
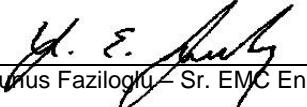




**BUREAU  
VERITAS**

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

# Test Report

Report No	ER1905-7
Client	Harman International Industries, Inc. Mark Bowman
Address	30001 Cabot Drive Novi, MI 48377
Phone	248-254-7751
Items tested FCC ID IC	INFO3 CSM MY19 HIGH 2AHPN-BE2829 6434C-BE2829
Equipment Type Equipment Code	Part 15 Spread Spectrum Transmitter DSS
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2
Test Dates	August 12 <sup>th</sup> to September 6 <sup>th</sup> , 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.

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, ISSED Canada RSS-247 Issue 2

The product is the INFO3 CSM MY19 HIGH. It is a frequency hopping spread spectrum transmitter that operates in the 2402 – 2480 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.

Issue No.	Reason for change	Date Issued
1	Original Release	November 9, 2017

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## ***Test Methodology***

All testing was performed according to the following rules/procedures/documents;  
CFR 47 Part 15.247, RSS-247 Issue 2, RSS-Gen Issue 4 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.

<b>Frequency</b>	<b>RBW</b>	<b>VBW</b>
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-25GHz	1MHz	3MHz

## Product Tested - Configuration Documentation

EUT Configuration									
<b>Work Order:</b>	R1905								
<b>Company:</b>	Harman International Industries, Incorporated								
<b>Company Address:</b>	30001 Cabot Drive								
	Novi, MI, 48377								
<b>Contact:</b>	Mark Bowman								
	MN			PN			SN		
<b>EUT:</b>	INFO3 CSM MY19 HIGH			--			Sample 1		
<b>EUT Description:</b>	GM MY 19 – High Car Stereo								
<b>Port Label</b>	<b>Port Type</b>	<b># ports</b>	<b># populated</b>	<b>cable type</b>	<b>shielded</b>	<b>ferrites</b>	<b>length (m)</b>	<b>in/out</b>	<b>comment</b>
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	
<b>Software Operating Mode Description:</b>									
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.

## 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 - R1905	
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC		
30-1000MHz Vertical Data						Test Site - CH1	
Operator: CCH			Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar				
FCC High model MY19 BT CH 39							
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)
31.349	41	-15.3	25.7	40	-14.3	PASS	
37.068	44.6	-19.6	25	40	-15	PASS	
39.682	53.5	-21.5	31.9	40	-8.1	PASS	-8.1
717.754	42	-12.3	29.7	46	-16.3	PASS	
848.138	43.6	-10.7	33	46	-13.1	PASS	
913.67	44.5	-9	35.5	46	-10.5	PASS	

Curtis Straus - a Bureau Veritas Company						Work Order - R1905	
Radiated Emissions Electric Field 3m Distance					EUT Power Input - 13.8V DC		
30-1000MHz Horizontal Data						Test Site - CH1	
Operator: CCH			Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar				
FCC High model MY19 BT CH 39							
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)
848.08	45.1	-10.7	34.5	46	-11.6	PASS	-11.6
873.422	35.2	-10.1	25.1	46	-20.9	PASS	
873.987	37.5	-10	27.4	46	-18.6	PASS	
893.492	38.6	-9.5	29.1	46	-16.9	PASS	
913.686	43.3	-9	34.3	46	-11.8	PASS	
918.003	32.6	-9.1	23.5	46	-22.5	PASS	

### 30-1000MHz

Curtis Straus - a Bureau Veritas Company												Work Order - R1905	
Radiated Emissions Electric Field 3m Distance												EUT Power Input - 13.8V DC	
1-6GHz Vertical Data												Test Site - CH1	
Operator: CCH											Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar		
FCC High model MY19 BT CH 0													
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)
1330.6	31.5	23.5	12.1	43.6	35.7	74	-30.4	PASS	54	-18.3	PASS		
5235	32.9	23.4	21.9	54.8	45.3	74	-19.2	PASS	54	-8.7	PASS		
5723.9	33.1	24	23	56.1	47	74	-17.8	PASS	54	-7	PASS	-17.8	-7

Curtis Straus - a Bureau Veritas Company												Work Order - R1905	
Radiated Emissions Electric Field 3m Distance												EUT Power Input - 13.8V DC	
1-6GHz Horizontal Data												Test Site - CH1	
Operator: CCH											Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar		
FCC High model MY19 BT CH 0													
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)
1423.4	32.2	23.6	12	44.3	35.6	74	-29.7	PASS	54	-18.4	PASS		
5833.1	33.3	23.5	23	56.3	46.4	74	-17.7	PASS	54	-7.5	PASS	-17.7	-7.5

### 1-6GHz Low Channel





**Test Report for Harman International Industries, Inc. • Report No. ER1905-7 • INFO3 CSM MY19 HIGH • November 9, 2017**

Curtis Straus - a Bureau Veritas Company												Work Order - R1905	
Radiated Emissions Electric Field 3m Distance												EUT Power Input - 13.8V DC	
1-6GHz Vertical Data												Test Site - CH1	
Operator: CCH												Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar	
FCC High model MY19 BT CH 39													
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)
1400.4	31.5	23.2	12.3	43.8	35.6	74	-30.2	PASS	54	-18.4	PASS		
5803.3	33.1	23.6	22.9	56	46.5	74	-18	PASS	54	-7.5	PASS	-18	-7.5

Curtis Straus - a Bureau Veritas Company											Work Order - R1905		
Radiated Emissions Electric Field 3m Distance											EUT Power Input - 13.8V DC		
1-6GHz Horizontal Data											Test Site - CH1		
Operator: CCH											Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar		
FCC High model MY19 BT CH 39													
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)
1043.8	36.1	28.9	8.4	44.6	37.3	74	-29.4	PASS	54	-16.6	PASS		
1391.4	33.4	23.1	12.4	45.8	35.4	74	-28.2	PASS	54	-18.5	PASS		
5278.4	31.8	23	22.1	53.9	45.2	74	-20.1	PASS	54	-8.8	PASS		
5802.3	33.8	23.6	22.9	56.7	46.5	74	-17.3	PASS	54	-7.4	PASS	-17.3	-7.4

**1-6GHz Center Channel**

Curtis Straus - a Bureau Veritas Company												Work Order - R1905		
Radiated Emissions Electric Field 3m Distance												EUT Power Input - 13.8V DC		
1-6GHz Vertical Data												Test Site - CH1		
Operator: CCH										Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar				
FCC High model MY19 BT CH 78														
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)
	1043.9	36.7	29.4	8.4	45.1	37.9	74	-28.8	PASS	54	-16.1	PASS		
	1341.6	32	23.4	12.2	44.2	35.6	74	-29.8	PASS	54	-18.4	PASS		
	3328.4	33.2	25.1	16.9	50.1	42	74	-23.9	PASS	54	-12	PASS		
5950.4	33	24	23.2	56.2	47.2	74	-17.8	PASS	54	-6.7	PASS	-17.8	-6.7	

Curtis Straus - a Bureau Veritas Company												Work Order - R1905	
Radiated Emissions Electric Field 3m Distance												EUT Power Input - 13.8V DC	
1-6GHz Horizontal Data												Test Site - CH1	
Operator: CCH										Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar			
FCC High model MY19 BT CH 0													
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)
1305.2	33.3	23.7	12.2	45.5	35.9	74	-28.5	PASS	54	-18.1	PASS		
5216.5	32.6	23.6	21.8	54.4	45.4	74	-19.6	PASS	54	-8.6	PASS	-19.6	-8.6
5248.5	31	23.3	22	53	45.3	74	-21	PASS	54	-8.7	PASS		

**1-6GHz High Channel**



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**Test Report for Harman International Industries, Inc. • Report No. ER1905-7 • INFO3 CSM MY19 HIGH • November 9, 2017**

Curtis Straus - a Bureau Veritas Company				Work Order - R1905													
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC													
6-18GHz Vertical Data				Test Site - CH1													
Operator: CCH				Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar													
FCC High model MY19 BT CH 39																	
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	Antenna Height	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)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)		
16416	28.9	20.9	33.1	62	53.9	83.5	-21.5	PASS	63.5	-9.6	PASS	200	310	-21.5	-9.6		
Curtis Straus - a Bureau Veritas Company				Work Order - R1905													
Radiated Emissions Electric Field 1m Distance				EUT Power Input - 13.8V DC													
6-18GHz Horizontal Data				Test Site - CH1													
Operator: CCH				Temp; Humid; Pres - 23.8°C; 33%RH; 1018mBar													
FCC High model MY19 BT CH 39																	
Frequency	Raw Peak Reading	Raw Avg Reading	Correction Factor	Adjusted Peak Amplitude	Adjusted Avg Amplitude	Peak Limit	Peak Margin	Peak Test Results	Avg Limit	Avg Margin	Avg Test Results	Antenna Height	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)	(Pass/Fail)	(cm)	(degrees)	(dB)	(dB)		
17894.2	28.9	19.9	34.7	63.5	54.5	83.5	-20	PASS	63.5	-9	PASS	146	14	-20	-9		

**6-18GHz**

Radiated Emissions Table															
Date: 29-Aug-17				Company: Harman International Industries						Work Order: R1905					
Engineer: Chris Hamel				EUT Desc: GM MY 19 - HIGH FCC						EUT Operating Voltage/Frequency: 13.8V DC					
Temp: 23.8°C				Humidity: 33%						Pressure: 1018mBar					
Frequency Range: 18-25GHz										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)	
No Emissions Found				---	---	---	---	---	---	---	---	---	---	---	
Table Result:				Pass				by				Worst Freq:			
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															
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															
Copyright Curtis-Straus LLC 2000															

**18-25GHz**



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## Test Equipment Used:

Rev. 8/25/2017								
<b>Cables</b>	<b>Range</b>		<b>Mfr</b>			<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Spectrum Analyzers / Receivers/Preselectors</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
<b>Radiated Emissions Sites</b>	<b>FCC Code</b>	<b>IC Code</b>	<b>VCCI Code</b>	<b>Range</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Preamps/Couplers Attenuators / Filters</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
2311 PA	1-1000MHz	PAM-103	COM-POWER	441175	2311	II	2/4/2018	2/4/2017
<b>Antennas</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
Red-Black Bilog	30-2000MHz	JB1	Sunol	A091604-2	1106	I	2/28/2019	2/28/2017
<b>Meteorological Meters</b>		<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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

Rev. 8/25/2017								
<b>Cables</b>	<b>Range</b>		<b>Mfr</b>			<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Spectrum Analyzers / Receivers/Preselectors</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	12/22/2017	12/22/2016
<b>Radiated Emissions Sites</b>	<b>FCC Code</b>	<b>IC Code</b>	<b>VCCI Code</b>	<b>Range</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Preamps/Couplers Attenuators / Filters</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
1517 HF Preamp	1-20GHz	CS	CS	N/A	1517	II	9/14/2017	8/14/2016
<b>Antennas</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
Blue Horn	1-18Ghz	3117	ETS	157647	1861	I	2/14/2019	2/14/2017
<b>Meteorological Meters</b>		<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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.

## 1-18GHz

Rev. 8/25/2017								
<b>Spectrum Analyzers / Receivers/Preselectors</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
Brown	9kHz-26.5GHz	E4407B	Agilent	SG44210511	1510	I	7/26/2018	7/26/2017
<b>Radiated Emissions Sites</b>	<b>FCC Code</b>	<b>IC Code</b>	<b>VCCI Code</b>	<b>Range</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Preamps/Couplers Attenuators / Filters</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	9/16/2017	9/16/2016
<b>Antennas</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
<b>Meteorological Meters</b>		<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Cables</b>	<b>Range</b>		<b>Mfr</b>			<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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 BT mode DH5									EUT Max Freq:								
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average					
									Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)			
Fund V	2402.2	83.3		---	---	---	---	---	---	---	---	---	---	---			
Fund H	2402.1	81.64		---	---	---	---	---	---	---	---	---	---	---			
V	2390.0	34.05	34.1	20.8	28.0	3.2	44.5	44.5	74.0	-29.5	Pass	54.0	-9.5	Pass			
V	2310.0	33.78	33.8	20.8	27.9	3.2	44.1	44.1	74.0	-29.9	Pass	54.0	-9.9	Pass			
				---	---	---	---	---	---	---	---	---	---	---			
Fund V	2480.04	83.25		---	---	---	---	---	---	---	---	---	---	---			
Fund H	2480.03	82.22		---	---	---	---	---	---	---	---	---	---	---			
V	2483.5	40.3	26.1	21.0	28.2	3.2	50.7	36.5	74.0	-23.3	Pass	54.0	-17.5	Pass			
V	2484.8	42.2	26.0	21.0	28.2	3.2	52.6	36.4	74.0	-21.4	Pass	54.0	-17.6	Pass			
Vpk	2500.0	34.4	34.4	21.1	28.3	3.2	44.8	44.8	74.0	-29.2	Pass	54.0	-9.2	Pass			
Table Result:									Pass			by -9.2 dB			Worst Freq: 2500.0 MHz		
Test Site: EMI Chamber 1			Cable 1: Asset #2051			Cable 2: Asset #2054			Cable 3: ---			Preselector: ---					
Analyzer: Rental SA#3			Preamp: Asset #1517			Antenna: Orange Horn											
CSsoft Radiated Emissions Calculator v 1.017.188																	
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor																	
Copyright Curtis-Straus LLC 2000																	

## AC Line Conducted Emissions LIMITS

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

\*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

## MEASUREMENTS / RESULTS

N/A. EUT is vehicle battery powered only.

## Measurement Uncertainty

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

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



## Conditions Of Testing

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

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS," "MTL," "ACTS," "MTL-ACTS" and CURTIS-STRAUS (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.
14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.



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

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

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

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

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





## Appendix A:

### ER1905-7 Appendix A CFR Title 47 FCC Part §15.247 and ISSED Canada RSS-247 Issue 2

#### DUT Information

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

#### Frequencies

BT CH 0 (2402 MHz)		
BT CH 1 (2403 MHz)	BT CH 2 (2404 MHz)	BT CH 3 (2405 MHz)
BT CH 4 (2406 MHz)	BT CH 5 (2407 MHz)	BT CH 6 (2408 MHz)
BT CH 7 (2409 MHz)	BT CH 8 (2410 MHz)	BT CH 9 (2411 MHz)
BT CH 10 (2412 MHz)	BT CH 11 (2413 MHz)	BT CH 12 (2414 MHz)
BT CH 13 (2415 MHz)	BT CH 14 (2416 MHz)	BT CH 15 (2417 MHz)
BT CH 16 (2418 MHz)	BT CH 17 (2419 MHz)	BT CH 18 (2420 MHz)
BT CH 19 (2421 MHz)	BT CH 20 (2422 MHz)	BT CH 21 (2423 MHz)
BT CH 22 (2424 MHz)	BT CH 23 (2425 MHz)	BT CH 24 (2426 MHz)
BT CH 25 (2427 MHz)	BT CH 26 (2428 MHz)	BT CH 27 (2429 MHz)
BT CH 28 (2430 MHz)	BT CH 29 (2431 MHz)	BT CH 30 (2432 MHz)
BT CH 31 (2433 MHz)	BT CH 32 (2434 MHz)	BT CH 33 (2435 MHz)
BT CH 34 (2436 MHz)	BT CH 35 (2437 MHz)	BT CH 36 (2438 MHz)
BT CH 37 (2439 MHz)	BT CH 38 (2440 MHz)	BT CH 39 (2441 MHz)
BT CH 40 (2442 MHz)	BT CH 41 (2443 MHz)	BT CH 42 (2444 MHz)
BT CH 43 (2445 MHz)	BT CH 44 (2446 MHz)	BT CH 45 (2447 MHz)
BT CH 46 (2448 MHz)	BT CH 47 (2449 MHz)	BT CH 48 (2450 MHz)
BT CH 49 (2451 MHz)	BT CH 50 (2452 MHz)	BT CH 51 (2453 MHz)
BT CH 52 (2454 MHz)	BT CH 53 (2455 MHz)	BT CH 54 (2456 MHz)
BT CH 55 (2457 MHz)	BT CH 56 (2458 MHz)	BT CH 57 (2459 MHz)
BT CH 58 (2460 MHz)	BT CH 59 (2461 MHz)	BT CH 60 (2462 MHz)
BT CH 61 (2463 MHz)	BT CH 62 (2464 MHz)	BT CH 63 (2465 MHz)
BT CH 64 (2466 MHz)	BT CH 65 (2467 MHz)	BT CH 66 (2468 MHz)
BT CH 67 (2469 MHz)	BT CH 68 (2470 MHz)	BT CH 69 (2471 MHz)
BT CH 70 (2472 MHz)	BT CH 71 (2473 MHz)	BT CH 72 (2474 MHz)
BT CH 73 (2475 MHz)	BT CH 74 (2476 MHz)	BT CH 75 (2477 MHz)
BT CH 76 (2478 MHz)	BT CH 77 (2479 MHz)	BT CH 78 (2480 MHz)

#### DUT Settings

No. of transmission chains 1  
Equipment Type Frequency Hopping Spread Spectrum

#### Antenna Gain

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



**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
<b>Signal Generators</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Cables</b>	<b>Range</b>		<b>Mfr</b>			<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Attenuators</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
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
<b>Wideband Radio Communication Tester</b>	<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>	<b>Calibrated on</b>
(Rental)CMW500	DC to 6GHz	CMW500	ROHDE & SCHWARZ	155905		I	6/2/2018	6/2/2017



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## Summary

Test	Frequency (MHz)	DH1 Result	DH3 Result	DH5 Result	2-DH1 Result	2-DH3 Result	2-DH5 Result	3-DH1 Result	3-DH3 Result	3-DH5 Result
Hopping Frequencies	--- (hopping)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Band Edge (during hopping)	--- (hopping)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Carrier Frequency Separation	2402.000 (hopping)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Carrier Frequency Separation	2480.000 (hopping)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Time of Channel Occupancy	2402.000 (hopping)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Time of Channel Occupancy	2441.000 (hopping)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Time of Channel Occupancy	2480.000 (hopping)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Emission Bandwidth 20 dB	2402.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Band Edge low	2402.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Peak output power	2402.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Conducted Spurious Emissions	2402.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Emission Bandwidth 20 dB	2441.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Peak output power	2441.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Conducted Spurious Emissions	2441.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Emission Bandwidth 20 dB	2480.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Band Edge high	2480.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Peak output power	2480.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Conducted Spurious Emissions	2480.000 (single)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS



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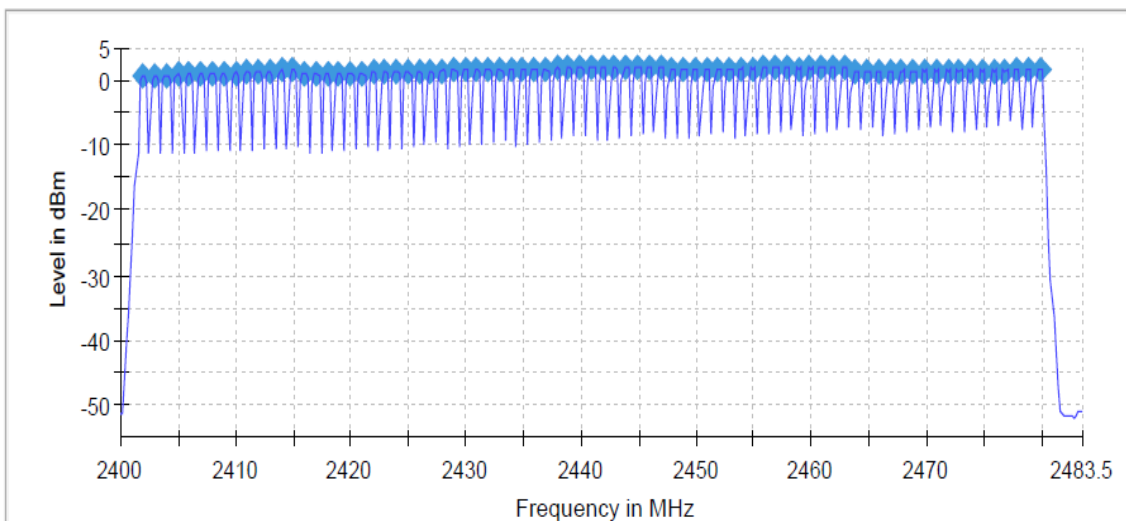
## Number of Hopping Frequencies

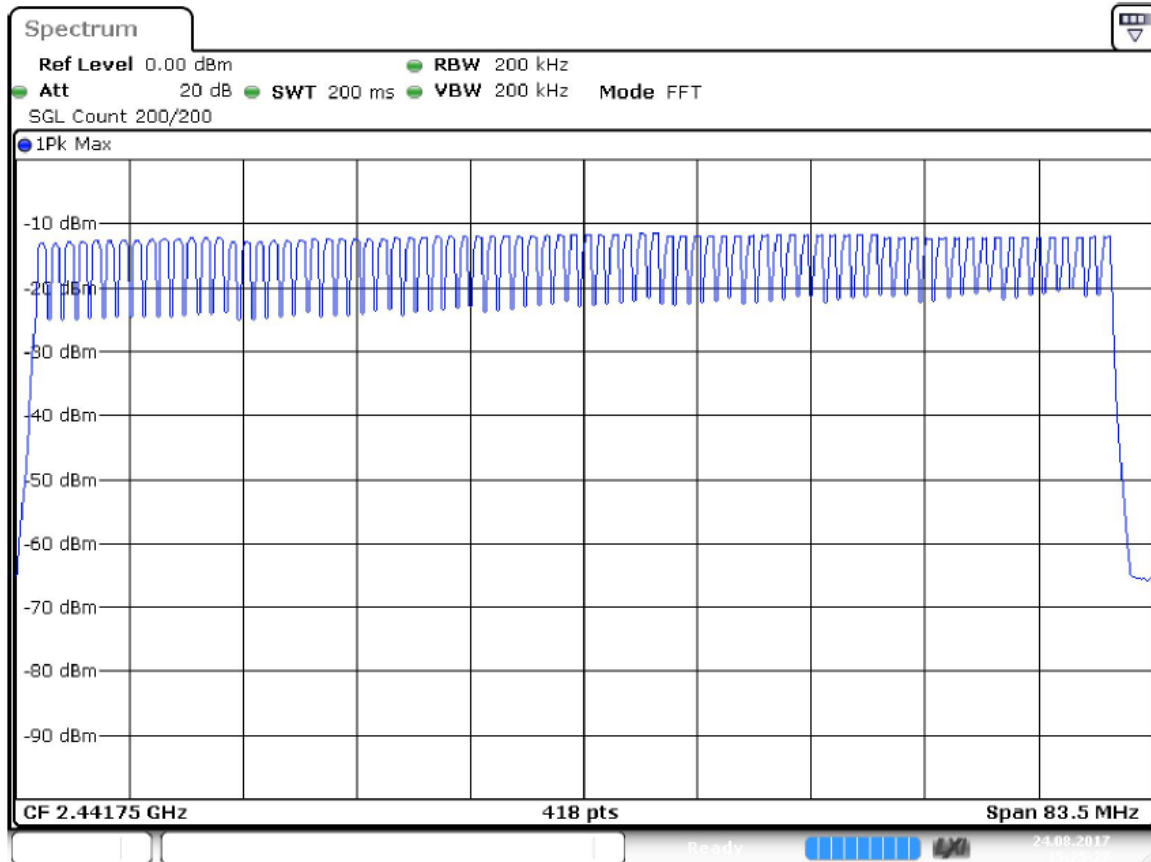
Test procedure in accordance with ANSI C63.10-2013

### Channels

Channels	Limit Min	Result
79	15	PASS

Sequence





## Band Edge (during hopping)

Test procedure in accordance with ANSI C63.10-2013

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

### Inband Peak

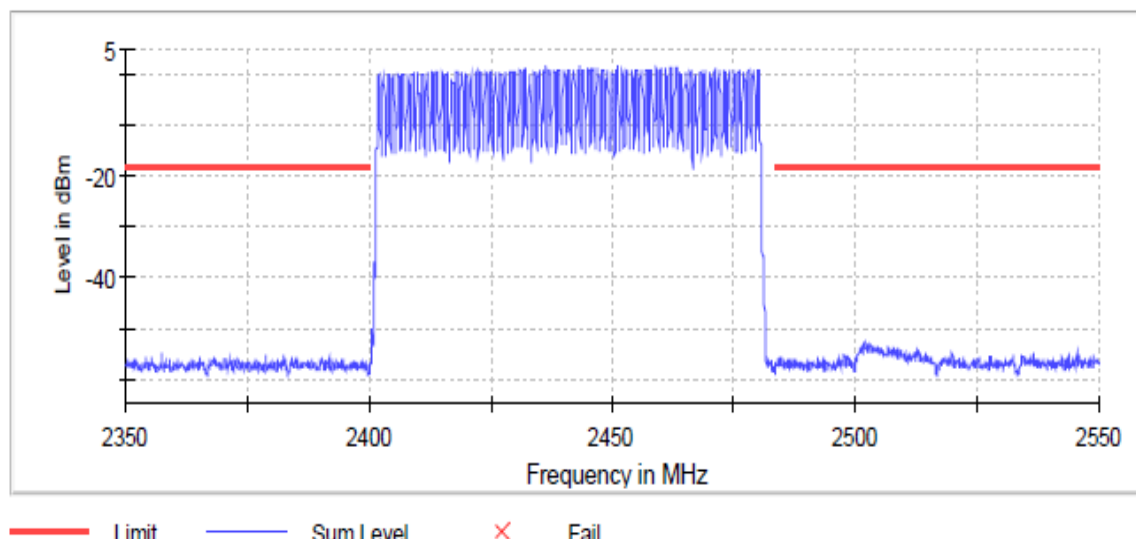
Data Rate	Frequency (MHz)	Level (dBm)
DH1	2447.100725	1.8
DH3	2462.946763	1.6
DH5	2443.101725	2.0
2-DH1	2445.951012	-1.7
2-DH3	2441.952012	-2.0
2-DH5	2431.104724	-1.7
3-DH1	2444.801300	-1.6
3-DH3	2430.104974	-1.5
3-DH5	2442.101975	-1.7

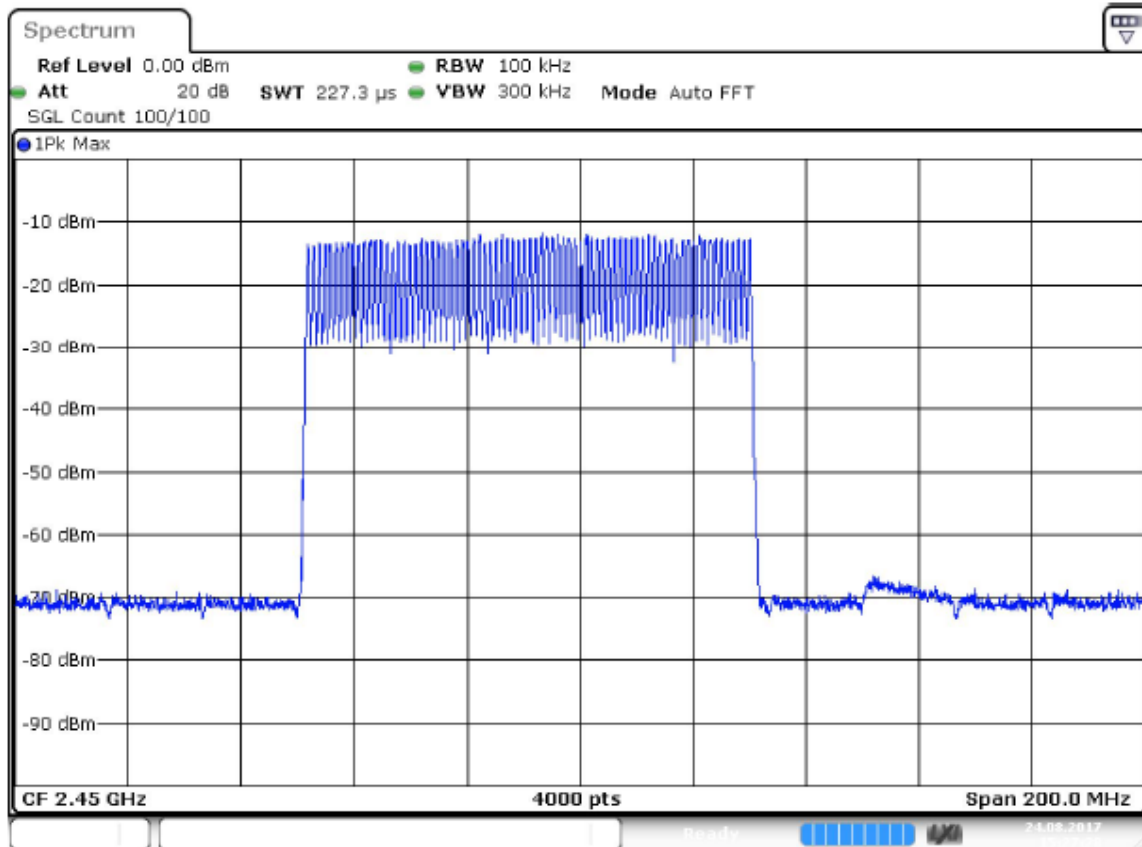
Plots for packet type DH5 shown below.

### Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2501.787053	-52.7	34.7	-18.0	PASS
2501.837041	-52.9	34.9	-18.0	PASS
2502.036991	-53.0	34.9	-18.0	PASS
2501.737066	-53.0	35.0	-18.0	PASS
2502.936766	-53.0	35.0	-18.0	PASS
2501.987003	-53.0	35.0	-18.0	PASS
2502.886778	-53.1	35.1	-18.0	PASS
2501.937016	-53.3	35.3	-18.0	PASS
2502.236941	-53.4	35.3	-18.0	PASS
2502.586853	-53.6	35.6	-18.0	PASS
2506.435891	-53.7	35.7	-18.0	PASS
2506.485879	-53.7	35.7	-18.0	PASS
2501.337166	-53.7	35.7	-18.0	PASS
2502.286928	-53.8	35.8	-18.0	PASS
2504.386403	-53.8	35.8	-18.0	PASS

Band Edge





## Carrier Frequency Separation

Test procedure in accordance with ANSI C63.10-2013

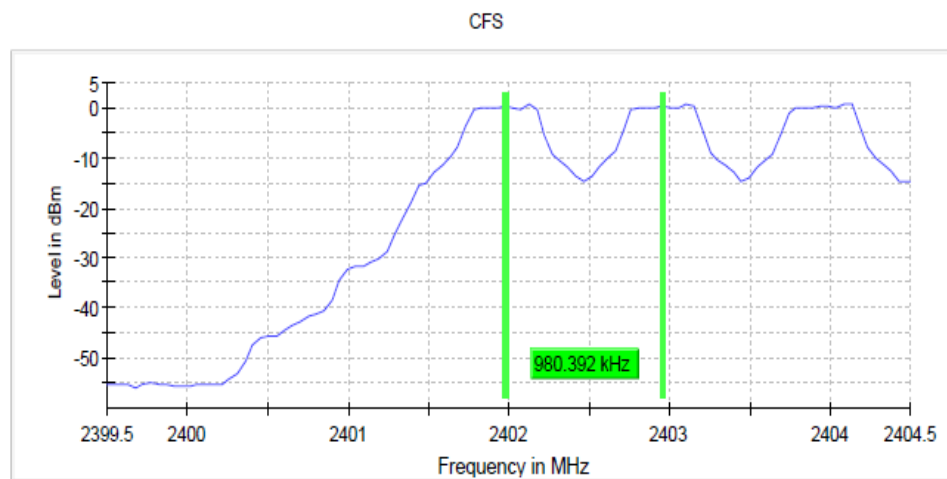
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty(k = 2) < 1%

### 2402 MHz

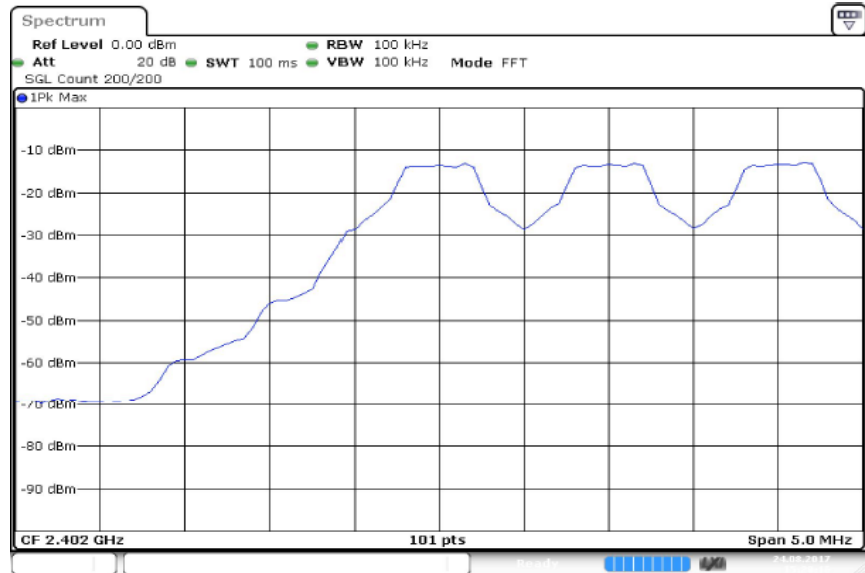
Limit is 2/3 of the widest 20dB bandwidth measured for worst case.

Packet Type	DUT Frequency (MHz)	Frequency Separation (MHz)	Minimum Limit (MHz)	Result
DH1	2402.000000	0.980392	0.921569	PASS
DH3	2402.000000	0.980392	0.921569	PASS
DH5	2402.000000	0.980392	0.921569	PASS
2-DH1	2402.000000	0.980392	0.921569	PASS
2-DH3	2402.000000	0.980393	0.921569	PASS
2-DH5	2402.000000	0.980392	0.921569	PASS
3-DH1	2402.000000	0.980392	0.921569	PASS
3-DH3	2402.000000	0.980392	0.921569	PASS
3-DH5	2402.000000	0.931373	0.921569	PASS

Plots for packet type DH5 shown below.





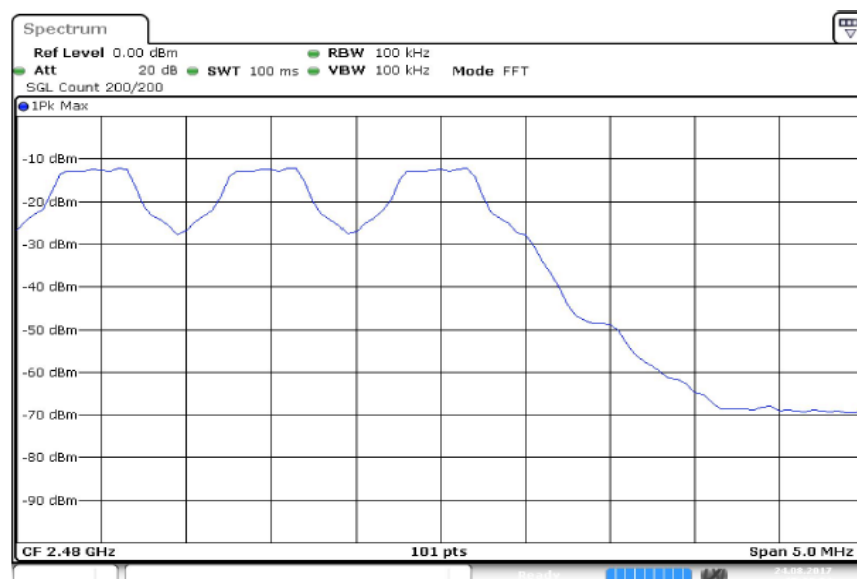
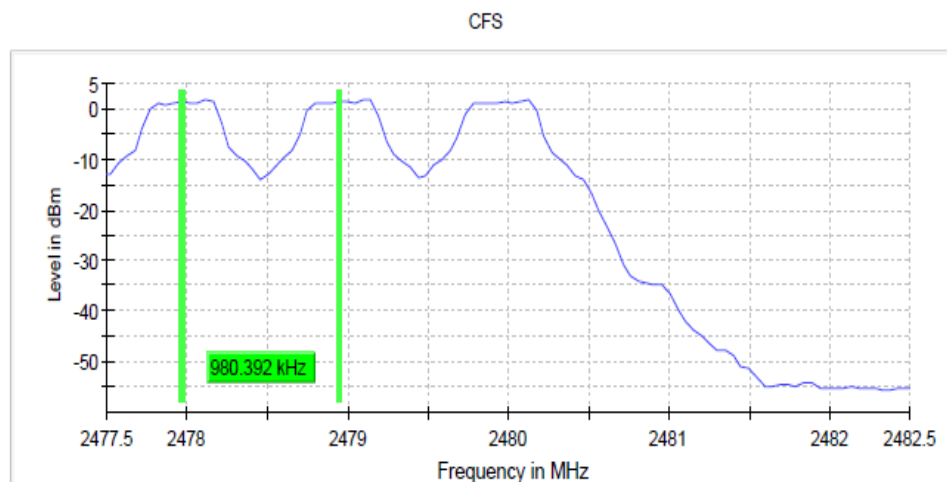


## 2480 MHz

Limit is 2/3 of the widest 20dB bandwidth measured for worst case.

Packet Type	DUT Frequency (MHz)	Frequency Separation (MHz)	Minimum Limit (MHz)	Result
DH1	2480.000000	0.980392	0.921569	PASS
DH3	2480.000000	0.980392	0.921569	PASS
DH5	2480.000000	0.980392	0.921569	PASS
2-DH1	2480.000000	0.980392	0.921569	PASS
2-DH3	2480.000000	0.980392	0.921569	PASS
2-DH5	2480.000000	0.980392	0.921569	PASS
3-DH1	2480.000000	0.980392	0.921569	PASS
3-DH3	2480.000000	0.980392	0.921569	PASS
3-DH5	2480.000000	0.980392	0.921569	PASS

Plots for packet type DH5 shown below.



## Time of Channel Occupancy (Dwell Time)

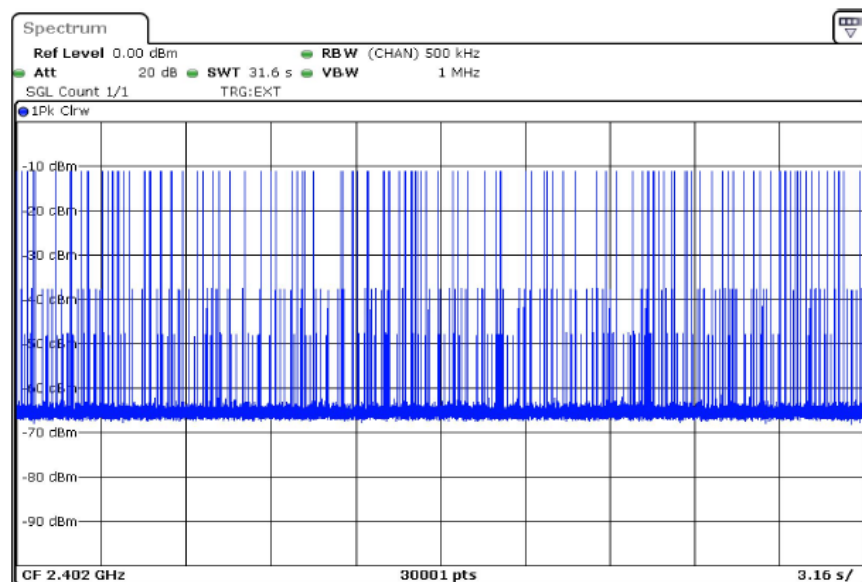
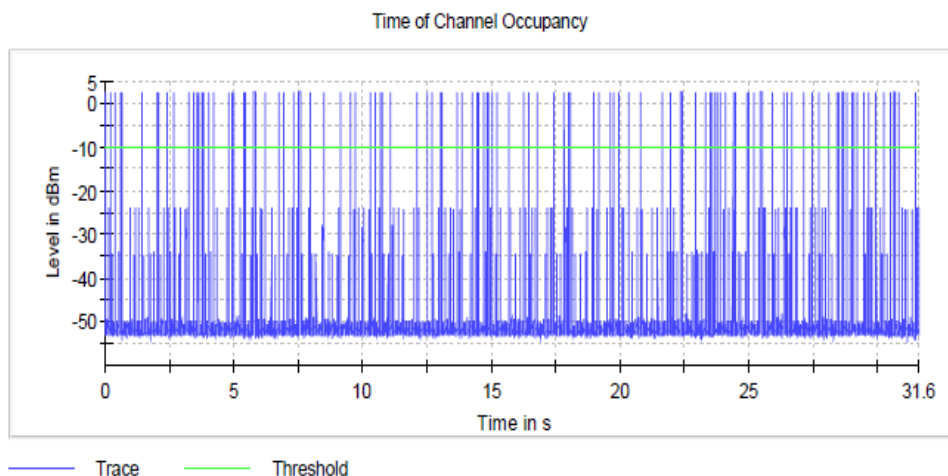
Test procedure in accordance with ANSI C63.10-2013

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

### 2402 MHz

Data Rate	Time (ms)	Limit Max (ms)	Result
DH1	123.150	400.000	PASS
DH3	239.410	400.000	PASS
DH5	326.370	400.000	PASS
2-DH1	104.860	400.000	PASS
2-DH3	197.500	400.000	PASS
2-DH5	244.210	400.000	PASS
3-DH1	103.780	400.000	PASS
3-DH3	191.030	400.000	PASS
3-DH5	208.260	400.000	PASS

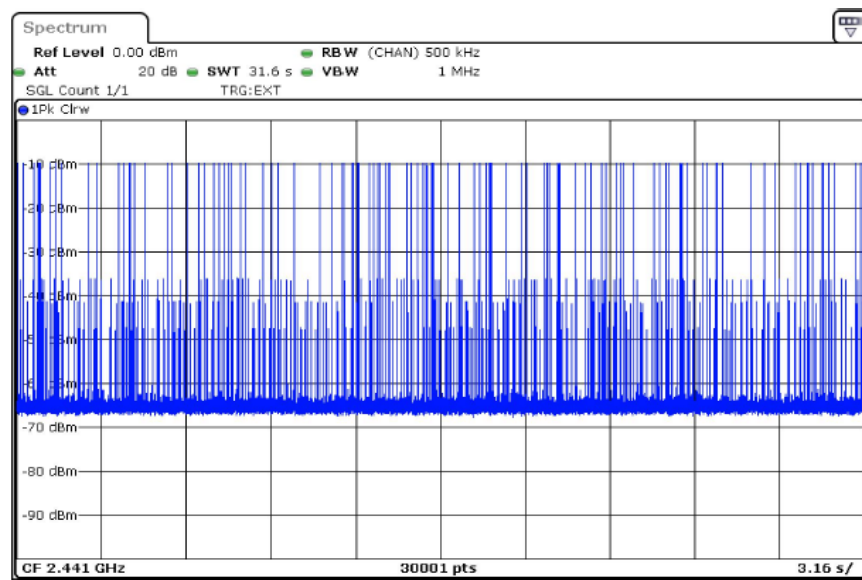
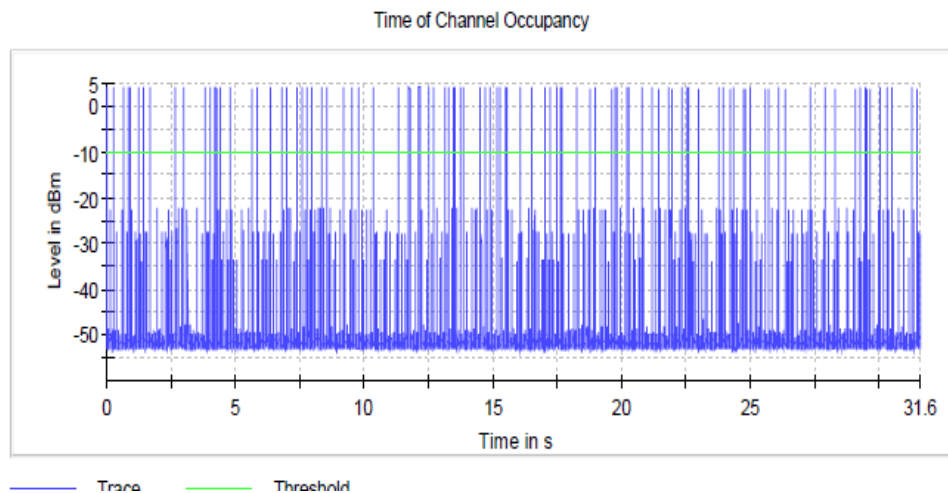
Plots for packet type DH5 shown below.



## 2441 MHz

Data Rate	Time (ms)	Limit Max (ms)	Result
DH1	122.530	400.000	PASS
DH3	268.960	400.000	PASS
DH5	291.700	400.000	PASS
2-DH1	109.750	400.000	PASS
2-DH3	219.300	400.000	PASS
2-DH5	257.090	400.000	PASS
3-DH1	109.730	400.000	PASS
3-DH3	232.810	400.000	PASS
3-DH5	238.300	400.000	PASS

Plots for packet type DH5 shown below.





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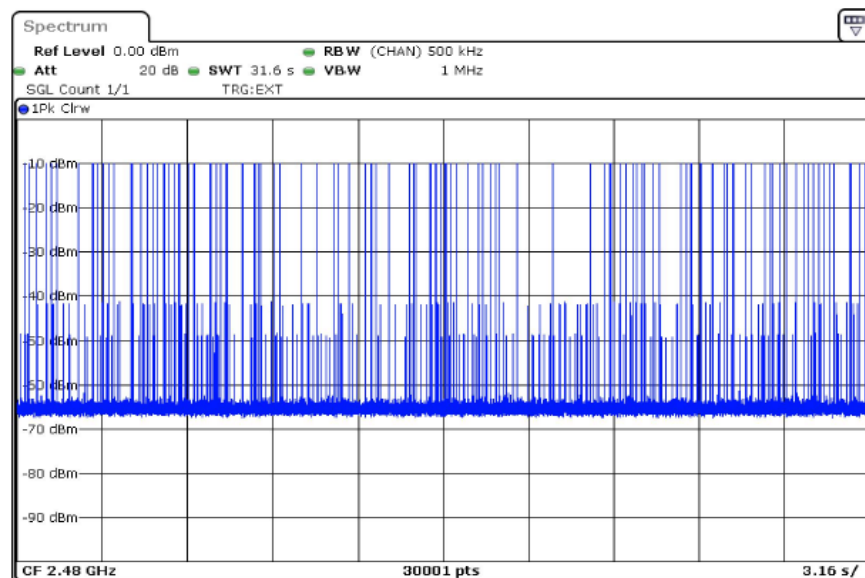
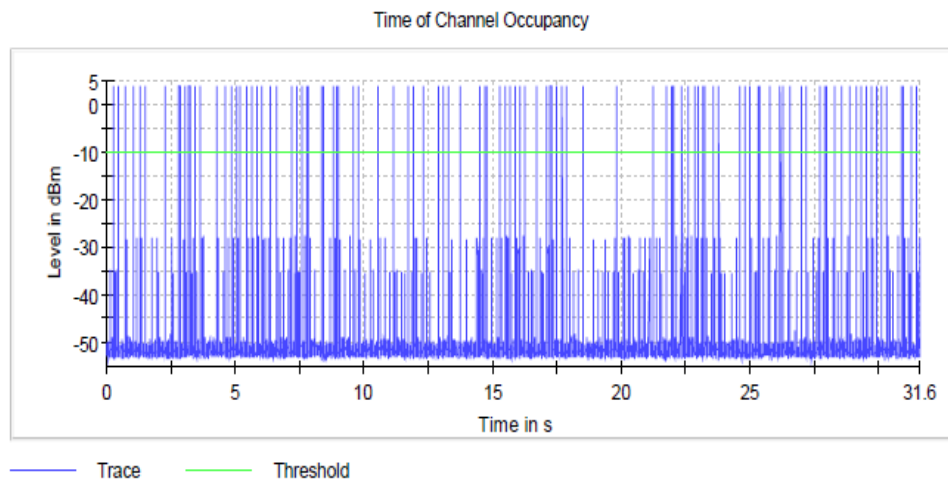
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## 2480 MHz

Data Rate	Time (ms)	Limit Max (ms)	Result
DH1	122.430	400.000	PASS
DH3	270.600	400.000	PASS
DH5	308.970	400.000	PASS
2-DH1	108.890	400.000	PASS
2-DH3	222.320	400.000	PASS
2-DH5	258.690	400.000	PASS
3-DH1	109.170	400.000	PASS
3-DH3	211.820	400.000	PASS
3-DH5	226.990	400.000	PASS

Plots for packet type DH5 shown below.

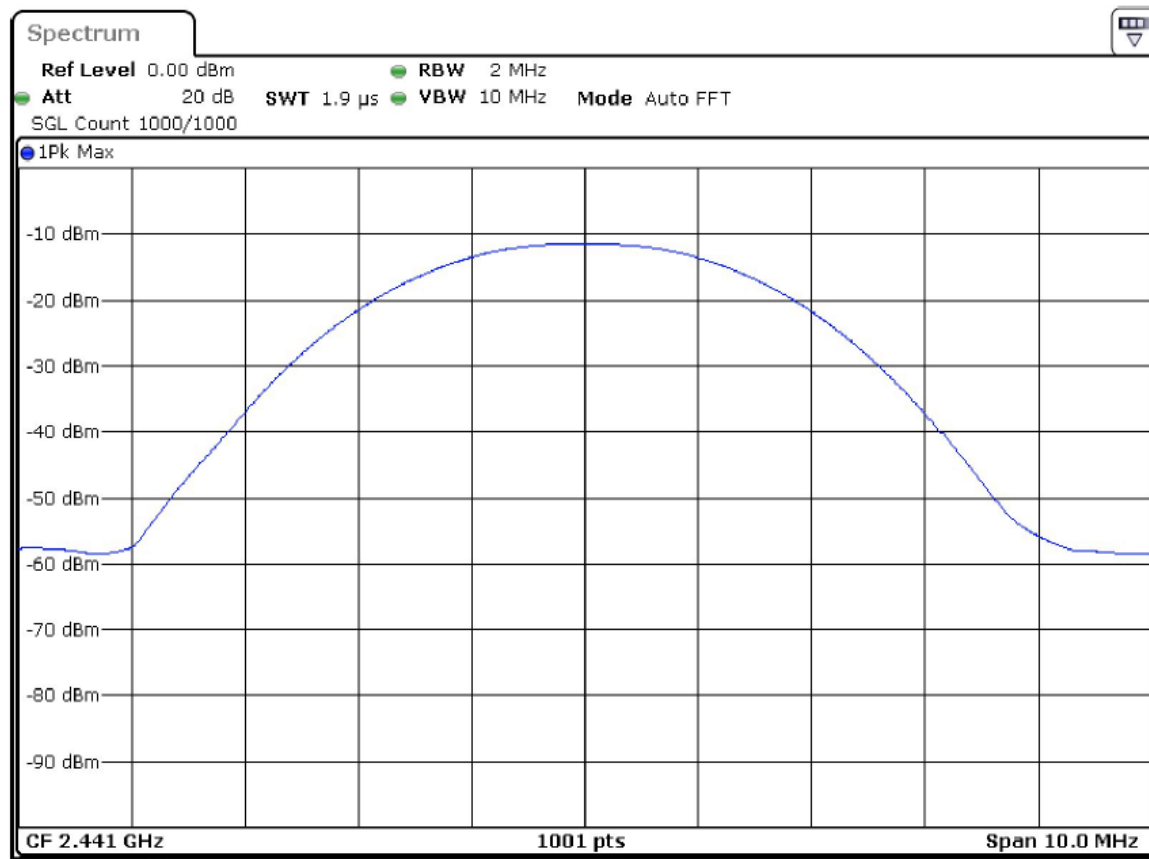


## Peak Output Power

Test procedure in accordance with ANSI C63.10-2013

Data Rate	2402MHz	2441MHz	2480MHz	Limit dBm
DH1	0.933	1.927	1.597	30
DH3	0.599	1.641	2.15	30
DH5	1.158	2.202	2.128	30
2-DH1	-0.523	0.498	0.297	30
2-DH3	-0.496	0.676	0.46	30
2-DH5	-0.528	0.794	0.46	30
3-DH1	-0.256	0.786	0.469	30
3-DH3	0.067	1.321	0.848	30
3-DH5	-0.08	1.113	0.927	30

Plot for packet type DH5 shown below.



## Emission Bandwidth 20 dB

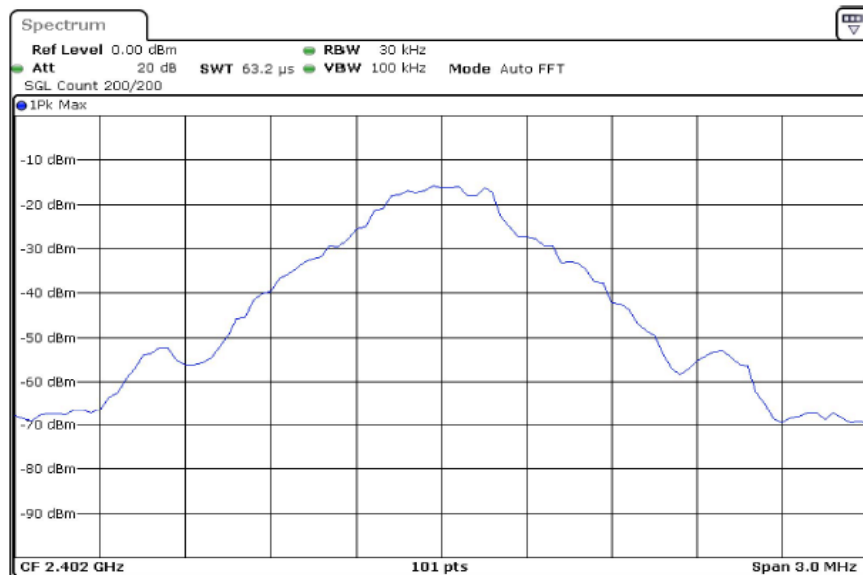
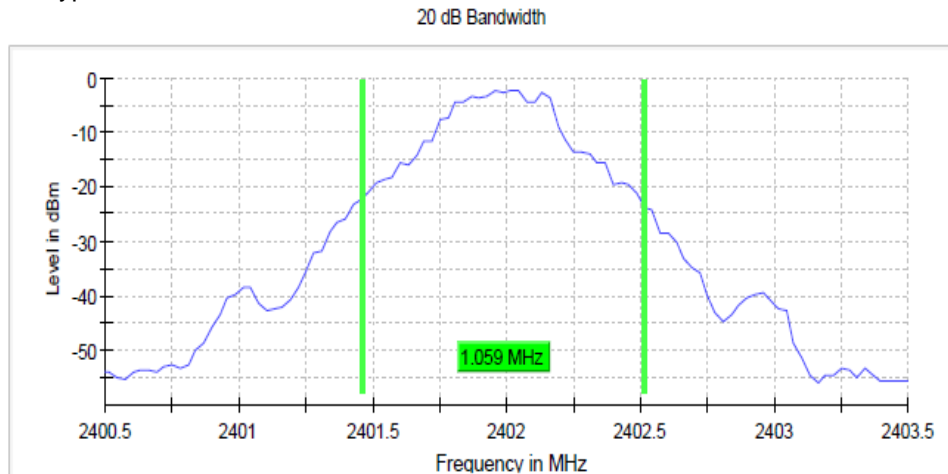
Test procedure in accordance with ANSI C63.10-2013

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

### 2402 MHz

Data Rate	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
DH1	1.058824	2401.455882	2402.514706	PASS
DH3	1.058824	2401.455882	2402.514706	PASS
DH5	1.058824	2401.455882	2402.514706	PASS
2-DH1	1.382353	2401.279412	2402.661765	PASS
2-DH3	1.382353	2401.279412	2402.661765	PASS
2-DH5	1.382353	2401.279412	2402.661765	PASS
3-DH1	1.352941	2401.308824	2402.661765	PASS
3-DH3	1.382353	2401.279412	2402.661765	PASS
3-DH5	1.382353	2401.279412	2402.661765	PASS

Plots for packet type DH5 shown below.







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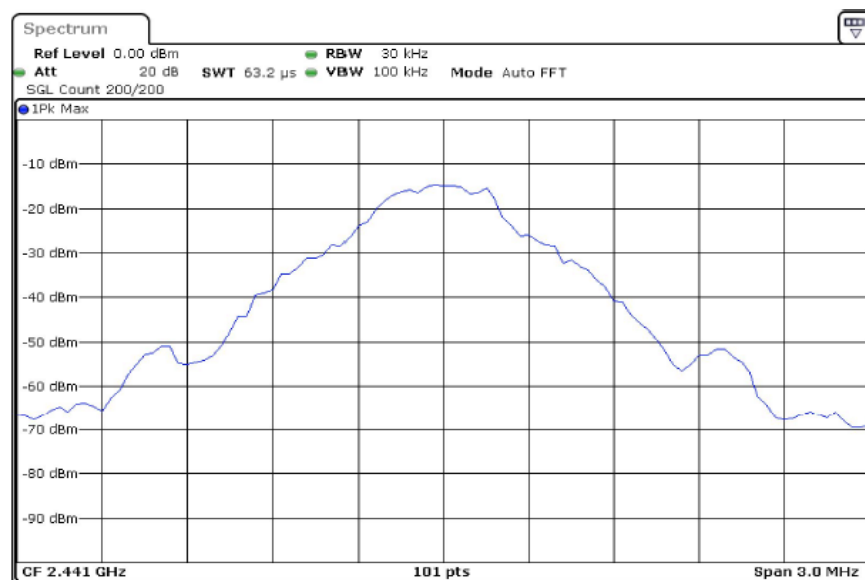
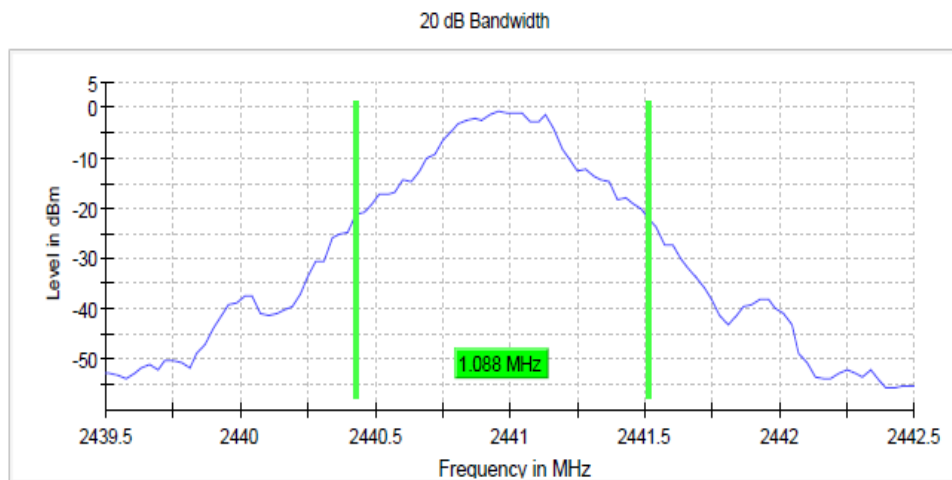
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## 2441 MHz

Data Rate	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
DH1	1.058824	2440.455882	2441.514706	PASS
DH3	1.058824	2440.455882	2441.514706	PASS
DH5	1.088235	2440.426471	2441.514706	PASS
2-DH1	1.382353	2440.279412	2441.661765	PASS
2-DH3	1.382353	2440.279412	2441.661765	PASS
2-DH5	1.382353	2440.279412	2441.661765	PASS
3-DH1	1.352941	2440.308824	2441.661765	PASS
3-DH3	1.382353	2440.279412	2441.661765	PASS
3-DH5	1.382353	2440.279412	2441.661765	PASS

Plots for packet type DH5 shown below.





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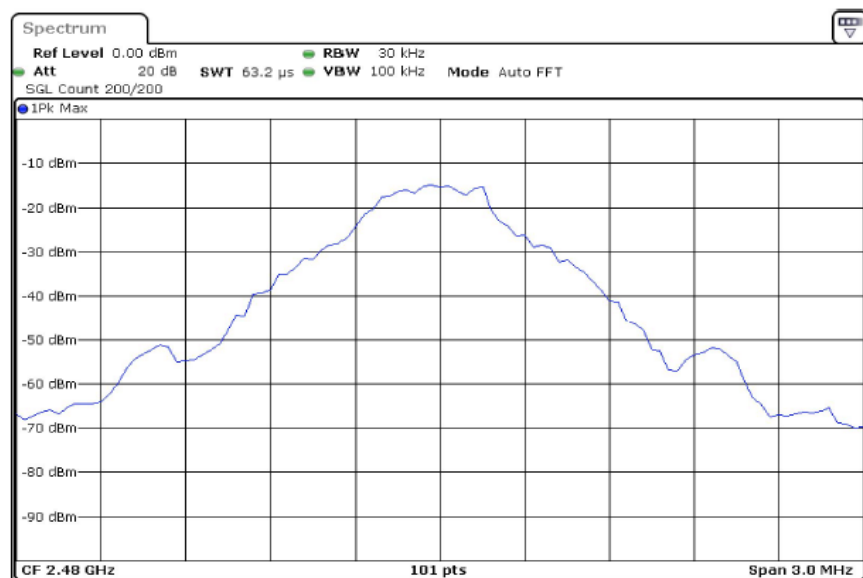
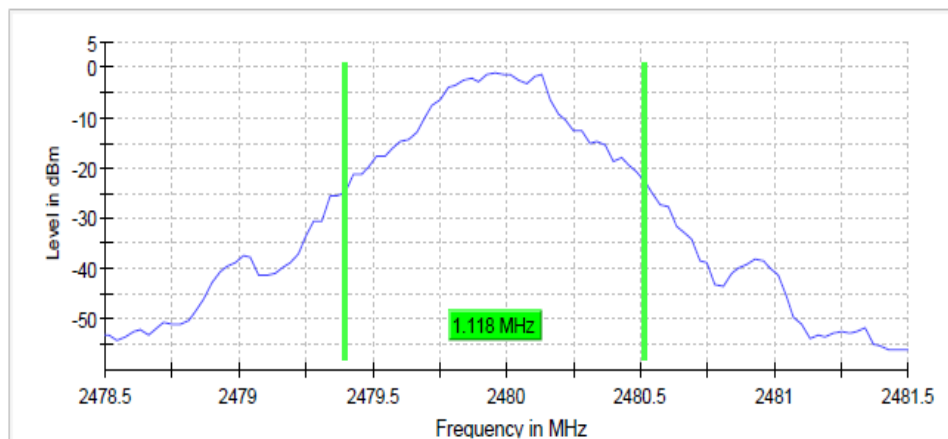


## 2480 MHz

Data Rate	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
DH1	1.058824	2479.455882	2480.514706	PASS
DH3	1.029412	2479.455882	2480.485294	PASS
DH5	1.117647	2479.397059	2480.514706	PASS
2-DH1	1.382353	2479.279412	2480.661765	PASS
2-DH3	1.382353	2479.279412	2480.661765	PASS
2-DH5	1.382353	2479.279412	2480.661765	PASS
3-DH1	1.323529	2479.308824	2480.632353	PASS
3-DH3	1.352941	2479.279412	2480.632353	PASS
3-DH5	1.382353	2479.279412	2480.661765	PASS

Plots for packet type DH5 shown below.

20 dB Bandwidth



## Band Edge Low (2402 MHz)

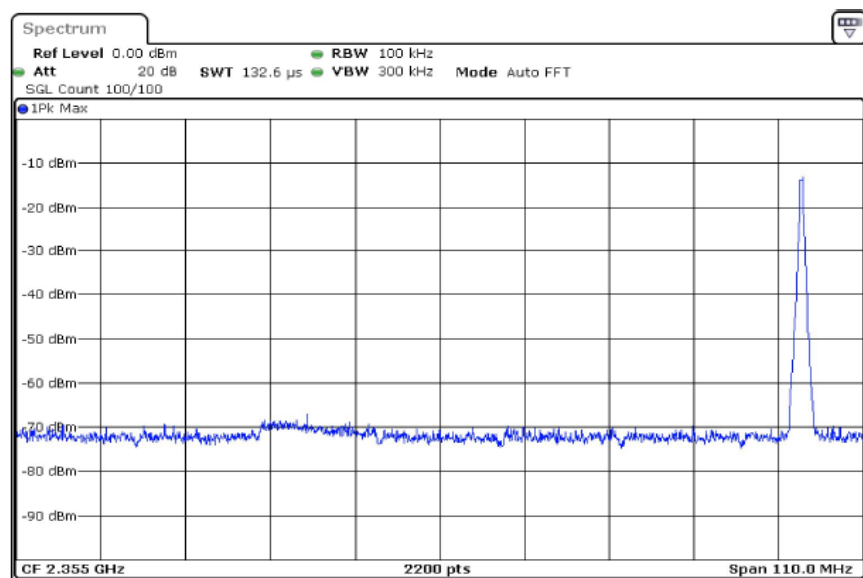
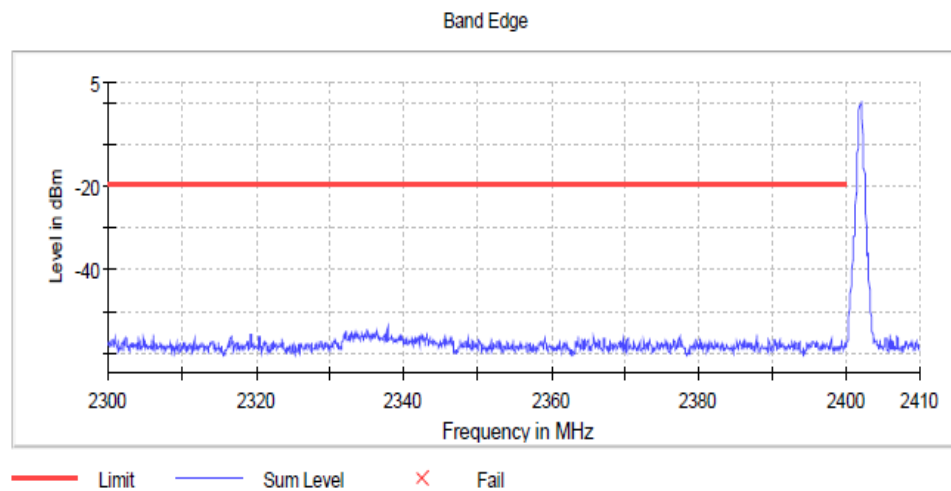
Test procedure in accordance with ANSI C63.10-2013

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

### Inband Peak

Data Rate	Frequency (MHz)	Level (dBm)
DH1	2401.778737	0.6
DH3	2402.078601	0.3
DH5	2402.078601	0.6
2-DH1	2401.778737	-3.0
2-DH3	2401.928669	-3.3
2-DH5	2401.778737	-3.3
3-DH1	2401.778737	-2.9
3-DH3	2402.128578	-3.0
3-DH5	2402.078601	-3.0

Plots for packet type DH5 shown below.





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## Band Edge High (2480 MHz)

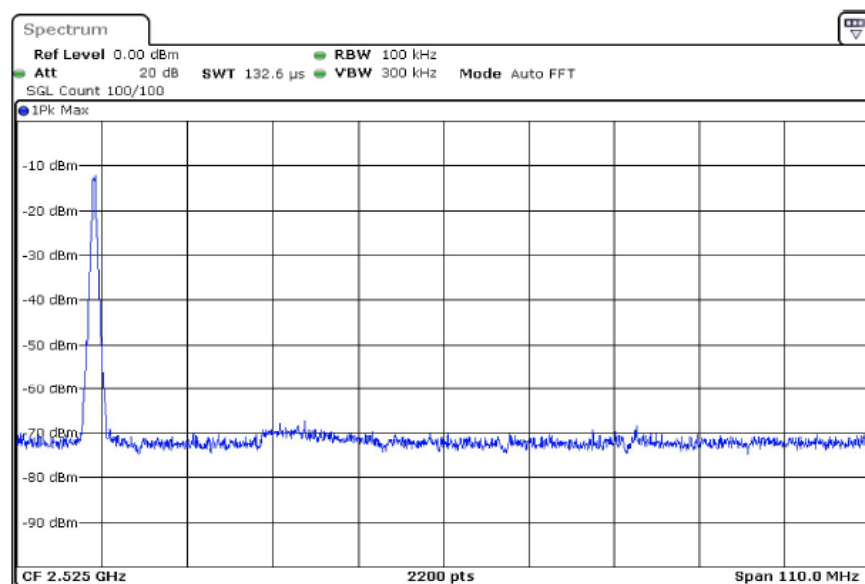
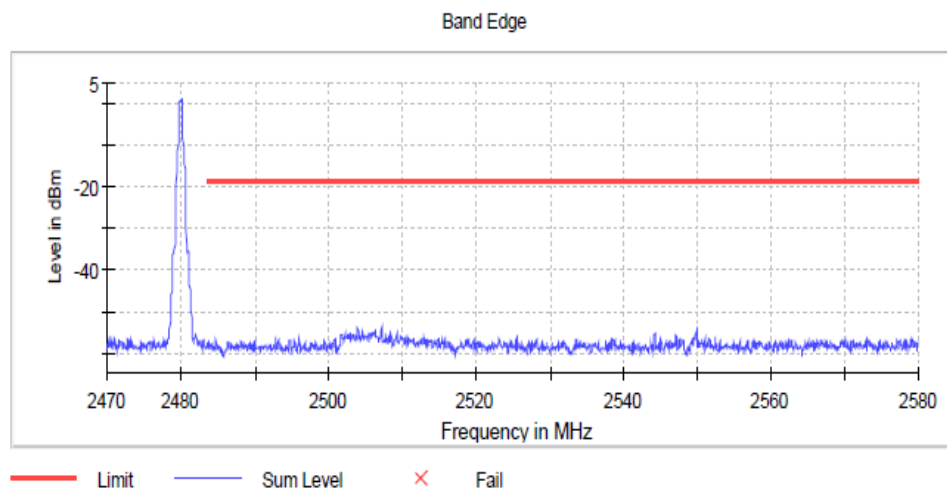
Test procedure in accordance with ANSI C63.10-2013

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

### Inband Peak

Data Rate	Frequency (MHz)	Level (dBm)
DH1	2479.820536	1.6
DH3	2480.120400	1.7
DH5	2480.120400	1.5
2-DH1	2479.820536	-2.2
2-DH3	2479.970468	-2.4
2-DH5	2480.120400	-2.2
3-DH1	2479.820536	-1.9
3-DH3	2479.970468	-2.4
3-DH5	2479.970468	-2.4

Plots for packet type DH5 shown below.





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## Conducted Spurious Emissions

Test procedure in accordance with ANSI C63.10-2013

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

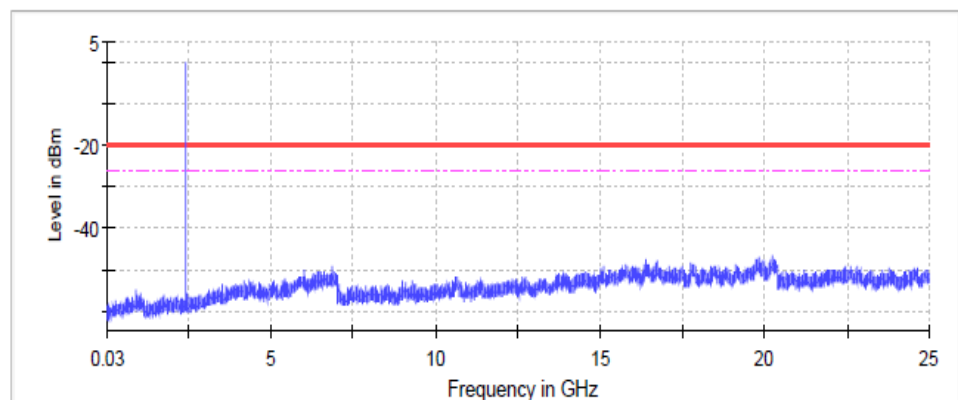
### 2402 MHz

Plots for packet type DH5 shown below.

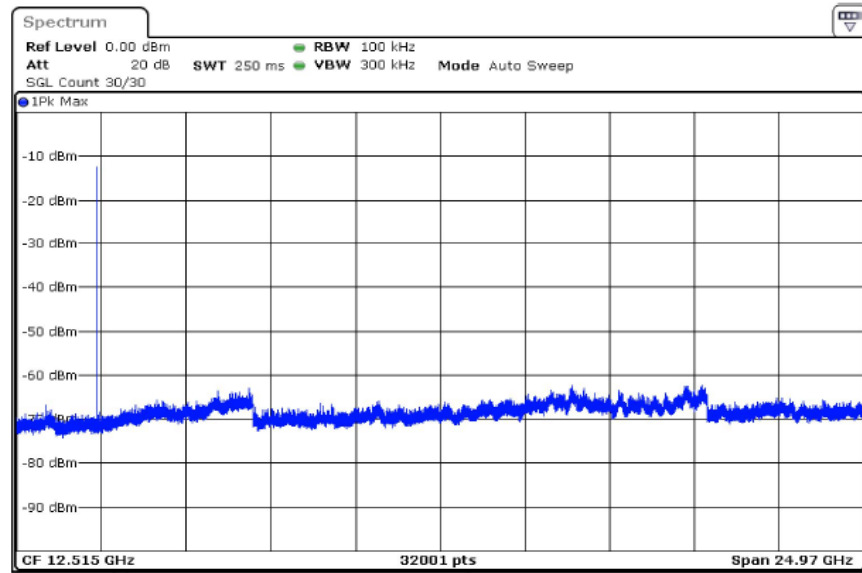
### Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
20232.978720	-46.8	26.9	-19.9
19815.537623	-47.1	27.2	-19.9
19774.183645	-47.4	27.5	-19.9
20311.785357	-47.5	27.6	-19.9
16405.785107	-47.5	27.6	-19.9
19728.928348	-47.5	27.7	-19.9
19771.842854	-47.6	27.7	-19.9
20195.526061	-47.6	27.7	-19.9
20268.870852	-47.8	27.9	-19.9
16743.639304	-47.8	27.9	-19.9
20333.632742	-47.9	28.0	-19.9
19750.775733	-47.9	28.0	-19.9
20275.893225	-47.9	28.0	-19.9
19837.385007	-47.9	28.1	-19.9
20003.581182	-47.9	28.1	-19.9

Spurious



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



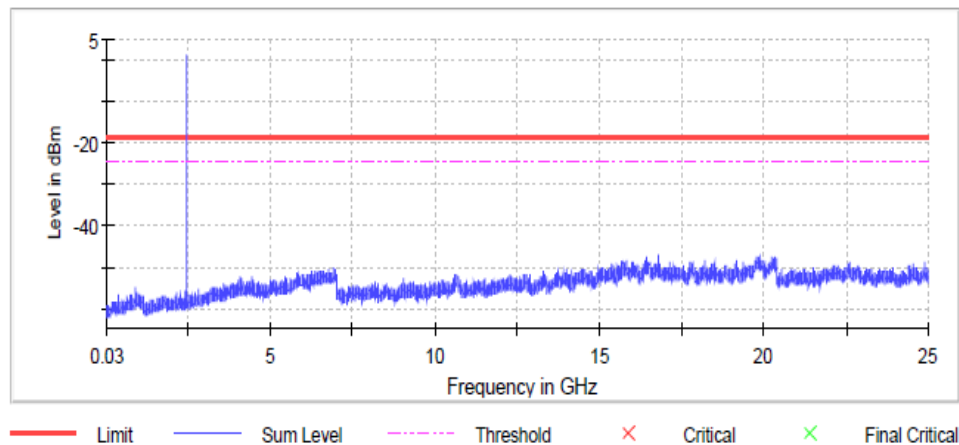
## 2441 MHz

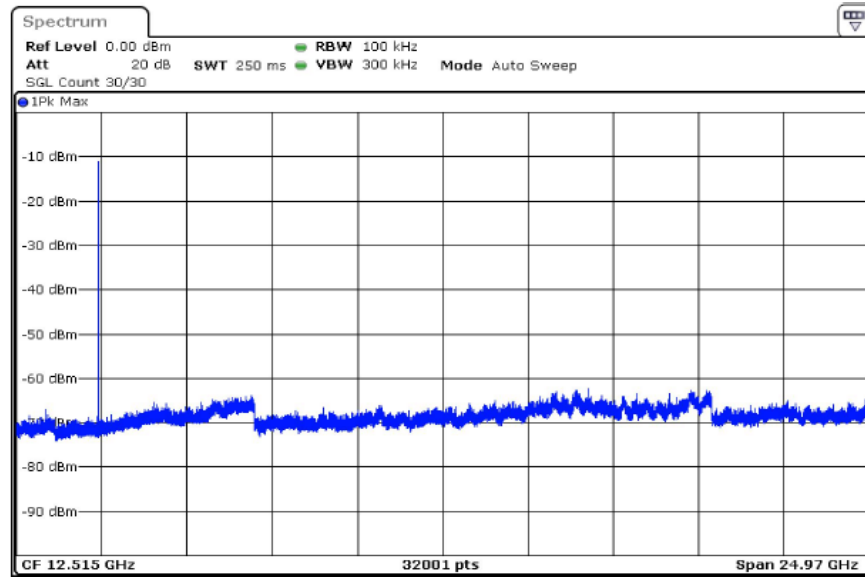
Plots for packet type DH5 shown below.

### Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
16777.970908	-47.2	28.7	-18.5
19892.003469	-47.5	29.0	-18.5
20218.933973	-47.5	29.0	-18.5
20329.731423	-47.6	29.1	-18.5
20236.880039	-47.6	29.1	-18.5
19821.779733	-47.6	29.1	-18.5
19780.425755	-47.6	29.1	-18.5
19834.263952	-47.6	29.1	-18.5
16434.654865	-47.7	29.2	-18.5
19813.977095	-47.8	29.3	-18.5
20267.310324	-47.8	29.3	-18.5
20323.489313	-47.9	29.4	-18.5
19832.703425	-47.9	29.4	-18.5
19824.120524	-47.9	29.4	-18.5
20300.861665	-47.9	29.4	-18.5

Spurious





## 2480 MHz

Plots for packet type DH5 shown below.

### Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
19784.327073	-46.9	27.7	-19.2
19775.744172	-47.3	28.1	-19.2
19796.811293	-47.4	28.2	-19.2
19570.534810	-47.5	28.3	-19.2
19763.259953	-47.5	28.3	-19.2
19846.748172	-47.6	28.4	-19.2
19812.416568	-47.6	28.4	-19.2
19774.963909	-47.7	28.5	-19.2
19852.990282	-47.9	28.8	-19.2
19771.842854	-48.0	28.8	-19.2
20275.112962	-48.0	28.8	-19.2
20254.045841	-48.0	28.8	-19.2
20328.951159	-48.0	28.8	-19.2
20238.440566	-48.0	28.8	-19.2
16443.237766	-48.0	28.8	-19.2

Spurious

