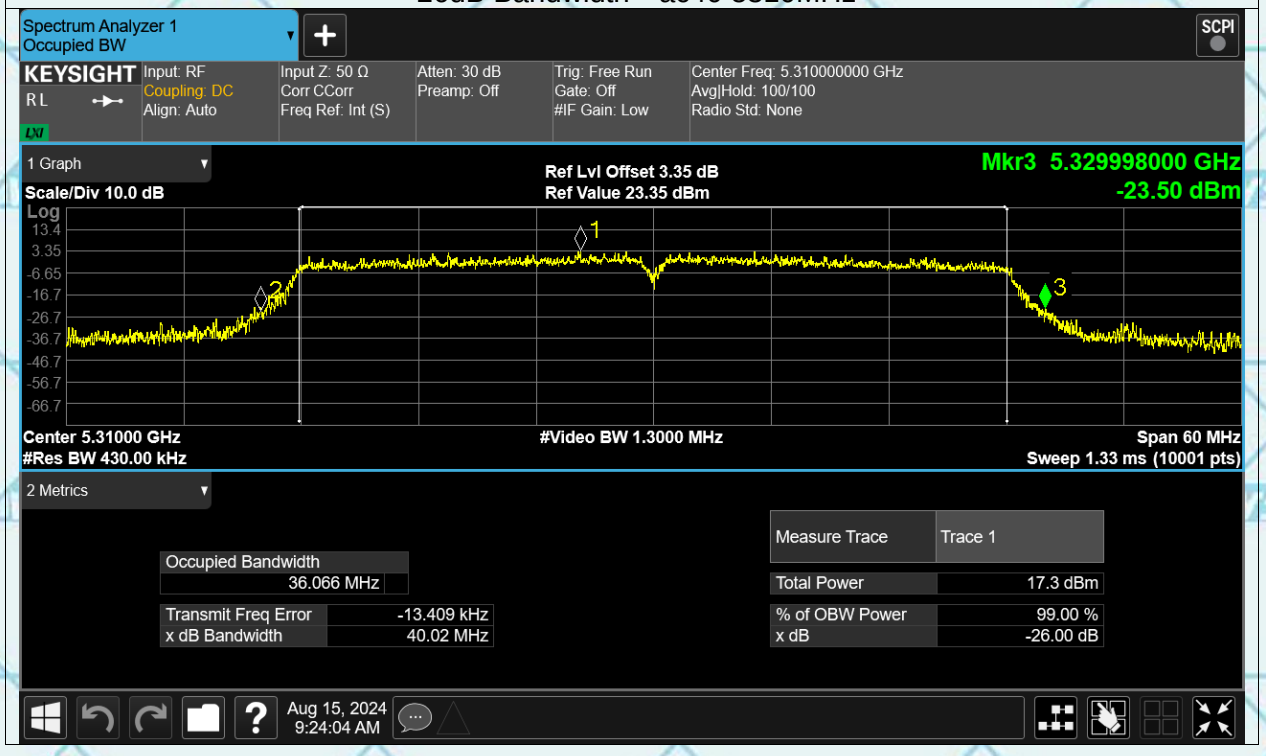
-26dB Bandwidth ac40 5230MHz



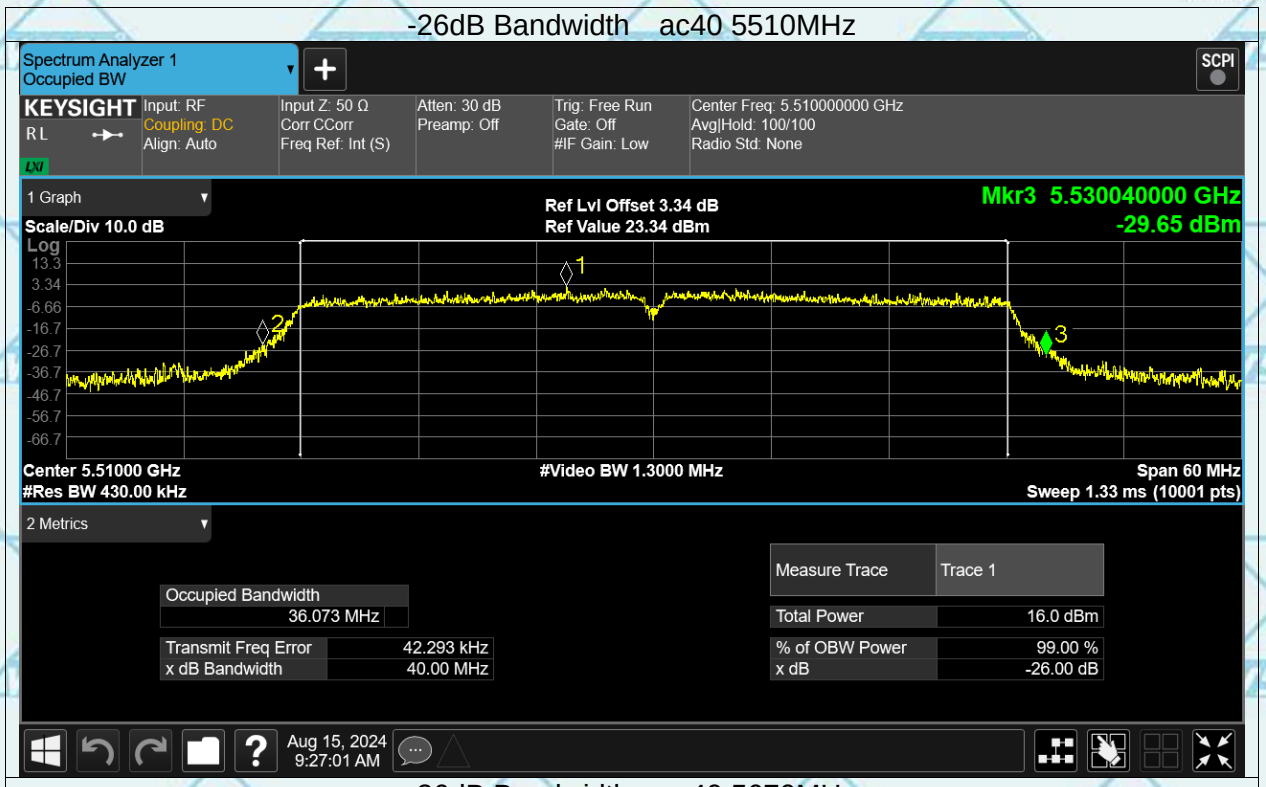
-26dB Bandwidth ac40 5270MHz



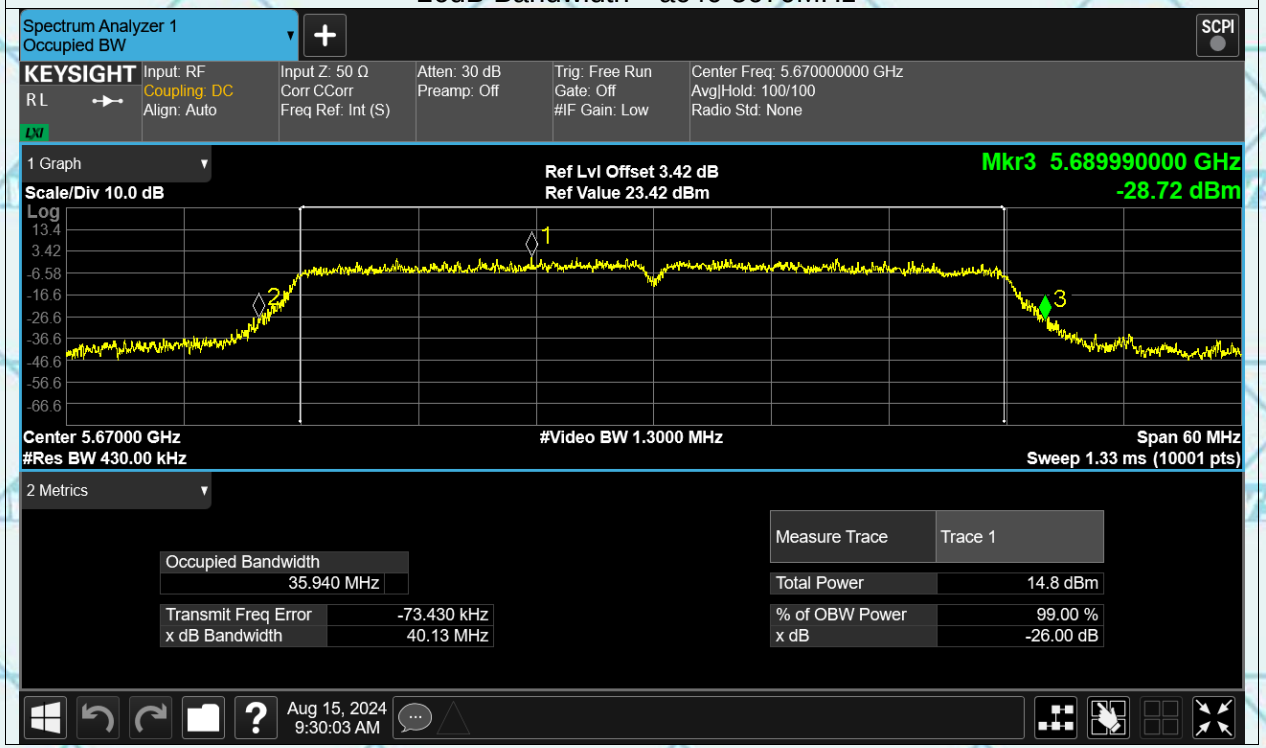
-26dB Bandwidth ac40 5310MHz



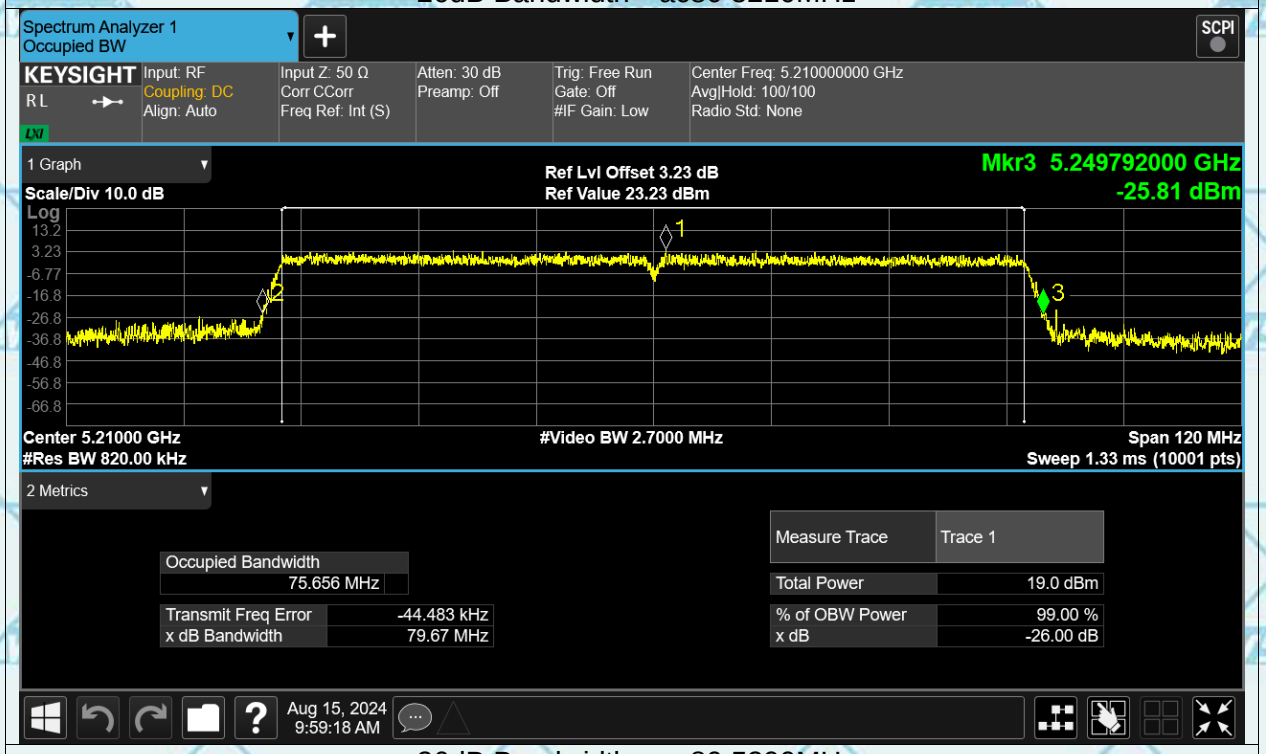
-26dB Bandwidth ac40 5510MHz



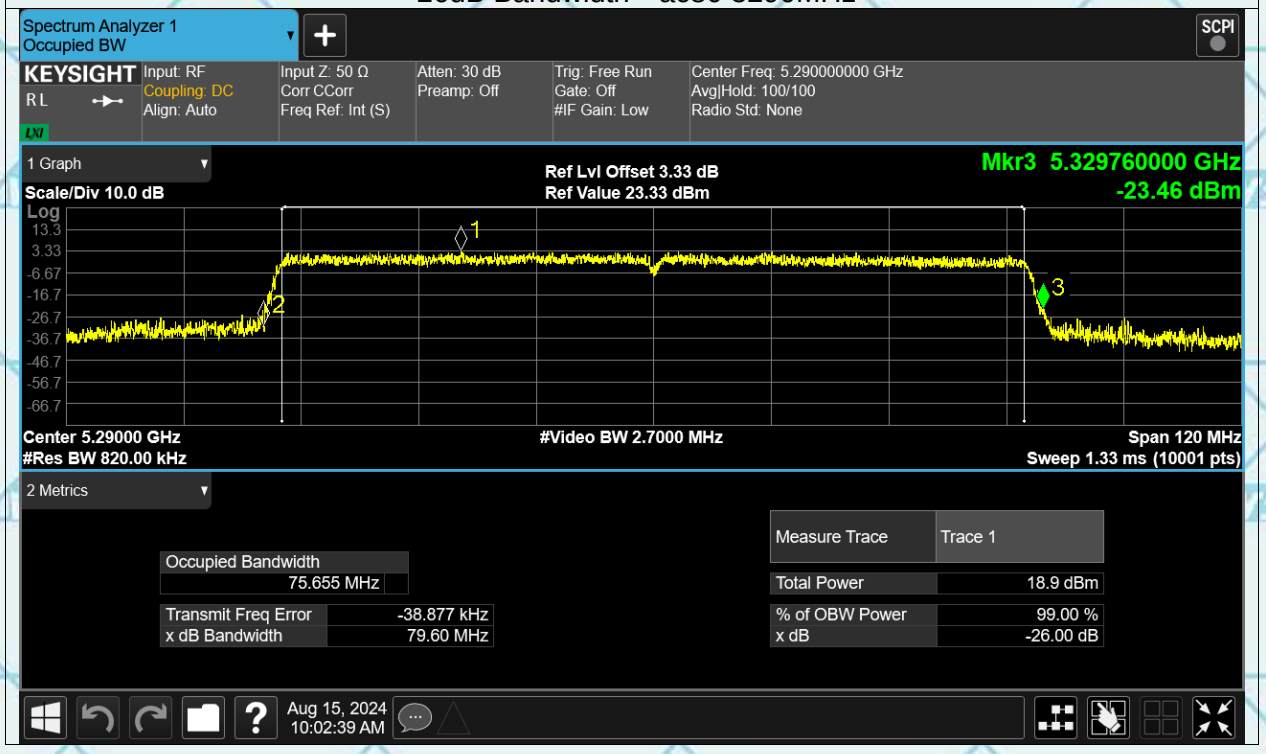
-26dB Bandwidth ac40 5670MHz



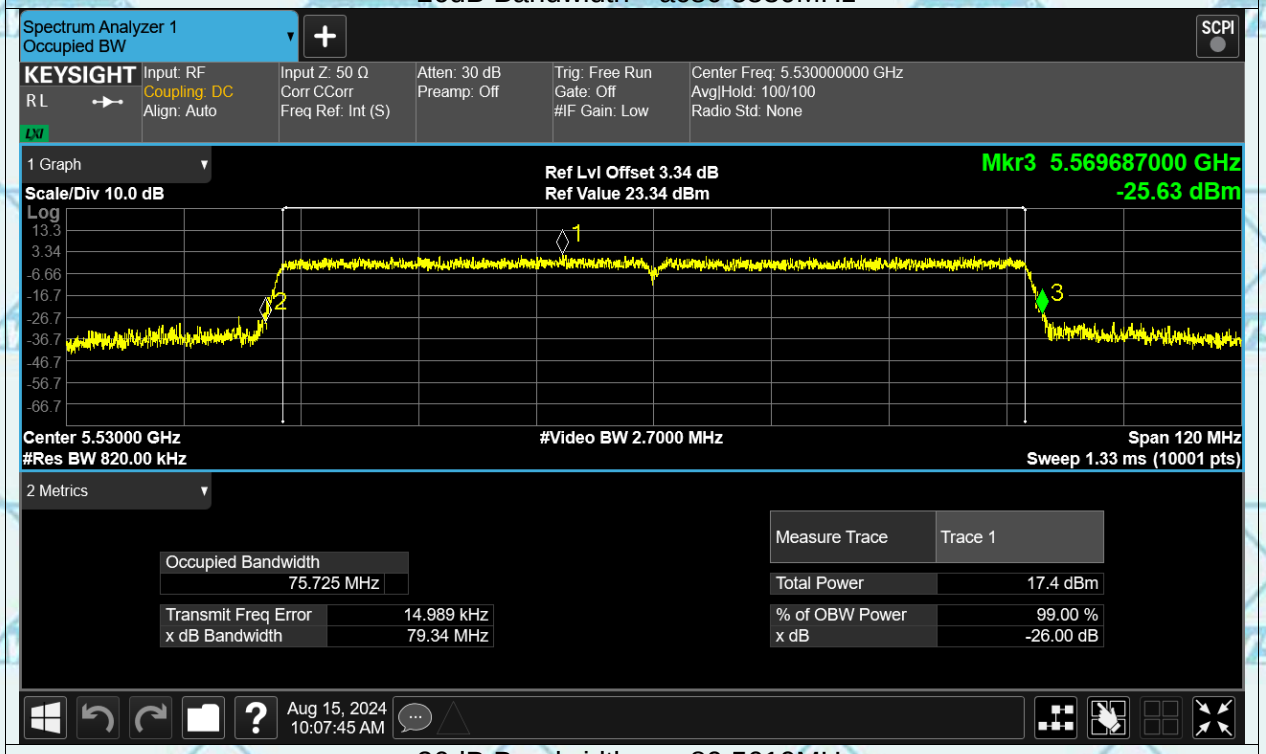
-26dB Bandwidth ac80 5210MHz



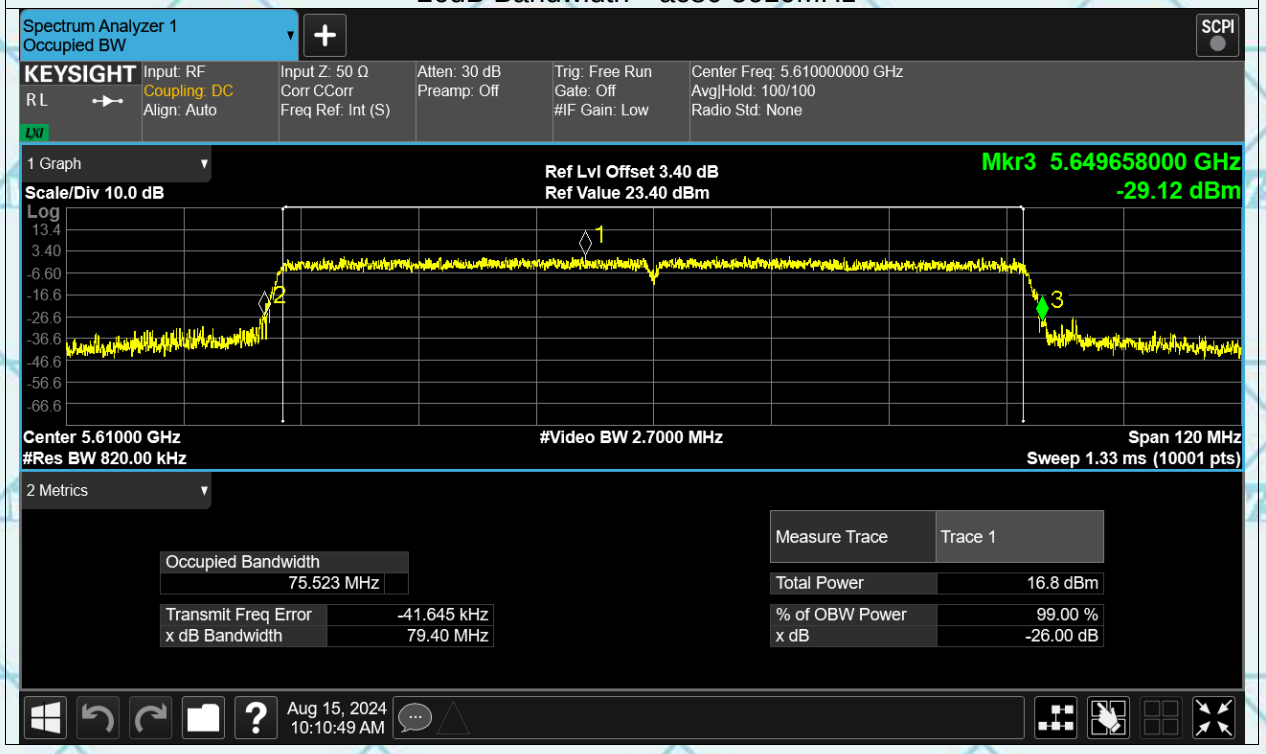
-26dB Bandwidth ac80 5290MHz



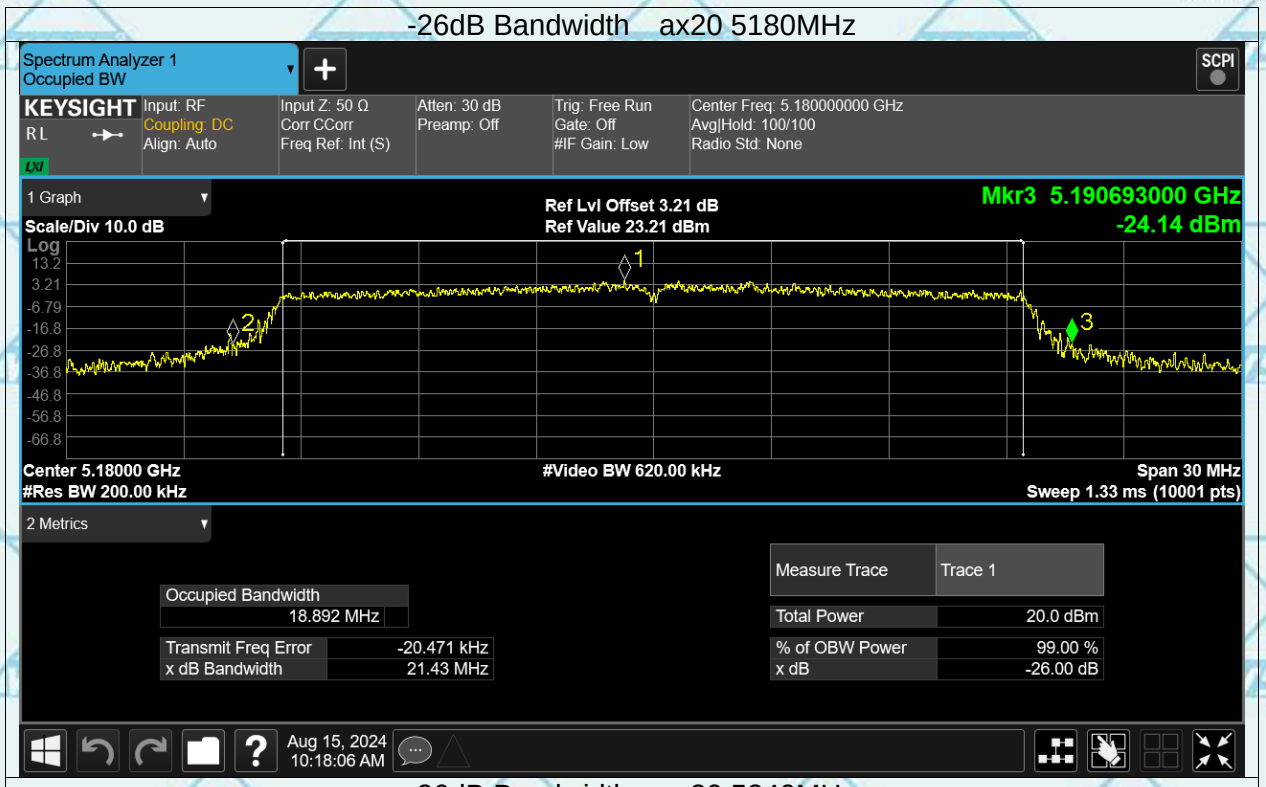
-26dB Bandwidth ac80 5530MHz



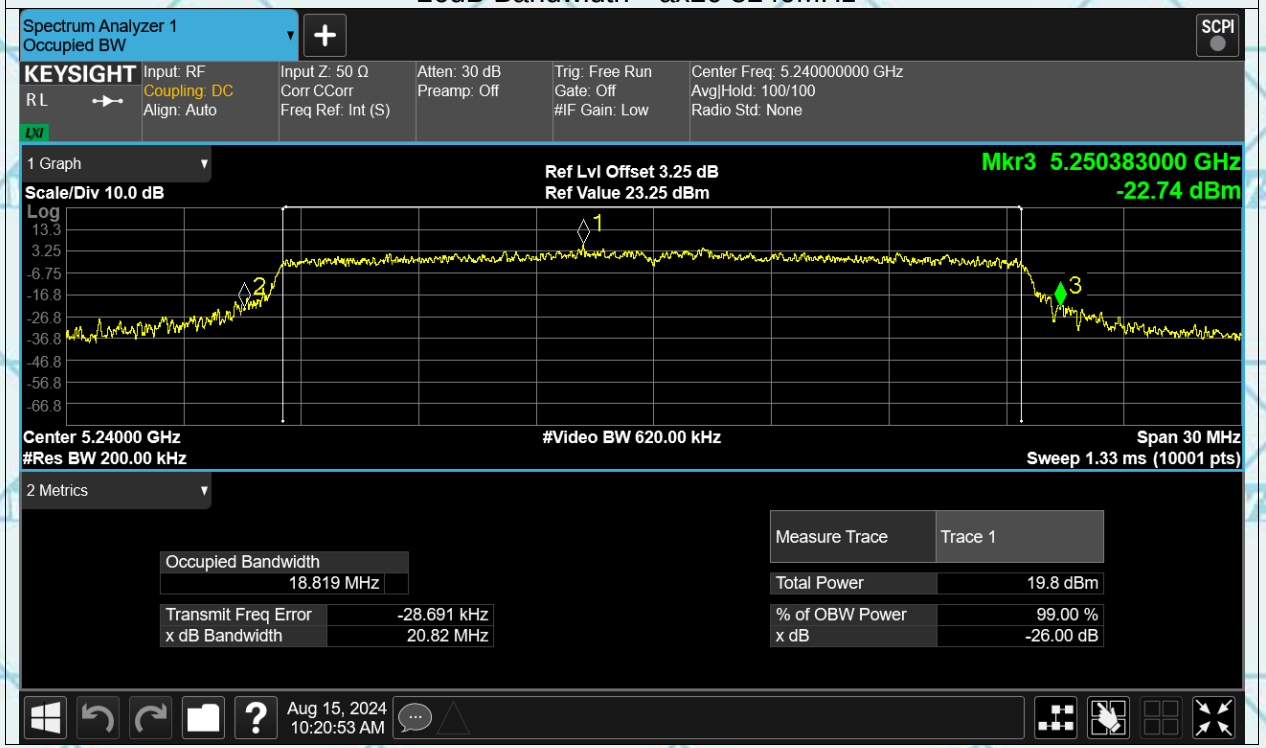
-26dB Bandwidth ac80 5610MHz



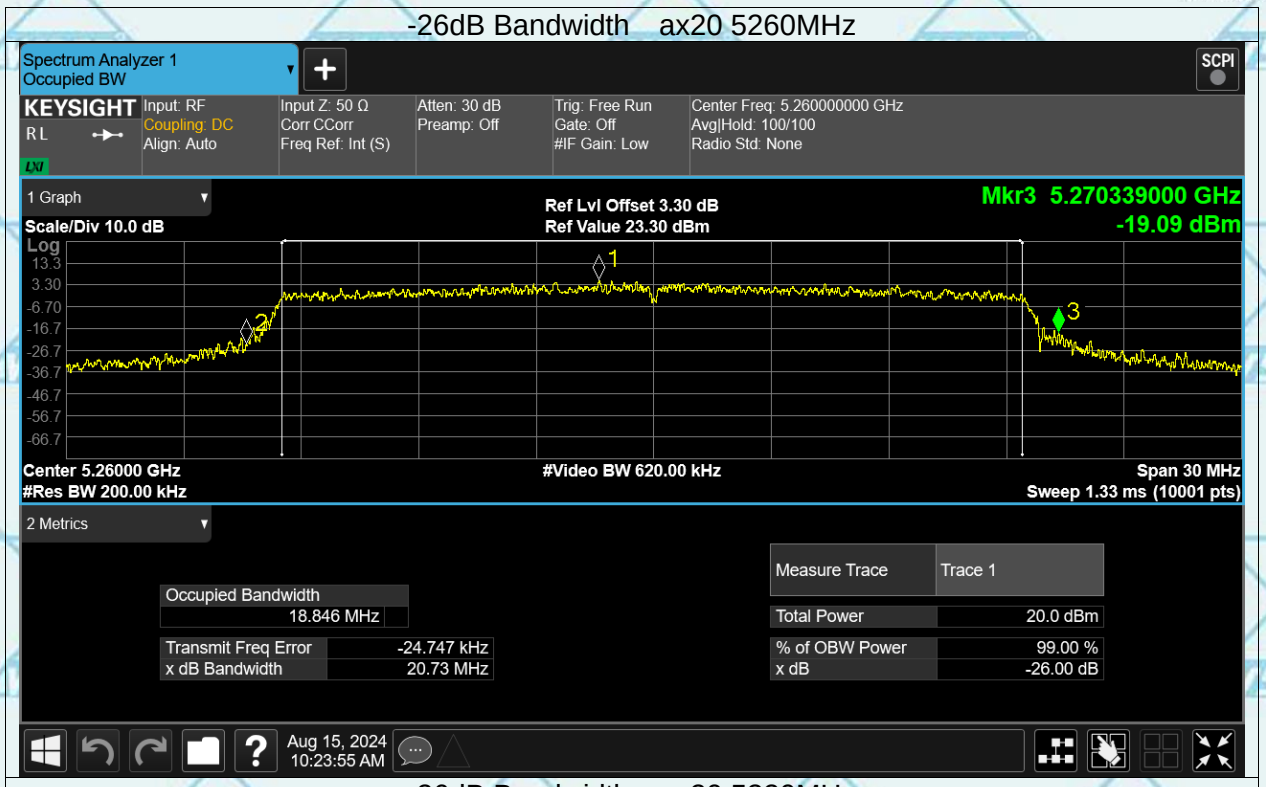
-26dB Bandwidth ax20 5180MHz



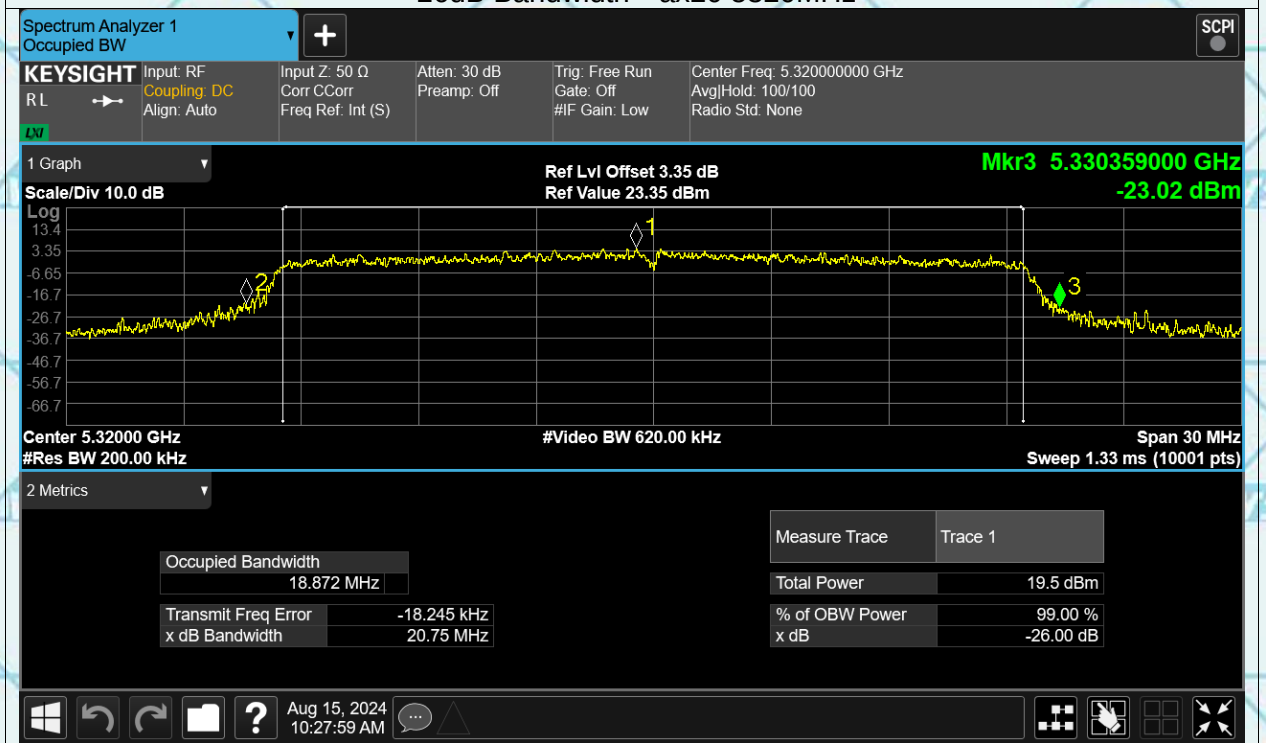
-26dB Bandwidth ax20 5240MHz



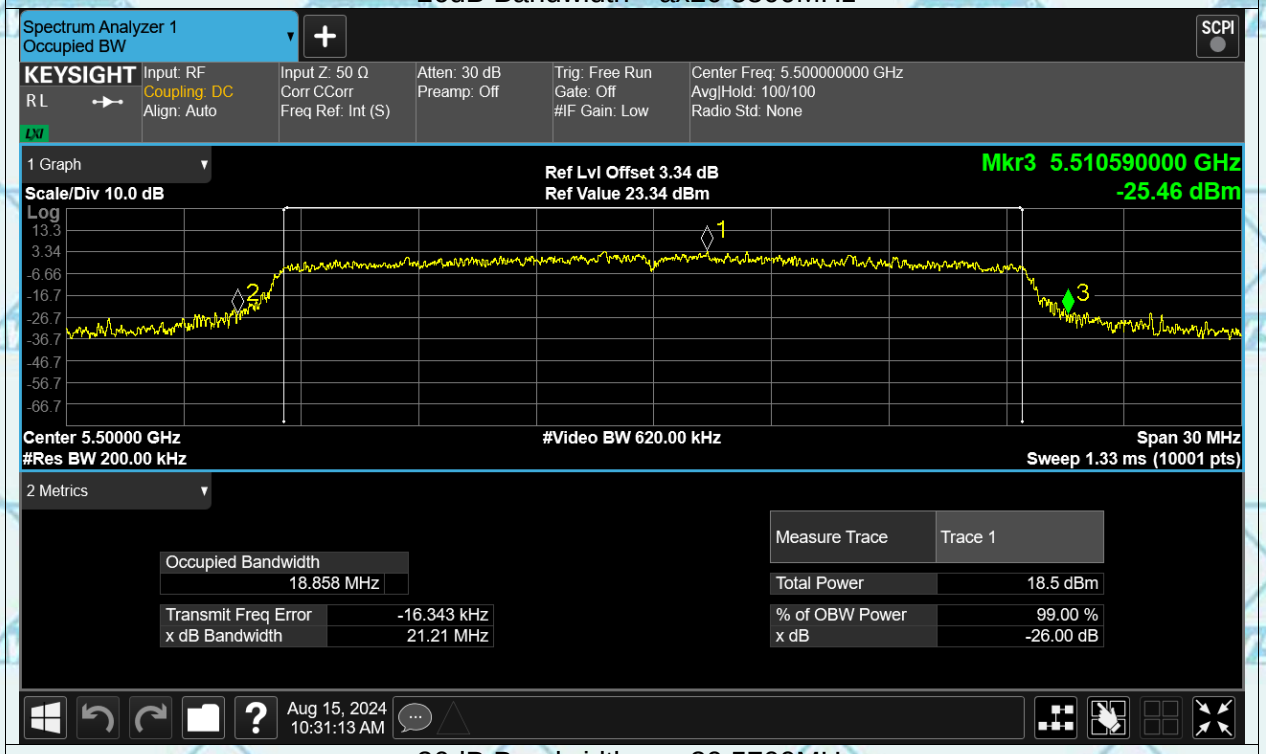
-26dB Bandwidth ax20 5260MHz



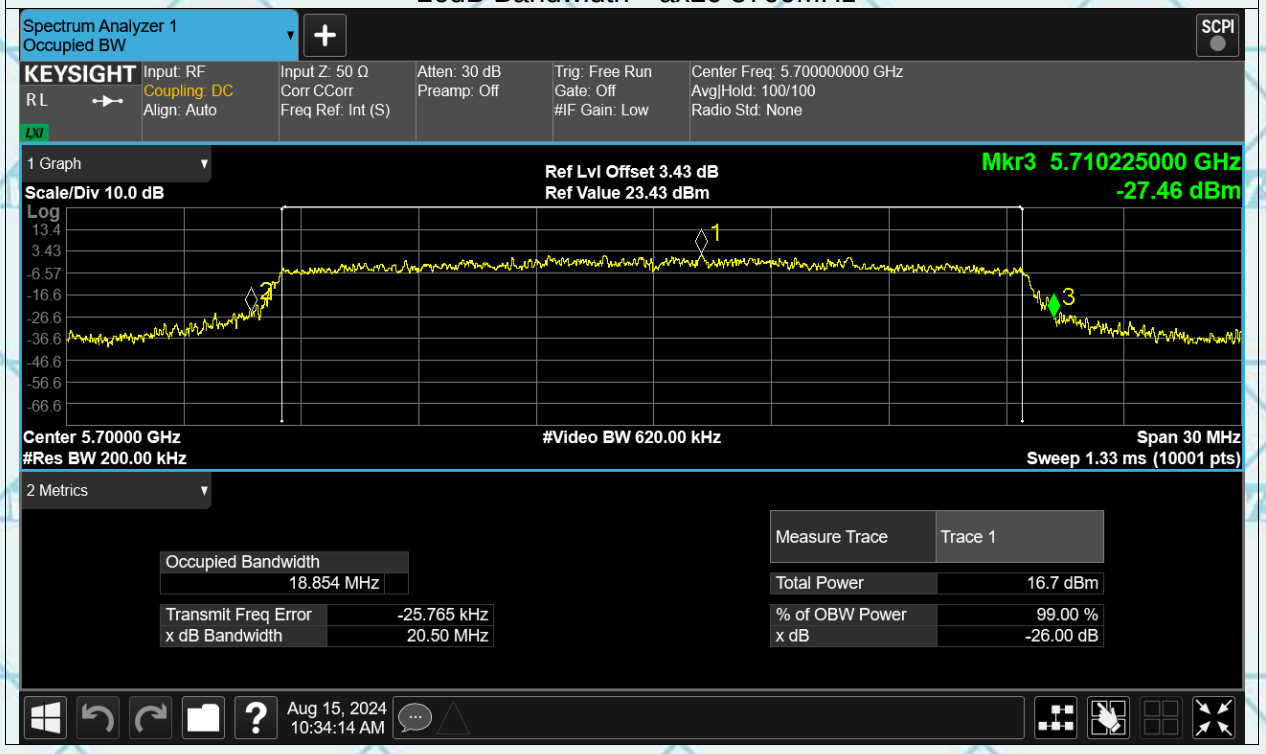
-26dB Bandwidth ax20 5320MHz



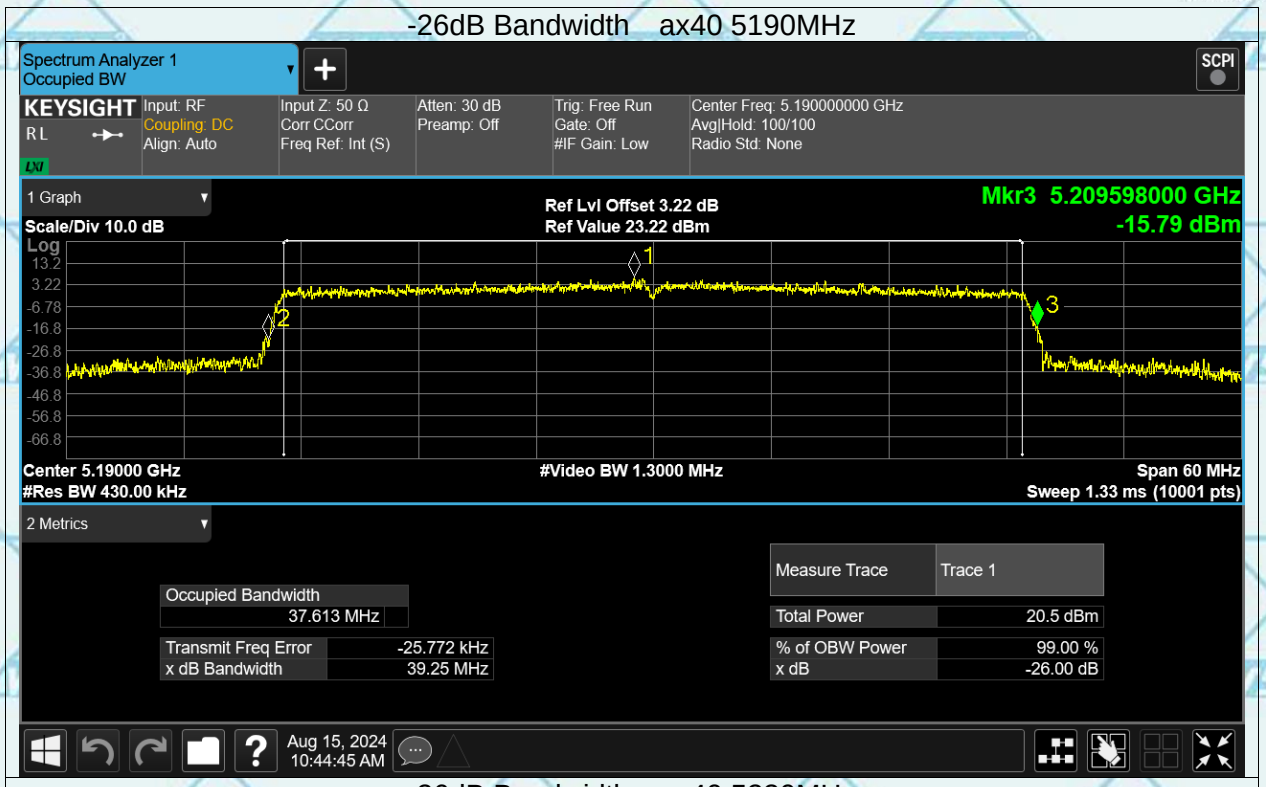
-26dB Bandwidth ax20 5500MHz



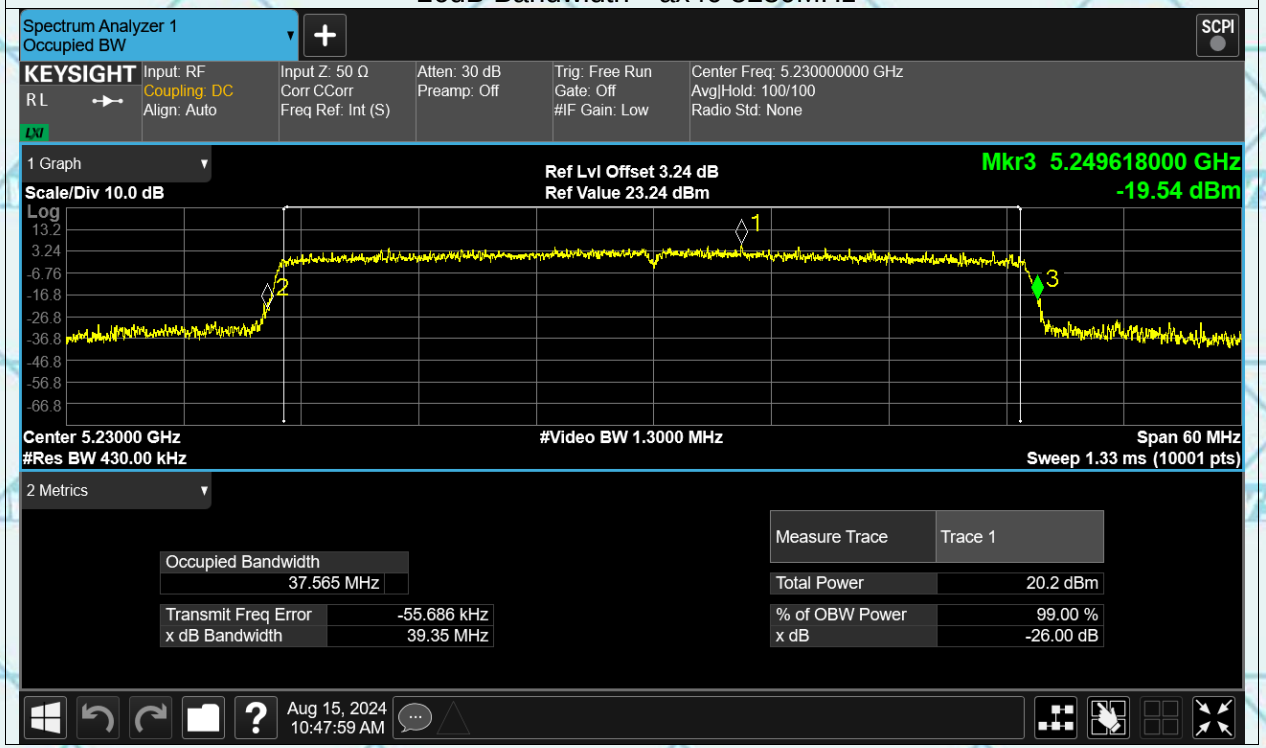
-26dB Bandwidth ax20 5700MHz



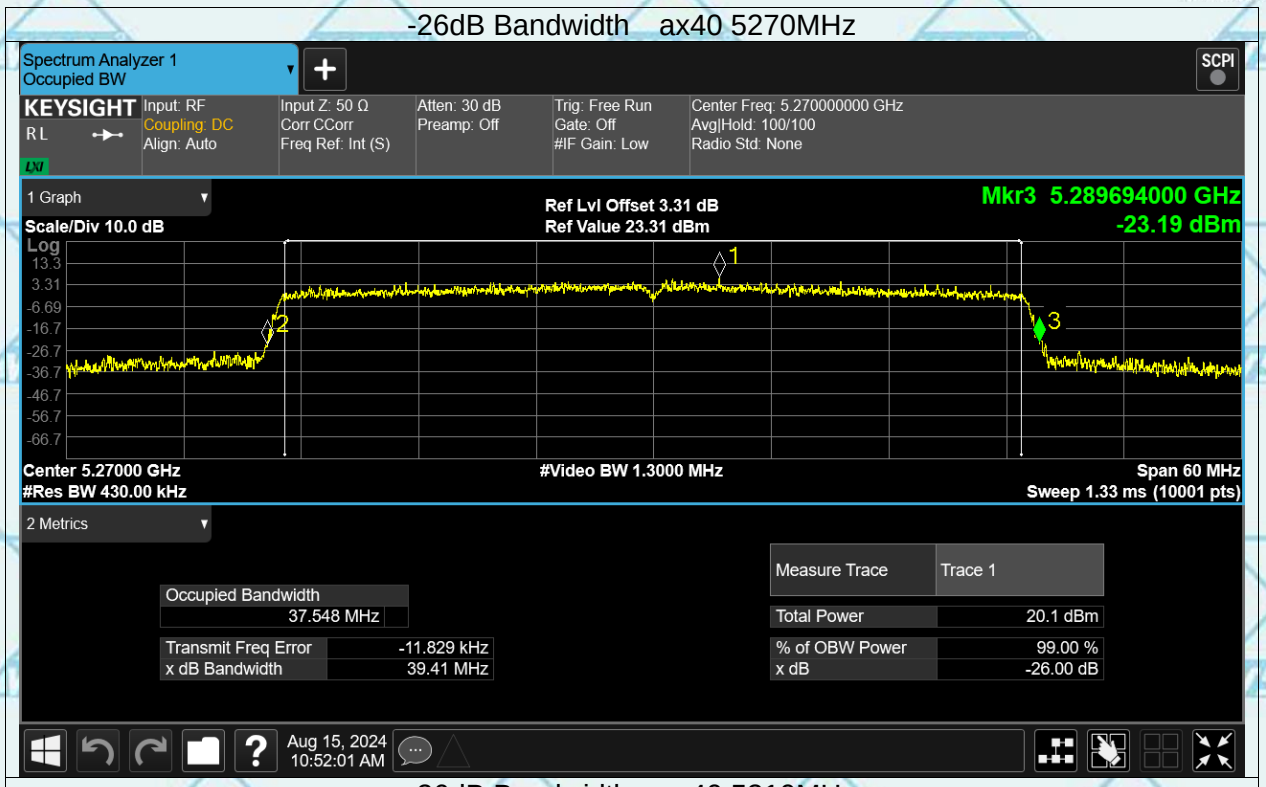
-26dB Bandwidth ax40 5190MHz



-26dB Bandwidth ax40 5230MHz



-26dB Bandwidth ax40 5270MHz



-26dB Bandwidth ax40 5310MHz