



**RADIATED SPURIOUS EMISSIONS PORTIONS OF  
FCC CFR47 PART 15 SUBPART C**

**CERTIFICATION TEST REPORT**

**FOR**

**DUAL BAND CDMA MOBILE PHONE**

**MODEL NUMBER: C5120**

**FCC ID: V65C5120**

**REPORT NUMBER: 11U13866-2**

**ISSUE DATE: JUNE 29, 2011**

*Prepared for*  
**KYOCERA COMMUNICATIONS, INC.**  
**9520 TOWNE CENTER DRIVE**  
**SAN DIEGO, CA 92121, USA**

*Prepared by*  
**COMPLIANCE CERTIFICATION SERVICES (UL CCS)**  
**47173 BENICIA STREET**  
**FREMONT, CA 94538, U.S.A.**  
**TEL: (510) 771-1000**  
**FAX: (510) 661-0888**

**NVLAP**<sup>®</sup>

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	06/29/11	Initial Issue	T. Chan

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS.....</b>	<b>4</b>
<b>2. TEST METHODOLOGY .....</b>	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION.....</b>	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY .....</b>	<b>5</b>
4.1. <i>MEASURING INSTRUMENT CALIBRATION .....</i>	5
4.2. <i>SAMPLE CALCULATION.....</i>	5
4.3. <i>MEASUREMENT UNCERTAINTY.....</i>	5
<b>5. EQUIPMENT UNDER TEST .....</b>	<b>6</b>
5.1. <i>DESCRIPTION OF EUT .....</i>	6
5.2. <i>DESCRIPTION OF AVAILABLE ANTENNAS .....</i>	6
5.3. <i>SOFTWARE AND FIRMWARE .....</i>	6
5.4. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	6
5.5. <i>DESCRIPTION OF TEST SETUP.....</i>	7
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>9</b>
<b>7. RADIATED TEST RESULTS .....</b>	<b>10</b>
7.1. <i>LIMITS AND PROCEDURE .....</i>	10
7.2. <i>TRANSMITTER ABOVE 1 GHz .....</i>	11
7.2.1. <i>BASIC DATA RATE GFSK MODULATION.....</i>	11
7.2.2. <i>ENHANCED DATA RATE 8PSK MODULATION.....</i>	20
7.3. <i>WORST-CASE BELOW 1 GHz .....</i>	29
<b>8. AC POWER LINE CONDUCTED EMISSIONS .....</b>	<b>32</b>
<b>9. SETUP PHOTOS.....</b>	<b>36</b>

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** KYOCERA COMMUNICATIONS, INC.  
9520 TOWNE CENTER DRIVE  
SAN DIEGO, CA 92121, USA

**EUT DESCRIPTION:** DUAL BAND CDMA MOBILE PHONE

**MODEL:** C5120

**SERIAL NUMBER:** 268435457816716265

**DATE TESTED:** JUNE 24 to 27, 2011

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	PASS (Radiated Portion)

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



---

THU CHAN  
ENGINEERING MANAGER  
UL CCS

Tested By:



---

DENNIS HUANG  
EMC ENGINEER  
UL CCS

## 2. TEST METHODOLOGY

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

## 3. FACILITIES AND ACCREDITATION

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

UL 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 Bluetooth and WLAN capable Dual-band CDMA slide Phone that is manufactured by Kyocera Corporation.

### 5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an internal antenna, with a maximum gain of -1.0 dBi.

### 5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was FIRMWARE 0202

The test utility software used during testing was 0.801SP

### 5.4. WORST-CASE CONFIGURATION AND MODE

The worst-position was the EUT with highest emissions. To determine the worst-case, the EUT was investigated for X, Y, and Z-Positions, and the worst position among X, Y, and Z with the phone opened. After the investigation, the worst-position was turned out to be in the Y-position with the phone close and AC/DC adapter.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Kyocera Corp.	SCP-30ADT	SSW-2001	DoC

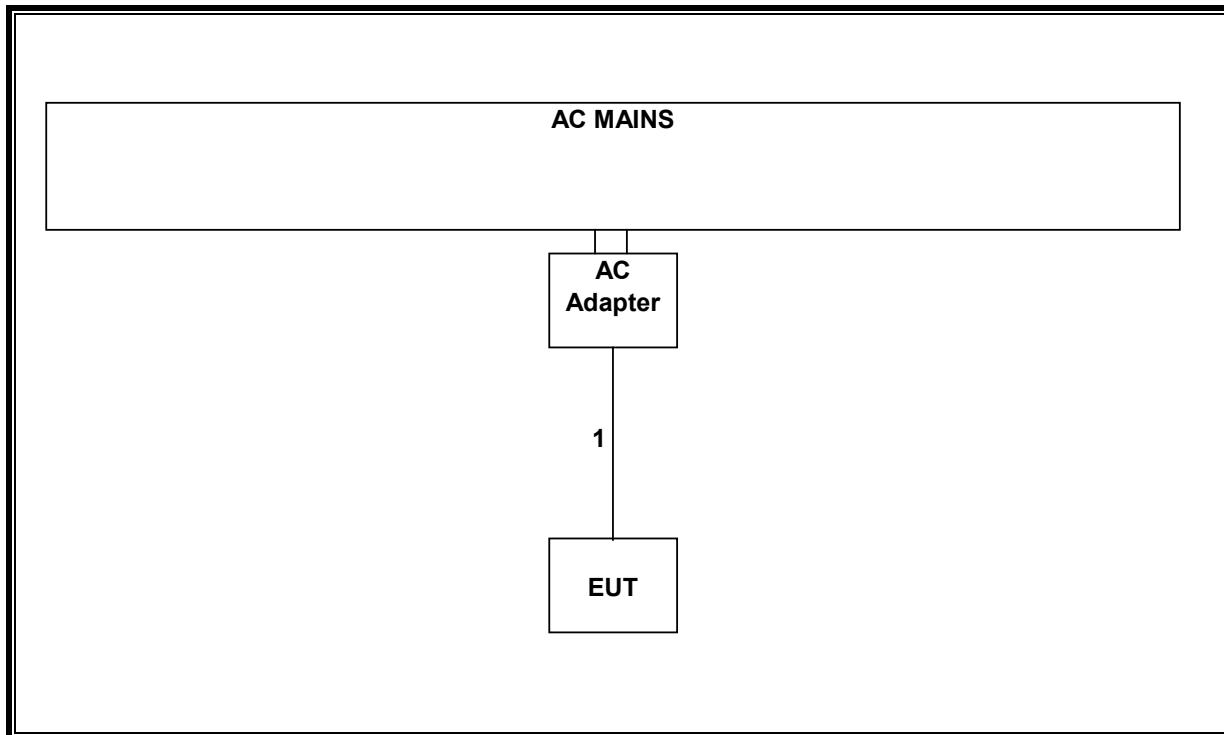
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC Power	1	Micro-USB	Shielded	1 m	

### TEST SETUP

The EUT is configured as stand alone unit with AC/DC adapter for all tests.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/10/11
Antenna, Horn, 18 GHz	EMCO	3115	C00872	06/30/12
Pre-Amplifier	Agilent / HP	8449B	C00749	07/14/11
Antenna, BiLog, 2 GHz	Sunol Sciences	JB1	C01171	07/12/11
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	01/27/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/14/11
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRM50702	N02683	CNR
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	None	07/02/11
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/10/11

## 7. RADIATED TEST RESULTS

### 7.1. 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.

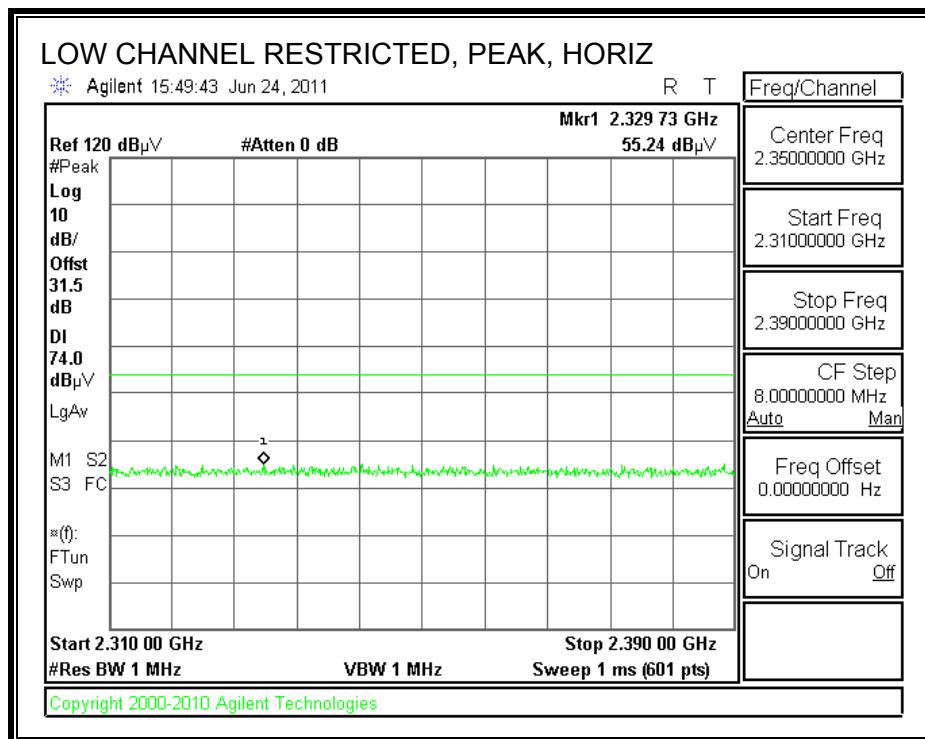
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

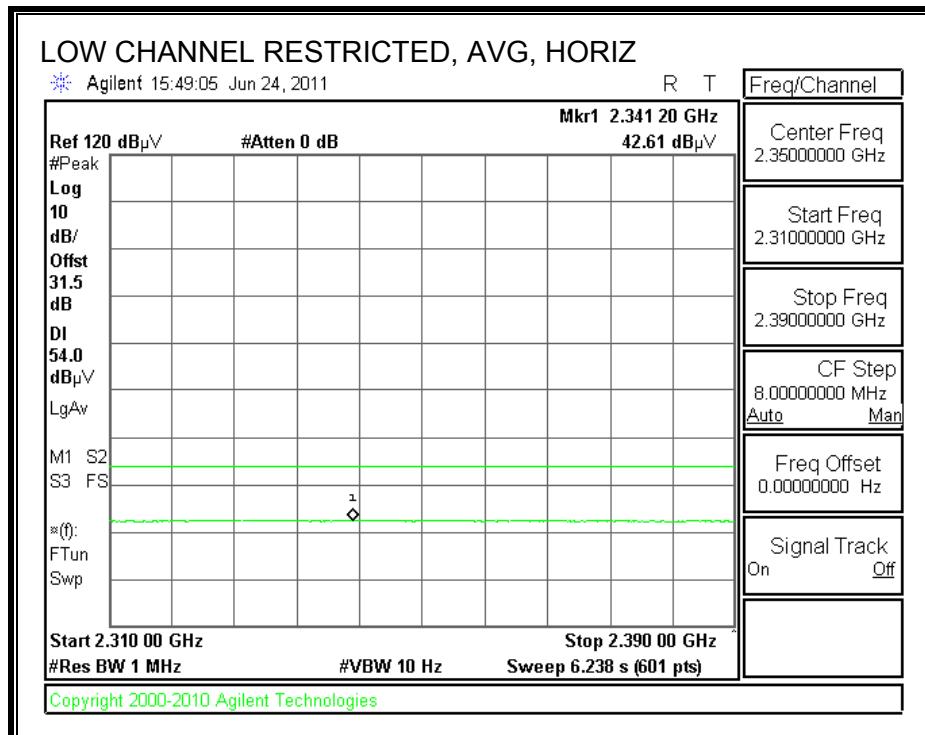
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

## 7.2. TRANSMITTER ABOVE 1 GHz

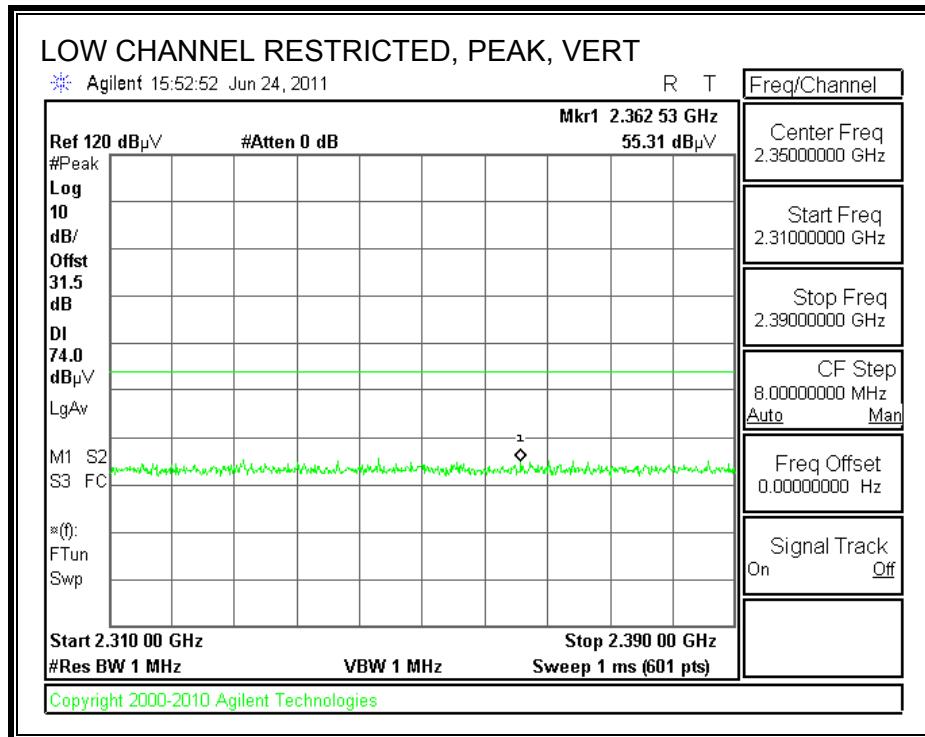
### 7.2.1. BASIC DATA RATE GFSK MODULATION

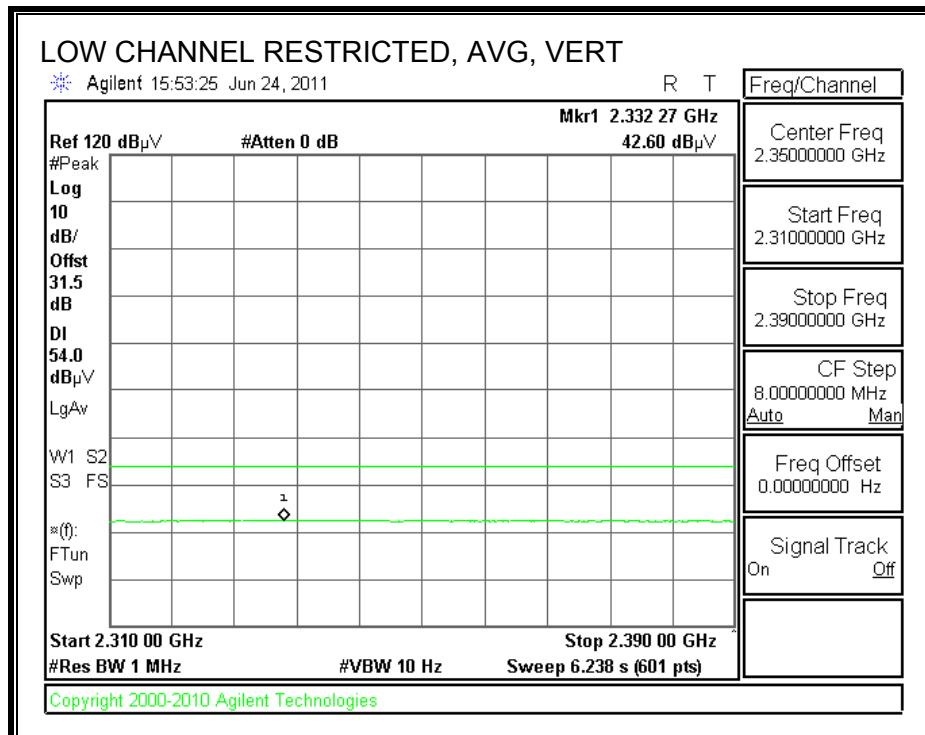
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



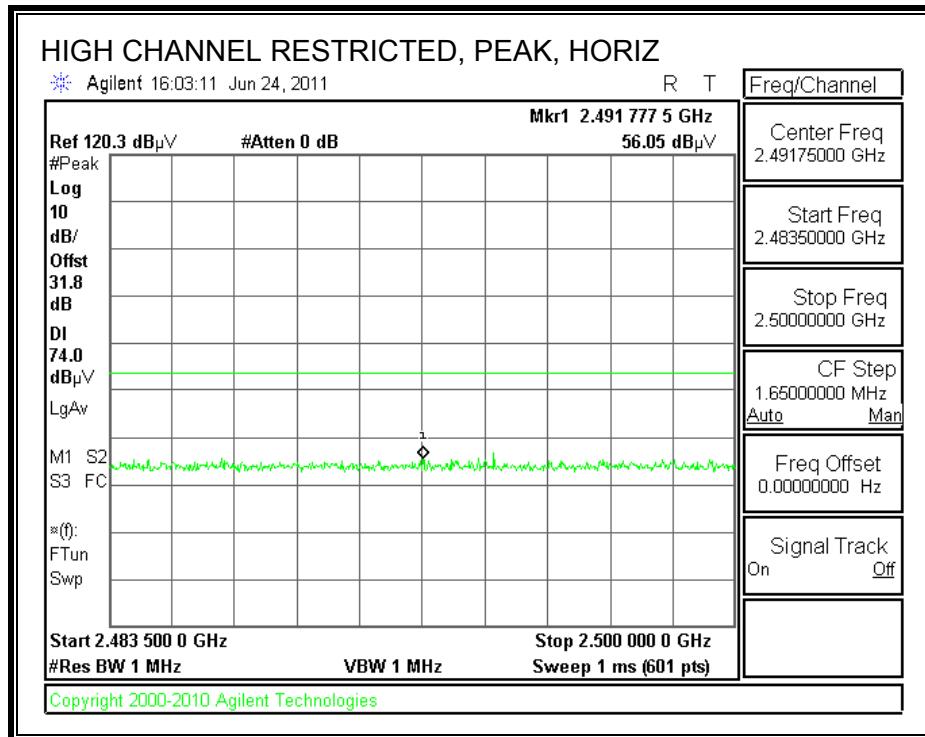


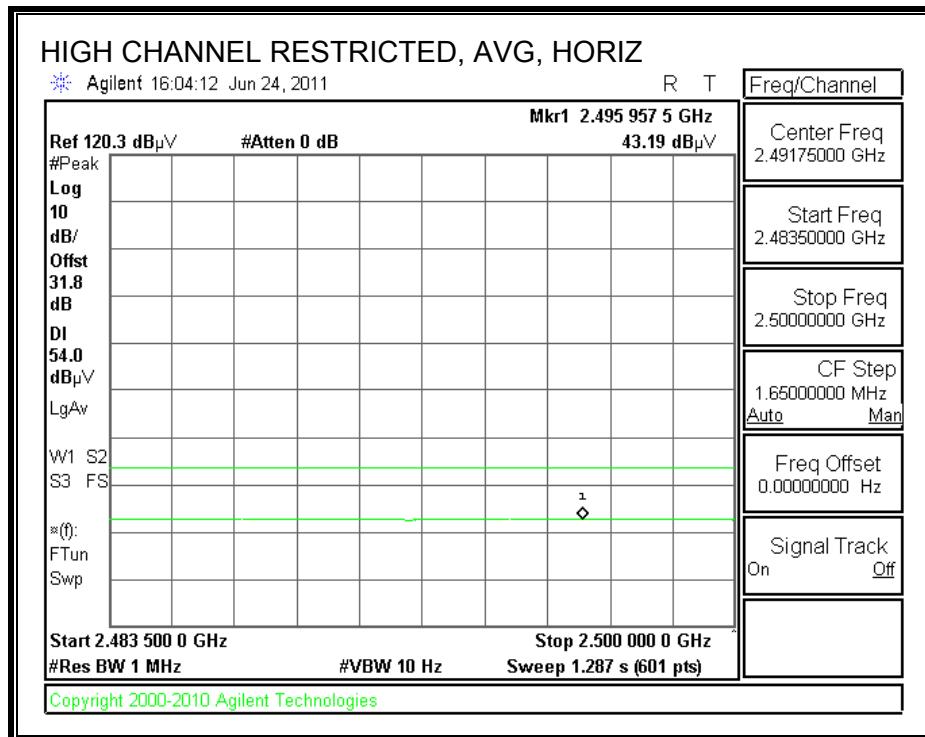
### **RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



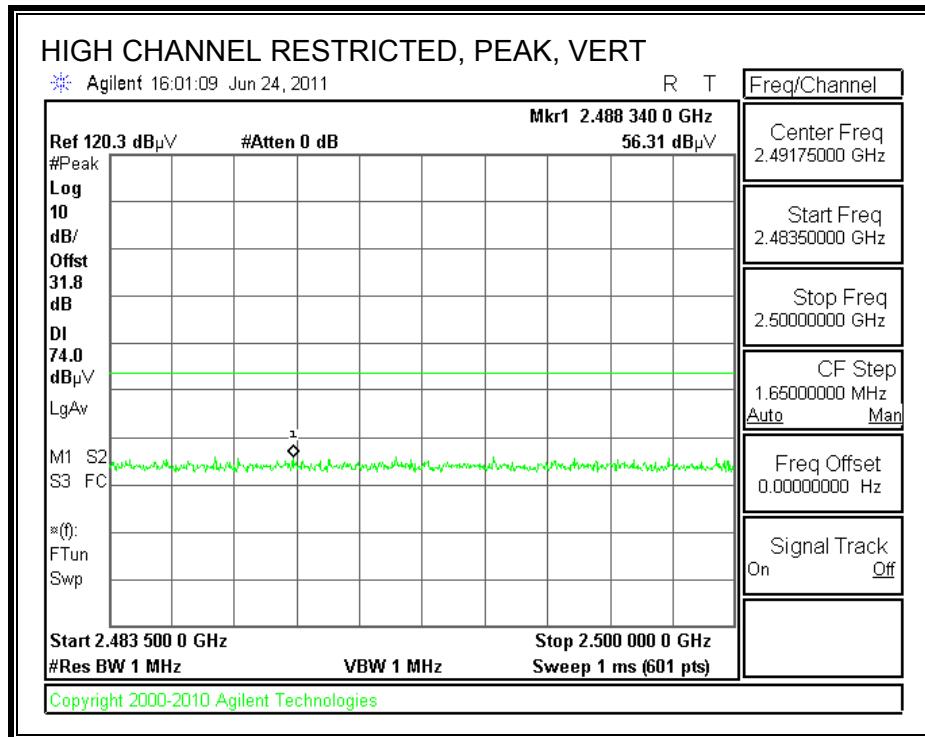


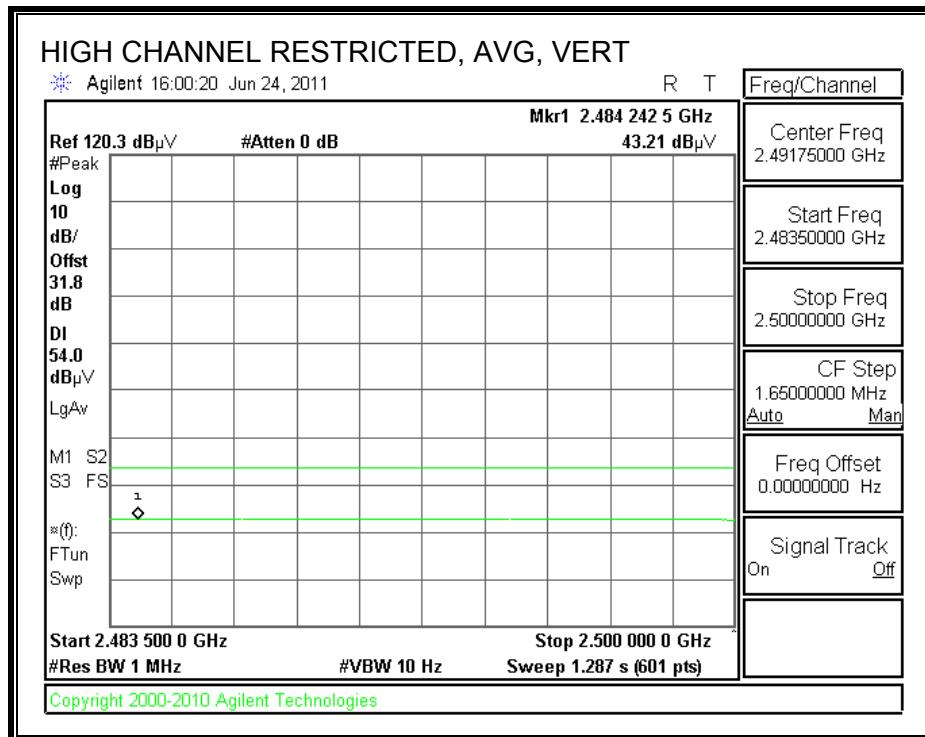
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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



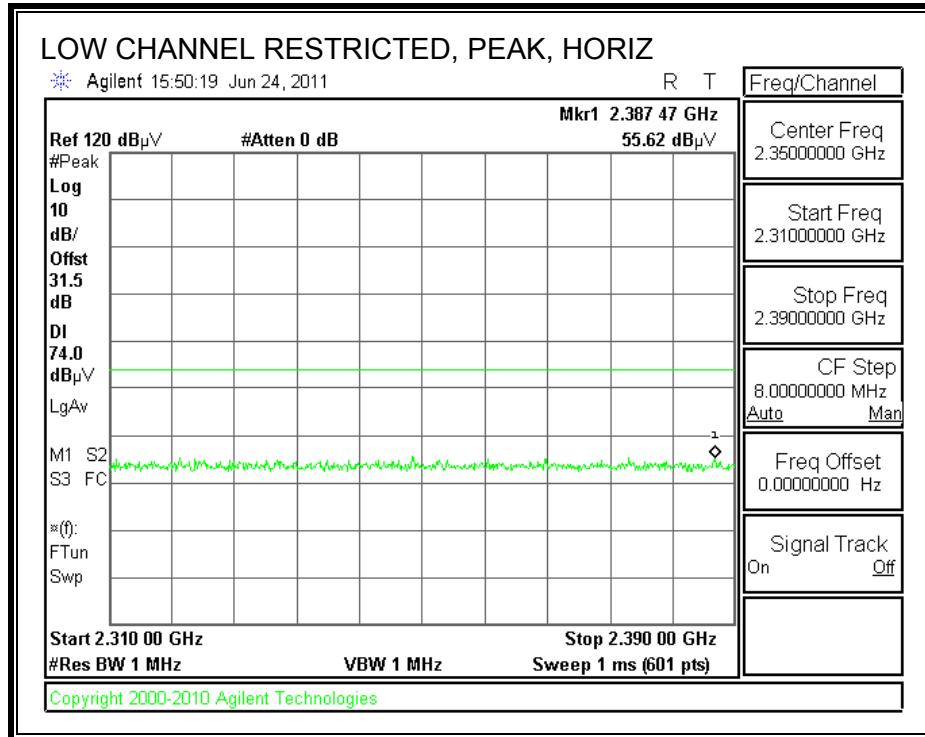


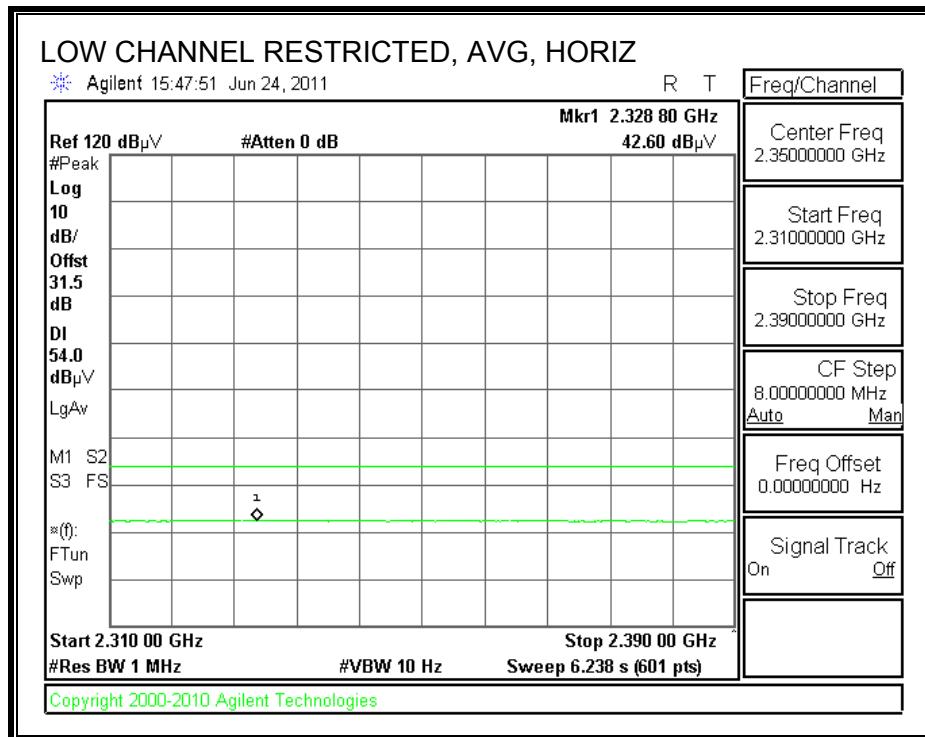
## HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 3m Chamber															
Company: KYOCRA WIRELESS Project #: 11U13866 Date: 06/24/2011 Test Engineer: DENNIS HUANG Configuration: EUT WITH AC ADAPTER Y AXIS Mode: TX, GFSK															
Test Equipment:															
Horn 1-18GHz		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz					Limit				
T60; S/N: 2238 @3m		T34 HP 8449B									FCC 15.205				
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	Fltr 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 Channel (2402MHz)															
4.804	3.0	36.4	24.0	32.7	5.8	-34.8	0.0	0.0	40.0	27.6	74	54	-34.0	-26.4	V
4.804	3.0	35.2	24.1	32.7	5.8	-34.8	0.0	0.0	38.8	27.7	74	54	-35.2	-26.3	H
Mid Channel (2441MHz)															
4.882	3.0	35.9	23.8	32.7	5.8	-34.8	0.0	0.0	39.6	27.6	74	54	-34.4	-26.4	V
4.882	3.0	36.1	23.8	32.7	5.8	-34.8	0.0	0.0	39.8	27.5	74	54	-34.2	-26.5	H
High Channel (2480MHz)															
4.960	3.0	36.1	23.9	32.8	5.9	-34.8	0.0	0.0	40.0	27.7	74	54	-34.0	-26.3	V
4.960	3.0	35.2	23.9	32.8	5.9	-34.8	0.0	0.0	39.1	27.7	74	54	-34.9	-26.3	H
No other emissions were found below 20dB from the system noise.															
Rev. 07.22.09															

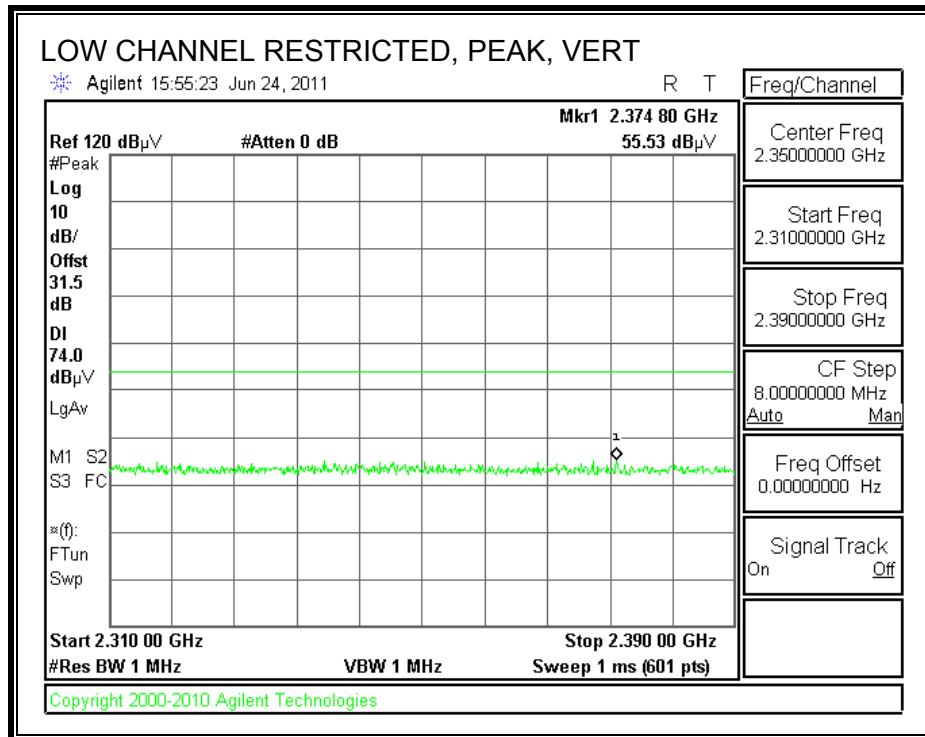
## 7.2.2. ENHANCED DATA RATE 8PSK MODULATION

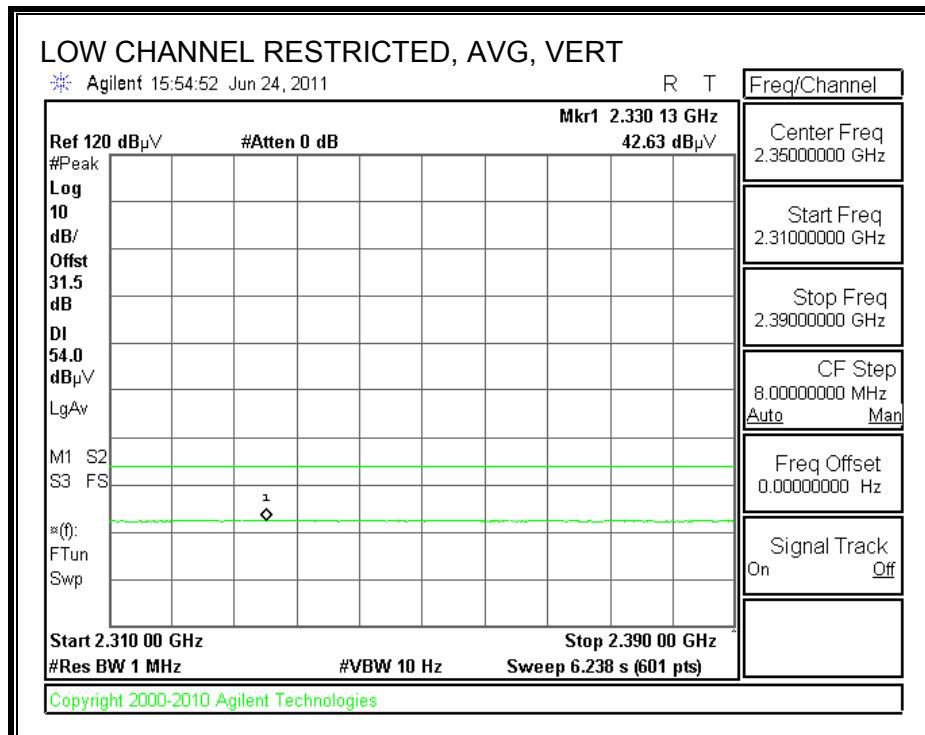
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



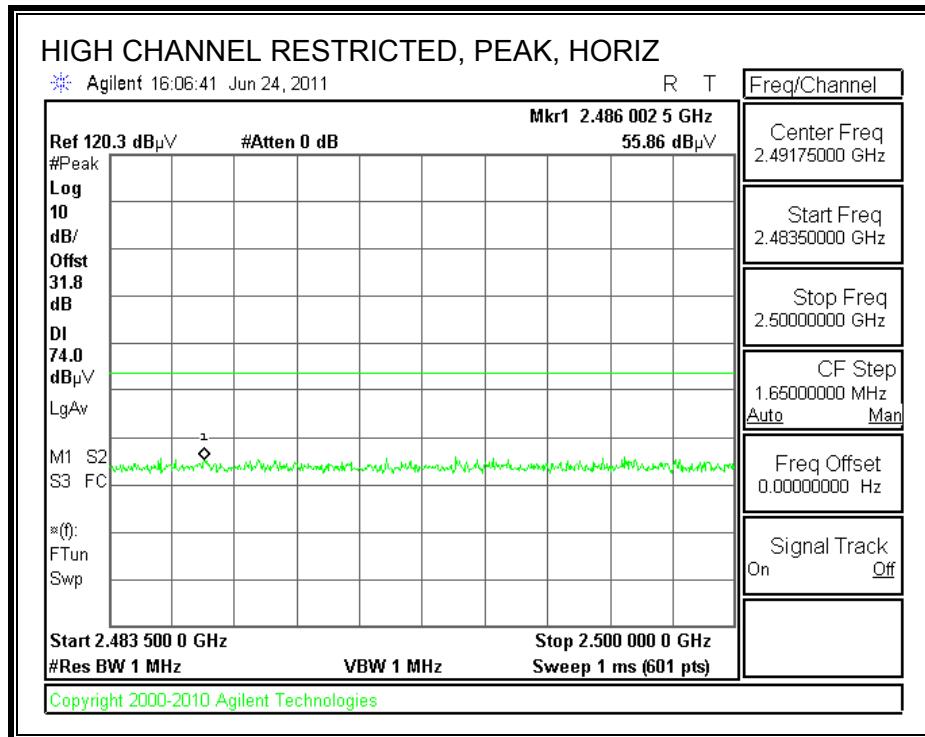


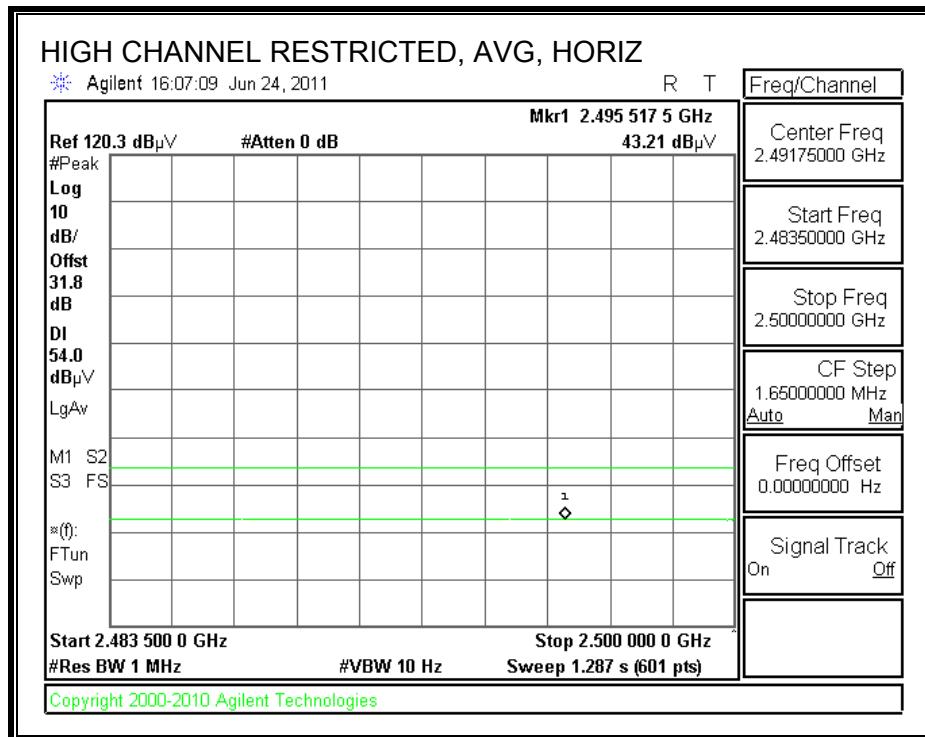
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



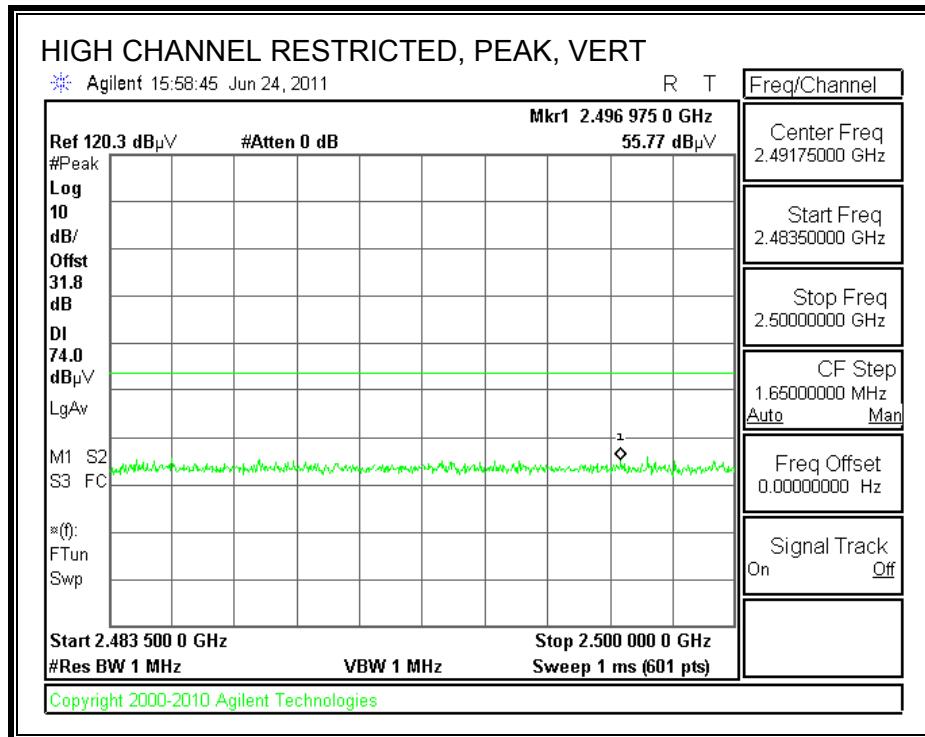


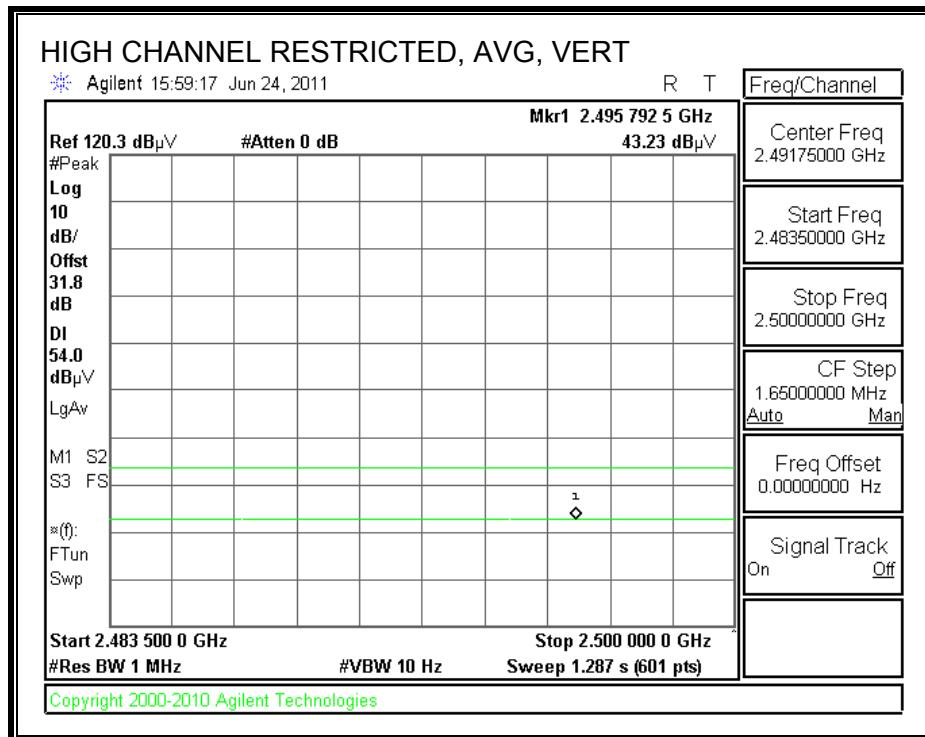
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**





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



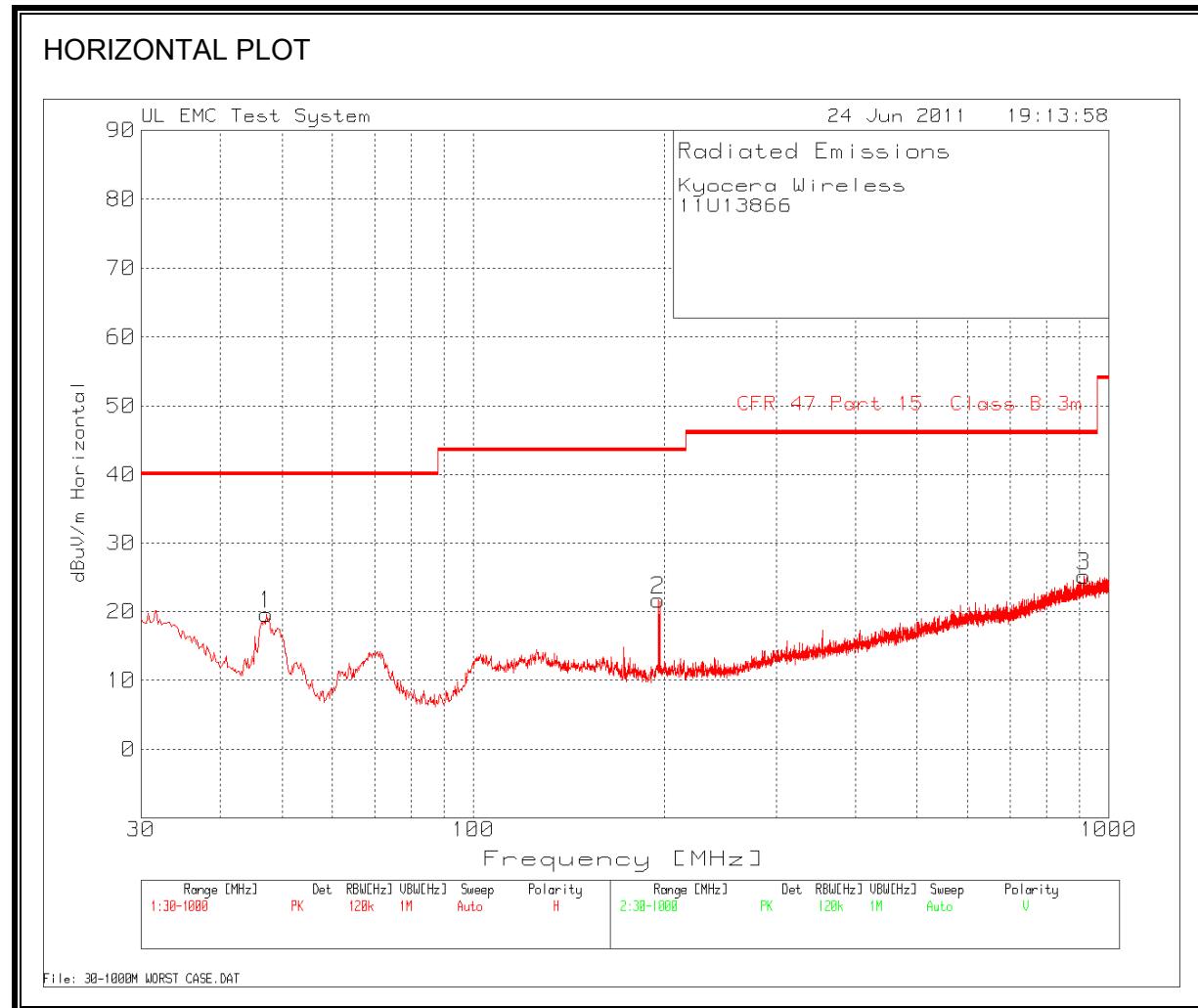


## HARMONICS AND SPURIOUS EMISSIONS

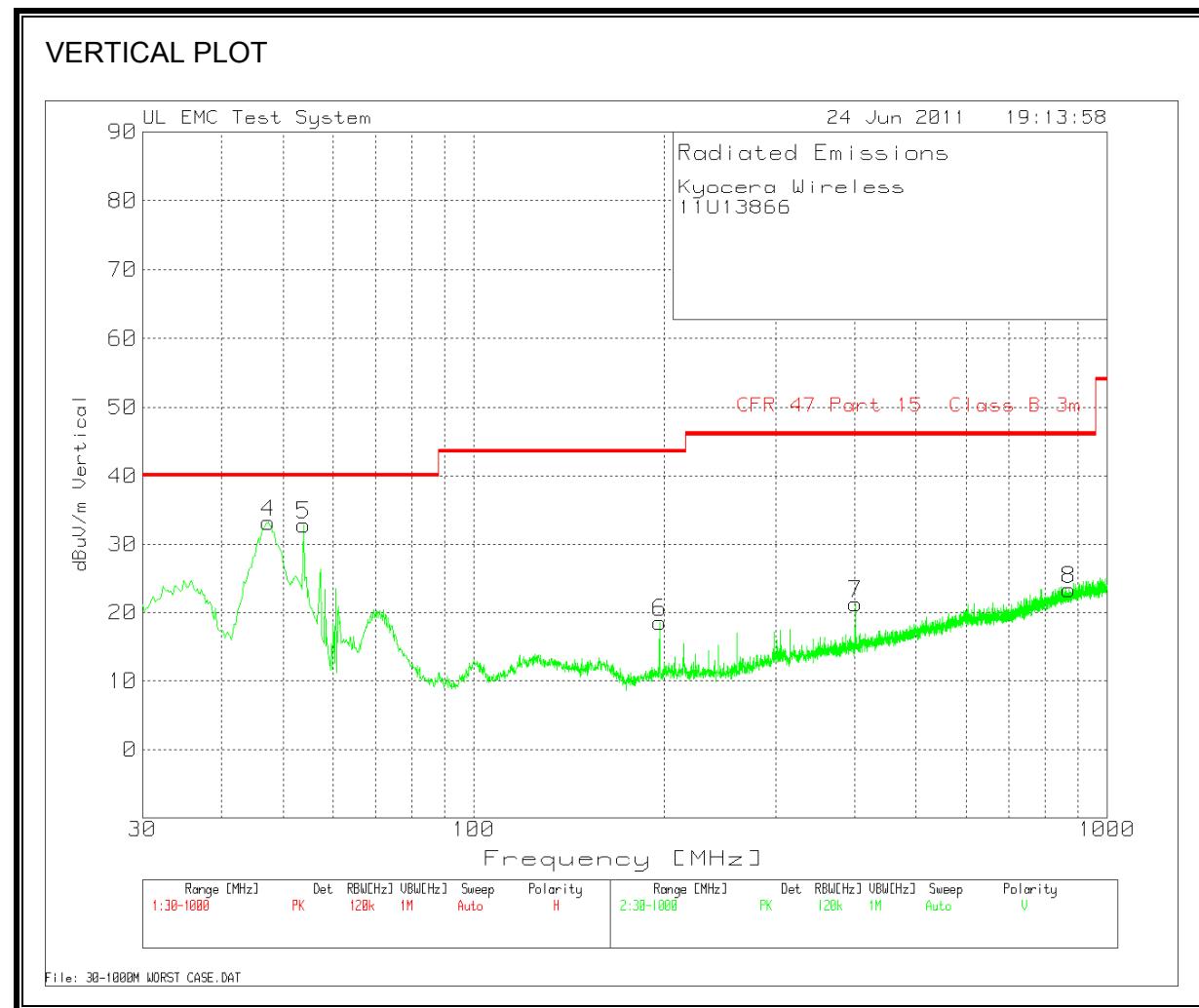
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																
Company: KYOCRA WIRELESS Project #: 11U13866 Date: 06/24/2011 Test Engineer: DENNIS HUANG Configuration: EUT WITH AC ADAPTER Y AXIS Mode: TX, Enhanced 8PSK																
<u>Test Equipment:</u>																
Hom 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T60; S/N: 2238 @3m			T34 HP 8449B									FCC 15.205				
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	Fltr 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 Channel (2402MHz)																
4.804	3.0	36.1	24.1	32.7	5.8	-34.8	0.0	0.0	39.7	27.7	74	54	-34.3	-26.3	V	
4.804	3.0	35.0	24.2	32.7	5.8	-34.8	0.0	0.0	38.6	27.8	74	54	-35.4	-26.2	H	
Mid Channel (2441MHz)																
4.882	3.0	36.9	24.0	32.7	5.8	-34.8	0.0	0.0	40.7	27.7	74	54	-33.3	-26.3	V	
4.882	3.0	35.9	23.9	32.7	5.8	-34.8	0.0	0.0	39.6	27.6	74	54	-34.4	-26.4	H	
High Channel (2480MHz)																
4.960	3.0	36.4	24.1	32.8	5.9	-34.8	0.0	0.0	40.2	27.9	74	54	-33.8	-26.1	V	
4.960	3.0	35.2	24.0	32.8	5.9	-34.8	0.0	0.0	39.1	27.8	74	54	-34.9	-26.2	H	
No other emissions were found below 20dB from the system noise.																
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											

### 7.3. 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)**



## HORIZONTAL AND VERTICAL DATA

### Horizontal 30 - 1000MHz

Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Transducer Factor [dB]	Gain/Loss Factor [dB]	Corrected Reading (dBuV/m)	FCC Class B 3m Limit	Margin	Height [cm]	Polarity
47.2522	36.32	PK	0.8	-17.5	19.62	40	-20.38	101	Horz
195.5436	36.41	PK	1.4	-16.1	21.71	43.5	-21.79	251	Horz
913.3513	27.33	PK	3.2	-5.4	25.13	46	-20.87	251	Horz

### Vertical 30 - 1000MHz

Test Frequency (MHz)	Meter Reading (dBuV)	Detector	Transducer Factor [dB]	Gain/Loss Factor [dB]	Corrected Reading (dBuV/m)	FCC Class B 3m Limit	Margin	Height [cm]	Polarity
47.446	50.04	PK	0.8	-17.6	33.24	40	-6.76	101	Vert
53.8429	51.57	PK	0.8	-19.4	32.97	40	-7.03	101	Vert
196.5128	33.15	PK	1.4	-16	18.55	43.5	-24.95	101	Vert
400.4377	32.1	PK	2.1	-12.9	21.3	46	-24.7	176	Vert
871.287	26.39	PK	3.1	-6.1	23.39	46	-22.61	101	Vert

PK - Peak detector

QP - Quasi-Peak detector

LnAv - Linear Average detector

LgAv - Log Average detector

Av - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

## 8. AC POWER LINE CONDUCTED EMISSIONS

### 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 <sup>*</sup>	56 to 46 <sup>*</sup>
0.5-5	56	46
5-30	60	50

<sup>\*</sup> 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 LINE.

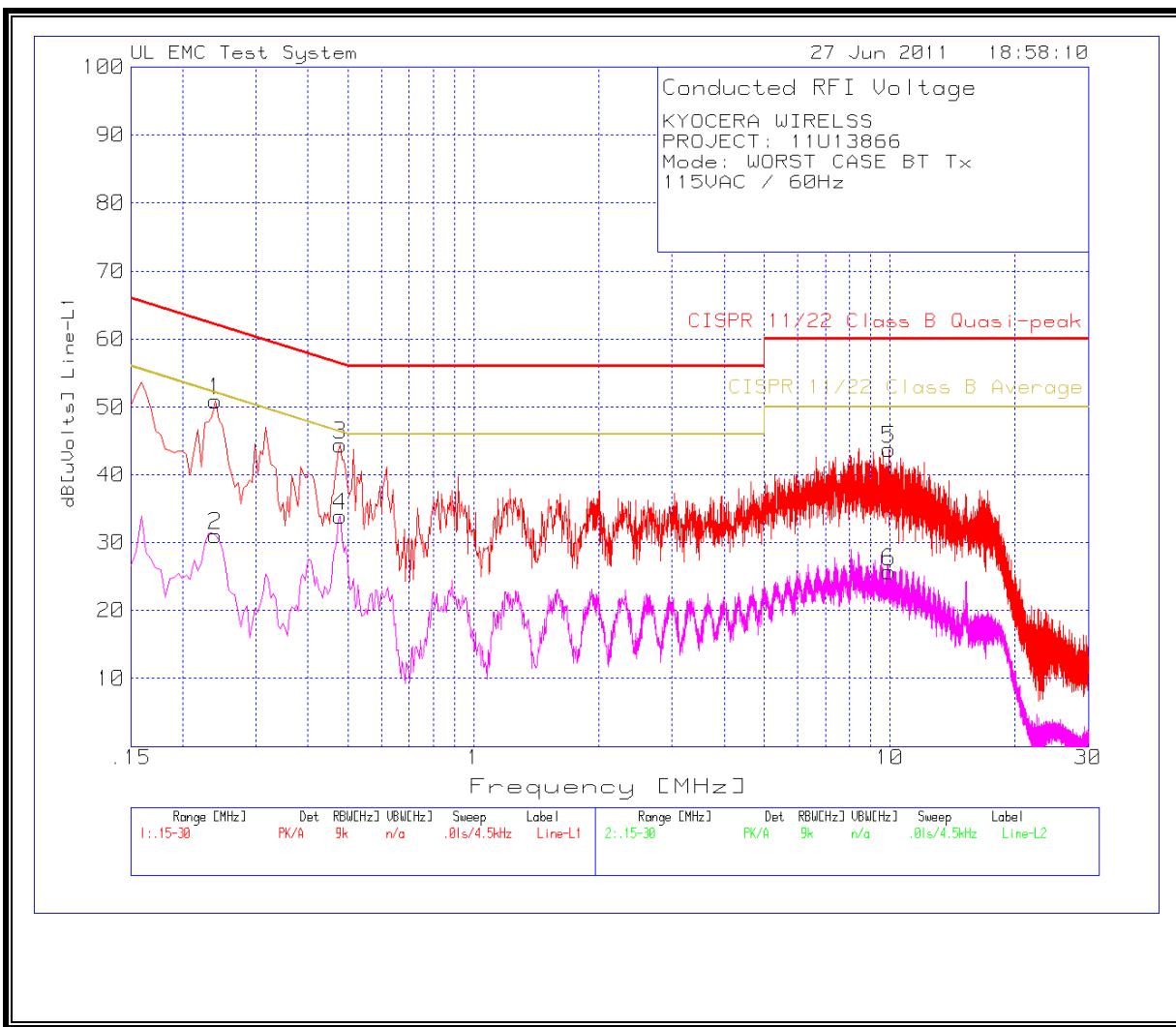
### RESULTS

**WORST CASE EMISSIONS**

KYOCERA WIRELSS									
PROJECT: 11U13866									
Mode: WORST CASE BT Tx									
115VAC / 60Hz									
Line-L1 0.15 - 30MHz									
Test Freq. (MHz)	Meter Reading	Detector	LISN [dB]	Conducted Emission Cable [dB]	Corrected Reading (dBuV)	Class B Quasi-peak Limit	Quasi-Peak Margin	Class B Average Limit	Margin
0.24	50.96	PK	0	0	50.96	62.1	-11.14	52.1	-1.14
0.24	31	Av	0	0	31	-	-	52.1	-21.1
0.4785	44.47	PK	0	0	44.47	56.4	-11.93	46.4	-1.93
0.4785	33.86	Av	0	0	33.86	-	-	46.4	-12.54
9.933	43.78	PK	0	0	43.78	60	-16.22	50	-6.22
9.933	25.73	Av	0	0	25.73	-	-	50	-24.27
Line-L2 0.15 - 30MHz									
Test Freq. (MHz)	Meter Reading	Detector	LISN [dB]	Conducted Emission Cable [dB]	Corrected Reading (dBuV)	Class B Quasi-peak Limit	Quasi-Peak Margin	Class B Average Limit	Margin
0.159	53.46	PK	0	0	53.46	65.5	-12.04	55.5	-2.04
0.159	26.66	Av	0	0	26.66	-	-	55.5	-28.84
0.2355	48.88	PK	0	0	48.88	62.3	-13.42	52.3	-3.42
0.2355	30.11	Av	0	0	30.11	-	-	52.3	-22.19
10.3425	37.43	PK	0	0	37.43	60	-22.57	50	-12.57
10.3425	19.93	Av	0	0	19.93	-	-	50	-30.07

PK - Peak detector  
QP - Quasi-Peak detector  
LnAv - Linear Average detector  
LgAv - Log Average detector  
Av - Average detector  
CAV - CISPR Average detector  
RMS - RMS detection

**LINE 1 RESULTS**



**LINE 2 RESULTS**

