



FCC CFR47 PART 15 SUBPART C

**BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT**

FOR

Tri Band CDMA Mobile Phone with WiFi/Bluetooth

MODEL NUMBER: C5215

FCC ID: V65C5215

REPORT NUMBER: 13U14946-2

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Prepared for
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NVLAP[®]

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	2013-04-15	Initial Issue	Joseph Danisi
Rev.1	2013-04-22	Remove Industry Canada rules	Joseph Danisi

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: Tri Band CDMA Mobile Phone with WiFi/Bluetooth

MODEL: C5215

DATE TESTED: 2013-03-29 to 2013-04-04

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

UL LLC 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 LLC 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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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 LLC By:

Tested By:



Name: Bob DeLisi
Title: WiSE Principal Engineer
UL LLC

Name: Joseph Danisi
Title: WiSE Project Lead
UL LLC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 2004, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/1002550.htm>.

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	± 3.3 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.00 dB
Radiated Emissions, >1GHz	±5.44, k=2

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 Tri Band CDMA Mobile Phone with WiFi/Bluetooth phone that is manufactured by Kyocera.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a dipole (internal) antenna, with a maximum gain of -1.0 dBi.

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was FCC Test Application version 0.110CR

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

5.1. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

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

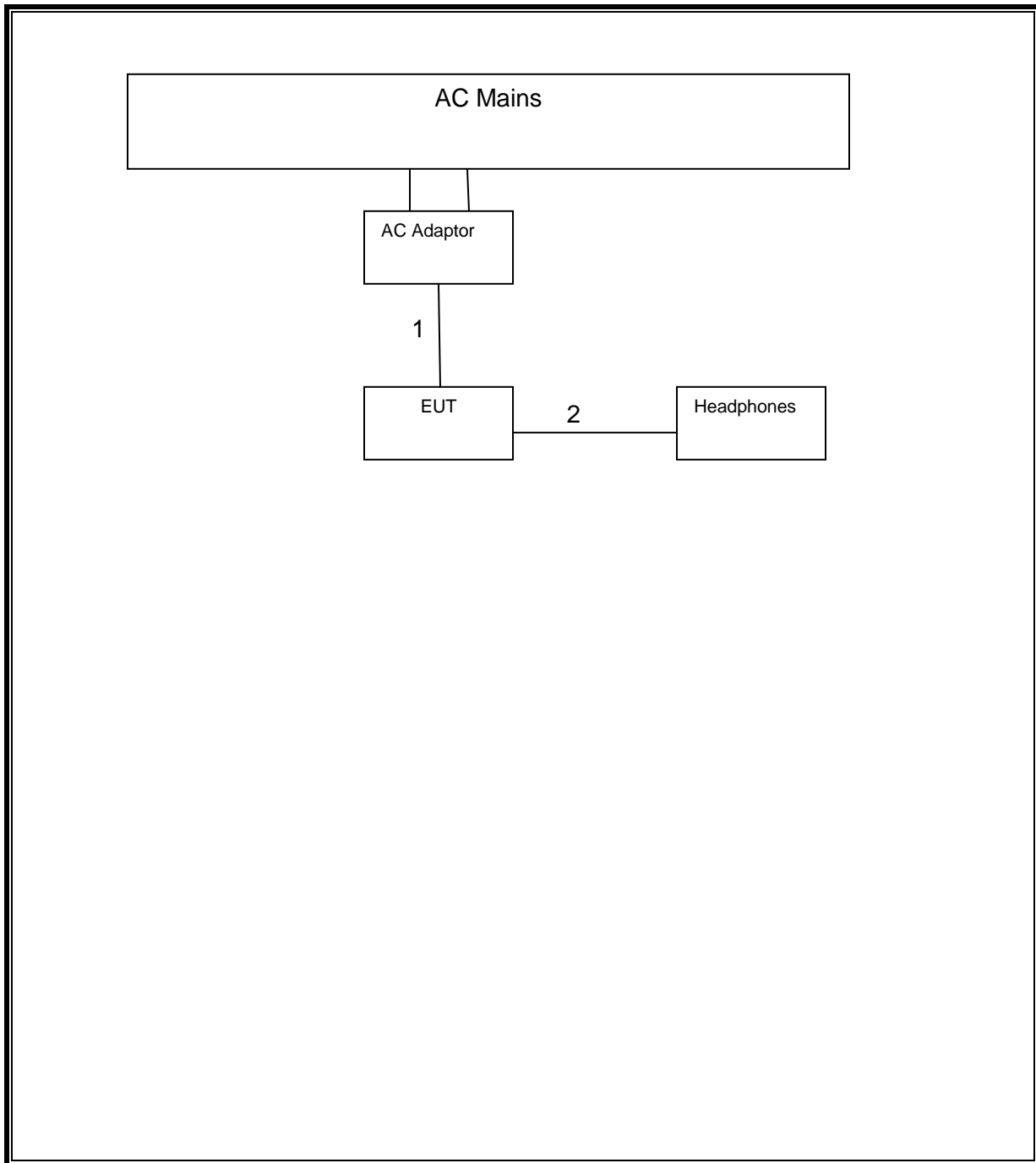
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	Mic	1	Earphone	Unsheilded	1.5m	N/A

TEST SETUP

The EUT is set up to transmit continuously

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2013-01-29	2014-01-31
Log-P Antenna	Schaffner	UPA6109	44068	2013-04-03	2014-04-03
Bicon Antenna	Schaffner	VBA6106A	54	2013-04-03	2014-04-03
Bias Tee	Miteq	AM-1523-7687	44392	N/A	N/A
Bias Tee	Miteq	AM-1523-7687	44393	N/A	N/A
Preamp	Miteq	AM-3A-000110-7687	44391	N/A	N/A
Preamp	Miteq	AM-3A-000110-7687	44394	N/A	N/A
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Multimeter	Fluke	83III	ME5B-305	N/A	N/A
Above 1GHz (Band Optimized System)					
EMI Receiver	Rohde & Schwarz	ESIB40	34968		
Horn Antenna (1-2 GHz)	ETS	3161-01 (26°)**	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02 (22°)**	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03 (22°)**	48106	2007-09-27	See * below
Horn Antenna (8-12 GHz)	ETS	3160-07 (26°)**	8933	2008-11-24	See * below
Horn Antenna (12-18 GHz)	ETS	3160-08 (26°)**	8932	2007-09-27	See * below
Horn Antenna (18-26.5 GHz)	ETS	3160-09 (27°)**	8947	2007-09-26	See * below
Horn Antenna (26.5-40 GHz)	ETS	3160-10 (27°)**	73004	2007-09-26	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-03-13	2014-03-13
Multimeter	Fluke	83V	43443	2013-01-28	2014-01-31

Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
<p>* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration.</p> <p>Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than $2D^2/\lambda$. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.</p> <p>** - Number in parentheses denotes antenna beam width.</p>					

Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESCI 7	75141	2013-01-30	2014-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2013-02-01	2014-02-28
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.5	44736	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-03-13	2014-03-13
Multimeter	Fluke	83V	43443	2013-01-28	2014-01-31

7. RADIATED TEST RESULTS

7.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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 10KHz for average measurements worst case.

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 spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable 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. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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

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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.

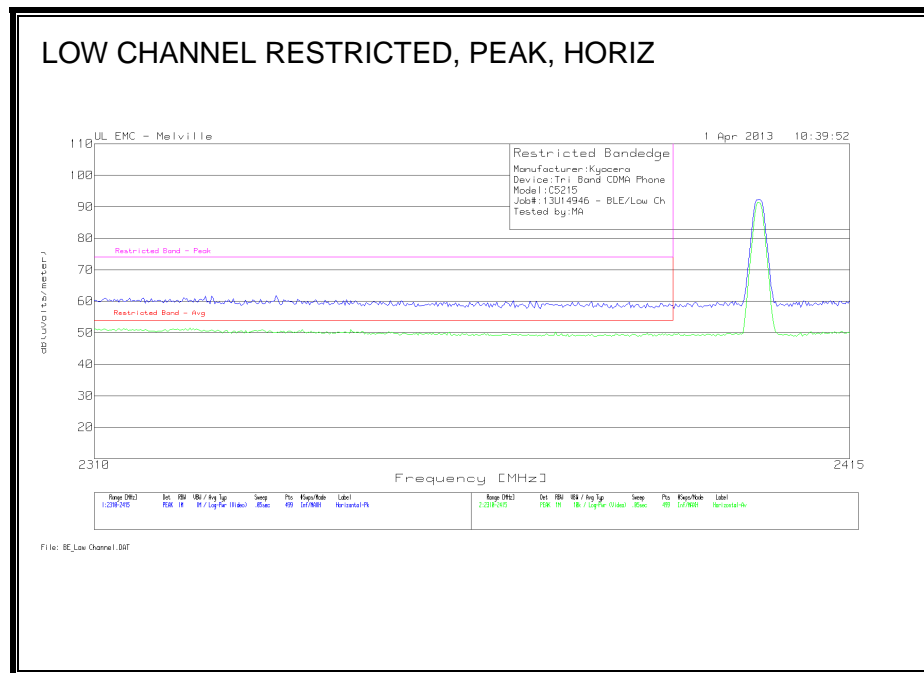
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

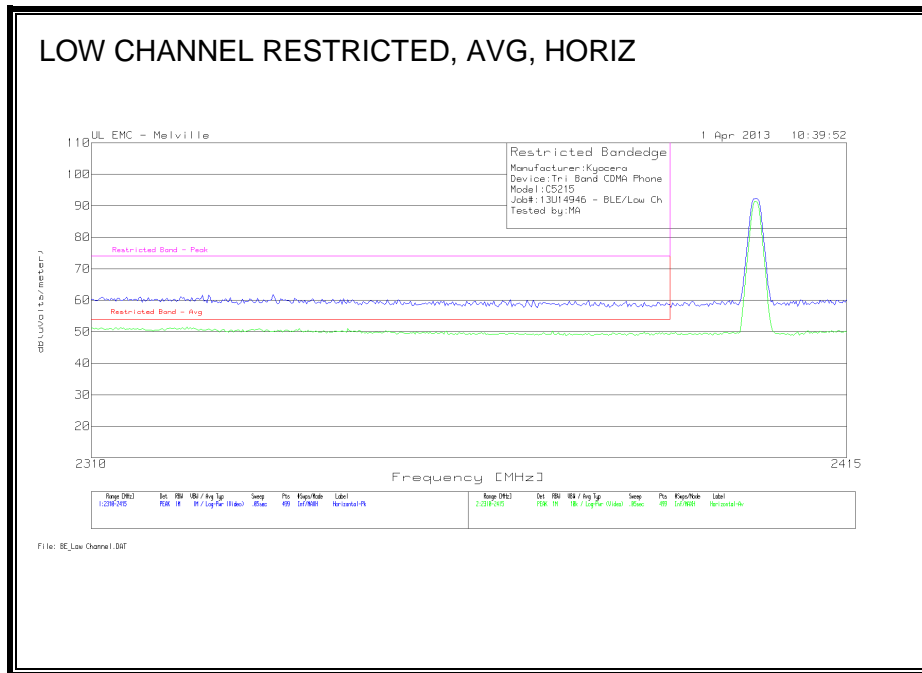
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2 TRANSMITTER ABOVE 1 GHz

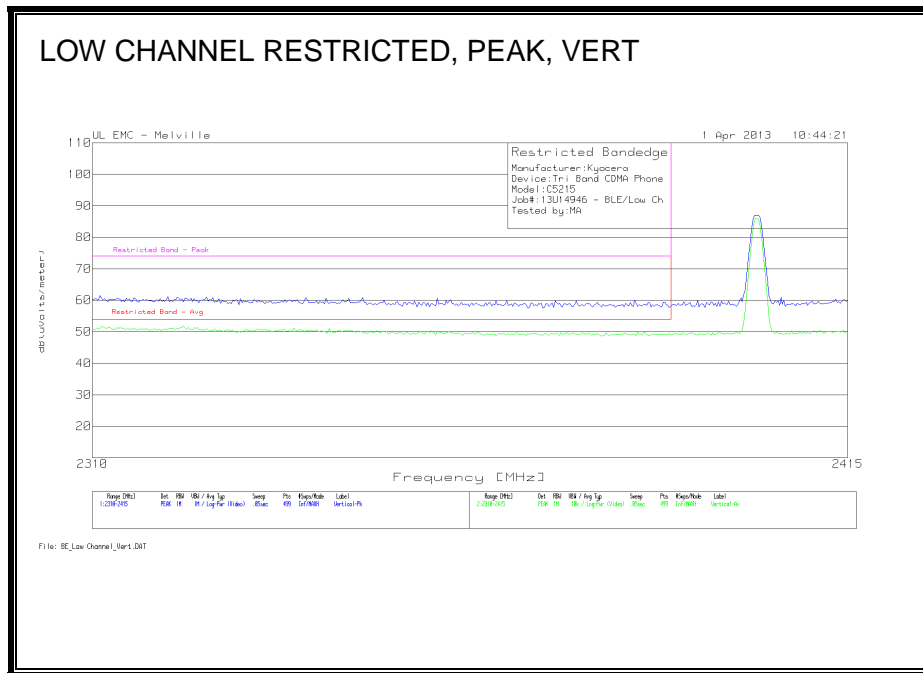
8.2.1 TX ABOVE 1 GHz FOR BLUETOOTH LOW ENERGY MODE IN THE 2.4 GHz BAND

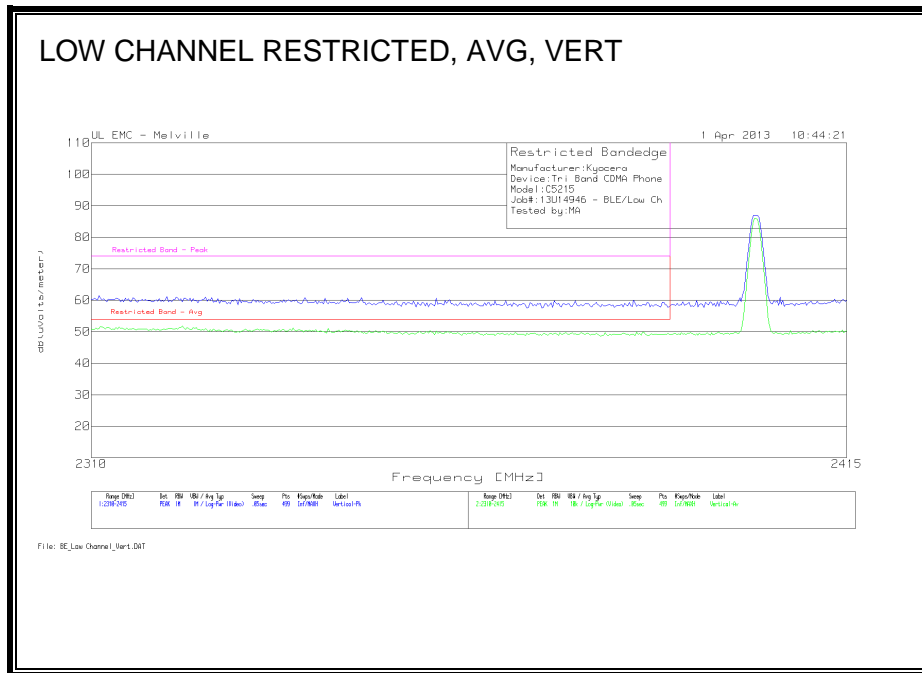
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



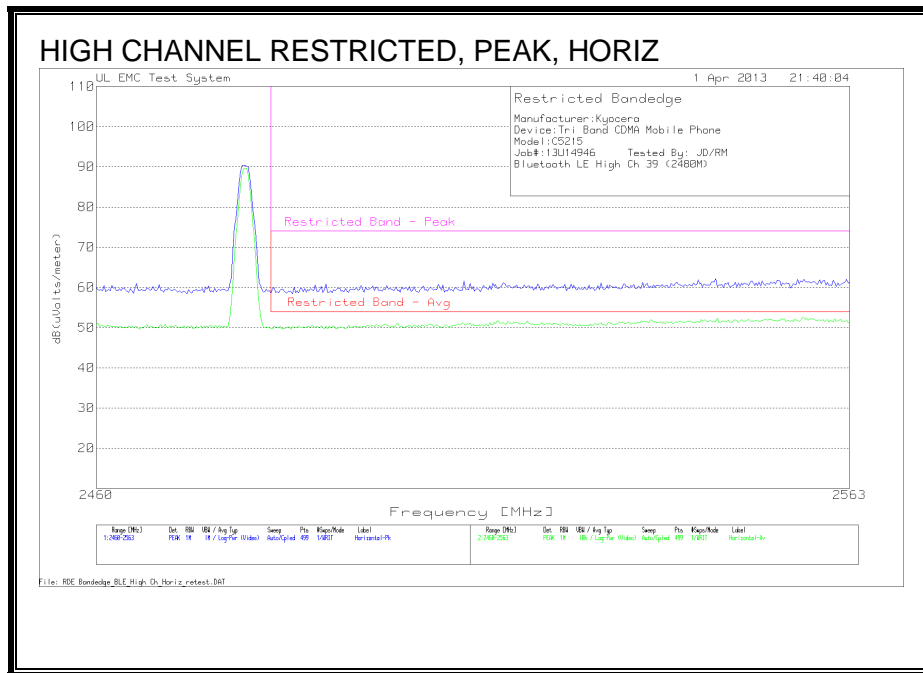


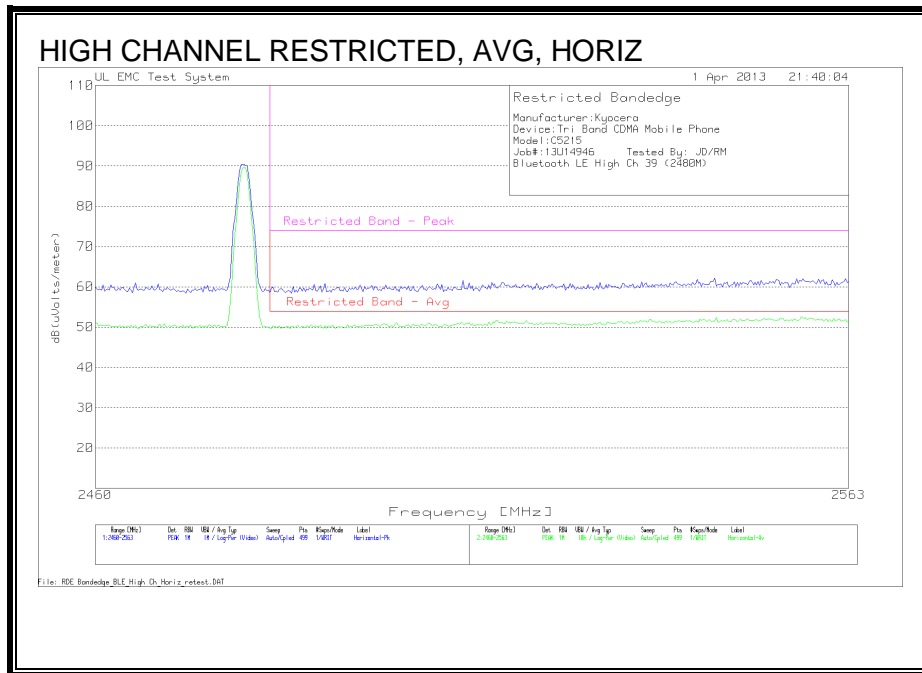
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



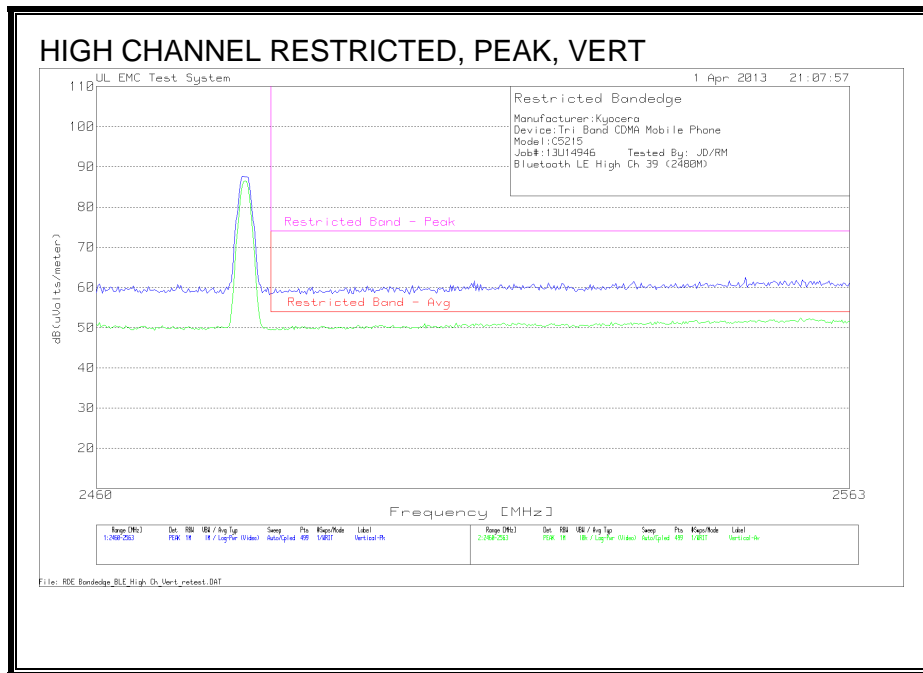


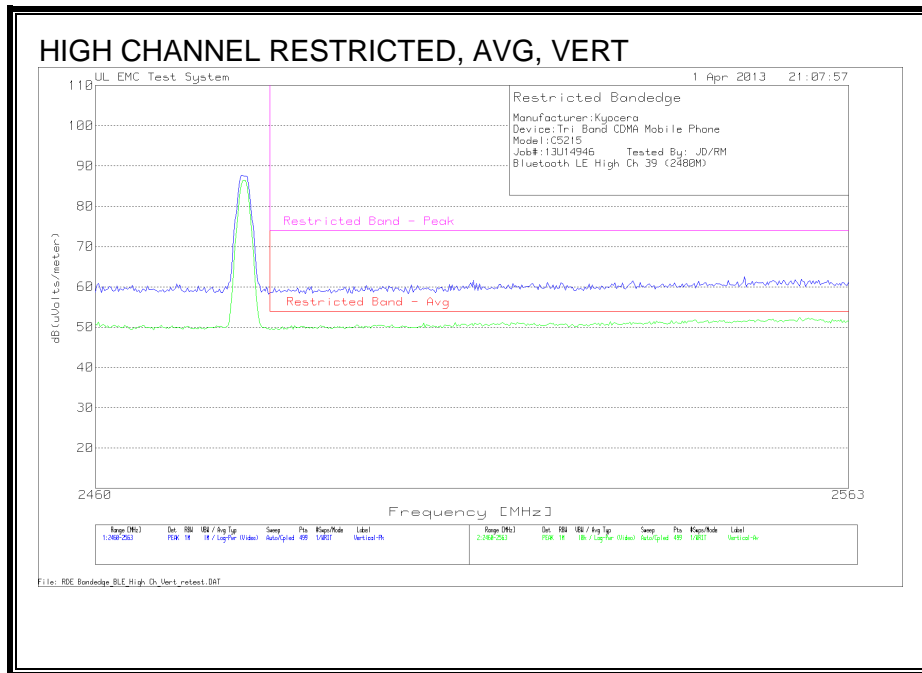
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



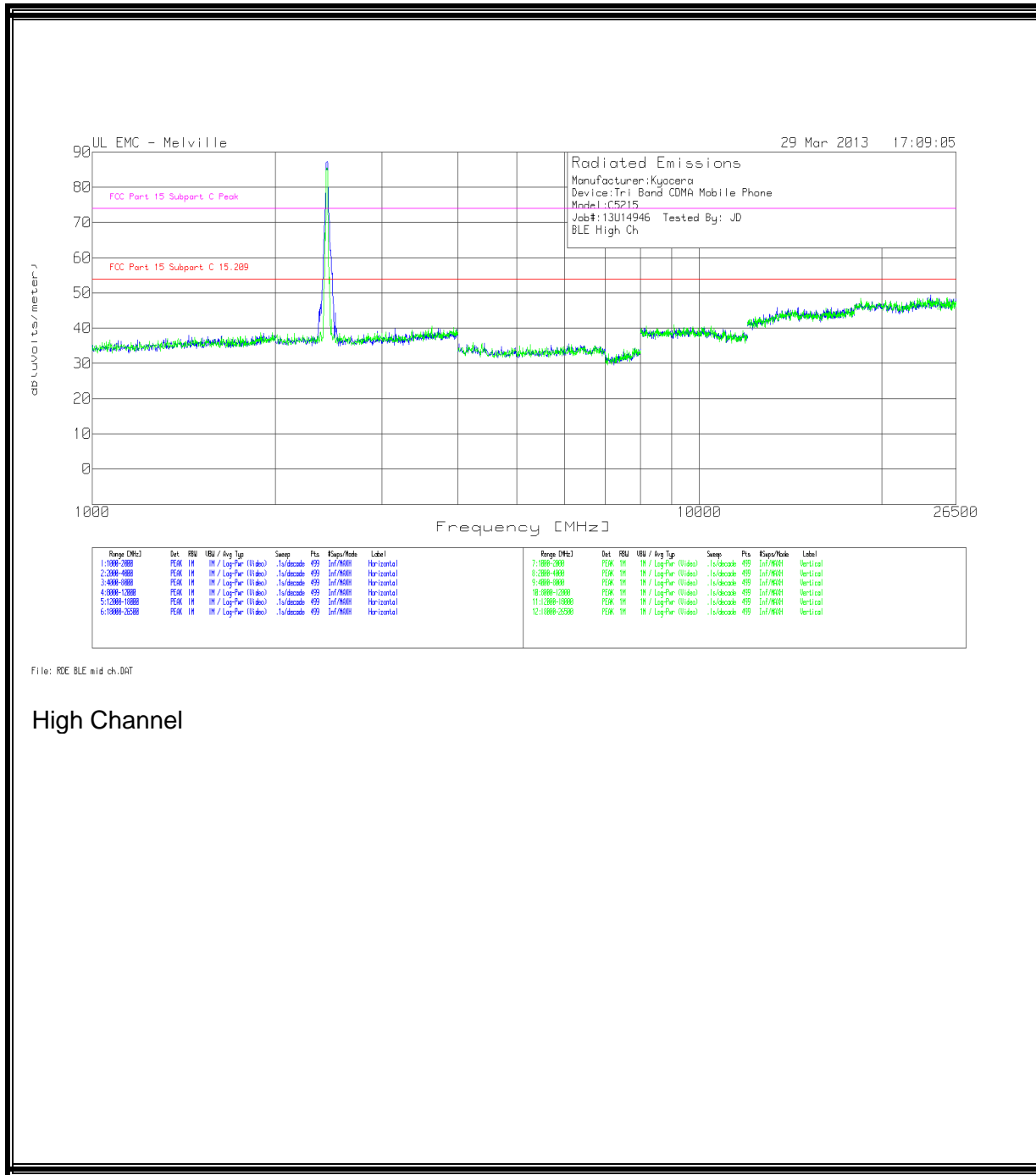


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

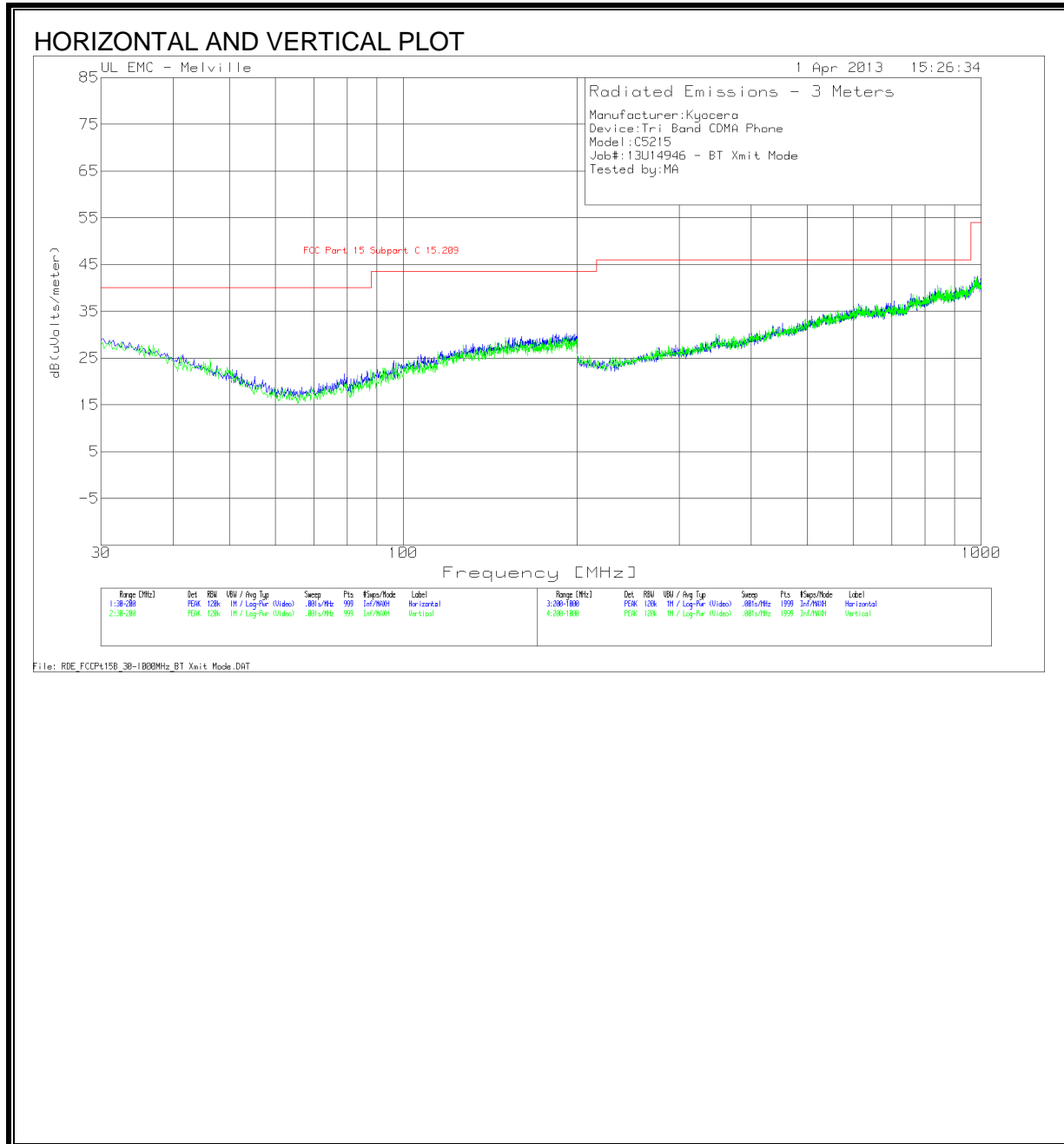


HORIZONTAL AND VERTICAL DATA

No emissions were detected within 6dB of the limit for low, mid, and high bands.

8.3 WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL AND VERTICAL PLOT)



HORIZONTAL AND VERTICAL DATA

Manufacturer: Kyocera
 Device: Tri Band CDMA Phone
 Model:C5215
 Job#:13U14946 - BT Xmit Mode
 Tested by: MA

Horizontal 30 - 200MHz

Marker No.	Test Frequency	Meter Reading	Detector	AF-43441 (dB/m)	GL-3M	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	32.7227	11.64	PK	16.8	0	28.44	40	-11.56	88	200	Horz
2	41.5716	12.15	PK	13.5	0.1	25.75	40	-14.25	1	100	Horz
3	190.6406	13.08	PK	15.7	0.9	29.68	43.5	-13.82	60	300	Horz

Horizontal 200 - 1000MHz

Marker No.	Test Frequency	Meter Reading	Detector	AF-44067 (dB/m)	GL-3M	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
4	706.2531	15.21	PK	20.2	1.8	37.21	46	-8.79	358	400	Horz
5	759.8799	14.19	PK	21.6	2	37.79	46	-8.21	15	200	Horz
6	983.5918	14.69	PK	24.6	2.2	41.49	54	-12.51	81	300	Horz
7	814.7074	15.02	PK	22.1	2.1	39.22	46	-6.78	9	400	Horz

Vertical 200 - 1000MHz

Marker No.	Test Frequency	Meter Reading	Detector	AF-44067 (dB/m)	GL-3M	dB(uVolts/meter)	FCC Part 15 Subpart C 15.209	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
8	660.2301	14.51	PK	20	2	36.51	46	-9.49	328	400	Vert

PK - Peak detector
 QP - Quasi-Peak detector
 LnAv - Linear Average detector

9 AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

ANSI C63.4

RESULTS

Passed

6 WORST EMISSIONS

Manufacturer: Kyocera

Device: Tri Band CDMA Mobile Phone

Model:C5215 Bluetooth

Job#:13U14946

Tested by: CD/MA

Line 1 .15 - 1MHz

Marker No.	Test Frequency	Meter Reading	Detector	47367 L1 (dB)	8447D Preamp (dB)	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
1	0.17862	64.31	PK	10.9	-27.2	48.01	64.5	-16.49	54.5	-6.49
2	0.39255	55.32	PK	10.3	-28	37.62	58	-20.38	48	-10.38
3	0.78692	49.53	PK	10.2	-28.2	31.53	56	-24.47	46	-14.47

Line 1 1 - 30MHz

Marker No.	Test Frequency	Meter Reading	Detector	47367 L1 (dB)	8447D Preamp (dB)	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
4	1.45573	48.85	PK	10.1	-28.3	30.65	56	-25.35	46	-15.35
5	5.68022	47.58	PK	10.2	-28.3	29.48	60	-30.52	50	-20.52
6	1.22425	48.89	PK	10.1	-28.3	30.69	56	-25.31	46	-15.31

Neutral .15 - 1MHz

Marker No.	Test Frequency	Meter Reading	Detector	47367 L1 (dB)	8447D Preamp (dB)	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
7	0.16039	65.63	PK	11.1	-27	49.73	65.4	-15.67	55.4	-5.67
8	0.40676	53.53	PK	10.3	-28.1	35.73	57.7	-21.97	47.7	-11.97
9	0.89865	65.73	PK	10.2	-28.2	47.73	56	-8.27	46	1.73

Neutral 1 - 30MHz

Marker No.	Test Frequency	Meter Reading	Detector	47367 L1 (dB)	8447D Preamp (dB)	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
10	12.38588	45.7	PK	10.4	-28.3	27.8	60	-32.2	50	-22.2
11	15.2649	42.4	PK	10.4	-28.3	24.5	60	-35.5	50	-25.5
12	22.93989	47.11	PK	10.6	-28.3	29.41	60	-30.59	50	-20.59

PK - Peak detector

QP - Quasi-Peak detector

LnAv - Linear Average detector

LgAv - Log Average detector

Av - Average detector

Manufacturer: Kyocera

Device: Tri Band CDMA Mobile Phone

Model:C5215 Bluetooth

Job#:13U14946

Tested by: CD/MA

Line 1 .15 - 1MHz

Test Frequency	Meter Reading	Detector	47367 L1 [dB]	8447D Preamp [dB]	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.17783	44.14	Av	11	-27.2	27.94	64.59	-36.65	54.59	-26.65
0.3938	42.09	Av	10.3	-28	24.39	57.98	-33.59	47.98	-23.59
0.78754	40.69	Av	10.2	-28.2	22.69	56	-33.31	46	-23.31

Line 1 1 - 30MHz

Test Frequency	Meter Reading	Detector	47367 L1 [dB]	8447D Preamp [dB]	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
1.47756	40.89	Av	10.1	-28.3	22.69	56	-33.31	46	-23.31
5.70534	40.59	Av	10.2	-28.3	22.49	60	-37.51	50	-27.51
1.21842	40.49	Av	10.2	-28.3	22.39	56	-33.61	46	-23.61

Neutral .15 - 1MHz

Test Frequency	Meter Reading	Detector	47367 L1 [dB]	8447D Preamp [dB]	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
0.15909	46.3	Av	11.1	-27	30.4	65.51	-35.11	55.51	-25.11
0.40673	40.89	Av	10.3	-28.1	23.09	57.71	-34.62	47.71	-24.62
0.90005	40.69	Av	10.2	-28.2	22.69	56	-33.31	46	-23.31

Neutral 1 - 30MHz

Test Frequency	Meter Reading	Detector	47367 L1 [dB]	8447D Preamp [dB]	(dB(uVolts))	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
12.3851	40.59	Av	10.4	-28.3	22.69	60	-37.31	50	-27.31
15.2975	40.99	Av	10.4	-28.3	23.09	60	-36.91	50	-26.91
22.9661	40.79	Av	10.6	-28.3	23.09	60	-36.91	50	-26.91

PK - Peak detector

QP - Quasi-Peak detector

LnAv - Linear Average detector

LgAv - Log Average detector

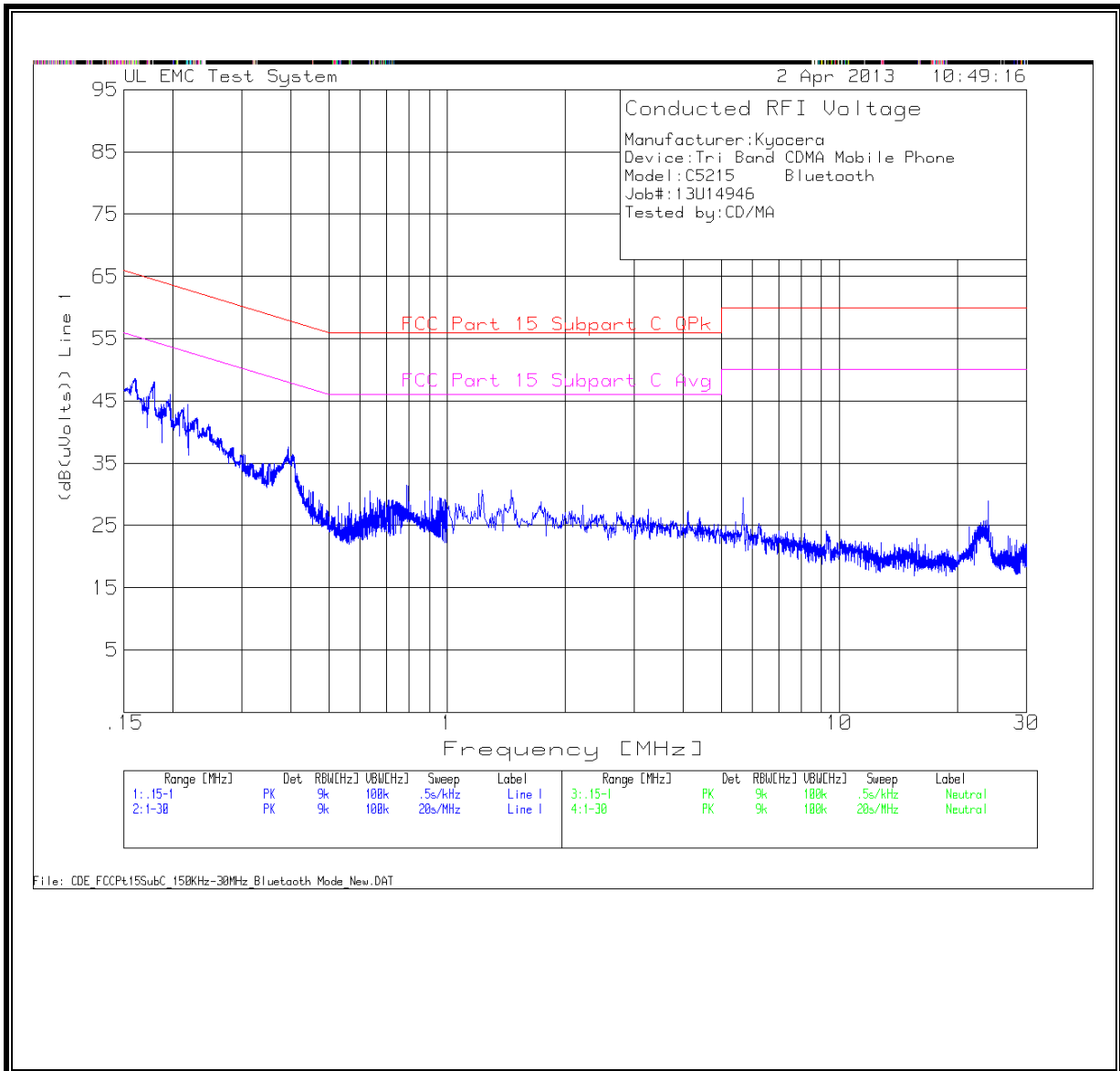
Av - Average detector

CAV - CISPR Average detector

RMS - RMS detection

CRMS - CISPR RMS detection

LINE 1 RESULTS



LINE 2 RESULTS

