



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

C2PC CERTIFICATION TEST REPORT

FOR

CDMA/GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS/UNII a/b/g/n/ac & NFC

MODEL NUMBER: LG-H790, LGH790, H790

FCC ID: ZNFH790

IC: 2703C-H790

REPORT NUMBER: 15I21523-E2V1

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Prepared for

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NVLAP LAB CODE 200065-0

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V1	09/14/15	Initial Issue	

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC.
EUT DESCRIPTION: CDMA/GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS/UNII a/b/g/n/ac & NFC
MODEL: LG-H790, LGH790, H790
SERIAL NUMBER: Conducted (21SE0), Radiated (21SDP)
DATE TESTED: AUGUST 22 – 26, 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, and ANSI C63.10-2009 for FCC and ANSI C63.10-2013 for IC, RSS-GEN Issue 4, and RSS-247 Issue 1.

ANSI C63.10-2009 Deviation

Radiated spurious emission above 1GHz was performed with the EUT elevated at 1.5 m instead of 0.8 m. 1.5 m is the required height in ANSI C63.10:2013 as referenced by RSS GEN issue 4.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss} \\ &\quad (\text{dB}) - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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 CDMA/GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS/UNII a/b/g/n/ac & NFC.

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	8.89	7.74
2402 - 2480	Enhanced 8PSK	7.61	5.77

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 a PIF (Planar Inverted F) antenna, with a maximum gain of -0.05 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1 GHz 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.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG	MCS-N04WS	SA560000030	N/A
Earphone	LG	N/A	N/A	N/A

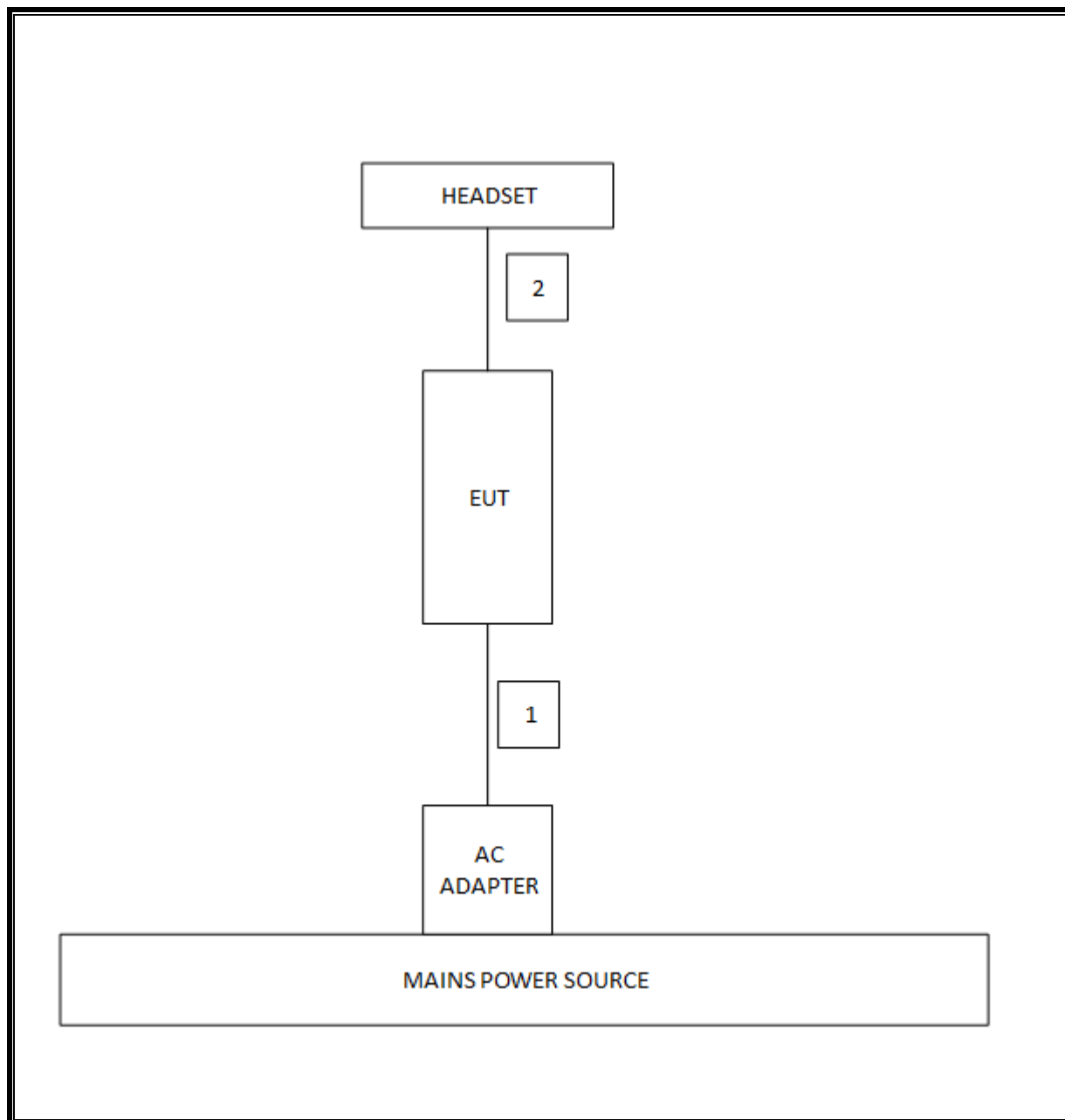
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1.0m	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
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	TBD	C00825	06/01/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	10/05/30	03/23/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	T404	06/29/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
CBT Bluetooth Tester	R & S	CBT	T258	06/30/16
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

C2PC reason: Please see LG-H790 change note for details.

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	1.367 MHz
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-49.43 dBm
15.247 (b)(1)	RSS-247 5.4(1)	TX conducted output power	<21dBm		Pass	8.89 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	0.328 s
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	Refer to Original Report 15I21235-E2
15.205, 15.209	RSS-GEN 8.9	Radiated Spurious Emission	< 54dBuV/m		Pass	41.23 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 $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to $\geq$ RBW. The sweep time is coupled.

RESULTS

8.1.1. BASIC DATA RATE GFSK MODULATION

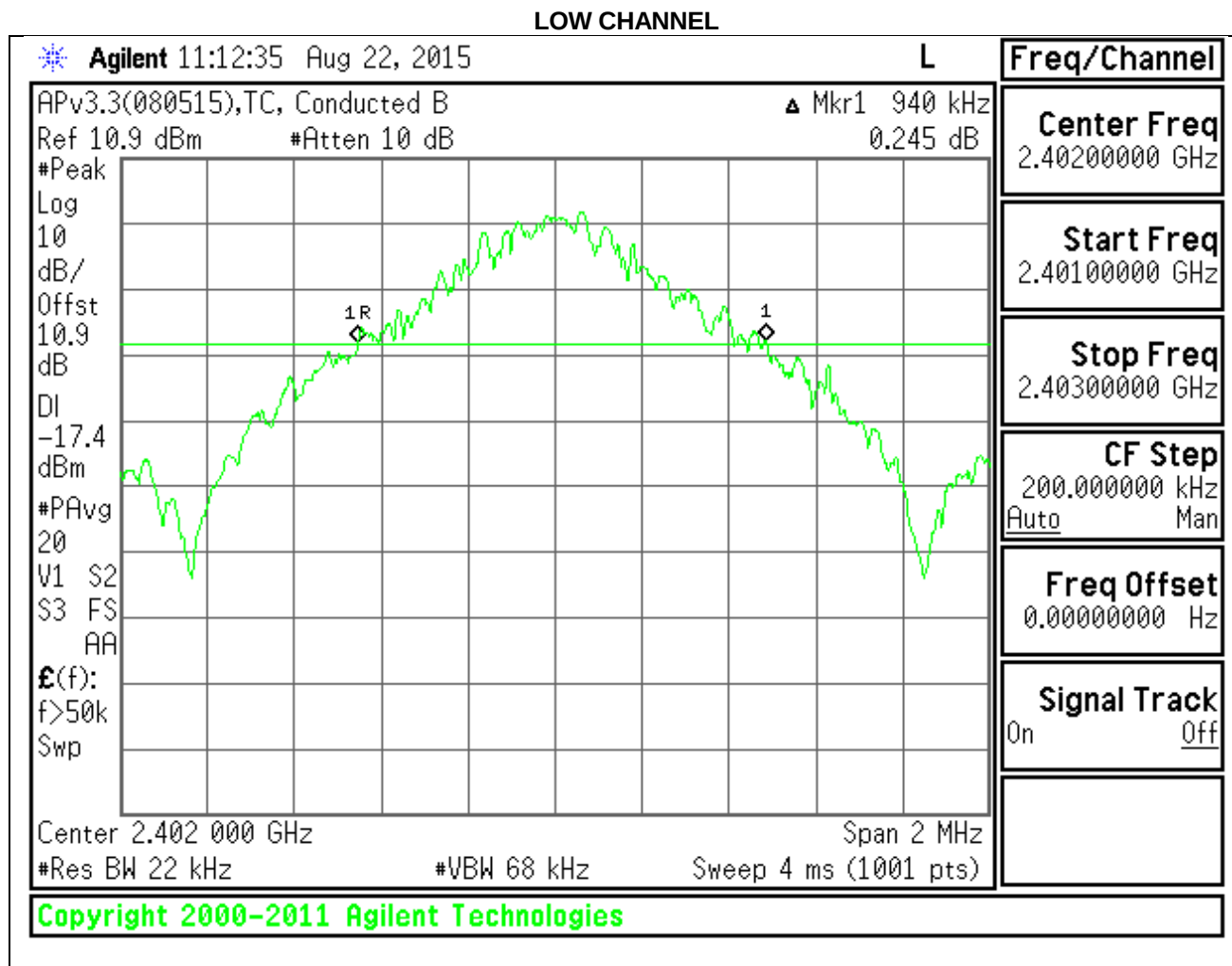
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	0.94	0.905
Middle	2441	0.936	0.901
High	2480	0.938	0.900
Worst		0.94	0.905

8.1.2. ENHANCED DATA RATE 8PSK MODULATION

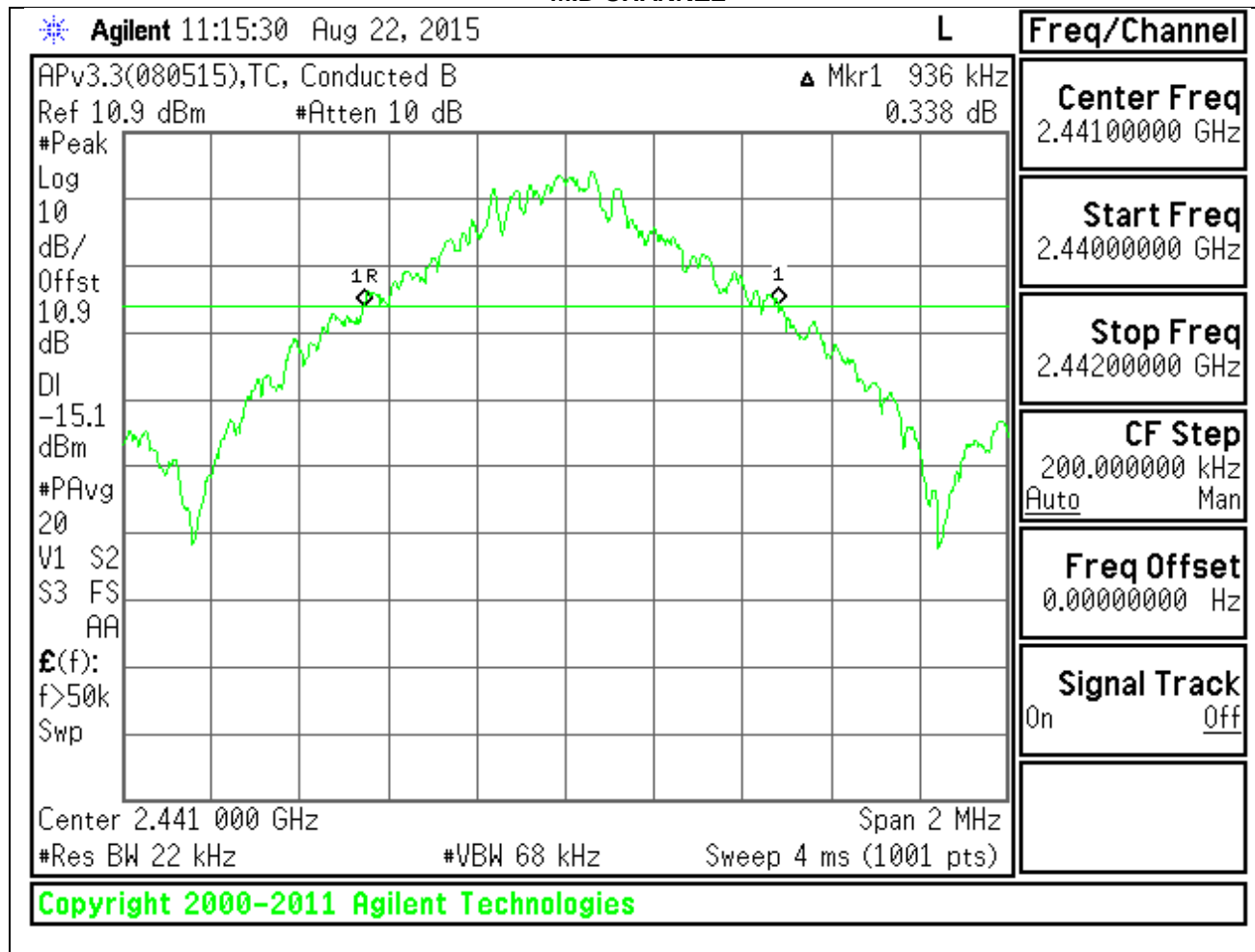
Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.311	1.193
Middle	2441	1.293	1.367
High	2480	1.305	1.182
Worst		1.311	1.367

8.1.3. 20 dB AND 99% BANDWIDTH PLOTS

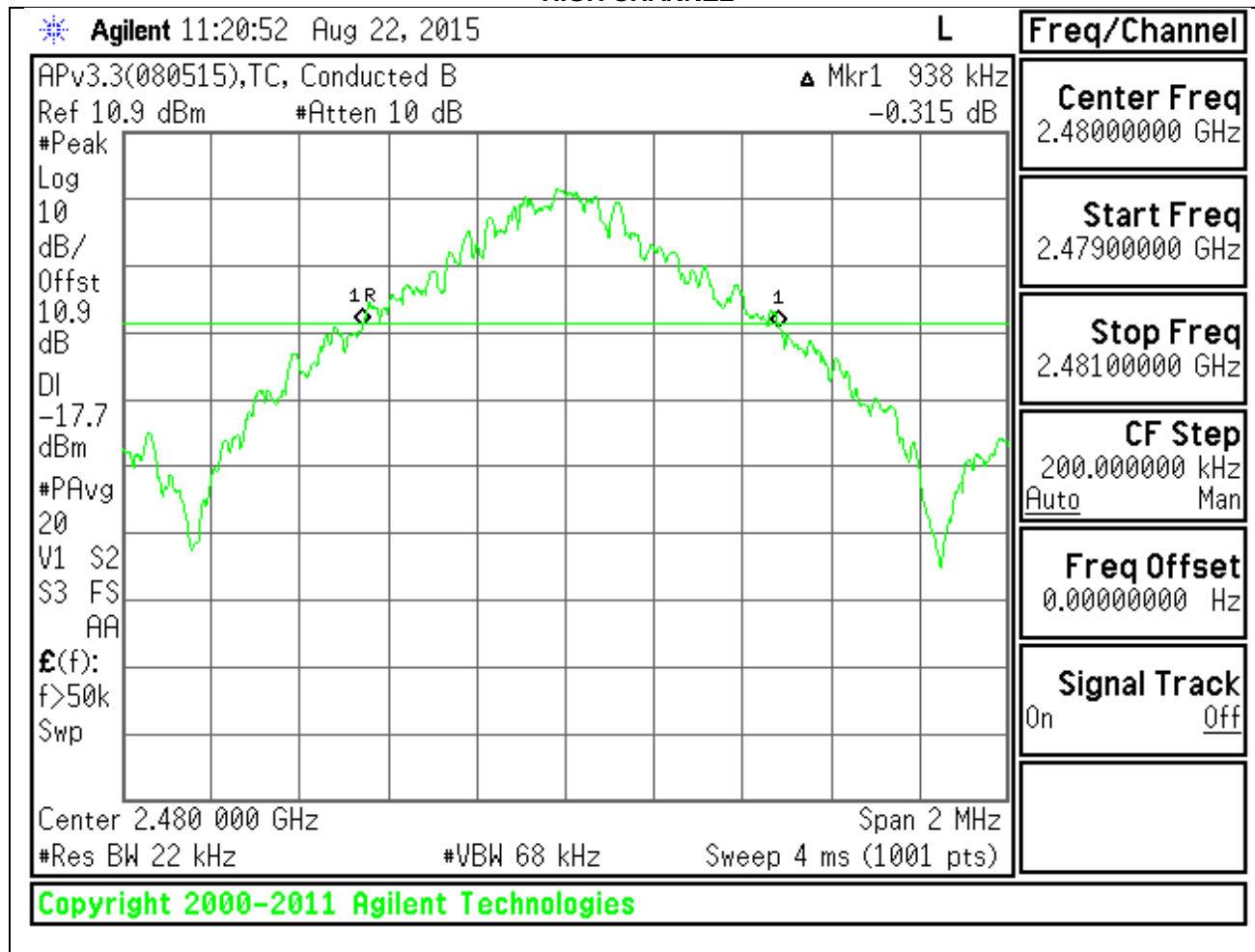
GFSK 20 dB BANDWIDTH



MID CHANNEL

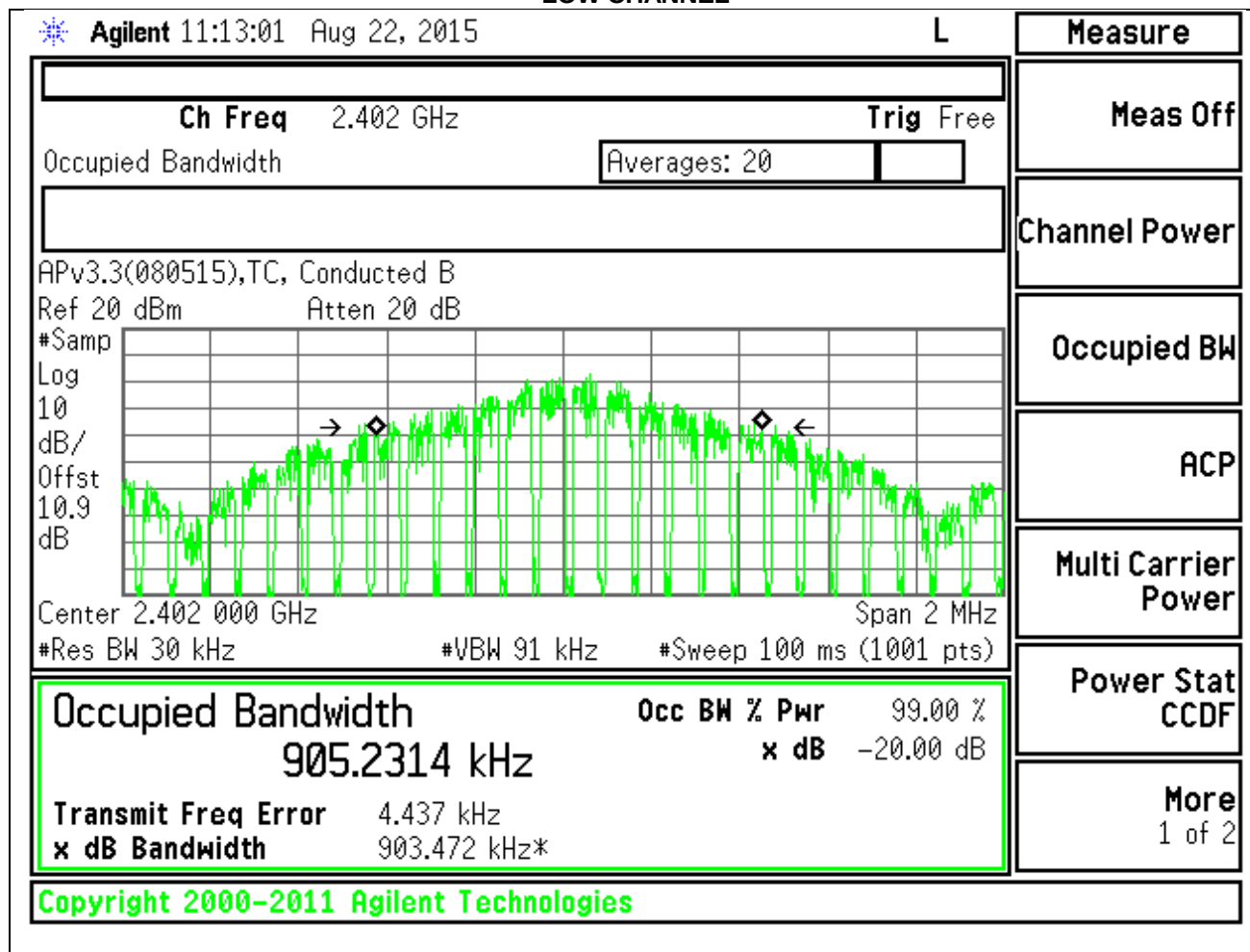


HIGH CHANNEL

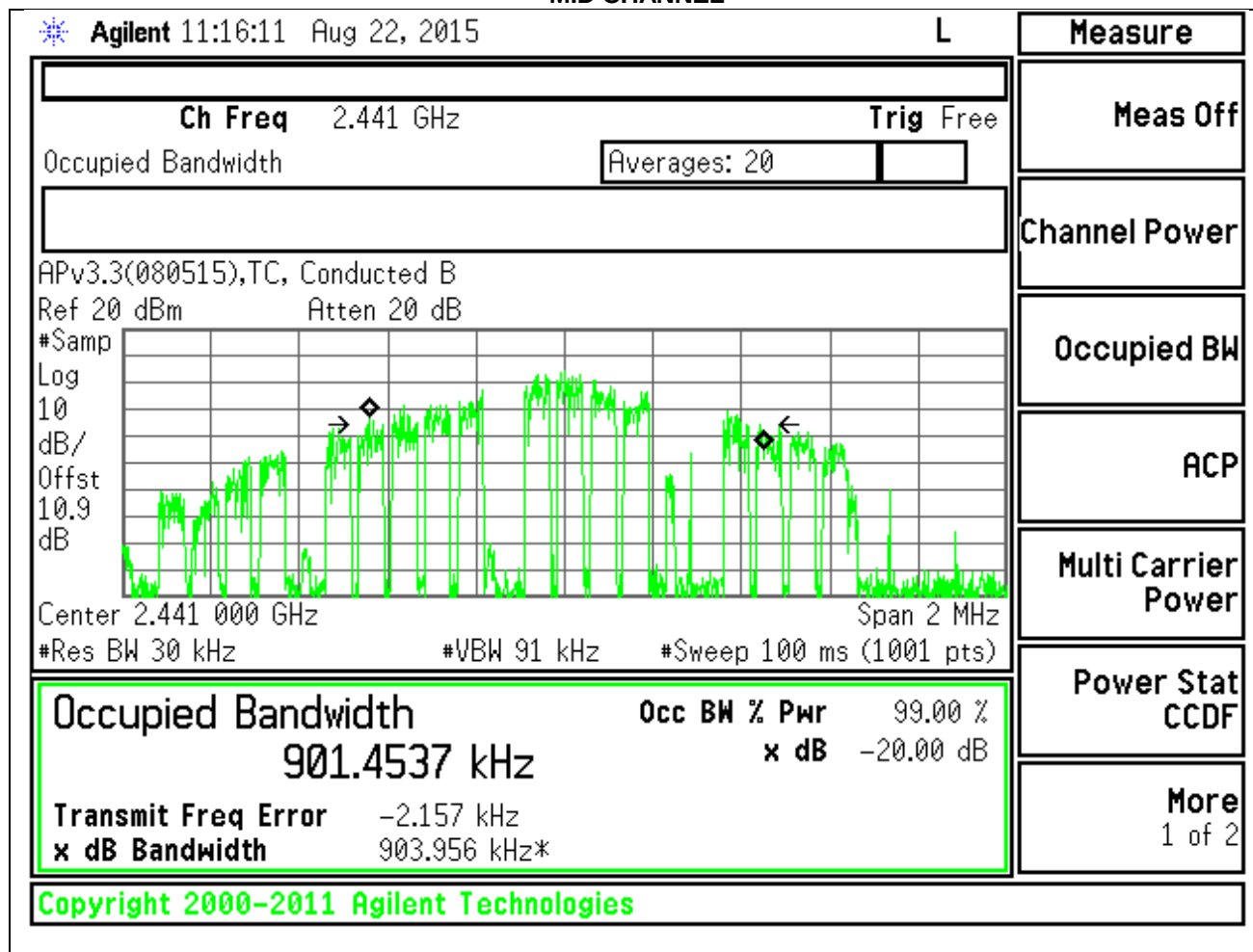


GFSK 99% BANDWIDTH

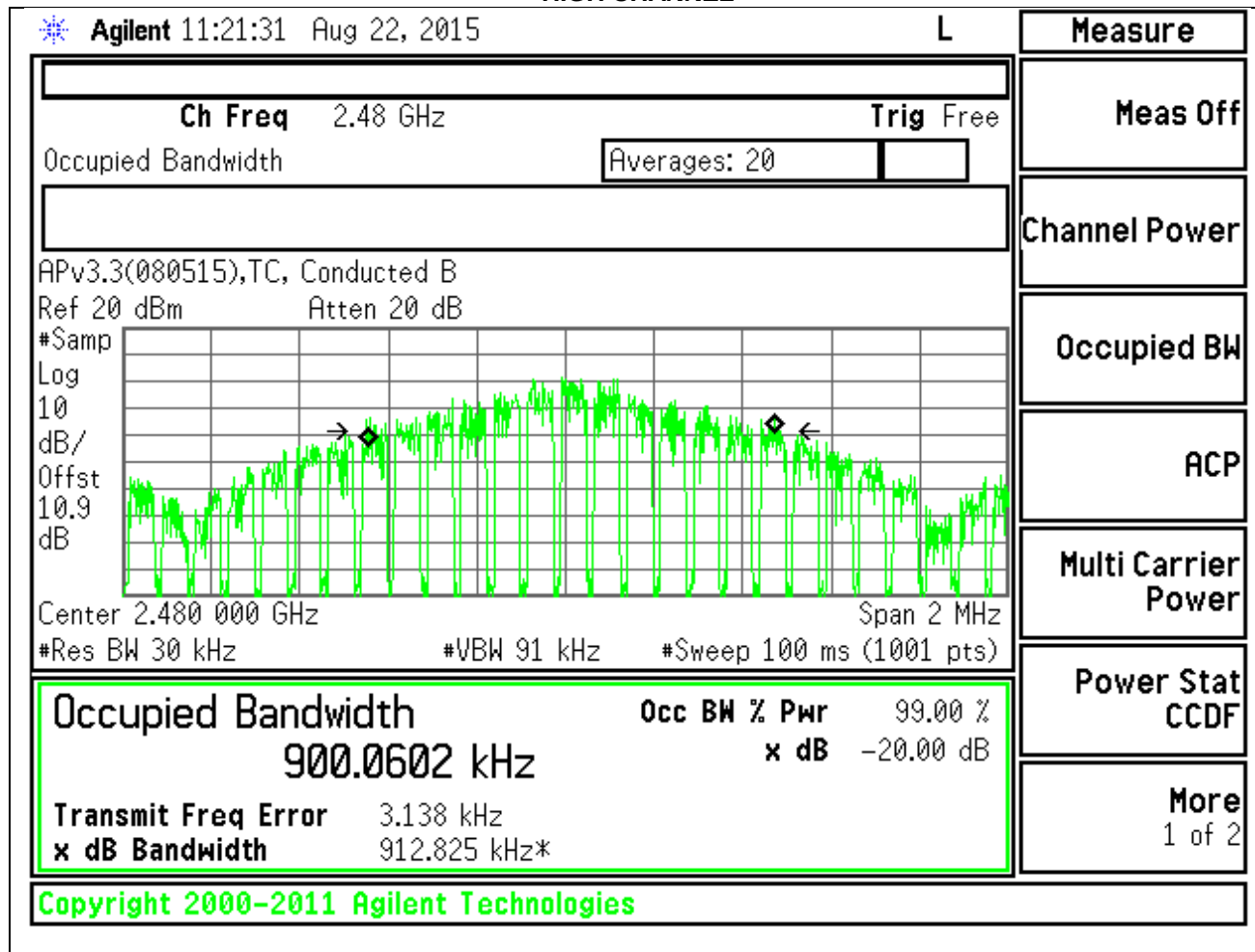
LOW CHANNEL



MID CHANNEL

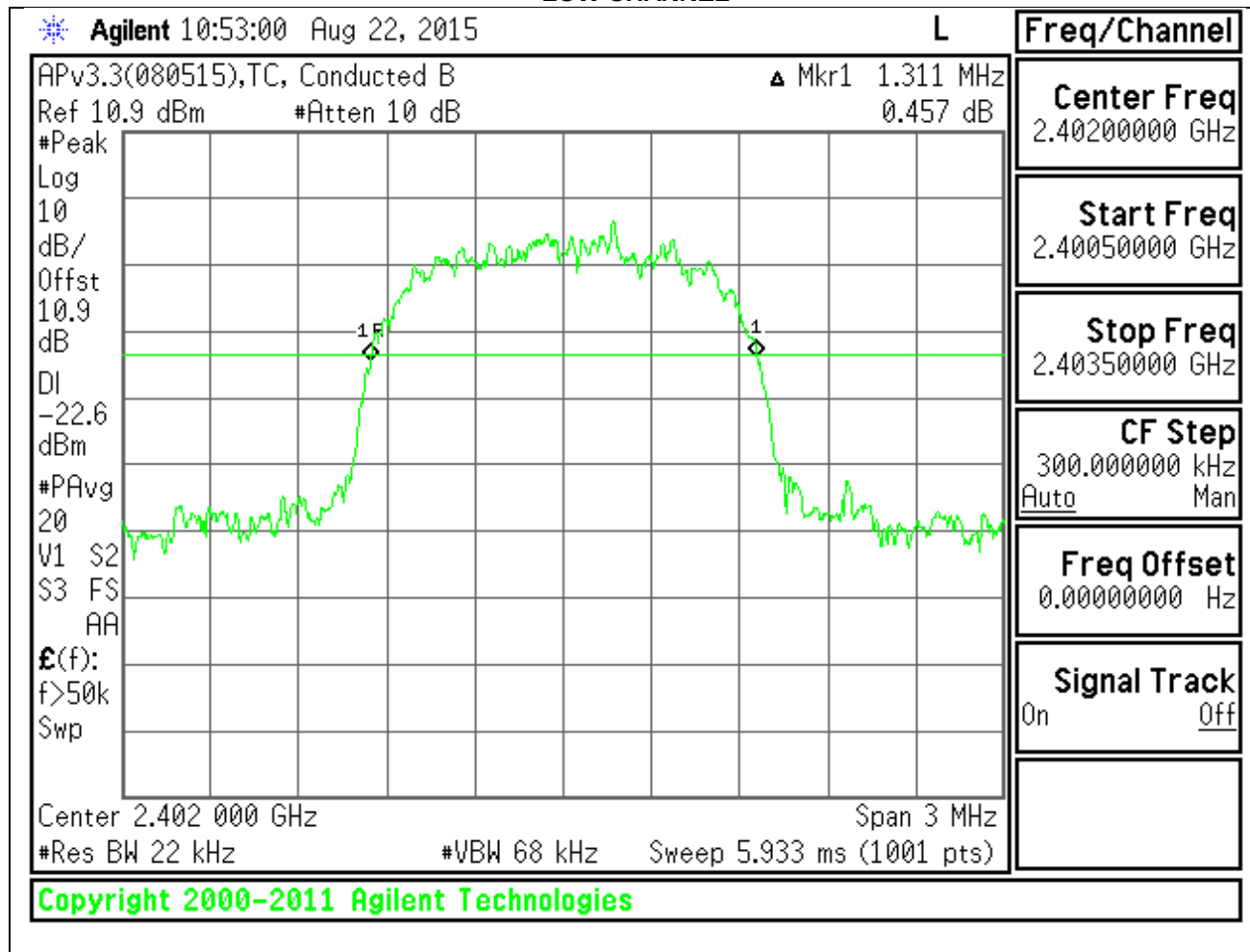


HIGH CHANNEL

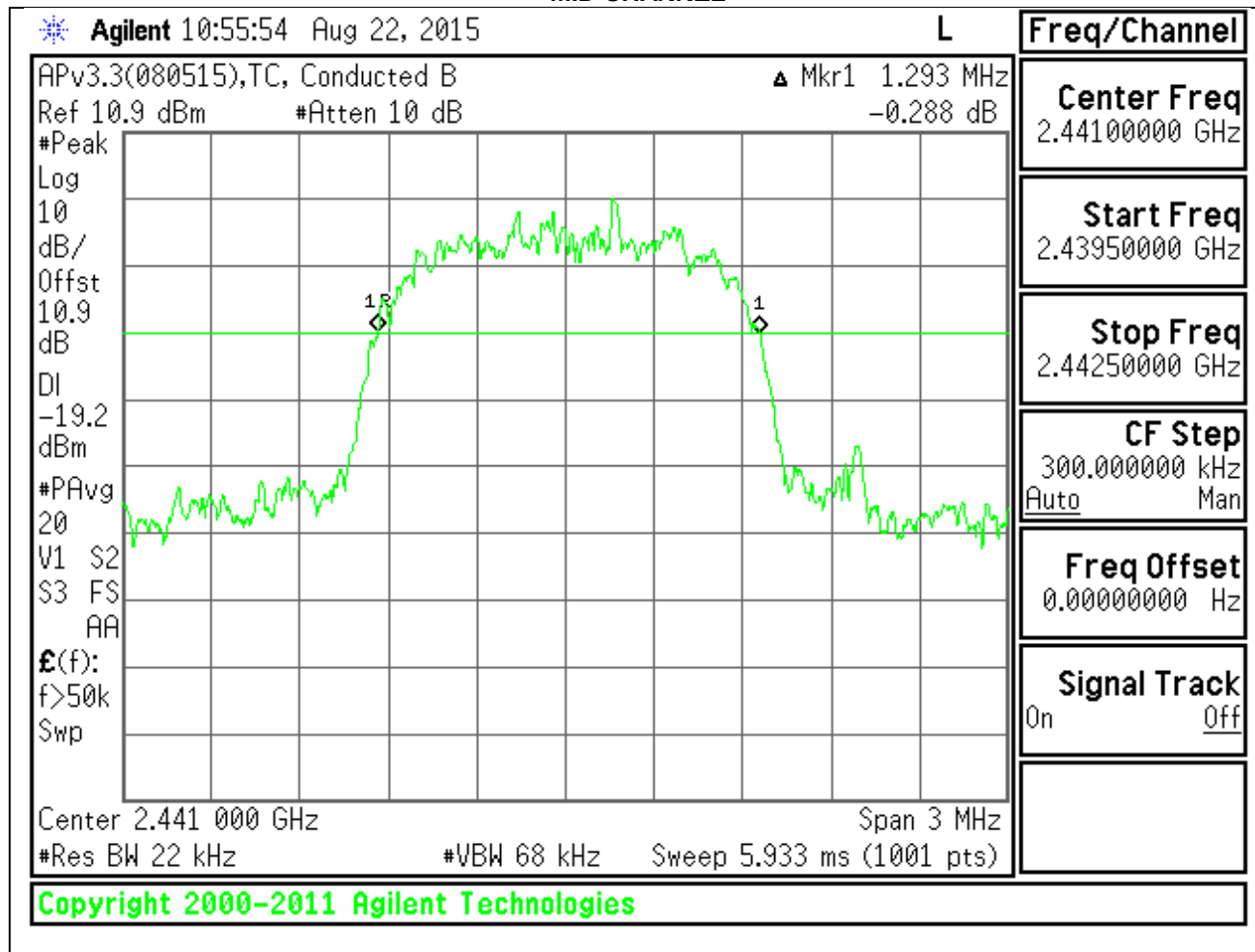


8PSK 20 dB BANDWIDTH

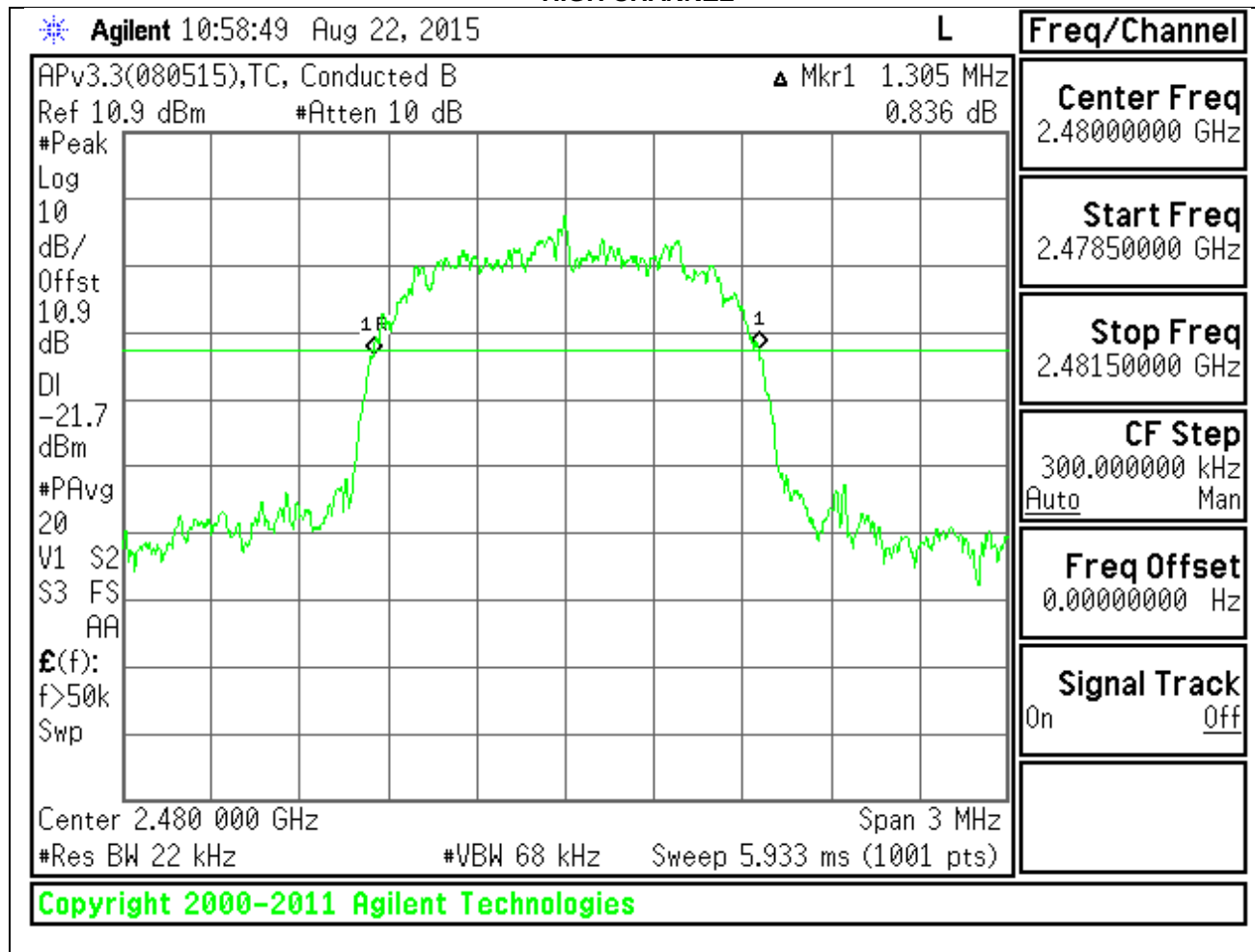
LOW CHANNEL



MID CHANNEL

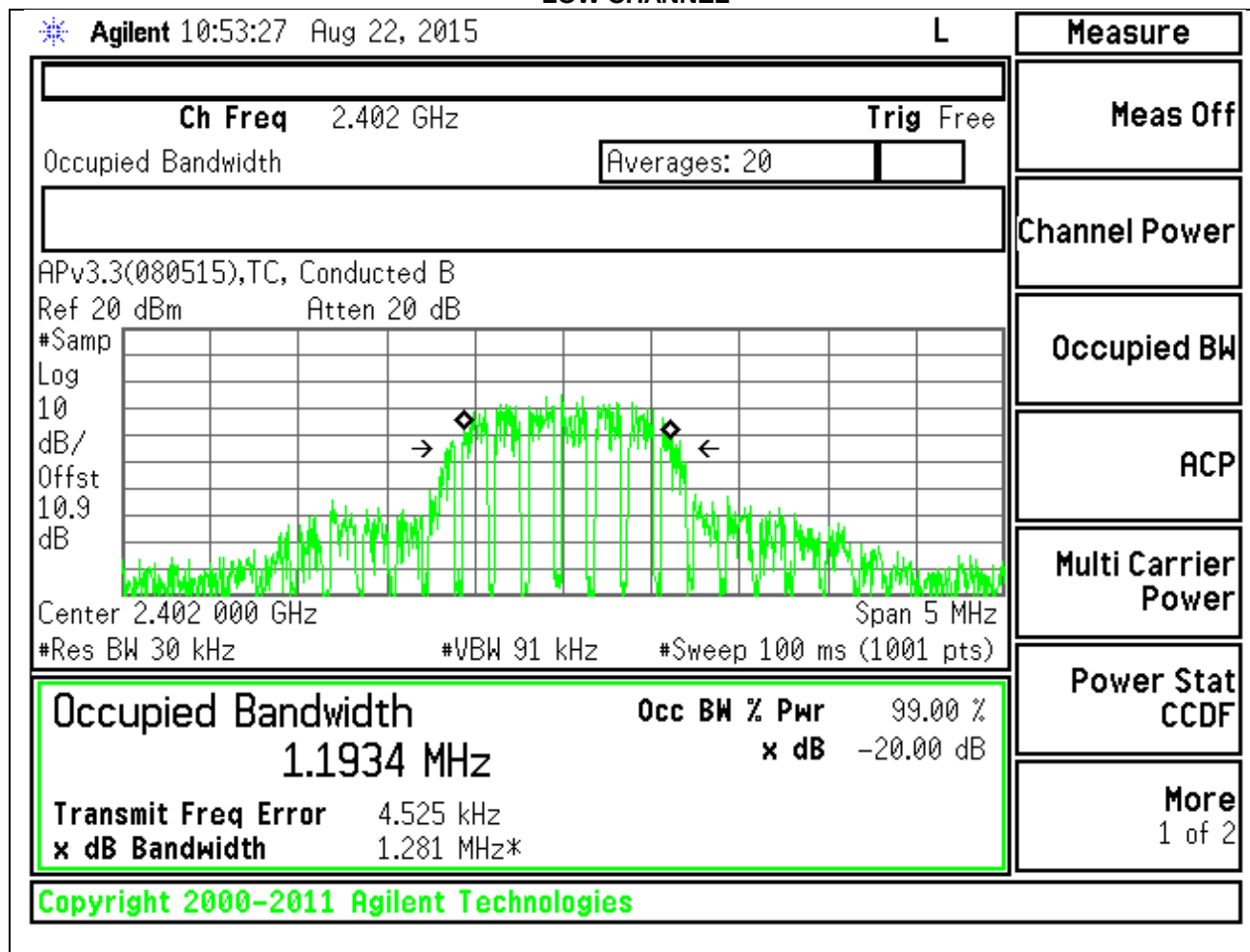


HIGH CHANNEL

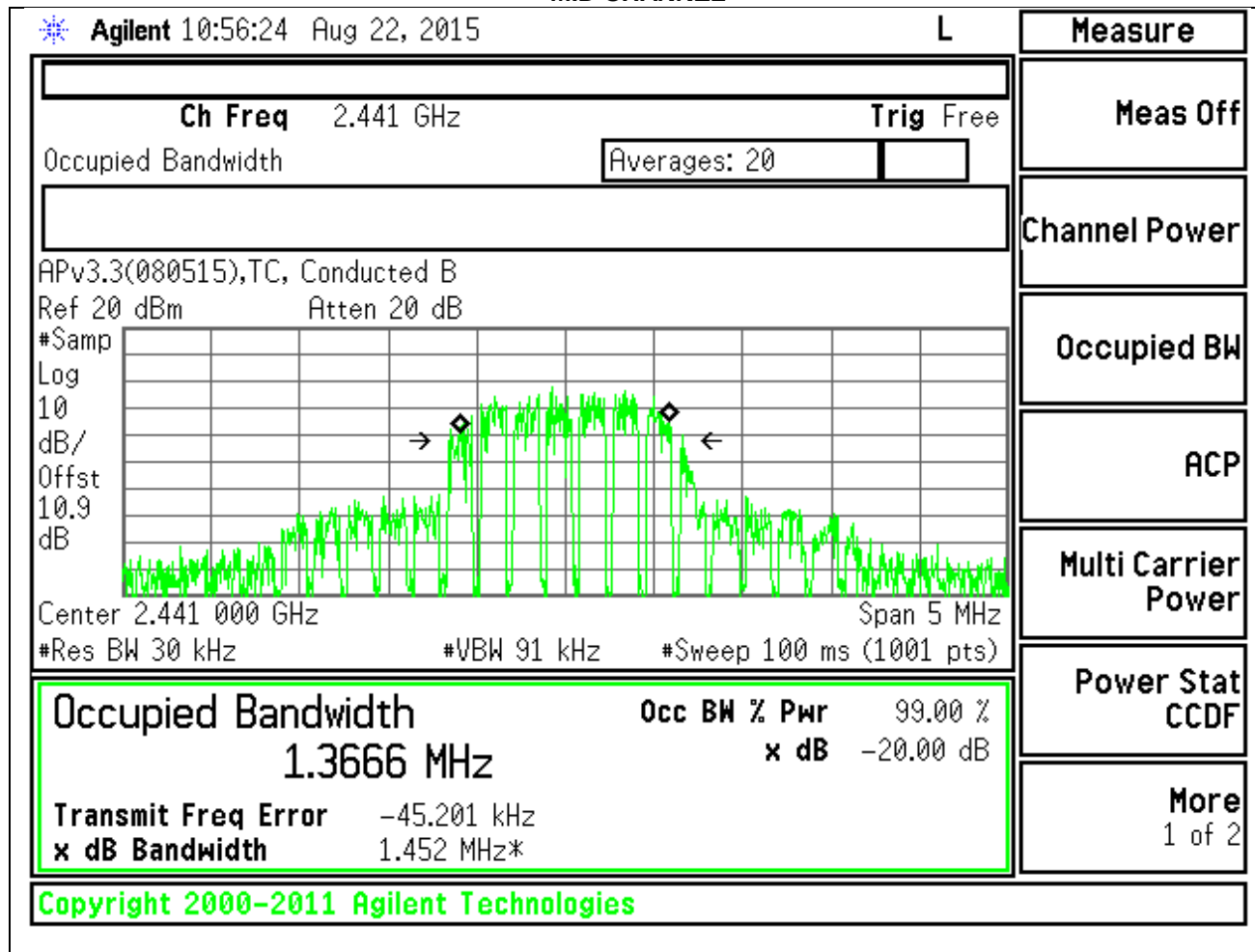


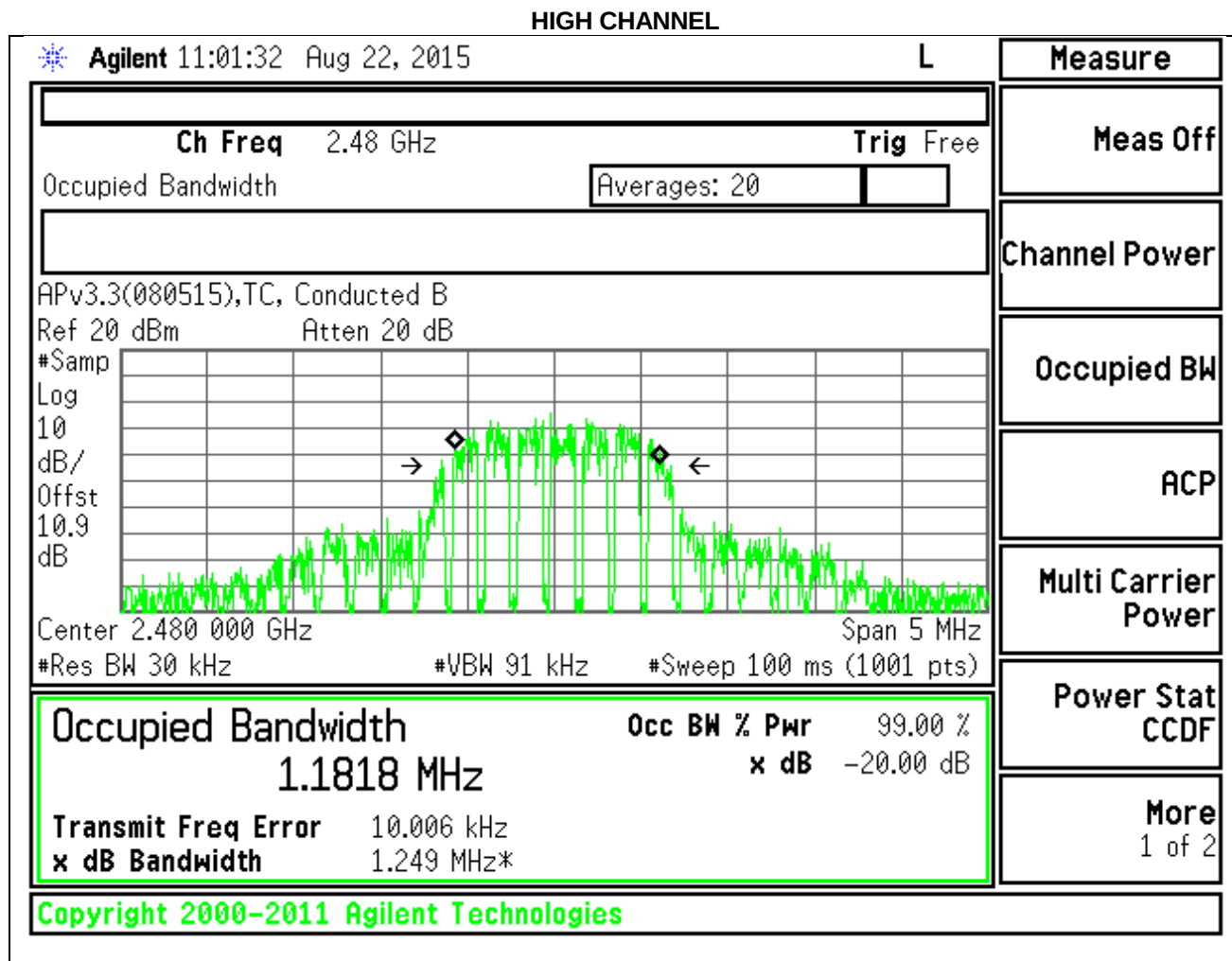
8PSK 99% BANDWIDTH

LOW CHANNEL



MID CHANNEL





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 hopping channel, whichever is greater.

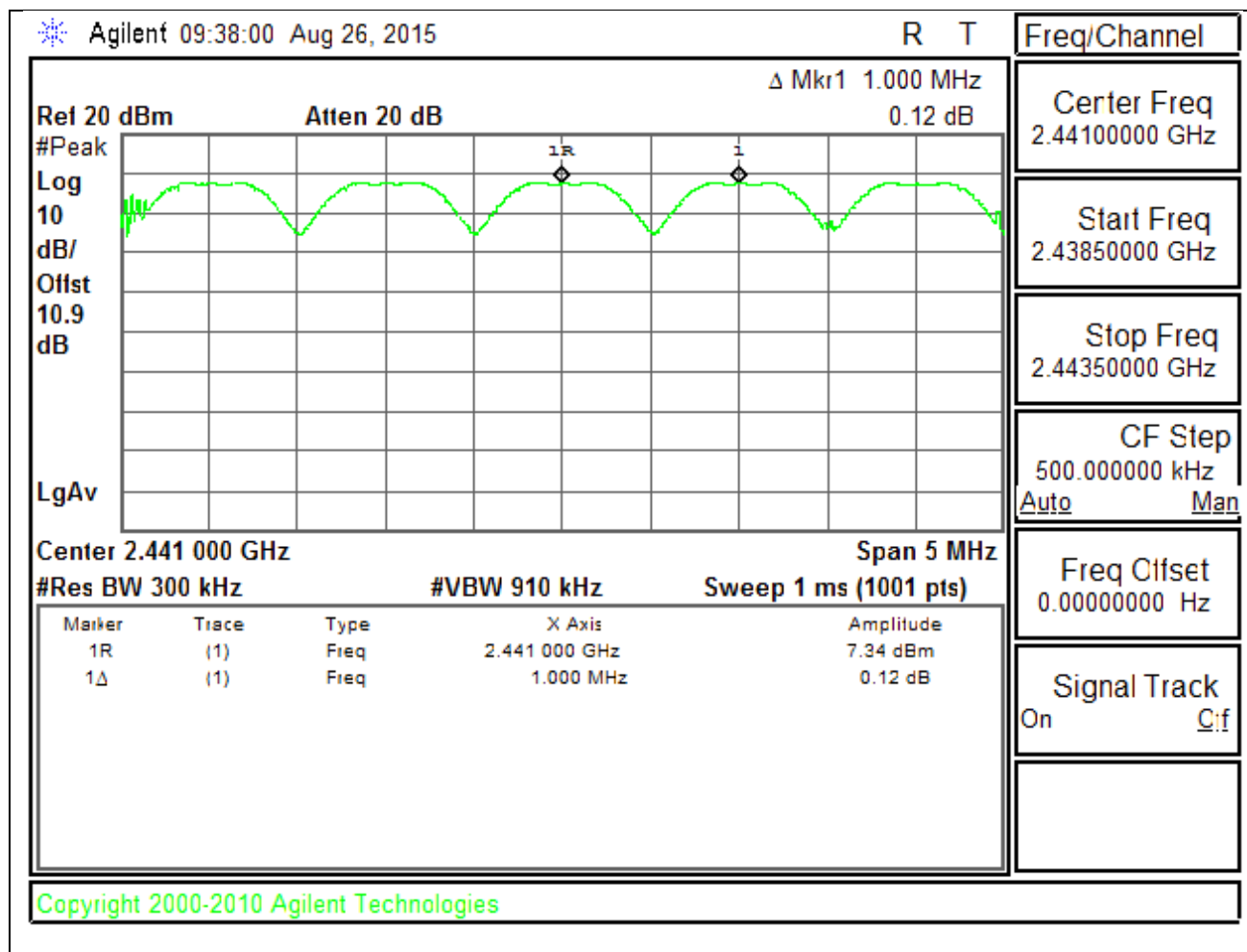
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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



8.3. 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.

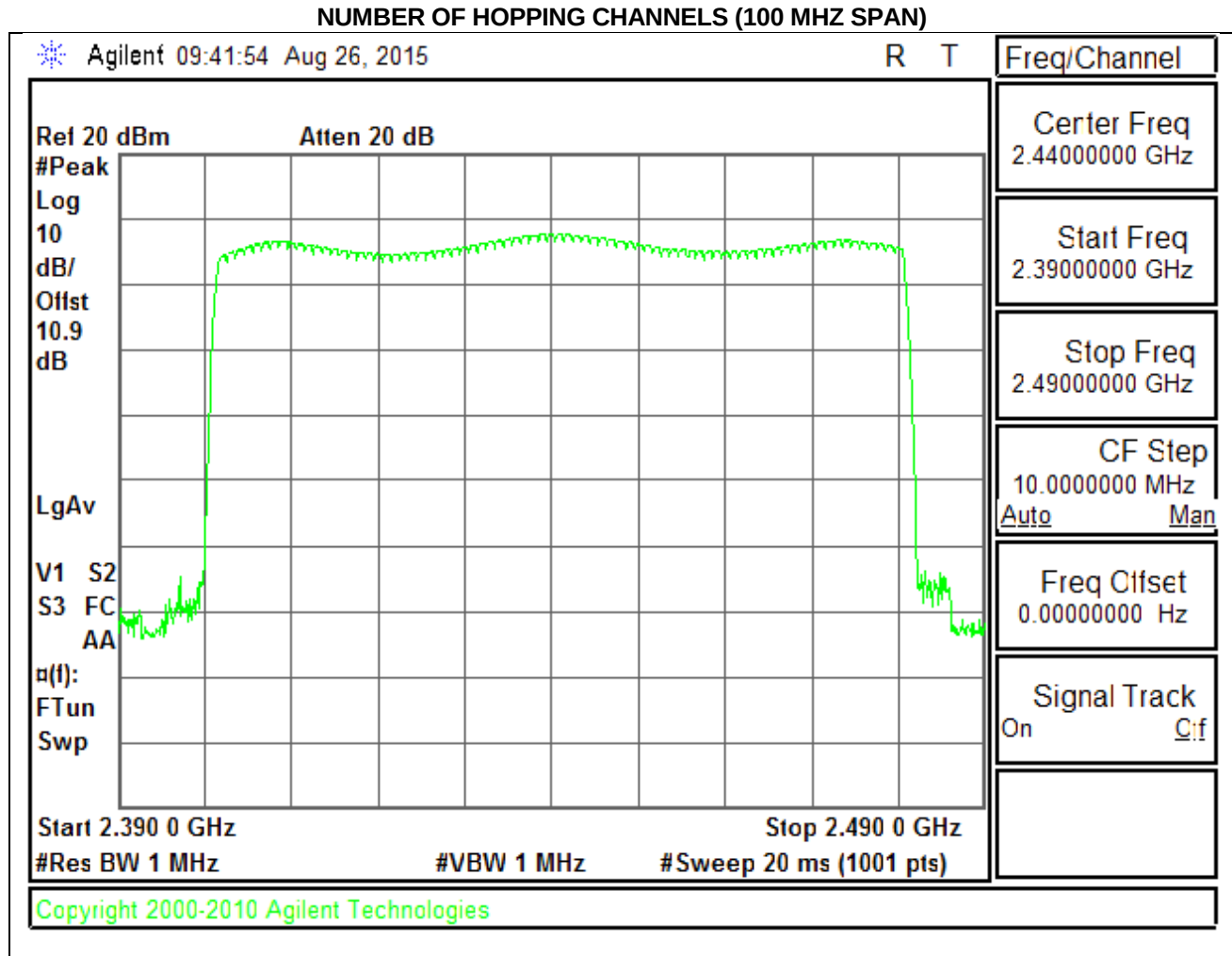
TEST PROCEDURE

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.

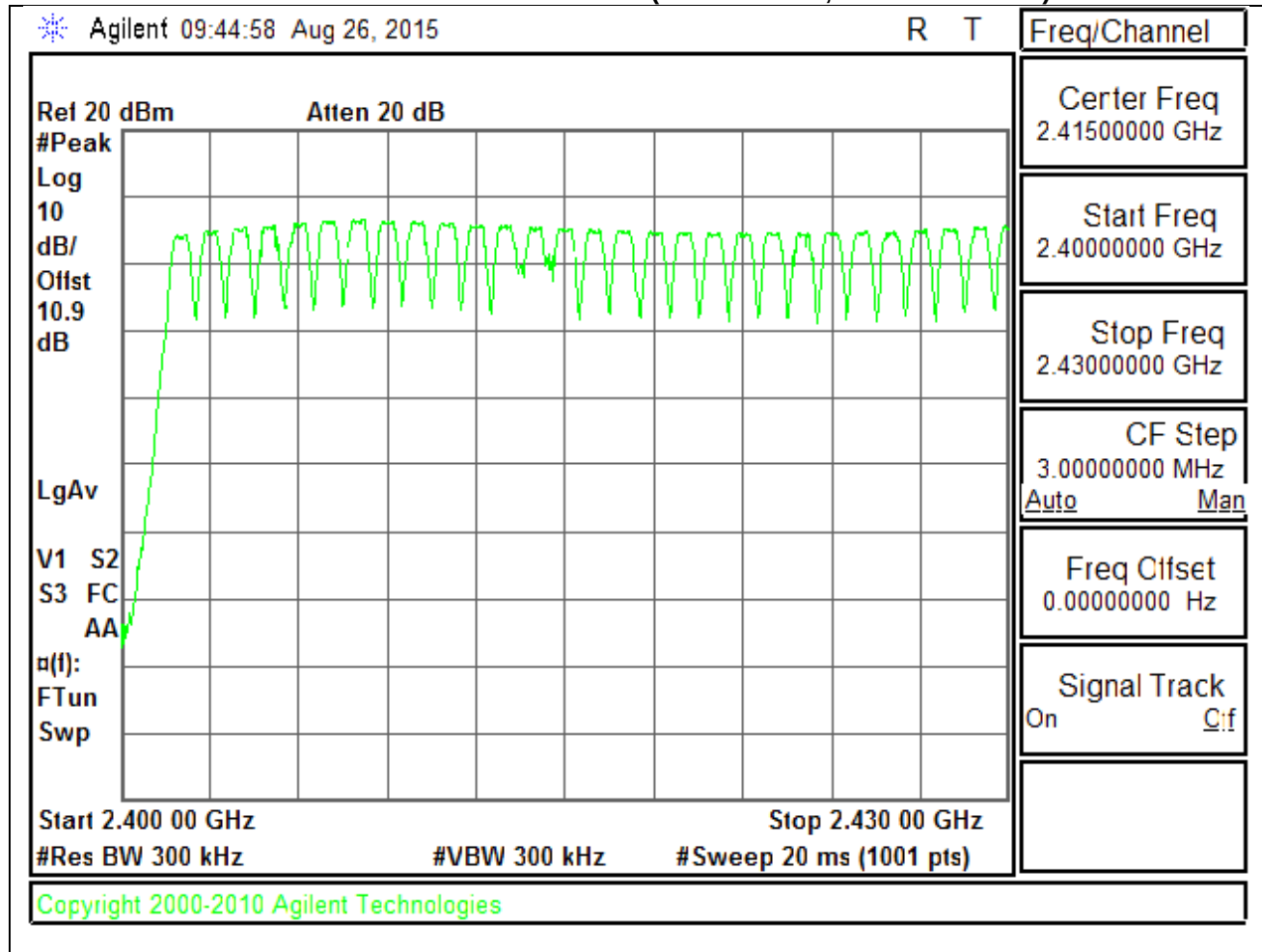
RESULTS

Normal Mode: 79 Channels observed.

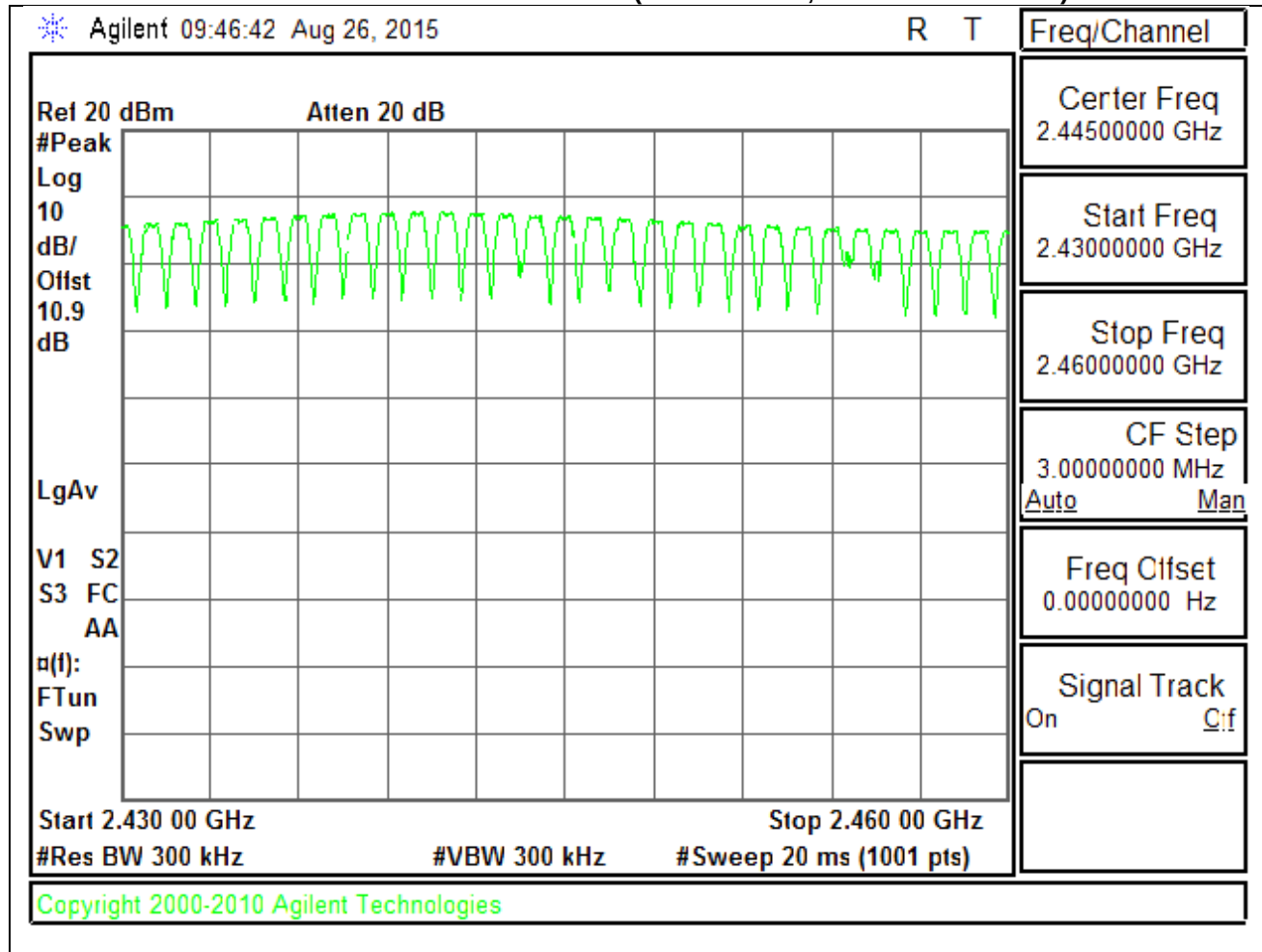
NUMBER OF HOPPING CHANNELS PLOTS



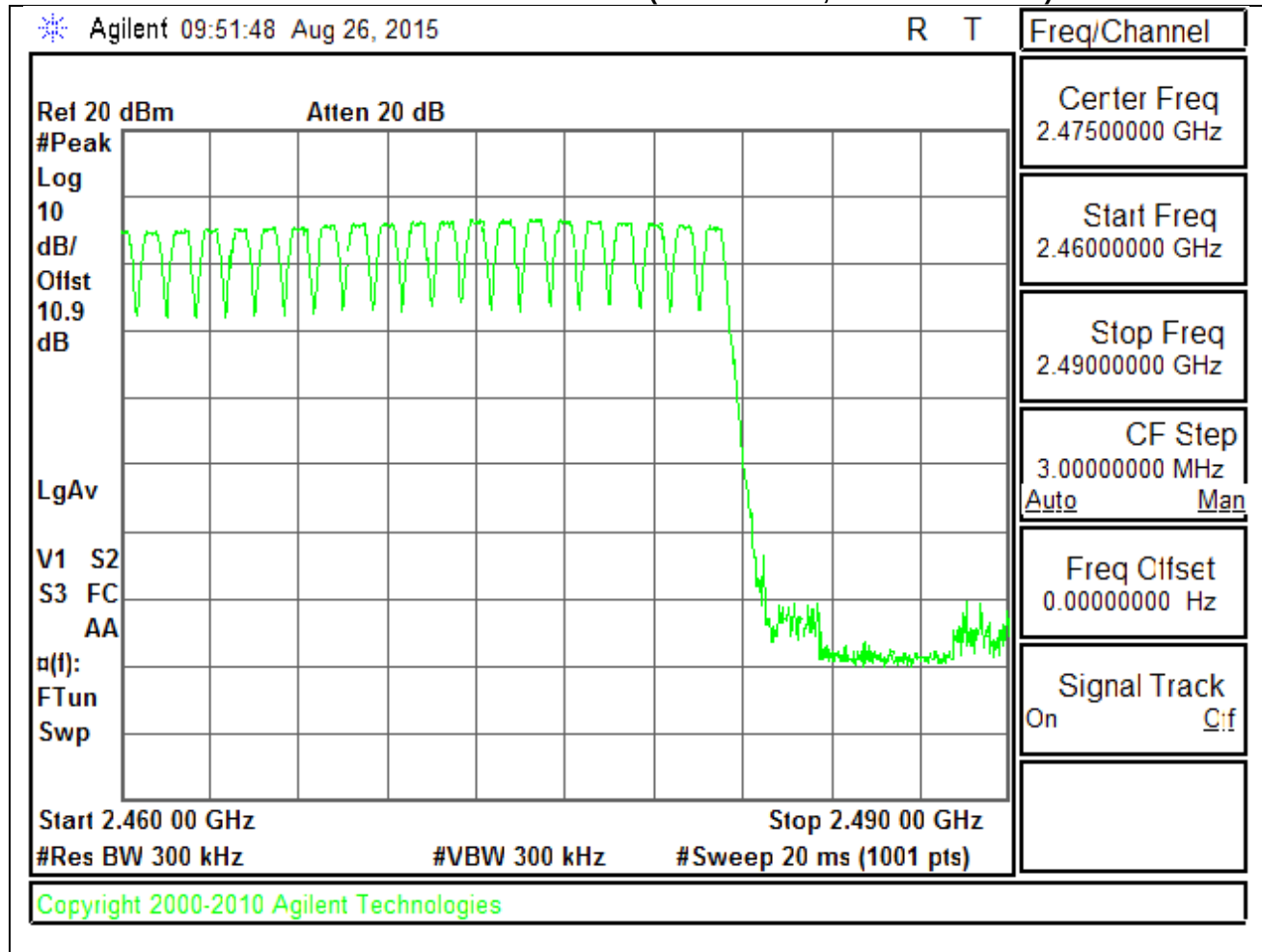
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)



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.

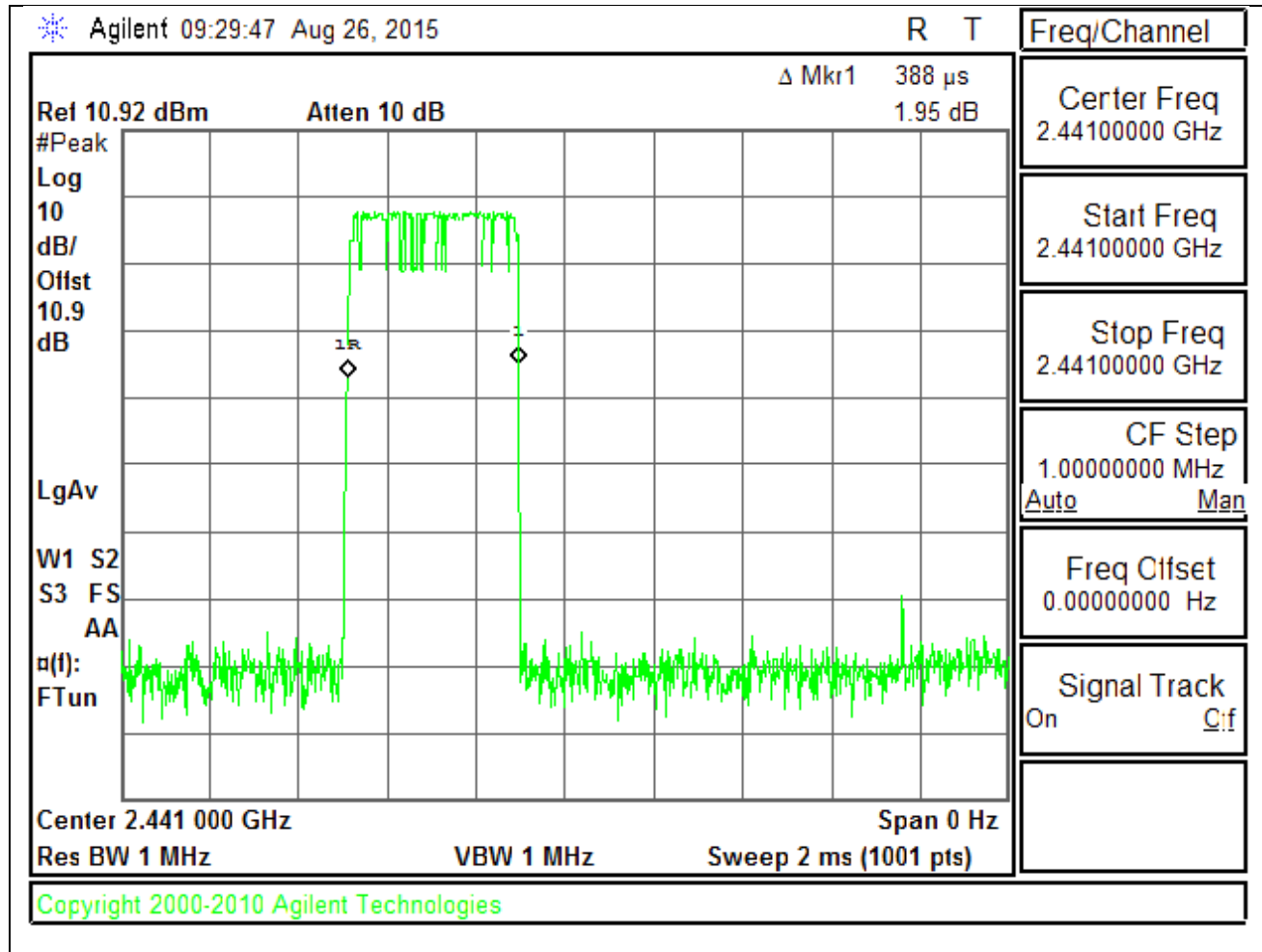
The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

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.

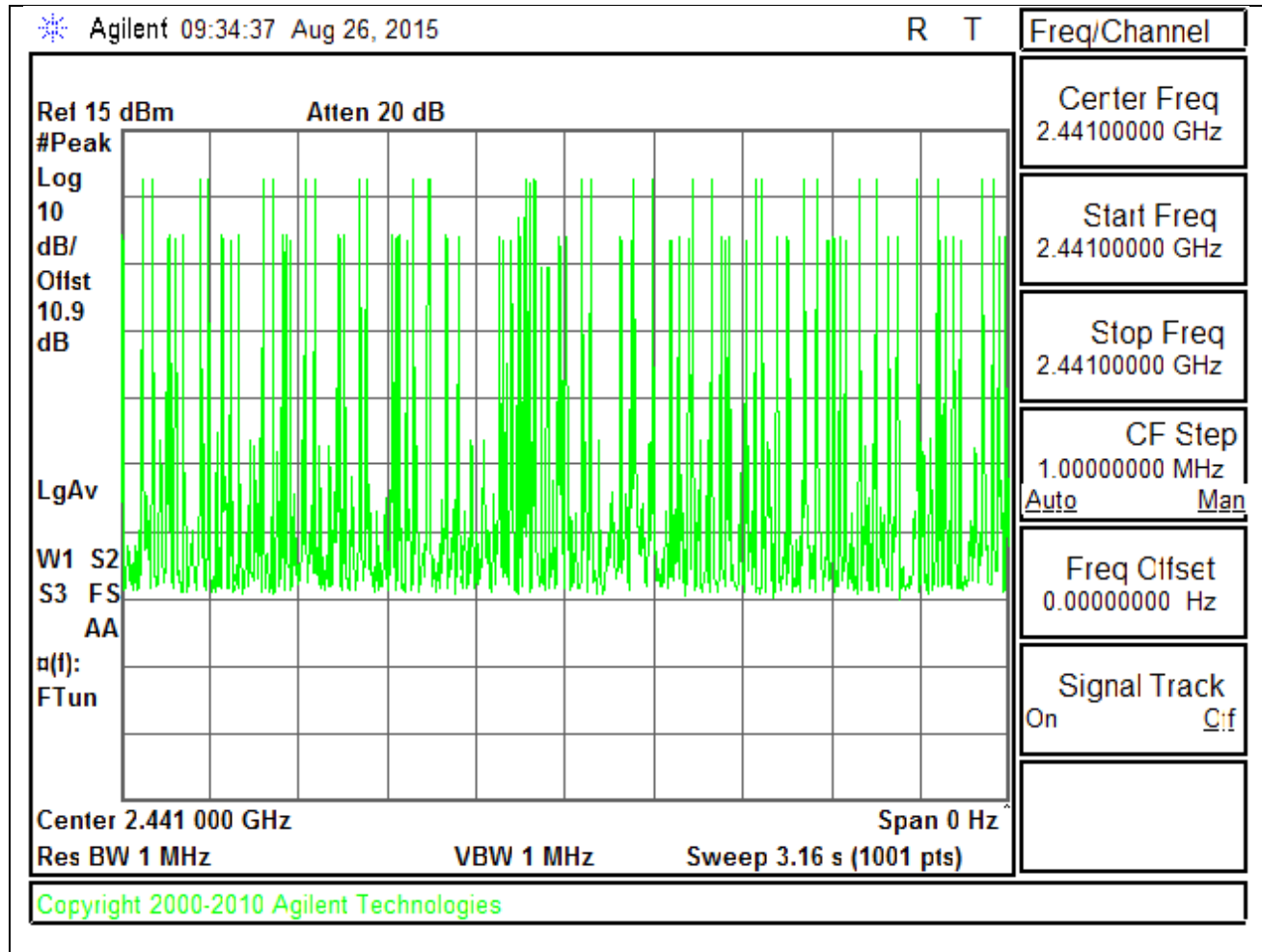
RESULTS

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	0.388	31	0.12028	0.4	-0.27972
DH3	1.64	20	0.328	0.4	-0.072
DH5	2.9	10	0.29	0.4	-0.11
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	0.388	7.75	0.03007	0.4	-0.36993
DH3	1.64	5	0.082	0.4	-0.318
DH5	2.9	2.5	0.0725	0.4	-0.3275

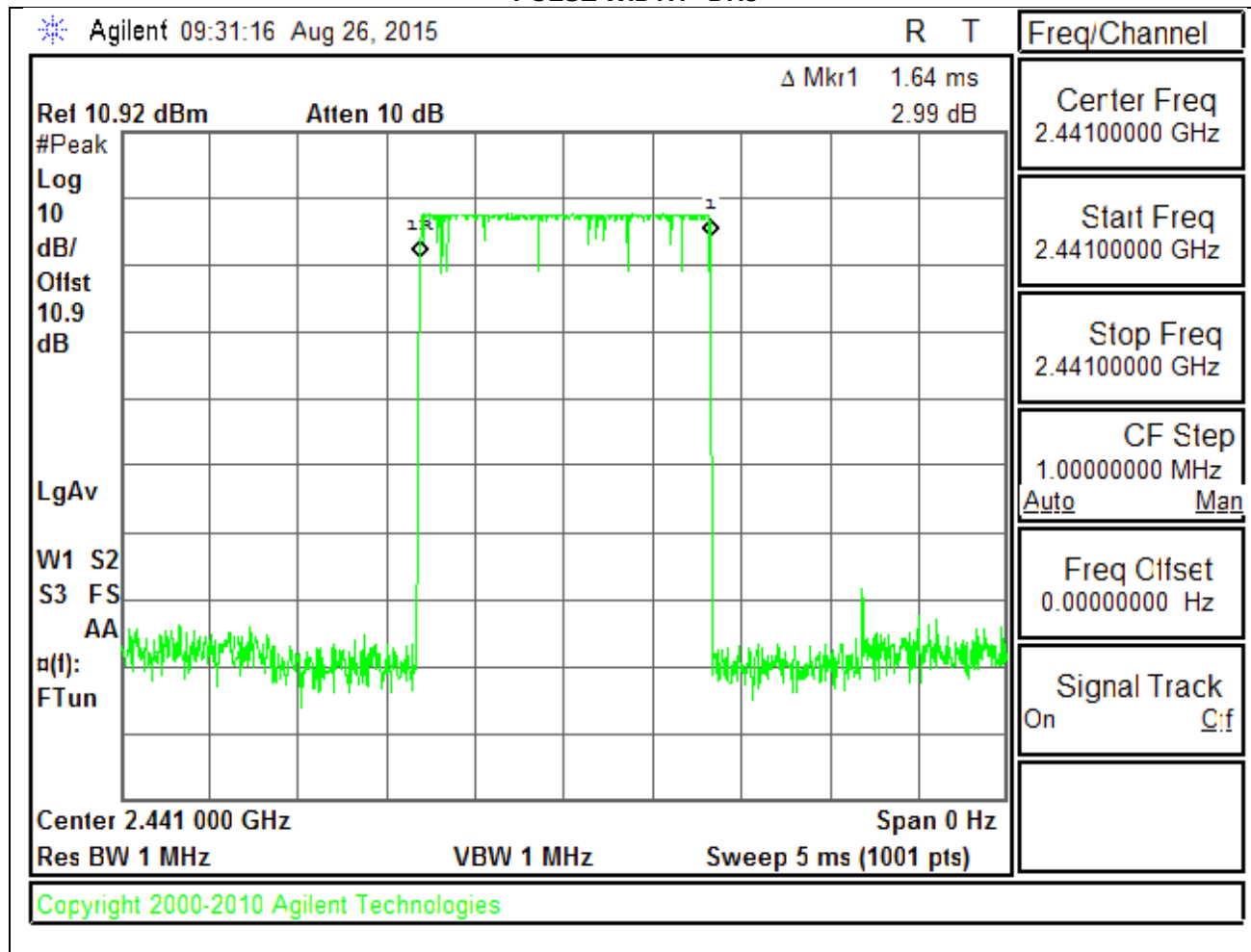
PULSE WIDTH - DH1



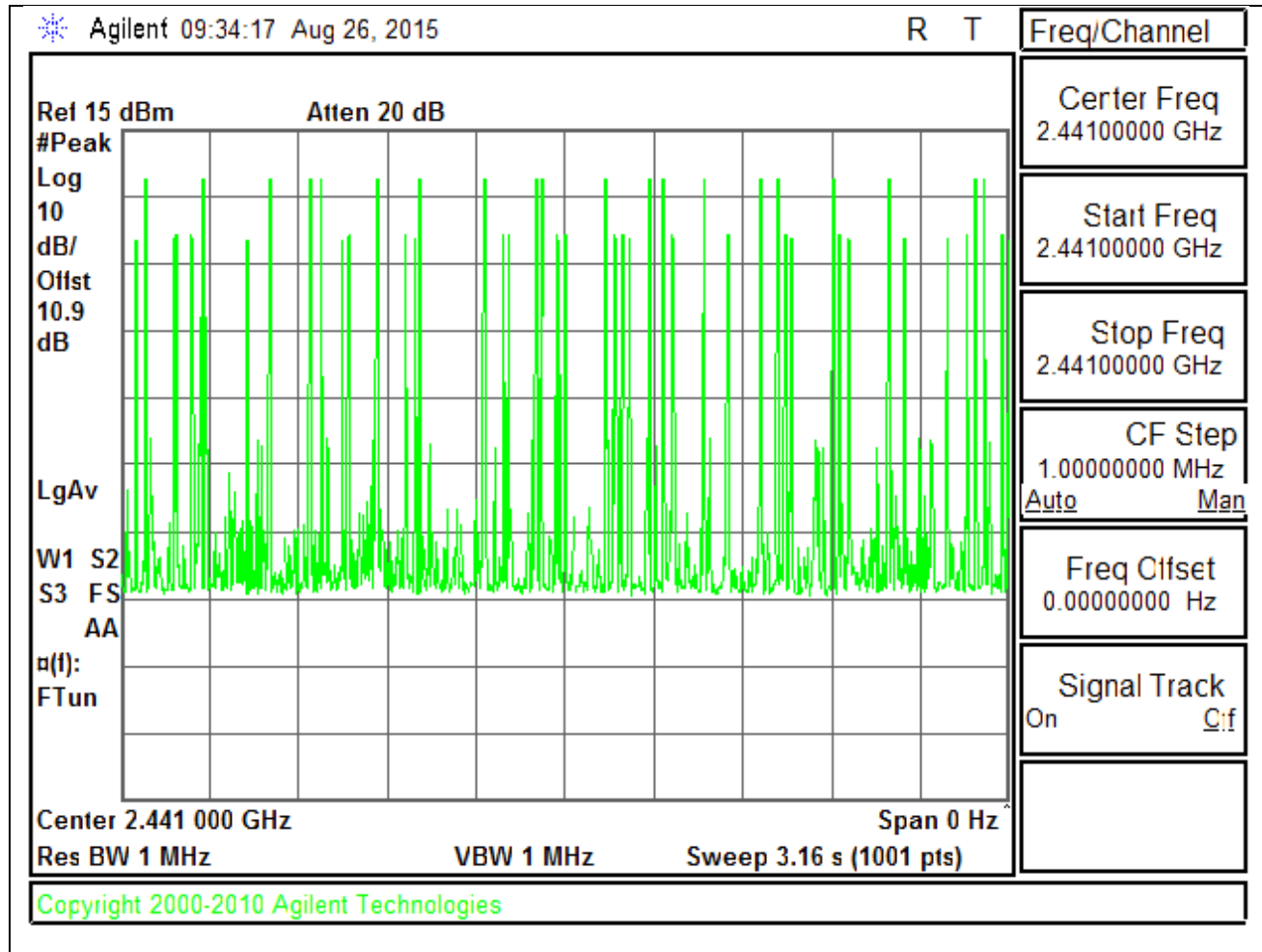
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH1



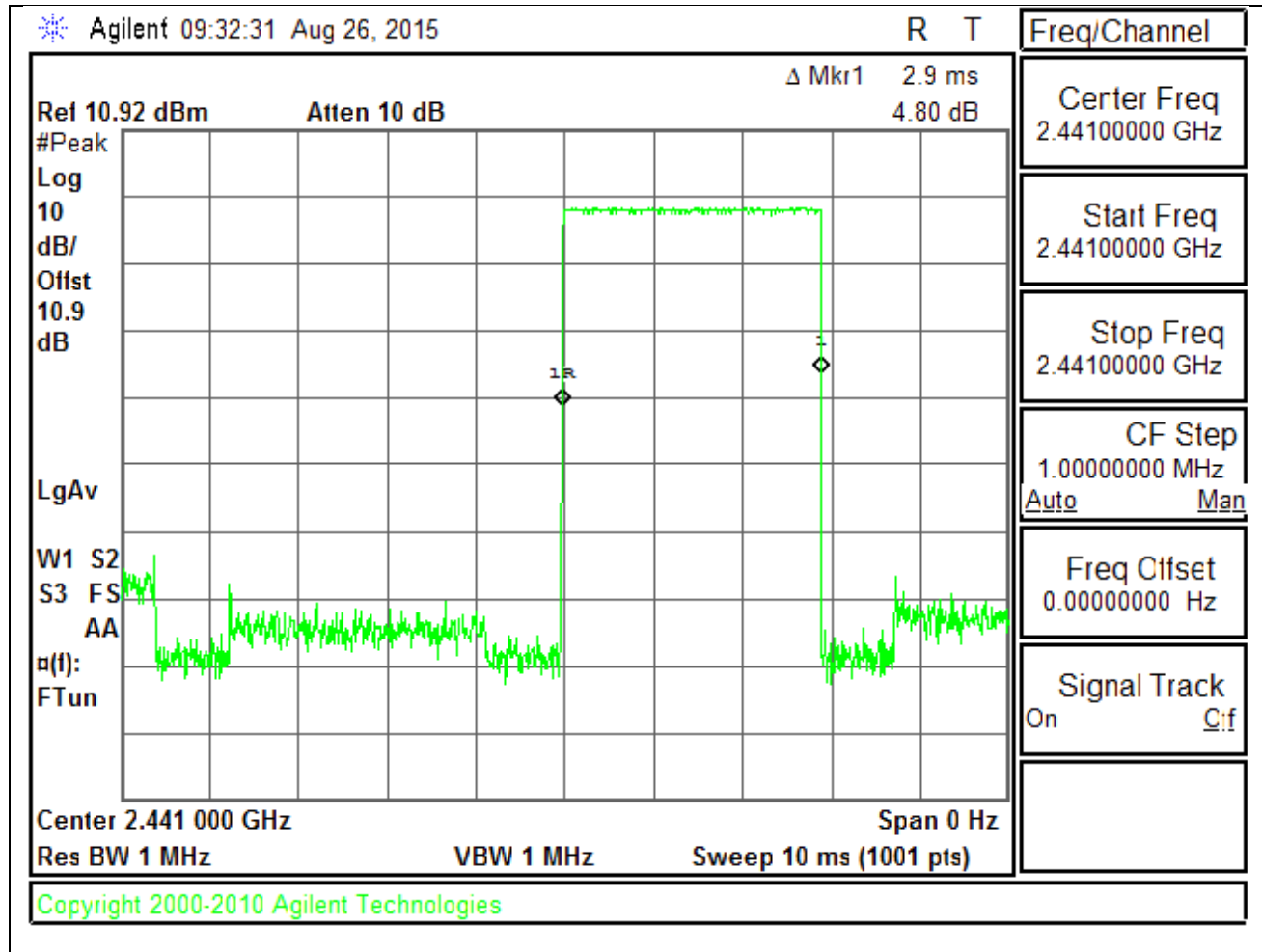
PULSE WIDTH - DH3



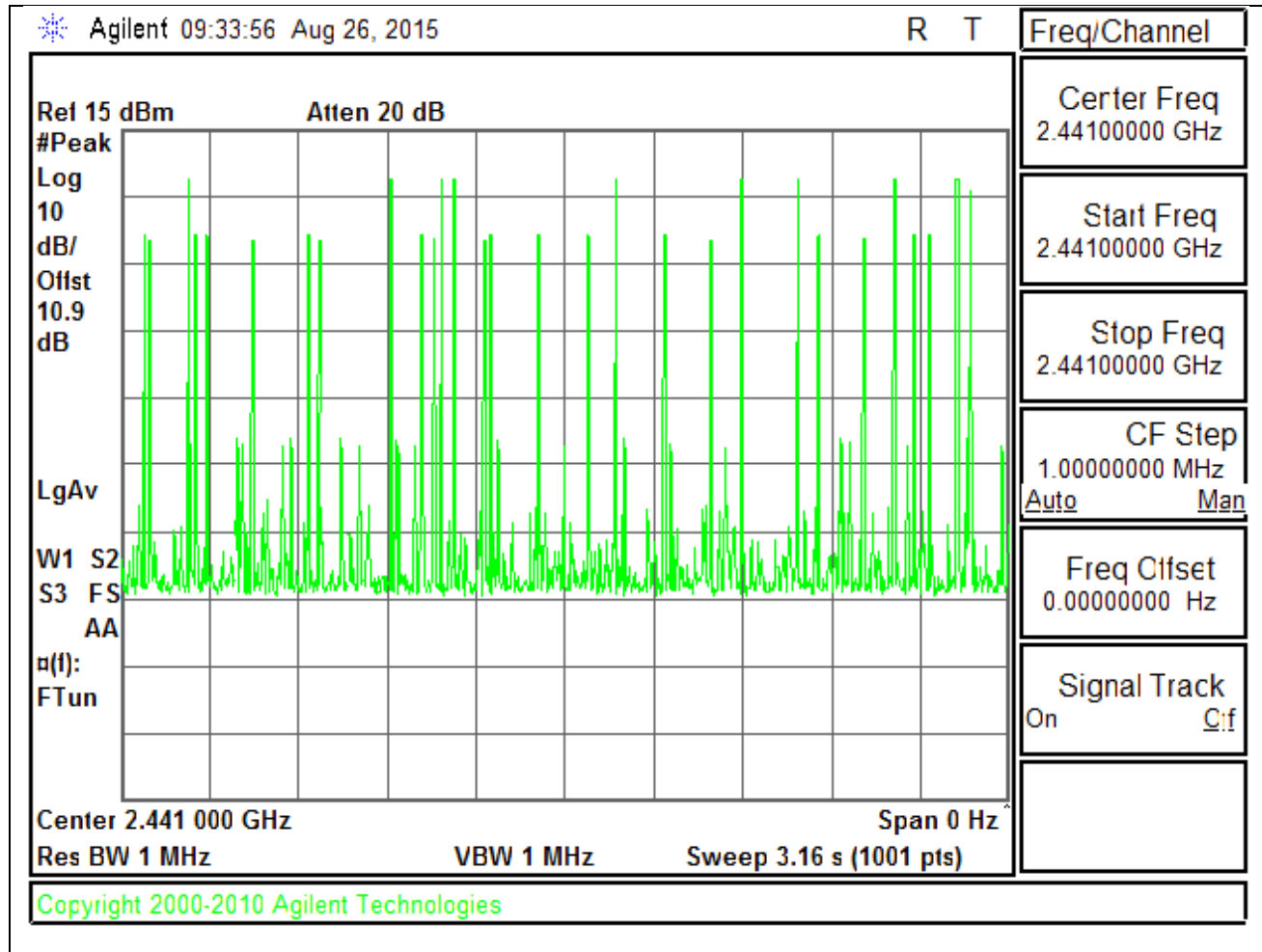
NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH3



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	6.64	21	-14.36
Middle	2441	8.89	21	-12.11
High	2480	6.78	21	-14.22
Worst		8.89		-12.11

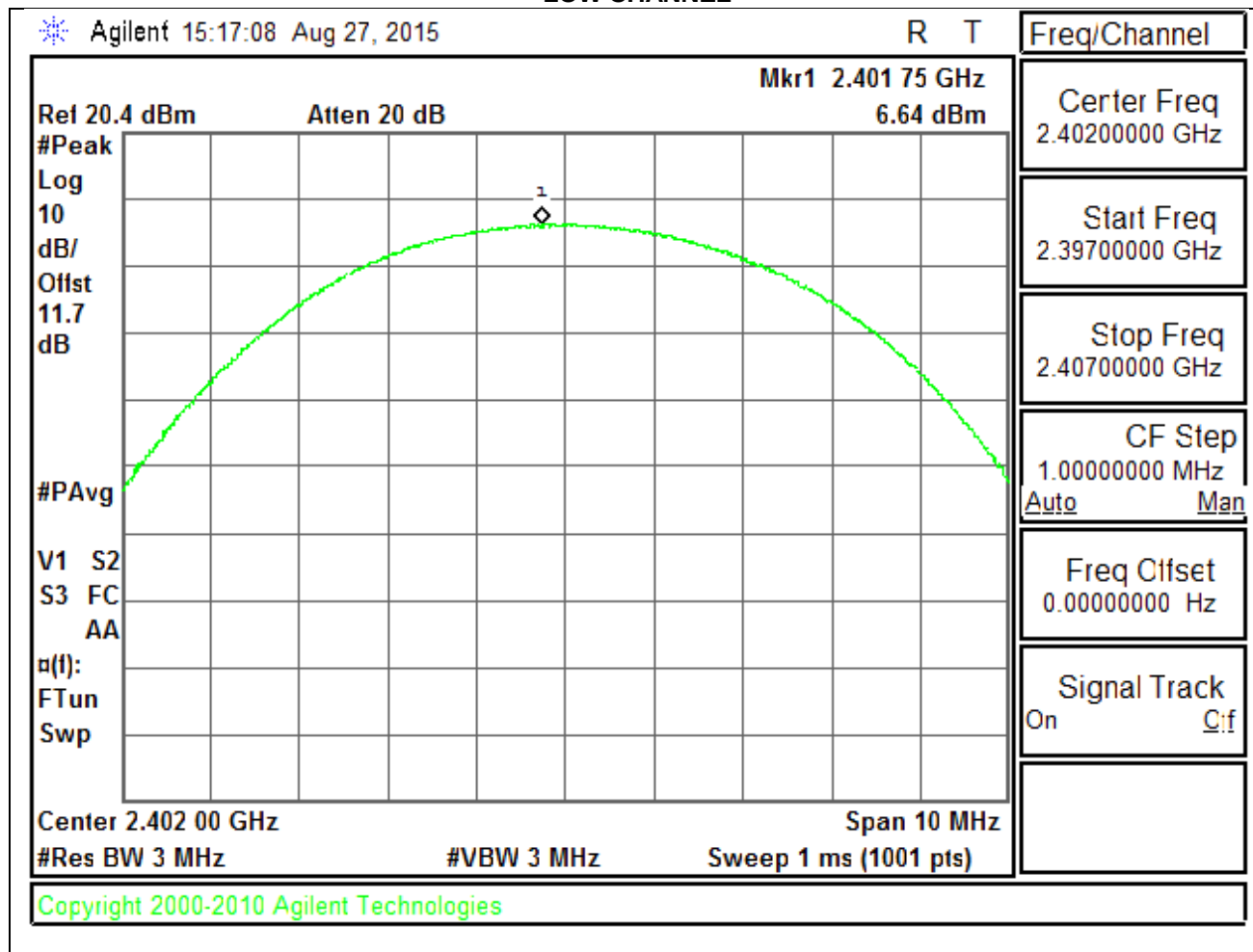
8.5.2. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	5.34	21	-15.66
Middle	2441	7.61	21	-13.39
High	2480	5.47	21	-15.53
Worst		7.61		-13.39

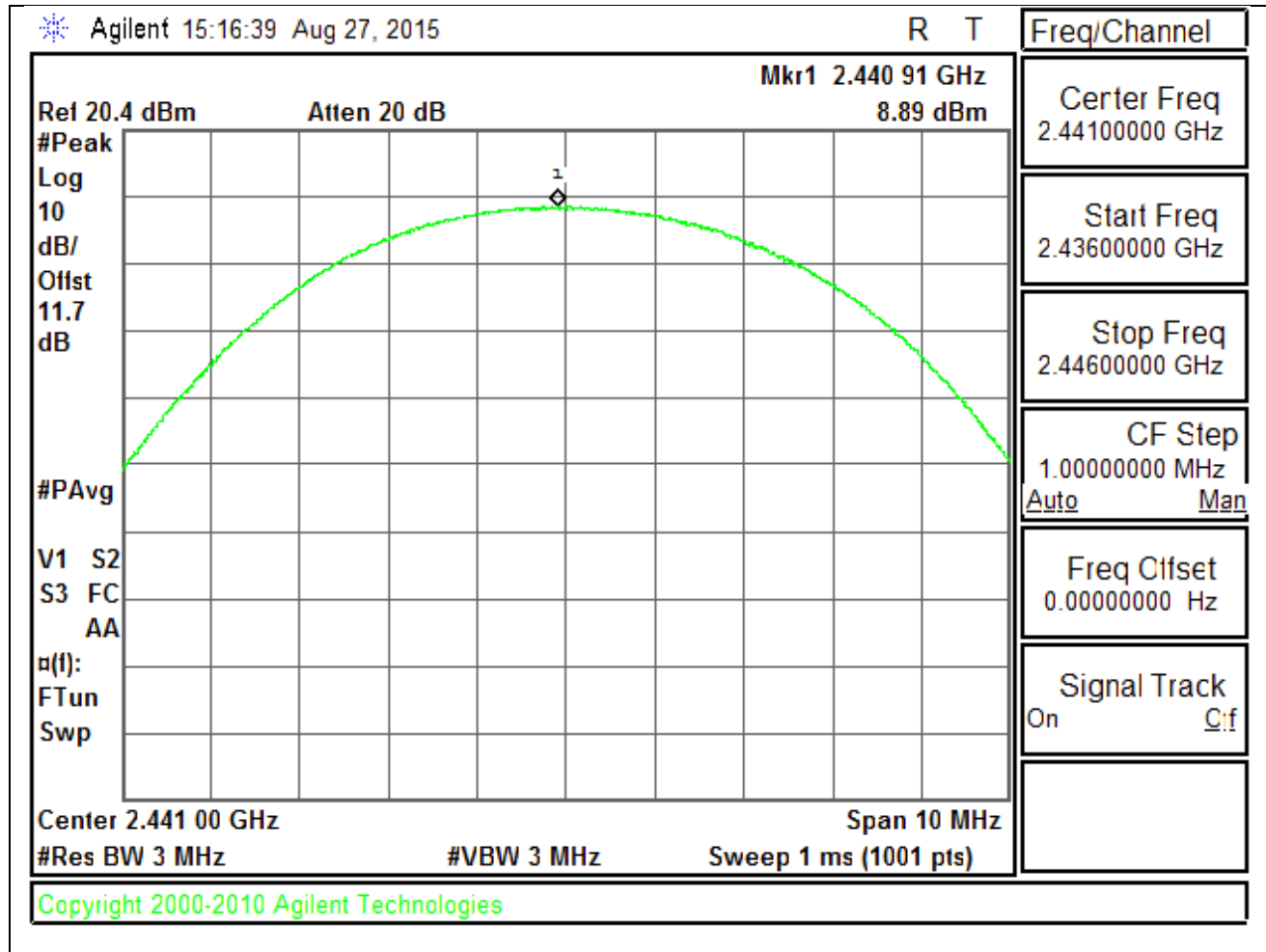
8.5.3. OUTPUT POWER PLOTS

GFSK OUTPUT POWER

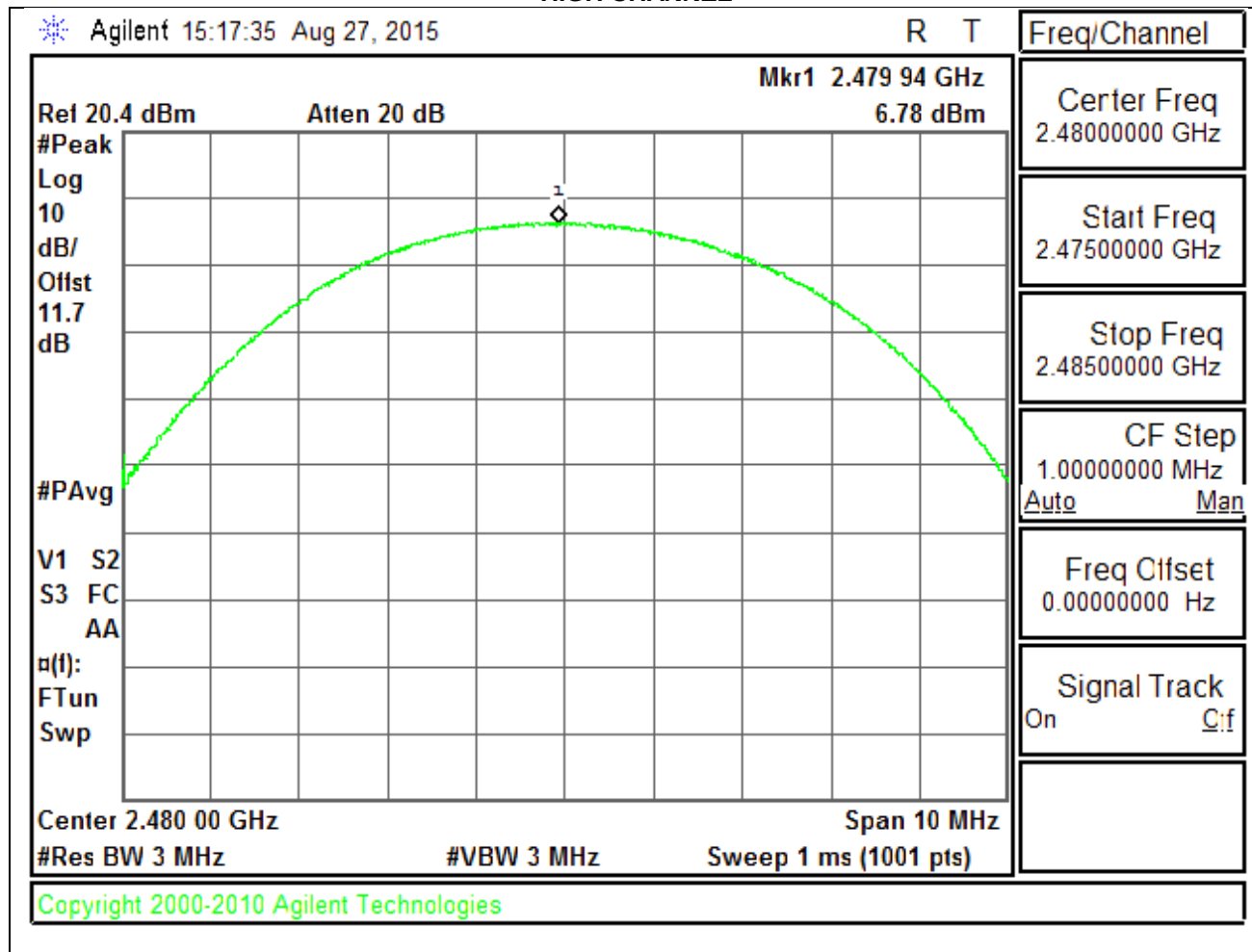
LOW CHANNEL



MID CHANNEL

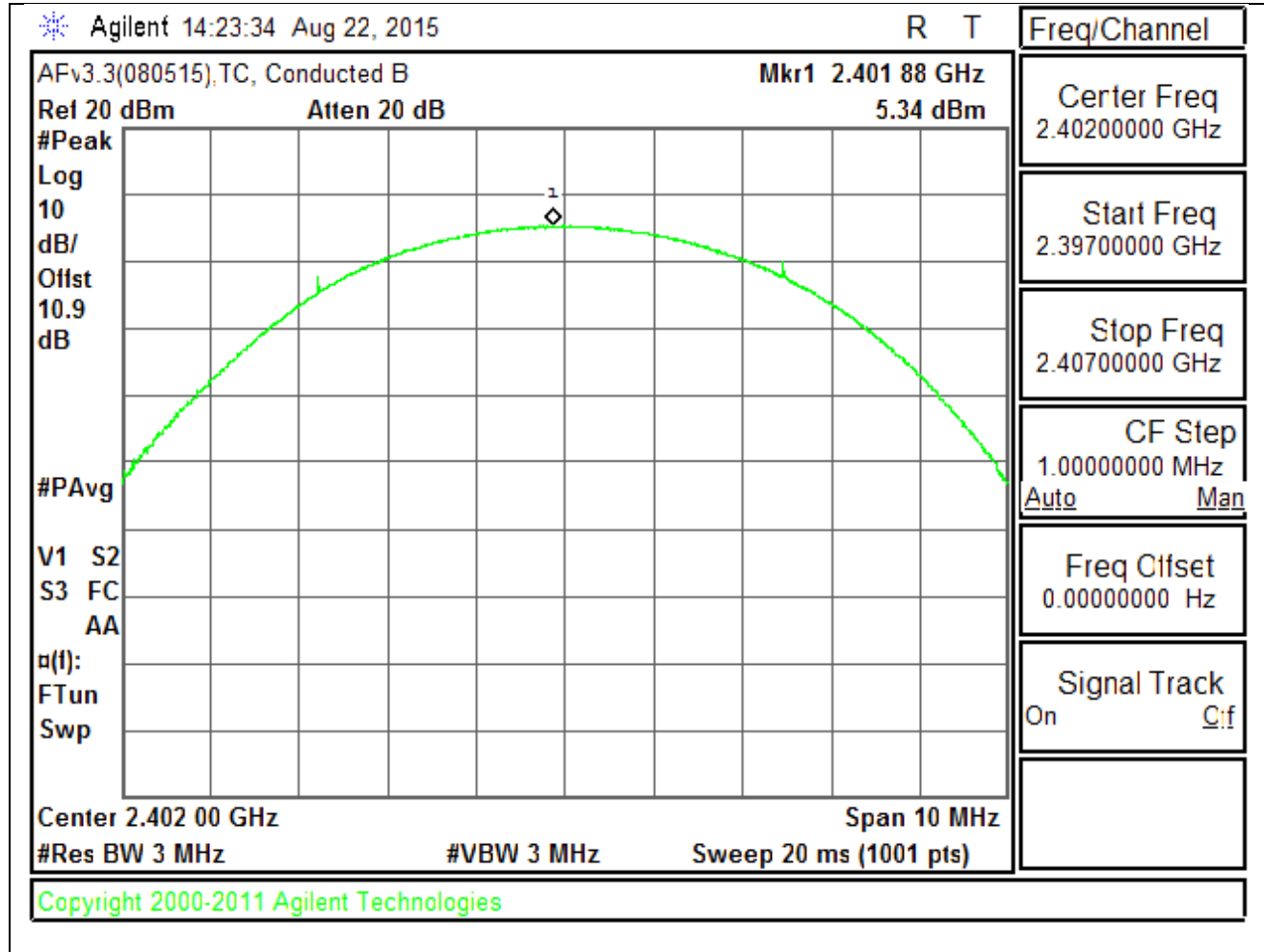


HIGH CHANNEL

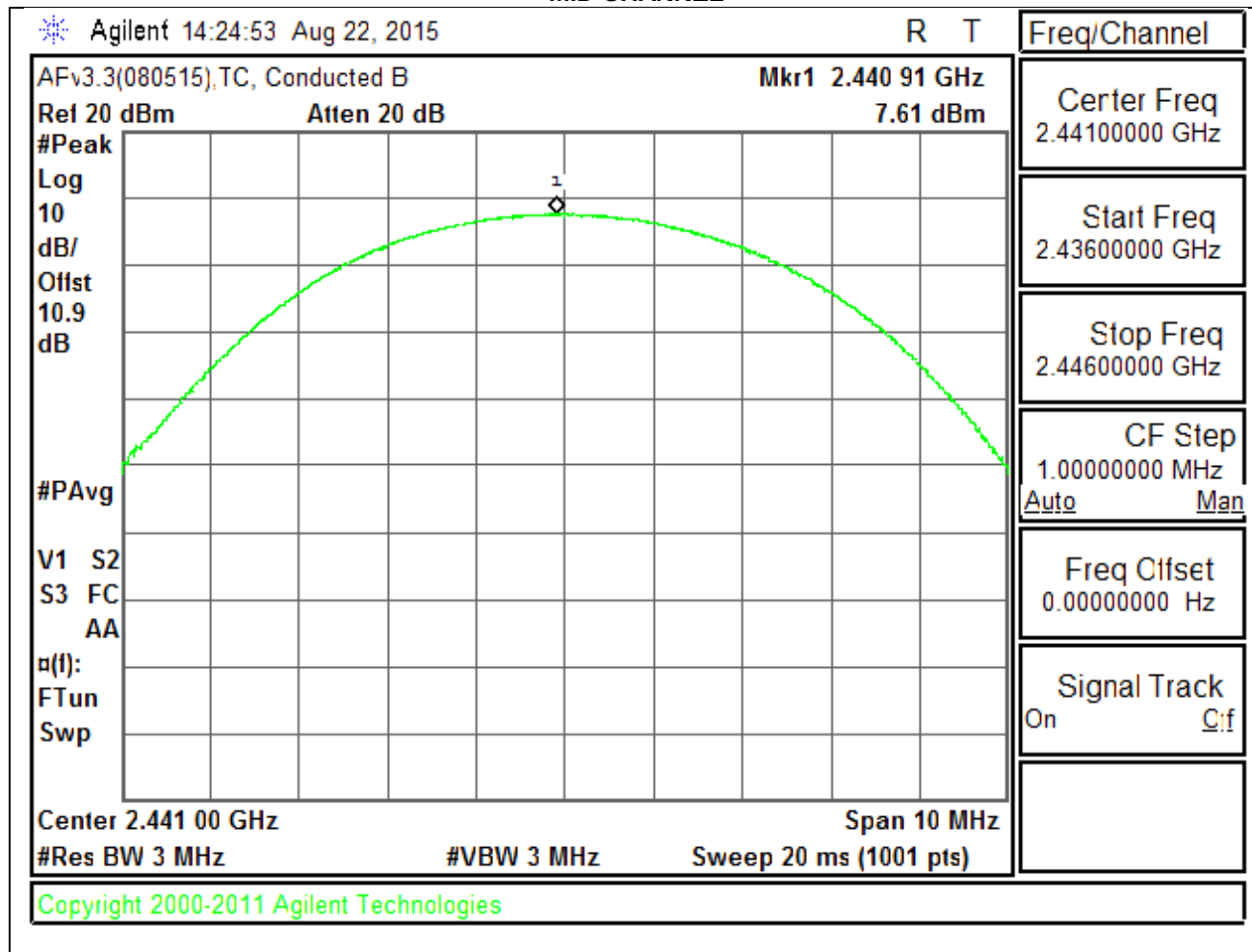


8PSK OUTPUT POWER

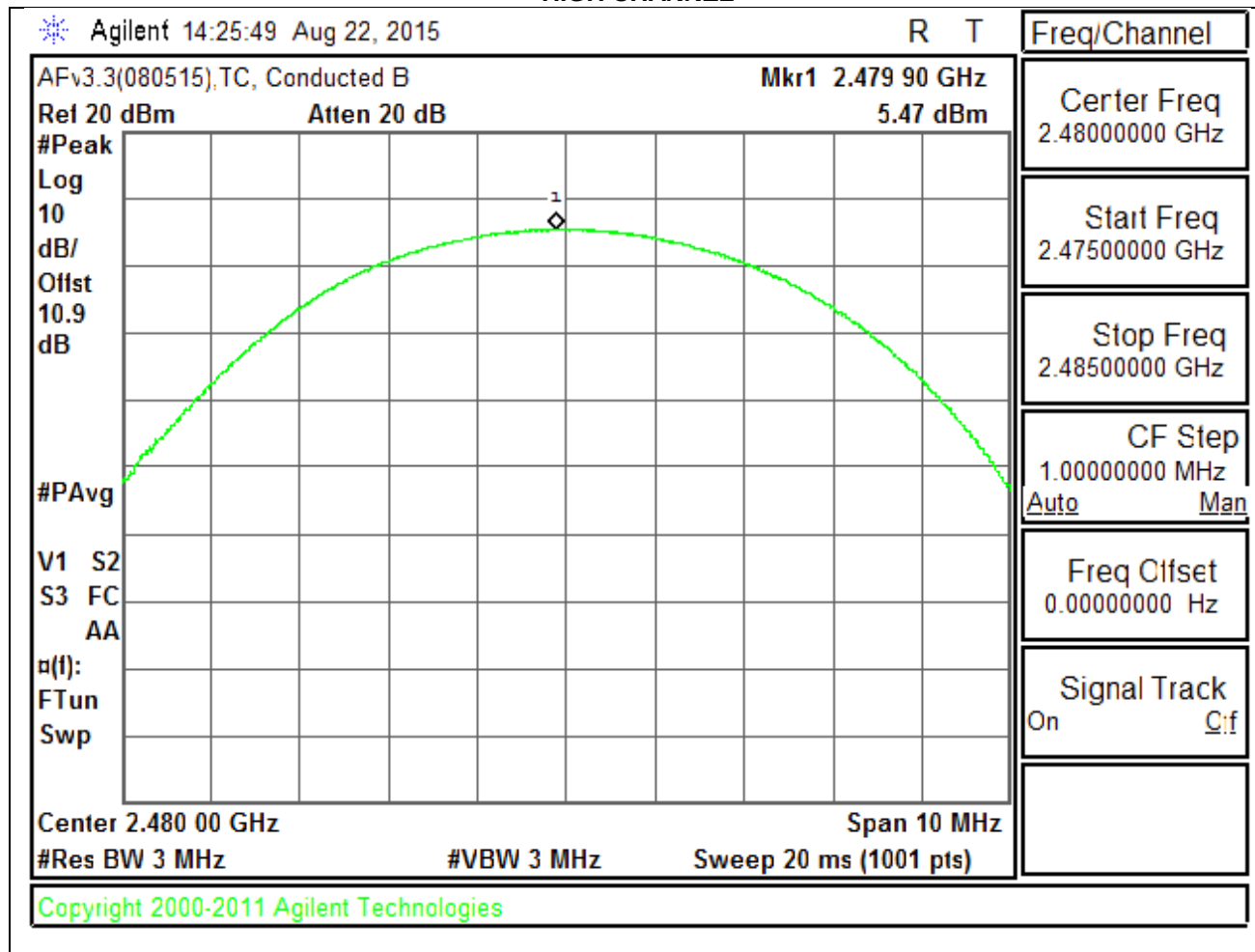
LOW CHANNEL



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	6.2
Middle	2441	8.5
High	2480	6.3
Worst		8.5

8.6.2. ENHANCED DATA RATE 8PSK MODULATION

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.7
Middle	2441	5.1
High	2480	2.7
Worst		5.1

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.

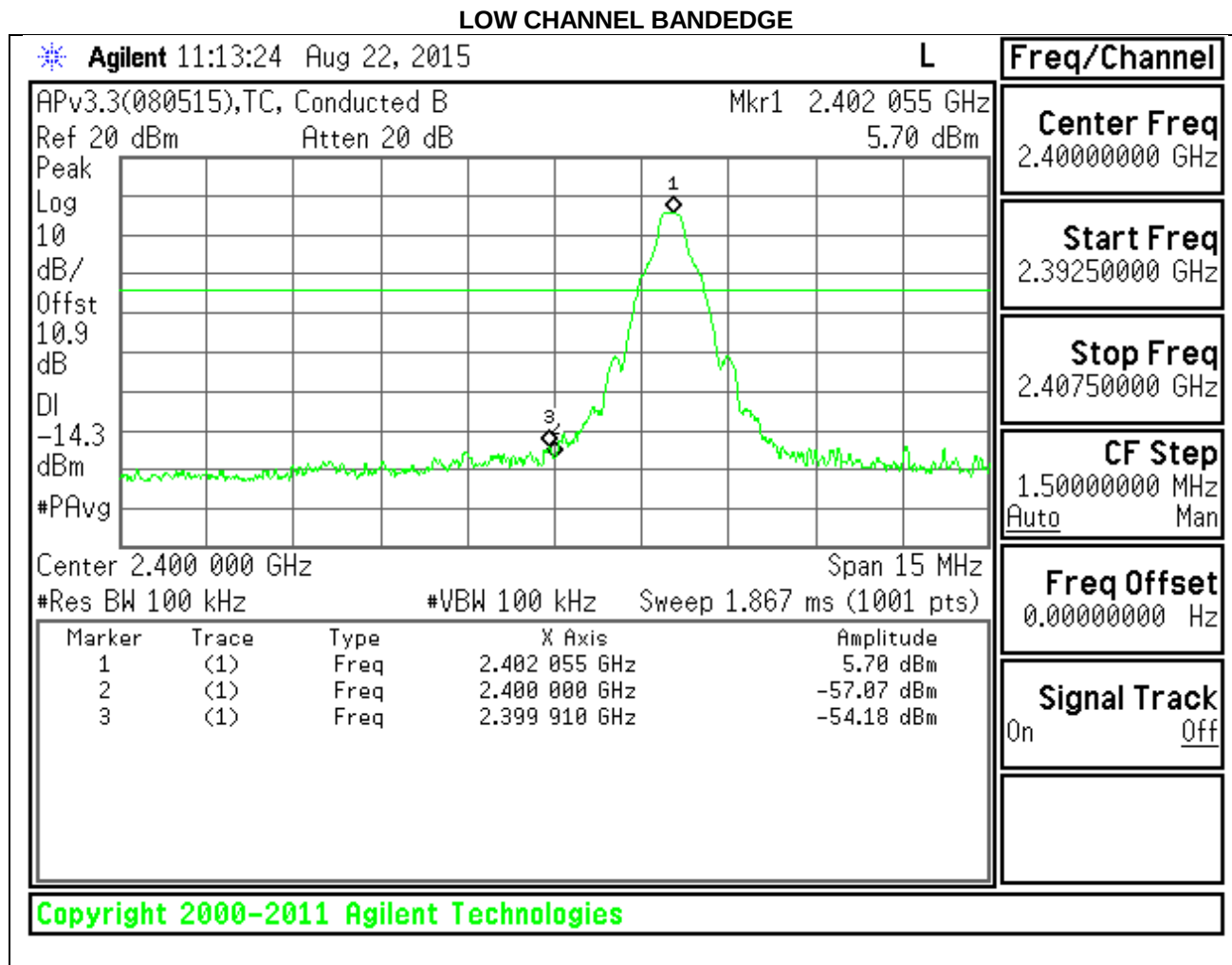
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

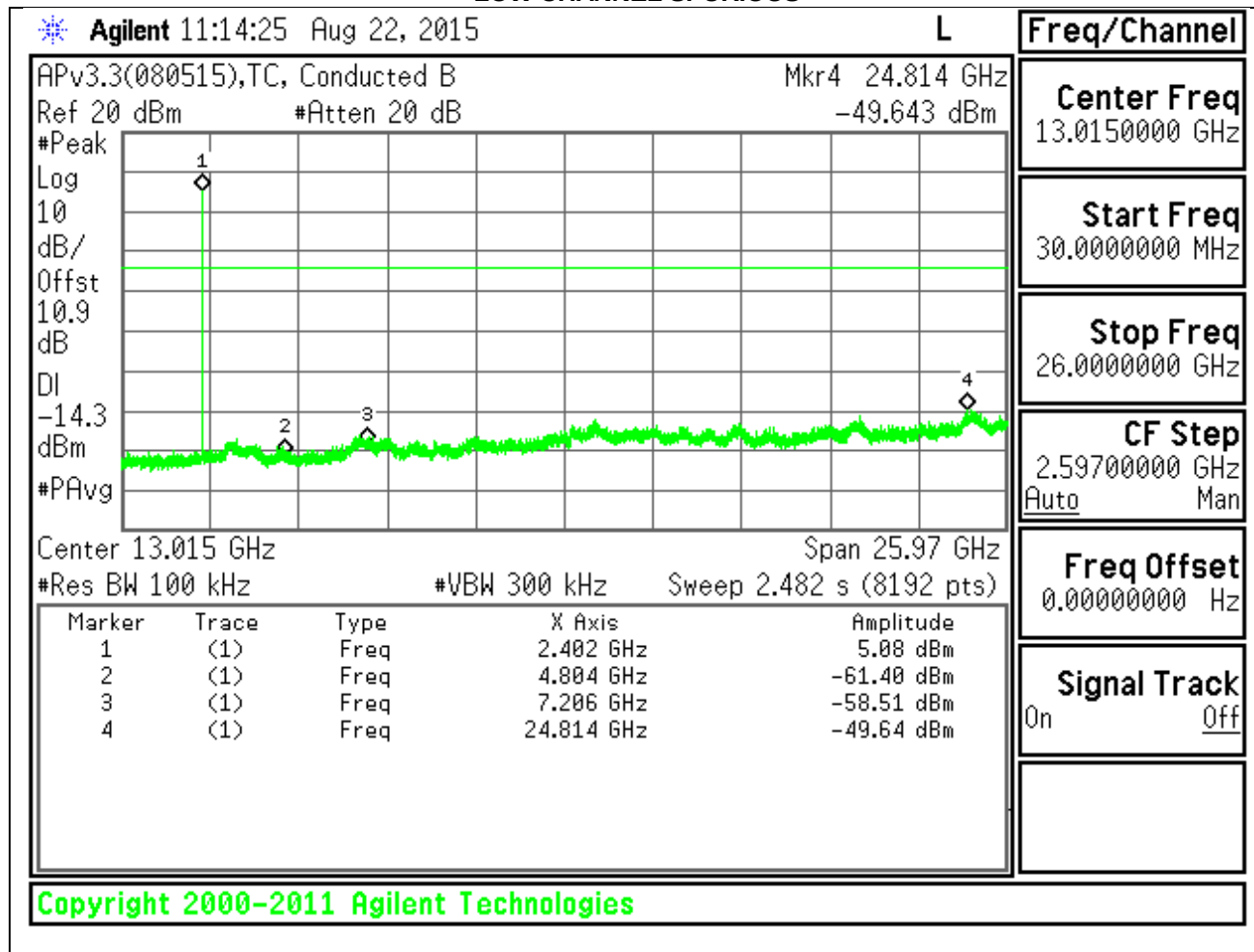
RESULTS

8.7.1. BASIC DATA RATE GFSK MODULATION

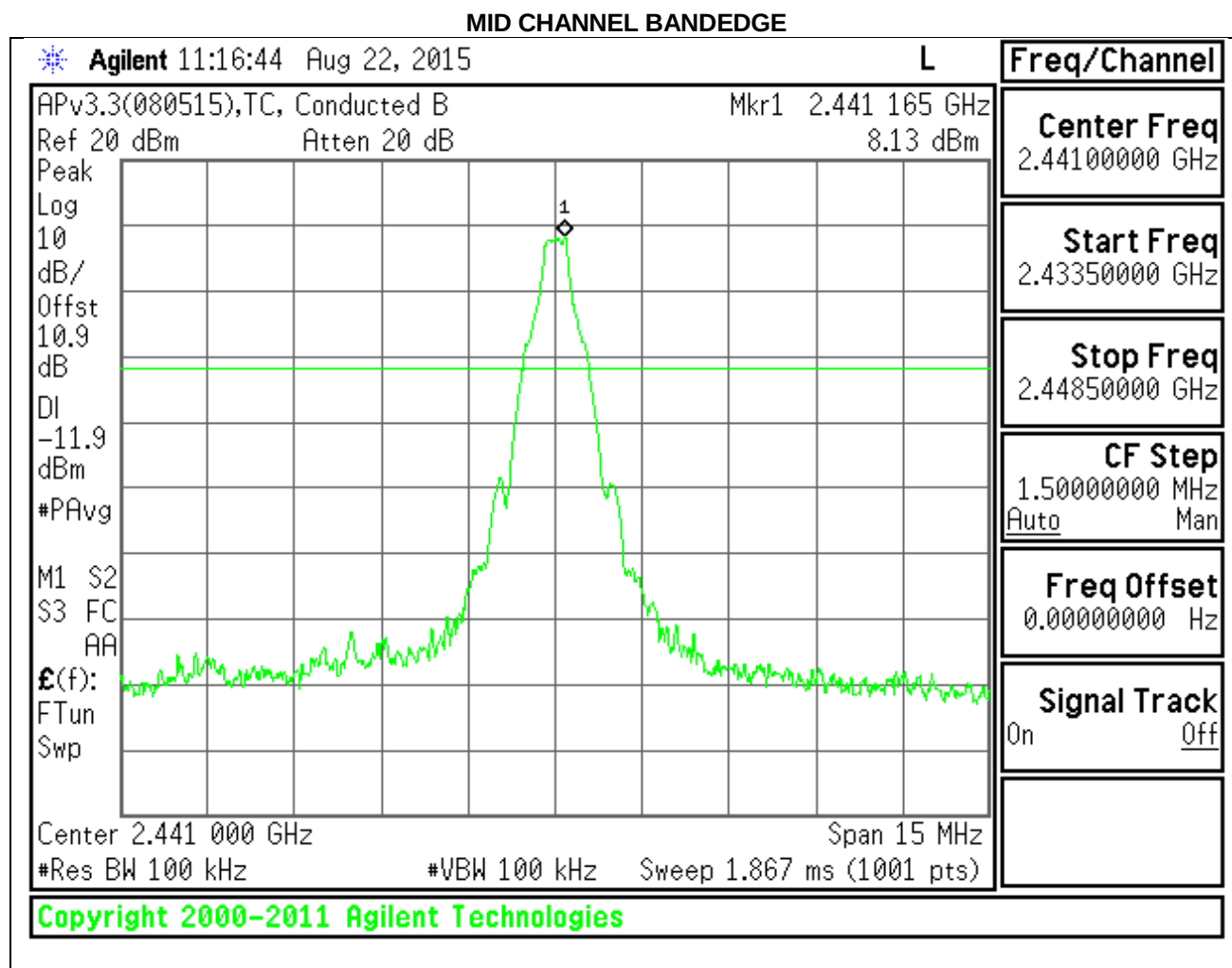
SPURIOUS EMISSIONS, LOW CHANNEL



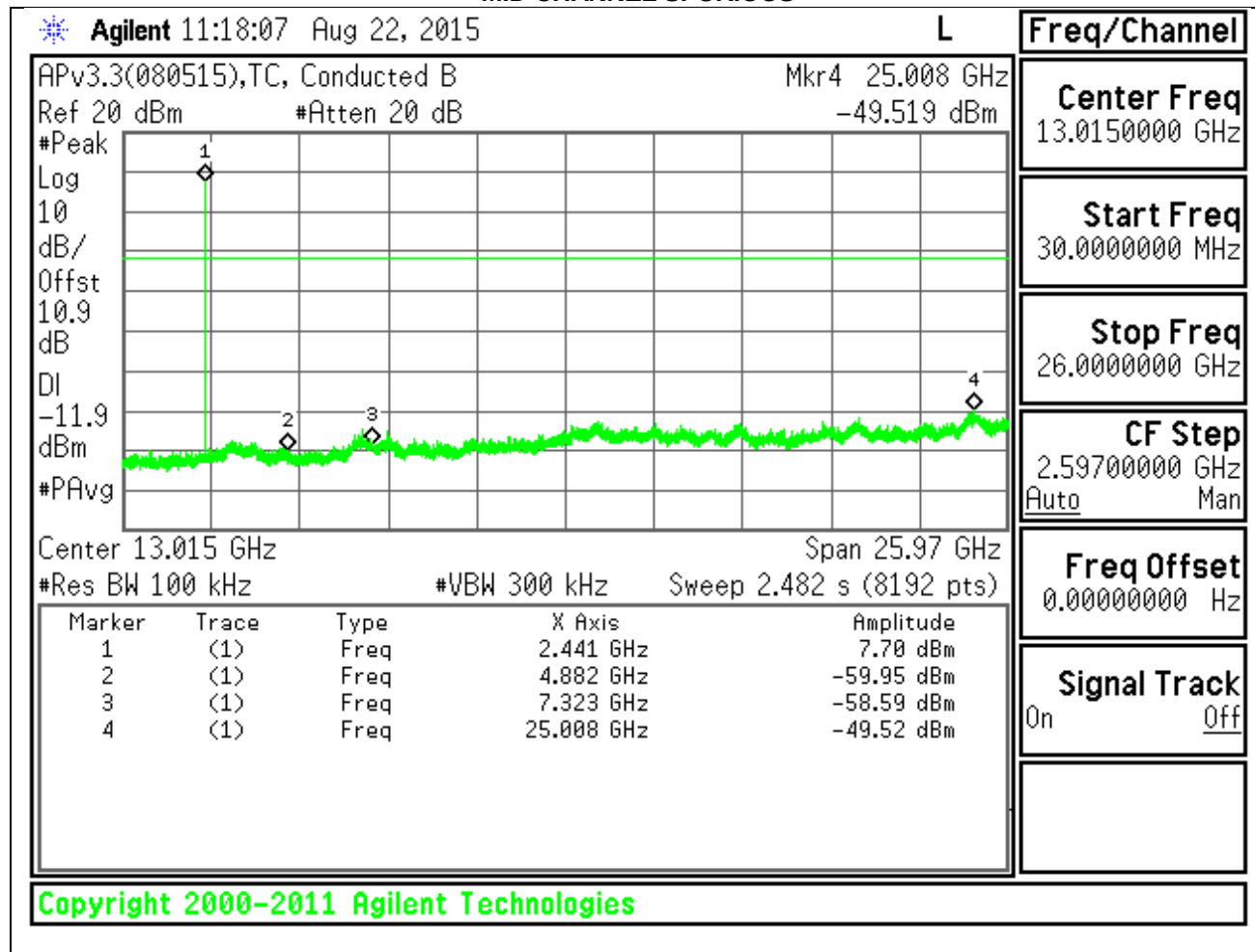
LOW CHANNEL SPURIOUS



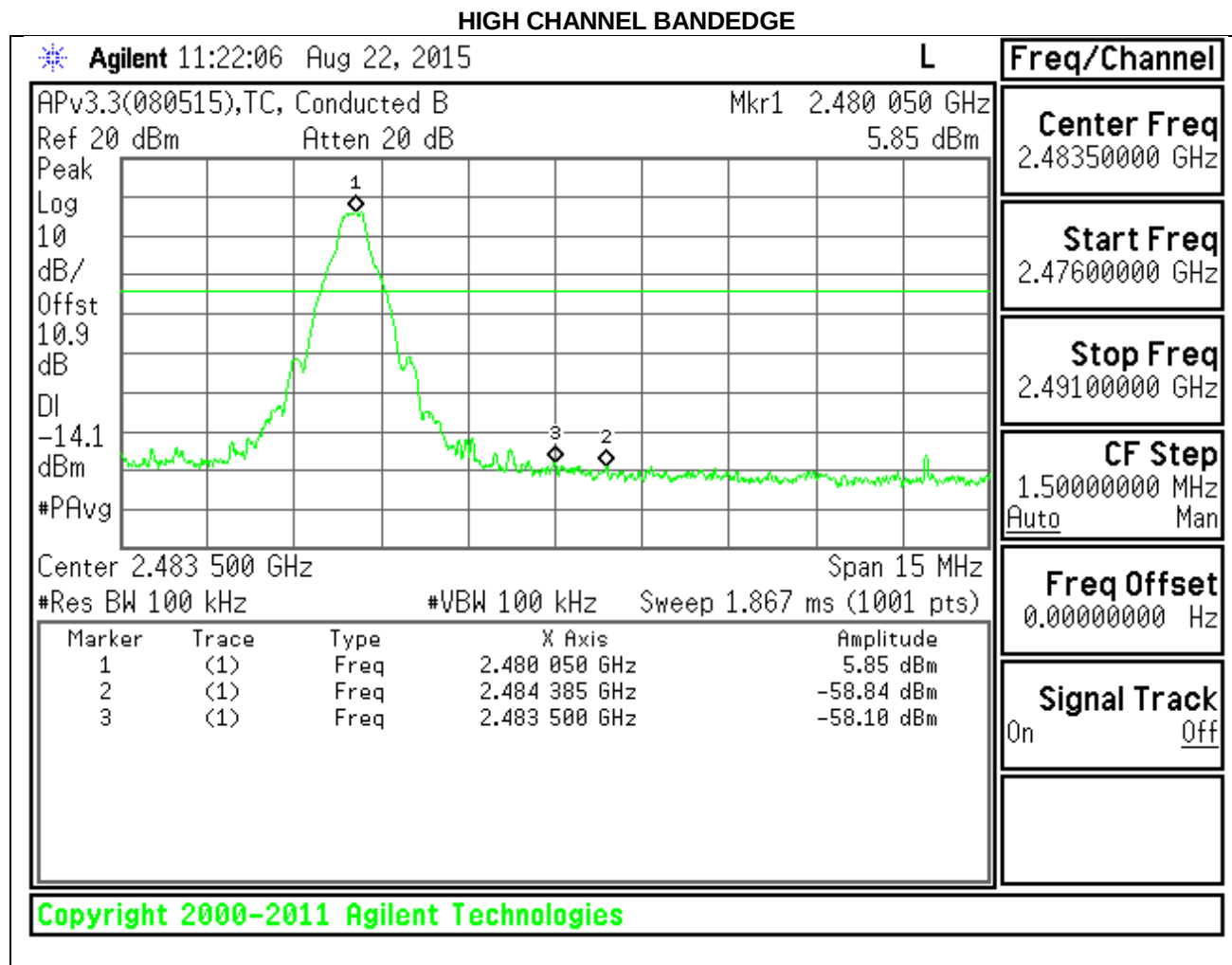
SPURIOUS EMISSIONS, MID CHANNEL



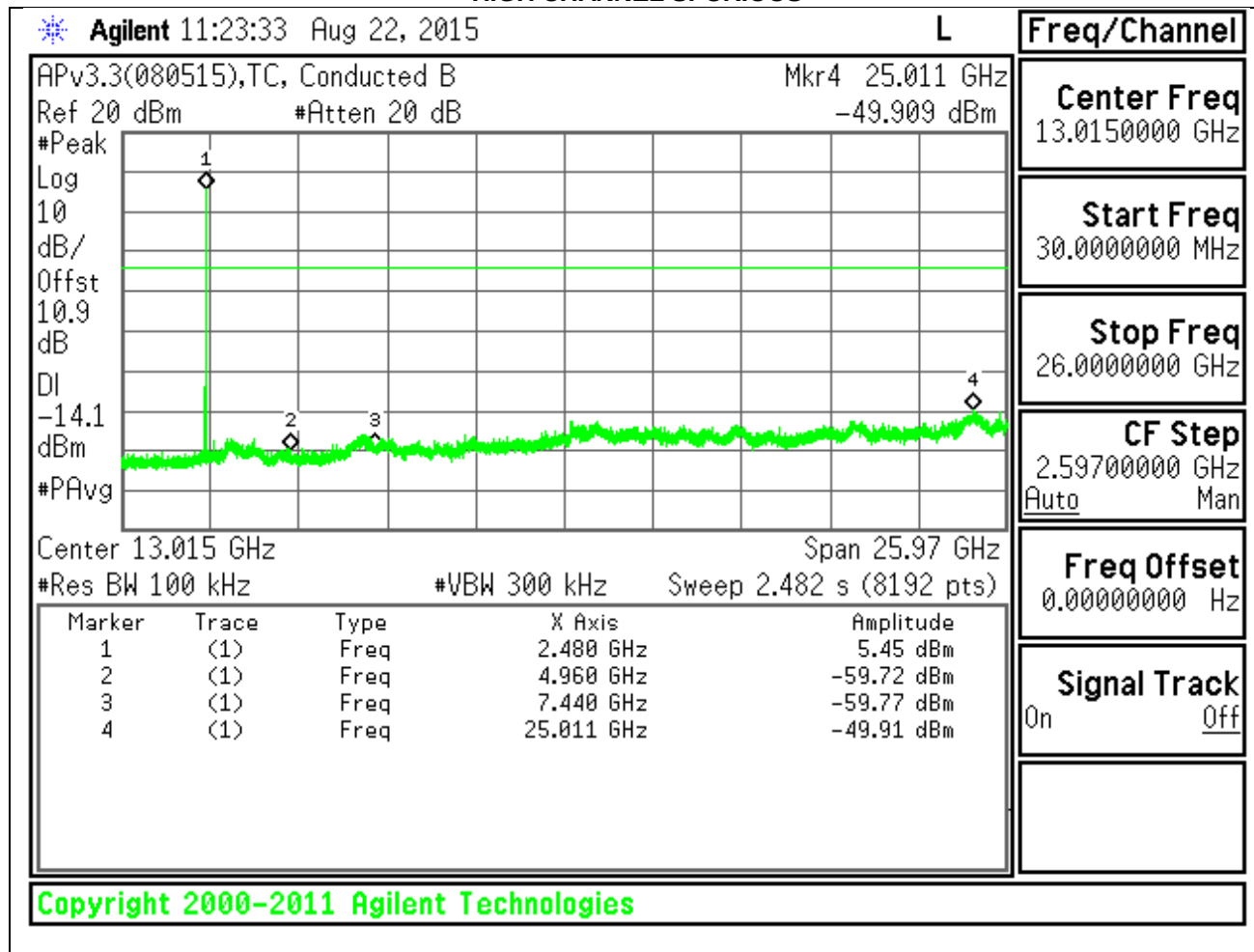
MID CHANNEL SPURIOUS



SPURIOUS EMISSIONS, HIGH CHANNEL

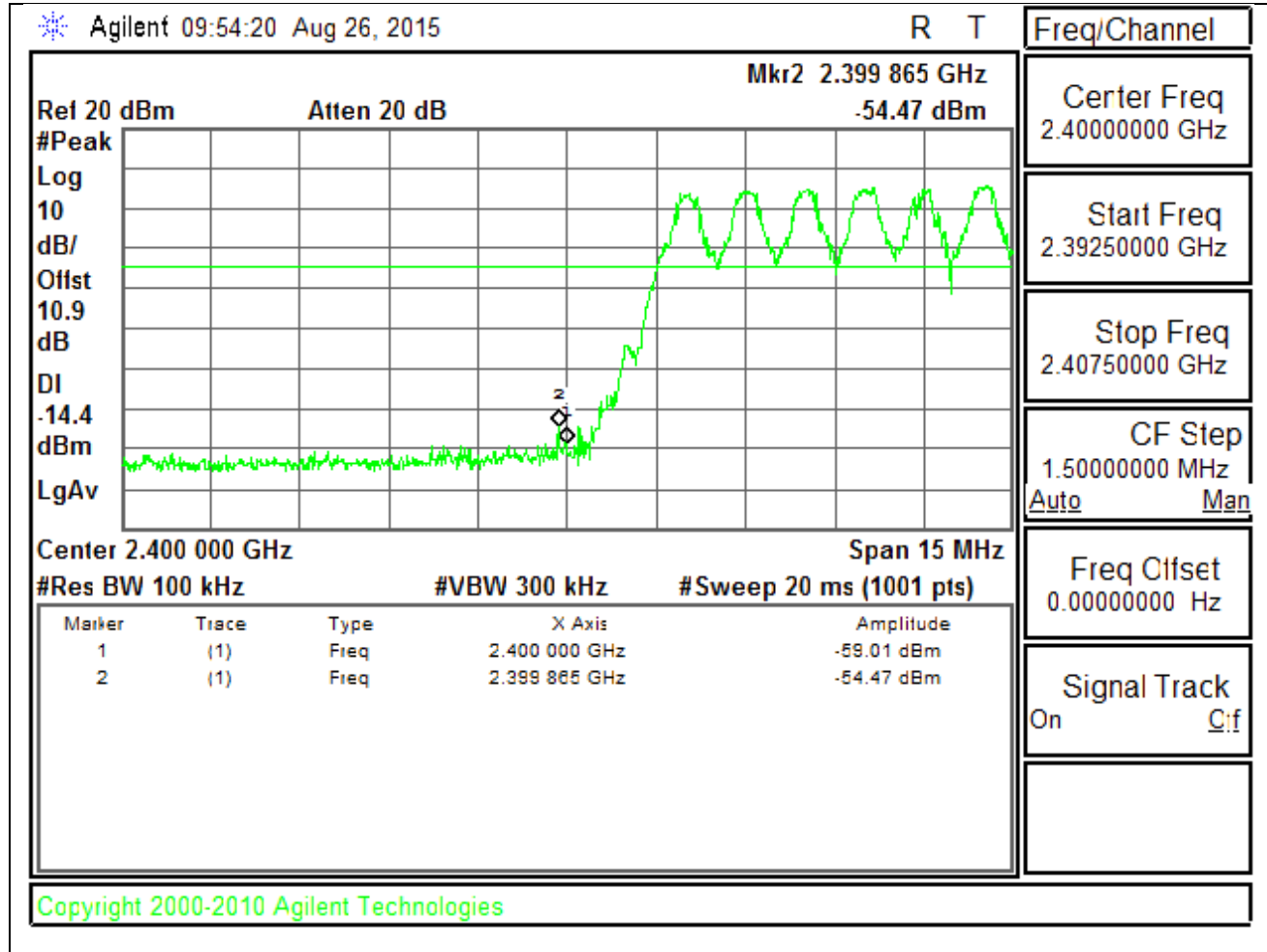


HIGH CHANNEL SPURIOUS

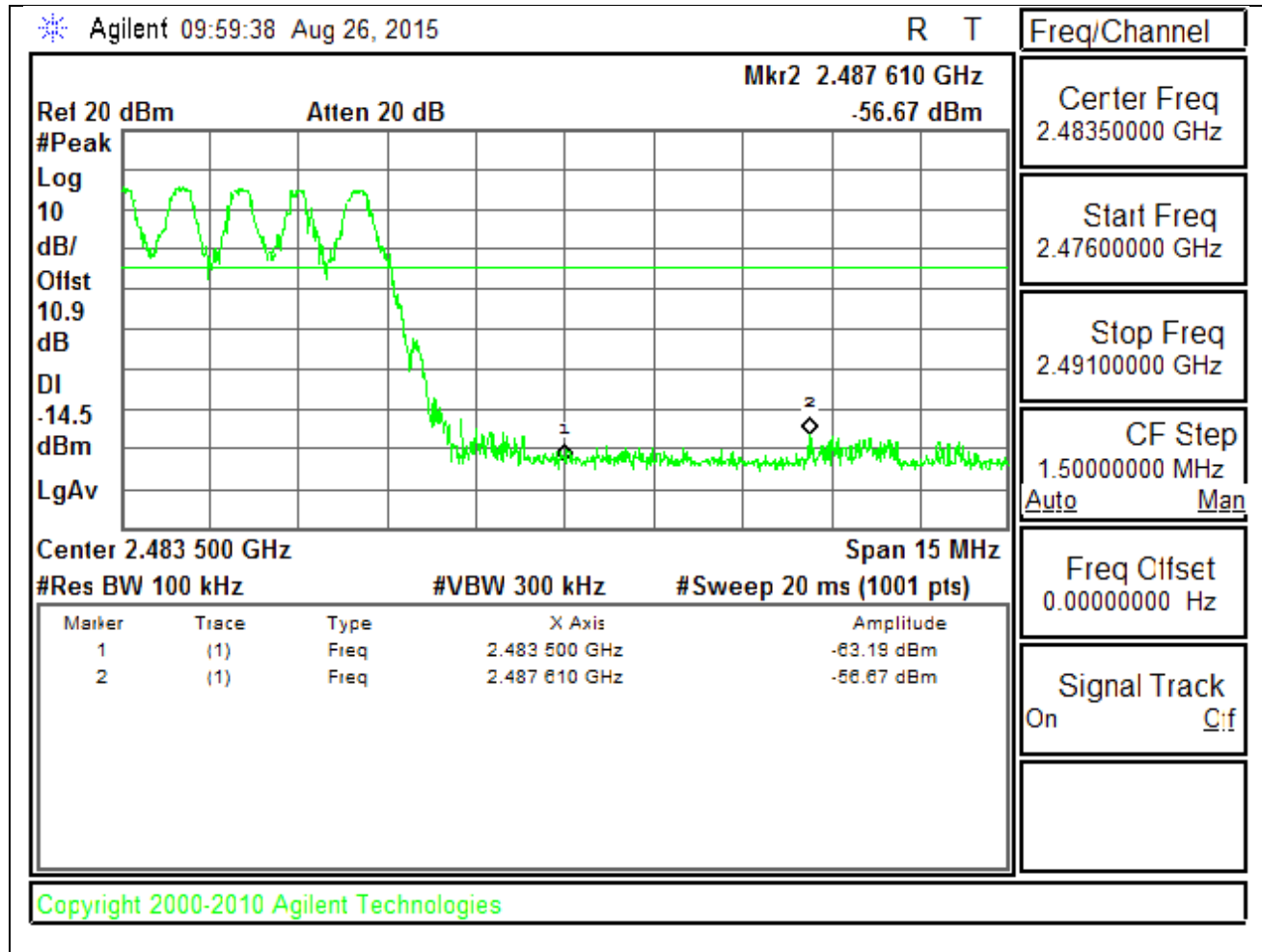


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

LOW BANDEDGE WITH HOPPING ON

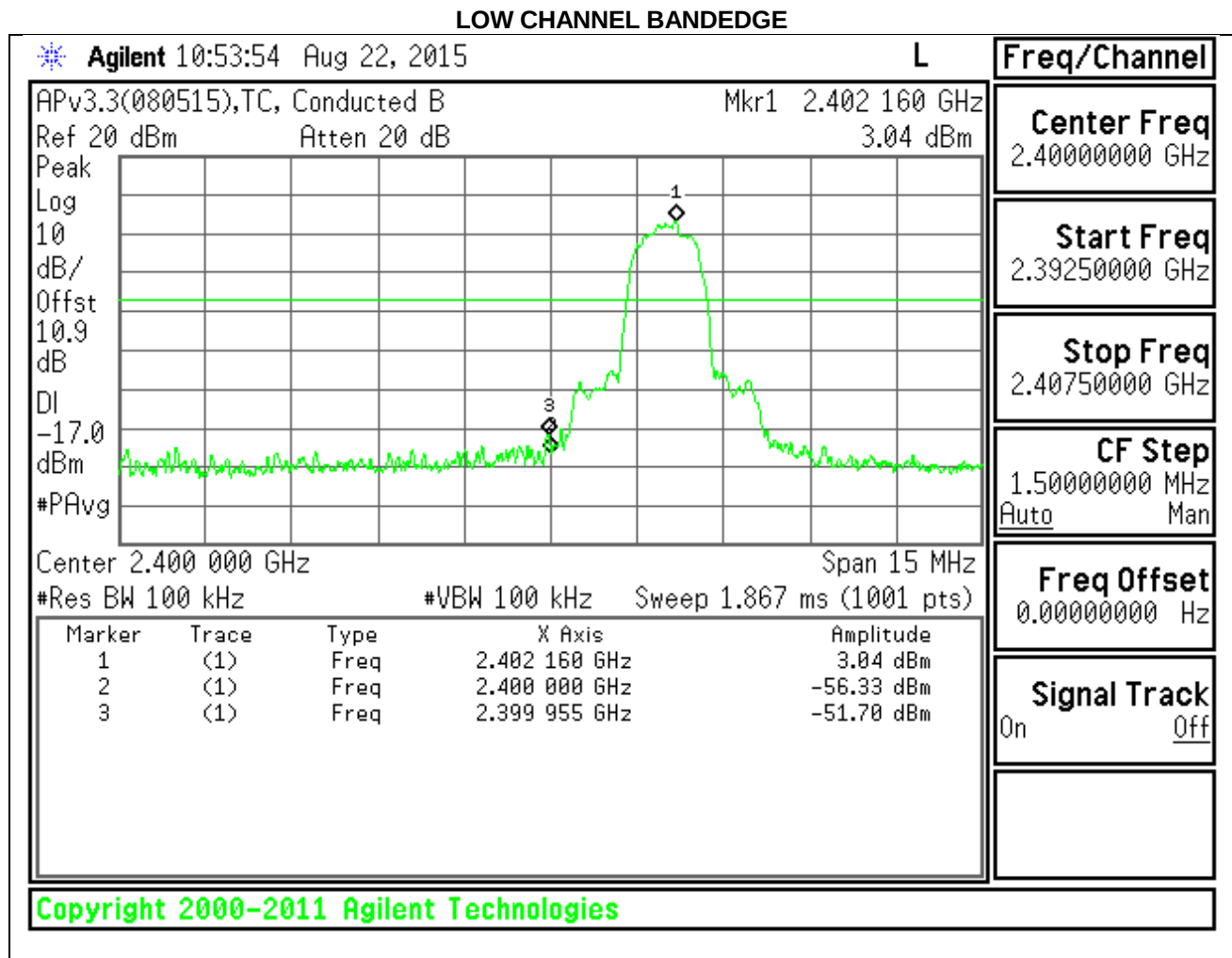


HIGH BANDEGE WITH HOPPING ON

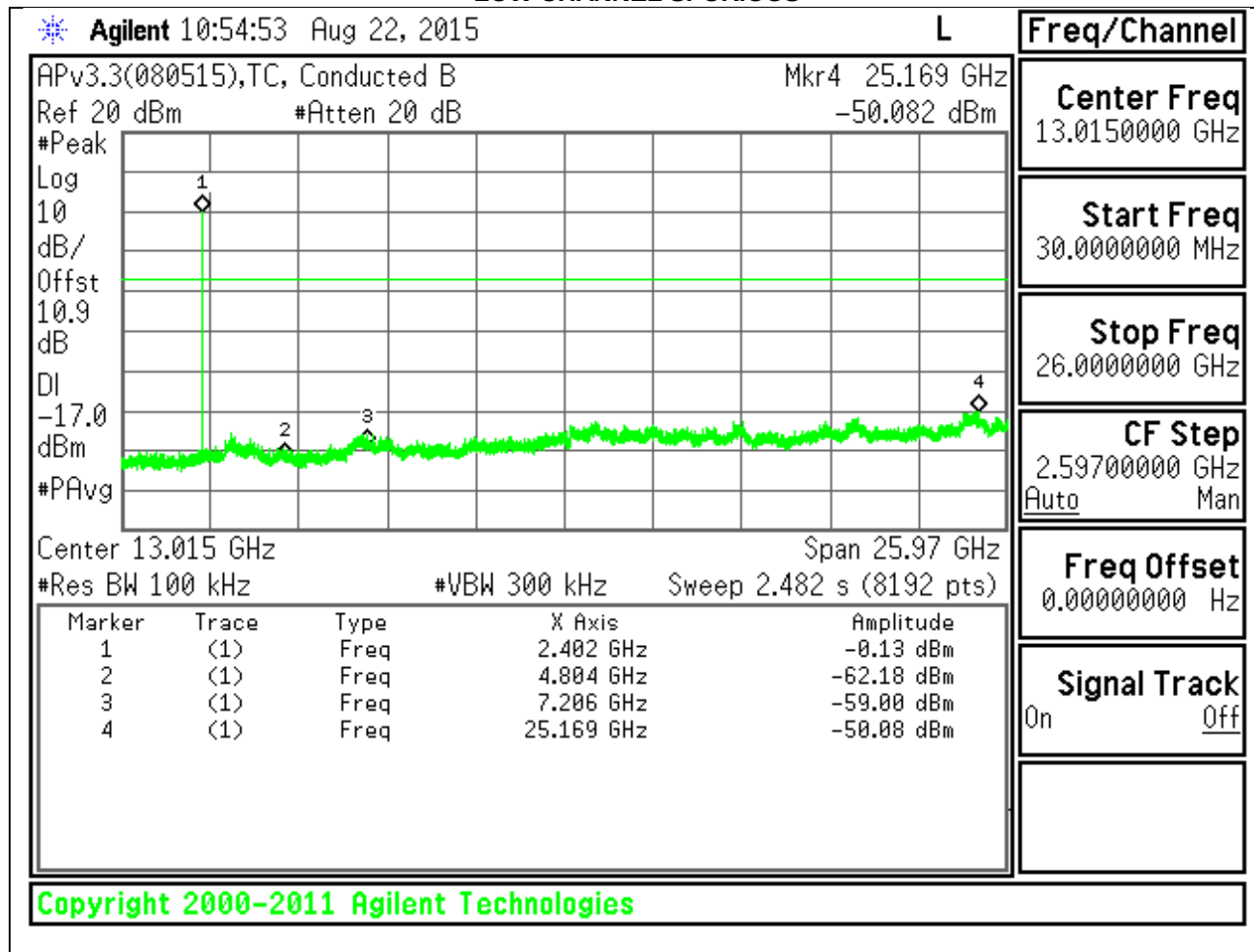


8.7.2. ENHANCED DATA RATE 8PSK MODULATION

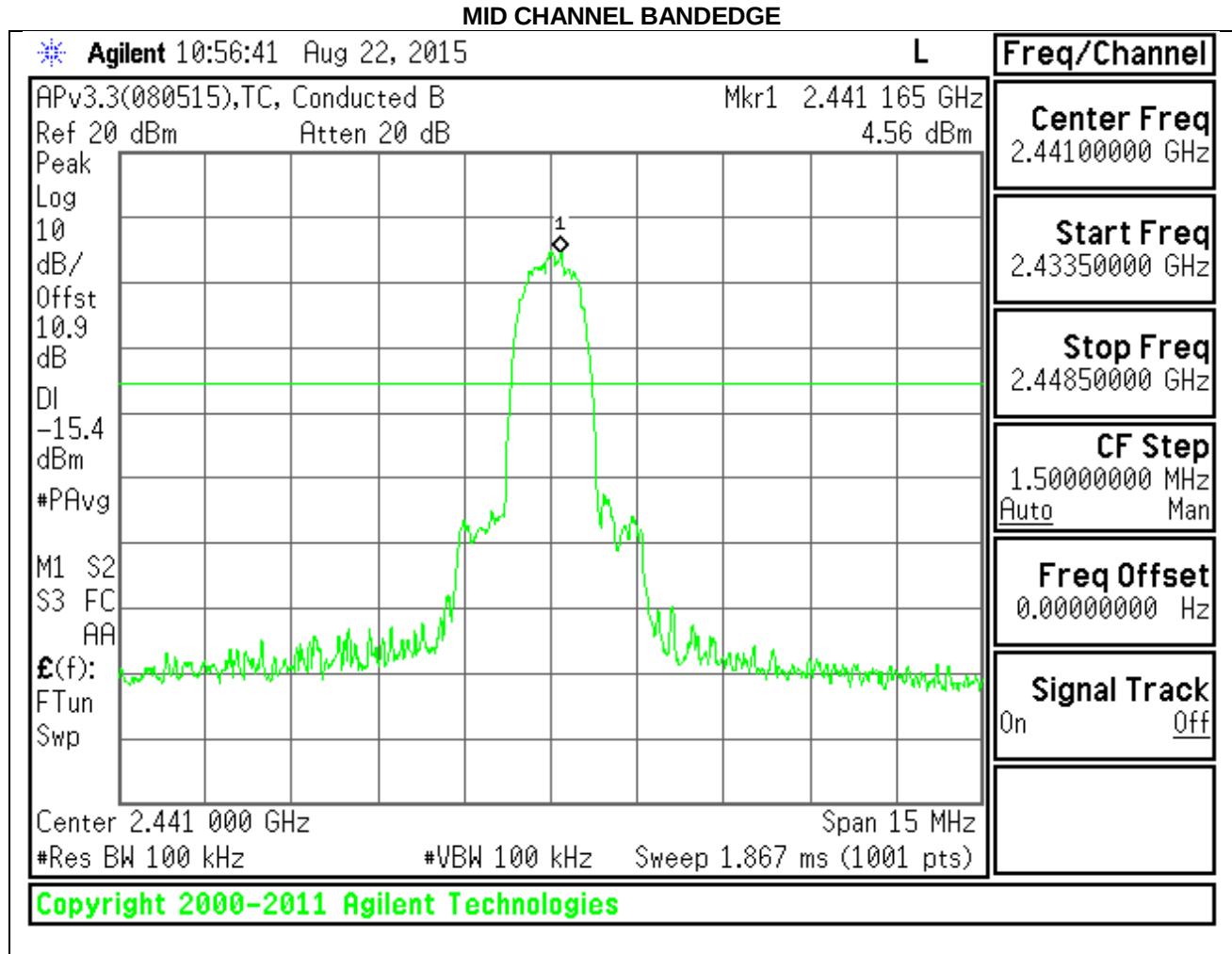
SPURIOUS EMISSIONS, LOW CHANNEL



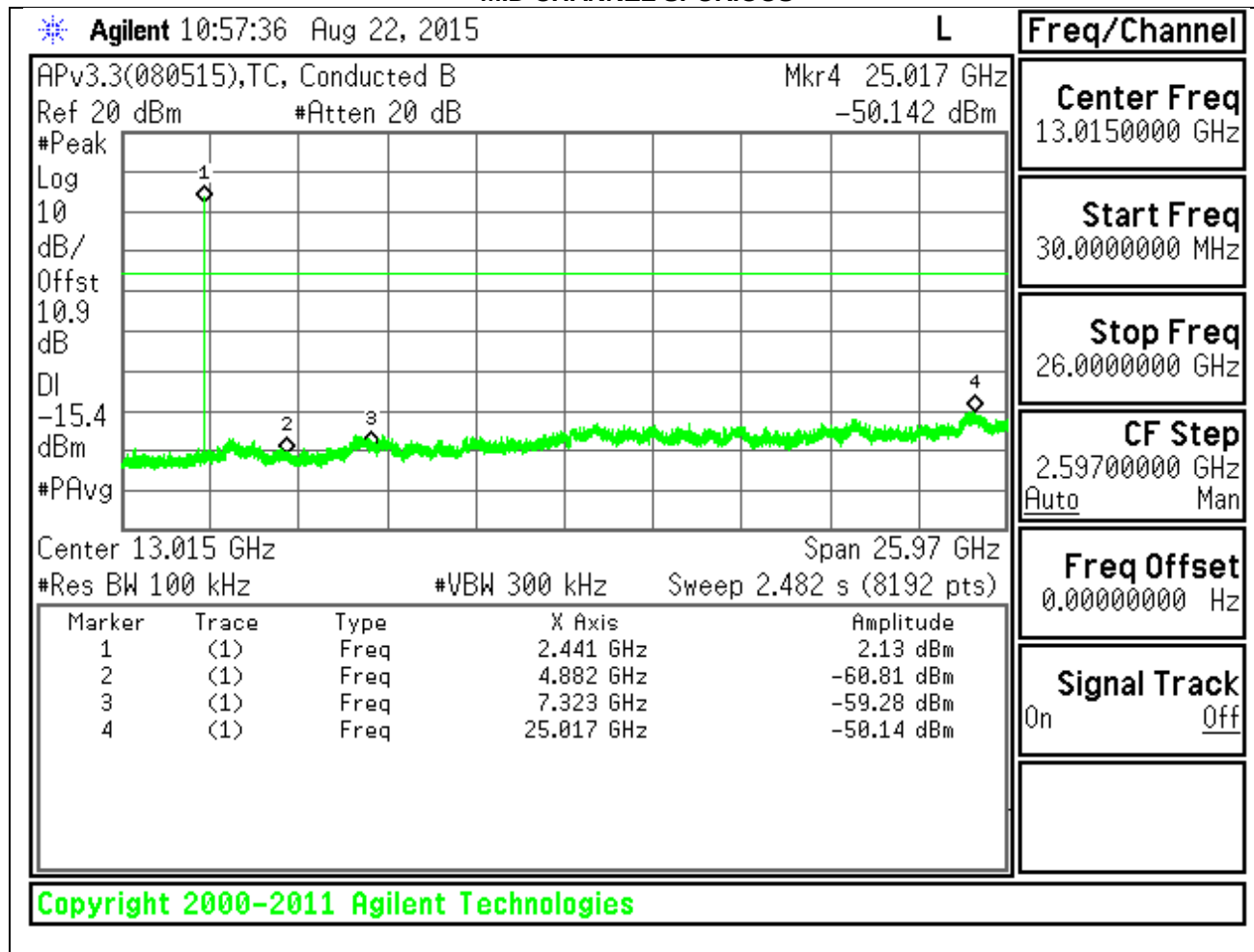
LOW CHANNEL SPURIOUS



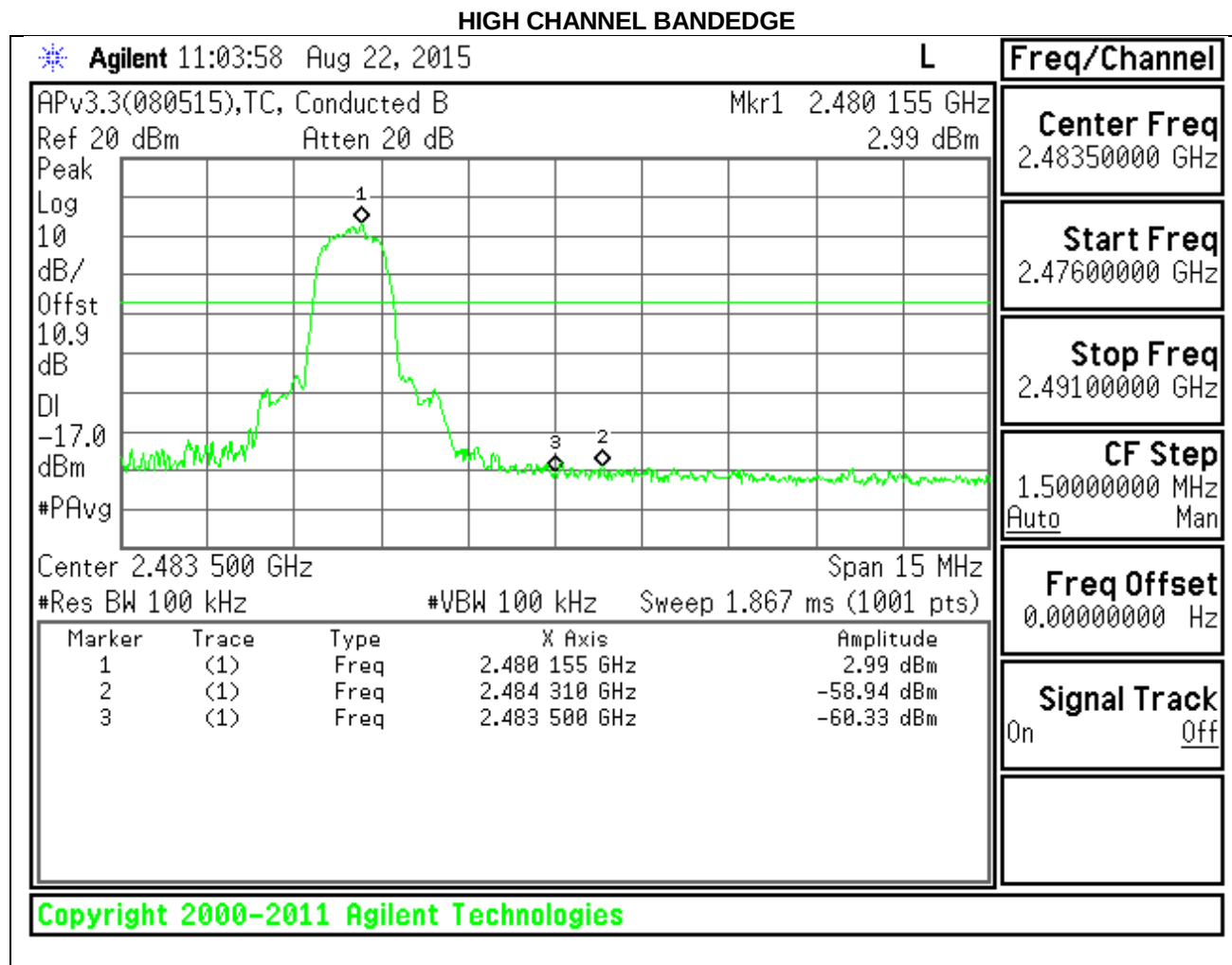
SPURIOUS EMISSIONS, MID CHANNEL



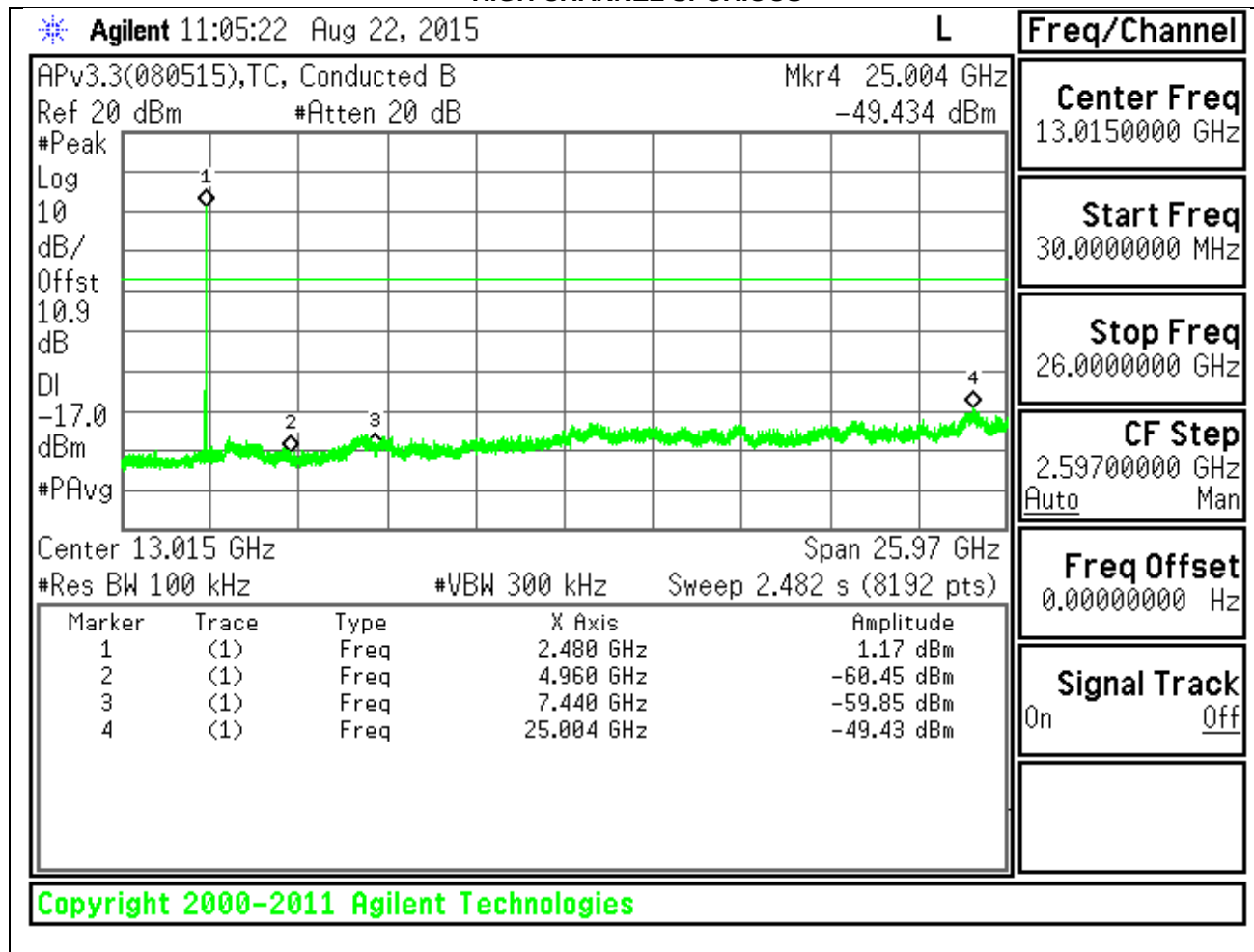
MID CHANNEL SPURIOUS



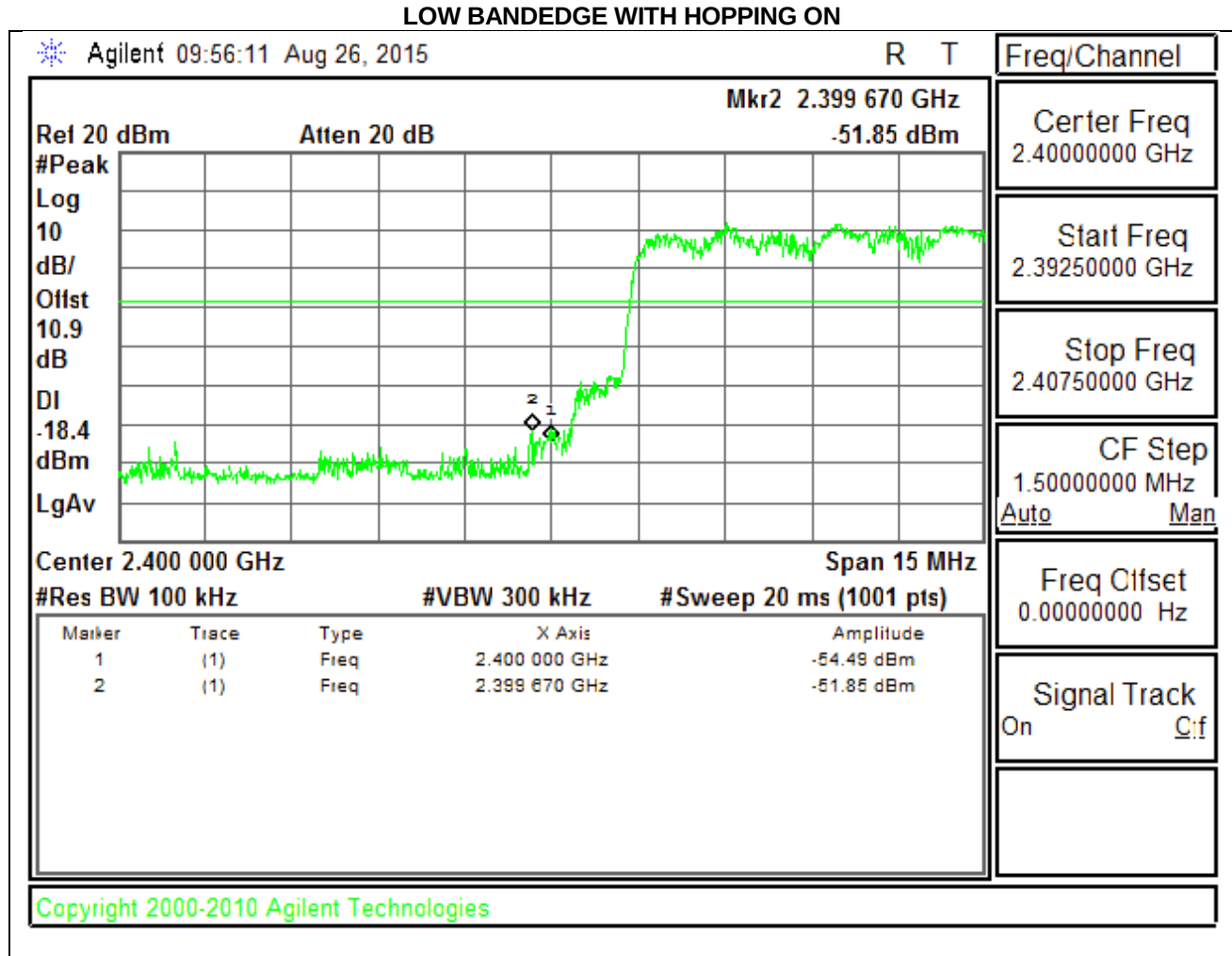
SPURIOUS EMISSIONS, HIGH CHANNEL



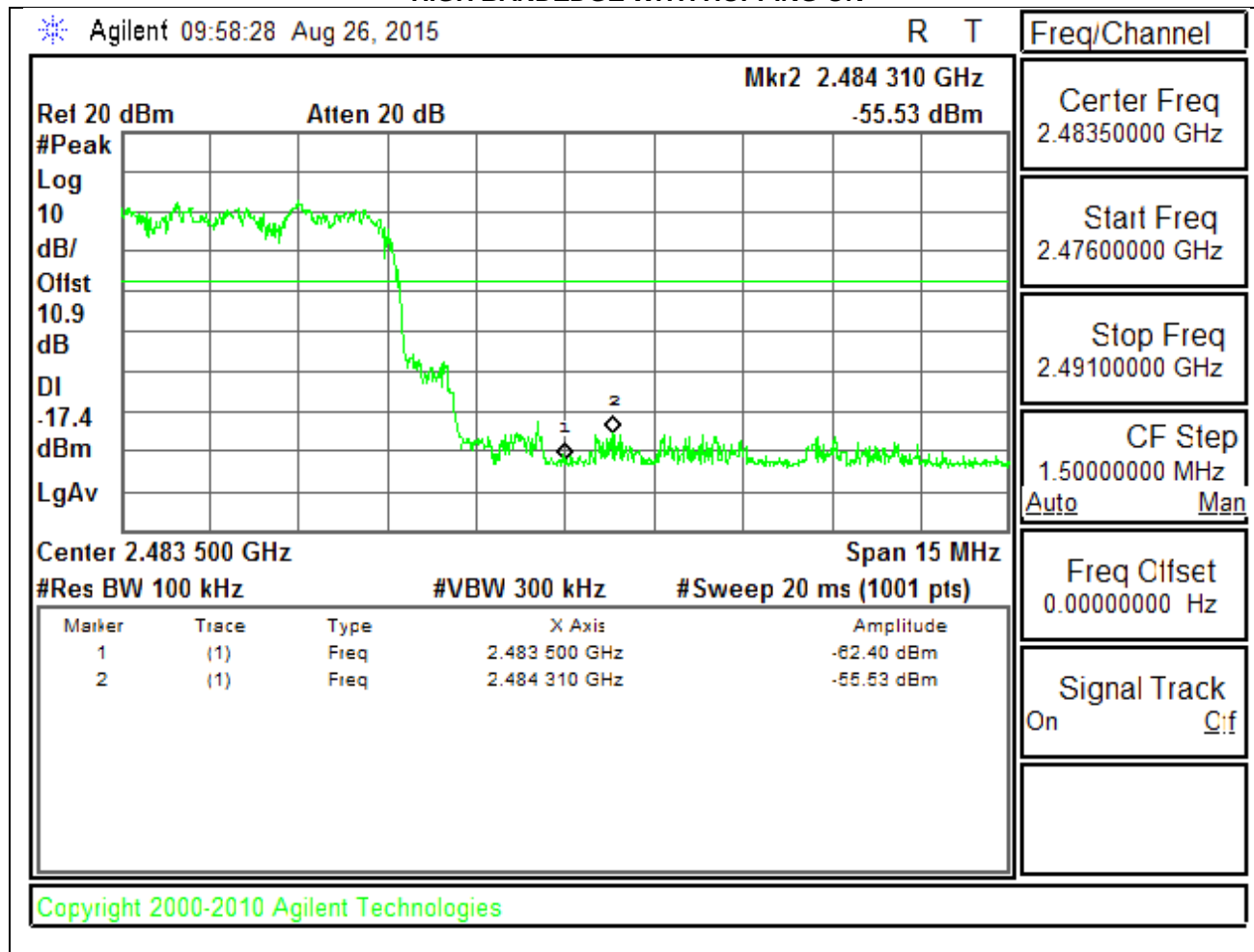
HIGH CHANNEL SPURIOUS



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



HIGH BANDEGE WITH HOPPING ON



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 150 cm for above 1GHz measurements. 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 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.
 $GFSK = 1/T = 1 / 0.002901S = 345Hz$.

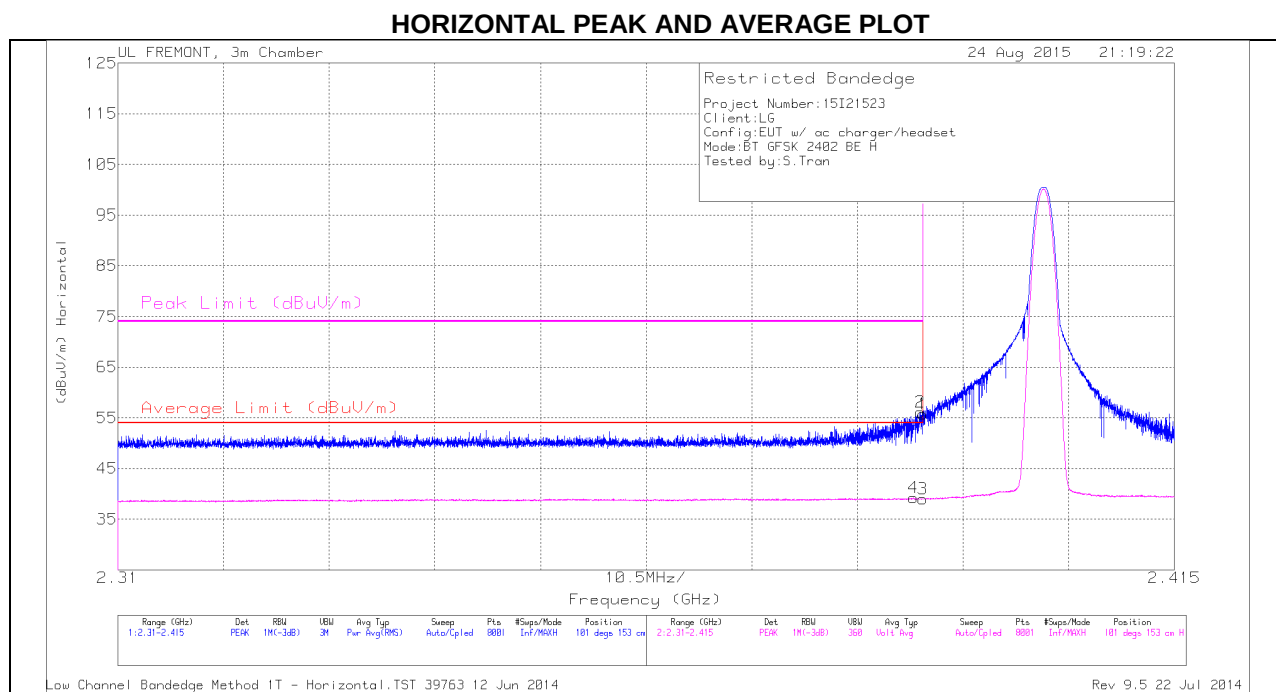
The spectrum from 1GHzHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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)



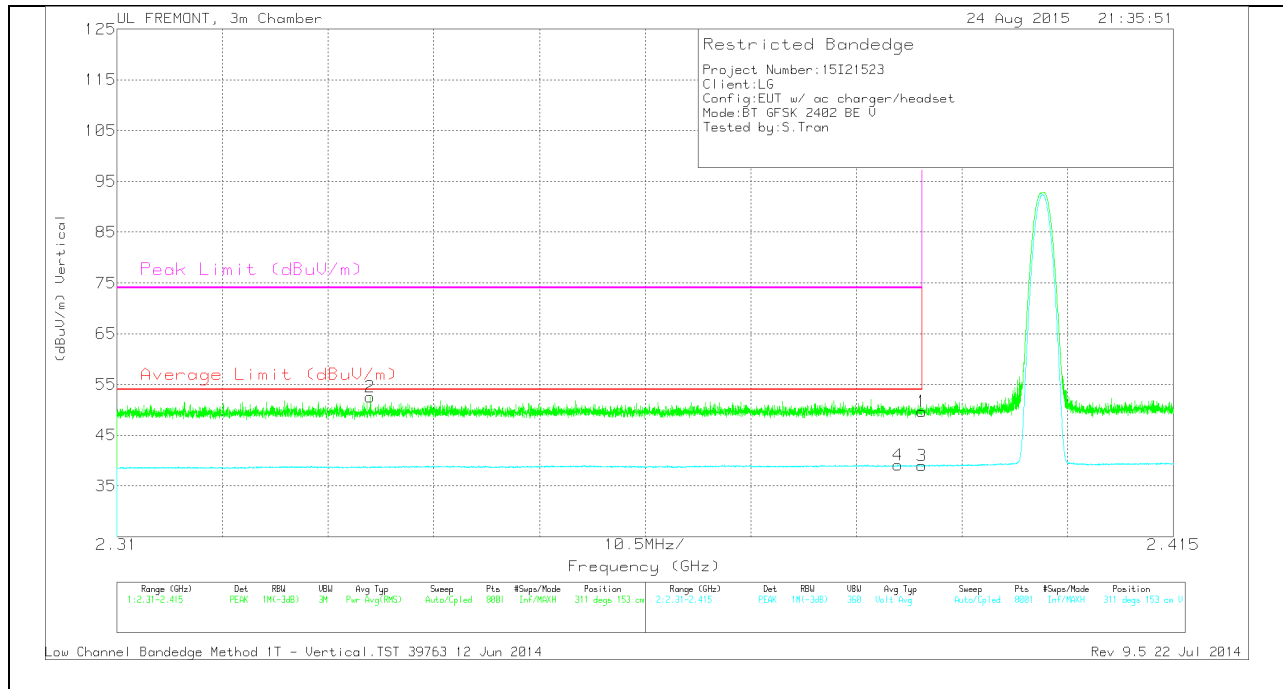
HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.389	29.66	VB1T	32	-22.4	39.26	54	-14.74	-	-	101	153	H
1	2.39	46.12	PK	32	-22.4	55.72	-	-	74	-18.28	101	153	H
2	2.39	46.55	PK	32	-22.4	56.15	-	-	74	-17.85	101	153	H
3	2.39	29.38	VB1T	32	-22.4	38.98	54	-15.02	-	-	101	153	H

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

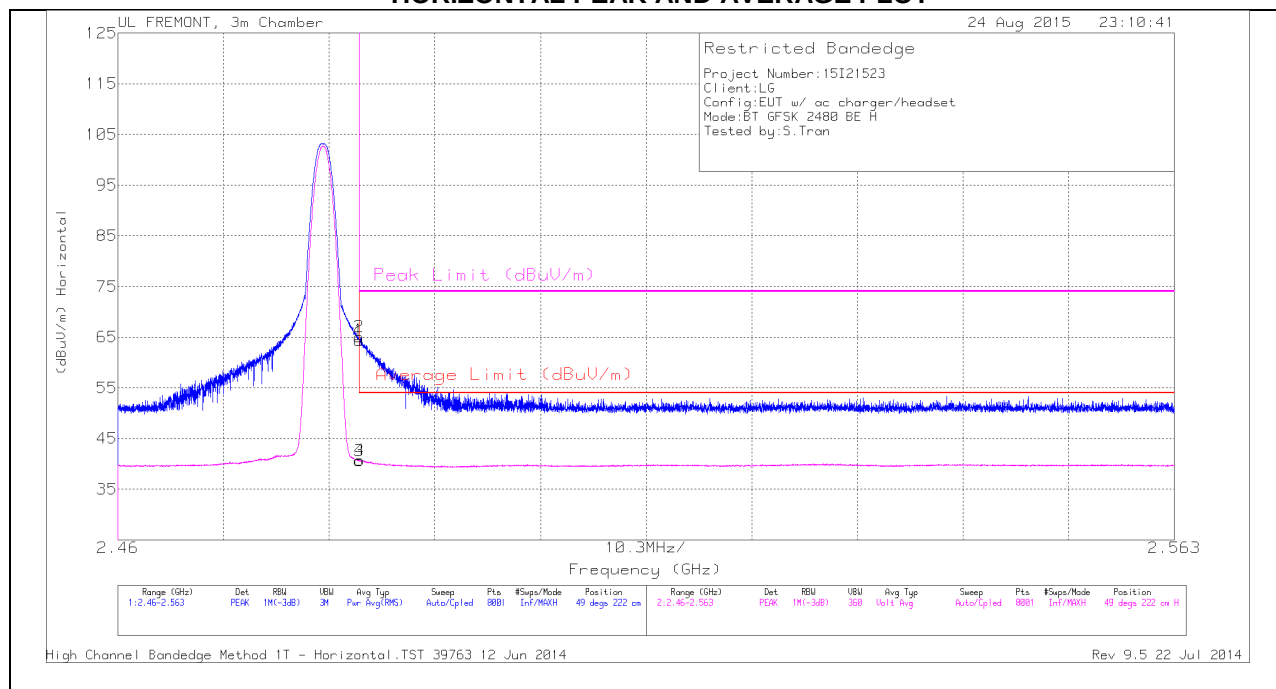
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.335	43.24	PK	31.8	-22.5	52.54	-	-	74	-21.46	311	153	V
4	2.388	29.52	VB1T	32	-22.4	39.12	54	-14.88	-	-	311	153	V
1	2.39	40.06	PK	32	-22.4	49.66	-	-	74	-24.34	311	153	V
3	2.39	29.39	VB1T	32	-22.4	38.99	54	-15.01	-	-	311	153	V

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



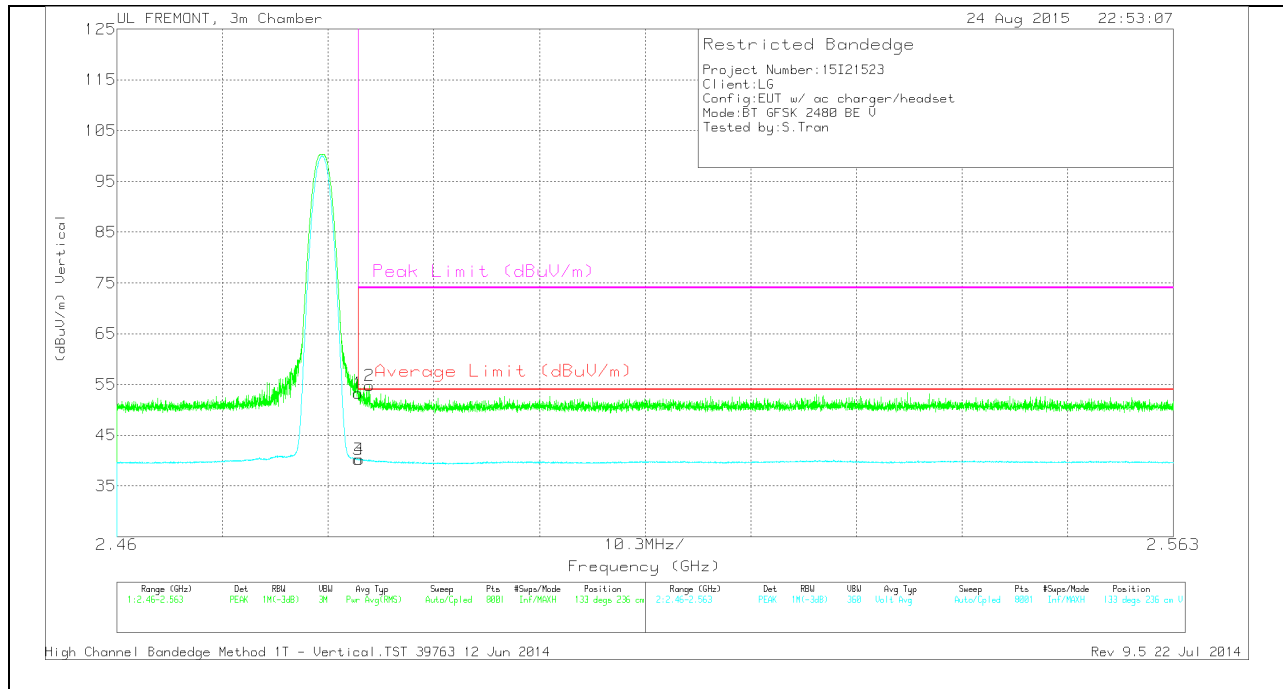
HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fitr/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	54.18	PK	32.3	-22.1	64.38	-	-	74	-9.62	49	222	H
2	2.484	54.87	PK	32.3	-22.1	65.07	-	-	74	-8.93	49	222	H
3	2.484	30.39	VB1T	32.3	-22.1	40.59	54	-13.41	-	-	49	222	H
4	2.484	30.48	VB1T	32.3	-22.1	40.68	54	-13.32	-	-	49	222	H

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

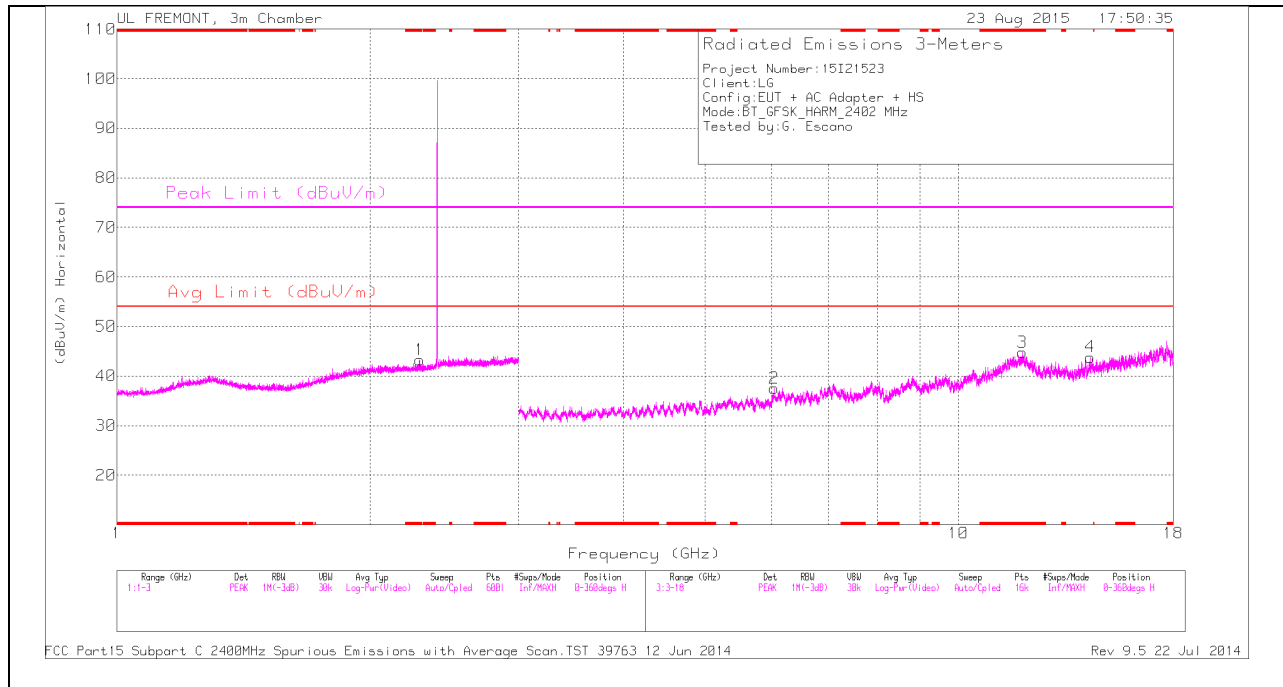
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	43.06	PK	32.3	-22.1	53.26	-	-	74	-20.74	133	236	V
3	2.484	30.02	VB1T	32.3	-22.1	40.22	54	-13.78	-	-	133	236	V
4	2.484	30.05	VB1T	32.3	-22.1	40.25	54	-13.75	-	-	133	236	V
2	2.485	44.59	PK	32.3	-22.1	54.79	-	-	74	-19.21	133	236	V

PK - Peak detector

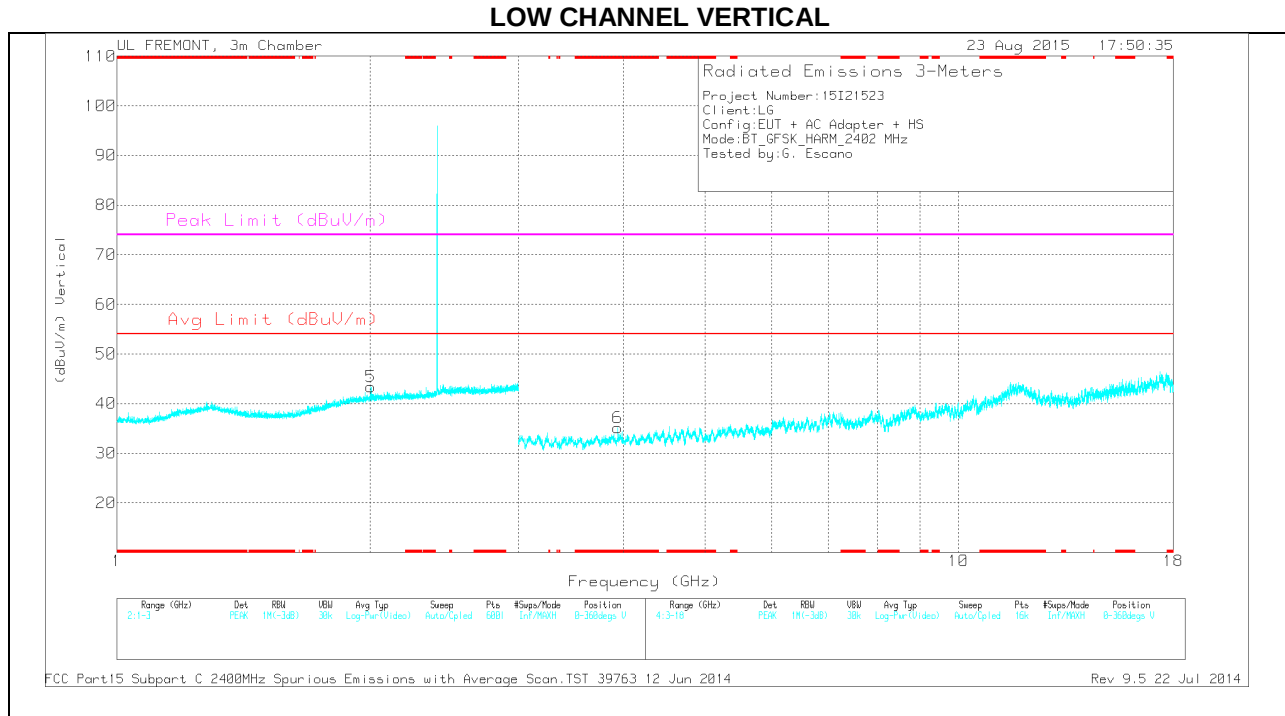
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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 T119 (dB/m)	Amp/Cbl/F ltr/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	* 2.288	33.94	PK	31.6	-22.3	43.24	-	-	74	-30.76	0-360	200	H
3	* 11.917	28.67	PK	39.1	-23	44.77	-	-	74	-29.23	0-360	200	H
6	* 3.938	32.09	PK	33.2	-30.2	35.09	-	-	74	-38.91	0-360	200	V
5	2.004	34.44	PK	31.5	-22.6	43.34	-	-	-	-	0-360	100	V
2	6.042	30.83	PK	35.2	-28.5	37.53	-	-	-	-	0-360	100	H
4	14.333	29.84	PK	39.4	-25.4	43.84	-	-	-	-	0-360	200	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector

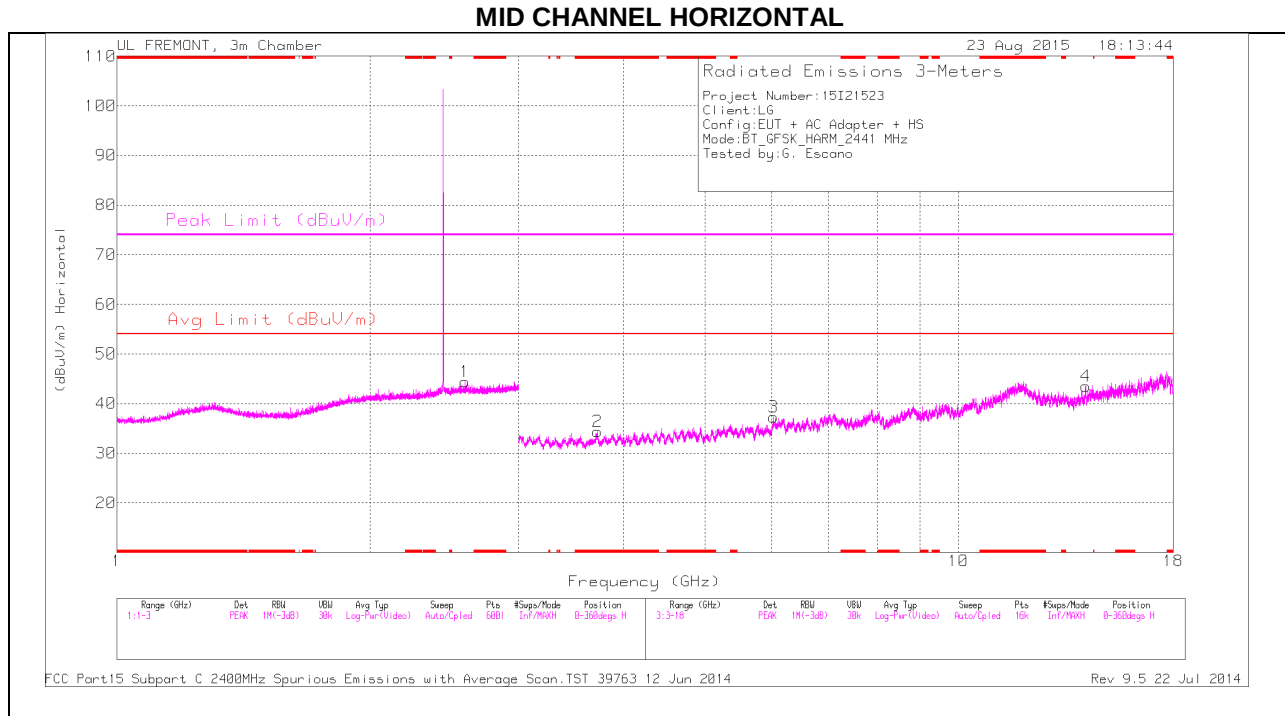
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.289	42.47	PK3	31.6	-22.4	51.67	-	-	74	-22.33	318	176	H
* 2.288	29.55	VB1T	31.6	-22.3	38.85	54	-15.15	-	-	318	176	H
* 11.917	37.17	PK3	39.1	-23	53.27	-	-	74	-20.73	144	207	H
* 11.917	24.43	VB1T	39.1	-23	40.53	54	-13.47	-	-	144	207	H
* 3.939	40.42	PK3	33.2	-30.2	43.42	-	-	74	-30.58	82	185	V
* 3.939	27.51	VB1T	33.2	-30.2	30.51	54	-23.49	-	-	82	185	V
2.004	42.52	PK3	31.5	-22.6	51.42	-	-	-	-	229	120	V
6.042	39.92	PK3	35.2	-28.5	46.62	-	-	-	-	183	154	H
14.332	39.03	PK3	39.4	-25.4	53.03	-	-	-	-	14	216	H

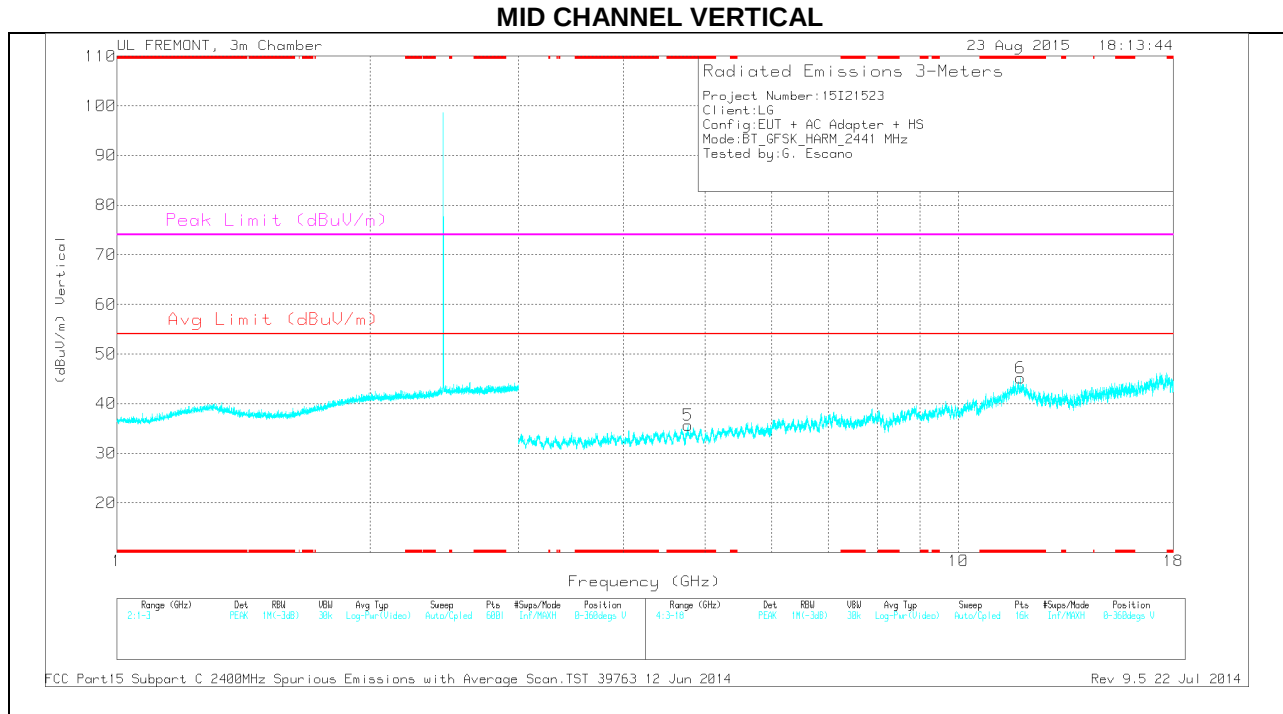
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK3 - FHSS Method: Maximum Peak

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



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 T119 (dB/m)	Amp/Cbl/F ltr/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	* 3.727	31.41	PK	33	-30	34.41	-	-	74	-39.59	0-360	200	H
5	* 4.77	31.68	PK	34	-30	35.68	-	-	74	-38.32	0-360	200	V
6	* 11.856	28.8	PK	39.1	-22.7	45.2	-	-	74	-28.8	0-360	200	V
1	2.594	34.06	PK	32.4	-22.1	44.36	-	-	-	-	0-360	100	H
3	6.024	31.14	PK	35.2	-29	37.34	-	-	-	-	0-360	100	H
4	14.16	30.2	PK	39.1	-25.8	43.5	-	-	-	-	0-360	200	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector

Radiated Emissions

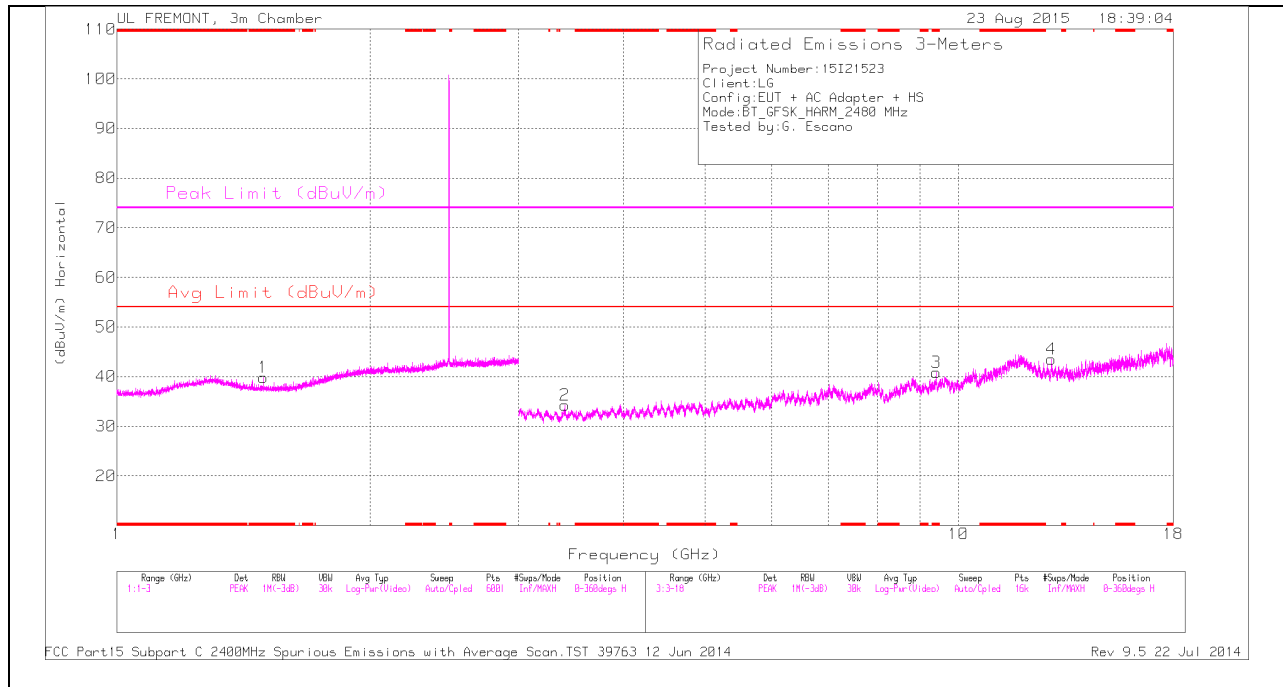
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.728	39.83	PK3	33	-30	42.83	-	-	74	-31.17	88	165	H
* 3.728	27.35	VB1T	33	-30	30.35	54	-23.65	-	-	88	165	H
* 11.856	37.1	PK3	39.1	-22.7	53.5	-	-	74	-20.5	13	186	V
* 11.855	24.44	VB1T	39.1	-22.7	40.84	54	-13.16	-	-	13	186	V
* 4.77	40.28	PK3	34	-30	44.28	-	-	74	-29.72	31	147	V
* 4.771	27.9	VB1T	34	-30	31.9	54	-22.1	-	-	31	147	V
2.594	42.55	PK3	32.4	-22.1	52.85	-	-	-	-	12	147	H
6.024	39.63	PK3	35.2	-29.1	45.73	-	-	-	-	119	193	H
14.161	39.37	PK3	39.1	-25.8	52.67	-	-	-	-	77	184	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

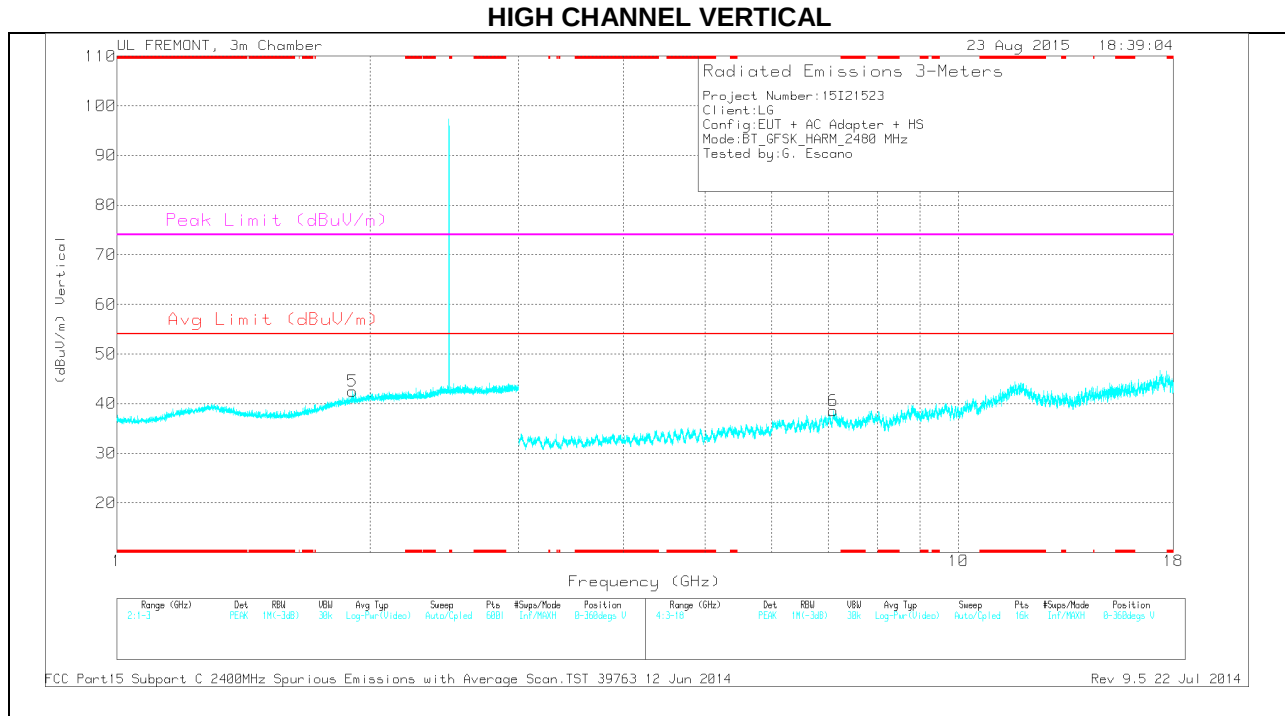
PK3 - FHSS Method: Maximum Peak

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.



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/F ltr/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	* 1.493	34.65	PK	28.1	-22.9	39.85	-	-	74	-34.15	0-360	200	H
3	* 9.405	28.42	PK	36.4	-24	40.82	-	-	74	-33.18	0-360	100	H
5	1.904	34.03	PK	31.1	-22.6	42.53	-	-	-	-	0-360	100	V
2	3.404	32.51	PK	32.7	-31	34.21	-	-	-	-	0-360	100	H
6	7.104	29.91	PK	35.6	-26.9	38.61	-	-	-	-	0-360	200	V
4	12.897	30.28	PK	39.1	-25.9	43.48	-	-	-	-	0-360	200	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AFT119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.494	42.46	PK3	28.1	-22.9	47.66	-	-	74	-26.34	3	185	H
* 1.492	29.69	VB1T	28.1	-22.9	34.89	54	-19.11	-	-	3	185	H
* 9.405	37.09	PK3	36.4	-24	49.49	-	-	74	-24.51	229	128	H
* 9.406	24	VB1T	36.4	-24	36.4	54	-17.6	-	-	229	128	H
1.903	42.45	PK3	31.1	-22.6	50.95	-	-	-	-	35	115	V
3.404	41.02	PK3	32.7	-31	42.72	-	-	-	-	108	138	H
7.105	38.94	PK3	35.6	-27	47.54	-	-	-	-	229	135	V
12.898	38.5	PK3	39.1	-25.9	51.7	-	-	-	-	75	256	H

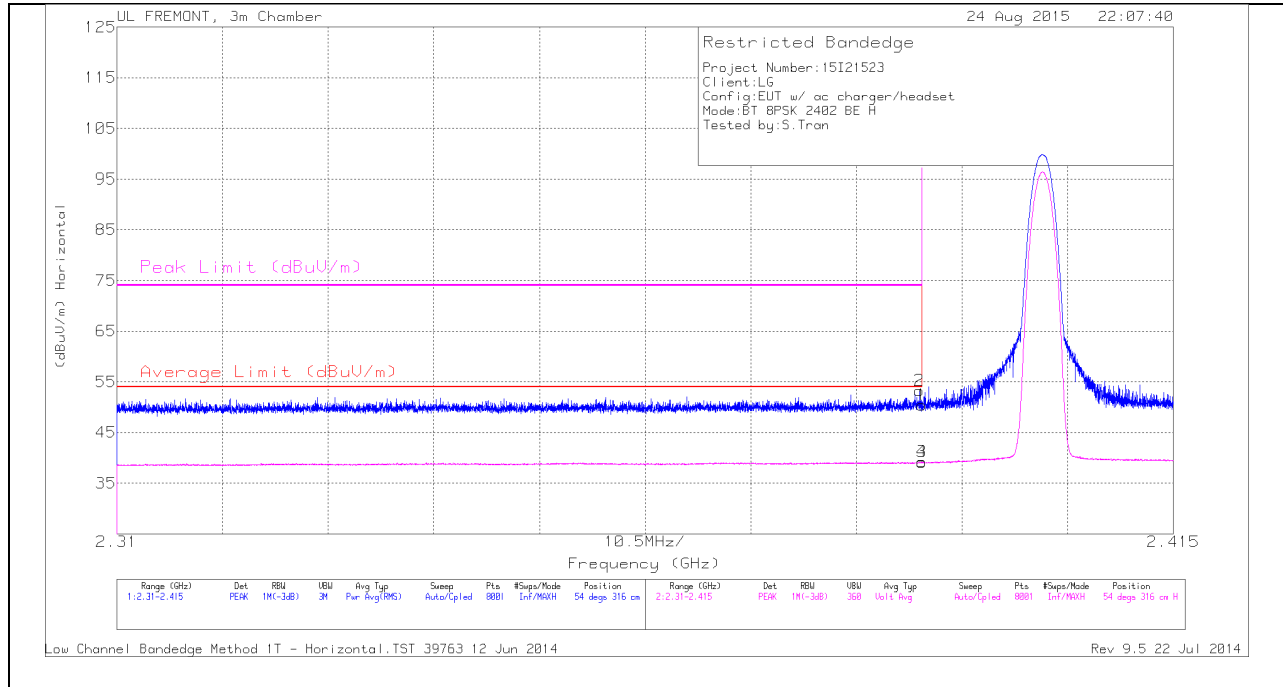
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

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



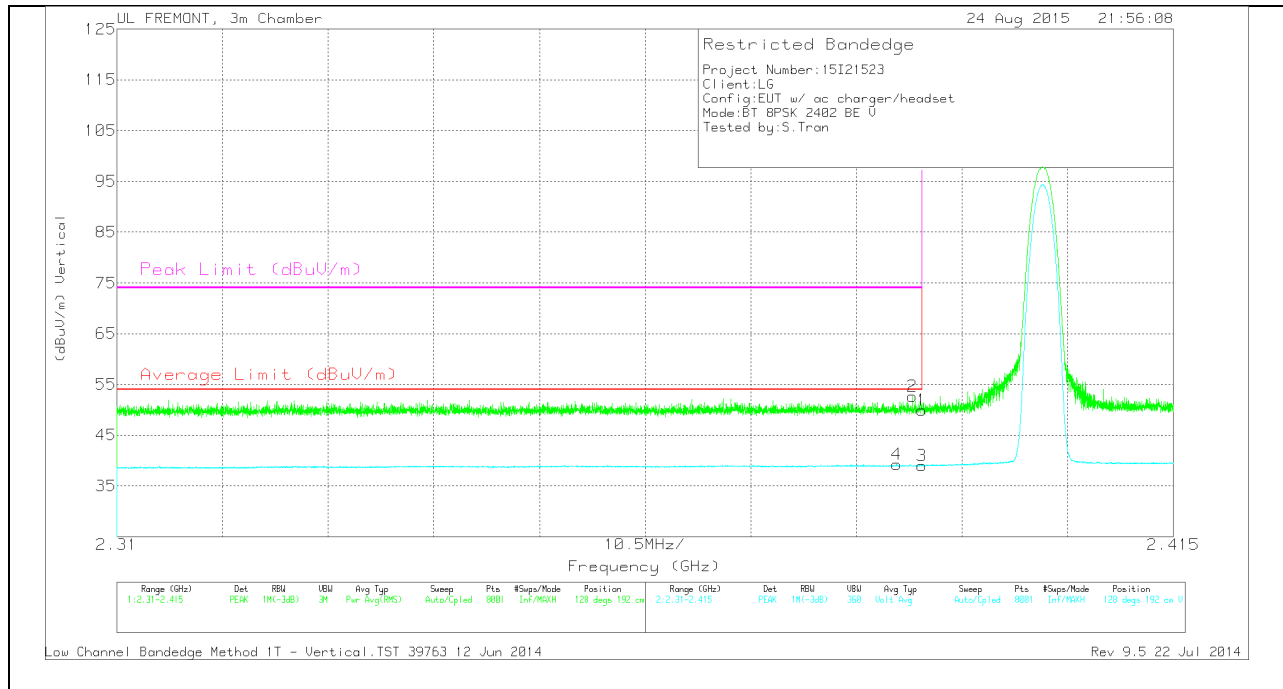
HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Filt/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	40.86	PK	32	-22.4	50.46	-	-	74	-23.54	54	316	H
2	2.39	43.69	PK	32	-22.4	53.29	-	-	74	-20.71	54	316	H
3	2.39	29.58	VB1T	32	-22.4	39.18	54	-14.82	-	-	54	316	H
4	2.39	29.6	VB1T	32	-22.4	39.2	54	-14.8	-	-	54	316	H

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

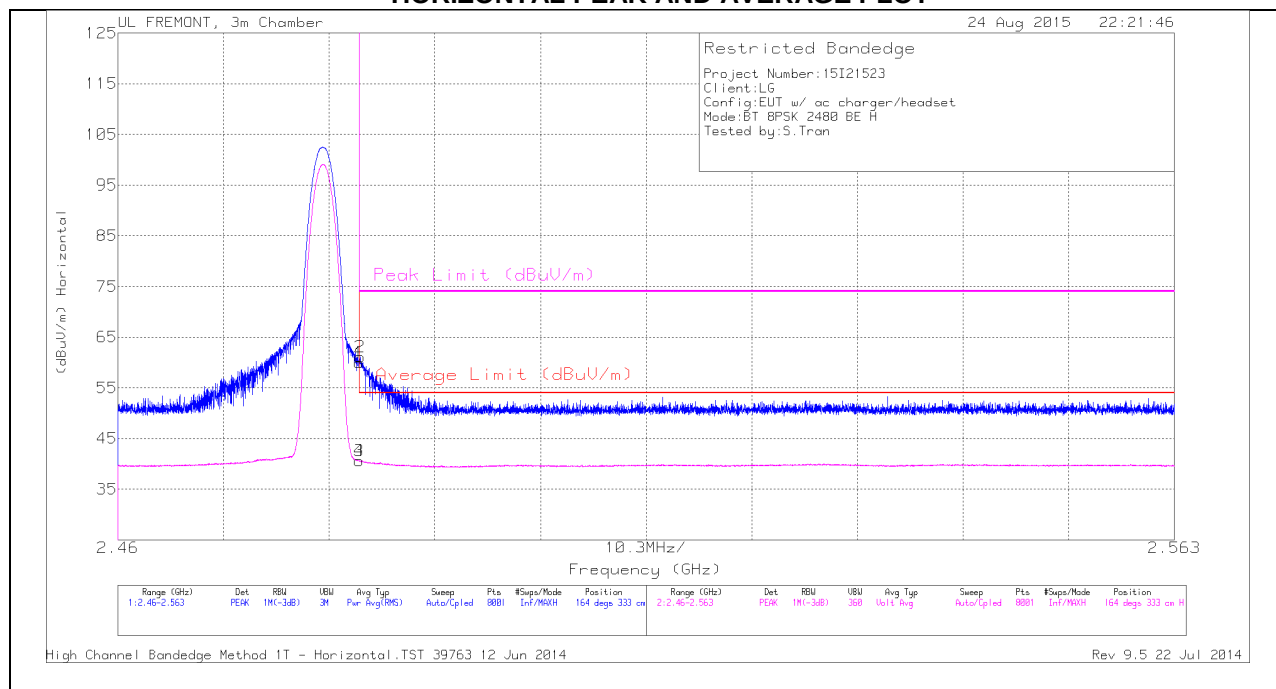
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	2.387	29.61	VB1T	32	-22.4	39.21	54	-14.79	-	-	128	192	V
2	2.389	43.04	PK	32	-22.4	52.64	-	-	74	-21.36	128	192	V
1	2.39	40.28	PK	32	-22.4	49.88	-	-	74	-24.12	128	192	V
3	2.39	29.42	VB1T	32	-22.4	39.02	54	-14.98	-	-	128	192	V

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



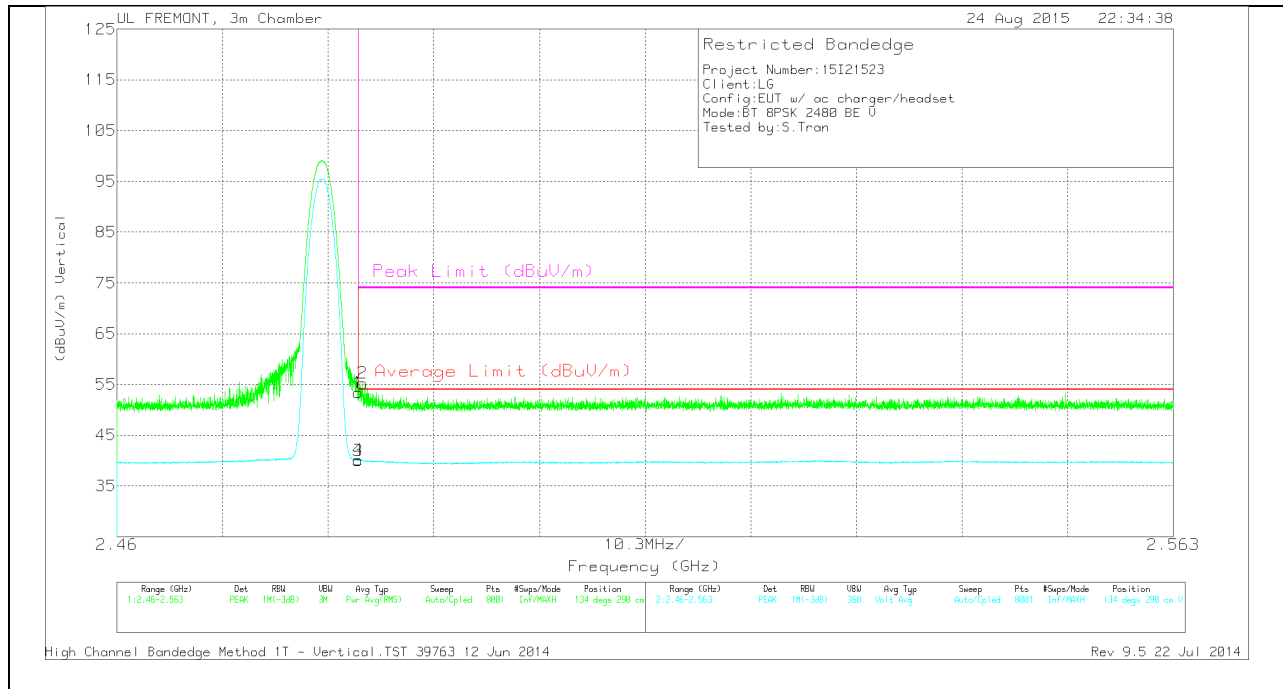
HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/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	49.8	PK	32.3	-22.1	60	-	-	74	-14	164	333	H
2	2.484	50.84	PK	32.3	-22.1	61.04	-	-	74	-12.96	164	333	H
3	2.484	30.4	VB1T	32.3	-22.1	40.6	54	-13.4	-	-	164	333	H
4	2.484	30.4	VB1T	32.3	-22.1	40.6	54	-13.4	-	-	164	333	H

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

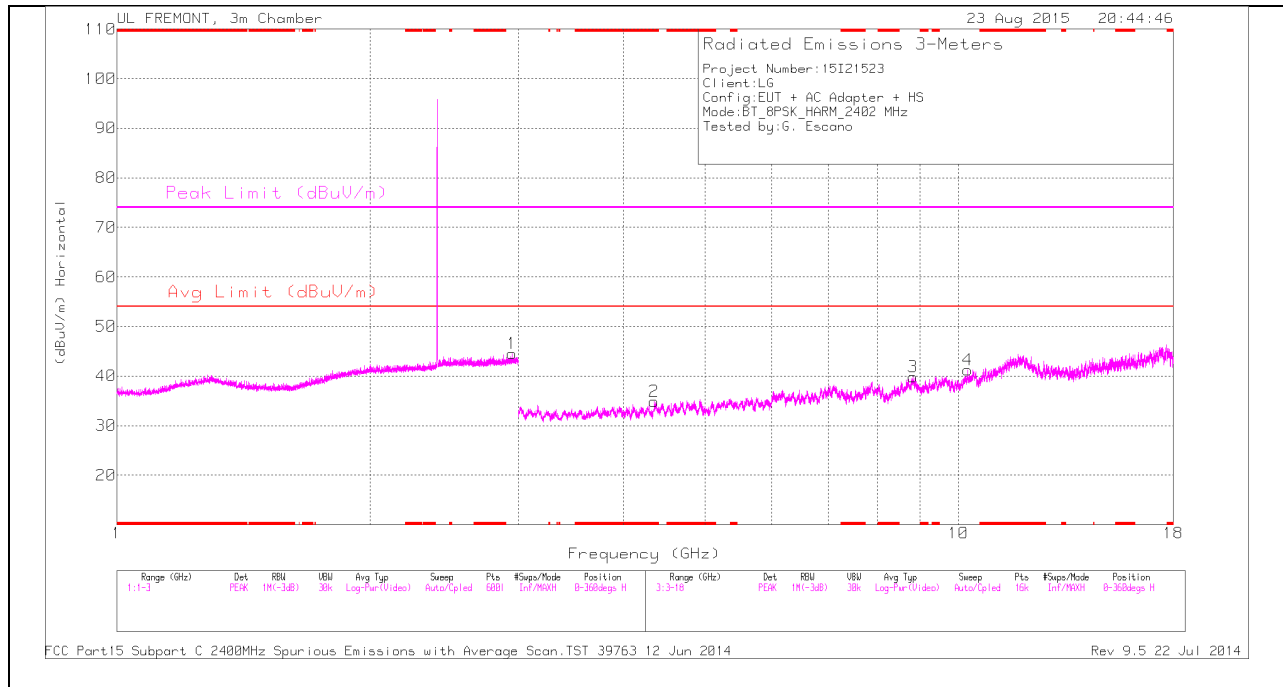
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.484	43.25	PK	32.3	-22.1	53.45	-	-	74	-20.55	134	290	V
2	2.484	45	PK	32.3	-22.1	55.2	-	-	74	-18.8	134	290	V
3	2.484	29.84	VB1T	32.3	-22.1	40.04	54	-13.96	-	-	134	290	V
4	2.484	29.91	VB1T	32.3	-22.1	40.11	54	-13.89	-	-	134	290	V

PK - Peak detector

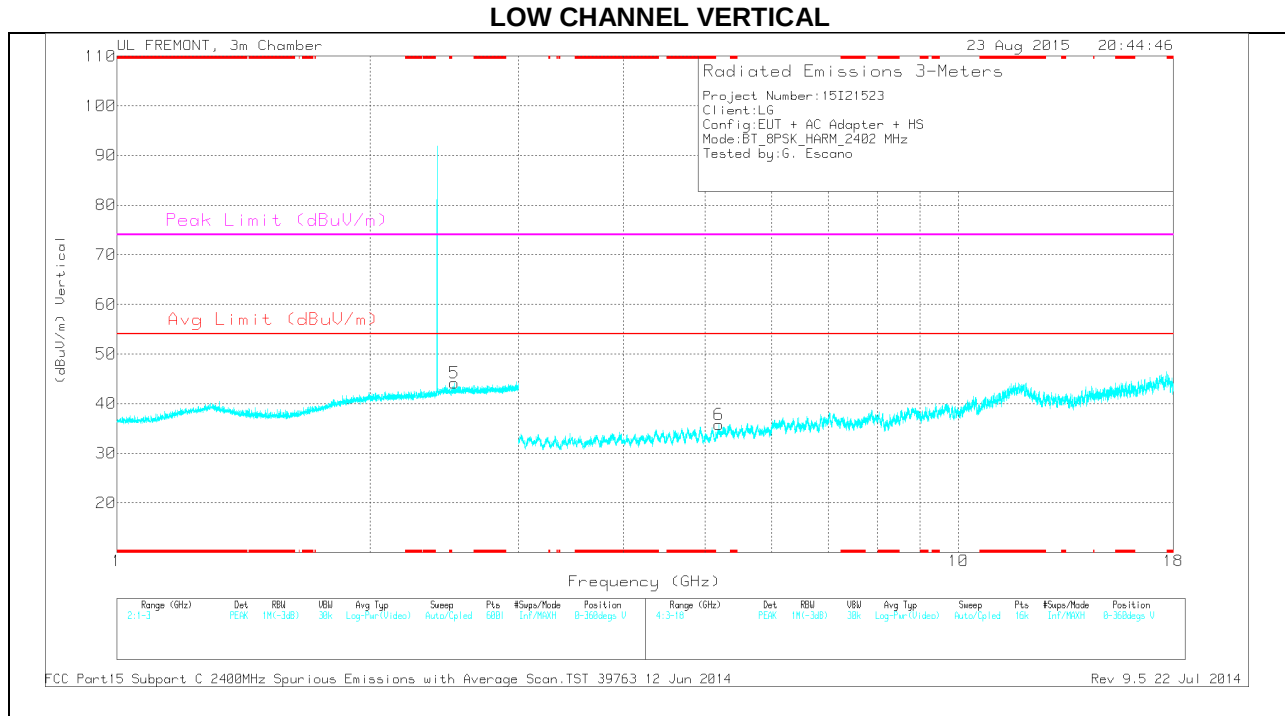
VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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.



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LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/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	* 4.349	30.92	PK	33.6	-29.6	34.92	-	-	74	-39.08	0-360	100	H
5	2.519	33.93	PK	32.3	-22.1	44.13	-	-	-	-	0-360	100	V
1	2.947	33.76	PK	32.7	-21.9	44.56	-	-	-	-	0-360	100	H
6	5.188	31.67	PK	34.3	-30.2	35.77	-	-	-	-	0-360	100	V
3	8.825	29.29	PK	35.9	-25.3	39.89	-	-	-	-	0-360	100	H
4	10.251	27.9	PK	37	-23.7	41.2	-	-	-	-	0-360	100	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector

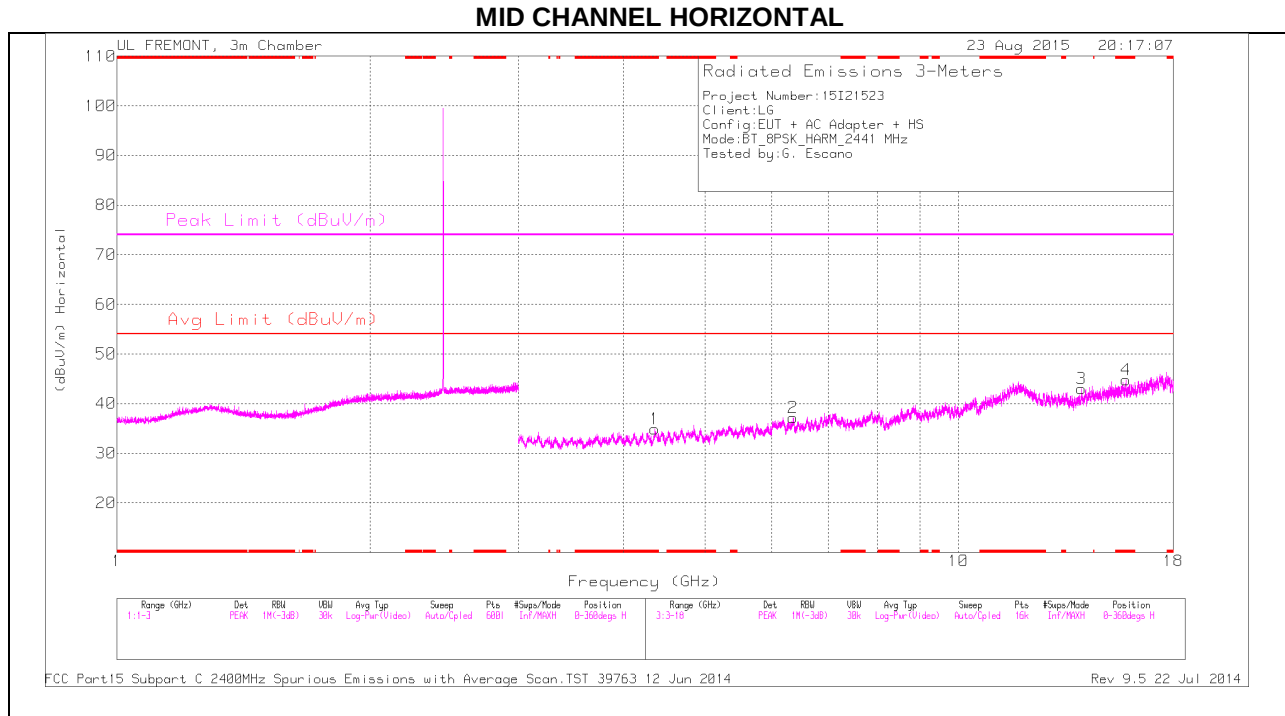
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.351	39.59	PK3	33.6	-29.5	43.69	-	-	74	-30.31	86	151	H
* 4.349	26.99	VB1T	33.6	-29.6	30.99	54	-23.01	-	-	86	151	H
2.518	42.74	PK3	32.3	-22.1	52.94	-	-	-	-	86	134	V
2.949	42	PK3	32.7	-21.9	52.8	-	-	-	-	20	115	H
5.187	40.58	PK3	34.3	-30.2	44.68	-	-	-	-	278	109	V
8.827	37.49	PK3	35.9	-25.2	48.19	-	-	-	-	115	100	H
10.252	36.27	PK3	37	-23.7	49.57	-	-	-	-	23	139	H

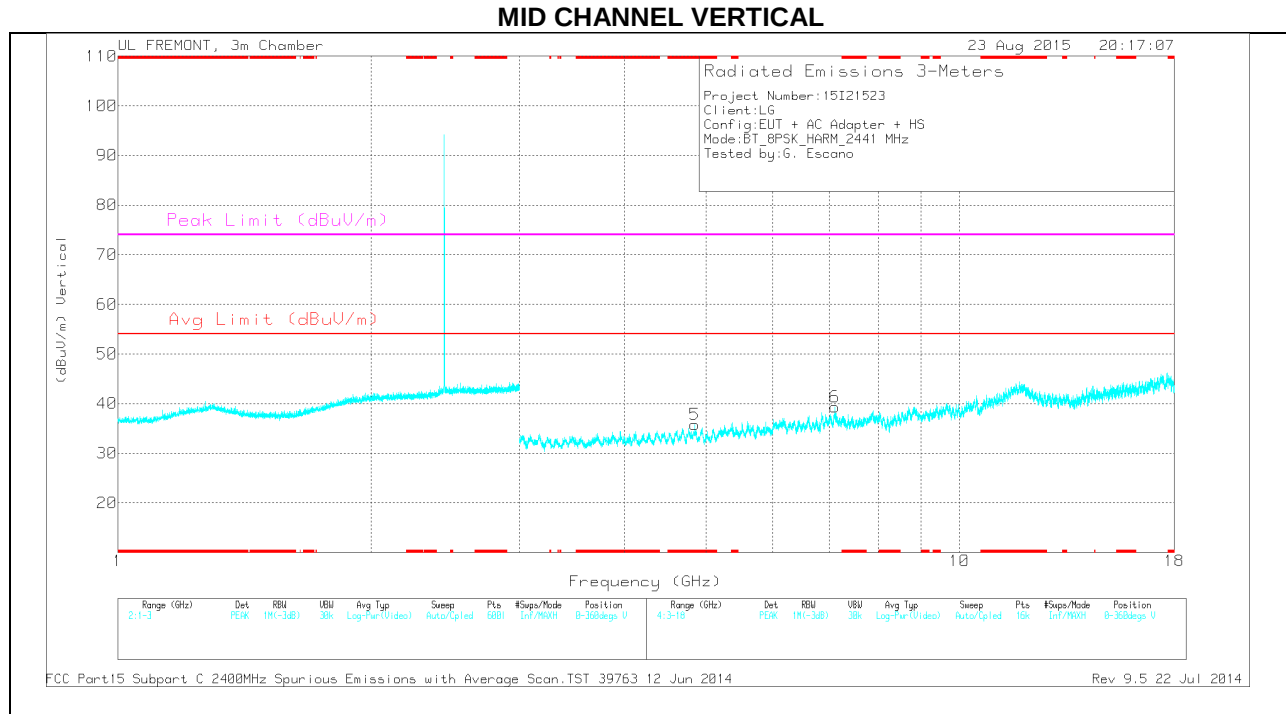
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK3 - FHSS Method: Maximum Peak

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



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 T119 (dB/m)	Amp/Cbl/F ltr/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	* 4.358	30.78	PK	33.6	-29.5	34.88	-	-	74	-39.12	0-360	100	H
4	* 15.81	29.52	PK	40.3	-25	44.82	-	-	74	-29.18	0-360	100	H
5	* 4.845	30.98	PK	34	-29.2	35.78	-	-	74	-38.22	0-360	100	V
2	6.364	29.69	PK	35.5	-28	37.19	-	-	-	-	0-360	100	H
6	7.11	30.89	PK	35.6	-27.2	39.29	-	-	-	-	0-360	100	V
3	14.003	31.05	PK	38.8	-26.8	43.05	-	-	-	-	0-360	200	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector

Radiated Emissions

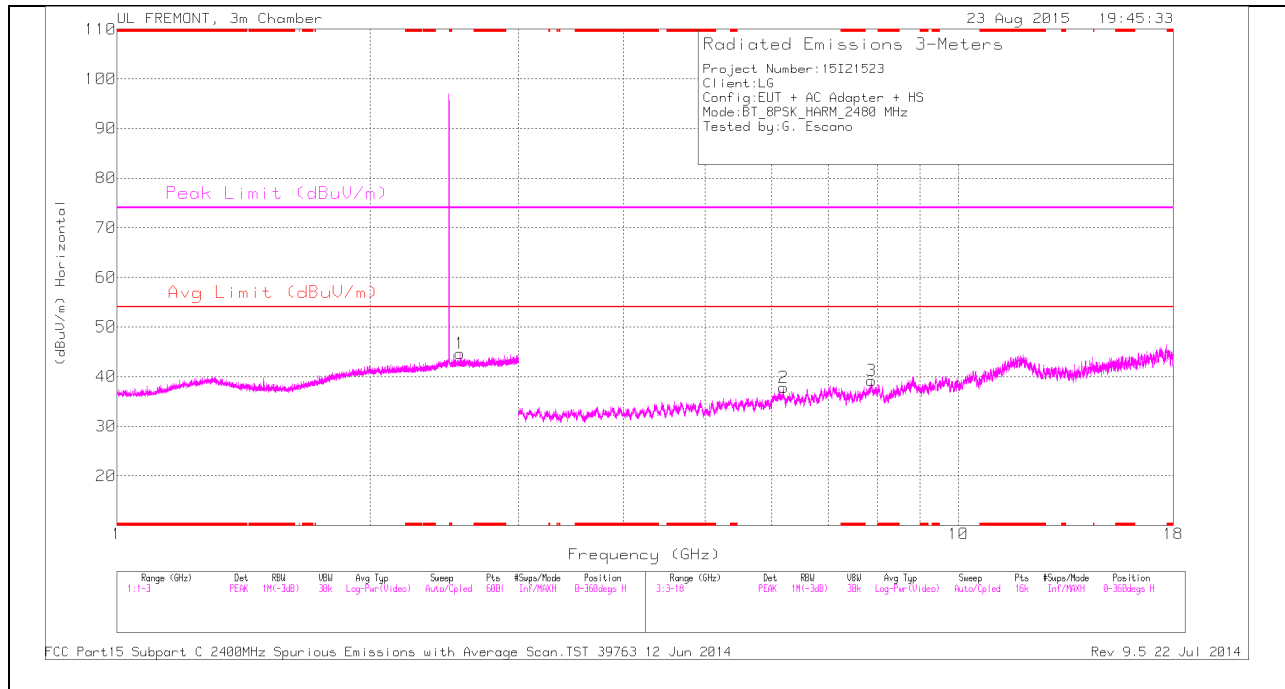
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.358	40.15	PK3	33.6	-29.5	44.25	-	-	74	-29.75	62	127	H
* 4.359	27.29	VB1T	33.6	-29.5	31.39	54	-22.61	-	-	62	127	H
* 15.811	38.55	PK3	40.3	-25	53.85	-	-	74	-20.15	217	156	H
* 15.81	25.93	VB1T	40.3	-25	41.23	54	-12.77	-	-	217	156	H
* 4.849	40.24	PK3	34	-29.2	45.04	-	-	74	-28.96	3	122	V
* 4.848	27.31	VB1T	34	-29.2	32.11	54	-21.89	-	-	3	122	V
6.365	38.57	PK3	35.5	-28.1	45.97	-	-	-	-	24	172	H
7.111	38.67	PK3	35.6	-27.3	46.97	-	-	-	-	46	121	V
14.003	40.99	PK3	38.8	-26.8	52.99	-	-	-	-	183	211	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

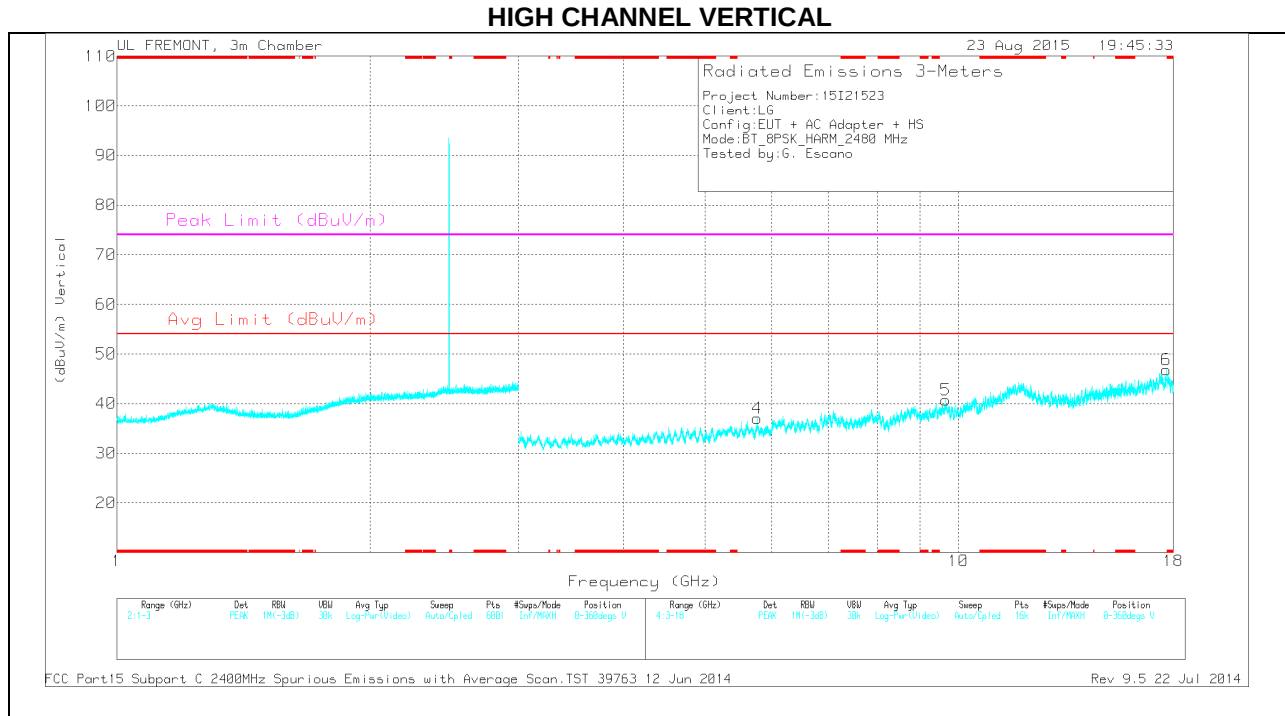
PK3 - FHSS Method: Maximum Peak

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.



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/F ltr/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	2.558	34.26	PK	32.4	-22	44.66	-	-	-	-	0-360	200	H
4	5.766	31.78	PK	34.8	-29.5	37.08	-	-	-	-	0-360	100	V
2	6.196	31.99	PK	35.3	-29.5	37.79	-	-	-	-	0-360	100	H
3	7.885	29.43	PK	35.8	-26	39.23	-	-	-	-	0-360	100	H
5	9.656	27.92	PK	36.8	-24	40.72	-	-	-	-	0-360	200	V
6	17.662	26.07	PK	41.4	-20.7	46.77	-	-	-	-	0-360	100	V

PK - Peak detector

Radiated Emissions

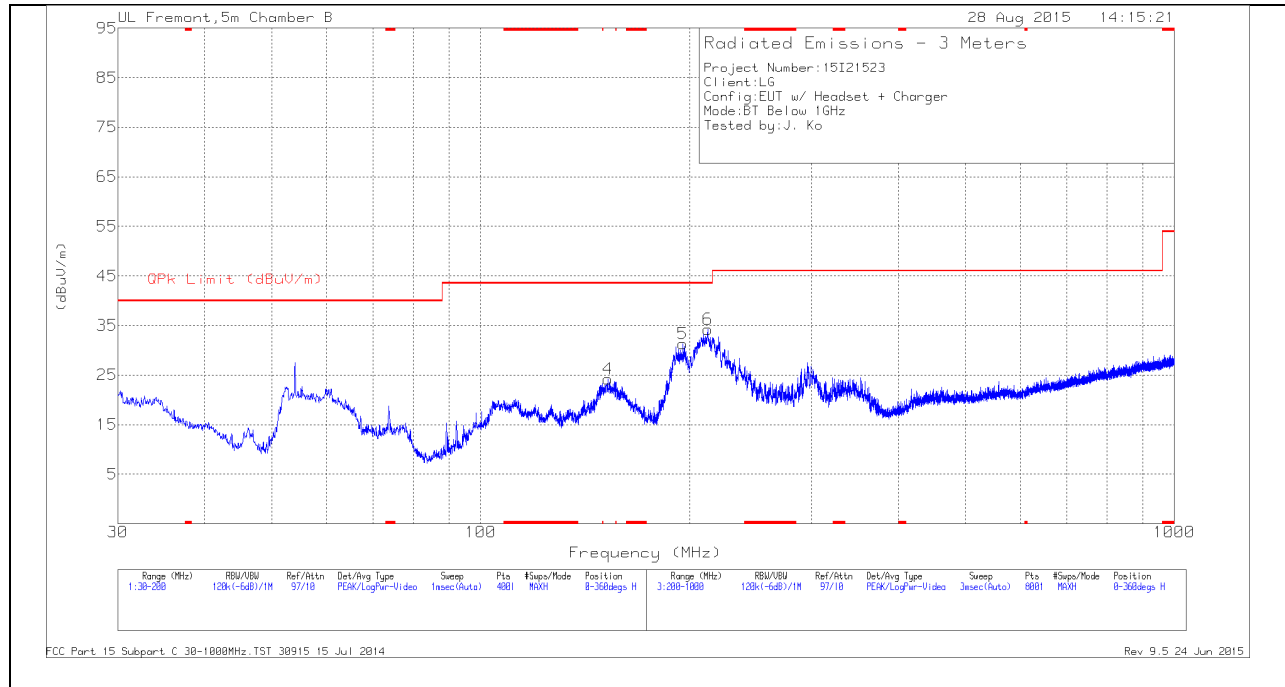
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.558	42.97	PK3	32.4	-22	53.37	-	-	-	-	327	135	H
5.765	40.62	PK3	34.8	-29.5	45.92	-	-	-	-	248	182	V
6.196	40.29	PK3	35.3	-29.5	46.09	-	-	-	-	250	117	H
7.886	37.47	PK3	35.8	-26	47.27	-	-	-	-	214	120	H
9.656	36.16	PK3	36.8	-24	48.96	-	-	-	-	324	120	V
17.663	35.09	PK3	41.4	-20.7	55.79	-	-	-	-	112	143	V

PK3 - FHSS Method: Maximum Peak

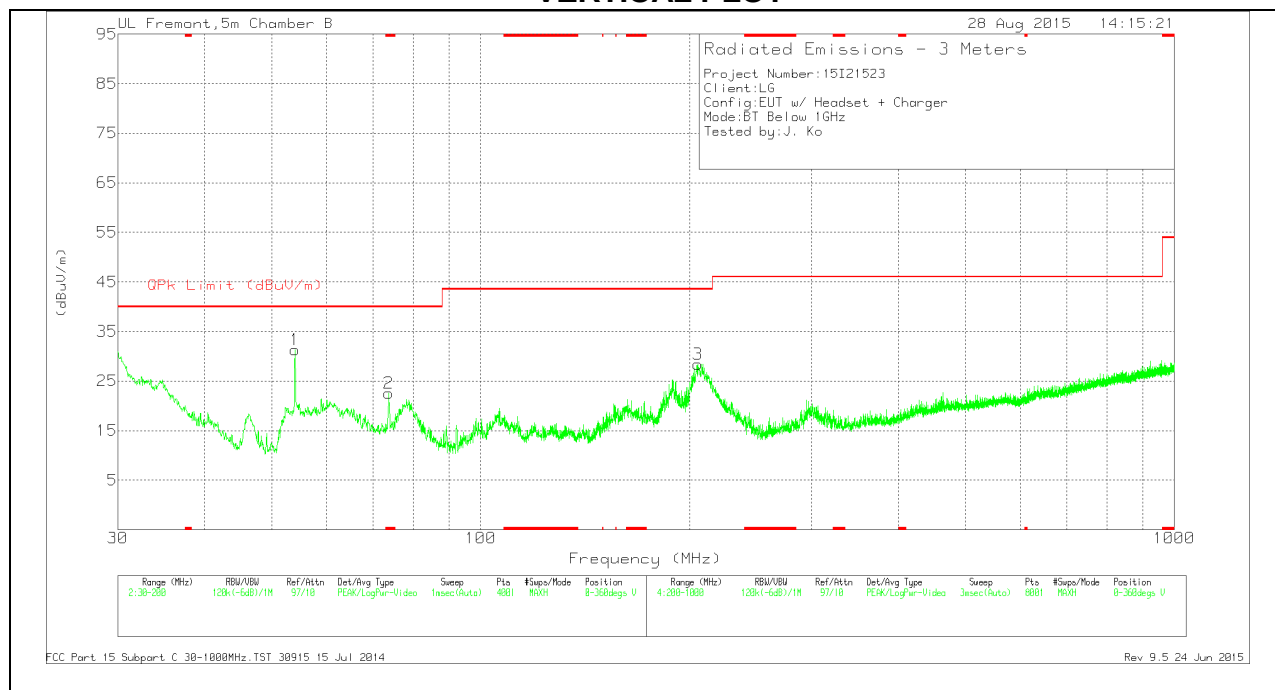
9.3. WORST-CASE BELOW 1 GHz

GFASK 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)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 73.7325	42.82	Pk	8	-28.3	22.52	40	-17.48	0-360	101	V
1	54.0125	52.39	Pk	7.4	-28.5	31.29	40	-8.71	0-360	101	V
4	152.5275	39.27	Pk	12.4	-27.5	24.17	43.52	-19.35	0-360	199	H
5	195.5375	46.21	Pk	12.2	-27.1	31.31	43.52	-12.21	0-360	100	H
3	205.7	44.65	Pk	10.8	-27	28.45	43.52	-15.07	0-360	101	V
6	212.6	50.73	Pk	10.5	-27	34.23	43.52	-9.29	0-360	101	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - 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

ANSI C63.10

RESULTS

Refer to original report 15I21235-E2.