FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1

CERTIFICATION TEST REPORT
For

BT + BLE + NORDIC and WLAN DTS/UNII a/b/g/n/ac

MODEL NUMBER: 1003
FCC ID: 2AES41003
IC ID: 20207-1003

REPORT NUMBER: 15U21133-E2 REVISION A
ISSUE DATE: AUG 18, 2015

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	07/20/15	Initial Issue	P. ZHANG
A	8/18/15	Update section 5.2	P. ZHANG

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: VALVE

EUT DESCRIPTION: BT+BLE+NORDIC and WLAN DTS/UNII a/b/g/n/ac

MODEL: 1003

SERIAL NUMBER: FL524000A0 (Conducted); FL524000E3 (Radiated)

DATE TESTED: JULY 11-17, 2015

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 ISSUE 1	Pass
INDUSTRY CANADA RSS-GEN ISSUE 4	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2009 for FCC and ANSI C63.10-2013 for IC, RSS-GEN Issue 4, RSS-247 Issue 1.

Testing for radiated emissions above 1GHz was performed with the EUT elevated at 1.5m instead of 0.8m. 1.5m is the required height in ANSI C63.10:2013 as referenced by RSS GEN issue 4. This test height has been permitted by FCC as discussed in FCC/TCB conference call in December 2014.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☒ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 2324B-6)
	☐ Chamber G(IC: 2324B-7)
	☐ Chamber H(IC: 2324B-8)

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 18000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a BT+BLE+NORDIC and WLAN DTS/UNII a/b/g/n/ac.

5.2. MAXIMUM OUTPUT POWER

Note: Power declared in the report are the worst case power & that production unit will not carry higher power listed in the report.

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	10.14	10.32
2402 - 2480	Enhanced 8PSK	9.83	9.62

Note: GFSK, Pi/4-DQPSK, 8PSK average Power are all investigated, The GFSK & 8PSK Power are the worst case. Testing is based on this mode to showing compliance. For average power data please refer to section 8.6.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an embedded antenna, with a maximum gain of 2.1 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC ADAPTER	CHICONY	A15-012N1A	N/A	N/A
LAPTOP	DELL	N/A	N/A	N/A
LAPTOP	DELL	N/A	N/A	N/A
ROUTER	NETGEAR	N600	N/A	N/A
ROUTER	D-LINK	DIR-655B1	N/A	N/A

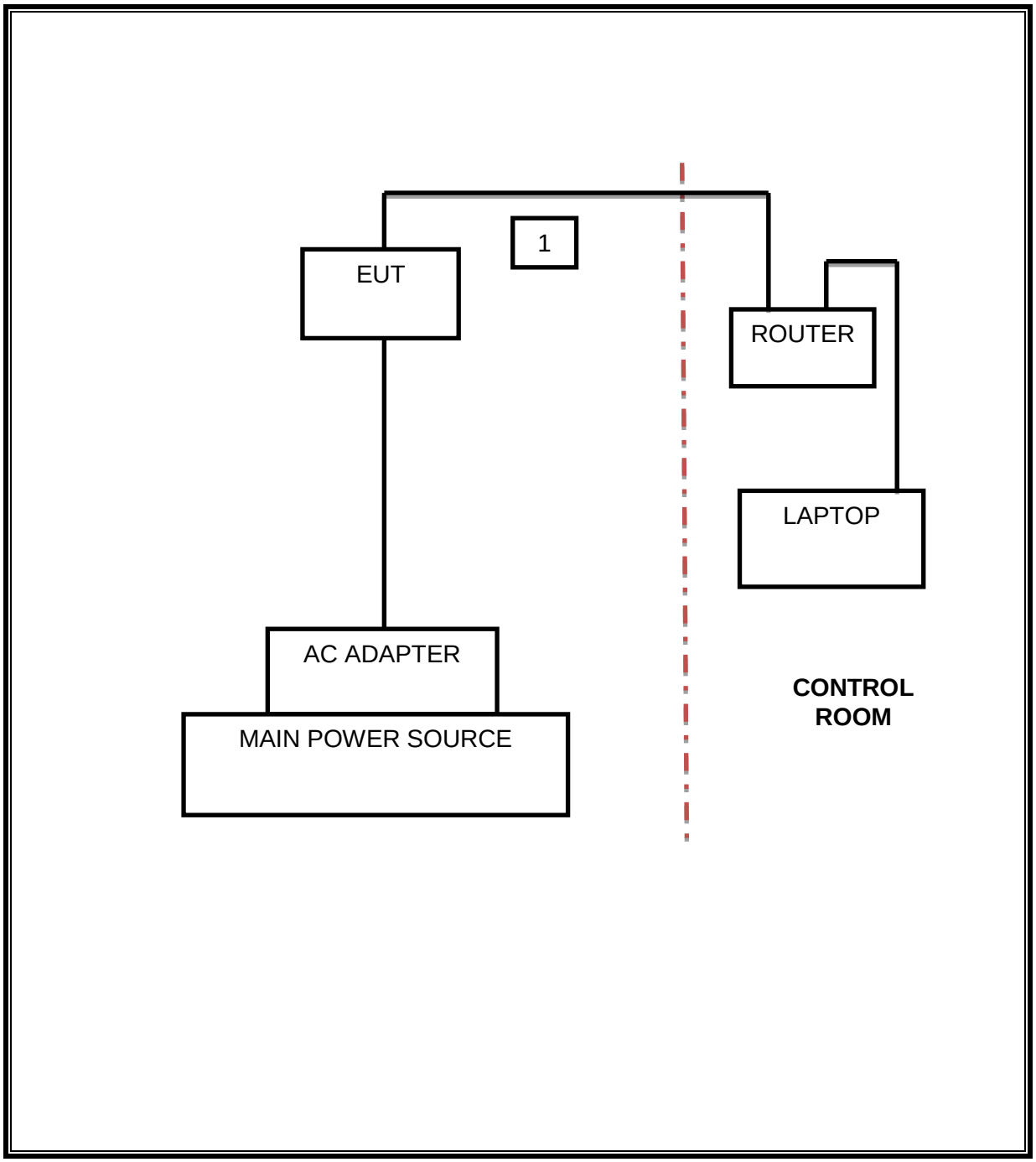
I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Ethernet	1	RJ-45	Unshielded	5m	N/A

TEST SETUP

EUT was set in the BT menu mode to enable BT communications.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/16
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/15
RF Preamplifier, 100KHz -> 1300MHz	HP	8447D	T10	01/06/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
CBT Bluetooth Tester	R & S	CBT	None	07/12/16
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/16
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012	
CLT Software	UL	UL RF	Ver 1.0, Feb 2 2015	
Antenna Port Software	UL	UL RF	Ver 2.1.1.1, Jan 20 2015	

7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1049	RSS-GEN 6.6	Occupied Band width (99%)	N/A	Conducted	Pass	1.178MHz
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-43.31 dBm
15.247 (b)(1)	RSS-247 5.4(1)	TX conducted output power	<21dBm		Pass	10.14 dBm
15.247 (a)(1)	RSS-247 5.1 (1)	Hopping frequency separation	> 25KHz		Pass	1 MHz
15.247 (a)(1)(iii)	RSS-247 5.1(4)	Number of Hopping channels	More than 15 non-overlapping channels		Pass	79 channels
15.247 (a)(1)(iii)	RSS-247 5.1(4)	Avg Time of Occupancy	< 0.4sec		Pass	0.369 s
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	52.59dBuV
15.205, 15.209	RSS-GEN 8.9	Radiated Spurious Emission	< 54dBuV/m		Pass	48.25 dBuV/m

8. ANTENNA PORT TEST RESULTS

8.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

RESULTS

8.1.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.973	0.873
Middle	2441	0.973	0.866
High	2480	0.971	0.864
Worst		0.973	0.873

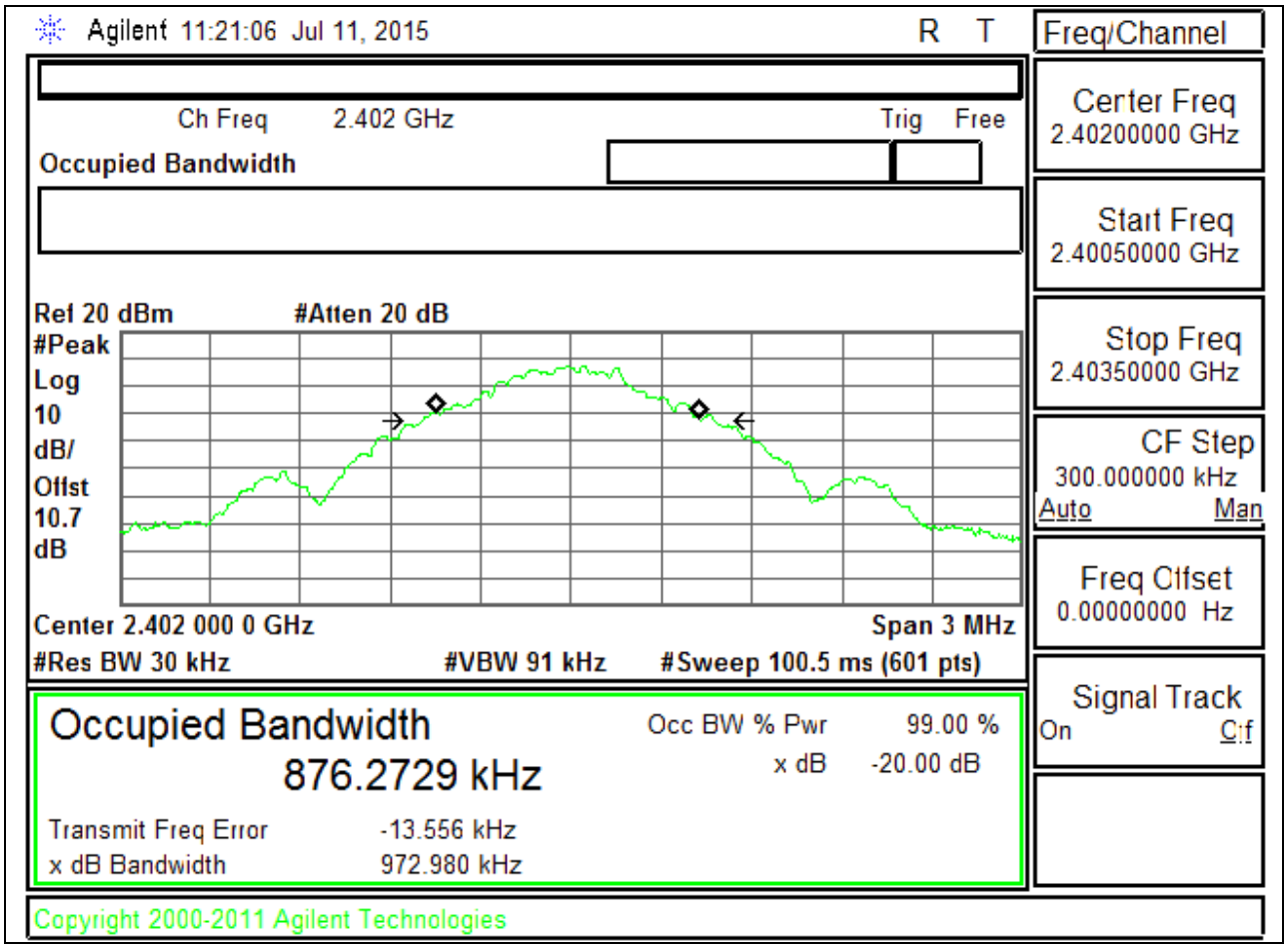
8.1.2. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.297	1.173
Middle	2441	1.296	1.161
High	2480	1.297	1.178
Worst		1.297	1.178

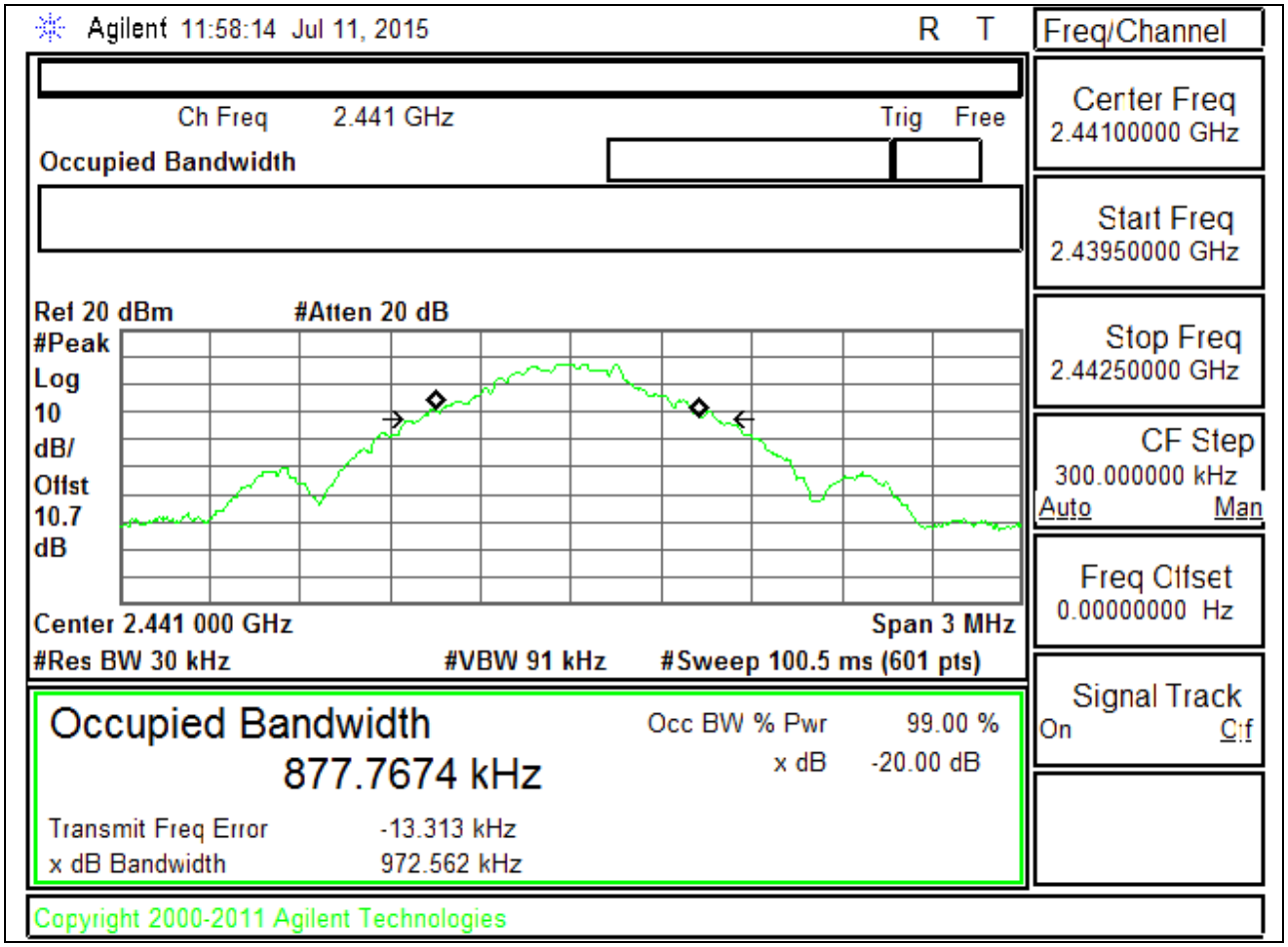
8.1.3. 20 dB AND 99% BANDWIDTH PLOTS

GFSK 20 dB BANDWIDTH

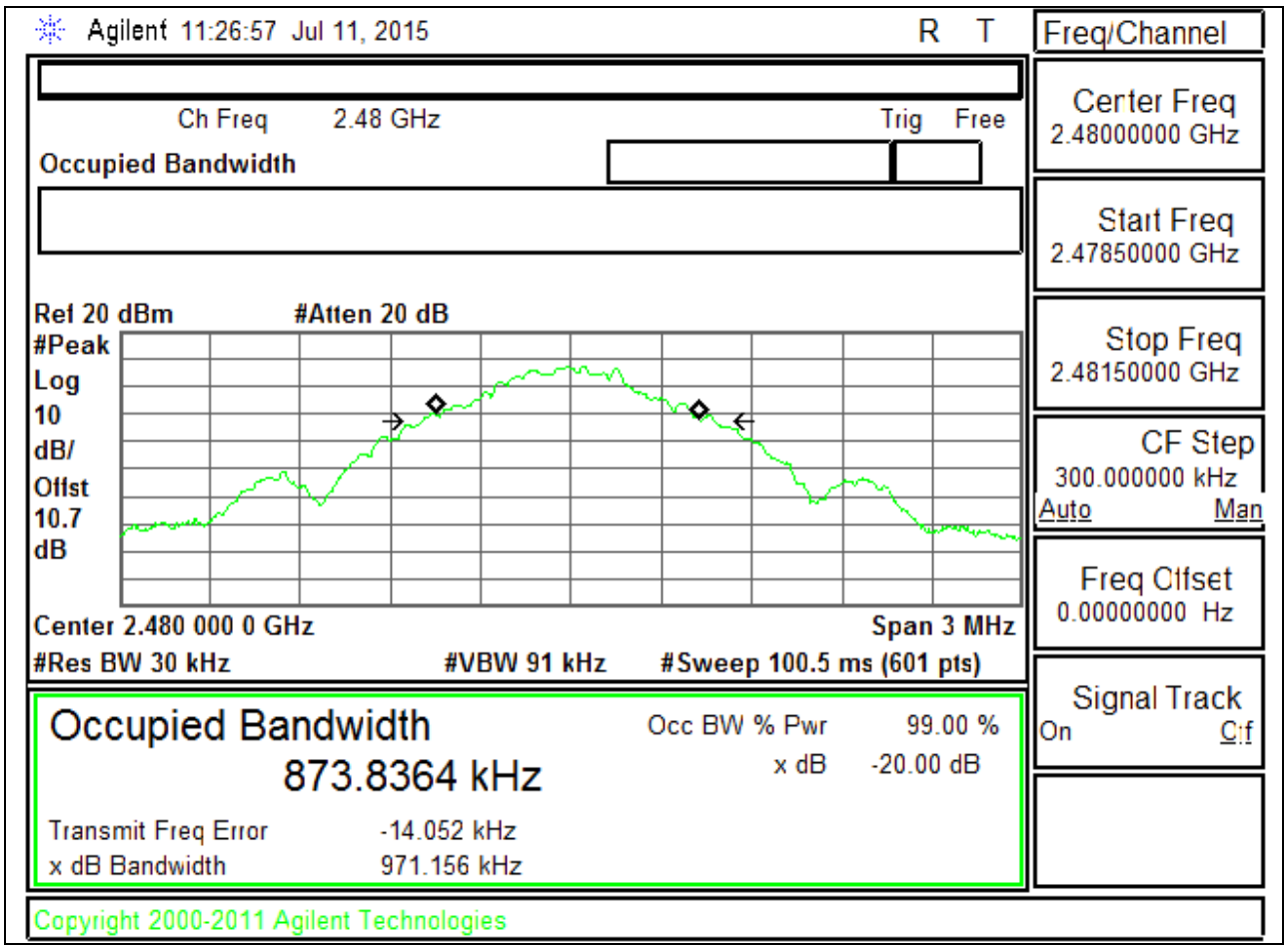
LOW CHANNEL



MID CHANNEL

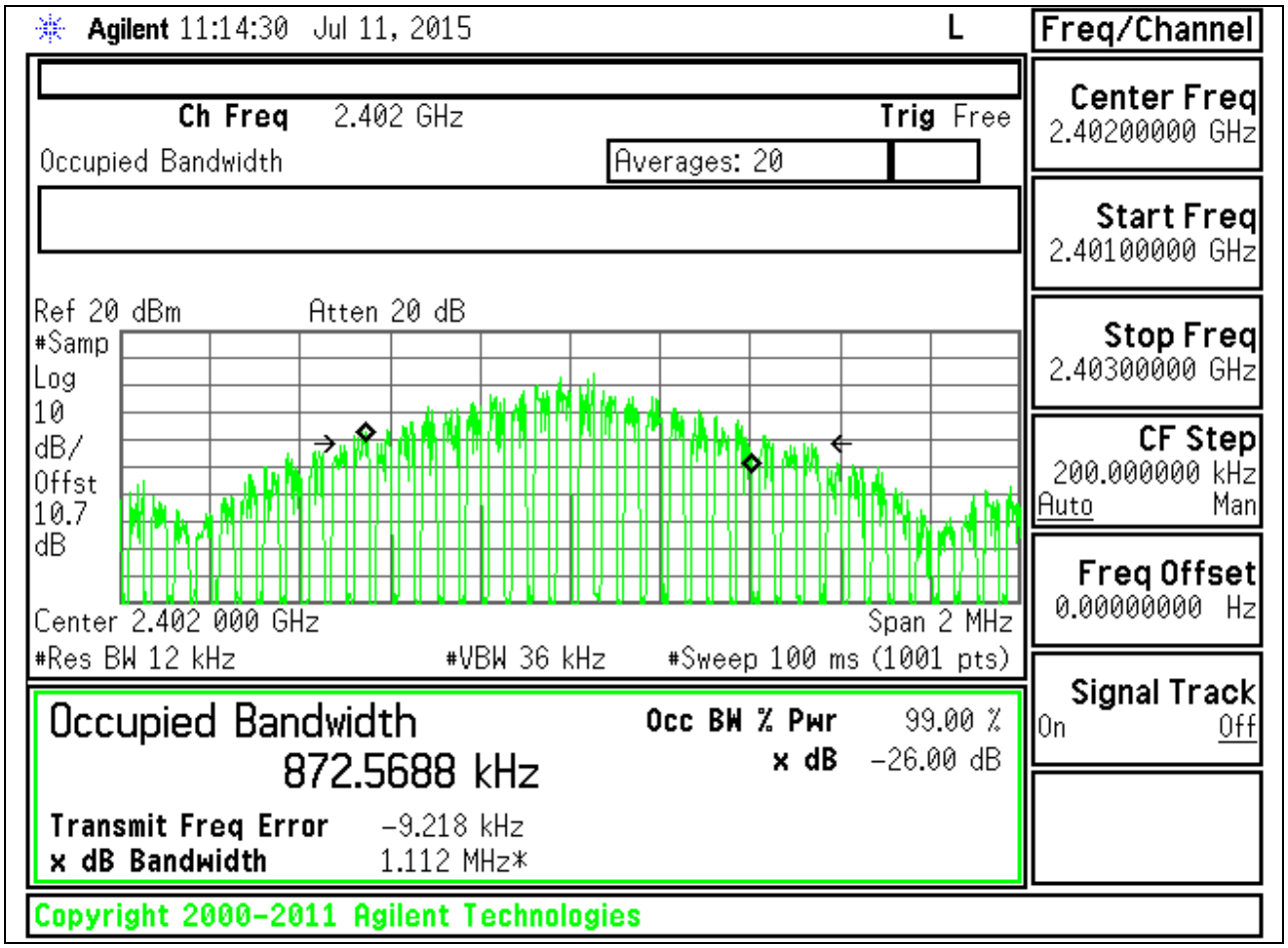


HIGH CHANNEL

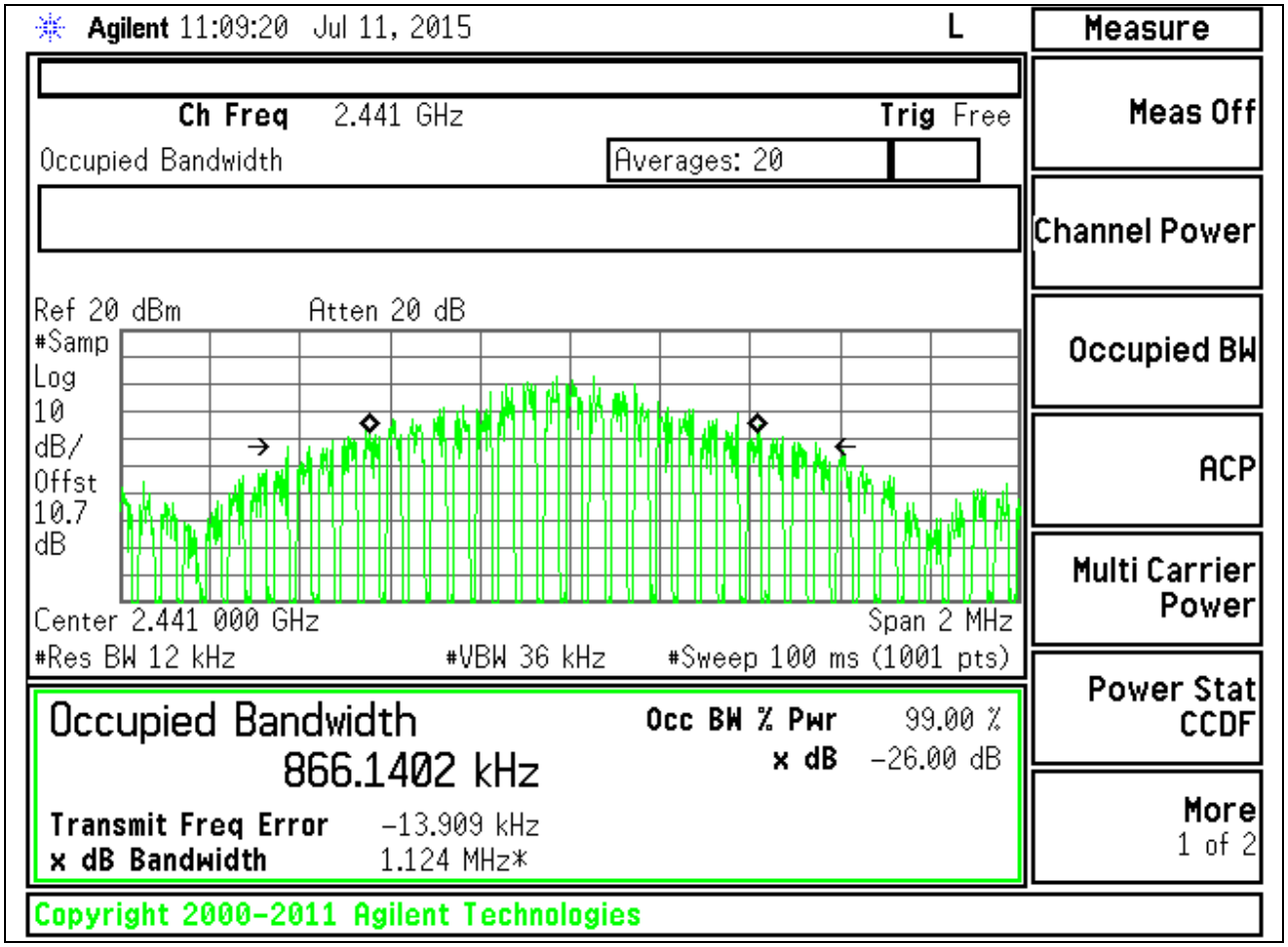


GFSK 99% BANDWIDTH

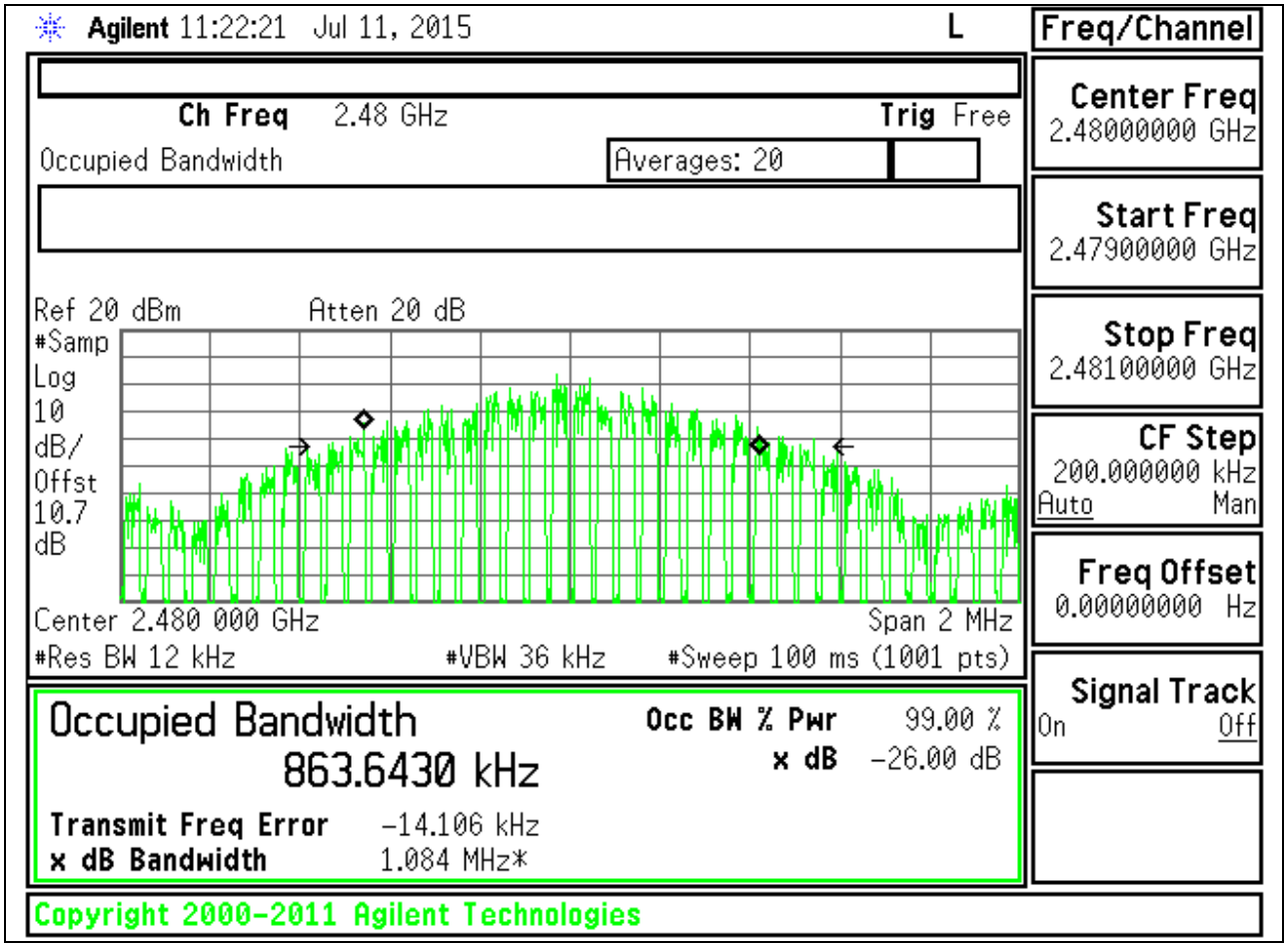
LOW CHANNEL



MID CHANNEL

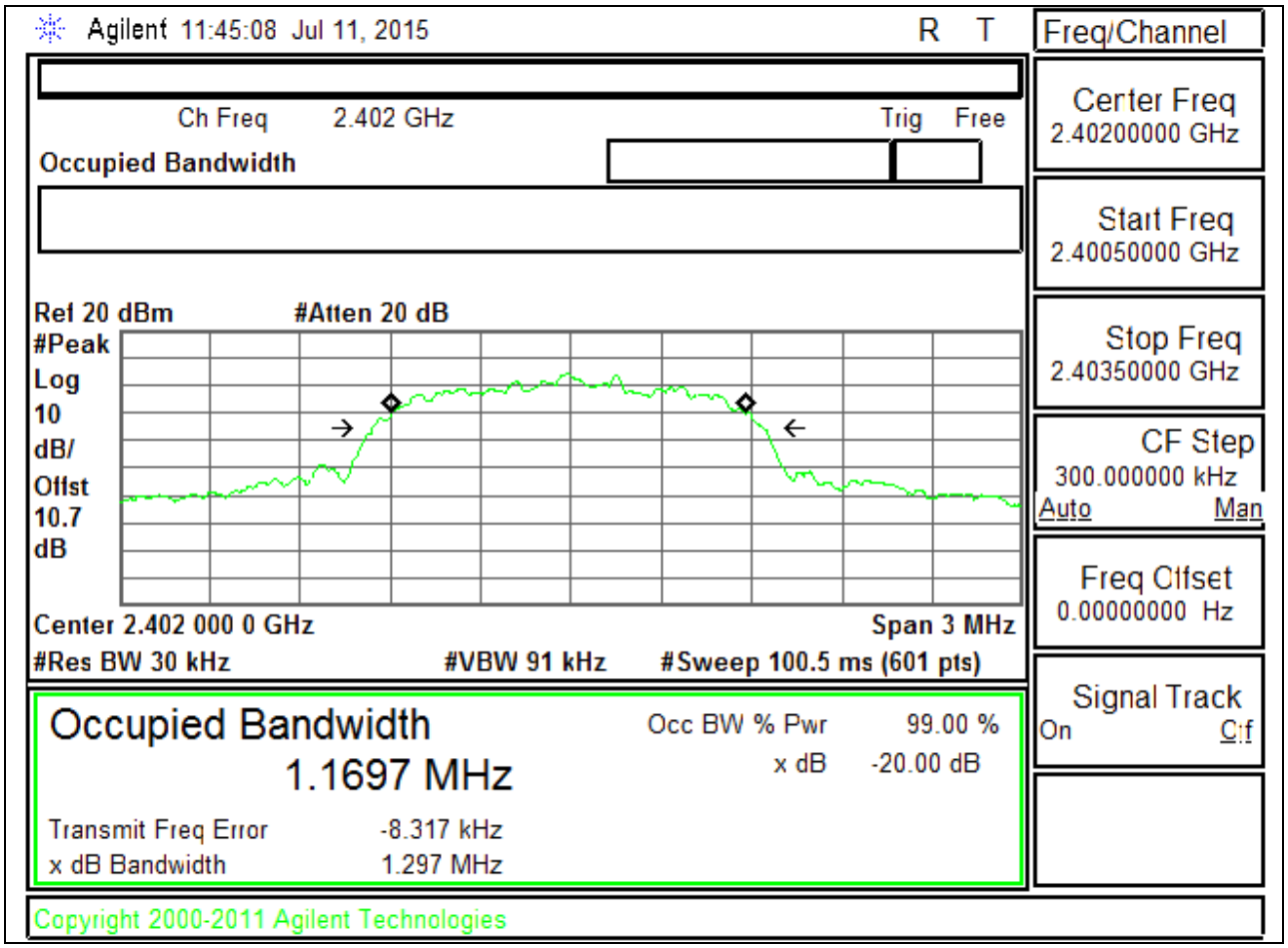


HIGH CHANNEL

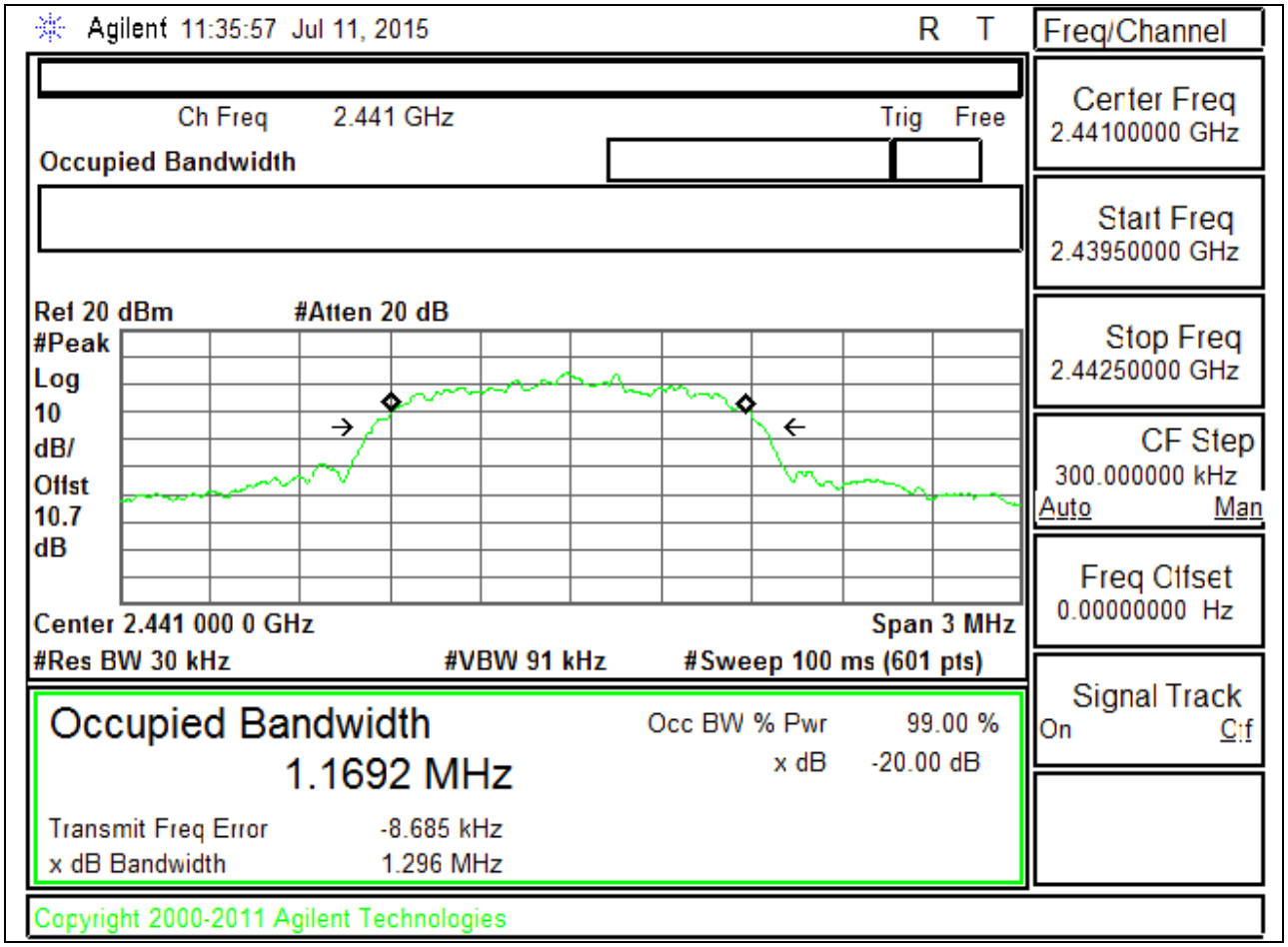


8PSK 20 dB BANDWIDTH

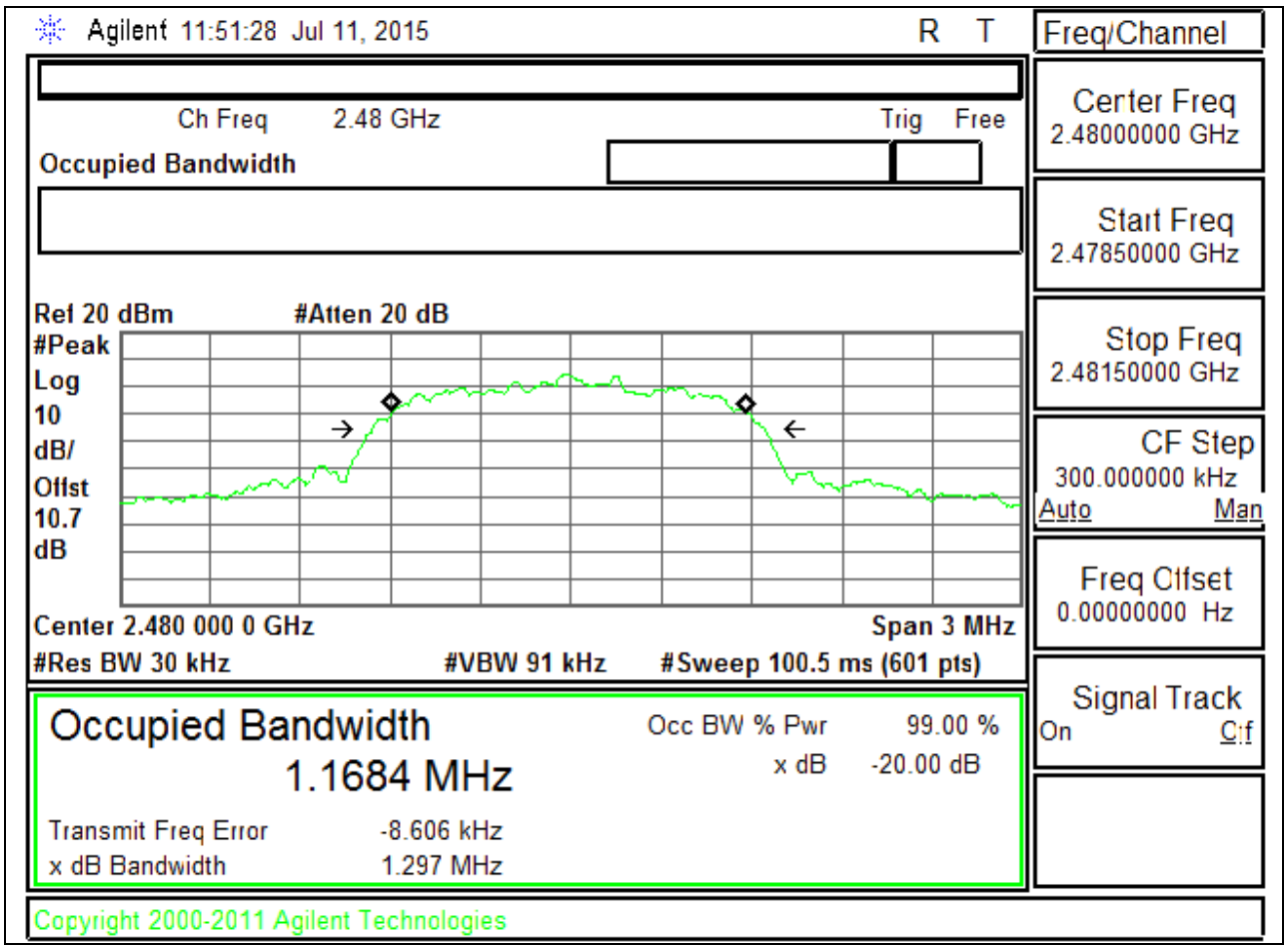
LOW CHANNEL



MID CHANNEL

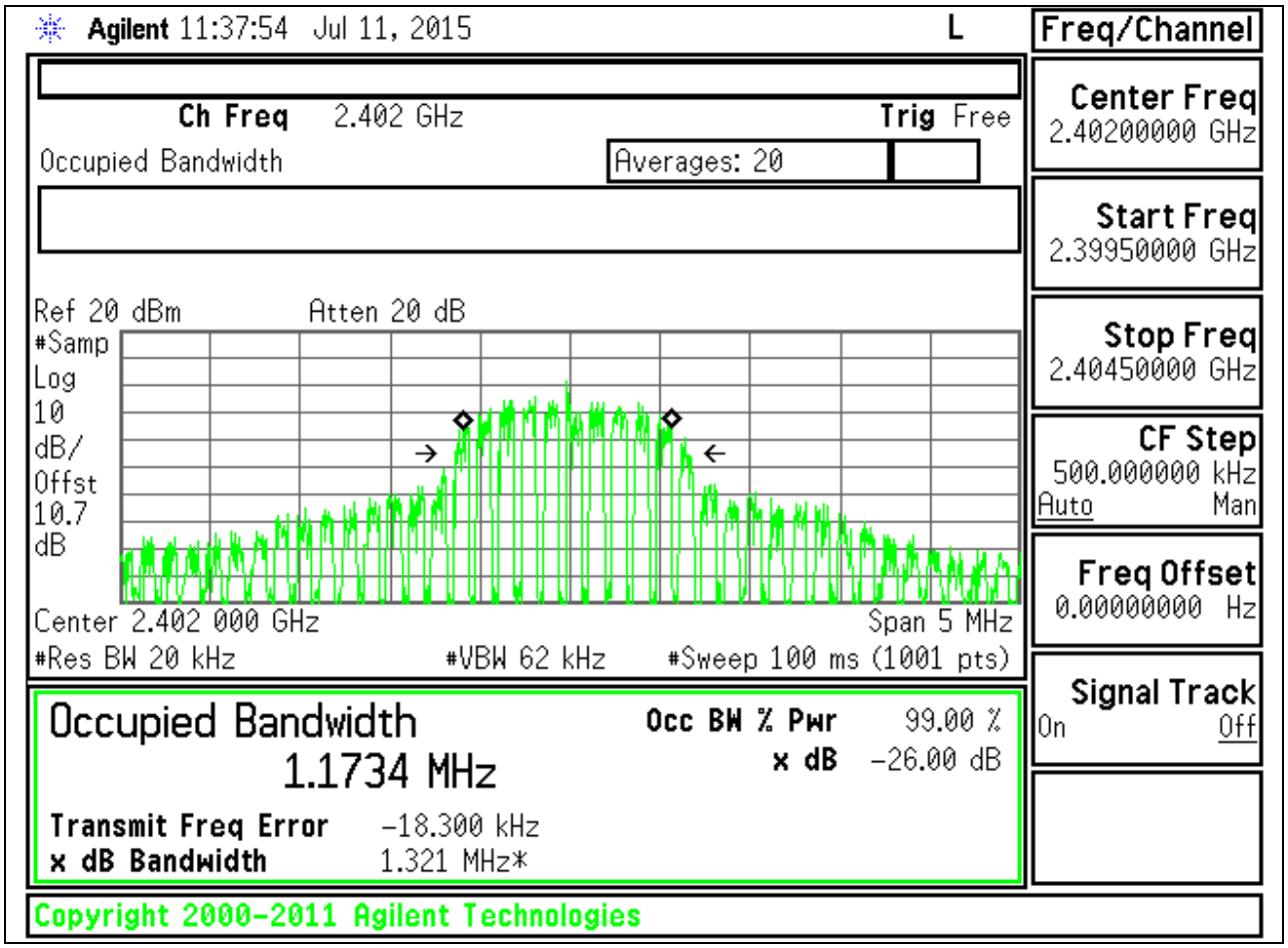


HIGH CHANNEL

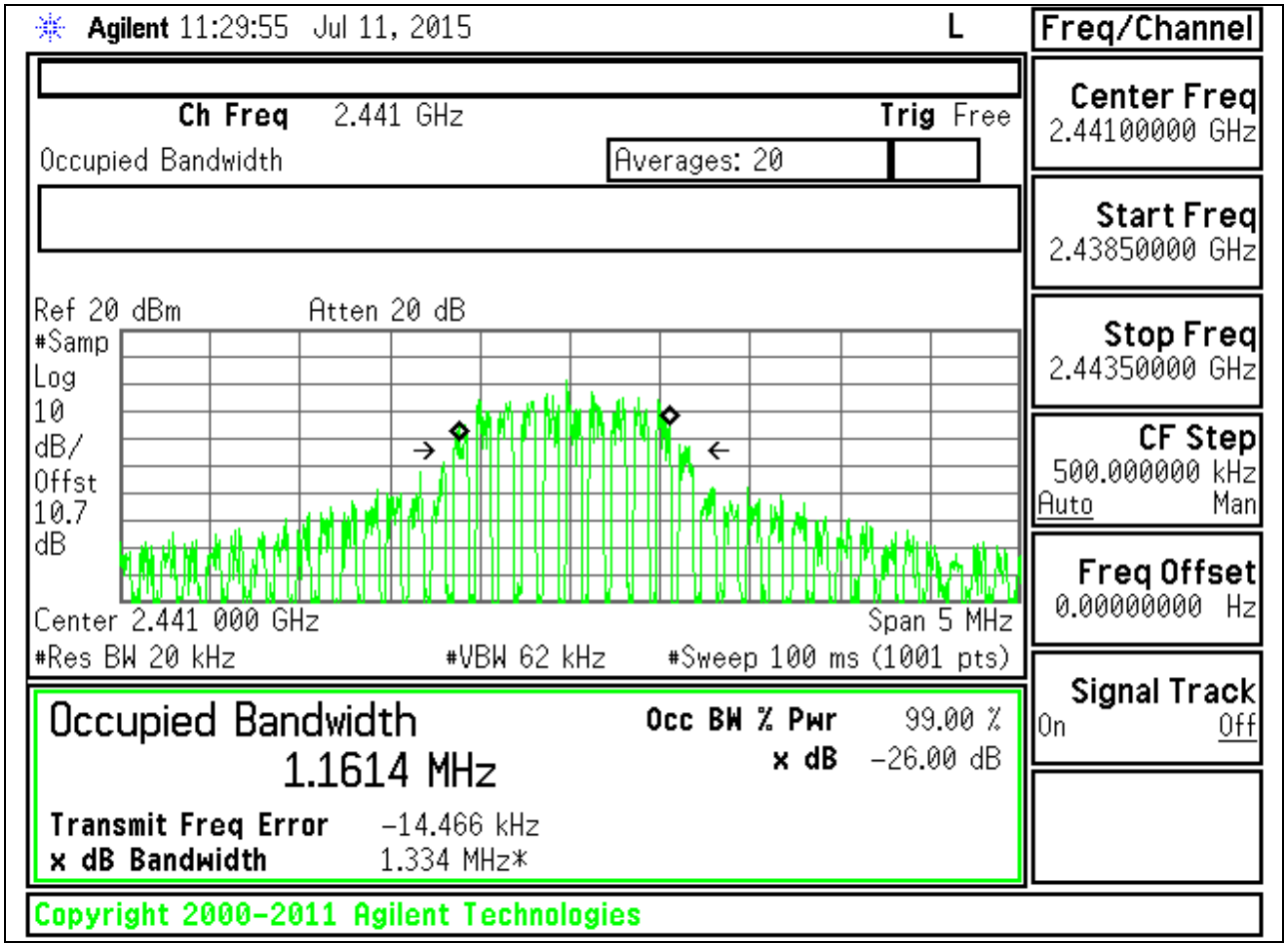


8PSK 99% BANDWIDTH

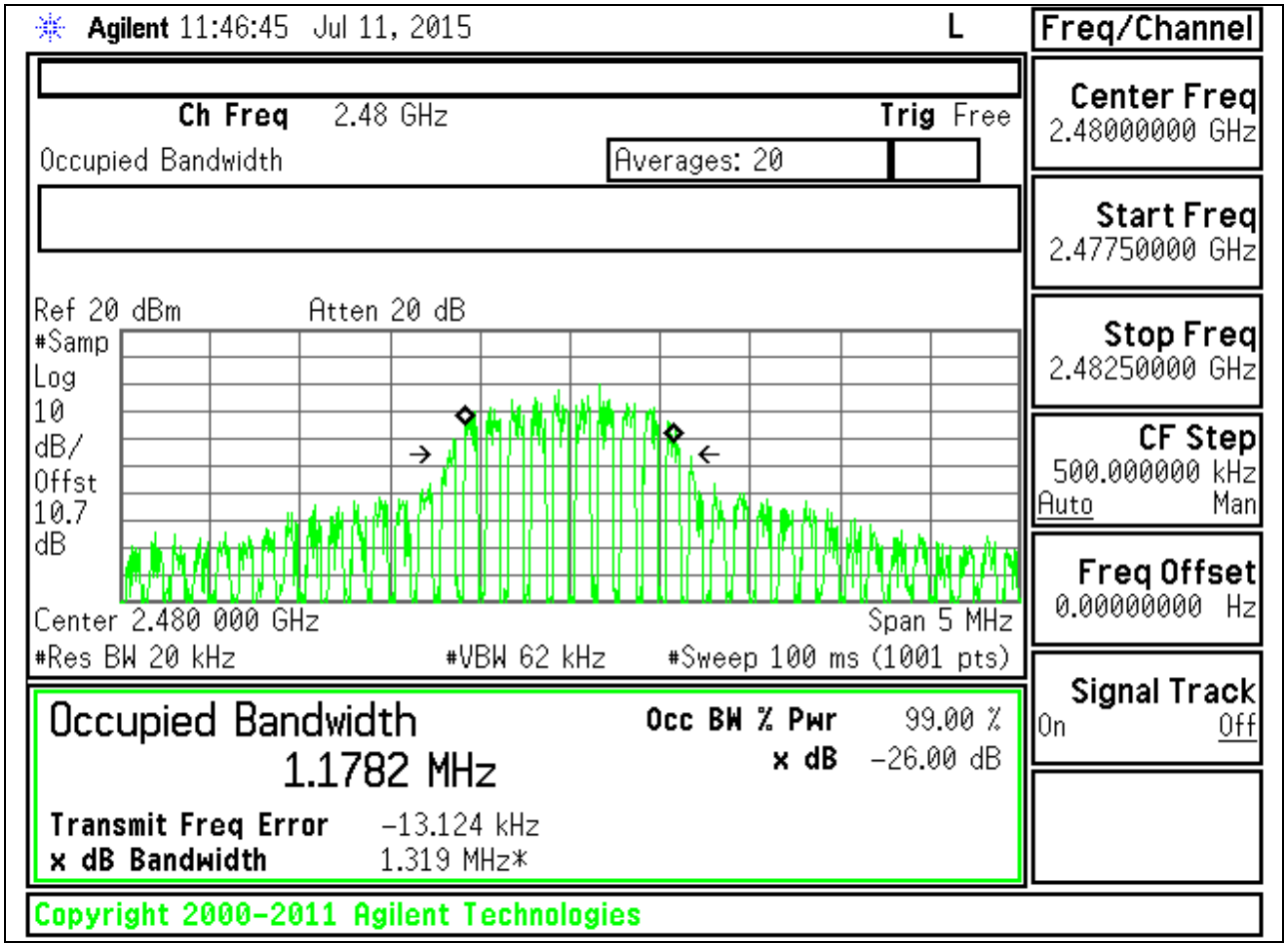
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-247 5.1(1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

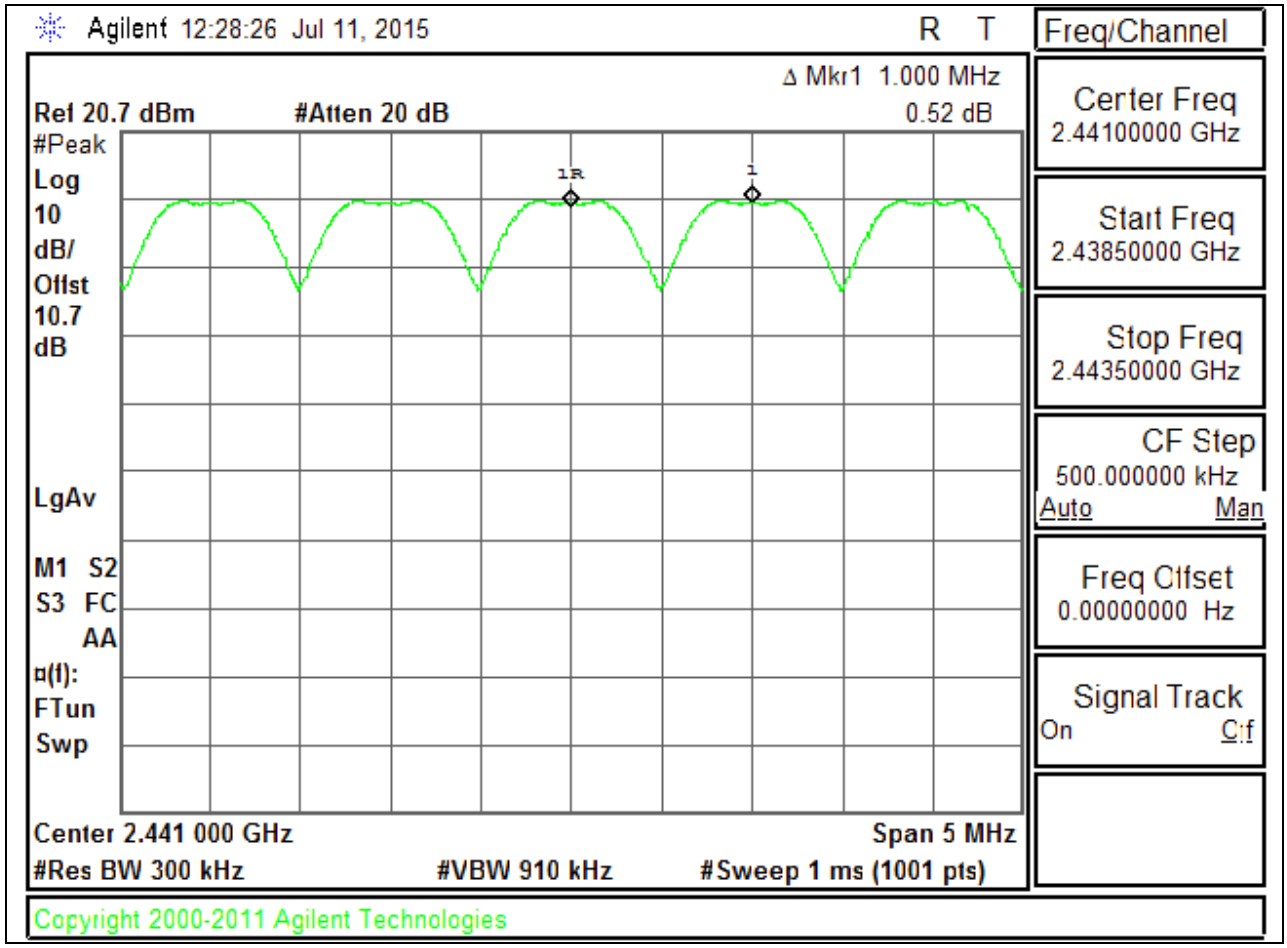
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION PLOT



8.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-247 5.1(4)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

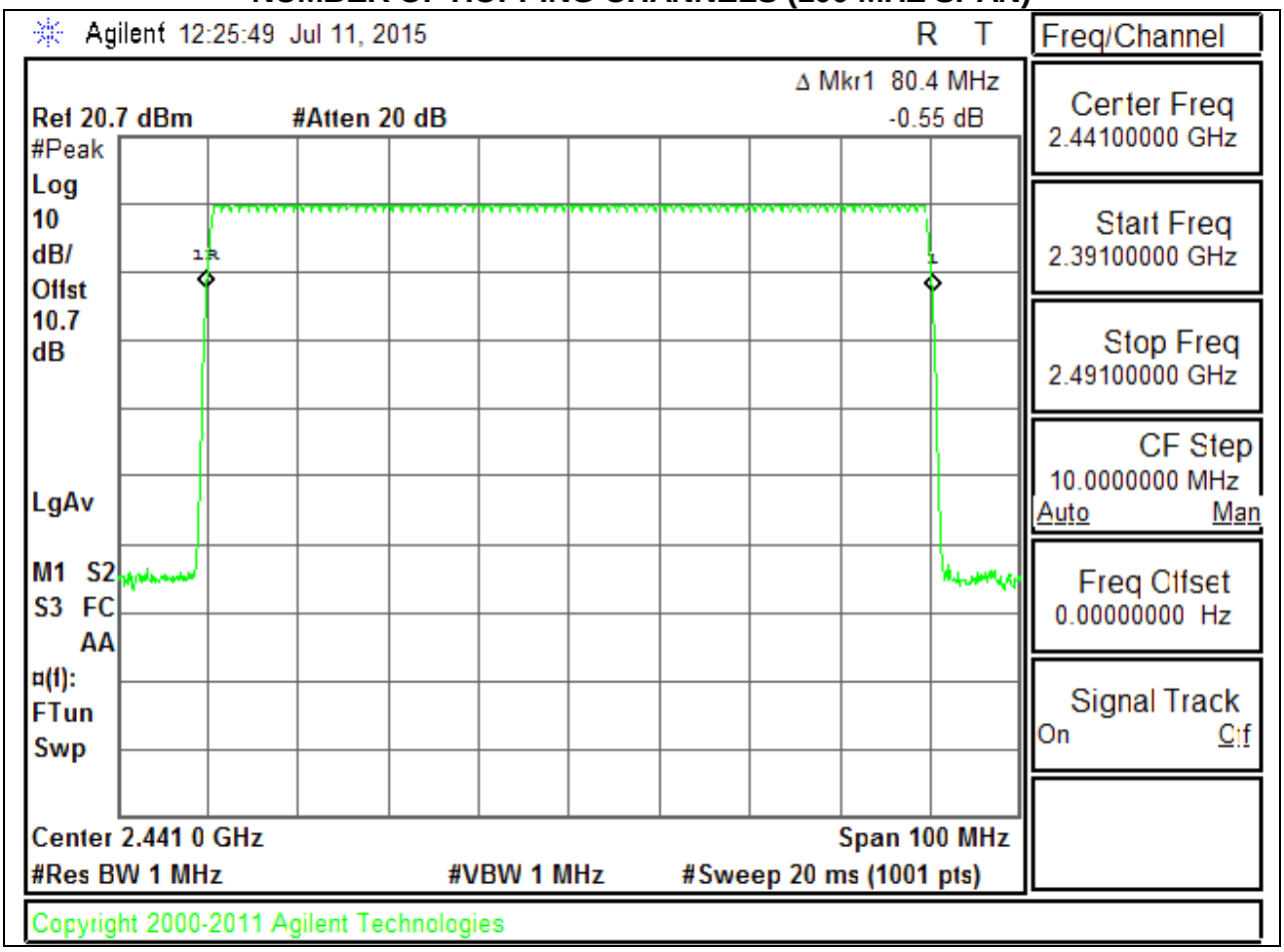
DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

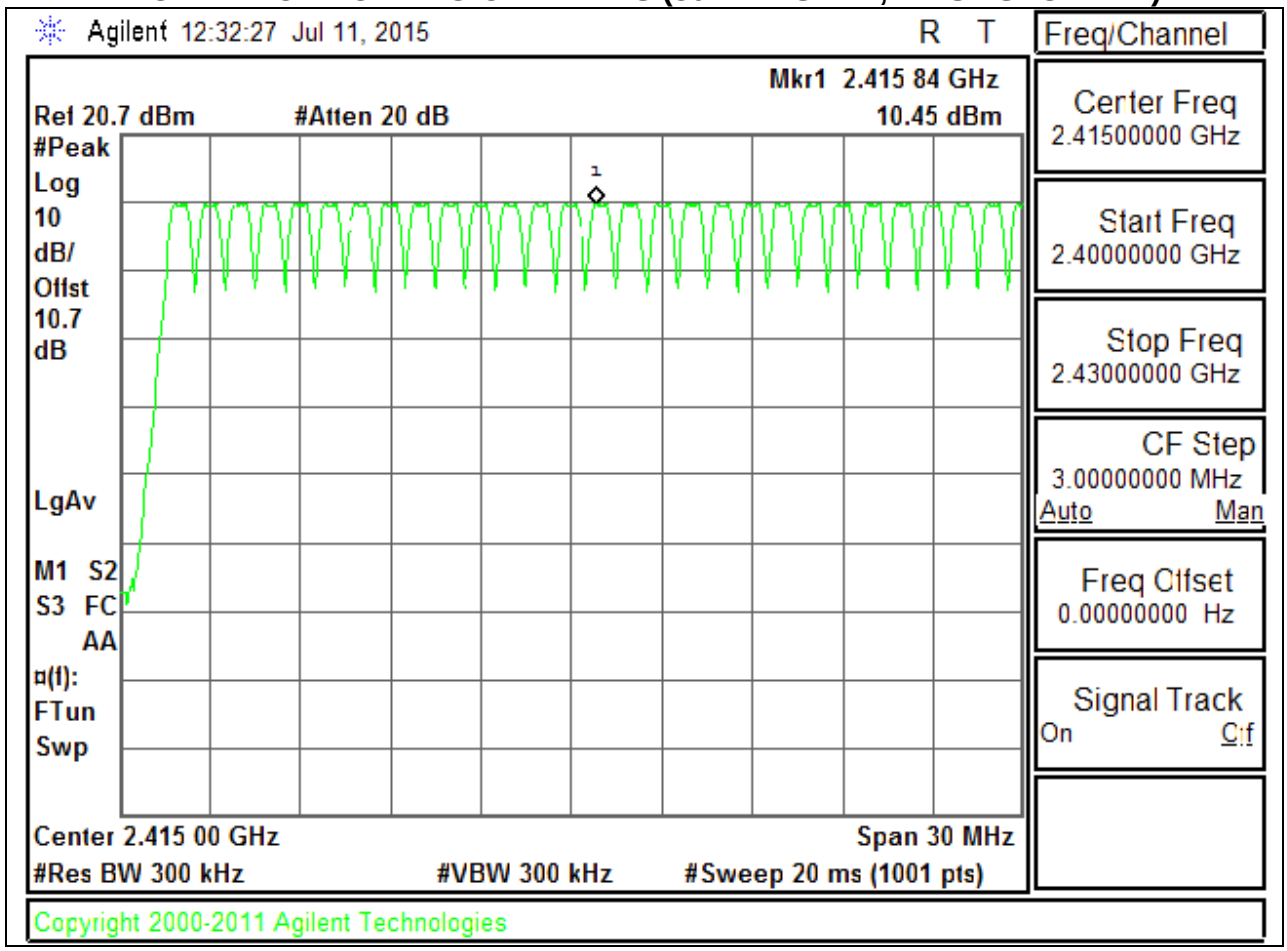
Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS PLOTS

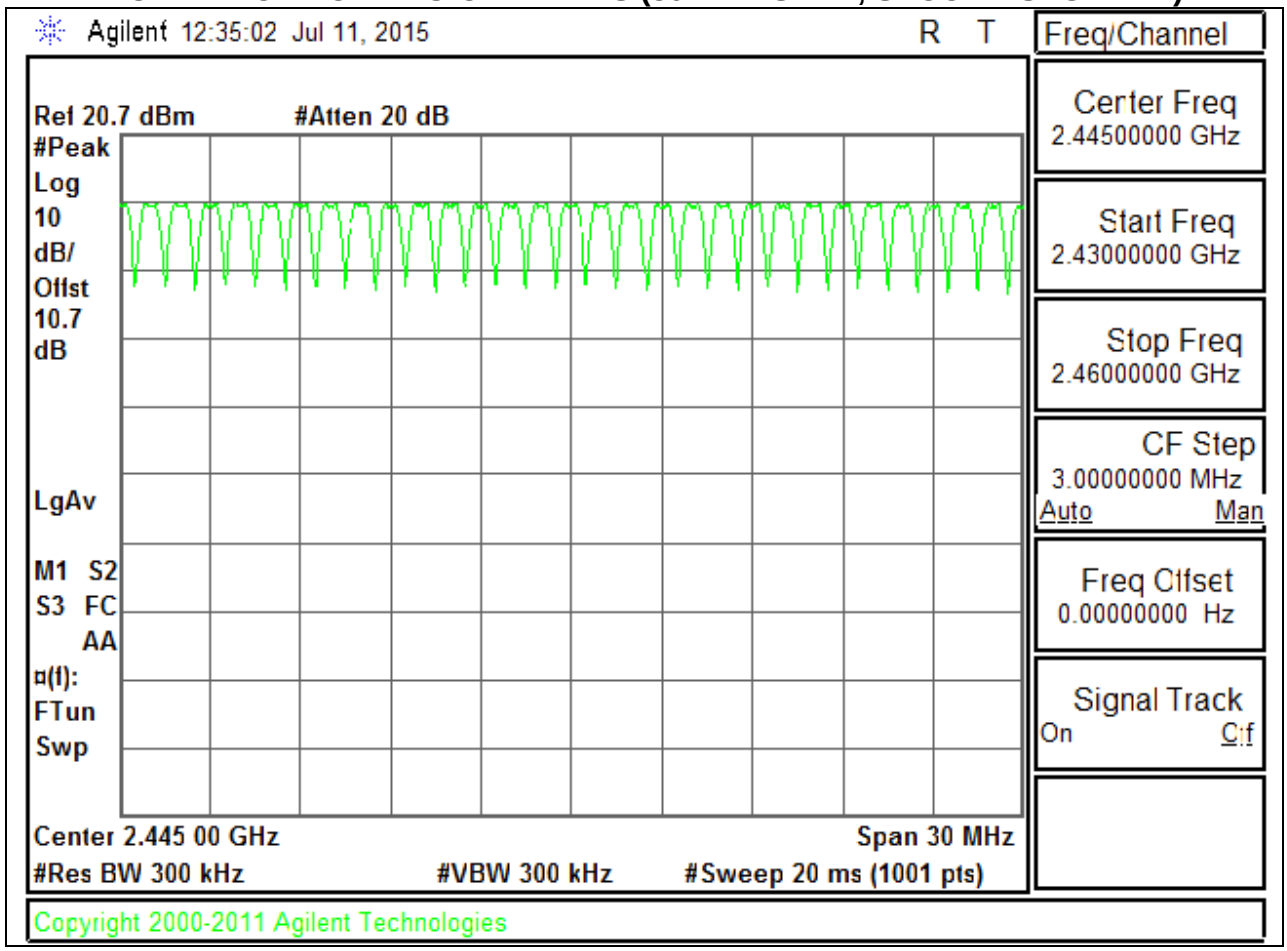
NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)



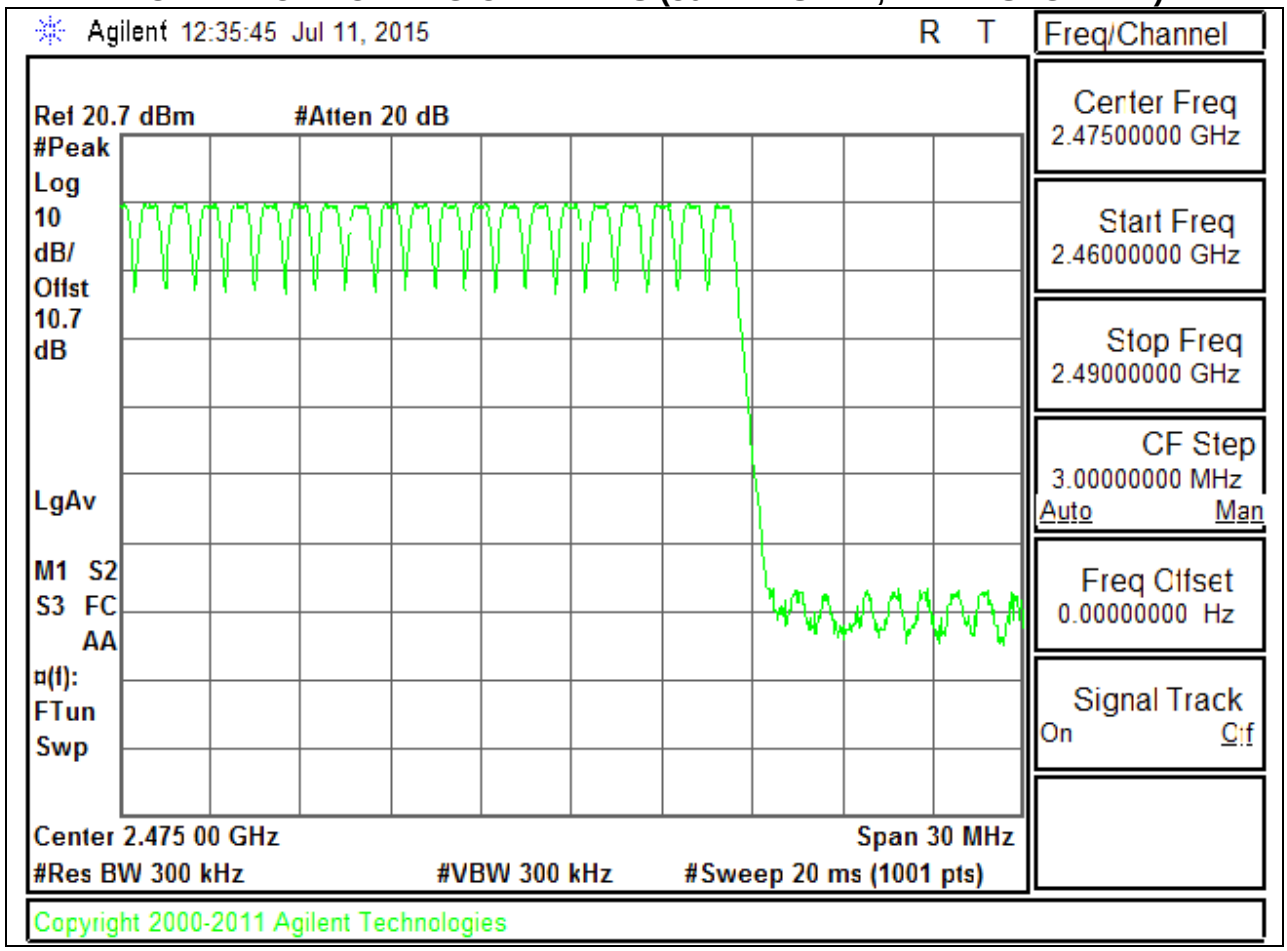
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)



NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, THIRD SEGMENT)



8.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-247 5.1(4)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

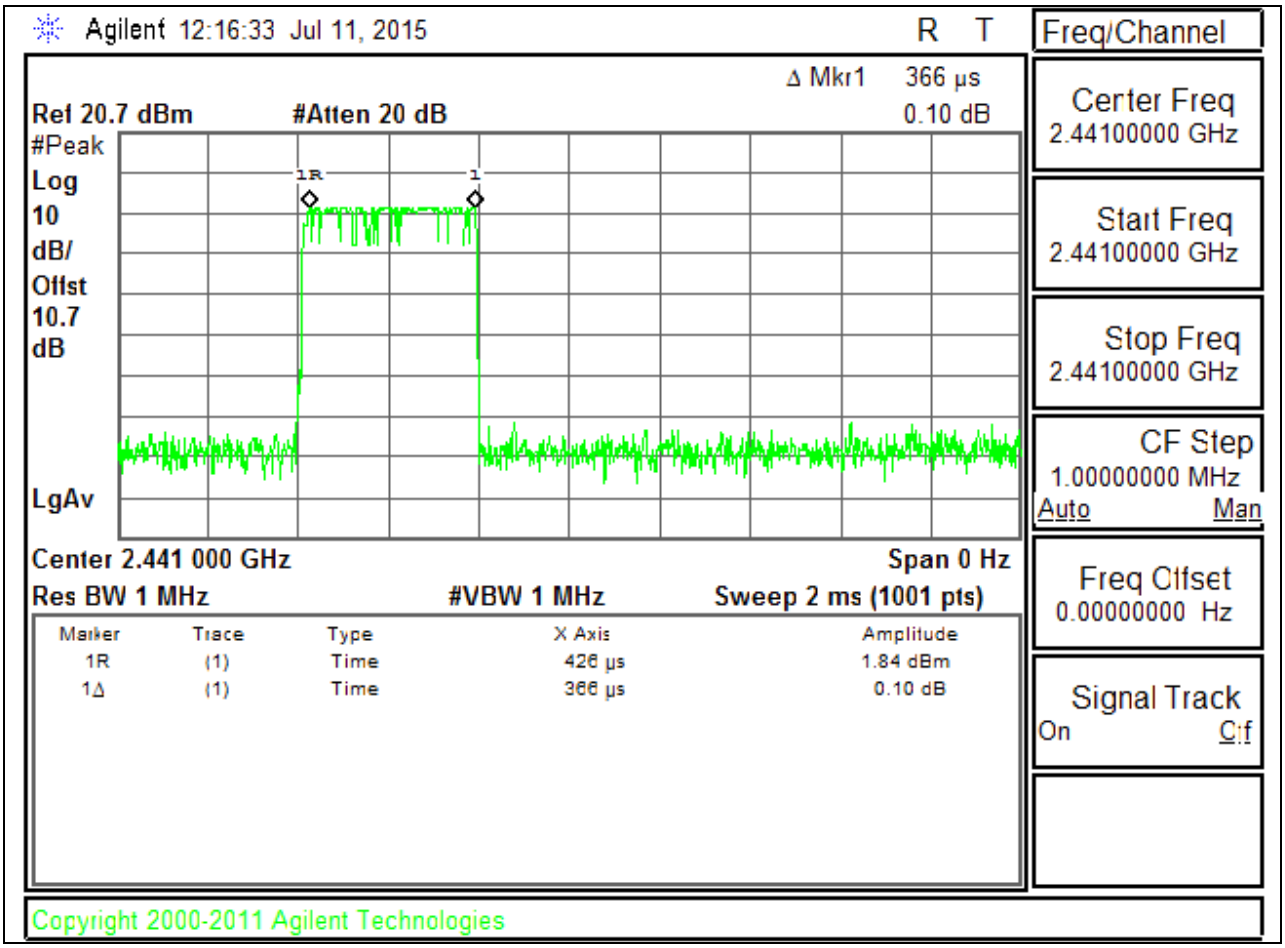
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to 10 * (# of pulses in 0.8 s) * pulse width.

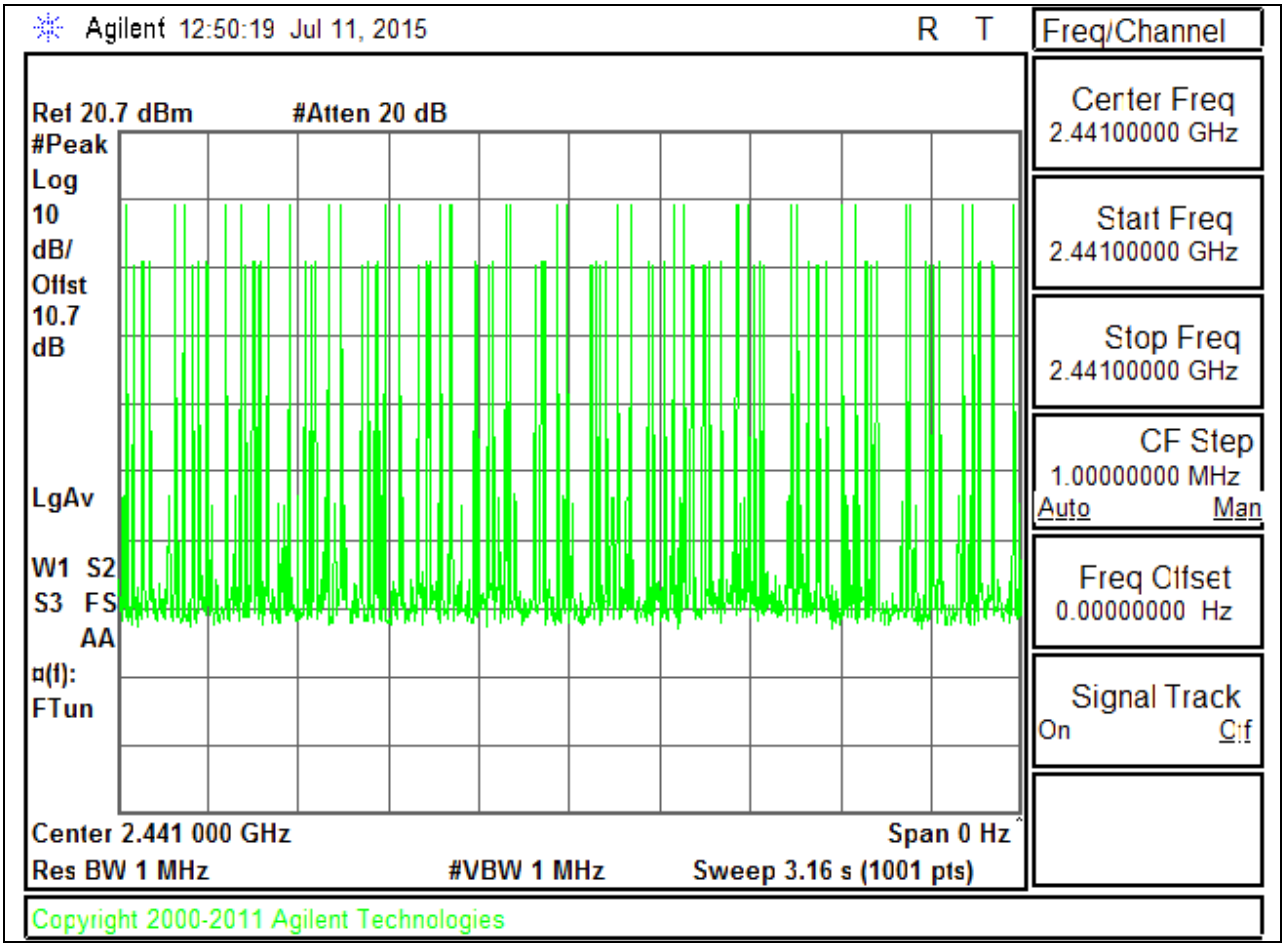
RESULTS

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.366	32	0.11712	0.4	-0.28288
DH3	1.616	19	0.30704	0.4	-0.09296
DH5	2.838	13	0.36894	0.4	-0.03106
DH Packet	Pulse Width (msec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.366	8	0.02928	0.4	-0.37072
DH3	1.616	4.75	0.07676	0.4	-0.32324
DH5	2.838	3.25	0.092235	0.4	-0.30777

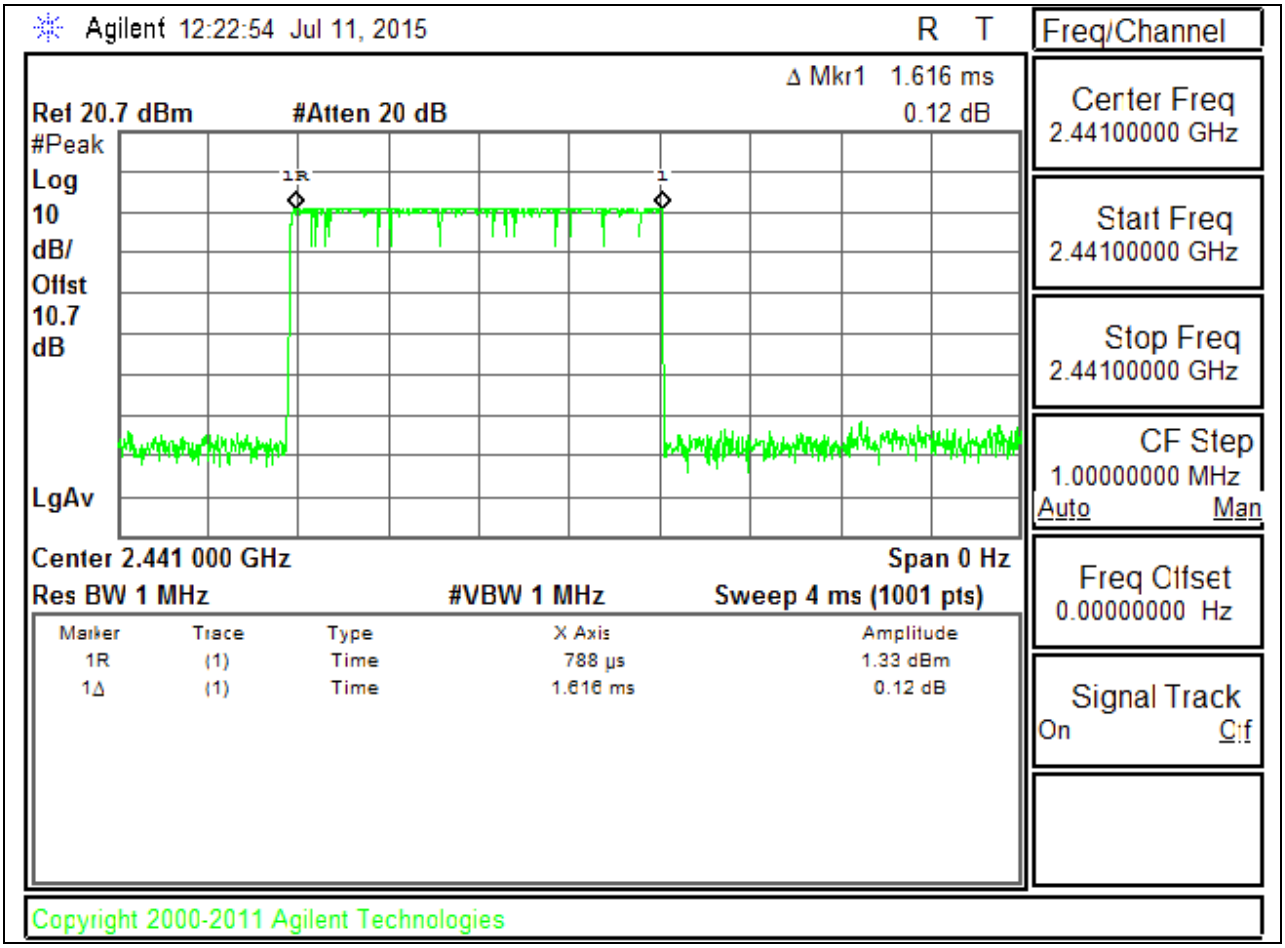
PULSE WIDTH - DH1



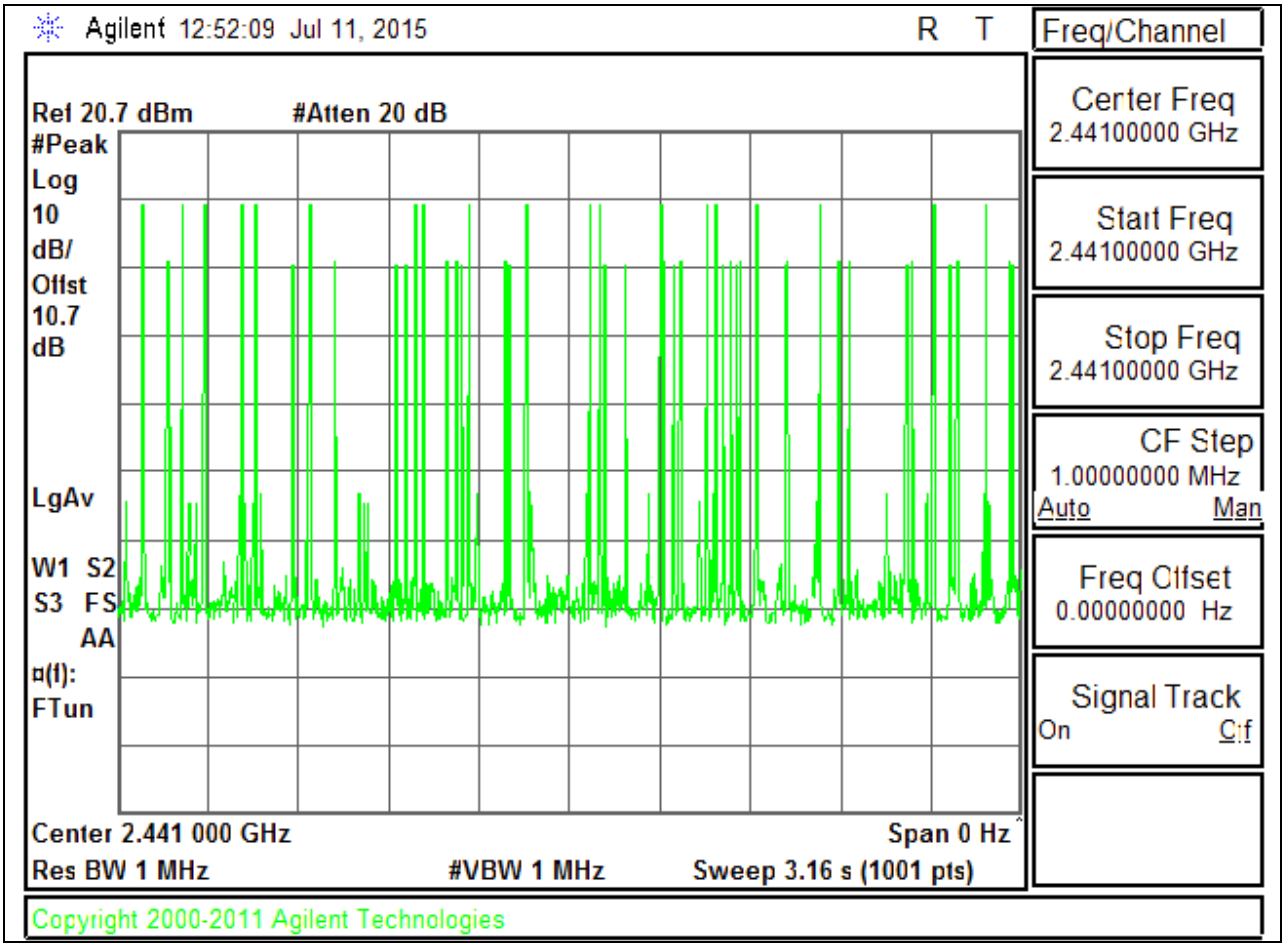
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH1



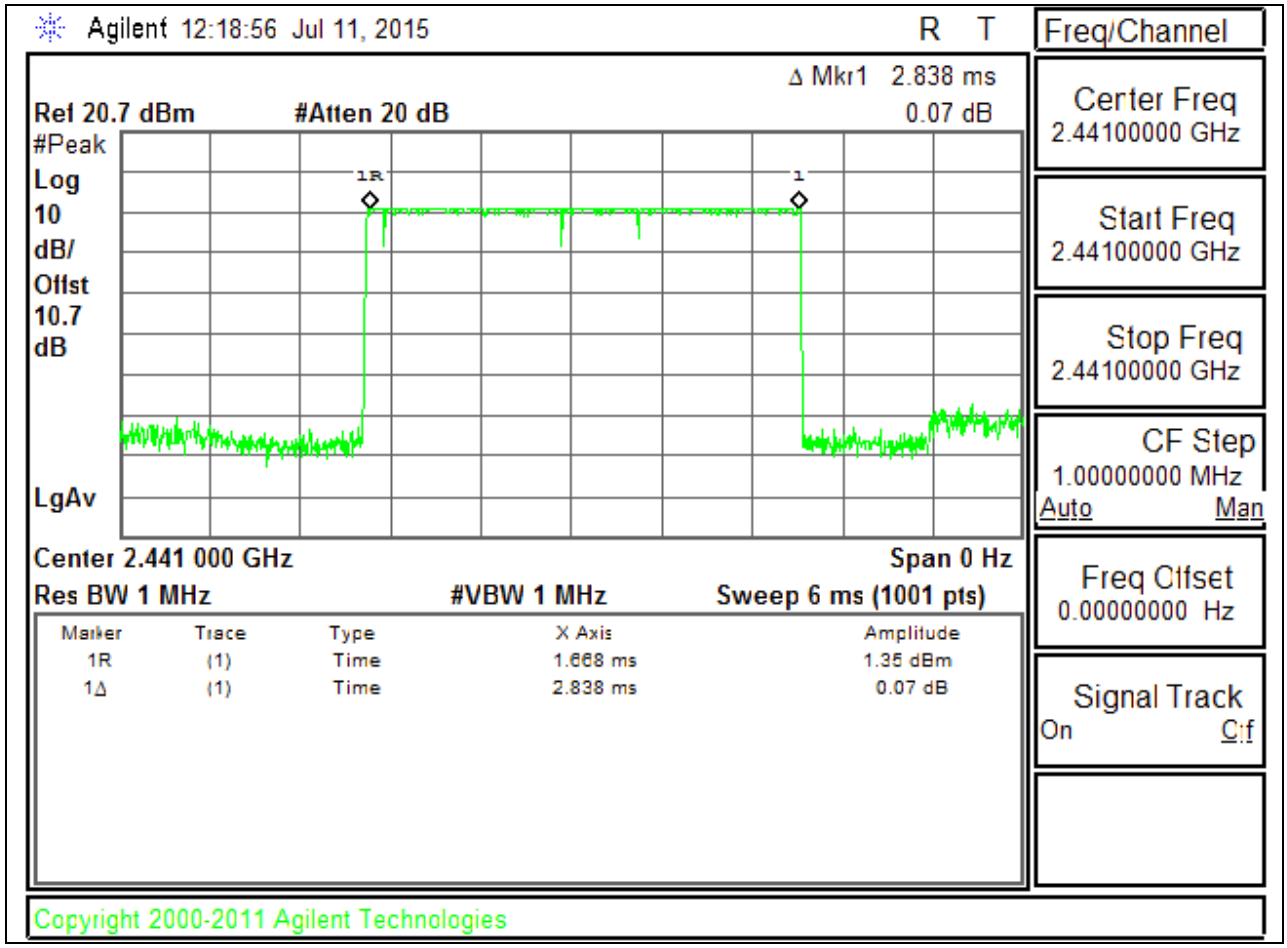
PULSE WIDTH - DH3



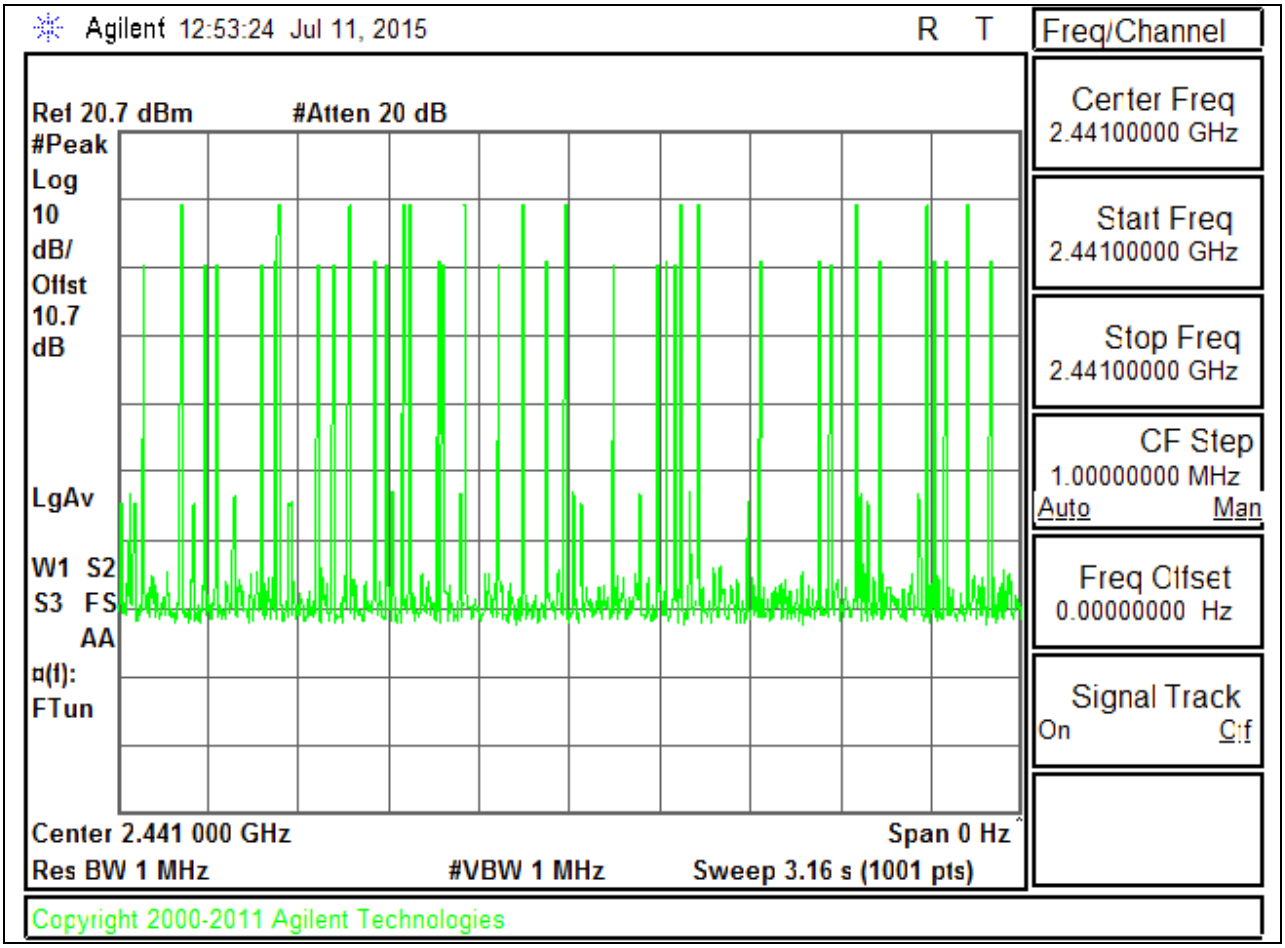
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH3



PULSE WIDTH - DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH5



8.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-247 5.4(1)

The maximum antenna gain is less than 6 dBi, therefore the limit is 21 dBm.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

8.5.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	10.14	21	-10.862
Middle	2441	10.06	21	-10.941
High	2480	9.99	21	-11.011
Worst		10.138		-10.862

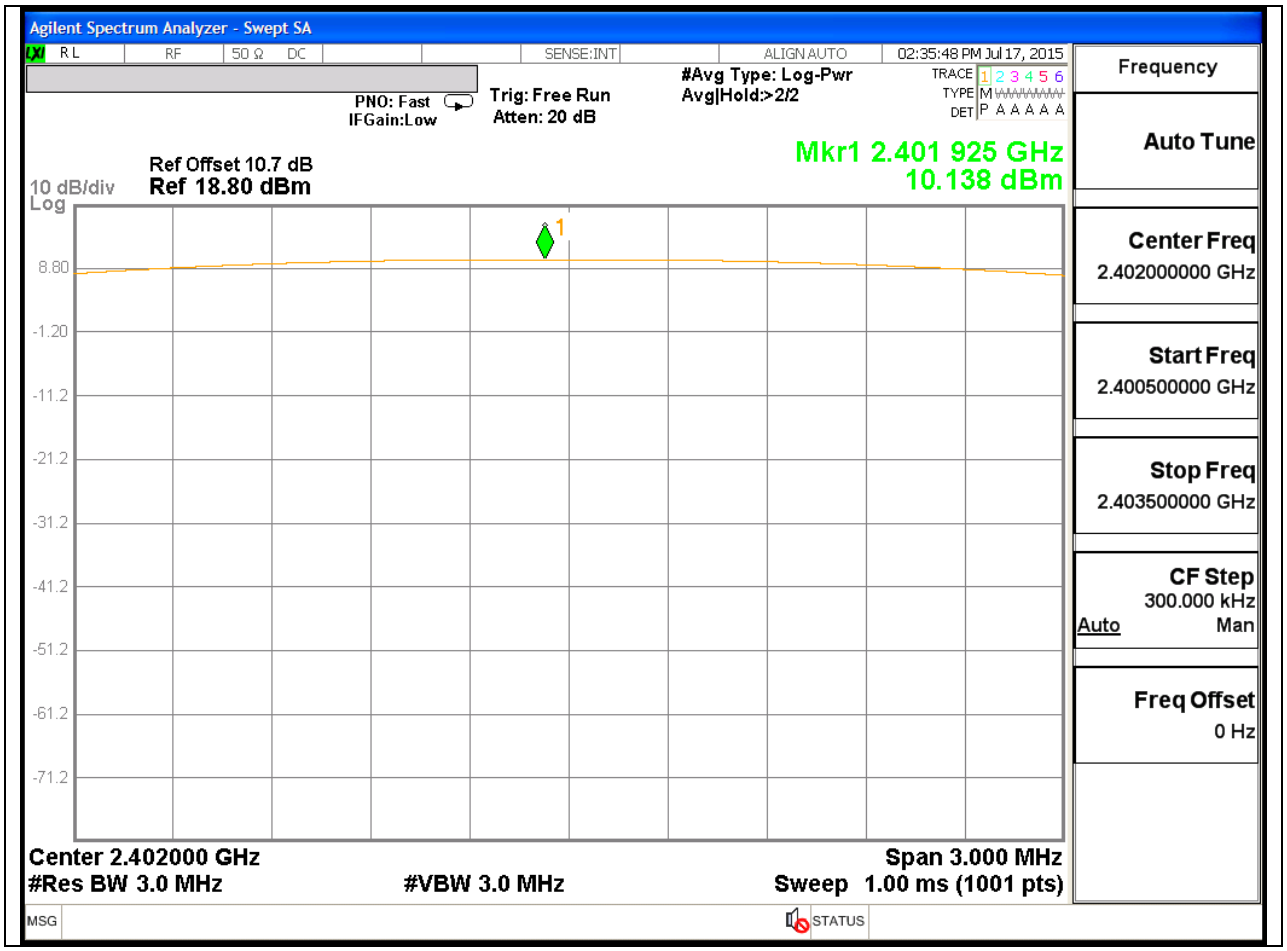
8.5.2. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.83	21	-11.166
Middle	2441	9.80	21	-11.198
High	2480	9.73	21	-11.271
Worst		9.83		-11.166

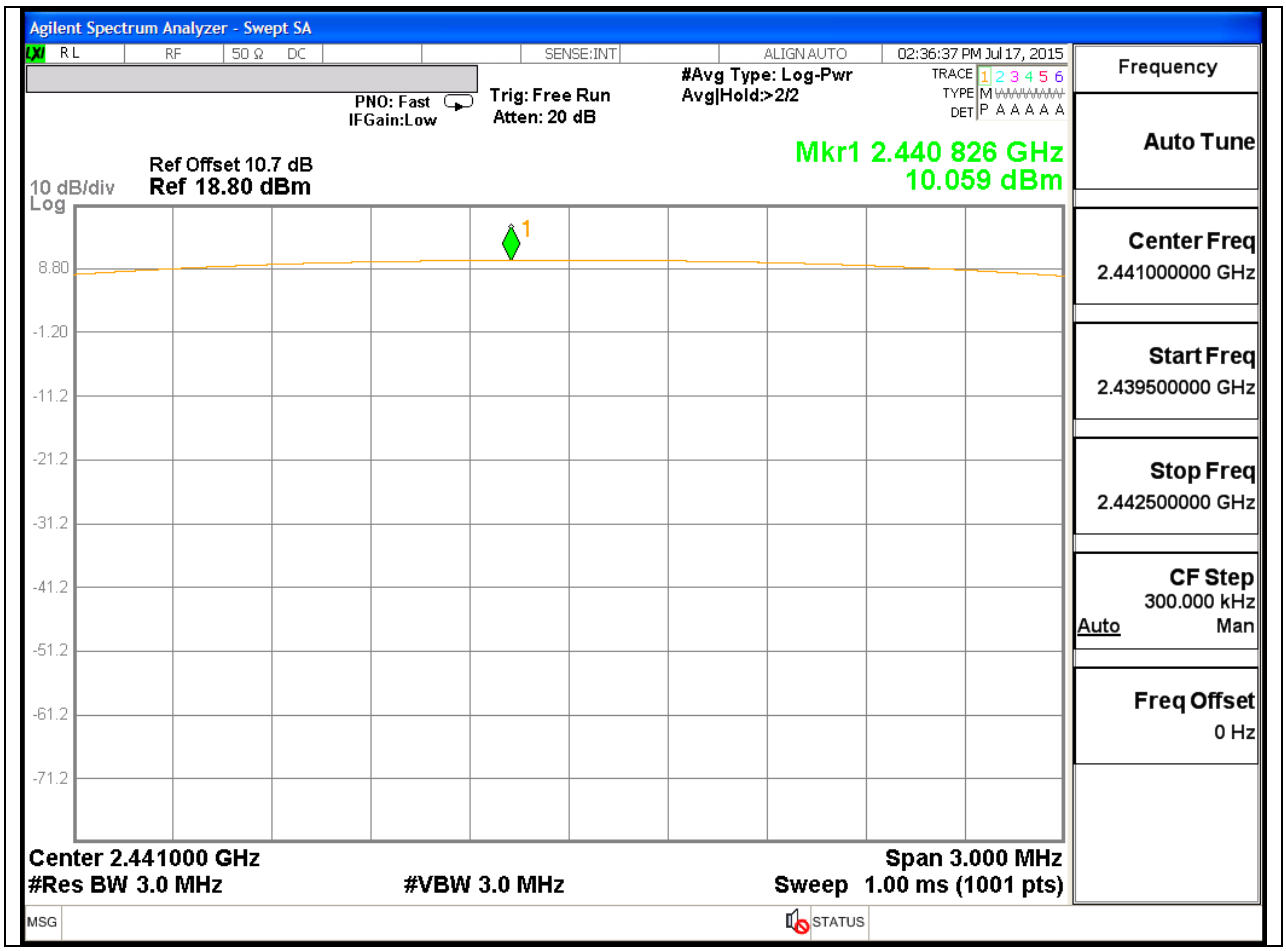
8.5.3. OUTPUT POWER PLOTS

GFSK OUTPUT POWER

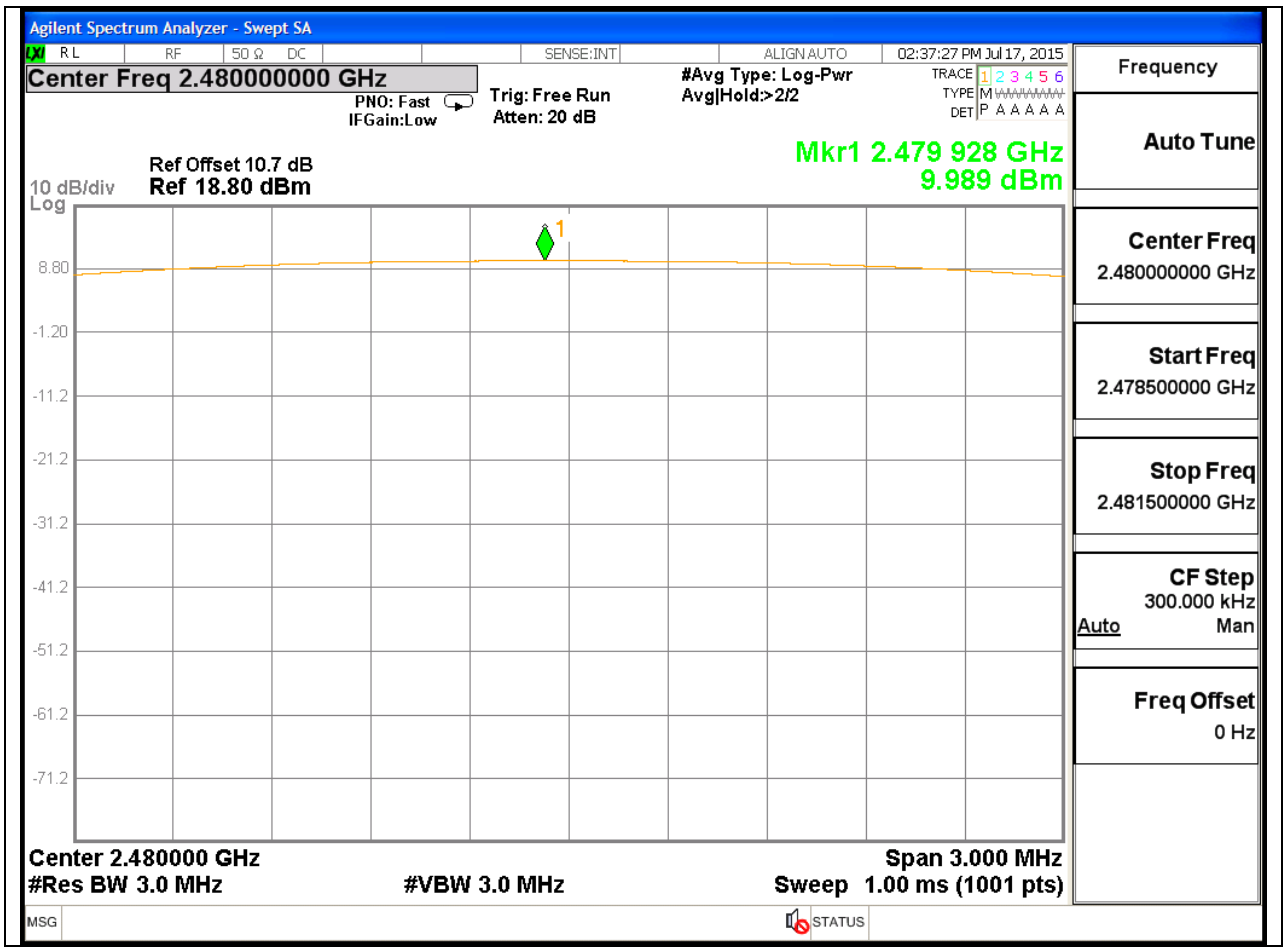
LOW CHANNEL



MID CHANNEL

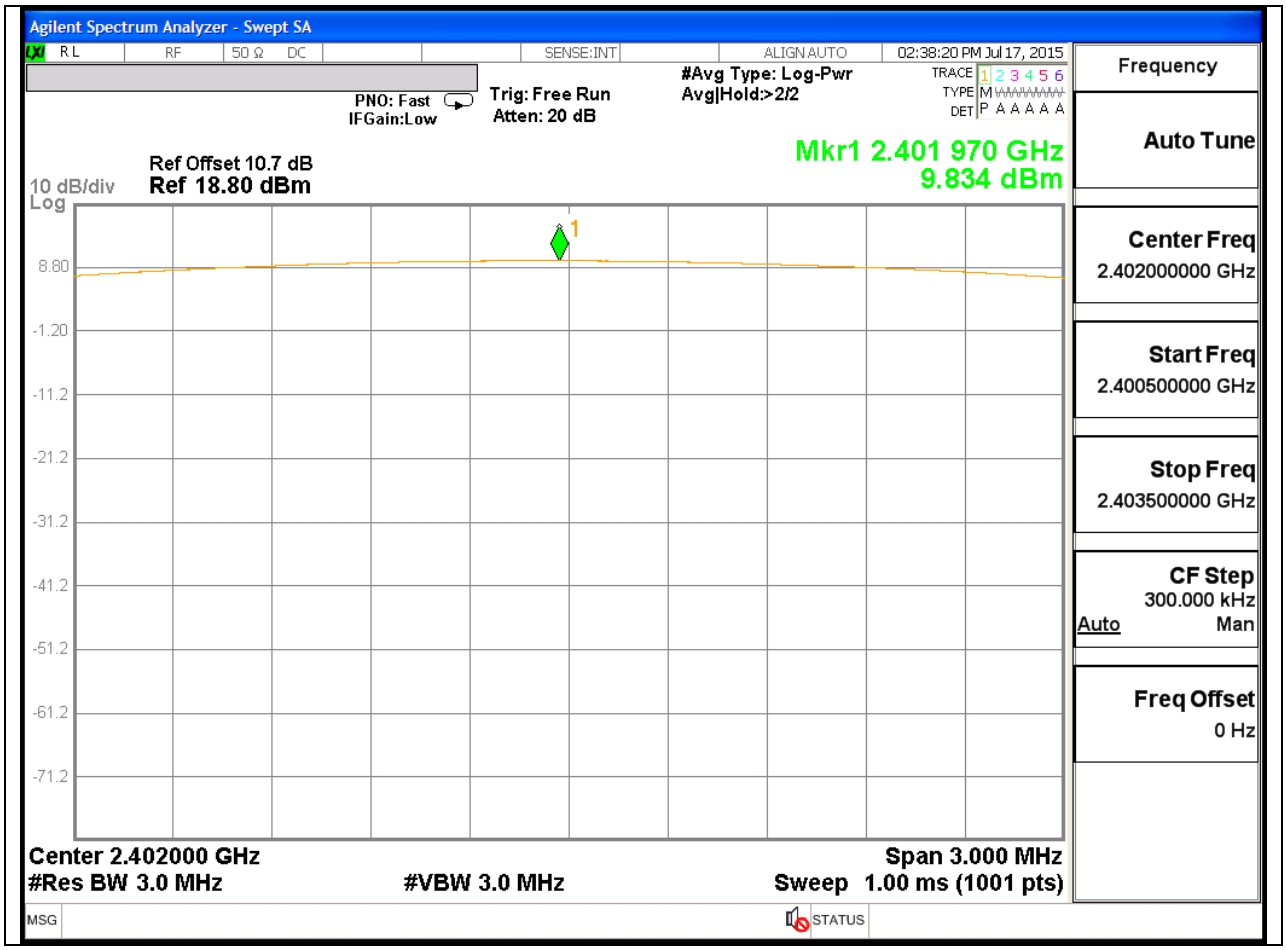


HIGH CHANNEL

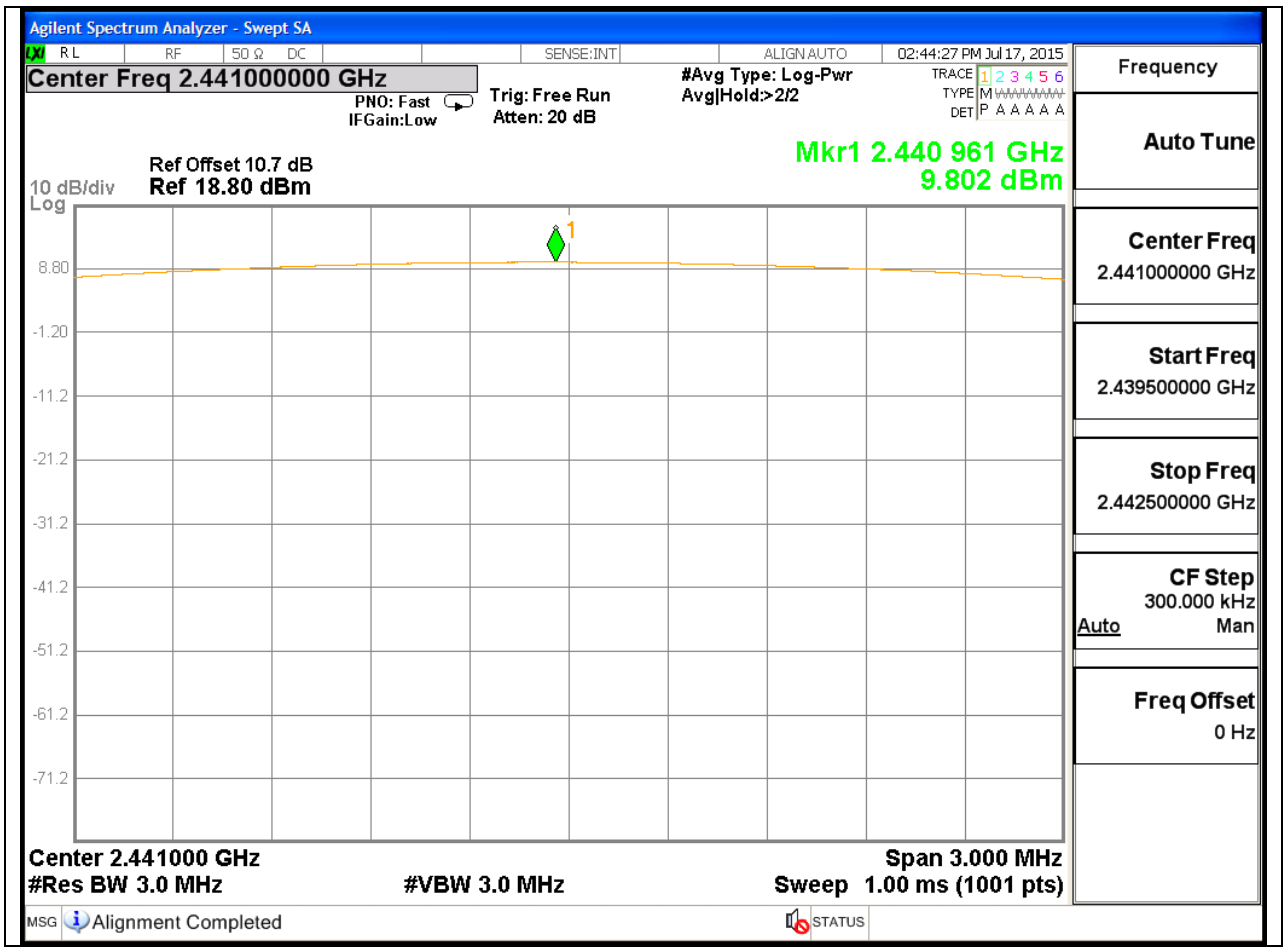


8PSK OUTPUT POWER

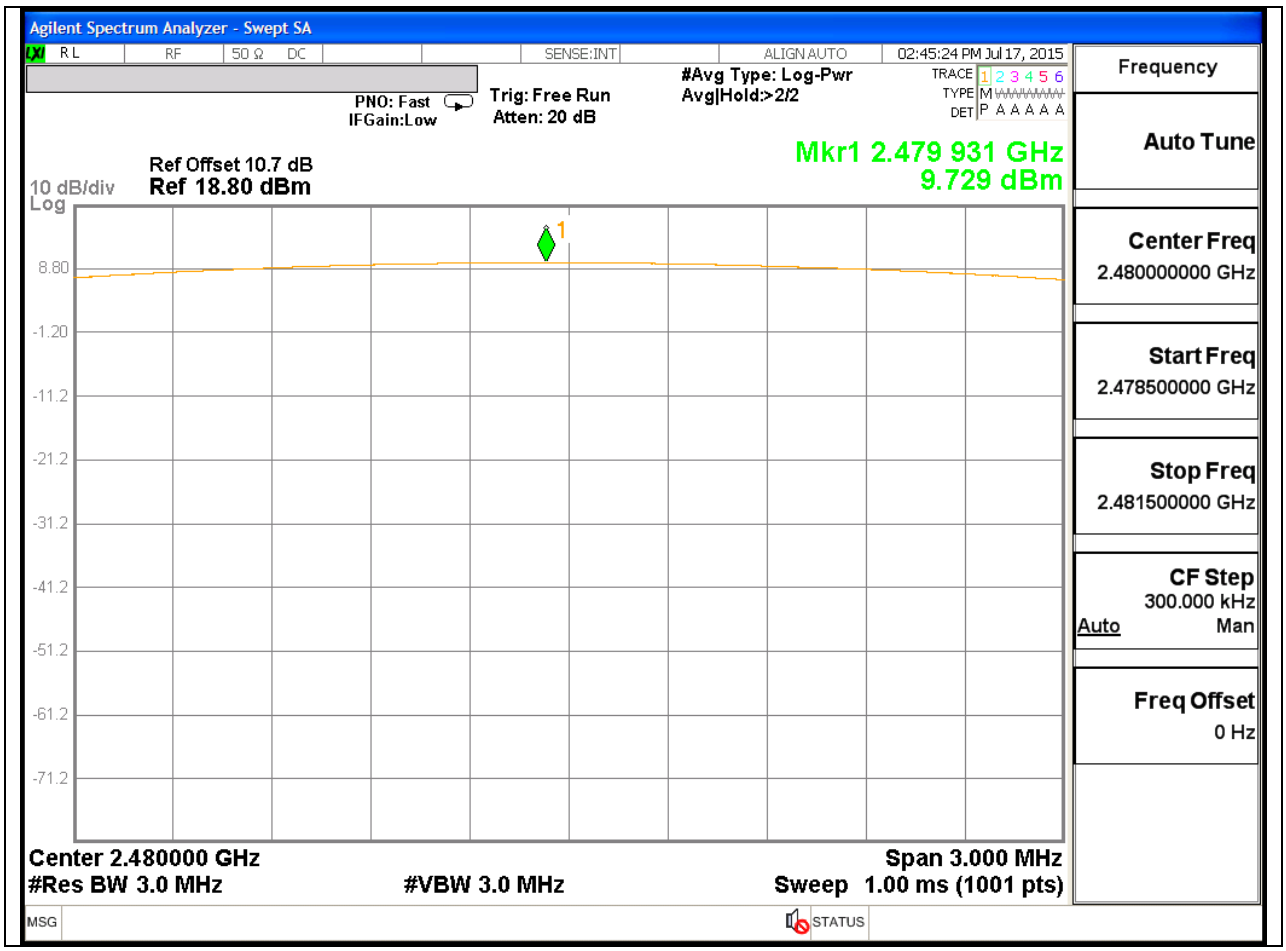
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

DA 00-705: The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.7 dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

8.6.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.82
Middle	2441	9.84
High	2480	9.75
Worst		9.84

8.6.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.70
Middle	2441	6.72
High	2480	6.63
Worst		6.72

8.6.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.71
Middle	2441	6.73
High	2480	6.64
Worst		6.73

8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 5.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

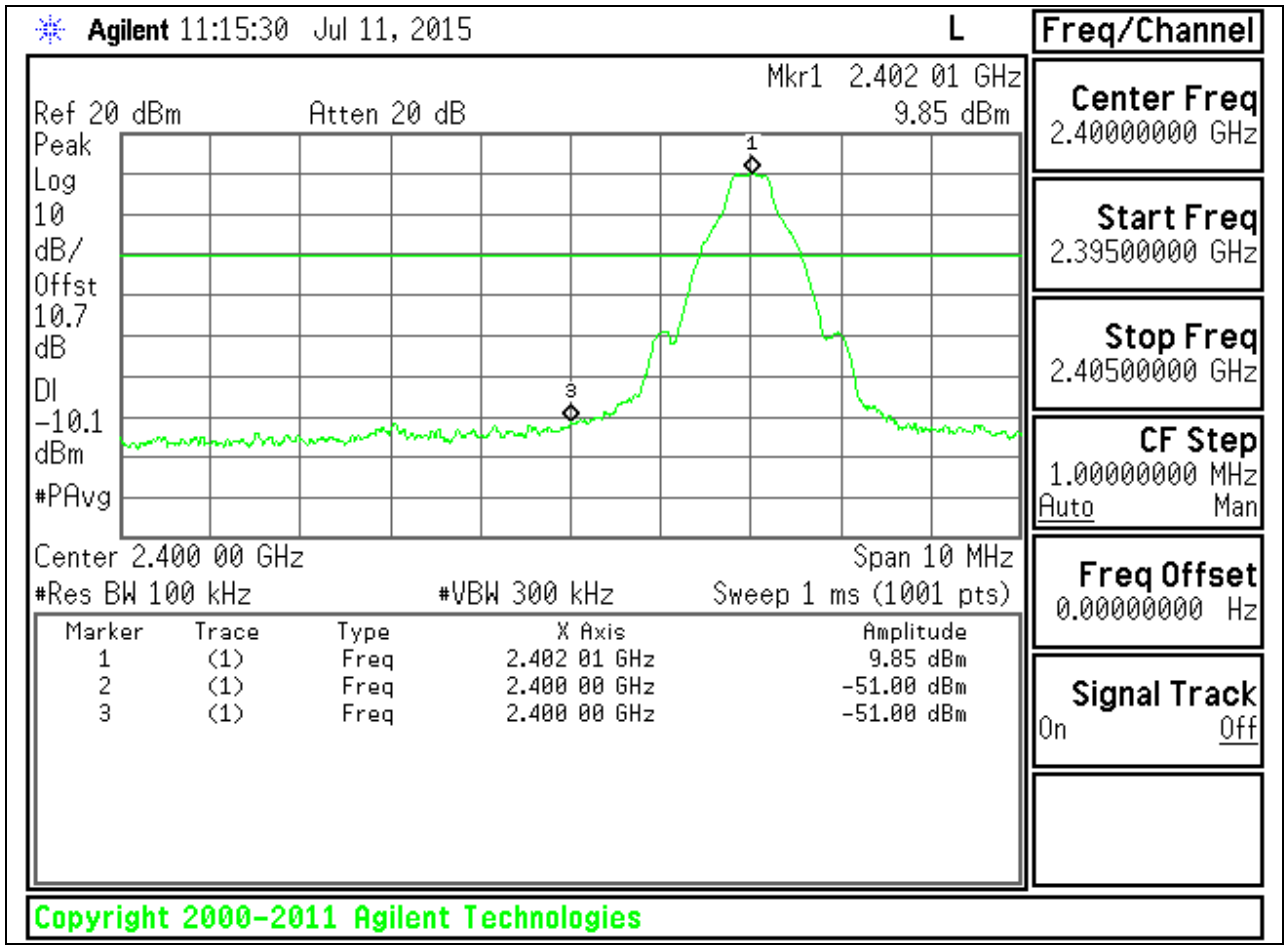
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

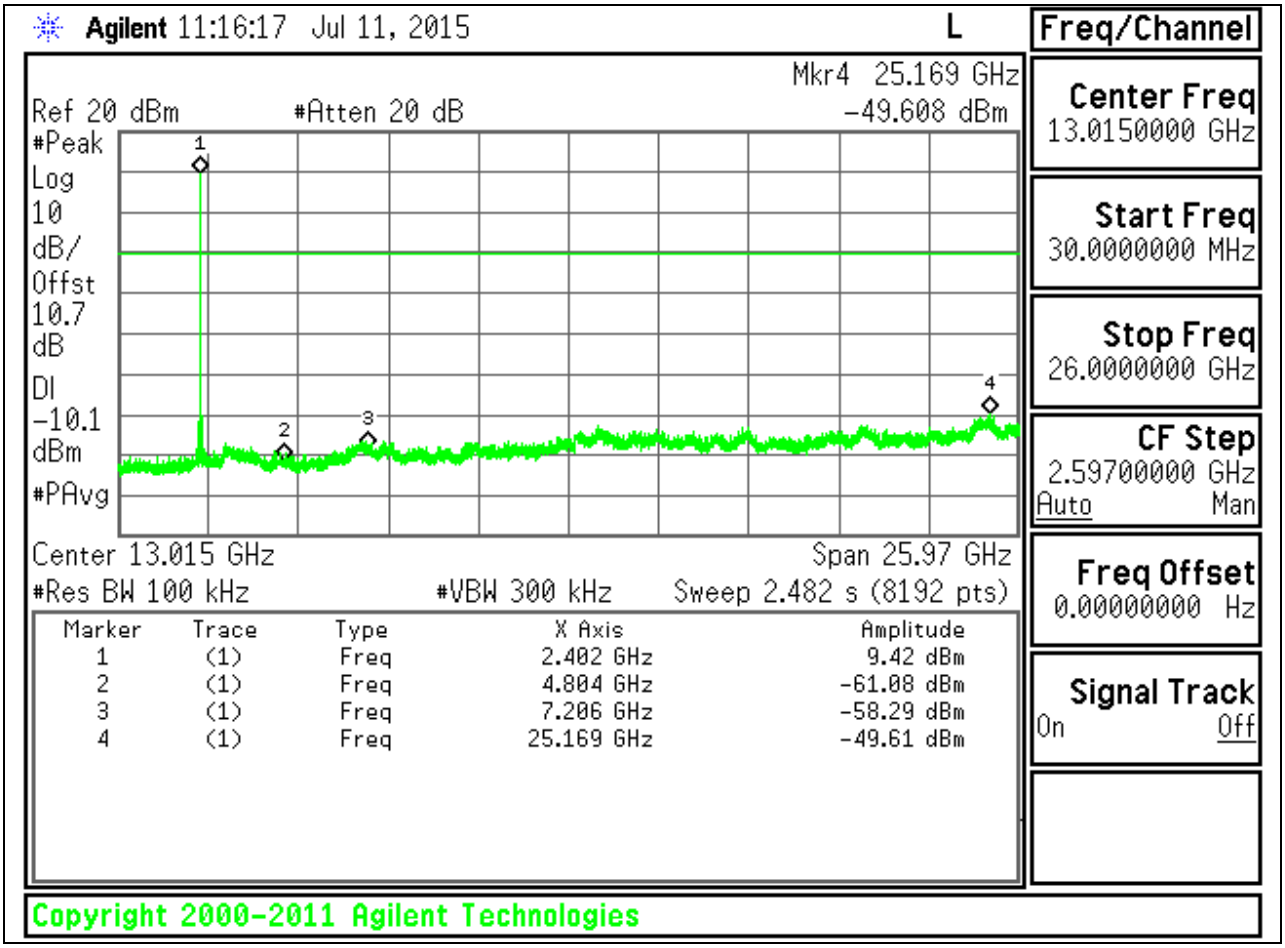
8.7.1. BASIC DATA RATE GFSK MODULATION

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE

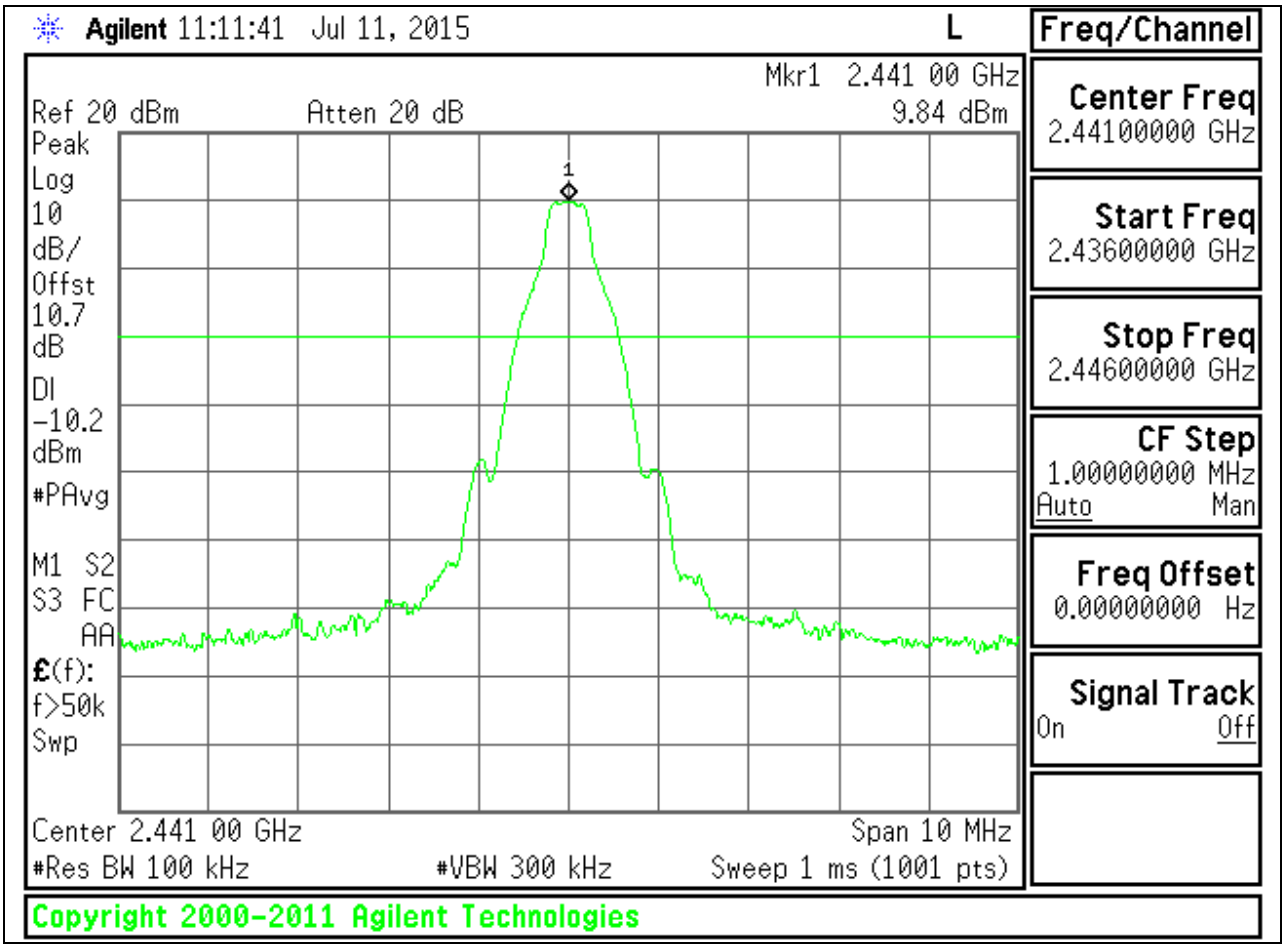


LOW CHANNEL SPURIOUS

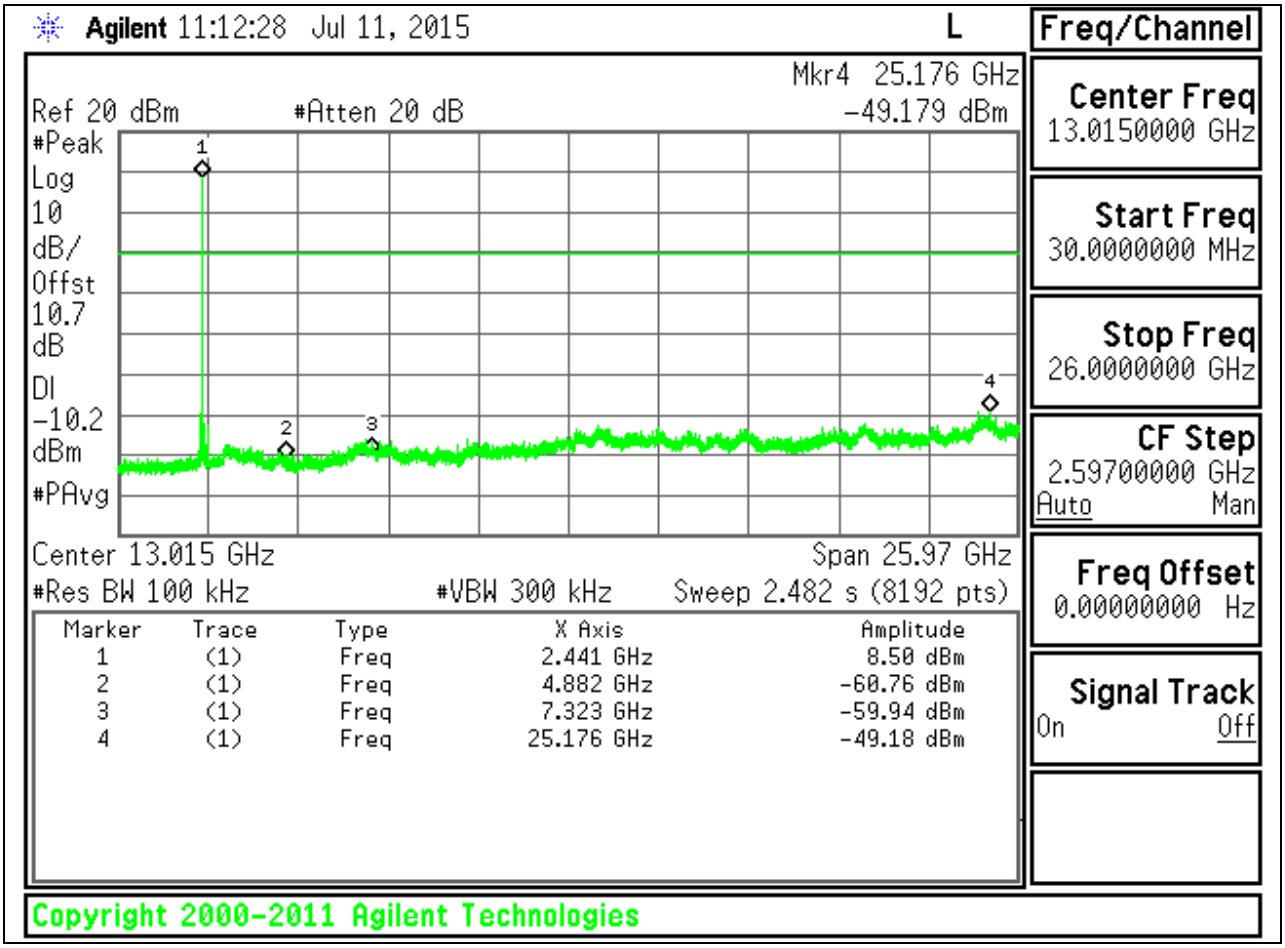


SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL BANDEDGE

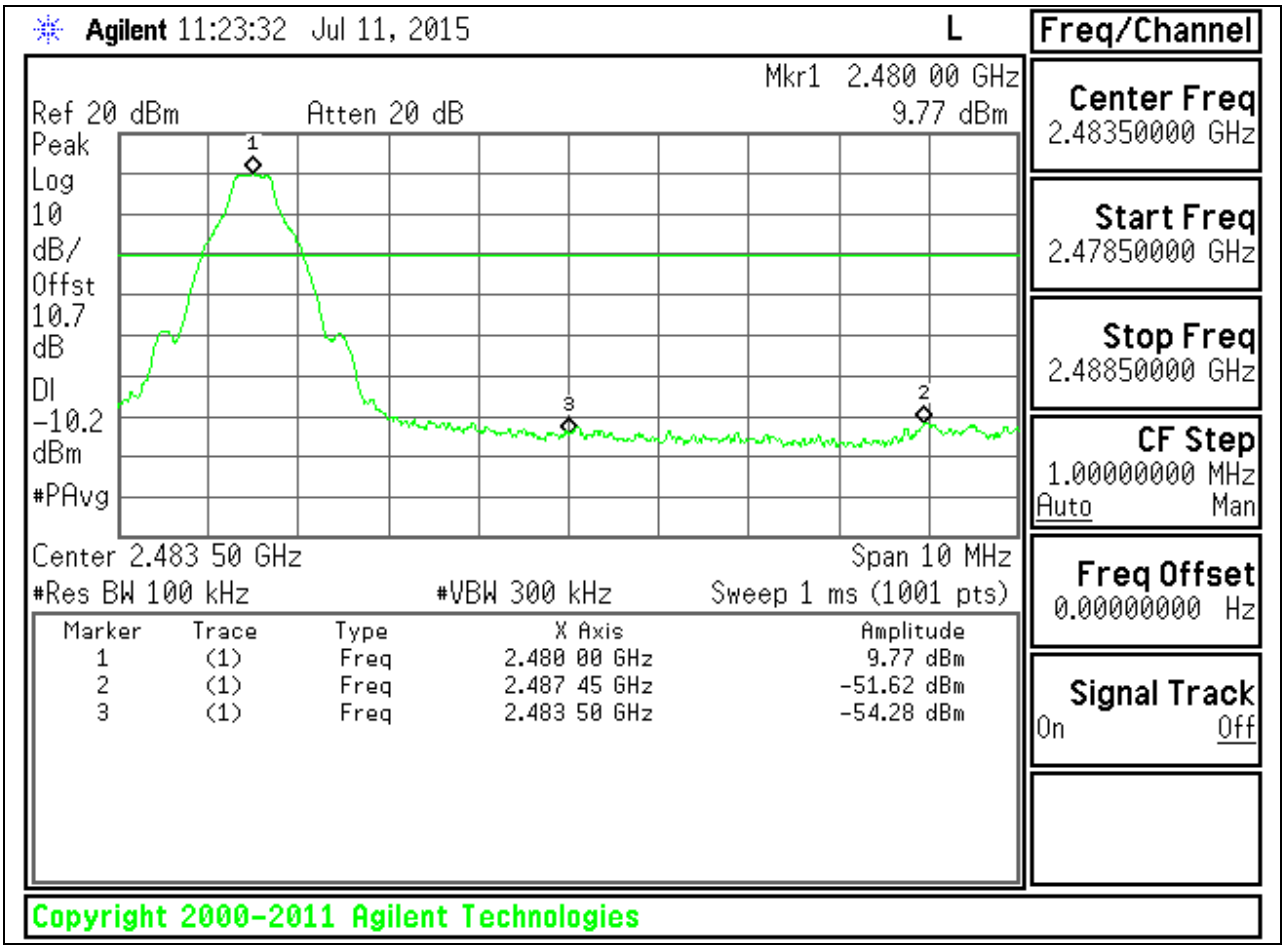


MID CHANNEL SPURIOUS

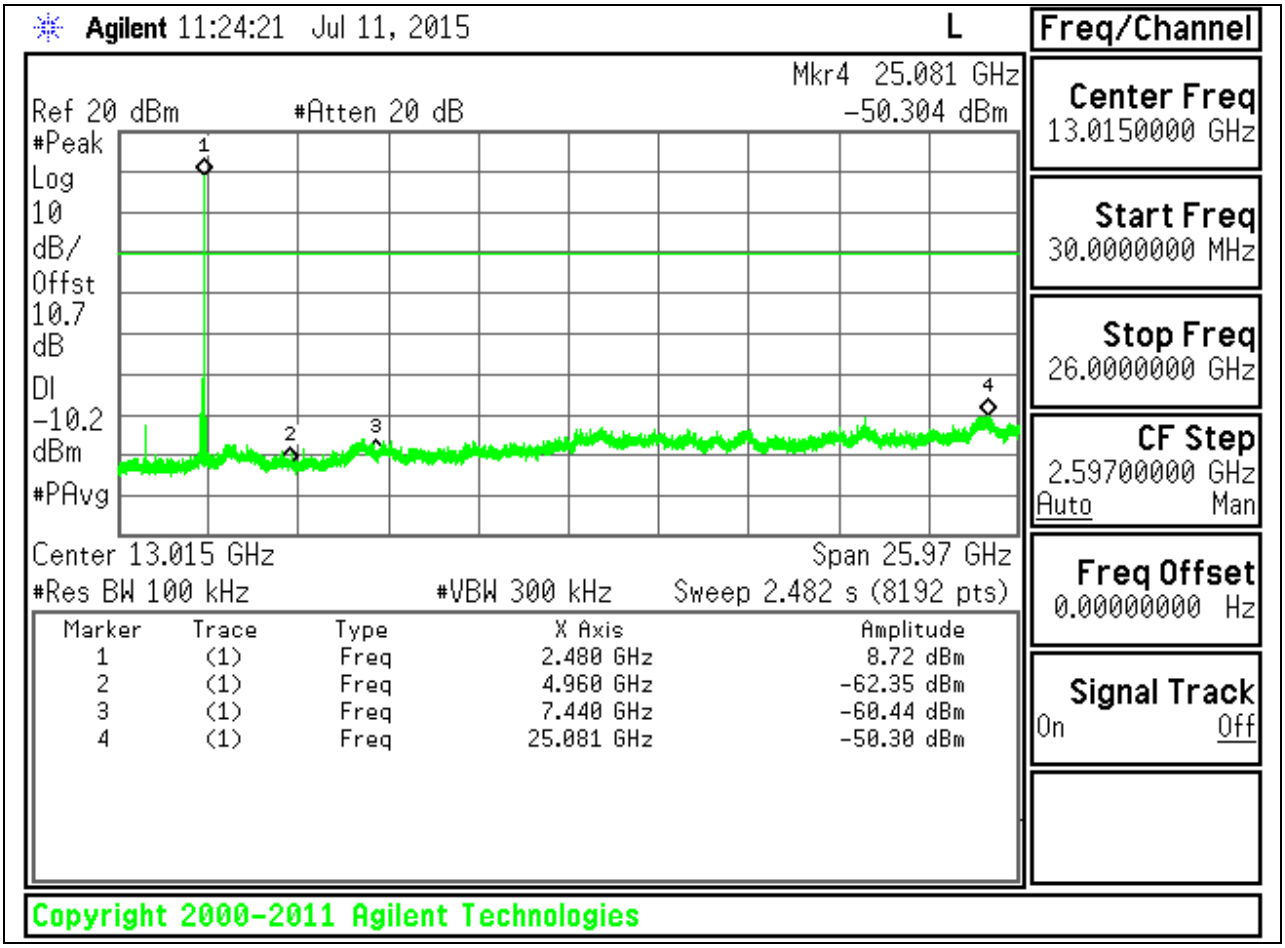


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE

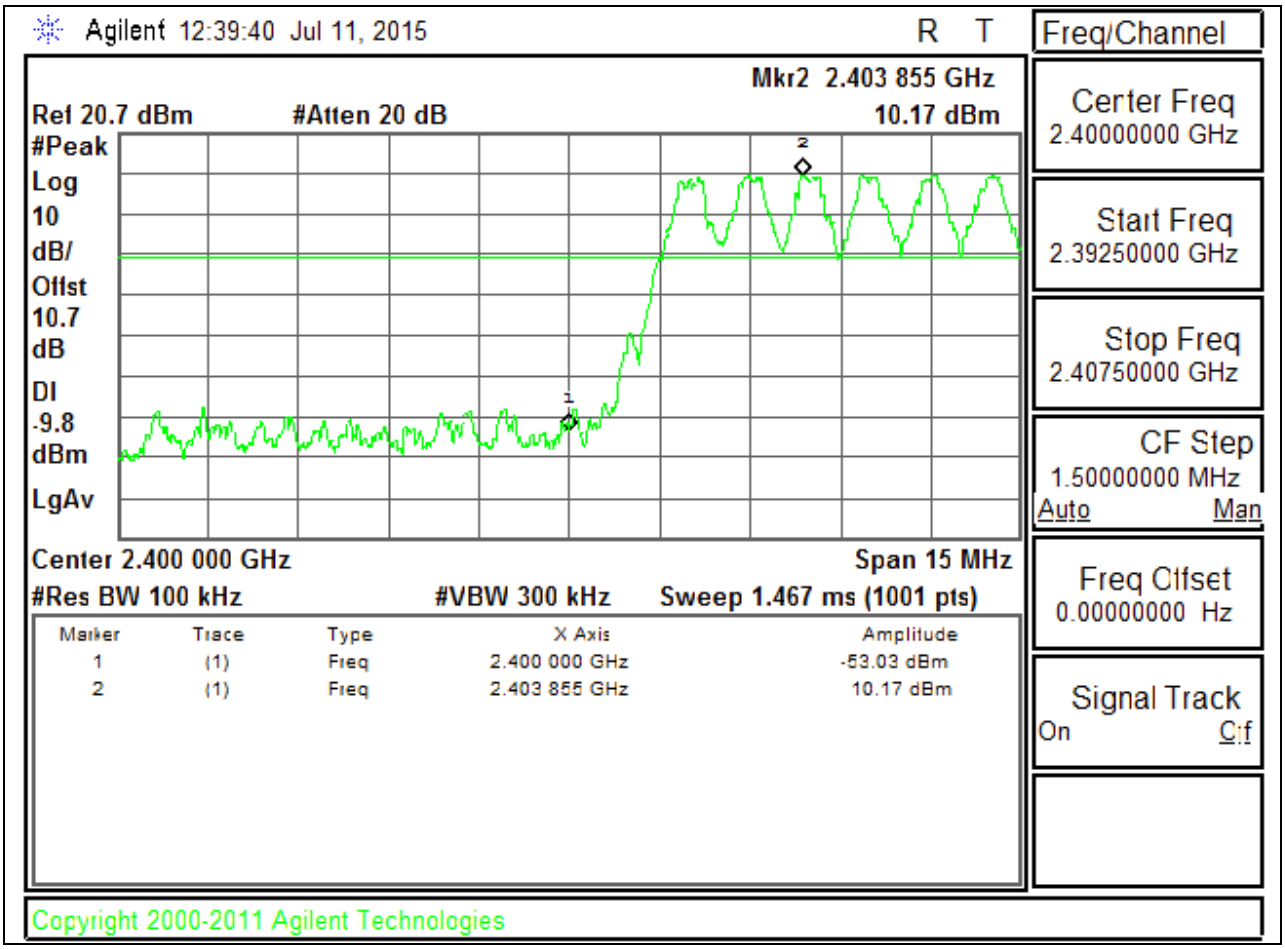


HIGH CHANNEL SPURIOUS

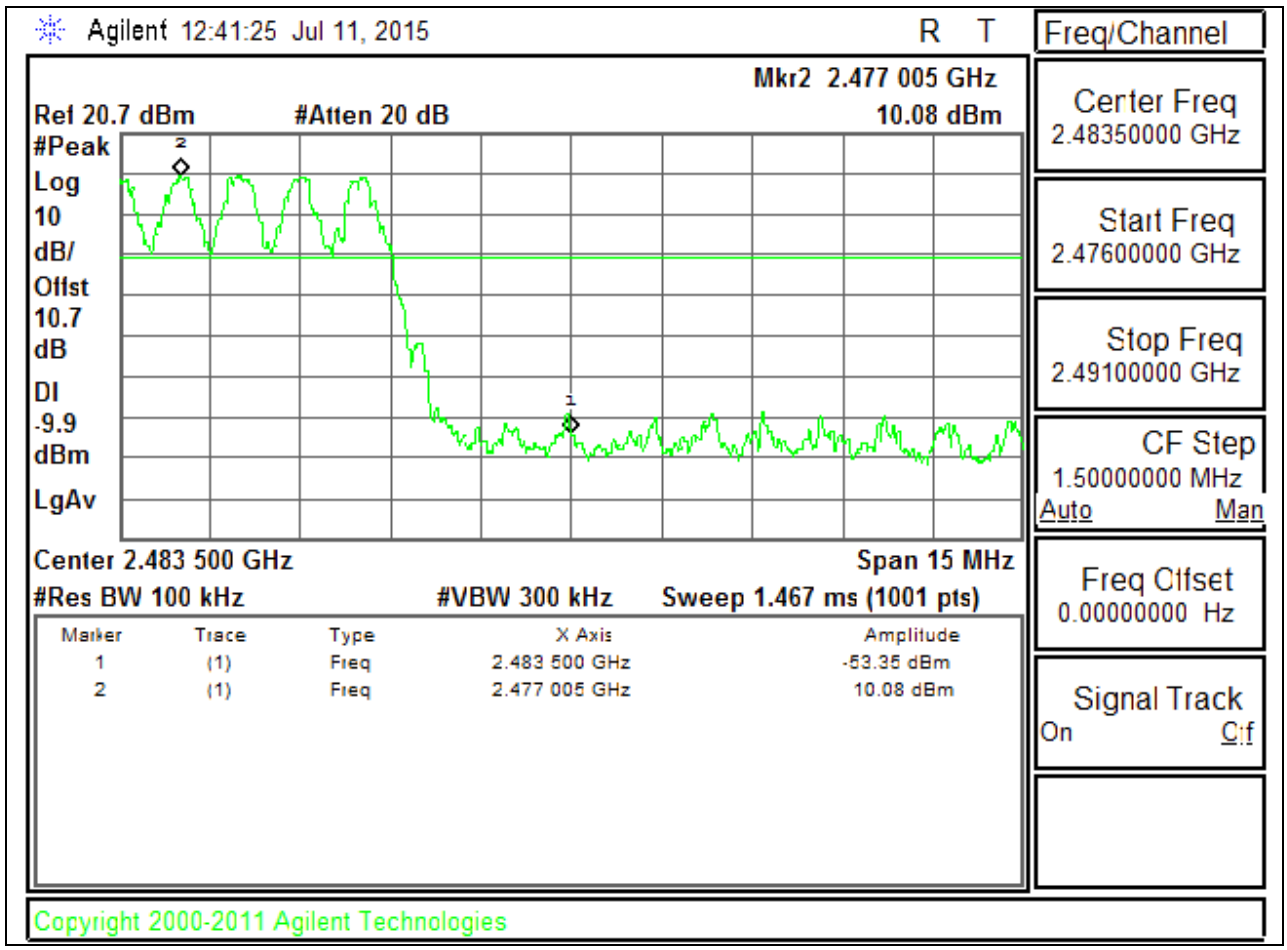


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



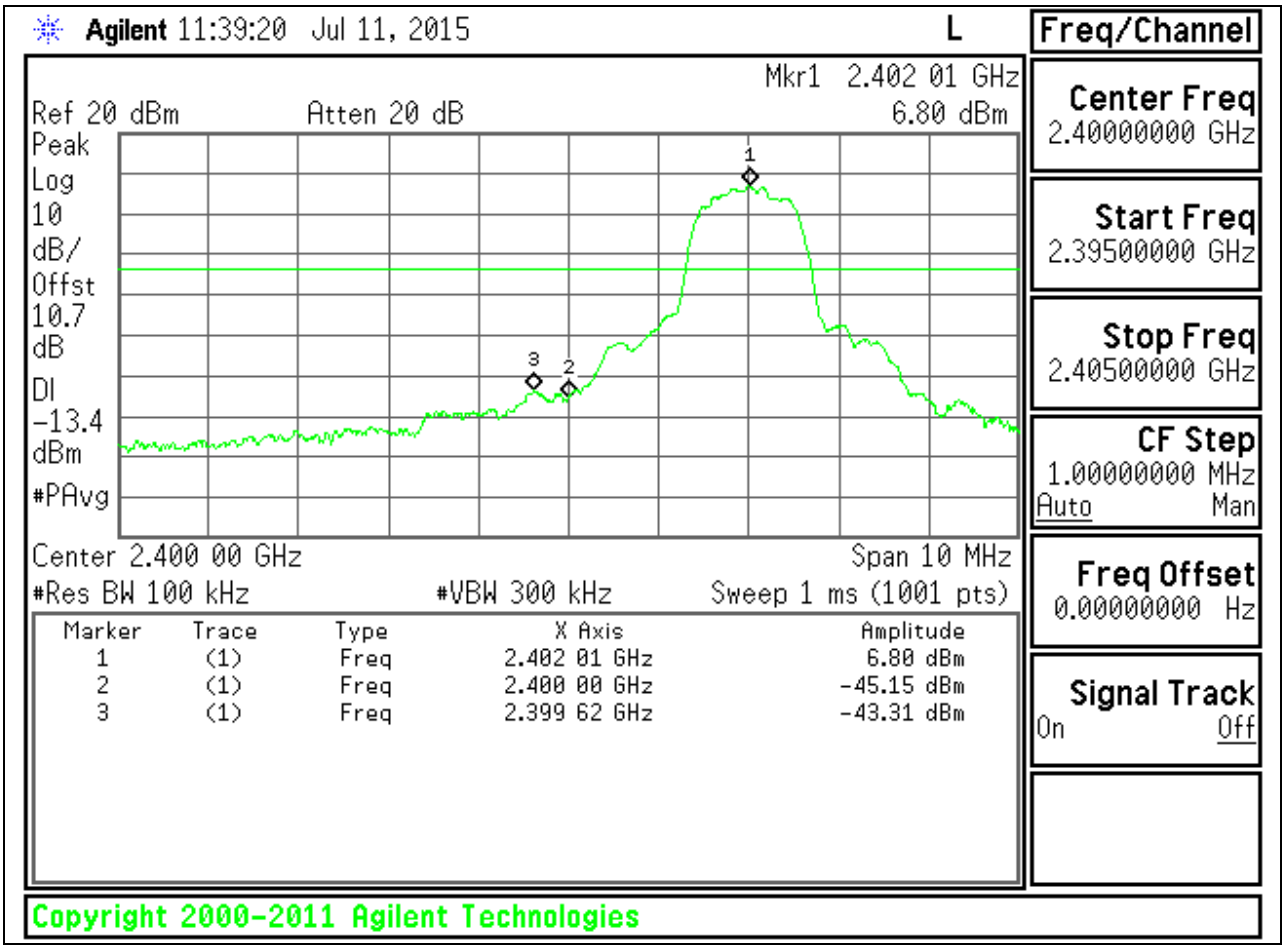
HIGH BANDEDGE WITH HOPPING ON



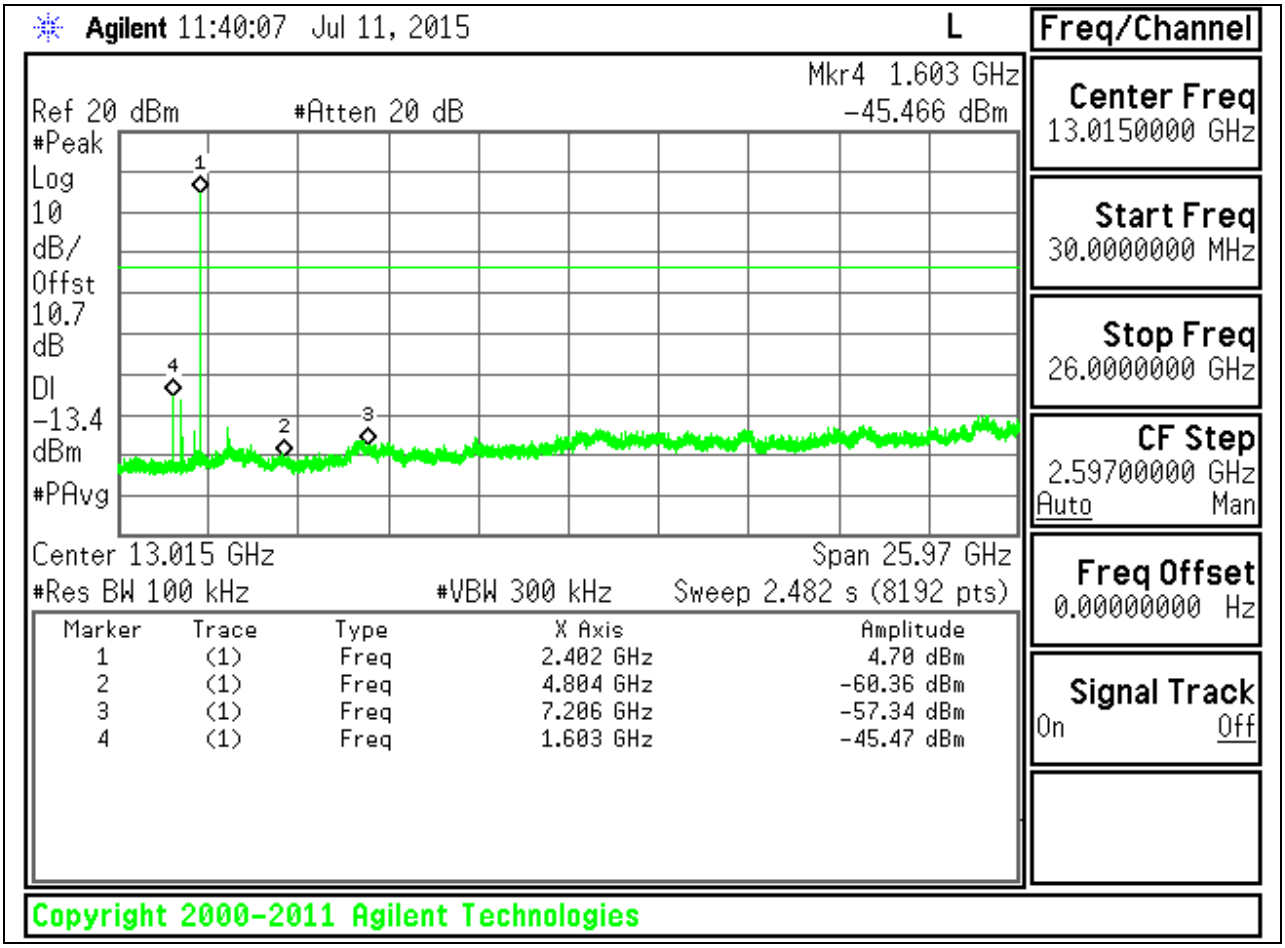
8.7.2. ENHANCED DATA RATE 8PSK MODULATION

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE

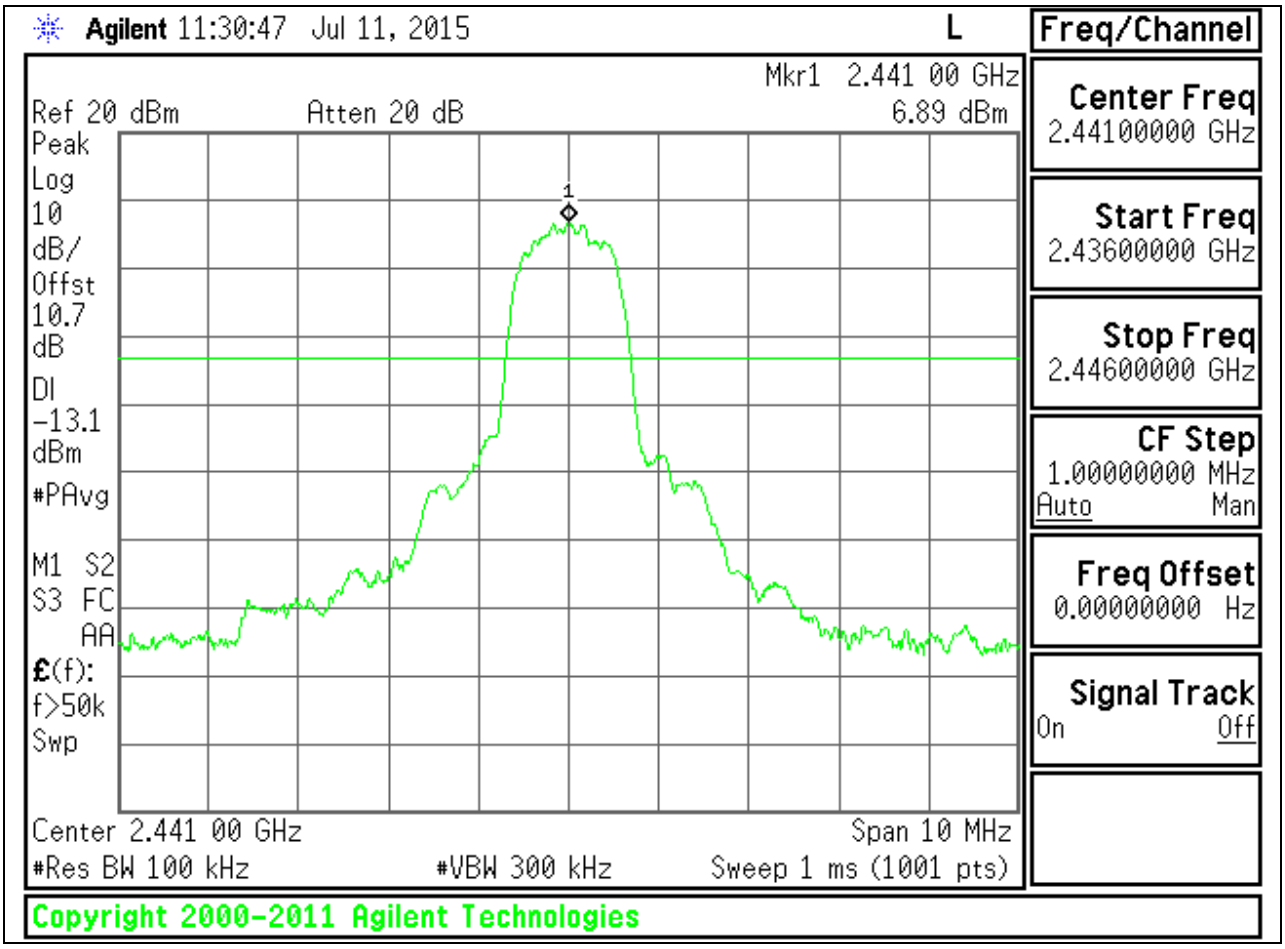


LOW CHANNEL SPURIOUS

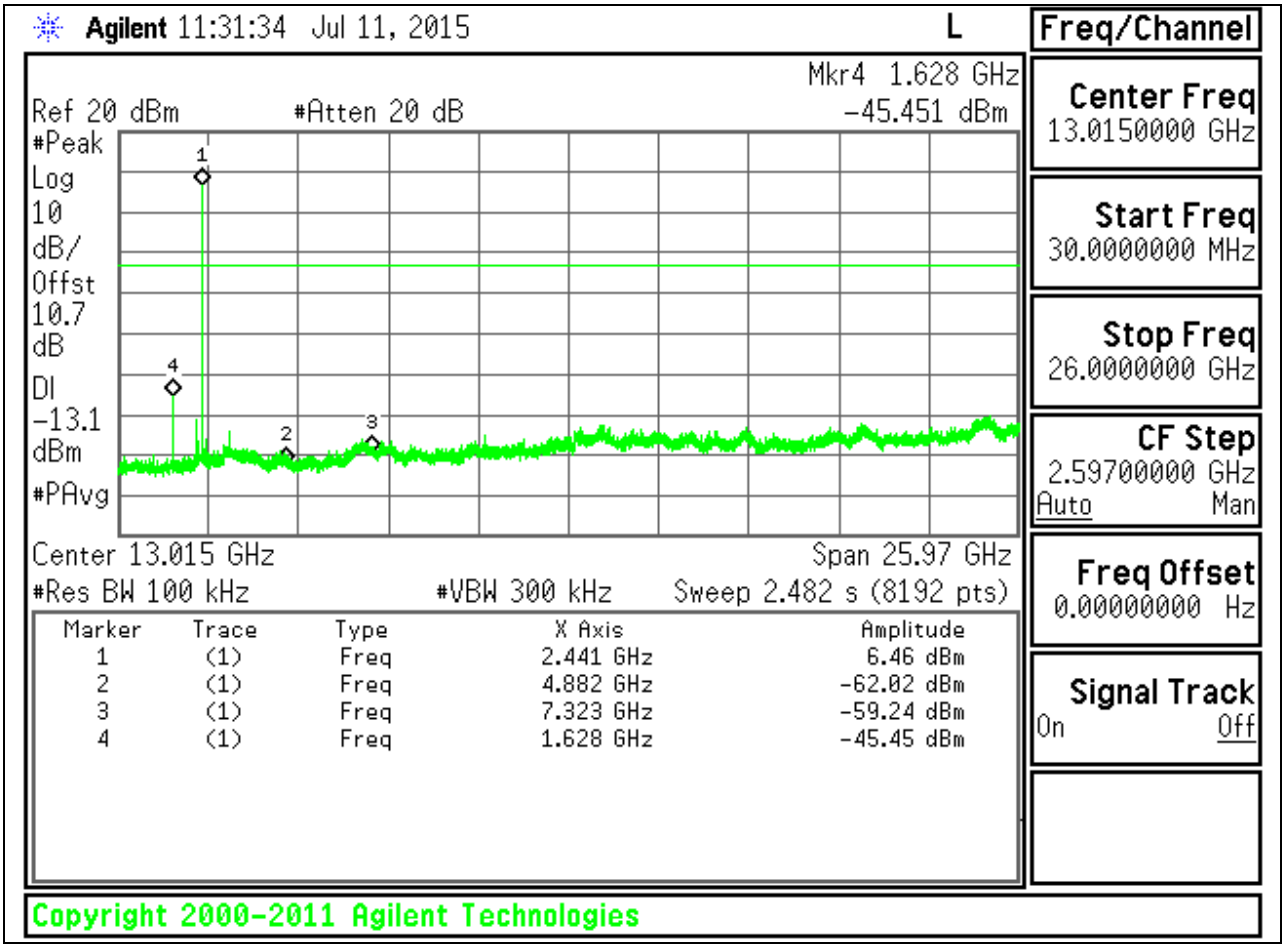


SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL BANDEDGE

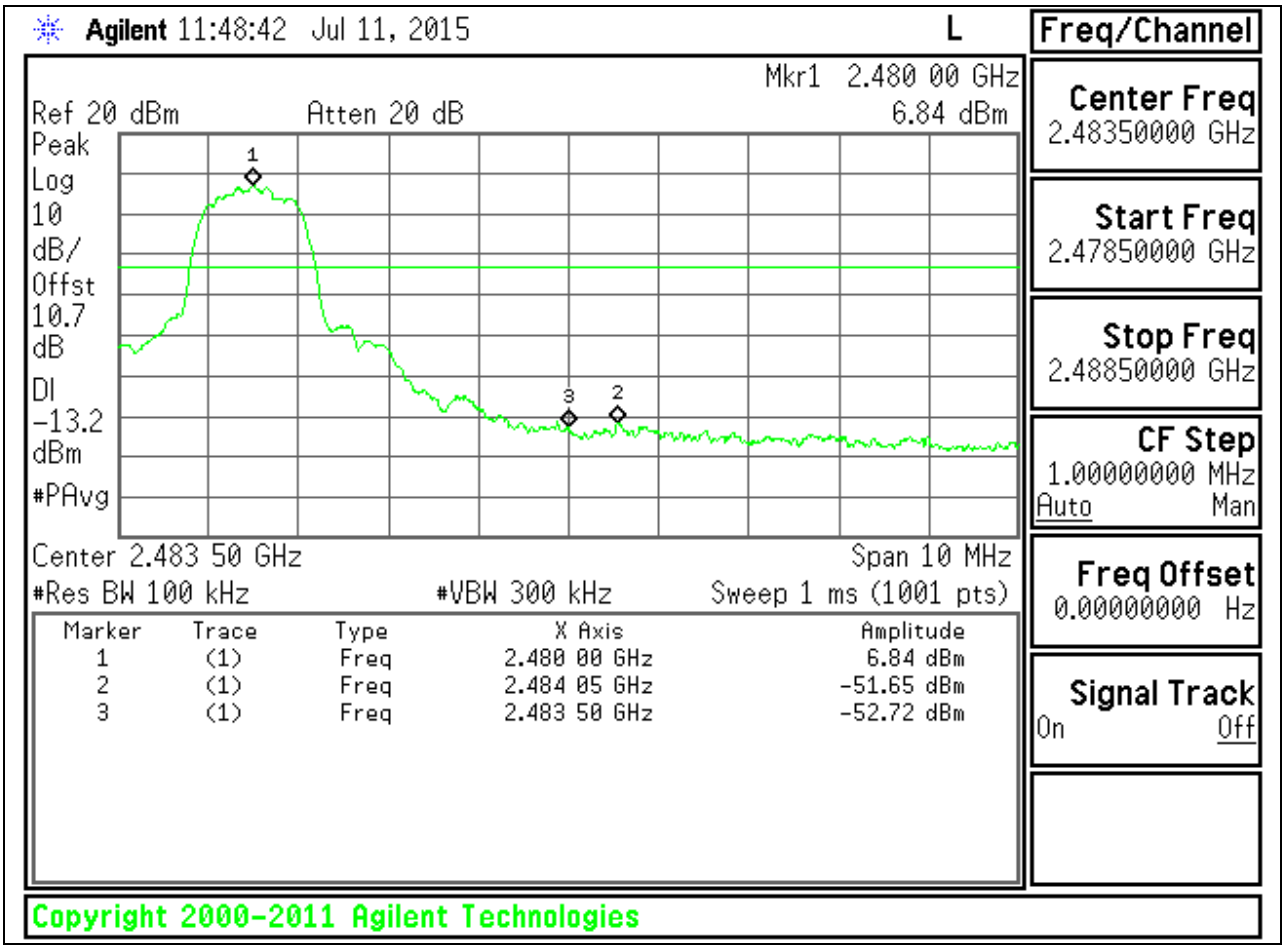


MID CHANNEL SPURIOUS

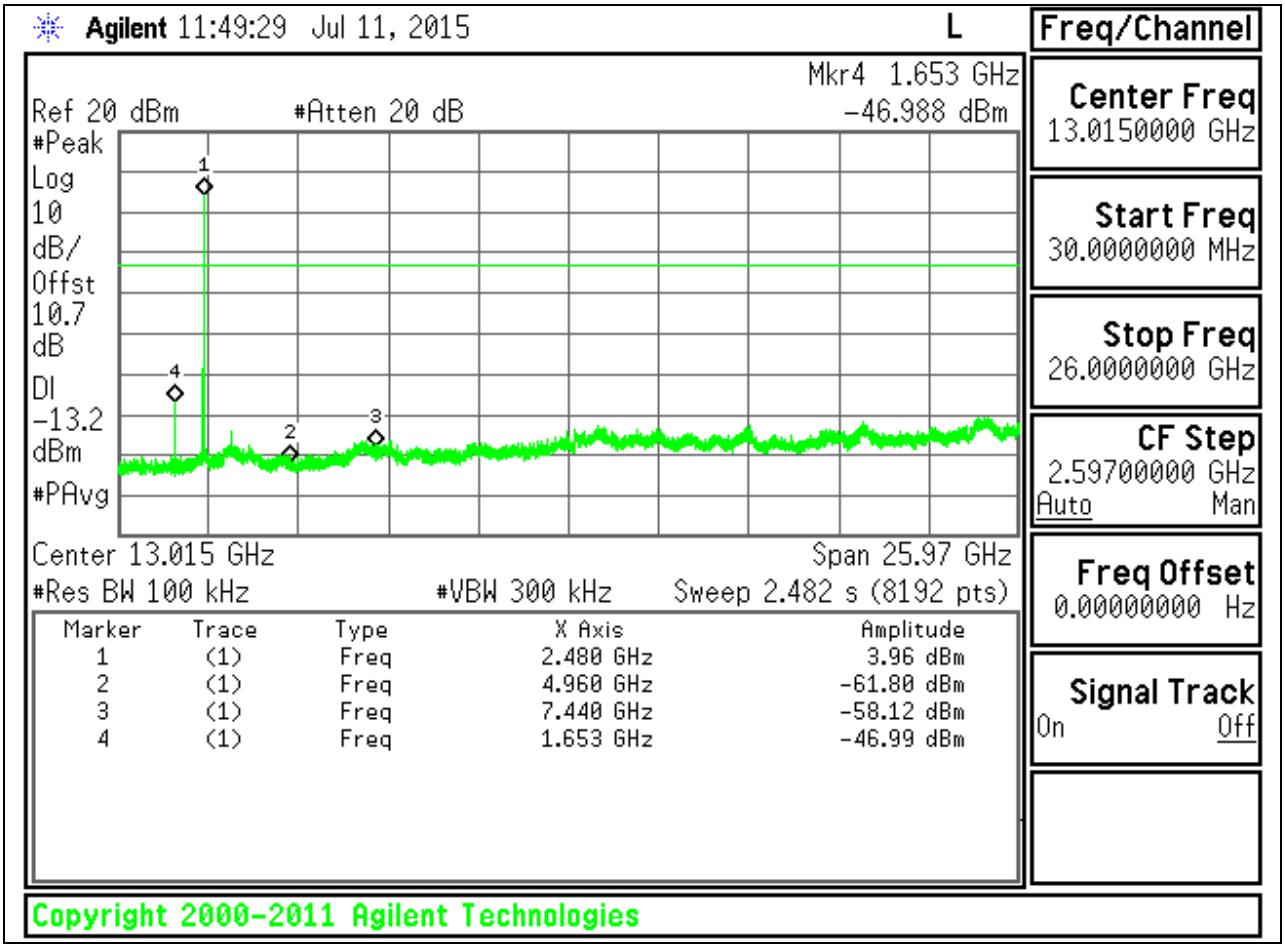


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE

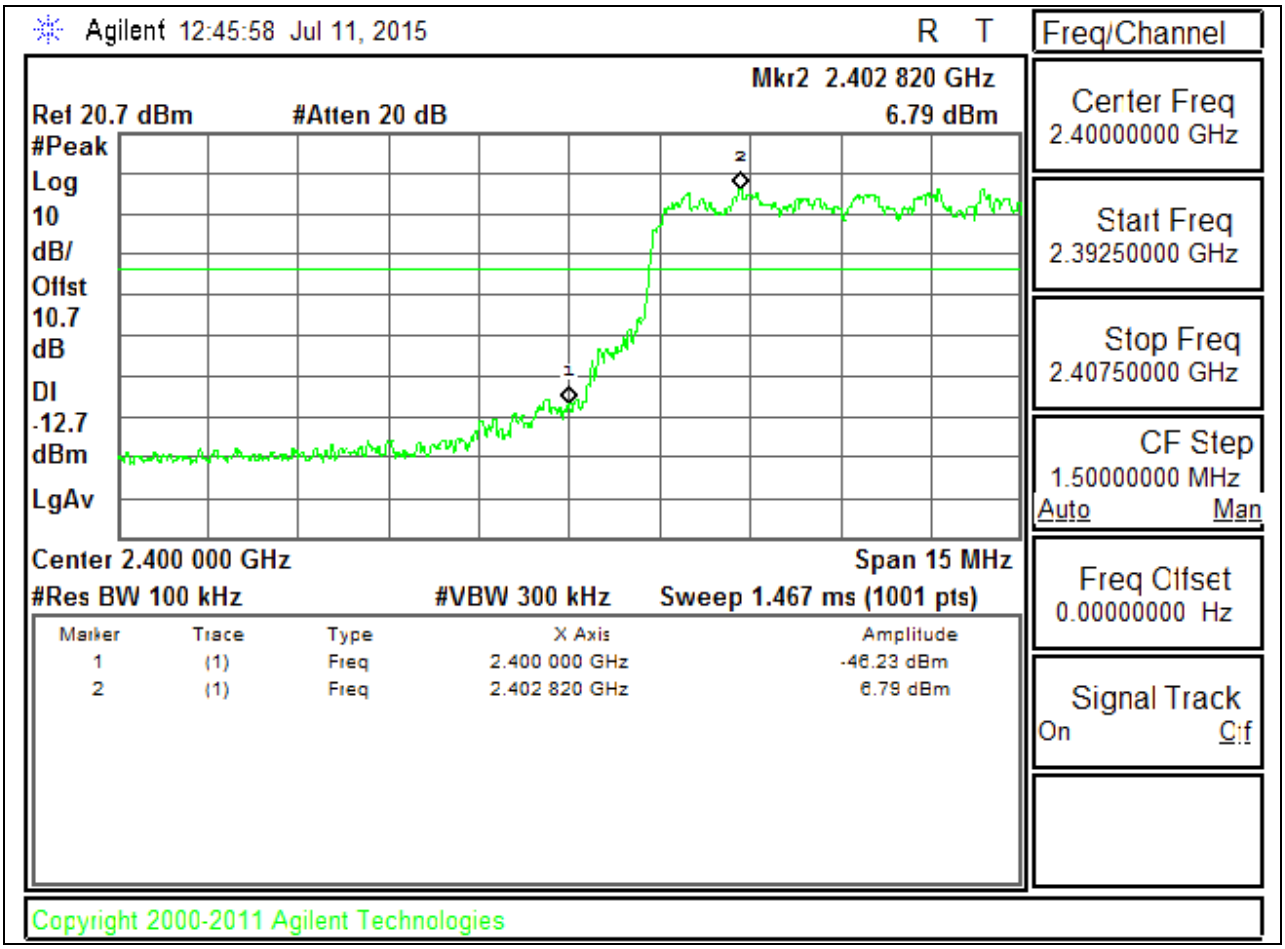


HIGH CHANNEL SPURIOUS

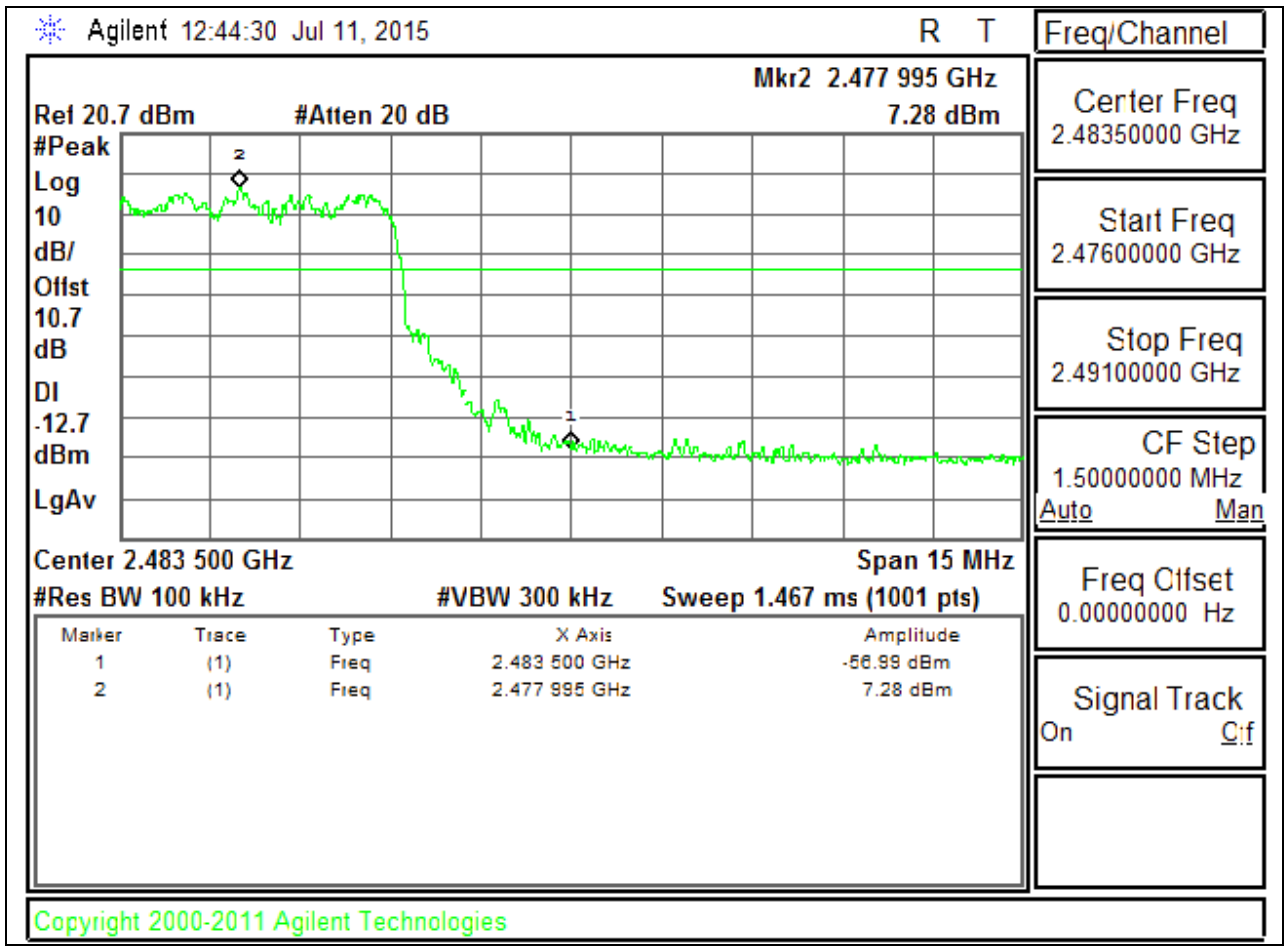


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON



HIGH BANDEDGE WITH HOPPING ON



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

IC RSS-GEN Clause 7 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For band edge measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 1/T (on time) for average measurement.
GFSK = 1/T = 1 / 0.0028S = 360Hz.
8PSK = 1/T =1 / 0.0028S = 360Hz

The spectrum from 1GHzHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

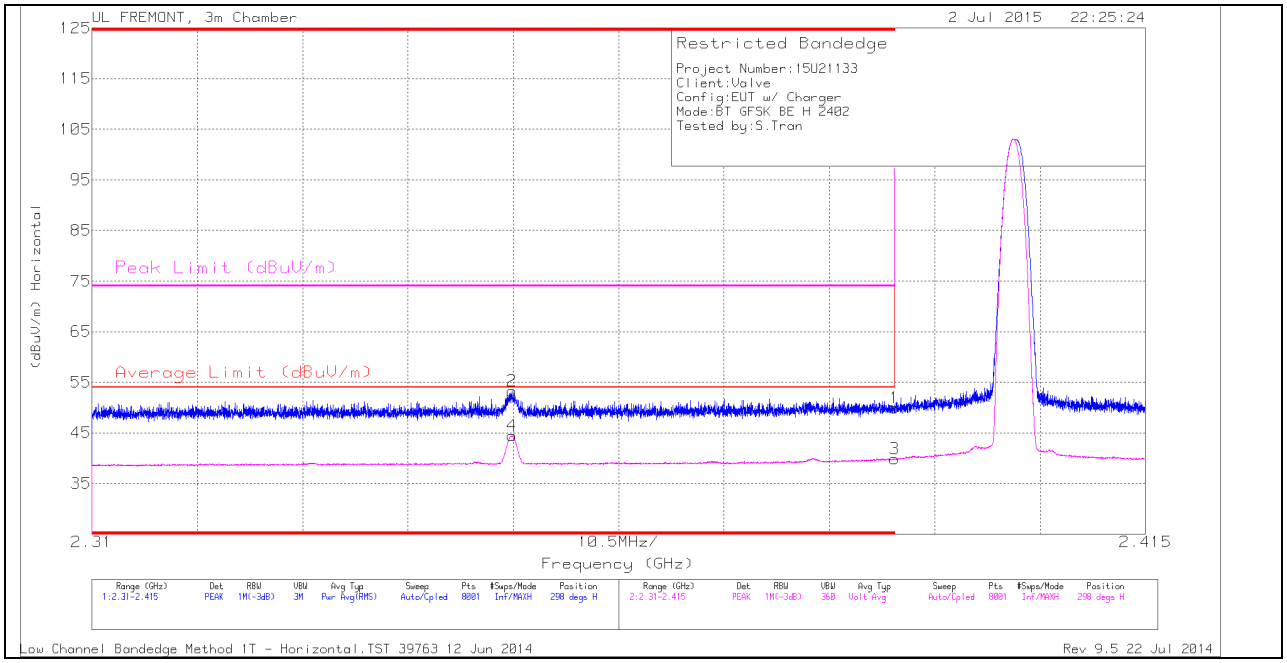
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

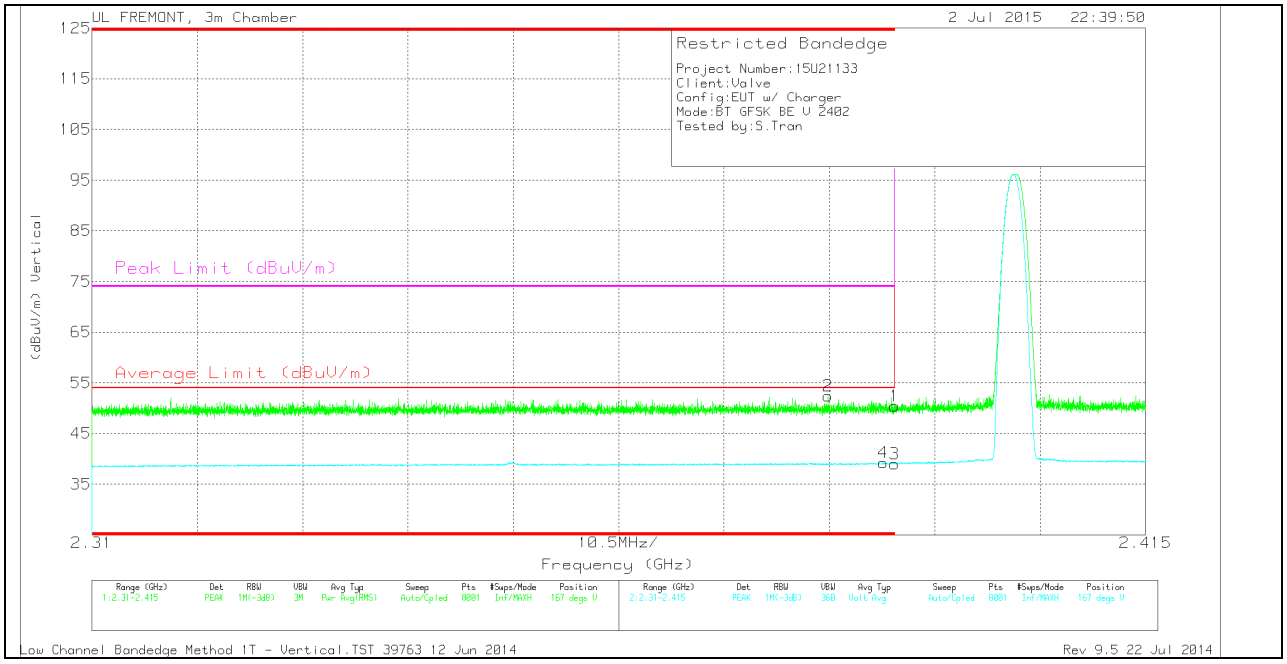
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.27	PK	32	-22.4	49.87	-	-	74	-24.13	298	125	H
2	* 2.352	44.02	PK	31.8	-22.5	53.32	-	-	74	-20.68	298	125	H
3	* 2.39	30.23	VB1T	32	-22.4	39.83	54	-14.17	-	-	298	125	H
4	* 2.352	35.1	VB1T	31.8	-22.5	44.4	54	-9.6	-	-	298	125	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.383	42.79	PK	32	-22.4	52.39	-	-	74	-21.61	167	309	V
4	* 2.389	29.62	VB1T	32	-22.4	39.22	54	-14.78	-	-	167	309	V
1	* 2.39	40.79	PK	32	-22.4	50.39	-	-	74	-23.61	167	309	V
3	* 2.39	29.45	VB1T	32	-22.4	39.05	54	-14.95	-	-	167	309	V

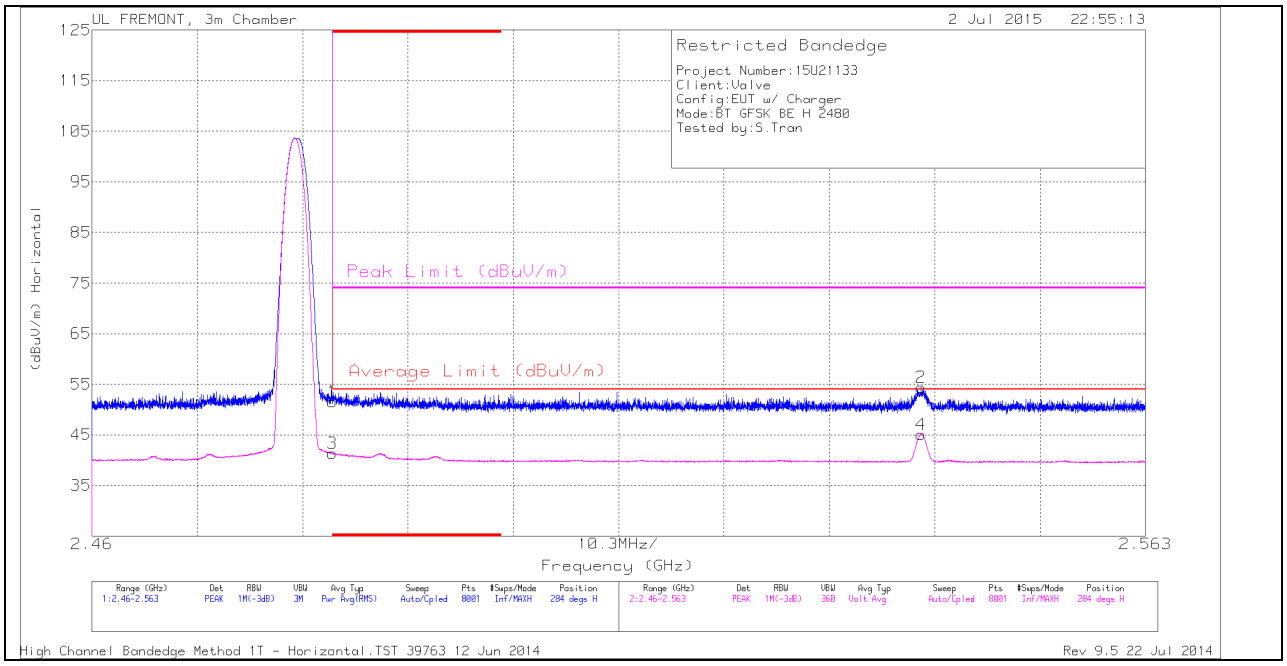
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

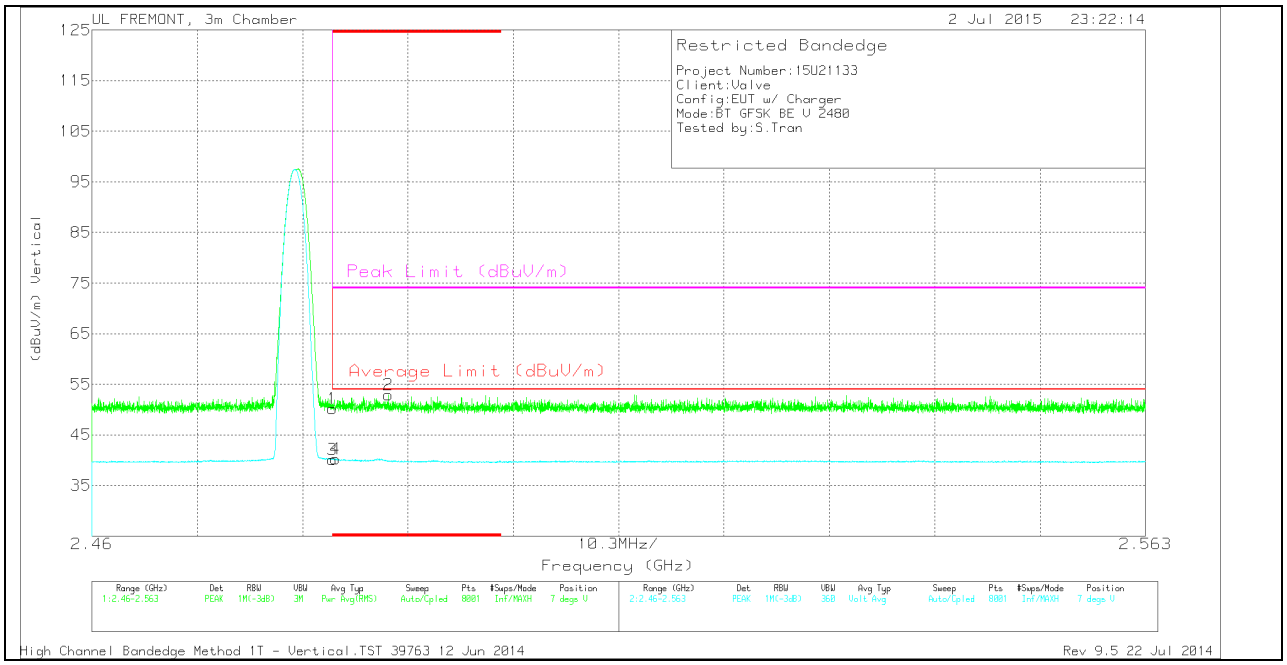
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.31	PK	32.3	-22.1	51.51	-	-	74	-22.49	284	143	H
3	* 2.484	31.12	VB1T	32.3	-22.1	41.32	54	-12.68	-	-	284	143	H
2	2.541	43.92	PK	32.4	-21.9	54.42	-	-	74	-19.58	284	143	H
4	2.541	34.61	VB1T	32.4	-21.9	45.11	54	-8.89	-	-	284	143	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39.96	PK	32.3	-22.1	50.16	-	-	74	-23.84	7	379	V
3	* 2.484	29.91	VB1T	32.3	-22.1	40.11	54	-13.89	-	-	7	379	V
4	* 2.484	30.05	VB1T	32.3	-22.1	40.25	54	-13.75	-	-	7	379	V
2	* 2.489	42.82	PK	32.3	-22.2	52.92	-	-	74	-21.08	7	379	V

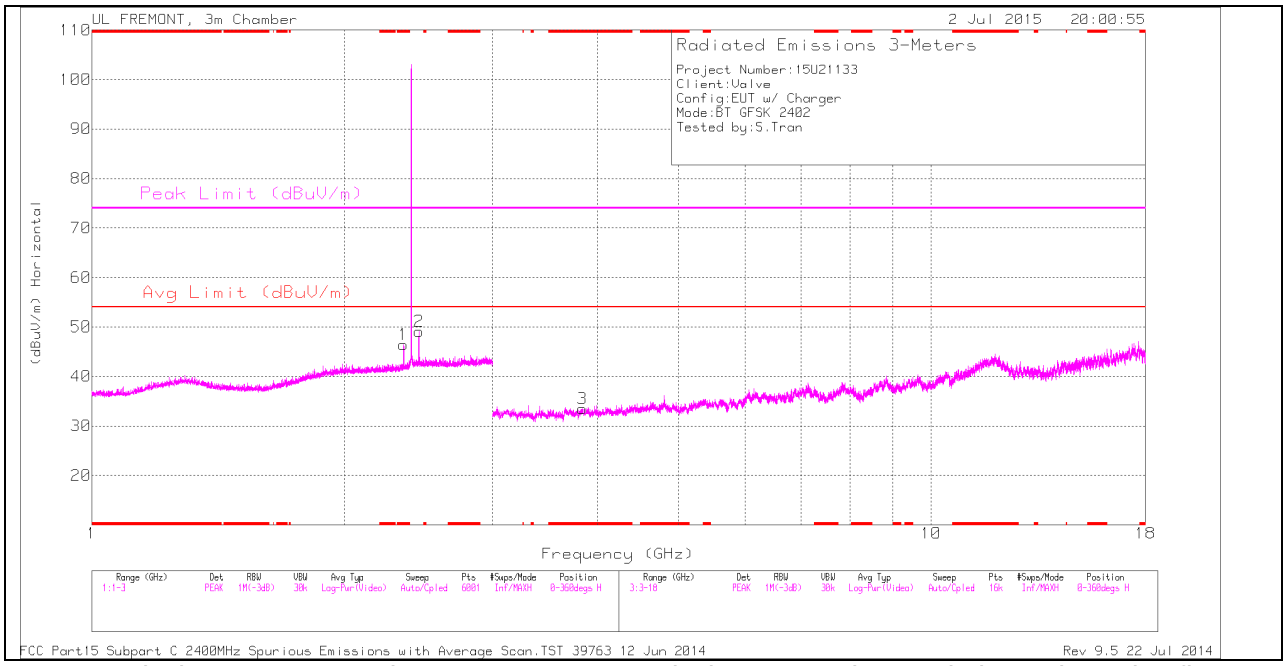
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

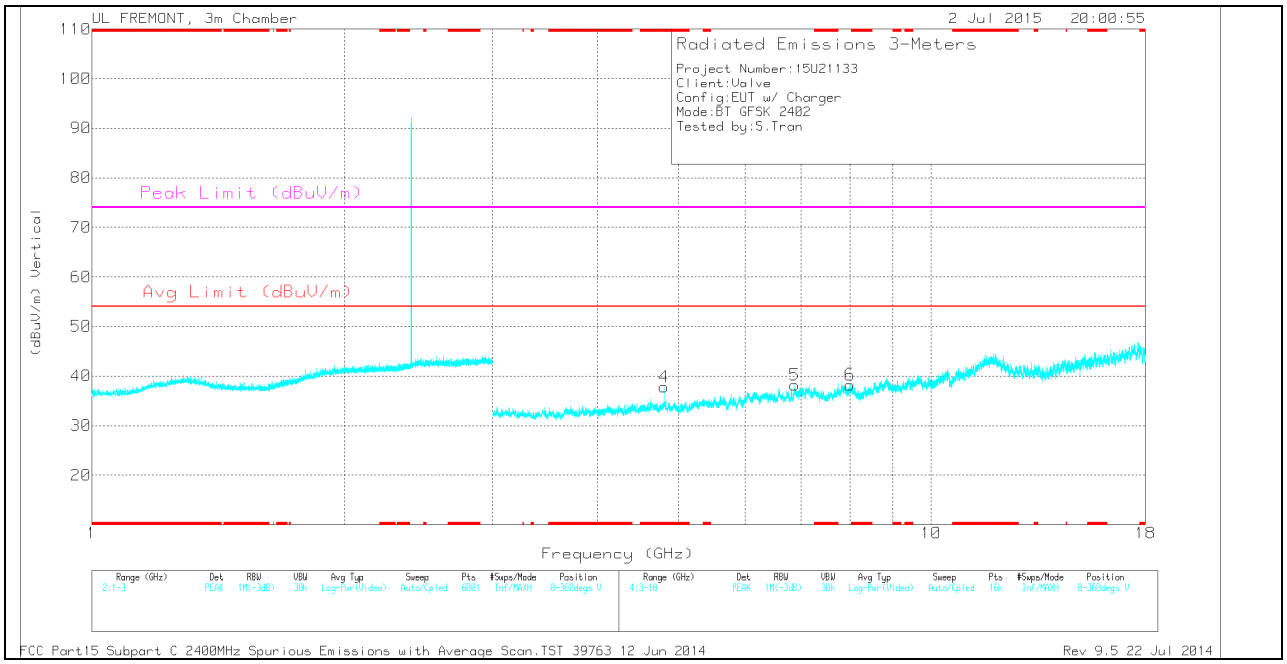
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.352	37.11	PK	31.8	-22.5	46.41	-	-	74	-27.59	0-360	200	H
3	* 3.839	30.67	PK	33.1	-30.3	33.47	-	-	74	-40.53	0-360	100	H
4	* 4.804	33.24	PK	34	-29.4	37.84	-	-	74	-36.16	0-360	100	V
2	2.452	39.05	PK	32.2	-22.2	49.05	-	-	-	-	0-360	100	H
5	6.877	29.86	PK	35.6	-27.3	38.16	-	-	-	-	0-360	100	V
6	8.002	29.75	PK	35.8	-27.3	38.25	-	-	-	-	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

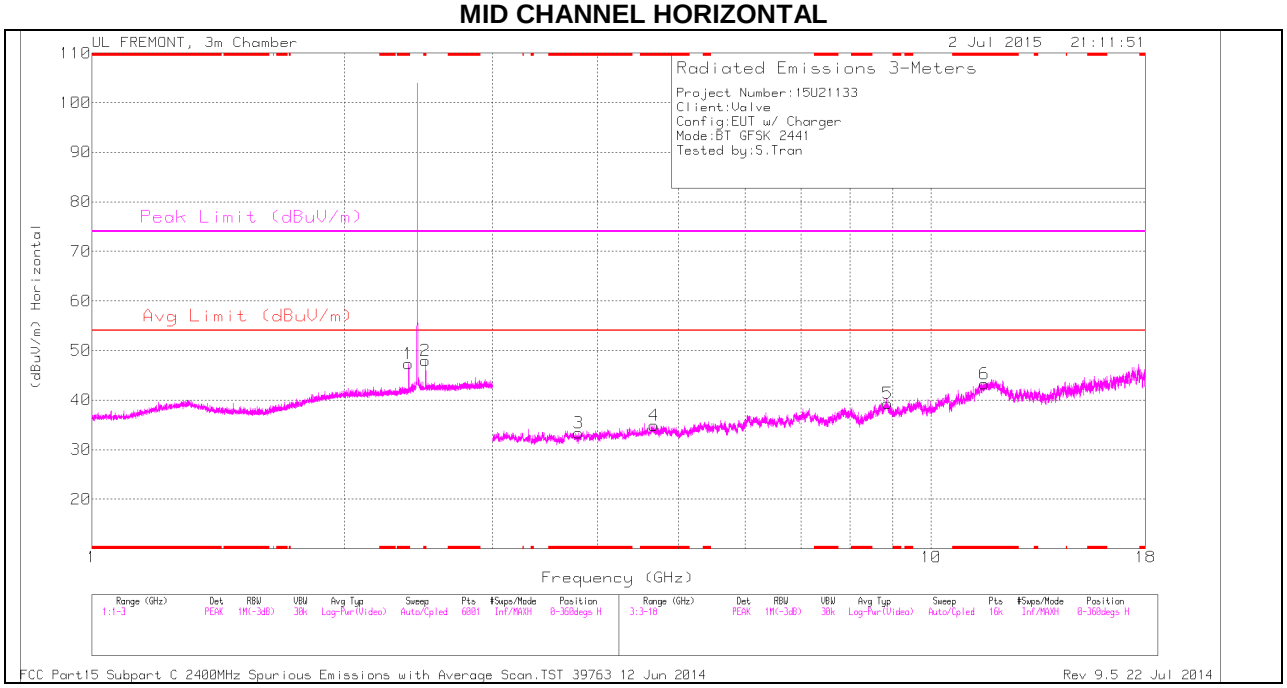
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.353	43.48	PK3	31.8	-22.4	52.88	-	-	74	-21.12	360	200	H
* 2.352	31.29	VB1T	31.8	-22.5	40.59	54	-13.41	-	-	360	200	H
* 3.841	40.3	PK3	33.1	-30.4	43	-	-	74	-31	310	100	H
* 3.84	27.77	VB1T	33.1	-30.3	30.57	54	-23.43	-	-	310	100	H
* 4.804	41.69	PK3	34	-29.4	46.29	-	-	74	-27.71	310	100	V
* 4.804	32.18	VB1T	34	-29.4	36.78	54	-17.22	-	-	310	100	V
2.452	45.45	PK3	32.2	-22.2	55.45	-	-	-	-	310	104	H
2.452	37.54	VB1T	32.2	-22.2	47.54	-	-	-	-	310	104	H
6.875	26.16	VB1T	35.6	-27.2	34.56	-	-	-	-	310	100	V
6.879	38.9	PK3	35.6	-27.4	47.1	-	-	-	-	310	100	V
8.003	39.42	PK3	35.8	-27.3	47.92	-	-	-	-	310	100	V
8.004	26.14	VB1T	35.8	-27.4	34.54	-	-	-	-	310	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

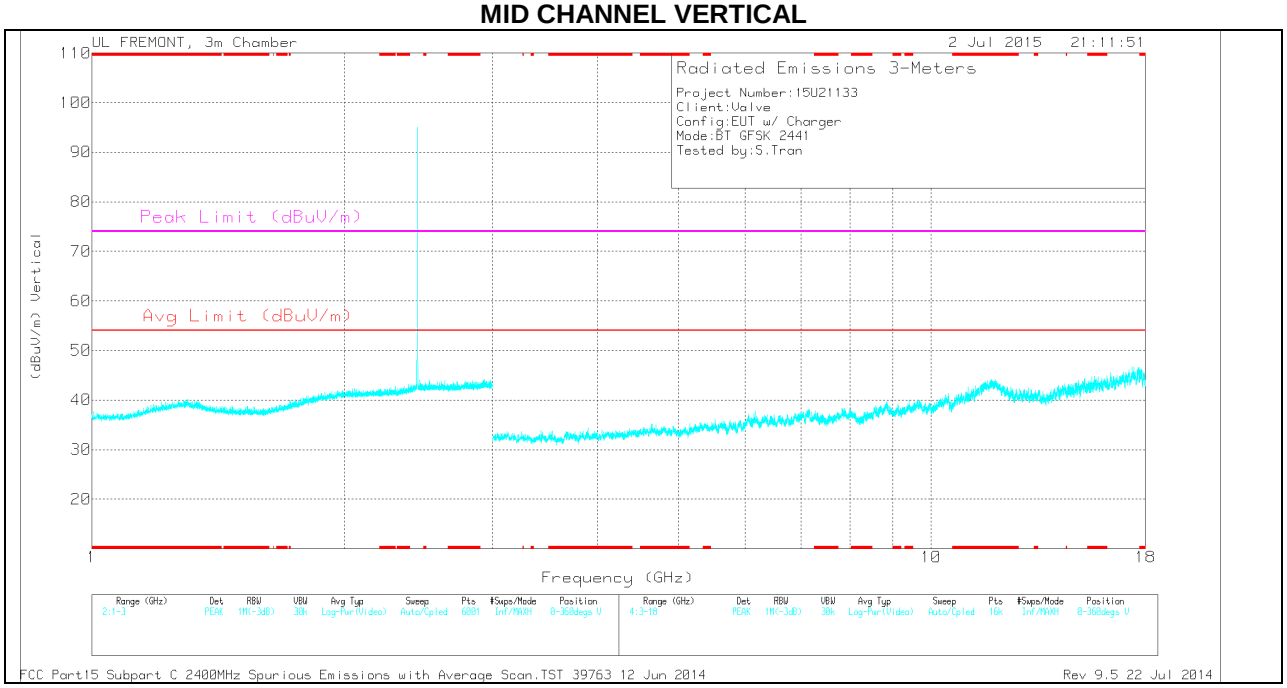
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.385	37.76	PK	32	-22.4	47.36	-	-	74	-26.64	0-360	200	H
2	* 2.497	37.76	PK	32.3	-22.1	47.96	-	-	74	-26.04	0-360	100	H
3	* 3.8	30.9	PK	33.1	-30.6	33.4	-	-	74	-40.6	0-360	100	H
4	* 4.676	31.13	PK	34	-30.2	34.93	-	-	74	-39.07	0-360	100	H
6	* 11.58	26.89	PK	38.6	-22.2	43.29	-	-	74	-30.71	0-360	200	H
5	8.878	28.62	PK	35.9	-25.2	39.32	-	-	-	-	0-360	100	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

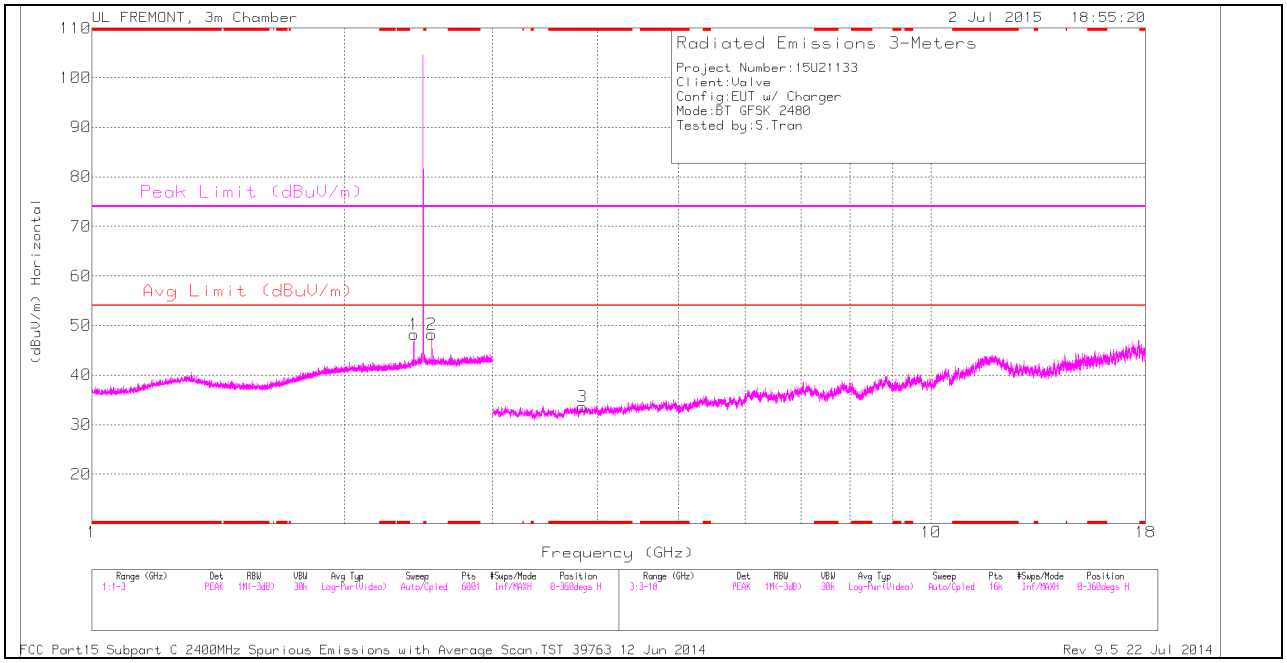
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.385	44.99	PK3	32	-22.4	54.59	-	-	74	-19.41	291	175	H
* 2.385	36.99	VB1T	32	-22.4	46.59	54	-7.41	-	-	291	175	H
* 2.497	45.15	PK3	32.3	-22.1	55.35	-	-	74	-18.65	317	160	H
* 2.497	38.05	VB1T	32.3	-22.1	48.25	54	-5.75	-	-	317	160	H
* 3.8	39.61	PK3	33.1	-30.6	42.11	-	-	74	-31.89	317	100	H
* 3.801	27.23	VB1T	33.1	-30.6	29.73	54	-24.27	-	-	317	100	H
* 4.675	40.04	PK3	34	-30.2	43.84	-	-	74	-30.16	317	100	H
* 4.676	27.52	VB1T	34	-30.2	31.32	54	-22.68	-	-	317	100	H
* 11.582	37.01	PK3	38.6	-22.2	53.41	-	-	74	-20.59	317	200	H
* 11.582	23.94	VB1T	38.6	-22.2	40.34	54	-13.66	-	-	317	200	H
8.879	37.41	PK3	35.9	-25.2	48.11	-	-	-	-	317	100	H
8.88	24.56	VB1T	35.9	-25.2	35.26	-	-	-	-	317	100	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

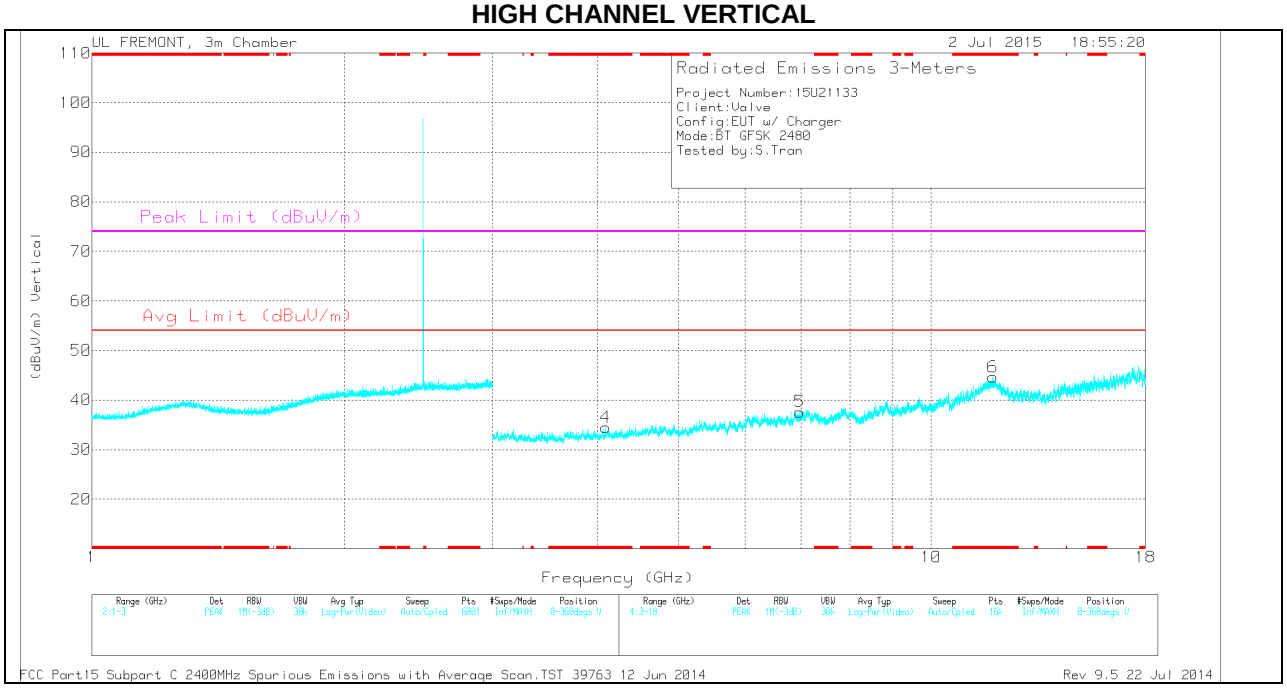
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 3.84	30.87	PK	33.1	-30.3	33.67	-	-	74	-40.33	0-360	200	H
4	* 4.096	31.66	PK	33.3	-30.5	34.46	-	-	74	-39.54	0-360	100	V
6	* 11.844	28.25	PK	39.1	-22.7	44.65	-	-	74	-29.35	0-360	100	V
1	2.418	38.4	PK	32.1	-22.3	48.2	-	-	-	-	0-360	100	H
2	2.541	37.7	PK	32.4	-21.9	48.2	-	-	-	-	0-360	100	H
5	6.972	30.72	PK	35.6	-28.7	37.62	-	-	-	-	0-360	200	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.841	40.46	PK3	33.1	-30.4	43.16	-	-	74	-30.84	325	200	H
* 3.842	27.79	VB1T	33.1	-30.4	30.49	54	-23.51	-	-	325	200	H
* 4.095	40.58	PK3	33.3	-30.6	43.28	-	-	74	-30.72	325	100	V
* 4.094	27.89	VB1T	33.3	-30.6	30.59	54	-23.41	-	-	325	100	V
* 11.842	37.09	PK3	39.1	-22.7	53.49	-	-	74	-20.51	325	100	V
* 11.842	24.43	VB1T	39.1	-22.8	40.73	54	-13.27	-	-	325	100	V
2.419	45.74	PK3	32.1	-22.3	55.54	-	-	-	-	317	144	H
2.419	38.11	VB1T	32.1	-22.3	47.91	-	-	-	-	317	144	H
2.541	45.13	PK3	32.4	-21.9	55.63	-	-	-	-	325	152	H
2.541	36.64	VB1T	32.4	-21.9	47.14	-	-	-	-	325	152	H
6.973	39.7	PK3	35.6	-28.6	46.7	-	-	-	-	325	200	V
6.974	27.22	VB1T	35.6	-28.6	34.22	-	-	-	-	325	200	V

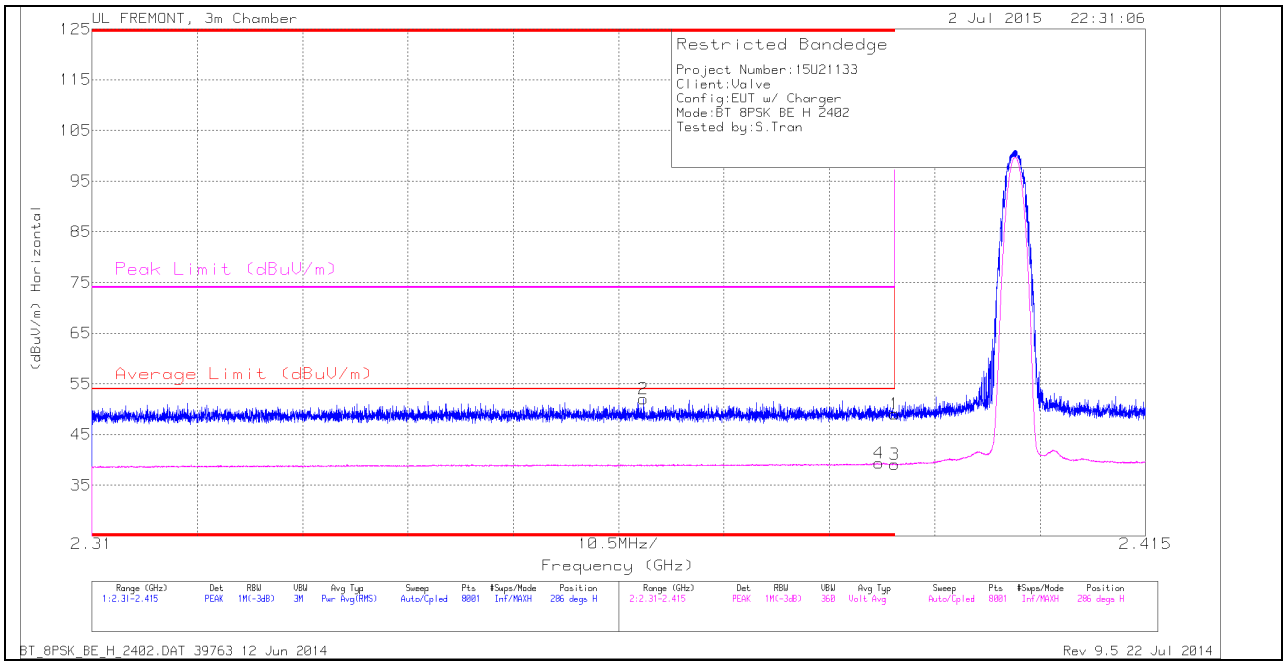
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

9.2.2. ENHANCED DATA RATE 8PSK MODULATION RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

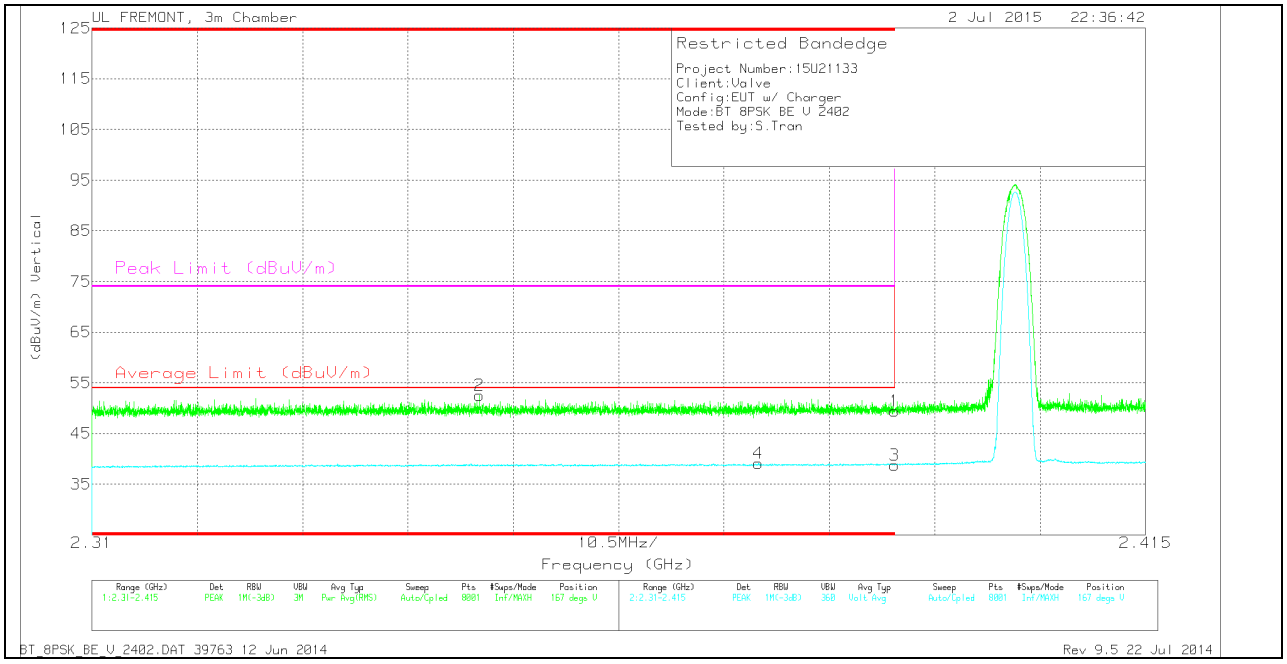
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.365	42.65	PK	31.9	-22.5	52.05	-	-	74	-21.95	286	125	H
4	* 2.388	29.75	VB1T	32	-22.4	39.35	54	-14.65	-	-	286	125	H
1	* 2.39	39.48	PK	32	-22.4	49.08	-	-	74	-24.92	286	125	H
3	* 2.39	29.53	VB1T	32	-22.4	39.13	54	-14.87	-	-	286	125	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.349	43.21	PK	31.8	-22.5	52.51	-	-	74	-21.49	167	309	V
4	* 2.376	29.63	VB1T	31.9	-22.4	39.13	54	-14.87	-	-	167	309	V
1	* 2.39	39.86	PK	32	-22.4	49.46	-	-	74	-24.54	167	309	V
3	* 2.39	29.18	VB1T	32	-22.4	38.78	54	-15.22	-	-	167	309	V

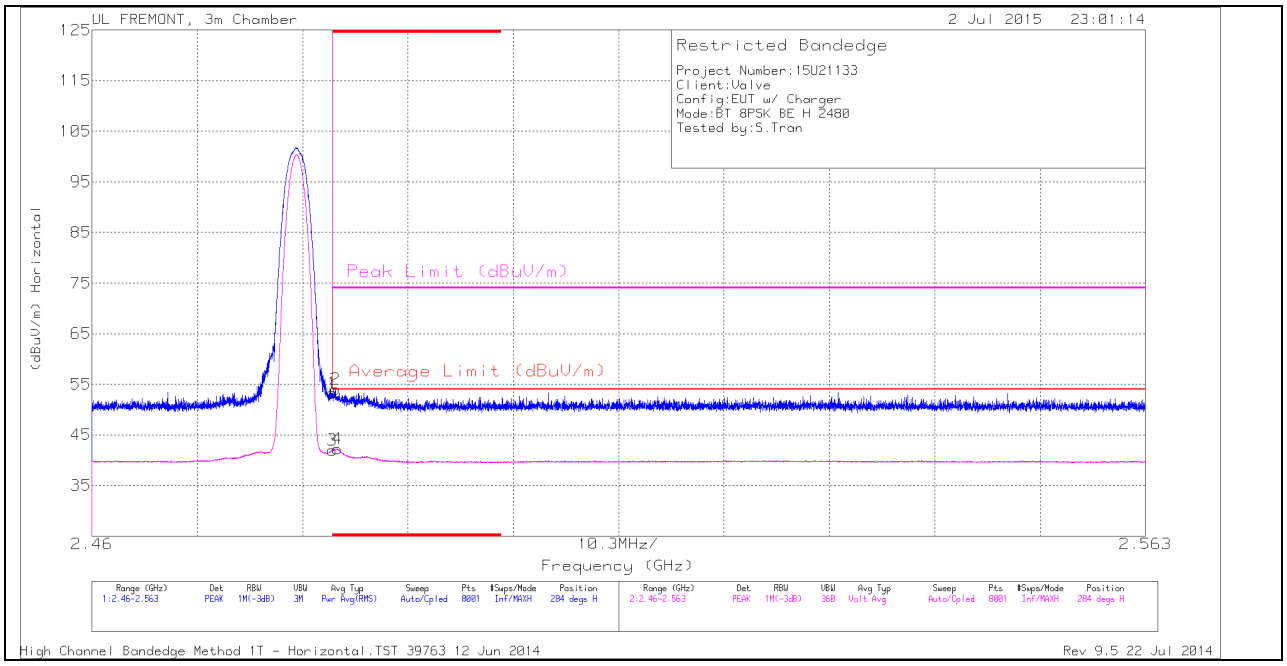
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

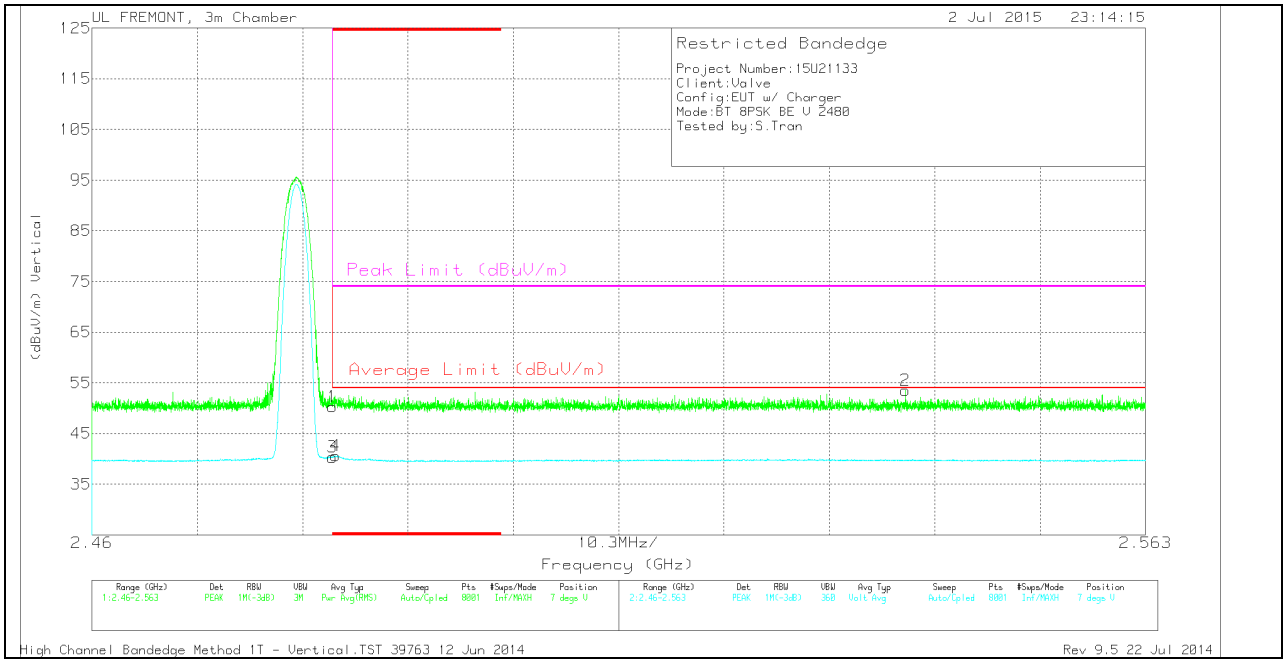
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.03	PK	32.3	-22.1	53.23	-	-	74	-20.77	284	143	H
2	* 2.484	43.78	PK	32.3	-22.1	53.98	-	-	74	-20.02	284	143	H
3	* 2.484	31.8	VB1T	32.3	-22.1	42	54	-12	-	-	284	143	H
4	* 2.484	32.04	VB1T	32.3	-22.1	42.24	54	-11.76	-	-	284	143	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.07	PK	32.3	-22.1	50.27	-	-	74	-23.73	7	379	V
3	* 2.484	30.1	VB1T	32.3	-22.1	40.3	54	-13.7	-	-	7	379	V
4	* 2.484	30.41	VB1T	32.3	-22.1	40.61	54	-13.39	-	-	7	379	V
2	2.54	43	PK	32.4	-21.9	53.5	-	-	74	-20.5	7	379	V

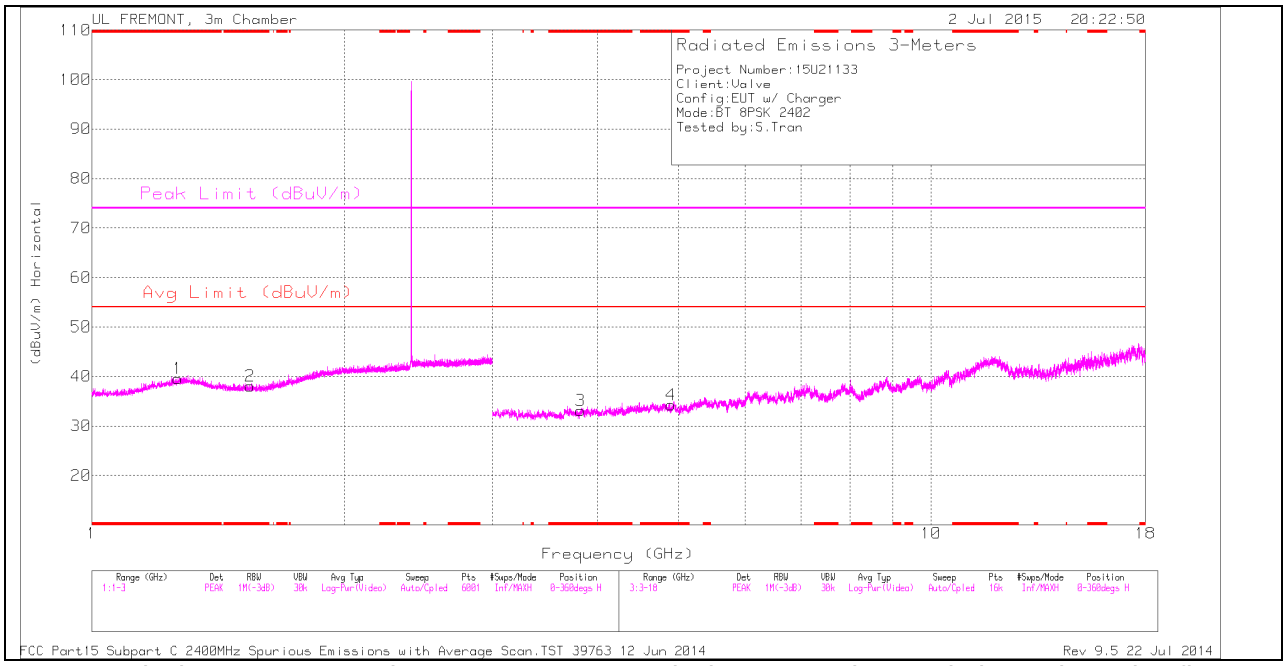
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

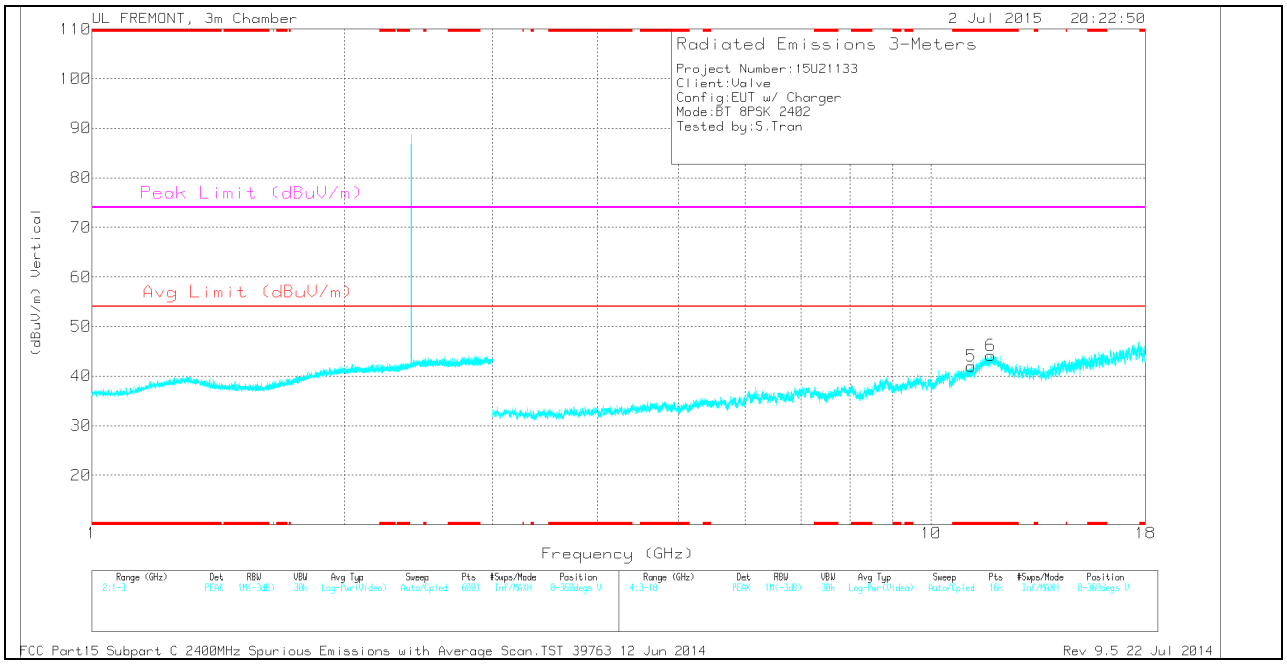
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.266	33.21	PK	29.6	-23.2	39.61	-	-	74	-34.39	0-360	100	H
2	* 1.542	32.77	PK	28.1	-22.8	38.07	-	-	74	-35.93	0-360	100	H
3	* 3.822	30.27	PK	33.1	-30.3	33.07	-	-	74	-40.93	0-360	100	H
4	* 4.9	29.8	PK	34	-29.5	34.3	-	-	74	-39.7	0-360	200	H
5	* 11.155	26.74	PK	37.9	-22.7	41.94	-	-	74	-32.06	0-360	200	V
6	* 11.77	27.63	PK	38.9	-22.4	44.13	-	-	74	-29.87	0-360	200	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

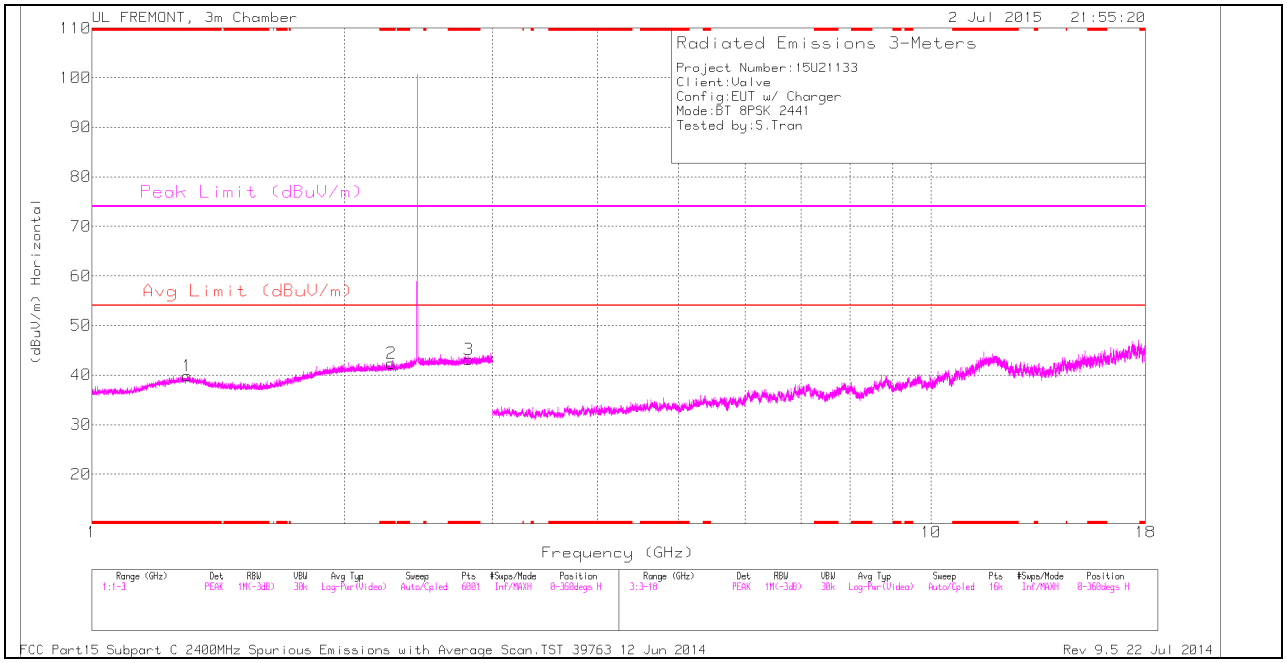
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.266	42.56	PK3	29.6	-23.2	48.96	-	-	74	-25.04	360	100	H
* 1.266	29.81	VB1T	29.6	-23.2	36.21	54	-17.79	-	-	360	100	H
* 1.541	42.57	PK3	28.1	-22.8	47.87	-	-	74	-26.13	360	100	H
* 1.542	29.67	VB1T	28.1	-22.8	34.97	54	-19.03	-	-	360	100	H
* 3.822	39.99	PK3	33.1	-30.3	42.79	-	-	74	-31.21	360	100	H
* 3.821	27.3	VB1T	33.1	-30.3	30.1	54	-23.9	-	-	360	100	H
* 3.822	39.65	PK3	33.1	-30.3	42.45	-	-	74	-31.55	360	100	H
* 3.821	27.37	VB1T	33.1	-30.3	30.17	54	-23.83	-	-	360	100	H
* 4.902	40.03	PK3	34	-29.5	44.53	-	-	74	-29.47	360	200	H
* 4.899	26.8	VB1T	34	-29.5	31.3	54	-22.7	-	-	360	200	H
* 11.156	36.34	PK3	37.9	-22.7	51.54	-	-	74	-22.46	360	200	V
* 11.156	23.69	VB1T	37.9	-22.7	38.89	54	-15.11	-	-	360	200	V
* 11.769	36.66	PK3	38.9	-22.4	53.16	-	-	74	-20.84	360	200	V
* 11.768	24.06	VB1T	38.9	-22.4	40.56	54	-13.44	-	-	360	200	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

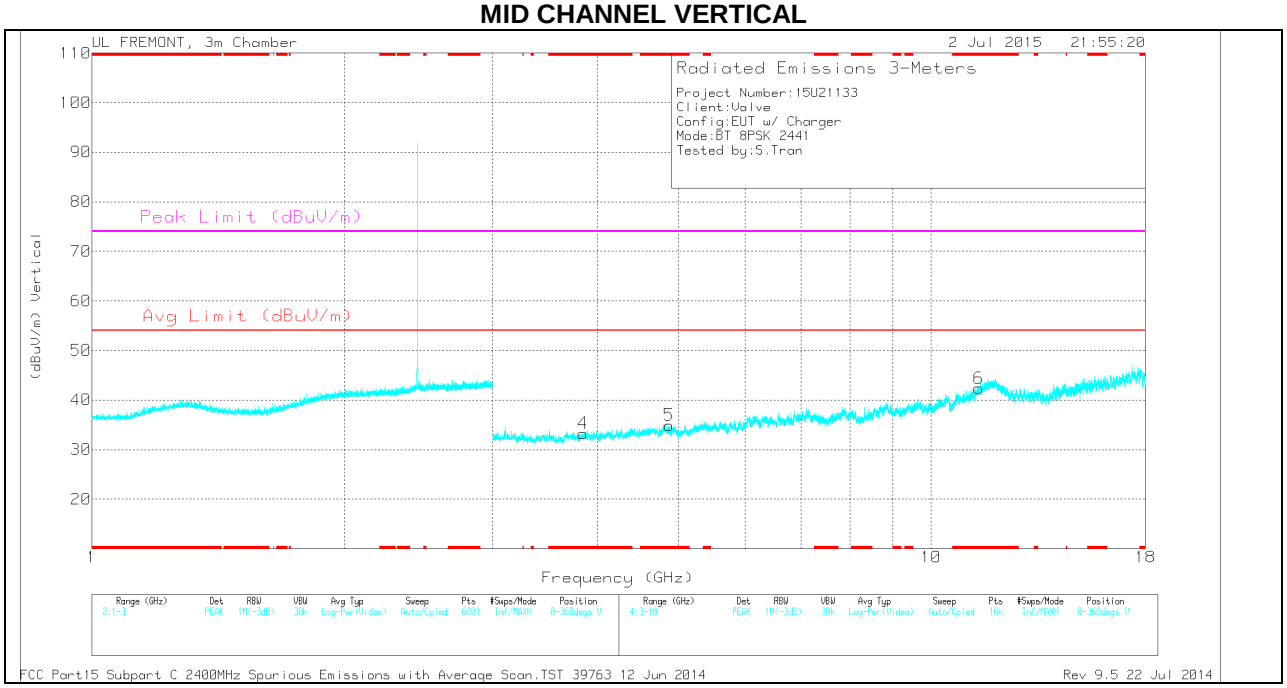
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

MID CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.299	33.17	PK	29.9	-23.2	39.87	-	-	74	-34.13	0-360	200	H
2	* 2.273	33.13	PK	31.6	-22.4	42.33	-	-	74	-31.67	0-360	200	H
3	* 2.809	32.64	PK	32.6	-22.1	43.14	-	-	74	-30.86	0-360	100	H
4	* 3.848	30.6	PK	33.1	-30.4	33.3	-	-	74	-40.7	0-360	200	V
5	* 4.868	30.05	PK	34	-29.1	34.95	-	-	74	-39.05	0-360	100	V
6	* 11.398	27.06	PK	38.2	-22.9	42.36	-	-	74	-31.64	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

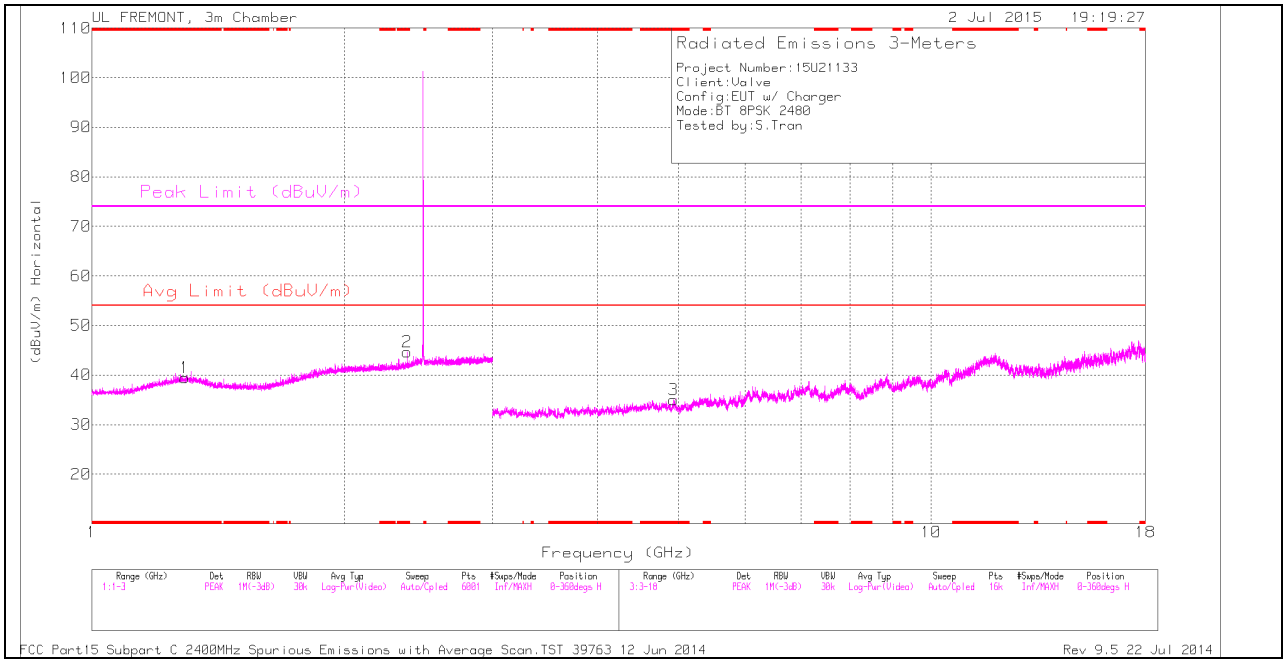
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.299	42.79	PK3	29.9	-23.2	49.49	-	-	74	-24.51	360	200	H
* 1.298	29.7	VB1T	29.9	-23.2	36.4	54	-17.6	-	-	360	200	H
* 2.275	42.21	PK3	31.6	-22.4	51.41	-	-	74	-22.59	360	200	H
* 2.274	29.47	VB1T	31.6	-22.4	38.67	54	-15.33	-	-	360	200	H
* 2.81	42.34	PK3	32.6	-22.1	52.84	-	-	74	-21.16	360	100	H
* 2.808	29.56	VB1T	32.6	-22.1	40.06	54	-13.94	-	-	360	100	H
* 3.85	40.14	PK3	33.1	-30.4	42.84	-	-	74	-31.16	360	200	V
* 3.848	27.57	VB1T	33.1	-30.5	30.17	54	-23.83	-	-	360	200	V
* 4.866	39.5	PK3	34	-29.1	44.4	-	-	74	-29.6	360	100	V
* 4.867	26.62	VB1T	34	-29.1	31.52	54	-22.48	-	-	360	100	V
* 11.398	36.51	PK3	38.2	-22.9	51.81	-	-	74	-22.19	360	100	V
* 11.399	24.11	VB1T	38.2	-22.9	39.41	54	-14.59	-	-	360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

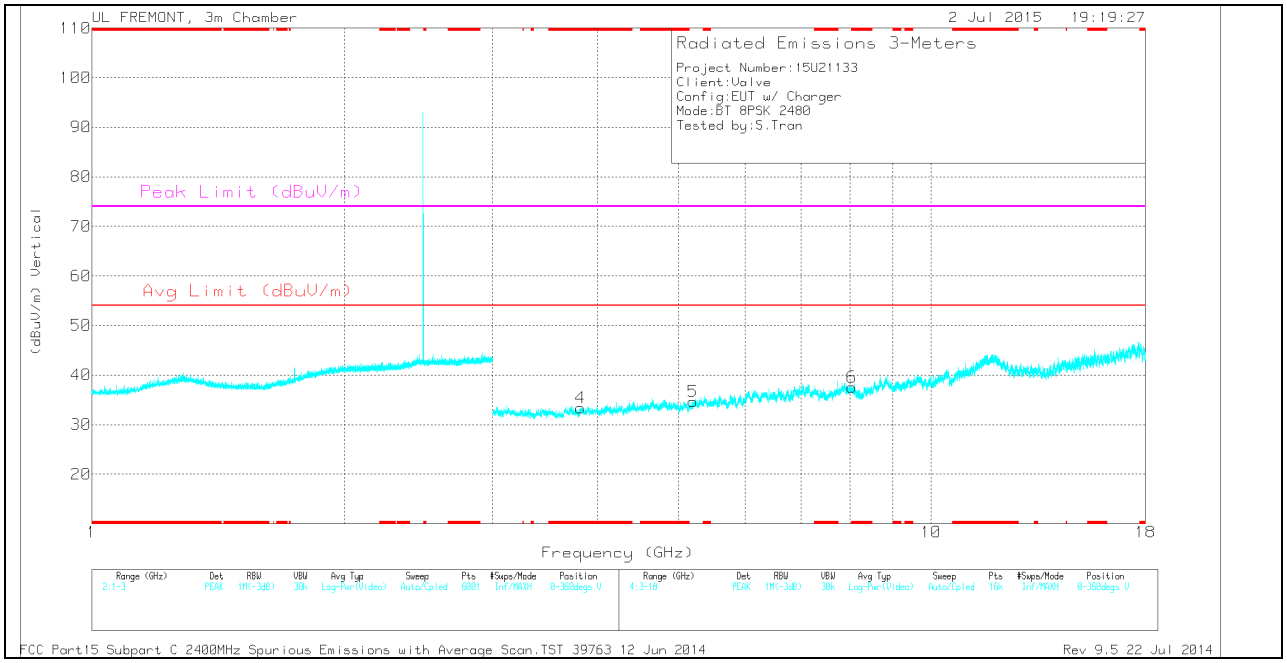
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.291	32.81	PK	29.8	-23.1	39.51	-	-	74	-34.49	0-360	100	H
2	* 2.374	35.21	PK	31.9	-22.4	44.71	-	-	74	-29.29	0-360	200	H
3	* 4.933	30.66	PK	34	-29.7	34.96	-	-	74	-39.04	0-360	100	H
4	* 3.823	30.52	PK	33.1	-30.2	33.42	-	-	74	-40.58	0-360	100	V
6	* 8.043	28.7	PK	35.7	-26.8	37.6	-	-	74	-36.4	0-360	100	V
5	5.201	30.51	PK	34.3	-30.2	34.61	-	-	-	-	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.293	42.93	PK3	29.8	-23.1	49.63	-	-	74	-24.37	360	100	H
* 1.292	29.76	VB1T	29.8	-23.1	36.46	54	-17.54	-	-	360	100	H
* 2.372	42.28	PK3	31.9	-22.4	51.78	-	-	74	-22.22	360	200	H
* 2.375	29.71	VB1T	31.9	-22.4	39.21	54	-14.79	-	-	360	200	H
* 4.933	40.1	PK3	34	-29.7	44.4	-	-	74	-29.6	360	100	H
* 4.932	27.68	VB1T	34	-29.7	31.98	54	-22.02	-	-	360	100	H
* 3.821	39.66	PK3	33.1	-30.3	42.46	-	-	74	-31.54	360	100	V
* 3.821	27.28	VB1T	33.1	-30.3	30.08	54	-23.92	-	-	360	100	V
* 8.044	37.92	PK3	35.7	-26.7	46.92	-	-	74	-27.08	360	100	V
* 8.045	25.51	VB1T	35.7	-26.7	34.51	54	-19.49	-	-	360	100	V
5.199	27.34	VB1T	34.3	-30.3	31.34	-	-	-	-	360	100	V
5.2	39.86	PK3	34.3	-30.2	43.96	-	-	-	-	360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

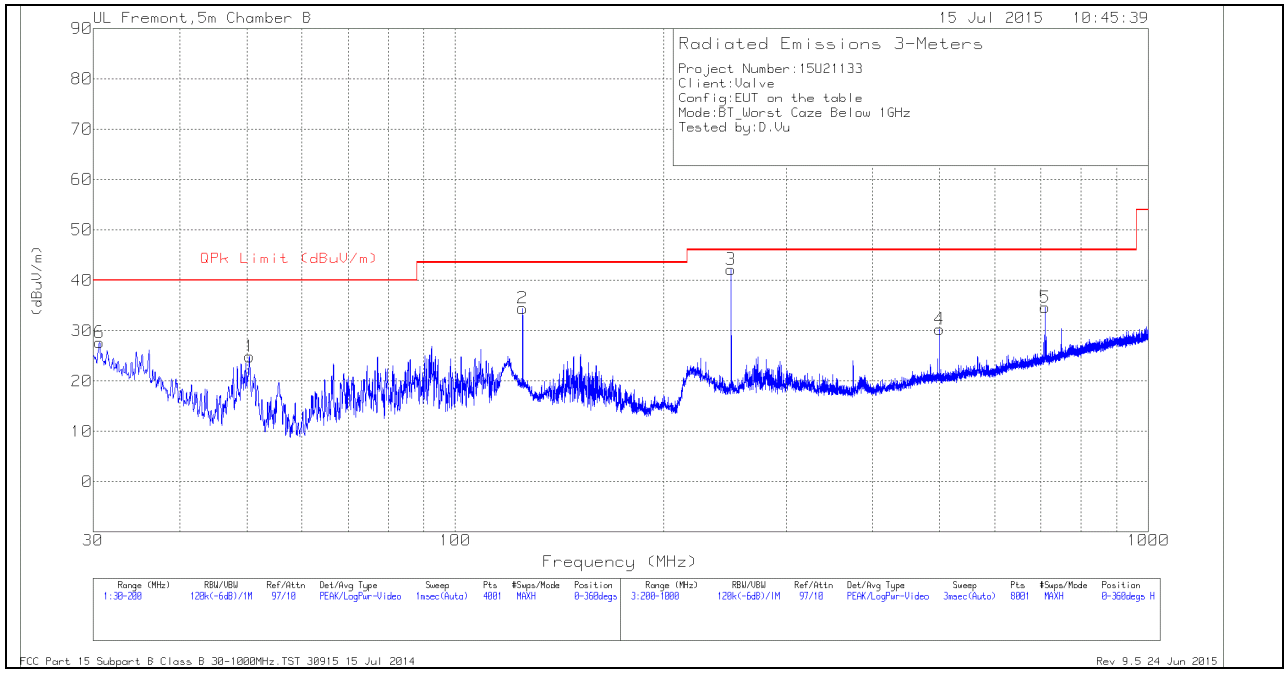
PK3 - FHSS Method: Maximum Peak

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

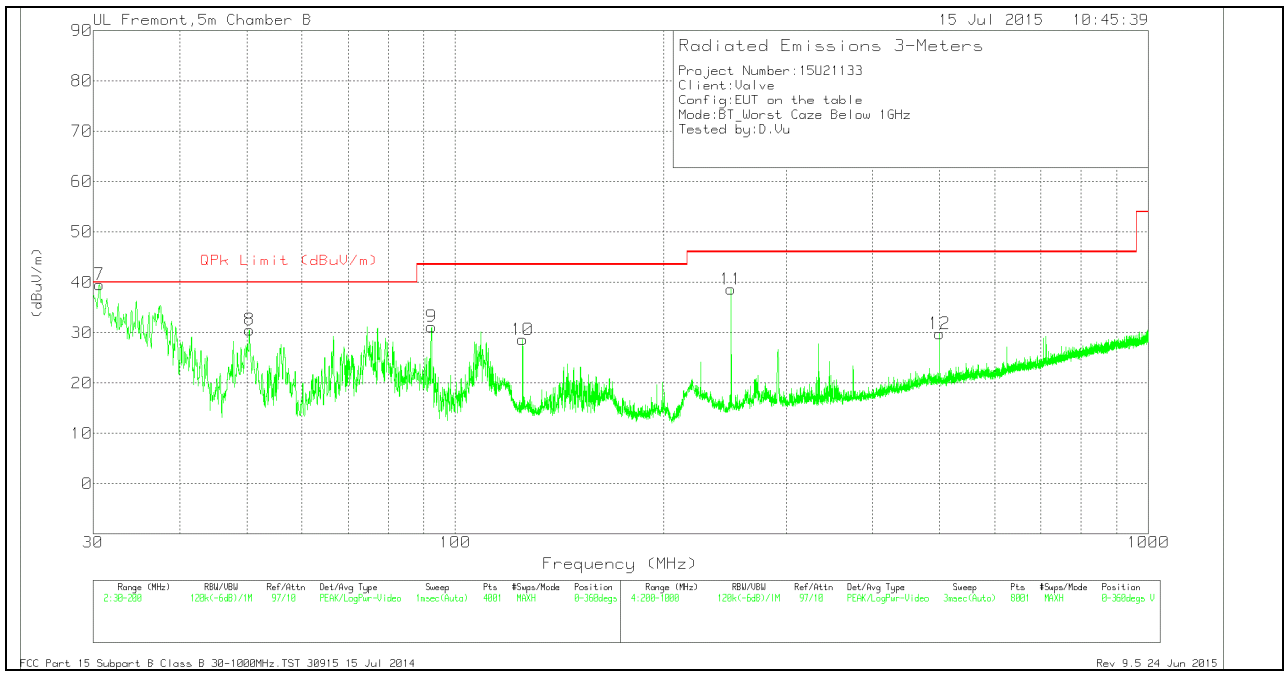
9.3. WORST-CASE BELOW 1 GHz

GFSK SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Class B QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	30.6375	36.16	Pk	20.3	-28.8	27.66	40	-12.34	0-360	199	H
7	30.6375	48.06	Pk	20.3	-28.8	39.56	40	-.44	0-360	101	V
1	50.4425	45.56	Pk	7.9	-28.6	24.86	40	-15.14	0-360	299	H
8	50.4425	51.27	Pk	7.9	-28.6	30.57	40	-9.43	0-360	101	V
9	92.39	51	Pk	8.2	-28	31.2	43.52	-12.32	0-360	101	V
2	125.03	47.96	Pk	14.2	-27.7	34.46	43.52	-9.06	0-360	199	H
10	125.03	42.13	Pk	14.2	-27.7	28.63	43.52	-14.89	0-360	101	V
3	250	56.86	Pk	11.6	-26.3	42.16	46.02	-3.86	0-360	101	H
11	250	53.31	Pk	11.6	-26.3	38.61	46.02	-7.41	0-360	101	V
4	500	38.19	Pk	17.8	-25.7	30.29	46.02	-15.73	0-360	199	H
12	500	37.7	Pk	17.8	-25.7	29.8	46.02	-16.22	0-360	199	V
5	709.5	38.54	Pk	20.4	-24.3	34.64	46.02	-11.38	0-360	399	H

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Class B QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
30.6235	44.94	Qp	20.3	-28.8	36.44	40	-3.56	351	106	V
250.0074	56.77	Qp	11.6	-26.3	42.07	46.02	-3.95	55	108	H

Qp - Quasi-Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
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.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

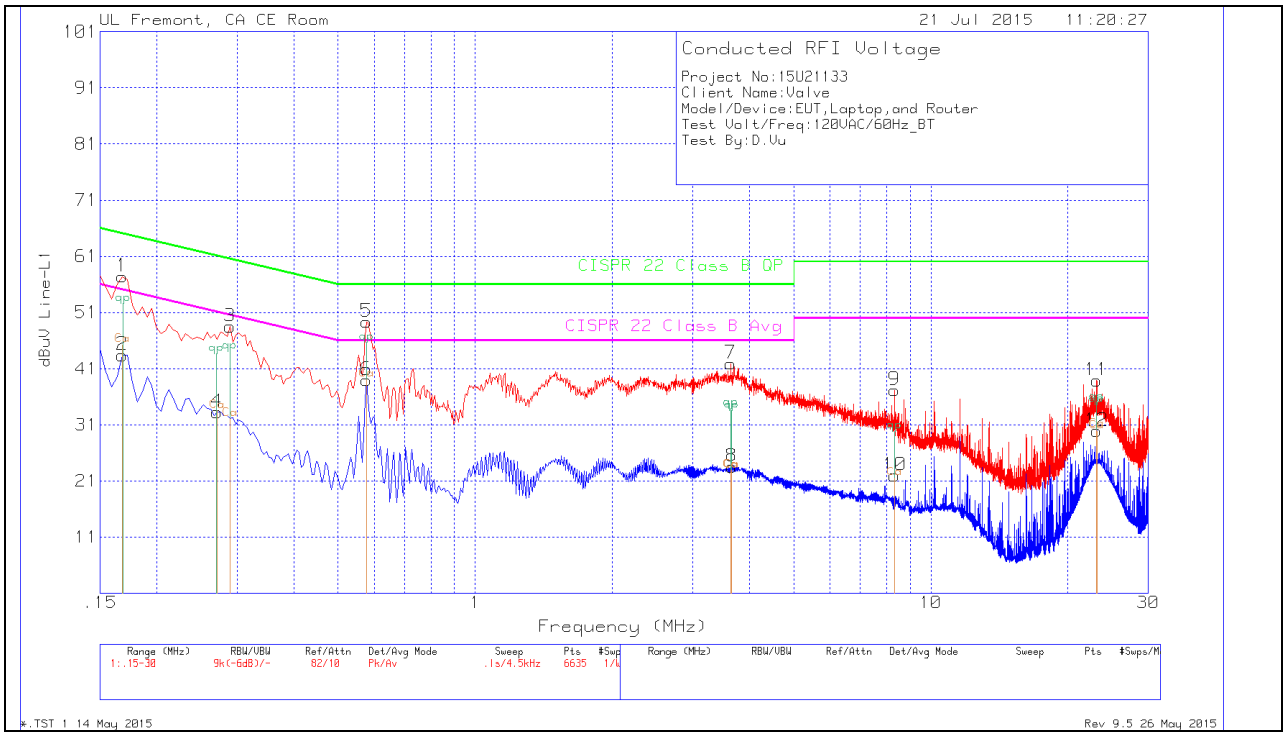
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

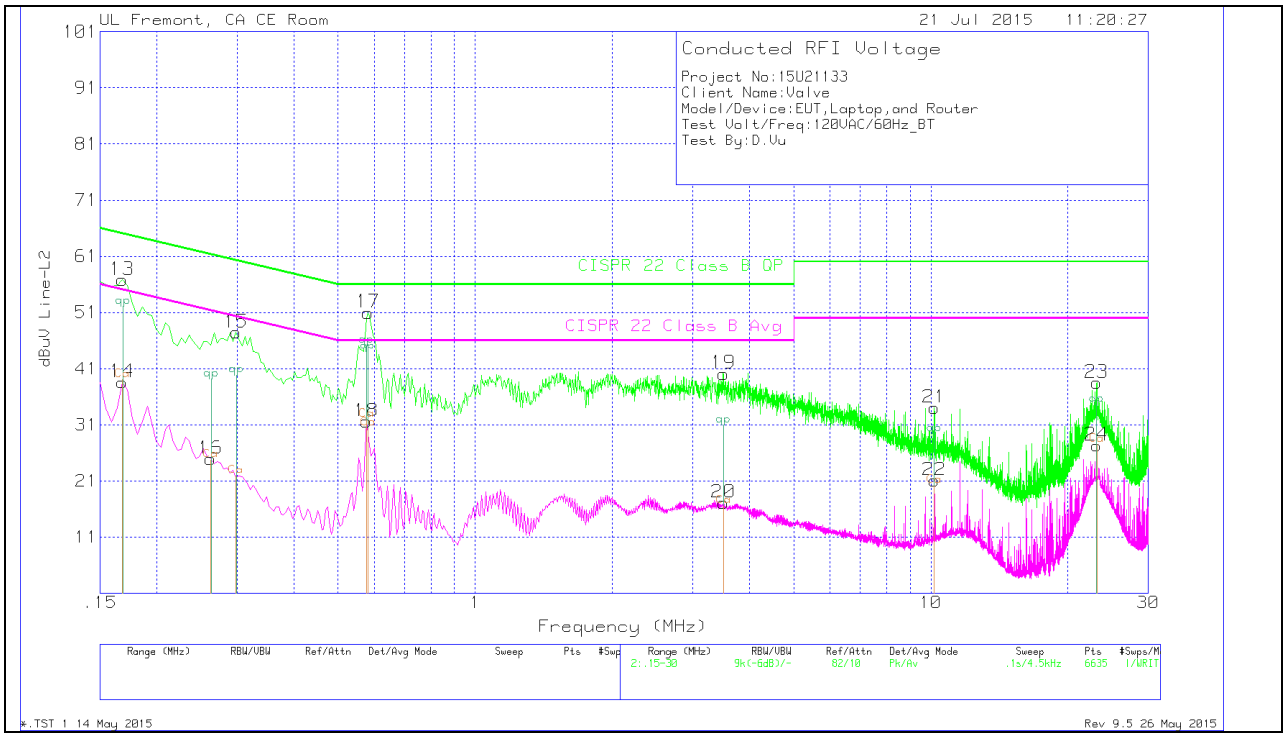
Range 1: Line-L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
.16868	44.05	Ca	1.2	0	45.25	-	-	55.03	-9.78
.28928	31.48	Ca	.6	0	32.08	-	-	50.55	-18.47
.27038	32.9	Ca	.6	0	33.5	-	-	51.11	-17.61
.57818	38.78	Ca	.3	0	39.08	-	-	46	-6.92
3.63863	22.64	Ca	.2	.1	22.94	-	-	46	-23.06
3.65618	22.58	Ca	.2	.1	22.88	-	-	46	-23.12
8.33168	21.2	Ca	.2	.1	21.5	-	-	50	-28.5
23.1281	29.65	Ca	.3	.2	30.15	-	-	50	-19.85
23.1304	29.32	Ca	.3	.2	29.82	-	-	50	-20.18

Range 1: Line-L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
.16868	51.39	Qp	1.2	0	52.59	65.03	-12.44	-	-
.28928	43.46	Qp	.6	0	44.06	60.55	-16.49	-	-
.27038	43.05	Qp	.6	0	43.65	61.11	-17.46	-	-
.57818	45.35	Qp	.3	0	45.65	56	-10.35	-	-
3.63863	33.65	Qp	.2	.1	33.95	56	-22.05	-	-
3.65618	33.22	Qp	.2	.1	33.52	56	-22.48	-	-
8.33168	29.54	Qp	.2	.1	29.84	60	-30.16	-	-
23.1281	34.53	Qp	.3	.2	35.03	60	-24.97	-	-
23.1304	34.13	Qp	.3	.2	34.63	60	-25.37	-	-

LINE 2 PLOT



LINE 2 RESULTS

Range 2: Line-L2 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
.16868	37.71	Ca	1.3	0	39.01	-	-	55.03	-16.02
.29918	21.27	Ca	.6	0	21.87	-	-	50.27	-28.4
.26363	24	Ca	.7	0	24.7	-	-	51.32	-26.62
.58088	30.09	Ca	.3	0	30.39	-	-	46	-15.61
.57728	31.62	Ca	.3	0	31.92	-	-	46	-14.08
3.50768	16.21	Ca	.2	.1	16.51	-	-	46	-29.49
10.1812	19.76	Ca	.2	.2	20.16	-	-	50	-29.84
23.1304	27	Ca	.3	.2	27.5	-	-	50	-22.5

Range 2: Line-L2 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
.16868	50.78	Qp	1.3	0	52.08	65.03	-12.95	-	-
.29918	39.26	Qp	.6	0	39.86	60.27	-20.41	-	-
.26363	38.44	Qp	.7	0	39.14	61.32	-22.18	-	-
.58088	43.72	Qp	.3	0	44.02	56	-11.98	-	-
.57728	44.8	Qp	.3	0	45.1	56	-10.9	-	-
3.50768	30.64	Qp	.2	.1	30.94	56	-25.06	-	-
10.1812	28.99	Qp	.2	.2	29.39	60	-30.61	-	-
23.1304	34.09	Qp	.3	.2	34.59	60	-25.41	-	-