CERTIFICATION TEST REPORT

Report Number. : 4789294522-E3V2

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	SM-J260MU/DS, SM-J260MU
FCC ID	:	A3LSMJ260MU
EUT Description	:	GSM/WCDMA/LTE Phone + BT/BLE, DTS b/g/n
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C

Date Of Issue:
January 28, 2020

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

IAS ACCREDITED
Testing Laboratory
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	01/20/20	Initial issue	Yeonhee Lim
V2	01/28/20	Updated to address TCB's question	Yeonhee Lim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE Phone + BT/BLE, DTS b/g/n
MODEL NUMBER:	SM-J260MU/DS, SM-J260MU
SERIAL NUMBER:	R3MC02TBTW (CONDUCTED) R38MC08F0QJ, R38MC08F1AP(RADIATED);
DATE TESTED:	DEC 19, 2019 – JAN 17, 2020;

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass

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:

Yeonhee Lim
Suwon Lab Technician
UL Korea, Ltd.

2. TEST METHODOLOGY

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

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 558074 D01 DTS Meas Guidance v05r02.
4. 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
☒ Chamber 1
☒ Chamber 2
☐ Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at http://www.iasonline.org/wp-content/uploads/2017/05/TL-637.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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

28.9 dBuV/m = 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB

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	2.35 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.49 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.82 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.49 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 1, Clause 4.4.2 in IEC Guide 115:2007.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The The EUT is a GSM/WCDMA/LTE Phone + BT/BLE, DTS b/g/n.
This test report addresses the DTS (WLAN) operational mode.

This report covers the Samsung models SM-J260MU/DS and SM-J260MU.
All components are same except for SIM Slot.
With some pre-scan, model SM-J260MU/DS was set for final test.

WiFi operating mode

Frequency rage	Mode	Antenna Stream
2.4GHz (2412 MHz ~ 2472 MHz)	802.11b SISO	TX/RX
	802.11g SISO	TX/RX
	802.11n(HT20) SISO	TX/RX

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]
2412 - 2472	802.11b SISO	18.74	74.82
	802.11g SISO	17.74	59.42
	802.11n(HT20) SISO	16.94	49.43

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.

The radio utilizes an internal antennas, with a maximum gain of 0.6 dBi.

5.4. TESTED CHANNELS LIST

802.11b Mode	Channel	Frequency (MHz)
Low	1	2412
Mid	6	2437
High	12	2467
Reduction High 1	13	2472

802.11g Mode	Channel	Frequency (MHz)
Reduction Low 1	1	2412
Low	2	2417
Mid	6	2437
High	10	2457
Reduction High 1	11	2462
Reduction High 2	12	2467
Reduction High 3	13	2472

802.11n HT20 Mode	Channel	Frequency (MHz)
Reduction Low 1	1	2412
Reduction Low 2	2	2417
Low	3	2422
Mid	6	2437
High	10	2457
Reduction High 1	11	2462
Reduction High 2	12	2467
Reduction High 3	13	2472

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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.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Based on the baseline scan, the worst-case data rates were:
802.11b mode: 1 Mbps
802.11g mode: 6 Mbps 1TX
802.11n HT20 mode: MCS0 1TX

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

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	ETA0U83EWE	R37MC4KKQG2HM3	N/A
Data Cable	SAMSUNG	ECB-DU68WE	N/A	N/A
EAR PHONE	SAMSUNG	EHS61ASFWE	N/A	N/A

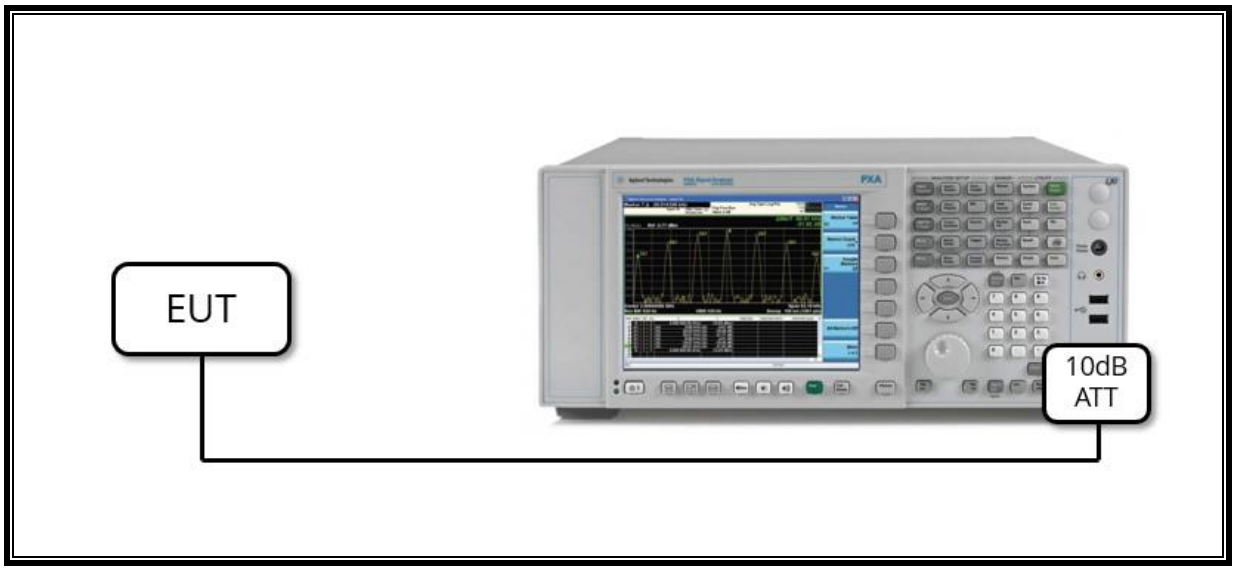
I/O CABLE

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	1.0m	N/A

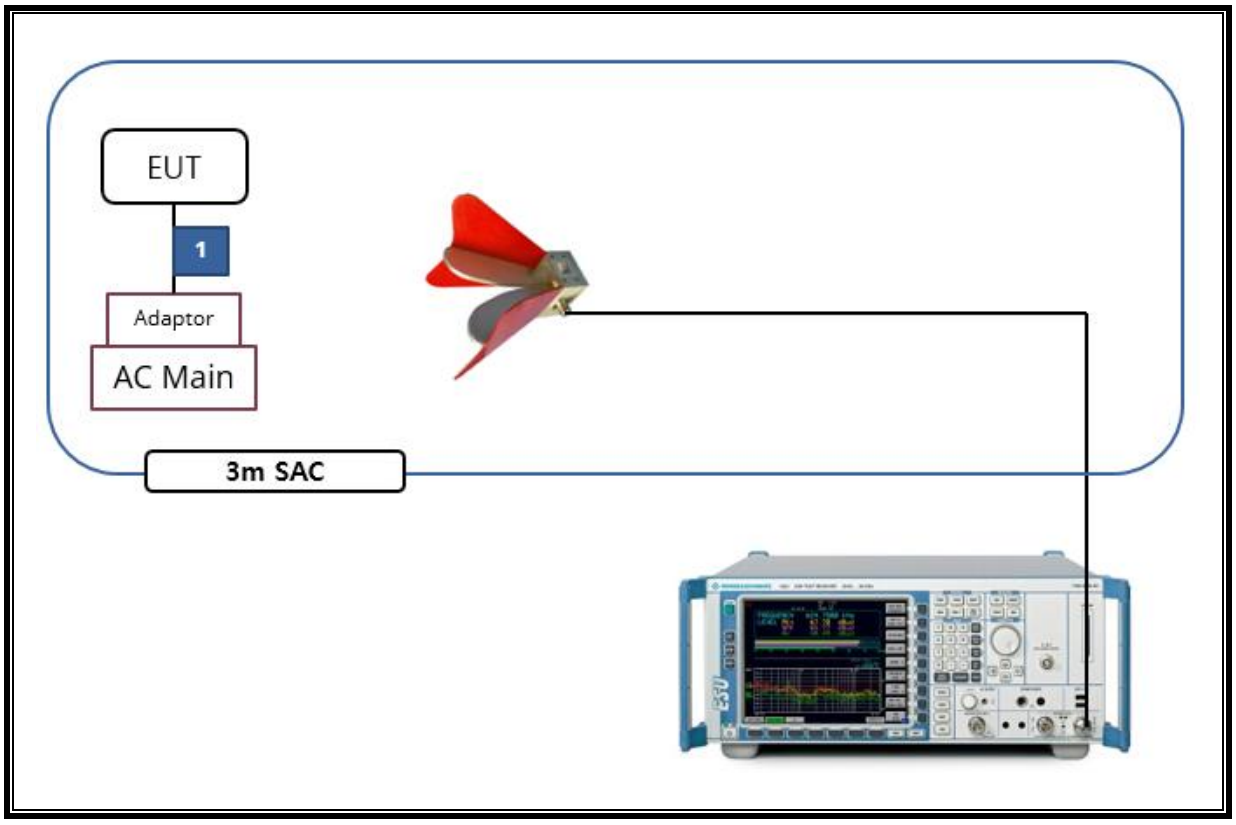
TEST SETUP

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)



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6. 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**	**Next Cal. Date**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00167211	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168724	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00205959	08-04-20
Antenna, Horn, 40 GHz	ETS	3116C	00166155	08-14-20
Antenna, Horn, 40 GHz	ETS	3116C	00168645	10-02-21
Preamplifier	ETS	3116C-PA	00168841	08-08-20
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-05-20
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-05-20
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-05-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-06-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-06-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-06-20
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-06-20
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-06-20
Spectrum Analyzer, 43.5 GHz	R&S	FSW43	104089	08-06-20
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-09-20
Attenuator	PASTERNACK	PE7087-10	A001	08-08-20
Attenuator	PASTERNACK	PE7087-10	A008	08-08-20
Attenuator	PASTERNACK	PE7004-10	2	08-06-20
Attenuator	PASTERNACK	PE7087-10	A009	08-08-20
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-06-20
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-06-20
EMI Test Receive, 44 GHz	R&S	ESW44	101590	08-05-20
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-05-20
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-06-20
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-06-20
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	08-06-20
LISN	R&S	ENV-216	101837	08-09-20
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-02-21
Antenna, Loop, 9kHz-30MHz				
Description	**Manufacturer**	**Model**	**Version**	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

7. REFERENCE MEASUREMENT RESULTS

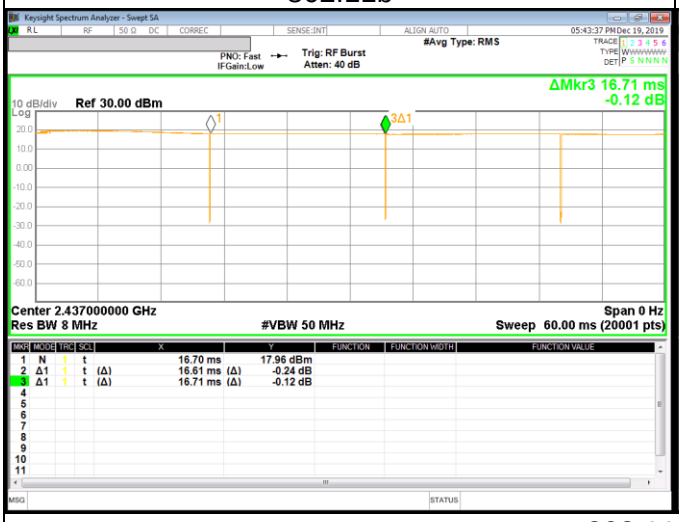
7.1. ON TIME AND DUTY CYCLE RESULTS

LIMITS

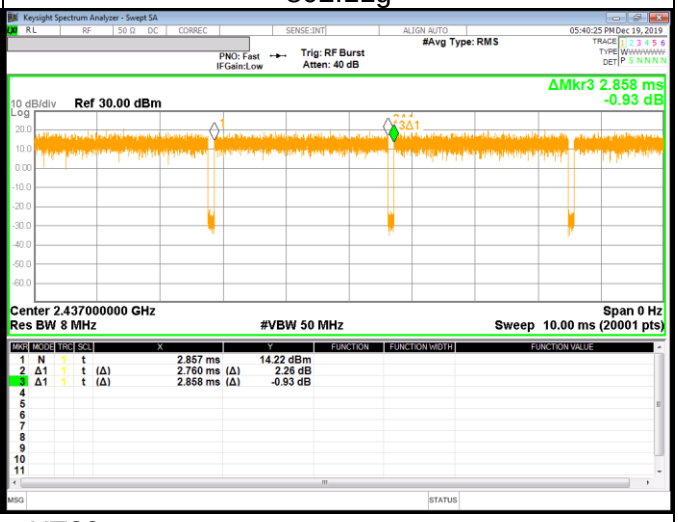
None; for reporting purposes only.

Band	Mode	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2.4 GHz	802.11b	16.610	16.710	0.944	99.40	0.00	0.060
	802.11g	2.760	2.858	0.965	96.57	0.15	0.362
	802.11n(HT20)	2.556	2.654	0.963	96.30	0.16	0.391

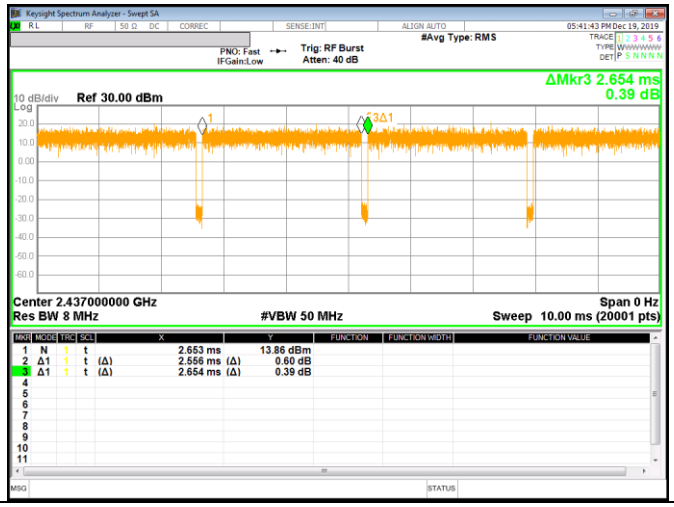
802.11b



802.11g



802.11n HT20



8. MEASUREMENT METHODS

6 dB BW : KDB 558074 D01 v05r02, Section 8.2

OUTPUT POWER : KDB 558074 D01 v05r02, Section 8.3.2.3.

POWER SPECTRAL DENSITY : KDB 558074 D01 v05r02, Section 8.4.

Out-of-band EMISSIONS (Conducted) : KDB 558074 D01 v05r02, Section 8.5.

Out-of-band EMISSIONS IN NON-RESTRICTED BANDS: KDB 558074 D01 v05r02, Section 8.5.

Out-of-band EMISSIONS IN RESTRICTED BANDS KDB 558074 D01 v05r02, Section 8.6.

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

9. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	Occupied Band width (6dB)	> 500kHz	Conducted	Pass
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-30dBc		Pass
15.247 (b)(3)	TX conducted output power	< 30dBm		Pass
15.247 (e)	PSD	< 8dBm		Pass
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass

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10. ANTENNA PORT TEST RESULTS

10.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

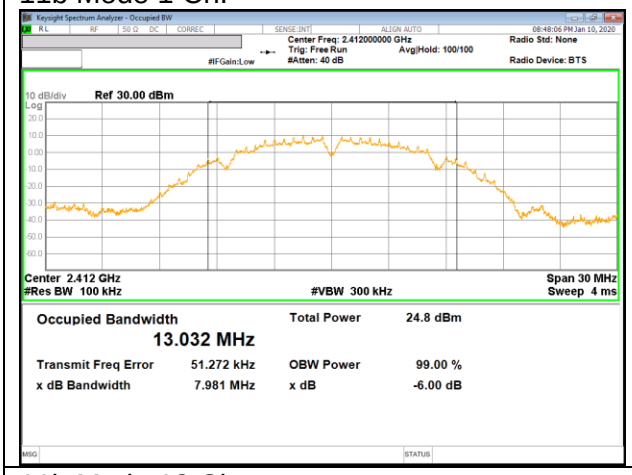
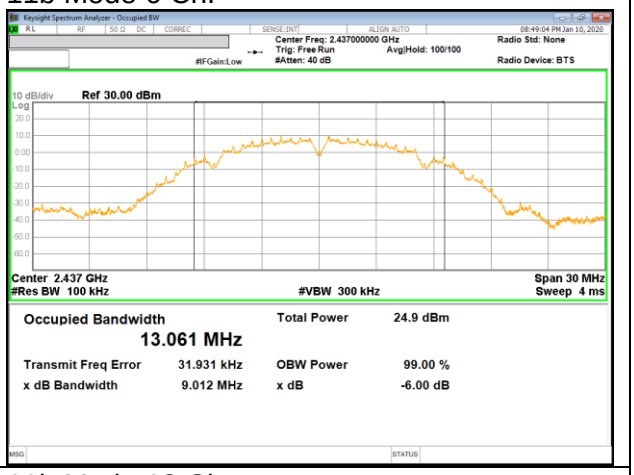
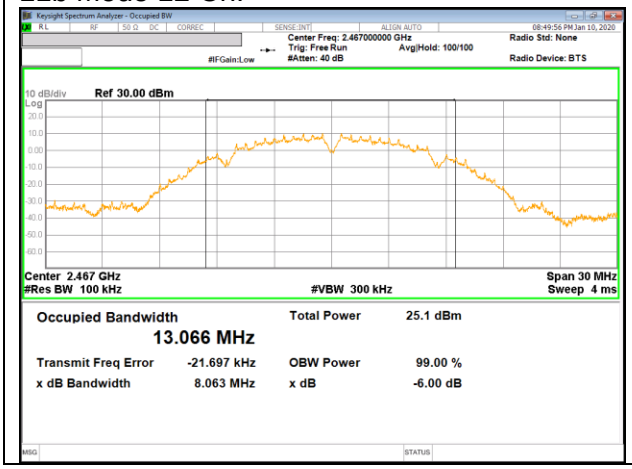
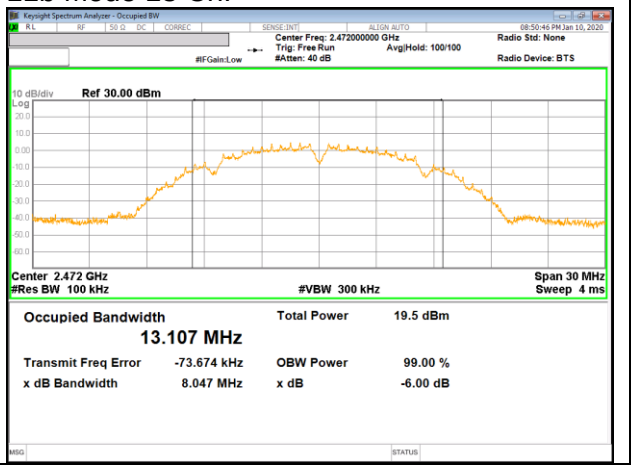
TEST PROCEDUR

Reference to KDB 558074 D01 15.247 Meas Guidance: The transmitter output is connected to a spectrum analyzer with the RBW set to100 kHz, the VBW >= 3 x RBW, peak detector and max hold

10.1.1. TEST RESULTS

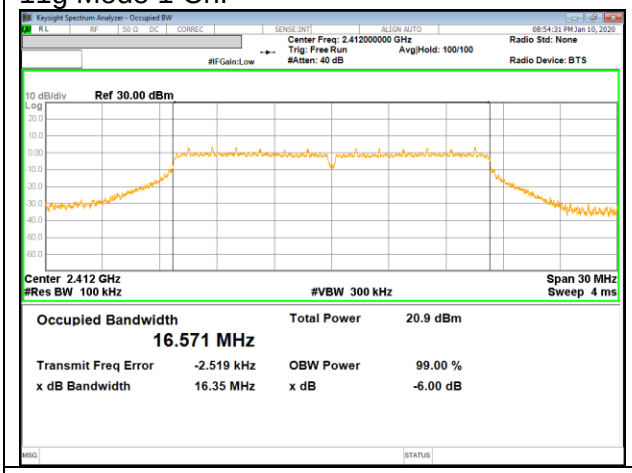
Mode	Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	6 dB BW Minimum Limit [MHz]
802.11b	1	2412	**7.981**	0.5
	6	2437	9.012	
	12	2467	8.063	
	13	2472	8.047	
	Worst		**7.981**	
802.11g	1	2412	16.35	0.5
	2	2417	16.34	
	6	2437	16.34	
	10	2457	**16.33**	
	11	2462	**16.33**	
	12	2467	**16.33**	
	13	2472	16.35	
	Worst		**16.33**	
802.11n HT20	1	2412	17.59	0.5
	2	2417	17.58	
	3	2422	17.59	
	6	2437	17.57	
	10	2457	17.56	
	11	2462	17.56	
	12	2467	**17.32**	
	13	2472	17.57	
	Worst		**17.32**	

10.1.2. 6 dB Bandwidth TEST PLOTS

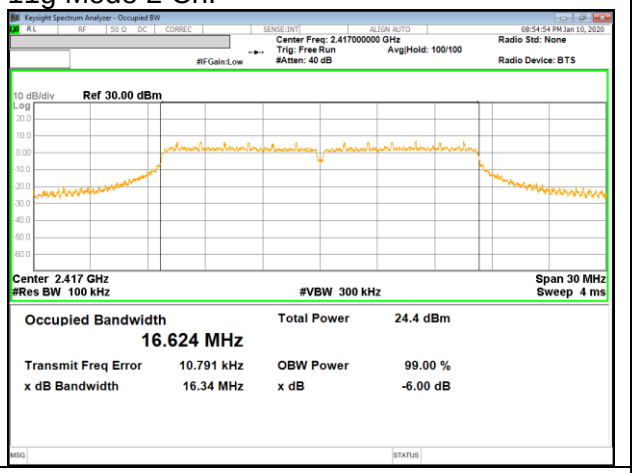
802.11b mode	
11b Mode 1 Ch.	11b Mode 6 Ch.
	
11b Mode 12 Ch.	11b Mode 13 Ch.
	

802.11g mode

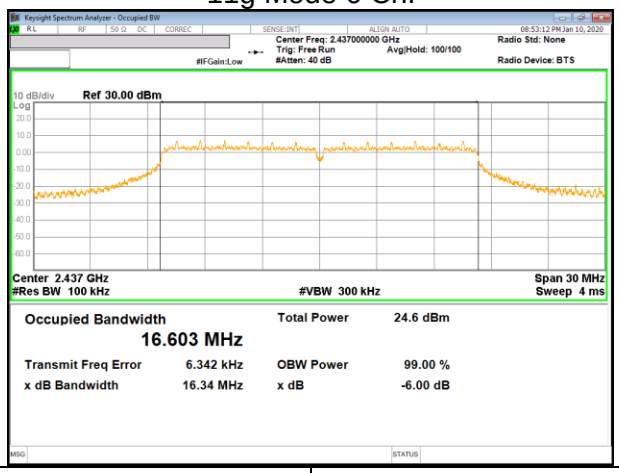
11g Mode 1 Ch.



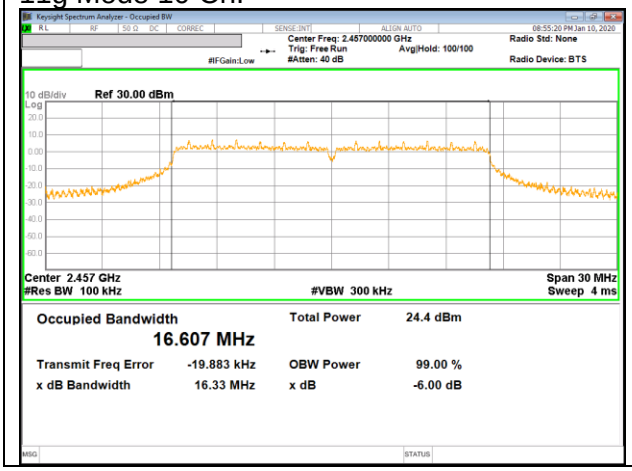
11g Mode 2 Ch.



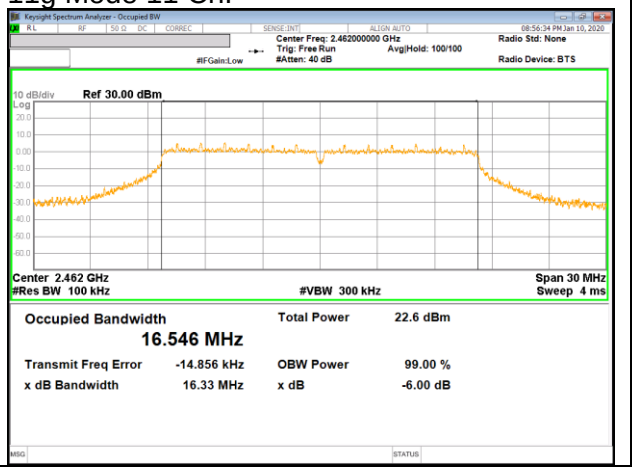
11g Mode 6 Ch.



11g Mode 10 Ch.

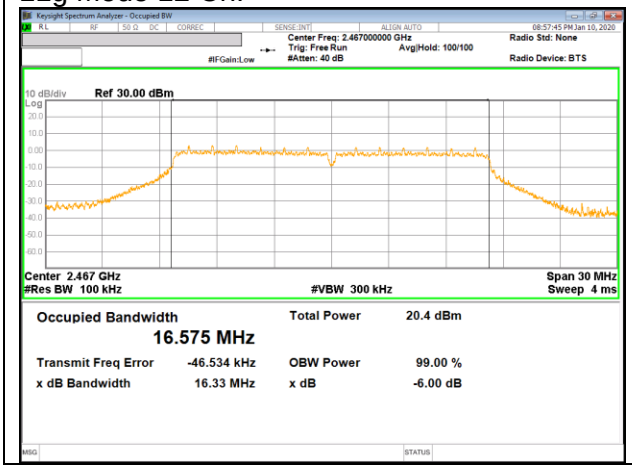


11g Mode 11 Ch.

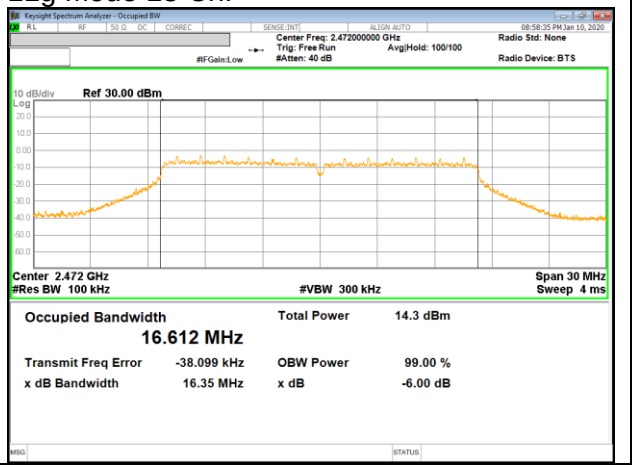


802.11g mode

11g Mode 12 Ch.

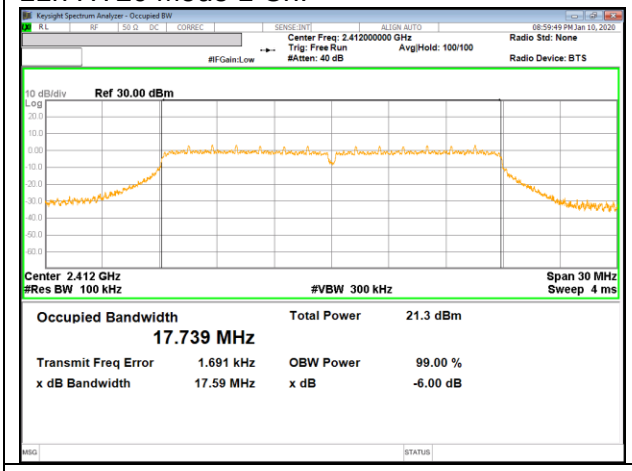


11g Mode 13 Ch.

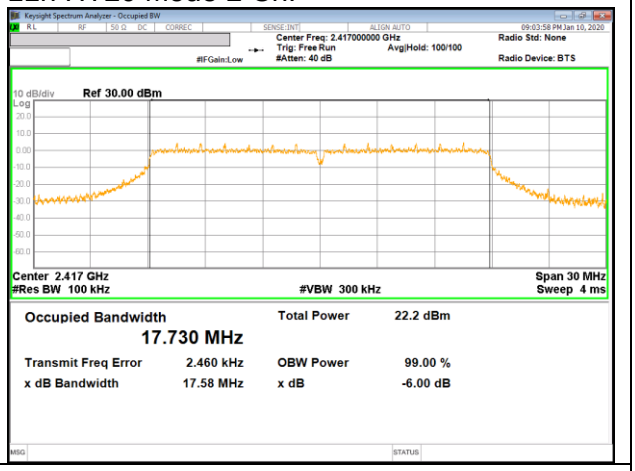


802.11n HT20 mode

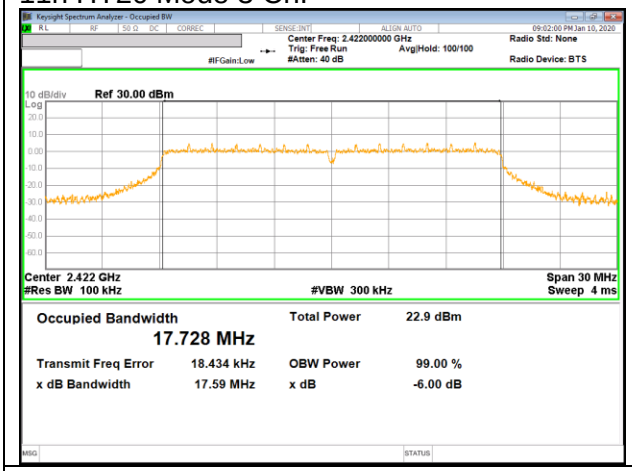
11n HT20 Mode 1 Ch.



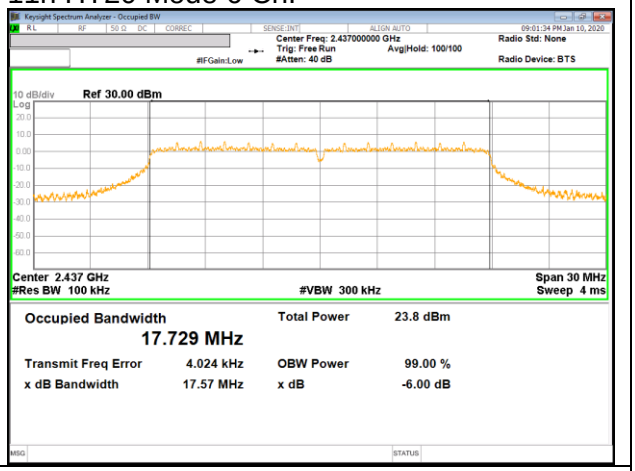
11n HT20 Mode 2 Ch.



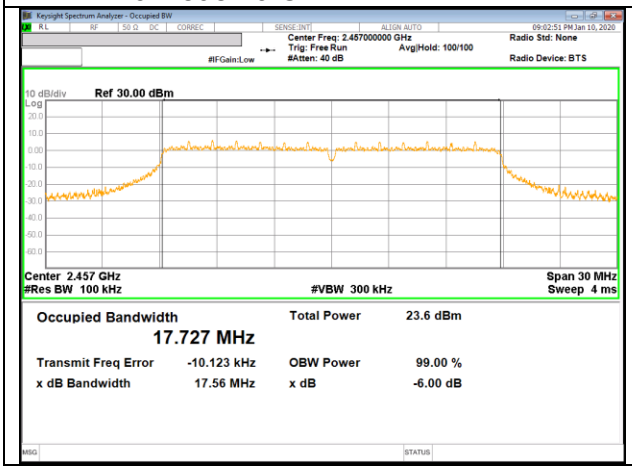
11n HT20 Mode 3 Ch.



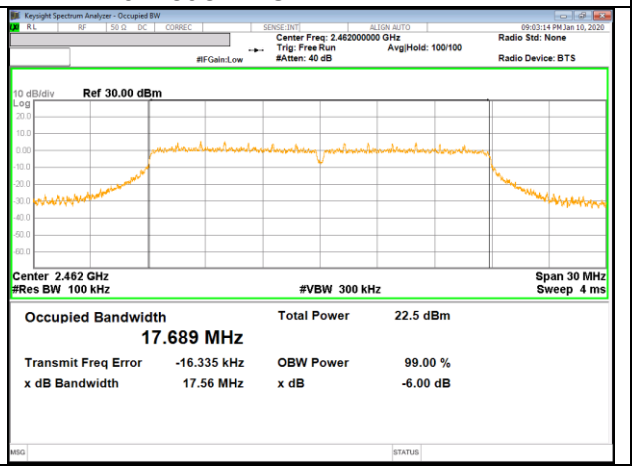
11n HT20 Mode 6 Ch.



11n HT20 Mode 10 Ch.

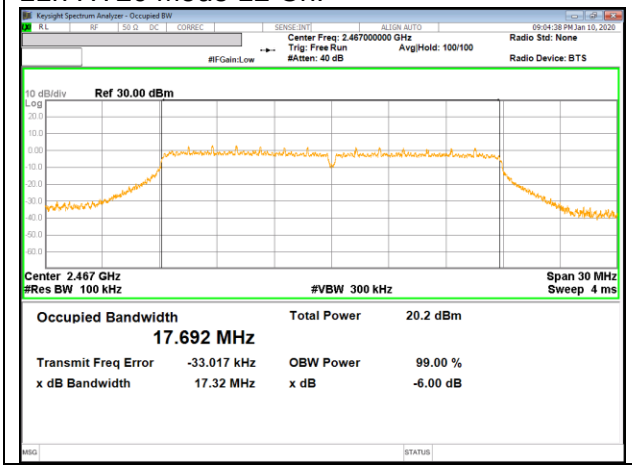


11n HT20 Mode 11 Ch.

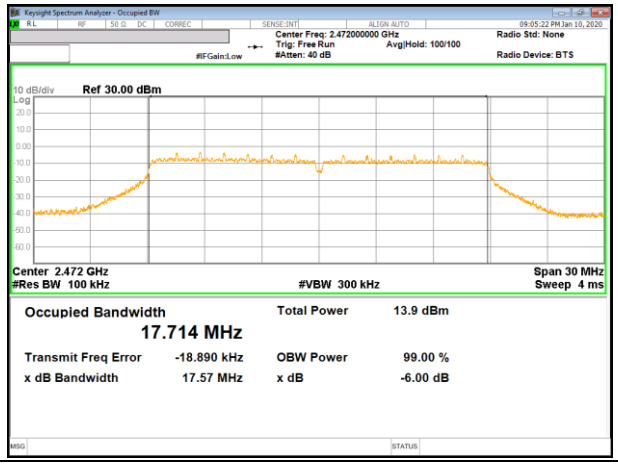


802.11n HT20 mode

11n HT20 Mode 12 Ch.



11n HT20 Mode 13 Ch.



10.2. OUTPUT POWER

LIMITS

FCC §15.247

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

The transmitter output is connected to a power meter.

The cable assembly insertion loss was entered as an offset in the power meter 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.

Duty cycle correction factor is not added to the average output power results for duty cycle factor > 98%.

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain. The directional gain is:

Bands [MHz]	Maximum Antenna Gain [dBi]
2412-2472	0.60

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218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

RESULTS

10.2.1. TEST RESULTS

Frequency Range [MHz]	ANT Gain	FCC Power Limit [dBm]	Max Power [dBm]
2412 - 2472	0.60	30.00	30.00

Included in Calculations of Corr'd Power			
Duty Cycle CF	802.11b	0.00	dB
	802.11g	0.15	dB
	802.11n HT20	0.16	dB

Calculation of Output Power result
→ Corr'd Power = Meas Power + Duty Cycle CF

Mode	Channel	Frequency [MHz]	Meas Power [dBm]	Corr'd Power [dBm]	Power Limit [dBm]
802.11b	1	2412	18.62	18.62	30.00
	6	2437	18.74	18.74	
	12	2467	18.65	18.65	
	13	2472	13.32	13.32	
Worst Case				**18.74**	
802.11g	1	2412	14.12	14.27	30.00
	2	2417	17.59	17.74	
	6	2437	17.55	17.70	
	10	2457	17.48	17.63	
	11	2462	15.78	15.93	
	12	2467	13.61	13.76	
	13	2472	7.36	7.51	
Worst Case				**17.74**	
802.11n HT20	1	2412	13.97	14.13	30.00
	2	2417	15.69	15.85	
	3	2422	16.21	16.37	
	6	2437	16.78	16.94	
	10	2457	16.66	16.82	
	11	2462	15.77	15.93	
	12	2467	13.68	13.84	
	13	2472	6.99	7.15	
Worst Case				**16.94**	

10.3. PSD

LIMITS

FCC §15.247

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 section8.4 under KDB558074 D01 15.247 Meas Guidance.

RESULTS

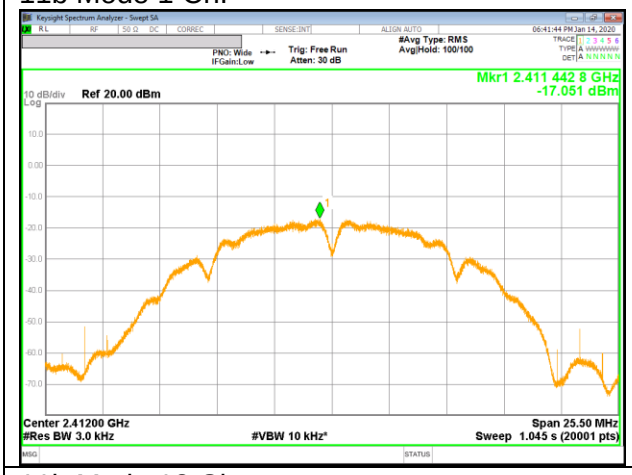
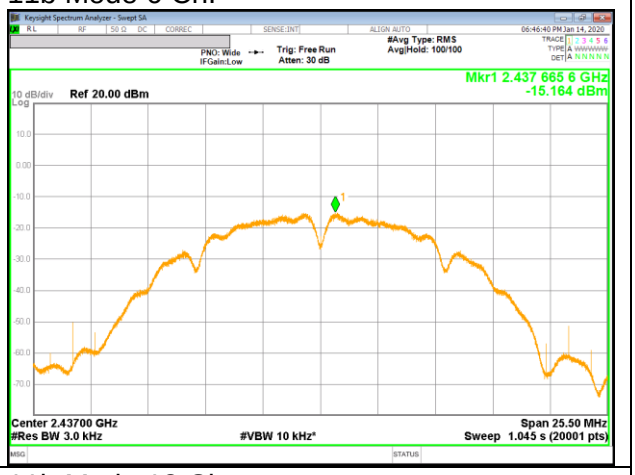
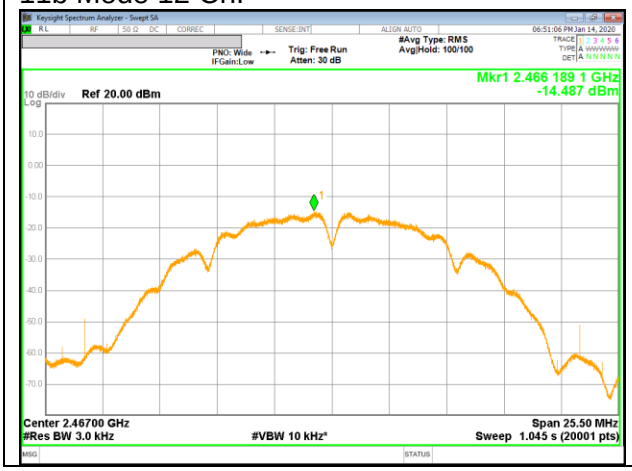
10.3.1. TEST RESULTS

Included in Calculations of Corr'd Power			
Duty Cycle CF	802.11b	0.00	dB
	802.11g	0.15	dB
	802.11n HT20	0.16	dB

Calculation of Output PSD result
1. 1TX : Corr'd PSD = Meas PSD + Duty Cycle CF

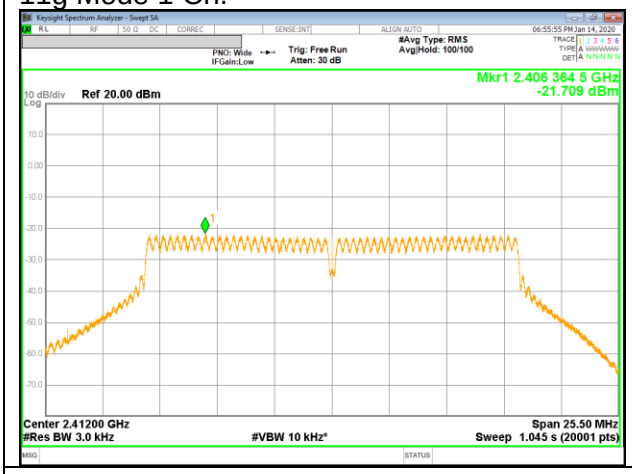
Mode	Channel	Frequency [MHz]	Meas PSD [dBm/3kHz]	Corr'd PSD [dBm/3kHz]	PSD Limit [dBm/3kHz]
802.11b	1	2412	-17.05	-17.05	8.00
	6	2437	-15.16	-15.16	
	12	2467	-14.49	-14.49	
	13	2472	-20.52	-20.52	
Worst Case				-14.49	
802.11g	1	2412	-21.71	-21.56	8.00
	2	2417	-18.82	-18.67	
	6	2437	-18.10	-17.95	
	10	2457	-18.73	-18.58	
	11	2462	-20.43	-20.28	
	12	2467	-22.88	-22.73	
	13	2472	-26.50	-26.35	
Worst Case				-17.95	
802.11n HT20	1	2412	-22.09	-21.93	8.00
	2	2417	-20.64	-20.48	
	3	2422	-20.29	-20.13	
	6	2437	-20.35	-20.19	
	10	2457	-20.56	-20.40	
	11	2462	-21.25	-21.09	
	12	2467	-23.52	-23.36	
	13	2472	-25.47	-25.31	
Worst Case				-20.13	

10.3.2. PSD PLOTS

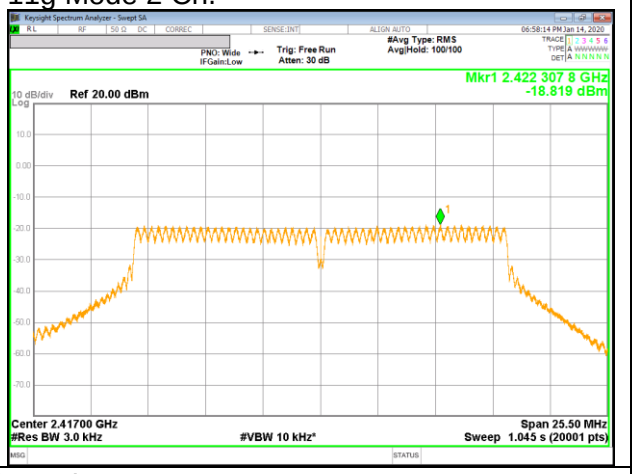
802.11b mode	
11b Mode 1 Ch.	11b Mode 6 Ch.
	
11b Mode 12 Ch.	11b Mode 13 Ch.
	

802.11g mode

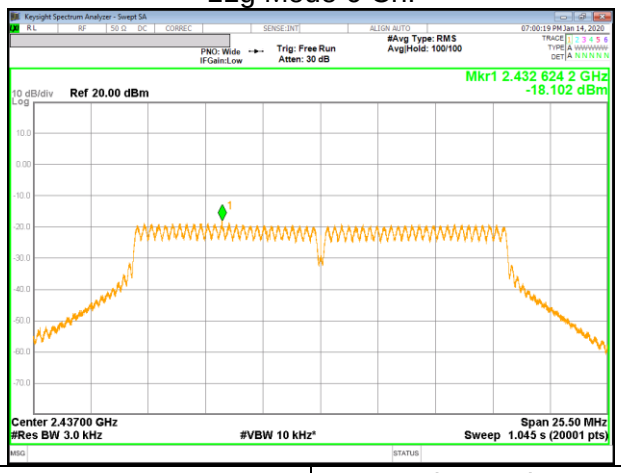
11g Mode 1 Ch.



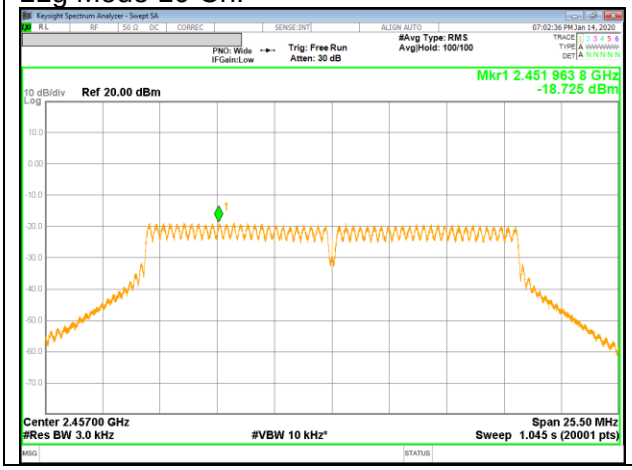
11g Mode 2 Ch.



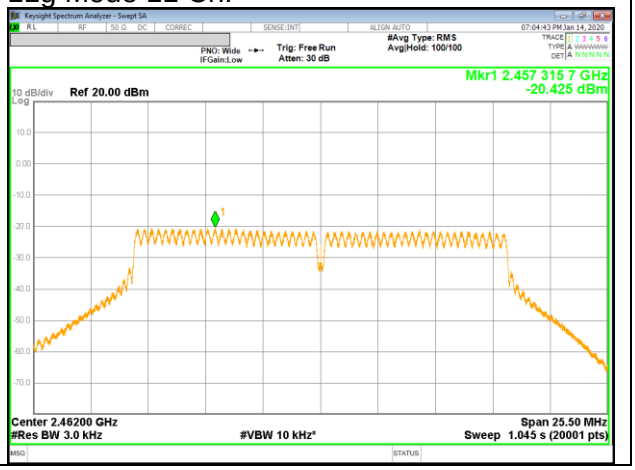
11g Mode 6 Ch.

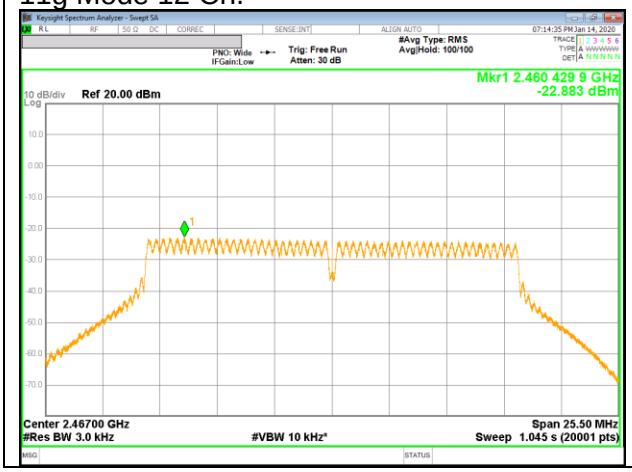
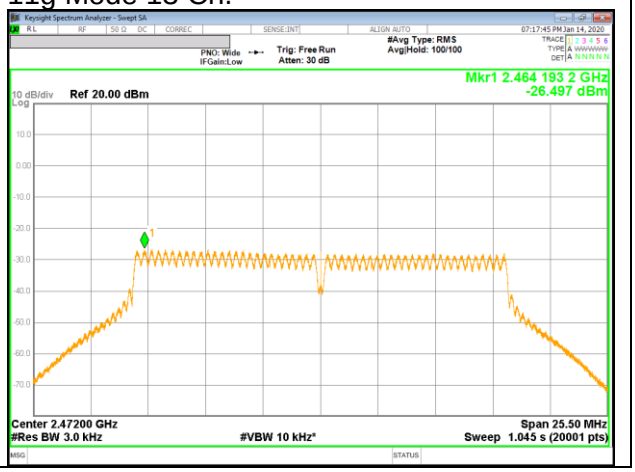


11g Mode 10 Ch.



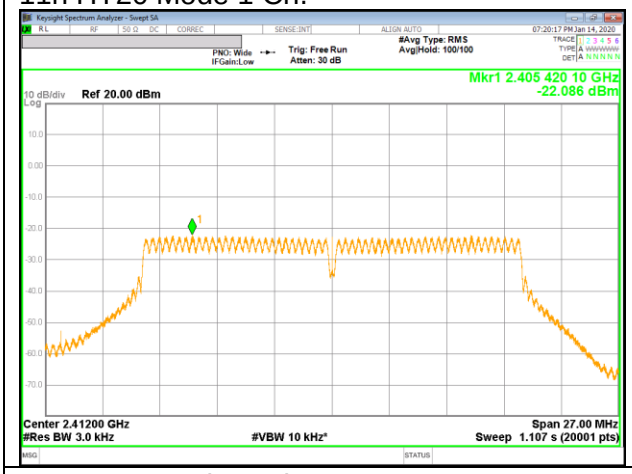
11g Mode 11 Ch.



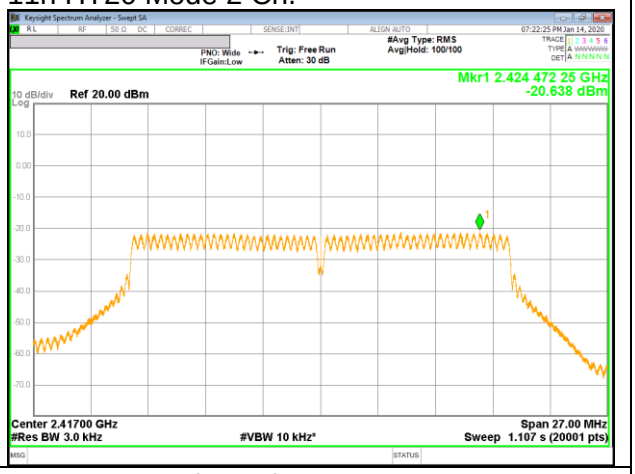
802.11g mode	
11g Mode 12 Ch.	11g Mode 13 Ch.
	

802.11n HT20 mode

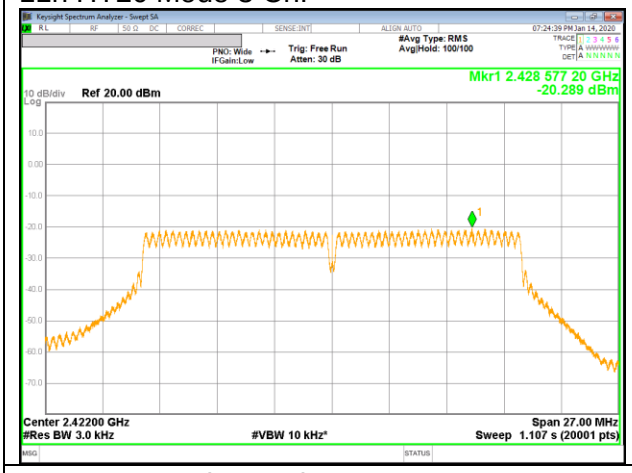
11n HT20 Mode 1 Ch.



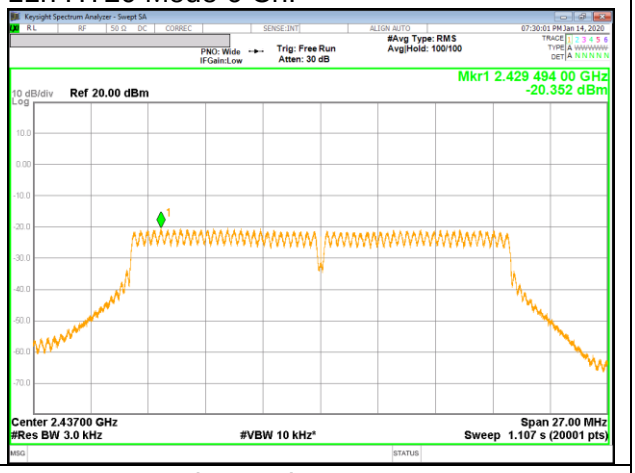
11n HT20 Mode 2 Ch.



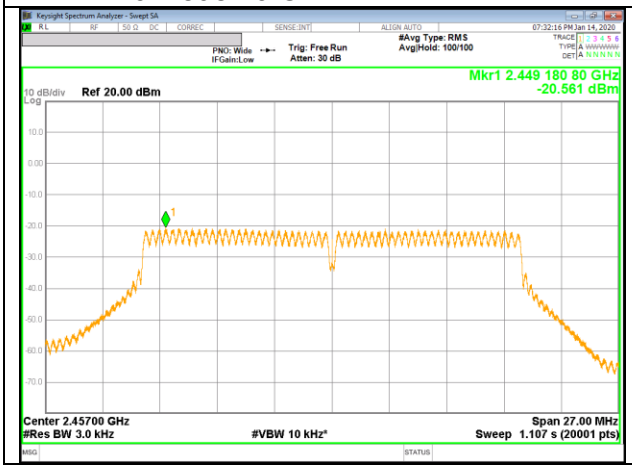
11n HT20 Mode 3 Ch.



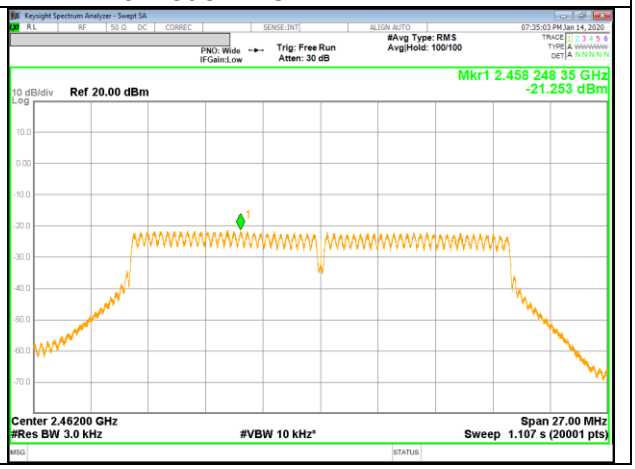
11n HT20 Mode 6 Ch.

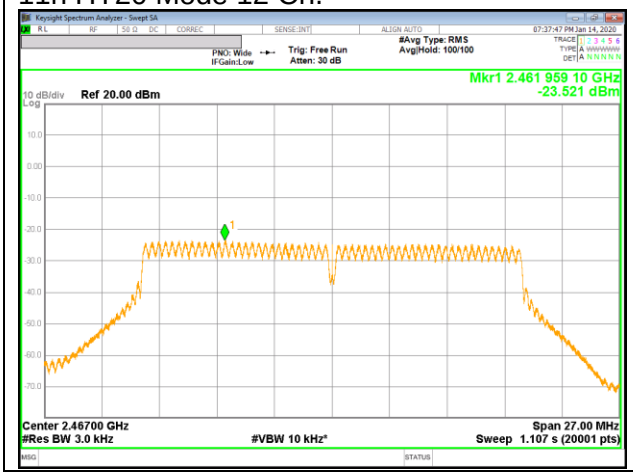
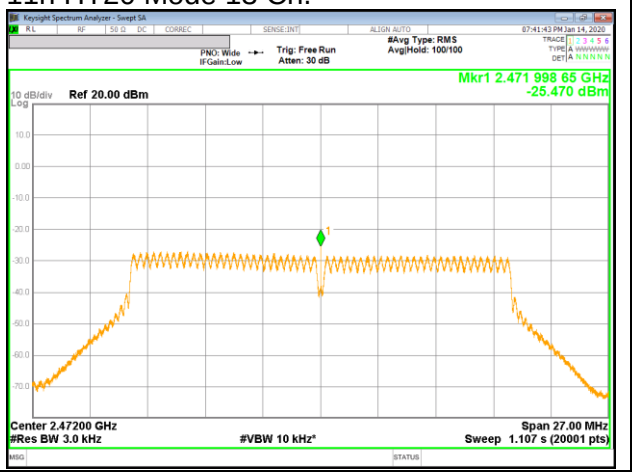


11n HT20 Mode 10 Ch.



11n HT20 Mode 11 Ch.



802.11n HT20 mode	
11n HT20 Mode 12 Ch.	11n HT20 Mode 13 Ch.
	

10.4. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

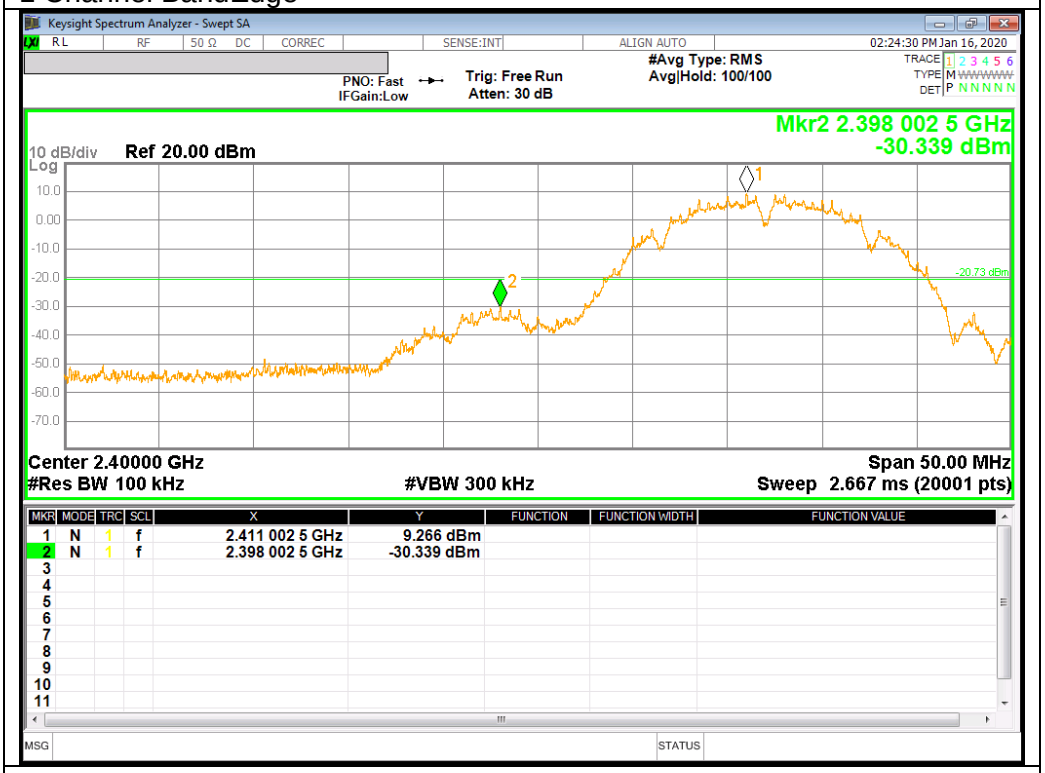
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge, out-of-band emissions (where measurements to the general radiated limits will not be made)

RESULTS

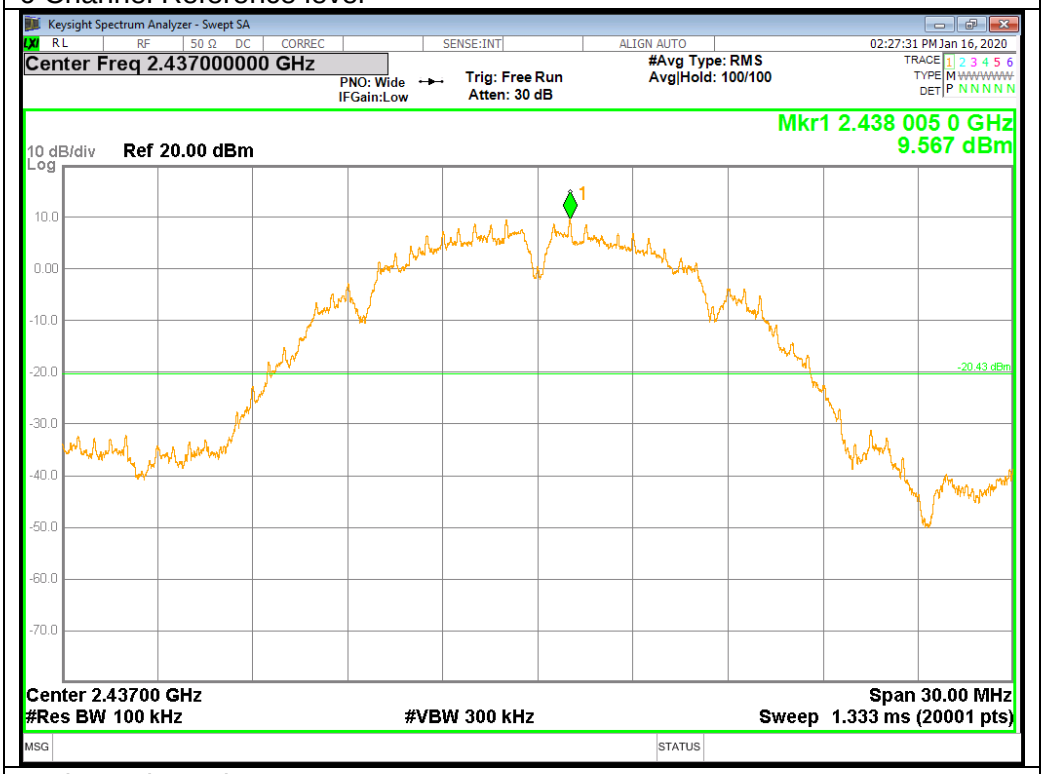
10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

1 Channel BandEdge



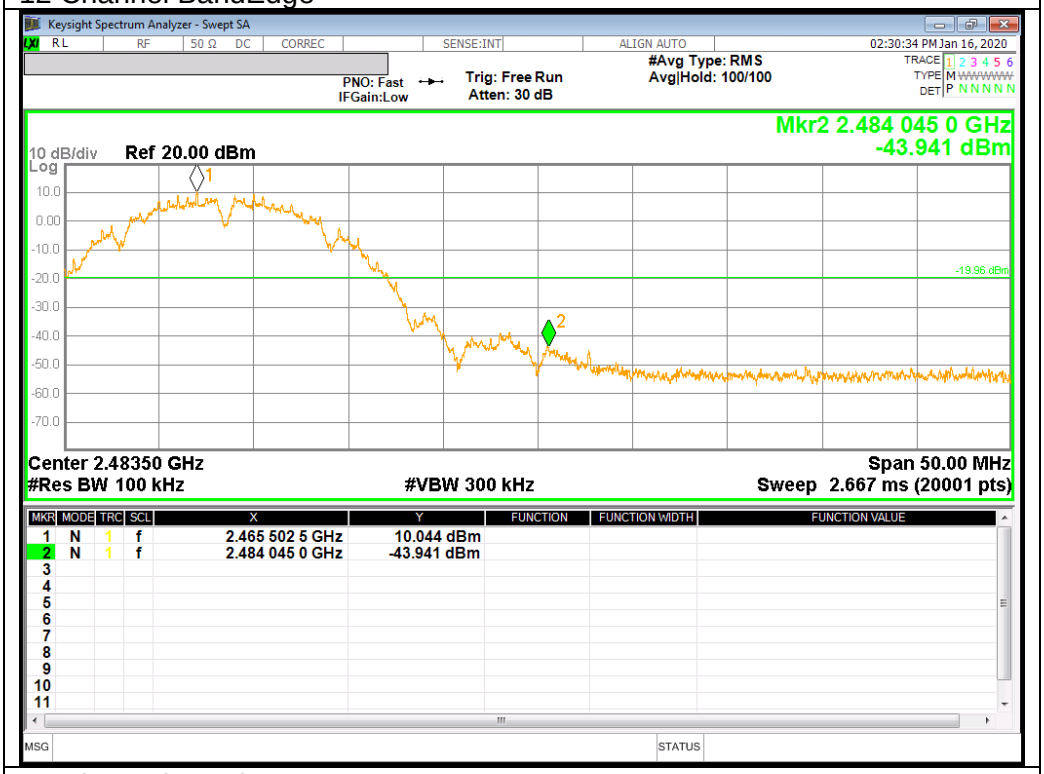
1 Channel Spurious

6 Channel Reference level



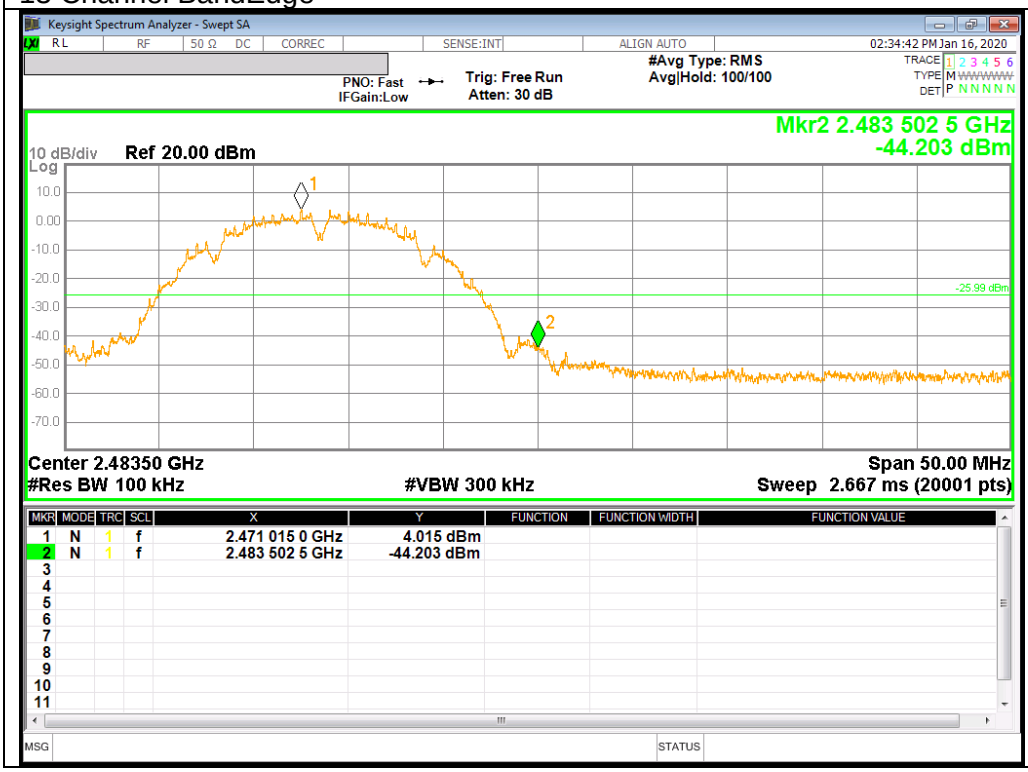
6 Channel Spurious

12 Channel BandEdge



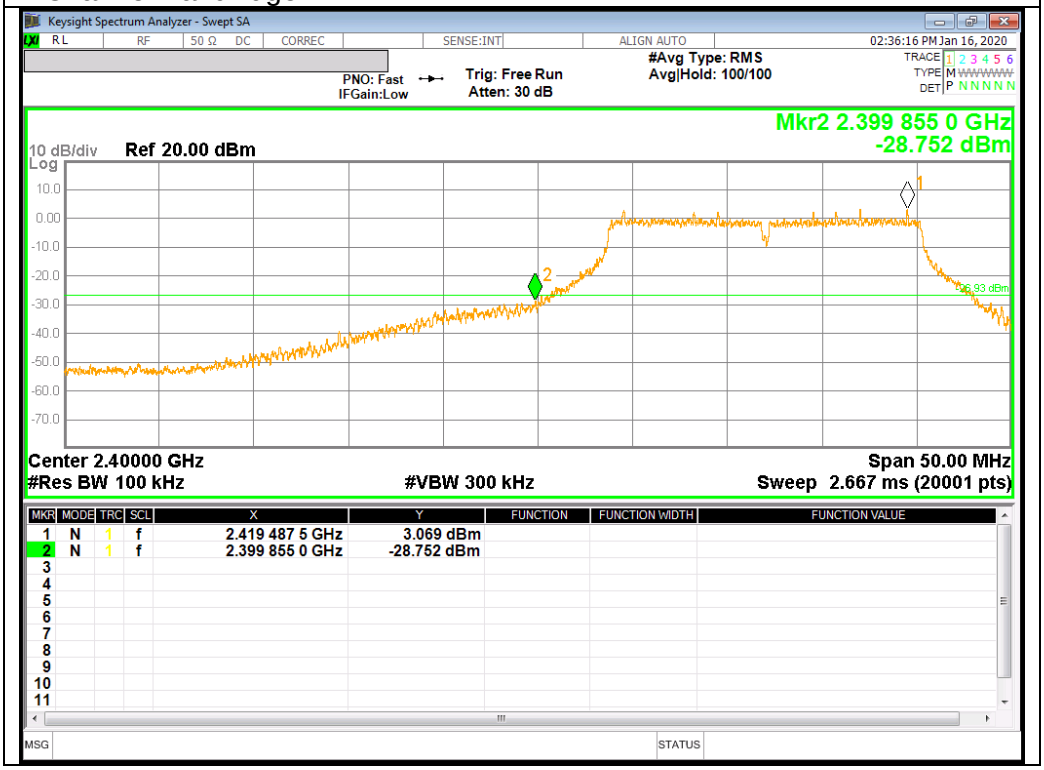
12 Channel Spurious

13 Channel BandEdge



10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

1 Channel BandEdge



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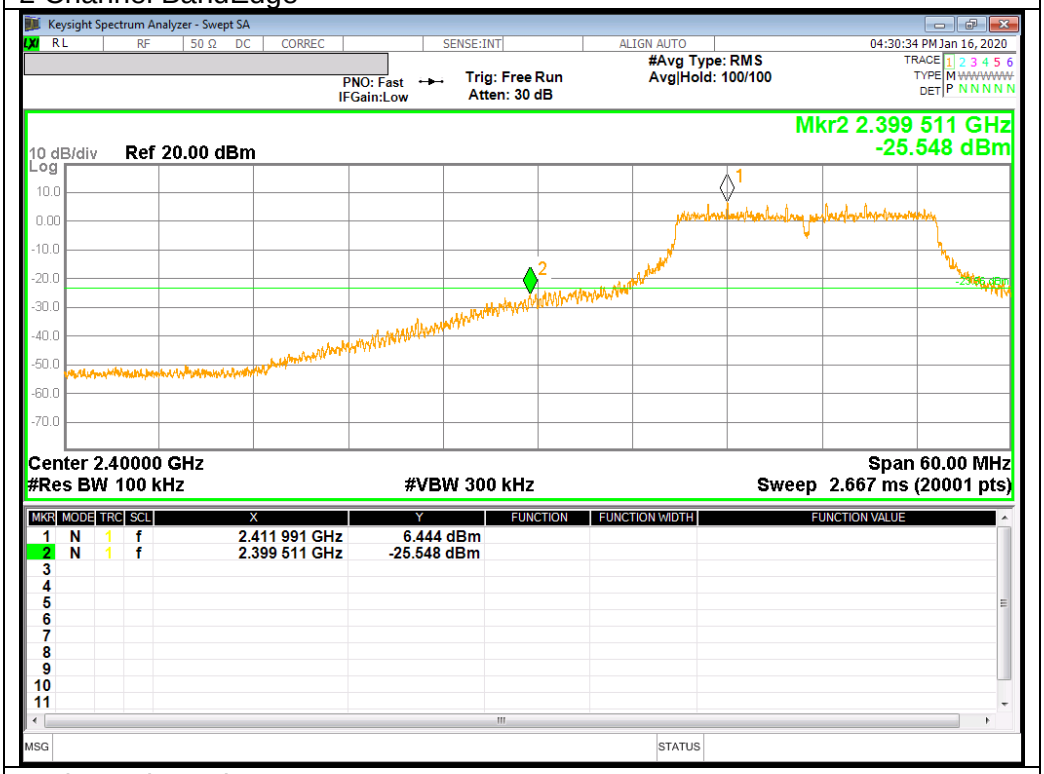
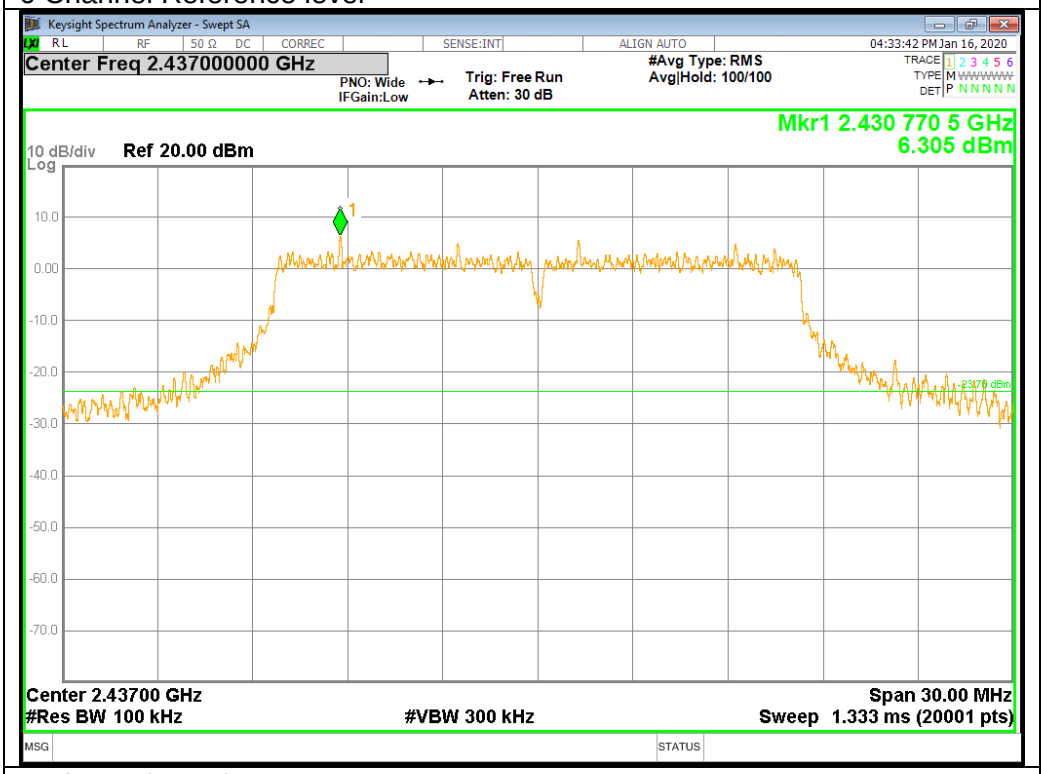
2 Channel BandEdge



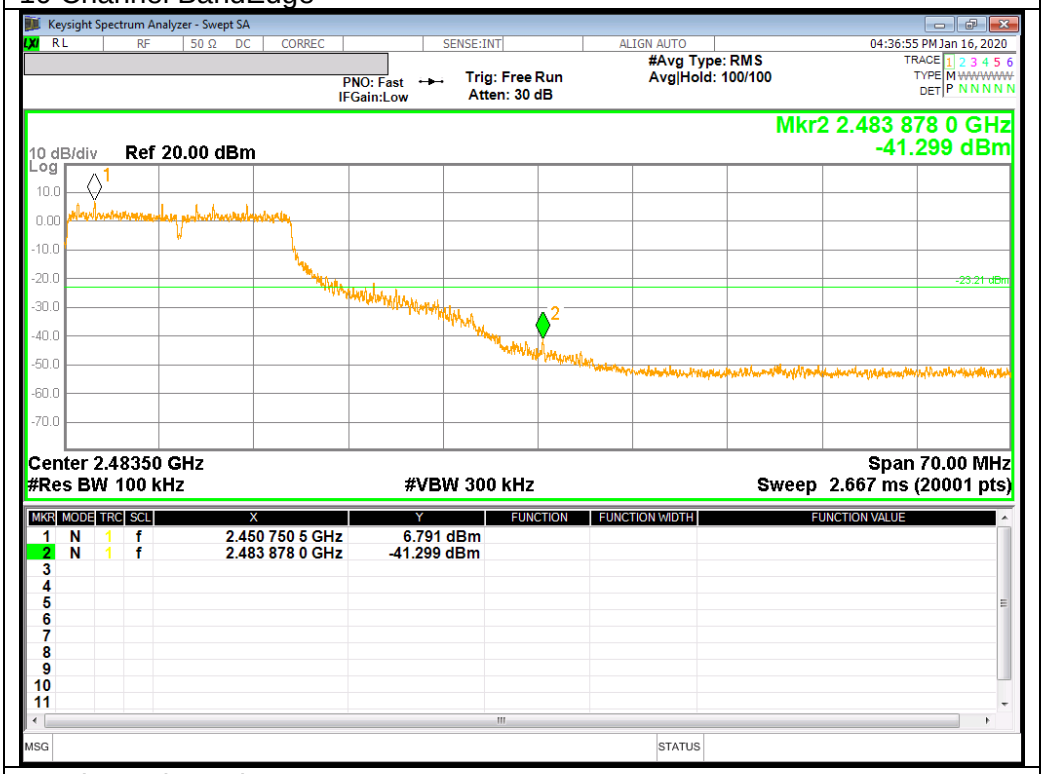
2 Channel Spurious

6 Channel Reference level



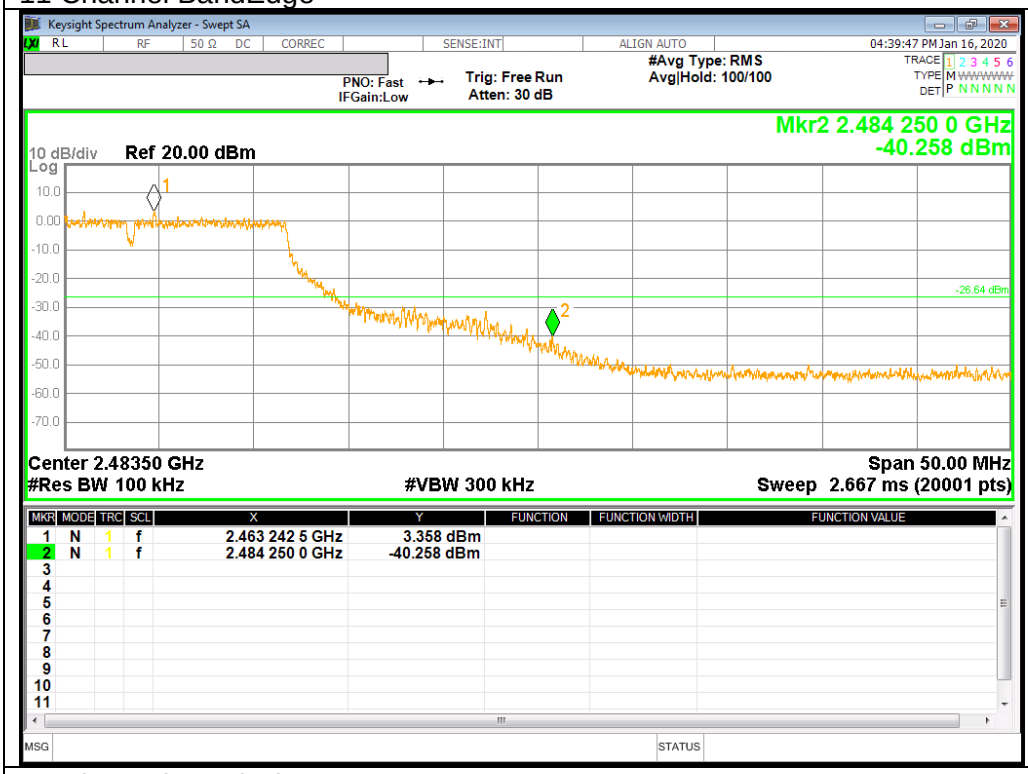
6 Channel Spurious

10 Channel BandEdge

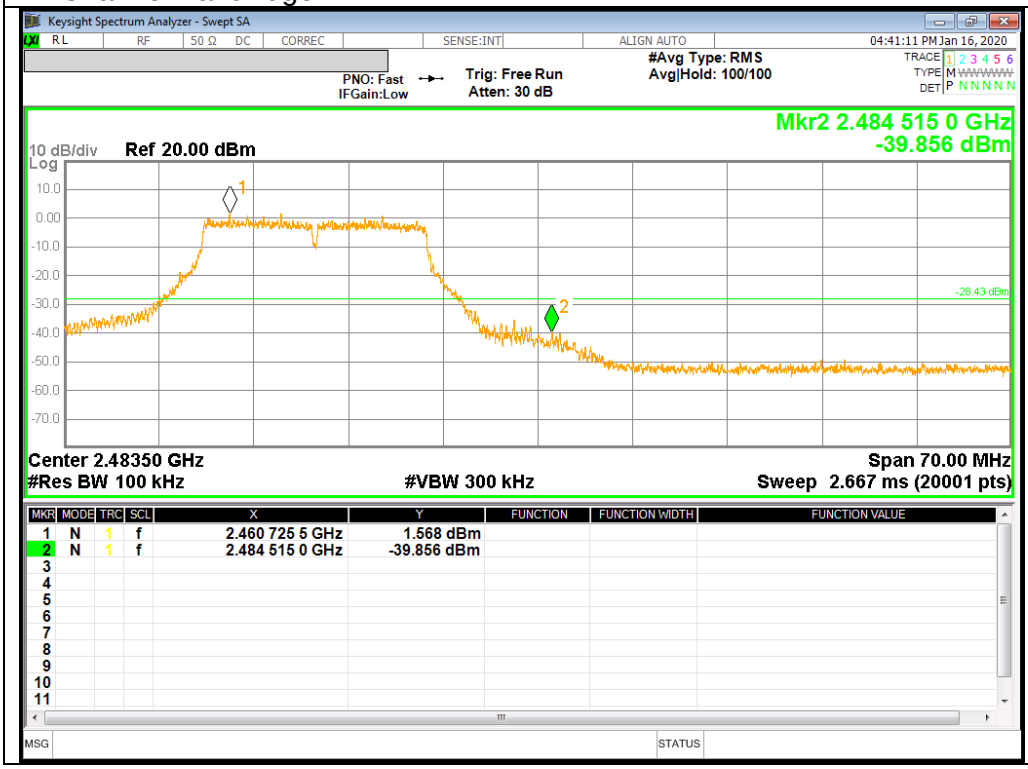


10 Channel Spurious

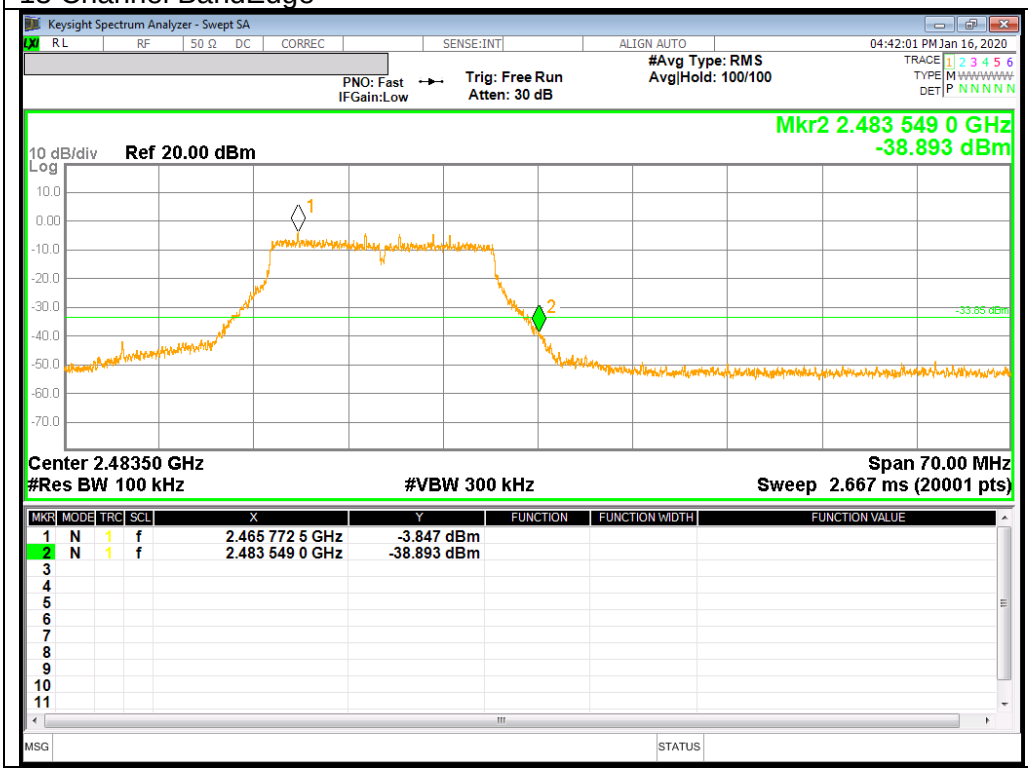
11 Channel BandEdge



12 Channel BandEdge

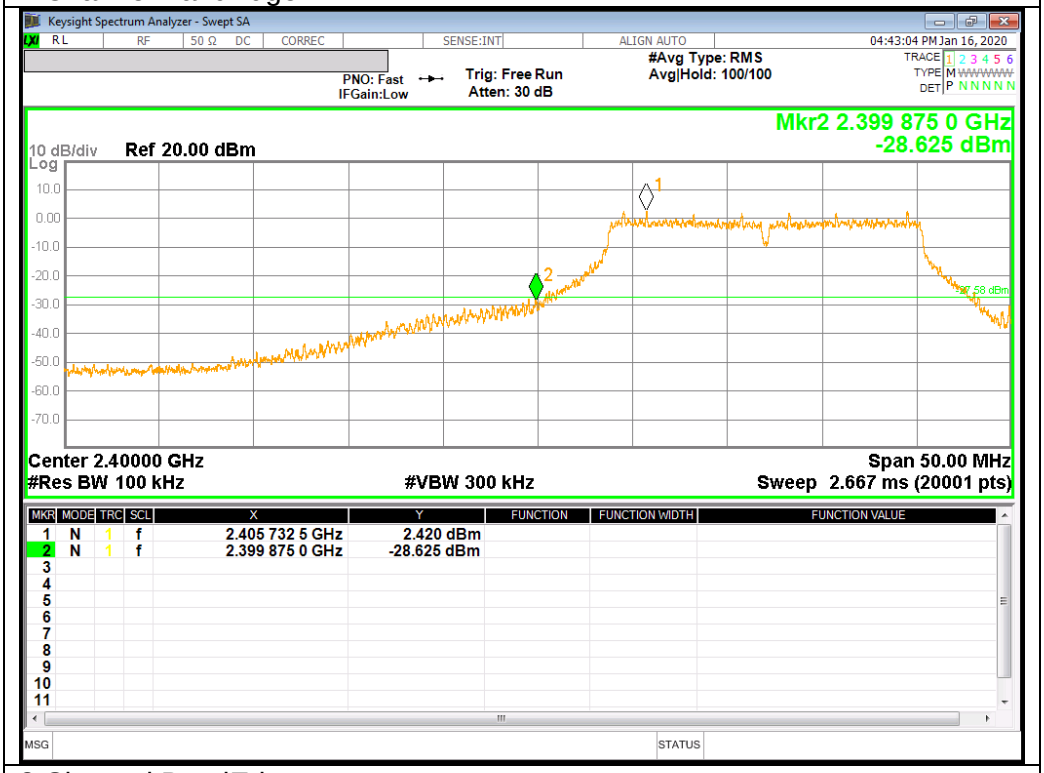


13 Channel BandEdge

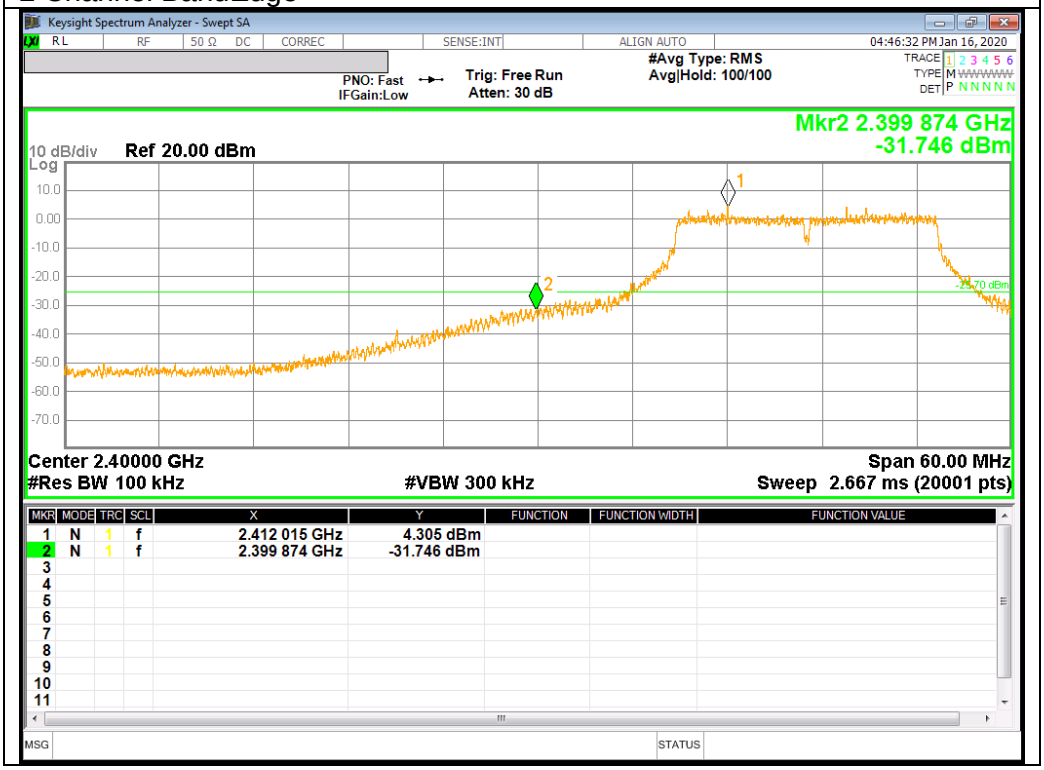


10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

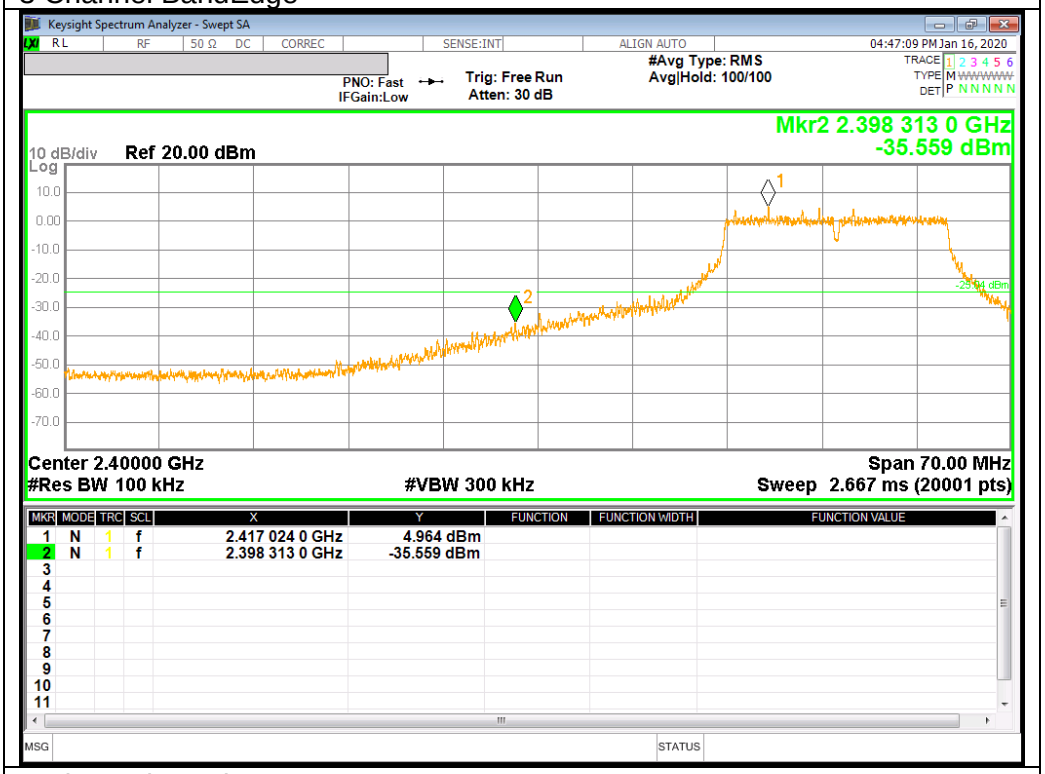
1 Channel BandEdge



2 Channel BandEdge

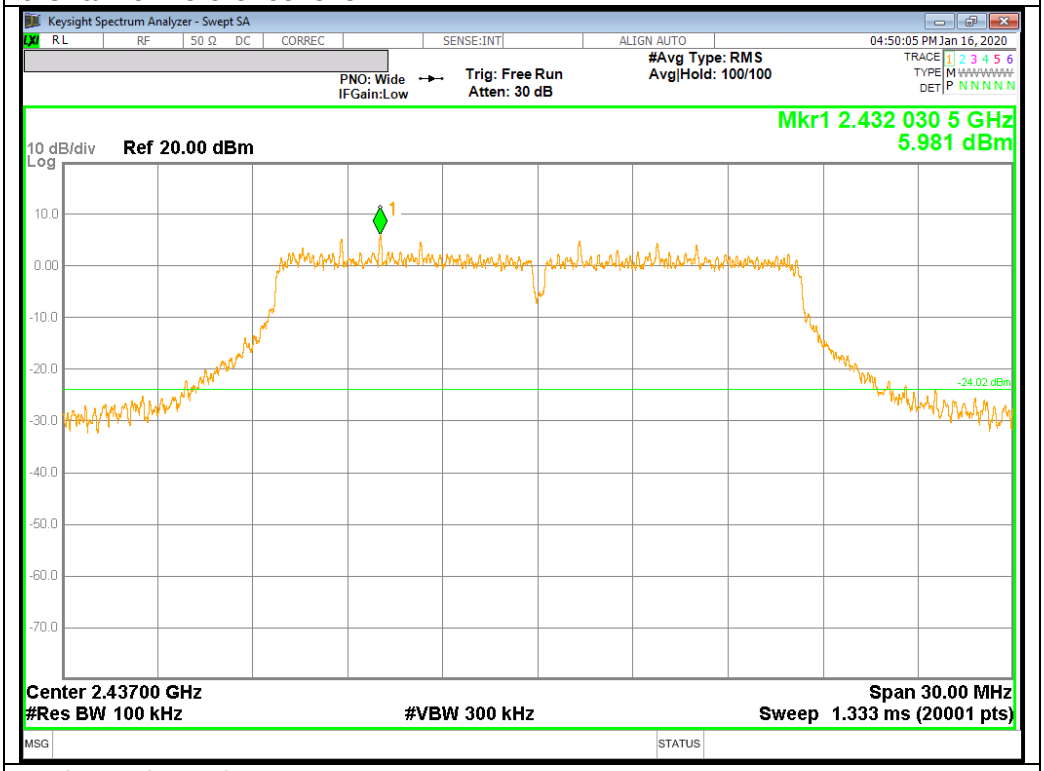


3 Channel BandEdge



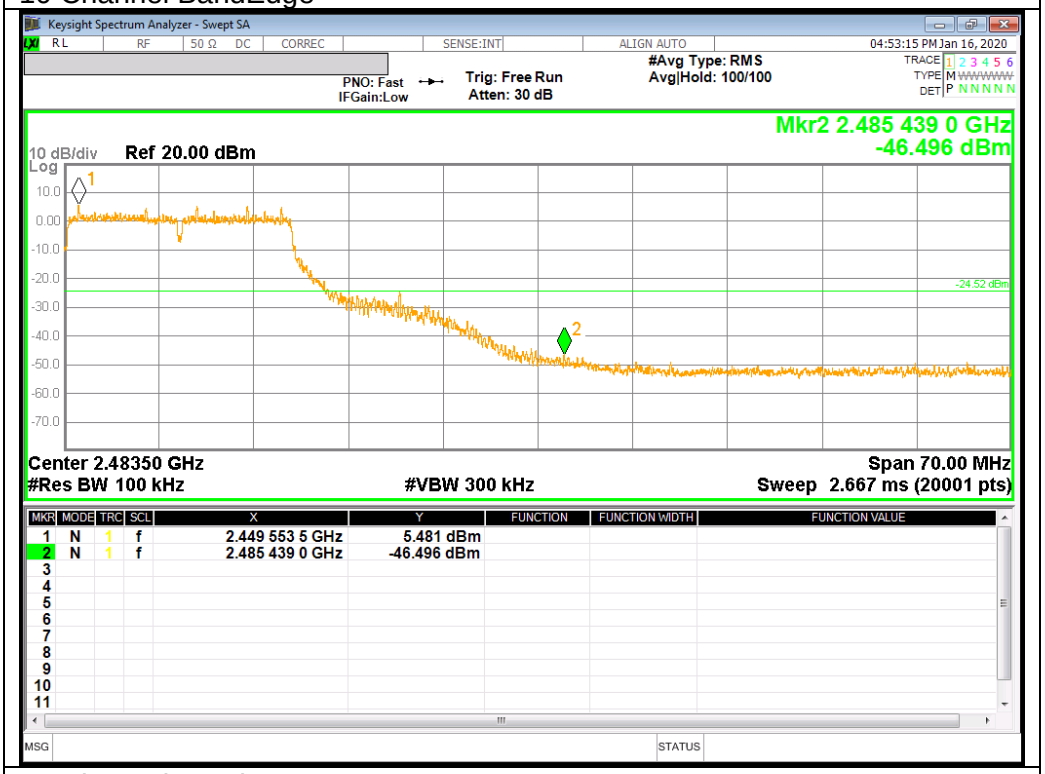
3 Channel Spurious

6 Channel Reference level



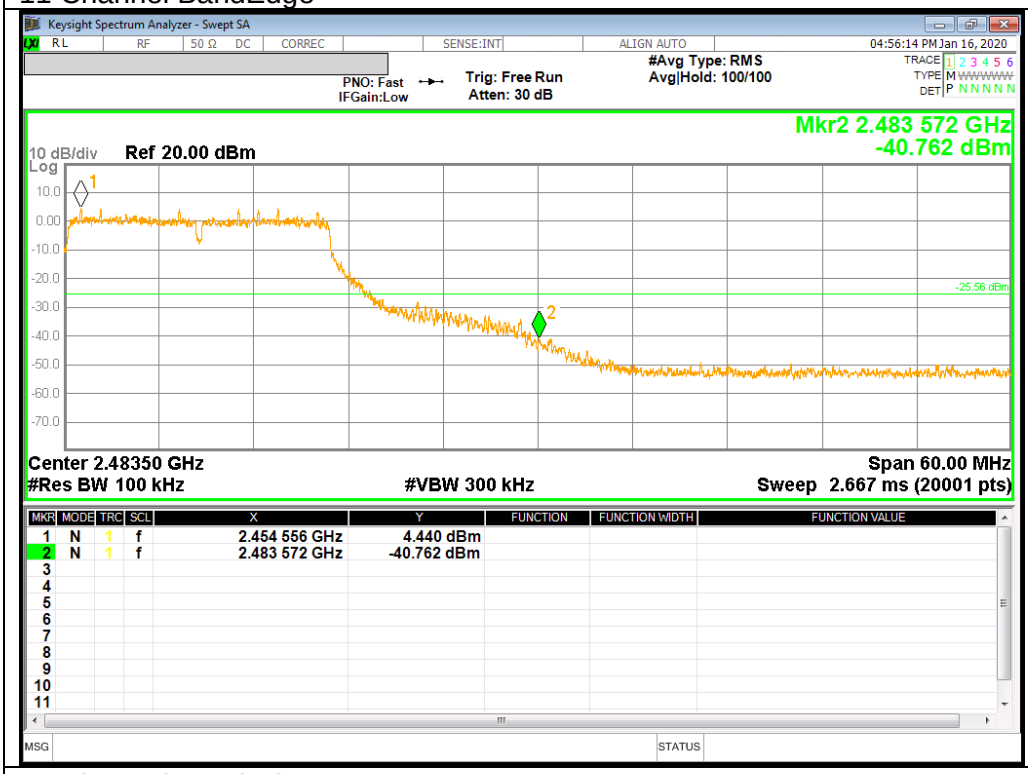
6 Channel Spurious

10 Channel BandEdge

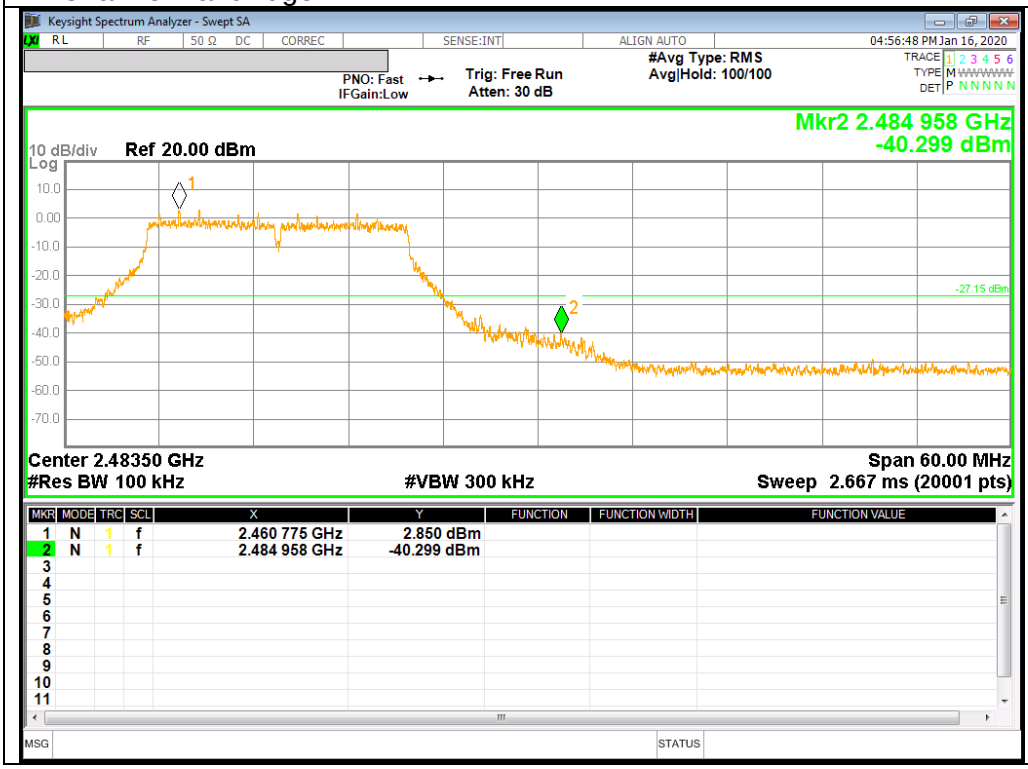


10 Channel Spurious

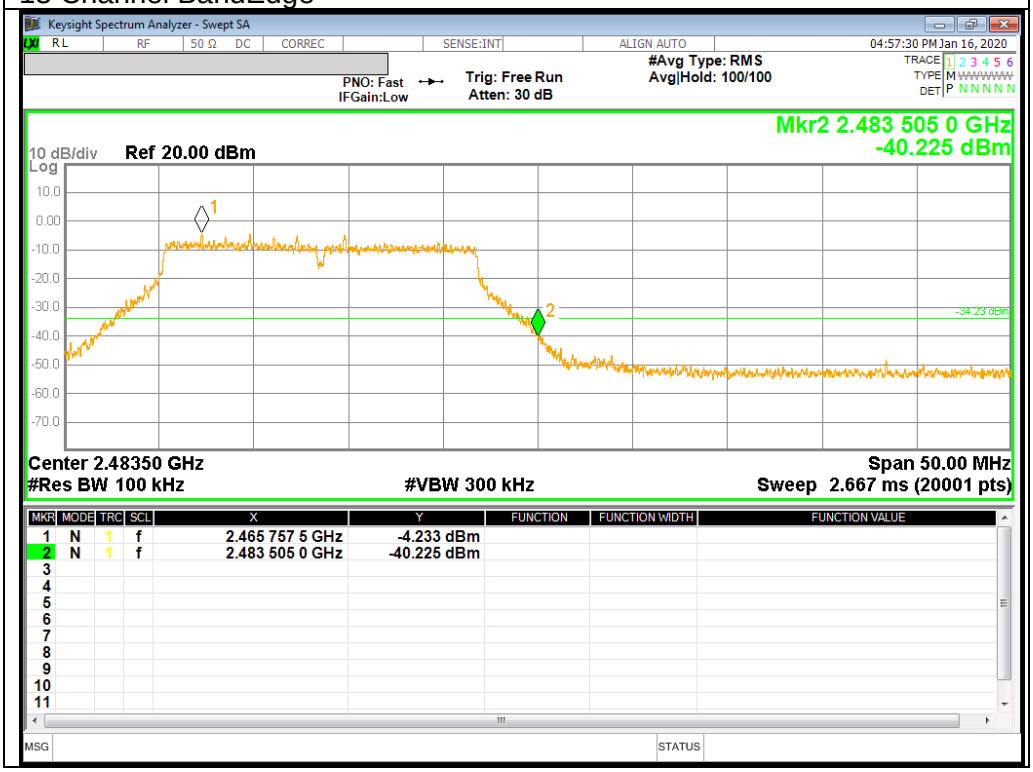
11 Channel BandEdge



12 Channel BandEdge



13 Channel BandEdge



11. RADIATED TEST RESULTS

11.1. LIMITS AND PROCEDURE

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.
(Restriced bandedge, Final detection of spurious harmonic emissions)
Duty cycle factor= 10log (1/x) For this sample B mode = 0dB (duty cycle >98%);
G mode = 0.15dB (duty cycle <98%); N mode = 0.16dB (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 field 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.

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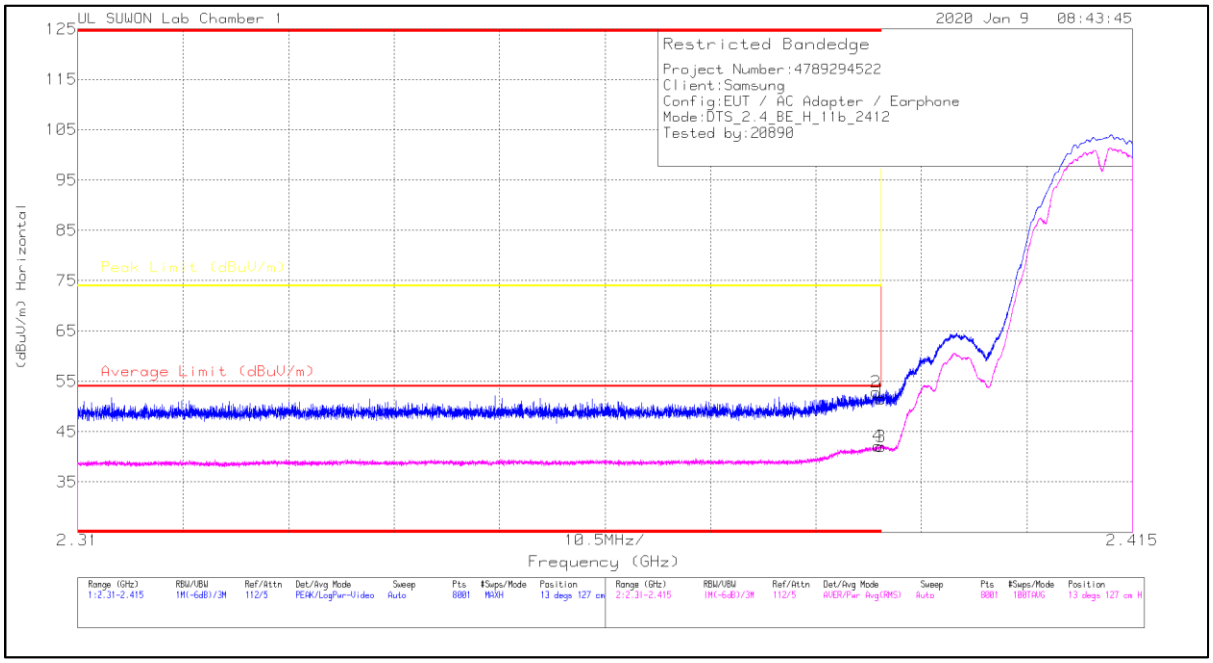
11.2. TRANSMITTER ABOVE 1 GHz

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

RESTRICTED BANDEDGE (1 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



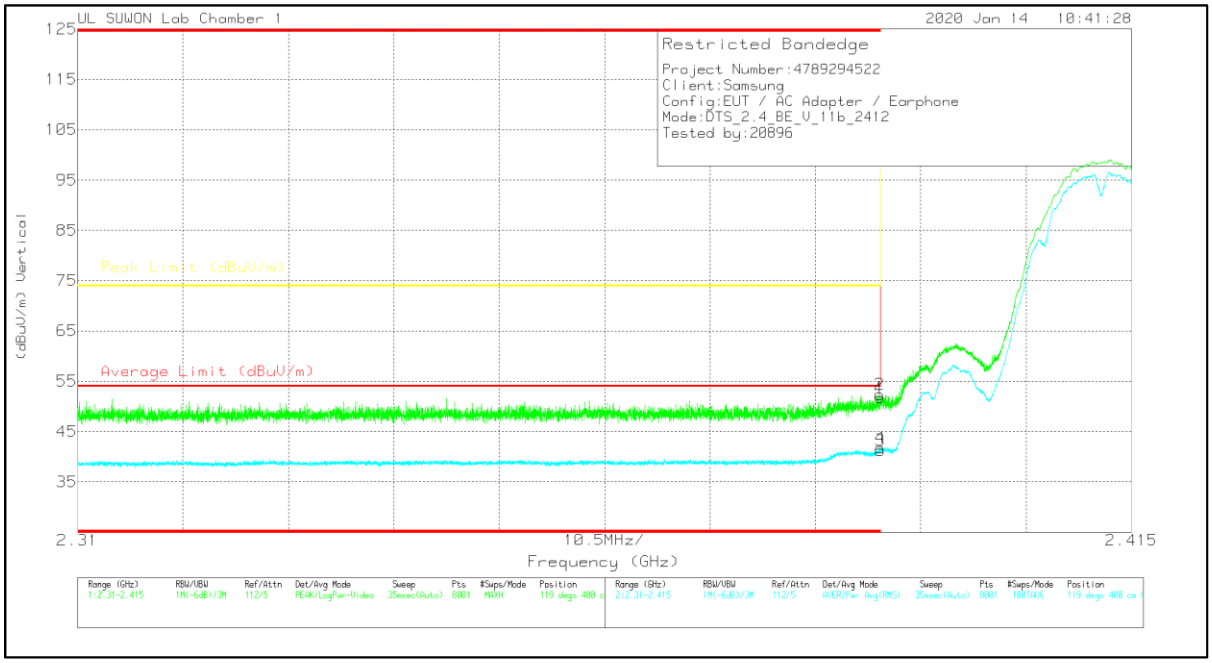
HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	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	* 2.39	45.3	Pk	31.7	-25.5	0	51.5	-	-	74	-22.5	13	127	H
2	* 2.38946	46.77	Pk	31.7	-25.6	0	52.87	-	-	74	-21.13	13	127	H
3	* 2.39	35.78	RMS	31.7	-25.5	0	41.98	54	-12.02	-	-	13	127	H
4	* 2.38968	36.01	RMS	31.7	-25.5	0	42.21	54	-11.79	-	-	13	127	H

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

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

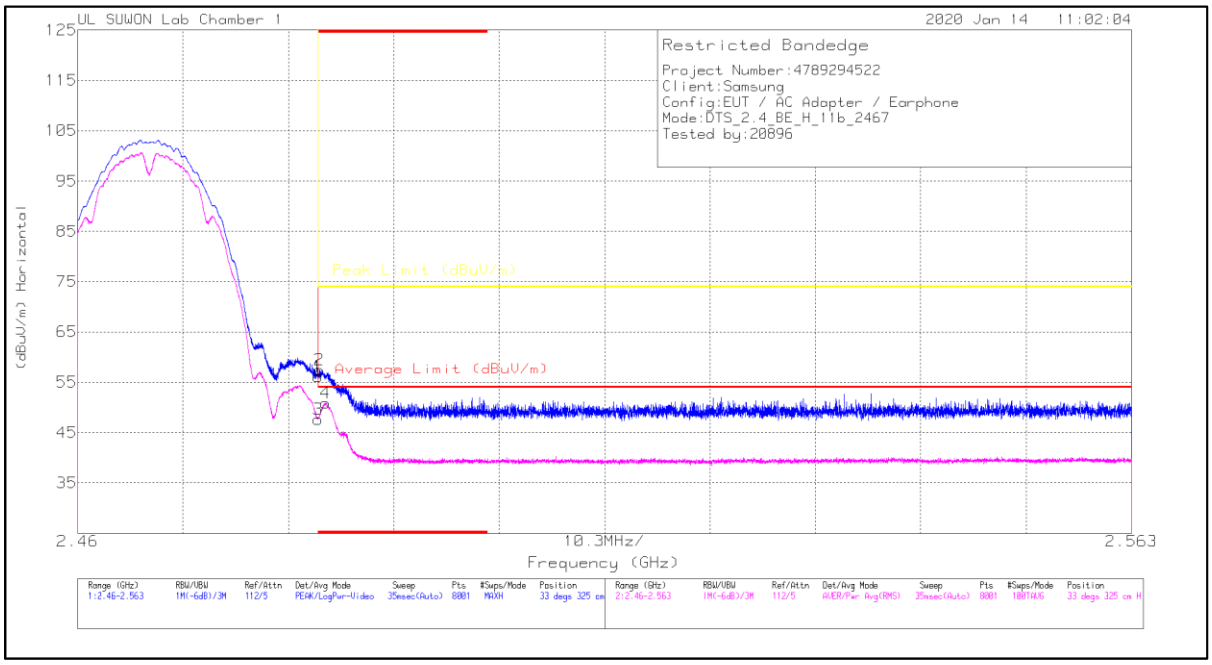
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	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	* 2.39	45.53	Pk	31.7	-25.5	0	51.73	-	-	74	-22.27	119	400	V
2	* 2.38991	46.18	Pk	31.7	-25.5	0	52.38	-	-	74	-21.62	119	400	V
3	* 2.39	35.06	RMS	31.7	-25.5	0	41.26	54	-12.74	-	-	119	400	V
4	* 2.38998	35.54	RMS	31.7	-25.5	0	41.74	54	-12.26	-	-	119	400	V

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

AUTHORIZED BANDEDGE (12 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



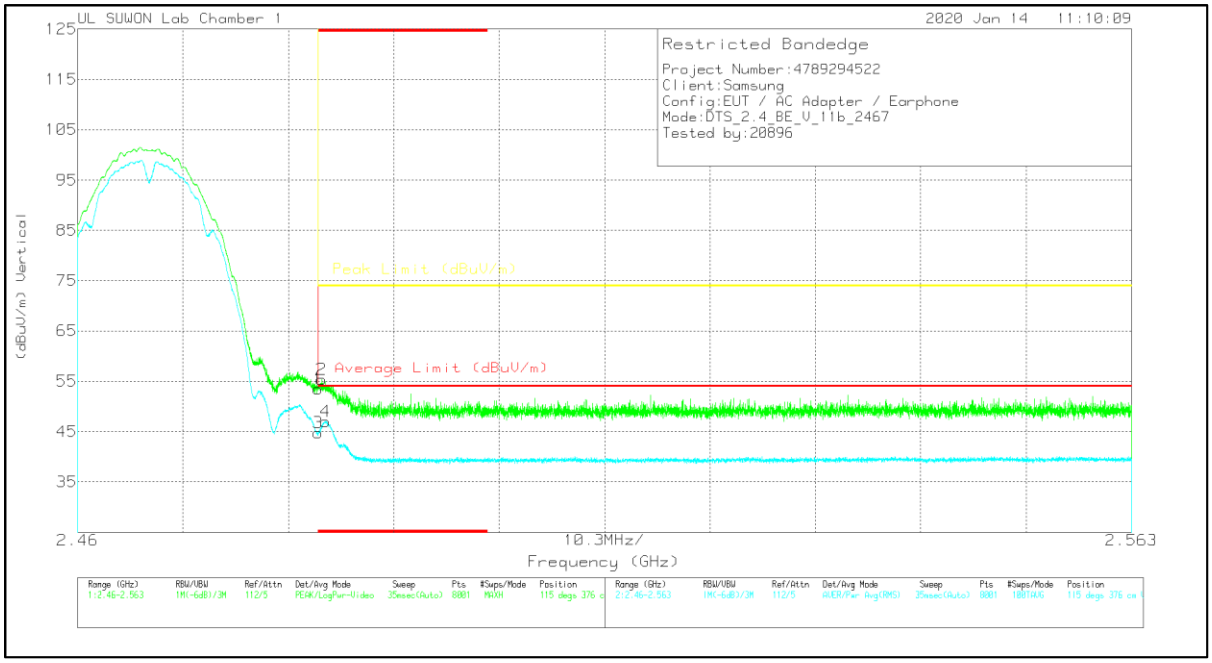
HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	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	49.47	Pk	31.9	-25.2	0	56.17	-	-	74	-17.83	33	325	H
2	* 2.4836	50.81	Pk	31.9	-25.2	0	57.51	-	-	74	-16.49	33	325	H
3	* 2.48351	40.96	RMS	31.9	-25.2	0	47.66	54	-6.34	-	-	33	325	H
4	* 2.48426	44.13	RMS	31.9	-25.1	0	50.93	54	-3.07	-	-	33	325	H

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

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

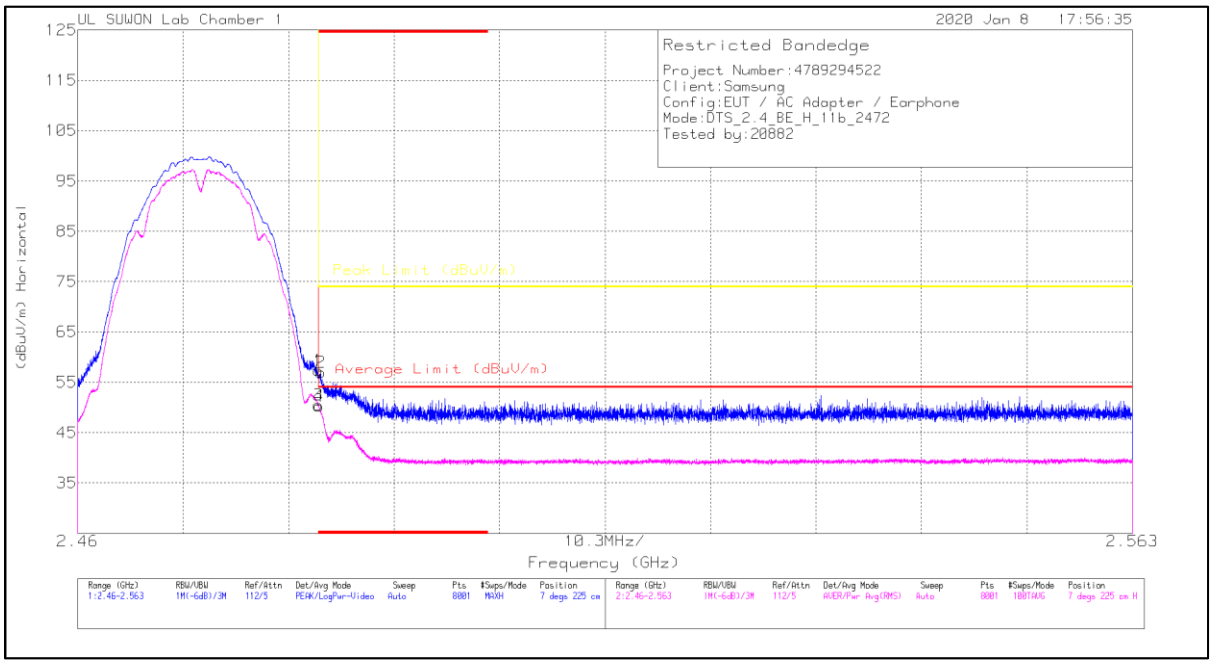
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	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	46.74	Pk	31.9	-25.2	0	53.44	-	-	74	-20.56	115	376	V
2	* 2.48383	48.7	Pk	31.9	-25.2	0	55.4	-	-	74	-18.6	115	376	V
3	* 2.48351	38.03	RMS	31.9	-25.2	0	44.73	54	-9.27	-	-	115	376	V
4	* 2.48426	40.25	RMS	31.9	-25.1	0	47.05	54	-6.95	-	-	115	376	V

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

AUTHORIZED BANDEDGE (13 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



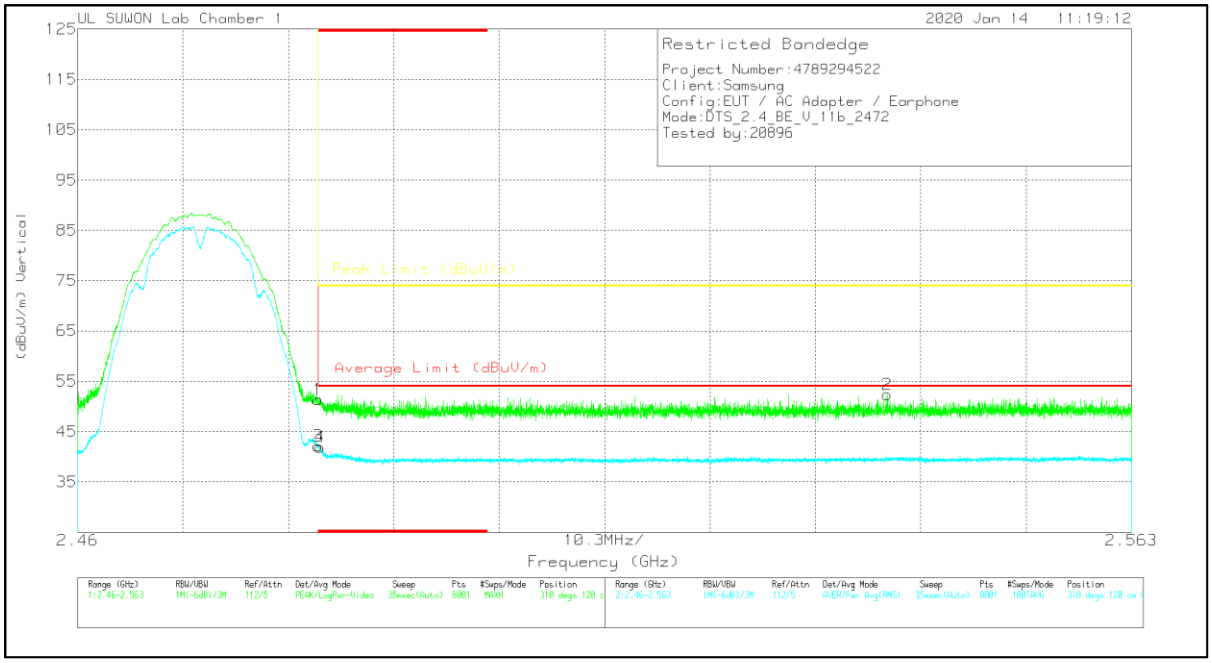
HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	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	50.68	Pk	31.9	-25.2	0	57.38	-	-	74	-16.62	7	225	H
2	* 2.48373	50.27	Pk	31.9	-25.2	0	56.97	-	-	74	-17.03	7	225	H
3	* 2.48351	43.78	RMS	31.9	-25.2	0	50.48	54	-3.52	-	-	7	225	H
4	* 2.48355	43.51	RMS	31.9	-25.2	0	50.21	54	-3.79	-	-	7	225	H

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

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	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	44.73	Pk	31.9	-25.2	0	51.43	-	-	74	-22.57	310	120	V
2	2.53916	45.48	Pk	32	-25.1	0	52.38	-	-	74	-21.62	310	120	V
3	* 2.48351	35.4	RMS	31.9	-25.2	0	42.1	54	-11.9	-	-	310	120	V
4	* 2.4837	35.17	RMS	31.9	-25.2	0	41.87	54	-12.13	-	-	310	120	V

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