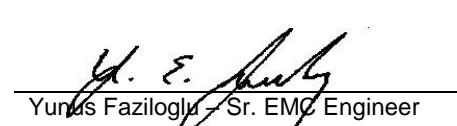




BUREAU
VERITAS

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

Test Report

Report No	ER1905-8
Client	Harman International Industries, Inc. Mark Bowman
Address	30001 Cabot Drive Novi, MI 48377
Phone	248-254-7751
Items tested	INFO3 CSM MY19 HIGH
FCC ID	2AHPN-BE2829
IC	6434C-BE2829
Equipment Type	Digital Transmission System
Equipment Code	DTS
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2
Test Dates	August 12 th to September 6 th , 2017
Results	As detailed within this report
Prepared by	 Zachary Johnson - Test Engineer
Authorized by	 Yunus Faziloglu - Sr. EMC Engineer
Issue Date	11/9/2017
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.

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Report REV Sep-08-2017 - YF



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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 INFO3 CSM MY19 HIGH. It is a direct sequence spread spectrum
transmitter that operates in the 2412 – 2462 MHz frequency range.

Antenna Type: Single switching PCB trace antenna

Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Max Gain (dBi)
2402	77,68	-1,0969	4,5
2441	78,18	-1,0690	4,89
2480	82,09	-0,8571	5,78

Maximum Gain: 5.78 dBi

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

Test samples were received in good condition.



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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 varying the test antenna's height and polarity with the EUT in worst case orientation X (laying flat).

EUT operating voltage is 9-16V 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:	R1905								
Company:	Harman International Industries, Incorporated								
Company Address:	30001 Cabot Drive								
	Novi, MI, 48377								
Contact:	Mark Bowman								
	MN			PN			SN		
EUT:	INFO3 CSM MY19 HIGH			--			Sample 1		
EUT Description:	GM MY 19 – High Car Stereo								
Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	comment
Antenna Ports	other	4	0					in	not used for permissive change test.
LVDS Harness	other	1	1	other	No	No	1	in	
USB	USB	2	2	USB	No	No	2	in	
Wiring Harness	Power DC	2	2	other	No	No	2	in	
Software Operating Mode Description:									
EUT runs an internal test mode that generates WIFI signal.									



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 single switching PCB trace antenna with 5.78dBi maximum 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.



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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)]

MEASUREMENTS / RESULTS

Curtis Straus - a Bureau Veritas Company				Work Order - R1509			
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC			
30-1000MHz Vertical Data				Test Site - CH1			
Operator: CCH®		Temp; Humid; Pres - 23°C; 34%RH; 1009mBar					
802.11n CH 6							
Frequency	Raw QP Reading	Correction Factor	Adjusted QP Amplitude	Limit FCC B	Margin FCC B	Test Results FCC B	Worst Margin FCC B
MHz	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	(Pass/Fail)	(dB)
147.023	53	-22.5	30.5	43.5	-13	PASS	
587.262	51.7	-14.6	37.1	46	-8.9	PASS	
652.517	48.1	-13.4	34.7	46	-11.3	PASS	
717.747	48.7	-12.3	36.5	46	-9.6	PASS	
783.222	47	-11.4	35.6	46	-10.5	PASS	
848.062	47.8	-10.7	37.2	46	-8.8	PASS	-8.8

Curtis Straus - a Bureau Veritas Company				Work Order - R1509			
Radiated Emissions Electric Field 3m Distance				EUT Power Input - 13.8V DC			
30-1000MHz Horizontal Data				Test Site - CH1			
Operator: CCH®		Temp; Humid; Pres - 23°C; 34%RH; 1009mBar					
802.11n CH 6							
Frequency	Raw QP Reading	Correction Factor	Adjusted QP Amplitude	Limit FCC B	Margin FCC B	Test Results FCC B	Worst Margin FCC B
MHz	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	(Pass/Fail)	(dB)
275.82	51.4	-21.4	30	46	-16	PASS	
587.285	51.5	-14.6	36.9	46	-9.1	PASS	-9.1
652.312	50.2	-13.4	36.8	46	-9.2	PASS	
717.744	45.1	-12.3	32.8	46	-13.2	PASS	
848.076	47.4	-10.7	36.7	46	-9.3	PASS	
913.314	45.9	-9	36.9	46	-9.1	PASS	

30-1000MHz



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Curtis Straus - a Bureau Veritas Company												Work Order - R1509
Radiated Emissions Electric Field 3m Distance												EUT Power Input - 13.8V DC
1-6GHz Vertical Data												Test Site - CH1
Operator: CCH®												Temp; Humid; Pres - 23°C; 34%RH; 1009mBar
802.11n CH 1												

Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Worst Peak Margin	Worst Avg Margin
MHz	(dB μ V)	(dB μ V)	(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB)	(Pass/Fail)	(dB μ V/m)	(dB)	(Pass/Fail)	(dB)	(dB)
1044.2	36.6	27.4	9.5	46.2	36.9	74	-27.8	PASS	54	-17.1	PASS		
5895.8	32.4	23.8	24.1	56.5	48	74	-17.4	PASS	54	-6	PASS	-17.4	-6

Curtis Straus - a Bureau Veritas Company												Work Order - R1509
Radiated Emissions Electric Field 3m Distance												EUT Power Input - 13.8V DC
1-6GHz Horizontal Data												Test Site - CH1
Operator: CCH®												Temp; Humid; Pres - 23°C; 34%RH; 1009mBar
802.11n CH 1												

Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Worst Peak Margin	Worst Avg Margin
MHz	(dB μ V)	(dB μ V)	(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB)	(Pass/Fail)	(dB μ V/m)	(dB)	(Pass/Fail)	(dB)	(dB)
5273.1	32.6	23.4	23.1	55.7	46.5	74	-18.3	PASS	54	-7.5	PASS	-18.3	-7.5

1-6GHz Low Channel

Curtis Straus - a Bureau Veritas Company												Work Order - R1509
Radiated Emissions Electric Field 3m Distance												EUT Power Input - 13.8V DC
1-6GHz Vertical Data												Test Site - CH1
Operator: CCH®												Temp; Humid; Pres - 23°C; 34%RH; 1009mBar
802.11n CH 6												

Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Worst Peak Margin	Worst Avg Margin
MHz	(dB μ V)	(dB μ V)	(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB)	(Pass/Fail)	(dB μ V/m)	(dB)	(Pass/Fail)	(dB)	(dB)
1043.8	35.9	28.7	8.4	44.3	37.1	74	-29.7	PASS	54	-16.9	PASS		
1333.7	32.4	23.5	12.2	44.6	35.6	74	-29.4	PASS	54	-18.3	PASS		

Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Worst Peak Margin	Worst Avg Margin
MHz	(dB μ V)	(dB μ V)	(dB/m)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB)	(Pass/Fail)	(dB μ V/m)	(dB)	(Pass/Fail)	(dB)	(dB)
1043.7	33.6	24.2	8.4	42	32.6	74	-31.9	PASS	54	-21.4	PASS		
1340.1	33.1	23.4	12.2	45.2	35.6	74	-28.7	PASS	54	-18.4	PASS		

5698.8	33.4	24.4	23.1	56.5	47.5	74	-17.5	PASS	54	-6.5	PASS	-17.5	-6.5
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1-6GHz Center Channel

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Curtis Straus - a Bureau Veritas Company											Work Order - R1509		
Radiated Emissions Electric Field 3m Distance											EUT Power Input - 13.8V DC		
1-6GHz Vertical Data											Test Site - CH1		
Operator: CCH®											Temp; Humid; Pres - 23°C; 34%RH; 1009mBar		
802.11n CH 11													
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dB)
1044.4	36.1	28.5	8.4	44.5	37	74	-29.4	PASS	54	-17	PASS		
5999.9	33.1	24.5	23.4	56.4	47.9	74	-17.6	PASS	54	-6.1	PASS	-17.6	-6.1

Curtis Straus - a Bureau Veritas Company											Work Order - R1509		
Radiated Emissions Electric Field 3m Distance											EUT Power Input - 13.8V DC		
1-6GHz Horizontal Data											Test Site - CH1		
Operator: CCH®											Temp; Humid; Pres - 23°C; 34%RH; 1009mBar		
802.11n CH 11													
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	Avg Results	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dB)
5271.1	32.3	23.4	22.1	54.4	45.5	74	-19.6	PASS	54	-8.5	PASS		
5283.5	32.2	23.4	22.1	54.3	45.5	74	-19.6	PASS	54	-8.4	PASS	-19.6	-8.4

1-6GHz High Channel

Curtis Straus - a Bureau Veritas Company											Work Order - R1509		
Radiated Emissions Electric Field 1m Distance											EUT Power Input - 13.8V DC		
6-18GHz Vertical Data											Test Site - CH1		
Operator: CCH®											Temp; Humid; Pres - 23°C; 34%RH; 1009mBar		
802.11n CH 6													
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(degrees)	(dB)	(dB)
7110.8	26.6	16.8	26.4	53	43.1	83.5	-30.5	PASS	63.5	-20.4	231		
16844.9	32.1	21.4	34.3	66.5	55.7	83.5	-17	PASS	63.5	-7.8	282	-17	-7.8

Curtis Straus - a Bureau Veritas Company											Work Order - R1509		
Radiated Emissions Electric Field 1m Distance											EUT Power Input - 13.8V DC		
6-18GHz Horizontal Data											Test Site - CH1		
Operator: CCH®											Temp; Humid; Pres - 23°C; 34%RH; 1009mBar		
802.11n CH 6													
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Results	Avg Limit	Avg Margin	EUT Azimuth	Worst Peak Margin	Worst Avg Margin
MHz	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dBµV/m)	(dB)	(degrees)	(dB)	(dB)
7085.4	27	16.8	26.4	53.3	43.2	83.5	-30.2	PASS	63.5	-20.3	14		
17954.6	29.2	20.4	36	65.1	56.4	83.5	-18.4	PASS	63.5	-7.1	219	-18.4	-7.1

6-18GHz



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November 9, 2017

Radiated Emissions Table										Work Order: R1905							
Date: 03-Sep-17	Company: Harman International Industries						EUT Operating Voltage/Frequency: 13.8V DC										
Engineer: Chris Hamel	EUT Desc: GM MY 19 - HIGH FCC						Humidity: 34%	Pressure: 1009mBar									
Temp: 23°C																	
Frequency Range: 18-25GHz										Measurement Distance: 0.1 m							
Notes: No Emissions Found.										EUT Max Freq:							
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dB μ V)	Average Reading (dB μ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dB μ V/m)	Adjusted Avg Reading (dB μ V/m)	FCC Class B High Frequency - Peak		FCC Class B High Frequency - Average						
		---	---	---	---	---	---	---	Limit (dB μ V/m)	Margin (dB)	Result (Pass/Fail)	Limit (dB μ V/m)	Margin (dB)	Result (Pass/Fail)			
Table Result: Pass by --- dB										Worst Freq: --- MHz							
Test Site: ---	Cable 1: Asset #2328						Cable 2: ---	Cable 3: ---									
Analyzer: Brown	Preamp: 18-26.5GHz						Antenna: 18-26.5GHz Horn	Preselector: ---									
CSsoft Radiated Emissions Calculator v 1.017.188	Copyright Curtis-Straus LLC 2000																
Adjusted Reading = Reading + Preamp Factor + Antenna Factor + Cable Factor																	

18-25GHz

Test Equipment Used:

Rev. 8/25/2017												
Cables		Range		Mfr				Cat	Calibration Due	Calibrated on		
Asset #2051		9kHz - 18GHz		Florida RF				II	3/5/2018	3/5/2017		
Asset #2054		9kHz - 18GHz		Florida RF				II	10/30/2017	10/30/2016		
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			
EMI Chamber 1		719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018	12/21/2016			
Preamps / Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on			
2311 PA		1-1000MHz	PAM-103	COM-POWER	441175	2311	II	2/4/2018	2/4/2017			
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on			
Red-Black Biolog		30-2000MHz	JB1	Sunol	A091604-2	1106	I	2/28/2019	2/28/2017			
Meteorological Meters			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			

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

30-1000MHz



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November 9, 2017

Rev. 8/25/2017	Cables	Range	Mfr		Cat	Calibration Due	Calibrated on
	Asset #2051	9kHz - 18GHz	Florida RF		II	3/5/2018	3/5/2017
	Asset #2054	9kHz - 18GHz	Florida RF		II	10/30/2017	10/30/2016
	Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Calibration Due
	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	Calibration Due
	EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	I
	EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I
							12/21/2018
							12/21/2016
	Preamps / Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Calibration Due
	1517 HF Preamp	1-20GHz	CS	CS	N/A	1517	II
							9/14/2017
							8/14/2016
	Antennas	Range	MN	Mfr	SN	Asset	Calibration Due
	Blue Horn	1-18Ghz	3117	ETS	157647	1861	I
							2/14/2019
							2/14/2017
	Meteorological Meters	MN	Mfr	SN	Asset	Calibration Due	Calibrated on
	Weather Clock (Pressure Only)	BA928	Oregon Scientific	C3166-1	831	I	4/28/2018
	TH A#2084	HTC-1	HDE		2084	II	3/23/2018
							3/23/2017

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

1-18GHz

Rev. 8/25/2017	Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
	Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	7/26/2018	7/26/2017
	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
	Preamps / Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
	HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	9/16/2017	9/16/2016
	Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
	HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
	Meteorological Meters	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		Asset	Cat	Calibration Due	Calibrated on
	Asset #2328	1 - 26.5GHz	PE350-72	Pasternack	1539		II	2/6/2018	2/6/2017

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

18-25GHz



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Radiated Band Edge

Radiated Emissions Table												
Date: 05-Sep-17		Company: Harman int.		Work Order: R1905								
Engineer: Chris Hamel		EUT Desc: GM MY 19 - HIGH FCC		EUT Operating Voltage/Frequency: 13.8V DC								
Temp: 24.4°C		Humidity: 40%		Pressure: 1001mbar								
Frequency Range:										Measurement Distance: 3 m		
Notes: Band edge 2.4GHz 802.11n 802.11n CH1 CH11										EUT Max Freq:		
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dB _µ V)	Average Reading (dB _µ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dB _µ V/m)	Adjusted Avg Reading (dB _µ V/m)	FCC Class B High Frequency - Peak	FCC Class B High Frequency - Average		
Fund V	2418.3	85.0	---	---	---	---	---	---	---	---		
Fund H	2413.3	84.3	---	---	---	---	---	---	---	---		
Vpk	2310.0	35.9	36.5	20.8	27.9	3.2	46.2	46.2	74.0 -27.8	Pass 54.0 -7.2		
V	2388.8	54.4	39.7	20.8	28.0	3.2	64.8	50.5	74.0 -9.2	Pass 54.0 -2.9		
Fund V	2467.7	90.32	---	---	---	---	---	---	---	---		
Fund H	2467.2	88.8	---	---	---	---	---	---	---	---		
V	2483.5	47.758	31.4	21.0	28.2	3.2	58.2	42.3	74.0 -15.8	Pass 54.0 -11.1		
V	2500.0	41.05	31.8	21.1	28.3	3.2	51.5	41.6	74.0 -22.5	Pass 54.0 -11.8		
Table Result:		Pass	by	-2.9 dB								
Worst Freq: 2388.8 MHz												
Test Site: EMI Chamber 1 Analyzer: Rental SA#3 CSsoft Radiated Emissions Calculator v1.017.188 Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor			Cable 1: Asset #2051 Preamp: Asset #1517			Cable 2: Asset #2054 Antenna: Orange Horn			Cable 3: --- Preselector: --- Copyright Curtis-Straus LLC 2000			



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Testing Cert. No. 1627-01

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.



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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 CISPR	5.6dB 4.6dB	N/A 5.2dB (Ucispr)
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 CISPR	3.9dB 3.6dB	N/A 3.6dB (Ucispr)
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 were 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.



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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



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Appendix A:

ER1905-8 Appendix A

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

DUT Information

Model: MY19 HIGH
 Manufacturer: Harman International Industries, Inc.
 Serial Number: 016

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:

2,4 GHz band

Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Max Gain (dBi)
2402	77,68	-1,0969	4,5
2441	78,18	-1,0690	4,89
2480	82,09	-0,8571	5,78

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

Test Equipment Used:

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
FSV40 Signal Generator	10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	6/30/2018	6/30/2017
Signal Generators	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
R&S®OSP120 with R&S®OSP-B157	30MHz-18GHz	OSP120	ROHDE & SCHWARZ	101674		I	6/1/2018	6/1/2017
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2052	9KHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
DUT1	30MHz-26GHz		Micro-Coax			II	6/21/2018	6/21/2017
Attenuators	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
Wideband Radio Communication Tester	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
(Rental)CMW500	DC to 6GHz	CMW500	ROHDE & SCHWARZ	155905		I	6/2/2018	6/2/2017



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Testing Cert. No. 1627-01

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



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Testing Cert. No. 1627-01

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

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)
1 Mbps	13	12.9	12.2	30.0	98.681
2 Mbps	13.3	13	12.4	30.0	98.758
5.5 Mbps	13	12.7	12.3	30.0	97.766
11 Mbps	13.1	12.8	12.3	30.0	96.859

802.11g

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)
6 Mbps	13.2	13	12.5	30.0	97.321
9 Mbps	13.1	12.9	12.3	30.0	96.530
12 Mbps	13.1	12.9	12.3	30.0	95.838
18 Mbps	13.1	12.8	12.3	30.0	94.378
24 Mbps	13.4	13.1	12.5	30.0	93.116
36 Mbps	13.3	13	12.7	30.0	90.787
48 Mbps	13.4	13.1	12.7	30.0	88.343
54 Mbps	13.3	13.1	12.6	30.0	87.542

802.11n(HT20)

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)
MCS0	13.1	12.6	12.1	30.0	97.274
MCS1	12.9	12.6	12.2	30.0	95.633
MCS2	13	12.8	12.3	30.0	94.307
MCS3	13.4	13.1	12.6	30.0	92.977
MCS4	13.3	13.1	12.7	30.0	90.622
MCS5	13.4	13.2	12.6	30.0	88.435
MCS6	13.4	13.2	12.6	30.0	87.470
MCS7	13.4	13.1	12.7	30.0	86.596



Peak Power Spectral Density

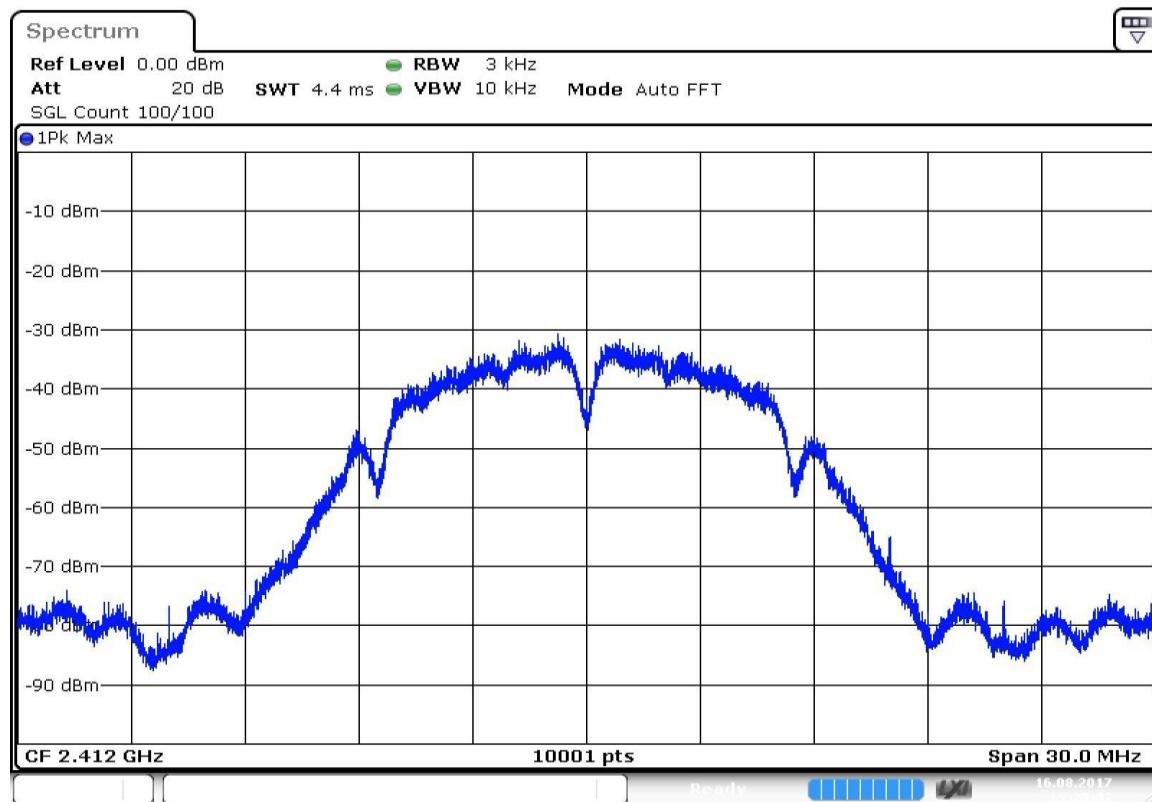
Test according to FCC KDB 558074 DTS Measurement Guidance v04 Section 10.2

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

802.11b

Data Rate	Peak PSD (dBm) 2412 MHz	Peak PSD (dBm) 2437 MHz	Peak PSD (dBm) 2462 MHz	Limit (dBm)
1 Mbps	-9.200	-10.790	-10.622	8
2 Mbps	-8.712	-9.760	-10.053	8
5.5 Mbps	-9.180	-9.841	-10.354	8
11 Mbps	-8.871	-10.553	-9.510	8

802.11b 2 Mbps 2412MHz



Date: 16.AUG.2017 15:29:43



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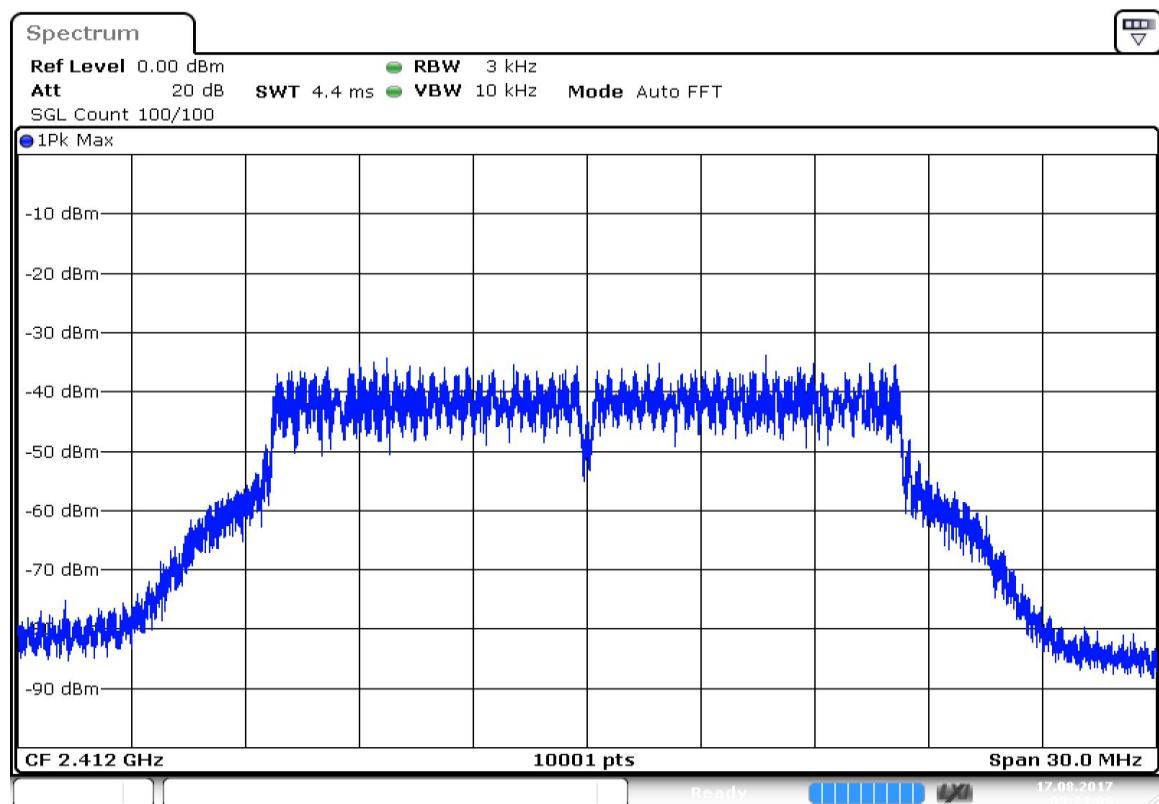
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Testing Cert. No. 1627-01

802.11g

Data Rate	Peak PSD (dBm) 2412 MHz	Peak PSD (dBm) 2437 MHz	Peak PSD (dBm) 2462 MHz	Limit (dBm)
6 Mbps	-12.009	-12.173	-13.241	8
9 Mbps	-13.468	-13.091	-13.871	8
12 Mbps	-11.896	-12.060	-12.913	8
18 Mbps	-13.488	-13.678	-14.343	8
24 Mbps	-12.684	-12.975	-13.182	8
36 Mbps	-12.828	-13.446	-13.625	8
48 Mbps	-13.697	-14.042	-14.342	8
54 Mbps	-13.780	-14.365	-14.603	8

802.11g 12 Mbps 2412MHz



Date: 17.AUG.2017 09:23:08



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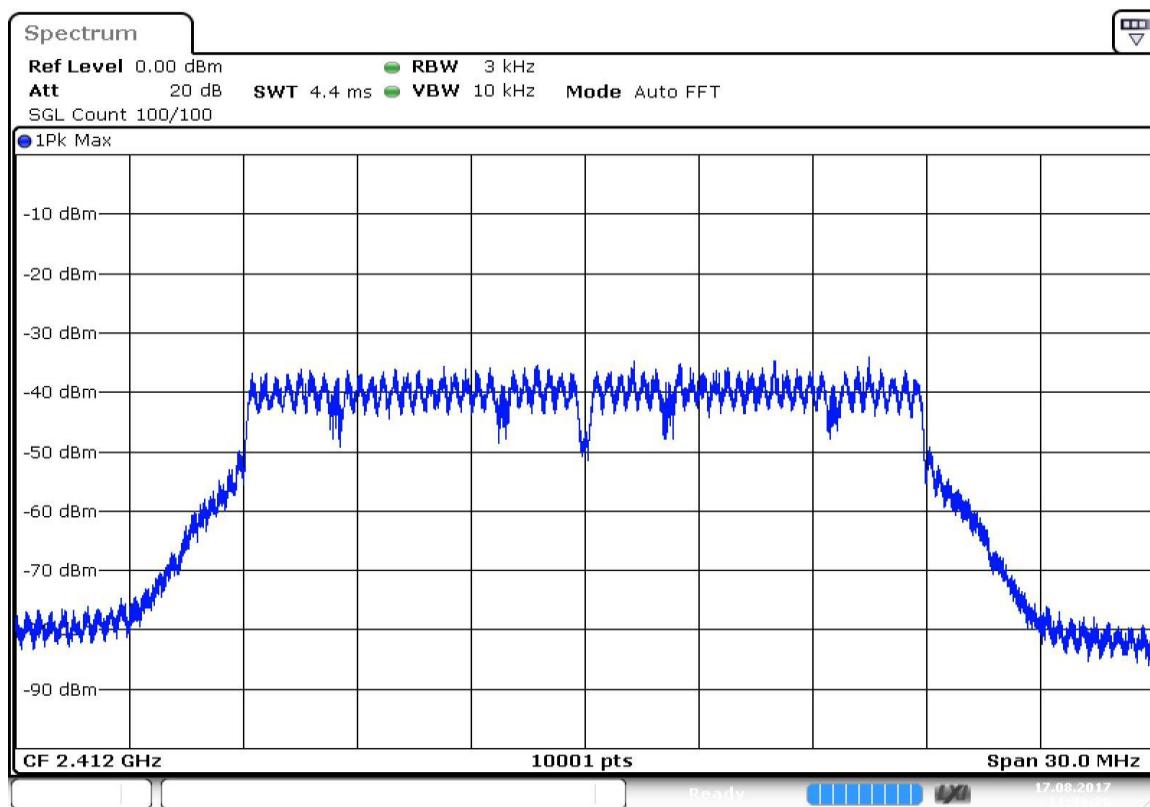
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Testing Cert. No. 1627-01

802.11n(HT20)

Data Rate	Peak PSD (dBm) 2412 MHz	Peak PSD (dBm) 2437 MHz	Peak PSD (dBm) 2462 MHz	Limit (dBm)
MCS0	-13.246	-12.558	-12.872	8
MCS1	-13.186	-13.910	-13.212	8
MCS2	-13.207	-13.242	-13.764	8
MCS3	-12.287	-13.015	-13.748	8
MCS4	-12.238	-12.981	-12.499	8
MCS5	-13.148	-12.998	-13.402	8
MCS6	-12.268	-12.721	-12.922	8
MCS7	-12.790	-12.453	-12.567	8

802.11n(HT20) MCS4 2412MHz



Date: 17.AUG.2017 11:33:20



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DTS Bandwidth (6dB)

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

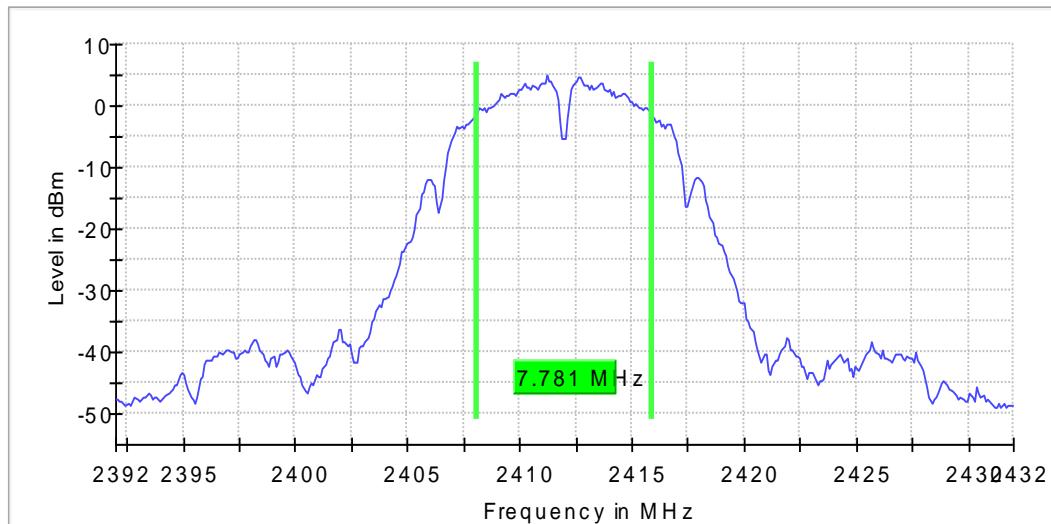
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.

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 2 Mbps	2412.000	7.780548	0.5	2408.109726	2415.890274
802.11g 48 Mbps	2412.000	16.658354	0.5	2403.620948	2420.279302
802.11n(HT20) MCS6	2412.000	17.855361	0.5	2403.022444	2420.877805
802.11b 2 Mbps	2437.000	7.980050	0.5	2432.910224	2440.890274
802.11g 48 Mbps	2437.000	16.658354	0.5	2428.620948	2445.279302
802.11n(HT20) MCS6	2437.000	17.855361	0.5	2428.022444	2445.877805
802.11b 2 Mbps	2462.000	7.980050	0.5	2458.009975	2465.990025
802.11g 48 Mbps	2462.000	16.658354	0.5	2453.620948	2470.279302
802.11n(HT20) MCS6	2462.000	17.855361	0.5	2453.022444	2470.877805



802.11b 2Mbps 2412MHz



Date: 16.AUG.2017 15:30:21



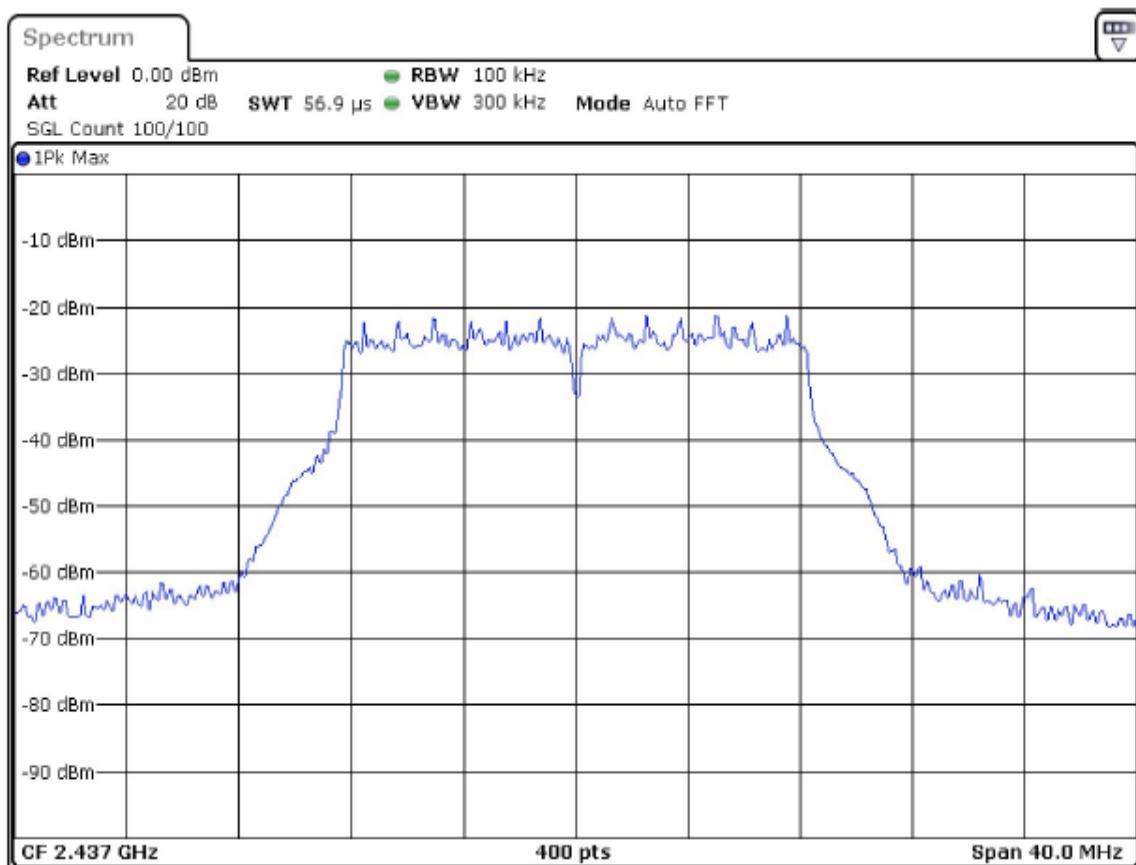
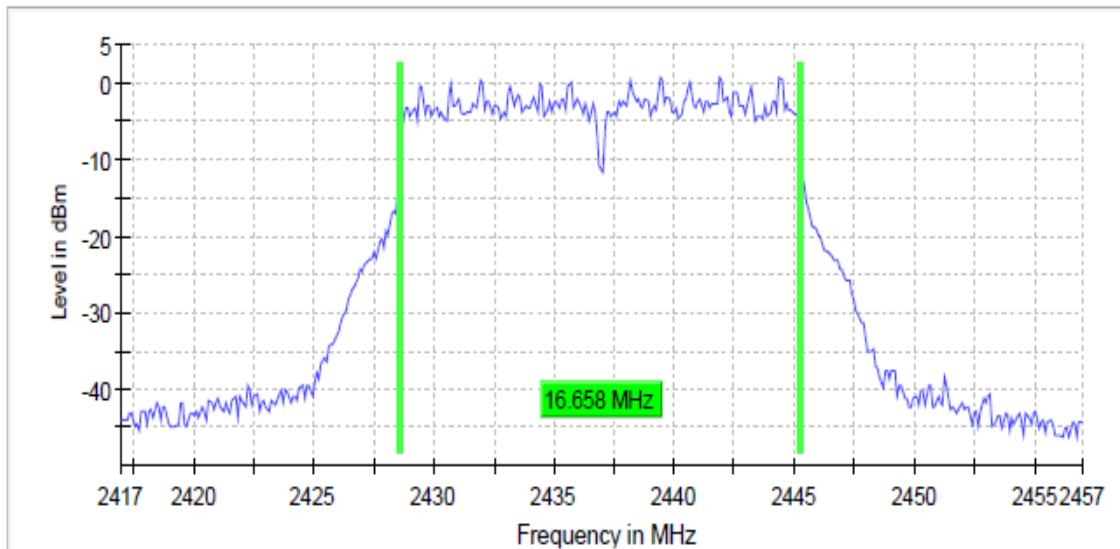
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Testing Cert. No. 1627-01

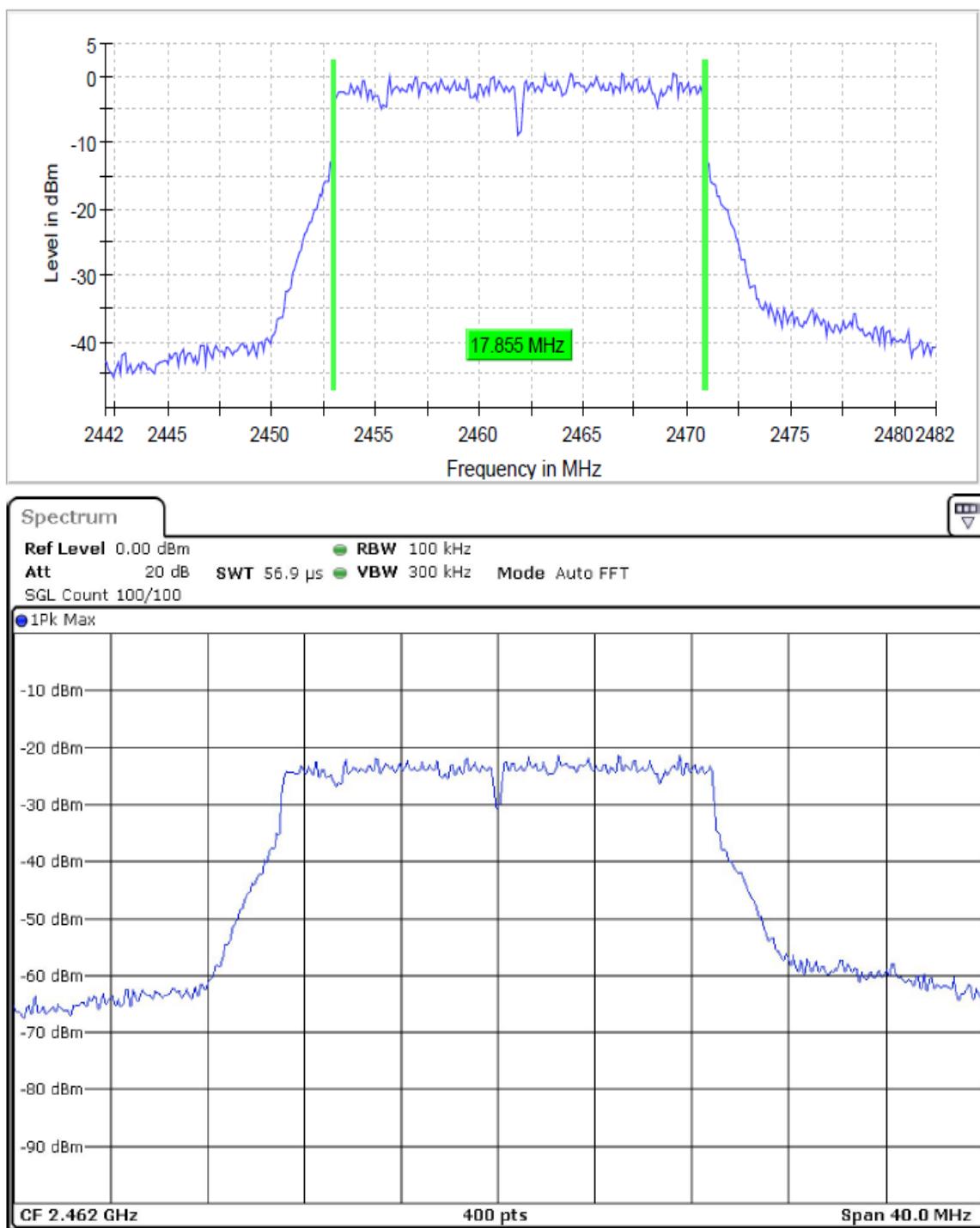
802.11g 48 Mbps 2437MHz



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802.11n(HT20) MCS6 2462MHz



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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 2Mbps 2412MHz

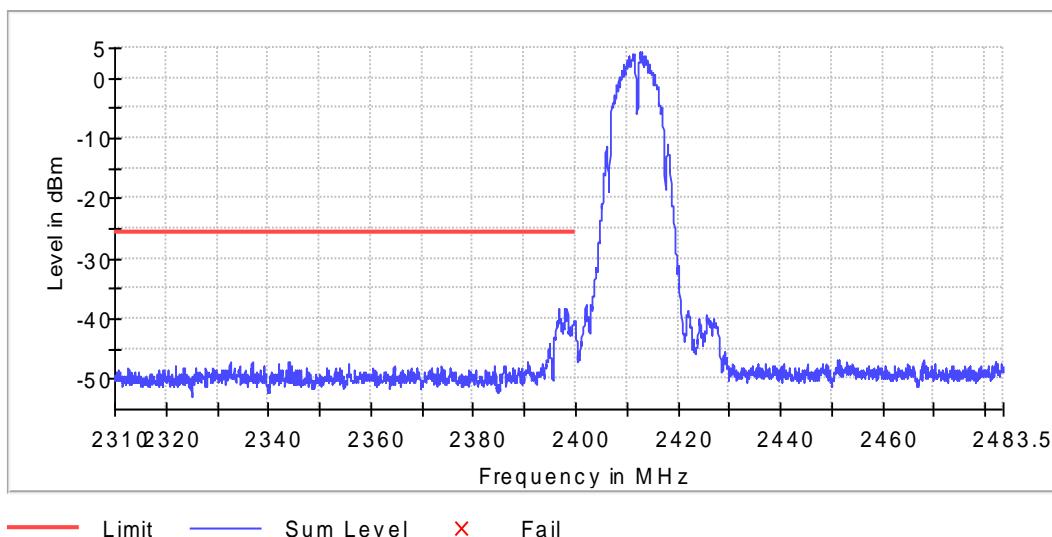
Band Edge Low

Inband Peak

Frequency (MHz)	Level (dBm)
2412.517504	4.4

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2397.826208	-38.2	12.6	-25.6	PASS
2398.325930	-38.2	12.6	-25.6	PASS
2398.275958	-38.3	12.7	-25.6	PASS
2396.826763	-38.3	12.7	-25.6	PASS
2397.776235	-38.5	12.9	-25.6	PASS
2398.225986	-39.0	13.3	-25.6	PASS
2396.776791	-39.1	13.5	-25.6	PASS
2398.176013	-39.1	13.5	-25.6	PASS
2396.876735	-39.2	13.6	-25.6	PASS
2398.375902	-39.4	13.8	-25.6	PASS
2398.425875	-39.7	14.1	-25.6	PASS
2397.876180	-39.8	14.1	-25.6	PASS
2397.926152	-39.9	14.3	-25.6	PASS
2398.126041	-39.9	14.3	-25.6	PASS
2396.726818	-39.9	14.3	-25.6	PASS



— Limit — Sum Level ✘ Fail



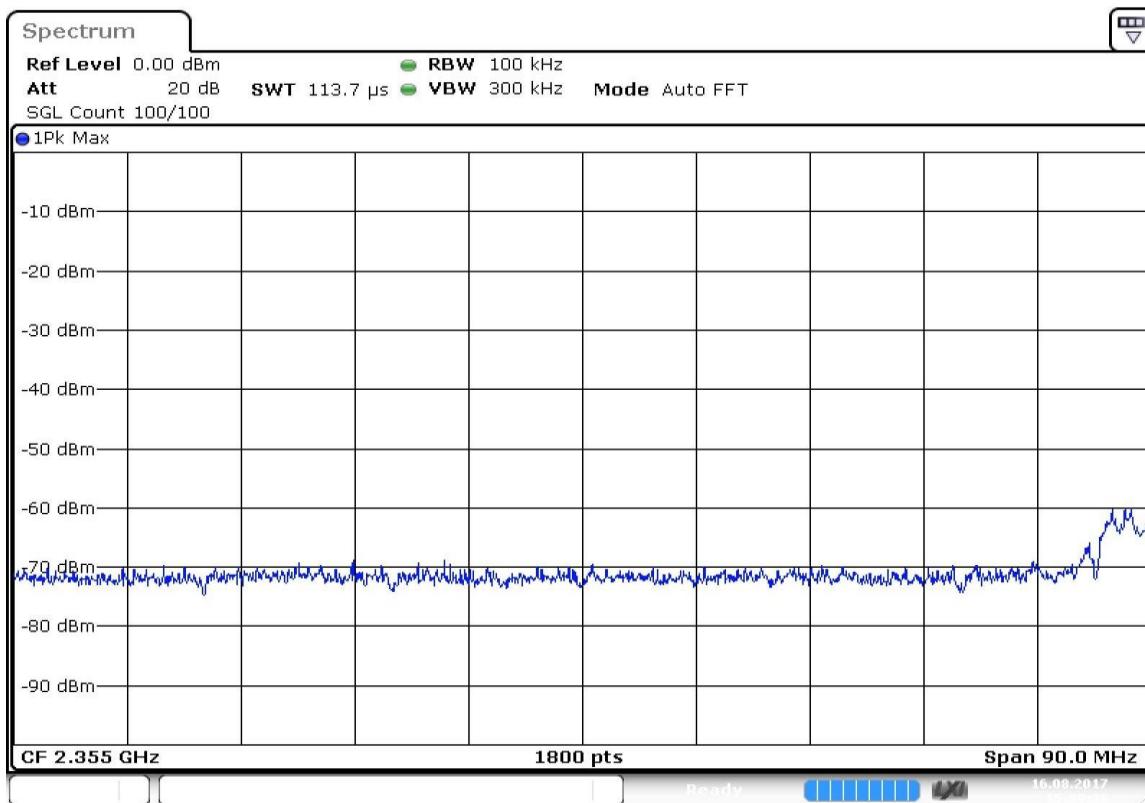
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Testing Cert. No. 1627-01

Test Report for Harman International Industries, Inc. • Report No. ER1905-8 • INFO3 CSM MY19 HIGH •
November 9, 2017



Date: 16.AUG.2017 15:30:38

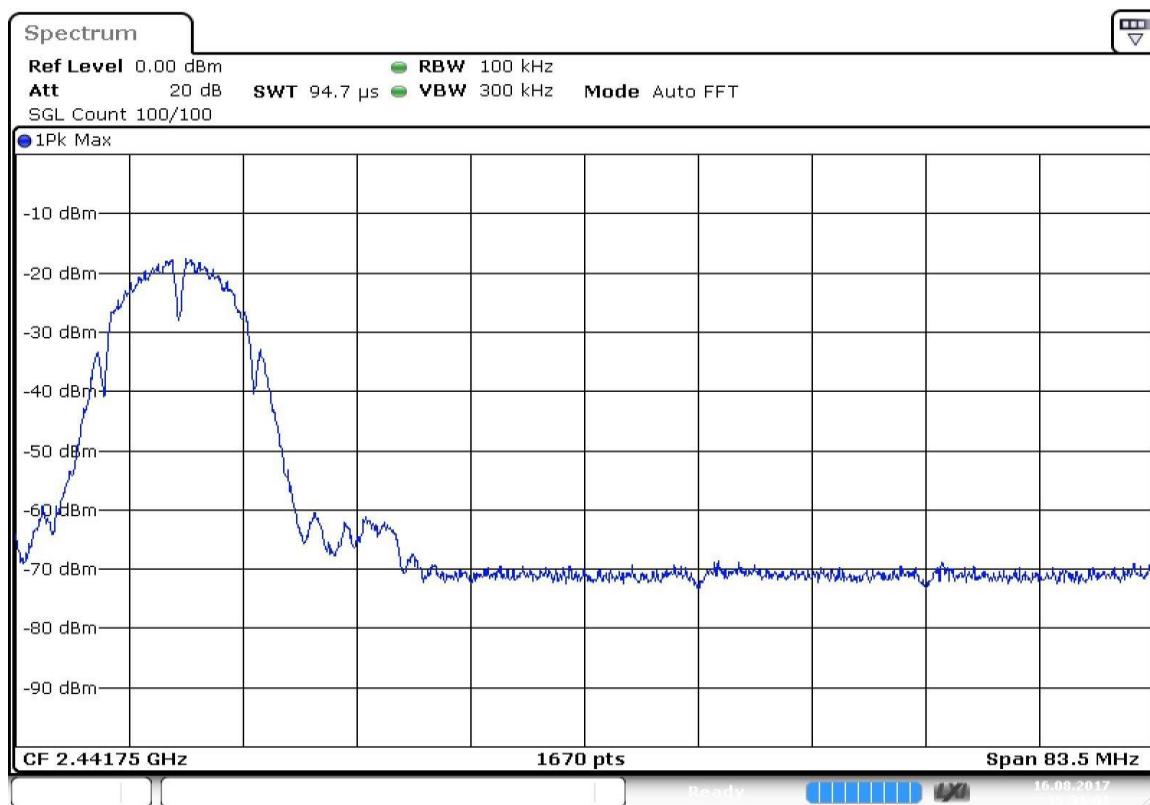


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Testing Cert. No. 1627-01

802.11b 2Mbps 2462MHz

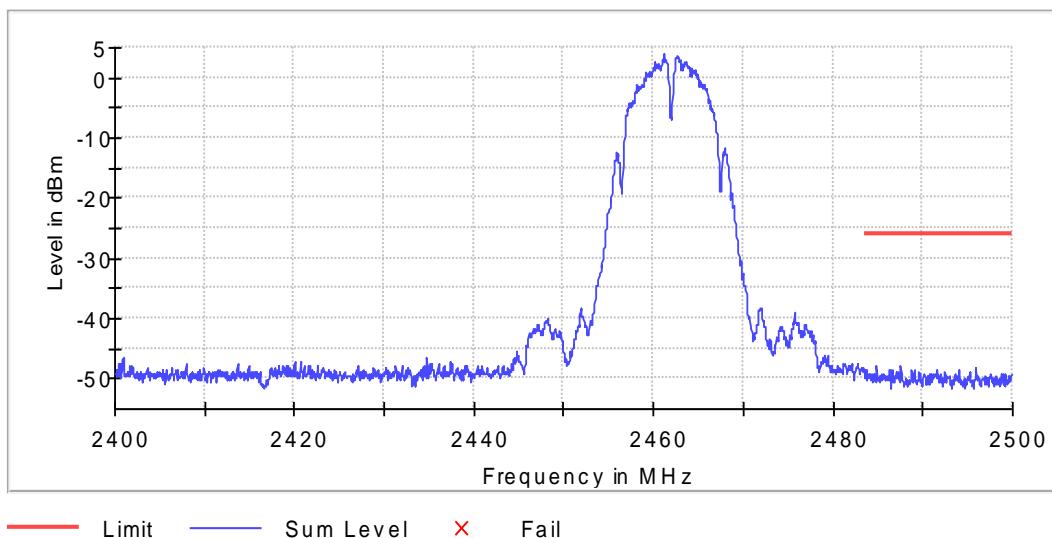
Band Edge High

Inband Peak

Frequency (MHz)	Level (dBm)
2461.188360	3.9

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2487.562689	-47.9	21.8	-26.1	PASS
2484.820997	-48.0	21.9	-26.1	PASS
2487.512840	-48.0	21.9	-26.1	PASS
2495.937311	-48.2	22.1	-26.1	PASS
2484.870846	-48.2	22.1	-26.1	PASS
2494.043051	-48.4	22.3	-26.1	PASS
2489.058157	-48.4	22.3	-26.1	PASS
2486.615559	-48.5	22.3	-26.1	PASS
2483.724320	-48.5	22.3	-26.1	PASS
2491.600453	-48.5	22.4	-26.1	PASS
2483.524924	-48.5	22.4	-26.1	PASS
2494.092900	-48.6	22.4	-26.1	PASS
2483.674471	-48.6	22.4	-26.1	PASS
2486.316465	-48.6	22.5	-26.1	PASS
2489.108006	-48.6	22.5	-26.1	PASS



— Limit — Sum Level ✕ Fail

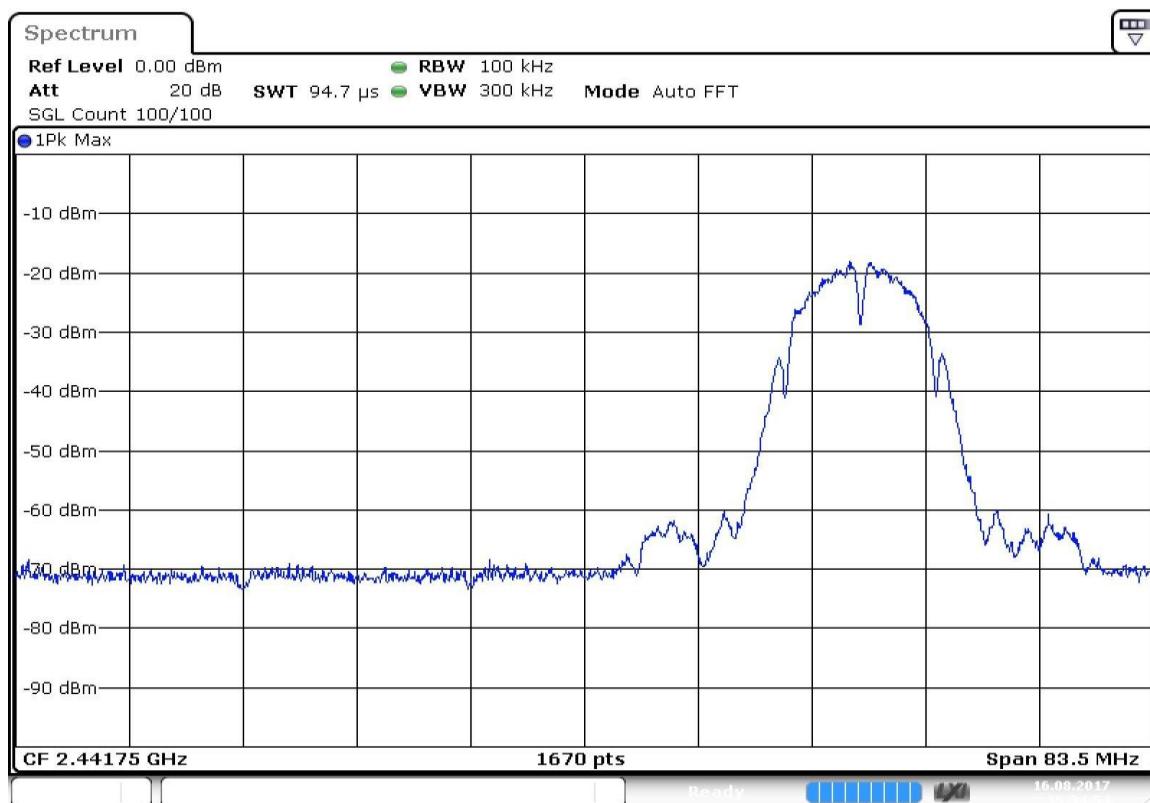


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Date: 16.AUG.2017 15:34:55

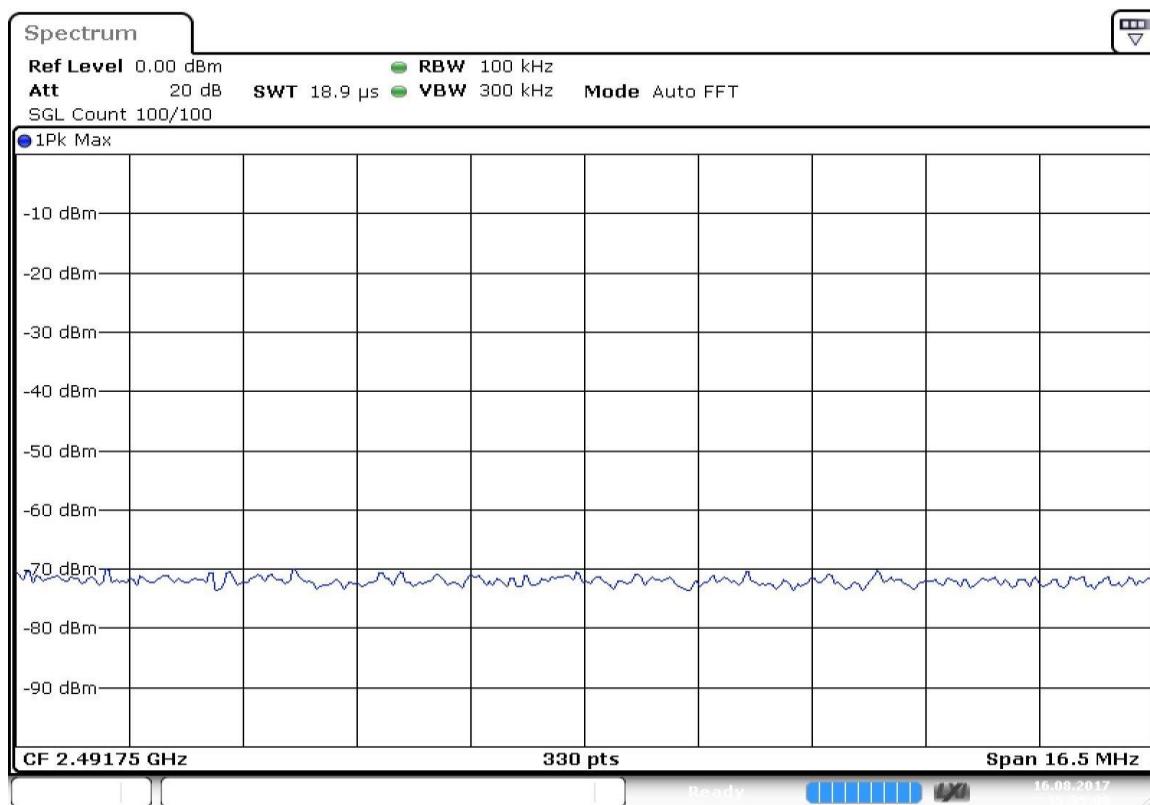


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Testing Cert. No. 1627-01



Date: 16.AUG.2017 15:35:00



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Testing Cert. No. 1627-01

802.11g 48 Mbps 2412MHz

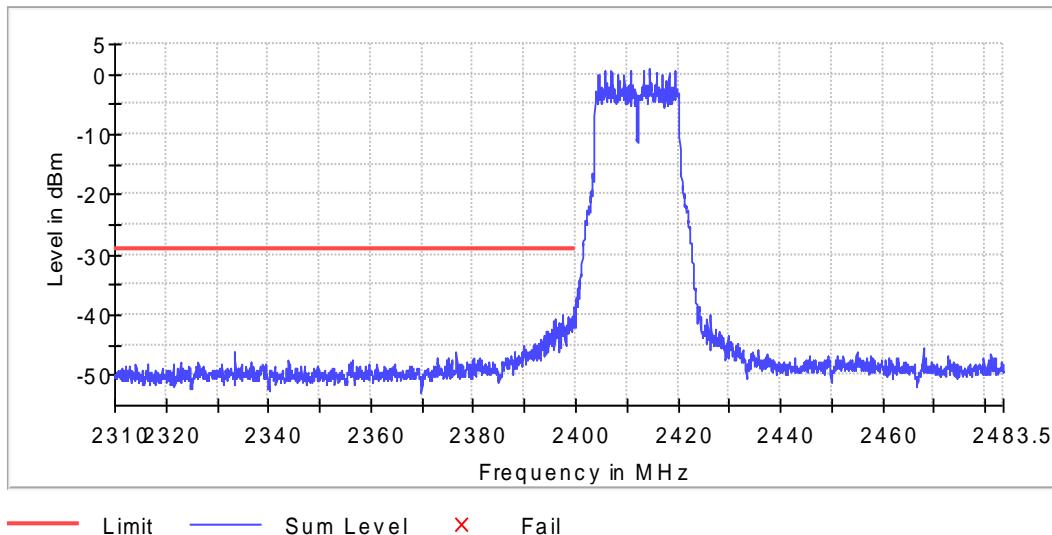
Band Edge Low

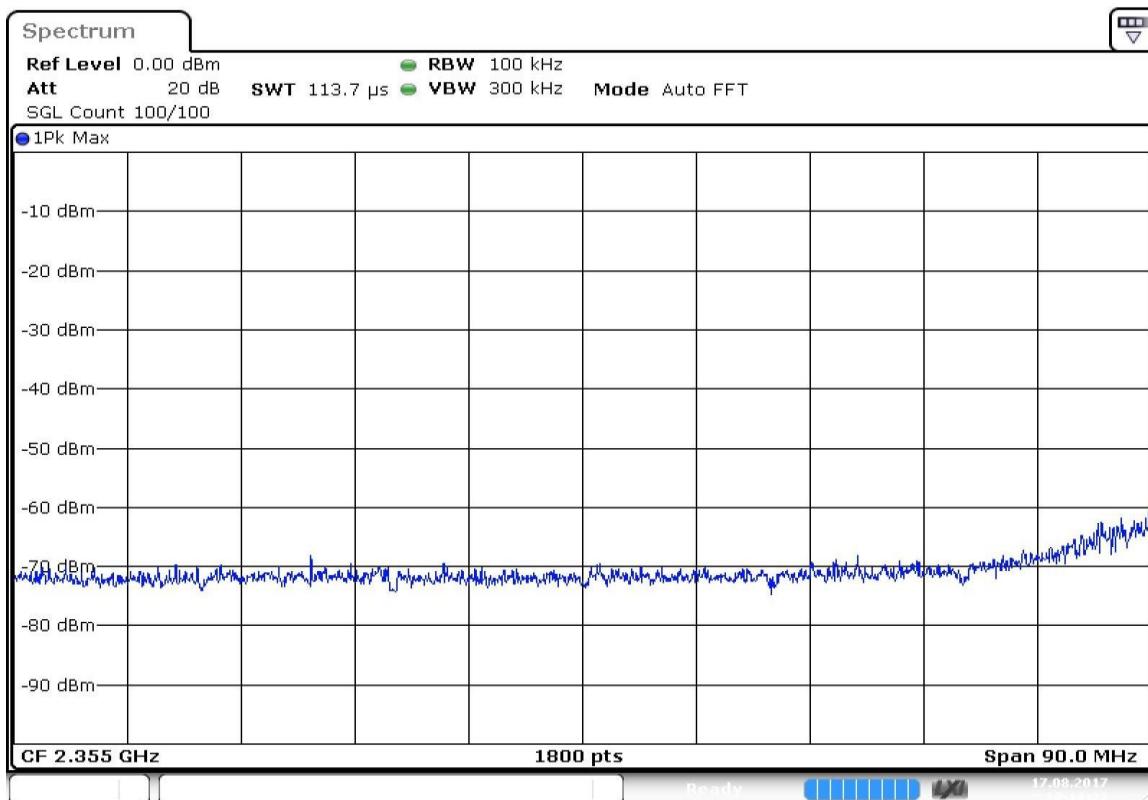
Inband Peak

Frequency (MHz)	Level (dBm)
2414.466338	0.9

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.775125	-38.7	9.7	-29.1	PASS
2399.725153	-38.9	9.8	-29.1	PASS
2399.825097	-39.1	10.0	-29.1	PASS
2397.576346	-40.0	10.9	-29.1	PASS
2399.475292	-40.0	11.0	-29.1	PASS
2399.675180	-40.3	11.2	-29.1	PASS
2399.425319	-40.4	11.3	-29.1	PASS
2398.575791	-40.4	11.4	-29.1	PASS
2397.526374	-40.5	11.4	-29.1	PASS
2395.977235	-40.6	11.6	-29.1	PASS
2399.125486	-40.7	11.6	-29.1	PASS
2396.027207	-40.7	11.7	-29.1	PASS
2398.525819	-40.7	11.7	-29.1	PASS
2398.875625	-40.7	11.7	-29.1	PASS
2398.825652	-40.9	11.8	-29.1	PASS



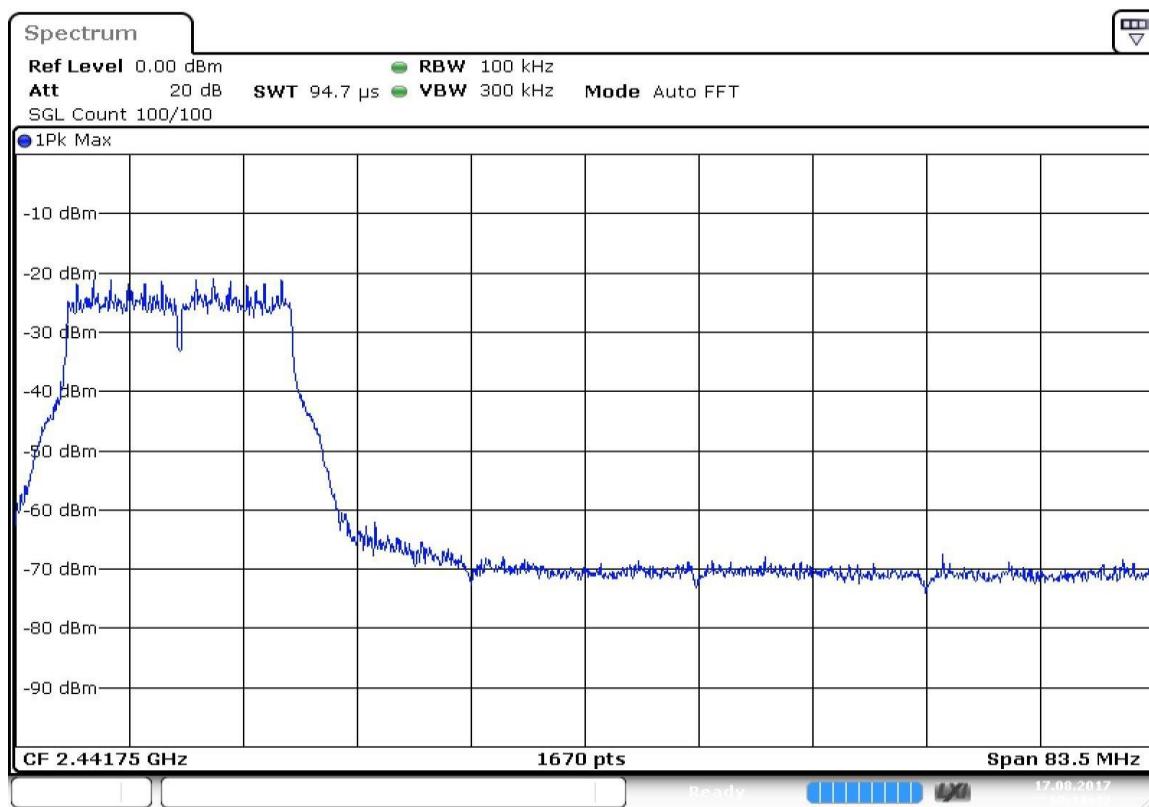


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Testing Cert. No. 1627-01



Date: 17.AUG.2017 10:11:42



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Testing Cert. No. 1627-01

802.11g 48 Mbps 2462MHz

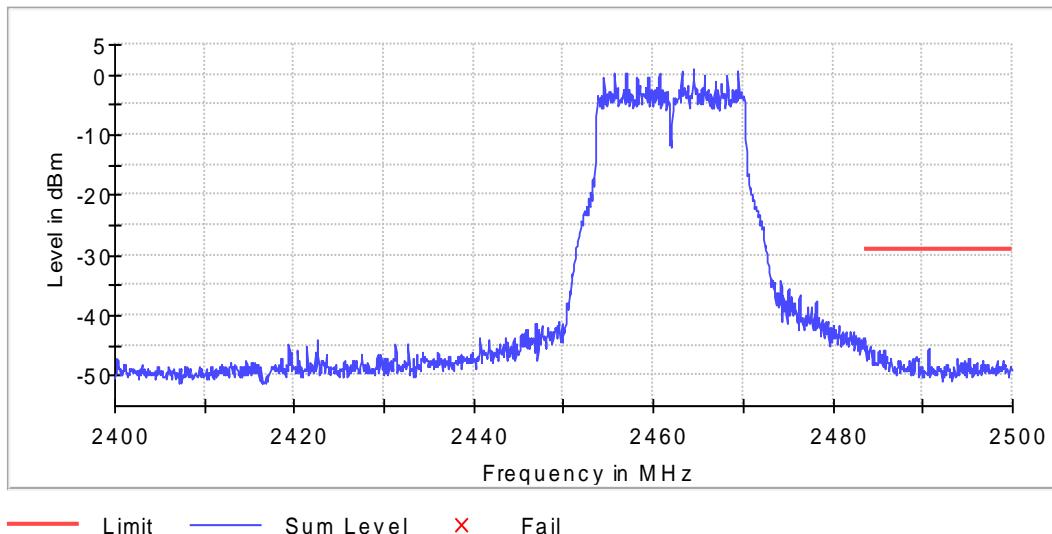
Band Edge High

Inband Peak

Frequency (MHz)	Level (dBm)
2464.436415	0.8

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.624622	-44.3	15.0	-29.2	PASS
2483.574773	-44.8	15.5	-29.2	PASS
2484.172961	-45.1	15.8	-29.2	PASS
2484.123112	-45.1	15.9	-29.2	PASS
2483.824018	-45.2	15.9	-29.2	PASS
2484.222810	-45.3	16.0	-29.2	PASS
2483.774169	-45.3	16.1	-29.2	PASS
2490.703172	-45.5	16.3	-29.2	PASS
2483.674471	-45.5	16.3	-29.2	PASS
2485.768127	-45.6	16.4	-29.2	PASS
2485.120091	-45.7	16.5	-29.2	PASS
2484.472054	-45.7	16.5	-29.2	PASS
2483.873867	-45.8	16.6	-29.2	PASS
2484.521903	-45.9	16.7	-29.2	PASS
2490.653323	-45.9	16.7	-29.2	PASS

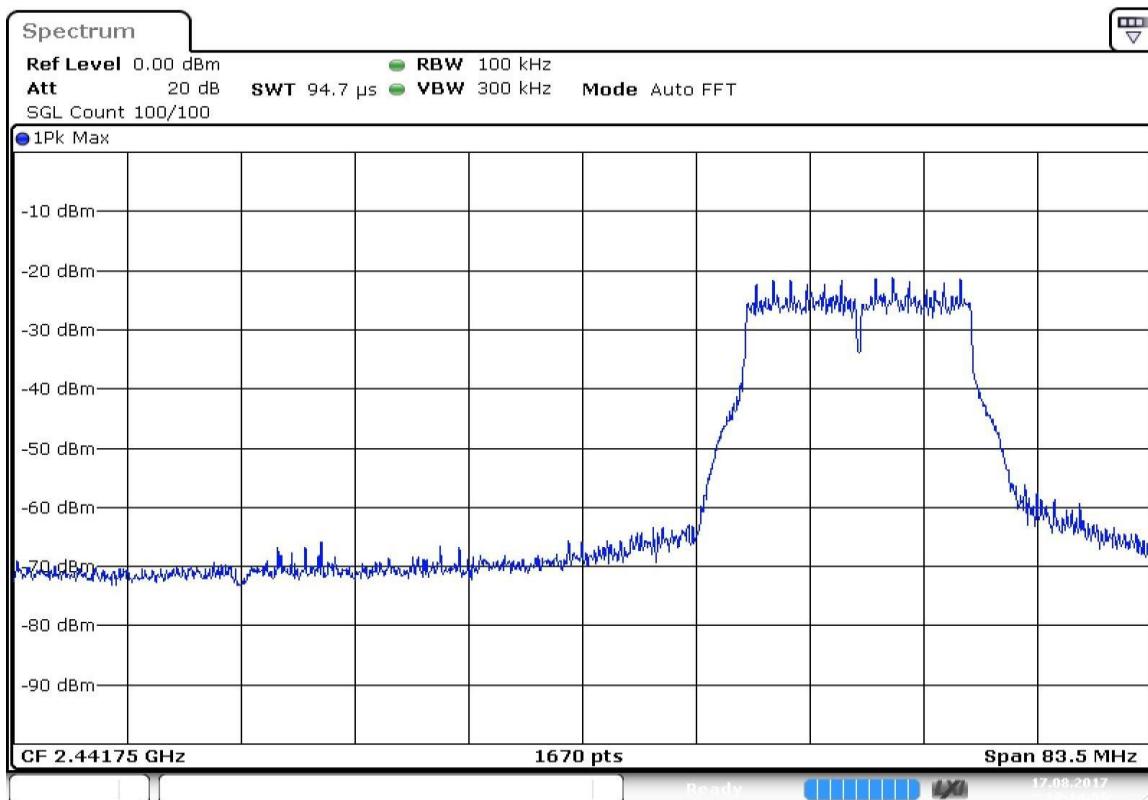


— Limit — Sum Level ✕ Fail



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Date: 17.AUG.2017 10:14:56

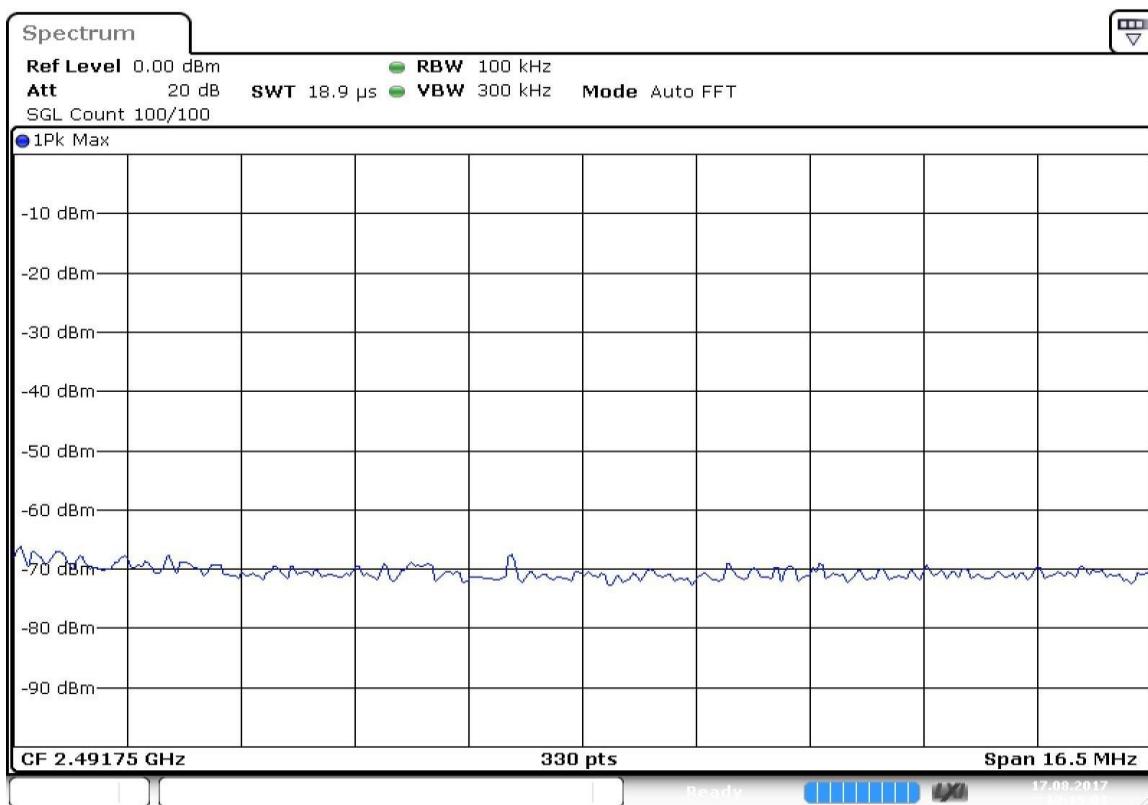


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Testing Cert. No. 1627-01



Date: 17.AUG.2017 10:15:01

802.11n(HT20) MCS6 2412MHz

Band Edge Low

Inband Peak

Frequency (MHz)	Level (dBm)
2414.466338	1.2

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.075514	-39.2	10.5	-28.8	PASS
2399.825097	-39.2	10.5	-28.8	PASS
2397.576346	-39.3	10.5	-28.8	PASS
2399.775125	-39.3	10.6	-28.8	PASS
2399.125486	-39.4	10.6	-28.8	PASS
2399.525264	-39.5	10.7	-28.8	PASS
2397.526374	-39.8	11.0	-28.8	PASS
2399.625208	-39.9	11.2	-28.8	PASS
2399.425319	-39.9	11.2	-28.8	PASS
2399.475292	-40.0	11.2	-28.8	PASS
2398.825652	-40.1	11.3	-28.8	PASS
2398.225986	-40.1	11.3	-28.8	PASS
2397.626319	-40.1	11.4	-28.8	PASS
2399.725153	-40.2	11.4	-28.8	PASS
2399.375347	-40.2	11.4	-28.8	PASS

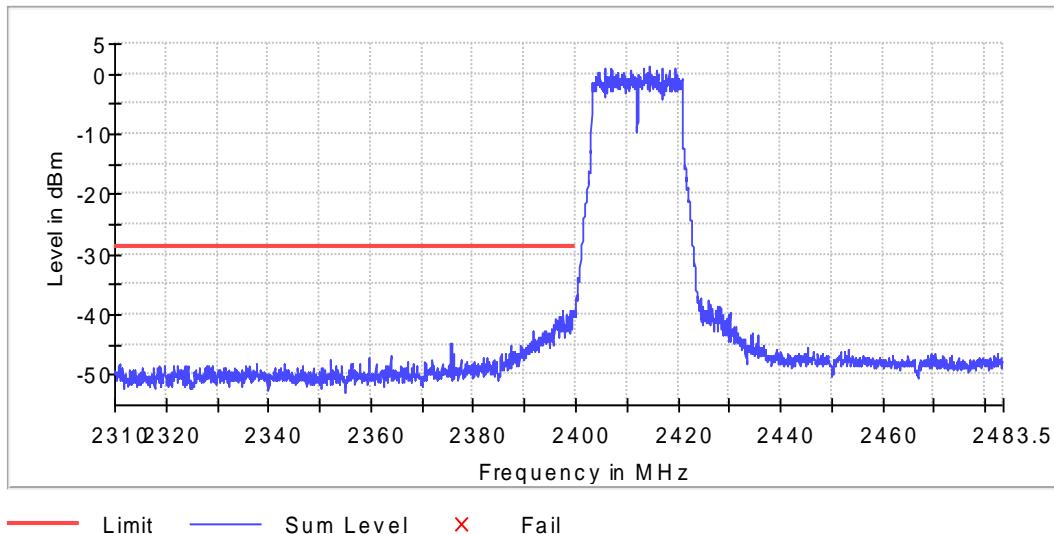


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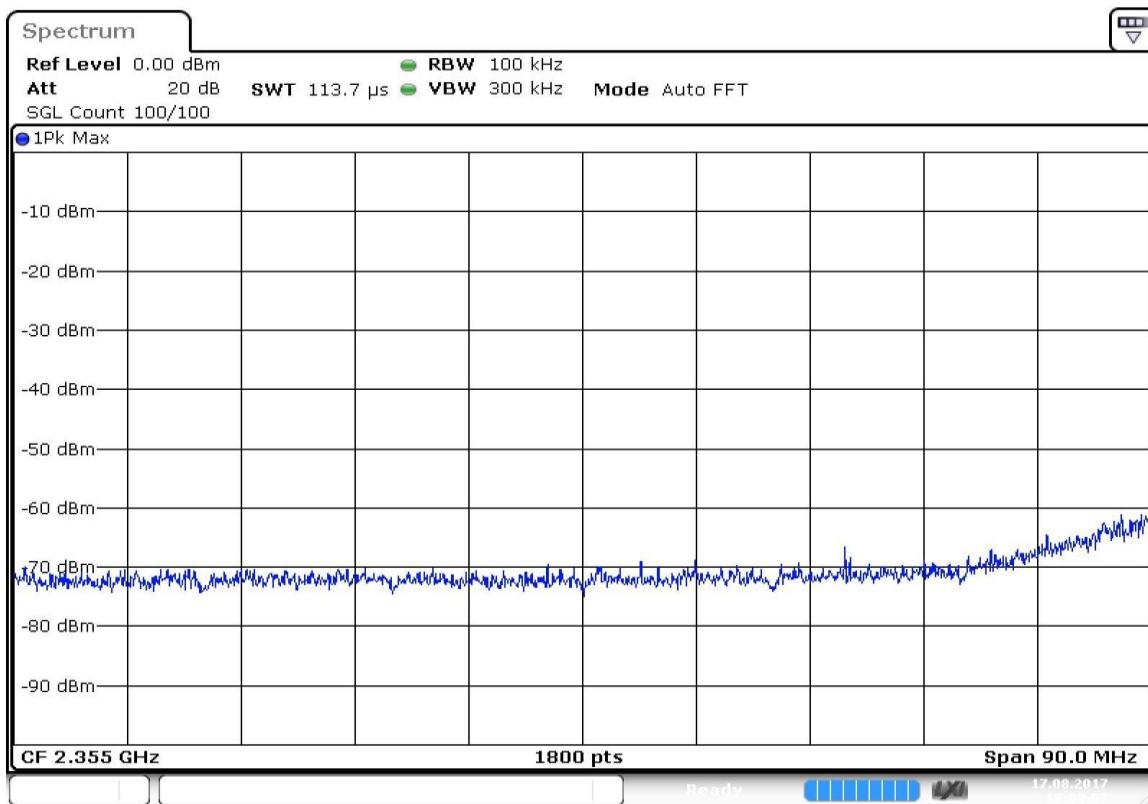
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Date: 17.AUG.2017 13:09:57

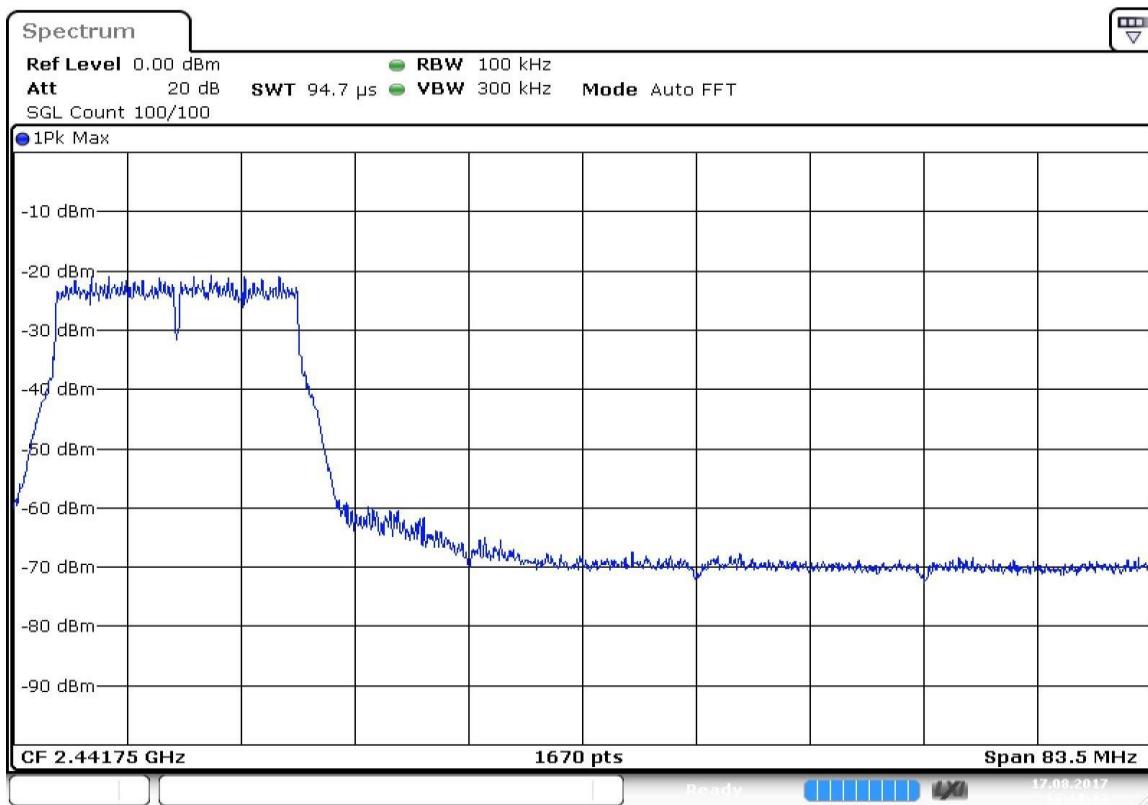


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802.11n(HT20) MCS6 2462MHz

Band Edge High

Inband Peak

Frequency (MHz)	Level (dBm)
2464.436415	0.5

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.824018	-44.6	15.1	-29.5	PASS
2483.774169	-44.6	15.1	-29.5	PASS
2484.771148	-44.8	15.3	-29.5	PASS
2483.624622	-44.9	15.4	-29.5	PASS
2485.070242	-45.1	15.7	-29.5	PASS
2483.674471	-45.2	15.7	-29.5	PASS
2485.020393	-45.3	15.8	-29.5	PASS
2484.721299	-45.3	15.8	-29.5	PASS
2484.571752	-45.3	15.8	-29.5	PASS
2483.574773	-45.3	15.9	-29.5	PASS
2485.469033	-45.5	16.0	-29.5	PASS
2485.419184	-45.5	16.0	-29.5	PASS
2486.466012	-45.7	16.2	-29.5	PASS
2485.120091	-45.7	16.3	-29.5	PASS
2484.272659	-45.8	16.3	-29.5	PASS

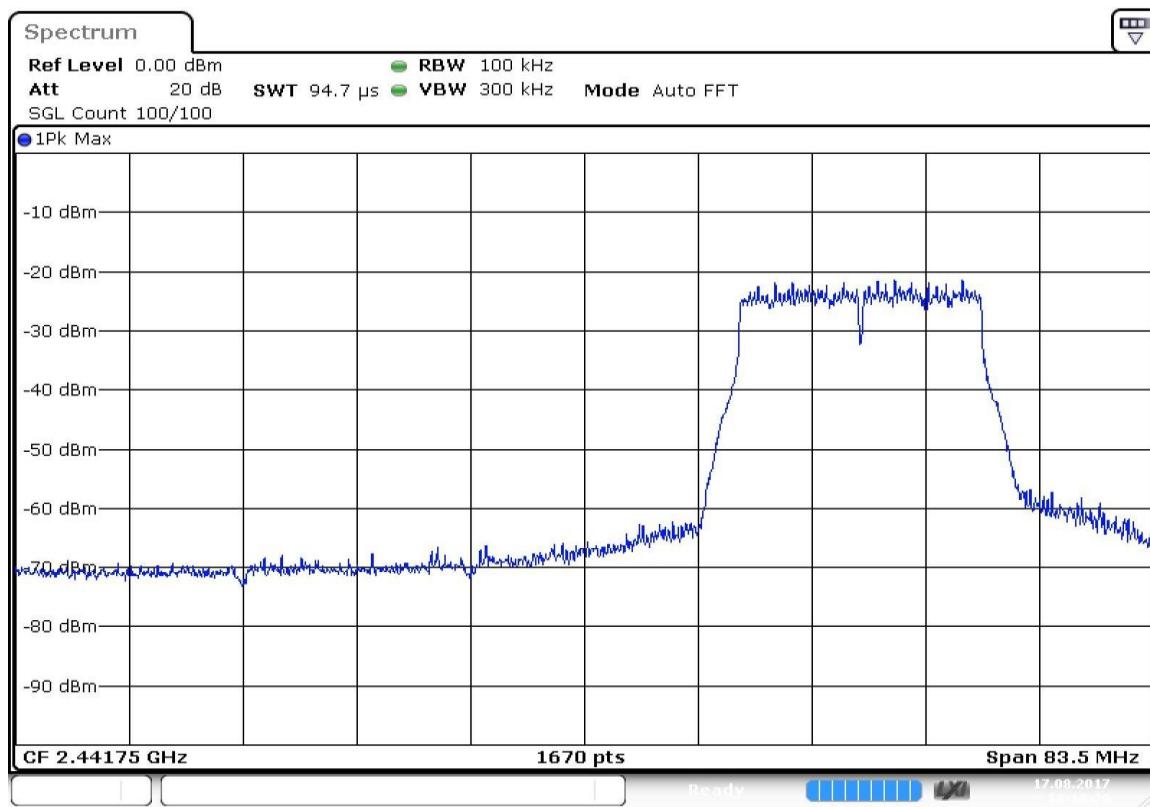
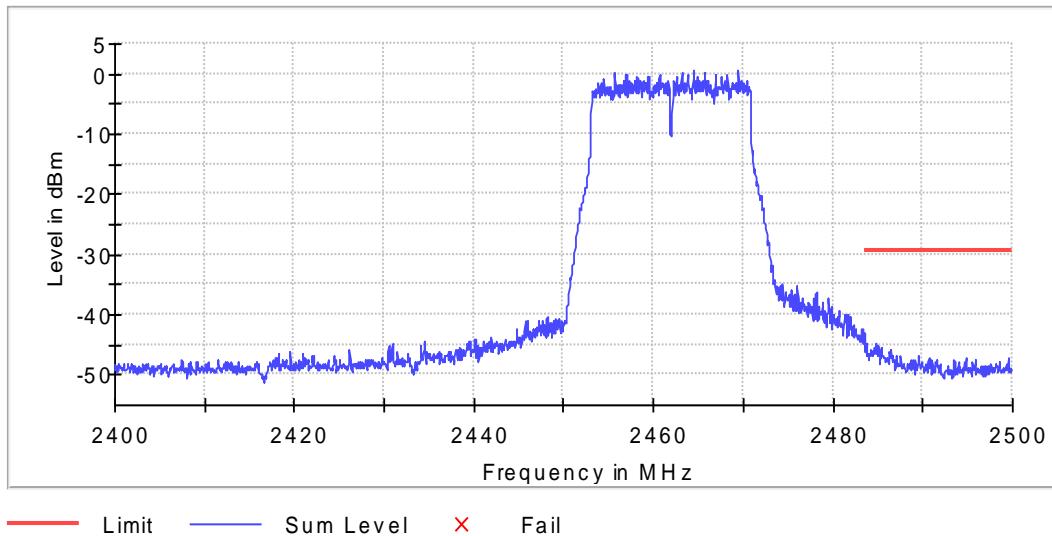


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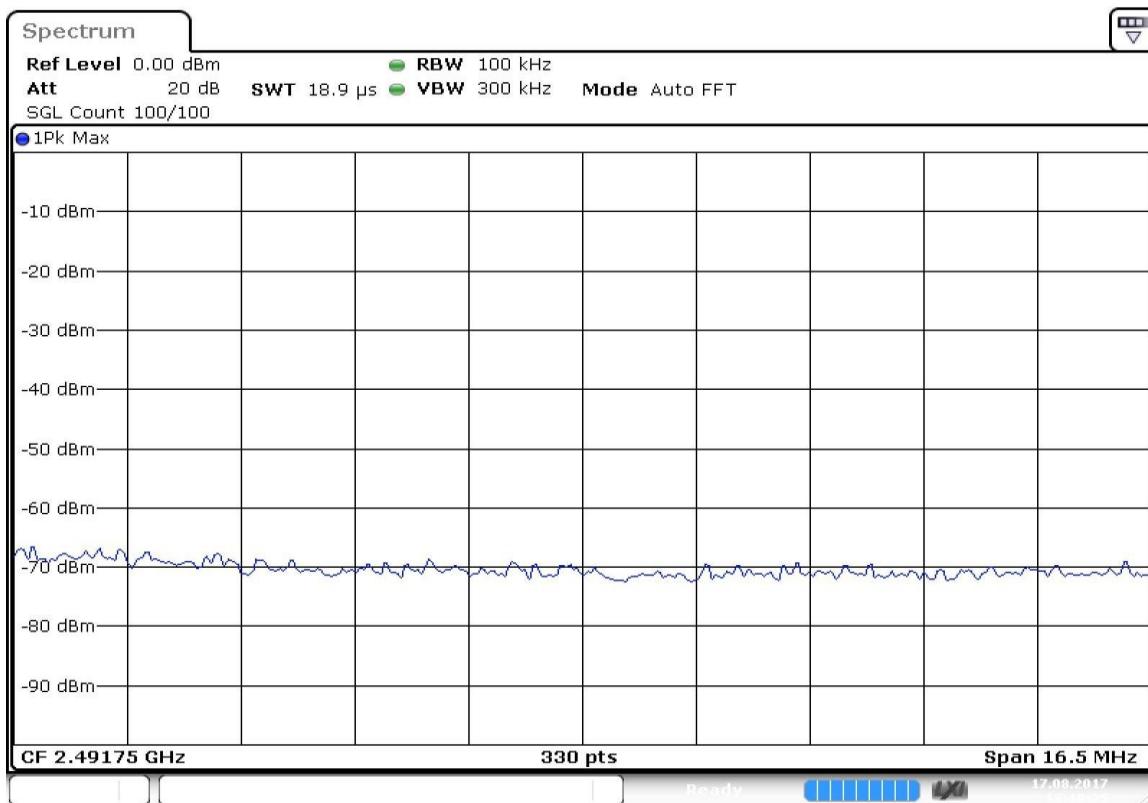
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Date: 17.AUG.2017 13:18:25

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 2Mbps 2412MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19769.502062	-38.8	13.6	-25.2
19746.874414	-39.4	14.3	-25.2
19764.820480	-39.5	14.3	-25.2
16415.148272	-39.6	14.4	-25.2
20304.762984	-39.6	14.5	-25.2
20298.520874	-39.6	14.5	-25.2
19776.524436	-39.7	14.6	-25.2
19746.094150	-39.8	14.6	-25.2
20141.687863	-39.8	14.6	-25.2
19733.609931	-39.8	14.7	-25.2
19773.403381	-39.8	14.7	-25.2
19750.775733	-39.9	14.7	-25.2
19749.995469	-39.9	14.8	-25.2
19757.017843	-40.0	14.8	-25.2
16362.870602	-40.0	14.9	-25.2

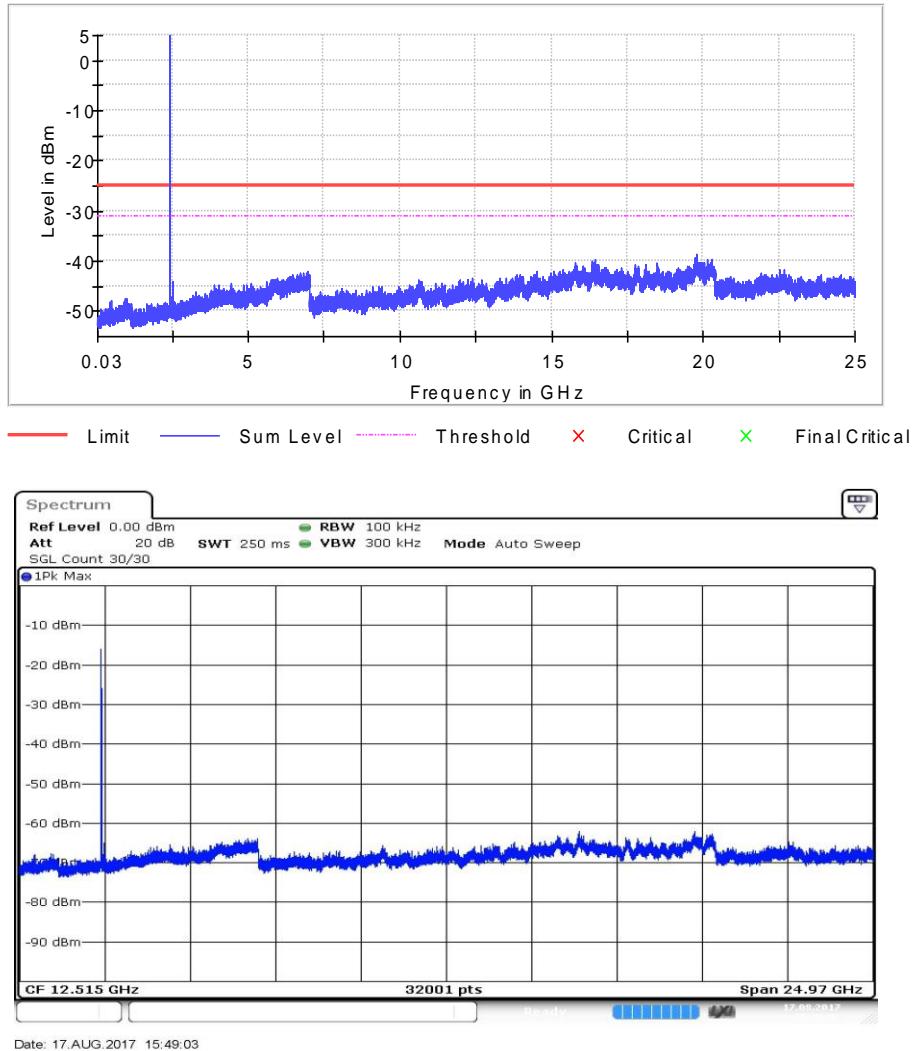


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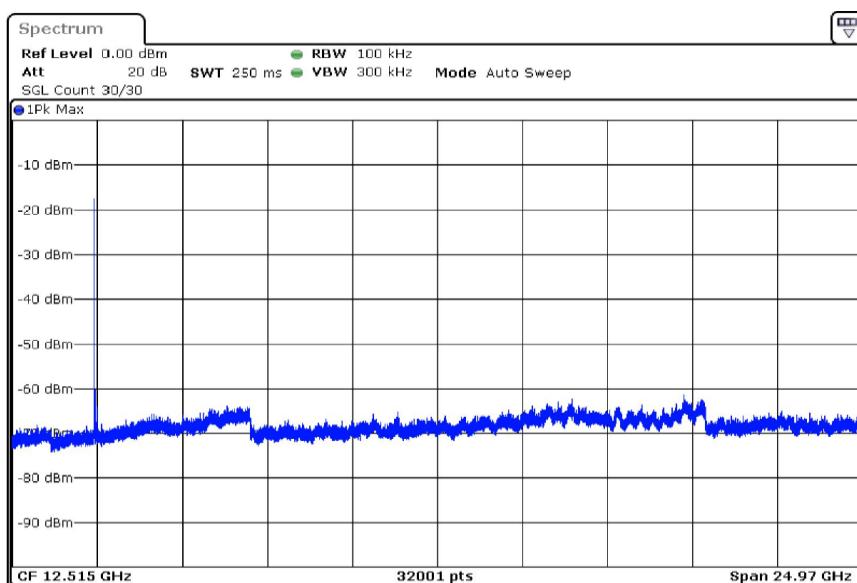
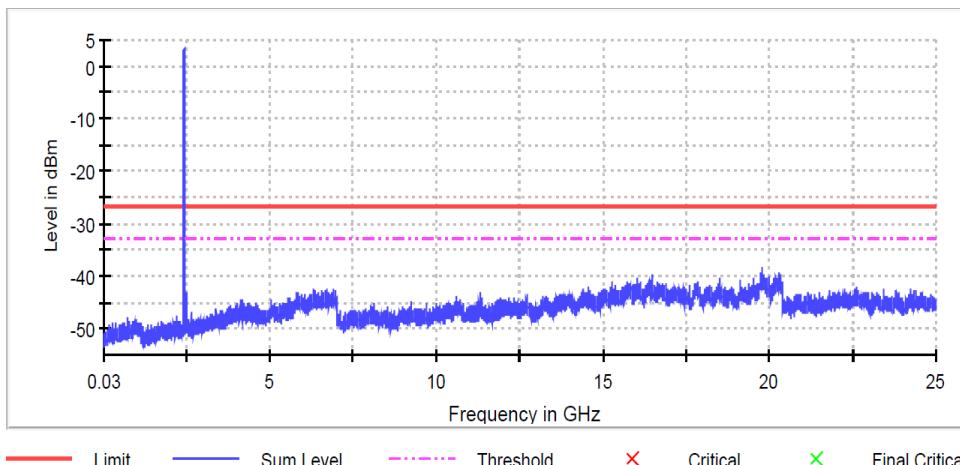
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Testing Cert. No. 1627-01

802.11b 2Mbps 2437MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19766.381007	-38.2	11.4	-26.8
19767.161271	-38.4	11.6	-26.8
19777.304700	-39.3	12.5	-26.8
20298.520874	-39.4	12.6	-26.8
19756.237579	-39.4	12.6	-26.8
18738.291513	-39.5	12.8	-26.8
19775.744172	-39.6	12.8	-26.8
20269.651116	-39.6	12.9	-26.8
18797.591557	-39.7	12.9	-26.8
16468.986470	-39.7	12.9	-26.8
19753.116524	-39.7	12.9	-26.8
20321.148522	-39.7	12.9	-26.8
19748.434942	-39.7	12.9	-26.8
19799.932348	-39.7	13.0	-26.8
19711.762546	-39.7	13.0	-26.8



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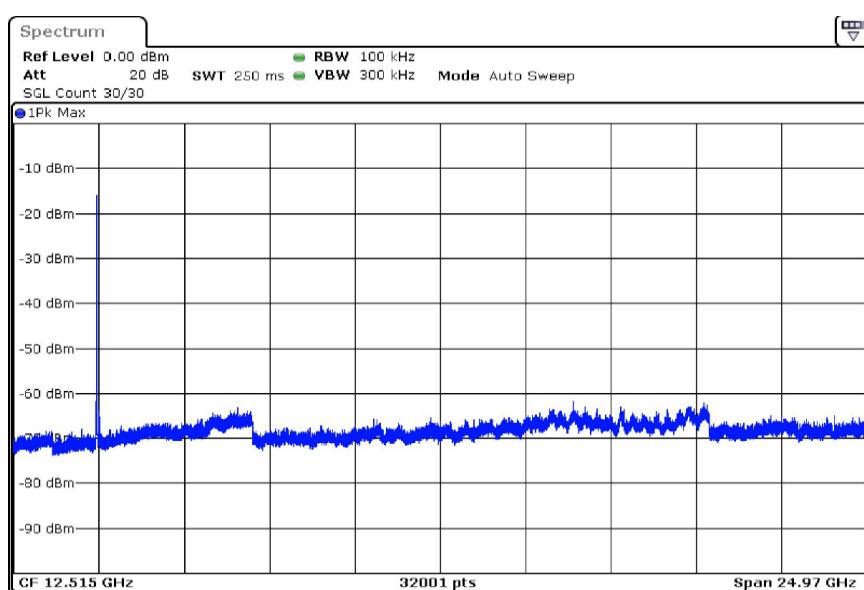
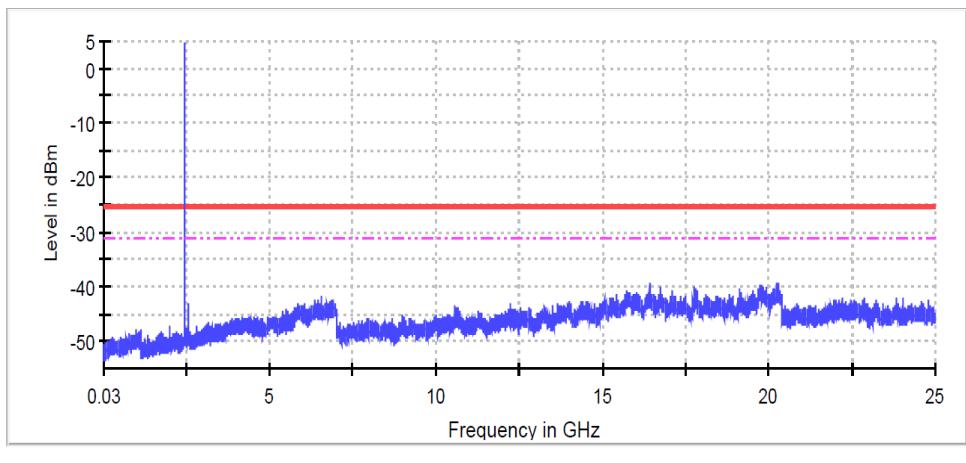
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Testing Cert. No. 1627-01

802.11b 2Mbps 2462MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
16514.148272	-39.2	14.0	-25.3
20313.345885	-39.4	14.1	-25.3
20225.956346	-39.4	14.1	-25.3
19740.632304	-39.7	14.4	-25.3
19797.591557	-39.8	14.5	-25.3
17778.269014	-39.9	14.6	-25.3
19844.407381	-39.9	14.7	-25.3
19767.941535	-40.0	14.7	-25.3
19854.550809	-40.0	14.7	-25.3
19735.170458	-40.0	14.7	-25.3
19736.730986	-40.0	14.7	-25.3
19774.963909	-40.0	14.7	-25.3
19846.748172	-40.1	14.8	-25.3
16745.980095	-40.1	14.8	-25.3
19820.999469	-40.1	14.8	-25.3



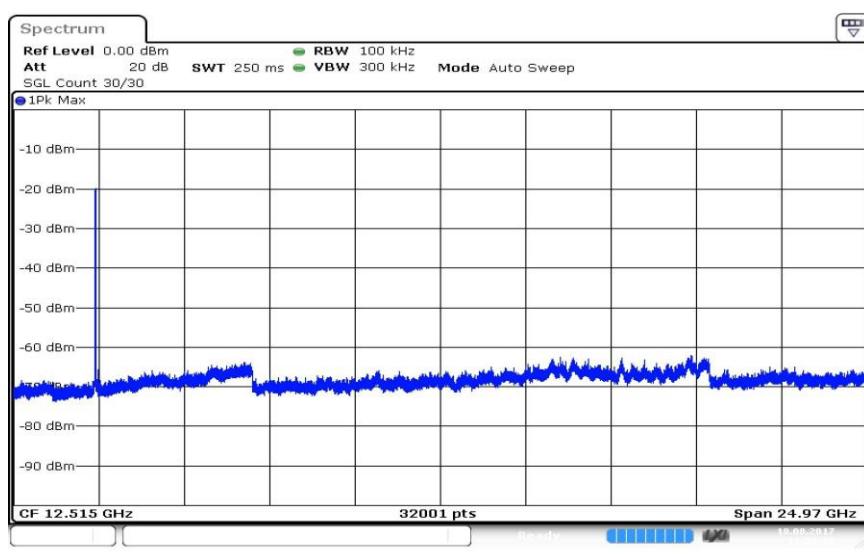
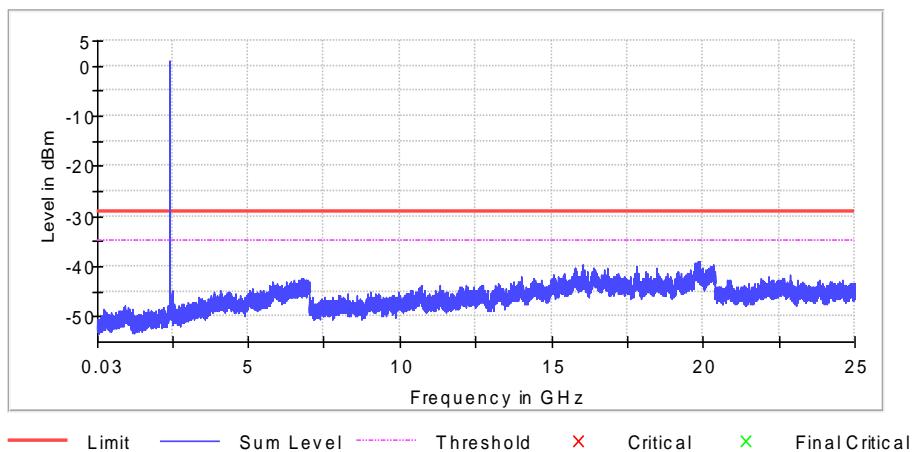
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802.11g 48 Mbps 2412MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19890.442941	-39.0	10.0	-29.0
19853.770546	-39.0	10.0	-29.0
19739.071777	-39.2	10.2	-29.0
2398.490563	-39.3	10.3	-29.0
19796.031029	-39.5	10.5	-29.0
19738.291513	-39.5	10.5	-29.0
19787.448128	-39.6	10.5	-29.0
19770.282326	-39.6	10.6	-29.0
19791.349447	-39.6	10.6	-29.0
19749.995469	-39.7	10.7	-29.0
16036.720361	-39.7	10.7	-29.0
19746.094150	-39.8	10.8	-29.0
2399.270827	-39.8	10.8	-29.0
19781.206018	-39.8	10.8	-29.0
20350.018280	-39.8	10.8	-29.0



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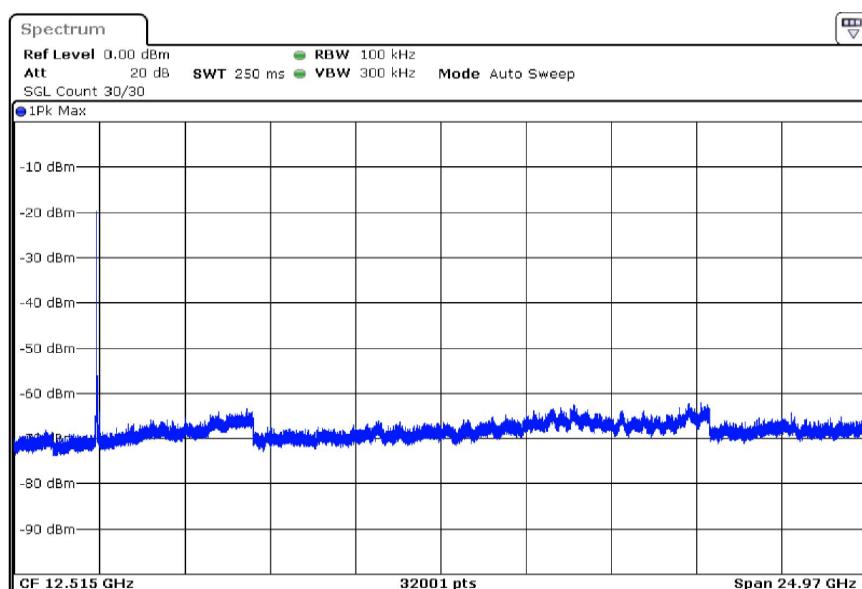
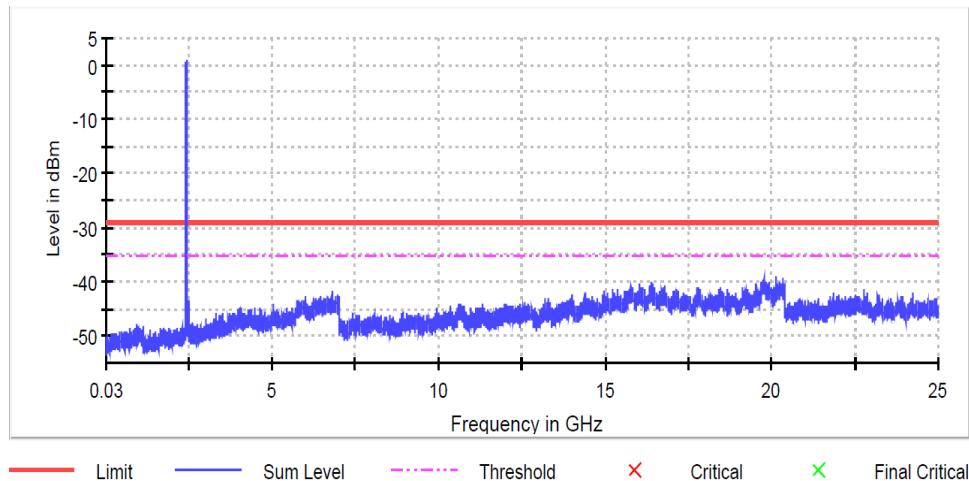
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Testing Cert. No. 1627-01

802.11g 48 Mbps 2437MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
20135.445753	-39.0	9.8	-29.1
19760.138898	-39.1	10.0	-29.1
19773.403381	-39.1	10.0	-29.1
19766.381007	-39.3	10.2	-29.1
19758.578370	-39.4	10.3	-29.1
20316.466940	-39.4	10.3	-29.1
19755.457315	-39.5	10.4	-29.1
19785.887601	-39.6	10.5	-29.1
19781.986282	-39.7	10.5	-29.1
19778.865227	-39.7	10.6	-29.1
19747.654678	-39.8	10.7	-29.1
19759.358634	-39.8	10.7	-29.1
19753.896788	-39.9	10.8	-29.1
19700.838854	-40.0	10.9	-29.1
19756.237579	-40.0	10.9	-29.1



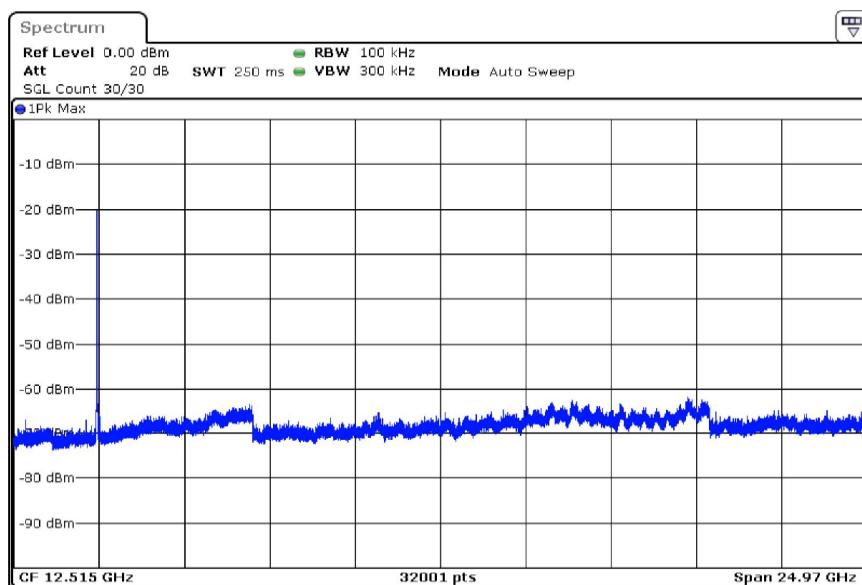
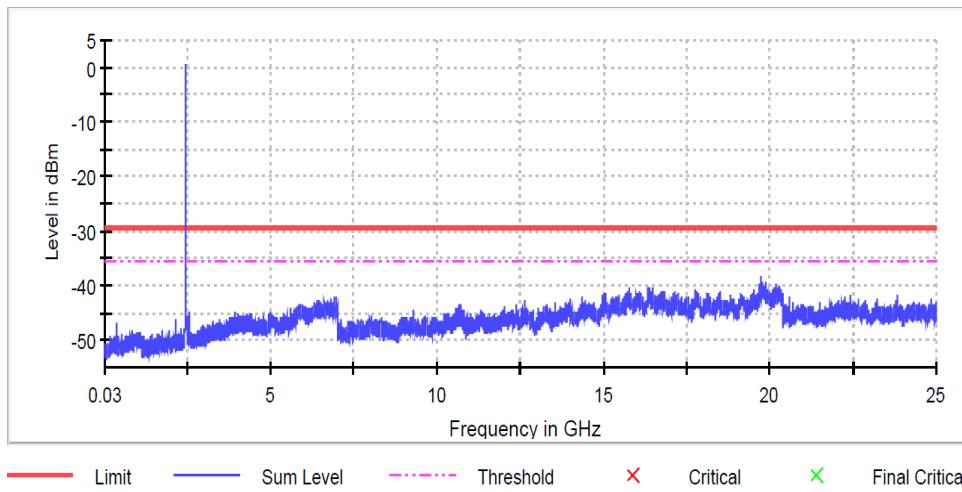
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802.11g 48 Mbps 2462MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19739.852040	-38.4	8.8	-29.5
19796.811293	-39.2	9.6	-29.5
19874.057403	-39.2	9.7	-29.5
19766.381007	-39.4	9.9	-29.5
19764.040216	-39.4	9.9	-29.5
19732.829667	-39.5	9.9	-29.5
19776.524436	-39.5	10.0	-29.5
19686.794107	-39.6	10.1	-29.5
19773.403381	-39.7	10.2	-29.5
19768.721799	-39.7	10.2	-29.5
20176.019468	-39.8	10.3	-29.5
19778.865227	-39.9	10.4	-29.5
19755.457315	-39.9	10.4	-29.5
20307.103775	-39.9	10.4	-29.5
19855.331073	-39.9	10.4	-29.5



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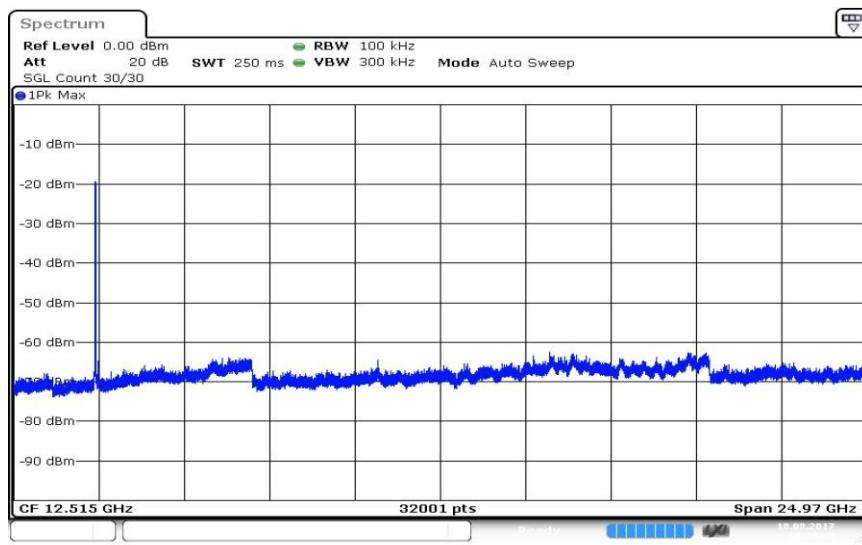
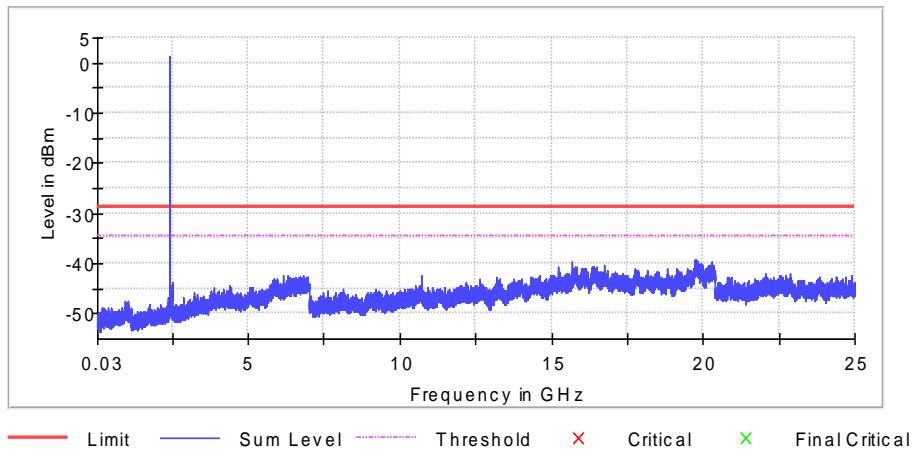
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Testing Cert. No. 1627-01

802.11n(HT20) MCS6 2412MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2397.710299	-38.5	9.9	-28.6
2399.270827	-39.3	10.7	-28.6
19745.313887	-39.3	10.7	-28.6
19767.161271	-39.4	10.8	-28.6
19743.753359	-39.5	10.9	-28.6
19781.986282	-39.5	10.9	-28.6
19849.869227	-39.5	11.0	-28.6
15704.328011	-39.6	11.0	-28.6
19793.690238	-39.6	11.0	-28.6
19781.206018	-39.7	11.1	-28.6
20297.740610	-39.8	11.2	-28.6
19753.116524	-39.8	11.2	-28.6
19849.088963	-39.8	11.2	-28.6
2398.490563	-39.8	11.2	-28.6
19803.053403	-39.8	11.2	-28.6



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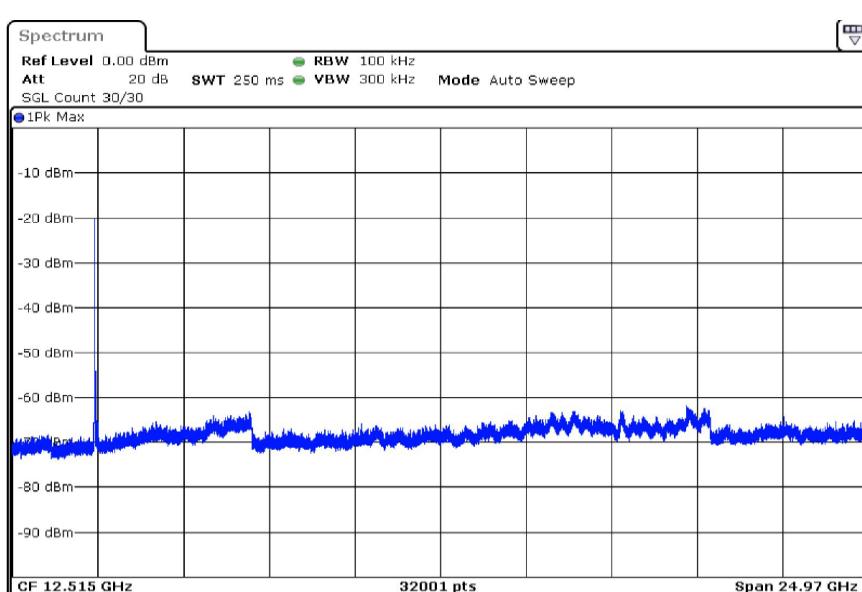
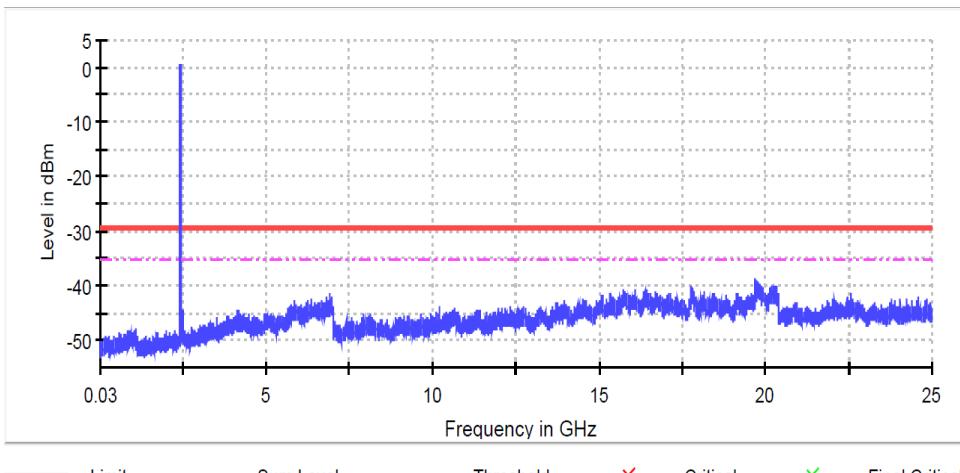
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802.11n(HT20) MCS6 2437MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19703.959909	-38.6	9.2	-29.3
19711.762546	-38.9	9.6	-29.3
19767.941535	-39.2	9.9	-29.3
19757.017843	-39.4	10.1	-29.3
19749.215205	-39.4	10.1	-29.3
19755.457315	-39.5	10.1	-29.3
19789.788919	-39.5	10.2	-29.3
19786.667865	-39.6	10.3	-29.3
19695.377008	-39.6	10.3	-29.3
19824.900787	-39.7	10.3	-29.3
19763.25953	-39.7	10.4	-29.3
19852.210018	-39.8	10.5	-29.3
20193.185270	-39.9	10.5	-29.3
20227.516874	-39.9	10.5	-29.3
19870.156084	-39.9	10.6	-29.3



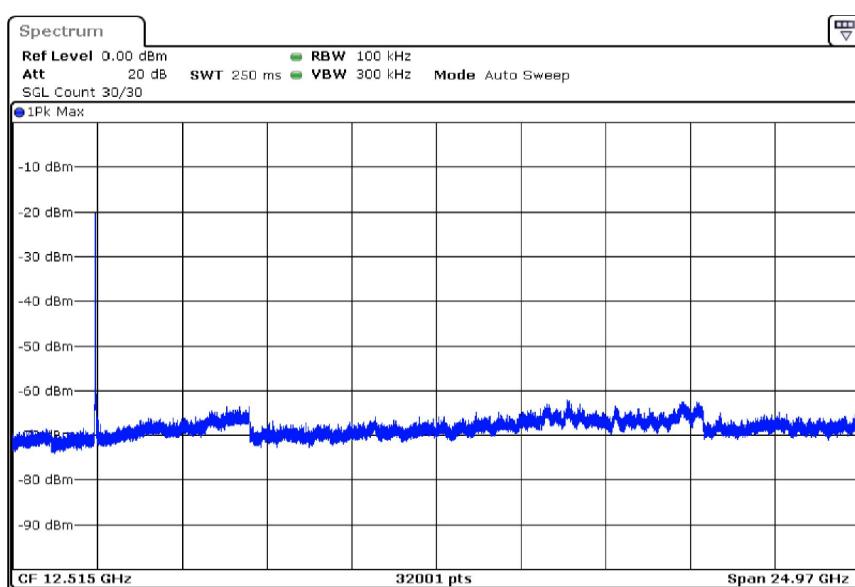
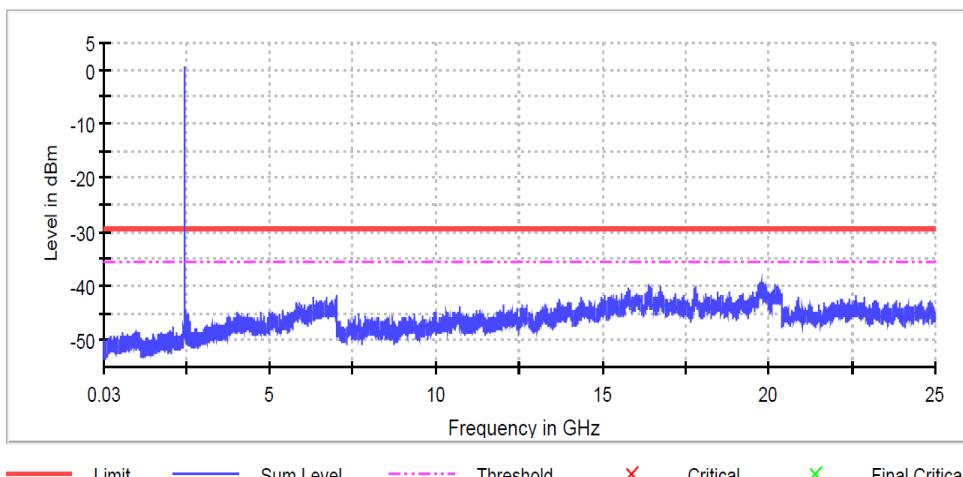
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802.11n(HT20) MCS6 2462MHz

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19741.412568	-39.2	9.7	-29.5
19758.578370	-39.2	9.7	-29.5
19772.623117	-39.2	9.7	-29.5
19792.129711	-39.2	9.7	-29.5
19749.995469	-39.2	9.8	-29.5
19820.219205	-39.3	9.8	-29.5
19747.654678	-39.4	9.9	-29.5
19738.291513	-39.4	9.9	-29.5
19750.775733	-39.6	10.1	-29.5
19803.053403	-39.6	10.1	-29.5
16368.332448	-39.6	10.1	-29.5
19764.040216	-39.6	10.1	-29.5
19700.058590	-39.6	10.2	-29.5
19874.837666	-39.8	10.3	-29.5
19763.259953	-39.8	10.3	-29.5



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