



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1**

CERTIFICATION TEST REPORT

FOR

RADIO TRANSCEIVER DEVICE

MODEL NUMBER: 1688

FCC ID: C3K1688

IC ID: 3048A-1688

REPORT NUMBER: 15U21746-E1V1

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MICROSOFT CORP.
EUT DESCRIPTION: RADIO TRANSCEIVER DEVICE
MODEL: 1688
SERIAL NUMBER: 26653556, 28453556
DATE TESTED: SEPTEMBER 15 – 25, 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 C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 1.

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
<input checked="" type="checkbox"/> Chamber A(IC: 2324B-1)	<input type="checkbox"/> Chamber D(IC: 2324B-4)
<input type="checkbox"/> Chamber B(IC: 2324B-2)	<input type="checkbox"/> Chamber E(IC: 2324B-5)
<input checked="" type="checkbox"/> Chamber C(IC: 2324B-3)	<input type="checkbox"/> Chamber F(IC: 2324B-6)
	<input type="checkbox"/> Chamber G(IC: 2324B-7)
	<input type="checkbox"/> 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 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a radio transceiver device, which contains an integrated 802.11 a/b/g/n/ac and BT 4.1 radios.

5.2. MAXIMUM OUTPUT POWER

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	9.96	9.91
2402 - 2480	Enhanced 8PSK	9.17	8.26

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 FPCB antenna, with a maximum gain of 5.3dBi.

5.4. SOFTWARE AND FIRMWARE

The software installed in the EUT during testing was Microsoft Ver. Th2_analog1_dev.150917-2108.

The EUT HW Build Phase: EV3B

The test utility software used during testing was Microsoft WiFi Tool, Ver 3.2.1 (526/2015)

5.5. 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 Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	X1 Carbon	N/A	N/A
AC Adapter	Microsoft	1623	0D130B03GDE54	N/A

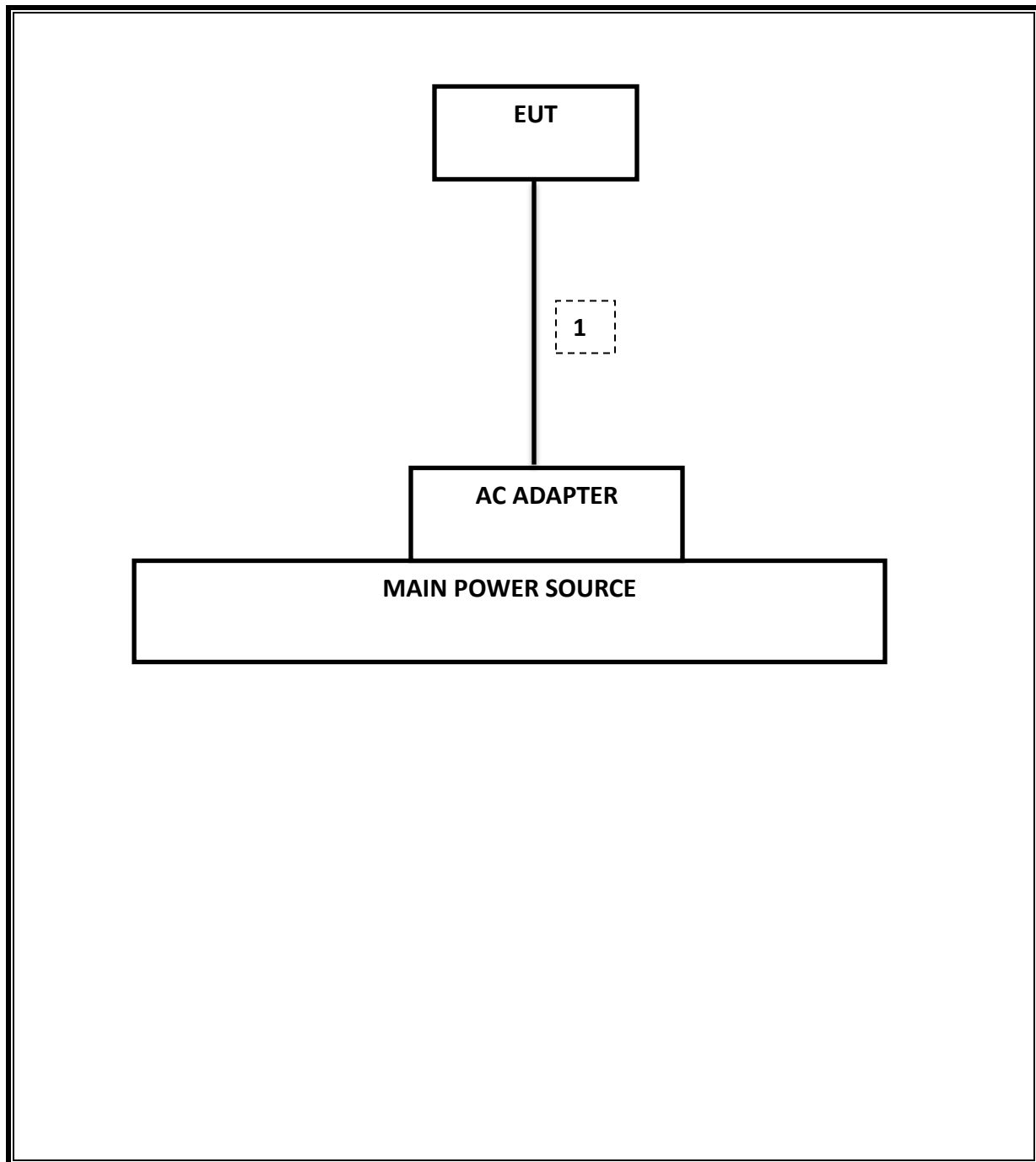
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A

TEST SETUP

EUT was set in the BT 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
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
Spectrum Analyzer, 9KHz-40GHz	HP	8564E	C00986	04/01/16
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/13/16
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/18/16
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
Antenna, Horn, 1-18 GHz	ETS	3117	C01022	02/21/16
Antenna, Horn, 18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/15
Antenna, Horn, 26-40 GHz	ARA	MWH-2640	C00891	06/28/16
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	03/06/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	T404	06/29/16
AC Power Supply, 2,500VA 45-500Hz	Elgar-Ametek	CW2501M	F00013	CNR
RF Preamplifier, 1GHz - 40GHz	Miteq	NSP4000-SP2	C00990	08/20/16
Attenuator / Switch driver	HP	11713A	F00204	CNR
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	F00219	05/23/16
High Pass Filter 6GHz	Micro-Tronics	HPS17542	F00222	05/22/16
High Pass Filter 3GHz	Micro-Tronics	HPM17543	F00224	05/22/16

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Version 9.5, 07/22/14
Conducted Software	UL	UL EMC	Version 9.5, 05/17/14
CLT Software	UL	UL RF	Version 1.0, 02/02/15
Antenna Port Software	UL	UL RF	Version 2.1.1.1, 1/20/15

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	0.867MHz
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-48.91dBm
15.247 (b)(1)	RSS-247 5.4(1)	TX conducted output power	<21dBm		Pass	9.96dBm
15.247 (a)(1)	RSS-247 5.1 (1)	Hopping frequency separation	> 25KHz		Pass	1MHz
15.247 (a)(1)(iii)	RSS-247 5.1(4)	Number of Hopping channels	More than 15 non-overlapping channels		Pass	79
15.247 (a)(1)(iii)	RSS-247 5.1(4)	Avg Time of Occupancy	< 0.4sec		Pass	0.2864sec
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	47.0dBuV
15.205, 15.209	RSS-GEN 8.9	Radiated Spurious Emission	< 54dBuV/m		Pass	46.33dBuV/m

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

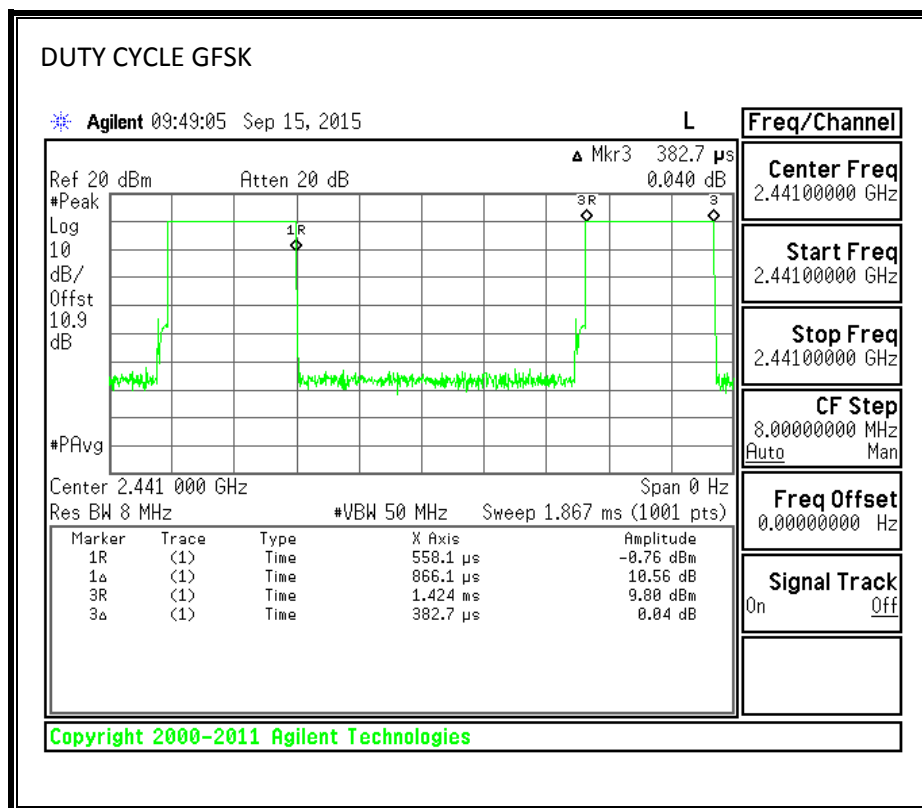
PROCEDURE

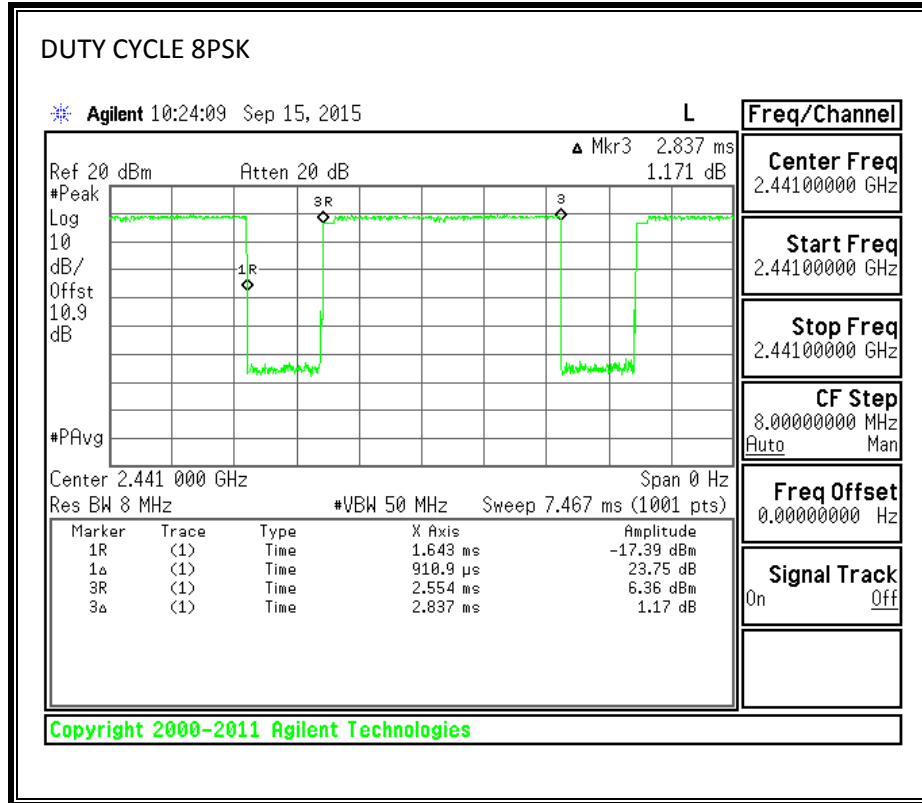
Zero-Span Spectrum Analyzer Method.

8.1.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
GFSK	0.383	1.249	0.306	30.6%	5.14	2.613
8PSK	2.837	3.748	0.757	75.7%	1.21	0.352

8.1.2. DUTY CYCLE PLOTS





8.2. 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 $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

8.2.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.852	0.839
Middle	2441	0.882	0.867
High	2480	0.880	0.877
Worst		0.852	0.867

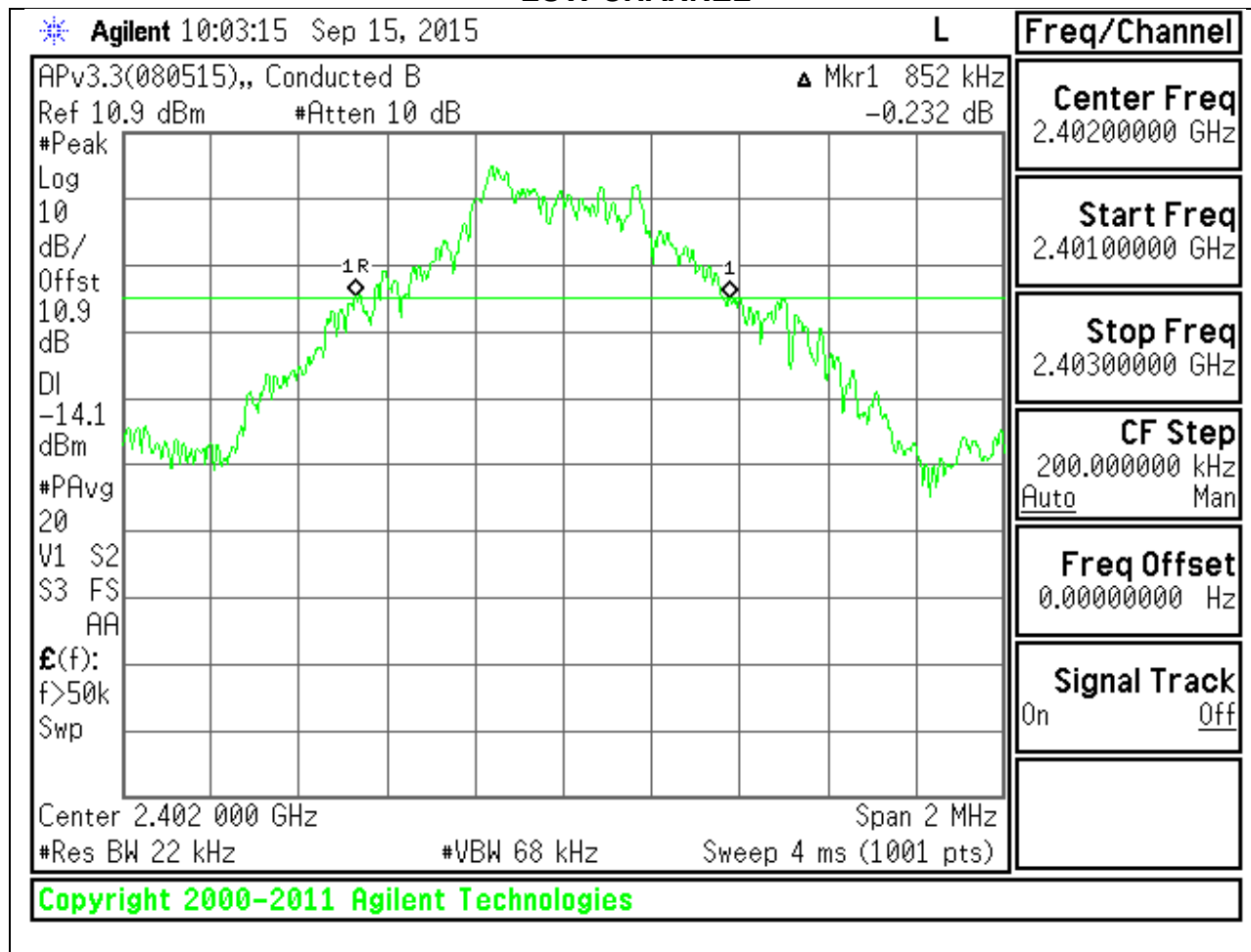
8.2.2. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.278	1.1563
Middle	2441	1.290	1.1696
High	2480	1.260	1.1649
Worst		1.260	1.1563

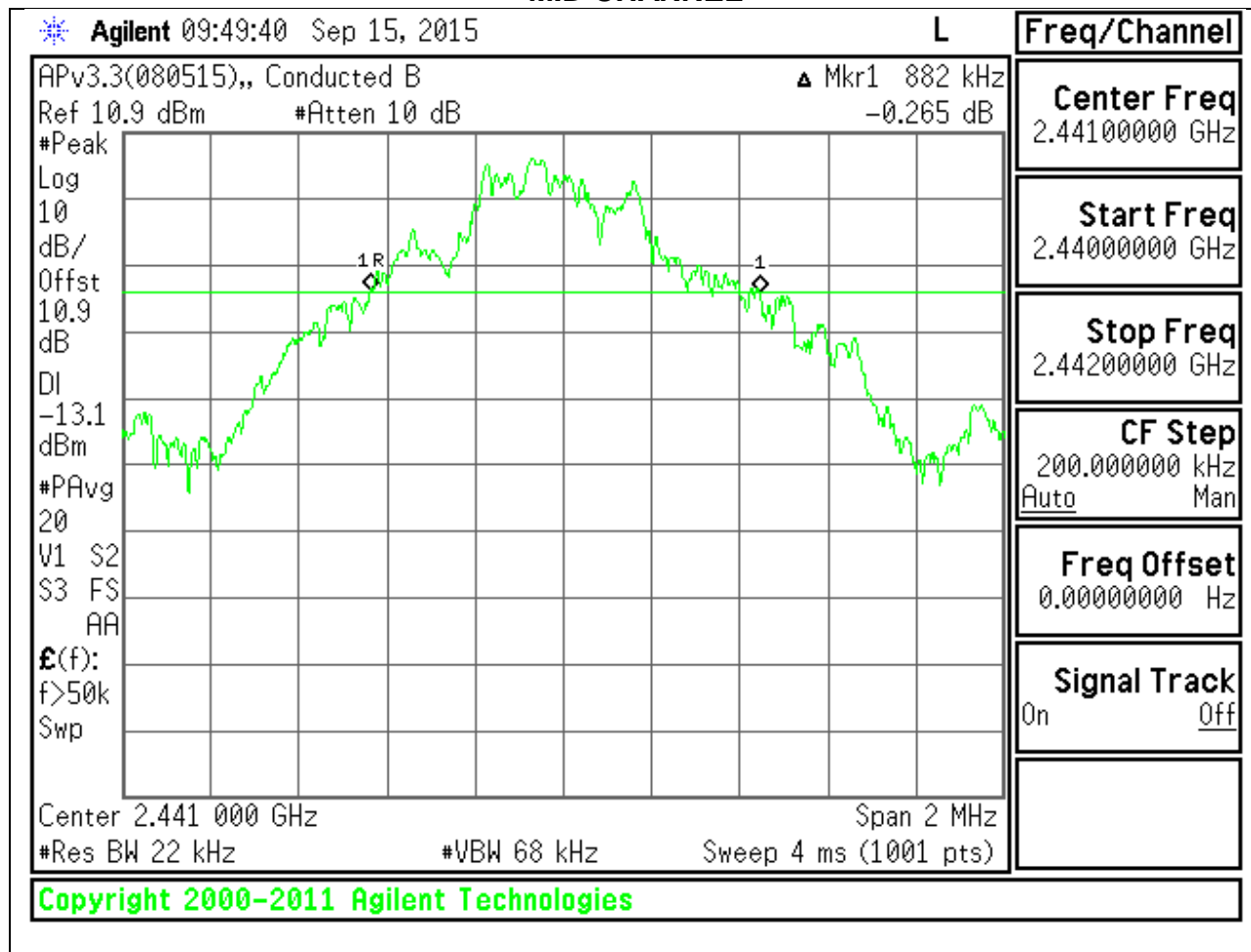
8.2.3. 20 dB AND 99% BANDWIDTH PLOTS

GFSK 20 dB BANDWIDTH

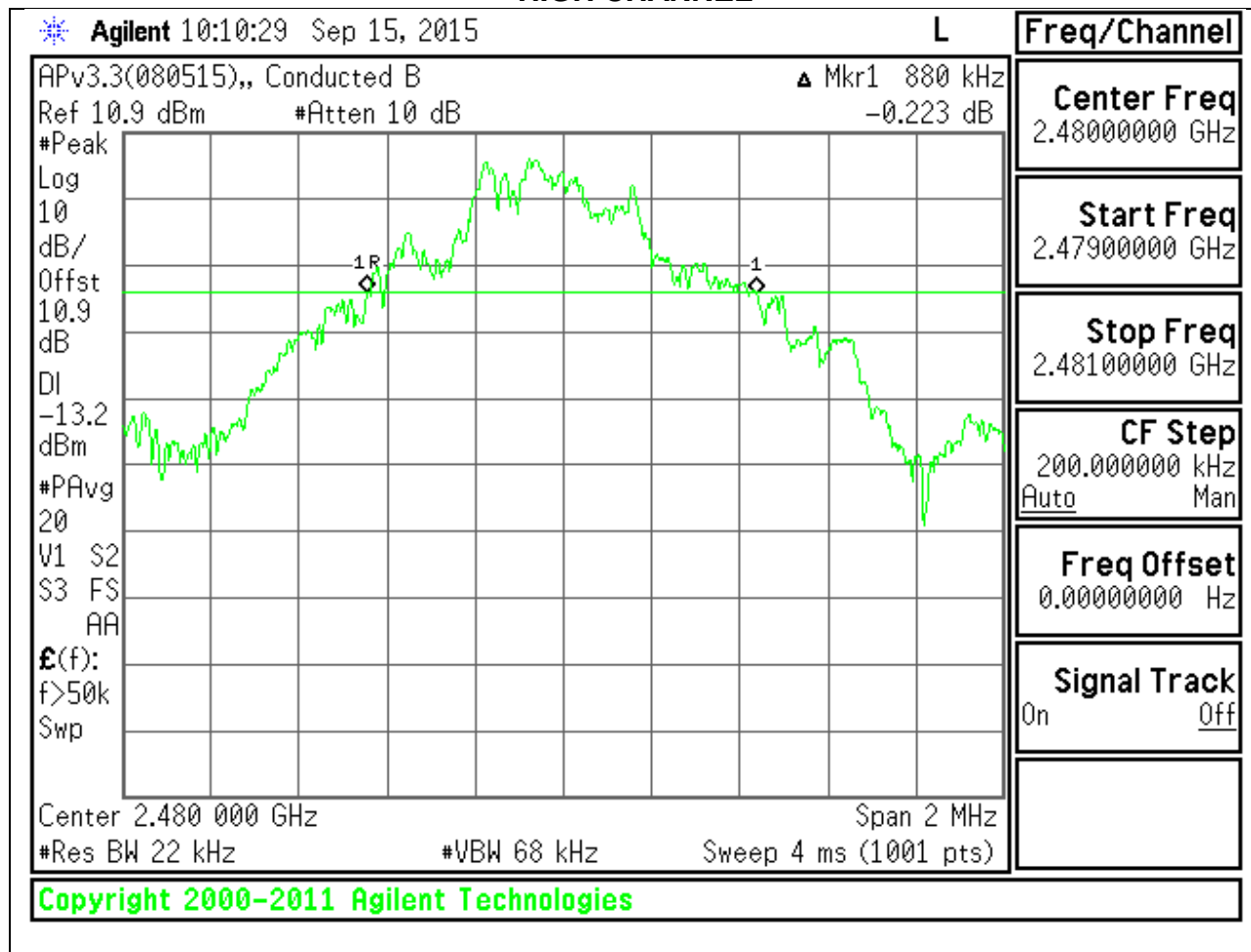
LOW CHANNEL



MID CHANNEL

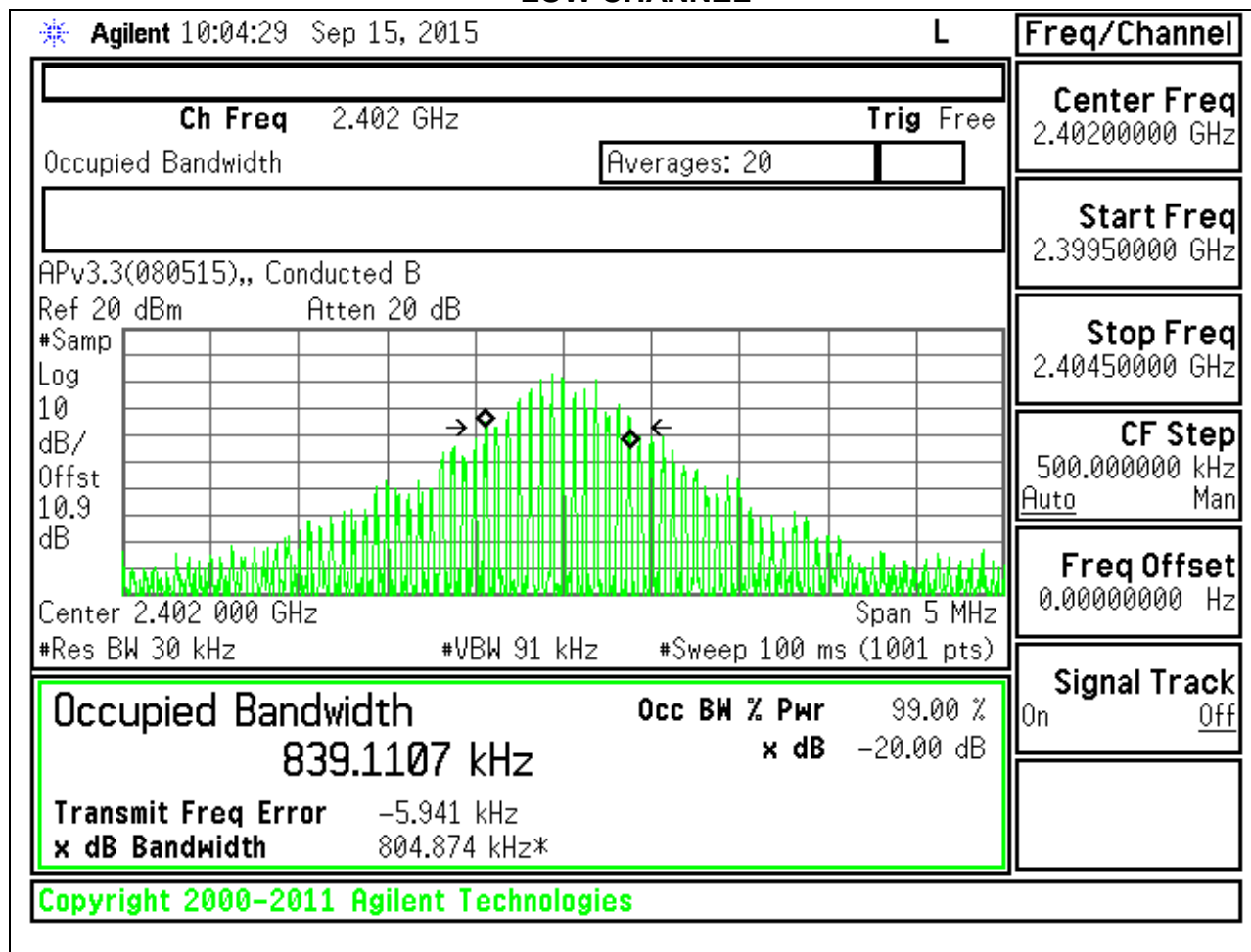


HIGH CHANNEL

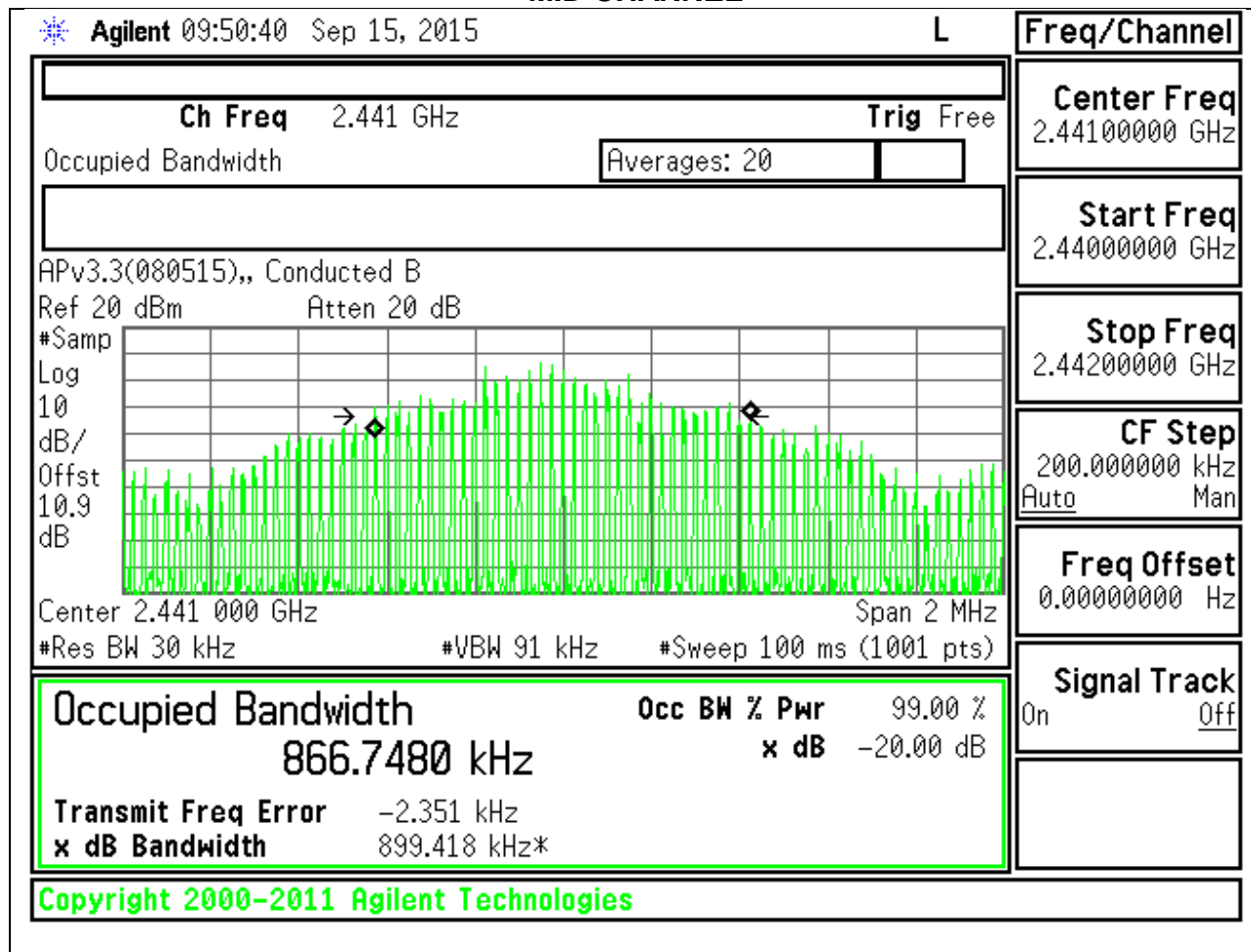


GFSK 99% BANDWIDTH

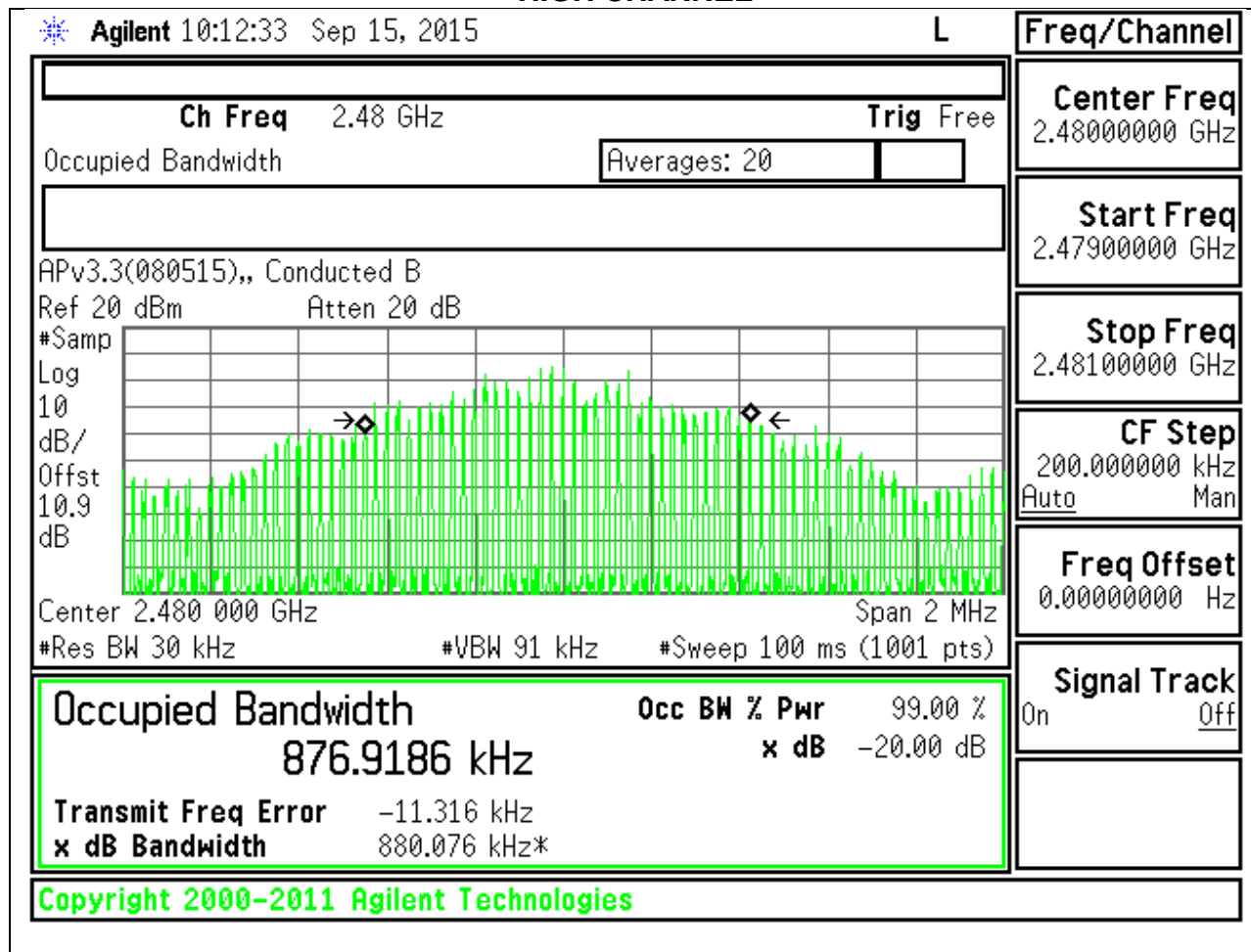
LOW CHANNEL



MID CHANNEL

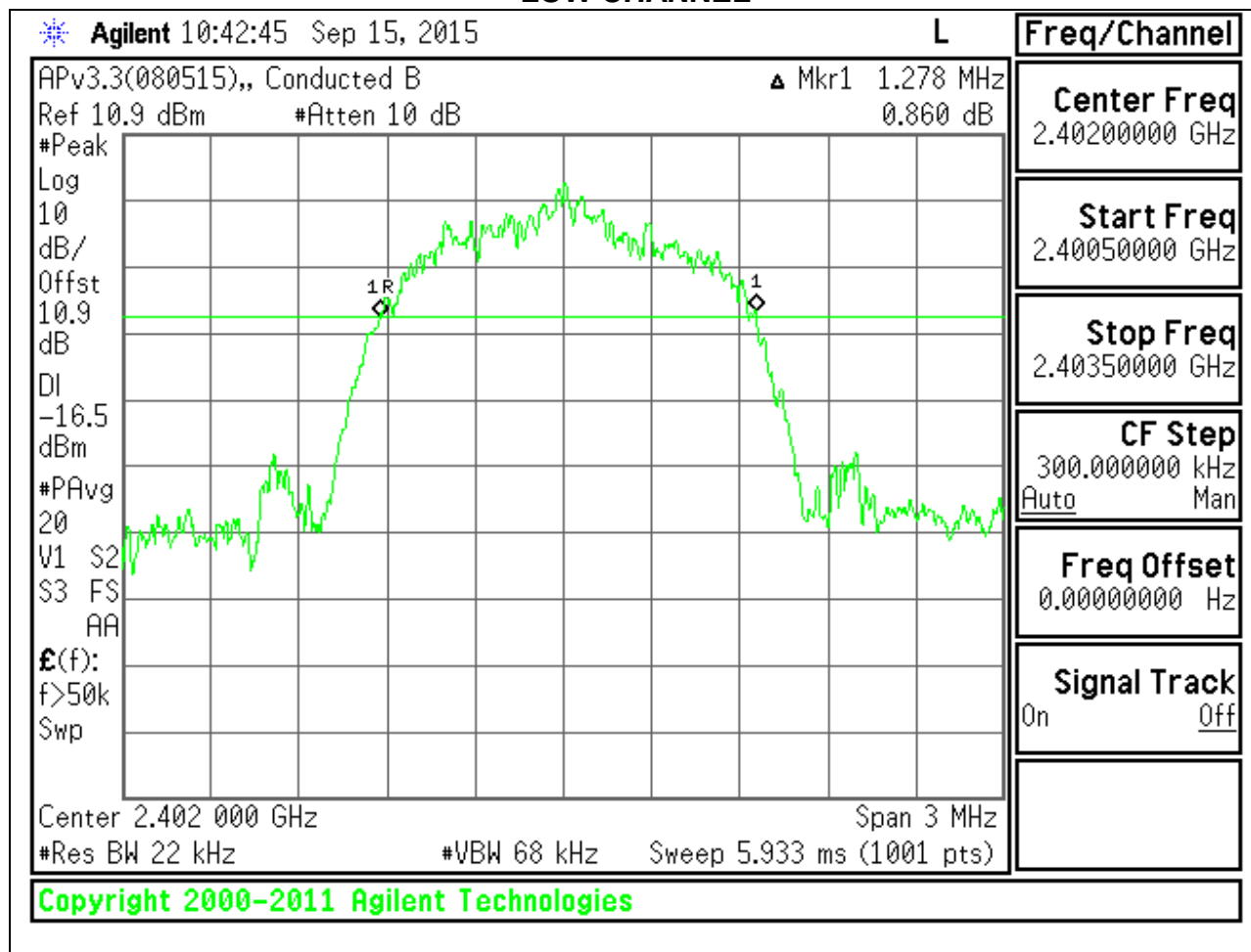


HIGH CHANNEL

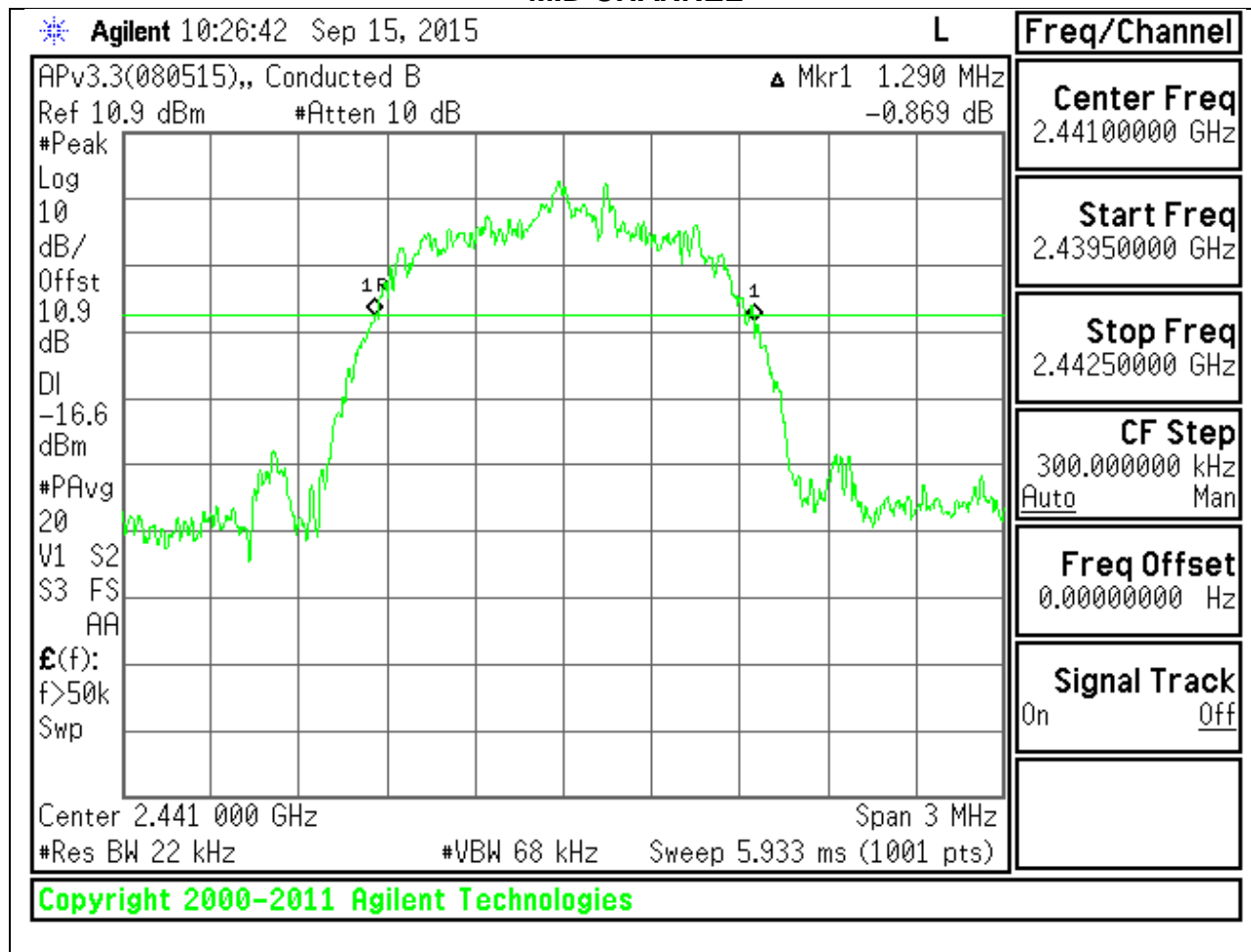


8PSK 20 dB BANDWIDTH

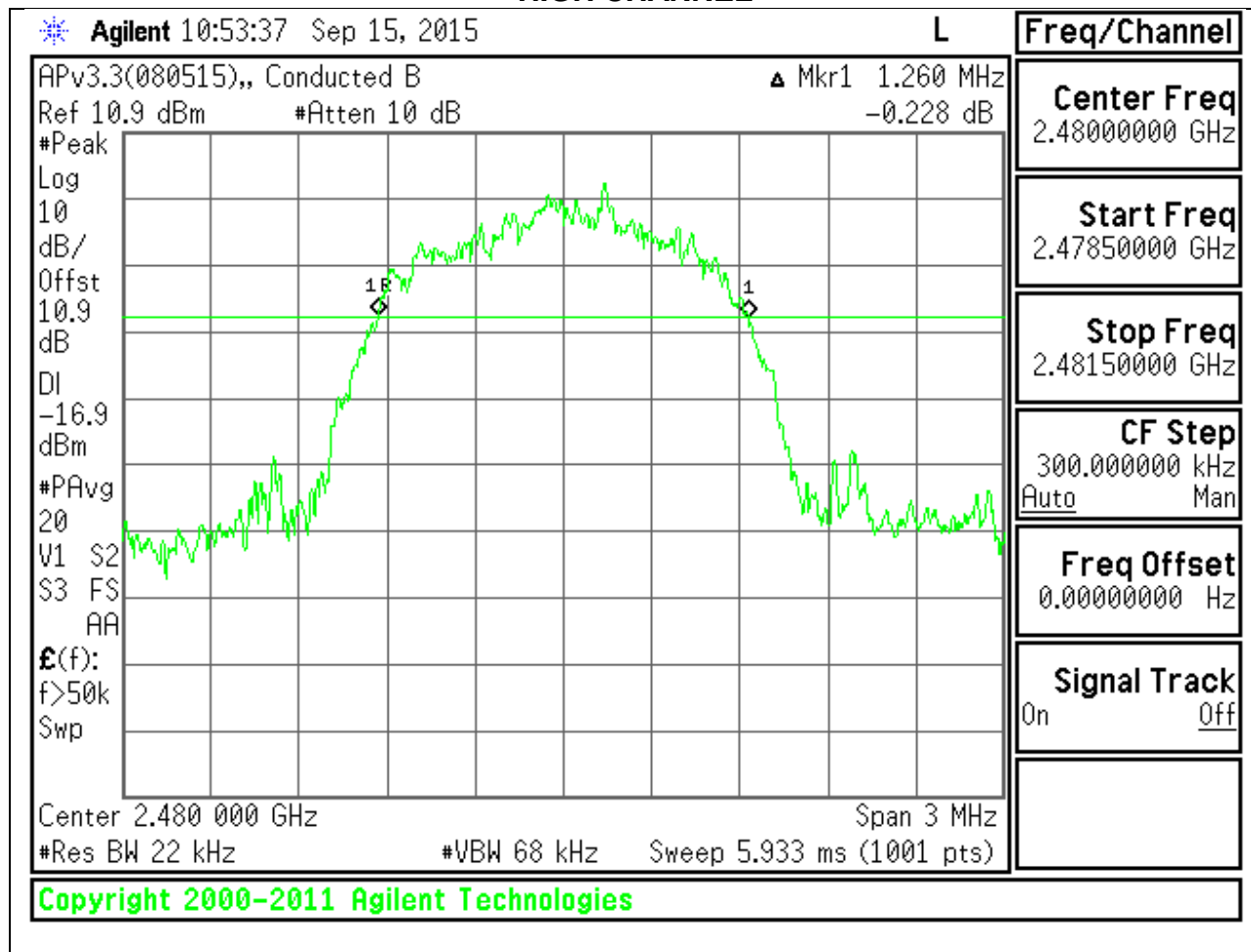
LOW CHANNEL



MID CHANNEL

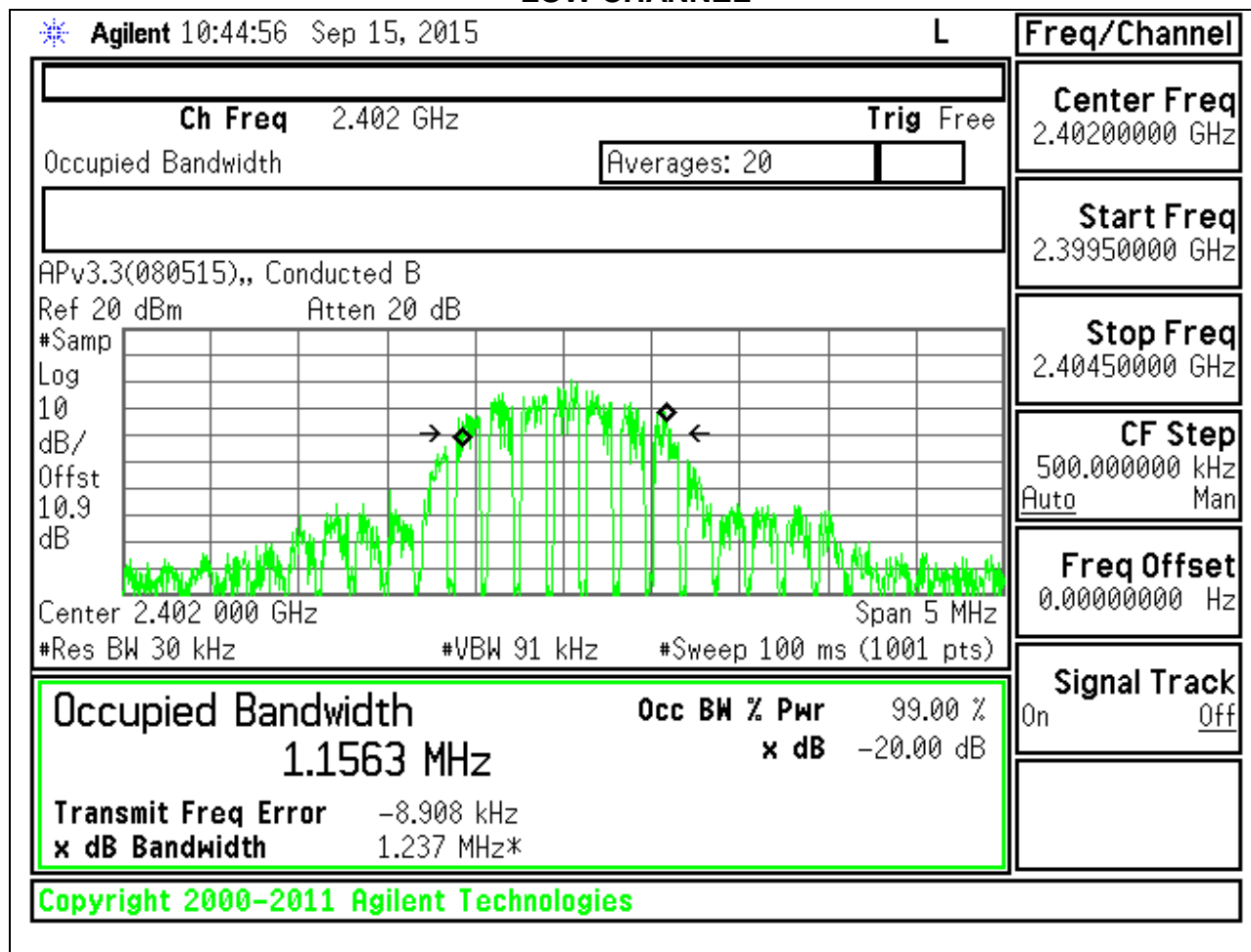


HIGH CHANNEL

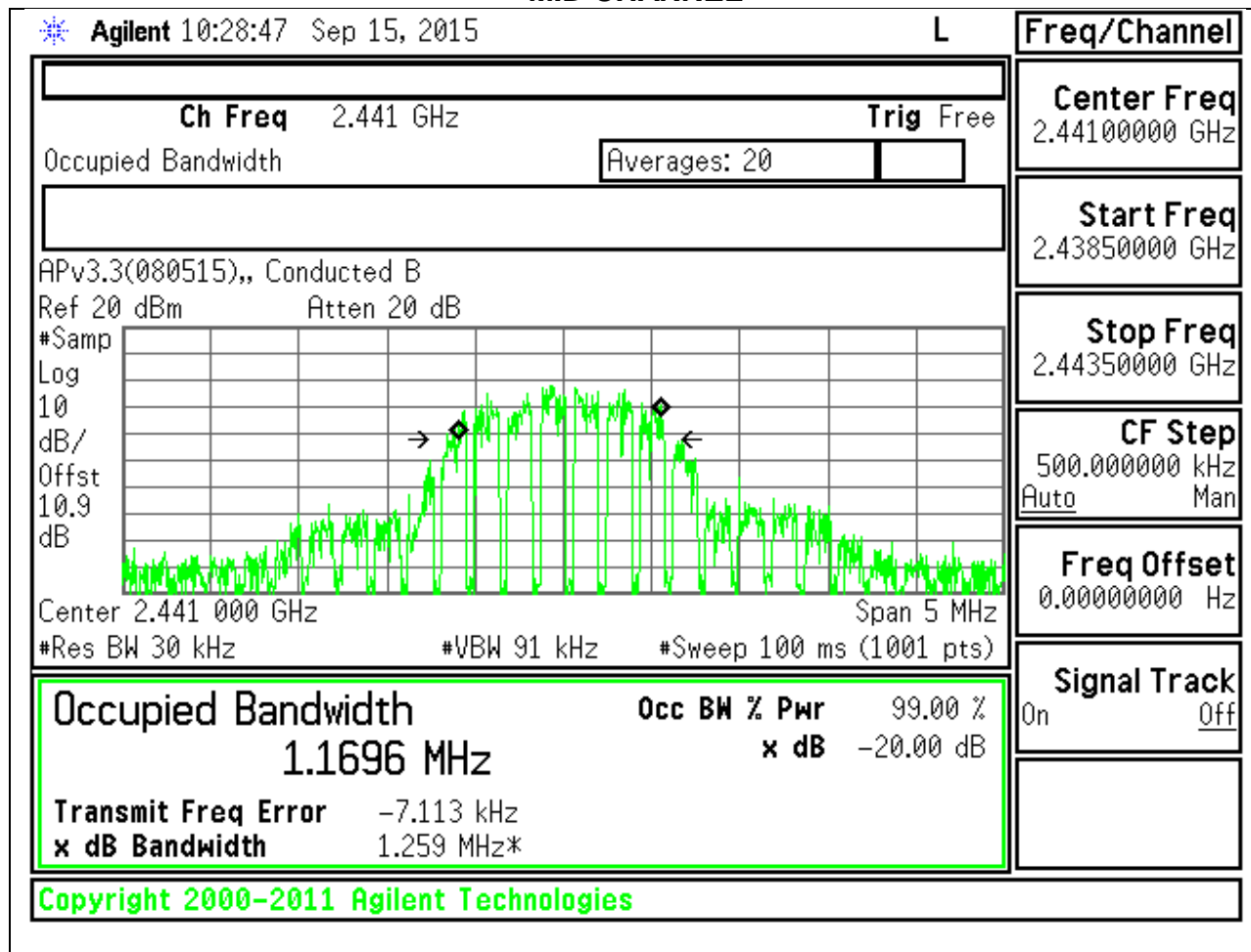


8PSK 99% BANDWIDTH

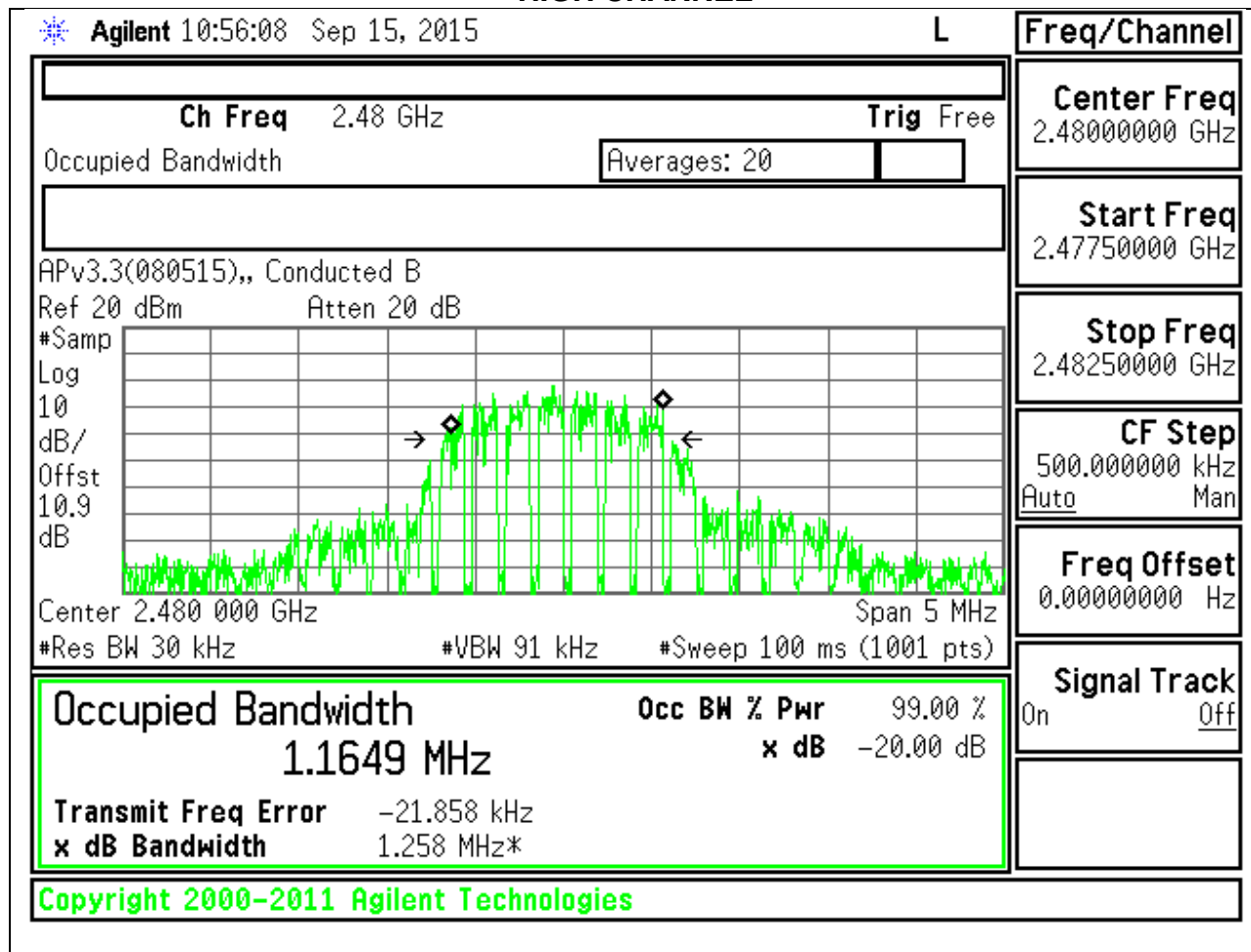
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.3. 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 hopping channel, whichever is greater.

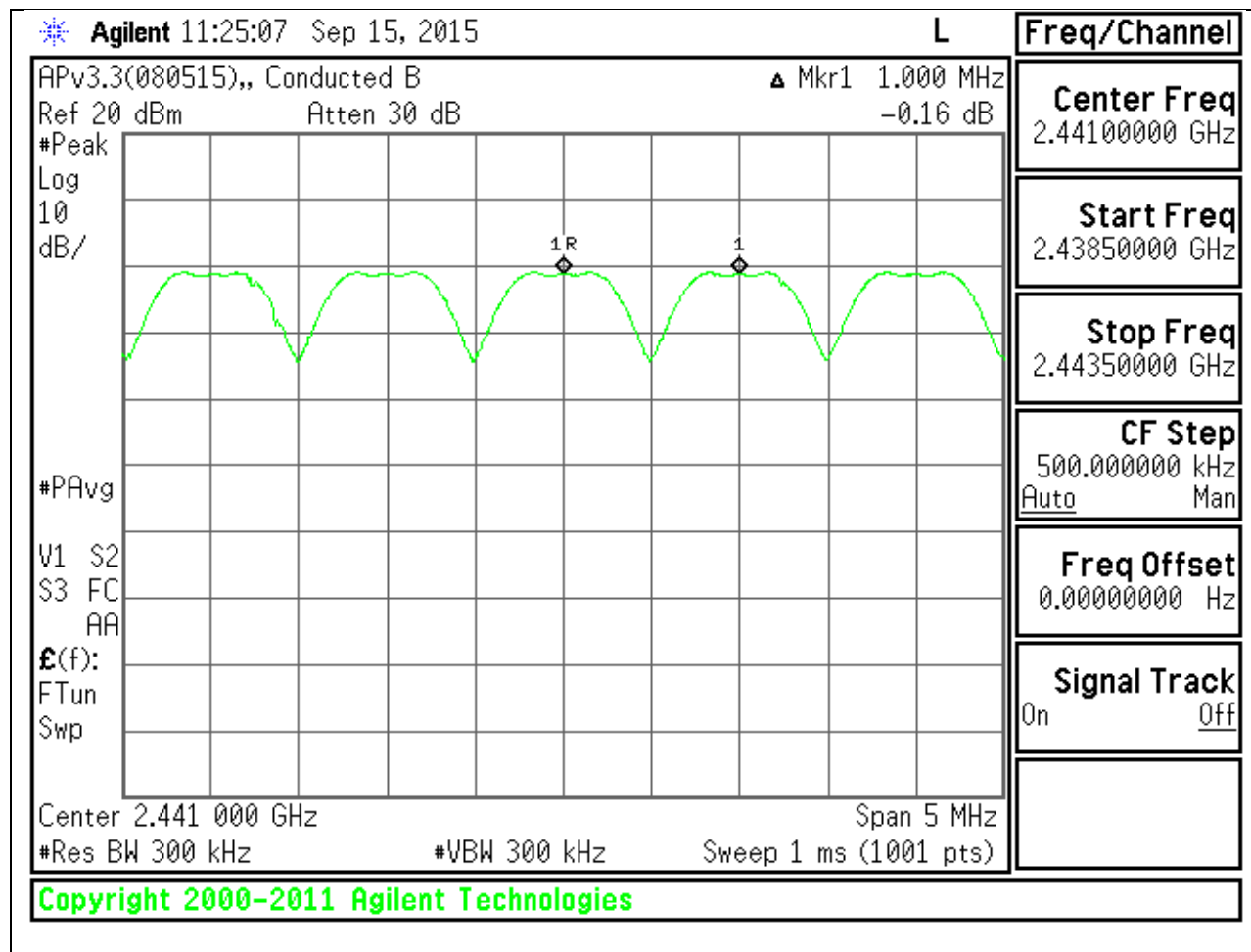
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



8.4. 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

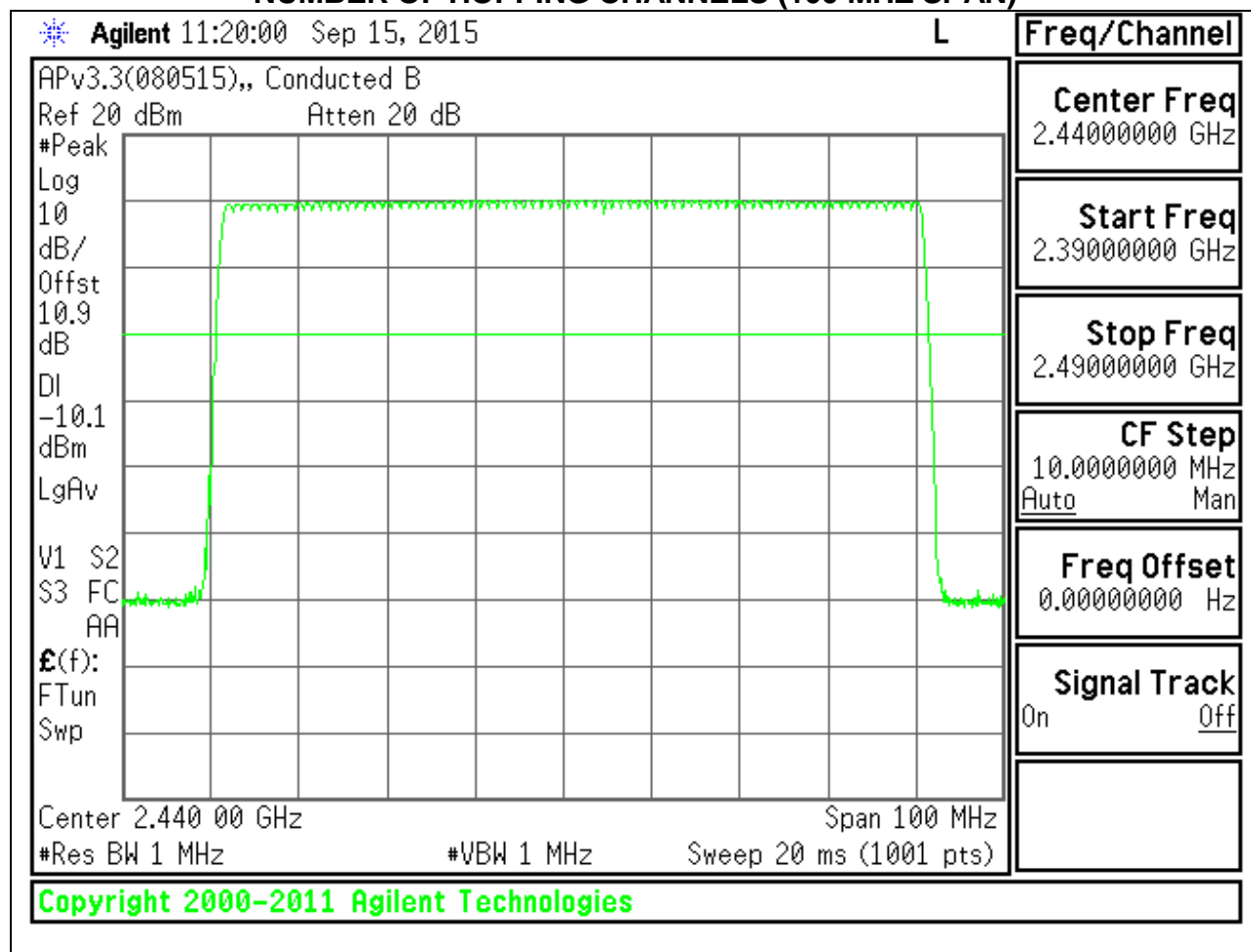
DA 00-705: The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

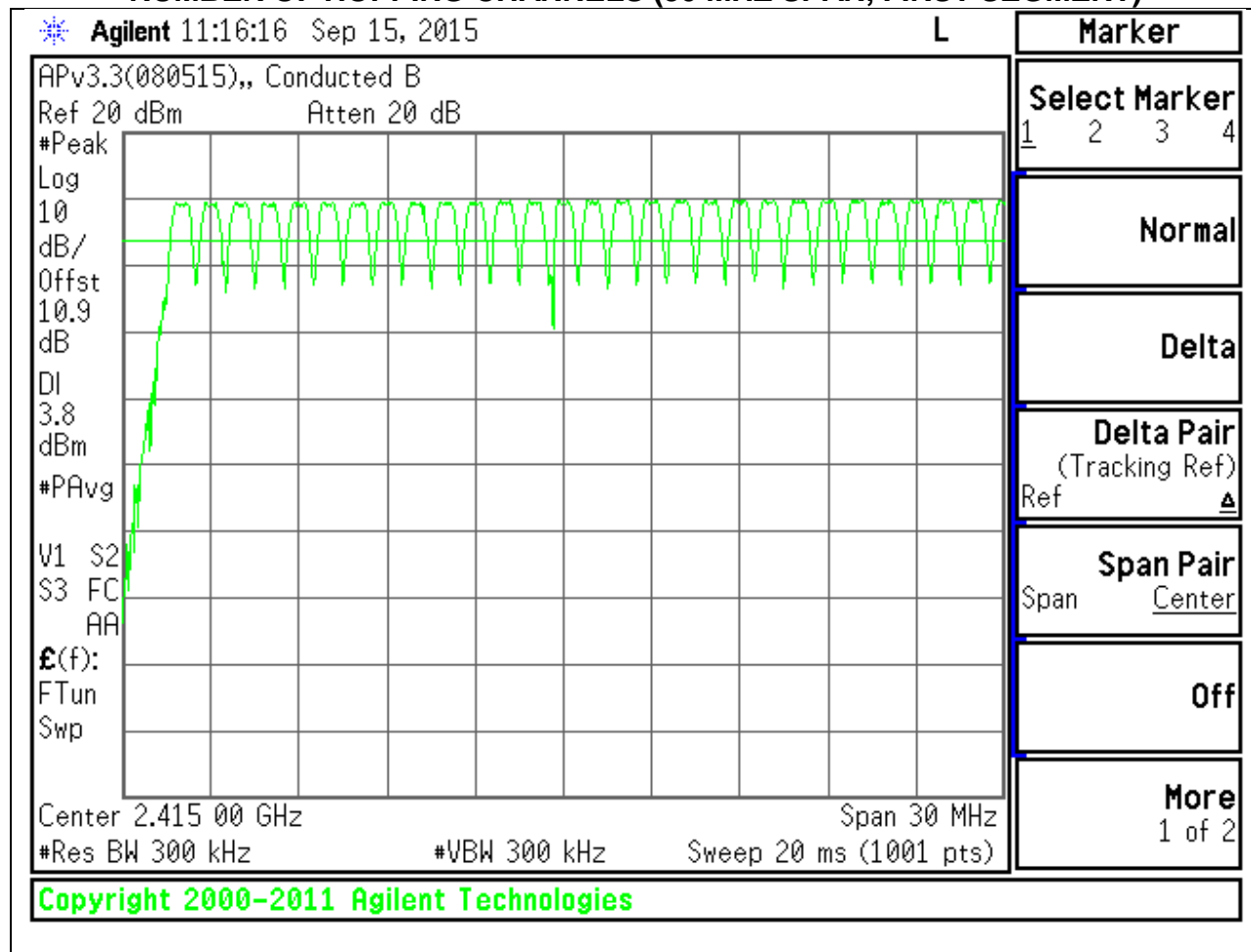
Normal Mode: 79 Channels observed.

NUMBER OF HOPPING CHANNELS PLOTS

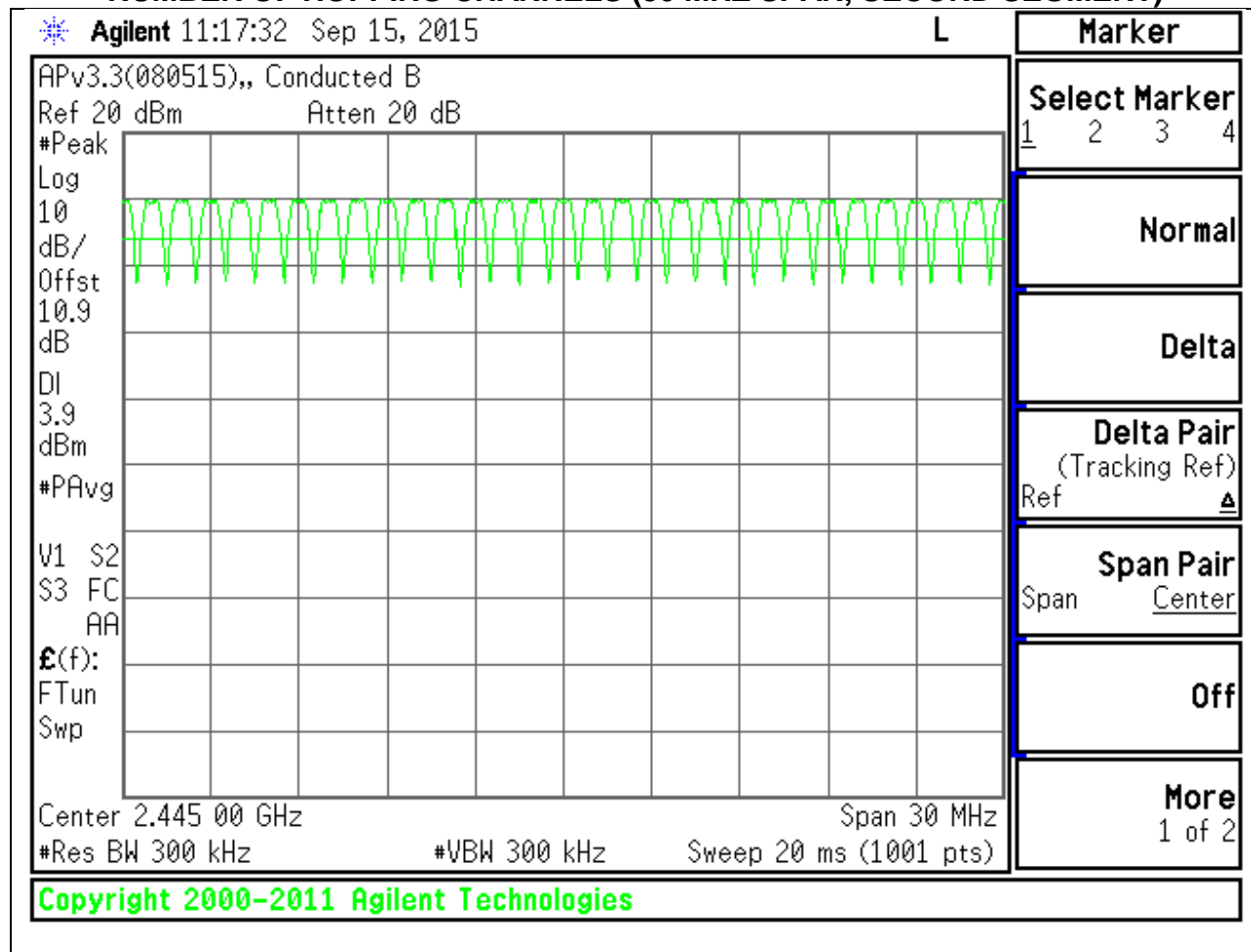
NUMBER OF HOPPING CHANNELS (100 MHz SPAN)



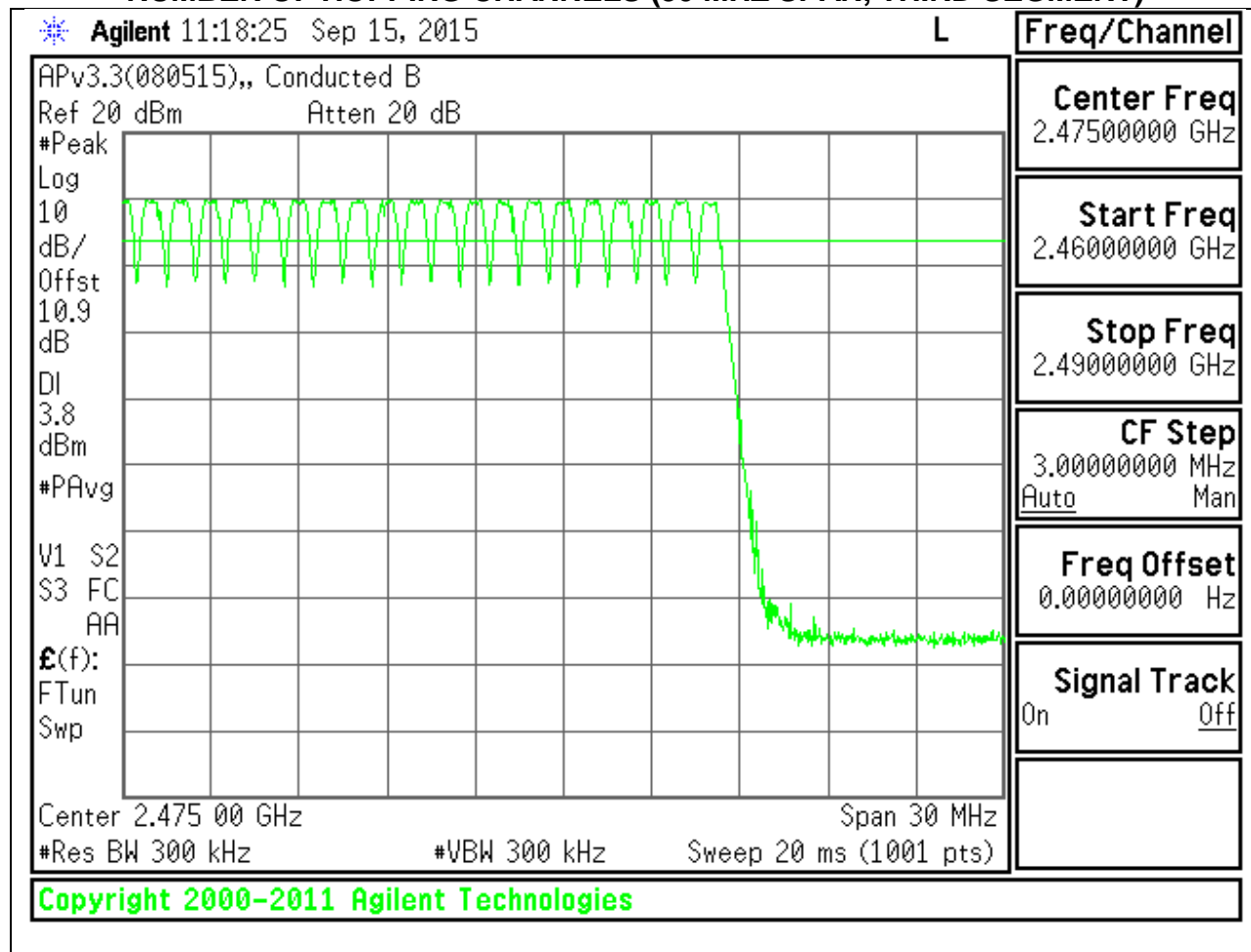
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



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



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



8.5. 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.

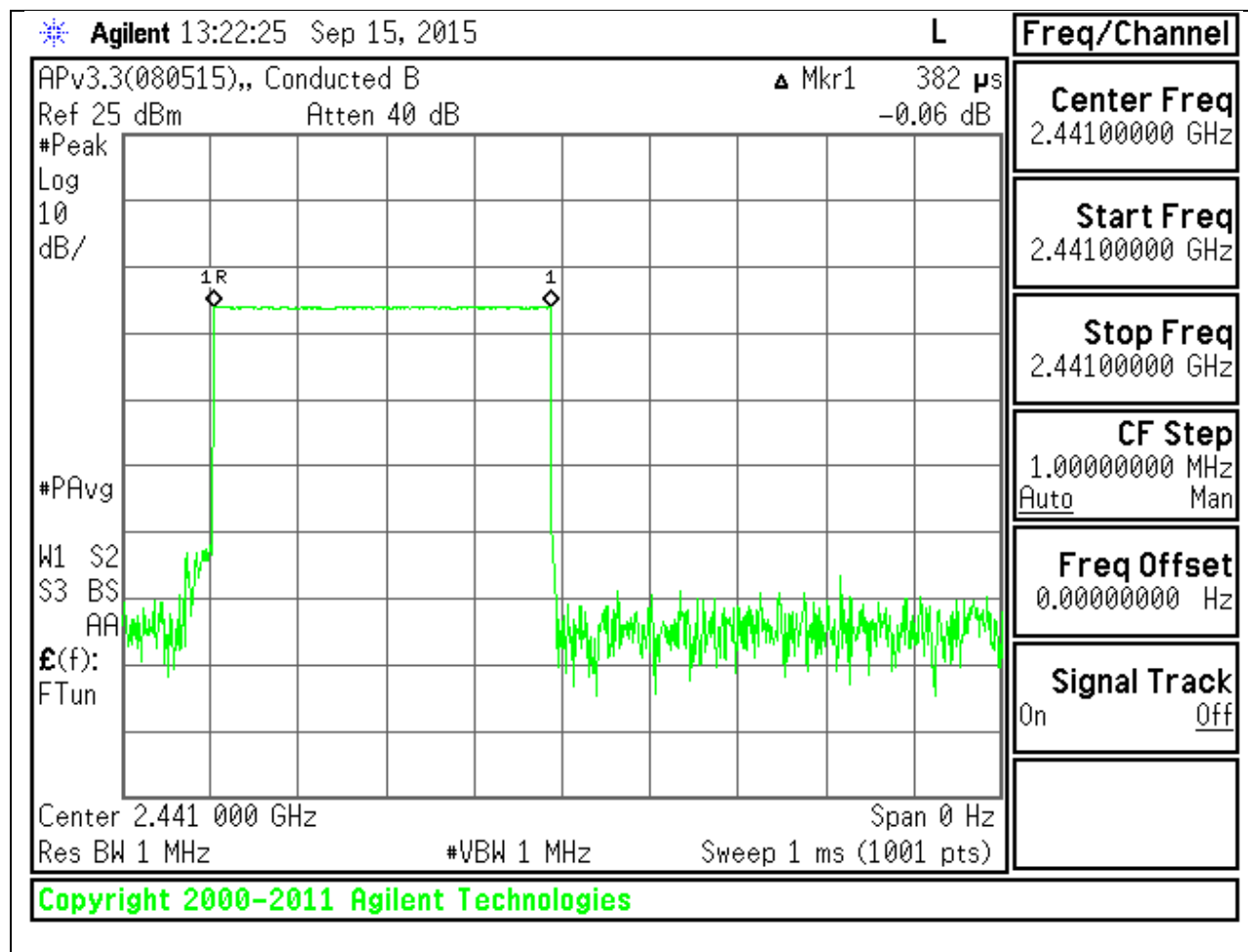
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

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

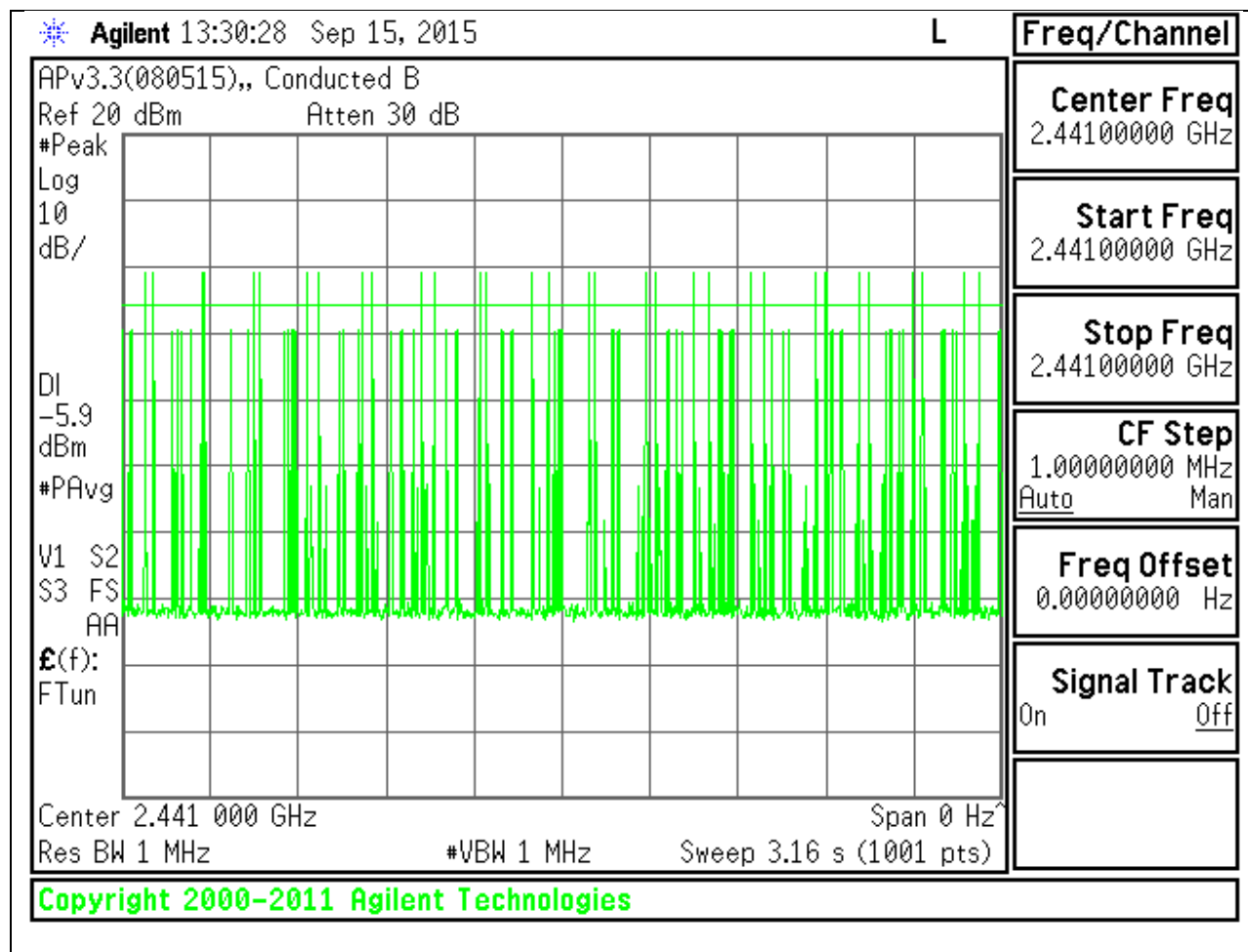
RESULTS

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	0.382	31	0.11842	0.4	-0.28158
DH3	1.630	14	0.2282	0.4	-0.1718
DH5	2.864	10	0.2864	0.4	-0.1136
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	0.382	7.75	0.029605	0.4	-0.3704
DH3	1.63	3.5	0.05705	0.4	-0.34295
DH5	2.864	2.5	0.0716	0.4	-0.3284

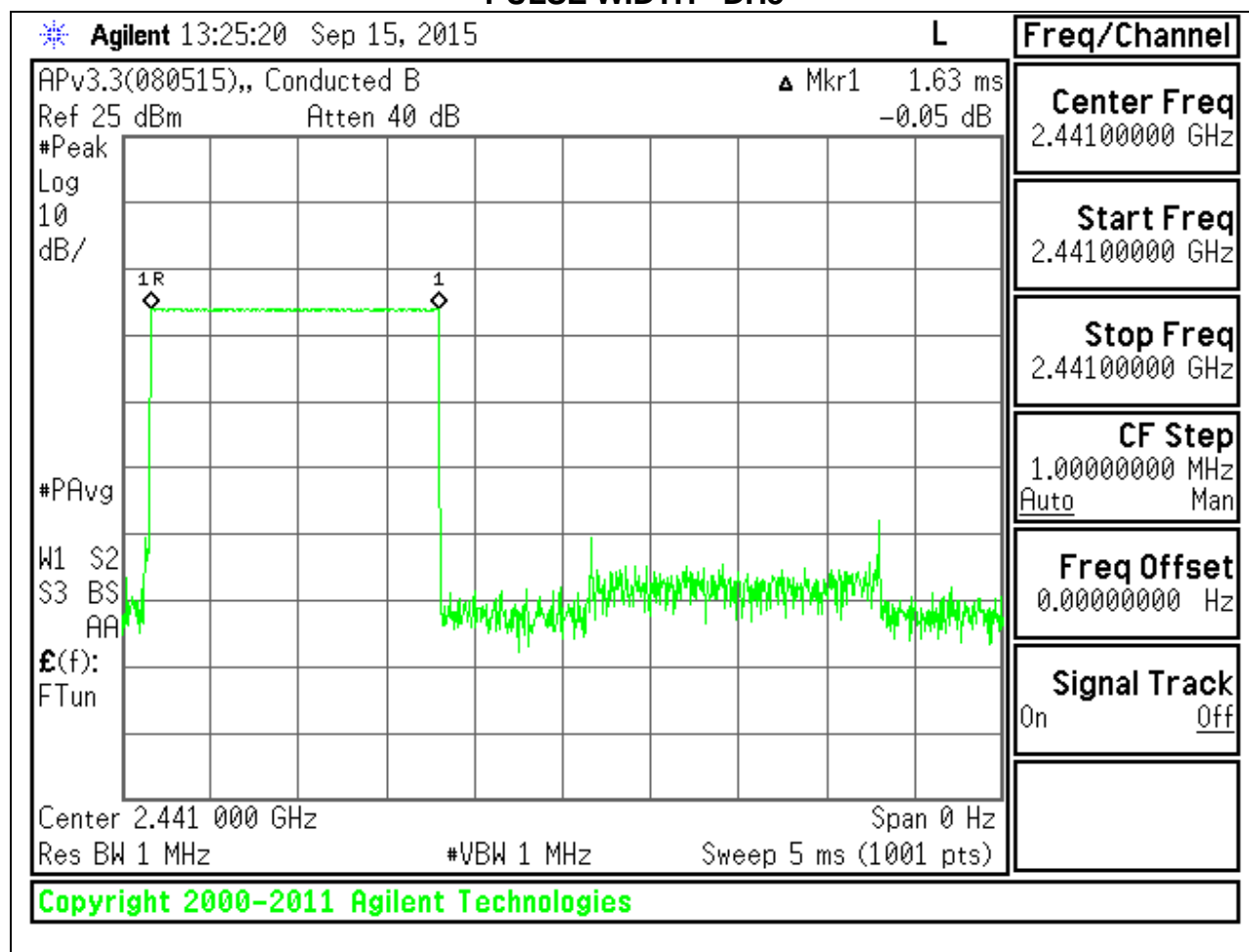
PULSE WIDTH - DH1



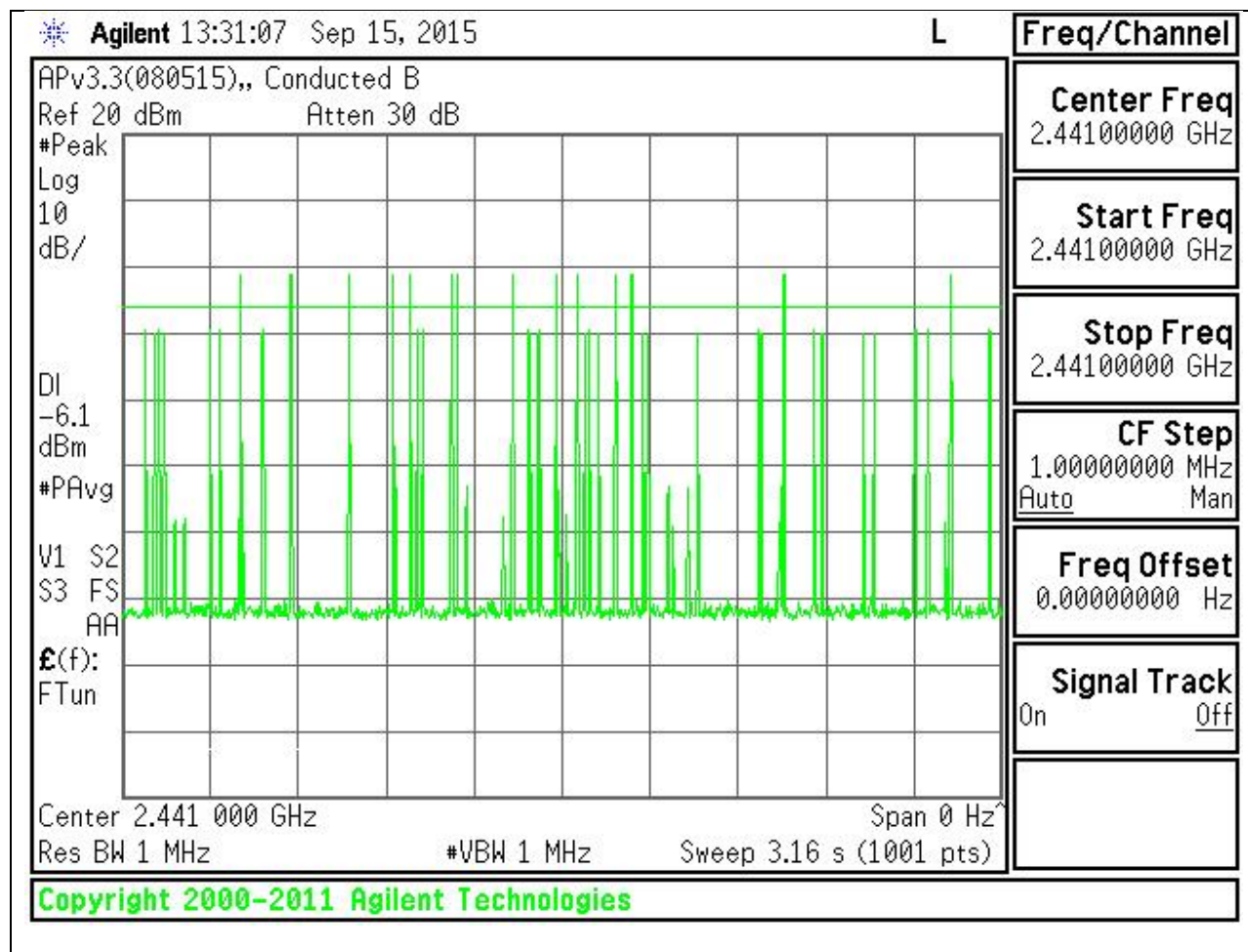
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH1



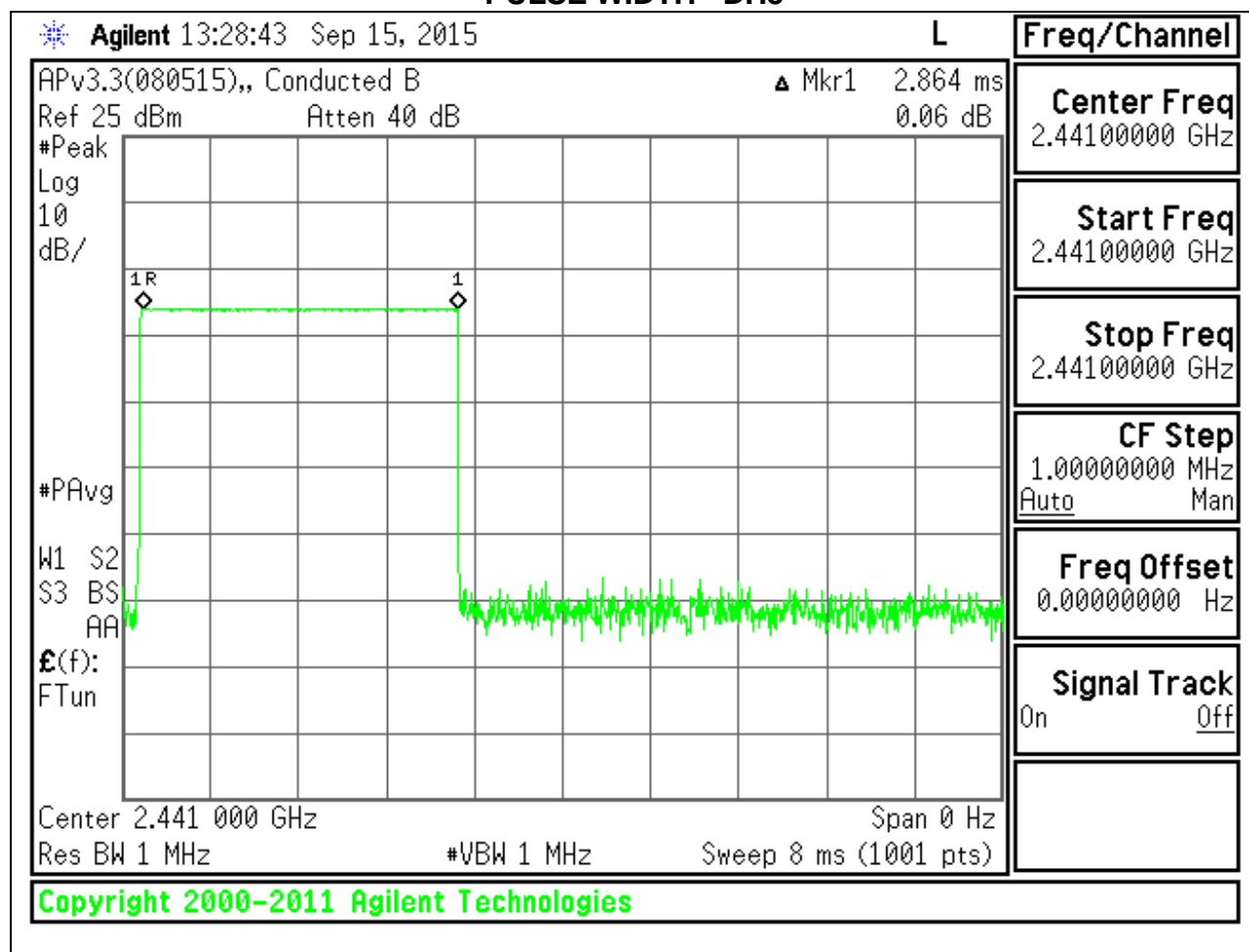
PULSE WIDTH - DH3



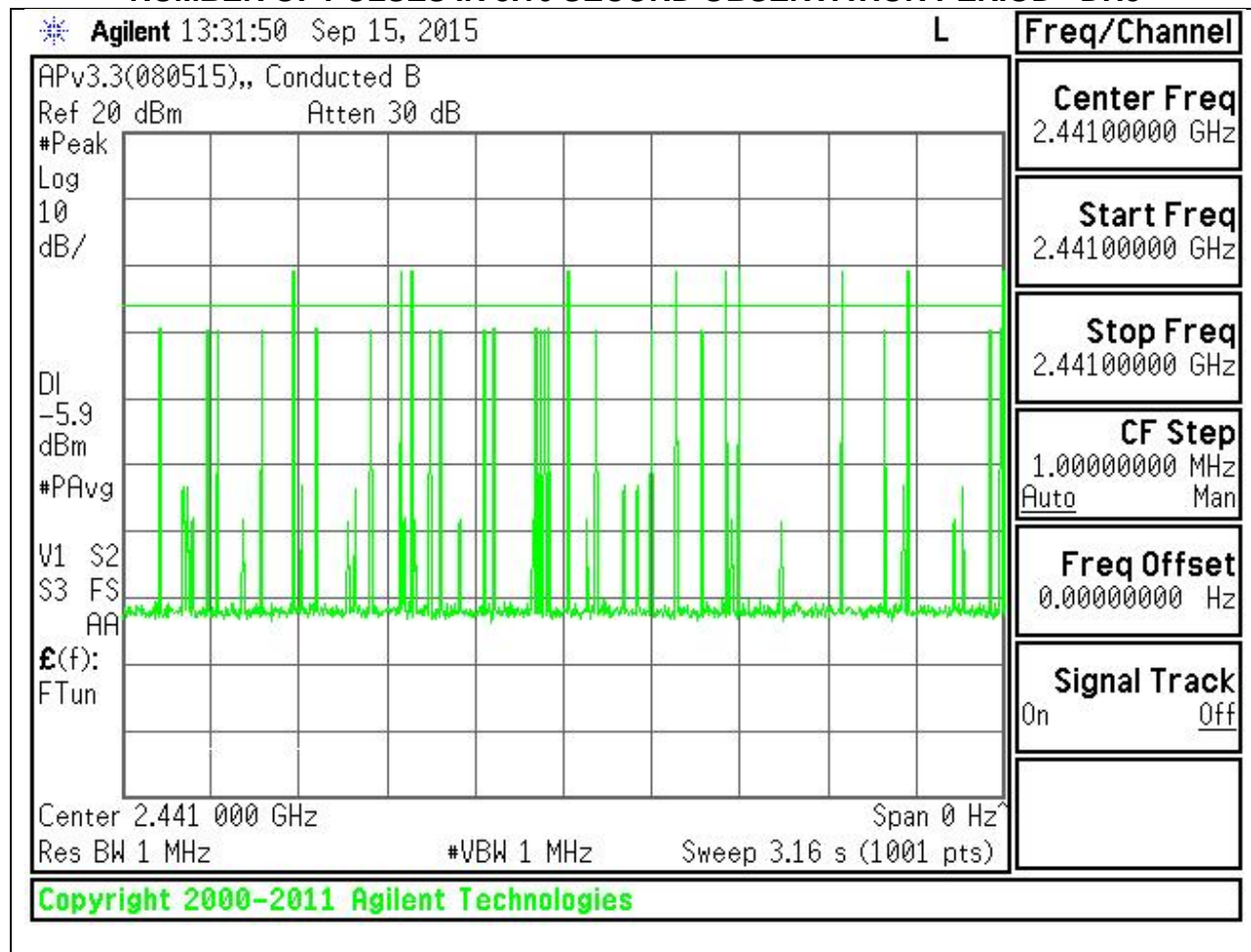
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH3



PULSE WIDTH - DH5



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH5



8.6. 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

8.6.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	9.360	21	-11.64
Middle	2441	9.960	21	-11.04
High	2480	9.690	21	-11.31
Worst		9.96		-11.04

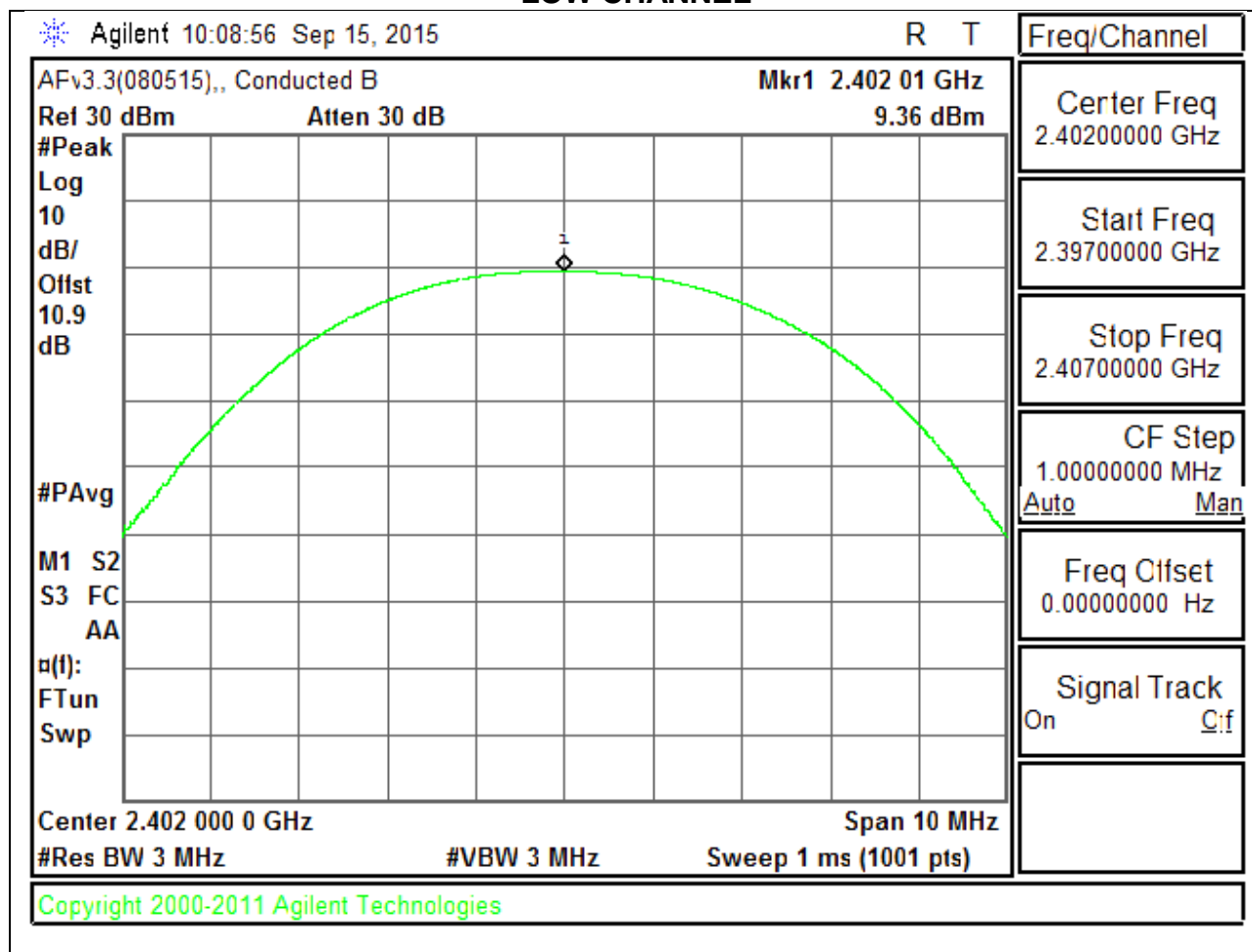
8.6.2. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.730	21	-12.27
Middle	2441	9.170	21	-11.83
High	2480	8.640	21	-12.36
Worst		9.17		-11.83

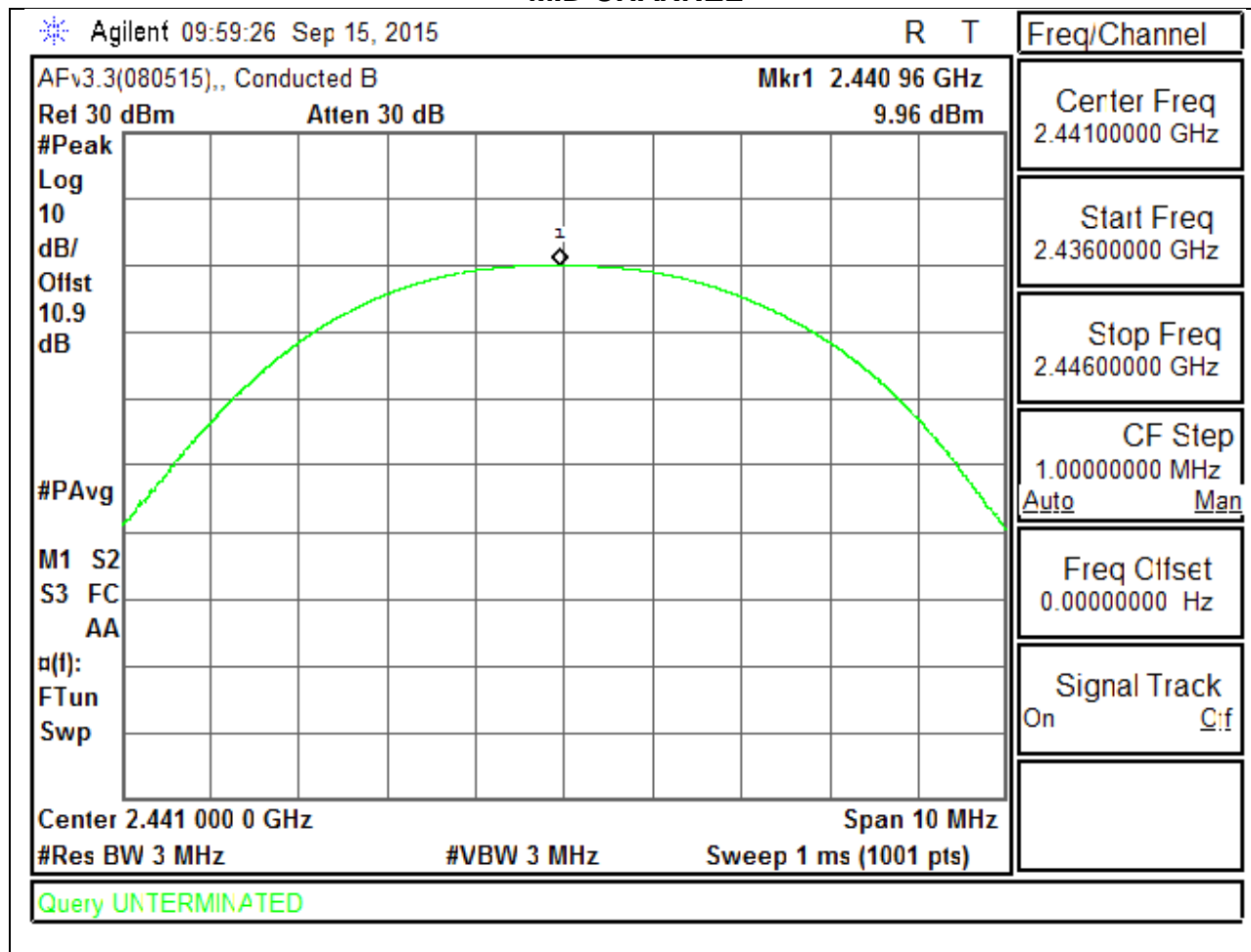
8.6.3. OUTPUT POWER PLOTS

GFSK OUTPUT POWER

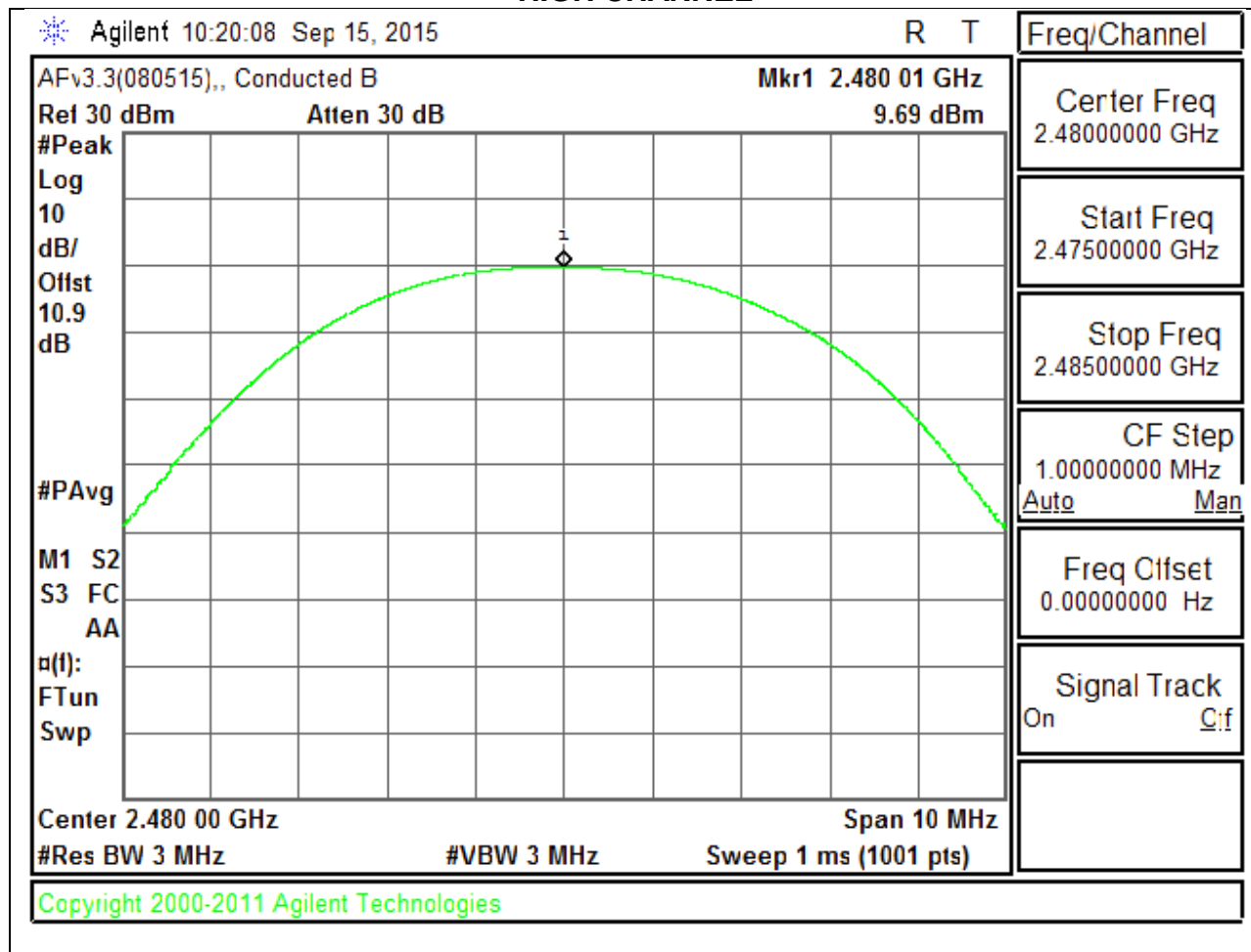
LOW CHANNEL



MID CHANNEL

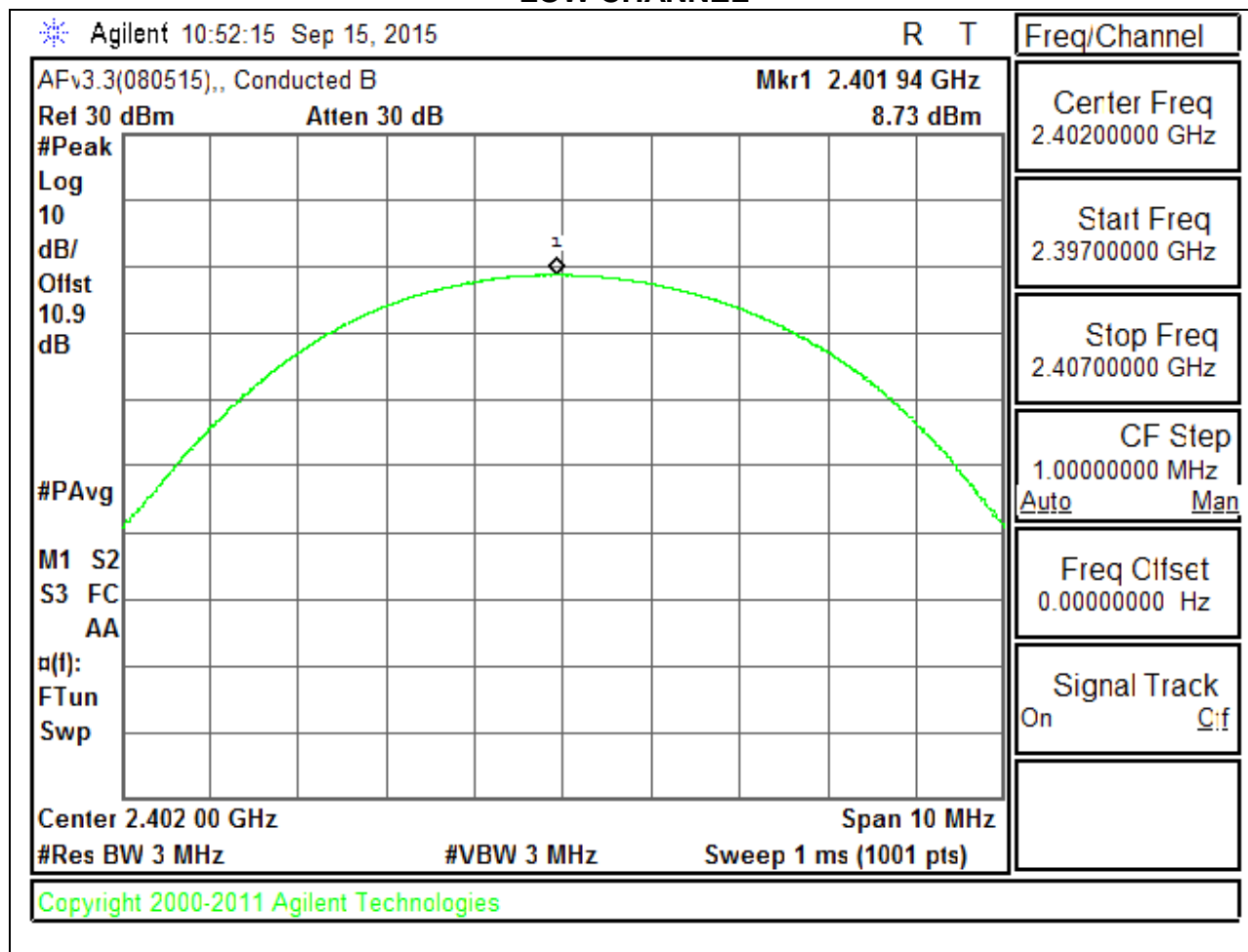


HIGH CHANNEL

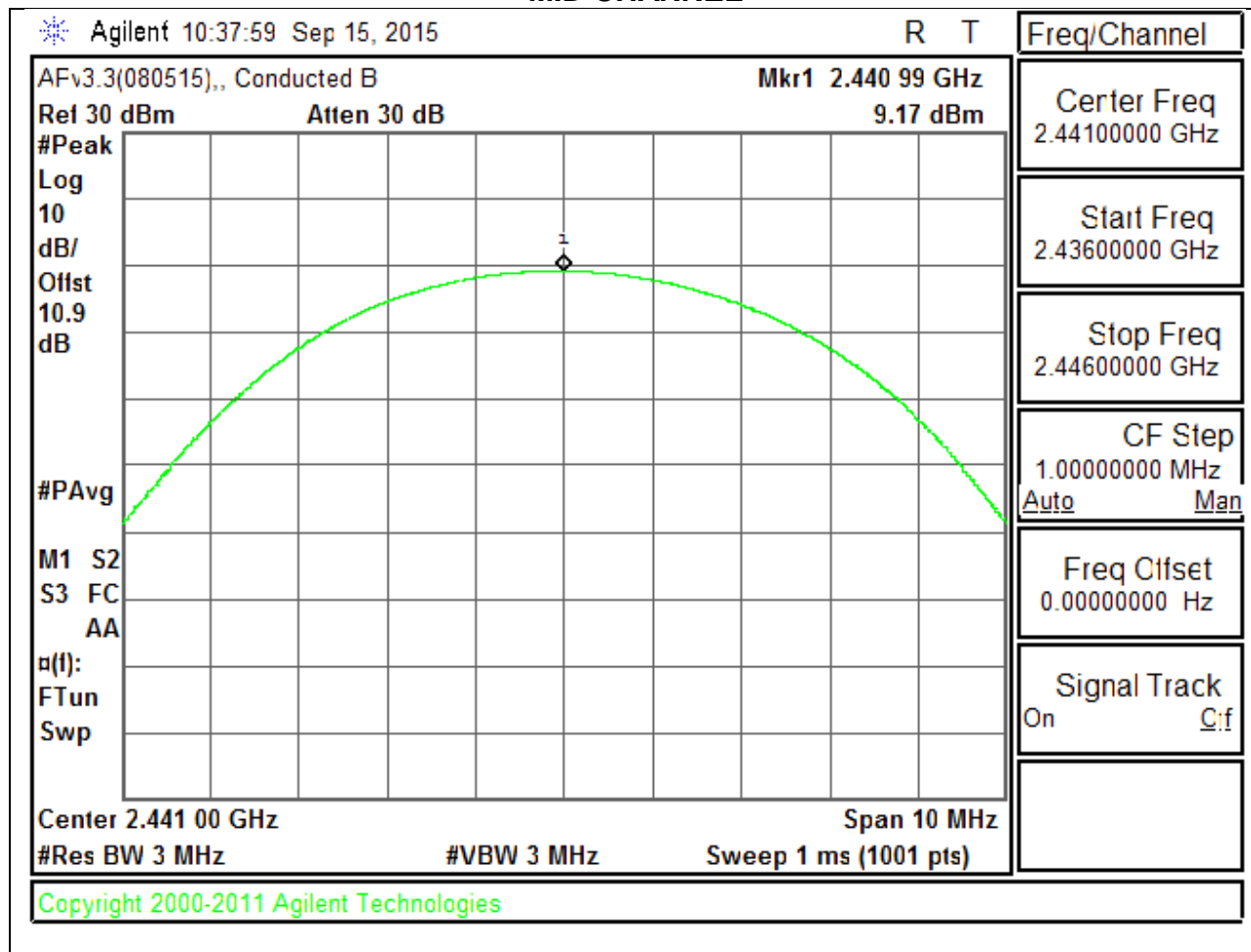


8PSK OUTPUT POWER

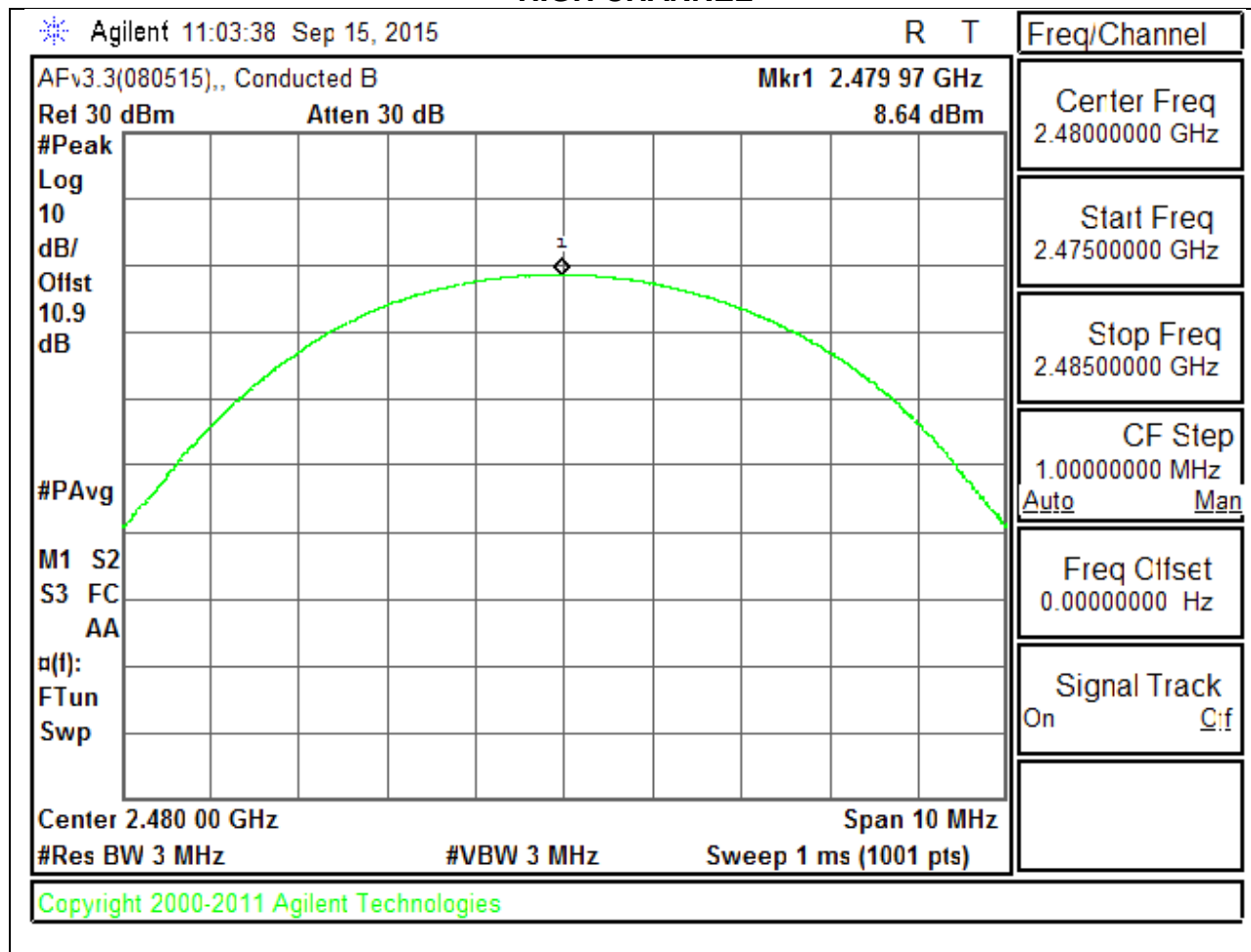
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.7. 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.

8.7.1. BASIC DATA RATE GFSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	9.00
Middle	2441	9.60
High	2480	9.40
Worst		9.60

8.7.2. DATA RATE PI/4-DQPSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.30
Middle	2441	6.60
High	2480	6.20
Worst		6.60

8.7.3. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	6.40
Middle	2441	6.60
High	2480	6.20
Worst		6.60

8.8. 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.

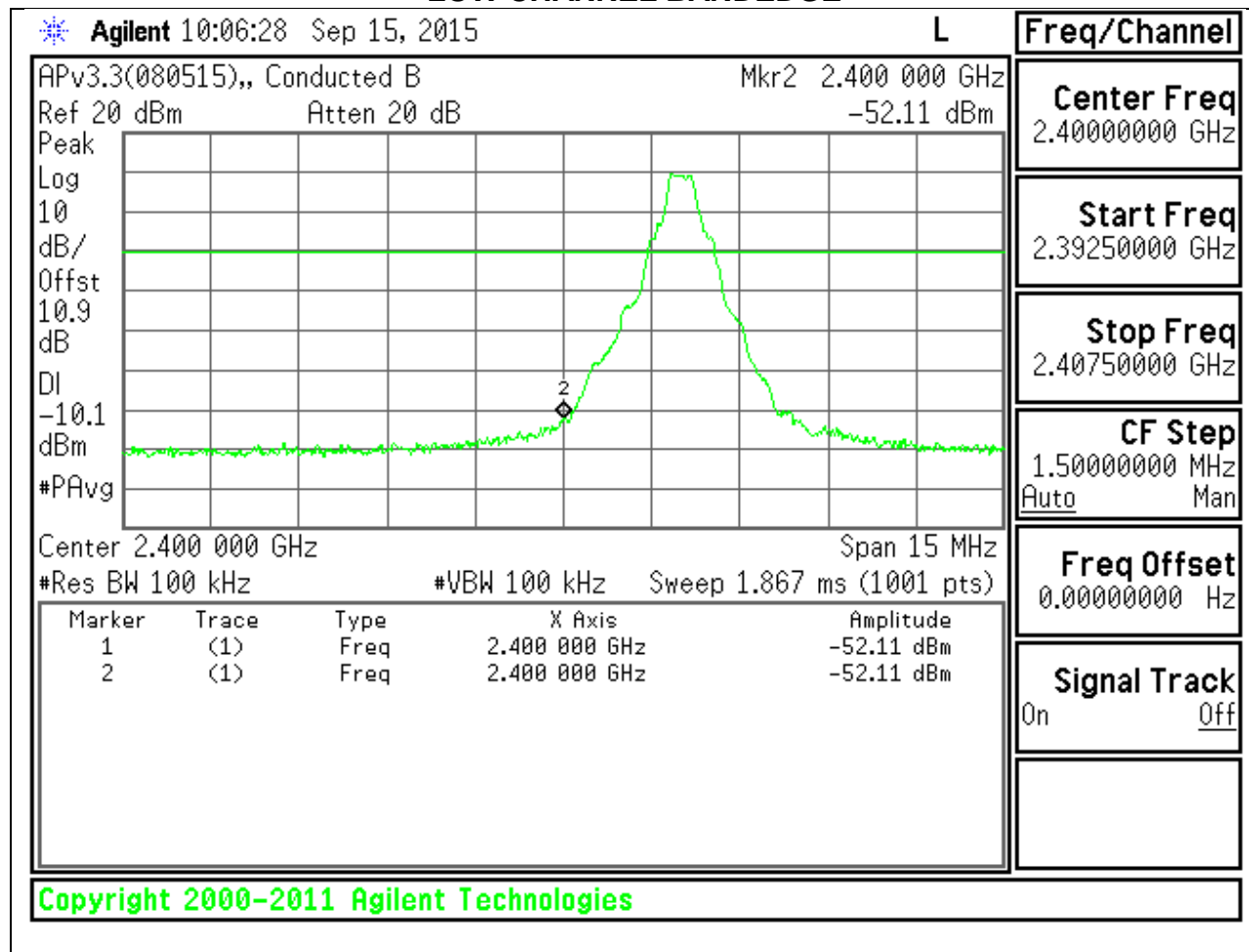
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

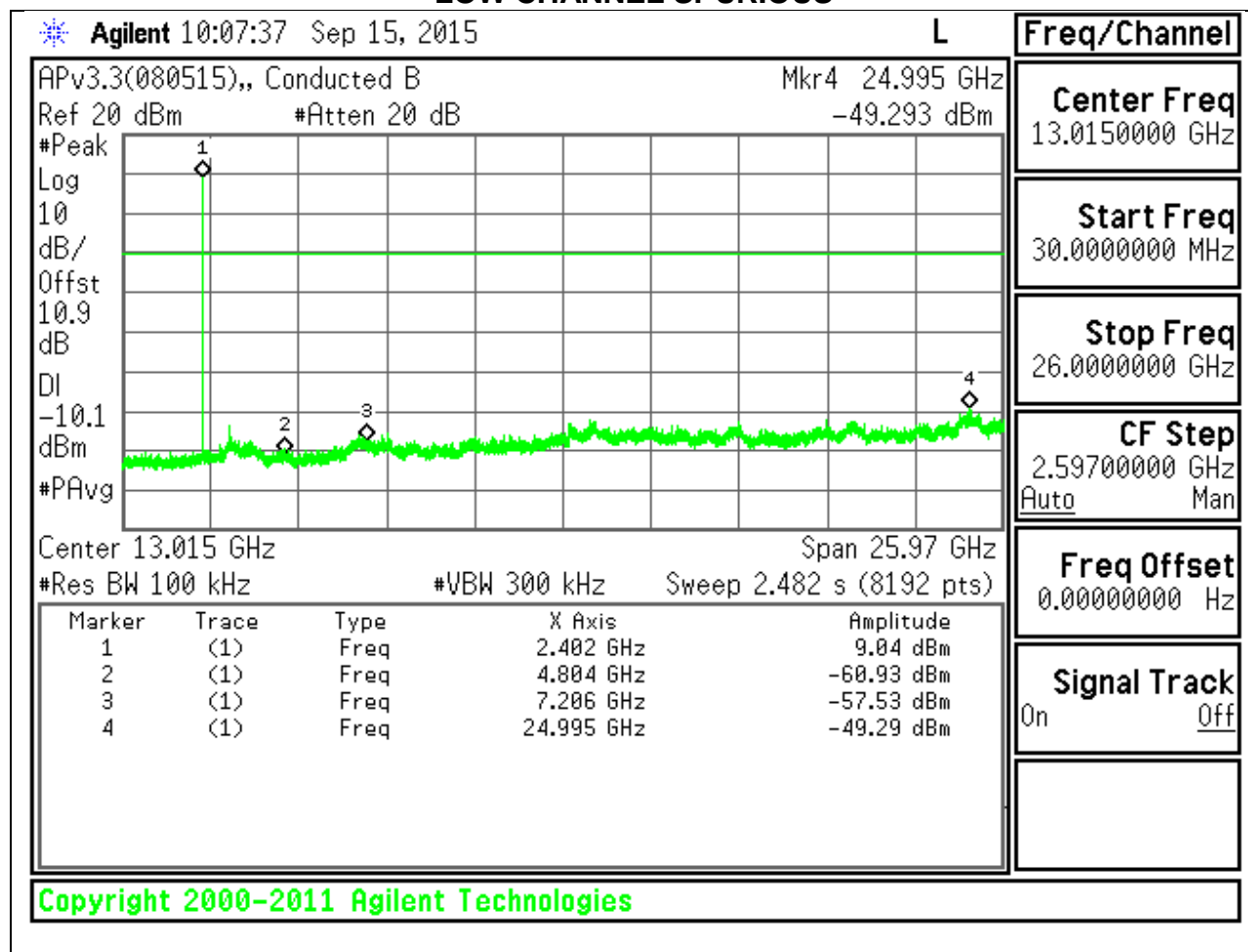
8.8.1. BASIC DATA RATE GFSK MODULATION

SPURIOUS EMISSIONS, LOW CHANNEL

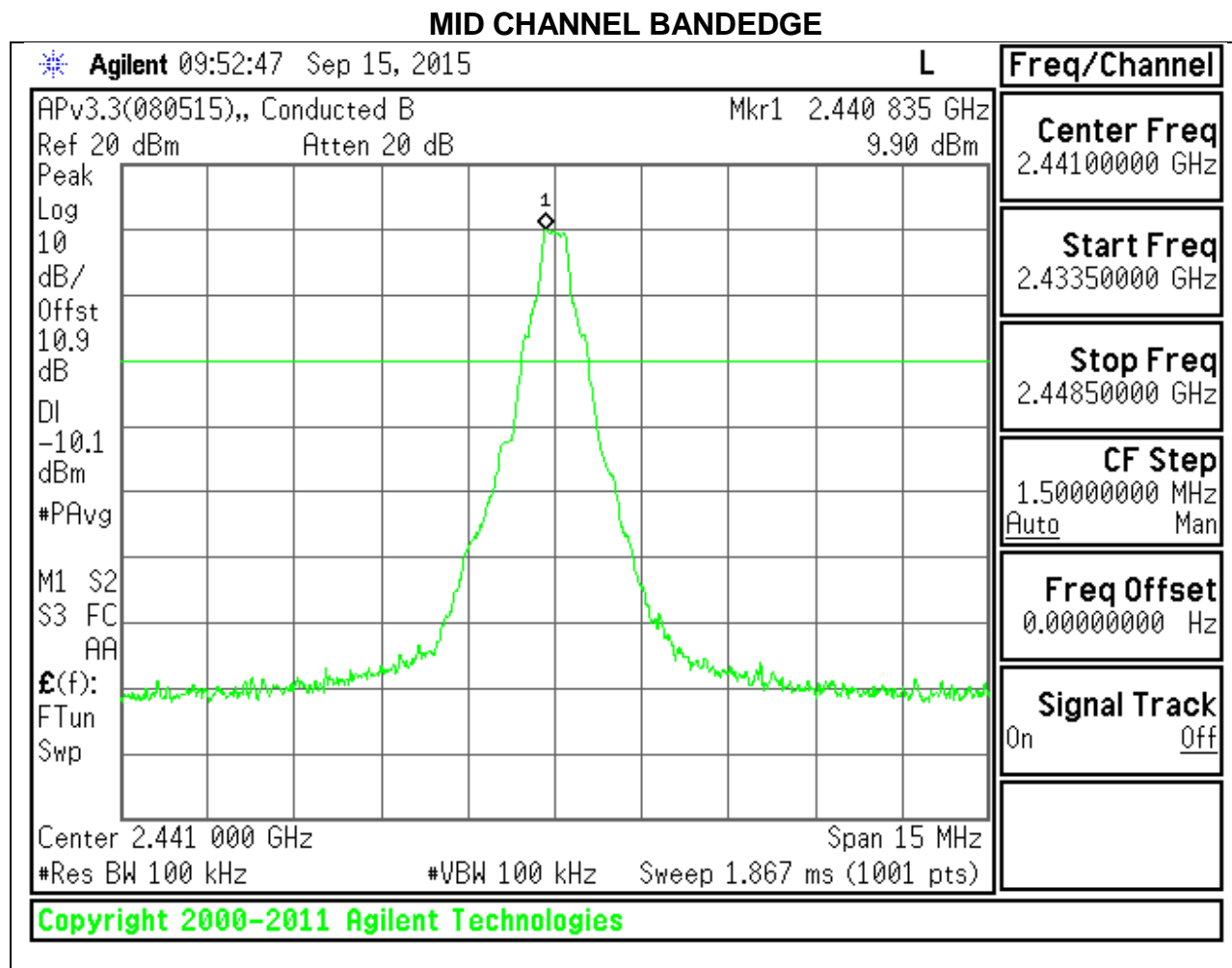
LOW CHANNEL BANDEDGE



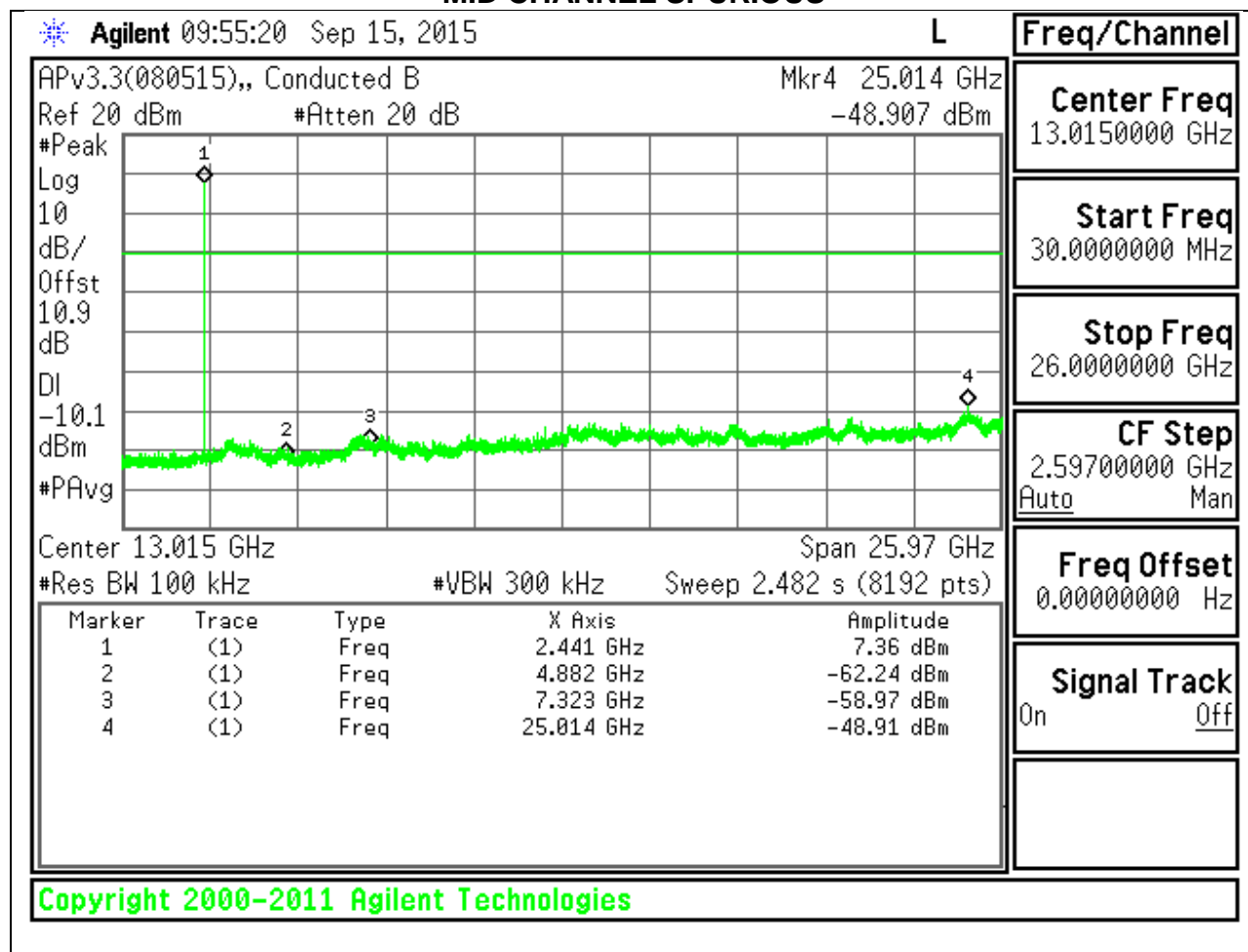
LOW CHANNEL SPURIOUS



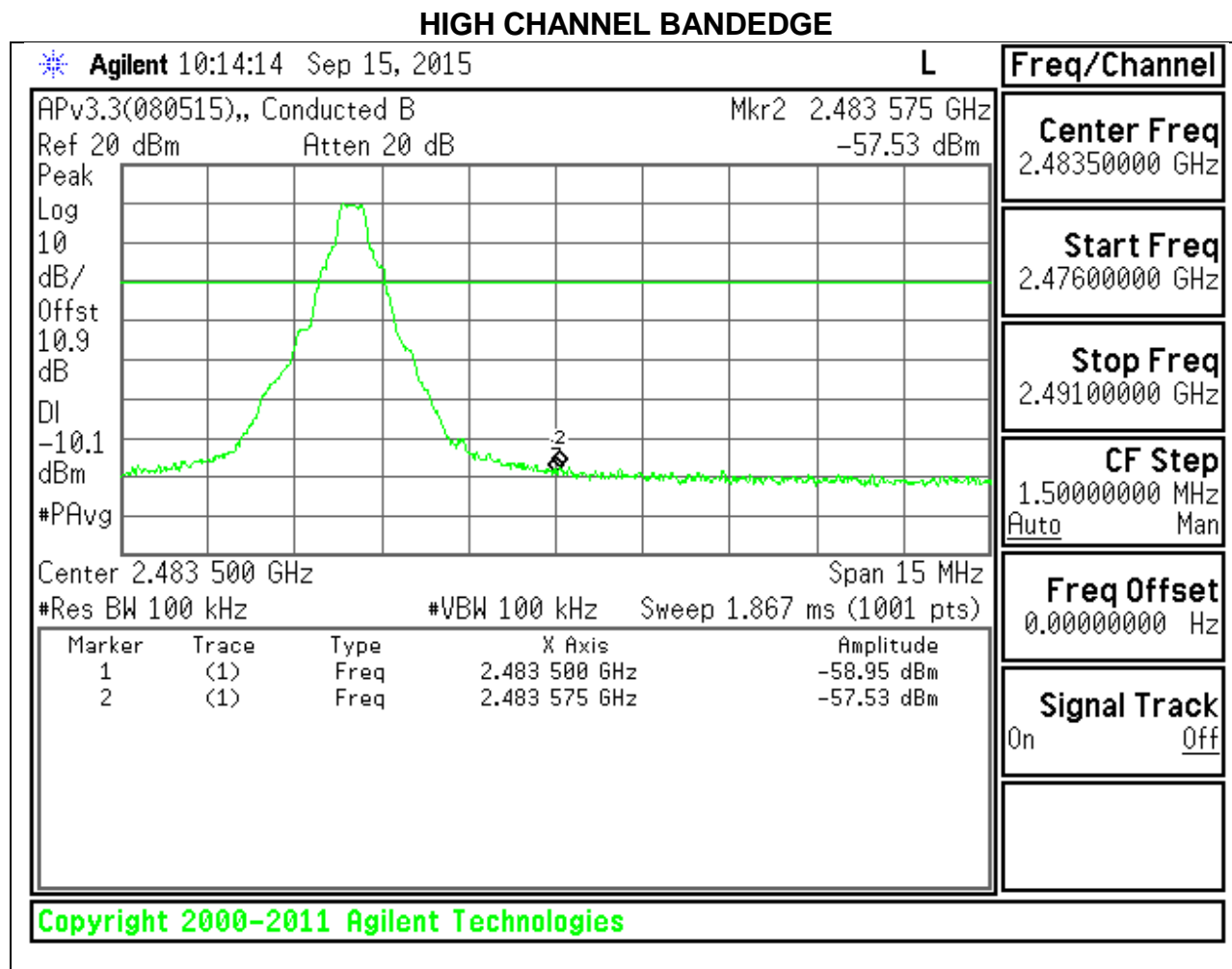
SPURIOUS EMISSIONS, MID CHANNEL



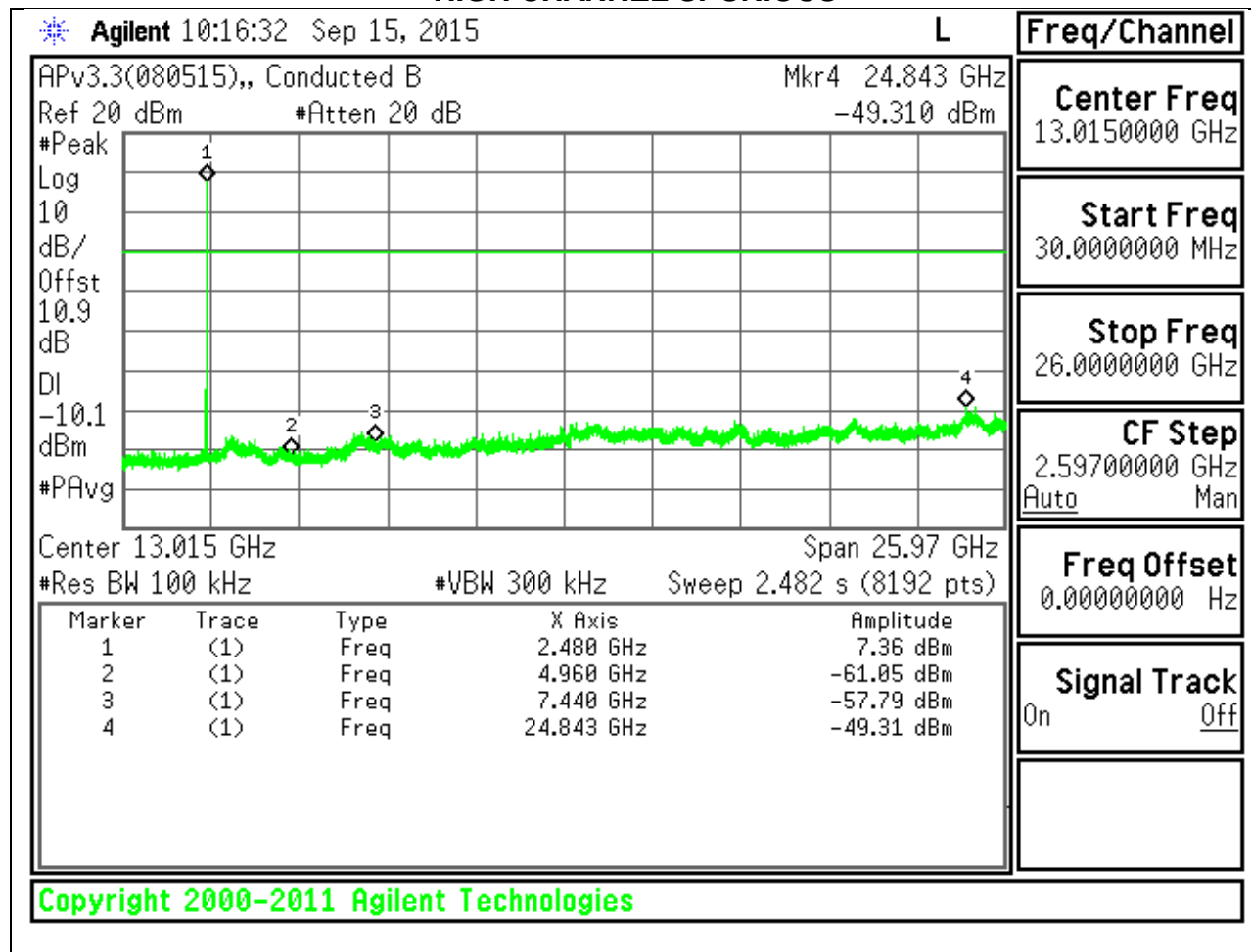
MID CHANNEL SPURIOUS



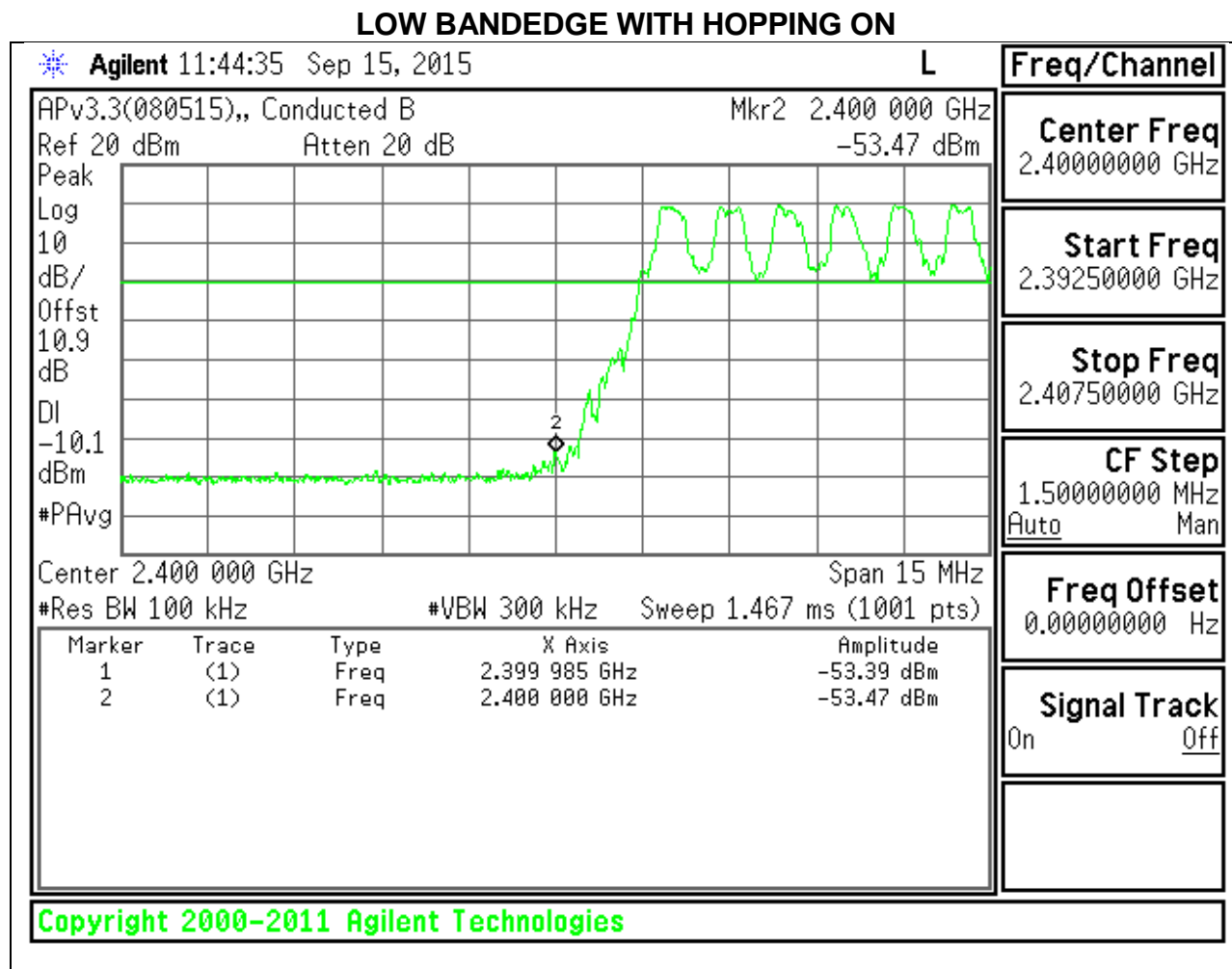
SPURIOUS EMISSIONS, HIGH CHANNEL



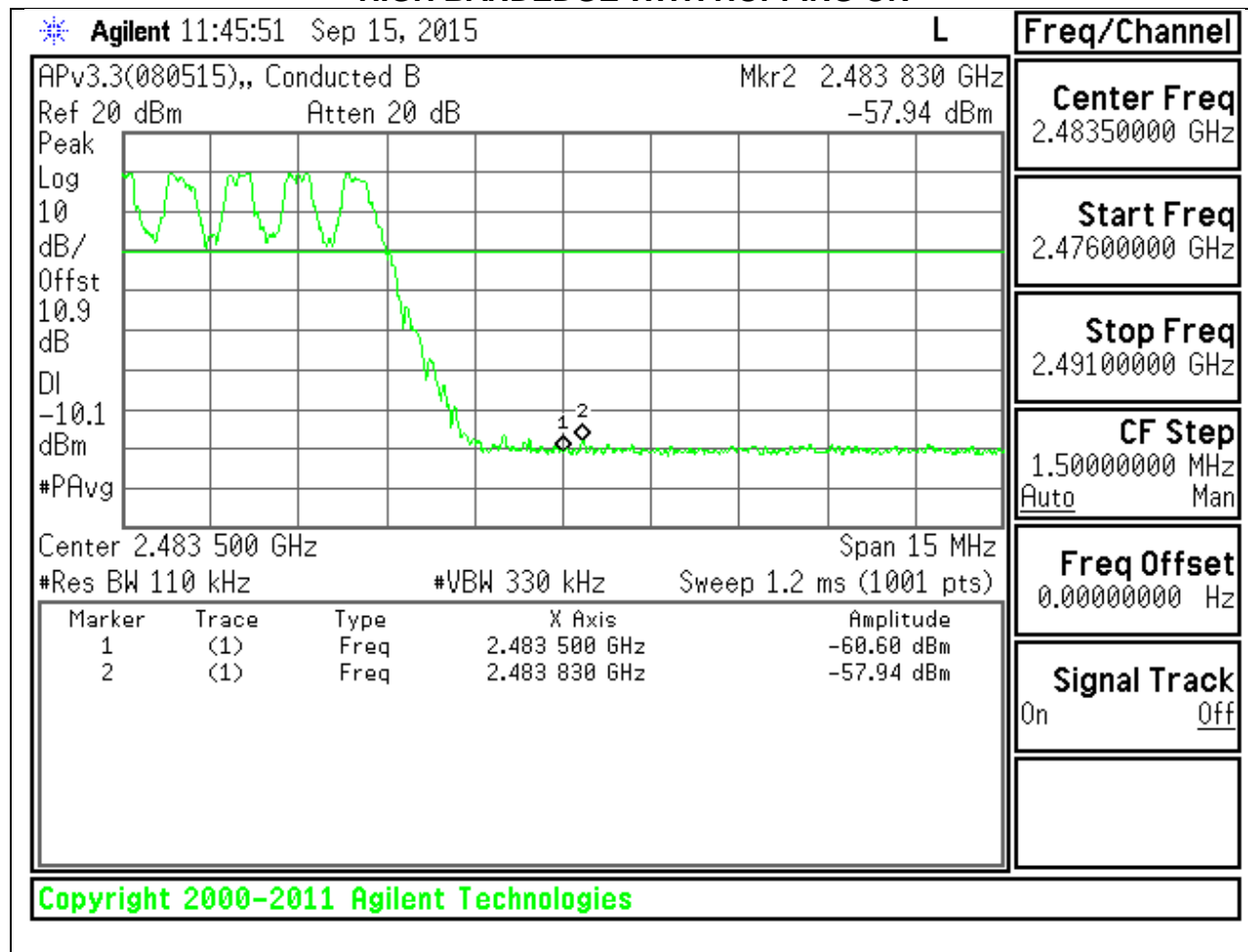
HIGH CHANNEL SPURIOUS



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

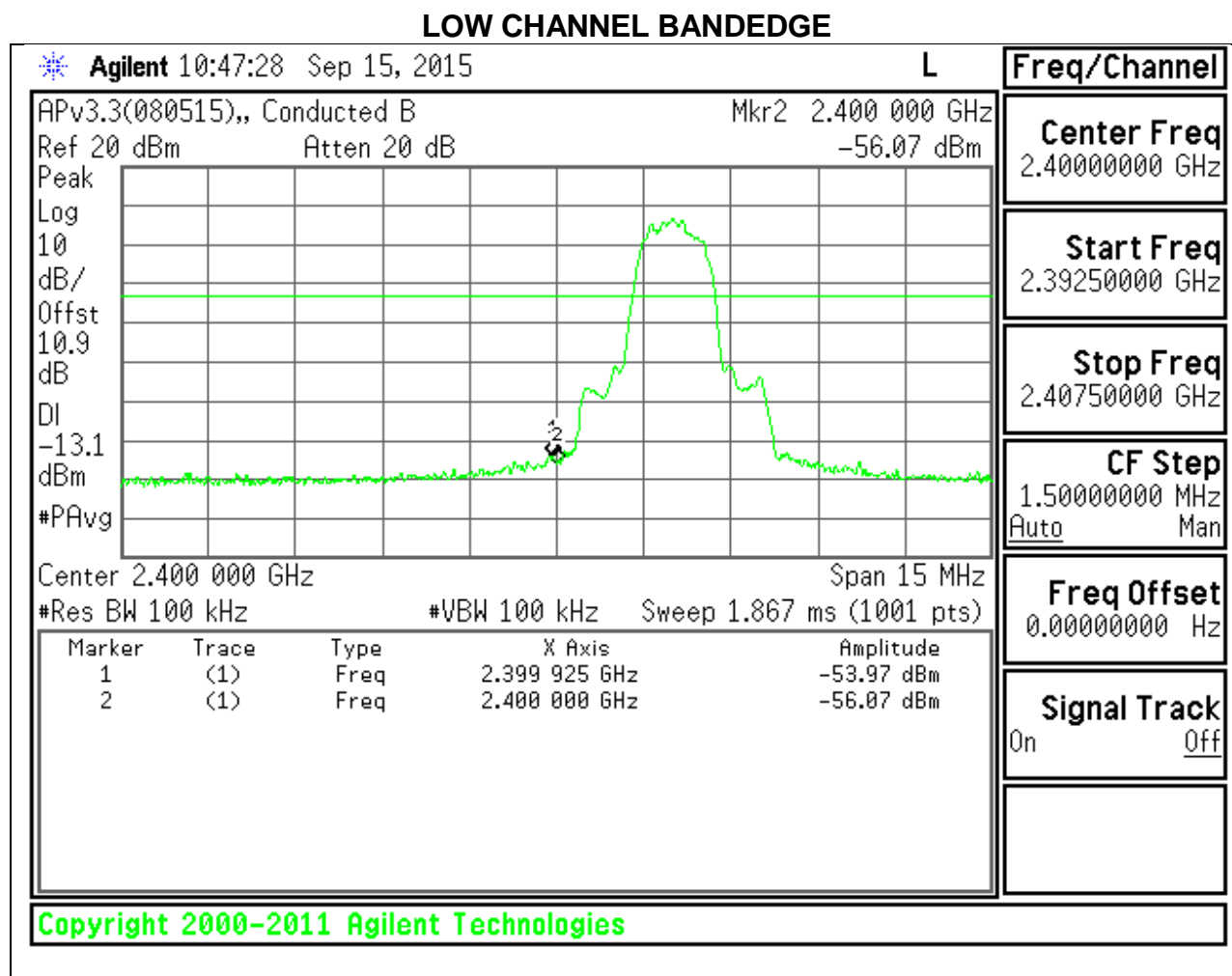


HIGH BANDEGE WITH HOPPING ON

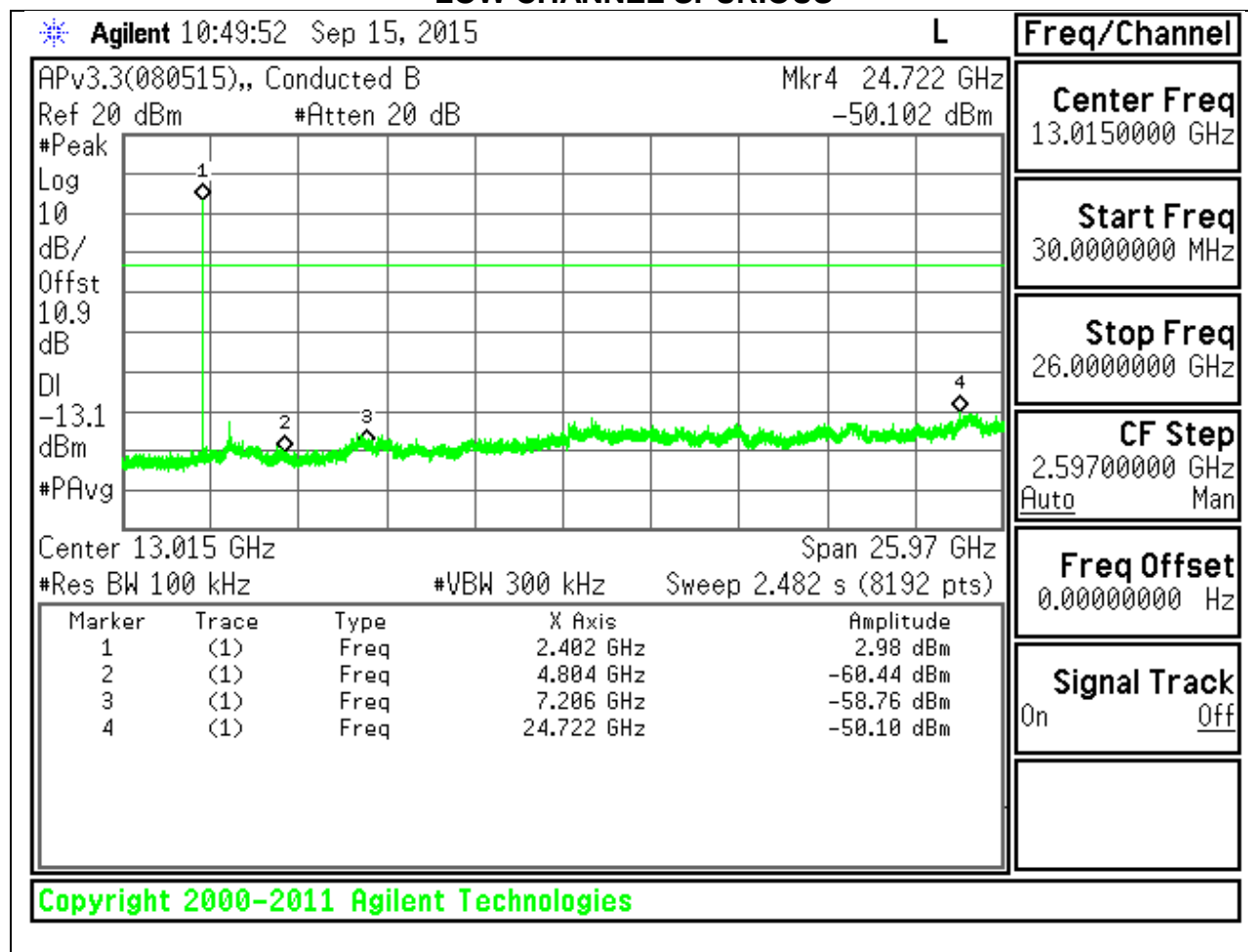


8.8.2. ENHANCED DATA RATE 8PSK MODULATION

SPURIOUS EMISSIONS, LOW CHANNEL

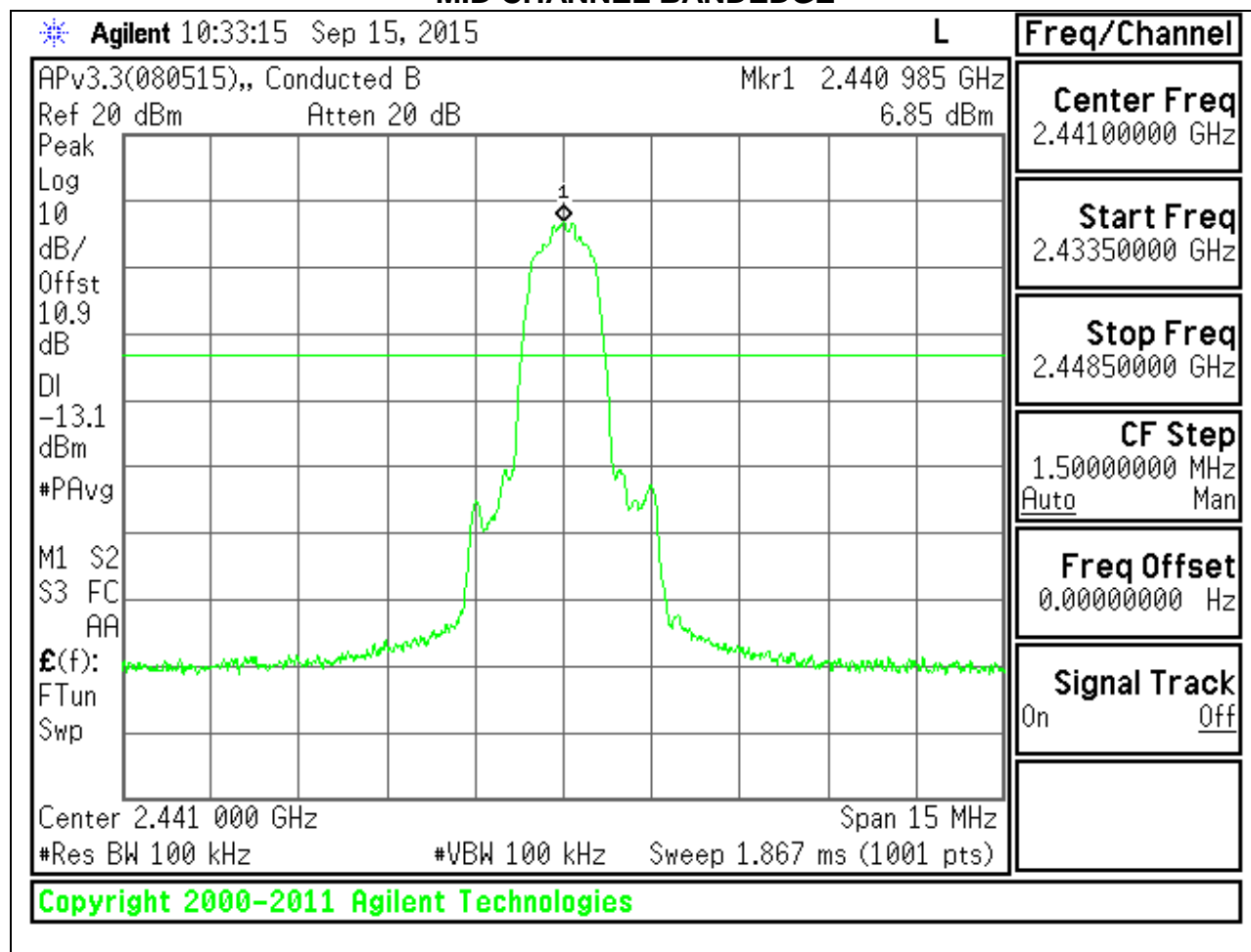


LOW CHANNEL SPURIOUS

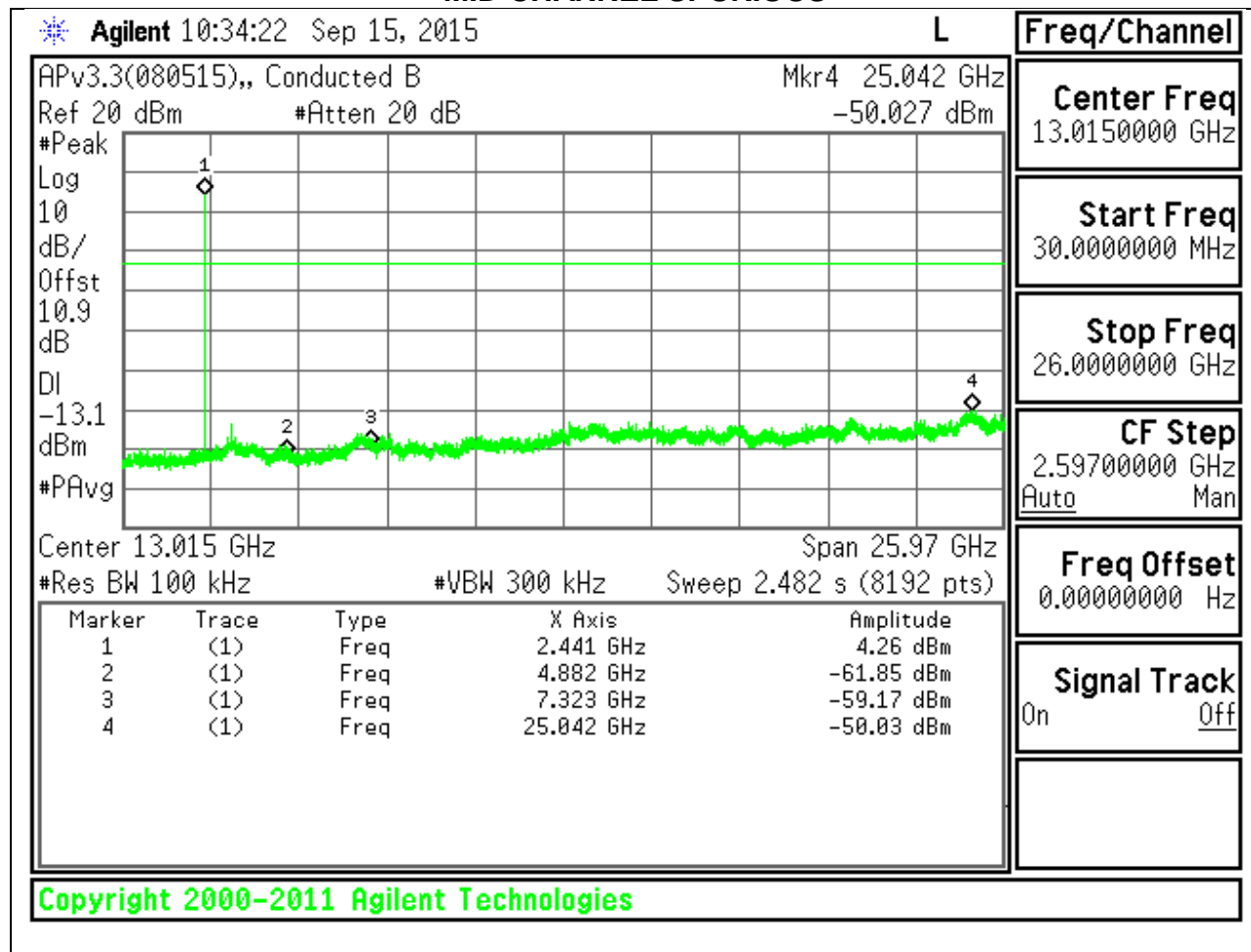


SPURIOUS EMISSIONS, MID CHANNEL

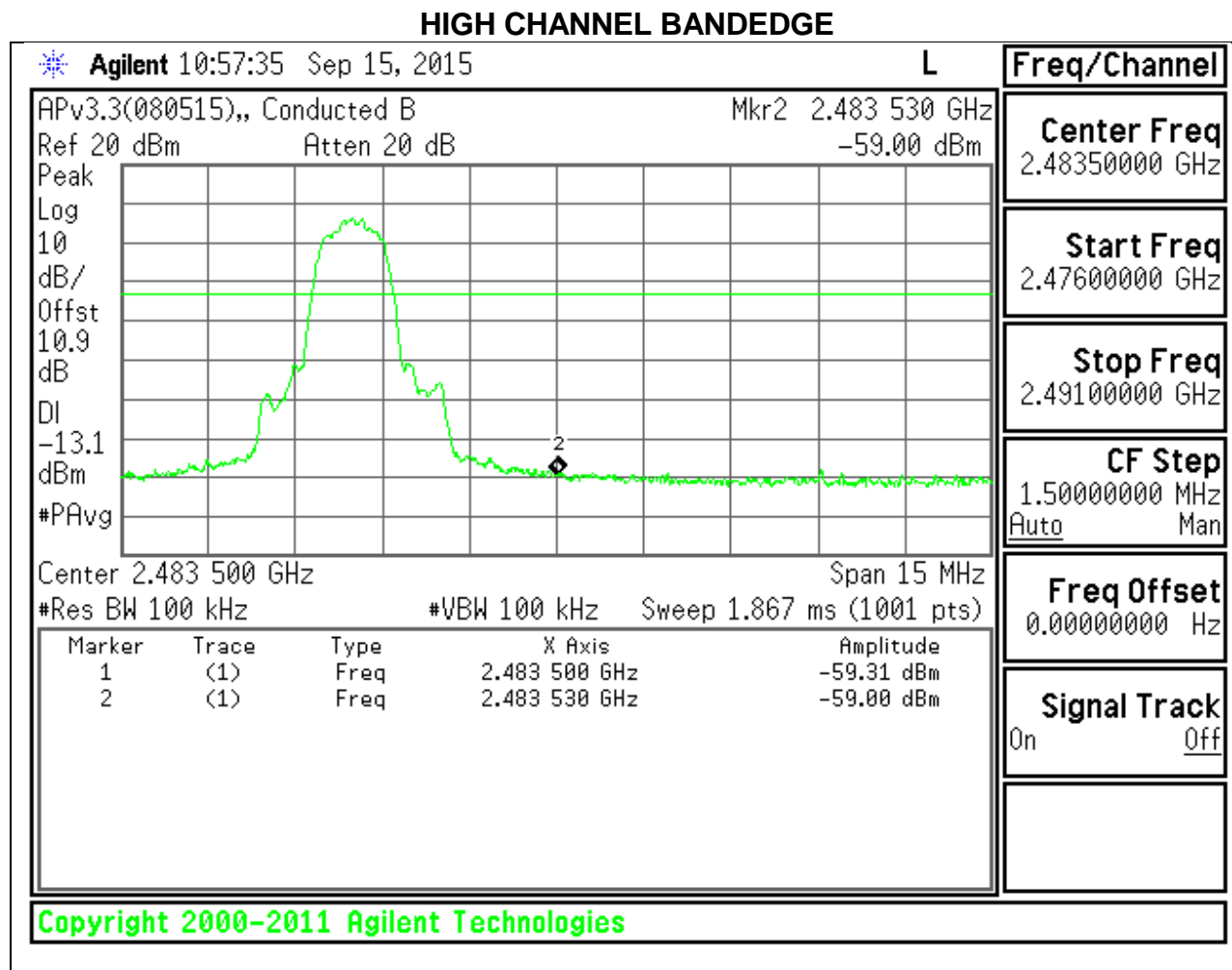
MID CHANNEL BANDEDGE



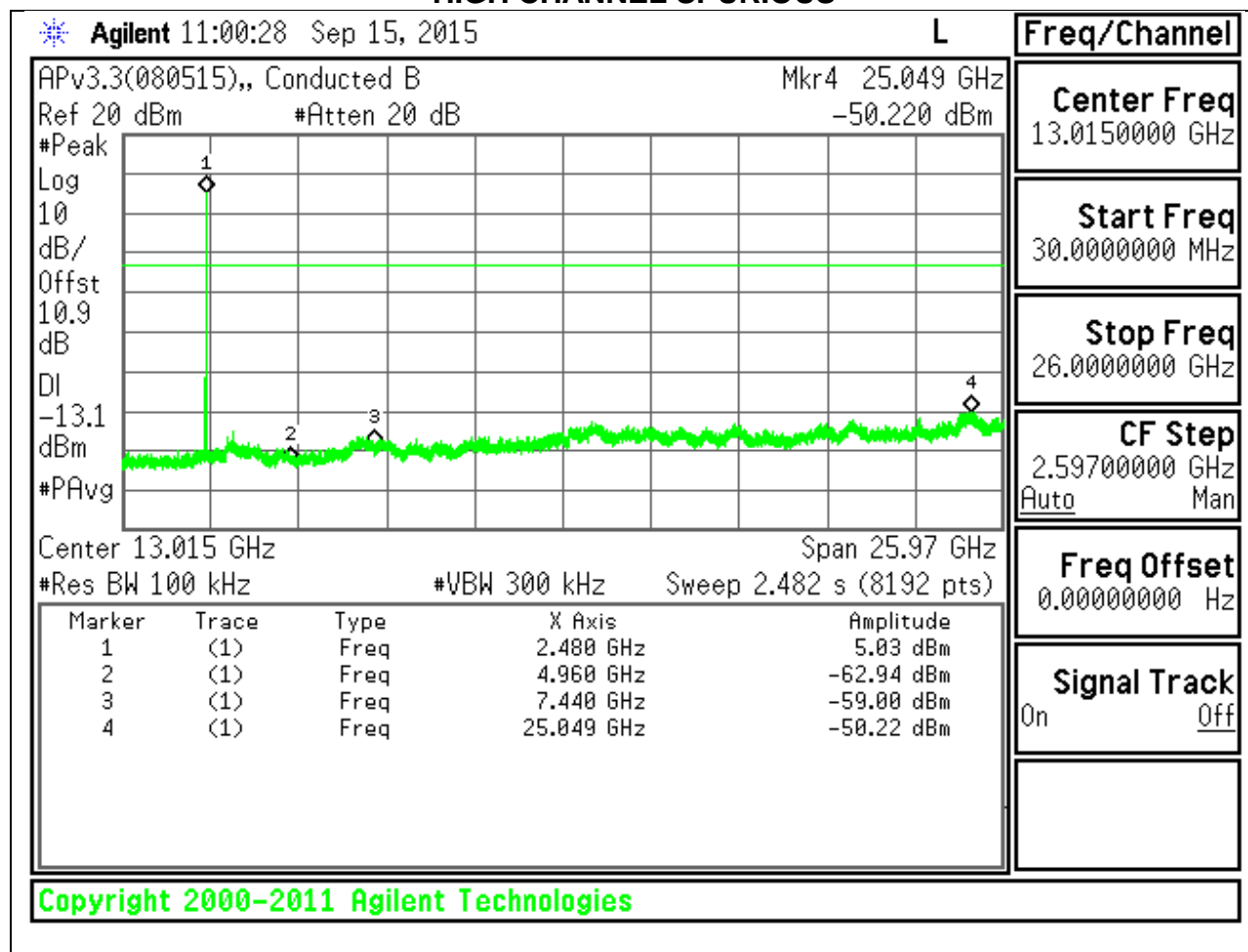
MID CHANNEL SPURIOUS



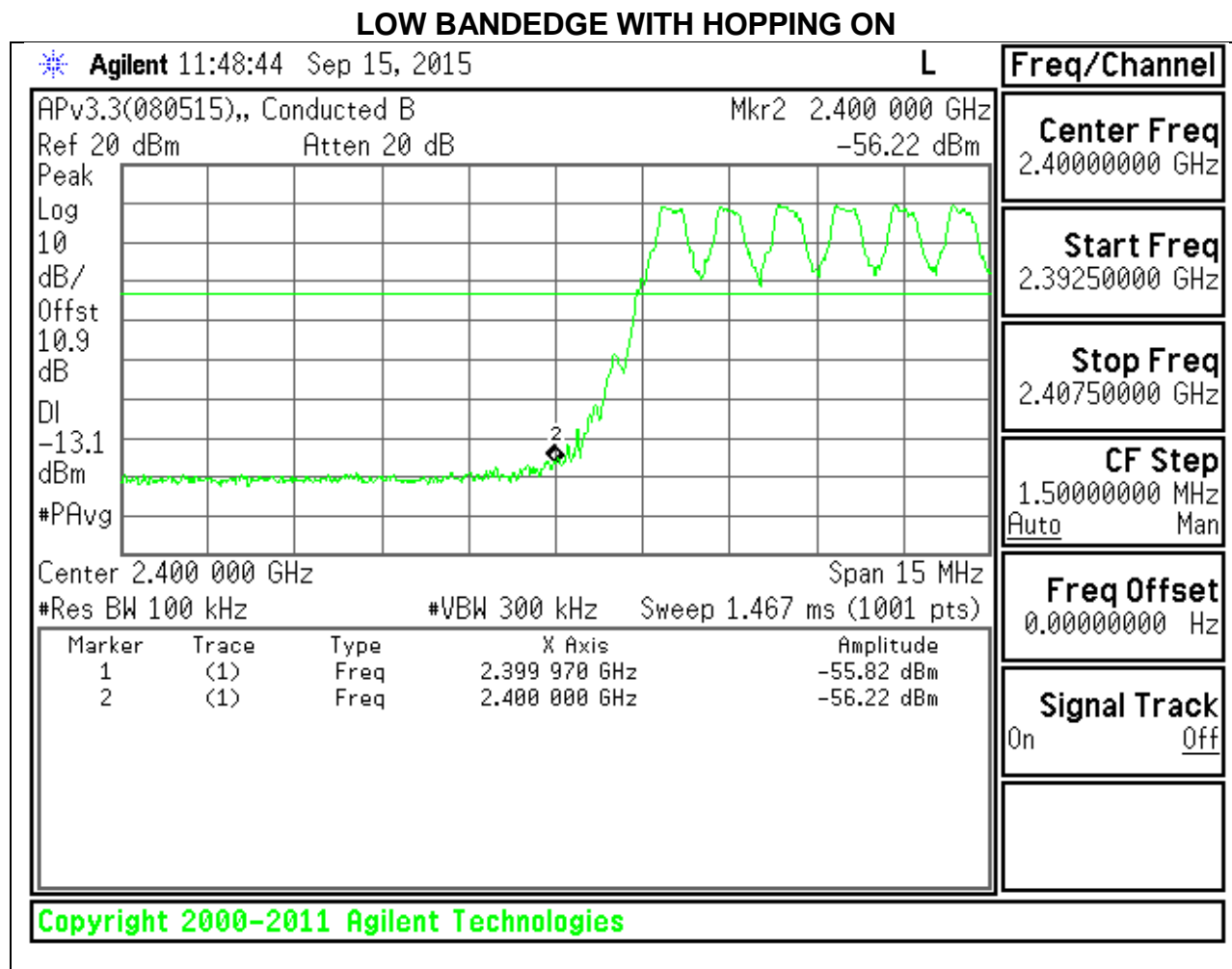
SPURIOUS EMISSIONS, HIGH CHANNEL



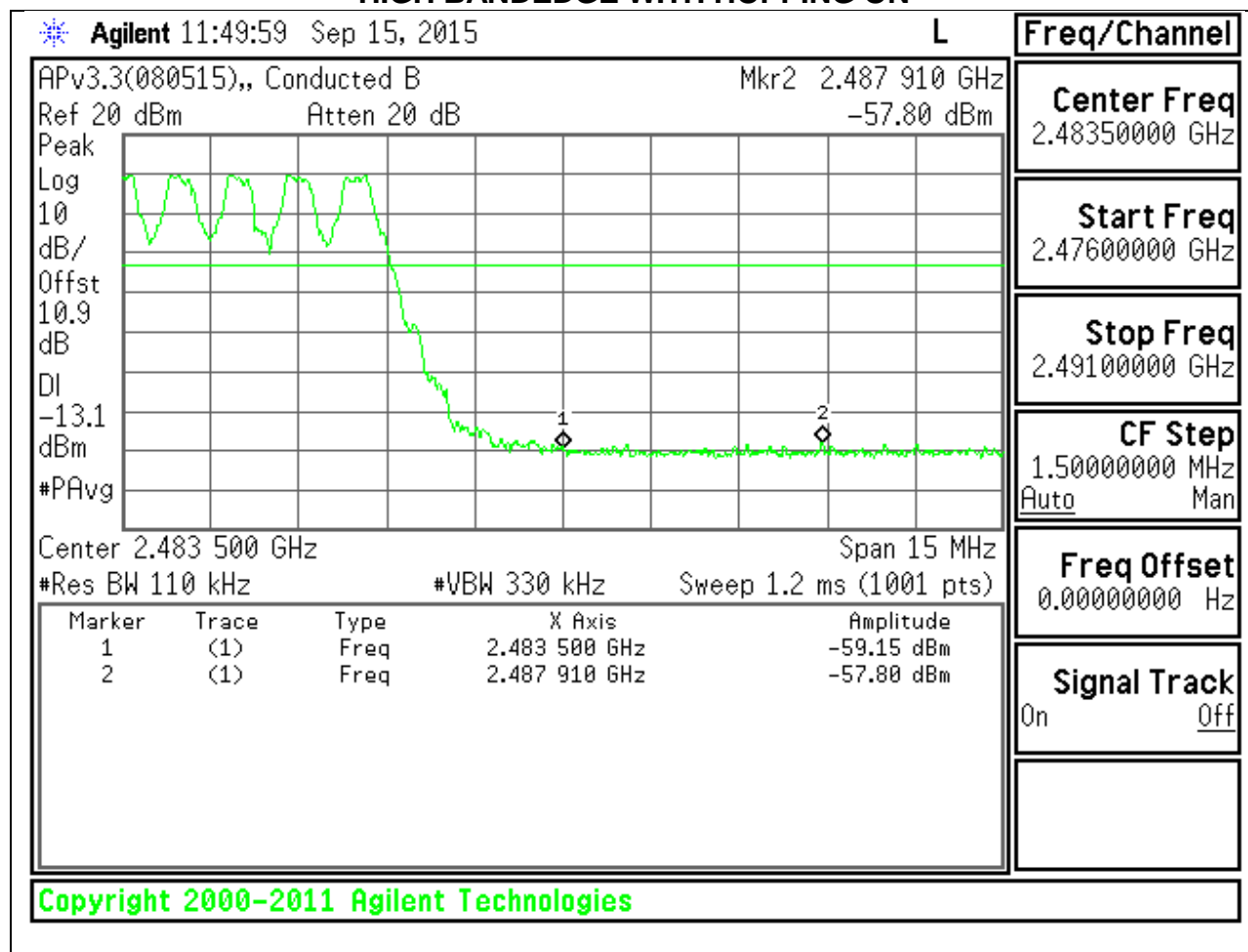
HIGH CHANNEL SPURIOUS



SPURIOUS BANDEDGE EMISSIONS 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. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. 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 and spurious emission 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: $1/T \text{ (on time)} = 1/0.3827\text{ms} = 2.6\text{KHz}$

8PSK: $1/T \text{ (on time)} = 1/2.837\text{ms} = 352\text{KHz}$

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.

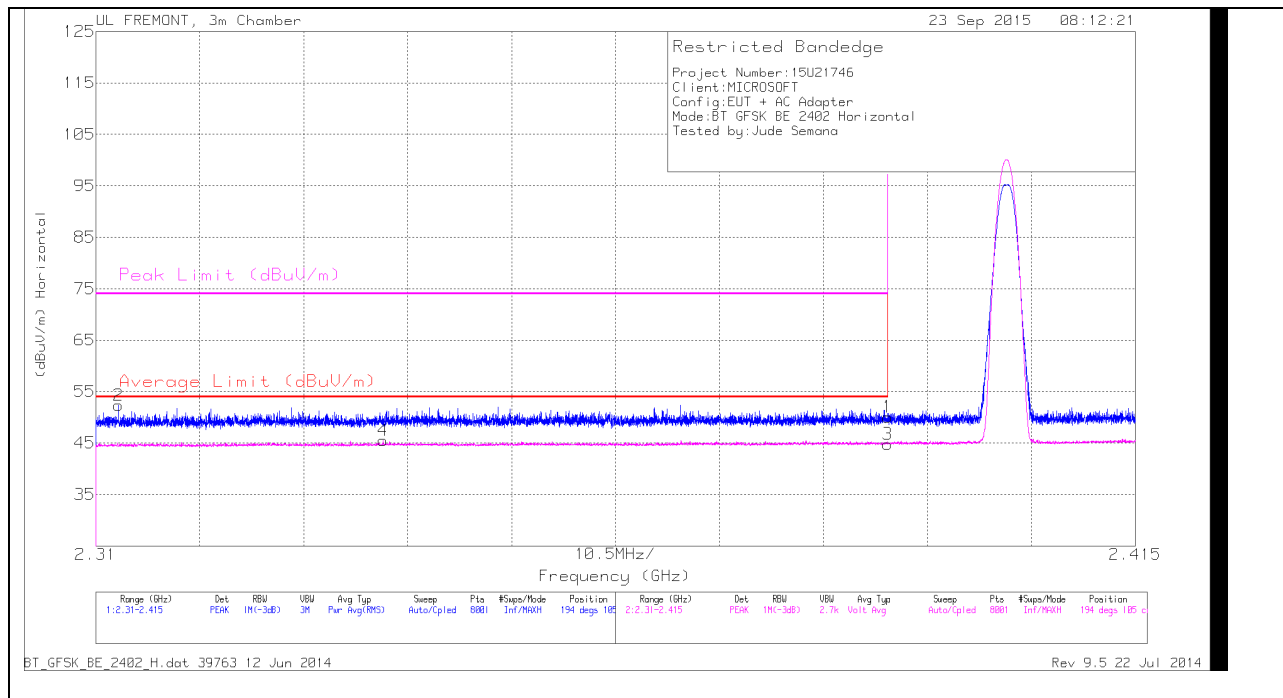
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

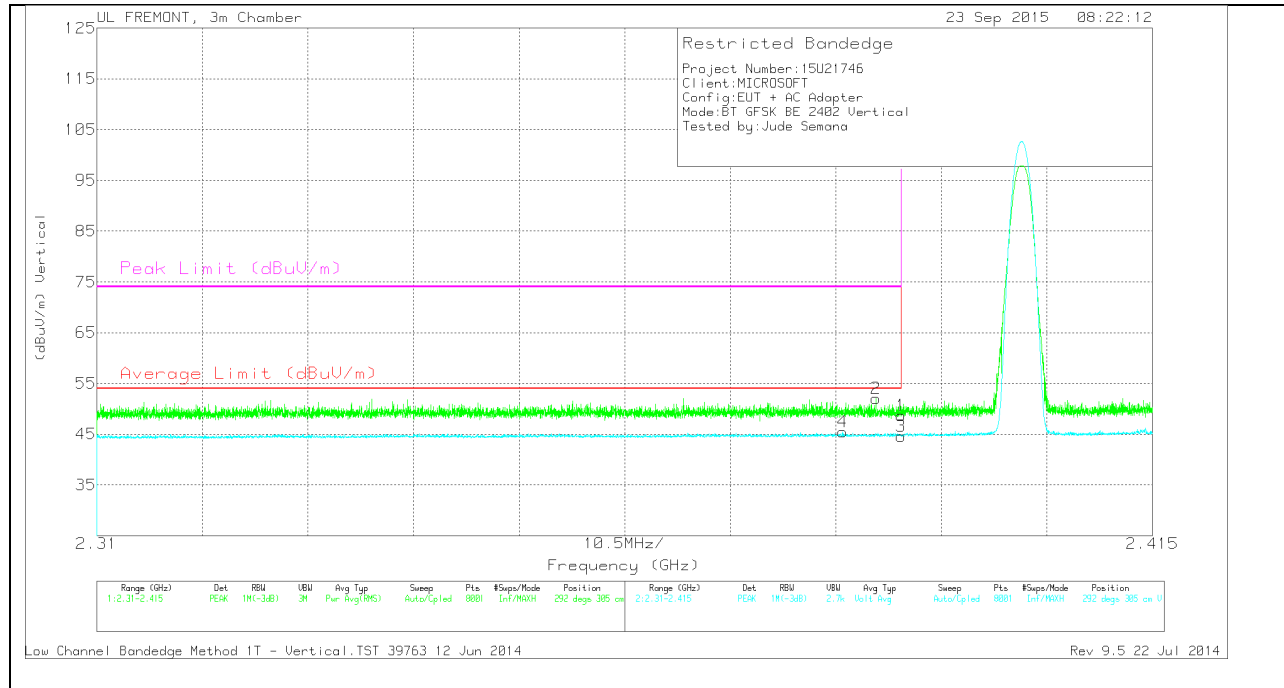
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.312	43.03	PK	31.7	-22.4	0	52.33	-	-	74	-21.67	194	105	H
4	2.339	36.08	VB1T	31.8	-22.4	0	45.48	54	-8.52	-	-	194	105	H
1	2.39	40.47	PK	32	-22.4	0	50.07	-	-	74	-23.93	194	105	H
3	2.39	35.19	VB1T	32	-22.4	0	44.79	54	-9.21	-	-	194	105	H

* - indicates frequency in CFR15.205/IC7.2.2 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/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.384	35.81	VB1T	32	-22.4	0	45.41	54	-8.59	-	-	292	305	V
2	2.387	42.4	PK	32	-22.4	0	52	-	-	74	-22	292	305	V
1	2.39	39.07	PK	32	-22.4	0	48.67	-	-	74	-25.33	292	305	V
3	2.39	35.01	VB1T	32	-22.4	0	44.61	54	-9.39	-	-	292	305	V

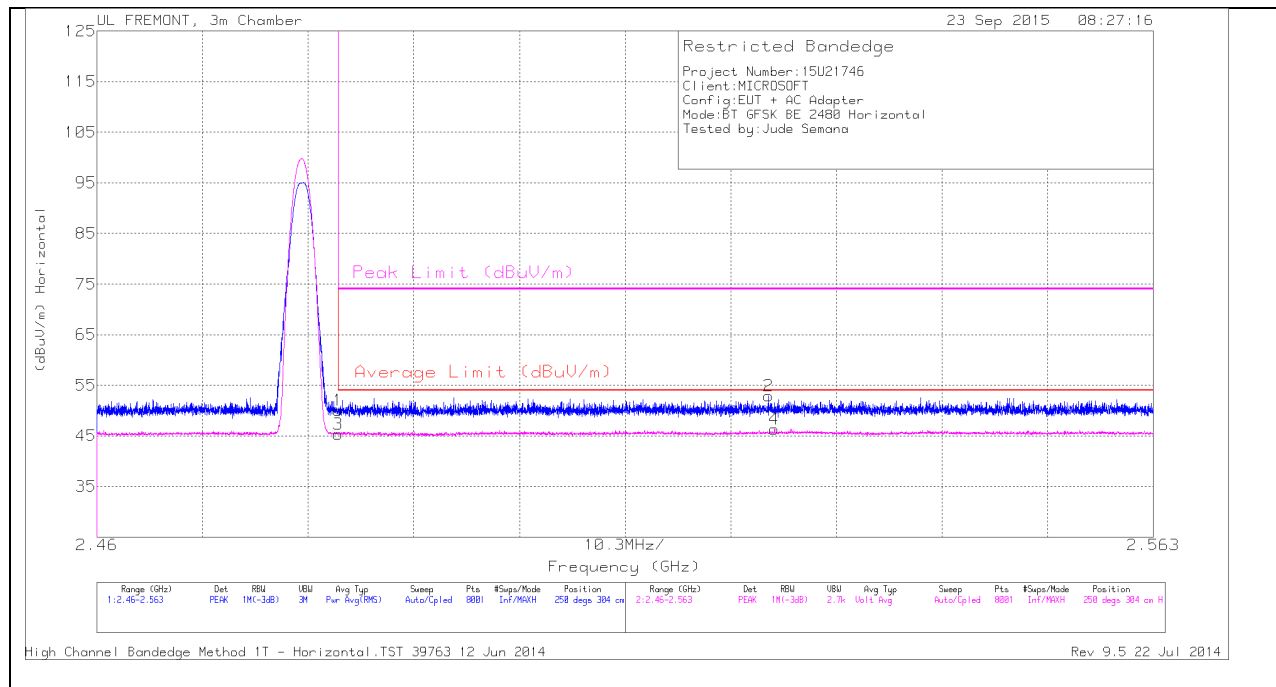
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

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

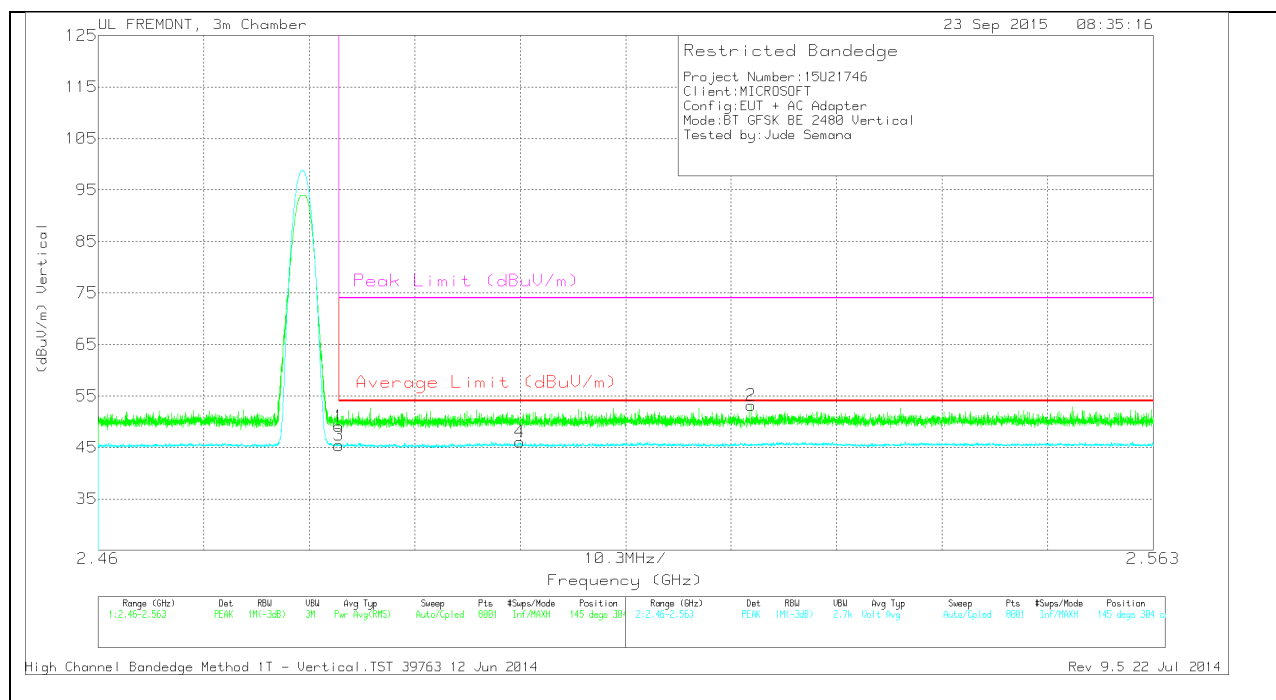
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	39.88	PK	32.3	-22.1	0	50.08	-	-	74	-23.92	250	304	H
3	2.484	35.15	VB1T	32.3	-22.1	0	45.35	54	-8.65	-	-	250	304	H
2	2.525	42.46	PK	32.4	-22	0	52.86	-	-	74	-21.14	250	304	H
4	2.526	35.93	VB1T	32.4	-22	0	46.33	54	-7.67	-	-	250	304	H

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

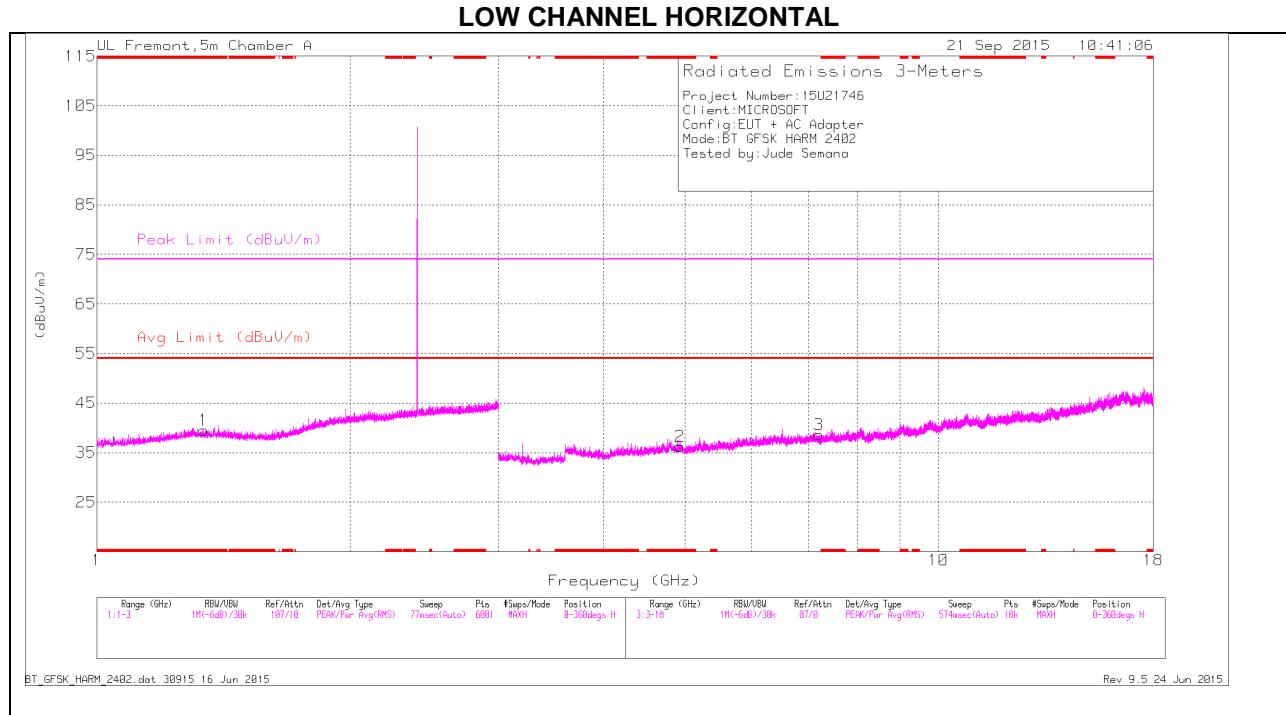
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	38.89	PK	32.3	-22.1	0	49.09	-	-	74	-24.91	145	304	V
3	2.484	35.2	VB1T	32.3	-22.1	0	45.4	54	-8.6	-	-	145	304	V
4	2.501	35.88	VB1T	32.3	-22.1	0	46.08	54	-7.92	-	-	145	304	V
2	2.524	42.75	PK	32.4	-22	0	53.15	-	-	74	-20.85	145	304	V

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

PK - Peak detector

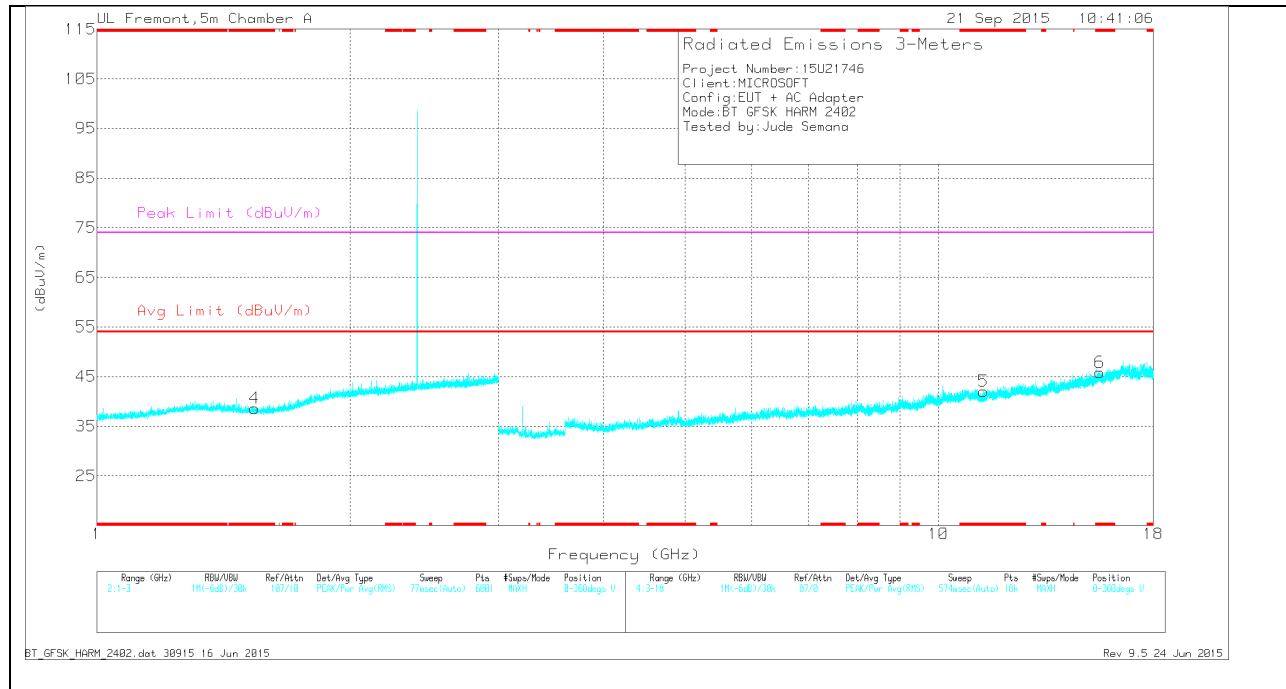
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

HARMONICS AND SPURIOUS EMISSIONS



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 T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.339	36.55	Pk	28.7	-25.8	0	39.45	-	-	74	-34.55	0-360	101	H
4	* 1.539	36.21	Pk	28	-25.6	0	38.61	-	-	74	-35.39	0-360	200	V
2	* 4.932	31.76	Pk	33.9	-29.5	0	36.16	-	-	74	-37.84	0-360	100	H
5	* 11.313	26.6	Pk	37.8	-22.3	0	42.1	-	-	74	-31.9	0-360	100	V
6	* 15.552	26.4	Pk	40.3	-20.8	0	45.9	-	-	74	-28.1	0-360	100	V
3	7.206	29.22	Pk	35.5	-26.1	0	38.62	-	-	-	-	0-360	100	H

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

Pk - Peak detector

Radiated Emissions

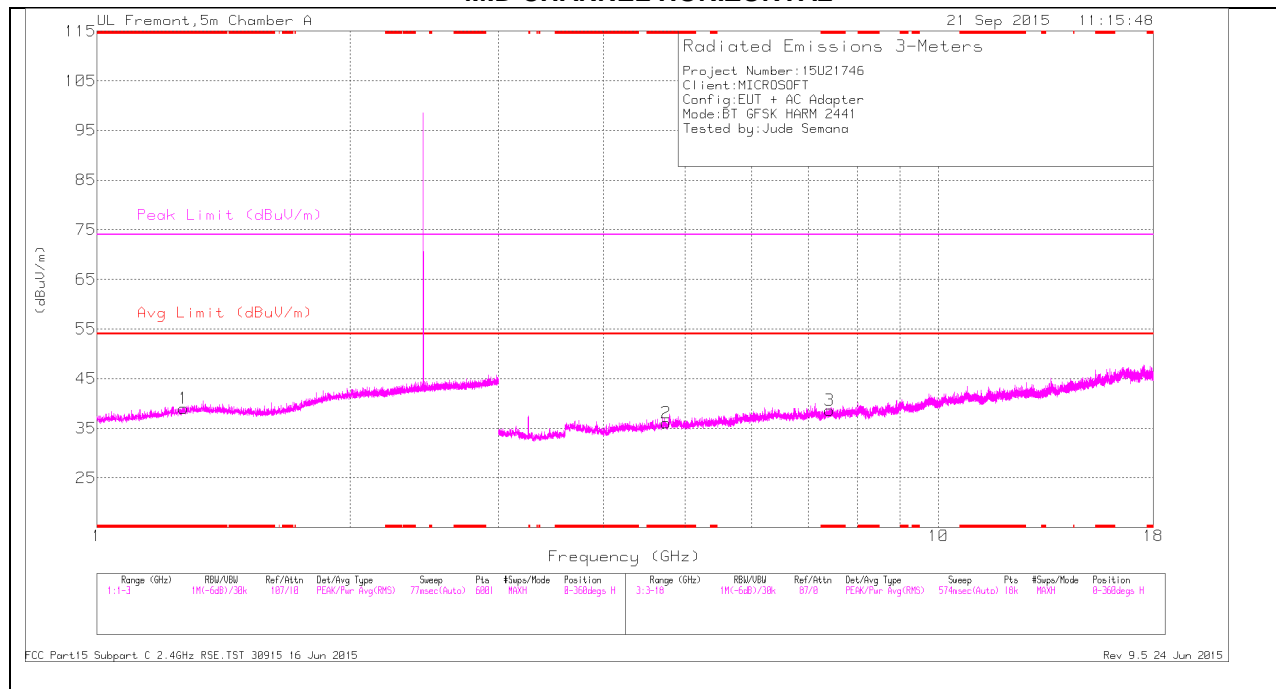
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.339	42.58	PK3	28.7	-25.8	45.48	-	-	74	-28.52	171	101	H
* 1.337	30.57	VA1T	28.7	-25.8	33.47	54	-20.53	-	-	171	101	H
* 1.539	42.53	PK3	28	-25.6	44.93	-	-	74	-29.07	171	200	V
* 1.539	30.48	VA1T	28	-25.6	32.88	54	-21.12	-	-	171	200	V
* 4.933	40.4	PK3	33.9	-29.5	44.8	-	-	74	-29.2	171	100	H
* 4.933	28.22	VA1T	33.9	-29.5	32.62	54	-21.83	-	-	171	100	H
* 11.315	35.45	PK3	37.8	-22.3	50.95	-	-	74	-23.05	171	100	V
* 11.315	24.08	VA1T	37.8	-22.3	39.58	54	-14.42	-	-	171	100	V
* 15.553	37.03	PK3	40.3	-20.9	56.43	-	-	74	-17.57	171	100	V
* 15.552	24.94	VA1T	40.3	-20.8	44.44	54	-9.56	-	-	171	100	V
7.208	38.97	PK3	35.5	-26.1	48.37	-	-	-	-	171	100	H
7.208	26.94	VA1T	35.5	-26.1	36.34	-	-	-	-	171	100	H

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

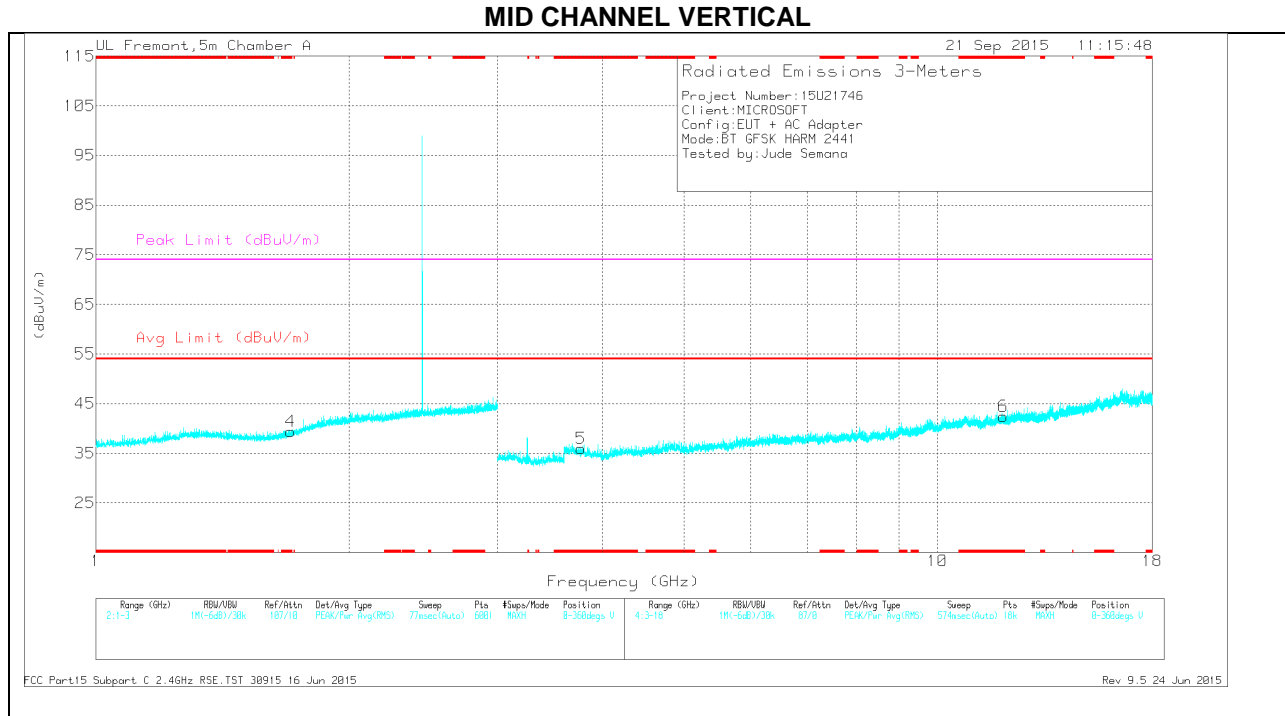
PK3 - FHSS Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

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.



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 T136 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.268	36.39	Pk	28.6	-26	0	38.99	-	-	74	-35.01	0-360	100	H
4	* 1.704	36.06	Pk	28.7	-25.4	0	39.36	-	-	74	-34.64	0-360	200	V
2	* 4.748	32.44	Pk	34.1	-30.5	0	36.04	-	-	74	-37.96	0-360	201	H
3	* 7.421	28.26	Pk	35.5	-25.1	0	38.66	-	-	74	-35.34	0-360	201	H
5	* 3.771	34.59	Pk	33.3	-31.9	0	35.99	-	-	74	-38.01	0-360	200	V
6	* 11.975	25.89	Pk	38.7	-22.2	0	42.39	-	-	74	-31.61	0-360	200	V

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

Pk - Peak detector

Radiated Emissions

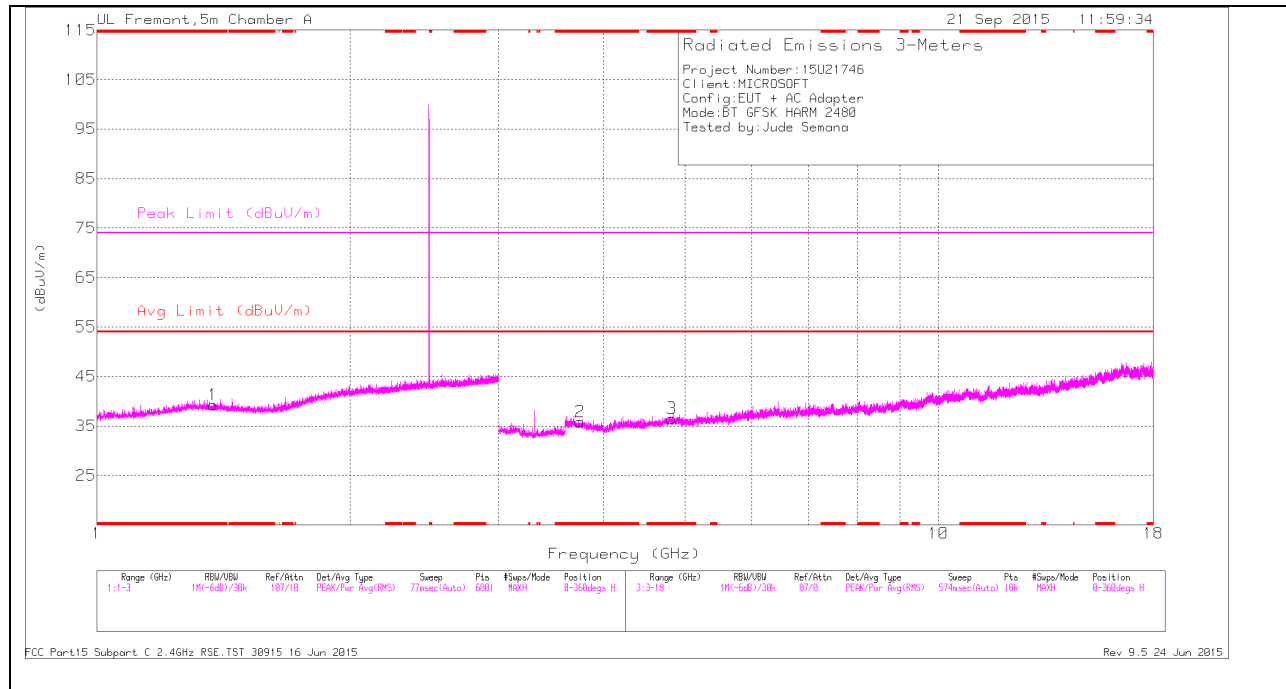
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.268	33.09	VA1T	28.6	-26	0	35.69	54	-18.31	-	-	360	100	H
* 1.269	42.12	PK3	28.6	-26	0	44.72	-	-	74	-29.28	171	100	H
* 1.703	32.73	VA1T	28.7	-25.4	0	36.03	54	-17.97	-	-	360	201	V
* 1.703	42.3	PK3	28.7	-25.4	0	45.6	-	-	74	-28.4	171	200	V
* 4.747	29.07	VA1T	34.1	-30.5	0	32.67	54	-21.33	-	-	360	201	H
* 7.423	24.85	VA1T	35.5	-25.1	0	35.25	54	-18.75	-	-	360	201	H
* 4.747	38.87	PK3	34.1	-30.5	0	42.47	-	-	74	-31.53	171	201	H
* 7.422	37.24	PK3	35.5	-25.1	0	47.64	-	-	74	-26.36	171	201	H
* 3.77	30.34	VA1T	33.3	-31.9	0	31.74	54	-22.26	-	-	360	201	V
*11.974	31.97	PK3	38.7	-22.2	0	48.77	-	-	-	-26.23	171	201	V
* 11.974	22.5	VA1T	38.7	-22.2	0	39	54	-15	-	-	360	201	V
* 3.771	39.54	PK3	33.3	-31.9	0	40.94	-	-	74	-33.06	171	200	V

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

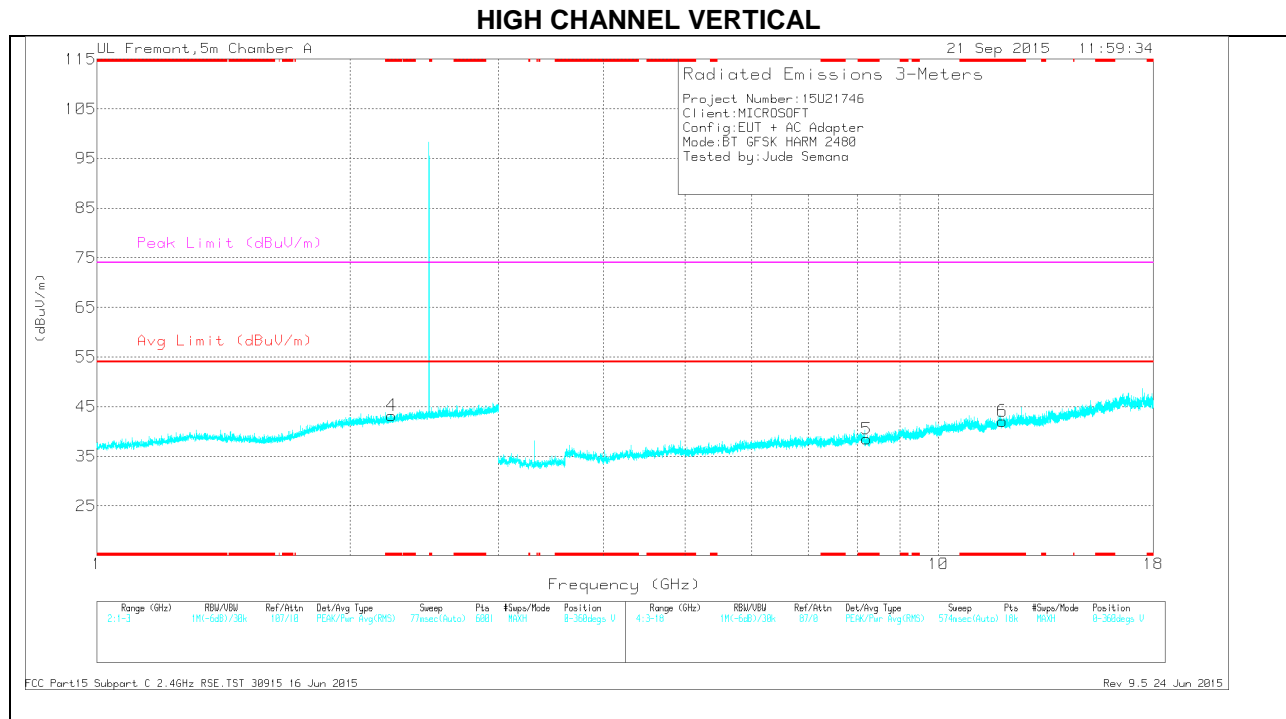
PK3 - FHSS Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average $V_B=1/T_{on}$ where: T_{on} is transmit duration

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.



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 T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.374	36.4	Pk	28.6	-25.8	0	39.2	-	-	74	-34.8	0-360	201	H
4	* 2.241	36.55	Pk	31.5	-24.8	0	43.25	-	-	74	-30.75	0-360	100	V
2	* 3.748	34.22	Pk	33.3	-31.7	0	35.82	-	-	74	-38.18	0-360	100	H
3	* 4.817	32.32	Pk	33.9	-29.7	0	36.52	-	-	74	-37.48	0-360	100	H
5	* 8.216	27.54	Pk	35.7	-24.7	0	38.54	-	-	74	-35.46	0-360	200	V
6	* 11.915	25.91	Pk	38.6	-22.4	0	42.11	-	-	74	-31.89	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 T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.374	32.89	VA1T	28.6	-25.8	0	35.69	54	-18.31	-	-	360	202	H
* 1.375	42.49	PK3	28.6	-25.8	0	45.29	-	-	74	-28.71	171	201	H
* 2.242	32.63	VA1T	31.5	-24.8	0	39.33	54	-14.67	-	-	360	100	V
* 2.24	42.57	PK3	31.5	-24.8	0	49.27	-	-	74	-24.73	171	100	V
* 3.747	30.39	VA1T	33.3	-31.7	0	31.99	54	-22.01	-	-	360	100	H
* 4.816	29.89	VA1T	33.9	-29.7	0	34.09	54	-19.91	-	-	360	100	H
* 3.748	39.23	PK3	33.3	-31.7	0	40.83	-	-	74	-33.17	171	100	H
* 4.817	38.71	PK3	33.9	-29.7	0	42.91	-	-	74	-31.09	171	100	H
* 8.216	24.33	VA1T	35.7	-24.7	0	35.33	54	-18.67	-	-	360	201	V
* 11.914	22.73	VA1T	38.6	-22.4	0	38.93	54	-15.07	-	-	360	201	V
* 8.215	37.76	PK3	35.7	-24.6	0	48.86	-	-	74	-25.14	171	200	V
* 11.917	37.16	PK3	38.6	-22.4	0	53.36	-	-	74	-20.64	171	200	V

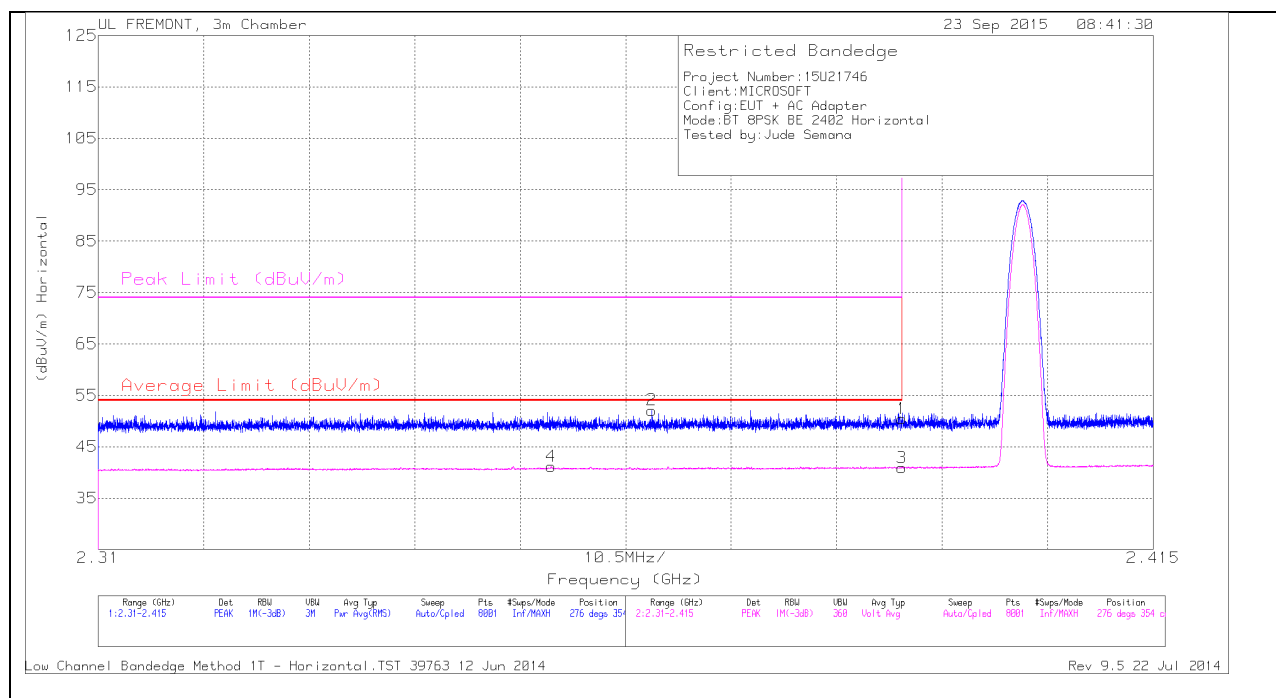
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK3 - FHSS Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

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

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

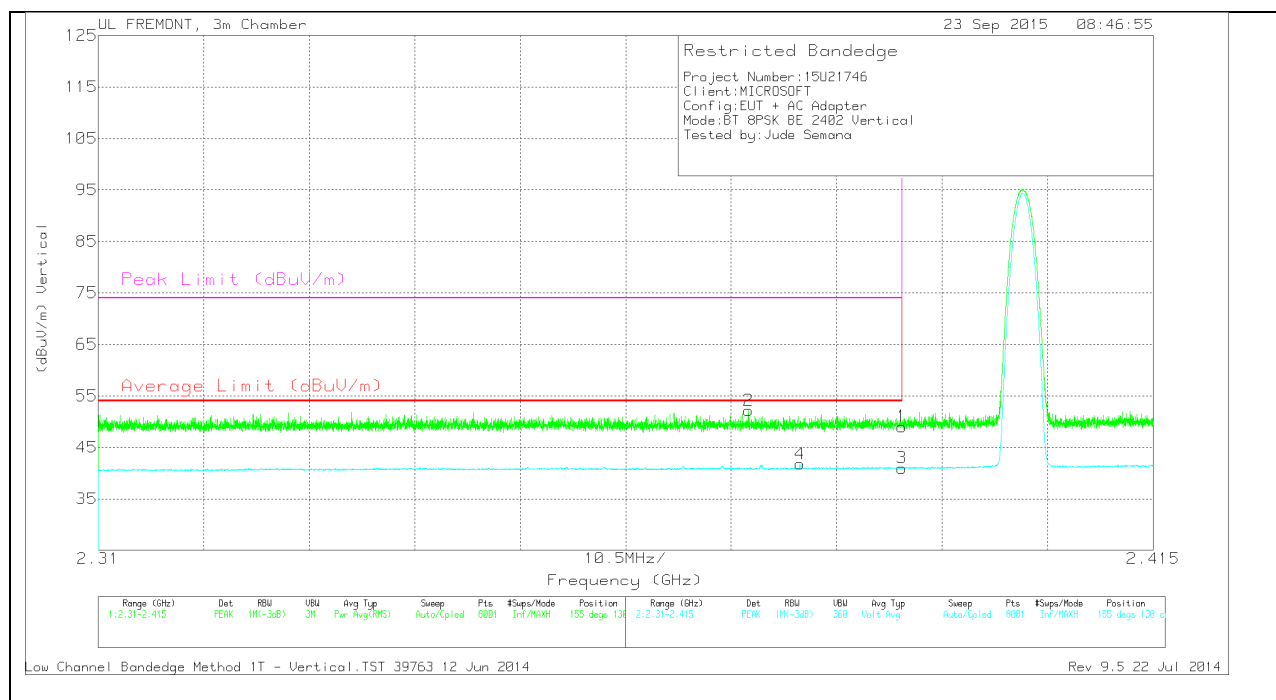
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.355	31.76	VB1T	31.8	-22.4	0	41.16	54	-12.84	-	-	276	354	H
2	2.365	42.69	PK	31.9	-22.5	0	52.09	-	-	74	-21.91	276	354	H
1	2.39	40.83	PK	32	-22.4	0	50.43	-	-	74	-23.57	276	354	H
3	2.39	31.29	VB1T	32	-22.4	0	40.89	54	-13.11	-	-	276	354	H

* - indicates frequency in CFR15.205/IC7.2.2 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/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.375	42.65	PK	31.9	-22.4	0	52.15	-	-	74	-21.85	155	130	V
4	2.38	32.24	VB1T	31.9	-22.4	0	41.74	54	-12.26	-	-	155	130	V
1	2.39	39.44	PK	32	-22.4	0	49.04	-	-	74	-24.96	155	130	V
3	2.39	31.38	VB1T	32	-22.4	0	40.98	54	-13.02	-	-	155	130	V

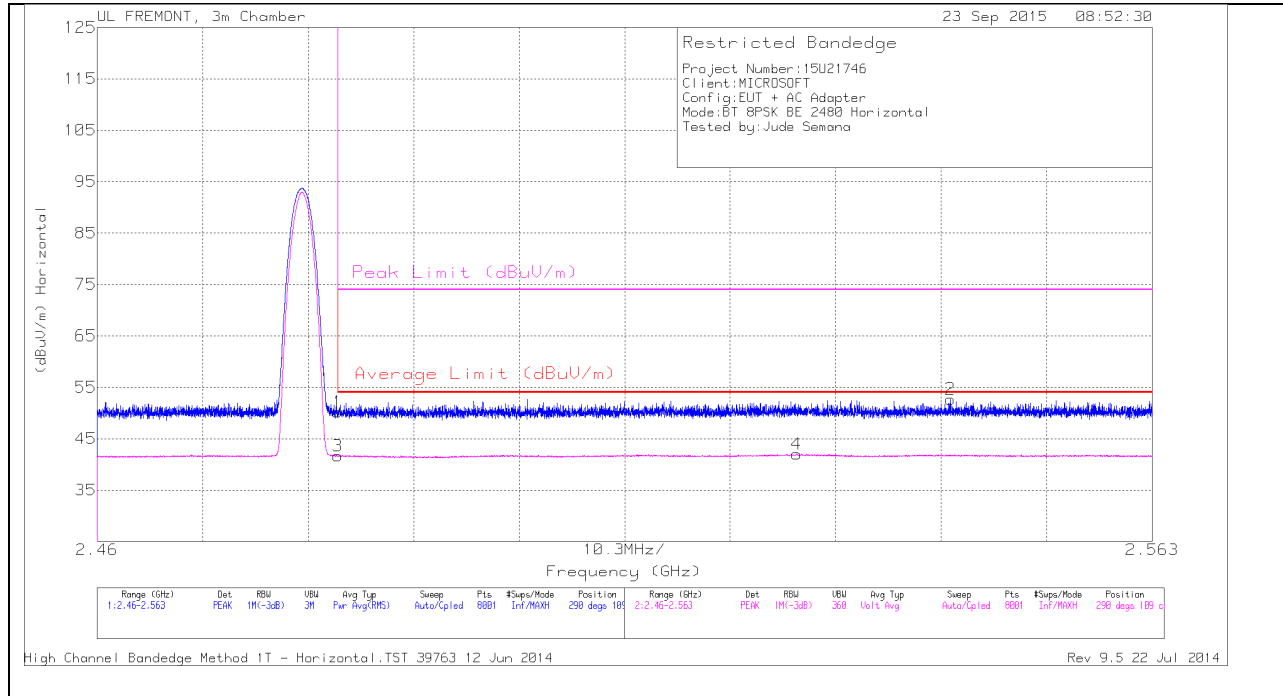
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

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

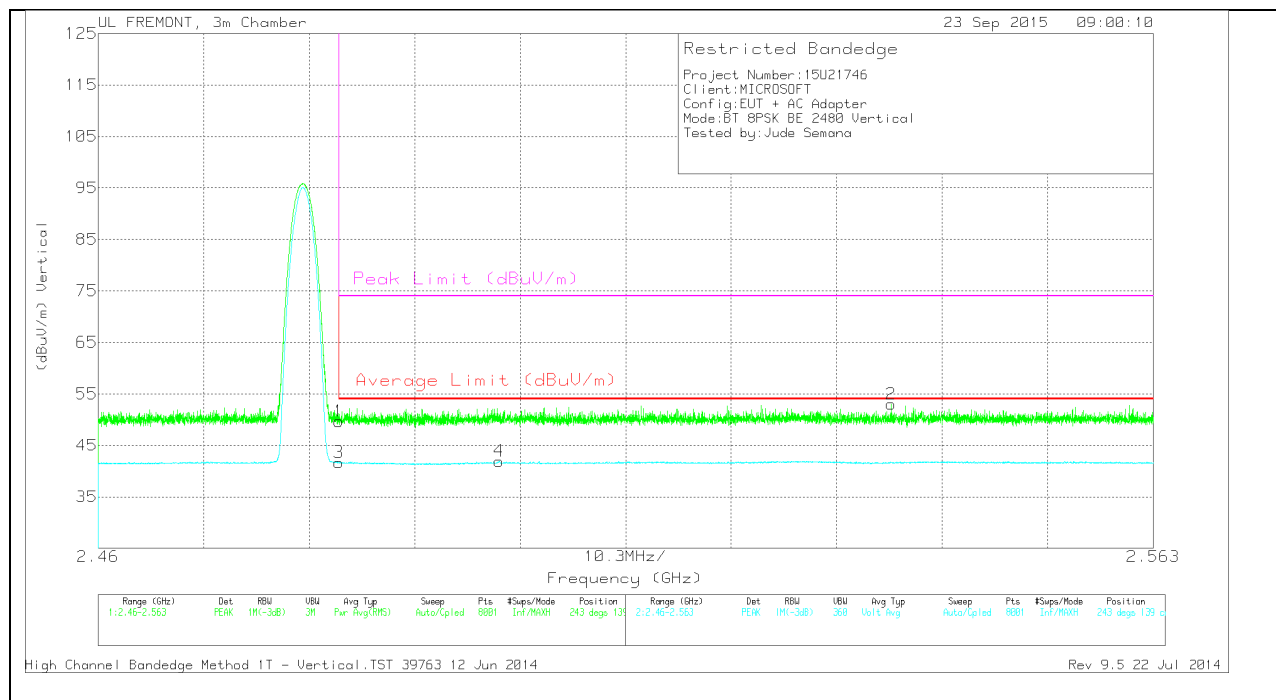
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	40	PK	32.3	-22.1	0	50.2	-	-	74	-23.8	290	109	H
3	2.484	31.45	VB1T	32.3	-22.1	0	41.65	54	-12.35	-	-	290	109	H
4	2.528	31.62	VB1T	32.4	-22	0	42.02	54	-11.98	-	-	290	109	H
2	2.543	42.18	PK	32.4	-21.9	0	52.68	-	-	74	-21.32	290	109	H

* - indicates frequency in CFR15.205/IC7.2.2 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/Filt r/Pad (dB)	DC Corr (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	39.48	PK	32.3	-22.1	0	49.68	-	-	74	-24.32	243	139	V
3	2.484	31.48	VB1T	32.3	-22.1	0	41.68	54	-12.32	-	-	243	139	V
4	2.499	31.74	VB1T	32.3	-22.1	0	41.94	54	-12.06	-	-	243	139	V
2	2.537	42.62	PK	32.4	-22	0	53.02	-	-	74	-20.98	243	139	V

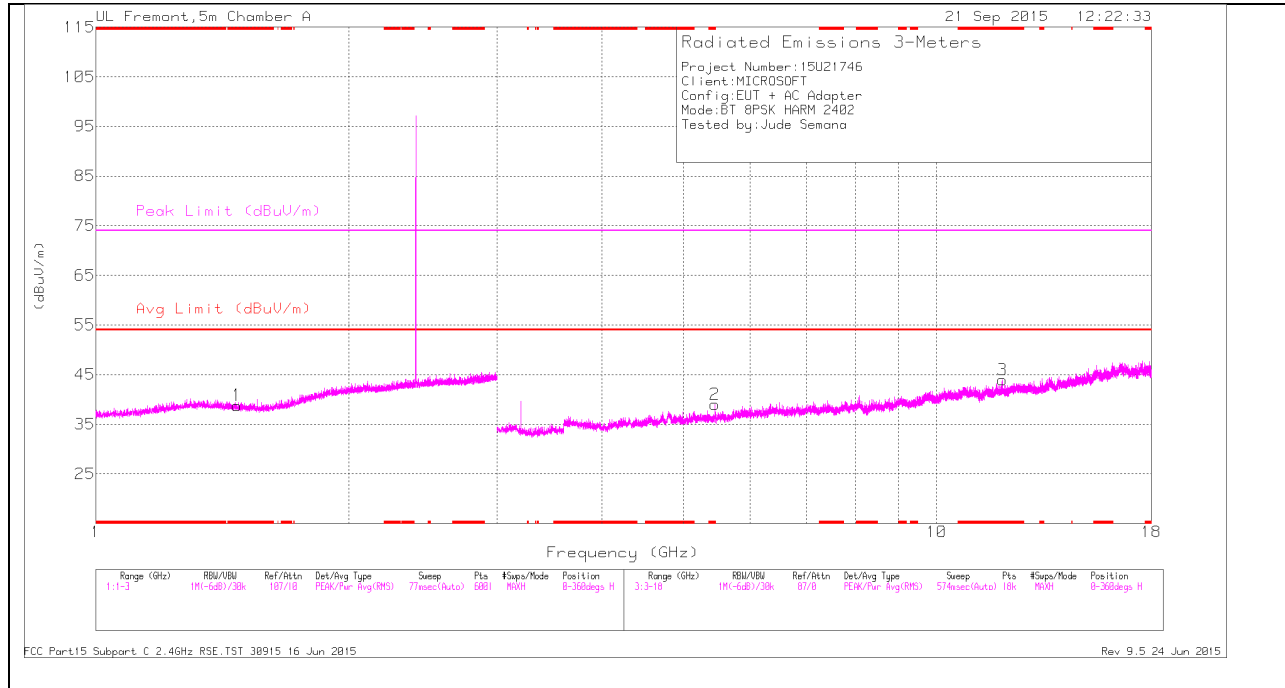
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

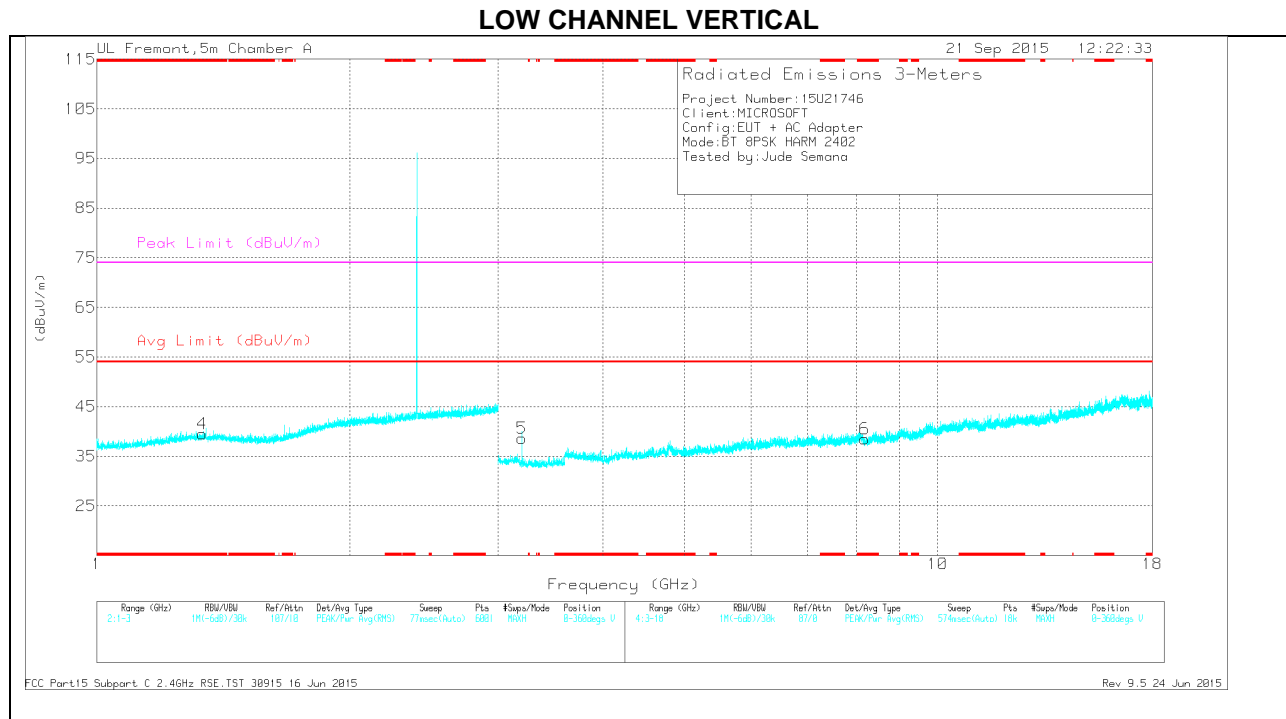
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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.



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 T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.473	36.21	Pk	28.2	-25.6	0	38.81	-	-	74	-35.19	0-360	100	H
4	* 1.335	36.68	Pk	28.7	-25.9	0	39.48	-	-	74	-34.52	0-360	100	V
2	* 5.449	33.35	Pk	34.5	-28.9	0	38.95	-	-	74	-35.05	0-360	100	H
3	* 11.967	27.52	Pk	38.6	-22.2	0	43.92	-	-	74	-30.08	0-360	100	H
6	* 8.186	27.57	Pk	35.7	-24.8	0	38.47	-	-	74	-35.53	0-360	100	V
5	3.203	37.94	Pk	32.7	-32	0	38.64	-	-	-	-	0-360	200	V

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

Pk - Peak detector

Radiated Emissions

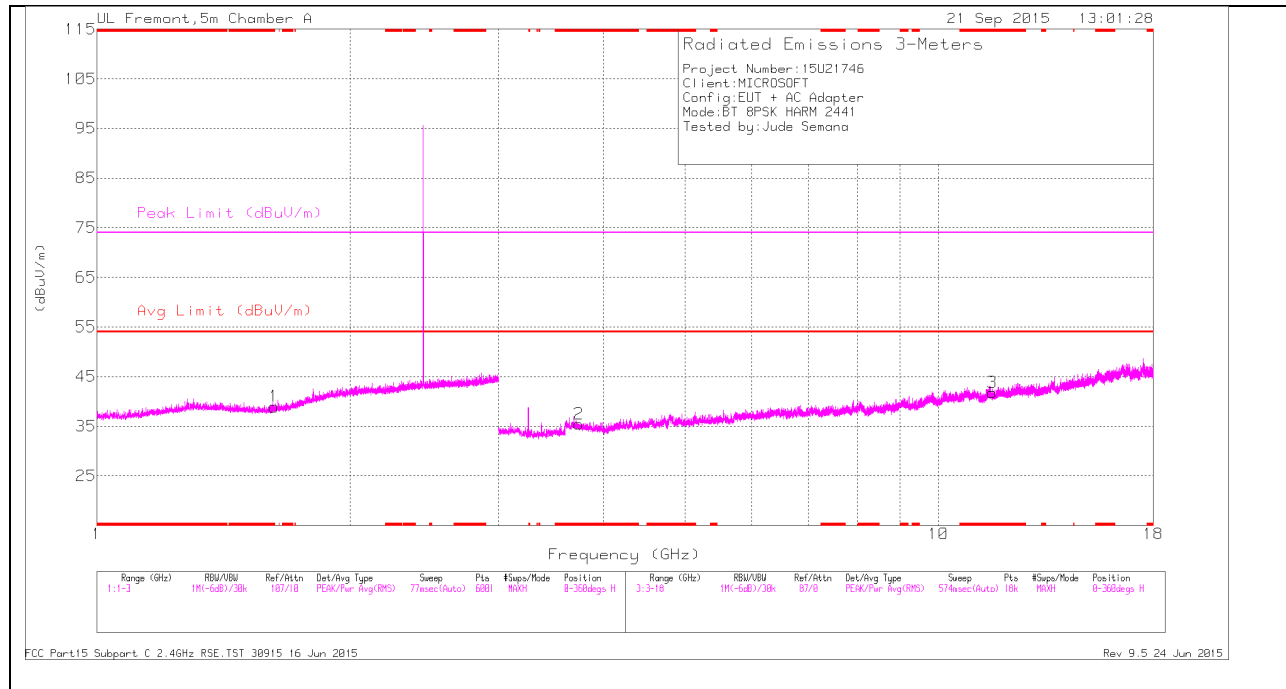
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.473	32.99	VA1T	28.2	-25.6	0	35.59	54	-18.41	-	-	360	100	H
* 1.474	42.83	PK3	28.2	-25.6	0	45.43	-	-	74	-28.57	171	100	H
* 1.334	33.36	VA1T	28.7	-25.9	0	36.16	54	-17.84	-	-	360	100	V
* 1.337	42.44	PK3	28.7	-25.8	0	45.34	-	-	74	-28.66	171	100	V
* 5.448	28.39	VA1T	34.5	-29	0	33.89	54	-20.11	-	-	360	100	H
* 11.966	22.85	VA1T	38.6	-22.2	0	39.25	54	-14.75	-	-	360	100	H
* 5.449	39.37	PK3	34.5	-28.9	0	44.97	-	-	74	-29.03	171	100	H
* 11.968	35.85	PK3	38.6	-22.2	0	52.25	-	-	74	-21.75	171	100	H
* 8.186	24.61	VA1T	35.7	-24.8	0	35.51	54	-18.49	-	-	360	100	V
* 8.188	36.66	PK3	35.7	-24.8	0	47.56	-	-	74	-26.44	171	100	V
3.202	40.62	PK3	32.7	-32	0	41.32	-	-	-	-	171	200	V
3.203	31.68	VA1T	32.7	-32	0	32.38	-	-	-	-	360	201	V

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

PK3 - FHSS Method: Maximum Peak

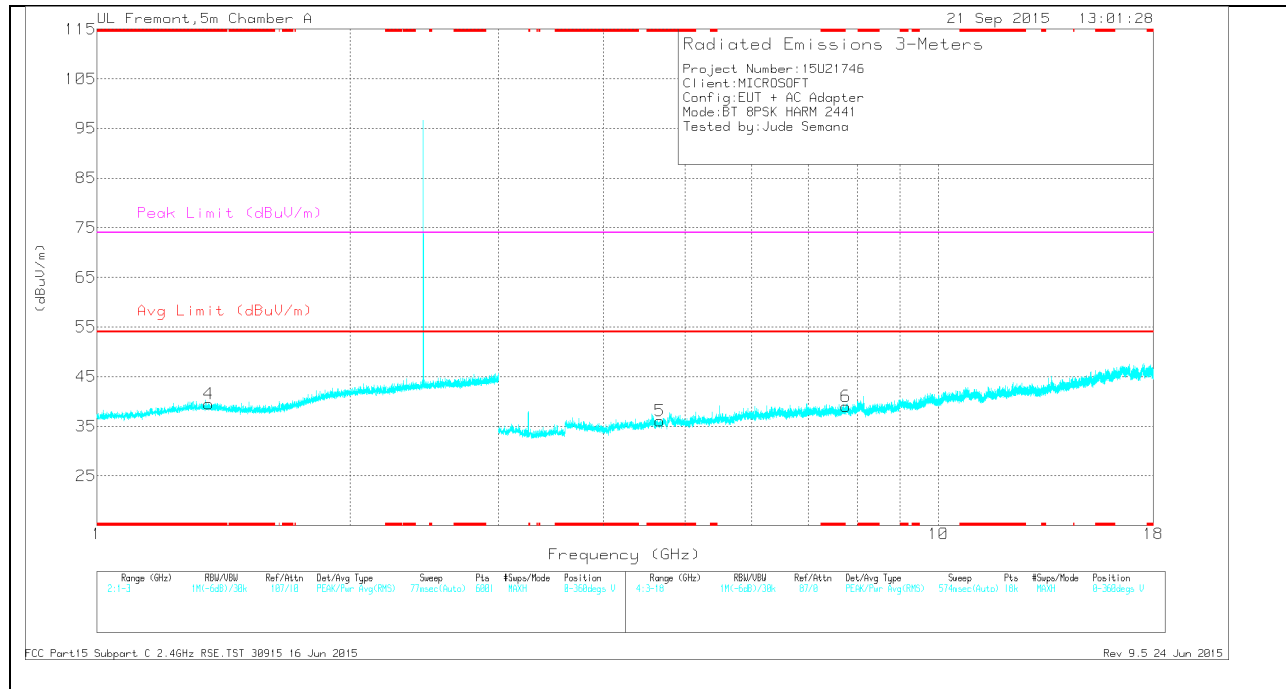
VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

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 T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.623	36.44	Pk	28.1	-25.6	0	38.94	-	-	74	-35.06	0-360	201	H
4	* 1.357	36.64	Pk	28.7	-25.8	0	39.54	-	-	74	-34.46	0-360	200	V
2	* 3.741	33.88	Pk	33.3	-31.7	0	35.48	-	-	74	-38.52	0-360	201	H
3	* 11.585	26.12	Pk	38.1	-22.4	0	41.82	-	-	74	-32.18	0-360	201	H
5	* 4.669	32.83	Pk	34.1	-30.9	0	36.03	-	-	74	-37.97	0-360	200	V
6	7.759	28.55	Pk	35.7	-25.2	0	39.05	-	-	-	-	0-360	100	V

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

Pk - Peak detector

Radiated Emissions

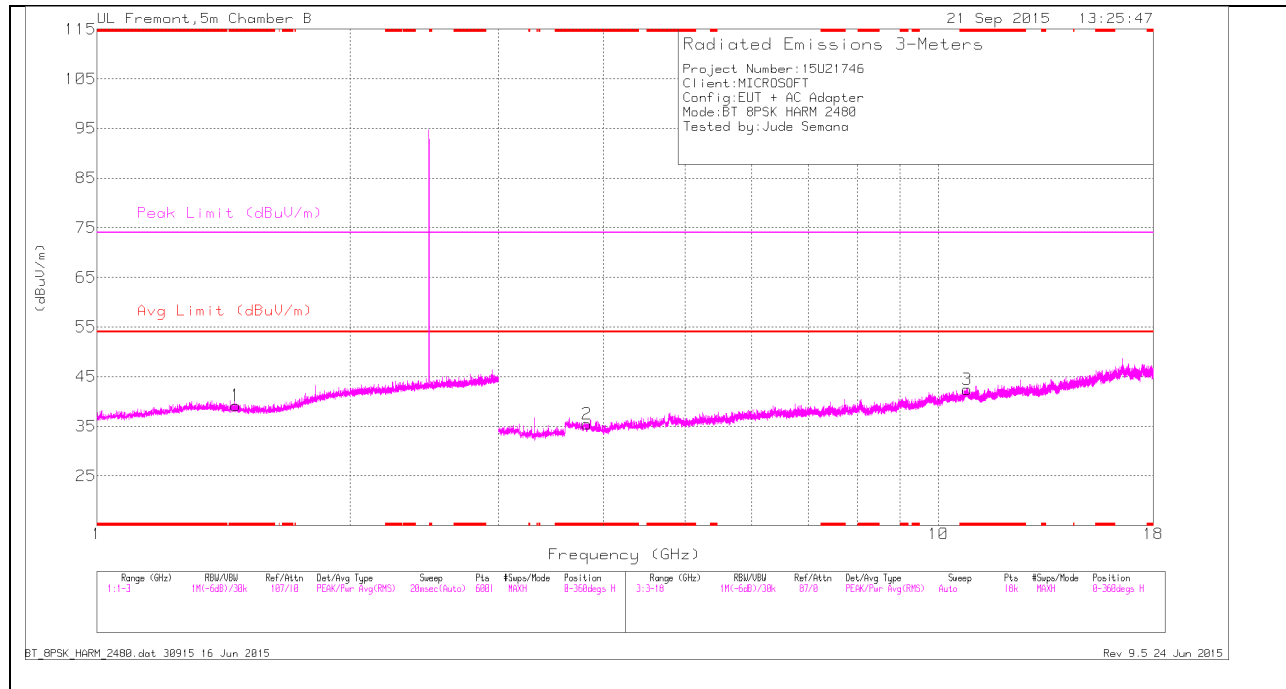
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.622	33.03	VA1T	28.1	-25.6	0	35.53	54	-18.47	-	-	360	202	H
* 1.622	41.87	PK3	28.1	-25.6	0	44.37	-	-	74	-29.63	171	201	H
* 1.358	33.1	VA1T	28.7	-25.8	0	36	54	-18	-	-	360	202	V
* 1.358	42.5	PK3	28.7	-25.8	0	45.4	-	-	74	-28.6	171	200	V
* 3.739	30.82	VA1T	33.3	-31.7	0	32.42	54	-21.58	-	-	360	202	H
* 11.584	23.03	VA1T	38.1	-22.4	0	38.73	54	-15.27	-	-	360	202	H
* 3.742	39.3	PK3	33.3	-31.7	0	40.9	-	-	74	-33.1	171	201	H
* 11.584	35.56	PK3	38.1	-22.4	0	51.26	-	-	74	-22.74	171	201	H
* 4.669	29.77	VA1T	34.1	-30.9	0	32.97	54	-21.03	-	-	360	202	V
* 4.67	39.21	PK3	34.1	-30.9	0	42.41	-	-	74	-31.59	171	200	V
7.758	38.33	PK3	35.7	-25.2	0	48.83	-	-	-	-	171	100	V
7.759	25.31	VA1T	35.7	-25.2	0	35.81	-	-	-	-	360	100	V

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

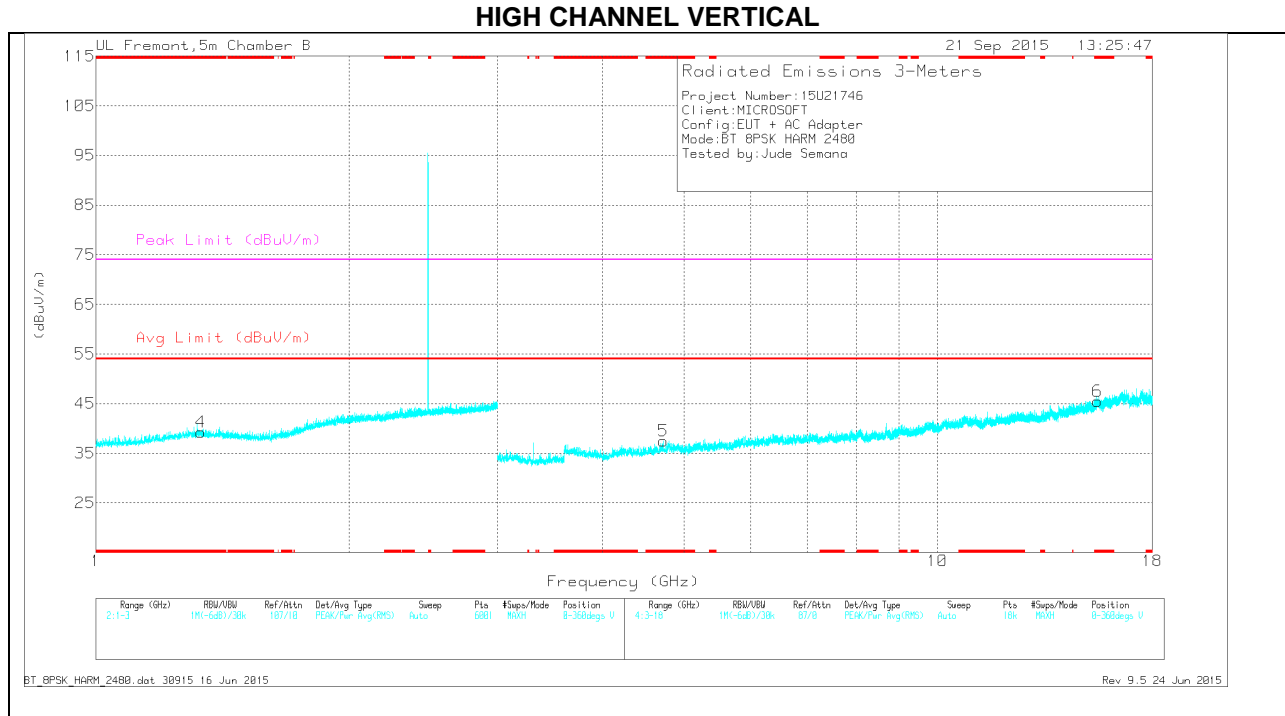
PK3 - FHSS Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average $V_B = 1/T_{on}$ where: T_{on} is transmit duration

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.



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 T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.461	36.49	Pk	28.3	-25.6	0	39.19	-	-	74	-34.81	0-360	100	H
4	* 1.333	36.45	Pk	28.7	-25.9	0	39.25	-	-	74	-34.75	0-360	200	V
2	* 3.821	33.84	Pk	33.4	-31.8	0	35.44	-	-	74	-38.56	0-360	201	H
3	* 10.82	26.16	Pk	37.8	-21.5	0	42.46	-	-	74	-31.54	0-360	201	H
5	* 4.719	34.08	Pk	34.1	-30.7	0	37.48	-	-	74	-36.52	0-360	200	V
6	* 15.498	26.58	Pk	40.3	-21.4	0	45.48	-	-	74	-28.52	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 T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.463	33.21	VA1T	28.3	-25.6	0	35.91	54	-18.09	-	-	359	100	H
* 1.461	43.1	PK3	28.3	-25.6	0	45.8	-	-	74	-28.2	171	100	H
* 1.339	42.58	PK3	28.7	-25.8	0	45.48	-	-	74	-28.52	171	101	H
* 1.337	30.57	VA1T	28.7	-25.8	0	33.47	54	-20.53	-	-	171	101	H
* 3.82	30.49	VA1T	33.4	-31.8	0	32.09	54	-21.91	-	-	359	201	H
* 10.82	22.83	VA1T	37.8	-21.5	0	39.13	54	-14.87	-	-	359	201	H
* 3.82	39.29	PK3	33.4	-31.8	0	40.89	-	-	74	-33.11	171	201	H
* 10.819	35.05	PK3	37.8	-21.5	0	51.35	-	-	74	-22.65	171	201	H
* 4.719	30.71	VA1T	34.1	-30.7	0	34.11	54	-19.89	-	-	359	201	V
* 15.498	23.82	VA1T	40.3	-21.4	0	42.72	54	-11.28	-	-	359	100	V
* 4.718	39.71	PK3	34.1	-30.7	0	43.11	-	-	74	-30.89	171	200	V
* 15.497	37.42	PK3	40.3	-21.4	0	56.32	-	-	74	-17.68	171	100	V

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

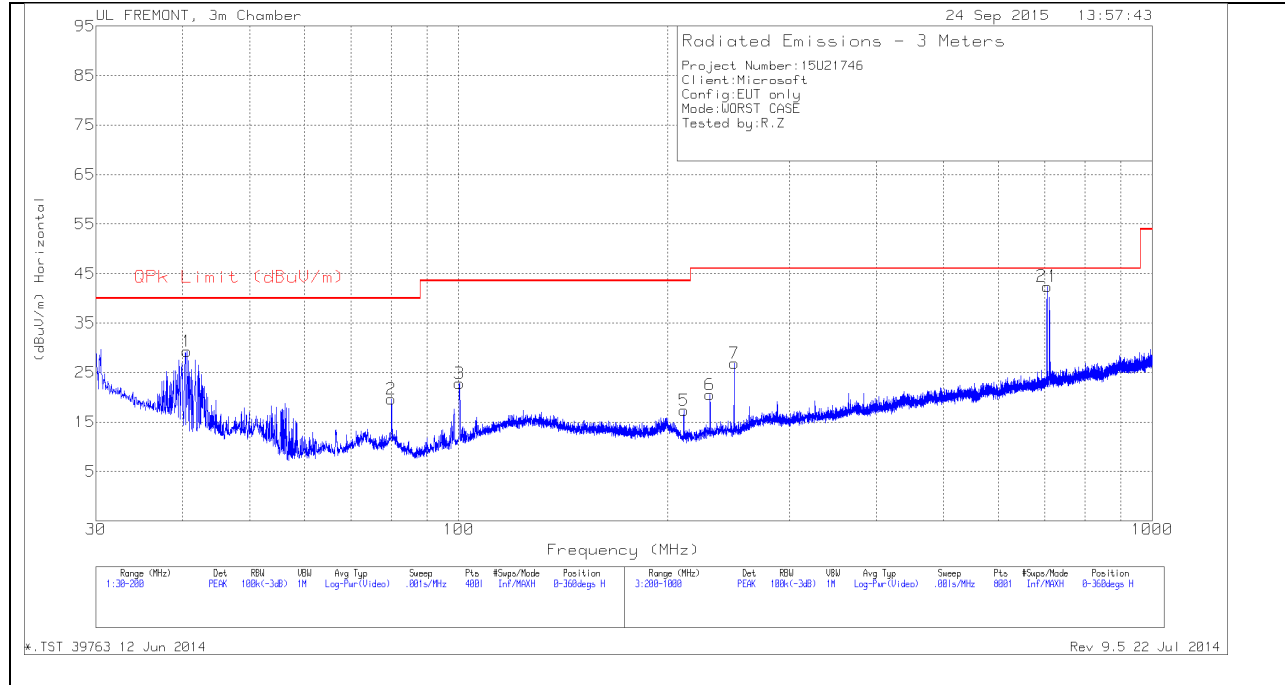
PK3 - FHSS Method: Maximum Peak

VA1T - FHSS: Linear Voltage Average $V_B=1/T_{on}$ where: T_{on} is transmit duration

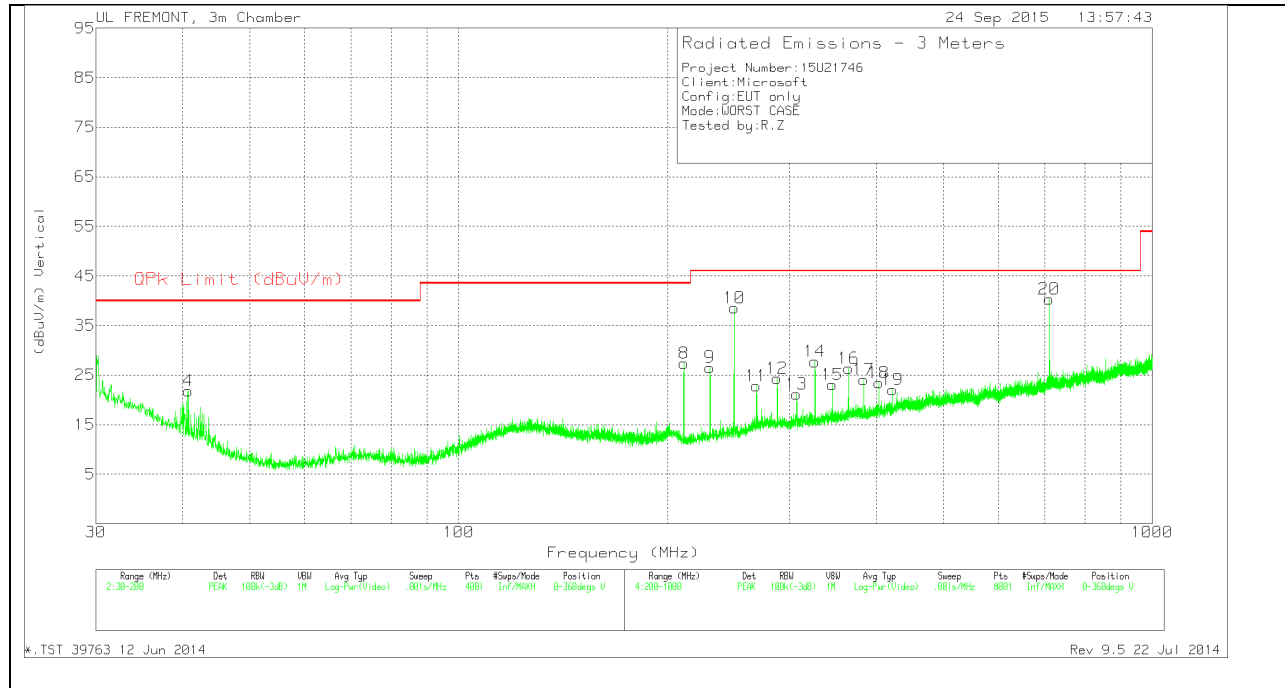
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	40.625	42.54	PK	13.8	-27	29.34	40	-10.66	0-360	100	H
4	40.7525	35.04	PK	13.7	-27	21.74	40	-18.26	0-360	100	V
2	79.98	38.19	PK	8	-26.6	19.59	40	-20.41	0-360	400	H
3	100.2525	39.3	PK	9.8	-26.3	22.8	43.52	-20.72	0-360	300	H
5	211.2	32	PK	10.3	-25	17.3	43.52	-26.22	0-360	100	H
8	211.2	42.08	PK	10.3	-25	27.38	43.52	-16.14	0-360	100	V
6	230.4	34.32	PK	11.1	-24.9	20.52	46.02	-25.5	0-360	100	H
9	230.4	40.35	PK	11.1	-24.9	26.55	46.02	-19.47	0-360	100	V
7	249.6	40.08	PK	11.5	-24.7	26.88	46.02	-19.14	0-360	100	H
10	249.6	51.73	PK	11.5	-24.7	38.53	46.02	-7.49	0-360	100	V
11	268.8	34.29	PK	13	-24.5	22.79	46.02	-23.23	0-360	100	V
12	288	35.34	PK	13.4	-24.4	24.34	46.02	-21.68	0-360	100	V
13	307.2	32.21	PK	13.4	-24.4	21.21	46.02	-24.81	0-360	100	V
14	326.4	38.2	PK	13.9	-24.4	27.7	46.02	-18.32	0-360	100	V
15	345.6	33.33	PK	14.2	-24.5	23.03	46.02	-22.99	0-360	100	V
16	364.8	36.04	PK	14.9	-24.6	26.34	46.02	-19.68	0-360	100	V
17	384	33.8	PK	15	-24.7	24.1	46.02	-21.92	0-360	100	V
18	403.2	32.71	PK	15.5	-24.8	23.41	46.02	-22.61	0-360	100	V
19	422.4	30.95	PK	16	-24.9	22.05	46.02	-23.97	0-360	200	V
21	705.5	46.42	PK	20.1	-24.1	42.42	46.02	-3.6	0-360	400	H
20	710.5	44.26	PK	20.2	-24.1	40.36	46.02	-5.66	0-360	300	V

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

PK - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
705.6471	25.72	QP	20.1	-24.1	21.72	46.02	-24.3	295	212	H

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

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.

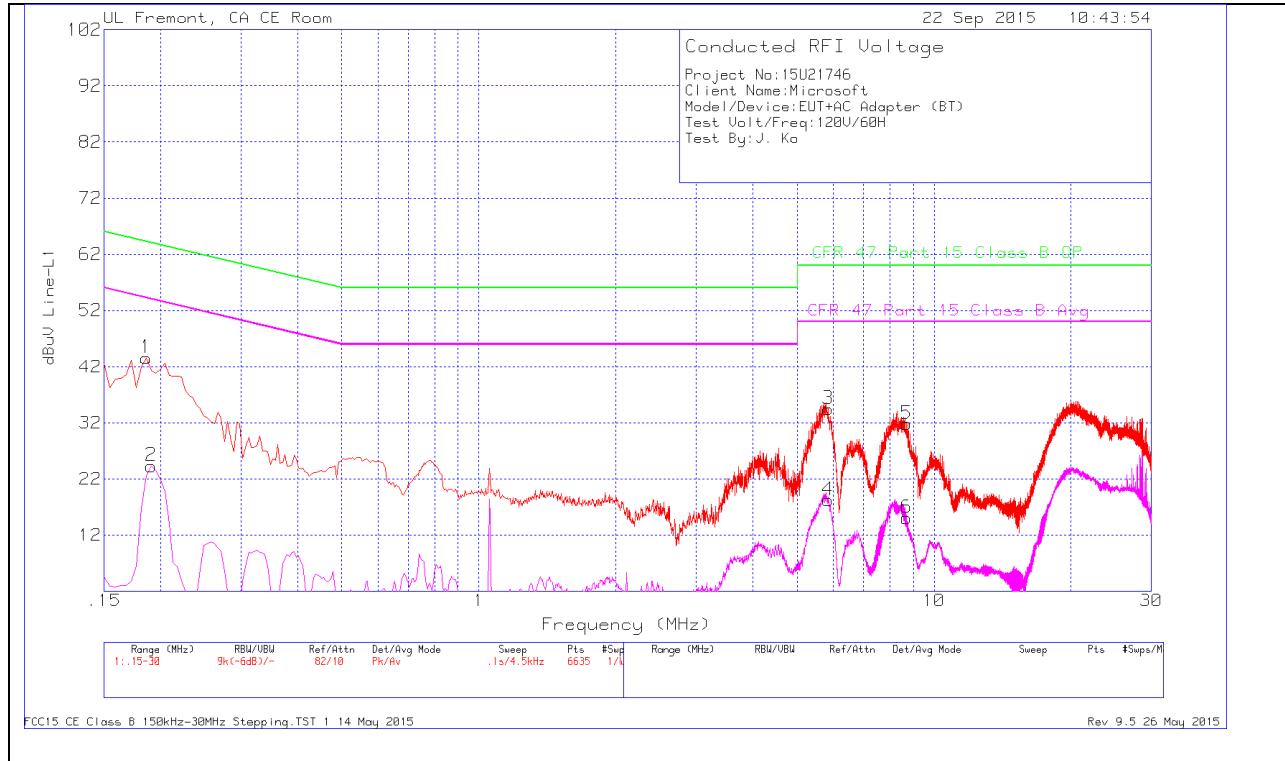
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

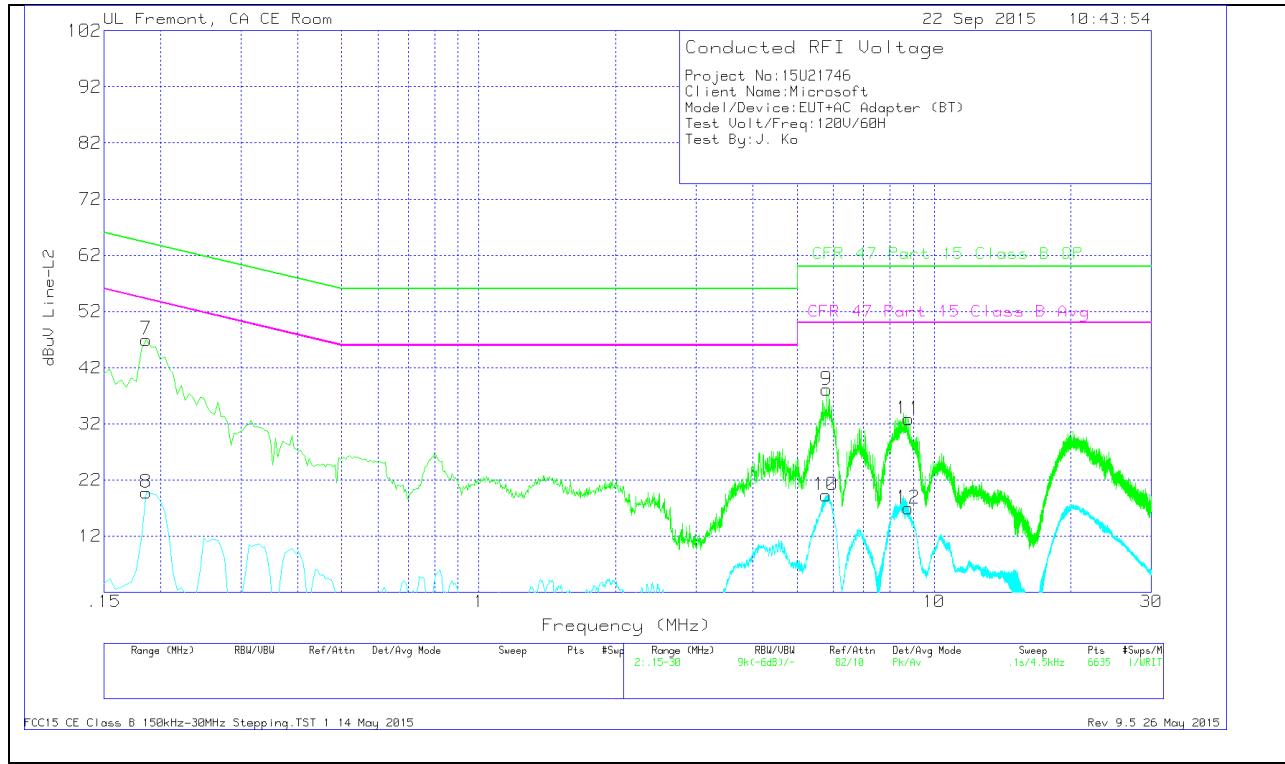
Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
1	.186	42.55	Pk	1	0	43.55	64.21	-20.66		
2	.1905	23.33	Av	1	0	24.33	-	-	54.01	-29.68
3	5.84925	34.17	Pk	.2	.1	34.47	60	-25.53		
4	5.8515	17.93	Av	.2	.1	18.23	-	-	50	-31.77
5	8.7045	31.5	Pk	.2	.1	31.8	60	-28.2		
6	8.7045	14.8	Av	.2	.1	15.1	-	-	50	-34.9

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



LINE 2 RESULTS

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
7	.186	45.9	Pk	1.1	0	47	64.21	-17.21		
8	.186	18.66	Av	1.1	0	19.76	-	-	54.21	-34.45
9	5.811	37.79	Pk	.2	.1	38.09	60	-21.91		
10	5.7885	19	Av	.2	.1	19.3	-	-	50	-30.7
11	8.7855	32.58	Pk	.2	.1	32.88	60	-27.12		
12	8.7765	16.66	Av	.2	.1	16.96	-	-	50	-33.04

Pk - Peak detector

Av - Average detection