



**FCC 47 CFR PART 15 SUBPART B
ICES-003 ISSUE 5**

TEST REPORT

FOR

SMART WATCH with 2.4 DTS b/g/n + BT and BLE

MODEL NUMBER: LG-W110, W110, LGW110

**FCC ID: ZNFW110
IC ID: 2703C-W110**

REPORT NUMBER: 14U18426-4E

ISSUE DATE: JULY 31, 2014

**Prepared for
LG ELECTRONICS MOBILECOMM U.S.A., INC
1000 SYLVAN AVENUE
ENGLEWOOD CLIFFS,
NEW JERSEY, 07632, U.S.A**

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



NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	7/31/14	Initial Issue	D. Corona

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. FACILITIES AND ACCREDITATION	5
3. CALIBRATION AND UNCERTAINTY	5
3.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>5</i>
3.2. <i>SAMPLE CALCULATION</i>	<i>5</i>
3.3. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>5</i>
4. EQUIPMENT UNDER TEST	6
4.1. <i>DESCRIPTION OF EUT</i>	<i>6</i>
4.2. <i>PRELIMINARY TEST CONFIGURATIONS.....</i>	<i>7</i>
4.3. <i>MODE(S) OF OPERATION</i>	<i>7</i>
4.4. <i>DETAILS OF TESTED SYSTEM</i>	<i>8</i>
5. TEST AND MEASUREMENT EQUIPMENT	11
6. APPLICABLE LIMITS AND TEST RESULTS	12
6.1. <i>RADIATED EMISSIONS.....</i>	<i>12</i>
6.2. <i>AC MAINS LINE CONDUCTED EMISSIONS</i>	<i>17</i>
7. SETUP PHOTOS.....	24

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC
EUT DESCRIPTION: SMART WATCH with 2.4 DTS b/g/n + BT and BLE
MODEL: LG-W110, W110, LGW110
SERIAL NUMBER: (Radiated)
DATE TESTED: JULY 29-30, 2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART B	Pass
ICES-003 ISSUE 5	Pass

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

Tested By:



DAN CORONIA
CONSUMER TECHNOLOGY DIVISION
PROJECT LEAD
UL Verification Services Inc.



CHARLES VERGONIO
CONSUMER TECHNOLOGY DIVISION
LAB TECHNICIAN
UL Verification Services Inc.

2. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ Chamber D
☐ Chamber B	☐ Chamber E
☐ Chamber C	☐ Chamber F

3. CALIBRATION AND UNCERTAINTY

3.1. 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.

3.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

3.3. 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%.

4. EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF EUT

The EUT is a SMART WATCH with 2.4 DTS + BT and BLE.

GENERAL INFORMATION

Power Requirements	Input :100-240 VAC / 50-60 Hz Output: 5VDC, 0.85 A
List of frequencies generated or used by the EUT	1.2GHz , 26MHz and 19.2MHz

SUBASSEMBLIES

The EUT was constructed using the following sub-assemblies:

Subassembly Description	Manufacturer	Part Number
Cradle	LG	SDT-330
AC adapter	Sunlin	MCS-02WR
USB cable	Ningbo BROAD	EAD62377902

4.2. PRELIMINARY TEST CONFIGURATIONS

The following configurations were investigated during preliminary testing:

EUT Configuration	Description
1	EUT with Cradle and adapter
2	EUT with Laptop

The worst-case configuration was determined to be EUT with Laptop.

4.3. MODE(S) OF OPERATION

Mode	Description
1	EUT attached with BT call box and under standby mode; EUT docked in the charger with charging function enabled

4.4. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Cradle	LG	SDT-330	N/A	N/A
AC adapter	Sunlin	MCS-02WR	N/A	N/A
USB cable	Ningbo BROAD	EAD62289301	N/A	N/A
Laptop	Lenovo	T430	N/A	N/A
USB drive	kingstone	N/A	N/A	N/A

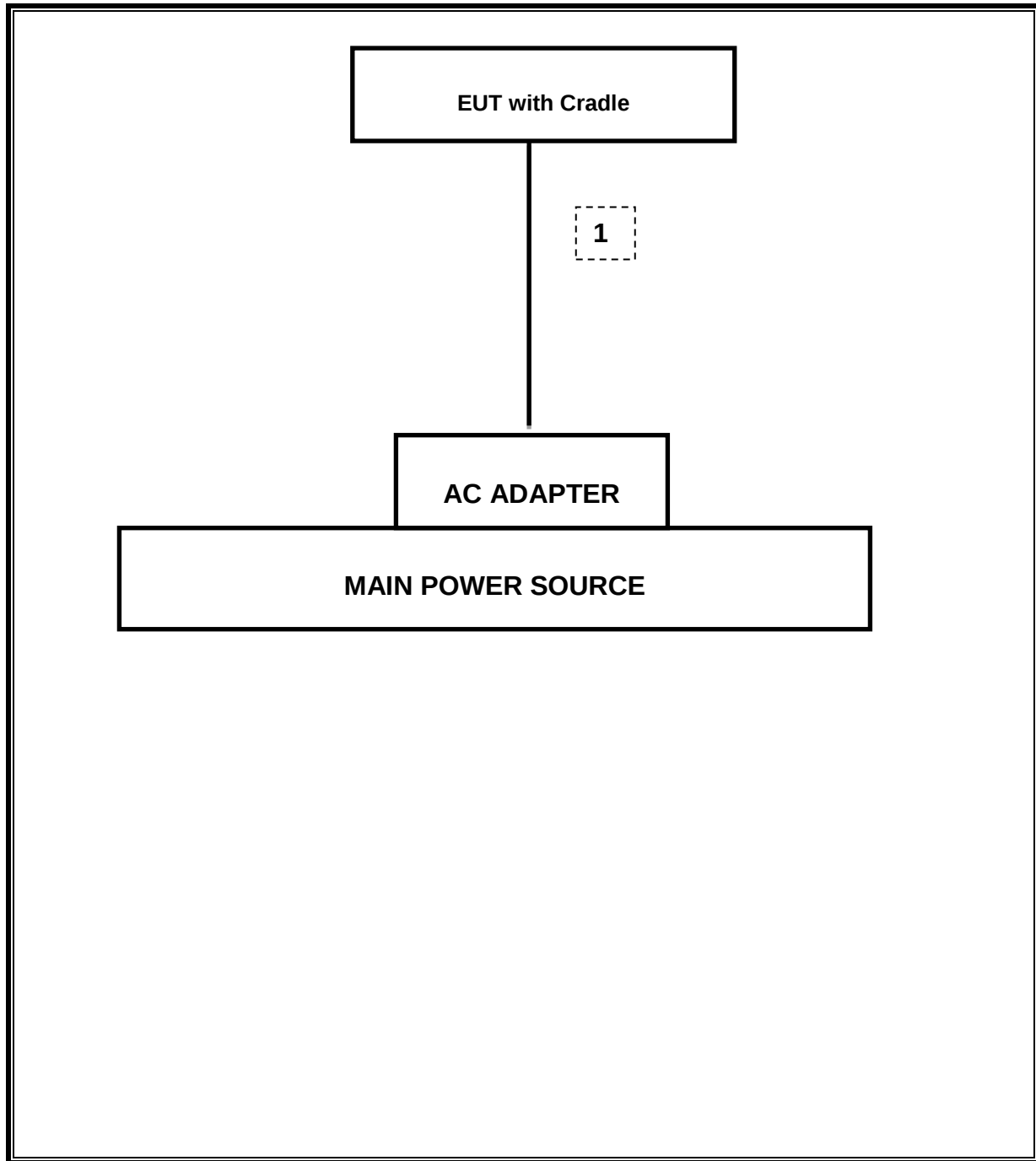
I/O CABLES

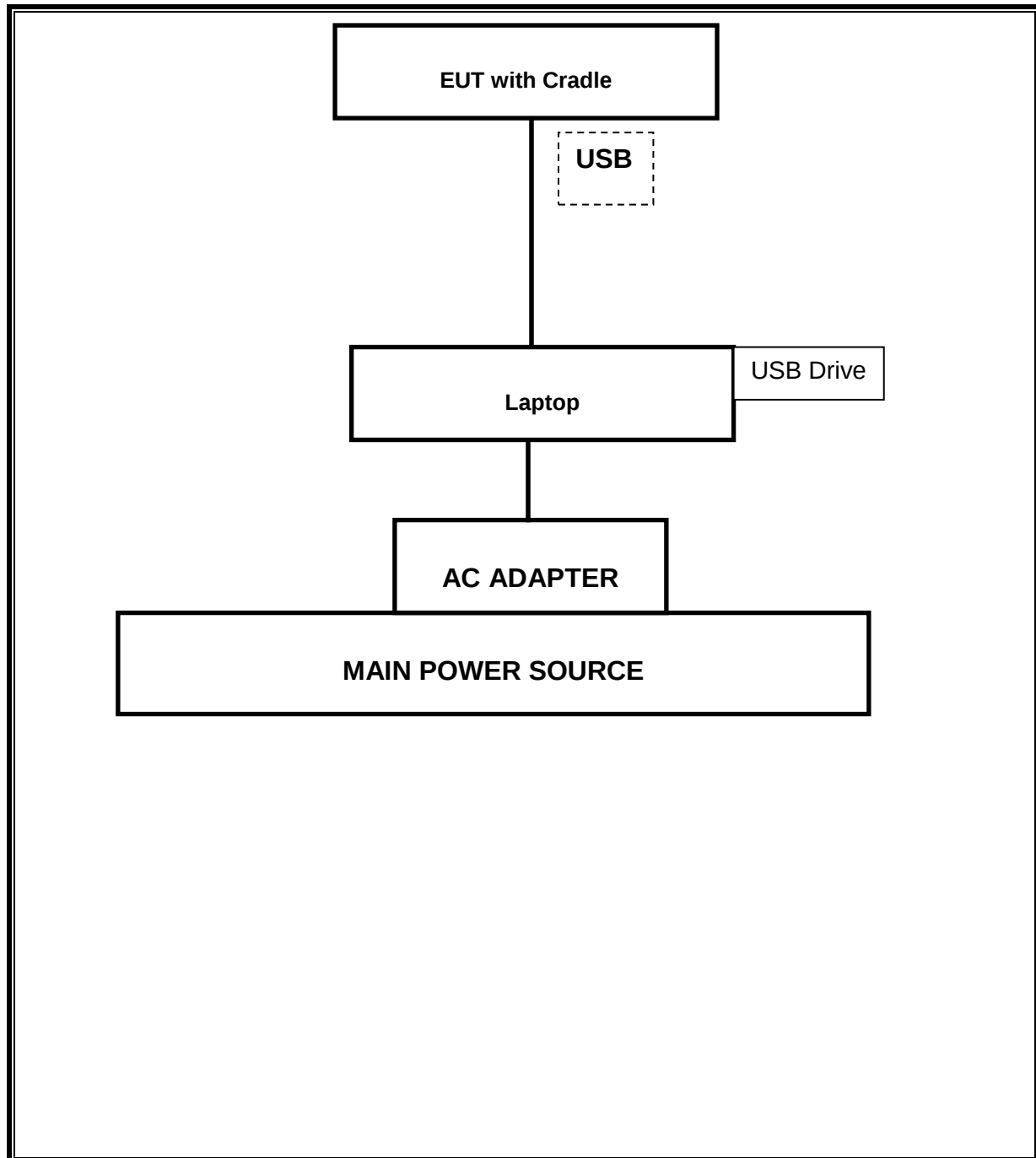
I/O CABLE LIST						
Cable No.	Port	No. of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB(Charger)	1	mini USB	USB	1	
1	USB(Laptop)	1	mini USB	USB	1	

TEST SETUP

The EUT is installed in a typical configuration. Test software exercised the EUT.

TEST SETUP DIAGRAM





5. 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	S/N	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/16/15
ESA-E Spectrum Analyzer, 9kHz-26.5 GHz	Agilent / HP	E4407B	C01098	03/26/15
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/12/15
OmniBER	HP	37717C	F00109	05/05/15
Spectrum Analyzer, 44 GHz	Agilent	N9030A	F00127	02/21/15
Antenna, Horn, 18 GHz	ETS	3117	F00131	02/19/15
EMI Test Receiver, 9 kHz-7GHz	R&S	ESCI 7	100935	08/21/14
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/15

6. APPLICABLE LIMITS AND TEST RESULTS

6.1. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4

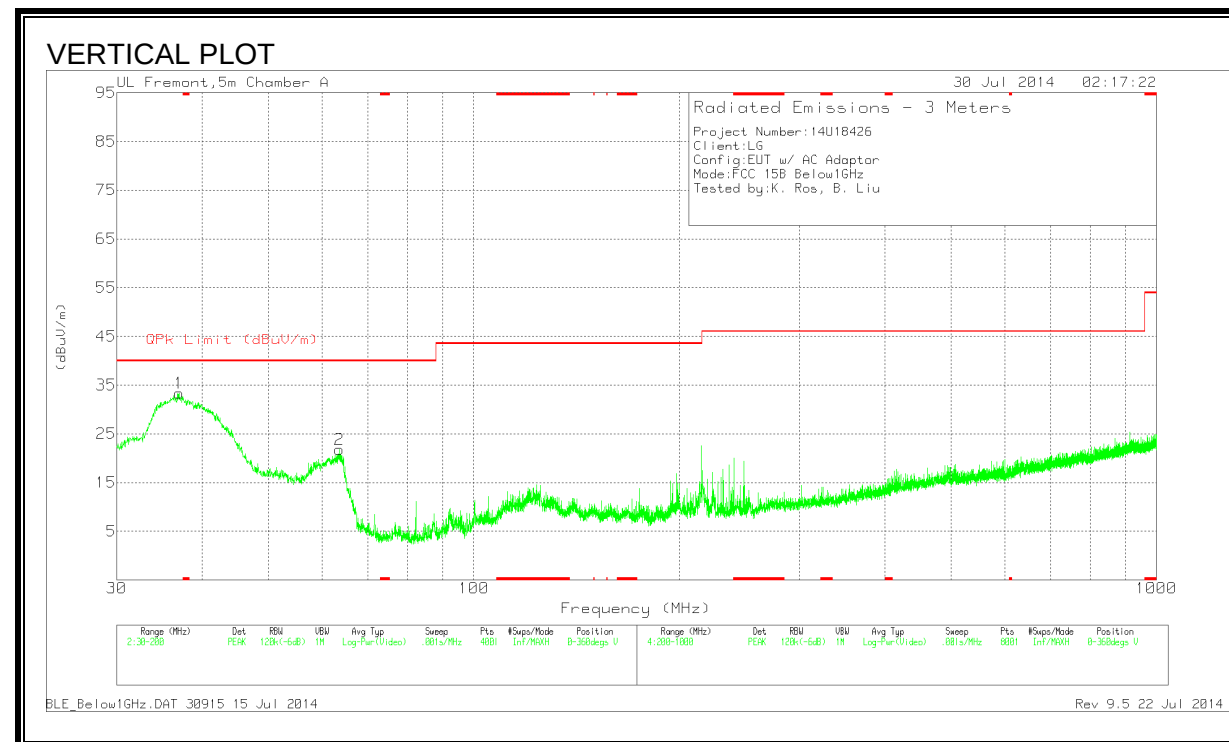
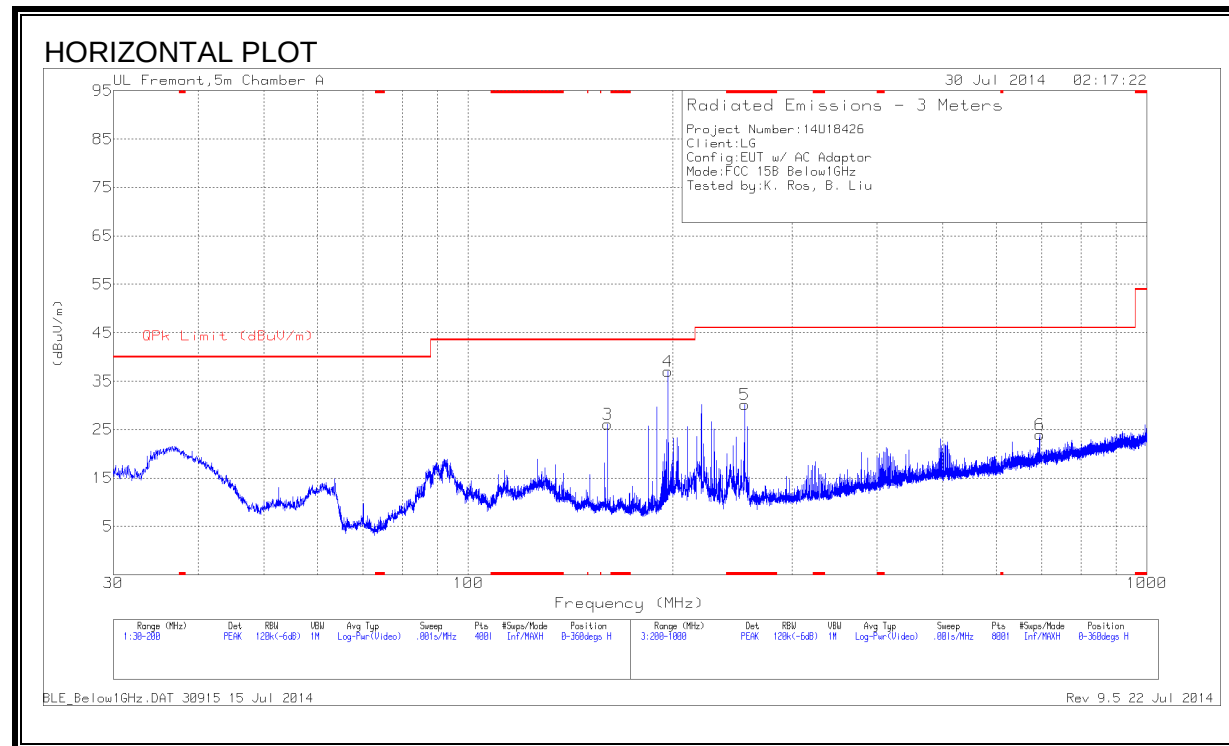
The highest clock frequency generated or used in the EUT is 26 MHz; therefore the frequency range was investigated from 30 MHz to 5000 MHz.

LIMIT

§15.109 (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dB μ V/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54
Note: The lower limit shall apply at the transition frequency.	

EUT WITH DOCK CHARGER BELOW 1GHZ RESULTS



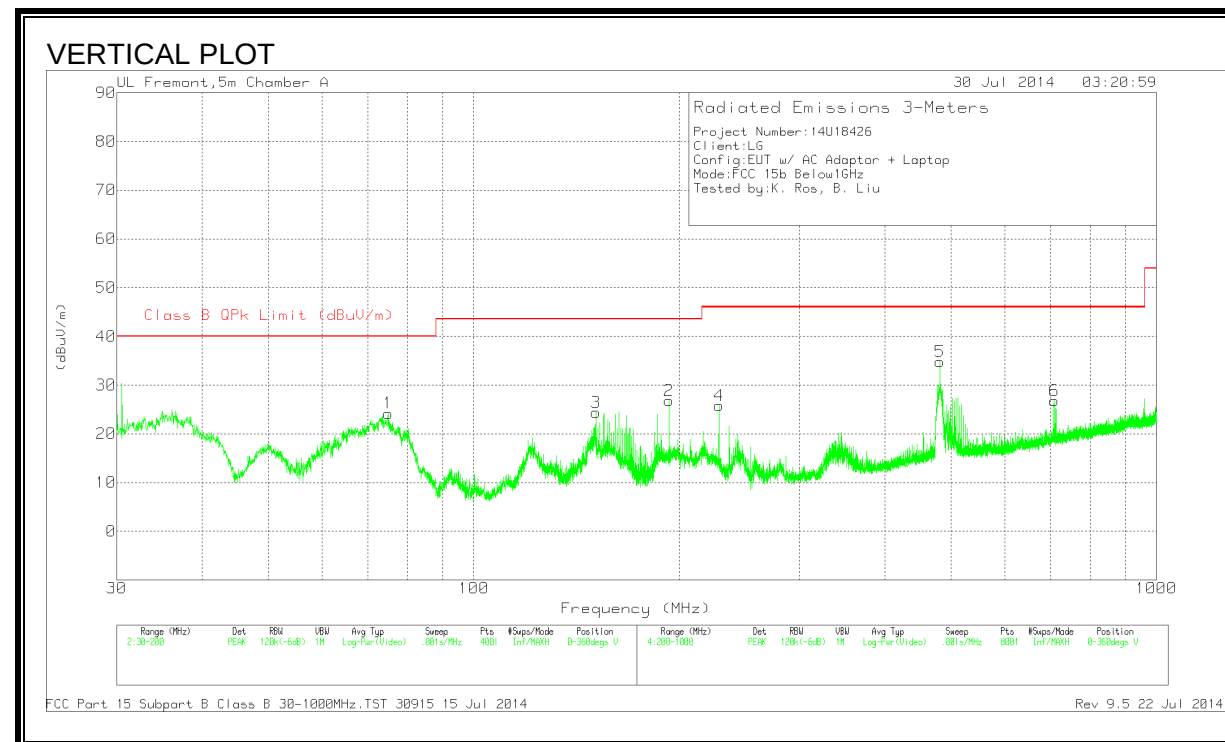
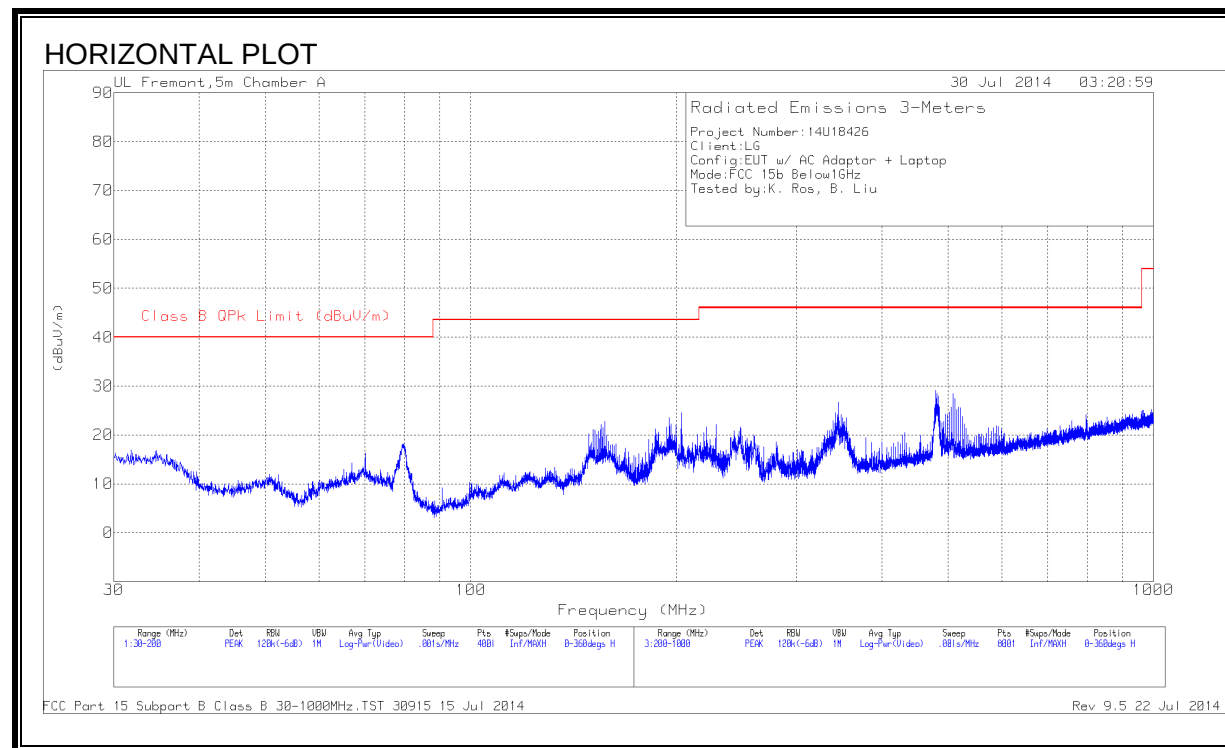
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 255.3	48.14	PK	11.5	-29.5	0	30.14	46.02	-15.88	0-360	101	H
1	37.0125	47.89	PK	16.5	-31.1	0	33.29	40	-6.71	0-360	101	V
2	63.575	44.74	PK	8.1	-31	0	21.84	40	-18.16	0-360	101	V
3	160.4325	43.96	PK	12.2	-30.1	0	26.06	43.52	-17.46	0-360	200	H
4	196.77	54.74	PK	12.3	-30	0	37.04	43.52	-6.48	0-360	101	H
6	694.7	31.85	PK	20.2	-28.1	0	23.95	46.02	-22.07	0-360	101	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

EUT WITH LAPTOP BELOW 1GHZ RESULTS



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	Class B QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	74.88	47.12	PK	8	-30.9	24.22	40	-15.78	0-360	101	V
3	150.955	42.05	PK	12.5	-30.1	24.45	43.52	-19.07	0-360	101	V
2	193.2	45.02	PK	11.7	-29.9	26.82	43.52	-16.7	0-360	101	V
4	228.6	44.49	PK	11	-29.7	25.79	46.02	-20.23	0-360	101	V
5	481.8	45.68	PK	17.7	-28.6	34.78	46.02	-11.24	0-360	101	V
6	708.8	34.57	PK	20.3	-28.1	26.77	46.02	-19.25	0-360	300	V

PK - Peak detector

6.2. AC MAINS LINE CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.4

LIMIT

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Notes: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

EUT WITH DOCK CHARGER RESULTS

6 WORST EMISSIONS

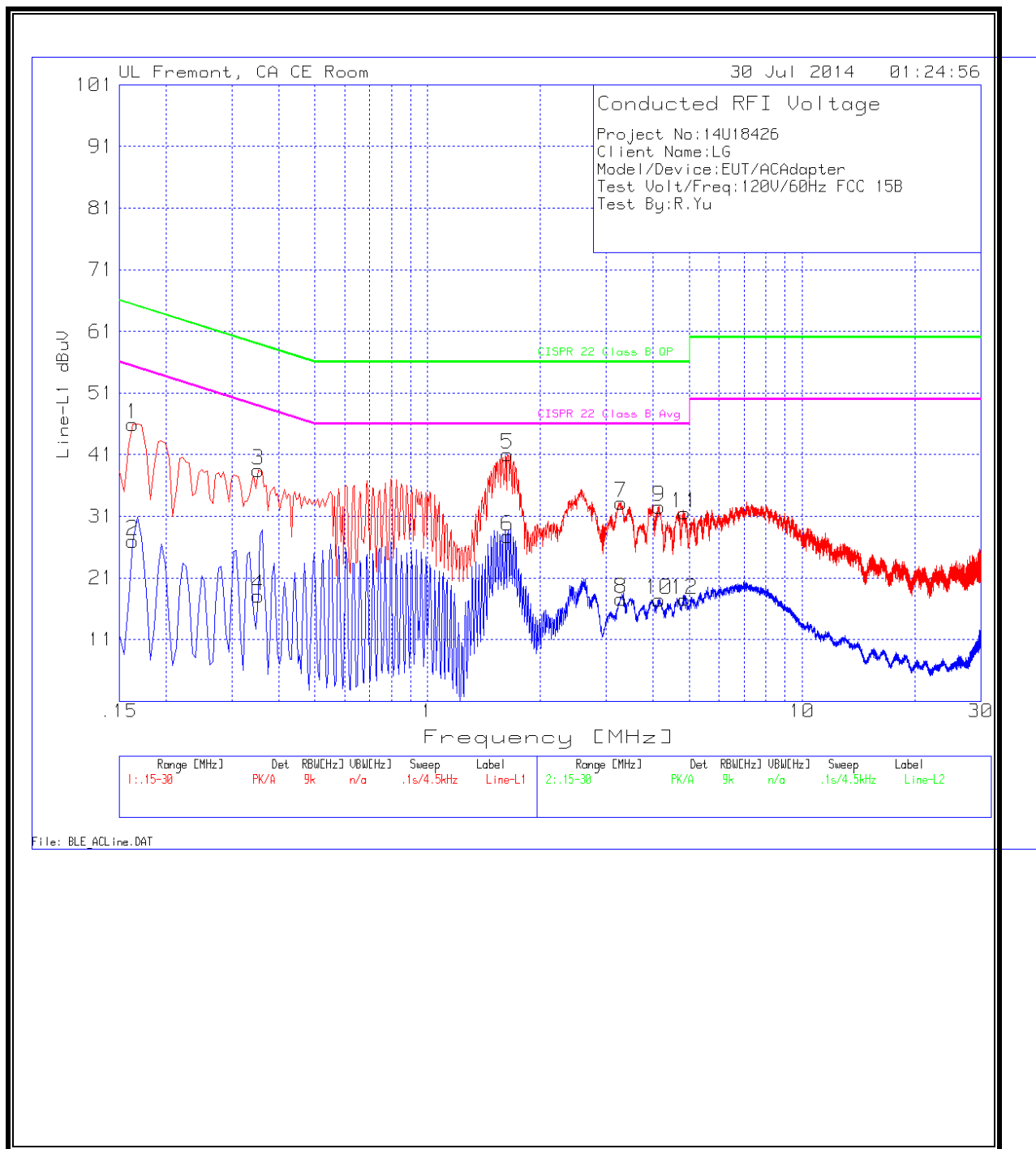
Line-L1 .15 - 30MHz

Trace Markers										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.1635	44.74	PK	1.2	0	45.94	65.3	-19.36	-	-
2	.1635	25.75	Av	1.2	0	26.95	-	-	55.3	-28.35
3	.3525	37.94	PK	.5	0	38.44	58.9	-20.46	-	-
4	.3525	17.56	Av	.5	0	18.06	-	-	48.9	-30.84
5	1.635	40.77	PK	.2	.1	41.07	56	-14.93	-	-
6	1.635	27.51	Av	.2	.1	27.81	-	-	46	-18.19
7	3.282	32.87	PK	.2	.1	33.17	56	-22.83	-	-
8	3.282	17.34	Av	.2	.1	17.64	-	-	46	-28.36
9	4.146	32.19	PK	.2	.1	32.49	56	-23.51	-	-
10	4.146	17.14	Av	.2	.1	17.44	-	-	46	-28.56
11	4.8525	31.27	PK	.2	.1	31.57	56	-24.43	-	-
12	4.8525	17.22	Av	.2	.1	17.52	-	-	46	-28.48

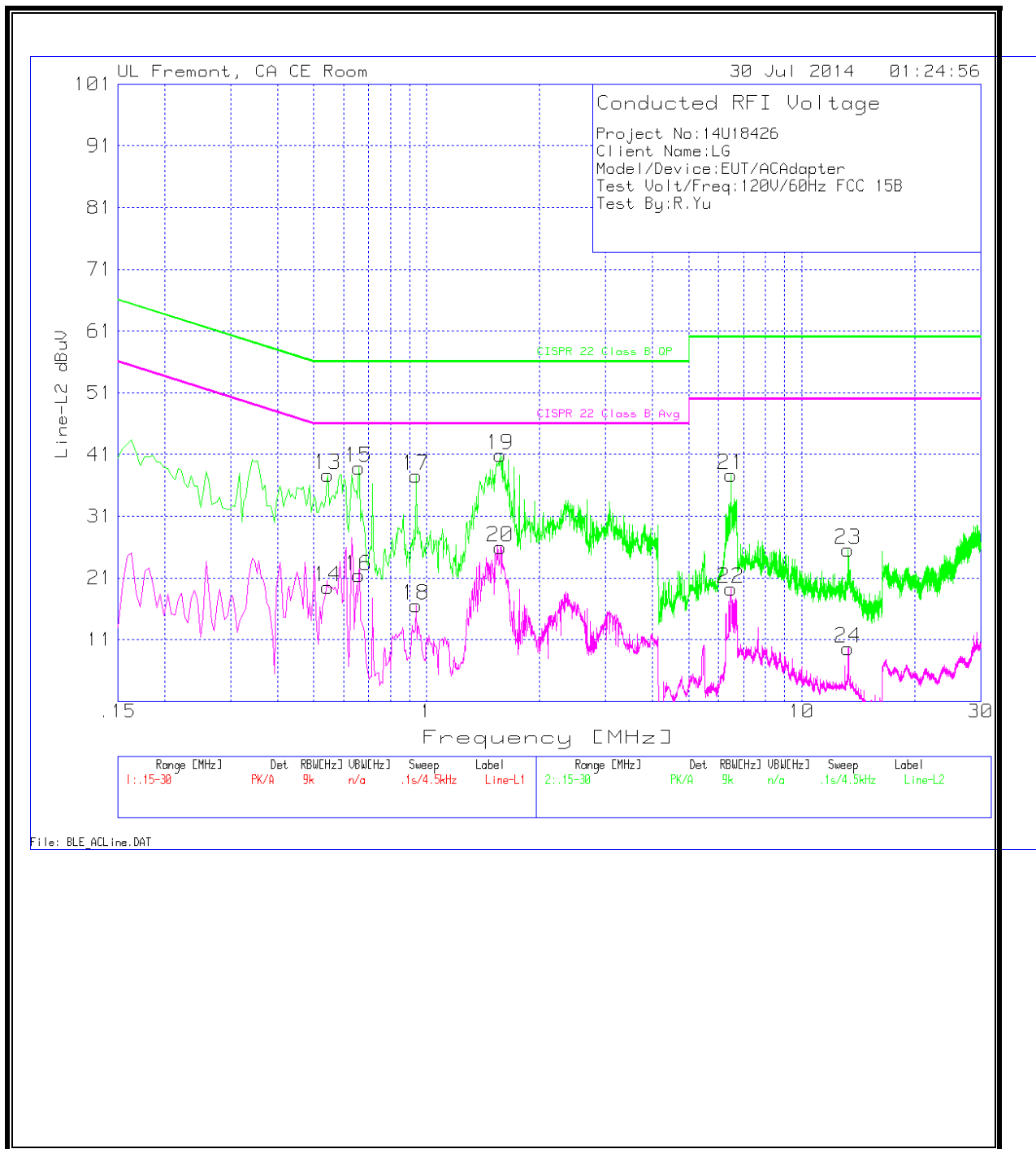
Line-L2 .15 - 30MHz

Trace Markers										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
13	.546	37.39	PK	.3	0	37.69	56	-18.31	-	-
14	.546	19.22	Av	.3	0	19.52	-	-	46	-26.48
15	.6585	38.55	PK	.3	0	38.85	56	-17.15	-	-
16	.6585	21.09	Av	.3	0	21.39	-	-	46	-24.61
17	.9375	37.28	PK	.3	0	37.58	56	-18.42	-	-
18	.9375	16.24	Av	.3	0	16.54	-	-	46	-29.46
19	1.572	40.67	PK	.2	.1	40.97	56	-15.03	-	-
20	1.572	25.62	Av	.2	.1	25.92	-	-	46	-20.08
21	6.4725	37.45	PK	.2	.1	37.75	60	-22.25	-	-
22	6.4725	18.98	Av	.2	.1	19.28	-	-	50	-30.72
23	13.308	25.07	PK	.3	.2	25.57	60	-34.43	-	-
24	13.308	9.13	Av	.3	.2	9.63	-	-	50	-40.37

LINE 1 RESULTS



LINE 2 RESULTS



EUT WITH LAPTOP RESULTS

6 WORST EMISSIONS

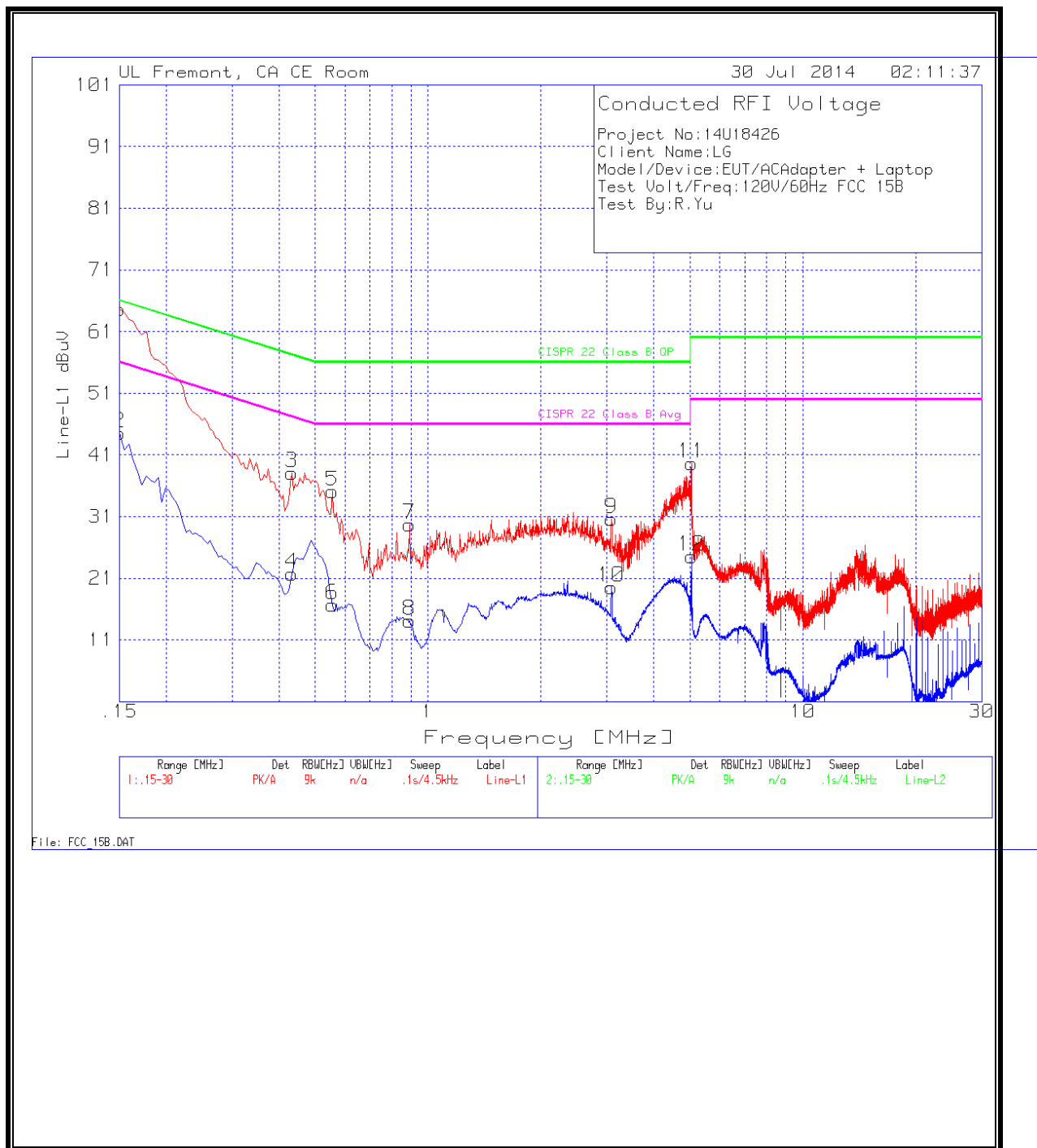
Line-L1 .15 - 30MHz

Trace Markers										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.15	63.18	PK	1.4	0	64.58	66	-1.42	-	-
2	.15	43.17	Av	1.4	0	44.57	-	-	56	-11.43
3	.4335	37.68	PK	.4	0	38.08	57.2	-19.12	-	-
4	.4335	21.28	Av	.4	0	21.68	-	-	47.2	-25.52
5	.555	34.76	PK	.3	0	35.06	56	-20.94	-	-
6	.555	16.41	Av	.3	0	16.71	-	-	46	-29.29
7	.8925	29.36	PK	.3	0	29.66	56	-26.34	-	-
8	.8925	13.79	Av	.3	0	14.09	-	-	46	-31.91
9	3.0795	30.26	PK	.2	.1	30.56	56	-25.44	-	-
10	3.0795	19.24	Av	.2	.1	19.54	-	-	46	-26.46
11	5.0415	39.33	PK	.2	.1	39.63	60	-20.37	-	-
12	5.0415	24.3	Av	.2	.1	24.6	-	-	50	-25.4

Line-L2 .15 - 30MHz

Trace Markers										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
13	.15	57.24	PK	1.5	0	58.74	66	-7.26	-	-
14	.15	38.3	Av	1.5	0	39.8	-	-	56	-16.2
15	.2175	48.66	PK	.9	0	49.56	62.9	-13.34	-	-
16	.2175	28.66	Av	.9	0	29.56	-	-	52.9	-23.34
17	.4965	38.36	PK	.4	0	38.76	56.1	-17.34	-	-
18	.4965	28.49	Av	.4	0	28.89	-	-	46.1	-17.21
19	.7845	29.8	PK	.3	0	30.1	56	-25.9	-	-
20	.7845	16.01	Av	.3	0	16.31	-	-	46	-29.69
21	4.8435	39.7	PK	.2	.1	40	56	-16	-	-
22	4.8435	25.95	Av	.2	.1	26.25	-	-	46	-19.75
23	7.4805	23.79	PK	.2	.1	24.09	60	-35.91	-	-
24	7.4805	10.85	Av	.2	.1	11.15	-	-	50	-38.85

LINE 1 RESULTS



LINE 2 RESULTS

