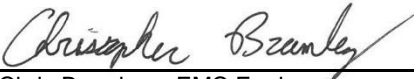
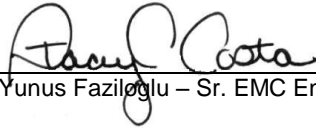




Test Report

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

Report No	ER3367-2
Client	Harman International Industries, Incorporated
Address	30001 Cabot Drive Novi MI 48377 USA
Phone	248-254-7751
Items tested FCC ID IC	BBXGTS 2AHPN-BE2839 6434C-BE2839
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	01-16-2018 to 01-16-2018
Results	As detailed within this report
Prepared by	 Chris Bramley – EMC Engineer
Authorized by	 Yunus Faziloglu – Sr. EMC Engineer
Issue Date	<u>2/15/2018</u>
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, ISED Canada RSS-247 Issue 2

The product is the “BBXGTS”. It is a frequency hopping spread spectrum transmitter that operates in the 2402 – 2480 MHz frequency range.

Antenna Type: PCB Trace

Maximum Gain: -2.55dBi

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	March 15, 2018



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Test Methodology

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

Radiated emissions were maximized by rotating the device around 3 orthogonal planes (X, Y and Z) as well as varying the test antenna's height and polarity.

EUT operating voltage is 13.5V DC from a vehicle battery.

The following bandwidths were used during radiated spurious emissions testing.

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

Product Tested - Configuration Documentation

EUT Configuration										
Work Order:	R3367									
Company:	Harman International Industries, Incorporated									
Company Address:	30001 Cabot Drive									
	Novi, MI, 48377									
Contact:	Mark Bowman									
	MN			PN			SN			
EUT:	BBXGTS			--			--			
EUT Description:	Automotive Infotainment Unit with Bluetooth									
EUT Components	MN						SN			
Head unit										
Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
DC Power Harness	other	1	1	other	No	No	1	in	yes	
GPS Antenna	other	1	1	Coaxial	Yes	No	1	in	yes	
FM antenna	other	1	1	Coaxial	Yes	No	1	in	yes	
USB	other	1	1	USB	Yes	No	1	in	yes	
Software Operating Mode Description:										
Test Mode										
Performance Criteria:										
EUT will operate in test mode supplied by customer. EUT will maintain connection with CMW with less than 10% PER.										

Statement of Conformity

RSS-GEN	RSP-100	RSS 247	Part 15	Comments
6.3			15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
	3.1		15.19	The label is shown in the label exhibit.
	4		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
3, 6.1			15.31	The EUT was tested in accordance with the measurement standards in this section.
6.13			15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
8.1			15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
8.3			15.203	EUT employs PCB trace antenna with maximum -2.55dBi 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 powered by a vehicle battery.

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

Test Results

Radiated Spurious Emissions

LIMITS

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

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

MEASUREMENTS / RESULTS

Curtis Straus - a Bureau Veritas Company

Radiated Emissions Electric Field 3m Distance

30-1000MHz Horizontal Data

Operator: CCH

Notes:

FCC 15.209 Limits. BT CH 39 DH1

Work Order - R3367

EUT Power Input - 12V DC

Test Site - CH 1

Conditions - 23.9°C; 31%RH; 1024mBar

0

0

Data Taken at January 16, 2018

Frequency (MHz)	Raw QP Reading (dBμV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBμV/m)	Lim1: FCC_pt15_2 09 (dBμV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_2 09 (dBμV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)
611.808	28	-7.5	20.5	46	-25.5	PASS		46	-25.5	PASS	
631.924	35.8	-6.6	29.2	46	-16.8	PASS		46	-16.8	PASS	
773.832	26.9	-4.3	22.6	46	-23.4	PASS		46	-23.4	PASS	
831.572	33.2	-3.8	29.5	46	-16.6	PASS		46	-16.6	PASS	
898.337	34.1	-2.3	31.8	46	-14.2	PASS	-14.2	46	-14.2	PASS	-14.2
959.045	26.8	-2.1	24.7	46	-21.3	PASS		46	-21.3	PASS	

Curtis Straus - a Bureau Veritas Company						Work Order - R3367					
Radiated Emissions Electric Field 3m Distance						EUT Power Input - 12V DC					
30-1000MHz Vertical Data						Test Site - CH 1					
Operator: CCH						Conditions - 23.9°C; 31%RH; 1024mBar					
Notes:						0					
FCC 15.209 Limits. BT CH 39 DH1						0					
Data Taken at January 16, 2018											
Frequency (MHz)	Raw QP Reading (dBμV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBμV/m)	Lim1: FCC_pt15_2 09 (dBμV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: FCC_pt15_2 09 (dBμV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)
191.009	40.4	-17	23.4	43.5	-20.1	PASS		43.5	-20.1	PASS	
603.308	30.2	-7.8	22.4	46	-23.6	PASS		46	-23.6	PASS	
898.11	33.3	-2.3	31	46	-15	PASS	-15	46	-15	PASS	-15
943.906	27.2	-2.2	24.9	46	-21.1	PASS		46	-21.1	PASS	
957.584	28.8	-2.1	26.7	46	-19.4	PASS		46	-19.4	PASS	
957.593	27.4	-2.1	25.3	46	-20.7	PASS		46	-20.7	PASS	

30-1000MHz CH 39



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Curtis Straus - a Bureau Veritas Company
 Radiated Emissions Electric Field 3m Distance
 1-6GHz Horizontal Data
 Operator: CCH
 Notes:
 0

Work Order - R3367
 EUT Power Input - 12V DC
 Test Site - CH 1
 Conditions - 23.9°C; 31%RH; 1024mBar
 0
 0

Data Taken at January 16, 2018

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	Av Lim: FCC_pt15_2 09_Average (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1348.1	46.3	36.9	-8.2	38.1	74	-35.9	PASS		28.8	54	-25.2	PASS	
2134	48.1	37.9	-3.7	44.4	74	-29.6	PASS	-29.6	34.1	54	-19.9	PASS	
3196.7	46.6	37	-3	43.7	74	-30.3	PASS		34	54	-19.9	PASS	
5714.3	42.6	34.2	0.5	43.1	74	-30.9	PASS		34.7	54	-19.3	PASS	-19.3

Curtis Straus - a Bureau Veritas Company
 Radiated Emissions Electric Field 3m Distance
 1-6GHz Vertical Data
 Operator: CCH
 Notes:
 0

Work Order - R3367
 EUT Power Input - 12V DC
 Test Site - CH 1
 Conditions - 23.9°C; 31%RH; 1024mBar
 0
 0

Data Taken at January 16, 2018

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	Av Lim: FCC_pt15_2 09_Average (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1364.9	49.2	37.5	-8.1	41.1	74	-32.9	PASS		29.4	54	-24.6	PASS	
2177.8	46.2	36.7	-3.4	42.8	74	-31.2	PASS		33.3	54	-20.6	PASS	
4269.1	44.6	36	-2.9	41.8	74	-32.2	PASS		33.1	54	-20.9	PASS	
5703.8	44.7	34.2	0.5	45.2	74	-28.7	PASS	-28.7	34.7	54	-19.3	PASS	-19.3

1-6GHz CH0

Curtis Straus - a Bureau Veritas Company
 Radiated Emissions Electric Field 3m Distance
 1-6GHz Horizontal Data
 Operator: CCH
 Notes:
 0

Work Order - R3367
 EUT Power Input - 12V DC
 Test Site - CH 1
 Conditions - 23.9°C; 31%RH; 1024mBar
 0
 0

Data Taken at January 16, 2018

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	Av Lim: FCC_pt15_2 09_Average (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1311.9	47.2	37.7	-8	39.2	74	-34.8	PASS		29.7	54	-24.3	PASS	
2136.1	46.9	37.9	-3.7	43.1	74	-30.8	PASS		34.2	54	-19.8	PASS	
3193.3	46.2	37.1	-3	43.3	74	-30.7	PASS	-30.7	34.1	54	-19.8	PASS	
5578.3	43	34.7	-0.2	42.8	74	-31.2	PASS		34.5	54	-19.5	PASS	-19.5



Curtis Straus - a Bureau Veritas Company
 Radiated Emissions Electric Field 3m Distance
 1-6GHz Vertical Data
 Operator: CCH
 Notes:
 0

Work Order - R3367
 EUT Power Input - 12V DC
 Test Site - CH 1
 Conditions - 23.9°C; 31%RH; 1024mBar
 0
 0

Data Taken at January 16, 2018

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	Av Lim: FCC_pt15_2 09_Average (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1247.2	47.2	37.9	-8.3	38.9	74	-35.1	PASS		29.6	54	-24.4	PASS	
2139.6	45.6	37.6	-3.7	41.9	74	-32.1	PASS		33.9	54	-20.1	PASS	
3244.9	46.5	37.1	-3.2	43.4	74	-30.6	PASS	-30.6	33.9	54	-20.1	PASS	
5600.3	43.4	34.5	-0.2	43.3	74	-30.7	PASS		34.3	54	-19.7	PASS	-19.7

1-6GHz CH39

Curtis Straus - a Bureau Veritas Company
 Radiated Emissions Electric Field 3m Distance
 1-6GHz Horizontal Data
 Operator: CCH
 Notes:
 0

Work Order - R3367
 EUT Power Input - 12V DC
 Test Site - CH 1
 Conditions - 23.9°C; 31%RH; 1024mBar
 0
 0

Data Taken at January 16, 2018

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	Av Lim: FCC_pt15_2 09_Average (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1391.5	47.8	37.4	-8	39.8	74	-34.1	PASS		29.4	54	-24.5	PASS	
2169.8	45.3	37	-3.5	41.9	74	-32.1	PASS		33.6	54	-20.4	PASS	
2867.4	44.9	36.1	-2.6	42.3	74	-31.7	PASS		33.5	54	-20.5	PASS	
4234.8	45.4	35.9	-3	42.4	74	-31.6	PASS		32.9	54	-21	PASS	
5949	43.6	33.8	0.7	44.3	74	-29.7	PASS	-29.7	34.4	54	-19.5	PASS	-19.5

Curtis Straus - a Bureau Veritas Company
 Radiated Emissions Electric Field 3m Distance
 1-6GHz Vertical Data
 Operator: CCH
 Notes:
 0

Work Order - R3367
 EUT Power Input - 12V DC
 Test Site - CH 1
 Conditions - 23.9°C; 31%RH; 1024mBar
 0
 0

Data Taken at January 16, 2018

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	Av Lim: FCC_pt15_2 09_Average (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
1347.5	46.2	37.5	-8.2	38	74	-36	PASS		29.3	54	-24.7	PASS	
2128.1	46	37.6	-3.8	42.3	74	-31.7	PASS		33.8	54	-20.2	PASS	
3189.8	46.6	37	-3	43.6	74	-30.3	PASS		34	54	-20	PASS	-20
5405	43.5	33.6	0.2	43.7	74	-30.3	PASS	-30.3	33.8	54	-20.2	PASS	

1-6GHz CH78



Curtis Straus - a Bureau Veritas Company
 Radiated Emissions Electric Field 1m Distance
 6-18GHz Horizontal Data
 Operator: CCH
 Notes:
 FCC 15.209 Limits. BT CH 39 DH1

Work Order - R3367
 EUT Power Input - 12V DC
 Test Site - CH 1
 Conditions - 23.9°C; 31%RH; 1024mBar
 0
 0

Data Taken at January 16, 2018

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	Av Lim: FCC_pt15_2 09_Average (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
9986.2	43.8	33.1	0	43.8	83.5	-39.7	PASS		33	63.5	-30.5	PASS	
11883.3	41.3	32.4	2.9	44.2	83.5	-39.3	PASS		35.3	63.5	-28.2	PASS	
12308.2	40.9	31.3	3.6	44.5	83.5	-39	PASS		35	63.5	-28.5	PASS	
16689.8	41.7	31.4	6.5	48.2	83.5	-35.3	PASS	-35.3	37.8	63.5	-25.7	PASS	-25.7

Curtis Straus - a Bureau Veritas Company
 Radiated Emissions Electric Field 1m Distance
 6-18GHz Vertical Data
 Operator: CCH
 Notes:
 FCC 15.209 Limits. BT CH 39 DH1

Work Order - R3367
 EUT Power Input - 12V DC
 Test Site - CH 1
 Conditions - 23.9°C; 31%RH; 1024mBar
 0
 0

Data Taken at January 16, 2018

Frequency (MHz)	Raw Peak Reading (dBμV)	Raw Avg Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBμV/m)	Peak Margin (dB)	Peak Results (Pass/Fail)	Worst Peak Margin (dB)	Adjusted Avg Amplitude (dBμV/m)	Av Lim: FCC_pt15_2 09_Average (dBμV/m)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
8863.1	42.3	33.8	-1	41.2	83.5	-42.3	PASS		32.7	63.5	-30.8	PASS	
10061.2	42.6	33.1	0.1	42.7	83.5	-40.8	PASS		33.2	63.5	-30.3	PASS	
10727.9	41.9	32.8	1	42.9	83.5	-40.6	PASS		33.8	63.5	-29.7	PASS	
12644.1	39.8	31	4.1	43.9	83.5	-39.6	PASS		35.1	63.5	-28.4	PASS	
16763.7	40.2	31.3	6.3	46.5	83.5	-37	PASS	-37	37.6	63.5	-25.9	PASS	-25.9

6-18GHz CH39

Radiated Emissions Table

Date: 16-Jan-18		Company: Harman international				Work Order: R3367									
Engineer: Chris Hamel		EUT Desc: BBXGTS				EUT Operating Voltage/Frequency: 12V DC									
Temp: 23.9°C		Humidity: 39%				Pressure: 1024mBar									
Frequency Range: 18-26.5GHz						Measurement Distance: 3 m									
Notes: No emissions found. BT Mode DH1 CH 39						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 15.209 High Frequency - Peak			FCC 15.209 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		N/A		dB		Worst Freq:		N/A		MHz	
Test Site: EMI Chamber 1				Cable 1: Asset #2328				Cable 2: ---				Cable 3: ---			
Analyzer: Rental SA#3				Preamp: 18-26.5GHz				Antenna: 18-26.5GHz Horn				Preselector: ---			
CSsoft Radiated Emissions Calculator v 1.017.197															
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor															
Copyright Curtis-Strass LLC 2000															

18-26.5GHz CH 39

Only middle channel was tested in 30MHz-1GHz and above 6GHz ranges since emissions were more than 10dB below the limits. Packet type DH1 was found to be the worst case and all measurements were done with DH1 packets.

Rev. 1/9/2018

Spectrum Analyzers / Receivers / Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2093 MXE EMI Receiver		20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	11/16/2018	11/16/2017
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
2311 PA		1-1000MHz	PAM-103	COM-POWER	441174	2311	II	10/29/2018	10/29/2017
2111 HF Preamp		0.5-18GHz	PAM-118A	COM-POWER	551063	2111	II	11/19/2018	11/19/2017
HF (Yellow)		18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	II	10/16/2018	10/16/2017
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Red-Brown Bilog		30-2000MHz	JB1	Sunol	A0032406	1218	I	1/13/2019	1/13/2017
HF (White) Horn		18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
Blue Horn		1-18Ghz	3117	ETS	157647	1861	I	2/14/2019	2/14/2017
Meteorological Meters/Chambers			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	4/28/2018	4/28/2016
TH A#2084			HTC-1	HDE		2084	II	3/23/2018	3/23/2017
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #1522		9kHz - 18GHz		Florida RF			II	2/11/2018	2/11/2017
Asset #2052		9kHz - 18GHz		Florida RF			II	3/5/2018	3/5/2017
Asset #2456		9KHz-18GHz		MegaPhase			II	10/29/2018	10/29/2017
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.

TEU Radiated Spurious Emissions

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Radiated Band Edge

Radiated Emissions Table														
Date: 16-Jan-18			Company: Harman international						Work Order: R3367					
Engineer: Chris Hamel			EUT Desc: Boom box GTS						EUT Operating Voltage/Frequency: 12V DC					
Temp: 23.9°C			Humidity: 39%						Pressure: 1024mBar					
Frequency Range: 2300-2500MHz									Measurement Distance: 3 m					
Notes: No Pulsed emissions found. BT Mode DH1									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 15.209 High Frequency - Peak			FCC 15.209 High Frequency - Average		
									Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
H Max	2406.0	59.0		0.0	32.2	3.0	---	---	74.0	---	---	54.0	---	---
V Max	2440.0	60.7		0.0	32.3	3.0	---	---	74.0	---	---	54.0	---	---
Low				---	---	---	---	---	---	---	---	---	---	---
V	2390.0	31.95	11.7	0.0	32.2	2.9	67.1	46.8	74.0	-6.9	Pass	54.0	-7.2	Pass
V	2373.2	37.9	17.7	0.0	32.1	2.9	72.9	52.7	74.0	-1.1	Pass	54.0	-1.3	Pass
				---	---	---	---	---	---	---	---	---	---	---
High				---	---	---	---	---	---	---	---	---	---	---
V	2483.5	32.5	13.4	0.0	32.4	3.0	67.9	48.8	74.0	-6.1	Pass	54.0	-5.2	Pass
V	2485.1	36.6	15.4	0.0	32.4	3.0	72.0	50.8	74.0	-2.0	Pass	54.0	-3.2	Pass
Table Result: Pass by -1.1 dB Worst Freq: 2373.2 MHz														
Test Site: EMI Chamber 1			Cable 1: Asset #2328						Cable 2: Asset #2052			Cable 3: ---		
Analyzer: Rental SA#3			Preamp: None						Antenna: Blue Horn			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.197														
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor														
Copyright Curtis-Straus LLC 2006														

Rev. 1/23/2018								
Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due
2093 MXE EMI Receiver		20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	11/16/2018
Radiated Emissions Sites		FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due
EMI Chamber 1		719150	2762A-6	A-0015	1-18GHz	1685	I	12/21/2018
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Blue Horn		1-18Ghz	3117	ETS	157647	1861	I	2/14/2019
Meteorological Meters/Chambers			MN	Mfr	SN	Asset	Cat	Calibration Due
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
Cables		Range		Mfr			Cat	Calibration Due
Asset #2052		9kHz - 18GHz		Florida RF			II	3/5/2018
Asset #2456		9kHz-18GHz		MegaPhase			II	10/29/2018
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard								

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

TEU Band edge



AC Line Conducted Emissions LIMITS

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

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

MEASUREMENTS / RESULTS

N/A. EUT is powered by a vehicle battery only.

Measurement Uncertainty

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

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz)	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)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4%	5%
	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.



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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



Appendix A:

ER3367-2 Appendix A
CFR Title 47 FCC Part §15.247 and ISED Canada RSS-247 Issue 2

DUT Information

DUT Name: BBXGTS
 Manufacturer: Harman International Industries, Inc
 Serial Number: 06

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 (dB)	Efficiency (%)	AvgGain (dBi)
2400	-3.31	46.71	-3.30590133
2410	-3.03	49.81	-3.02683458
2420	-3.12	48.76	-3.11936303
2430	-2.67	54.06	-2.67123959
2440	-2.55	55.54	-2.55394125
2450	-2.60	54.94	-2.60111345
2460	-2.80	52.52	-2.79675283
2470	-2.88	51.55	-2.8777133
2480	-2.96	50.59	-2.95935321
2490	-2.87	51.6	-2.87350298
2500	-2.80	52.46	-2.80171714

Test Equipment Used:

Rev. 11/9/2017									
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
FSV40 Signal/Spectrum Analyzer	10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	6/30/2018	6/30/2017	
Signal Generators/Comparison Noise Emitter	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
SMBV100A Vector Signal Generator	9KHz-6GHz	SMBV100A	ROHDE & SCHWARZ	261919	2201	I	6/26/2018	6/26/2017	
SMB100A Signal Generator	100kHz-40GHz	SMB100A	ROHDE & SCHWARZ	179846	2435	I	10/13/2018	10/13/2017	
Power/Noise Meters		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
OSP - open switch and control platform	30MHz-18GHz	OSP120	ROHDE & SCHWARZ	101674		I	6/1/2018	6/1/2017	
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on	
DUT1	30MHz-26GHz		Micro-Coax			II	6/21/2018	6/21/2017	
DUT2	30MHz-26GHz		Micro-Coax			II	6/22/2018	6/22/2017	
DUT3	30MHz-26GHz		Micro-Coax			II	6/23/2018	6/23/2017	
DUT4	30MHz-26GHz		Micro-Coax			II	6/24/2018	6/24/2017	
Attenuators / Couplers	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
10dB Attenuator-01 Brown	30MHz-26GHz		Mini Circuits			II	7/13/2018	7/14/2017	
10dB Attenuator-02 Yellow	30MHz-26GHz		Mini Circuits			II	7/13/2018	7/14/2017	
10dB Attenuator-03 Red	30MHz-26GHz		Mini Circuits			II	7/13/2018	7/14/2017	
10dB Attenuator-04 orange	30MHz-26GHz		Mini Circuits			II	7/13/2018	7/14/2017	
API - 30dB 20W Attenuator	9KHz-40GHz	89-30-11	API Weinschel	703	2121	I	3/22/2018	3/22/2017	
Directional Coupler	0.5GHz-18GHz	UDC	AA MCS	001040	2434	II	8/11/2018	8/11/2017	
Communication Tester	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
CMW500 Wideband Radio Communication Tester	DC to 6GHz	CMW500	ROHDE & SCHWARZ	155905		I	6/2/2018	6/2/2017	
Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on	
Temp/Humidity Chamber #18		EPX-2H	Espec	137664	1645	I	1/5/2019	1/5/2018	

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



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	---	---	---	---	---	---	---	---
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	---	---	---	---	---	---	---	---
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	---	---	---	---	---	---	---	---



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Testing Cert. No. 1627-01

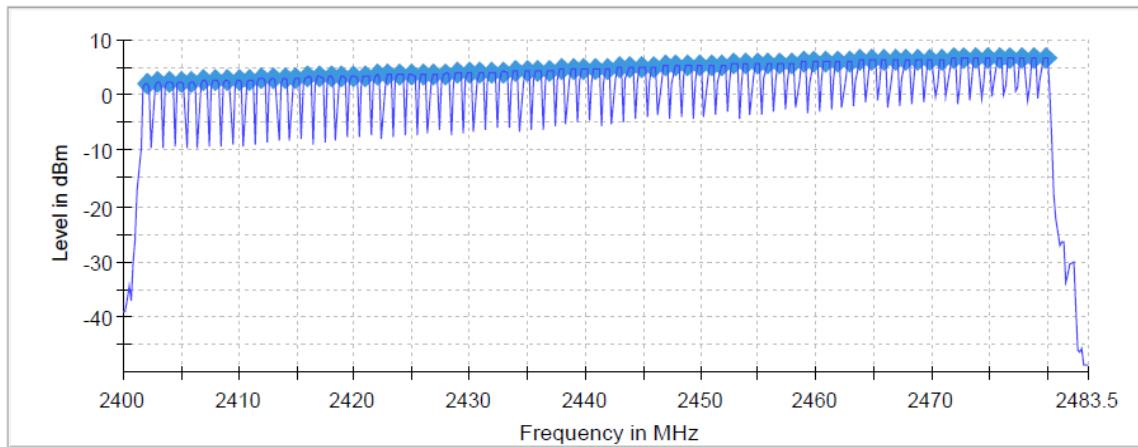
Number of Hopping Frequencies

Test procedure in accordance with ANSI C63.10-2013

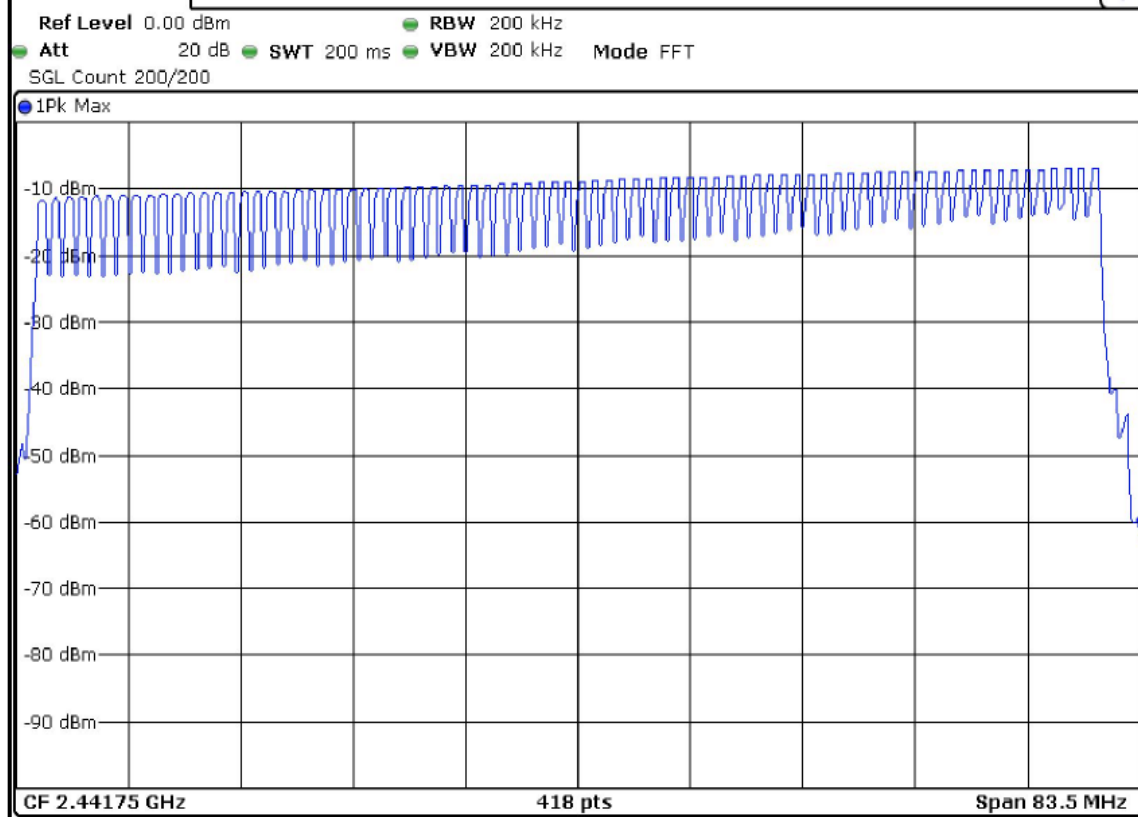
Channels

Channels	Limit Min	Result
79	15	PASS

Sequence



Spectrum



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

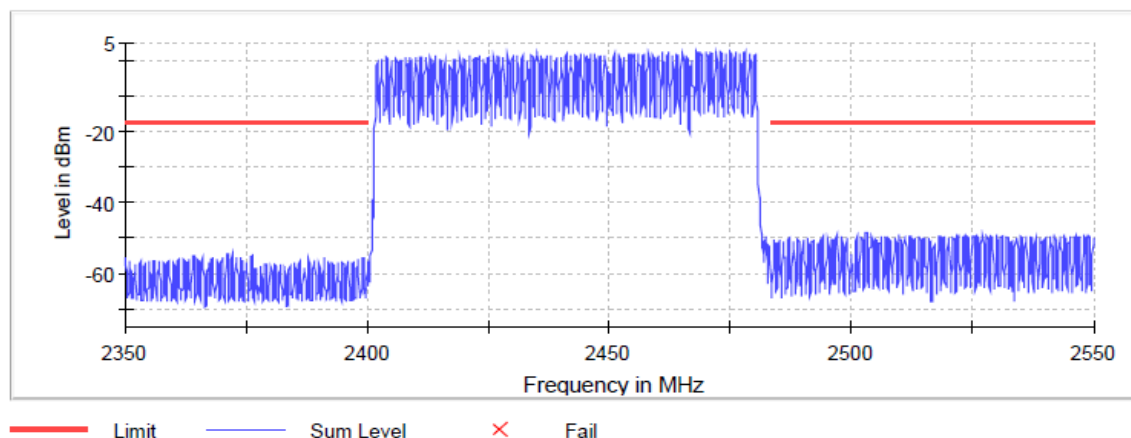
Data Rate	Frequency (MHz)	Level (dBm)
DH1	2471.975000	2.7
DH3	2473.175000	2.6
DH5	2465.975000	2.5
2-DH1	2465.825000	2.1
2-DH3	2474.975000	1.8
2-DH5	2464.975000	2.1
3-DH1	2467.825000	2.2
3-DH3	2462.975000	2.0
3-DH5	2472.975000	2.0

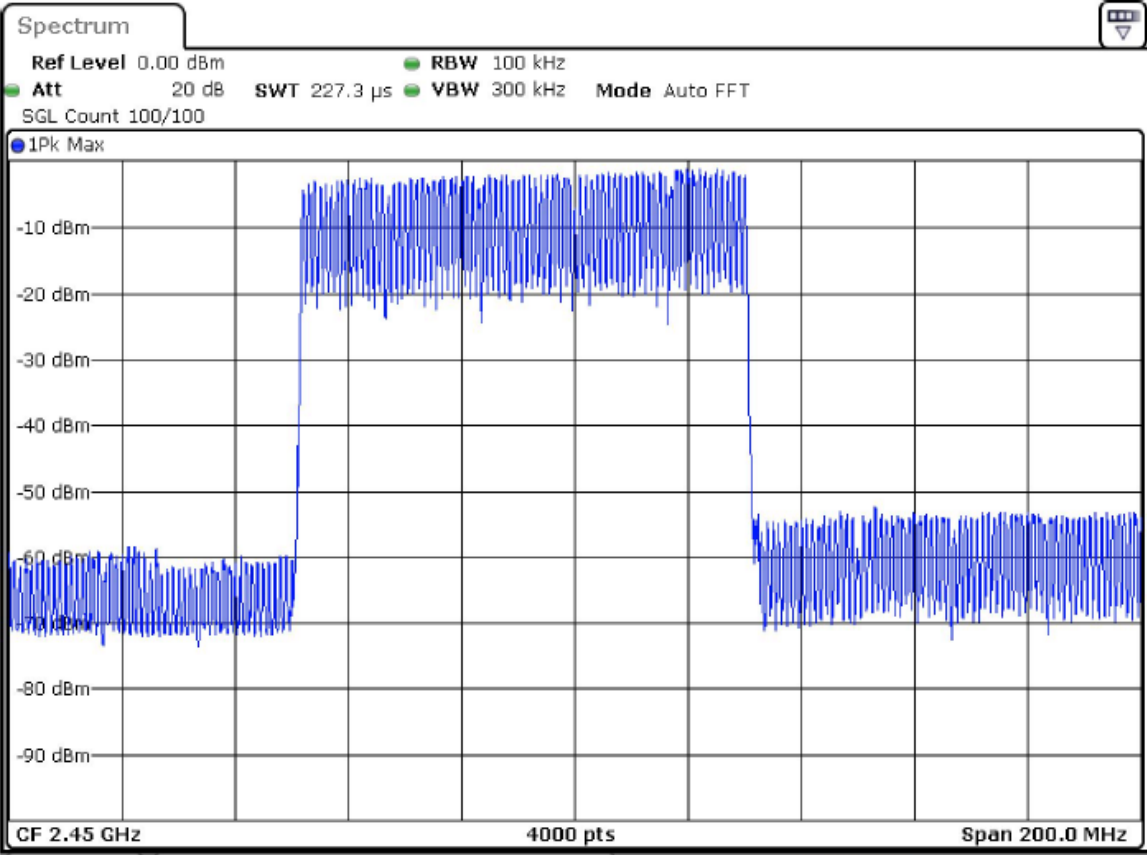
Plots for packet type DH1 shown below.

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2502.975000	-48.3	31.0	-17.3	PASS
2503.025000	-48.5	31.2	-17.3	PASS
2496.825000	-48.9	31.6	-17.3	PASS
2548.825000	-49.1	31.7	-17.3	PASS
2509.825000	-49.1	31.8	-17.3	PASS
2529.975000	-49.1	31.8	-17.3	PASS
2547.975000	-49.1	31.8	-17.3	PASS
2541.825000	-49.1	31.8	-17.3	PASS
2521.975000	-49.2	31.8	-17.3	PASS
2525.825000	-49.2	31.9	-17.3	PASS
2496.875000	-49.2	31.9	-17.3	PASS
2543.975000	-49.2	31.9	-17.3	PASS
2530.025000	-49.2	31.9	-17.3	PASS
2525.175000	-49.3	31.9	-17.3	PASS
2523.175000	-49.3	32.0	-17.3	PASS

Band Edge





Carrier Frequency Separation

Test procedure in accordance with ANSI C63.10-2013

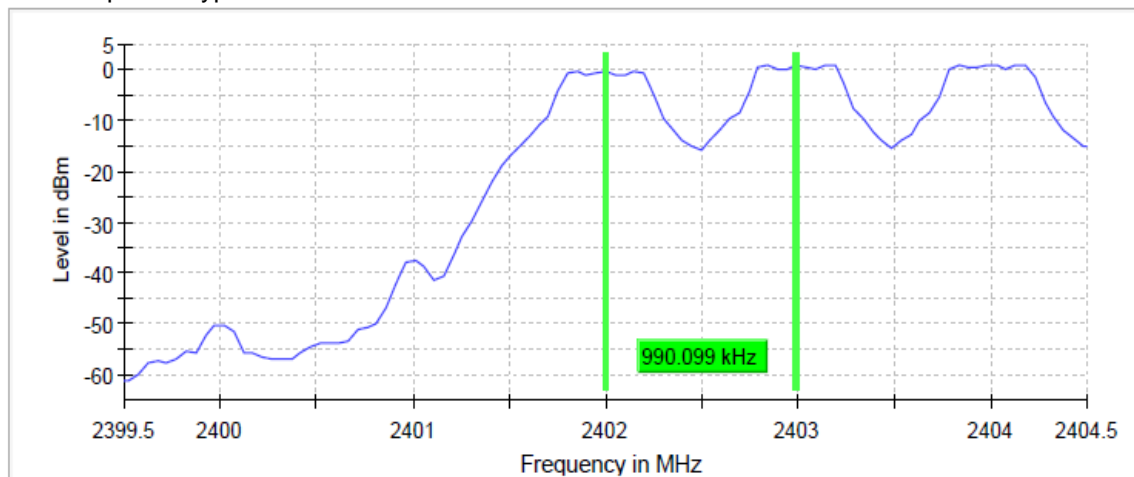
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty(k = 2) < 1%

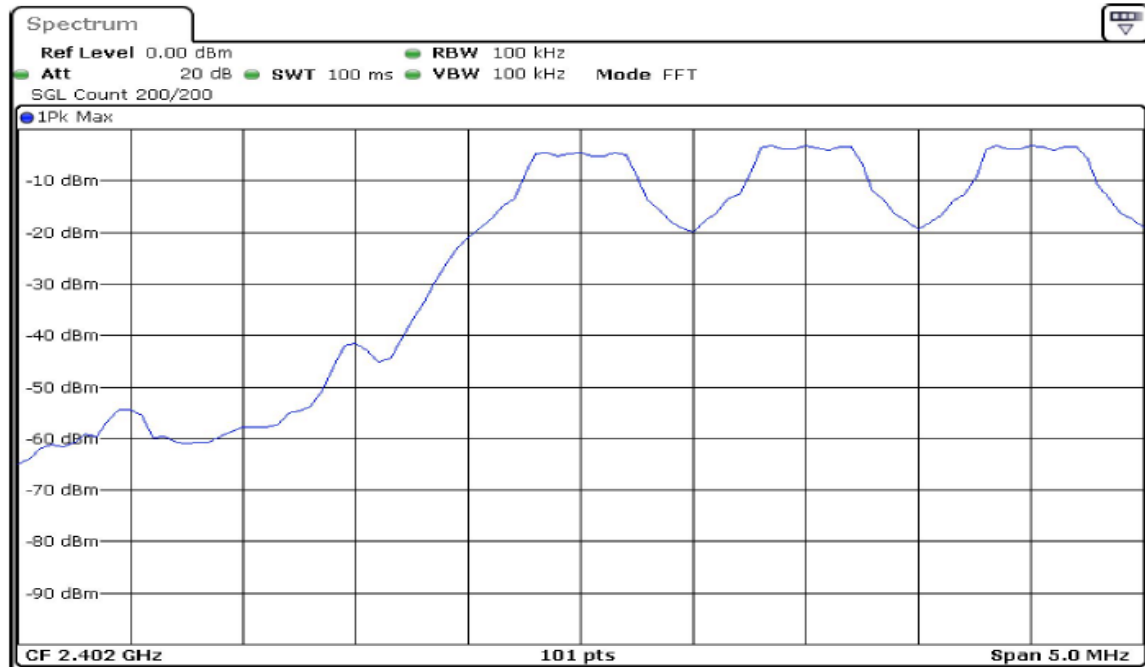
2402 MHz

Limit is 2/3 of the 20dB bandwidth measured for the corresponding mode.

Packet Type	DUT Frequency (MHz)	Frequency Separation (MHz)	Minimum Limit (MHz)	Result
DH1	2402.000000	0.990099	0.640000	PASS
DH3	2402.000000	0.990099	0.650000	PASS
DH5	2402.000000	0.990099	0.660000	PASS
2-DH1	2402.000000	0.990099	0.880000	PASS
2-DH3	2402.000000	0.990099	0.900000	PASS
2-DH5	2402.000000	0.990099	0.900000	PASS
3-DH1	2402.000000	0.990099	0.860000	PASS
3-DH3	2402.000000	0.990099	0.880000	PASS
3-DH5	2402.000000	0.990099	0.880000	PASS

Plots for packet type DH1 shown below.

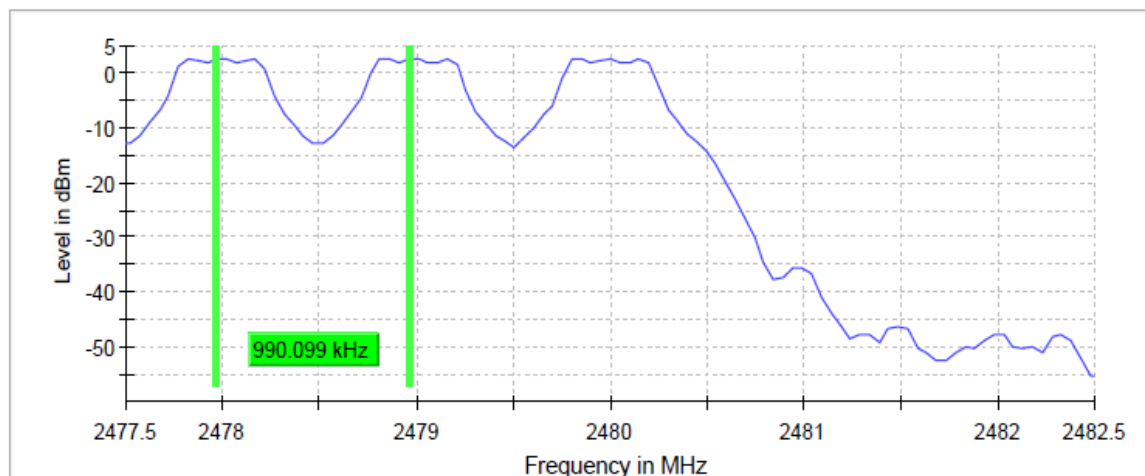


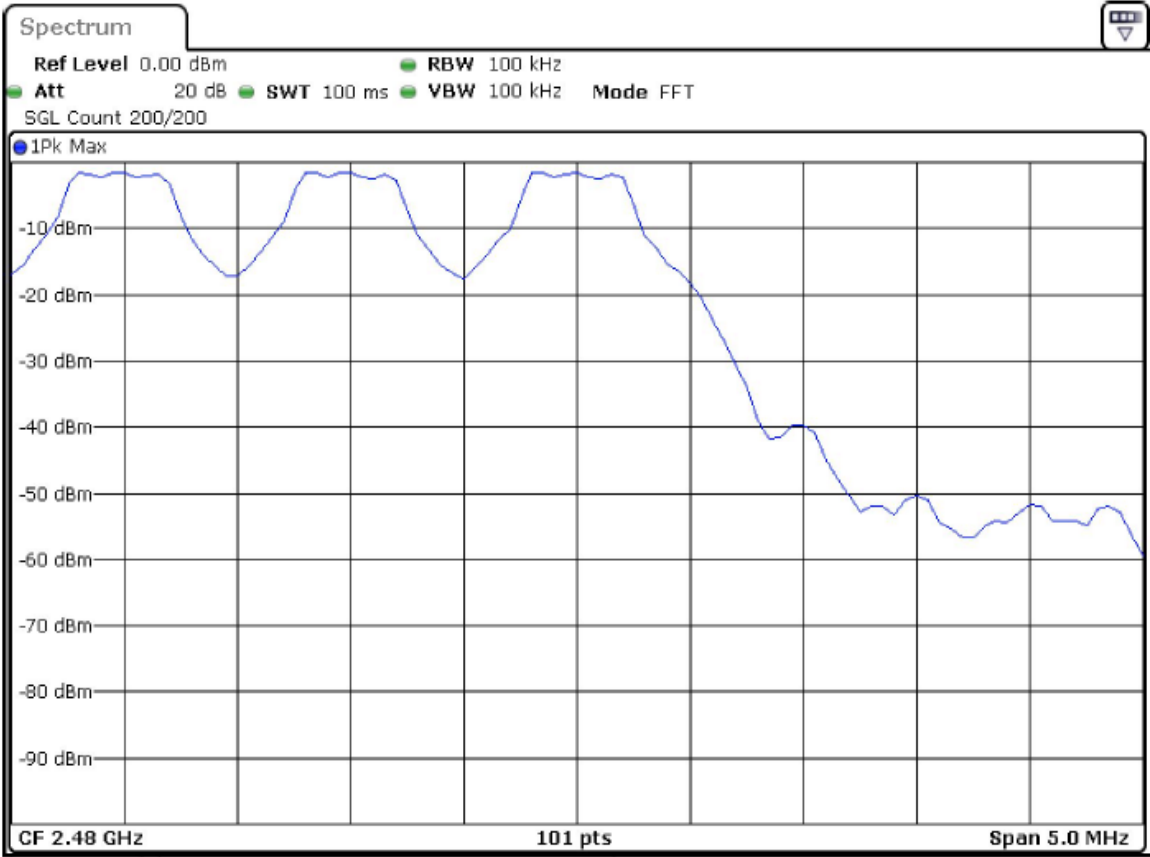
**2480 MHz**

Limit is 2/3 of the 20dB bandwidth measured for the corresponding mode.

Packet Type	DUT Frequency (MHz)	Frequency Separation (MHz)	Minimum Limit (MHz)	Result
DH1	2480.000000	0.990099	0.640000	PASS
DH3	2480.000000	0.990099	0.650000	PASS
DH5	2480.000000	0.990099	0.660000	PASS
2-DH1	2480.000000	0.990099	0.880000	PASS
2-DH3	2480.000000	0.990099	0.900000	PASS
2-DH5	2480.000000	0.990099	0.900000	PASS
3-DH1	2480.000000	0.990099	0.850000	PASS
3-DH3	2480.000000	0.990099	0.880000	PASS
3-DH5	2480.000000	0.990099	0.880000	PASS

Plots for packet type DH1 shown below.





Time of Channel Occupancy (Dwell Time)

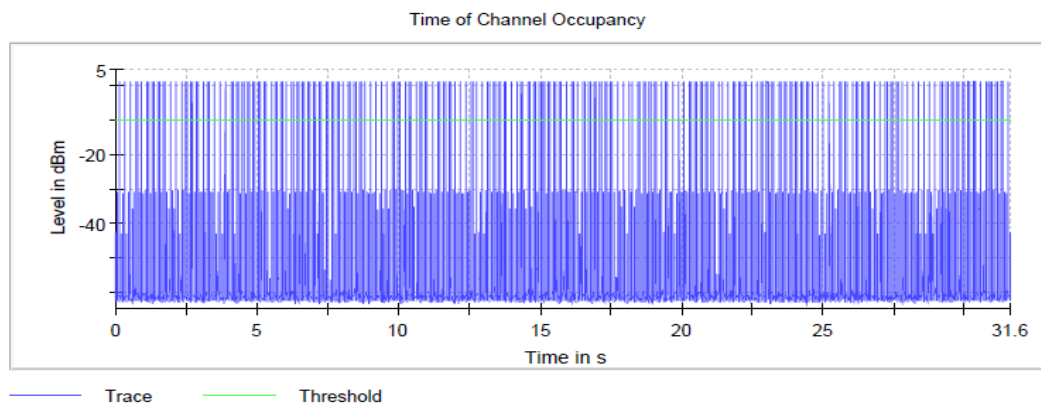
Test procedure in accordance with ANSI C63.10-2013

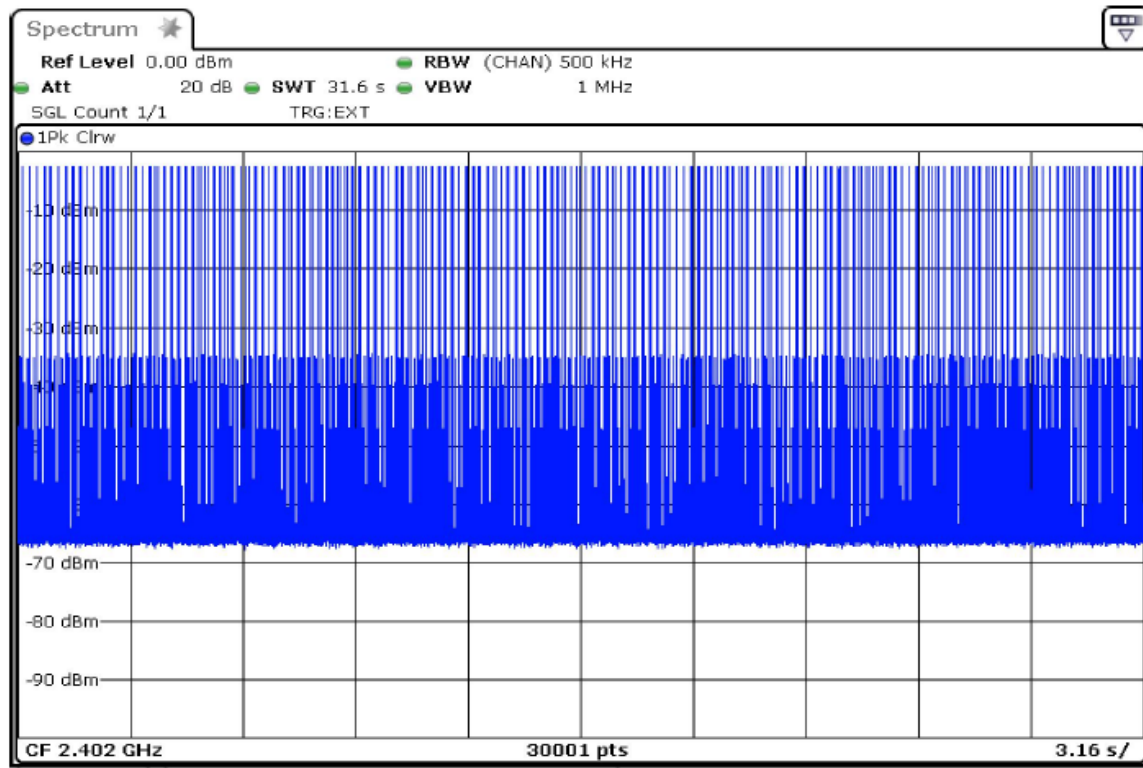
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1%

2402 MHz

Data Rate	Time (ms)	Limit Max (ms)	Result
DH1	124.830	400.000	PASS
DH3	264.970	400.000	PASS
DH5	297.450	400.000	PASS
2-DH1	111.420	400.000	PASS
2-DH3	214.340	400.000	PASS
2-DH5	269.760	400.000	PASS
3-DH1	111.960	400.000	PASS
3-DH3	226.640	400.000	PASS
3-DH5	258.210	400.000	PASS

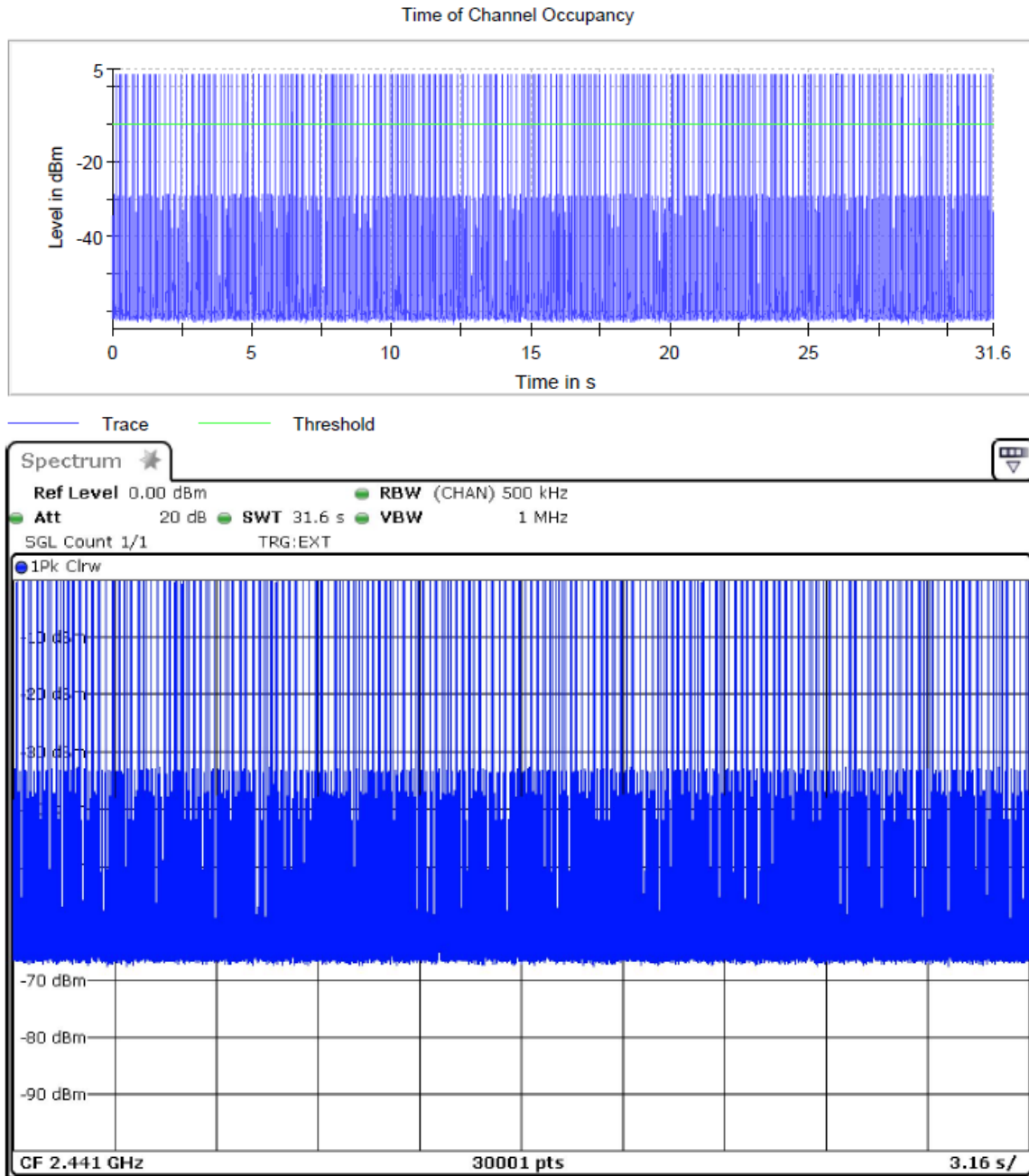
Plots for packet type DH1 shown below.



**2441 MHz**

Data Rate	Time (ms)	Limit Max (ms)	Result
DH1	125.310	400.000	PASS
DH3	270.230	400.000	PASS
DH5	289.610	400.000	PASS
2-DH1	116.590	400.000	PASS
2-DH3	242.820	400.000	PASS
2-DH5	286.690	400.000	PASS
3-DH1	119.090	400.000	PASS
3-DH3	225.390	400.000	PASS
3-DH5	284.280	400.000	PASS

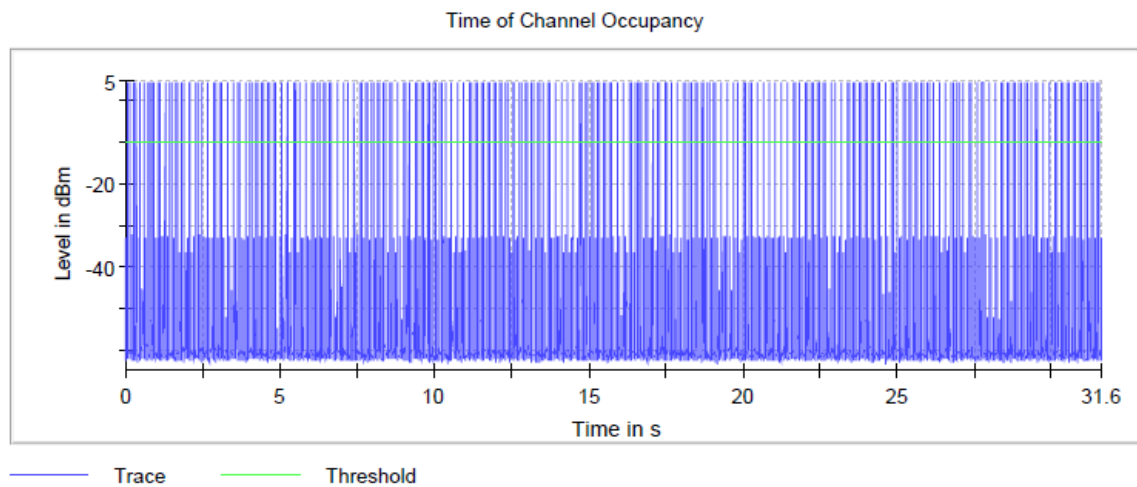
Plots for packet type DH1 shown below.

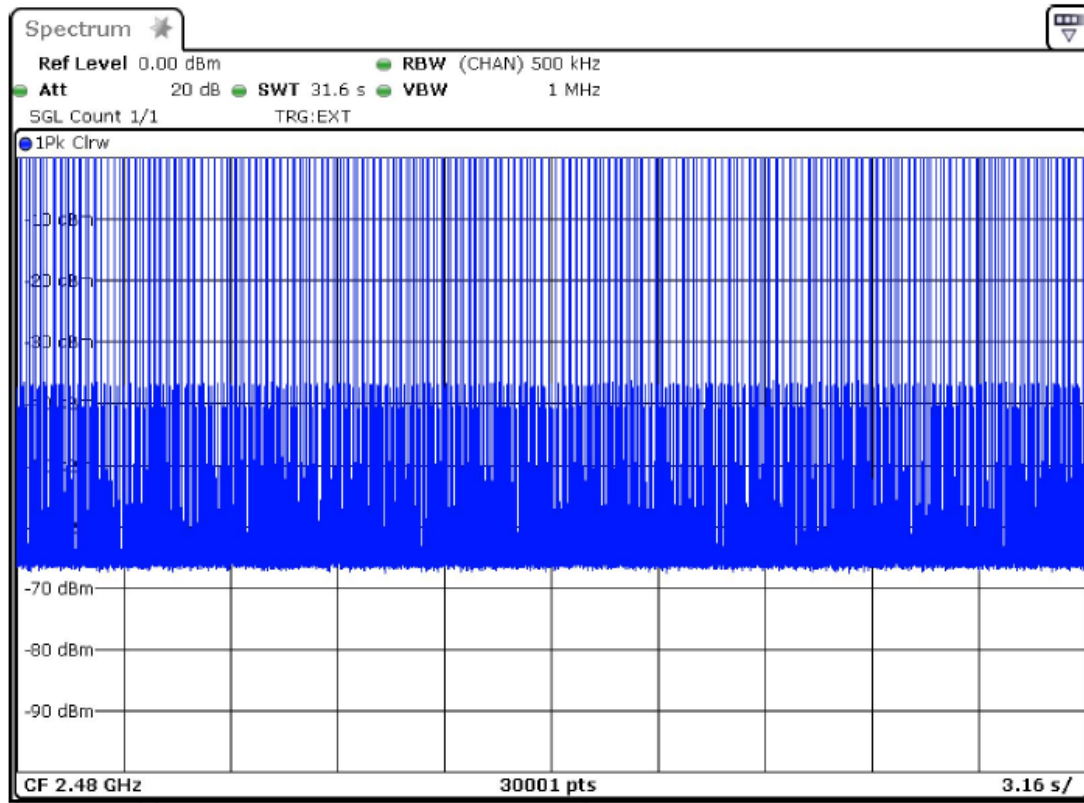


2480 MHz

Data Rate	Time (ms)	Limit Max (ms)	Result
DH1	125.470	400.000	PASS
DH3	252.170	400.000	PASS
DH5	330.130	400.000	PASS
2-DH1	117.720	400.000	PASS
2-DH3	254.670	400.000	PASS
2-DH5	282.770	400.000	PASS
3-DH1	120.600	400.000	PASS
3-DH3	230.910	400.000	PASS
3-DH5	264.830	400.000	PASS

Plots for packet type DH1 shown below.



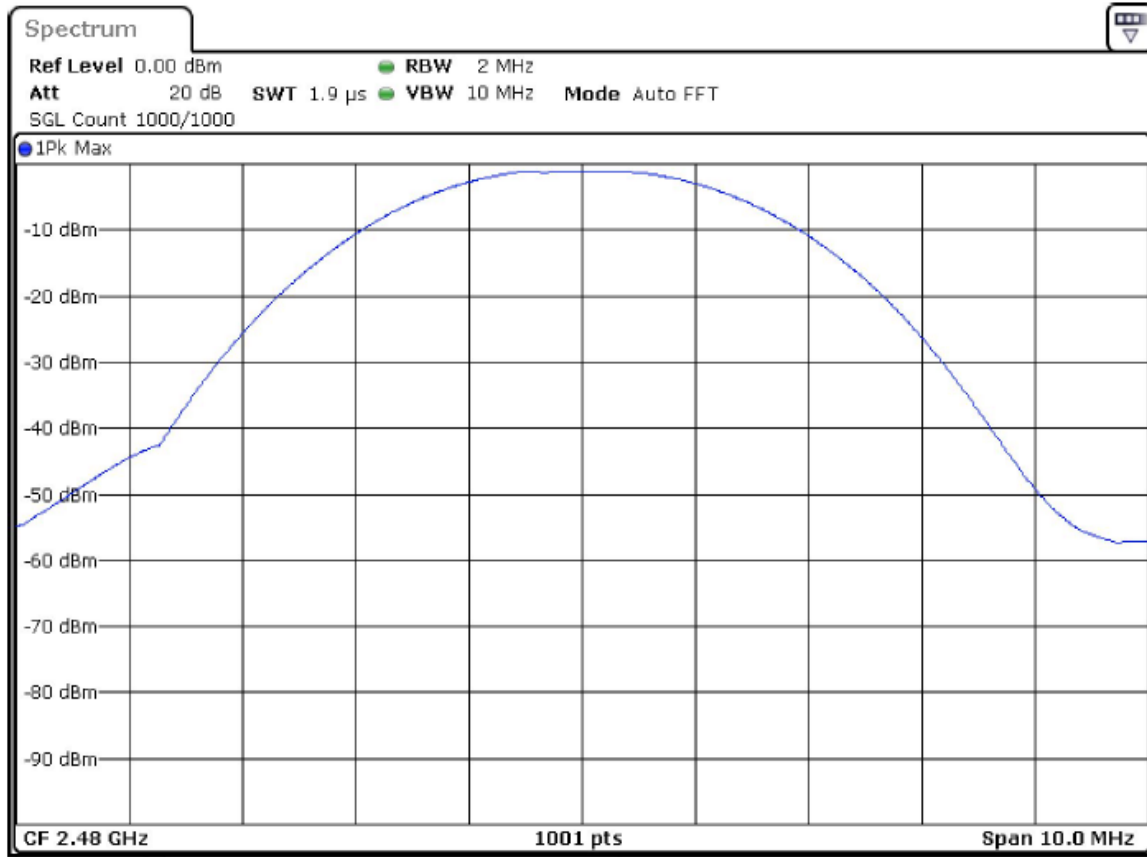


Peak Output Power

Test procedure in accordance with ANSI C63.10-2013

Data Rate	2402MHz	2441MHz	2480MHz	Limit dBm
DH1	0.141	2.409	3.184	30
DH3	0.044	2.337	3.063	30
DH5	-0.06	2.24	2.951	30
2-DH1	0.248	2.183	2.763	30
2-DH3	0.347	2.277	2.799	30
2-DH5	0.38	2.291	2.856	30
3-DH1	0.4	2.423	2.987	30
3-DH3	0.567	2.565	3.082	30
3-DH5	0.571	2.646	2.927	30

Plot for packet type DH1 shown below.



Emission Bandwidth 20 dB

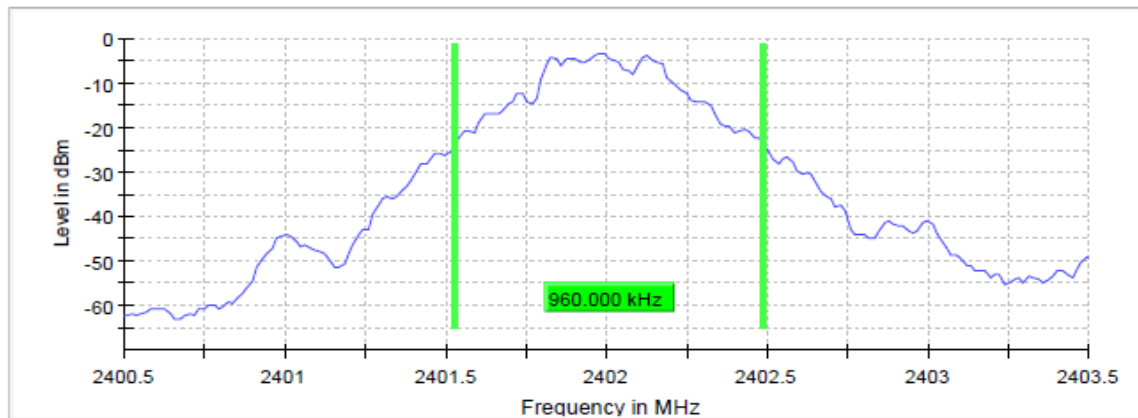
Test procedure in accordance with ANSI C63.10-2013

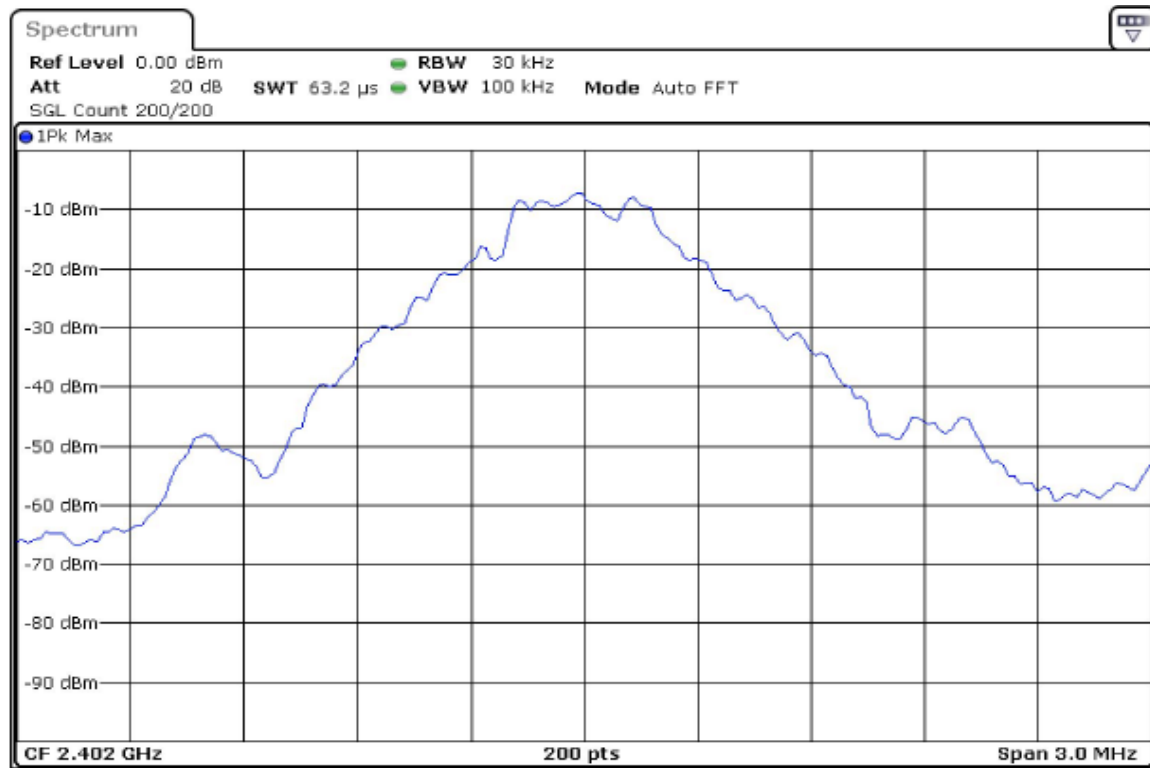
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

2402 MHz

Data Rate	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
DH1	0.960000	2401.527500	2402.487500	PASS
DH3	0.975000	2401.512500	2402.487500	PASS
DH5	0.990000	2401.512500	2402.502500	PASS
2-DH1	1.320000	2401.317500	2402.637500	PASS
2-DH3	1.350000	2401.317500	2402.667500	PASS
2-DH5	1.350000	2401.317500	2402.667500	PASS
3-DH1	1.290000	2401.347500	2402.637500	PASS
3-DH3	1.320000	2401.332500	2402.652500	PASS
3-DH5	1.320000	2401.332500	2402.652500	PASS

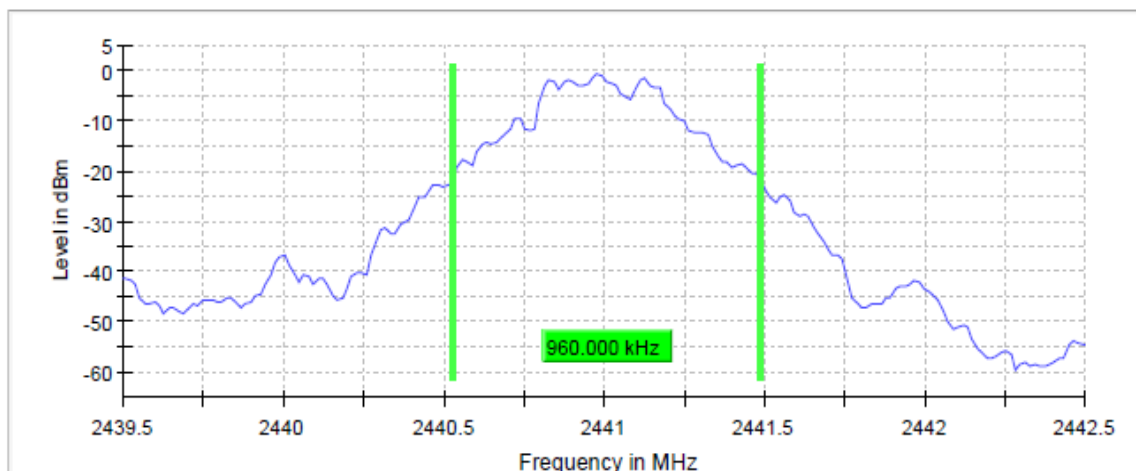
Plots for packet type DH1 shown below.



**2441 MHz**

Data Rate	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
DH1	0.960000	2440.527500	2441.487500	PASS
DH3	0.975000	2440.512500	2441.487500	PASS
DH5	0.990000	2440.512500	2441.502500	PASS
2-DH1	1.320000	2440.317500	2441.637500	PASS
2-DH3	1.350000	2440.317500	2441.667500	PASS
2-DH5	1.350000	2440.317500	2441.667500	PASS
3-DH1	1.275000	2440.362500	2441.637500	PASS
3-DH3	1.320000	2440.332500	2441.652500	PASS
3-DH5	1.320000	2440.332500	2441.652500	PASS

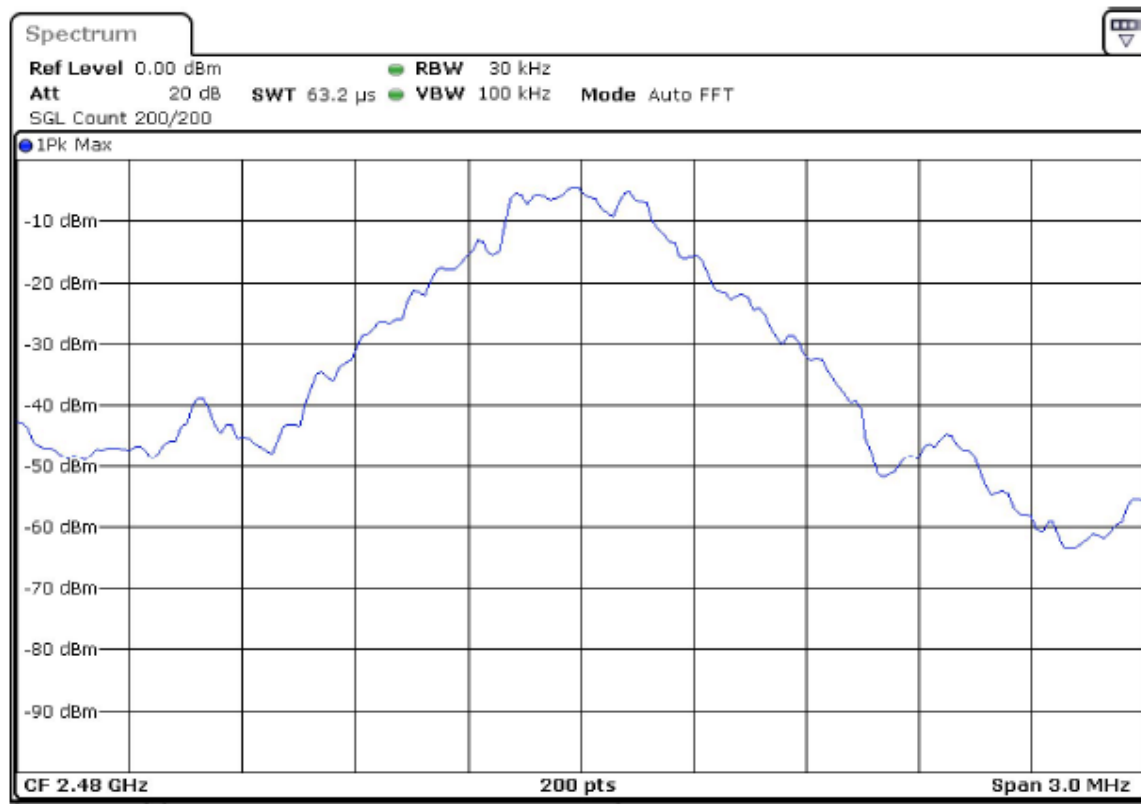
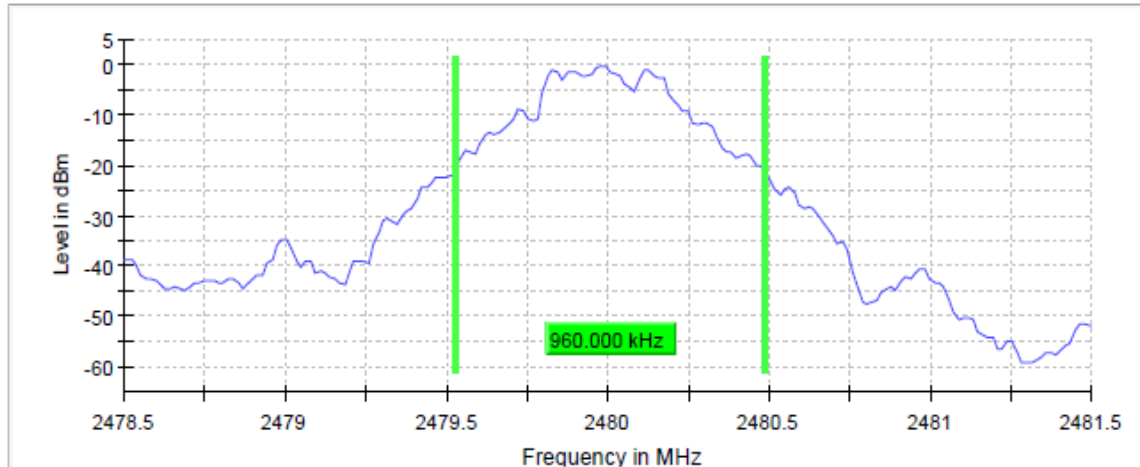
Plots for packet type DH1 shown below.



**2480 MHz**

Data Rate	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
DH1	0.960000	2479.527500	2480.487500	PASS
DH3	0.975000	2479.512500	2480.487500	PASS
DH5	0.990000	2479.512500	2480.502500	PASS
2-DH1	1.320000	2479.317500	2480.637500	PASS
2-DH3	1.350000	2479.317500	2480.667500	PASS
2-DH5	1.350000	2479.317500	2480.667500	PASS
3-DH1	1.275000	2479.362500	2480.637500	PASS
3-DH3	1.320000	2479.332500	2480.652500	PASS
3-DH5	1.320000	2479.332500	2480.652500	PASS

Plots for packet type DH1 shown below.

**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

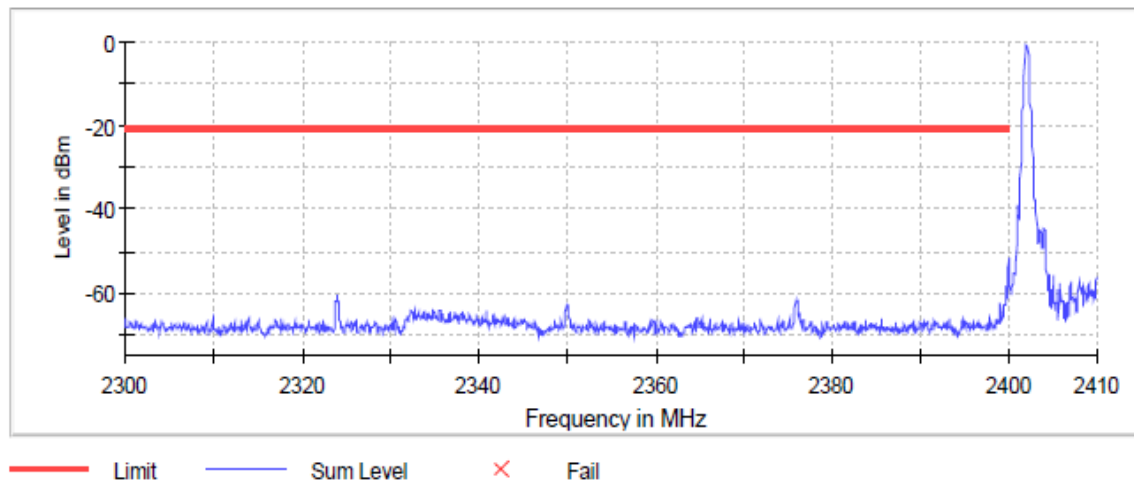
Inband Peak

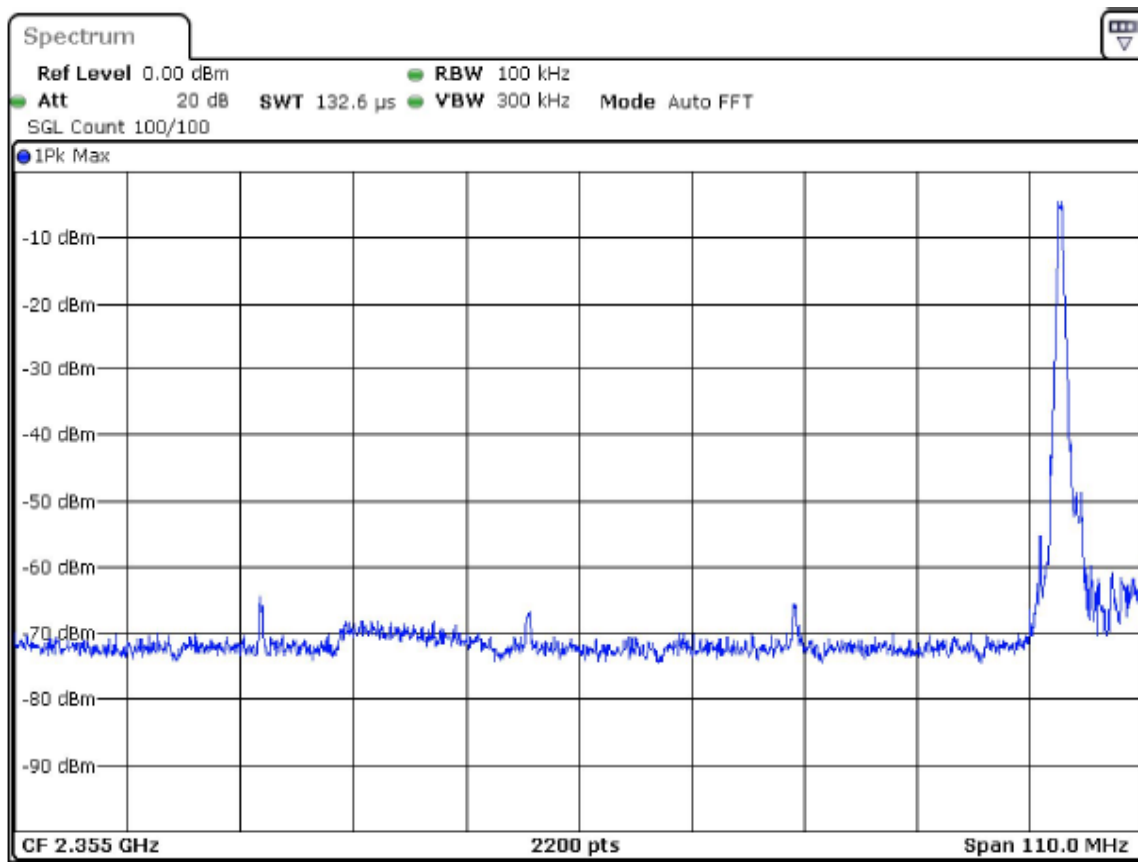
Data Rate	Frequency (MHz)	Level (dBm)
DH1	2401.825000	-0.6
DH3	2402.175000	-0.5
DH5	2401.975000	-0.5
2-DH1	2401.975000	-0.7
2-DH3	2401.975000	-0.7
2-DH5	2401.975000	-0.7
3-DH1	2401.825000	-0.6
3-DH3	2401.975000	-0.7
3-DH5	2401.975000	-0.7

Plots for packet type DH1 shown below.

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.975000	-51.4	30.8	-20.6	PASS
2399.925000	-53.9	33.4	-20.6	PASS
2399.675000	-58.6	38.0	-20.6	PASS
2399.625000	-58.9	38.3	-20.6	PASS
2399.725000	-59.3	38.7	-20.6	PASS
2399.875000	-59.8	39.2	-20.6	PASS
2323.925000	-60.6	40.1	-20.6	PASS
2399.825000	-61.0	40.4	-20.6	PASS
2324.025000	-61.3	40.8	-20.6	PASS
2323.975000	-61.4	40.9	-20.6	PASS
2399.775000	-61.6	41.0	-20.6	PASS
2375.825000	-61.7	41.1	-20.6	PASS
2376.075000	-61.7	41.1	-20.6	PASS
2399.575000	-61.7	41.2	-20.6	PASS
2376.025000	-61.7	41.2	-20.6	PASS





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

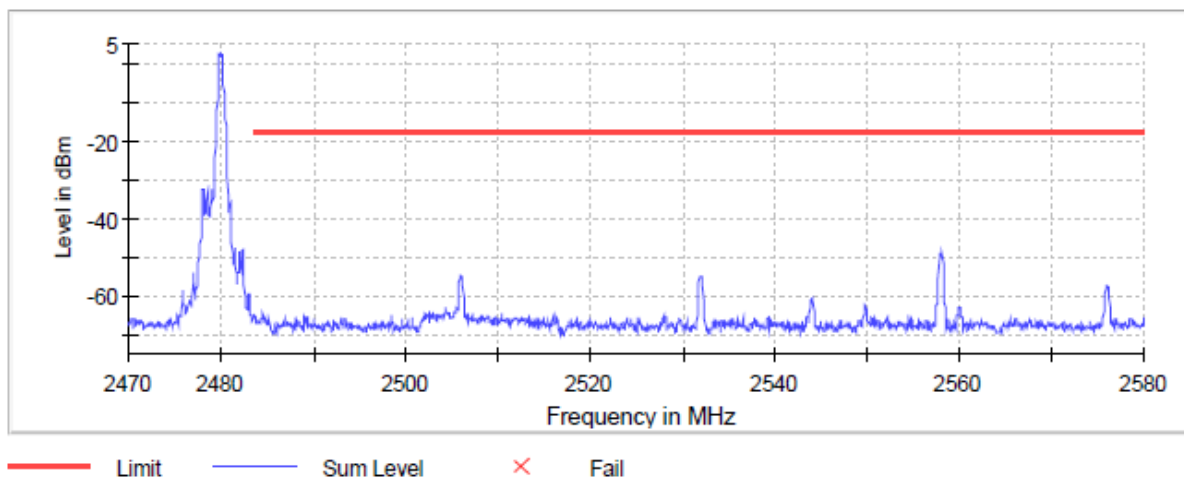
Inband Peak

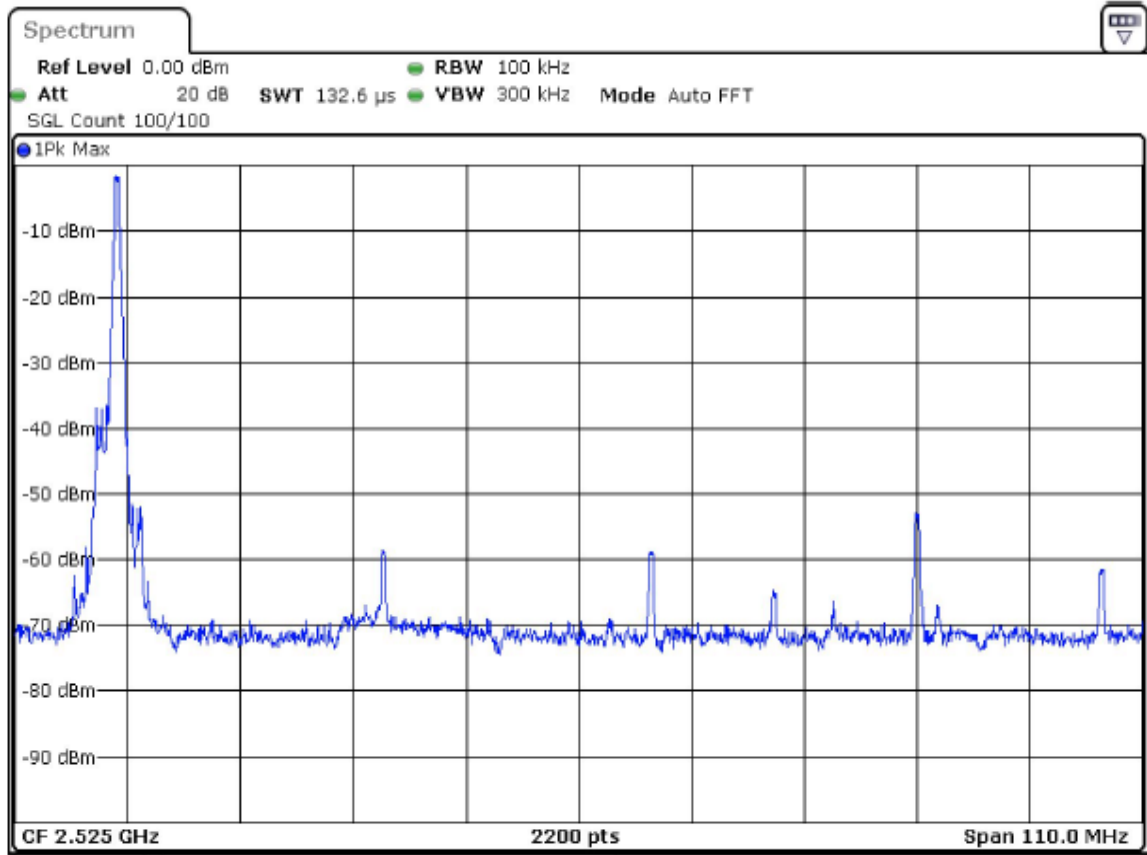
Data Rate	Frequency (MHz)	Level (dBm)
DH1	2479.975000	2.5
DH3	2480.175000	2.5
DH5	2479.975000	2.4
2-DH1	2479.975000	1.8
2-DH3	2479.975000	1.8
2-DH5	2479.975000	1.8
3-DH1	2479.825000	1.9
3-DH3	2479.975000	1.8
3-DH5	2479.975000	1.8

Plots for packet type DH1 shown below.

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2557.825000	-48.9	31.4	-17.5	PASS
2557.975000	-49.0	31.5	-17.5	PASS
2558.175000	-49.1	31.6	-17.5	PASS
2558.025000	-49.2	31.7	-17.5	PASS
2558.125000	-49.2	31.7	-17.5	PASS
2557.875000	-49.6	32.1	-17.5	PASS
2557.925000	-49.6	32.1	-17.5	PASS
2558.075000	-50.2	32.7	-17.5	PASS
2557.775000	-50.5	33.0	-17.5	PASS
2558.225000	-51.7	34.2	-17.5	PASS
2505.975000	-54.6	37.2	-17.5	PASS
2506.025000	-54.8	37.3	-17.5	PASS
2531.975000	-54.9	37.4	-17.5	PASS
2532.075000	-54.9	37.4	-17.5	PASS
2505.925000	-55.1	37.6	-17.5	PASS





Conducted Spurious Emissions

Test procedure in accordance with ANSI C63.10-2013

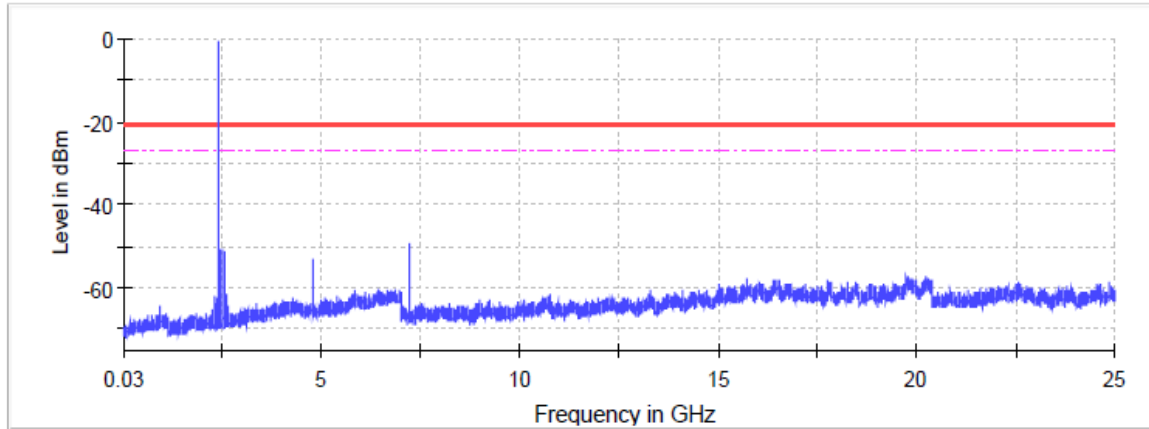
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

2402 MHz

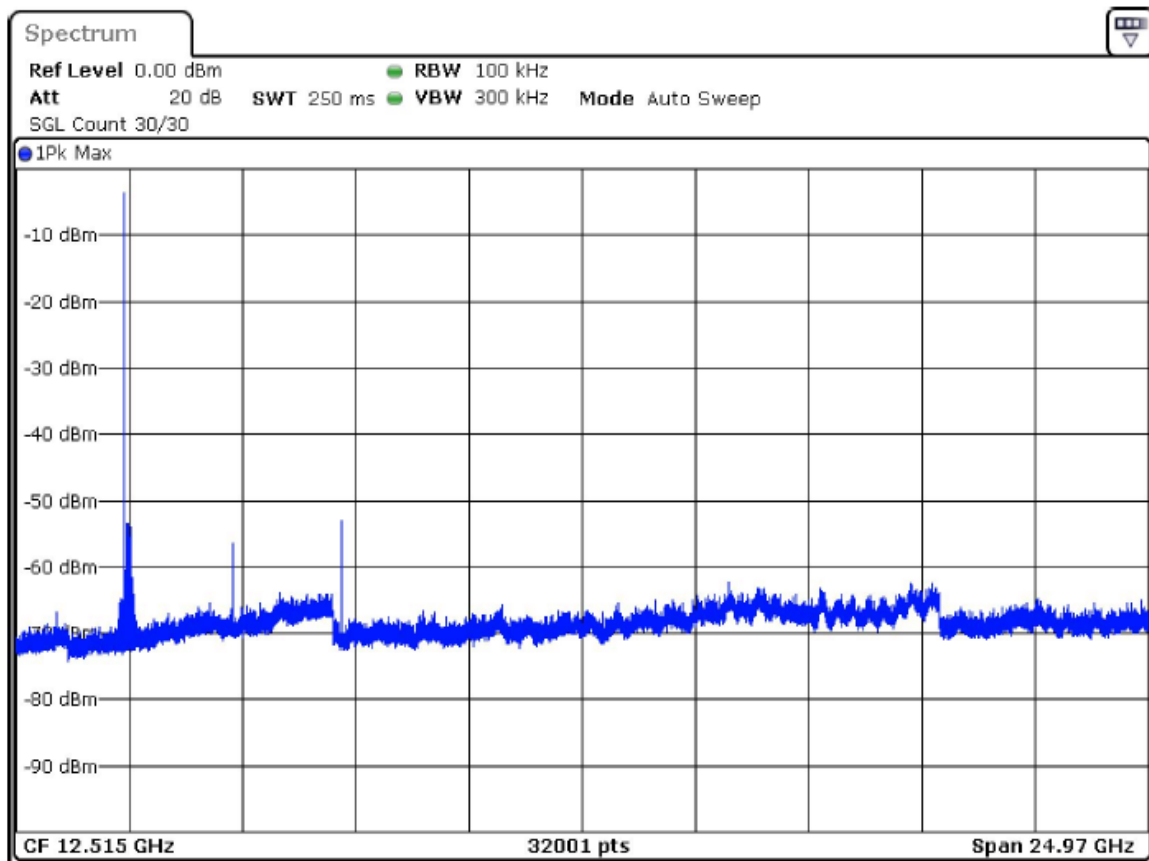
Plots for packet type DH1 shown below.

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7206.699947	-49.2	28.6	-20.6
7205.919659	-50.6	30.0	-20.6
2506.244336	-50.6	30.0	-20.6
2558.523640	-51.0	30.4	-20.6
2557.743352	-51.3	30.7	-20.6
2531.993844	-52.4	31.9	-20.6
7205.139371	-52.5	31.9	-20.6
4804.192838	-52.9	32.3	-20.6
2505.464048	-55.7	35.1	-20.6
20235.170620	-57.0	36.4	-20.6
19797.428987	-57.3	36.7	-20.6
19763.876598	-57.4	36.8	-20.6
19788.845817	-57.5	36.9	-20.6
4803.412550	-57.5	36.9	-20.6
20242.193213	-57.6	37.0	-20.6



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

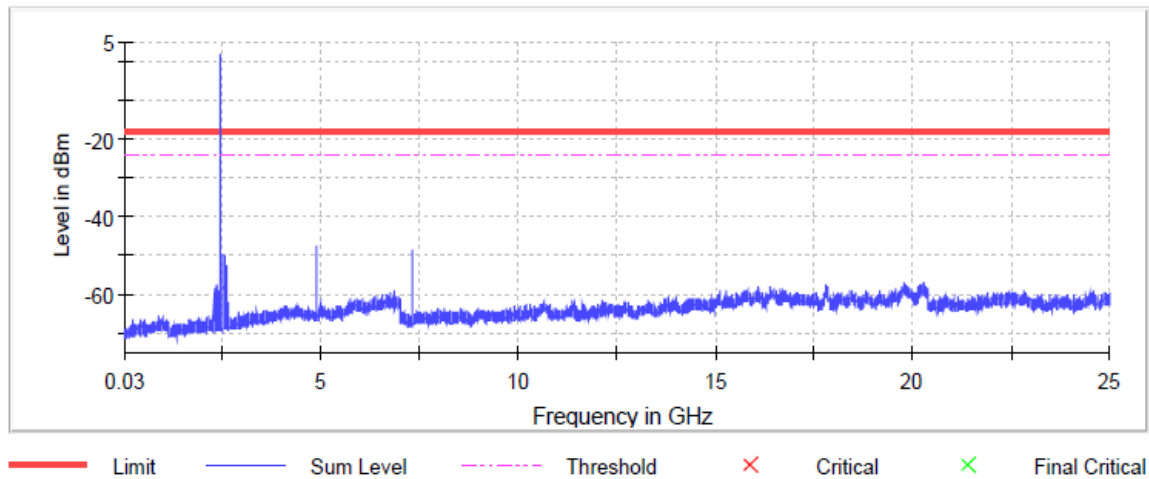


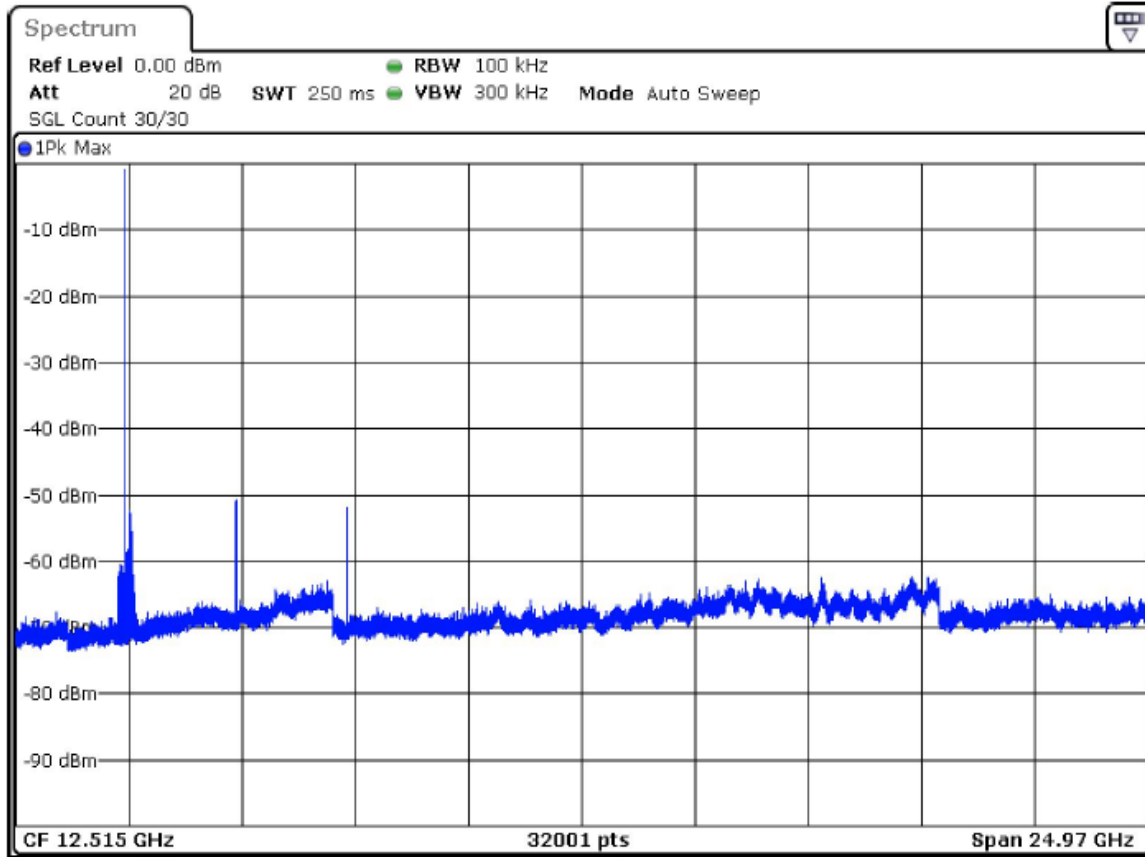
2441 MHz

Plots for packet type DH1 shown below.

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
4882.221649	-47.5	29.5	-18.0
4881.441361	-47.6	29.6	-18.0
7322.182588	-48.3	30.4	-18.0
7323.743164	-48.5	30.5	-18.0
2518.728946	-49.3	31.4	-18.0
2545.258742	-49.8	31.8	-18.0
7322.962876	-50.2	32.3	-18.0
2519.509234	-50.6	32.6	-18.0
2571.008250	-51.1	33.1	-18.0
2544.478454	-51.9	33.9	-18.0
2596.757758	-52.6	34.6	-18.0
2597.538046	-53.0	35.0	-18.0
2492.979438	-55.2	37.2	-18.0
19788.065529	-56.9	39.0	-18.0
19781.042936	-57.0	39.0	-18.0





2480 MHz

Plots for packet type DH1 shown below.

Pre Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
7440.006094	-46.9	29.7	-17.3
4959.470173	-48.1	30.9	-17.3
7440.786382	-48.8	31.5	-17.3
7439.225805	-48.8	31.5	-17.3
2557.743352	-48.9	31.7	-17.3
2584.273148	-49.1	31.8	-17.3
4960.250461	-49.4	32.1	-17.3
2583.492860	-51.3	34.1	-17.3
2558.523640	-51.6	34.3	-17.3
1731.418237	-52.0	34.7	-17.3
1748.584575	-52.4	35.1	-17.3
2610.022656	-52.5	35.3	-17.3
2635.772163	-53.2	36.0	-17.3
2531.993844	-54.5	37.2	-17.3
2375.936221	-54.8	37.5	-17.3

