

RADIATED SPURIOUS EMISSIONS PORTIONS OF

FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E
FCC CFR47 PART 27 SUBPART L
INDUSTRY CANADA RSS-132 ISSUE 2
INDUSTRY CANADA RSS-133 ISSUE 5
INDUSTRY CANADA RSS-139 ISSUE 2

CERTIFICATION TEST REPORT

FOR

TRI BAND CDMA MOBILE PHONE WITH BLUETOOTH + WiFi

FCC MODEL NUMBER: C5121 IC MODEL NUMBER: C5121

FCC ID: OVFC51213CD IC: 3572A-C5121

REPORT NUMBER: 11U13924-1

ISSUE DATE: AUGUST 12, 2011

Prepared for

KYOCERA COMMUNICATIONS, INC 9520 TOWNE CENTRE DRIVE SAN DIEGO, CA 92121, U.S.A.

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
	08/12/11	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: KYOCERA COMMUNICATIONS, INC

9520 TOWNE CENTRE DRIVE SAN DIEGO, CA 92121, U.S.A

EUT DESCRIPTION: TRI BAND CDMA MOBILE PHONE WITH BLUETOOTH + WiFi

MODEL: C5121

SERIAL NUMBER: A0000012FF2341

DATE TESTED: AUGUST 8 TO 12, 2011

APPLICABLE STANDARDS

STANDARD TEST RESULTS

FCC PART 22H, 24E, AND 27L PASS (Radiated Portion)

IC RSS-132 ISSUE 2, RSS-133 ISSUE 5, AND RSS-139 ISSUE 2 PASS (Radiated Portion)

Compliance Certification Services, Inc. (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:

1 huj

ENGINEERING MANAGER

THU CHAN

UL CCS

STEVE AGUILAR EMC TECHNICIAN UL CCS

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, FCC Part 27, RSS-132 Issue 2, RSS-133 Issue 5 and RSS-139 Issue 2.

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB - 26.9 dB = 28.9 dBuV/m

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. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak ERP & EIRP output powers as follows:

824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Output Power (dBm)	ERP Output Power (mW)	
Low CH - 824.70		26.95	495.5	
Mid CH – 836.52	CDMA2000	29.01	796.2	
High CH – 848.31		26.20	416.9	

1850 to 1910 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Output Power (dBm)	ERP Output Power (mW)	
Low CH – 1851.25		27.52	564.9	
Mid CH – 1880.00	CDMA2000	29.81	957.2	
High CH – 1908.75		28.51	709.6	

1710 to 1755 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Output Power (dBm)	ERP Output Power (mW)
Low CH – 1711.25		26.83	481.9
Mid CH – 1733.00	AWS	27.93	620.9
High CH – 1753.75		25.31	339.6

5.3. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent, Rohde & Schwarz, or Anritsu Communication Test Set.

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, or Z with AC/DC adapter and headset, after the investigations, the worst-position was turned out to be X-Position without AC Adapter and with headset.

PROCEDURE USED TO ESTABLISH TEST SIGNAL

3G-CDMA2000 1xRTT

This procedure assumes the Agilent E5515C Test Set has the following applications installed and with valid license.

Application Rev, License
CDMA2000 Mobil Test B.10.11, L

1xRTT

- Call Setup > Shift & Preset
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > RC3 (Fwd3, Rvs3)
- FCH Service Option (SO) Setup > 55
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
 - > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Cell Info > Cell Parameters > System ID (SID) > 4395
 - > Network ID (NID) > 0
 - > Initial Registration Channel > 1125 (PCS)

Once "Active Cell" show "Connected" then change "Rvs Power Ctrl" from "Active bits" to "All Up bits" to get the maximum power.

Worst-case Measurement Result @ Low, Middle and High Channel

Worst-case Measurement Result for Low, Middle and High Channel under Radio Configuration RC3 and Service Option 55.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST								
Description Manufacturer Model Serial Number FC								
AC Adapter	Kyocera	CSP-31ADT	SSW-2001	DoC				
Earphone								

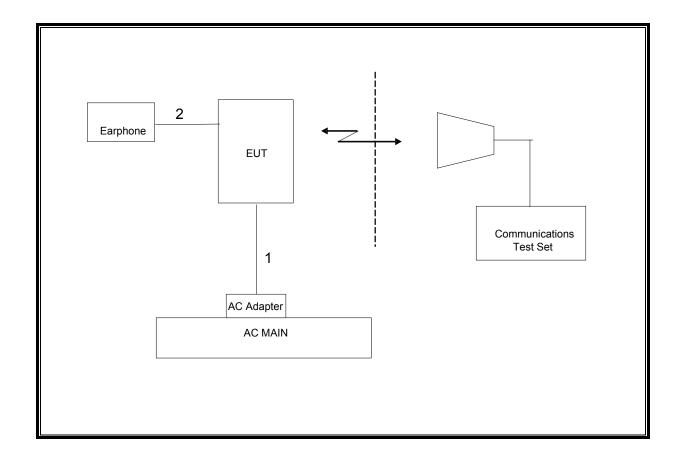
I/O CABLES

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

TEST SETUP

The EUT is a CDMA phone and-is tested as a standalone configuration. Communications Test Set is used to link the device under test.

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	C01161	12/07/11				
Communications Test Set	Agilent / HP	E5515C	1000732	09/27/12				
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/14/12				
EMI Test Receiver, 9 kHz-7	R&S	ESCI 7	1000741	07/06/12				
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/12				
Antenna, Horn, 18 GHz	EMCO	3115	C00872	06/29/12				
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/16/12				
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/27/12				
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	07/12/12				
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/12/12				
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/10/11				
Dipole	EMCO	3121C-DB4	00-22117	07/16/12				
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR				
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR				

7. LIMITS AND RESULTS

7.1. RADIATED OUTPUT POWER

LIMITS

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(b) & RSS133 § 6.4 Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

27.50 (d) (2) & RSS-139 § 6.4 Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band are limited to a peak EIRP of 1 watt.

RSS-132 § 4.4 The maximum ERP shall be 6.3 Watts for mobile stations.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17, RSS-132, RSS-133, & RSS-139.

RESULTS

CELL OUTPUT POWER (ERP)

High Frequency Substitution Measurement

Compliance Certification Services Chamber A

 Company:
 KYOCERA

 Project #:
 11U13924

 Date:
 08/10/11

 Test Engineer:
 STEVE AGUILAR

Configuration: EUT ALONE W/EARPHONE
Mode: TX, CELL BAND CDMA MODE

Test Equipment:

Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)

Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 193961002) Warehouse.

f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Margin	Notes
MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	(dB)	
824.70	26.16	V	0.5	0.0	25.66	38.5	-12.8	
824.70	27.45	Н	0.5	0.0	26.95	38.5	-11.5	
836.52	23.75	V	0.5	0.0	23.25	38.5	-15.2	
836.52	29.51	Н	0.5	0.0	29.01	38.5	-9.4	
848.31	20.14	V	0.5	0.0	19.64	38.5	-18.8	
848.31	26.70	Н	0.5	0.0	26.20	38.5	-12.2	

Rev. 3.17.11

PCS OUTPUT POWER (EIRP)

High Frequency Fundamental Measurement

Compliance Certification Services Chamber A

 Company:
 KYOCERA

 Project #:
 11U13924

 Date:
 08/09/11

 Test Engineer:
 STEVE AGUILAR

Configuration: EUT ALONE w/ EARPHONE
Mode: TX, PCS BAND CDMA MODE

Test Equipment:

Receiving: Horn T73, and Camber A SMA Cables

Substitution: Horn T60 Substitution, 4ft SMA Cable (193961002) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.851	14.9	V	0.85	8.01	22.01	33.0	-11.0	
1.851	20.4	Н	0.85	8.01	27.52	33.0	-5.5	
1.880	16.7	V	0.85	8.13	23.95	33.0	-9.1	
1.880	22.5	Н	0.85	8.13	29.81	33.0	-3.2	
1.909	17.2	V	0.85	8.13	24.51	33.0	-8.5	
1.909	21.2	Н	0.85	8.13	28.51	33.0	-4.5	

Rev. 3.17.11

AWS OUTPUT POWER (EIRP)

High Frequency Fundamental Measurement Compliance Certification Services Chamber B

Company: KYOCERA
Project #:11U13924
Date: 8-10 TO 8-11, 2011
Test Engineer: STEVE AGUILAR
Configuration: EUT ALONE w/ EARPHONE
Mode: TX, AWS BAND CDMA MODE

Test Equipment:

Receiving: Horn T59, and Camber B SMA Cables

Substitution: Horn T60 Substitution, 6ft SMA Cable (244640002) Warehouse

f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Delta	Notes
GHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
1.711	16.2	V	0.67	8.01	23.54	30.0	-6.5	
1.711	19.5	Н	0.67	8.01	26.83	30.0	-3.2	
1.733	17.6	V	0.67	8.07	24.97	30.0	-5.0	
1.733	20.5	Н	0.67	8.07	27.93	30.0	-2.1	
1.753	12.8	V	0.67	8.13	20.25	30.0	-9.8	
1.753	17.9	Н	0.67	8.13	25.31	30.0	-4.7	

Rev. 1.24.7

7.2. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (e) and §24.238 (a), RSS-132 § 4.5.1, & RSS-133 § 6.5.1 (a) (i) & (b): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

§27.53 (g) and RSS-139 § 6.5 For operations in the 1710–1755MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10 (P) dB.

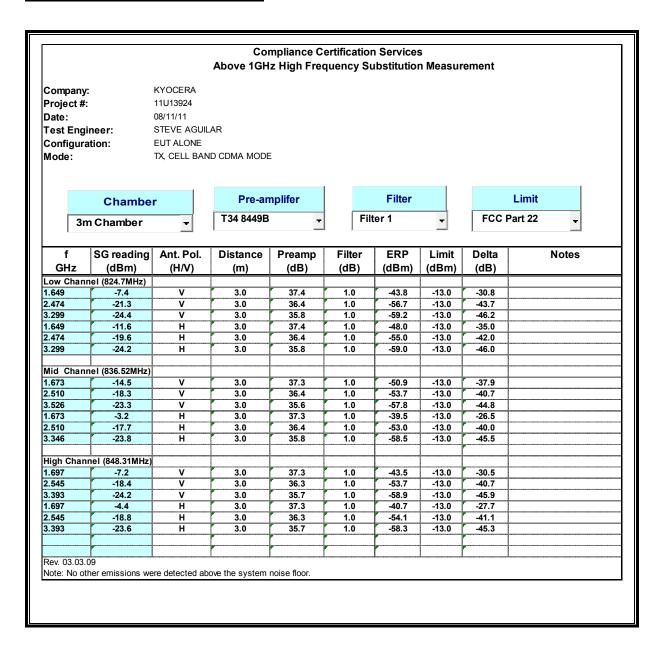
TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 22.917 (b), FCC 24.238 (b), & FCC 27.53 (g)(1)(2)(3), RSS-132, RSS-133, & RSS-139.

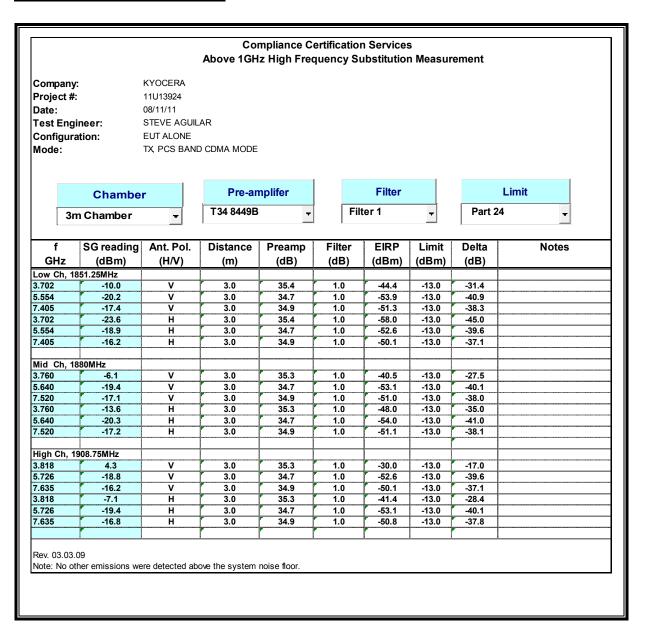
RESULTS

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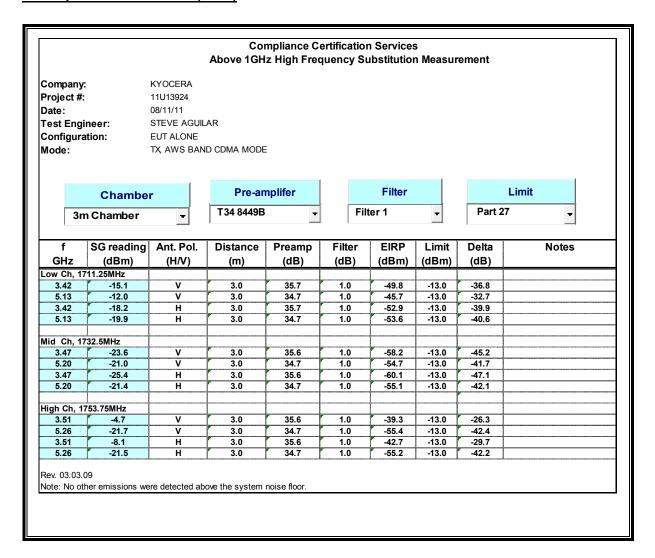
CELL SPURIOUS & HARMONIC (ERP)



PCS Spurious & Harmonic (EIRP)



AWS Spurious & Harmonic (EIRP)



7.1. RECEIVER SPURIOUS EMISSIONS

LIMIT

RSS-Gen 7.2.2

Spurious Emission Limits for Receivers:

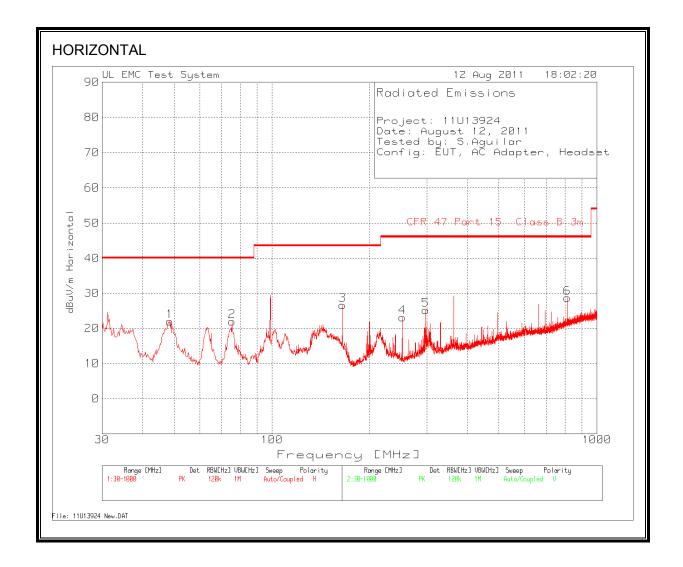
Spurious Frequency (MHz)	Field Strength (microvolts/m at 3 metres)				
30-88	100				
88-216	150				
216-960	200				
Above 960	500				

TEST PROCEDURE

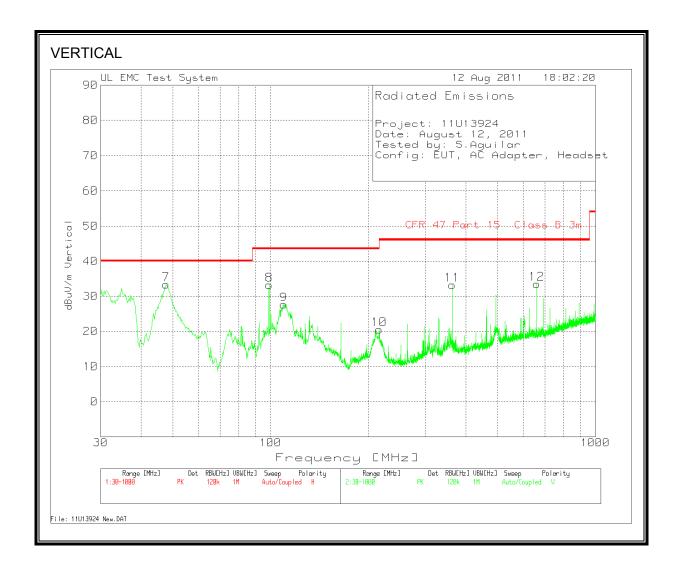
The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (local oscillator frequency, intermediate frequency or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable and local oscillator frequencies.

RESULTS

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



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



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

Project: 11U1	.3924									
Model: KyoceraF21										
Date: August	τ 12, 2011									
Tested by: St	teve Aguila	ır								
Config: EUT,	AC Adapte	r, Headset								
Mode: RX, Idl	le				<u> </u>					
Horizontal 30) - 1000MHz	<u>'</u>								
Test	Meter		3m Cable		3m Bilog T185		CFR 47 Part 15			
Frequency			• •	PreAmp [dB]	[dB]	dBuV/m		Margin	Height [cm]	Polarity
48.4153	39.21	PK	0.8	-28.2	10.1	21.91	40	-18.09	251	Horz
75.3597	41	PK	1	-28.1	8.1	22	40	-18	251	Horz
164.9161	40.87	PK	1.3	-27.8	12.2	26.57	43.5	-16.93	251	Horz
251.9524	37.11	PK	1.6	-27.4	11.8	23.11	46	-22.89	99	Horz
296.9245	37.29	PK	1.8	-27.3	13.4	25.19	46	-20.81	99	Horz
812.1643	32.81	PK	2.9	-28	21	28.71	46	-17.29	251	Horz
Vertical 30 - 1	1000MHz									
Test Meter		3m Cable	3m T15	3m Bilog T185		CFR 47 Part 15			<u> </u>	
Frequency	Reading	Detector	[dB]	PreAmp [dB]	[dB]	dBuV/m	Class B 3m	Margin	Height [cm]	Polarity
47.6399	50.38	PK	0.8	-28.2	10.5	33.48	40	-6.52	100	Vert
99.0088	51.28	PK	1	-28.1	9.1	33.28	43.5	-10.22	100	Vert
109.8641	43.16	PK	1.1	-28	11.4	27.66	43.5	-15.84	100	Vert
216.0911	34.7	PK	1.5	-27.6	11.9	20.5	46	-25.5	100	Vert
362.8317	44.5	PK	2	-27.6	14.4	33.3	46	-12.7	100	Vert
659.996	40.58	PK	2.7	-28.4	18.7	33.58	46	-12.42	100	Vert

SPURIOUS EMISSIONS ABOVE 1000 MHz (WORST-CASE CONFIGURATION)

Note: No emissions above the noise floor were observed.

7.2. POWER LINE CONDUCTED EMISSION

LIMIT

RSS-Gen 7.2.2

Except when the requirements applicable to a given device state otherwise, for any licence-exempt radio communication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 2. The tighter limit applies at the frequency range boundaries.

Table 2 – AC Power Lines Conducted Emission Limits

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		

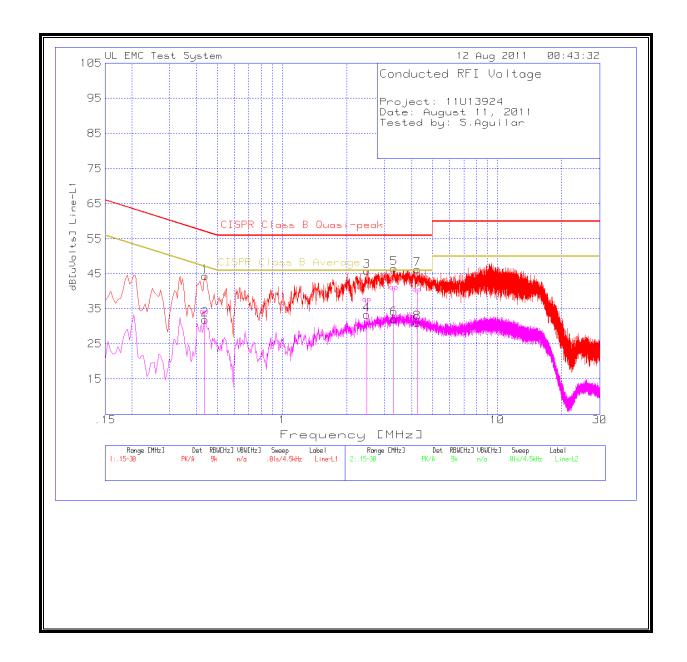
Decreases with the logarithm of the frequency.

RESULTS

WORST EMISSIONS

Project: 11U	13924								
Model: Kyoo	era F21								
Date: Augus	t 11, 2011								
Tested by: S	.Aguilar								
Line-L1 .15 -	30MHz								
Test	Meter			Conducted		CISPR Class B		CISPR Class B	
Frequency	Reading		LISN [dB]	Cable [dB]	dB[uVolts]	Quasi-peak	Margin	Average	Margin
0.438	44.33	PK	0	0	44.33	57.1	-12.77	47.1	-2.77
0.438	31.91	Av	0	0	31.91			47.1	-15.19
2.4765	45.89	PK	0	0	45.89	56	-10.11	46	-0.11
2.4765	33.26	Av	0	0	33.26			46	-12.74
3.309	46.59	PK	0	0	46.59	56	-9.41	46	0.59
3.309	32.14	Av	0	0	32.14			46	-13.86
4.254	46.33	PK	0	0	46.33	56	-9.67	46	0.33
4.254	30.98	Av	0	0	30.98			46	-15.02
Line-L2 .15 -	30MHz								
Test	Meter			Conducted		CISPR Class B		CISPR Class B	
Frequency	Reading	Detector	LISN [dB]	Cable [dB]	dB[uVolts]	Quasi-peak	Margin	Average	Margin
0.4155	41.24	PK	0	0	41.24	57.5	-16.26	47.5	-6.26
0.4155	22.86	Av	0	0	22.86		1	47.5	-24.64
3.0975	43.57	PK	0	0	43.57	56	-12.43	46	-2.43
3.0975	27.04	Av	0	0	27.04			46	-18.96
3.3585	44.17	PK	0	0	44.17	56	-11.83	46	-1.83
3.3585	26.22	Av	0	0	26.22		1	46	-19.78
4.6995	42.8	PK	0	0	42.8	56	-13.2	46	-3.2
4.6995	26.79	Av	0	0	26.79			46	-19.21

LINE 1 RESULTS RX IDLE MODE



LINE 2 RESULTS – RX IDLE MODE

