
FCC Test Report

Report No.: AGC16626250802FR04

FCC ID : 2BGBLP140

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : Smart Diagnostic System

BRAND NAME : GEARWRENCH

MODEL NAME : GWSMART10

APPLICANT : Apex Tool Group, LLC

DATE OF ISSUE : Jan. 22, 2026

STANDARD(S) : FCC Part 15 Subpart E §15.407

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jan. 22, 2026	Valid	Initial Release

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Table of Contents

1. General Information	5
2. Product Information	6
2.1 Product Technical Description	6
2.2 Table of Carrier Frequency	7
2.3 IEEE 802.11n Modulation Scheme	8
2.4 Related Submittal(S) / Grant (S)	9
2.5 Test Methodology	9
2.6 Special Accessories	9
2.7 Equipment Modifications	9
2.8 Antenna Requirement	9
2.9 Description of Test Software	10
3. Test Environment	11
3.1 Address of The Test Laboratory	11
3.2 Test Facility	11
3.3 Environmental Conditions	12
3.4 Measurement Uncertainty	12
3.5 List of Equipment Used	13
4. System Test Configuration	15
4.1 EUT Configuration	15
4.2 EUT Exercise	15
4.3 Configuration of Tested System	15
4.4 Equipment Used in Tested System	16
4.5 Summary of Test Results	17
5. Description of Test Modes	18
6. Duty Cycle Measurement	21
7. RF Output Power Measurement	24
7.1 Provisions Applicable	24
7.2 Measurement Procedure	24
7.3 Measurement Setup (Block Diagram of Configuration)	25
7.4 Measurement Result	25
8. 6dB&26dB Bandwidth Measurement	27
8.1 Provisions Applicable	27
8.2 Measurement Procedure	27
8.3 Measurement Setup (Block Diagram of Configuration)	27
8.4 Measurement Results	28

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9. Power Spectral Density Measurement.....	45
9.1 Provisions Applicable	45
9.2 Measurement Procedure.....	45
9.3 Measurement Setup (Block Diagram of Configuration)	45
9.4 Measurement Result	46
10. Conducted Band Edge and Out-of-Band Emissions.....	60
10.1 Provisions Applicable	60
10.2 Measurement Procedure.....	60
10.3 Measurement Setup (Block Diagram of Configuration)	61
10.4 Measurement Results	62
11. Radiated Spurious Emission	82
11.1 Measurement Limit	82
11.2 Measurement Procedure	83
11.3 Measurement Setup (Block Diagram of Configuration)	85
11.4 Measurement Result	86
12. AC Power Line Conducted Emission Test.....	147
12.1 Measurement limit.....	147
12.2 Block Diagram of Line Conducted Emission Test.....	147
12.3 Preliminary Procedure of Line Conducted Emission Test.....	148
12.4 Final Procedure of Line Conducted Emission Test.....	148
12.5 Test Result of Line Conducted Emission Test.....	149
Appendix I: Photographs of Test Setup.....	151
Appendix II: Photographs of EUT.....	151

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1. General Information

Applicant	Apex Tool Group, LLC
Address	910 Ridgebrook Road, Suite 200 Sparks, Maryland 21152
Manufacturer	Shenzhen Xtooltech intelligent Co., Ltd.
Address	17&18/F,A2 Building, Creative City, Liuxian Avenue, Nanshan District, Shenzhen, China
Factory	Bao'an Branch of Shenzhen Xtooltech Intelligent Co., Ltd.
Address	2,3,4/F, Building 12, Tangtou Third Industrial Zone, Shiyan street, Bao'an District, Shenzhen
Product Designation	Smart Diagnostic System
Brand Name	GEARWRENCH
Test Model	GWSMART10
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Aug. 13, 2025
Date of Test	Aug. 13, 2025 – Jan. 22, 2026
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-5G WLAN-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By		
	Cici Li	Jan. 22, 2026
	(Project Engineer)	
Reviewed By		
	Bibo Zhang	Jan. 22, 2026
	(Reviewer)	
Approved By		
	Angela Li	Jan. 22, 2026
	(Authorized Officer)	

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2. Product Information

2.1 Product Technical Description

Equipment Type	☐ Outdoor access points ☐ Fixed P2P access points	☐ Indoor access points ☒ Client devices
Operation Frequency	☒ U-NII 1:5150MHz~5250MHz ☒ U-NII 2C:5470MHz~5725MHz	☒ U-NII 2A: 5250MHz~5350MHz ☒ U-NII 3: 5725MHz~5850MHz
DFS Design Type	☐ Master ☐ Slave with radar detection ☒ Slave without radar detection	
TPC Function	☐ Yes ☒ No	
Hardware Version	PAD01_PX30_MB_V3.0_20240827	
Software Version	N/A	
Test Frequency Range	For 802.11a/n-HT20: 5180~5240MHz/5260~5320MHz/5500~5700MHz/5745~5825MHz;	
RF Output Power	802.11a:12.90dBm,802.11n(HT20):12.11dBm;	
Modulation	802.11a/n:(64-QAM, 16-QAM, QPSK, BPSK) OFDM	
Data Rate	802.11a:6/9/12/18/24/36/48/54Mbps; 802.11n: up to 72.2Mbps;	
Number of channels	4 channels of U-NII-1 Band;4 channels of U- NII-2A Band 8 channels of U-NII-2C Band;5 channels of U- NII 3 Band	
Antenna Designation	PIFA Antenna	
Antenna Gain	2.18dBi	
Power Supply	DC 7.2V by Battery, DC 12V from Adapter	

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2.2 Table of Carrier Frequency

For 5180~5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

For 5260~5320MHz:

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

For 5500~5700MHz:

11 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

For 5745~5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz	--	--

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2.3 IEEE 802.11n Modulation Scheme

MCS Index	N _{ss}	Modulation	R	N _{BPSC}	N _{CBPS}	N _{DBPS}	Data rate (Mbps)
							800nsGI
					20MHz	20MHz	20MHz
0	1	BPSK	1/2	1	52	26	6.5
1	1	QPSK	1/2	2	104	52	13.0
2	1	QPSK	3/4	2	104	78	19.5
3	1	16-QAM	1/2	4	208	104	26.0
4	1	16-QAM	3/4	4	208	156	39.0
5	1	64-QAM	2/3	6	312	208	52.0
6	1	64-QAM	3/4	6	312	234	58.5
7	1	64-QAM	5/6	6	312	260	65.0

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	Guard interval

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2.4 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: 2BGBLP140 filing to comply with the FCC Part 15 requirements.

2.5 Test Methodology

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2020	American National Standard for Testing Unlicensed Wireless Devices
4	KDB 789033	789033 D02 General U-NII Test Procedures New Rules v02r01

2.6 Special Accessories

Refer to section 4.4.

2.7 Equipment Modifications

Not available for this EUT intended for grant.

2.8 Antenna Requirement

Standard Requirement
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
EUT Antenna: The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna is 2.18dBi.

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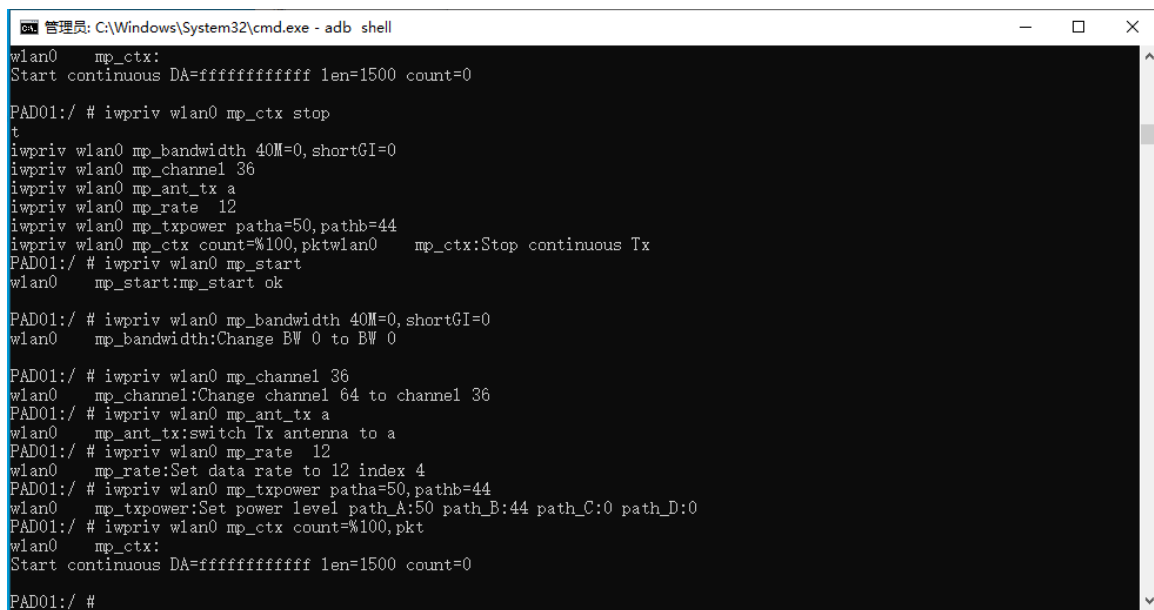
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2.9 Description of Test Software

For IEEE 802.11 mode:

The test utility software used during testing was “cmd.exe”.

Software Setting Diagram



```

管理员: C:\Windows\System32\cmd.exe - adb shell
wlan0 mp_ctx:
Start continuous DA=ffffffff len=1500 count=0

PAD01:/ # iwpriv wlan0 mp_ctx stop
t
iwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
iwpriv wlan0 mp_channel 36
iwpriv wlan0 mp_ant_tx a
iwpriv wlan0 mp_rate 12
iwpriv wlan0 mp_txpower patha=50,pathb=44
iwpriv wlan0 mp_ctx count=%100, pktwlan0 mp_ctx:Stop continuous Tx
PAD01:/ # iwpriv wlan0 mp_start
wlan0 mp_start:mp_start ok

PAD01:/ # iwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
wlan0 mp_bandwidth:Change BW 0 to BW 0

PAD01:/ # iwpriv wlan0 mp_channel 36
wlan0 mp_channel:Change channel 64 to channel 36
PAD01:/ # iwpriv wlan0 mp_ant_tx a
wlan0 mp_ant_tx:switch Tx antenna to a
PAD01:/ # iwpriv wlan0 mp_rate 12
wlan0 mp_rate:Set data rate to 12 index 4
PAD01:/ # iwpriv wlan0 mp_txpower patha=50,pathb=44
wlan0 mp_txpower:Set power level path_A:50 path_B:44 path_C:0 path_D:0
PAD01:/ # iwpriv wlan0 mp_ctx count=%100, pkt
wlan0 mp_ctx:
Start continuous DA=ffffffff len=1500 count=0
PAD01:/ #
  
```

Test Mode- U-NII 1	Channel	Power Index
802.11a	L/M/H	52
802.11n(HT20)	L/M/H	50
Test Mode- U-NII 2A	Channel	Power Index
802.11a	L/M/H	44
802.11n(HT20)	L/M/H	43
Test Mode- U-NII 2C	Channel	Power Index
802.11a	L/M/H	47
802.11n(HT20)	L/M/H	46
Test Mode- U-NII 3	Channel	Power Index
802.11a	L/M/H	50
802.11n(HT20)	L/M/H	49

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3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories.)

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

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3.3 Environmental Conditions

	Normal Conditions
Temperature range (°C)	15 - 35
Relative humidity range	20% - 75%
Pressure range (kPa)	86 - 106
Power supply	DC 7.2V by Battery

3.4 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of spurious emissions, conducted	$U_c = \pm 2 \%$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2.7 \%$
Uncertainty of Duty Cycle	$U_c = \pm 2 \%$

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3.5 List of Equipment Used

● RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2025-05-08	2026-05-07
☒	AGC-ER-E087	Spectrum Analyzer	KEYSIGHT	N9020B	MY56101792	2025-05-08	2026-05-07
☒	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2025-01-14	2026-01-13
☒	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2026-01-13	2027-01-12
☒	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2025-01-14	2026-01-13
☒	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2026-01-13	2027-01-12
☒	AGC-ER-A008	6dB Fixed Attenuator	Mini circuits	BW-K6-2W44+	N/A	2025-01-30	2026-01-29
☒	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2025-01-14	2026-01-13
☒	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2026-01-13	2027-01-12
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-03-05	2026-03-04
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2024-03-05	2026-03-04
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2025-03-27	2026-03-26
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-09-24	2025-09-23
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2025-09-05	2027-09-04
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2024-07-24	2026-07-23
☒	AGC-EM-A118	5G Filter	SongYi	N/A	N/A	2025-05-16	2026-05-15
☒	AGC-EM-A138	6dB Attenuator	EeatSheep	LM-XX-6-5W	N/A	2025-05-16	2027-05-15
☐	AGC-EM-A139	6dB Attenuator	EeatSheep	LM-XX-6-5W	N/A	2025-05-16	2027-05-15

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● AC Power Line Conducted Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2025-05-08	2026-05-07
☒	AGC-EM-A171	Attenuator	Mini-Circuits	UNAT-10A+	N/A	2024-02-01	2026-01-31
☒	AGC-EM-A171	Attenuator	Mini-Circuits	UNAT-10A+	N/A	2026-01-13	2028-01-12
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2025-05-08	2026-05-07

● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71
☒	AGC-EM-S003	RE Test System	FARA	EZ-EMC	VRA-03A
☐	AGC-EM-S004	RE Test System	Tonscend	TS+Ver2.1(JS32-RE)	4.0.0.0
☒	AGC-ER-S012	BT/WIFI Test System	Tonscend	JS1120-2	2.6
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0

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4. System Test Configuration

4.1 EUT Configuration

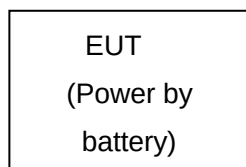
The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT Exercise

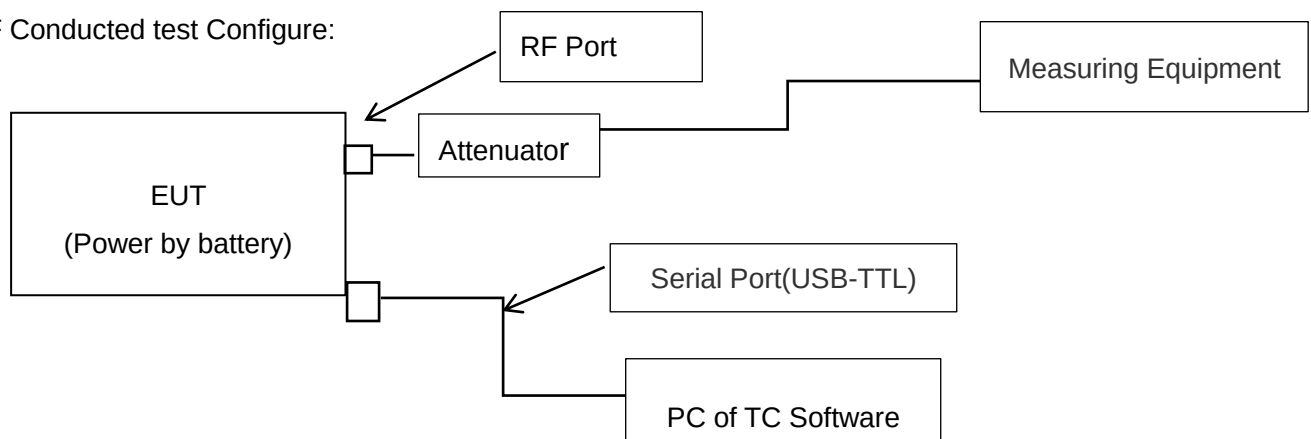
The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of Tested System

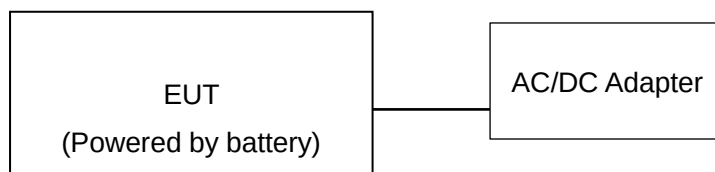
Radiated Emission Configure:



RF Conducted test Configure:



AC Power Line Conducted Emission Configure:



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4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Redmi Notebook PC	Redmi	XMA2002-AB	--	--
2	Control Box	RISYM	USB-TTL	--	--

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Adapter	Shenzhen ABP Technology Co. Ltd	PD0202C	Input: 100-240V~, 50-60Hz, 0.5A Max Output: 5.0Vdc, 3.0A or 9.0Vdc, 2.22A or 12.0Vdc, 1.67A 20.04W Max.	--

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4.5 Summary of Test Results

Item	FCC Rules	Description Of Test	Result
1	§15.203	Antenna Equipment	Pass
2	§15.407(a/1/2/3)	RF Output Power	Pass
3	§15.407(e)	6dB Bandwidth Measurement	Pass
4	§15.403(a)	26dB bandwidth Measurement	Pass
5	§15.407(a/1/2/3)	Power Spectral Density	Pass
6	§15.407(b)(1/2/3/4)	Conducted Spurious Emission	Pass
7	§15.209, §15.407(b)(1/2/3/4)	Radiated Emission & Band Edge	Pass
8	§15.207	AC Power Line Conducted Emission	Pass

Note:

1. Refer to the manufacturer's declaration in the user manual.
2. The device operates without the transmission of information.

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5. Description of Test Modes

EUT Configure Mode	Applicable To				Description
	RE > 1G	RE < 1G	PLC	APCM	
A	☒	☒	☒	☒	Powered by Adapter with WIFI(5G) Link
B	☒	☒	--	☒	Powered by Battery with WIFI(5G) Link
C	--	--	--	--	Powered by USB with WIFI(5G) Link

Where, **RE > 1G: Radiated Emission above 1GHz** **PLC: Power Line Conducted Emission**

RE < 1G: Radiated Emission below 1GHz **APCM: Antenna Port Conducted Measurement**

NOTE 1: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.

NOTE 2: "--" means no effect.

● Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (IF EUT with antenna diversity architecture).
- ☐ Support 802.11ax, device debugging is tested in Full RU state
- ☐ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
B	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
B	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
B	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
B	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0

● Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).
- ☐ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
B	802.11a	5180-5240	36 to 48	48	OFDM	6.0

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● **Power Line Conducted Emission Test:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).
- ☐ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	48	OFDM	6.0

● **Band edge Measurement:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).
- ☐ Support 802.11ax, device debugging is tested in Full RU state
- ☐ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
B	802.11a	5180-5240	36 to 48	36	OFDM	6.0
B	802.11a	5260-5320	52 to 64	64	OFDM	6.0
B	802.11a	5500-5700	100 to 140	100	OFDM	6.0
B	802.11a	5745-5825	149 to 165	149, 165	OFDM	MCS0

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● **Antenna Port Conducted Measurement:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).
- ☐ Support 802.11ax, device debugging is tested in Full RU state
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
A	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	MCS0
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
A	802.11n (20MHz)		52 to 64	52, 60, 64	OFDM	MCS0
A	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
A	802.11n (20MHz)		100 to 140	100, 116, 140	OFDM	MCS0
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
A	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	MCS0

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6. Duty Cycle Measurement

5GHz WLAN (NII) operation is possible in 20MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = Average. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)
Band U-NII1:5150MHz-5250MHz			
802.11a	6	96.23	0.17
802.11n_HT20	MCS0	92.57	0.34
Band U-NII 2A:5250MHz-5350MHz			
802.11a	6	95.38	0.21
802.11n_HT20	MCS0	95.76	0.19
Band U-NII 2C:5470MHz-5725MHz			
802.11a	6	93.69	0.28
802.11n_HT20	MCS0	92.89	0.32
Band U-NII 3:5725MHz-5850MHz			
802.11a	6	95.73	0.19
802.11n_HT20	MCS0	95.43	0.20

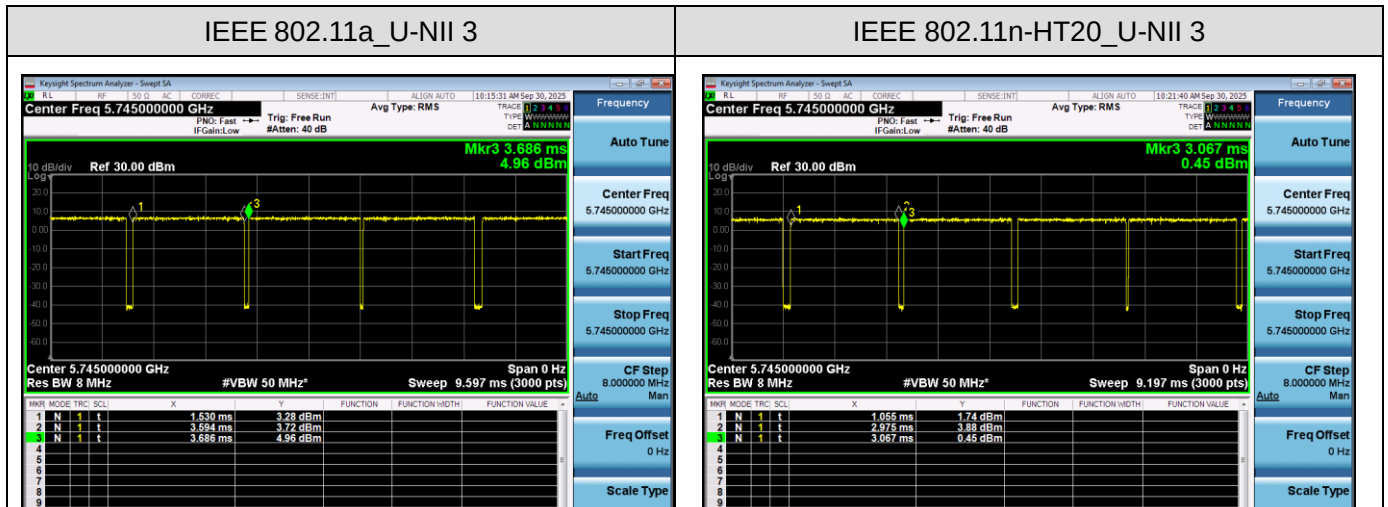
Remark:

1. Duty Cycle factor = $10 * \log (1/ \text{Duty cycle})$
2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.
3. Involving the test items of duty cycle compensation coefficient, the final results have been added and calculated by the software and presented.

The test plots as follows:



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7. RF Output Power Measurement

7.1 Provisions Applicable

Operation Band	EUT Category		LIMIT
U-NII-1	☐	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p < 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
	☐	Fixed point-to-point Access Point	1 Watt (30 dBm)
	☐	Indoor Access Point	1 Watt (30 dBm)
	☒	Client devices	250mW (23.98 dBm)
U-NII-2A	/		250mW (23.98 dBm) or 11 dBm+10 log B*
U-NII-2C	/		250mW (23.98 dBm) or 11 dBm+10 log B*
U-NII-3	/		1 Watt (30 dBm)

Note: Where B is the 26dB emission bandwidth in MHz.

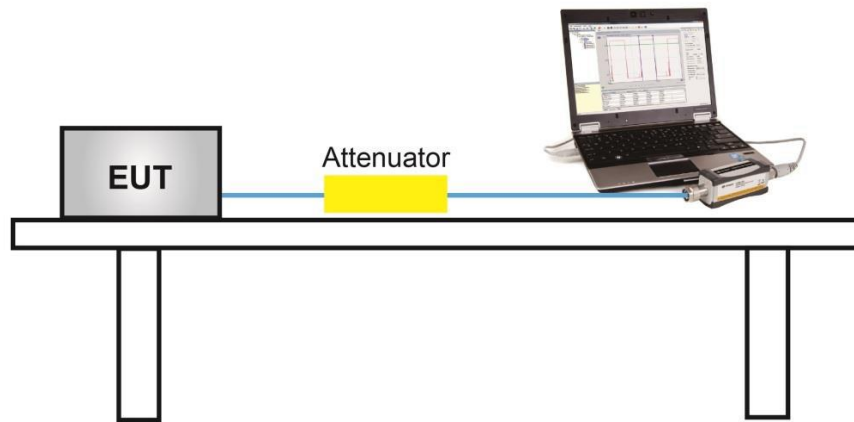
7.2 Measurement Procedure

☒ Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

1. The testing follows the ANSI C63.10 Section 12.3.3.1
2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:
3. The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
4. At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
5. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
6. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
7. Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
8. Adjust the measurement in dBm by adding $[10 \log (1 / D)]$, where D is the duty cycle {e.g., $[10 \log (1 / 0.25)]$, if the duty cycle is 25%}.
9. The final test results have been increased by the duty cycle factor and recorded in the report.

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7.3 Measurement Setup (Block Diagram of Configuration)



7.4 Measurement Result

Test Data of Conducted Output Power for band 5.15-5.25 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5180	12.35	22.18	Pass
	5200	12.45	22.20	Pass
	5240	12.90	22.19	Pass
802.11n20	5180	11.49	22.47	Pass
	5200	11.79	22.47	Pass
	5240	12.11	22.46	Pass

Test Data of Conducted Output Power for band 5.25-5.35 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5260	9.73	23.19	Pass
	5300	9.82	23.20	Pass
	5320	9.97	23.18	Pass
802.11n20	5260	9.09	23.48	Pass
	5300	9.23	23.47	Pass
	5320	9.27	23.47	Pass

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Test Data of Conducted Output Power for band 5.470-5.725 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5500	10.65	23.21	Pass
	5600	9.48	23.23	Pass
	5700	8.92	23.21	Pass
802.11n20	5500	10.20	23.47	Pass
	5600	9.12	23.46	Pass
	5700	8.63	23.48	Pass

Test Data of Conducted Output Power for band 5.725-5.850 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5745	9.76	30	Pass
	5785	10.56	30	Pass
	5825	10.35	30	Pass
802.11n20	5745	9.10	30	Pass
	5785	9.84	30	Pass
	5825	9.92	30	Pass

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8. 6dB&26dB Bandwidth Measurement

8.1 Provisions Applicable

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

8.2 Measurement Procedure

◆ -6dB bandwidth (DTS bandwidth) Test setting:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 100kHz.
4. Set the VBW $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold.
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

◆ 99% occupied bandwidth test setting:

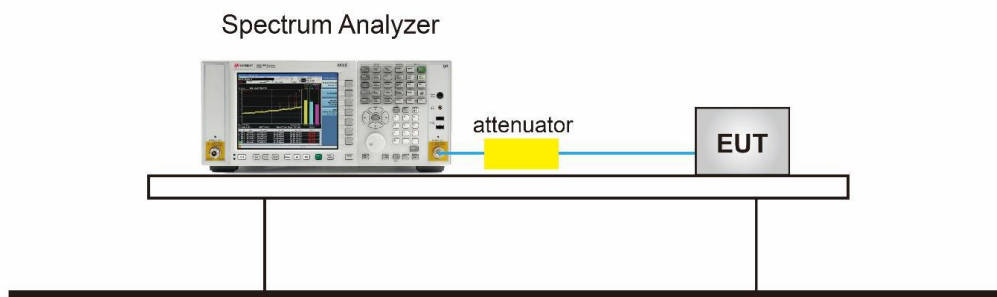
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

◆ -26dB Bandwidth test setting:

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

8.3 Measurement Setup (Block Diagram of Configuration)



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8.4 Measurement Results

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5180	16.518	19.549	N/A	Pass
	5200	16.577	20.666	N/A	Pass
	5240	16.568	20.556	N/A	Pass
802.11n20	5180	17.654	20.563	N/A	Pass
	5200	17.645	21.069	N/A	Pass
	5240	17.632	21.017	N/A	Pass

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.25-5.35 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5260	16.565	20.584	N/A	Pass
	5300	16.590	20.666	N/A	Pass
	5320	16.530	20.088	N/A	Pass
802.11n20	5260	17.687	21.215	N/A	Pass
	5300	17.660	21.025	N/A	Pass
	5320	17.673	21.353	N/A	Pass

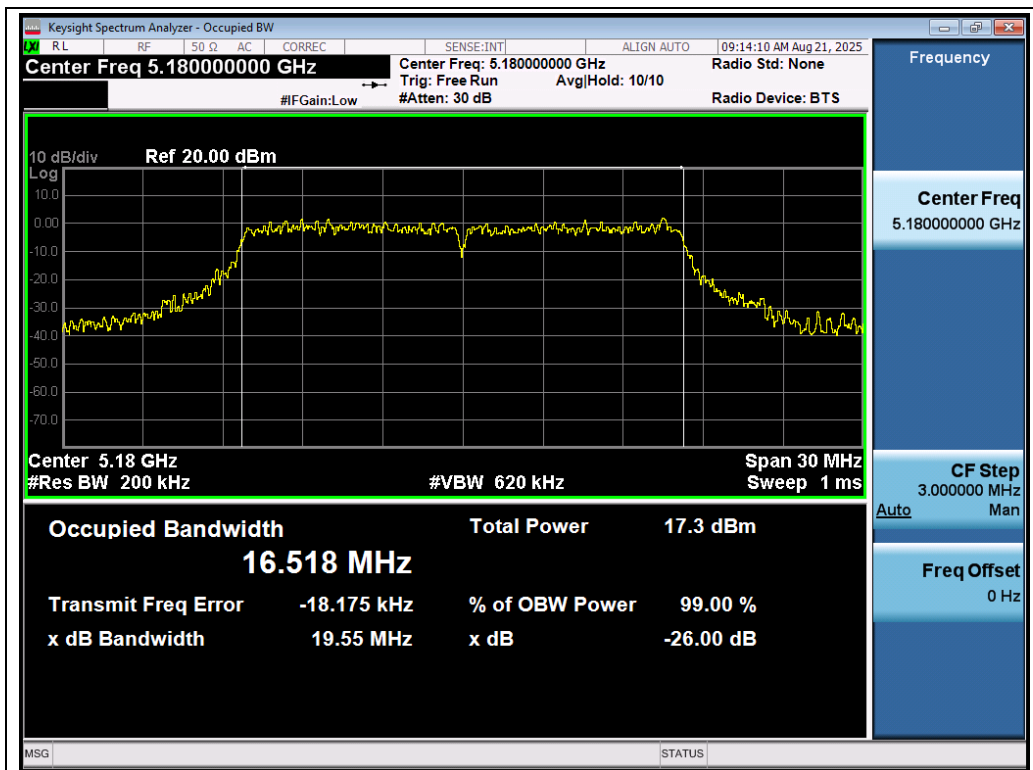
Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.47-5.725 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5500	16.626	20.993	N/A	Pass
	5600	16.725	20.369	N/A	Pass
	5700	16.653	21.336	N/A	Pass
802.11n20	5500	17.673	21.128	N/A	Pass
	5600	17.626	20.575	N/A	Pass
	5700	17.700	21.639	N/A	Pass

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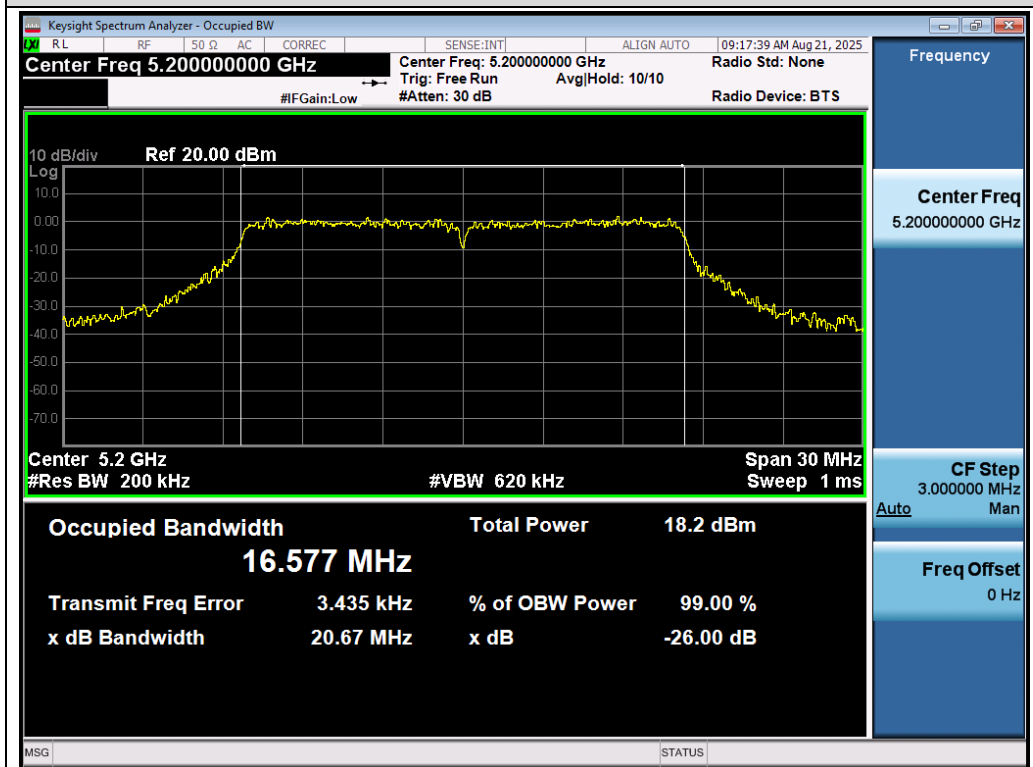
Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.725-5.85 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5745	16.599	16.353	0.5	Pass
	5785	16.631	16.378	0.5	Pass
	5825	16.611	16.352	0.5	Pass
802.11n20	5745	17.706	17.582	0.5	Pass
	5785	17.656	17.319	0.5	Pass
	5825	17.662	17.080	0.5	Pass

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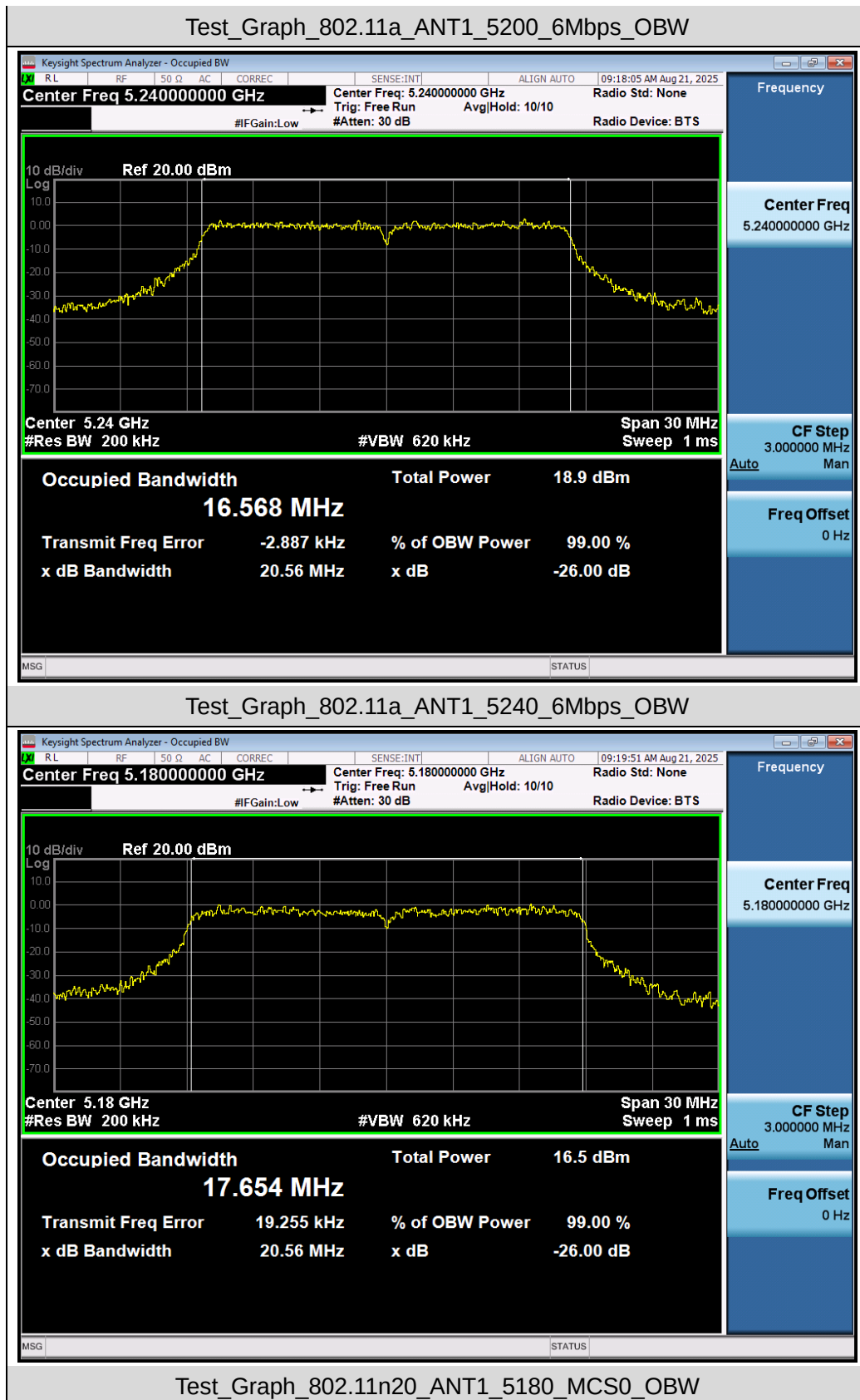
Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz



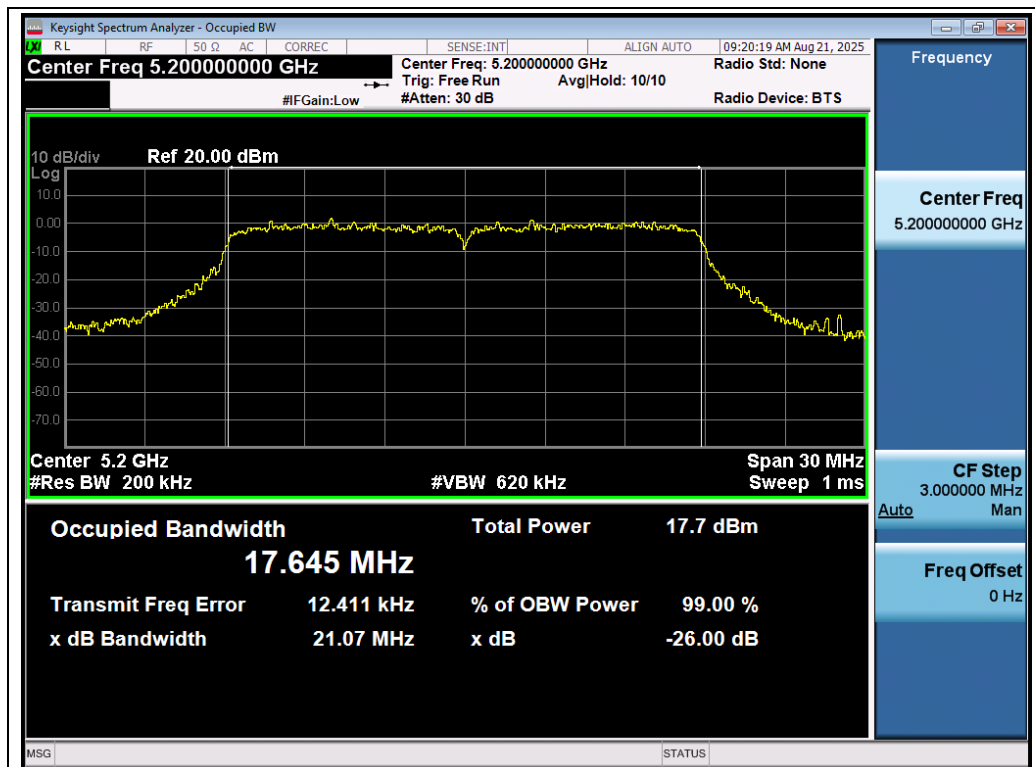
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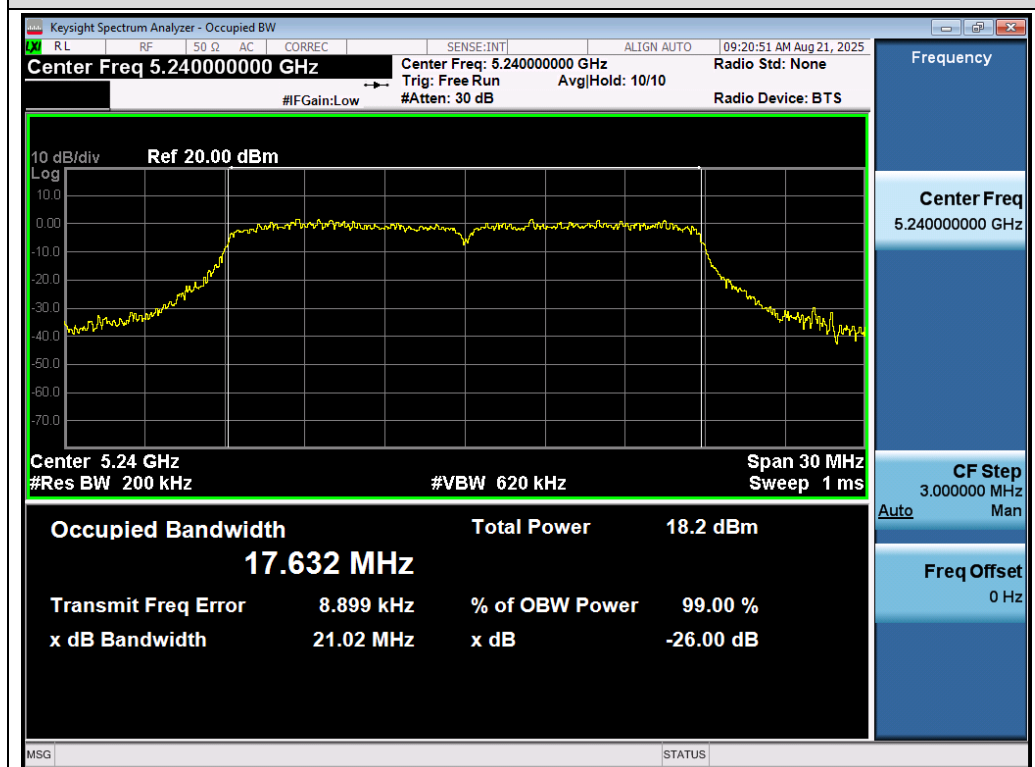
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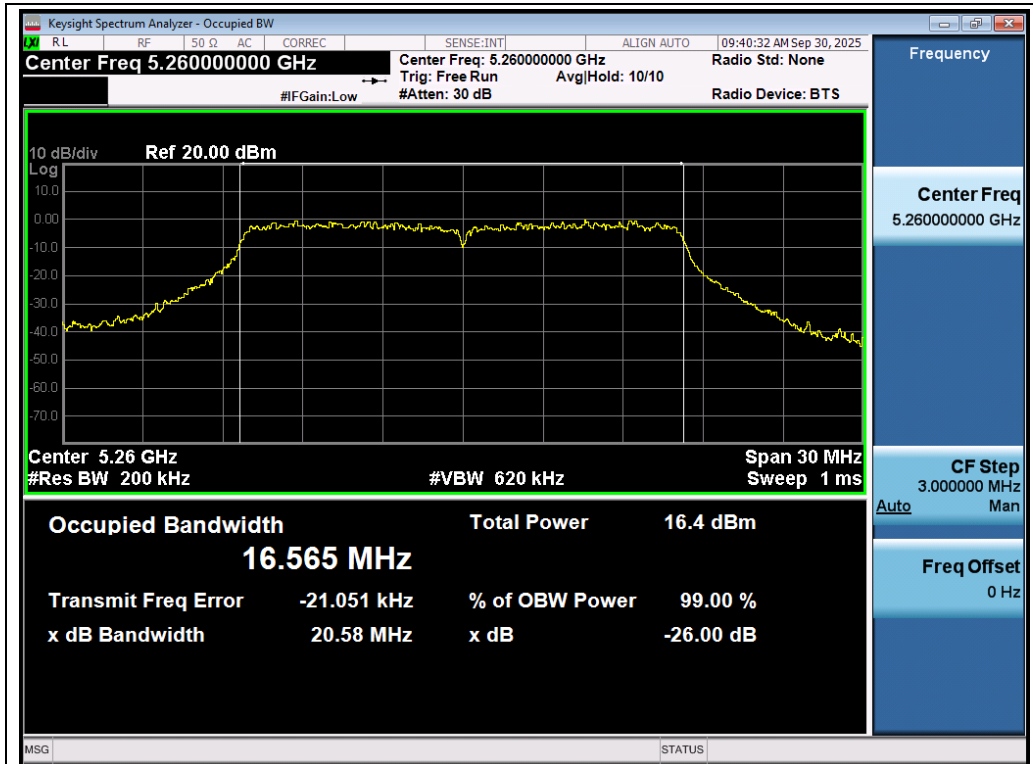
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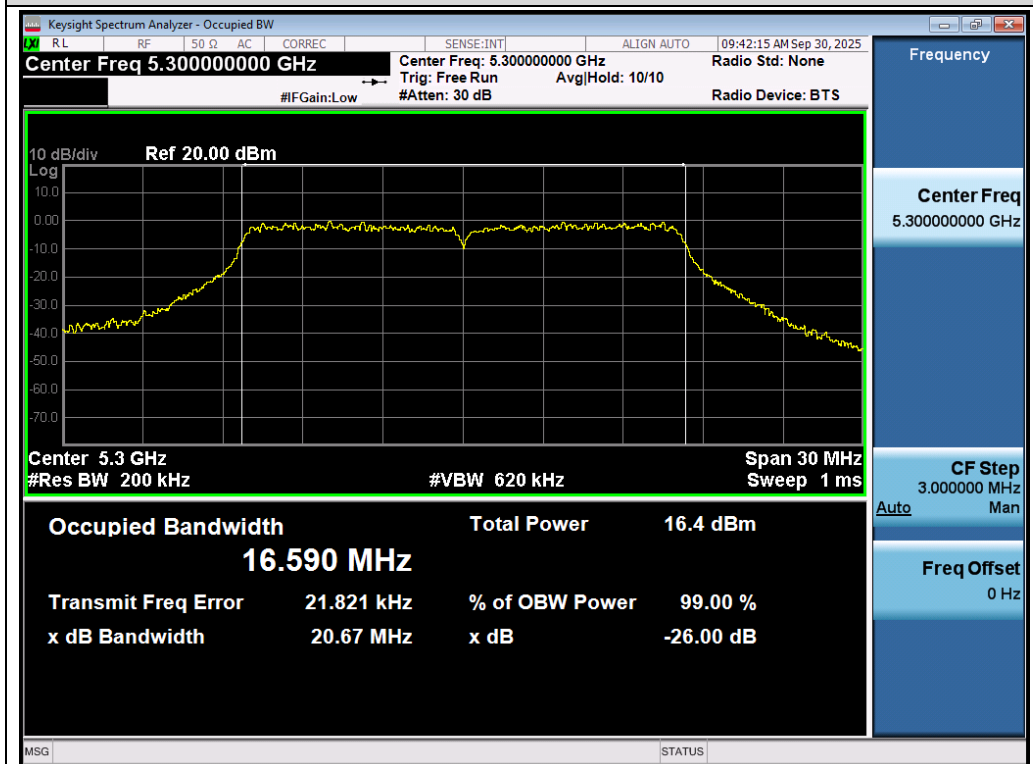
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Test Graphs of Occupied Bandwidth for band 5.25-5.35 GHz

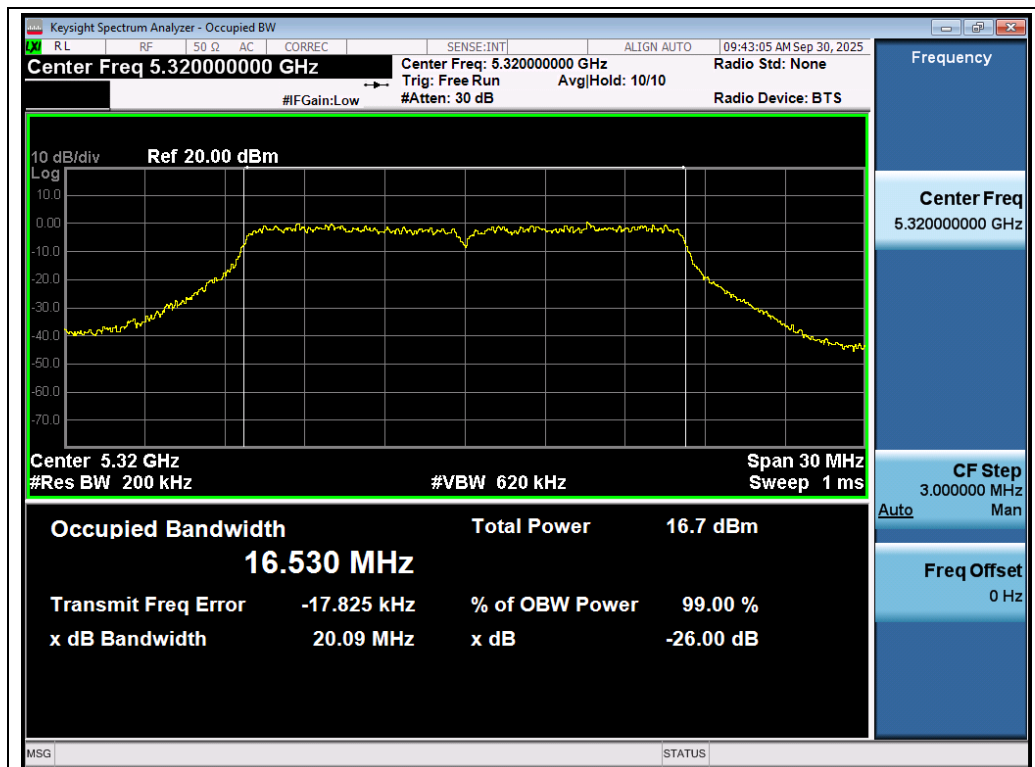


Test_Graph_802.11a_ANT1_5260_6Mbps_OBW

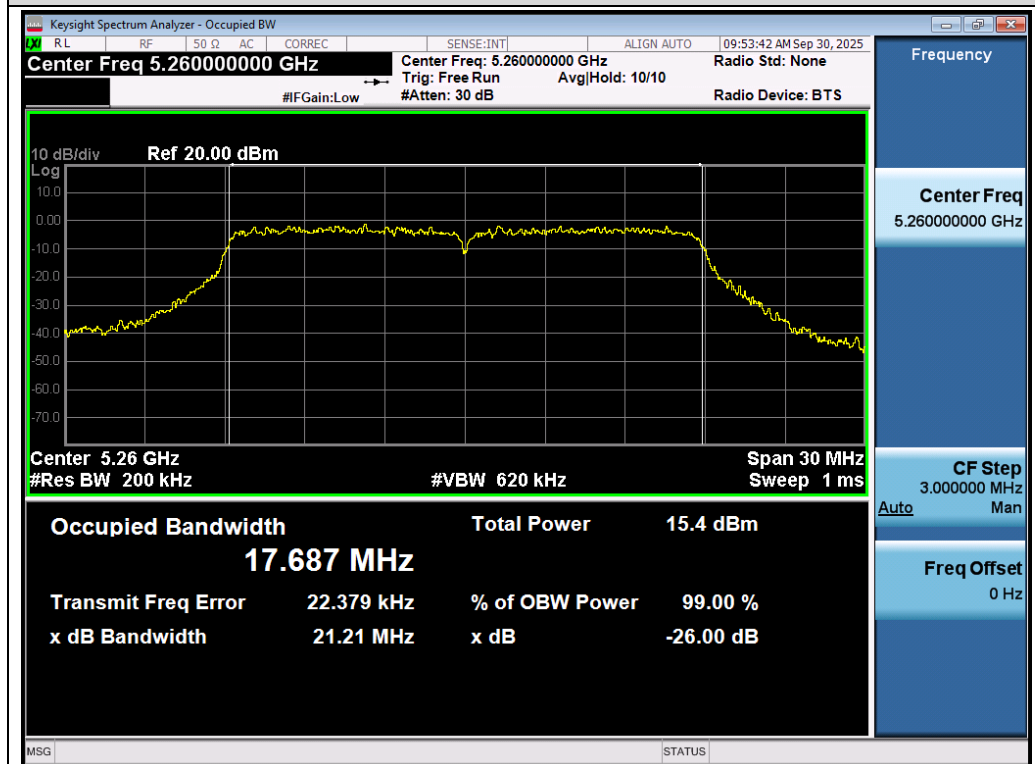


Test_Graph_802.11a_ANT1_5300_6Mbps_OBW

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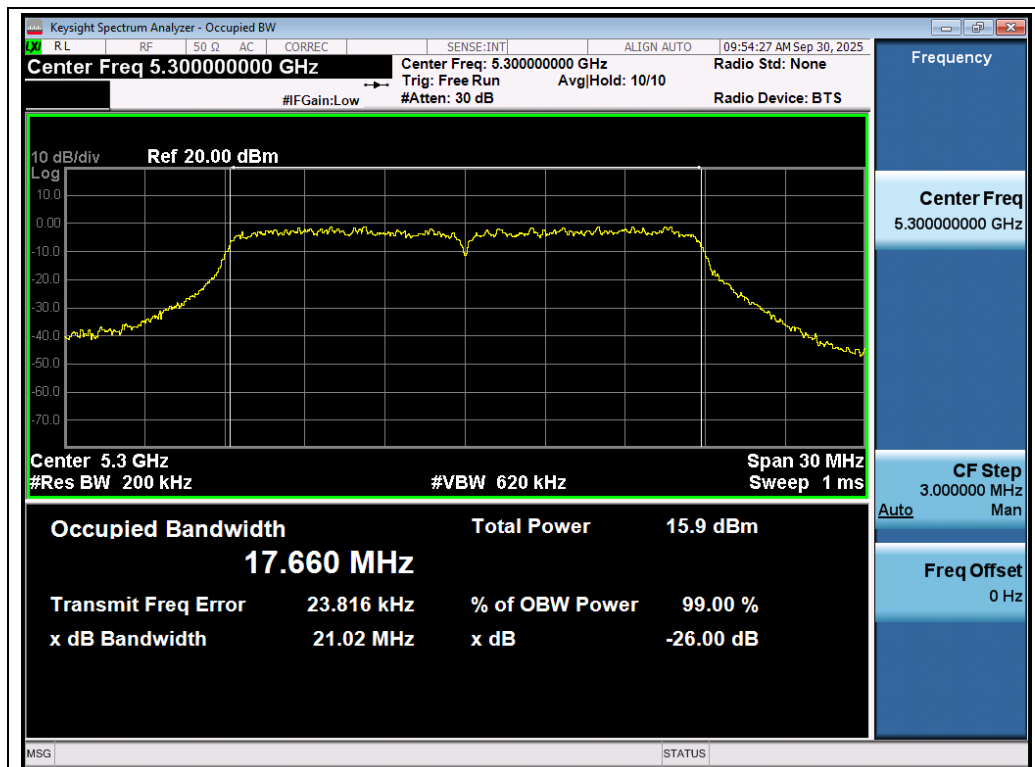


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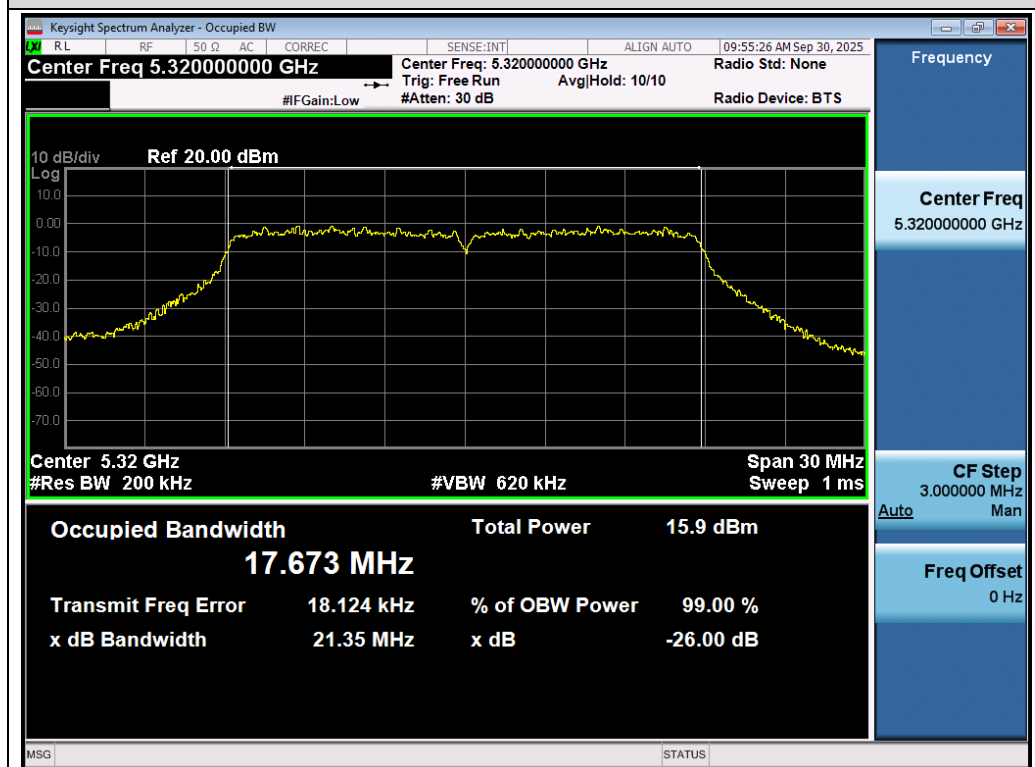


Test_Graph_802.11n20_ANT1_5260_MCS0_OBW

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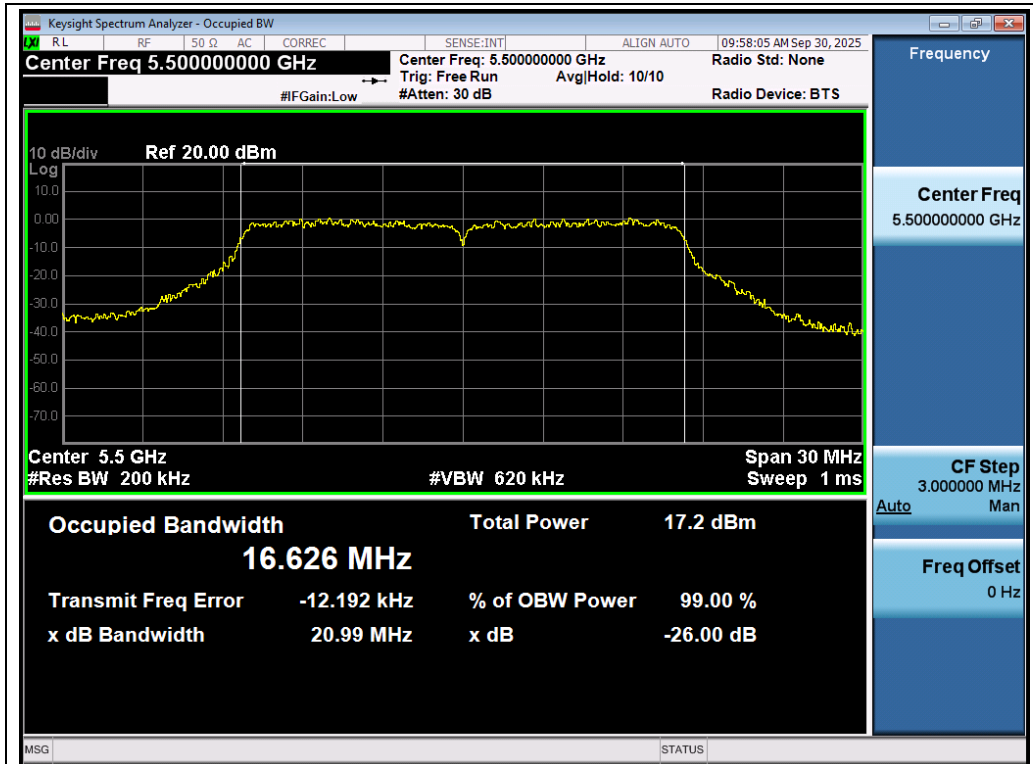
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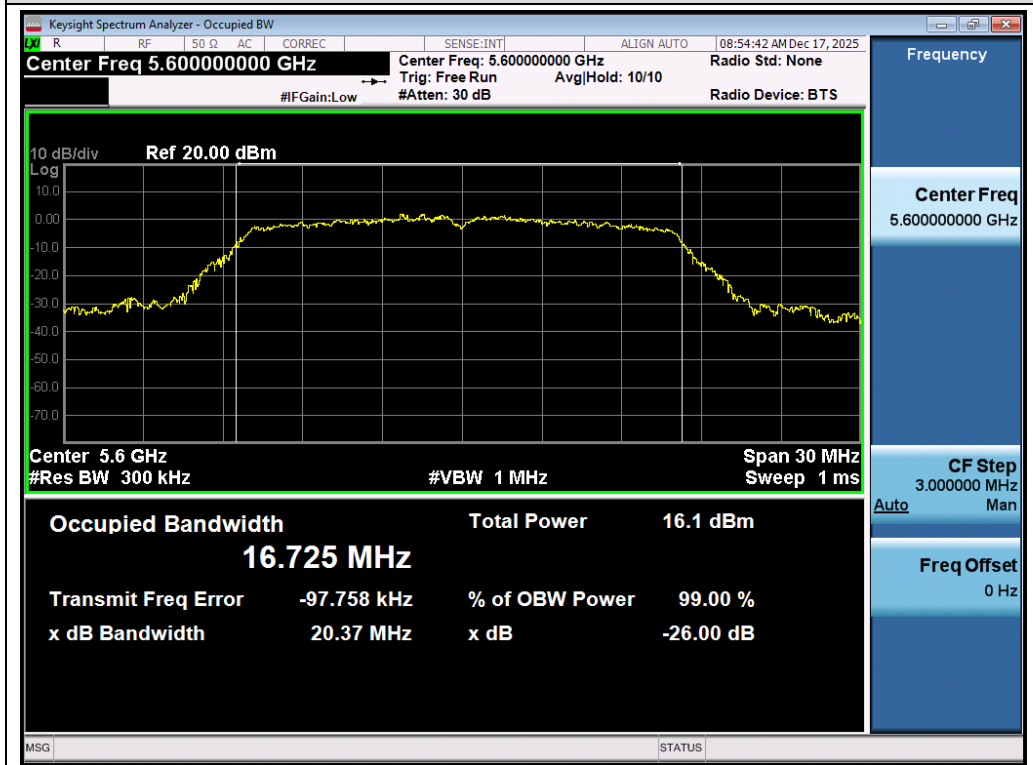
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Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.470-5.725 GHz

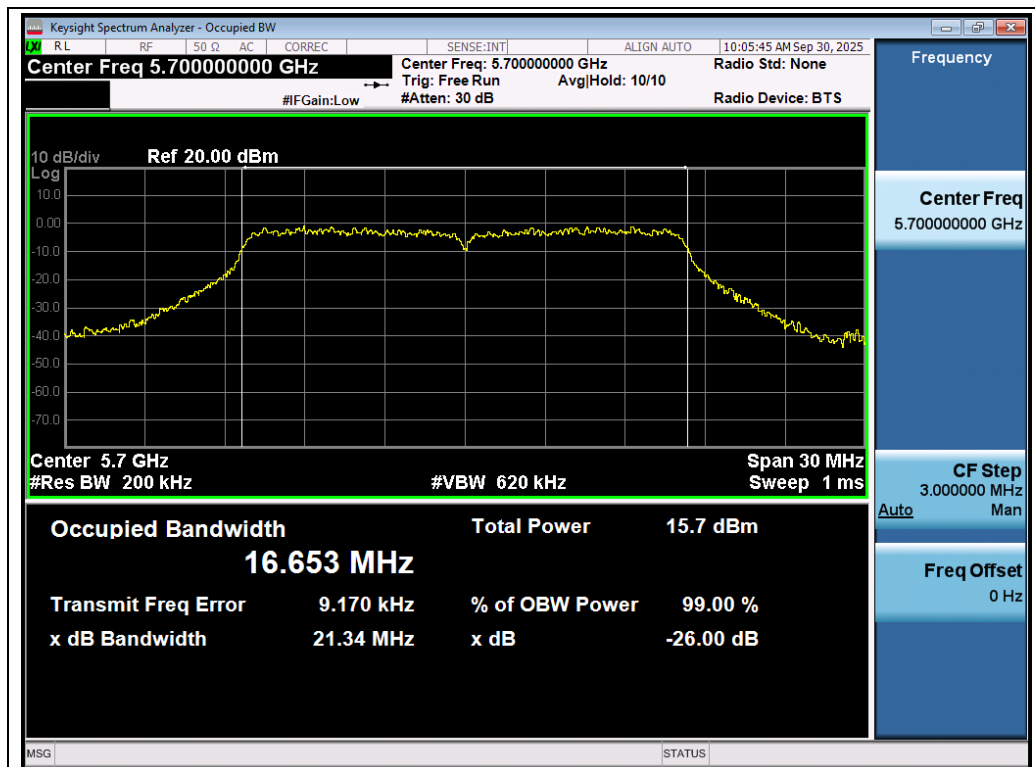


Test_Graph_802.11a_ANT1_5500_6Mbps_OBW

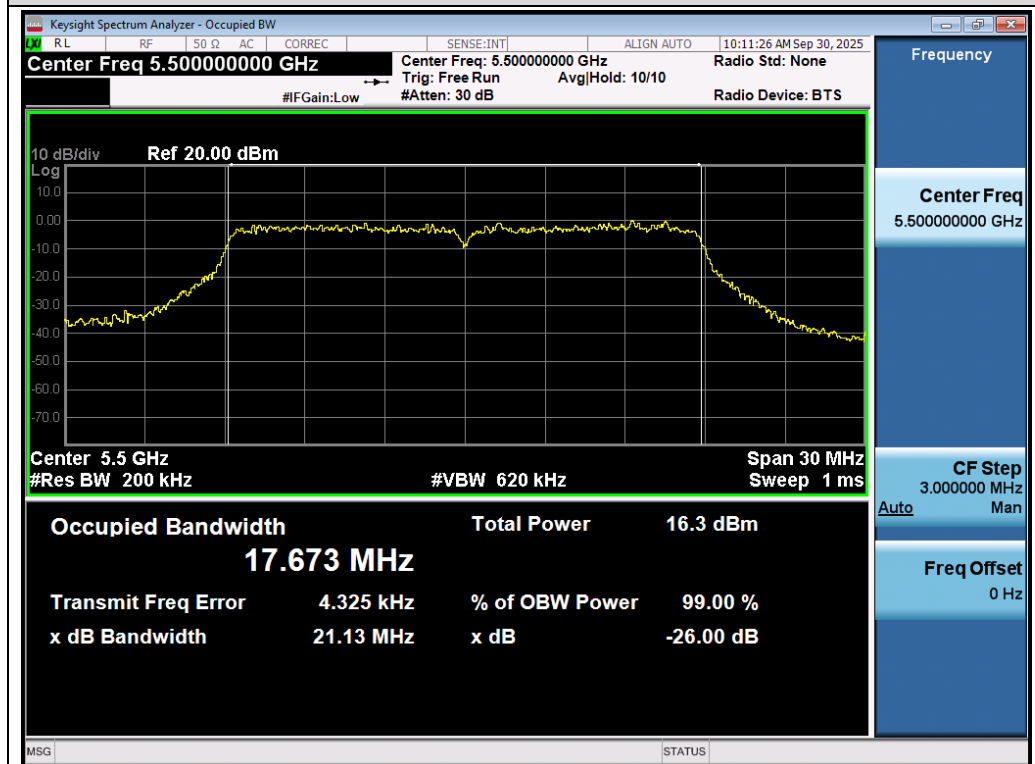


Test_Graph_802.11a_ANT1_5600_6Mbps_OBW

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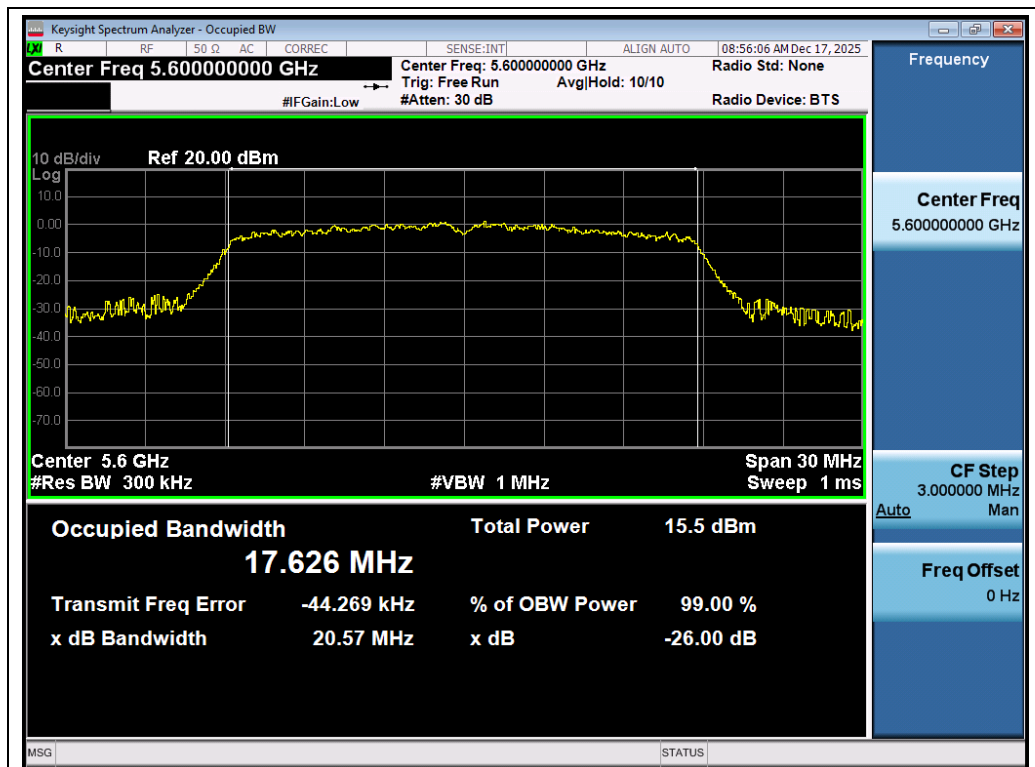


Test_Graph_802.11a_ANT1_5700_6Mbps_OBW

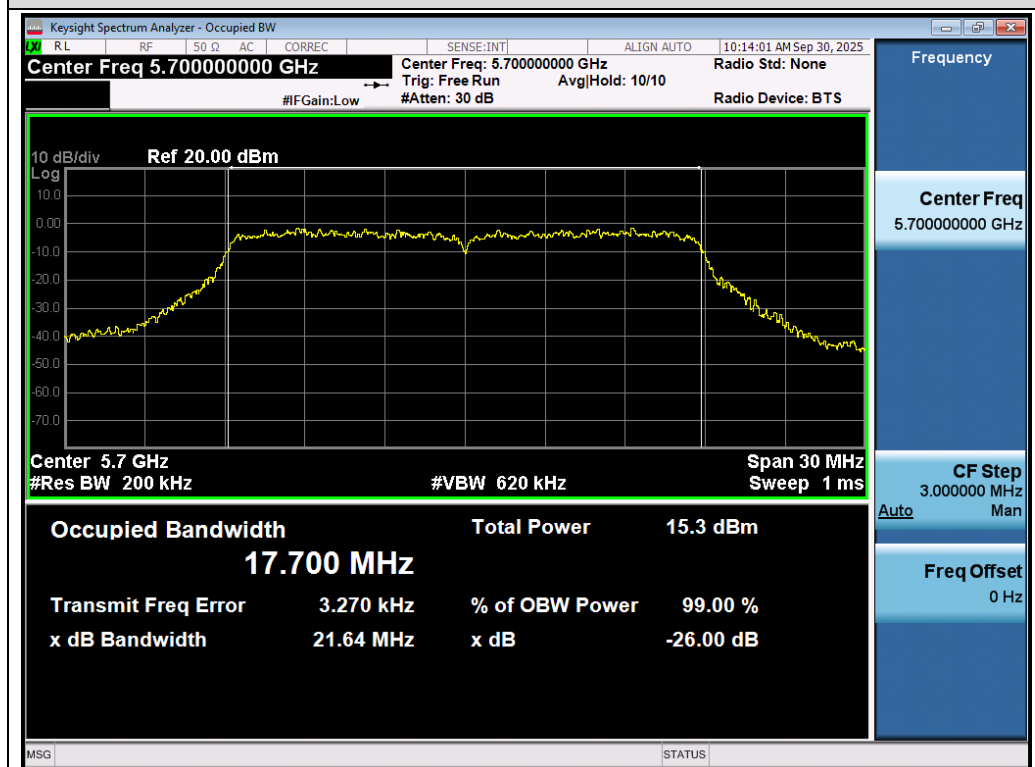


Test_Graph_802.11n20_ANT1_5500_MCS0_OBW

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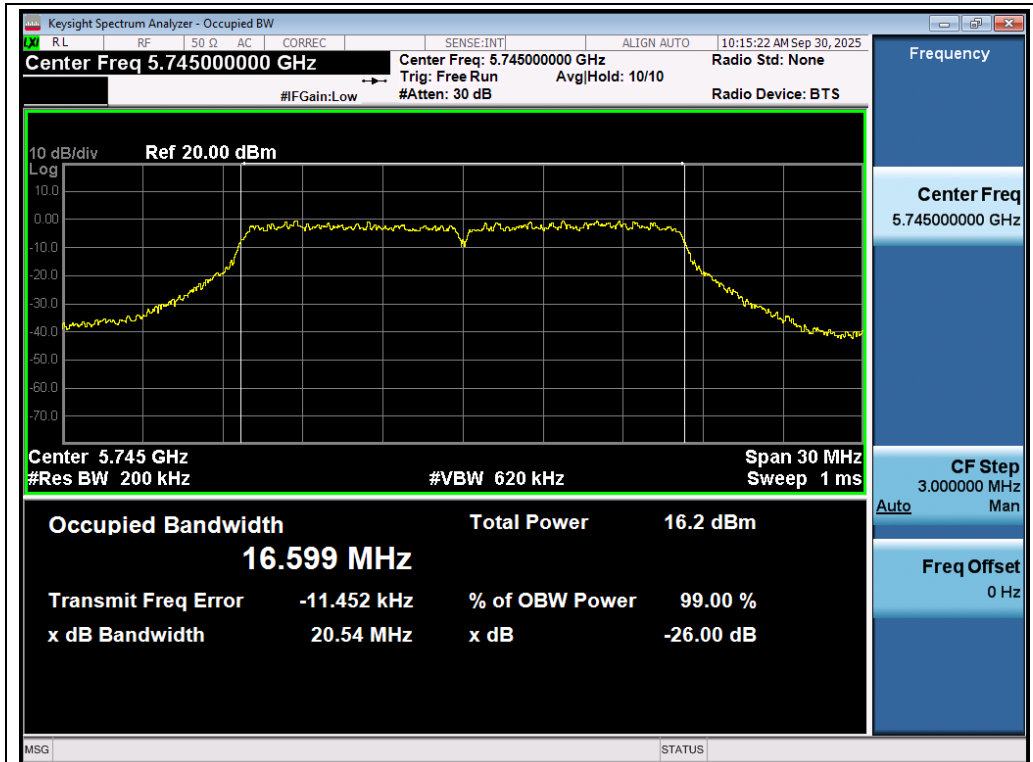
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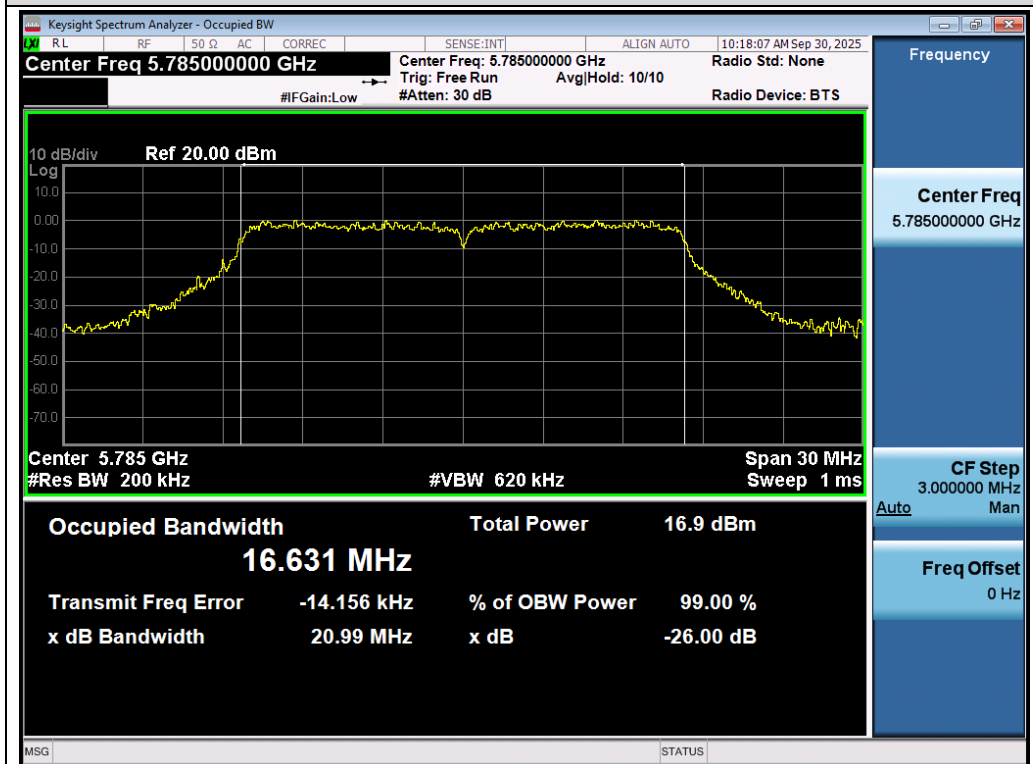
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Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.745-5.825 GHz

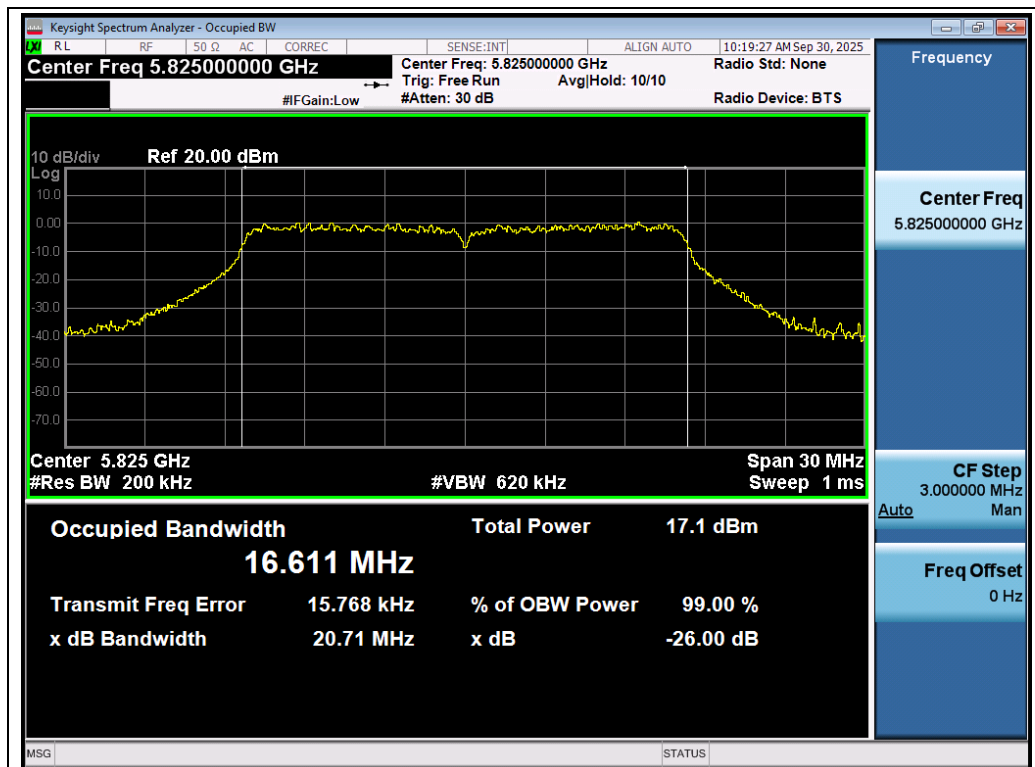


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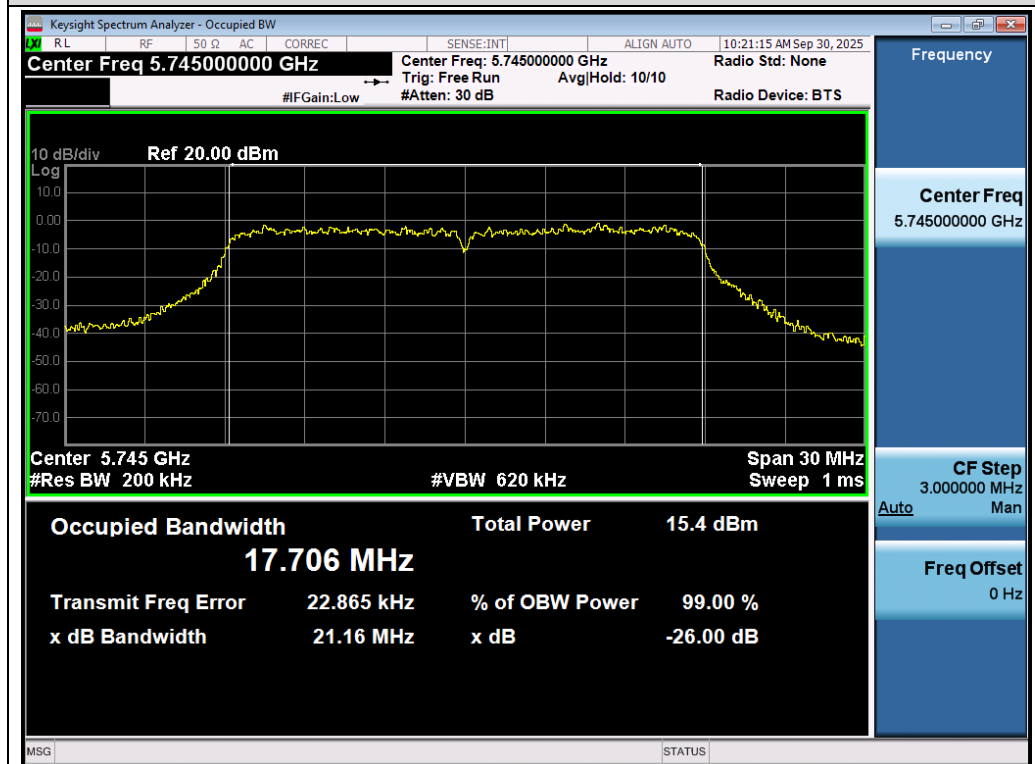


Test_Graph_802.11a_ANT1_5785_6Mbps_OBW

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

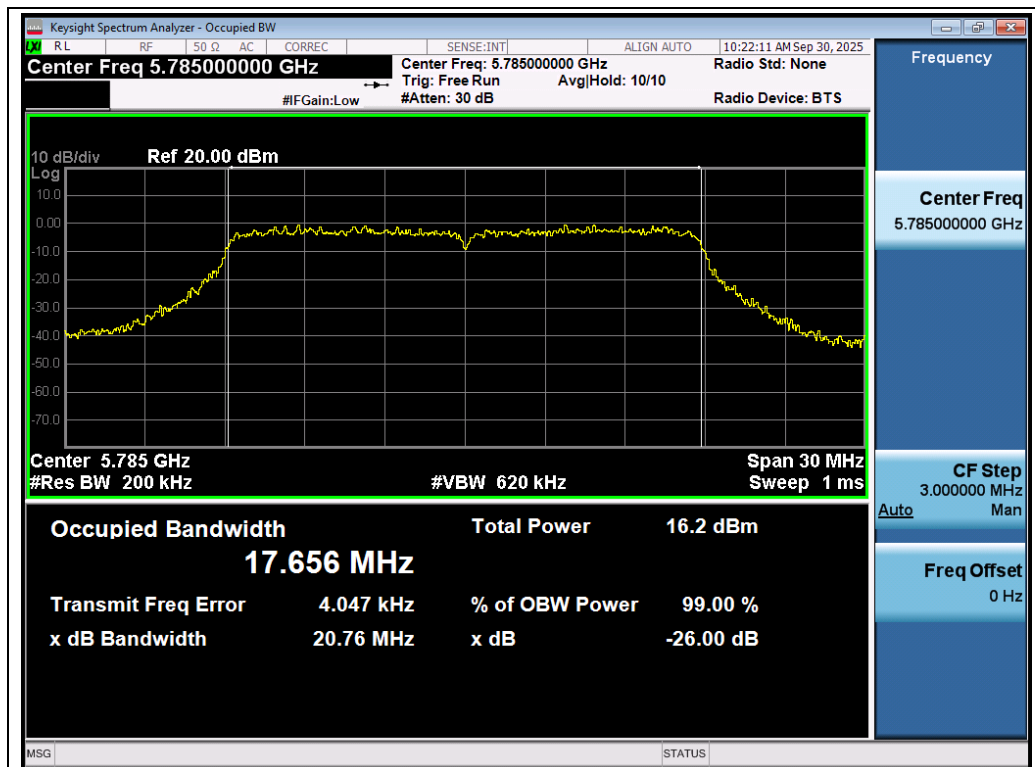


Test_Graph_802.11a_ANT1_5825_6Mbps_OBW

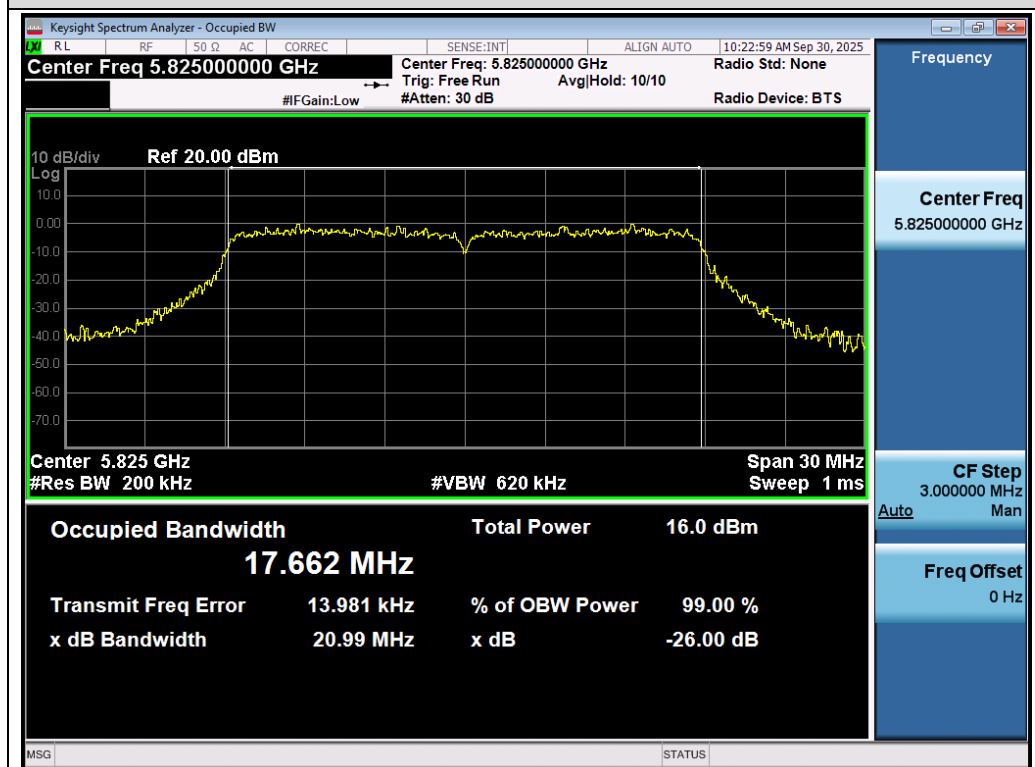


Test_Graph_802.11n20_ANT1_5745_MCS0_OBW

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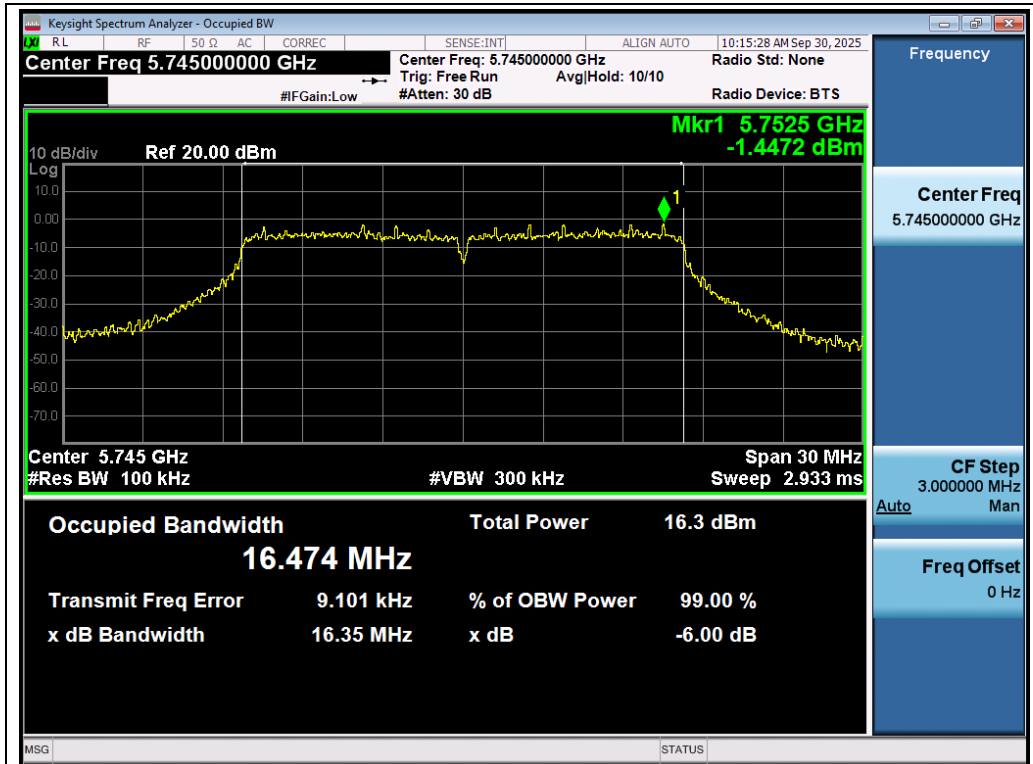
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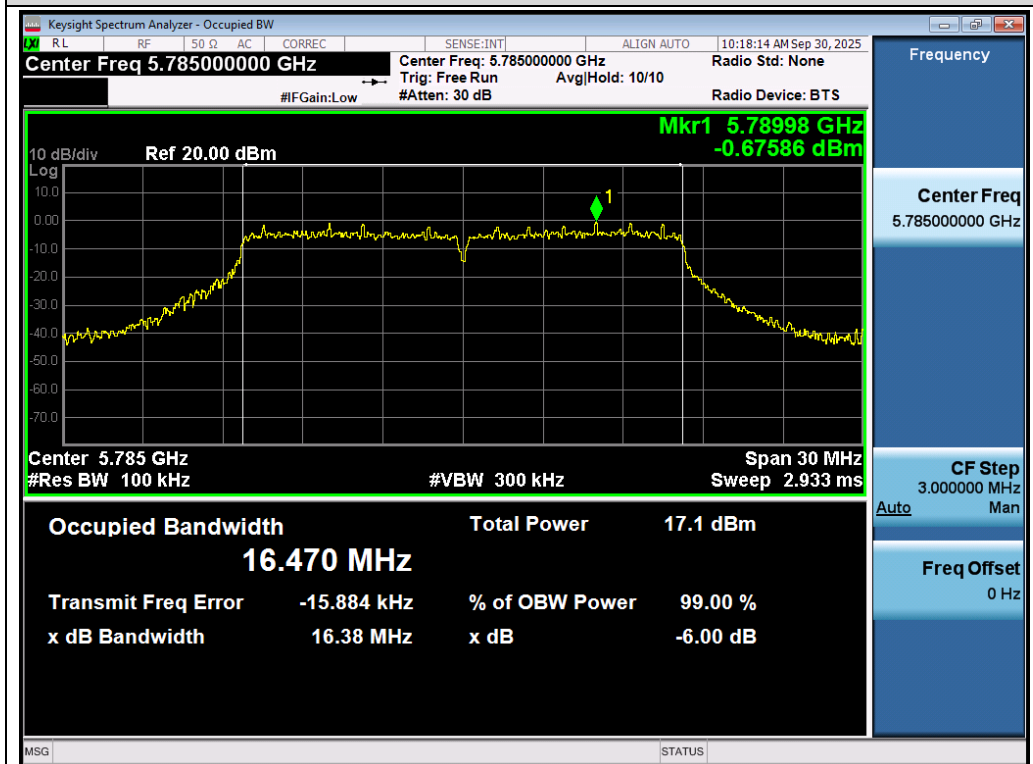
Test_Graph_802.11n20_ANT1_5825_MCS0_OBW

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Test Graphs of DTS Bandwidth for band 5.725-5.85 GHz



Test_Graph_802.11a_ANT1_5745_6Mbps_DTSPW

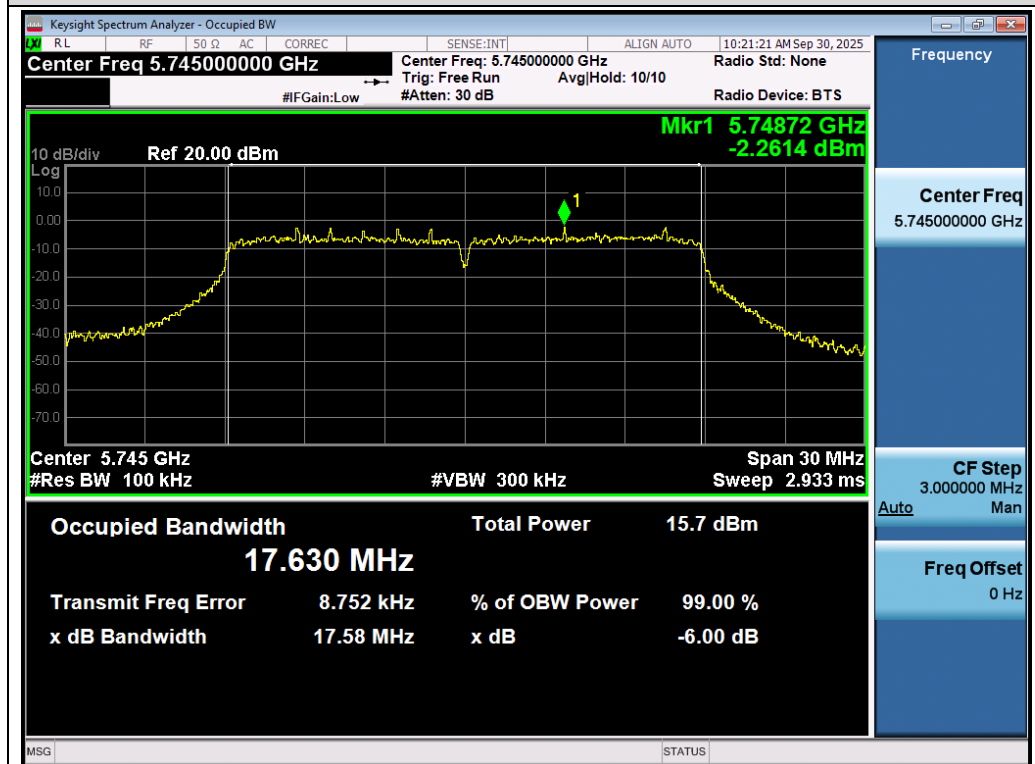


Test_Graph_802.11a_ANT1_5785_6Mbps_DTSPW

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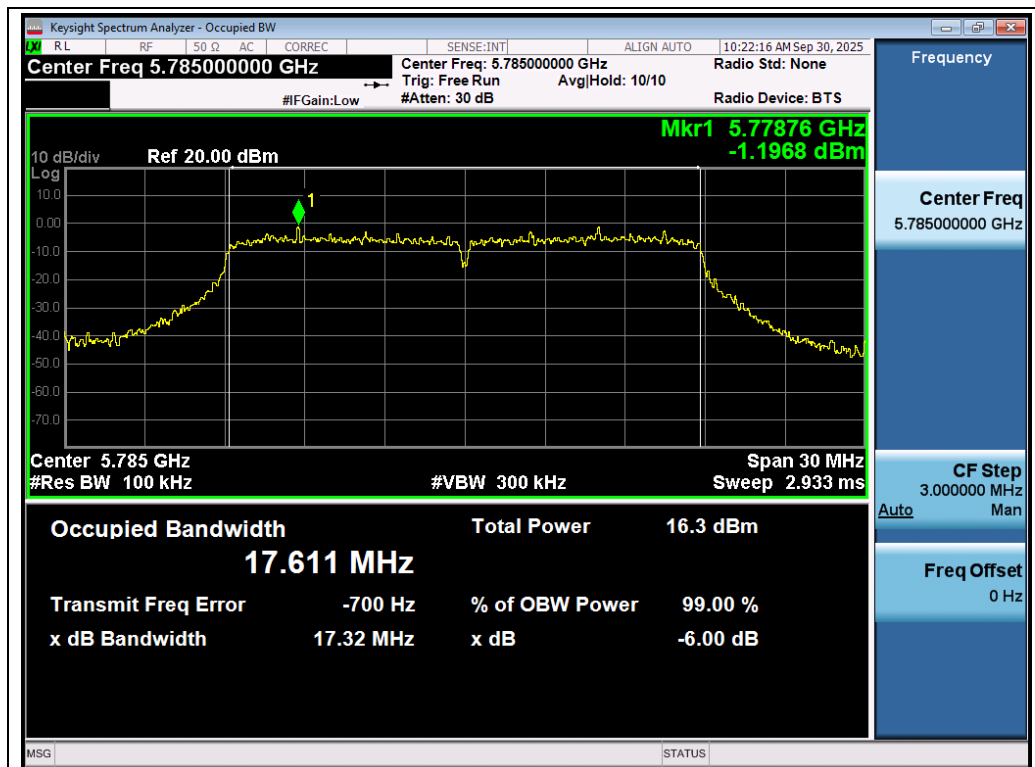


Test_Graph_802.11a_ANT1_5825_6Mbps_DTSBW



Test_Graph_802.11n20_ANT1_5745_MCS0_DTSBW

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Test_Graph_802.11n20_ANT1_5785_MCS0_DTSBW



Test_Graph_802.11n20_ANT1_5825_MCS0_DTSBW

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9. Power Spectral Density Measurement

9.1 Provisions Applicable

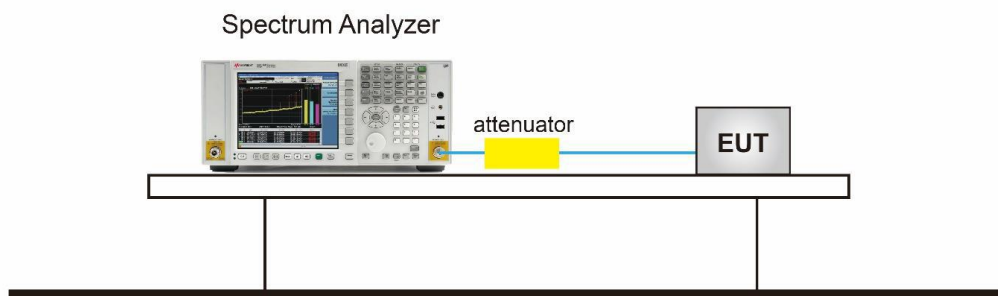
Operation Band	EUT Category		LIMIT
U-NII-1	☐	Outdoor Access Point	17dBm/ MHz
	☐	Fixed point-to-point Access Point	17dBm/ MHz
	☐	Indoor Access Point	17dBm/ MHz
	☒	Client devices	11dBm/ MHz
U-NII-2A	/		11dBm/ MHz
U-NII-2C	/		11dBm/ MHz
U-NII-3	/		30 dBm/500kHz

9.2 Measurement Procedure

☒ For Average power spectral density test:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator.
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz.
4. If measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100KHz
5. Set VBW $\geq$ [3×RBW].
6. Sweep Time=Auto couple.
7. Detector function=RMS (i.e., power averaging).
8. Trace average at least 100 traces in power averaging (rms) mode.
9. When the measurement bandwidth of Maximum PSD is specified in 100 kHz, add a constant factor $10 \cdot \log(500\text{kHz}/100\text{kHz}) = 6.99$ dB to the measured result.
10. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
11. Add $[10 \log (1/D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1/0.25)] = 6$ dB if the duty cycle is 25%.
12. The final test results have been increased by the duty cycle factor and recorded in the report

9.3 Measurement Setup (Block Diagram of Configuration)



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9.4 Measurement Result

Test Data of Conducted Output Power Density for band 5.15-5.25 GHz				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5180	1.385	11	Pass
	5200	1.442	11	Pass
	5240	1.997	11	Pass
802.11n20	5180	0.247	11	Pass
	5200	0.520	11	Pass
	5240	1.021	11	Pass

Test Data of Conducted Output Power Density for band 5.25-5.35 GHz				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5260	-1.240	11	Pass
	5300	-1.163	11	Pass
	5320	-1.006	11	Pass
802.11n20	5260	-2.199	11	Pass
	5300	-1.931	11	Pass
	5320	-1.771	11	Pass

Test Data of Conducted Output Power Density for band 5.470-5.725 GHz				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5500	-0.270	11	Pass
	5600	-0.670	11	Pass
	5700	-2.041	11	Pass
802.11n20	5500	-1.099	11	Pass
	5600	-0.904	11	Pass
	5700	-2.517	11	Pass

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Test Data of Conducted Output Power Density for band 5.725-5.85 GHz					
Test Mode	Test Channel	Average Power Density	Average Power Density	Limits (dBm/500kHz)	Pass or Fail
802.11a	5745	-10.053	-3.063	30	Pass
	5785	-9.257	-2.267	30	Pass
	5825	-9.457	-2.467	30	Pass
802.11n20	5745	-11.139	-4.149	30	Pass
	5785	-9.949	-2.959	30	Pass
	5825	-9.905	-2.915	30	Pass

Note:1.Power density(dBm/500kHz) = Power density(dBm/100kHz)+10*log(500/100).

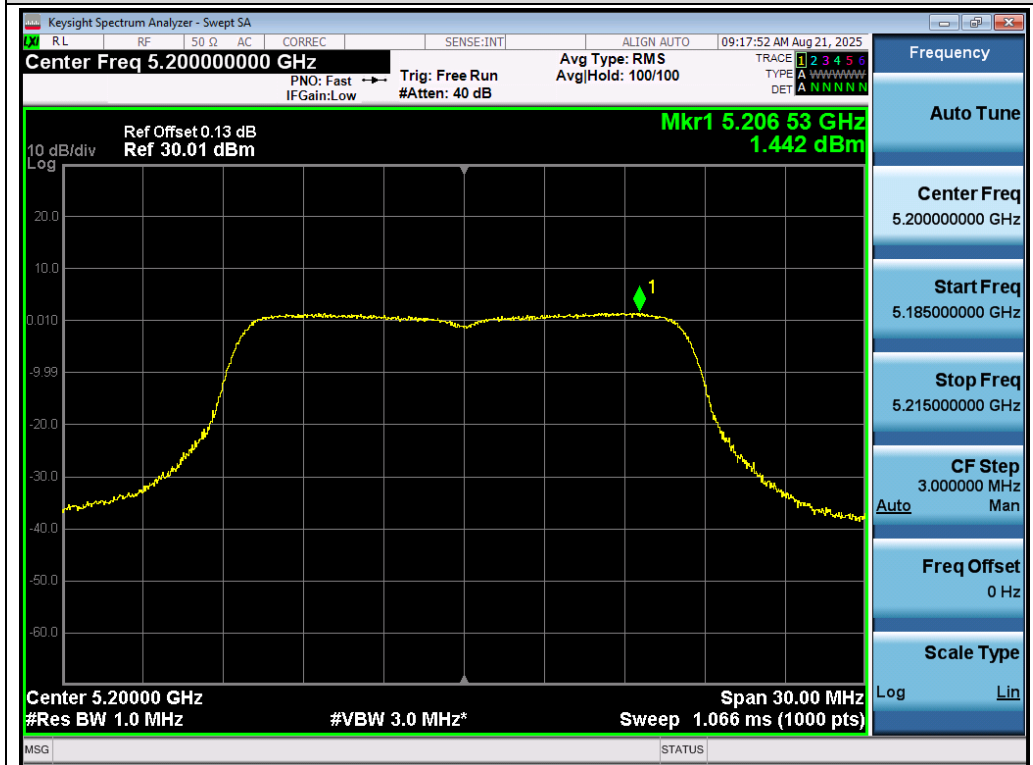
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Test Graphs of Conducted Output Power Spectral Density for band 5.15-5.25 GHz

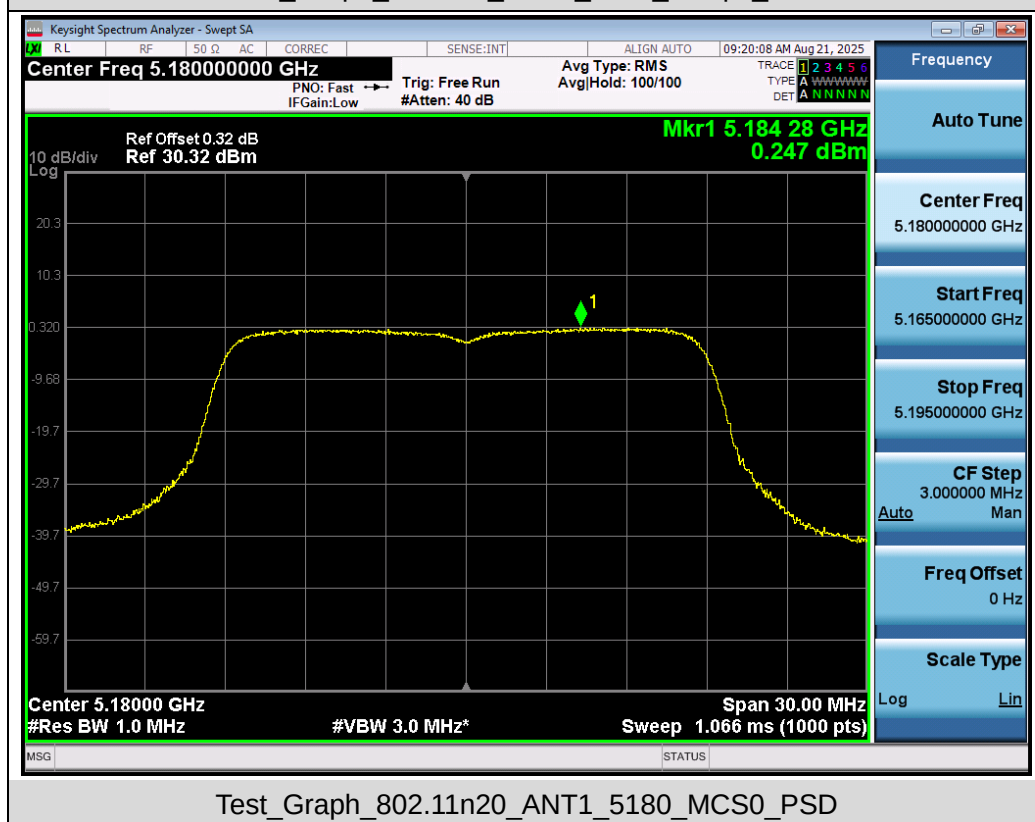
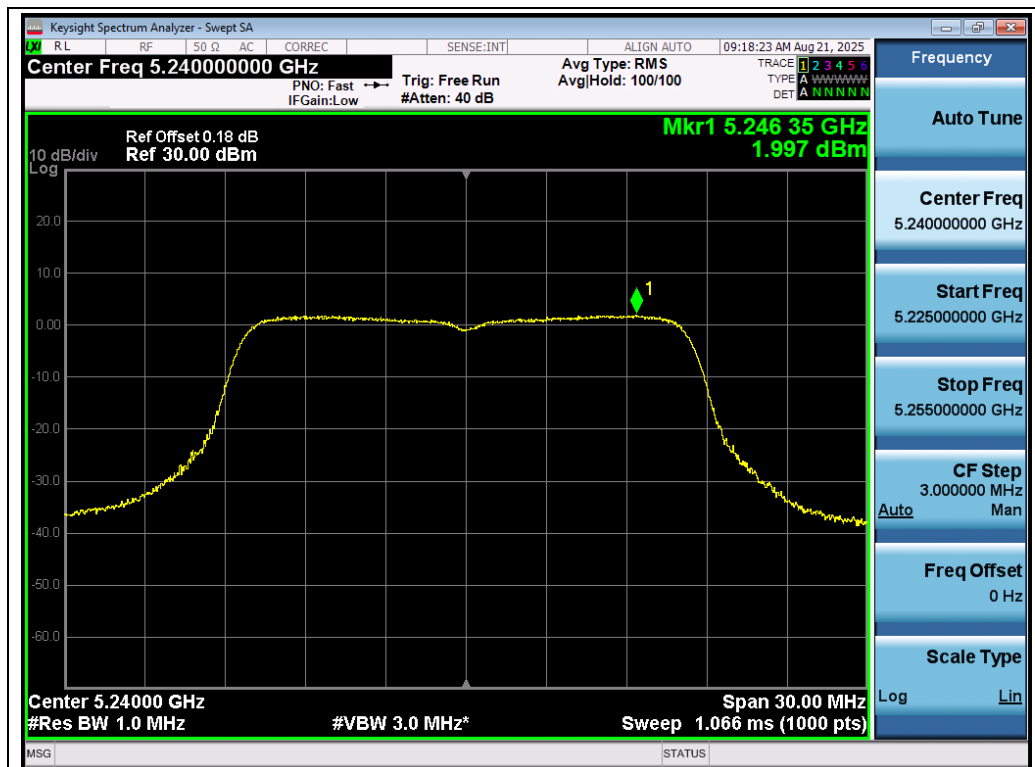


Test_Graph_802.11a_ANT1_5180_6Mbps_PSD



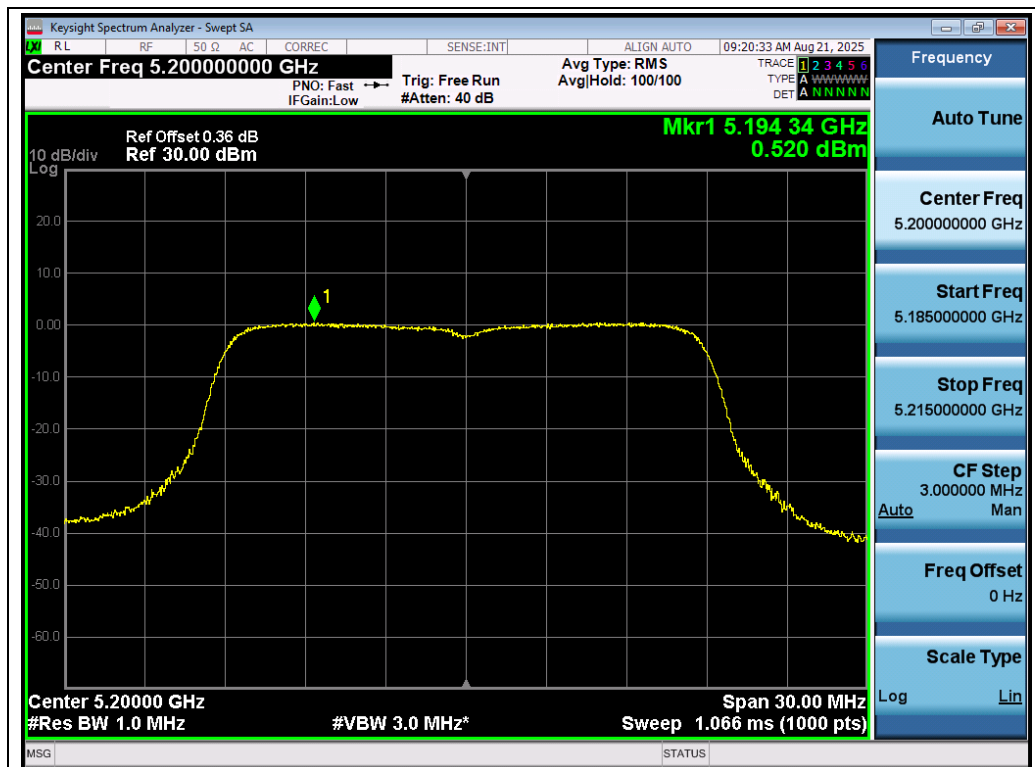
Test_Graph_802.11a_ANT1_5200_6Mbps_PSD

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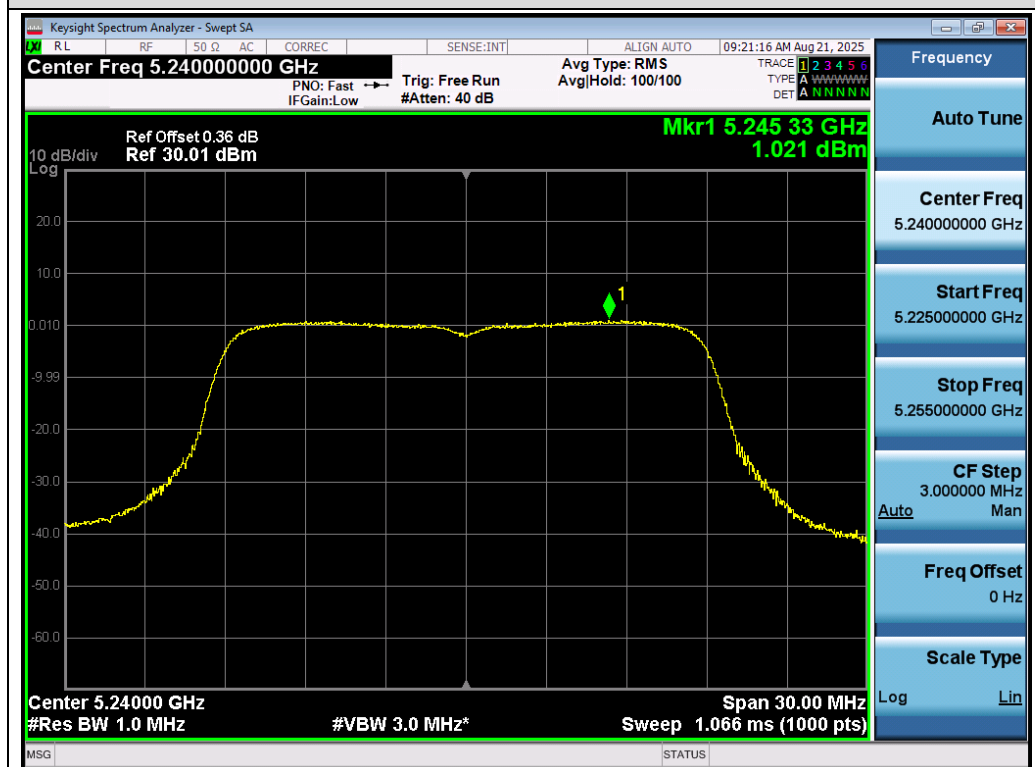


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Test_Graph_802.11n20_ANT1_5200_MCS0_PSD



Test_Graph_802.11n20_ANT1_5240_MCS0_PSD

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Test Graphs of Conducted Output Power Spectral Density for band 5.25-5.35 GHz



Test_Graph_802.11a_ANT1_5260_6Mbps_PSD



Test_Graph_802.11a_ANT1_5300_6Mbps_PSD

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Test_Graph_802.11a_ANT1_5320_6Mbps_PSD



Test_Graph_802.11n20_ANT1_5260_MCS0_PSD

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Test_Graph_802.11n20_ANT1_5300_MCS0_PSD



Test_Graph_802.11n20_ANT1_5320_MCS0_PSD

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Test Graphs of Conducted Output Power Spectral Density for band 5.470-5.725 GHz



Test_Graph_802.11a_ANT1_5500_6Mbps_PSD

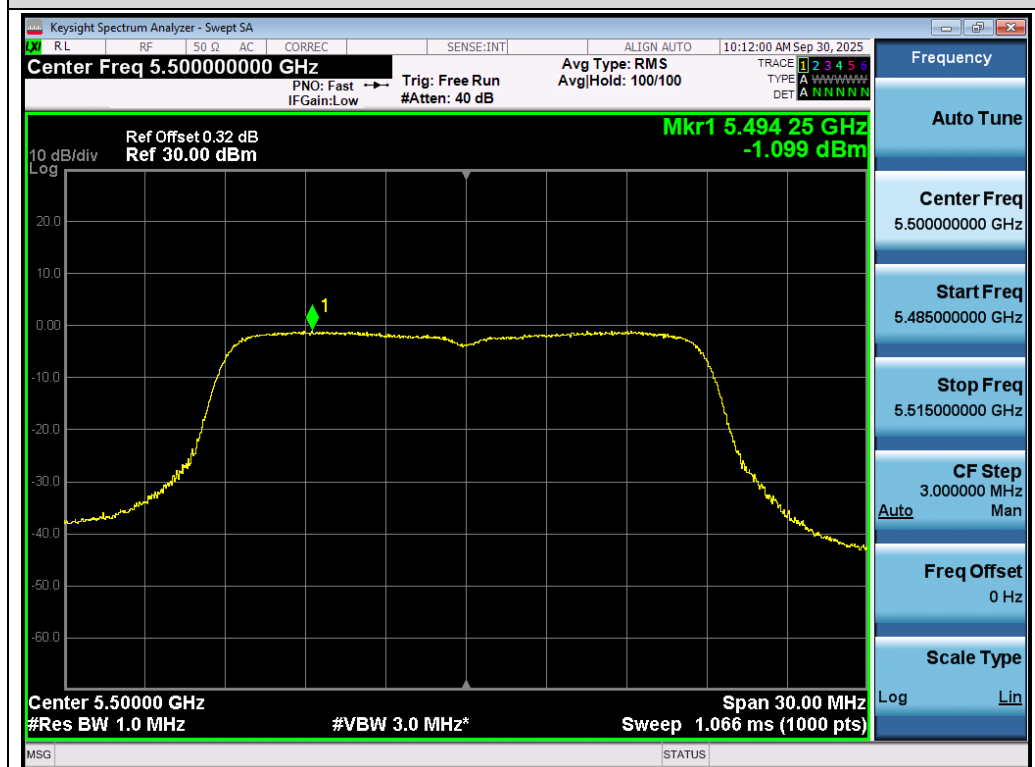


Test_Graph_802.11a_ANT1_5600_6Mbps_PSD

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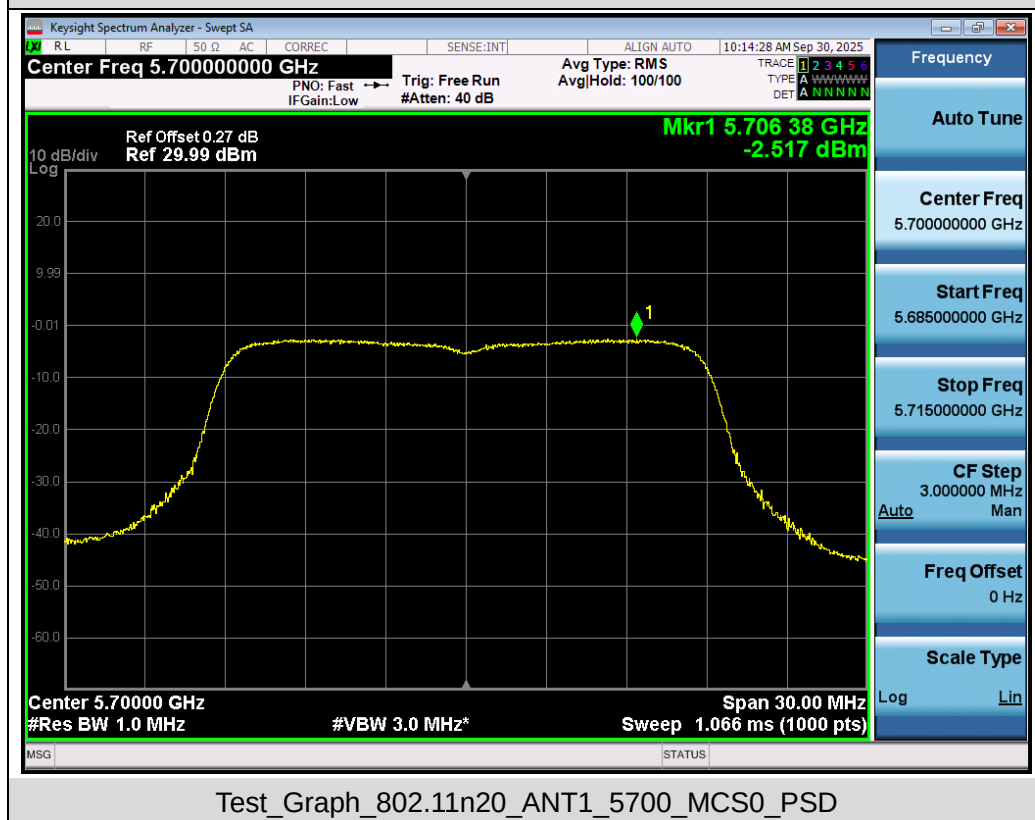
Test_Graph_802.11a_ANT1_5700_6Mbps_PSD



Test_Graph_802.11n20_ANT1_5500_MCS0_PSD

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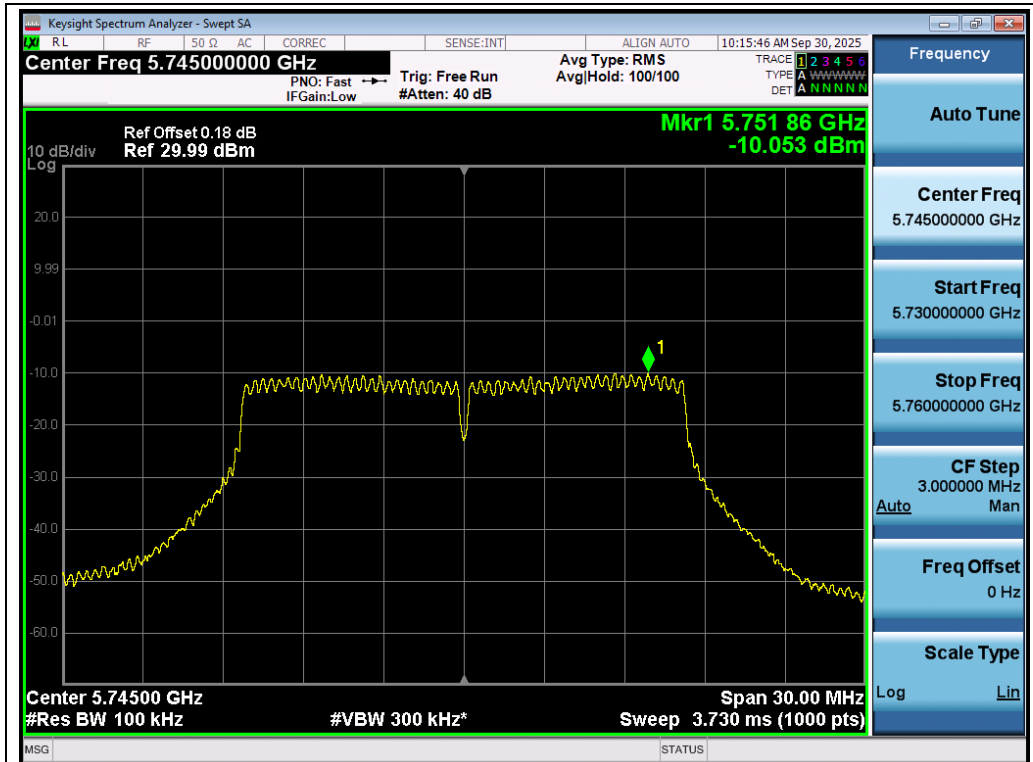
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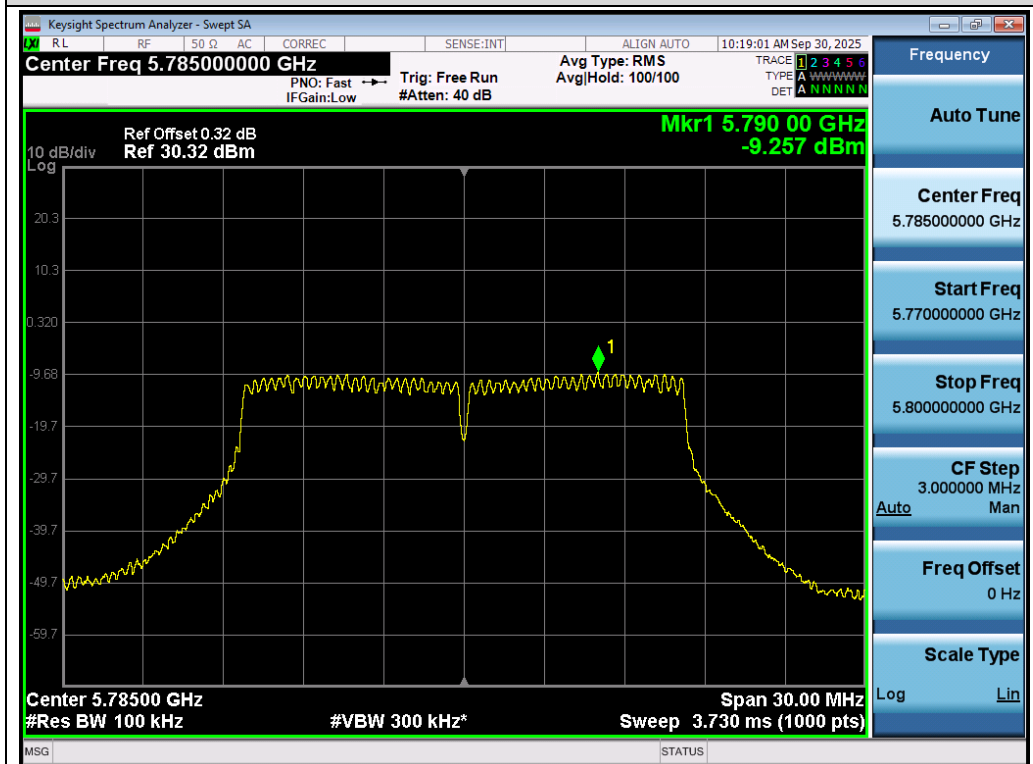
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Test Graphs of Conducted Output Power Spectral Density for band 5.725-5.85 GHz

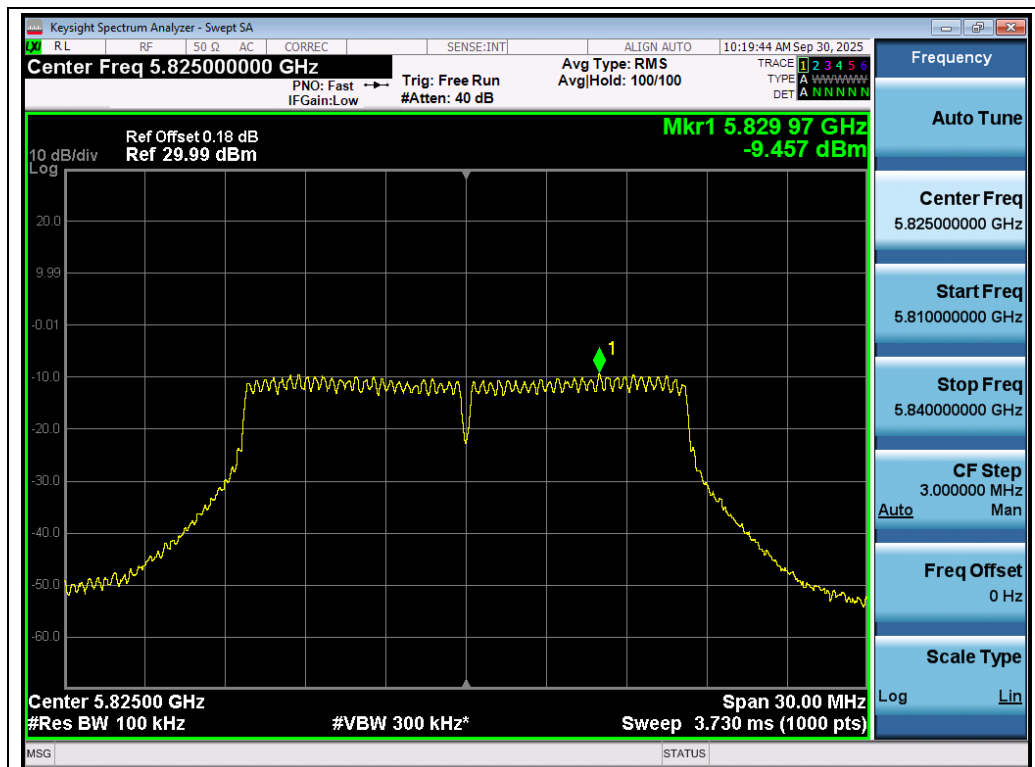


Test_Graph_802.11a_ANT1_5745_6Mbps_PSD

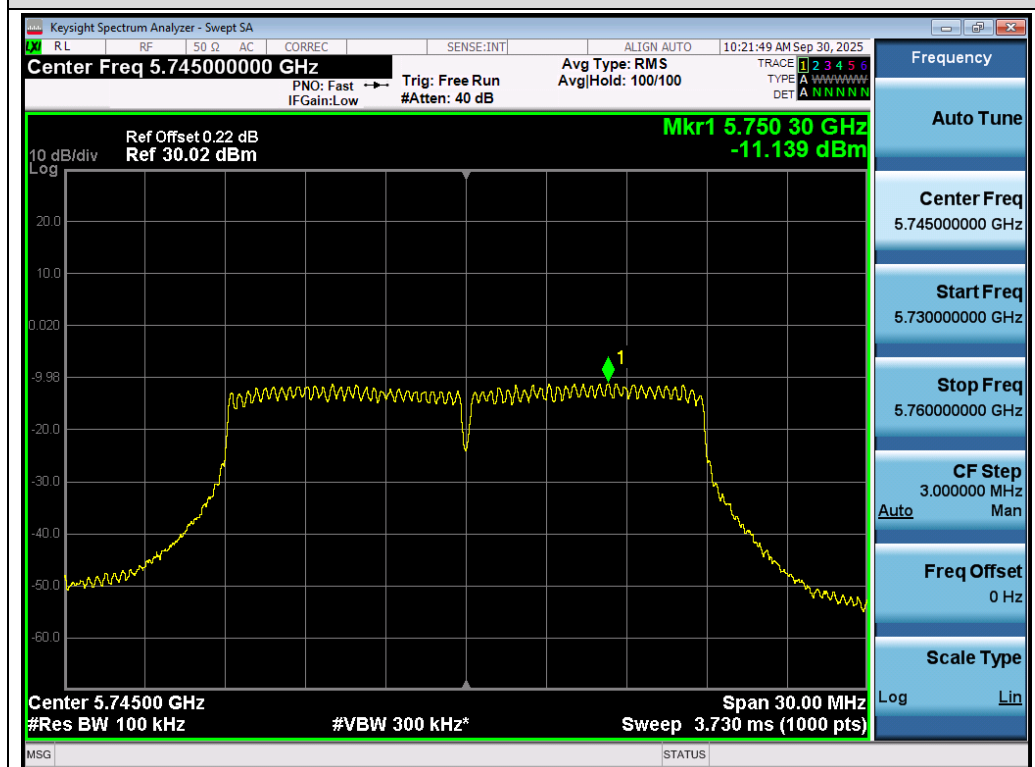


Test_Graph_802.11a_ANT1_5785_6Mbps_PSD

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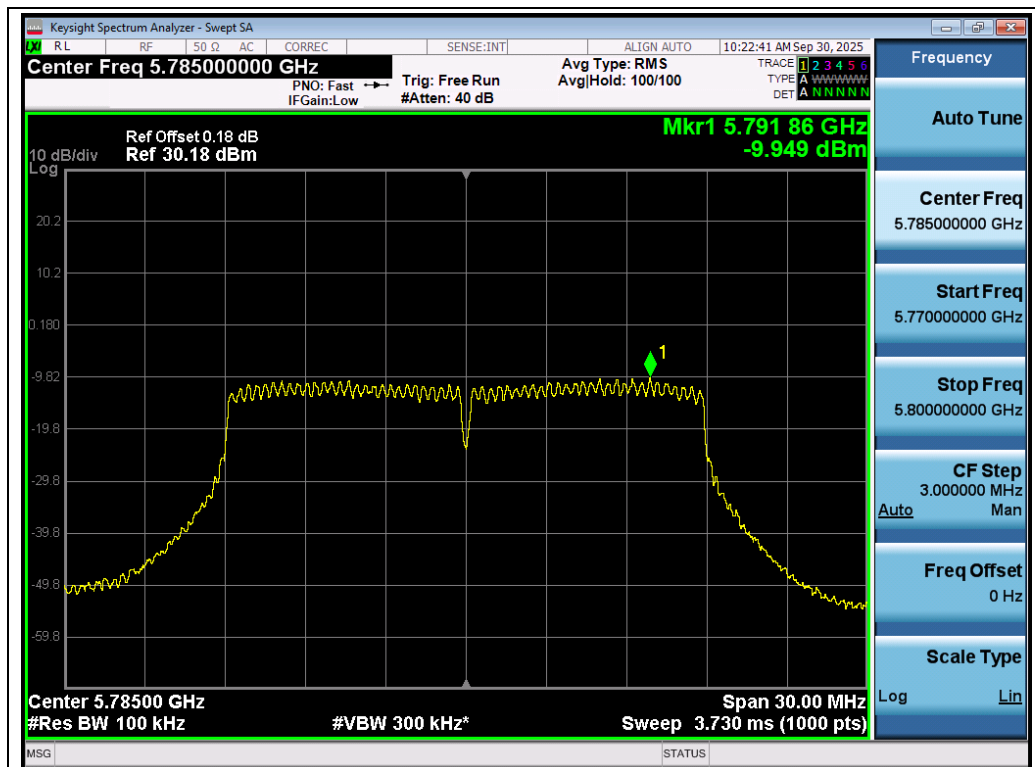


Test_Graph_802.11a_ANT1_5825_6Mbps_PSD

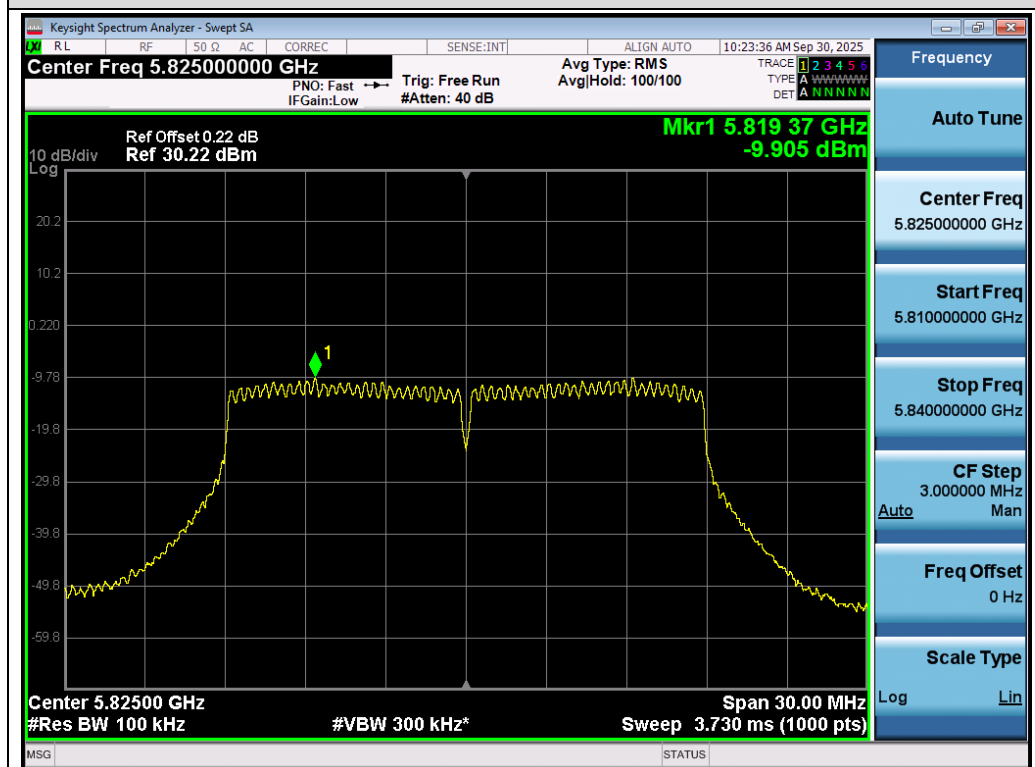


Test_Graph_802.11n20_ANT1_5745_MCS0_PSD

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Test_Graph_802.11n20_ANT1_5785_MCS0_PSD



Test_Graph_802.11n20_ANT1_5825_MCS0_PSD

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10. Conducted Band Edge and Out-of-Band Emissions

10.1 Provisions Applicable

Restricted bands	Applicable to	Limit	
	789033 D02 General UNII Test Procedures New Rules v02r01	Field strength at 3m (dBuV/m)	
		PK: 74	AV: 54
Out of the restricted bands	Applicable to	EIRP Limit (dBm/MHz)	Equivalent field Strength at 3m (dBuV/m)
	FCC 15.407(b)(1)	PK: -27	PK: 68.2
	15.407(b)(2)		
	15.407(b)(3)		
	15.407(b)(4)	See Note 2	

Note 1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000}{3} \sqrt{30 P} \quad \mu\text{V/m, where } P \text{ is the eirp (Watts).}$$

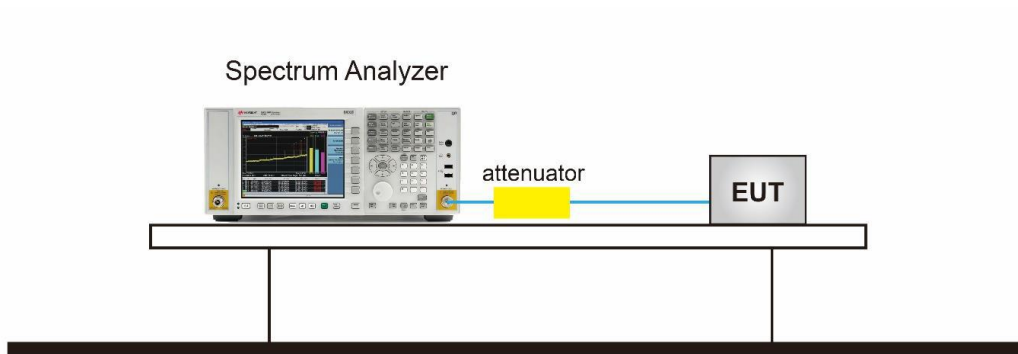
Note 2: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

10.2 Measurement Procedure

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
3. RBW = 1MHz; VBW= 3MHz; Sweep = auto; Detector function = Peak. (Test frequency below 1GHz)
4. RBW = 1 MHz; VBW= 3 MHz; Sweep = auto; Detector function = Peak. (Test frequency Above 1GHz)
5. Set SPA Trace 1 Max hold, then View.
6. Antenna gain and path loss have been compensated to the Correction factor.
7. Mark the maximum useless stray point and compare it with the limit value to record the result.

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10.3 Measurement Setup (Block Diagram of Configuration)

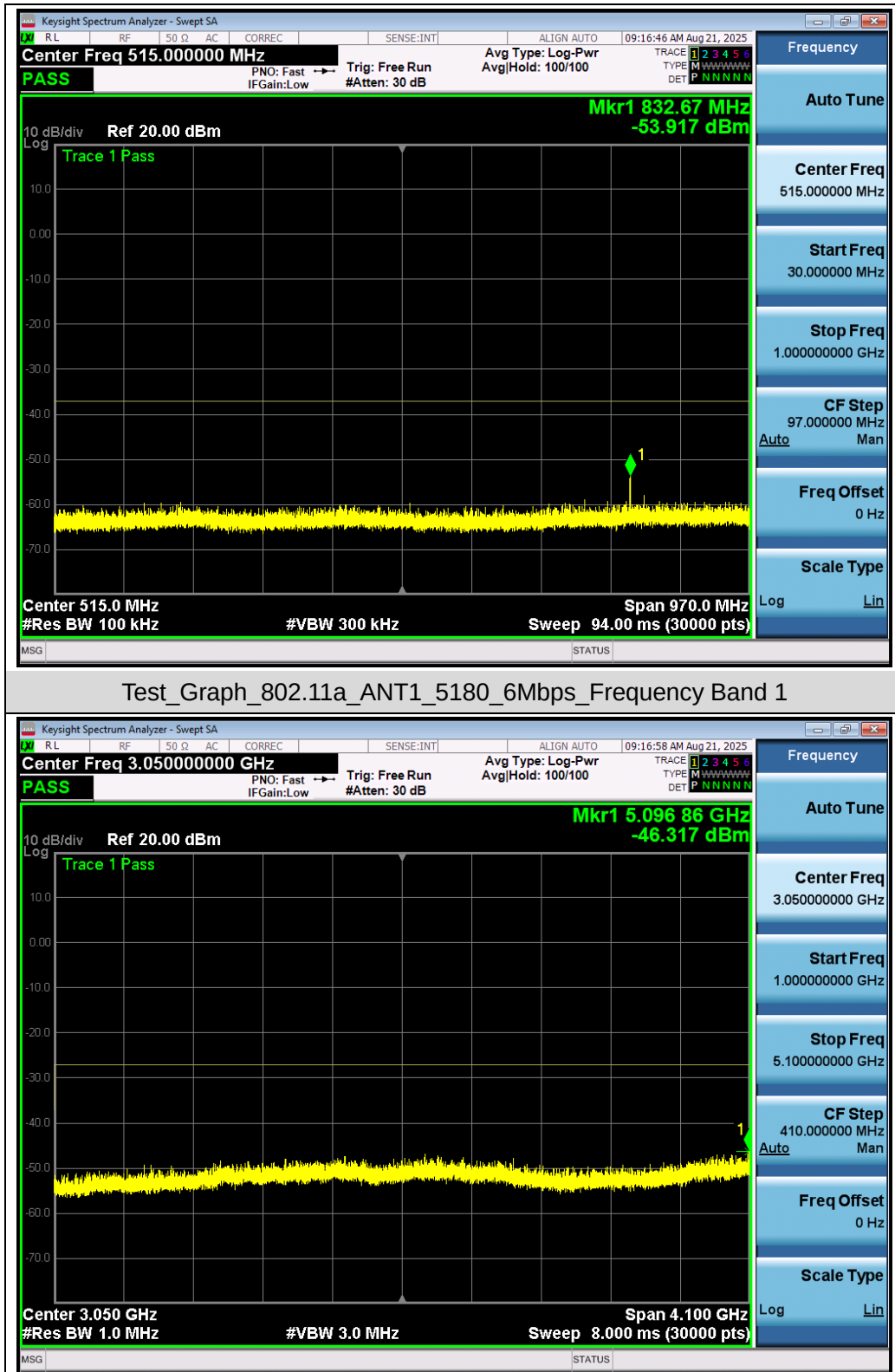


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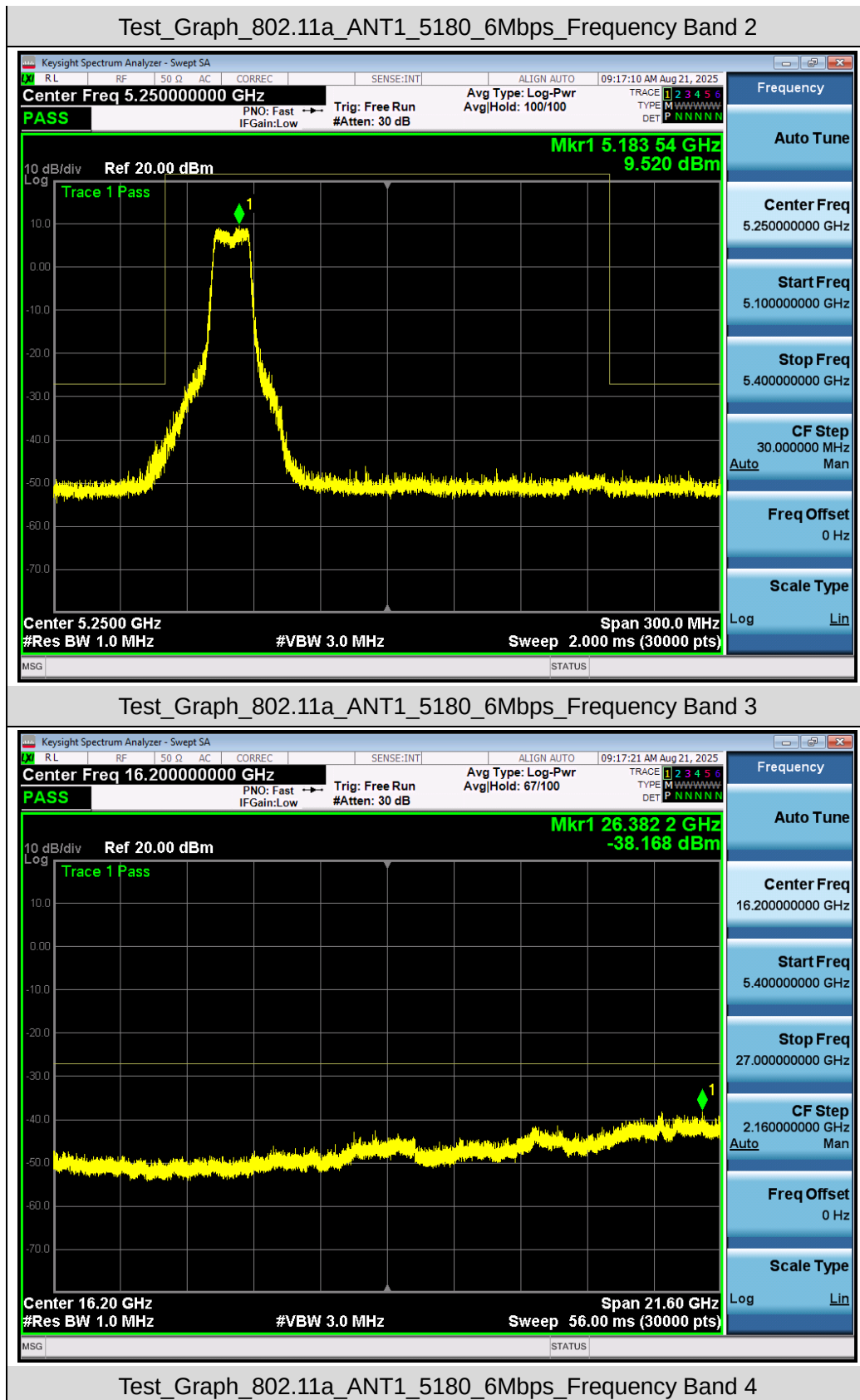
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10.4 Measurement Results

Test Graphs of Spurious Emissions outside of the 5.15-5.25 GHz band



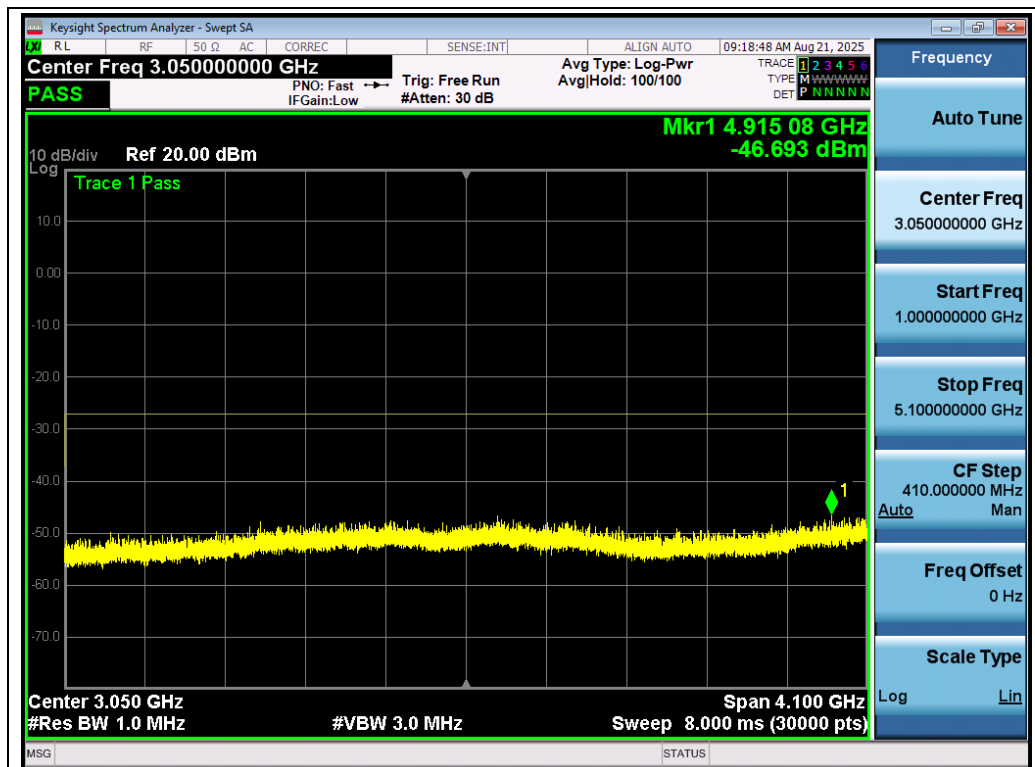
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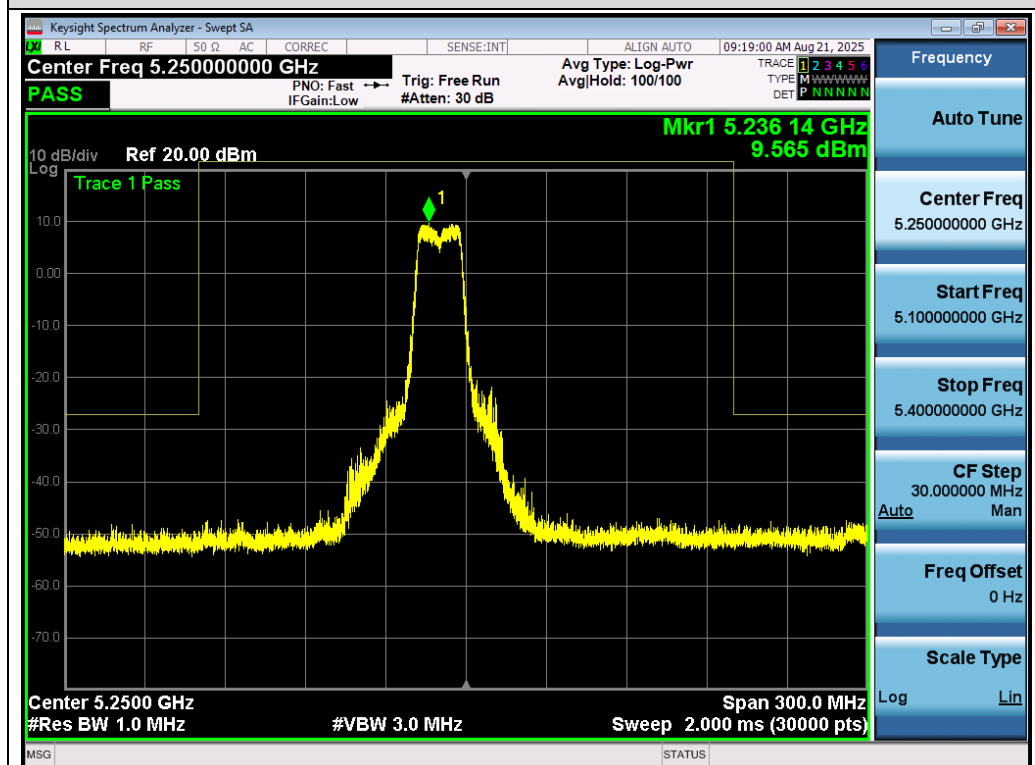
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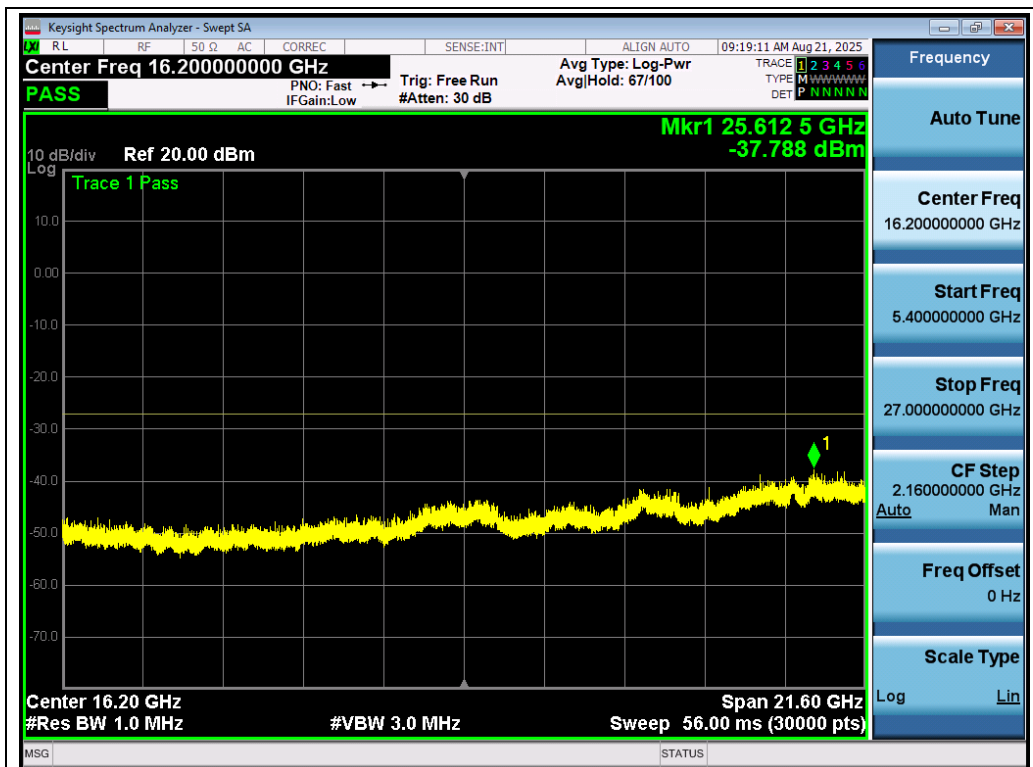


Test_Graph_802.11a_ANT1_5240_6Mbps_Frequency Band 2

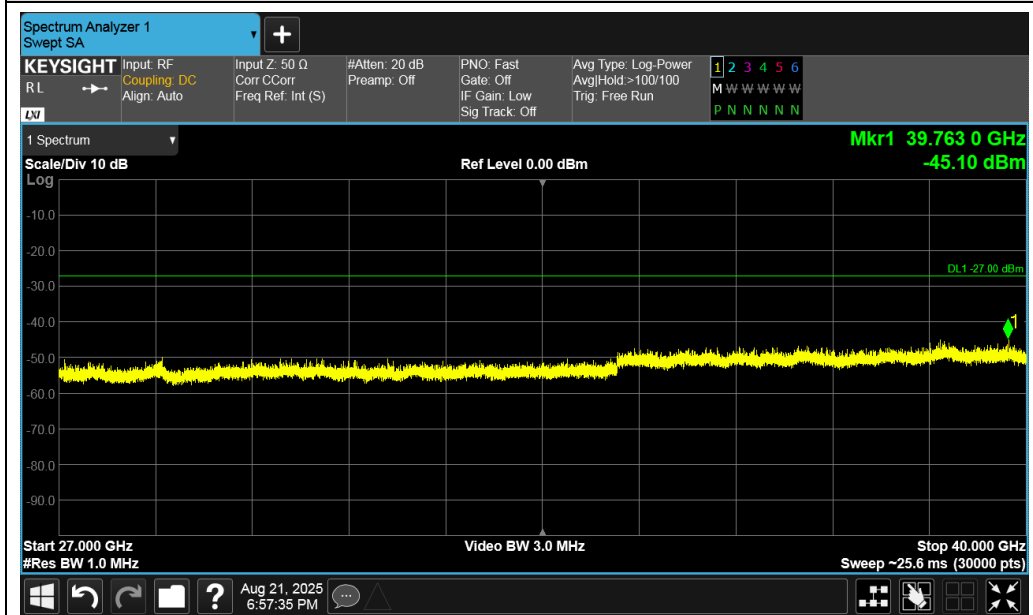


Test_Graph_802.11a_ANT1_5240_6Mbps_Frequency Band 3

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Test_Graph_802.11a_ANT1_5240_6Mbps_Frequency Band 4

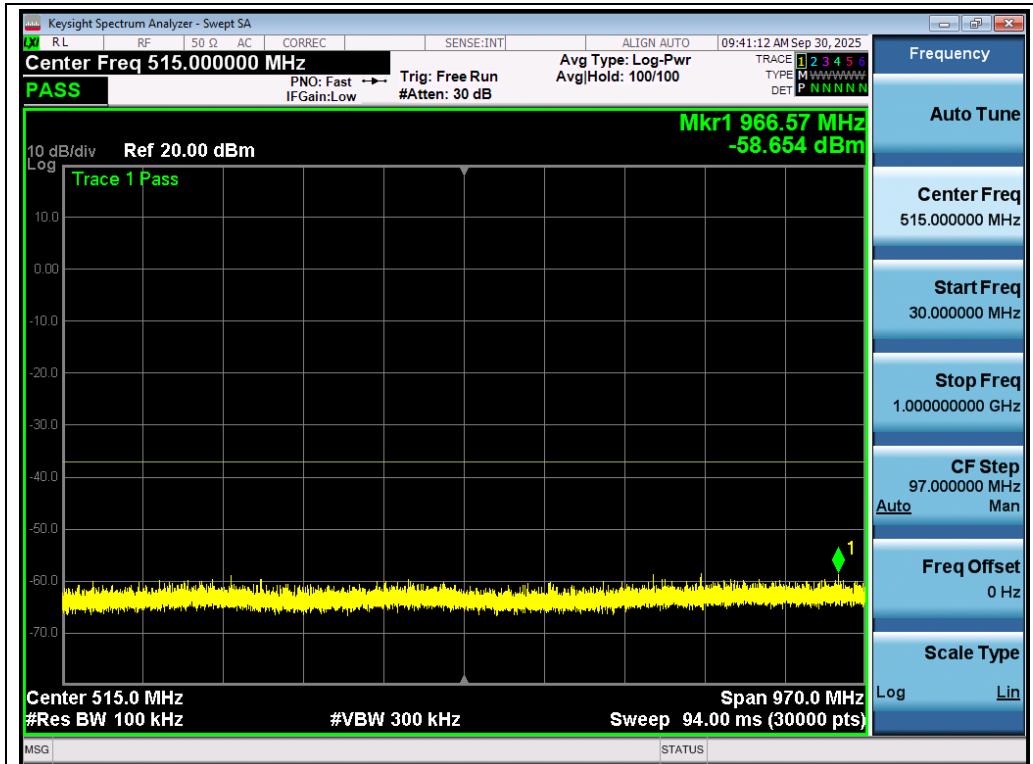


Test_Graph_802.11a_ANT1_5240_6Mbps_Frequency Band 5

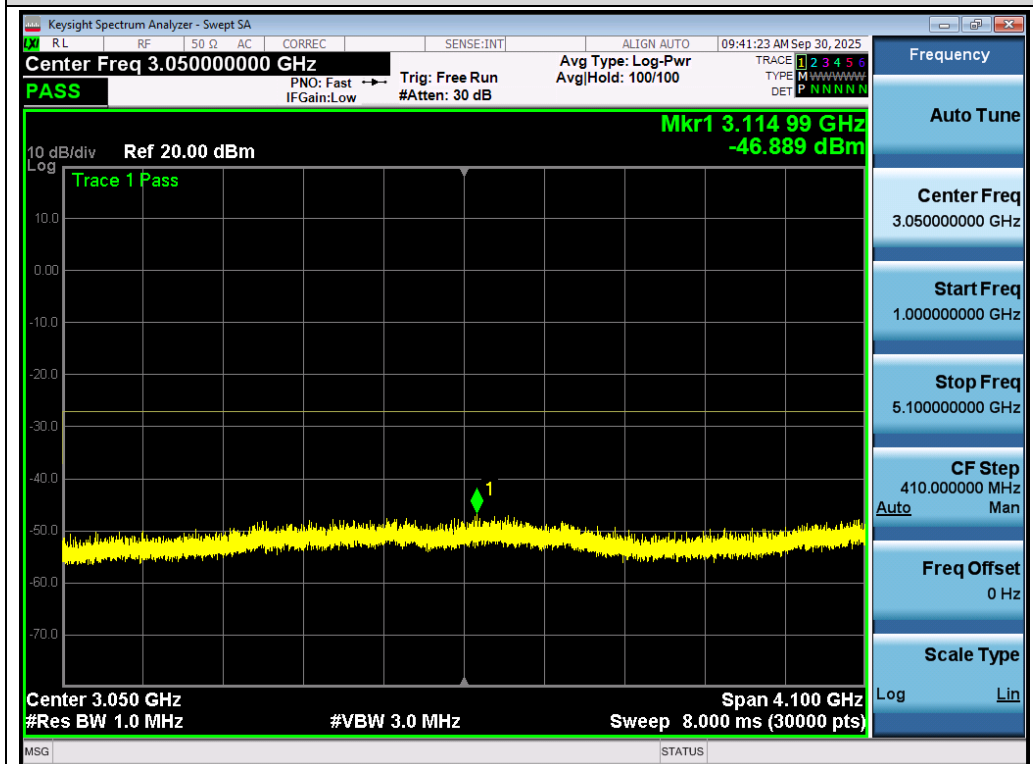
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Test Graphs of Spurious Emissions outside of the 5.25-5.35 GHz band



Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 1



Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 2

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