



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

FOR

DUAL BAND CDMA PHONE WITH BT 2.0+EDR

MODEL NUMBER: E4233

FCC ID: V65E4233

REPORT NUMBER: 11U14121-1, Revision A1

ISSUE DATE: JANUARY 3, 2012

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

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	11/03/11	Initial Issue	T. Chan
A	11/14/11	Revised Typo in EUT description on cover page	A. Zaffar
A1	01/03/12	Revised EUT description to remove all instances of: Military Specs	A. Zaffar

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: DUAL BAND CDMA PHONE
WITH BLUETOOTH 2.0 +EDR

MODEL: E4233

SERIAL NUMBER: MEID 268435457816724579

DATE TESTED: NOVEMBER 2- 3, 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:

Tested By:



THU CHAN
ENGINEERING MANAGER
UL CCS



THANH NGUYEN
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:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 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 Dual band CDMA phone with Bluetooth 2.0 +EDR, manufactured by Kyocera Communications, Inc.

5.2. SOFTWARE AND FIRMWARE

The test utility hardware used was: 0101

The test utility software used was: 0.300sp01a

5.3. 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. After the investigation, the worst-position was turned out to be in the Z-position with the AC/DC adapter.

5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC Adapter	Kyocera	SCP-31ADT	2041	N/A
Headset	N/A	N/A	N/A	N/A

I/O CABLES

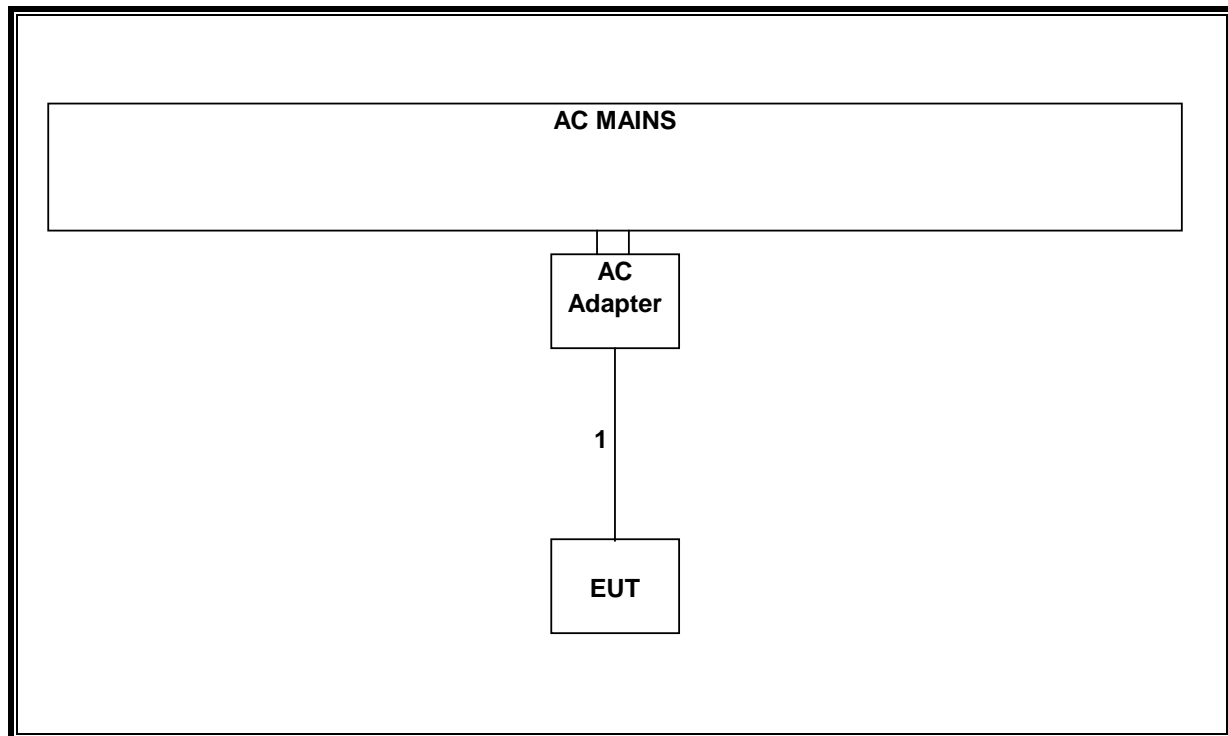
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	DC	Un-shielded	1.5m	DCD-1214
2	Mic	1	Headset	Un-shielded	1m	NA

TEST SETUP

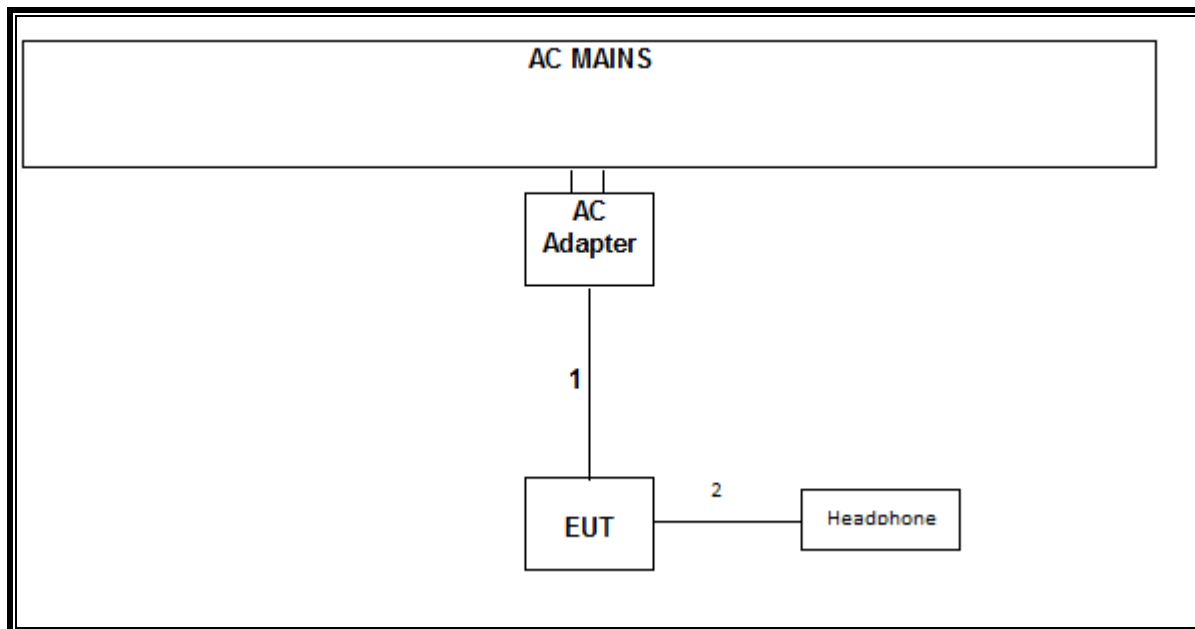
The EUT is configured as standalone unit with AC/DC adapter for all tests.

SETUP DIAGRAM FOR TESTS

Testing above 1GHz



Testing below 1GHz



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	C01179	01/19/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/16/12
Antenna, Horn, 18 GHz	EMCO	3115	C00945	06/29/12
Preamplifier, 26.5 GHz	Preamplifier, 26.5 GHz	Agilent / HP	8449B	07/12/12
Preamplifier, 1300 MHz	Preamplifier, 1300 MHz	Agilent / HP	8447D	01/27/12
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRM50702	N02683	CNR
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	N/A	07/05/12

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.

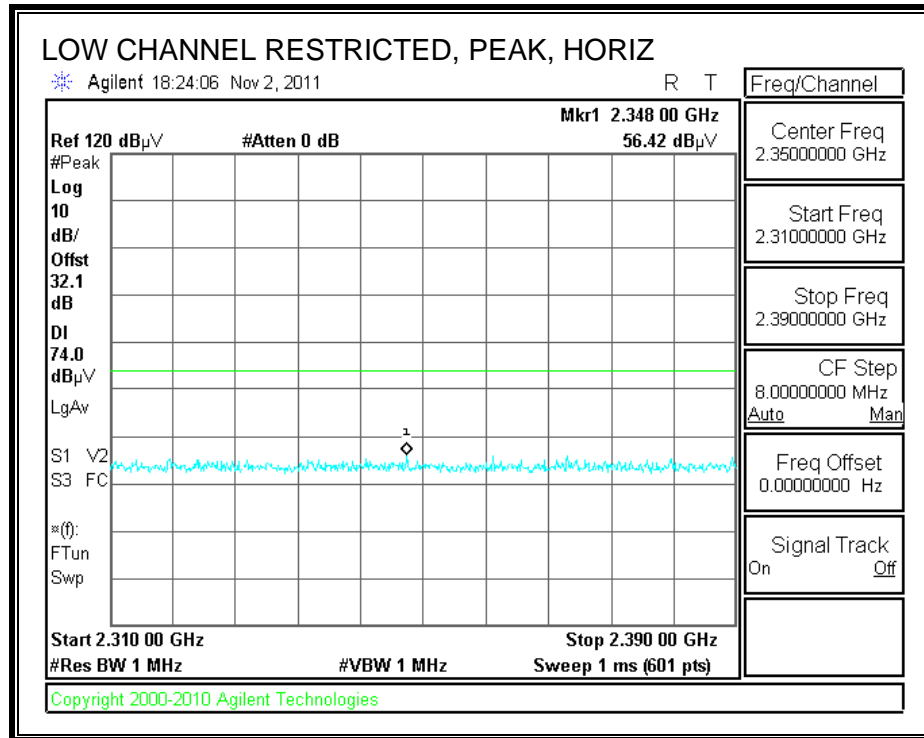
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

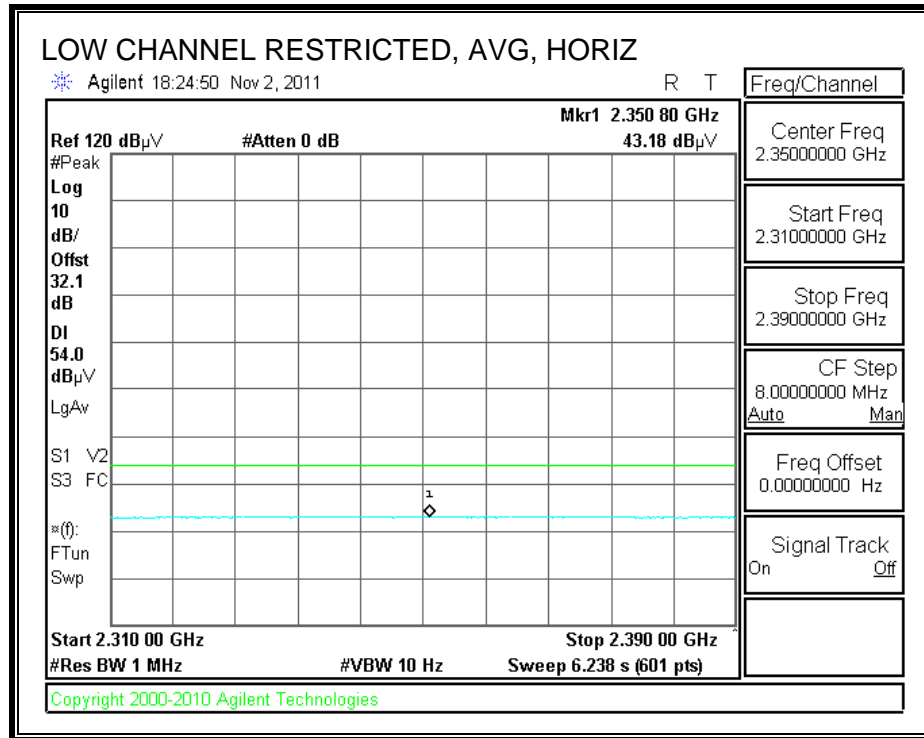
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

7.2. TRANSMITTER ABOVE 1 GHz

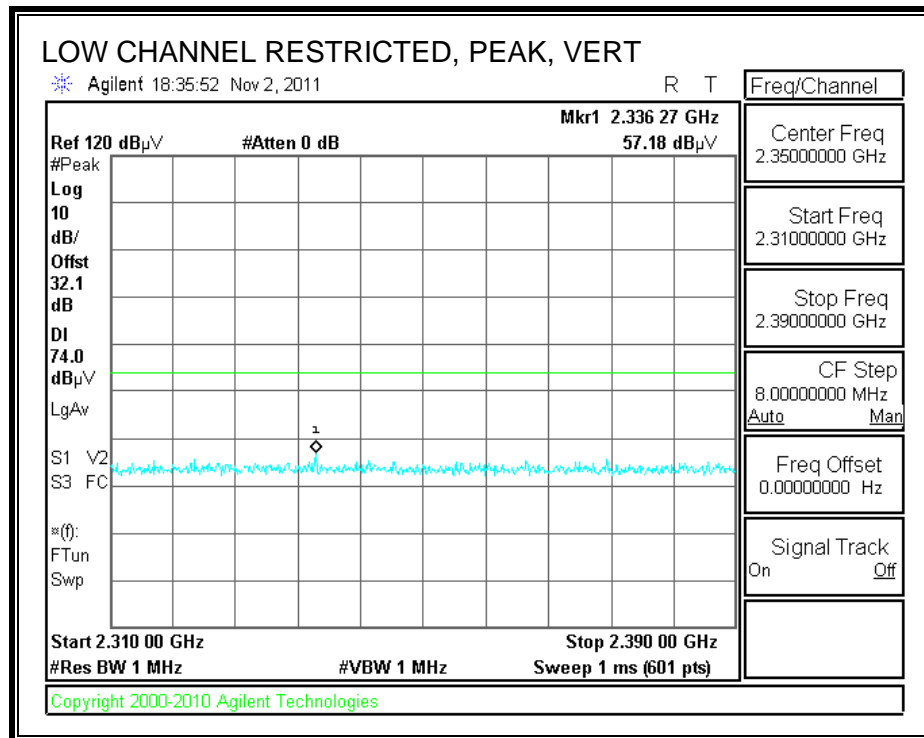
7.2.1. BASIC DATA RATE QPSK MODULATION

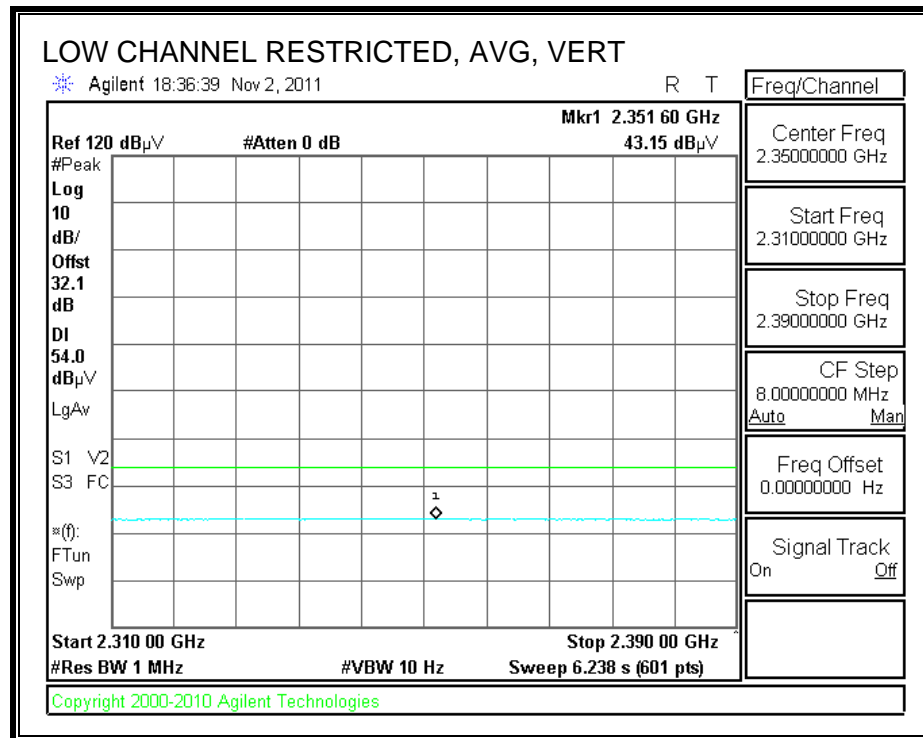
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



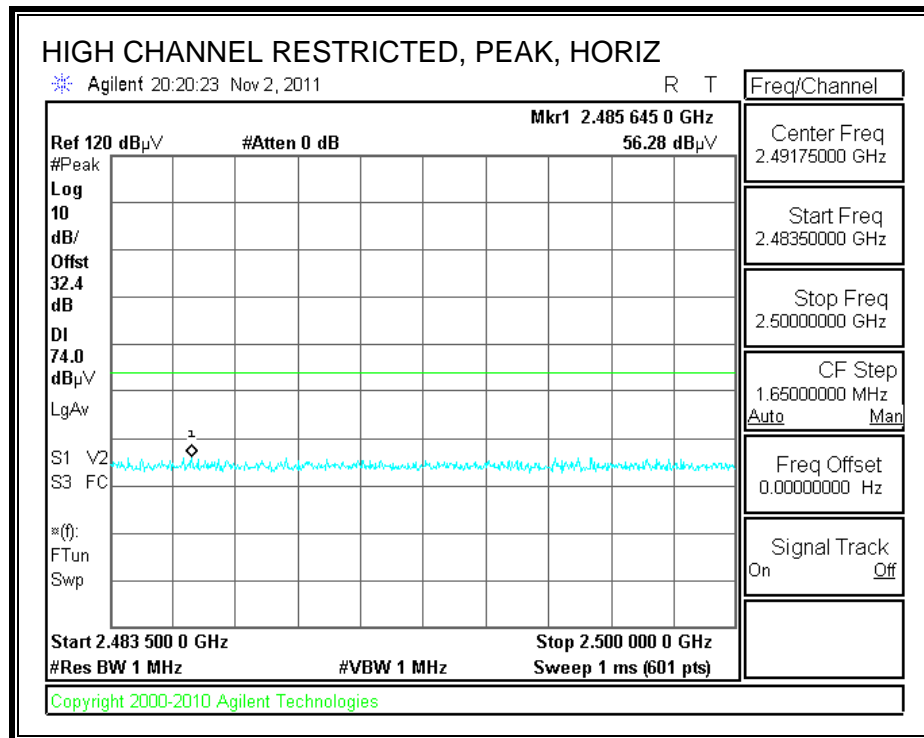


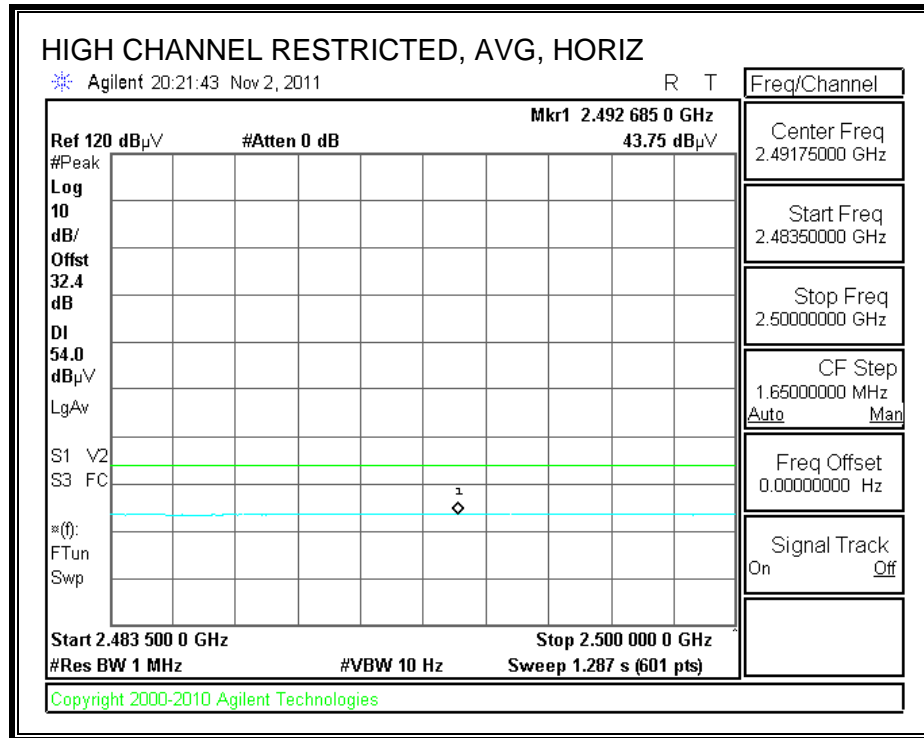
RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)



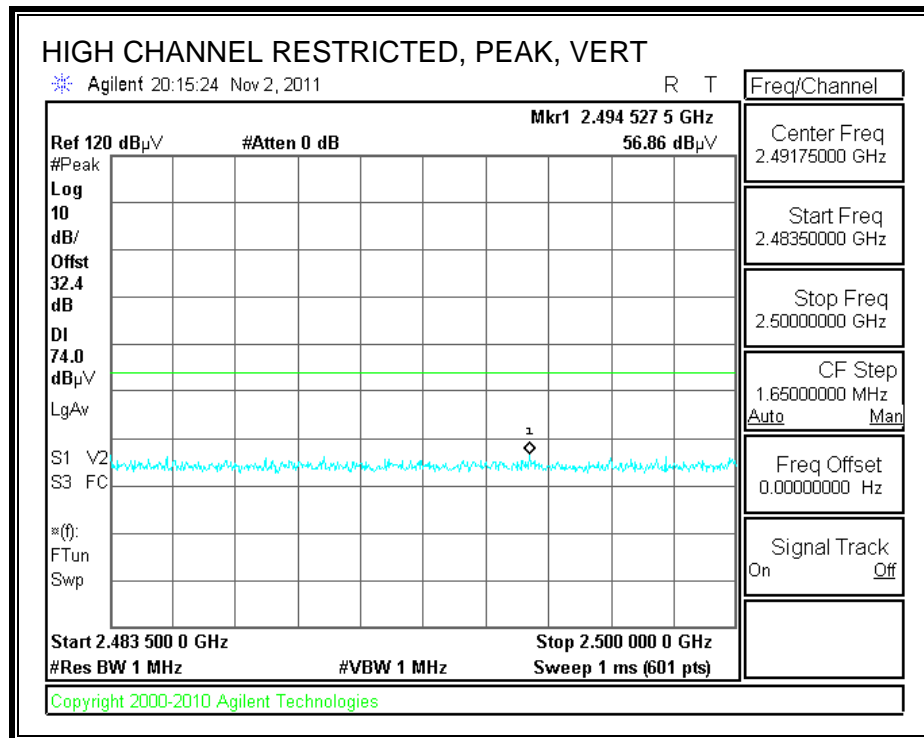


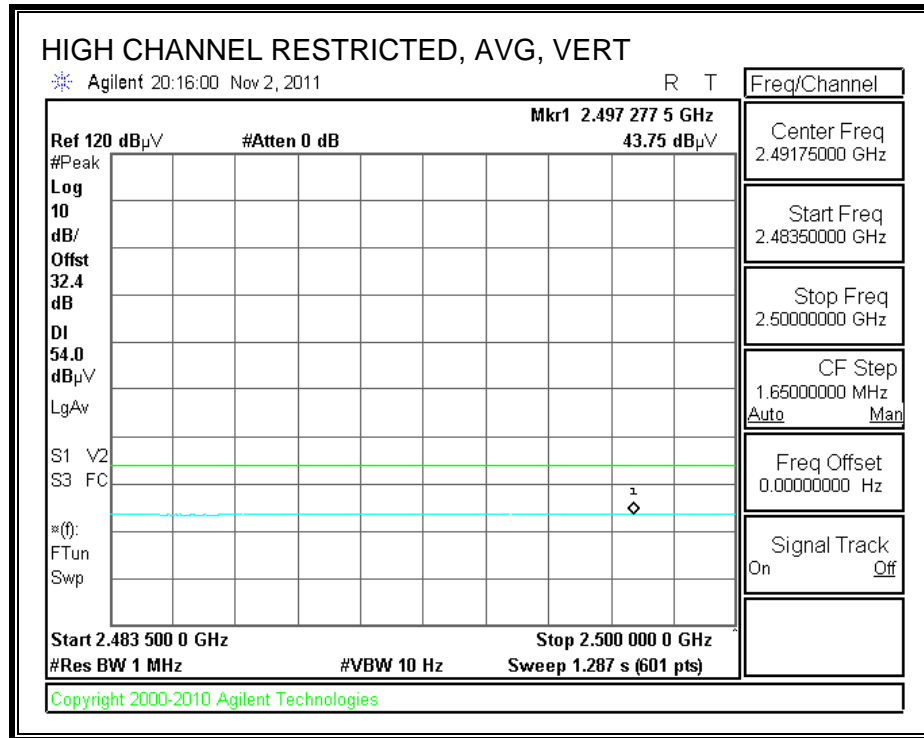
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)





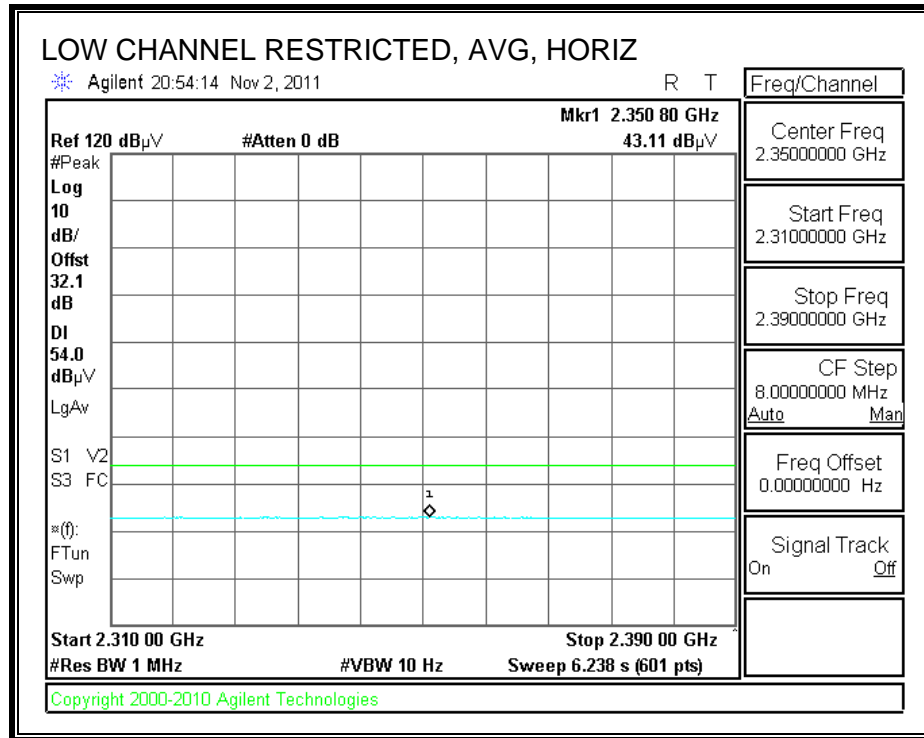
RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)



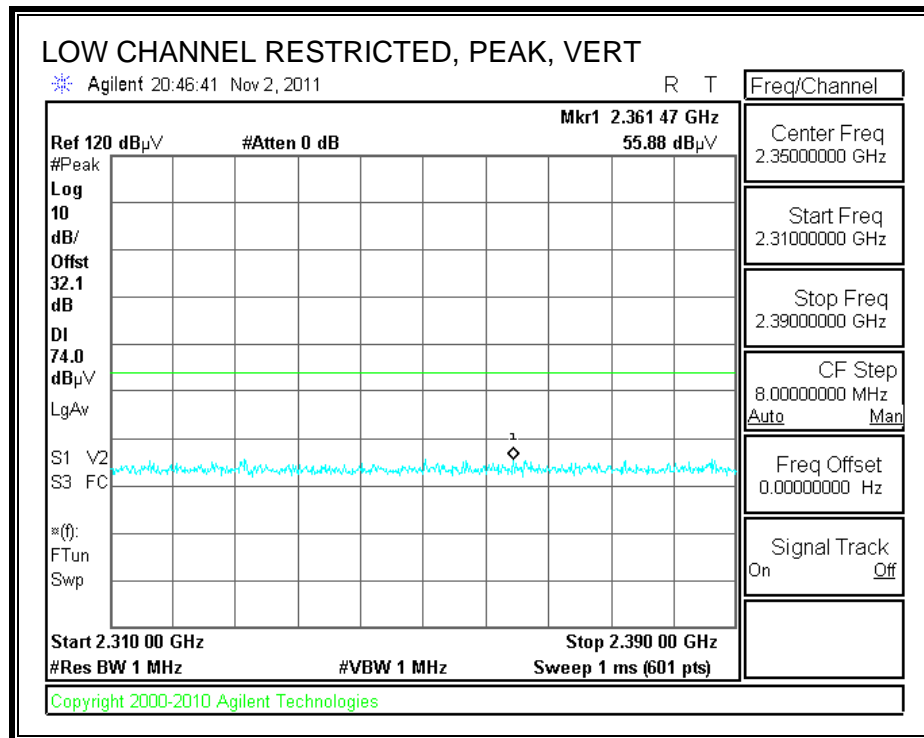


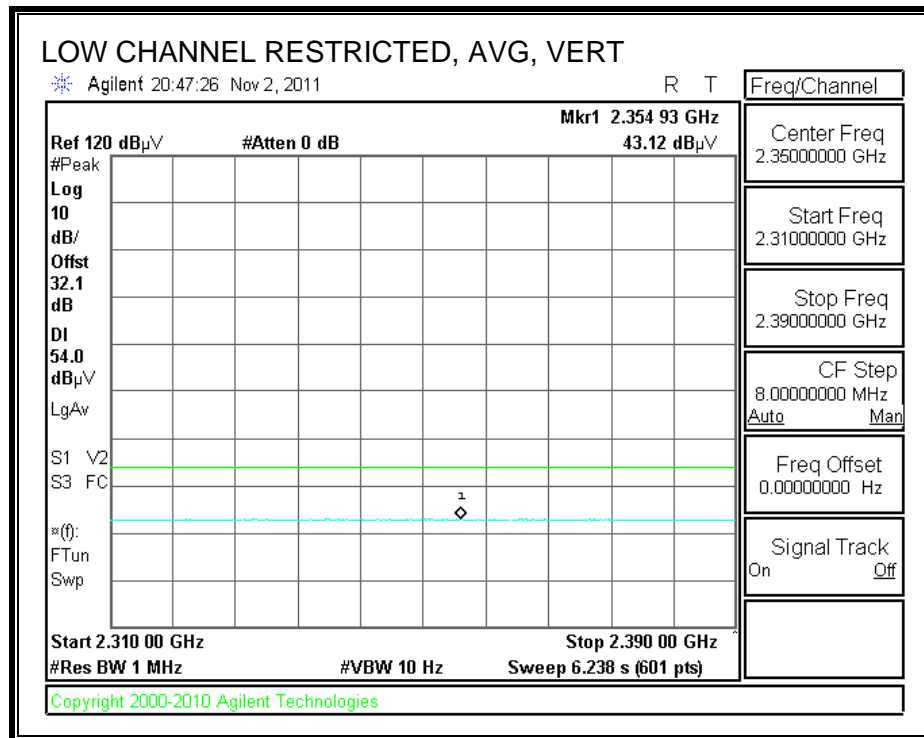
HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement																
Compliance Certification Services, Fremont 5m Chamber-A																
Company:		KEOCERA														
Project #:		11U14121														
Date:		11/2/2011														
Test Engineer:		Thanh Nguyen														
Configuration:		EUT, AC/DC Adapter, Earphone														
Mode:		Transmit GFSK														
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T73; S/N: 6717 @3m			T144 Miteq 3008A00931						T125; ARA 18-26GHz; S/N:1007			FCC 15.205				
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 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	37.4	25.8	33.4	6.2	-35.5	0.0	0.0	41.5	29.9	74	54	-32.5	-24.1	V	
4.804	3.0	38.6	27.2	33.4	6.2	-35.5	0.0	0.0	42.7	31.3	74	54	-31.3	-22.7	H	
Mid Ch																
4.882	3.0	38.9	25.6	33.5	6.2	-35.5	0.0	0.0	43.1	29.9	74	54	-30.9	-24.1	H	
7.323	3.0	38.4	26.5	35.7	8.4	-35.4	0.0	0.0	47.0	35.2	74	54	-27.0	-18.8	H	
4.882	3.0	38.7	26.5	33.5	6.2	-35.5	0.0	0.0	42.9	30.7	74	54	-31.1	-23.3	V	
7.323	3.0	38.5	26.8	35.7	8.4	-35.4	0.0	0.0	47.2	35.5	74	54	-26.8	-18.5	V	
High Ch																
4.960	3.0	37.6	26.5	33.6	6.3	-35.5	0.0	0.0	42.0	30.8	74	54	-32.0	-23.2	V	
7.440	3.0	37.4	26.2	35.9	8.4	-35.5	0.0	0.0	46.2	35.1	74	54	-27.8	-18.9	V	
4.960	3.0	38.6	25.8	33.6	6.3	-35.5	0.0	0.0	42.9	30.1	74	54	-31.1	-23.9	H	
7.440	3.0	38.1	25.6	35.9	8.4	-35.5	0.0	0.0	46.9	34.5	74	54	-27.1	-19.5	H	
V																
No other emissions were detected above the noise floor.																
Rev. 07.08.11																

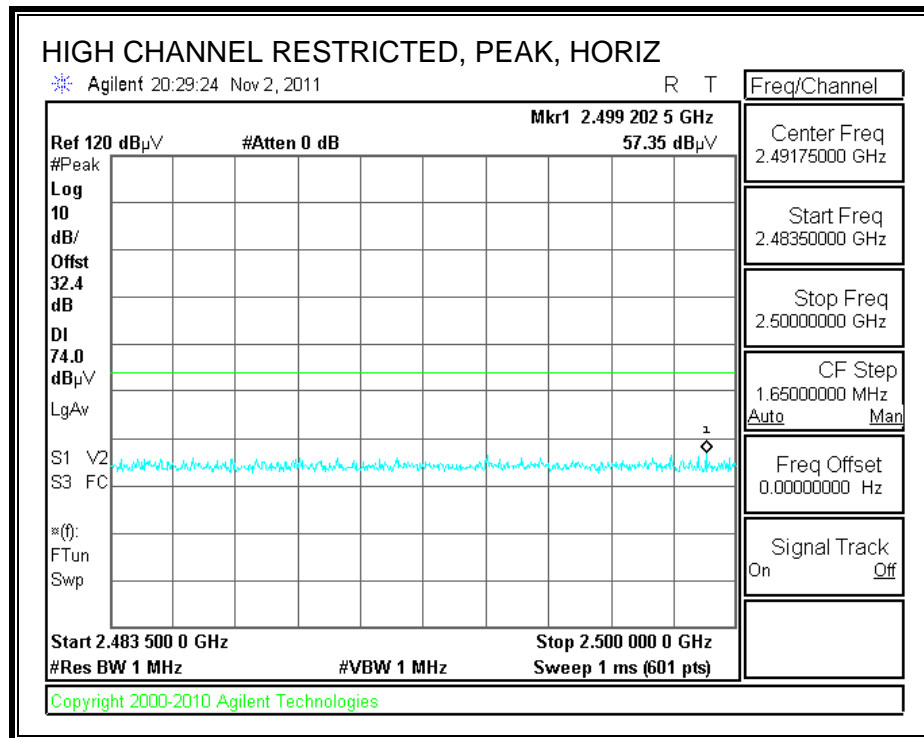


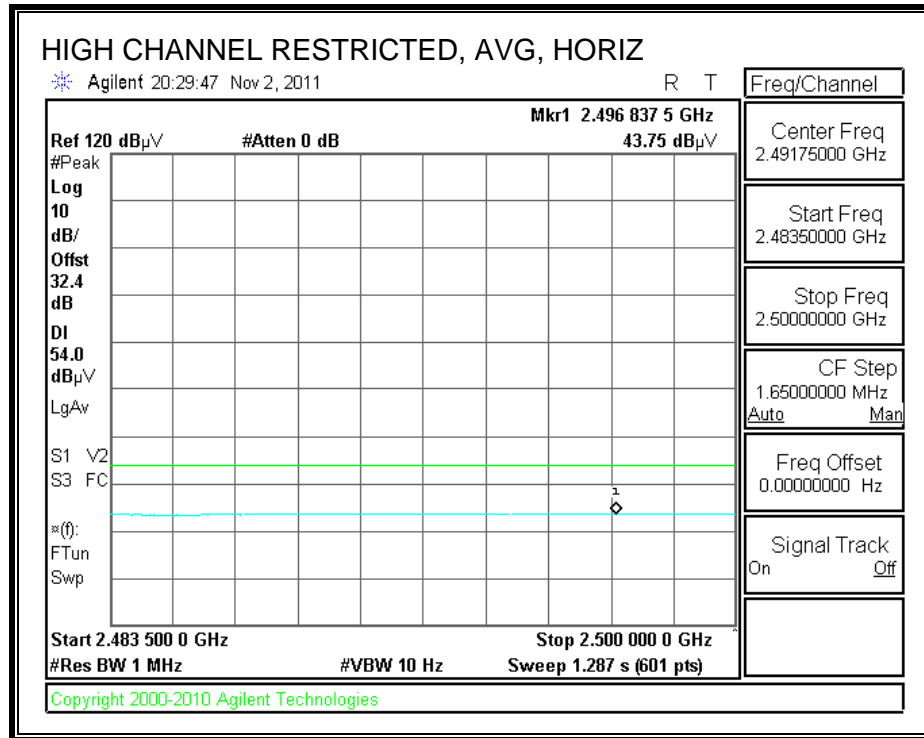
RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)



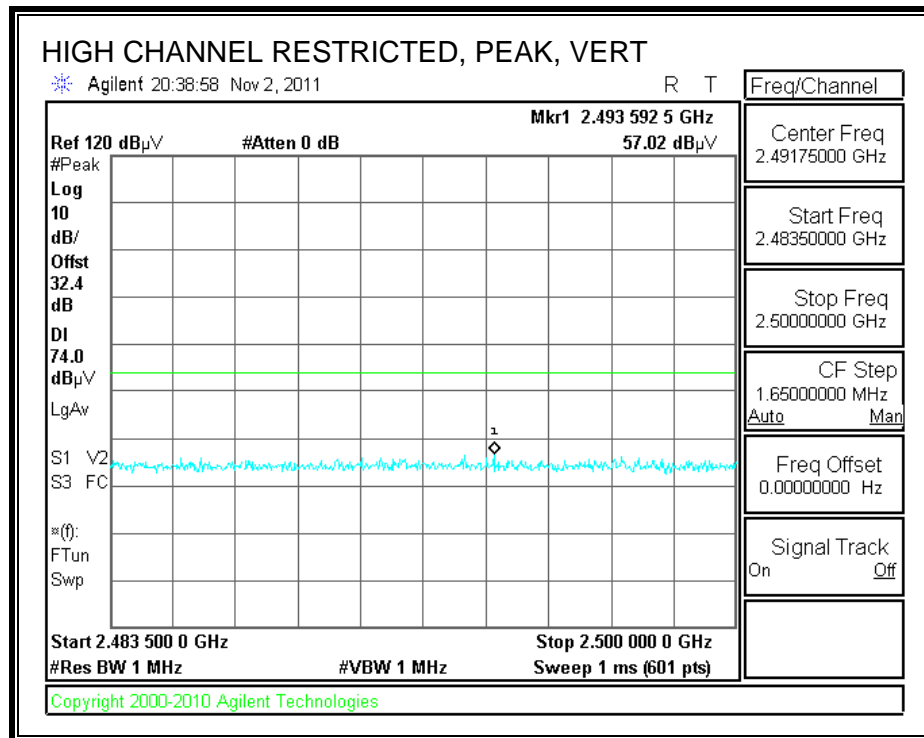


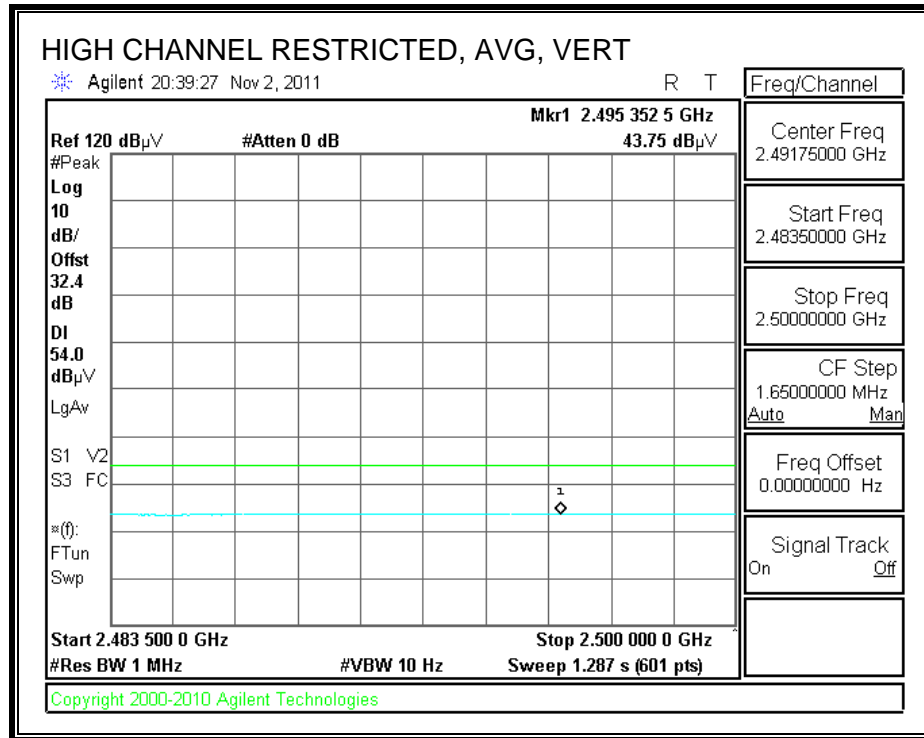
RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)



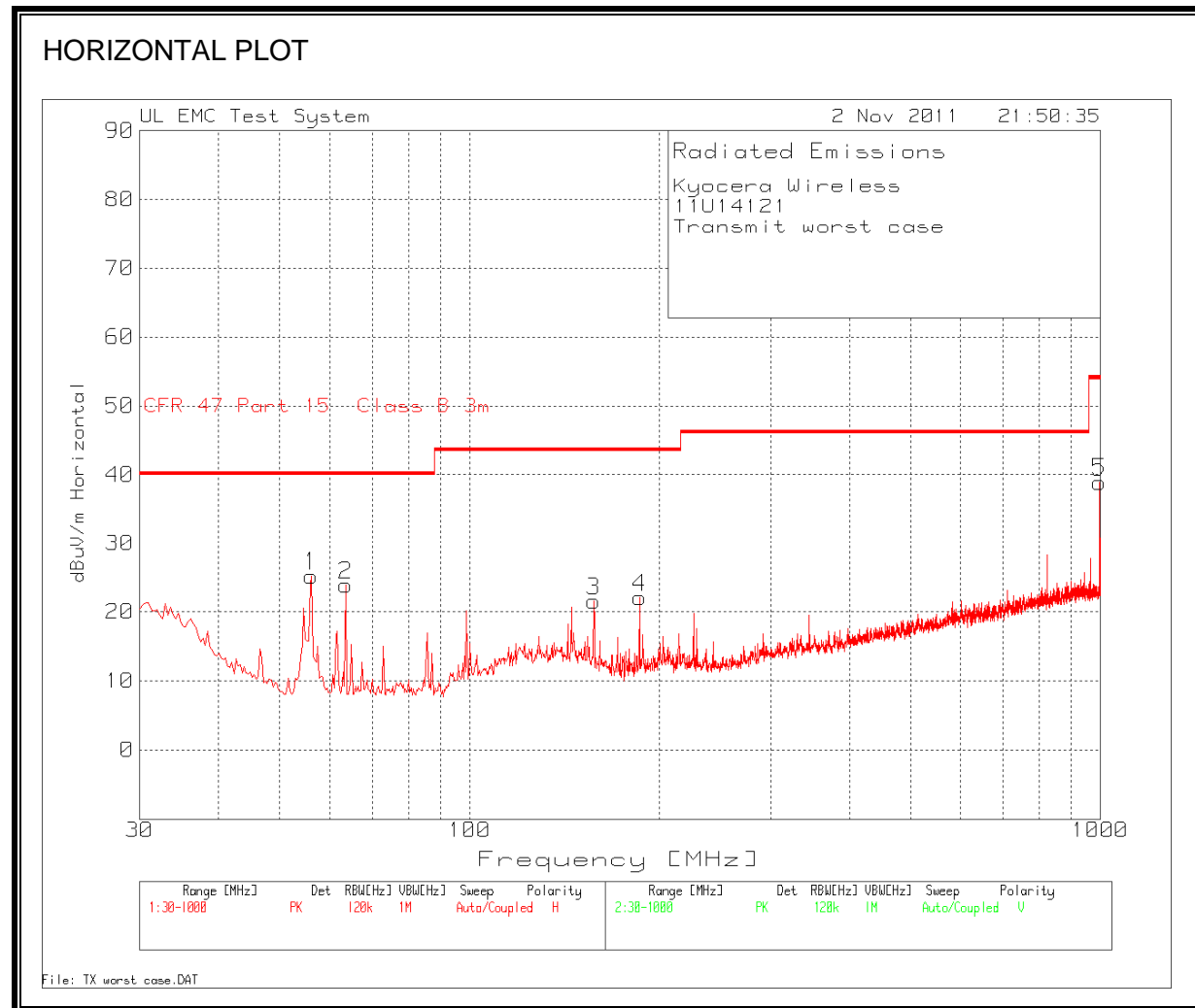


HARMONICS AND SPURIOUS EMISSIONS

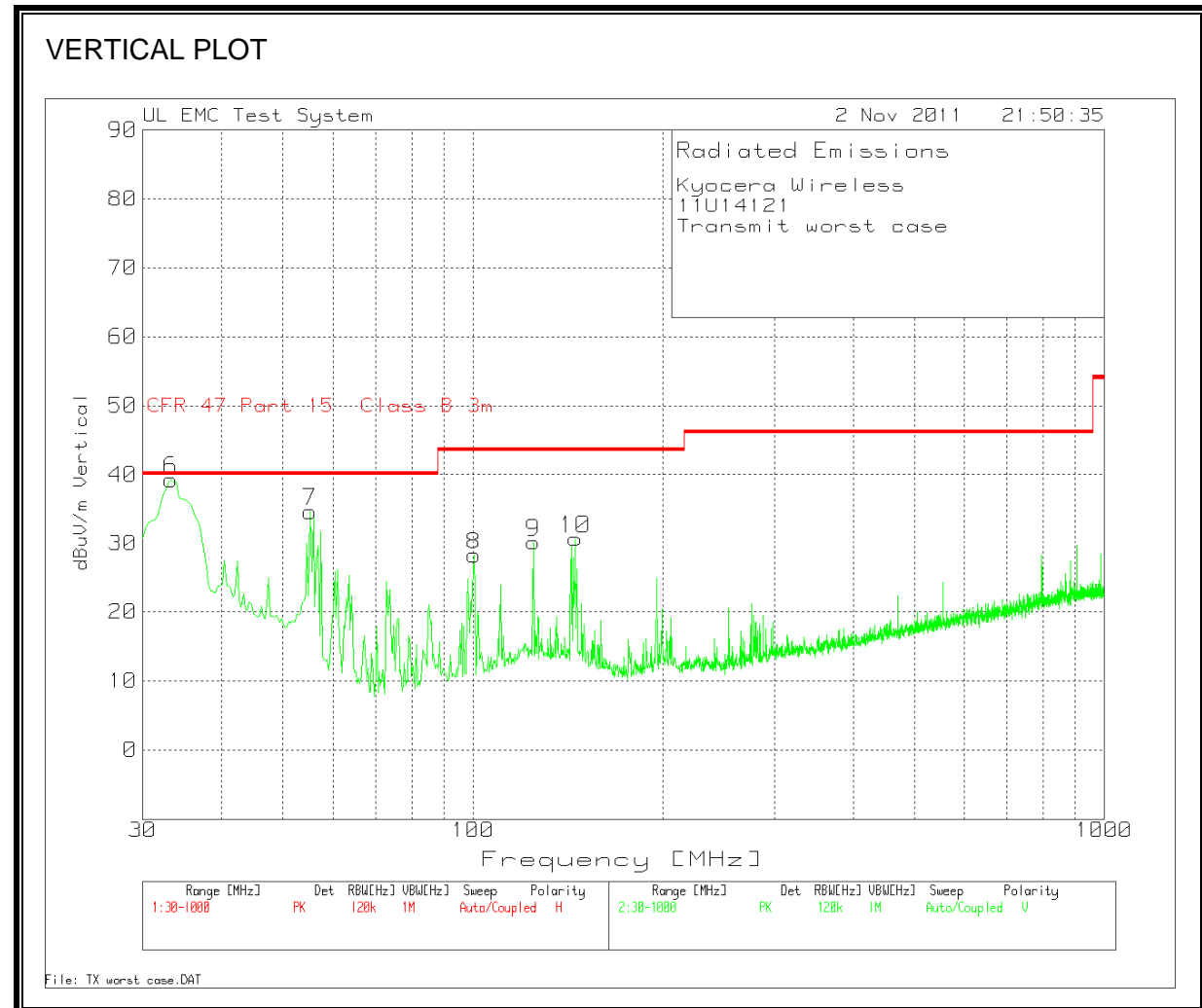
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3' cable 22807700				12' cable 22807600				20' cable 22807500								R_001			
<div style="text-align: right;"> Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz </div>																			
f	Dist	Read Pk	Read Avg.	AF	CL	Amp	D Corr	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)				
Low Ch																			
4.804	3.0	38.8	25.6	33.4	6.2	-35.5	0.0	0.0	42.9	29.7	74	54	-31.1	-24.3	V				
4.804	3.0	38.4	26.5	33.4	6.2	-35.5	0.0	0.0	42.5	30.6	74	54	-31.5	-23.4	H				
Mid Ch																			
4.882	3.0	39.4	27.3	33.5	6.2	-35.5	0.0	0.0	43.6	31.6	74	54	-30.4	-22.4	H				
7.323	3.0	38.7	25.9	35.7	8.4	-35.4	0.0	0.0	47.4	34.6	74	54	-26.6	-19.4	H				
4.882	3.0	38.4	26.4	33.5	6.2	-35.5	0.0	0.0	42.6	30.6	74	54	-31.4	-23.4	V				
7.323	3.0	37.7	25.6	35.7	8.4	-35.4	0.0	0.0	46.3	34.3	74	54	-27.7	-19.7	V				
High Ch																			
4.960	3.0	37.5	27.3	33.6	6.3	-35.5	0.0	0.0	41.9	31.7	74	54	-32.1	-22.3	V				
7.440	3.0	38.0	25.8	35.9	8.4	-35.5	0.0	0.0	46.8	34.7	74	54	-27.2	-19.3	V				
4.960	3.0	38.4	26.9	33.6	6.3	-35.5	0.0	0.0	42.7	31.2	74	54	-31.3	-22.8	H				
7.440	3.0	37.6	25.4	35.9	8.4	-35.5	0.0	0.0	46.5	34.2	74	54	-27.5	-19.8	H				
No other emissions were detected above the noise floor.																			
Rev. 07.08.11																			
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

Kyocera Wireless

11U14121

Transmit worst case

Range 1 30 - 1000MHz

Test Freq. (MHz)	Meter Reading (dBuV)	Detector	Cable Loss [dB]	Pre-Amp Gain [dB]	Antenna Factor [dB]	dBuV/m	FCCClass B Limit	Margin	Height [cm]	Polarity
56.1726	44.6	PK	0.8	-28.3	8.1	25.2	40	-14.8	91	Horz
63.6043	43.31	PK	0.8	-28.2	8	23.91	40	-16.09	91	Horz
157.3085	36.42	PK	1.3	-28.1	11.9	21.52	43.5	-21.98	91	Horz
186.066	37.34	PK	1.5	-28.1	11.3	22.04	43.5	-21.46	91	Horz
998.3844	40.65	PK	3.5	-27.7	22.5	38.95	54	-15.05	91	Horz

Range 2 30 - 1000MHz

Test Freq. (MHz)	Meter Reading (dBuV)	Detector	Cable Loss [dB]	Pre-Amp Gain [dB]	Antenna Factor [dB]	dBuV/m	FCCClass B Limit	Margin	Height [cm]	Polarity
33.2312	48.31	PK	0.6	-28.3	18.7	39.31	40	-0.69	108	Vert
33.574	43.14	QP	0.6	-28.3	18.6	34.04	40	-5.96	115	Vert
55.2032	54.04	PK	0.8	-28.3	8.1	34.64	40	-5.36	108	Vert
55.2029	37.33	QP	0.8	-28.3	8.1	17.93	40	-22.07	182	Vert
100.4397	45.34	PK	1.1	-28.2	10	28.24	43.5	-15.26	108	Vert
124.6736	43.43	PK	1.2	-28.2	13.7	30.13	43.5	-13.37	108	Vert
145.3531	44.52	PK	1.3	-28.1	12.9	30.62	43.5	-12.88	108	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.

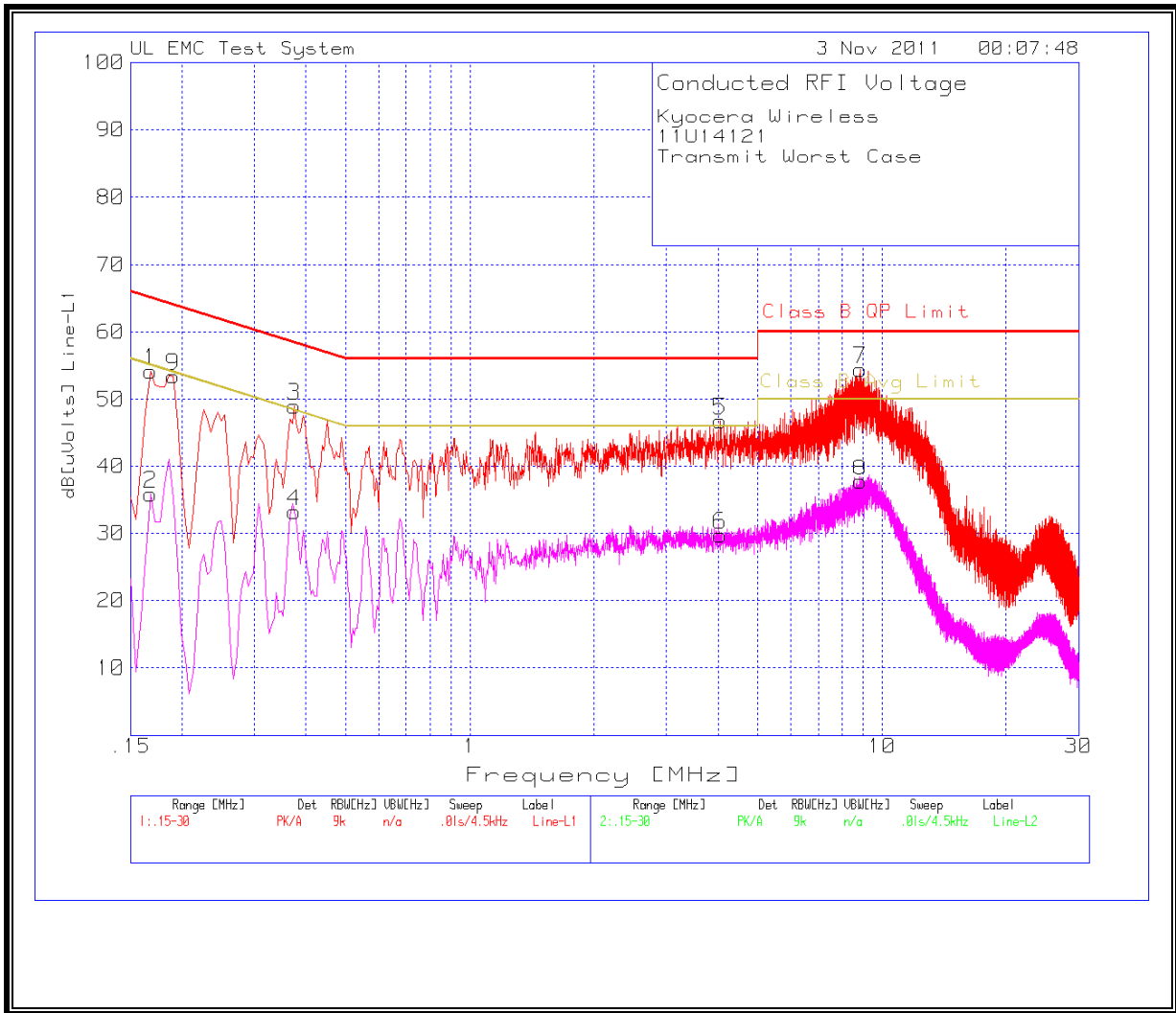
Line conducted data is recorded for both NEUTRAL and LINE.

RESULTS

WORST CASE EMISSIONS

Kyocera Wireless									
11U14121									
Transmit Worst Case									
Line-L1 .15 - 30MHz									
Test Freq. (MHz)	Meter Reading	Detector	LISN [dB]	Conduct ed Emission Cable [dB]	Correct Reading (dBuVolts)	Class B Quasi-peak Limit	Quasi-Peak Margin	Class B Average Limit	Average Margin
0.168	54.19	PK	0	0	54.19	65.1	-10.91		
0.168	35.78	Av	0	0	35.78	65.1	-29.32	55.1	-19.32
0.375	48.96	PK	0	0	48.96	58.4	-9.44		
0.375	33.15	Av	0	0	33.15	58.4	-25.25	48.4	-15.25
4.056	46.85	PK	0	0	46.85	56	-9.15		
4.056	29.7	Av	0	0	29.7	56	-26.3	46	-16.3
8.871	54.43	PK	0	0	54.43	60	-5.57		
8.871	37.68	Av	0	0	37.68	60	-22.32	50	-12.32
0.1905	53.46	PK	0	0	53.46	64	-10.54		
Line-L2 .15 - 30MHz									
Test Freq. (MHz)	Meter Reading	Detector	LISN [dB]	Conduct ed Emission Cable [dB]	Correct Reading (dBuVolts)	Class B Quasi-peak Limit	Quasi-Peak Margin	Class B Average Limit	Average Margin
0.186	52.47	PK	0	0	52.47	64.2	-11.73		
0.186	38.82	Av	0	0	38.82	64.2	-25.38	54.2	-15.38
0.384	47.63	PK	0	0	47.63	58.2	-10.57		
0.384	28.75	Av	0	0	28.75	58.2	-29.45	48.2	-19.45
2.805	46.33	PK	0	0	46.33	56	-9.67		
2.805	27.16	Av	0	0	27.16	56	-28.84	46	-18.84
8.439	55.73	PK	0	0	55.73	60	-4.27		
8.439	31.76	Av	0	0	31.76	60	-28.24	50	-18.24

LINE 1 RESULTS



LINE 2 RESULTS

