CERTIFICATION TEST REPORT

Report Number. : U-4791479704-FR4V2

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	WCF933M
FCC ID	:	A3LWCF933M
IC	:	649E-WCF933M
EUT Description	:	DTS/UNII a/b/g/n/ac/ax module and BT/BLE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E INDUSTRY CANADA RSS-247 Issue 3 INDUSTRY CANADA RSS-GEN Issue 5

Date Of Issue:
2025-01-23

Prepared by:
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IAS ACCREDITED
Testing Laboratory
TL-1087

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2025-01-17	Initial issue	Jaehyeok Bang
V2	2025-01-23	Updated to address TCB`s question	Jaehyeok Bang

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UL Korea, Ltd. Uiwang Laboratory FORM ID: FCC_15E(05)
42, Obongsandan 1-ro, Uiwang-si, Gyeonggi-do, Republic of Korea TEL: (031) 389-9603 FAX: (031) 462-8355

ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	DTS/UNII a/b/g/n/ac/ax module and BT/BLE
MODEL NUMBER:	WCF933M
SERIAL NUMBER:	4C573957A86C(1) (CONDUCTED); 4C573957A868(3), 4C573957A85E(5) (RADIATED);
DATE TESTED:	2024-11-01 ~ 2025-01-15

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Complies
INDUSTRY CANADA RSS-247 Issue 3	Complies
INDUSTRY CANADA RSS-GEN Issue 5	Complies

UL KOREA LTD. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL KOREA LTD. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL KOREA LTD. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL KOREA LTD. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL KOREA LTD. By:

Changmin Kim
Senior Laboratory Engineer
UL Korea, Ltd.

Tested By:

Jaehyeok Bang
Laboratory Test Engineer
UL Korea, Ltd.

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2. MANUFACTURER INFORMATION

Applicant Information

Company Name:	SAMSUNG ELECTRONICS CO., LTD.
Address:	129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA

Manufacturer Information 1

Company Name:	Chengdu Xuguang Technology Co., Ltd.
Address:	No.86 2nd Section, Park Road, Longquanyi District, Chengdu City, Sichuan Province, P.R.China

Manufacturer Information 2

Company Name:	CHEMTROVINA COMPANY LIMITED
Address:	Nhon Trach 2 – Loc Khang IZ, Hiep Phuoc Town, Nhon Trach District,, Dong Nai Province, Vietnam

Manufacturer Information 3

Company Name:	CHEMTRONICS CO., LTD.
Address:	35, Buk-ri, Namsa-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea

Manufacturer Information 4

Company Name:	SJIT CO., LTD.
Address:	#54-11, Dongtanhana 1 gil, Hwaseong-si, Gyeonggi-Do, Korea

Company Name:	SJIT VINA Co., Ltd
Address:	Lot X2, Ho Nai Industrial Zone, Ho Nai 3 Commune, Trang Bom District, Dong Nai Province, Vietnam

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 789033 D02 General UNII Test Procedures New Rules v02r01
4. KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
5. KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02
6. KDB 662911 D01 v02r01
7. IC RSS-GEN Issue 5.
8. IC RSS-247 Issue 3.
9. ANSI C63.10-2020.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 42, Obongsandan 1-ro, Uiwang-si, Gyeonggi-do, Republic of Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

42, Obongsandan 1-ro
☒ Chamber 1
☒ Chamber 2

Used ISED Test Site Reg.(company number): 32001
CAB Identifier: KR0161

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-1087. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2022/05/TL-1087-Cert-New.pdf

5. CALIBRATION AND UNCERTAINTY

5.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

AC Corrected Reading (dBuV) = Measured Voltage (dBuV) + Extension Cord Loss (dB) + Cable Loss (dB)
44.72 dBuV = 34.72 dBuV + 9.9 dB + 0.1 dB

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Common Items

PARAMETER	UNCERTAINTY
RF Output Power	0.94 dB
Power Spectral Density	0.85 dB
Occupied Bandwidth	0.07 %
AC Power Line Conducted Emissions	2.32 dB

Uncertainty figures are valid to a confidence level of 95%, k=2

Chamber 1

PARAMETER	UNCERTAINTY
Radiated Disturbance, 30 MHz to 1 GHz	3.64 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.38 dB
Radiated Disturbance, Above 18 GHz	6.23 dB

Uncertainty figures are valid to a confidence level of 95%, k=2

Chamber 2

PARAMETER	UNCERTAINTY
Radiated Disturbance, 9 kHz to 30 MHz	1.66 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.39 dB

Uncertainty figures are valid to a confidence level of 95%, k=2

5.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Clause 4.3.3 in IEC Guide 115:2023. Measurement Uncertainty is not applied when providing statements of conformity in accordance with IEC Guide 115:2023, 4.3.3

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The EUT is a DTS/UNII a/b/g/n/ac/ax module and BT/BLE.
This test report addresses the NII (WLAN) operational mode.

Representative model	Software	Hardware Type	Difference
WCF933M	Same	Type1	Basic
		Type2	1) Change the gravity sensor position 2) Add Illuminance Sensor dualization Parts
Note1. H/W changes that are not RF related. Spot-Check test was performed on Type2. The hardware Type 1 was used for final testing and is representative of the test results in this report.			

WiFi operating mode

Frequency rage	Mode	ANT0	ANT1
5GHz (5180 MHz ~ 5850 MHz)	802.11a SISO	TX/RX	TX/RX
	802.11n MIMO	TX/RX	
	802.11ac MIMO	TX/RX	
	802.11ax MIMO	TX/RX	

Simultaneous TX Condition

Simultaneous Tx Condition - RSDB

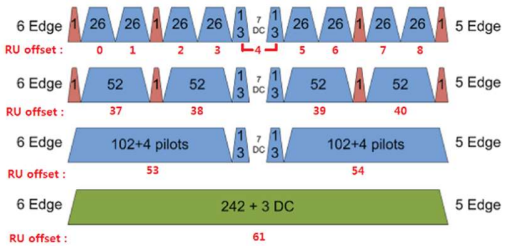
Mode	# of TX	5GHz WLAN		2.4GHz WLAN		Test Case
		ANT0	ANT1	ANT0	ANT1	
2.4GHz SISO + 5GHz SISO	**2**	**O**	**X**	**X**	**O**	**O**

Note. Simultaneous transmission were investigated, and no noticeable emission was found

802.11ax RU allocations

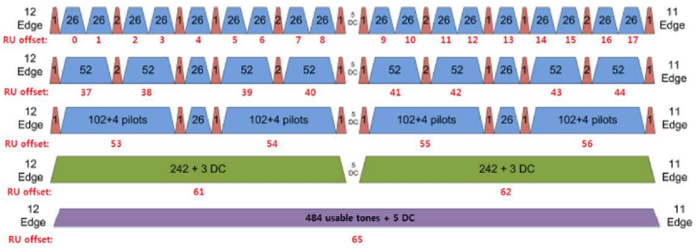
- HE 20 Mode -

20 MHz

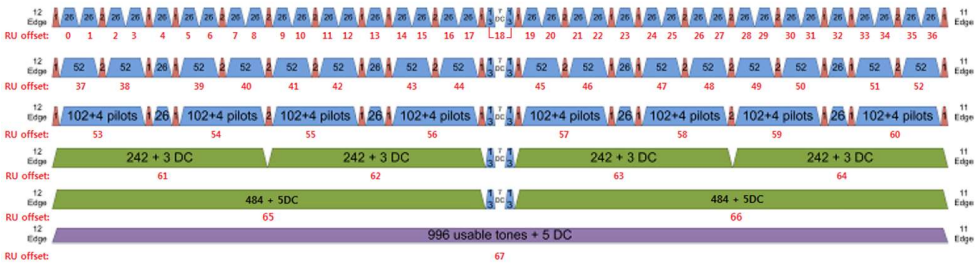


- HE 40 Mode -

40 MHz



- HE 80(996T)



Test RU offset for tones in each modes

Mode	Tones	RU offset
HE20	26T	0
		4
		8
	52T	37
		38
		40
	106T	53
		54
	242T / SU Note	61 / -
HE40	26T	0
		9
		17
	52T	37
		41
		44
	106T	53
		54
		56
	242T	61
		62
	484T / SU Note	63 / -
HE80	26T	0
		18
		36
	52T	37
		45
		52
	106T	53
		57
		60
	242T	61
		62
		64
	484T	65
		66
	996T / SU Note	67 / -

Note: Full RU(Resource Unit) mode and SU(Single Unit) mode have no difference in physical waveform. This report has been reported the Full RU(Resource Unit) mode with highest output power in MIMO.

Band portion of RU allocation about straddle channels

Mode	Channel	Tones	RU offset	Portion
HE20	Straddle 5720 MHz	26T	6	UNII 2C & UNII 3
		242T / SU	61 / -	
HE40	Straddle 5710 MHz	26T	15	UNII 2C & UNII 3
		484T / SU	65 / -	
HE80	Straddle 5690 MHz	26T	34	UNII 2C & UNII 3
		996T / SU	67 / -	

Note: In case of RU straddle channel, test was performed overlapping RU position.

MAXIMUM OUTPUT POWER

Band	Frequency Range [MHz]	Mode	Output Power [dBm]	Output Power [mW]	Antenna Gain [dBi]	e.i.r.p Note1 [dBm]
UNII-1	5180 - 5240	802.11a SISO	14.03	25.29	0.24	14.27
		802.11n(HT20) MIMO	13.89	24.49	3.99	17.88
		802.11ax(HE20) MIMO	13.39	21.83	3.99	17.38
	5190 - 5230	802.11n(HT40) MIMO	12.45	17.58	3.99	16.44
		802.11ax(HE40) MIMO	12.39	17.34	3.99	16.38
	5210	802.11ac(VHT80) MIMO	11.92	15.56	3.99	15.91
		802.11ax(HE80) MIMO	12.51	17.82	3.99	16.50
UNII-2A	5260 - 5320	802.11a SISO	16.12	40.93	0.79	16.91
		802.11n(HT20) MIMO	16.36	43.25	4.25	20.61
		802.11ax(HE20) MIMO	15.76	37.67	4.25	20.01
	5270 - 5310	802.11n(HT40) MIMO	15.05	31.99	4.25	19.30
		802.11ax(HE40) MIMO	14.90	30.90	4.25	19.15
	5290	802.11ac(VHT80) MIMO	13.88	24.43	4.25	18.13
		802.11ax(HE80) MIMO	14.39	27.48	4.25	18.64
UNII-2C	5500 - 5720	802.11a SISO	14.91	30.97	1.75	16.66
		802.11n(HT20) MIMO	16.58	45.50	4.76	21.34
		802.11ax(HE20) MIMO	15.69	37.07	4.76	20.45
	5510 - 5710	802.11n(HT40) MIMO	14.52	28.31	4.76	19.28
		802.11ax(HE40) MIMO	14.49	28.12	4.76	19.25
	5570	802.11ac(VHT80) MIMO	13.41	21.93	4.76	18.17
		802.11ax(HE80) MIMO	14.30	26.92	4.76	19.06
UNII-3	5745 - 5825	802.11a SISO	19.10	81.28	1.41	20.51
		802.11n(HT20) MIMO	20.56	113.76	4.40	24.96
		802.11ax(HE20) MIMO	20.43	110.41	4.40	24.83
	5755 - 5795	802.11n(HT40) MIMO	19.74	94.19	4.40	24.14
		802.11ax(HE40) MIMO	19.76	94.62	4.40	24.16
	5775	802.11n(VHT80) MIMO	15.36	34.36	4.40	19.76
		802.11ax(HE80) MIMO	16.00	39.81	4.40	20.40

Note 1: e.i.r.p = Output Power[dBm] + Antenna gain[dBi]

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6.2. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 internal antenna was Permanently attached.
Therefore this E.U.T Complies with the requirement of §15.203.

The radio utilizes a internal antenna, with a maximum gain of:

UNII Band	Frequency Range[MHz]	ANT0 Gain [dBi]	ANT1 Gain [dBi]	Correlated Chains Directional Gain[dBi]
UNII 1	5150 - 5250	1.67	0.24	3.99
UNII 2A	5250 - 5350	1.66	0.79	4.25
UNII 2C	5470 - 5725	1.75	1.74	4.76
UNII 3	5725 - 5850	1.41	1.37	4.40

Directional gain for the MIMO operations is determined using KDB 662911 D01 Multiple Transmitter Output section F (2)(d)(1) for *Unequal antenna gains, with equal transmit powers*. The gain is calculated using the formula for correlated transmissions across the two transmit antennas.
Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}$] dBi.
Sample calculation for this device with $N_{ANT} = 2$
Directional gain = 10 log[$(10^{1.67/20} + 10^{0.24/20})^2 / 2$] = 3.99 dBi

6.3. List of test reduction and modes covering other modes:

The output power on covered modes is equal to or less than one referenced.

Authorized Frequency Band			
Mode	**Antenna Stream**	**Mode**	**Covered by**
802.11a	SISO	802.11a 1TX	
802.11n HT20	MIMO	802.11n HT20 2TX	
802.11ac VHT20		802.11ac VHT20 2TX	802.11n HT20 2TX
802.11ax HE20(SU)		802.11ax HE20 RU(242T) 2TX	802.11ax HE20 SU 2TX
802.11n HT40		802.11n HT40 2TX	
802.11ac VHT40		802.11ac VHT40 2TX	802.11n HT40 2TX
802.11ax HE40(SU)		802.11ax HE40 RU(484T) 2TX	802.11ax HE40 SU 2TX
802.11ac VHT80		802.11ac VHT80 2TX	
802.11ax HE80(SU)		802.11ax HE80 RU(996T) 2TX	802.11ax HE80 SU 2TX

6.4. WORST-CASE CONFIGURATION AND MODE

Both SISO and MIMO have been investigated and confirmed MIMO was the worst case set for radiated band edge and spurious emission tests.

ANT0	ANT1	MIMO
	X	

The fundamentals of the EUT were investigated in three orthogonal orientations X, Y and Z on 2TX MIMO mode. It was determined that X orientation were the worst-case for 2TX MIMO mode.

Radiated harmonics spurious 1~18 GHz Low/Mid/High channels,18-40GHz were performed with the EUT set at the 2TX MIMO mode. Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

For Radiated spurious test, 802.11a 1TX mode has equal or higher output power and PSD results than other modes and therefore, it was set for full test. Spot-check was performed in 802.11n 2TX, 802.11ac 2TX or 802.11ax 2TX.

For Radiated band-edge test, 802.11a 1TX, 802.11n 2TX, 802.11ac 2TX, 802.11ax 2TX Full Ru mode were fully tested except 802.11ax 2TX partial RU modes. 802.11ax Full Ru mode resulted in radiated band-edge test is worse than partial RU modes; therefore, only Full Ru mode was reported.

For 802.11ax mode, output power and PSD tests were investigated between all different tones and found that Full Ru mode had the highest output power and RU 26T has the highest PSD readings; and therefore, conducted tests were performed on Full Ru mode and RU 26T mode.

In case of 6dB Bandwidth, it was tested at the RU allocation with lowest tones number, RU 26Tones as the worst-case scenario.

Based on the baseline scan, the worst-case data rates were:
802.11a mode: 6 Mbps 1Tx
802.11n HT20 mode: MCS0 2Tx
802.11n HT40 mode: MCS0 2Tx
802.11ac VHT80 mode: MCS0 2Tx
802.11ax HE20 mode: MCS0 2Tx
802.11ax HE40 mode: MCS0 2Tx
802.11ax HE80 mode: MCS0 2Tx

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6.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Test Jig	MediaTek	-	-	N/A
Laptop	Lenovo	TP00136D	PF-4M6STB	N/A
Charger	Lenovo	ADLX45YCC3G	8SSA10R16915C2TJ	N/A

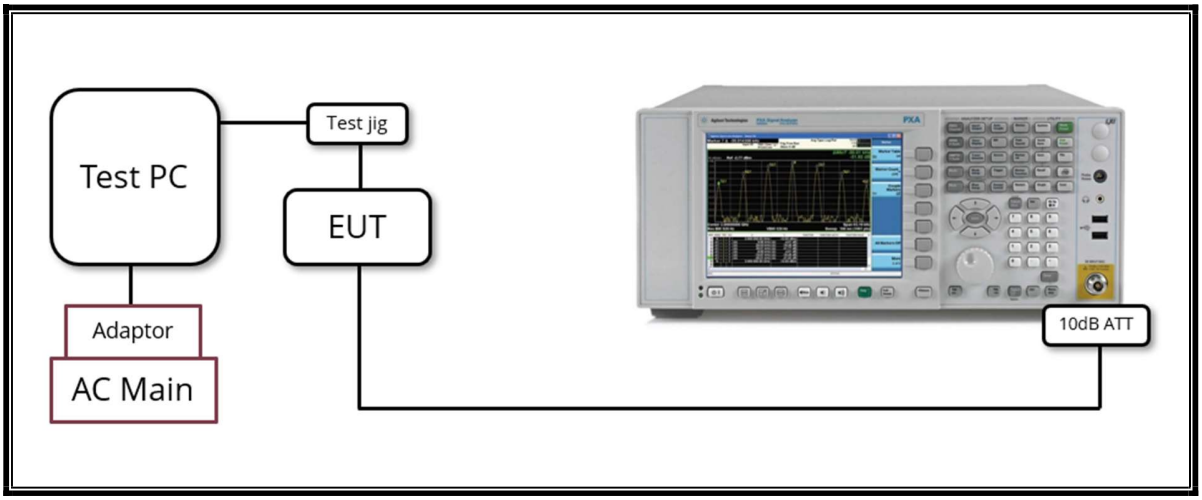
I/O CABLE

I/O Cable List						
Cable No.	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power and Data	1	24 pin	Unshielded	20 cm	N/A

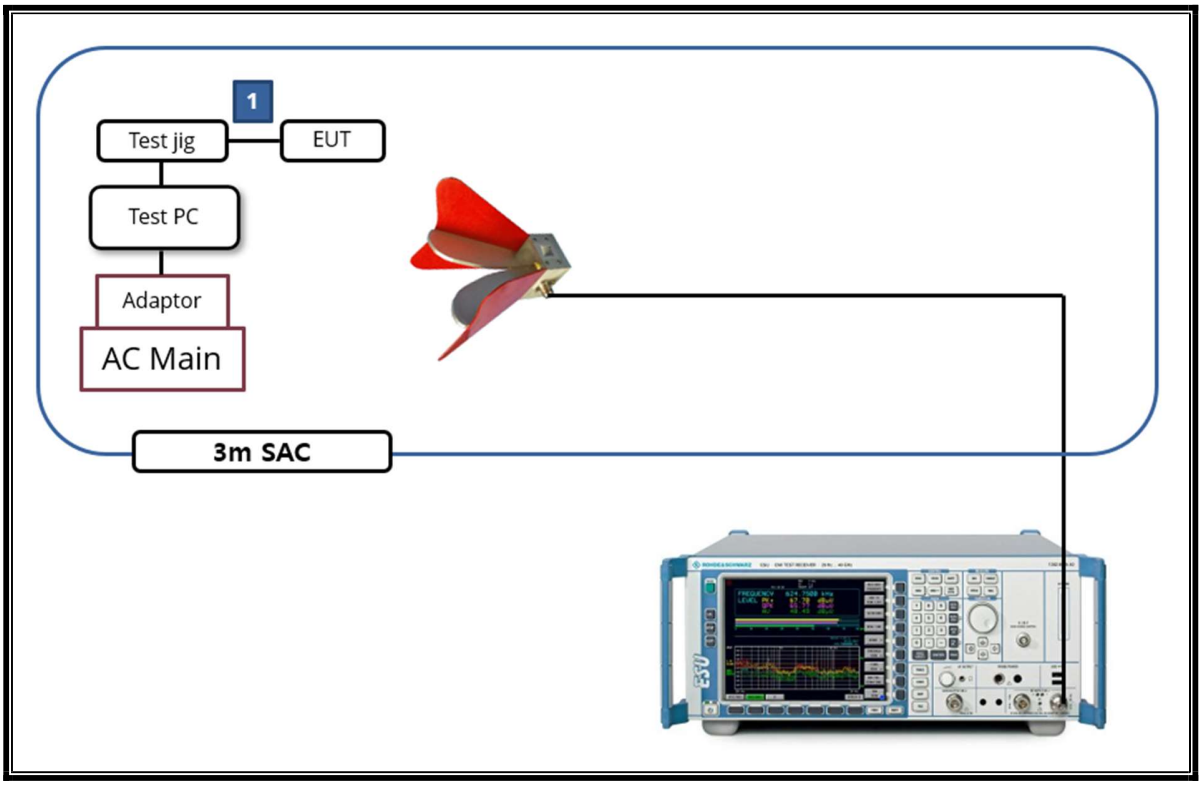
TEST SETUP

The EUT is a stand-alone unit during the tests.
Test software exercised the EUT to enable NII mode.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due date
Spectrum Analyzer	KEYSIGHT	N9030B	MY57143717	2024-07-23	2025-07-23
EMI Test Receiver	Rohde & Schwarz	ESW44	103297	2024-07-18	2025-07-18
EMI Test Receiver	Rohde & Schwarz	ESW44	103313	2024-01-29	2025-01-29
EMI Test Receiver	Rohde & Schwarz	ESW44	103350	2024-04-08	2025-04-08
EMI Test Receiver	Rohde & Schwarz	ESR7	102328	2024-01-29	2025-01-29
2 Line LISN	Rohde & Schwarz	EVN216	102638	2024-01-30	2025-01-30
Signal Generator	Rohde & Schwarz	SMB100B	103196	2024-07-18	2025-07-18
Signal Generator	Rohde & Schwarz	SMB100A	184060	2024-07-18	2025-07-18
Loop Antenna	TESEQ	HLA 6121	65111	2023-08-01	2025-08-01
TRILOG BROADBAND ANTENNA	Schwarzbeck	VULB 9163	01670	2023-10-17	2025-10-17
Double-Ridged Guide Antenna	ETS LINDGREN	3117	00261223	2024-09-24	2025-09-24
Double-Ridged Guide Antenna	ETS LINDGREN	3117	00261463	2024-09-20	2025-09-20
DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA	ETS LINDGREN	3116C	00261440	2024-09-20	2025-09-20
Amplifier	ETS LINDGREN	3116C-PA	00261440	2024-09-20	2025-09-20
Signal Conditioning Unit	Rohde & Schwarz	SCU01F	100316	2024-03-22	2025-03-22
Amplifier	EXYNOD	ELNA03-40D	631509	2024-07-18	2025-07-18
Amplifier	BNZ	BZR-01001800-231040-182020	28452	2024-04-08	2025-04-08
Amplifier	BNZ	BZR-01001800-231040-181515	31049	2024-07-18	2025-07-18
Power Sensor	Rohde & Schwarz	111164	NRP8S	2024-07-23	2025-07-23
Power Sensor	Rohde & Schwarz	104521	NRP8S	2024-07-25	2025-07-25
Attenuator	Centric RF	C040-10	N/A	2024-01-11	2025-01-11
				2025-01-10	2026-01-10
Attenuator	Centric RF	C040-10	N/A	2024-01-11	2025-01-11
				2025-01-10	2026-01-10
Attenuator	EXYNOD	RLAN-210-18G	10A001	2024-04-08	2025-04-08
Fixed Attenuator	PASTERNACK	PE7087-10	2241	2024-07-18	2025-07-18
Low Pass Filter	Micro-Tronics	LPS17541	019	2024-07-18	2025-07-18
Low Pass Filter	Micro-Tronics	LPS17541	050	2024-04-08	2025-04-08
High Pass Filter	Micro-Tronics	HPM50107	G115	2024-07-18	2025-07-18
High Pass Filter	Micro-Tronics	HPM17543	021	2024-07-18	2025-07-18
High Pass Filter	Micro-Tronics	HPS17542	020	2024-07-18	2025-07-18
High Pass Filter	Micro-Tronics	HPM17543	051	2024-04-08	2025-04-08
High Pass Filter	Micro-Tronics	HPS17542	051	2024-04-08	2025-04-08
Humidity/Baro/Temp DATA RECORDER	Lutron	MHB-382SD	AL.92208	2024-07-23	2025-07-23

Humidity/Baro/Temp DATA RECORDER	Lutron	MHB-382SD	AM.00223	2024-01-11	2025-01-11
				2025-01-02	2026-01-02
Humidity/Baro/Temp DATA RECORDER	Lutron	MHB-382SD	AM.00227	2024-01-11	2025-01-11
				2025-01-02	2026-01-02
Digital Multimeter	Fluke Corporation	17B+	51260820WS	2024-07-18	2025-07-18

UL Software			
Description	Manufacturer	Model	Vesrsion
Radiated software	UL	UL EMC	Ver 9.5
AC Line Conducted Software	Rohde & Schwarz	EMC32	Ver 11.10.00

8. SUMMARY TABLE

FCC Part Section	IC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.407(e)	RSS-247 6.2.4.2	6dB Bandwidth (5.8GHz)	> 500kHz	Conducted	Complies
15.407 (a)(1)(iv)	RSS-247 6.2.1.1 6.2.2.1 6.2.3.1	TX Cond. Power (5.150-5.250)	< 24dBm		Complies
15.407 (a)(2)	RSS-247 6.2.2.1	TX Cond. Power (5.250-5.350 & 5.470-5.725)	< 24dBm or 11+10Log(26dB BW)		Complies
15.407 (a)(3)(i)	RSS-247 6.2.4.2	TX Cond. Power (5.725-5.850)	< 30dBm		Complies
15.407 (a)(1)(iv) & (a)(2)	RSS-247 6.2.1.1 6.2.2.1 6.2.3.1	PSD (5.150-5.250 5.250-5.350 & 5.470-5.725)	< 11dBm/MHz		Complies
15.407 (a)(3)	RSS-247 6.2.4.2	PSD (5.725-5.850)	< 30dBm/500kHz		Complies
15.207 (a)	RSS-GEN Clause 8.8	AC Power Line conducted emissions	Section 13	Radiated	Complies
15.407 (b) & 15.209	RSS-Gen 8.9 RSS-Gen 8.10 RSS-247 6.2	Radiated Spurious Emission	< 74dBuV/m PK < 54dBuV/m AV		Complies
15.407 (h)(2)	RSS-247 6.3	Dynamic Frequency Selection	N/A	Condcuted	Complies[Note]

Note. This EUT does not support channel puncturing.

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9. MEASUREMENT METHODS

On-Time and Duty Cycle : KDB 789033 D02 v02r01, Section II.B.

6dB Emission BW : KDB 789033 D02 v02r01, Section II.C.2.

26dB Emission BW : KDB 789033 D02 v02r01, Section II.C.1.

99% Occupied BW : KDB 789033 D02 v02r01, Section II.D.

Conducted Output Power : KDB 789033 D02 v02r01, Section II.E.3.a(Method PM)

Conducted Output Power for Straddle Channel (ch144/142/138 for 20/40/80MHz BW):

KDB 789033 D02 v02r01, Section II.E.2.b(Method SA-1)

Power Spectral Density : KDB 789033 D02 v02r01, Section II.F.

Unwanted emissions in restricted bands : KDB 789033 D02 v02r01, Section II.G.3 – II.G.6.

Unwanted emissions in non-restricted bands : KDB 789033 D02 v02r01, Section II.G.3 – II.G.6.

AC Power Line Conducted Emission : ANSI C63.10-2020, Section 6.2.

10. REFERENCE MEASUREMENTS RESULTS

10.1. ON TIME AND DUTY CYCLE RESULTS

Mode	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor[dB]
802.11a SISO	2.756	3.206	0.860	85.964	0.66
802.11n(HT20) MIMO	5.083	5.623	0.904	90.397	0.44
802.11n(HT40) MIMO	4.779	5.464	0.875	87.463	0.58
802.11ac(VHT80) MIMO	2.232	2.906	0.768	76.807	1.15

Mode	ANT.	Tone	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor[dB]
802.11ax HE20	MIMO	26T	1.604	2.017	0.80	79.52	1.00
		242T	1.211	1.652	0.73	73.31	1.35
802.11ax HE40	MIMO	26T	1.604	2.017	0.80	79.52	1.00
		484T	1.204	1.680	0.72	71.67	1.45
802.11ax HE80	MIMO	26T	1.604	2.017	0.80	79.52	1.00
		996T	1.148	1.678	0.68	68.41	1.65

Note. If the duty cycle is over 98%, compensation is not included in average measurement.

LIMITS

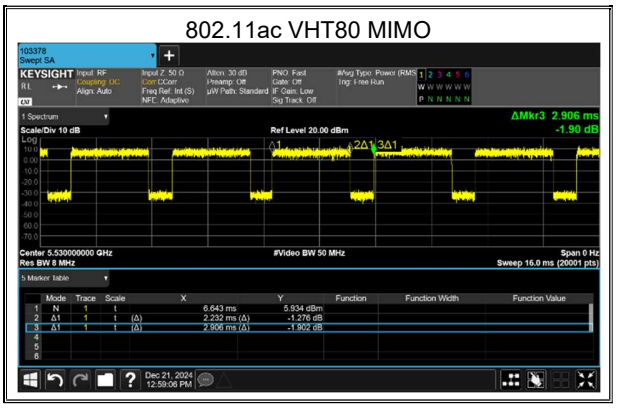
None; for reporting purposes only.

PROCEDURE

KDB 789033 D02 v02r01 Zero-Span Spectrum Analyzer Method.

DUTY CYCLE SAMPLE PLOTS

802.11ac VHT80 MIMO



10.2. 26 dB BANDWIDTH & 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

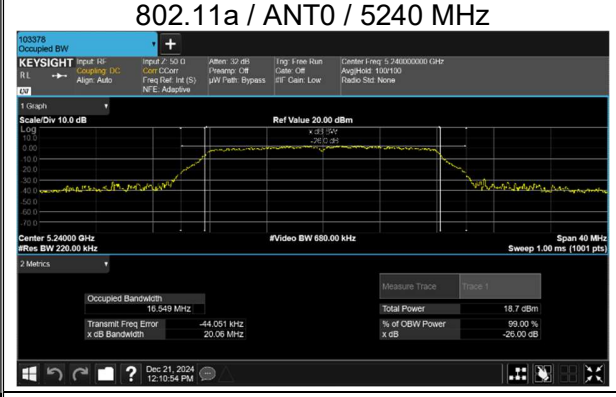
TEST PROCEDURE

Reference to 789033 D02 General UNII Test Procedures New Rules v02r01: The transmitter output is connected to a spectrum analyzer with the RBW set to approximately 1% of EBW, the VBW > RBW, peak detector and max hold.
- 26 dB Bandwidth
RBW set to approximately 1% of EBW, the VBW > RBW, peak detector and max hold.
- 99% Bandwidth
RBW: 1 ~ 5% of 99% Bandwidth, VBW >= 3 x RBW, sample detector.

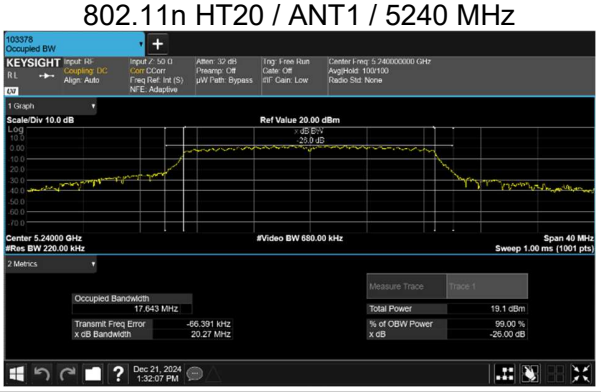
RESULTS
- Please refer to the next page

WORST CASE TEST PLOTS

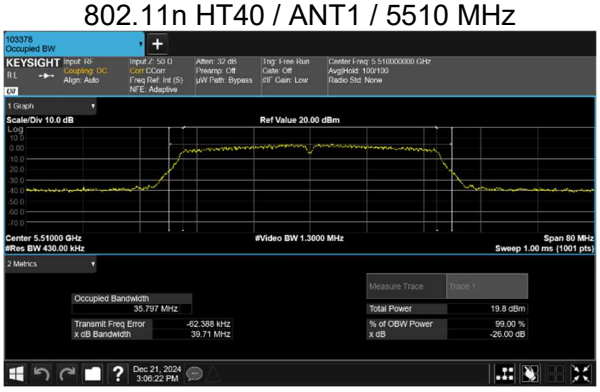
802.11a / ANT0 / 5240 MHz



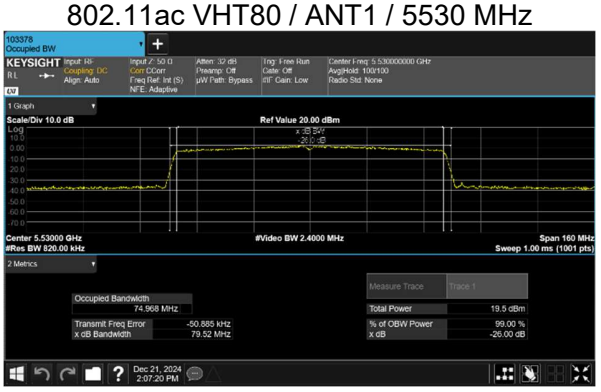
802.11n HT20 / ANT1 / 5240 MHz



802.11n HT40 / ANT1 / 5510 MHz



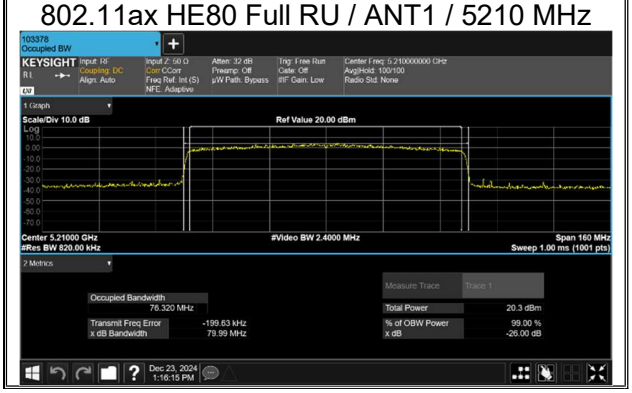
802.11ac VHT80 / ANT1 / 5530 MHz



802.11ax HE20 Full RU / ANT1 / 5180 MHz

802.11ax HE40 Full RU / ANT1 / 5270 MHz

802.11ax HE80 Full RU / ANT1 / 5210 MHz



10.2.1. 802.11a

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz]	
			ANT0	ANT1		ANT0	ANT1
UNII-1 Note	36	5180	27.38	31.18	20.06	17.55	17.54
	40	5200	27.14	30.95		17.50	17.47
	48	5240	**20.06**	21.82		16.55	16.57
UNII-2A Note	52	5260	26.17	32.91	25.75	17.42	18.17
	60	5300	26.08	26.74		17.20	17.14
	64	5320	**25.75**	28.06		17.20	17.16
UNII-2C	100	5500	27.81	**24.21**	24.21	17.79	16.84
	116	5580	25.24	24.46		17.21	16.94
	140	5700	26.30	25.04		17.51	16.96

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.2. 802.11n HT20

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz]	
			ANT0	ANT1		ANT0	ANT1
UNII-1 Note	36	5180	29.65	29.09	20.27	18.57	18.14
	40	5200	26.96	28.69		18.56	18.17
	48	5240	20.34	**20.27**		17.64	17.64
UNII-2A Note	52	5260	24.84	**24.42**	24.42	18.26	17.99
	60	5300	27.98	28.12		18.55	18.14
	64	5320	28.88	28.38		18.56	18.19
UNII-2C	100	5500	28.26	25.88	25.40	18.57	18.14
	116	5580	27.22	**25.40**		18.42	18.01
	140	5700	27.17	26.89		18.60	18.10

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.3. 802.11n HT40

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz]	
			ANT 0	ANT 1		ANT 0	ANT 1
UNII-1 Note	38	5190	40.53	**39.81**	39.81	35.91	35.81
	46	5230	40.46	39.86		35.93	35.76
UNII-2A Note	54	5270	40.50	**39.85**	39.85	35.90	35.77
	62	5310	40.17	40.01		35.92	35.76
UNII-2C	102	5510	41.47	**39.71**	39.71	36.12	35.80
	110	5550	40.14	39.85		35.93	35.73
	134	5670	40.33	39.78		35.88	35.74

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.4. 802.11ac VHT80

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz]	
			ANT 0	ANT 1		ANT 0	ANT 1
UNII-1 Note	42	5210	79.85	79.69	**79.69**	74.95	74.96
UNII-2A Note	58	5290	79.83	79.71	**79.71**	75.13	74.98
UNII-2C	106	5530	79.74	79.52	**79.52**	74.98	74.97
	122	5610	79.91	79.53		75.19	74.98

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.5. 802.11ax HE20

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz](Note)	
			ANT 0	ANT 1		ANT 0	ANT 1
UNII-1 Note	36	5180	23.99	24.43	**19.91**	19.06	19.04
	40	5200	24.38	25.61		19.08	19.08
	48	5240	**19.91**	19.91		18.83	18.83
UNII-2A Note	52	5260	25.09	23.72	**21.90**	19.11	19.06
	60	5300	24.81	25.10		19.06	19.05
	64	5320	25.75	**21.90**		19.10	19.06
UNII-2C	100	5500	23.72	**22.86**	**22.86**	19.04	19.05
	116	5580	26.69	23.06		19.07	19.05
	140	5700	27.93	23.60		19.07	19.05

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.6. 802.11ax HE40

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz](Note)	
			ANT0	ANT1		ANT0	ANT1
UNII-1 Note	38	5190	39.63	39.51	**39.45**	37.48	37.43
	46	5230	39.55	**39.45**		37.45	37.41
UNII-2A Note	54	5270	39.62	**39.43**	**39.43**	37.44	37.46
	62	5310	39.68	39.53		37.46	37.42
UNII-2C	102	5510	39.54	**39.54**	**39.54**	37.45	37.44
	110	5550	39.65	39.69		37.45	37.45
	134	5670	39.67	39.62		37.44	37.45

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.7. 802.11ax HE80

Band	Channel	Center Freq. [MHz]	26 dB BW [MHz]		Worst	99% BW [MHz](Note)	
			ANT0	ANT1		ANT0	ANT1
UNII-1 Note	42	5210	80.25	**79.99**	**79.99**	76.71	76.32
UNII-2A Note	58	5290	80.15	**80.12**	**80.12**	76.63	76.75
UNII-2C	106	5530	**80.07**	80.19	**80.07**	76.73	76.70
	122	5610	80.14	80.08		76.80	76.80

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.8. STRADDLE CHANNEL

Mode	Channel	Center Freq. [MHz]	26 dB BW [MHz]			
			ANT0		ANT1	
			UNII-2C	UNII-3	UNII-2C	UNII-3
802.11a	Straddle	5720	17.57	7.22	17.66	6.74
802.11n HT20	Straddle	5720	17.31	8.01	17.28	7.29
802.11n HT40	Straddle	5710	35.08	4.94	34.87	4.91
802.11ac VHT80	Straddle	5690	74.83	4.73	74.77	4.70
802.11ax HE20 (Full RU 242T)	Straddle	5720	16.70	7.30	15.98	5.75
802.11ax HE40 (Full RU 484T)	Straddle	5710	34.81	4.64	34.78	4.61
802.11ax HE80 (Full RU 996T)	Straddle	5690	75.02	4.89	75.02	4.82

10.2.9. 802.11ax HE20(RU)

Band Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]		99% BW [MHz]	
				ANT0	ANT1	ANT0	ANT1
UNII-1 Note	5180	26T	0	20.69	20.36	18.77	18.64
			4	18.06	18.00	17.09	16.98
			8	20.98	20.21	18.97	18.62
	5200		0	23.99	24.43	18.80	18.65
			4	20.44	20.12	17.09	17.01
			8	18.10	18.02	18.93	18.65
	5240		0	21.04	21.06	18.17	18.08
			4	24.38	25.61	16.97	16.84
			8	19.00	18.95	18.09	18.05
UNII-2A Note	5260	26T	0	21.35	20.38	18.86	18.63
			4	18.07	18.00	17.08	16.99
			8	20.46	20.67	18.81	18.85
	5300		0	25.09	23.72	18.81	18.69
			4	20.73	20.51	17.10	16.99
			8	18.07	18.00	18.90	18.66
	5320		0	21.40	20.48	18.75	18.65
			4	24.81	25.10	17.10	17.00
			8	20.40	20.18	18.87	18.69
UNII-2C	5500	26T	0	21.10	20.52	18.79	18.62
			4	18.08	18.01	17.12	17.00
			8	20.40	20.68	18.83	18.77
	5580		0	23.72	22.86	18.86	18.65
			4	20.56	20.33	17.12	16.95
			8	18.09	17.99	18.94	18.72
	5700		0	21.38	21.00	18.77	18.60
			4	26.69	23.06	17.03	16.98
			8	20.59	20.27	18.83	18.72

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.10. 802.11ax HE40(RU)

Band	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]		99% BW [MHz]	
				ANT0	ANT1	ANT0	ANT1
UNII-1 Note	5190	26T	0	18.91	18.93	17.91	17.80
			9	22.62	22.08	20.23	19.94
			17	18.93	18.92	17.79	17.79
	5230		0	20.64	18.99	18.75	17.85
			9	21.98	21.85	20.19	19.89
			17	19.01	18.99	17.76	17.81
UNII-2A Note	5270	26T	0	20.97	18.97	18.79	17.76
			9	22.02	21.84	20.13	19.71
			17	18.95	18.93	17.77	17.68
	5310		0	19.06	20.25	17.84	18.60
			9	22.65	21.72	20.22	19.75
			17	19.15	19.01	17.84	17.78
UNII-2C	5510	26T	0	18.95	20.52	17.86	18.62
			9	22.11	21.69	20.17	19.70
			17	19.02	18.93	17.78	17.78
	5550		0	19.03	20.47	17.81	18.58
			9	22.42	21.61	20.08	19.73
			17	19.21	18.89	17.82	17.79
	5670		0	20.98	20.18	18.82	18.55
			9	21.99	21.74	20.15	19.70
			17	19.11	18.92	17.84	17.82

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.11. 802.11ax HE80(RU)

Band	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]		99% BW [MHz]	
				ANT0	ANT1	ANT0	ANT1
UNII-1 Note	5210	26T	0	19.47	19.17	18.36	18.01
			18	38.43	38.26	36.77	36.45
			36	19.32	19.17	18.16	18.11
UNII-2A Note	5290	26T	0	20.81	20.15	18.72	18.68
			18	38.65	38.43	36.68	36.34
			36	19.30	19.11	18.03	17.96
UNII-2C	5530	26T	0	20.57	20.66	18.75	18.70
			18	38.59	38.29	36.51	36.39
			36	19.36	19.05	18.11	17.96
	5610	26T	0	20.93	20.24	18.82	18.70
			18	38.65	38.35	36.60	36.34
			36	19.24	18.95	18.08	17.92

Note. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

10.2.12. 802.11ax STRADDLE CHANNEL(RU)

Band	Mode	Center Freq. [MHz]	Tones	RU offset	26 dB BW [MHz]			
					ANT0		ANT1	
					UNII-2C	UNII-3	UNII-2C	UNII-3
Straddle Channel	HE20	5720	26T	6	14.06	3.94	14.10	3.87
	HE40	5710		15	14.46	4.03	14.18	4.14
	HE80	5690		34	14.67	4.15	14.42	4.12

11. ANTENNA PORT TEST RESULTS

11.1. 6 dB BANDWIDTH & 99% BANDWIDTH

LIMITS

FCC §15.407 / RSS-247 Section 6.2.4.2 and 6.2.5.2
- 6 dB Bandwidth
The minimum 6 dB bandwidth shall be at least 500 kHz.
- 99% Bandwidth
None; for reporting purposes only.

TEST PROCEDURE

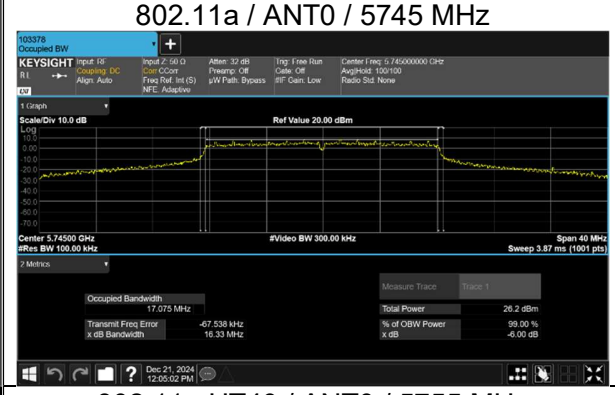
- 6 dB Bandwidth
RBW set to 100 kHz, the VBW >=3 x RBW, peak detector and max hold.
- 99% Bandwidth
RBW: 1 ~ 5% of 99% Bandwidth, VBW >= 3 x RBW, sample detector.

RESULTS

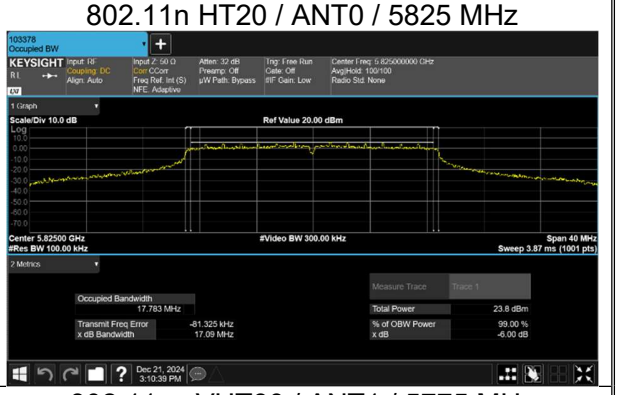
- Please refer to the next page

WORST CASE TEST PLOTS

802.11a / ANT0 / 5745 MHz



802.11n HT20 / ANT0 / 5825 MHz



802.11n HT40 / ANT0 / 5755 MHz

802.11ac VHT80 / ANT1 / 5775 MHz

802.11ax HE20 0RU / ANT1 / 5785 MHz

802.11ax HE40 0RU / ANT1 / 5755 MHz

802.11ax HE80 0RU / ANT1 / 5775 MHz

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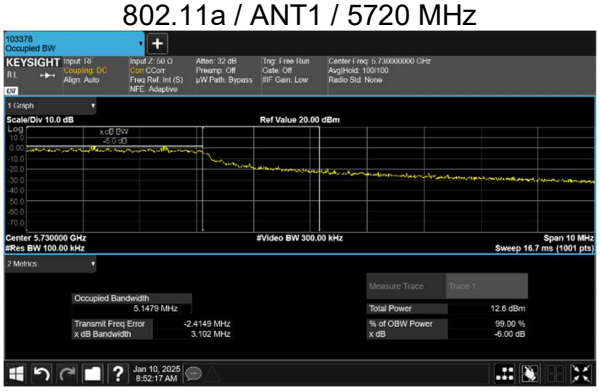
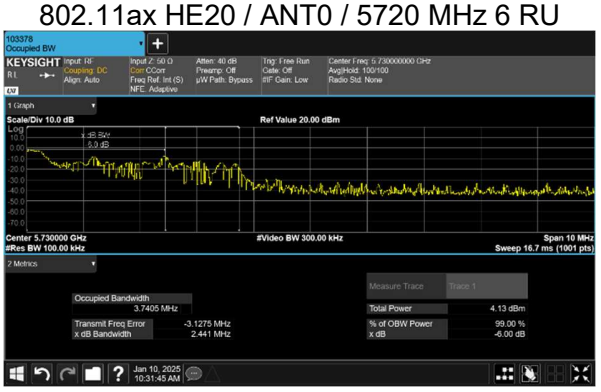
WORST CASE TEST PLOTS(STRADDLE CHANNELS)

802.11a / ANT1 / 5720 MHz



802.11ax HE20 / ANT0 / 5720 MHz 6 RU



11.1.1. STRADDLE CHANNEL

Mode	Channel	Center Freq. [MHz]	6 dB BW [MHz]	
			UNII-3	
			ANT 0	ANT 1
802.11a	Straddle	5720	3.10	3.13
802.11n HT20	Straddle	5720	3.75	3.75
802.11n HT40	Straddle	5710	3.11	3.14
802.11ac VHT80	Straddle	5690	3.12	3.13
802.11ax HE20 (Full RU 242T)	Straddle	5720	4.46	4.48
802.11ax HE40 (Full RU 484T)	Straddle	5710	3.97	3.33
802.11ax HE80 (Full RU 996T)	Straddle	5690	3.96	4.01

Band	Mode	Center Freq. [MHz]	Tones	RU offset	6 dB BW [MHz]	
					UNII-3	
					ANT 0	ANT 1
Straddle Channel	**HE20**	5720	26T	6	2.45	2.44
	HE40	5710		15	3.48	3.46
	HE80	5690		34	3.49	3.33

11.1.2. UNII-3 BAND(6 dB BANDWIDTH)

Mode	Channel	Center Freq. [MHz]	6 dB BW [MHz]		Worst	Minimum Limit [MHz]
			ANT0	ANT1		
802.11a	149	5745	**16.33**	16.36	**16.33**	0.5
	157	5785	16.34	16.36		
	165	5825	16.33	16.36		
802.11n HT20	149	5745	17.29	17.62	**17.09**	
	157	5785	17.31	17.61		
	165	5825	**17.09**	17.61		
802.11n HT40	151	5755	**32.67**	35.08	**32.67**	
	159	5795	33.89	35.08		
802.11ac VHT80	155	5775	75.19	**75.18**	**75.18**	
802.11ax HE20 (Full RU 242T)	149	5745	**18.89**	18.97	**18.89**	
	157	5785	18.96	19.06		
	165	5825	18.91	19.02		
802.11ax HE40 (Full RU 484T)	151	5755	35.17	36.07	**35.13**	
	159	5795	35.14	**35.13**		
802.11ax HE80 (Full RU 996T)	155	5775	**75.16**	75.22	**75.16**	

11.1.3. UNII-3 BAND(99% BANDWIDTH)

Mode	Channel	Center Freq. [MHz]	99% BW [MHz]		Worst	Minimum Limit [MHz]
			ANT0	ANT1		
802.11a	149	5745	18.52	17.31	17.15	-
	157	5785	18.54	18.15		
	165	5825	17.82	**17.15**		
802.11n HT20	149	5745	18.73	18.28	18.13	
	157	5785	18.80	18.32		
	165	5825	18.62	**18.13**		
802.11n HT40	151	5755	36.25	**36.05**	36.05	
	159	5795	36.28	36.14		
802.11ac VHT80	155	5775	75.17	**75.01**	75.01	
802.11ax HE20 (Full RU 242T)	149	5745	19.21	**19.09**	19.09	
	157	5785	19.18	19.12		
	165	5825	19.14	**19.09**		
802.11ax HE40 (Full RU 484T)	151	5755	37.60	**37.53**	37.53	
	159	5795	37.54	37.54		
802.11ax HE80 (Full RU 996T)	155	5775	**76.80**	**76.80**	76.80	

11.1.4. UNII-3 BAND(RU)

Mode	Channel	Center Freq. [MHz]	Tones	RU offset	6 dB BW [MHz]		Minimum Limit [MHz]
					ANT0	ANT1	
HE20	149	5745	26T	0	2.158	2.149	0.5
	157	5785			2.135	**2.125**	
	165	5825			2.126	2.145	
	Minimum 6dB Bandwidth				**2.125**		
HE40	151	5755	26T	0	2.162	**2.148**	
	159	5795			2.153	2.177	
	Minimum 6dB Bandwidth				**2.148**		
HE80	155	5775	26T	0	2.258	**2.173**	
	Minimum 6dB Bandwidth				**2.173**		

11.2. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407 (a)(1)(iv), (a)(2), (a)(3)(i), (a)(3)(iii) / RSS-247

FCC

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 5.725-5.850 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.

For client devices operating under the control of an indoor access point in the 5.850-5.895 GHz band, the maximum power spectral density must not exceed 14 dBm e.i.r.p. in any 1-megahertz band, and the maximum e.i.r.p. over the frequency band of operation must not exceed 30 dBm. Client devices operating on a channel that spans the 5.725-5.850 GHz and 5.850-5.895 GHz bands must not exceed an e.i.r.p. of 30 dBm.

IC

Frequency band 5150-5250 MHz:
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:
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.

Frequency bands 5470-5600 MHz and 5650-5725 MHz:
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.

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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.

Frequency band 5725-5850 MHz :
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.

Note. Conducted output power results for 5250-5350MHz and 5470-5725MHz bands are all below 250mW and sum with directional gain documented in page 37(less than 0 dBi), it is confirmed that both bands also comply with eirp limit.

TEST PROCEDURE

KDB 789033 Method PM is used for output power. Duty correction factor has already been applied to the power meter and the average power value is measured.

KDB 789033 Method SA-2 is used for PSD. RBW set to 1MHz(500kHz for the band 5.725-5.85 GHz, the VBW >= 3 x RBW, RMS detector and trace averaging).

Straddle Channel(UNII-2C&3)

KDB 789033 Method PM is used for output power of straddle channel.
(verification that both limit of UNII-2C and UNII-3 power are satisfied)

KDB 789033 Method SA-2 is used for PSD of straddle channel. RBW set to 1MHz, VBW >= 3 x RBW, RMS detector and trace averaging. Peak marker value of the spectrum is used for PSD. Considering the PSD's RBW setting and test limit, the UNII-2C measurement method (RBW 1MHz) covers UNII-3 (RBW 500kHz).

Straddle Channel(UNII-3&4)

KDB 789033 Method PM is used for total power of straddle channel.
(verification that both limit of UNII-3 and UNII-4 power & e.i.r.p. are satisfied)

KDB 789033 Method SA-2 is used for PSD of straddle channel. RBW set to 1MHz, VBW >= 3 x RBW, RMS detector and trace averaging. Peak marker value of the spectrum is used for PSD. Considering the PSD's RBW setting and test limit, the UNII-4 measurement method (RBW 1MHz) covers UNII-3 (RBW 500kHz).

DIRECTIONAL ANTENNA GAIN

For OUTPUT POWER and PSD: The TX chains are correlated and the antenna gains are unequal among the chains. The directional gain is:

Frequency Band [MHz]	ANT0 Gain [dBi]	ANT1 Gain [dBi]	Correlated Chains Directional Gain [dBi]
UNII 1 5150 - 5250	1.67	0.24	3.99
UNII 2A 5250 - 5350	1.66	0.79	4.25
UNII 2C 5470 - 5725	1.75	1.74	4.76
UNII 3 5725 - 5850	1.41	1.37	4.40

Note. Since the correrated gain does not exceed 6dBi, bands for UNII-1,2A,2C,3 do not consider the antenna gain.

11.2.1. 802.11a MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Average Power [dBm]		Ant. Gain [dBi]		Corr'd Power [dBm]		Limit [dBm]	Limit [dBm
			ANT0	ANT1	ANT0	ANT1	ANT0	ANT1	ANT0	ANT1
UNII-1	36	5180	11.67	14.00	1.67	0.24	13.34	14.24	22.19 e.i.r.p	22.19 e.i.r.p
	40	5200	11.96	13.73	1.67	0.24	13,63	13.97		
	48	5240	11.73	14.03	1.67	0.24	13.40	14.27		

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
* Corr'd Power = Ant0 Average Power + Ant0 Ant.gain, Ant1 Average Power + Ant1 Ant.gain,

Band	Channel	Center Freq. [MHz]	Average Power [dBm]		Direct. Gain [dBi]	Corr'd Power [dBm]		Limit [dBm]	Limit [dBm
			ANT0	ANT1		ANT0	ANT1	ANT0	ANT1
UNII-2A	52	5260	14.01	16.12	-	-	-	23.36	23.34
	60	5300	14.44	15.15	-	-	-		
	64	5320	14.68	15.33	-	-	-		
UNII-2C	100	5500	14.44	13.02	-	-	-	23.26	22.36
	116	5580	13.52	12.14	-	-	-		
	140	5700	14.91	14.32	-	-	-		
UNII-2C&3	144 Straddle	5720	14.10	12.56	-	-	-	23.28 or 30.00	23.25 or 30.00
UNII-3	149	5745	18.86	16.40	-	-	-	30.00	30.00
	157	5785	19.10	17.99	-	-	-		
	165	5825	17.82	15.76	-	-	-		

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]

PSD Results

Band	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]		DCCF.	Direct. Gain [dBi]		Corr'd PSD [dBm]		Limit [dBm/ MHz]
			ANT0	ANT1		ANT0	ANT1	ANT0	ANT1	
UNII-1	36	5180	0.39	4.75	0.66	1.67	0.24	2.71	5.64	10.00 e.i.r.p
	40	5200	0.76	3.84	0.66	1.67	0.24	3.08	4.74	
	48	5240	0.47	4.42	0.66	1.67	0.24	2.79	5.32	
UNII-2A	52	5260	3.05	6.64	0.66			3.70	7.30	11.00
	60	5300	3.91	5.63	0.66			4.56	6.29	
	64	5320	3.94	5.93	0.66			4.59	6.58	
UNII-2C	100	5500	3.25	3.67	0.66			3.91	4.32	11.00
	116	5580	2.46	2.89	0.66			3.11	3.55	
	140	5700	4.11	4.88	0.66			4.77	5.54	
UNII-2C&3	144 Straddle	5720	3.14	2.22	0.66			3.79	2.88	11.00 or 30.00/500kHz
UNII-3	149	5745	5.29	3.91	0.66			5.95	4.57	30.00/500kHz
	157	5785	5.69	5.64	0.66			6.34	6.29	
	165	5825	4.75	3.51	0.66			5.41	4.16	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant0 PSD + Duty CF [dB] (in case of UNII-1: added directional gain)
Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-1: added directional gain)

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11.2.2. 802.11n HT20 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Average Power [dBm]		Direct. Gain [dBi]	Corr'd Power [dBm]	Limit [dBm]
			ANT0	ANT1			
UNII-1	36	5180	10.77	9.54	3.99	17.20	22.46 e.i.r.p
	40	5200	11.12	10.23	3.99	17.70	
	48	5240	10.82	10.93	3.99	17.88	
UNII-2A	52	5260	12.63	12.72		15.69	23.55
	60	5300	14.06	12.31		16.28	
	64	5320	14.15	12.38		16.36	
UNII-2C	100	5500	13.52	11.58		15.67	23.55
	116	5580	12.77	10.20		14.68	
	140	5700	14.20	12.84		16.58	
UNII-2C&3	144 Straddle	5720	14.10	12.56		16.41	23.56 or 30.00
UNII-3	149	5745	17.75	16.83		20.32	30.00
	157	5785	17.97	17.08		20.56	
	165	5825	16.44	14.48		18.58	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power(in case of UNII-1: added directional gain)

PSD Results

Band	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]		DCCF.	Direct. Gain [dBi]	Corr'd PSD [dBm]	Limit [dBm/ MHz]
			ANT0	ANT1				
UNII-1	36	5180	-0.73	0.11	0.44	3.99	7.15	10.00 e.i.r.p
	40	5200	-0.57	0.43	0.44	3.99	7.40	
	48	5240	-0.34	1.39	0.44	3.99	8.05	
UNII-2A	52	5260	1.36	3.04	0.44		5.73	11.00
	60	5300	3.06	3.50	0.44		6.73	
	64	5320	2.92	3.14	0.44		6.48	
UNII-2C	100	5500	2.11	2.21	0.44		5.61	11.00
	116	5580	1.32	0.64	0.44		4.44	
	140	5700	2.86	2.70	0.44		6.23	
UNII-2C&3	144 Straddle	5720	2.16	1.69	0.44		5.38	11.00 or 30.00/500kHz
UNII-3	149	5745	3.45	3.90	0.44		7.13	30.00/500kHz
	157	5785	3.88	4.14	0.44		7.46	
	165	5825	2.54	1.52	0.44		5.51	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-1: added directional gain)

11.2.3. 802.11n HT40 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Average Power [dBm]		Direct. Gain [dBi]	Corr'd Power [dBm]	Limit [dBm]
			ANT0	ANT1			
UNII-1	38	5190	9.93	8.89	3.99	16.44	23.01 e.i.r.p
	46	5230	9.46	8.91	3.99	16.19	
UNII-2A	54	5270	12.14	11.93		15.05	23.98
	62	5310	12.57	10.86		14.81	
UNII-2C	102	5510	11.82	9.57		13.85	23.98
	110	5550	12.44	10.32		14.52	
	134	5670	12.21	10.32		14.38	
UNII-2C&3	142 Straddle	5710	13.32	12.15		15.78	23.98 or 30.00
UNII-3	151	5755	16.96	15.93		19.49	30.00
	159	5795	17.12	16.29		19.74	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power(in case of UNII-1: added directional gain)

PSD Results

Band	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]		DCCF.	Direct. Gain [dBi]	Corr'd PSD [dBm]	Limit [dBm/ MHz]
			ANT0	ANT1				
UNII-1	38	5190	-3.75	-2.56	0.58	3.99	4.47	10.00 e.i.r.p
	46	5230	-4.15	-2.32	0.58	3.99	4.44	
UNII-2A	54	5270	-0.94	0.83	0.58		3.62	11.00
	62	5310	-0.53	-0.21	0.58		3.22	
UNII-2C	102	5510	-2.49	-2.34	0.58		1.17	11.00
	110	5550	-1.29	-1.17	0.58		2.36	
	134	5670	-1.37	-1.57	0.58		2.12	
UNII-2C&3	142 Straddle	5710	-0.07	-1.00	0.58		3.08	11.00 or 30.00/500kHz
UNII-3	151	5755	0.89	-0.86	0.58		3.69	30.00/500kHz
	159	5795	1.44	-0.27	0.58		4.26	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-1: added directional gain)

11.2.4. 802.11ac VHT80 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Average Power [dBm]		Direct. Gain [dBi]	Corr'd Power [dBm]	Limit [dBm]
			ANT0	ANT1			
UNII-1	42	5210	9.60	8.09	3.99	15.91	23.01 e.i.r.p
UNII-2A	58	5290	11.03	10.71		13.88	23.98
UNII-2C	106	5530	10.70	8.58		12.78	23.98
	122	5610	11.44	9.02		14.55	
UNII-2C&3	138 Straddle	5690	11.03	9.07		13.17	23.98 or 30.00
UNII-3	155	5775	12.85	11.78		15.36	30.00

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power(in case of UNII-1: added directional gain)

PSD Results

Band	Channel	Center Freq. [MHz]	Meas PSD [dBm/MHz]		DCCF.	Direct. Gain [dBi]	Corr'd PSD [dBm]	Limit [dBm/ MHz]
			ANT0	ANT1				
UNII-1	42	5210	-6.85	-6.69	1.15	3.99	-2.61	10.00 e.i.r.p
UNII-2A	58	5290	-5.69	-3.81	1.15		-0.49	11.00
UNII-2C	106	5530	-6.25	-6.43	1.15		-2.18	11.00
	122	5610	-5.50	-6.54	1.15		-1.83	
UNII-2C&3	138 Straddle	5690	-5.81	-7.09	1.15		-2.24	11.00 or $30.00_{/500kHz}$
UNII-3	155	5775	-6.90	-7.05	1.15		-2.81	$30.00_{/500kHz}$

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-1: added directional gain)

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11.2.5. 802.11ax HE20 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Average Power [dBm]		Direct. Gain [dBi]	Corr'd Power [dBm]	Limit [dBm]
					ANT0	ANT1			
UNII-1	36	5180	26T	0	1.98	1.63	3.99	8.81	22.26 e.i.r.p.
				4	2.37	2.11	3.99	9.24	
				8	2.60	2.25	3.99	9.43	
			242T	61	10.79	9.36	3.99	17.13	
	40	5200	26T	0	2.24	2.07	3.99	9.16	
				4	2.60	2.39	3.99	9.50	
				8	2.74	2.62	3.99	9.68	
			242T	61	11.04	9.61	3.99	17.38	
	48	5240	26T	0	1.73	2.28	3.99	9.01	
				4	2.18	2.72	3.99	9.46	
				8	2.42	2.99	3.99	9.71	
			242T	61	10.44	9.54	3.99	17.02	
UNII-2A	52	5260	26T	0	4.64	5.22		7.95	22.30
				4	4.90	5.55		8.25	
				8	5.00	5.60		8.32	
			242T	61	11.53	11.69		14.62	
	60	5300	26T	0	5.10	4.58		7.86	
				4	5.29	4.84		8.08	
				8	5.37	4.95		8.18	
			242T	61	12.50	12.49		15.51	
	64	5320	26T	0	5.32	4.88		8.12	
				4	5.36	5.07		8.23	
				8	5.36	5.09		8.24	
			242T	61	12.70	12.80		15.76	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power(in case of UNII-1 added directional gain)

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Average Power [dBm]		Corr'd Power [dBm]	Limit [dBm]
					ANT0	ANT1		
UNII-2C	100	5500	26T	0	5.61	4.72	8.20	23.29
				4	5.47	4.66	8.09	
				8	5.55	4.70	8.16	
			242T	61	13.53	11.61	15.69	
	116	5580	26T	0	4.88	3.25	7.15	
				4	5.02	3.43	7.31	
				8	5.11	3.46	7.37	
			242T	61	12.59	10.18	14.56	
	140	5700	26T	0	4.95	4.36	7.68	
				4	5.14	4.53	7.86	
				8	5.17	4.50	7.86	
			242T	61	13.11	12.07	15.63	
UNII-2C & 3	144 Straddle	5720	26T	0	5.04	4.32	7.71	23.78 or 30.00
				4	5.17	4.41	7.82	
				8	5.20	4.52	7.88	
			242T	61	13.95	12.49	16.29	
UNII-3	149	5745	26T	0	11.59	11.55	14.58	30.00
				4	11.79	11.64	14.73	
				8	11.87	11.56	14.73	
			242T	61	17.61	16.74	20.21	
	157	5785	26T	0	11.74	11.54	14.65	
				4	11.87	11.59	14.74	
				8	11.93	11.64	14.80	
			242T	61	17.86	16.92	20.43	
	165	5825	26T	0	10.43	9.11	12.83	
				4	10.56	9.25	12.96	
				8	10.46	9.24	12.90	
			242T	61	16.46	14.49	18.60	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power(in case of UNII-1 added directional gain)

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PSD Results

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Meas PSD [dBm/MHz]		Direct. Gain [dBi]	Corr'd PSD [dBm/MHz]	PSD Limit [dBm/MHz]
					ANT0	ANT1			
UNII-1	36	5180	26T	0	-0.87	-1.38	3.99	6.88	10.00 e.i.r.p.
				4	-1.48	-2.02	3.99	6.26	
				8	-0.03	-0.63	3.99	7.68	
			242T	61	-1.07	-1.07	3.99	7.28	
	40	5200	26T	0	-0.42	-0.97	3.99	7.32	
				4	-0.85	-1.51	3.99	6.83	
				8	0.05	-0.13	3.99	7.96	
			242T	61	-1.70	-0.43	3.99	7.33	
	48	5240	26T	0	-0.94	-0.52	3.99	7.27	
				4	-1.61	-1.26	3.99	6.57	
				8	-0.31	0.16	3.99	7.93	
			242T	61	-1.85	-0.38	3.99	7.30	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB]

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Meas PSD [dBm/MHz]		Corr'd PSD [dBm/MHz]	PSD Limit [dBm/MHz]
					ANT0	ANT1		
UNII-2A	52	5260	26T	0	1.47	2.47	6.01	11.00
				4	0.42	1.76	5.15	
				8	1.50	3.65	6.72	
			242T	61	0.04	1.59	5.24	
	60	5300	26T	0	2.04	1.80	5.93	
				4	0.71	0.98	4.86	
				8	2.03	2.02	6.04	
			242T	61	1.54	1.95	6.11	
	64	5320	26T	0	2.14	2.07	6.11	
				4	1.11	1.51	5.32	
				8	2.23	2.33	6.29	
			242T	61	1.53	2.80	6.57	
UNII-2C	100	5500	26T	0	1.40	1.89	5.66	11.00
				4	0.43	0.74	4.60	
				8	1.56	2.14	5.86	
			242T	61	0.61	1.32	5.34	
	116	5580	26T	0	1.33	0.70	5.03	
				4	0.59	-0.54	4.07	
				8	1.67	0.74	5.24	
			242T	61	-0.05	0.30	4.49	
	140	5700	26T	0	1.48	1.44	5.47	
				4	0.40	0.43	4.42	
				8	2.45	1.84	6.17	
			SU	-	1.44	1.91	6.04	
UNII-2C & 3	144 Straddle	5720	26T	0	1.50	1.06	5.30	11.00 or 30.00
				4	0.89	1.33	5.48	
				8	2.06	2.25	6.17	
			242T	61	1.25	1.28	5.63	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB]

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Meas PSD [dBm]		Direct. Gain [dBi]	Corr'd PSD [dBm]	PSD Limit [dBm]
					ANT0	ANT1			
UNII-3	149	5745	26T	0	5.83	6.05		9.95	30.00 /500kHz
				4	5.81	5.77		9.80	
				8	5.98	6.12		10.06	
			242T	61	2.42	3.27		7.23	
	157	5785	26T	0	5.87	5.92		9.90	
				4	5.91	6.61		10.29	
				8	6.03	6.57		10.32	
			242T	61	2.68	3.38		7.40	
	165	5825	26T	0	4.50	3.81		8.18	
				4	4.78	3.91		8.37	
				8	5.05	3.97		8.56	
			242T	61	1.33	0.85		5.46	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-1: added directional gain)

11.2.6. 802.11ax HE40 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Average Power [dBm]		Direct. Gain [dBm]	Corr'd Power [dBm]	Limit [dBm]
					ANT0	ANT1			
UNII-1	38	5190	26T	0	-1.84	-3.26	3.99	4.51	22.50 e.i.r.p.
				9	-1.19	-2.71	3.99	5.12	
				17	-0.96	-2.52	3.99	5.33	
			484T	65	10.04	8.61	3.99	16.38	
	46	5230	26T	0	-2.11	-3.65	3.99	4.19	
				9	-0.68	-2.16	3.99	5.64	
				17	-0.51	-2.05	3.99	5.79	
			484T	65	9.54	8.60	3.99	16.10	
UNII-2A	54	5270	26T	0	4.34	3.12		6.78	23.47
				9	5.74	4.52		8.18	
				17	5.68	4.62		8.19	
			484T	65	12.23	11.52		14.90	
	62	5310	26T	0	4.72	3.62		7.22	
				9	5.94	5.15		8.57	
				17	5.77	5.19		8.50	
			484T	65	12.63	10.66		14.77	
UNII-2C	102	5510	26T	0	3.94	3.87		6.92	23.50
				9	4.42	4.31		7.38	
				17	4.45	3.44		6.98	
			484T	65	11.91	9.59		13.91	
	110	5550	26T	0	5.13	3.52		7.41	
				9	5.63	3.87		7.85	
				17	5.51	3.83		7.76	
			484T	65	12.40	10.31		14.49	
	134	5670	26T	0	3.27	2.56		5.94	
				9	3.67	2.91		6.32	
				17	3.42	2.61		6.04	
			484T	65	12.27	10.25		14.39	
UNII-2C & 3	142 Straddle	5710	26T	0	2.51	1.96		5.25	22.52 or 30.00
				9	3.64	3.21		6.44	
				17	3.51	2.78		6.17	
			484T	65	13.45	12.21		15.88	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Average Power [dBm]		Corr'd Power [dBm]	Limit [dBm]
					ANT0	ANT1		
UNII-3	151	5755	26T	0	8.20	7.46	10.85	30.00
				9	9.35	8.79	12.09	
				17	9.21	8.63	11.94	
			484T	65	17.02	16.04	19.57	
	159	5795	26T	0	8.27	7.75	11.03	
				9	9.52	9.01	12.28	
				17	9.34	8.92	12.15	
			484T	65	17.17	16.28	19.76	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power(in case of UNII-1: added directional gain)

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PSD Results

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Meas PSD [dBm/MHz]		Direct. Gain [dBi]	Corr'd PSD [dBm /MHz]	PSD Limit [dBm/MHz]
					ANT0	ANT1			
UNII-1	38	5190	26T	0	-5.65	-4.87	3.99	2.76	10.00 e.i.r.p.
				9	-5.66	-4.04	3.99	3.22	
				17	-4.63	-3.68	3.99	3.87	
			484T	65	-4.45	-4.11	3.99	4.17	
	46	5230	26T	0	-6.25	-4.02	3.99	3.01	
				9	-4.73	-3.64	3.99	3.85	
				17	-4.19	-3.49	3.99	4.17	
			484T	65	-5.12	-3.76	3.99	4.06	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-1: added directional gain)

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Meas PSD [dBm/MHz]		Corr'd PSD [dBm/MHz]	PSD Limit [dBm/MHz]
					ANT0	ANT1		
UNII-2A	54	5270	26T	0	1.25	2.53	5.95	11.00
				9	1.89	3.18	6.60	
				17	2.22	3.17	6.74	
			484T	65	-2.32	-0.61	3.08	
	62	5310	26T	0	1.93	2.13	6.04	
				9	2.56	3.86	7.27	
				17	2.32	3.89	7.18	
			484T	65	-1.92	-1.73	2.64	
UNII-2C	102	5510	26T	0	0.52	0.91	4.73	11.00
				9	1.03	1.45	5.25	
				17	0.99	1.25	5.13	
			484T	65	-2.23	-2.97	1.88	
	118	5590	26T	0	1.46	0.44	4.99	
				9	1.94	1.95	5.95	
				17	2.06	1.72	5.90	
			484T	65	-2.55	-2.16	2.11	
	134	5670	26T	0	-1.23	-0.19	3.33	
				9	0.01	0.59	4.32	
				17	-0.31	0.67	4.22	
			484T	65	-2.73	-3.02	1.59	
UNII-2C & 3	142 Straddle	5710	26T	0	-0.24	-0.37	3.71	11.00 or $30.00_{/500kHz}$
				9	0.18	0.03	4.56	
				17	0.38	0.07	4.24	
			484T	65	-1.50	-1.86	2.78	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB]

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Band	Channel	Center Freq. [MHz]	Tones	RU offset	Meas PSD [dBm]		Direct. Gain [dBi]	Corr'd PSD [dBm]	PSD Limit [dBm]
					ANT0	ANT1			
UNII-3	151	5755	26T	0	3.23	3.06		7.15	30.00 /500kHz
				9	3.16	3.42		7.30	
				17	3.22	3.51		7.38	
			484T	65	-0.10	-0.69		4.08	
	159	5795	26T	0	3.28	3.60		7.45	
				9	3.60	3.78		7.70	
				17	3.55	3.81		7.69	
			484T	65	0.19	-0.57		4.29	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-4: added directional gain)

11.2.7. 802.11ax HE80 MODE

Output Power Results

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Average Power [dBm]		Direct. Gain [dBi]	Corr'd Power [dBm]	Limit [dBm]
					ANT0	ANT1			
UNII-1	42	5210	26T	0	-1.61	-3.12	3.99	4.70	22.55 e.i.r.p.
				18	-0.89	-2.52	3.99	5.37	
				36	-0.45	-2.14	3.99	5.79	
			996T	67	10.14	8.74	3.99	16.50	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power(in case of UNII-1: added directional gain)

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Average Power [dBm]		Corr'd Power [dBm]	Limit [dBm]
					ANT0	ANT1		
UNII-2A	58	5290	26T	0	3.90	2.66	6.33	23.54
				18	4.44	3.23	6.89	
				36	4.29	3.63	6.98	
			996T	67	11.69	11.04	14.39	
UNII-2C	106	5530	26T	0	4.40	2.64	6.62	23.53
				18	4.54	2.77	6.75	
				36	4.55	3.97	7.28	
			996T	67	11.28	10.09	13.74	
	122	5610	26T	0	4.10	2.84	6.53	
				18	4.66	3.42	7.09	
				36	4.80	3.63	7.26	
			996T	67	12.09	10.30	14.30	
UNII-2C & 3	138 Straddle	5690	26T	0	3.45	2.61	6.06	23.53 or 30.00
				18	3.68	3.19	6.45	
				36	3.58	2.84	6.24	
			996T	67	11.74	9.80	13.89	
UNII-3	155	5775	26T	0	5.66	5.17	8.43	30.00
				18	6.05	5.42	8.76	
				36	5.82	5.53	8.69	
			996T	67	13.48	12.44	16.00	

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]
Corr'd Power = Ant0 Average Power + Ant1 Average Power(in case of UNII-4: added directional gain)

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PSD Results

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Meas PSD [dBm/MHz]		Direct. Gain [dBi]	Corr'd PSD [dBm /MHz]	PSD Limit [dBm/MHz]
					ANT0	ANT1			
UNII-1	42	5210	26T	0	-5.94	-5.29	3.99	2.40	10.00 e.i.r.p
				18	-6.05	-5.42	3.99	2.28	
				36	-5.05	-4.16	3.99	3.42	
			996T	67	-7.62	-7.18	3.99	1.26	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-1: added directional gain)

Band	Channel	Center Freq. [MHz]	Tones	RU offset	Meas PSD [dBm/MHz]		Corr'd PSD [dBm/MHz]	PSD Limit [dBm/MHz]
					ANT0	ANT1		
UNII-2A	58	5290	26T	0	-1.27	-0.34	3.23	11.00
				18	-0.72	0.35	3.86	
				36	0.39	1.78	5.15	
			996T	65	-5.81	-4.33	-0.35	
UNII-2C	106	5530	26T	0	-1.93	-1.13	2.50	11.00
				18	-0.64	-0.24	3.58	
				36	0.16	0.53	4.36	
			996T	65	-5.68	-6.48	-1.40	
	122	5610	26T	0	-0.82	0.12	3.69	
				18	-0.45	0.38	3.99	
				36	0.58	0.91	4.76	
			996T	65	-4.84	-6.40	-0.89	
UNII-2C & 3	138 Straddle	5690	26T	0	-0.14	-1.10	3.41	11.00 or 30.00/500kHz
				18	-1.08	-0.72	3.76	
				36	0.19	0.08	4.14	
			996T	65	-5.71	-6.77	-1.55	
UNII-3	155	5775	26T	0	-0.61	-1.90	2.80	30.00 /500kHz
				18	-0.12	-0.38	3.76	
				36	-0.16	0.02	3.94	
			996T	65	-6.84	-6.91	-2.21	

* Calculation of PSD: Corr'd PSD = Ant0 PSD + Ant1 PSD + Duty CF [dB] (in case of UNII-4: added directional gain)

11.2.8. PPSD PLOTS(WORST CASE)

802.11a / ANT0 / 5785 MHz

802.11a / ANT1 / 5260 MHz

802.11n HT20 / ANT0 / 5240 MHz

802.11n HT20 / ANT1 / 5240 MHz

802.11n HT40 / ANT0 / 5190 MHz

802.11n HT40 / ANT1 / 5190 MHz

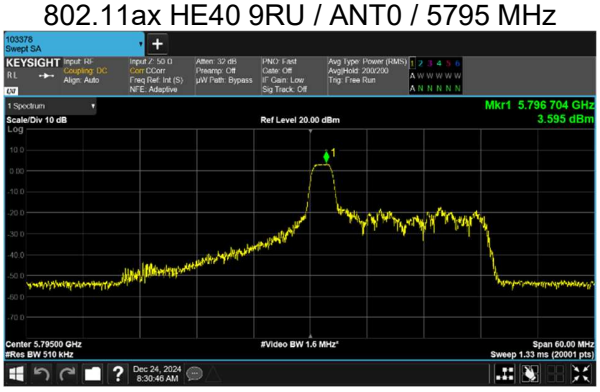
802.11ac VHT80 / ANT0 / 5210 MHz

802.11ac VHT80 / ANT1 / 5210 MHz

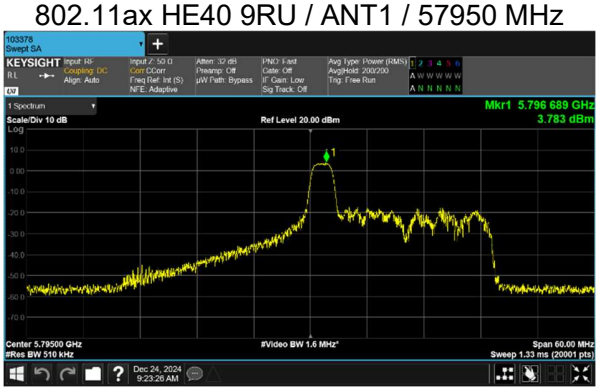
802.11ax HE20 8RU / ANT0 / 5785 MHz

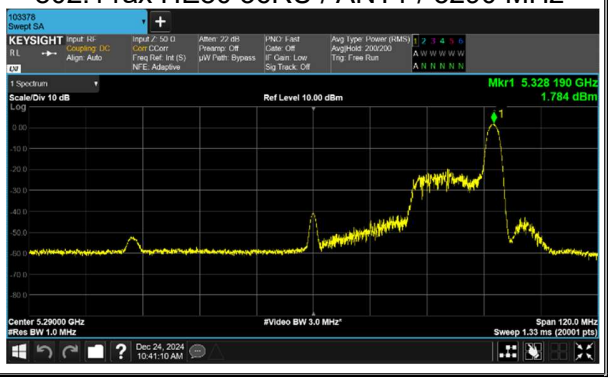
802.11ax HE20 8RU / ANT1 / 5785 MHz

802.11ax HE40 9RU / ANT0 / 5795 MHz



802.11ax HE40 9RU / ANT1 / 57950 MHz



802.11ax HE80 36RU / ANT0 / 5290 MHz	802.11ax HE80 36RU / ANT1 / 5290 MHz
	

12. TRANSMITTER ABOVE 1 GHz

LIMITS

IC RSS-GEN (8.9) & (8.10) / FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

RSS-Gen (8.9)

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

Frequency (MHz)	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (m)
0.009–0.490 Note 1	6.37/F (F in kHz)	300
0.490–1.705	63.7/F (F in kHz)	30
1.705–30.0	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.		

Note: The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to Y-51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

RSS-Gen (8.10) / FCC Part 15.205 (a): Restricted frequency bands

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	162.0125 ~	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	167.17	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	167.72 ~ 173.2	2655 ~ 2900		
8.291 ~ 8.294	37.5 ~ 38.25	240 ~ 285	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	322 ~ 335.4	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	399.90 ~ 410	3345.8 ~ 3358		
		608 ~ 614	3600 ~ 4400		
		960 ~ 1240			

▪ RSS-Gen 8.10 : Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.
▪ FCC Part 15.205(b) : The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

FCC §15.407 (b)

(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 solely in the 5.725–5.850 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.
(5)For transmitters operating solely in the 5.850-5.895 GHz band or operating on a channel that spans across 5.725-5.895 GHz:
(ii) For a client device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of −5 dBm/MHz and shall decrease linearly to an e.i.r.p. of −27 dBm/MHz at or above 5.925 GHz.
(iii) For a client device or indoor access point or subordinate device, all emissions below 5.725 GHz shall not exceed an e.i.r.p. of −27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.72 GHz, and from 5.72 GHz increasing linearly to a level of

27 dBm/MHz at 5.725 GHz.
(6) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary,
provided the measured energy is integrated to show the total power over 1 MHz.
(7) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
(8) The provisions of §15.205 apply to intentional radiators operating under this section.
(9) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

Note

- Limit translation to field strength level (FCC §15.407)

E[dBuV/m] = EIRP[dBm] + 95.2 = -27dBm + 95.2 = 68.2dBuV/m

E[dBuV/m] = EIRP[dBm] + 95.2 = -17dBm + 95.2 = 78.2dBuV/m

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 100 cm for above 1GHz. EUT is set 3 meters away from the receiving antenna and scan from 1m to 4m to find out the highest emission.
The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Reference to KDB 789033 D02 v02r01 UNII part G) 6) c) Method AD:
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor to the reading offset for average measurements.In UNII-4, unwanted emissions outside of restricted bands are measured with an RMS detector.

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

The spectrum from 1GHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

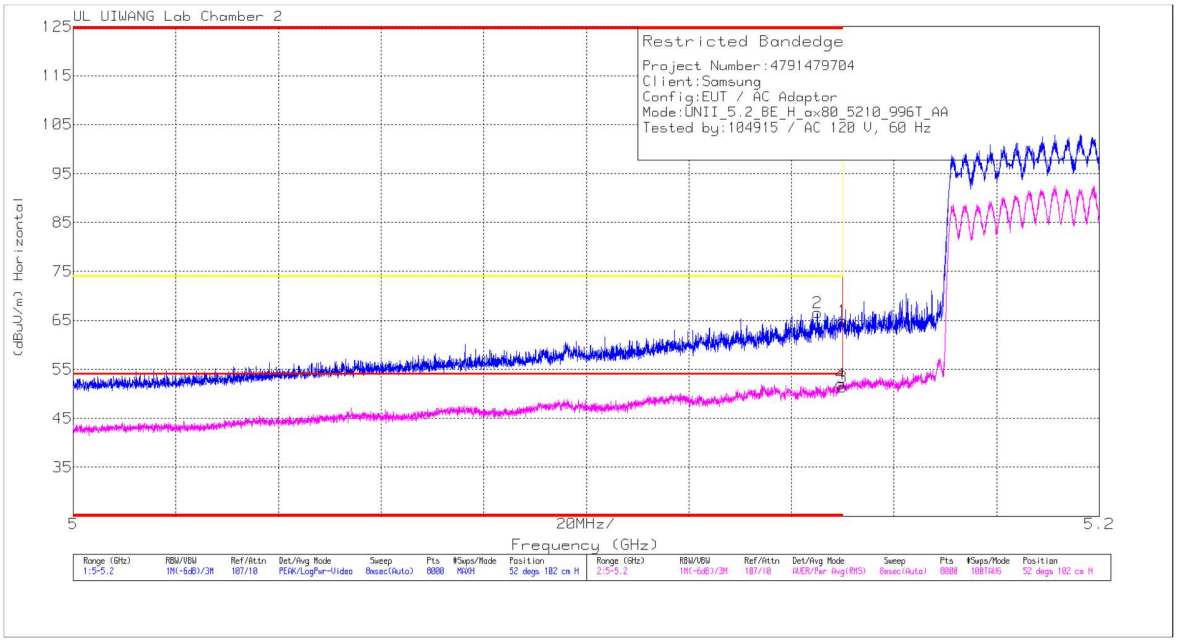
Note : Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

12.1. TX ABOVE 1GHz 1Tx & 2Tx MODE IN THE 5.2GHz BAND

BANDEDGE (WORST CASE: 802.11ax HE80 / 5210 MHz)

HORIZONTAL PEAK AND AVERAGE DATA



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	CH2_AF_1-18G_3117_240920 (dB/m)	FB2_PL_1-18G_10dB_240409 (dB)	CH2_CL_1-40G_Thru_240617 (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*5.14999	54.24	Pk	34.2	-33.6	10.1	0	64.94	-	-	74	-9.06	52	102	H
2	*5.14504	55.93	Pk	34.2	-33.6	10.1	0	66.63	-	-	74	-7.37	52	102	H
3	*5.14999	38.99	RMS	34.2	-33.6	10.1	1.65	51.34	54	-2.66	-	-	52	102	H
4	*5.14959	39.62	RMS	34.2	-33.6	10.1	1.65	51.97	54	-2.03	-	-	52	102	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection