



TEST REPORT

Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-4904-0113 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR26-SRF0150 Page (1) of (85)	
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1. Client

- Name : CERAGEM CO., LTD.
- Address : 10, Jeongja 1-gil, Seonggeo-eup, Seobuk-gu, Cheonan-si, Chungcheongnam-do, Republic of Korea
- Date of Receipt : 2025-12-01

2. Use of Report : Certification

3. Name of Product / Model : CELLUNIC Medispa All in One / CGM ESK-2601

4. Manufacturer / Country of Origin : BTB Korea Co., Ltd / Korea

5. FCC ID : 2A3VY-CGMESK2601

6. IC Certificate No. : 35414-CGMESK2601

7. Date of Test : 2025-12-04 to 2026-02-26

8. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing
 (Address: 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

9. Test method used : FCC Part 15 Subpart E, 15.407
 RSS-247 Issue 4 July 2025
 RSS-Gen Issue 5 February 2021

10. Test Result : Refer to the test result in the test report

Affirmation	Tested by Name : Minjung Kim (Signature)	Technical Manager Name : Kwonse Kim (Signature)
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2026-08-26

Eurofins KCTL Co.,Ltd.

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REPORT REVISION HISTORY

Date	Revision	Page No
2026-08-26	Originally issued	-

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General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

☐ Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ Statement not required by the standard or client used for type testing

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1. General information

Client : CERAGEM CO., LTD.
 Address : 10, Jeongja 1-gil, Seonggeo-eup, Seobuk-gu, Cheonan-si, Chungcheongnam-do, Republic of Korea
 Manufacturer : BTB Korea Co., Ltd
 Address : 7, Dongwon-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea
 Laboratory : Eurofins KCTL Co.,Ltd.
 Address : 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
 Accreditations : FCC Site Designation No: KR0040, FCC Site Registration No: 687132
 VCCI Registration No. : R-20080, G-20078, C-20059, T-20056
 CAB Identifier: KR0040
 ISED Number: 8035A
 KOLAS No.: KT231

2. Device information

Equipment under test : CELLUNIC Medispa All in One
 Model : CGM ESK-2601
 Modulation technique : WIFI(802.11a/n/ac/ax) : OFDM, OFDMA
 Number of channels : UNII 1 : 4 ch (20 MHz), 2 ch (40 MHz)
 : UNII 3 : 5 ch (20 MHz), 2 ch (40 MHz)
 Power source : DC 11.1 V (Battery)
 Antenna specification : FPCB Antenna
 Antenna gain : UNII 1 : 2.10 dBi
 : UNII 3 : 2.84 dBi
 Frequency range : UNII 1 : 5 180 MHz ~ 5 240 MHz (802.11a/n/ac/ax_HT20/VHT20/HE20)
 : UNII 1 : 5 190 MHz ~ 5 230 MHz (802.11n/ac/ax_HT40/VHT40/HE40)
 : UNII 3 : 5 745 MHz ~ 5 825 MHz (802.11a/n/ac/ax_HT20/VHT20/HE20)
 : UNII 3 : 5 755 MHz ~ 5 795 MHz (802.11n/ac/ax_HT40/VHT40/HE40)
 Software version : V1.1.10
 Hardware version : V1.0
 Test device serial No. : MACG0KO60500003
 Operation temperature : -20 °C ~ 50 °C

2.1. Frequency/channel operations

This device contains the following capabilities:

WLAN 5 GHz_802.11a/n(HT20/40)/ac(VHT20/40)/ax(HE20/40)

UNII-1

Ch.	Frequency (MHz)
36	5 180
40	5 200
48	5 240

UNII-3

Ch.	Frequency (MHz)
149	5 745
157	5 785
165	5 825

Table 2.1.1. 802.11a/n/ac/ax HT20/VHT20/HE20

UNII-1

Ch.	Frequency (MHz)
38	5 190
46	5 230

UNII-3

Ch.	Frequency (MHz)
151	5 755
159	5 795

Table 2.1.2. 802.11n/ac/ax HT40/VHT40/HE40

2.2. RF power setting in TEST SW

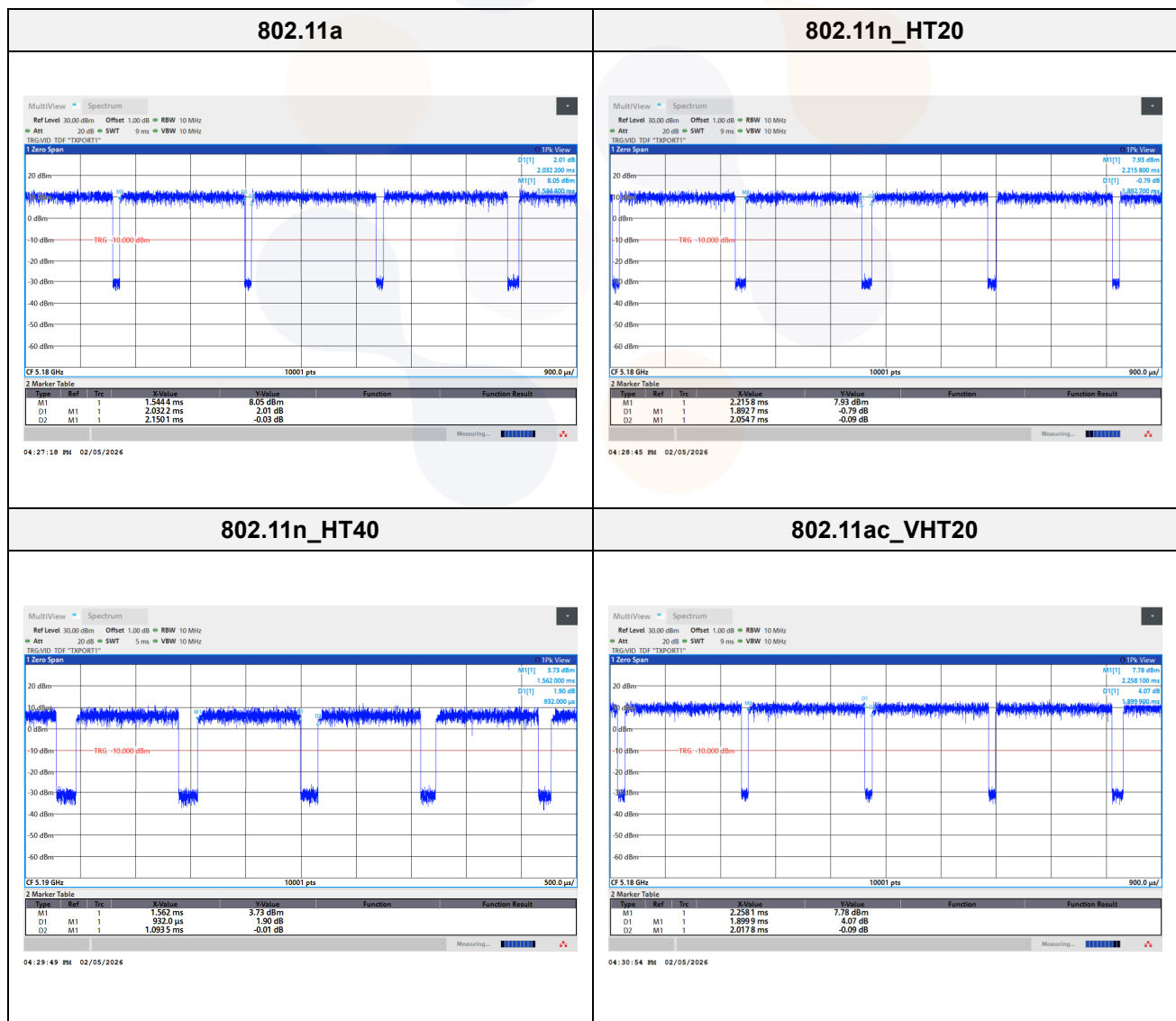
Test Program	Test Mode	Frequency	RF Power Setting value
		[MHz]	
ADB	802.11a	5 180	16.00
		5 200	15.00
		5 240	16.00
		5 745	16.00
		5 785	16.00
		5 825	16.00
	802.11n_HT20	5 180	15.00
		5 200	16.00
		5 240	16.00
		5 745	16.00
		5 785	16.00
		5 825	16.00
	802.11n_HT40	5 190	16.00
		5 230	16.00
		5 755	16.00
		5 795	16.00
	802.11ac_VHT20	5 180	16.00
		5 200	16.00
		5 240	16.00
		5 745	16.00
		5 785	16.00
		5 825	16.00
	802.11ac_VHT40	5 190	15.00
		5 230	16.00
		5 755	16.00
		5 795	16.00
	802.11ax_HE20	5 180	15.00
		5 200	16.00
		5 240	16.00
		5 745	16.00
		5 785	16.00
	802.11ax_HE40	5 190	15.00
		5 230	15.00
		5 755	16.00
		5 795	16.00

2.3. Duty Cycle Factor

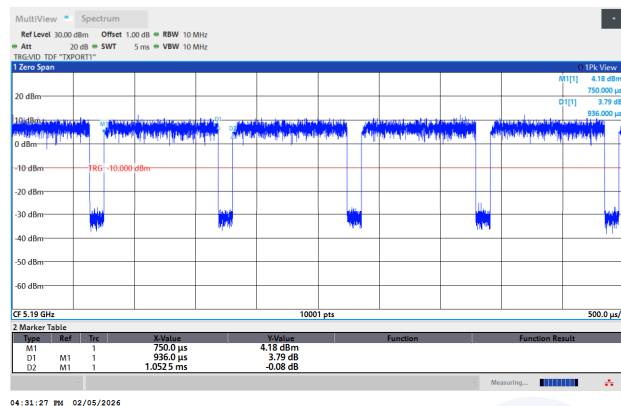
Test mode	Period (ms)	On time (ms)	Duty cycle		Duty Cycle Factor (dB)
			(Linear)	(%)	
802.11a	2.150	2.032	0.945 1	94.51	0.25
802.11n_HT20	2.055	1.893	0.921 2	92.12	0.36
802.11n_HT40	1.094	0.932	0.851 9	85.19	0.70
802.11ac_VHT20	2.018	1.900	0.941 5	94.15	0.26
802.11ac_VHT40	1.053	0.936	0.888 9	88.89	0.51
802.11ax HE20	1.584	1.462	0.923 0	92.30	0.35
802.11ax HE40	0.879	0.763	0.868 0	86.80	0.61

Notes:

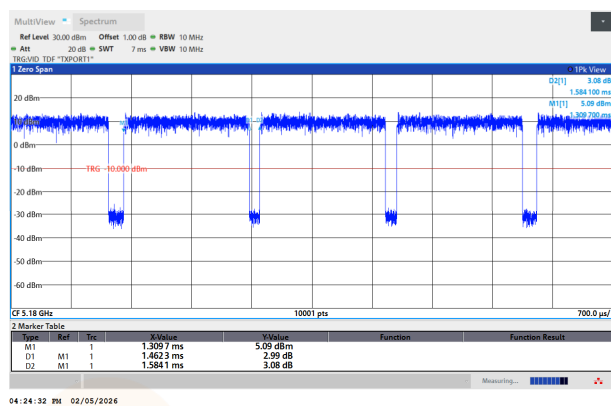
1. Duty cycle (Linear) = T_{On} time / Period
2. DCF(Duty cycle factor) = $10\log(1/\text{duty cycle})$
3. DCF is not compensated to average result if the duty cycle is more than 98%



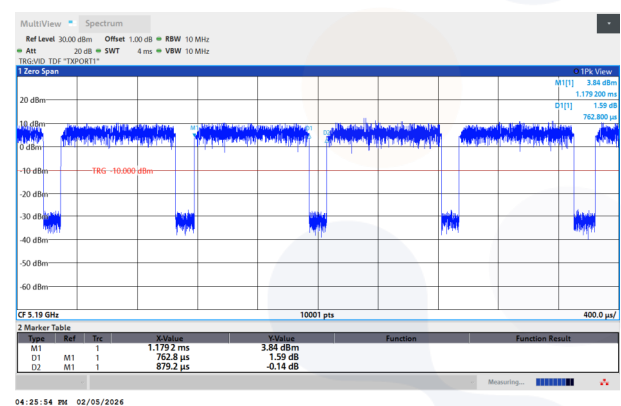
802.11ac_VHT40



802.11ax HE20



802.11ax HE40



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3. Antenna requirement

Requirement of FCC part section 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.

Requirement of RSS-Gen Section 6.8:

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.

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.

- The transmitter has permanently attached FPCB Antenna (Internal antenna) on board.
- The E.U.T Complies with the requirement of §15.203, §15.407.

4. Summary of tests

FCC Part section(s)	IC Rule Reference	Parameter	Test Condition	Test results
15.407(a)	RSS-247 (7.3)	Maximum conducted output power	Conducted	Pass
15.407(a)	RSS-247 (7.3)	Maximum power spectral density		Pass
15.407(a)	RSS-Gen (6.7)	26 dB Channel Bandwidth		Pass
15.407(e)	RSS-247 (7.3)	6 dB Channel Bandwidth		Pass
-	RSS-Gen (6.7)	Occupied Bandwidth		Pass
15.407(g)	RSS-Gen (8.11)	Frequency Stability		Pass
15.207(a)	RSS-Gen (8.8)	AC Conducted Emissions		Pass
15.407(b), 15.205(a), 15.209(a)	RSS-Gen (8.9), (8.10) RSS-247 (7.3)	Spurious emission	Radiated	Pass
		Band-edge, restricted band		Pass

Notes:

- All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst-case emissions.
- According to exploratory test no any obvious emission were detected from 9 MHz to 30 MHz. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
- EUT was investigated in three orthogonal orientations X, Y and Z. it was determined that **X** orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in **X** orientation
- This product does not support simultaneous operation under all conditions.
- For 11ax, partial RU is not supported, only SU is supported.
- The test procedure(s) in this report were performed in accordance as following.
 - ANSI C63.10-2020+Cor.1-2023
 - ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024
 - KDB 789033 D02 v02r01
- Based on the baseline scan, the worst-case data rates were:
 - 802.11a mode: 6Mbps
 - 802.11n HT20 mode: MCS0
 - 802.11n HT40 mode: MCS0
 - 802.11ac VHT20 mode: MCS0
 - 802.11ac VHT40 mode: MCS0
 - 802.11ax_HE20 mode: MCS0
 - 802.11ax_HE40 mode: MCS0

5. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2020.

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicated a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty ($\pm$)	
Maximum Peak Output Power	0.9 dB	
Peak Power Spectral Density	1.4 dB	
Channel Bandwidth	0.9 %	
Occupied Bandwidth	0.9 %	
Conducted spurious emission	1.7 dB	
Radiated spurious Emissions (Bandedge, restricted band)	Below 30 MHz	2.4 dB
	30 MHz to 1 000 MHz	2.6 dB
	1 000 MHz to 18 000 MHz	4.7 dB
	Above 18 000 MHz	4.8 dB
AC Conducted Emissions	150 kHz to 30 MHz	2.8 dB

6. Measurement results explanation example

The offset level is set in the spectrum analyzer to compensate the RF cable loss factor between EUT conducted output port and spectrum analyzer.

With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Frequency (MHz)	Factor(dB)	Frequency (MHz)	Factor(dB)
30	9.93	9 000	11.50
50	9.95	10 000	11.65
100	10.00	11 000	11.68
200	10.09	12 000	11.79
300	10.14	13 000	11.83
400	10.18	14 000	11.90
500	10.24	15 000	11.98
600	10.28	16 000	12.05
700	10.32	17 000	12.05
800	10.35	18 000	12.10
900	10.38	19 000	12.08
1 000	10.32	20 000	11.99
2 000	10.57	21 000	11.70
3 000	10.76	22 000	12.03
4 000	10.83	23 000	12.27
5 000	10.90	24 000	12.45
6 000	11.09	25 000	12.39
7 000	11.02	26 000	12.51
8 000	11.36	26 500	12.65

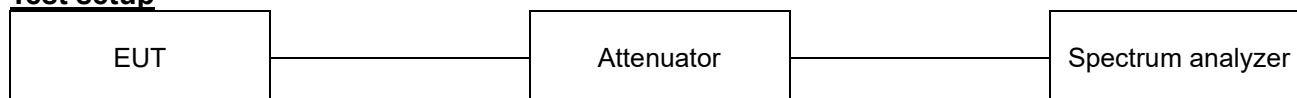
Note:

Offset(dB) = RF cable loss(dB) + Attenuator(dB)

7. Test results

7.1. Maximum conducted output power

Test setup



Limit

FCC

According to §15.407(a),

Band	EUT category	Conducted output power limit
UNII-1	Outdoor access point	1 W (30 dBm)
	Indoor access point	
	Fixed point-to-point access point	
	√ Client device	250 mW (23.98 dBm)
UNII-2A	-	250 mW or 11 dBm + 10logB ¹⁾
UNII-2C	-	250 mW or 11 dBm + 10logB ¹⁾
UNII-3	√	1 W (30 dBm)

IC

According to RSS-247(7.3),

Band	Power limits	
	Maximum conducted output power	Maximum e.i.r.p
UNII 1	-	200 mW or 10 + 10 logB ¹⁾ , dBm
UNII 2A	250 mW or 11 dBm + 10logB ¹⁾	1 W or 17 dBm + 10logB ¹⁾
UNII 2C	250 mW or 11 dBm + 10logB ¹⁾	1 W or 17 dBm + 10logB ¹⁾
UNII 3	1 W (30 dBm)	-

Notes:

- 1) Conducted output power limit B is the 26 dB emission bandwidth.
- 2) Maximum e.i.r.p. limit B is the 99% emission bandwidth.

Test procedure

ANSI C63.10 - Section 12.4.2.4

KDB 789033 D02 v02r01 - Section E.2.d)

Test settings

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

- a) Measure the duty cycle D of the transmitter output signal as described in 12.2.
- b) Set span to encompass the entire 99% OBW of the signal.
- c) Set RBW = 1 MHz.
- d) Set VBW $\geq$ 3 MHz.
- e) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- f) Sweep time = auto.
- g) Detector = Power averaging (rms), if available. Otherwise, use sample detector mode.
- h) Do not use sweep triggering. Allow the sweep to “free run.”
- i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
- j) Compute power by integrating the spectrum across the 99% OBW of the signal using the instrument's band-power measurement function with band limits set equal to the EBW or OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 99% OBW of the spectrum.
- k) Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1 / 0.25)] = 6$ dB if the duty cycle is 25%.

Test results

Conducted Output Power

Test mode	Band	Frequency (MHz)	Tones	RU offset	Measured output power			Limit (dBm)
					Reading (dBm)	DCF (dB)	Result (dBm)	
802.11a	UNII 1	5 180	N/A	N/A	2.62	0.25	2.87	23.98
		5 200			2.38		2.63	
		5 240			2.62		2.87	
	UNII 3	5 745			1.94		2.19	30.00
		5 785			2.28		2.53	
		5 825			2.74		2.99	
802.11n HT20	UNII 1	5 180			1.18	0.36	1.54	23.98
		5 200			2.07		2.43	
		5 240			2.16		2.52	
	UNII 3	5 745			1.71		2.07	30.00
		5 785			2.12		2.48	
		5 825			2.32		2.68	
802.11n HT40	UNII 1	5 190			3.83	0.70	4.53	23.98
		5 230			4.23		4.93	
	UNII 3	5 755			3.31		4.01	30.00
		5 795			3.47		4.17	
802.11ac VHT20	UNII 1	5 180			2.67	0.26	2.93	23.98
		5 200			2.38		2.64	
		5 240			2.53		2.79	
	UNII 3	5 745			1.67		1.93	30.00
		5 785			2.06		2.32	
		5 825			2.23		2.49	
802.11ac VHT40	UNII 1	5 190			2.88	0.51	3.39	23.98
		5 230			3.96		4.47	
	UNII 3	5 755			3.66		4.17	30.00
		5 795			3.44		3.95	
802.11ax HE20	UNII 1	5 180	SU	-	0.89	0.35	1.24	23.98
		5 200			1.99		2.34	
		5 240			2.24		2.59	
	UNII 3	5 745			1.29		1.64	30.00
		5 785			1.56		1.91	
		5 825			1.93		2.28	
802.11ax HE40	UNII 1	5 190			2.61	0.61	3.22	23.98
		5 230			2.72		3.33	
	UNII 3	5 755			2.88		3.49	30.00
		5 795			3.21		3.82	

Note:

- Result (dBm) = Reading (dBm) + D.C.F (dB)

e.i.r.p.

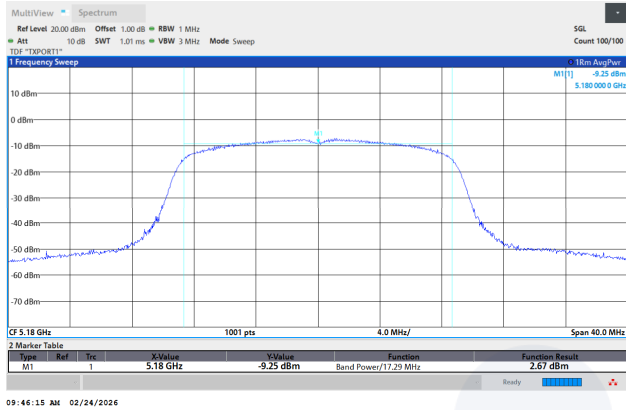
Test mode	Band	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
802.11a	UNII 1	5180	N/A	N/A	2.87	2.10	4.97	22.11
		5200			2.67		4.73	
		5240			2.87		4.97	
802.11n HT20	UNII 1	5180			1.54		3.64	22.38
		5200			2.43		4.53	
		5240			2.52		4.62	
802.11n HT40	UNII 1	5190			4.53		6.63	23.01
		5230			4.93		7.03	
802.11ac VHT20	UNII 1	5180			2.93		5.03	22.38
		5200			2.64		4.74	
		5240			2.79		4.89	
802.11ac VHT40	UNII 1	5190			3.39		5.49	23.01
		5230			4.47		6.57	
802.11ax HE20	UNII 1	5180	SU	-	1.24		3.34	22.63
		5200			2.34		4.44	
		5240			2.59		4.69	
802.11ax HE40	UNII 1	5190			3.22		5.32	23.01
		5230			3.33		5.43	

Note:

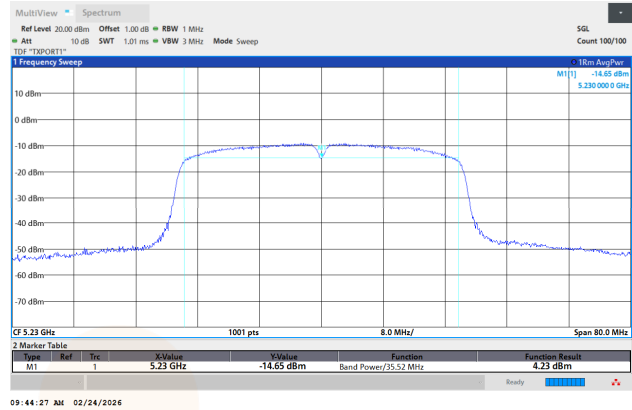
- E.I.R.P. Calculation: E.I.R.P. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

In order to simplify the report, attached plots were the worst case per bandwidth

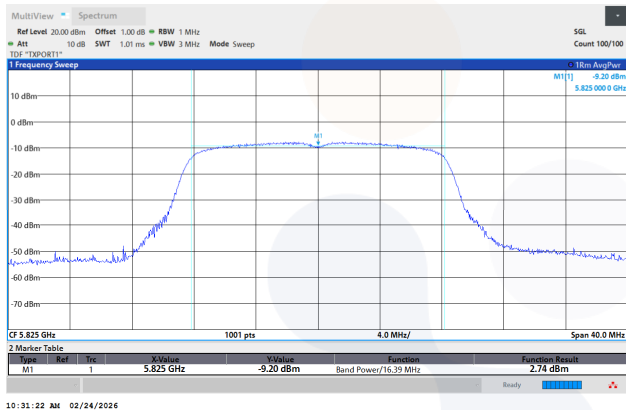
UNII 1 / 802.11ac VHT20 / Low ch.



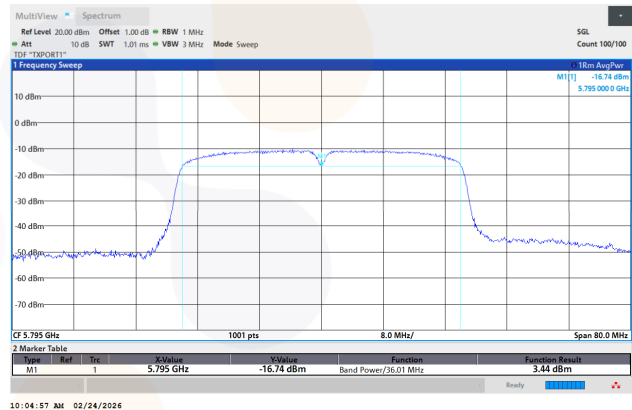
UNII 1 / 802.11n HT40 / High ch.



UNII 3 / 802.11a / High ch.

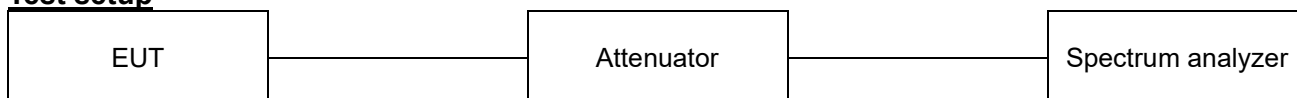


UNII 3 / 802.11ac VHT40 / High ch.



7.2. Maximum Power Spectral Density

Test setup



Limit

According to §15.407(a),

Band	EUT category		Limit
UNII-1		Outdoor access point	17dBm/MHz
		Indoor access point	
		Fixed point-to-point access point	
	√	Client device	11 dBm /MHz
UNII-2A			11 dBm /MHz
UNII-2C			11 dBm /MHz
UNII-3		√	30 dBm /500 kHz

According to RSS-247(7.3),

Band	e.i.r.p. spectral density	Limit
UNII 1	√	10 dBm/MHz

Band	Power spectral density	Limit
UNII 2A		11 dBm /MHz
UNII 2C		11 dBm /MHz
UNII 3	√	30 dBm /500 kHz

Notes:

When using transmitting antennas with a directional gain exceeding 6 dBi, 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 exceed 6 dBi

Test procedure

ANSI C63.10 - Section 12.6, 12.4.2.4

KDB 789033 D02 v02r01 – Section E and F

Test settings (12.6)

Notwithstanding that some regulatory requirements refer to peak power spectral density (PPSD), in some cases the intent is to measure the maximum value of the time average of the power spectral density during a period of continuous transmission. The procedure for this method is as follows:

- Create an average power spectrum for the EUT operating mode being tested by following the instructions in 12.4.2 for measuring maximum conducted output power using a spectrum analyzer or EMI receiver; that is, select the appropriate test method (SA-1, SA-2, SA-3, or their respective alternatives) and apply it up to, but not including, the step labeled, "Compute power...." (This procedure is required even if the maximum conducted output power measurement was performed using the power meter method PM.)
- Use the peak search function on the instrument to find the peak of the spectrum.
- Make the following corrections to the peak value of the spectrum, if applicable:
 - If method SA-2 or SA-2A was used, then add $[10 \log (1 / D)]$, where D is the duty cycle, to the peak of the spectrum.
 - If method SA-3A was used and the linear mode was used in step h) of 12.4.2.7, add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

- d) The result is the PPSD.
- e) The procedure in item a) through item c) requires the use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified by some regulatory authorities.⁸⁵ This requirement also permits use of resolution bandwidths less than 1 MHz “provided that the measured power is integrated to show the total power over the measurement bandwidth” (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following adjustments to the procedures apply:
 - 1) Set $RBW \geq 1 / T$, where T is defined in 12.2 a).
 - 2) Set $VBW \geq [3 \times RBW]$.
 - 3) Care shall be taken such that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Test settings (12.4.2.4)

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

- a) Measure the duty cycle D of the transmitter output signal as described in 12.2.
- b) Set span to encompass the entire 99% OBW of the signal.
- c) Set $RBW = 1 \text{ MHz}$.
- d) Set $VBW \geq 3 \text{ MHz}$.
- e) Number of points in sweep $\geq [2 \times \text{span} / RBW]$. (This gives bin-to-bin spacing $\leq RBW / 2$, so that narrowband signals are not lost between frequency bins.)
- f) Sweep time = auto.
- g) Detector = Power averaging (rms), if available. Otherwise, use sample detector mode.
- h) Do not use sweep triggering. Allow the sweep to “free run.”
- i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
- j) Compute power by integrating the spectrum across the 99% OBW of the signal using the instrument’s band-power measurement function with band limits set equal to the EBW or OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 99% OBW of the spectrum.
- k) Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1 / 0.25)] = 6 \text{ dB}$ if the duty cycle is 25%.

Test results

Power spectral density

Test mode	Band	Frequency (MHz)	Tones	RU offset	Measured PSD (dBm/MHz)	DCF (dB)	Maximum PSD (dB m/MHz)	Limit (dBm/MHz)
802.11a	UNII 1	5 180	N/A	N/A	-7.43	0.25	-7.18	11.00
		5 200			-7.14		-6.89	
		5 240			-7.19		-6.94	
802.11n HT20		5 180			-8.57	0.36	-8.21	
		5 200			-8.07		-7.71	
		5 240			-7.31		-6.95	
802.11n HT40		5 190			-9.66	0.70	-8.96	
		5 230			-8.97		-8.27	
802.11ac VHT20		5 180			-7.37	0.26	-7.11	
		5 200			-7.66		-7.40	
		5 240			-7.34		-7.08	
802.11ac VHT40		5 190			-10.32	0.51	-9.81	
		5 230			-9.25		-8.74	
802.11ax HE20		5 180			-8.95	0.35	-8.60	
		5 200			-8.22		-7.87	
		5 240			-7.69		-7.34	
802.11ax HE40		5 190			-10.86	0.61	-10.25	
		5 230			-10.50		-9.89	

Note:

- Maximum PSD(dBm/MHz) = Measured PSD (dBm/MHz) + D.C.F(dB))

Test mode	Band	Frequency (MHz)	Tones	RU offset	Measured PSD (dBm/ 500kHz)	DCF (dB)	Maximum PSD (dB m/ 500 kHz)	Limit (dBm/ 500kHz)
802.11a	UNII 3	5 745	N/A	N/A	-11.31	0.25	-11.06	30.00
		5 785			-11.12		-10.87	
		5 825			-9.54		-9.29	
802.11n HT20		5 745			-11.63	0.36	-11.27	
		5 785			-11.29		-10.93	
		5 825			-11.01		-10.65	
802.11n HT40		5 755			-13.17	0.70	-12.47	
		5 795			-13.10		-12.40	
802.11ac VHT20		5 745			-11.64	0.26	-11.38	
		5 785			-11.29		-11.03	
		5 825			-10.99		-10.73	
802.11ac VHT40		5 755			-13.04	0.51	-12.53	
		5 795			-13.00		-12.49	
802.11ax HE20		5 745	SU	-	-11.80	0.35	-11.45	
		5 785			-12.02		-11.67	
		5 825			-10.44		-10.09	
802.11ax HE40		5 755			-14.01	0.61	-13.40	
		5 795			-13.21		-12.60	

Note:

- Maximum PSD (dB m/500 kHz) = Reading (dB m/500 kHz) + D.C.F (dB)

e.i.r.p spectral density

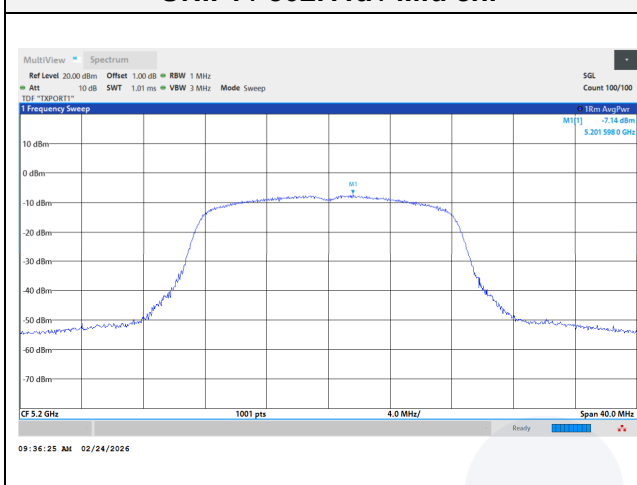
Test mode	Band	Tones	RU offset	Frequency (MHz)	Measured PSD (dBm/MHz)	DCF (dB)	Maximum PSD (dBm/MHz)	ANT Gain (dBi)	E.I.R.P. PSD (dBm/MHz)	Limit (dBm/MHz)
802.11a	UNII 1	N/A	N/A	5 180	-7.43	0.25	-7.18	2.10	-5.08	10.00
				5 200	-7.14		-6.89		-4.79	
				5 240	-7.19		-6.94		-4.84	
802.11n HT20				5 180	-8.57	0.36	-8.21	2.10	-6.11	
				5 200	-8.07		-7.71		-5.61	
				5 240	-7.31		-6.95		-4.85	
802.11n HT40				5 190	-9.66	0.70	-8.96	2.10	-6.86	
				5 230	-8.97		-8.27		-6.17	
802.11ac VHT20				5 180	-7.37	0.26	-7.11	2.10	-5.01	
				5 200	-7.66		-7.40		-5.30	
				5 240	-7.34		-7.08		-4.98	
802.11ac VHT40				5 190	-10.32	0.51	-9.81	2.10	-7.71	
				5 230	-9.25		-8.74		-6.64	
802.11ax HE20		SU	-	5 180	-8.95	0.35	-8.60	2.10	-6.50	
				5 200	-8.22		-7.87		-5.77	
				5 240	-7.69		-7.34		-5.24	
802.11ax HE40				5 190	-10.86	0.61	-10.25	2.10	-8.15	
				5 230	-10.50		-9.89		-7.79	

Notes:

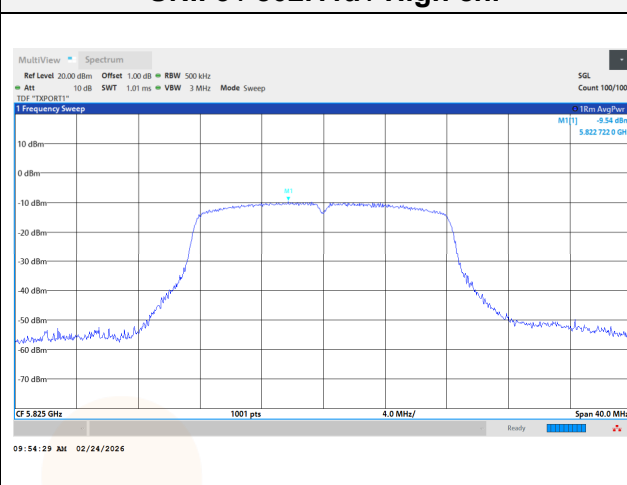
- Maximum PSD (dB m/MHz) = Measured PSD (dB m/MHz) + DCF (dB)
- E.I.R.P PSD (dB m/MHz) = Maximum PSD (dB m/MHz) + Antenna gain (dB i)

In order to simplify the report, attached plots were the worst case per bandwidth

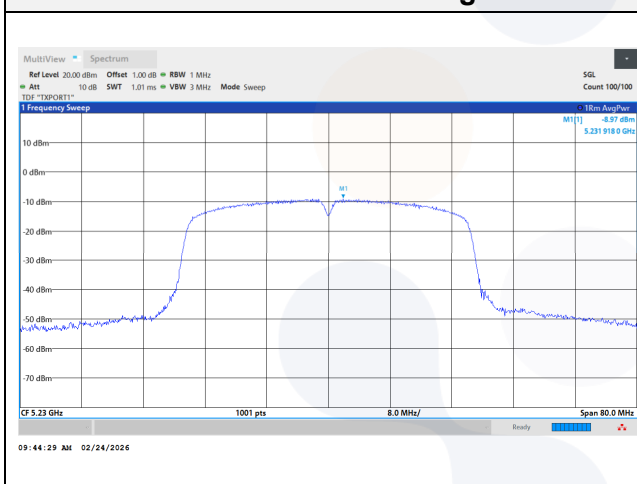
UNII 1 / 802.11a / Mid ch.



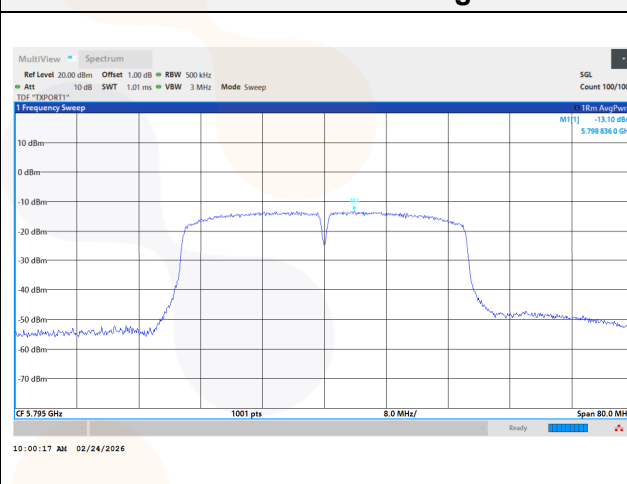
UNII 3 / 802.11a / High ch.



UNII 1 / 802.11n HT40 / High ch.

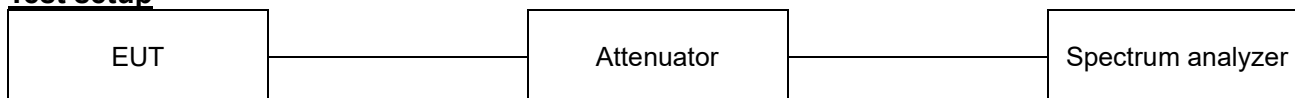


UNII 3 / 802.11n HT40 / High ch.



7.3. 26 dB Bandwidth & 99% Bandwidth

Test setup



Limit

N/A

Test procedure

ANSI C63.10 - Section 12.5.2, 6.9.3

KDB 789033 D02 v02r01 - Section C.1 (26dB bandwidth), Section D (99% bandwidth)

Test settings

Emission bandwidth for all other bands (or 26 dB Bandwidth)

- Set RBW = Shall be in the range of 1% to 5% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from 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%.

Occupied bandwidth (or 99% Occupied Bandwidth)

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:

- 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.
- 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.
- 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.
- Step a) through step c) might require iteration to adjust within the specified range.
- 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.
- Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- 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.
- 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).

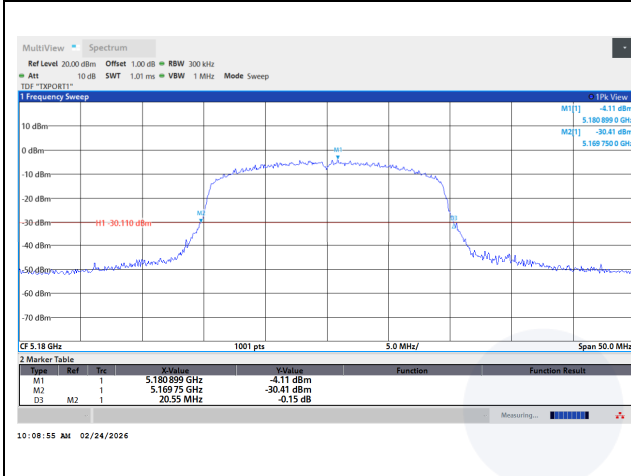
Test results

Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII 1	802.11a	5 180	N/A	N/A	19.650	16.266
		5 200			20.000	16.283
		5 240			19.600	16.251
	802.11n HT20	5 180			20.250	17.287
		5 200			20.150	17.309
		5 240			20.350	17.306
	802.11n HT40	5 190			40.300	35.575
		5 230			40.000	35.522
	802.11ac VHT20	5 180			20.500	17.289
		5 200			20.500	17.291
		5 240			20.300	17.291
	802.11ac VHT40	5 190			40.100	35.543
		5 230			40.100	35.534
	802.11ax HE20	5 180	SU	-	20.550	18.327
		5 200			20.450	18.373
		5 240			20.450	18.390
	802.11ax HE40	5 190			40.700	36.748
		5 230			40.500	36.655

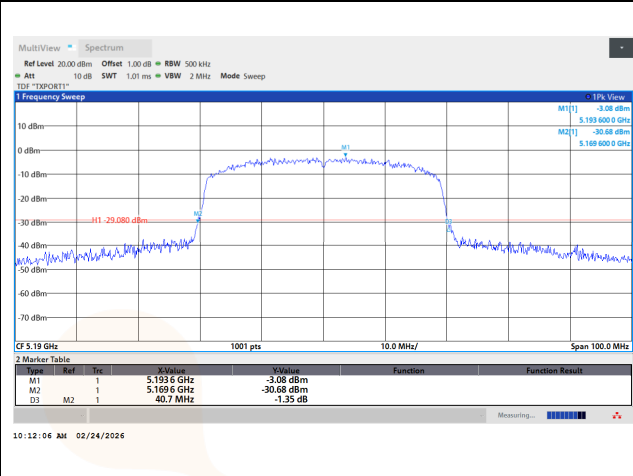
In order to simplify the report, attached plots were the worst case per bandwidth

26 dB bandwidth

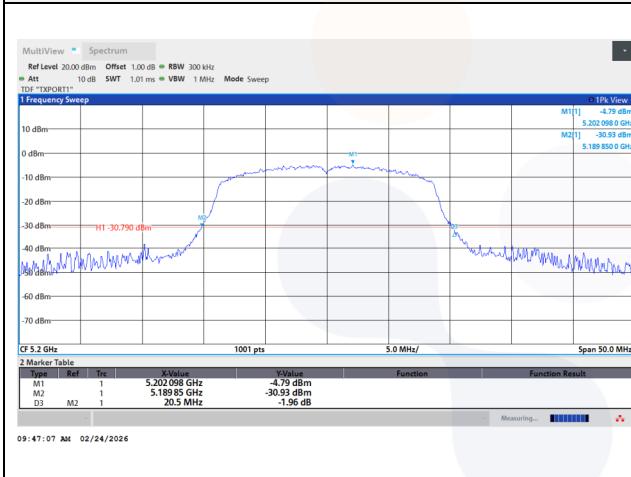
UNII 1 / 802.11ax HE20 / Low ch.



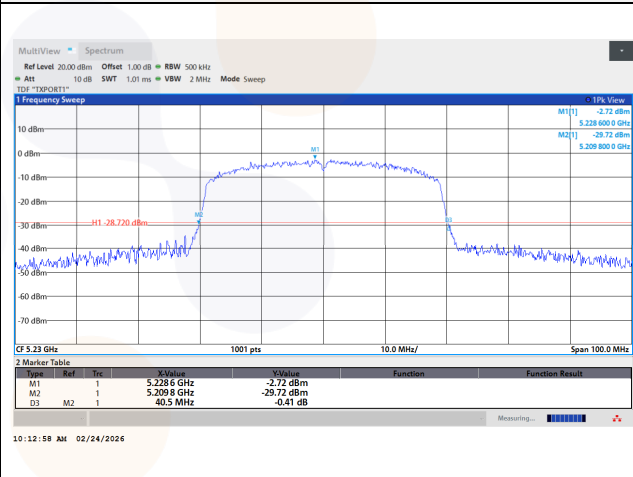
UNII 1 / 802.11ax HE40 / Low ch.



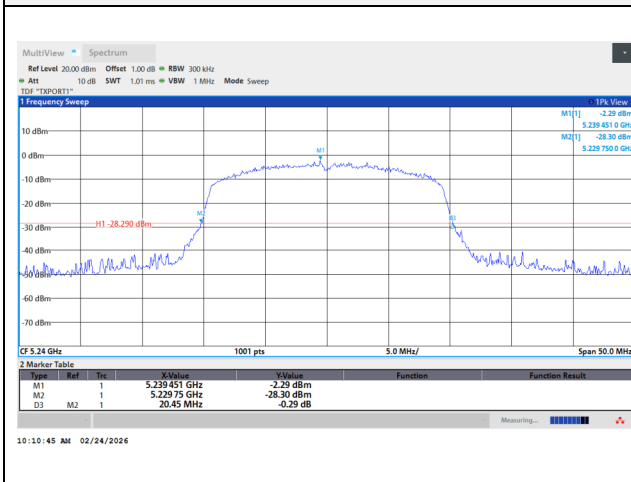
UNII 1 / 802.11ac VHT20 / Mid ch.



UNII 1 / 802.11ax HE40 / High ch.



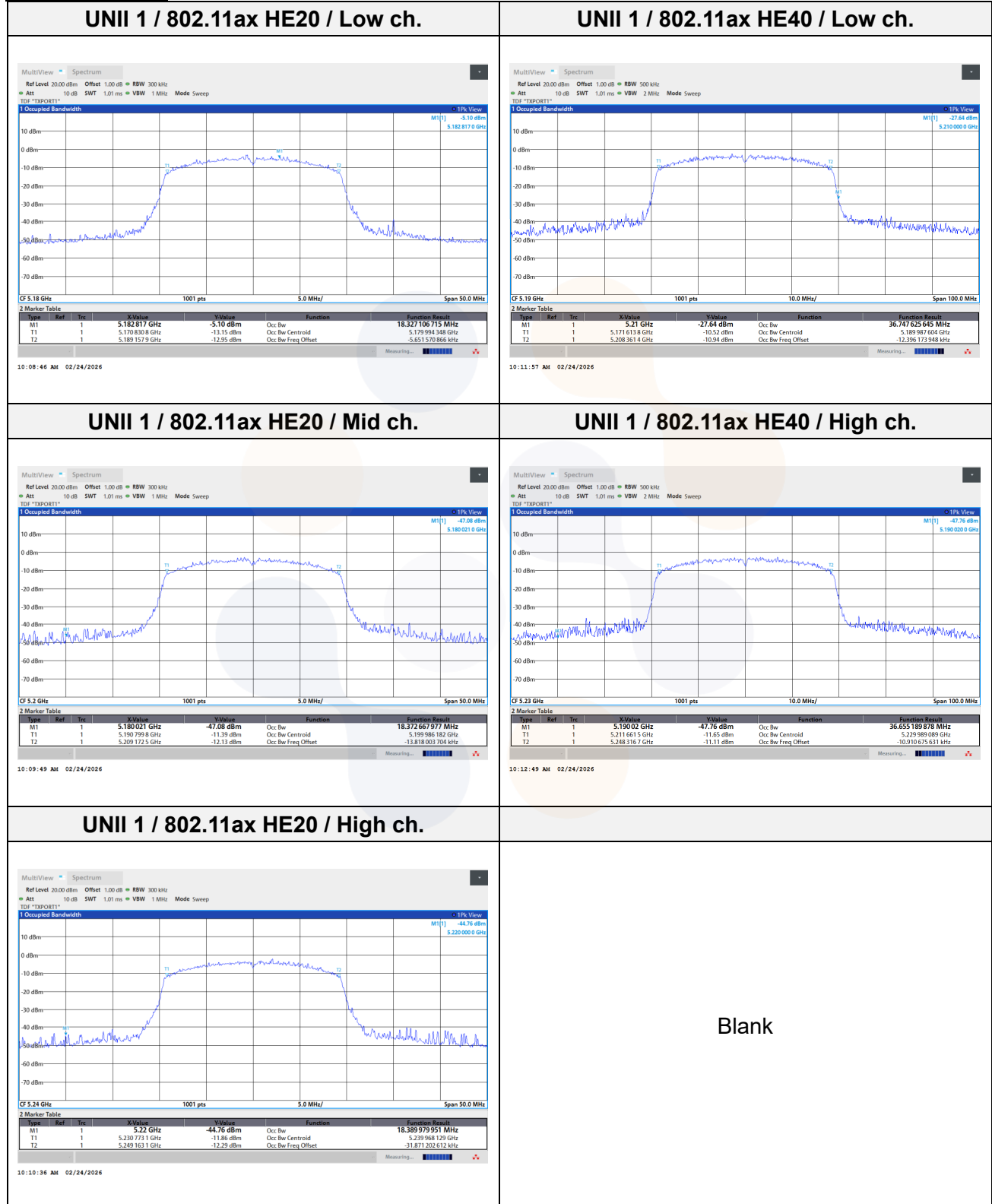
UNII 1 / 802.11ax HE20 / High ch.



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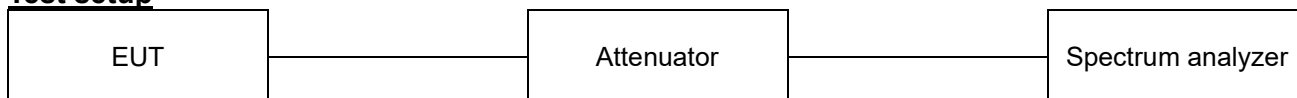
In order to simplify the report, attached plots were the worst case per bandwidth

99% bandwidth



7.4. 6 dB Bandwidth & 99% Bandwidth

Test setup



Limit

According to §15.407(e), RSS-247(7.3.4.2) and (7.3.5.2),

For equipment operating in the band 5 725-5 850 MHz bands, the 6 dB bandwidth shall be at least 500 kHz

Test procedure

ANSI C63.10 - Section 12.5.1, 6.9.3

KDB 789033 D02 v02r01 - Section C.2, Section D

Test settings

Emission Bandwidth for the band 5.725 to 5.85 GHz

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

Occupied bandwidth (or 99% emission bandwidth)

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:

- 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.
- 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.
- 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.
- Step a) through step c) might require iteration to adjust within the specified range.
- 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.
- Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- 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.
- 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).

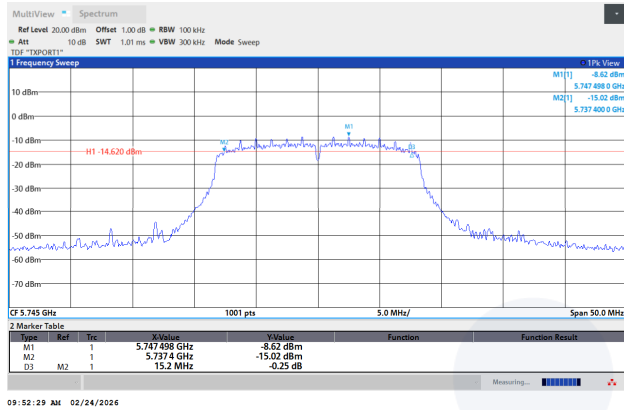
Test results

Test mode	Band	Frequency (MHz)	Tones	RU offset	6dB bandwidth (MHz)	Limit (MHz)	99% bandwidth (MHz)
802.11a	UNII 3	5 745	N/A	N/A	15.200	0.50	16.359
		5 785			15.250		16.392
		5 825			15.450		16.391
802.11n HT20		5 745			15.250		17.428
		5 785			15.250		17.433
		5 825			15.250		17.425
802.11n HT40		5 755			35.300		35.904
		5 795			35.400		35.911
802.11ac VHT20		5 745			15.250		17.431
		5 785			15.200		17.405
		5 825			15.250		17.417
802.11ac VHT40		5 755			35.300		35.921
		5 795	35.400	36.007			
802.11ax HE20		5 745	SU	-	16.100		18.533
		5 785			15.750		18.537
		5 825			15.450		18.550
802.11ax HE40		5 755			35.400		37.156
		5 795			35.400		37.157

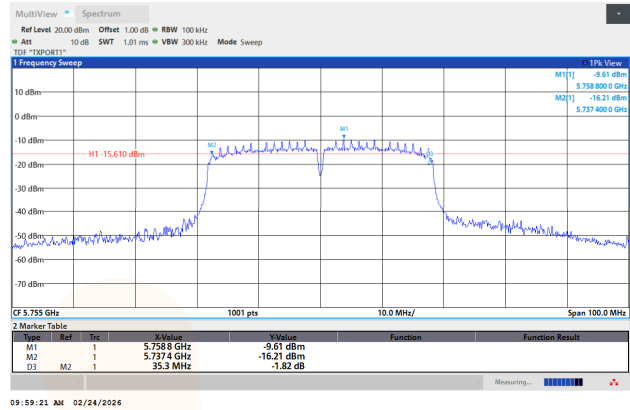
In order to simplify the report, attached plots were the worst case per bandwidth

6 dB bandwidth

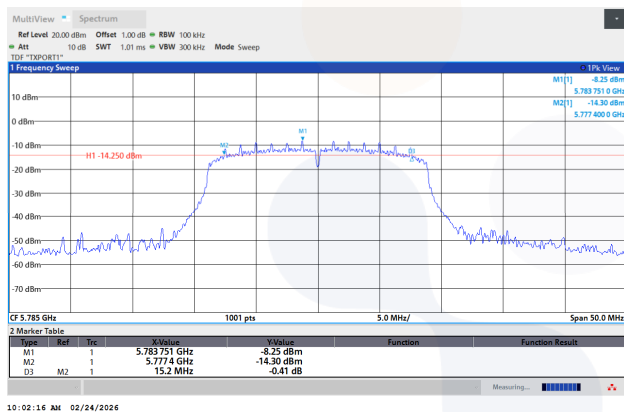
UNII 3 / 802.11a / Low ch.



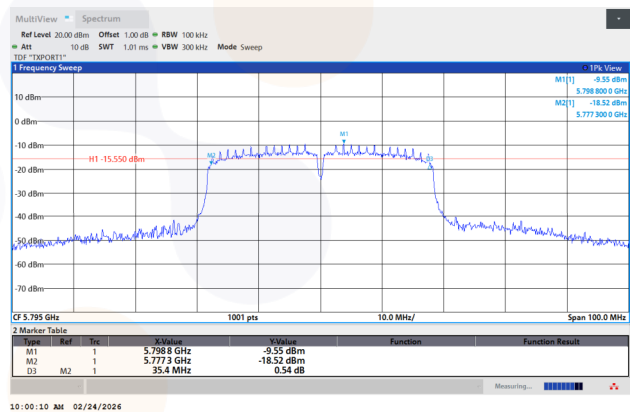
UNII 3 / 802.11n HT40 / Low ch.



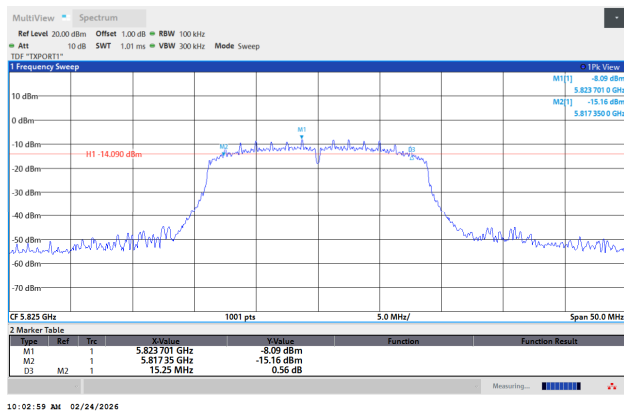
UNII 3 / 802.11ac VHT20 / Mid ch.



UNII 3 / 802.11n HT40 / High ch.



UNII 3 / 802.11ac VHT20 / High ch.



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