TEST REPORT

Applicant Name:	FCC: SweatWorks LLC IC: BB & NE Co Pty Ltd
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Report Number:	2501R30997E-RFD
FCC ID:	2BFH9-SW01A
IC:	33730-SW01A

Test Standard (s)

FCC PART 15.407; RSS-GEN ISSUE 5, FEBRUARY 2021 AMENDMENT 2;
RSS-247 ISSUE 3, AUGUST 2023

Sample Description

Product Type:	21.5″ CONSOLE
Model No.:	SW01A
Multiple Model(s) No.:	N/A
Trade Mark:	YOUR REFORMER
Date Received:	2025-04-01
Issue Date:	2025-05-16

Test Result:	Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

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Allen Bai
RF Engineer

Approved By:

Nancy Wang

Nancy Wang
RF Supervisor

Note: The information marked# is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2501R30997E-RF-00D	Original Report	2025-05-16

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

HVIN	SW01A
FVIN	SW01A
Frequency Range	5150-5250MHz; 5725-5850MHz
Mode	802.11a/n20/n40/ac20/ac40/ac80
Maximum Conducted Average Output Power	5150-5250MHz: 13.35dBm; 5725-5850MHz: 11.00dBm
EIRP	5150-5250MHz: 15.02dBm
Modulation Technique	OFDM
Antenna Specification#	5150-5250MHz: 1.67dBi; 5725-5850MHz: 2.49dBi (provided by the applicant)
Voltage Range	DC 12V from adapter
Sample serial number	30PG-2 for Conducted and Radiated Emissions Test 30PG-1 for RF Conducted Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	Model:J652-1205000DI Input:100-240V~50/60Hz 1.7A Output:12.0V ⎓5.0A 60.0W

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules and RSS-GEN Issue 5, February 2021 Amendment 2 and RSS-247 Issue 3, August 2023 of the Innovation, Science and Economic Development Canada rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2020, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and RSS-GEN Issue 5, February 2021 Amendment 2 and RSS-247 Issue 3, August 2023.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		109.2kHz(k=2, 95% level of confidence)
RF Frequency		56.6Hz(k=2, 95% level of confidence)
RF output power, conducted		0.86dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.60dB(k=2, 95% level of confidence)
Power Spectral Density		0.90dB(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9kHz-150kHz	3.63dB(k=2, 95% level of confidence)
	150kHz-30MHz	3.66dB(k=2, 95% level of confidence)
Radiated Emissions	9kHz - 30MHz	3.60dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	5.32dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	5.43dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	5.77dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.73dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.34dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.40dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.64dB(k=2, 95% level of confidence)
Temperature		±1℃
Humidity		±1%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 715558, the FCC Designation No. : CN5045.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0023.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacturer.

For 5150-5250MHz Band, 7 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240
42	5210	/	/

For 802.11a/ac20 mode: channel 36, 40, 48 were tested;
For 802.11ac40 mode: channel 38, 46 were tested;
For 802.11ac80 mode, channel 42 was tested.

For 5725-5850MHz Band, 8 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785
151	5755	159	5795
153	5765	161	5805
155	5775	165	5825

For 802.11a/ac20 mode: channel 149, 157, 165 were tested;
For 802.11ac40 mode: channel 151, 159 were tested;
For 802.11ac80 mode, channel 155 was tested.

EUT Exercise Software

Exercise Software#	Engineering mode		
5150-5250 MHz Band			
Mode	**Test Channels**	**Data rate**	**Power Level#**
802.11a	Low	6Mbps	17
	Middle	6Mbps	17
	High	6Mbps	17
802.11ac-VHT20	Low	MCS0	17
	Middle	MCS0	17
	High	MCS0	17
802.11ac-VHT40	Low	MCS0	14
	High	MCS0	14
802.11ac-VHT80	Middle	MCS0	14

5725-5850 MHz Band			
Mode	Test Channels	Data rate	Power Level#
			ANT 1
802.11a	Low	6Mbps	17
	Middle	6Mbps	17
	High	6Mbps	17
802.11ac-VHT20	Low	MCS0	17
	Middle	MCS0	17
	High	MCS0	17
802.11ac-VHT40	Low	MCS0	17
	High	MCS0	17
802.11ac-VHT80	Middle	MCS0	17

Note:
1. The worst-case data rates are determined to be as follows for each mode based upon inverstigation by measuring the power and PSD across all data rates bandwidths, and modulations.
2. The n20/n40 mode was reduced test as identical parameter with ac20/ac40 mode.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

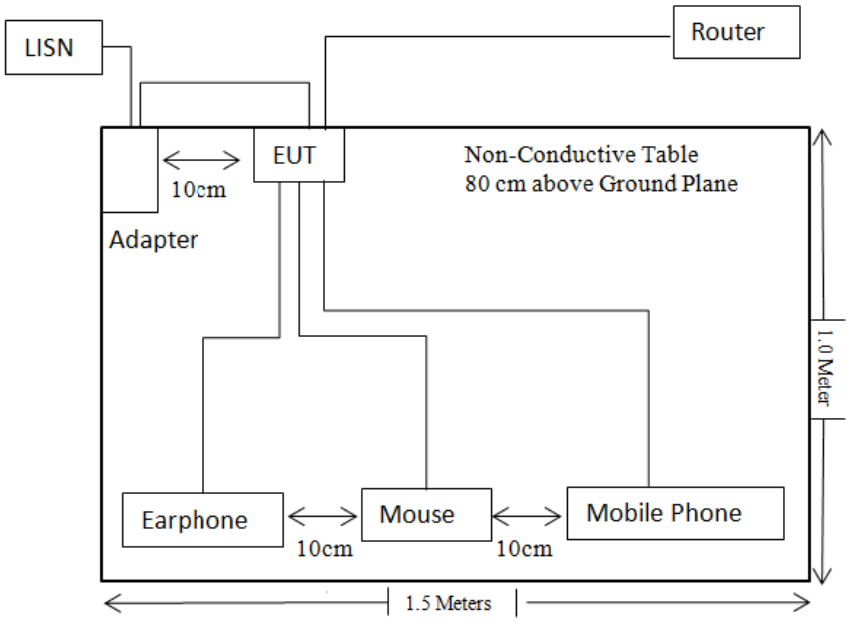
Manufacturer	Description	Model	Serial Number
OUPU	Receptacle	PDU-OP1606K	6971041358020
Honor	Mobilephone	CHL-AL00	Unknown
TP-LINK	Router	TL-R406	Unknown
Dell	Mouse	MS116T	Unknown
Vivo	Earphone	XE160	Unknown

External I/O Cable

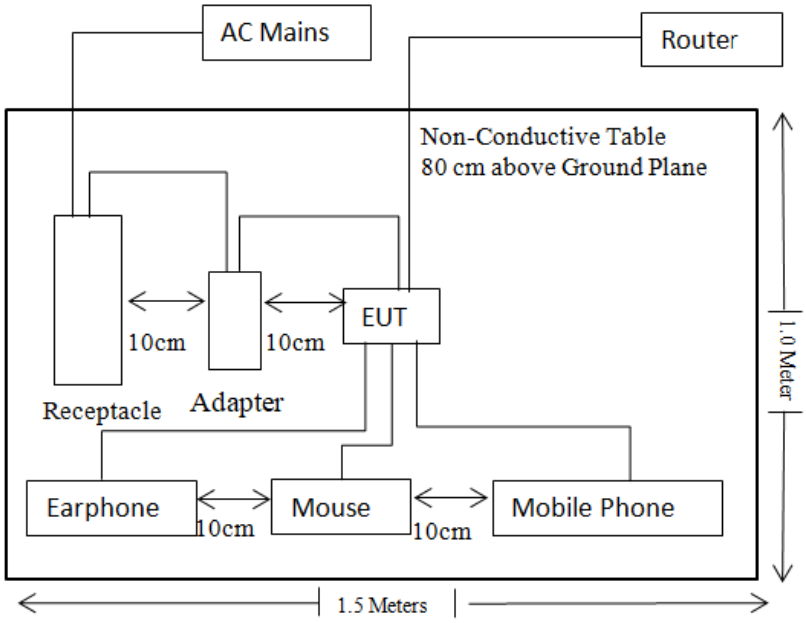
Cable Description	Length (m)	From Port	To
Unshielded Un-detachable AC Cable	1.2	Receptacle	AC Mains
Shielded Un-detachable DC Cable	1.2	EUT	Adapter
Unshielded Detachable AC Cable	1.5	Adapter	LISN/Receptacle
Unshielded Detachable USB Cable	1.2	EUT	Mobile phone
Unshielded Un-detachable USB Cable	1.5	EUT	Mouse
Unshielded Un-detachable Audio Cable	1.0	EUT	Earphone
Unshielded Detachable RJ45 Cable	10.0	EUT	Router

Block Diagram of Test Setup

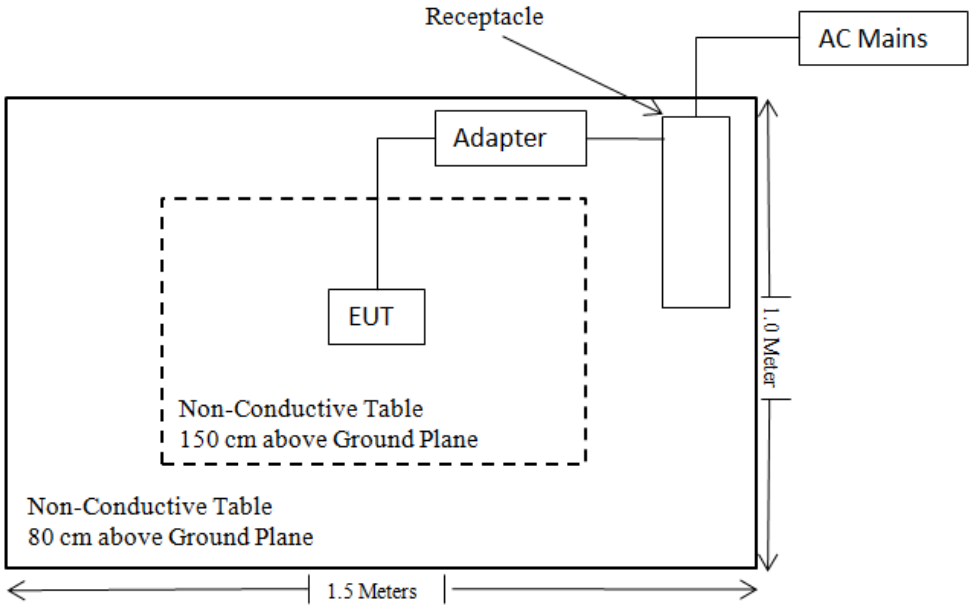
For Conducted Emissions:



For Radiated Emissions below 1GHz:



For Radiated Emissions above 1GHz:



SUMMARY OF TEST RESULTS

FCC Rules	RSS-247 & RSS-Gen & RSS-102 Rules	Description of Test	Result
FCC §1.1307 (b) & §2.1091	/	MPE-Based Exemption	Compliant
/	RSS-102 § 6.6	Field reference level exposure exemption limits	Compliant
FCC §15.203	RSS-Gen §6.8	Antenna Requirement	Compliant
FCC §15.207(a)	RSS-Gen §8.8	Conducted Emissions	Compliant
FCC §15.205& §15.209 &§15.407(b)	RSS-Gen §8.10&RSS-247§6.2	Undesirable Emission& Restricted Bands	Compliant
FCC §15.407(a) (e)	RSS- Gen§6.7, RSS-247 § 6.2	Emission Bandwidth & 99% Bandwidth	Compliant
FCC §15.407(a)	RSS-247 §6.2	Conducted Transmitter Output Power	Compliant
FCC §15.407 (a)	RSS-247 §6.2	Power Spectral Density	Compliant
FCC §15.407 (h)	RSS-247 §6.2	Transmit Power Control (TPC)	Not Applicable
FCC §15.407 (h)	RSS-247 §6.3	Dynamic Frequency Selection (DFS)	Not Applicable
/	RSS-247 §6.4	Additional requirement	Compliant
C63.10 §11.6	C63.10 §11.6	Duty Cycle	/
/	RSS-Gen clause 6.11	Frequency Stability	Compliant

Not Applicable: The device operates on 5150-5250MHz and 5725-5850MHz only.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2024/12/04	2025/12/03
Rohde & Schwarz	LISN	ENV216	101613	2024/12/04	2025/12/03
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2024/05/21	2025/05/20
Unknown	CE Cable	Unknown	UF A210B-1-0720-504504	2024/05/21	2025/05/20
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2024/12/04	2025/12/03
Sonoma instrument	Pre-amplifier	310N	186238	2024/05/21	2025/05/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	XH500C	J-10M-A	2024/06/18	2025/06/17
BACL	Active Loop Antenna	1313-1A	4031911	2024/05/14	2027/05/13
Unknown	Cable	2Y194	0735	2024/12/04	2025/12/03
Unknown	Cable	PNG214	1354	2024/12/04	2025/12/03
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR
Rohde&Schwarz	Spectrum Analyzer	FSV40	101605	2025/03/26	2026/03/25
A.H.System	Preamplifier	PAM-0118P	489	2024/11/15	2025/11/14
Schwarzbeck	Horn Antenna	BBHA9120D (1201)	1143	2023/07/26	2026/07/25
Unknown	RF Cable	KMSE	0735	2024/12/06	2025/12/05
Unknown	RF Cable	UFA147	219661	2024/12/06	2025/12/05
Unknown	RF Cable	XH750A-N	J-10M	2024/12/06	2025/12/05
JD	Multiplex Switch Test Control Set	DT7220FSU	DQ77926	2024/06/18	2025/06/17
JD	Multiplex Switch Test Control Set	DT7220SCU	DS79903	2024/09/09	2025/09/08
A.H.System	Pre-amplifier	PAM-1840VH	190	2024/06/18	2025/06/17
Electro-Mechanics Co	Horn Antenna	3116	9510-2270	2023/09/18	2026/09/17
UTIFLEX	RF Cable	NO. 13	232308-001	2024/12/18	2025/12/17
Audix	EMI Test software	E3	191218(V9)	NCR	NCR

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV40-N	102259	2024/12/04	2025/12/03
ANRITSU	Microwave peak power sensor	MA24418A	12622	2024/05/21	2025/05/20
Unknown	10dB Attenuator	Unknown	F-03-EM190	2024/06/27	2025/06/26
BACL	Temperature & Humidity Chamber	BTH-150-40	30145	2024/12/06	2025/12/05
Fluke	Digital Multimeter	287	19000011	2024/05/21	2025/05/20
HELLVIAO	Contact voltage regulator	TDGC2-5KVA	Unknown	NCR	NCR

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

REQUIREMENTS AND TEST PROCEDURES

Conducted Emissions

Applicable Standard

FCC §15.207 & RSS-Gen §8.8

Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50 µH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Table 4 - AC Power Lines Conducted Emission Limits		
Frequency range (MHz)	Conducted limit (dBµV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56[1]	56 to 46[1]
0.5 – 5	56	46
5 – 30	60	50

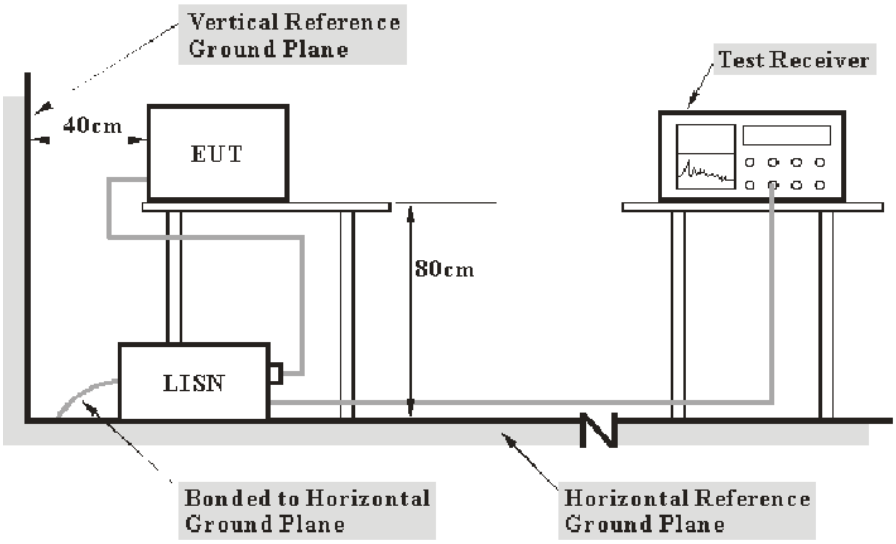
Note 1: The level decreases linearly with the logarithm of the frequency.

For an EUT with a permanent or detachable antenna operating between 150 kHz and 30 MHz, the AC power-line conducted emissions must be measured using the following configurations:

(a) Perform the AC power-line conducted emissions test with the antenna connected to determine compliance with the limits of table 4 outside the transmitter's fundamental emission band.

(b) Retest with a dummy load instead of the antenna to determine compliance with the limits of table 4 within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network that simulates the antenna in the fundamental frequency band.

EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.207 & RSS-247/RSS-Gen limits.

The spacing between the peripherals was 10 cm.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN; the other related equipments were connected to the other LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and Average detection mode.

Factor & Over Limit Calculation

The factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

Factor = LISN VDF + Cable Loss

The "**Over limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over limit of -7 dB means the emission is 7 dB below the limit. The equation for calculation is as follows:

Over Limit = Level – Limit
Level = Read Level + Factor

Note: The term "cable loss" refers to the combination of a cable and a 10dB transient limiter (attenuator).

Undesirable Emission & Restricted Bands

Applicable Standard

FCC §15.407 (b); §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band:
(i) 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.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

According to RSS-247§6.2

Frequency band 5150-5250 MHz

6.2.1.2 Unwanted emission limits

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHzshall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

Frequency band 5250-5350 MHz

6.2.2.2 Unwanted emission limits

Devices shall comply with the following:

a. All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or

b. All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

Frequency band 5470-5600 MHz and 5650-5725 MHz

6.2.3.2 Unwanted emission limits

Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p.at 5850 MHz instead of 5725 MHz.

Frequency band 5725-5850 MHz

6.2.4.3 Unwanted emission limits

Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

a. 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 Bm/MHz at 5 MHz above or below the band edges;

b. 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;

c. 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and

d. -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

According to RSS-Gen §8.10

Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

a. The transmit frequency, including fundamental components of modulation, of license-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287.
b. Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.
c. Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

Table 5 – General field strength limits at frequencies above 30 MHz

Frequency (MHz)	Field strength (μV/m at 3 m)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

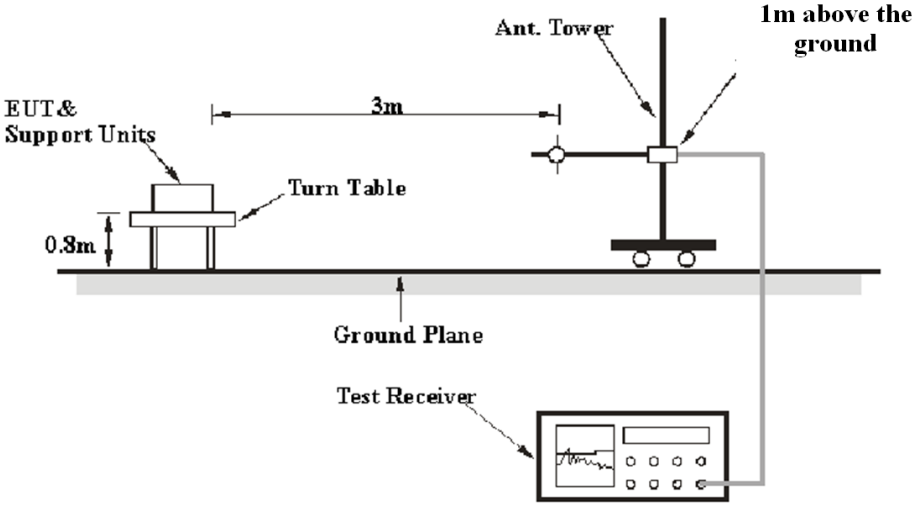
Table 6 – General field strength limits at frequencies below 30 MHz

Frequency	Magnetic field strength (H-Field) (μA/m)	Measurement distance (m)
9 - 490 kHz[Note 1]	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

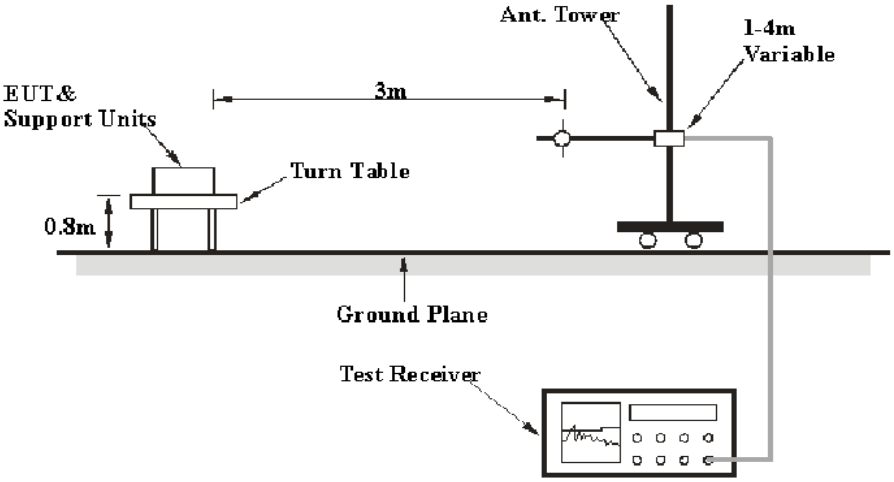
Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

EUT Setup

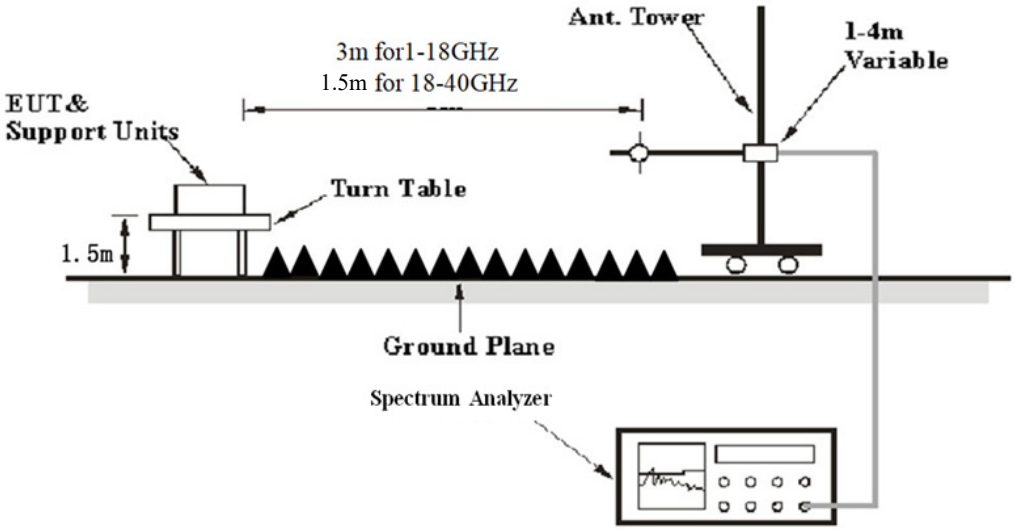
9 kHz-30MHz:



30MHz-1GHz:



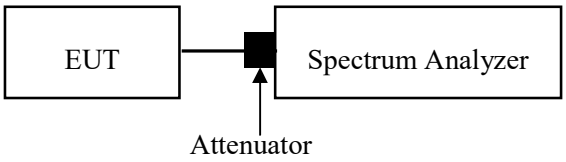
Above 1 GHz:



The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC 15.209, FCC 15.407, RSS-247 and RSS-Gen limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

Unwanted emissions fall into the band 5250-5350 MHz:



EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

9 kHz-1GHz:

Frequency Range	RBW	Video B/W	IF B/W	Measurement	Detector
9 kHz – 150 kHz	/	/	200 Hz	QP	QP
	300 Hz	1 kHz	/	PK	Peak
150 kHz – 30 MHz	/	/	9 kHz	QP	QP
	10 kHz	30 kHz	/	PK	Peak
30 MHz – 1000 MHz	/	/	120 kHz	QP	QP
	100 kHz	300 kHz	/	PK	Peak

1-40GHz:

Pre-scan

Measurement	Duty cycle	RBW	Video B/W	Detector
PK	Any	1MHz	3 MHz	Peak
AV	>98%	1MHz	1 kHz	Peak
	<98%	1MHz	≥1/Ton	Peak

Final measurement for emission identified during pre-scan

Measurement	Duty cycle	RBW	Video B/W	Detector
PK	Any	1MHz	3 MHz	Peak
AV	>98%	1MHz	10 Hz	Peak
	<98%	1MHz	≥1/Ton	Peak

Note: Ton is minimum transmission duration

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Unwanted emissions fall into the band 5250-5350 MHz:

Frequency Range	RBW	Video B/W	Measurement
5250-5350 MHz	(1%-5%)* 99% Bandwidth	3*RBW	Peak

Note: The limit was calculated by attenuated below the channel power by at least 26 dB per RSS-247 §6.2.1.2

Test Procedure

Radiated Spurious Emission

During the radiated emission test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all the installation combinations.

All final data was recorded in Quasi-peak detection mode except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, average detection modes for frequency bands 9–90 kHz and 110–490 kHz, peak and average detection modes for frequencies above 1 GHz.

For 9 kHz-30MHz, the report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground-parallel) unless the margin is greater than 20 dB.

According to ANSI C63.10-2020,9.2.1: For field strength measurements made at other than the distance specified by the limit, extrapolate the measured field strength to the field strength at the distance specified by the limit using an inverse distance correction factor (20 dB/decade of distance)

$$E_{\mathrm{SpecLimit}} = E_{\mathrm{Meas}} + 20\log\left(\frac{d_{\mathrm{Meas}}}{d_{\mathrm{SpecLimit}}}\right)$$

where

$E_{\mathrm{SpecLimit}}$	is the field strength of the emission at the distance specified by the limit, in dBμV/m
E_{Meas}	is the field strength of the emission at the measurement distance, in dBμV/m
d_{Meas}	is the measurement distance, in m
$d_{\mathrm{SpecLimit}}$	is the distance specified by the limit, in m

So the extrapolation factor of 1m is 20*log(1.5/3)= -6.0 dB, for 18-40GHz range, the limit of 1.5m distance was added by 6.0dB from limit of 3m to compared with the result measurement at 1.5m distance.

Factor & Over Limit/Margin Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Over Limit/Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

Over Limit = Level – Limit; Margin = Limit–Corrected Amplitude
Level / Corrected Amplitude = Read Level + Factor

Emission Bandwidth & 99% Occupied Bandwidth

Applicable Standard

According to FCC §15.407(a) (13), the maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

According to FCC §15.407(e), Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

According to RSS-247 § 6.2.4.2, For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

According to RSS-Gen § 6.7, the occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

Test Procedure

According to ANSI C63.10-2020 Section 12.5.1 & 12.5.2 & 12.5.3

12.5.1 Emission bandwidth for the band 5.725 GHz to 5.85 GHz

The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max-hold.
e) Sweep = No faster than coupled (auto) time.
f) Allow the trace to stabilize.
g) 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.

12.5.2 Emission bandwidth for all other bands

The procedure for this method is as follows:

a) Set RBW = shall be in the range of 1% to 5% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = peak.
d) Trace mode = max-hold.
e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is in the range of 1% to 5%.

12.5.3 Occupied bandwidth

See 6.9.3 for the measurement procedure for OBW.

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be at least three times the RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.6.2.

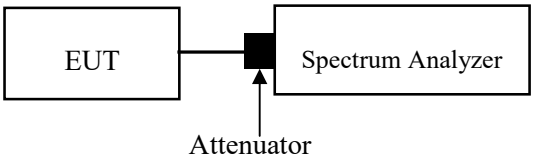
d) Step a) through step c) might require iteration to adjust within the specified range.

e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max-hold mode (until the trace stabilizes) shall be used.

f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

h) The occupied bandwidth shall be reported by providing spectral plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).



Conducted Transmitter Output Power

Applicable Standard

According to FCC §15.407(a)

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

According to RSS-247 §6.2:

Frequency band 5150-5250 MHz

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

Frequency band 5250-5350 MHz

6.2.2.1(a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

6.2.2.1(b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Frequency band 5470-5600 MHz and 5650-5725MHz

6.2.3.1 The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

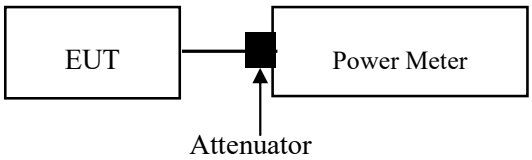
Frequency band 5725-5850 MHz

6.2.4.2 The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipointFootnote3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

Test Procedure

According to ANSI C63.10-2020 Section 12.4.3.2 Method PM-G

a. Place the EUT on a bench and set it in transmitting mode.
b. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.



Note: A short RF cable with low cable loss connected to the EUT antenna port,which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable and/or power splitter loss

Power Spectral Density

According to FCC §15.407(a)

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

According to RSS-247 §6.2:

Frequency band 5150-5250 MHz

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

Frequency band 5250-5350 MHz

6.2.2.1(a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
6.2.2.2(b) All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

Frequency band 5470-5600 MHz and 5650-5725MHz

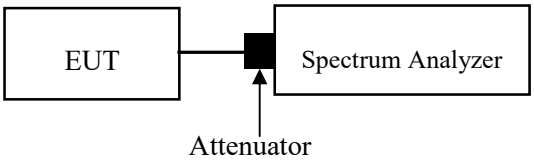
6.2.3.1 The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

Frequency band 5725-5850 MHz

6.2.4.2 The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipointFootnote3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

Test Procedure

According to ANSI C63.10-2020 Clause 12.6 Method SA-1 should be applied



Note: A short RF cable with low cable loss connected to the EUT antenna port,which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable and/or power splitter loss

Frequency stability

Applicable Standard

According to RSS-GEN Clause 6.11

Frequency stability is a measure of frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at an appropriate reference temperature and the rated supply voltage.

When the measurement method of transmitter frequency stability is not stated in the applicable RSS or reference standards, the following conditions apply:

a. The reference temperature for radio transmitters is +20°C (+68°F).
b. A hand-held device that is only capable of operating using internal batteries shall be tested at the battery's nominal voltage, and again at the battery's operating end-point voltage, which shall be specified by the equipment manufacturer. For this test, either a battery or an external power supply can be used.
c. The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency-determining circuit element shall be made subsequent to this initial set-up.

With the transmitter installed in an environmental test chamber, the unmodulated carrier frequency and frequency stability shall be measured under the conditions specified below for licensed and licence-exempt devices, unless specified otherwise in the applicable RSS. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement.

For licensed devices, the following measurement conditions apply:

a. at the temperatures of -30°C (-22°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage
b. at the temperature of +20°C (+68°F) and at ±15% of the manufacturer's rated supply voltage

For licence-exempt devices, the following conditions apply:

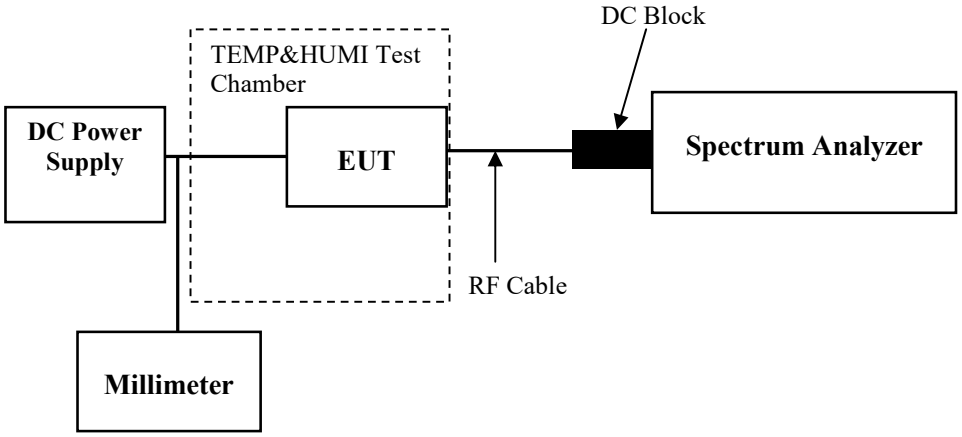
a. at the temperatures of -20°C (-4°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage
b. at the temperature of +20°C (+68°F) and at ±15% of the manufacturer's rated supply voltage

If the frequency stability limits are only met within a temperature range that is smaller than the range specified in (a) for licensed or licence-exempt devices, the frequency stability requirement will be deemed to be met if the transmitter is automatically prevented from operating outside this smaller temperature range and if the published operating characteristics for the equipment are revised to reflect this restricted temperature range.

If the device contains both licence and licence-exempt transmitter modules, the device's frequency stability shall be measured under the most stringent condition specified in the applicable RSS of the transmitter module.

In addition, if an unmodulated carrier is not available, the method used to measure frequency stability shall be described in the test report.

Test Procedure



Additional requirements

Applicable Standard

According to RSS-247 Clause 6.4 Additional requirement

The following requirements shall apply:

a. The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signalling information or the use of repetitive codes where required by the technology.

b. All LE-LAN devices must contain security features to protect against modification of software by unauthorized parties.

   Manufacturers must implement security features in any digitally modulated devices capable of operating in any of the frequency ranges within the 5 GHz band, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers may use various means, including the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment certification.

   Manufacturers must take steps to ensure that DFS functionality cannot be disabled by the operator of the LE-LAN device.

c. The user manual for LE-LAN devices shall contain instructions related to the restrictions mentioned in the above sections, namely that:

   i. the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
   ii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;
   iii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits as appropriate; and
   iv. where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

Result

Pass

RSS-247 Clause 6.4 a):

The device shall automatically discontinue transmission in cases of absence of information to transmit, or operation failure. Please refer to declaration.

RSS-247 Clause 6.4 b):

The device must contain security features to protect against modification of software by unauthorized parties. Please refer to declaration.

RSS-247 Clause 6.4 c):

1. Compliant, please refer to the User Manual.

2. Not Applicable, the device has no detachable antenna.

3. Not Applicable, the device has no detachable antenna.

4. Compliant, please refer to the antenna information and output power section.

Duty Cycle

Test Procedure

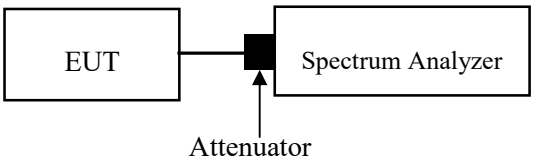
According to ANSI C63.10-2020 Section 12.2

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

a) A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.

b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:

1) Set the center frequency of the instrument to the center frequency of the transmission.
2) Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value.
3) Set VBW ≥ RBW. Set detector = peak or average.
4) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if T ≤ 16.7 μs.)



ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, 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 shall be considered sufficient to comply with the provisions of this Section. 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.

Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has one internal antenna arrangement which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	Antenna Gain#	Impedance	Frequency Range
PCB	1.67dBi	50Ω	5150-5250MHz
PCB	2.49dBi	50Ω	5725-5850MHz

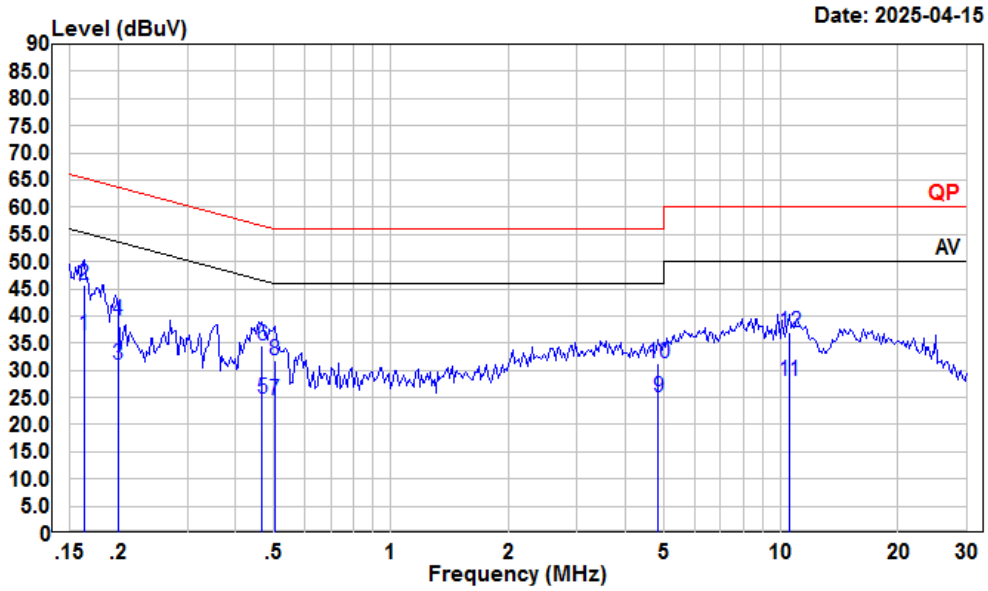
Result: Compliant

TEST DATA AND RESULTS

Conducted Emissions

Temperature (°C)	25.2	**Relative Humidity (%)**	47
ATM Pressure (kPa)	100.6	**Test engineer**	Macy Shi
Test date	2025/4/15		
EUT operation mode	Transmitting (Maximum output power mode, 802.11a 5240MHz)		

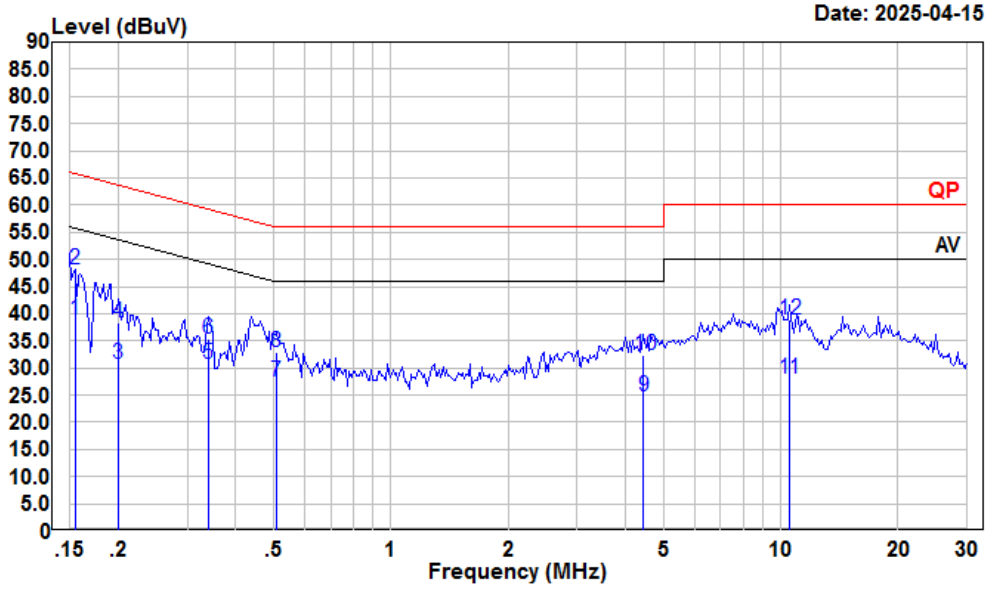
AC 120V 60 Hz, Line



Condition: Line
Project : 2501R30997E-RF
tester : Macy.shi Note:Transmitting
Setting : RBW:9kHz

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.163	16.19	36.41	10.11	10.11	55.30	-18.89	Average
2	0.163	25.41	45.63	10.11	10.11	65.30	-19.67	QP
3	0.200	10.96	30.95	9.90	10.09	53.62	-22.67	Average
4	0.200	19.26	39.25	9.90	10.09	63.62	-24.37	QP
5	0.466	4.29	24.87	10.45	10.13	46.58	-21.71	Average
6	0.466	13.96	34.54	10.45	10.13	56.58	-22.04	QP
7	0.502	3.94	24.58	10.50	10.14	46.00	-21.42	Average
8	0.502	11.18	31.82	10.50	10.14	56.00	-24.18	QP
9	4.848	4.76	25.15	10.21	10.18	46.00	-20.85	Average
10	4.848	10.78	31.17	10.21	10.18	56.00	-24.83	QP
11	10.508	7.56	28.06	10.29	10.21	50.00	-21.94	Average
12	10.508	16.46	36.96	10.29	10.21	60.00	-23.04	QP

AC 120V 60 Hz, Neutral



Condition: Neutral
Project : 2501R30997E-RF
tester : Macy.shi Note:Transmitting
Setting : RBW:9kHz

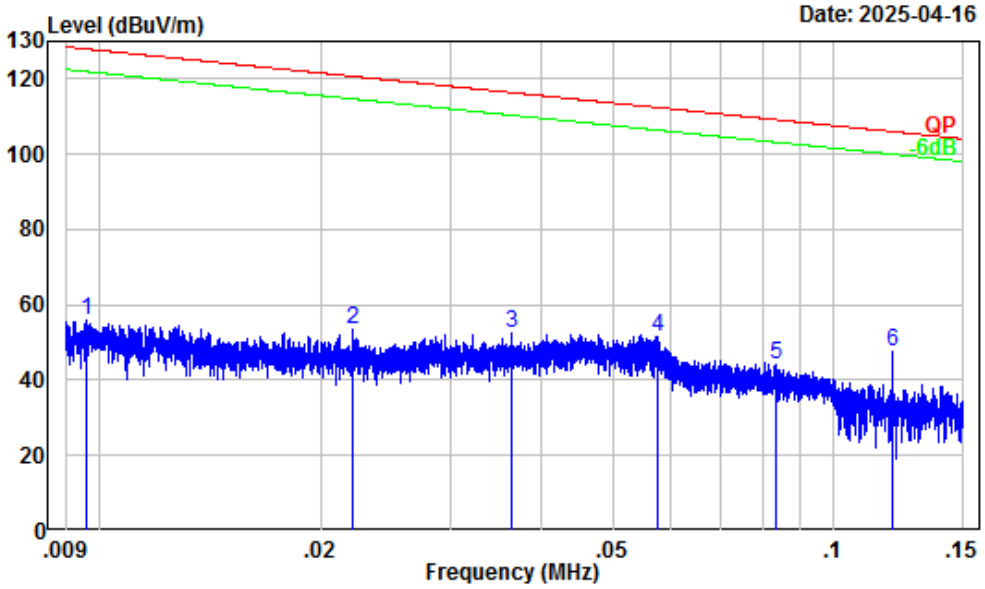
	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.155	18.62	39.02	10.28	10.12	55.74	-16.72	Average
2	0.155	27.86	48.26	10.28	10.12	65.74	-17.48	QP
3	0.200	10.48	30.67	10.10	10.09	53.62	-22.95	Average
4	0.200	18.17	38.36	10.10	10.09	63.62	-25.26	QP
5	0.339	10.10	30.61	10.39	10.12	49.22	-18.61	Average
6	0.339	14.73	35.24	10.39	10.12	59.22	-23.98	QP
7	0.507	6.83	27.57	10.60	10.14	46.00	-18.43	Average
8	0.507	12.28	33.02	10.60	10.14	56.00	-22.98	QP
9	4.454	4.29	24.69	10.20	10.20	46.00	-21.31	Average
10	4.454	12.00	32.40	10.20	10.20	56.00	-23.60	QP
11	10.508	7.34	27.91	10.36	10.21	50.00	-22.09	Average
12	10.508	18.32	38.89	10.36	10.21	60.00	-21.11	QP

Undesirable Emission

Temperature (°C)	22.5-23.1	**Relative Humidity (%)**	45-48
ATM Pressure (kPa):	101.1	**Test engineer:**	Anson Su&Visen Wu
Test date:	2025/04/15-2025/04/16		
EUT operation mode:	Below 1GHz: Transmitting (Maximum output power mode, 802.11a 5240MHz) Above 1GHz: Transmitting		
Note:	1. For the radiated spurious emission below 30MHz, only the worst case (parallel) was recorded. 2. The spurious emission from 9 kHz-30MHz of IC RSS-Gen standard, the unit of final result on the test plots are dBμV/m, so the limit should be added by 51,5 dB from dBμA/m to dBμV/m. 3. When the test result of peak was less than the limit of QP/Average more than 6dB, just peak value were recorded. 4. After pre-scan in the X, Y and Z axes of orientation, the worst case z-axis of orientation were recorded.		

Below 1GHz:

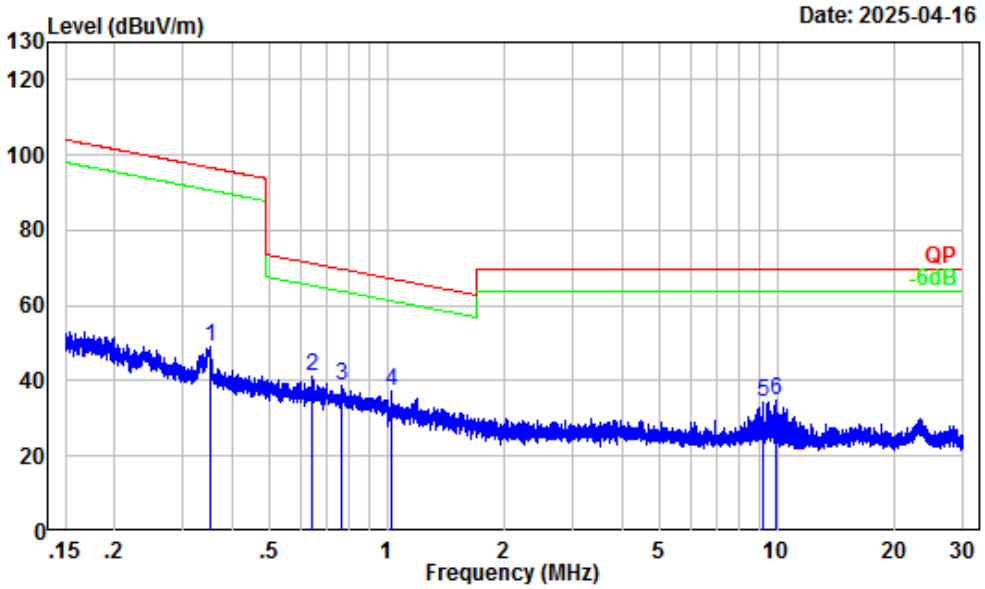
9kHz-150kHz



Site : Chamber A
Condition : 3m
Project Number : 2501R30997E-RF
Test Mode : 5G WIFI Transmitting
Detector: Peak RBW/VBW: 0.3/1kHz
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.01	32.37	23.61	55.98	127.93	-71.95	Peak
2	0.02	30.00	23.33	53.33	120.71	-67.38	Peak
3	0.04	27.82	24.80	52.62	116.36	-63.74	Peak
4	0.06	25.65	25.88	51.53	112.41	-60.88	Peak
5	0.08	23.18	21.11	44.29	109.20	-64.91	Peak
6	0.12	20.81	26.55	47.36	106.01	-58.65	Peak

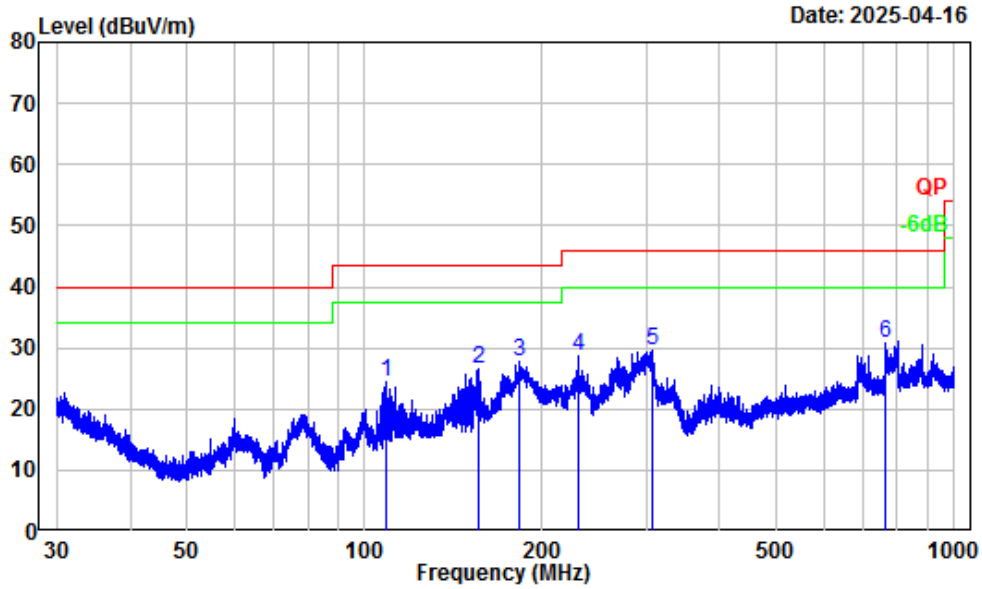
150kHz-30MHz



Site : Chamber A
Condition : 3m
Project Number : 2501R30997E-RF
Test Mode : 5G WIFI Transmitting
Detector: Peak RBW/VBW: 10/30kHz
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.35	9.21	39.92	49.13	96.67	-47.54	Peak
2	0.64	4.68	36.32	41.00	71.44	-30.44	Peak
3	0.77	3.11	35.44	38.55	69.83	-31.28	Peak
4	1.03	1.12	35.93	37.05	67.23	-30.18	Peak
5	9.25	-2.88	37.30	34.42	69.54	-35.12	Peak
6	9.97	-2.80	37.86	35.06	69.54	-34.48	Peak

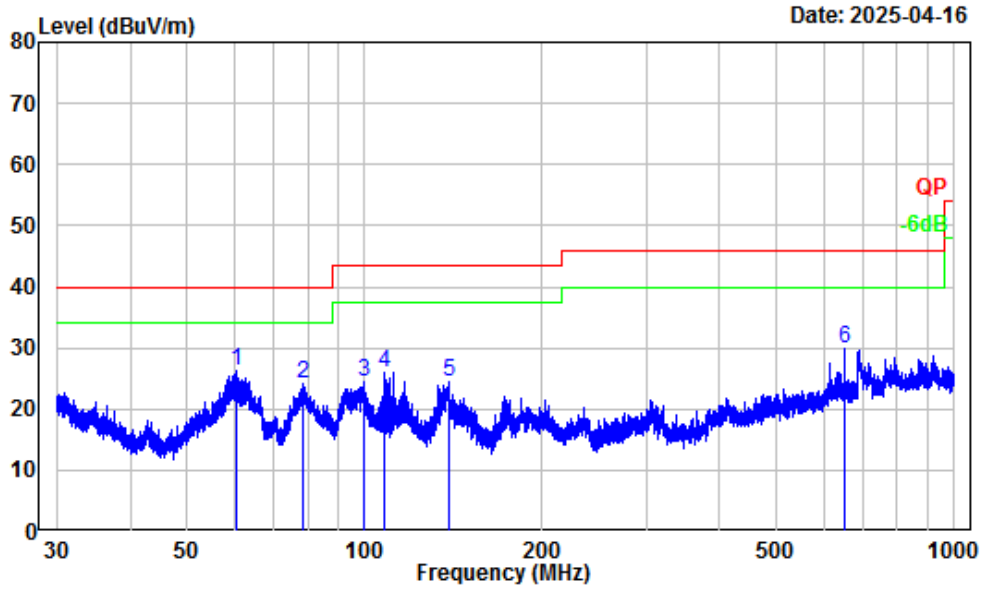
30MHz-1GHz_Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number : 2501R30997E-RF
Test Mode : 5G WIFI Transmitting
Detector: Peak RBW/VBW: 100/300kHz
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	108.36	-13.53	38.11	24.58	43.50	-18.92	Peak
2	155.77	-12.64	39.07	26.43	43.50	-17.07	Peak
3	182.88	-13.89	41.66	27.77	43.50	-15.73	Peak
4	229.80	-13.86	42.53	28.67	46.00	-17.33	Peak
5	306.62	-11.07	40.66	29.59	46.00	-16.41	Peak
6	763.71	-2.60	33.46	30.86	46.00	-15.14	Peak

30MHz-1GHz_Vertical



Site : Chamber A
Condition : 3m Vertical
Project Number : 2501R30997E-RF
Test Mode : 5G WIFI Transmitting
Detector: Peak RBW/VBW: 100/300kHz
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	60.68	-18.12	44.35	26.23	40.00	-13.77	Peak
2	78.72	-17.88	42.14	24.26	40.00	-15.74	Peak
3	99.48	-16.05	40.52	24.47	43.50	-19.03	Peak
4	107.89	-13.63	39.69	26.06	43.50	-17.44	Peak
5	138.57	-11.75	36.15	24.40	43.50	-19.10	Peak
6	649.94	-4.13	34.12	29.99	46.00	-16.01	Peak

Above 1GHz:
5150-5250 MHz

Frequency (MHz)	Reading (dBµV)	PK/Ave	Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
802.11a							
Low Channel							
5150.00	68.68	PK	H	-7.45	61.23	74.0	-12.77
5150.00	54.19	AV	H	-7.45	46.74	54.0	-7.26
5150.00	67.47	PK	V	-7.45	60.02	74.0	-13.98
5150.00	53.13	AV	V	-7.45	45.68	54.0	-8.32
10360.00	49.36	PK	H	2.53	51.89	68.2	-16.31
10360.00	48.06	PK	V	2.53	50.59	68.2	-17.61
Middle Channel							
10400	46.64	PK	H	2.55	49.19	68.2	-19.01
10400	46.51	PK	V	2.55	49.06	68.2	-19.14
High Channel							
5350	65.48	PK	H	-6.74	58.74	74.0	-15.26
5350	52.49	AV	H	-6.74	45.75	54.0	-8.25
5350	67.55	PK	V	-6.74	60.81	74.0	-13.19
5350	53.39	AV	V	-6.74	46.65	54.0	-7.35
10480	46.58	PK	H	2.25	48.83	68.2	-19.37
10480	46.20	PK	V	2.25	48.45	68.2	-19.75
802.11ac20							
Low Channel							
5150	69.40	PK	H	-7.45	61.95	74.0	-12.05
5150	53.17	AV	H	-7.45	45.72	54.0	-8.28
5150	69.04	PK	V	-7.45	61.59	74.0	-12.41
5150	53.51	AV	V	-7.45	46.06	54.0	-7.94
10360	46.14	PK	H	2.53	48.67	68.2	-19.53
10360	45.86	PK	V	2.53	48.39	68.2	-19.81
Middle Channel							
10400	46.73	PK	H	2.55	49.28	68.2	-18.92
10400	46.85	PK	V	2.55	49.40	68.2	-18.80
High Channel							
5350	65.69	PK	H	-6.74	58.95	74.0	-15.05
5350	52.58	AV	H	-6.74	45.84	54.0	-8.16
5350	66.91	PK	V	-6.74	60.17	74.0	-13.83
5350	53.50	AV	V	-6.74	46.76	54.0	-7.24
10480	46.71	PK	H	2.25	48.96	68.2	-19.24
10480	46.71	PK	V	2.25	48.96	68.2	-19.24

Frequency (MHz)	Reading (dBµV)	PK/Ave	Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
802.11ac40							
Low Channel							
5150	68.36	PK	H	-7.45	60.91	74.0	-13.09
5150	53.77	AV	H	-7.45	46.32	54.0	-7.68
5150	69.83	PK	V	-7.45	62.38	74.0	-11.62
5150	54.35	AV	V	-7.45	46.90	54.0	-7.10
10380	47.01	PK	H	2.54	49.55	68.2	-18.65
10380	47.01	PK	V	2.54	49.55	68.2	-18.65
High Channel							
5350	66.18	PK	H	-6.74	59.44	74.0	-14.56
5350	53.10	AV	H	-6.74	46.36	54.0	-7.64
5350	65.58	PK	V	-6.74	58.84	74.0	-15.16
5350	54.07	AV	V	-6.74	47.33	54.0	-6.67
10460	46.62	PK	H	2.32	48.94	68.2	-19.26
10460	46.39	PK	V	2.32	48.71	68.2	-19.49
802.11ac80							
Middle Channel							
5150	71.07	PK	H	-7.45	63.62	74.0	-10.38
5150	57.26	AV	H	-7.45	49.81	54.0	-4.19
5150	69.58	PK	V	-7.45	62.13	74.0	-11.87
5150	56.14	AV	V	-7.45	48.69	54.0	-5.31
5350	66.41	PK	H	-6.74	59.67	74.0	-14.33
5350	53.61	AV	H	-6.74	46.87	54.0	-7.13
5350	65.86	PK	V	-6.74	59.12	74.0	-14.88
5350	53.00	AV	V	-6.74	46.26	54.0	-7.74
10420	47.39	PK	H	2.48	49.87	68.2	-18.33
10420	47.27	PK	V	2.48	49.75	68.2	-18.45

5725-5850MHz

Frequency (MHz)	Reading (dBµV)	PK/Ave	Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
802.11a							
Low Channel							
5725	81.75	PK	H	-5.49	76.26	122.2	-45.94
5725	82.13	PK	V	-5.49	76.64	122.2	-45.56
5720	77.44	PK	H	-5.53	71.91	110.8	-38.89
5720	78.53	PK	V	-5.53	73.00	110.8	-37.80
5700	65.94	PK	H	-5.72	60.22	105.2	-44.98
5700	66.19	PK	V	-5.72	60.47	105.2	-44.73
5650	66.07	PK	H	-5.86	60.21	68.2	-7.99
5650	66.09	PK	V	-5.86	60.23	68.2	-7.97
11490	52.75	PK	H	3.54	56.29	74.0	-17.71
11490	40.19	AV	H	3.54	43.73	54.0	-10.27
11490	52.91	PK	V	3.54	56.45	74.0	-17.55
11490	39.92	AV	V	3.54	43.46	54.0	-10.54
Middle Channel							
11570	51.28	PK	H	3.3	54.58	74.0	-19.42
11570	38.52	AV	H	3.3	41.82	54.0	-12.18
11570	52.43	PK	V	3.3	55.73	74.0	-18.27
11570	39.51	AV	V	3.3	42.81	54.0	-11.19
High Channel							
5850	75.24	PK	H	-4.68	70.56	122.2	-51.64
5850	77.00	PK	V	-4.68	72.32	122.2	-49.88
5855	71.60	PK	H	-4.65	66.95	110.8	-43.85
5855	72.21	PK	V	-4.65	67.56	110.8	-43.24
5875	65.84	PK	H	-4.57	61.27	105.2	-43.93
5875	65.46	PK	V	-4.57	60.89	105.2	-44.31
5925	65.63	PK	H	-4.45	61.18	68.2	-7.02
5925	65.45	PK	V	-4.45	61.00	68.2	-7.20
11650	52.26	PK	H	3.42	55.68	74.0	-18.32
11650	39.87	AV	H	3.42	43.29	54.0	-10.71
11650	53.71	PK	V	3.42	57.13	74.0	-16.87
11650	40.57	AV	V	3.42	43.99	54.0	-10.01

Frequency (MHz)	Reading (dBµV)	PK/Ave	Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
802.11ac20							
Low Channel							
5725	81.95	PK	H	-5.49	76.46	122.2	-45.74
5725	82.12	PK	V	-5.49	76.63	122.2	-45.57
5720	79.60	PK	H	-5.53	74.07	110.8	-36.73
5720	80.07	PK	V	-5.53	74.54	110.8	-36.26
5700	67.39	PK	H	-5.72	61.67	105.2	-43.53
5700	68.13	PK	V	-5.72	62.41	105.2	-42.79
5650	65.28	PK	H	-5.86	59.42	68.2	-8.78
5650	65.82	PK	V	-5.86	59.96	68.2	-8.24
11490	51.47	PK	H	3.54	55.01	74.0	-18.99
11490	38.61	AV	H	3.54	42.15	54.0	-11.85
11490	51.42	PK	V	3.54	54.96	74.0	-19.04
11490	39.37	AV	V	3.54	42.91	54.0	-11.09
Middle Channel							
11570	51.74	PK	H	3.3	55.04	74.0	-18.96
11570	39.23	AV	H	3.3	42.53	54.0	-11.47
11570	51.44	PK	V	3.3	54.74	74.0	-19.26
11570	39.13	AV	V	3.3	42.43	54.0	-11.57
High Channel							
5850	78.58	PK	H	-4.68	73.90	122.2	-48.30
5850	77.70	PK	V	-4.68	73.02	122.2	-49.18
5855	75.25	PK	H	-4.65	70.60	110.8	-40.20
5855	75.67	PK	V	-4.65	71.02	110.8	-39.78
5875	65.58	PK	H	-4.57	61.01	105.2	-44.19
5875	65.36	PK	V	-4.57	60.79	105.2	-44.41
5925	65.56	PK	H	-4.45	61.11	68.2	-7.09
5925	65.11	PK	V	-4.45	60.66	68.2	-7.54
11650	52.78	PK	H	3.42	56.20	74.0	-17.80
11650	39.72	AV	H	3.42	43.14	54.0	-10.86
11650	52.41	PK	V	3.42	55.83	74.0	-18.17
11650	39.82	AV	V	3.42	43.24	54.0	-10.76

Frequency (MHz)	Reading (dBµV)	PK/Ave	Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
802.11ac40							
Low Channel							
5725	78.68	PK	H	-5.49	73.19	122.2	-49.01
5725	80.68	PK	V	-5.49	75.19	122.2	-47.01
5720	76.75	PK	H	-5.53	71.22	110.8	-39.58
5720	78.68	PK	V	-5.53	73.15	110.8	-37.65
5700	71.37	PK	H	-5.72	65.65	105.2	-39.55
5700	72.94	PK	V	-5.72	67.22	105.2	-37.98
5650	66.13	PK	H	-5.86	60.27	68.2	-7.93
5650	66.39	PK	V	-5.86	60.53	68.2	-7.67
11510	52.67	PK	H	3.53	56.20	74.0	-17.80
11510	39.92	AV	H	3.53	43.45	54.0	-10.55
11510	52.99	PK	V	3.53	56.52	74.0	-17.48
11510	39.57	AV	V	3.53	43.10	54.0	-10.90
High Channel							
5850	70.63	PK	H	-4.68	65.95	122.2	-56.25
5850	72.01	PK	V	-4.68	67.33	122.2	-54.87
5855	69.92	PK	H	-4.65	65.27	110.8	-45.53
5855	70.66	PK	V	-4.65	66.01	110.8	-44.79
5875	65.71	PK	H	-4.57	61.14	105.2	-44.06
5875	65.73	PK	V	-4.57	61.16	105.2	-44.04
5925	64.78	PK	H	-4.45	60.33	68.2	-7.87
5925	65.19	PK	V	-4.45	60.74	68.2	-7.46
11590	51.86	PK	H	3.21	55.07	74.0	-18.93
11590	39.42	AV	H	3.21	42.63	54.0	-11.37
11590	51.64	PK	V	3.21	54.85	74.0	-19.15
11590	39.68	AV	V	3.21	42.89	54.0	-11.11

Frequency (MHz)	Reading (dBµV)	PK/Ave	Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
802.11ac80							
Middle Channel							
5725	75.79	PK	H	-5.49	70.30	122.2	-51.90
5725	73.94	PK	V	-5.49	68.45	122.2	-53.75
5720	73.97	PK	H	-5.53	68.44	110.8	-42.36
5720	73.27	PK	V	-5.53	67.74	110.8	-43.06
5700	70.68	PK	H	-5.72	64.96	105.2	-40.24
5700	70.92	PK	V	-5.72	65.20	105.2	-40.00
5650	65.34	PK	H	-5.86	59.48	68.2	-8.72
5650	66.40	PK	V	-5.86	60.54	68.2	-7.66
5850	77.12	PK	H	-4.68	72.44	122.2	-49.76
5850	78.31	PK	V	-4.68	73.63	122.2	-48.57
5855	75.78	PK	H	-4.65	71.13	110.8	-39.67
5855	77.19	PK	V	-4.65	72.54	110.8	-38.26
5875	72.57	PK	H	-4.57	68.00	105.2	-37.20
5875	73.79	PK	V	-4.57	69.22	105.2	-35.98
5925	66.97	PK	H	-4.45	62.52	68.2	-5.68
5925	67.10	PK	V	-4.45	62.65	68.2	-5.55
11550	51.10	PK	H	3.37	54.47	74.0	-19.53
11550	39.72	AV	H	3.37	43.09	54.0	-10.91
11550	51.33	PK	V	3.37	54.70	74.0	-19.30
11550	39.00	AV	V	3.37	42.37	54.0	-11.63

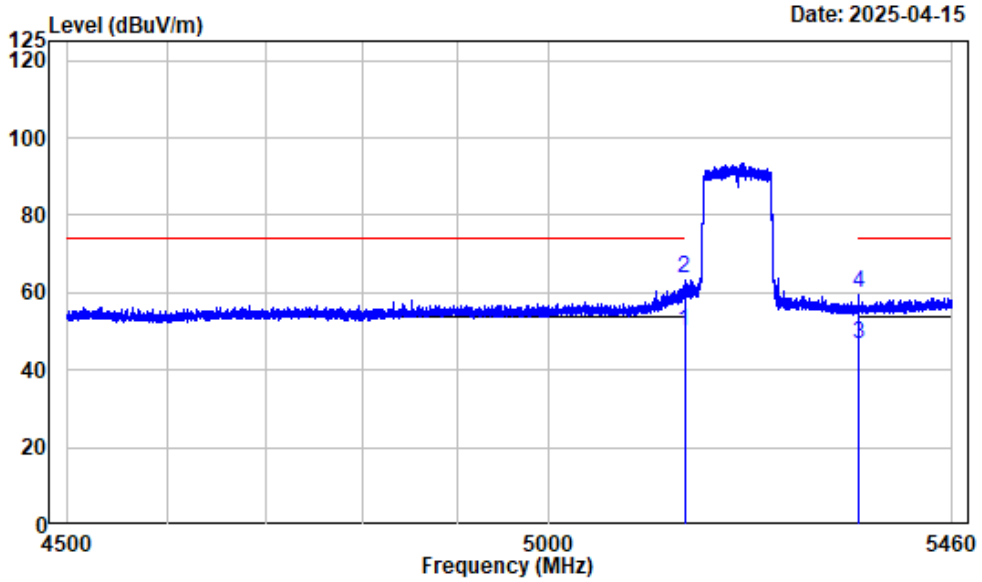
Note:
Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.

Test plots

Band Edge (Listed with the worst margin test plots)

5150-5250MHz:

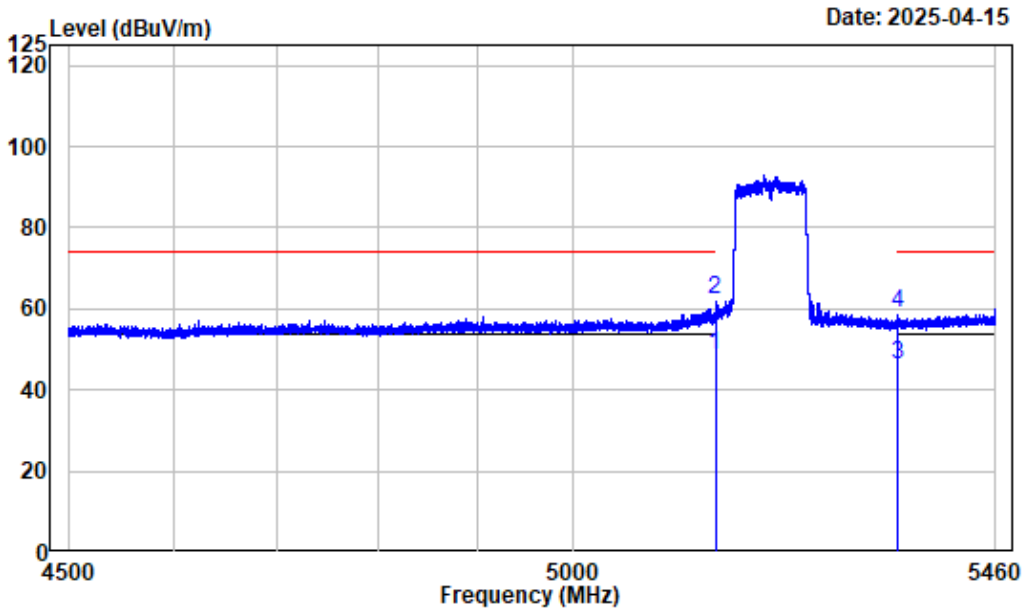
Band edge_Horizontal




```
Condition        : Horizontal
Project No.      : 2501R30997E-RF
Tester           : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
                 : Average reading: RBW:1MHz VBW:1kHz Detector:Peak
Note             : 5GWiFi_B1_ac80_5210
```

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	5150.000	-7.45	57.26	49.81	54.00	-4.19	Average
2	5150.000	-7.45	71.07	63.62	74.00	-10.38	Peak
3	5350.000	-6.74	53.61	46.87	54.00	-7.13	Average
4	5350.000	-6.74	66.41	59.67	74.00	-14.33	Peak

Band edge_Vertical

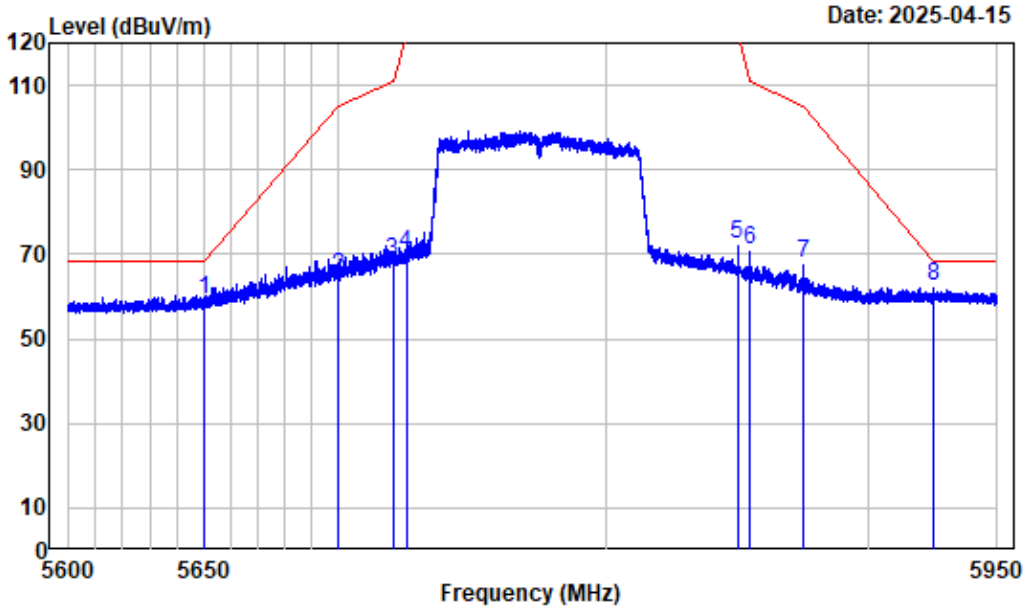


Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
: Average reading: RBW:1MHz VBW:1kHz Detector:Peak
Note : 5GWiFi_B1_ac80_5210

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	5150.000	-7.45	56.14	48.69	54.00	-5.31	Average
2	5150.000	-7.45	69.58	62.13	74.00	-11.87	Peak
3	5350.000	-6.74	53.00	46.26	54.00	-7.74	Average
4	5350.000	-6.74	65.86	59.12	74.00	-14.88	Peak

5725-5850MHz:

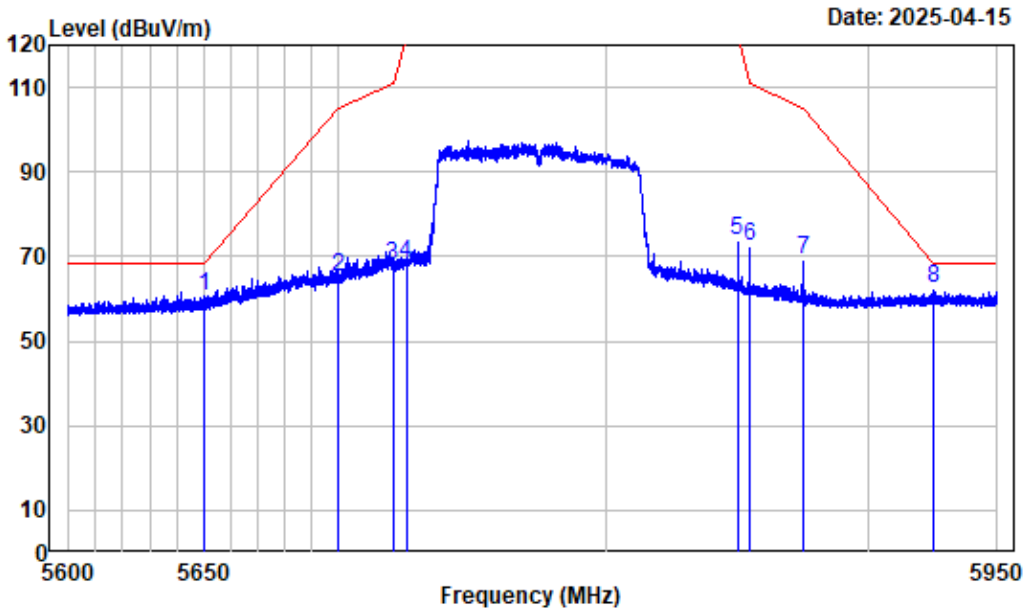
Band edge_Horizontal



Condition : Horizontal
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B4_ac80_5775

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	5650.000	-5.86	65.34	59.48	68.20	-8.72	Peak
2	5700.000	-5.72	70.68	64.96	105.20	-40.24	Peak
3	5720.000	-5.53	73.97	68.44	110.80	-42.36	Peak
4	5725.000	-5.49	75.79	70.30	122.20	-51.90	Peak
5	5850.000	-4.68	77.12	72.44	122.20	-49.76	Peak
6	5855.000	-4.65	75.78	71.13	110.80	-39.67	Peak
7	5875.000	-4.57	72.57	68.00	105.20	-37.20	Peak
8	5925.000	-4.45	66.97	62.52	68.20	-5.68	Peak

Band edge_Vertical

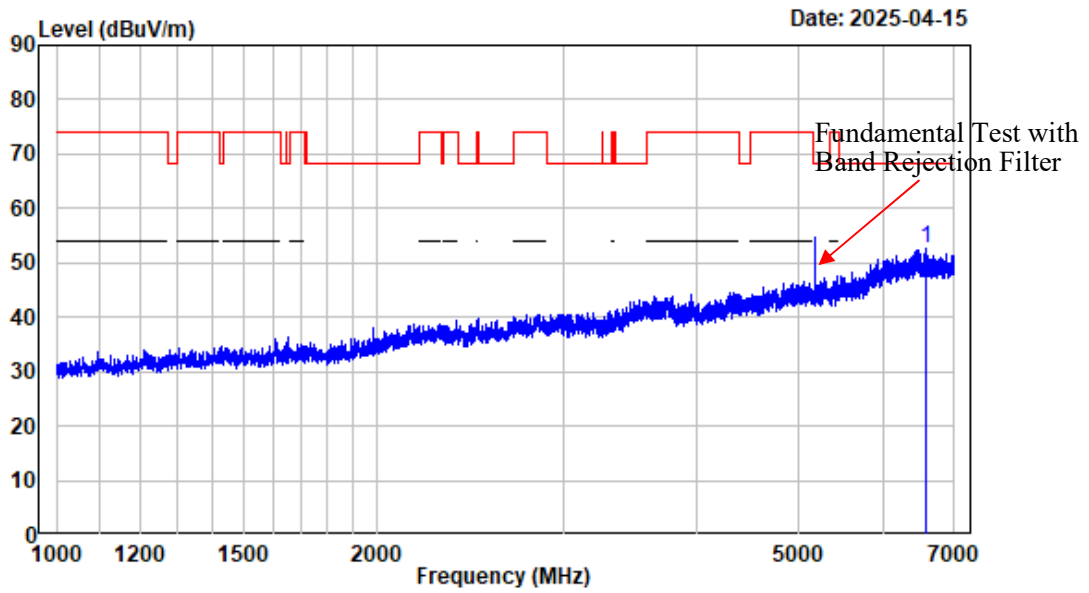


Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B4_ac80_5775

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	5650.000	-5.86	66.40	60.54	68.20	-7.66	Peak
2	5700.000	-5.72	70.92	65.20	105.20	-40.00	Peak
3	5720.000	-5.53	73.27	67.74	110.80	-43.06	Peak
4	5725.000	-5.49	73.94	68.45	122.20	-53.75	Peak
5	5850.000	-4.68	78.31	73.63	122.20	-48.57	Peak
6	5855.000	-4.65	77.19	72.54	110.80	-38.26	Peak
7	5875.000	-4.57	73.79	69.22	105.20	-35.98	Peak
8	5925.000	-4.45	67.10	62.65	68.20	-5.55	Peak

Listed with the worst harmonic margin test plot

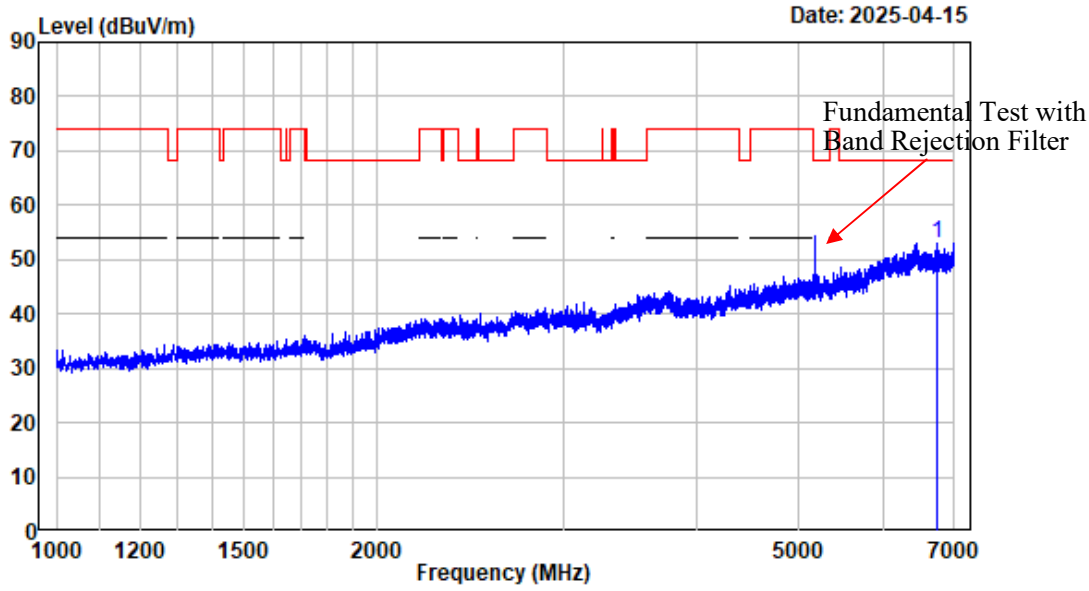
1-7GHz_Horizontal_802.11a




```
Condition        : Horizontal
Project No.      : 2501R30997E-RF
Tester           : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note             : 5GWiFi_B1_A_5180
```

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	6594.949	-3.12	55.68	52.56	68.20	-15.64	Peak

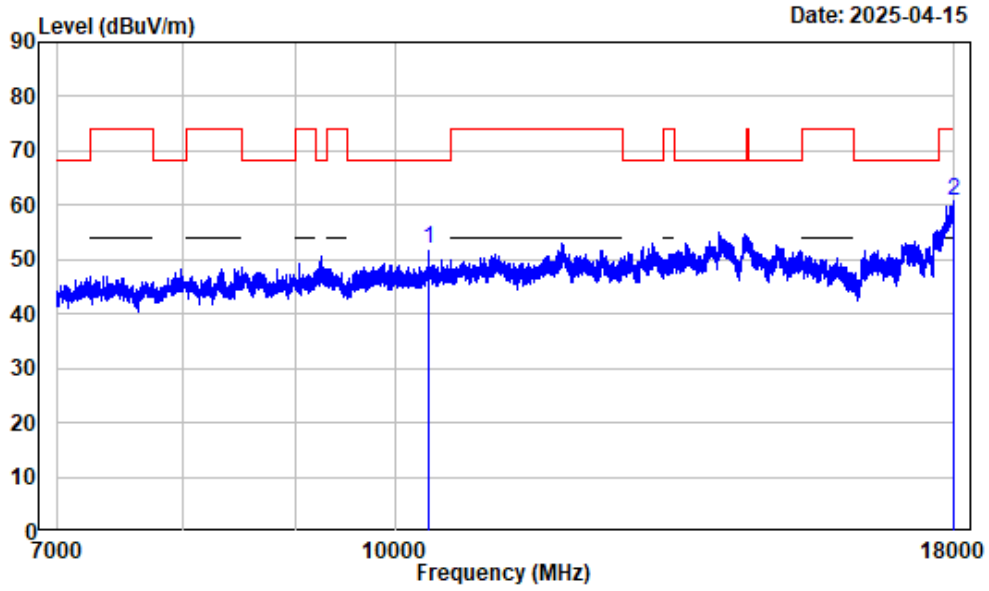
1-7GHz_Vertical_802.11a



Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B1_A_5180

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	6756.220	-3.22	56.11	52.89	68.20	-15.31	Peak

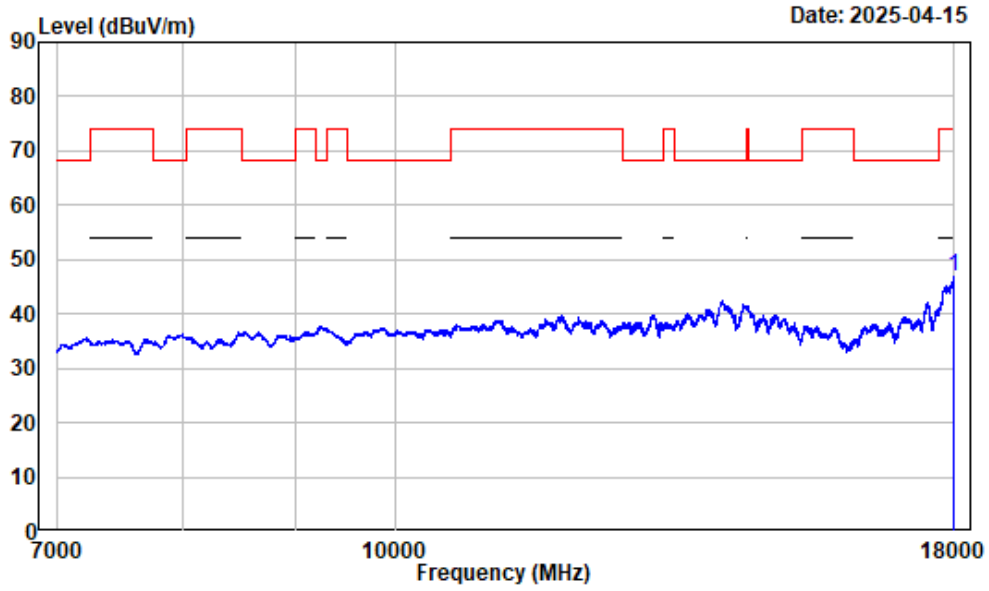
7-18GHz_Horizontal_Peak_802.11a



Condition : Horizontal
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B1_A_5180

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	10360.000	2.53	49.36	51.89	68.20	-16.31	Peak
2	17997.250	13.19	47.73	60.92	74.00	-13.08	Peak

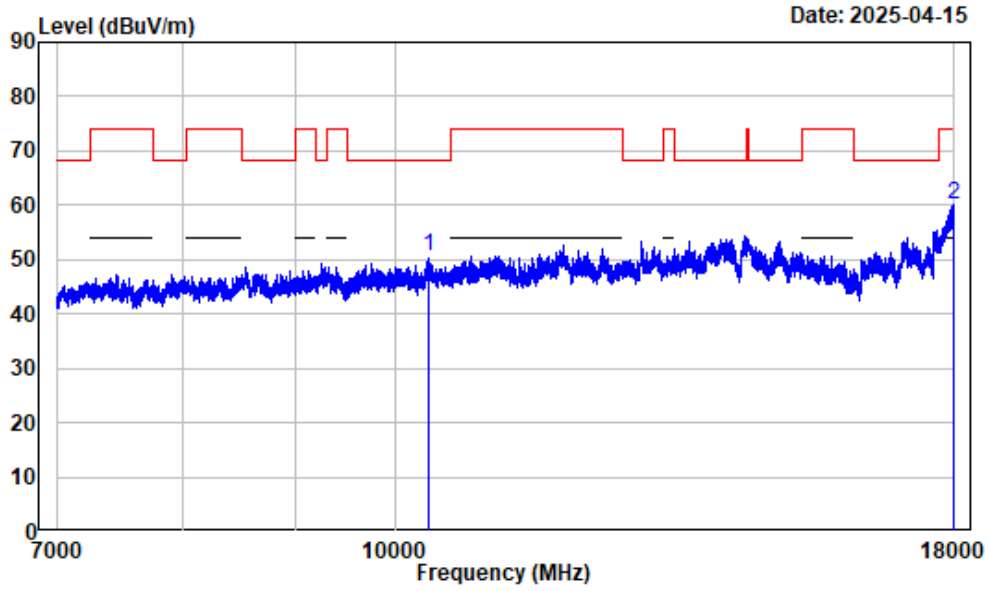
7-18GHz_Horizontal_Average_802.11a



Condition : Horizontal
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Average reading: RBW:1MHz VBW:1kHz Detector:Peak
Note : 5GWiFi_B1_A_5180

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	17986.250	13.12	33.67	46.79	54.00	-7.21	Average

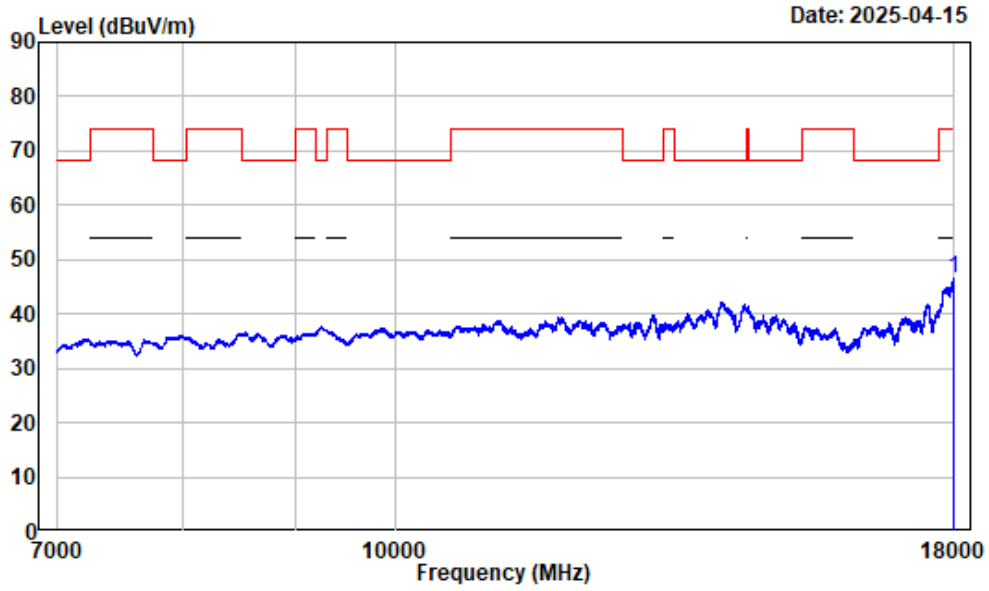
7-18GHz_Vertical_Peak_802.11a



Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B1_A_5180

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	10360.000	2.53	48.06	50.59	68.20	-17.61	Peak
2	17983.500	13.11	46.93	60.04	74.00	-13.96	Peak

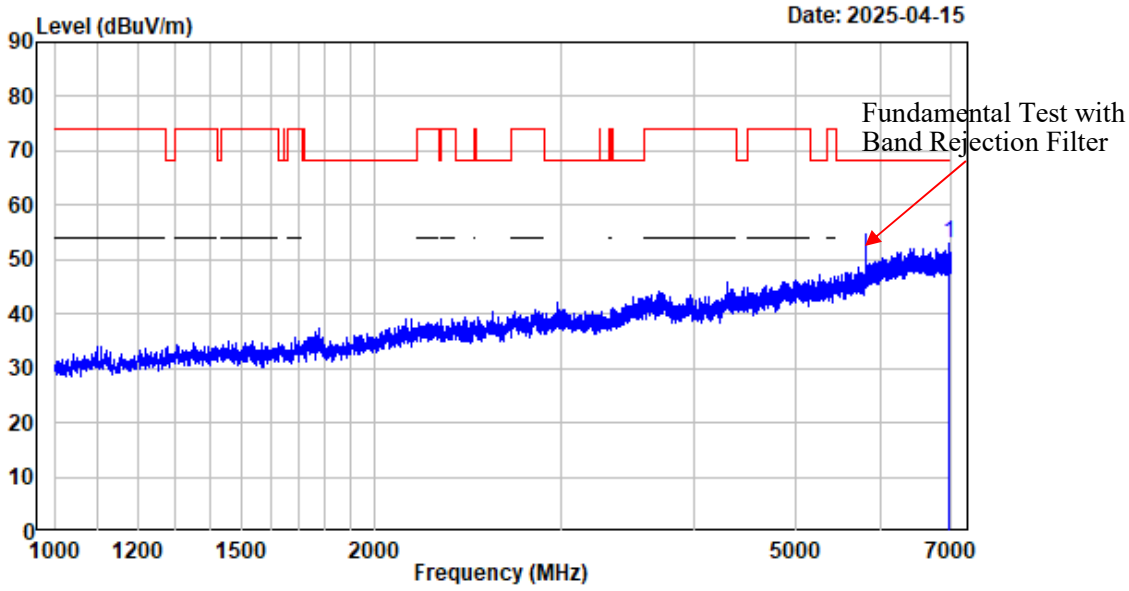
7-18GHz_Vertical_Average_802.11a



Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Average reading: RBW:1MHz VBW:1kHz Detector:Peak
Note : 5GWiFi_B1_A_5180

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	17998.630	13.19	33.28	46.47	54.00	-7.53	Average

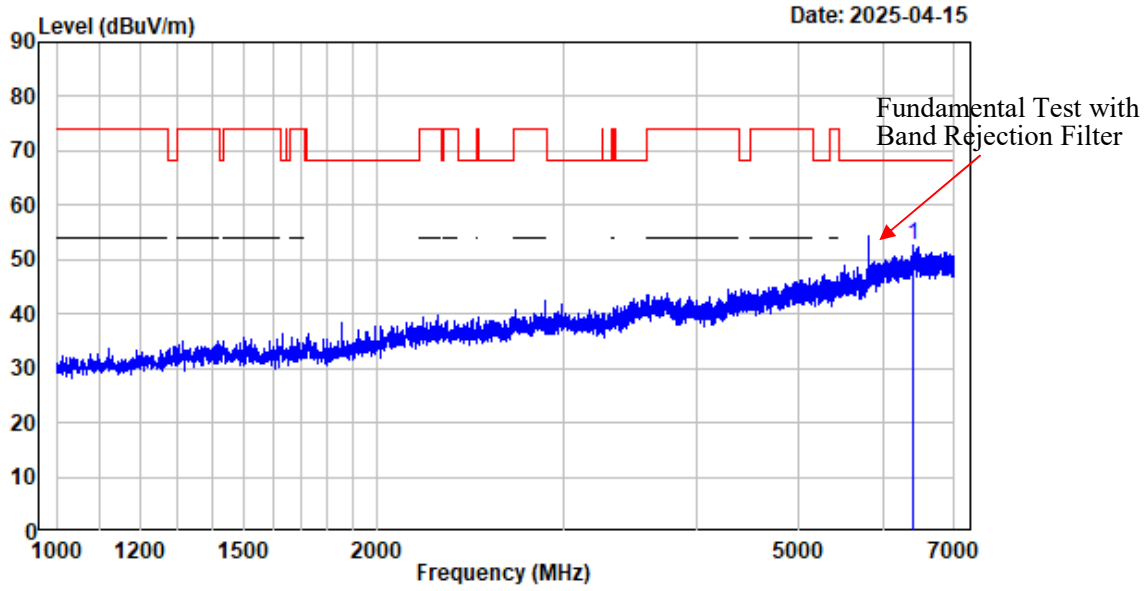
1-7GHz_Horizontal_802.11a



Condition : Horizontal
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B4_A_5825

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	6954.244	-2.72	55.57	52.85	68.20	-15.35	Peak

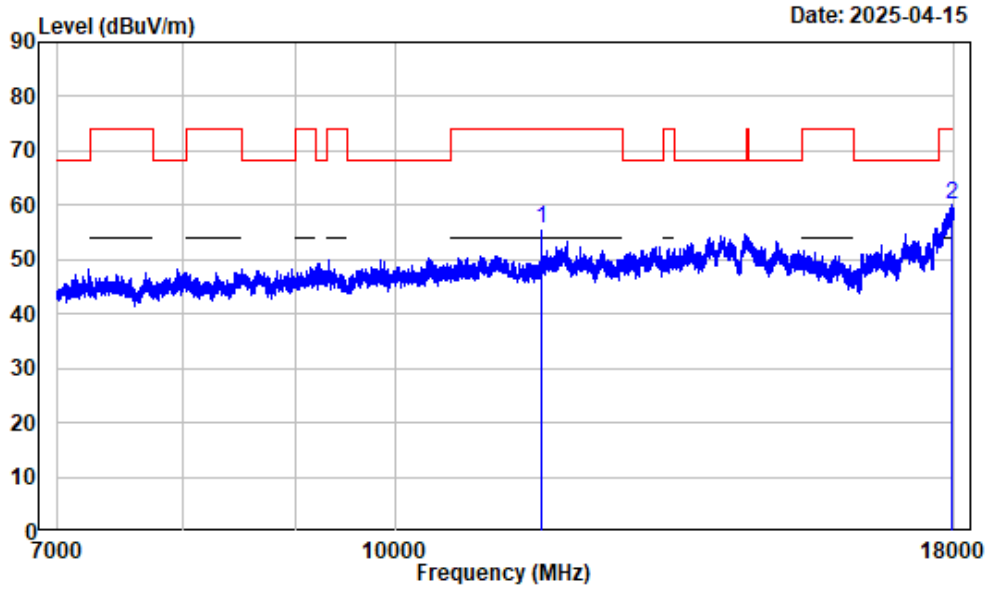
1-7GHz_Vertical_802.11a



Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B4_A_5825

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	6390.924	-2.98	55.73	52.75	68.20	-15.45	Peak

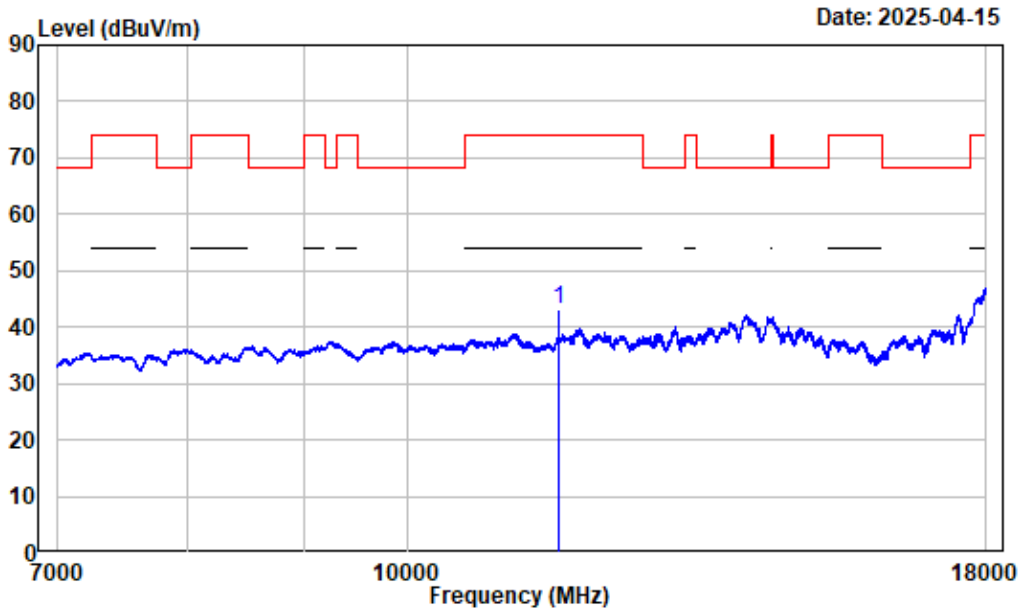
7-18GHz_Horizontal_Peak_802.11a



Condition : Horizontal
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B4_A_5825

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	11650.000	3.42	52.26	55.68	74.00	-18.32	Peak
2	17969.750	13.06	47.00	60.06	74.00	-13.94	Peak

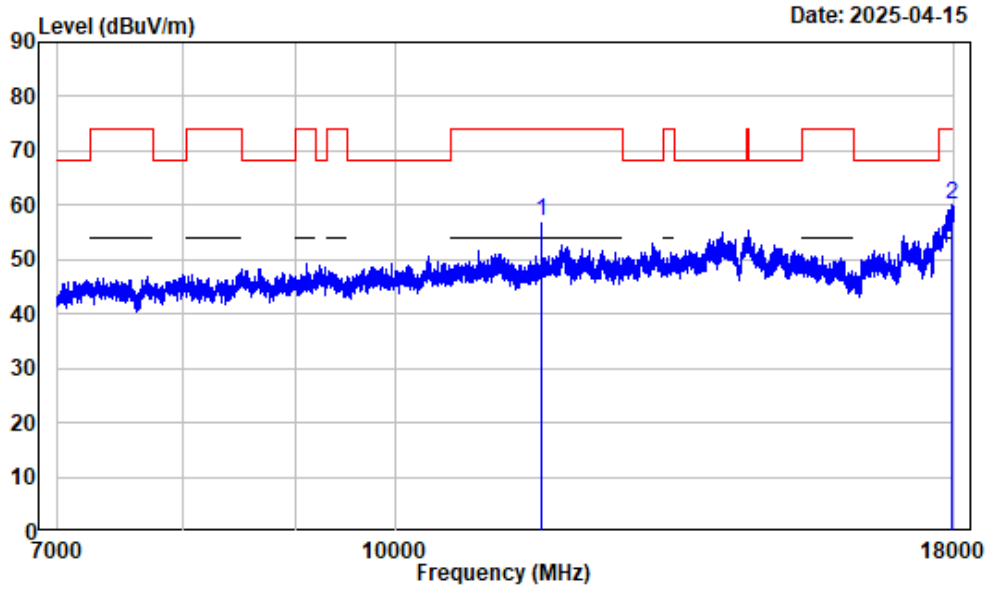
7-18GHz_Horizontal_Average_802.11a



Condition : Horizontal
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Average reading: RBW:1MHz VBW:1kHz Detector:Peak
Note : 5GWiFi_B4_A_5825

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	11650.000	3.42	39.87	43.29	54.00	-10.71	Average
2	18000.000	13.20	34.07	47.27	54.00	-6.73	Average

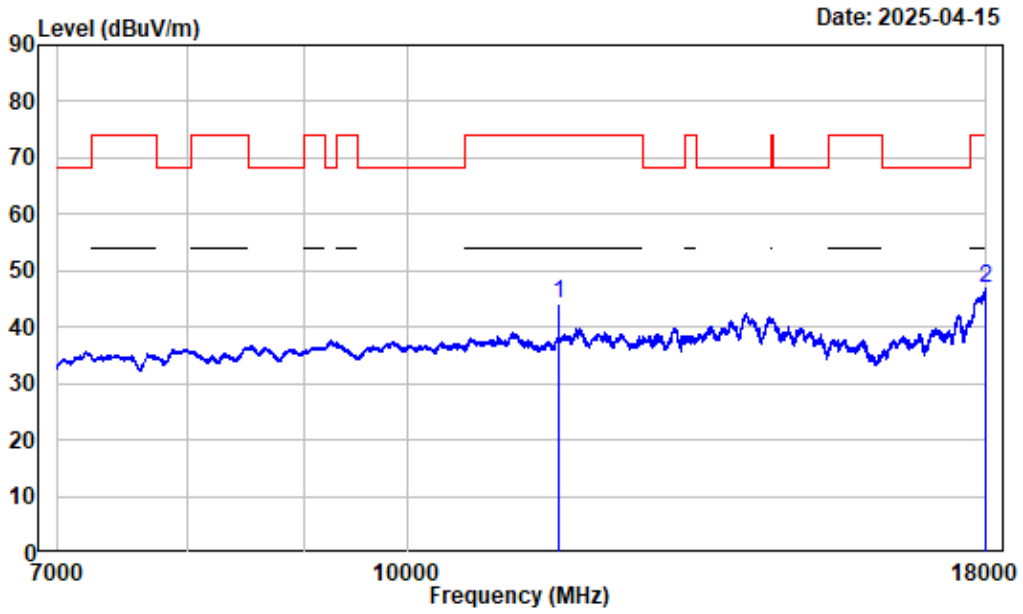
7-18GHz_Vertical_Peak_802.11a



Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B4_A_5825

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	11650.000	3.42	53.71	57.13	74.00	-16.87	Peak
2	17964.250	13.02	47.16	60.18	74.00	-13.82	Peak

7-18GHz_Vertical_Average_802.11a

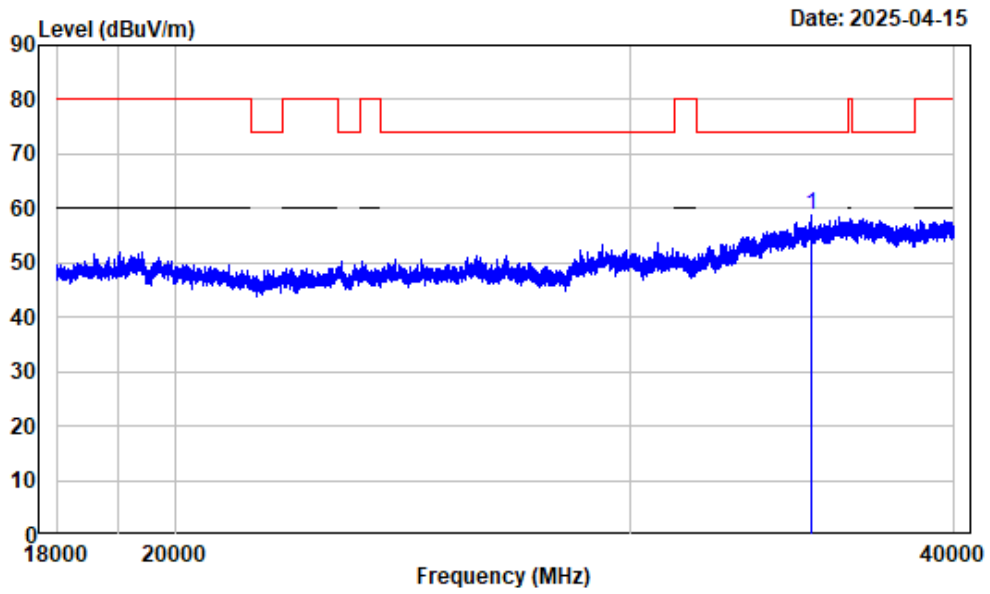


Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Average reading: RBW:1MHz VBW:1kHz Detector:Peak
Note : 5GWiFi_B4_A_5825

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	11650.000	3.42	40.57	43.99	54.00	-10.01	Average
2	17998.630	13.19	33.68	46.87	54.00	-7.13	Average

18-40GHz (Only with worst case margin mode plot):

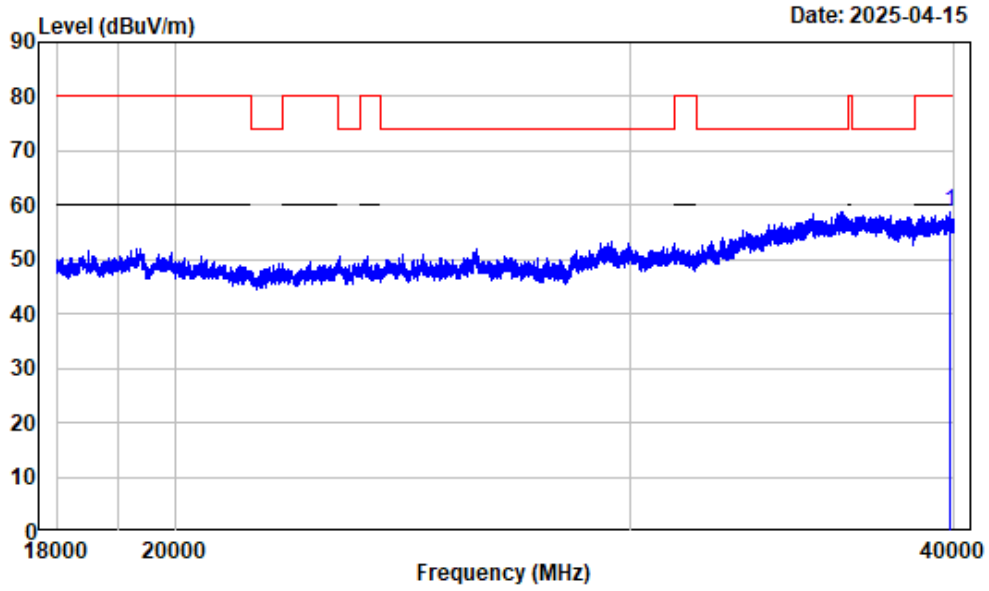
18-40GHz_Horizontal_802.11a




```
Condition        : Horizontal
Project No.      : 2501R30997E-RF
Tester           : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note             : 5GWiFi_B4_A_5825
```

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	35228.150	23.57	35.27	58.84	74.20	-15.36	peak

18-40GHz_Vertical_802.11a



Condition : Vertical
Project No. : 2501R30997E-RF
Tester : Visen Wu
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 5GWiFi_B4_A_5825

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	39845.980	22.26	36.64	58.90	80.00	-21.10	Peak

RF Conducted data

26dB attenuated below the channel power

Test Information:

Sample No.:	30PG-1	**Test Date:**	2025/04/10~2025/04/17
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Rainbow Zhu	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	23.5-24.4	**Relative Humidity: (%)**	47-52	**ATM Pressure: (kPa)**	100.4

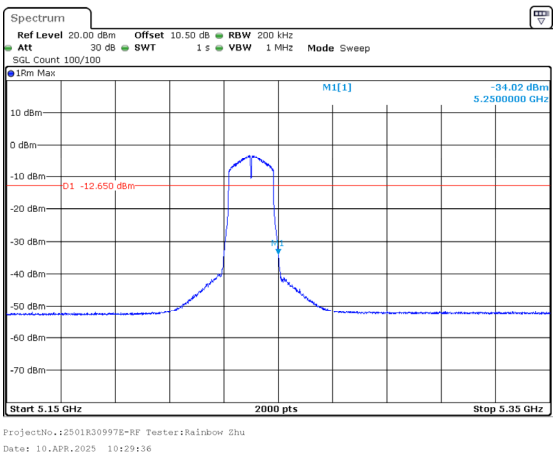
Test Data:

5150-5250MHz

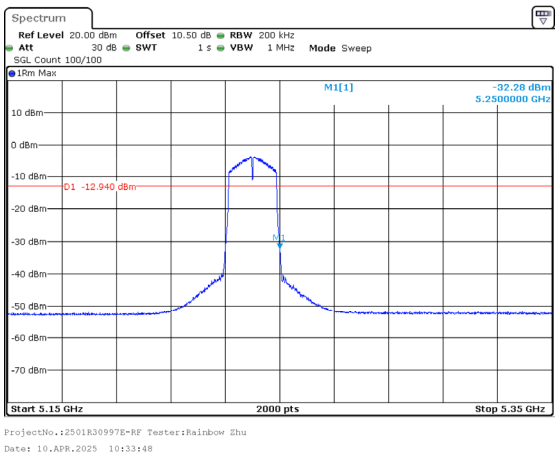
Mode	Test Frequency (MHz)	Result (dBm)	Limit (dBm)	Verdict
802.11a	5240	-34.02	-12.65	Pass
802.11ac20	5240	**-32.28**	-12.94	Pass
802.11ac40	5230	-35.79	-16.02	Pass
802.11ac80	5210	-34.98	-16.17	Pass

5150-5250MHz

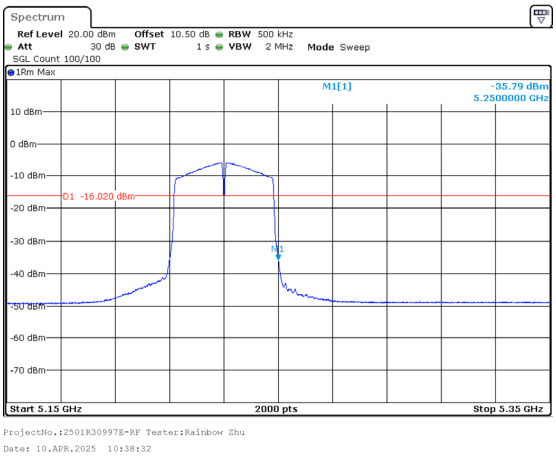
802.11a_5240MHz



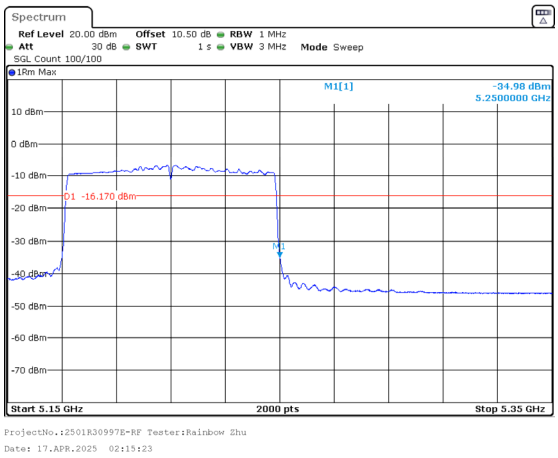
802.11ac20_5240MHz



802.11ac40_5230MHz



802.11ac80_5210MHz



Emission Bandwidth

Test Information:

Sample No.:	30PG-1	**Test Date:**	2025/04/10~2025/04/17
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Rainbow Zhu	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	23.5-24.4	**Relative Humidity: (%)**	47-52	**ATM Pressure: (kPa)**	100.4

Test Data:

26dB Emission Bandwidth
5150-5250MHz

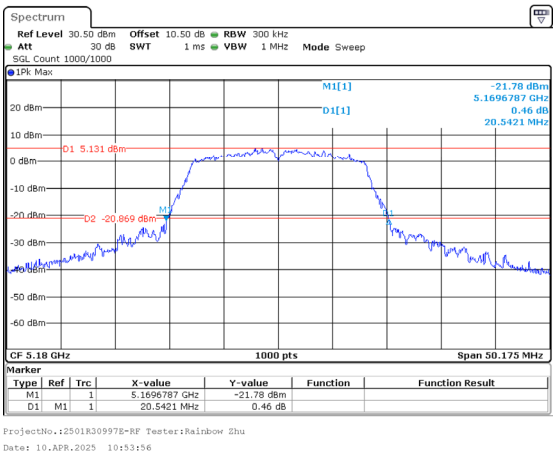
Mode	Test Frequency (MHz)	Result (MHz)
802.11a	5180	20.542
	5200	20.291
	5240	20.342
802.11ac20	5180	20.291
	5200	20.442
	5240	20.392
802.11ac40	5190	40.841
	5230	40.941
802.11ac80	5210	**84.885**

6dB Emission Bandwidth
5725-5850MHz

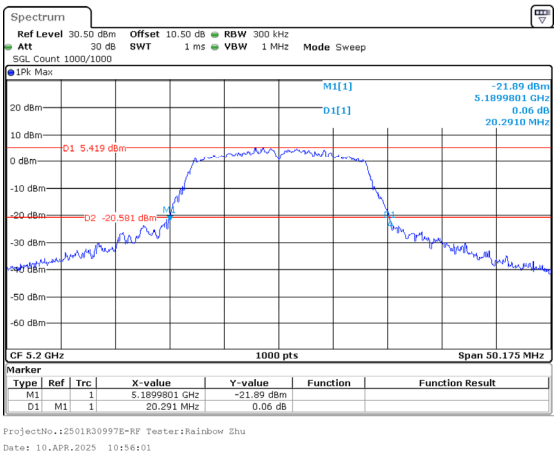
Mode	Test Frequency (MHz)	Result (MHz)	Limit (MHz)	Verdict
802.11a	5745	15.215	0.5	Pass
	5785	15.215	0.5	Pass
	5825	15.215	0.5	Pass
802.11ac20	5745	15.215	0.5	Pass
	5785	15.215	0.5	Pass
	5825	15.215	0.5	Pass
802.11ac40	5755	35.235	0.5	Pass
	5795	35.235	0.5	Pass
802.11ac80	5775	**75.876**	0.5	Pass

5150-5250MHz

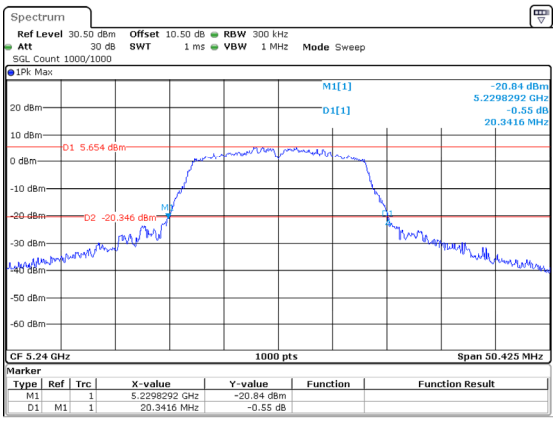
802.11a_5180MHz



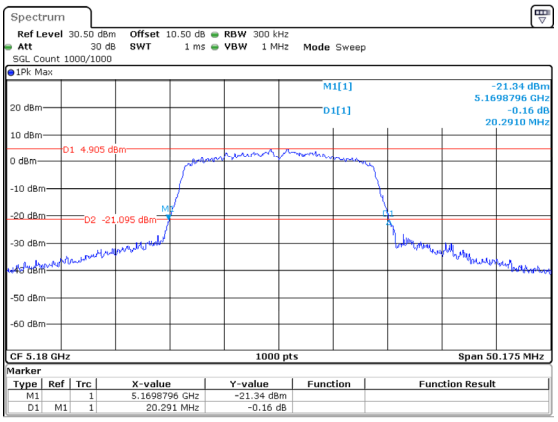
802.11a_5200MHz



802.11a_5240MHz



802.11ac20_5180MHz



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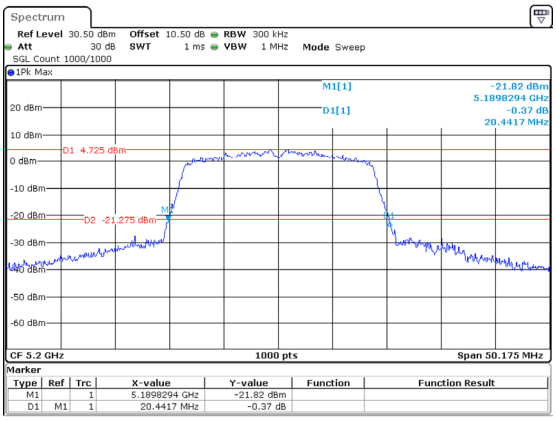

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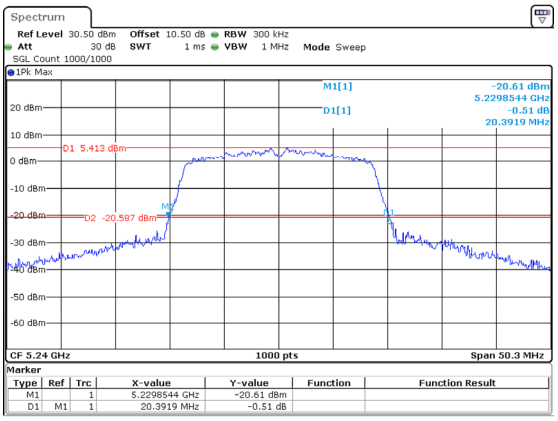
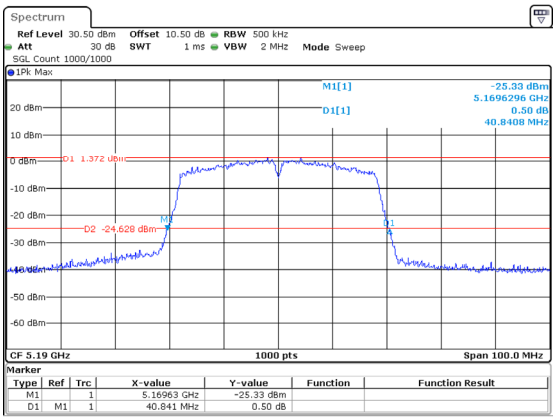
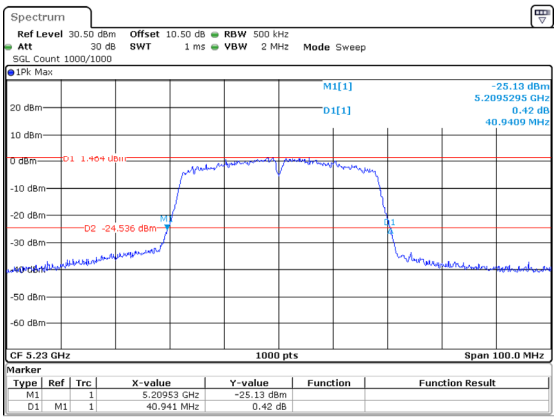


802.11ac40_5190MHz

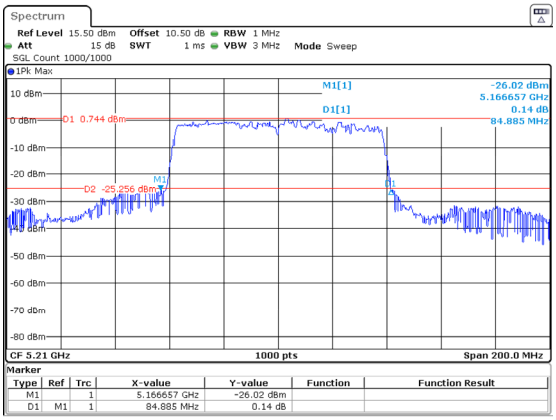


802.11ac40_5230MHz

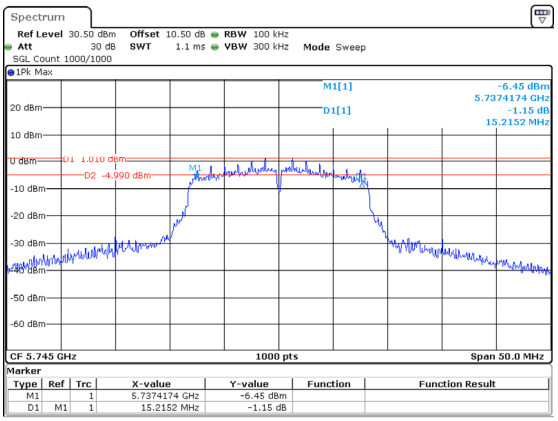


5725-5850MHz

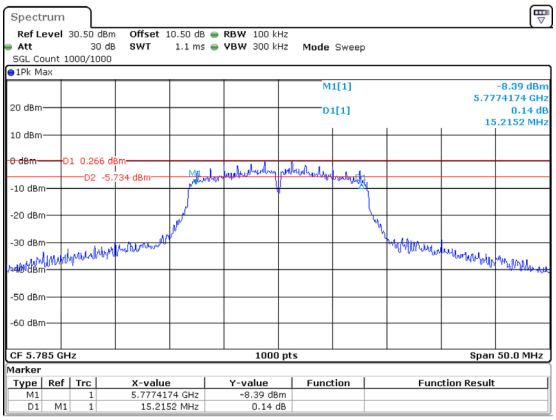
802.11ac80_5210MHz



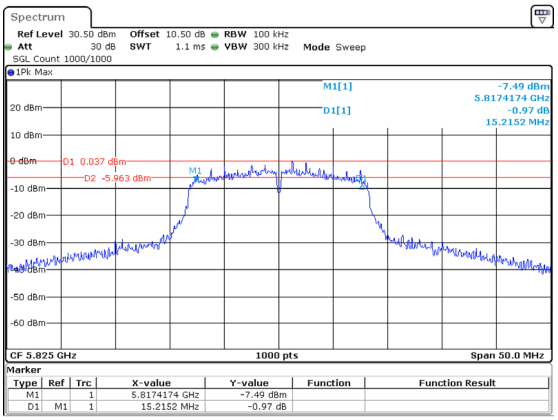
802.11a_5745MHz



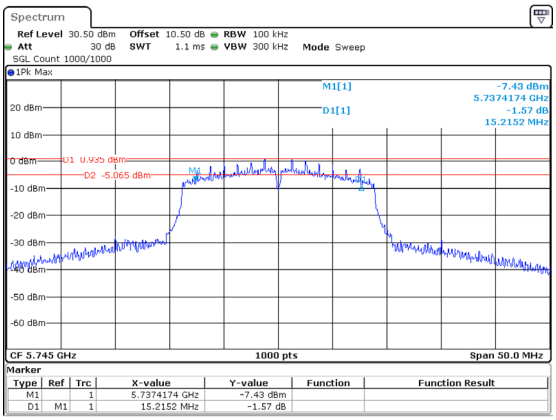
802.11a_5785MHz



802.11a_5825MHz



802.11ac20_5745MHz



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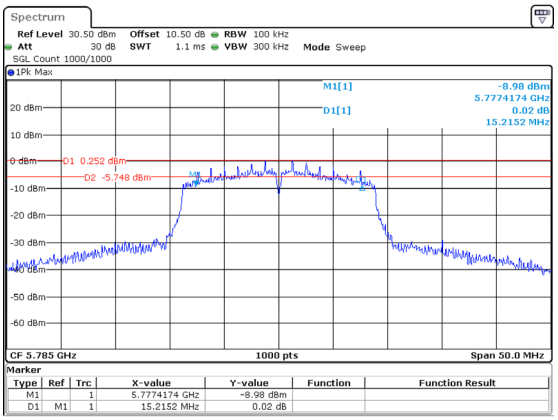

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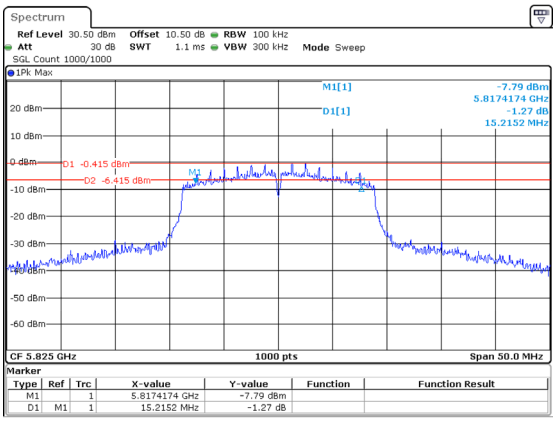
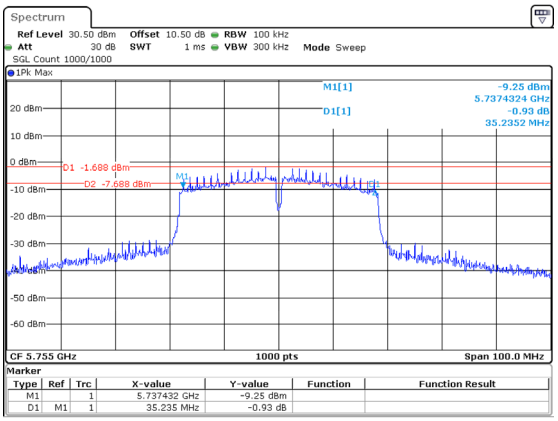
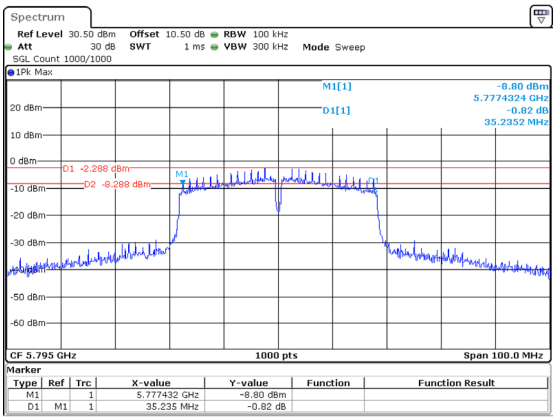


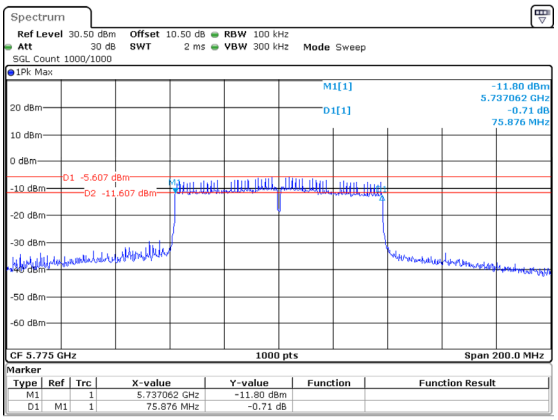
802.11ac40_5755MHz



802.11ac40_5795MHz



802.11ac80_5775MHz



99% Occupied Bandwidth

Test Information:

Sample No.:	30PG-1	**Test Date:**	2025/04/10~2025/04/17
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Rainbow Zhu	**Test Result:**	N/A

Environmental Conditions:

Temperature: (°C)	23.5-24.4	**Relative Humidity: (%)**	47-52	**ATM Pressure: (kPa)**	100.4

Test Data:

5150-5250MHz

Mode	Test Frequency (MHz)	99% OBW (MHz)
802.11a	5180	16.500
	5200	16.500
	5240	16.550
802.11ac20	5180	17.500
	5200	17.500
	5240	17.500
802.11ac40	5190	36.100
	5230	36.000
802.11ac80	5210	**76.600**

Note:
The 99% Occupied Bandwidth have not fall into the band 5250-5350MHz, please refer to the test plots of 99% Occupied Bandwidth.

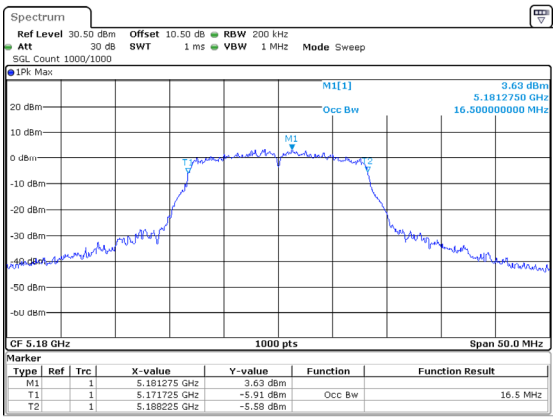
5725-5850MHz

Mode	Test Frequency (MHz)	99% OBW (MHz)
802.11a	5745	16.750
	5785	16.800
	5825	16.800
802.11ac20	5745	17.650
	5785	17.650
	5825	17.700
802.11ac40	5755	36.200
	5795	36.300
802.11ac80	5775	**76.200**

Note:
The 99% Occupied Bandwidth have not fall into the band 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.

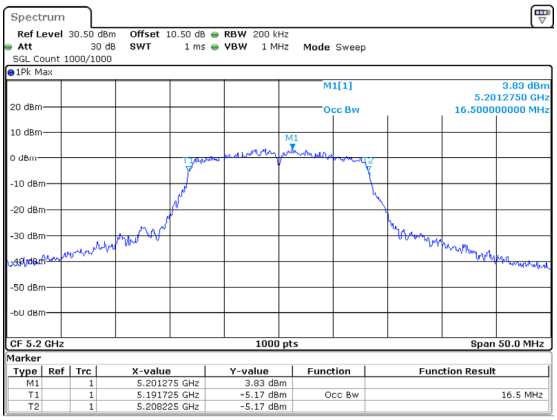
5150-5250MHz

802.11a_5180MHz



ProjectNo.:2501R30997E-RF Tester:Rainbow Zhu
Date: 10.APR.2025 10:54:40

802.11a_5200MHz



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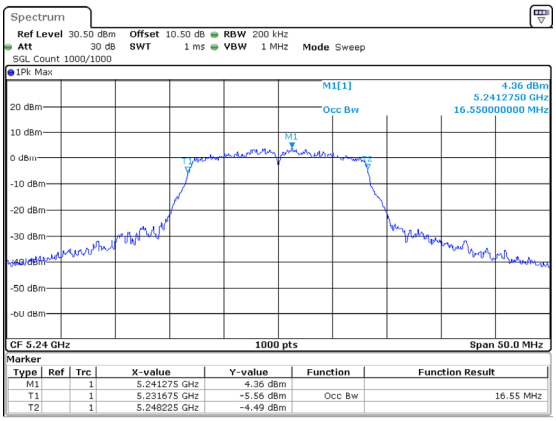
802.11a_5240MHz



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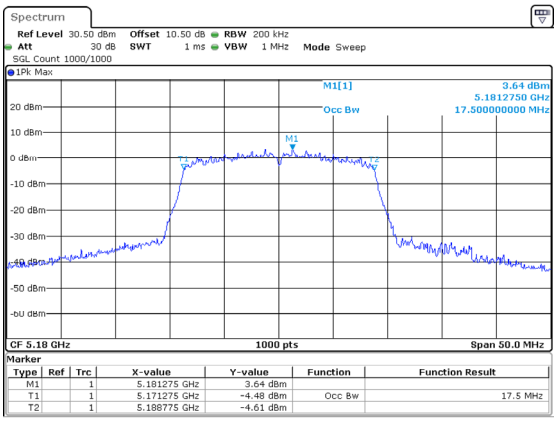
802.11ac20_5180MHz



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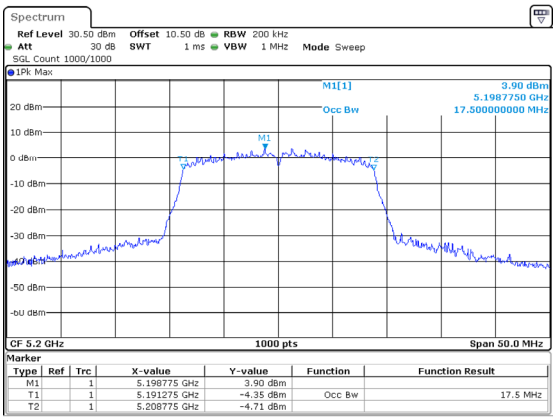
802.11ac20_5200MHz



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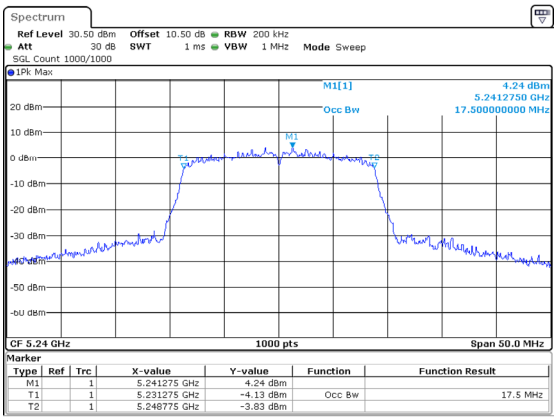
802.11ac20_5240MHz



ProjectNo.:2501R30997E-RF Tester:Rainbow Zhu
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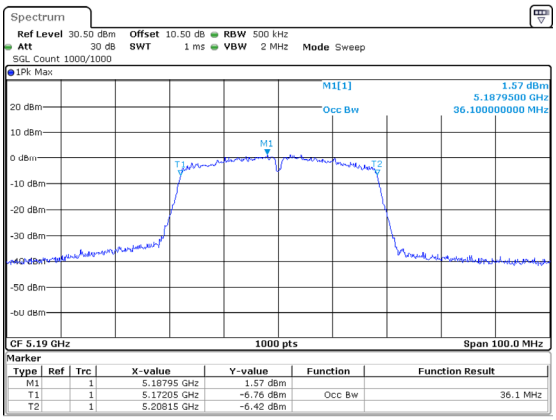
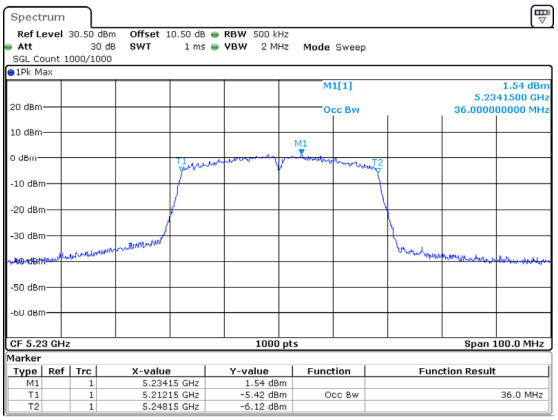
802.11ac40_5190MHz

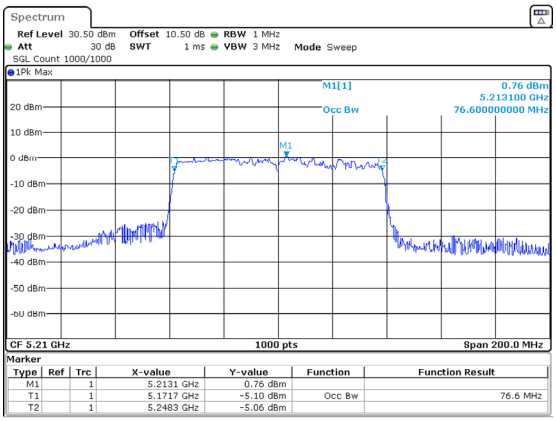


802.11ac40_5230MHz

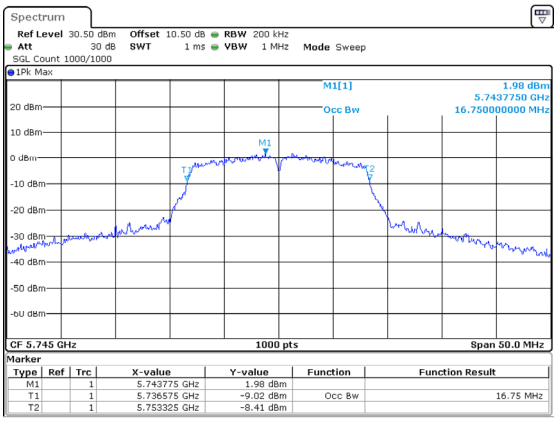


5725-5850MHz

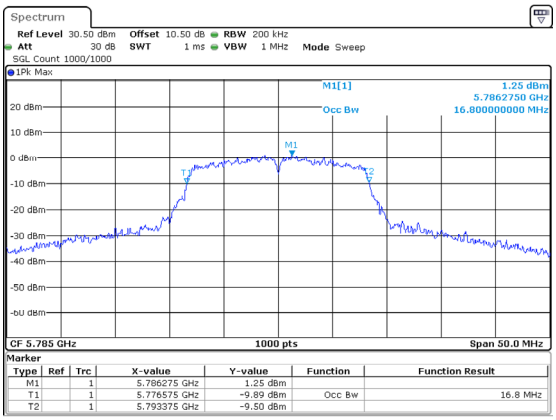
802.11ac80_5210MHz



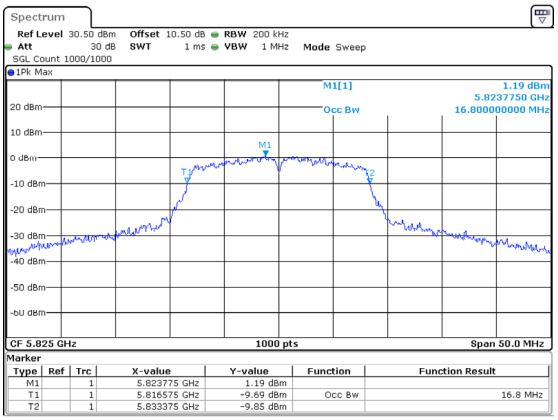
802.11a_5745MHz



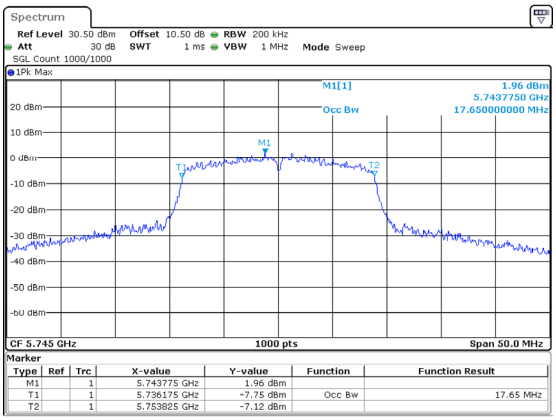
802.11a_5785MHz



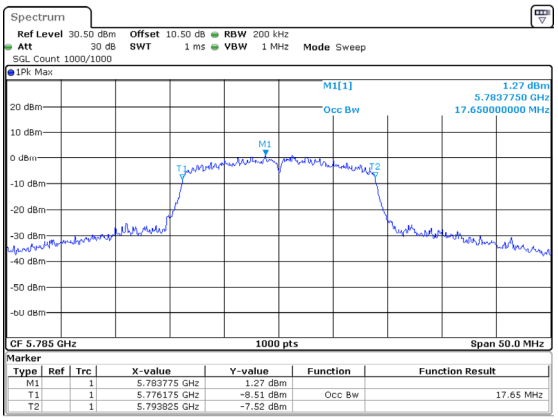
802.11a_5825MHz



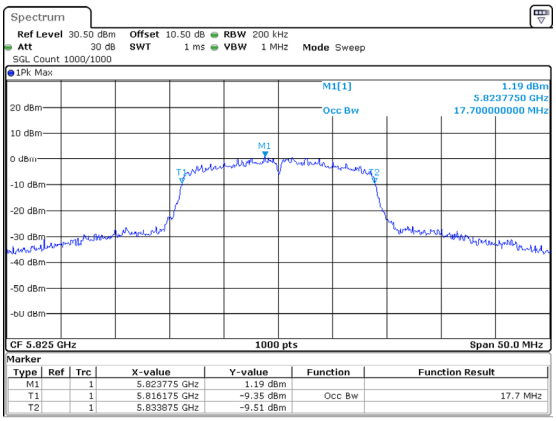
802.11ac20_5745MHz



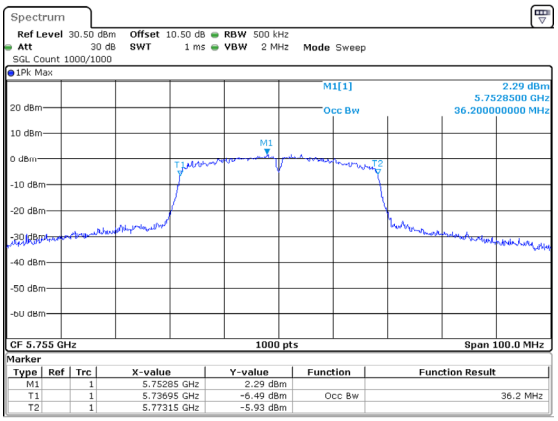
802.11ac20_5785MHz



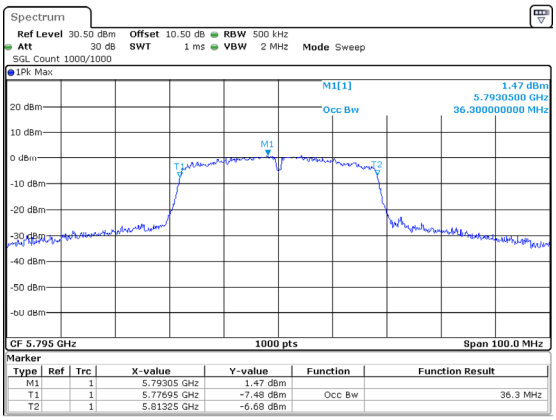
802.11ac20_5825MHz



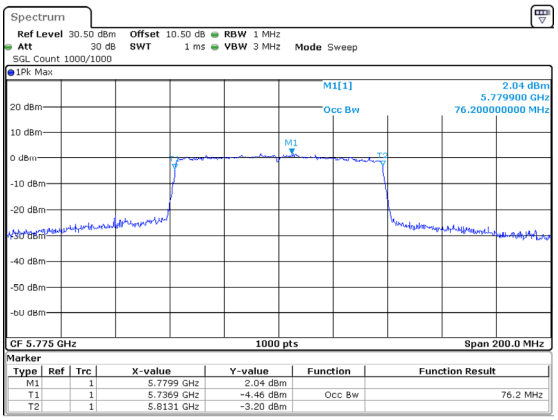
802.11ac40_5755MHz



802.11ac40_5795MHz



802.11ac80_5775MHz



Maximum Conducted Output Power

Test Information:

Sample No.:	30PG-1	**Test Date:**	2025/04/10~2025/04/17
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Rainbow Zhu	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	23.5-24.4	**Relative Humidity: (%)**	47-52	**ATM Pressure: (kPa)**	100.4

Test Data:

5150-5250MHz

Mode	Test Frequency (MHz)	Average Output Power(dBm)	FCC Limit (dBm)	EIRP (dBm)	ISEDC EIRP Limit (dBm)	Verdict
802.11a	5180	12.64	24	14.31	22.17	Pass
	5200	12.86	24	14.53	22.17	Pass
	5240	**13.35**	24	15.02	22.19	Pass
802.11ac20	5180	12.54	24	14.21	22.43	Pass
	5200	12.72	24	14.39	22.43	Pass
	5240	13.06	24	14.73	22.43	Pass
802.11ac40	5190	9.76	24	11.43	23.01	Pass
	5230	9.98	24	11.65	23.01	Pass
802.11ac80	5210	9.83	24	11.50	23.01	Pass

5725-5850MHz

Mode	Test Frequency (MHz)	Average Output Power(dBm)	Limit (dBm)	Verdict
802.11a	5745	**11.00**	30	Pass
	5785	10.33	30	Pass
	5825	10.14	30	Pass
802.11ac20	5745	10.84	30	Pass
	5785	10.17	30	Pass
	5825	9.98	30	Pass
802.11ac40	5755	10.47	30	Pass
	5795	9.91	30	Pass
802.11ac80	5775	9.97	30	Pass

Note:
The EUT is a client device.

Power Spectral Density

Test Information:

Sample No.:	30PG-1	**Test Date:**	2025/04/10~2025/04/17
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Rainbow Zhu	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	23.5-24.4	**Relative Humidity: (%)**	47-52	**ATM Pressure: (kPa)**	100.4

Test Data:

5150-5250MHz

Mode	Test Frequency (MHz)	Reading (dBm/MHz)	Duty Cycle Factor(dB)	Result (dBm/MHz)	FCC Limit (dBm/MHz)	EIRP (dBm/MHz)	ISEDC EIRP Limit (dBm/MHz)	Verdict
802.11a	5180	3.06	0	3.06	11	4.73	10	Pass
	5200	2.95	0	2.95	11	4.62	10	Pass
	5240	3.53	0	**3.53**	11	5.20	10	Pass
802.11ac20	5180	2.77	0	2.77	11	4.44	10	Pass
	5200	2.68	0	2.68	11	4.35	10	Pass
	5240	3.12	0	3.12	11	4.79	10	Pass
802.11ac40	5190	-3.12	0	-3.12	11	-1.45	10	Pass
	5230	-3.11	0	-3.11	11	-1.44	10	Pass
802.11ac80	5210	-6.91	0	-6.91	11	-5.24	10	Pass

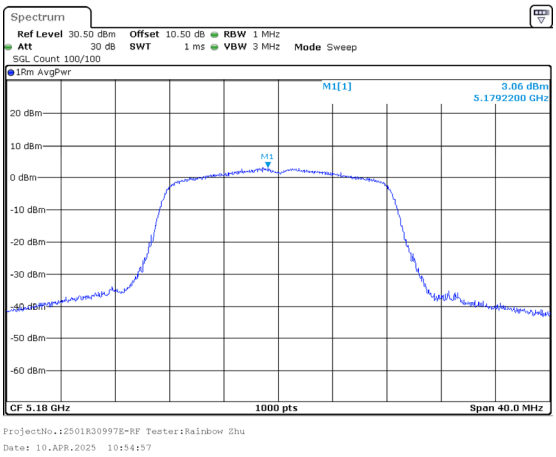
5725-5850MHz

Mode	Test Frequency (MHz)	Reading (dBm/500kHz)	Duty Cycle Factor(dB)	Result (dBm/500kHz)	Limit (dBm/500kHz)	Verdict
802.11a	5745	-1.79	0	-1.79	30	Pass
	5785	-2.28	0	-2.28	30	Pass
	5825	-2.46	0	-2.46	30	Pass
802.11ac20	5745	-1.78	0	**-1.78**	30	Pass
	5785	-2.73	0	-2.73	30	Pass
	5825	-2.57	0	-2.57	30	Pass
802.11ac40	5755	-5.17	0	-5.17	30	Pass
	5795	-5.92	0	-5.92	30	Pass
802.11ac80	5775	-9.53	0	-9.53	30	Pass

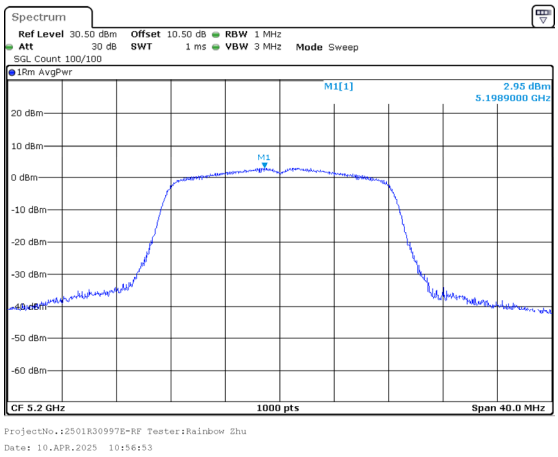
Result = Reading + Duty Cycle Factor

5150-5250MHz

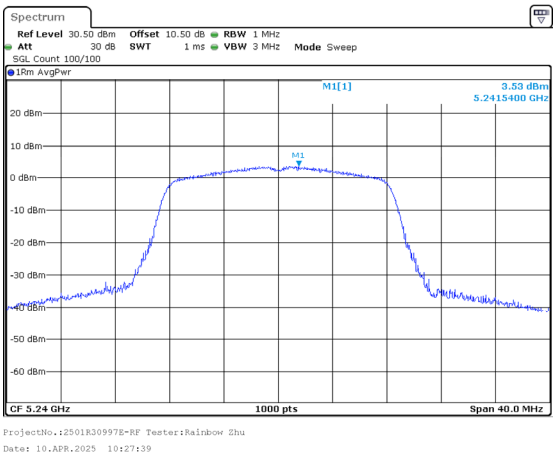
802.11a_5180MHz



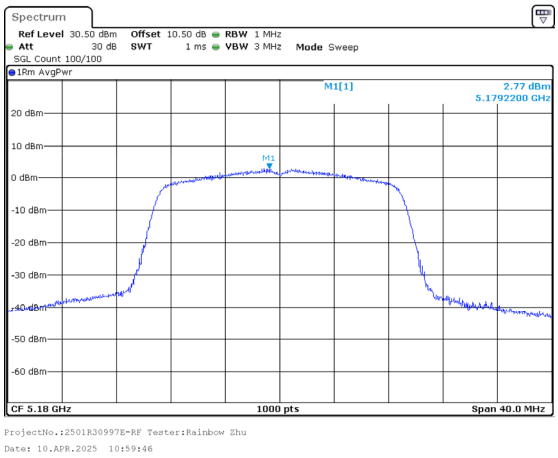
802.11a_5200MHz



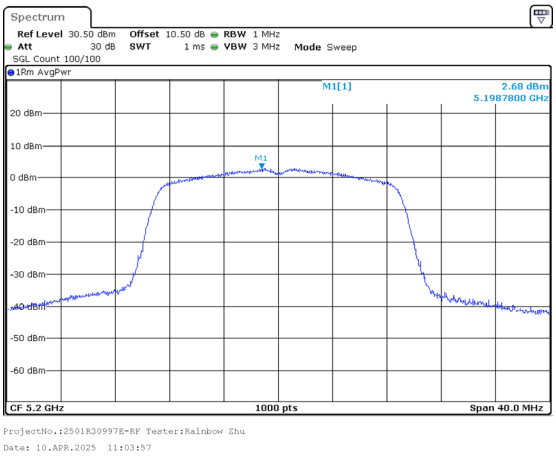
802.11a_5240MHz



802.11ac20_5180MHz



802.11ac20_5200MHz



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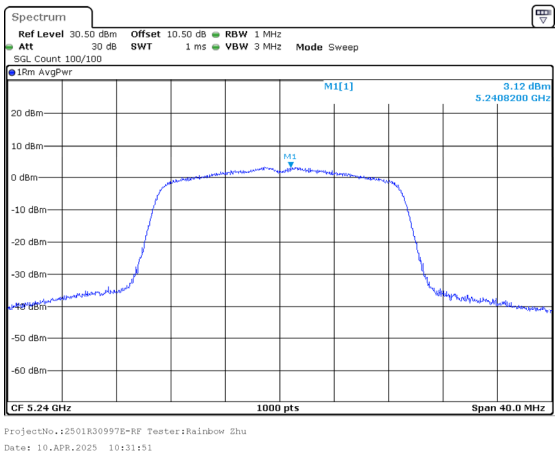
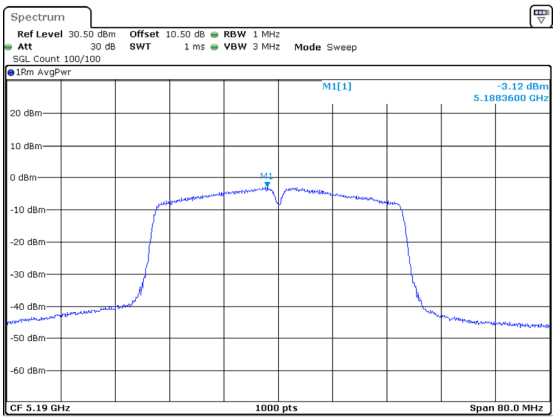
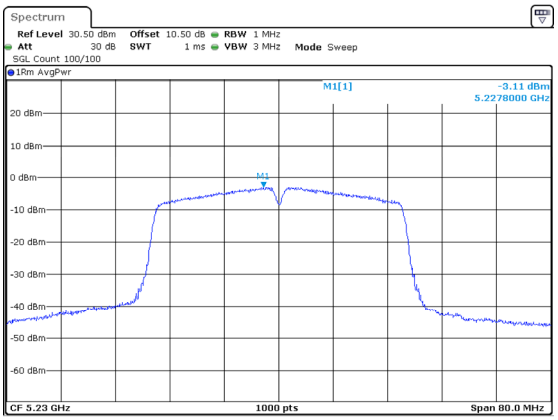


802.11ac40_5190MHz



ProjectNo.:2501R30997E-RF Tester:Rainbow Zhu
Date: 10.APR.2025 11:05:41

802.11ac40_5230MHz



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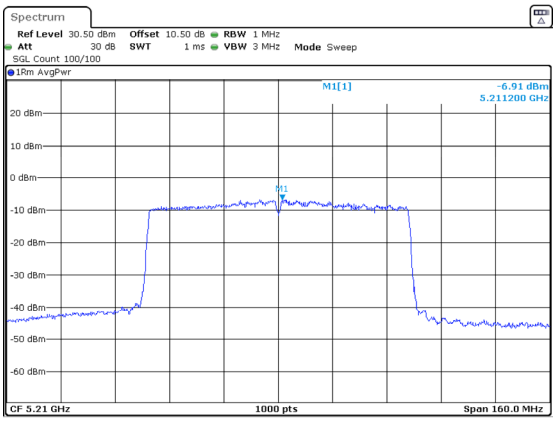
Date: 10.APR.2025 10:36:36

5725-5850MHz

802.11ac80_5210MHz



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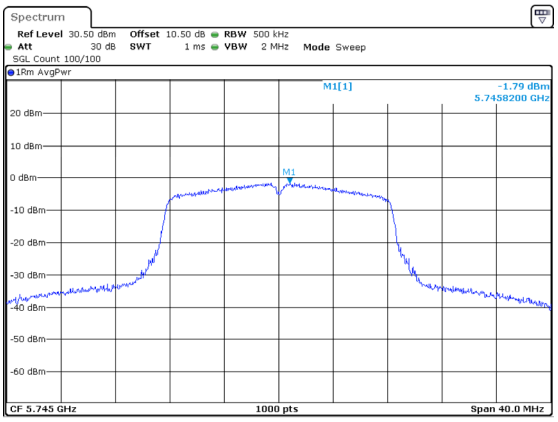
Date: 17.APR.2025 02:13:26

802.11a_5745MHz



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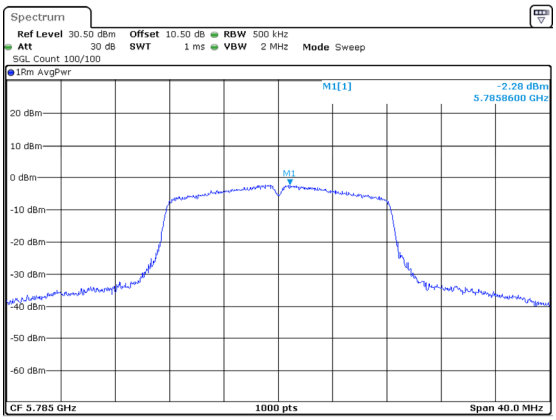
Date: 10.APR.2025 11:08:26

802.11a_5785MHz



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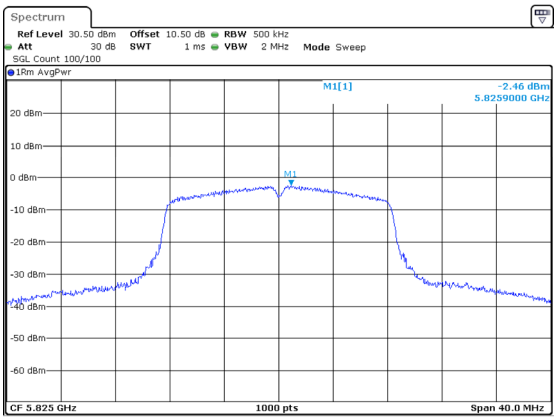
Date: 10.APR.2025 11:10:49

802.11a_5825MHz



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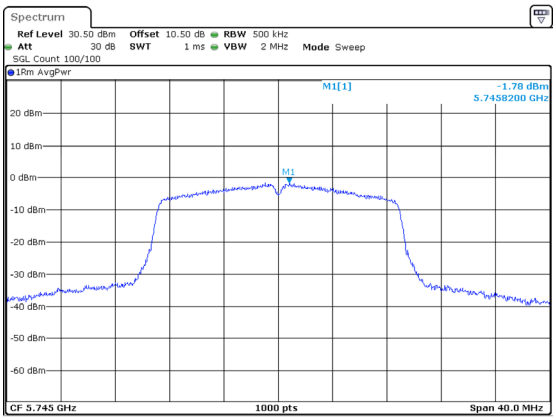
Date: 10.APR.2025 11:12:48

802.11ac20_5745MHz



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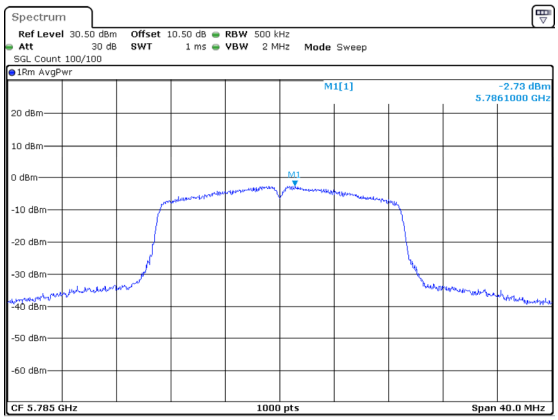
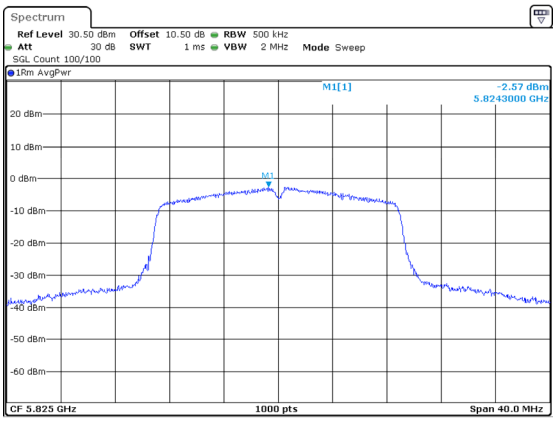
Date: 10.APR.2025 11:15:06

802.11ac20_5785MHz



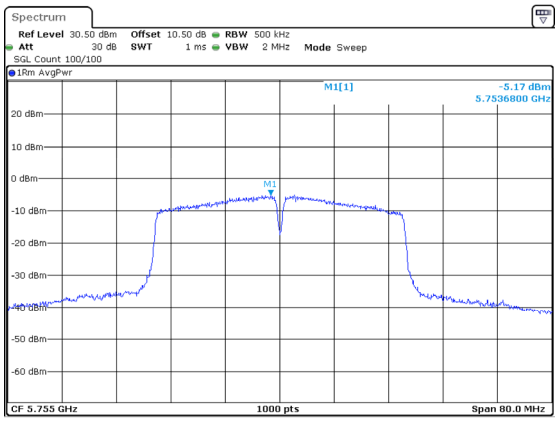
ProjectNo.:2501R30997E-RF Tester:Rainbow Zhu
Date: 10.APR.2025 11:17:42

802.11ac20_5825MHz



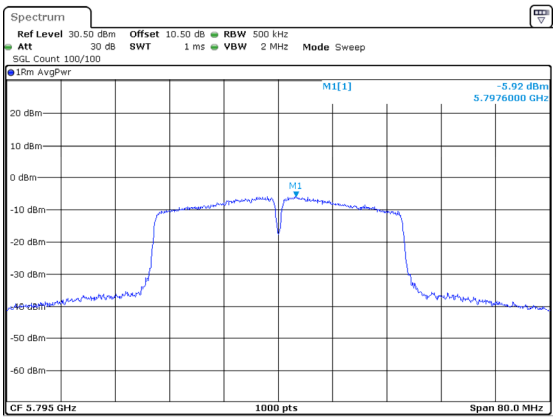
ProjectNo.:2501R30997E-RF Tester:Rainbow Zhu
Date: 10.APR.2025 11:19:27

802.11ac40_5755MHz



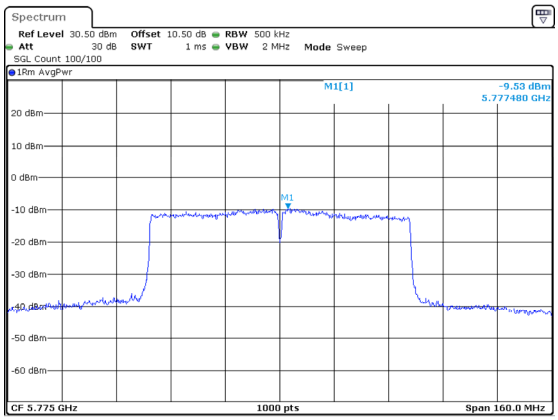
ProjectNo.:2501R30997E-RF Tester:Rainbow Zhu
Date: 10.APR.2025 11:20:40

802.11ac40_5795MHz



ProjectNo.:2501R30997E-RF Tester:Rainbow Zhu
Date: 10.APR.2025 11:21:45

802.11ac80_5775MHz



ProjectNo.:2501R30997E-RF Tester:Rainbow Zhu
Date: 10.APR.2025 11:23:25

Duty Cycle

Test Information:

Sample No.:	30PG-1	**Test Date:**	2025/04/10
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Rainbow Zhu	**Test Result:**	N/A

Environmental Conditions:

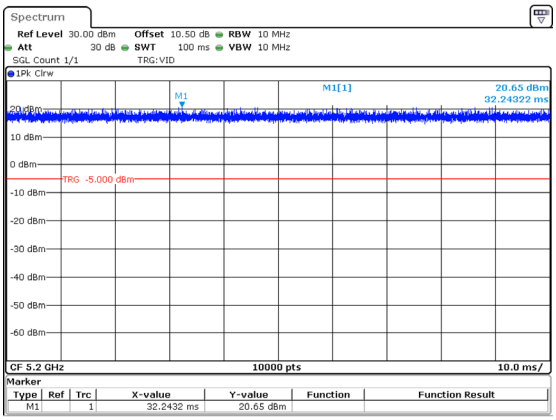
Temperature: (°C)	24.3	**Relative Humidity: (%)**	47	**ATM Pressure: (kPa)**	100.2

Test Data:

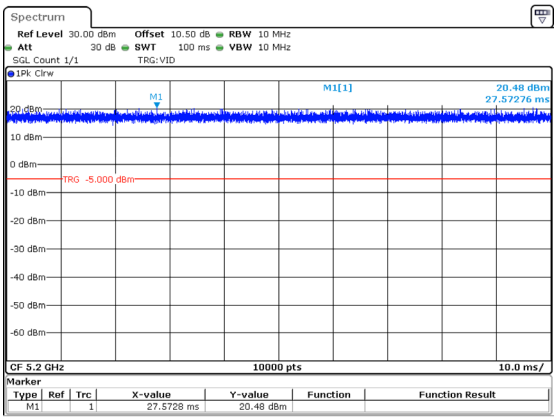
Mode	Test Frequency (MHz)	Ton (ms)	Ton+Toff (ms)	Duty Cycle (%)	Duty Cycle Factor(dB)	1/Ton (Hz)	VBW Setting (kHz)
802.11a	5200	**100**	100	100	0	NA	0.010
802.11ac20	5200	**100**	100	100	0	NA	0.010
802.11ac40	5190	**100**	100	100	0	NA	0.010
802.11ac80	5210	**100**	100	100	0	NA	0.010

Duty Cycle = Ton/(Ton+Toff)*100%

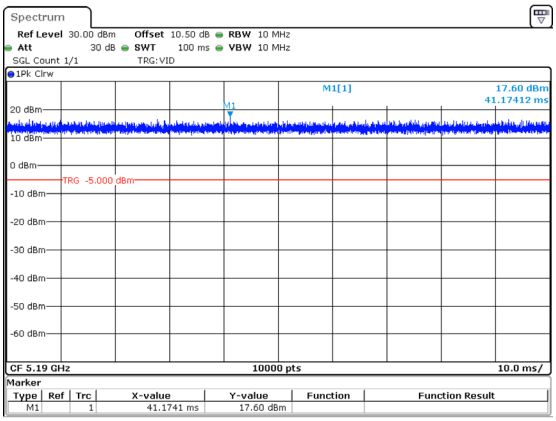
802.11a_5200MHz



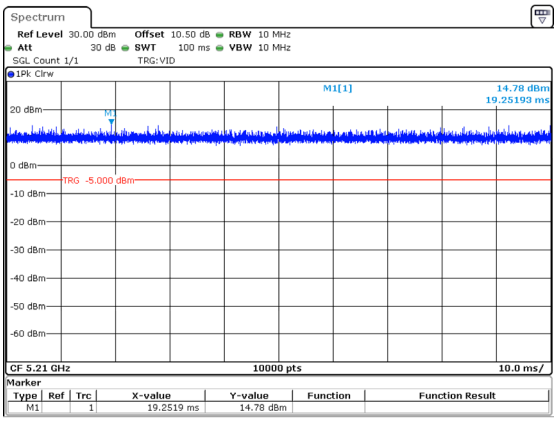
802.11ac20_5200MHz



802.11ac40_5190MHz



802.11ac80_5210MHz



Frequency Stability

Test Information:

Sample No.:	30PG-1	**Test Date:**	2025/04/10~2025/04/17
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Rainbow Zhu	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	23.5-24.4	**Relative Humidity: (%)**	47-52	**ATM Pressure: (kPa)**	100.4

5150-5250MHz

Test Channel: Lowest for Lower Edge, Highest for Upper Edge						
Test mode	Temperature (℃)	Voltage (V_{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
802.11a	-20	132	5170.072	5150.0000	5249.889	5250.0000
	20	132	5170.135	5150.0000	5249.871	5250.0000
	50	132	5170.140	5150.0000	5249.846	5250.0000
	-20	120	5170.068	5150.0000	5249.845	5250.0000
	20	120	5170.041	5150.0000	5250.891	5250.0000
	50	120	5170.004	5150.0000	5249.967	5250.0000
	-20	108	5170.108	5150.0000	5249.826	5250.0000
	20	108	5170.158	5150.0000	5249.813	5250.0000
	50	108	5170.074	5150.0000	5249.851	5250.0000

Test Channel: Lowest for Lower Edge, Highest for Upper Edge						
Test mode	Temperature (℃)	Voltage (V_{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
802.11ac20	-20	132	5170.132	5150.0000	5249.932	5250.0000
	20	132	5170.155	5150.0000	5249.939	5250.0000
	50	132	5170.058	5150.0000	5249.913	5250.0000
	-20	120	5170.165	5150.0000	5249.967	5250.0000
	20	120	5170.146	5150.0000	5249.921	5250.0000
	50	120	5170.074	5150.0000	5249.933	5250.0000
	-20	108	5170.155	5150.0000	5249.996	5250.0000
	20	108	5170.048	5150.0000	5249.859	5250.0000
	50	108	5170.039	5150.0000	5249.950	5250.0000

Test Channel: Lowest for Lower Edge, Highest for Upper Edge						
Test mode	Temperature (℃)	Voltage (V_{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
802.11ac40	-20	132	5170.157	5150.0000	5249.852	5250.0000
	20	132	5170.022	5150.0000	5249.874	5250.0000
	50	132	5170.152	5150.0000	5249.822	5250.0000
	-20	120	5170.155	5150.0000	5249.837	5250.0000
	20	120	5170.035	5150.0000	5249.822	5250.0000
	50	120	5170.147	5150.0000	5249.909	5250.0000
	-20	108	5170.114	5150.0000	5249.824	5250.0000
	20	108	5170.186	5150.0000	5249.949	5250.0000
	50	108	5170.087	5150.0000	5249.978	5250.0000

Test Channel: Lowest for Lower Edge, Highest for Upper Edge						
Test mode	Temperature (℃)	Voltage (V_{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
802.11ac80	-20	132	5170.122	5150.0000	5249.903	5250.0000
	20	132	5170.111	5150.0000	5249.971	5250.0000
	50	132	5170.157	5150.0000	5249.931	5250.0000
	-20	120	5170.043	5150.0000	5249.833	5250.0000
	20	120	5170.171	5150.0000	5249.843	5250.0000
	50	120	5170.198	5150.0000	5249.892	5250.0000
	-20	108	5170.082	5150.0000	5249.841	5250.0000
	20	108	5170.007	5150.0000	5249.818	5250.0000
	50	108	5170.054	5150.0000	5249.898	5250.0000

5725-5850MHz

Test Channel: Lowest for Lower Edge, Highest for Upper Edge						
Test mode	Temperature (℃)	Voltage (V_{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
802.11a	-20	132	5735.077	5725.0000	5834.955	5850.0000
	20	132	5735.024	5725.0000	5834.900	5850.0000
	50	132	5735.111	5725.0000	5834.802	5850.0000
	-20	120	5735.086	5725.0000	5834.966	5850.0000
	20	120	5735.039	5725.0000	5834.972	5850.0000
	50	120	5735.158	5725.0000	5834.966	5850.0000
	-20	108	5735.071	5725.0000	5834.825	5850.0000
	20	108	5735.171	5725.0000	5834.854	5850.0000
	50	108	5735.034	5725.0000	5834.808	5850.0000

Test Channel: Lowest for Lower Edge, Highest for Upper Edge						
Test mode	Temperature (℃)	Voltage (V_{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
802.11ac20	-20	132	5735.053	5725.0000	5834.847	5850.0000
	20	132	5735.100	5725.0000	5834.973	5850.0000
	50	132	5735.045	5725.0000	5834.857	5850.0000
	-20	120	5735.030	5725.0000	5834.809	5850.0000
	20	120	5735.068	5725.0000	5834.965	5850.0000
	50	120	5735.130	5725.0000	5834.996	5850.0000
	-20	108	5735.175	5725.0000	5834.941	5850.0000
	20	108	5735.017	5725.0000	5834.941	5850.0000
	50	108	5735.158	5725.0000	5834.835	5850.0000

Test Channel: Lowest for Lower Edge, Highest for Upper Edge						
Test mode	Temperature (℃)	Voltage (V_{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
802.11ac40	-20	132	5735.030	5725.0000	5814.939	5850.0000
	20	132	5735.169	5725.0000	5814.906	5850.0000
	50	132	5735.101	5725.0000	5814.863	5850.0000
	-20	120	5735.130	5725.0000	5814.952	5850.0000
	20	120	5735.043	5725.0000	5814.967	5850.0000
	50	120	5735.034	5725.0000	5814.968	5850.0000
	-20	108	5735.119	5725.0000	5814.887	5850.0000
	20	108	5735.010	5725.0000	5814.908	5850.0000
	50	108	5735.151	5725.0000	5814.939	5850.0000

Test Channel: Lowest for Lower Edge, Highest for Upper Edge						
Test mode	Temperature (℃)	Voltage (V_{AC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
802.11ac80	-20	132	5735.041	5725.0000	5814.960	5850.0000
	20	132	5735.132	5725.0000	5814.857	5850.0000
	50	132	5735.128	5725.0000	5814.841	5850.0000
	-20	120	5735.032	5725.0000	5814.814	5850.0000
	20	120	5735.103	5725.0000	5814.952	5850.0000
	50	120	5735.032	5725.0000	5814.979	5850.0000
	-20	108	5735.095	5725.0000	5814.900	5850.0000
	20	108	5735.049	5725.0000	5814.990	5850.0000
	50	108	5735.033	5725.0000	5814.894	5850.0000

RF EXPOSURE EVALUATION

MPE-Based Exemption

Applicable Standard

According to subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

According to KDB 447498 D04 v01 Interim General RF Exposure Guidance

MPE-Based Exemption:
General frequency and separation-distance dependent MPE-based effective radiated power(ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(3)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

R is the minimum separation distance in meters
f = frequency in MHz

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Result

Mode	Frequency (MHz)	Tune up conducted power#(dBm)	Antenna Gain#		ERP		Evaluation Distance (m)	ERP Limit (mW)
			(dBi)	(dBd)	(dBm)	(mW)		
BT	2402-2480	12.5	4.47	2.32	14.82	30.34	0.2	768
BLE	2402-2480	7.5	4.47	2.32	9.82	9.59	0.2	768
2.4G Wi-Fi	2412-2462	20.5	4.47	2.32	22.82	191.43	0.2	768
5.2G Wi-Fi	5180-5240	13.5	1.67	-0.48	13.02	20.04	0.2	768
5.8G Wi-Fi	5745-5825	11.5	2.49	0.34	11.84	15.28	0.2	768

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.
2. 0dBd=2.15dBi
3. BT, 2.4G and 5G Wi-Fi cannot transmit simultaneously.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant

Field reference level exposure exemption limits

Applicable Standard

According to RSS-102 Issue 6§6.6:

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

• below 20 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 1 W (adjusted for tune-up tolerance)

• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz

• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance)

• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}\ W$ (adjusted for tune-up tolerance), where f is in MHz

• at or above 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 5 W (adjusted for tune-up tolerance) In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the EIRP was derived.

Calculated Data:

Mode	Frequency (MHz)	Maximum tune-up conducted power# (dBm)	Antenna Gain#	Maximum tune-up EIRP		Evaluation Distance (m)	Limit (mW)
			(dBi)	(dBm)	(mW)		
BT	2402-2480	12.5	4.47	16.97	49.77	0.2	2676
BLE	2402-2480	7.5	4.47	11.97	15.74	0.2	2676
2.4G Wi-Fi	2412-2462	20.5	4.47	24.97	314.05	0.2	2684
5.2G Wi-Fi	5180-5240	13.5	1.67	15.17	32.89	0.2	4525
5.8G Wi-Fi	5745-5825	11.5	2.49	13.99	25.06	0.2	4857

Note: The tune up conducted power# and antenna gain# was declared by the applicant.
BT, 2.4G and 5G Wi-Fi cannot transmit simultaneously.

Result: Compliant

Note: To maintain compliance with the RF exposure guidelines, place the equipment at least 20cm from nearby persons.

EUT PHOTOGRAPHS

Please refer to the attachment 2501R30997E-RF External photo and 2501R30997E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2501R30997E-RF-00B Test Setup photo.

******* END OF REPORT *******