



**FCC CFR47 PART 15 SUBPART C  
CLASS II PERMISSIVE CHANGE**

**CERTIFICATION TEST REPORT**

**FOR**

**TRI BAND CDMA MOBILE PHONE WITH BLUETOOTH**

**MODEL NUMBER: S2150**

**FCC ID: V65S2150**

**REPORT NUMBER: 12U14698-3, Revision A**

**ISSUE DATE: NOVEMBER 21, 2012**

*Prepared for*  
**KYOCERA COMMUNICATIONS, INC**  
**8611 BALBOA AVENUE**  
**SAN DIEGO, CA 92123, U.S.A.**

*Prepared by*  
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**NVLAP**<sup>®</sup>

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	11/19/12	Initial Issue	T. LEE
A	11/21/12	Corrected model number on cover page	A. Zaffar

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** KYOCERA COMMUNICATIONS, INC  
8611 BALBOA AVENUE  
SAN DIEGO, CA 92123, U.S.A

**EUT DESCRIPTION:** TRI BAND CDMA MOBILE PHONE WITH BLUETOOTH

**MODEL:** S2150

**SERIAL NUMBER:** 268435457816728097

**DATE TESTED:** NOVEMBER 15- 19, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	PASS

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:



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TIM LEE  
STAFF ENGINEER  
UL CCS

Tested By:



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TOM CHEN  
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, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

## 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 Bluetooth featured Tri Band CDMA Phone that is manufactured by Kyocera Communications, Inc.

### 5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The change filed under this application is alternate component change.

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

### 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was Version 0.200CR.

The test utility software used during testing was BT Test.

### 5.5. WORST-CASE CONFIGURATION AND MODE

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

The worst-position is the EUT with highest emissions. To determine the worst-case, the EUT was investigated for folded and unfolded X, Y, and Z-Positions, and the worst position among X, Y, or Z with AC/DC adapter and headset, after the investigations, the worst-position was turned out to be folded at Z-Position with AC Adapter and headset. It was determined that DH5 produced the worse-case data rate and that the Z-axis yielded the worse-case orientation.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	S/N	FCC ID
AC Adapter	Kyocera	SCP-36ADT	SSW-2001	N/A
Headset	N/A	N/A	N/A	N/A

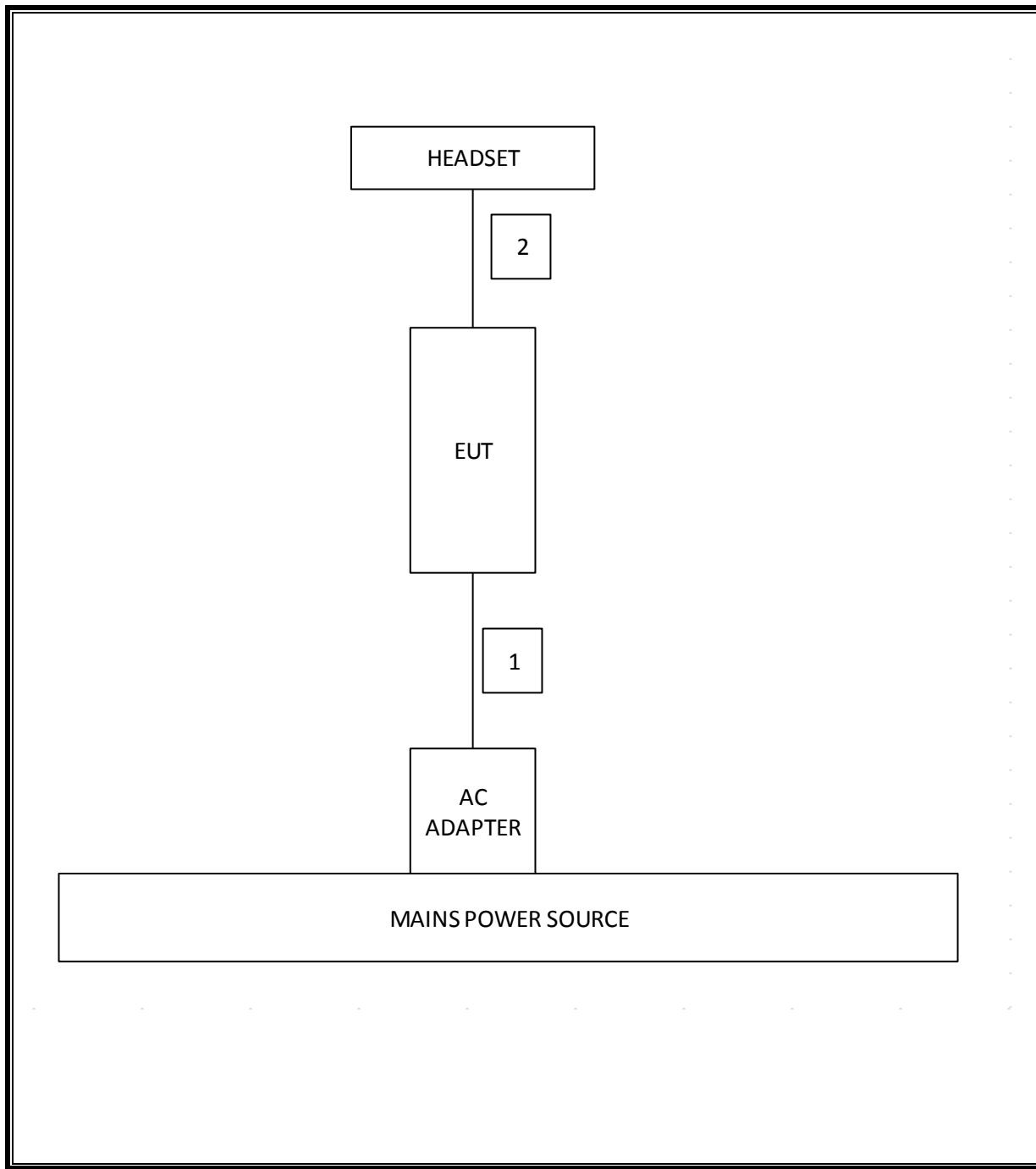
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	USB	Shielded	1.5m	N/A
2	EAR JACK	1	Earphone	Un-shielded	1.5m	N/A

### TEST SETUP

The EUT is a stand-alone device.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	3/22/2013
Antenna, Horn, 18 GHz	EMCO	3115	C00872	9/20/2013
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	10/28/2013
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01011	3/23/2013
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	11/11/2013
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	8/8/2013
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/2013

## 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.

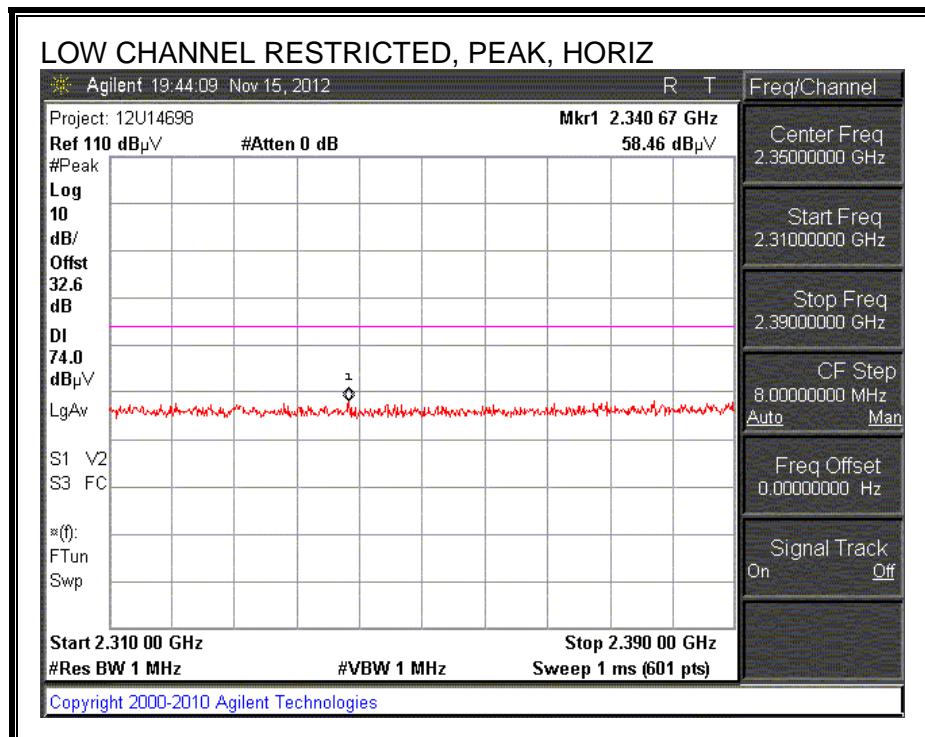
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

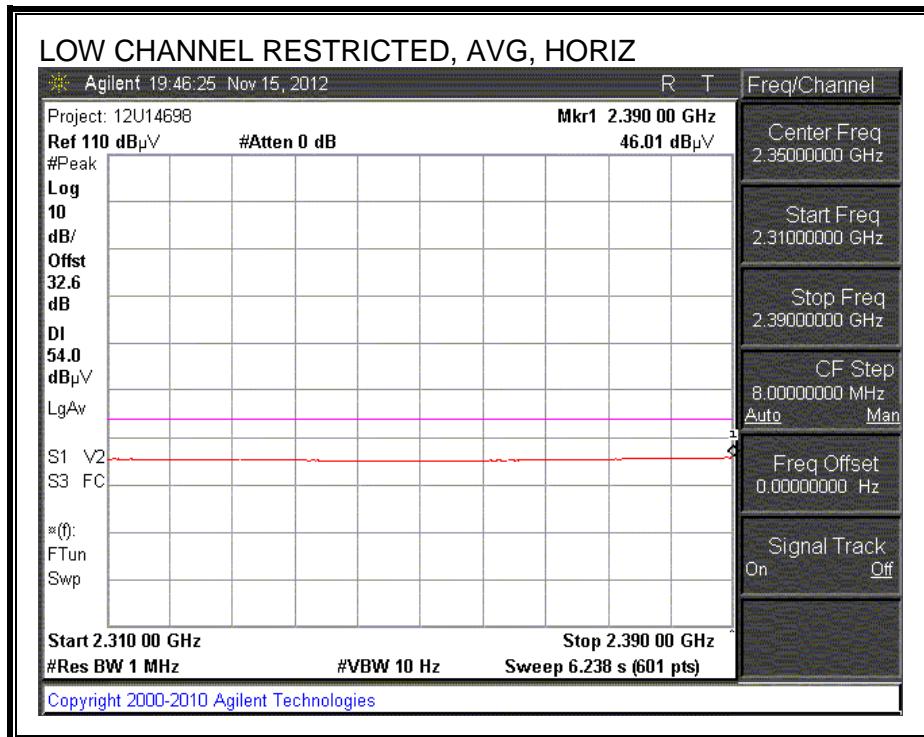
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

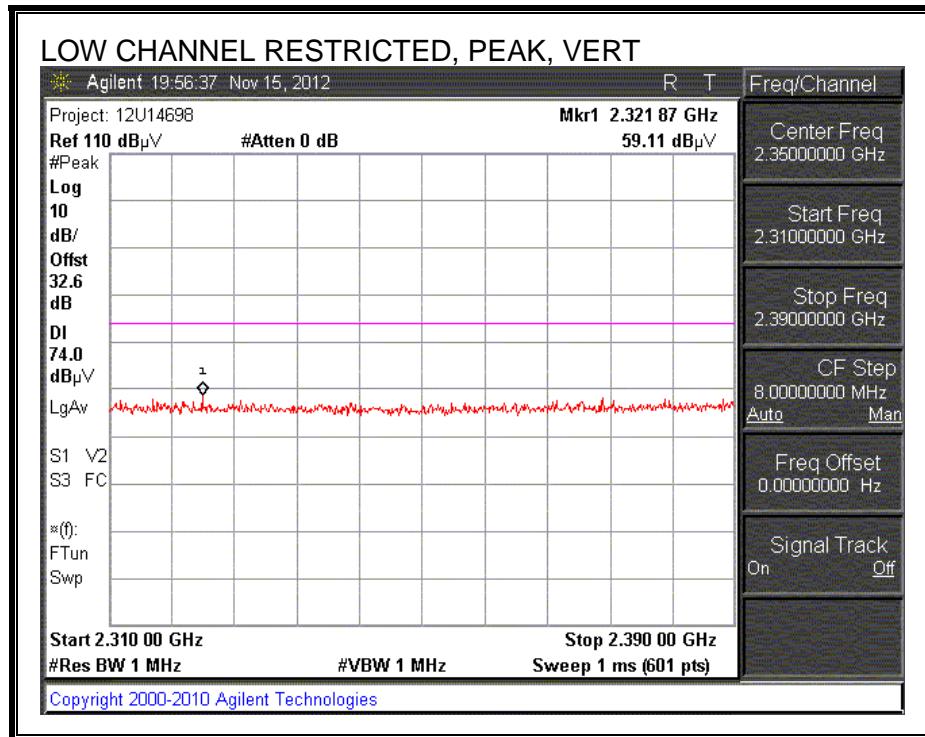
## 7.2. TRANSMITTER ABOVE 1 GHz

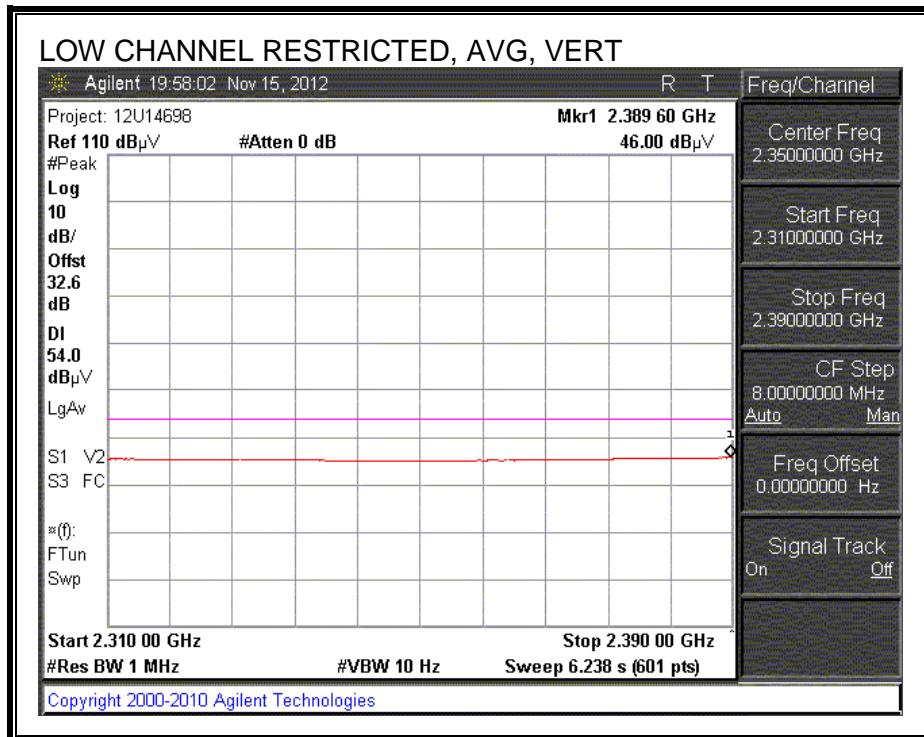
### 7.2.1. BASIC DATA RATE GFSK MODULATION

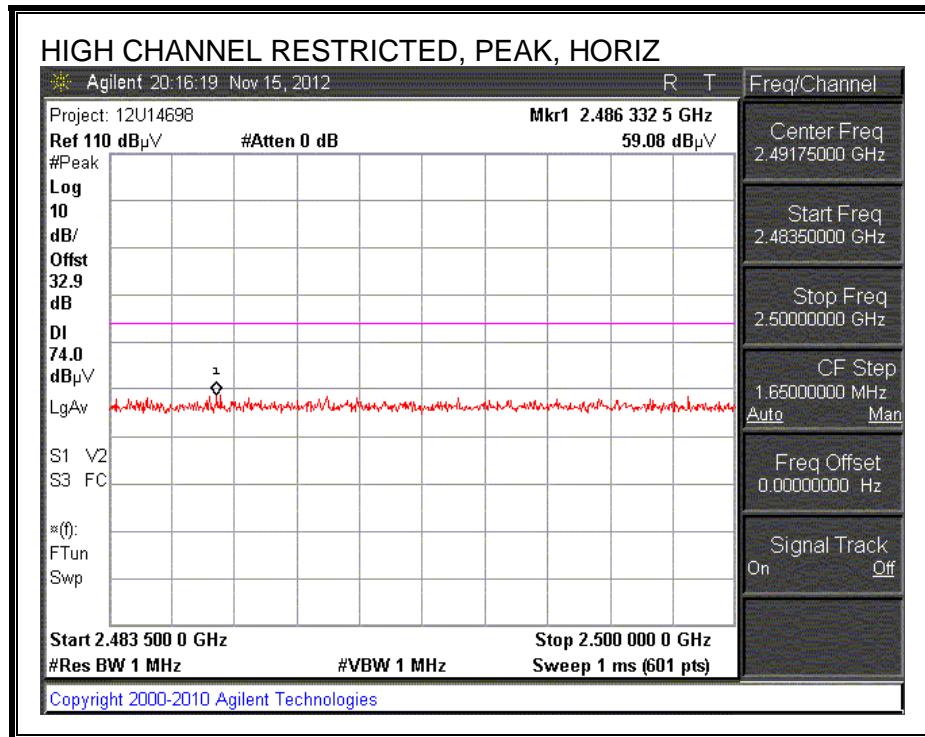
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

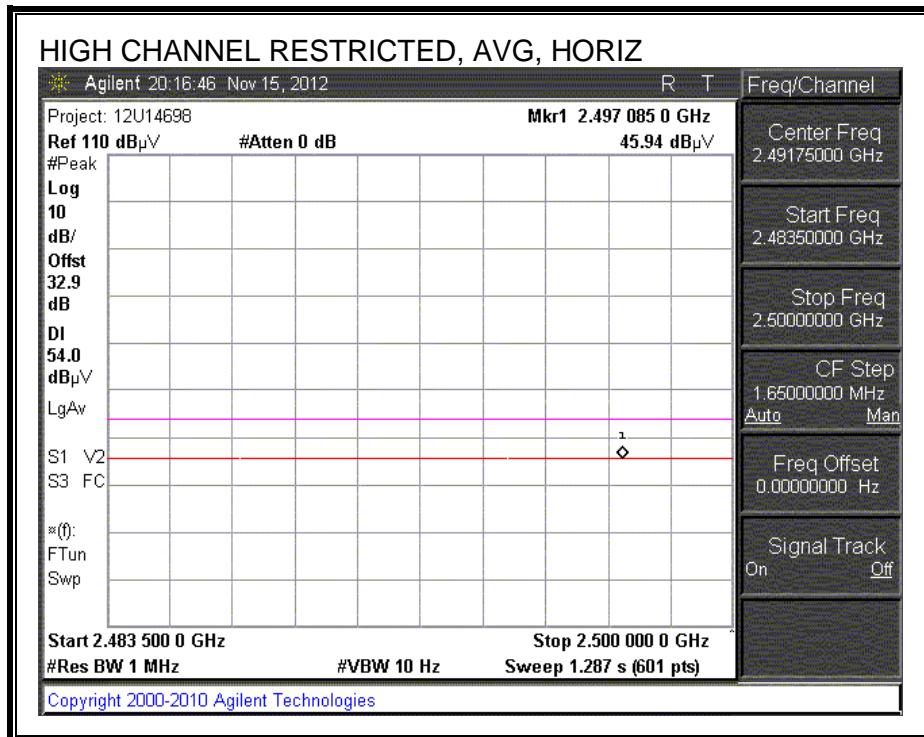


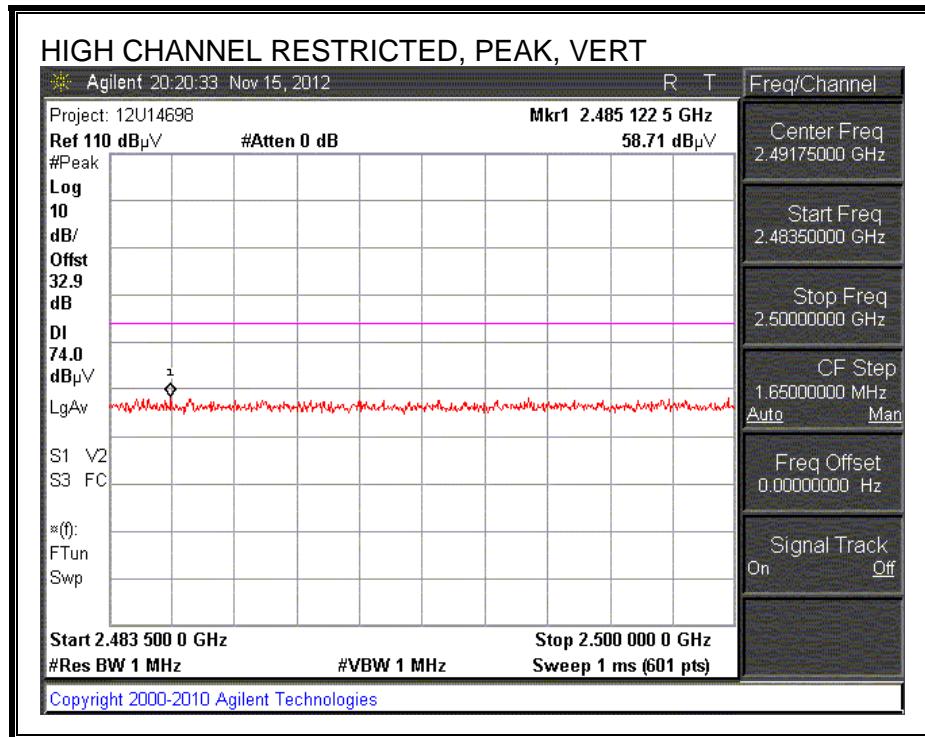


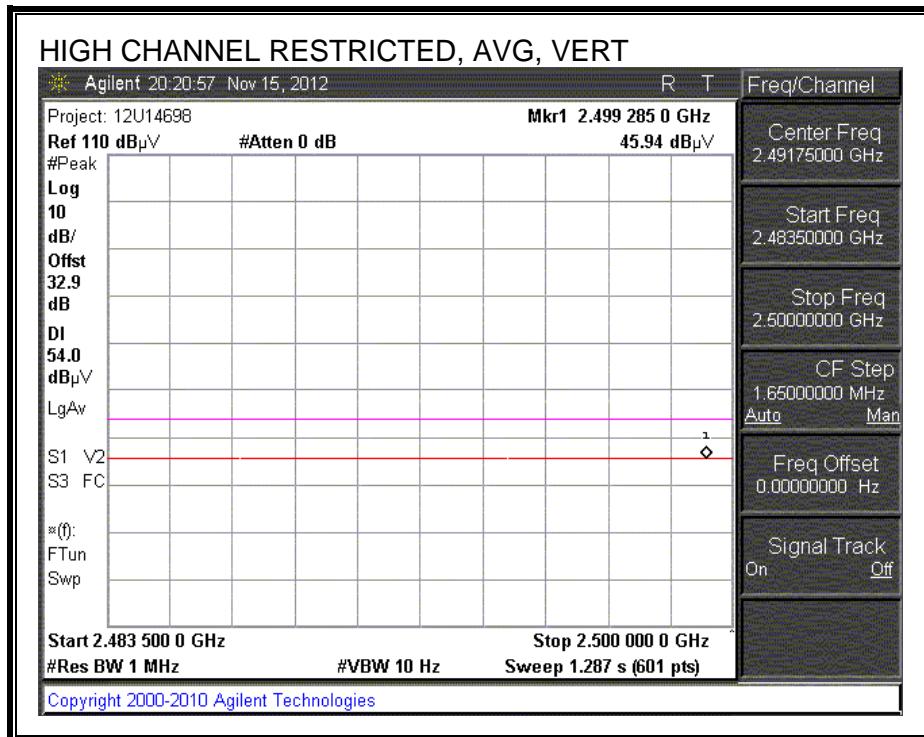
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



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



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



**HARMONICS AND SPURIOUS EMISSIONS****High Frequency Measurement**  
**Compliance Certification Services, Fremont 5m Chamber**

Test Engr: Tom Chen  
 Date: 11/17/12  
 Project #: 12U14698  
 Company: Kyocera Inc.,  
 Test Target: FCC Class B  
 Mode Oper: Bluetooth GFSK, TX mode

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

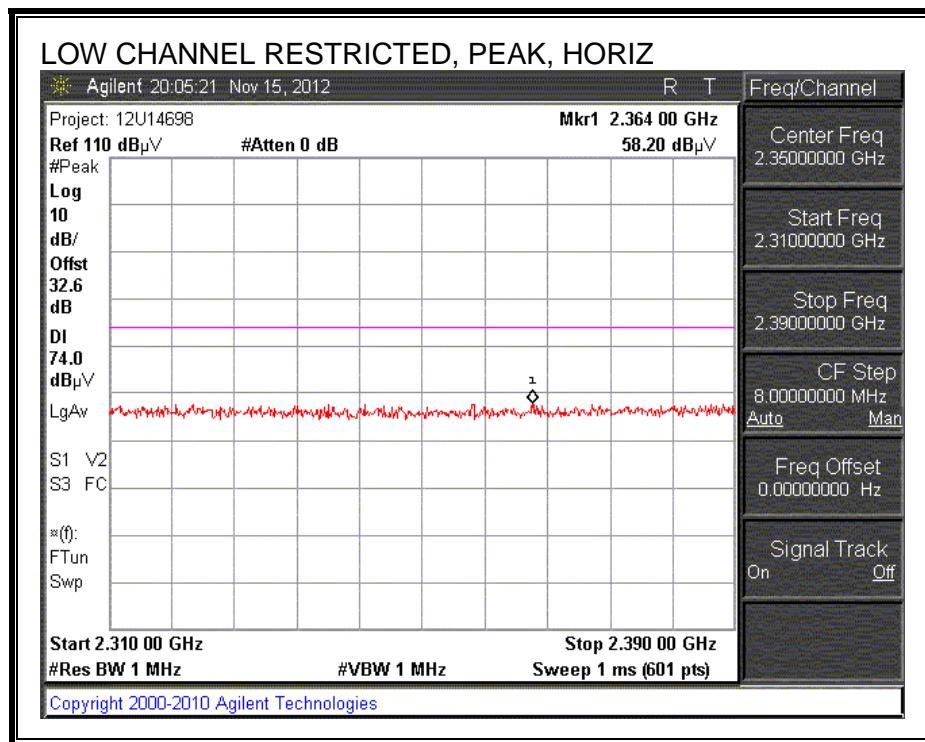
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
<b>2402 MHz GFSK</b>													
4.804	3.0	43.8	33.1	6.3	-34.8	0.0	0.0	48.3	74.0	-25.7	V	P	
4.804	3.0	34.0	33.1	6.3	-34.8	0.0	0.0	38.6	54.0	-15.4	V	A	
4.804	3.0	47.5	33.1	6.3	-34.8	0.0	0.0	52.0	74.0	-22.0	H	P	
4.804	3.0	37.4	33.1	6.3	-34.8	0.0	0.0	41.9	54.0	-12.1	H	A	
<b>2441 MHz GFSK</b>													
4.882	3.0	42.3	33.1	6.3	-34.8	0.0	0.0	46.9	74.0	-27.1	V	P	
4.882	3.0	32.8	33.1	6.3	-34.8	0.0	0.0	37.5	54.0	-16.5	V	A	
4.882	3.0	45.2	33.1	6.3	-34.8	0.0	0.0	49.9	74.0	-24.1	H	P	
4.882	3.0	35.1	33.1	6.3	-34.8	0.0	0.0	39.8	54.0	-14.2	H	A	
<b>2480 MHz GFSK</b>													
4.960	3.0	44.4	33.2	6.4	-34.8	0.0	0.0	49.1	74.0	-24.9	H	P	
4.960	3.0	35.6	33.2	6.4	-34.8	0.0	0.0	40.4	54.0	-13.6	H	A	
4.960	3.0	38.7	33.2	6.4	-34.8	0.0	0.0	43.5	74.0	-30.5	V	P	
4.960	3.0	28.1	33.2	6.4	-34.8	0.0	0.0	32.9	54.0	-21.1	V	A	

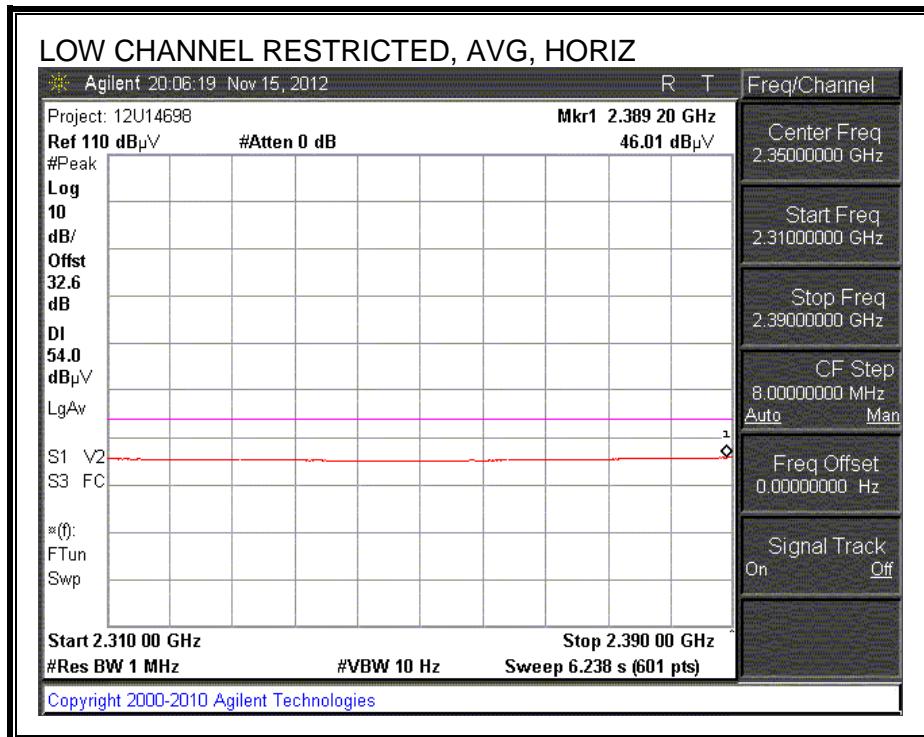
Rev. 4.1.2.7

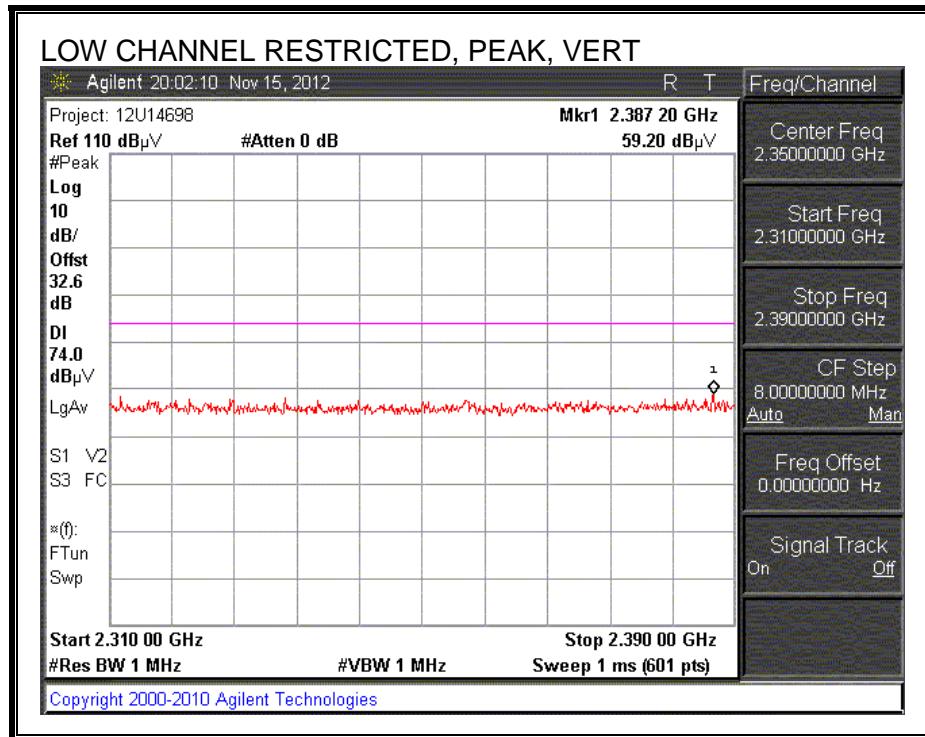
Note: No other emissions were detected above the system noise floor.

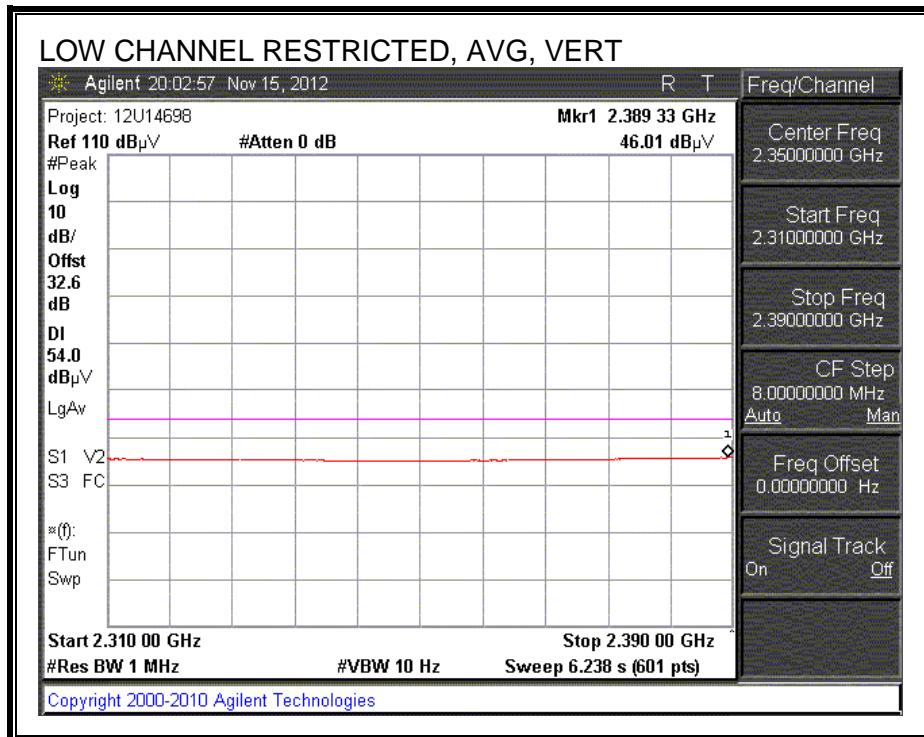
## 7.2.2. ENHANCED DATA RATE 8PSK MODULATION

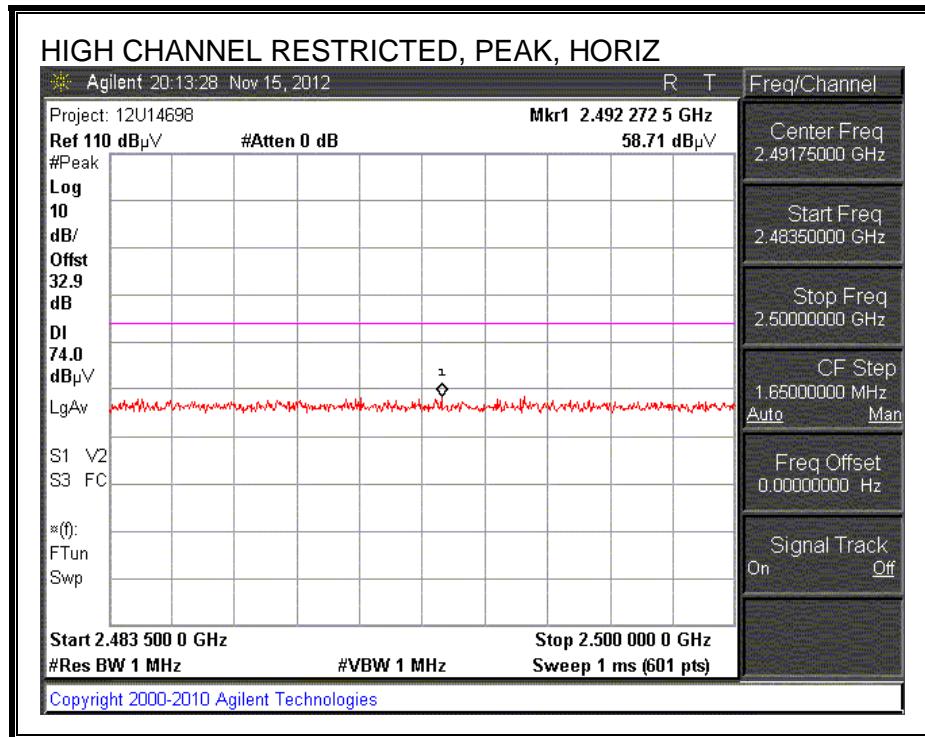
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

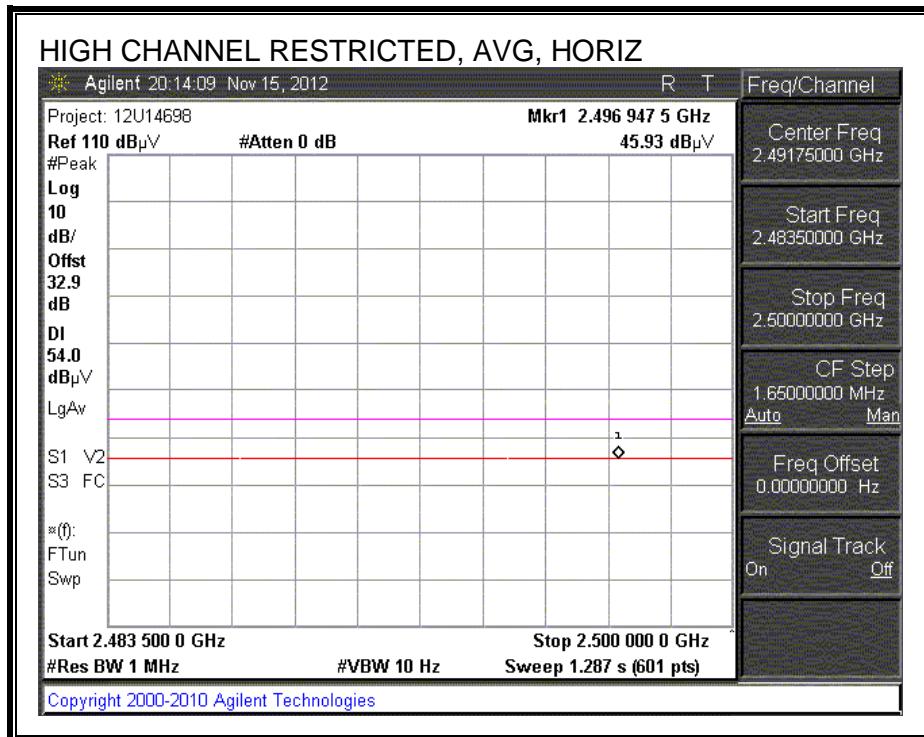


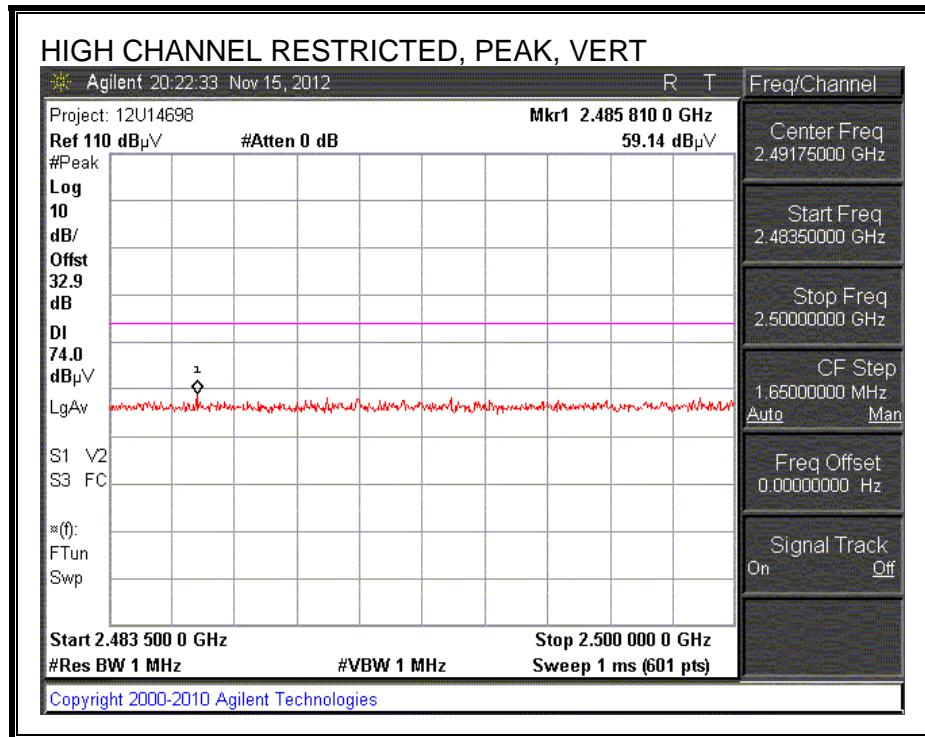


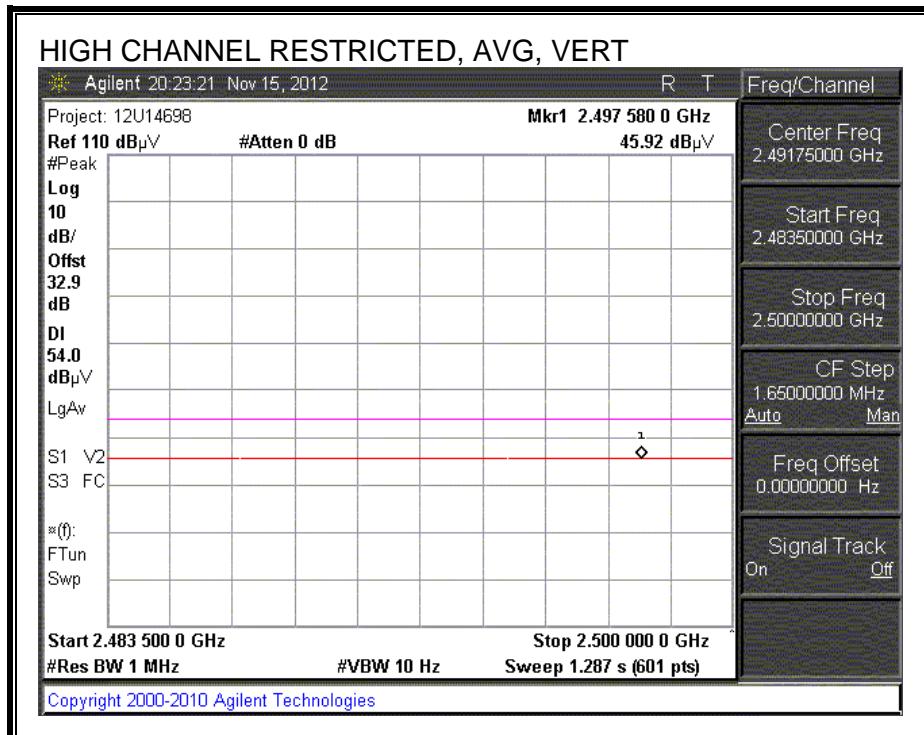
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



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



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



**HARMONICS AND SPURIOUS EMISSIONS****High Frequency Measurement**  
**Compliance Certification Services, Fremont 5m Chamber**

Test Engr: Tom Chen  
 Date: 11/17/12  
 Project #: 12U14698  
 Company: Kyocera  
 Test Target: FCC Class B  
 Mode Oper: Bluetooth 8PSK, TX mode

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

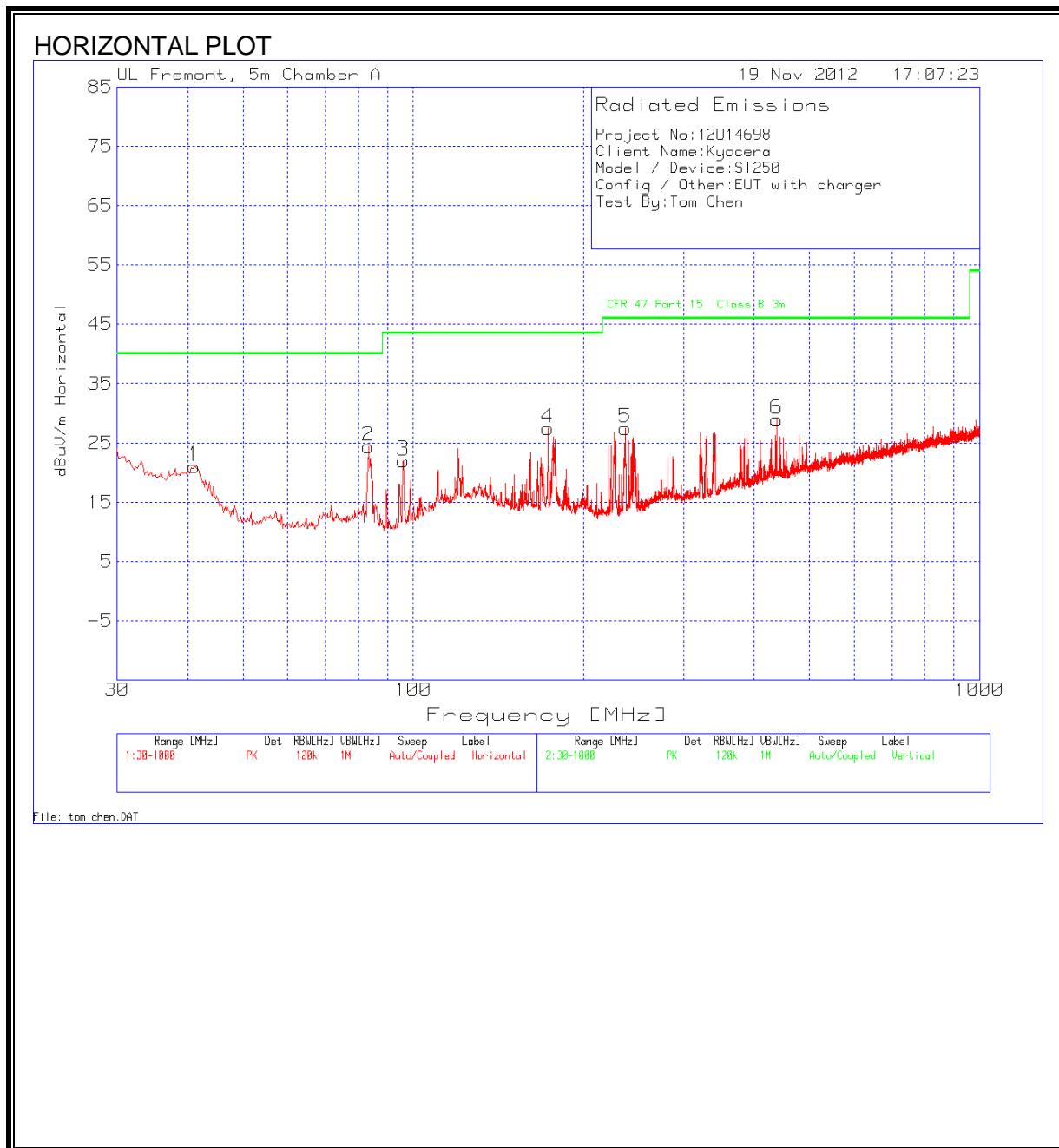
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
<b>2402 MHz 8PSK</b>													
4.804	3.0	46.3	33.1	6.3	-34.8	0.0	0.0	50.9	74.0	-23.1	H	P	
4.804	3.0	37.3	33.1	6.3	-34.8	0.0	0.0	41.8	54.0	-12.2	H	A	
4.804	3.0	42.6	33.1	6.3	-34.8	0.0	0.0	47.2	74.0	-26.8	V	P	
4.804	3.0	33.8	33.1	6.3	-34.8	0.0	0.0	38.4	54.0	-15.6	V	A	
<b>2441 MHz 8PSK</b>													
4.882	3.0	43.7	33.1	6.3	-34.8	0.0	0.0	48.4	74.0	-25.6	H	P	
4.882	3.0	35.4	33.1	6.3	-34.8	0.0	0.0	40.0	54.0	-14.0	H	A	
4.882	3.0	41.8	33.1	6.3	-34.8	0.0	0.0	46.4	74.0	-27.6	V	P	
4.882	3.0	33.1	33.1	6.3	-34.8	0.0	0.0	37.7	54.0	-16.3	V	A	
<b>2480 MHz 8PSK</b>													
4.960	3.0	39.3	33.2	6.4	-34.8	0.0	0.0	44.0	74.0	-30.0	V	P	
4.960	3.0	28.3	33.2	6.4	-34.8	0.0	0.0	33.1	54.0	-20.9	V	A	
4.960	3.0	44.0	33.2	6.4	-34.8	0.0	0.0	48.8	74.0	-25.2	H	P	
4.960	3.0	35.9	33.2	6.4	-34.8	0.0	0.0	40.7	54.0	-13.3	H	A	

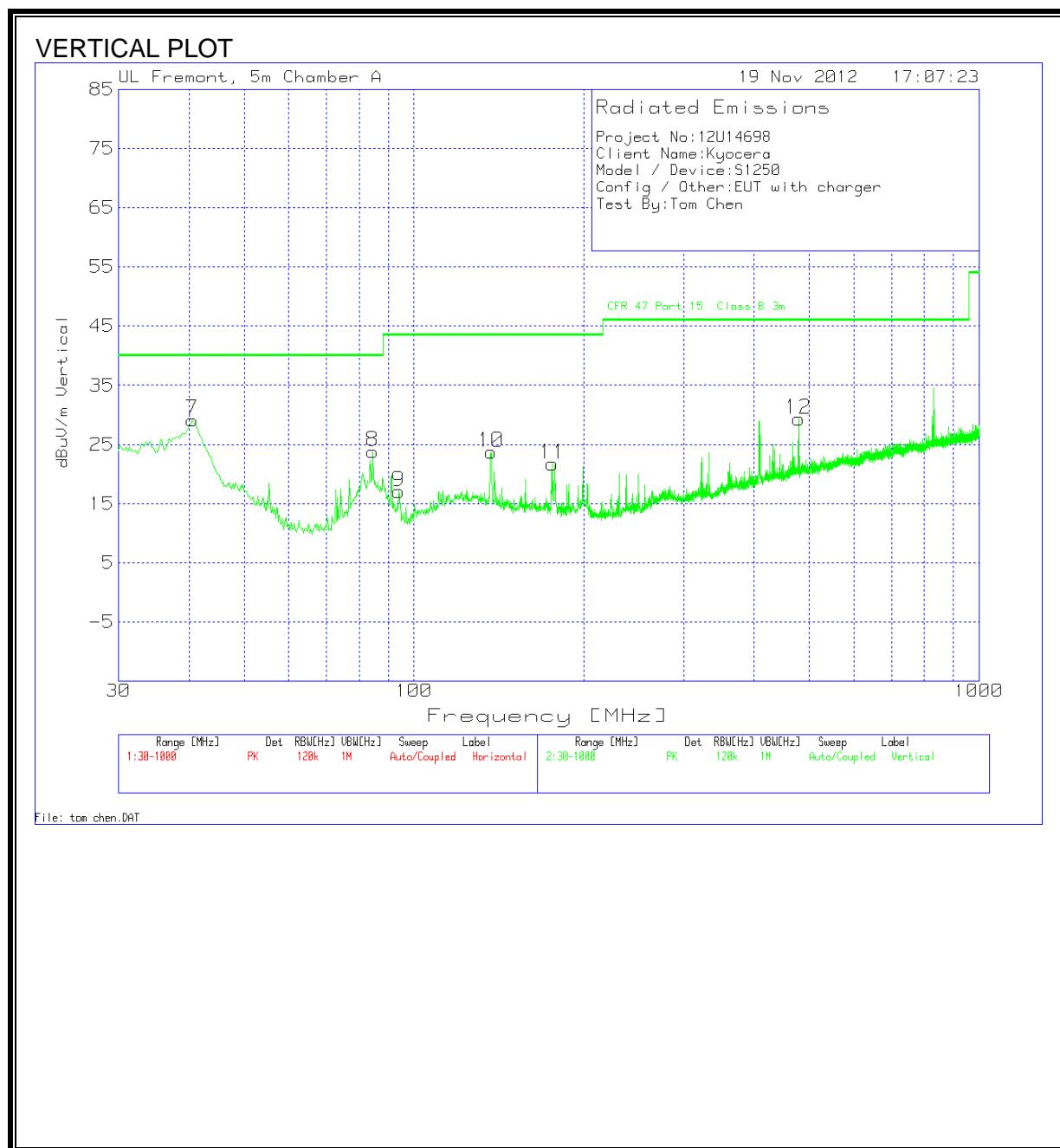
Rev. 4.1.2.7

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

### 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

Project No:12U14698

Client Name:Kyocera

Model / Device:S2150

Config / Other:EUT with charger

Test By:Tom Chen

Horizontal 30 - 1000MHz

Test Frequency	Meter Reading	Detector	25MHz-1GHz ChmbrA Amplified.TX (dB)	T243 Sunol Bilog.TXT (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Polarity
41.0492	35.1	PK	-27.4	13.3	21	40	-19	Horz
83.3074	44.23	PK	-27.1	7.3	24.43	40	-15.57	Horz
96.1011	39.78	PK	-26.9	9.1	21.98	43.5	-21.52	Horz
172.8637	42.55	PK	-26.5	11.4	27.45	43.5	-16.05	Horz
236.8325	42.18	PK	-26	11.3	27.48	46	-18.52	Horz
438.8189	37.57	PK	-25.3	16.7	28.97	46	-17.03	Horz

Vertical 30 - 1000MHz

Test Frequency	Meter Reading	Detector	25MHz-1GHz ChmbrA Amplified.TX (dB)	T243 Sunol Bilog.TXT (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Polarity
40.4676	42.82	PK	-27.3	13.6	29.12	40	-10.88	Vert
84.4704	43.5	PK	-27.1	7.4	23.8	40	-16.2	Vert
93.9688	35.55	PK	-27	8.5	17.05	43.5	-26.45	Vert
137.0024	37.39	PK	-26.7	13	23.69	43.5	-19.81	Vert
175.7714	36.8	PK	-26.4	11.3	21.7	43.5	-21.8	Vert
479.5264	37	PK	-25	17.3	29.3	46	-16.7	Vert

## 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	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**

Project No:12U14698

Client Name:Kyocera

Model/Device:S2150

Test Volt/Freq:120 VAC / 60Hz

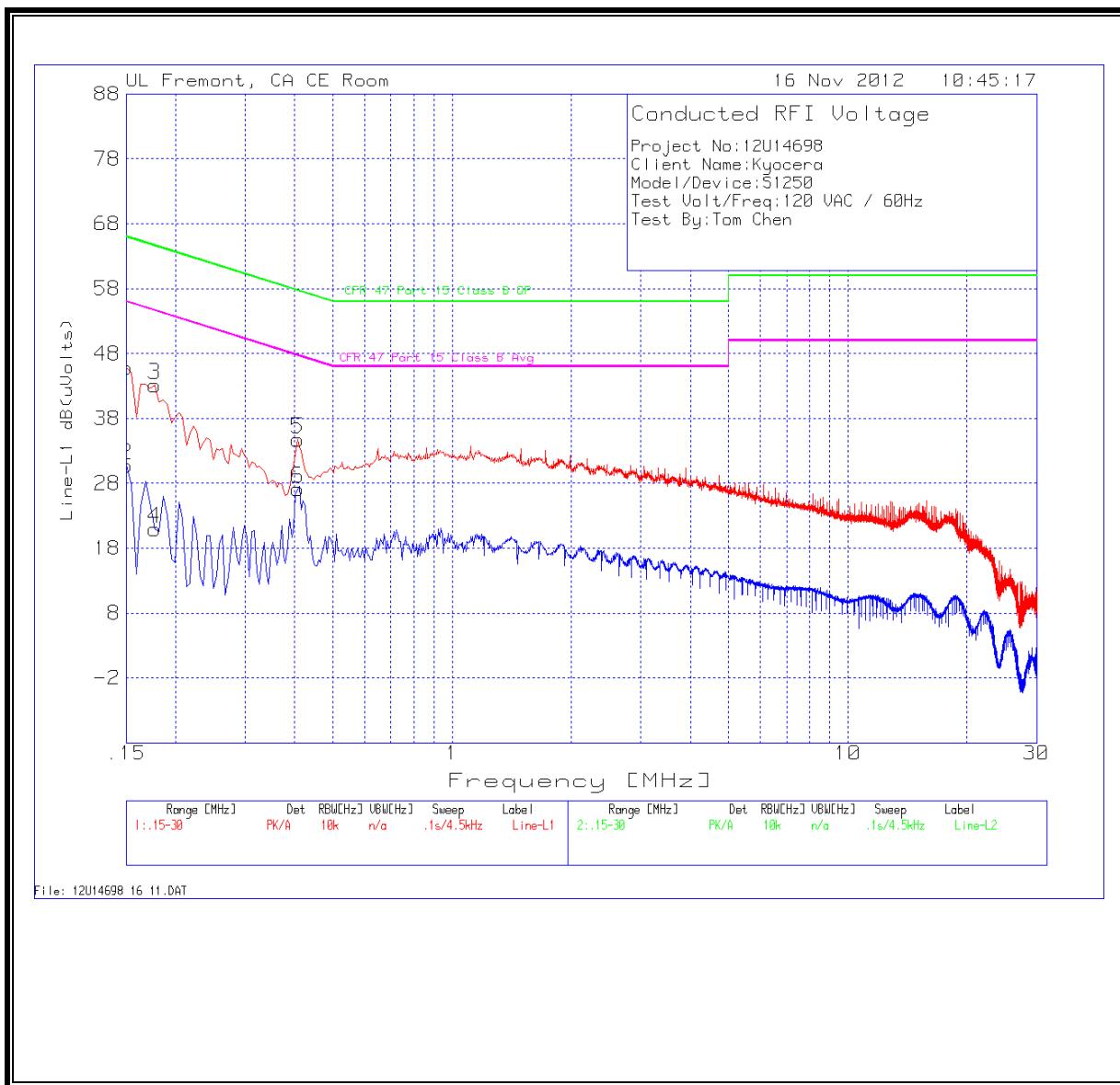
Test By:Tom Chen

Line-L1 .15 - 30MHz

Test Frequency	Meter Reading	Detector	T24 IL L1.TXT (dB)	LC Cables 1&3.TXT (dB)	dB(uVolts)	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.15	45.68	PK	0.1	0	45.78	66	-20.22	-	-
0.15	30.71	Av	0.1	0	30.81	-	-	56	-25.19
0.177	43.03	PK	0.1	0	43.13	64.6	-21.47	-	-
0.177	20.84	Av	0.1	0	20.94	-	-	54.6	-33.66
0.4065	34.71	PK	0.1	0	34.81	57.7	-22.89	-	-
0.4065	27.08	Av	0.1	0	27.18	-	-	47.7	-20.52

Line-L2 .15 - 30MHz

Test Frequency	Meter Reading	Detector	T24 IL L2.TXT (dB)	LC Cables 2&3.TXT (dB)	dB(uVolts)	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.159	36.39	PK	0.1	0	36.49	65.5	-29.01	-	-
0.159	18.35	Av	0.1	0	18.45	-	-	55.5	-37.05
0.1725	35.6	PK	0.1	0	35.7	64.8	-29.1	-	-
0.1725	17.28	Av	0.1	0	17.38	-	-	54.8	-37.42
0.411	29.86	PK	0.1	0	29.96	57.6	-27.64	-	-
0.411	16.42	Av	0.1	0	16.52	-	-	47.6	-31.08

**LINE 1 RESULTS**

**LINE 2 RESULTS**