

CERTIFICATION TEST REPORT

Report Number. : 4791196626-E5V2

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

Model : SM-F956B, SM-F956B/DS

FCC ID : A3LSMF956B

EUT Description : GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax,
NFC, WPT and UWB

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:

2024-05-14

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Revision History

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V1	2024-05-02	Initial issue	Dexter(Hyunsik) Yun
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB
MODEL NUMBER: SM-F956B, SM-F956B/DS
SERIAL NUMBER: 7b456db5b1507ece, 7b456db5ae507ece (CONDUCTED); R3CX10SANYE, R3CX10SANMD, R3CX403N9CM (RADIATED);
DATE TESTED: 2024-02-20 ~ 2024-05-02

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
47 CFR Part 15 Subpart C	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:



Seokhwan Hong
Suwon Lab Engineer
UL KOREA LTD.

Tested By:



Dexter(Hyunsik) Yun
Suwon Lab Engineer
UL KOREA LTD.

2. TEST METHODOLOGY

1. FCC 47 CFR Part 2.
2. FCC 47 CFR Part 15.
3. KDB 558074 D01 DTS Meas Guidance v05r02.
4. KDB 662911 D01 Multiple Transmitter Output v02r01
5. ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, 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.

218 Maeyeong-ro	
<input checked="" type="checkbox"/>	Chamber 1(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 2(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 3(3m semi-anechoic chamber)
<input type="checkbox"/>	Chamber 4(3m Full-anechoic chamber)
<input type="checkbox"/>	Chamber 5(3m Full-anechoic chamber)

UL KOREA LTD. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

4. CALIBRATION AND UNCERTAINTY

4.1. 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.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 28.9 \text{ dBuV/m} &= 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} \end{aligned}$$

$$\begin{aligned} \text{AC Corrected Reading (dBuV)} &= \text{Measured Voltage (dBuV)} + \text{Extension Cord Loss} \\ &\text{(dB)} + \text{Cable Loss (dB)} \\ 44.72 \text{ dBuV} &= 34.72 \text{ dBuV} + 9.9 \text{ dB} + 0.1 \text{ dB} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.79 dB
Radiated Disturbance, 9 kHz to 30 MHz	1.69 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.07 dB
Radiated Disturbance, 1 GHz to 18 GHz	4.99 dB
Radiated Disturbance, Above 18 GHz	5.96 dB

Uncertainty figures are valid to a confidence level of 95%.

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Clause 4.4.3 in IEC Guide 115:2023.

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB. This test report addresses the DTS(WLAN) operational mode.

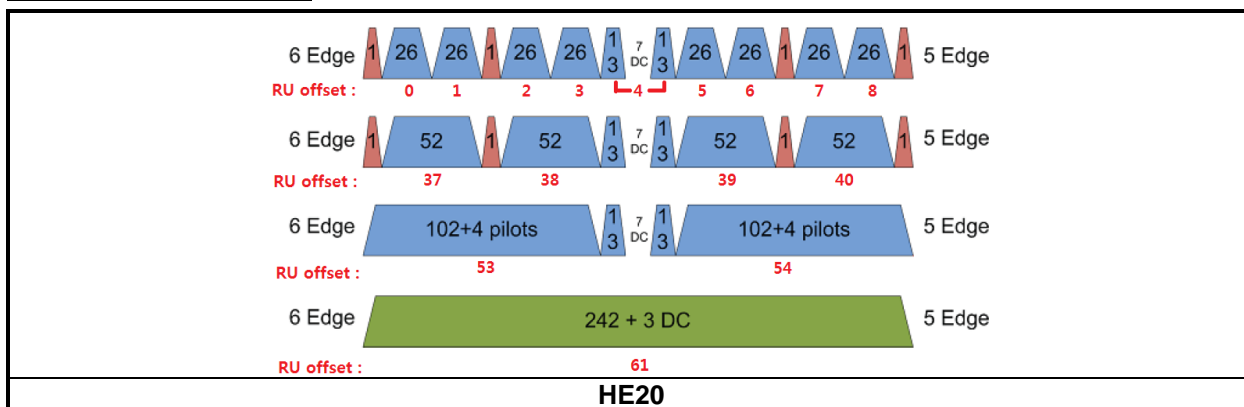
Representative model	Difference	Derivative model
		SM-F956B/DS
SM-F956B	Hardware	Different Sim Tray
	Software	Same as SM-F956B

The model SM-F956B was used for final testing and is representative of the test results in this report.

WiFi operating mode

Frequency rage	Mode	ANT 1	ANT 2
2.4GHz (2412 MHz ~ 2472 MHz)	802.11b MIMO		TX/RX
	802.11g MIMO		TX/RX
	802.11n(HT20) MIMO		TX/RX
	802.11ax(HE20) MIMO		TX/RX

802.11ax RU allocations



Test RU offset for tones

Mode	Tones number in RU	RU offset
HE20	26T	0
		4
		8
	52T	37
		38
		40
	106T	53
54		
242T / SU ^{Note 1}	61 / -	

Note. Full RU(Resource Unit) 242T mode and SU(Single Unit) mode have no difference in physical waveform. This report has been reported the SU mode with highest output power in MIMO.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Frequency Range [MHz]	Mode	Output Power [dBm]		Output Power [mW]	
		ANT1	ANT2	ANT1	ANT2
2412 - 2472	802.11b MIMO	22.52		178.65	
	802.11g MIMO	20.34		108.14	
	802.11n(HT20) MIMO	20.19		104.47	
	802.11ax(HE20) MIMO	20.00		100.00	

5.3. 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.**

Bands [MHz]	ANT 1 [dBi]	ANT 2 [dBi]	Correlated Directional Gain [dBi]
2 412 ~ 2 472	-2.22	-1.78	1.01

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 = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dBi.

Sample calculation for this device with $N_{ANT} = 2$
 Directional gain = $10 \log[(10^{-2.22/20} + 10^{-1.78/20})^2 / 2] = 1.01$ dBi

“SUB4” and “SUB3” as indicated in antenna specification are written as ANT1 and ANT2 in this report.

5.4. 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
802.11ac VHT20	MIMO	802.11ac VHT20 2TX	802.11n HT20 2TX

5.5. TESTED CHANNELS LIST

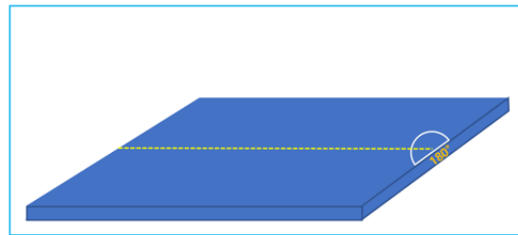
Ch.	Frequency [MHz]	11b		11g		11n(HT20)		11ax(HE20)	
		SISO	MIMO	SISO	MIMO	SISO	MIMO	SISO	MIMO
1	2 412		○		○		○		○
2	2 417		○		○		○		○
6	2 437		○		○		○		○
10	2 457		○		○		○		○
11	2 462		○		○		○		○
12	2 467		○		○		○		○
13	2 472		○		○		○		○

Note. SISO mode test was performed only to check average power. Because MIMO mode target power is 3dB higher than SISO mode.

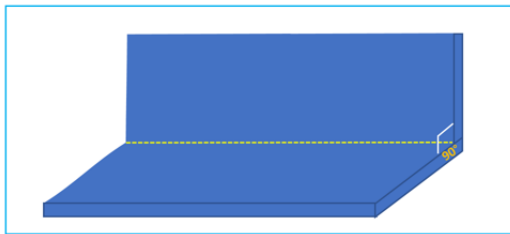
5.6. WORST-CASE CONFIGURATION AND MODE

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

- i. Worst case of antenna axis: X
- ii. Foldable condition: Open



Open



Half-folded



Full-folded

Radiated and power line conducted tests were performed with EUT connected to AC power adapter as the worst-case configuration. Radiated harmonics spurious 1~18 GHz Low/Mid/High channels, 18-26GHz 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.

Simultaneous transmission with related transmitters were investigated and no noticeable emission was found.

For 802.11ax mode, output power and PSD tests were investigated between all different tones and found that SU mode had the highest output power and RU 26T has the highest PSD readings which was documented in this report. And after some pre-tests, SU mode was determined as the worst case set for final conducted/radiated band edge tests with some spot-check performed at the lowest RU offset of the lowest frequency and the highest RU offset of the highest frequency.

For conducted/radiated spurious tests, 802.11ax SU mode has lower PSD results than 802.11ax RU 26T and therefore, 802.11ax RU 26T's highest power offset was set for full test.

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:

802.11b mode: 1 Mbps 2TX

802.11g mode: 6 Mbps 2TX

802.11n HT20 mode: MCS0 2TX

802.11ax HE20 mode: MCS0 2TX

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37N9QP6H09DK3	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02111A	N/A

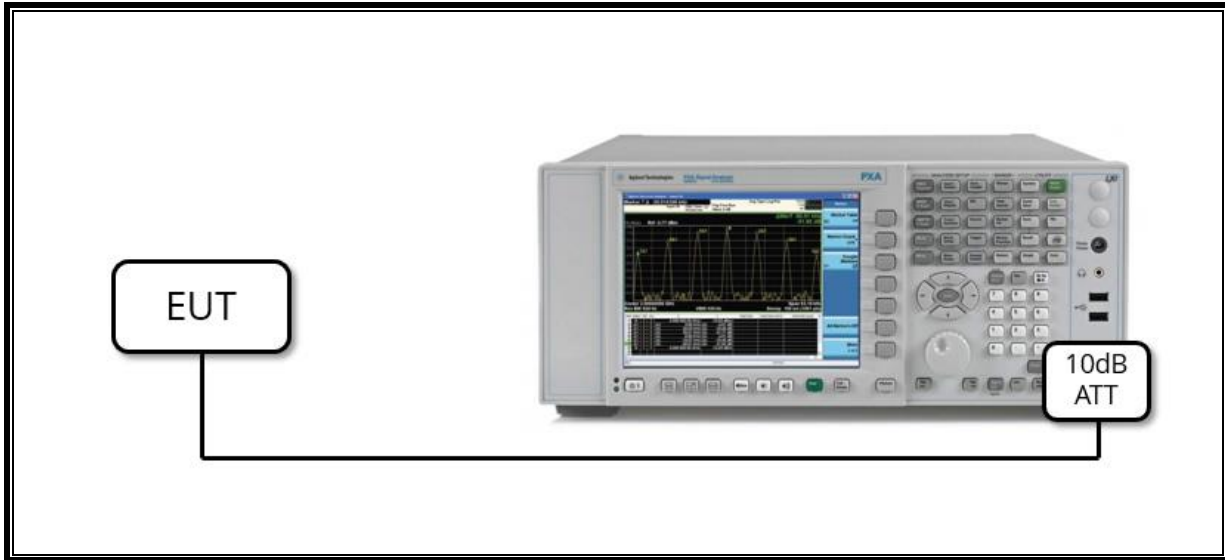
I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A

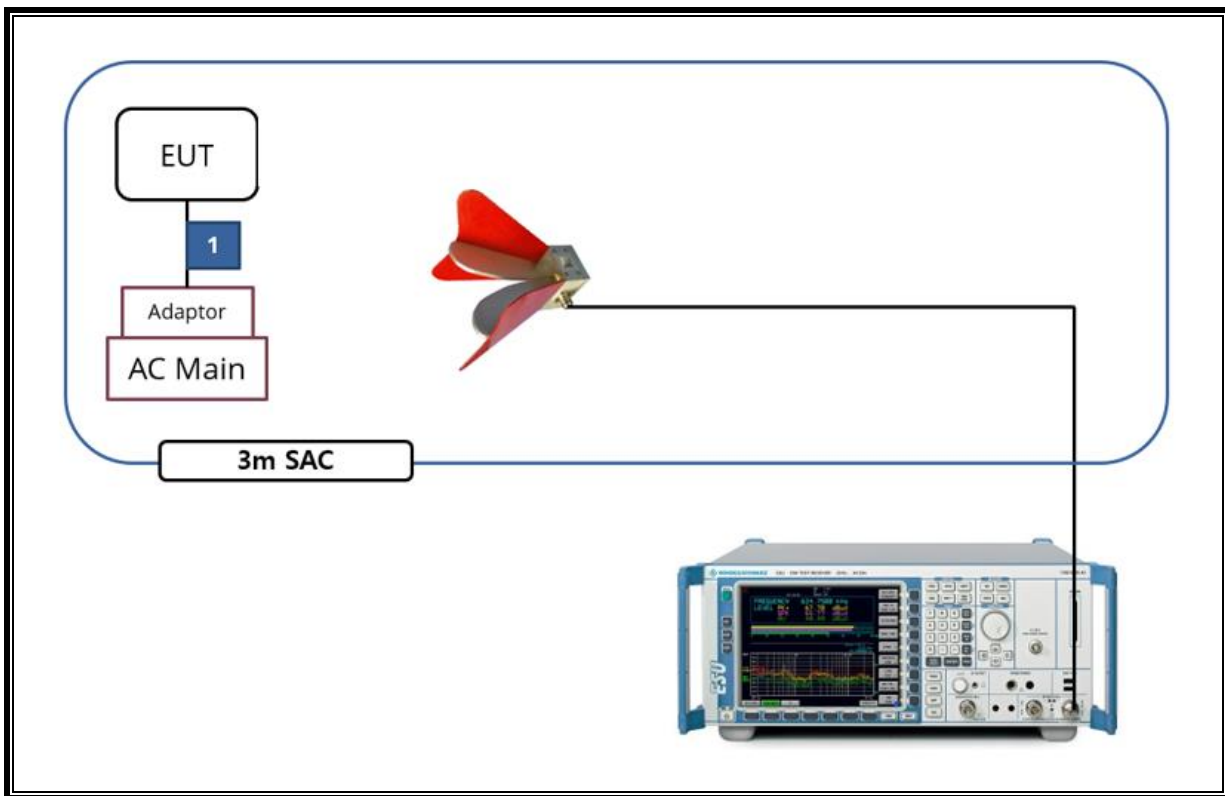
TEST SETUP

The EUT is a stand-alone unit during the tests.
Test software in hidden menu exercised the EUT to enable DTS mode.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. MEASUREMENT METHOD

6 dB BW : ANSI C63.10-2013, Section 11.8.2 Option 2

OUTPUT POWER : ANSI C63.10-2013, Section 11.9.2.3.1 Method AVGPM

POWER SPECTRAL DENSITY : ANSI C63.10-2013, Section 11.10.3 & 11.10.5 Method AVGPSD-1 and Method AVGPSD-2

Out-of-band Emissions (Conducted) : ANSI C63.10-2013, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Non-restricted Bands: ANSI C63.10-2013, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Restricted Bands : ANSI C63.10-2013, Section 11.12 Emissions in restricted frequency bands

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2

7. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2024-08-15
Antenna, Horn, 18 GHz	ETS	3117	00168717	2024-08-21
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2024-08-02
Preamplifier	ETS	3116C-PA	00168841	2024-07-25
Preamplifier, 1000 MHz	Sonoma	310N	341282	2024-07-24
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2024-07-24
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2024-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2024-07-24
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9040B	MY60080268	2025-01-03
Average Power Sensor	Agilent / HP	U2000A	MY54270007	2024-07-23
Average Power Sensor	Agilent / HP	U2000A	MY54260010	2024-07-24
Attenuator	PASTERNAK	PE7087-10	A001	2024-07-23
Attenuator	PASTERNAK	PE7087-10	A008	2024-07-27
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2024-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2024-07-24
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2024-07-23
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2024-07-23
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2024-07-23
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	2024-07-24
LISN	R&S	ENV-216	101837	2024-07-23
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2025-09-06
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

8. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	Occupied Bandwidth(6dB)	> 500kHz	Conducted	Complies
2.1051, 15.247(d)	Band Edge / Conducted Spurious Emission	-30 dBc		Complies
15.247 (b)(3)	TX conducted output power	< 30 dBm		Complies
15.247(e)	PSD	< 8 dBm/3kHz		Complies
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	Complies
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	Complies

9. ANTENNA PORT TEST RESULTS

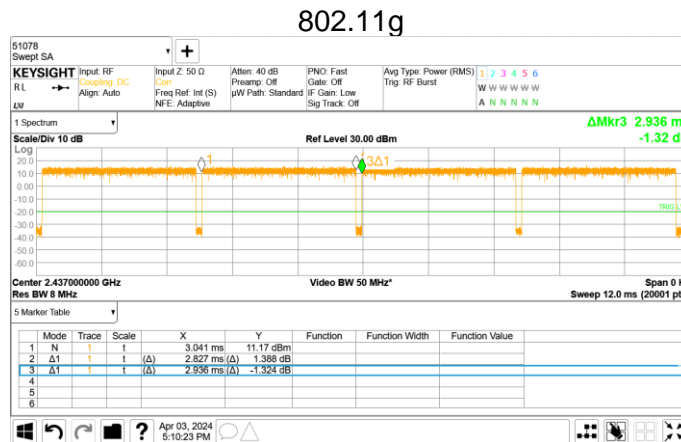
9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

Mode	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor[dB]	1/T Minimum VBW[kHz]
802.11b MIMO	8.813	8.920	0.988	98.800	-	0.11
802.11g MIMO	2.827	2.936	0.963	96.287	0.16	0.35
802.11n(HT20) MIMO	5.278	5.388	0.980	97.958	0.09	0.19
802.11ax(HE20) MIMO SU	5.452	5.471	0.997	99.653	-	0.18
802.11ax(HE20) MIMO 26T	2.596	2.622	0.990	99.008	-	0.39
802.11ax(HE20) MIMO 52T	2.591	2.617	0.990	99.006	-	0.39
802.11ax(HE20) MIMO 106T	1.436	1.461	0.983	98.289	-	0.70

Note. According to ANSI C63.10 Section 11.6, do not apply the Duty Cycle Correction Factor judging that a duty cycle of greater than or equal to 98% is continuous signal.



9.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

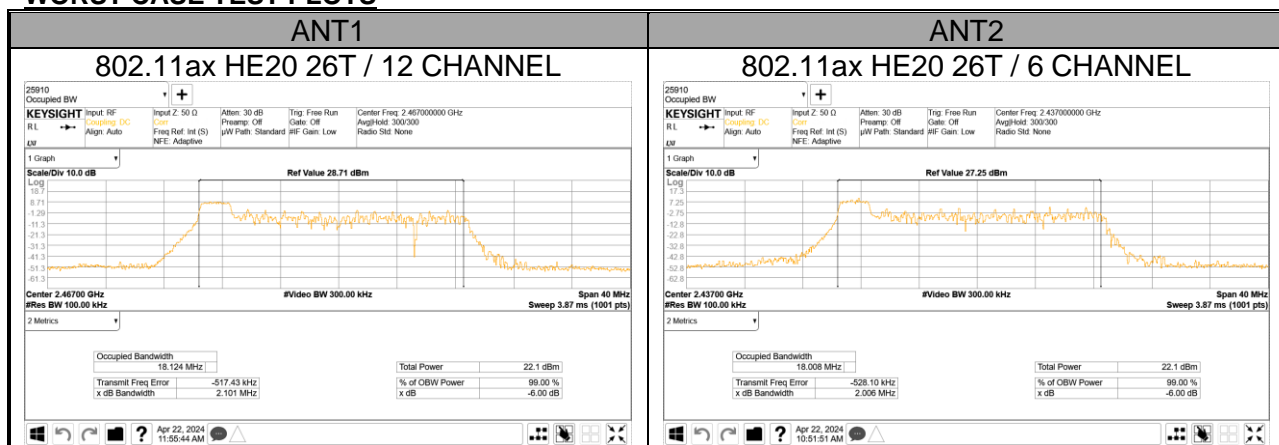
TEST PROCEDURE

Reference to KDB 558074 D01 15.247 Meas Guidance: The transmitter output is connected to a spectrum analyzer with the RBW set to 100 kHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS



9.2.1. 802.11b MIMO MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	13.12	13.14	0.5
2	2 417	13.12	13.11	
6	2 437	13.15	13.14	
11	2 462	13.13	13.13	
12	2 467	13.14	13.14	
13	2 472	13.13	13.13	
Worst		13.11		

9.2.2. 802.11g MIMO MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	16.36	16.39	0.5
6	2 437	16.37	16.37	
10	2 457	16.37	16.39	
11	2 462	16.45	16.38	
12	2 467	16.34	16.34	
13	2 472	16.39	16.35	
Worst		16.34		

9.2.3. 802.11n HT20 MIMO MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	17.63	17.62	0.5
6	2 437	17.64	17.61	
10	2 457	17.63	17.61	
11	2 462	17.59	17.61	
12	2 467	17.60	17.64	
13	2 472	17.60	17.73	
Worst		17.59		

9.2.4. 802.11ax HE20(26T) MIMO MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	17.04	2.06	0.5
6	2 437	2.12	2.01	
11	2 462	2.12	2.09	
12	2 467	2.10	2.08	
13	2 472	2.10	2.04	
Worst		2.01		

9.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

Measurements perform using a wideband RF frame average power sensor. The cable assembly insertion loss and duty cycle correction factor was entered as an offset in the power sensor to allow for direct reading of power. Output power measurement was performed utilizing the 8.3.2.3 under KDB558074 D01 15.247 Meas Guidance.

DIRECTIONAL ANTENNA GAIN

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

Bands [MHz]	ANT 1 [dBi]	ANT 2 [dBi]	Correlated Directional Gain [dBi]
2 412 - 2 472	-2.22	-1.78	1.01

Note. Since the correlated directional gain does not exceed 6dBi, it is not mentioned further below.

9.3.1. TEST RESULTS

- 802.11b,g,n,ax(SU) mode

Mode	Channel	Frequency [MHz]	Average Power [dBm]			Power Limit [dBm]
			ANT1	ANT2	Total Corr'd Power [dBm]	
802.11b	1	2 412	18.38	18.82	21.62	30.00
	2	2 417	19.38	19.62	22.51	
	6	2 437	19.28	19.72	22.52	
	11	2 462	19.45	19.53	22.50	
	12	2 467	5.31	5.50	8.42	
	13	2 472	-1.52	-1.64	1.43	
Worst Case					22.52	
802.11g	1	2 412	17.18	17.47	20.34	
	6	2 437	16.99	17.41	20.22	
	10	2 457	17.05	17.19	20.13	
	11	2 462	15.09	15.36	18.24	
	12	2 467	5.02	5.13	8.09	
	13	2 472	-1.11	-1.18	1.87	
Worst Case					20.34	
802.11n HT20	1	2 412	17.02	17.34	20.19	
	6	2 437	16.90	17.27	20.10	
	10	2 457	16.89	17.05	19.98	
	11	2 462	14.95	15.23	18.10	
	12	2 467	4.90	5.02	7.97	
	13	2 472	-1.45	-1.43	1.57	
Worst Case					20.19	
802.11ax HE20(SU)	1	2 412	14.84	15.28	18.08	
	2	2 417	16.80	17.09	19.96	
	6	2 437	16.77	17.20	20.00	
	10	2 457	16.76	16.94	19.86	
	11	2 462	14.85	15.12	18.00	
	12	2 467	4.85	4.88	7.88	
	13	2 472	-1.54	-1.66	1.41	
Worst Case					20.00	

- Calculation of Output Power result

Average Power = Meas. Power + Duty Cycle CF / Total Corr'd Power = ANT1's Average Power + ANT2's Average Power

- 802.11ax (RU) mode

Channel	Frequency [MHz]	Tones	RU Offset	MIMO Average Power [dBm]			Power Limit [dBm]
				ANT1	ANT2	Total Corr'd Power [dBm]	
1	2 412	26T	0	12.70	13.46	16.11	30.00
			4	13.15	13.06	16.12	
			8	13.91	13.60	16.77	
6	2 437	26T	0	13.61	13.14	16.39	
			4	12.66	13.02	15.85	
			8	13.32	13.55	16.45	
11	2 462	26T	0	13.98	13.59	16.80	
			4	12.78	12.79	15.80	
			8	12.60	13.24	15.94	
12	2 467	26T	0	5.57	5.08	8.34	
			4	4.62	4.47	7.56	
			8	4.74	4.59	7.68	
13	2 472	26T	0	-0.46	-0.64	2.46	
			4	-1.38	-1.29	1.68	
			8	-1.70	-2.12	1.11	
Worst Case						16.80	

9.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

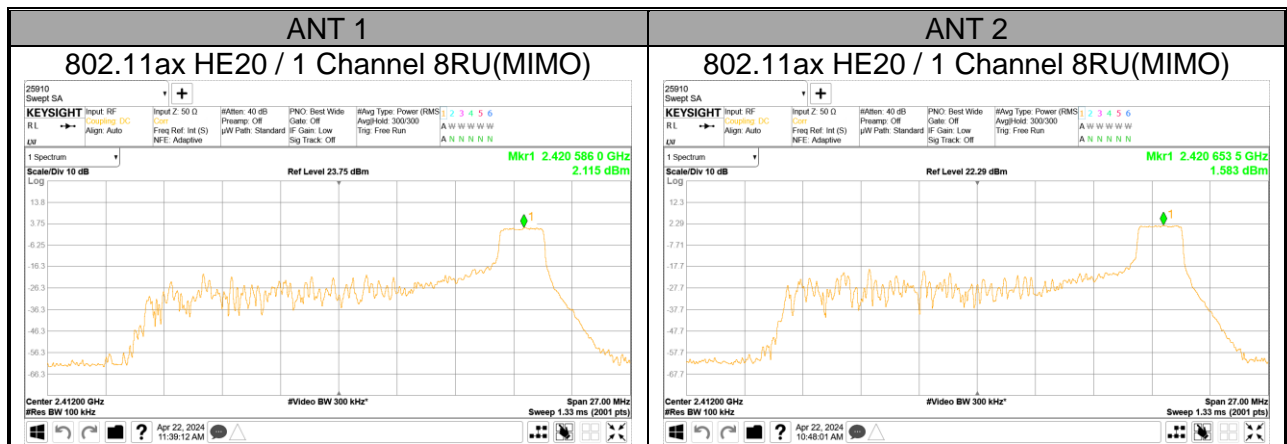
TEST PROCEDURE

Power Spectral Density was performed utilizing the section 8.4 under KDB558074 D01 15.247 Meas Guidance.

RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS



9.4.1. 802.11b/g/n HT20/ax HE20 MODE TEST RESULTS

- MIMO Mode

Mode	Channel	Frequency [MHz]	Meas PSD [dBm/100kHz]		DCCF	Total Corr'd PSD [dBm/100kHz]	PSD Limit [dBm/3kHz]
			ANT1	ANT2			
802.11b	1	2 412	0.30	0.26	0.00	3.29	8.00 ^{Note}
	2	2 417	1.07	0.90	0.00	3.99	
	6	2 437	0.90	1.62	0.00	4.28	
	11	2 462	1.10	1.37	0.00	4.25	
	12	2 467	-13.04	-12.77	0.00	-9.89	
	13	2 472	-20.12	-20.12	0.00	-17.11	
802.11g	1	2 412	-2.28	-2.49	0.16	0.78	
	6	2 437	-2.84	-2.26	0.16	0.63	
	10	2 457	-2.14	-2.45	0.16	0.88	
	11	2 462	-3.99	-4.52	0.16	-1.08	
	12	2 467	-14.60	-14.85	0.16	-11.55	
	13	2 472	-21.30	-21.32	0.16	-18.14	
802.11n HT20	1	2 412	-2.71	-2.42	0.09	0.54	
	6	2 437	-2.81	-2.51	0.09	0.45	
	10	2 457	-2.65	-2.88	0.09	0.34	
	11	2 462	-4.84	-4.46	0.09	-1.55	
	12	2 467	-14.58	-14.58	0.09	-11.48	
	13	2 472	-21.12	-21.22	0.09	-18.07	
802.11ax HE20 SU	1	2 412	-6.36	-6.38	0.00	-3.36	
	2	2 417	-4.71	-4.27	0.00	-1.47	
	6	2 437	-4.42	-4.40	0.00	-1.40	
	10	2 457	-4.46	-4.44	0.00	-1.44	
	11	2 462	-6.20	-6.28	0.00	-3.23	
	12	2 467	-16.13	-16.63	0.00	-13.36	
	13	2 472	-23.11	-23.00	0.00	-20.05	

- MIMO Mode(802.11ax HE20 RU mode)

Channel	Frequency [MHz]	Tones	RU Offset	Meas PPSD [dBm/100kHz]		DCCF	Total Corr'd PPSD [dBm/100kHz]	PSD Limit [dBm/3kHz]
				ANT1	ANT2			
1	2 412	26T	0	1.71	1.26	0.00	4.50	8.00 ^{Note}
			4	1.10	0.95	0.00	4.04	
			8	2.12	1.58	0.00	4.87	
6	2 437	26T	0	1.71	1.06	0.00	4.41	
			4	0.43	0.95	0.00	3.71	
			8	1.48	1.57	0.00	4.54	
11	2 462	26T	0	1.99	1.51	0.00	4.76	
			4	0.80	0.70	0.00	3.76	
			8	0.48	1.23	0.00	3.88	

Calculation of Output PSD result

- 2TX : Total PSD = ANT1 Meas PSD + ANT2 Meas PSD + Duty Cycle CF

Note. RBW 100kHz measurement data is lower than 3kHz limit.

9.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

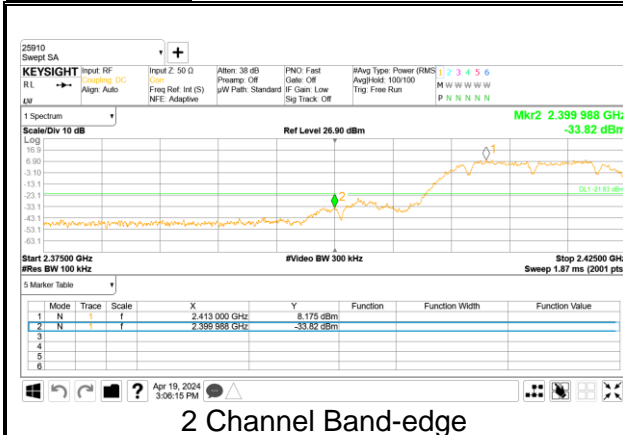
FCC §15.247 (d)

Output power was measured based on the use of average measurement, therefore the required attenuation is 30 dB.

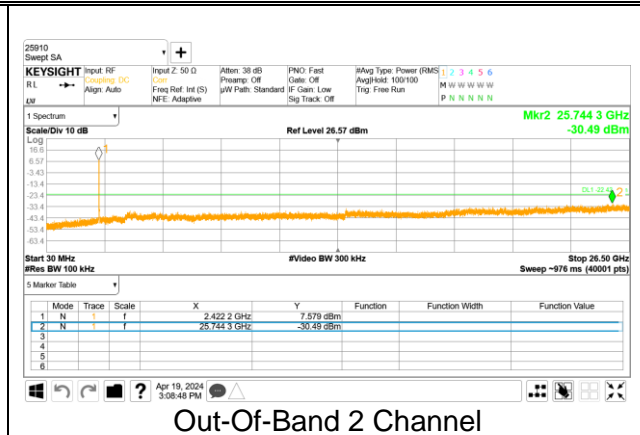
RESULTS

9.5.1. 802.11b MODE

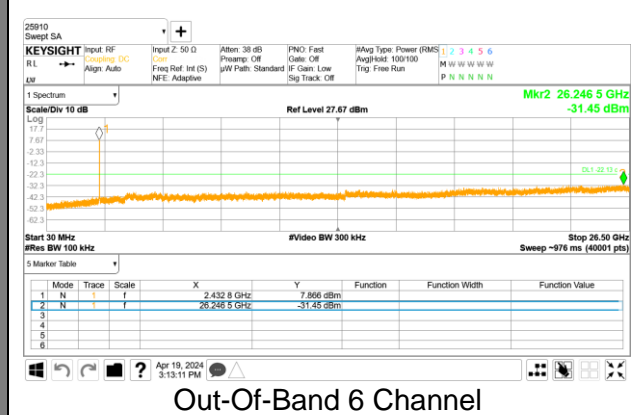
2TX Antenna 1



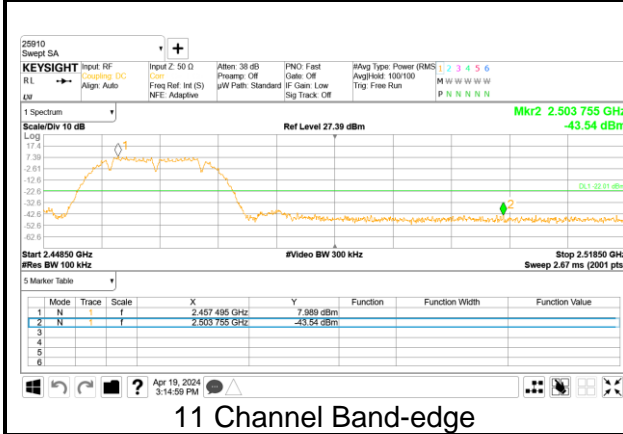
2 Channel Band-edge



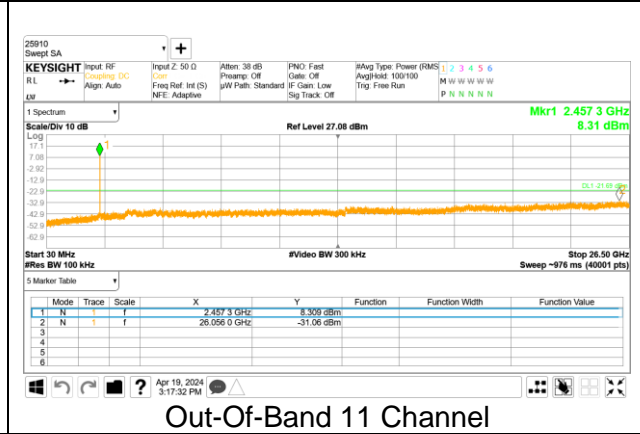
Out-Of-Band 2 Channel



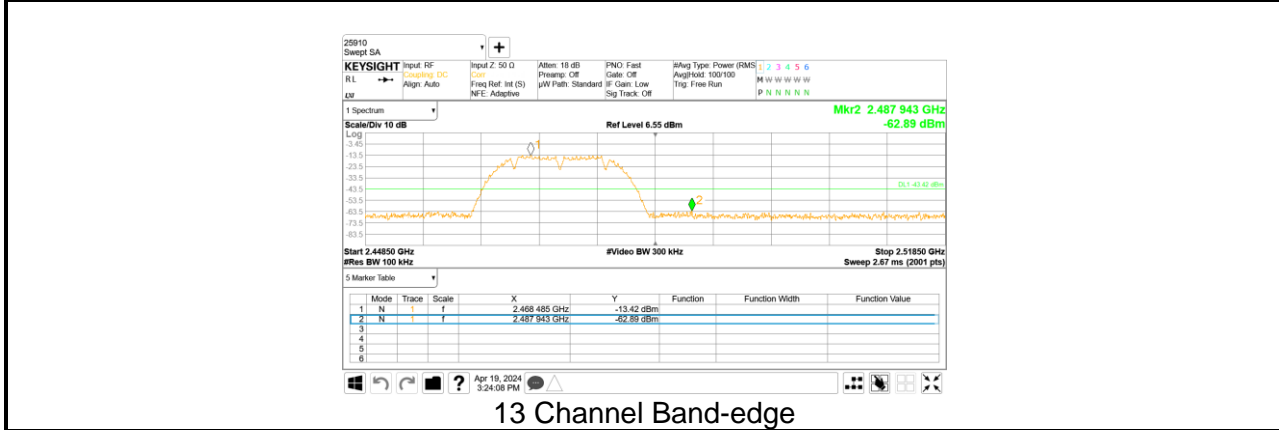
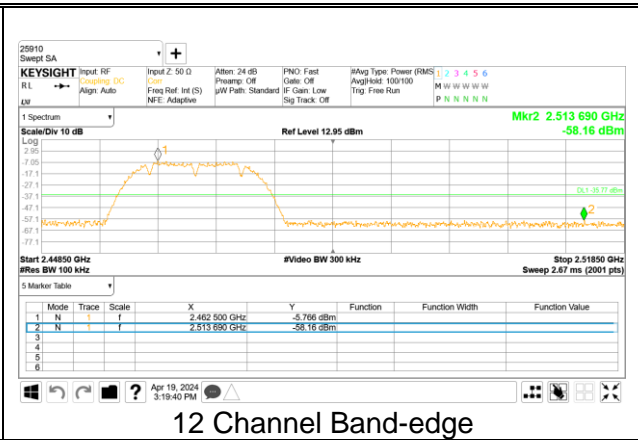
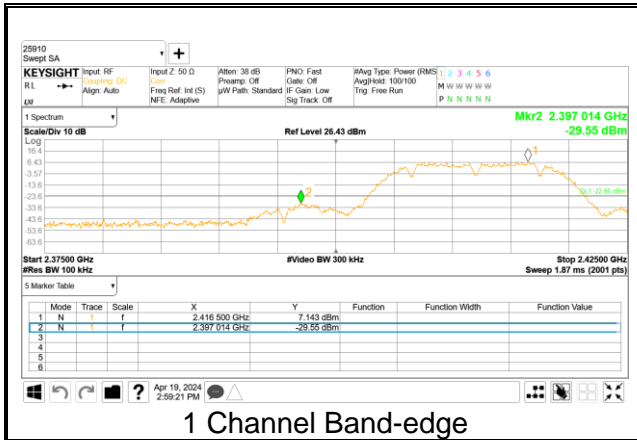
Out-Of-Band 6 Channel



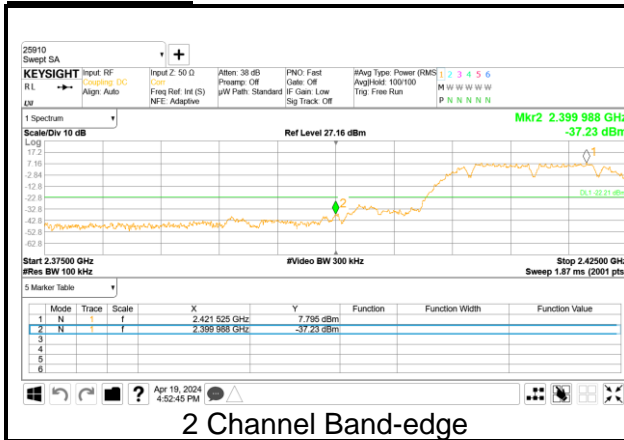
11 Channel Band-edge



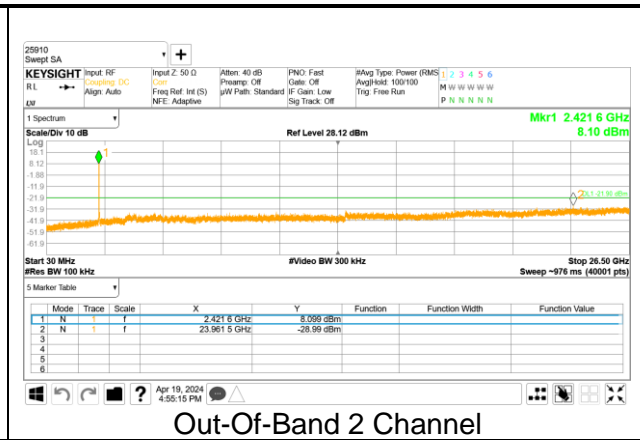
Out-Of-Band 11 Channel



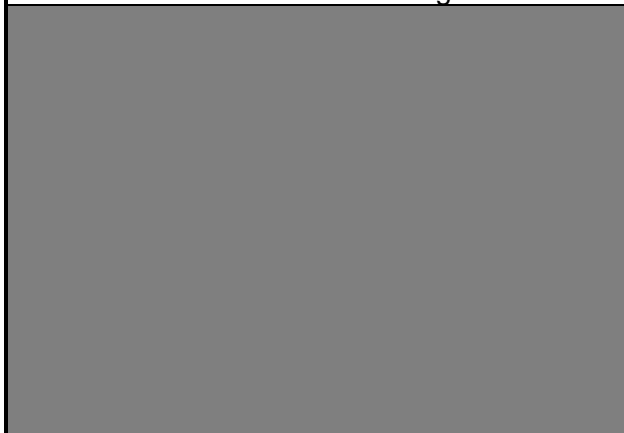
2TX Antenna 2



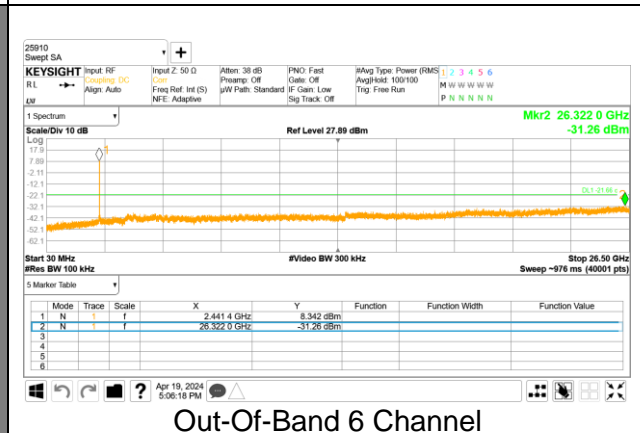
2 Channel Band-edge



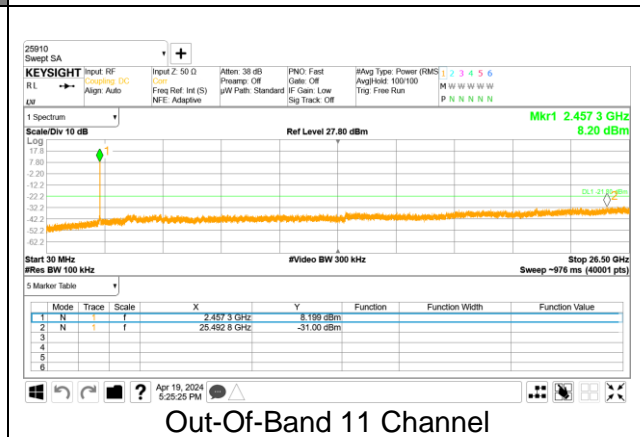
Out-Of-Band 2 Channel



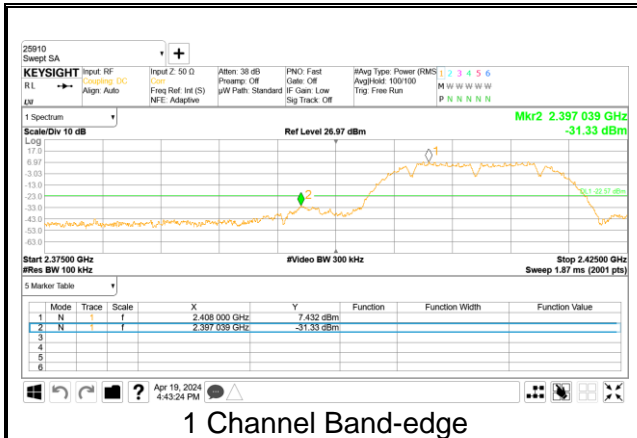
Out-Of-Band 6 Channel



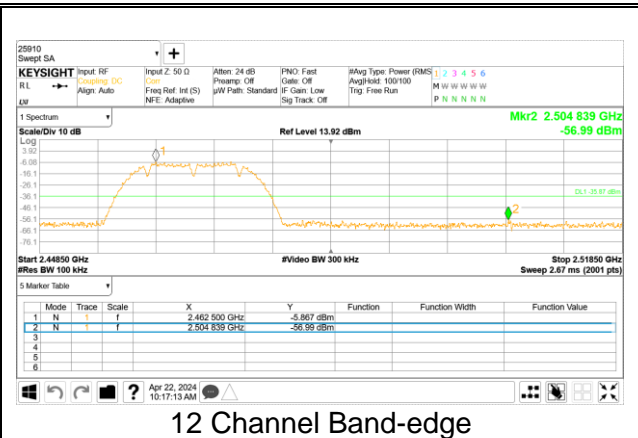
11 Channel Band-edge



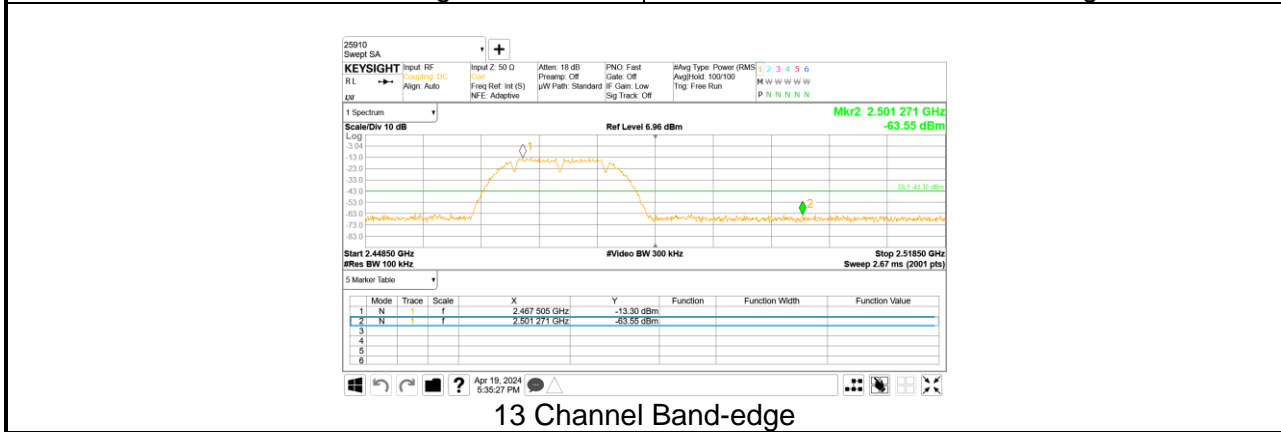
Out-Of-Band 11 Channel



1 Channel Band-edge



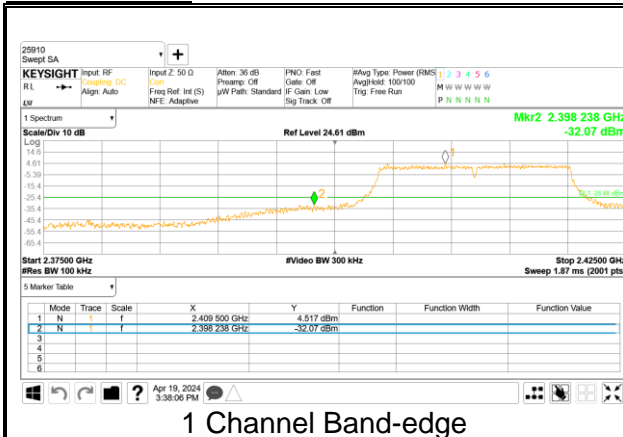
12 Channel Band-edge



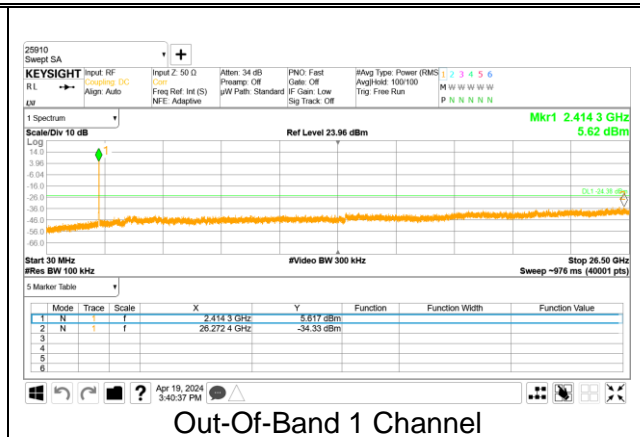
13 Channel Band-edge

9.5.2. 802.11g MODE

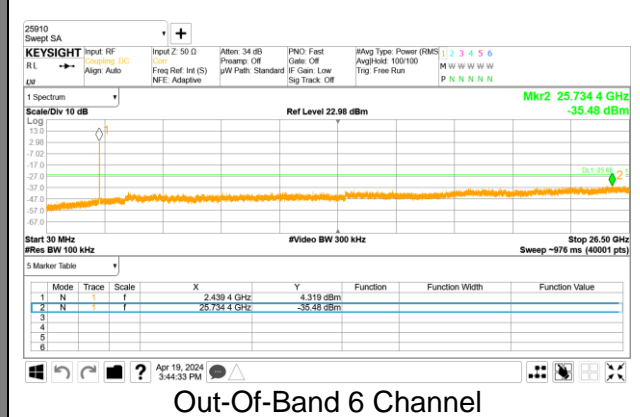
2TX Antenna 1



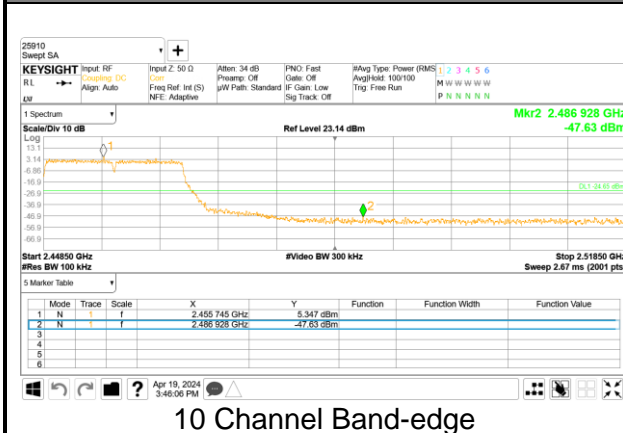
1 Channel Band-edge



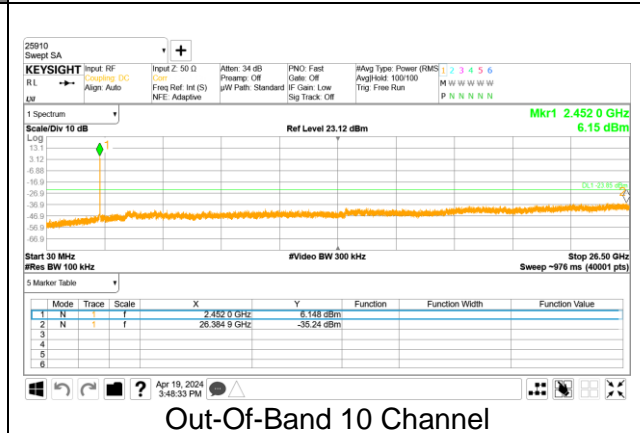
Out-Of-Band 1 Channel



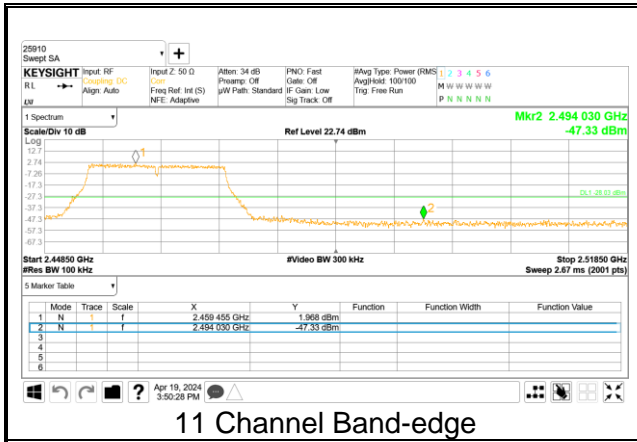
Out-Of-Band 6 Channel



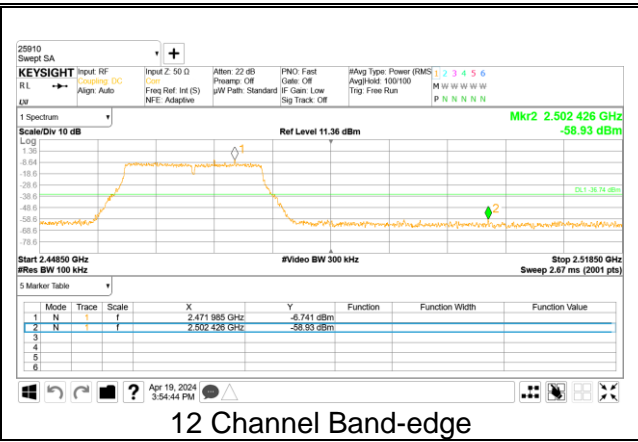
10 Channel Band-edge



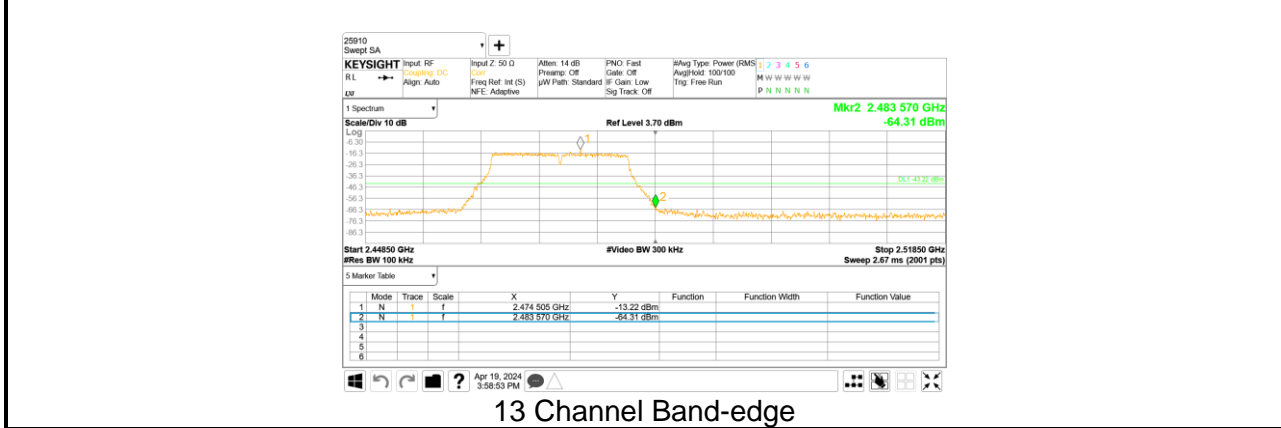
Out-Of-Band 10 Channel



11 Channel Band-edge

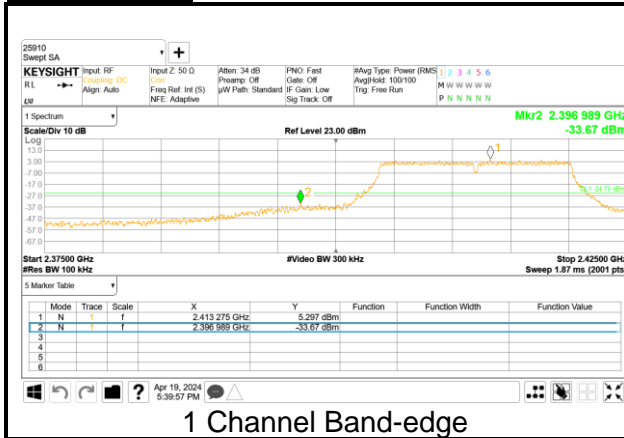


12 Channel Band-edge

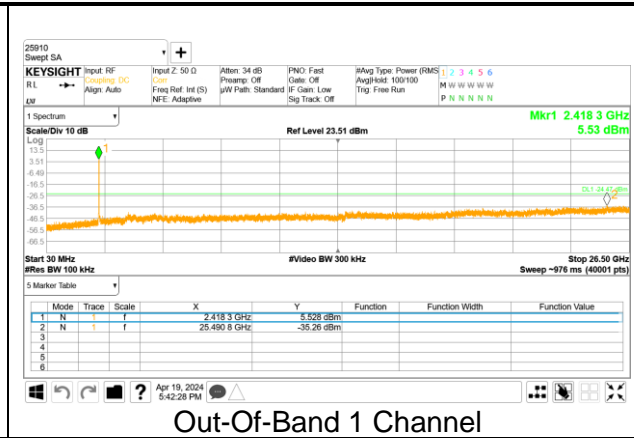


13 Channel Band-edge

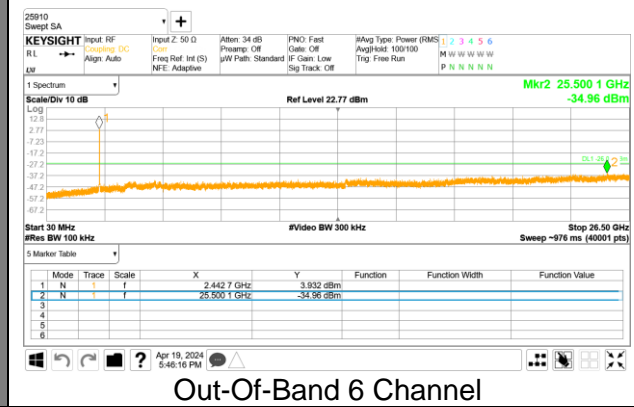
2TX Antenna 2



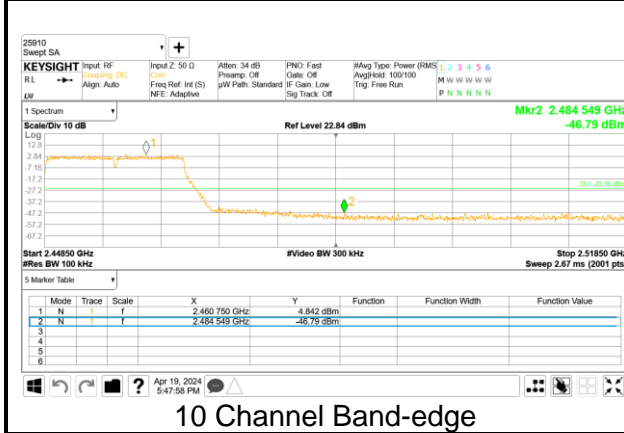
1 Channel Band-edge



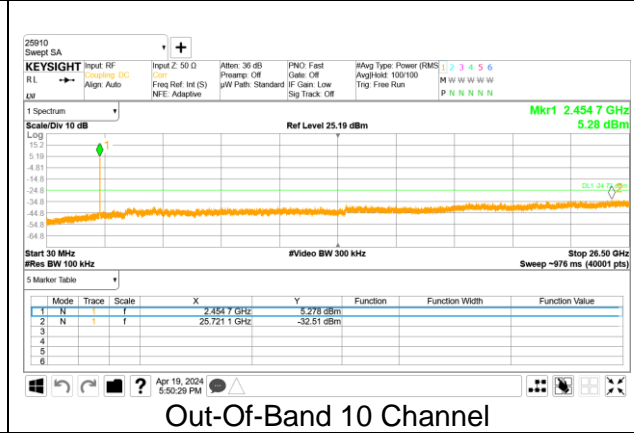
Out-Of-Band 1 Channel



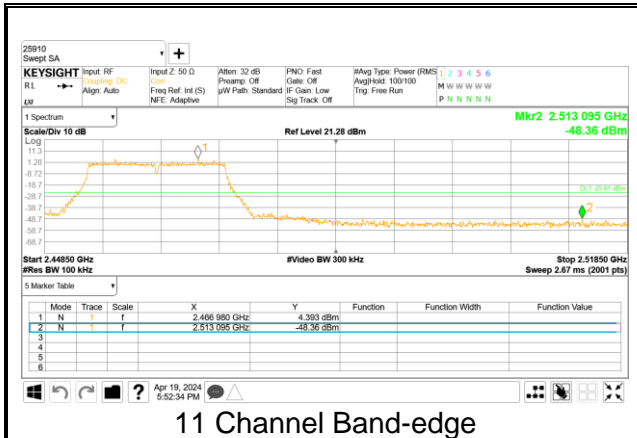
Out-Of-Band 6 Channel



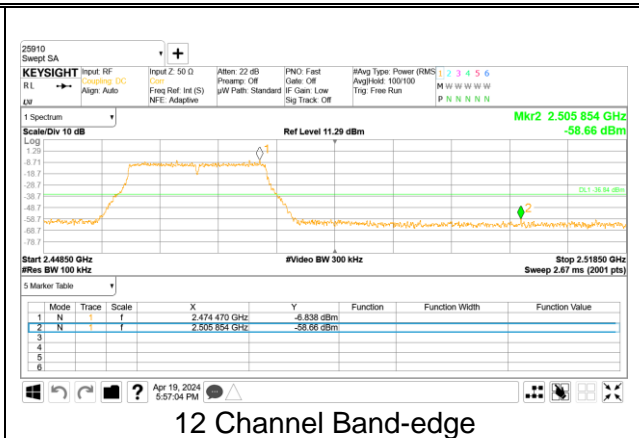
10 Channel Band-edge



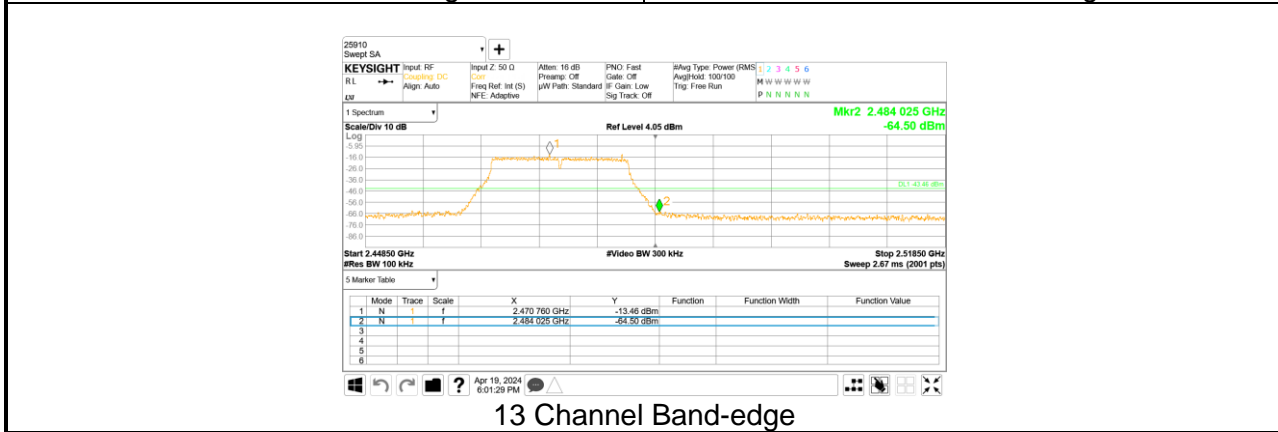
Out-Of-Band 10 Channel



11 Channel Band-edge



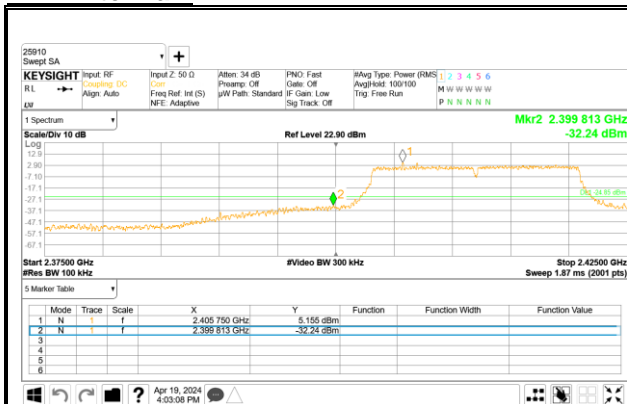
12 Channel Band-edge



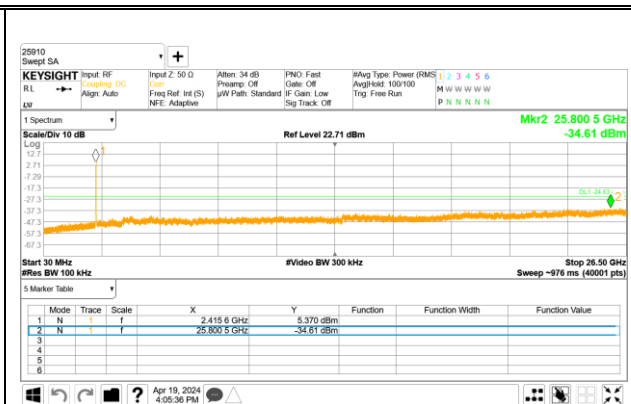
13 Channel Band-edge

9.5.3. 802.11n HT20 MODE

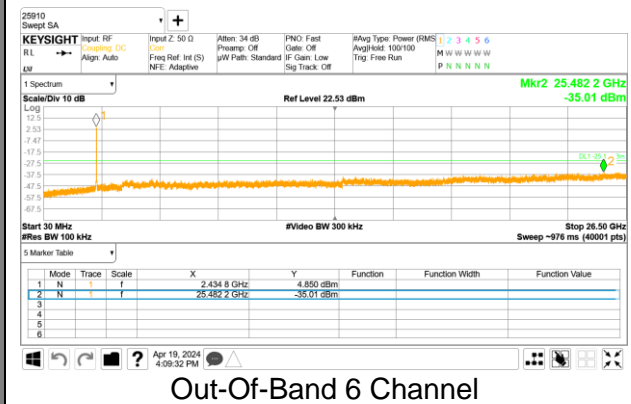
2TX Antenna 1



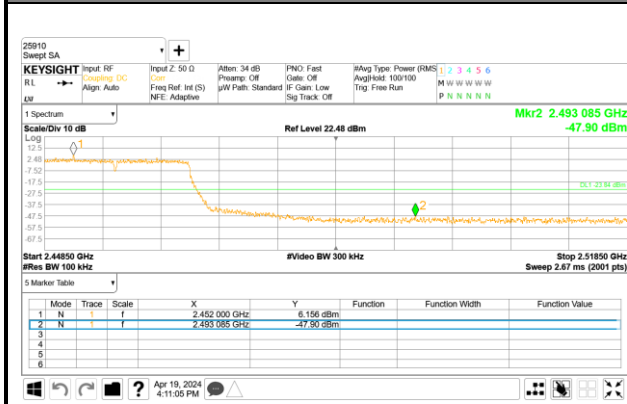
1 Channel Band-edge



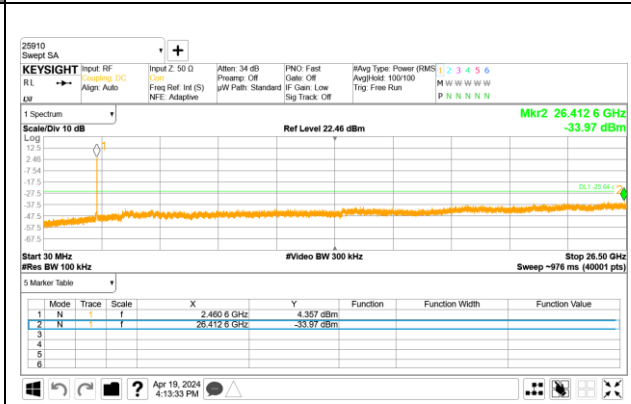
Out-Of-Band 1 Channel



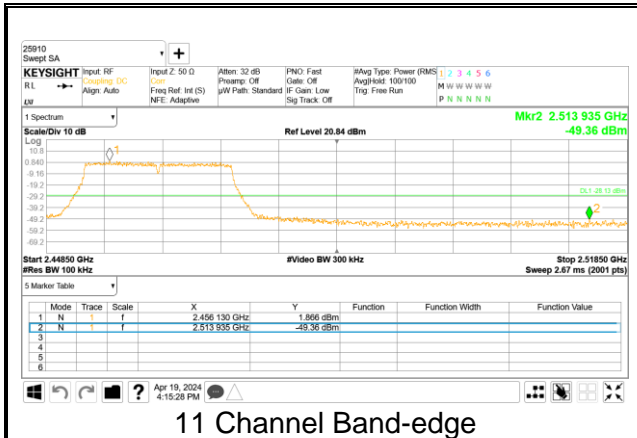
Out-Of-Band 6 Channel



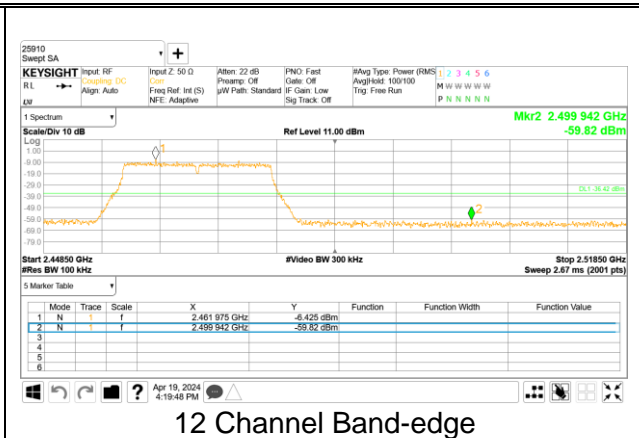
10 Channel Band-edge



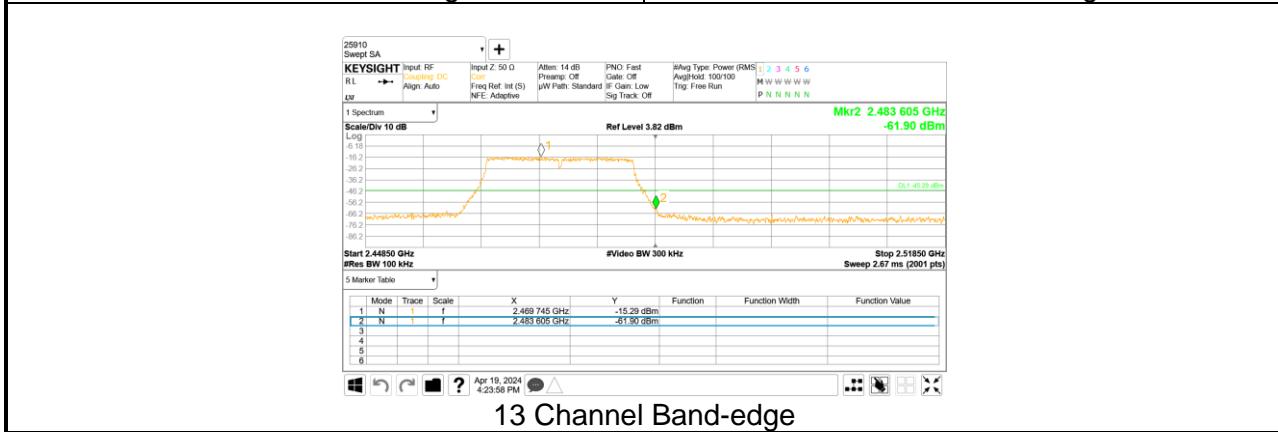
Out-Of-Band 10 Channel



11 Channel Band-edge

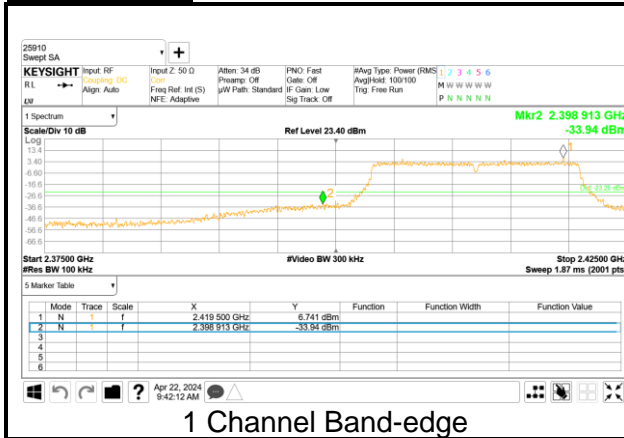


12 Channel Band-edge

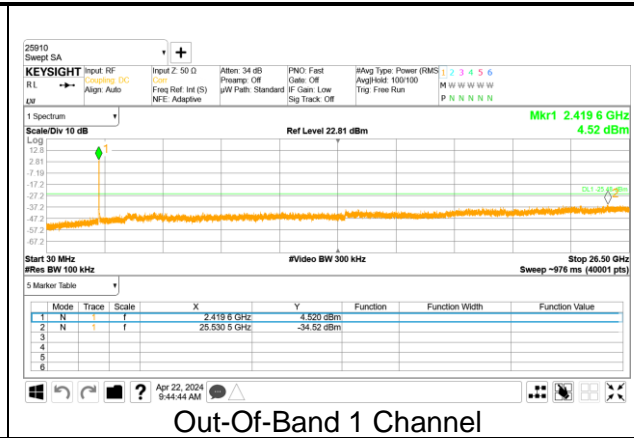


13 Channel Band-edge

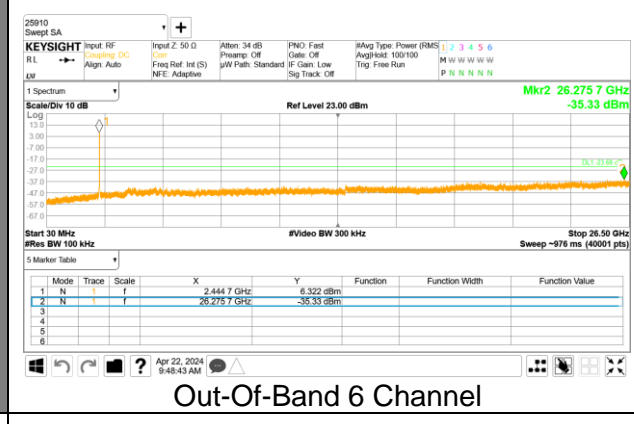
2TX Antenna 2



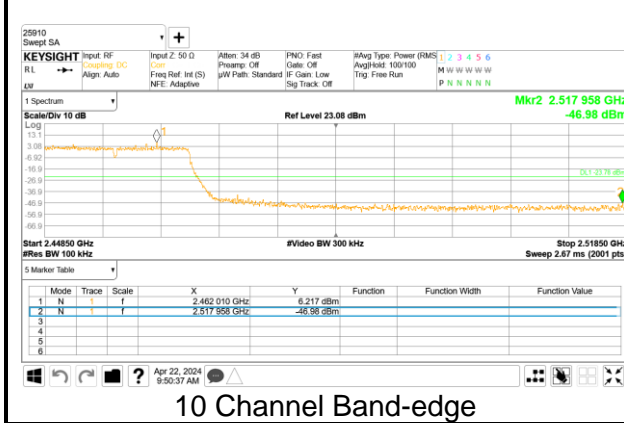
1 Channel Band-edge



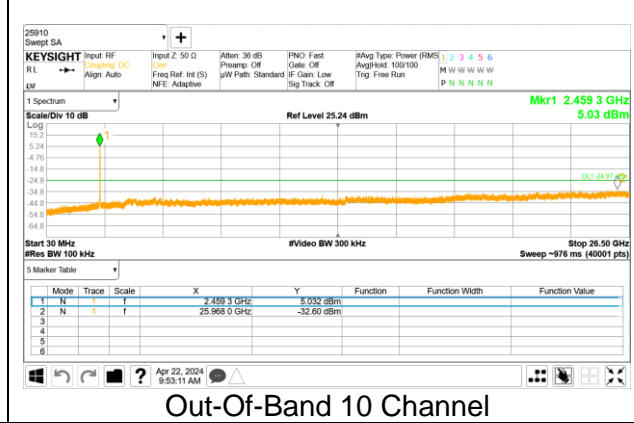
Out-Of-Band 1 Channel



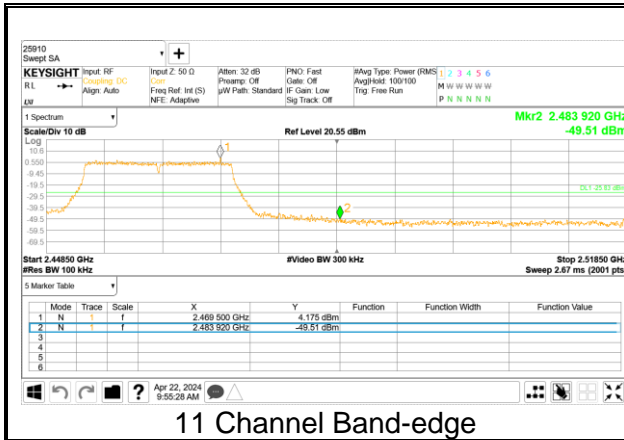
Out-Of-Band 6 Channel



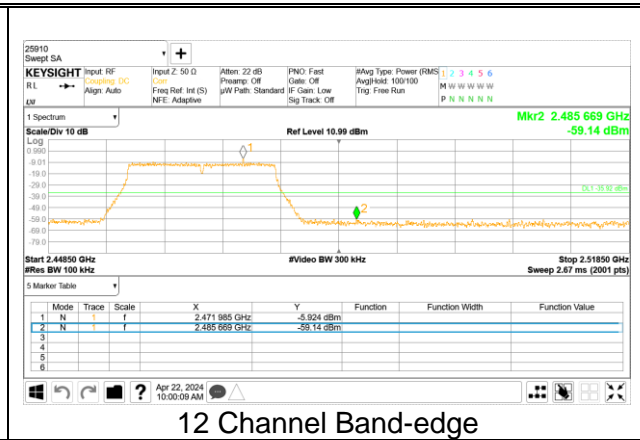
10 Channel Band-edge



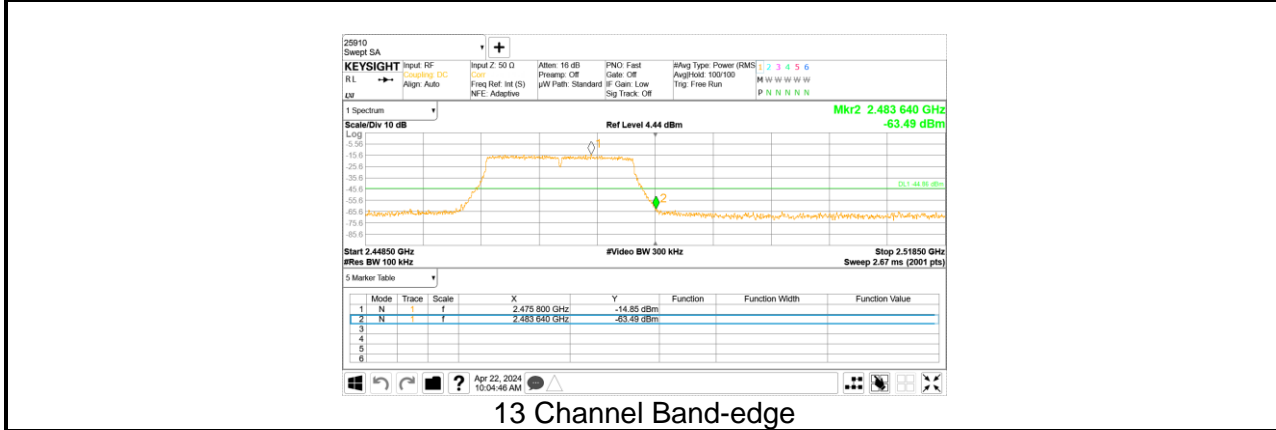
Out-Of-Band 10 Channel



11 Channel Band-edge



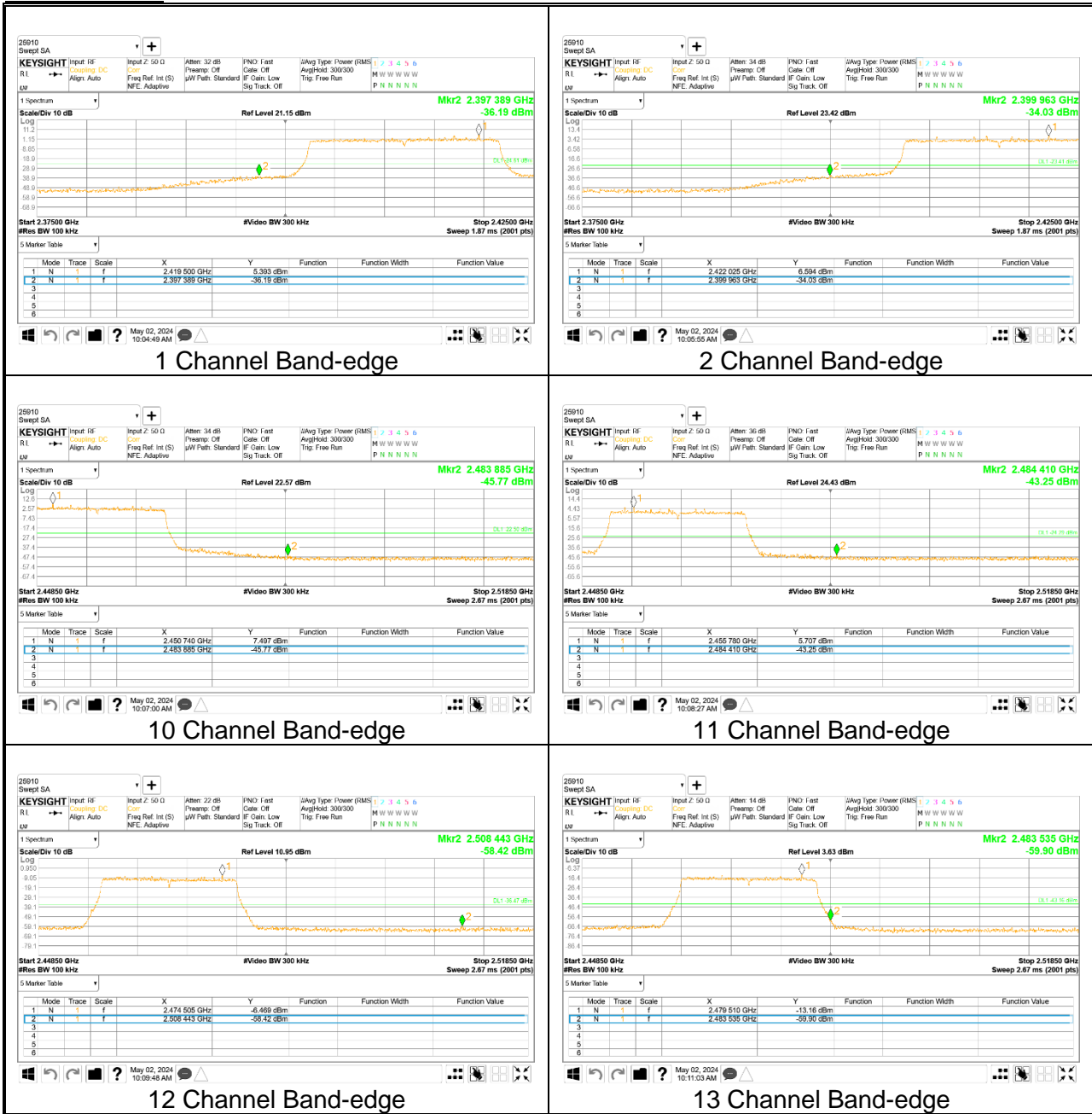
12 Channel Band-edge



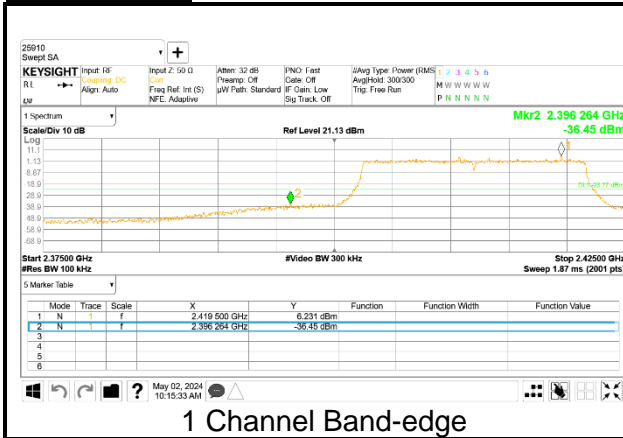
13 Channel Band-edge

9.5.4. 802.11ax HE20(SU) MODE

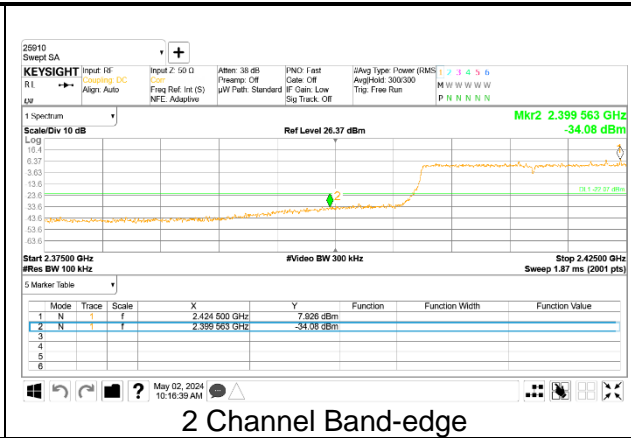
2TX Antenna 1



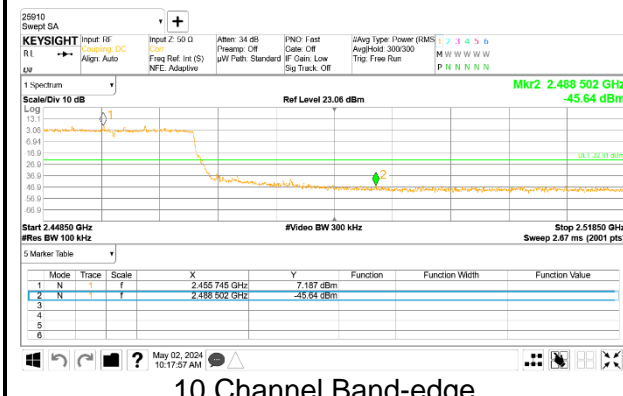
2TX Antenna 2



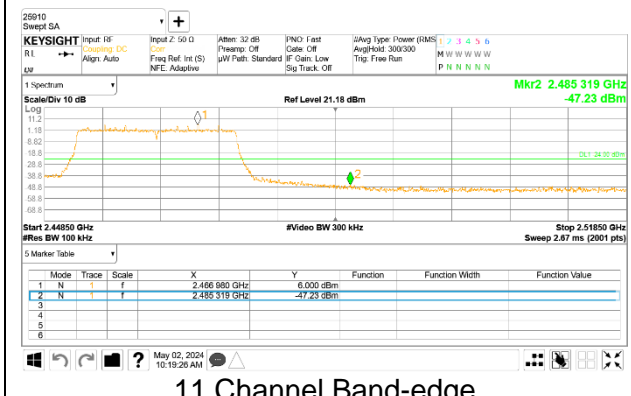
1 Channel Band-edge



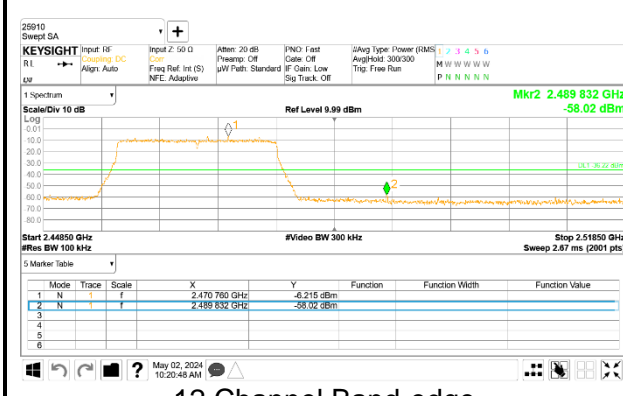
2 Channel Band-edge



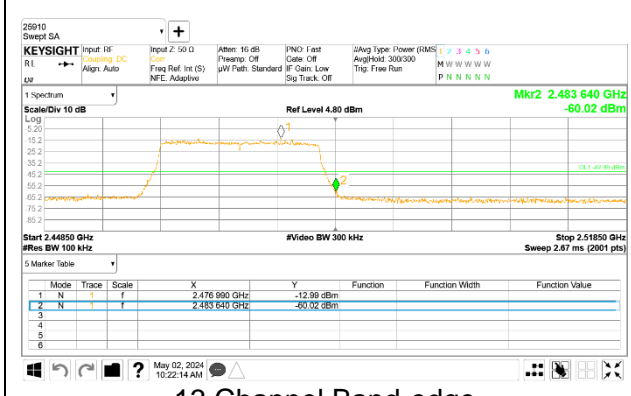
10 Channel Band-edge



11 Channel Band-edge



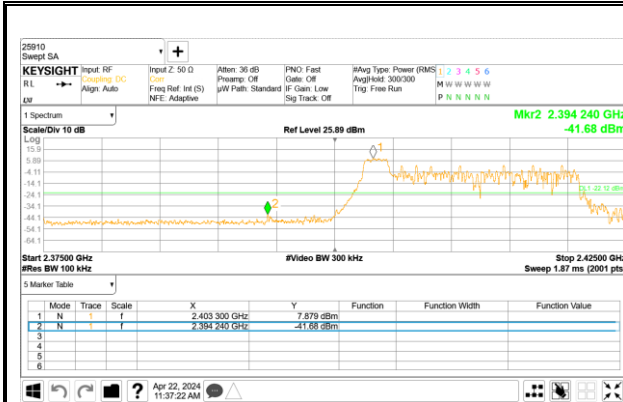
12 Channel Band-edge



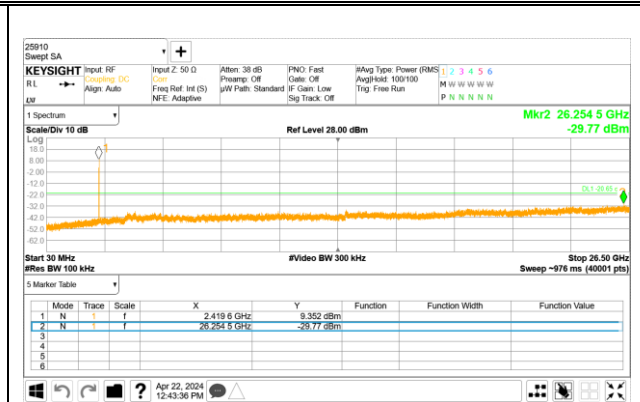
13 Channel Band-edge

9.5.5. 802.11ax HE20(RU) MODE

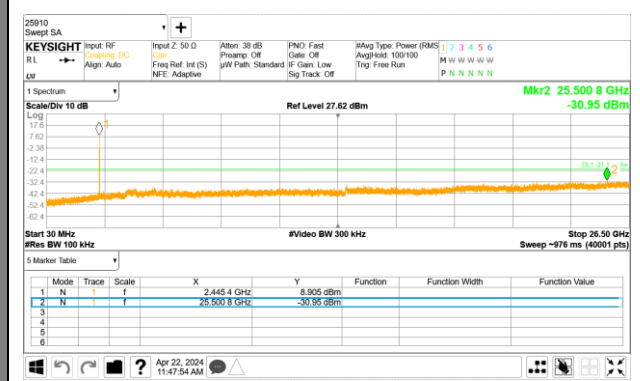
2TX Antenna 1 MODE



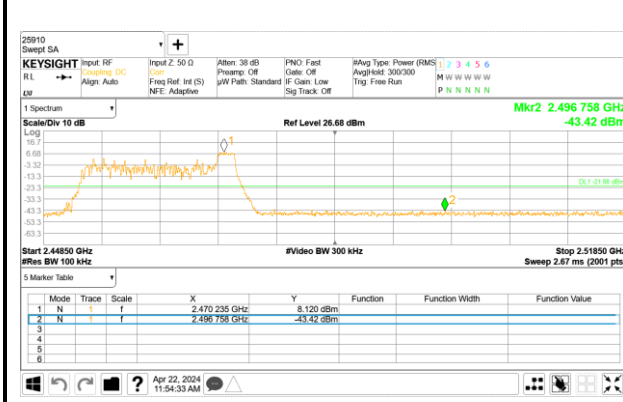
1 Channel Band-edge(0RU)



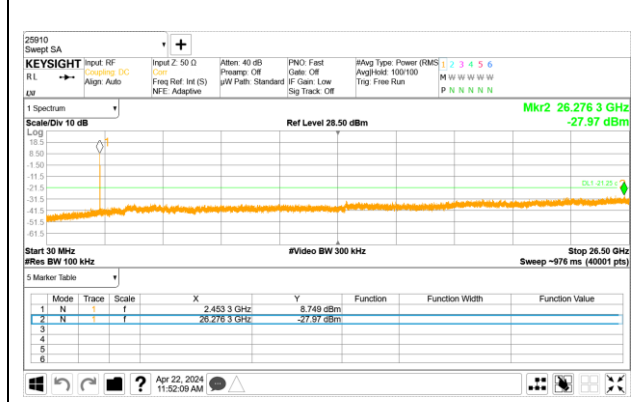
Out-Of-Band 1 Channel(8RU)



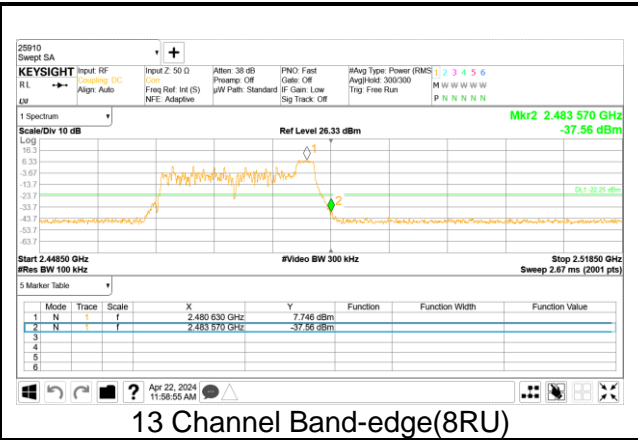
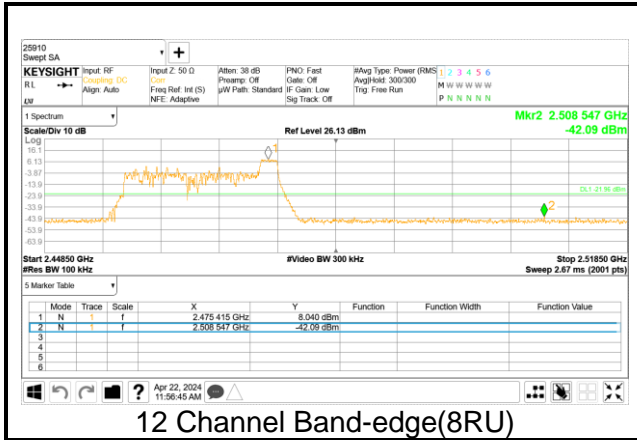
Out-Of-Band 6 Channel(8RU)



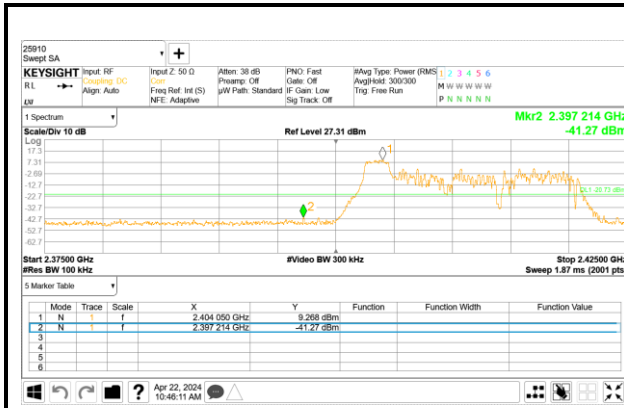
11 Channel Band-edge(8RU)



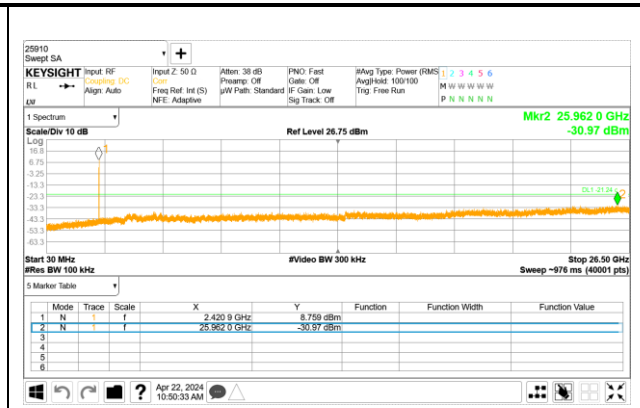
Out-Of-Band 11 Channel(0RU)



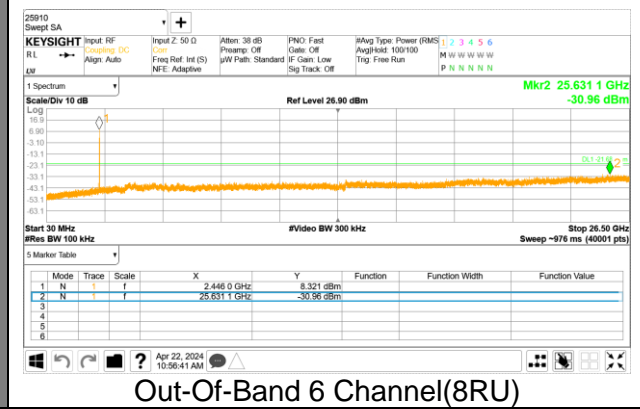
2TX Antenna 2 MODE



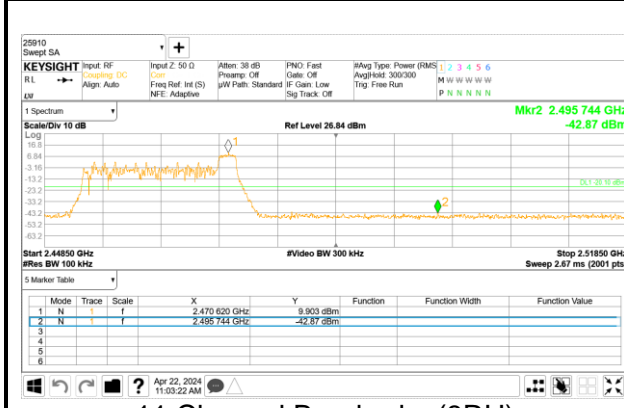
1 Channel Band-edge(0RU)



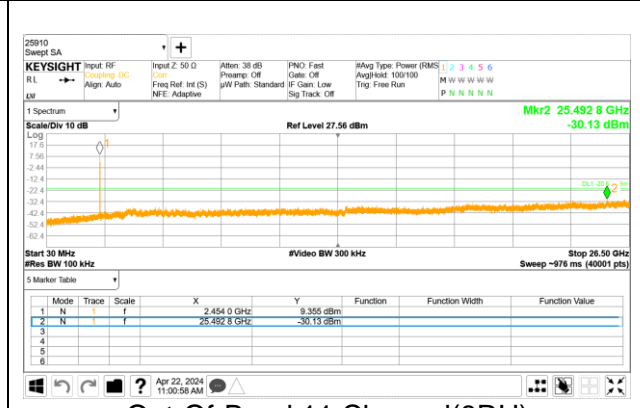
Out-Of-Band 1 Channel(8RU)



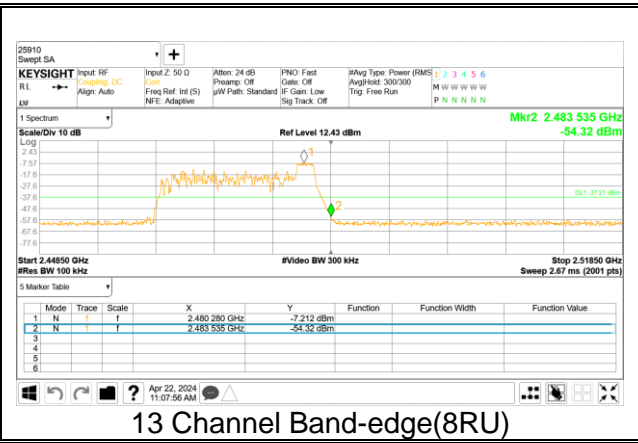
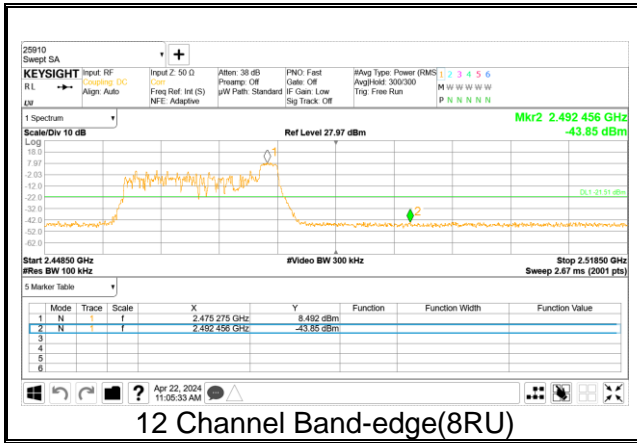
Out-Of-Band 6 Channel(8RU)



11 Channel Band-edge(8RU)



Out-Of-Band 11 Channel(8RU)



10. RADIATED TEST RESULTS

LIMITS

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.

FCC Part 15.205 (a) : Only spurious emissions are permitted in any of the frequency bands listed below :

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			

▪ 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.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1 GHz and 150 cm for above 1 GHz. The antenna to EUT distance is 3 meters. 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.

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 for average measurements.
(Restricted bandedge, Final detection of spurious harmonic emissions)

Duty cycle factor = $10\log(1/x)$ For this sample:

802.11b MIMO mode = 0 dB (duty cycle > 98%);
802.11g MIMO mode = 0.16 dB (96.29%);
802.11n(HT20) MIMO mode = 0.09 dB (97.96%);
802.11ax(HE20) MIMO SU mode = 0 dB (duty cycle > 98%);
802.11ax(HE20) MIMO 26 Tone mode = 0 dB (duty cycle > 98%).

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 1 GHz to 26 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 9 kHz to 30 MHz; 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 area 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.

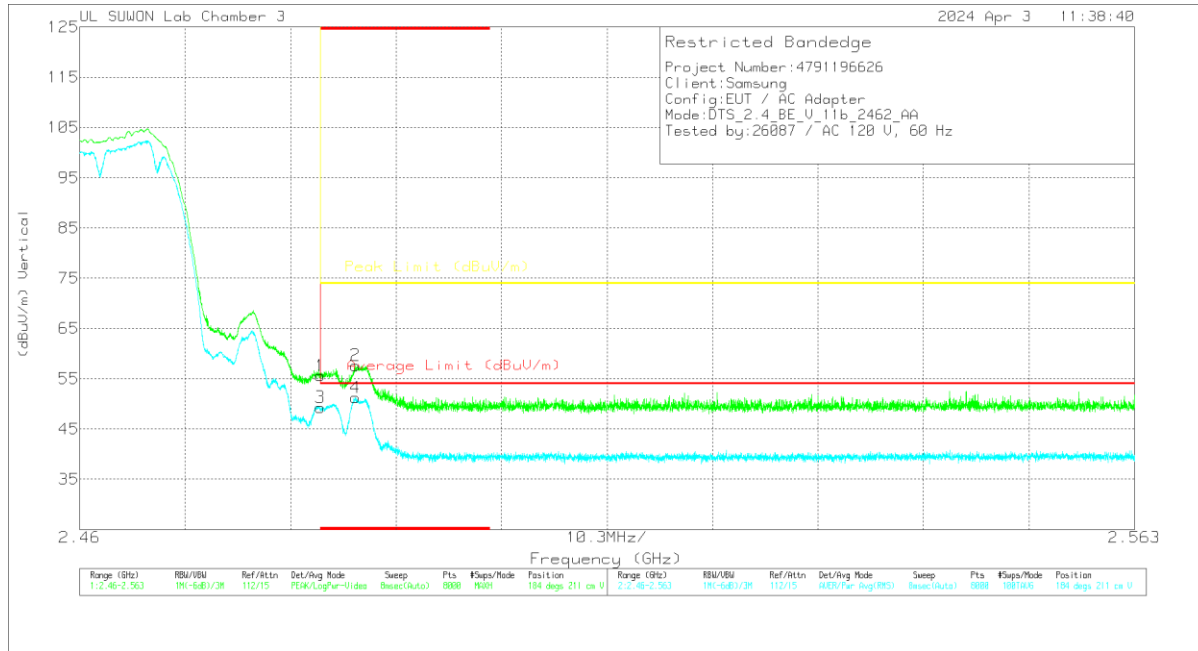
10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

2TX Antenna 1 + Antenna 2

BANDEDGE (WORST CASE: 11 CHANNEL)

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_S57_Factor(dB)	10dB_Path Loss(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	* 2.4835	48.01	Pk	32.4	-24.8	0	55.61	-	-	74	-18.39	184	211	V
2	* 2.48694	50.07	Pk	32.4	-24.8	0	57.67	-	-	74	-16.33	184	211	V
3	* 2.4835	41.72	RMS	32.4	-24.8	0	49.32	54	-4.68	-	-	184	211	V
4	* 2.4869	43.64	RMS	32.4	-24.8	0	51.24	54	-2.76	-	-	184	211	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

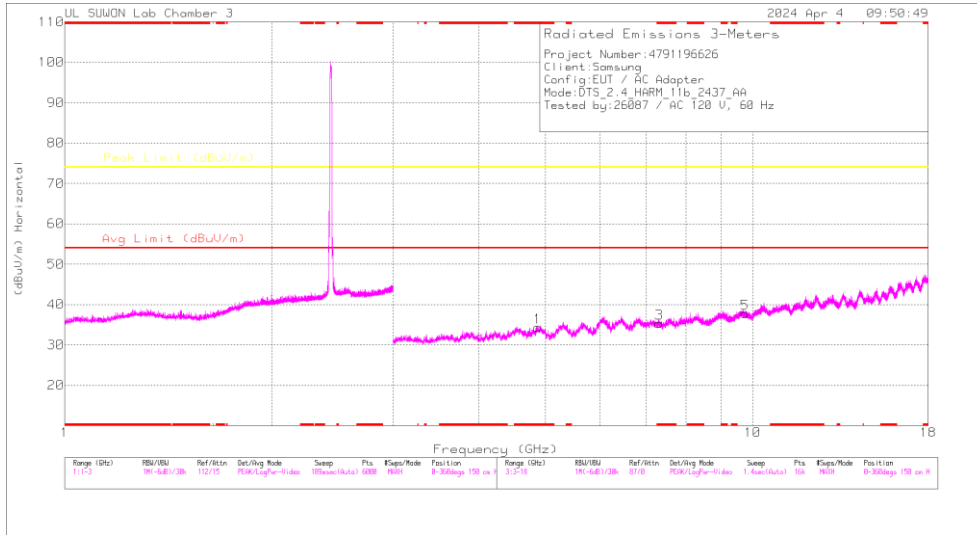
BANDEDGE TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
2412	MIMO	* 2.39	43.26	Pk	32.10	-24.80	0.00	50.56	-	-	74.00	-23.44	138	112	H	
		* 2.38631	45.66	Pk	32.10	-24.80	0.00	52.96	-	-	74.00	-21.04	138	112	H	
		* 2.39	33.41	RMS	32.10	-24.80	0.00	40.71	54.00	-13.29	-	-	-	138	112	H
		* 2.38624	35.40	RMS	32.10	-24.80	0.00	42.70	54.00	-11.30	-	-	-	138	112	H
		* 2.39	49.33	Pk	32.10	-24.80	0.00	56.63	-	-	74.00	-17.37	-	255	301	V
		* 2.38598	50.59	Pk	32.10	-24.90	0.00	57.79	-	-	74.00	-16.21	-	255	301	V
		* 2.39	42.20	RMS	32.10	-24.80	0.00	49.50	54.00	-4.50	-	-	-	255	301	V
		* 2.38614	43.37	RMS	32.10	-24.80	0.00	50.67	54.00	-3.33	-	-	-	255	301	V
2417	MIMO	* 2.39	42.31	Pk	32.10	-24.80	0.00	49.61	-	-	74.00	-24.39	199	192	H	
		* 2.38824	45.38	Pk	32.10	-24.80	0.00	52.68	-	-	74.00	-21.32	199	192	H	
		* 2.39	32.96	RMS	32.10	-24.80	0.00	40.26	54.00	-13.74	-	-	-	199	192	H
		* 2.38897	35.30	RMS	32.10	-24.80	0.00	42.60	54.00	-11.40	-	-	-	199	192	H
		* 2.39	46.51	Pk	32.10	-24.80	0.00	53.81	-	-	74.00	-20.19	-	256	245	V
		* 2.38912	48.05	Pk	32.10	-24.80	0.00	55.35	-	-	74.00	-18.65	-	256	245	V
		* 2.39	38.19	RMS	32.10	-24.80	0.00	45.49	54.00	-8.51	-	-	-	256	245	V
		* 2.38901	39.56	RMS	32.10	-24.80	0.00	46.86	54.00	-7.14	-	-	-	256	245	V
2462	MIMO	* 2.4835	47.72	Pk	32.40	-24.80	0.00	55.32	-	-	74.00	-18.68	201	183	H	
		* 2.48358	48.33	Pk	32.40	-24.80	0.00	55.93	-	-	74.00	-18.07	201	183	H	
		* 2.4835	41.29	RMS	32.40	-24.80	0.00	48.89	54.00	-5.11	-	-	-	201	183	H
		* 2.48356	41.55	RMS	32.40	-24.80	0.00	49.15	54.00	-4.85	-	-	-	201	183	H
		* 2.4835	48.01	Pk	32.40	-24.80	0.00	55.61	-	-	74.00	-18.39	-	184	211	V
		* 2.48694	50.07	Pk	32.40	-24.80	0.00	57.67	-	-	74.00	-16.33	-	184	211	V
		* 2.4835	41.72	RMS	32.40	-24.80	0.00	49.32	54.00	-4.68	-	-	-	184	211	V
		* 2.4869	43.64	RMS	32.40	-24.80	0.00	51.24	54.00	-2.76	-	-	-	184	211	V
2467	MIMO	* 2.4835	40.75	Pk	32.40	-24.80	0.00	48.35	-	-	74.00	-25.65	199	175	H	
		2.524	44.21	Pk	32.40	-24.80	0.00	51.81	-	-	74.00	-22.19	199	175	H	
		* 2.4835	31.73	RMS	32.40	-24.80	0.00	39.33	54.00	-14.67	-	-	-	199	175	H
		2.561	33.01	RMS	32.40	-24.70	0.00	40.71	54.00	-13.29	-	-	-	199	175	H
		* 2.4835	41.89	Pk	32.40	-24.80	0.00	49.49	-	-	74.00	-24.51	-	204	209	V
		2.557	44.46	Pk	32.40	-24.70	0.00	52.16	-	-	74.00	-21.84	-	204	209	V
		* 2.4835	31.85	RMS	32.40	-24.80	0.00	39.45	54.00	-14.55	-	-	-	204	209	V
		2.555	32.98	RMS	32.40	-24.70	0.00	40.68	54.00	-13.32	-	-	-	204	209	V
2472	MIMO	* 2.4835	41.00	Pk	32.40	-24.80	0.00	48.60	-	-	74.00	-25.40	169	177	H	
		2.519	44.21	Pk	32.40	-24.80	0.00	51.81	-	-	74.00	-22.19	169	177	H	
		* 2.4835	32.12	RMS	32.40	-24.80	0.00	39.72	54.00	-14.28	-	-	-	169	177	H
		2.561	32.93	RMS	32.40	-24.70	0.00	40.63	54.00	-13.37	-	-	-	169	177	H
		* 2.4835	41.06	Pk	32.40	-24.80	0.00	48.66	-	-	74.00	-25.34	-	191	193	V
		2.563	44.17	Pk	32.40	-24.80	0.00	51.77	-	-	74.00	-22.23	-	191	193	V
		* 2.4835	31.77	RMS	32.40	-24.80	0.00	39.37	54.00	-14.63	-	-	-	191	193	V
		2.555	32.83	RMS	32.40	-24.60	0.00	40.63	54.00	-13.37	-	-	-	191	193	V

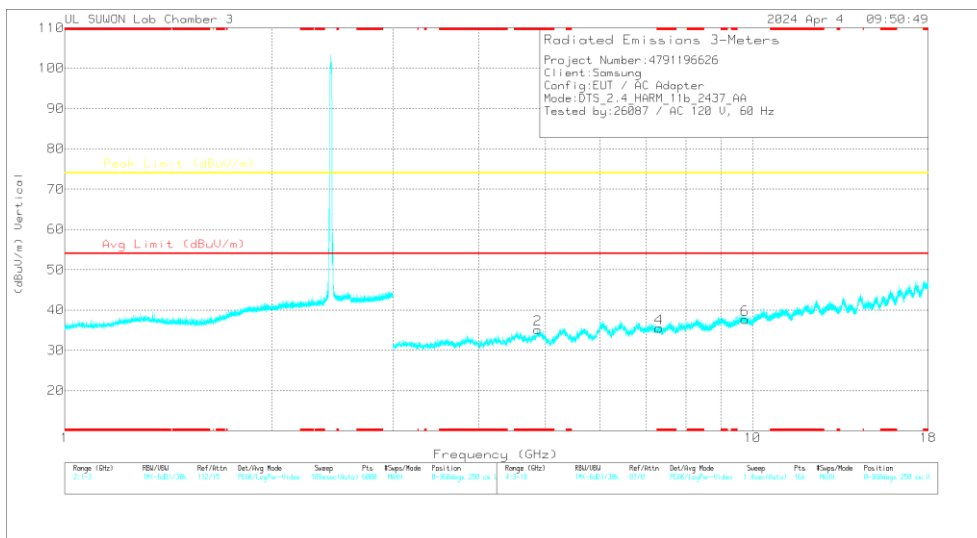
Note1. Pk - Peak detector, RMS - RMS detector
 Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 6 CHANNEL)

CH 6 RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB)	3GHz_HP_Pat h_Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.87402	40.39	PK2	34.2	-29.8	0	44.79	-	-	74	-29.21	196	182	H
* 4.87407	29.8	MAv1	34.2	-29.8	0	34.2	54	-19.8	-	-	196	182	H
* 4.87393	41.8	PK2	34.2	-29.8	0	46.2	-	-	74	-27.8	207	268	V
* 4.8739	31.18	MAv1	34.2	-29.8	0	35.58	54	-18.42	-	-	207	268	V
* 7.30903	35.47	PK2	35.8	-25.5	0	45.77	-	-	74	-28.23	0	100	H
* 7.31003	35.01	PK2	35.8	-25.5	0	45.31	-	-	74	-28.69	0	100	V
9.74415	32.37	PK2	36.9	-21.6	0	47.67	-	-	74	-26.33	156	154	H
9.74938	31.54	PK2	36.9	-21.5	0	46.94	-	-	74	-27.06	198	251	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2417	MIMO	* 4.83376	40.08	PK2	34.20	-30.00	0.00	44.28	-	-	74.00	-29.72	233	100	H
		* 4.8338	28.87	MAv1	34.20	-30.00	0.00	33.07	54.00	-20.93	-	-	233	100	H
		* 4.83395	39.31	PK2	34.20	-30.00	0.00	43.51	-	-	74.00	-30.49	201	113	V
		* 4.83413	29.40	MAv1	34.20	-30.00	0.00	33.60	54.00	-20.40	-	-	201	113	V
		* 7.25224	35.14	PK2	35.80	-25.70	0.00	45.24	-	-	74.00	-28.76	0	100	H
		* 7.25252	35.51	PK2	35.80	-25.70	0.00	45.61	-	-	74.00	-28.39	0	100	V
		9.665	32.64	PK2	36.80	-21.70	0.00	47.74	-	-	74.00	-26.26	0	100	H
		9.655	32.22	PK2	36.80	-21.70	0.00	47.32	-	-	74.00	-26.68	0	100	V
		* 4.87402	40.39	PK2	34.20	-29.80	0.00	44.79	-	-	74.00	-29.21	196	182	H
		* 4.87407	29.80	MAv1	34.20	-29.80	0.00	34.20	54.00	-19.80	-	-	196	182	H
2437	MIMO	* 4.87393	41.80	PK2	34.20	-29.80	0.00	46.20	-	-	74.00	-27.80	207	268	V
		* 4.8739	31.18	MAv1	34.20	-29.80	0.00	35.58	54.00	-18.42	-	-	207	268	V
		* 7.30903	35.47	PK2	35.80	-25.50	0.00	45.77	-	-	74.00	-28.23	0	100	H
		* 7.31003	35.01	PK2	35.80	-25.50	0.00	45.31	-	-	74.00	-28.69	0	100	V
		9.744	32.37	PK2	36.90	-21.60	0.00	47.67	-	-	74.00	-26.33	156	154	H
		9.749	31.54	PK2	36.90	-21.50	0.00	46.94	-	-	74.00	-27.06	198	251	V
		* 4.92103	41.46	PK2	34.20	-29.90	0.00	45.76	-	-	74.00	-28.24	160	200	H
		* 4.92411	29.12	MAv1	34.20	-30.00	0.00	33.32	54.00	-20.68	-	-	160	200	H
2462	MIMO	* 4.92418	40.92	PK2	34.20	-30.00	0.00	45.12	-	-	74.00	-28.88	178	391	V
		* 4.92402	29.98	MAv1	34.20	-30.00	0.00	34.18	54.00	-19.82	-	-	178	391	V
		* 7.3868	34.37	PK2	35.70	-25.30	0.00	44.77	-	-	74.00	-29.23	0	100	H
		* 7.38699	34.32	PK2	35.70	-25.30	0.00	44.72	-	-	74.00	-29.28	0	100	V
		9.849	31.85	PK2	37.10	-21.40	0.00	47.55	-	-	74.00	-26.45	0	100	H
		9.846	31.16	PK2	37.10	-21.40	0.00	46.86	-	-	74.00	-27.14	0	100	V

Note1. PK2 - KDB558074 Method: Maximum Peak / MAV1 - KDB558074 Option 1 Maximum RMS Average

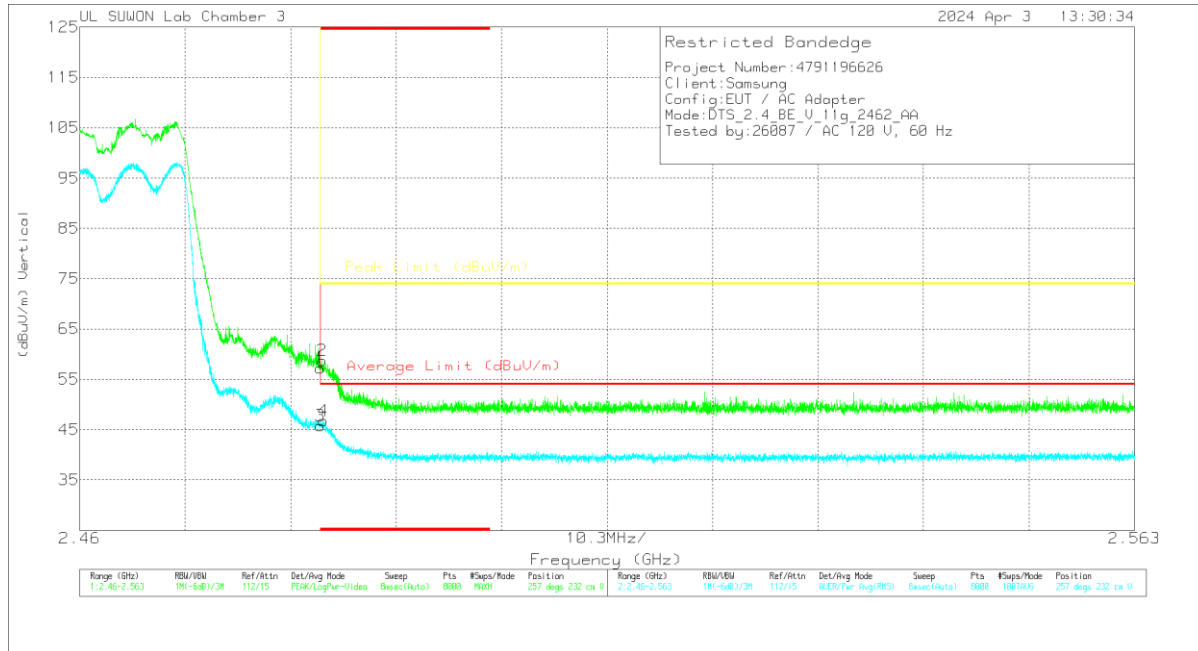
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

10.1.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

2TX Antenna 1 + Antenna 2

BANDEDGE (WORST CASE: 11 CHANNEL)

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB)	10dB_Path Loss(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	* 2.4835	49.64	Pk	32.4	-24.8	0	57.24	-	-	74	-16.76	257	232	V
2	* 2.48368	51.08	Pk	32.4	-24.8	0	58.68	-	-	74	-15.32	257	232	V
3	* 2.4835	37.98	RMS	32.4	-24.8	16	45.74	54	-8.26	-	-	257	232	V
4	* 2.4838	38.98	RMS	32.4	-24.8	16	46.74	54	-7.26	-	-	257	232	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

BANDEDGE TEST DATA

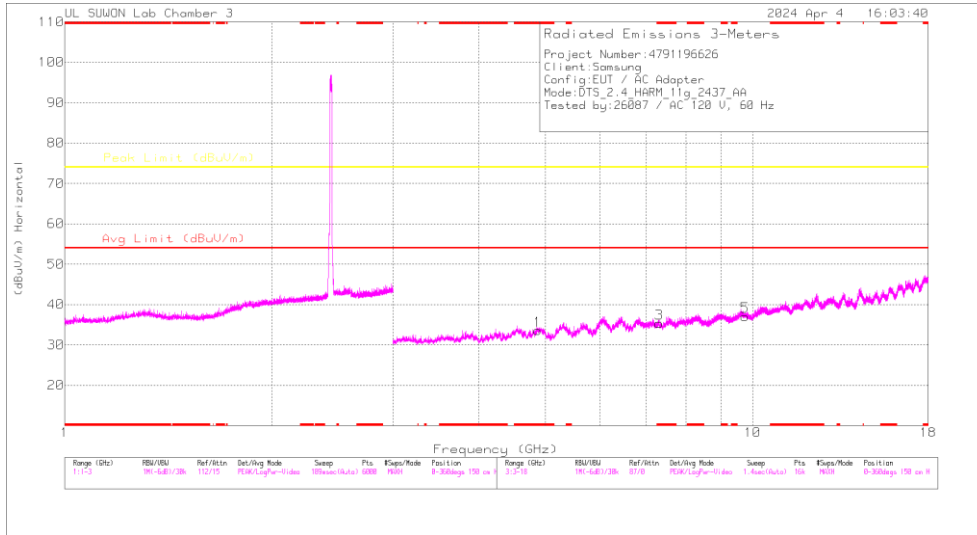
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result dBuV/m	AV Limit dBuV/m	AV Margin [dB]	PK Limit dBuV/m	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
2412	MIMO	2.39	49.93	Pk	32.10	-24.80	0.00	57.23	-	-	74.00	-16.77	168	196	H	
		* 2.38998	50.97	Pk	32.10	-24.80	0.00	58.27	-	-	74.00	-15.73	168	196	H	
		* 2.39	37.08	RMS	32.10	-24.80	0.16	44.54	54.00	-9.46	-	-	-	168	196	H
		* 2.38969	37.21	RMS	32.10	-24.80	0.16	44.67	54.00	-9.33	-	-	-	168	196	H
		2.39	49.05	Pk	32.10	-24.80	0.00	56.35	-	-	74.00	-17.65	212	221	V	
		* 2.38941	50.09	Pk	32.10	-24.80	0.00	57.39	-	-	74.00	-16.61	212	221	V	
		* 2.39	37.42	RMS	32.10	-24.80	0.16	44.88	54.00	-9.12	-	-	-	212	221	V
		* 2.38934	38.05	RMS	32.10	-24.80	0.16	45.51	54.00	-8.49	-	-	-	212	221	V
2457	MIMO	* 2.4835	43.15	Pk	32.40	-24.80	0.00	50.75	-	-	74.00	-23.25	199	106	H	
		* 2.48358	45.42	Pk	32.40	-24.80	0.00	53.02	-	-	74.00	-20.98	199	106	H	
		* 2.4835	33.70	RMS	32.40	-24.80	0.16	41.46	54.00	-12.54	-	-	-	199	106	H
		* 2.48367	33.90	RMS	32.40	-24.80	0.16	41.66	54.00	-12.34	-	-	-	199	106	H
		* 2.4835	45.95	Pk	32.40	-24.80	0.00	53.55	-	-	74.00	-20.45	250	289	V	
		* 2.48461	50.32	Pk	32.40	-24.80	0.00	57.92	-	-	74.00	-16.08	250	289	V	
		* 2.4835	35.30	RMS	32.40	-24.80	0.16	43.06	54.00	-10.94	-	-	-	250	289	V
		* 2.48413	36.30	RMS	32.40	-24.80	0.16	44.06	54.00	-9.94	-	-	-	250	289	V
2462	MIMO	* 2.4835	49.41	Pk	32.40	-24.80	0.00	57.01	-	-	74.00	-16.99	167	183	H	
		* 2.48358	50.12	Pk	32.40	-24.80	0.00	57.72	-	-	74.00	-16.28	167	183	H	
		* 2.4835	36.55	RMS	32.40	-24.80	0.16	44.31	54.00	-9.69	-	-	-	167	183	H
		* 2.48356	37.54	RMS	32.40	-24.80	0.16	45.30	54.00	-8.70	-	-	-	167	183	H
		* 2.4835	49.64	Pk	32.40	-24.80	0.00	57.24	-	-	74.00	-16.76	257	232	V	
		* 2.48368	51.08	Pk	32.40	-24.80	0.00	58.68	-	-	74.00	-15.32	257	232	V	
		* 2.4835	37.98	RMS	32.40	-24.80	0.16	45.74	54.00	-8.26	-	-	-	257	232	V
		* 2.4838	38.98	RMS	32.40	-24.80	0.16	46.74	54.00	-7.26	-	-	-	257	232	V
2467	MIMO	* 2.4835	41.47	Pk	32.40	-24.80	0.00	49.07	-	-	74.00	-24.93	167	106	H	
		* 2.49293	44.45	Pk	32.40	-24.80	0.00	52.05	-	-	74.00	-21.95	167	106	H	
		* 2.4835	31.75	RMS	32.40	-24.80	0.16	39.51	54.00	-14.49	-	-	-	167	106	H
		2.515	33.00	RMS	32.40	-24.70	0.16	40.86	54.00	-13.14	-	-	-	167	106	H
		* 2.4835	41.15	Pk	32.40	-24.80	0.00	48.75	-	-	74.00	-25.25	250	283	V	
		2.514	44.61	Pk	32.40	-24.60	0.00	52.41	-	-	74.00	-21.59	250	283	V	
		* 2.4835	32.03	RMS	32.40	-24.80	0.16	39.79	54.00	-14.21	-	-	-	250	283	V
		2.551	32.98	RMS	32.40	-24.70	0.16	40.84	54.00	-13.16	-	-	-	250	283	V
2472	MIMO	* 2.4835	43.55	Pk	32.40	-24.80	0.00	51.15	-	-	74.00	-22.95	207	276	H	
		2.551	44.52	Pk	32.40	-24.70	0.00	52.22	-	-	74.00	-21.78	207	276	H	
		* 2.4835	31.79	RMS	32.40	-24.80	0.16	39.55	54.00	-14.45	-	-	-	207	276	H
		2.538	33.17	RMS	32.40	-24.70	0.16	41.03	54.00	-12.97	-	-	-	207	276	H
		* 2.4835	41.61	Pk	32.40	-24.80	0.00	49.21	-	-	74.00	-24.79	260	187	V	
		* 2.4962	44.43	Pk	32.40	-24.80	0.00	52.03	-	-	74.00	-21.97	260	187	V	
		* 2.4835	32.56	RMS	32.40	-24.80	0.16	40.32	54.00	-13.68	-	-	-	260	187	V
		2.531	33.15	RMS	32.40	-24.80	0.16	40.91	54.00	-13.09	-	-	-	260	187	V

Note1. Pk - Peak detector, RMS - RMS detector

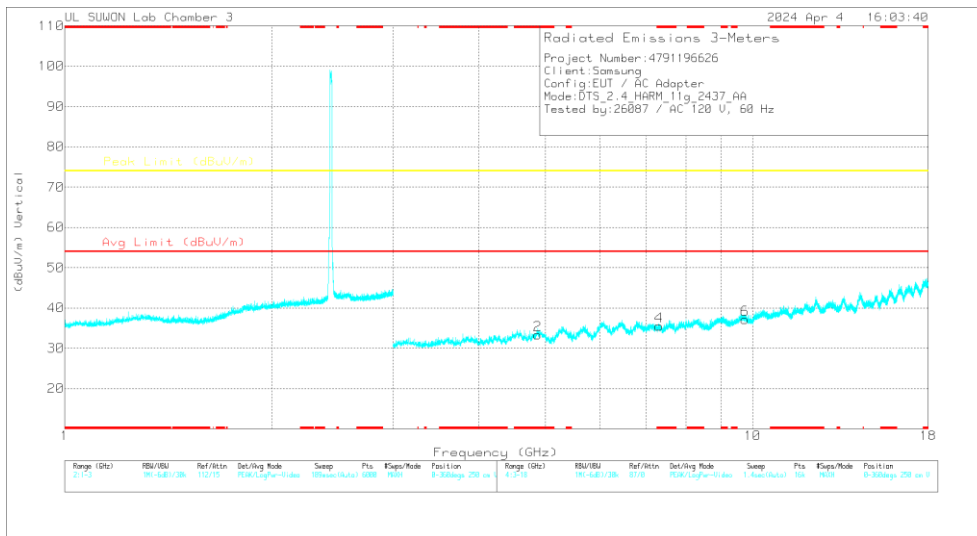
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS (WORST CASE: 6 CHANNEL)

CH 6 RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB)	3GHz_HP_Pat h_Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.87153	39.71	PK2	34.2	-29.9	0	44.01	-	-	74	-29.99	0	100	H
* 4.87236	39.65	PK2	34.2	-29.9	0	43.95	-	-	74	-30.05	0	100	V
* 7.30744	35.98	PK2	35.8	-25.5	0	46.28	-	-	74	-27.72	250	224	H
* 7.30999	24.96	MAV1	35.8	-25.5	.16	35.42	54	-18.58	-	-	250	224	H
* 7.30804	36.18	PK2	35.8	-25.5	0	46.48	-	-	74	-27.52	235	106	V
* 7.30639	24.52	MAV1	35.8	-25.5	.16	34.98	54	-19.02	-	-	235	106	V
9.75285	31.92	PK2	36.9	-21.6	0	47.22	-	-	74	-26.78	0	100	H
9.74533	31.48	PK2	36.9	-21.6	0	46.78	-	-	74	-27.22	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAV1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	MIMO	* 4.8187	38.92	PK2	34.30	-30.00	0.00	43.22	-	-	74.00	-30.78	0	100	H
		* 4.82018	39.17	PK2	34.30	-30.00	0.00	43.47	-	-	74.00	-30.53	0	100	V
		7.232	36.76	PK2	35.80	-25.80	0.00	46.76	-	-	74.00	-27.24	256	235	H
		7.237	38.57	PK2	35.80	-25.70	0.00	48.67	-	-	74.00	-25.33	232	103	V
		9.649	31.87	PK2	36.80	-21.80	0.00	46.87	-	-	74.00	-27.13	0	100	H
		9.646	32.01	PK2	36.80	-21.70	0.00	47.11	-	-	74.00	-26.89	0	100	V
2437	MIMO	* 4.87153	39.71	PK2	34.20	-29.90	0.00	44.01	-	-	74.00	-29.99	0	100	H
		* 4.87236	39.65	PK2	34.20	-29.90	0.00	43.95	-	-	74.00	-30.05	0	100	V
		* 7.30744	35.98	PK2	35.80	-25.50	0.00	46.28	-	-	74.00	-27.72	250	224	H
		* 7.30999	24.96	MAv1	35.80	-25.50	0.16	35.42	54.00	-18.58	-	-	250	224	H
		* 7.30804	36.18	PK2	35.80	-25.50	0.00	46.48	-	-	74.00	-27.52	235	106	V
		* 7.30639	24.52	MAv1	35.80	-25.50	0.16	34.98	54.00	-19.02	-	-	235	106	V
		9.753	31.92	PK2	36.90	-21.60	0.00	47.22	-	-	74.00	-26.78	0	100	H
		9.745	31.48	PK2	36.90	-21.60	0.00	46.78	-	-	74.00	-27.22	0	100	V
2457	MIMO	* 4.91335	40.06	PK2	34.20	-29.90	0.00	44.36	-	-	74.00	-29.64	0	100	H
		* 4.91301	40.41	PK2	34.20	-29.90	0.00	44.71	-	-	74.00	-29.29	0	100	V
		* 7.3692	36.74	PK2	35.80	-25.40	0.00	47.14	-	-	74.00	-26.86	251	222	H
		* 7.36611	24.86	MAv1	35.80	-25.40	0.16	35.42	54.00	-18.58	-	-	251	222	H
		* 7.35542	34.66	PK2	35.80	-25.40	0.00	45.06	-	-	74.00	-28.94	234	177	V
		* 7.37515	23.21	MAv1	35.70	-25.40	0.16	33.67	54.00	-20.33	-	-	234	177	V
		9.828	31.75	PK2	37.10	-21.50	0.00	47.35	-	-	74.00	-26.65	0	100	H
		9.828	32.30	PK2	37.10	-21.50	0.00	47.90	-	-	74.00	-26.10	0	100	V

Note1. PK2 - KDB558074 Method: Maximum Peak / MAv1 - KDB558074 Option 1 Maximum RMS Average

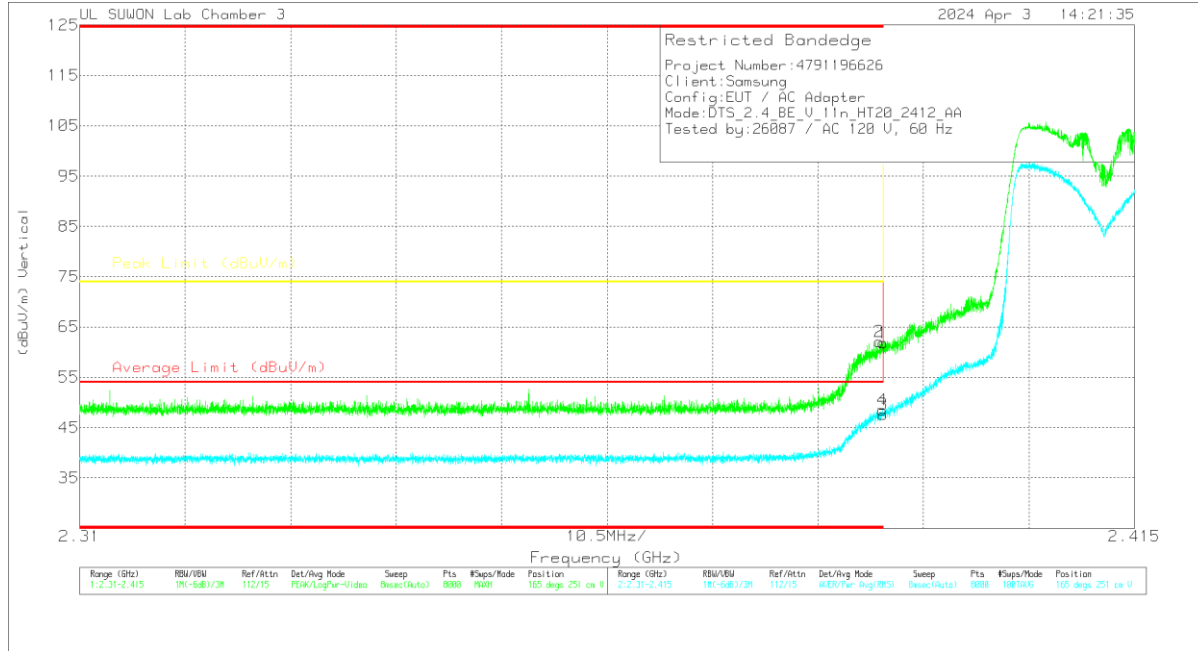
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

10.1.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

2TX Antenna 1 + Antenna 2

BANDEDGE (WORST CASE: 1 CHANNEL)

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_S57_Factor(dB)	10dB_Path Loss(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	* 2.39	54.6	Pk	32.1	-24.8	0	61.9	-	-	74	-12.1	165	251	V
2	* 2.38959	54.78	Pk	32.1	-24.8	0	62.08	-	-	74	-11.92	165	251	V
3	* 2.39	40.22	RMS	32.1	-24.8	.09	47.61	54	-6.39	-	-	165	251	V
4	* 2.38993	41.1	RMS	32.1	-24.8	.09	48.49	54	-5.51	-	-	165	251	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

BANDEDGE TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
2412	MIMO	* 2.39	52.05	Pk	32.10	-24.80	0.00	59.35	-	-	74.00	-14.65	167	211	H	
		* 2.38985	52.70	Pk	32.10	-24.80	0.00	60.00	-	-	74.00	-14.00	167	211	H	
		* 2.39	38.22	RMS	32.10	-24.80	0.09	45.61	54.00	-8.39	-	-	-	167	211	H
		* 2.38998	38.82	RMS	32.10	-24.80	0.09	46.21	54.00	-7.79	-	-	-	167	211	H
		* 2.39	54.60	Pk	32.10	-24.80	0.00	61.90	-	-	74.00	-12.10	165	251	V	
		* 2.38959	54.78	Pk	32.10	-24.80	0.00	62.08	-	-	74.00	-11.92	165	251	V	
		* 2.39	40.22	RMS	32.10	-24.80	0.09	47.61	54.00	-6.39	-	-	-	165	251	V
		* 2.38993	41.10	RMS	32.10	-24.80	0.09	48.49	54.00	-5.51	-	-	-	165	251	V
2457	MIMO	* 2.4835	44.77	Pk	32.40	-24.80	0.00	52.37	-	-	74.00	-21.63	144	103	H	
		* 2.48364	45.99	Pk	32.40	-24.80	0.00	53.59	-	-	74.00	-20.41	144	103	H	
		* 2.4835	34.06	RMS	32.40	-24.80	0.09	41.75	54.00	-12.25	-	-	-	144	103	H
		* 2.48355	34.70	RMS	32.40	-24.80	0.09	42.39	54.00	-11.61	-	-	-	144	103	H
		* 2.4835	44.90	Pk	32.40	-24.80	0.00	52.50	-	-	74.00	-21.50	246	101	V	
		* 2.48512	48.27	Pk	32.40	-24.80	0.00	55.87	-	-	74.00	-18.13	246	101	V	
		* 2.4835	34.93	RMS	32.40	-24.80	0.09	42.62	54.00	-11.38	-	-	-	246	100	V
		* 2.48351	35.96	RMS	32.40	-24.80	0.09	43.65	54.00	-10.35	-	-	-	246	100	V
2462	MIMO	* 2.4835	50.83	Pk	32.40	-24.80	0.00	58.43	-	-	74.00	-15.57	141	105	H	
		* 2.48386	53.57	Pk	32.40	-24.80	0.00	61.17	-	-	74.00	-12.83	141	105	H	
		* 2.4835	39.11	RMS	32.40	-24.80	0.09	46.80	54.00	-7.20	-	-	-	141	105	H
		* 2.48369	39.59	RMS	32.40	-24.80	0.09	47.28	54.00	-6.72	-	-	-	141	105	H
		* 2.4835	50.93	Pk	32.40	-24.80	0.00	58.53	-	-	74.00	-15.47	261	186	V	
		* 2.48524	53.77	Pk	32.40	-24.80	0.00	61.37	-	-	74.00	-12.63	261	186	V	
		* 2.4835	38.70	RMS	32.40	-24.80	0.09	46.39	54.00	-7.61	-	-	-	261	186	V
		* 2.4838	40.70	RMS	32.40	-24.80	0.09	48.39	54.00	-5.61	-	-	-	261	186	V
2467	MIMO	* 2.4835	41.53	Pk	32.40	-24.80	0.00	49.13	-	-	74.00	-24.87	129	106	H	
		2.505	45.07	Pk	32.40	-24.70	0.00	52.77	-	-	74.00	-21.23	129	106	H	
		* 2.4835	32.12	RMS	32.40	-24.80	0.09	39.81	54.00	-14.19	-	-	-	129	106	H
		2.556	32.95	RMS	32.40	-24.70	0.09	40.74	54.00	-13.26	-	-	-	129	106	H
		* 2.4835	41.18	Pk	32.40	-24.80	0.00	48.78	-	-	74.00	-25.22	250	283	V	
		2.560	44.47	Pk	32.40	-24.70	0.00	52.17	-	-	74.00	-21.83	250	283	V	
		* 2.4835	31.77	RMS	32.40	-24.80	0.09	39.46	54.00	-14.54	-	-	-	250	283	V
		2.530	33.14	RMS	32.40	-24.70	0.09	40.93	54.00	-13.07	-	-	-	250	283	V
2472	MIMO	* 2.4835	42.69	Pk	32.40	-24.80	0.00	50.29	-	-	74.00	-23.71	136	104	H	
		2.547	44.35	Pk	32.40	-24.70	0.00	52.05	-	-	74.00	-21.95	136	104	H	
		* 2.4835	32.08	RMS	32.40	-24.80	0.09	39.77	54.00	-14.23	-	-	-	136	104	H
		2.558	32.99	RMS	32.40	-24.70	0.09	40.78	54.00	-13.22	-	-	-	136	104	H
		* 2.4835	43.47	Pk	32.40	-24.80	0.00	51.07	-	-	74.00	-22.93	262	184	V	
		2.505	44.14	Pk	32.40	-24.60	0.00	51.94	-	-	74.00	-22.06	262	184	V	
		* 2.4835	32.40	RMS	32.40	-24.80	0.09	40.09	54.00	-13.91	-	-	-	262	184	V
		2.518	33.10	RMS	32.40	-24.80	0.09	40.79	54.00	-13.21	-	-	-	262	184	V

Note1. Pk - Peak detector, RMS - RMS detector
 Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band