MEASUREMENT REPORT

FCC ID	:	**2BH7FRE225BE**
Applicant	:	**TP-Link Systems Inc.**
Application Type	:	**Certification**
Product	:	**BE3600 Wi-Fi 7 Range Extender, BE3200 Wi-Fi 7 Range Extender**
Model No.	:	**RE225BE**
Series Model No.	:	**RE3200BE, RE223BE**
Brand Name	:	**tp-link**
FCC Classification	:	**Unlicensed National Information Infrastructure (NII)**
FCC Rule Part(s)	:	**Part15 Subpart E (Section 15.407)**
Received Date	:	**December 9, 2024**
Test Date	:	**December 20, 2024~January 3, 2025**

Test By : Owen Tsai
(Owen Tsai)

Reviewed By : Paddy Chen
(Paddy Chen)

Approved By : Chenz Ker
(Chenz Ker)

Testing Laboratory
3261

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 and KDB 291074. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
2412TW0110-U5	1.0	Original Report	2025-04-29	

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Description Page

General Information

Applicant	TP-Link Systems Inc.
Applicant Address	10 Mauchly, Irvine, CA 92618
Manufacturer	TP-Link Systems Inc.
Manufacturer Address	10 Mauchly, Irvine, CA 92618
Test Site	MRT Technology (Taiwan) Co., Ltd
Test Site Address	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
MRT FCC Registration No.	291082
FCC Rule Part(s)	Part 15.407

Test Facility / Accreditations

1. MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.
2. MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada.
3. MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Canada, EU and TELEC Rules.

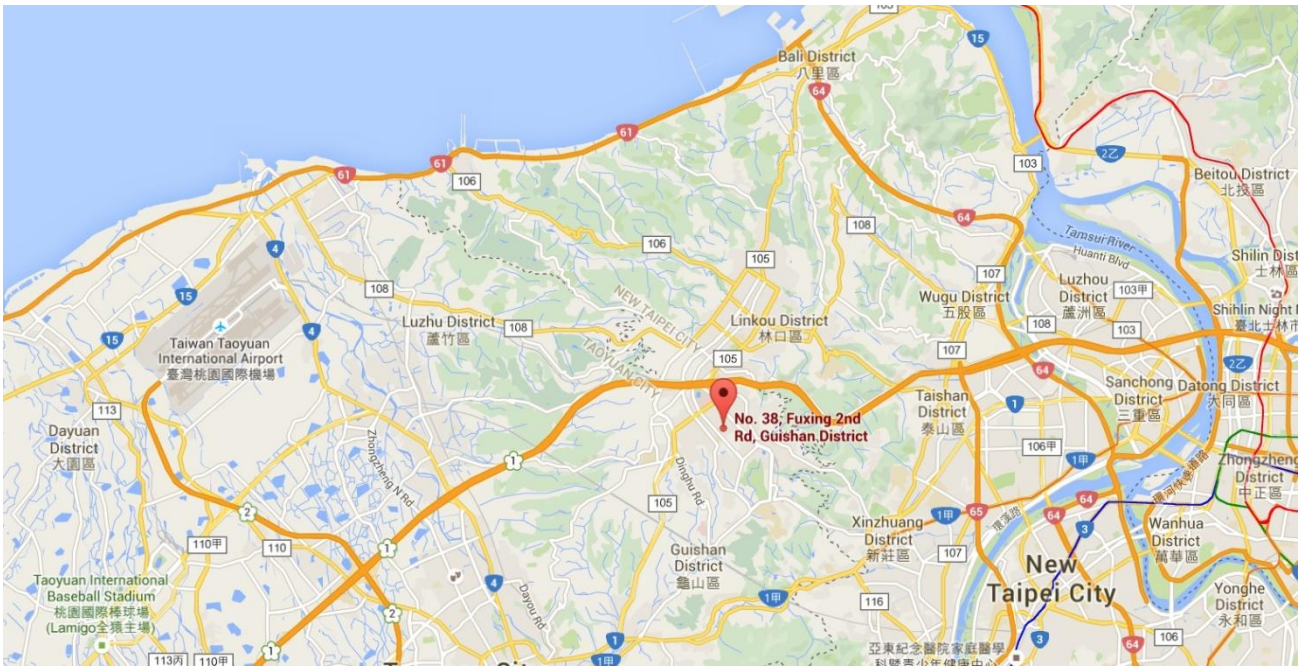
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	BE3600 Wi-Fi 7 Range Extender, BE3200 Wi-Fi 7 Range Extender
Model No.:	RE225BE
Series Model Number:	RE3200BE, RE223BE
Brand Name:	tp-link
Wi-Fi Specification	802.11a/b/g/n/ac/ax/be
EUT IdentificationNo.	#1-1 (Conducted) #1-2 (Radiated)
Rating	100-240V~50/60Hz 0.4A

Note:

1. Model Difference: The difference of models only for marketing different, the other hardware was the same. (declared by the manufacturer)
2. The test was performed base on RE225BE.

2.2. Product Specification Subjective to this Report

Frequency Range:	For 802.11a/n-HT20/ac-VHT20/ax-HE20/be-EHT20: 5845MHz, 5865MHz, 5885MHz For 802.11n-HT40/ac-VHT40/ax-HE40/be-EHT40: 5835MHz, 5875MHz For 802.11ac-VHT80/ax-HE80/be-EHT80: 5855MHz For 802.11ac-VHT160/ax-HE160/be-EHT160: 5815MHz
Type of Modulation:	802.11a/n/ac: OFDM 802.11ax/be: OFDMA
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 1733.4Mbps 802.11ax: up to 2402Mbps 802.11be: up to 2882Mbps

Note: For other features of this EUT, test report will be issued separately.

2.3. Working Frequencies for this report

802.11a/n-HT20/ac-VHT20/ax-HE20/be-EHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
169	5845 MHz	173	5865 MHz	177	5885 MHz

802.11n-HT40/ac-VHT40/ax-HE40/be-EHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
167	5835 MHz	175	5875 MHz	--	--

802.11ac-VHT80/ax-HE80/be-EHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
171	5855 MHz	--	--	--	--

802.11ac-VHT160/ax-HE160/be-EHT160

Channel	Frequency	Channel	Frequency	Channel	Frequency
163	5815 MHz	--	--	--	--

2.4. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	T_X Paths	Number of spatial streams	Max Antenna Gain (dBi)	Beamforming Directional Gain (dBi)	CDD Directional Gain (dBi)	
						For Power	For PSD
Wi-Fi Antenna							
Dipole	2412 ~ 2462	2	1	3.81	5.94	3.81	5.94
	5150 ~ 5250	2	1	5.36	6.08	5.36	6.08
	5250 ~ 5350	2	1	5.53	5.83	5.53	5.83
	5470 ~ 5725	2	1	5.31	5.81	5.31	5.81
	5725 ~ 5895	2	1	4.98	6.02	4.98	6.02

Remark:

1. The device supports CDD Mode and Beamforming mode, details refer to the table as below.
2. CDD signals are correlated, the directional gain as follows,

   When N_{SS}=1, for power measurements: the max directional gain (each angle) = 10 log[($10^{G1/10}$ + $10^{G2/10}$ + … + $10^{GN/10}$) /N_{ANT}]

   For power spectral density (PSD) measurements: the max directional gain (each angle) = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + … + $10^{GN/20}$)^2 /N_{ANT}]
3. Beamforming signals are correlated, the directional gain as follows,

   the max directional gain (each angle) = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + … + $10^{GN/20}$)^2 /N_{ANT}]
4. The information as above is from the antenna report.

Test Mode	T_X Paths	CDD Mode	Beamforming Mode
802.11b/g/n (DTS)	2	√	X
802.11ax/be (DTS)	2	√	√
802.11a/n (NII)	2	√	X
802.11ac/ax/be (NII)	2	√	√

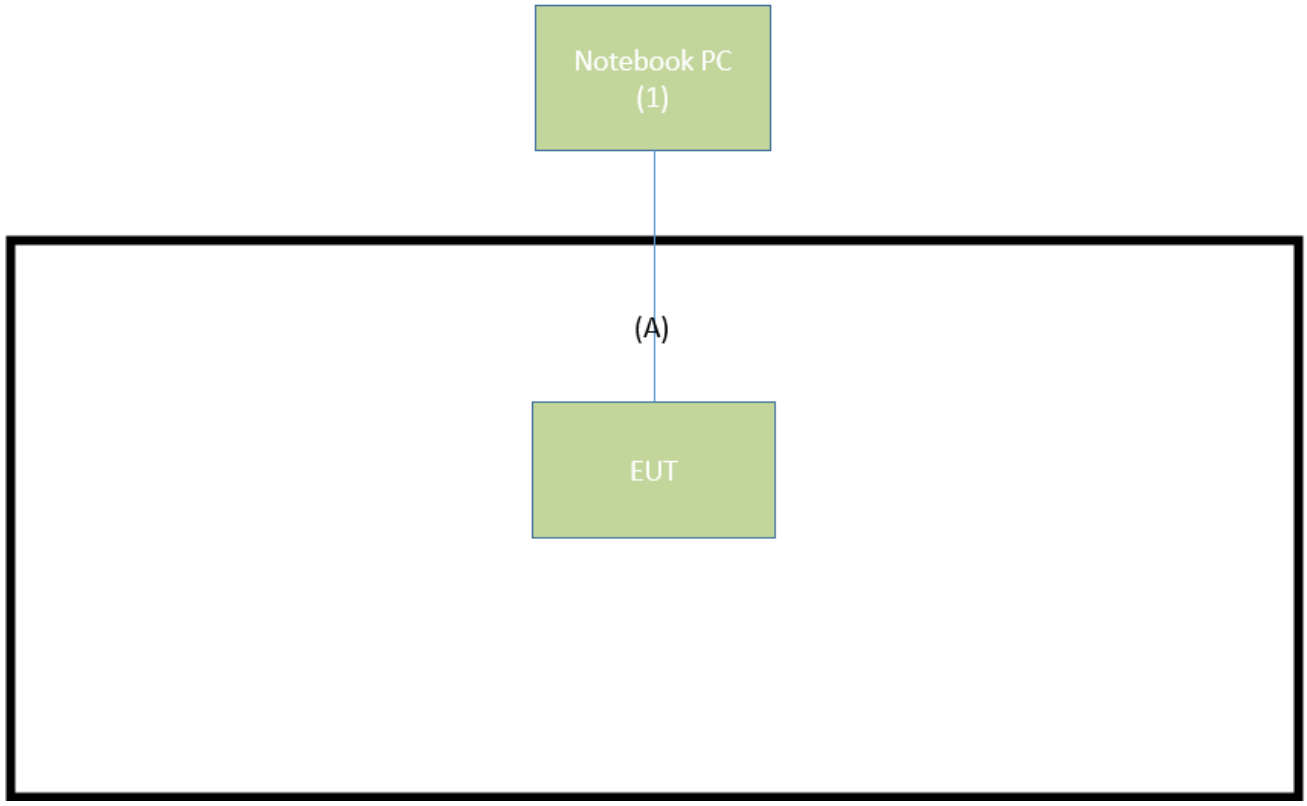
2.5. Test Mode

CDD Mode
Mode 1: Transmit by 802.11a_Nss=1 (6Mbps)
Mode 2: Transmit by 802.11ac-VHT20_Nss=1 (MCS0)
Mode 3: Transmit by 802.11ac-VHT40_Nss=1 (MCS0)
Mode 4: Transmit by 802.11ac-VHT80_Nss=1 (MCS0)
Mode 5: Transmit by 802.11ac-VHT160_Nss=1 (MCS0)
Mode 6: Transmit by 802.11ax-HE20_Nss=1 (MCS0)
Mode 7: Transmit by 802.11ax-HE40_Nss=1 (MCS0)
Mode 8: Transmit by 802.11ax-HE80_Nss=1 (MCS0)
Mode 9: Transmit by 802.11ax-HE160_Nss=1 (MCS0)
Mode 10: Transmit by 802.11be-EHT20_N_{SS}=1 (MCS0)
Mode 11: Transmit by 802.11be-EHT40_N_{SS}=1 (MCS0)
Mode 12: Transmit by 802.11be-EHT80_N_{SS}=1 (MCS0)
Mode 13: Transmit by 802.11be-EHT160_N_{SS}=1 (MCS0)
Remark: 1. For Radiated emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power. 2. This device supports 2 N_{SS} and power level of 2 Nss is less than or equal to the power of 1 N_{SS}. The worst case is N_{SS}=1. 3. 802.11n and 802.11ac have same modulation type and same power value, so we only show 802.11ac test data in report. 4. For beamforming operation, the manufacturer automatically reduces power based on a factor calculated as the difference between the beamforming directional gain and the CDD directional power gain. Thus, only the CDD mode was evaluated in this report. 5. EUT supports one configuration only in 802.11ax/be full RU mode. 6. As Designated by manufacturer, the lowest data rate was the worst condition, so all the tests were done with lowest data rate.

2.6. Configuration of Test System

The devicewas tested per the guidance ANSI C63.10: 2013was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.

Connection Diagram



Signal Cable Type		Signal Cable Description
A	LAN Cable	Non-Shielded, 2m

2.7. Test System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	Lenovo	V14 G3 ABA	N/A	Non-shielded, 0.8m

2.8. Description of Test Software

The test utility software used during testing was “accessMTool”, the version is ver REL_3_3_0_1.

Note: Final power setting please refer to operational description.

2.9. Applied Standards

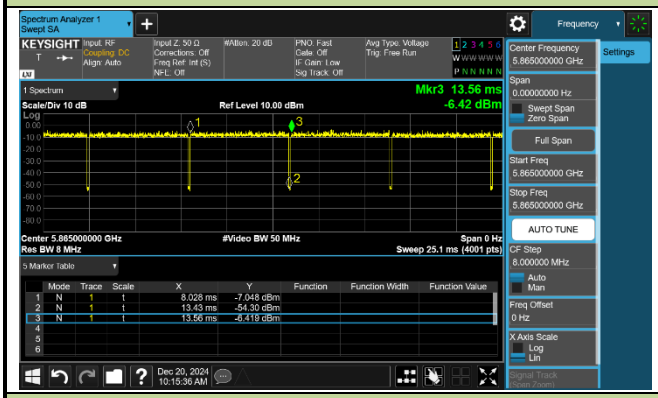
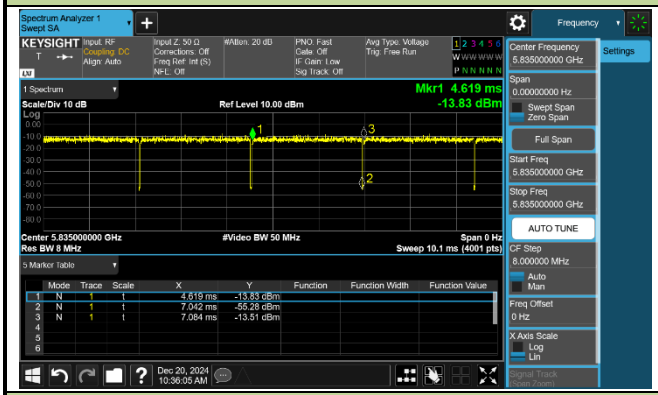
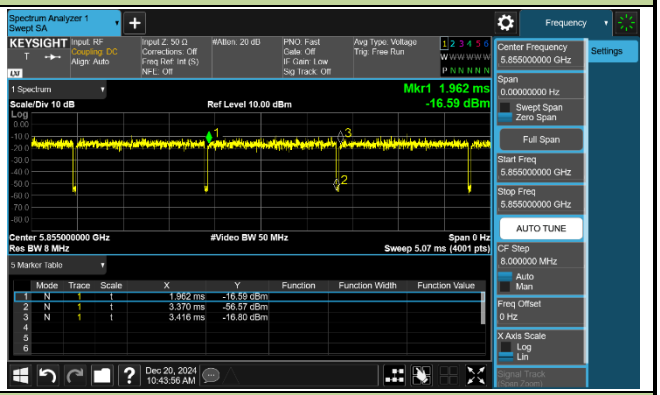
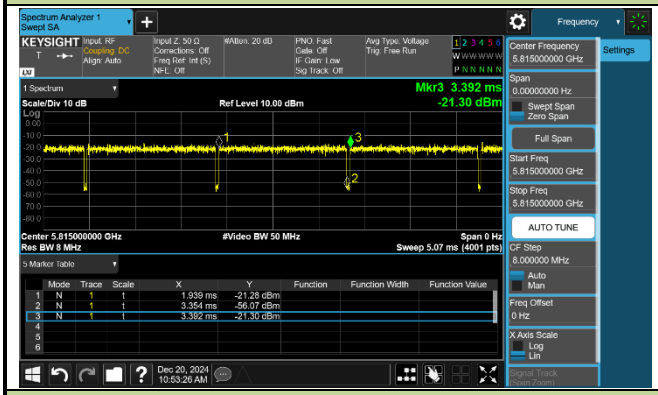
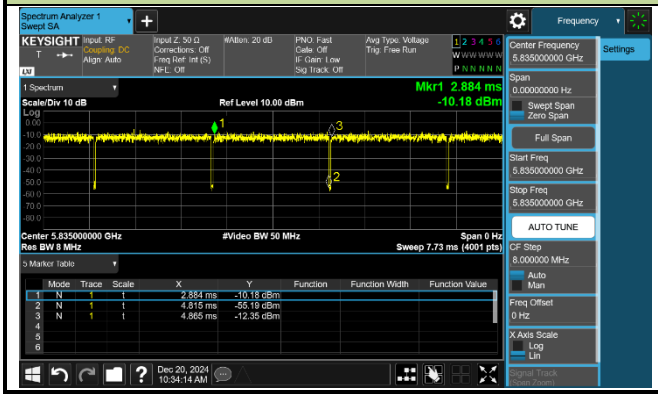
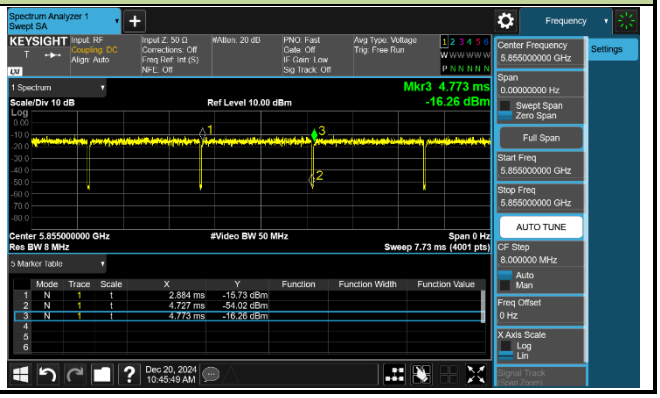
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

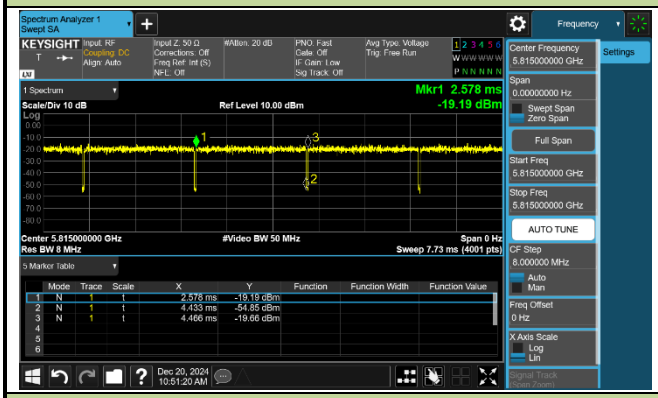
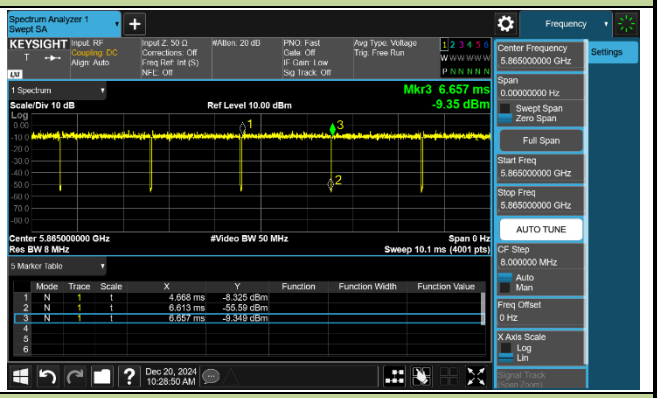
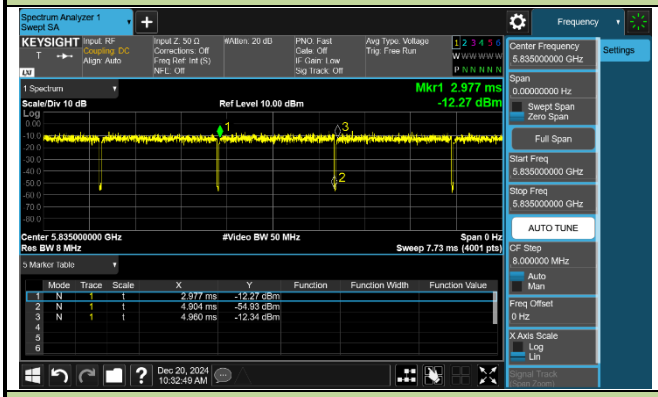
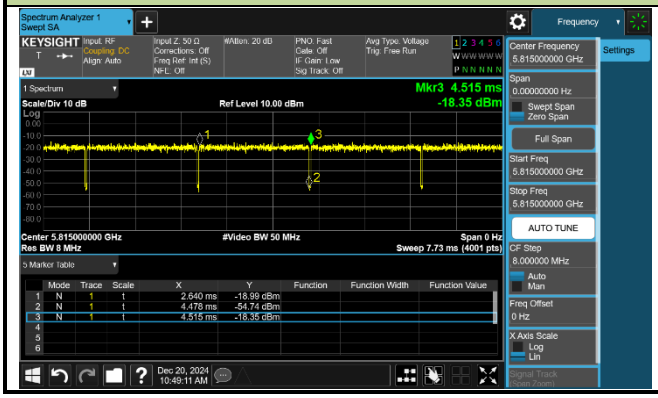
- FCC Part 15.407
- KDB 789033 D02v02r01
- KDB 291074 D02v01
- KDB 662911 D01v02r01
- ANSI C63.10-2013

2.10. Duty Cycle

5GHz (NII) operation is possible in 20MHz, 40MHz, 80MHz and 160MHz 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. 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:

Test Mode	Duty Cycle
802.11a	97.65%
802.11ac-VHT20	98.30%
802.11ac-VHT40	98.30%
802.11ac-VHT80	96.84%
802.11ac-VHT160	97.38%
802.11ax-HE20	97.65%
802.11ax-HE40	97.48%
802.11ax-HE80	97.56%
802.11ax-HE160	98.25%
802.11be-EHT20	97.79%
802.11be-EHT 40	97.18%
802.11be-EHT 80	97.35%
802.11be-EHT 160	98.03%

Duty Cycle (T = Transmission Duration)	
802.11a	802.11ac-VHT20
	
802.11ac-VHT40	802.11ac-VHT80
	
802.11ac-VHT160	802.11ax-HE20
	
802.11ax-HE40	802.11ax-HE80
	

802.11ax-HE160	802.11be-EHT20
	
802.11be-EHT40	802.11be-EHT80
	
802.11be-EHT160	
	

2.11. Test Configuration

The device was tested per the guidance of KDB 789033 D02v02r01.ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testingand AC line conducted testing.

2.12. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.13. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphletsupplied to the user and be readily visible to the purchaser at the time of purchase. However, when the deviceis so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label andlabel location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 789033 D02v02r01 were used in themeasurement.

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.
The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.
Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.
An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remotecontrolled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An80cm high PVC support structure is placed on top of the turntable.
For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated tomaximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.
Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

KDB 291074 DR01: An Indoor Access point in the U-NII-4 band (5.850-5.895 GHz) and U-NII -3 & -4 span channels must use an integrated antenna

- The antenna of the device is built in and locked inside the enclosure.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2025/3/5
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2025/4/21
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2025/5/14
DIVA PLUS Funk-Wetterstation	TFA	35.1083	MRTTWA00050	1 year	2025/6/2

Radiated Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Acitve Loop Antenna	SCHWARZBECK	FMZB 1519B	MRTTWA00002	1 year	2025/5/7
Broadband TRILOG Antenna	SCHWARZBECK	VULB 9162	MRTTWA00086	1 year	2025/11/5
Broadband Hornantenna	RFSPIN	DRH18-E	MRTTWA00087	1 year	2025/5/20
Broadband Preamplifier	EMC Instruments corporation	EMC118A45SE	MRTTWA00088	1 year	2025/5/14
Breitband Hornantenna	SCHWARZBECK	BBHA 9170	MRTTWA00004	1 year	2025/3/26
Broadband Amplifier	SCHWARZBECK	BBV 9721	MRTTWA00006	1 year	2025/3/21
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2025/3/5
Signal Analyzer	R&S	FSVA3044	MRTTWA00092	1 year	2025/6/20
Antenna Cable	HUBERSUHNER	SF106	MRTTWE00034	1 year	2025/6/25
Cable	HUBERSUHNER	EMC105-NM-NM-3000	MRTTWE00035	1 year	2025/6/25
Temperature/Humidity Meter	TFA	35.1083	MRTTWA00050	1 year	2025/6/2

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
X-Series USB Peak and Average Power Sensor	KEYSIGHT	U2021XA	MRTTWA00014	1 year	2025/4/16
EXA Signal Analyzer	KEYSIGHT	N9010A	MRTTWA00012	1 year	2025/9/24
Attenuator	WTI	218FS-20	MRTTWE00026	1 year	2025/8/12
Attenuator	WTI	218FS-10	MRTTWE00027	1 year	2025/10/31
Temperature & Humidity Chamber	TEN BILLION	TTH-B3UP	MRTTWA00036	1 year	2025/6/13
DIVA PLUS Funk-Wetterstation	TFA	35.1083	MRTTWA00050	1 year	2025/6/6

Software	**Version**	**Function**
e3	9.160520a	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: ± 2.53dB
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: ± 4.25dB 1GHz ~ 40GHz: ± 4.45dB
Conducted Power (Carrier Power / Power Density)
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): ± 0.84dB
Conducted Spurious Emission
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):± 2.65 dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): ± 3.3%
Temp. / Humidity
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): ±0.82°C/ ±3%
Frequency Error
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): ±78.4Hz

7. TEST RESULT

7.1. Summary

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section 7.2
15.407(e)	6dB Bandwidth	≥ 500kHz		Pass	Section 7.3
15.407(a)(3)(ii)	Maximum Conducted Output Power	Refer to section 7.4		Pass	Section 7.4
15.407(a)(3)(ii) (12)	Peak Power Spectral Density	Refer to section 7.5		Pass	Section 7.5
15.407(g)	Frequency Stability	N/A		Pass	Section 7.6
15.407(b)(5)	Undesirable Emissions	Refer to Section 7.7	Radiated	Pass	Section 7.7
15.205, 15.209 15.407(b)(5)(i), (8), (9)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restrictedbands must meet theradiated limits detailed in15.209		Pass	Section 7.8
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.9

Notes:

1) Determining compliance is based on the test results met the regulation limits or requirements declared by clients, and the test results don't take into account the value of measurement uncertainty.
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part ofthe system to connect the EUT to the analyzer at all frequencies of interest.
3) For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

7.2. 26dB Bandwidth Measurement

7.2.1.Test Limit

N/A

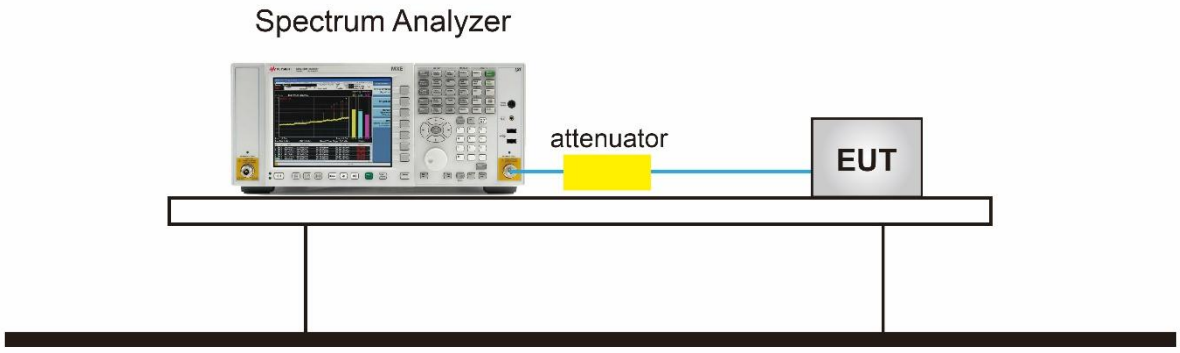
7.2.2.Test Procedure used

KDB 789033 D02v02r01- Section II)C.1) (26dB Bandwidth)
KDB 789033 D02v02r01- Section II)D) (99% Bandwidth)

7.2.3.Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. VBW ≥ 3×RBW.
4. Detector = Peak.
5. Trace mode = max hold.

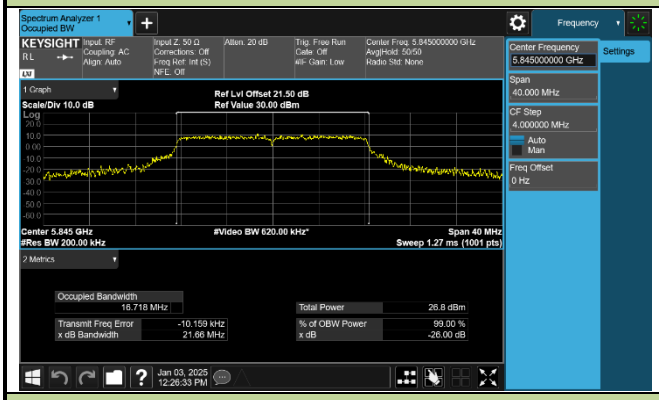
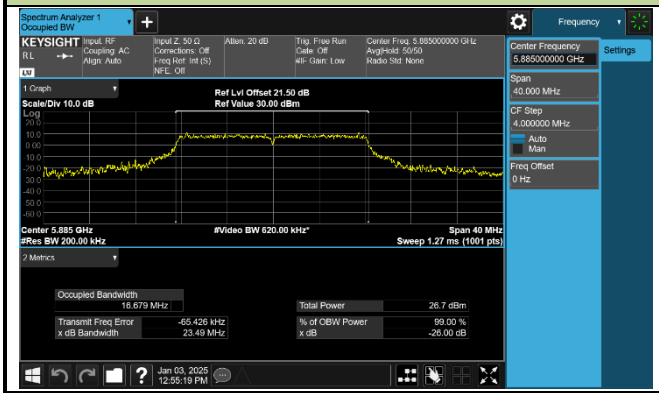
7.2.4.Test Setup

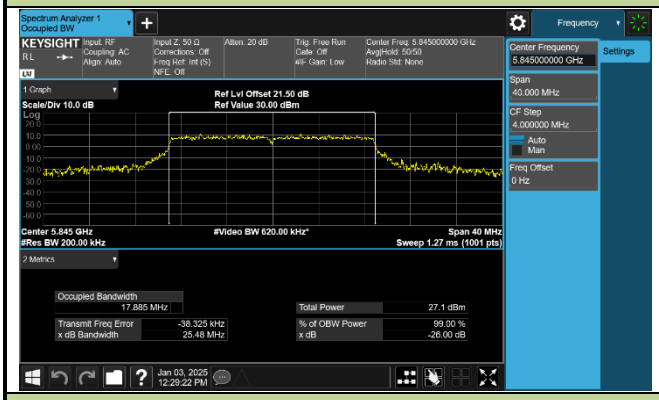
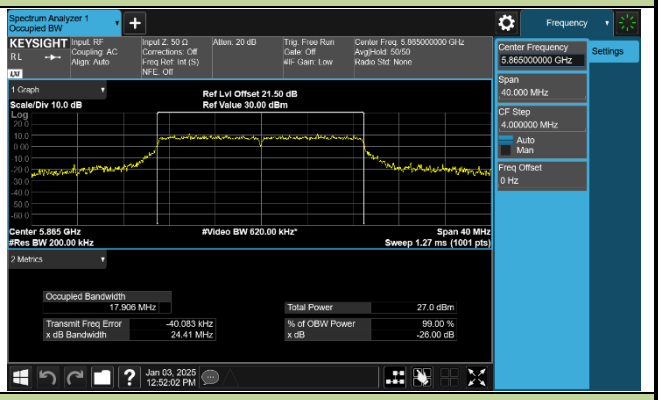
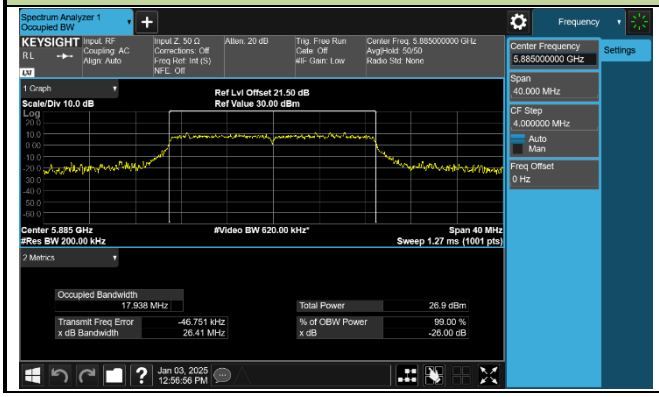


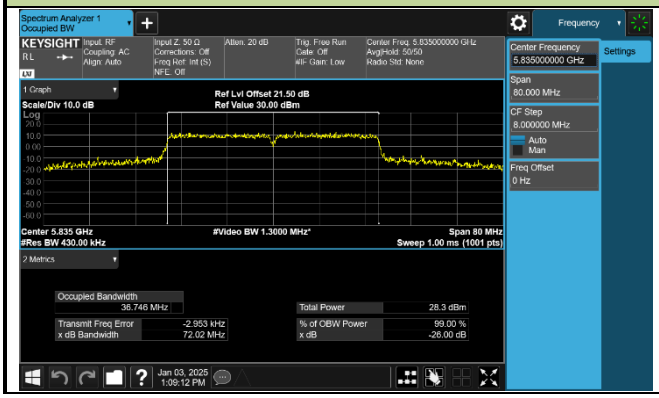
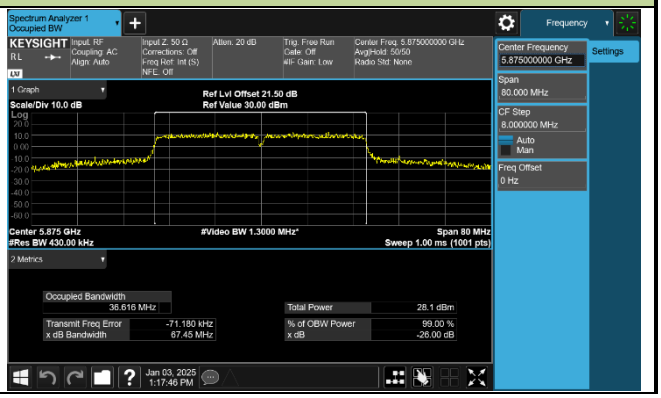
7.2.5.Test Result

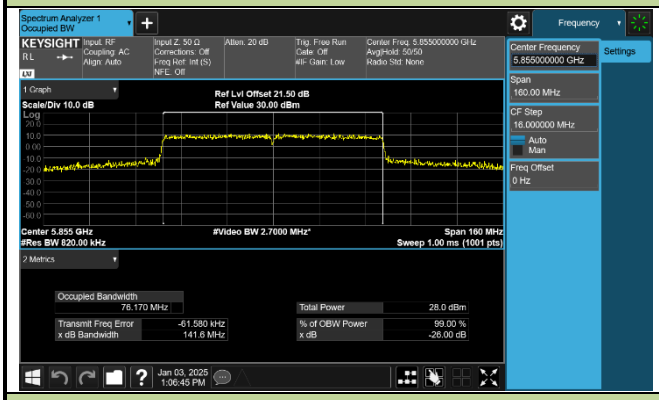
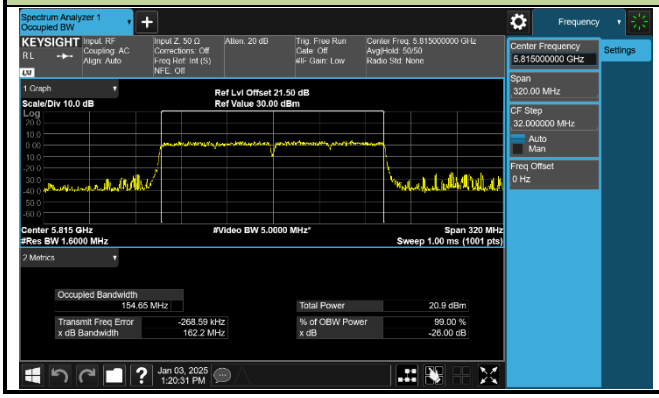
Product	BE3600 Wi-Fi 7 Range Extender, BE3200 Wi-Fi 7 Range Extender	Test Engineer	Peter
Test Site	SR6	Test Date	2025/1/3

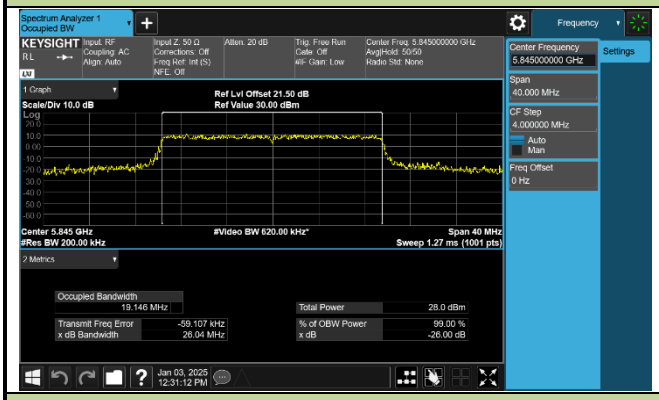
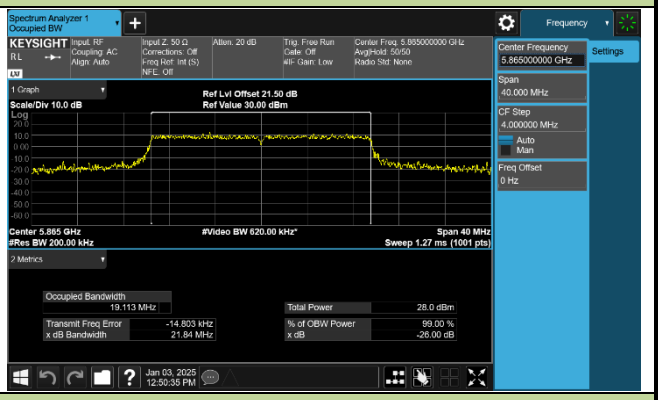
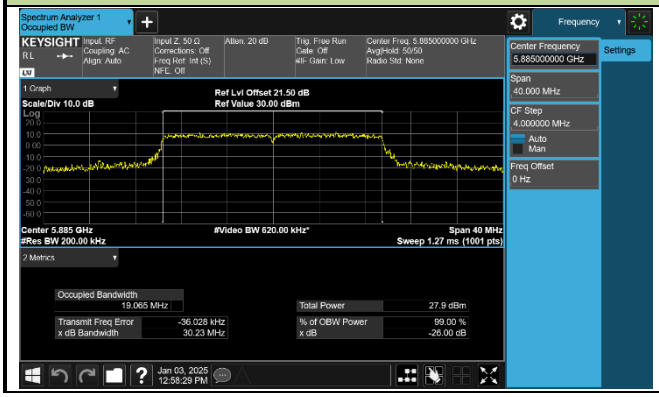
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Ant 1					
802.11a	6Mbps	169	5845	21.660	16.718
802.11a	6Mbps	173	5865	22.380	16.770
802.11a	6Mbps	177	5885	23.490	16.679
802.11ac-VHT20	MCS0	169	5845	25.480	17.885
802.11ac-VHT20	MCS0	173	5865	24.410	17.906
802.11ac-VHT20	MCS0	177	5885	26.410	17.938
802.11ac-VHT40	MCS0	167	5835	72.020	36.746
802.11ac-VHT40	MCS0	175	5875	67.450	36.616
802.11ac-VHT80	MCS0	171	5855	141.600	76.170
802.11ac-VHT160	MCS0	163	5815	162.200	154.650
802.11ax-HE20	MCS0	169	5845	26.040	19.146
802.11ax-HE20	MCS0	173	5865	21.840	19.113
802.11ax-HE20	MCS0	177	5885	30.230	19.065
802.11ax-HE40	MCS0	167	5835	70.150	38.026
802.11ax-HE40	MCS0	175	5875	63.560	37.970
802.11ax-HE80	MCS0	171	5855	122.200	77.691
802.11ax-HE160	MCS0	163	5815	162.800	156.450
802.11be-EHT20	MCS0	169	5845	26.130	19.095
802.11be-EHT20	MCS0	173	5865	26.900	19.061
802.11be-EHT20	MCS0	177	5885	29.050	19.156
802.11be-EHT40	MCS0	167	5835	70.170	38.108
802.11be-EHT40	MCS0	175	5875	66.440	38.097
802.11be-EHT80	MCS0	171	5855	126.000	77.570
802.11be-EHT160	MCS0	163	5815	162.300	156.310

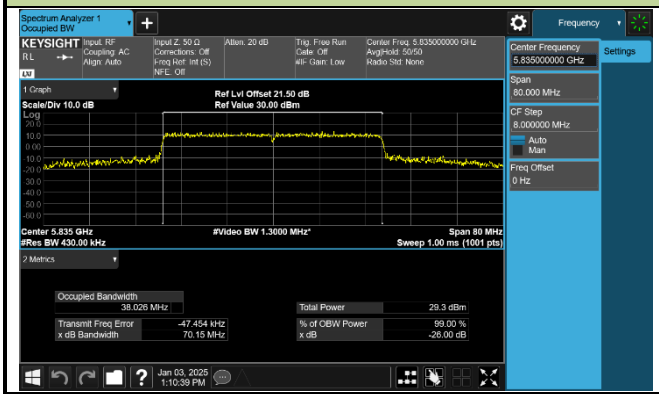
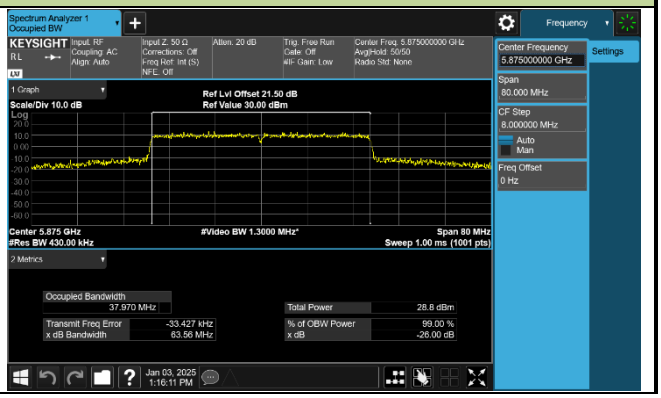
802.11a 26dB Bandwidth & 99% Bandwidth	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

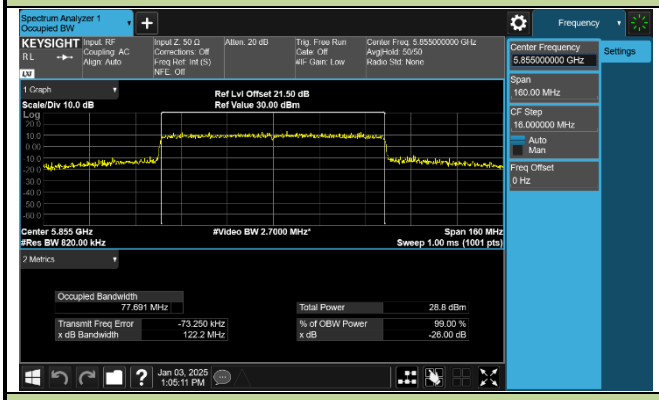
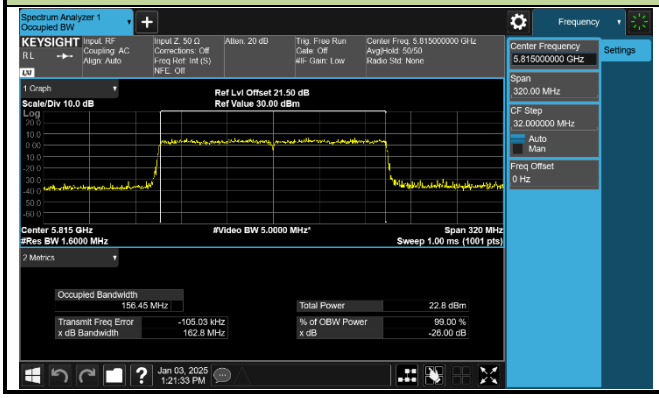
802.11ac-VHT20 26dB Bandwidth & 99% Bandwidth	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

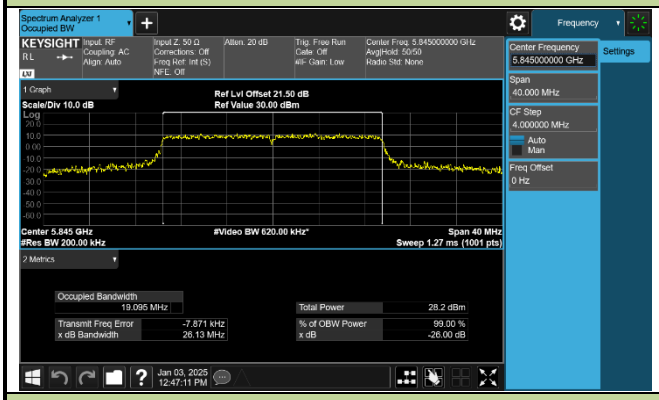
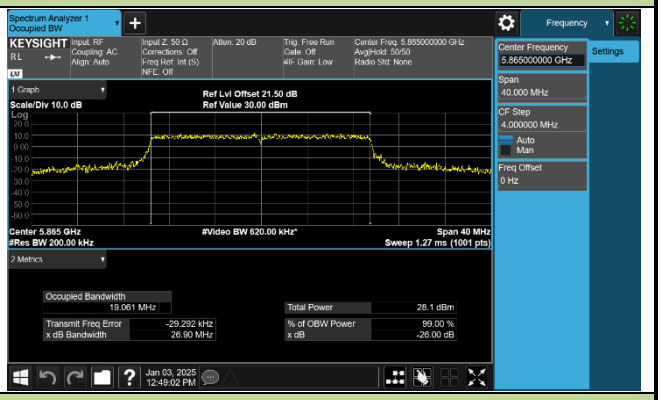
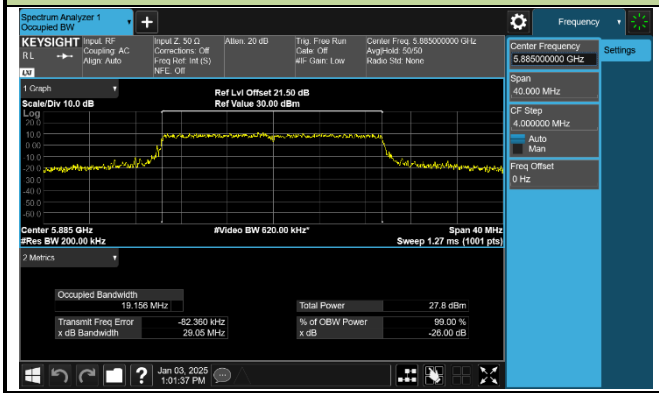
802.11ac-VHT40 26dB Bandwidth & 99% Bandwidth	
Channel 167 (5835MHz)	Channel 175 (5875MHz)
	

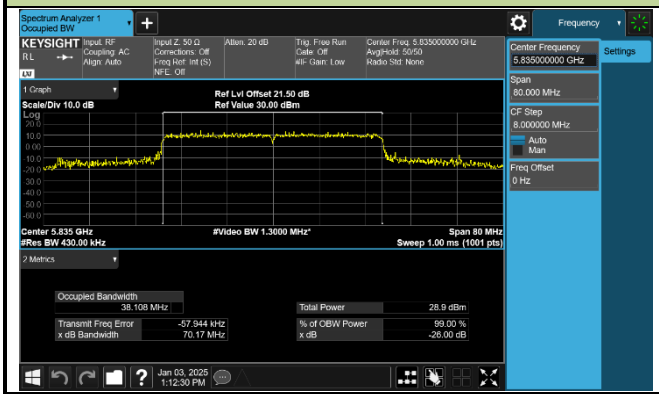
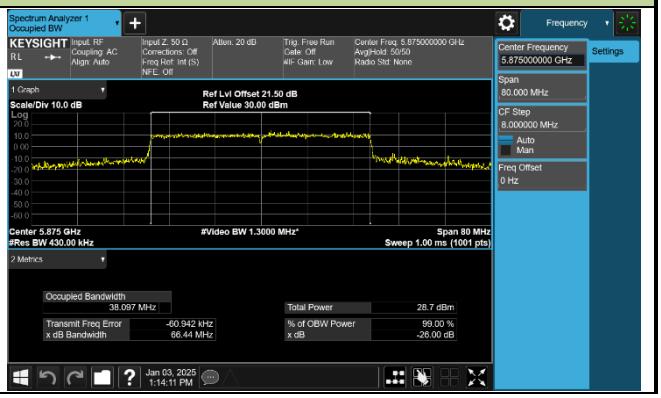
802.11ac-VHT80 26dB Bandwidth & 99% Bandwidth	
Channel 171 (5855MHz)	
	
802.11ac-VHT160 26dB Bandwidth & 99% Bandwidth	
Channel 163 (5815MHz)	
	

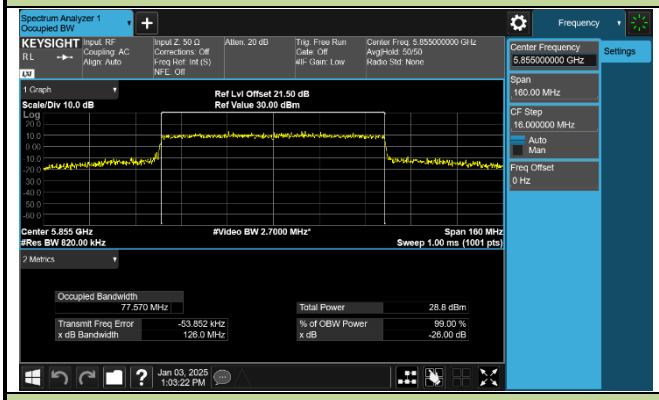
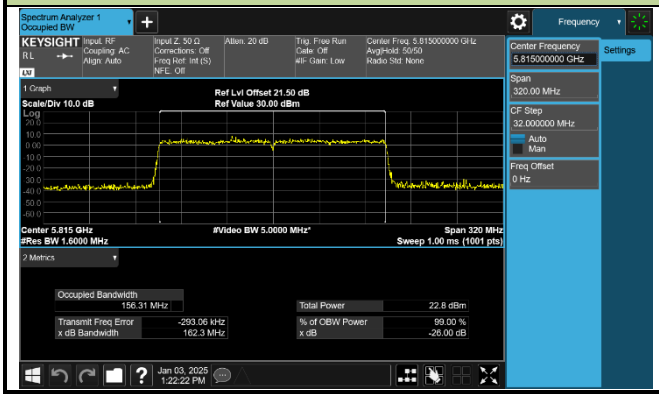
802.11ax-HE20 26dB Bandwidth & 99% Bandwidth	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

802.11 ax-HE40 26dB Bandwidth & 99% Bandwidth	
Channel 167 (5835MHz)	Channel 175 (5875MHz)
	

802.11 ax-HE80 26dB Bandwidth & 99% Bandwidth	
Channel 171 (5855MHz)	
	
802.11 ax-HE160 26dB Bandwidth & 99% Bandwidth	
Channel 163 (5815MHz)	
	

802.11be-EHT20 26dB Bandwidth & 99% Bandwidth	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

802.11be-EHT40 26dB Bandwidth & 99% Bandwidth	
Channel 167 (5835MHz)	Channel 175 (5875MHz)
	

802.11be-EHT80 26dB Bandwidth & 99% Bandwidth	
Channel 171 (5855MHz)	
	
802.11be-EHT160 26dB Bandwidth & 99% Bandwidth	
Channel 163 (5815MHz)	
	

7.3. 6dB Bandwidth Measurement

7.3.1.Test Limit

The minimum 6dBbandwidth shall be at least 500 kHz.

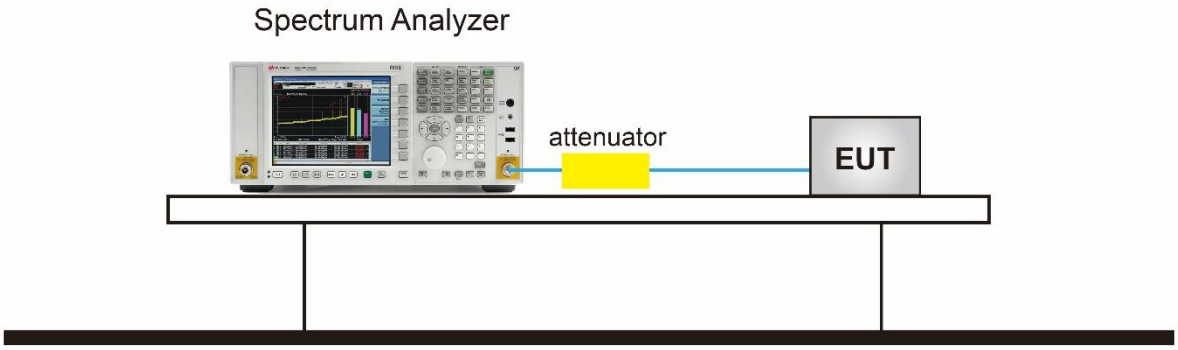
7.3.2.Test Procedure used

KDB 789033 D02v02r01- Section C.2

7.3.3.Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

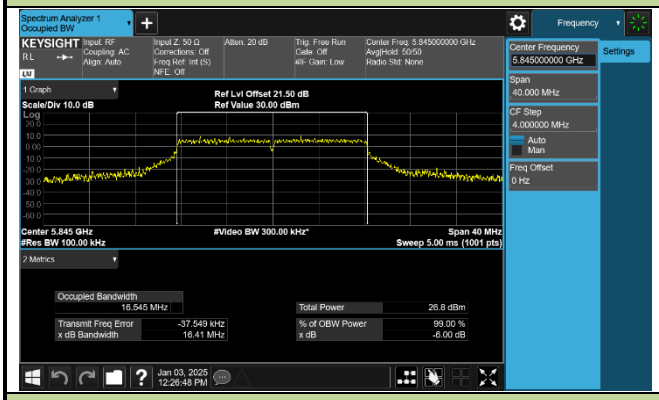
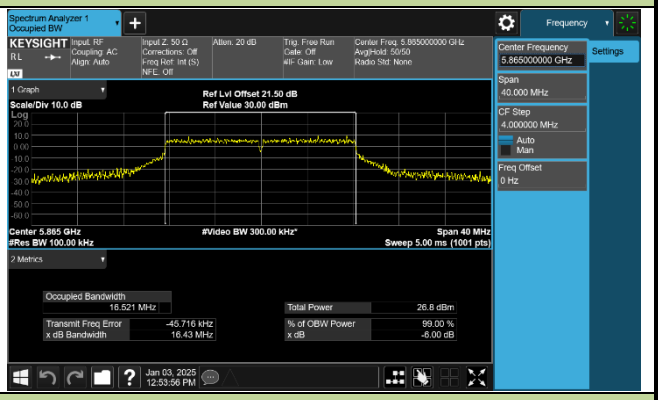
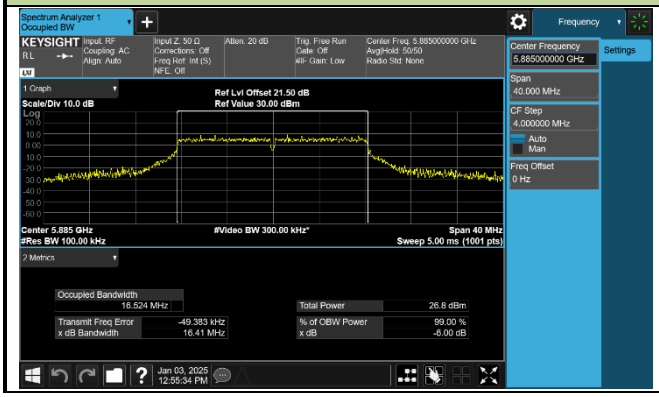
7.3.4.Test Setup

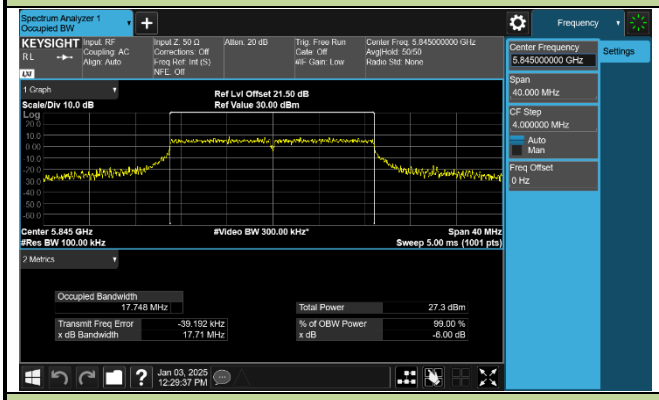
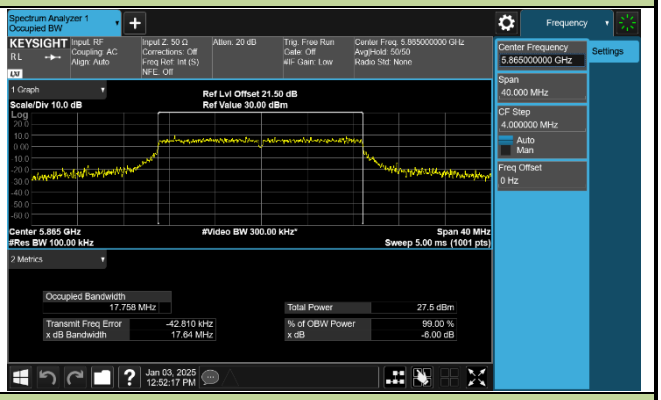
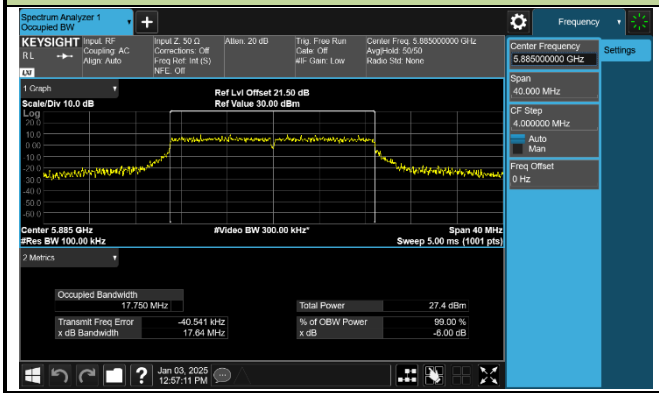


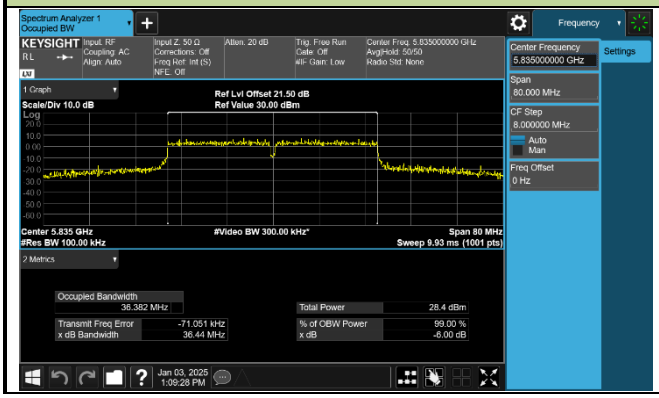
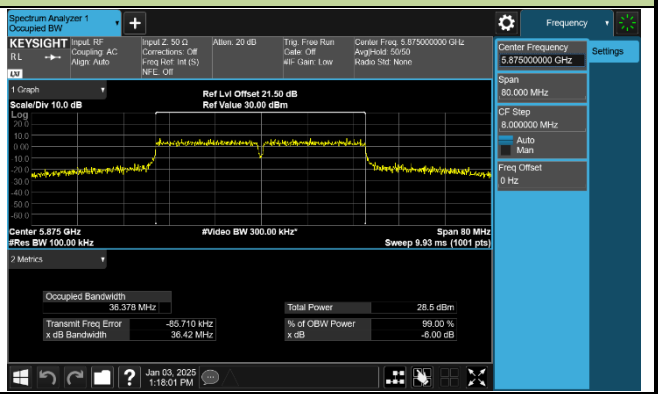
7.3.5.TestResult

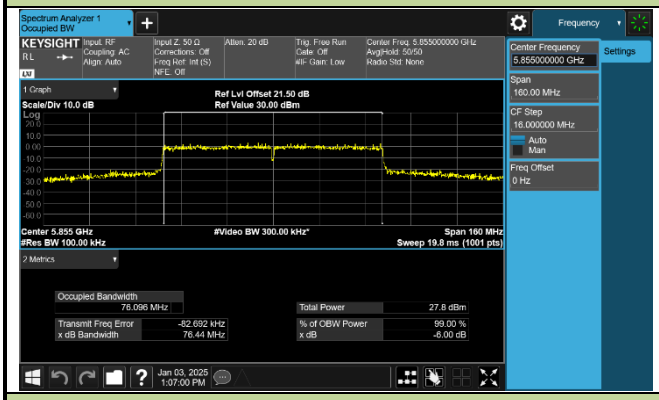
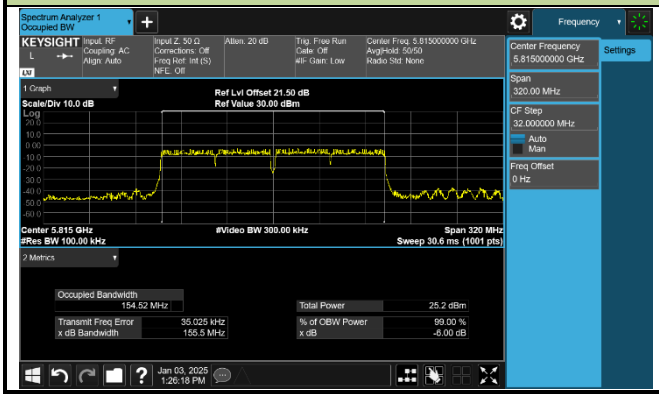
Product	BE3600 Wi-Fi 7 Range Extender, BE3200 Wi-Fi 7 Range Extender	Test Engineer	Peter
Test Site	SR6	Test Date	2025/1/3

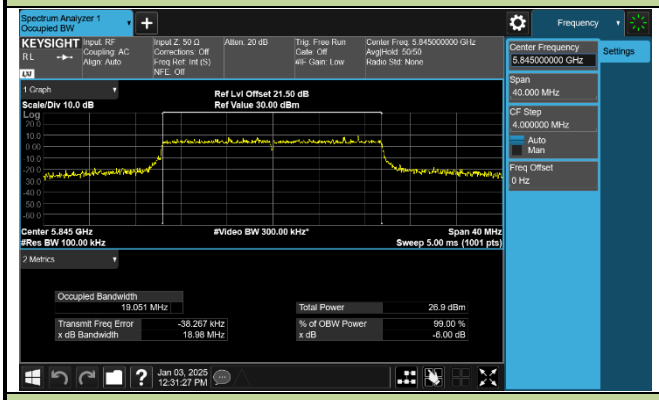
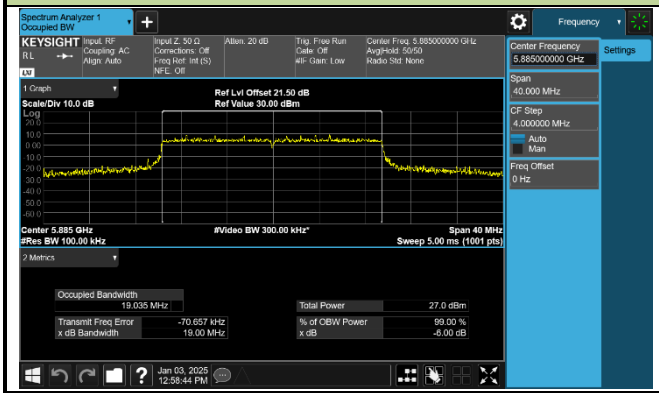
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 1						
802.11a	6Mbps	169	5845	16.410	≥ 0.5	Pass
802.11a	6Mbps	173	5865	16.430	≥ 0.5	Pass
802.11a	6Mbps	177	5885	16.410	≥ 0.5	Pass
802.11ac-VHT20	MCS0	169	5845	17.710	≥ 0.5	Pass
802.11ac-VHT20	MCS0	173	5865	17.640	≥ 0.5	Pass
802.11ac-VHT20	MCS0	177	5885	17.640	≥ 0.5	Pass
802.11ac-VHT40	MCS0	167	5835	36.440	≥ 0.5	Pass
802.11ac-VHT40	MCS0	175	5875	36.420	≥ 0.5	Pass
802.11ac-VHT80	MCS0	171	5855	76.440	≥ 0.5	Pass
802.11ac-VHT160	MCS0	163	5815	155.500	≥ 0.5	Pass
802.11ax-HE20	MCS0	169	5845	18.980	≥ 0.5	Pass
802.11ax-HE20	MCS0	173	5865	18.810	≥ 0.5	Pass
802.11ax-HE20	MCS0	177	5885	19.000	≥ 0.5	Pass
802.11ax-HE40	MCS0	167	5835	37.590	≥ 0.5	Pass
802.11ax-HE40	MCS0	175	5875	37.740	≥ 0.5	Pass
802.11ax-HE80	MCS0	171	5855	77.320	≥ 0.5	Pass
802.11ax-HE160	MCS0	163	5815	156.100	≥ 0.5	Pass
802.11be-EHT20	MCS0	169	5845	18.940	≥ 0.5	Pass
802.11be-EHT20	MCS0	173	5865	19.000	≥ 0.5	Pass
802.11be-EHT20	MCS0	177	5885	18.990	≥ 0.5	Pass
802.11be-EHT40	MCS0	167	5835	37.470	≥ 0.5	Pass
802.11be-EHT40	MCS0	175	5875	37.660	≥ 0.5	Pass
802.11be-EHT80	MCS0	171	5855	77.650	≥ 0.5	Pass
802.11be-EHT160	MCS0	163	5815	157.100	≥ 0.5	Pass

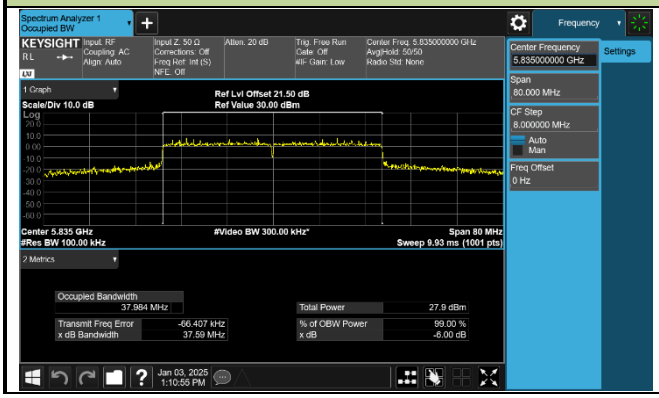
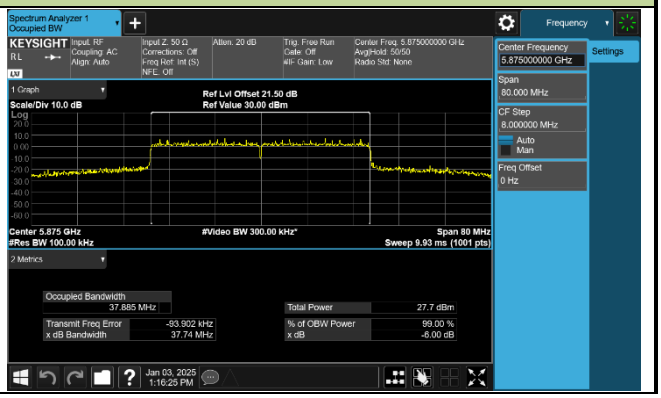
802.11a 6dB Bandwidth	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

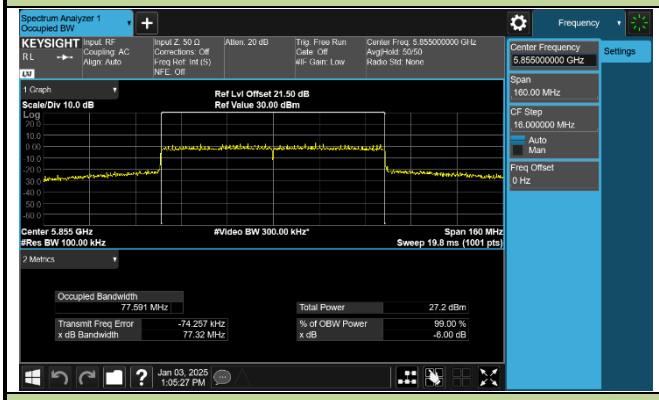
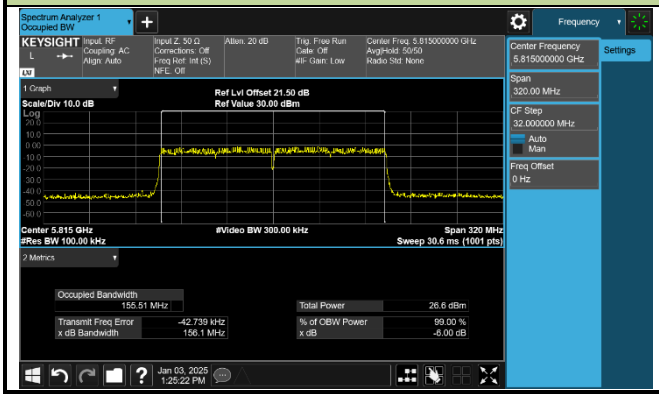
802.11ac-VHT20 6dB Bandwidth	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

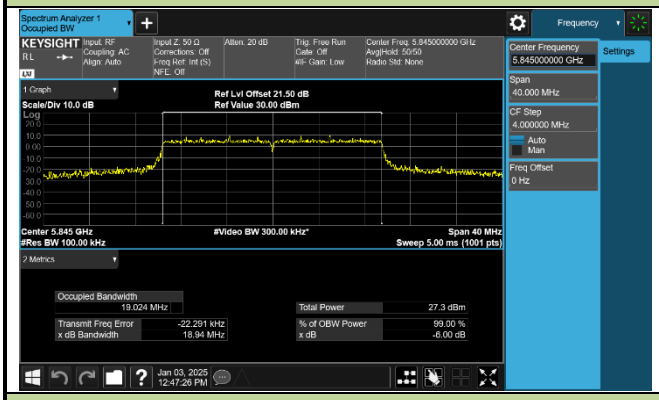
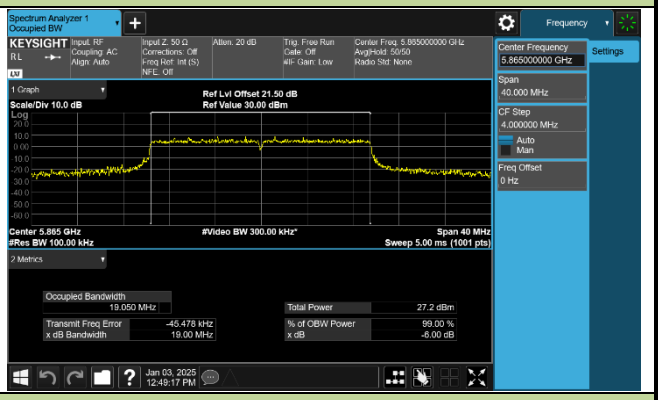
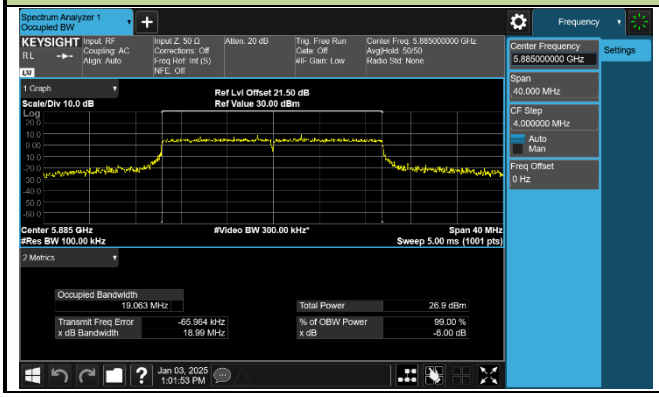
802.11ac-VHT40 6dB Bandwidth	
Channel 167 (5835MHz)	Channel 175 (5875MHz)
	

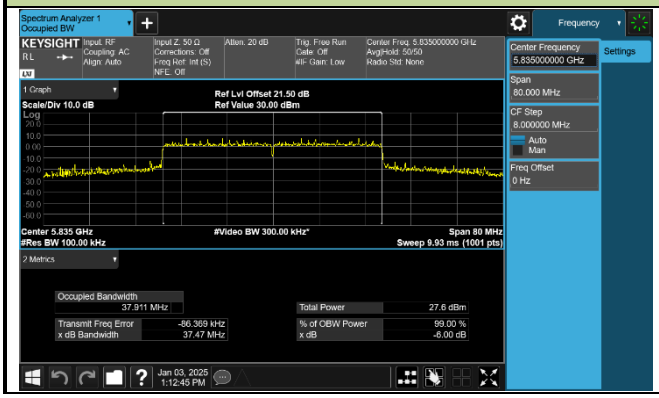
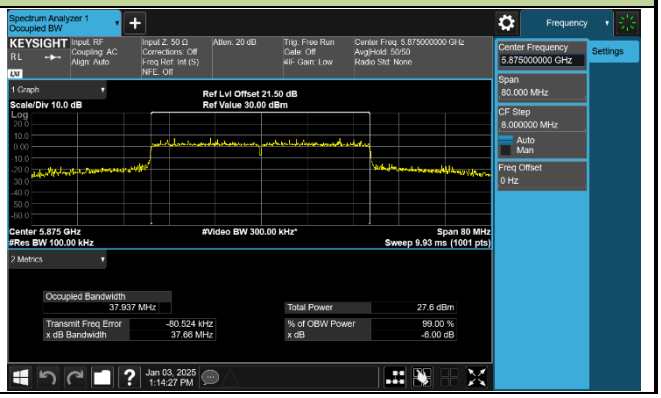
802.11ac-VHT80 6dB Bandwidth	
Channel 171 (5855MHz)	
	
802.11ac-VHT160 6dB Bandwidth	
Channel 163 (5815MHz)	
	

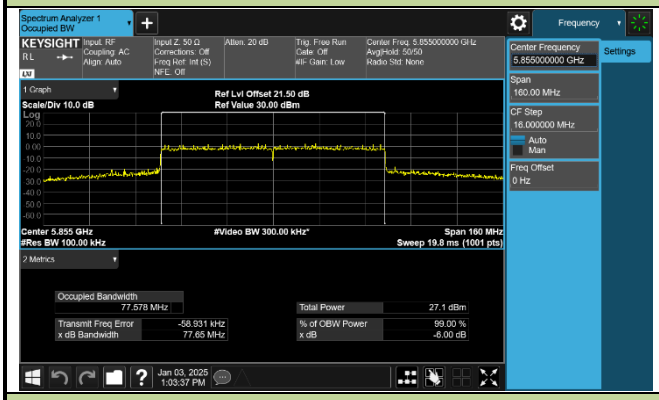
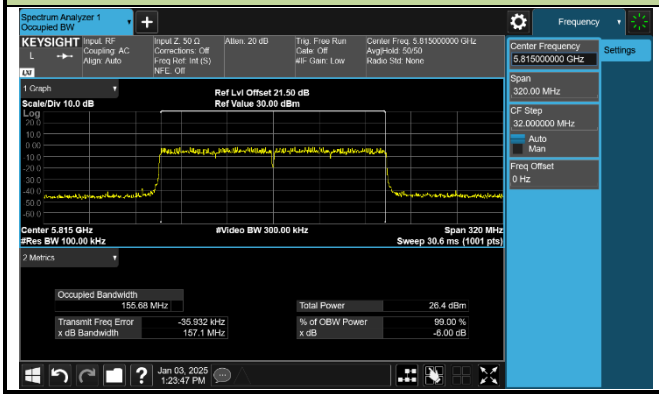
802.11ax-HE20 6dB Bandwidth	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

802.11 ax-HE40 6dB Bandwidth	
Channel 167 (5835MHz)	Channel 175 (5875MHz)
	

802.11 ax-HE80 6dB Bandwidth	
Channel 171 (5855MHz)	
	
802.11 ax-HE160 6dB Bandwidth	
Channel 163 (5815MHz)	
	

802.11be-EHT20 6dB Bandwidth	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

802.11be-EHT40 6dB Bandwidth	
Channel 167 (5835MHz)	Channel 175 (5875MHz)
	

802.11be-EHT80 6dB Bandwidth	
Channel 171 (5855MHz)	
	
802.11be-EHT160 6dB Bandwidth	
Channel 163 (5815MHz)	
	

7.4. Output Power Measurement

7.4.1.Test Limit

For an indoor access point operating in the 5.850-5.895 GHz band, the maximum e.i.r.p. over the frequency band of operation must not exceed 36 dBm. Indoor access points operating on a channel that spans the 5.725-5.850 GHz and 5.850-5.895 GHz bands must not exceed an e.i.r.p. of 36 dBm.

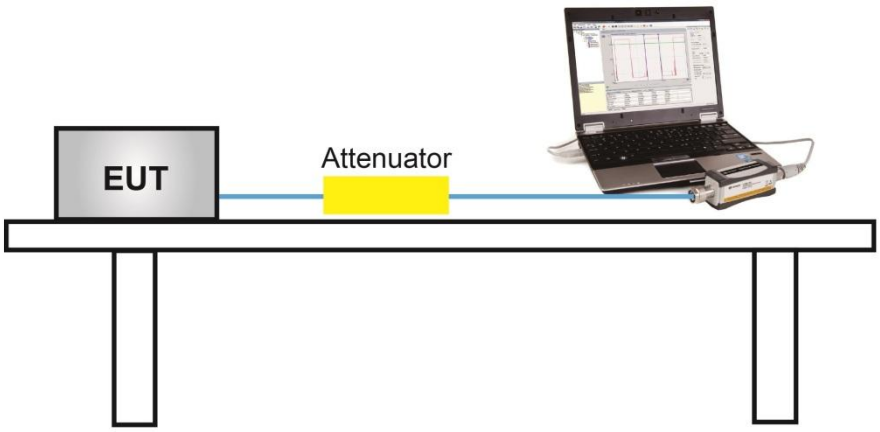
7.4.2.Test Procedure Used

KDB 789033D02v02r01- Section E)3)b) Method PM-G

7.4.3.Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

7.4.4.Test Setup



7.4.5.Test Result

Product	BE3600 Wi-Fi 7 Range Extender, BE3200 Wi-Fi 7 Range Extender	Test Engineer	Peter
Test Site	SR6	Test Date	2025/1/3
Test Mode	CDD Mode		

Test Mode	Data Rate	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Ant Gain (dBi)	EIRP Power (dBm)	EIRP Limit (dBm)	Result
11a	6Mbps	169	5845	22.36	22.94	4.98	30.65	≤ 36.00	Pass
11a	6Mbps	173	5865	22.45	22.97	4.98	30.71	≤ 36.00	Pass
11a	6Mbps	177	5885	22.32	22.83	4.98	30.57	≤ 36.00	Pass
11ac-VHT20	MCS0	169	5845	22.77	23.64	4.98	31.22	≤ 36.00	Pass
11ac-VHT20	MCS0	173	5865	22.49	23.36	4.98	30.94	≤ 36.00	Pass
11ac-VHT20	MCS0	177	5885	22.85	23.21	4.98	31.02	≤ 36.00	Pass
11ac-VHT40	MCS0	167	5835	23.80	24.54	4.98	32.18	≤ 36.00	Pass
11ac-VHT40	MCS0	175	5875	23.80	24.62	4.98	32.22	≤ 36.00	Pass
11ac-VHT80	MCS0	171	5855	23.65	24.43	4.98	32.05	≤ 36.00	Pass
11ac-VHT160	MCS0	163	5815	16.30	17.11	4.98	24.71	≤ 36.00	Pass
11ax-HE20	MCS0	169	5845	22.96	23.74	4.98	31.36	≤ 36.00	Pass
11ax-HE20	MCS0	173	5865	23.12	23.75	4.98	31.44	≤ 36.00	Pass
11ax-HE20	MCS0	177	5885	22.99	23.68	4.98	31.34	≤ 36.00	Pass
11ax-HE40	MCS0	167	5835	23.76	24.47	4.98	32.12	≤ 36.00	Pass
11ax-HE40	MCS0	175	5875	23.84	24.38	4.98	32.11	≤ 36.00	Pass
11ax-HE80	MCS0	171	5855	23.73	24.51	4.98	32.13	≤ 36.00	Pass
11ax-HE160	MCS0	163	5815	18.25	18.63	4.98	26.43	≤ 36.00	Pass
11be-EHT20	MCS0	169	5845	22.82	23.61	4.98	31.22	≤ 36.00	Pass
11be-EHT20	MCS0	173	5865	23.04	23.65	4.98	31.35	≤ 36.00	Pass
11be-EHT20	MCS0	177	5885	22.99	23.51	4.98	31.25	≤ 36.00	Pass
11be-EHT40	MCS0	167	5835	23.83	24.50	4.98	32.17	≤ 36.00	Pass
11be-EHT40	MCS0	175	5875	23.89	24.33	4.98	32.11	≤ 36.00	Pass
11be-EHT80	MCS0	171	5855	23.86	24.53	4.98	32.20	≤ 36.00	Pass
11be-EHT160	MCS0	163	5815	18.43	18.80	4.98	26.61	≤ 36.00	Pass

Note 1: EIRP = $10*\log\{10^{(\text{Ant 0 Average Power }/10)} + 10^{(\text{Ant 1 Average Power }/10)}\}$ + Antenna gain (dBi).

7.5. Power Spectral Density Measurement

7.5.1.Test Limit

For an indoor access point operating in the 5.850-5.895 GHz band, the maximum power spectral density must not exceed 20 dBm e.i.r.p. in any 1-megahertz band.

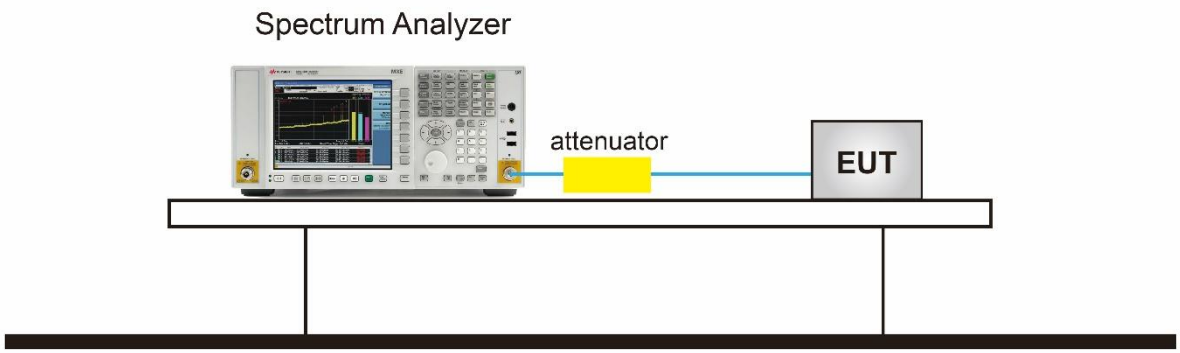
7.5.2.Test Procedure Used

KDB 789033 D02v02r01-SectionF

7.5.3.Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz
4. VBW = 3MHz
5. Number of sweep points ≥ 2 × (span / RBW)
6. Detector = power averaging (Average)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add 10*log(1/x), where x is the duty cycle, to the measured power in order 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 percent.

7.5.4.Test Setup



7.5.5.Test Result

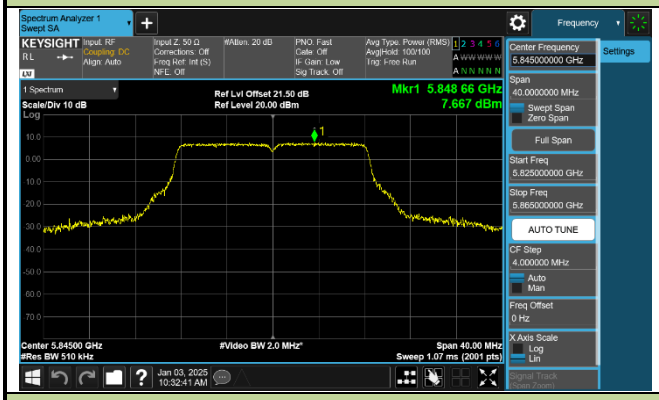
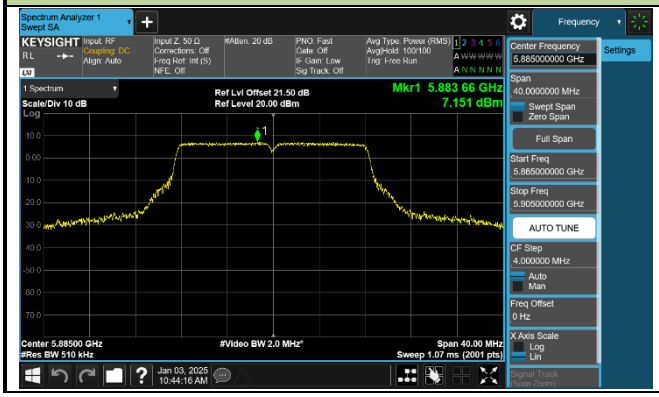
Product	BE3600 Wi-Fi 7 Range Extender, BE3200 Wi-Fi 7 Range Extender	Test Engineer	Peter
Test Site	SR6	Test Date	2025/1/3
Mode	Power Spectral Density (U-NII- 1) CDD Mode		

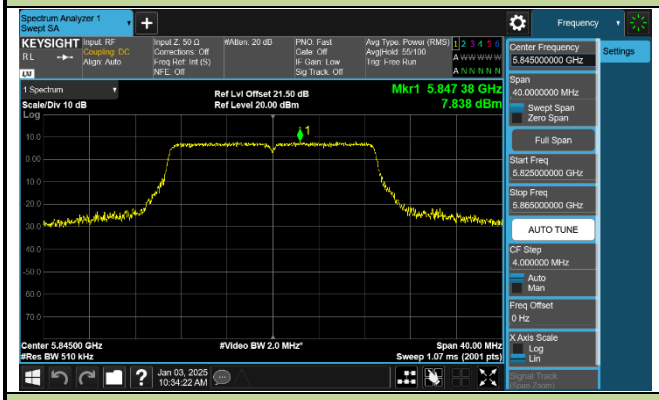
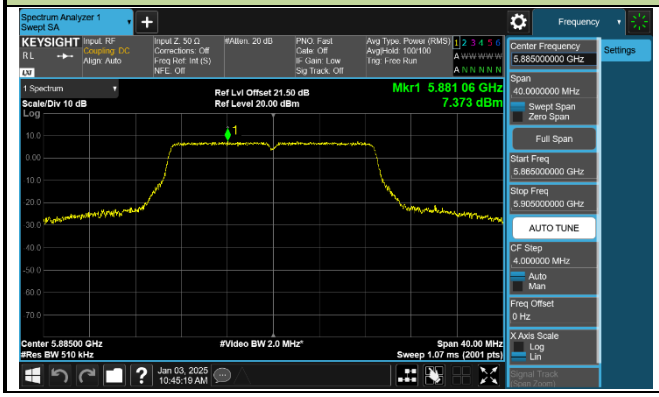
Test Mode	Data Rate/ MCS	Ch. No.	Freq. (MHz)	Ant 0 PSD (dBm/MHz)	Ant 1 PSD (dBm/MHz)	Duty Cycle (%)	Ant Gain (dBi)	Total PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
11a	6Mbps	169	5845	7.667	8.109	97.65%	6.02	17.027	≤20.00	Pass
11a	6Mbps	173	5865	7.310	8.023	97.65%	6.02	16.815	≤20.00	Pass
11a	6Mbps	177	5885	7.151	8.015	97.65%	6.02	16.738	≤20.00	Pass
11ac-VHT20	MCS0	169	5845	7.838	8.520	98.30%	6.02	17.297	≤20.00	Pass
11ac-VHT20	MCS0	173	5865	7.747	8.534	98.30%	6.02	17.263	≤20.00	Pass
11ac-VHT20	MCS0	177	5885	7.373	8.138	98.30%	6.02	16.877	≤20.00	Pass
11ac-VHT40	MCS0	167	5835	5.485	6.530	98.30%	6.02	15.144	≤20.00	Pass
11ac-VHT40	MCS0	175	5875	5.264	6.175	98.30%	6.02	14.848	≤20.00	Pass
11ac-VHT80	MCS0	171	5855	2.299	3.621	96.84%	6.02	12.180	≤20.00	Pass
11ac-VHT160	MCS0	163	5815	-7.342	-6.289	97.38%	6.02	2.362	≤20.00	Pass
11ax-HE20	MCS0	169	5845	7.708	8.313	97.65%	6.02	17.155	≤20.00	Pass
11ax-HE20	MCS0	173	5865	7.659	8.078	97.65%	6.02	17.007	≤20.00	Pass
11ax-HE20	MCS0	177	5885	7.853	8.239	97.48%	6.02	17.191	≤20.00	Pass
11ax-HE40	MCS0	167	5835	5.809	6.769	97.48%	6.02	15.457	≤20.00	Pass
11ax-HE40	MCS0	175	5875	5.381	6.339	97.48%	6.02	15.028	≤20.00	Pass
11ax-HE80	MCS0	171	5855	2.864	3.562	97.56%	6.02	12.365	≤20.00	Pass
11ax-VHT160	MCS0	163	5815	-5.216	-4.801	98.25%	6.02	4.103	≤20.00	Pass
11be-EHT20	MCS0	169	5845	7.590	8.651	97.79%	6.02	17.280	≤20.00	Pass
11be-EHT20	MCS0	173	5865	7.845	8.650	97.79%	6.02	17.393	≤20.00	Pass
11be-EHT20	MCS0	177	5885	7.199	8.100	97.79%	6.02	16.800	≤20.00	Pass
11be-EHT40	MCS0	167	5835	5.244	6.037	97.18%	6.02	14.813	≤20.00	Pass
11be-EHT40	MCS0	175	5875	5.455	6.224	97.18%	6.02	15.011	≤20.00	Pass
11be-EHT80	MCS0	171	5855	3.096	3.619	97.35%	6.02	12.512	≤20.00	Pass
11be-EHT160	MCS0	163	5815	-5.130	-4.722	98.03%	6.02	4.195	≤20.00	Pass

Note 1: The total PSD (dBm/MHz) = 10*log {$10^{(\text{Ant 0 PSD}/10)}$ + $10^{(\text{Ant 1 PSD}/10)}$} + 10*log (1/Duty Cycle) (dBm/MHz).

Note 2: EIRP PSD (dBm/MHz) = Total PSD (dBm/MHz) + Antenna Gain (dBi).

Note 3: For Channels span the 5.725-5.850 GHz and 5.850-5.895 GHz bands, we record the maximum level of 5.725-5.850 GHz and 5.850-5.895 GHz with RBW=1MHz, and the level complied with the 5.850-5.895 GHz EIRP PSD Limit.

802.11a Power Spectral Density - Ant 0	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

802.11ac-VHT20 Power Spectral Density - Ant 0	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)	
	

802.11ac-VHT40 Power Spectral Density - Ant 0	
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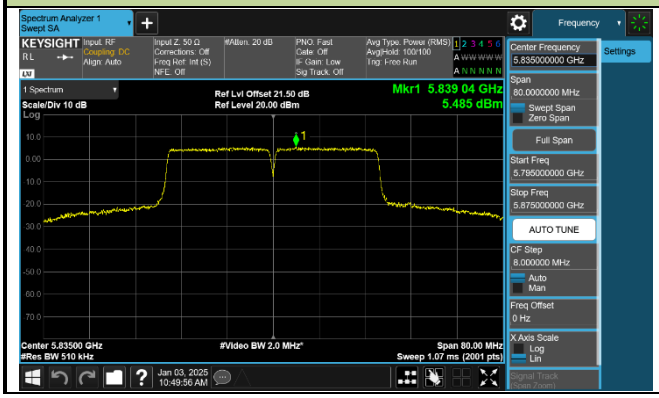
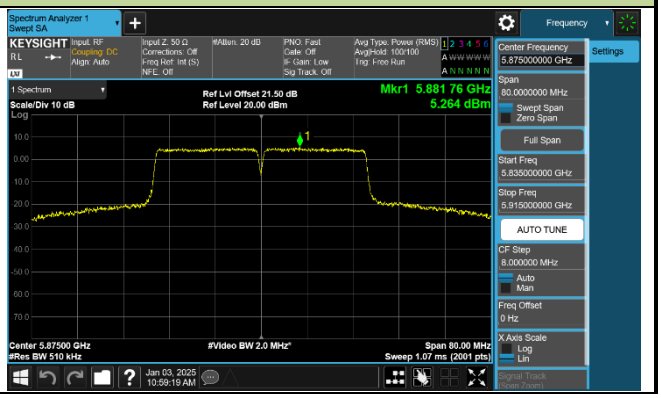
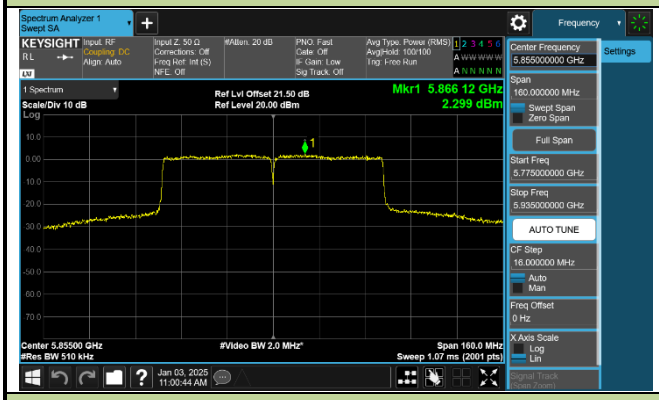
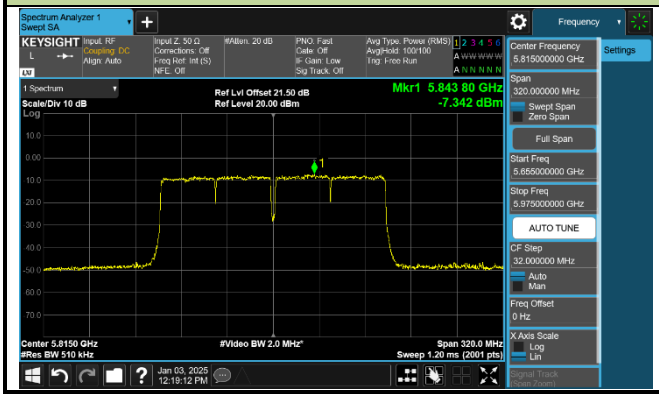
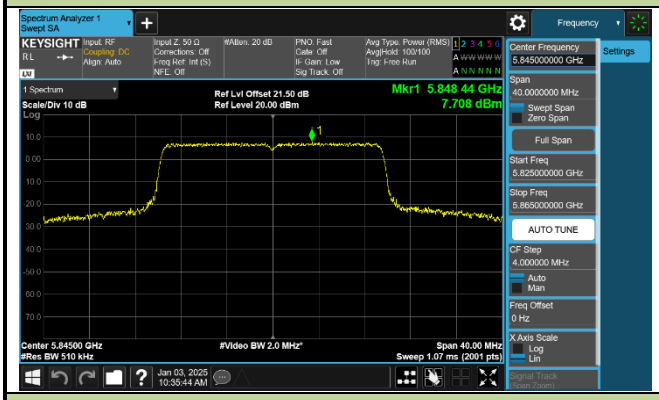
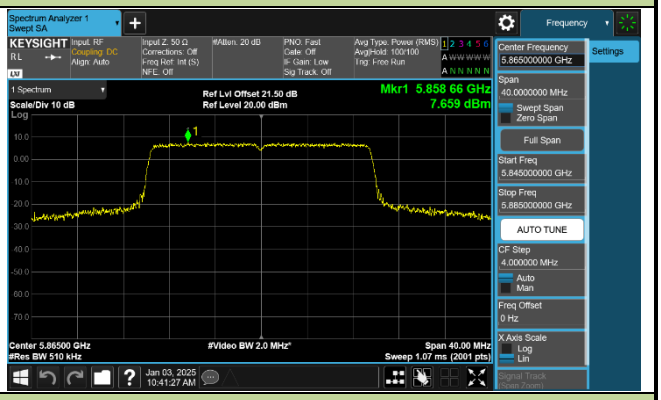
	

802.11ac-VHT80 Power Spectral Density - Ant 0	
Channel 171 (5855MHz)	
	
802.11ac-VHT160 Power Spectral Density - Ant 0	
Channel 163 (5815MHz)	
	

802.11ax-HE20 Power Spectral Density - Ant 0	
Channel 169 (5845MHz)	Channel 173 (5865MHz)
	
Channel 177 (5885MHz)