



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

**CERTIFICATION TEST REPORT\***

**FOR**

**RUGGEDIZED HANDHELD PDA-TYPE DEVICE WITH DUAL BAND  
GSM/GPRS/WCDMA/HSDPA 802.11 b/g & BT**

**MODEL NUMBER: CN4, CN4e\*\***

**FCC ID: EHA-03CN4  
IC: 1223A-01CN4**

**REPORT NUMBER: 09U12493-2, Revision B**

**ISSUE DATE: JUNE 19, 2009**

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\* This report covers the radiated portion of GFSK modulation, the radiated and conducted portions of 8PSK modulation, for conducted portion of GFSK modulation refer to report number ITRM0128.1

\*\* Model differences are described within the body of this report



**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Issue Date	Revisions	Revised By
--	05/11/09	Initial Issue	F. Ibrahim
A	06/11/09	Revised FCC ID	A. Zaffar
B	06/19/09	Revised EUT Description	A. Zaffar

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** INTERMEC TECHNOLOGIES CORP  
550 SECOND STREET SE  
CEDAR RAPIDS, IOWA, 52401, U.S.A

**EUT DESCRIPTION:** RUGGEDIZED HANDHELD PDA-TYPE DEVICE w/ DUAL BAND  
GSM/GPRS/WCDMA/HSDPA, 802.11 b/g & BT

**MODEL:** CN4, CN4e

**SERIAL NUMBER:** 03590990181, 03590990054

**DATE TESTED:** APRIL 23-30, 2009

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

\* This report covers the radiated portion of GFSK modulation, the radiated and conducted portions of 8PSK modulation, for conducted portion of GFSK modulation refer to report number ITRM0128.1

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. 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. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:



FRANK IBRAHIM  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

Tested By:



TOM CHEN  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, 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. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a ruggedized handheld PDA-type device w/ dual band GSM/GPRS/WCDMA/HSDPA, 802.11 B/G & BT.

### 5.2. DESCRIPTION OF MODEL(S) DIFFERENCES

CN4 is standard and CN4e is extended, both are available with numeric or QWERTY keypads.

CN4e with QWERTY keypad was selected as a representative model for radiated emissions and radiated immunity testing.

### 5.3. 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	Enhanced 8PSK	1.93	1.56

### 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Meander line monopole antenna, with a maximum gain of 0.5 dBic (-1.65 dBi).

### 5.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was v.20961.

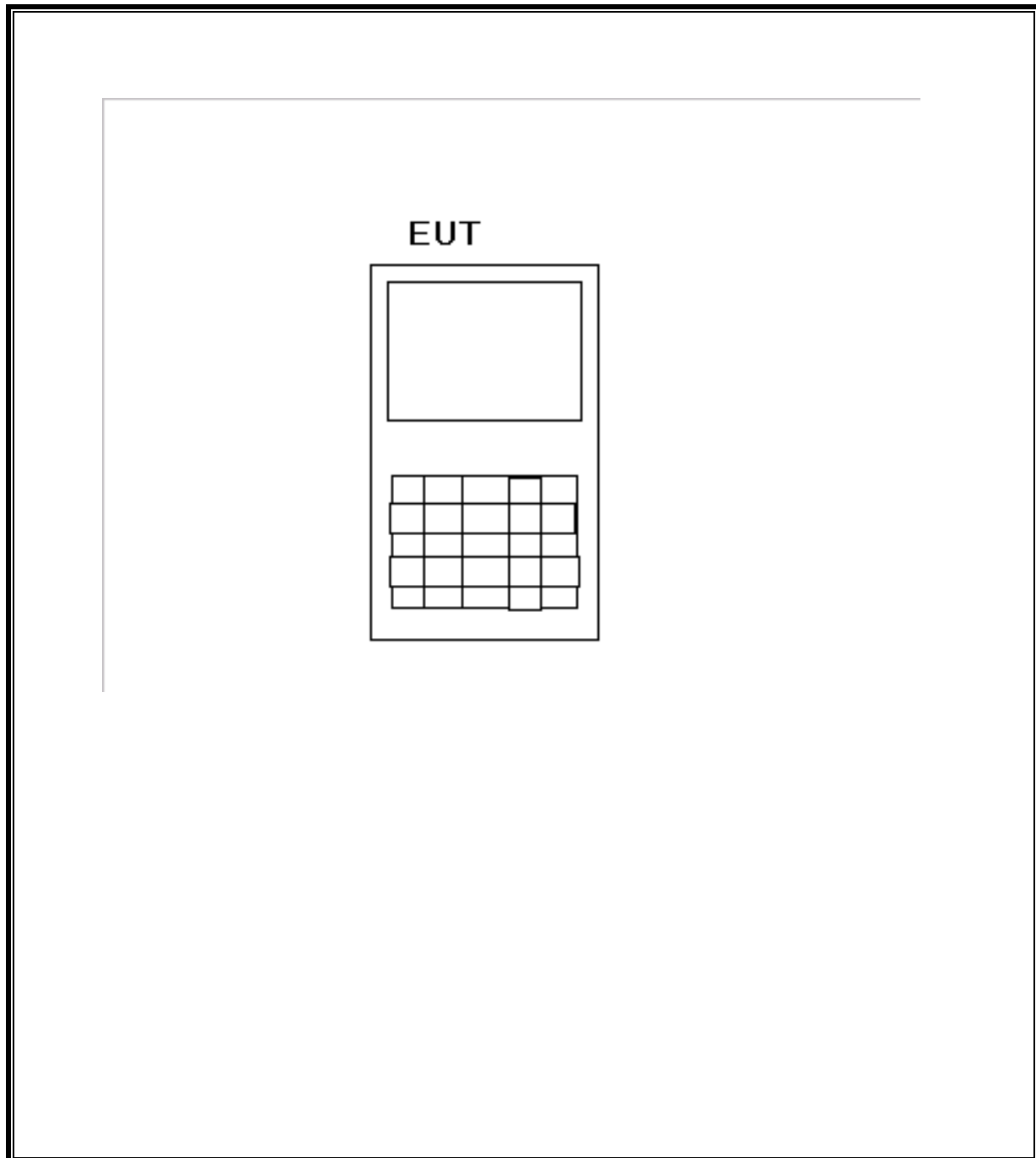
The test utility software used during testing was broadtest.exe, V1.4.

### 5.6. WORST-CASE CONFIGURATION AND MODE

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

## 5.7. DESCRIPTION OF TEST SETUP

### TEST SETUP



## 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
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	11/07/08	02/07/10
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/09	01/14/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	12/16/08	12/16/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	02/04/09	02/04/10
Antenna, Horn, 18 GHz	EMCO	3115	C00945	01/29/09	01/29/10
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	02/06/08	08/06/09
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/29/08	10/29/09



## 7. ANTENNA PORT TEST RESULTS

### 7.1. ENHANCED DATA RATE 8PSK MODULATION

#### 7.1.1. 20 dB AND 99% BANDWIDTH

##### LIMIT

None; for reporting purposes only.

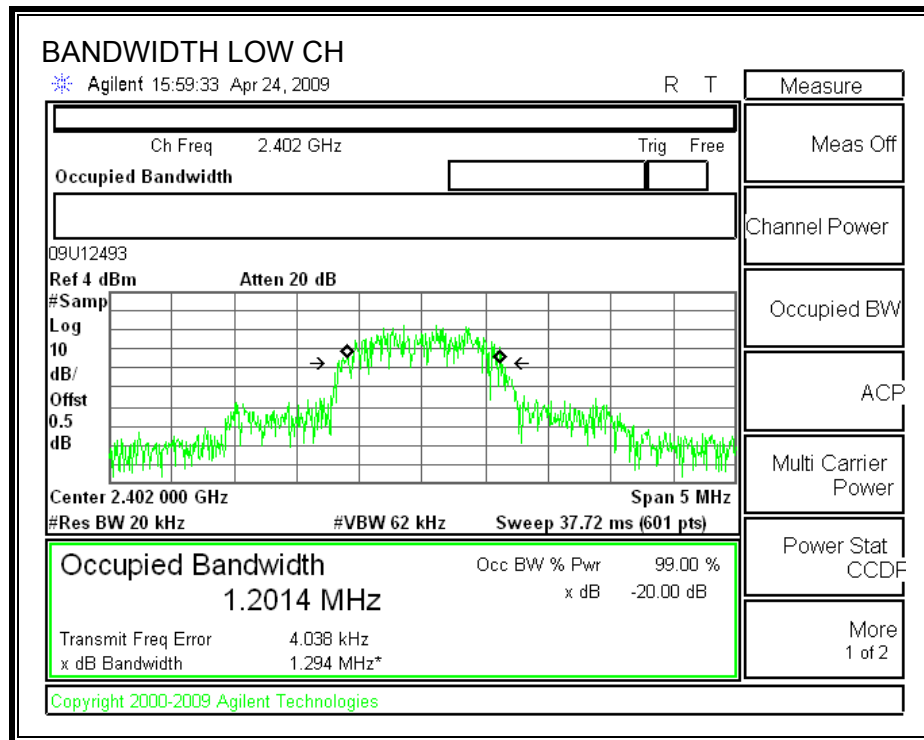
##### TEST PROCEDURE

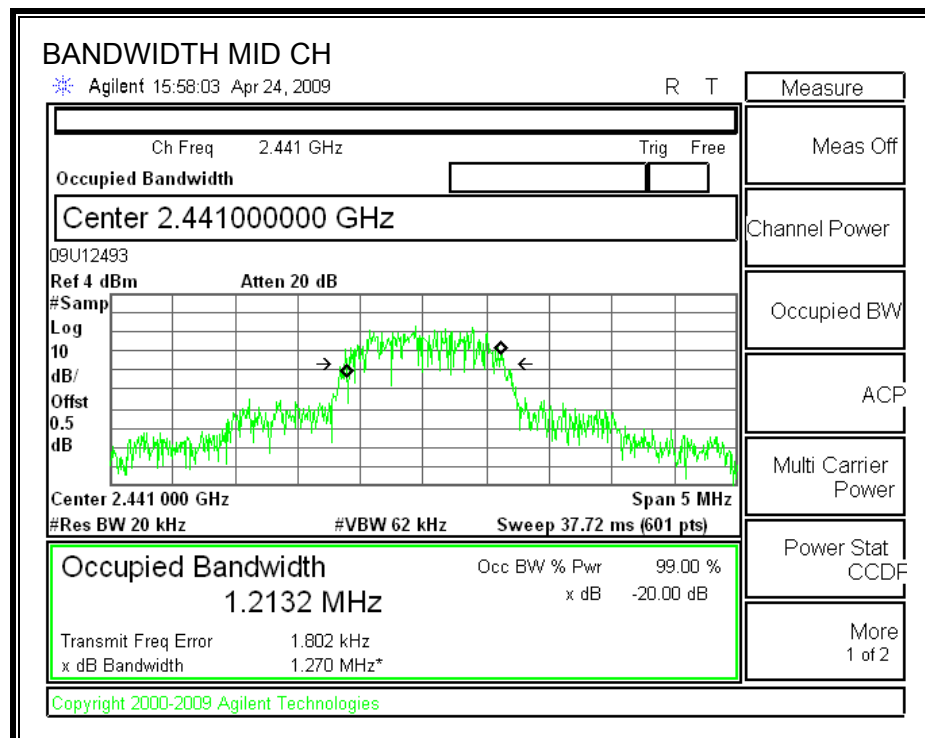
The transmitter output is connected to a spectrum analyzer. The RBW is set to  $\geq 1\%$  of the 20 dB bandwidth. The VBW is set to  $\geq$  RBW. The sweep time is coupled.

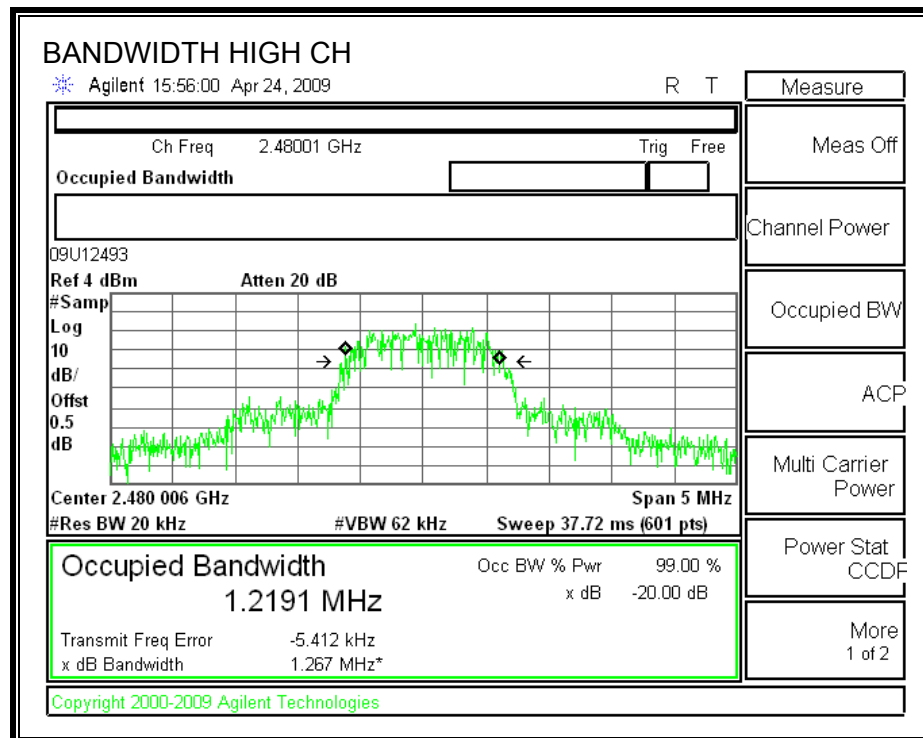
##### RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	2402	1.294	1.2014
Middle	2441	1.270	1.2132
High	2480	1.267	1.2191

**20 dB AND 99% 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.

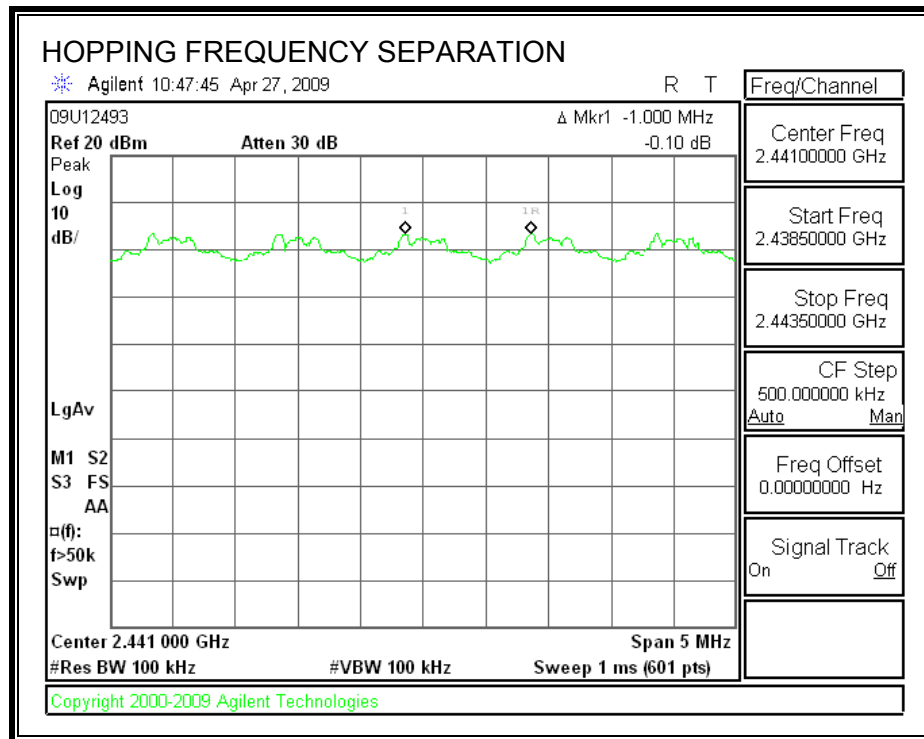
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

### TEST PROCEDURE

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

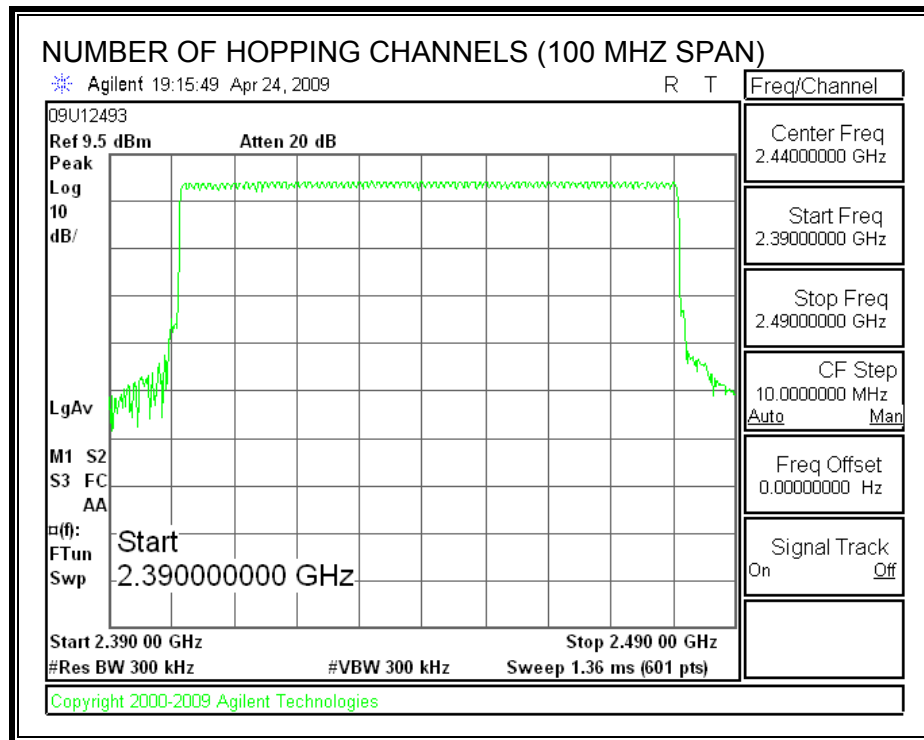
#### **TEST PROCEDURE**

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.

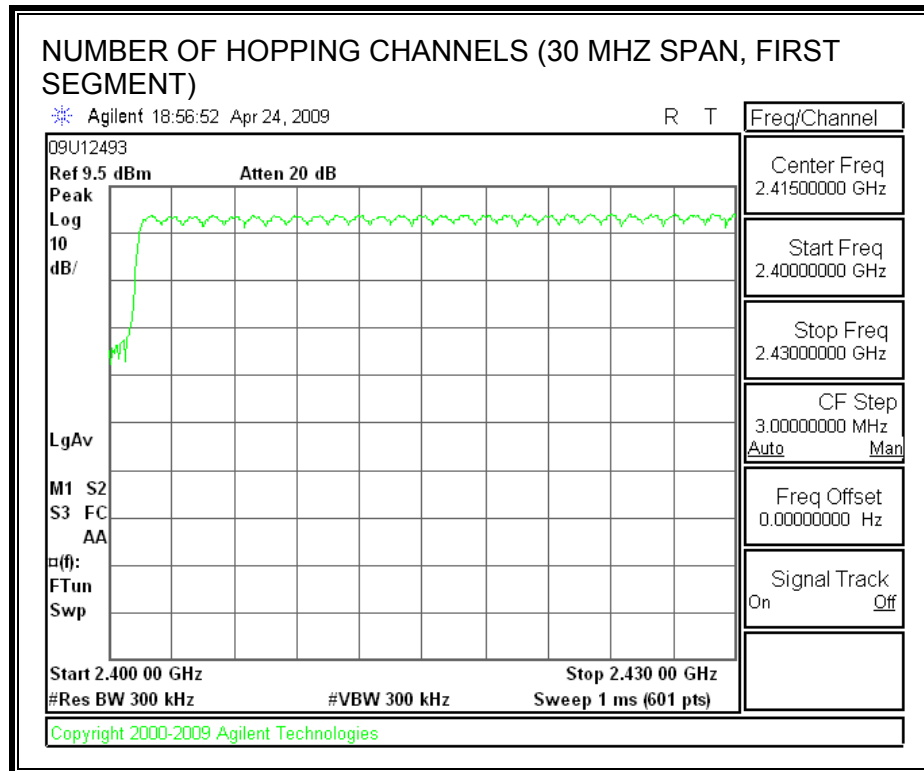
#### **RESULTS**

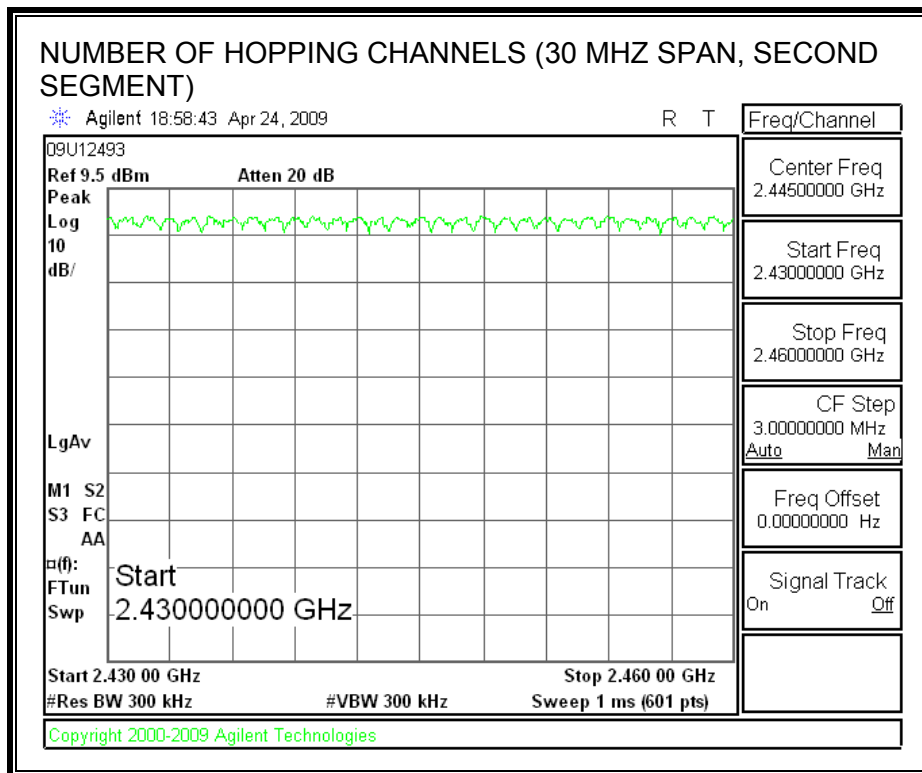
79 Channels observed.

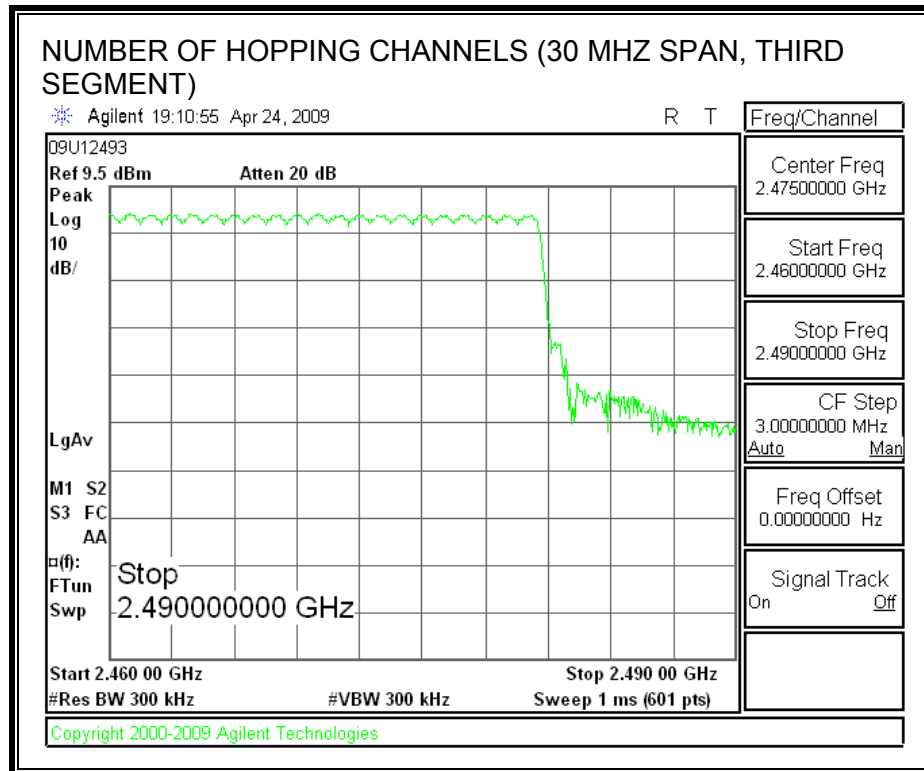
**NUMBER OF HOPPING CHANNELS**











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

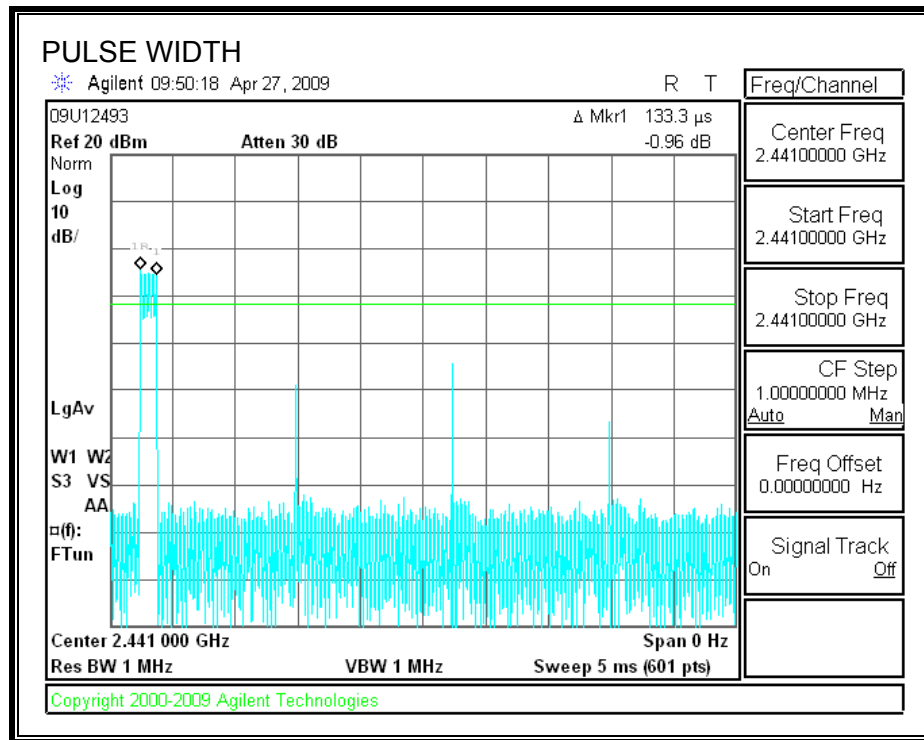
##### RESULTS

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

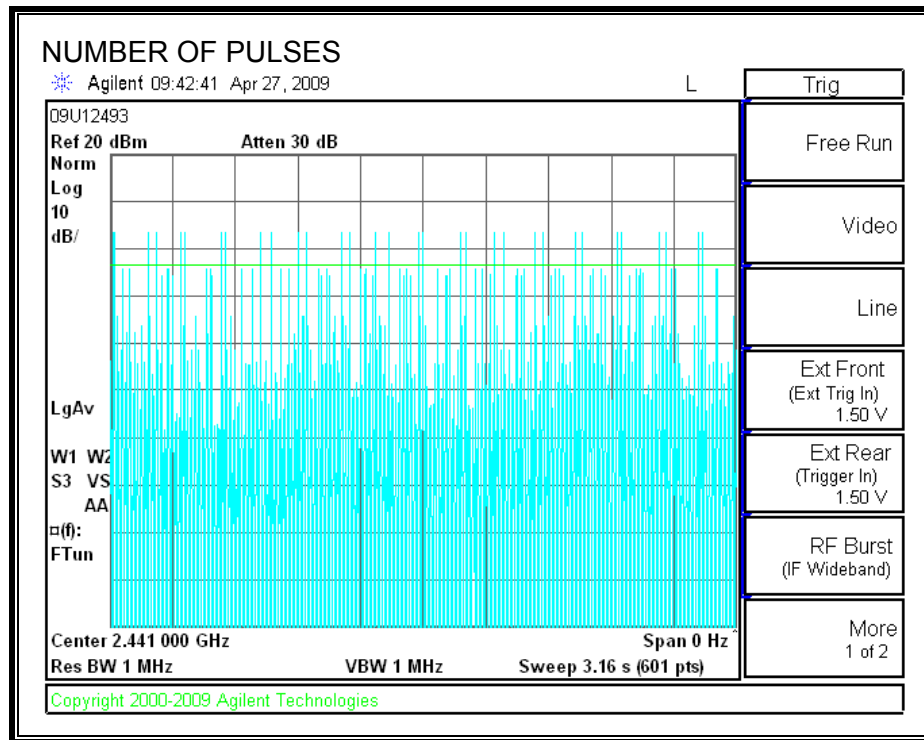
##### 8PSK Mode

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
DH5	0.1333	31	0.0413	0.4	-0.3587

# 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.

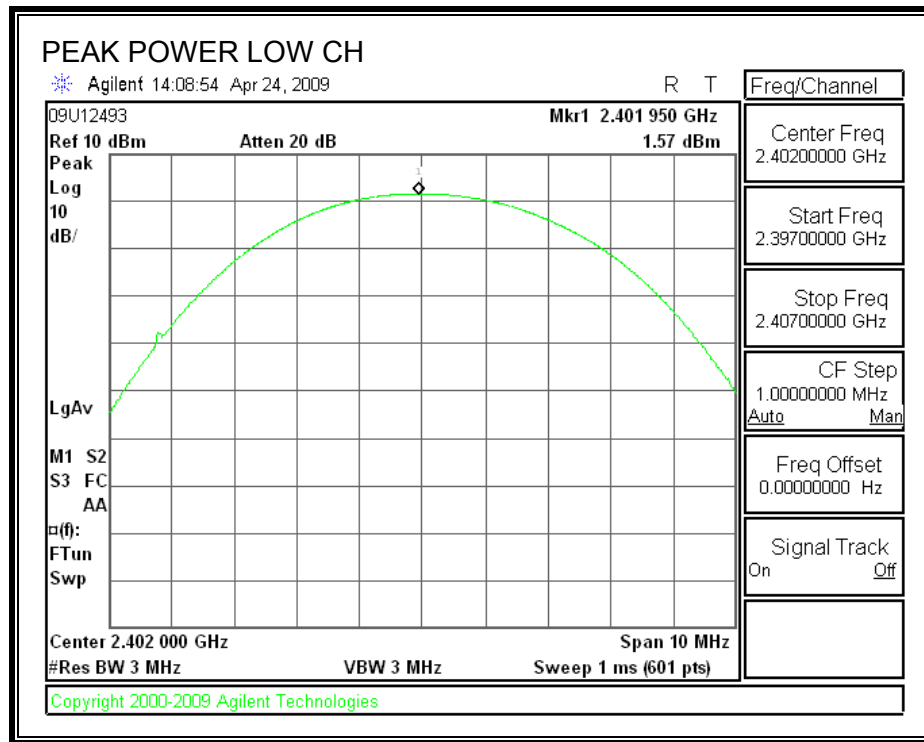
#### TEST PROCEDURE

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.

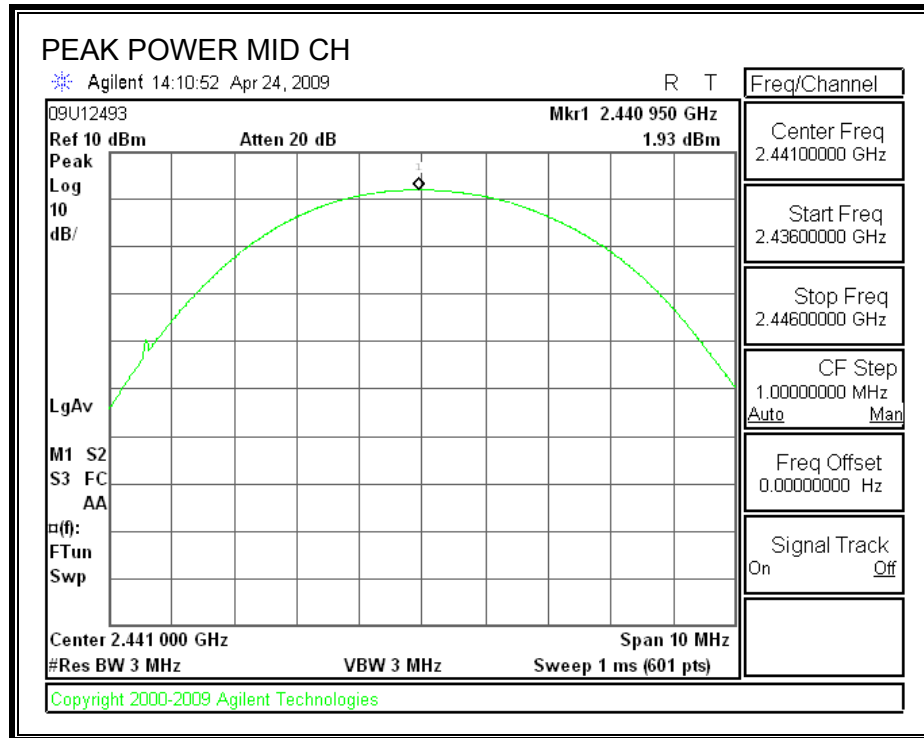
#### RESULTS

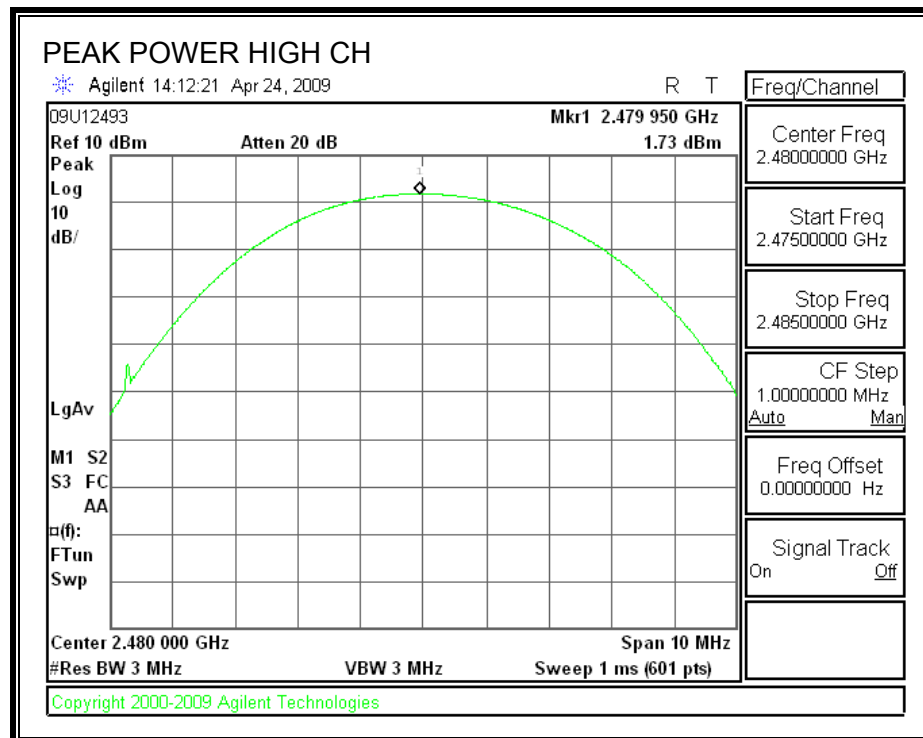
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.57	30	-28.43
Middle	2441	1.93	30	-28.07
High	2480	1.73	30	-28.27

## 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 0 dB was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	-2.50
Middle	2441	-2.23
High	2480	-2.18

### **7.1.7. CONDUCTED SPURIOUS EMISSIONS**

#### **LIMITS**

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

#### **TEST PROCEDURE**

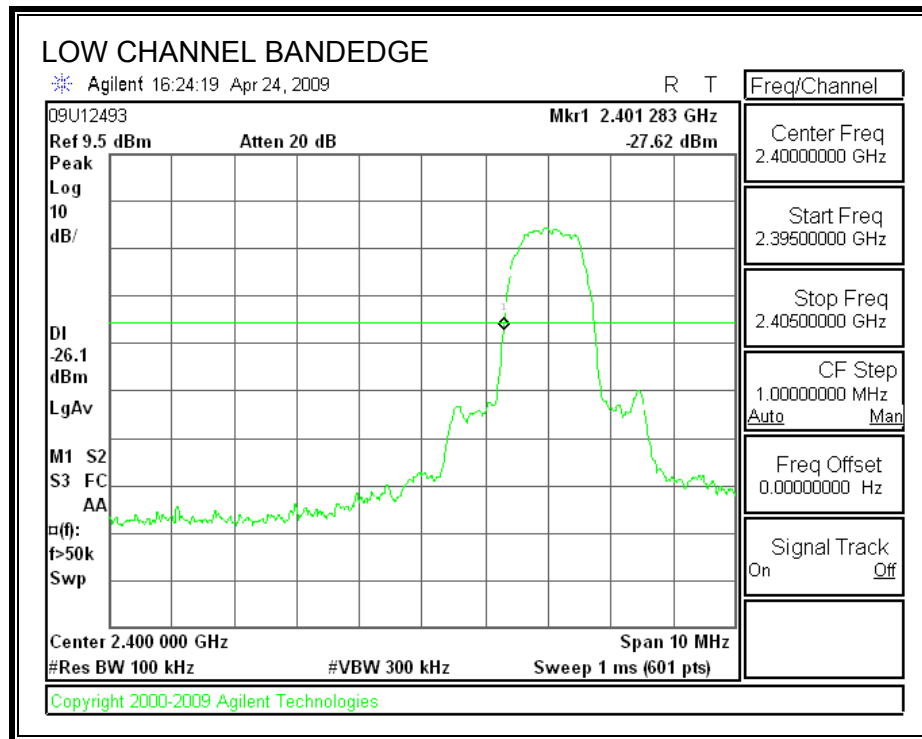
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

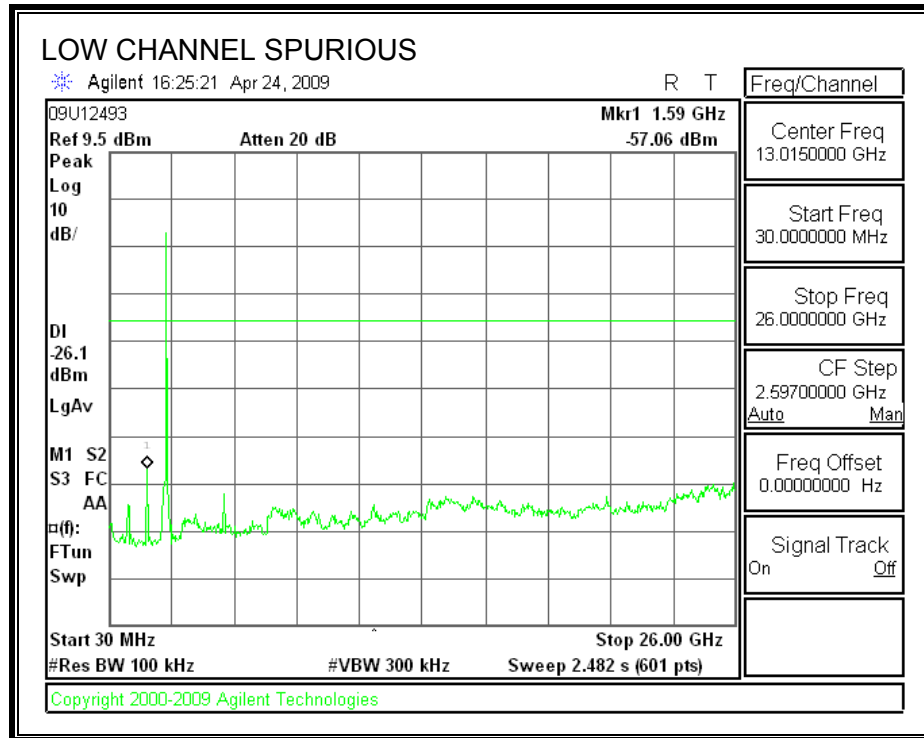
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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

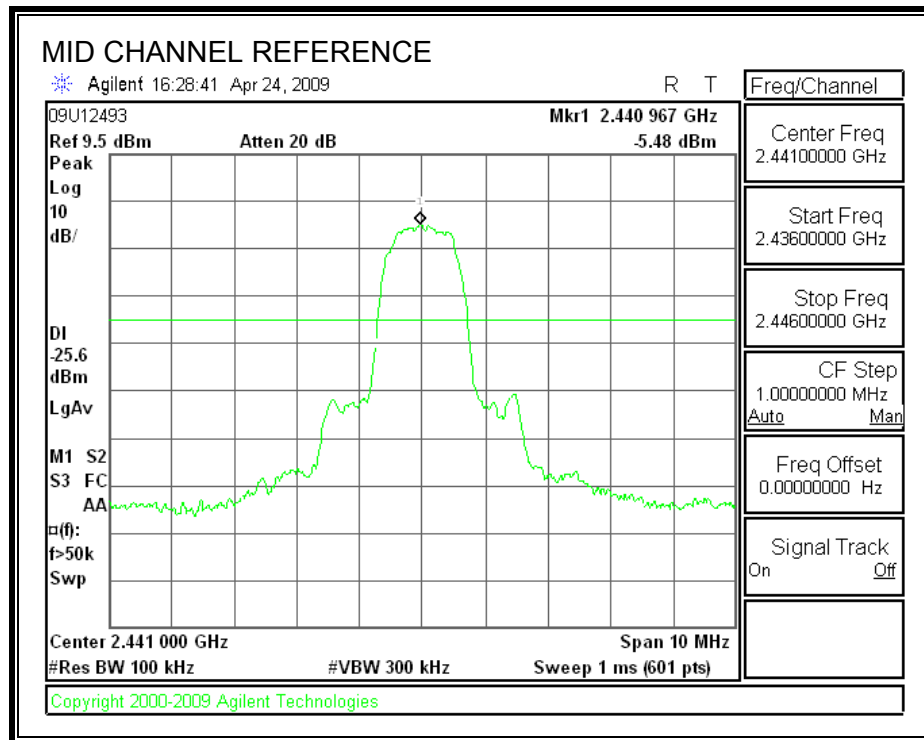
## RESULTS

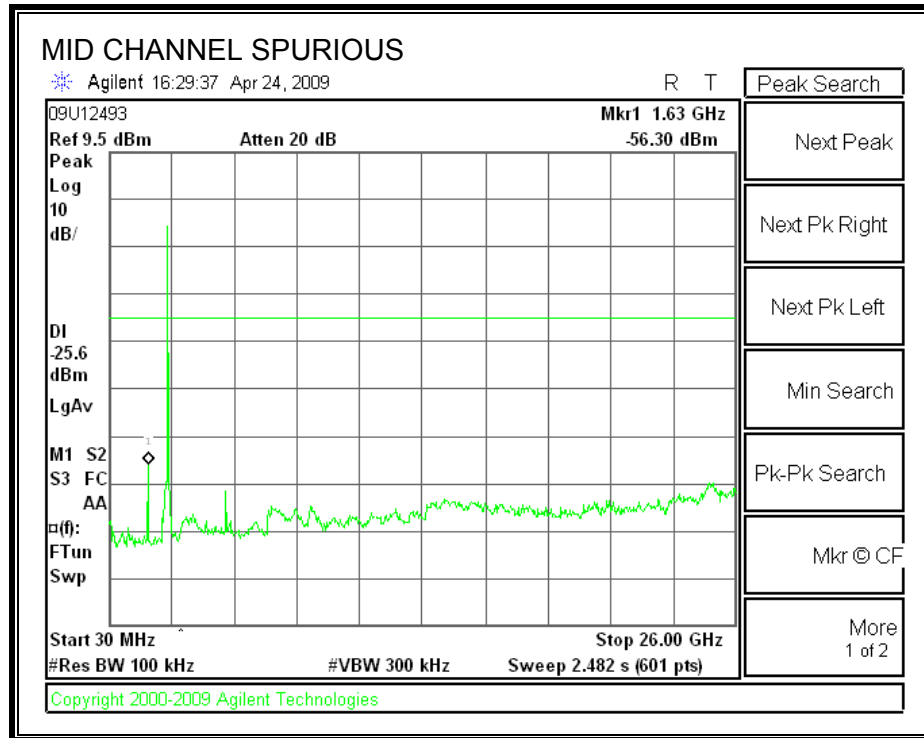
### SPURIOUS EMISSIONS, LOW CHANNEL





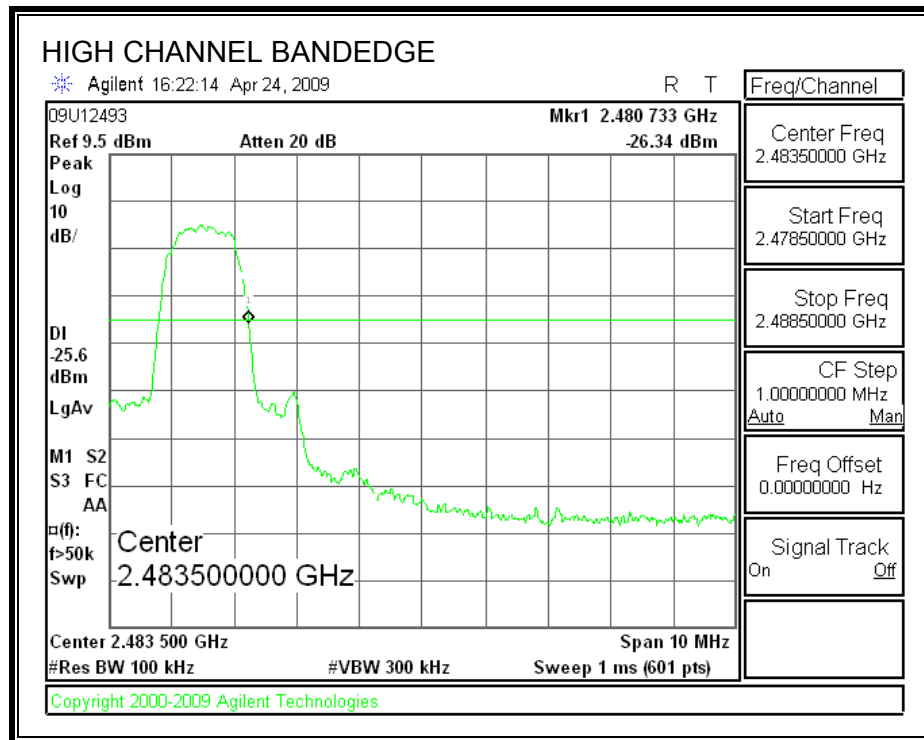
**SPURIOUS EMISSIONS, MID CHANNEL**

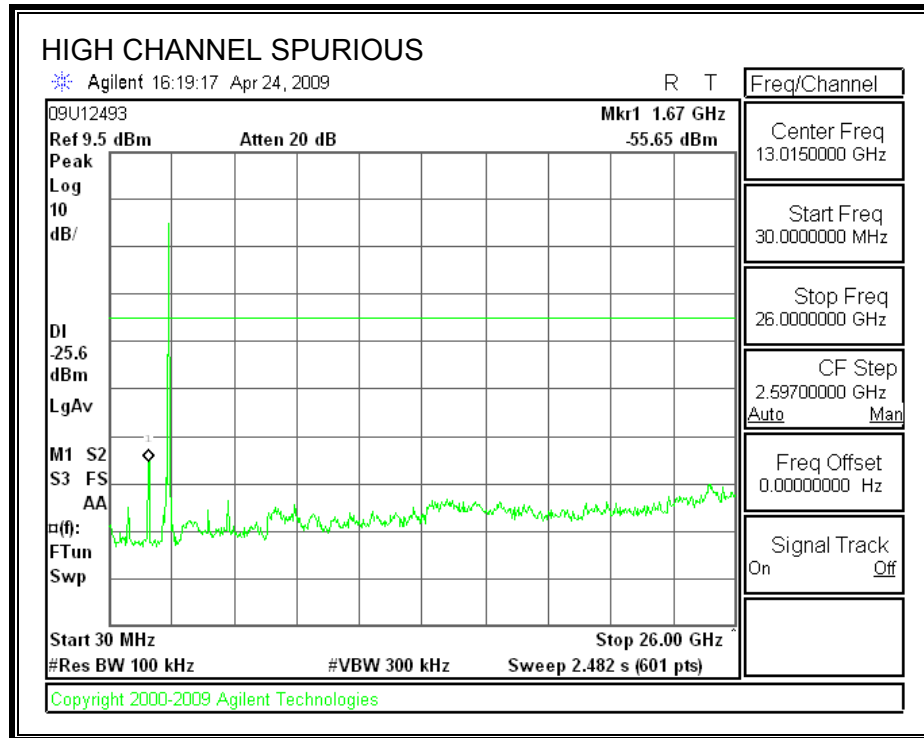




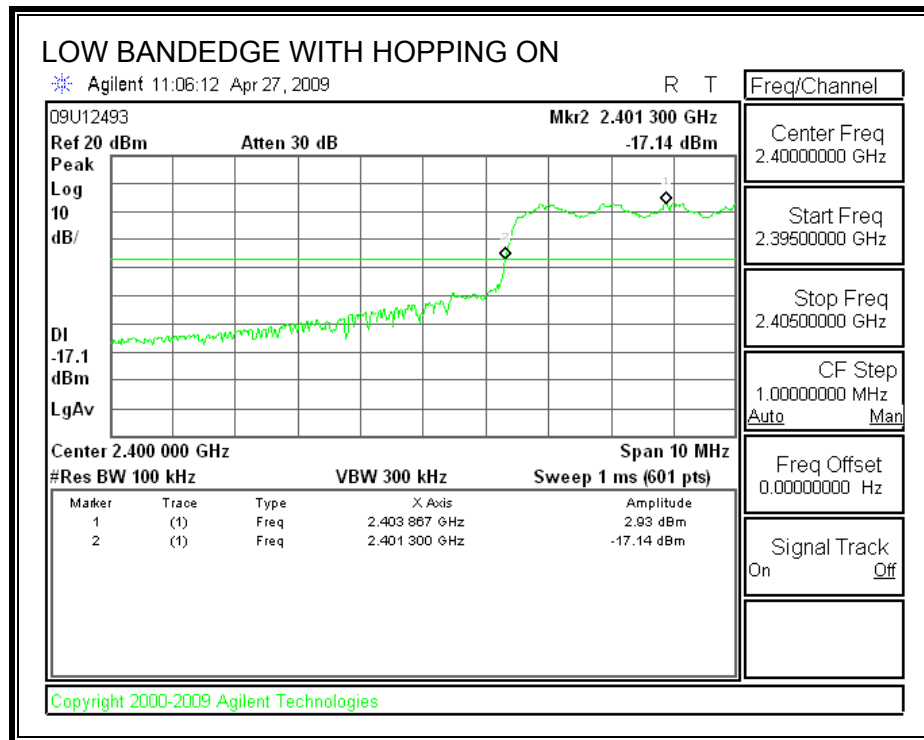


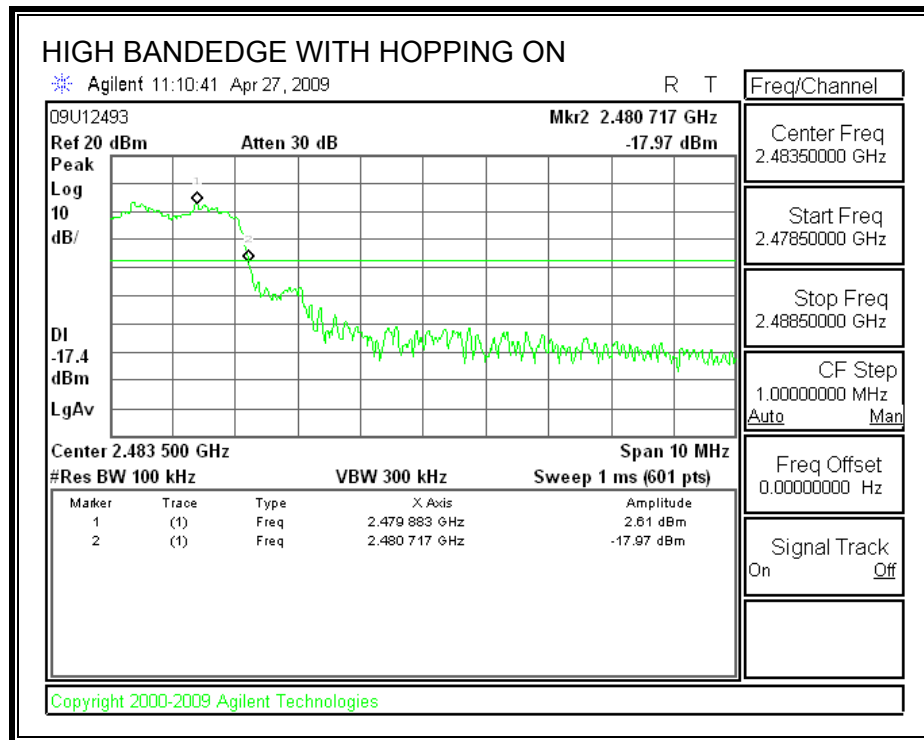
**SPURIOUS EMISSIONS, HIGH CHANNEL**





**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**





## 8. RADIATED TEST RESULTS

### 8.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

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

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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

For 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 10 Hz for average measurements.

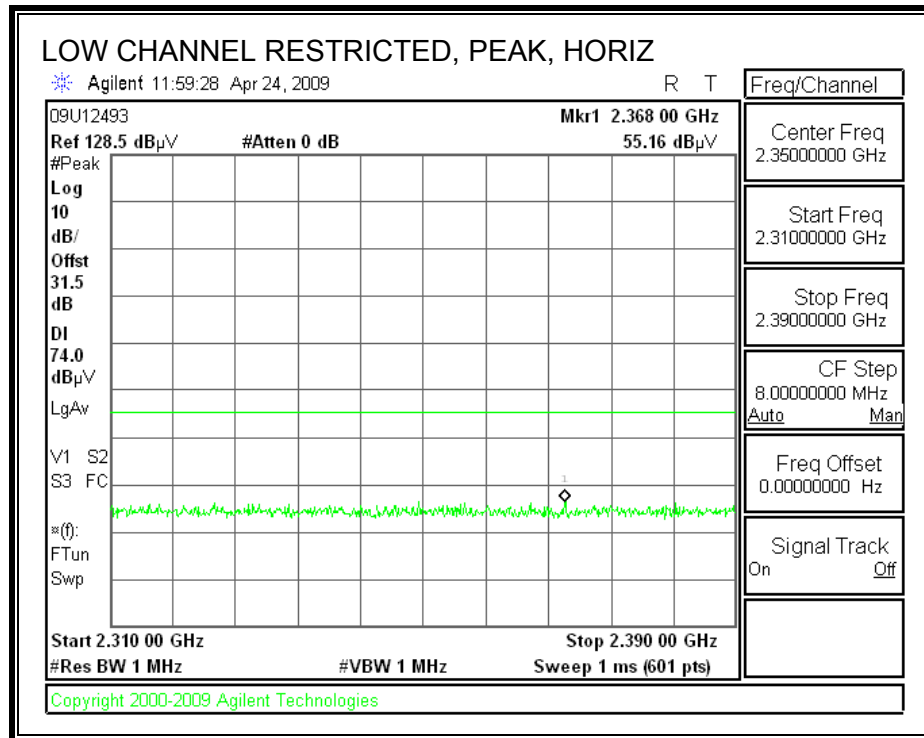
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

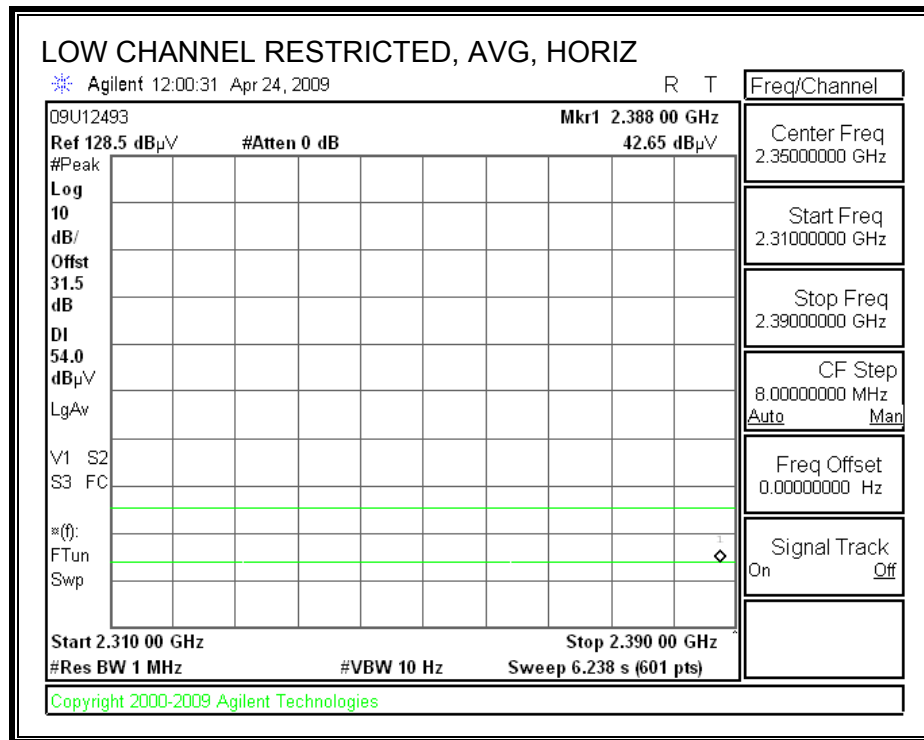
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

## 8.2. TRANSMITTER ABOVE 1 GHz

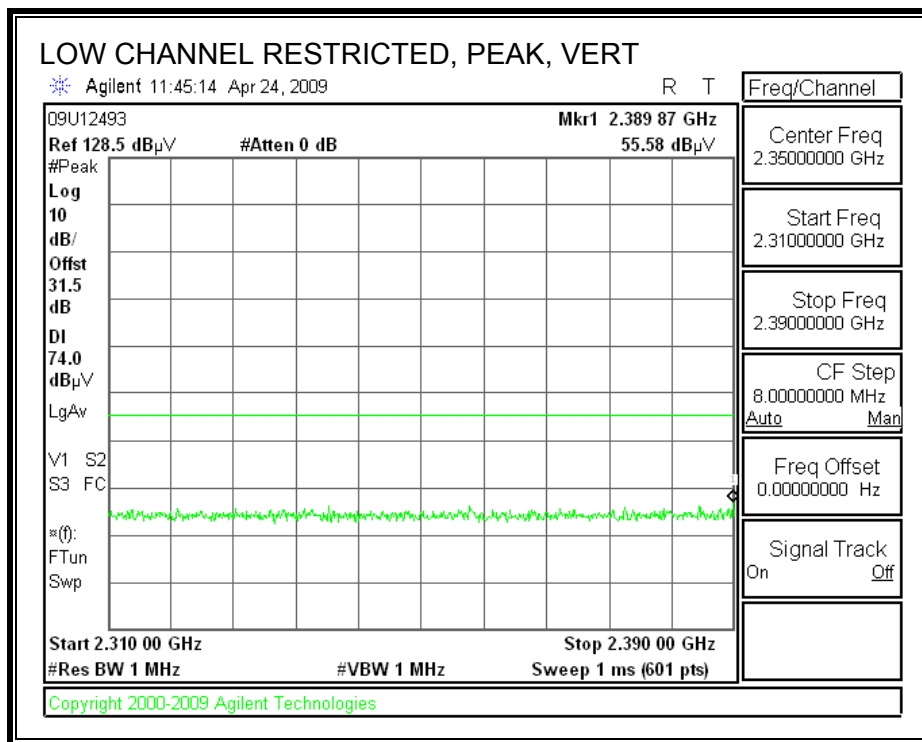
### 8.2.1. BASIC DATA RATE GFSK MODULATION

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

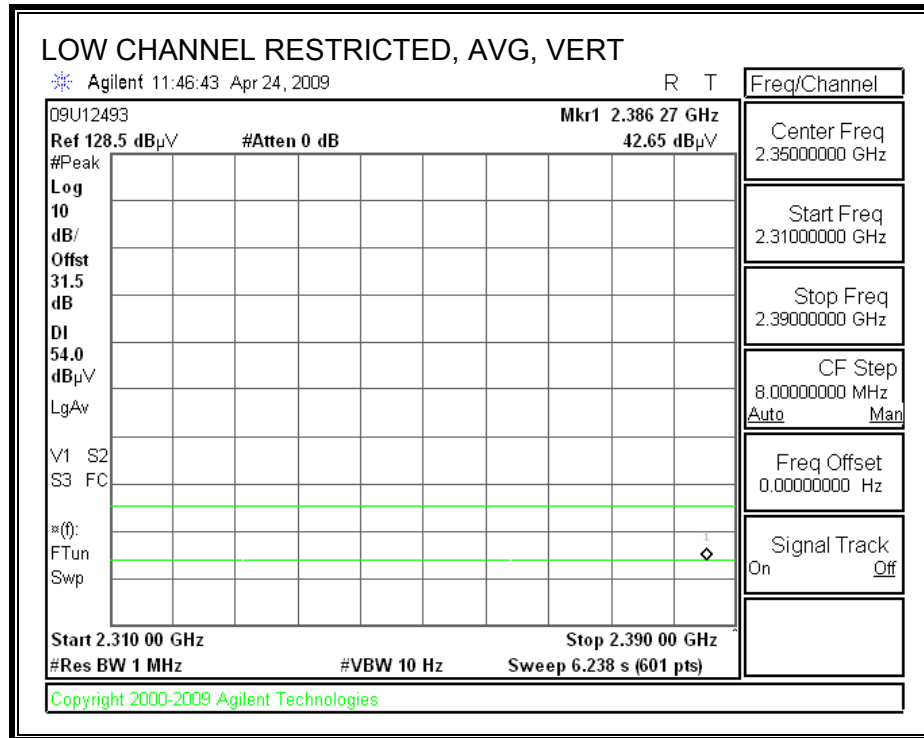




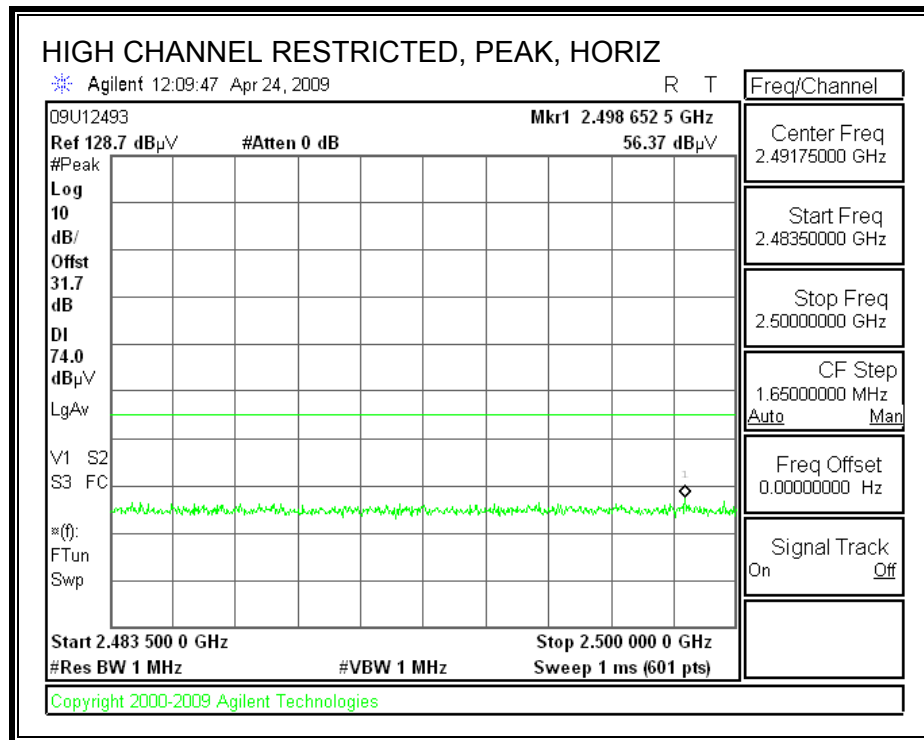
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

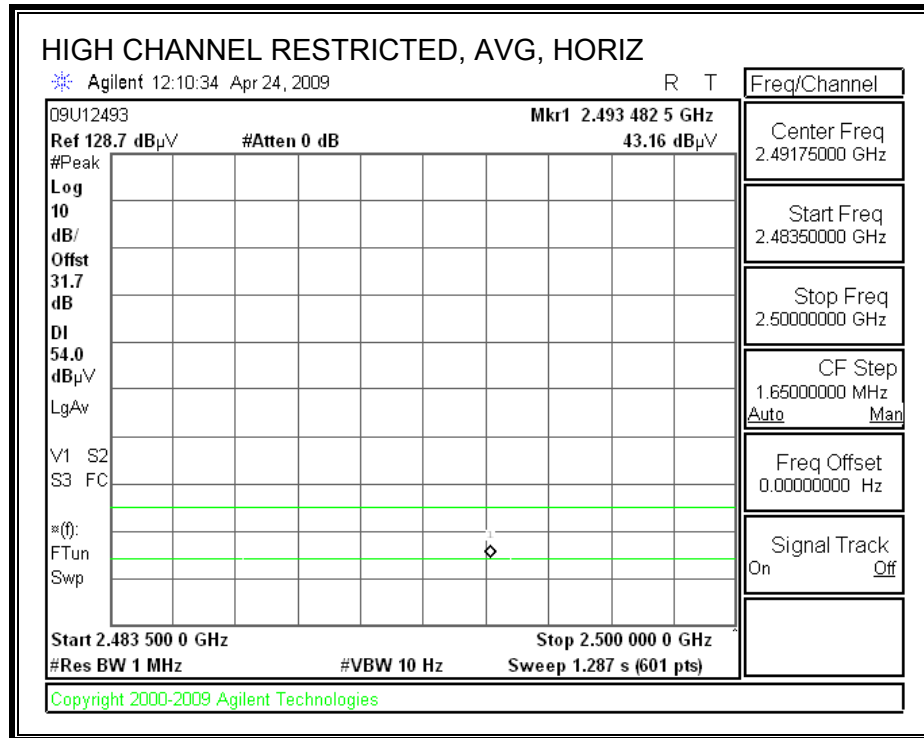




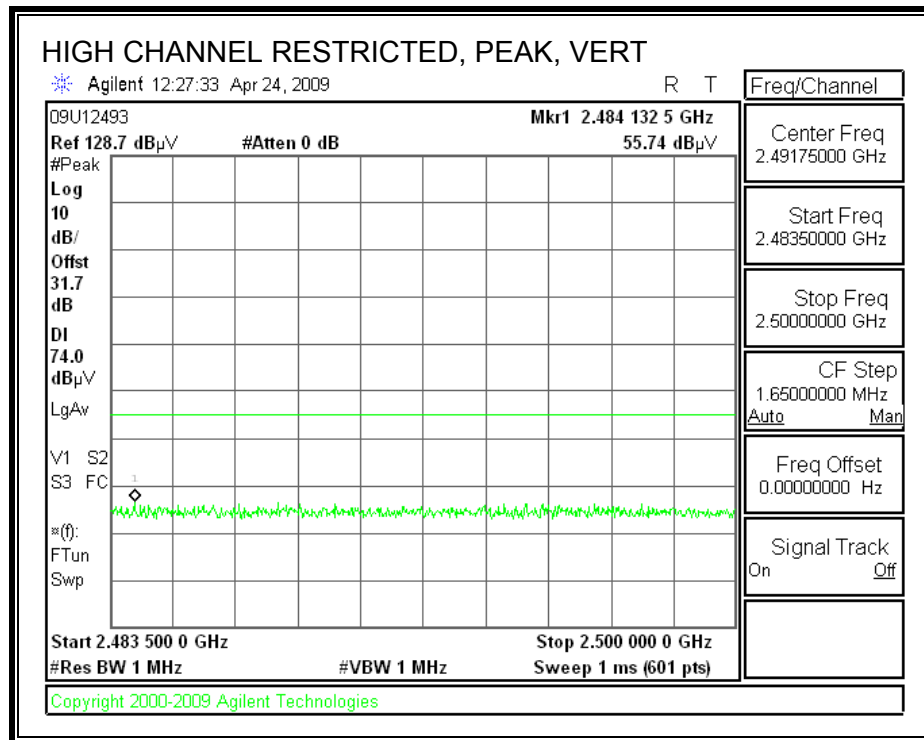


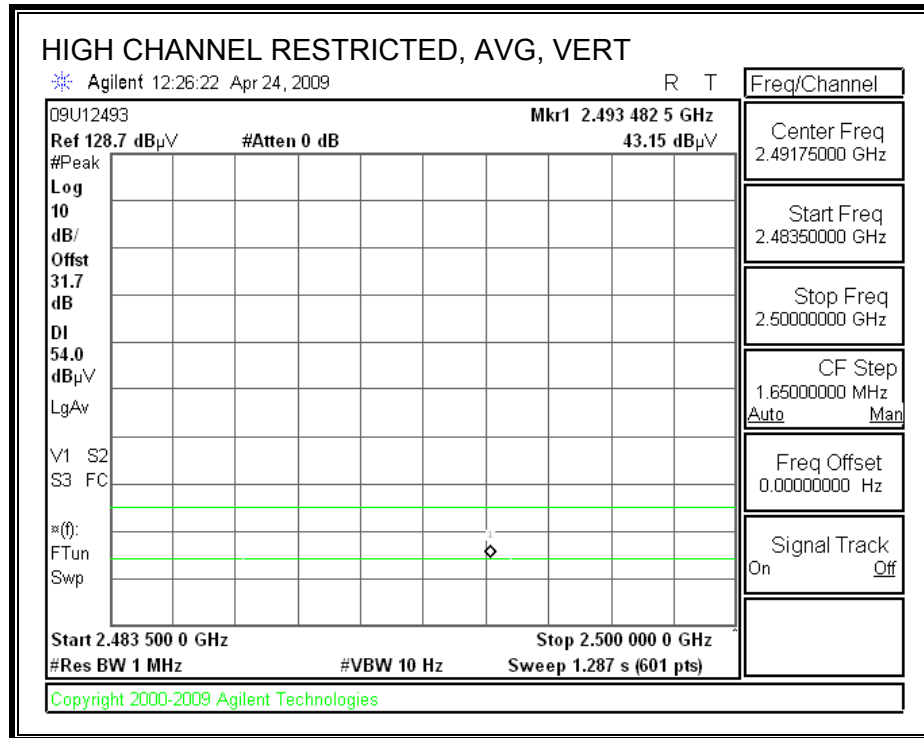
**RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)**





**RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)**



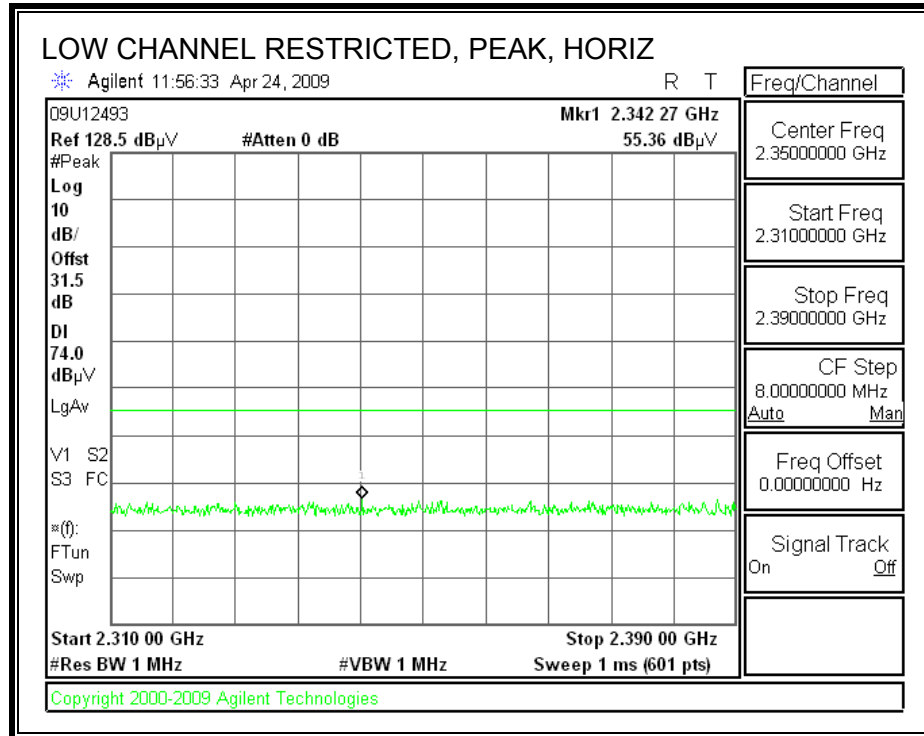


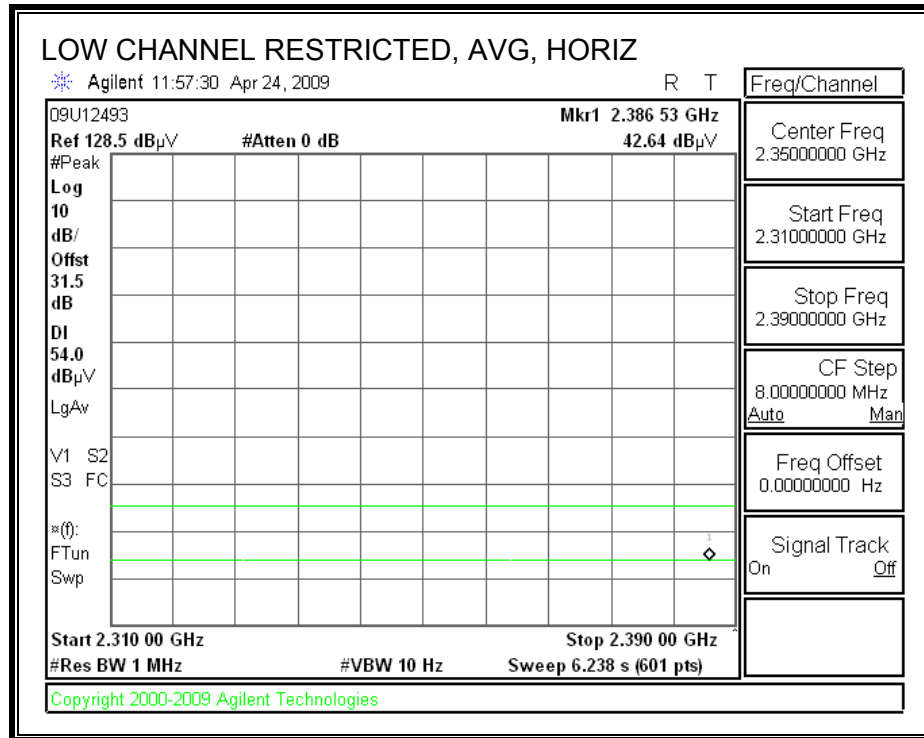
# **HARMONICS AND SPURIOUS EMISSIONS**

High Frequency Measurement																
Compliance Certification Services, Fremont 5m Chamber																
Company: Silver Spring Networks Project #: 09U12493 Date: 4/29/2009 Test Engineer: Tom Chen Configuration: EUT standalone Mode: BT GFSK TX Test 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									FCC 15.209				
Hi Frequency Cables																
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Measurements	
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			Measurements VBW=1MHz Hz, VBW=10Hz	
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fctr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	
<b>Low CH 2402 MHz</b>																
4.804	3.0	42.7	34.1	33.7	5.8	-36.5	0.0	0.0	45.8	37.1	74	54	-28.2	-16.9	V	
7.206	3.0	41.6	32.7	36.2	7.2	-36.2	0.0	0.0	48.8	39.8	74	54	-25.2	-14.2	V	
9.608	3.0	39.9	30.4	37.9	8.5	-36.9	0.0	0.0	49.4	39.9	74	54	-24.6	-14.1	V	
4.804	3.0	43.6	34.4	33.7	5.8	-36.5	0.0	0.0	46.7	37.4	74	54	-27.3	-16.6	H	
7.206	3.0	42.7	33.8	36.2	7.2	-36.2	0.0	0.0	49.8	40.9	74	54	-24.2	-13.1	H	
9.608	3.0	42.0	31.7	37.9	8.5	-36.9	0.0	0.0	51.5	41.2	74	54	-22.5	-12.8	H	
<b>Mid CH 2441 MHz</b>																
4.882	3.0	42.1	34.0	33.8	5.8	-36.5	0.0	0.0	45.3	37.2	74	54	-28.7	-16.8	V	
7.323	3.0	43.0	34.7	36.2	7.3	-36.2	0.0	0.0	50.2	42.0	74	54	-23.8	-12.0	V	
9.764	3.0	42.1	33.9	38.0	8.6	-37.0	0.0	0.0	51.6	43.5	74	54	-22.4	-10.5	V	
4.882	3.0	42.7	35.0	33.8	5.8	-36.5	0.0	0.0	45.9	38.2	74	54	-28.1	-15.8	H	
7.323	3.0	43.5	34.9	36.2	7.3	-36.2	0.0	0.0	50.8	42.2	74	54	-23.2	-11.8	H	
9.764	3.0	41.4	34.3	38.0	8.6	-37.0	0.0	0.0	51.0	43.9	74	54	-23.0	-10.1	H	
<b>Hi CH 2480 MHz</b>																
4.960	3.0	41.3	33.6	33.9	5.9	-36.5	0.0	0.0	44.6	36.9	74	54	-29.4	-17.1	V	
7.440	3.0	43.0	35.2	36.3	7.3	-36.2	0.0	0.0	50.5	42.6	74	54	-23.5	-11.4	V	
9.920	3.0	41.1	33.0	38.0	8.7	-37.1	0.0	0.0	50.7	42.6	74	54	-23.3	-11.4	V	
4.960	3.0	42.4	34.3	33.9	5.9	-36.5	0.0	0.0	45.7	37.6	74	54	-28.3	-16.4	H	
7.440	3.0	43.6	35.4	36.3	7.3	-36.2	0.0	0.0	51.0	42.8	74	54	-23.0	-11.2	H	
9.920	3.0	41.6	33.7	38.0	8.7	-37.1	0.0	0.0	51.2	43.3	74	54	-22.8	-10.7	H	
Rev. 11.10.08																
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											

## 8.2.2. ENHANCED DATA RATE 8PSK MODULATION

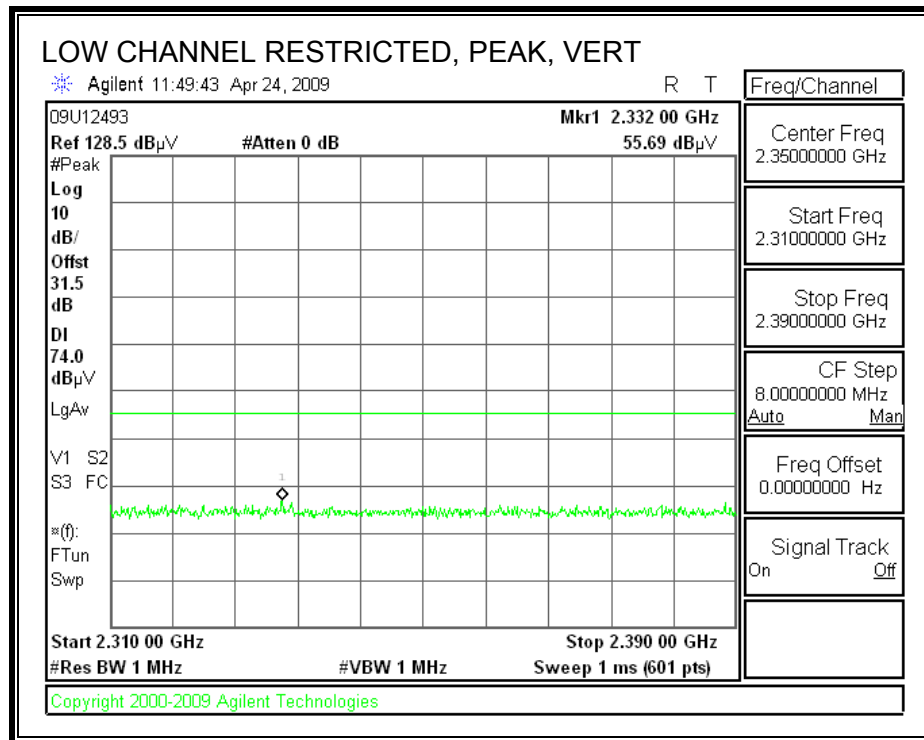
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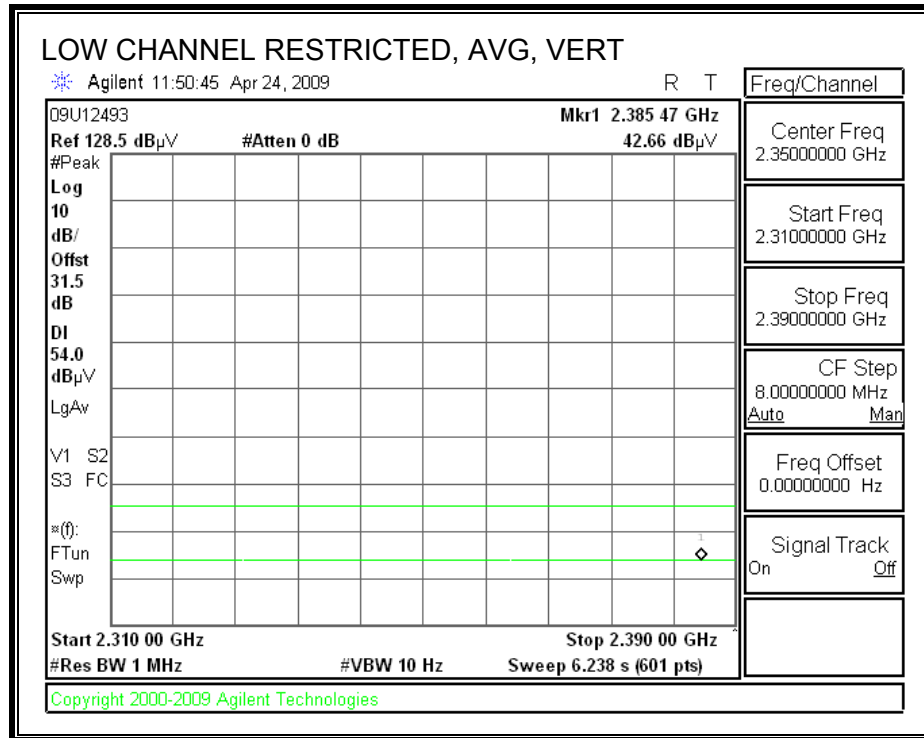




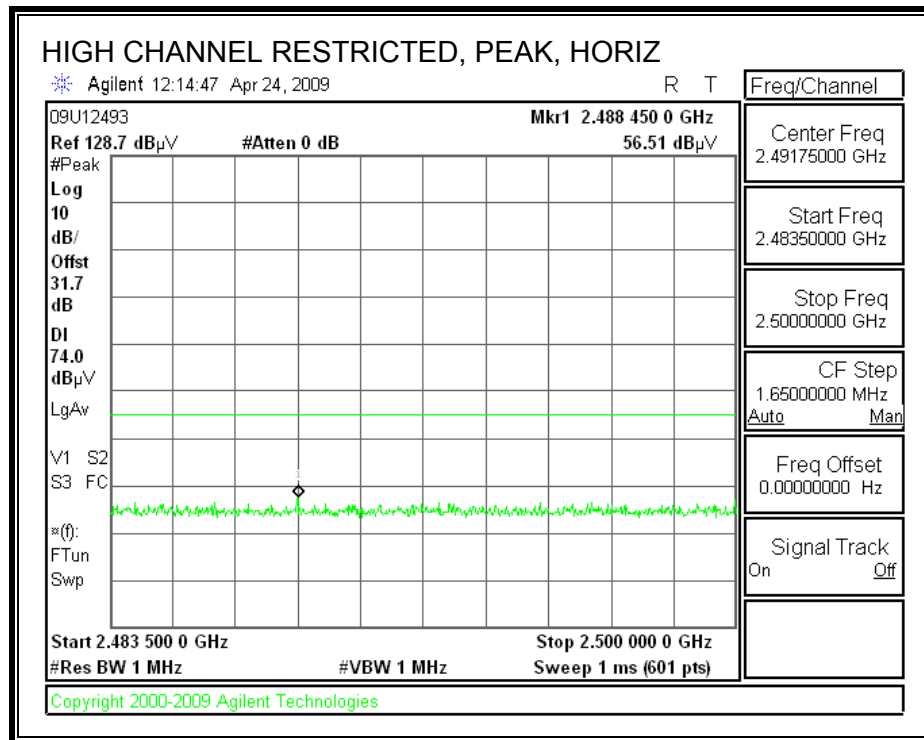


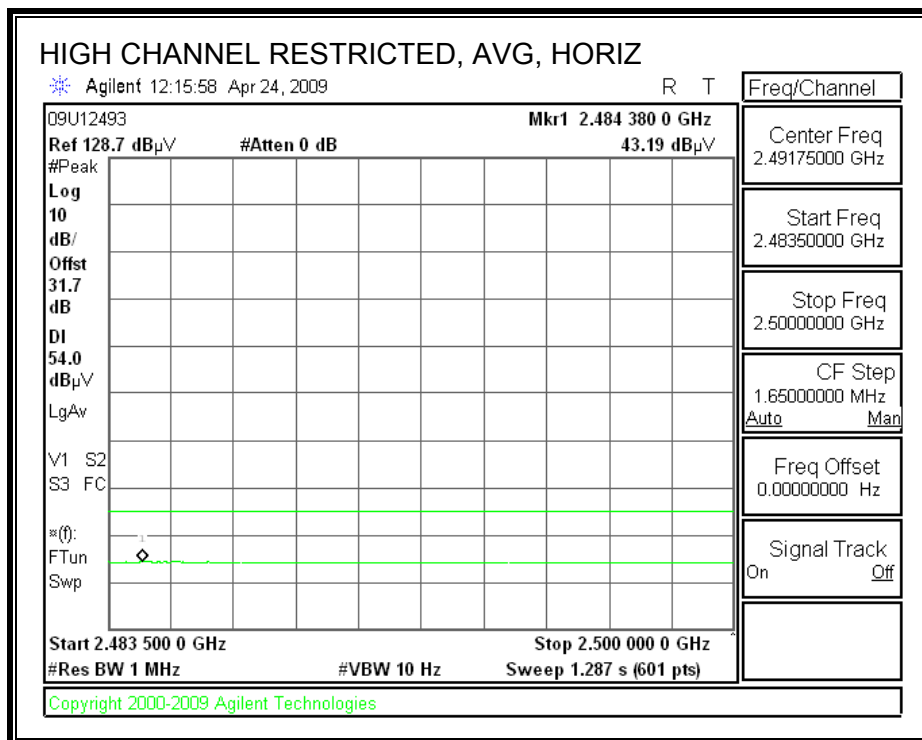
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



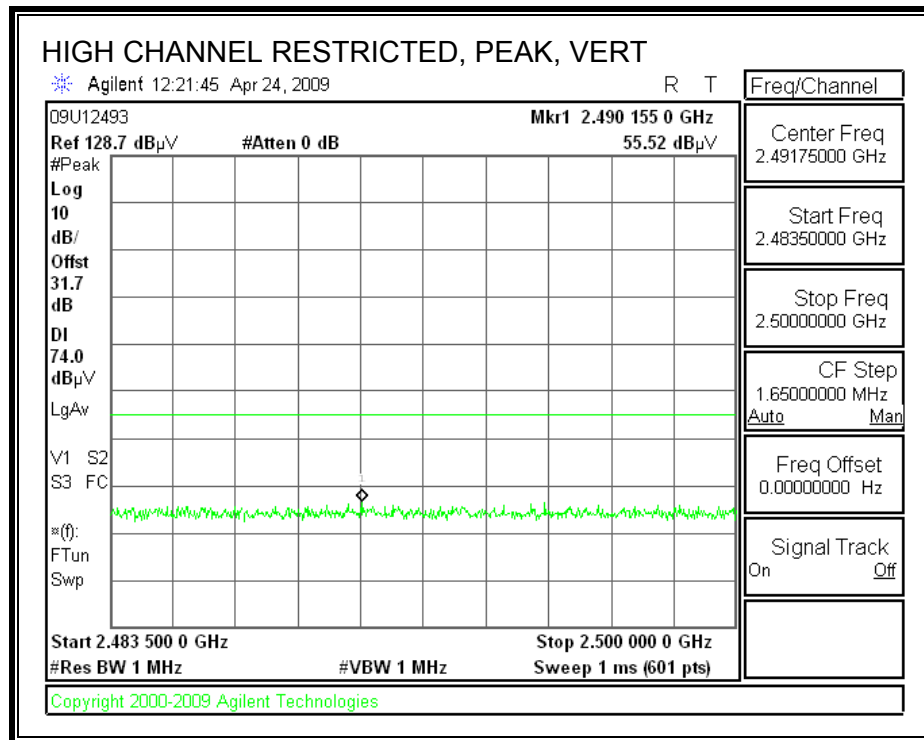


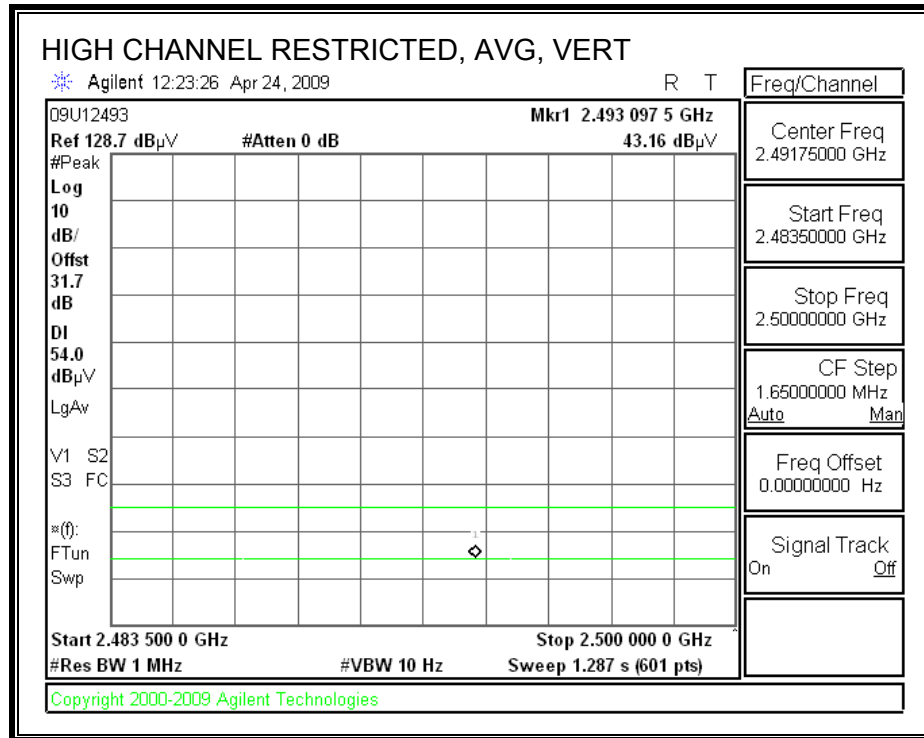
**RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)**





**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**





# **HARMONICS AND SPURIOUS EMISSIONS**

High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Silver Spring Networks Project #: 09U12493 Date: 4/28/2009 Test Engineer: Tom Chen Configuration: EUT standalone Mode: BT 8PSK TX Test 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						FCC 15.209							
Hi Frequency Cables															
3' cable 22807700		12' cable 22807600		20' cable 22807500		HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz					
3' cable 22807700		12' cable 22807600		20' cable 22807500				R_001							
f	Dist	Read Pk	Read Avg	AF	CL	Amp	D Corr	Ftr	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)
<b>Low CH 2402 MHz</b>															
4.804	3.0	43.4	34.5	33.7	5.8	-36.5	0.0	0.0	46.5	37.5	74	54	-27.5	-16.5	V
7.206	3.0	42.3	33.1	36.2	7.2	-36.2	0.0	0.0	49.5	40.2	74	54	-24.5	-13.8	V
9.608	3.0	40.6	30.8	37.9	8.5	-36.9	0.0	0.0	50.1	40.3	74	54	-23.9	-13.7	V
4.804	3.0	44.3	34.8	33.7	5.8	-36.5	0.0	0.0	47.4	37.8	74	54	-26.6	-16.2	H
7.206	3.0	43.4	34.2	36.2	7.2	-36.2	0.0	0.0	50.5	41.3	74	54	-23.5	-12.7	H
9.608	3.0	42.7	32.1	37.9	8.5	-36.9	0.0	0.0	52.2	41.6	74	54	-21.8	-12.4	H
<b>Mid CH 2441 MHz</b>															
4.882	3.0	42.8	34.4	33.8	5.8	-36.5	0.0	0.0	46.0	37.6	74	54	-28.0	-16.4	V
7.323	3.0	43.7	35.1	36.2	7.3	-36.2	0.0	0.0	50.9	42.4	74	54	-23.1	-11.6	V
9.764	3.0	42.8	34.3	38.0	8.6	-37.0	0.0	0.0	52.3	43.9	74	54	-21.7	-10.1	V
4.882	3.0	43.4	35.4	33.8	5.8	-36.5	0.0	0.0	46.6	38.6	74	54	-27.4	-15.4	H
7.323	3.0	44.2	35.3	36.2	7.3	-36.2	0.0	0.0	51.5	42.6	74	54	-22.5	-11.4	H
9.764	3.0	42.1	34.7	38.0	8.6	-37.0	0.0	0.0	51.7	44.3	74	54	-22.3	-9.7	H
<b>Hi CH 2480 MHz</b>															
4.960	3.0	42.0	34.0	33.9	5.9	-36.5	0.0	0.0	45.3	37.3	74	54	-28.7	-16.7	V
7.440	3.0	43.7	35.6	36.3	7.3	-36.2	0.0	0.0	51.2	43.0	74	54	-22.8	-11.0	V
9.920	3.0	41.8	33.4	38.0	8.7	-37.1	0.0	0.0	51.4	43.0	74	54	-22.6	-11.0	V
4.960	3.0	43.1	34.7	33.9	5.9	-36.5	0.0	0.0	46.4	38.0	74	54	-27.6	-16.0	H
7.440	3.0	44.3	35.8	36.3	7.3	-36.2	0.0	0.0	51.7	43.2	74	54	-22.3	-10.8	H
9.920	3.0	42.3	34.1	38.0	8.7	-37.1	0.0	0.0	51.9	43.7	74	54	-22.1	-10.3	H
Rev. 11.10.08															
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											

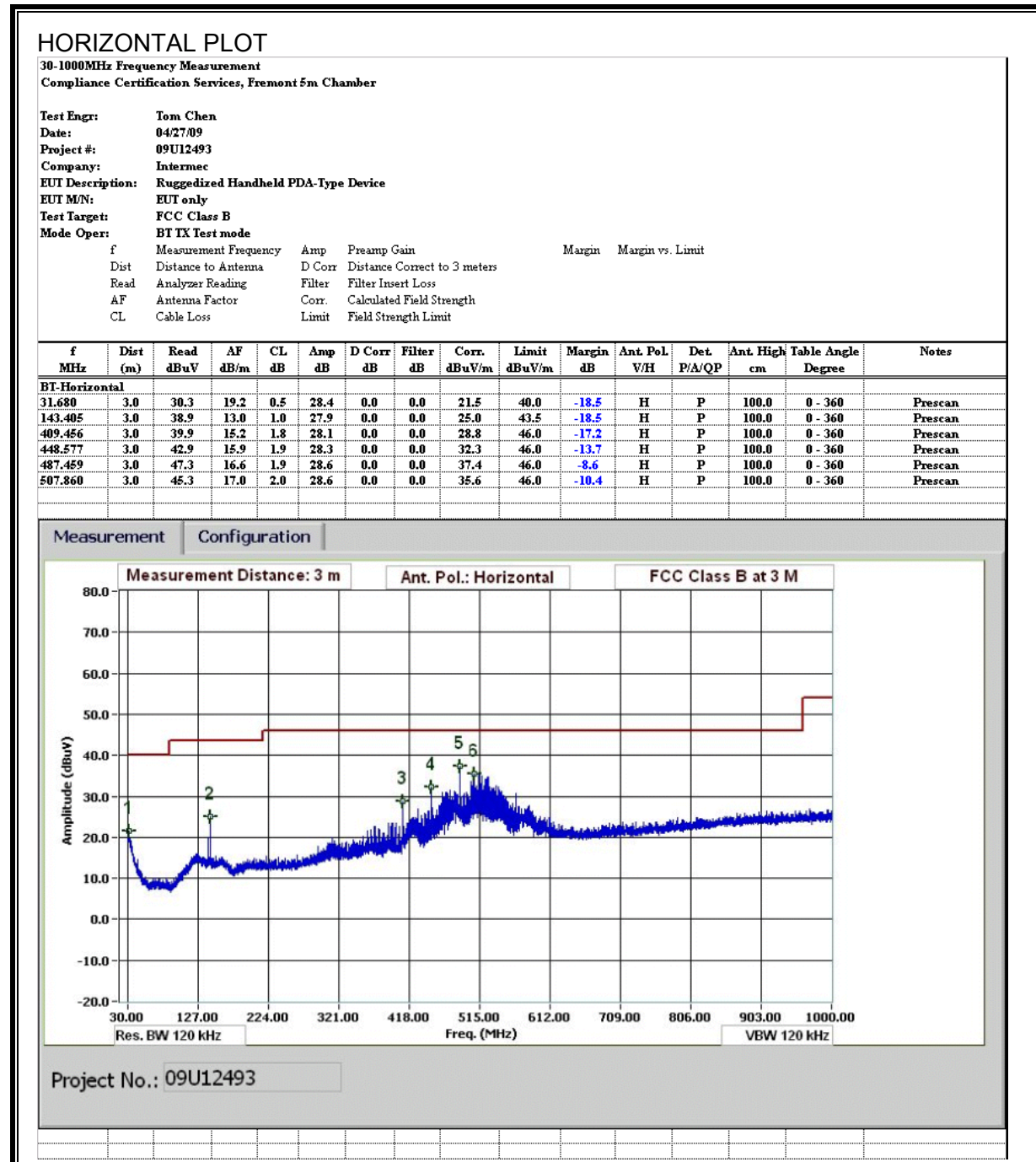
### 8.3. RECEIVER ABOVE 1 GHz

High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
<b>Company:</b> Intermec <b>Project #:</b> 09U12493 <b>Date:</b> 4/27/2009 <b>Test Engineer:</b> Tom Chen <b>Configuration:</b> EUT only <b>Mode:</b> RX mode															
<b>Test Equipment:</b>															
Horn 1-18GHz		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz		Limit							
T60; S/N: 2238 @3m		T34 HP 8449B						RX RSS 210							
Hi Frequency Cables															
3' cable 22807700		12' cable 22807600		20' cable 22807500		HPF		Reject Filter		<b>Peak Measurements</b> RBW=VBW=1MHz <b>Average Measurements</b> RBW=1MHz ; VBW=10Hz					
3' cable 22807700		12' cable 22807600		20' cable 22807500											
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)
1.031	3.0	41.4	37.3	24.6	2.4	-38.2	0.0	0.0	30.1	26.1	74	54	-43.9	-27.9	H
1.609	3.0	39.0	37.1	26.5	3.1	-37.4	0.0	0.0	31.1	29.2	74	54	-42.9	-24.8	H
3.184	3.0	36.6	34.2	30.1	4.5	-35.7	0.0	0.0	35.5	33.1	74	54	-38.5	-20.9	H
1.134	3.0	41.3	37.1	24.9	2.5	-38.1	0.0	0.0	30.7	26.5	74	54	-43.3	-27.5	V
1.954	3.0	39.4	37.6	27.7	3.4	-36.9	0.0	0.0	33.5	31.7	74	54	-40.5	-22.3	V
2.569	3.0	38.3	36.3	28.5	4.0	-36.2	0.0	0.0	34.6	32.6	74	54	-39.4	-21.4	V
Rev. 11.10.08															
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										



## 8.4. WORST-CASE BELOW 1 GHz

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



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

**VERTICAL PLOT**

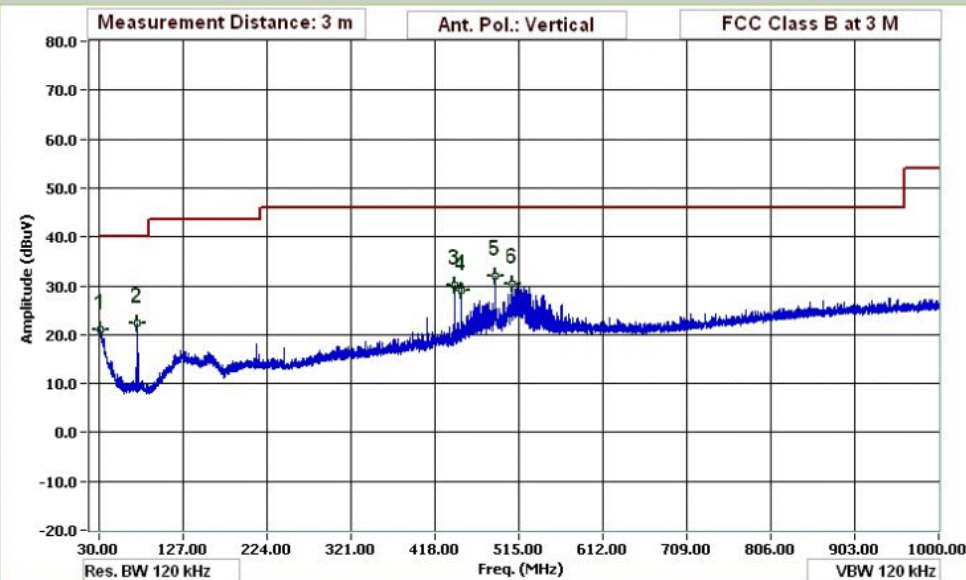
30-1000MHz Frequency Measurement  
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen  
Date: 04/27/09  
Project #: 09U12493  
Company: Intermec  
EUT Description: Ruggedized Handheld PDA-Type Device  
EUT M/N: EUT only  
Test Target: FCC Class B  
Mode Oper: BT TX Test mode

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
BT-Vert															
31.560	3.0	29.8	19.2	0.5	28.4	0.0	0.0	21.1	40.0	-18.9	V	P	100.0	0 - 360	Prescan
74.042	3.0	41.8	8.1	0.7	28.3	0.0	0.0	22.3	40.0	-17.7	V	P	100.0	0 - 360	Prescan
440.657	3.0	40.8	15.8	1.8	28.3	0.0	0.0	30.1	46.0	-15.9	V	P	100.0	0 - 360	Prescan
448.577	3.0	39.5	15.9	1.9	28.3	0.0	0.0	29.0	46.0	-17.0	V	P	100.0	0 - 360	Prescan
487.459	3.0	42.1	16.6	1.9	28.6	0.0	0.0	32.1	46.0	-13.9	V	P	100.0	0 - 360	Prescan
507.860	3.0	40.0	17.0	2.0	28.6	0.0	0.0	30.3	46.0	-15.7	V	P	100.0	0 - 360	Prescan

Measurement Configuration



Project No.: 09U12493