
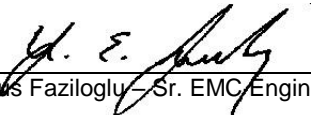




Test Report

Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

Report No	ER2501-18
Client	Harman International Industries, Incorporated
Address	30001 Cabot Drive Novi, MI 48377
Phone	248-254-7751
Items tested FCC ID IC	GEN3.1 HIGH VA 2AHPN-BE2838 6434C-BE2838
Equipment Type Equipment Code	Digital Transmission System DTS
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2
Test Dates	October 20 th to November 10 th , 2017
Results	As detailed within this report
Prepared by	 Zachary Johnson EMC Engineer
Authorized by	 Yunus Faziloglu Sr. EMC Engineer
Issue Date	11/28/2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 15 of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



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One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



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Report REV Sep-08-2017 - YF



Summary

This test report supports an application for certification of a transmitter operating pursuant to:
CFR Title 47 FCC Part 15.247, ISSED Canada RSS-247 Issue 2

The product is the GEN3.1 HIGH VA. It is a direct sequence spread spectrum transmitter that operates in the 2412 – 2462 MHz frequency range.

Antenna Type: PCB Trace

Gain: 1.28 dBi maximum peak

We found that the product met the above requirements without modification.

Modifications: None

Test samples were received in good condition.

Issue No.	Reason for change	Date Issued
1	Original Release	November 28, 2017

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Test Methodology

All testing was performed according to the following rules/procedures/documents;
CFR 47 Part 15.247, RSS-247 Issue 2, RSS-Gen Issue 4, FCC KDB 558074 D01 DTS
Measurement Guidance v04 and ANSI C63.10-2013.

Radiated emissions were maximized by testing the device in the in-vehicle setup orientation and
varying the test antenna's height and polarity.

EUT operating voltage is 13.5V DC

The following bandwidths were used during radiated spurious and AC line conducted emissions
testing.

Frequency	RBW	VBW
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-25GHz	1MHz	3MHz

Product Tested - Configuration Documentation

EUT Configuration											
Work Order:	R2501										
Company:	Harman International Industries, Incorporated										
Company Address:	30001 Cabot Drive										
	Novi, MI, 48377										
Contact:	Mark Bowman										
	MN			PN			SN				
EUT:	GEN3.1 HIGH VA										
EUT Description:	Car Stereo System										
EUT Components	MN			SN							
Back up camera											
GPS antenna											
FM/AM antenna											
Support Equipment	MN			SN							
CS Supplied Laptop.											
USB to Ethernet Converter											
13.5Vdc Power Supply											
Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment	
DC main	Power DC	2	2	Power DC	No	No	1.2	in	yes		
Audio		1	1	-	No	No	1.2	in	yes		
USB		3	1	USB	Yes	No	1	in	yes	Redundant	
GPS antenna		1	1	Coaxial	Yes	No	1.3	in	yes		
FM/AM antenna	-	1	1		Yes	No	0.4	in	yes		
Back up camera		1	1		Yes	No	0.3	in	yes		
Dab/xm		1	1	Coaxial	Yes	No	1	in	yes		
Software Operating Mode Description:											
EUT may be operating in 1 of 2 modes. For immunity, EUT will connect with a CMW and operate as normal with traffic while doing emissions scans eut will operate by transmitting a constant signal. For Bluetooth eut will still need to be connected to CMW.											
Performance Criteria:											
Eut will connect to CMW and preform less than 10% PER during test.BT- EUT will connect to tablet or CMW over bluetooth and stay connected at appropriate distance											

Statement of Conformity

RSS-GEN	RSP-100	RSS 247	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
	3.1		15.19	The label is shown in the label exhibit.
	4		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
3, 6.1			15.31	The EUT was tested in accordance with the measurement standards in this section.
6.13			15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
8.1			15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
8.3			15.203	EUT employs PCB trace antenna with 1.28 dBi maximum peak gain.
8.10			15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable
8.8			15.207	N/A, EUT is vehicle battery powered only.

Refer to Appendix A of this report for antenna port conducted measurements.

Test Results

Radiated Spurious Emissions

LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

[15.247(d)]

All results below are for the in-vehicle setup orientation only.

MEASUREMENTS / RESULTS

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 30-1000MHz Horizontal Data Operator: CCH Notes: Spurious TX Mode 802.11b 20MHz 11Mbps CH 6 filtering 2300-2500MHz						Work Order - R2501 EUT Power Input - 13.8V DC Test Site - CH 1 Conditions - 22.2°C; 24%RH; 1012mBar Witnessed by - Filtering 2300-2500MHz					
Frequency (MHz)	Raw QP Reading (dBμV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBμV/m)	Lim1: FCC_pt15_1 09_Class_B (dBμV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_1 09_Class_B (dBμV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)
65.213	54.3	-27.5	26.8	40	-13.2	PASS		40	-13.2	PASS	
497.387	50.4	-15.7	34.8	46	-11.2	PASS		46	-11.2	PASS	
511.501	50.9	-15.6	35.4	46	-10.7	PASS	-10.7	46	-10.7	PASS	-10.7
513.538	47.8	-15.5	32.3	46	-13.8	PASS		46	-13.8	PASS	
529.938	45.7	-15	30.7	46	-15.4	PASS		46	-15.4	PASS	
797.417	33.9	-9.4	24.5	46	-21.5	PASS		46	-21.5	PASS	
Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 30-1000MHz Vertical Data Operator: CCH Notes: Spurious TX Mode 802.11b 20MHz 11Mbps CH 6 filtering 2300-2500MHz						Work Order - R2501 EUT Power Input - 13.8V DC Test Site - CH 1 Conditions - 22.2°C; 24%RH; 1012mBar Witnessed by - Filtering 2300-2500MHz					
81.507	52.1	-27.7	24.4	40	-15.6	PASS		40	-15.6	PASS	
432.032	50.5	-17	33.5	46	-12.5	PASS	-12.5	46	-12.5	PASS	-12.5
448.354	45.9	-16.6	29.4	46	-16.7	PASS		46	-16.7	PASS	
511.505	44.8	-15.6	29.2	46	-16.8	PASS		46	-16.8	PASS	
797.508	40.4	-9.4	31.1	46	-15	PASS		46	-15	PASS	
798.094	41.3	-9.4	31.9	46	-14.1	PASS		46	-14.1	PASS	

30-1000MHz Center Channel



**Test Report for Harman International Industries, Incorporated • GEN3.1 HIGH VA • Report No. ER2501-18 •
November 28, 2017**

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Horizontal Data Operator: CCH Notes: Spurious TX Mode 802.11b 20MHz 11Mbps CH 1 filtering 2300-2 ¹ EUT Maximum Frequency - 802.11b 20MHz 11Mbps	Work Order - R2501 EUT Power Input - 13.8V DC Test Site - CH 1 Conditions - 22.2°C; 24%RH; 1012mBar Witnessed by - Filtering 2300-2500MHz
---	---

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	PK Lim. FCC_pt15_1 09_ClassB_ Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	AV Lim. FCC_pt15_1 09_ClassB_ AVG (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Average Margin (dB)
1594.2	48.1	38.1	-11.6	36.5	74	-37.5	PASS		26.5	54	-27.5	PASS	
2093.7	48.1	38.3	-8.5	39.5	74	-34.4	PASS		29.8	54	-24.2	PASS	
2256.9	46.4	37.7	-110.5	-64.1	74	-138.1	PASS		-72.8	54	-126.7	PASS	
2442.6	50.9	40.7	-110.2	-59.3	74	-133.3	PASS		-69.5	54	-123.5	PASS	
2799.4	49	39.4	-62	-13.1	74	-87	PASS		-22.7	54	-76.6	PASS	
5792.4	45.9	35.3	-0.3	45.7	74	-28.3	PASS	-28.3	35	54	-19	PASS	-19

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Vertical Data Operator: CCH Notes: Spurious TX Mode 802.11b 20MHz 11Mbps CH 1 filtering 2300-2 ¹ EUT Maximum Frequency - 802.11b 20MHz 11Mbps	Work Order - R2501 EUT Power Input - 13.8V DC Test Site - CH 1 Conditions - 22.2°C; 24%RH; 1012mBar Witnessed by - Filtering 2300-2500MHz
---	---

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	PK Lim. FCC_pt15_1 09_ClassB_ Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	AV Lim. FCC_pt15_1 09_ClassB_ AVG (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1329.5	46.2	37.8	-12	34.2	74	-39.7	PASS		25.9	54	-28.1	PASS	
2085.1	46.9	38.4	-8.6	38.3	74	-35.7	PASS		29.9	54	-24.1	PASS	
2467.1	50.9	40.5	-110.1	-59.2	74	-133.2	PASS		-69.6	54	-123.5	PASS	
2807.6	48.4	39.3	-3.8	44.6	74	-29.4	PASS	-29.4	35.5	54	-18.5	PASS	-18.5
5009.6	44.6	36.6	-2	42.6	74	-31.4	PASS		34.6	54	-19.3	PASS	

1-6GHz Low Channel

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Horizontal Data Operator: CCH Notes: Spurious TX Mode 802.11b 20MHz 11Mbps CH 6 filtering 2300-2 ¹ EUT Maximum Frequency - 802.11b 20MHz 11Mbps	Work Order - R2501 EUT Power Input - 13.8V DC Test Site - CH 1 Conditions - 22.2°C; 24%RH; 1012mBar Witnessed by - Filtering 2300-2500MHz
---	---

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	PK Lim. FCC_pt15_1 09_ClassB_ Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	AV Lim. FCC_pt15_1 09_ClassB_ AVG (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Average Margin (dB)
2196.7	47.9	37.2	-7.5	40.4	74	-33.5	PASS		29.7	54	-24.2	PASS	
2259.4	47	37.7	-110.5	-63.5	74	-137.5	PASS		-72.7	54	-126.7	PASS	
2470.3	49.7	40.3	-110.1	-60.4	74	-134.4	PASS		-69.8	54	-123.7	PASS	
2800.8	49.1	39.4	-3.5	45.6	74	-28.4	PASS	-28.4	35.8	54	-18.1	PASS	-18.1
4627.6	44	35.6	-3.1	40.9	74	-33.1	PASS		32.4	54	-21.5	PASS	
5775.4	43.7	35.5	-0.3	43.3	74	-30.6	PASS		35.1	54	-18.8	PASS	



**Test Report for Harman International Industries, Incorporated • GEN3.1 HIGH VA • Report No. ER2501-18 •
November 28, 2017**

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Vertical Data Operator: CCH Notes: Spurious TX Mode 802.11b 20MHz 11Mbps CH 6 filtering 2300-2500MHz						Work Order - R2501 EUT Power Input - 13.8V DC Test Site - CH 1 Conditions - 22.2°C; 24%RH; 1012mBar Witnessed by - Filtering 2300-2500MHz EUT Maximum Frequency - 802.11b 20MHz 11Mbps							
Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	PK Lim. FCC_pt15_1 09_ClassB_1 Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	AV Lim. FCC_pt15_1 09_ClassB_1 AVG (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
2112.3	47.1	37.6	-8.4	38.7	74	-35.3	PASS		29.3	54	-24.7	PASS	
2485.6	49.8	39.9	-110	-60.2	74	-134.2	PASS		-70.1	54	-124.1	PASS	
2803.9	47.7	39.4	-3.6	44.1	74	-29.9	PASS		35.8	54	-18.2	PASS	-18.2
4587.8	47	36.8	-3.4	43.6	74	-30.3	PASS		33.4	54	-20.6	PASS	
5048.4	46.3	36.4	-1.7	44.6	74	-29.4	PASS	-29.4	34.6	54	-19.4	PASS	
5844.6	43.9	35.3	-0.3	43.5	74	-30.4	PASS		34.9	54	-19	PASS	

1-6GHz Mid Channel

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Horizontal Data Operator: CCH Notes: Spurious TX Mode 802.11b 20MHz 11Mbps CH 11 filtering 2300-2500MHz						Work Order - R2501 EUT Power Input - 13.8V DC Test Site - CH 1 Conditions - 22.2°C; 24%RH; 1012mBar Witnessed by - Filtering 2300-2500MHz EUT Maximum Frequency - 802.11b 20MHz 11Mbps							
Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	PK Lim. FCC_pt15_1 09_ClassB_1 Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	AV Lim. FCC_pt15_1 09_ClassB_1 AVG (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Average Margin (dB)
1328.7	47.7	37.4	-12	35.7	74	-38.2	PASS		25.5	54	-28.5	PASS	
2172.6	46.1	36.9	-7.7	38.4	74	-35.6	PASS		29.2	54	-24.8	PASS	
2805.9	50.1	39.4	-3.7	46.4	74	-27.6	PASS	-27.6	35.7	54	-18.3	PASS	-18.3
3462.3	46.5	37.4	-6.5	40	74	-34	PASS		30.9	54	-23	PASS	
4454.4	45.4	36.3	-3.9	41.5	74	-32.5	PASS		32.4	54	-21.6	PASS	
5769.1	43.8	35.4	-0.3	43.4	74	-30.5	PASS		35.1	54	-18.9	PASS	

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Vertical Data Operator: CCH Notes: Spurious TX Mode 802.11b 20MHz 11Mbps CH 11 filtering 2300-2500MHz						Work Order - R2501 EUT Power Input - 13.8V DC Test Site - CH 1 Conditions - 22.2°C; 24%RH; 1012mBar Witnessed by - Filtering 2300-2500MHz EUT Maximum Frequency - 802.11b 20MHz 11Mbps							
Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	PK Lim. FCC_pt15_1 09_ClassB_1 Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	AV Lim. FCC_pt15_1 09_ClassB_1 AVG (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1594.5	46	38.2	-11.6	34.4	74	-39.6	PASS		26.6	54	-27.4	PASS	
2092.7	46.4	38.3	-8.5	37.9	74	-36.1	PASS		29.8	54	-24.2	PASS	
2439.7	50.9	40.6	-110.2	-59.3	74	-133.3	PASS		-69.6	54	-123.6	PASS	
2803.7	48.3	39.3	-3.6	44.7	74	-29.3	PASS	-29.3	35.7	54	-18.3	PASS	-18.3
4604.7	46	36.6	-3.3	42.7	74	-31.3	PASS		33.3	54	-20.7	PASS	
5783.8	44.8	35.5	-0.3	44.5	74	-29.5	PASS		35.2	54	-18.8	PASS	

1-6GHz High Channel



**Test Report for Harman International Industries, Incorporated • GEN3.1 HIGH VA • Report No. ER2501-18 •
November 28, 2017**

Curtis Straus - a Bureau Veritas Company	Work Order - R2501
Radiated Emissions Electric Field 1m Distance	EUT Power Input - 13.8V DC
6-18GHz Horizontal Data	Test Site - CH 1
Operator: CCH	Conditions - 22.2°C; 24%RH; 1012mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
Spurious TX Mode 802.11b 20MHz 11Mbps CH 6 filtering 2300-2500MHz	EUT Maximum Frequency - 802.11b 20MHz 11Mbps

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	PK Lim: FCC_pt15_1 09_ClassB_1 Peak (dBμV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	AV Lim: FCC_pt15_1 09_ClassB_1 AVG (dBμV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)	Worst Avg Margin (dB)
12627.2	42.8	33	10.9	53.7	83.5	-29.8	PASS		43.8	63.5	-19.7	PASS	
13039.3	40.4	32.9	11	51.4	83.5	-32.1	PASS		43.9	63.5	-19.6	PASS	
13306.1	40.2	32.3	13.8	54	83.5	-29.5	PASS		46.1	63.5	-17.4	PASS	
14300.8	42.8	33.8	12.4	55.3	83.5	-28.2	PASS		46.3	63.5	-17.2	PASS	
16979.3	41.9	32.8	17.3	59.2	83.5	-24.3	PASS		50.1	63.5	-13.4	PASS	
17699.2	40.1	29.6	24.3	64.4	83.5	-19.1	PASS	-19.1	53.9	63.5	-9.6	PASS	-9.6

Curtis Straus - a Bureau Veritas Company	Work Order - R2501
Radiated Emissions Electric Field 1m Distance	EUT Power Input - 13.8V DC
6-18GHz Vertical Data	Test Site - CH 1
Operator: CCH	Conditions - 22.2°C; 24%RH; 1012mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
Spurious TX Mode 802.11b 20MHz 11Mbps CH 6 filtering 2300-2500MHz	EUT Maximum Frequency - 802.11b 20MHz 11Mbps

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	PK Lim: FCC_pt15_1 09_ClassB_1 Peak (dBμV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	AV Lim: FCC_pt15_1 09_ClassB_1 AVG (dBμV/m)	Avg Margin (dB)	Avg Test Results (Pass/Fail)	Worst Avg Margin (dB)
13342.8	42.5	32.6	13.4	55.9	83.5	-27.6	PASS		46	63.5	-17.5	PASS	
13769.2	41.9	34.1	13	54.8	83.5	-28.7	PASS		47.1	63.5	-16.4	PASS	
14326.7	43.3	34.3	12.5	55.8	83.5	-27.7	PASS		46.9	63.5	-16.6	PASS	
17011.6	40.2	31.3	17.5	57.7	83.5	-25.8	PASS		48.8	63.5	-14.7	PASS	
17213.8	41.8	30.5	16.8	58.6	83.5	-24.9	PASS		47.3	63.5	-16.2	PASS	
17661.6	39.9	30.7	23.4	63.3	83.5	-20.2	PASS	-20.2	54	63.5	-9.5	PASS	-9.5

6-18GHz Center Channel

Radiated Emissions Table														
Date: 15-Nov-17				Company: Harman					Work Order: R2501					
Engineer: Chris Hamel				EUT Desc: GEN3.1 HIGH VA					EUT Operating Voltage/Frequency: 13.8V DC					
Temp: 22.3°C				Humidity: 24%					Pressure: 1018mBar					
Frequency Range: 18-40 GHz									Measurement Distance: 0.1 m					
Notes: Combined 18-26.5GHz and 26.5-40GHz. No emissions found.									EUT Max Freq:					
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
				---	---	---	---	---	---	---	---	---	---	---
Table Result: Pass by N/A dB Worst Freq: N/A MHz														
Test Site: EMI Chamber 1				Cable 1: Asset #2323					Cable 2: ---			Cable 3: ---		
Analyzer: Gold				Preamp: 18-26.5GHz					Antenna: 18-26.5GHz Horn			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.197														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
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Test Site: EMI Chamber 1				Cable 1: Asset #2323					Cable 2: Asset #2324			Cable 3: ---		
Analyzer: Gold				Preamp: 40GHz Mixer					Antenna: 40GHz Mixer			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.197														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
Copyright Curtis-Straus LLC 2000														

18-40GHz Center Channel



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Radiated Band Edge

Radiated Emissions Table														
Date: 21-Oct-17			Company: Harmon			Work Order: R2501								
Engineer: Aristotelis Casternopoulos			EUT Desc: VG4 FCC High			EUT Operating Voltage/Frequency: 12VDC								
Temp: 26.3C			Humidity: 22%			Pressure: 1017%								
Frequency Range: 1-6GHz										Measurement Distance: 3 m				
Notes: 802.11b 1Mbps										EUT Max Freq: None				
Antenna Polarization (H/ V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
Low														
H Max	2412.9	64.861		0.0	28.5	3.4	---	---	74.0	---	---	54.0	---	---
V Max	2412.873	65.47		0.0	28.5	3.4	---	---	74.0	---	---	54.0	---	---
V	2390.0	21.591	12.2	0.0	28.4	3.4	53.4	44.0	74.0	-20.6	Pass	54.0	-10.0	Pass
V	2371.534	22.703	10.3	0.0	28.3	3.4	54.4	42.0	74.0	-19.6	Pass	54.0	-12.0	Pass
High														
H Max	2462.866	63.957		0.0	28.5	3.5	---	---	74.0	---	---	54.0	---	---
V Max	2461.117	64.827		0.0	28.5	3.5	---	---	74.0	---	---	54.0	---	---
V	2483.5	20.524	10.6	0.0	28.6	3.5	52.6	42.7	74.0	-21.4	Pass	54.0	-11.3	Pass
V	2486.6	20.02	10.4	0.0	28.6	3.5	52.1	42.5	74.0	-21.9	Pass	54.0	-11.5	Pass
V	2488.342	22.635	10.8	0.0	28.6	3.5	54.7	42.9	74.0	-19.3	Pass	54.0	-11.1	Pass
Table Result: Pass by -10.0 dB Worst Freq: 2390.0 MHz														
Test Site: EMI Chamber 2			Cable 1: Asset #2052			Cable 2: Asset #2053			Cable 3: ---					
Analyzer: Rental SA#3			Preamp: None			Antenna: Orange Horn			Preselector: ---					
CSsoft Radiated Emissions Calculator v 1.017.195														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
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802.11B

Radiated Emissions Table																
Date: 21-Oct-17					Company: Harmon					Work Order: R2501						
Engineer: Aristotelis Casternopoulos					EUT Desc: VG4 FCC High					EUT Operating Voltage/Frequency: 12VDC						
Temp: 26.3					Humidity: 22%					Pressure: 1017						
Frequency Range: 1-6GHz										Measurement Distance: 3 m						
Notes: 802.11g 6Mbps Power reduced to 30										EUT Max Freq: None						
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average				
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)		
High				---	---	---	---	---	---	---	---	---	---	---		
V Max	2468.592	65.649		0.0	28.5	3.5	---	---	74.0	---	---	54.0	---	---		
H Max	2468.5	63.886		---	---	---	---	---	---	---	---	---	---	---		
V	2483.5	33.876	18.1	0.0	28.6	3.5	66.0	50.2	74.0	-8.0	Pass	54.0	-3.8	Pass		
V	2483.6	33.283	18.0	0.0	28.6	3.5	65.4	50.1	74.0	-8.6	Pass	54.0	-3.9	Pass		
V	2484.0	33.88	17.5	0.0	28.6	3.5	66.0	49.6	74.0	-8.0	Pass	54.0	-4.4	Pass		
V	2484.9	31.906	12.4	0.0	28.6	3.5	64.0	44.5	74.0	-10.0	Pass	54.0	-9.5	Pass		
Low				---	---	---	---	---	---	---	---	---	---	---		
V Max	2410.1	61.125		0.0	28.5	3.4	---	---	74.0	---	---	54.0	---	---		
H Max	2418.7	61.622		---	---	---	---	---	---	---	---	---	---	---		
V	2930.0	22.13	11.2	0.0	30.0	3.8	55.9	45.0	74.0	-18.1	Pass	54.0	-9.0	Pass		
V	2389.4	23.174	10.9	0.0	28.4	3.4	55.0	42.7	74.0	-19.0	Pass	54.0	-11.3	Pass		
Table Result:				Pass	by -3.8 dB				Worst Freq:				2483.5 MHz			
Test Site: EMI Chamber 2					Cable 1: Asset #2052					Cable 2: Asset #2053					Cable 3: ---	
Analyzer: Rental SA#3					Preamp: None					Antenna: Orange Horn					Preselector: ---	
CSsoft Radiated Emissions Calculator v 1.017.195																
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor																
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802.11G



**Test Report for Harman International Industries, Incorporated • GEN3.1 HIGH VA • Report No. ER2501-18 •
November 28, 2017**

Radiated Emissions Table																			
Date: 21-Oct-17					Company: Harmon					Work Order: R2501									
Engineer: Aristotelis Casternopoulos					EUT Desc: VG4 FCC High					EUT Operating Voltage/Frequency: 12VDC									
Temp: 26.3					Humidity: 22%					Pressure: 1017									
Frequency Range: 1-6GHz										Measurement Distance: 3 m									
Notes: 802.11n MCS 0										EUT Max Freq: None									
Antenna Polarization (H/ V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average							
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)					
Low				---	---	---	---	---	---	---	---	---	---	---					
H Max	2413.197	65.511		0.0	28.5	3.4	---	---	74.0	---	---	54.0	---	---					
V Max	2418.128	65.294		0.0	28.5	3.4	---	---	74.0	---	---	54.0	---	---					
				---	---	---	---	---	---	---	---	---	---	---					
H	2390.0	25.052	13.6	0.0	28.4	3.4	56.9	45.4	74.0	-17.1	Pass	54.0	-8.6	Pass					
H	2389.27	30.186	13.2	0.0	28.4	3.4	62.0	45.0	74.0	-12.0	Pass	54.0	-9.0	Pass					
H	2388.424	29.117	12.9	0.0	28.4	3.4	60.9	44.7	74.0	-13.1	Pass	54.0	-9.3	Pass					
				---	---	---	---	---	---	---	---	---	---	---					
High				---	---	---	---	---	---	---	---	---	---	---					
H Max	2463.743	63.36		0.0	28.5	3.5	---	---	74.0	---	---	54.0	---	---					
V Max	2456.179	65.09		0.0	28.5	3.5	---	---	74.0	---	---	54.0	---	---					
				---	---	---	---	---	---	---	---	---	---	---					
V	2483.5	29.553	15.7	0.0	28.6	3.5	61.7	47.8	74.0	-12.3	Pass	54.0	-6.2	Pass					
V	2483.833	32.411	15.3	0.0	28.6	3.5	64.5	47.4	74.0	-9.5	Pass	54.0	-6.6	Pass					
V	2485.741	29.696	13.5	0.0	28.6	3.5	61.8	45.6	74.0	-12.2	Pass	54.0	-8.4	Pass					
V	2486.615	28.939	12.8	0.0	28.6	3.5	61.0	44.9	74.0	-13.0	Pass	54.0	-9.1	Pass					
Table Result: Pass by -6.2 dB Worst Freq: 2483.5 MHz																			
Test Site: EMI Chamber 2					Cable 1: Asset #2052					Cable 2: Asset #2053					Cable 3: ---				
Analyzer: Rental SA#3					Preamp: None					Antenna: Orange Horn					Preselector: ---				
CSsoft Radiated Emissions Calculator v 1.017.195																			
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor																			
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802.11N

Rev. 11/9/2017											
Spectrum Analyzers / Receivers/Preselectors				Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold				100Hz-26.5 GHz	E 4407B	Agilent	MY45113816	1284	I	2/28/2018	2/28/2017
Rental MXE EMI Receiver(1170725)				20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
Radiated Emissions Sites				FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 1				719150	2762A-6	A-0015	30-1000MHz	1685	I	12/21/2018	12/21/2016
EMI Chamber 1				719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018	12/21/2016
Mixers/Duplexers				Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Mixer / Horn				26.5-40 GHz	11970A	Agilent	3003A10230	2154	I	3/12/2019	3/12/2016
Preamps/Couplers Attenuators / Filters				Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2310 PA				1-1000MHz	PAM-103	COM-POWER	441175	2310	II	10/29/2018	10/29/2017
2111 HF Preamp				0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	10/29/2018	10/29/2017
HF (Yellow)				18-26.5GHz	AFS 4-18002650-60-8P-4	CS	467559	1266	II	10/16/2018	10/16/2017
Antennas				Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-Brown Bilog				30-2000M Hz	JB1	Sunol	A0032406	1218	I	1/13/2019	1/13/2017
Orange Horn				1-18GHz	3115	EMCO	0004-6123	390	I	10/13/2018	10/13/2016
HF (White) Horn				18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
Meteorological Meters/Chambers				MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Weather Clock (Pressure Only)				BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016	
TH A#2084				HTC-1	HDE		2084	II	3/23/2018	3/23/2017	
Cables				Range	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Asset #1509				9kHz - 18GHz	Florida RF			II	10/2/2018	10/2/2017	
Asset #1522				9kHz - 18GHz	Florida RF			II	2/11/2018	2/11/2017	
Asset #2456				9KHz-18GHz	MegaPhase			II	10/29/2018	10/29/2017	
Asset #2457				9KHz-18GHz	MegaPhase			II	10/29/2018	10/29/2017	
Asset #2466				9KHz-18GHz	MegaPhase			II	10/29/2018	10/29/2017	
Asset #2323				1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 002	2323	II	8/19/2018	8/19/2017
Asset #2324				1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 001	2324	II	8/19/2018	8/19/2017

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

TEU 30MHz to 26.5GHz



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



AC Line Conducted Emissions

LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dB μ V)	Average limit (dB μ V)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

MEASUREMENTS / RESULTS

N/A. EUT is vehicle battery powered only.

Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz)		
NIST	5.6dB	N/A
CISPR	4.6dB	5.2dB (Ucisp)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions		
NIST	3.9dB	N/A
CISPR	3.6dB	3.6dB (Ucisp)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		



Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.

2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.

3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.

4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.

5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS," "MTL," "ACTS," "MTL-ACTS" and CURTIS-STRAUS (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.

6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.

7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.

8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.

9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.

10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.

11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.

12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.

13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.



15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.
Rev.160009121(2)_#684340 v14CS



Appendix A:

ER2501-18 Appendix A CFR Title 47 FCC Part §15.247 and ISCED Canada RSS-247 Issue 2

DUT Information

Model: GEN3.1 HIGH VA
Manufacturer: Harman International Industries, Inc.
Serial Number: 074

Mode	Channel	Frequency
802.11b/g/n(HT20)	1	2412 MHz
802.11b/g/n(HT20)	2	2417 MHz
802.11b/g/n(HT20)	3	2422 MHz
802.11b/g/n(HT20)	4	2427 MHz
802.11b/g/n(HT20)	5	2432 MHz
802.11b/g/n(HT20)	6	2437 MHz
802.11b/g/n(HT20)	7	2442 MHz
802.11b/g/n(HT20)	8	2447 MHz
802.11b/g/n(HT20)	9	2452 MHz
802.11b/g/n(HT20)	10	2457 MHz
802.11b/g/n(HT20)	11	2462 MHz

Antenna Gain:

Frequency	Efficiency [%]	Peak Gain [dBi]	Efficiency [dB]
2400	28.4533	0.0733687	-5.458673571
2402	29.438	0.2508994	-5.31091699
2405	29.3776	0.220957	-5.319836867
2410	30.3714	0.33533	-5.175351884
2415	31.1824	0.426418	-5.060904617
2420	32.0601	0.474909	-4.940351274
2425	33.1718	0.585229	-4.792309617
2430	34.2808	0.702777	-4.649490516
2435	35.0979	0.721518	-4.547188677
2440	35.8381	0.701526	-4.45655023
2441	36.5783	0.681534	-4.367764825
2445	36.3931	0.635128	-4.389809492
2450	36.2933	0.511544	-4.401735414
2455	36.226	0.422265	-4.409796172

2460	36.4253	0.404181	-4.385968627
2462	36.6246	0.386097	-4.362271098
2465	36.1577	0.35627	-4.417992029
2470	35.7852	0.292361	-4.462965512
2475	36.1898	0.37715	-4.41413817
2480	36.6349	0.572204	-4.361049896
2485	36.5849	0.785245	-4.366981277
2490	36.7043	0.969106	-4.352830541
2495	37.4741	1.1403	-4.262687886
2500	37.5863	1.27655	-4.249704242

Number of transmission chains 1
Equipment Type Digital Transmission System (DTS)

Test Equipment Used:

Rev. 11/9/2017									
Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
FSV40 Signal/Spectrum Analyzer	10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	6/30/2018	6/30/2017	
Signal Generators/Comparaison Noise Emitter	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
SMBV100A Vector Signal Generator	9KHz-6GHz	SMBV100A	ROHDE & SCHWARZ	261919	2201	I	6/26/2018	6/26/2017	
SMB100A Signal Generator	100kHz-40GHz	SMB100A	ROHDE & SCHWARZ	179846	2434	I	5/30/2018	5/30/2017	
Power/Noise Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
OSP - open switch and control platform	30MHz-18GHz	OSP120	ROHDE & SCHWARZ	101674		I	6/1/2018	6/1/2017	
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on	
DUT1	30MHz-26GHz		Micro-Coax			II	6/21/2018	6/21/2017	
DUT2	30MHz-26GHz		Micro-Coax			II	6/22/2018	6/22/2017	
DUT3	30MHz-26GHz		Micro-Coax			II	6/23/2018	6/23/2017	
DUT4	30MHz-26GHz		Micro-Coax			II	6/24/2018	6/24/2017	
Attenuators / Couplers	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
10dB Attenuator-01 Brown	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017	
10dB Attenuator-02 Yellow	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017	
10dB Attenuator-03 Red	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017	
10dB Attenuator-04 orange	30MHz-26GHz		Mini Curcuits			II	7/13/2018	7/14/2017	
API - 30dB 20W Attenuator	9KHz-40GHz	89-30-11	API Weinschel	703	2121	I	3/22/2018	3/22/2017	
Directional Coupler	0.5GHz-18GHz	UDC	AA MCS	001040		II	8/11/2018	8/11/2017	
Communication Tester	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
CMW500 Wideband Radio Communication Tester	DC to 6GHz	CMW500	ROHDE & SCHWARZ	155905		I	6/2/2018	6/2/2017	
Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Temp/Humidity Chamber #18		EPX-2H	Espec	137664	1645	I	4/21/2018	4/21/2017	

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



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Test Results Summary

Test	Frequency (MHz)	802.11b	802.11g	802.11n (HT20)
Average Output Power	2412.000	PASS	PASS	PASS
Peak Power Spectral Density	2412.000	PASS	PASS	PASS
DTS Bandwidth (6dB)	2412.000	PASS	PASS	PASS
Conducted Band Edges	2412.000	PASS	PASS	PASS
Conducted Spurious Emissions	2412.000	PASS	PASS	PASS
Average Output Power	2437.000	PASS	PASS	PASS
Peak Power Spectral Density	2437.000	PASS	PASS	PASS
DTS Bandwidth (6dB)	2437.000	PASS	PASS	PASS
Conducted Band Edges	2437.000	PASS	PASS	PASS
Conducted Spurious Emissions	2437.000	PASS	PASS	PASS
Average Output Power	2462.000	PASS	PASS	PASS
Peak Power Spectral Density	2462.000	PASS	PASS	PASS
DTS Bandwidth (6dB)	2462.000	PASS	PASS	PASS
Conducted Band Edges	2462.000	PASS	PASS	PASS
Conducted Spurious Emissions	2462.000	PASS	PASS	PASS



Average Output Power (Gated)

Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 9.2.3.2.

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.
Expanded Combined Uncertainty of absolute Level Measurement (K=2) < 1 dB

802.11b (Power Setting: Default)

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)
1 Mbps	16.886	16.382	15.748	30	98.906
2 Mbps	16.822	16.714	15.692	30	97.838
5.5 Mbps	16.971	16.43	15.796	30	94.510
11 Mbps	17.109	16.735	15.983	30	90.099

802.11g (Power Setting: 30)

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)
6 Mbps	11.526	11.509	12.072	30	93.333
9 Mbps	11.664	11.613	12.116	30	90.333
12 Mbps	11.708	11.557	12.144	30	87.649
18 Mbps	11.725	11.588	12.18	30	82.774
24 Mbps	11.807	11.633	12.168	30	78.484
36 Mbps	11.872	11.642	12.322	30	71.537
48 Mbps	12.017	11.883	12.45	30	65.621
54 Mbps	11.929	11.891	12.488	30	63.742

802.11n(HT20) (Power Setting: Default)

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	13.943	13.828	13.398	30	92.891
MCS1	13.906	13.615	13.524	30	87.039
MCS2	14.007	13.649	13.524	30	82.156
MCS3	13.998	13.695	13.524	30	78.101
MCS4	12.725	12.373	12.164	30	71.428
MCS5	12.795	12.479	12.149	30	66.214
MCS6	12.608	12.499	12.231	30	64.217
MCS7	12.713	12.526	12.274	30	62.091

Peak Power Spectral Density

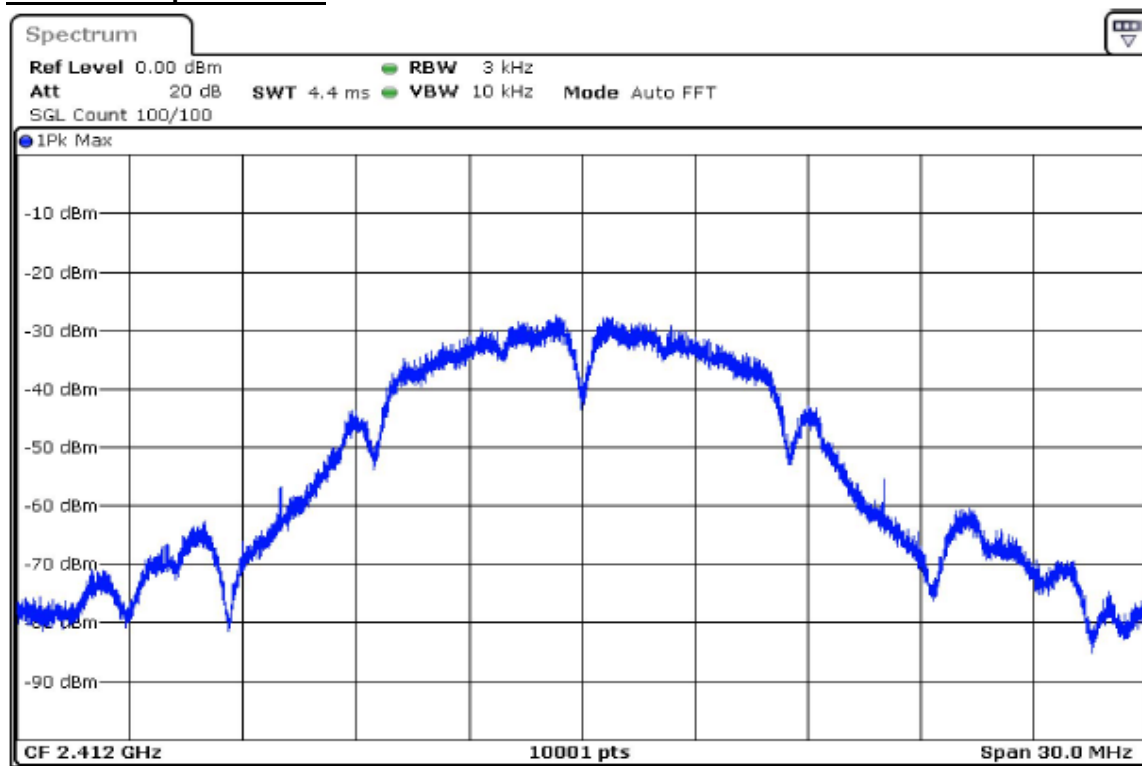
Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 10.2

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.3 dB

802.11b (Power Setting: Default)

Data Rate	Peak PSD (dBm) 2412 MHz	Peak PSD (dBm) 2437 MHz	Peak PSD (dBm) 2462 MHz	Limit (dBm)
1 Mbps	-5.845	-6.207	-5.979	8
2 Mbps	-5.316	-5.987	-6.318	8
5.5 Mbps	-6.014	-5.709	-6.343	8
11 Mbps	-5.873	-6.353	-6.820	8

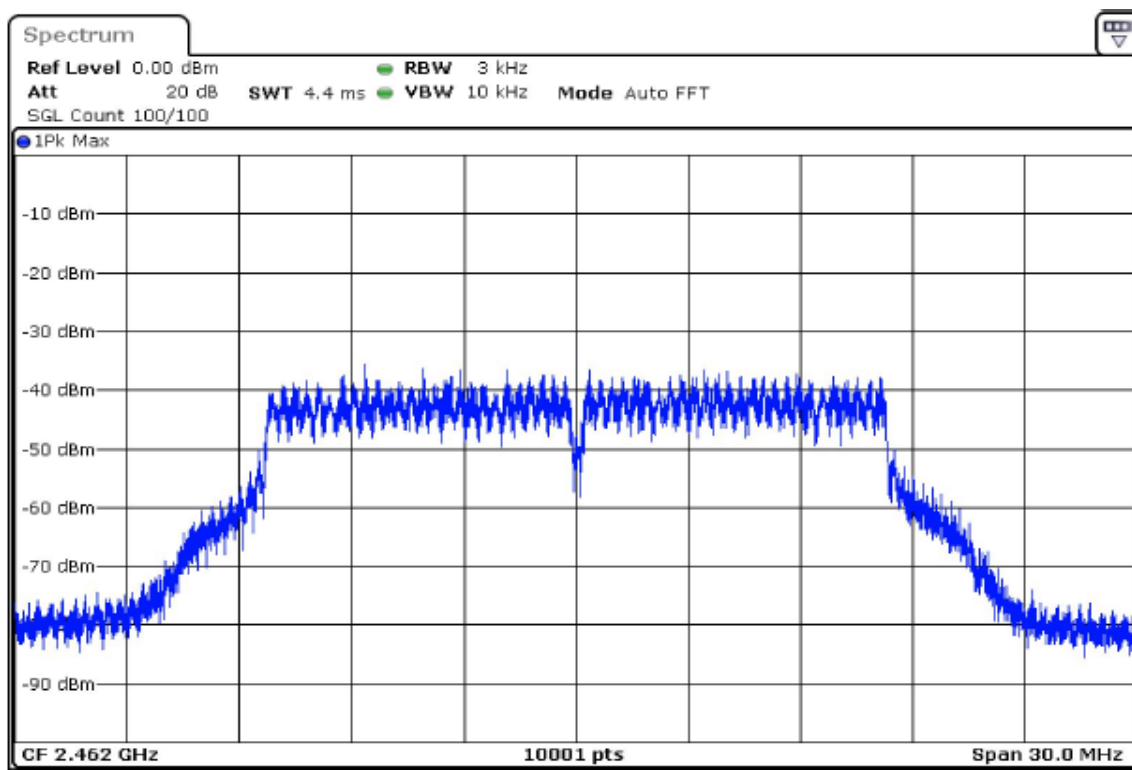
802.11b 2 Mbps 2412MHz



802.11g (Power Setting: 30)

Data Rate	Peak PSD (dBm) 2412 MHz	Peak PSD (dBm) 2437 MHz	Peak PSD (dBm) 2462 MHz	Limit (dBm)
6 Mbps	-14.301	-14.206	-13.812	8
9 Mbps	-15.225	-15.178	-14.466	8
12 Mbps	-14.197	-14.282	-13.844	8
18 Mbps	-15.175	-15.126	-14.403	8
24 Mbps	-14.518	-14.629	-14.027	8
36 Mbps	-15.365	-15.658	-15.658	8
48 Mbps	-16.101	-16.138	-15.629	8
54 Mbps	-17.039	-17.026	-16.312	8

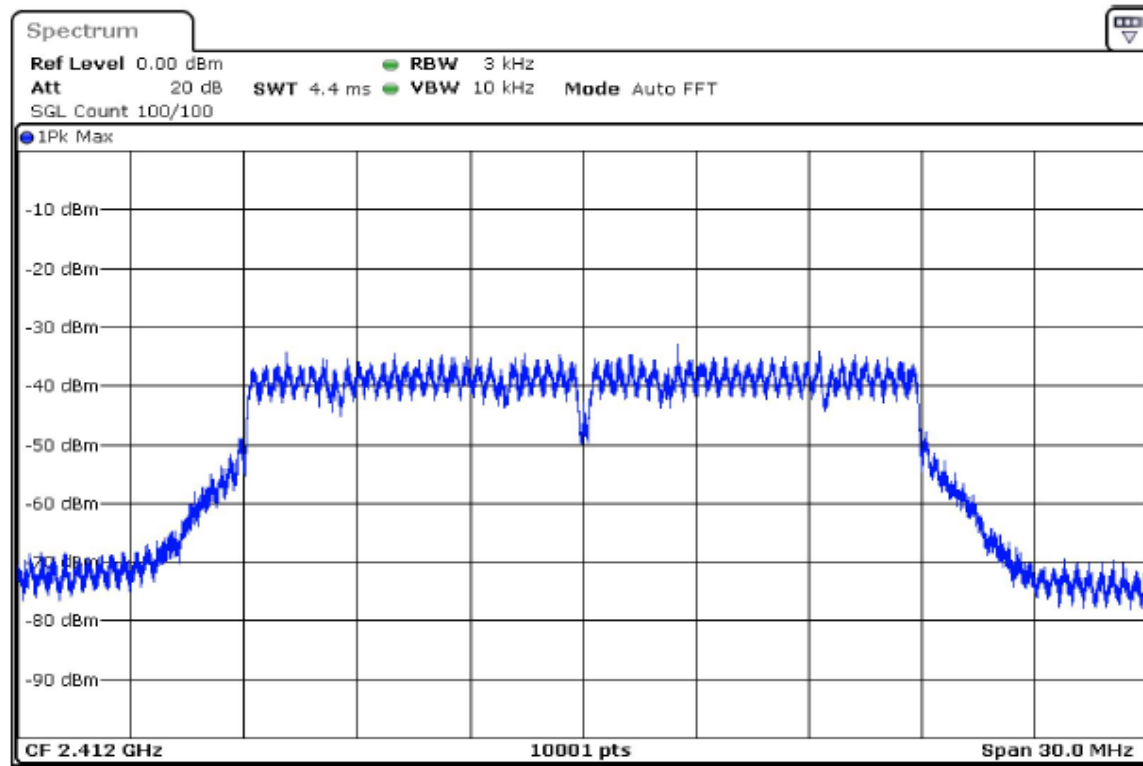
802.11g 6 Mbps 2462MHz



802.11n(HT20) (Power Setting: Default)

Data Rate	Peak PSD (dBm) 2412 MHz	Peak PSD (dBm) 2437 MHz	Peak PSD (dBm) 2462 MHz	Limit (dBm)
MCS0	-10.943	-12.313	-12.083	8
MCS1	-11.752	-12.062	-12.395	8
MCS2	-11.761	-12.680	-11.862	8
MCS3	-11.570	-12.267	-12.267	8
MCS4	-13.740	-13.299	-13.497	8
MCS5	-13.563	-14.376	-14.204	8
MCS6	-13.147	-13.633	-14.177	8
MCS7	-13.410	-13.572	-13.571	8

802.11n(HT20) MCS0 2412MHz



DTS Bandwidth (6dB)

Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 8.1

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Minimum Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11b 11 Mbps	2412.000	8.179552	0.5	2407.910224	2416.089776
802.11g 54 Mbps	2412.000	16.558604	0.5	2403.720698	2420.279302
802.11n(HT20) MCS2	2412.000	17.855361	0.5	2403.022444	2420.877805
802.11b 11 Mbps	2437.000	7.980050	0.5	2432.910224	2440.890274
802.11g 54 Mbps	2437.000	16.558604	0.5	2428.720698	2445.279302
802.11n(HT20) MCS2	2437.000	17.855361	0.5	2428.022444	2445.877805
802.11b 11 Mbps	2462.000	7.980050	0.5	2457.910224	2465.890274
802.11g 54 Mbps	2462.000	16.558604	0.5	2453.720698	2470.279302
802.11n(HT20) MCS2	2462.000	17.855361	0.5	2453.022444	2470.877805



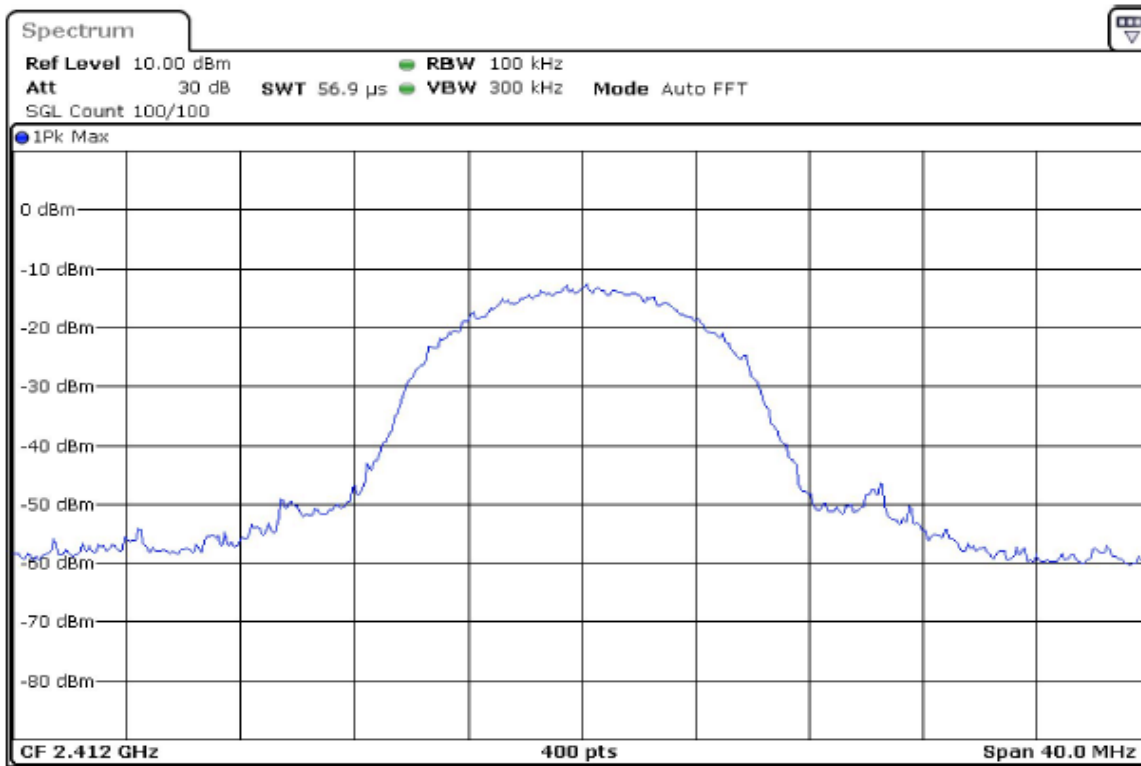
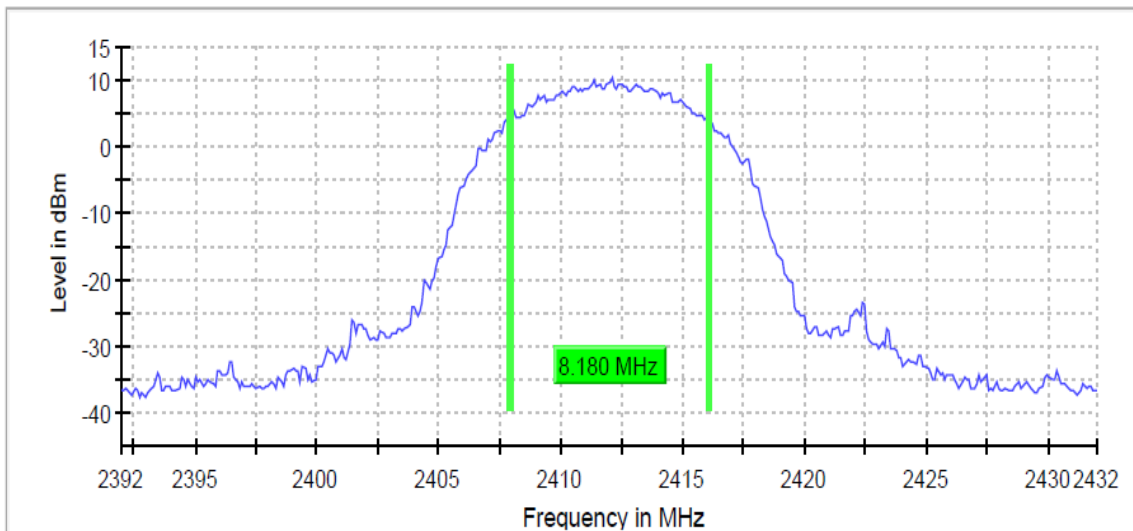
BUREAU
VERITAS

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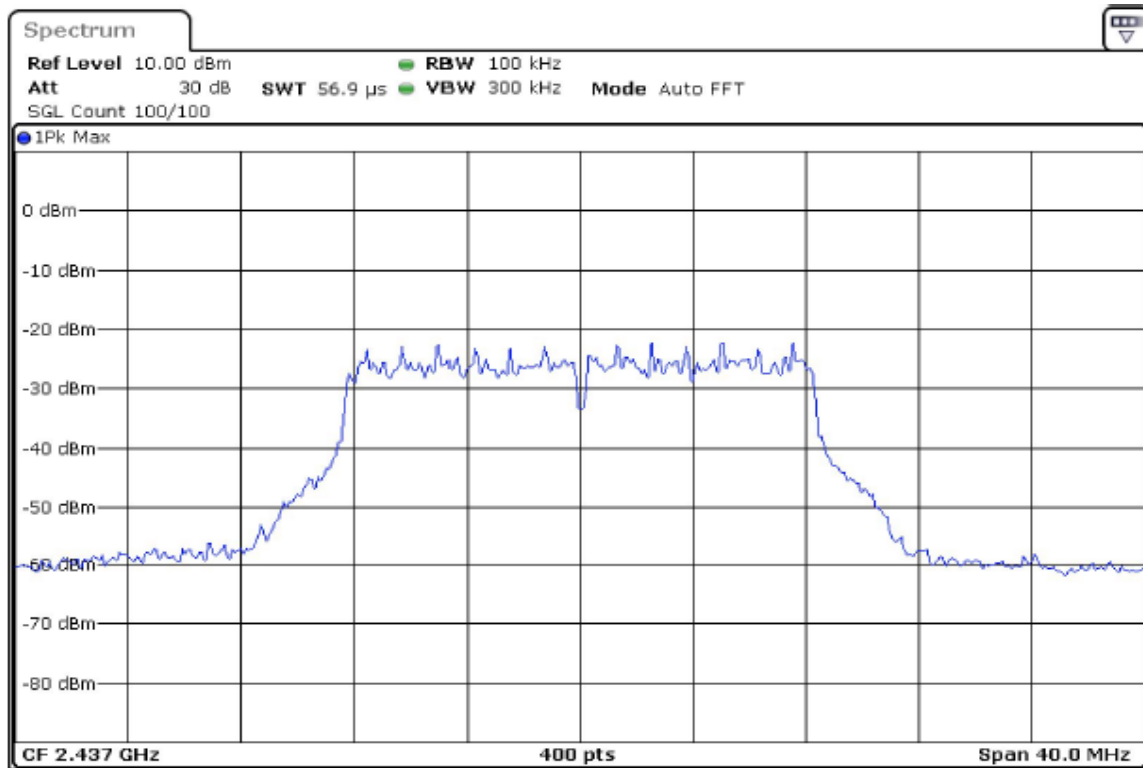
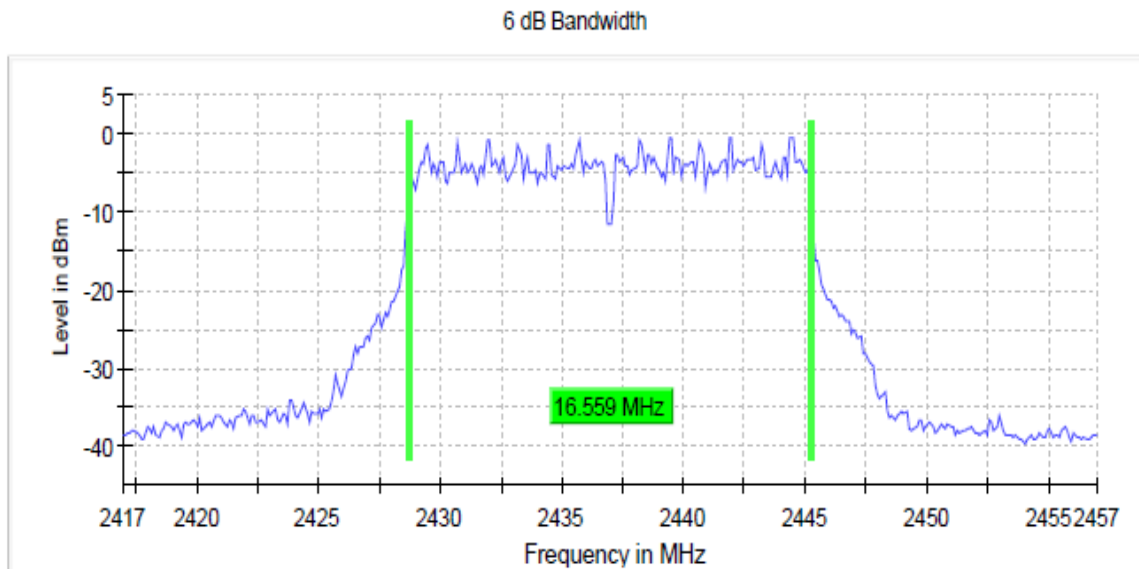


802.11b 11Mbps 2412MHz

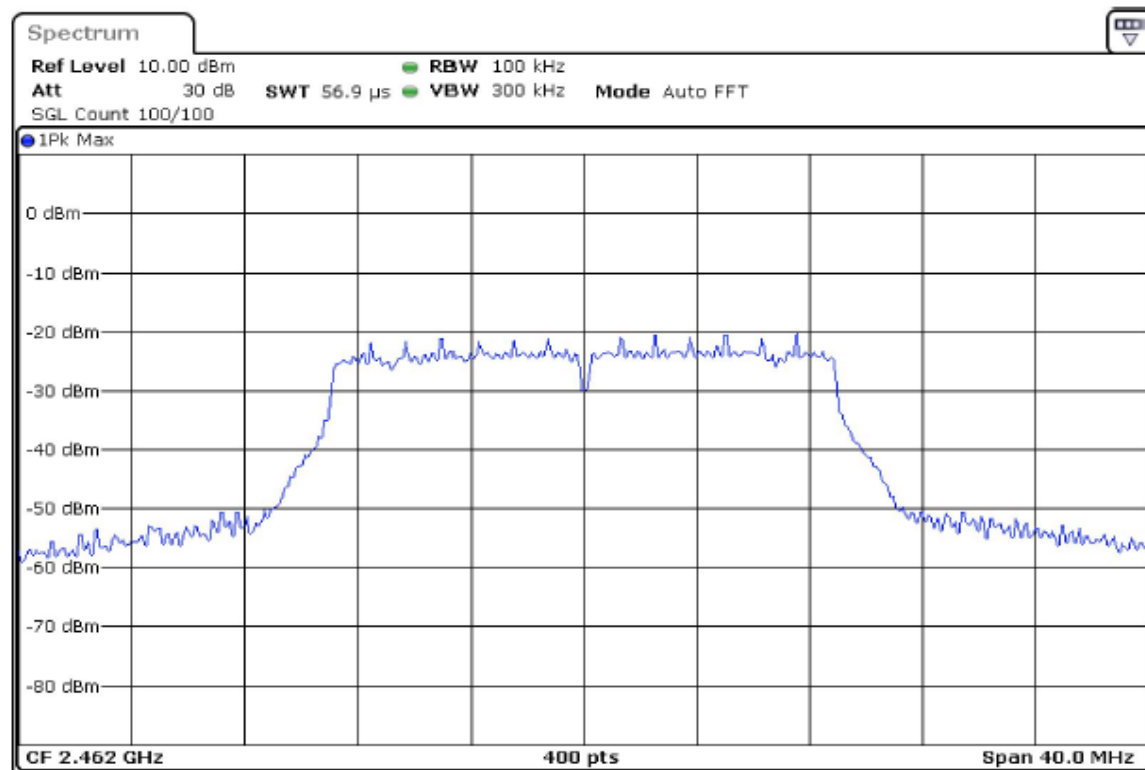
6 dB Bandwidth



802.11g 54 Mbps 2437MHz



802.11n(HT20) MCS2 2462MHz



Conducted Band Edge

Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 11.

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

802.11b 11Mbps 2412MHz

Band Edge Low

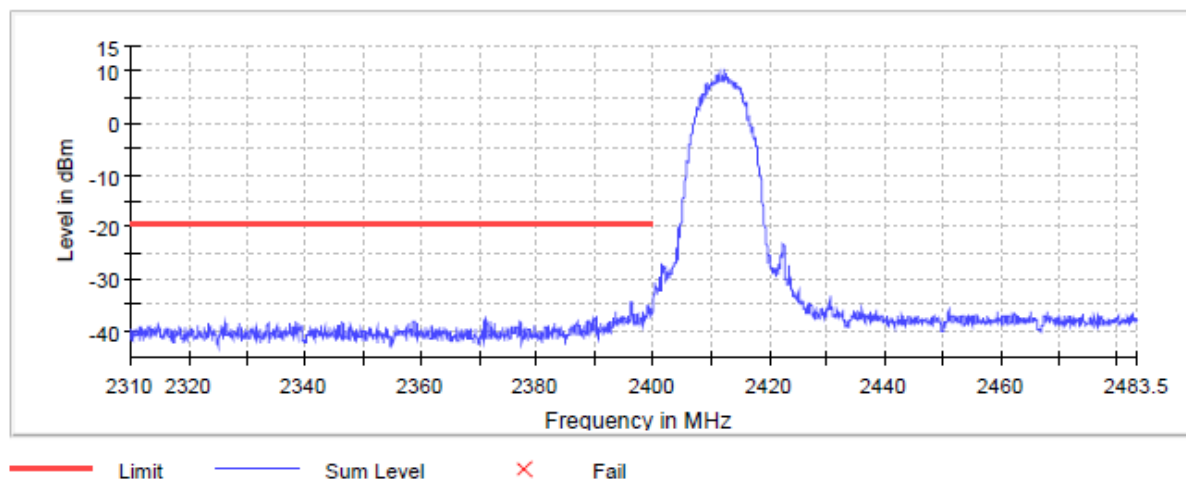
Inband Peak

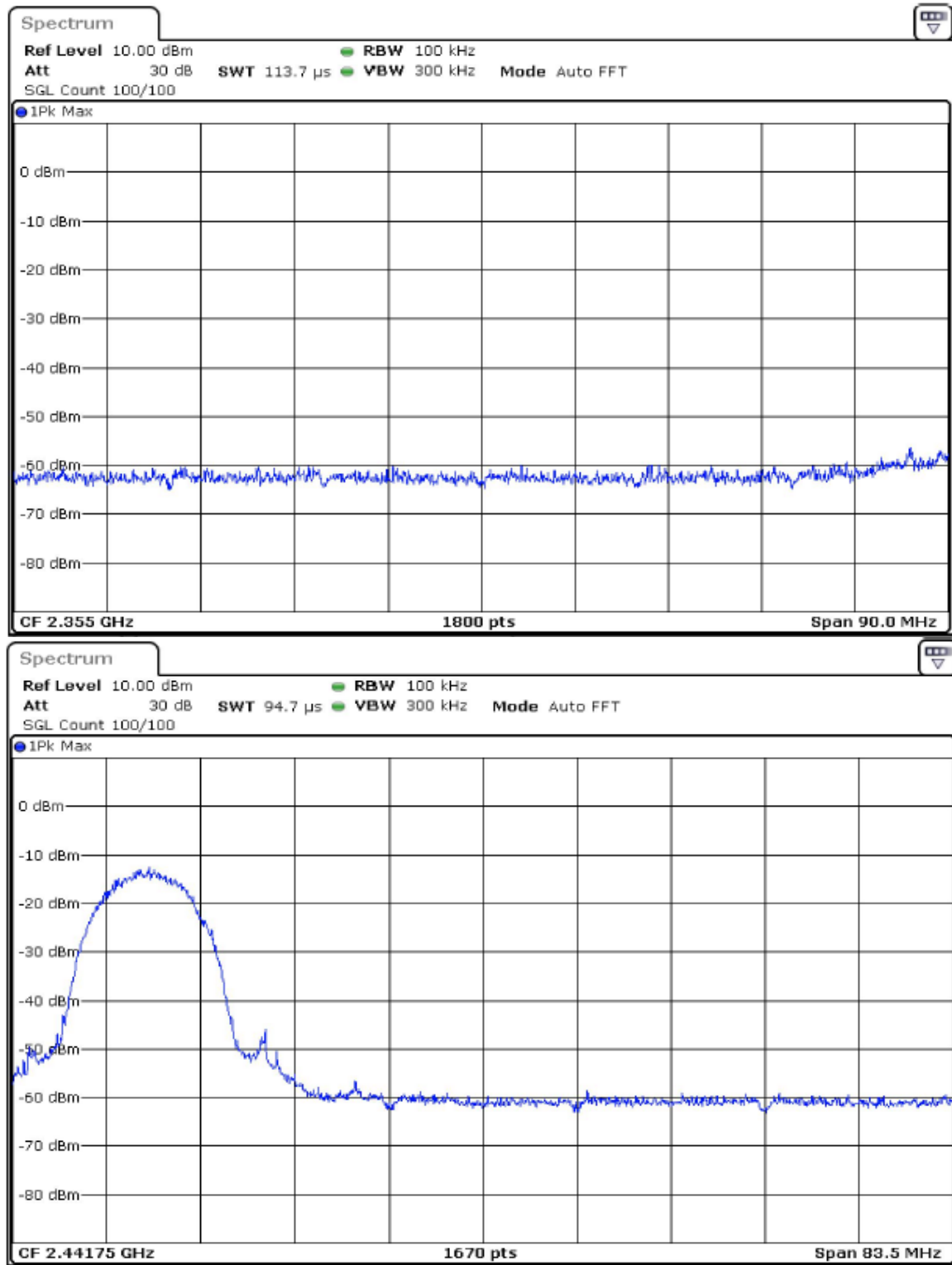
Frequency (MHz)	Level (dBm)
2412.117744	10.3

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2396.227096	-34.4	14.7	-19.7	PASS
2396.177124	-34.7	15.0	-19.7	PASS
2396.277068	-35.2	15.5	-19.7	PASS
2399.075514	-35.2	15.5	-19.7	PASS
2396.476957	-35.3	15.7	-19.7	PASS
2399.125486	-35.3	15.7	-19.7	PASS
2399.225430	-35.4	15.8	-19.7	PASS
2396.127152	-35.5	15.8	-19.7	PASS
2398.975569	-35.5	15.9	-19.7	PASS
2396.377013	-35.8	16.1	-19.7	PASS
2399.575236	-35.8	16.1	-19.7	PASS
2396.426985	-35.8	16.1	-19.7	PASS
2395.977235	-35.8	16.2	-19.7	PASS
2398.925597	-35.9	16.2	-19.7	PASS
2399.275403	-35.9	16.2	-19.7	PASS

Band Edge





802.11b 11Mbps 2462MHz

Band Edge High

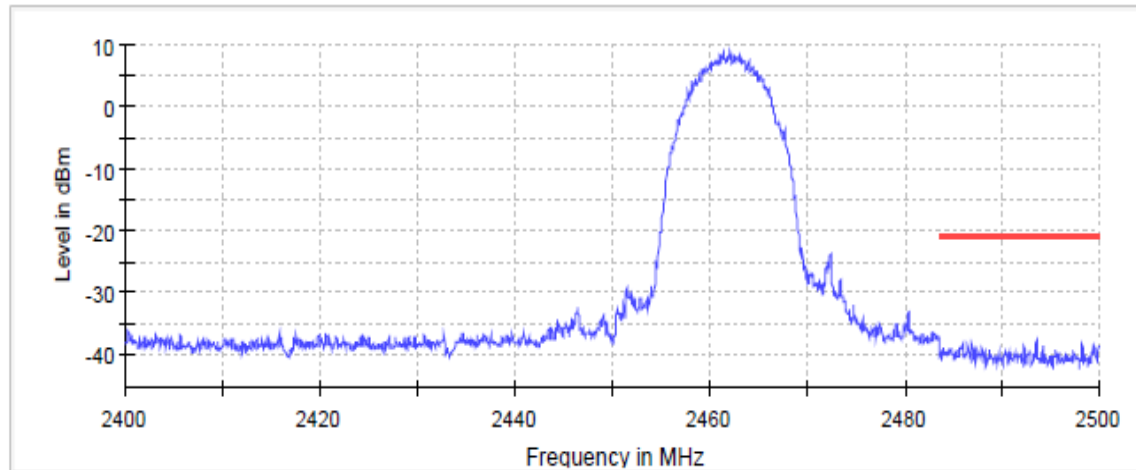
Inband Peak

Frequency (MHz)	Level (dBm)
2462.087822	9.1

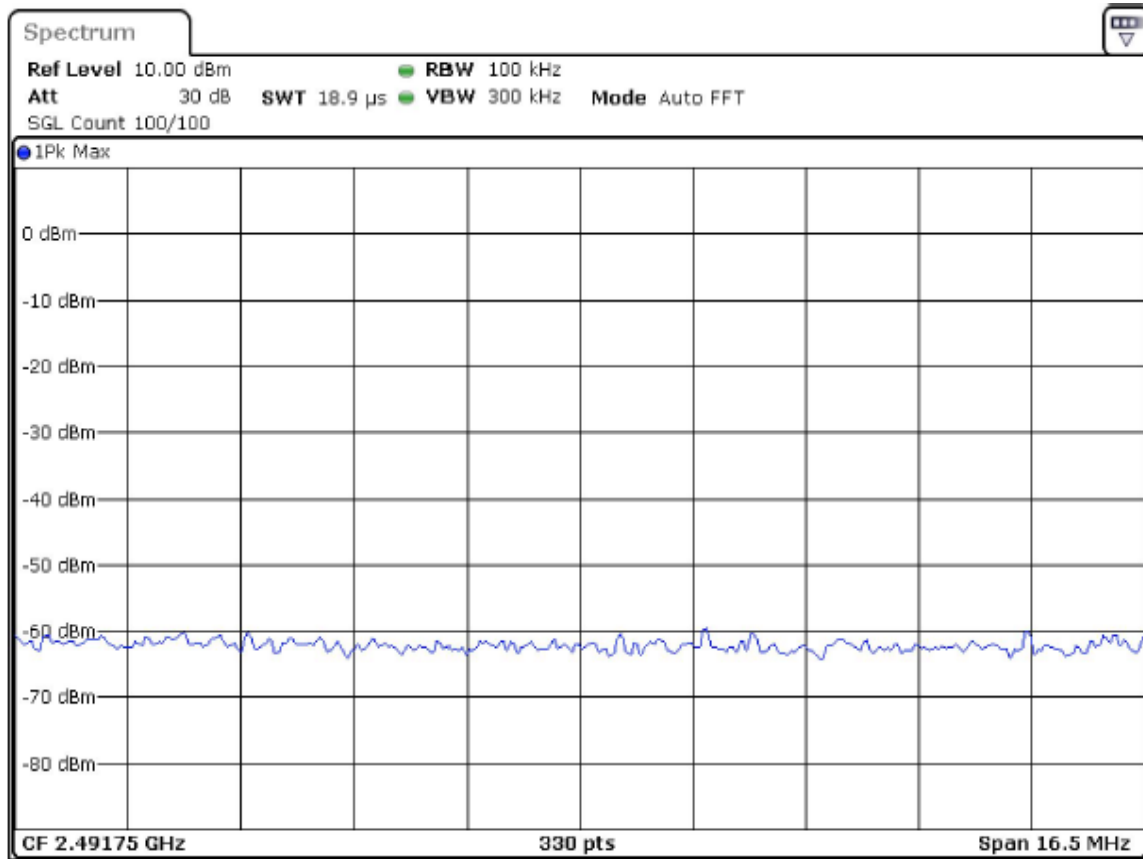
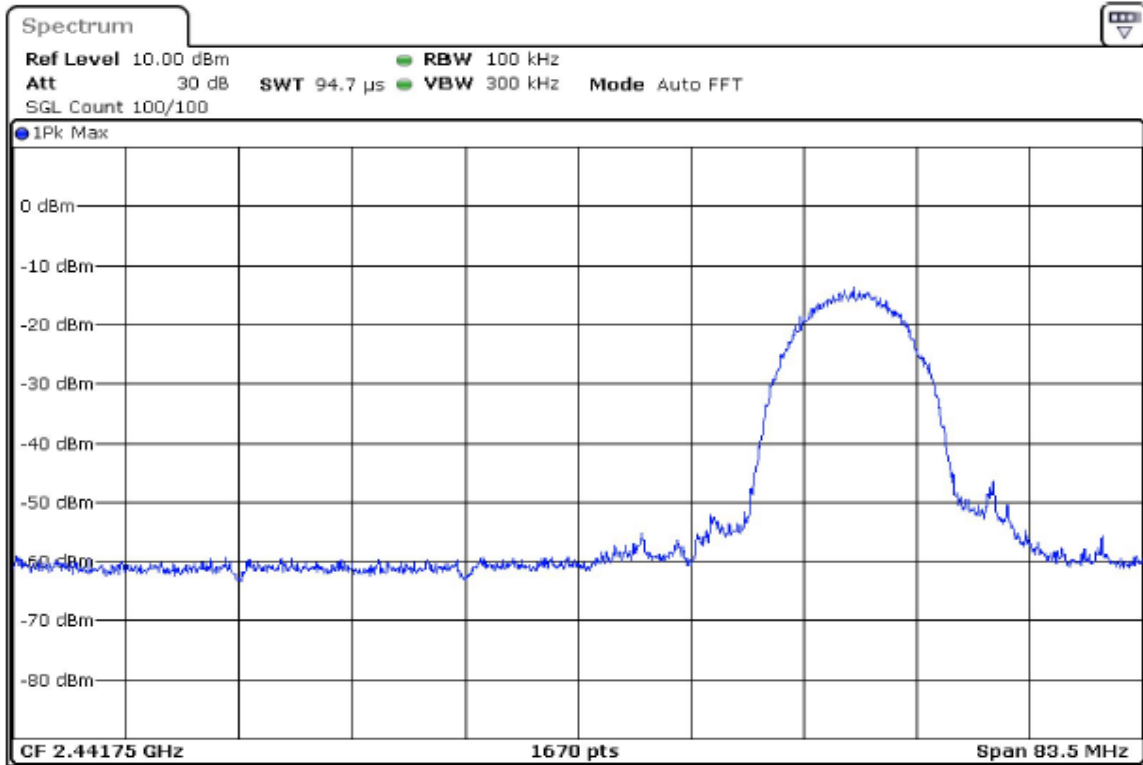
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2493.544562	-37.6	16.7	-20.9	PASS
2498.230363	-38.0	17.1	-20.9	PASS
2493.494713	-38.1	17.2	-20.9	PASS
2486.914653	-38.2	17.3	-20.9	PASS
2485.967523	-38.3	17.4	-20.9	PASS
2498.180514	-38.3	17.4	-20.9	PASS
2494.242447	-38.4	17.5	-20.9	PASS
2500.000000	-38.4	17.5	-20.9	PASS
2499.925227	-38.4	17.5	-20.9	PASS
2492.298338	-38.5	17.6	-20.9	PASS
2494.192598	-38.6	17.7	-20.9	PASS
2499.476586	-38.6	17.7	-20.9	PASS
2486.515861	-38.6	17.7	-20.9	PASS
2493.594411	-38.6	17.7	-20.9	PASS
2499.327039	-38.7	17.8	-20.9	PASS

Band Edge



— Limit — Sum Level × Fail



802.11g 54 Mbps 2412MHz

Band Edge Low

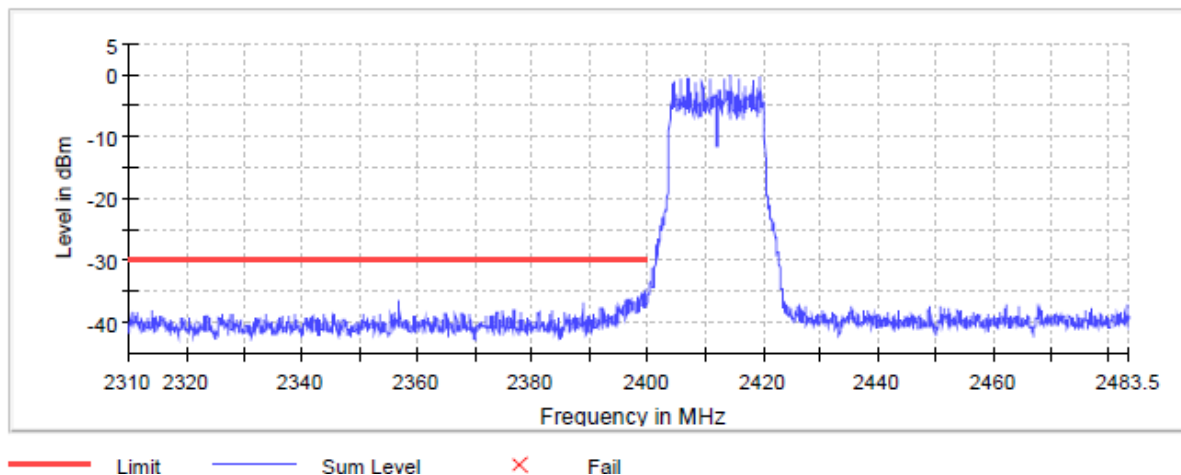
Inband Peak

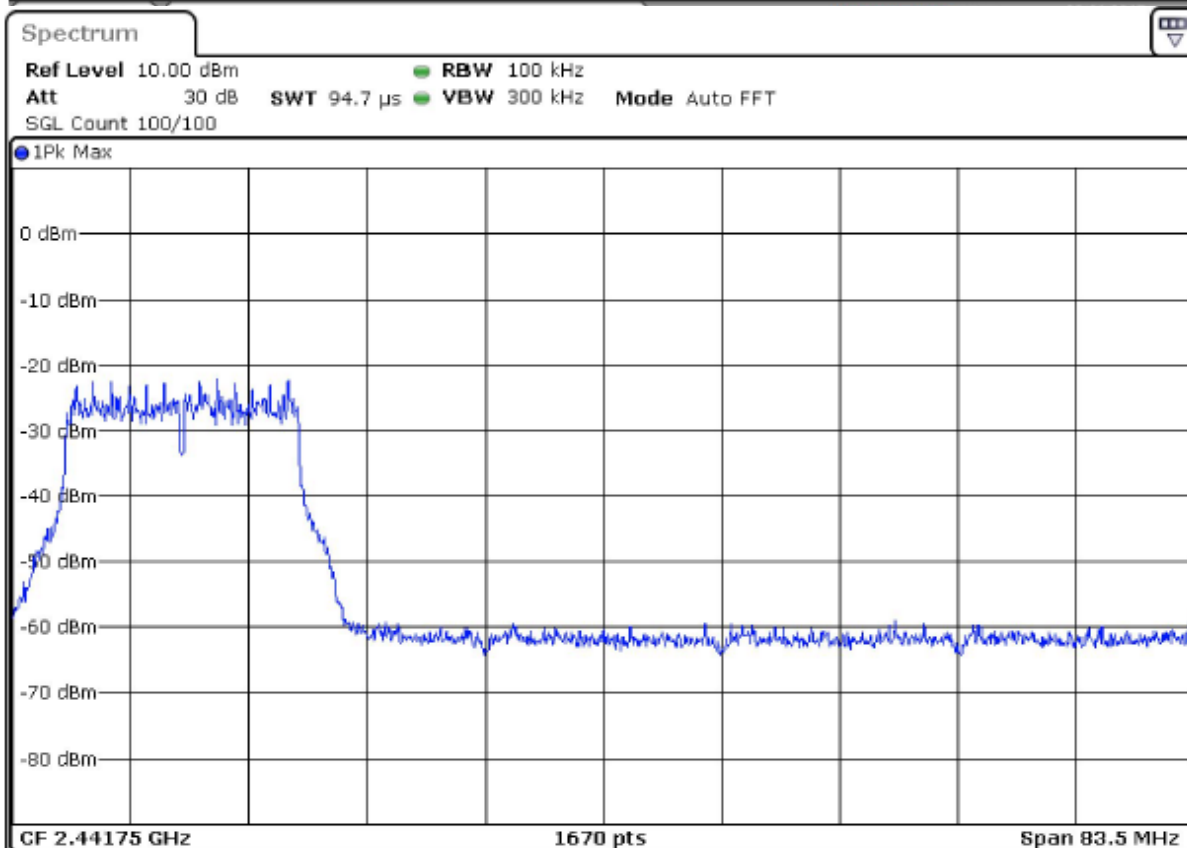
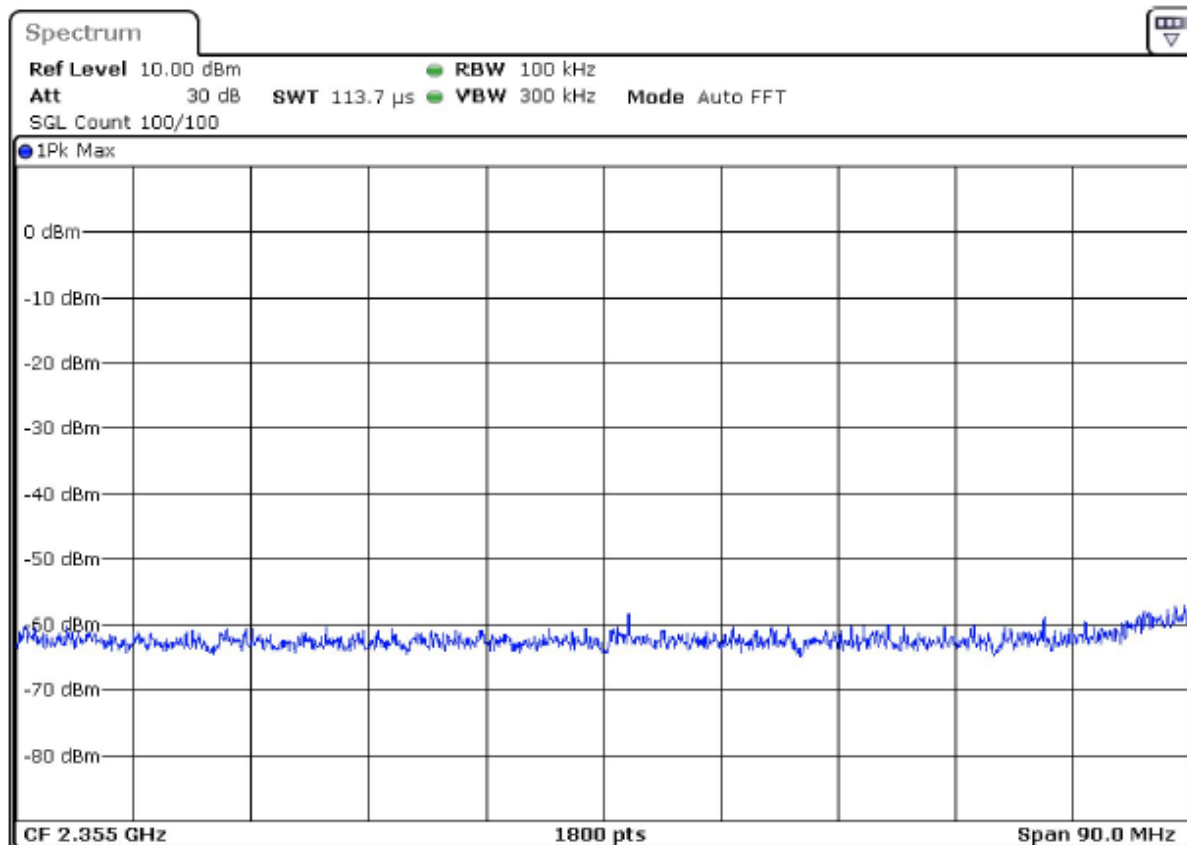
Frequency (MHz)	Level (dBm)
2414.516308	-0.1

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.475292	-35.1	5.0	-30.1	PASS
2398.825652	-35.4	5.3	-30.1	PASS
2399.425319	-35.5	5.5	-30.1	PASS
2399.525264	-35.7	5.6	-30.1	PASS
2398.775680	-35.7	5.6	-30.1	PASS
2398.225986	-35.8	5.7	-30.1	PASS
2399.575236	-35.8	5.7	-30.1	PASS
2398.875625	-35.9	5.8	-30.1	PASS
2399.625208	-35.9	5.8	-30.1	PASS
2396.426985	-36.1	6.0	-30.1	PASS
2396.377013	-36.2	6.1	-30.1	PASS
2398.176013	-36.2	6.1	-30.1	PASS
2396.726818	-36.3	6.2	-30.1	PASS
2396.676846	-36.4	6.3	-30.1	PASS
2399.375347	-36.4	6.3	-30.1	PASS

Band Edge





802.11g 54 Mbps 2462MHz

Band Edge High

Inband Peak

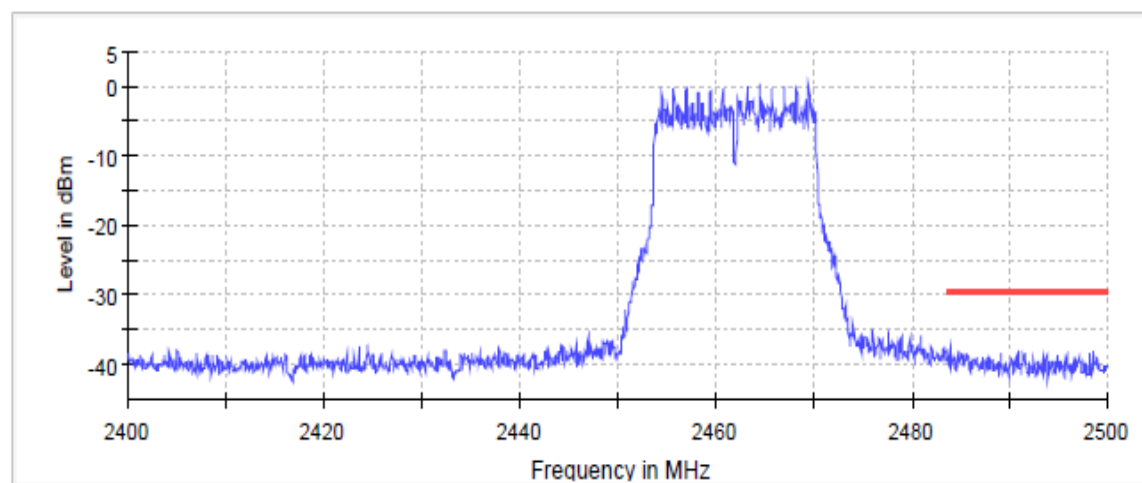
Inband Peak

Frequency (MHz)	Level (dBm)
2469.483393	0.4

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.923716	-37.5	7.9	-29.6	PASS
2483.973565	-37.6	8.0	-29.6	PASS
2490.902568	-38.0	8.4	-29.6	PASS
2483.524924	-38.1	8.5	-29.6	PASS
2498.579305	-38.1	8.5	-29.6	PASS
2490.952417	-38.2	8.6	-29.6	PASS
2484.771148	-38.2	8.6	-29.6	PASS
2498.529456	-38.2	8.6	-29.6	PASS
2484.721299	-38.3	8.7	-29.6	PASS
2489.108006	-38.3	8.7	-29.6	PASS
2489.157855	-38.4	8.8	-29.6	PASS
2498.230363	-38.5	8.9	-29.6	PASS
2491.600453	-38.6	9.0	-29.6	PASS
2485.020393	-38.6	9.0	-29.6	PASS
2493.743958	-38.6	9.0	-29.6	PASS

Band Edge

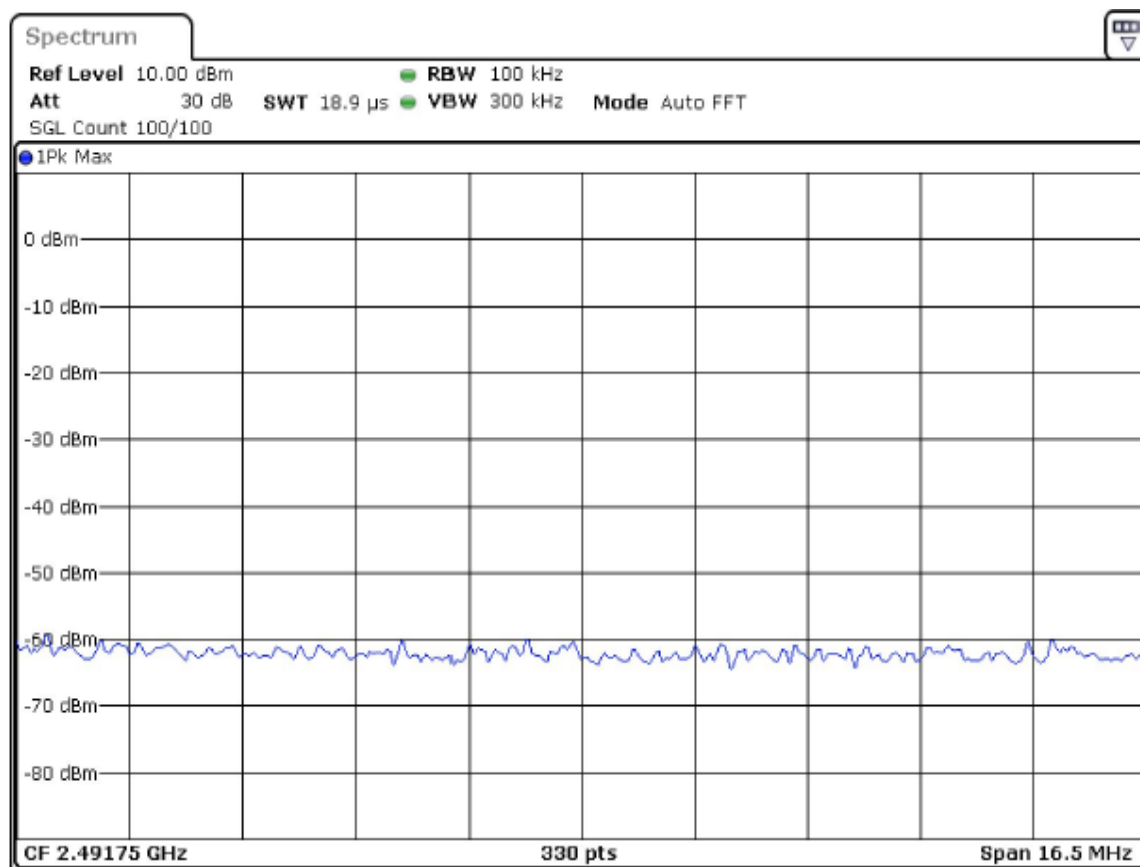
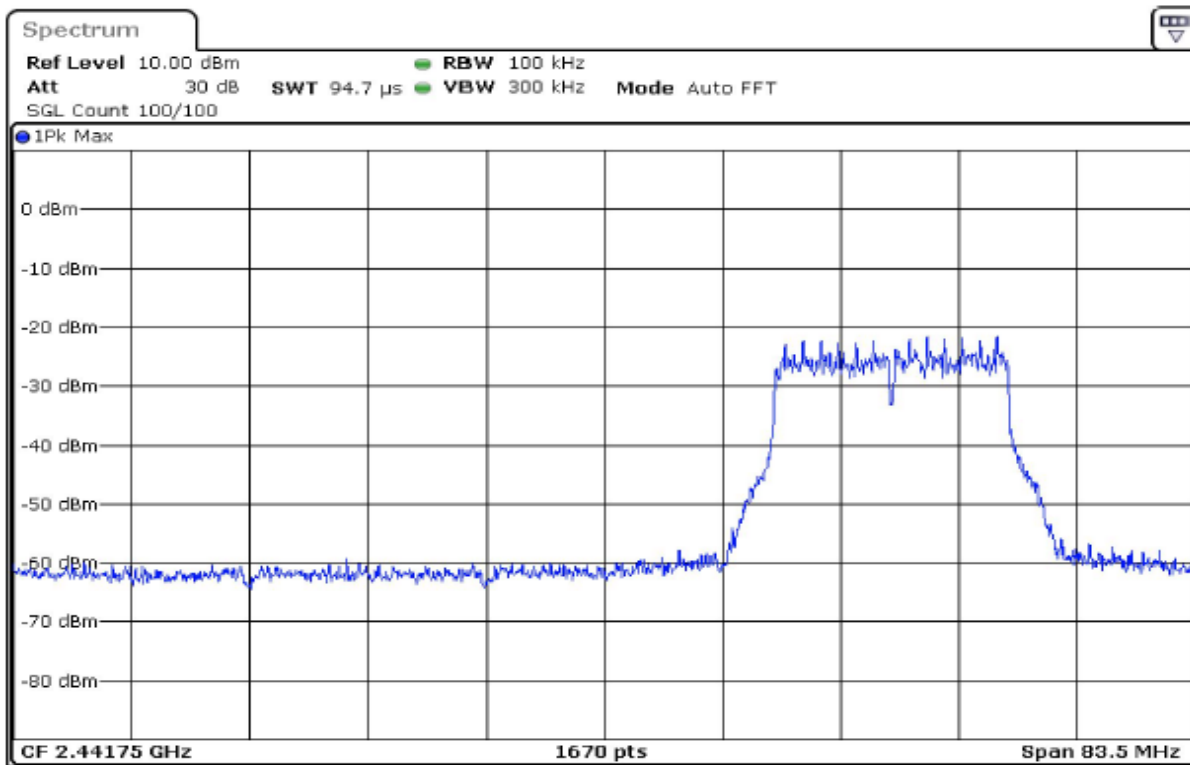


— Limit — Sum Level × Fail



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802.11n(HT20) MCS2 2412MHz

Band Edge Low

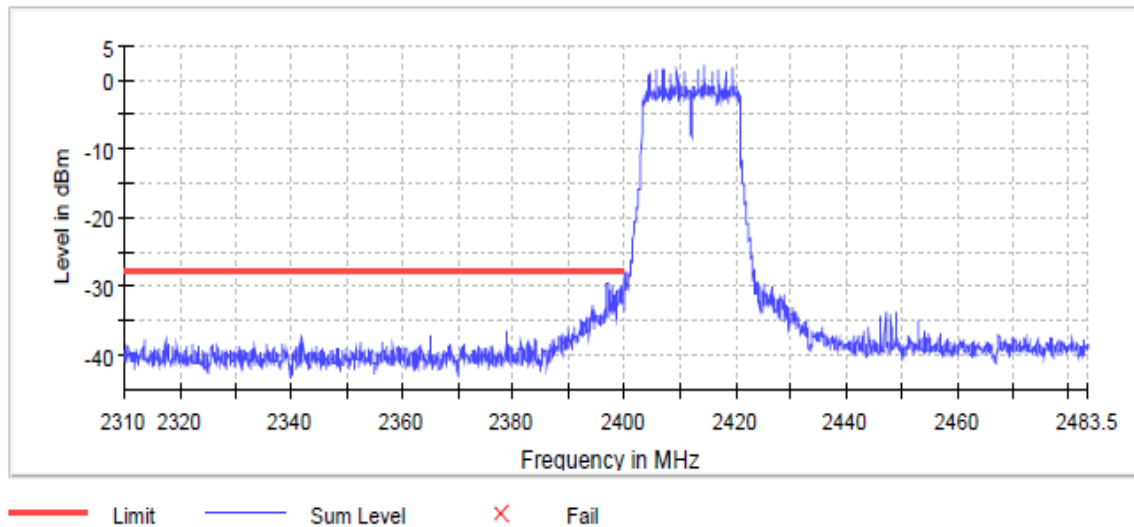
Inband Peak

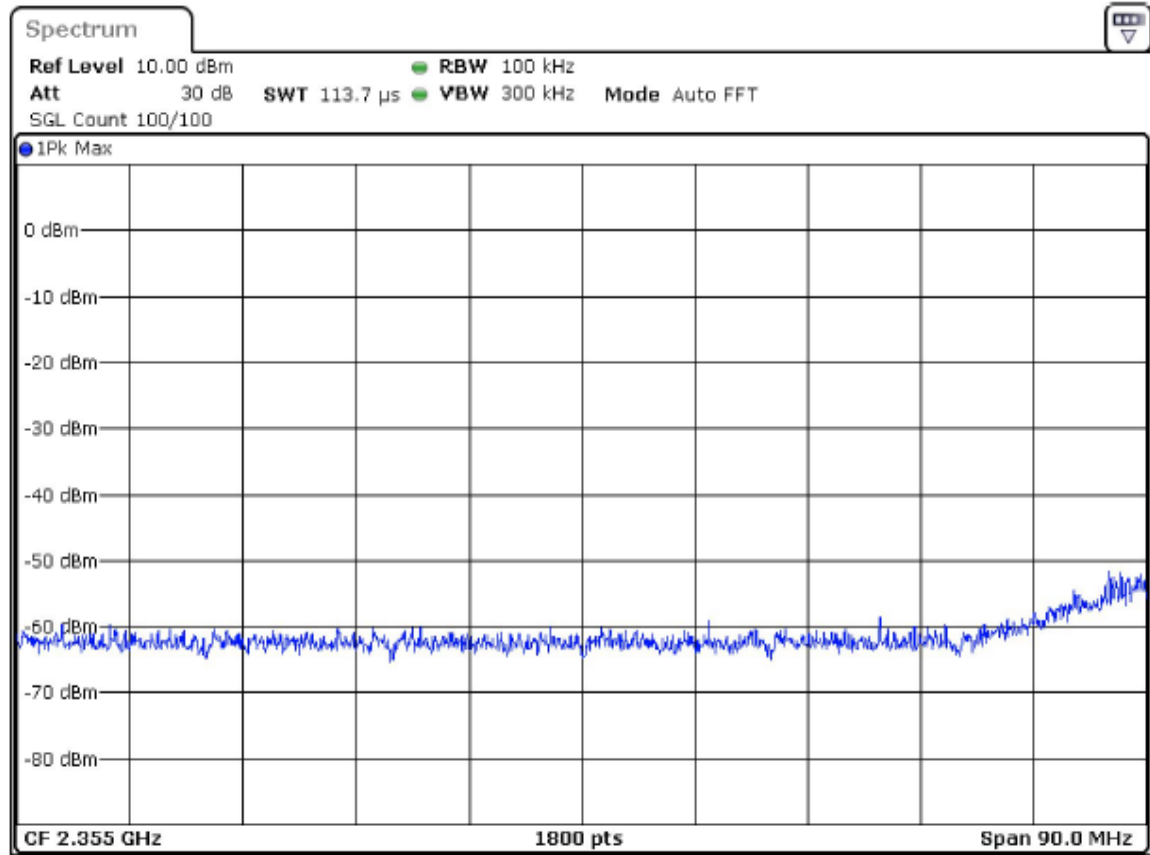
Frequency (MHz)	Level (dBm)
2414.516308	2.1

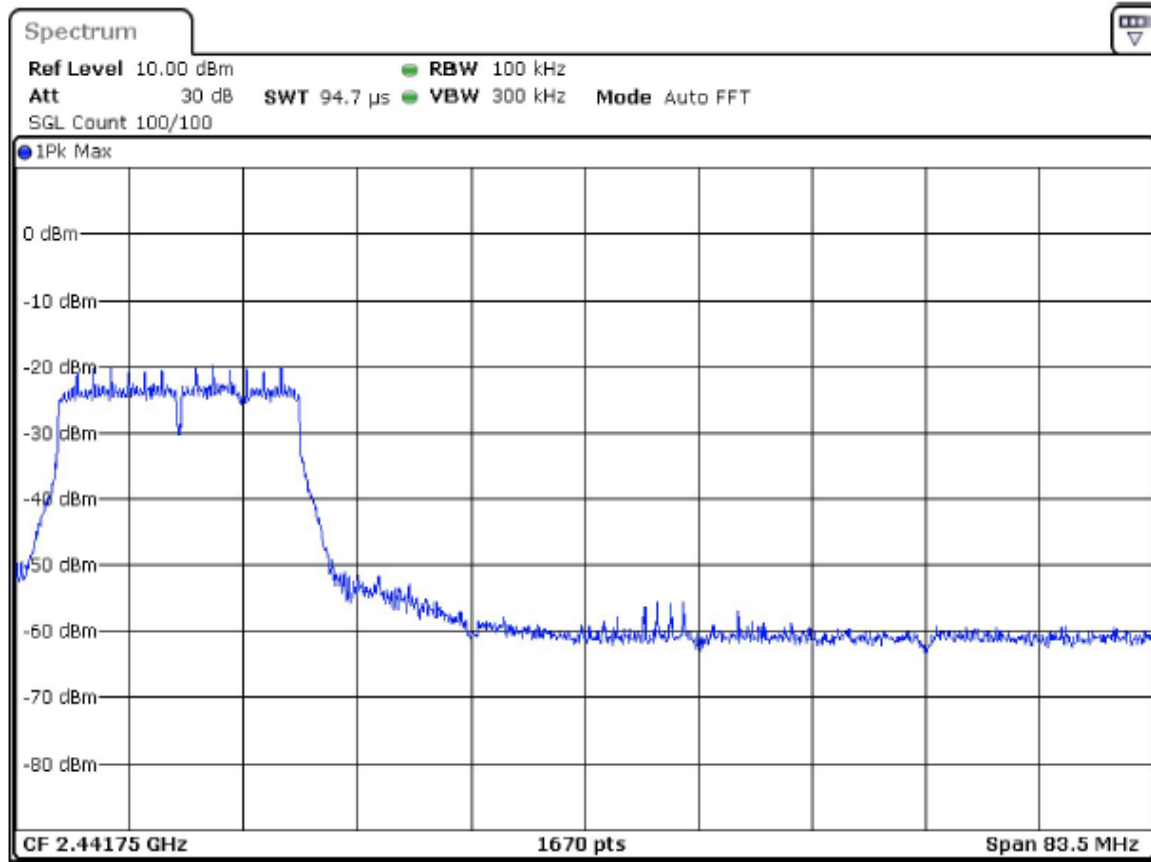
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2396.976680	-29.7	1.8	-27.9	PASS
2396.926707	-29.7	1.8	-27.9	PASS
2397.926152	-29.9	2.0	-27.9	PASS
2399.475292	-30.1	2.2	-27.9	PASS
2399.525264	-30.4	2.5	-27.9	PASS
2399.425319	-30.4	2.5	-27.9	PASS
2397.876180	-30.5	2.5	-27.9	PASS
2397.276513	-30.5	2.6	-27.9	PASS
2397.976124	-30.6	2.7	-27.9	PASS
2397.326485	-30.6	2.7	-27.9	PASS
2399.075514	-30.7	2.7	-27.9	PASS
2398.525819	-30.8	2.9	-27.9	PASS
2397.026652	-30.8	2.9	-27.9	PASS
2399.125486	-30.9	3.0	-27.9	PASS
2398.475847	-30.9	3.0	-27.9	PASS

Band Edge







802.11n(HT20) MCS2 2462MHz

Band Edge High

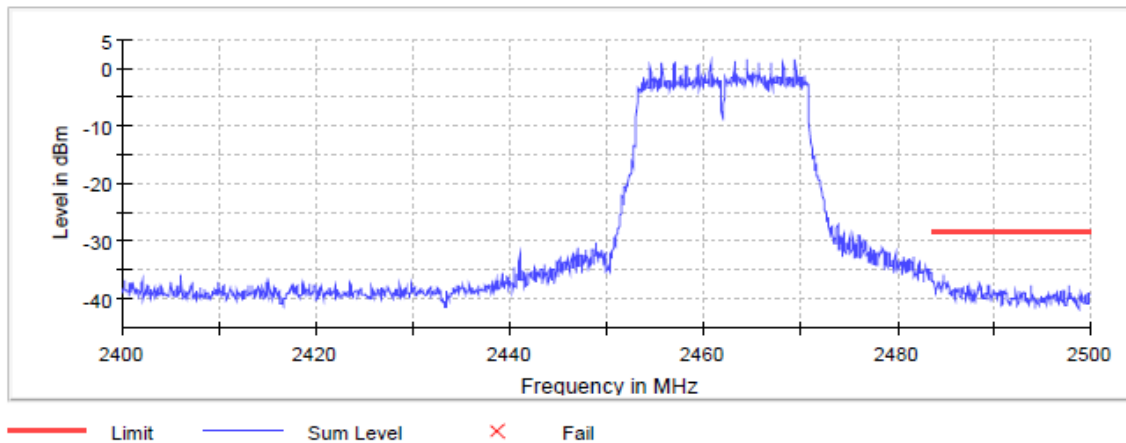
Inband Peak

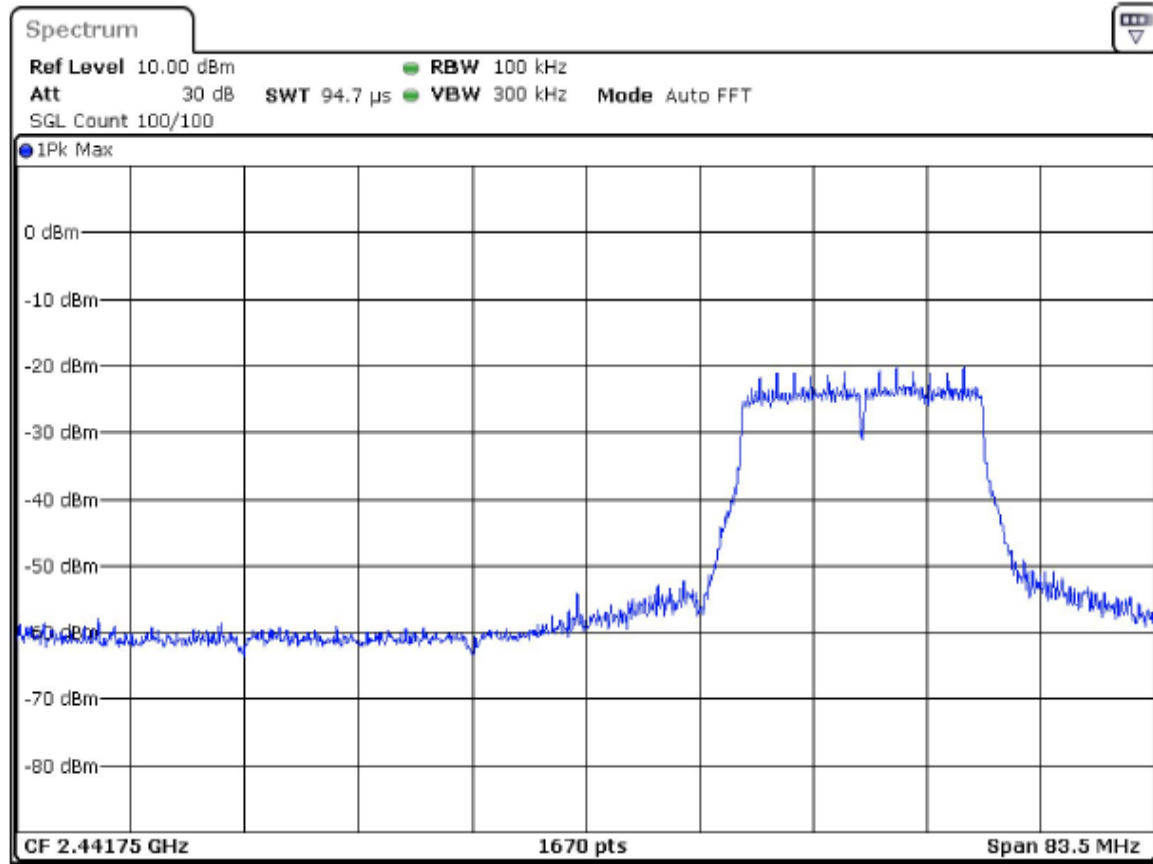
Frequency (MHz)	Level (dBm)
2464.486385	1.6

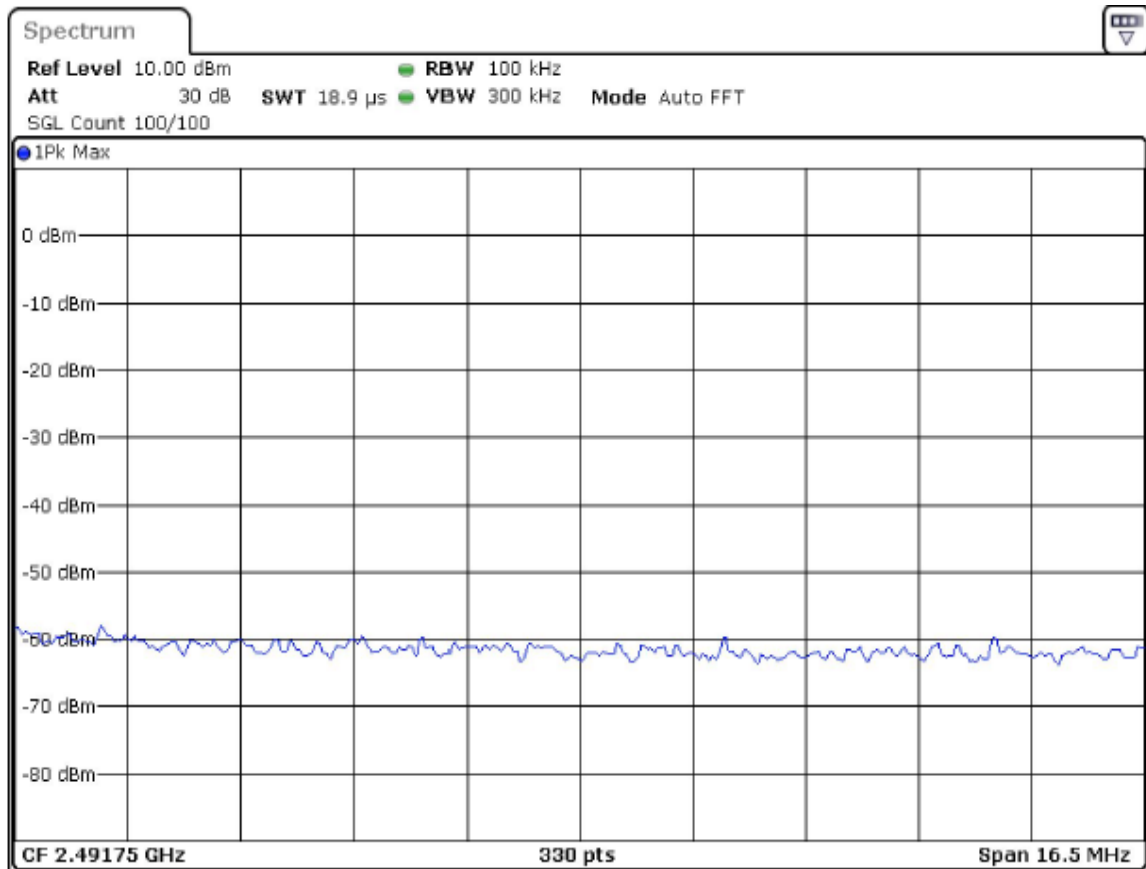
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2484.771148	-36.1	7.7	-28.4	PASS
2483.574773	-36.3	7.9	-28.4	PASS
2484.820997	-36.5	8.1	-28.4	PASS
2483.524924	-36.5	8.2	-28.4	PASS
2483.674471	-37.0	8.6	-28.4	PASS
2484.721299	-37.0	8.6	-28.4	PASS
2483.824018	-37.1	8.7	-28.4	PASS
2483.873867	-37.2	8.8	-28.4	PASS
2483.724320	-37.2	8.8	-28.4	PASS
2484.322508	-37.2	8.9	-28.4	PASS
2484.272659	-37.2	8.9	-28.4	PASS
2483.774169	-37.3	8.9	-28.4	PASS
2483.624622	-37.3	8.9	-28.4	PASS
2485.120091	-37.4	9.1	-28.4	PASS
2484.920695	-37.5	9.1	-28.4	PASS

Band Edge







Conducted Spurious Emissions

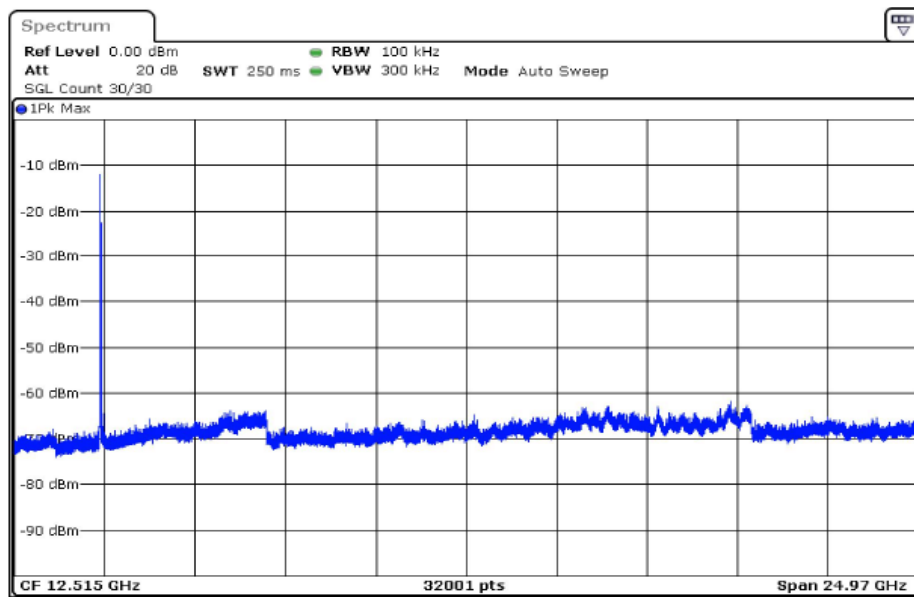
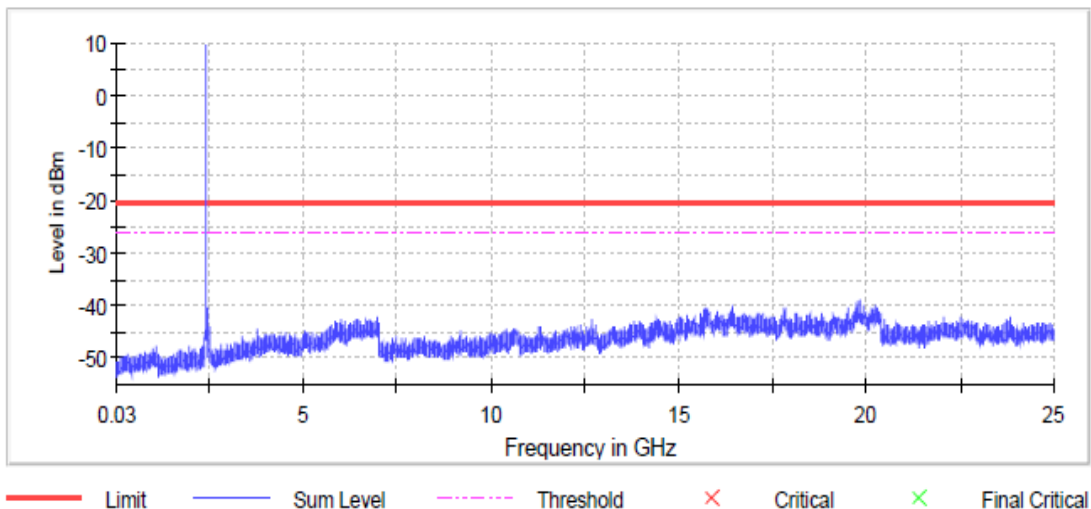
Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 11.

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.8 dB

802.11b 11 Mbps 2412MHz

Pre Measurements

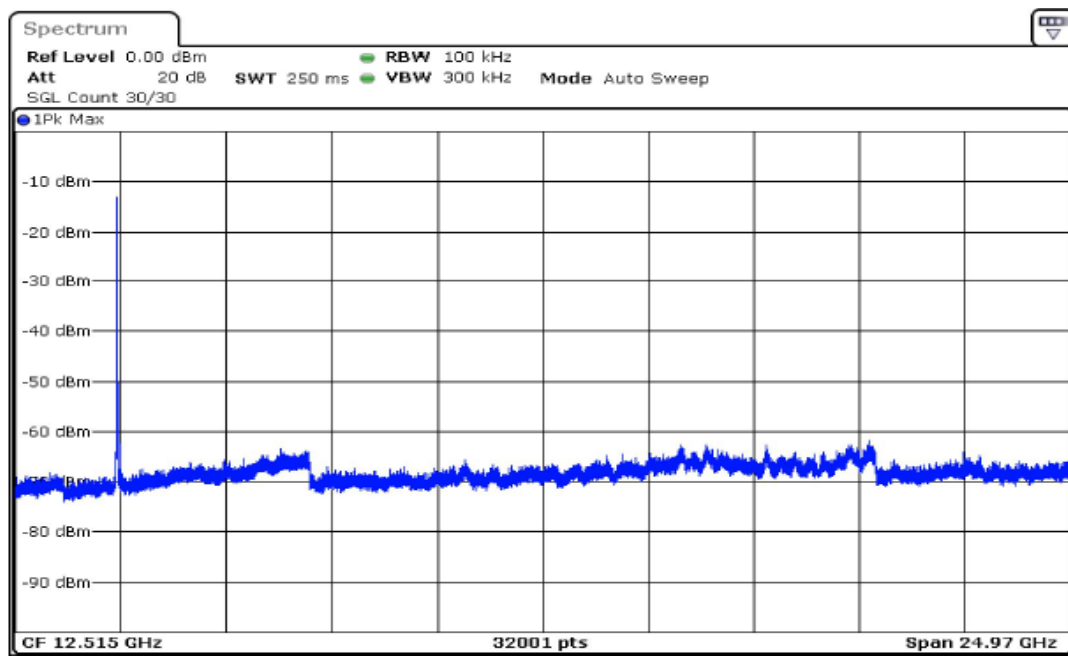
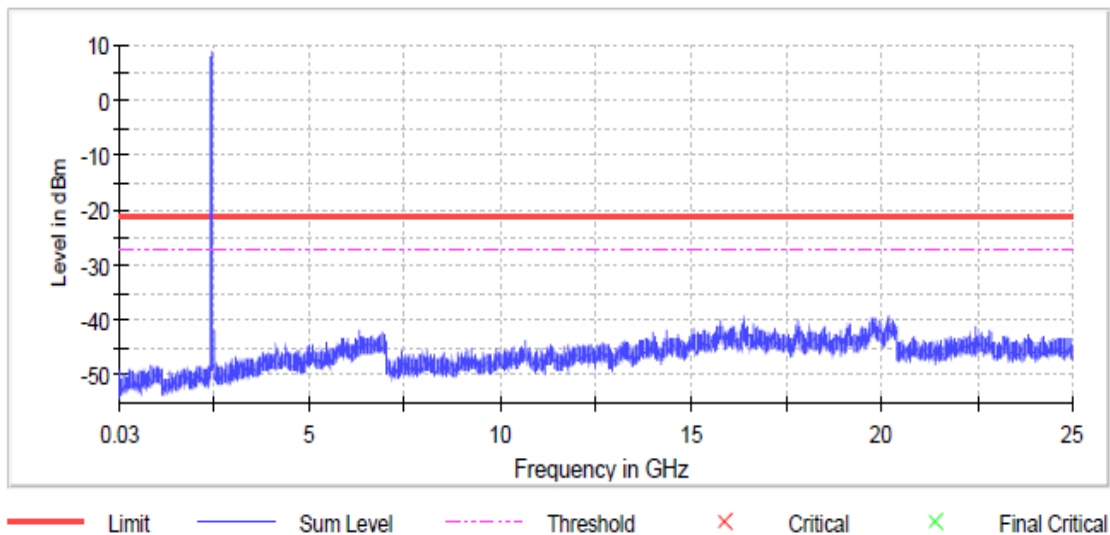
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2396.149772	-34.5	14.2	-20.3
2399.270827	-36.5	16.2	-20.3
2393.808981	-37.6	17.3	-20.3
2394.589244	-37.7	17.4	-20.3
2398.490563	-37.8	17.5	-20.3
19829.582370	-38.8	18.5	-20.3
19760.919161	-39.1	18.8	-20.3
2393.028717	-39.1	18.9	-20.3
19806.174458	-39.4	19.2	-20.3
19791.349447	-39.5	19.2	-20.3
2397.710299	-39.6	19.3	-20.3
19778.084963	-39.7	19.4	-20.3
2396.930036	-39.7	19.5	-20.3
19957.545622	-39.8	19.5	-20.3
2395.369508	-39.8	19.5	-20.3



802.11b 11Mbps 2437MHz

Pre Measurements

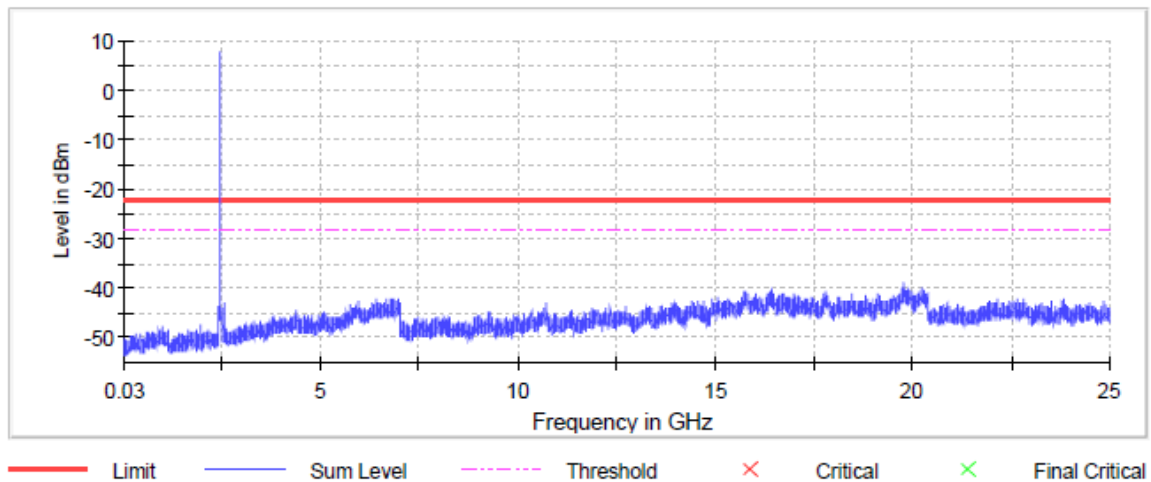
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
20211.911599	-39.1	17.9	-21.2
19756.237579	-39.4	18.2	-21.2
19752.336260	-39.5	18.3	-21.2
19764.820480	-39.6	18.4	-21.2
19820.219205	-39.6	18.4	-21.2
17784.511124	-39.7	18.5	-21.2
19806.174458	-39.9	18.7	-21.2
20311.785357	-39.9	18.7	-21.2
15765.968846	-39.9	18.7	-21.2
19773.403381	-39.9	18.7	-21.2
19760.919161	-39.9	18.7	-21.2
19765.600744	-39.9	18.7	-21.2
19927.895600	-39.9	18.7	-21.2
19948.182457	-39.9	18.7	-21.2
20282.135335	-40.0	18.8	-21.2

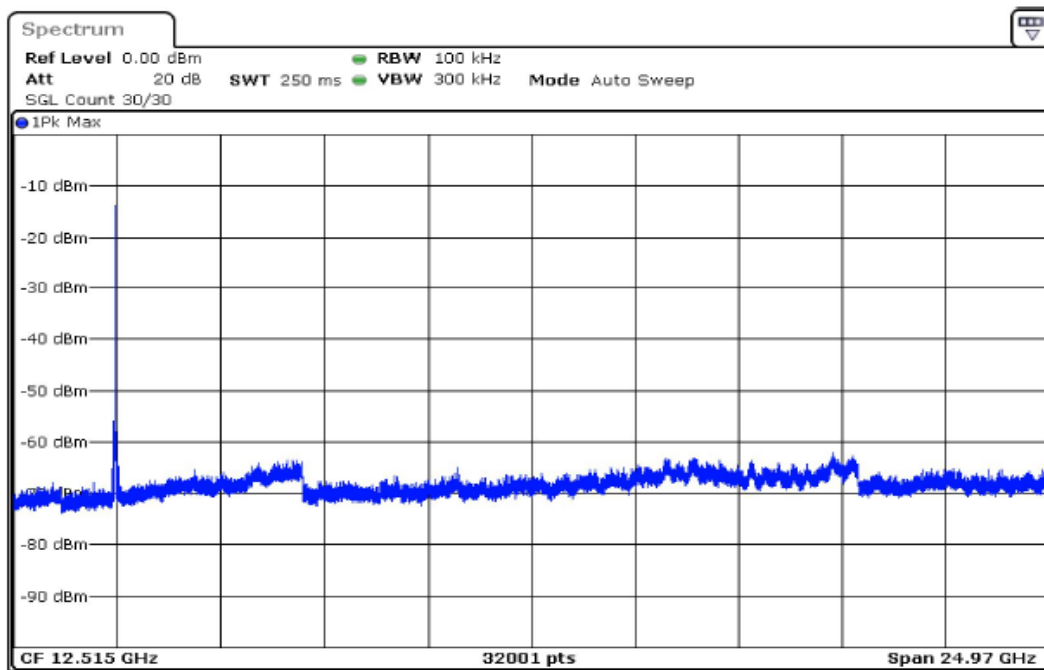


802.11b 11Mbps 2462MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19784.327073	-38.8	16.6	-22.1
19785.107337	-39.3	17.1	-22.1
19774.963909	-39.4	17.2	-22.1
19760.919161	-39.7	17.5	-22.1
19807.734985	-39.7	17.6	-22.1
19754.677051	-39.9	17.7	-22.1
20261.068214	-39.9	17.8	-22.1
19782.766546	-40.0	17.9	-22.1
19764.820480	-40.0	17.9	-22.1
19925.554809	-40.1	17.9	-22.1
19783.546810	-40.1	17.9	-22.1
19760.138898	-40.1	18.0	-22.1
19752.336260	-40.1	18.0	-22.1
19779.645491	-40.2	18.0	-22.1
19735.950722	-40.2	18.1	-22.1

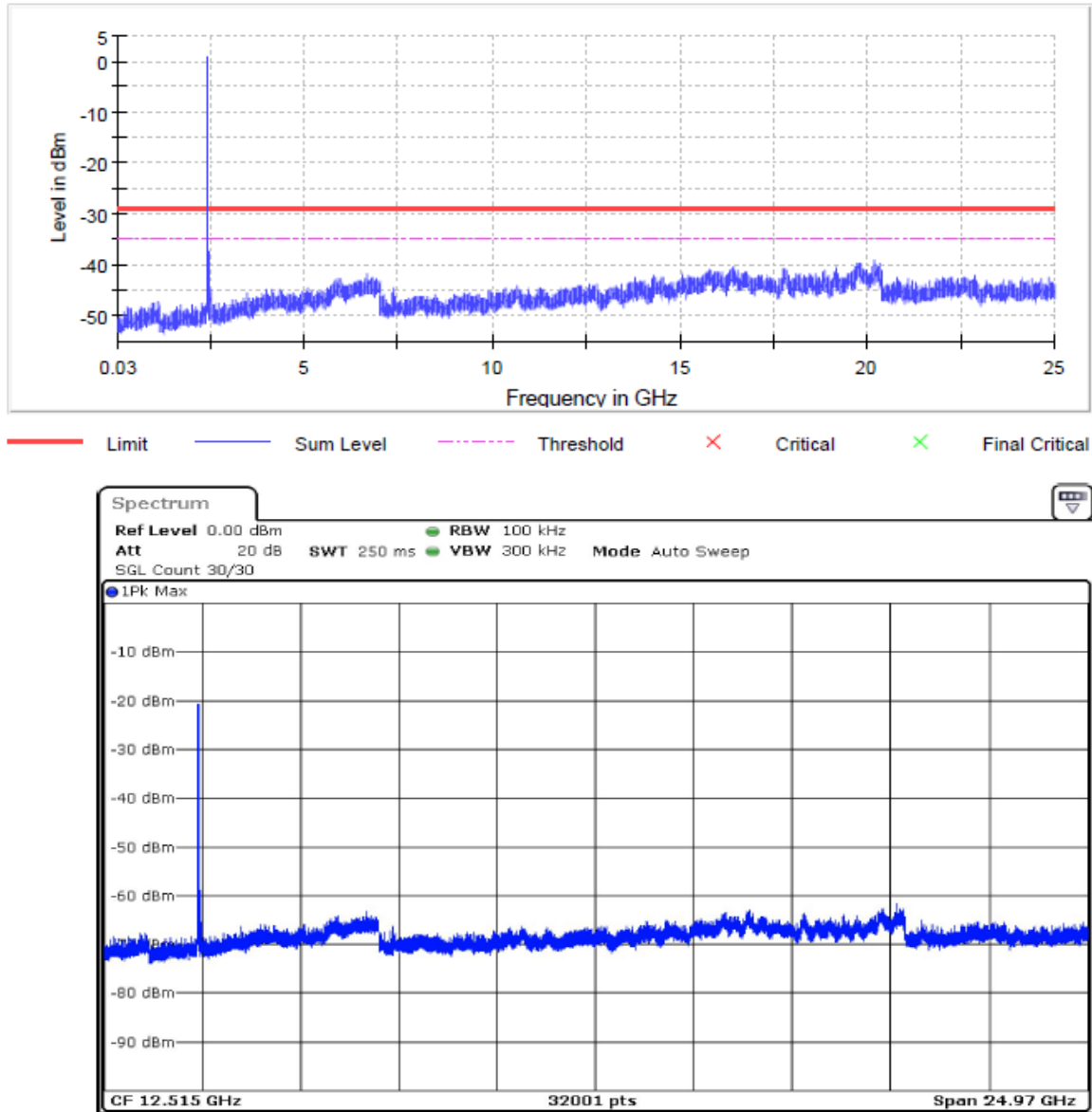




802.11g 54 Mbps 2412MHz

Pre Measurements

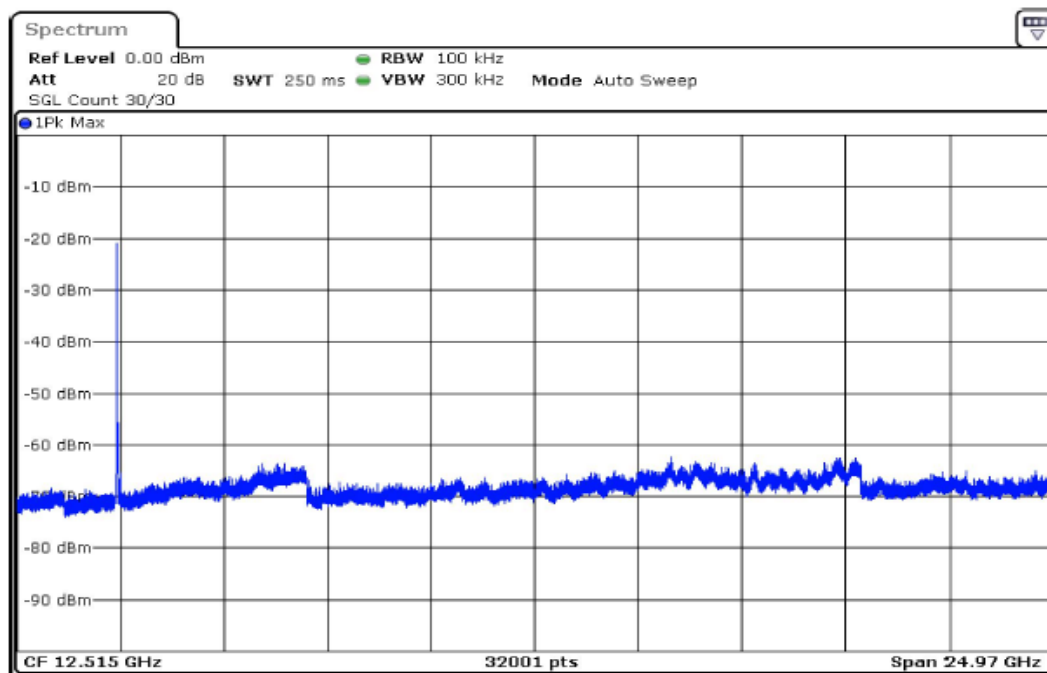
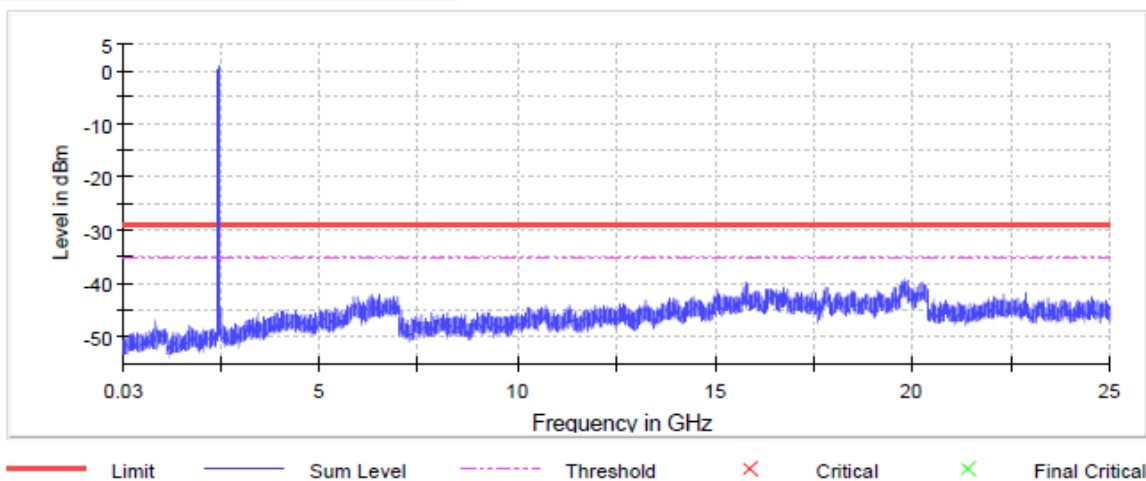
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2398.490563	-36.3	7.3	-29.0
2399.270827	-37.4	8.4	-29.0
2397.710299	-37.6	8.6	-29.0
2396.930036	-38.7	9.7	-29.0
20168.216830	-38.9	9.9	-29.0
2396.149772	-39.3	10.3	-29.0
19854.550809	-39.6	10.6	-29.0
19793.690238	-39.6	10.6	-29.0
20340.655115	-39.6	10.6	-29.0
19720.345447	-39.8	10.8	-29.0
19774.963909	-39.8	10.8	-29.0
19772.623117	-39.8	10.8	-29.0
19794.470502	-39.9	10.9	-29.0
20326.610368	-40.1	11.1	-29.0
19836.604743	-40.1	11.1	-29.0



802.11g 54 Mbps 2437MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19773.403381	-39.3	10.0	-29.2
19865.474502	-39.3	10.1	-29.2
19742.192832	-39.7	10.5	-29.2
19849.869227	-39.7	10.5	-29.2
15803.421505	-39.8	10.6	-29.2
19792.129711	-39.8	10.6	-29.2
20256.386632	-39.8	10.6	-29.2
19848.308699	-39.8	10.6	-29.2
19900.586370	-39.9	10.7	-29.2
19748.434942	-39.9	10.7	-29.2
19828.802106	-40.0	10.8	-29.2
20265.749797	-40.0	10.8	-29.2
19760.138898	-40.1	10.9	-29.2
15812.784670	-40.1	10.9	-29.2
19844.407381	-40.1	10.9	-29.2

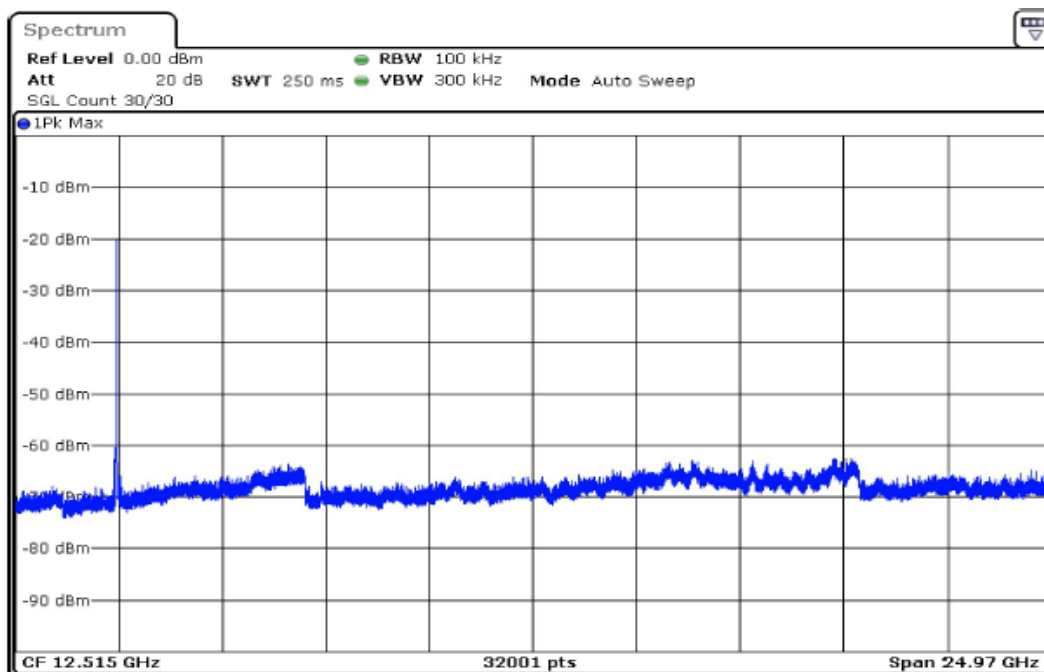


802.11g 54 Mbps 2462MHz Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
20077.706237	-39.3	10.6	-28.7
19771.842854	-39.3	10.6	-28.7
19748.434942	-39.4	10.7	-28.7
19788.228392	-39.5	10.8	-28.7
19849.869227	-39.6	10.9	-28.7
19780.425755	-39.6	10.9	-28.7
19746.094150	-39.6	10.9	-28.7
19806.954722	-39.6	10.9	-28.7
19804.613930	-39.7	11.0	-28.7
19816.317886	-39.8	11.1	-28.7
19955.985095	-39.8	11.1	-28.7
19759.358634	-39.8	11.1	-28.7
20191.624742	-39.9	11.2	-28.7
19792.909974	-39.9	11.2	-28.7
19772.623117	-39.9	11.2	-28.7



— Limit — Sum Level - - - Threshold × Critical × Final Critical



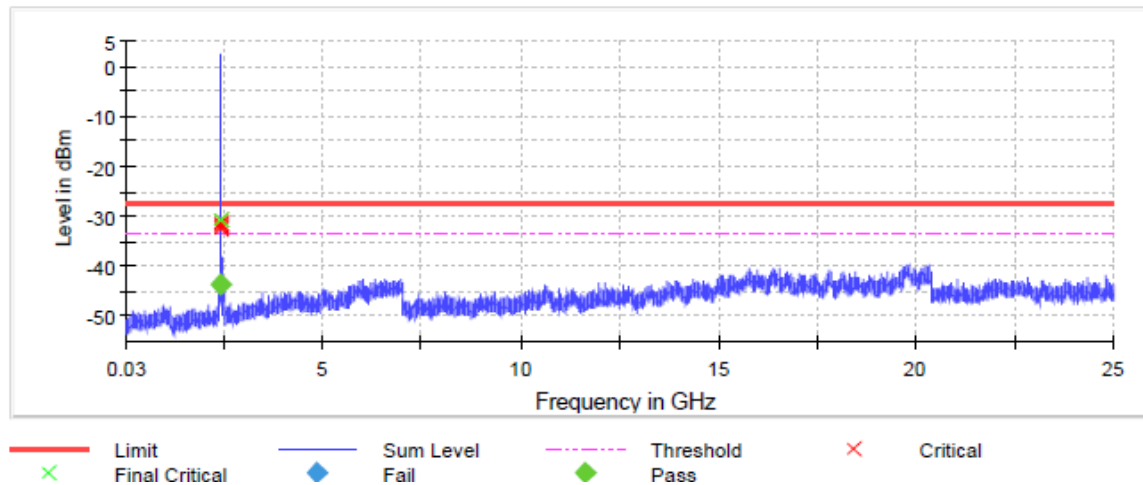
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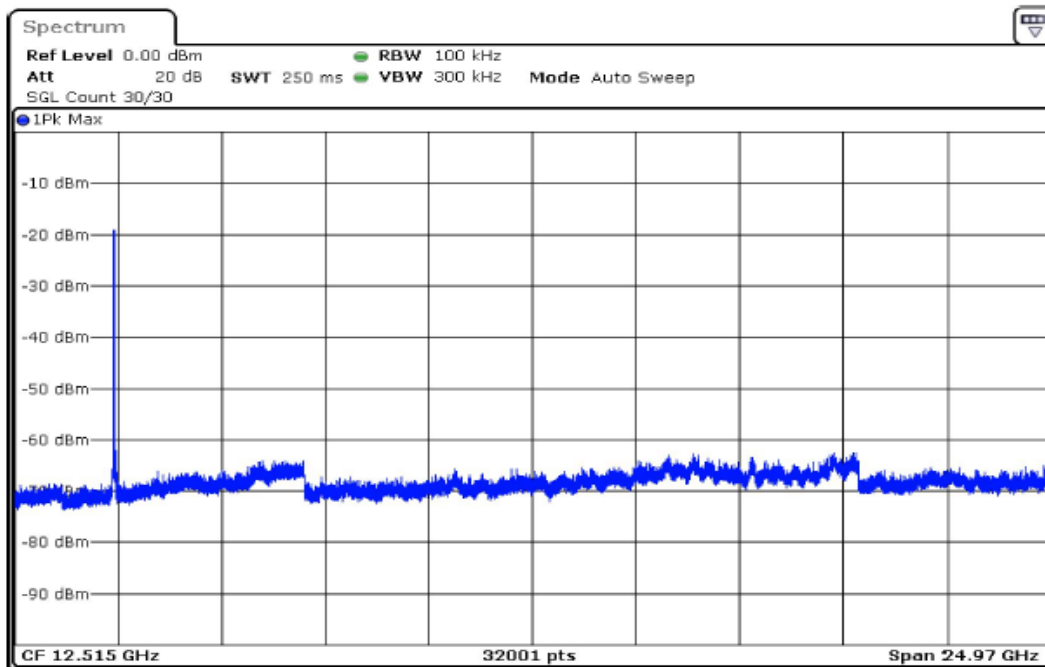


802.11n(HT20) MCS2 2412MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2397.710299	-30.9	3.5	-27.4
2396.930036	-31.3	3.9	-27.4
2398.490563	-31.4	4.0	-27.4
2399.270827	-31.9	4.5	-27.4
2396.149772	-32.0	4.6	-27.4
2395.369508	-32.6	5.2	-27.4
2393.808981	-34.1	6.7	-27.4
2394.589244	-34.5	7.1	-27.4
2393.028717	-35.2	7.8	-27.4
2392.248453	-35.7	8.3	-27.4
2391.468189	-38.7	11.3	-27.4
2390.687926	-39.0	11.5	-27.4
2388.347135	-39.1	11.7	-27.4
19773.403381	-39.4	12.0	-27.4
20321.928786	-39.4	12.0	-27.4

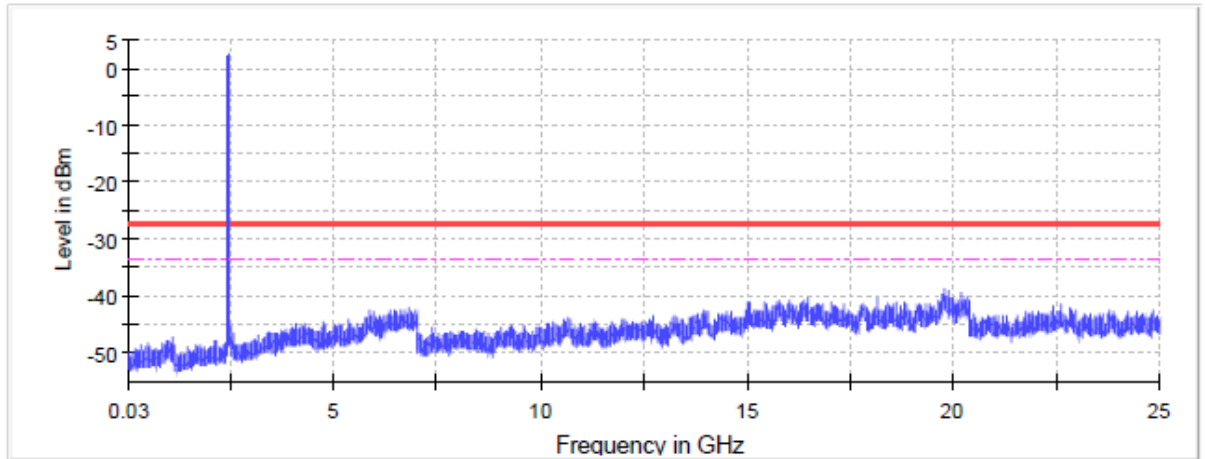




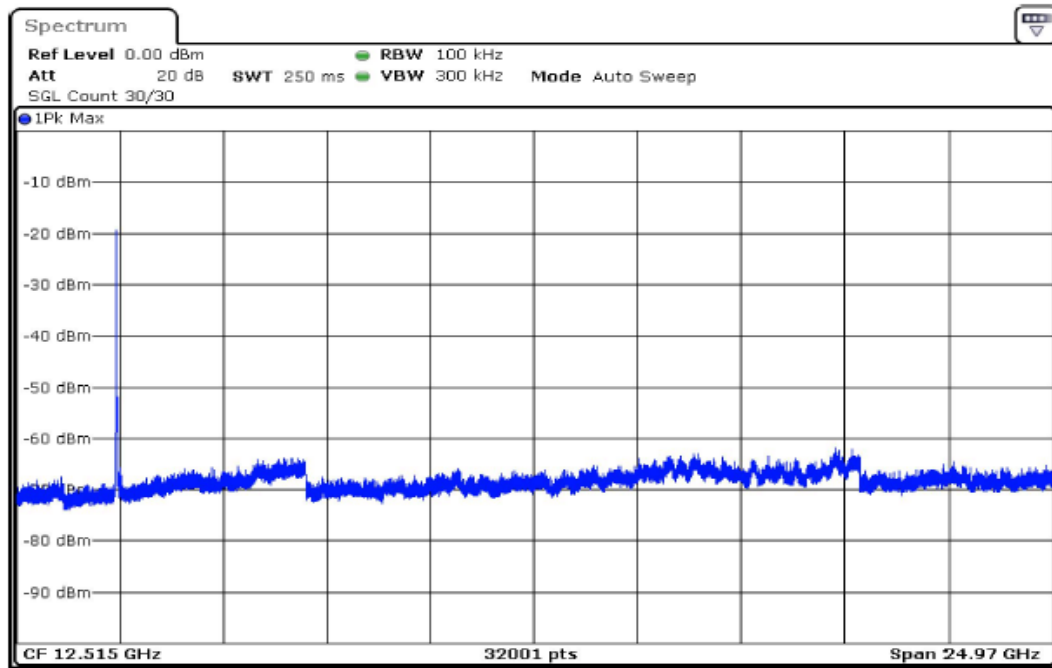
802.11n(HT20) MCS2 2437MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19775.744172	-38.7	11.2	-27.5
19871.716611	-39.1	11.6	-27.5
20186.162896	-39.4	11.9	-27.5
19776.524436	-39.5	12.0	-27.5
19749.995469	-39.6	12.1	-27.5
19803.833667	-39.6	12.1	-27.5
19774.963909	-39.7	12.2	-27.5
19786.667865	-39.7	12.2	-27.5
19763.259953	-39.7	12.2	-27.5
19758.578370	-39.7	12.2	-27.5
19761.699425	-39.9	12.4	-27.5
19809.295513	-40.0	12.5	-27.5
19750.775733	-40.0	12.5	-27.5
19778.084963	-40.0	12.5	-27.5
19792.129711	-40.0	12.5	-27.5



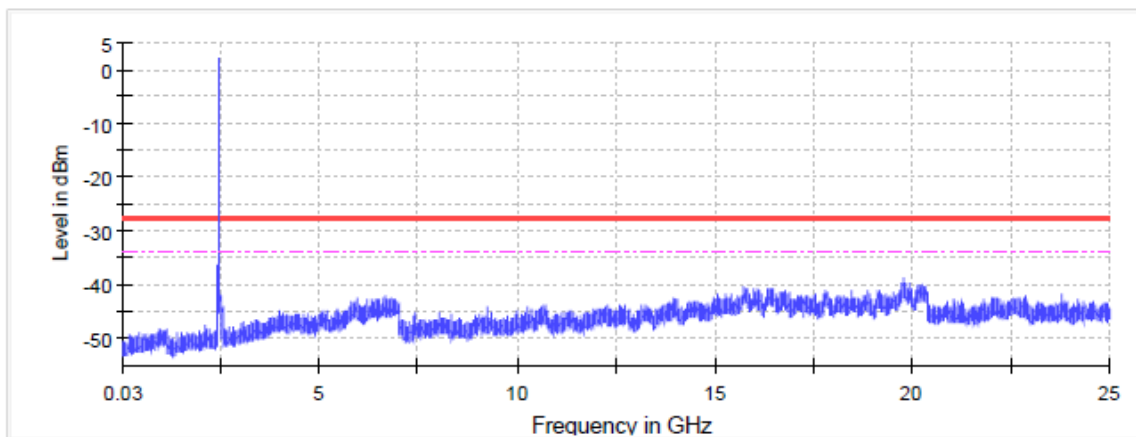
— Limit — Sum Level - - - Threshold × Critical × Final Critical



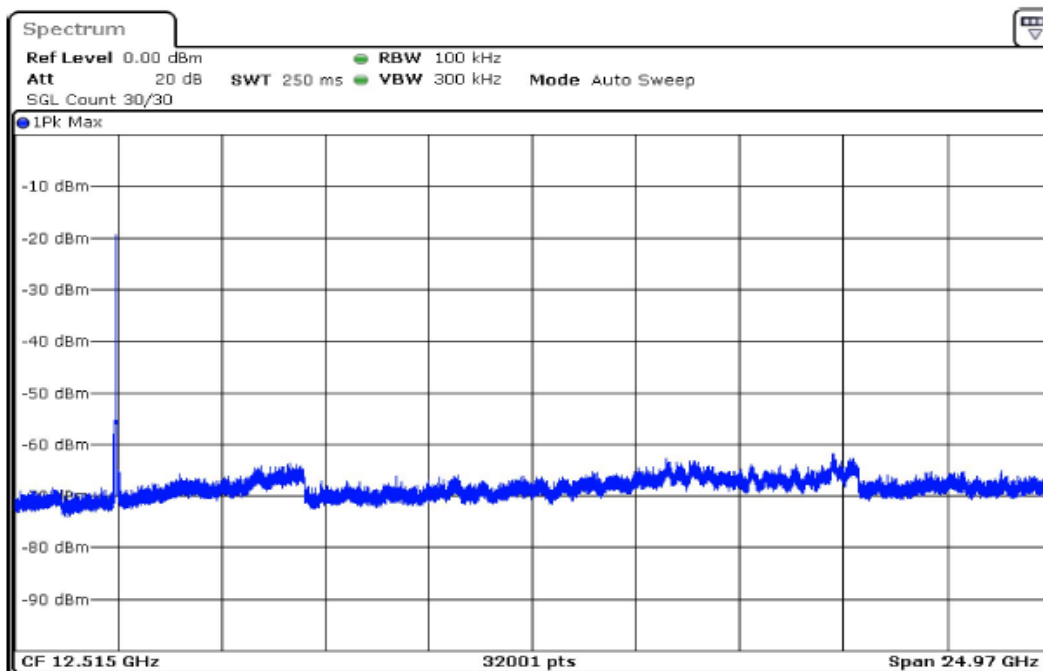
802.11n(HT20) MCS2 2462MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2483.539310	-38.3	10.6	-27.7
19786.667865	-38.6	10.9	-27.7
19767.941535	-38.7	10.9	-27.7
19769.502062	-39.5	11.7	-27.7
19745.313887	-39.6	11.8	-27.7
19784.327073	-39.7	11.9	-27.7
19746.874414	-39.7	12.0	-27.7
19813.196831	-39.7	12.0	-27.7
19958.325886	-39.8	12.0	-27.7
19771.062590	-39.8	12.0	-27.7
19768.721799	-39.8	12.1	-27.7
19793.690238	-39.8	12.1	-27.7
19804.613930	-39.8	12.1	-27.7
19757.798106	-39.9	12.1	-27.7
19722.686238	-39.9	12.2	-27.7



— Limit — Sum Level - - - Threshold × Critical × Final Critical



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