
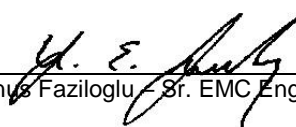




Test Report



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

Report No	ER2501-16
Client	Harman International Industries, Incorporated
Address	30001 Cabot Drive Novi, MI 48377
Phone	248-254-7751
Items tested FCC ID IC	GEN3.1 MID VA 2AHPN-BE2837 6434C-BE2837
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	11/30/2017
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 16 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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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, ISED Canada RSS-247 Issue 2

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

Antenna Type: PCB Trace
Gain: 0.38dBi 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 30, 2017



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										
EUT:	MN GEN3.1 MID VA			PN				SN			
EUT Description:	Car Stereo System										
EUT Components	MN					SN					
audio Harness											
Back up camera											
GPS antenna											
Power Harness											
USB diag port											
Support Equipment	MN					SN					
CS Supplied Laptop.											
Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment	
Audio	-	1	1	-	No	No	1	in	yes		
DC Power		1	1		No	No	1	in	yes		
Back up camera	-	1	1	-	No	No	0.1	in	yes		
Dab/XM	-	1	1	Coaxial	Yes	No	1	in	yes		
FM/AM antenna	-	1	1	Coaxial	Yes	No	0.1	in	yes		
Next gen port		1	0					in	no		
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.											

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 0.38dBi 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				Work Order - R2501							
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC							
30-1000MHz Horizontal Data				Test Site - CH2							
Operator: CCH				Conditions - 23.7°C; 25%RH; 1010mBar							
Notes:				Witnessed by - Filtering 2300-2500MHz							
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps											
Data Taken at 2:25:11 AM Monday November 20 2017											

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBµV/m)	Lim1: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)
249.551	32.7	-23.1	9.6	46	-36.4	PASS		46	-36.4	PASS	
393.182	28	-18.3	9.8	46	-36.3	PASS		46	-36.3	PASS	
792.202	33	-9	24	46	-22	PASS		46	-22	PASS	
793.511	31.6	-9.1	22.5	46	-23.5	PASS		46	-23.5	PASS	
798.05	41.1	-9	32	46	-14	PASS	-14	46	-14	PASS	-14
800.838	31.7	-9	22.7	46	-23.3	PASS		46	-23.3	PASS	

Curtis Straus - a Bureau Veritas Company				Work Order - R2501							
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC							
30-1000MHz Vertical Data				Test Site - CH2							
Operator: CCH				Conditions - 23.7°C; 25%RH; 1010mBar							
Notes:				Witnessed by - Filtering 2300-2500MHz							
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500MHz. EUT Maximum Frequency - 802.11b 5.5Mbps											
Data Taken at 2:25:11 AM Monday November 20 2017											

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBµV/m)	Lim1: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)
774.556	27.7	-8.9	18.8	46	-27.2	PASS		46	-27.2	PASS	
780.302	28.2	-8.7	19.5	46	-26.5	PASS		46	-26.5	PASS	
792.952	30.8	-9.1	21.7	46	-24.3	PASS		46	-24.3	PASS	
794.774	31.7	-9.1	22.6	46	-23.4	PASS		46	-23.4	PASS	
797.683	36.8	-9	27.7	46	-18.3	PASS	-18.3	46	-18.3	PASS	-18.3
800.08	32	-9	22.9	46	-23.1	PASS		46	-23.1	PASS	

30-1000MHz Center Channel



Curtis Straus - a Bureau Veritas Company	Work Order - R2501
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Horizontal Data	Test Site - CH2
Operator: CCH	Conditions - 23.7°C; 25%RH; 1010mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps	

Data Taken at 2:25:11 AM Monday November 20 2017

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)
1596.3	20.5	11.3	29.2	49.7	74	-24.3	PASS		40.5	54	-13.4	PASS	
2187.1	21.1	11.8	33.7	54.8	74	-19.2	PASS		45.5	54	-8.4	PASS	
2805.9	19.8	12	37.9	57.8	74	-16.2	PASS	-16.2	49.9	54	-4	PASS	-4
3567.2	20.2	12.4	36.1	56.3	74	-17.7	PASS		48.4	54	-5.5	PASS	
5821.9	17.7	9.4	40	57.6	74	-16.3	PASS		49.4	54	-4.6	PASS	

Curtis Straus - a Bureau Veritas Company	Work Order - R2501
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Vertical Data	Test Site - CH2
Operator: CCH	Conditions - 23.7°C; 25%RH; 1010mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps	

Data Taken at 2:25:11 AM Monday November 20 2017

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)
1596.2	21.8	13.6	29.2	51	74	-23	PASS		42.8	54	-11.2	PASS	
2167.1	21.2	11.8	33.5	54.7	74	-19.3	PASS		45.3	54	-8.7	PASS	
2808.1	21.3	12	37.8	59.1	74	-14.9	PASS		49.9	54	-4.1	PASS	-4.1
3557.6	22.6	12.3	36	58.6	74	-15.4	PASS		48.3	54	-5.6	PASS	
5837.8	19.4	9.5	39.9	59.2	74	-14.7	PASS	-14.7	49.3	54	-4.6	PASS	

1-6GHz Low Channel

Curtis Straus - a Bureau Veritas Company	Work Order - R2501
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Horizontal Data	Test Site - CH2
Operator: CCH	Conditions - 23.7°C; 25%RH; 1010mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps	

Data Taken at 2:25:11 AM Monday November 20 2017

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)
1592.8	20.3	11.1	29.2	49.5	74	-24.5	PASS		40.3	54	-13.7	PASS	
2153.8	21.8	11.8	33.4	55.2	74	-18.8	PASS		45.1	54	-8.8	PASS	
2802.3	21.3	12	38.1	59.4	74	-14.6	PASS	-14.6	50.1	54	-3.9	PASS	-3.9
3596.9	20.2	12.6	36.3	56.4	74	-17.5	PASS		48.9	54	-5.1	PASS	
5976.3	18.2	9.5	40.3	58.5	74	-15.4	PASS		49.8	54	-4.2	PASS	



Curtis Straus - a Bureau Veritas Company	Work Order - R2501
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Vertical Data	Test Site - CH2
Operator: CCH	Conditions - 23.7°C; 25%RH; 1010mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps	

Data Taken at 2:25:11 AM Monday November 20 2017

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)
1595.8	21.2	12.5	29.2	50.4	74	-23.6	PASS		41.7	54	-12.3	PASS	
2168.8	20.8	11.8	33.5	54.3	74	-19.6	PASS		45.4	54	-8.6	PASS	
2809.2	21.5	12	37.8	59.3	74	-14.7	PASS		49.8	54	-4.2	PASS	
3571.4	21.7	12.4	36.1	57.8	74	-16.2	PASS		48.5	54	-5.5	PASS	
5992.9	19.5	9.5	40.5	59.9	74	-14.1	PASS	-14.1	49.9	54	-4	PASS	-4

1-6GHz Mid Channel

Curtis Straus - a Bureau Veritas Company	Work Order - R2501
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Horizontal Data	Test Site - CH2
Operator: CCH	Conditions - 23.7°C; 25%RH; 1010mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps	

Data Taken at 2:25:11 AM Monday November 20 2017

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)
1595.5	21.7	11.5	29.2	50.9	74	-23.1	PASS		40.7	54	-13.3	PASS	
2193.5	21.2	11.8	33.8	55	74	-19	PASS		45.6	54	-8.4	PASS	
2804.5	21.4	12	38	59.4	74	-14.5	PASS	-14.5	50	54	-4	PASS	-4
3572.1	21.3	12.4	36.1	57.4	74	-16.6	PASS		48.5	54	-5.5	PASS	
5372.6	19.6	9.4	39.7	59.3	74	-14.7	PASS		49.1	54	-4.9	PASS	

Curtis Straus - a Bureau Veritas Company	Work Order - R2501
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 13.8V DC
1-6GHz Vertical Data	Test Site - CH2
Operator: CCH	Conditions - 23.7°C; 25%RH; 1010mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps	

Data Taken at 2:25:11 AM Monday November 20 2017

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)
1597.3	21.7	12.7	29.2	50.9	74	-23.1	PASS		41.9	54	-12	PASS	
2198.9	21.2	11.9	33.8	55	74	-19	PASS		45.7	54	-8.3	PASS	
2803.5	20.5	12	38	58.6	74	-15.4	PASS		50	54	-4	PASS	-4
3578	20.6	12.4	36.1	56.7	74	-17.3	PASS		48.6	54	-5.4	PASS	
5763.4	19	9.4	40	59	74	-15	PASS	-15	49.4	54	-4.6	PASS	

1-6GHz High Channel



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 - CH2
Operator: CCH	Conditions - 23.7°C; 25%RH; 1010mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps	

Data Taken at 2:25:11 AM Monday November 20 2017

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	PK Lim.	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	AV Lim.	Avg Margin (dB)	Avg Test Results (Pass/Fail)	Worst Avg Margin (dB)
					FCC_pt15_1 09_ClassB_Peak (dBµV/m)					FCC_pt15_1 09_ClassB_AVG (dBµV/m)			
7588.7	8.4	-0.2	43.5	52	83.5	-31.5	PASS		43.3	63.5	-20.2	PASS	
11823.6	9.2	0.9	47.9	57.1	83.5	-26.4	PASS		48.7	63.5	-14.8	PASS	
12507.5	11.6	1.4	48.8	60.5	83.5	-23	PASS		50.2	63.5	-13.3	PASS	
13492.1	10.7	1.2	51.6	62.3	83.5	-21.2	PASS		52.8	63.5	-10.7	PASS	
13851.5	10.6	1.7	52.3	62.8	83.5	-20.7	PASS		54	63.5	-9.5	PASS	
17673.7	13.5	4.5	58.1	71.6	83.5	-11.9	PASS	-11.9	62.6	63.5	-0.9	PASS	-0.9

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 - CH2
Operator: CCH	Conditions - 23.7°C; 25%RH; 1010mBar
Notes:	Witnessed by - Filtering 2300-2500MHz
EUT is Transmitting 2.4g 802.11b 5.5Mbps. Filtering 2300-2500M EUT Maximum Frequency - 802.11b 5.5Mbps	

Data Taken at 2:25:11 AM Monday November 20 2017

Frequency (MHz)	Raw Peak Reading (dBµV)	Raw Avg Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	PK Lim.	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBµV/m)	AV Lim.	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
					FCC_pt15_1 09_ClassB_Peak (dBµV/m)					FCC_pt15_1 09_ClassB_AVG (dBµV/m)			
10459.6	9.9	1.1	45.5	55.3	83.5	-28.2	PASS		46.6	63.5	-16.9	PASS	
11918.2	10.5	1.1	48	58.4	83.5	-25.1	PASS		49	63.5	-14.5	PASS	
12522.9	10.6	1.3	48.7	59.2	83.5	-24.3	PASS		49.9	63.5	-13.6	PASS	
13927.6	10.1	1.5	52.4	62.4	83.5	-21.1	PASS		53.8	63.5	-9.7	PASS	
15054.4	11.9	2.5	48.2	60.1	83.5	-23.4	PASS		50.7	63.5	-12.8	PASS	
17681.2	13.9	4.6	58.2	72	83.5	-11.5	PASS	-11.5	62.8	63.5	-0.7	PASS	-0.7

6-18GHz Center Channel

Radiated Emissions Table

Date: 20-Nov-17	Company: Harman International	Work Order: R2501
Engineer: Chris Hamel	EUT Desc: GEN3.1 MID VA	EUT Operating Voltage/Frequency: 13.8V DC
Temp: 24.4°C	Humidity: 26%	Pressure: 996mBar
Frequency Range: 18-40GHz		Measurement Distance: 0.1 m
Notes: 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 2	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		Copyright Curtis-Straus LLC 2000	
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor			

Test Site: EMI Chamber 2	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		Copyright Curtis-Straus LLC 2000	
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor			

18-40GHz Center Channel



**Test Report for Harman International Industries, Incorporated • GEN3.1 MID VA • Report No. ER2501-16 •
November 30, 2017**

Rev. 10/22/2017

Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold		100Hz-26.5 GHz	E4407B	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 2		719150	2762A-7	A-0015	30-1000MHz	1686	I	12/21/2018	12/21/2016
EMI Chamber 2		719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018	12/21/2016
Mixers/Diplexers		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
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-Black Bilog		30-2000MHz	JB1	Sunol	A091604-2	1106	I	2/28/2019	2/28/2017
HF (White) Horn		18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
Blue Horn		1-18Ghz	3117	ETS	157647	1861	I	2/14/2019	2/14/2017
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#2078		HTC-1	HDE		2078	II	3/23/2018	3/23/2017	
Preamps /Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Blue		0.009-2000MHz	ZFL-1000-LN	CS	N/A	759	II	5/9/2018	5/9/2017
2463 HF PA		5-18GHz	PAM-118A	COM-POWER	443005	2463	II	10/9/2018	10/9/2017
HF (Yellow)		18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	10/16/2018	10/16/2017

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

Test Equipment Used 30MHz to 40GHz



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Radiated Band Edge

Radiated Emissions Table															
Date: 03-Nov-17			Company: Harmon			Work Order: R2501									
Engineer: Aristotelis Castemopoulos			EUT Desc: VG4 FCC Mid			EUT Operating Voltage/Frequency: 12VDC									
Temp: 24.5			Humidity: 37%			Pressure: 1008									
Frequency Range: 1-6GHz						Measurement Distance: 3 m									
Notes: 2.4GHz 802.11b 20MHz Tx Power=Default						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 Edge															
V Max	2412.138	72.493		0.0	32.3	3.1	---	---	---	74.0	---	---	54.0	---	---
H Max	2412.498	70.424		0.0	32.3	3.1	---	---	---	74.0	---	---	54.0	---	---
V	2390.0	22.58	12.5	0.0	32.2	3.1	57.9	47.8	74.0	-16.1	Pass	54.0	-6.2	Pass	
V	2387.314	25.601	12.6	0.0	32.2	3.1	60.9	47.9	74.0	-13.1	Pass	54.0	-6.1	Pass	
High Edge															
V Max	2462.409	70.88		0.0	32.4	3.2	---	---	---	74.0	---	---	54.0	---	---
H Max	2461.918	68.431		0.0	32.4	3.2	---	---	---	74.0	---	---	54.0	---	---
V	2483.5	21.734	12.9	0.0	32.4	3.2	57.3	48.5	74.0	-16.7	Pass	54.0	-5.5	Pass	
V	2488.275	24.047	12.0	0.0	32.4	3.3	59.7	47.7	74.0	-14.3	Pass	54.0	-6.3	Pass	
Table Result: Pass by -5.5 dB Worst Freq: 2483.5 MHz															
Test Site: EMI Chamber 1			Cable 1: Asset #2456			Cable 2: Asset #2457			Cable 3: ---						
Analyzer: Rental SA#3			Preamp: None			Antenna: Blue Horn			Preselector: ---						
CSsoft Radiated Emissions Calculator v 1.017.196											Copyright Curtis-Straus LLC 2000				
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															

802.11b

Radiated Emissions Table															
Date: 03-Nov-17			Company: Harmon			Work Order: R2501									
Engineer: Aristotelis Castemopoulos			EUT Desc: VG4 FCC Mid			EUT Operating Voltage/Frequency: 12VDC									
Temp: 24.5			Humidity: 37%			Pressure: 1008									
Frequency Range: 1-6GHz						Measurement Distance: 3 m									
Notes: 2.4GHz 802.11g 20MHz Tx Power=32						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)	
Power=32															
Low Edge															
V Max	2416.37	61.66		0.0	32.3	3.1	---	---	---	74.0	---	---	54.0	---	---
H Max	2416.095	58.700		0.0	32.3	3.1	---	---	---	74.0	---	---	54.0	---	---
V	2390.0	20.116	11.7	0.0	32.2	3.1	55.4	47.0	74.0	-18.6	Pass	54.0	-7.0	Pass	
V	2359.176	22.46	11.0	0.0	32.0	3.1	57.6	46.1	74.0	-16.4	Pass	54.0	-7.9	Pass	
V	2366.652	22.499	11.1	0.0	32.1	3.1	57.7	46.3	74.0	-16.3	Pass	54.0	-7.7	Pass	
High Edge															
V Max	2466.333	64.98		0.0	32.4	3.2	---	---	---	74.0	---	---	54.0	---	---
H Max	2466.036	60.157		0.0	32.4	3.2	---	---	---	74.0	---	---	54.0	---	---
V	2483.5	25.021	15.3	0.0	32.4	3.2	60.6	50.9	74.0	-13.4	Pass	54.0	-3.1	Pass	
V	2484.084	30.696	15.0	0.0	32.4	3.2	66.3	50.6	74.0	-7.7	Pass	54.0	-3.4	Pass	
V	2484.445	31.454	14.7	0.0	32.4	3.2	67.1	50.3	74.0	-6.9	Pass	54.0	-3.7	Pass	
V	2488.865	28.369	12.9	0.0	32.4	3.3	64.1	48.6	74.0	-9.9	Pass	54.0	-5.4	Pass	
Table Result: Pass by -3.1 dB Worst Freq: 2483.5 MHz															
Test Site: EMI Chamber 1			Cable 1: Asset #2456			Cable 2: Asset #2457			Cable 3: ---						
Analyzer: Rental SA#3			Preamp: None			Antenna: Blue Horn			Preselector: ---						
CSsoft Radiated Emissions Calculator v 1.017.196											Copyright Curtis-Straus LLC 2000				
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															

802.11g



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Radiated Emissions Table															
Date: 07-Nov-17					Company: Harmon					Work Order: R2501					
Engineer: Aristotelis Castemopoulos					EUT Desc: VG4 FCC Mid					EUT Operating Voltage/Frequency: 12VDC					
Temp: 23.6					Humidity: 22%					Pressure: 1015					
Frequency Range: 1-6GHz										Measurement Distance: 3 m					
Notes: 2.4GHz 802.11a 20MHz Tx Power=38										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)	
Power=38															
Low Edge															
V Max	2418.087	60.653		0.0	32.3	3.1				74.0			54.0		
H Max	2419.275	59.897		0.0	32.3	3.1				74.0			54.0		
V	2390.0	20.397	11.5	0.0	32.2	3.1	55.7	46.8	74.0	-18.3	Pass	54.0	-7.2	Pass	
V	2385.898	22.12	11.1	0.0	32.2	3.1	57.4	46.4	74.0	-16.6	Pass	54.0	-7.6	Pass	
V	2353.87	22.761	10.9	0.0	32.0	3.1	57.9	46.0	74.0	-16.1	Pass	54.0	-8.0	Pass	
High Edge															
V Max	2467.522	63.306		0.0	32.4	3.2			74.0			54.0			
H Max	2469.189	66.289													
V	2483.5	27.984	14.4	0.0	32.4	3.2	63.6	50.0	74.0	-10.4	Pass	54.0	-4.0	Pass	
V	2483.925	34.326	14.2	0.0	32.4	3.2	69.9	49.8	74.0	-4.1	Pass	54.0	-4.2	Pass	
V	2484.587	33.32	13.8	0.0	32.4	3.2	68.9	49.4	74.0	-5.1	Pass	54.0	-4.6	Pass	
V	2486.285	31.148	12.8	0.0	32.4	3.3	66.8	48.5	74.0	-7.2	Pass	54.0	-5.5	Pass	
Table Result: Pass by -4.0 dB Worst Freq: 2483.5 MHz															
Test Site: EMI Chamber 1			Cable 1: Asset #2456			Cable 2: Asset #2457			Cable 3: ---						
Analyzer: Rental SA#3			Preamp: None			Antenna: Blue Horn			Preselector: ---						
CSsoft Radiated Emissions Calculator v 1.017.197										Copyright Curtis-Straus LLC 2000					
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															

802.11a

Rev. 11/5/2017

Spectrum Analyzers / Receivers/Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
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
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Blue Horn	1-18GHz	3117	ETS	157647	1861	I	2/14/2019	2/14/2017
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#2081	HTC-1	HDE		2081	II	3/23/2018	3/23/2017	
Cables	Range	Mfr	Cat	Calibration Due	Calibrated on			
Asset #2456	9KHz-18GHz	MegaPhase	II	10/29/2018	10/29/2017			
Asset #2457	9KHz-18GHz	MegaPhase	II	10/29/2018	10/29/2017			

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

Band Edge Test Equipment Used



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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 powered by a vehicle battery 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		
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%	5%
Adjacent channel power	0.3dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	1.9dB	3dB
Conducted emission of receivers	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		
Voltage (AC, <10kHz)	1.3%	3%
Voltage (DC)	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:

CFR Title 47 FCC Part §15.247 and ISED Canada RSS-247 Issue 2

DUT Information

Model: GEN3.1 MID VA
Manufacturer: Harman International Industries, Inc.
Serial Number: 096

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



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Antenna Gain:

Frequency	Efficiency [%]	Peak Gain [dBi]	Efficiency [dB]
2400	27.5759	-0.346604	-5.594703045
2402	27.8658	-0.346006	-5.549284843
2405	27.8566	-0.171463	-5.550718919
2410	28.2118	-0.0276734	-5.495692036
2415	28.3198	0.0703329	-5.47909818
2420	28.4283	0.101875	-5.462491102
2425	28.7202	0.144621	-5.418125401
2430	29.0618	0.160079	-5.366774903
2435	29.1796	0.142808	-5.349206658
2440	29.2362	0.112557	-5.340790758
2441	29.2928	0.082306	-5.332391136
2445	29.1799	0.0388361	-5.349162008
2450	28.7984	-0.0614676	-5.406316404
2455	28.6374	-0.16971	-5.430664143
2460	28.8522	-0.228147	-5.39821066
2462	29.067	-0.286584	-5.365997894
2465	28.8558	-0.325766	-5.397668808
2470	28.7344	-0.448801	-5.415978669
2475	29.2672	-0.342111	-5.336188246
2480	29.8094	-0.21967	-5.256467653
2485	29.9644	-0.0947805	-5.233944141
2490	30.2587	0.0513981	-5.191497344
2495	31.19	0.216943	-5.059846252
2500	31.6833	0.378915	-4.991695904

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/Comparison 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 Circuits			II	7/13/2018	7/14/2017
10dB Attenuator-02 Yellow	30MHz-26GHz		Mini Circuits			II	7/13/2018	7/14/2017
10dB Attenuator-03 Red	30MHz-26GHz		Mini Circuits			II	7/13/2018	7/14/2017
10dB Attenuator-04 orange	30MHz-26GHz		Mini Circuits			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.



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	18.563	18.544	17.979	30	98.906
2 Mbps	18.872	18.779	18.219	30	97.839
5.5 Mbps	19.031	18.721	18.216	30	94.475
11 Mbps	18.871	18.494	18.276	30	90.058

802.11g (Power Setting: 32)

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)
6 Mbps	12.374	12.425	12.866	30	93.333
9 Mbps	12.448	12.505	12.955	30	90.333
12 Mbps	12.508	12.468	12.966	30	87.647
18 Mbps	12.51	12.578	13.003	30	82.767
24 Mbps	12.605	12.567	13.024	30	78.472
36 Mbps	12.692	12.587	13.042	30	71.474
48 Mbps	12.791	12.802	13.114	30	65.613
54 Mbps	12.767	12.794	13.159	30	63.737

802.11n(HT20) (Power Setting: 38)

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	11.264	11.196	11.717	30	92.867
MCS1	11.23	11.326	11.798	30	87.018
MCS2	11.259	11.268	11.767	30	82.153
MCS3	11.324	11.316	11.803	30	78.085
MCS4	11.434	11.422	11.836	30	71.426
MCS5	11.437	11.475	11.835	30	66.198
MCS6	11.534	11.488	11.968	30	64.208
MCS7	11.521	11.529	11.874	30	62.092

Peak Power Spectral Density

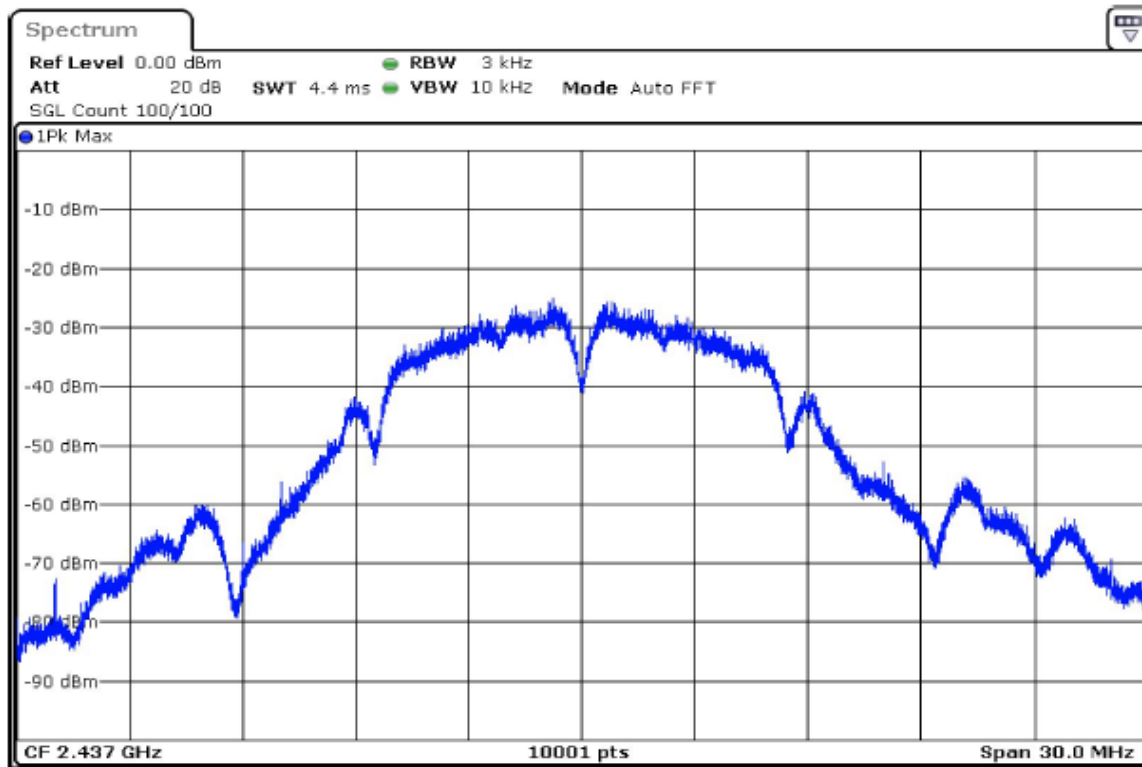
Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 10.2

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	-3.861	-3.301	-4.958	8
2 Mbps	-3.242	-3.180	-4.227	8
5.5 Mbps	-3.675	-3.419	-4.682	8
11 Mbps	-4.082	-4.765	-4.388	8

802.11b 2Mbps 2437MHz

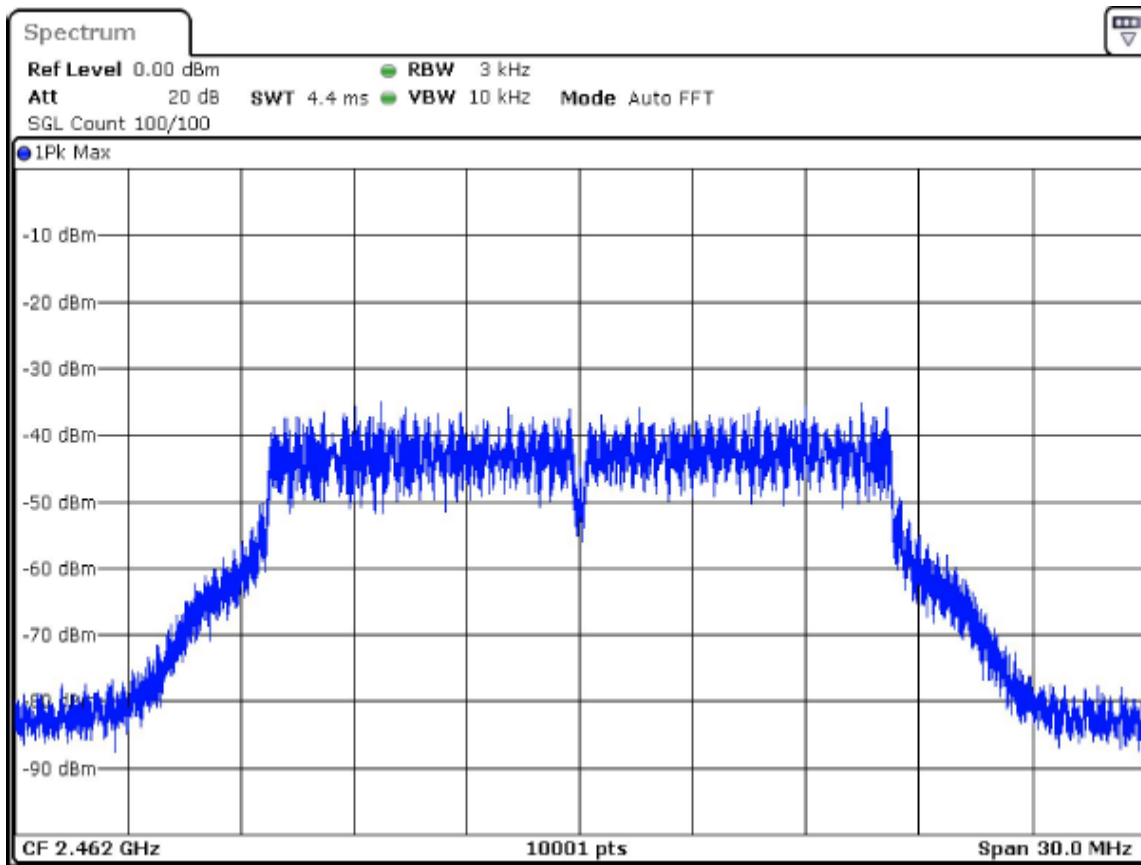


802.11g (Power Setting: 32)



Data Rate	Peak PSD (dBm) 2412 MHz	Peak PSD (dBm) 2437 MHz	Peak PSD (dBm) 2462 MHz	Limit (dBm)
6 Mbps	-13.467	-13.430	-13.065	8
9 Mbps	-14.415	-14.260	-13.763	8
12 Mbps	-13.370	-13.444	-13.058	8
18 Mbps	-14.490	-14.402	-14.010	8
24 Mbps	-13.760	-13.730	-13.285	8
36 Mbps	-14.713	-14.759	-14.409	8
48 Mbps	-15.313	-15.320	-15.018	8
54 Mbps	-15.665	-15.590	-15.338	8

802.11g 12Mbps 2462MHz



802.11n(HT20) (Power Setting: 38)

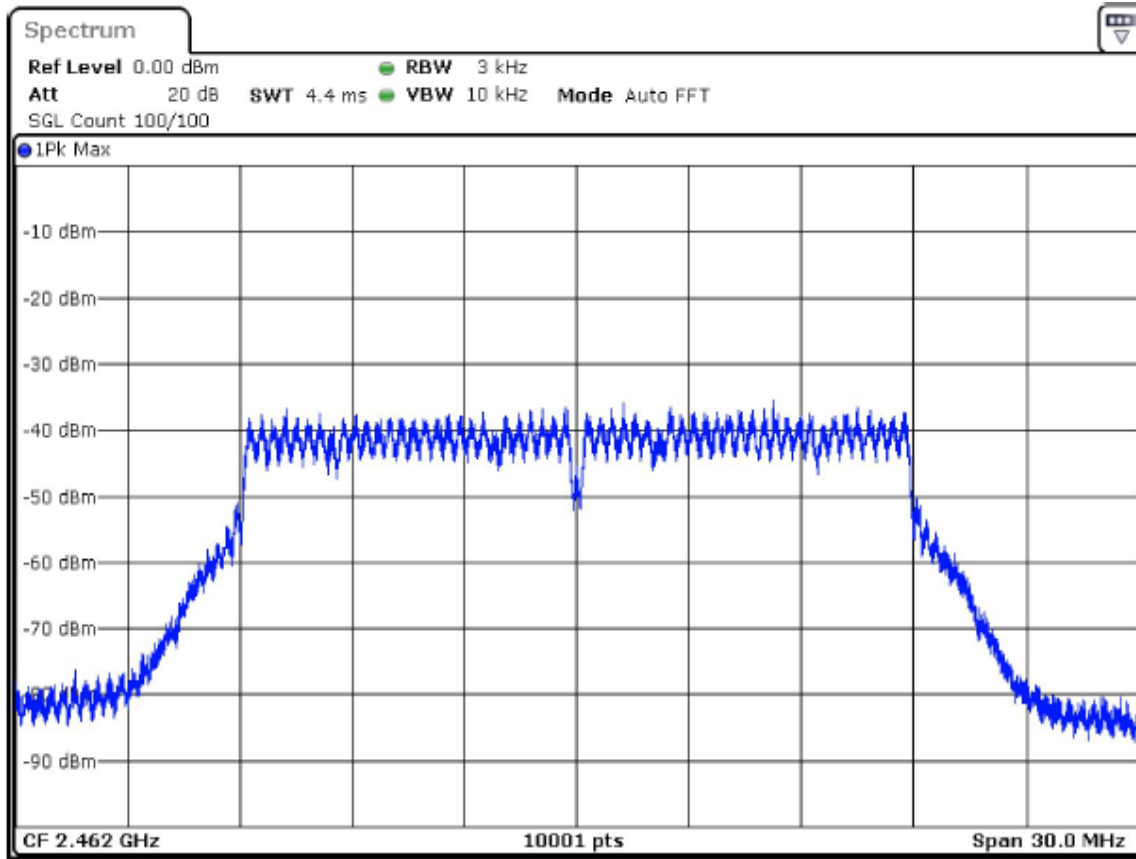


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Data Rate	Peak PSD (dBm) 2412 MHz	Peak PSD (dBm) 2437 MHz	Peak PSD (dBm) 2462 MHz	Limit (dBm)
MCS0	-14.307	-13.953	-13.570	8
MCS1	-14.288	-14.499	-14.410	8
MCS2	-14.658	-13.660	-14.815	8
MCS3	-14.502	-14.276	-14.654	8
MCS4	-15.252	-14.229	-14.633	8
MCS5	-15.377	-14.955	-14.436	8
MCS6	-15.019	-14.494	-14.297	8
MCS7	-15.120	-14.676	-14.503	8

802.11n(HT20) MCS0 2462MHz



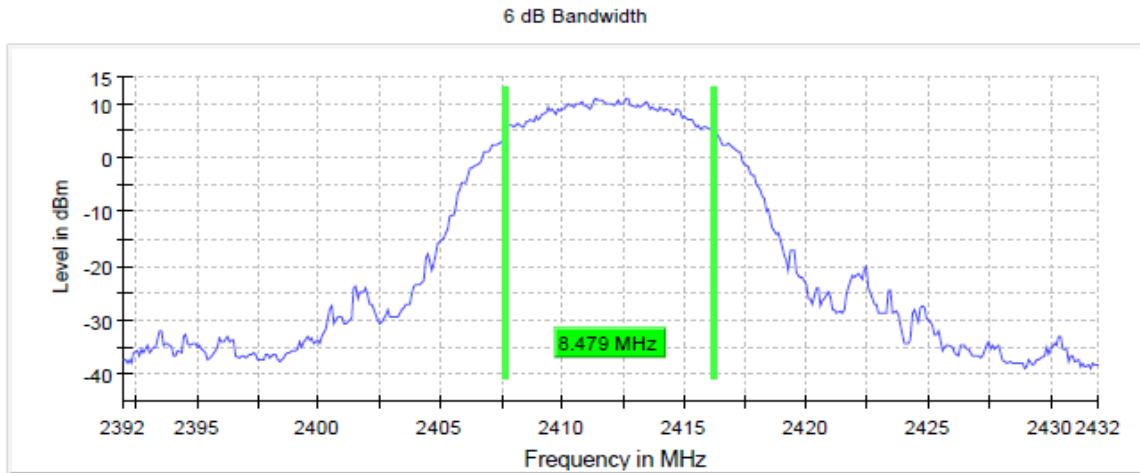
DTS Bandwidth (6dB)

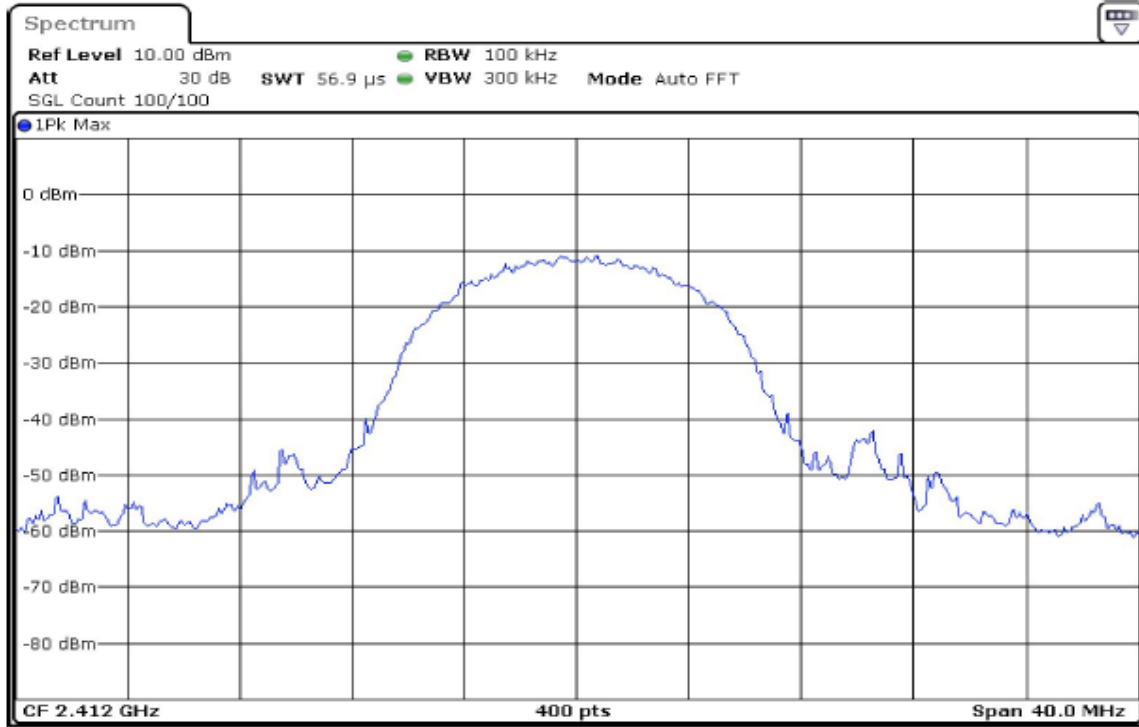
Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 8.1

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

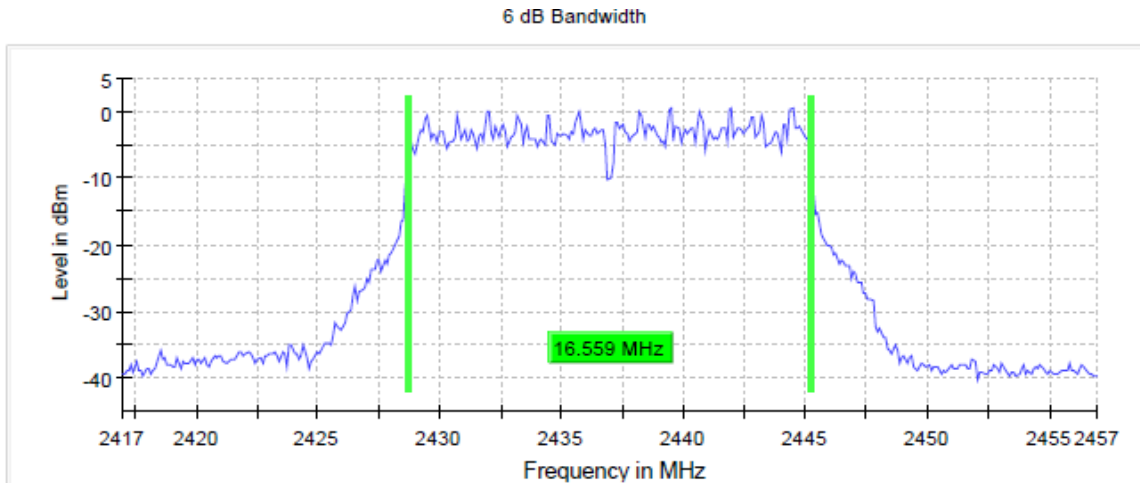
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Minimum Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11b 5.5 Mbps	2412.000	8.478803	0.5	2407.710723	2416.189526
802.11g 54 Mbps	2412.000	16.458853	0.5	2403.720698	2420.179551
802.11n(HT20) MCS6	2412.000	17.955112	0.5	2403.022444	2420.977556
802.11b 5.5 Mbps	2437.000	8.478803	0.5	2432.710723	2441.189526
802.11g 54 Mbps	2437.000	16.558604	0.5	2428.720698	2445.279302
802.11n(HT20) MCS6	2437.000	17.855361	0.5	2428.022444	2445.877805
802.11b 5.5 Mbps	2462.000	8.179551	0.5	2457.810474	2465.990025
802.11g 54 Mbps	2462.000	16.558604	0.5	2453.720698	2470.279302
802.11n(HT20) MCS6	2462.000	17.855361	0.5	2453.022444	2470.877805

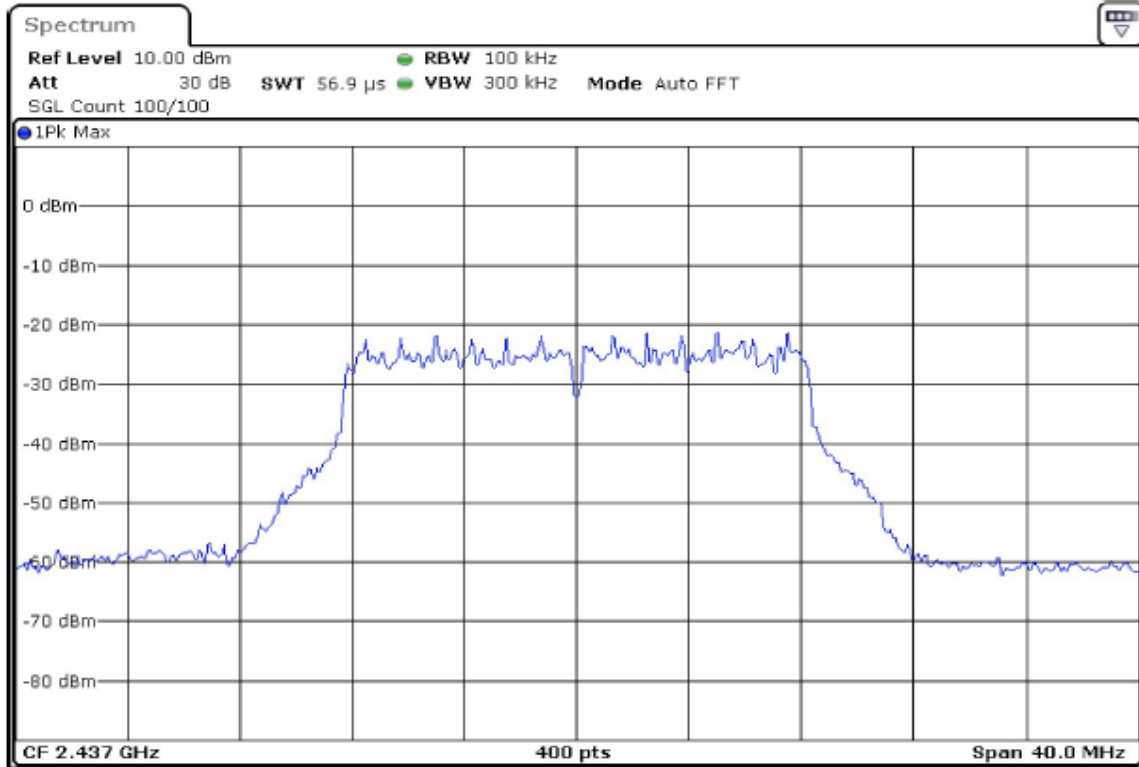
802.11b 5.5Mbps 2412MHz





802.11g 54 Mbps 2437MHz

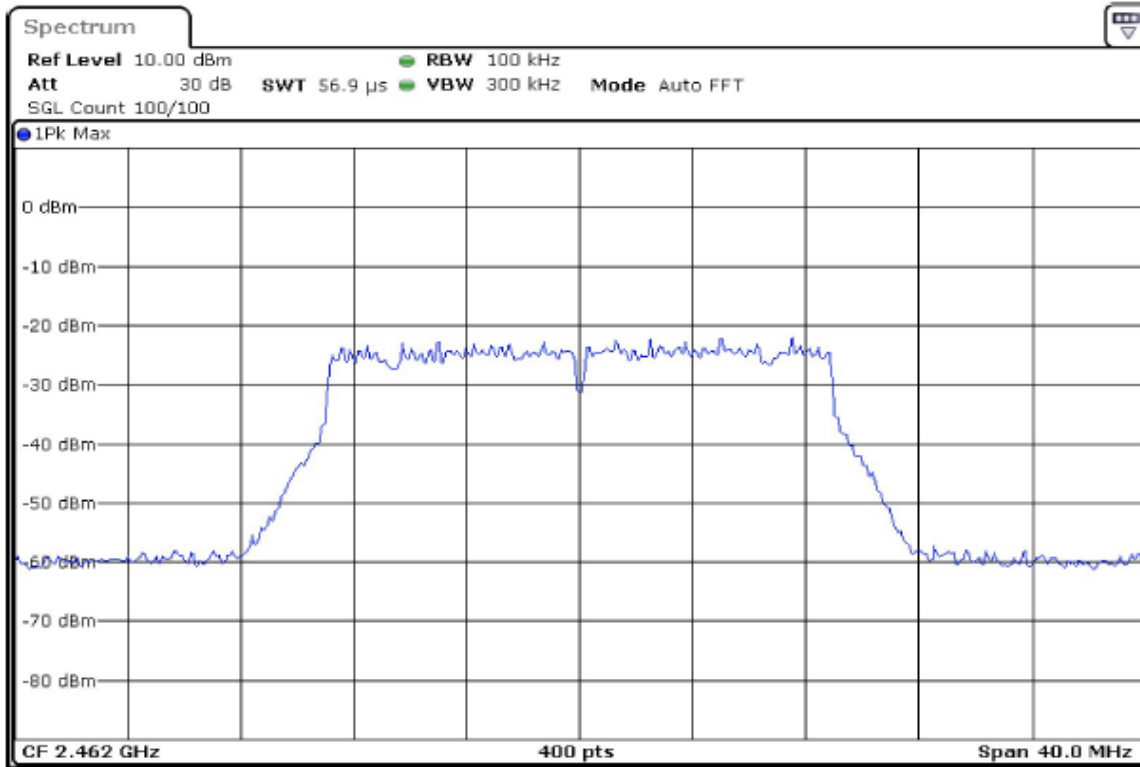




802.11n(HT20) MCS6 2462MHz

6 dB Bandwidth





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 5.5Mbps 2412MHz

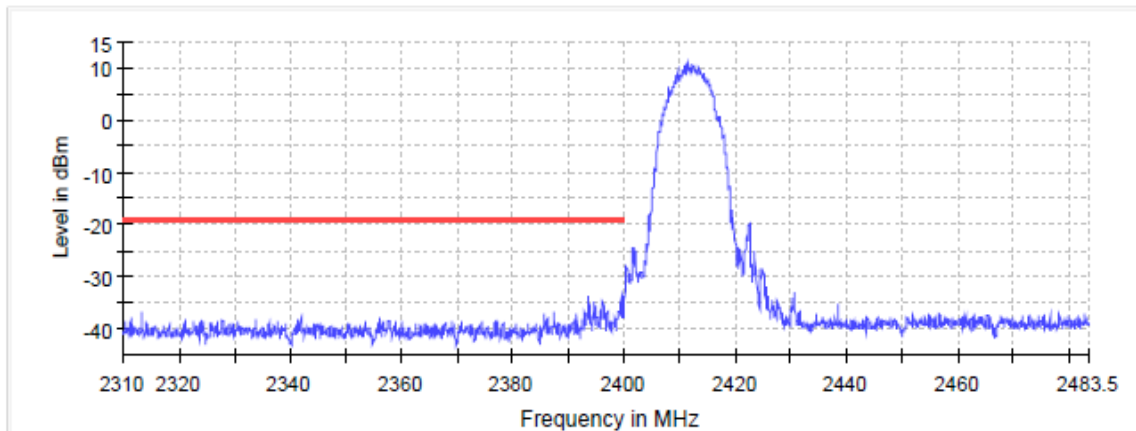
Band Edge Low

Inband Peak

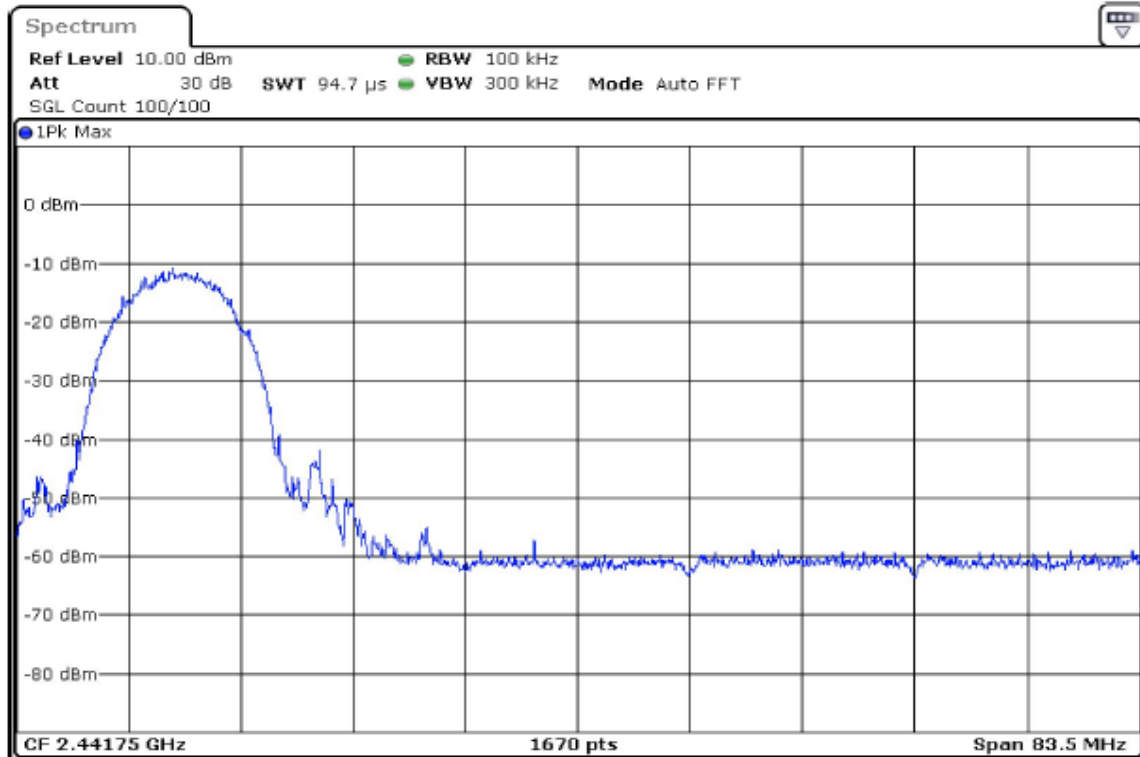
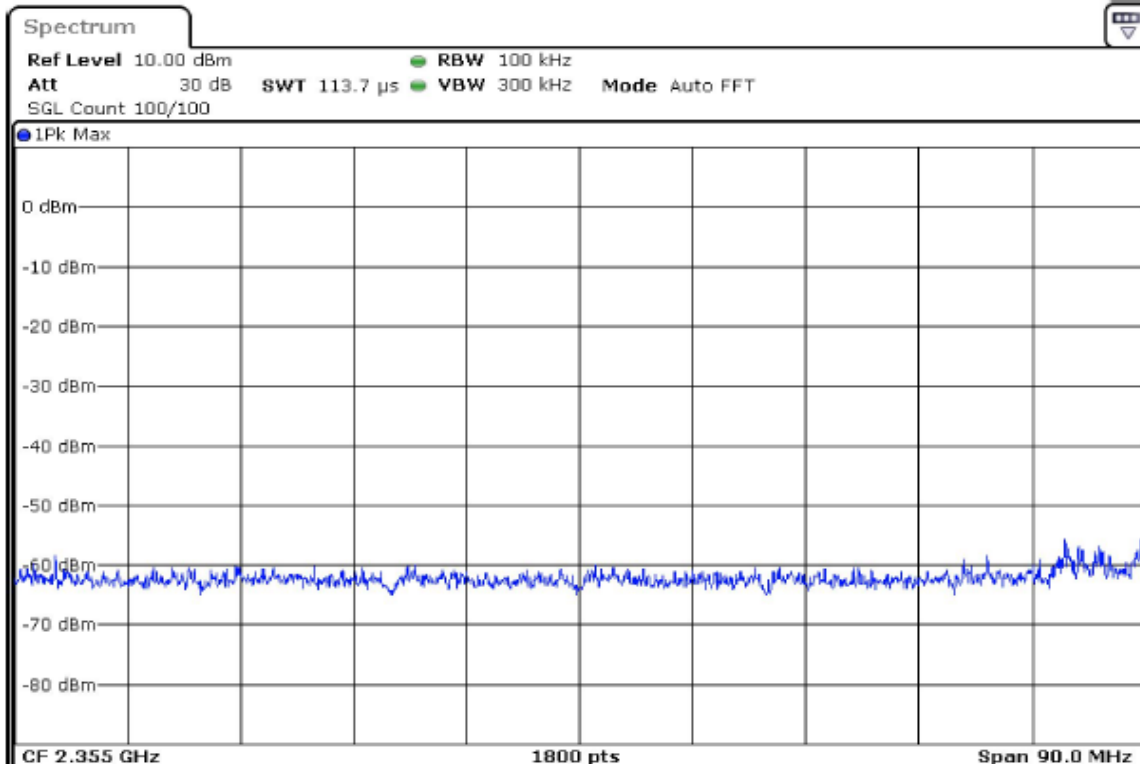
Frequency (MHz)	Level (dBm)
2411.618043	11.0

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.525264	-33.7	14.8	-19.0	PASS
2393.478623	-33.8	14.8	-19.0	PASS
2399.475292	-33.8	14.8	-19.0	PASS
2393.528595	-34.4	15.5	-19.0	PASS
2393.428651	-34.6	15.6	-19.0	PASS
2396.177124	-34.8	15.9	-19.0	PASS
2394.528040	-35.0	16.0	-19.0	PASS
2394.578012	-35.1	16.1	-19.0	PASS
2399.425319	-35.2	16.2	-19.0	PASS
2396.127152	-35.3	16.4	-19.0	PASS
2394.478068	-35.3	16.4	-19.0	PASS
2393.778456	-35.4	16.5	-19.0	PASS
2399.225430	-35.5	16.5	-19.0	PASS
2396.227096	-35.6	16.6	-19.0	PASS
2394.827873	-35.7	16.7	-19.0	PASS



— Limit — Sum Level × Fail



802.11b 5.5Mbps 2462MHz

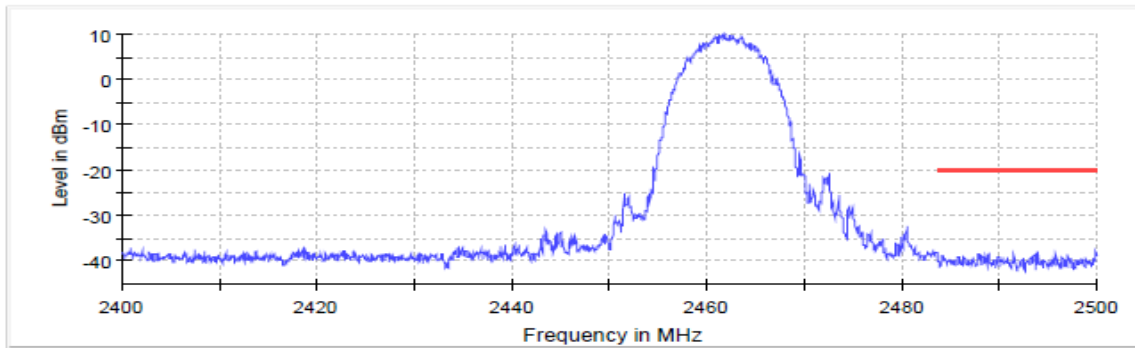
Band Edge High

Inband Peak

Frequency (MHz)	Level (dBm)
2461.538151	10.0

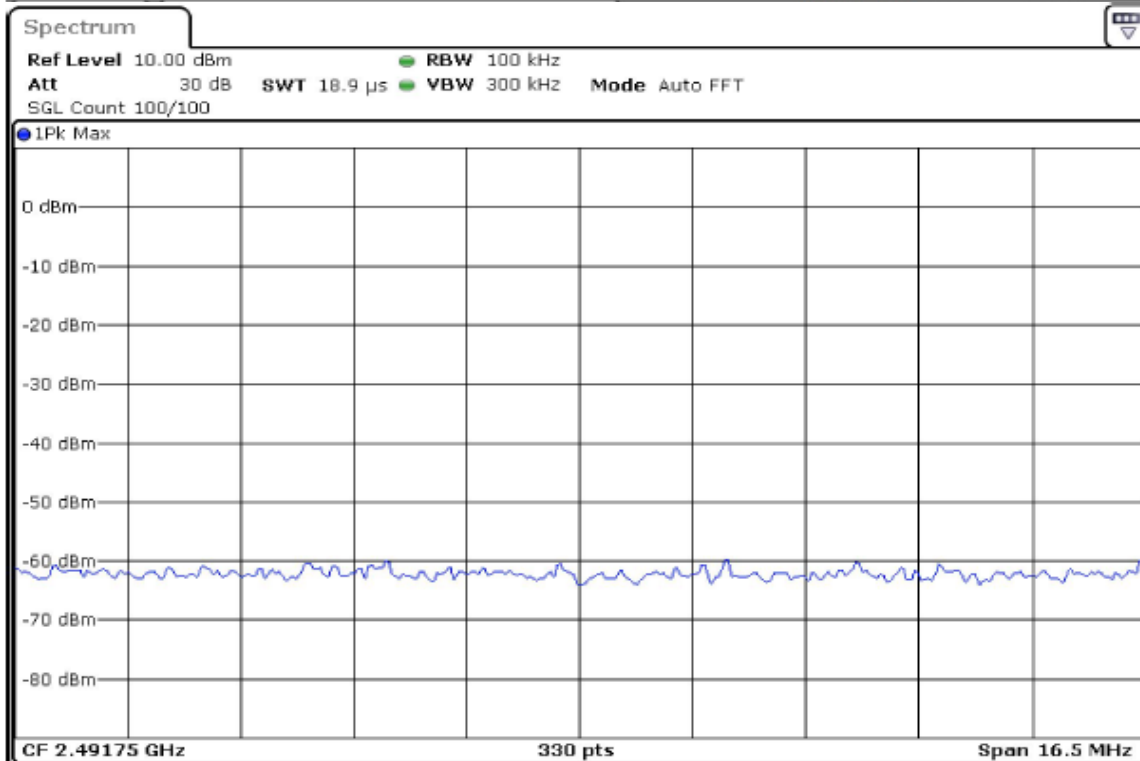
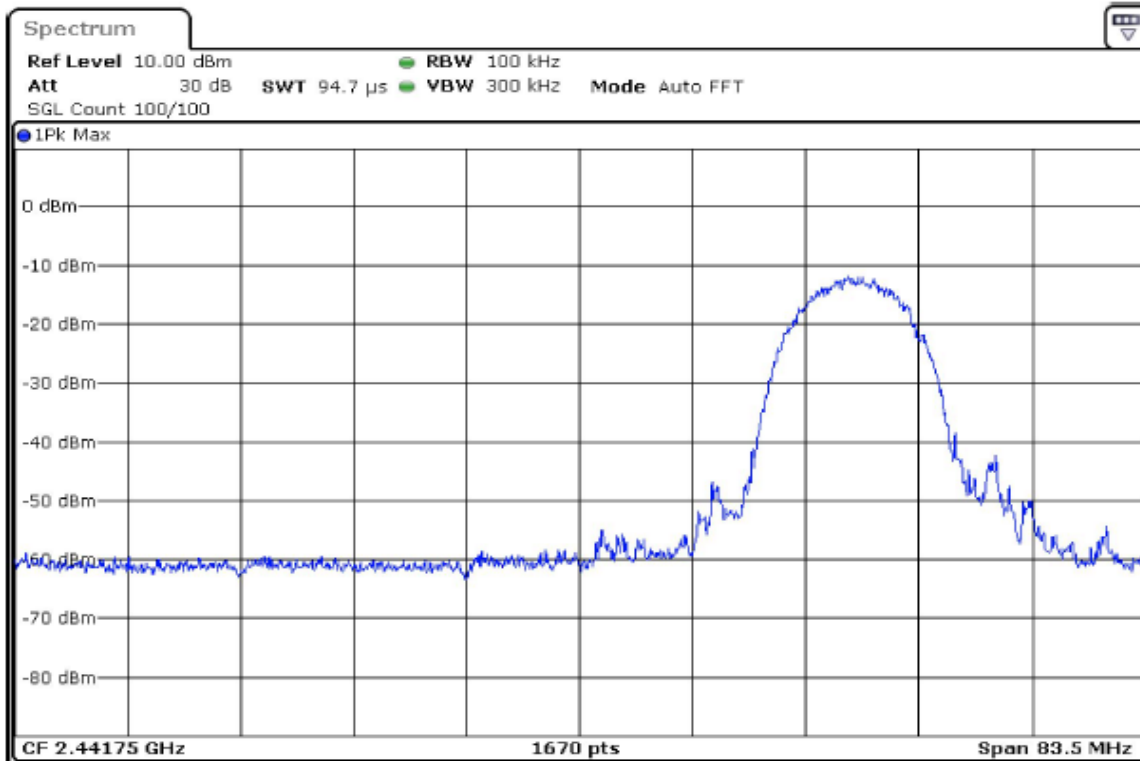
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2493.843656	-37.7	17.7	-20.0	PASS
2493.893505	-37.9	17.9	-20.0	PASS
2499.875378	-37.9	17.9	-20.0	PASS
2488.908610	-38.0	18.0	-20.0	PASS
2499.825529	-38.1	18.0	-20.0	PASS
2488.958459	-38.2	18.1	-20.0	PASS
2495.737915	-38.3	18.3	-20.0	PASS
2487.762085	-38.4	18.3	-20.0	PASS
2495.787764	-38.4	18.4	-20.0	PASS
2487.811934	-38.5	18.5	-20.0	PASS
2496.934290	-38.6	18.5	-20.0	PASS
2491.450906	-38.6	18.6	-20.0	PASS
2493.544562	-38.6	18.6	-20.0	PASS
2488.709215	-38.6	18.6	-20.0	PASS
2491.401057	-38.7	18.7	-20.0	PASS



— Limit — Sum Level × Fail





802.11g 54 Mbps 2412MHz

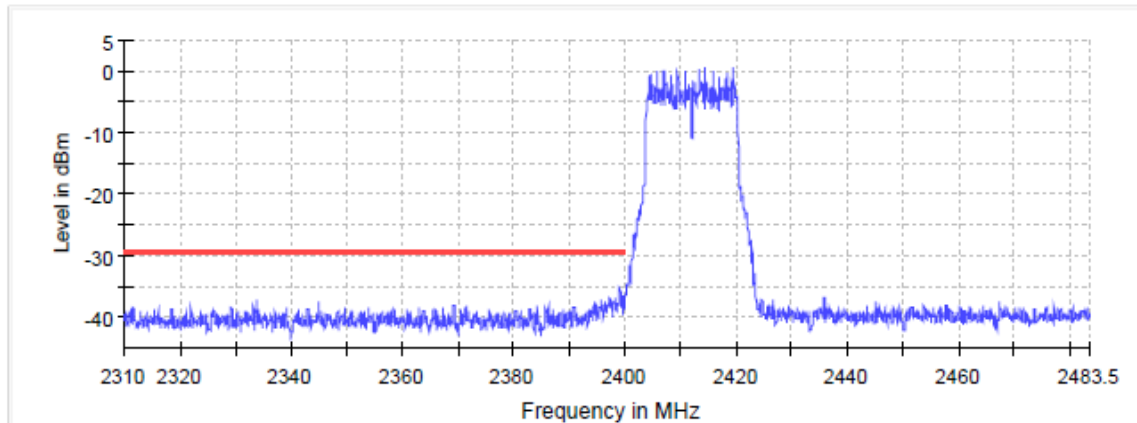
Band Edge Low

Inband Peak

Frequency (MHz)	Level (dBm)
2414.516308	0.6

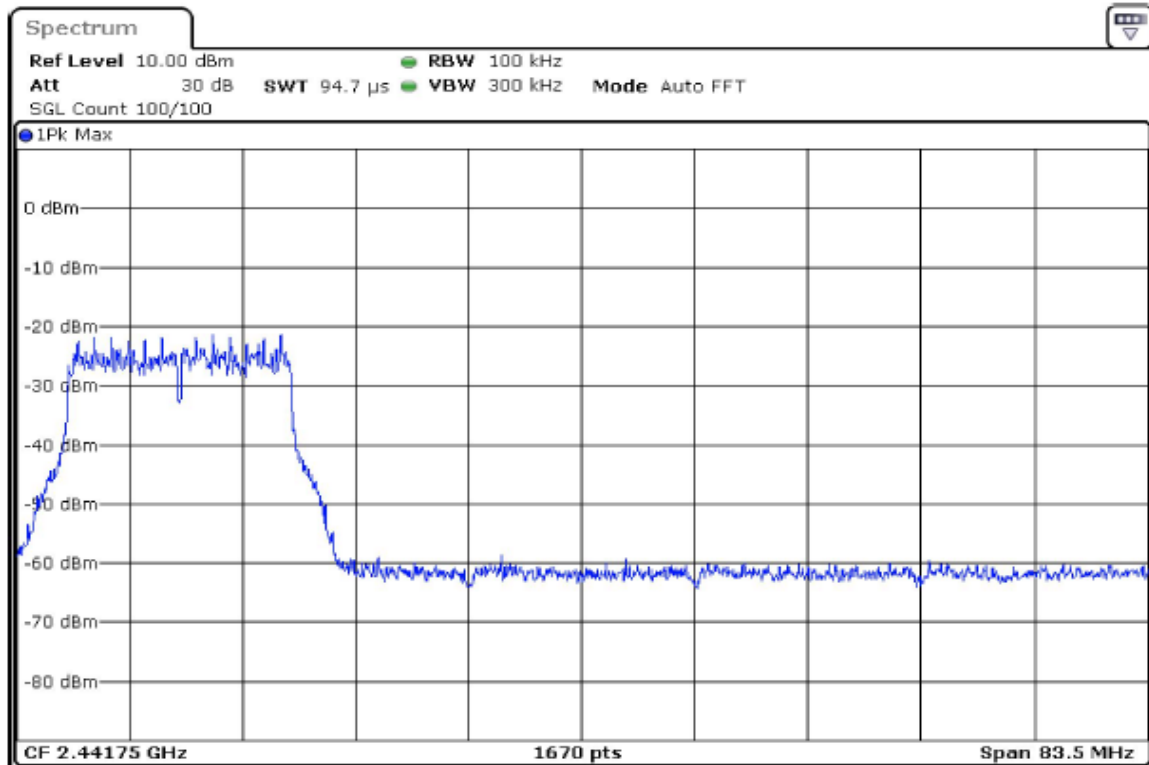
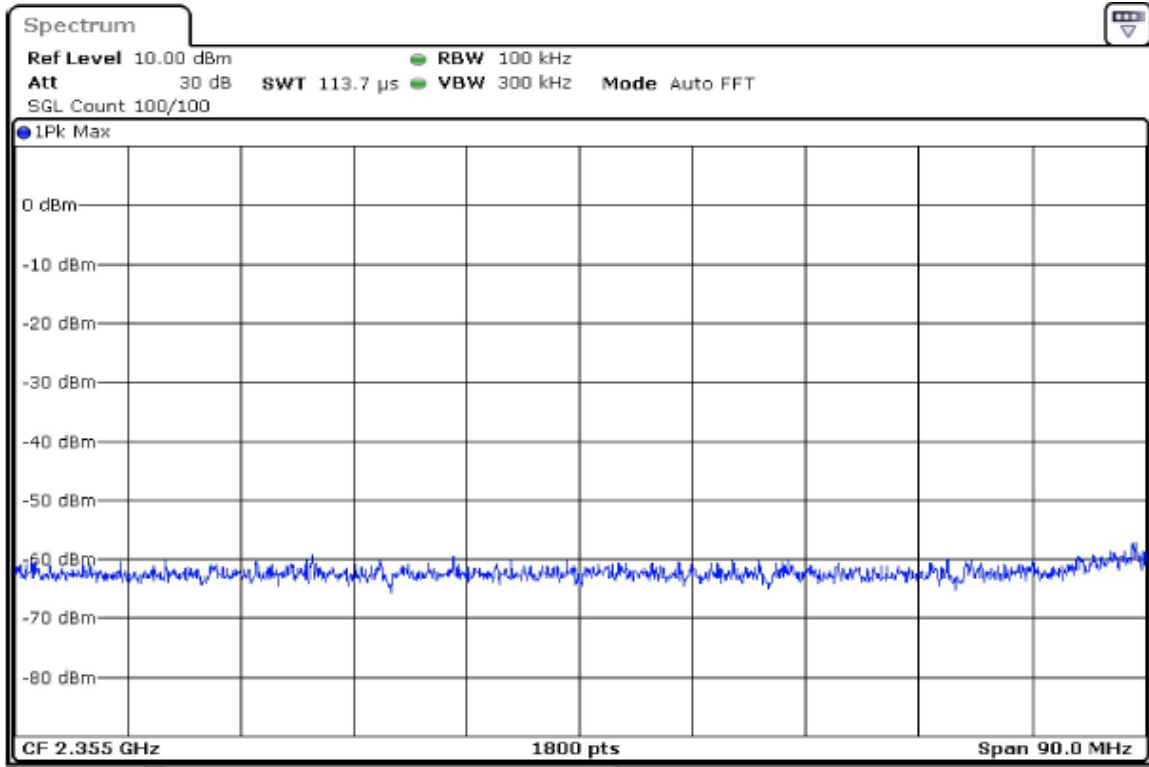
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.075514	-35.4	6.0	-29.4	PASS
2398.875625	-35.5	6.1	-29.4	PASS
2398.825652	-35.6	6.3	-29.4	PASS
2399.125486	-36.0	6.6	-29.4	PASS
2398.925597	-36.2	6.8	-29.4	PASS
2399.025541	-36.2	6.8	-29.4	PASS
2399.175458	-36.4	7.0	-29.4	PASS
2399.725153	-36.7	7.3	-29.4	PASS
2398.176013	-36.8	7.4	-29.4	PASS
2397.026652	-36.8	7.4	-29.4	PASS
2397.076624	-36.8	7.5	-29.4	PASS
2397.276513	-36.9	7.5	-29.4	PASS
2399.775125	-36.9	7.5	-29.4	PASS
2398.225986	-36.9	7.6	-29.4	PASS
2399.225430	-37.0	7.7	-29.4	PASS



— Limit — Sum Level × Fail





802.11g 54 Mbps 2462MHz

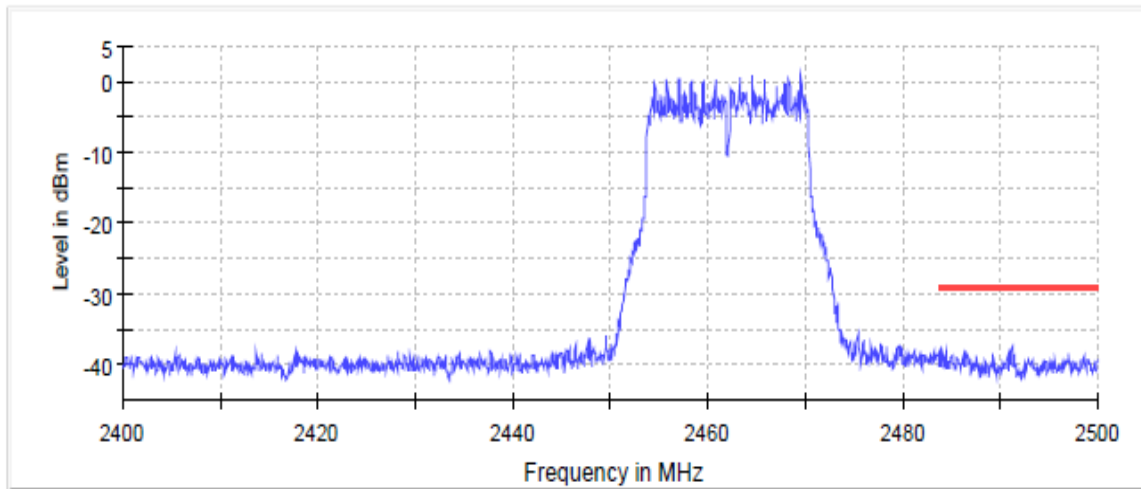
Band Edge High

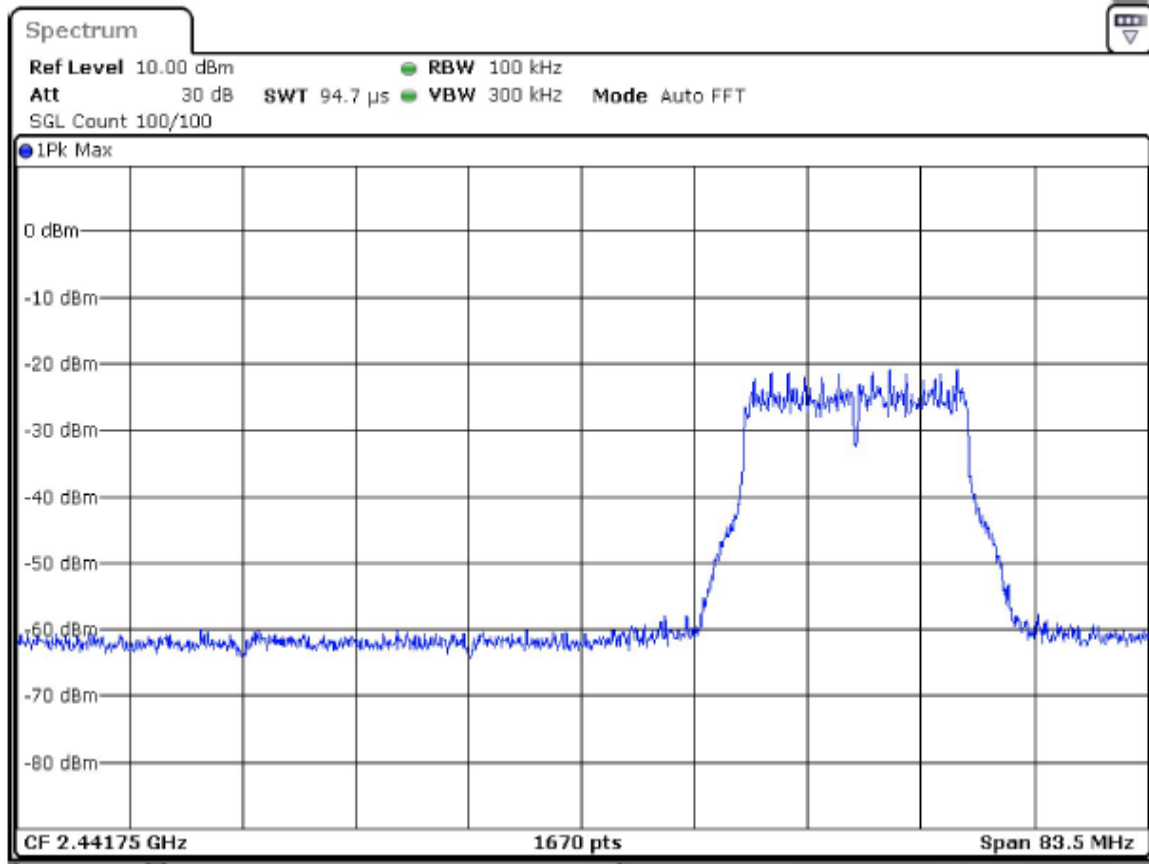
Inband Peak

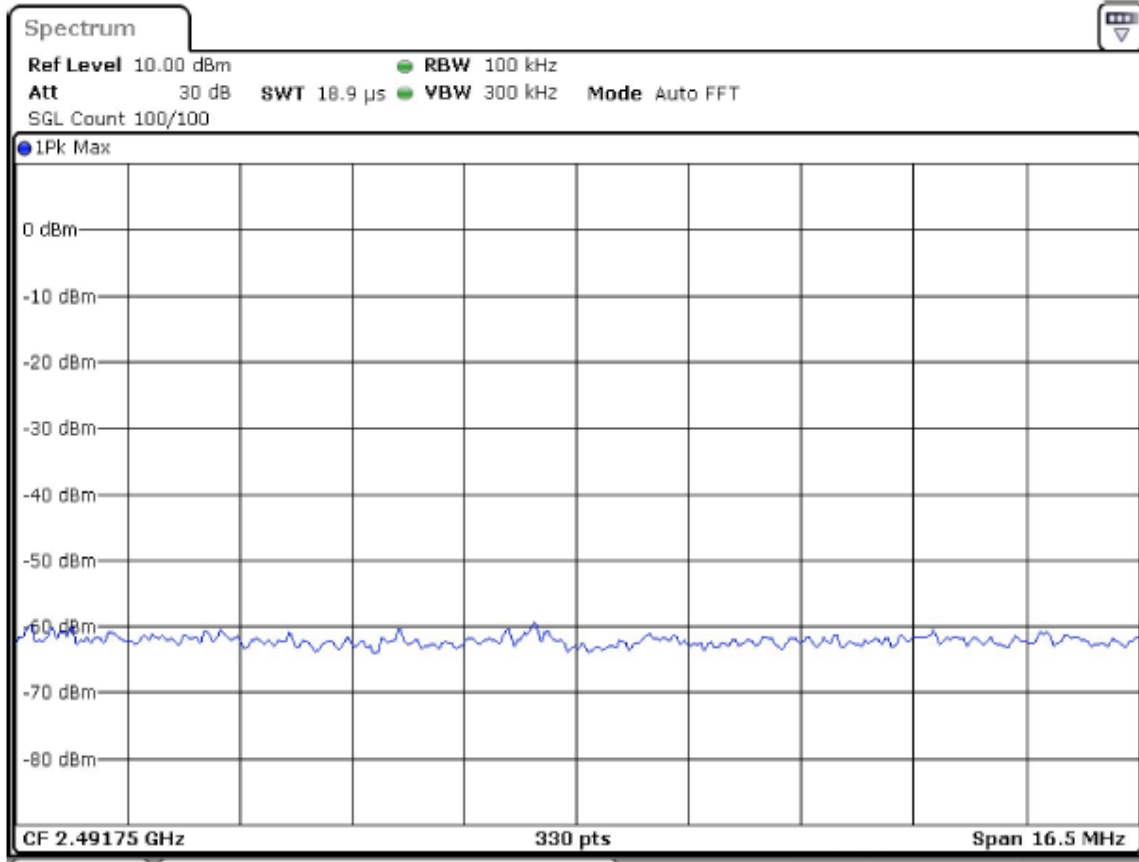
Frequency (MHz)	Level (dBm)
2464.486385	1.1

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2491.101964	-37.4	8.5	-28.9	PASS
2491.151813	-37.7	8.8	-28.9	PASS
2483.724320	-37.8	8.8	-28.9	PASS
2483.774169	-38.1	9.2	-28.9	PASS
2484.322508	-38.3	9.3	-28.9	PASS
2491.052115	-38.3	9.3	-28.9	PASS
2484.073263	-38.3	9.4	-28.9	PASS
2484.372356	-38.3	9.4	-28.9	PASS
2490.703172	-38.4	9.4	-28.9	PASS
2489.157855	-38.4	9.4	-28.9	PASS
2496.934290	-38.4	9.5	-28.9	PASS
2489.108006	-38.4	9.5	-28.9	PASS
2484.023414	-38.5	9.5	-28.9	PASS
2483.674471	-38.5	9.6	-28.9	PASS
2486.515861	-38.5	9.6	-28.9	PASS







802.11n(HT20) MCS6 2412MHz

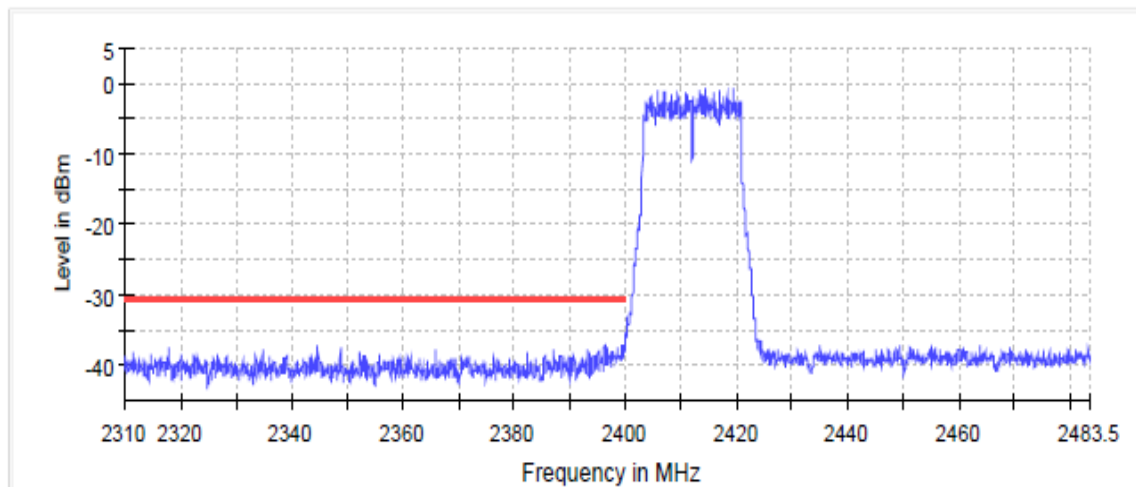
Band Edge Low

Inband Peak

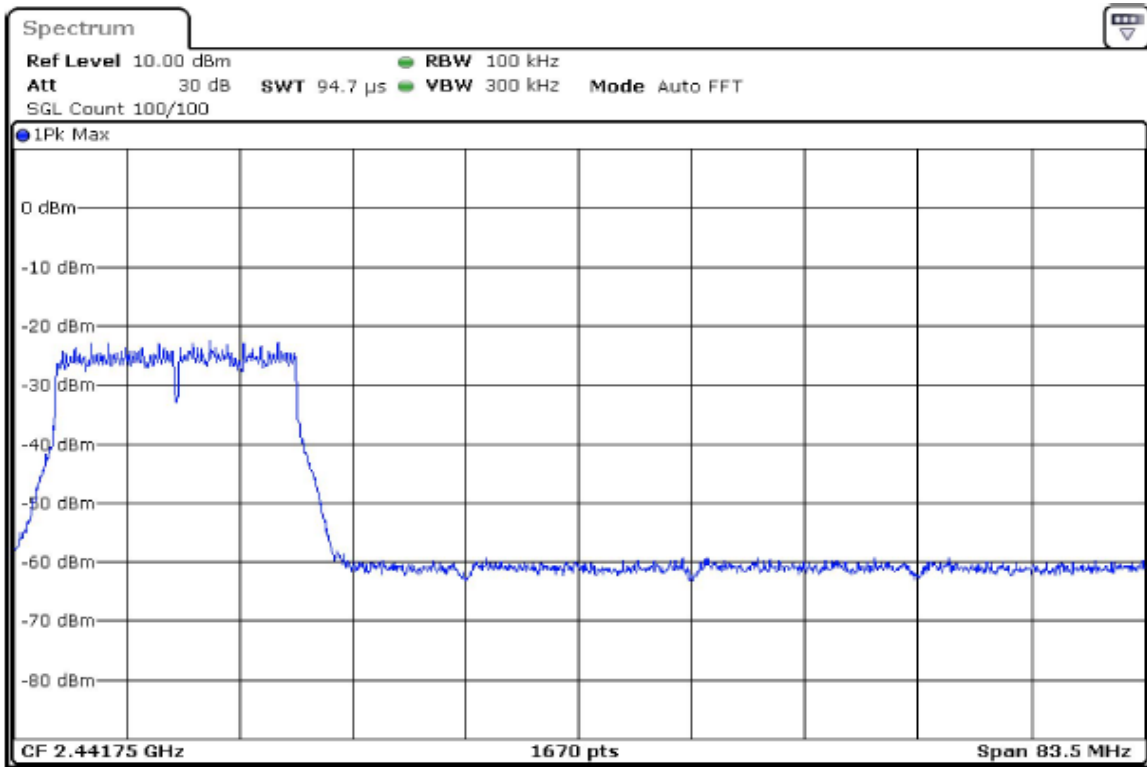
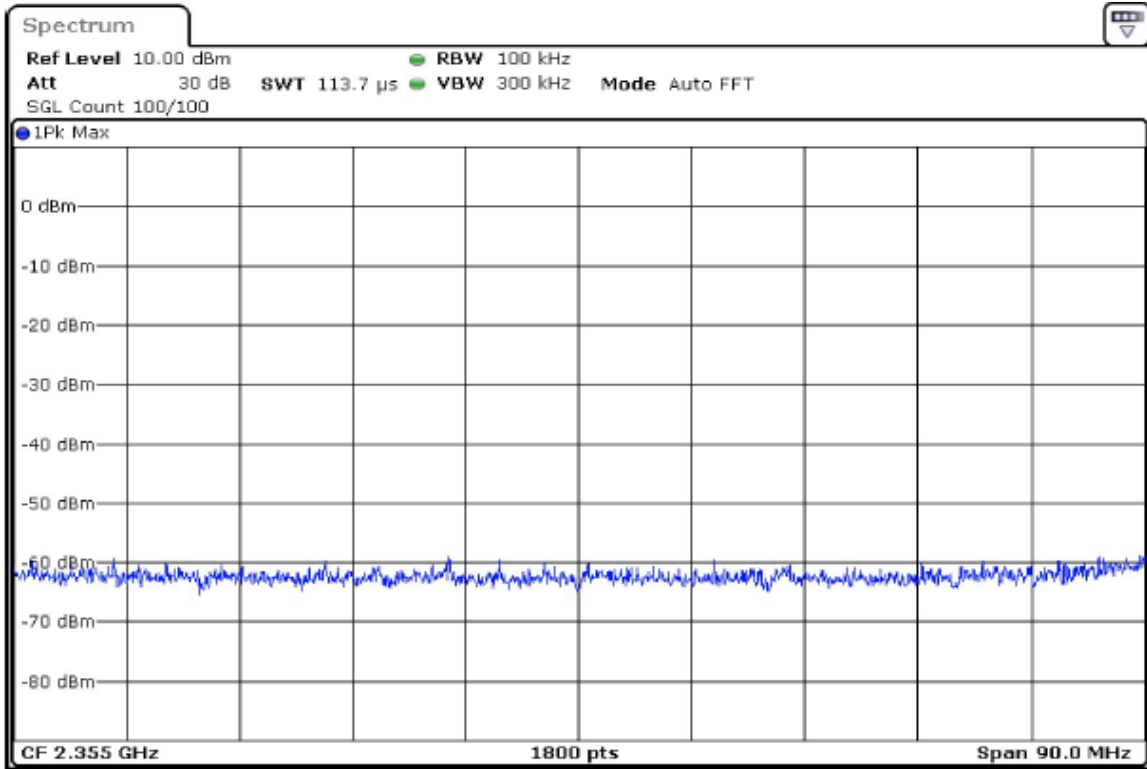
Frequency (MHz)	Level (dBm)
2414.516308	-0.6

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.475292	-37.0	6.4	-30.6	PASS
2396.227096	-37.1	6.5	-30.6	PASS
2344.655747	-37.1	6.5	-30.6	PASS
2399.725153	-37.2	6.6	-30.6	PASS
2399.925042	-37.3	6.7	-30.6	PASS
2399.425319	-37.3	6.7	-30.6	PASS
2399.525264	-37.4	6.8	-30.6	PASS
2396.177124	-37.5	6.9	-30.6	PASS
2317.970572	-37.5	6.9	-30.6	PASS
2398.425875	-37.5	6.9	-30.6	PASS
2318.020544	-37.5	6.9	-30.6	PASS
2396.676846	-37.5	6.9	-30.6	PASS
2399.775125	-37.5	6.9	-30.6	PASS
2348.703498	-37.6	7.0	-30.6	PASS
2398.475847	-37.6	7.0	-30.6	PASS



— Limit — Sum Level × Fail



802.11n(HT20) MCS6 2462MHz

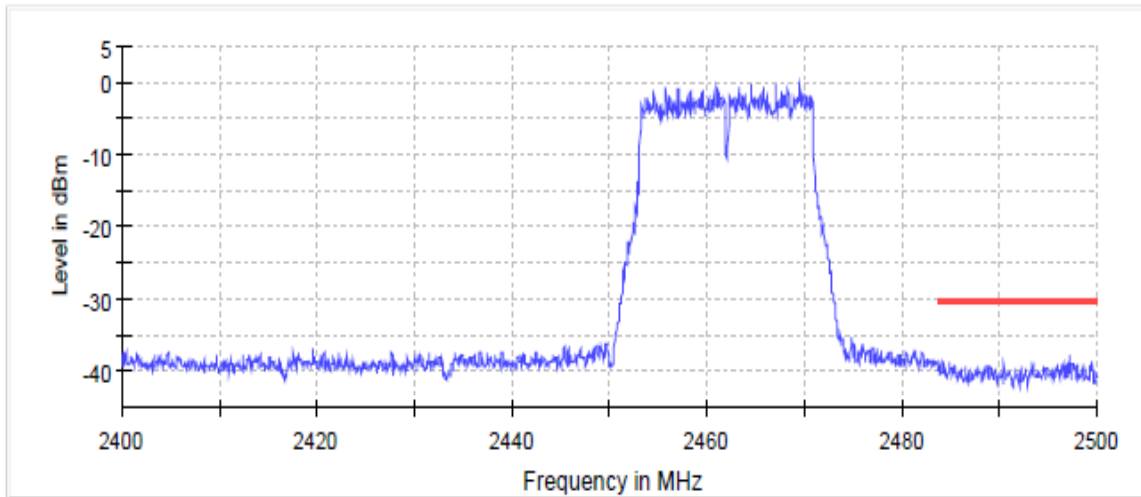
Band Edge High

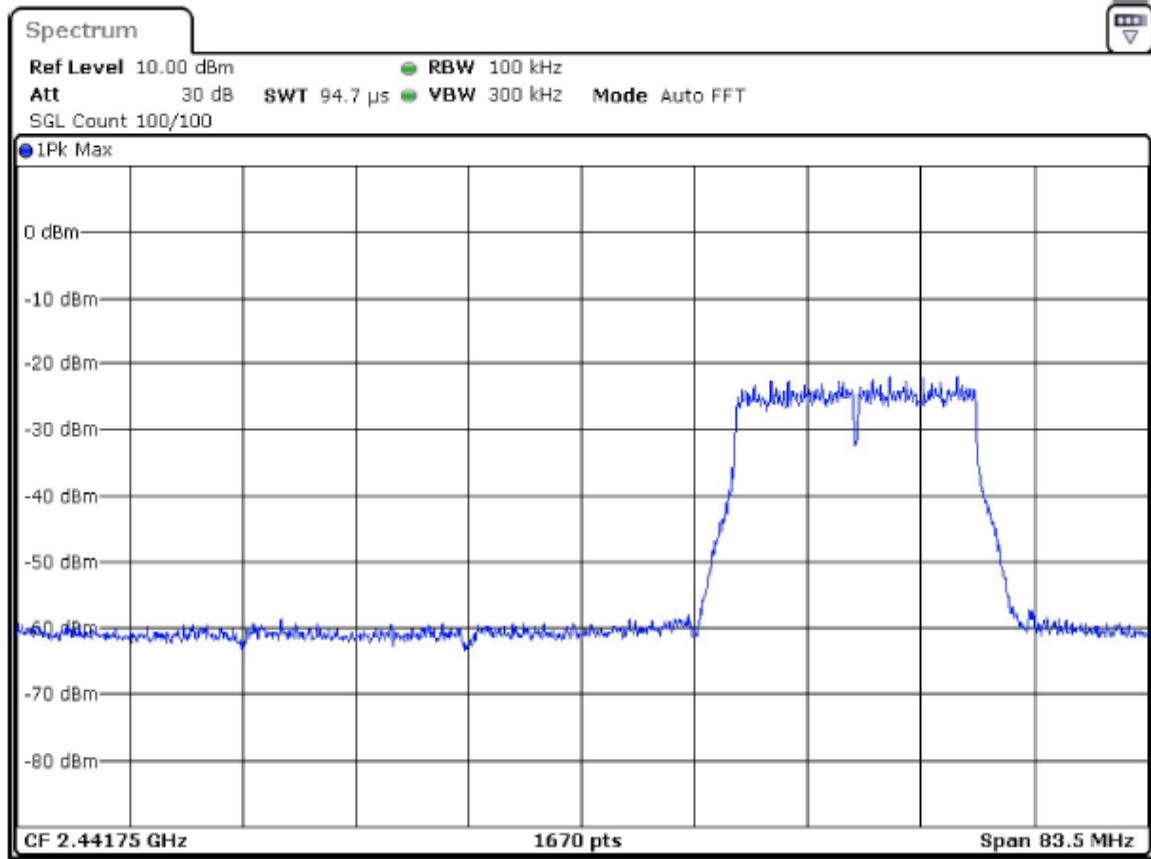
Inband Peak

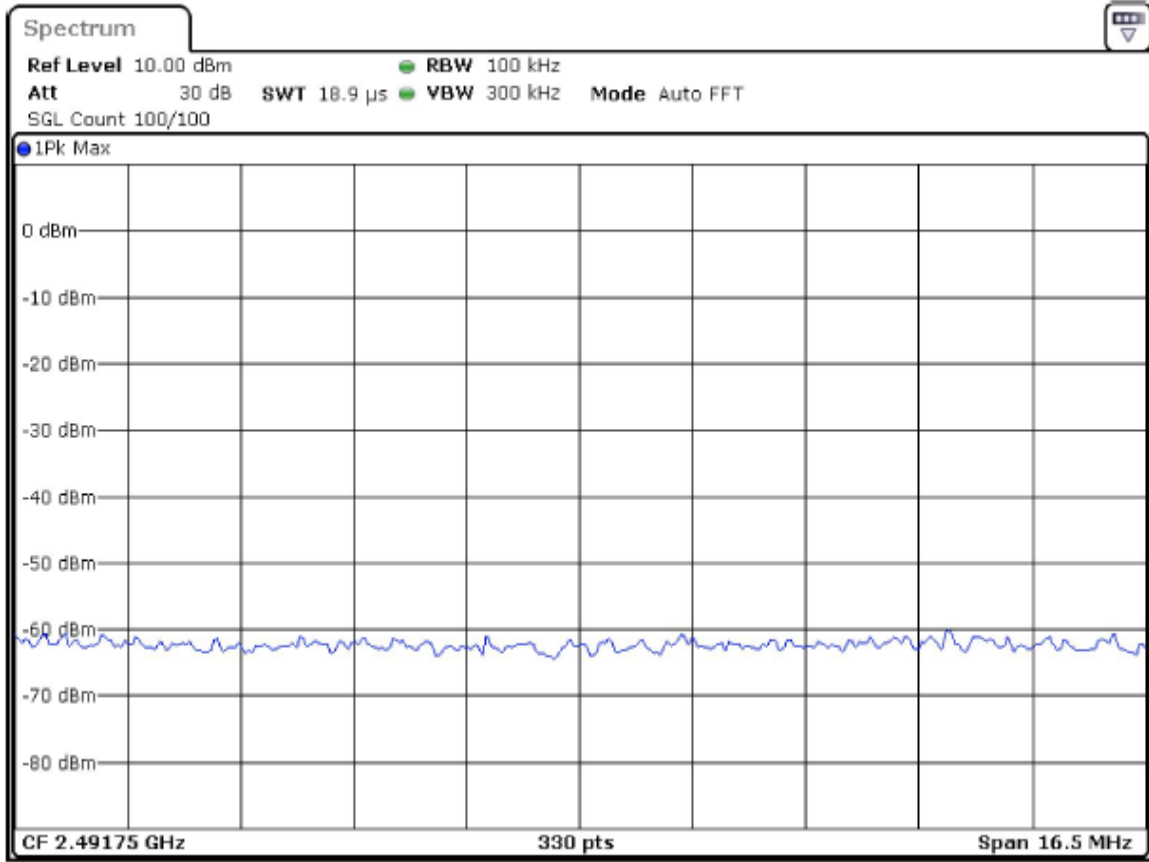
Frequency (MHz)	Level (dBm)
2464.486385	-0.2

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2497.083837	-37.9	7.7	-30.2	PASS
2497.033988	-38.4	8.2	-30.2	PASS
2483.524924	-38.6	8.5	-30.2	PASS
2493.195619	-38.7	8.5	-30.2	PASS
2483.973565	-38.7	8.5	-30.2	PASS
2484.272659	-38.8	8.6	-30.2	PASS
2483.923716	-38.8	8.6	-30.2	PASS
2499.476586	-38.8	8.6	-30.2	PASS
2484.222810	-38.8	8.7	-30.2	PASS
2484.820997	-38.9	8.7	-30.2	PASS
2499.426737	-38.9	8.7	-30.2	PASS
2497.133686	-38.9	8.8	-30.2	PASS
2493.245468	-38.9	8.8	-30.2	PASS
2484.771148	-39.0	8.8	-30.2	PASS
2496.435801	-39.0	8.9	-30.2	PASS







Conducted Spurious Emissions

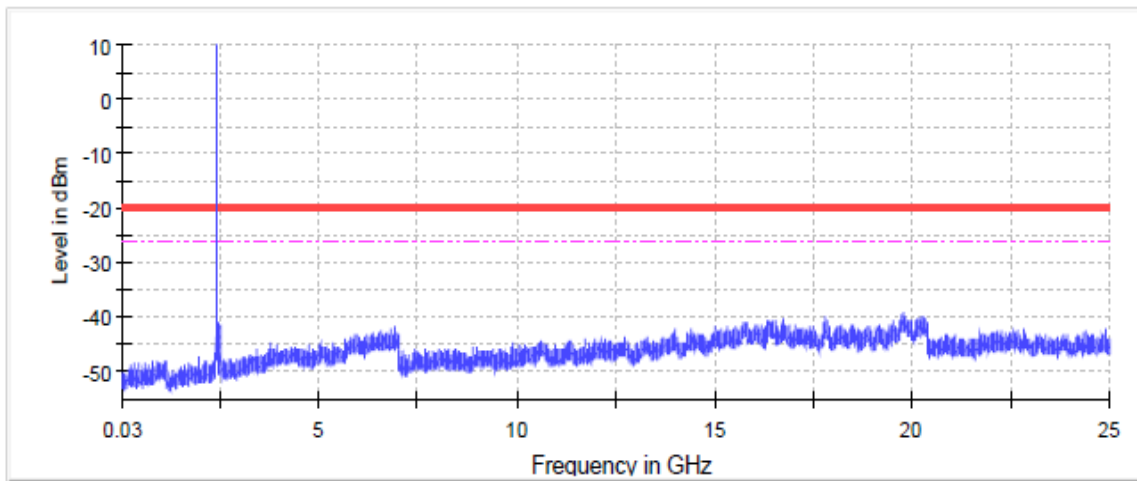
Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 11.

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

802.11b 5.5 Mbps 2412MHz

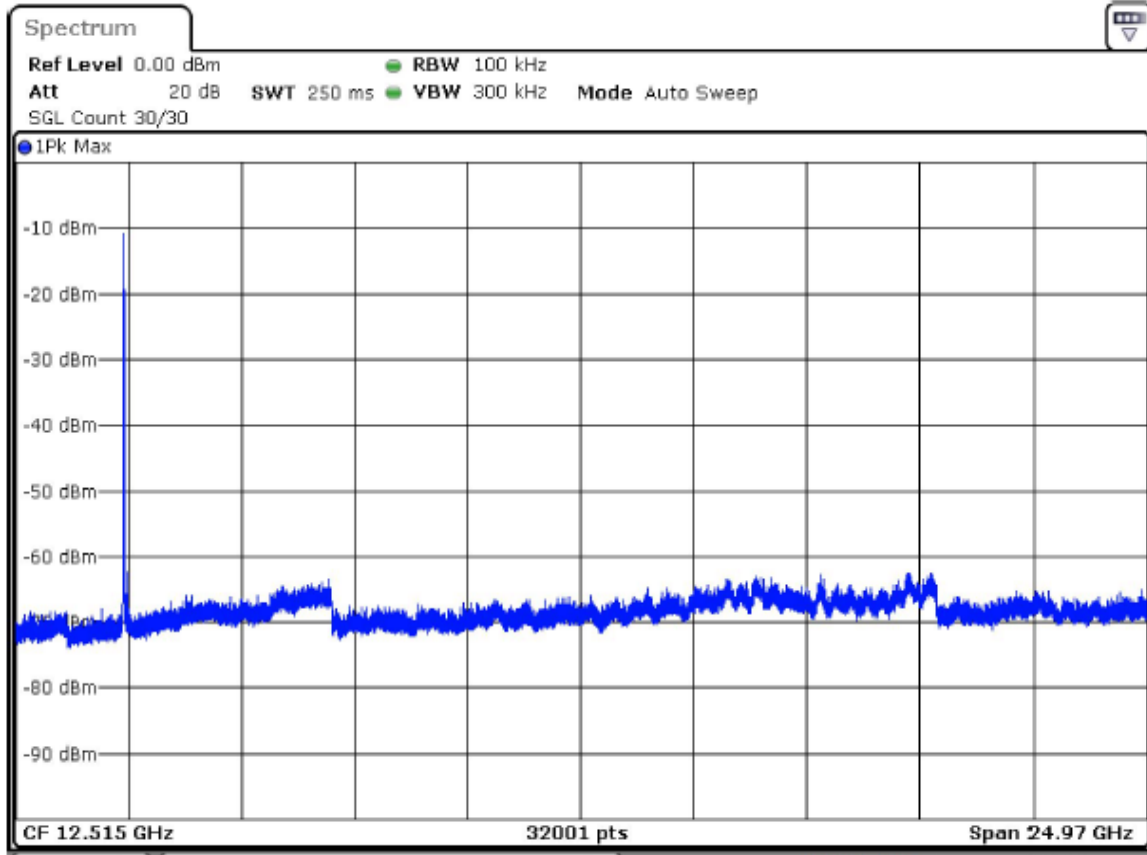
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2396.149772	-35.8	15.7	-20.0
2394.589244	-36.3	16.3	-20.0
2393.028717	-37.0	17.0	-20.0
2393.808981	-37.3	17.3	-20.0
2399.270827	-37.4	17.4	-20.0
19764.820480	-39.2	19.2	-20.0
19725.807293	-39.3	19.3	-20.0
19785.107337	-39.3	19.3	-20.0
20288.377445	-39.7	19.7	-20.0
2395.369508	-39.7	19.7	-20.0
2398.490563	-39.8	19.8	-20.0
19778.865227	-39.8	19.8	-20.0
19760.919161	-39.8	19.8	-20.0
20257.947160	-39.9	19.8	-20.0
17828.205893	-39.9	19.9	-20.0



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



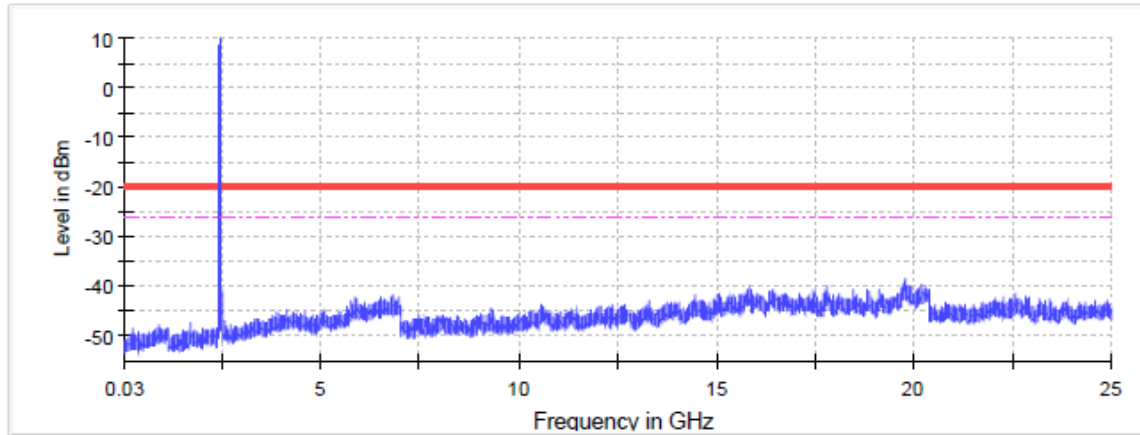


802.11b 5.5 Mbps 2437MHz

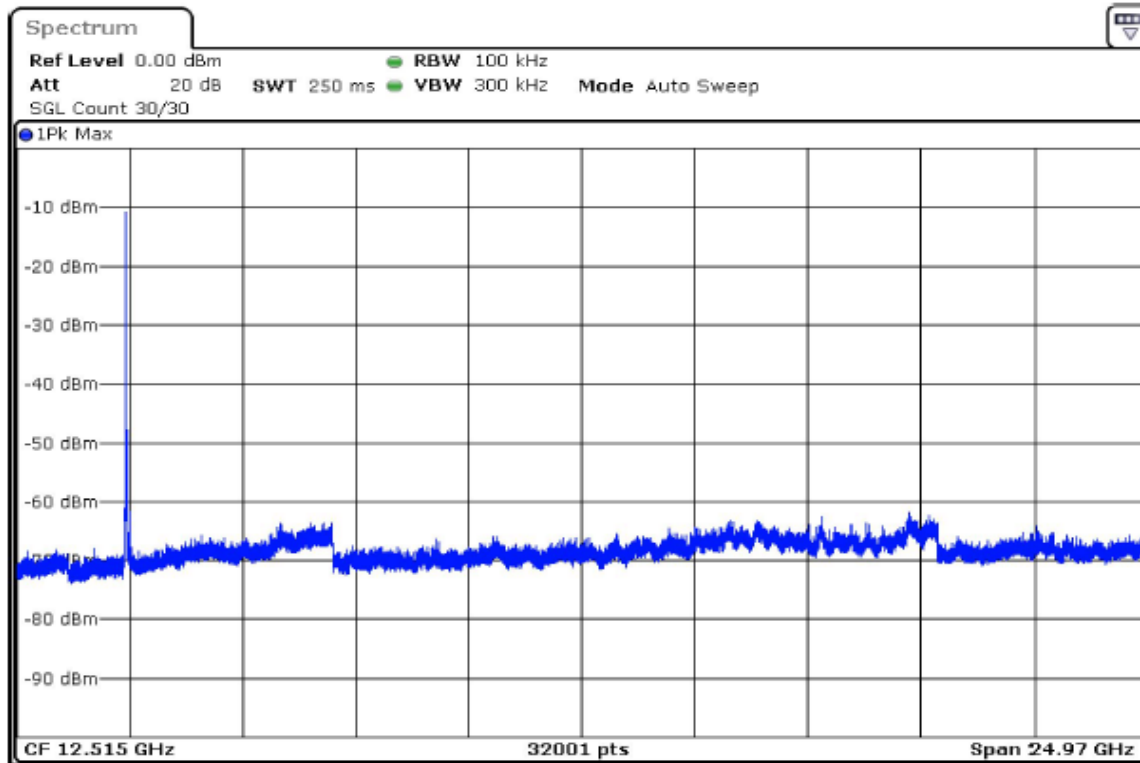
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19758.578370	-38.6	18.5	-20.0
19768.721799	-39.2	19.2	-20.0
19720.345447	-39.6	19.5	-20.0
20196.306325	-39.6	19.6	-20.0
19739.852040	-39.7	19.7	-20.0
17821.183520	-39.8	19.7	-20.0
19763.259953	-39.8	19.8	-20.0
19774.183645	-39.8	19.8	-20.0
19875.617930	-39.9	19.9	-20.0
19948.962721	-39.9	19.9	-20.0
19806.954722	-39.9	19.9	-20.0
19789.788919	-40.0	19.9	-20.0
19820.999469	-40.0	20.0	-20.0
20192.405006	-40.0	20.0	-20.0
19751.555997	-40.0	20.0	-20.0





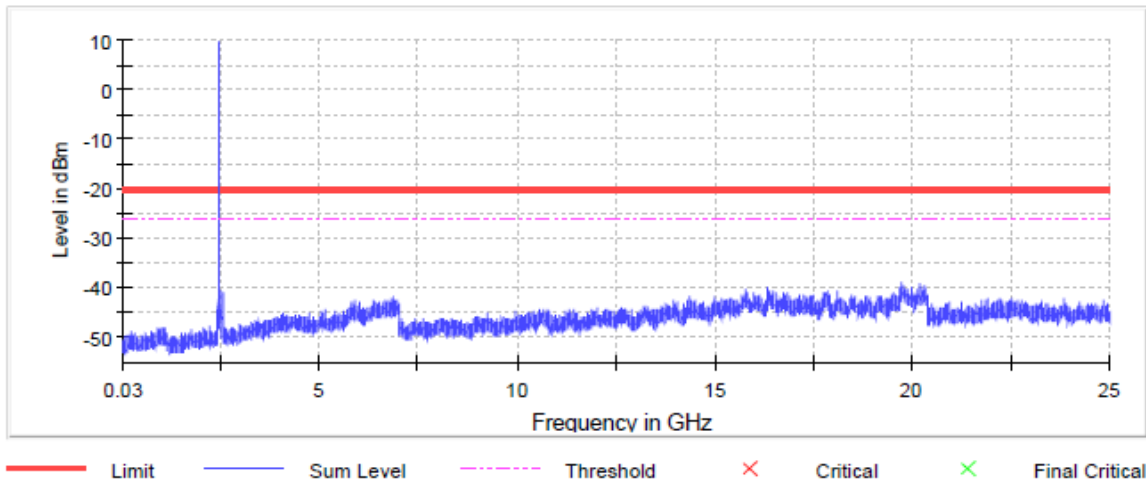
— Limit — Sum Level - - - Threshold X Critical X Final Critical

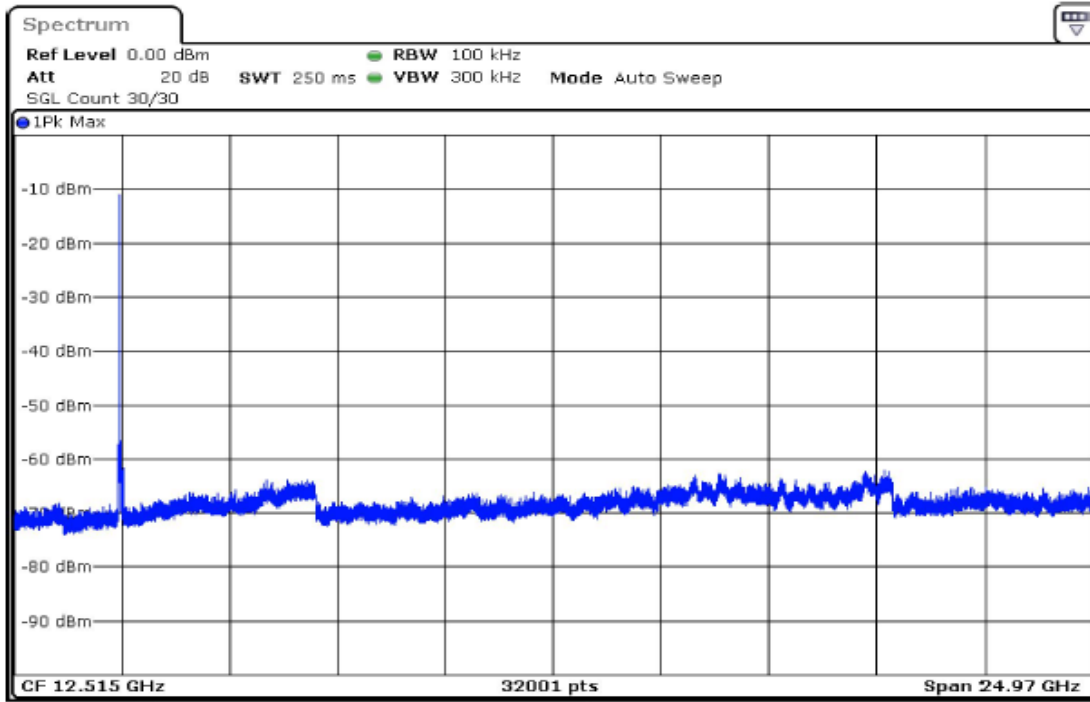


802.11b 5.5Mbps 2462MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19743.753359	-38.8	18.6	-20.2
20196.306325	-39.2	19.0	-20.2
19735.950722	-39.3	19.1	-20.2
20274.332698	-39.3	19.1	-20.2
19778.865227	-39.5	19.3	-20.2
20189.283951	-39.5	19.3	-20.2
19779.645491	-39.5	19.3	-20.2
20199.427380	-39.5	19.3	-20.2
20290.718236	-39.6	19.3	-20.2
20278.234017	-39.6	19.4	-20.2
19787.448128	-39.7	19.4	-20.2
19964.567996	-39.7	19.5	-20.2
19757.017843	-39.8	19.5	-20.2
19723.466502	-39.8	19.6	-20.2
19767.161271	-39.8	19.6	-20.2

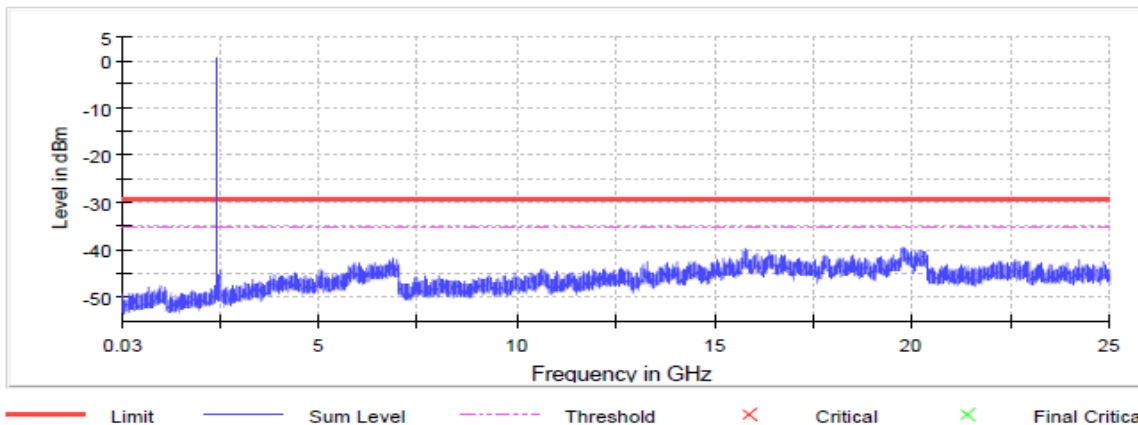




802.11g 54 Mbps 2412MHz

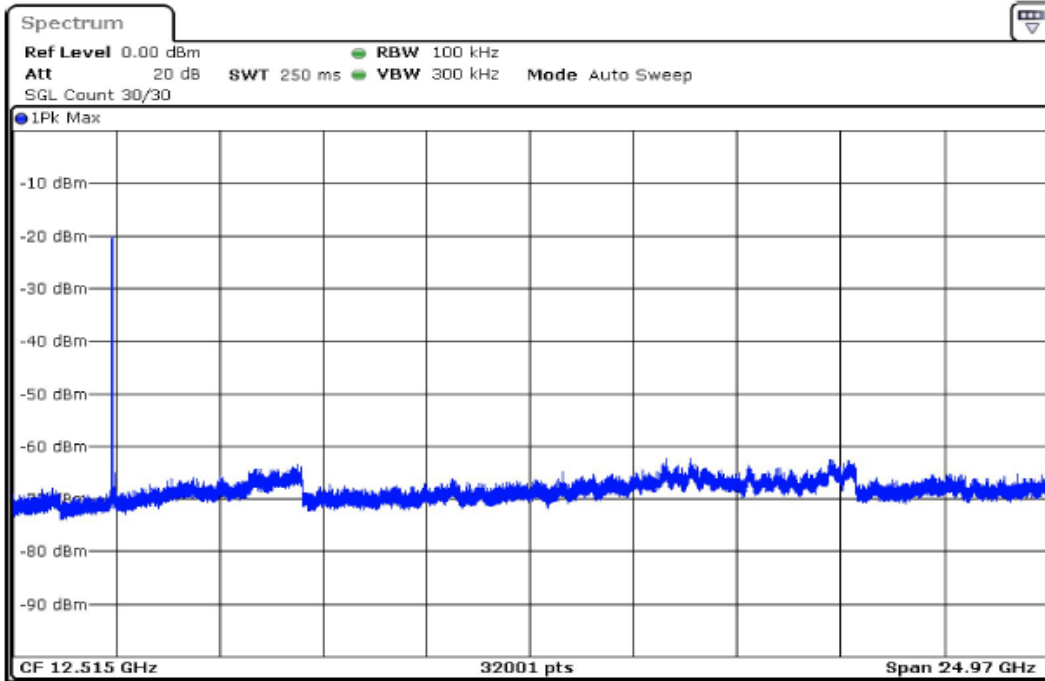
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2398.490563	-37.6	8.2	-29.3
2399.270827	-38.1	8.8	-29.3
2397.710299	-39.0	9.6	-29.3
2396.930036	-39.2	9.9	-29.3
19767.161271	-39.3	9.9	-29.3
19798.371821	-39.4	10.0	-29.3
19785.887601	-39.5	10.1	-29.3
19840.506062	-39.6	10.3	-29.3
15796.399131	-39.7	10.4	-29.3
19784.327073	-39.7	10.4	-29.3
19837.385007	-39.8	10.4	-29.3
19747.654678	-39.8	10.5	-29.3
19760.138898	-39.8	10.5	-29.3
19781.206018	-39.9	10.5	-29.3
16401.103525	-39.9	10.5	-29.3



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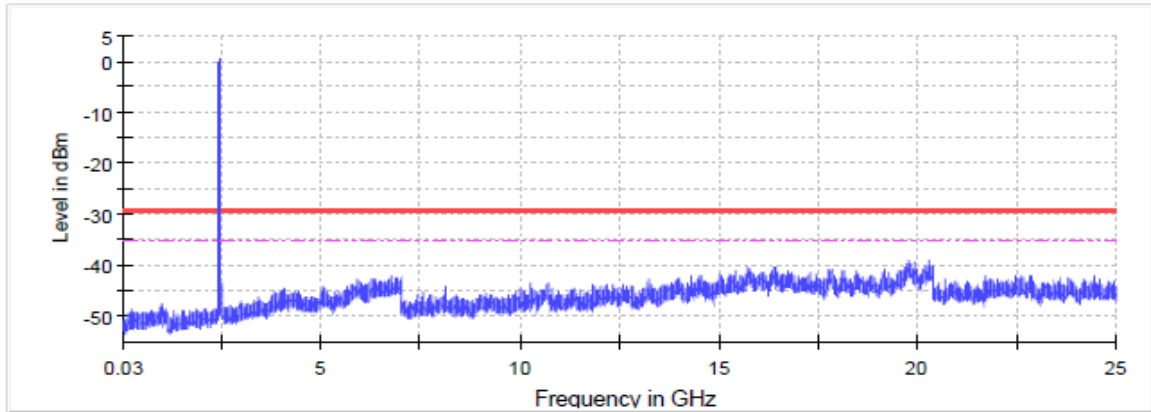


802.11g 54 Mbps 2437MHz

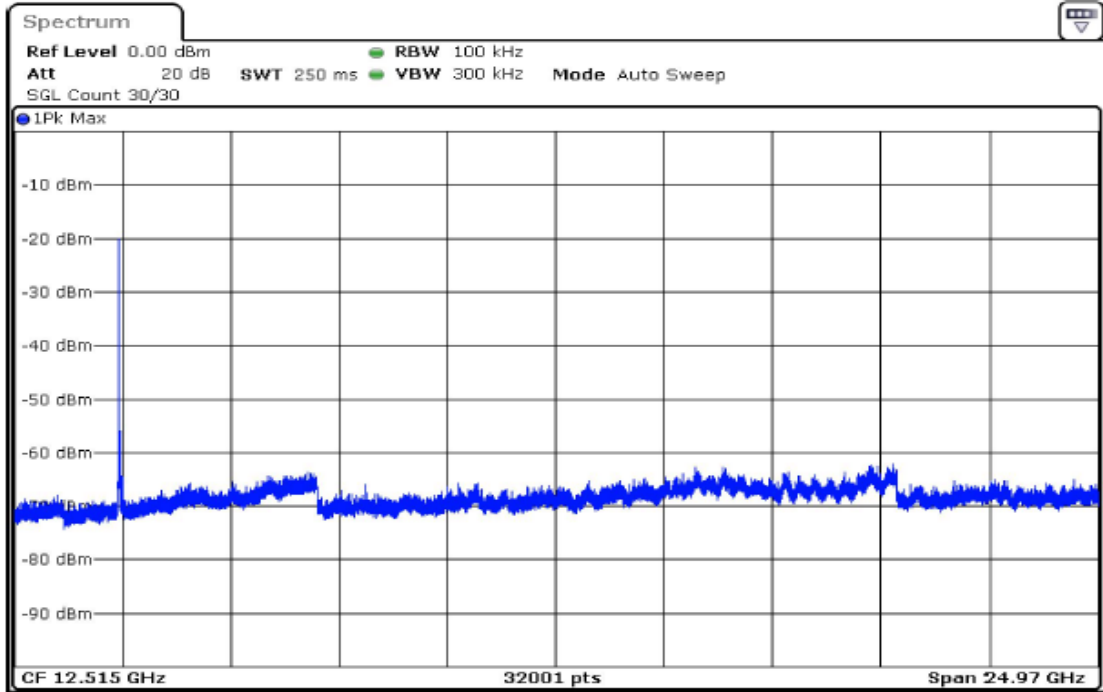
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
20284.476126	-39.0	9.6	-29.3
19760.138898	-39.1	9.8	-29.3
19782.766546	-39.1	9.8	-29.3
19934.137710	-39.2	9.8	-29.3
19761.699425	-39.4	10.1	-29.3
19765.600744	-39.5	10.2	-29.3
19835.044216	-39.7	10.3	-29.3
19754.677051	-39.8	10.4	-29.3
19806.174458	-39.8	10.5	-29.3
19746.094150	-39.9	10.6	-29.3
20319.587995	-39.9	10.6	-29.3
19799.932348	-40.0	10.6	-29.3
20176.019468	-40.0	10.6	-29.3
19743.753359	-40.0	10.7	-29.3
19768.721799	-40.0	10.7	-29.3





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

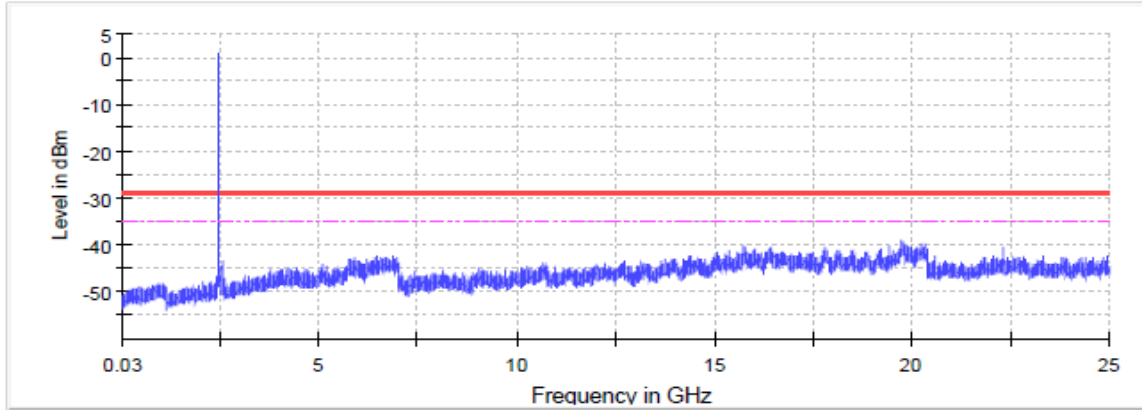


802.11g 54 Mbps 2462MHz

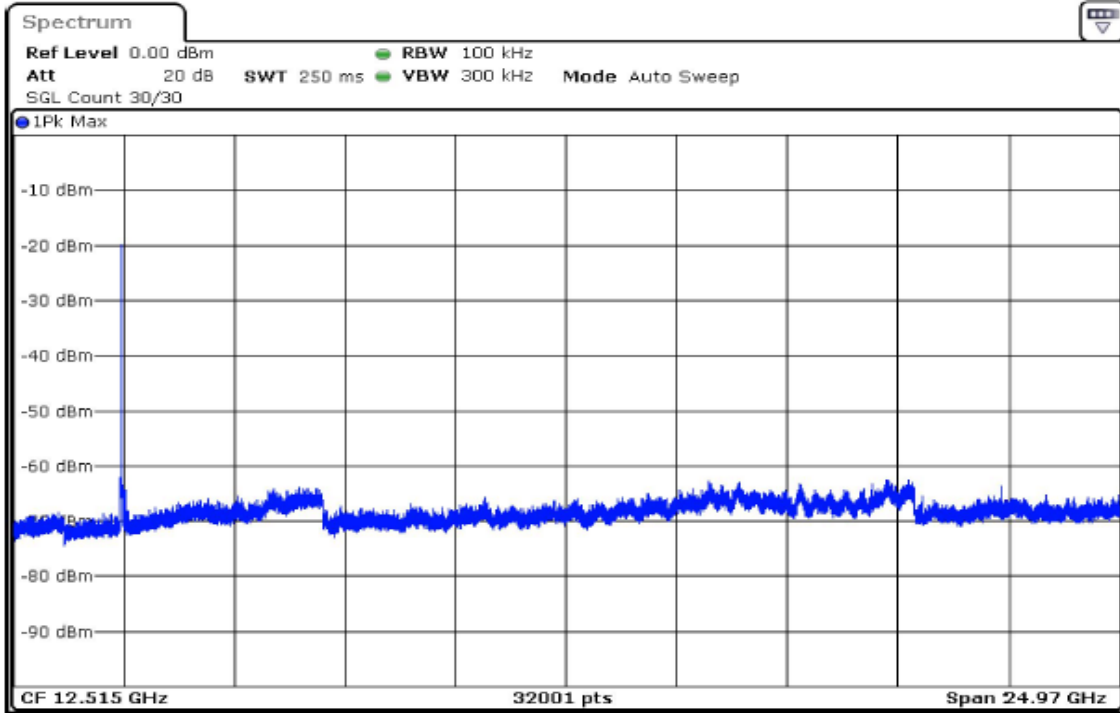
Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19749.215205	-39.1	10.1	-29.1
19770.282326	-39.2	10.1	-29.1
19800.712612	-39.5	10.4	-29.1
19757.017843	-39.7	10.6	-29.1
19779.645491	-39.7	10.6	-29.1
19782.766546	-39.7	10.7	-29.1
20358.601181	-39.8	10.7	-29.1
20247.023467	-39.8	10.7	-29.1
19765.600744	-39.8	10.8	-29.1
19767.161271	-39.9	10.8	-29.1
19864.694238	-40.0	10.9	-29.1
19756.237579	-40.0	10.9	-29.1
19794.470502	-40.0	10.9	-29.1
19741.412568	-40.0	10.9	-29.1
19806.954722	-40.0	11.0	-29.1





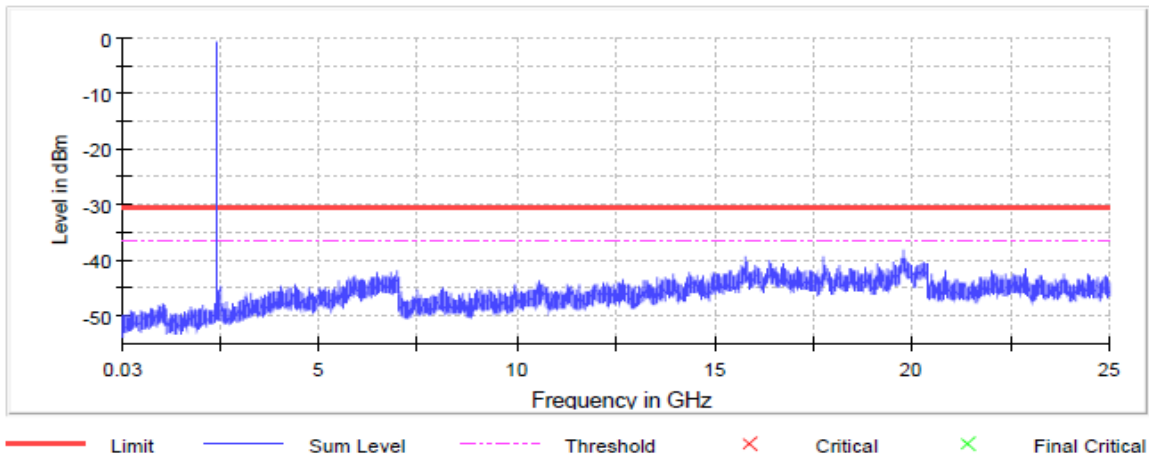
— Limit — Sum Level - - - Threshold × Critical × Final Critical

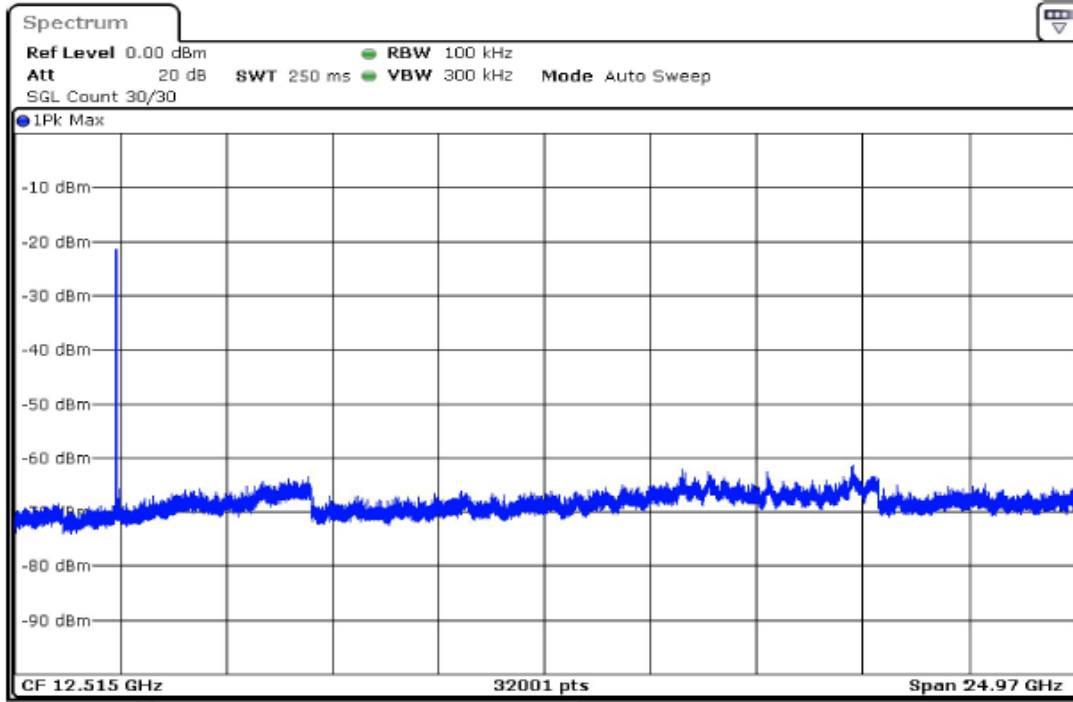


802.11n(HT20) MCS6 2412MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19768.721799	-38.1	7.5	-30.6
19764.820480	-38.3	7.8	-30.6
19769.502062	-38.9	8.3	-30.6
19784.327073	-38.9	8.4	-30.6
15761.287263	-39.3	8.7	-30.6
17772.026905	-39.4	8.9	-30.6
19793.690238	-39.5	8.9	-30.6
19746.094150	-39.6	9.1	-30.6
19824.120524	-39.7	9.2	-30.6
19779.645491	-39.7	9.2	-30.6
19798.371821	-39.8	9.2	-30.6
19758.578370	-39.8	9.3	-30.6
19739.071777	-39.9	9.3	-30.6
19810.075777	-39.9	9.4	-30.6
16370.673239	-39.9	9.4	-30.6



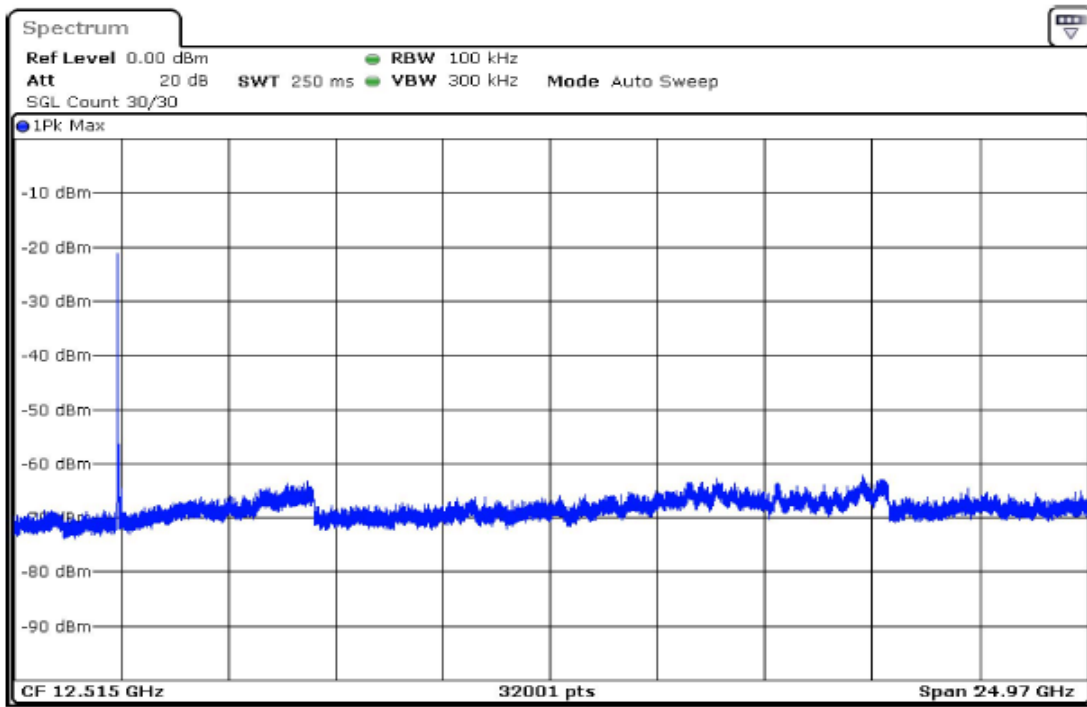
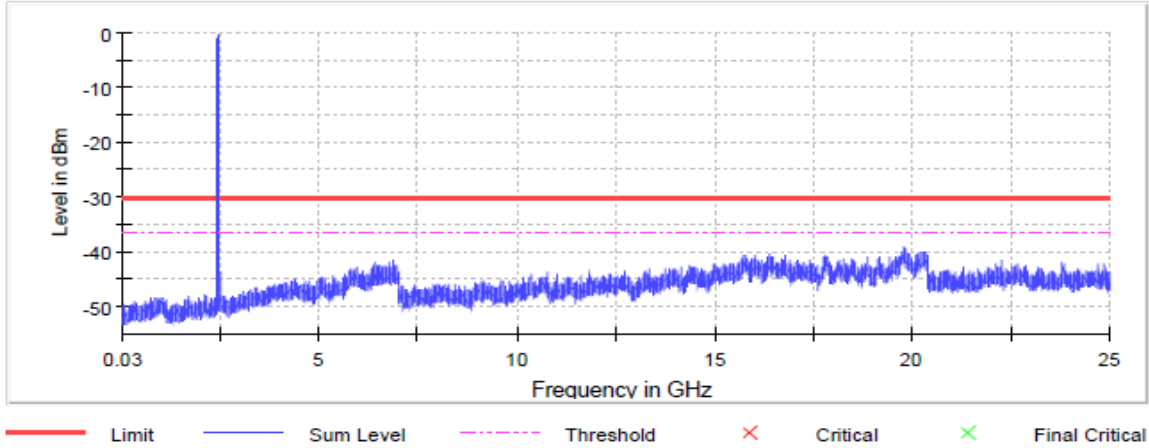


802.11n(HT20) MCS6 2437MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19782.766546	-39.0	8.6	-30.4
19808.515249	-39.4	9.0	-30.4
19789.788919	-39.5	9.1	-30.4
19806.174458	-39.6	9.1	-30.4
19842.846853	-39.8	9.4	-30.4
19810.075777	-39.8	9.4	-30.4
19847.528436	-39.8	9.4	-30.4
19769.502062	-39.9	9.5	-30.4
19753.896788	-39.9	9.5	-30.4
19781.206018	-40.0	9.5	-30.4
20300.861665	-40.0	9.5	-30.4
19749.215205	-40.0	9.6	-30.4
19739.071777	-40.1	9.7	-30.4
20316.466940	-40.1	9.7	-30.4
19770.282326	-40.1	9.7	-30.4





802.11n(HT20) MCS6 2462MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19824.900787	-39.2	9.3	-30.0
20247.023467	-39.5	9.6	-30.0
19746.094150	-39.5	9.6	-30.0
19763.259953	-39.6	9.6	-30.0
19737.511249	-39.7	9.7	-30.0
19821.779733	-39.8	9.8	-30.0
19751.555997	-39.8	9.8	-30.0
16371.453503	-39.8	9.8	-30.0
19778.865227	-39.8	9.8	-30.0
19776.524436	-39.9	9.9	-30.0
20340.655115	-39.9	10.0	-30.0
19774.183645	-39.9	10.0	-30.0
19743.753359	-40.0	10.0	-30.0
19813.196831	-40.0	10.0	-30.0
19759.358634	-40.0	10.1	-30.0

