



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

**CERTIFICATION TEST REPORT  
FOR**

**SINGLE-BAND 1xRTT CDMA PHONE WITH BLUETOOTH**

**MODEL NUMBER: SA002**

**FCC ID: V65SA002**

**REPORT NUMBER: 10U13058-3, Revision B**

**ISSUE DATE: FEBRUARY 22, 2010**

*Prepared for*  
**KYOCERA CORPORATION  
C/O KYOCERA COMMUNICATION INC.  
10300 CAMPUS POINT DRIVE  
SAN DIEGO, CA 92121**

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



**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Issue Date	Revisions	Revised By
--	02/09/10	Initial Issue	T. Chan
A	02/18/10	Removed software and firmware information	A. Zaffar
B	02/22/10	Revised company address	A. Zaffar

## 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. MEASURING INSTRUMENT CALIBRATION.....	5
4.2. SAMPLE CALCULATION.....	5
4.3. MEASUREMENT UNCERTAINTY.....	5
<b>5. EQUIPMENT UNDER TEST .....</b>	<b>6</b>
5.1. DESCRIPTION OF EUT.....	6
5.2. DESCRIPTION OF AVAILABLE ANTENNAS.....	6
5.3. SOFTWARE AND FIRMWARE.....	6
5.4. WORST-CASE CONFIGURATION AND MODE .....	6
5.5. DESCRIPTION OF TEST SETUP.....	7
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>9</b>
<b>7. RADIATED TEST RESULTS .....</b>	<b>10</b>
7.1. LIMITS AND PROCEDURE .....	10
7.2. TRANSMITTER ABOVE 1 GHz .....	11
7.2.1. BASIC DATA RATE GFSK MODULATION.....	11
7.2.2. ENHANCED DATA RATE 8PSK MODULATION.....	16
7.3. WORST-CASE BELOW 1 GHz.....	21
<b>8. AC POWER LINE CONDUCTED EMISSIONS .....</b>	<b>24</b>
<b>9. SETUP PHOTOS.....</b>	<b>28</b>

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** KYOCERA CORPORATION  
C/O KYOCERA COMMUNICATION INC.  
10300 CAMPUS POINT DRIVE  
SAN DIEGO, CA 92121

**EUT DESCRIPTION:** SINGLE-BAND 1XRTT CDMA PHONE WITH BLUETOOTH

**MODEL:** SA002

**SERIAL NUMBER:** SSAEP000157

**DATE TESTED:** FEBRUARY 05, 2010

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

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:



THU CHAN  
EMC MANAGER  
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 C63.4-2003, 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.

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 featured Single-band CDMA Phone that manufactured by Kyocera Corporations.

### **5.2. DESCRIPTION OF AVAILABLE ANTENNAS**

The radio utilizes an internal antenna, with a maximum gain of -2.9dBi

### **5.3. SOFTWARE AND FIRMWARE**

N/A

### **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 case is X position with slide-out without AC/DC adapter.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC Adapter	KDDI	0203PQA	HS-XLA	N/A

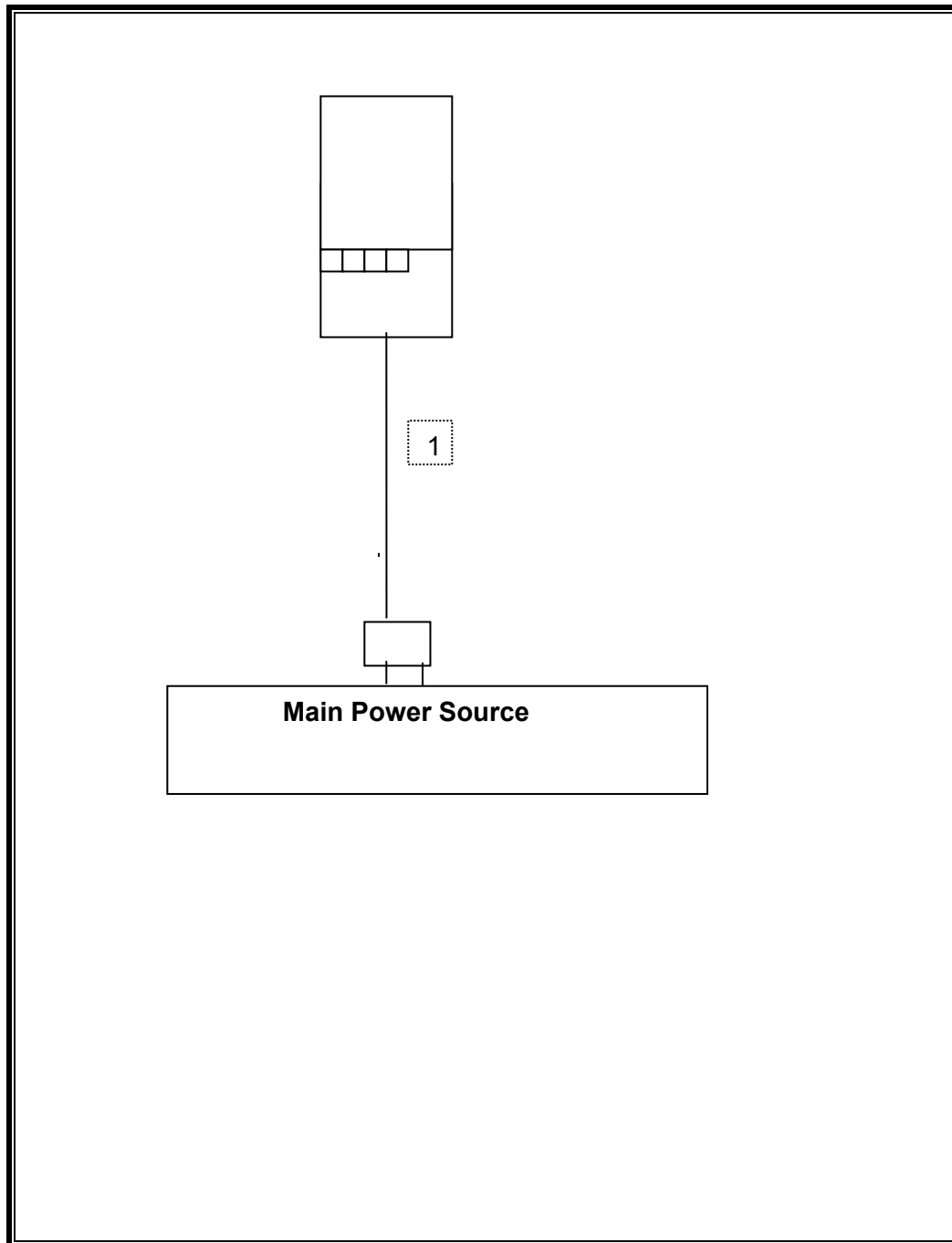
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC Input	1	DC	Un-Shielded	2.0 m	N/A

### TEST SETUP

The EUT is a stand alone for above 1GHz radiated emission, and with AC/DC adapter for below 1GHz radiated emissions, also AC Line Conduction 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, 44 GHz	Agilent / HP	E4446A	C01069	10/08/10
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	08/05/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	12/16/10
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/11
Antenna, Horn, 18 GHz	EMCO	3115	C00945	01/29/11
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/29/10
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRM50702	N02685	CNR

## 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, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

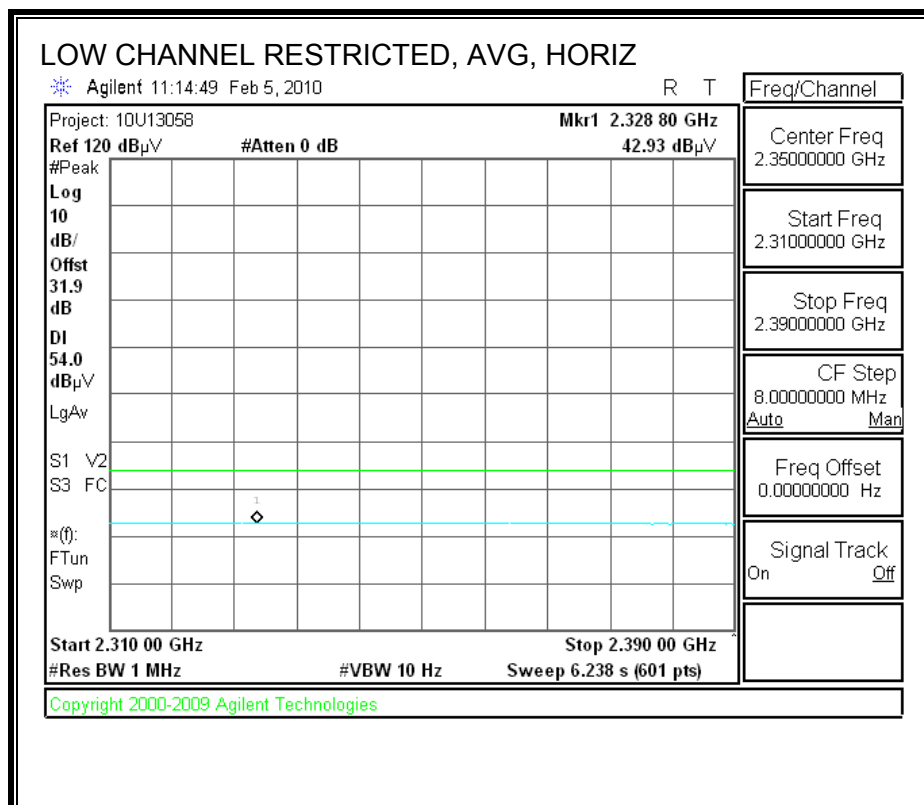
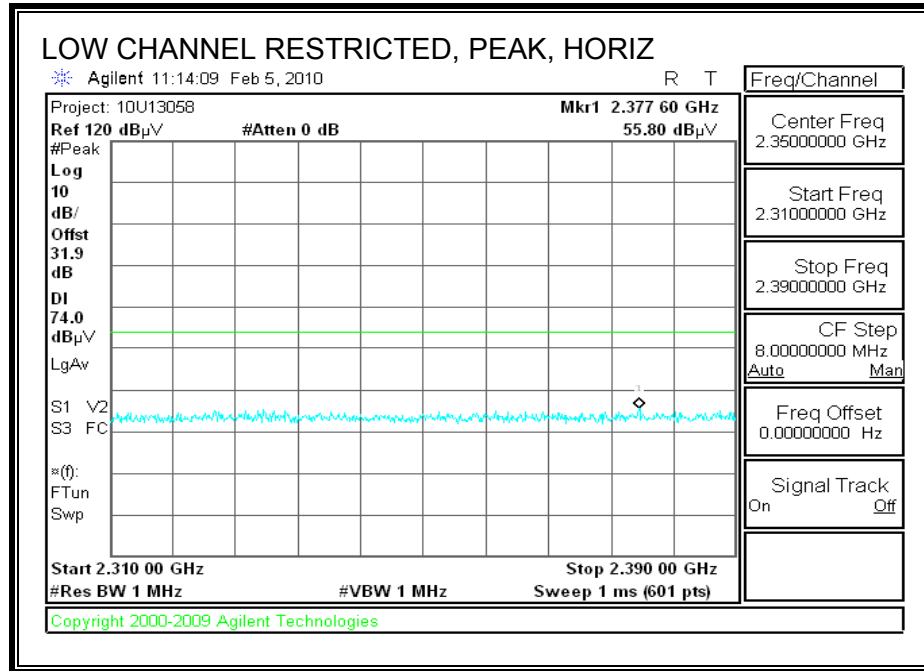
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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.

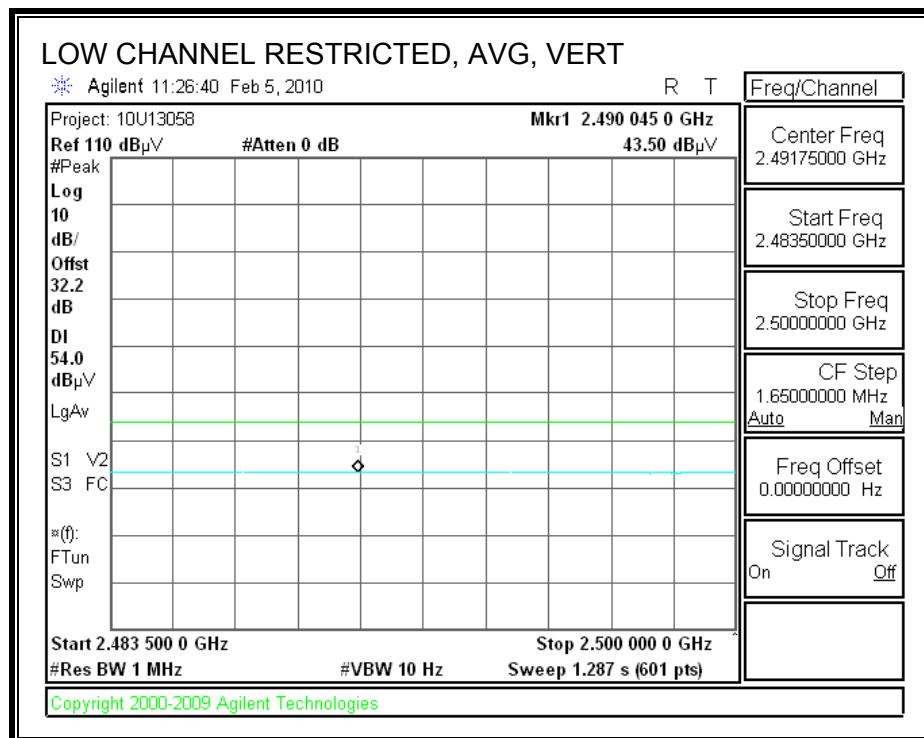
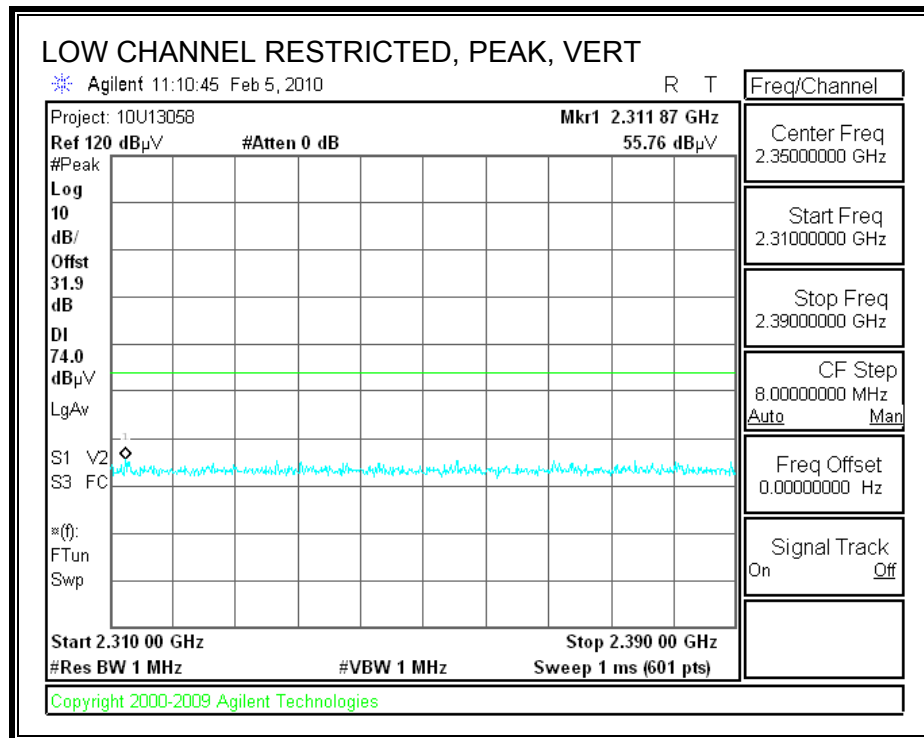
## 7.2. TRANSMITTER ABOVE 1 GHz

### 7.2.1. BASIC DATA RATE GFSK MODULATION

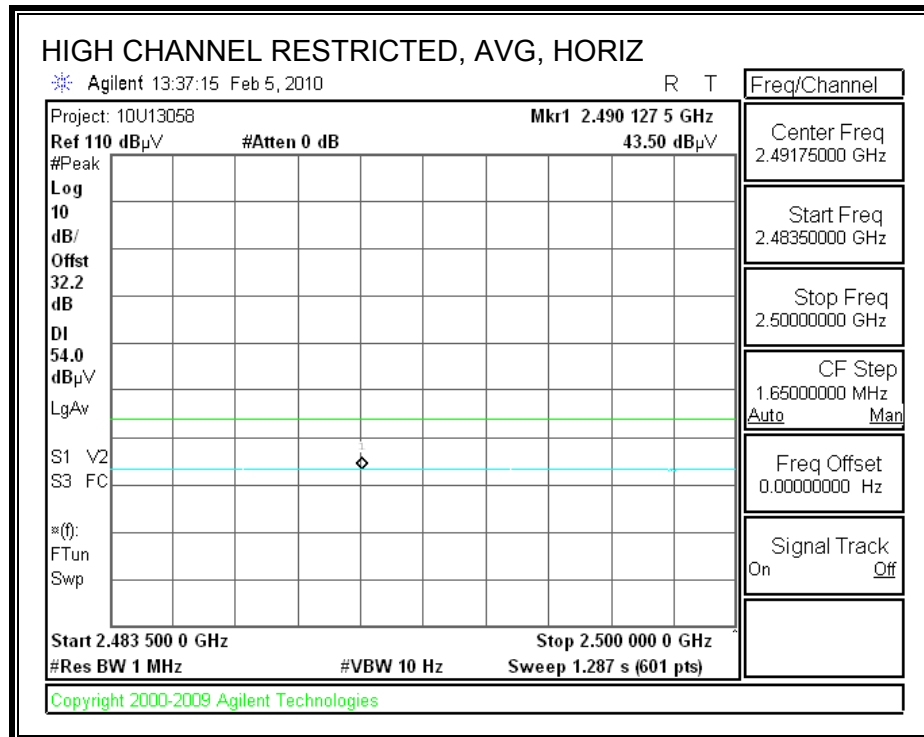
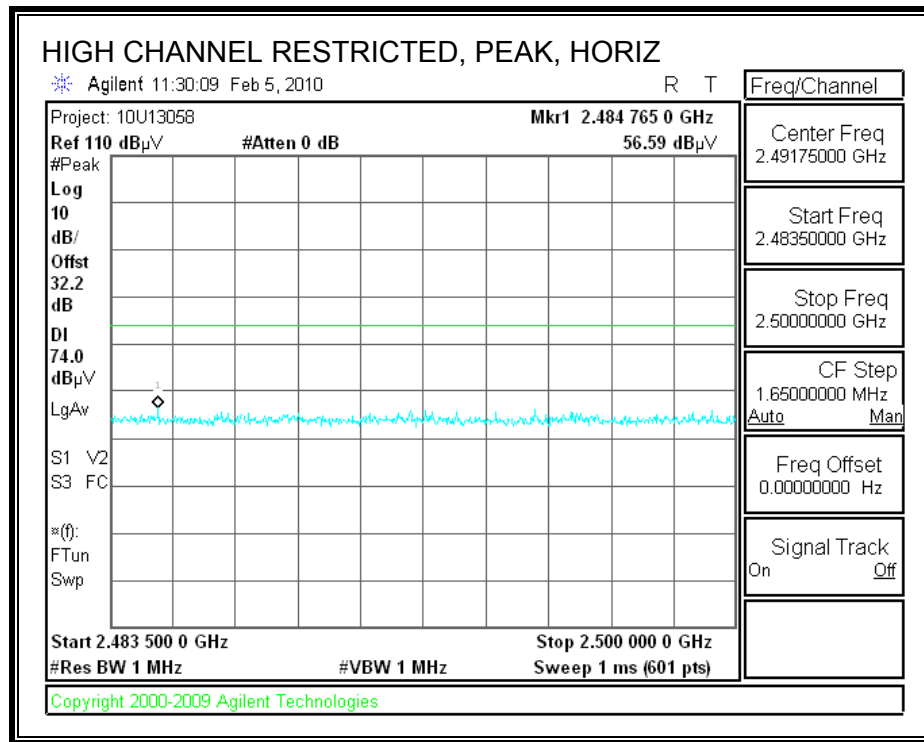
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



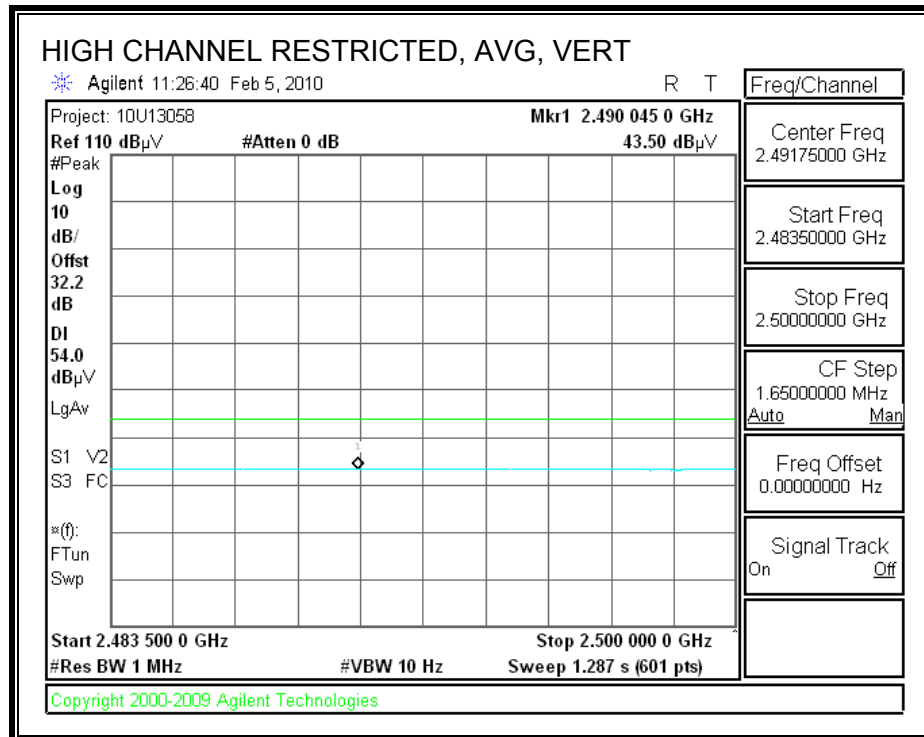
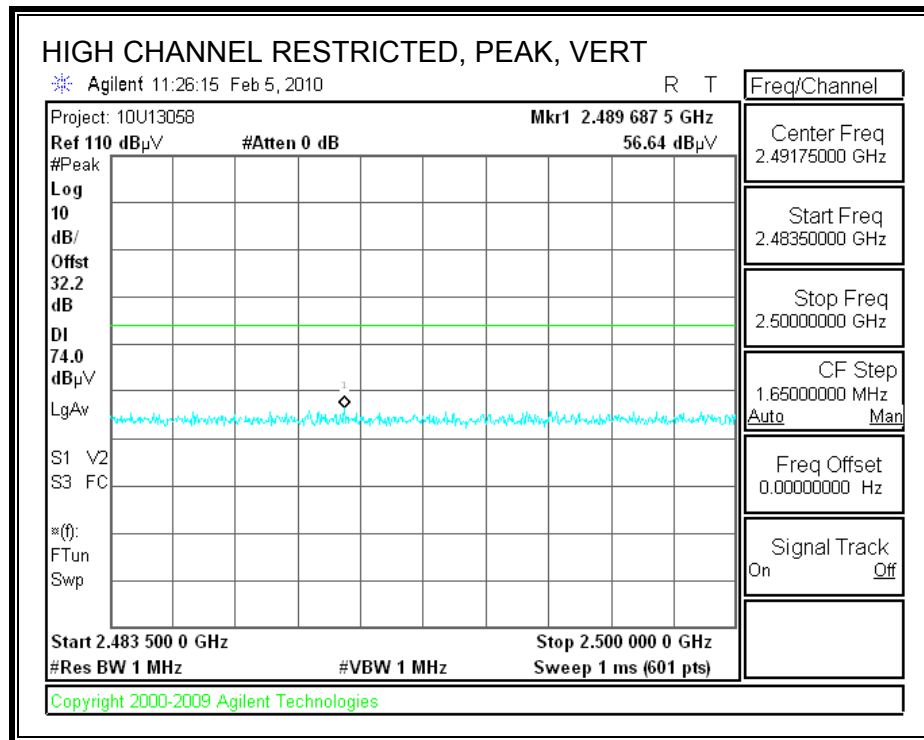
**RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)**



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



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



## HARMONICS AND SPURIOUS EMISSIONS

### High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber

Test Engr: Thanh Nguyen  
Date: 02/05/10  
Project #: 10U13058  
Company: Kyocera  
EUT Description: Single band CDMA with Bluetooth + EDR  
EUT M/N: SA002  
Test Target: FCC Part 15.247 BT  
Mode Oper: Transmit GFSK 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

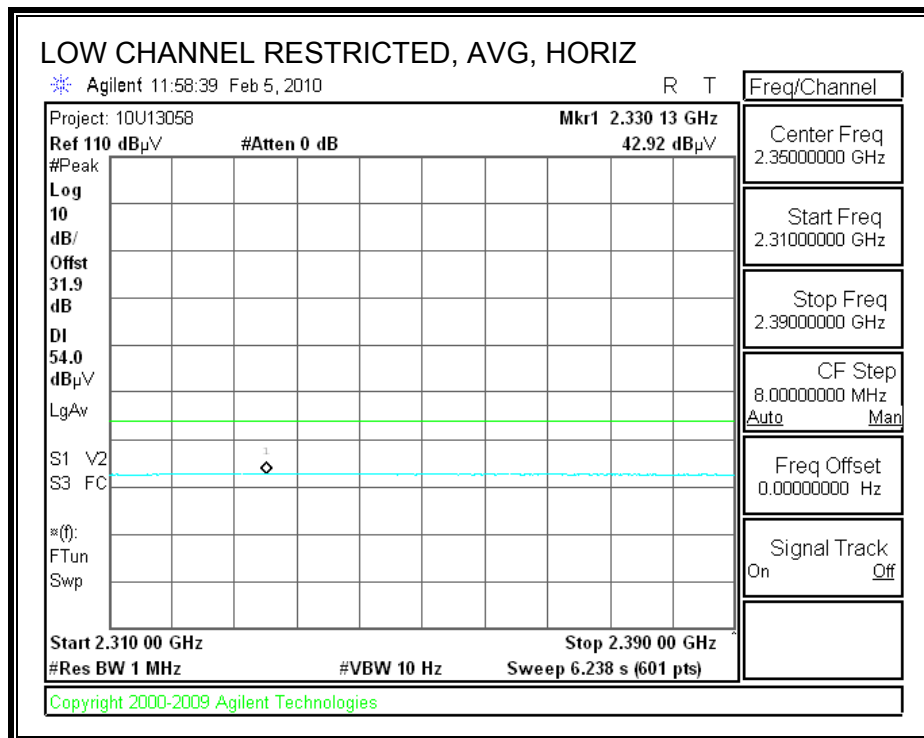
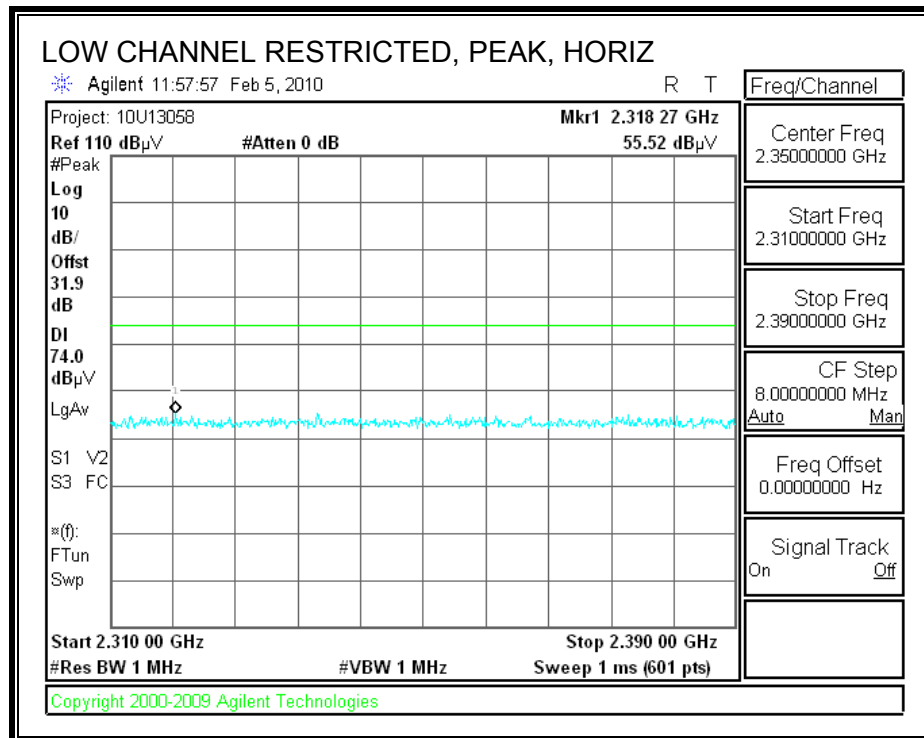
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol V/H	Det. P/A/QP	Ant. High cm	Table Angle Degree	Notes
<b>Low channel</b>															
4.804	3.0	37.1	32.7	5.8	-34.8	0.0	0.0	40.7	74.0	-33.3	V	P	99.0	215.0	
4.804	3.0	27.5	32.7	5.8	-34.8	0.0	0.0	31.1	54.0	-22.9	V	A	99.0	215.0	
7.206	3.0	31.2	35.4	7.2	-34.2	0.0	0.0	39.6	74.0	-34.4	V	P	100.0	9.0	Noise floor
7.206	3.0	19.6	35.4	7.2	-34.2	0.0	0.0	28.1	54.0	-25.9	V	A	100.0	9.0	Noise floor
4.804	3.0	32.1	32.7	5.8	-34.8	0.0	0.0	35.7	74.0	-38.3	H	P	100.0	146.0	
4.804	3.0	21.3	32.7	5.8	-34.8	0.0	0.0	24.9	54.0	-29.1	H	A	100.0	146.0	
7.206	3.0	31.4	35.4	7.2	-34.2	0.0	0.0	39.8	74.0	-34.2	H	P	100.0	192.0	Noise floor
7.206	3.0	19.6	35.4	7.2	-34.2	0.0	0.0	28.0	54.0	-26.0	H	A	100.0	192.0	Noise floor
<b>Mid channel</b>															
4.882	3.0	36.8	32.7	5.8	-34.8	0.0	0.0	40.6	74.0	-33.4	V	P	100.0	354.0	
4.882	3.0	27.5	32.7	5.8	-34.8	0.0	0.0	31.2	54.0	-22.8	V	A	100.0	354.0	
7.323	3.0	31.7	35.5	7.3	-34.1	0.0	0.0	40.4	74.0	-33.6	V	P	100.0	49.0	Noise floor
7.323	3.0	19.6	35.5	7.3	-34.1	0.0	0.0	28.2	54.0	-25.8	V	A	100.0	49.0	Noise floor
4.882	3.0	32.7	32.7	5.8	-34.8	0.0	0.0	36.4	74.0	-37.6	H	P	99.0	145.0	
4.882	3.0	21.3	32.7	5.8	-34.8	0.0	0.0	25.1	54.0	-28.9	H	A	99.0	145.0	
7.323	3.0	31.6	35.5	7.3	-34.1	0.0	0.0	40.2	74.0	-33.8	H	P	100.0	315.0	Noise floor
7.323	3.0	19.5	35.5	7.3	-34.1	0.0	0.0	28.2	54.0	-25.8	H	A	100.0	315.0	Noise floor
<b>High Channel</b>															
4.960	3.0	35.7	32.8	5.9	-34.8	0.0	0.0	39.6	74.0	-34.4	V	P	100.0	347.0	
4.960	3.0	26.1	32.8	5.9	-34.8	0.0	0.0	30.0	54.0	-24.0	V	A	100.0	347.0	
7.440	3.0	31.7	35.6	7.3	-34.1	0.0	0.0	40.6	74.0	-33.4	V	P	100.0	90.0	Noise floor
7.440	3.0	19.3	35.6	7.3	-34.1	0.0	0.0	28.2	54.0	-25.8	V	A	100.0	90.0	Noise floor
4.960	3.0	31.7	32.8	5.9	-34.8	0.0	0.0	35.6	74.0	-38.4	H	P	100.0	193.0	
4.960	3.0	20.0	32.8	5.9	-34.8	0.0	0.0	23.8	54.0	-30.2	H	A	100.0	193.0	
7.440	3.0	31.8	35.6	7.3	-34.1	0.0	0.0	40.7	74.0	-33.3	H	P	161.0	87.0	Noise floor
7.440	3.0	19.8	35.6	7.3	-34.1	0.0	0.0	28.7	54.0	-25.3	H	A	161.0	87.0	Noise floor

Rev. 4.1.2.7

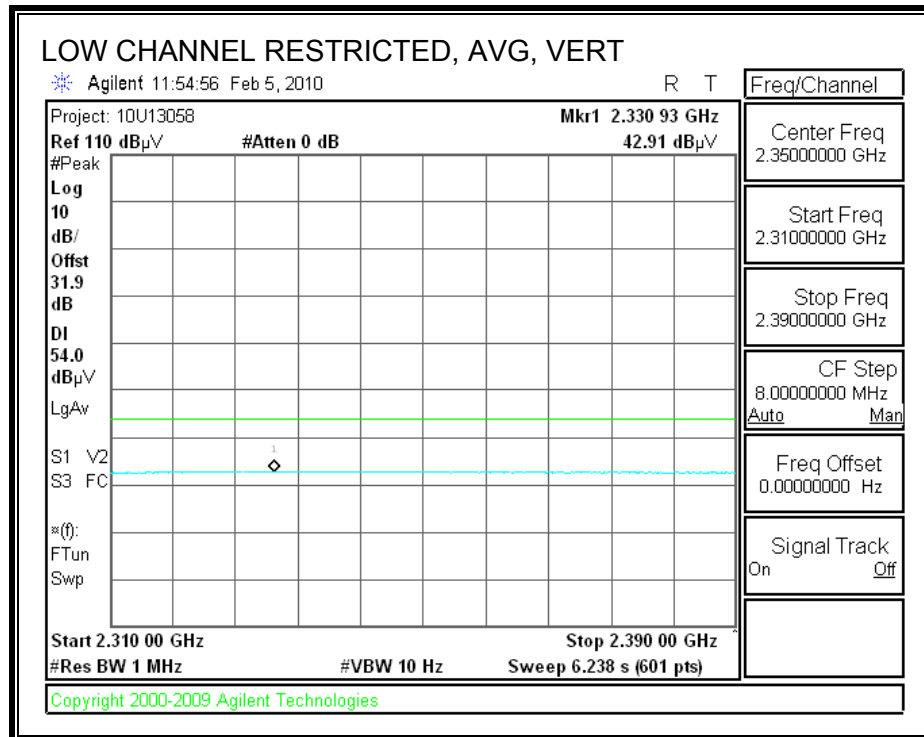
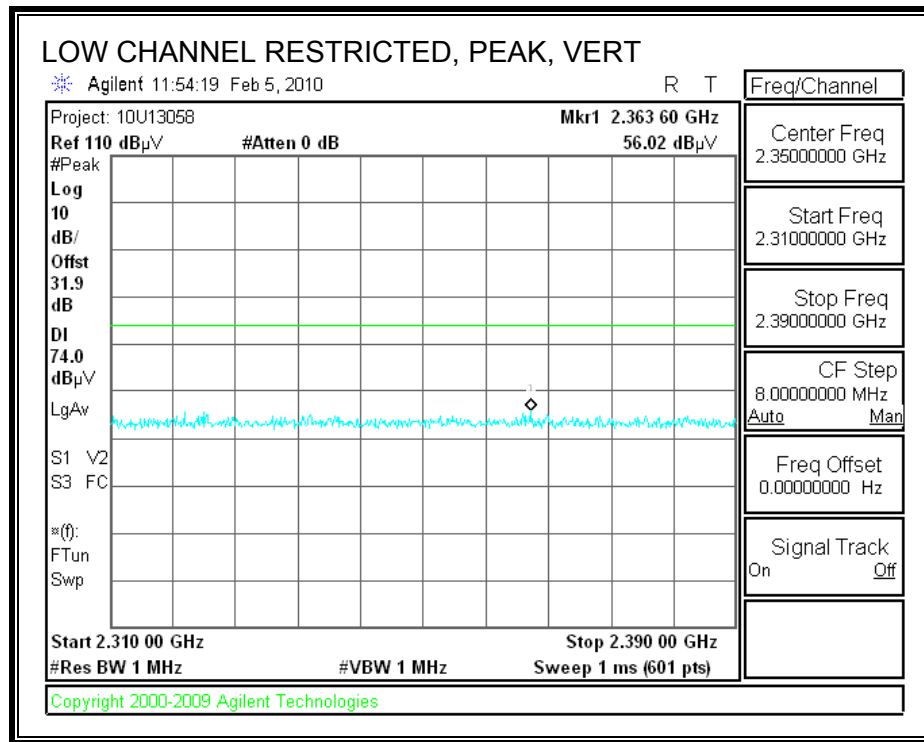
Note: No other emissions were detected above the system noise floor.

## 7.2.2. ENHANCED DATA RATE 8PSK MODULATION

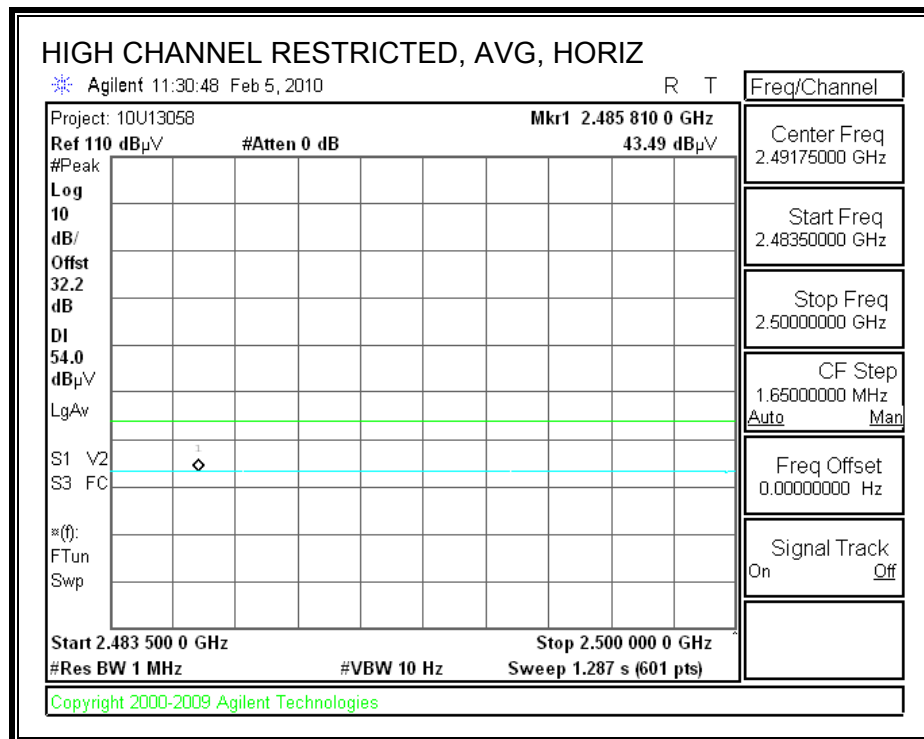
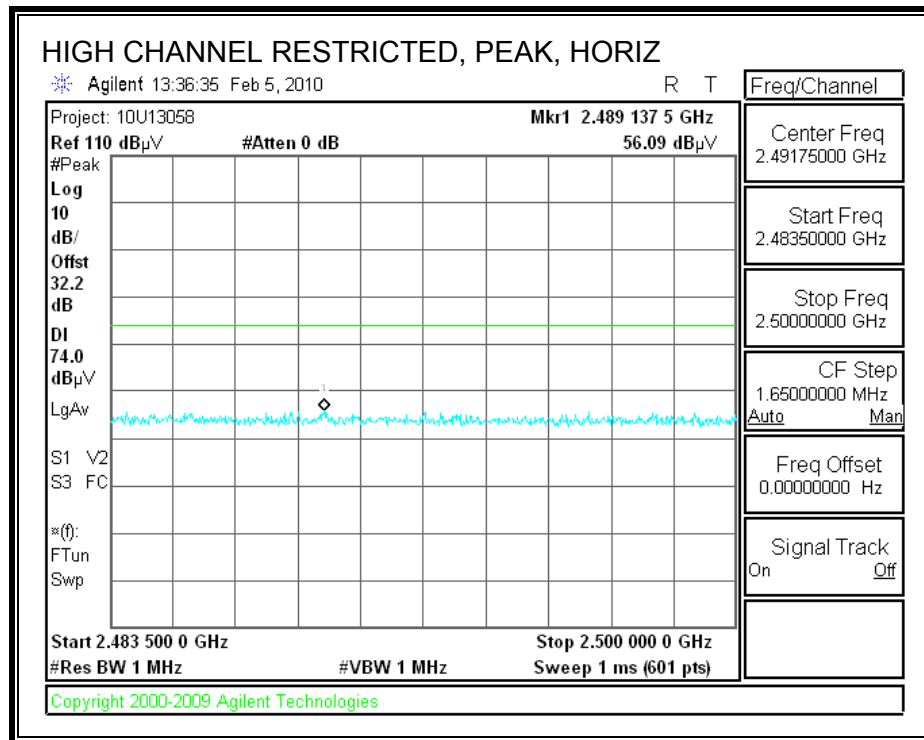
### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



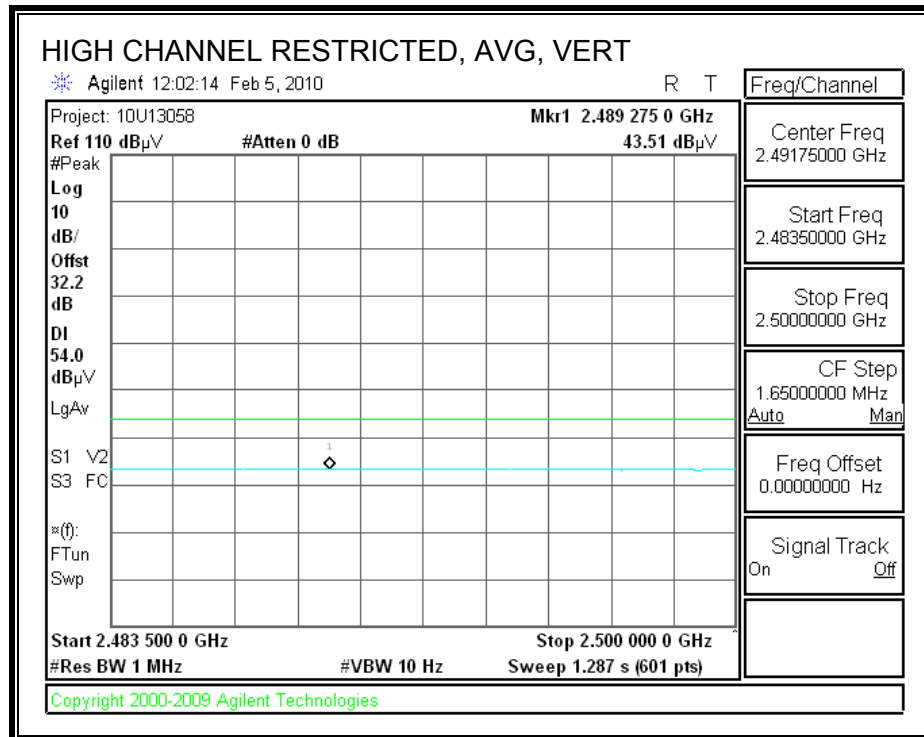
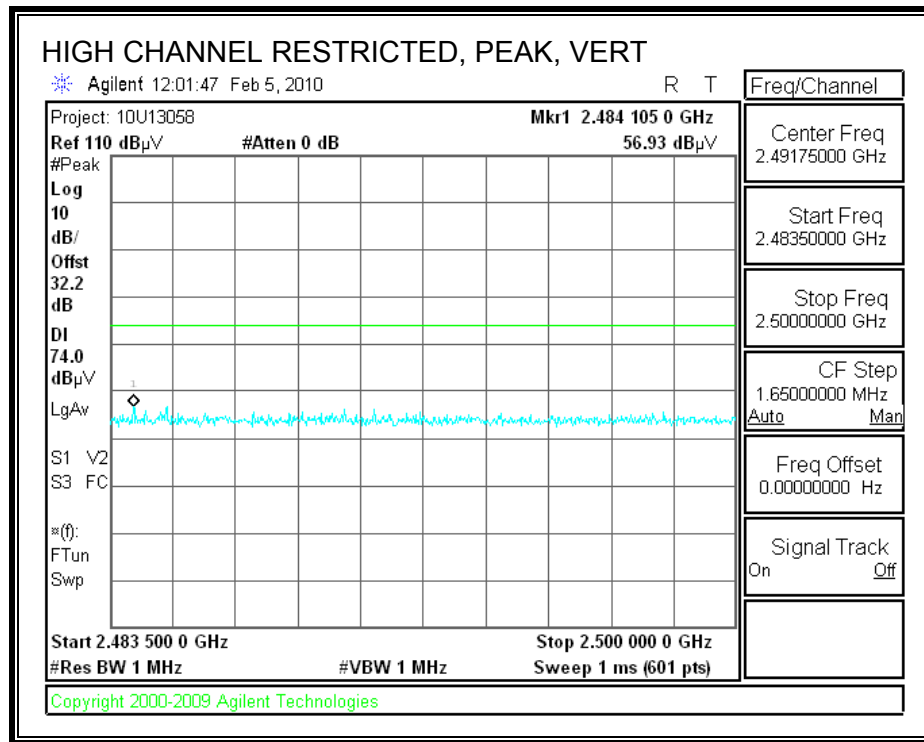
**RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)**



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



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



## HARMONICS AND SPURIOUS EMISSIONS

### High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber

Test Engr: Thanh Nguyen  
Date: 02/05/10  
Project #: 10U13058  
Company: Kyocera  
EUT Description: Single band CDMA with Bluetooth + EDR  
EUT M/N: SA002  
Test Target: FCC Part 15.247 BT  
Mode Oper: Transmit 8PSK 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	Filt dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol V/H	Det. P/A/QP	Ant. High cm	Table Angle Degree	Notes
<b>Harmonics Spurious</b>															
<b>Low Channel</b>															
4.804	3.0	35.6	32.7	5.8	-34.8	0.0	0.0	39.2	74.0	-34.8	V	P	99.0	34.0	
4.804	3.0	27.6	32.7	5.8	-34.8	0.0	0.0	31.2	54.0	-22.8	V	A	99.0	34.0	
7.206	3.0	32.5	35.4	7.2	-34.2	0.0	0.0	41.0	74.0	-33.0	V	P	100.0	232.0	Noise floor
7.206	3.0	19.6	35.4	7.2	-34.2	0.0	0.0	28.0	54.0	-26.0	V	A	100.0	232.0	Noise floor
4.804	3.0	32.0	32.7	5.8	-34.8	0.0	0.0	35.6	74.0	-38.4	H	P	100.0	77.0	
4.804	3.0	20.4	32.7	5.8	-34.8	0.0	0.0	24.0	54.0	-30.0	H	A	100.0	77.0	
7.206	3.0	32.7	35.4	7.2	-34.2	0.0	0.0	41.1	74.0	-32.9	H	P	100.0	60.0	Noise floor
7.206	3.0	19.7	35.4	7.2	-34.2	0.0	0.0	28.2	54.0	-25.8	H	A	100.0	60.0	Noise floor
<b>Mid Channel</b>															
4.882	3.0	34.3	32.7	5.8	-34.8	0.0	0.0	38.0	74.0	-36.0	V	P	100.0	149.0	
4.882	3.0	25.3	32.7	5.8	-34.8	0.0	0.0	29.1	54.0	-24.9	V	A	100.0	149.0	
7.323	3.0	33.2	35.5	7.3	-34.1	0.0	0.0	41.9	74.0	-32.1	V	P	188.0	335.0	Noise floor
7.323	3.0	20.5	35.5	7.3	-34.1	0.0	0.0	29.2	54.0	-24.8	V	A	188.0	335.0	Noise floor
4.882	3.0	33.4	32.7	5.8	-34.8	0.0	0.0	37.2	74.0	-36.8	H	P	186.0	165.0	
4.882	3.0	21.0	32.7	5.8	-34.8	0.0	0.0	24.8	54.0	-29.2	H	A	186.0	165.0	
7.323	3.0	33.1	35.5	7.3	-34.1	0.0	0.0	41.7	74.0	-32.3	H	P	180.0	321.0	Noise floor
7.323	3.0	20.4	35.5	7.3	-34.1	0.0	0.0	29.1	54.0	-24.9	H	A	180.0	321.0	Noise floor
<b>High Channel</b>															
4.960	3.0	34.5	32.8	5.9	-34.8	0.0	0.0	38.4	74.0	-35.6	V	P	99.0	101.0	
4.960	3.0	25.2	32.8	5.9	-34.8	0.0	0.0	29.1	54.0	-24.9	V	A	99.0	101.0	
7.440	3.0	32.6	35.6	7.3	-34.1	0.0	0.0	41.5	74.0	-32.5	V	P	100.0	139.0	Noise floor
7.440	3.0	19.6	35.6	7.3	-34.1	0.0	0.0	28.5	54.0	-25.5	V	A	100.0	139.0	Noise floor
4.960	3.0	32.5	32.8	5.9	-34.8	0.0	0.0	36.4	74.0	-37.6	H	P	100.0	320.0	
4.960	3.0	21.2	32.8	5.9	-34.8	0.0	0.0	25.1	54.0	-28.9	H	A	100.0	320.0	
7.440	3.0	32.8	35.6	7.3	-34.1	0.0	0.0	41.7	74.0	-32.3	H	P	196.0	94.0	Noise floor
7.440	3.0	20.8	35.6	7.3	-34.1	0.0	0.0	29.7	54.0	-24.3	H	A	196.0	94.0	Noise floor

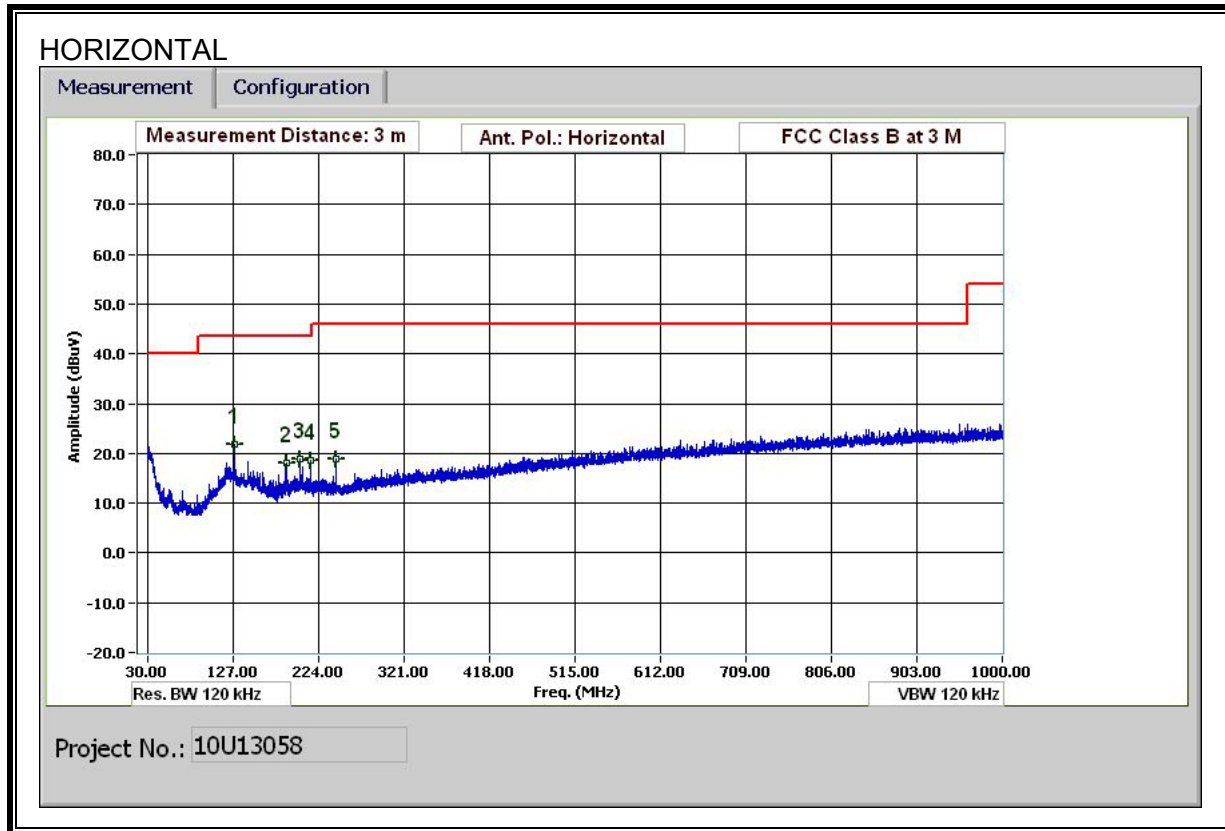
Rev. 4.1.2.7

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

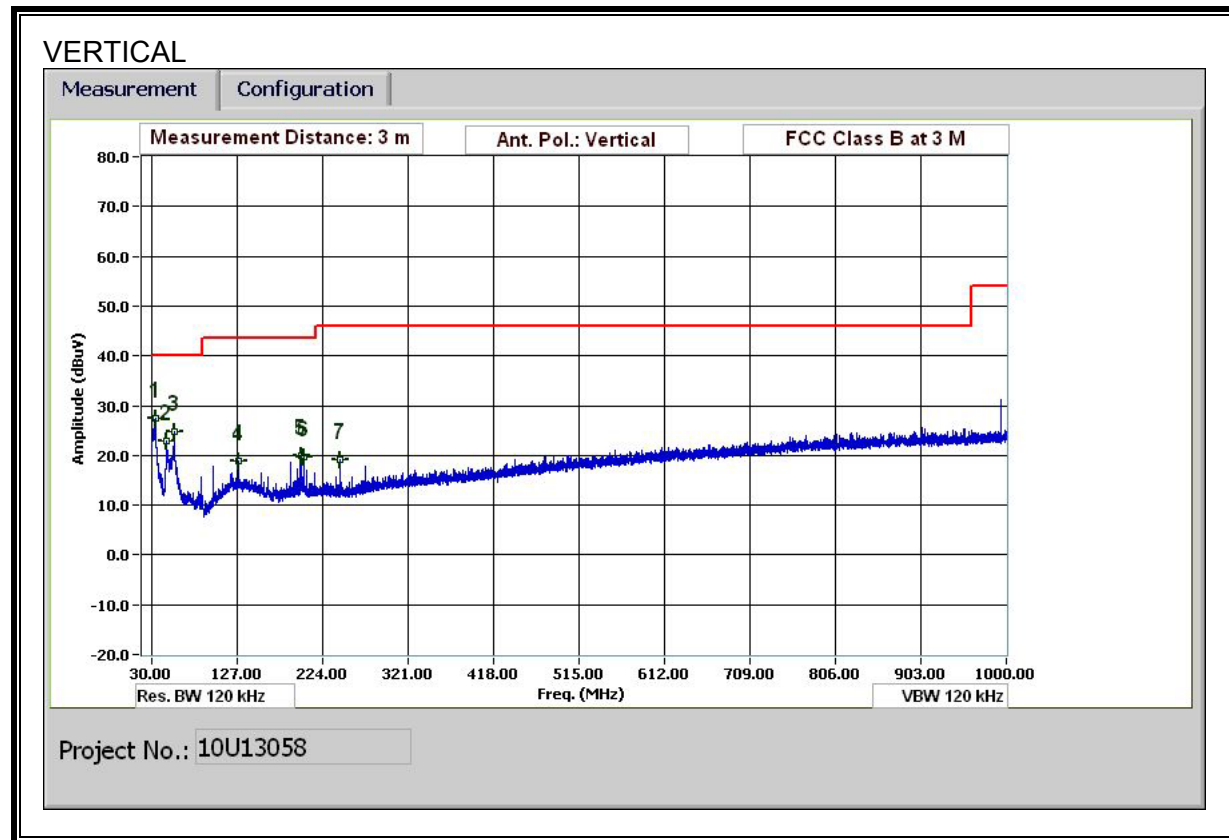
### 7.3. WORST-CASE BELOW 1 GHz

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

##### PLOTS



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





## 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.

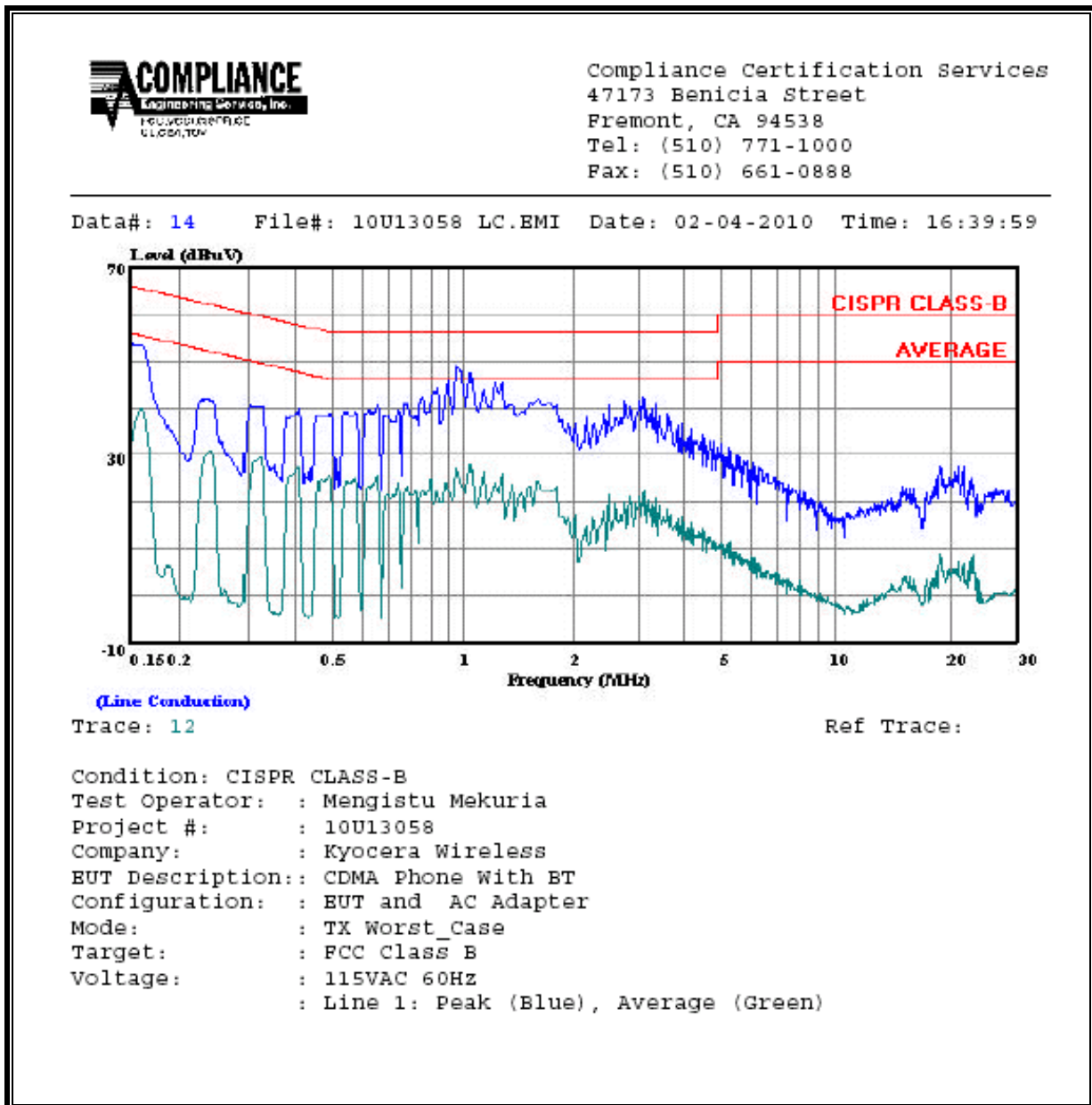
Line conducted data is recorded for both NEUTRAL and HOT lines.

### RESULTS

**6 WORST EMISSIONS (EUT WITH AC ADAPTER)**

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCC B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
1.00	45.72	--	23.98	0.00	56.00	46.00	-10.28	-22.02	L1
1.05	48.81	--	27.12	0.00	56.00	46.00	-7.19	-18.88	L1
1.14	47.55	--	27.98	0.00	56.00	46.00	-8.45	-18.02	L1
0.99	48.05	--	22.92	0.00	56.00	46.00	-7.95	-23.08	L2
1.14	49.15	--	24.97	0.00	56.00	46.00	-6.85	-21.03	L2
1.40	46.71	--	24.30	0.00	56.00	46.00	-9.29	-21.70	L2
6 Worst Data									

**LINE 1 RESULTS**

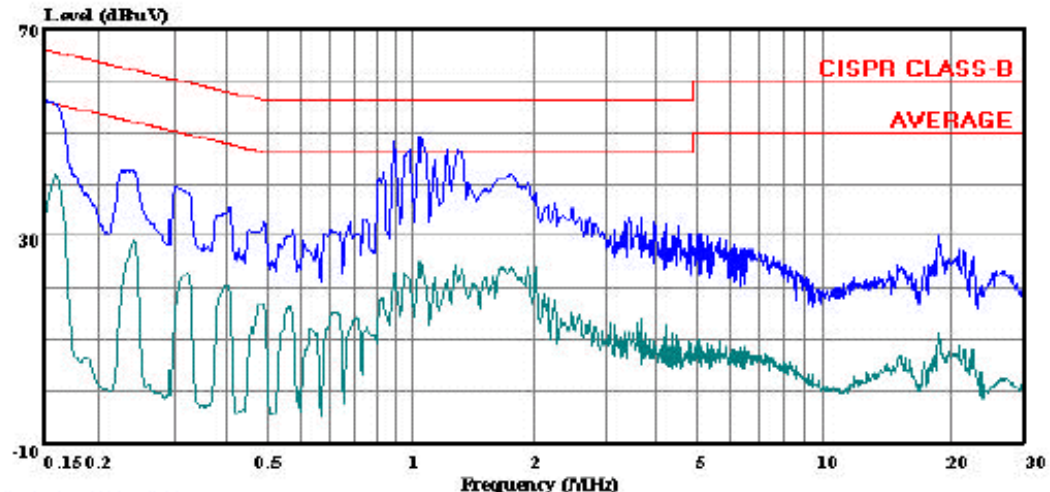


**LINE 2 RESULTS**



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

Data#: 7 File#: 10U13058 LC.EMI Date: 02-04-2010 Time: 16:31:29



(Line Conduction)

Trace: 5

Ref Trace:

Condition: CISPR CLASS-B  
Test Operator: : Mengistu Mekuria  
Project #: : 10U13058  
Company: : Kyocera Wireless  
EUT Description: : CDMA Phone With BT  
Configuration: : EUT and AC Adapter  
Mode: : TX Worst\_Case  
Target: : FCC Class B  
Voltage: : 115VAC 60Hz  
Line 2: Peak (Blue), Average (Green)