FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Tablet + BT/BLE and DTS/UNII a/b/g/n/ac and ANT+

MODEL NUMBER : SM-T819Y

FCC ID: A3LSMT819Y

REPORT NUMBER: 16K23303-E1V2

ISSUE DATE: MAY 12, 2016

Prepared for
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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	05/10/16	Initial issue	SungGil Park
V2	05/12/16	Section 1.2 revised	SungGil Park

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE Tablet + BT/BLE and DTS/UNII a/b/g/n/ac and ANT+
MODEL NUMBER:	SM-T819Y
SERIAL NUMBER:	R32G600B77F, R32H20028DJ (RADIATED); R32H20027PL (CONDUCTED)
DATE TESTED:	FEB 04, 2016 - MAY 05, 2016

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:

CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

1.1. TEST DATA REUSE

The FCC ID: A3LSMT819Y shares the same enclosure and circuit board as FCC ID: A3LSMT819. The WLAN circuitry and layout are identical between these two units. The WLAN antennas and surrounding circuitry are the same between these two units.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMT819 remains representative of FCC ID: A3LSMT819Y. The test data of FCC ID: A3LSMT819 being submitted for this application to cover WLAN features.

1.2. SPOT CHECK VERIFICATION DATA

Band		Test Item	Worst Mode	Worst Freq. (MHz)	Worst Bandwidth (MHz)	Test Limit (dBµV/m)	Original Model SM-T819 (FCC ID : A3LSMT819)	Spot Check Model SM-T819Y (FCC ID : A3LSMT819Y)	Deviation
							Measured Data(dBµV/m)	Measured Power (dBµV/m)	
DTS	2.4GHz	Band Edge	802.11b	2462.0	20	54(avg)	44.04	45.72	1.68
		RSE	802.11b	2412.0	20	54(avg)	47.46	43.47	-3.99
		Band Edge	802.11g	2412.0	20	54(avg)	50.30	45.79	-4.51
		RSE	802.11g	2412.0	20	54(avg)	38.34	36.05	-2.29
		Band Edge	802.11n	2462.0	20	54(avg)	51.62	50.22	-1.40
		RSE	802.11n	2412.0	20	54(avg)	39.42	36.75	-2.67

Comparison of two models, Deviation is within The EMC Lab Measurement Uncertainty range and all test results are under FCC Technical Limits.

1.3. REFERENCE DETAIL

Reference application that contains the reused reference data.

Equipment Class	Reference FCC ID	Report Title / Section
DTS	A3LSMT819	16K22867-E1V1_FCC Report DTS WLAN / All sections

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

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:

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

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

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	4.14 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Tablet + BT/BLE and DTS/UNII a/b/g/n/ac and ANT+
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
	802.11n	TX / RX	TX / RX
	802.11n MIMO	TX / RX	TX / RX
5 GHz	802.11a	TX / RX	TX / RX
	802.11n	TX / RX	TX / RX
	802.11ac	TX / RX	TX / RX
	802.11n/ac MIMO	TX / RX	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]	
		Antenna1	Antenna2	Antenna1	Antenna2
2412 - 2472	802.11b	14.62	15.49	28.97	35.40
	802.11g	15.25	15.11	33.50	32.43
	802.11g MIMO	18.15		65.34	
	802.11n SISO	14.12	14.45	25.82	27.86
	802.11n MIMO	17.30		53.68	

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes FPCB antennas, with a antenna1's maximum gain of -3.35 dBi and antenna2's maximum gain of -3.87 dBi .

5.4. LIST OF TEST REDUCTION AND MODES

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

2400 - 2483.5 MHz Authorized Frequency Band (Antenna Port & Radiated Testing)		
Frequency Range (MHz)	Mode	Covered by
2412 - 2472	802.11b Legacy 1TX	802.11b Legacy 1TX
	802.11g Legacy 1TX	802.11g CDD 2TX
	802.11n 1TX	802.11n HT20 CDD 2TX
	802.11n STBC 2TX	802.11n HT20 CDD 2TX

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of 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.

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

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20 mode: MCS0

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA20EWE	R37GBTP1HN3DK3	N/A
Data Cable	SAMSUNG	EP-DG925UWE	N/A	N/A
Earphone	SAMSUNG	E0-EG900BW	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	Mini-USB	Shielded	0.8m	N/A
2	Audio	1	Mini-Jack	Unshielded	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.

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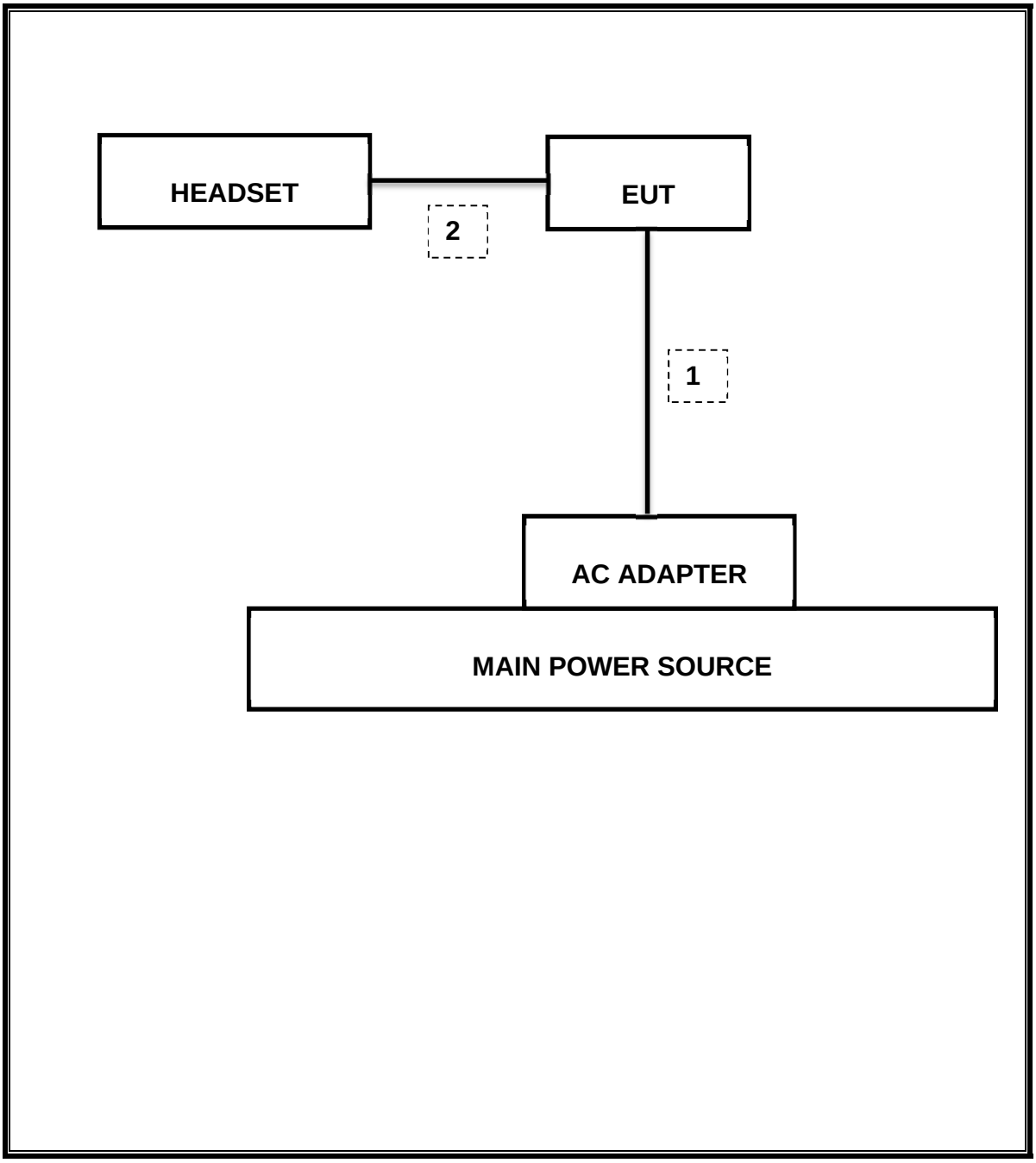
SETUP DIAGRAM FOR TESTS



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	11-17-16
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-26-16
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	09-23-16
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	08-24-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-19-16
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-16
Average Power Sensor	R&S	NRZ-Z91	102681	08-18-16
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-18-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-19-16
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-19-16
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	08-18-16
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	015	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	016	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	015	08-18-16
LISN	R&S	ENV-216	101836	08-19-16
LISN	R&S	ENV-216	101837	08-19-16

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r05: Measurement Procedure §9.2.3.1 AVGPM is used for average power and §10.2 AVGPSD-2 is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

Band edge emissions within Restricted Bands are measured using RMS with duty cycle factor offset method.

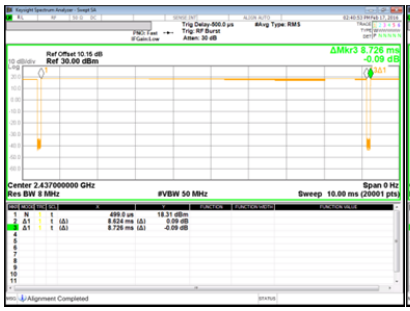
8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

8.1. 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	8.624	8.726	0.988	98.8%	0.00	0.010
802.11g	1.432	1.530	0.936	93.6%	0.29	0.698
802.11n HT20	1.34	1.438	0.932	93.2%	0.31	0.746



[802.11b Mode]

[802.11g Mode]

[802.11n Mode]

9. 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	7.528 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-29.188 dBm
15.247	TX conducted output power	<30dBm		Pass	18.15 dBm (AV)
15.247	PSD	<8dBm		Pass	-15.26 dBm (AV)
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	44.47 dBuV (QP)
15.205, 15.209	Radiated Spurious Emission	< 40dBuV/m	Radiated	Pass	33.94 dBuV/m (QP)

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 PROCEDURE

Reference to KDB 558074 D01 DTS Meas Guidance v03r05: The transmitter output is connected to a spectrum analyzer with the RBW set to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

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RESULTS

10.1.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		Primary Antenna 1	Secondary Antenna 2	
Low	2412	8.037	8.047	0.5
Mid	2437	8.040	8.056	0.5
High	2462	8.042	8.047	0.5
12	2467	8.009	8.034	0.5
13	2472	8.039	7.528	0.5
Worst		7.528		

10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

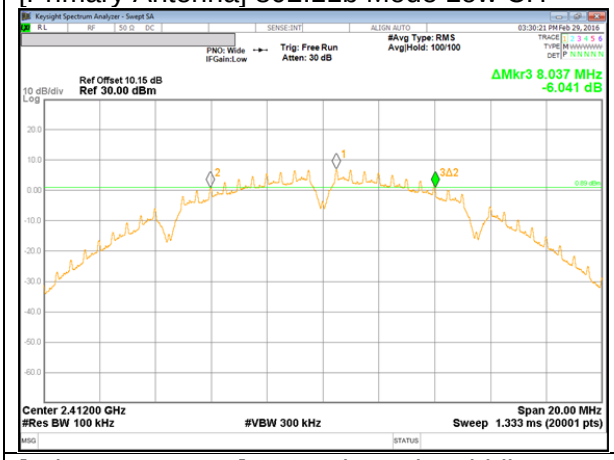
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		Primary Antenna 1	Secondary Antenna 2	
Low	2412	16.035	15.902	0.5
Mid	2437	16.308	16.307	0.5
High	2462	16.292	16.288	0.5
12	2467	15.920	15.902	0.5
13	2472	15.735	15.708	0.5
Worst		15.708		

10.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

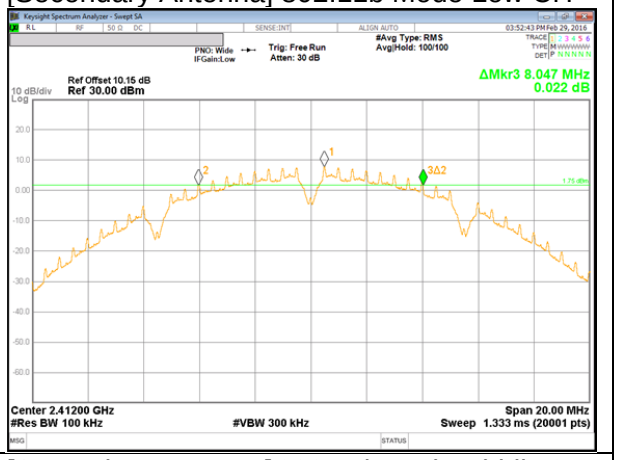
Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		Chain 0	Chain 1	
Low	2412	16.400	16.271	0.5
Mid	2437	16.923	17.133	0.5
High	2462	17.032	16.882	0.5
12	2467	16.177	16.531	0.5
13	2472	16.066	16.070	0.5
Worst		16.066		

10.1.4. 6 dB BANDWIDTH PLOTS

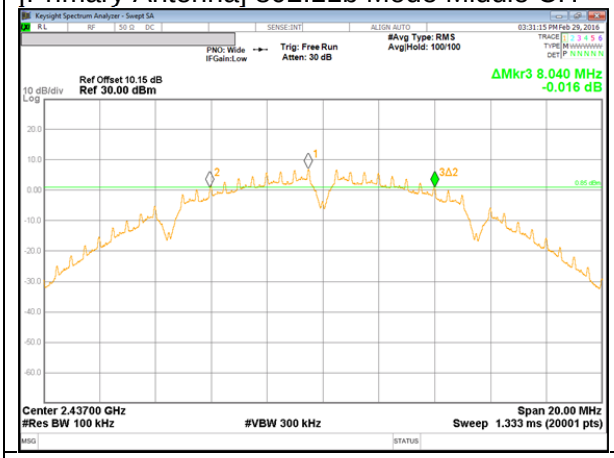
[Primary Antenna] 802.11b Mode Low CH



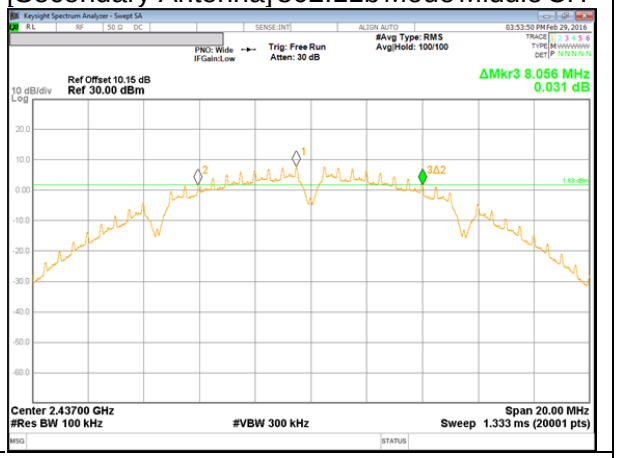
[Secondary Antenna] 802.11b Mode Low CH



[Primary Antenna] 802.11b Mode Middle CH

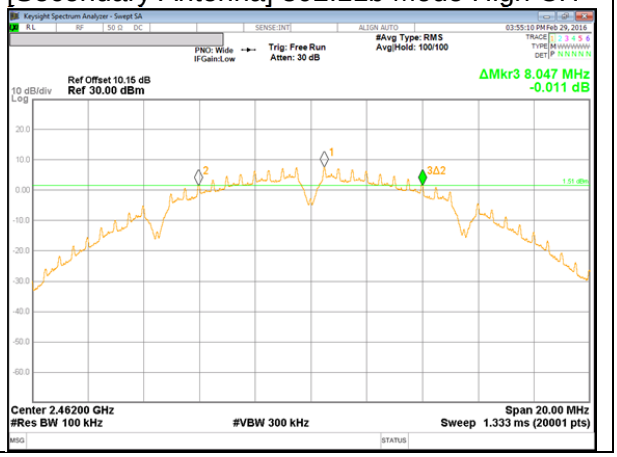


[Secondary Antenna] 802.11b Mode Middle CH



[Primary Antenna] 802.11b Mode High CH

[Secondary Antenna] 802.11b Mode High CH

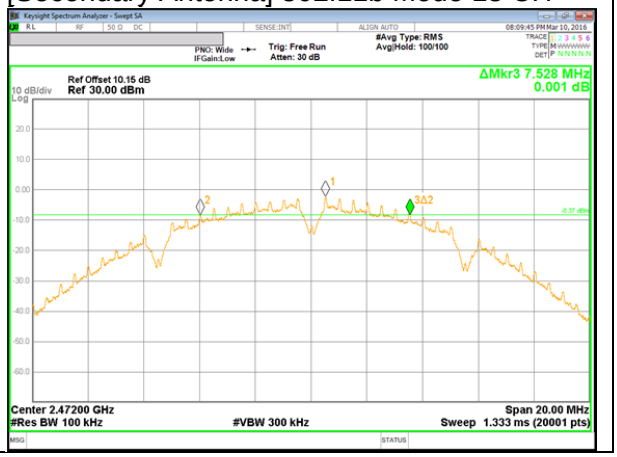


[Primary Antenna] 802.11b Mode 12 CH

[Secondary Antenna] 802.11b Mode 12 CH

[Primary Antenna] 802.11b Mode 13 CH

[Secondary Antenna] 802.11b Mode 13 CH



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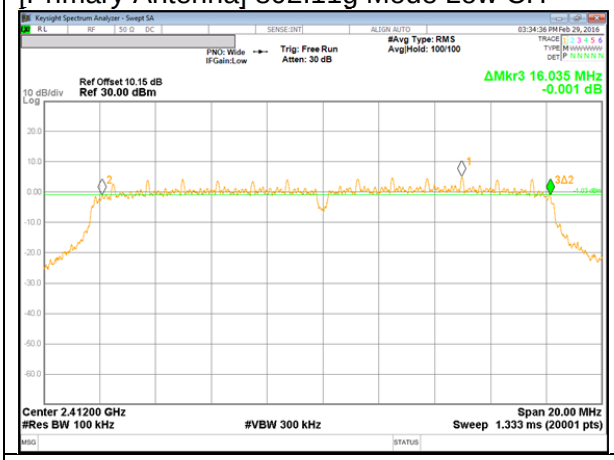
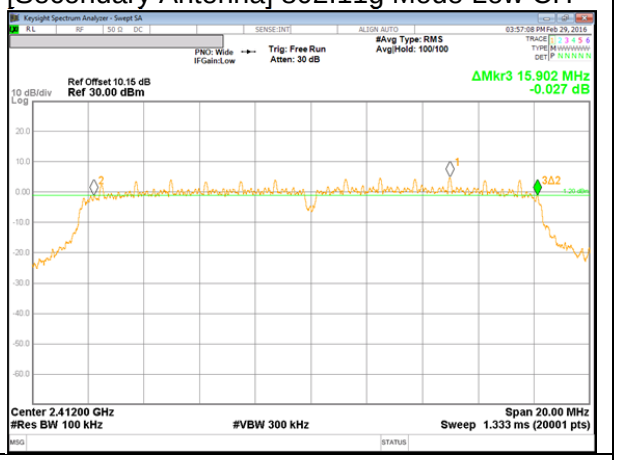
[Primary Antenna] 802.11g Mode Low CH

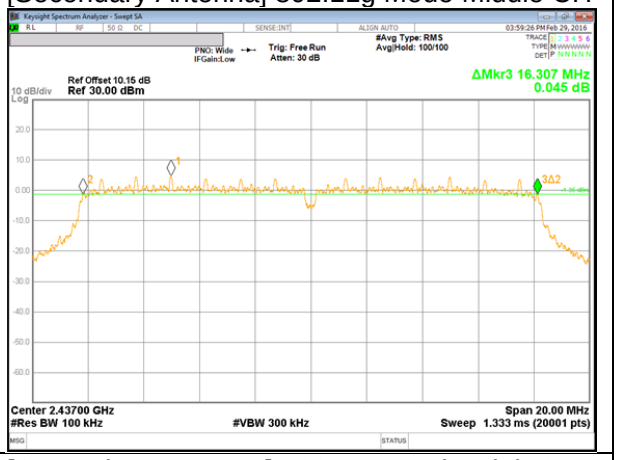


[Secondary Antenna] 802.11g Mode Low CH

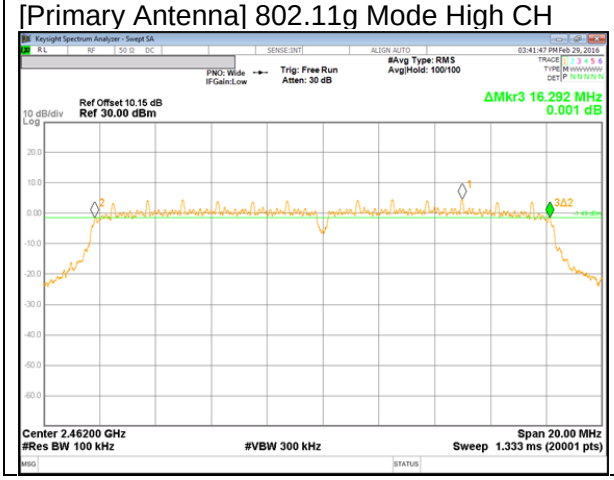


[Primary Antenna] 802.11g Mode Middle CH

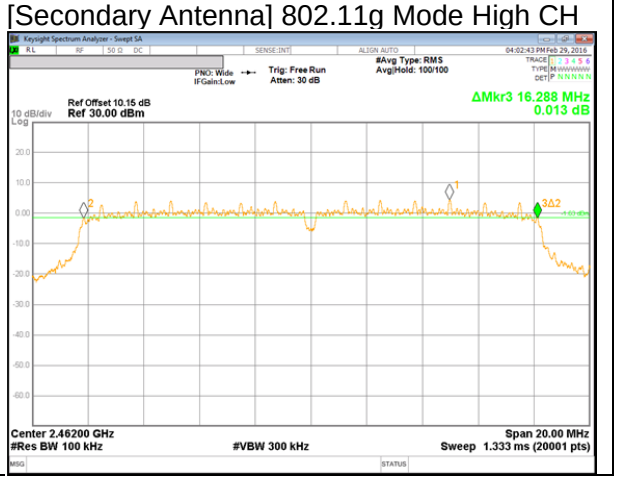
[Secondary Antenna] 802.11g Mode Middle CH



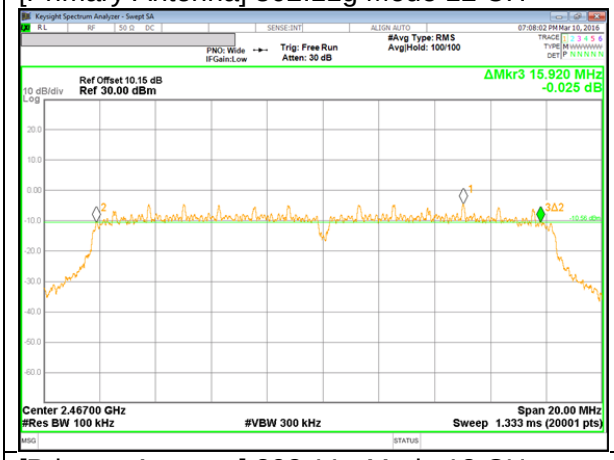
[Primary Antenna] 802.11g Mode High CH



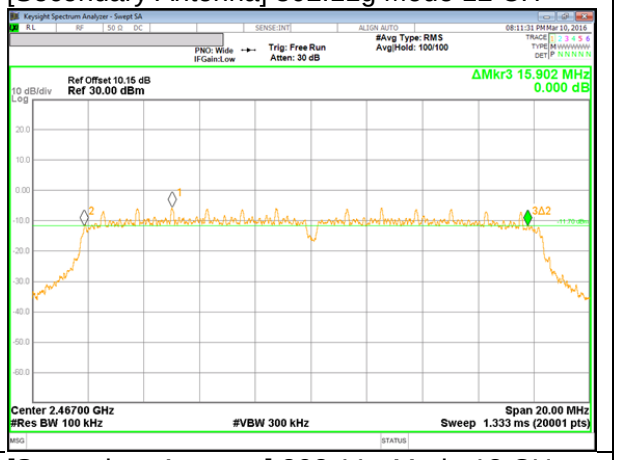
[Secondary Antenna] 802.11g Mode High CH



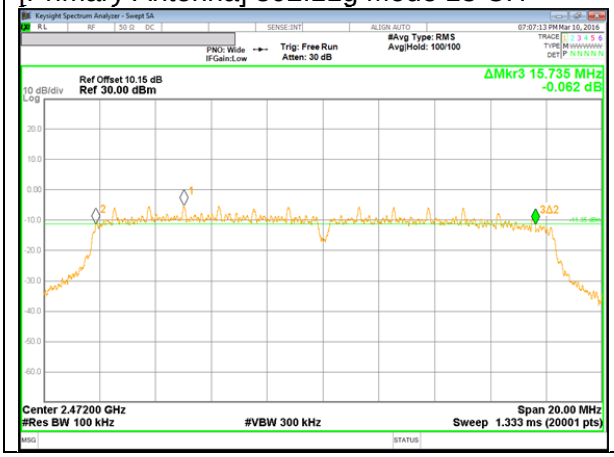
[Primary Antenna] 802.11g Mode 12 CH



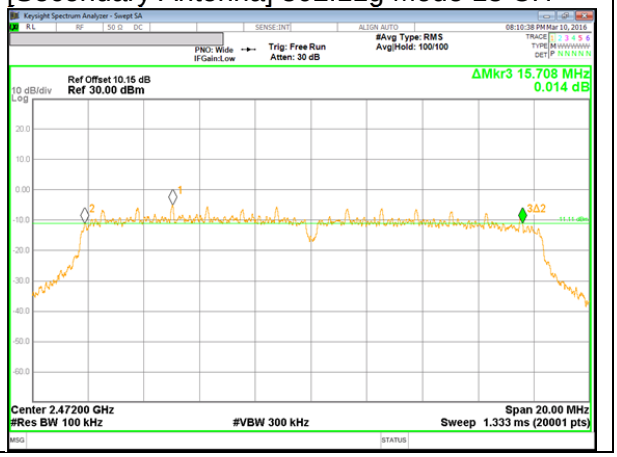
[Secondary Antenna] 802.11g Mode 12 CH



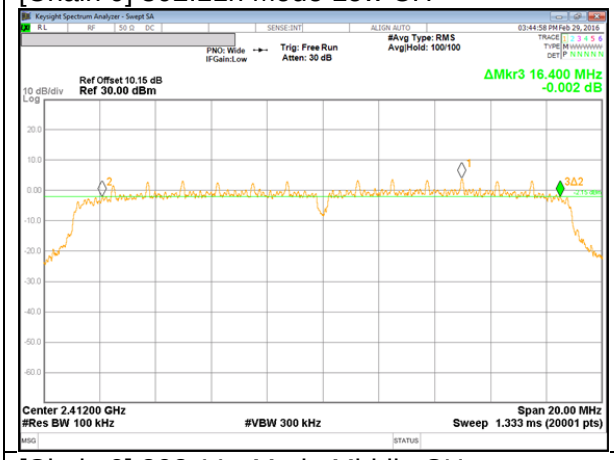
[Primary Antenna] 802.11g Mode 13 CH



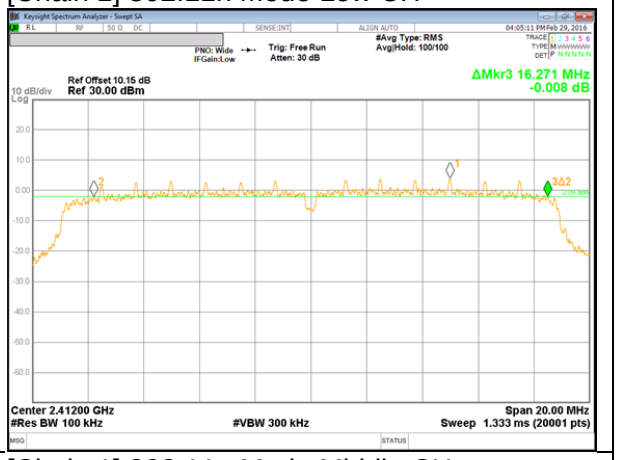
[Secondary Antenna] 802.11g Mode 13 CH



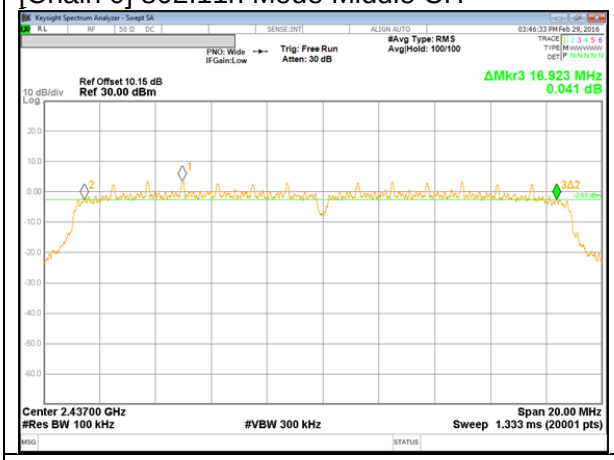
[Chain 0] 802.11n Mode Low CH



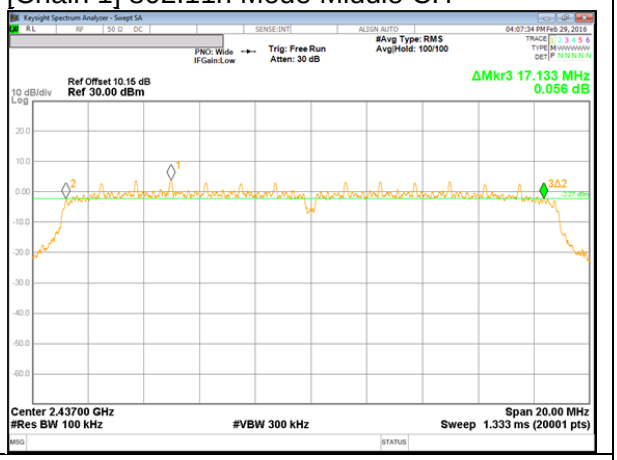
[Chain 1] 802.11n Mode Low CH



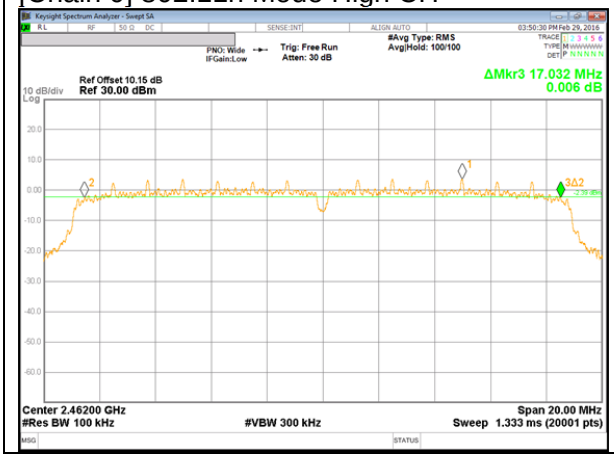
[Chain 0] 802.11n Mode Middle CH



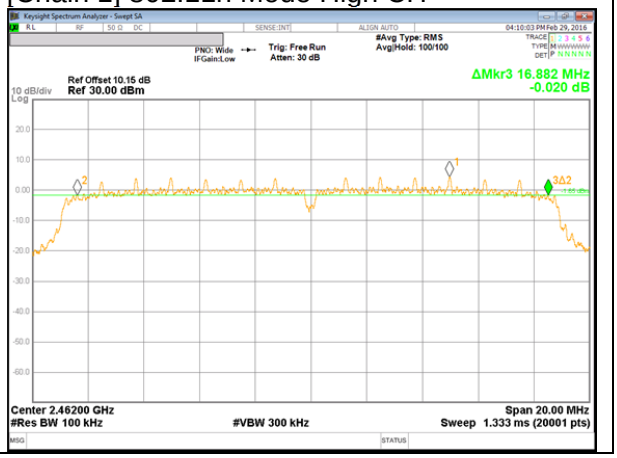
[Chain 1] 802.11n Mode Middle CH



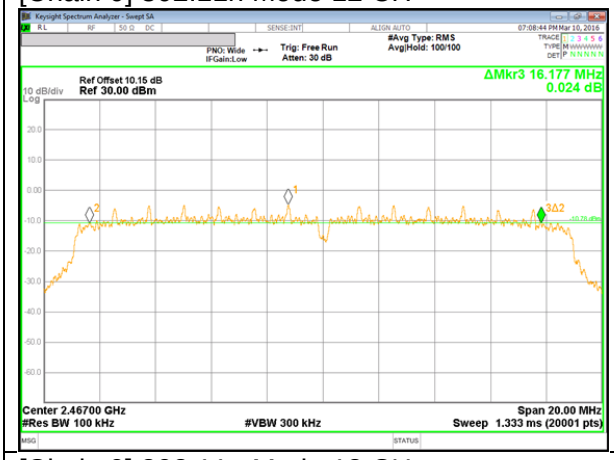
[Chain 0] 802.11n Mode High CH



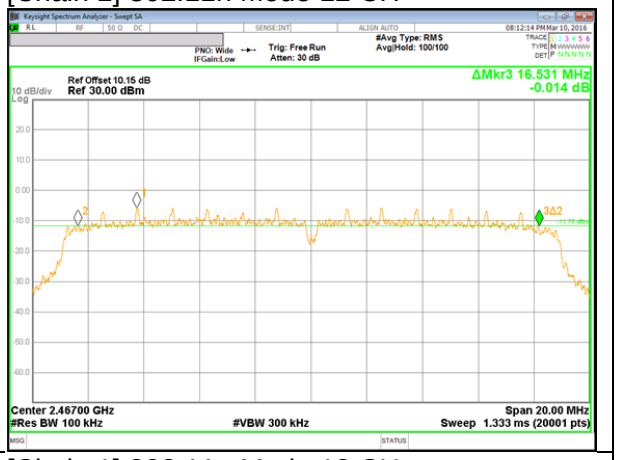
[Chain 1] 802.11n Mode High CH



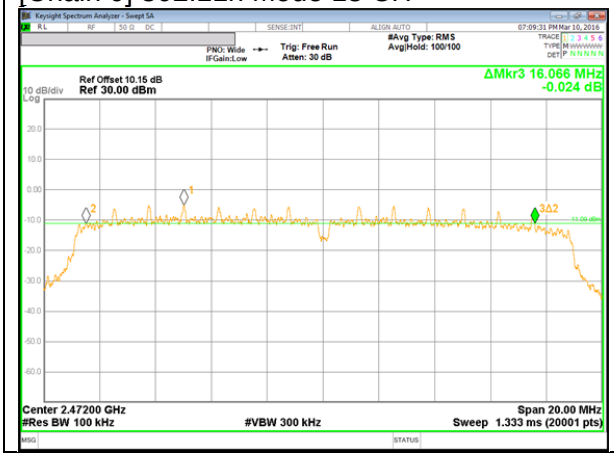
[Chain 0] 802.11n Mode 12 CH



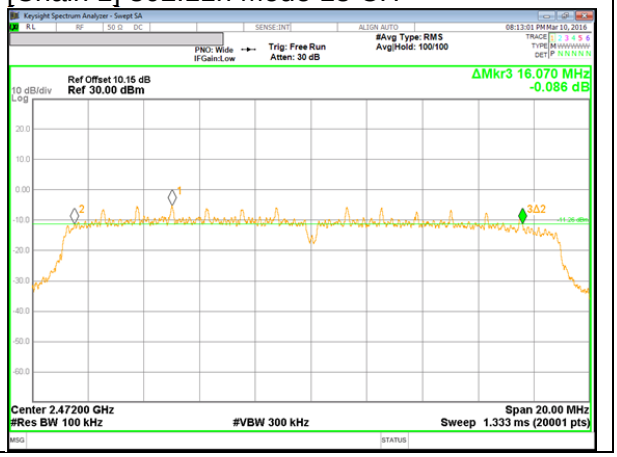
[Chain 1] 802.11n Mode 12 CH



[Chain 0] 802.11n Mode 13 CH



[Chain 1] 802.11n Mode 13 CH



10.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.2.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]	
		Primary Antenna 1	Secondary Antenna 2
Low	2412	12.990	12.960
Mid	2437	12.896	13.012
High	2462	12.840	12.984
12	2467	12.846	12.846
13	2472	12.688	12.642
Worst		12.642	

10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

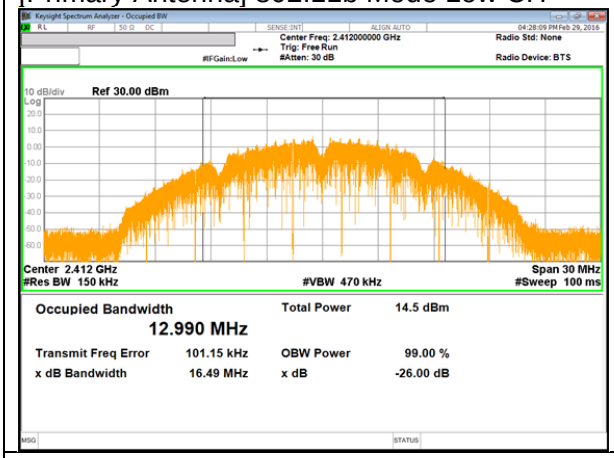
Channel	Frequency [MHz]	99% Bandwidth [MHz]	
		Primary Antenna 1	Secondary Antenna 2
Low	2412	16.404	16.415
Mid	2437	16.381	16.397
High	2462	16.391	16.429
12	2467	16.370	16.312
13	2472	16.370	16.365
Worst		16.312	

10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

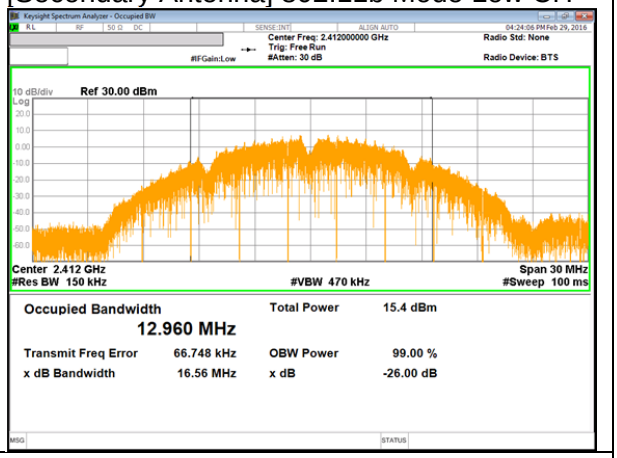
Channel	Frequency [MHz]	99% Bandwidth [MHz]	
		Primary Antenna 1	Secondary Antenna 2
Low	2412	17.605	17.518
Mid	2437	17.598	17.602
High	2462	17.559	17.550
12	2467	17.572	17.587
13	2472	17.528	17.474
Worst		17.474	

10.2.4. 99% BANDWIDTH PLOTS

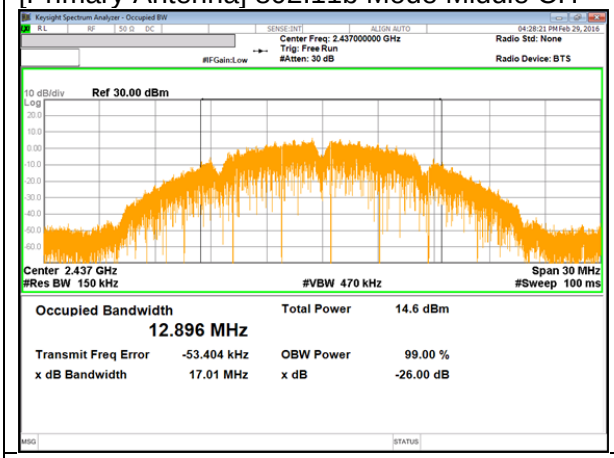
[Primary Antenna] 802.11b Mode Low CH



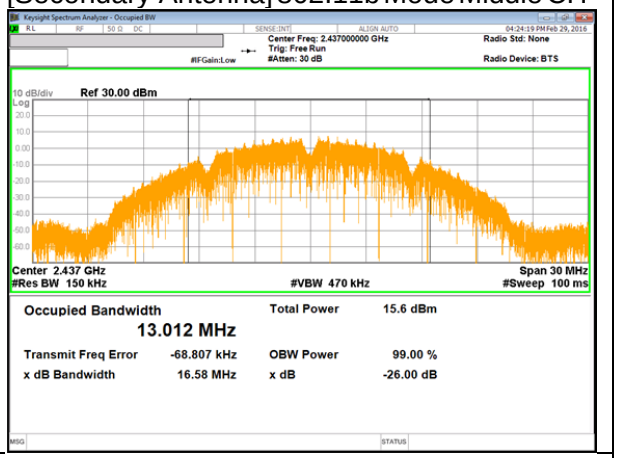
[Secondary Antenna] 802.11b Mode Low CH



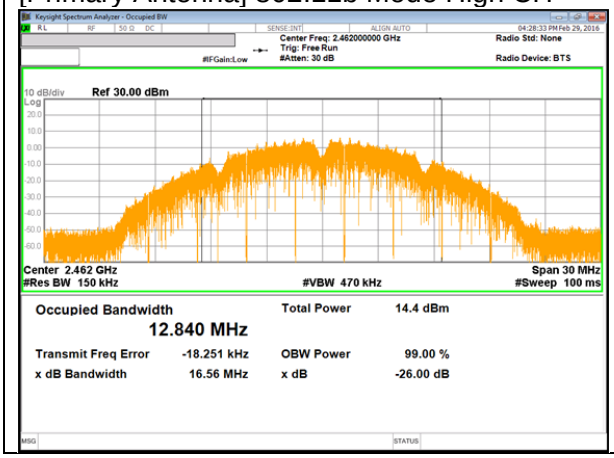
[Primary Antenna] 802.11b Mode Middle CH



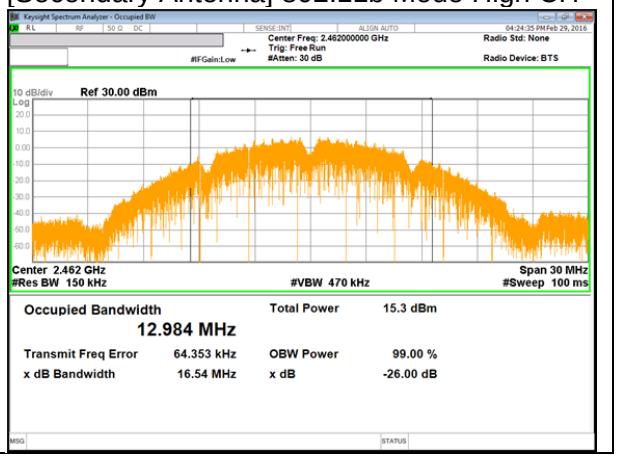
[Secondary Antenna] 802.11b Mode Middle CH



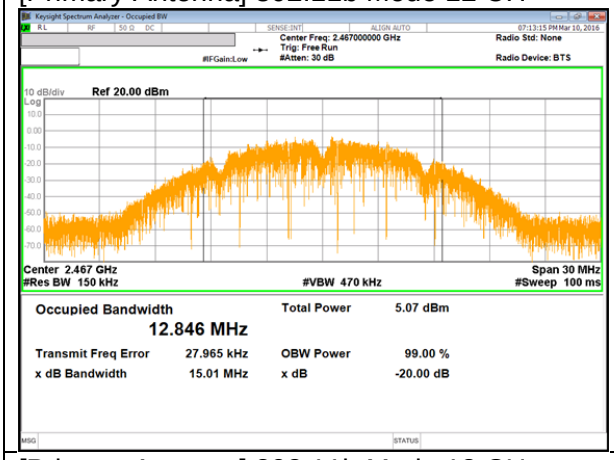
[Primary Antenna] 802.11b Mode High CH



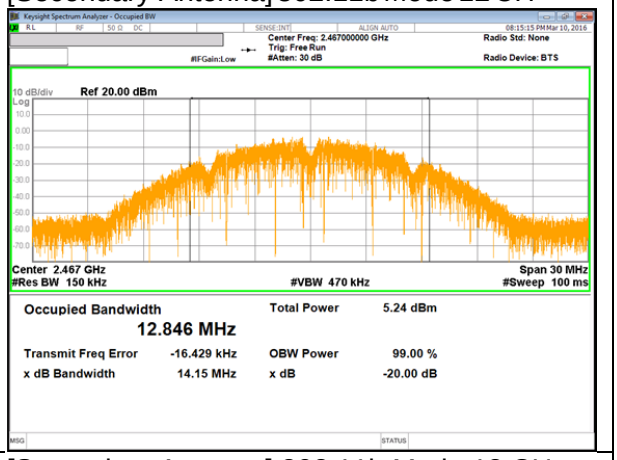
[Secondary Antenna] 802.11b Mode High CH



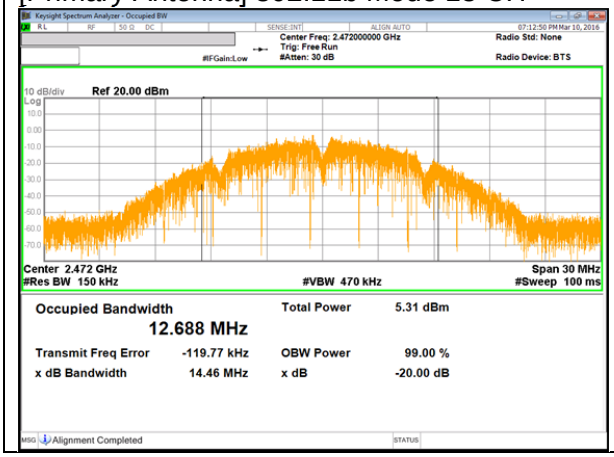
[Primary Antenna] 802.11b Mode 12 CH



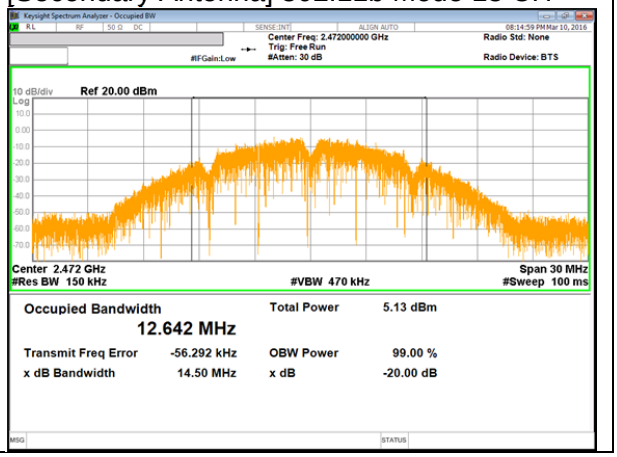
[Secondary Antenna] 802.11b Mode 12 CH



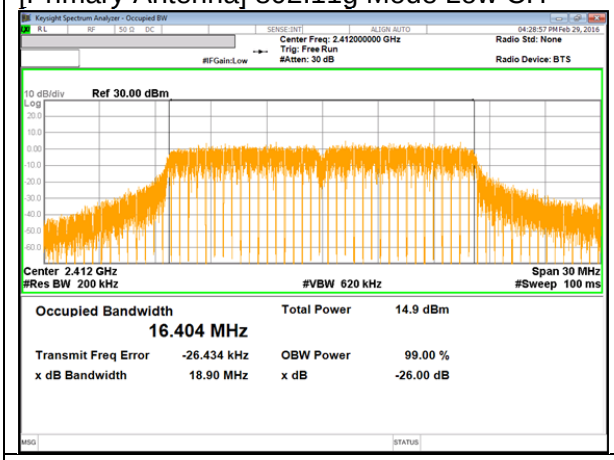
[Primary Antenna] 802.11b Mode 13 CH



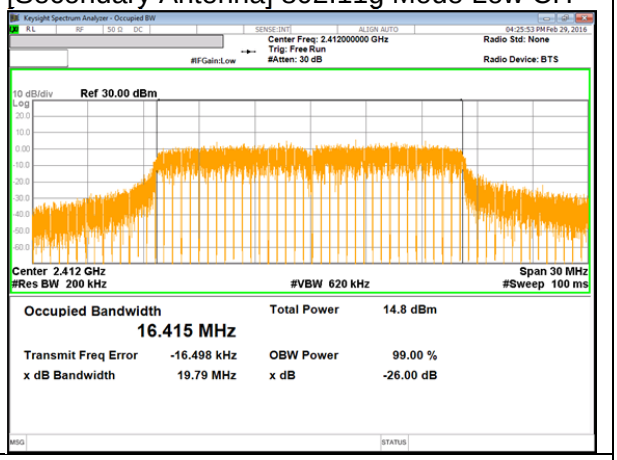
[Secondary Antenna] 802.11b Mode 13 CH



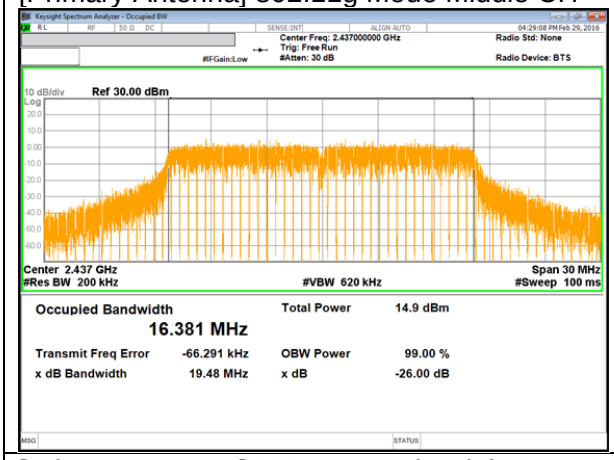
[Primary Antenna] 802.11g Mode Low CH



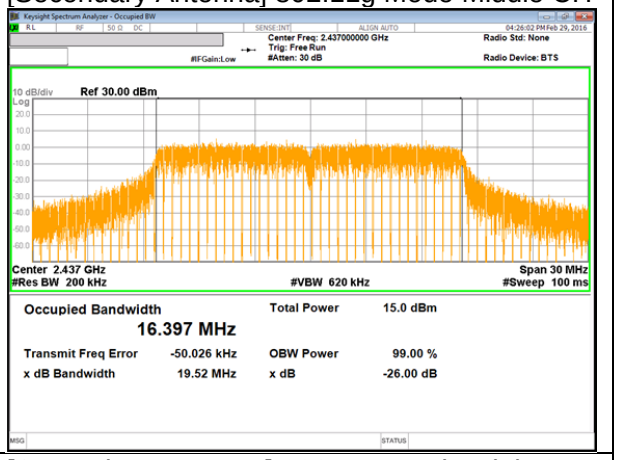
[Secondary Antenna] 802.11g Mode Low CH



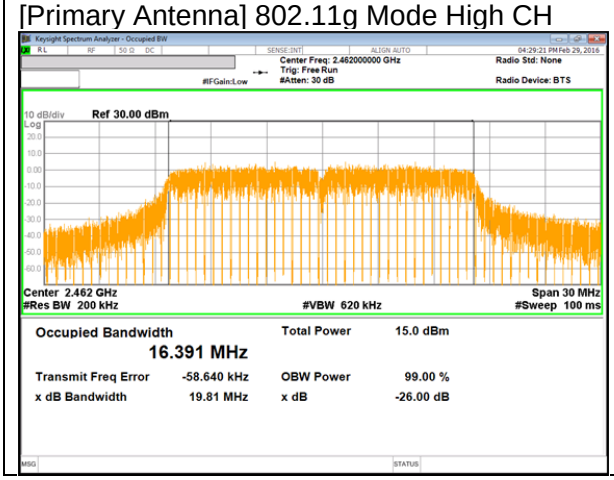
[Primary Antenna] 802.11g Mode Middle CH



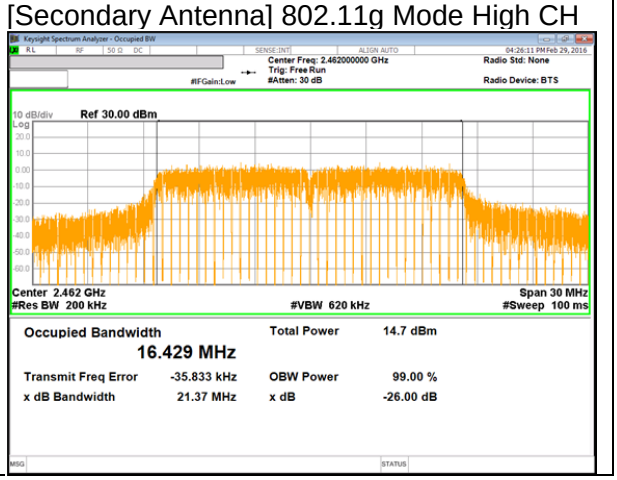
[Secondary Antenna] 802.11g Mode Middle CH



[Primary Antenna] 802.11g Mode High CH



[Secondary Antenna] 802.11g Mode High CH



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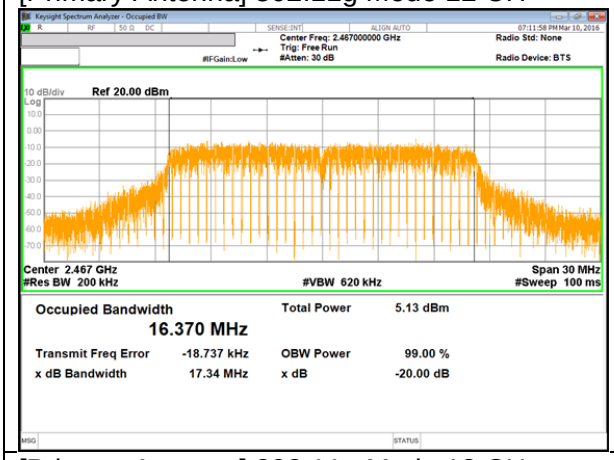
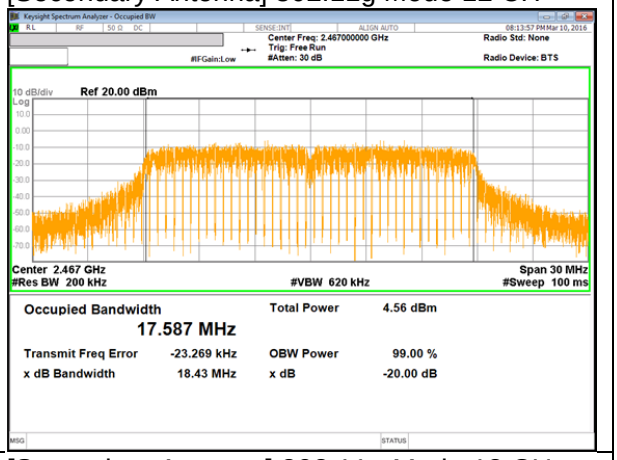
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

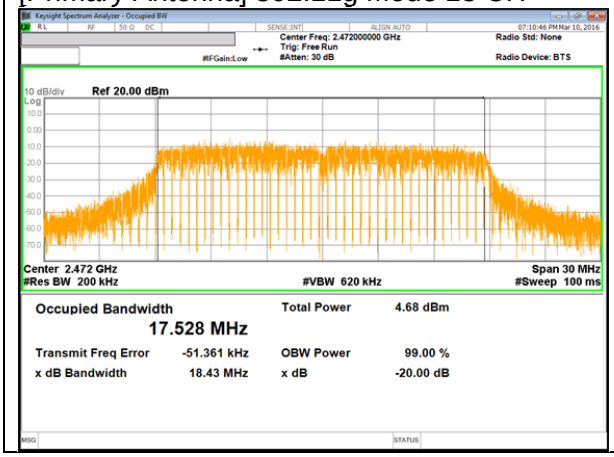
[Primary Antenna] 802.11g Mode 12 CH



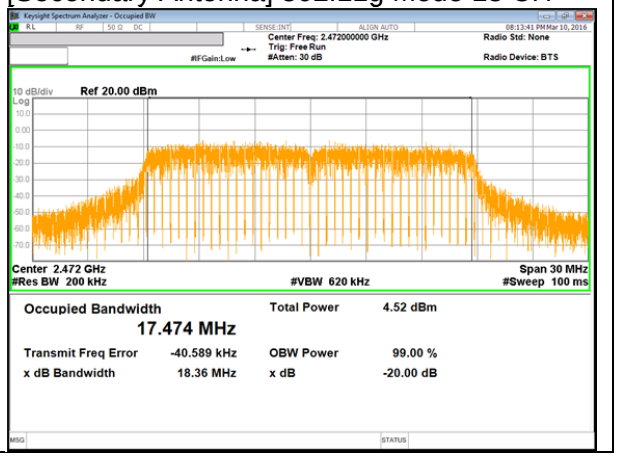
[Secondary Antenna] 802.11g Mode 12 CH



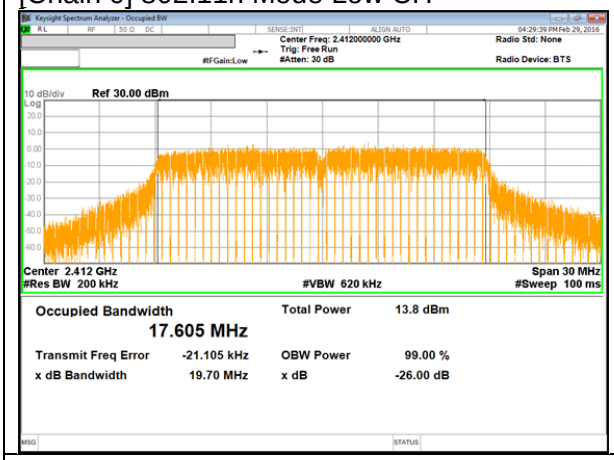
[Primary Antenna] 802.11g Mode 13 CH



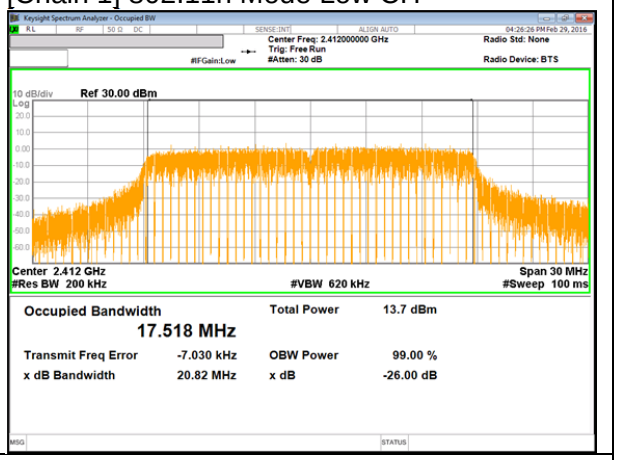
[Secondary Antenna] 802.11g Mode 13 CH



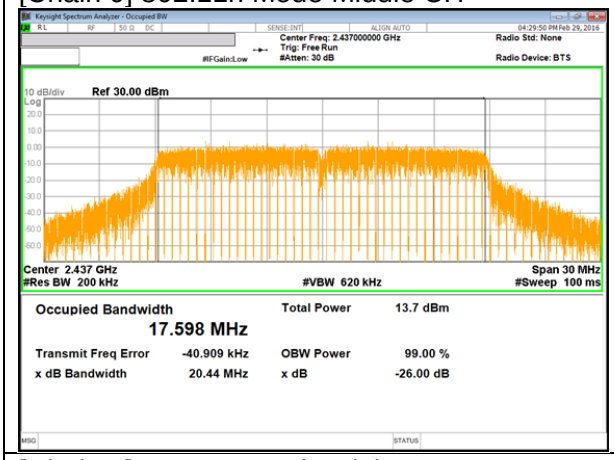
[Chain 0] 802.11n Mode Low CH



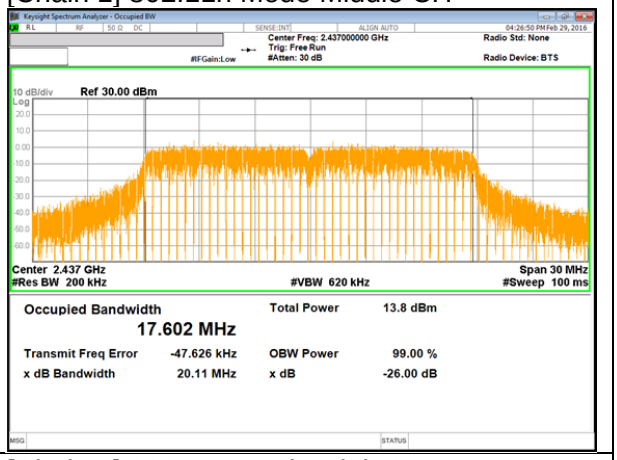
[Chain 1] 802.11n Mode Low CH



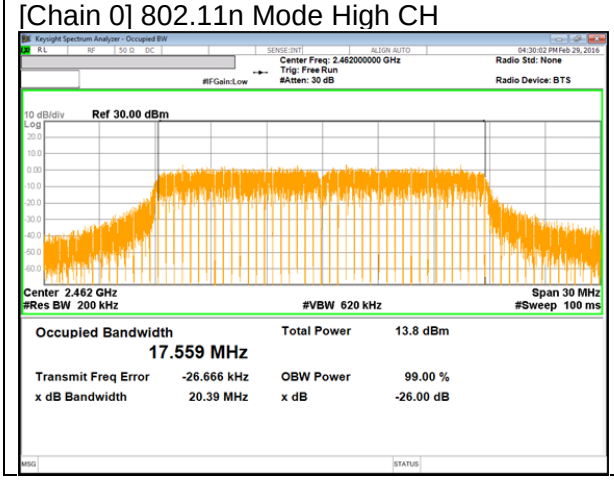
[Chain 0] 802.11n Mode Middle CH



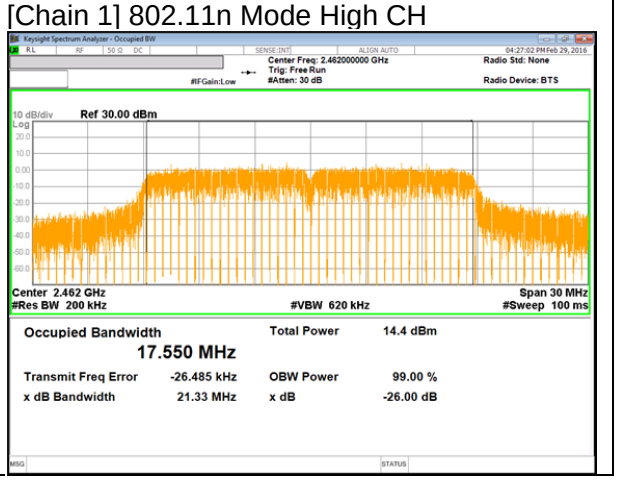
[Chain 1] 802.11n Mode Middle CH



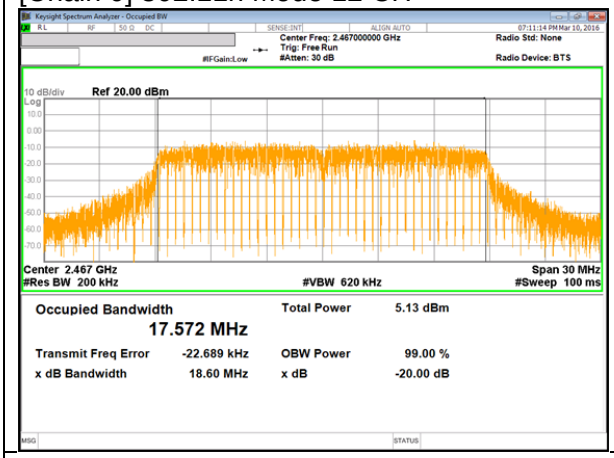
[Chain 0] 802.11n Mode High CH



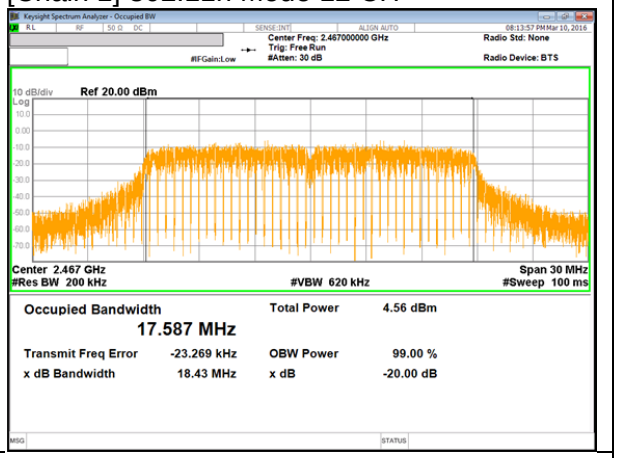
[Chain 1] 802.11n Mode High CH



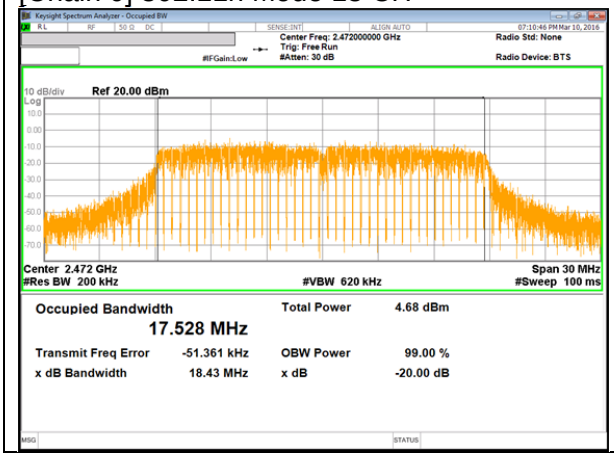
[Chain 0] 802.11n Mode 12 CH



[Chain 1] 802.11n Mode 12 CH



[Chain 0] 802.11n Mode 13 CH



[Chain 1] 802.11n Mode 13 CH

10.3. 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 of 10.1 dB (including 10 dB pad and 0.1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

For Power: The TX chains are uncorrelated and the antenna gain is the same for each chain. The directional gain is equal to the antenna gain.

2.4GHz

Chain 0 Antenna Gain [dBi]	Chain 1 Antenna Gain [dBi]	Uncorrelated Chains Directional Gain [dBi]
-3.35	-3.87	-3.60

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

2.4GHz

Chain 0 Antenna Gain [dBi]	Chain 1 Antenna Gain [dBi]	Correlated Chains Directional Gain [dBi]
-3.35	-3.87	-0.60

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

RESULTS

10.3.1. 802.11b MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain Primary [dBi]	Directional Gain Secondary [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-3.35	-3.87	30.00	30.00	36.00	30.00
Mid	2437	-3.35	-3.87	30.00	30.00	36.00	30.00
High	2462	-3.35	-3.87	30.00	30.00	36.00	30.00
12	2467	-3.35	-3.87	30.00	30.00	36.00	30.00
13	2472	-3.35	-3.87	30.00	30.00	36.00	30.00

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

Results

Channel	Frequency [MHz]	Primary Meas Power [dBm]	Secondary Meas Power [dBm]	Maximum Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	14.59	15.46	15.46	30.00	-14.54
Mid	2437	14.55	15.49	15.49	30.00	-14.51
High	2462	14.62	15.15	15.15	30.00	-14.85
12	2467	4.66	5.28	5.28	30.00	-24.72
13	2472	5.15	5.22	5.22	30.00	-24.78
Worst				15.49		

10.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain Primary [dBi]	Directional Gain Secondary [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-3.35	-3.87	30.00	30.00	36.00	30.00
Mid	2437	-3.35	-3.87	30.00	30.00	36.00	30.00
High	2462	-3.35	-3.87	30.00	30.00	36.00	30.00
12	2467	-3.35	-3.87	30.00	30.00	36.00	30.00
13	2472	-3.35	-3.87	30.00	30.00	36.00	30.00

Duty Cycle CF [dB]	0.29	Included in Calculations of Corr'd Power

Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Maximum Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	15.25	15.03	18.15	30.00	-11.85
Mid	2437	15.15	15.11	18.14	30.00	-11.86
High	2462	15.17	14.72	17.96	30.00	-12.04
12	2467	5.34	5.07	8.22	30.00	-21.78
13	2472	4.85	4.94	7.91	30.00	-22.09
Worst				18.15		

10.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-3.60	30.00	30.00	36.00	30.00
Mid	2437	-3.60	30.00	30.00	36.00	30.00
High	2462	-3.60	30.00	30.00	36.00	30.00
12	2467	-3.60	30.00	30.00	36.00	30.00
13	2472	-3.60	30.00	30.00	36.00	30.00

Duty Cycle CF [dB]	0.31	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	14.06	13.97	17.03	30.00	-12.97
Mid	2437	14.03	14.05	17.05	30.00	-12.95
High	2462	14.12	14.45	17.30	30.00	-12.70
12	2467	5.25	4.82	8.05	30.00	-21.95
13	2472	4.64	4.71	7.69	30.00	-22.31
Worst				17.30		

10.4. 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 AVGPSD-2” under KDB558074 D01 DTS Meas Guidance v03r05

RESULTS

10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	Primary Antenna 1 [dBm]	Secendary Antenna 2 [dBm]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-16.15	-15.71	-15.71	8.00	-23.71
Mid	2437	-16.57	-15.26	-15.26	8.00	-23.26
High	2462	-16.41	-15.67	-15.67	8.00	-23.67
12	2467	-25.69	-25.78	-25.69	8.00	-33.69
13	2472	-25.31	-25.78	-25.31	8.00	-33.31

Duty Cycle CF [dB]	0.00	Included in Calculations of PPSD

10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	Primary Antenna 1 [dBm]	Secendary Antenna 2 [dBm]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-18.68	-18.85	-15.46	8.00	-23.46
Mid	2437	-19.09	-19.35	-15.92	8.00	-23.92
High	2462	-18.82	-19.60	-15.90	8.00	-23.90
12	2467	-28.20	-29.21	-25.38	8.00	-33.38
13	2472	-28.82	-29.09	-25.65	8.00	-33.65

Duty Cycle CF [dB]	0.29	Included in Calculations of PPSD

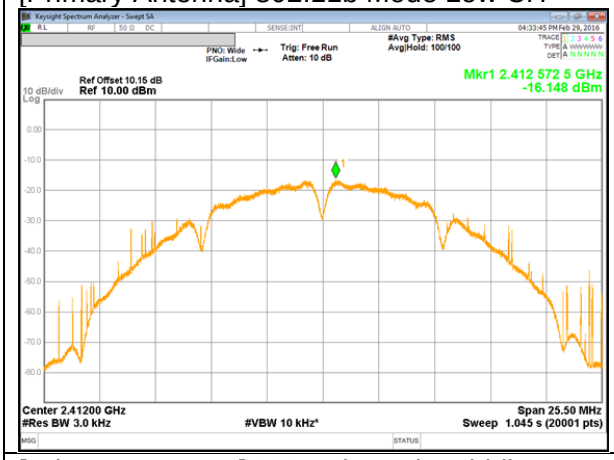
10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	Chain 0 Meas [dBm]	Chain 1 Meas [dBm]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-19.98	-20.29	-16.81	8.00	-24.81
Mid	2437	-20.13	-20.17	-16.83	8.00	-24.83
High	2462	-20.19	-19.70	-16.62	8.00	-24.62
12	2467	-28.82	-27.27	-24.65	8.00	-32.65
13	2472	-28.45	-28.19	-25.00	8.00	-33.00

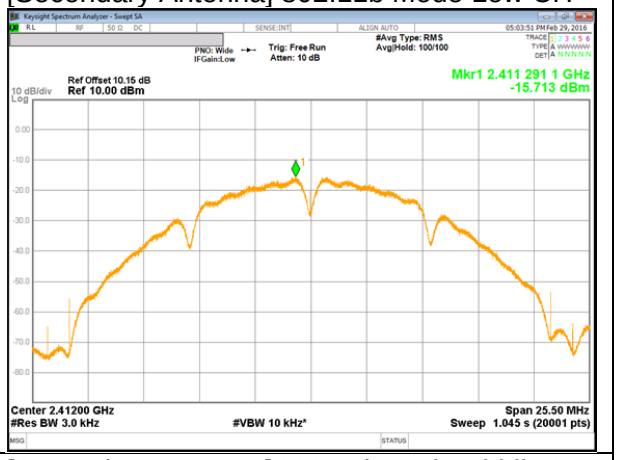
Duty Cycle CF [dB]	0.31	Included in Calculations of PPSD

10.4.4. PSD PLOTS

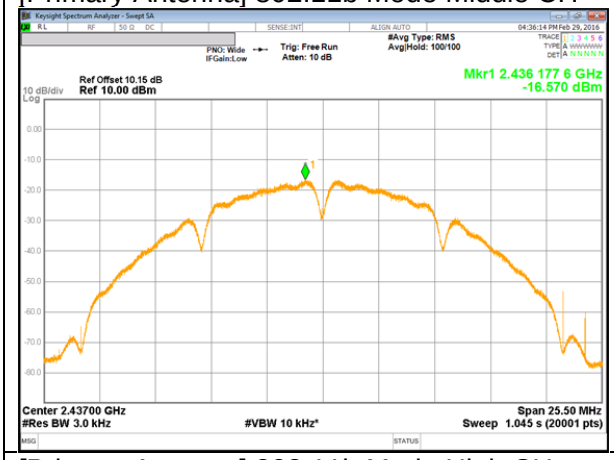
[Primary Antenna] 802.11b Mode Low CH



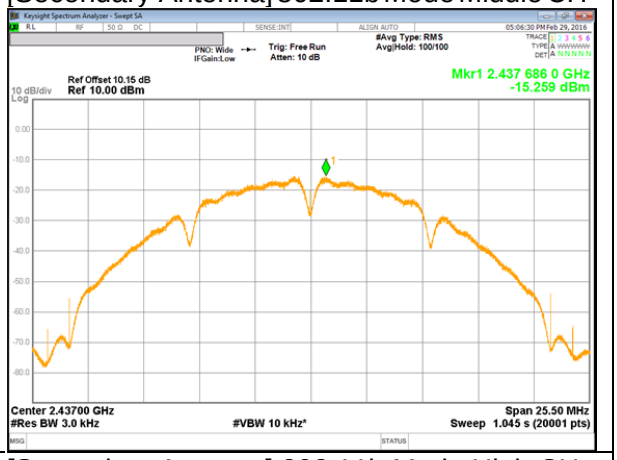
[Secondary Antenna] 802.11b Mode Low CH



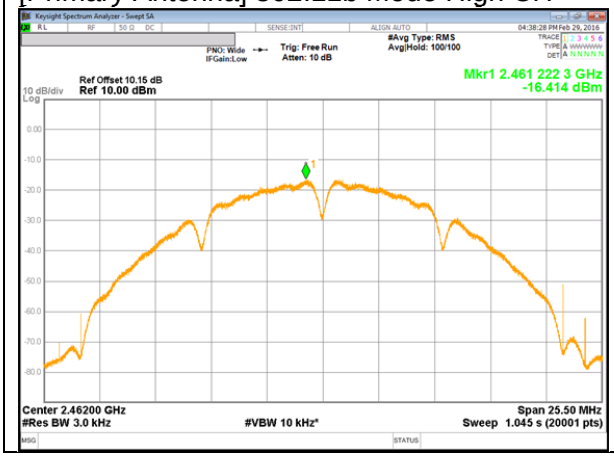
[Primary Antenna] 802.11b Mode Middle CH



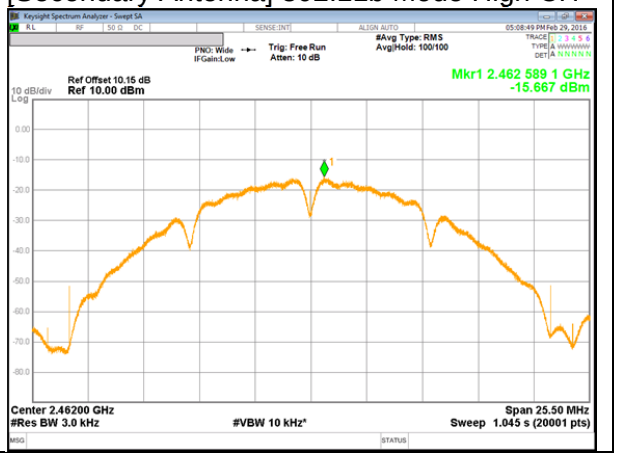
[Secondary Antenna] 802.11b Mode Middle CH



[Primary Antenna] 802.11b Mode High CH



[Secondary Antenna] 802.11b Mode High CH



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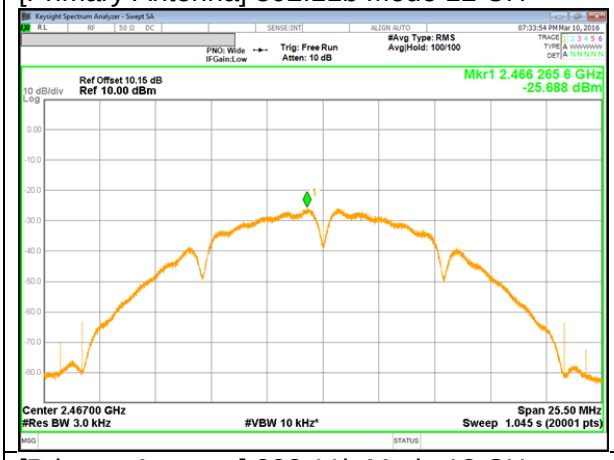
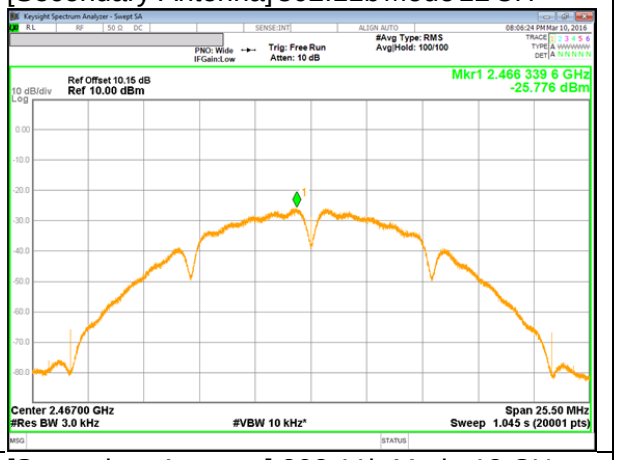
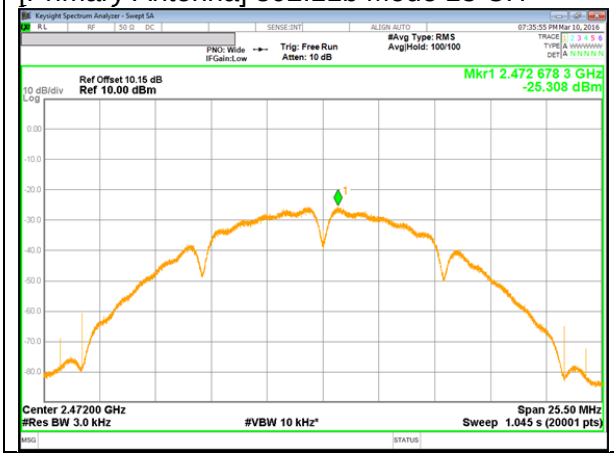
[Primary Antenna] 802.11b Mode 12 CH



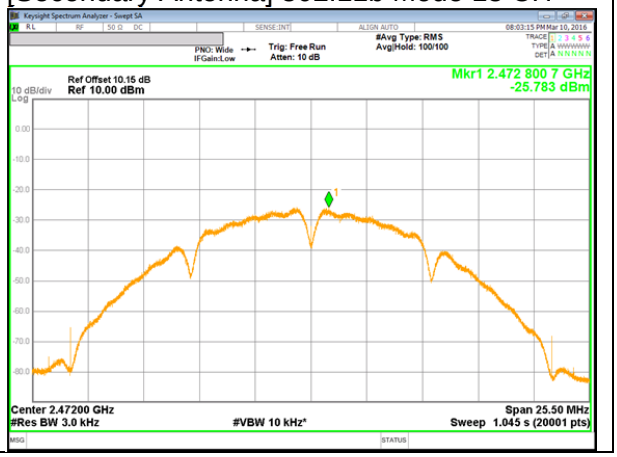
[Secondary Antenna] 802.11b Mode 12 CH



[Primary Antenna] 802.11b Mode 13 CH



[Secondary Antenna] 802.11b Mode 13 CH



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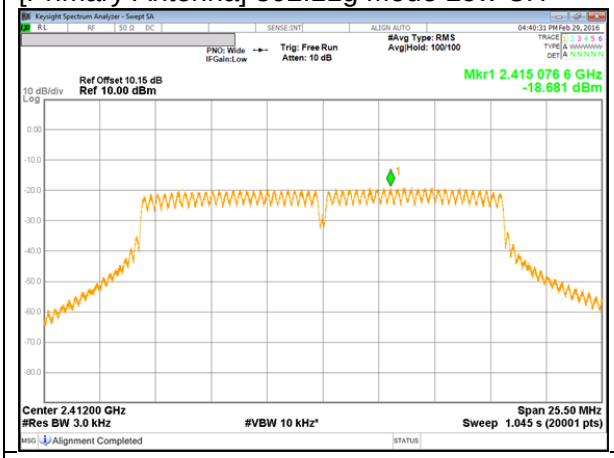
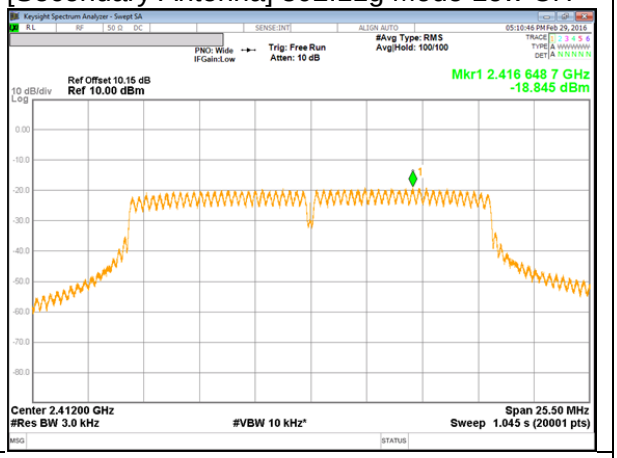
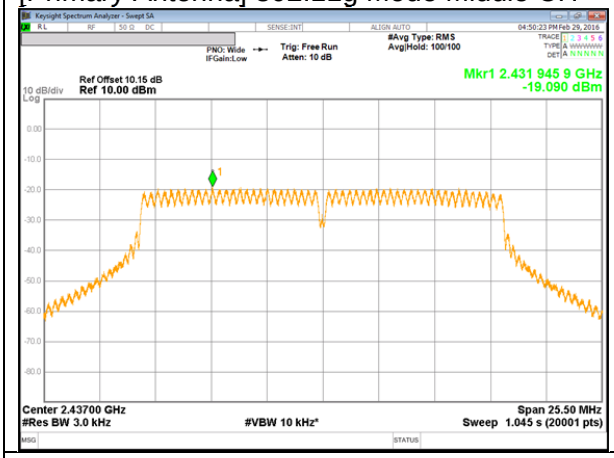
[Primary Antenna] 802.11g Mode Low CH



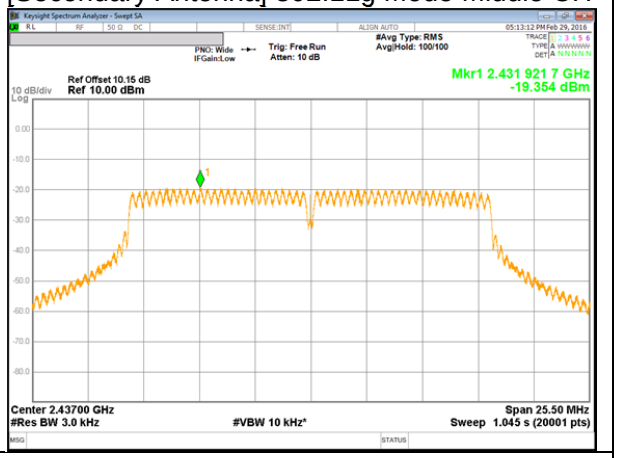
[Secondary Antenna] 802.11g Mode Low CH



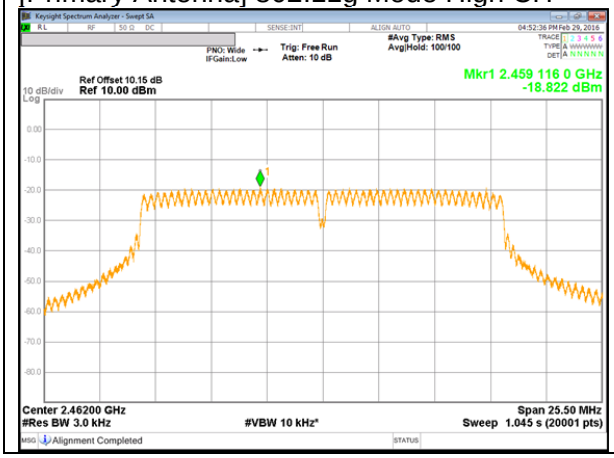
[Primary Antenna] 802.11g Mode Middle CH



[Secondary Antenna] 802.11g Mode Middle CH



[Primary Antenna] 802.11g Mode High CH



[Secondary Antenna] 802.11g Mode High CH