



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 7**

CERTIFICATION TEST REPORT

FOR

**UNIFIED COMMUNICATION (UC) DEVICE WITH PSTN, USB
AND 2 BLUETOOTH RADIOS**

MODEL NUMBER: P820, P820-M, P830, P830-M

**FCC ID: AL8-P820, AL8-P830
IC: 457A-P820, 457A-P830**

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* Models differences are contained in the body of this report



NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	07/26/10	Initial Issue	F. Ibrahim
A	08/10/10	Revised RBW and VBW in the Hopping Frequency Separation sections, revised the setup diagram, I/O list and peripherals list, and revised the average time of occupancy for 8PSK modulation.	F. Ibrahim

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	6
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	6
4.2. <i>SAMPLE CALCULATION</i>	6
4.3. <i>MEASUREMENT UNCERTAINTY</i>	6
5. EQUIPMENT UNDER TEST	7
5.1. <i>DESCRIPTION OF EUT</i>	7
5.2. <i>MODEL(S) DIFFERENCES</i>	7
5.3. <i>MAXIMUM OUTPUT POWER</i>	7
5.4. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	8
5.5. <i>SOFTWARE AND FIRMWARE</i>	8
5.6. <i>WORST-CASE CONFIGURATION AND MODE</i>	8
5.7. <i>DESCRIPTION OF TEST SETUP</i>	9
6. TEST AND MEASUREMENT EQUIPMENT	11
7. ANTENNA PORT TEST RESULTS (MICROPHONE MODULE)	12
7.1. <i>BASIC DATA RATE GFSK MODULATION</i>	12
7.1.1. 20 dB AND 99% BANDWIDTH.....	12
7.1.2. HOPPING FREQUENCY SEPARATION	19
7.1.3. NUMBER OF HOPPING CHANNELS.....	21
7.1.4. AVERAGE TIME OF OCCUPANCY.....	26
7.1.5. OUTPUT POWER	29
7.1.6. AVERAGE POWER	33
7.1.7. CONDUCTED SPURIOUS EMISSIONS.....	34
7.2. <i>ENHANCED DATA RATE 8PSK MODULATION</i>	43
7.2.1. 20 dB AND 99% BANDWIDTH.....	43
7.2.2. HOPPING FREQUENCY SEPARATION	50
7.2.3. NUMBER OF HOPPING CHANNELS.....	52
7.2.4. AVERAGE TIME OF OCCUPANCY.....	57
7.2.5. OUTPUT POWER	60
7.2.6. AVERAGE POWER	64
7.2.7. CONDUCTED SPURIOUS EMISSIONS.....	65
8. ANTENNA PORT TEST RESULTS (MOBILE PHONE MODULE)	74
8.1. <i>BASIC DATA RATE GFSK MODULATION</i>	74
8.1.1. 20 dB AND 99% BANDWIDTH.....	74
8.1.2. HOPPING FREQUENCY SEPARATION	81

8.1.3.	NUMBER OF HOPPING CHANNELS.....	83
8.1.4.	AVERAGE TIME OF OCCUPANCY.....	88
8.1.5.	OUTPUT POWER	91
8.1.6.	AVERAGE POWER	95
8.1.7.	CONDUCTED SPURIOUS EMISSIONS.....	96
8.2.	<i>ENHANCED DATA RATE 8PSK MODULATION</i>	105
8.2.1.	20 dB AND 99% BANDWIDTH.....	105
8.2.2.	HOPPING FREQUENCY SEPARATION	112
8.2.3.	NUMBER OF HOPPING CHANNELS.....	114
8.2.4.	AVERAGE TIME OF OCCUPANCY.....	119
8.2.5.	OUTPUT POWER	122
8.2.6.	AVERAGE POWER	126
8.2.7.	CONDUCTED SPURIOUS EMISSIONS.....	127
9.	TX ABOVE 1 GHz (MICROPHONE MODULE)	136
9.1.	<i>BASIC DATA RATE GFSK MODULATION</i>	136
9.2.	<i>ENHANCED DATA RATE 8PSK MODULATION</i>	145
10.	TX ABOVE 1 GHz (MOBILE PHONE MODULE).....	154
10.1.	<i>BASIC DATA RATE GFSK MODULATION</i>	154
10.2.	<i>ENHANCED DATA RATE 8PSK MODULATION</i>	163
11.	RECEIVER ABOVE 1 GHz (MICROPHONE MODULE)	172
12.	RECEIVER ABOVE 1 GHz (MOBILE PHONE MODULE)	173
13.	RADIATED EMISSIONS 30-1000 MHz (MICROPHONE MODULE)	174
14.	RADIATED EMISSIONS 30-1000 MHz (MOBILE PHONE MODULE)	177
15.	AC POWER LINE CONDUCTED EMISSIONS (MICROPHONE MODULE).....	180
16.	AC POWER LINE CONDUCTED EMISSIONS (MOBILE PHONE MODULE).....	184
17.	MAXIMUM PERMISSIBLE EXPOSURE	187
18.	SETUP PHOTOS	191

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: PLANTRONICS, INC.
345 ENCINAL STREET
SANTA CRUZ, CA 95060, U.S.A

EUT DESCRIPTION: UNIFIED COMMUNICATION (UC) DEVICE WITH PSTN, USB
AND 2 BLUETOOTH RADIOS

MODEL: P820, P820-M, P830, P830-M

SERIAL NUMBER: 21,22B, 31, 32B

DATE TESTED: JULY 07- 17, 2010

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 7 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 2	Pass

Compliance Certification Services, Inc. (CCS) 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 CCS 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS 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.

Approved & Released For CCS By:

Tested By:



FRANK IBRAHIM
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

THANH NGUYEN
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

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:

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

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 1000 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 Unified Communication (UC) telephony product connecting up to three networks : PC to VOIP, Cell Phone, PSTN into to one common interface.

The radio module is manufactured by CSR

5.2. MODEL(S) DIFFERENCES

P820 is exactly P830 with PSTN circuits de-populated.

The -M versions of the P820 and P830 are electrically identical to the non -M versions. The difference is that the -M versions have firmware that optimizes them for use with the Microsoft OS which makes them enumerate as a specific device.

P830 was selected as a representative model for performing the testing.

5.3. MAXIMUM OUTPUT POWER

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

Microphone module:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	7.82	6.05
2402 - 2480	Enhanced 8PSK	3.63	2.31

Mobile phone module:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	Basic GFSK	4.32	2.70
2402 - 2480	Enhanced 8PSK	4.05	2.54

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Each radio utilizes a PIFA antenna, with a maximum gain of 1.5 dBi.

5.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was V00.39 2010.05.26 11:00

The test utility software used during testing was CSR Bluetooth.exe 2.0

5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

Radiated emission 30-1000 MHz was performed with the EUT set to transmit at the channel with highest output power.

EUT is desktop unit; therefore it is tested in desktop layout.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	D400	Plantronics 31938	DoC
AC/DC Adapter	Dell	LA90PS0-09	CN0DF266-71615-855	DoC
Test Fixture	Plantronics	N/A	N/A	N/A
Modem	Blaster	DE5621	DD0020404375	DoC

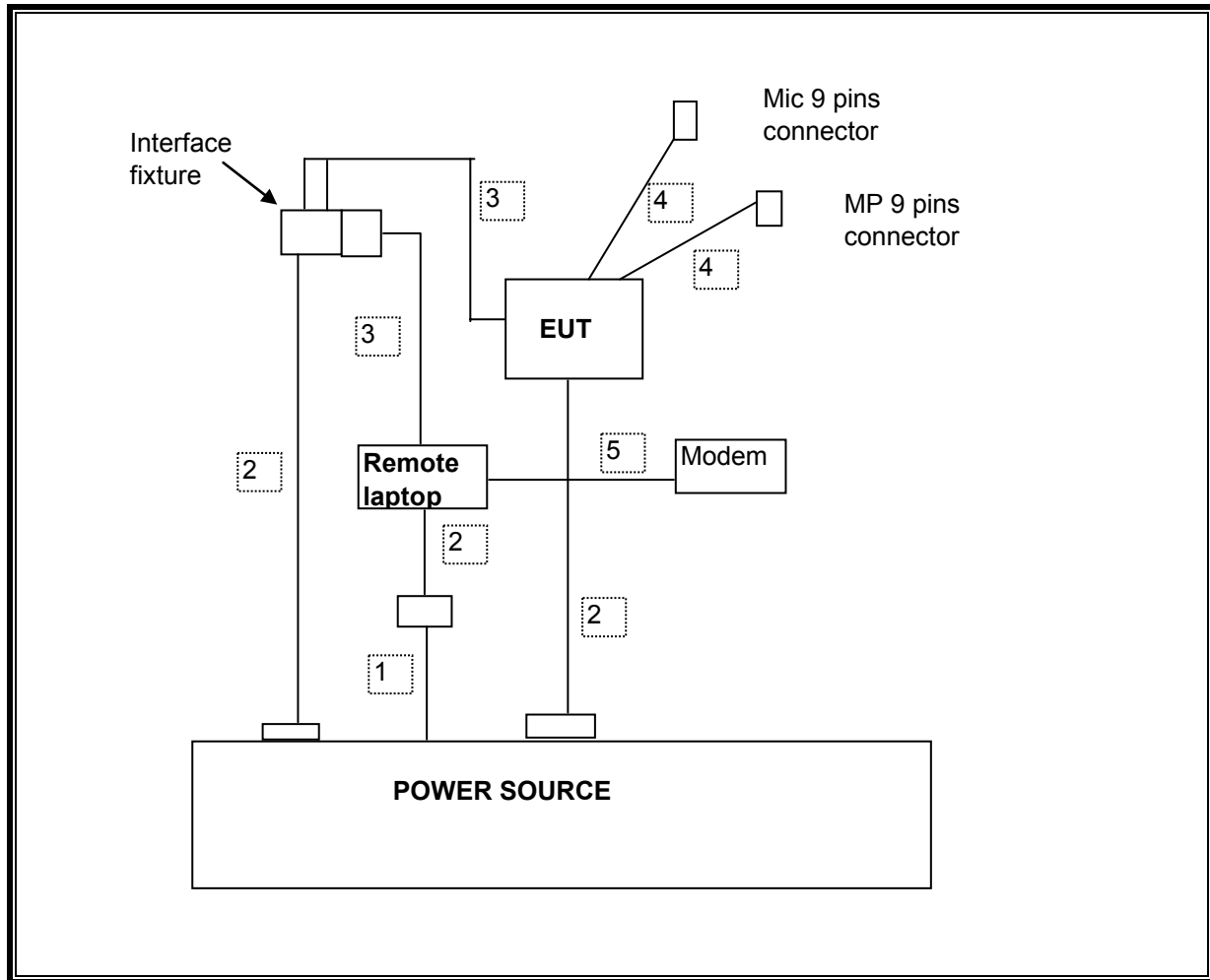
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	N/A
2	DC	3	DC	Un-shielded	2m	N/A
3	Serial	2	9 Pin	Un-shielded	0.3m	N/A
4	Serial	2	9 Pin	Un-shielded	0.3m	N/A
5	Serial	1	DB15 - DB9	Un-shielded	1.5 m	Modem cable

TEST SETUP

The EUT is connected to a host laptop computer via test fixture , after using test software exercised the radio card, remove support laptop

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 Date	Cal Due
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/09	12/18/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	03/31/09	12/19/10
PSA Series Spectrum Analyzer	Agilent / HP	E4446A	C01069	01/05/10	04/05/11
Power Meter	Boonton	4541 RF	C01189	02/26/10	02/26/11
Power sensor	Boonton	57006	6871	02/27/10	02/27/11
Antenna, Horn, 18 GHz	EMCO	3115	C00945	04/22/09	12/18/10
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	08/05/09	12/17/10
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/29/09	10/29/10
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	N02481	10/29/09	10/29/10
EMI Receiver	R & S	ESHS 20	N02396	02/06/09	08/06/10

7. ANTENNA PORT TEST RESULTS (MICROPHONE MODULE)

7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

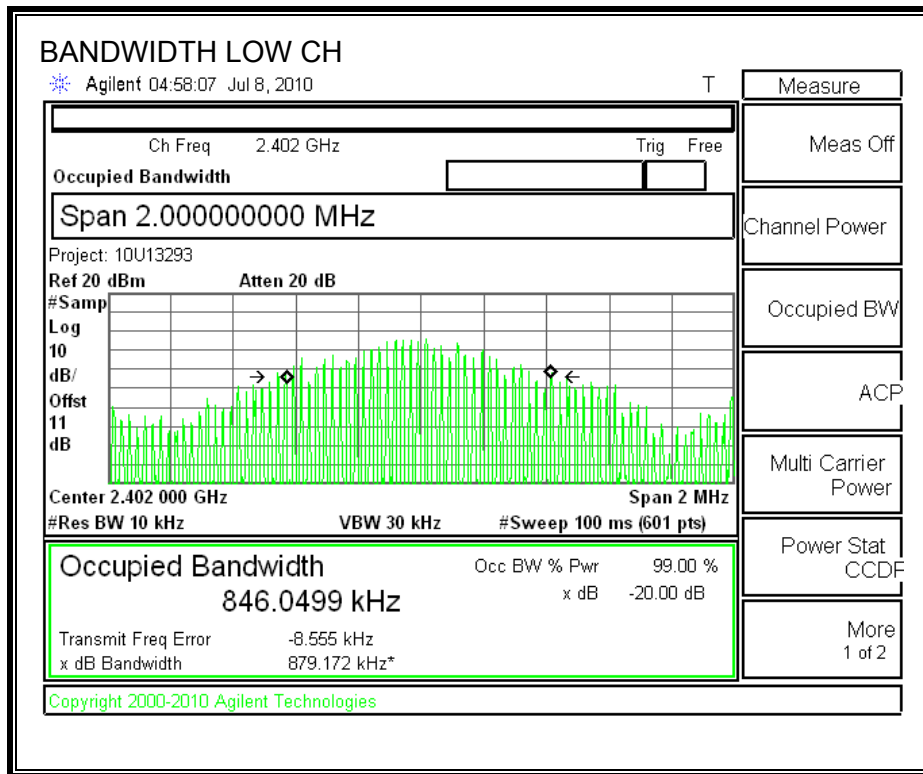
TEST PROCEDURE

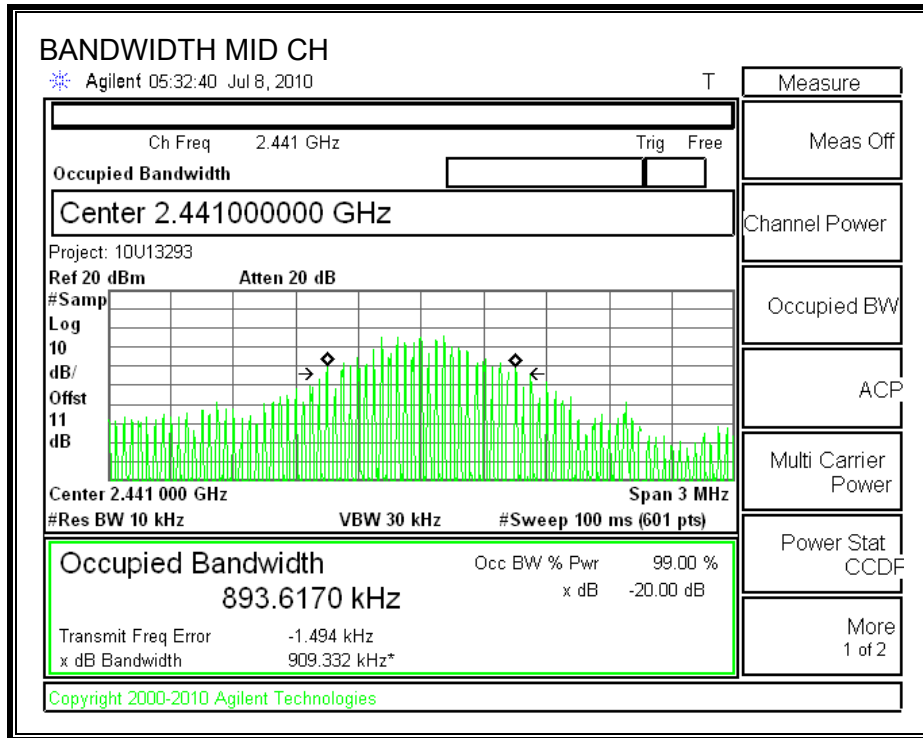
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

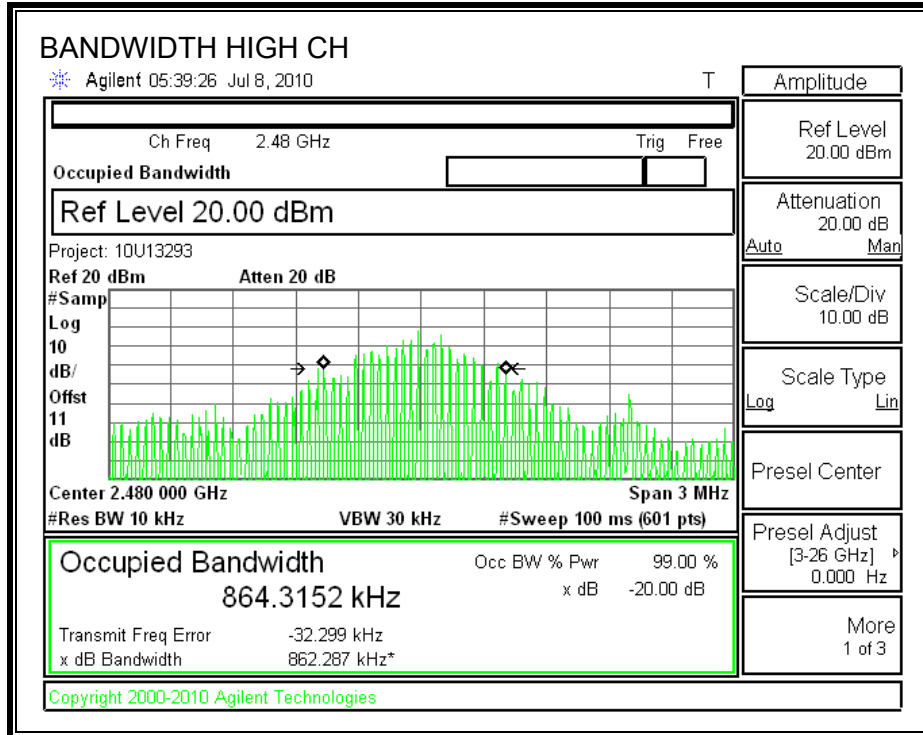
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	916.39	846.0499
Middle	2441	915.976	893.617
High	2480	920.128	864.3152

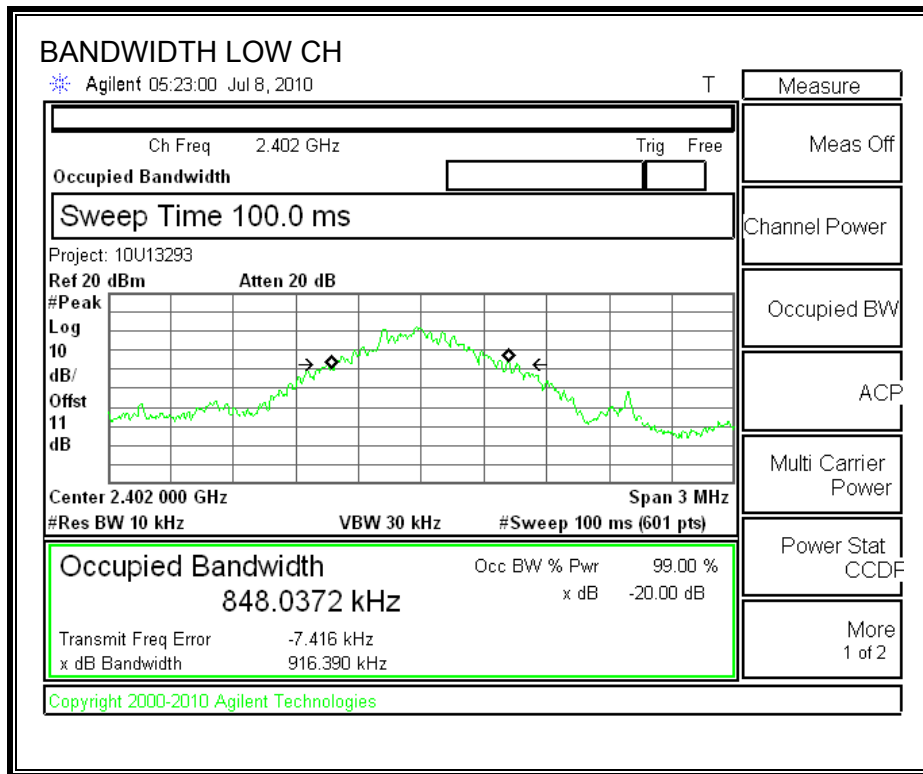
99% BANDWIDTH

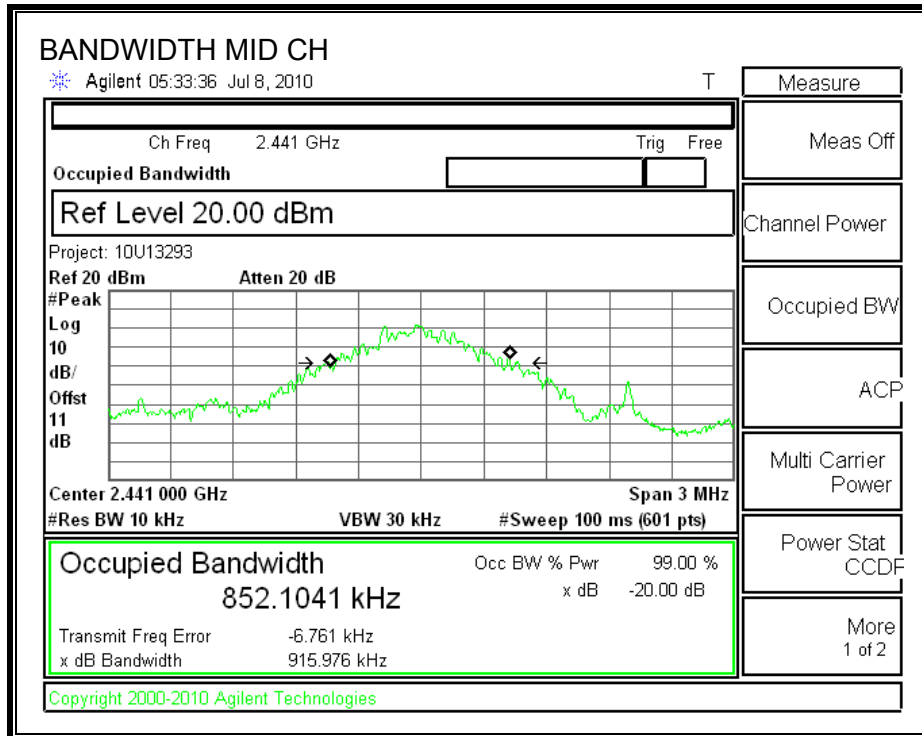


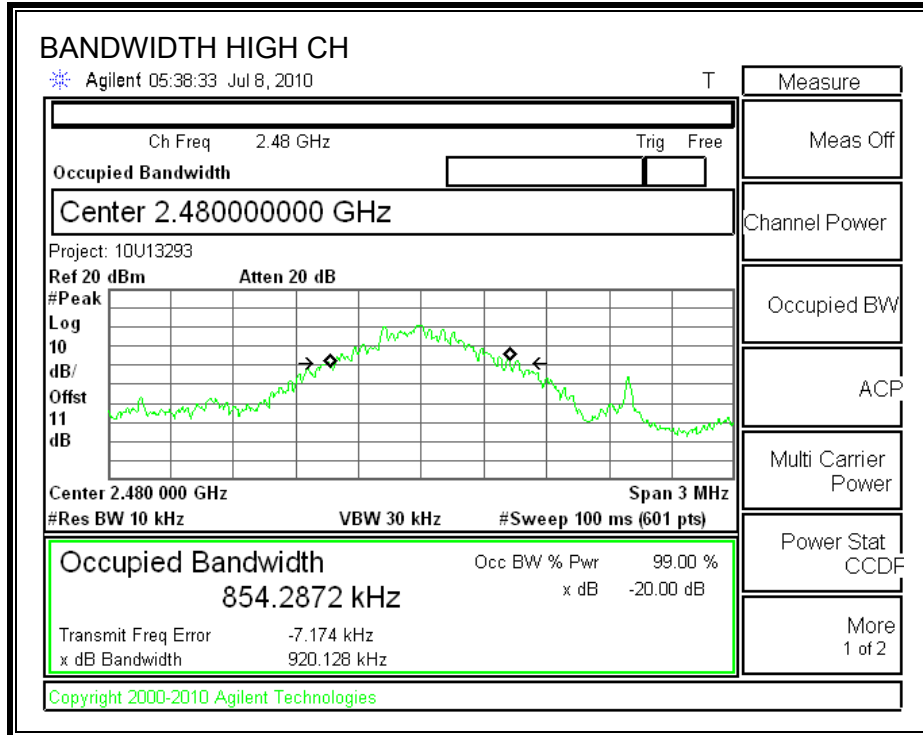




20dB BANDWIDTH







7.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

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.

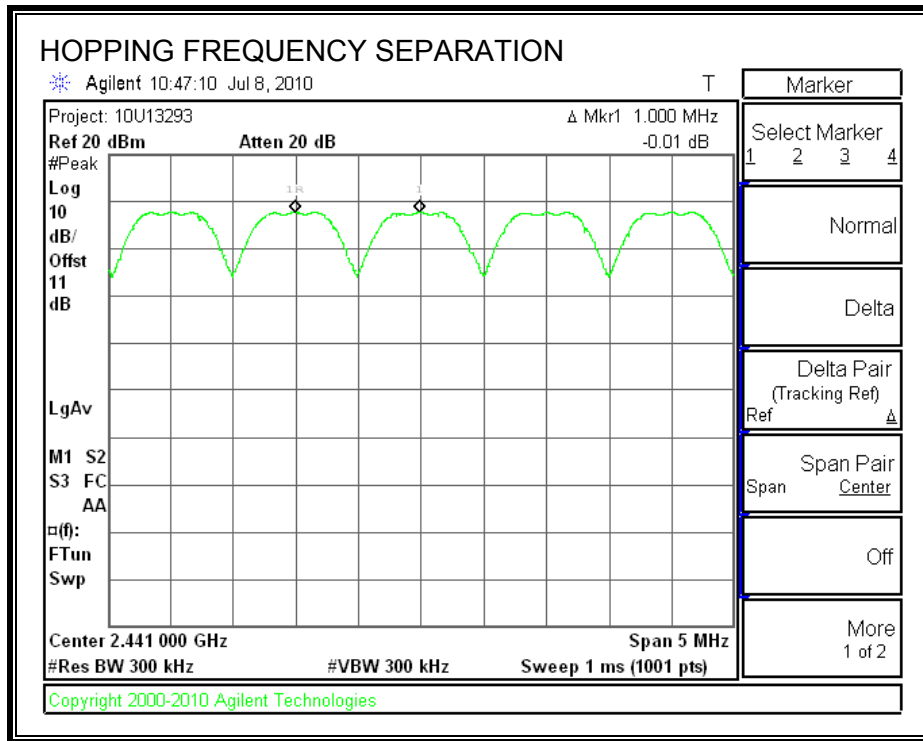
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

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



7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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

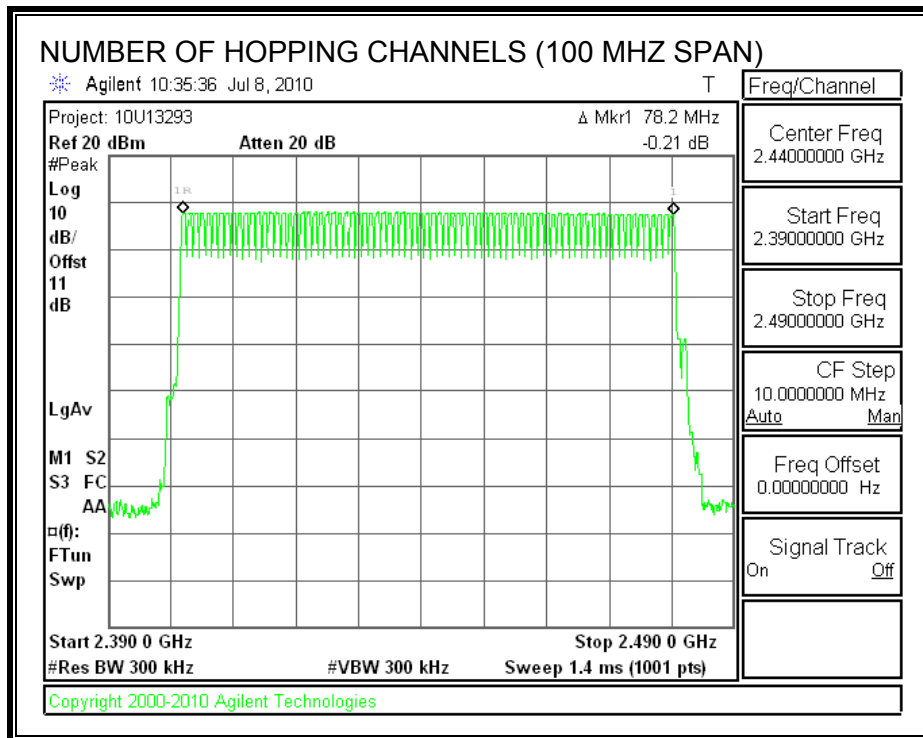
TEST PROCEDURE

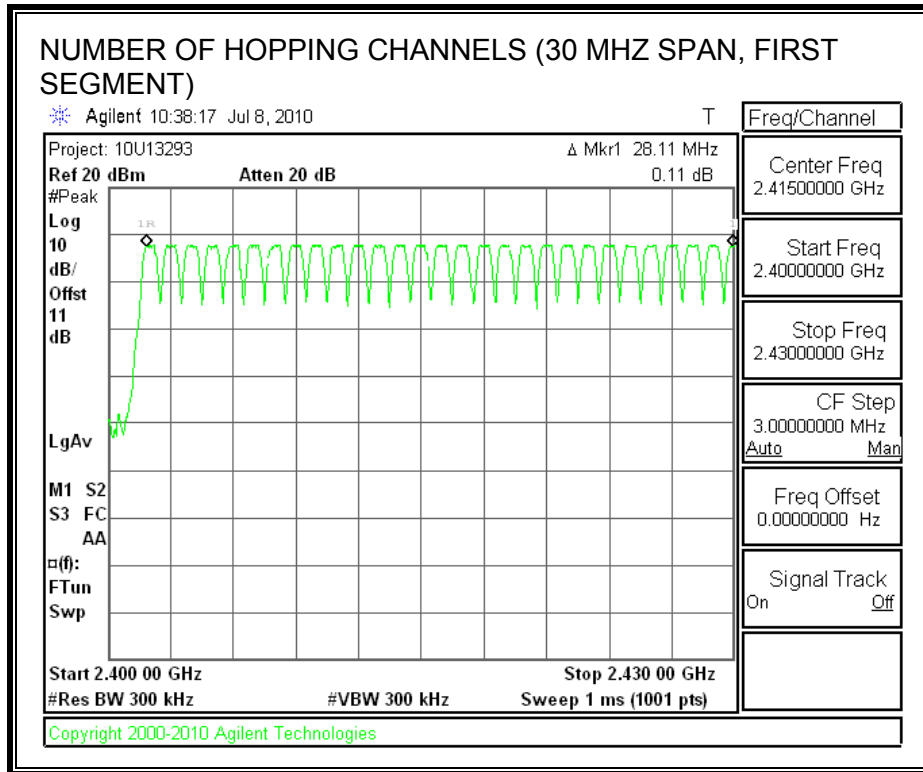
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

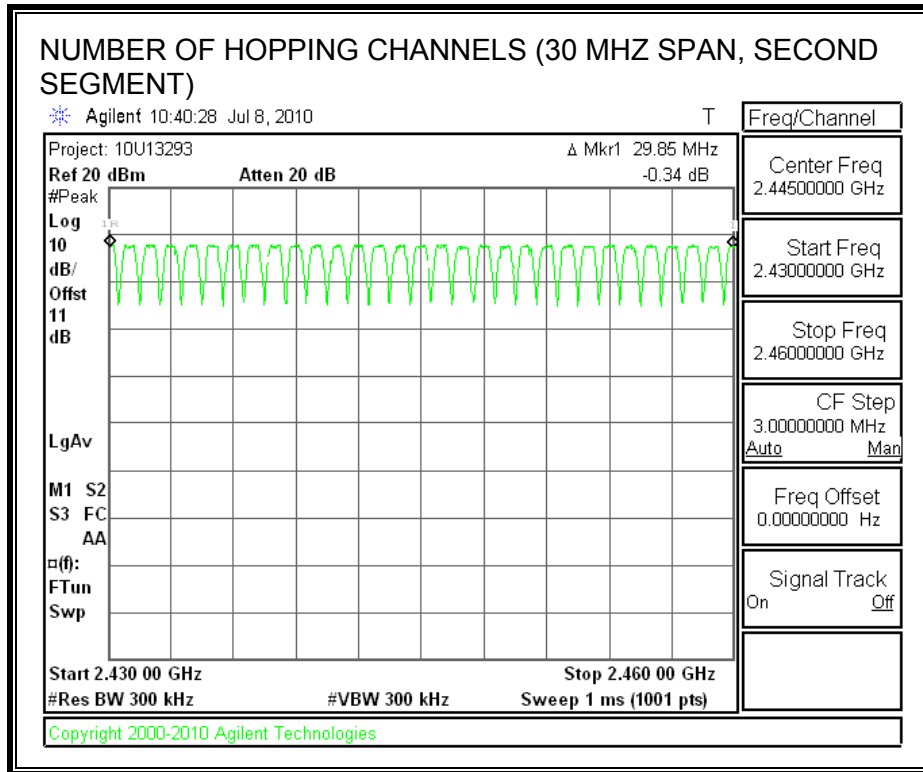
RESULTS

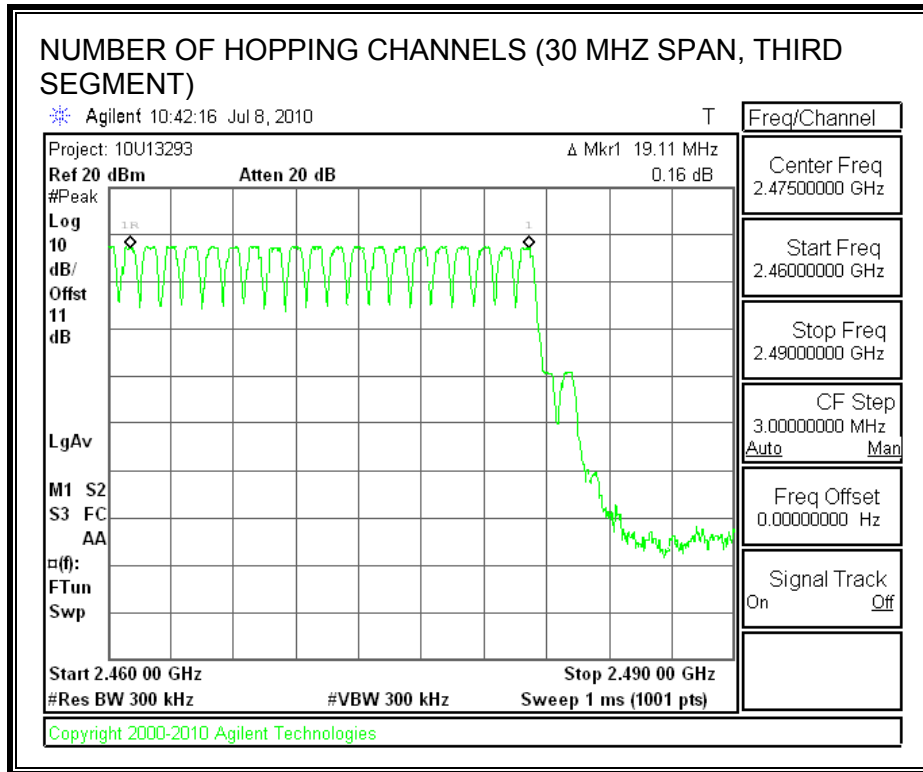
79 Channels observed.

NUMBER OF HOPPING CHANNELS









7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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 $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

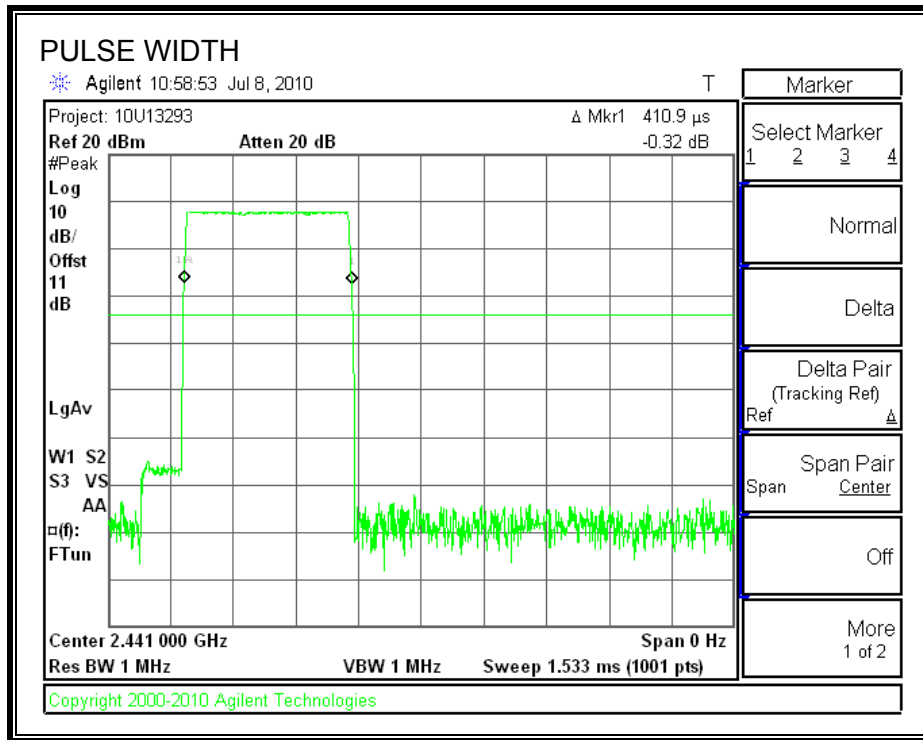
RESULTS

Time Of Occupancy = $10 * xx \text{ pulses} * yy \text{ msec} = zz \text{ msec}$

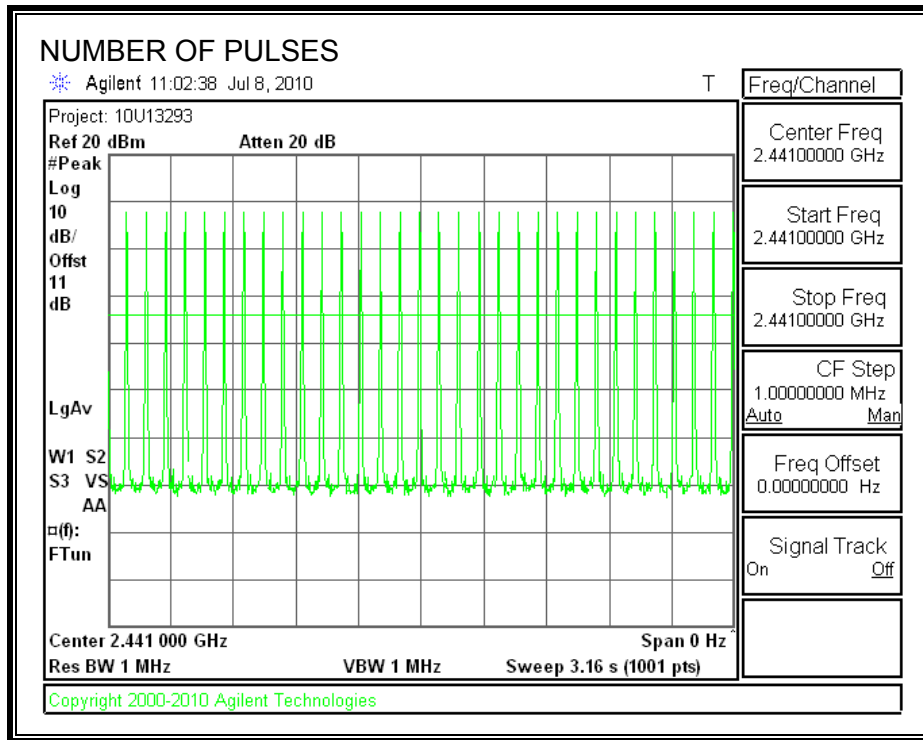
GFSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.4109	32	0.131	0.4	0.269

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

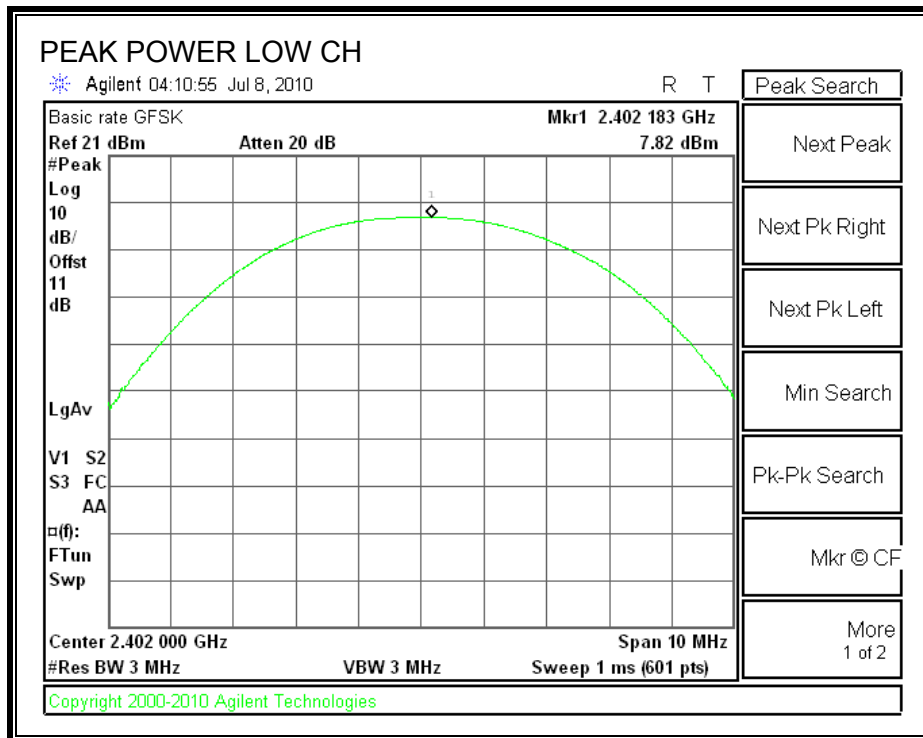
TEST PROCEDURE

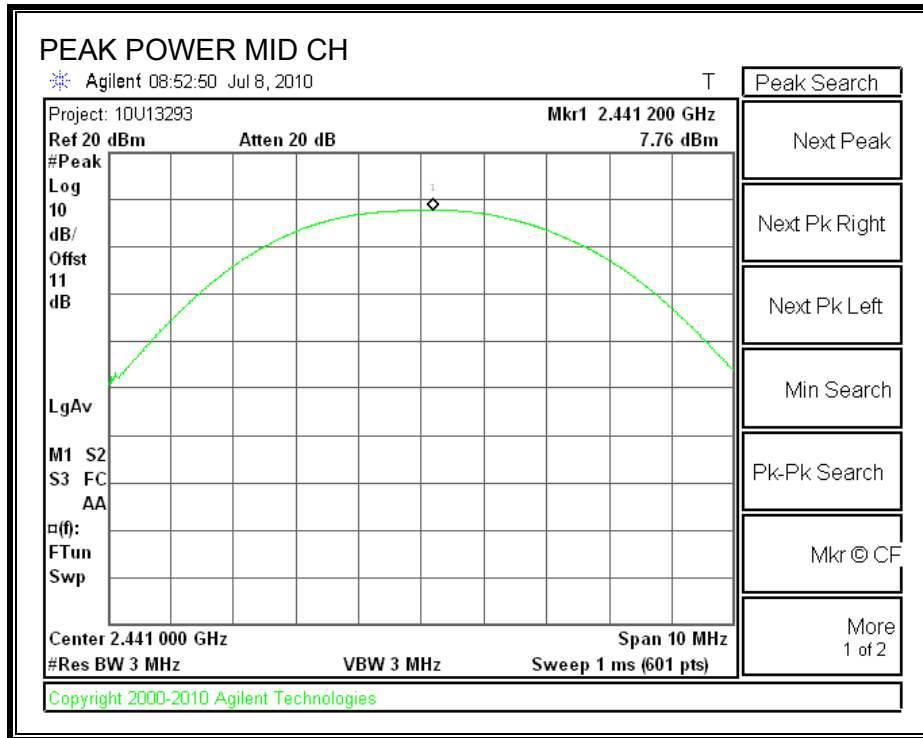
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

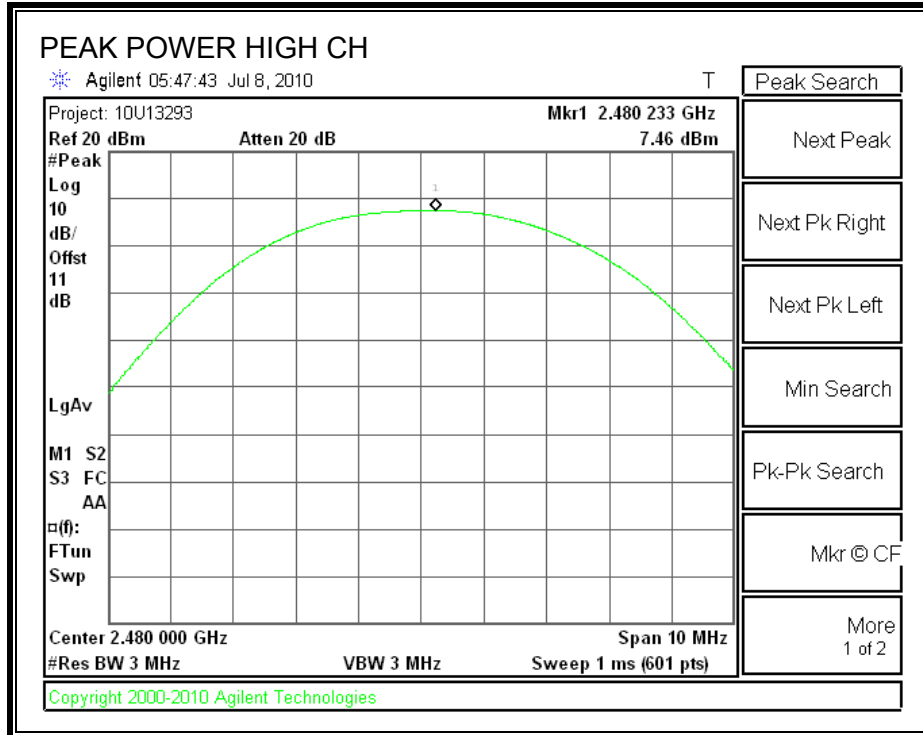
RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	7.82	30	-22.18
Middle	2441	7.76	30	-22.24
High	2480	7.46	30	-22.54

OUTPUT POWER







7.1.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	2.67
Middle	2441	2.60
High	2480	2.31

7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

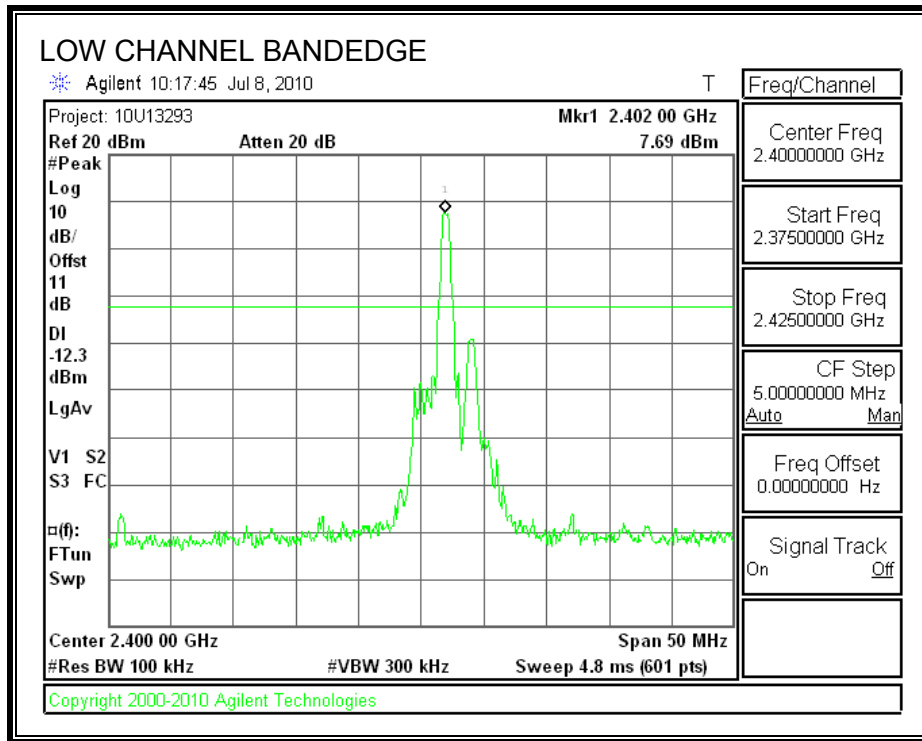
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

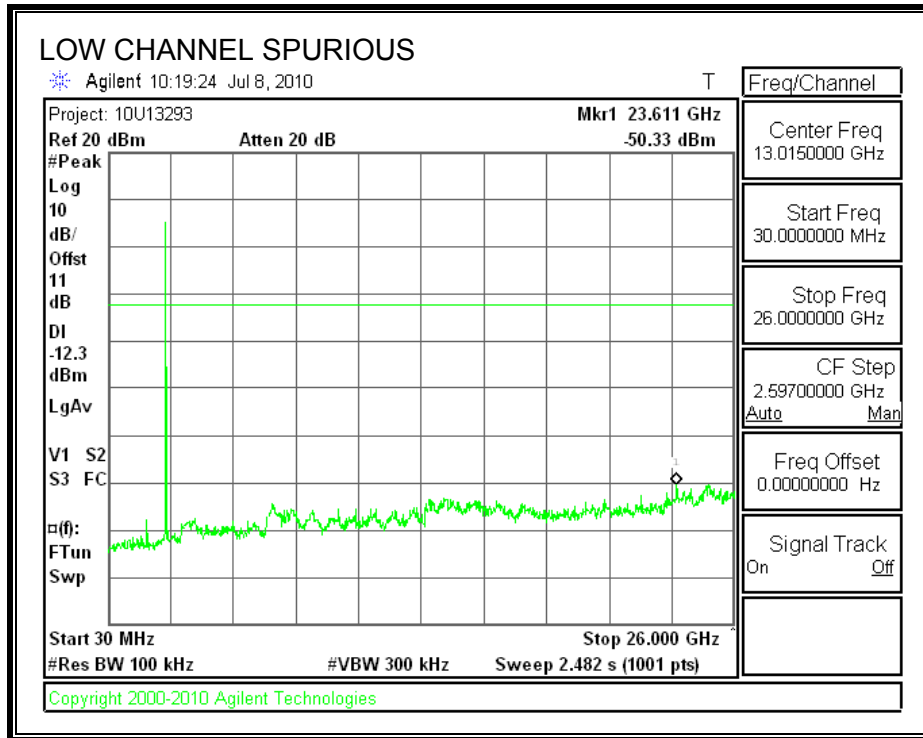
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

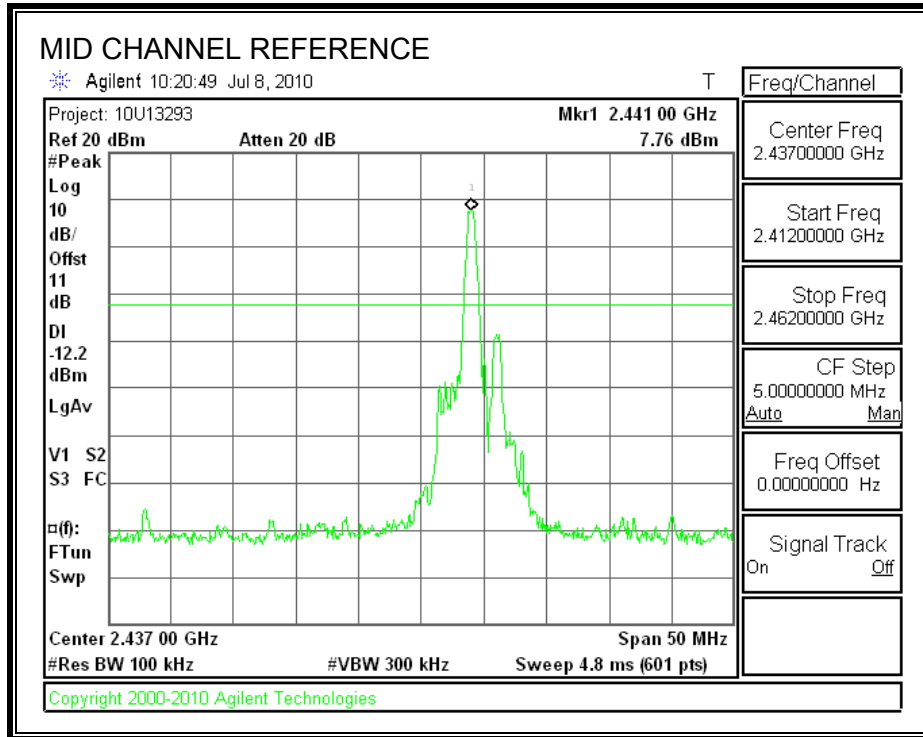
RESULTS

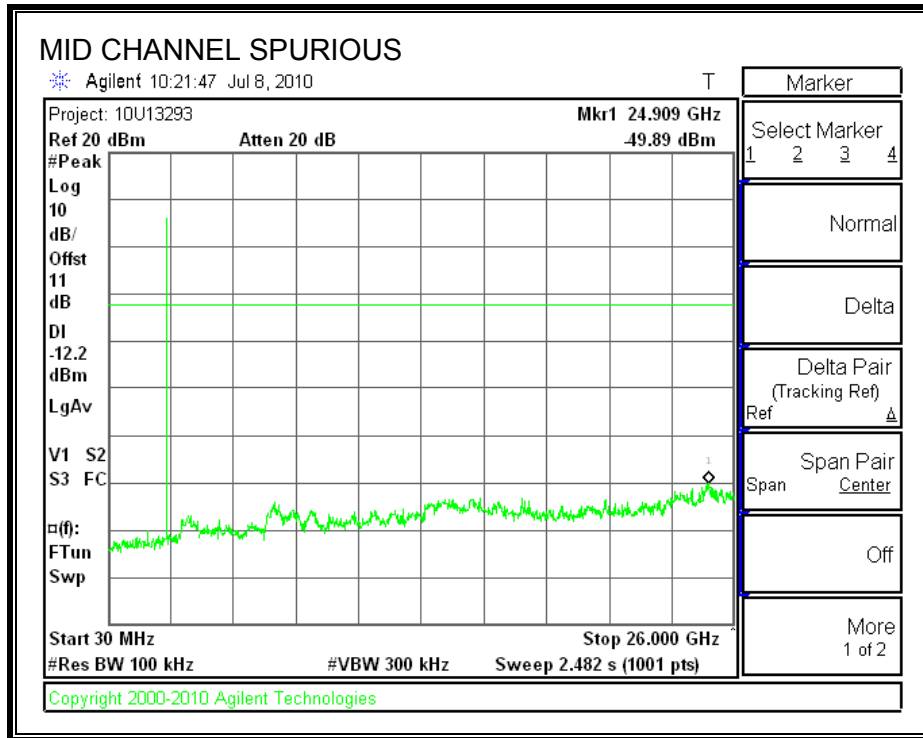
SPURIOUS EMISSIONS, LOW CHANNEL



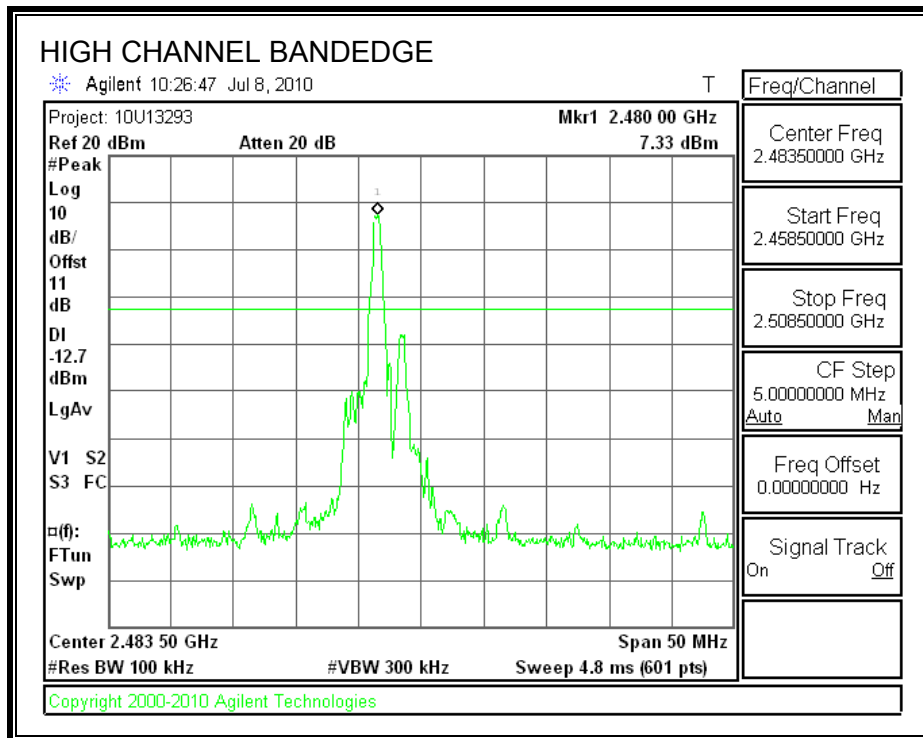


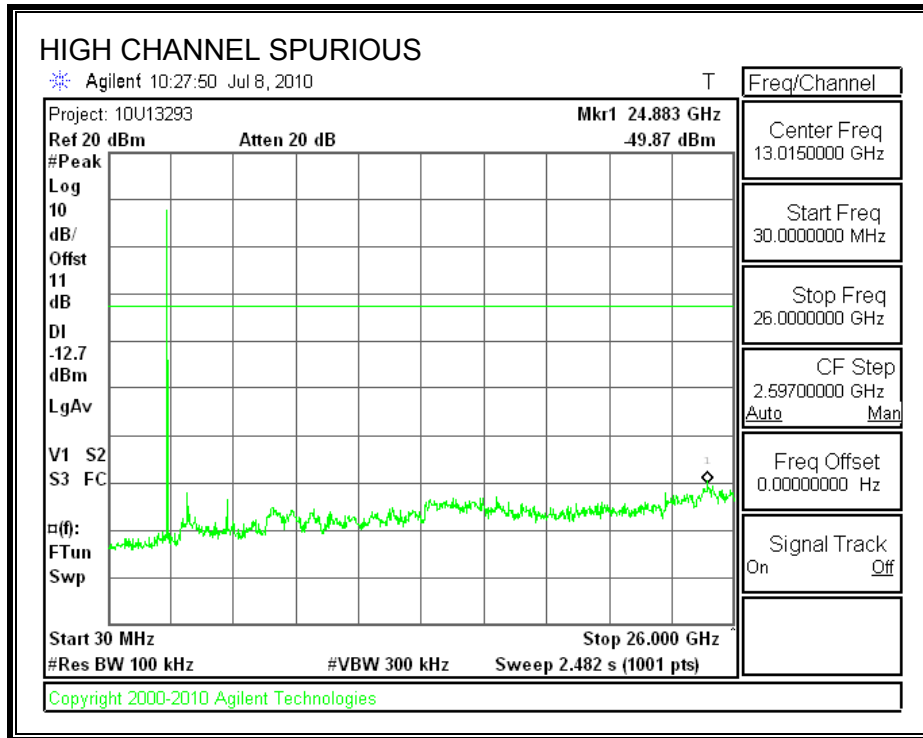
SPURIOUS EMISSIONS, MID CHANNEL



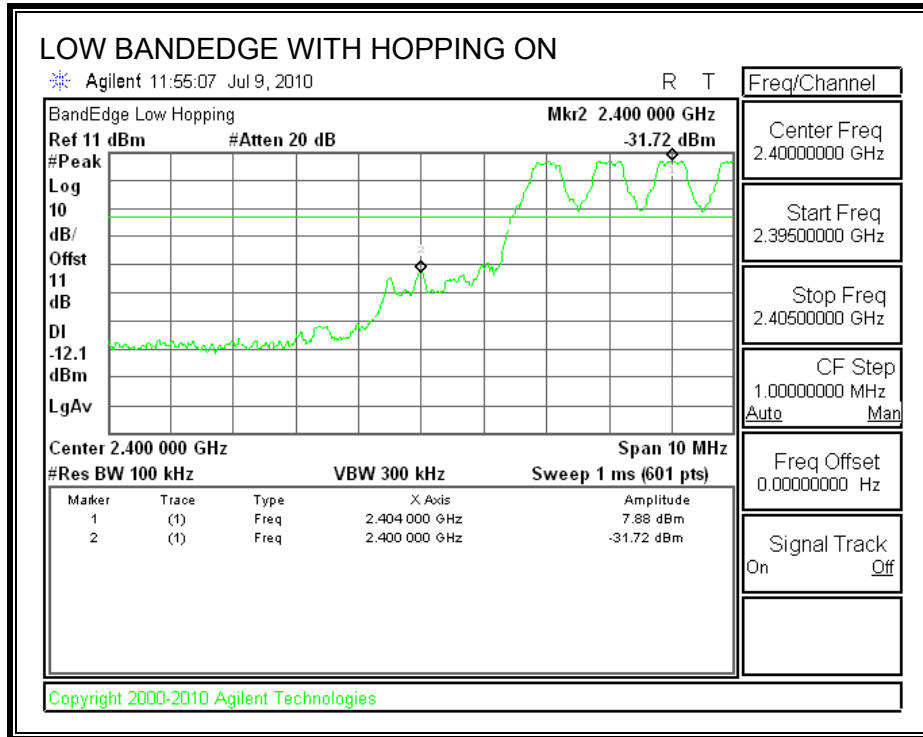


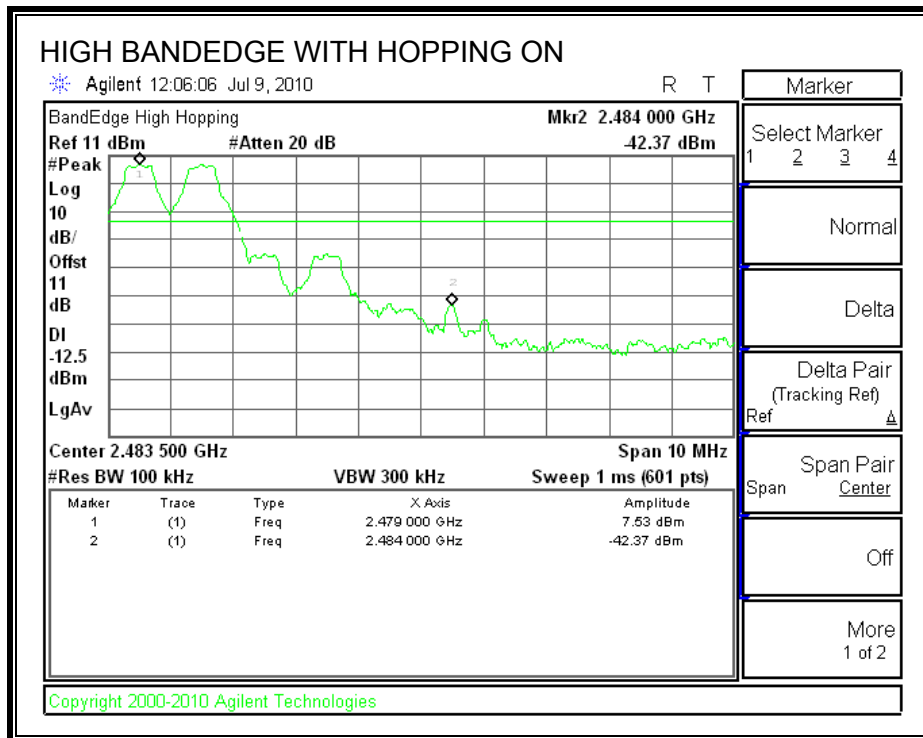
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON





7.2. ENHANCED DATA RATE 8PSK MODULATION

7.2.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

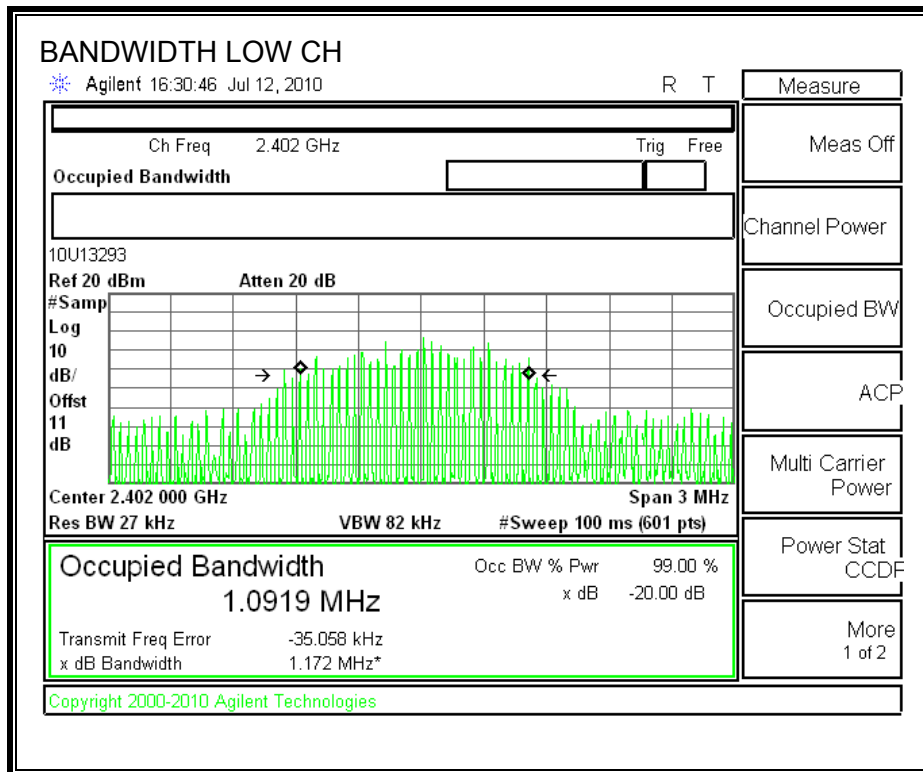
TEST PROCEDURE

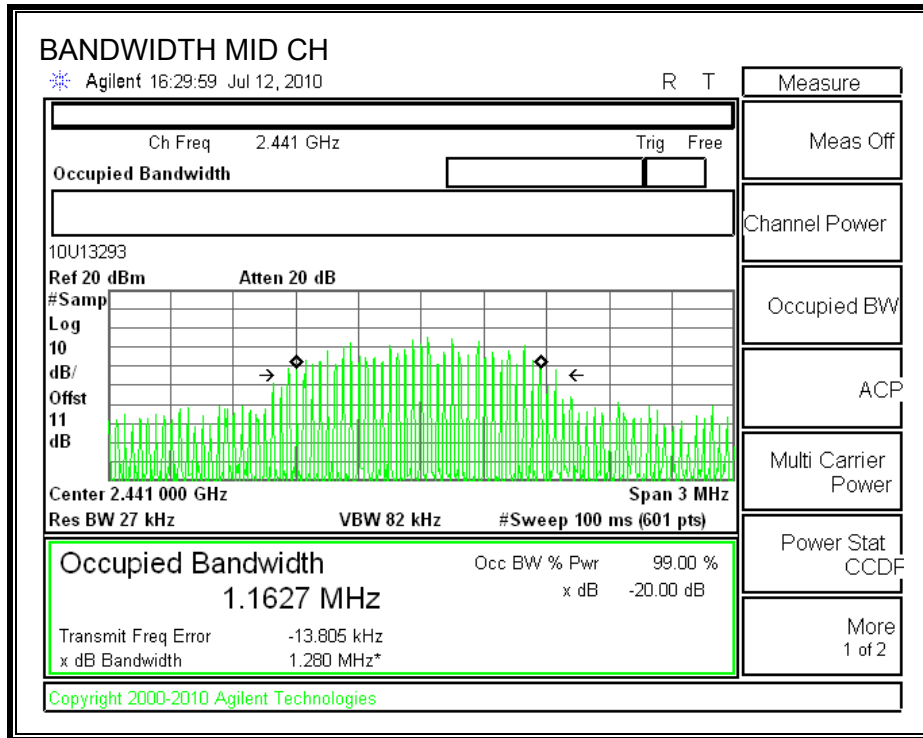
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

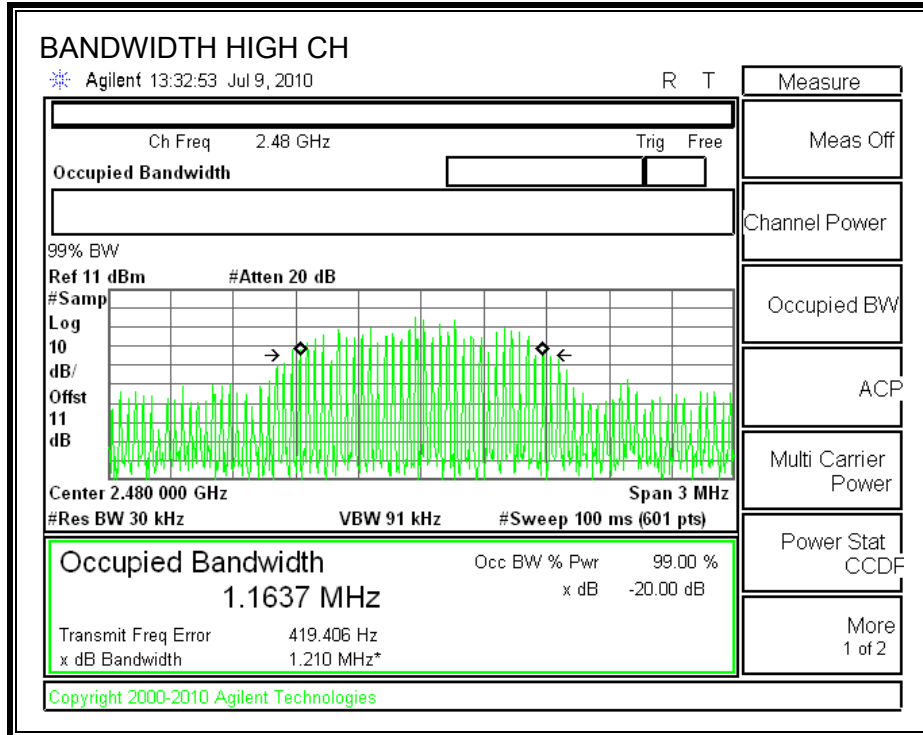
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.211	1.0919
Middle	2441	1.216	1.1627
High	2480	1.217	1.1637

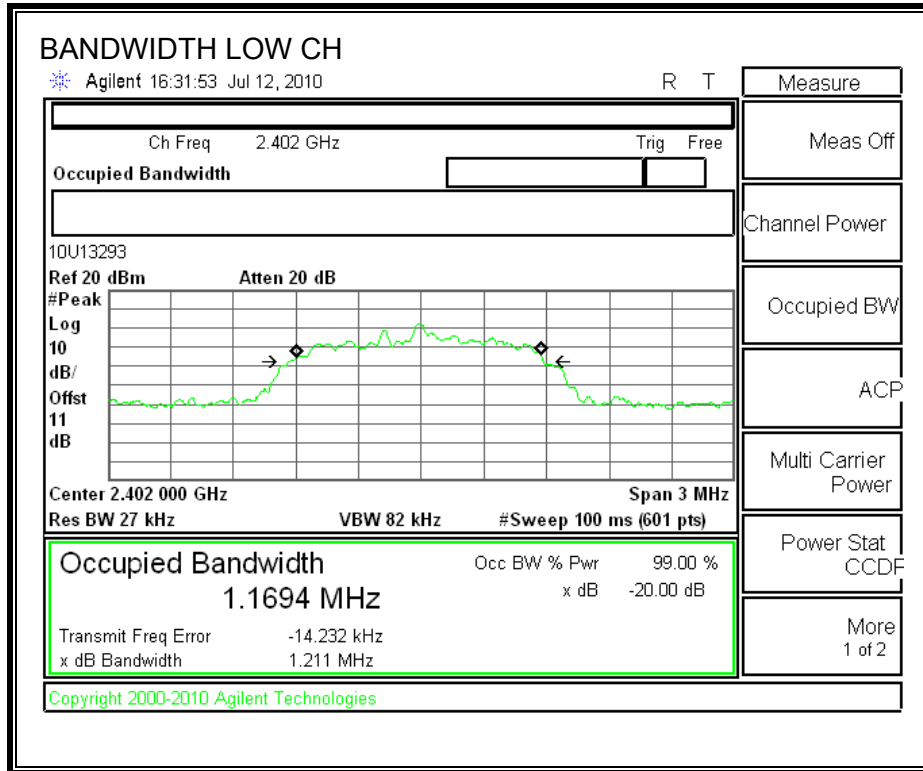
99% BANDWIDTH

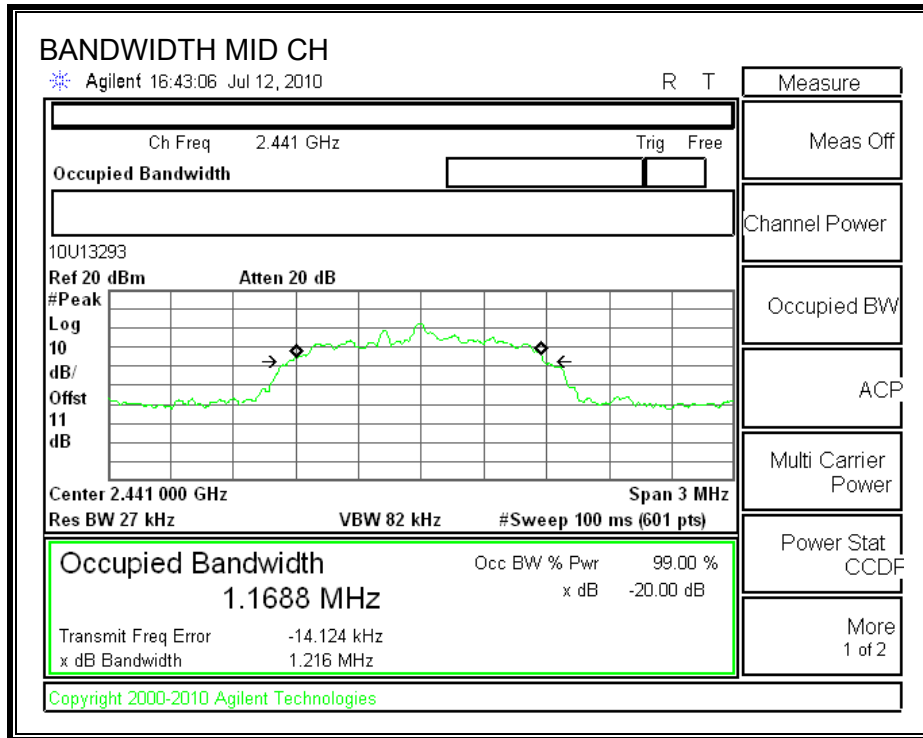


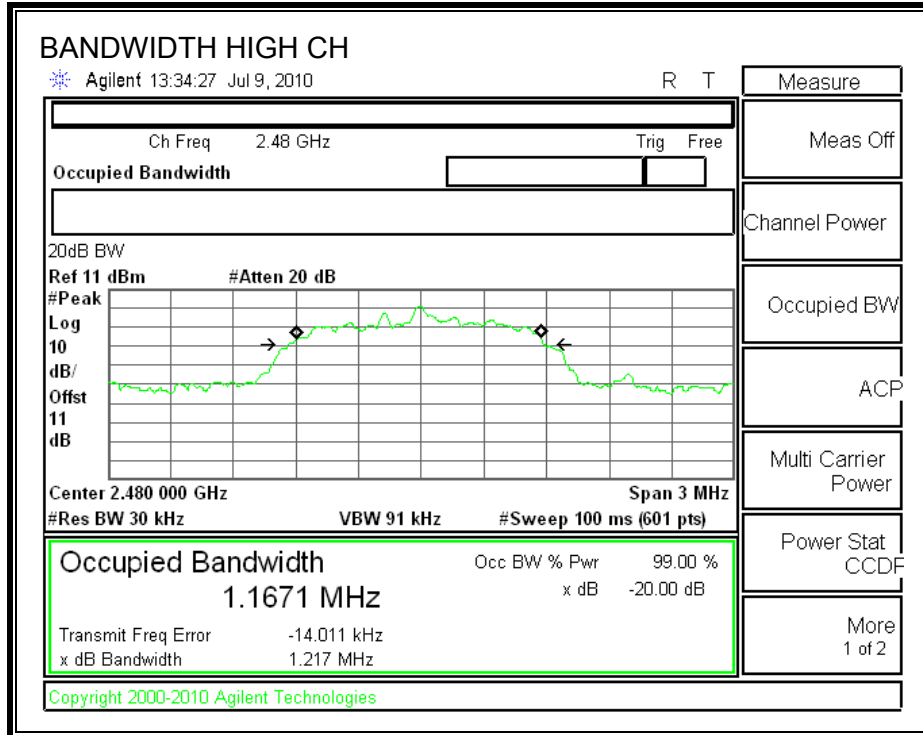




20dB BANDWIDTH







7.2.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

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.

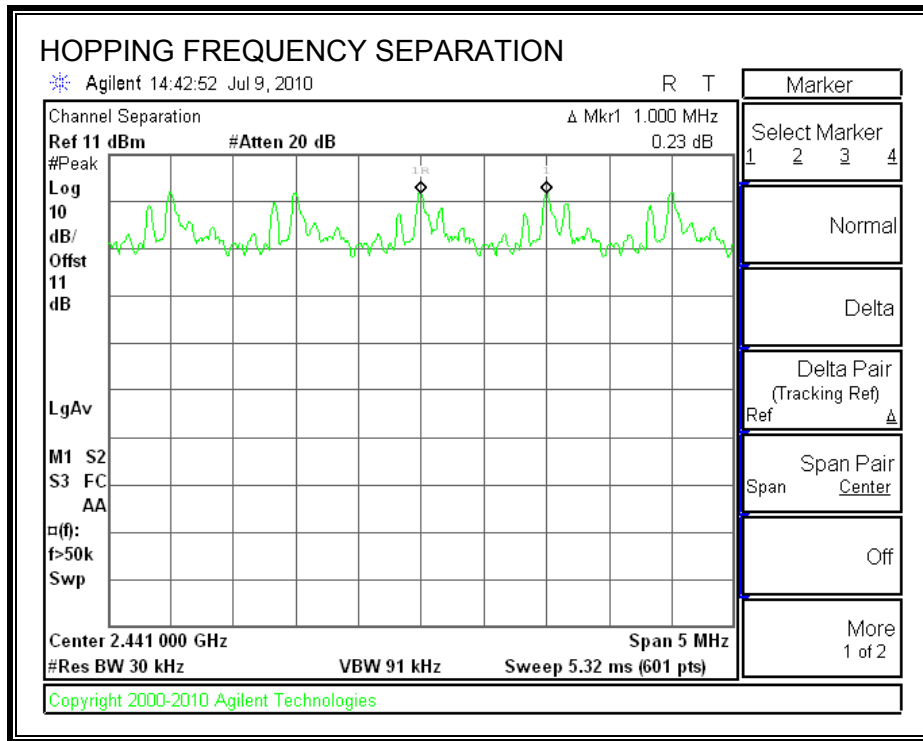
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 30 kHz and the VBW is set to 91 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



7.2.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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

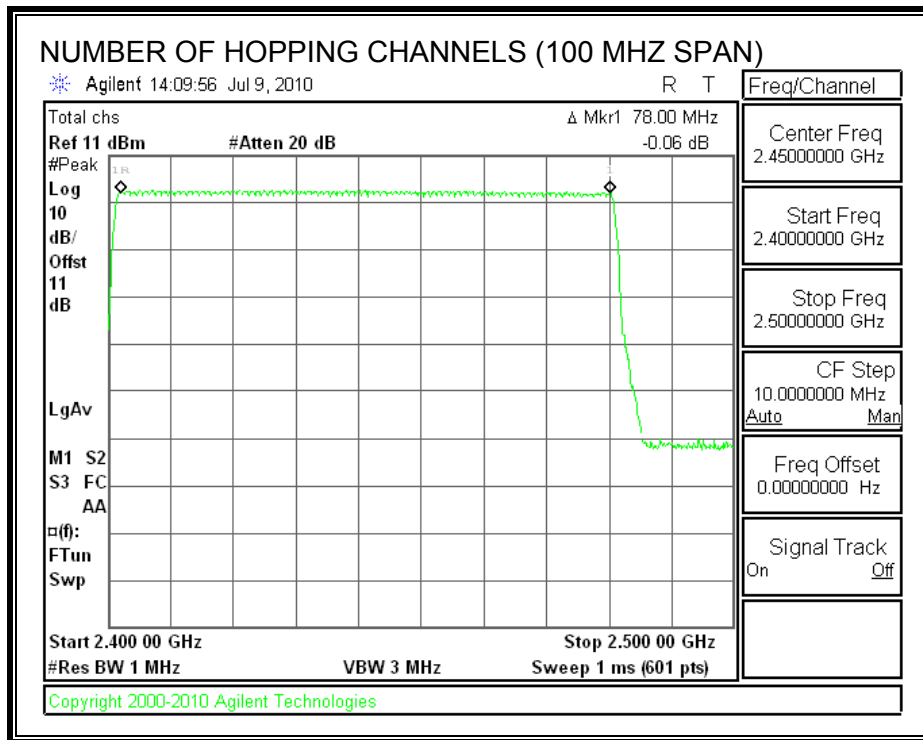
TEST PROCEDURE

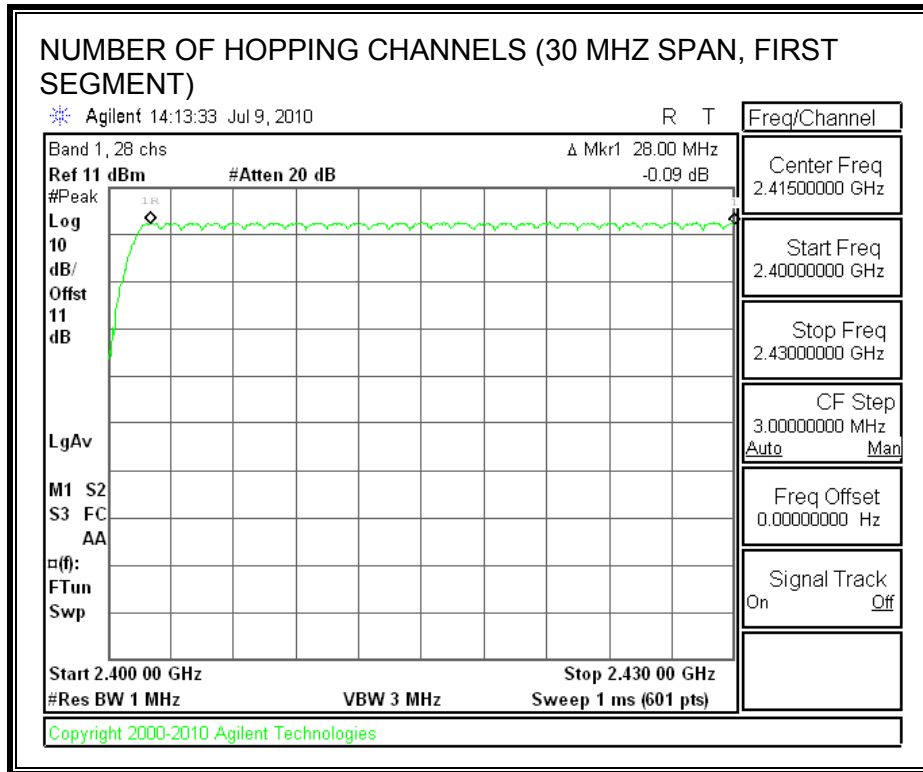
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

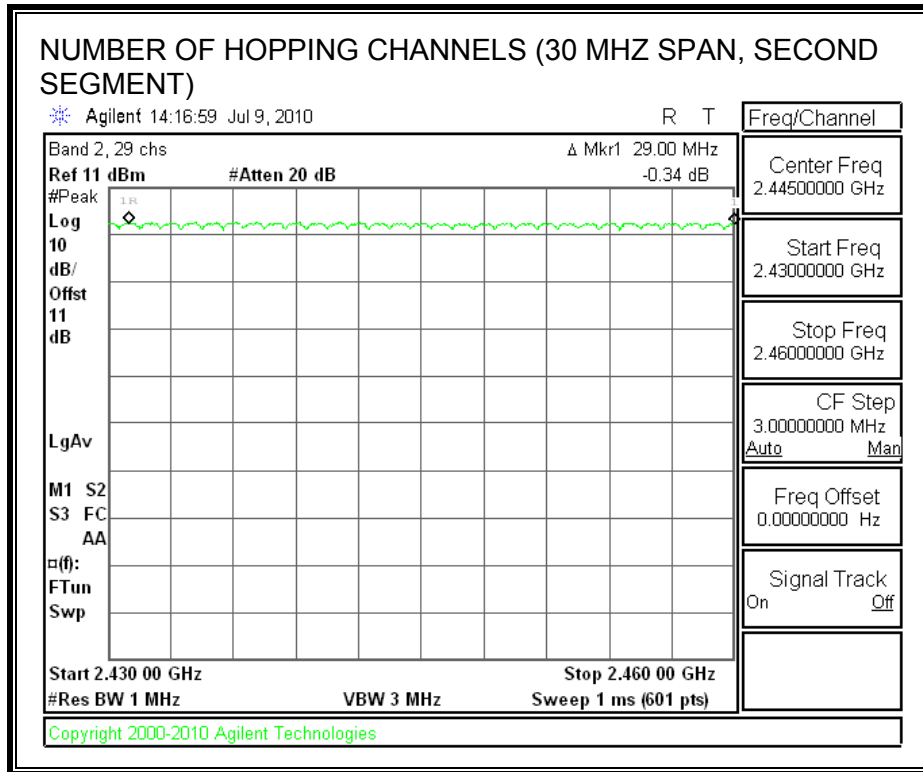
RESULTS

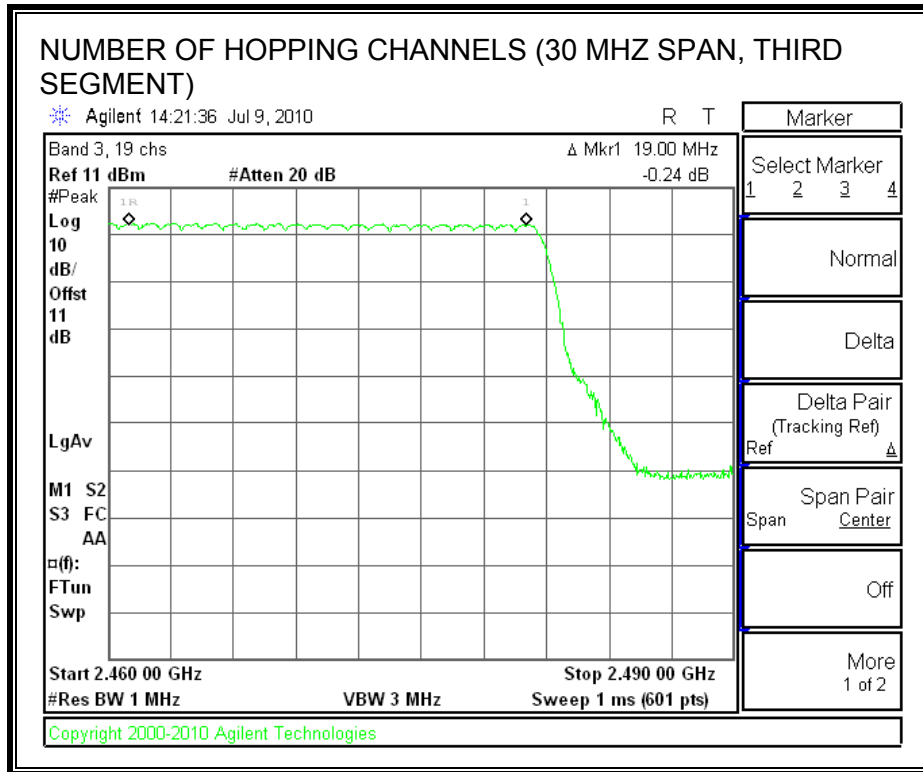
79 Channels observed.

NUMBER OF HOPPING CHANNELS









7.2.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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 $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

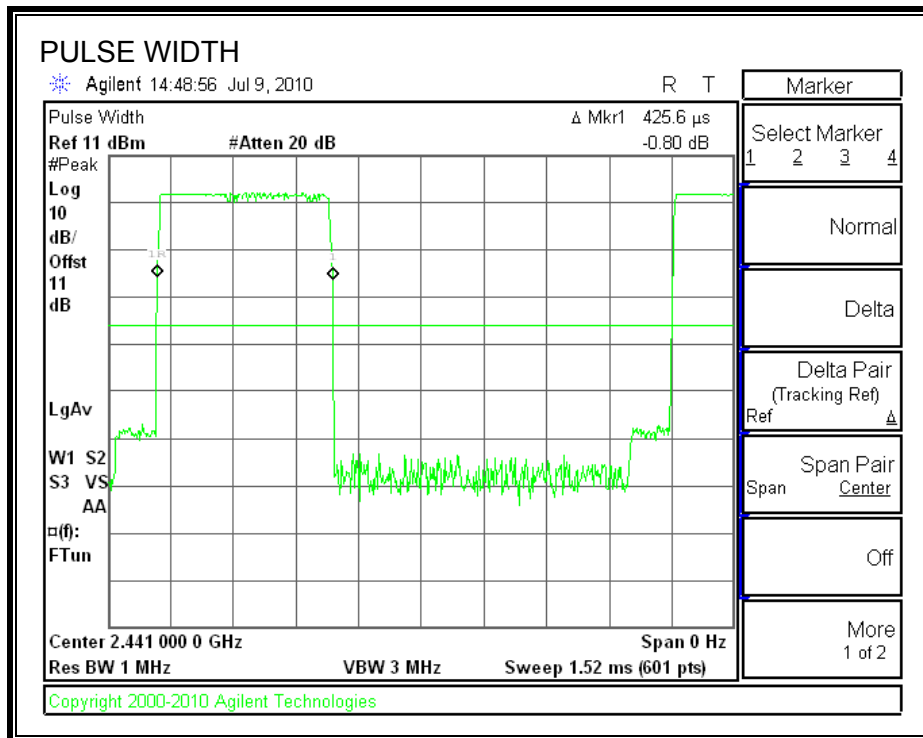
RESULTS

Time Of Occupancy = $10 * xx \text{ pulses} * yy \text{ msec} = zz \text{ msec}$

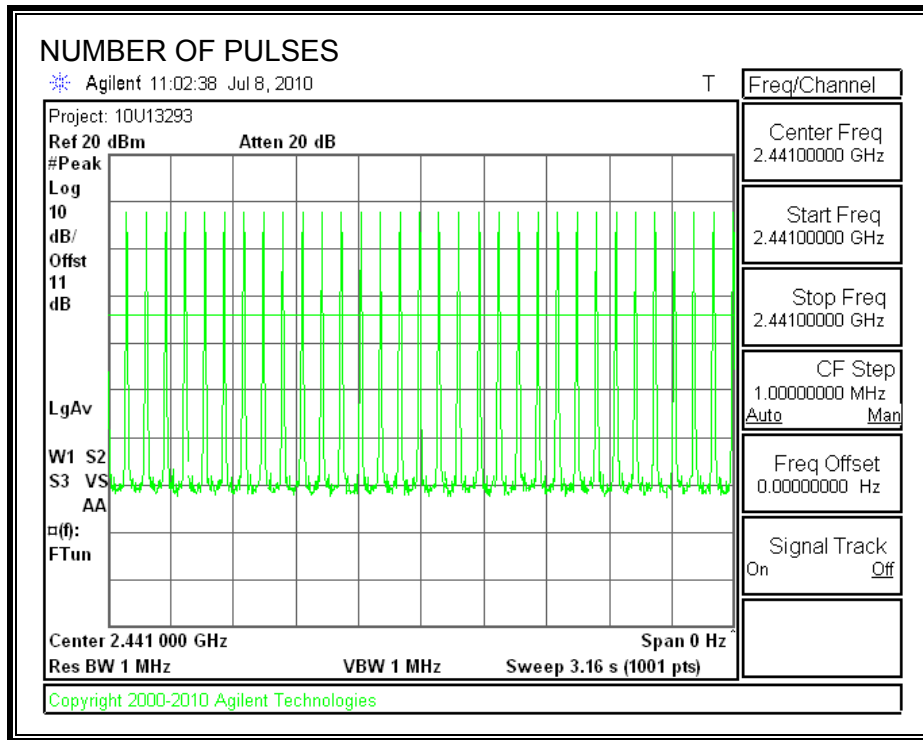
8PSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.4256	32	0.136	0.4	0.264

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



7.2.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

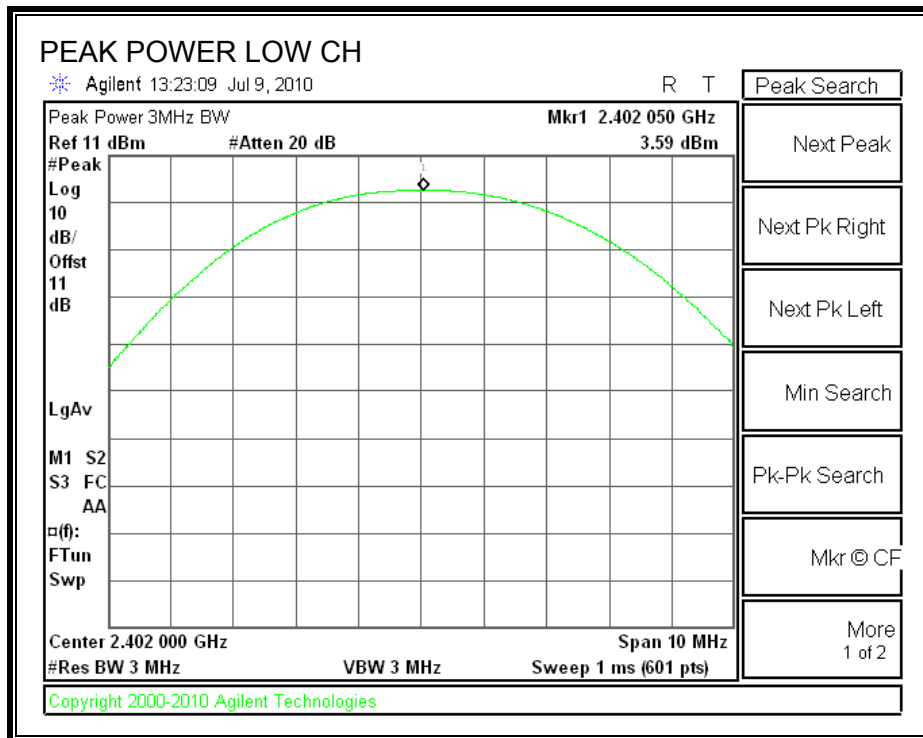
TEST PROCEDURE

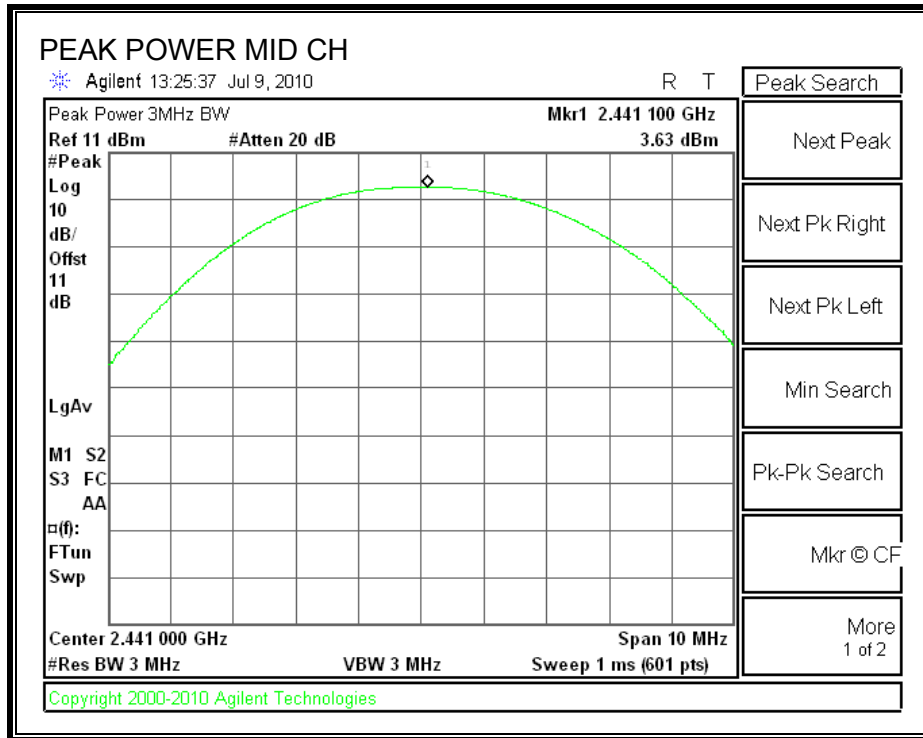
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

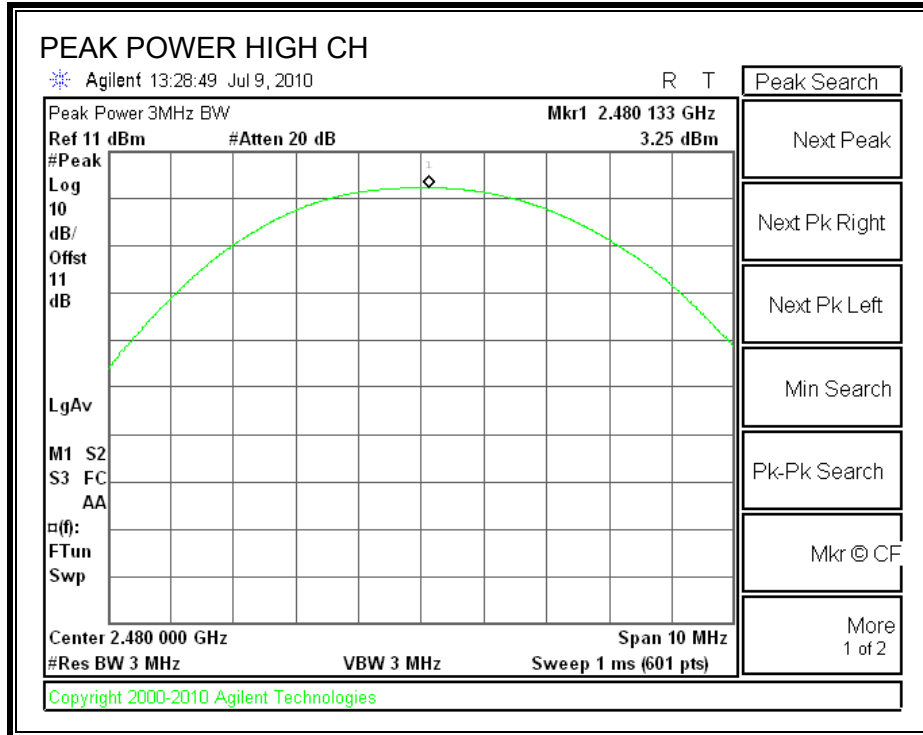
RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	3.59	30	-26.41
Middle	2441	3.63	30	-26.37
High	2480	3.25	30	-26.75

OUTPUT POWER







7.2.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	1.33
Middle	2441	1.24
High	2480	0.90

7.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

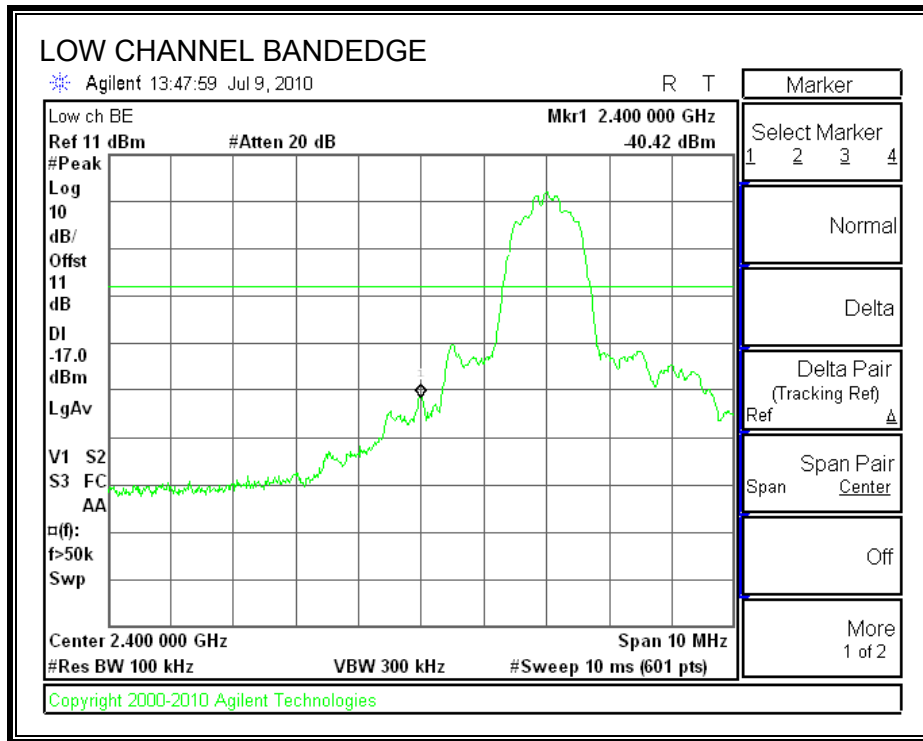
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

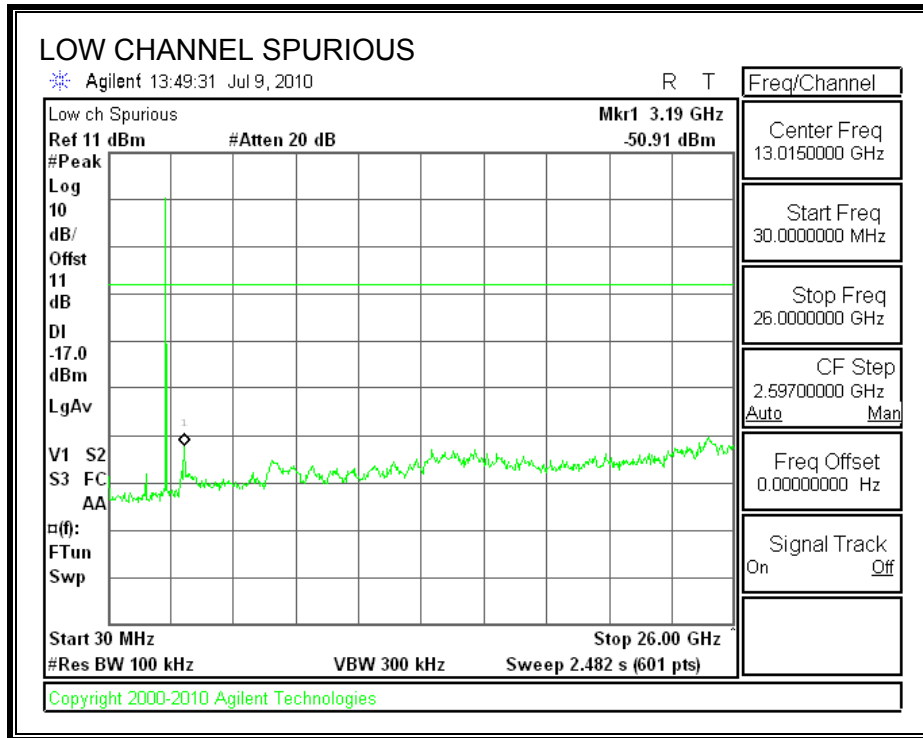
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

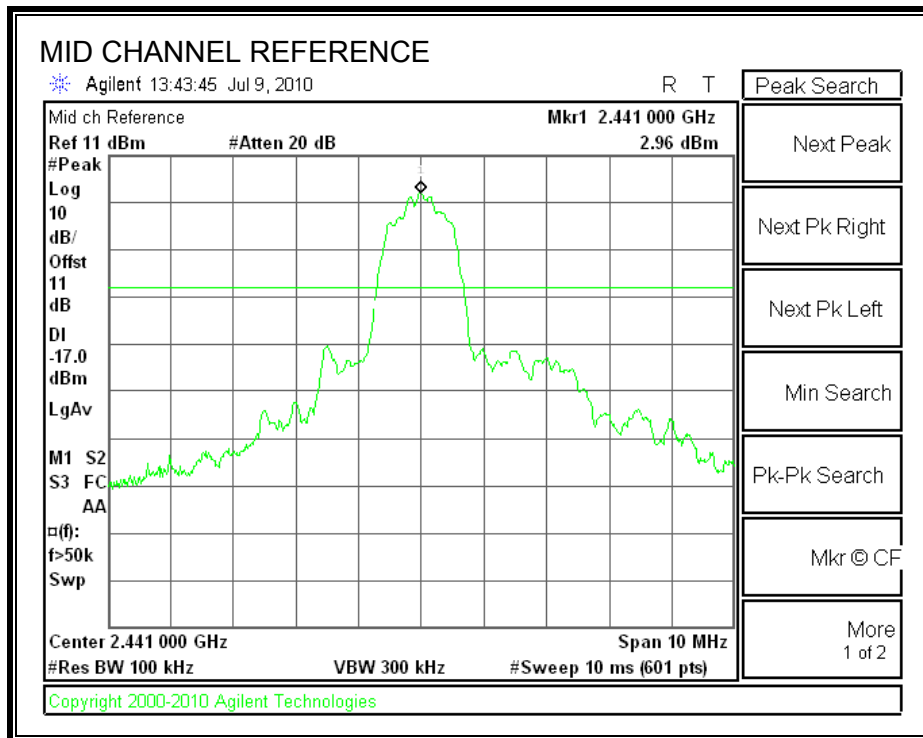
RESULTS

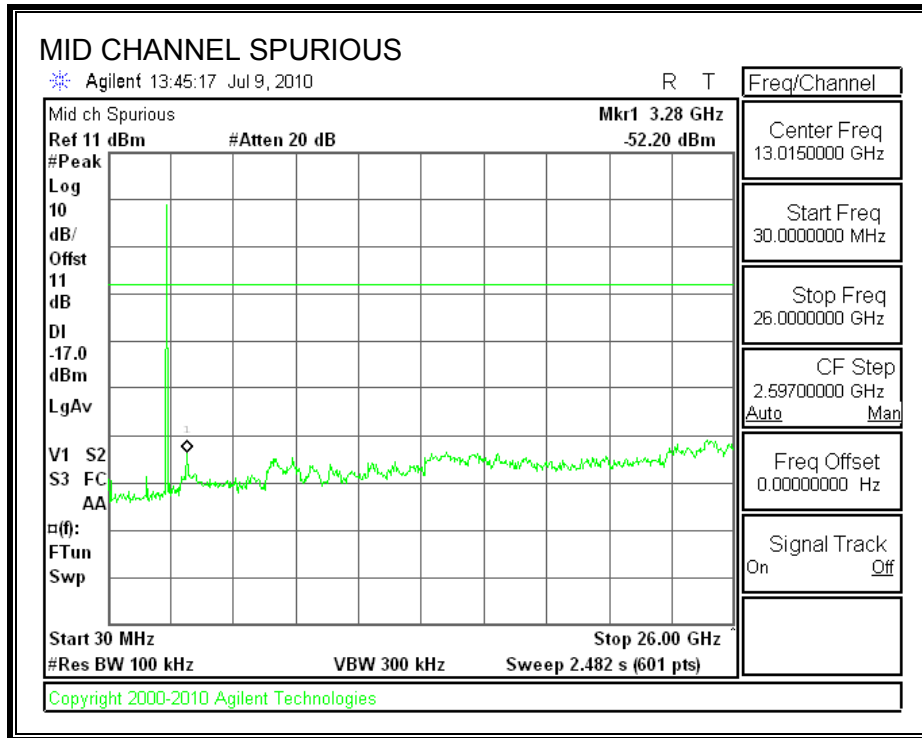
SPURIOUS EMISSIONS, LOW CHANNEL



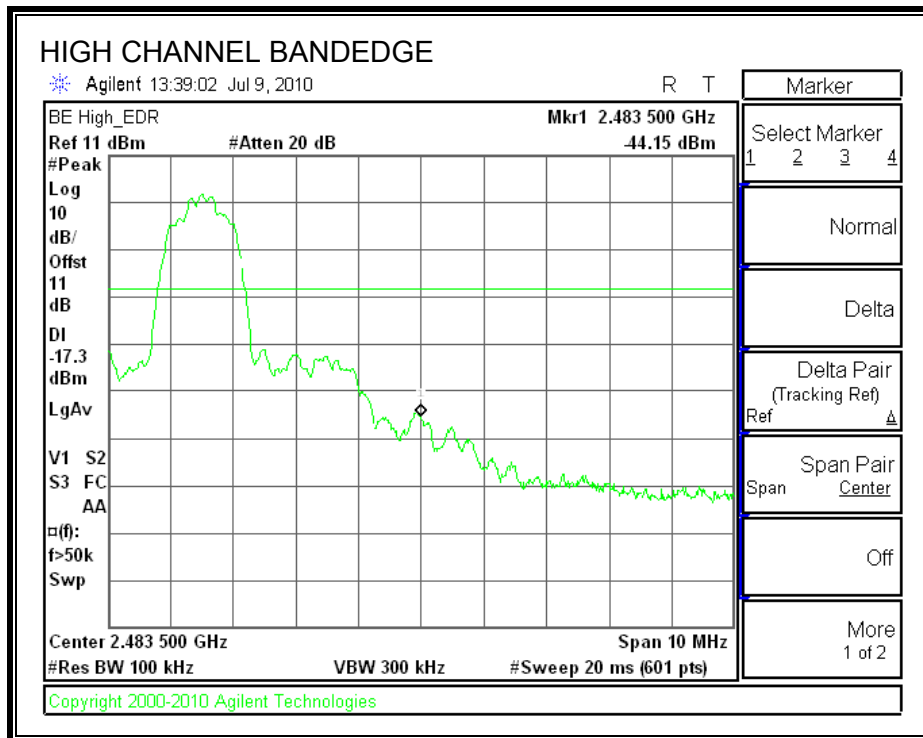


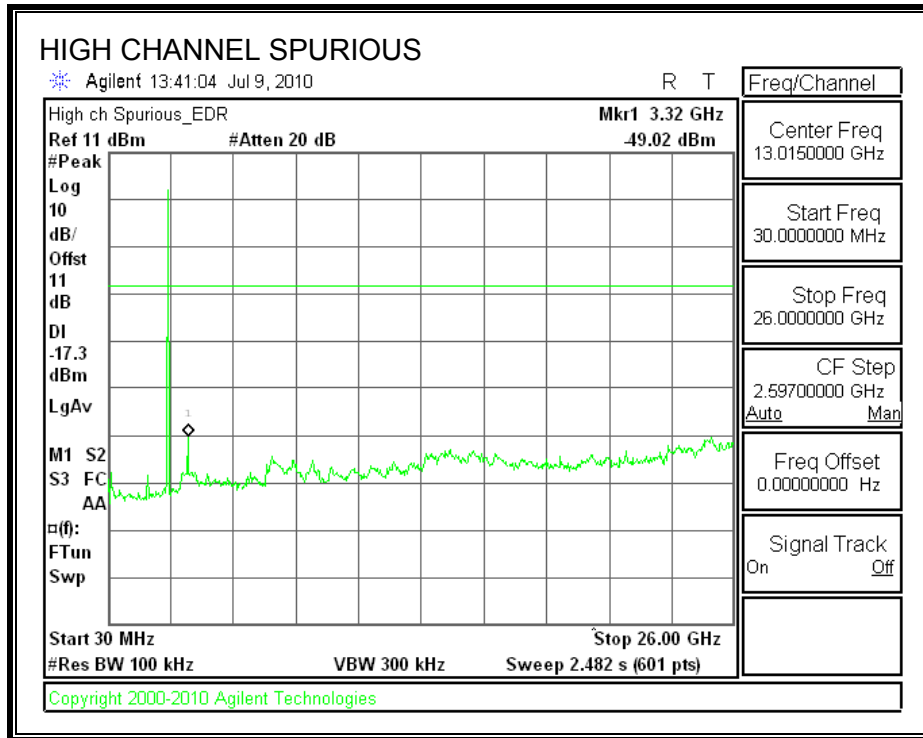
SPURIOUS EMISSIONS, MID CHANNEL



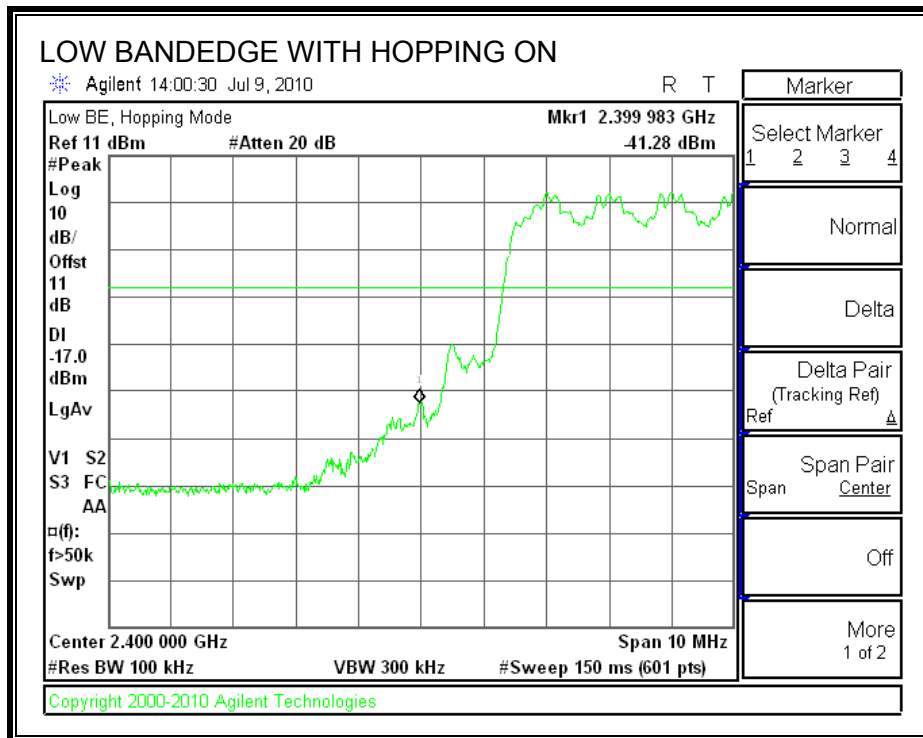


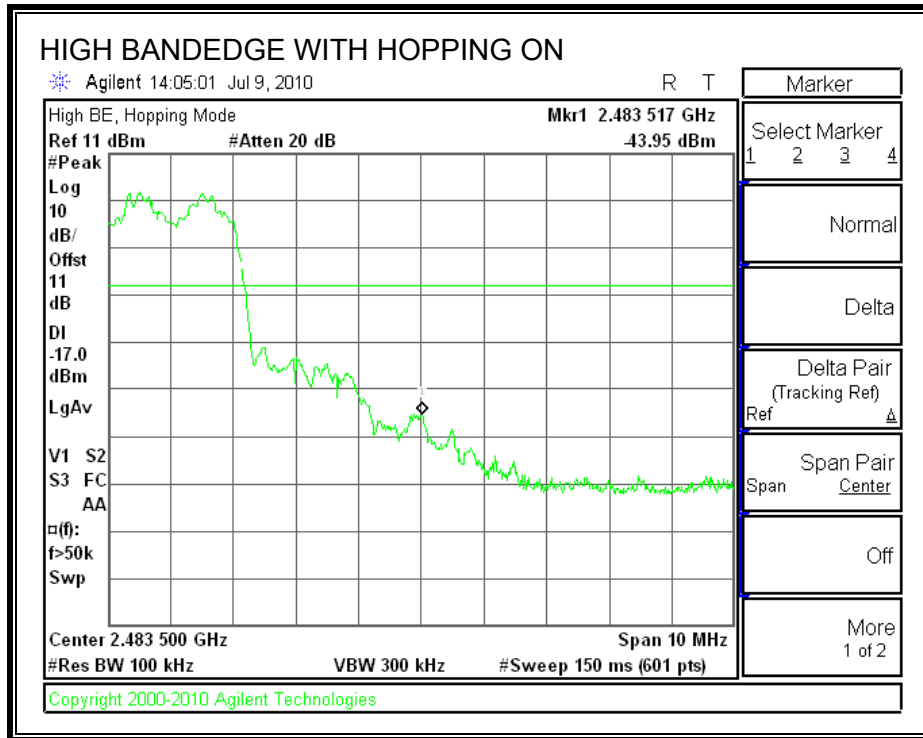
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON





8. ANTENNA PORT TEST RESULTS (MOBILE PHONE MODULE)

8.1. BASIC DATA RATE GFSK MODULATION

8.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

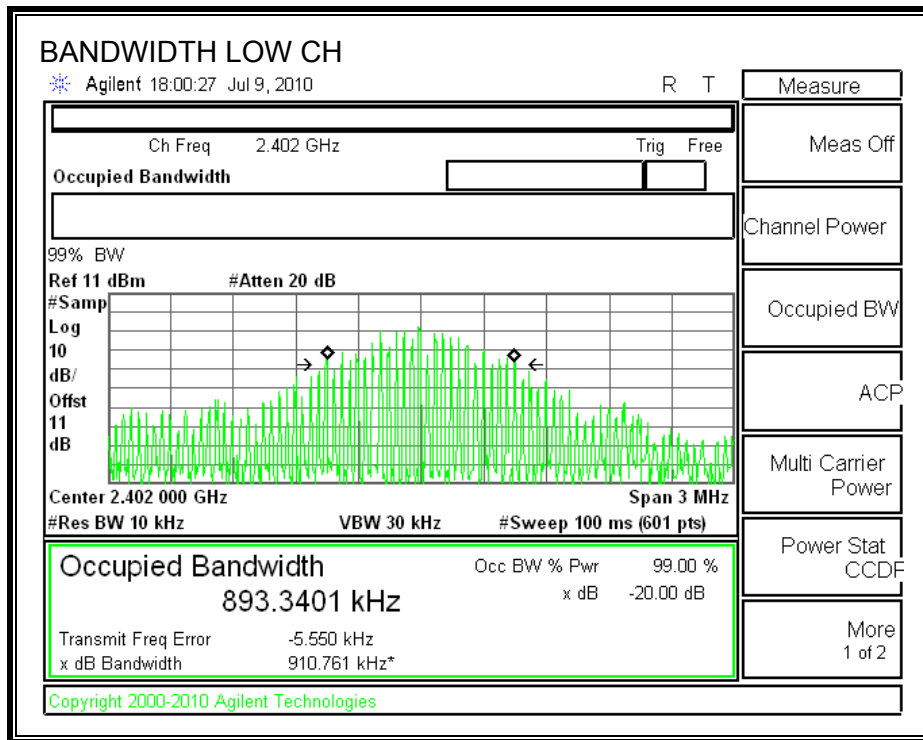
TEST PROCEDURE

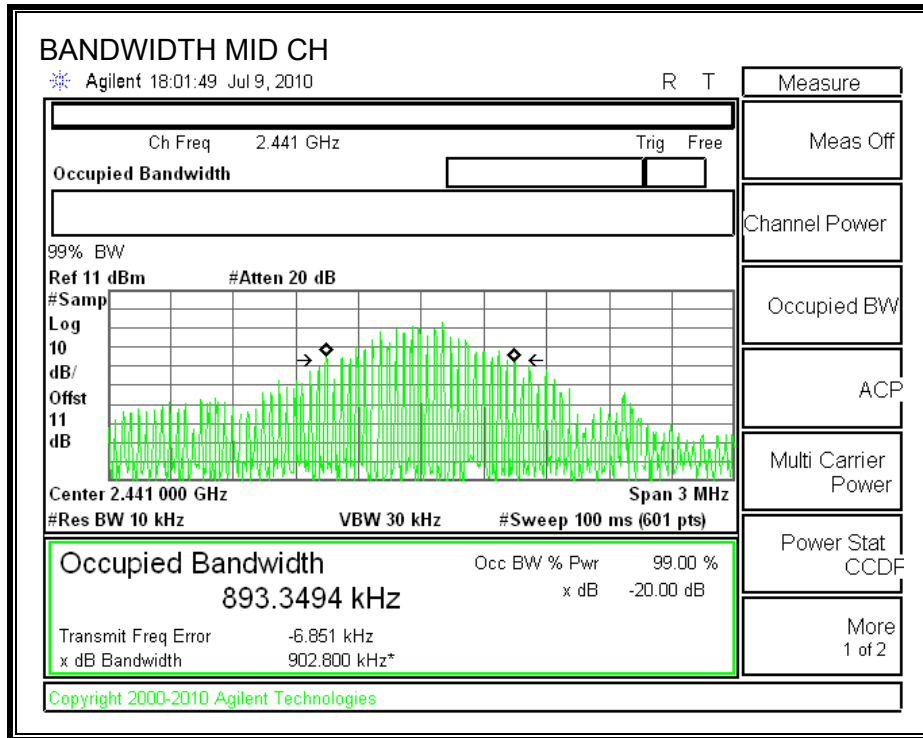
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

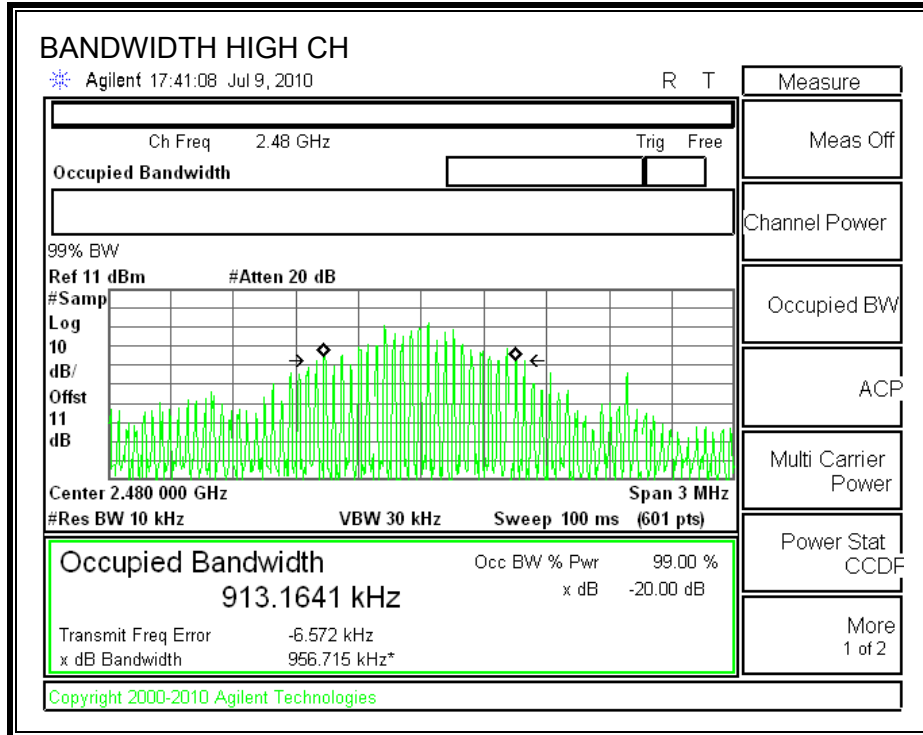
RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	918.935	893.3401
Middle	2441	917.93	893.3494
High	2480	918.54	913.1641

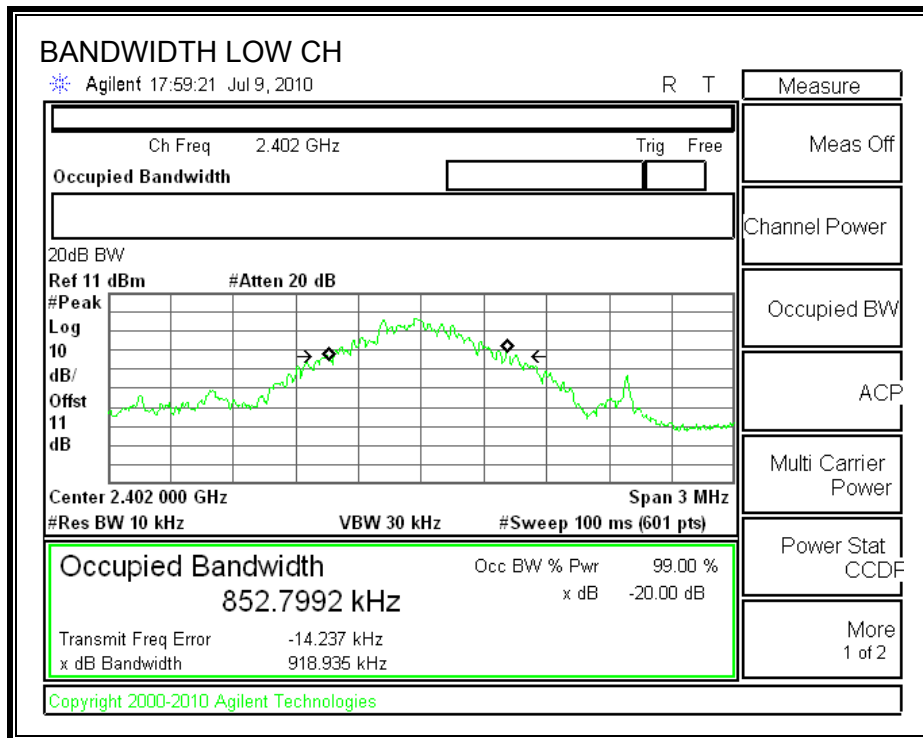
99% BANDWIDTH

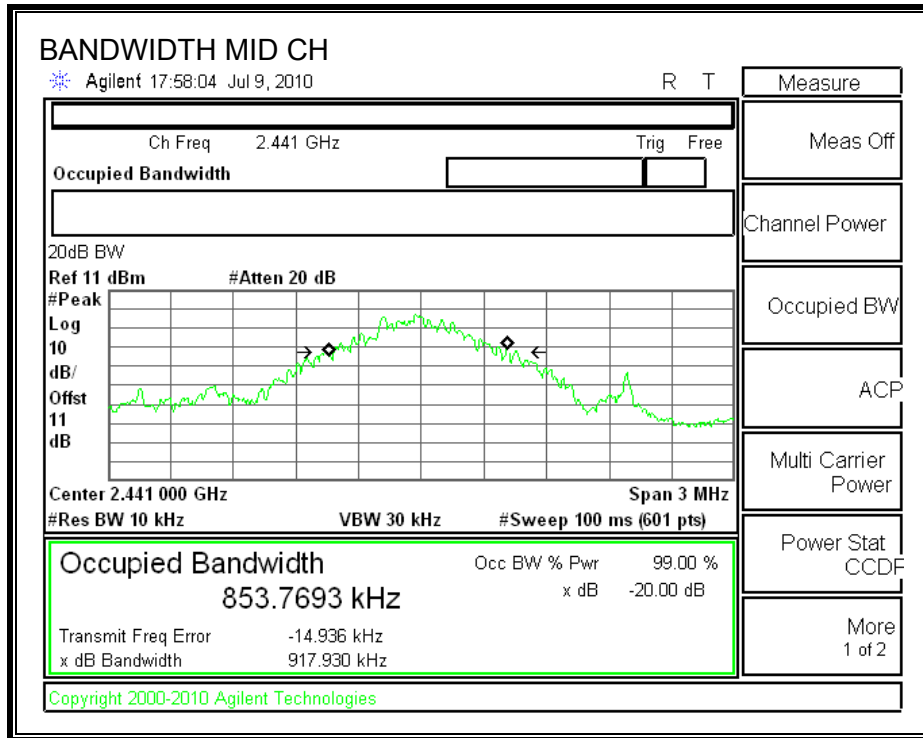


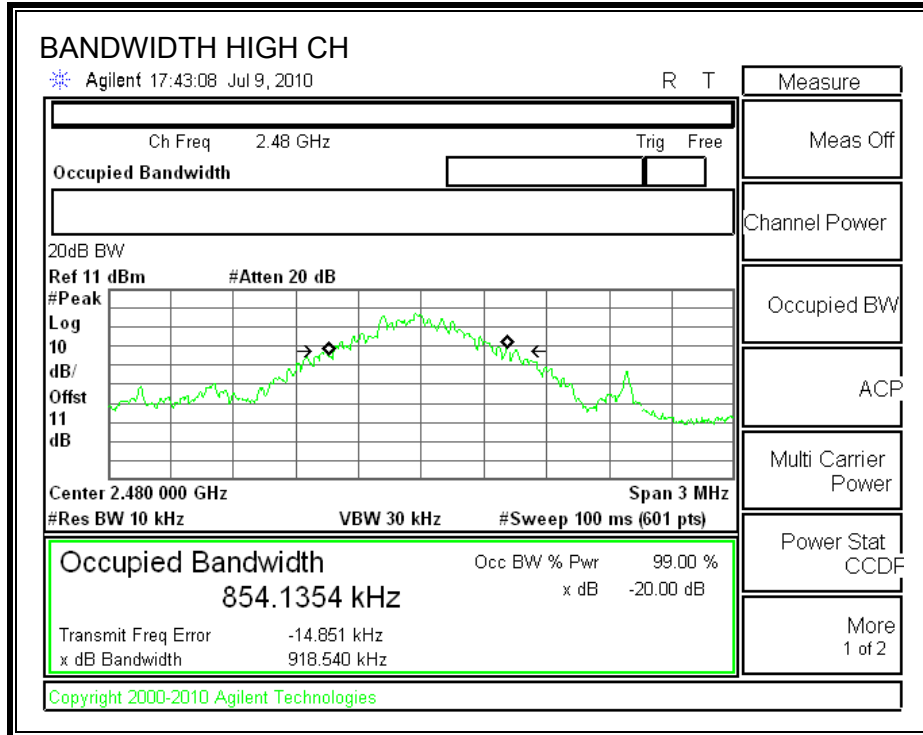




20dB BANDWIDTH







8.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

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.

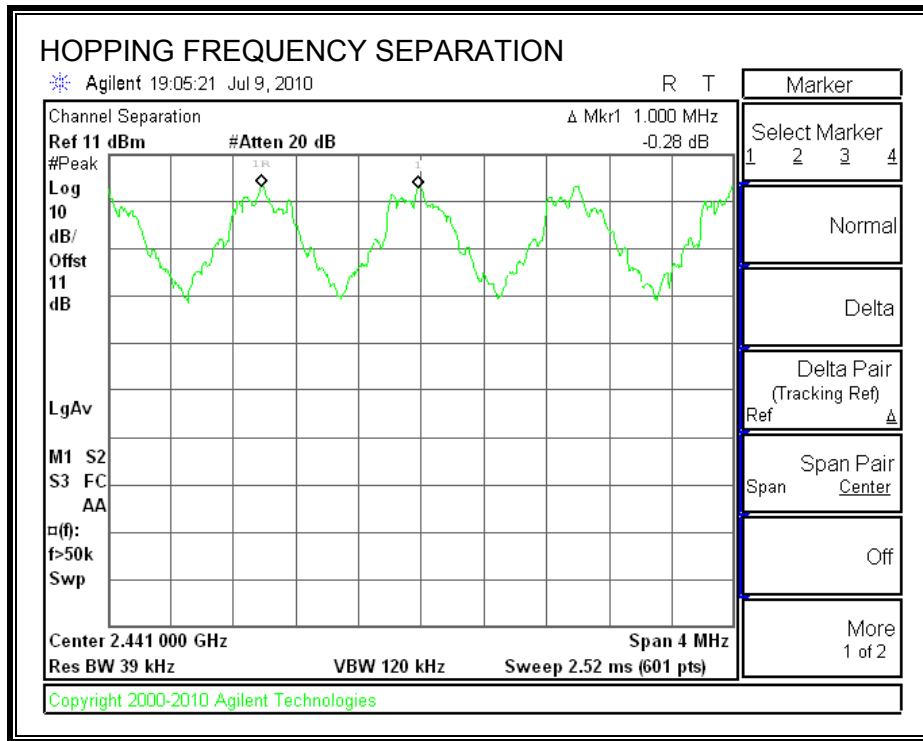
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 39 kHz and the VBW is set to 120 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



8.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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

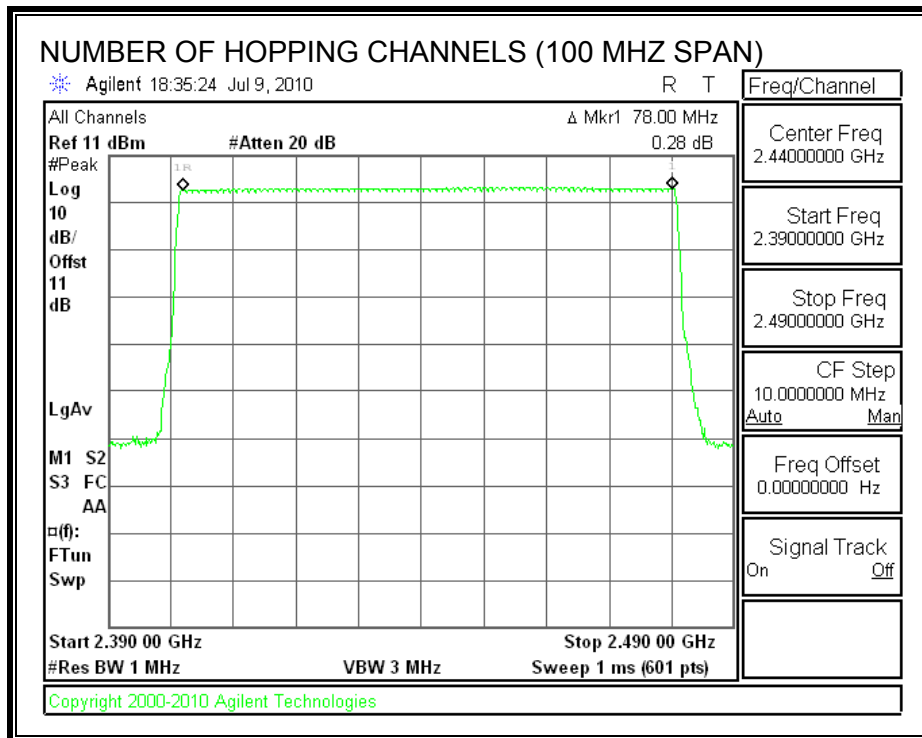
TEST PROCEDURE

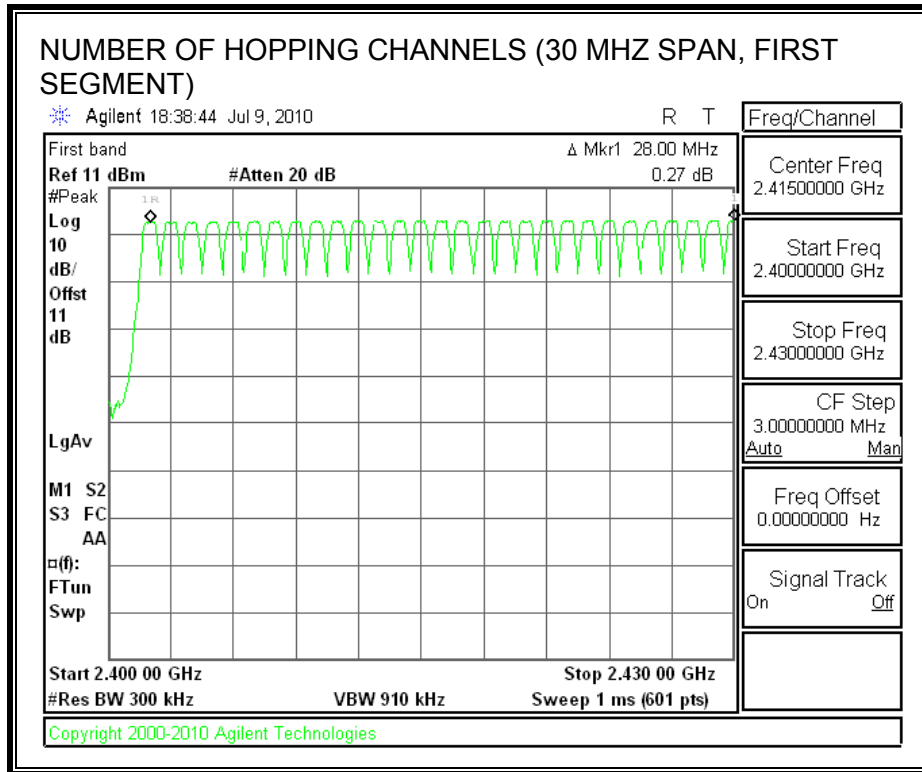
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

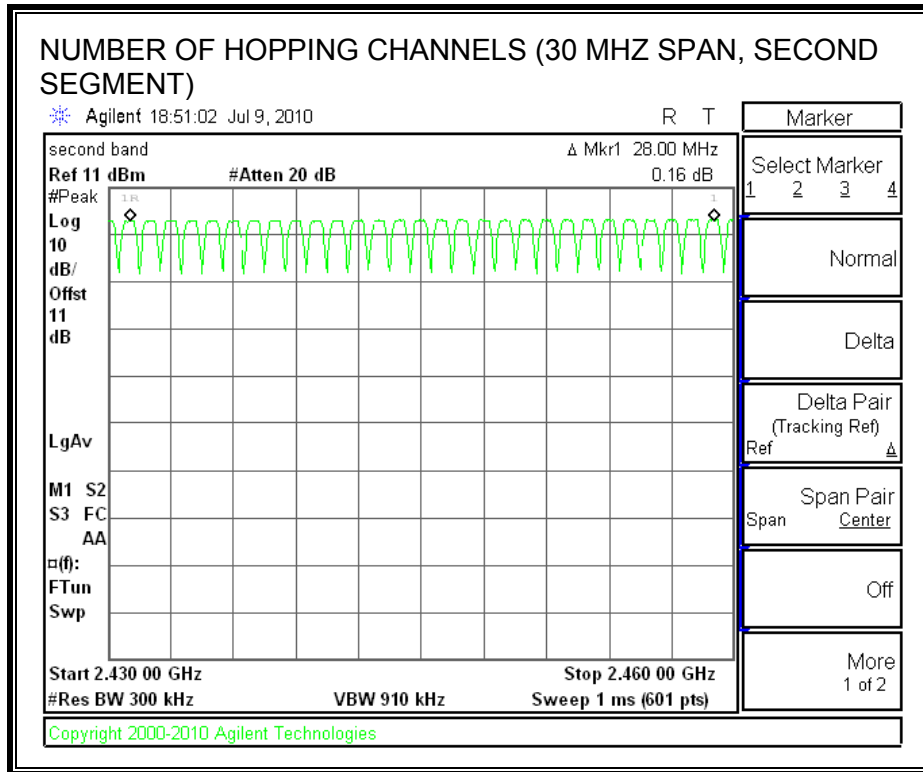
RESULTS

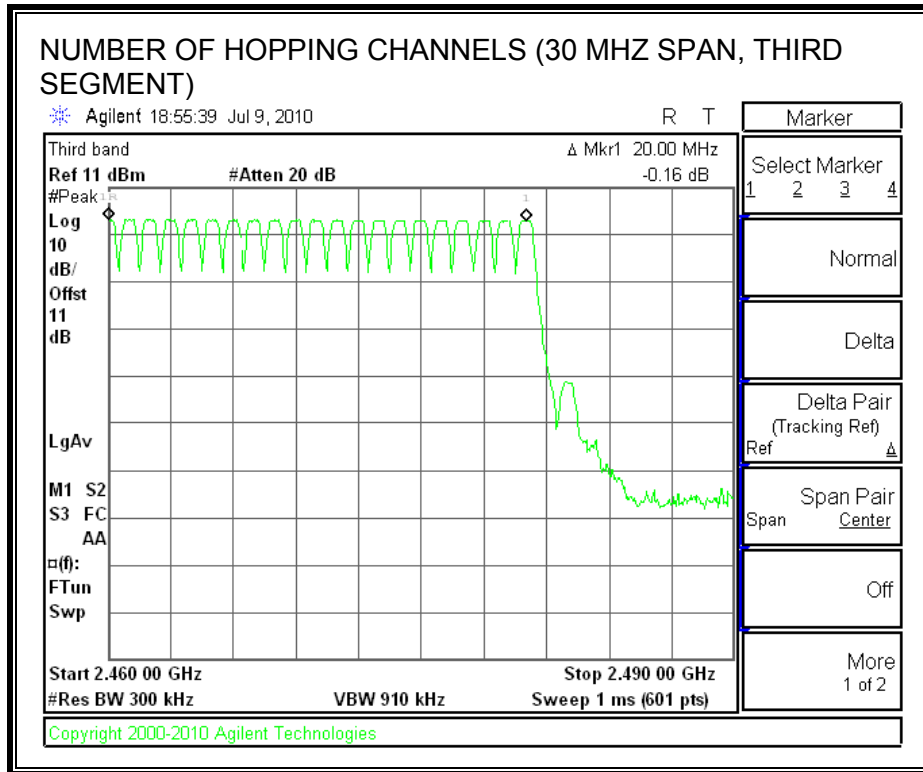
79 Channels observed.

NUMBER OF HOPPING CHANNELS









8.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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 $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

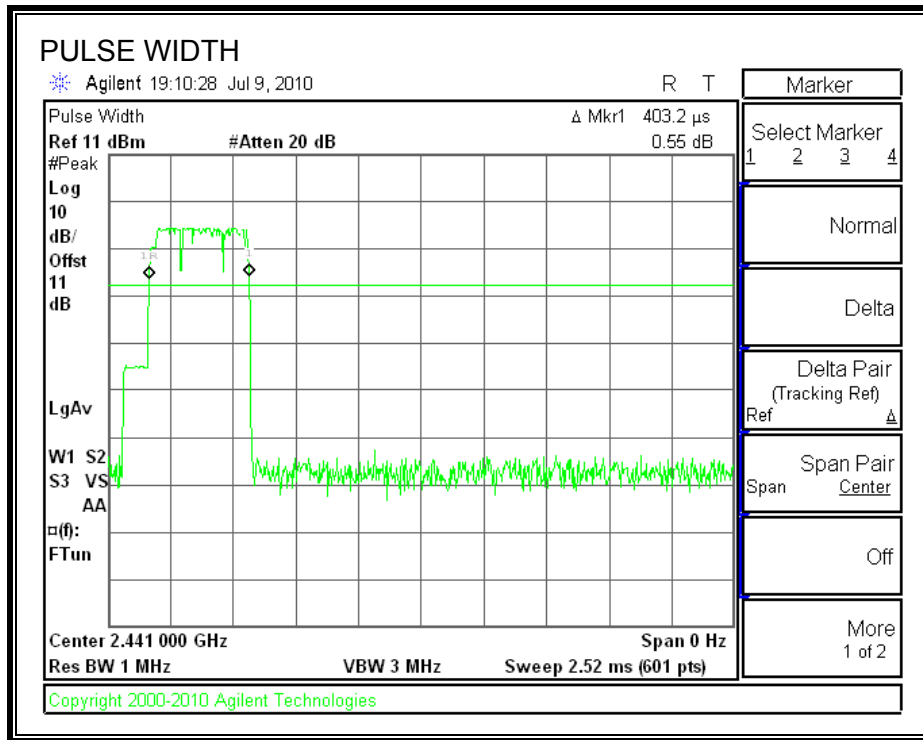
RESULTS

Time Of Occupancy = $10 * xx \text{ pulses} * yy \text{ msec} = zz \text{ msec}$

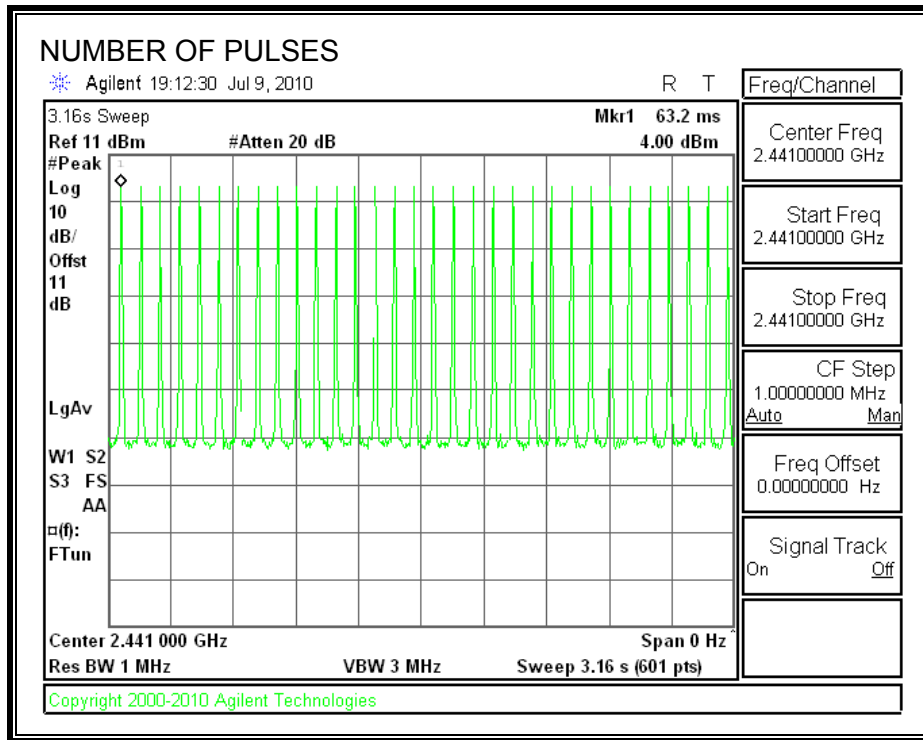
GFSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.4032	32	0.129	0.4	0.271

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



8.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

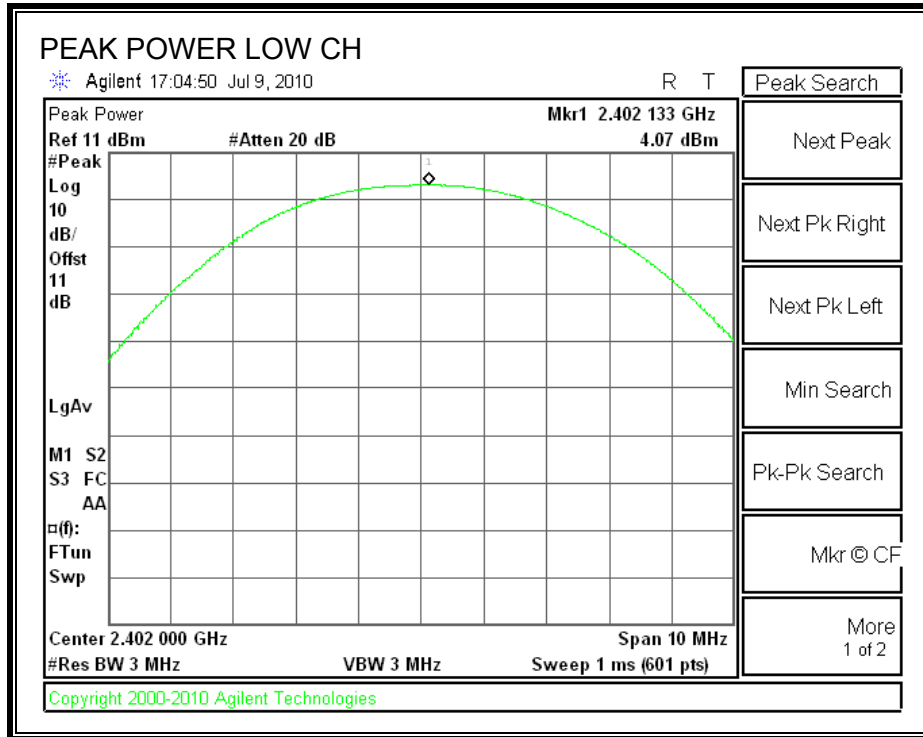
TEST PROCEDURE

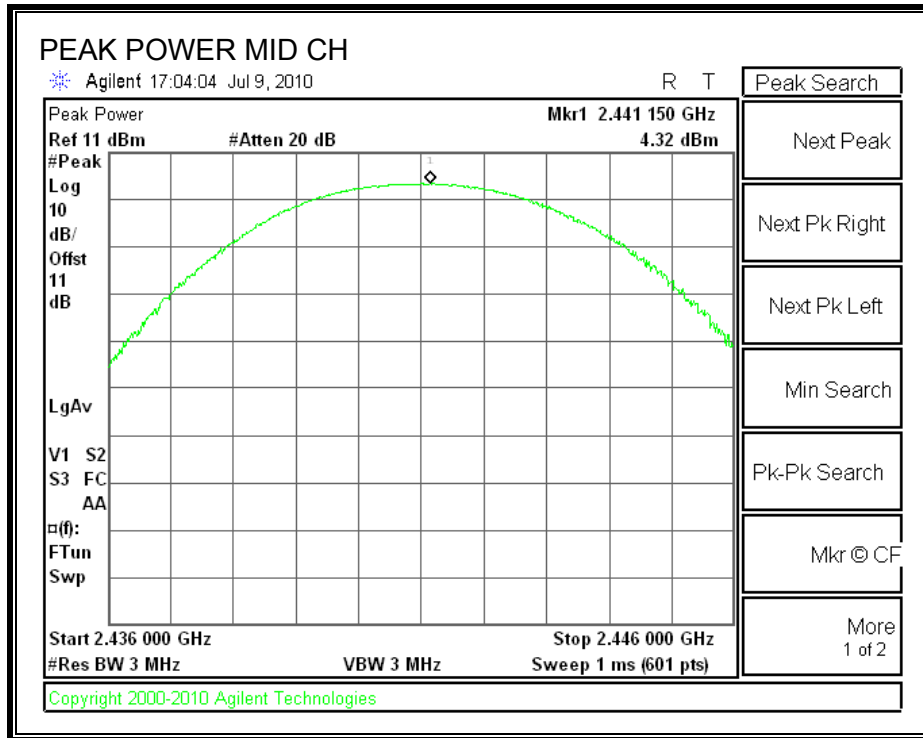
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

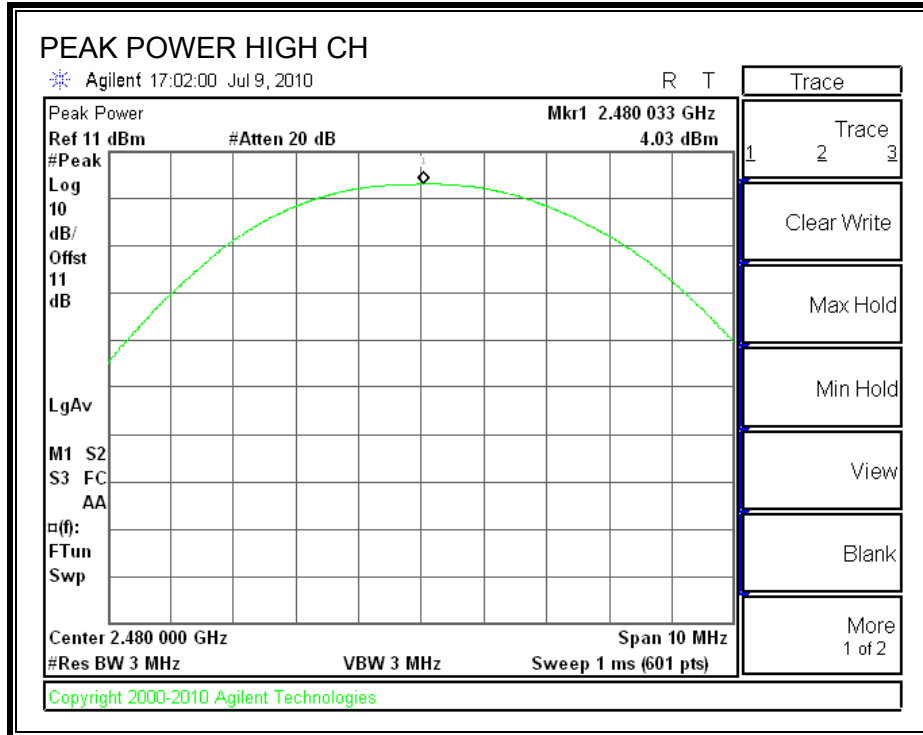
RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	4.07	30	-25.93
Middle	2441	4.32	30	-25.68
High	2480	4.03	30	-25.97

OUTPUT POWER







8.1.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and .5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	0.47
Middle	2441	0.63
High	2480	0.61

8.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

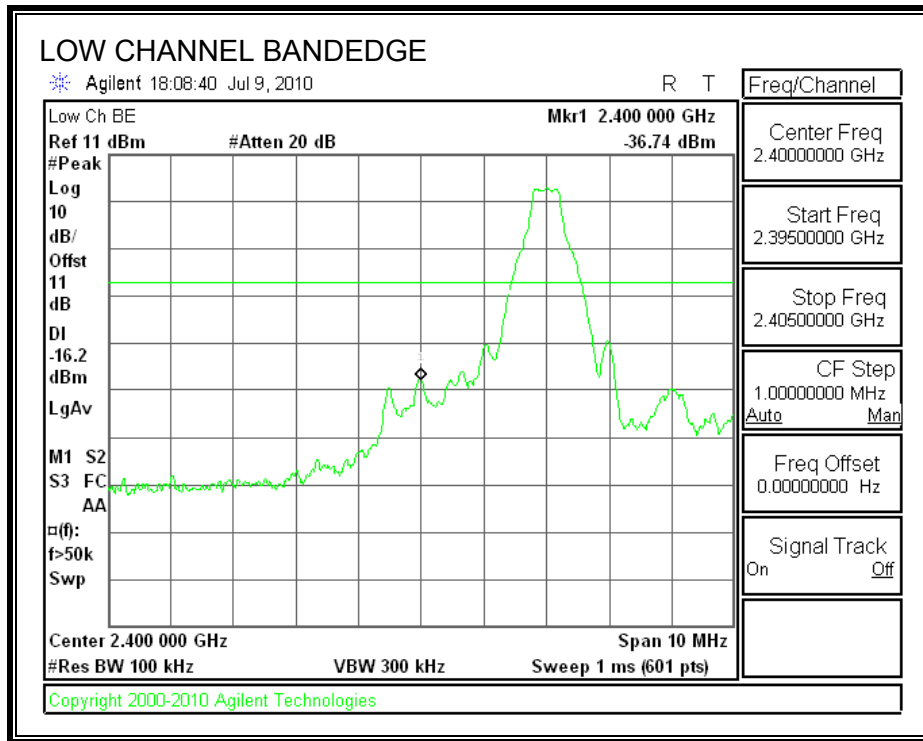
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

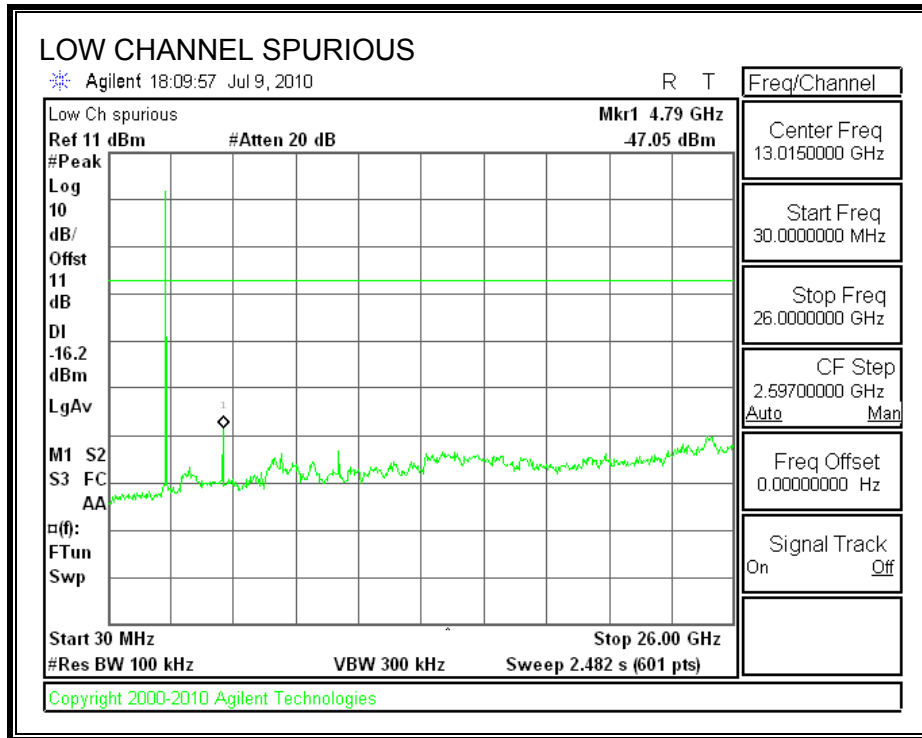
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

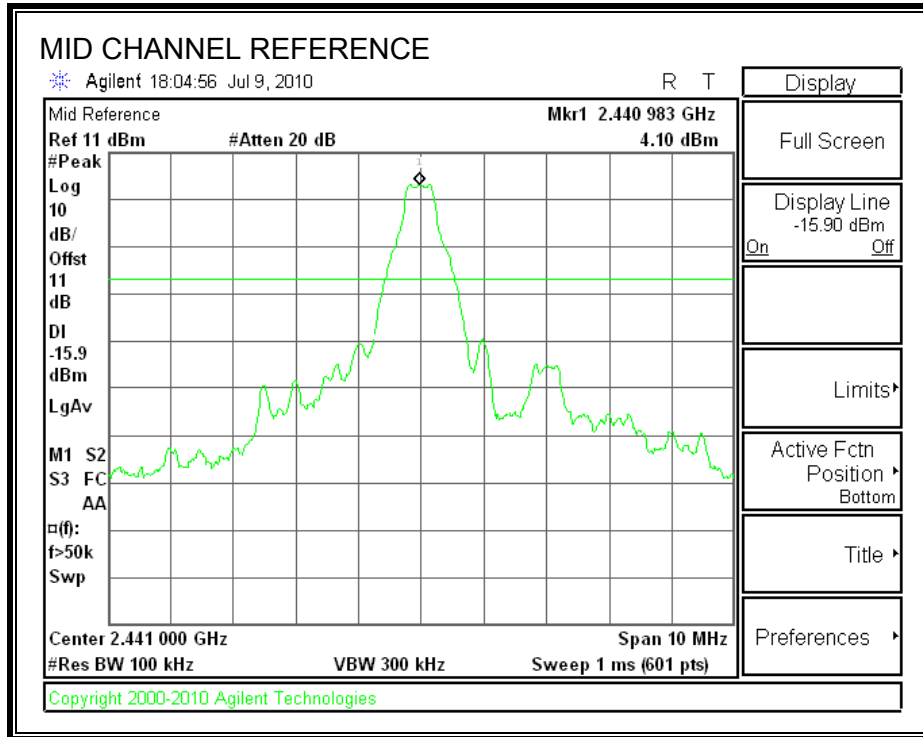
RESULTS

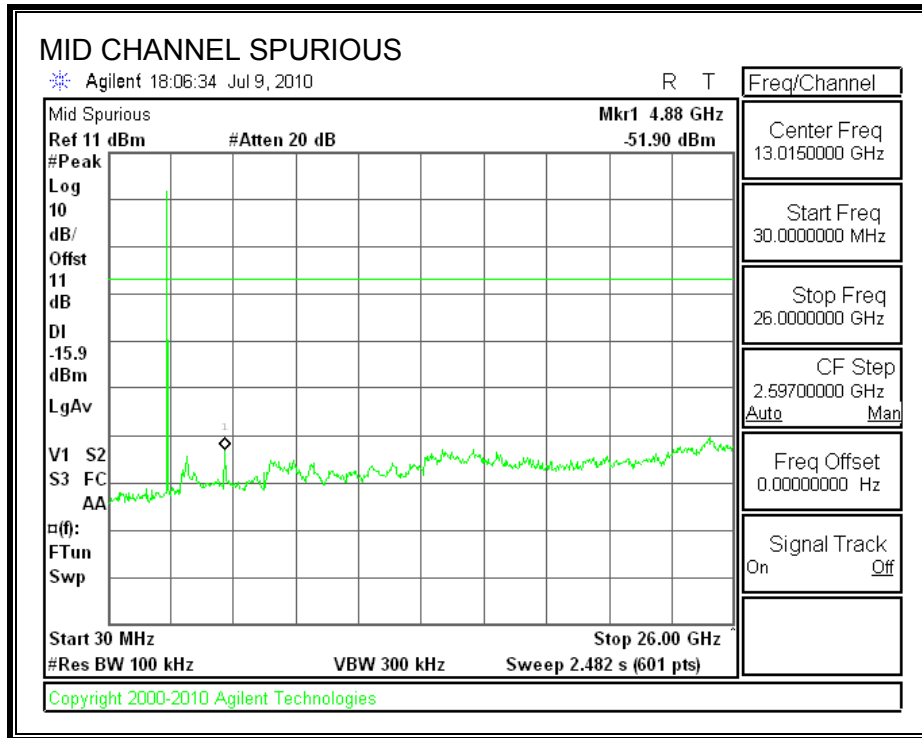
SPURIOUS EMISSIONS, LOW CHANNEL



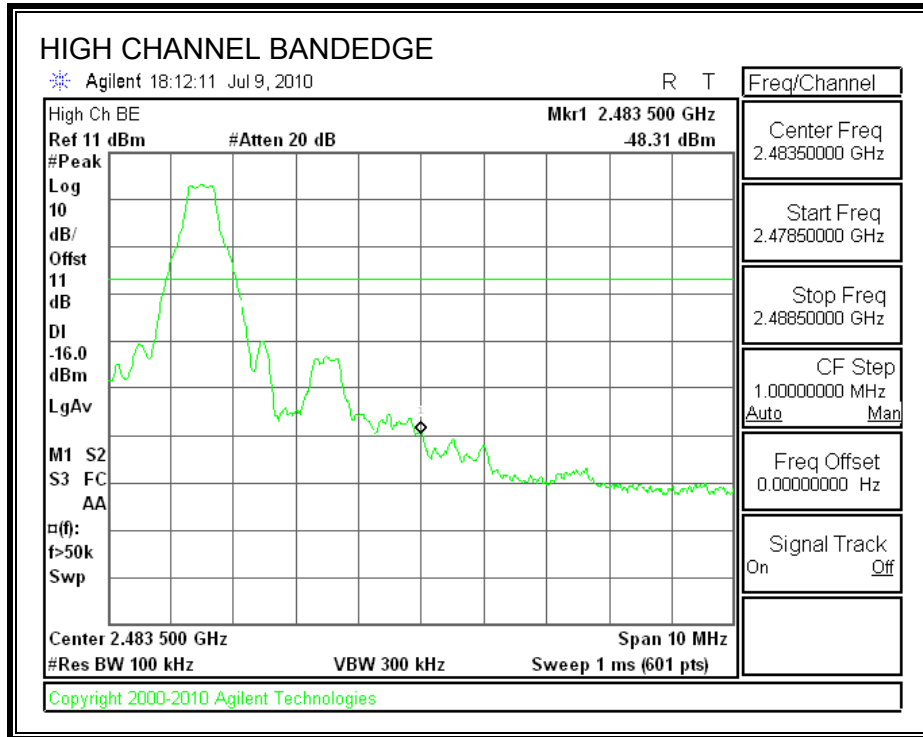


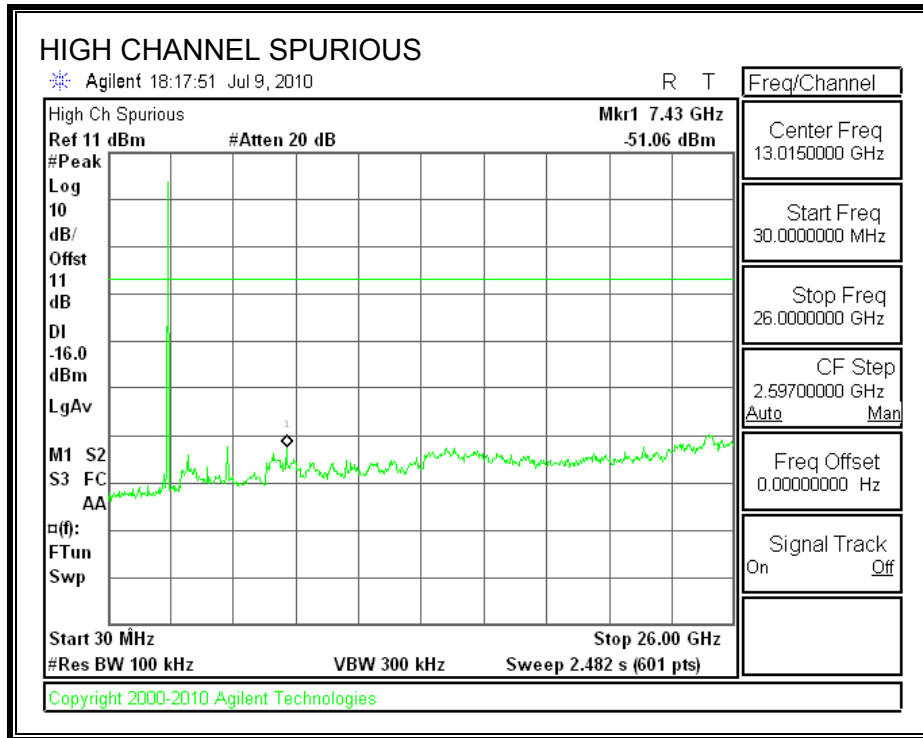
SPURIOUS EMISSIONS, MID CHANNEL



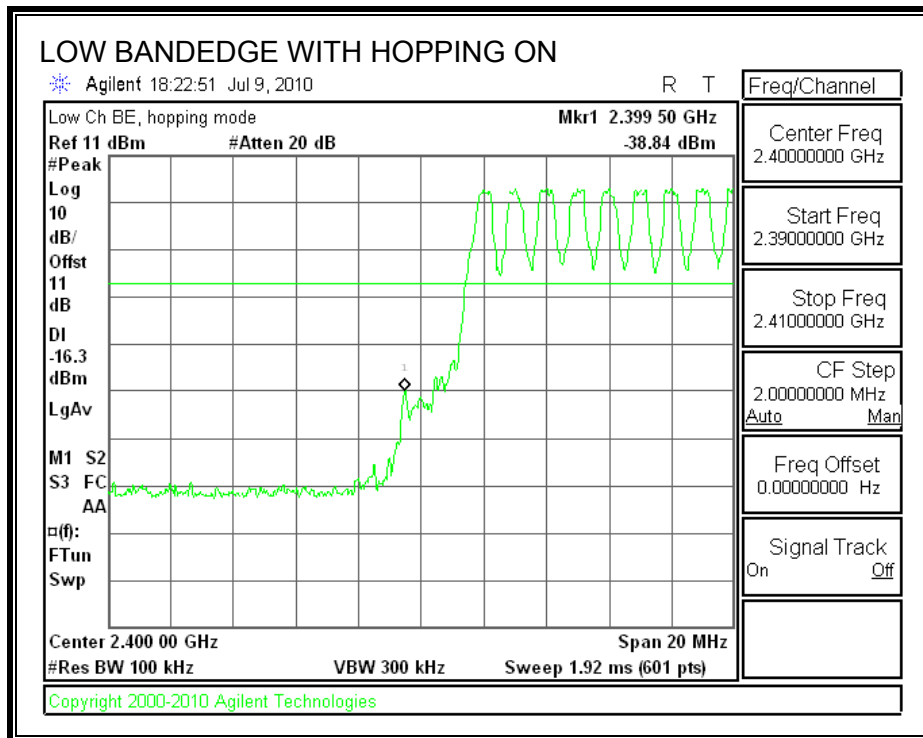


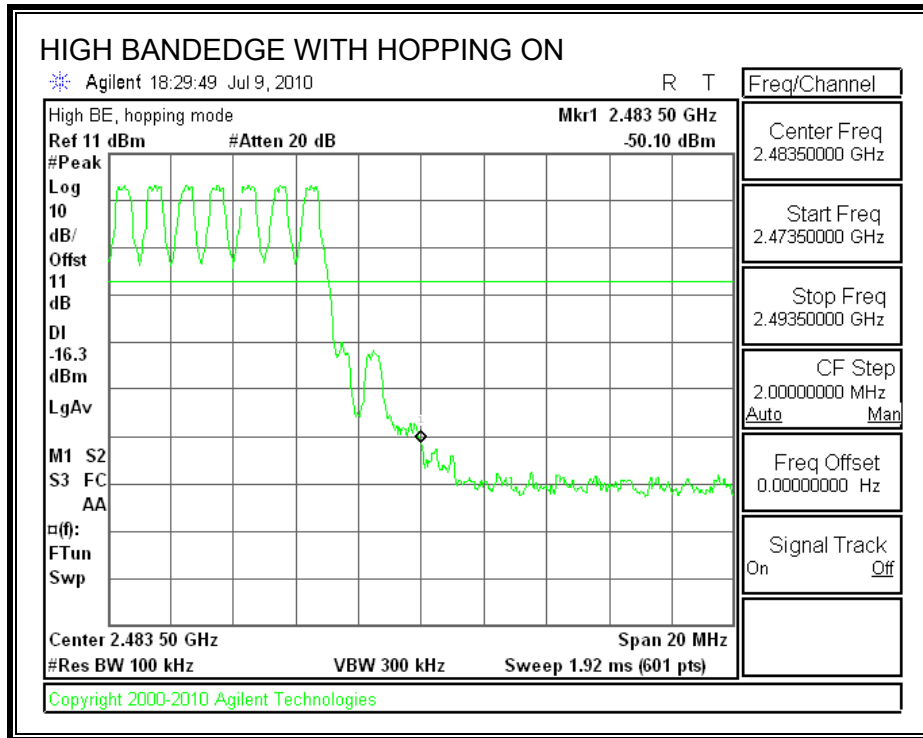
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON





8.2. ENHANCED DATA RATE 8PSK MODULATION

8.2.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

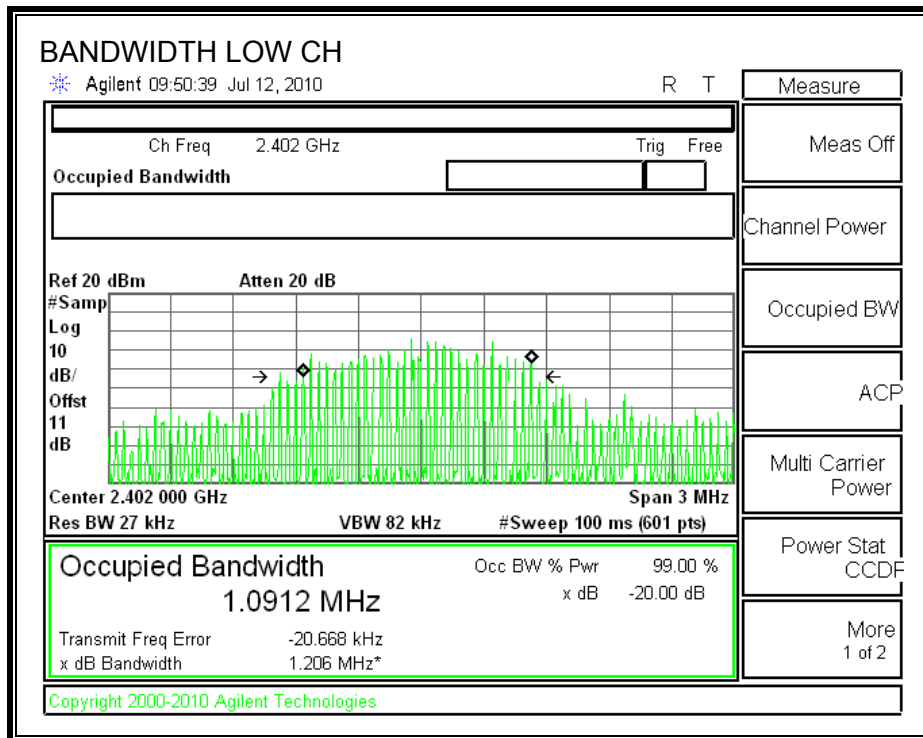
TEST PROCEDURE

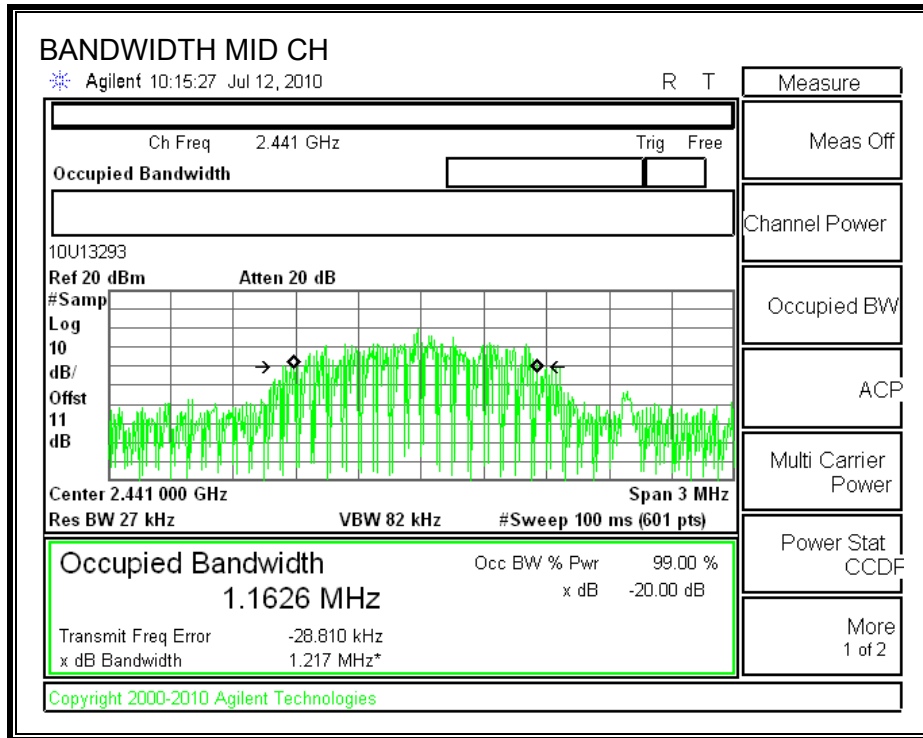
The transmitter output is connected to a spectrum analyzer. The RBW is set to $\geq 1\%$ of the 20 dB bandwidth. The VBW is set to \geq RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.211	1.0912
Middle	2441	1.214	1.1626
High	2480	1.218	1.2312

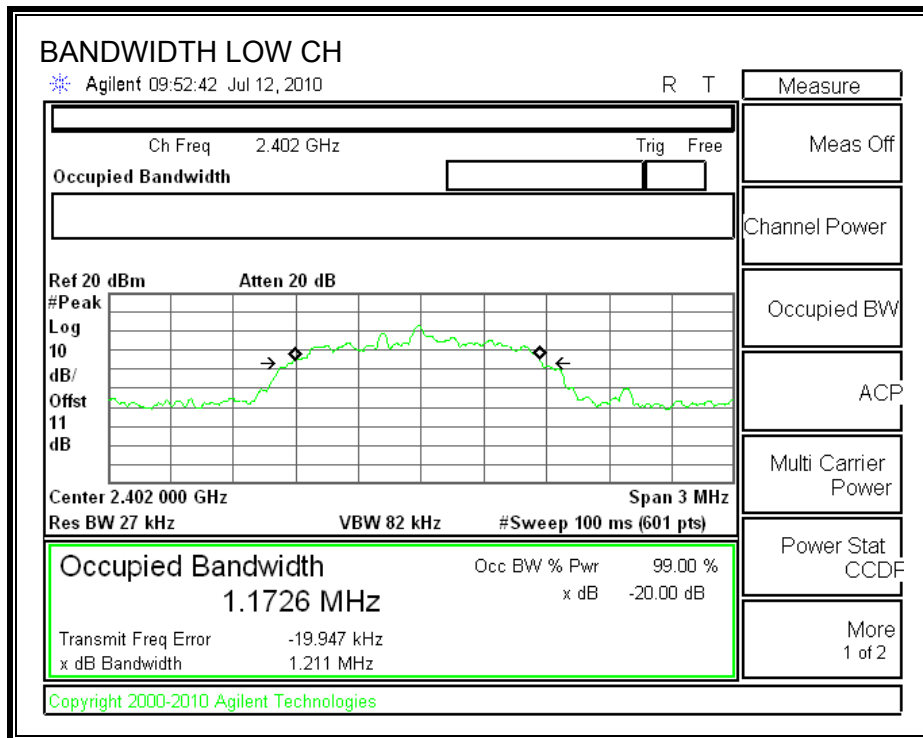
99% BANDWIDTH

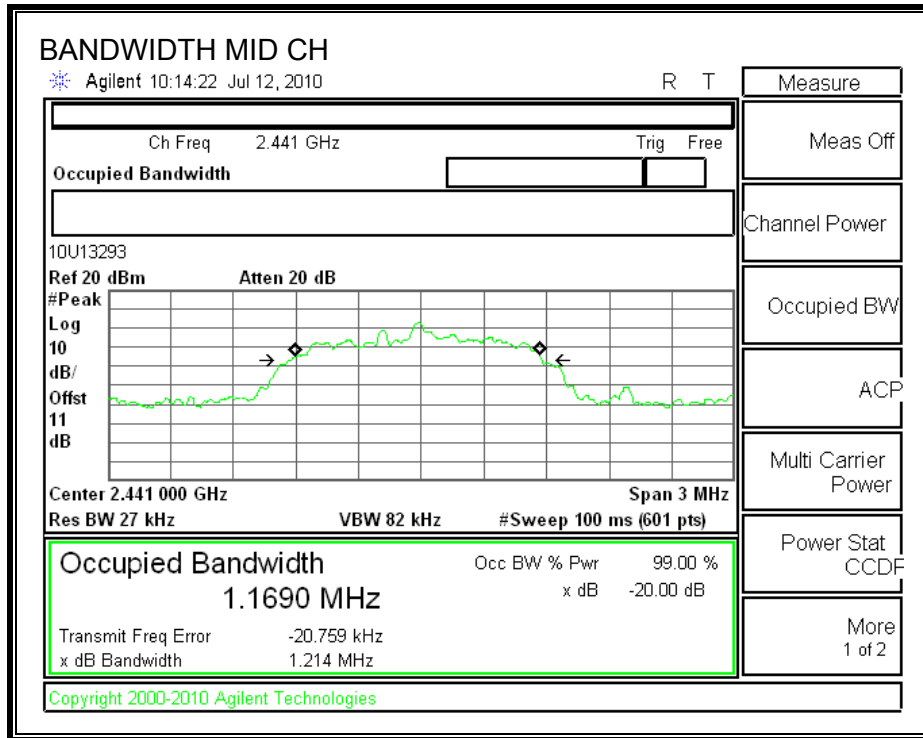


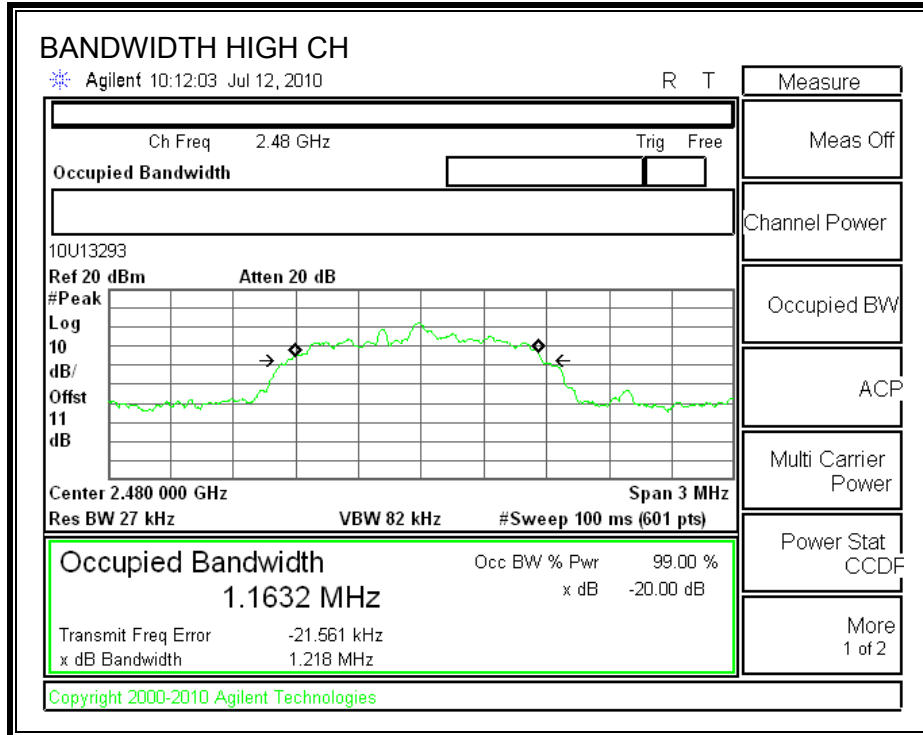




20dB BANDWIDTH







8.2.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

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.

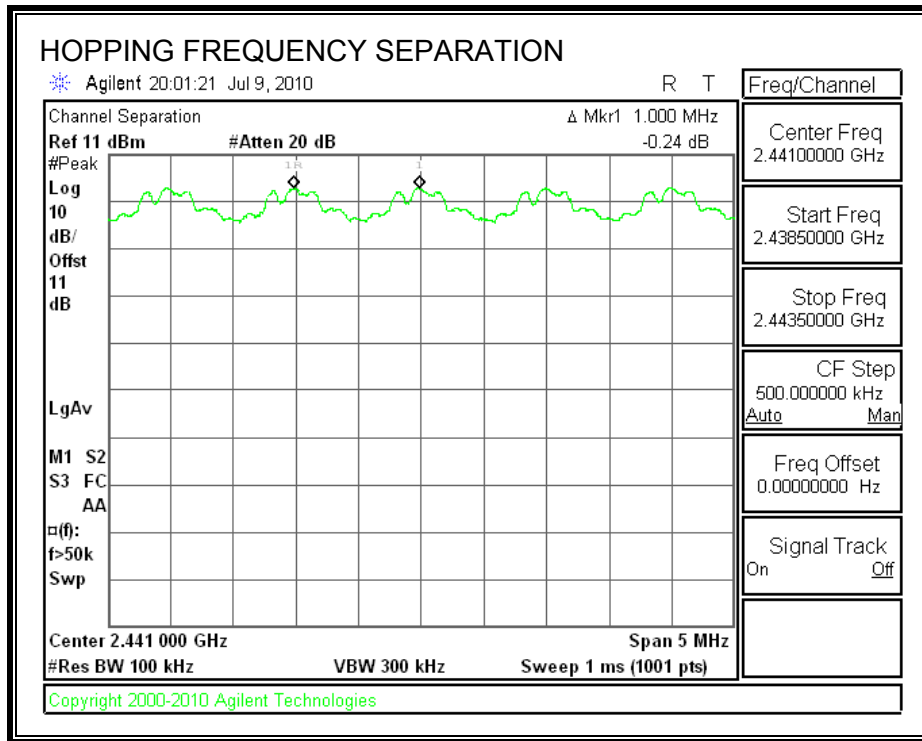
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

HOPPING FREQUENCY SEPARATION



8.2.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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

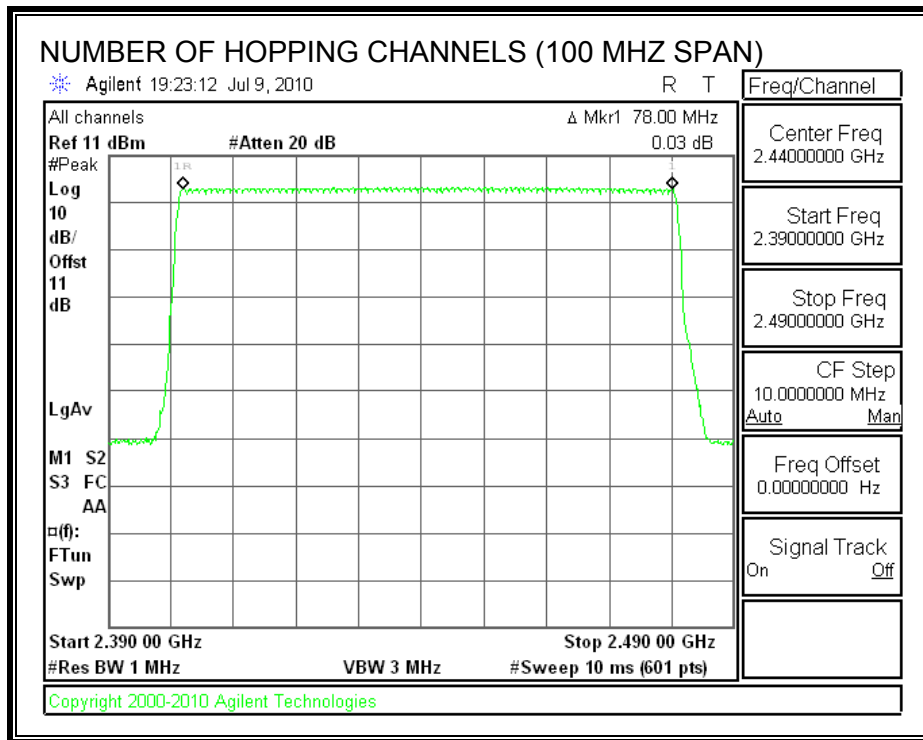
TEST PROCEDURE

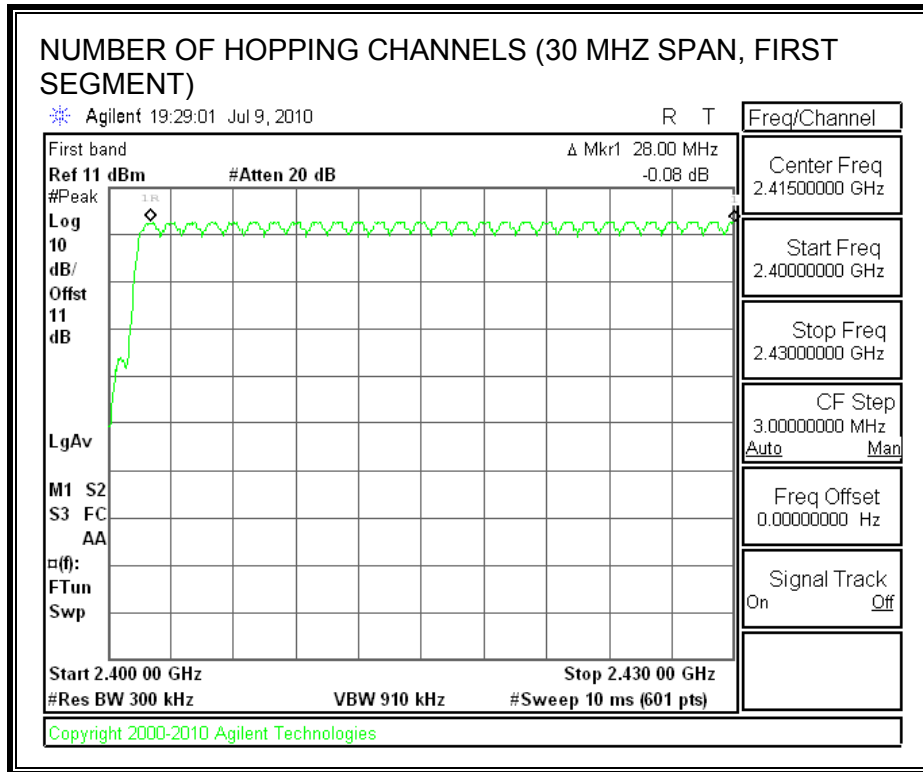
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

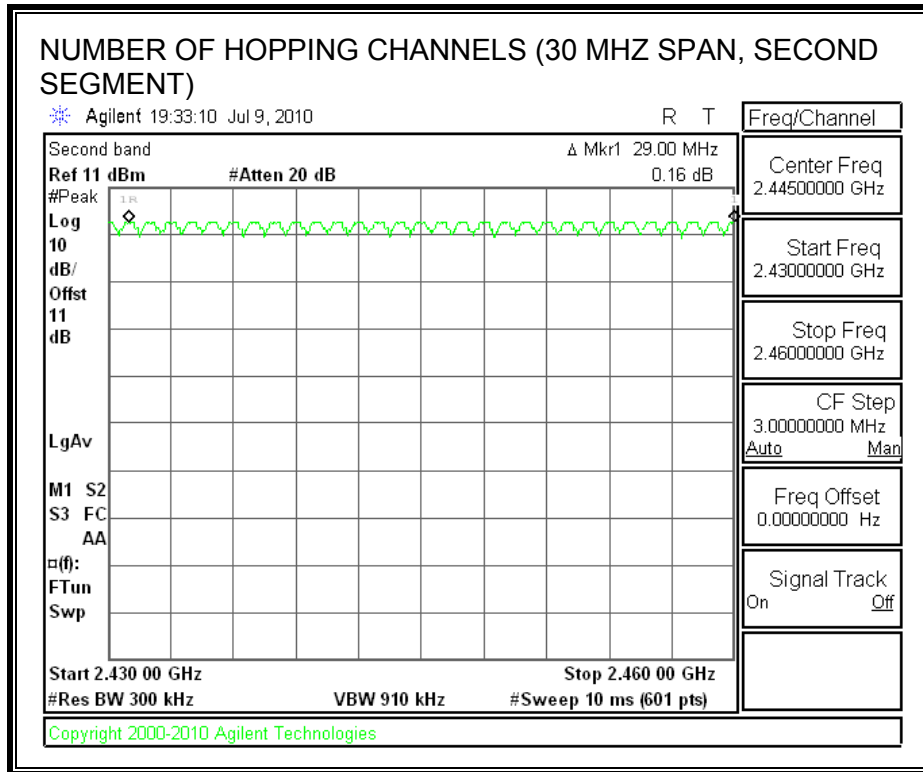
RESULTS

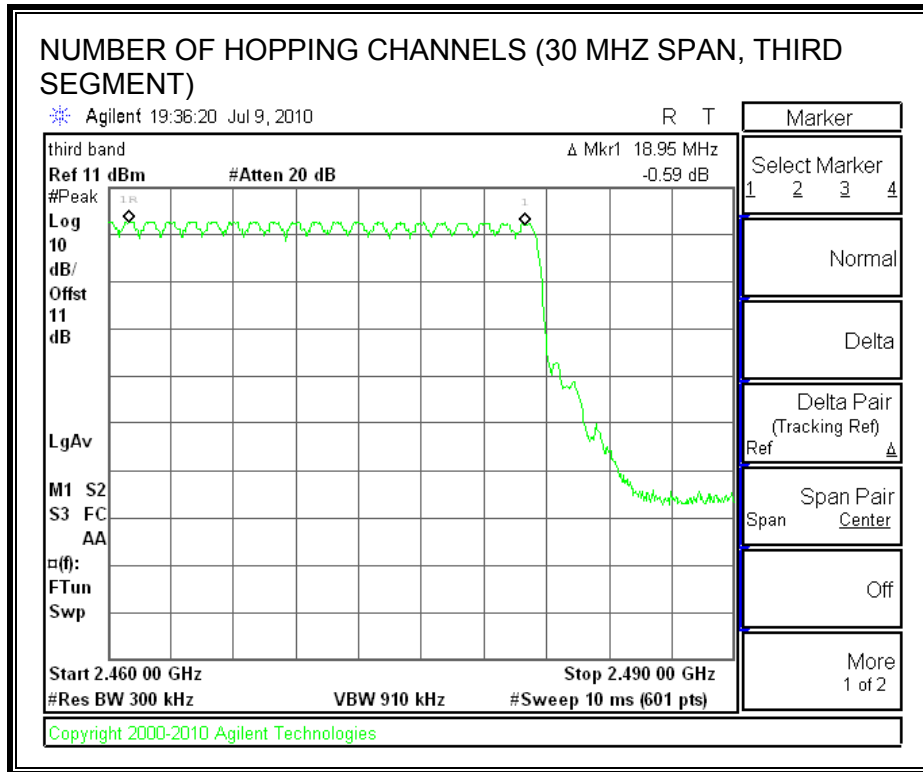
79 Channels observed.

NUMBER OF HOPPING CHANNELS









8.2.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

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 $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{ pulse width}$.

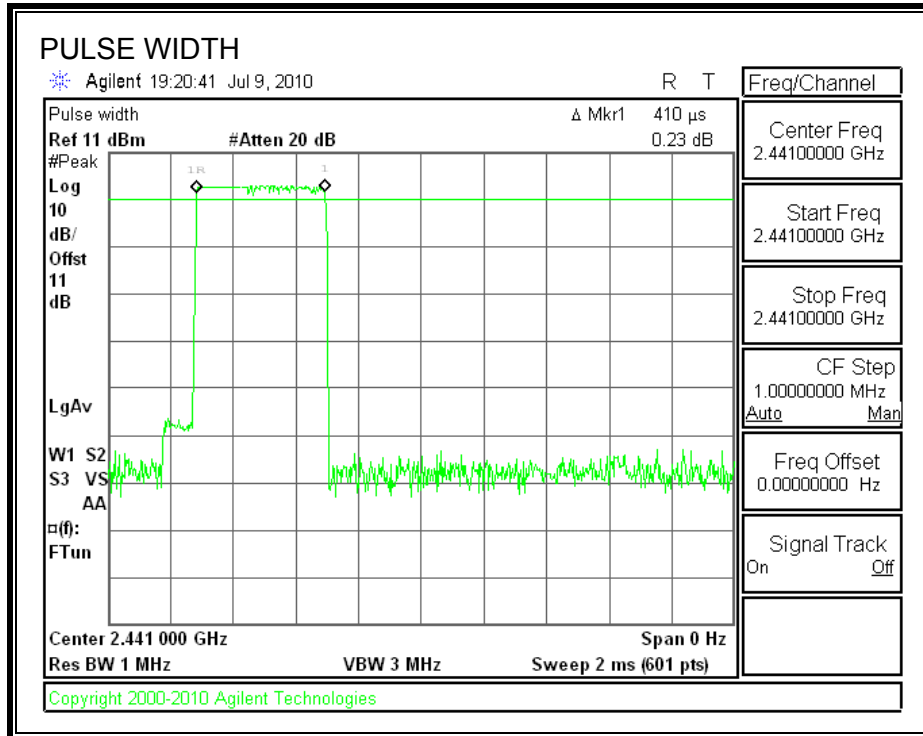
RESULTS

Time Of Occupancy = $10 * xx \text{ pulses} * yy \text{ msec} = zz \text{ msec}$

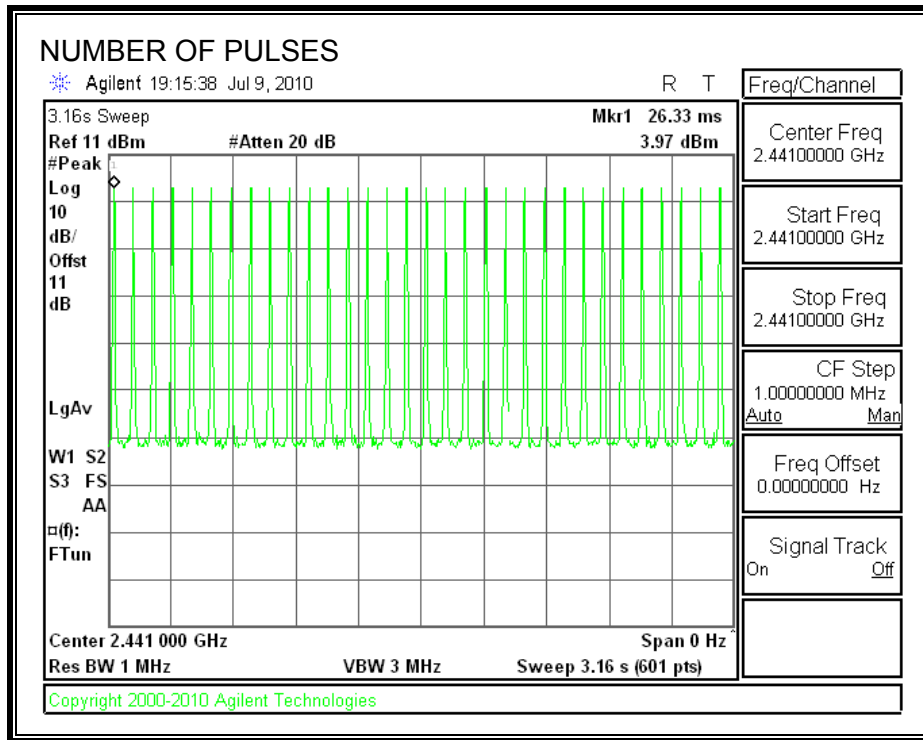
8PSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH1	0.41	32	0.131	0.4	0.269

PULSE WIDTH



NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



8.2.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 7 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

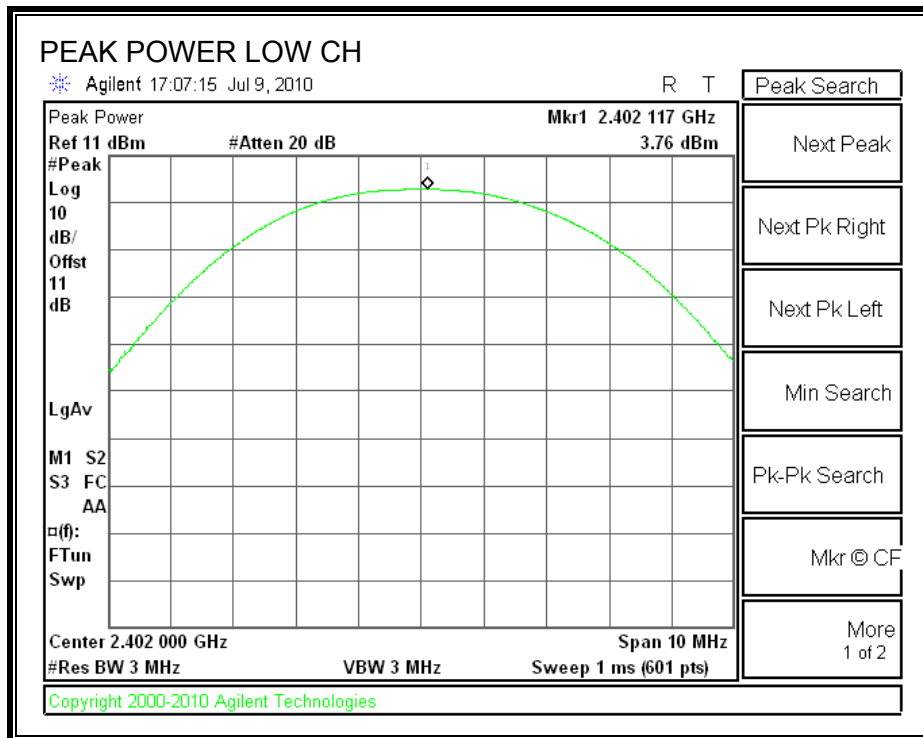
TEST PROCEDURE

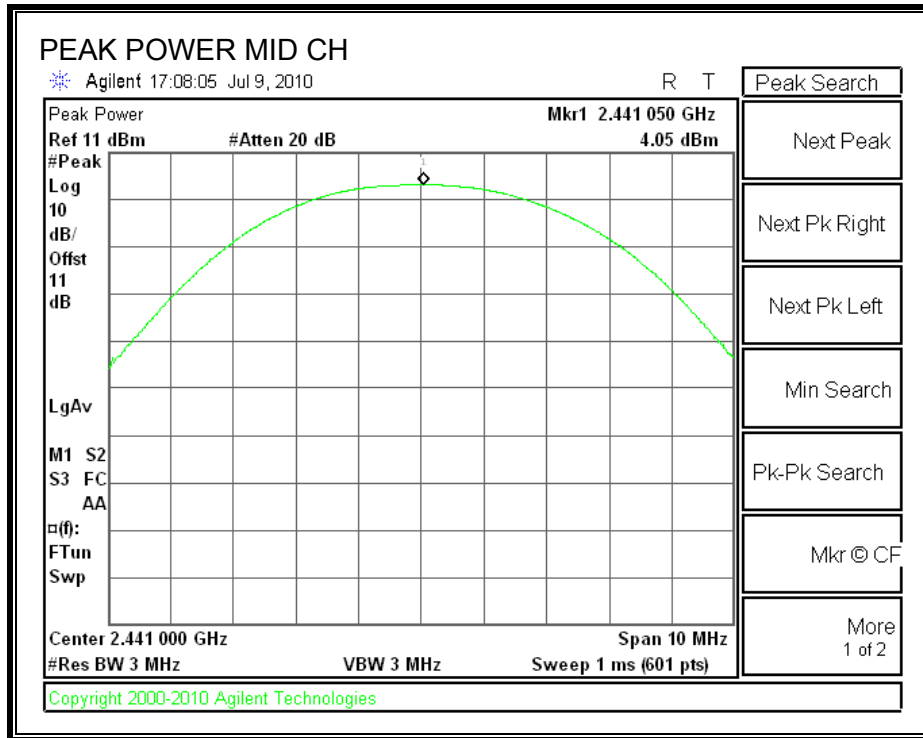
The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

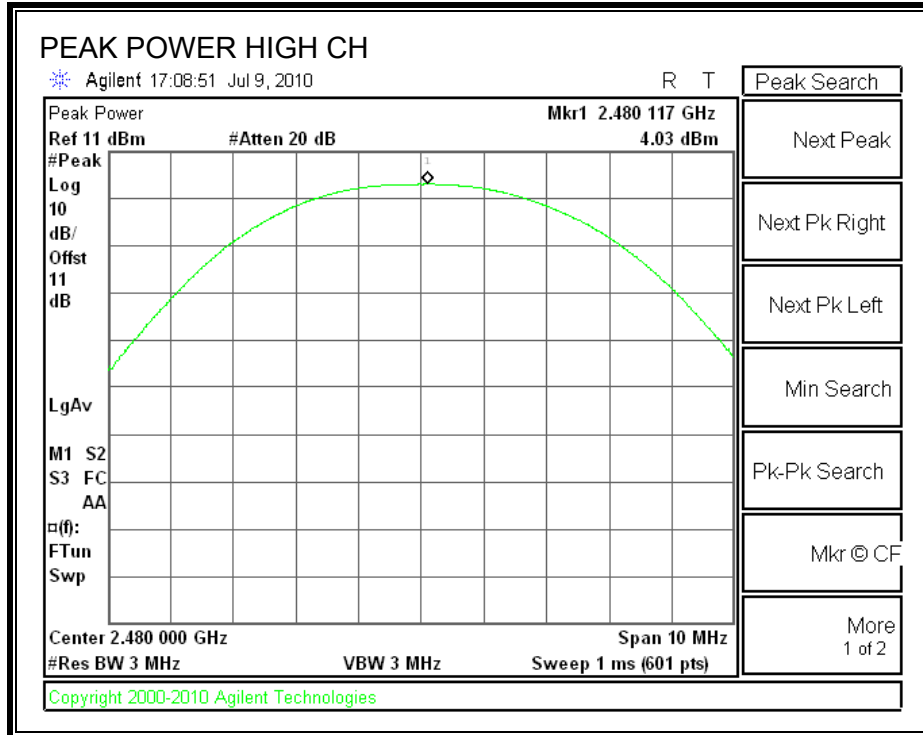
RESULTS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	3.76	30	-26.24
Middle	2441	4.05	30	-25.95
High	2480	4.03	30	-25.97

OUTPUT POWER







8.2.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and .5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	1.98
Middle	2441	1.79
High	2480	1.62

8.2.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

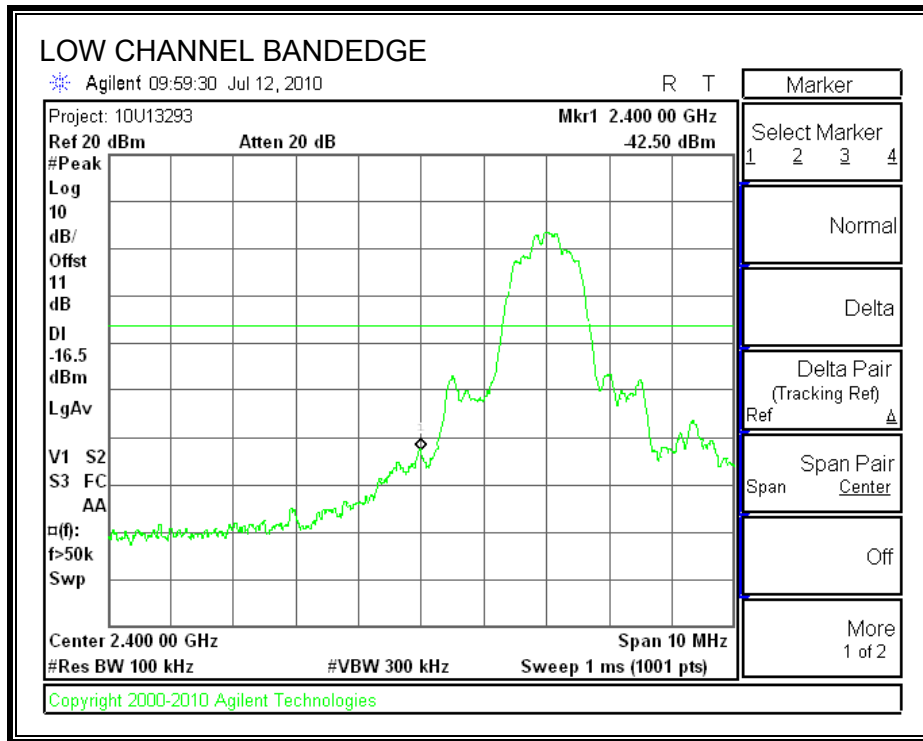
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

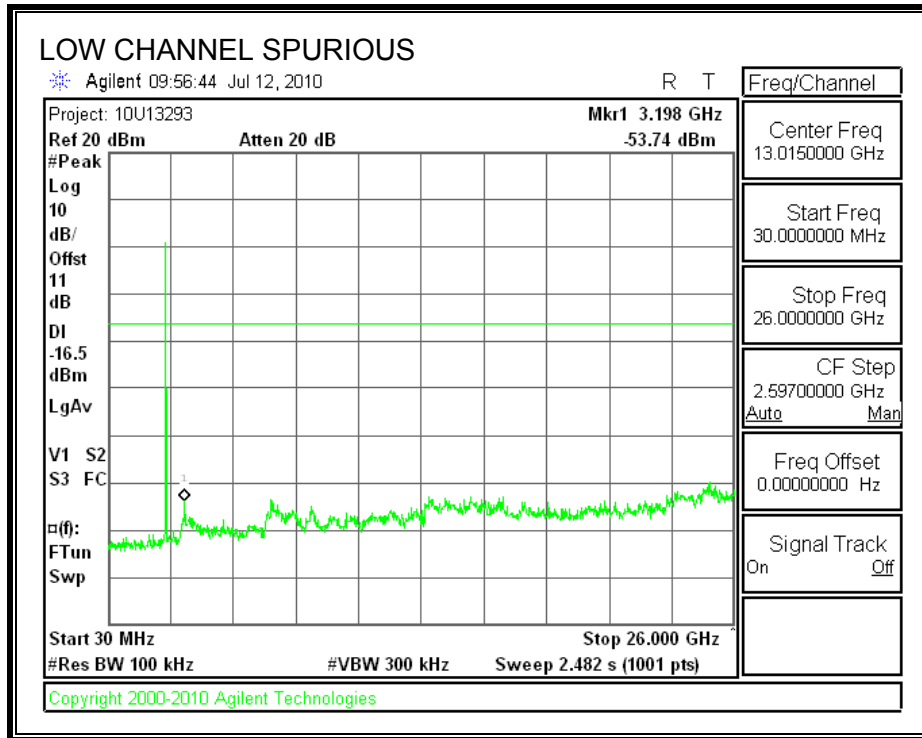
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

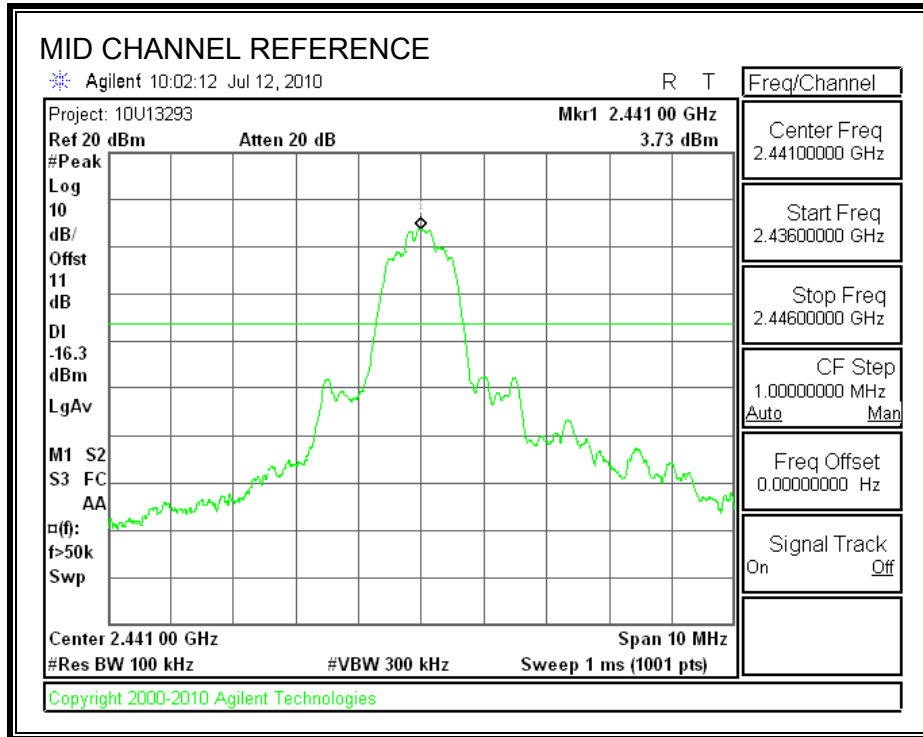
RESULTS

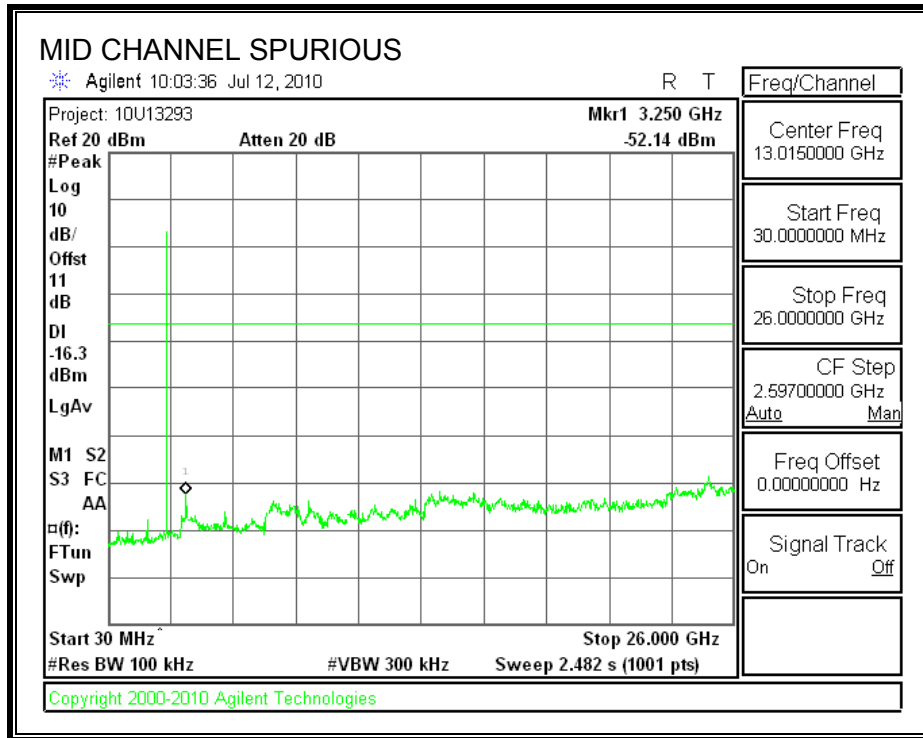
SPURIOUS EMISSIONS, LOW CHANNEL



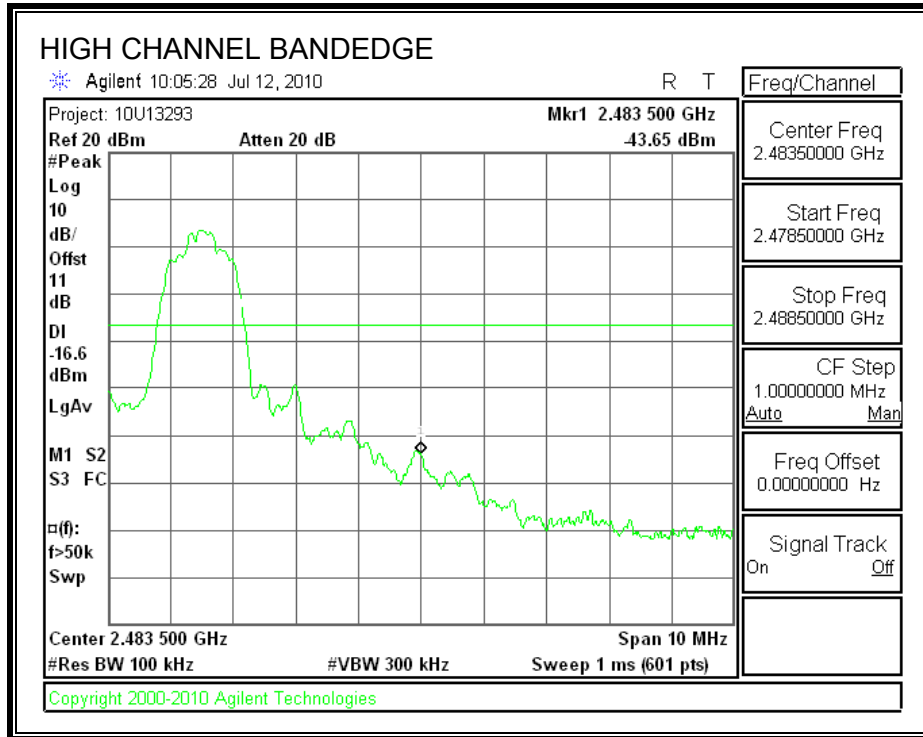


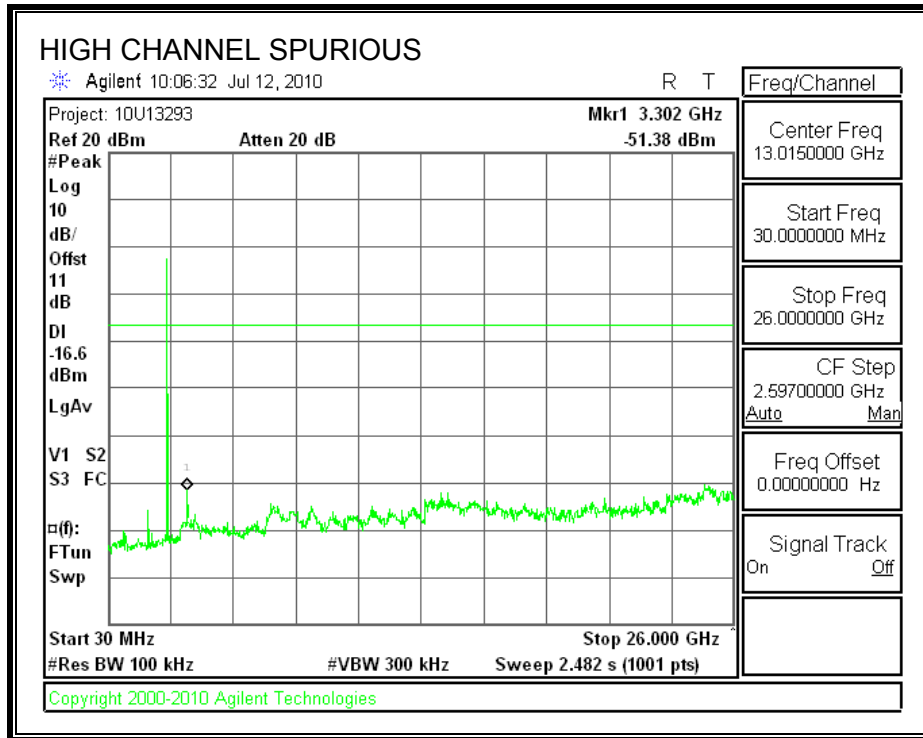
SPURIOUS EMISSIONS, MID CHANNEL



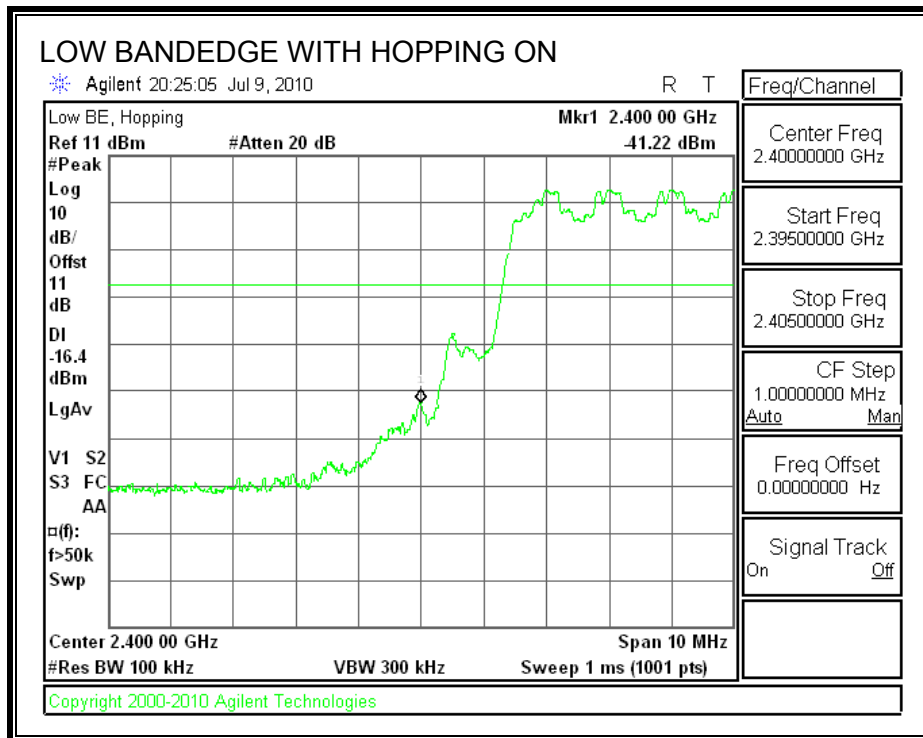


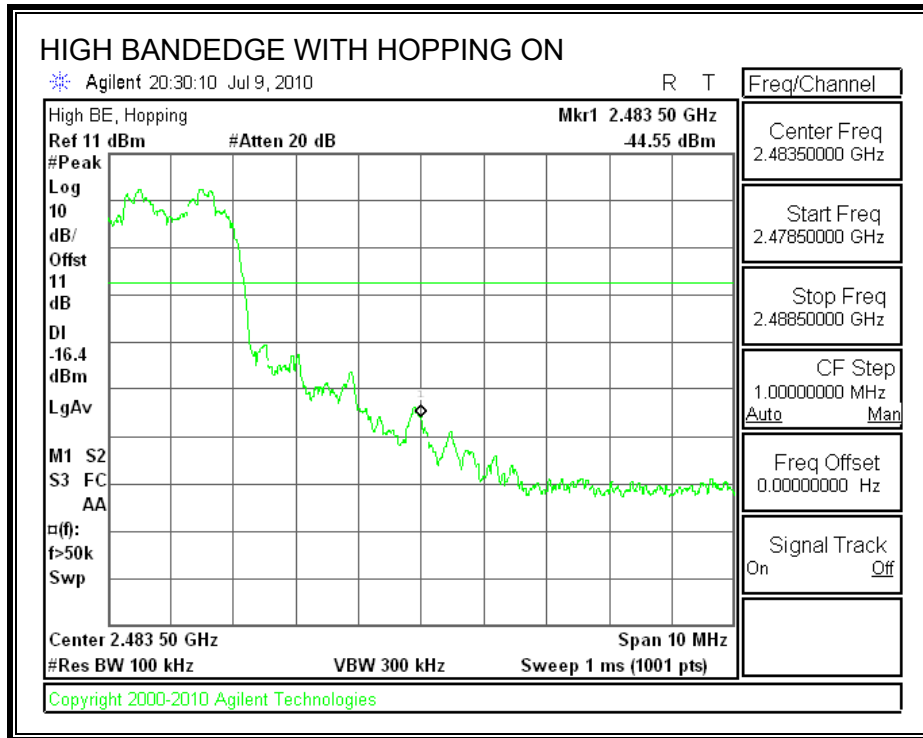
SPURIOUS EMISSIONS, HIGH CHANNEL





SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

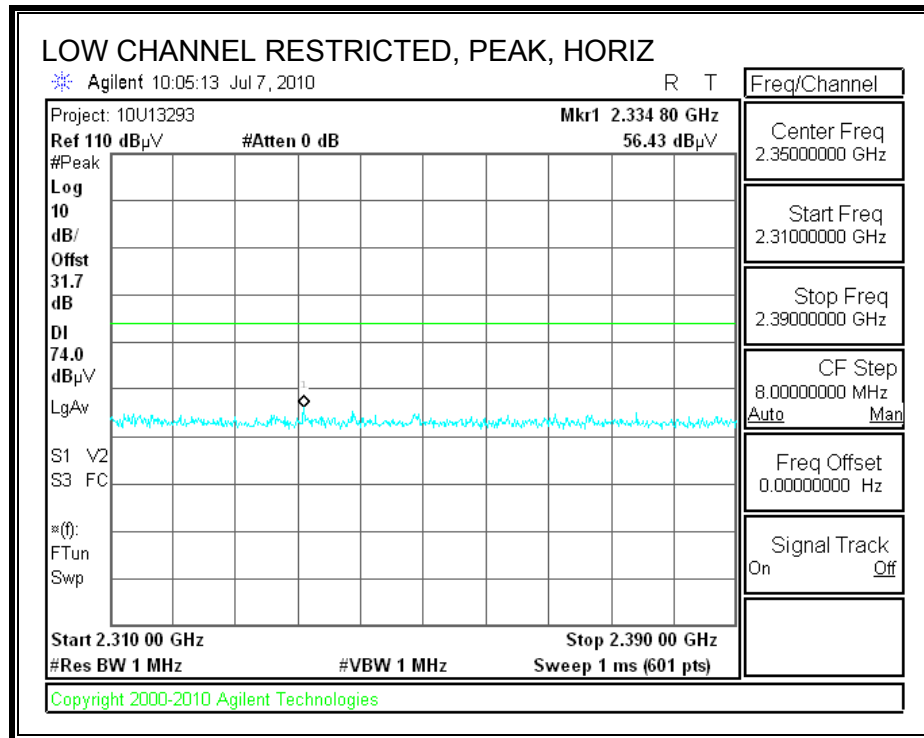


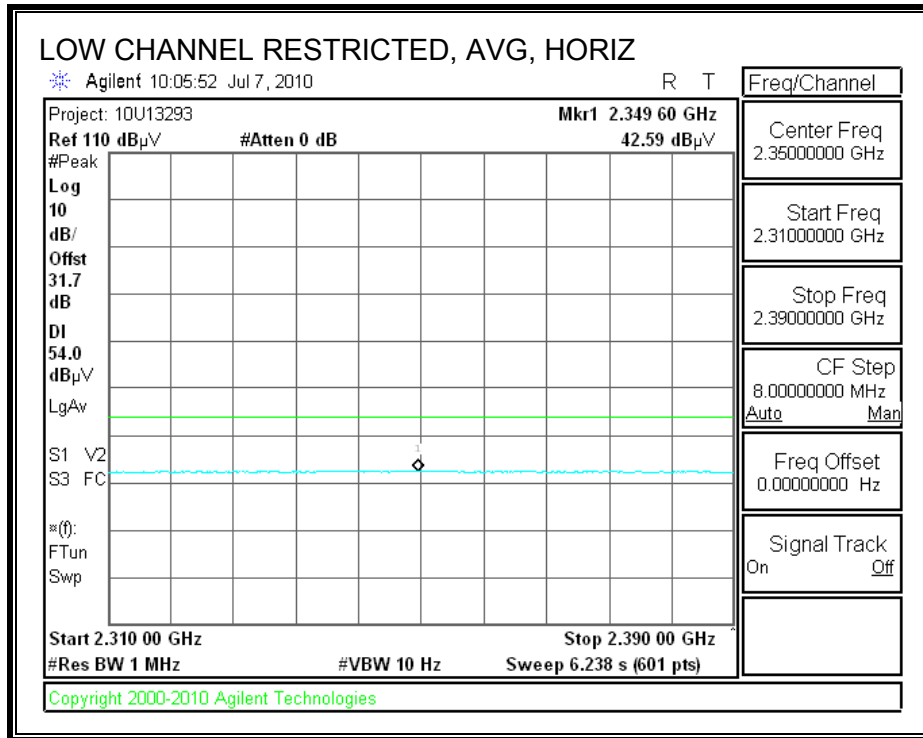


9. TX ABOVE 1 GHz (MICROPHONE MODULE)

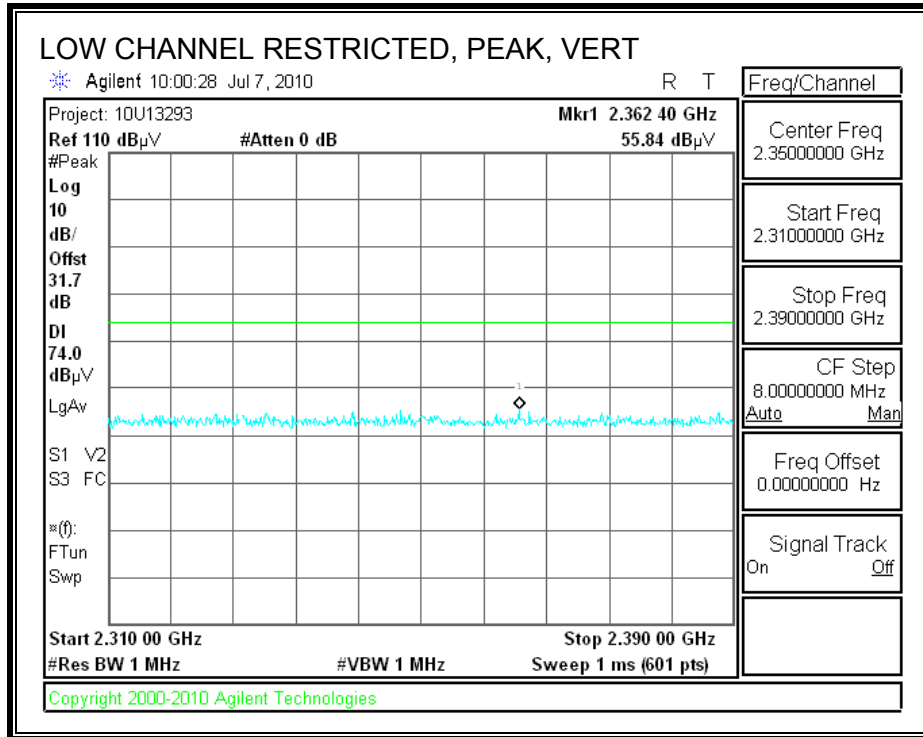
9.1. BASIC DATA RATE GFSK MODULATION

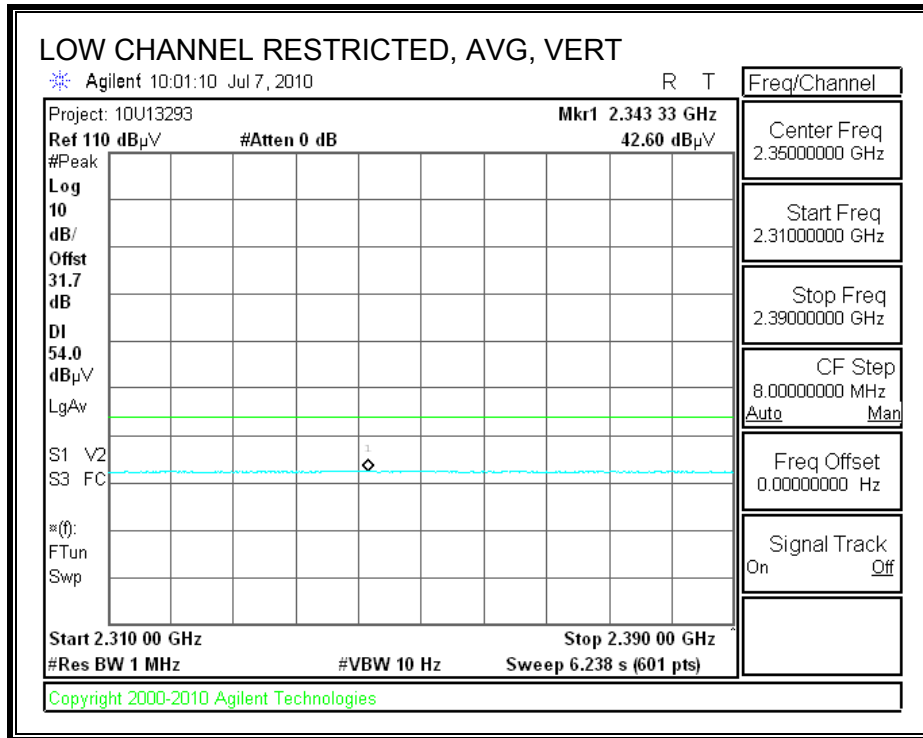
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



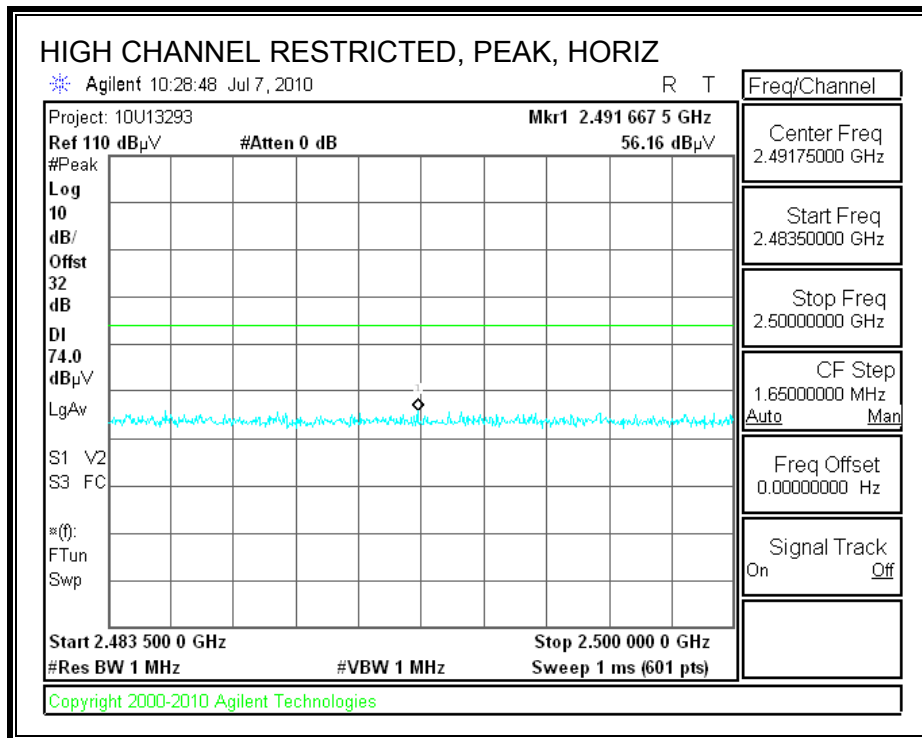


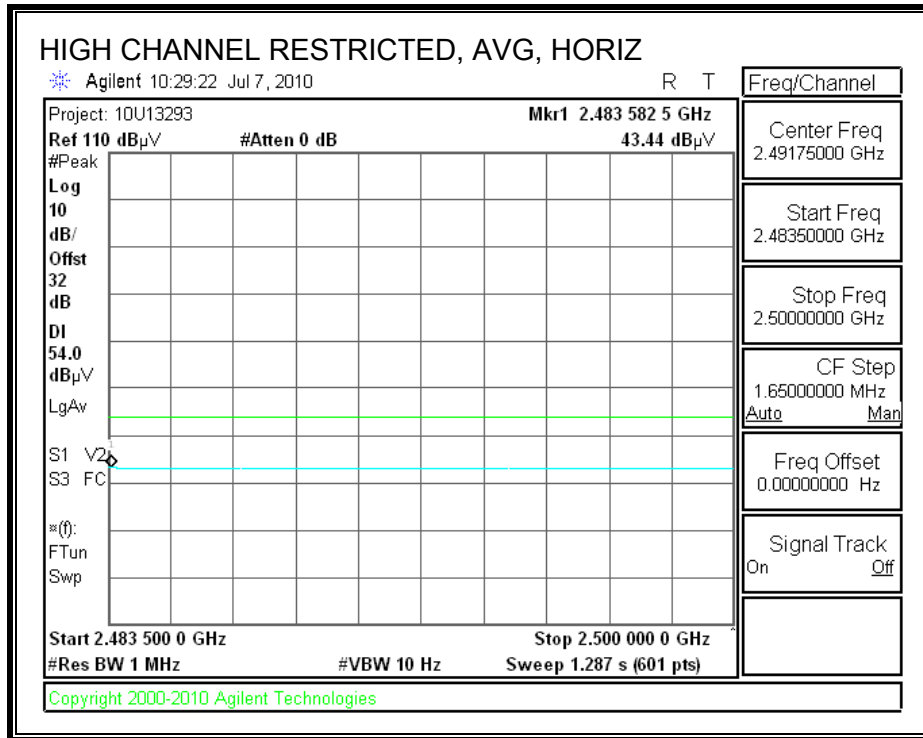
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



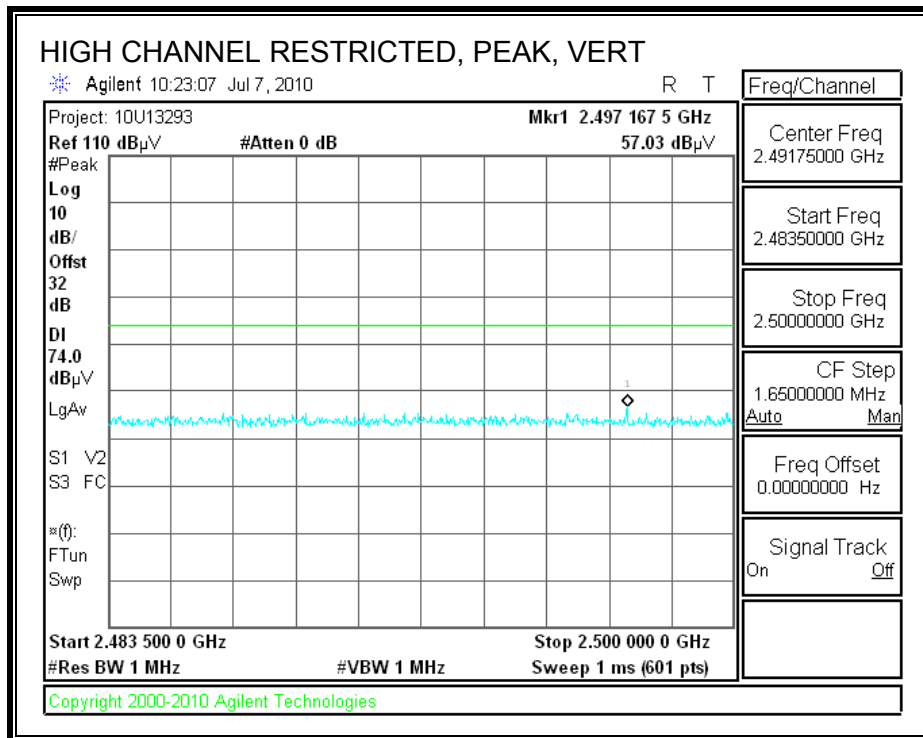


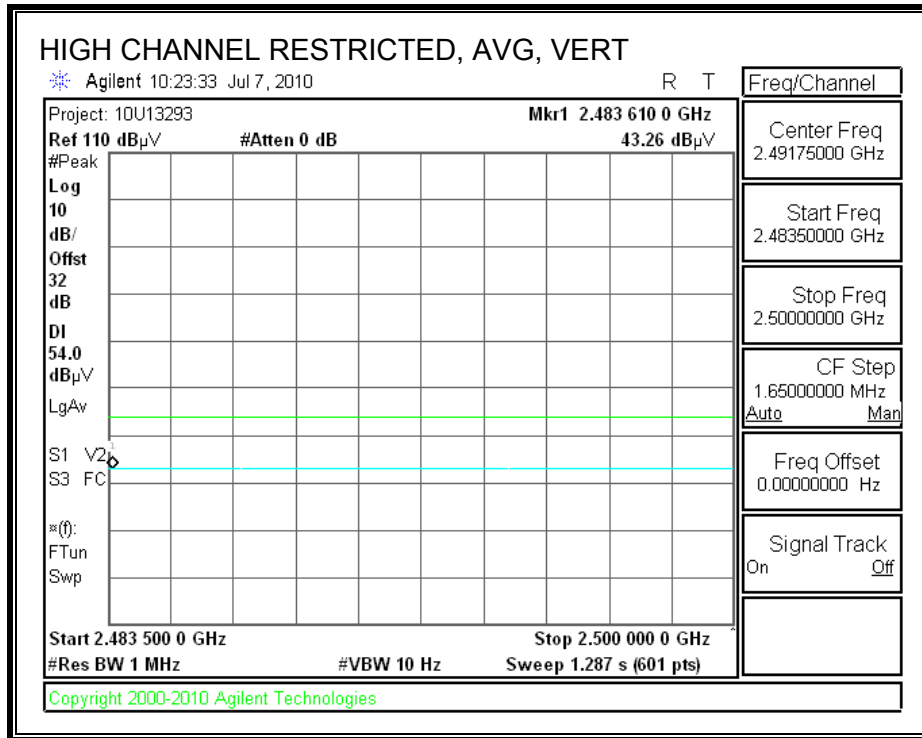
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



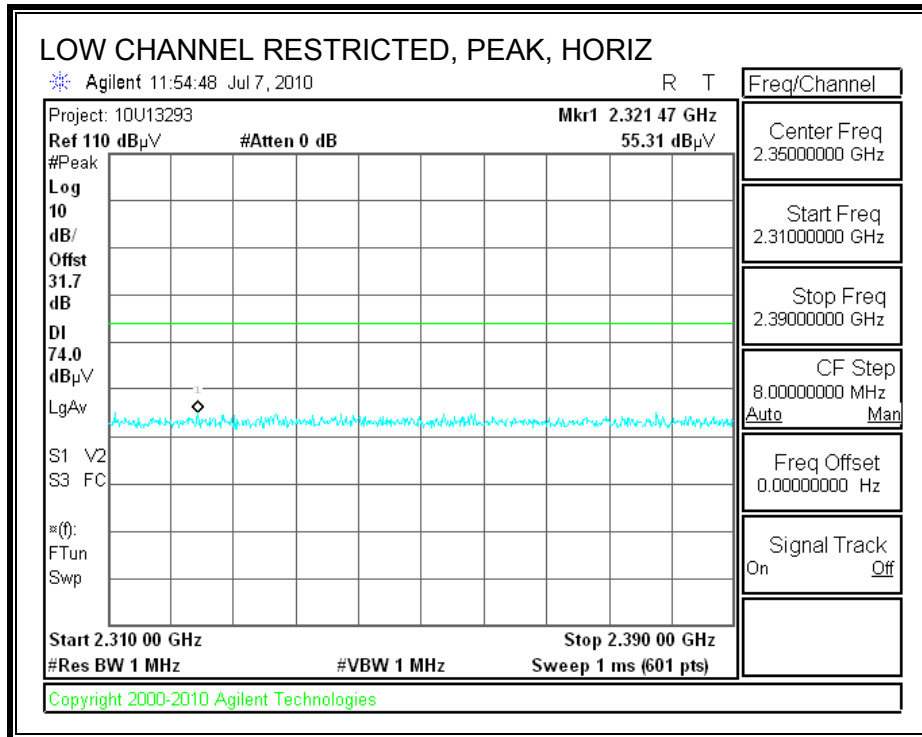


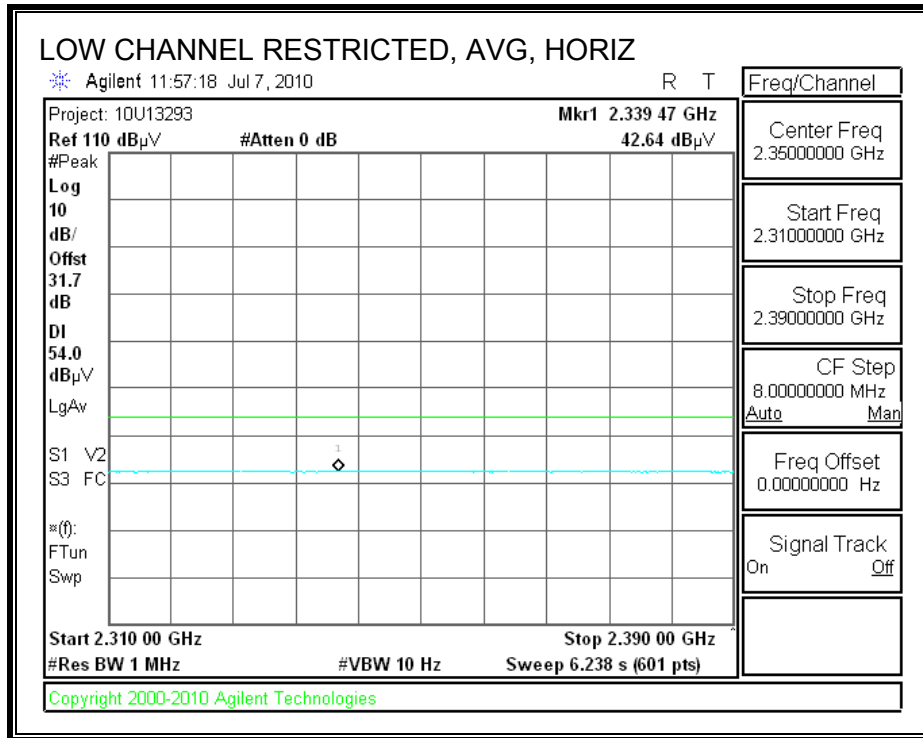
HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																			
Company:		Plantronics, Inc																	
Project #:		10U13293																	
Date:		7/7/10																	
Test Engineer:		Thanh Nguyen																	
Configuration:		EUT with Microphone and remote support laptop																	
Mode:		Tx BT basic rate																	
Test Equipment:																			
Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 26-40GHz				Horn > 18GHz				Limit			
T73; S/N: 6717 @3m				T144 Miteq 3008A00931												FCC 15.209			
Hi Frequency Cables																			
3' cable 22807700				12' cable 22807600				20' cable 22807500				HPF				Reject Filter			
3' cable 22807700				12' cable 22807600				20' cable 22807500								R_001			
Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz; VBW=10Hz																			
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)				
Low Ch																			
4.804	3.0	51.7	34.3	33.0	5.8	-36.5	0.0	0.0	54.1	36.7	74	54	-19.9	-17.3	V				
7.206	3.0	41.0	28.6	35.1	7.2	-36.2	0.0	0.0	47.1	34.7	74	54	-26.9	-19.3	V				
9.608	3.0	37.8	25.0	37.4	8.5	-36.9	0.0	0.0	46.8	34.0	74	54	-27.2	-20.0	Noise floor				
4.804	3.0	47.7	32.2	33.0	5.8	-36.5	0.0	0.0	50.1	34.5	74	54	-23.9	-19.5	H				
7.206	3.0	37.8	24.9	35.1	7.2	-36.2	0.0	0.0	43.9	31.0	74	54	-30.1	-23.0	Noise floor				
Mid Ch																			
4.882	3.0	48.9	29.4	33.1	5.8	-36.5	0.0	0.0	51.4	31.8	74	54	-22.6	-22.2	V				
7.323	3.0	35.5	25.1	35.3	7.3	-36.2	0.0	0.0	41.9	31.4	74	54	-32.1	-22.6	Noise floor				
4.882	3.0	52.5	30.6	33.1	5.8	-36.5	0.0	0.0	54.9	33.1	74	54	-19.1	-20.9	H				
7.323	3.0	37.6	25.3	35.3	7.3	-36.2	0.0	0.0	43.9	31.7	74	54	-30.1	-22.3	Noise floor				
High Ch																			
4.960	3.0	51.7	31.9	33.2	5.9	-36.5	0.0	0.0	54.3	34.5	74	54	-19.7	-19.5	V				
7.440	3.0	38.8	24.6	35.5	7.3	-36.2	0.0	0.0	45.4	31.2	74	54	-28.6	-22.8	Noise floor				
4.960	3.0	46.8	28.5	33.2	5.9	-36.5	0.0	0.0	49.4	31.1	74	54	-24.6	-22.9	H				
7.440	3.0	38.3	24.5	35.5	7.3	-36.2	0.0	0.0	44.9	31.1	74	54	-29.1	-22.9	Noise floor				
No other emissions were detected above noise floor																			
Rev. 07.22.09																			
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit						
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit						
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit						
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit						
CL	Cable Loss					HPF	High Pass Filter												

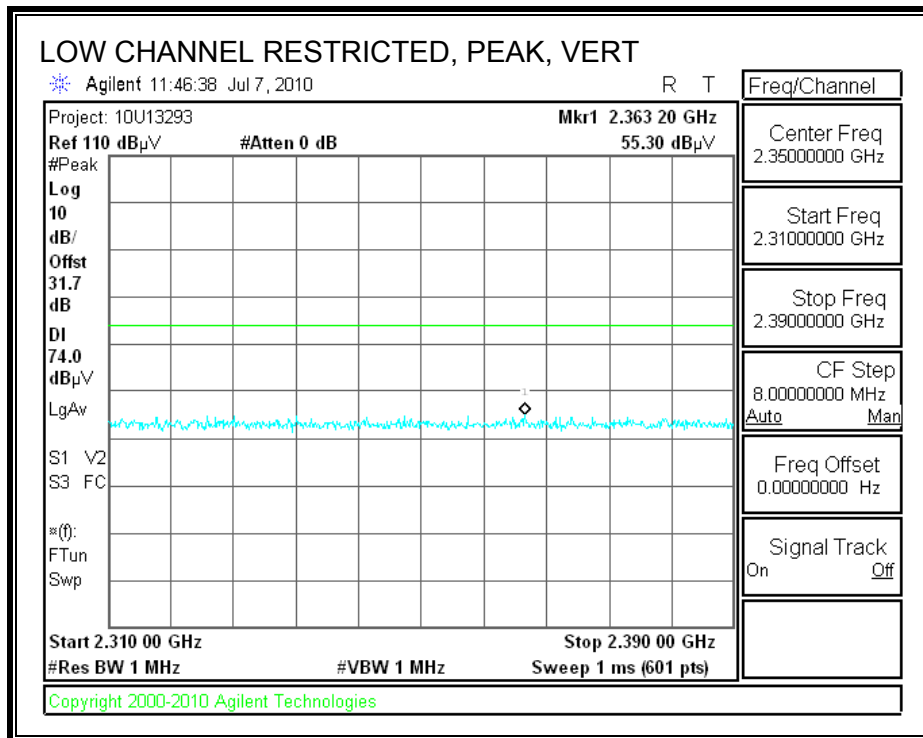
9.2. ENHANCED DATA RATE 8PSK MODULATION

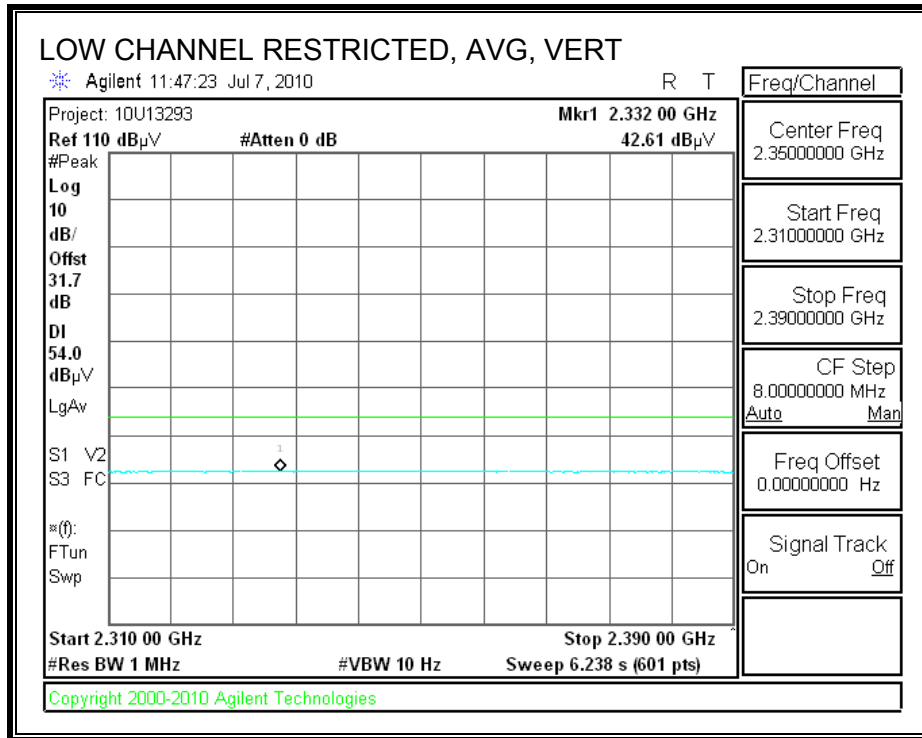
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



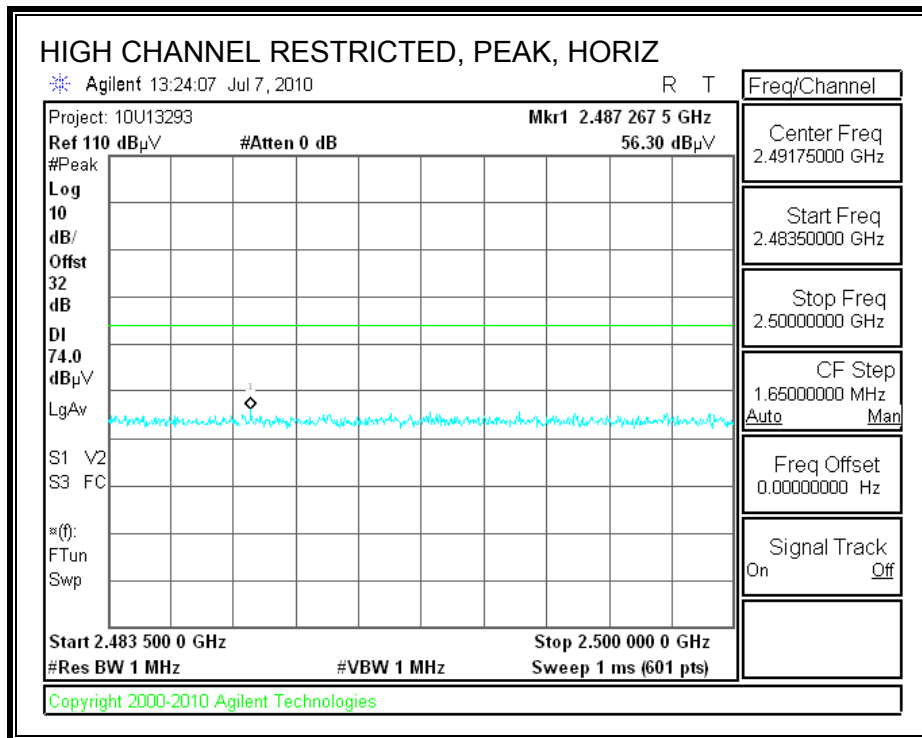


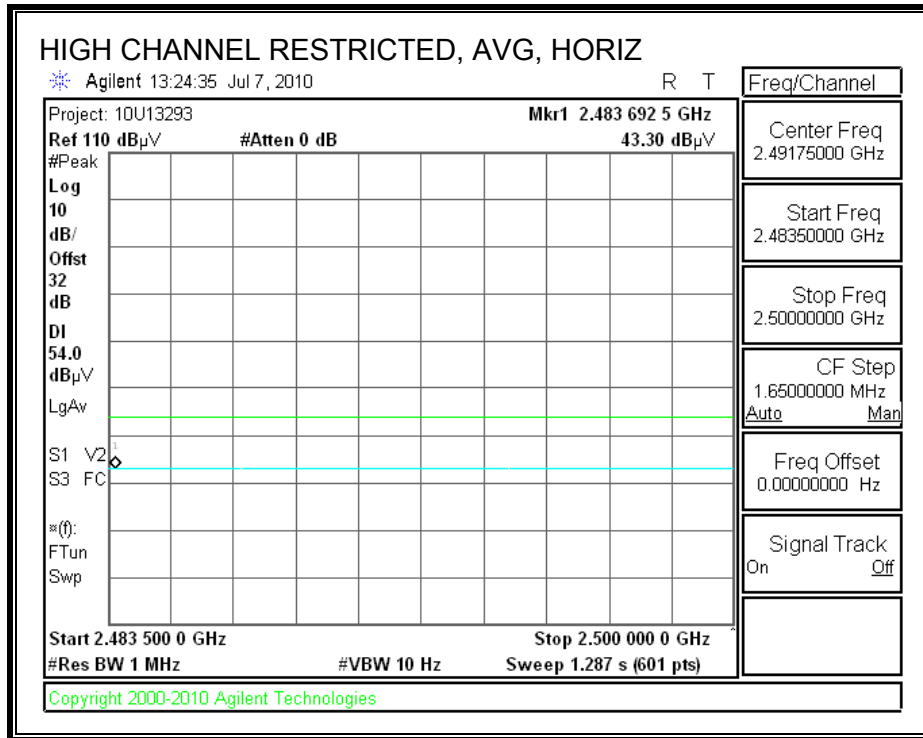
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



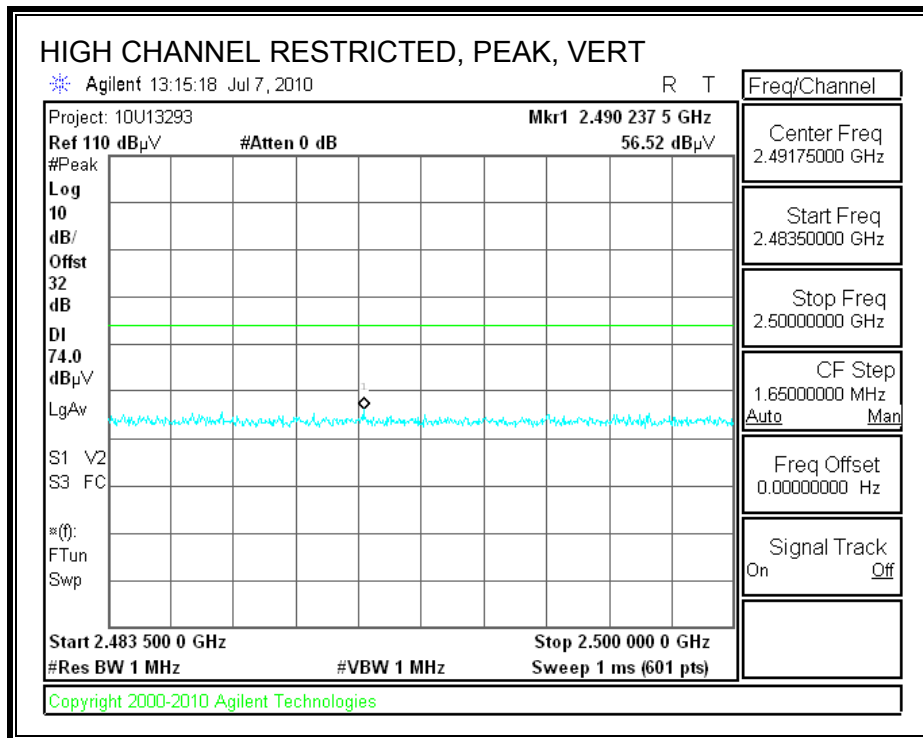


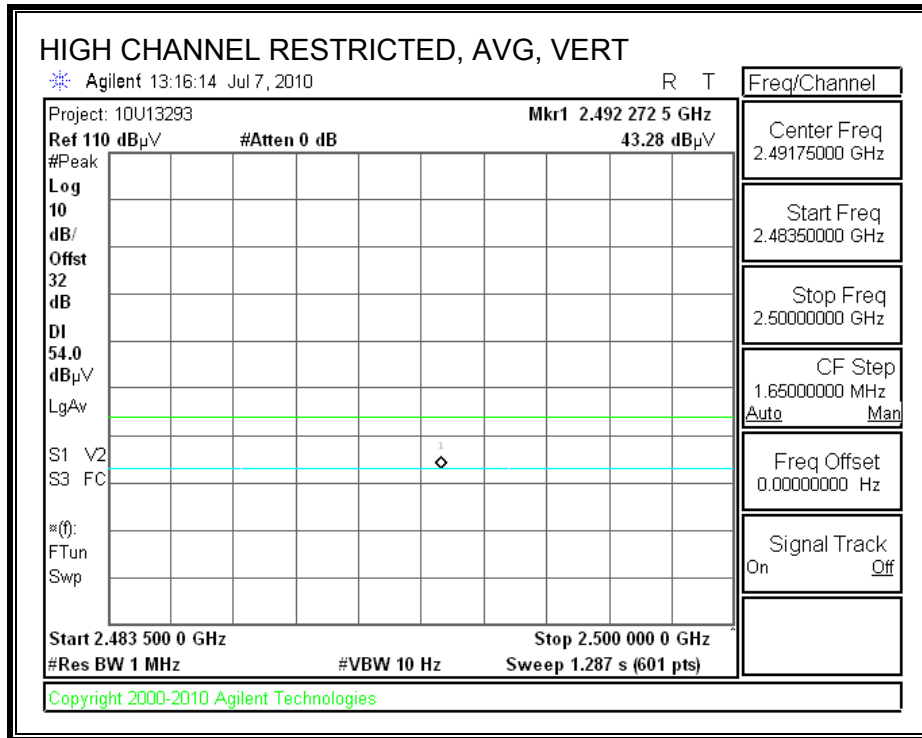
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Company: Plantronics, Inc
 Project #: 10U13293
 Date: 7/7/10
 Test Engineer: Thanh Nguyen
 Configuration: EUT with Microphone and remote support laptop
 Mode: Tx BT with EDR

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931			FCC 15.209

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch															
4.804	3.0	46.0	29.4	33.0	5.8	-36.5	0.0	0.0	48.4	31.7	74	54	-25.6	-22.3	V
7.206	3.0	38.7	25.0	35.1	7.2	-36.2	0.0	0.0	44.8	31.1	74	54	-29.2	-22.9	Noise floor
4.804	3.0	41.7	28.4	33.0	5.8	-36.5	0.0	0.0	44.1	30.7	74	54	-29.9	-23.3	H
7.206	3.0	38.4	25.0	35.1	7.2	-36.2	0.0	0.0	44.6	31.1	74	54	-29.4	-22.9	Noise floor
Mid Ch															
4.882	3.0	42.0	28.3	33.1	5.8	-36.5	0.0	0.0	44.5	30.8	74	54	-29.5	-23.2	V
7.323	3.0	38.0	25.1	35.3	7.3	-36.2	0.0	0.0	44.4	31.5	74	54	-29.6	-22.5	Noise floor
4.882	3.0	40.7	30.6	33.1	5.8	-36.5	0.0	0.0	43.1	33.1	74	54	-30.9	-20.9	H
7.323	3.0	37.6	25.3	35.3	7.3	-36.2	0.0	0.0	43.9	31.7	74	54	-30.1	-22.3	Noise floor
High Ch															
4.960	3.0	51.7	31.9	33.2	5.9	-36.5	0.0	0.0	54.3	34.5	74	54	-19.7	-19.5	V
7.440	3.0	38.8	24.6	35.5	7.3	-36.2	0.0	0.0	45.4	31.2	74	54	-28.6	-22.8	Noise floor
4.960	3.0	41.7	27.3	33.2	5.9	-36.5	0.0	0.0	44.3	29.9	74	54	-29.7	-24.1	H
7.440	3.0	37.6	24.6	35.5	7.3	-36.2	0.0	0.0	44.2	31.2	74	54	-29.8	-22.8	Noise floor
No other emissions were detected above noise floor															

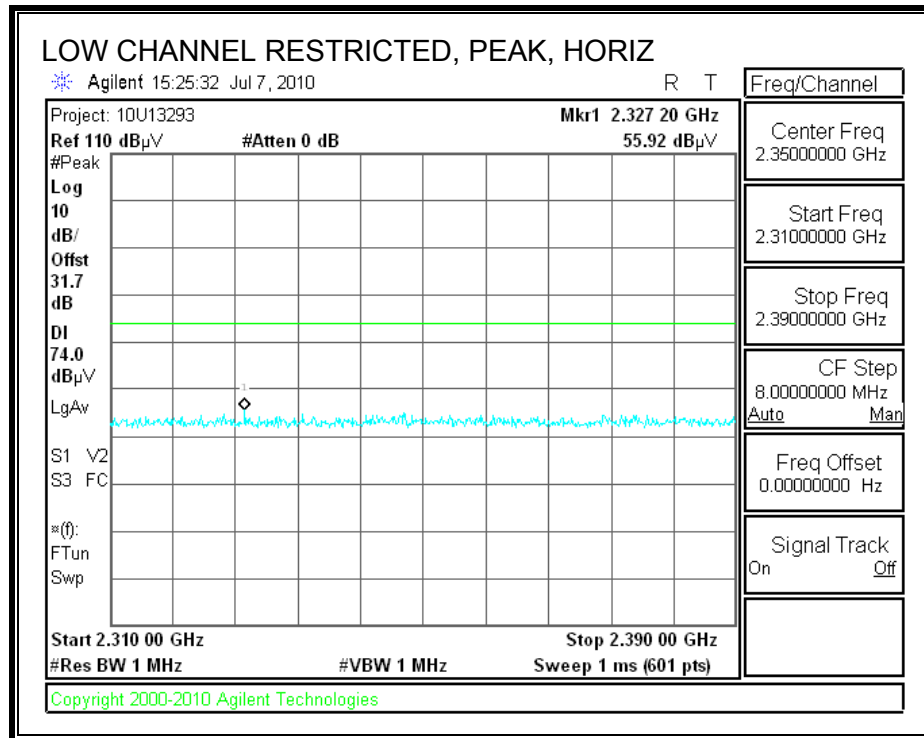
Rev. 07.22.09

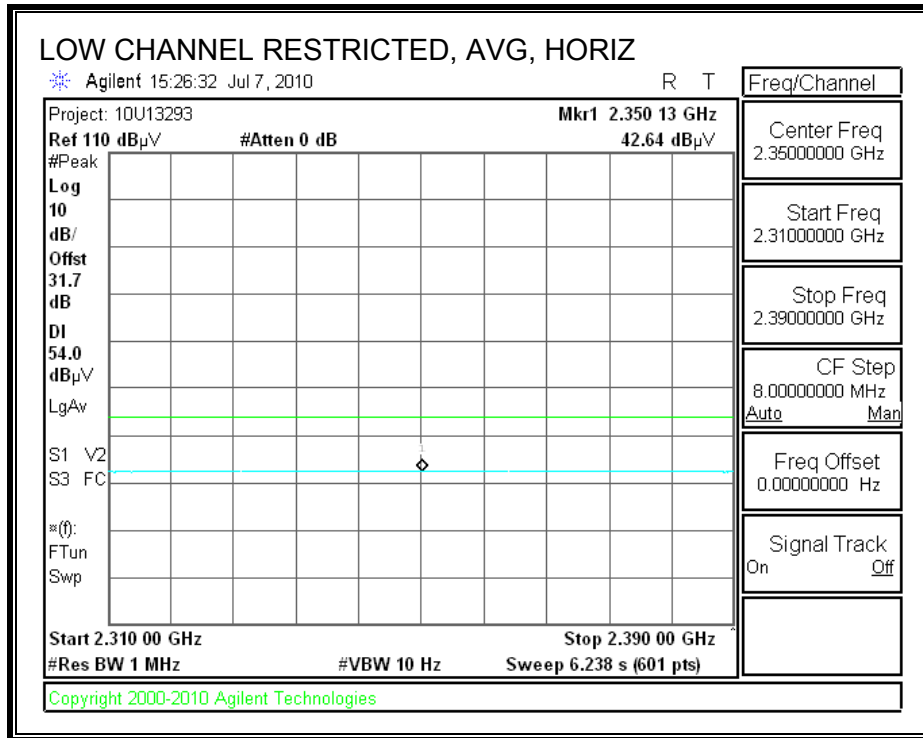
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

10. TX ABOVE 1 GHz (MOBILE PHONE MODULE)

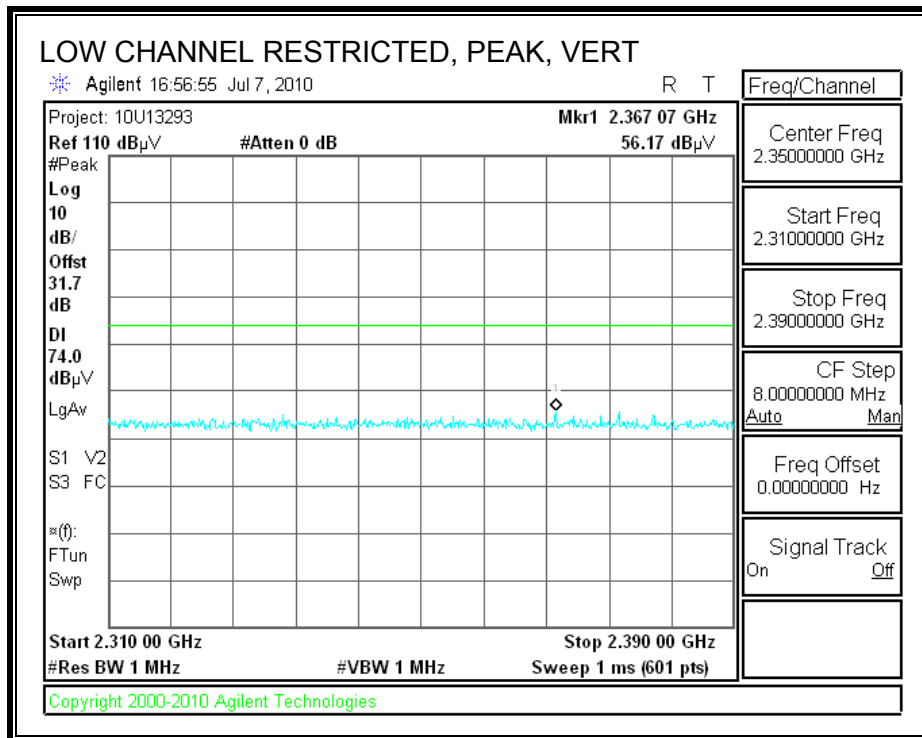
10.1. BASIC DATA RATE GFSK MODULATION

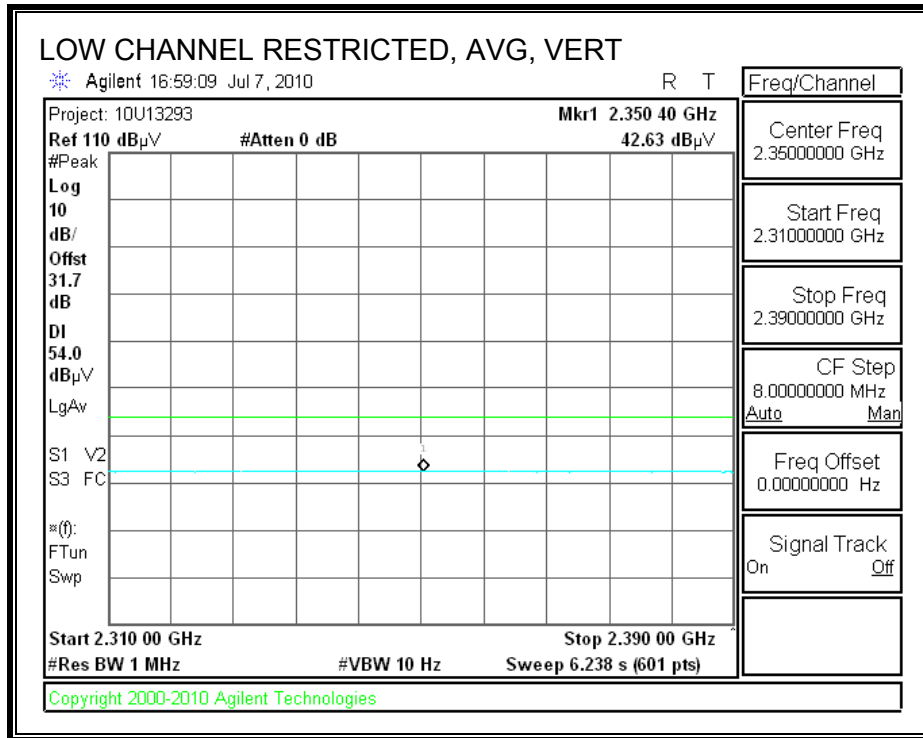
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



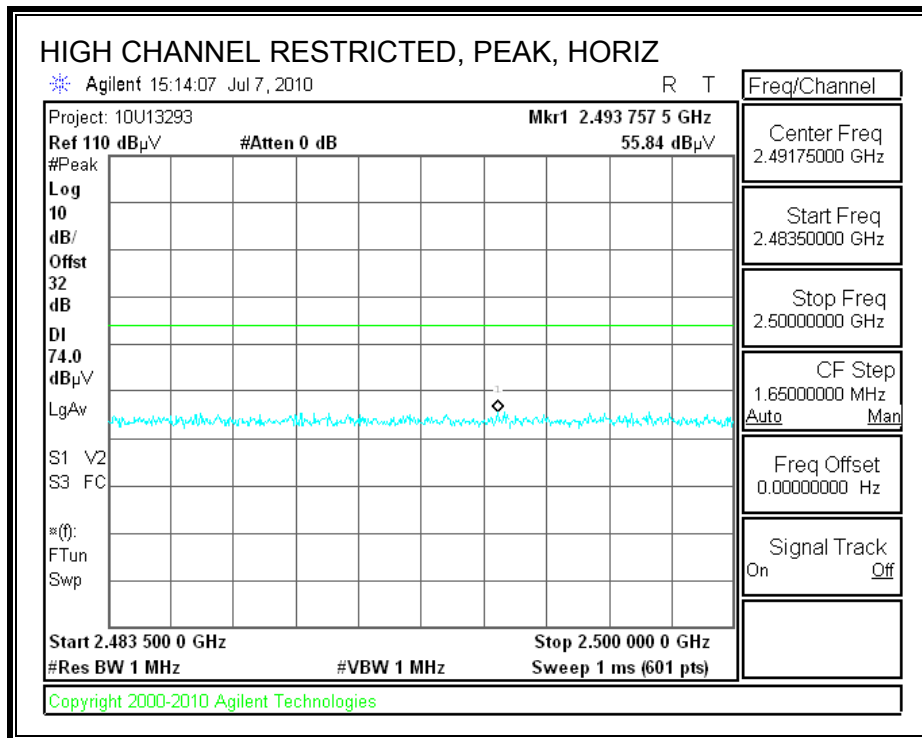


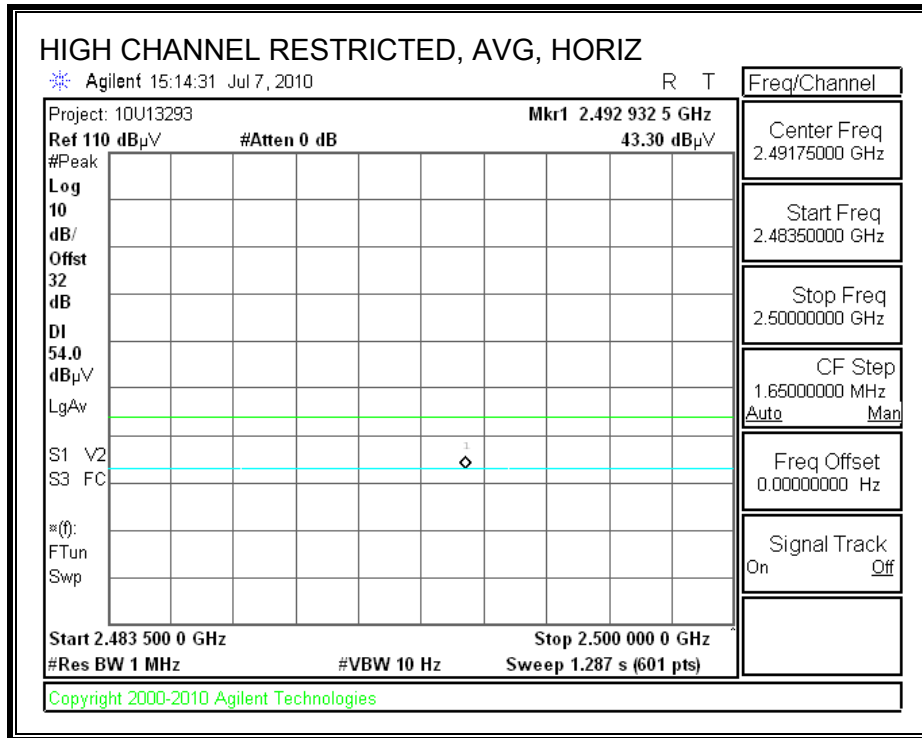
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



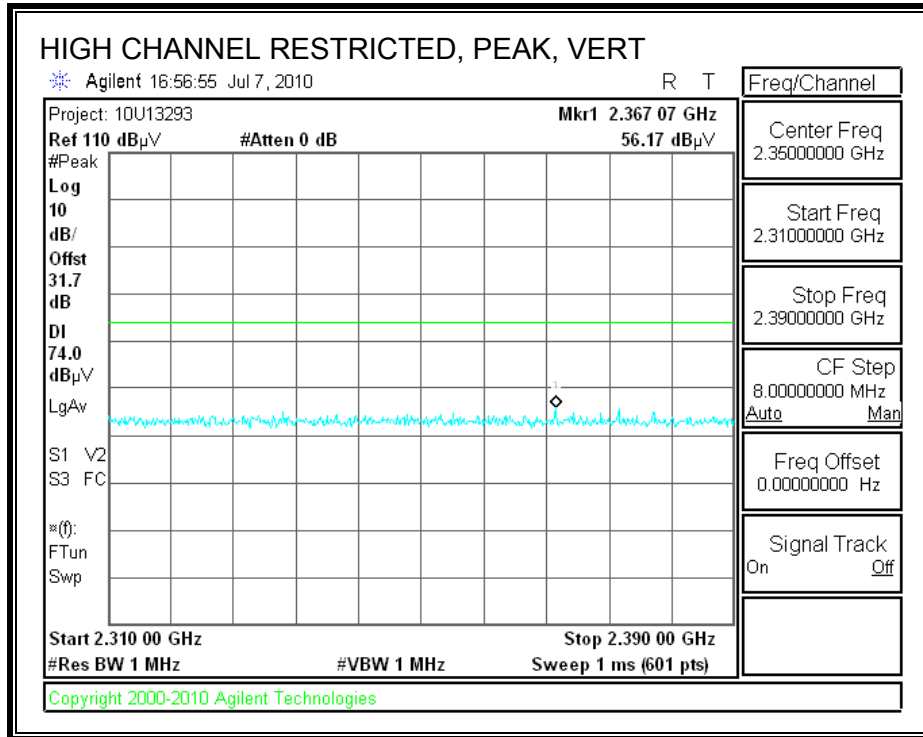


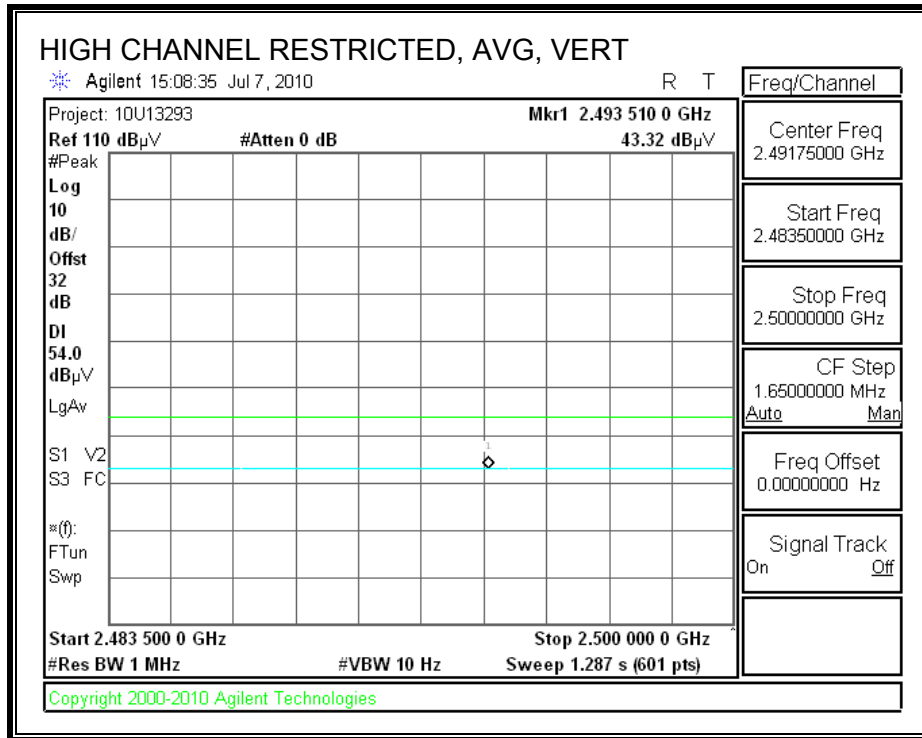
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



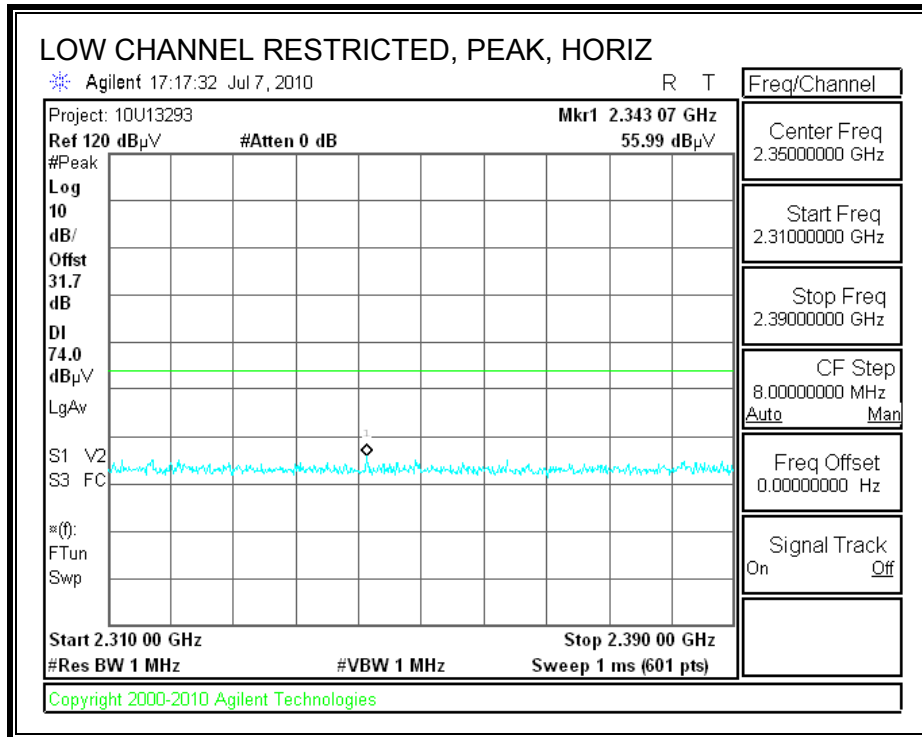


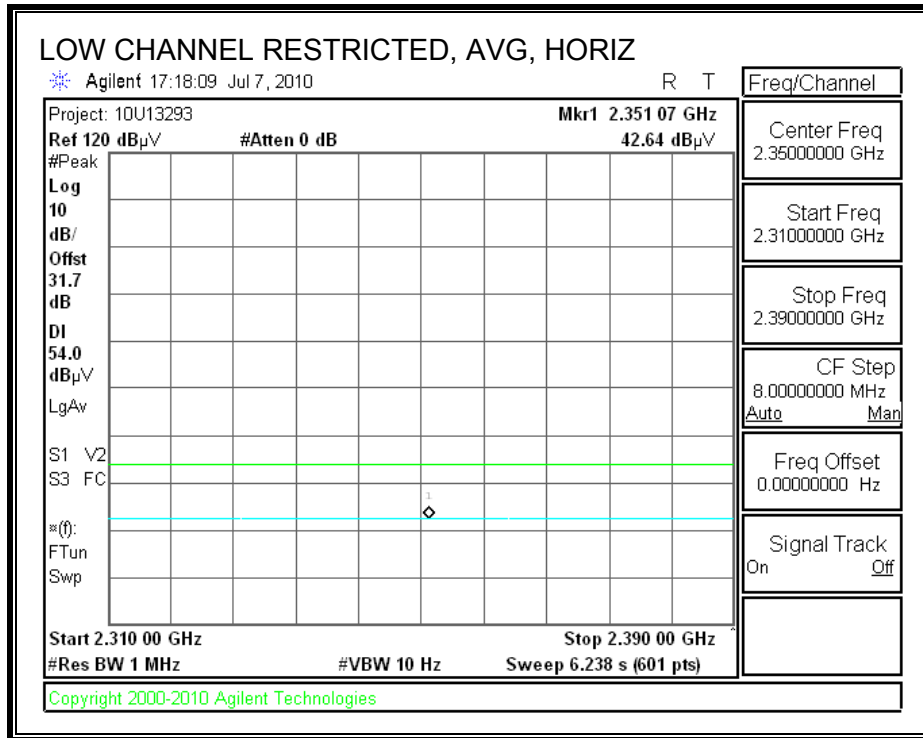
HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement																	
Compliance Certification Services, Fremont 5m Chamber																	
Company:		Plantronics, Inc															
Project #:		10U13293															
Date:		7/7/10															
Test Engineer:		Thanh Nguyen															
Configuration:		EUT with Mobile phone and remote support laptop															
Mode:		Tx BT with Basic rate															
Test Equipment:																	
Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 26-40GHz				Horn > 18GHz				Limit	
T73; S/N: 6717 @3m				T144 Miteq 3008A00931												FCC 15.209	
Hi Frequency Cables																	
3' cable 22807700				12' cable 22807600				20' cable 22807500				HPF				Reject Filter	
3' cable 22807700				12' cable 22807600				20' cable 22807500								R_001	
Peak Measurements REW=VBW=1MHz Average Measurements REW=1MHz ; VBW=10Hz																	
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)		
Low Ch																	
4.804	3.0	46.1	30.5	33.0	5.8	-36.5	0.0	0.0	48.4	32.9	74	54	-25.6	-21.1	V		
7.206	3.0	38.0	24.8	35.1	7.2	-36.2	0.0	0.0	44.1	31.0	74	54	-29.9	-23.0	Noise floor		
4.804	3.0	44.3	29.7	33.0	5.8	-36.5	0.0	0.0	46.6	32.0	74	54	-27.4	-22.0	H		
7.206	3.0	38.3	25.3	35.1	7.2	-36.2	0.0	0.0	44.4	31.4	74	54	-29.6	-22.6	Noise floor		
Mid Ch																	
4.882	3.0	45.1	30.2	33.1	5.8	-36.5	0.0	0.0	47.6	32.7	74	54	-26.4	-21.3	V		
7.323	3.0	38.3	25.2	35.3	7.3	-36.2	0.0	0.0	44.6	31.6	74	54	-29.4	-22.4	Noise floor		
4.882	3.0	45.5	30.4	33.1	5.8	-36.5	0.0	0.0	48.0	32.9	74	54	-26.0	-21.1	H		
7.323	3.0	38.7	25.1	35.3	7.3	-36.2	0.0	0.0	45.1	31.5	74	54	-28.9	-22.5	Noise floor		
High Ch																	
4.960	3.0	46.0	30.3	33.2	5.9	-36.5	0.0	0.0	48.6	32.9	74	54	-25.4	-21.1	V		
7.440	3.0	40.0	25.3	35.5	7.3	-36.2	0.0	0.0	46.7	31.9	74	54	-27.3	-22.1	Noise floor		
4.960	3.0	45.8	30.3	33.2	5.9	-36.5	0.0	0.0	48.4	32.9	74	54	-25.6	-21.1	H		
7.440	3.0	38.9	25.2	35.5	7.3	-36.2	0.0	0.0	45.5	31.8	74	54	-28.5	-22.2	Noise floor		
No other emissions were detected above noise floor																	
Rev. 07.22.09																	
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit				
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit				
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit				
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit				
CL	Cable Loss					HPF	High Pass Filter										

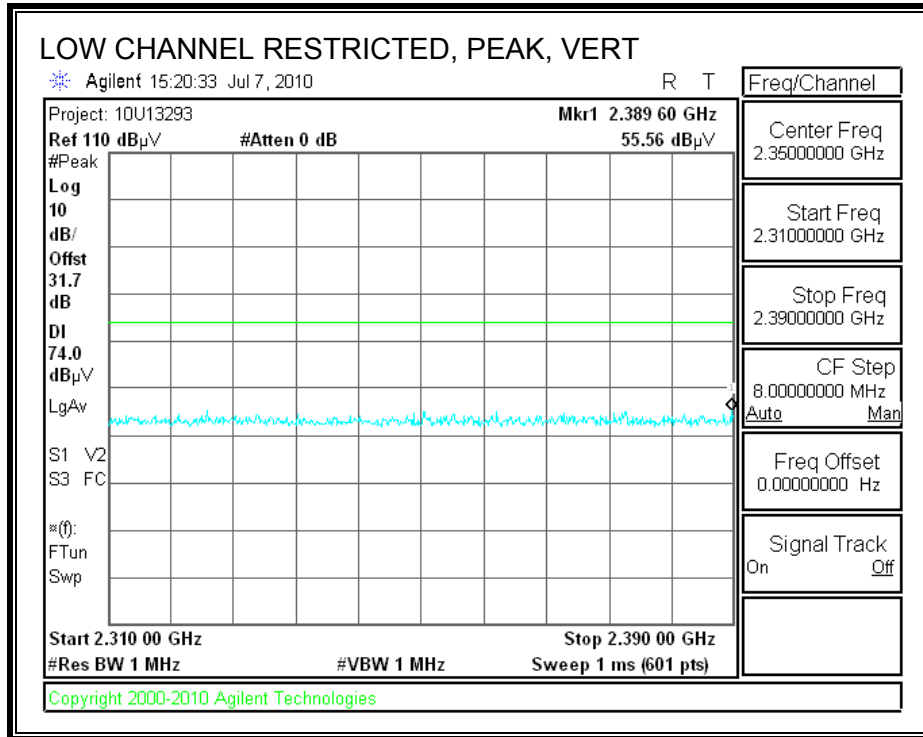
10.2. ENHANCED DATA RATE 8PSK MODULATION

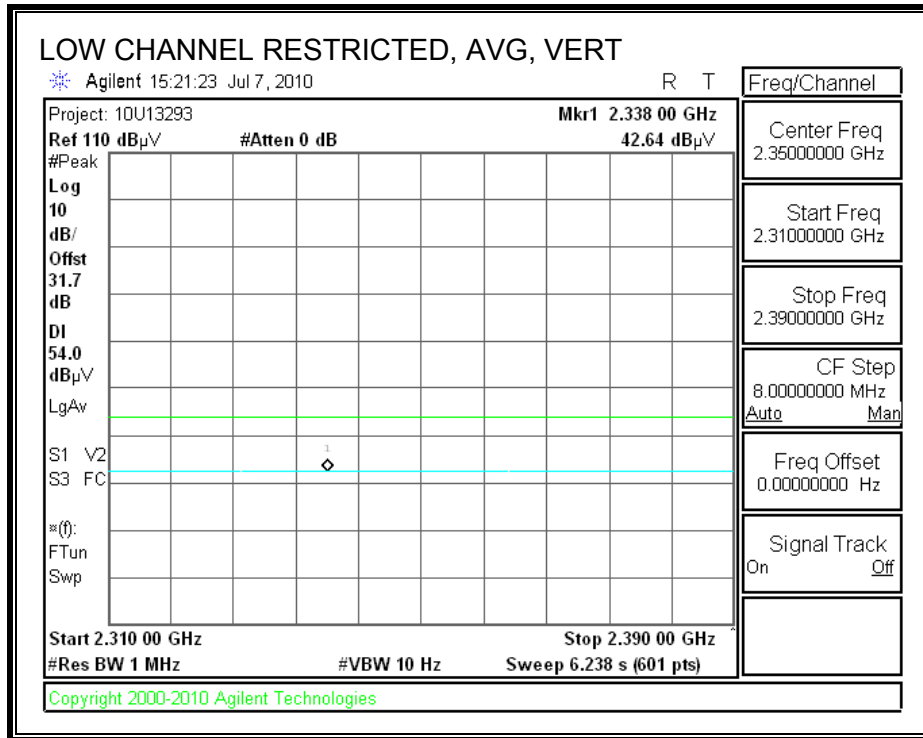
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



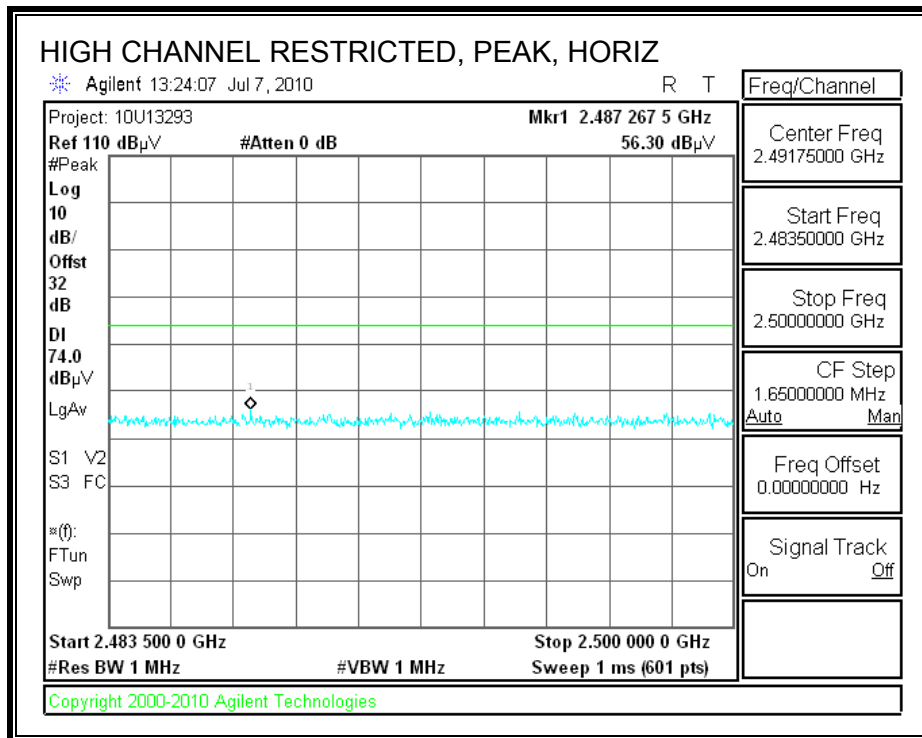


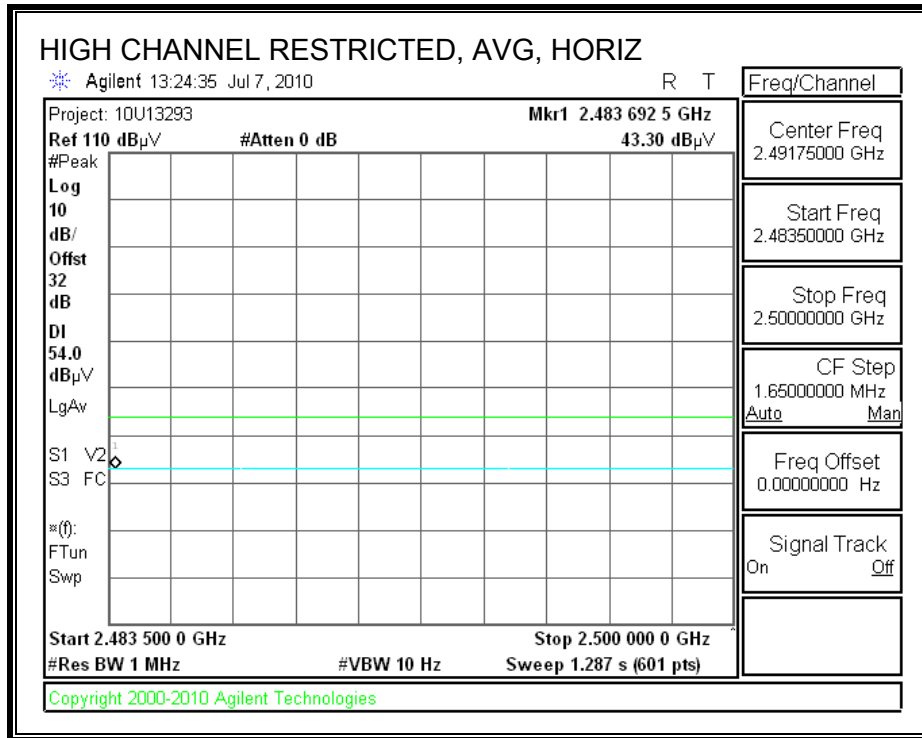
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



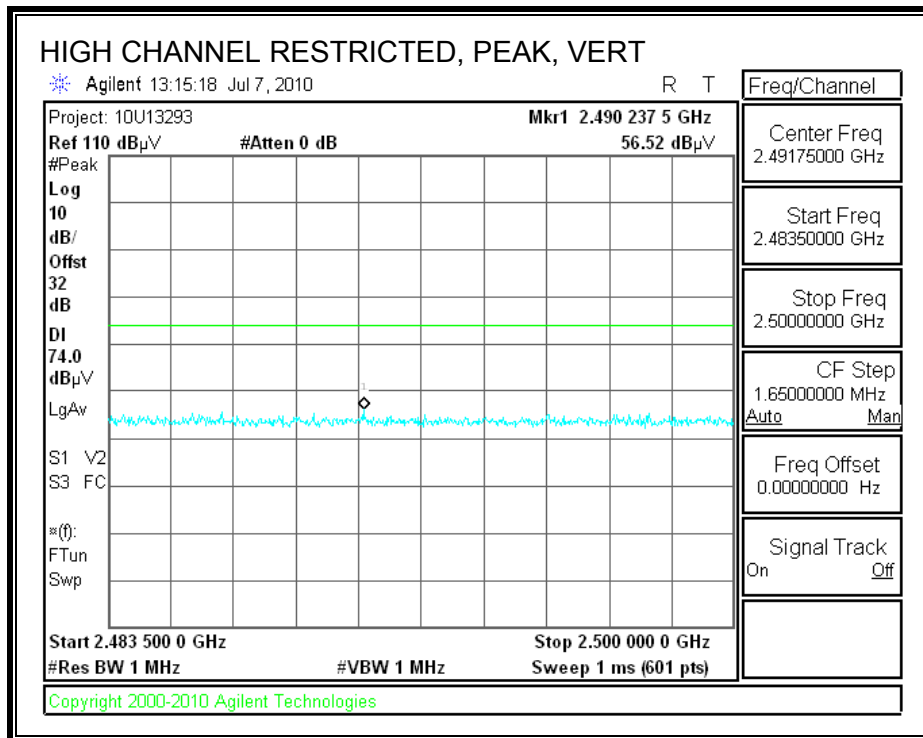


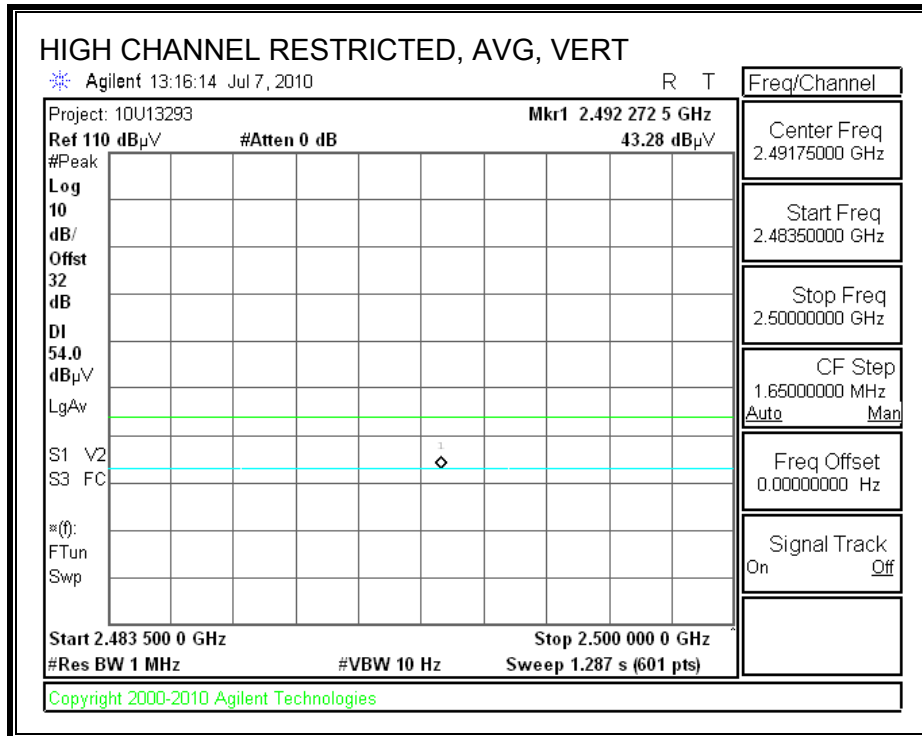
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Company: Plantronics, Inc
 Project #: 10U13293
 Date: 7/7/10
 Test Engineer: Thanh Nguyen
 Configuration: EUT with Mobile phone and remote support laptop
 Mode: Tx BT with EDR

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931			FCC 15.209

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500		R_001	Average Measurements RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fldr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch															
4.804	3.0	44.8	29.2	33.0	5.8	-36.5	0.0	0.0	47.1	31.6	74	54	-26.9	-22.4	V
7.206	3.0	38.7	25.0	35.1	7.2	-36.2	0.0	0.0	44.8	31.1	74	54	-29.2	-22.9	Noise floor
4.804	3.0	39.2	28.4	33.0	5.8	-36.5	0.0	0.0	41.6	30.7	74	54	-32.4	-23.3	H
7.206	3.0	37.5	25.0	35.1	7.2	-36.2	0.0	0.0	43.7	31.1	74	54	-30.3	-22.9	Noise floor
Mid Ch															
4.882	3.0	41.6	28.4	33.1	5.8	-36.5	0.0	0.0	44.1	30.8	74	54	-29.9	-23.2	V
7.323	3.0	39.2	25.6	35.3	7.3	-36.2	0.0	0.0	45.5	32.0	74	54	-28.5	-22.0	Noise floor
4.882	3.0	41.5	28.4	33.1	5.8	-36.5	0.0	0.0	43.9	30.8	74	54	-30.1	-23.2	H
7.323	3.0	38.6	25.1	35.3	7.3	-36.2	0.0	0.0	45.0	31.5	74	54	-29.0	-22.5	Noise floor
High Ch															
4.960	3.0	43.6	28.3	33.2	5.9	-36.5	0.0	0.0	46.2	30.9	74	54	-27.8	-23.1	V
7.440	3.0	40.0	25.3	35.5	7.3	-36.2	0.0	0.0	46.7	31.9	74	54	-27.3	-22.1	Noise floor
4.960	3.0	42.2	27.4	33.2	5.9	-36.5	0.0	0.0	44.8	30.0	74	54	-29.2	-24.0	H
7.440	3.0	37.9	24.7	35.5	7.3	-36.2	0.0	0.0	44.5	31.3	74	54	-29.5	-22.7	Noise floor
No other emissions were detected above noise floor															

Rev. 07.22.09

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

11. RECEIVER ABOVE 1 GHz (MICROPHONE MODULE)

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Company: Plantronics, Inc
 Project #: 10U13293
 Date: 7/13/10
 Test Engineer: Thanh Nguyen
 Configuration: EUT with Mobile phone
 Mode: Receive mode

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931			RX RSS 210

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500			Average Measurements RBW=1MHz ; VBW=10Hz

f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fldr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
1.628	3.0	53.3	46.8	26.0	3.1	-38.6	0.0	0.0	43.7	37.3	74	54	-30.3	-16.7	V
2.017	3.0	44.4	32.0	27.3	3.5	-38.0	0.0	0.0	37.1	24.7	74	54	-36.9	-29.3	Noise floor
1.628	3.0	52.3	47.8	26.0	3.1	-38.6	0.0	0.0	42.7	38.2	74	54	-31.3	-15.8	H
No other emissions were detected above noise floor															

Rev. 07.22.09

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

12. RECEIVER ABOVE 1 GHz (MOBILE PHONE MODULE)

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Company: Plantronics, Inc
 Project #: 10U13293
 Date: 7/13/10
 Test Engineer: Thanh Nguyen
 Configuration: EUT with Mobile phone
 Mode: Receive mode

Test Equipment:

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931			RX RSS 210

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter	Peak Measurements RBW=VBW=1MHz
3' cable 22807700	12' cable 22807600	20' cable 22807500			Average Measurements RBW=1MHz ; VBW=10Hz

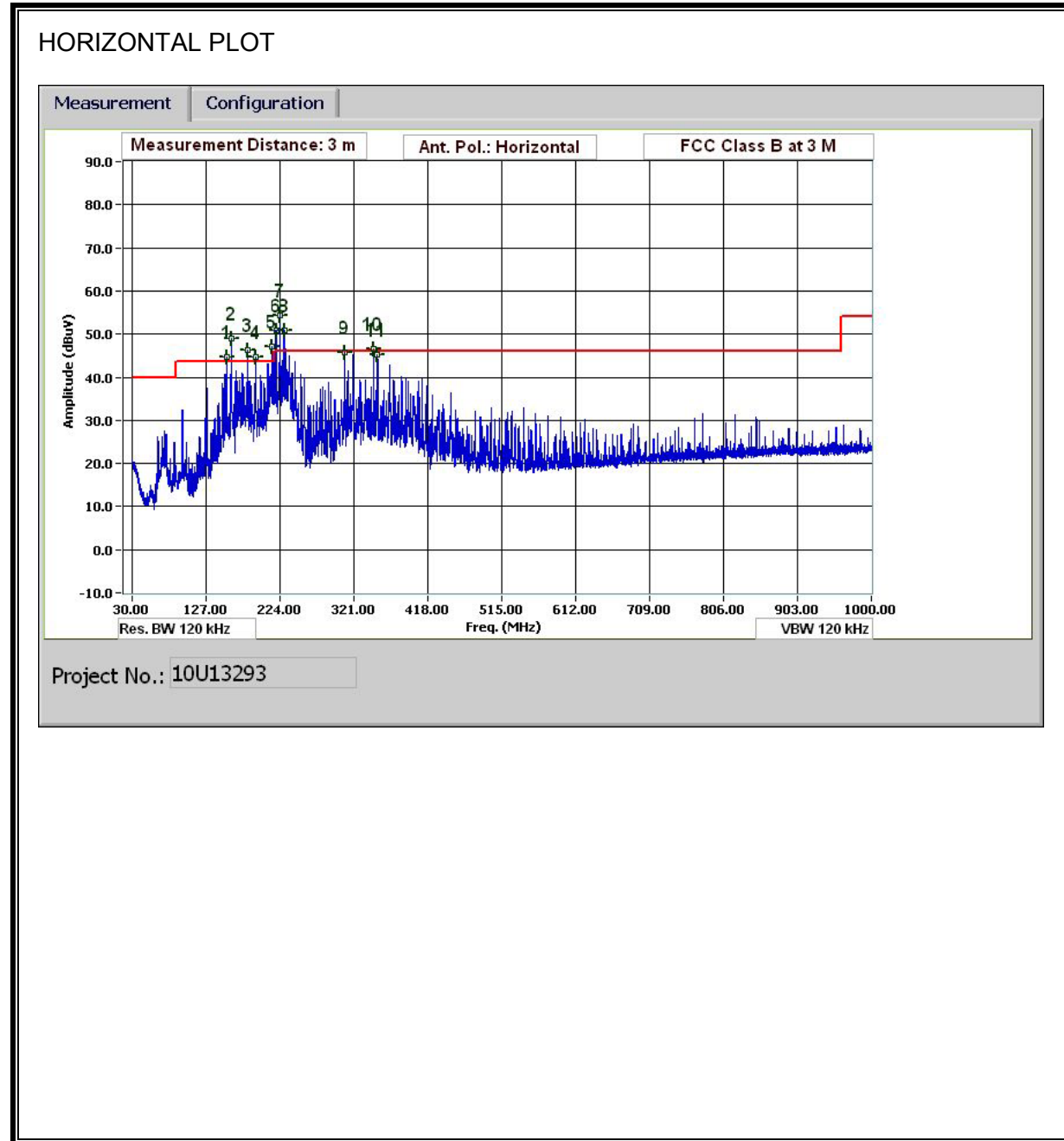
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	Fldr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)
1.628	3.0	53.3	46.8	26.0	3.1	-38.6	0.0	0.0	43.7	37.3	74	54	-30.3	-16.7	V
2.017	3.0	44.4	32.0	27.3	3.5	-38.0	0.0	0.0	37.1	24.7	74	54	-36.9	-29.3	Noise floor
1.628	3.0	52.3	47.8	26.0	3.1	-38.6	0.0	0.0	42.7	38.2	74	54	-31.3	-15.8	H
No other emissions were detected above noise floor															

Rev. 07.22.09

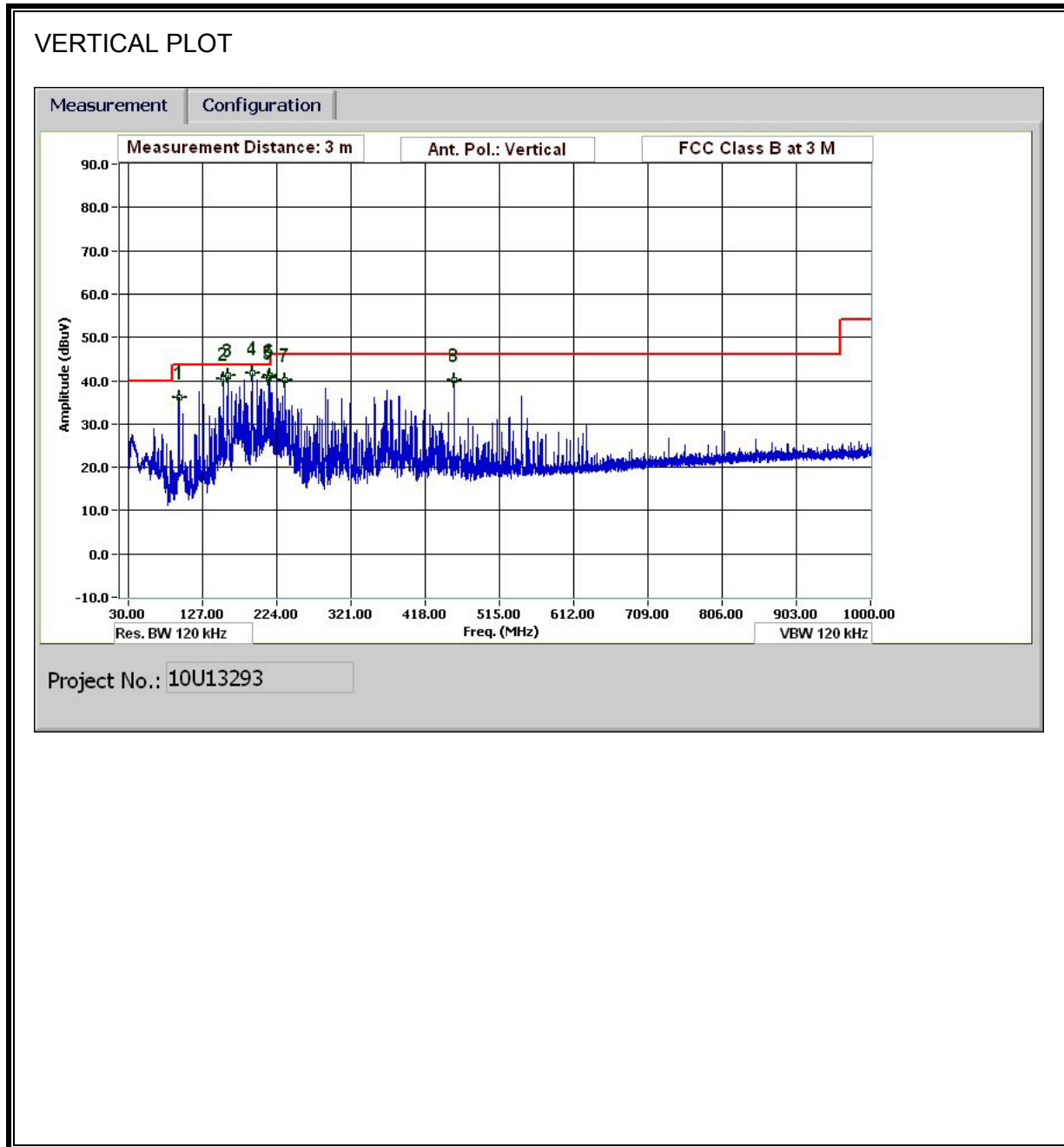
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

13. RADIATED EMISSIONS 30-1000 MHz (MICROPHONE MODULE)

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



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



HORIZONTAL and VERTICAL DATA

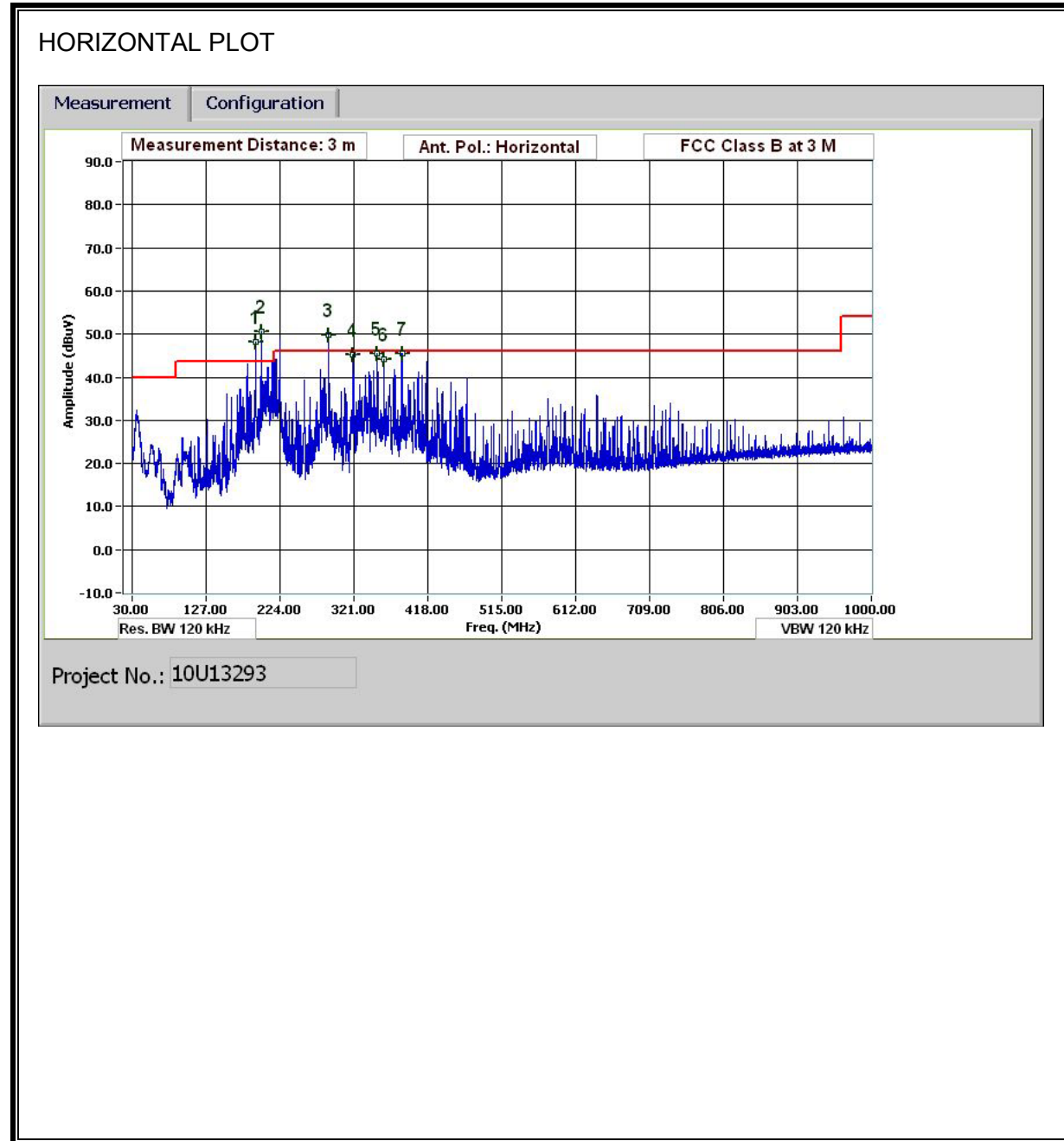
30-1000MHz Frequency Measurement																
Compliance Certification Services, Fremont 5m Chamber																
Test Engr:		Thanh Nguyen														
Date:		07/07/10														
Project #:		10U13293														
Company:		Plantronics, Inc.														
EUT Description:		UC Device														
EUT M/N:		P830														
Test Target:		FCC Class B														
Mode Oper:		Tx Microphone worst case														
f	Measurement Frequency	Amp	Preamp Gain		Margin	Margin vs. Limit										
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters													
Read	Analyzer Reading	Filter	Filter Insert Loss													
AF	Antenna Factor	Corr.	Calculated Field Strength													
CL	Cable Loss	Limit	Field Strength Limit													
f	Dist	Read	AF	CL	Amp	D Corr	Filter	Corr.	Limit	Margin	Ant. Pol.	Det.	Ant. High	Table Angle	Notes	
MHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	cm	Degree		
Worst case																
96.003	3.0	54.5	9.0	0.9	28.3	0.0	0.0	36.0	43.5	-7.5	V	P	100.0	0 - 360		
154.685	3.0	55.4	12.2	1.1	28.3	0.0	0.0	40.5	43.5	-3.0	V	P	100.0	0 - 360		
159.965	3.0	53.4	11.7	1.1	28.3	0.0	0.0	38.3	43.5	-5.2	V	QP	100.0	0 - 360		
191.887	3.0	54.4	11.5	1.2	28.2	0.0	0.0	38.4	43.5	-5.1	V	QP	100.0	0 - 360		
213.608	3.0	52.3	11.9	1.3	28.2	0.0	0.0	36.9	43.5	-6.6	V	QP	100.0	0 - 360		
215.288	3.0	53.5	11.9	1.3	28.2	0.0	0.0	38.3	43.5	-5.3	V	QP	100.0	0 - 360		
234.728	3.0	55.0	11.9	1.3	28.2	0.0	0.0	40.0	46.0	-6.0	V	P	100.0	0 - 360		
456.018	3.0	50.2	15.9	1.9	27.9	0.0	0.0	40.1	46.0	-5.9	V	P	100.0	0 - 360		
154.685	3.0	49.6	12.2	1.1	28.3	0.0	0.0	35.8	43.5	-7.7	H	QP	100.0	0 - 360		
159.965	3.0	54.2	11.7	1.1	28.3	0.0	0.0	39.0	43.5	-4.6	H	QP	100.0	0 - 360		
181.326	3.0	52.0	11.2	1.2	28.2	0.0	0.0	36.1	43.5	-7.4	H	QP	100.0	0 - 360		
192.007	3.0	50.3	11.5	1.2	28.2	0.0	0.0	34.7	43.5	-8.8	H	QP	100.0	0 - 360		
213.368	3.0	51.7	11.9	1.3	28.2	0.0	0.0	37.3	43.5	-6.3	H	QP	100.0	0 - 360		
218.768	3.0	56.4	11.9	1.3	28.2	0.0	0.0	41.4	46.0	-4.7	H	QP	100.0	0 - 360		
223.928	3.0	60.0	11.9	1.3	28.2	0.0	0.0	44.2	46.0	-1.8	H	QP	100.0	0 - 360		
229.328	3.0	56.2	11.9	1.3	28.2	0.0	0.0	42.4	46.0	-3.7	H	QP	100.0	0 - 360		
309.252	3.0	49.3	13.6	1.5	28.1	0.0	0.0	36.3	46.0	-9.8	H	QP	100.0	0 - 360		
346.693	3.0	49.3	14.1	1.7	28.1	0.0	0.0	37.6	46.0	-8.4	H	QP	100.0	0 - 360		
351.973	3.0	47.9	14.2	1.7	28.1	0.0	0.0	38.3	46.0	-7.8	H	QP	100.0	0 - 360		

Rev. 1.27.09

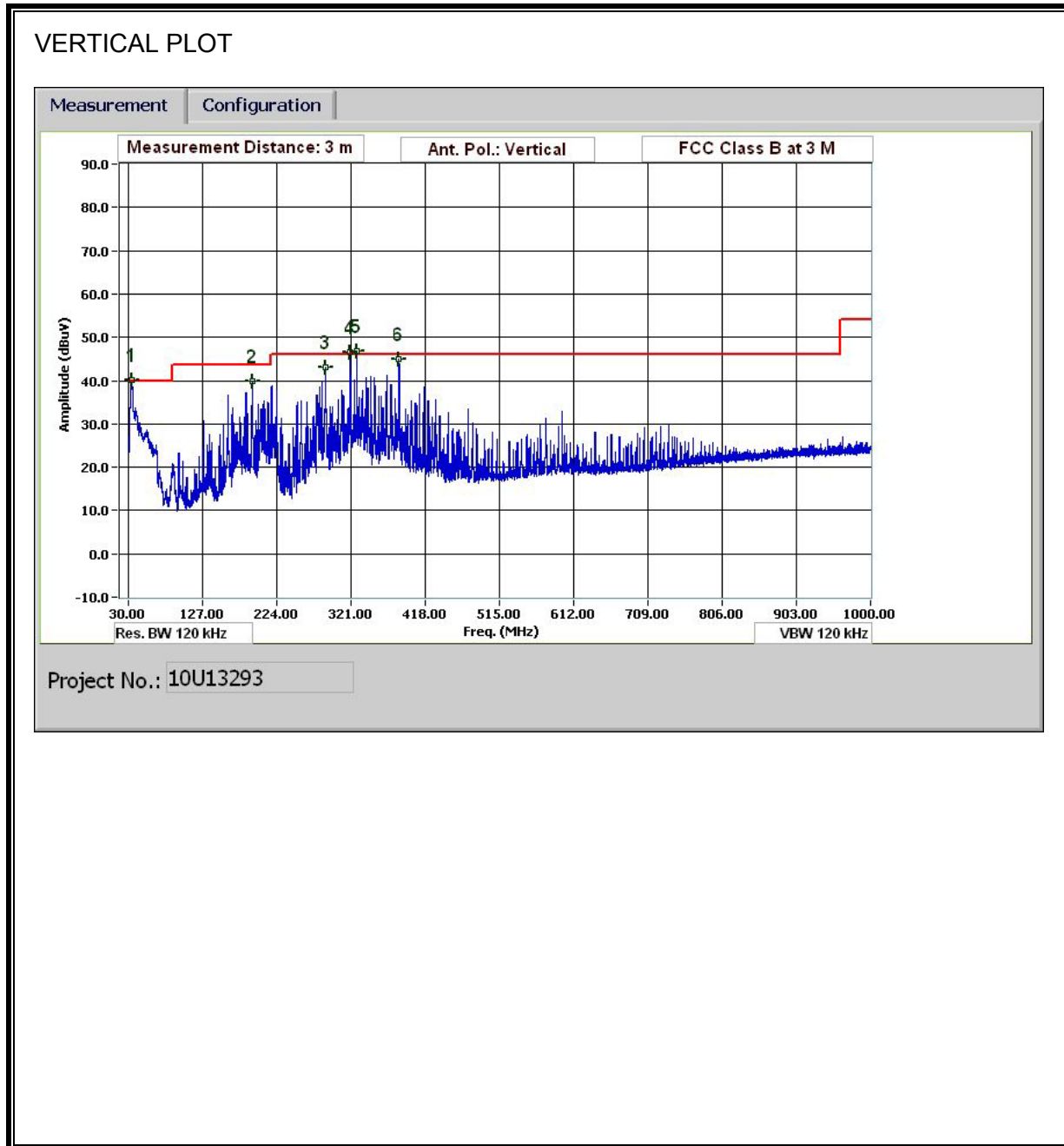
Note: No other emissions were detected above the system noise floor.

14. RADIATED EMISSIONS 30-1000 MHz (MOBILE PHONE MODULE)

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



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



HORIZONTAL and VERTICAL DATA

30-1000MHz Frequency Measurement																
Compliance Certification Services, Fremont 5m Chamber																
Test Engr:		Thanh Nguyen														
Date:		07/27/10														
Project #:		10U13293														
Company:		Plantronics, Inc.														
EUT Description:		UC Device														
EUT M/N:		P830														
Test Target:		FCC Class B														
Mode Oper:		Tx Mobile worst case														
f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit											
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters													
Read	Analyzer Reading	Filter	Filter Insert Loss													
AF	Antenna Factor	Corr.	Calculated Field Strength													
CL	Cable Loss	Limit	Field Strength Limit													
f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filter dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol V/H	Det. P/A/QP	Ant. High cm	Table Angle Degree	Notes	
MP Tx Worst Case																
192.007	3.0	55.1	11.4	1.1	27.4	0.0	0.0	40.2	43.5	-3.3	H	QP	100.0	0 - 360		
200.047	3.0	52.5	12.0	1.2	27.4	0.0	0.0	39.0	43.5	-4.5	H	P	100.0	0 - 360		
288.011	3.0	62.5	13.1	1.4	27.4	0.0	0.0	39.0	46.0	-7.0	H	QP	100.0	0 - 360		
319.932	3.0	53.7	13.8	1.5	27.5	0.0	0.0	36.5	46.0	-9.5	H	QP	100.0	0 - 360		
351.973	3.0	55.2	14.3	1.6	27.7	0.0	0.0	43.7	46.0	-2.4	H	QP	100.0	0 - 360		
359.894	3.0	42.5	14.4	1.6	27.8	0.0	0.0	33.9	46.0	-12.1	H	QP	100.0	0 - 360		
384.015	3.0	52.4	14.8	1.7	27.9	0.0	0.0	42.0	46.0	-4.1	H	QP	100.0	0 - 360		
33.960	3.0	47.0	18.1	0.5	28.4	0.0	0.0	37.1	40.0	-2.9	V	QP	100.0	0 - 360		
192.007	3.0	54.9	11.4	1.1	27.4	0.0	0.0	40.0	43.5	-3.5	V	P	100.0	0 - 360		
288.011	3.0	55.9	13.1	1.4	27.4	0.0	0.0	43.0	46.0	-3.0	V	P	100.0	0 - 360		
320.052	3.0	53.2	13.8	1.5	27.5	0.0	0.0	41.0	46.0	-5.0	V	QP	100.0	0 - 360		
327.972	3.0	44.3	13.9	1.6	27.6	0.0	0.0	32.2	46.0	-13.8	V	QP	100.0	0 - 360		
383.895	3.0	49.6	14.8	1.7	27.9	0.0	0.0	38.8	46.0	-7.3	V	QP	100.0	0 - 360		

Rev. 1.27.09

Note: No other emissions were detected above the system noise floor.

15. AC POWER LINE CONDUCTED EMISSIONS (MICROPHONE MODULE)

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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 C63.4.

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

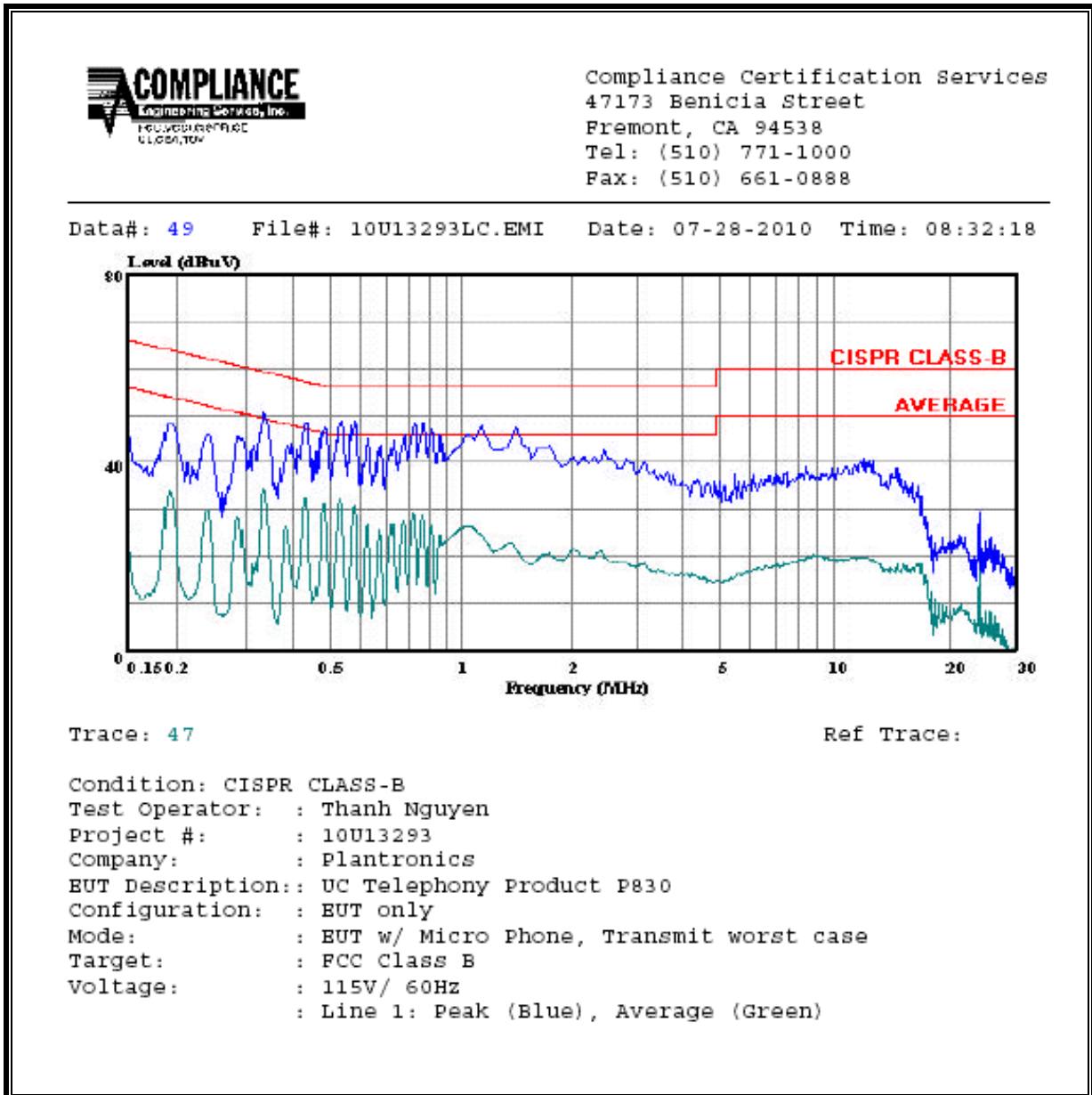
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Class	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.34	50.70	--	33.77	0.00	59.30	49.30	-8.60	-15.53	L1
0.58	48.92	--	32.19	0.00	56.00	46.00	-7.08	-13.81	L1
1.23	47.64	--	26.35	0.00	56.00	46.00	-8.36	-19.65	L1
0.33	52.36	--	42.75	0.00	59.45	49.45	-7.09	-6.70	L2
0.52	49.20	--	40.70	0.00	56.00	46.00	-6.80	-5.30	L2
0.85	49.16	--	37.69	0.00	56.00	46.00	-6.84	-8.31	L2
6 Worst Data									

LINE 1 RESULTS

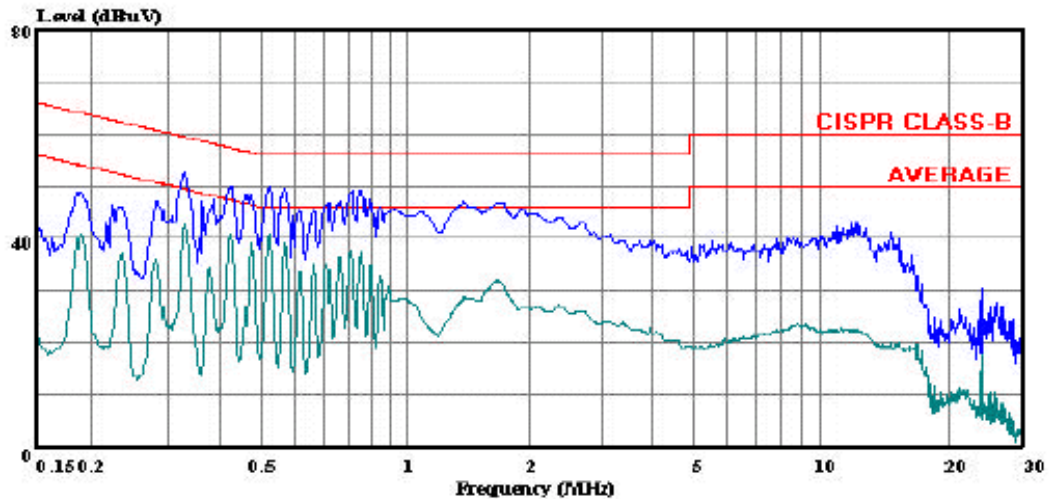


LINE 2 RESULTS



Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 56 File#: 10U13293LC.EMI Date: 07-28-2010 Time: 08:58:55



Trace: 54

Ref Trace:

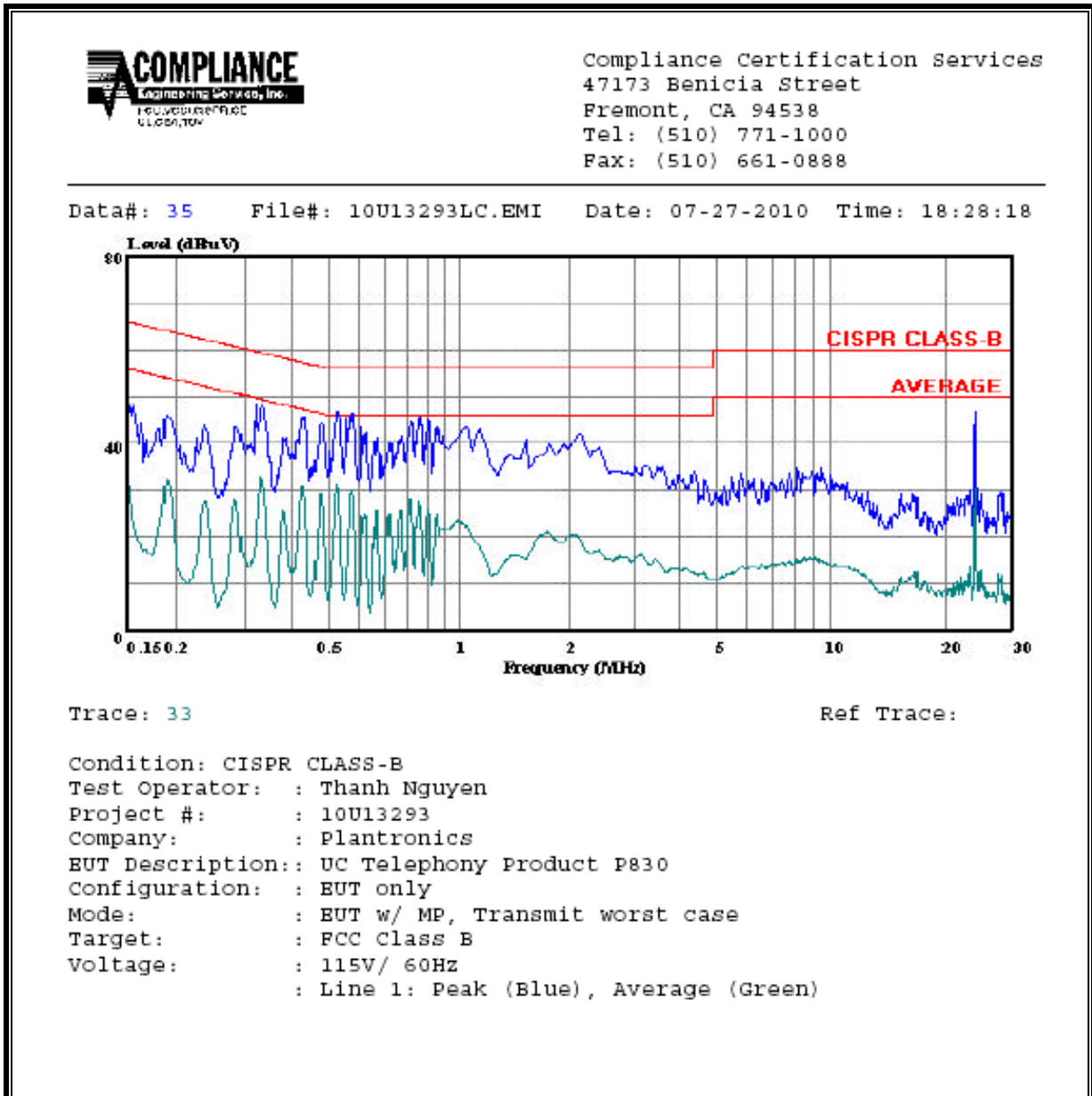
Condition: CISPR CLASS-B
Test Operator: : Thanh Nguyen
Project #: : 10U13293
Company: : Plantronics
EUT Description: UC Telephony Product P830
Configuration: : EUT only
Mode: : EUT w/ Micro Phone, Transmit worst case
Target: : FCC Class B
Voltage: : 115V/ 60HZ
: Line 2: Peak (Blue), Average (Green)

16. AC POWER LINE CONDUCTED EMISSIONS (MOBILE PHONE MODULE)

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Class	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.33	48.01	--	32.81	0.00	59.35	49.35	-11.34	-16.54	L1
0.53	46.61	--	31.15	0.00	56.00	46.00	-9.39	-14.85	L1
24.01	46.73	--	32.94	0.00	60.00	50.00	-13.27	-17.06	L1
0.32	49.76	--	40.29	0.00	59.66	49.66	-9.90	-9.37	L2
0.52	46.87	--	38.19	0.00	56.00	46.00	-9.13	-7.81	L2
24.01	50.62	--	35.03	0.00	60.00	50.00	-9.38	-14.97	L2
6 Worst Data									

LINE 1 RESULTS

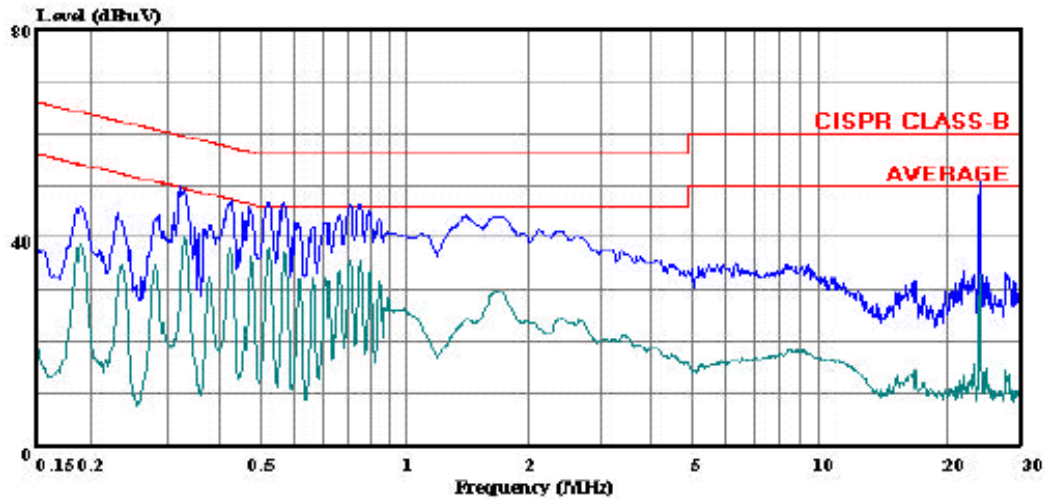


LINE 2 RESULTS



Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 42 File#: 10U13293LC.EMI Date: 07-27-2010 Time: 19:02:17



Trace: 40

Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Thanh Nguyen
Project #: : 10U13293
Company: : Plantronics
BUT Description: UC Telephony Product P830
Configuration: : BUT only
Mode: : BUT w/ MP, Transmit worst case
Target: : FCC Class B
Voltage: : 115V/ 60HZ
: Line 2: Peak (Blue), Average (Green)

17. MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

IC RULES

IC Safety Code 6, Section 2.2.1 (a) A person other than an RF and microwave exposed worker shall not be exposed to electromagnetic radiation in a frequency band listed in Column 1 of Table 5, if the field strength exceeds the value given in Column 2 or 3 of Table 5, when averaged spatially and over time, or if the power density exceeds the value given in Column 4 of Table 5, when averaged spatially and over time.

**Table 5
 Exposure Limits for Persons Not Classed As RF and Microwave Exposed Workers (Including the General Public)**

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m ²)	5 Averaging Time (min)
0.003–1	280	2.19		6
1–10	280/ <i>f</i>	2.19/ <i>f</i>		6
10–30	28	2.19/ <i>f</i>		6
30–300	28	0.073	2*	6
300–1 500	1.585 <i>f</i> ^{0.5}	0.0042 <i>f</i> ^{0.5}	<i>f</i> /150	6
1 500–15 000	61.4	0.163	10	6
15 000–150 000	61.4	0.163	10	616 000 / <i>f</i> ^{1.2}
150 000–300 000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616 000 / <i>f</i> ^{1.2}

* Power density limit is applicable at frequencies greater than 100 MHz.

- Notes:**
1. Frequency, *f*, is in MHz.
 2. A power density of 10 W/m² is equivalent to 1 mW/cm².
 3. A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

EQUATIONS

Power density is given by:

$$S = \text{EIRP} / (4 * \text{Pi} * \text{D}^2)$$

where

S = Power density in W/m²

EIRP = Equivalent Isotropic Radiated Power in W

D = Separation distance in m

Power density in units of W/m² is converted to units of mW/cm² by dividing by 10.

Distance is given by:

$$D = \text{SQRT} (\text{EIRP} / (4 * \text{Pi} * S))$$

where

D = Separation distance in m

EIRP = Equivalent Isotropic Radiated Power in W

S = Power density in W/m²

For multiple colocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the Power * Gain product (in linear units) of each transmitter.

$$\text{Total EIRP} = (P1 * G1) + (P2 * G2) + \dots + (Pn * Gn)$$

where

Px = Power of transmitter x

Gx = Numeric gain of antenna x

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm²

From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m²

RESULTS

(MPE distance equals 20 cm)

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	IC Power Density (W/m ²)	FCC Power Density (mW/cm ²)
2.4 GHz	Bluetooth	0.20	7.82	1.50	0.02	0.002