



FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

CDMA/GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac, ANT+ and NFC

MODEL NUMBER : SM-W2018

FCC ID: A3LSMW2018

REPORT NUMBER: 4788164548-E1V3

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	11/15/17	Initial issue	Junwhan Lee
V2	11/27/17	Updated to address TCB's question	Junwhan Lee
V3	11/28/17	Updated to address TCB's question	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: CDMA/GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac, ANT+ and NFC

MODEL NUMBER: SM-W2018

SERIAL NUMBER: R38J906NV9N (RADIATED);
ce07171719f8a10d02 (CONDUCTED)

DATE TESTED: SEP 28, 2017 - NOV 14, 2017

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:



SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Junwhan Lee
Suwon Lab Engineer
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 v04.
4. ANSI C63.10-2013.
5. KDB 662911 D01 v02r01

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

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.32 dB
Radiated Disturbance, Below 1GHz	3.86 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

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

WiFi MIMO Condition

Frequency	Mode	Antenna 1	Antenna 2
2.4 GHz	802.11b	TX / RX	TX / RX
	802.11g	TX / RX	TX / RX
	802.11g MIMO	TX / RX	TX / RX
	802.11n	TX / RX	TX / RX
	802.11n MIMO	TX / RX	TX / RX
5 GHz	802.11a	TX / RX	TX / RX
	802.11a MIMO	TX / RX	TX / RX
	802.11n	TX / RX	TX / RX
	802.11n MIMO	TX / RX	TX / RX
	802.11ac	TX / RX	TX / RX
	802.11ac MIMO	TX / RX	TX / RX

Simultaneous TX Condition

Frequency	Supported
2.4 GHz Antenna 1 + 5 GHz Antenna 2	Yes
2.4 GHz Antenna 2 + 5 GHz Antenna 1	Yes
2.4 GHz Antenna 1 + 5 GHz Antenna 1	No
2.4 GHz Antenna 2 + 5 GHz Antenna 2	No

Spurious Emissions for Simultaneous Transmission were reported on UNII Test Report section 10.5. (Test Report number : 4788164548-E4V3)

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]	
		Antenna1	Antenna2	Antenna1	Antenna2
2412 - 2472	802.11b	14.47	14.28	27.99	26.79
	802.11g MIMO	19.32		85.51	
	802.11n20 MIMO	19.53		89.74	

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes internal antenna, with a antenna1's maximum gain of -2.6 dBi and antenna2's maximum gain of -6.7 dBi .

5.4. LIST OF TEST REDUCTION AND MODES

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

Frequency Range (MHz)	Mode	Covered by
2412 - 2472	802.11b Legacy 1TX	802.11b Legacy 1TX
	802.11g 1TX	802.11g CDD 2TX
	802.11g CDD 2TX	802.11g CDD 2TX
	802.11n HT20 1TX	802.11n HT20 CDD 2TX
	802.11n HT20 SDM/CDD 2TX	802.11n HT20 CDD 2TX

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.

For Radiated Band Edge measurement, 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. Also, Test results of flip cover closed configuration were more worst cases in comparison with test results of flip cover open configuration. Therefore, Radiated Band Edge tests were conducted on the condition of flip cover closed configuration.

For Radiated Spurious measurement, the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation. Also, Test results of flip cover open configuration were more worst cases in comparison with test results of flip cover closed configuration. Therefore, Radiated Spurious radiated tests were conducted on the condition of flip cover open configuration.

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps (Legacy 1TX)
802.11g mode: 6 Mbps (2TX CDD)
802.11n HT20 mode: MCS0 (2TX CDD)

Note : Radiated spurious test for 802.11g mode and 802.11n mode, test results of separate transmitting antenna(each Antenna1 and Antenna2) were more worse. So this test report contained each test results on section 10(for only radiated spurious test).

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA12CBC	DW3J908CS/B- E	N/A
Data Cable	SAMSUNG	EP-DG950CBE	N/A	N/A

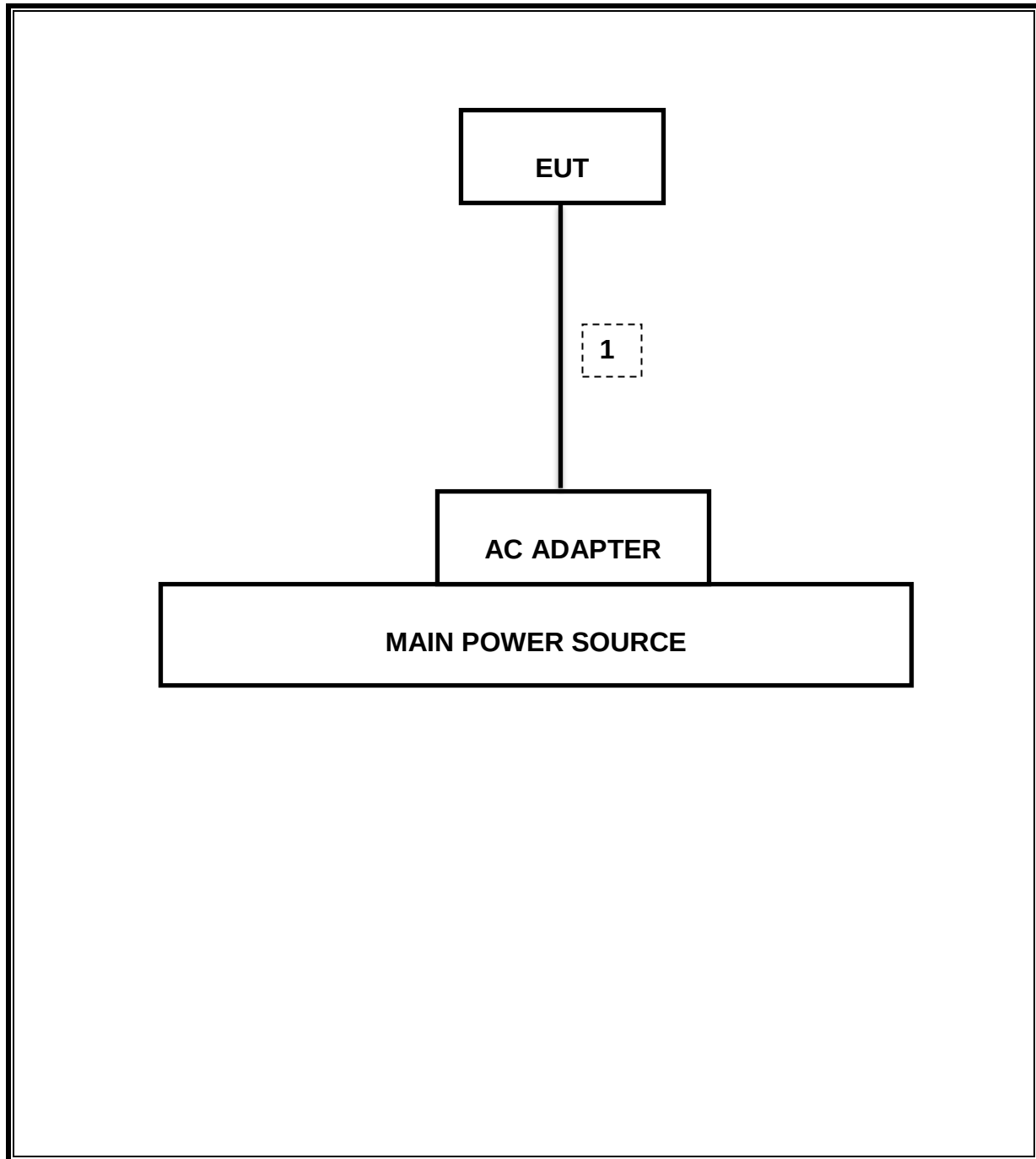
I/O CABLES

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	1.2m	N/A

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



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	Cal Due
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	08-31-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-14-19
Antenna, Horn, 18 GHz	ETS	3115	00167211	10-14-18
Antenna, Horn, 18 GHz	ETS	3115	00161451	03-10-19
Antenna, Horn, 18 GHz	ETS	3117	00168724	05-31-19
Antenna, Horn, 18 GHz	ETS	3117	00168717	05-31-19
Antenna, Horn, 40 GHz	ETS	3116C	00166155	11-30-17
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	12-15-17
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-09-18
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-07-18
Preamplifier	ETS	3115-PA	00167475	08-09-18
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-08-18
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-08-18
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-08-18
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-08-18
Attenuator	PASTERNAK	PE7087-10	A009	08-08-18
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-08-18
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-08-18
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-07-18
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-08-18
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-08-18
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-08-18
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-08-18
High Pass Filter 6GHz	Micro-Tronics	HPM17542	009	08-08-18
High Pass Filter 6GHz	Micro-Tronics	HPM17542	016	08-08-18
LISN	R&S	ENV-216	101837	08-09-18
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	11-25-17
				10-26-19
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

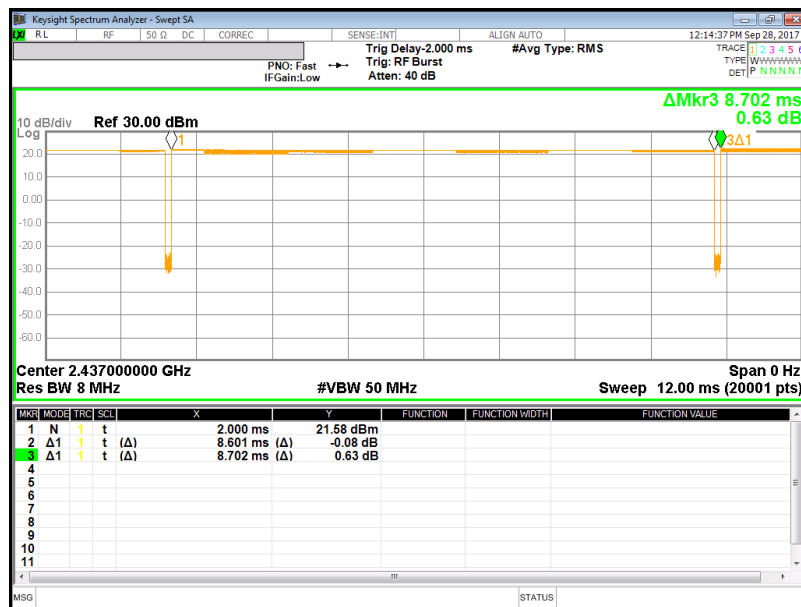
7. REFERENCE MEASUREMENT RESULTS

7.1. ON TIME AND DUTY CYCLE RESULTS

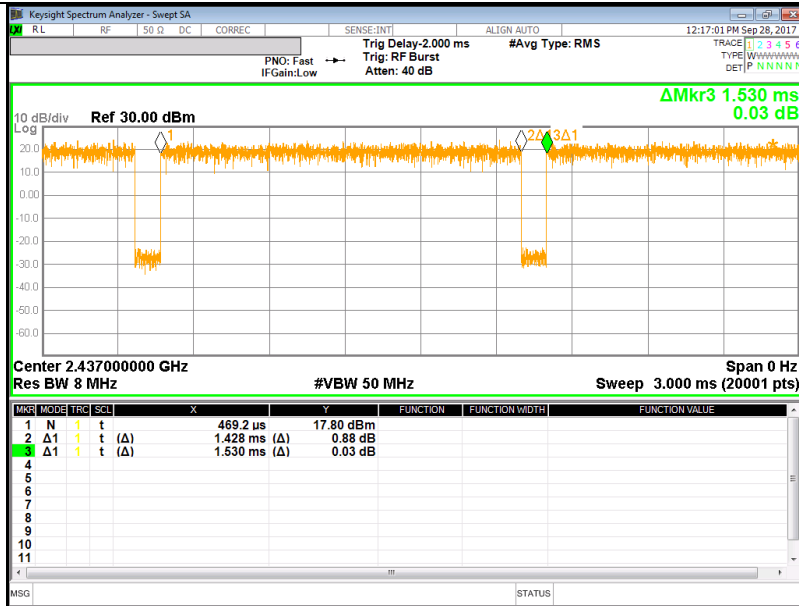
Mode	ON Time B [msec]	Period [msec]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2400MHz Bands						
802.11b	8.601	8.702	0.988	98.8%	0.00	0.010
802.11g	1.428	1.53	0.933	93.3%	0.30	0.700
802.11n HT20	1.335	1.437	0.929	92.9%	0.32	0.749

LIMITS

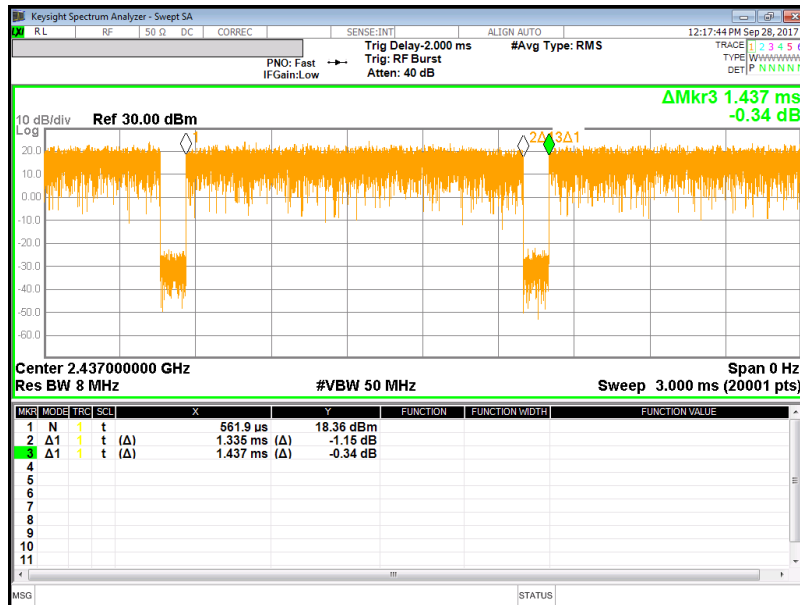
None; for reporting purposes only.



[802.11b Mode]



[802.11g Mode]



[802.11n20 Mode]

8. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	7.061 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-28.601 dBm
15.247	TX conducted output power	<30dBm		Pass	19.53 dBm (AV)
15.247	PSD	<8dBm		Pass	-8.92 dBm (AV)
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	43.32 dBuV (Pk)
15.205, 15.209	Radiated Spurious Emission	< 74dBuV/m	Radiated	Pass	71.99 dBuV/m (Pk)

9. ANTENNA PORT TEST RESULTS

9.1. 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 DTS Meas Guidance v04: The transmitter output is connected to a spectrum analyzer with the RBW set to 100KHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

RESULTS

9.1.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANTENNA 1	ANTENNA 2	
1	2412	7.062	7.061	0.5
6	2437	7.067	7.549	0.5
11	2462	7.557	7.067	0.5
12	2467	7.527	7.533	0.5
13	2472	7.061	7.506	0.5
Worst		7.061		

9.1.2. 802.11g MODE IN THE 2.4 GHz BAND

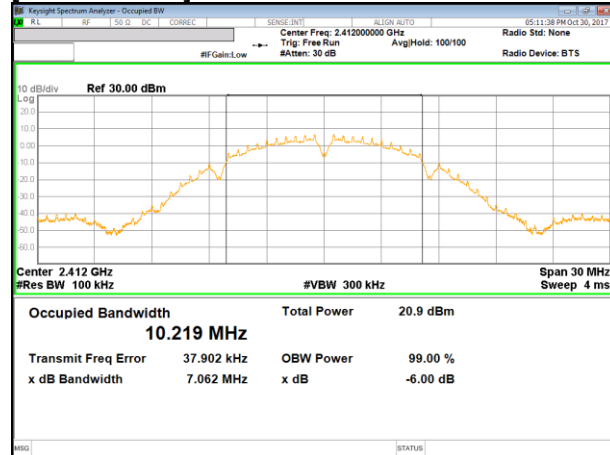
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANTENNA 1	ANTENNA 2	
1	2412	16.29	15.98	0.5
6	2437	16.28	16.30	0.5
11	2462	16.04	15.73	0.5
12	2467	16.06	15.72	0.5
13	2472	16.04	15.71	0.5
Worst		15.71		

9.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

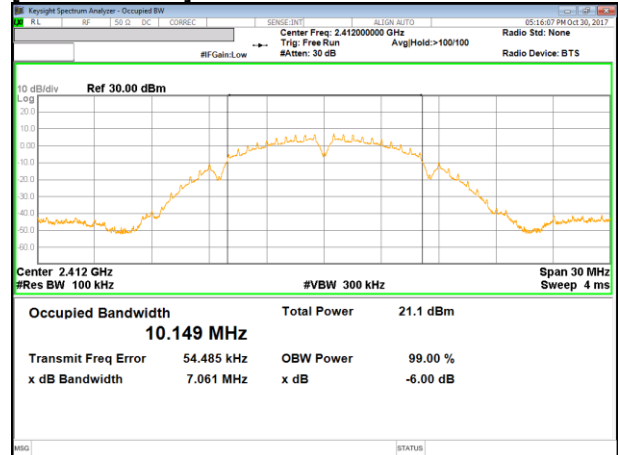
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		ANTENNA 1	ANTENNA 2	
1	2412	17.13	17.27	0.5
6	2437	17.28	17.05	0.5
11	2462	17.26	16.65	0.5
12	2467	16.91	16.31	0.5
13	2472	16.34	16.34	0.5
Worst		16.31		

9.1.4. 6 dB BANDWIDTH PLOTS

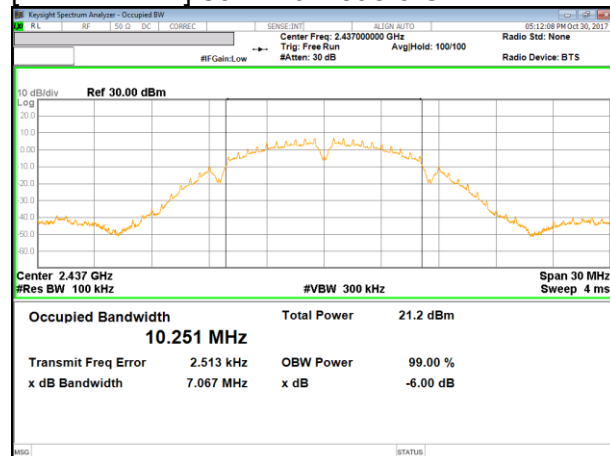
[ANTENNA 1] 802.11b Mode 1 CH



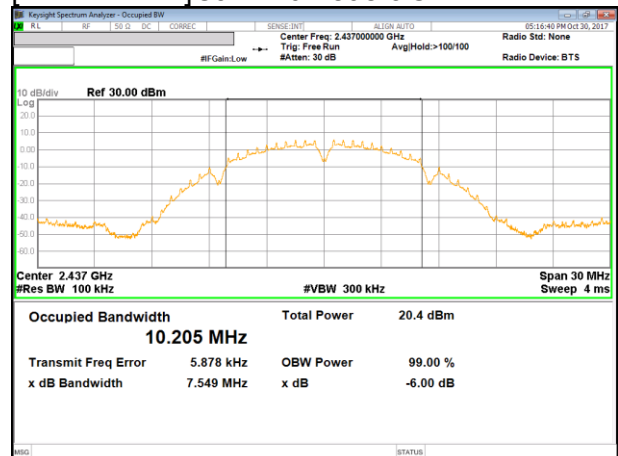
[ANTENNA 2] 802.11b Mode 1 CH



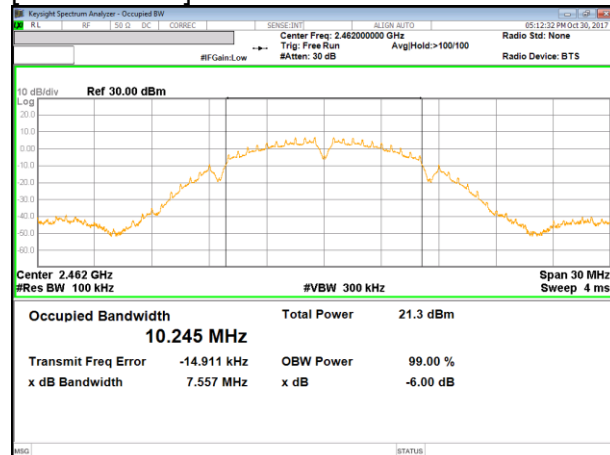
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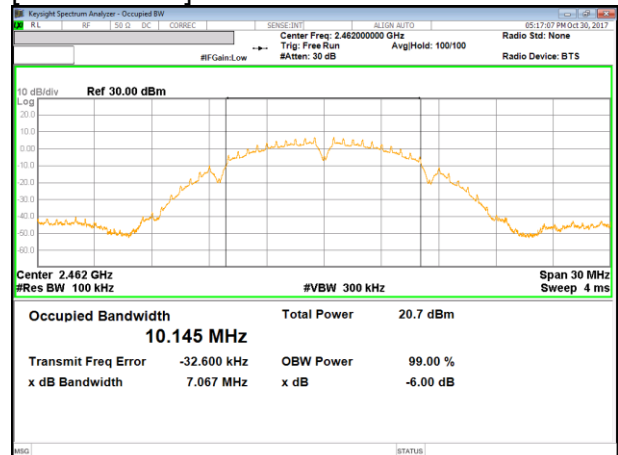
[ANTENNA 2] 802.11b Mode 6 CH



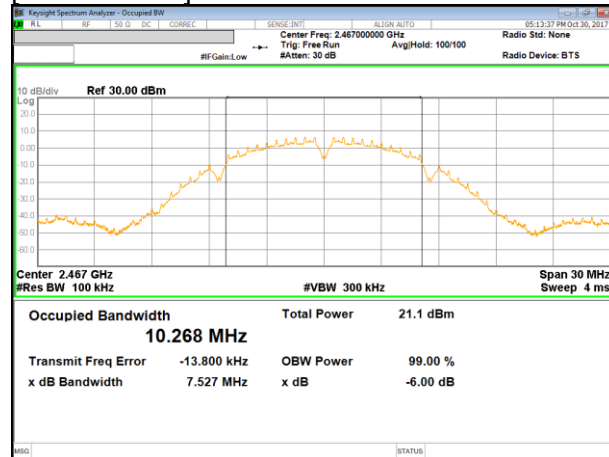
[ANTENNA 1] 802.11b Mode 11 CH



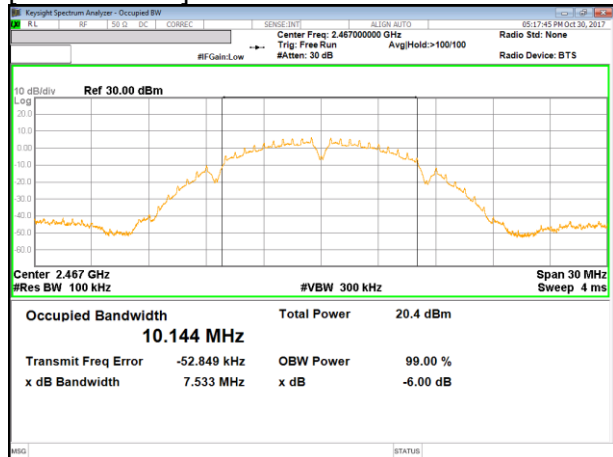
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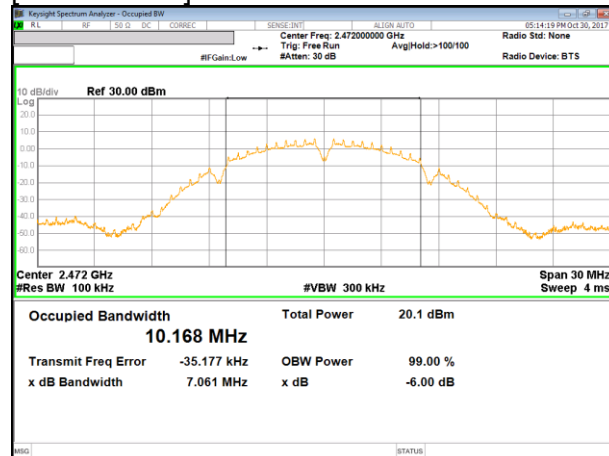
[ANTENNA 1] 802.11b Mode 12 CH



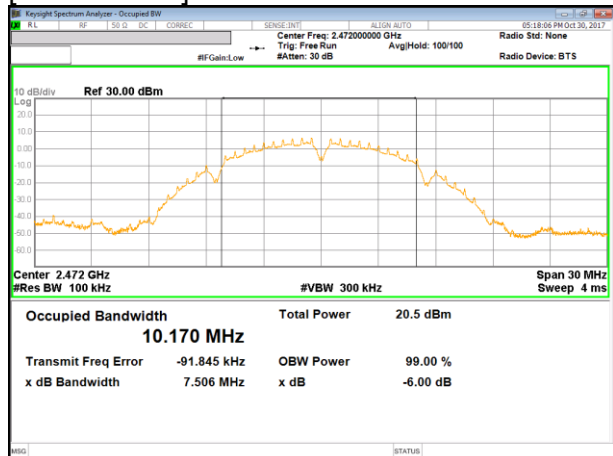
[ANTENNA 2] 802.11b Mode 12 CH



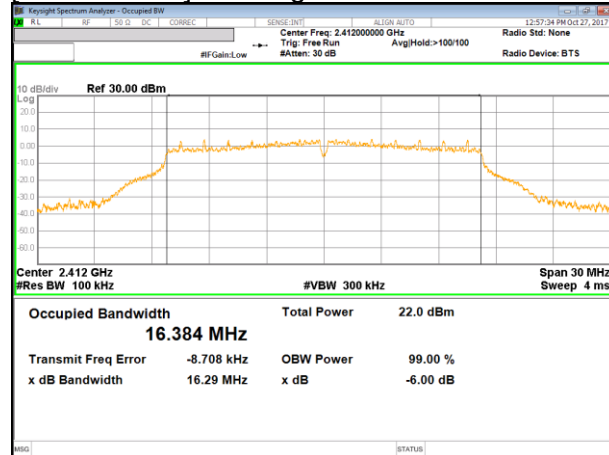
[ANTENNA 1] 802.11b Mode 13 CH



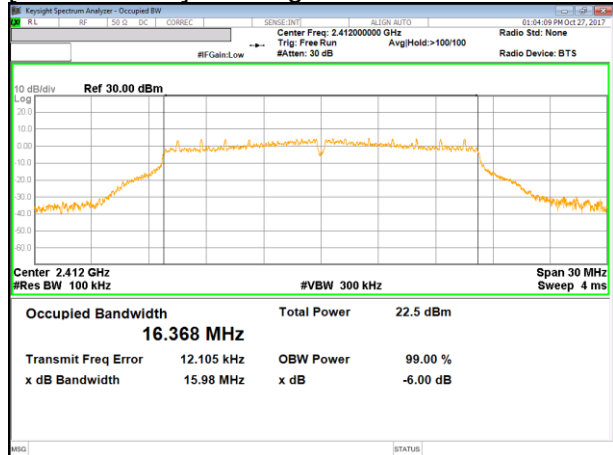
[ANTENNA 2] 802.11b Mode 13 CH



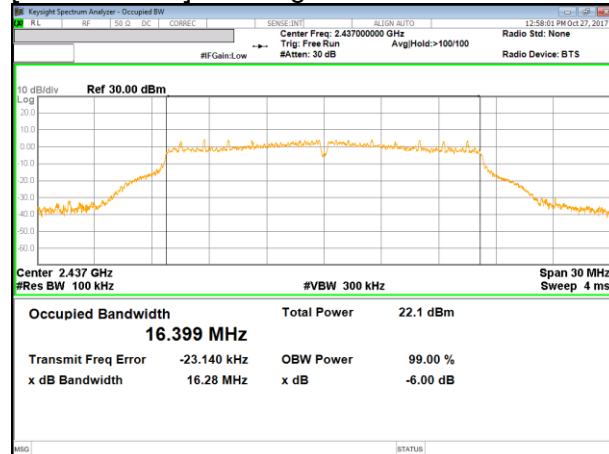
[ANTENNA 1] 802.11g Mode 1 CH



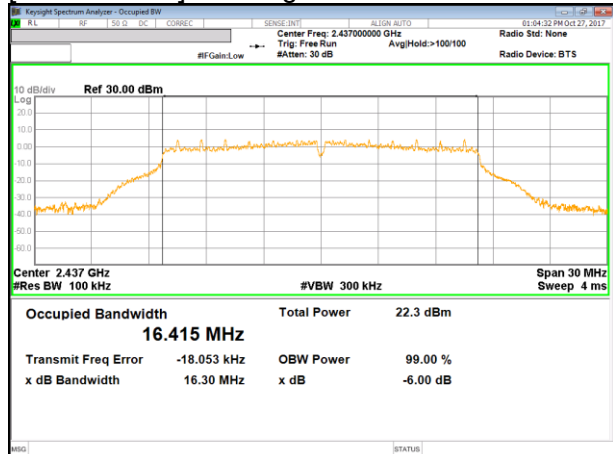
[ANTENNA 2] 802.11g Mode 1 CH



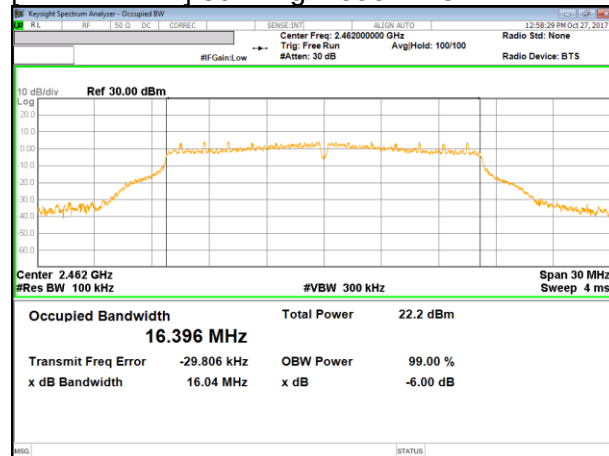
[ANTENNA 1] 802.11g Mode 6 CH



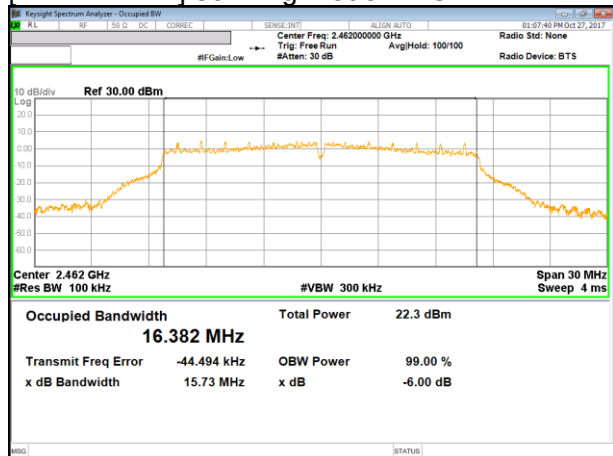
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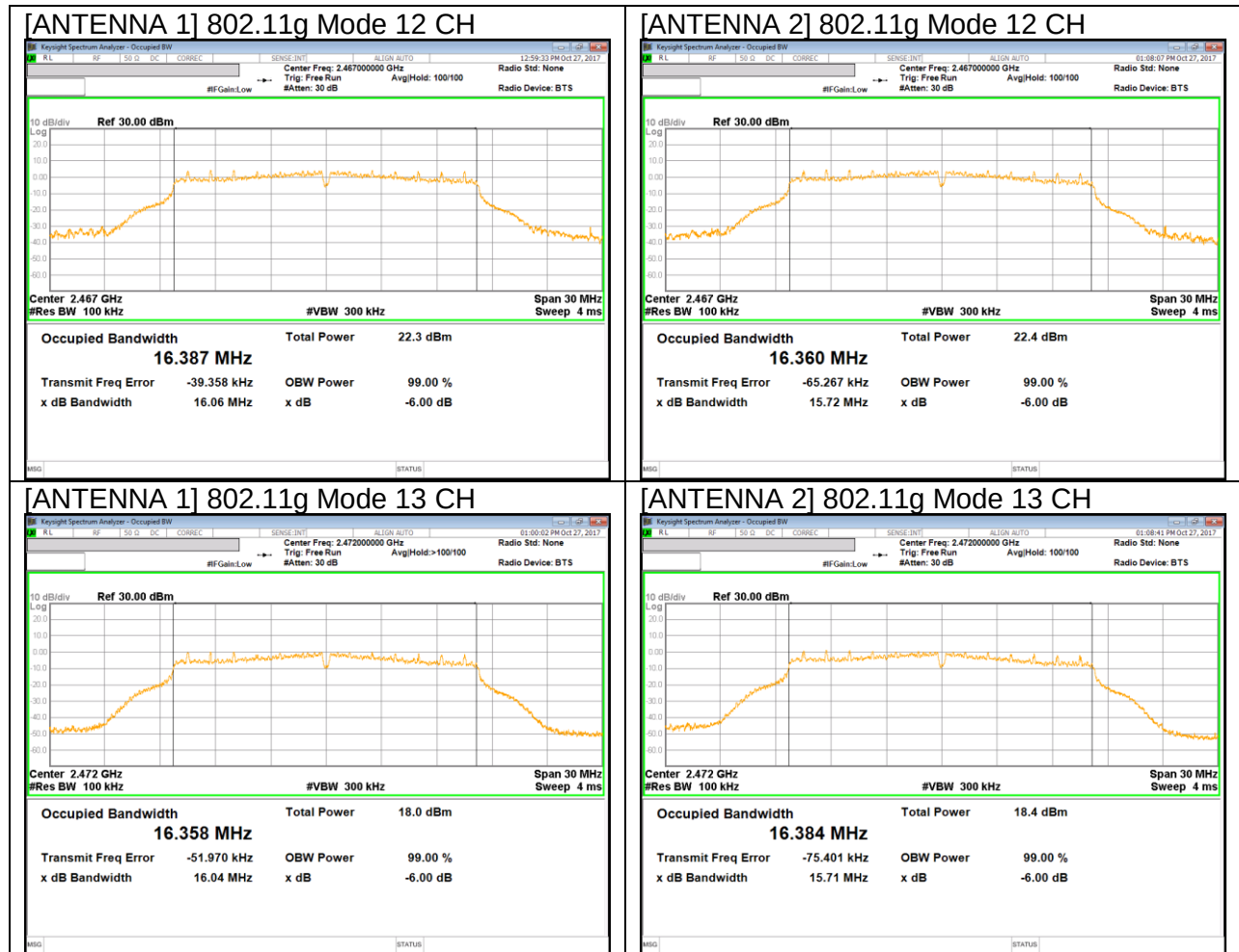


[ANTENNA 1] 802.11g Mode 11 CH

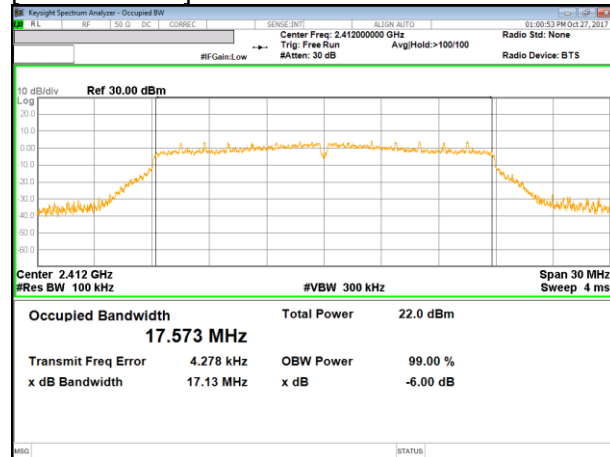


[ANTENNA 2] 802.11g Mode 11 CH

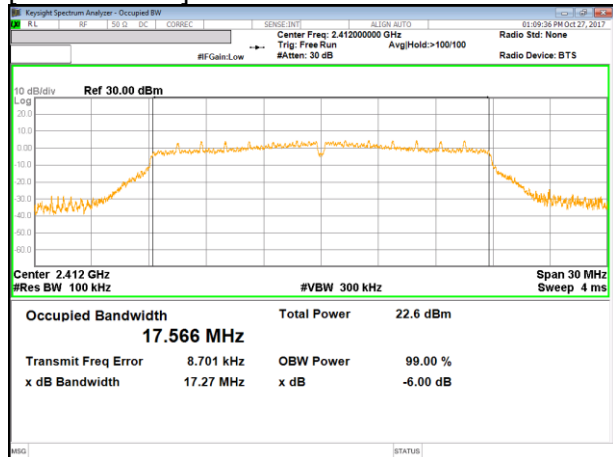




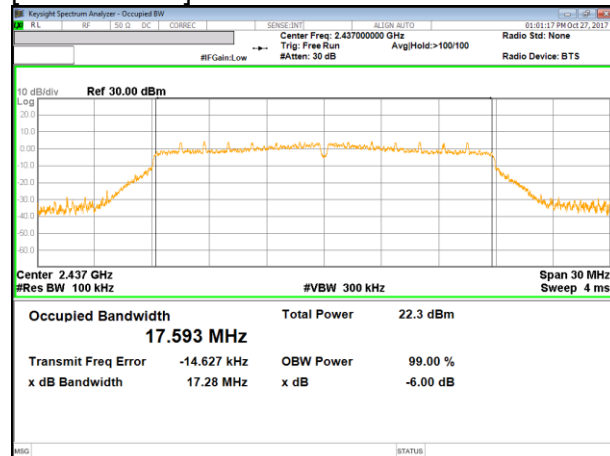
[ANTENNA 1] 802.11n20 Mode 1 CH



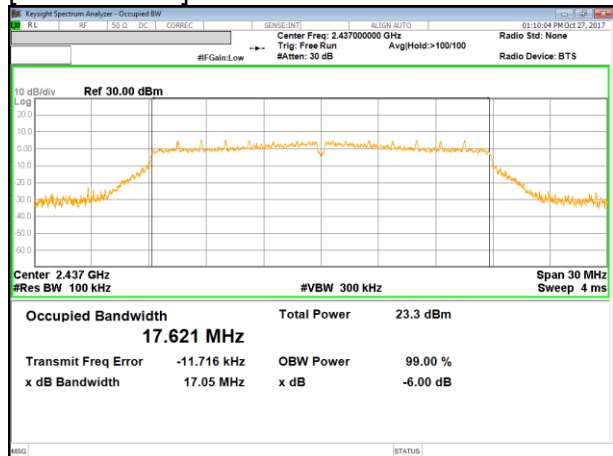
[ANTENNA 2] 802.11n20 Mode 1 CH



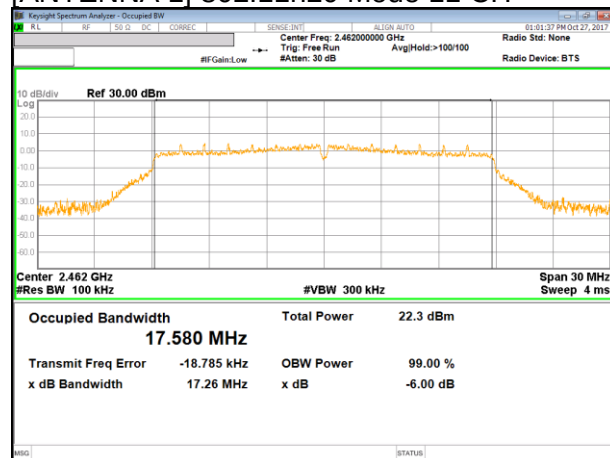
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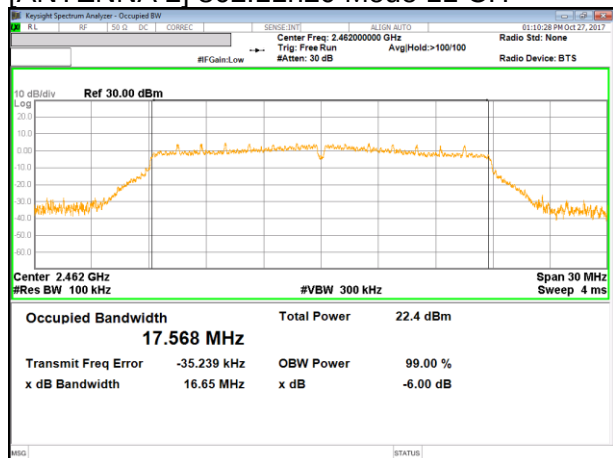
[ANTENNA 2] 802.11n20 Mode 6 CH

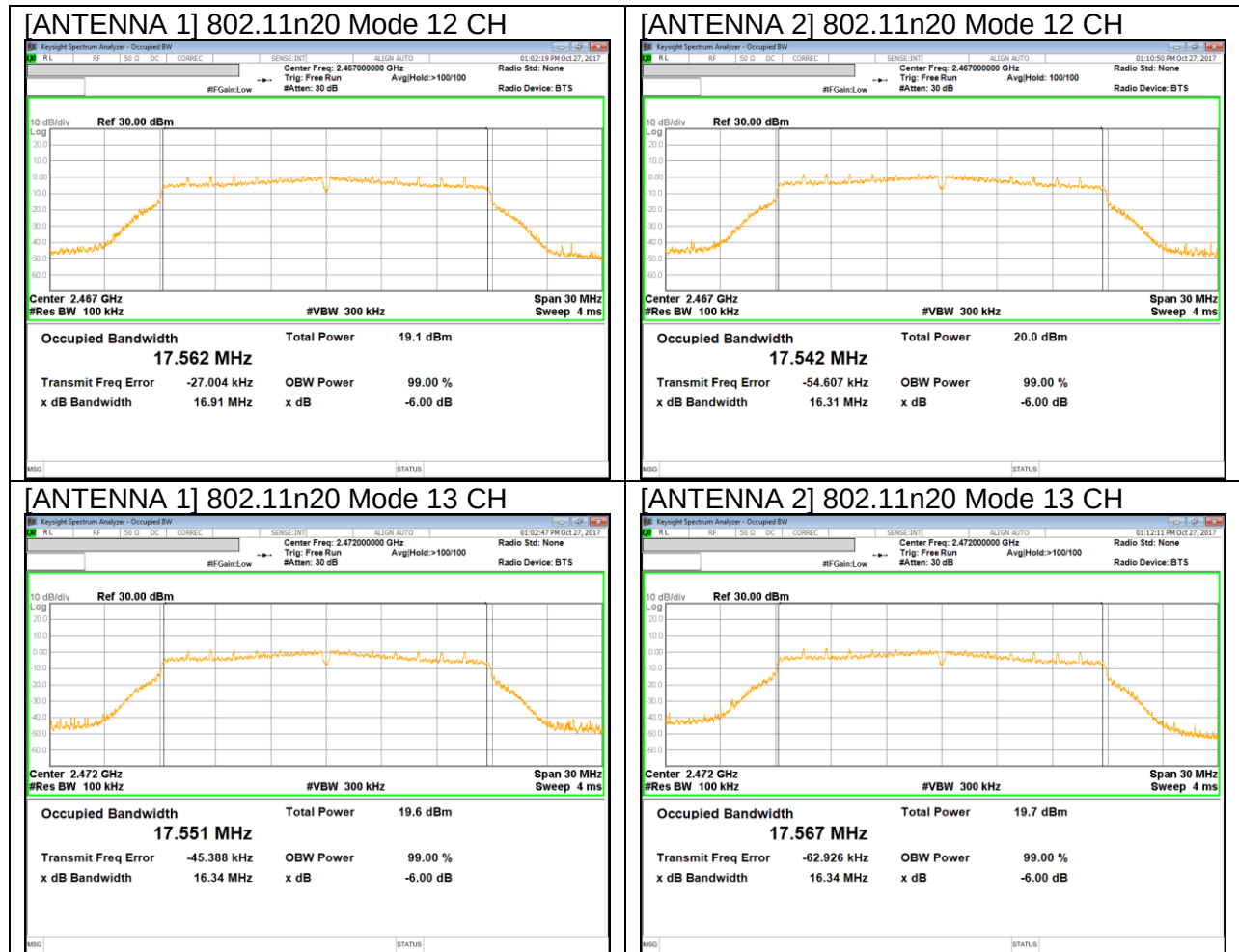


[ANTENNA 1] 802.11n20 Mode 11 CH



[ANTENNA 2] 802.11n20 Mode 11 CH





9.2. 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 “§9.2.3.1 AVGPM” under KDB558074 D01 DTS Meas Guidance v04.

Duty cycle correction factor is already added to the average output power results for duty cycle factor < 98%. (802.11g, 802.11n mode)

DIRECTIONAL ANTENNA GAIN

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

2.4GHz

Antenna 1 Gain [dBi]	Antenna 2 Gain [dBi]	Correlated Chains Directional Gain [dBi]
-2.60	-6.70	-1.40

- IEEE 802.11b Mode is not supported MIMO operation. So can't transmit on two antennas as the same time.

RESULTS

9.2.1. 802.11b MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain ANTENNA1 [dBi]	Directional Gain ANTENNA2 [dBi]	FCC Power Limit [dBm]	Max Power [dBm]
1	2412	-2.60	-6.70	30.00	30.00
6	2437	-2.60	-6.70	30.00	30.00
11	2462	-2.60	-6.70	30.00	30.00
12	2467	-2.60	-6.70	30.00	30.00
13	2472	-2.60	-6.70	30.00	30.00

Duty Cycle CF [dB]	0.00	Included in Calculations of Corr'd Power
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Results

Channel	Frequency [MHz]	ANTENNA1 Meas Power [dBm]	ANTENNA2 Meas Power [dBm]	Maximum Power [dBm]	Power Limit [dBm]	Margin [dB]
1	2412	14.16	14.28	14.28	30.00	-15.84
6	2437	14.46	13.87	14.46	30.00	-15.54
11	2462	14.47	14.00	14.47	30.00	-15.53
12	2467	14.36	13.68	14.36	30.00	-15.64
13	2472	13.39	13.82	13.82	30.00	-16.61
Worst				14.47	30.00	-15.53

9.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain [dBi]	FCC Power Limit [dBm]	Max Power EIRP Limit [dBm]
1	2412	-1.40	30.00	30.00
6	2437	-1.40	30.00	30.00
11	2462	-1.40	30.00	30.00
12	2467	-1.40	30.00	30.00
13	2472	-1.40	30.00	30.00

Duty Cycle CF [dB]	0.30	Included in Calculations of Corr'd Power
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Results

Channel	Frequency [MHz]	ANTENNA1 Meas Power [dBm]	ANTENNA2 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
1	2412	15.68	16.19	19.25	30.00	-10.75
6	2437	15.96	16.05	19.32	30.00	-10.68
11	2462	15.97	15.91	19.25	30.00	-10.75
12	2467	15.94	15.92	19.24	30.00	-10.76
13	2472	11.60	12.00	15.11	30.00	-14.89
Worst				19.32	30.00	-10.68

9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain [dBi]	FCC Power Limit [dBm]	Max Power EIRP Limit [dBm]
1	2412	-1.40	30.00	30.00
6	2437	-1.40	30.00	30.00
11	2462	-1.40	30.00	30.00
12	2467	-1.40	30.00	30.00
13	2472	-1.40	30.00	30.00

Duty Cycle CF [dB]	0.32	Included in Calculations of Corr'd Power
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Results

Channel	Frequency [MHz]	ANTENNA1 Meas Power [dBm]	ANTENNA2 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
1	2412	15.65	15.87	19.09	30.00	-10.91
6	2437	16.04	16.36	19.53	30.00	-10.47
11	2462	16.01	15.64	19.16	30.00	-10.84
12	2467	12.67	13.20	16.27	30.00	-13.73
13	2472	13.26	12.90	16.41	30.00	-13.59
Worst				19.53	30.00	-10.47

9.3. 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 "Method §10.3 AVGPSD-1(802.11 b mode) and §10.5 AVGPSD-2(802.11 g/n mode)" under KDB558074 D01 DTS Meas Guidance v04

RESULTS

9.3.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	Antenna 1 [dBm]	Antenna 2 [dBm]	Max PSD [dBm]	Limit [dBm]	Margin [dB]
1	2412	-16.75	-15.99	-15.99	8.00	-23.99
6	2437	-16.33	-16.90	-16.33	8.00	-24.33
11	2462	-16.36	-16.82	-16.36	8.00	-24.36
12	2467	-16.39	-16.92	-16.39	8.00	-24.39
13	2472	-16.79	-16.77	-16.77	8.00	-24.77

Duty Cycle CF [dB]	0.00	Included in Calculations of PPSP
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9.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	Antenna 1 [dBm]	Antenna 2 [dBm]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
1	2412	-13.00	-11.57	-8.92	8.00	-16.92
6	2437	-12.55	-12.64	-9.29	8.00	-17.29
11	2462	-12.40	-12.34	-9.06	8.00	-17.06
12	2467	-12.46	-12.53	-9.18	8.00	-17.18
13	2472	-17.04	-16.43	-13.41	8.00	-21.41

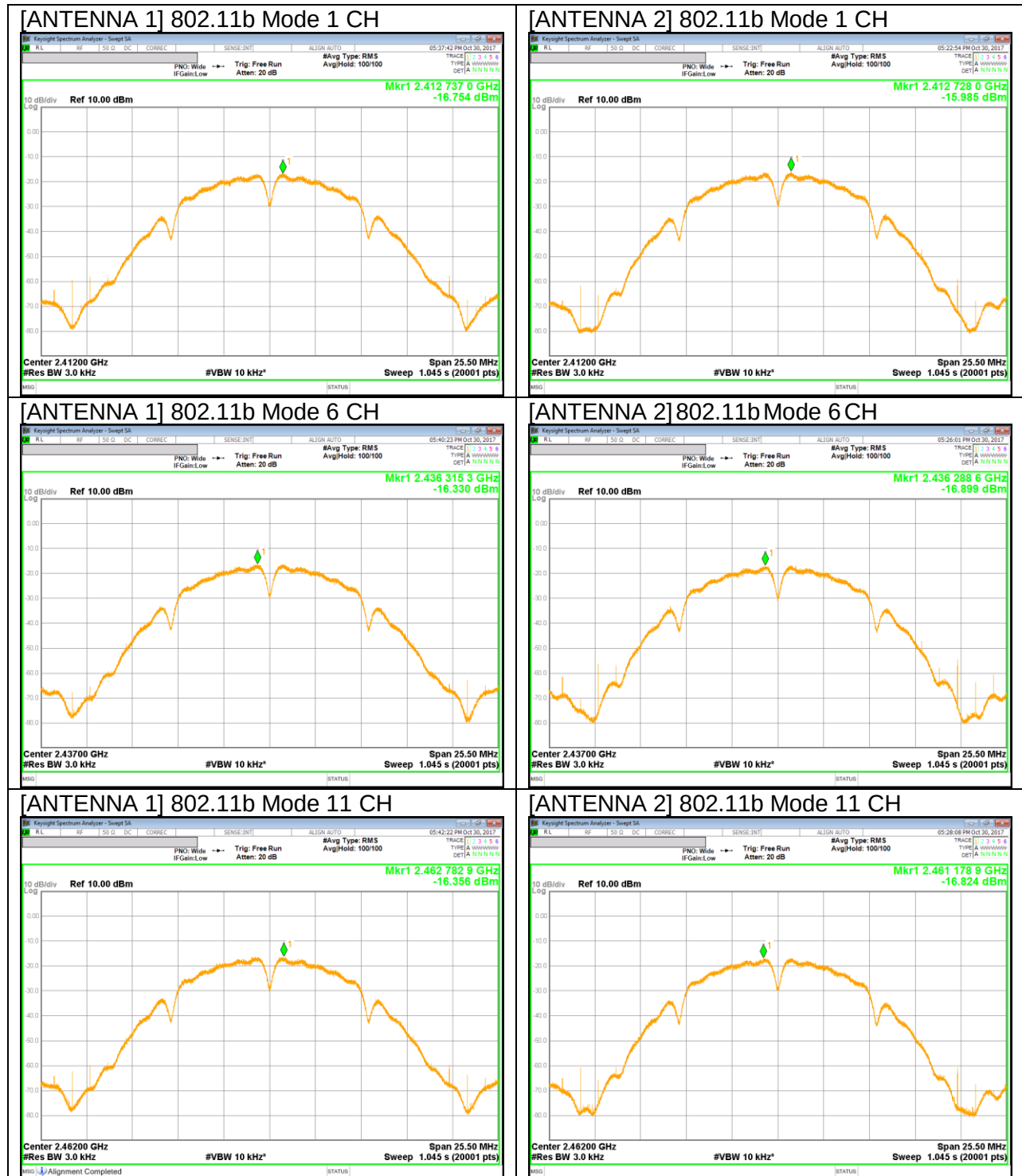
Duty Cycle CF [dB]	0.30	Included in Calculations of PPSP
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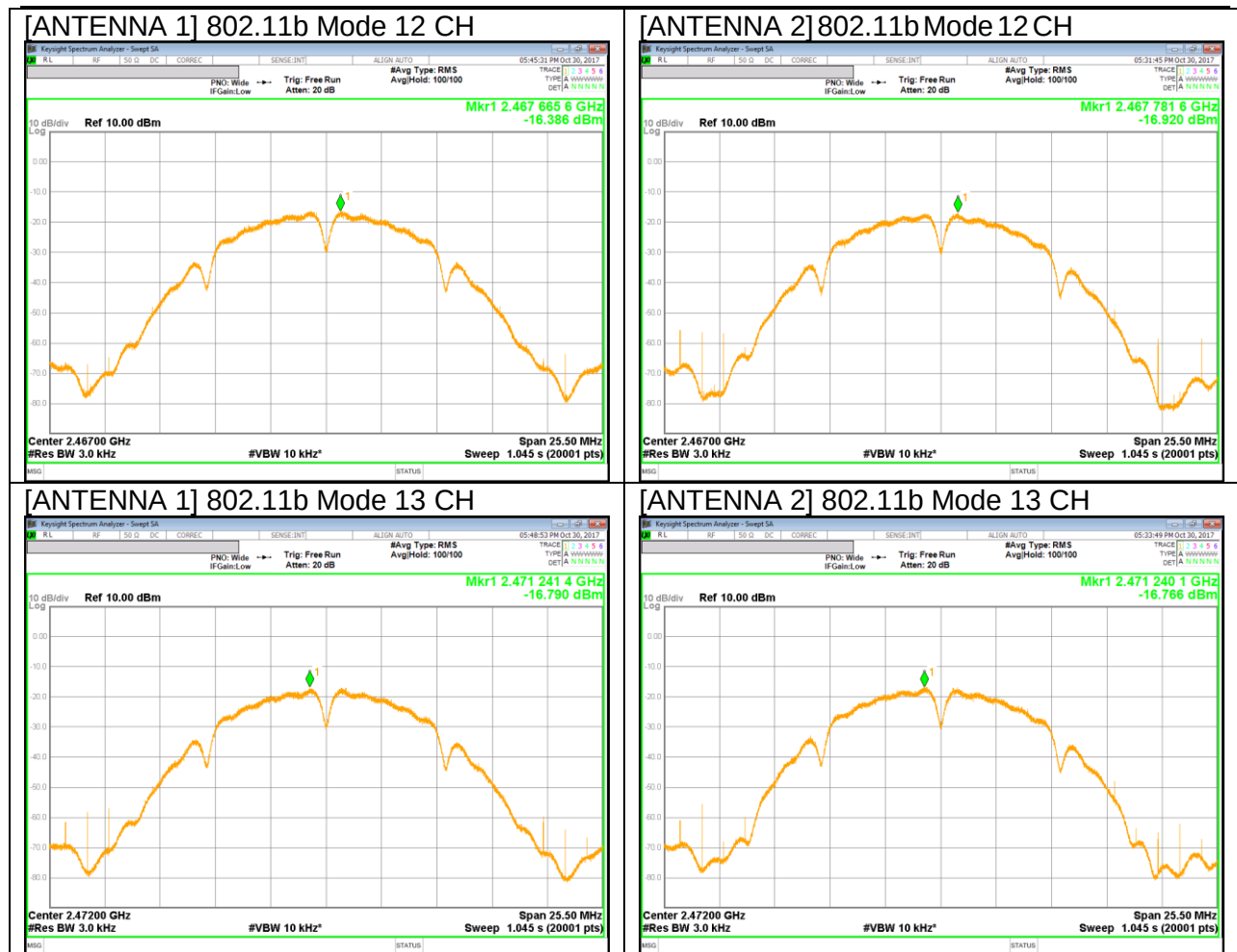
9.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

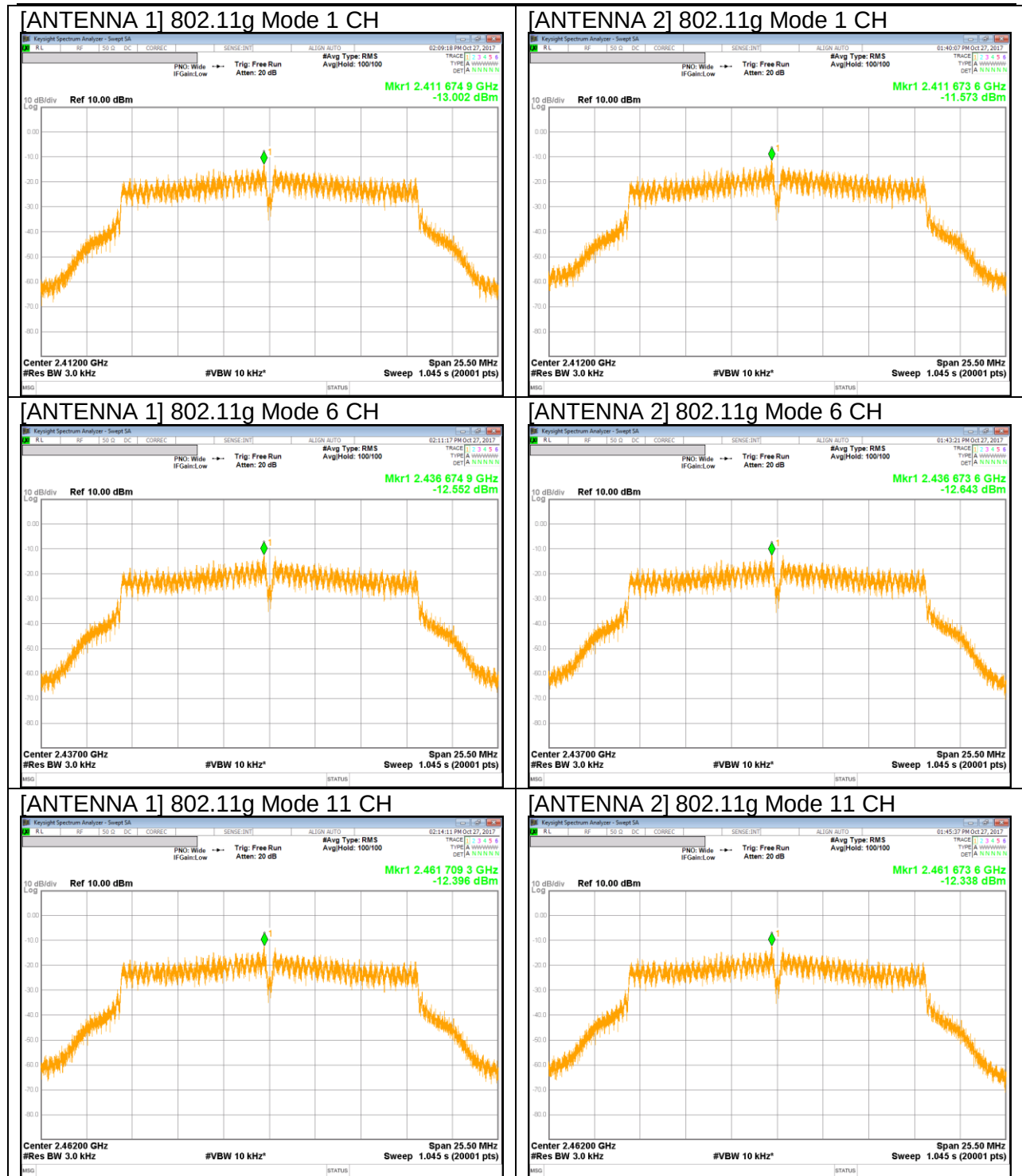
Channel	Frequency [MHz]	Antenna 1 [dBm]	Antenna 2 [dBm]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
1	2412	-16.73	-15.83	-12.93	8.00	-20.93
6	2437	-16.38	-15.60	-12.64	8.00	-20.64
11	2462	-16.54	-16.46	-13.17	8.00	-21.17
12	2467	-19.57	-18.40	-15.61	8.00	-23.61
13	2472	-18.51	-18.95	-15.39	8.00	-23.39

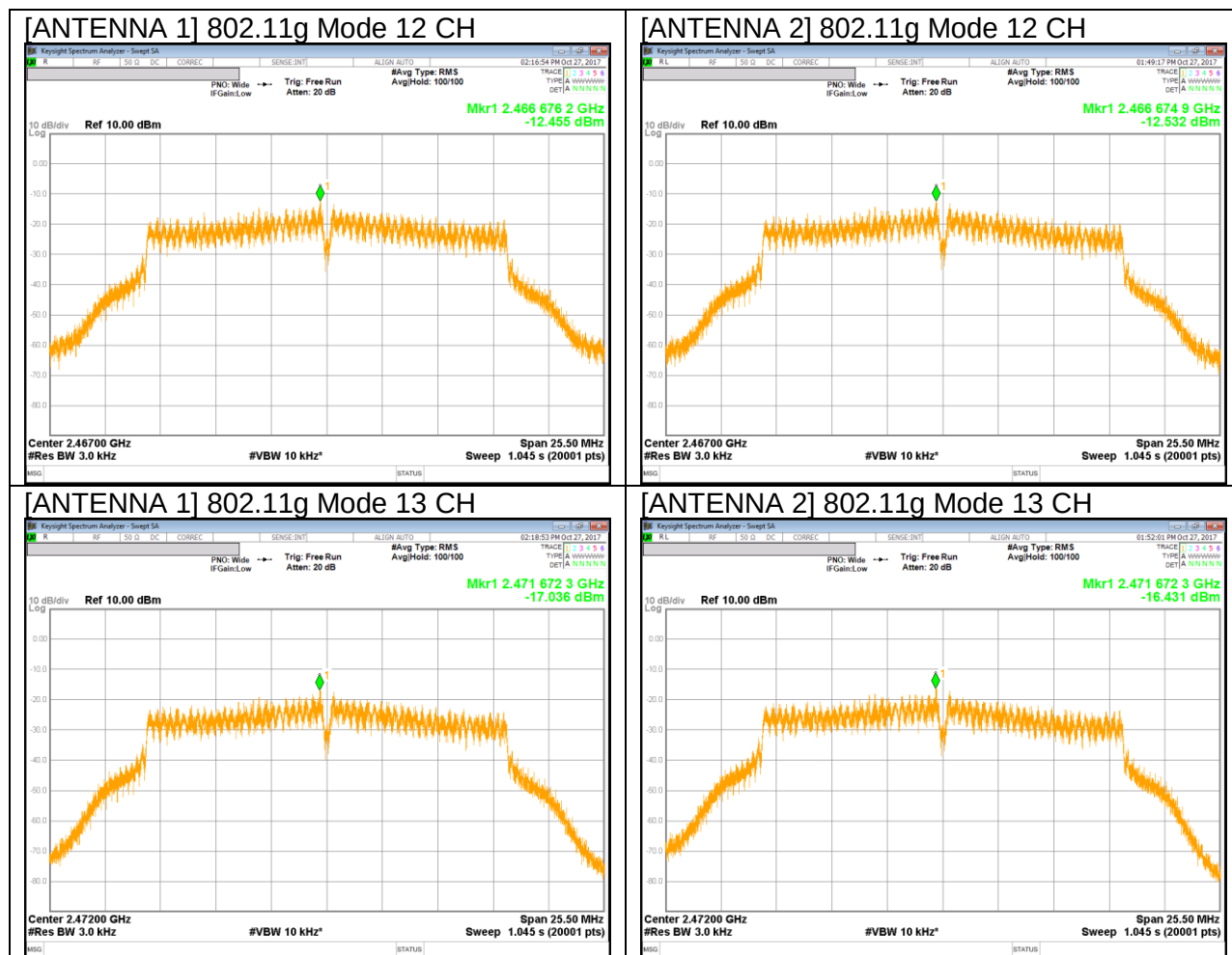
Duty Cycle CF [dB]	0.32	Included in Calculations of PPSP
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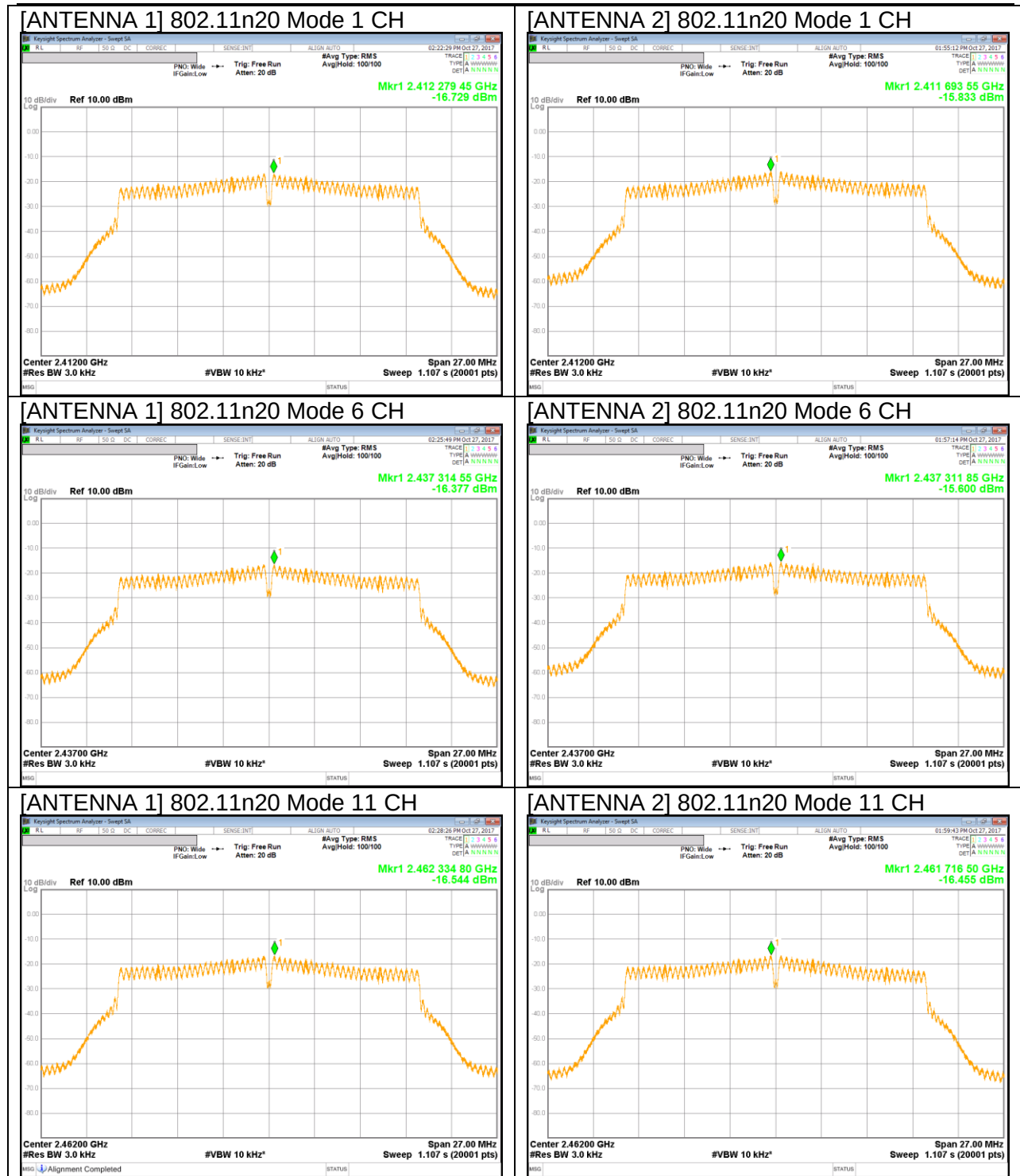
9.3.4. PSD PLOTS

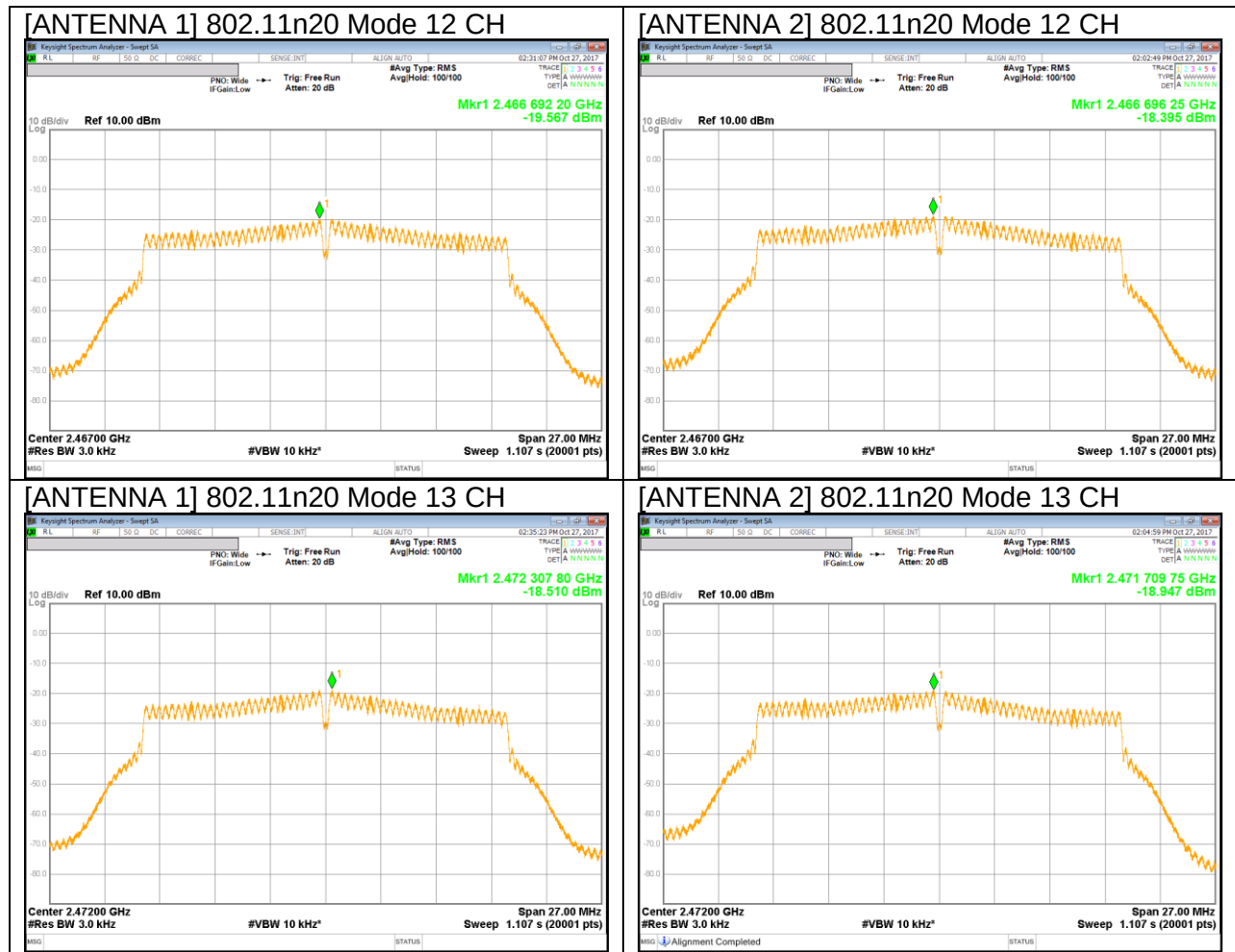












9.4. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

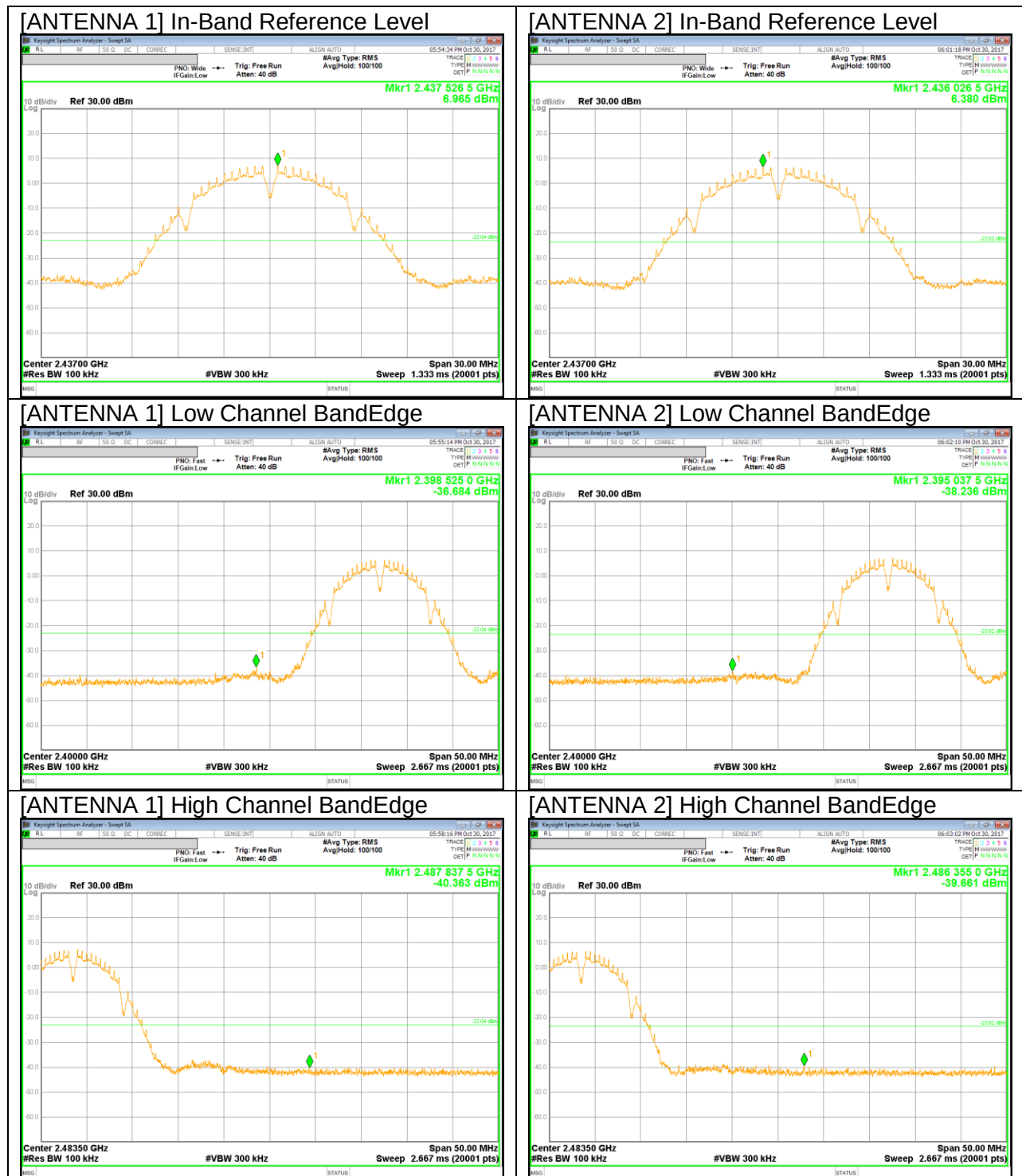
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

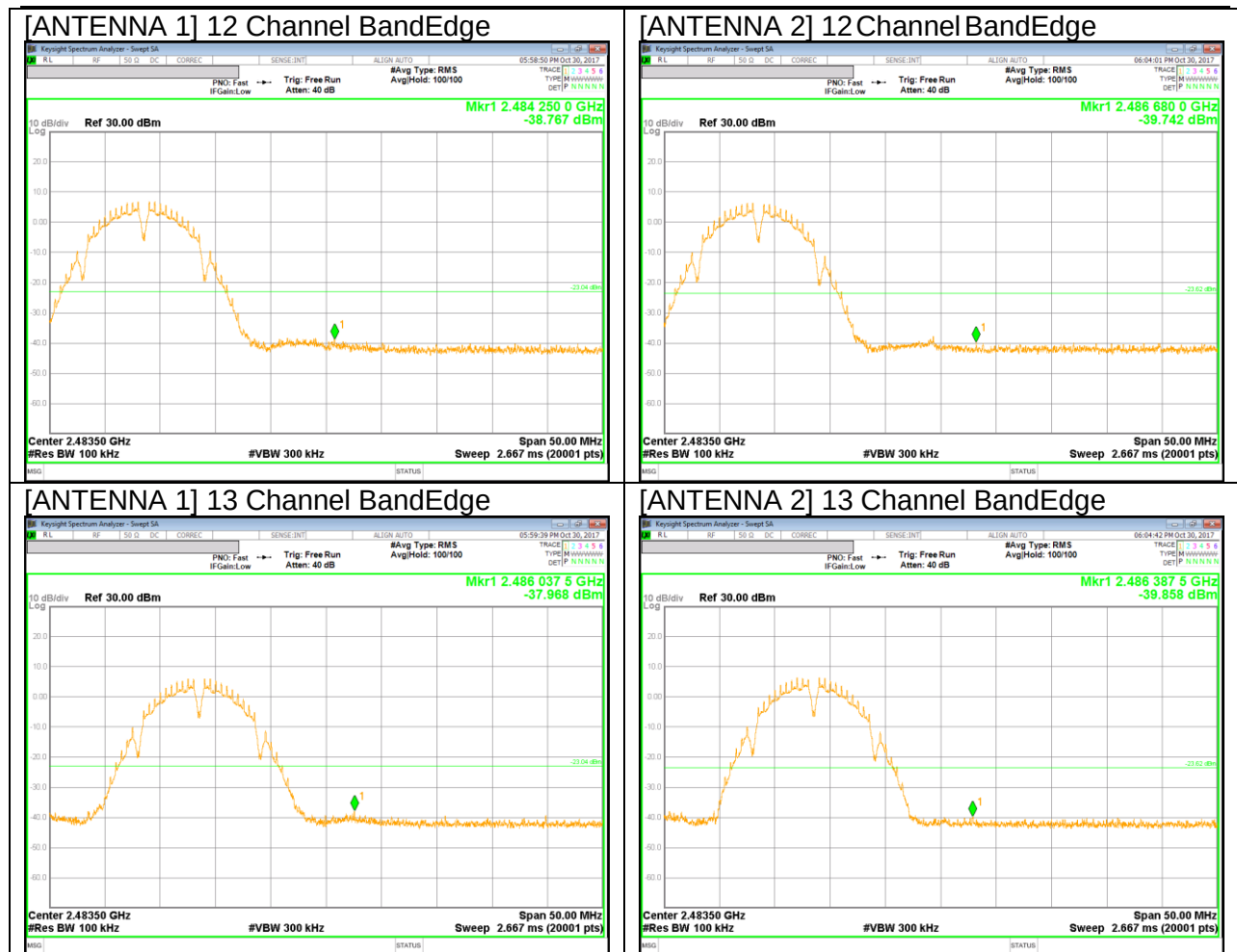
TEST PROCEDURE

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 (where measurements to the general radiated limits will not be made) and out-of-band emissions.

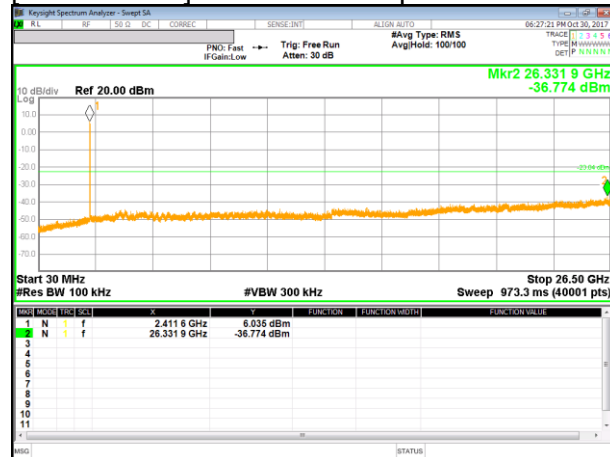
RESULTS

9.4.1. 802.11b MODE IN THE 2.4 GHz BAND

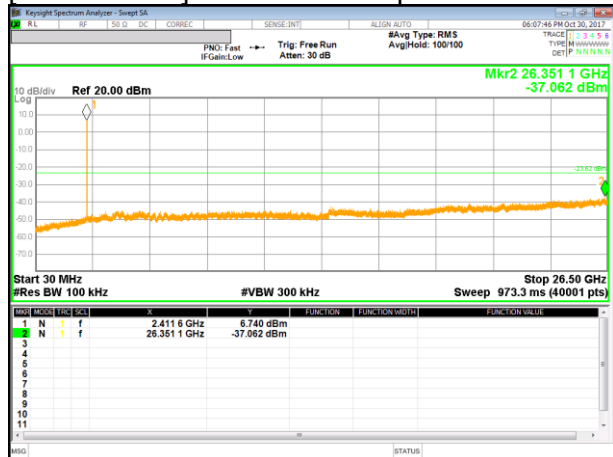




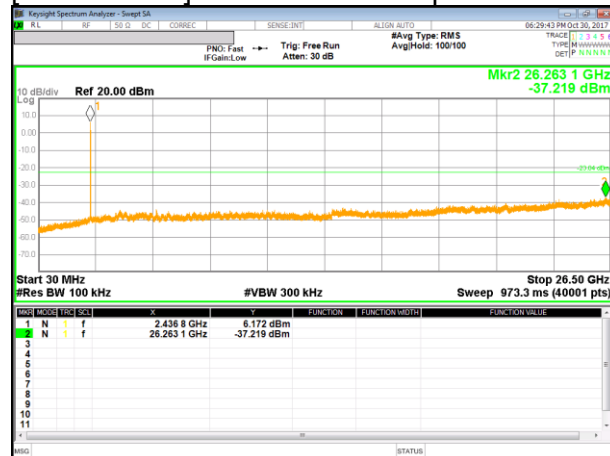
[ANTENNA 1] Low Channel Spurious



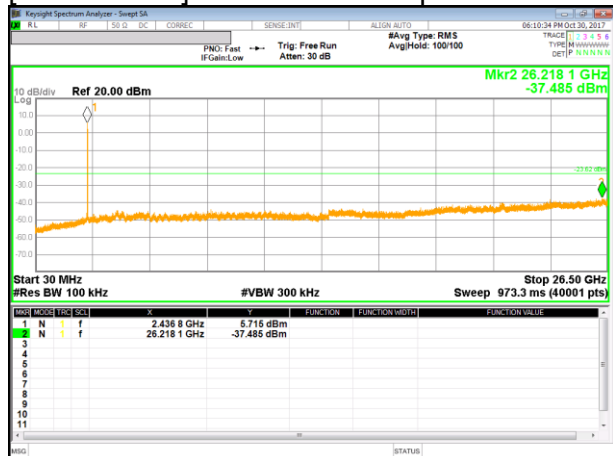
[ANTENNA 2] Low Channel Spurious



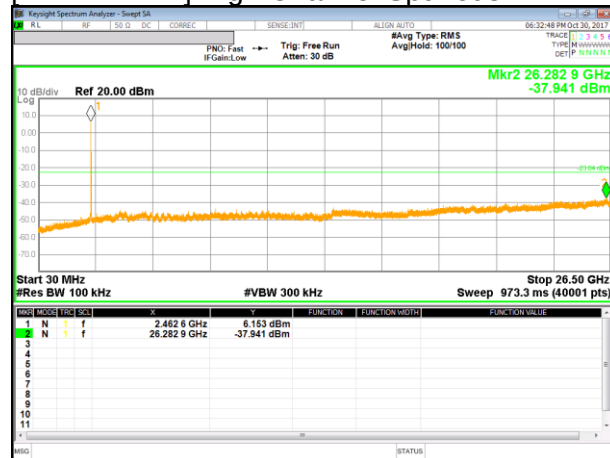
[ANTENNA 1] Middle Channel Spurious



[ANTENNA 2] Middle Channel Spurious



[ANTENNA 1] High Channel Spurious



[ANTENNA 2] High Channel Spurious

