



CERTIFICATION TEST REPORT

Report Number. : 4790541052-E3V2

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

Model : SM-S918B/DS, SM-S918B

FCC ID : A3LSMS918B

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:

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Prepared by:

UL Korea, Ltd.

26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL Korea, LTD. Suwon Laboratory

218 Maeyeong-ro, Yeongtong-gu

Suwon-si, Gyeonggi-do, 16675, Korea

TEL: (031) 337-9902

FAX: (031) 213-5433



Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	2022-10-28	Initial issue	Hyunsik Yun
V2	2022-11-09	Updated to address TCB's Question	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-S918B/DS, SM-S918B
SERIAL NUMBER: R3CT7081YTB, R3CT7081YEP (CONDUCTED); R3CT90WSHFB (RADIATED);
DATE TESTED: 2022-09-13 ~ 2022-10-28;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 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:



Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Hyunsik Yun
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

1. FCC CFR 47 Part 2.
2. FCC CFR 47 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:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$28.9 \text{ dBuV/m} = 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB}$$

$$\text{Corrected Reading (dBuV)} = \text{Meter Reading (dBuV)} + \text{External Cable (dB)} + \text{Cableloss (dB)}$$

$$46.62 \text{ dBuV} + 9.8 \text{ dB} + 0.1 \text{ dB} = 56.52 \text{ dBuV}$$

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	3.02 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.05 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.78 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.58 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 Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

5. EQUIPMENT UNDER TEST

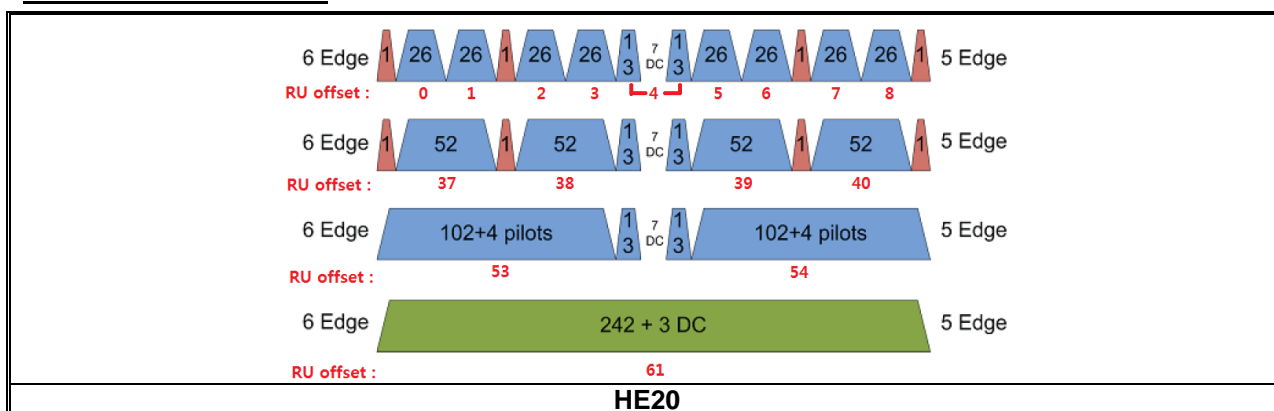
5.1. EUT DESCRIPTION

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.

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
		40
106T	53	
242T / SU ^{Note 1}	54	
		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	21.58		143.88	
	802.11g MIMO	20.59		114.55	
	802.11n(HT20) MIMO	20.58		114.29	
	802.11ax(HE20) MIMO	19.28		84.72	

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	-4.49	-8.38	-3.21

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 = $10 \log[(10^{0.40/20} + 10^{0.30/20})^2 / 2] = 3.36$ dBi

“Wi-Fi 1” and “Wi-Fi 2” as indicated in antenna specification are written as ANT 1 and ANT 2 in this report.

5.4. TESTED CHANNELS LIST

Ch.	Frequency [MHz]	11b		11g		11n(HT20)		11ax(HE20)	
		SISO ANT2	MIMO	SISO ANT2	MIMO	SISO ANT2	MIMO	SISO ANT2	MIMO
1	2 412		○		○		○		○
6	2 437		○		○		○		○
11	2 462		○		○		○		○
12	2 467		○		○		○		○
13	2 472		○		○		○		○

5.5. WORST-CASE CONFIGURATION AND 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.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/High Channels.

Worst case of antenna axis:

ANT2	MIMO
Z	X

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

Worst-case selection criteria for 802.11ax test items :

For the 6dB Bandwidth, it was tested at the RU allocation with lowest tones number for each bandwidth.

All radiated and power line conducted tests were performed attached with travel adapter for the worst-case condition mode.

Test case configuration for 802.11b, g, n HT20, ax HE20(SU)modes :

SISO ANT2 Target[dBm]						MIMO Target[dBm]					
Ch.	Freq.	802.11b	802.11g	802.11n HT20	802.11ax HE20	Ch.	Freq.	802.11b	802.11g	802.11n HT20	802.11ax HE20
1	2412	18	17	17	16	1	2412	21	20	20	19
6	2437	18	17	17	16	6	2437	21	20	20	19
11	2462	18	17	17	16	11	2462	21	20	20	19
12	2467	5	5	5	5	12	2467	8	8	8	8
13	2472	-1	-1	-1	-1	13	2472	2	2	2	2

	Radiated Band-Edge, Conducted Band-Edge
	Radiated Band-Edge, Radiated Spurious Emission, Conducted Band-Edge, Conducted Spurious Emission, PSD
	Radiated Spurious Emission, Conducted Spurious Emission, PSD

Note1. CH12, 13 SISO & MIMO target power is same. Therefore, radiation was tested in SISO mode. MIMO mode was performed spot-check.

Note2. In 802.11ax (RU mode), conducted & radiated spurious test was performed on the lower tone(26T) with high density.

Test case configuration for 802.11ax HE20(RU) modes :

MIMO Worst RU offset[dBm]					
Mode	Ch.	Freq.	Tone	RU offset	Test Case
802.11ax RU mode	1	2412	26 T	0	-
				4	-
				8	O
	6	2437		0	-
				4	-
				8	O
	11	2462		0	O
				4	-
				8	-

Note1. In 802.11ax HE20(RU) mode, the test case according to RU offset was selected from the offset with worst average power.

Note2. Radiated Band-Edge: investigated additional test with other lower RU tones. SU Mode (Worst case) is reported.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37R38J4A28SE3	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02111ABBE	N/A

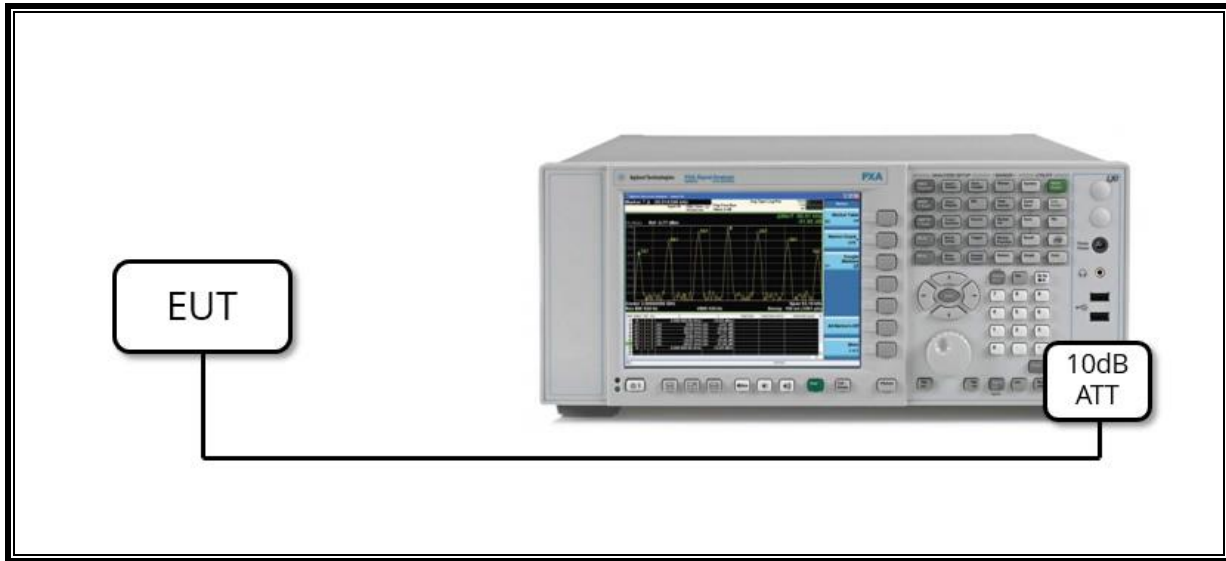
I/O CABLE

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

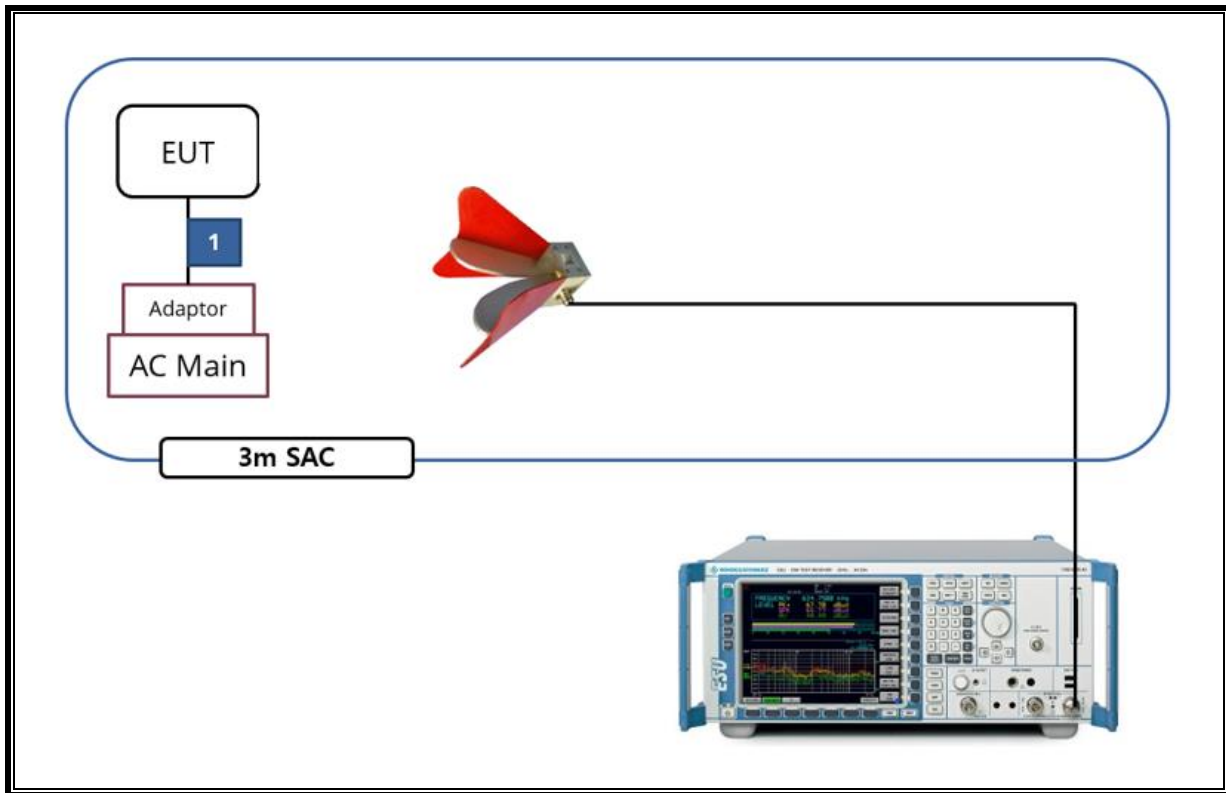
TEST SETUP

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, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2024-08-15
Antenna, Horn, 18 GHz	ETS	3115	00167211	2024-08-04
Antenna, Horn, 18 GHz	ETS	3115	00161451	2024-08-21
Antenna, Horn, 18 GHz	ETS	3117	00168724	2024-08-04
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	2023-08-04
Preamplifier, 1000 MHz	Sonoma	310N	341282	2023-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2023-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2023-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2023-08-01
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2023-08-01
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2023-08-03
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2023-08-01
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY60070693	2023-01-18
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9040B	MY60080268	2023-01-19
Average Power Sensor	Agilent / HP	U2000A	MY54270007	2023-08-03
Average Power Sensor	Agilent / HP	U2000A	MY54260010	2023-08-03
Attenuator	PASTERNAK	PE7087-10	A001	2023-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2023-08-03
Attenuator	PASTERNAK	PE7004-10	2	2023-08-01
Attenuator	PASTERNAK	PE7087-10	A009	2023-08-03
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2023-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2023-07-29
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2023-08-01
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2023-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2023-08-01
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	2023-08-01
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2023-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2023-08-01
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2023-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	2023-08-01
LISN	R&S	ENV-216	101837	2023-08-04
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2023-10-06
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	PASS
2.1051, 15.247(d)	Band Edge / Conducted Spurious Emission	-30 dBc		PASS
15.247 (b)(3)	TX conducted output power	< 30 dBm		PASS
15.247(e)	PSD	< 8 dBm/3kHz		PASS
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	PASS
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	PASS

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

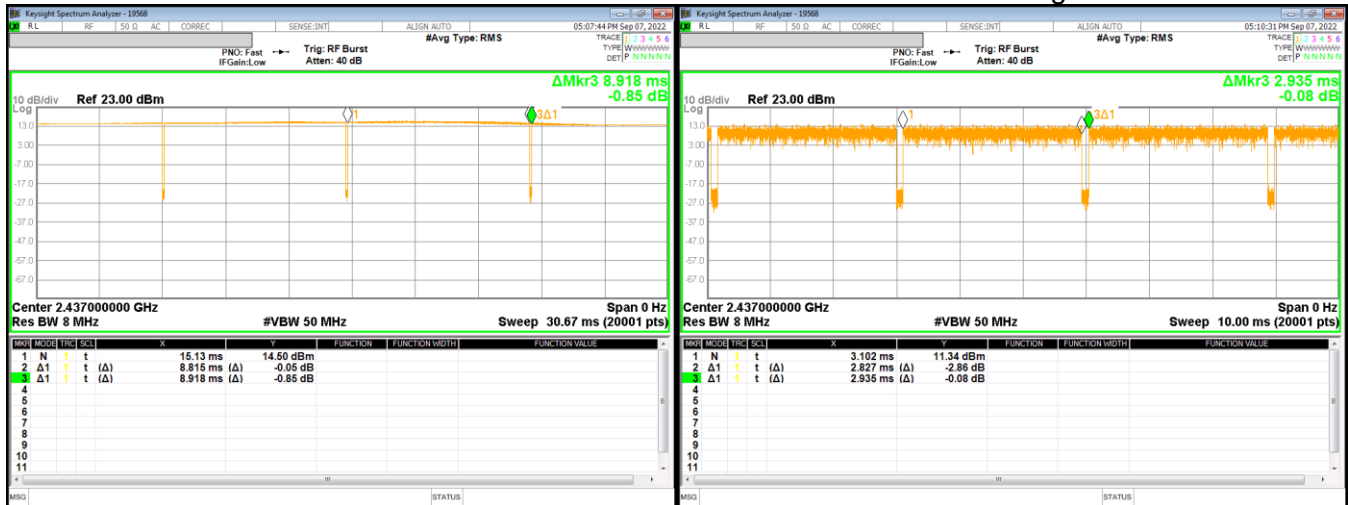
None; for reporting purposes only.

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	8.815	8.918	0.988	98.845	-	0.11
802.11g MIMO	2.827	2.935	0.963	96.320	0.16	0.35
802.11n(HT20) MIMO	5.018	5.136	0.977	97.702	0.10	0.20
802.11ax(HE20) MIMO SU	2.589	2.641	0.980	98.031	-	0.39
802.11ax(HE20) MIMO 26T	2.586	2.613	0.990	98.967	-	0.39
802.11ax(HE20) MIMO 52T	1.433	1.461	0.981	98.084	-	0.70
802.11ax(HE20) MIMO 106T	5.439	5.459	0.996	99.634	-	0.18

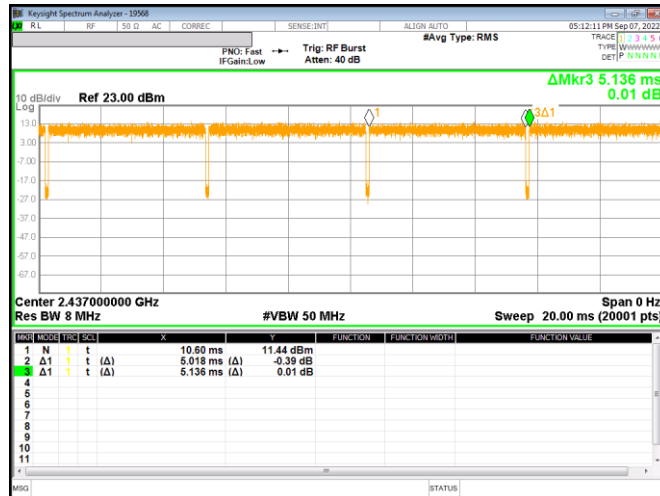
Note. According to ANSI C63.10 Section 11.6, do not apply the Duty Cycle Correction Factor judging that a duty cycle of greater than or equal to 98% is continuous signal.

802.11b

802.11g

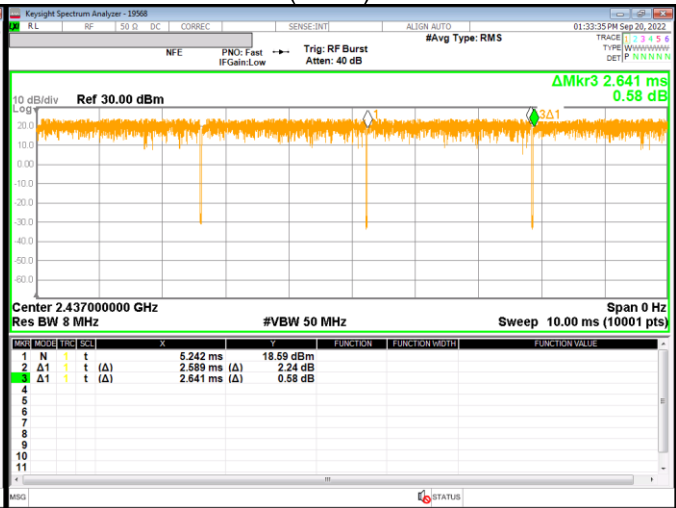
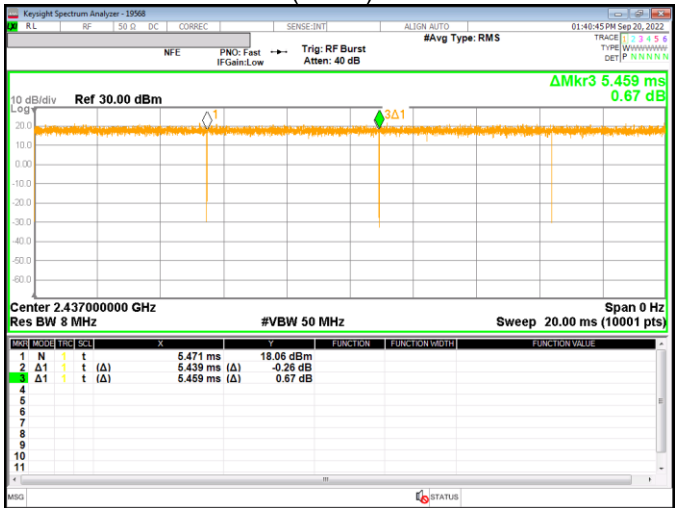


802.11n HT20



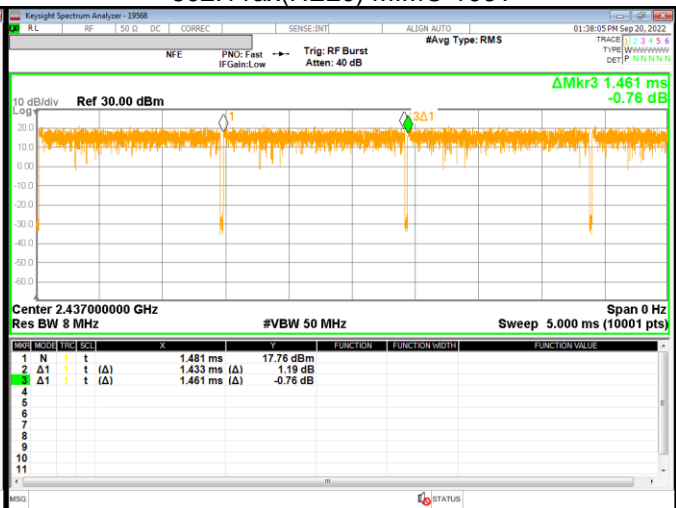
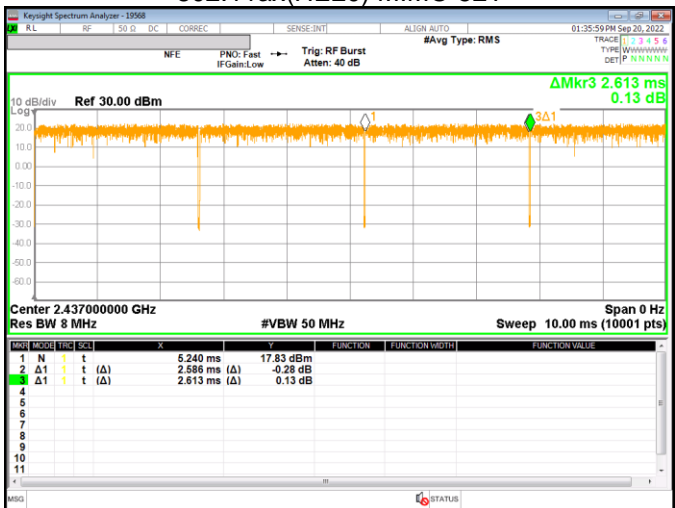
802.11ax(HE20) MIMO SU

802.11ax(HE20) MIMO 26T



802.11ax(HE20) MIMO 52T

802.11ax(HE20) MIMO 106T



9.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

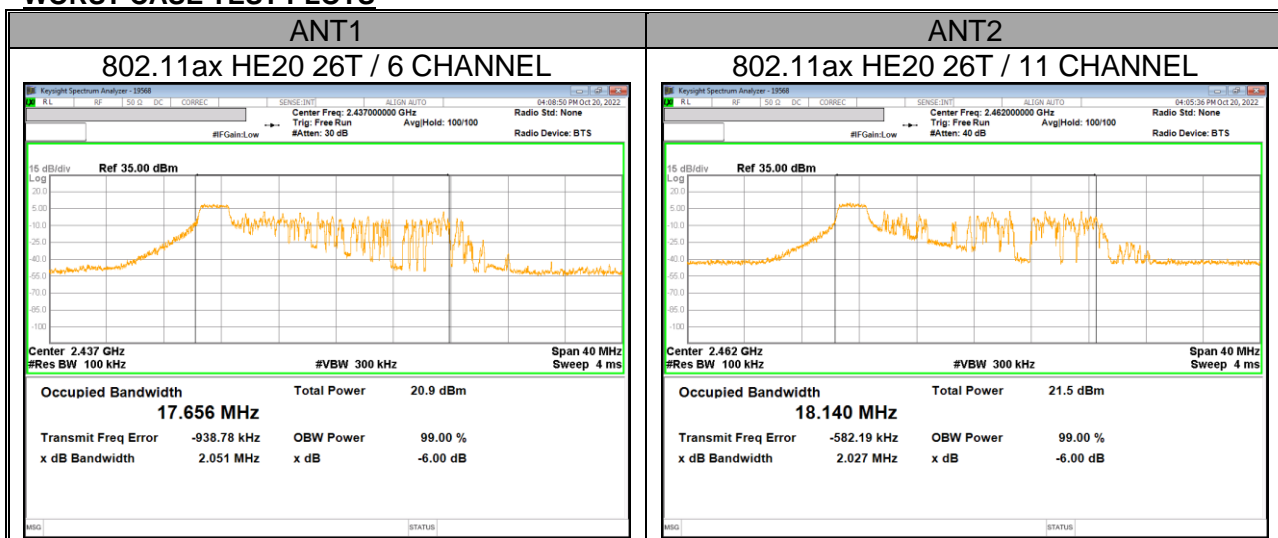
TEST PROCEDURE

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 SISO MODE IN THE 2.4 GHZ BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANT 1	ANT 2	
1	2 412	7.562	7.097	0.5
6	2 437	7.113	7.564	
11	2 462	8.016	7.071	
12	2 467	7.076	7.091	
13	2 462	7.602	7.113	
Worst		7.076	7.071	

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	16.340	16.340	0.5
6	2 437	16.300	16.320	
11	2 462	16.310	16.350	
12	2 467	16.320	16.320	
13	2 472	16.060	16.320	
Worst		16.060	16.320	

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	17.570	17.610	0.5
6	2 437	17.580	17.570	
11	2 462	17.580	17.580	
12	2 467	17.580	17.530	
13	2 472	17.200	17.540	
Worst		17.200	17.530	

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	2.060	2.071	0.5
6	2 437	2.051	2.058	
11	2 462	2.094	2.027	
12	2 467	2.076	2.057	
13	2 472	2.057	2.057	
Worst		2.051	2.027	

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	-4.49	-8.38	-3.21

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]	SISO Average Power [dBm]		MIMO Average Power [dBm]			Power Limit [dBm]
			ANT1	ANT2	ANT1	ANT2	Total Corr'd Power [dBm]	
802.11b	1	2 412		18.72	18.41	18.72	21.58	30.00
	6	2 437		18.40	18.19	18.40	21.31	
	11	2 462		18.47	18.44	18.47	21.47	
	12	2 467		5.88	5.08	4.30	7.72	
	13	2 472		-0.77	-0.56	-0.96	2.25	
Worst Case				18.72			21.58	
802.11g	1	2 412		17.75	17.33	17.82	20.59	
	6	2 437		17.50	17.22	17.54	20.39	
	11	2 462		17.55	17.54	17.59	20.58	
	12	2 467		4.35	4.72	4.11	7.44	
	13	2 472		-0.56	-0.44	-0.76	2.41	
Worst Case				17.75			20.59	
802.11n HT20	1	2 412		17.79	17.30	17.82	20.58	
	6	2 437		17.53	17.25	17.54	20.41	
	11	2 462		17.57	17.53	17.58	20.57	
	12	2 467	4.36	4.61	4.07	7.36		
	13	2 472	-0.59	-0.55	-0.82	2.33		
Worst Case			17.79			20.58		
802.11ax HE20(SU)	1	2 412		15.93	16.59	19.28		
	6	2 437		15.28	15.93	18.63		
	11	2 462		15.90	16.46	19.20		
	12	2 467		4.48	4.22	7.36		
	13	2 472		-0.77	-0.77	-0.80	2.23	
Worst Case						19.28		

- 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	SISO Average Power [dBm]		MIMO Average Power [dBm]			Power Limit [dBm]
				ANT1	ANT2	ANT1	ANT2	Total Corr'd Power [dBm]	
1	2 412	26T	0			12.33	13.72	16.09	30.00
			4			12.58	13.25	15.94	
			8			13.11	13.06	16.10	
		52T	37			13.45	14.92	17.26	
			38			13.22	14.31	16.81	
			40			14.39	14.60	17.51	
		106T	53			14.09	15.39	17.80	
			54			15.16	15.55	18.37	
6	2 437	26T	0			13.42	13.72	16.58	
			4			12.81	13.39	16.12	
			8			13.19	13.93	16.59	
		52T	37			14.26	14.67	17.48	
			38			14.03	14.53	17.30	
			40			14.13	14.89	17.54	
		106T	53			15.11	15.66	18.40	
			54			14.85	15.77	18.34	
11	2 462	26T	0			13.53	13.92	16.74	
			4			13.14	13.42	16.29	
			8			13.39	13.48	16.45	
		52T	37			14.00	14.44	17.24	
			38			14.26	14.66	17.47	
			40			14.27	14.47	17.38	
		106T	53			15.23	15.87	18.57	
			54			15.04	15.54	18.31	
12	2 467	26T	0			5.13	5.00	8.08	
			4			4.67	4.35	7.52	
			8			4.74	4.36	7.56	
		52T	37			5.17	5.03	8.11	
			38			4.83	4.62	7.74	
			40			4.80	4.43	7.63	
		106T	53			4.93	4.73	7.84	
			54			4.68	4.30	7.50	
13	2 472	26T	0			-0.06	-0.37	2.80	
			4			-0.66	-1.19	2.09	
			8			-0.61	-1.10	2.16	
		52T	37			-0.20	-0.51	2.66	
			38			-0.44	-0.88	2.36	
			40			-0.66	-1.12	2.13	
		106T	53			-0.64	-0.66	2.36	
			54			-0.73	-0.71	2.29	
Worst Case							19.28		

9.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

RSS-247 (5.2) (b)

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.

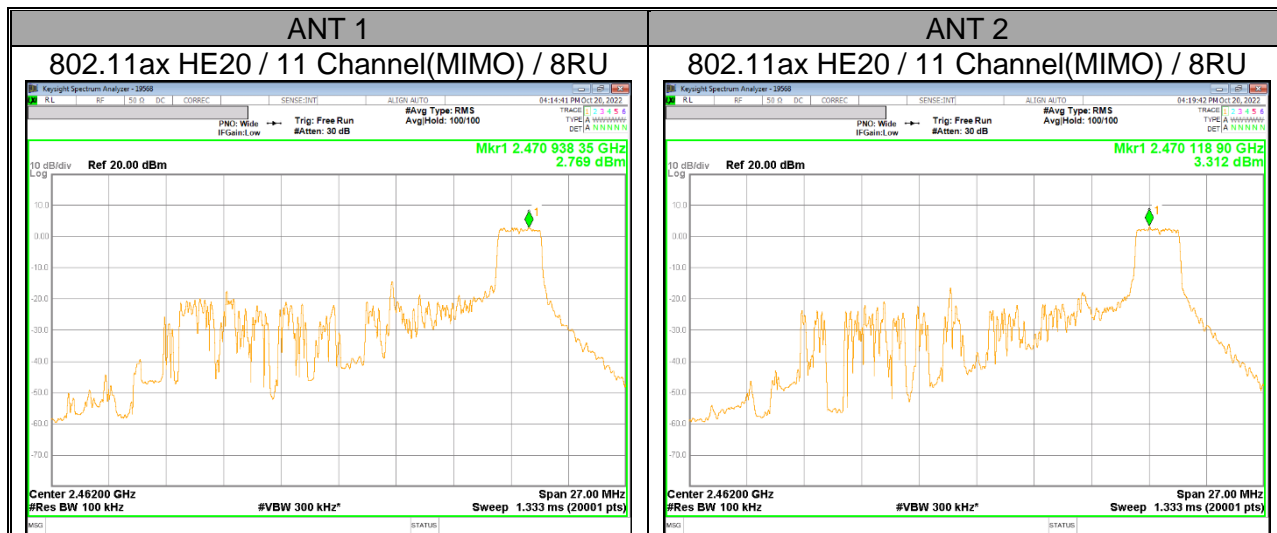
TEST PROCEDURE

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 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	-0.78	-0.59	0.00	2.32	8.00 ^{Note}
	6	2 437	-1.17	-0.91	0.00	1.97	
	11	2 462	-0.75	-0.54	0.00	2.37	
	12	2 467	-14.65	-15.20	0.00	-11.91	
	13	2 472	-19.77	-19.65	0.00	-16.70	
802.11g	1	2 412	-5.72	-4.57	0.16	-1.94	
	6	2 437	-5.79	-5.24	0.16	-2.34	
	11	2 462	-5.00	-4.76	0.16	-1.71	
	12	2 467	-18.51	-18.96	0.16	-15.56	
	13	2 472	-23.64	-23.83	0.16	-20.56	
802.11n HT20	1	2 412	-6.10	-5.43	0.10	-2.64	
	6	2 437	-6.02	-5.89	0.10	-2.84	
	11	2 462	-5.96	-5.57	0.10	-2.65	
	12	2 467	-18.68	-18.82	0.10	-15.64	
	13	2 472	-23.99	-23.63	0.10	-20.70	

- MIMO Mode(802.11ax HE20)

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	0.75	2.14		4.51	8.00 ^{Note}
			4	1.58	2.14		4.88	
			8	2.68	2.72		5.71	
6	2 437	26T	0	2.31	2.58		5.46	
			4	1.64	2.04		4.86	
			8	1.50	2.45		5.01	
11	2 462	26T	0	2.32	2.79		5.57	
			4	2.60	2.79		5.70	
			8	2.77	3.31		6.06	

Calculation of Output PSD result

- 1TX : Corr'd PSD = Meas PSD + Duty Cycle CF
 - 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

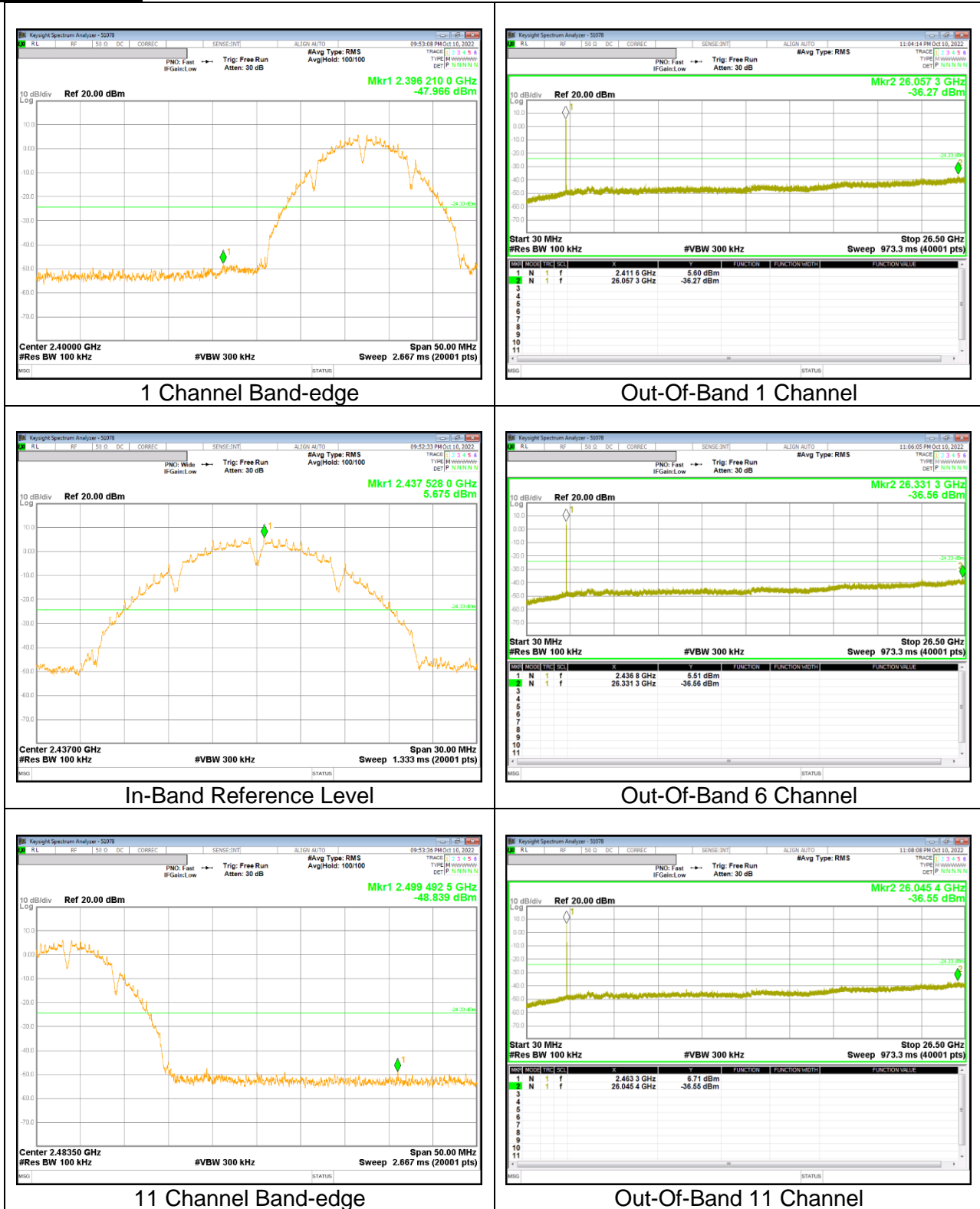
FCC §15.247 (d)

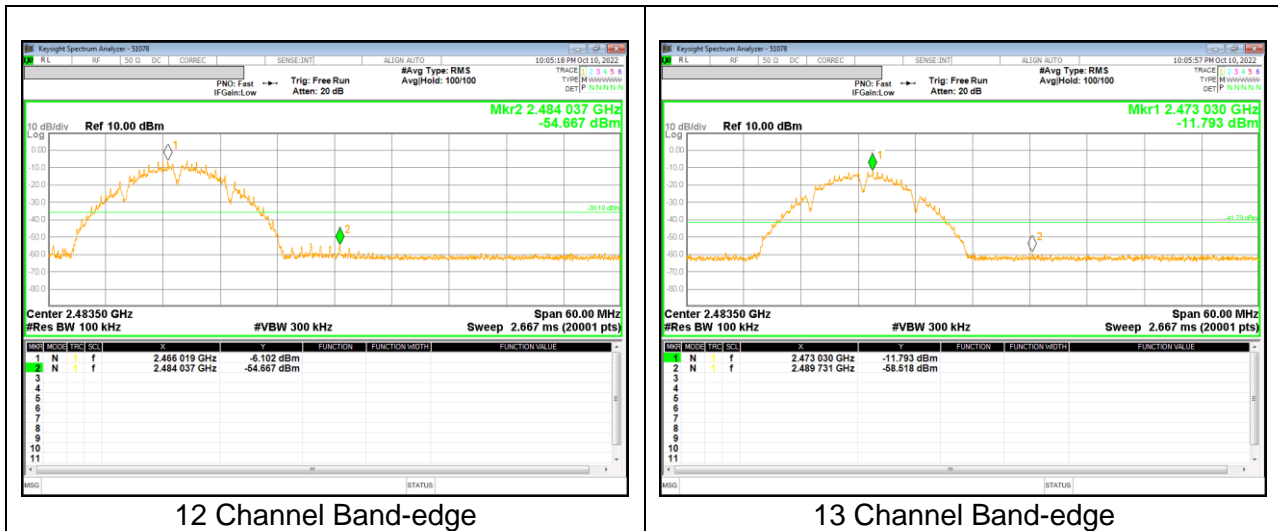
Output power was measured based on the use of average measurement, therefore the required attenuation is 30 dB.

RESULTS

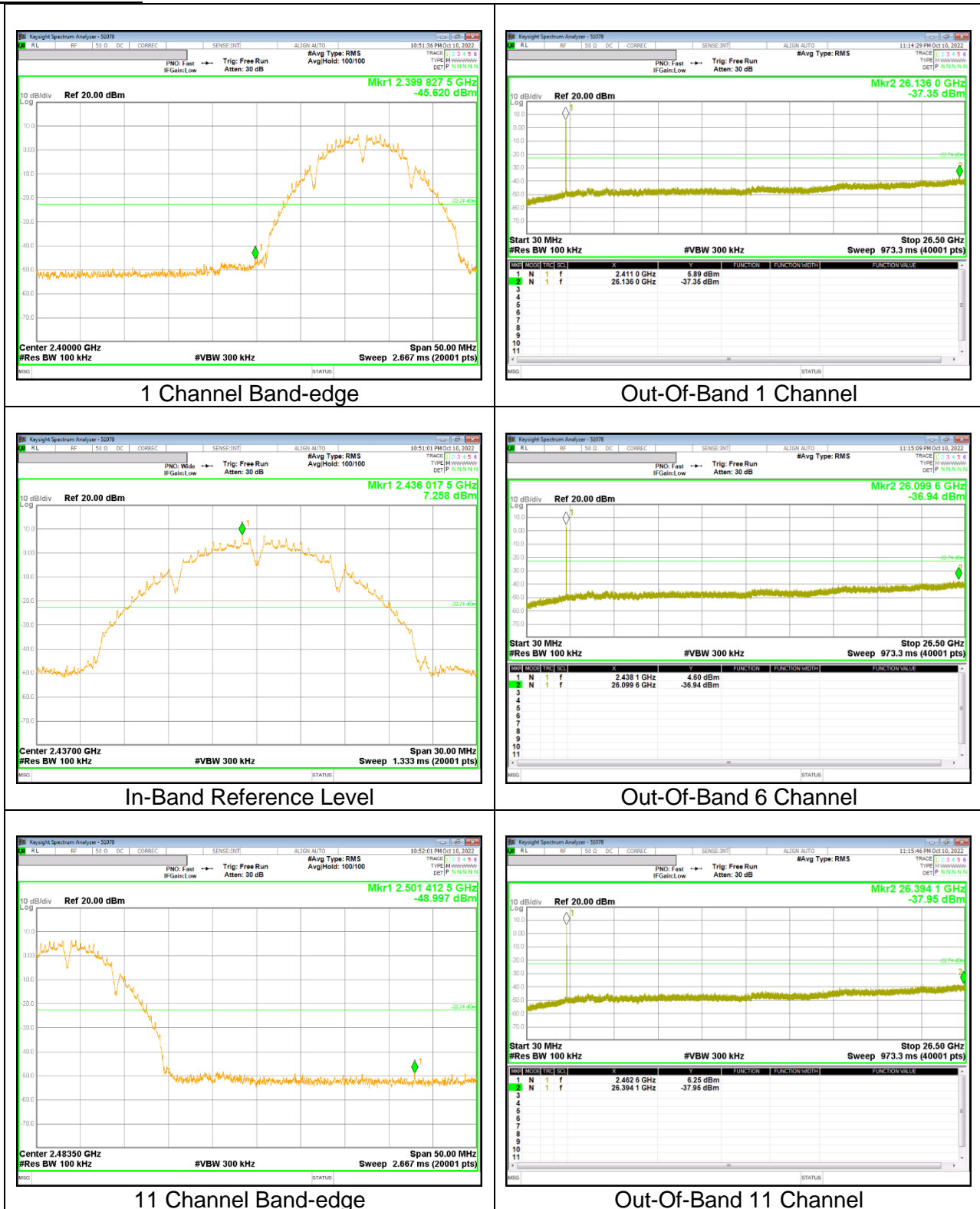
9.5.1. 802.11b MODE

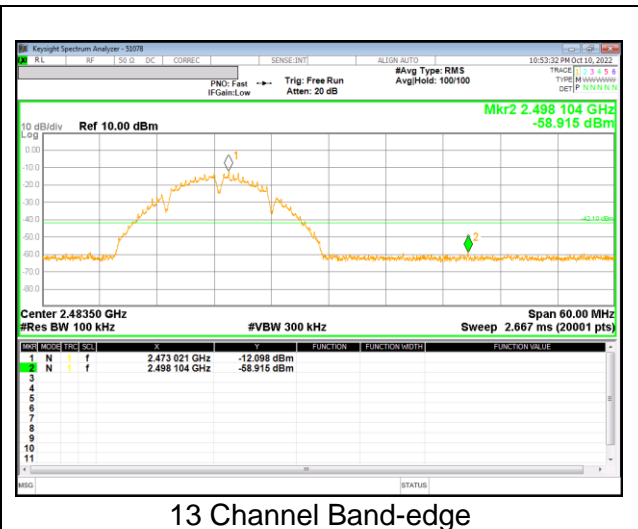
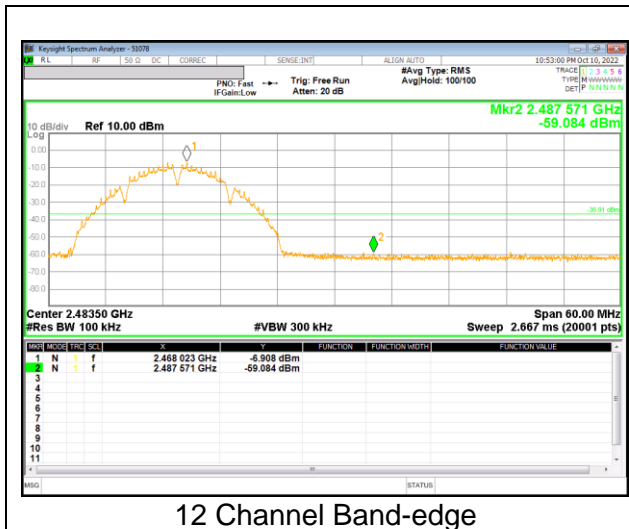
1TX Antenna 1





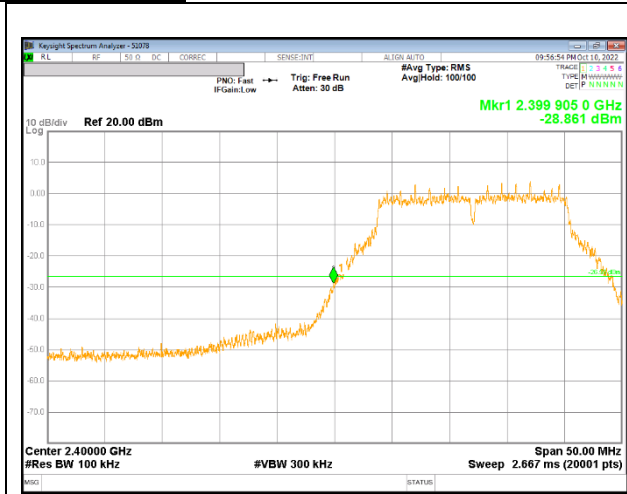
1TX Antenna 2



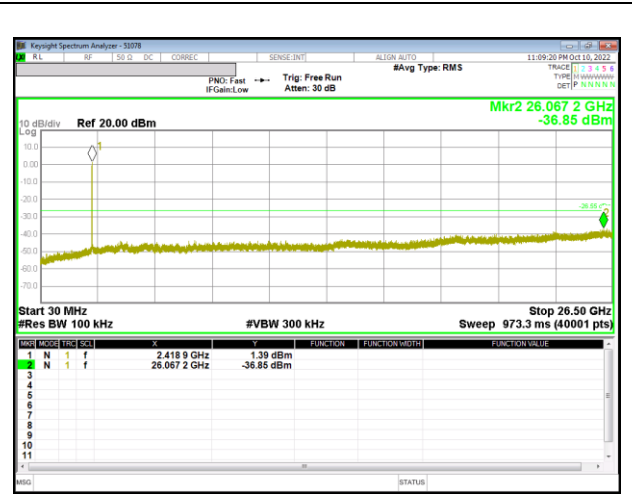


9.5.2. 802.11g MODE

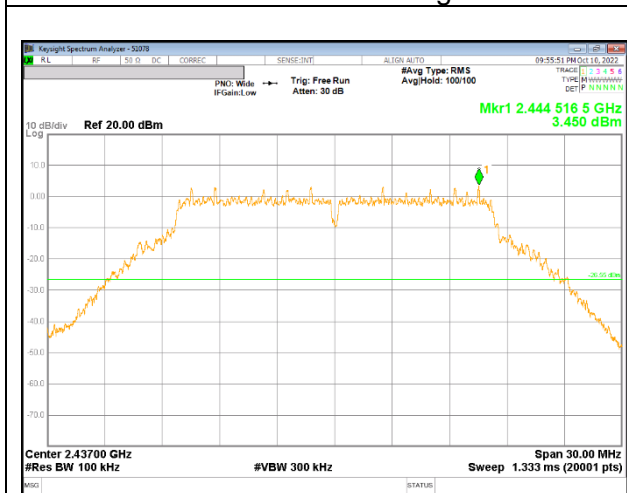
2TX Antenna 1



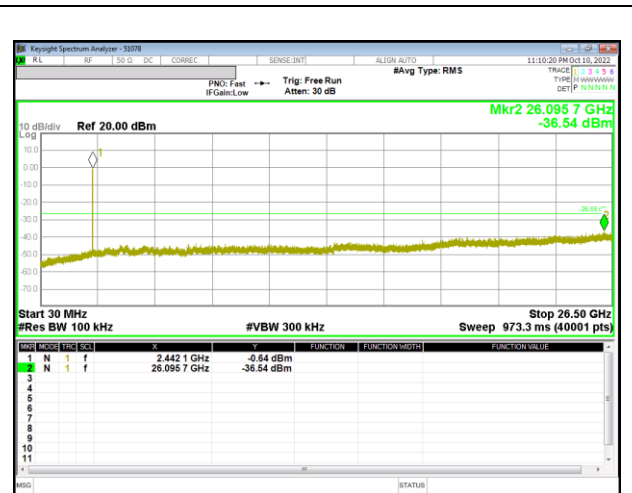
1 Channel Band-edge



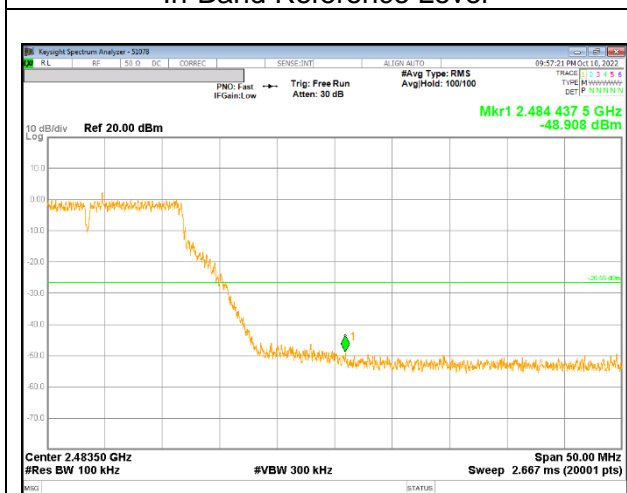
Out-Of-Band 1 Channel



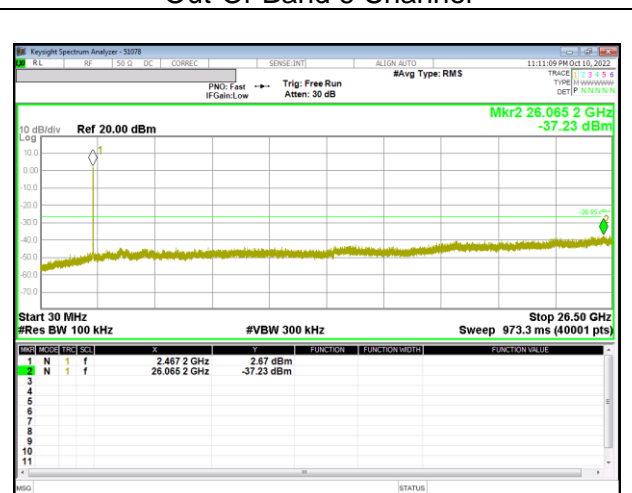
In-Band Reference Level



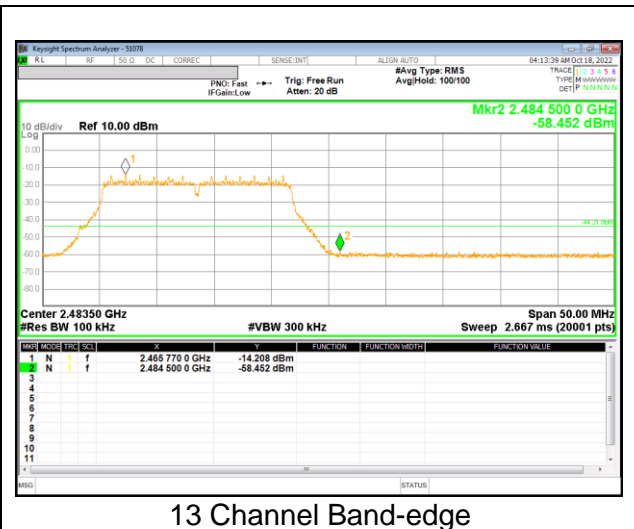
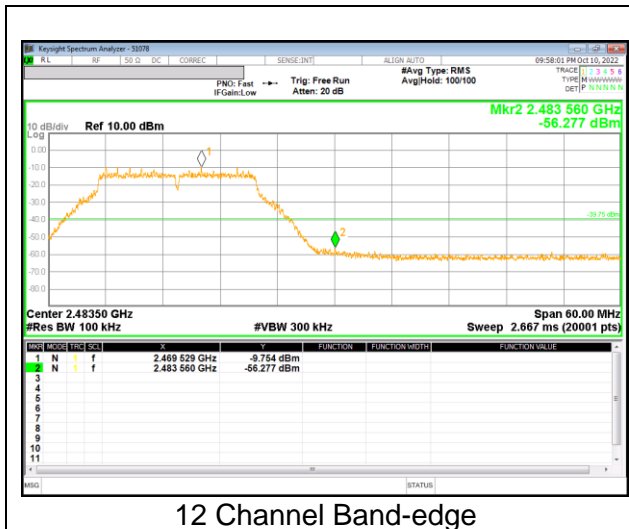
Out-Of-Band 6 Channel



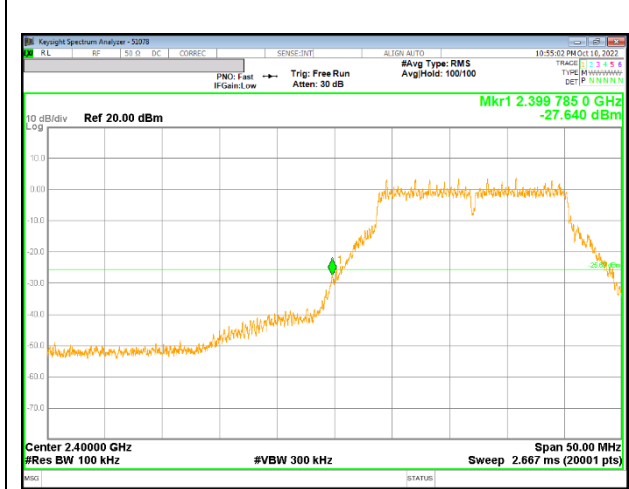
11 Channel Band-edge



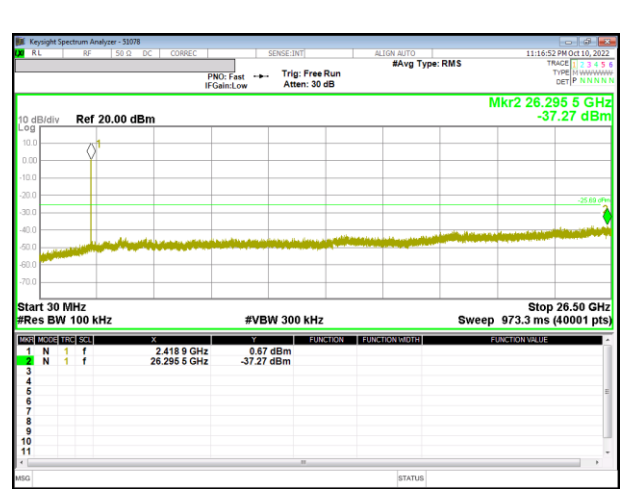
Out-Of-Band 11 Channel



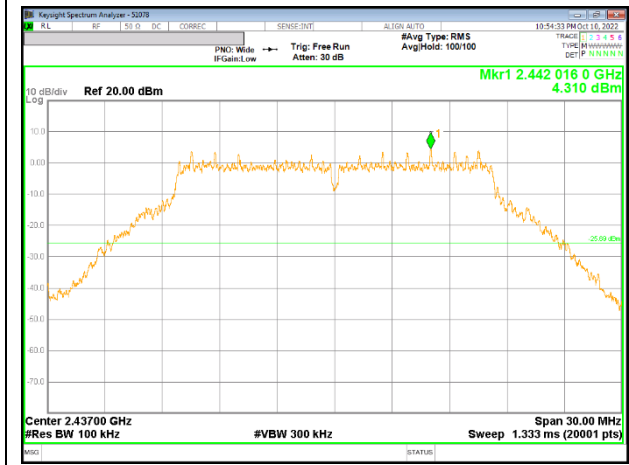
2TX Antenna 2



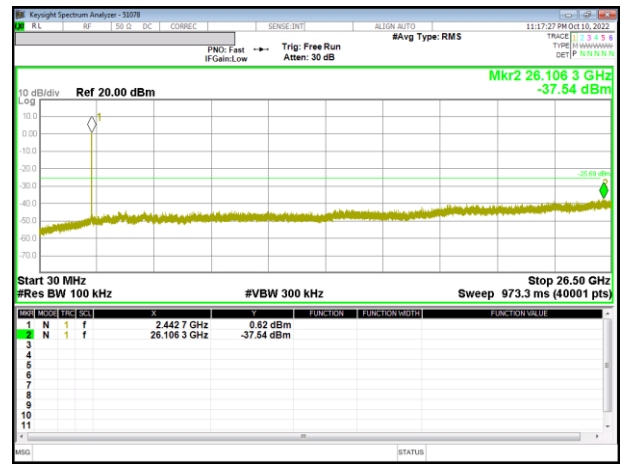
1 Channel Band-edge



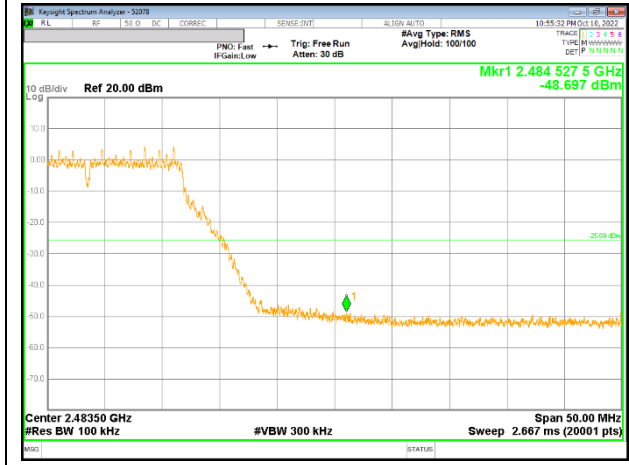
Out-Of-Band 1 Channel



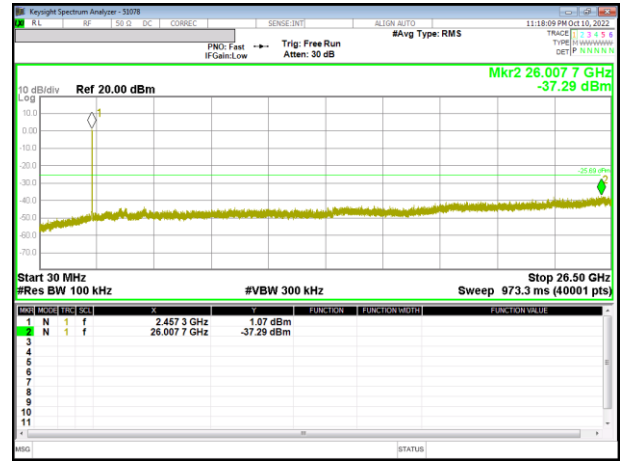
In-Band Reference Level



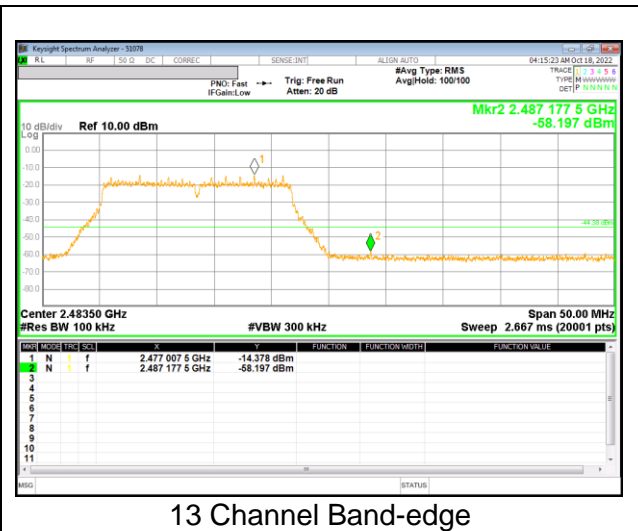
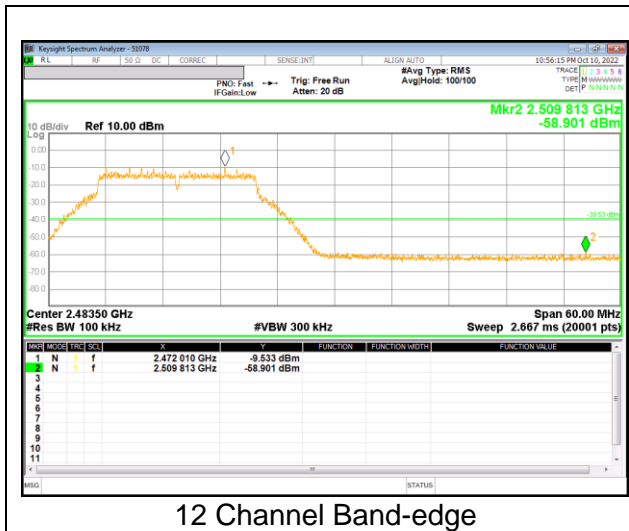
Out-Of-Band 6 Channel



11 Channel Band-edge

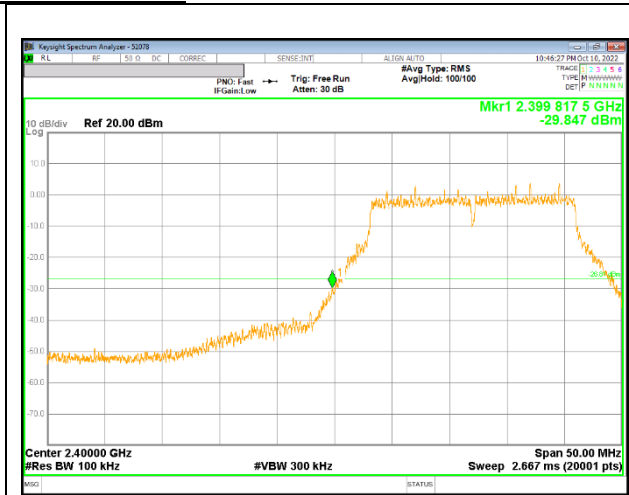


Out-Of-Band 11 Channel

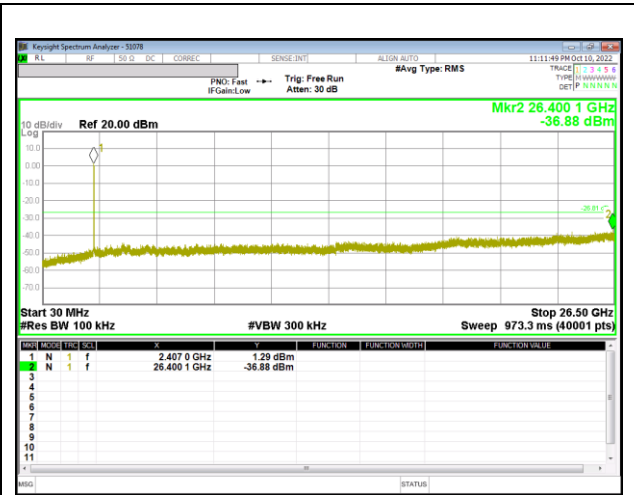


9.5.3. 802.11n HT20 MODE

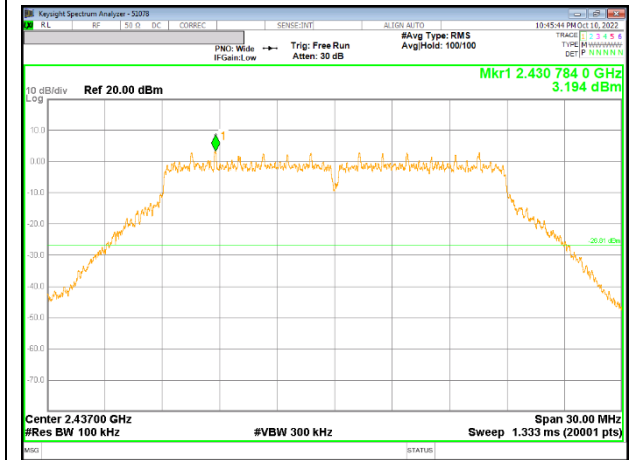
2TX Antenna 1



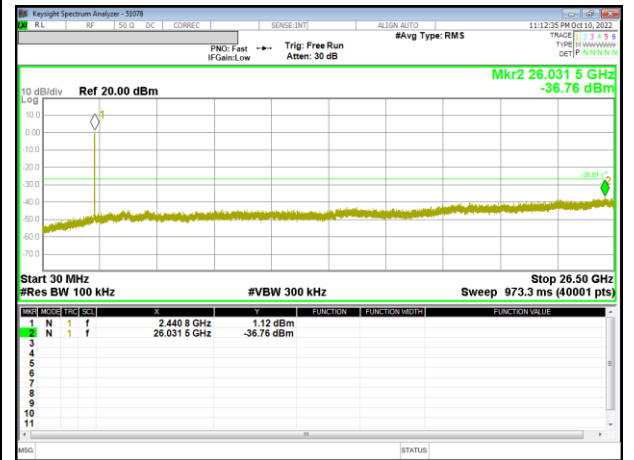
1 Channel Band-edge



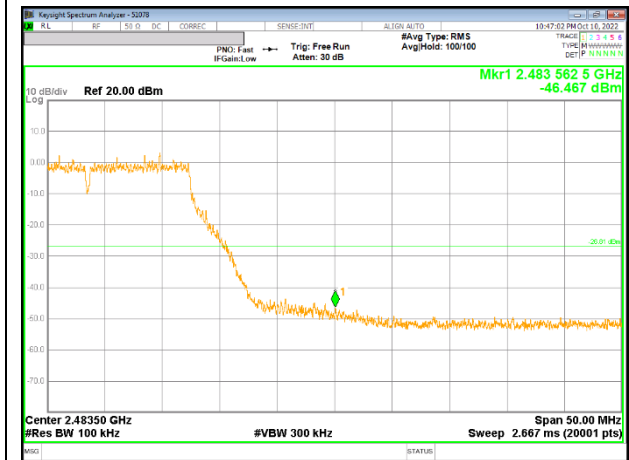
Out-Of-Band 1 Channel



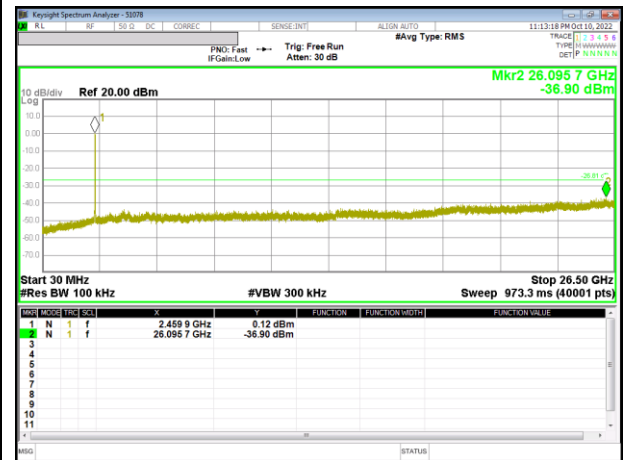
In-Band Reference Level



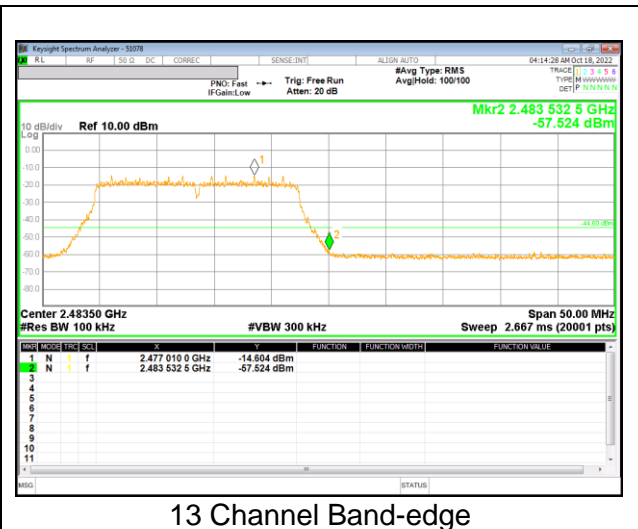
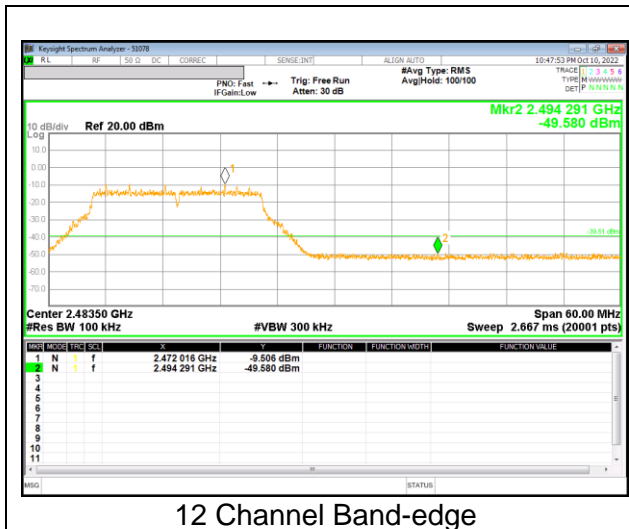
Out-Of-Band 6 Channel



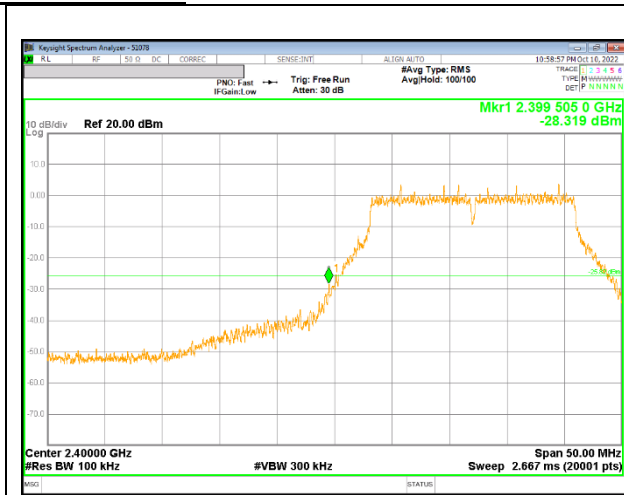
11 Channel Band-edge



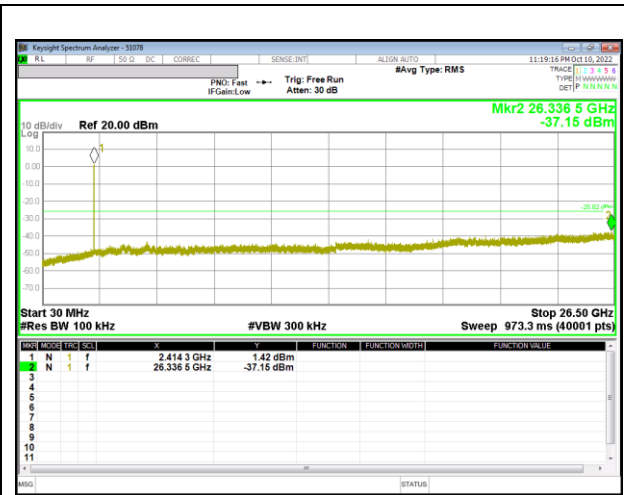
Out-Of-Band 1 Channel



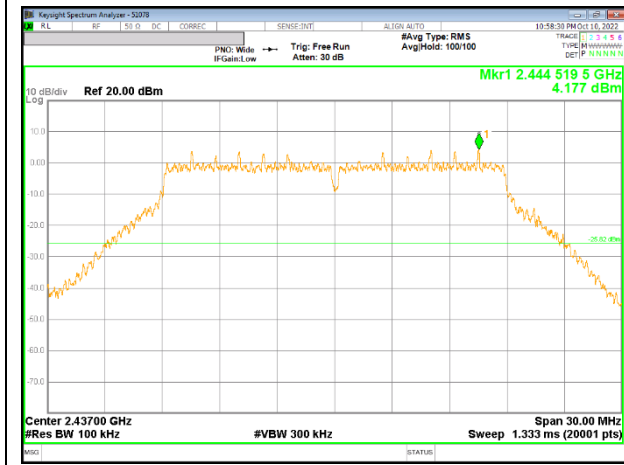
2TX Antenna 2



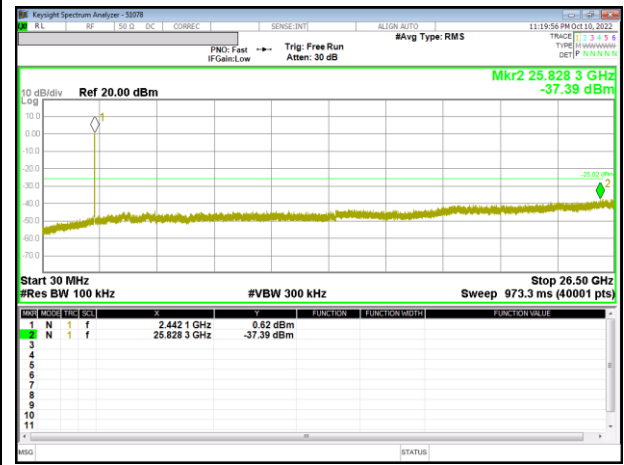
1 Channel Band-edge



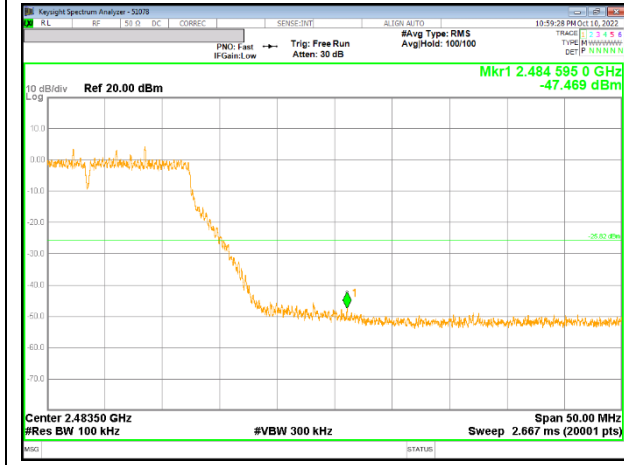
Out-Of-Band 1 Channel



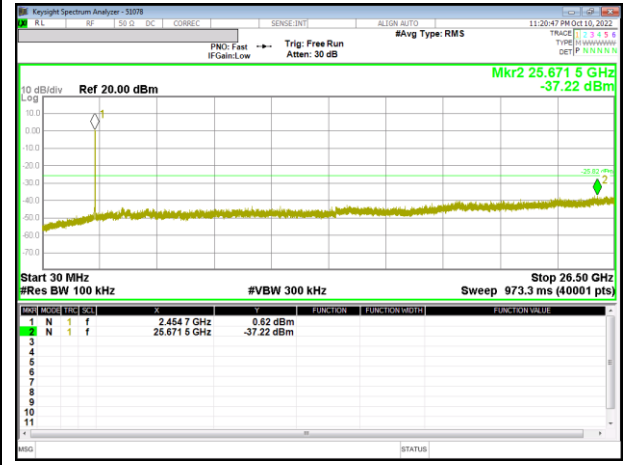
In-Band Reference Level



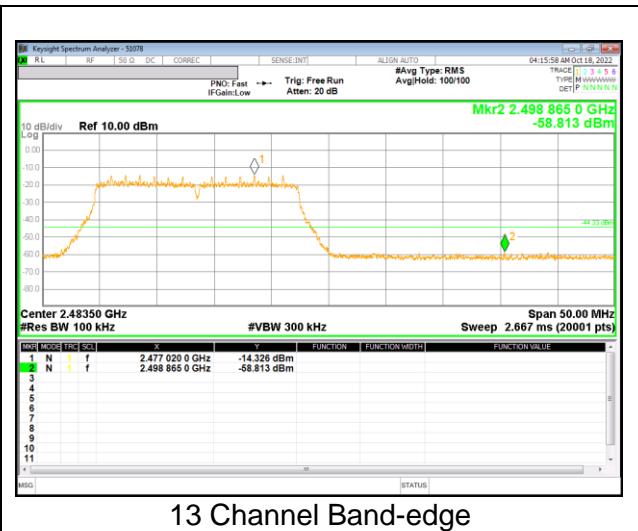
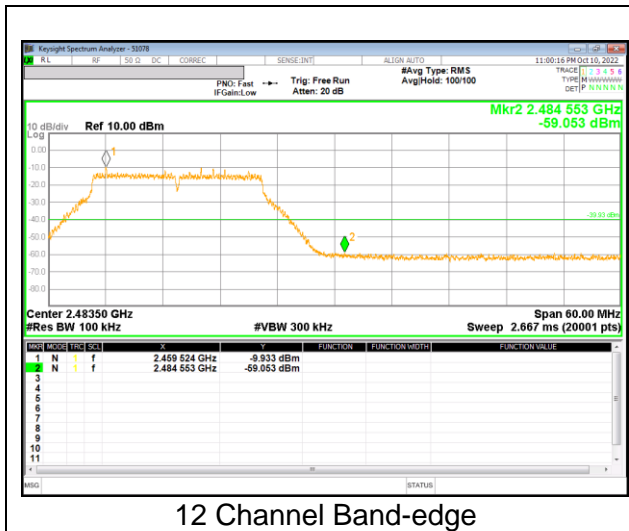
Out-Of-Band 6 Channel



11 Channel Band-edge

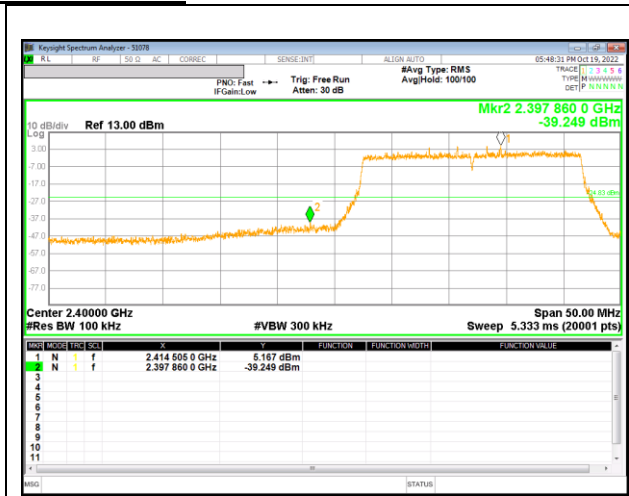


Out-Of-Band 11 Channel

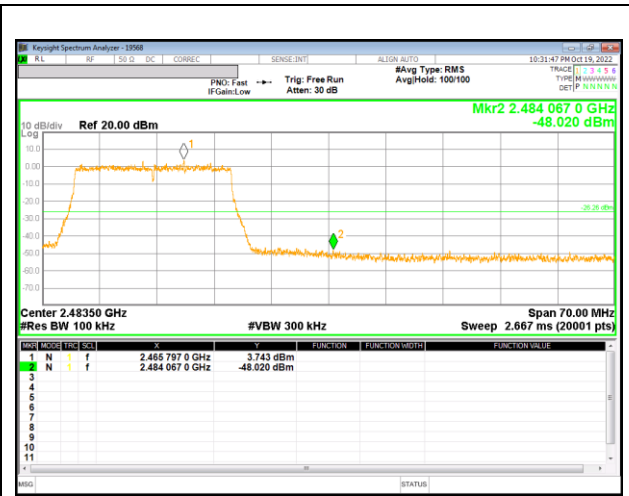


9.5.4. 802.11ax HE20(SU) MODE

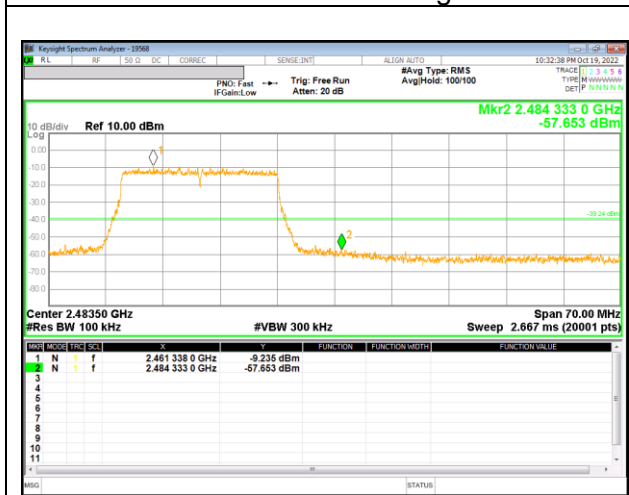
2TX Antenna 1



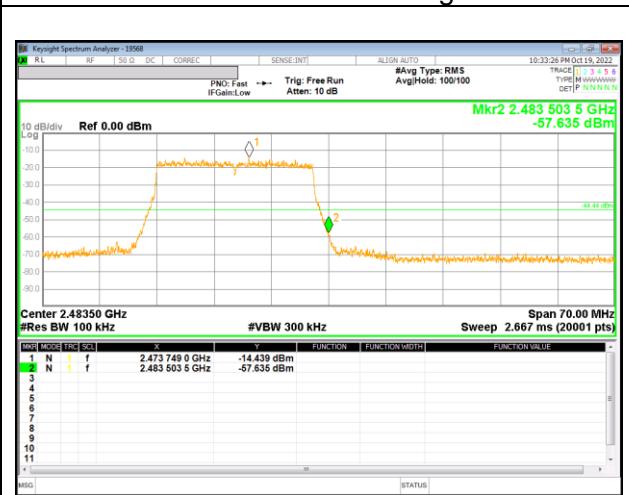
1 Channel Band-edge



11 Channel Band-edge

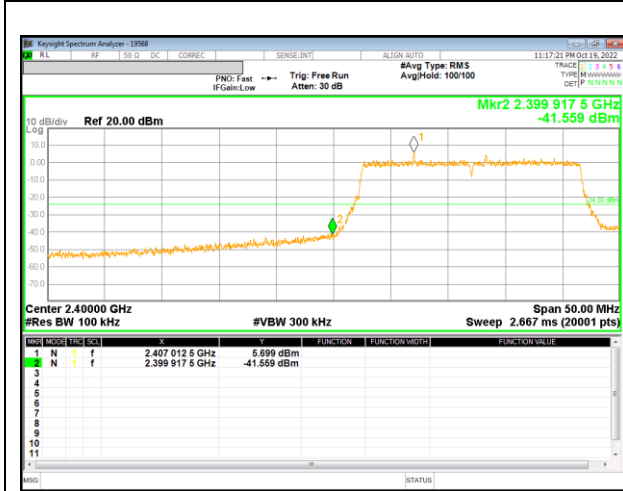


12 Channel Band-edge

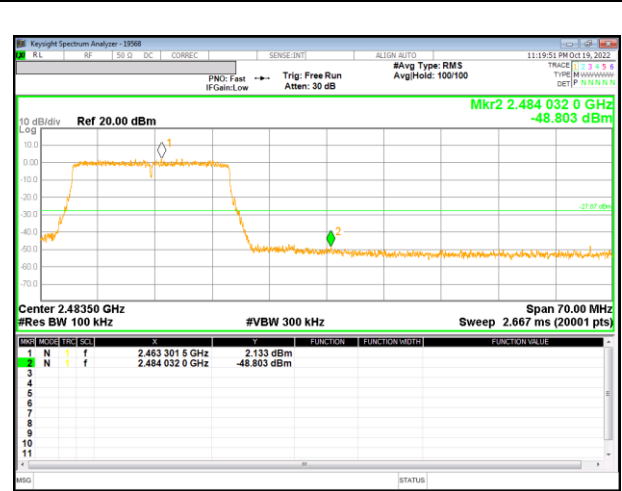


13 Channel Band-edge

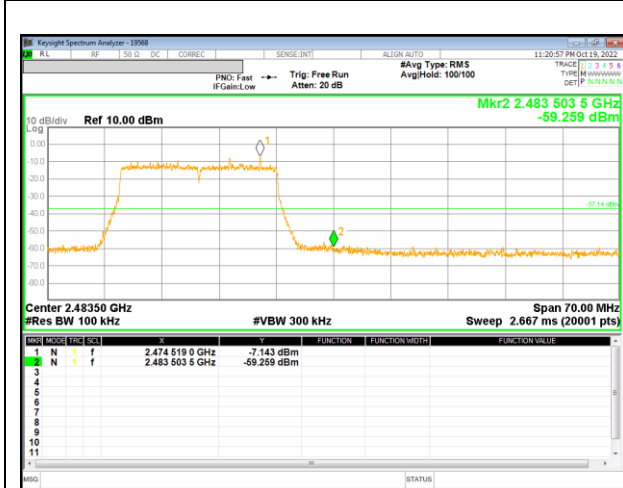
2TX Antenna 2



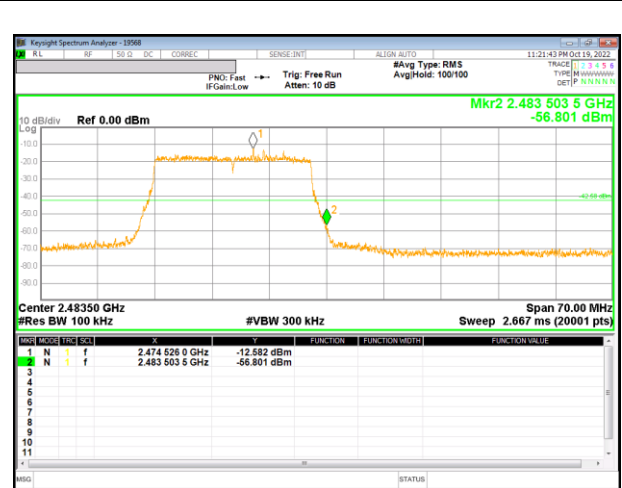
1 Channel Band-edge



11 Channel Band-edge



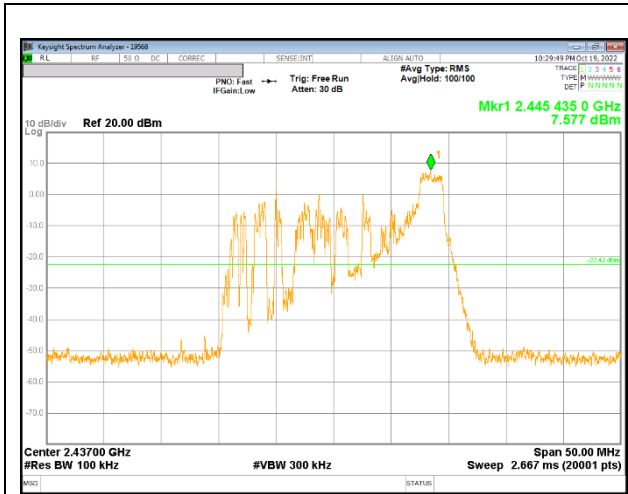
12 Channel Band-edge



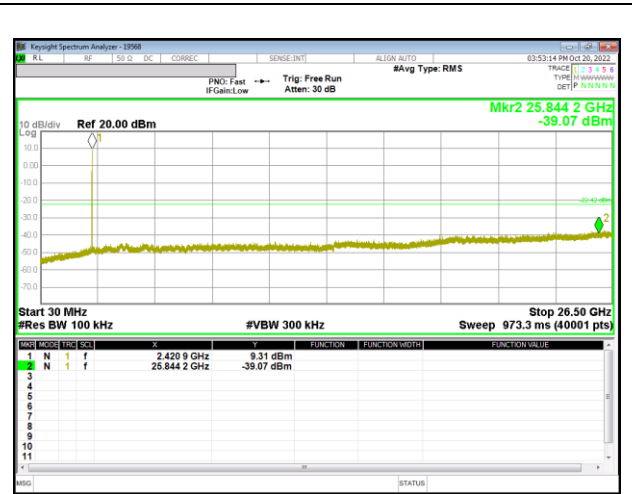
13 Channel Band-edge

9.5.5. 802.11ax HE20(RU) MODE

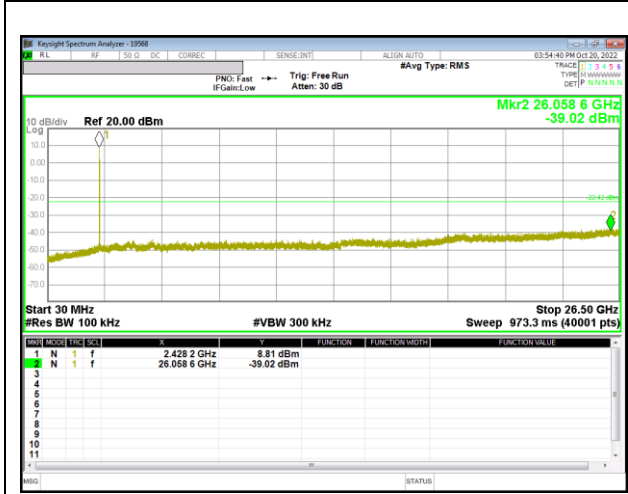
2TX Antenna 1 MODE



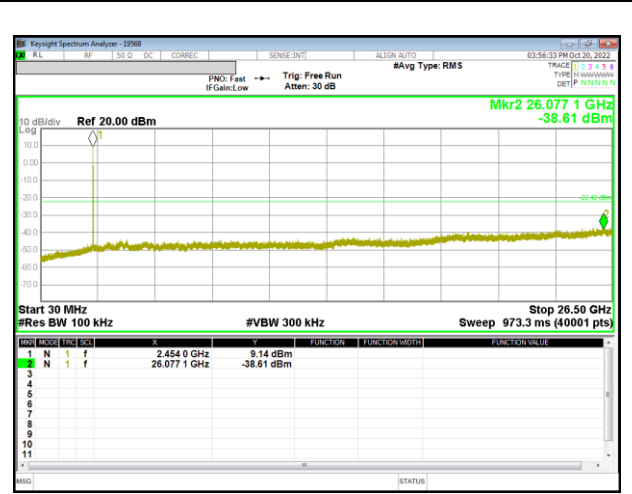
In-Band Reference Level



Out-Of-Band 1 Channel(8RU)

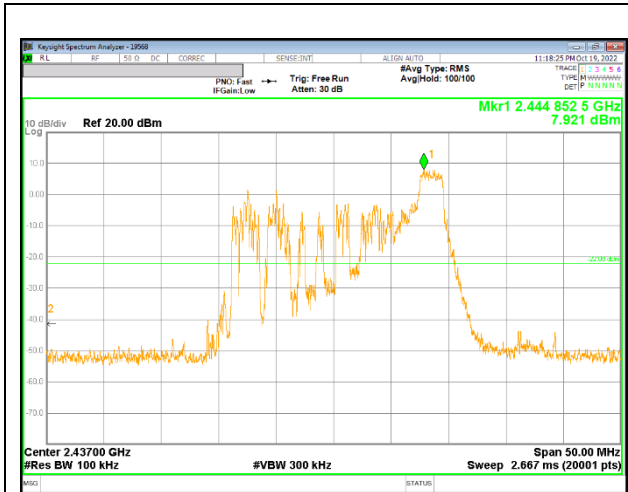


Out-Of-Band 6 Channel(0RU)

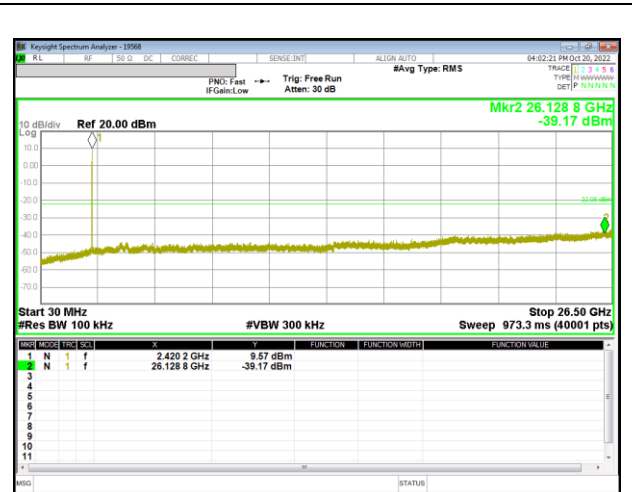


Out-Of-Band 11 Channel(0RU)

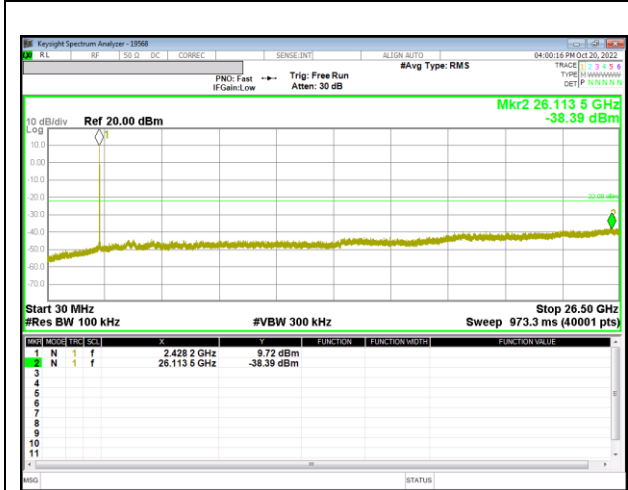
2TX Antenna 2 MODE



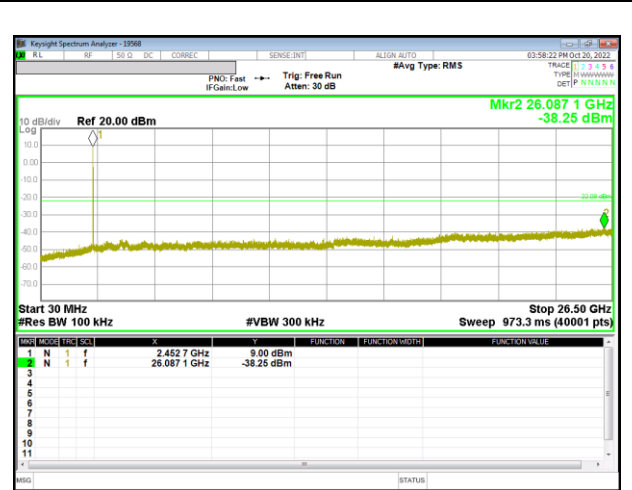
In-Band Reference Level



Out-Of-Band 1 Channel(8RU)



Out-Of-Band 6 Channel(0RU)



Out-Of-Band 11 Channel(0RU)

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 (96.32%);
802.11n(HT20) MIMO mode = 0.10 dB (97.70%);
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.

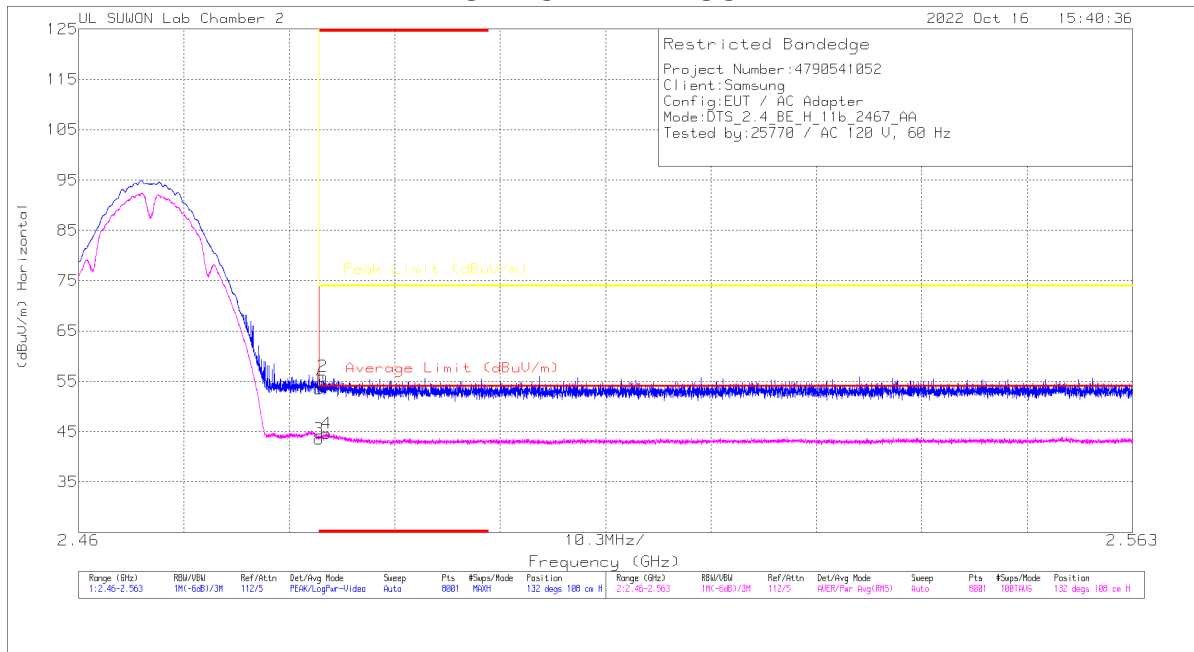
10.1. TRANSMITTER ABOVE 1 GHz

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

2TX Antenna 1 + Antenna 2

BANDEDGE(ANT1 WORST CASE: 12 CHANNEL)

HORIZONTAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBu)	Det	3117_00168724	10dB_ATT(dB)	DC Corr (dB)	Corrected Reading (dBu/m)	Average Limit (dBu/m)	Margin (dB)	Peak Limit (dBu/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	41.16	PK		31.9	-19.6	0	53.46	-	74	-20.54	132	108	H
2	* 2.48386	43.69	PK		31.9	-19.6	0	55.99	-	74	-18.01	132	108	H
3	* 2.48351	31.27	RMS		31.9	-19.6	0	43.57	54	-10.43	-	132	108	H
4	* 2.48423	32.39	RMS		31.9	-19.6	0	44.69	54	-9.31	-	132	108	H

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

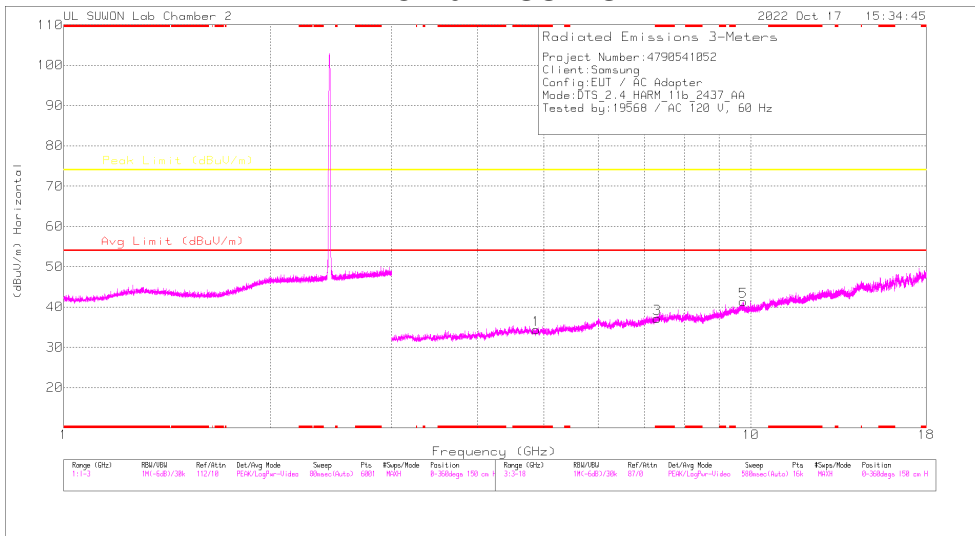
BANDEDGE TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBu/m]	AV Limit [dBu/m]	AV Margin [dB]	PK Limit [dBu/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	MIMO	* 2.39	41.08	Pk	31.70	-19.70	0.00	53.08	-	-	74.00	-20.92	161	125	H
		* 2.38687	43.96	Pk	31.70	-19.60	0.00	56.06	-	-	74.00	-17.94	161	125	H
		* 2.39	31.50	RMS	31.70	-19.70	0.00	43.50	54.00	-10.50	-	-	161	125	H
		* 2.38825	32.29	RMS	31.70	-19.60	0.00	44.39	54.00	-9.61	-	-	161	125	H
		* 2.39	40.66	Pk	31.70	-19.70	0.00	52.66	-	-	74.00	-21.34	190	400	V
		* 2.34325	44.25	Pk	31.60	-19.60	0.00	56.25	-	-	74.00	-17.75	190	400	V
		* 2.39	30.71	RMS	31.70	-19.70	0.00	42.71	54.00	-11.29	-	-	190	400	V
		* 2.3882	31.69	RMS	31.70	-19.50	0.00	43.89	54.00	-10.11	-	-	190	400	V
2462	MIMO	* 2.48351	41.46	Pk	31.90	-19.60	0.00	53.76	-	-	74.00	-20.24	131	132	H
		2.531	43.92	Pk	31.90	-19.50	0.00	56.32	-	-	74.00	-17.68	131	132	H
		* 2.48351	30.96	RMS	31.90	-19.60	0.00	43.26	54.00	-10.74	-	-	131	132	H
		* 2.48708	31.74	RMS	31.90	-19.60	0.00	44.04	54.00	-9.96	-	-	131	132	H
		* 2.48351	41.08	Pk	31.90	-19.60	0.00	53.38	-	-	74.00	-20.62	206	339	V
		2.553	43.98	Pk	32.00	-19.50	0.00	56.48	-	-	74.00	-17.52	206	339	V
		* 2.48351	31.35	RMS	31.90	-19.60	0.00	43.65	54.00	-10.35	-	-	206	339	V
		2.555	31.40	RMS	32.00	-19.40	0.00	44.00	54.00	-10.00	-	-	206	339	V
2467	MIMO	* 2.48351	41.16	Pk	31.90	-19.60	0.00	53.46	-	-	74.00	-20.54	132	108	H
		* 2.48386	43.69	Pk	31.90	-19.60	0.00	55.99	-	-	74.00	-18.01	132	108	H
		* 2.48351	31.27	RMS	31.90	-19.60	0.00	43.57	54.00	-10.43	-	-	132	108	H
		* 2.48423	32.39	RMS	31.90	-19.60	0.00	44.69	54.00	-9.31	-	-	132	108	H
		* 2.48351	40.71	Pk	31.90	-19.60	0.00	53.01	-	-	74.00	-20.99	204	336	V
		2.503	44.11	Pk	31.90	-19.50	0.00	56.51	-	-	74.00	-17.49	204	336	V
		* 2.48351	31.02	RMS	31.90	-19.60	0.00	43.32	54.00	-10.68	-	-	204	336	V
		* 2.48427	31.84	RMS	31.90	-19.60	0.00	44.14	54.00	-9.86	-	-	204	336	V
2472	MIMO	* 2.48351	40.00	Pk	31.90	-19.60	0.00	52.30	-	-	74.00	-21.70	130	106	H
		2.521	44.10	Pk	31.90	-19.50	0.00	56.50	-	-	74.00	-17.50	130	106	H
		* 2.48351	30.88	RMS	31.90	-19.60	0.00	43.18	54.00	-10.82	-	-	130	106	H
		2.556	31.18	RMS	32.00	-19.30	0.00	43.88	54.00	-10.12	-	-	130	106	H
		* 2.48351	40.94	Pk	31.90	-19.60	0.00	53.24	-	-	74.00	-20.76	192	336	V
		* 2.49758	43.68	Pk	31.90	-19.50	0.00	56.08	-	-	74.00	-17.92	192	336	V
		* 2.48351	30.52	RMS	31.90	-19.60	0.00	42.82	54.00	-11.18	-	-	192	336	V
		2.561	31.40	RMS	32.00	-19.50	0.00	43.90	54.00	-10.10	-	-	192	336	V

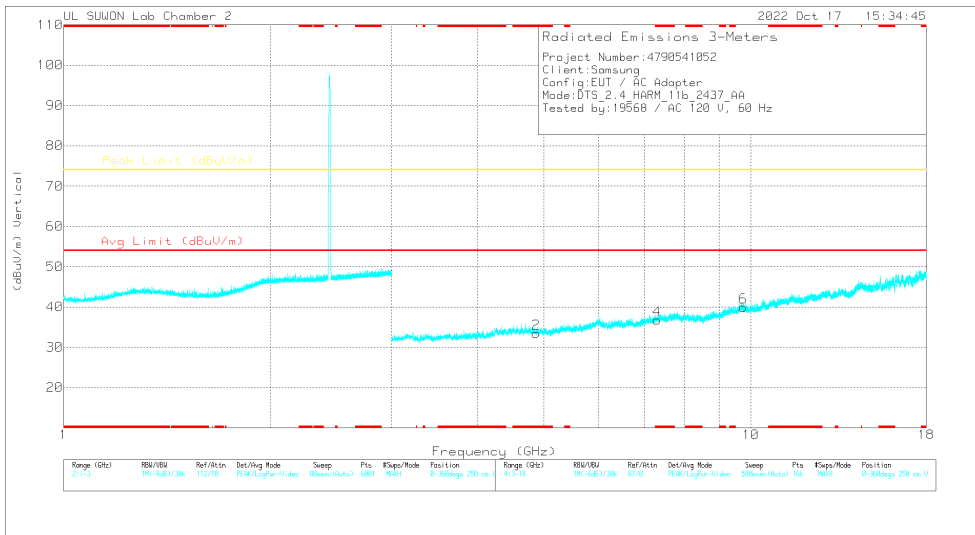
Note1. Pk - Peak detector, RMS - RMS detector
 Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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	3117_00168724	3GHz_HP[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
* 4.86878	37.24	PK2	34	-27.8	0	43.44	-	-	74	-30.56	360	100	H
* 4.87972	36.58	PK2	34	-27.7	0	42.88	-	-	74	-31.12	360	100	V
* 7.30426	35.59	PK2	35.7	-24.7	0	46.59	-	-	74	-27.41	360	100	H
* 7.30759	35.5	PK2	35.7	-24.7	0	46.5	-	-	74	-27.5	360	100	V
9.7545	32.73	PK2	37.1	-20.9	0	48.93	-	-	74	-25.07	360	100	H
9.75481	33.67	PK2	37.1	-20.9	0	49.87	-	-	74	-24.13	360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	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	* 4.82308	36.93	PK2	34.00	-27.80	0.00	43.13	-	-	74.00	-30.87	0	100	H
		* 4.82413	36.85	PK2	34.00	-27.80	0.00	43.05	-	-	74.00	-30.95	0	100	V
		7.244	35.12	PK2	35.70	-25.20	0.00	45.62	-	-	74.00	-28.38	0	100	H
		7.241	35.73	PK2	35.70	-25.20	0.00	46.23	-	-	74.00	-27.77	0	100	V
		9.641	32.50	PK2	37.00	-21.00	0.00	48.50	-	-	74.00	-25.50	0	100	H
		9.652	32.82	PK2	37.00	-20.90	0.00	48.92	-	-	74.00	-25.08	0	100	V
2437	MIMO	* 4.86878	37.24	PK2	34.00	-27.80	0.00	43.44	-	-	74.00	-30.56	360	100	H
		* 4.87972	36.58	PK2	34.00	-27.70	0.00	42.88	-	-	74.00	-31.12	360	100	V
		* 7.30426	35.59	PK2	35.70	-24.70	0.00	46.59	-	-	74.00	-27.41	360	100	H
		* 7.30759	35.50	PK2	35.70	-24.70	0.00	46.50	-	-	74.00	-27.50	360	100	V
		9.755	32.73	PK2	37.10	-20.90	0.00	48.93	-	-	74.00	-25.07	360	100	H
		9.755	33.67	PK2	37.10	-20.90	0.00	49.87	-	-	74.00	-24.13	360	100	V
2462	MIMO	* 4.92274	36.39	PK2	34.00	-27.20	0.00	43.19	-	-	74.00	-30.81	0	100	H
		* 4.92587	36.11	PK2	34.00	-27.20	0.00	42.91	-	-	74.00	-31.09	0	100	V
		* 7.38488	35.25	PK2	35.70	-23.80	0.00	47.15	-	-	74.00	-26.85	0	100	H
		* 7.38593	35.26	PK2	35.70	-23.90	0.00	47.06	-	-	74.00	-26.94	0	100	V
		9.848	32.63	PK2	37.20	-21.50	0.00	48.33	-	-	74.00	-25.67	0	100	H
		9.848	32.37	PK2	37.20	-21.50	0.00	48.07	-	-	74.00	-25.93	0	100	V

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

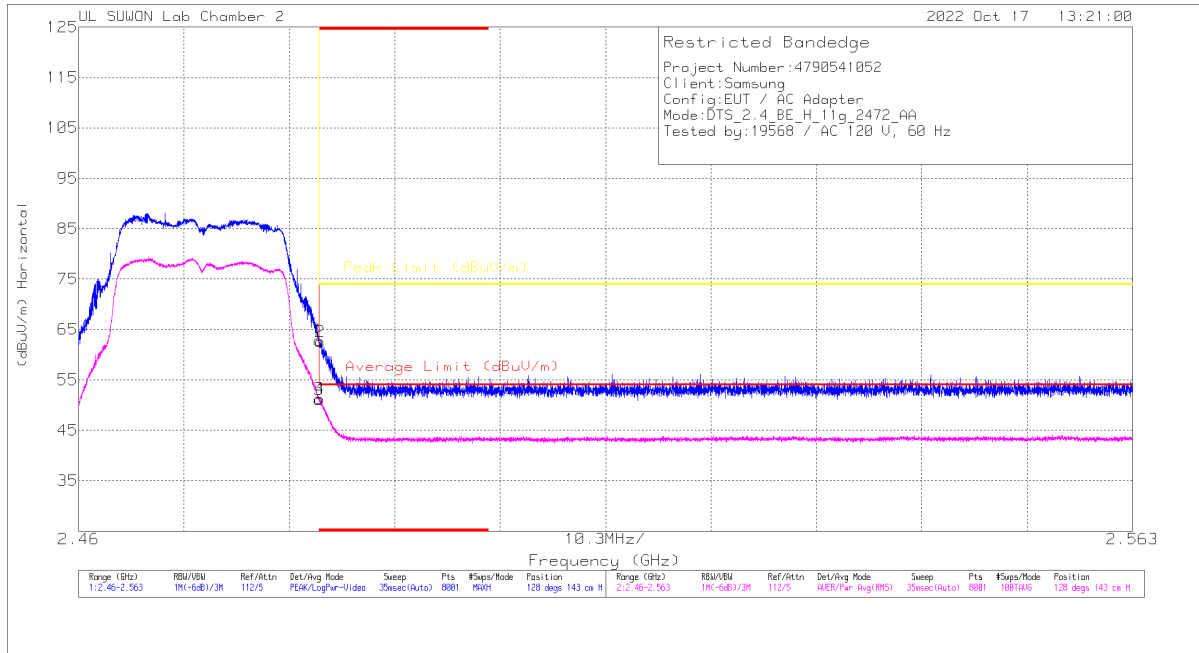
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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

2TX Antenna 1 + Antenna 2

BANDEDGE (WORST CASE: 13 CHANNEL)

HORIZONTAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBu/m)	Det	3117_00168724	10dB_ATT(dB)	DC Corr (dB)	Corrected Reading (dBu/m)	Average Limit (dBu/m)	Margin (dB)	Peak Limit (dBu/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	50.54	PK	31.9	-19.6	0	62.84	-	-	74	-11.16	128	143	H
2	* 2.48364	50.31	PK	31.9	-19.6	0	62.61	-	-	74	-11.39	128	143	H
3	* 2.48351	38.73	RMS	31.9	-19.6	-16	51.19	54	-2.81	-	-	128	143	H
4	* 2.48354	38.77	RMS	31.9	-19.6	-16	51.23	54	-2.77	-	-	128	143	H

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

BANDEDGE TEST DATA

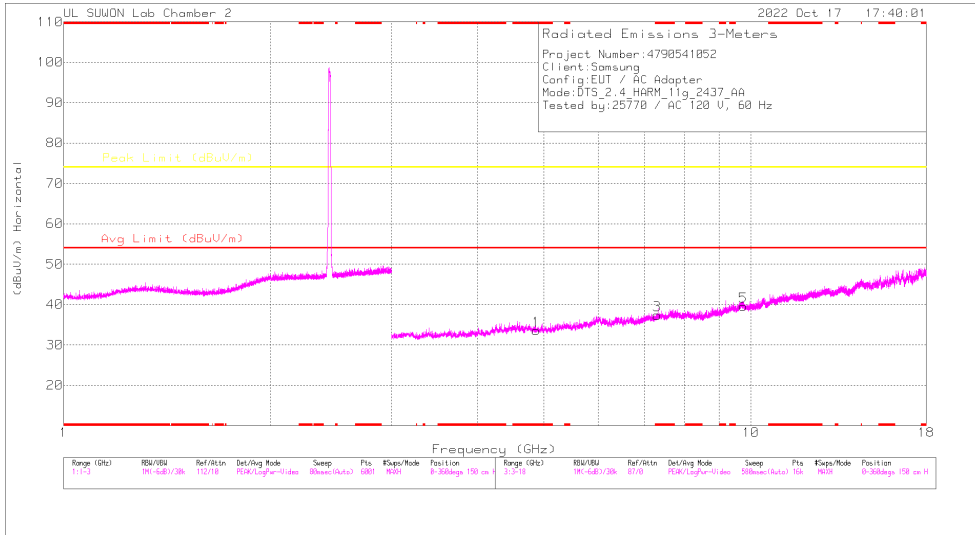
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity	
2412	MIMO	* 2.39	42.91	Pk	31.70	-19.70	0.00	54.91	-	-	74.00	-19.09	126	125	H	
		* 2.38828	45.11	Pk	31.70	-19.60	0.00	57.21	-	-	74.00	-16.79	126	125	H	
		* 2.39	32.33	RMS	31.70	-19.70	0.16	44.49	54.00	-9.51	-	-	-	126	125	H
		* 2.38972	32.99	RMS	31.70	-19.70	0.16	45.15	54.00	-8.85	-	-	-	126	125	H
		* 2.39	42.63	Pk	31.70	-19.70	0.00	54.63	-	-	74.00	-19.37	201	318	V	
		* 2.38763	44.23	Pk	31.70	-19.50	0.00	56.43	-	-	74.00	-17.57	201	318	V	
		* 2.39	31.65	RMS	31.70	-19.70	0.16	43.81	54.00	-10.19	-	-	-	201	318	V
		* 2.38803	31.98	RMS	31.70	-19.50	0.16	44.34	54.00	-9.66	-	-	-	201	318	V
2462	MIMO	* 2.48351	42.25	Pk	31.90	-19.60	0.00	54.55	-	-	74.00	-19.45	126	132	H	
		* 2.48414	44.47	Pk	31.90	-19.60	0.00	56.77	-	-	74.00	-17.23	126	132	H	
		* 2.48351	32.17	RMS	31.90	-19.60	0.16	44.63	54.00	-9.37	-	-	-	126	132	H
		* 2.48441	32.40	RMS	31.90	-19.60	0.16	44.86	54.00	-9.14	-	-	-	126	132	H
		* 2.48351	42.46	Pk	31.90	-19.60	0.00	54.76	-	-	74.00	-19.24	201	376	V	
		* 2.48741	44.54	Pk	31.90	-19.60	0.00	56.84	-	-	74.00	-17.16	201	376	V	
		* 2.48351	31.68	RMS	31.90	-19.60	0.16	44.14	54.00	-9.86	-	-	-	201	376	V
		* 2.48381	31.95	RMS	31.90	-19.60	0.16	44.41	54.00	-9.59	-	-	-	201	376	V
2467	MIMO	* 2.48351	42.17	Pk	31.90	-19.60	0.00	54.47	-	-	74.00	-19.53	127	129	H	
		* 2.48388	43.81	Pk	31.90	-19.60	0.00	56.11	-	-	74.00	-17.89	127	129	H	
		* 2.48351	31.69	RMS	31.90	-19.60	0.16	44.15	54.00	-9.85	-	-	-	127	129	H
		* 2.4837	31.81	RMS	31.90	-19.60	0.16	44.27	54.00	-9.73	-	-	-	127	129	H
		* 2.48351	40.94	Pk	31.90	-19.60	0.00	53.24	-	-	74.00	-20.76	203	376	V	
		2.552	43.99	Pk	32.00	-19.50	0.00	56.49	-	-	74.00	-17.51	203	376	V	
		* 2.48351	31.25	RMS	31.90	-19.60	0.16	43.71	54.00	-10.29	-	-	-	203	376	V
		2.556	31.23	RMS	32.00	-19.30	0.16	44.09	54.00	-9.91	-	-	-	203	376	V
2472	MIMO	* 2.48351	50.54	Pk	31.90	-19.60	0.00	62.84	-	-	74.00	-11.16	128	143	H	
		* 2.48364	50.31	Pk	31.90	-19.60	0.00	62.61	-	-	74.00	-11.39	128	143	H	
		* 2.48351	38.73	RMS	31.90	-19.60	0.16	51.19	54.00	-2.81	-	-	-	128	143	H
		* 2.48354	38.77	RMS	31.90	-19.60	0.16	51.23	54.00	-2.77	-	-	-	128	143	H
		* 2.48351	49.51	Pk	31.90	-19.60	0.00	61.81	-	-	74.00	-12.19	207	375	V	
		* 2.4839	50.03	Pk	31.90	-19.60	0.00	62.33	-	-	74.00	-11.67	207	375	V	
		* 2.48351	37.62	RMS	31.90	-19.60	0.16	50.08	54.00	-3.92	-	-	-	207	375	V
		* 2.48357	38.21	RMS	31.90	-19.60	0.16	50.67	54.00	-3.33	-	-	-	207	375	V

Note1. Pk - Peak detector, RMS - RMS detector

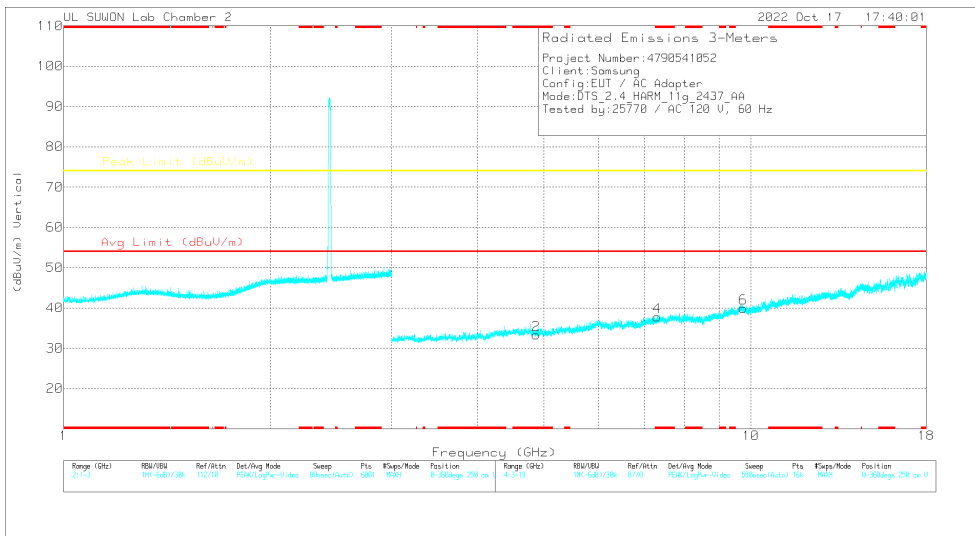
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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	3117_00168724	3GHz_HP[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
* 4.87592	36.49	PK2	34	-27.8	0	42.69	-	-	74	-31.31	0	100	H
* 4.87324	37.2	PK2	34	-27.7	0	43.5	-	-	74	-30.5	0	100	V
* 7.31251	35.39	PK2	35.7	-24.6	0	46.49	-	-	74	-27.51	0	100	H
* 7.31265	35.65	PK2	35.7	-24.6	0	46.75	-	-	74	-27.25	0	100	V
9.75026	32.66	PK2	37.1	-20.9	0	48.86	-	-	74	-25.14	0	100	H
9.75085	32.62	PK2	37.1	-20.9	0	48.82	-	-	74	-25.18	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	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	* 4.83365	37.23	PK2	34.00	-27.80	0.00	43.43	-	-	74.00	-30.57	0	100	H
		* 4.83395	37.03	PK2	34.00	-27.80	0.00	43.23	-	-	74.00	-30.77	0	100	V
		7.243	35.42	PK2	35.70	-25.20	0.00	45.92	-	-	74.00	-28.08	0	100	H
		7.235	35.56	PK2	35.70	-25.20	0.00	46.06	-	-	74.00	-27.94	0	100	V
		9.653	32.61	PK2	37.00	-20.90	0.00	48.71	-	-	74.00	-25.29	0	100	H
		9.644	32.79	PK2	37.00	-21.00	0.00	48.79	-	-	74.00	-25.21	0	100	V
2437	MIMO	* 4.87592	36.49	PK2	34.00	-27.80	0.00	42.69	-	-	74.00	-31.31	0	100	H
		* 4.87324	37.20	PK2	34.00	-27.70	0.00	43.50	-	-	74.00	-30.50	0	100	V
		* 7.31251	35.39	PK2	35.70	-24.60	0.00	46.49	-	-	74.00	-27.51	0	100	H
		* 7.31265	35.65	PK2	35.70	-24.60	0.00	46.75	-	-	74.00	-27.25	0	100	V
		9.750	32.66	PK2	37.10	-20.90	0.00	48.86	-	-	74.00	-25.14	0	100	H
		9.751	32.62	PK2	37.10	-20.90	0.00	48.82	-	-	74.00	-25.18	0	100	V
2462	MIMO	* 4.92338	35.48	PK2	34.00	-27.20	0.00	42.28	-	-	74.00	-31.72	0	100	H
		* 4.92654	36.34	PK2	34.00	-27.20	0.00	43.14	-	-	74.00	-30.86	0	100	V
		* 7.38764	34.87	PK2	35.70	-23.90	0.00	46.67	-	-	74.00	-27.33	0	100	H
		* 7.38569	35.48	PK2	35.70	-23.90	0.00	47.28	-	-	74.00	-26.72	0	100	V
		9.846	32.72	PK2	37.20	-21.50	0.00	48.42	-	-	74.00	-25.58	0	100	H
		9.846	32.85	PK2	37.20	-21.50	0.00	48.55	-	-	74.00	-25.45	0	100	V

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

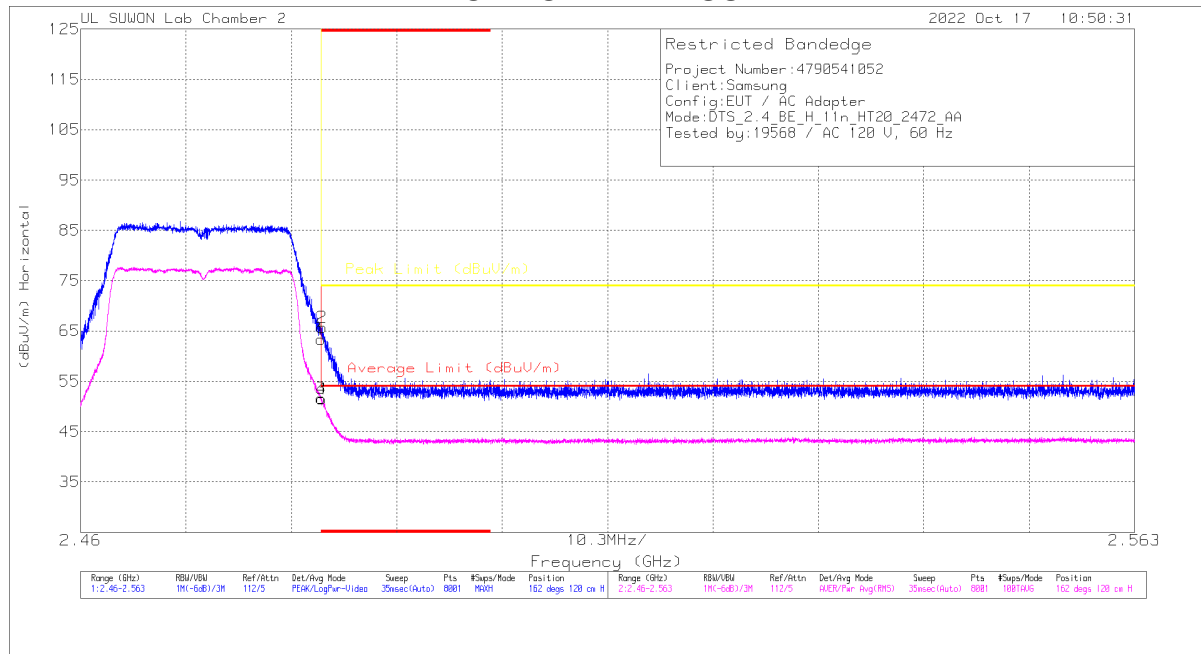
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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: 13 CHANNEL)

HORIZONTAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT[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	* 2.48351	51.07	Pk	31.9	-19.6	0	63.37	-	-	74	-10.63	162	120	H
2	* 2.48359	53.39	Pk	31.9	-19.6	0	65.69	-	-	74	-8.31	162	120	H
3	* 2.48351	39.25	RMS	31.9	-19.6	.1	51.65	54	-2.35	-	-	162	120	H
4	* 2.48357	39.15	RMS	31.9	-19.6	.1	51.55	54	-2.45	-	-	162	120	H

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

Pk - Peak detector

RMS - RMS detection