FCC 47 CFR PART 15 SUBPART B

CERTIFICATION TEST REPORT

FOR

TABLET with GSM/GPRS/EDGE/WCDMA, 802.11bgn, BT3.0

MODEL NUMBER: GT-P3100

FCC ID: A3LGTP3100

REPORT NUMBER: 12I14206-4

ISSUE DATE: FEBRUARY 13, 2012

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO, 443-742
SOUTH KOREA

Prepared by
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Revision History

Rev.	Issue Date	Revisions	Revised By
	02-13-12	Initial	S. Leitner

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO, 443-742, SOUTH KOREA

EUT DESCRIPTION: TABLET with GSM/GPRS/EDGE/WCDMA, 802.11bgn, BT3.0

MODEL: GT-P3100

SERIAL NUMBER: 02000

DATE TESTED: FEBRUARY 6-7, 2012

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART B	PASS

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 CCS By:

STEVE LEITNER
EMC SUPERVISOR
UL CCS

Tested By:

STEVE AGUILAR
EMC TECHNICIAN
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003.

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 a tablet with GSM/GPRS/EDGE/WCDMA, 802.11bgn, and Bluetooth 3.0.

GENERAL INFORMATION

Power Requirements, AC adapter	Input: 100-240 V / 50-60 Hz, 0.35 A Output: 5 V, 2 A
Maximum frequency generated or used by the EUT	26 MHz (oscillator), 1.2 GHz (processor)

5.2. EUT SUBASSEMBLIES

Description	Model Number	Serial Number
Tablet PC	GT-P3100	02000
AC Adapter (illustrated as AC Adapter 1 in setup diagram)	ETA-P11X	03046

5.3. PRELIMINARY TEST CONFIGURATIONS

The following configurations were investigated during preliminary testing:

EUT Configuration	Description
Configuration 1	The EUT standalone, configured with a headset.
Configuration 2	The EUT was connected to the AC mains with an AC adapter and configured with a headset.
Configuration 3	The EUT, configured with a headset, was connected to a USB port of a notebook PC with a minimum set of peripherals.

The worst-case configuration was determined to be Configuration 3. The worst-case orientation was determined to be in the “Y” axis.

5.4. MODE(S) OF OPERATION

Mode	Description
Active	The EUT played movie.
Charge Mode	The batteries of the EUT were being charged while in Configuration 2.
USB Mode	While in Configuration 3 the EUT played a Movie (audio and video) while charging from the laptop.

5.5. SOFTWARE AND FIRMWARE

Bluetooth firmware - BCM4330B1_002.001.003.0634.0678.hcd
Wi-Fi Firmware Rev 5.90.125.1191

EUT driver software version: P3100.001

5.6. MODIFICATIONS

No modifications were made during testing.

5.7. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

CONFIGURATIONS 1 and 2

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	03/17/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	7/16/2012
Preamplifier, 1300 Hz	Agilent / HP	8447D	C00580	01/27/12
Antenna, Horn, 18 GHz	EMCO	3115	C00783	6/29/2012
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	7/12/2012
EMI Test Receiver, 9 kHz-7	R & S	ESCI 7	1000741	07/06/12
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/12
LISN, 30 MHz	Solar	8012-50-R-24-BNC	N02481	C.N.R.

CONFIGURATION 3

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Notebook PC	Lenovo	Type 2537-C84	R8-1EHNE	DoC
AC Adapter	Lenovo	42T4418	11S42T4430ZGW	DoC
USB Printer	HP	7850	MY56K1304B	DoC
AC Adapter	HP	0957-2084	571480654	DoC
USB Mouse	Ativa	7890-104	M0170513	DoC
Headset	Samsung	EHS64AVFWE	N/A	N/A

I/O CABLES

CONFIGURATION 1

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	Audio	1	Mini-Jack	Unshielded	1.2 m	Volume control attached

CONFIGURATION 2

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC Power	1	USB	Shielded	1.0 m	Standard A USB at ac adapter end, 30-pin connector at EUT end
2	Audio	1	Mini-Jack	Unshielded	1.2 m	Volume control attached

CONFIGURATION 3

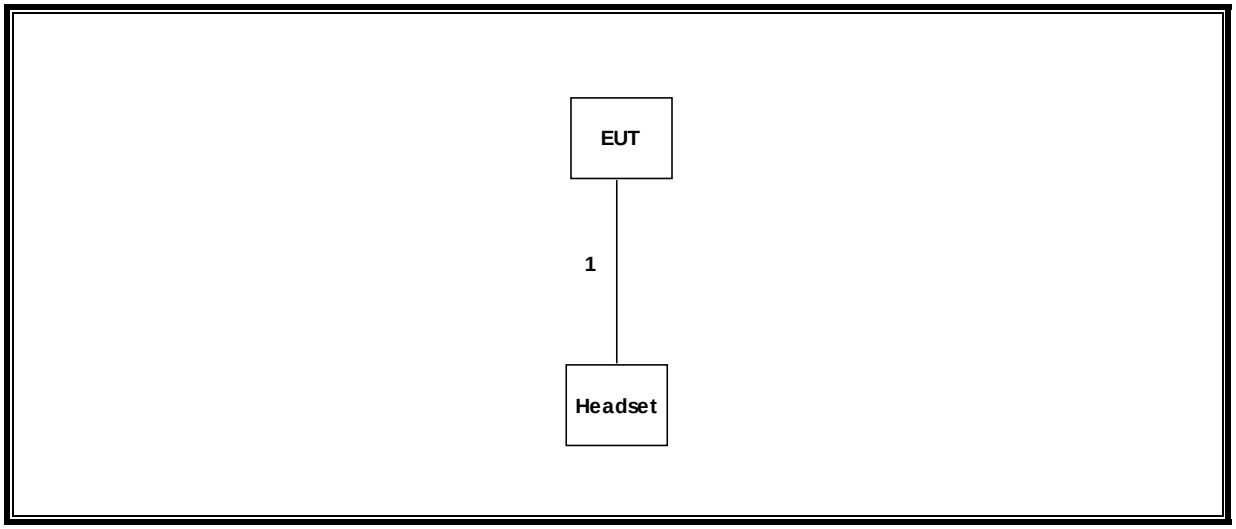
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC Power	1	2-Prong	Unshielded	1.0 m	--
2	AC Power	1	2-Prong	Unshielded	2.0 m	--
3	DC Power	1	Mini-Jack	Unshielded	1.75 m	Ferrite at PC End
4	DC Power	1	Bananna	Unshielded	2.0 m	--
5	USB	1	USB-A	Shielded	2.0 m	--
6	USB	1	USB	Shielded	1.0 m	Standard A USB at PC end, 30-pin connector at EUT end
7	Audio	1	Mini-Jack	Unshielded	1.2 m	--
8	USB	1	USB-A	Shielded	1.75 m	--

TEST SETUP

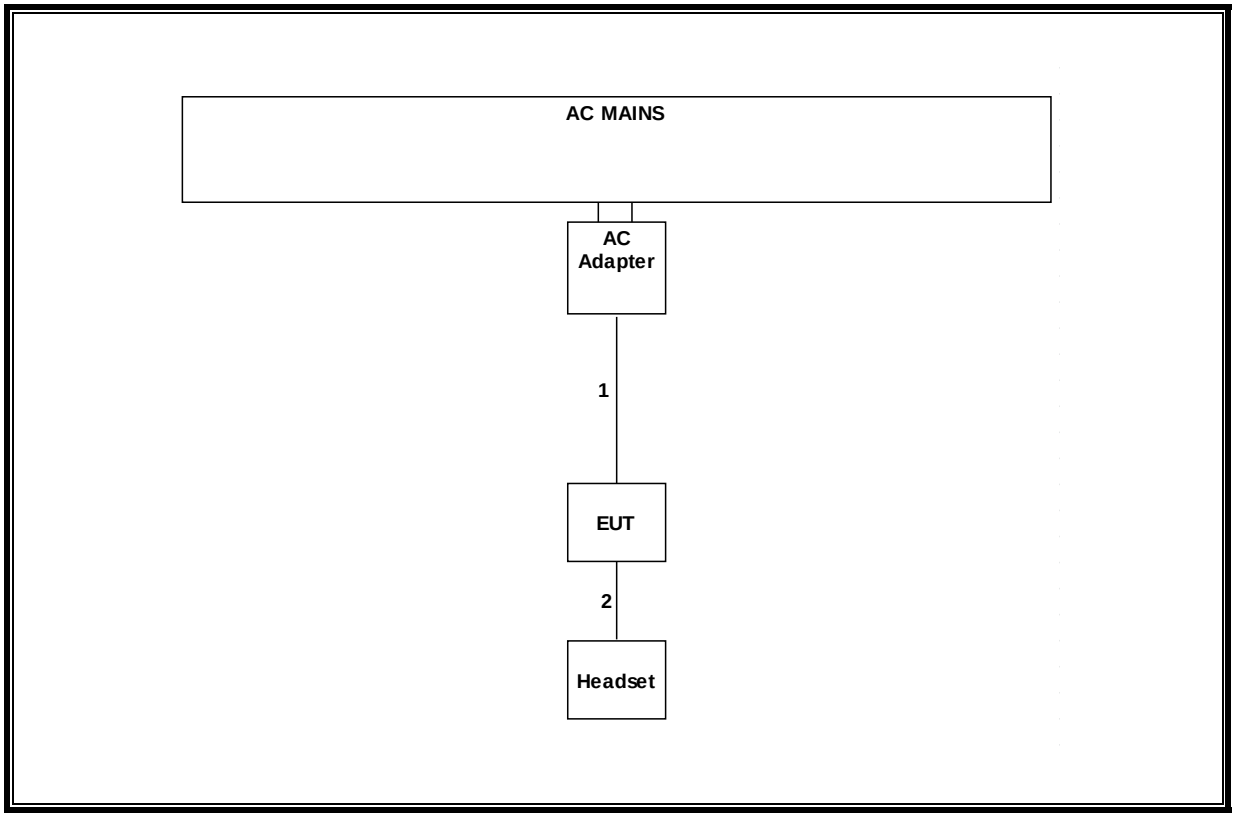
The EUT was installed in a typical configuration per the following diagrams. Test software exercised the EUT.

TEST SETUP DIAGRAM

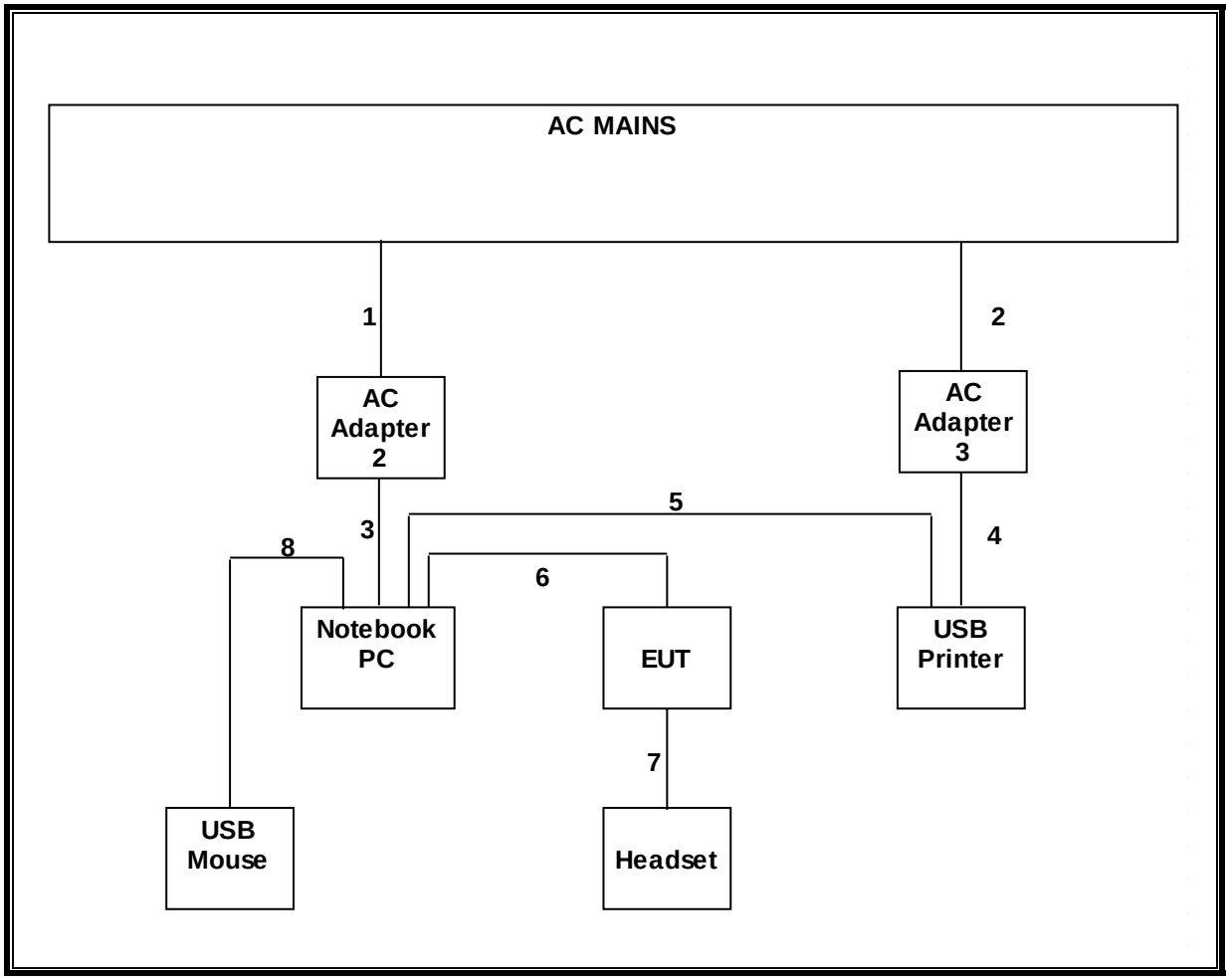
CONFIGURATION 1



CONFIGURATION 2



CONFIGURATION 3



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**	**Serial Number**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	3/17/2012
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	7/16/2012
Preamplifier, 1300 Hz	Agilent / HP	8447D	C00580	11/11/2012
Antenna, Horn, 18 GHz	EMCO	3115	C00783	6/29/2012
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	7/12/2012
EMI Test Receiver, 9 kHz-7	R & S	ESCI 7	1000741	7/6/2012
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/2012
LISN, 30 MHz	Solar	8012-50-R-24-BNC	N02481	C.N.R.

7. APPLICABLE LIMITS AND TEST RESULTS

7.1. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4

The highest clock frequency generated or used in the EUT is 1200 MHz; therefore the frequency range was investigated from 30 MHz to 6000 MHz.

LIMIT

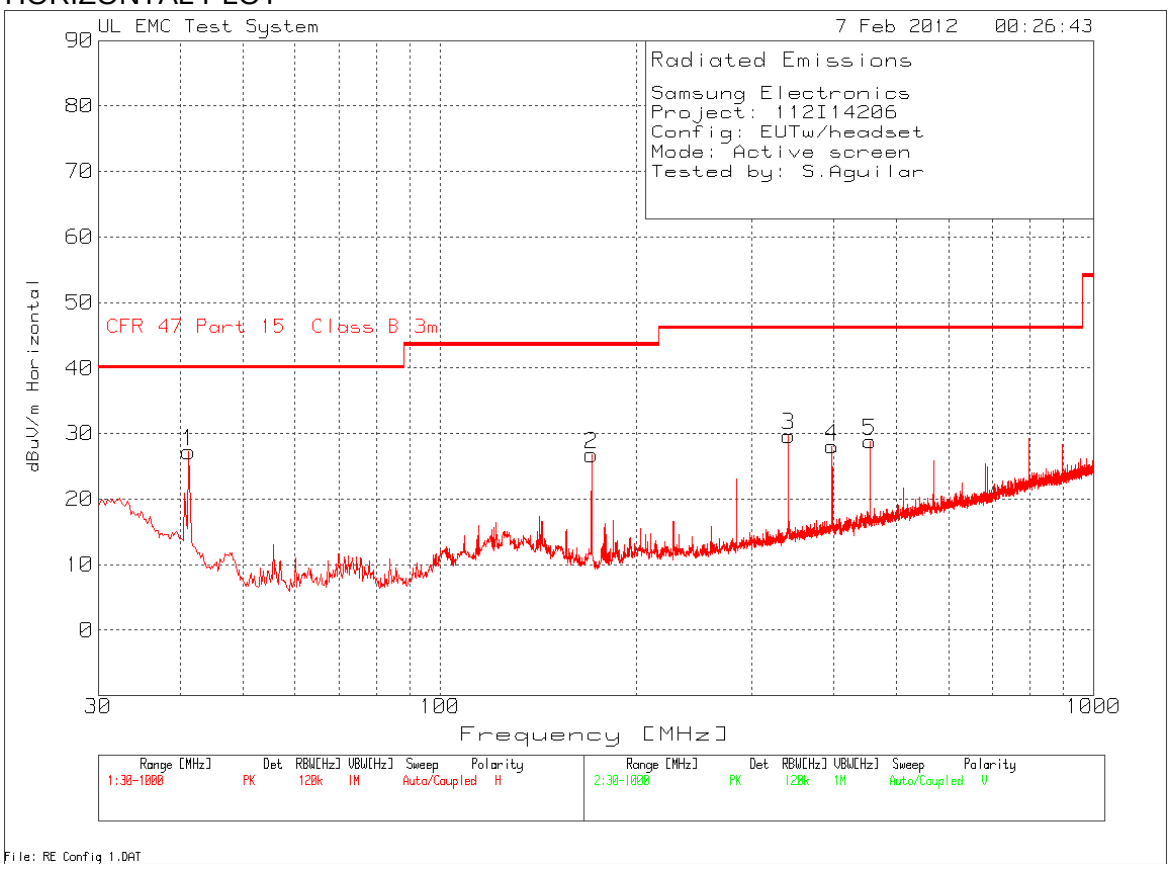
§15.109 (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dBµV/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.	

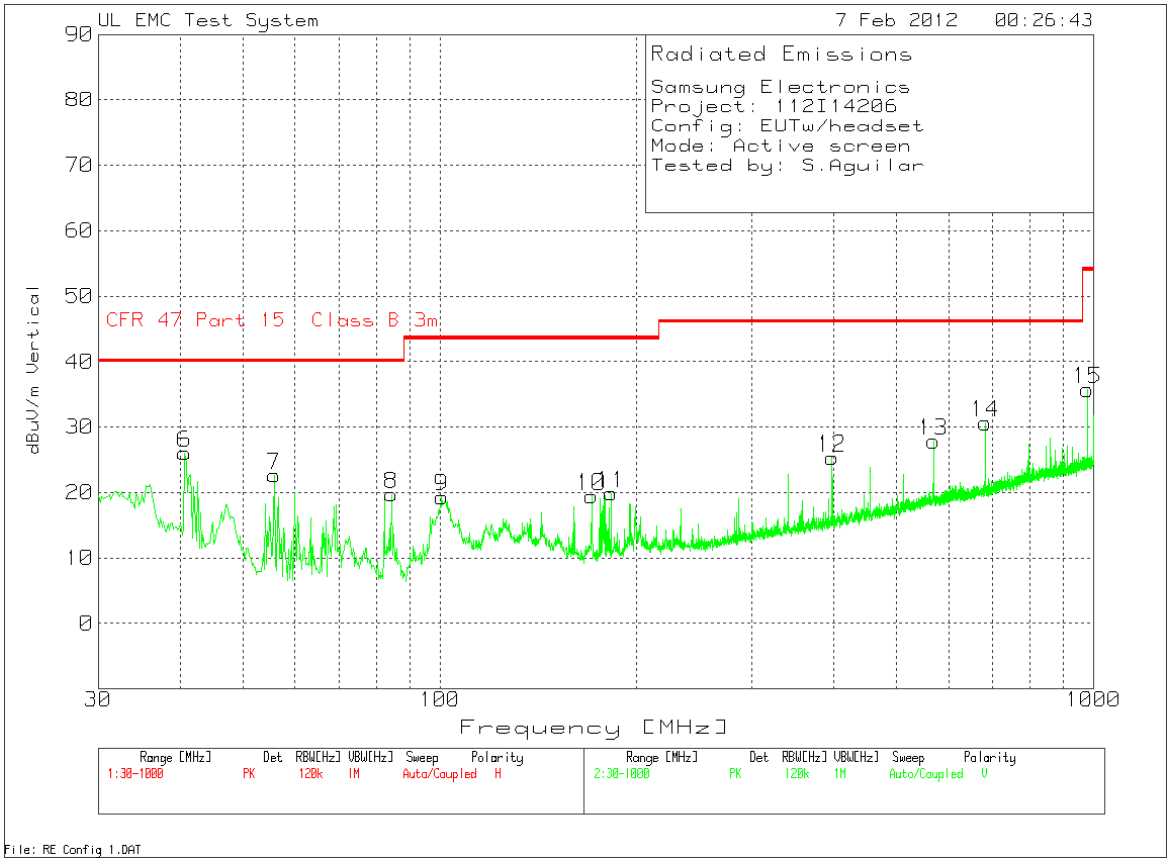
RESULTS

RADIATED EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION) – CONFIGURATION 1

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

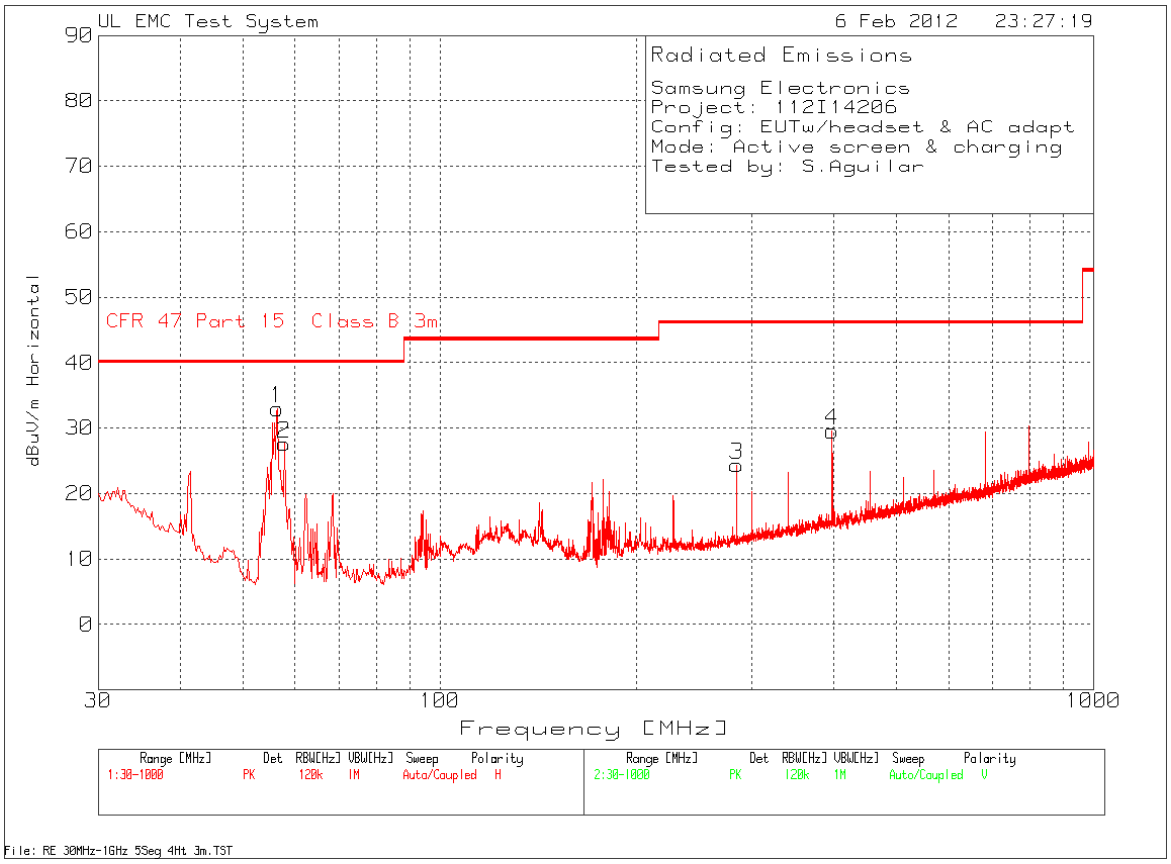
Samsung Electronics
Project: 112I14206
Config: EUTw/headset
Mode: Active screen
Tested by: S.Aguilar

Test Frequency	Meter Reading	Detector	Amplifier [dB]	T130 Bilog [dB]	Corrected dBuV/m	Class B 3m limit	QP Margin	Height [cm]	Polarity
41.243	43.12	PK	-29.2	13.3	27.22	40	-12.78	200	Horz
170.5376	44.49	PK	-27.8	10.1	26.79	43.5	-16.71	200	Horz
341.3149	42.47	PK	-26.8	14	29.67	46	-16.33	100	Horz
398.1115	39.97	PK	-26.9	15	28.07	46	-17.93	100	Horz
455.1019	39.85	PK	-27	16	28.85	46	-17.15	100	Horz
40.6615	41.54	PK	-29.2	13.7	26.04	40	-13.96	100	Vert
55.7814	43.75	PK	-29	7.9	22.65	40	-17.35	200	Vert
84.2766	40.94	PK	-28.7	7.5	19.74	40	-20.26	300	Vert
100.5596	37.72	PK	-28.6	10.2	19.32	43.5	-24.18	100	Vert
170.5376	37.17	PK	-27.8	10.1	19.47	43.5	-24.03	200	Vert
182.7498	36.59	PK	-27.7	11	19.89	43.5	-23.61	200	Vert
398.1115	37.23	PK	-26.9	15	25.33	46	-20.67	200	Vert
568.8889	36.74	PK	-26.7	17.8	27.84	46	-18.16	100	Vert
682.6759	37.84	PK	-26.3	19.1	30.64	46	-15.36	100	Vert
978.4832	37.62	PK	-24.3	22.4	35.72	54	-18.28	100	Vert

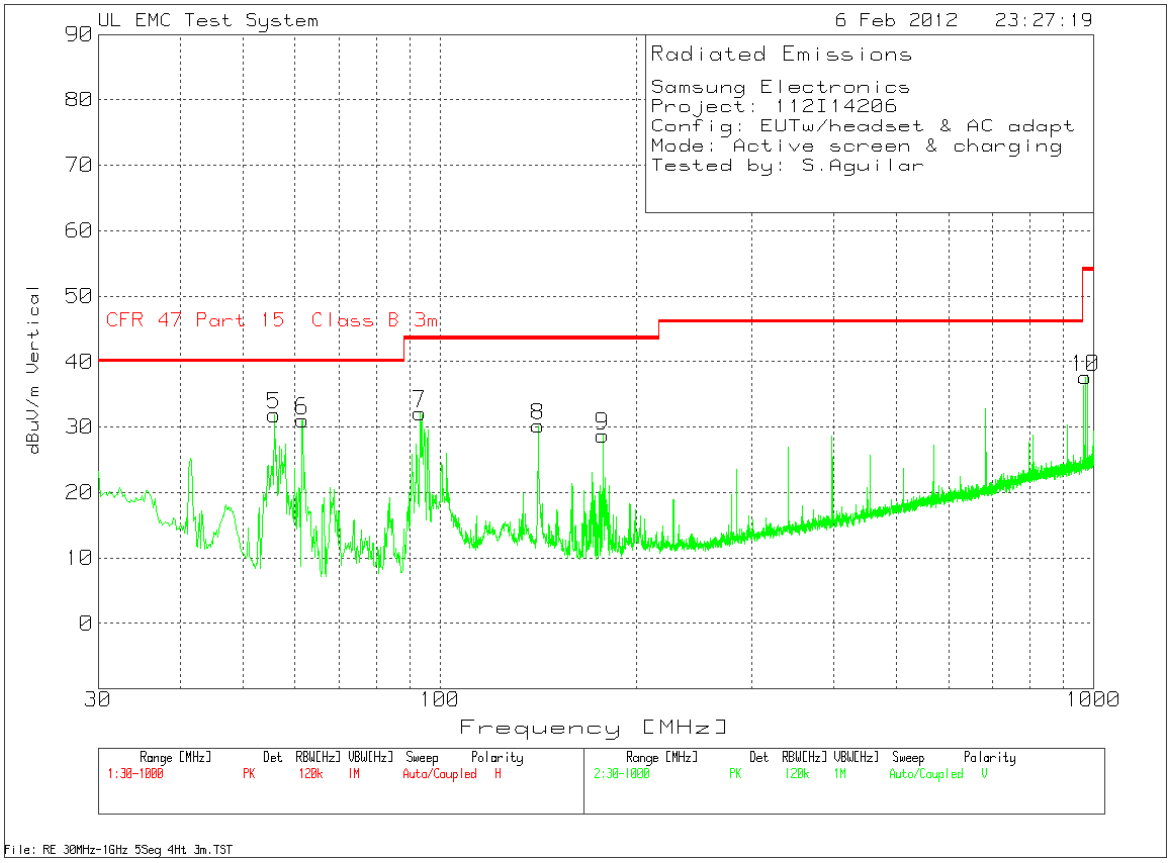
PK - Peak detector
QP - Quasi-peak detector

CONFIGURATION 2

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

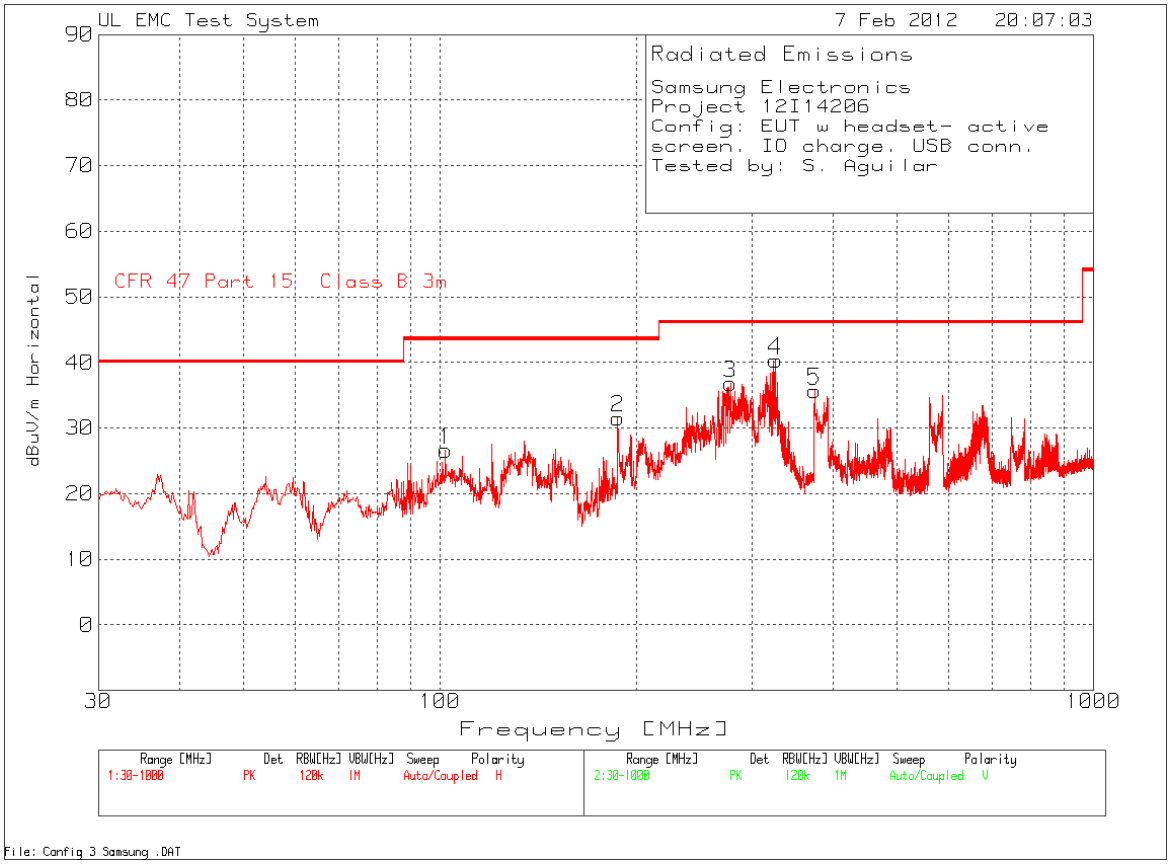
Samsung Electronics
Project: 112I14206
Config: EUTw/headset & AC adapt
Mode: Active screen & charging
Tested by: S.Aguilar

Test Frequency	Meter Reading	Detector	Amplifier [dB]	T130 Bilog [dB]	Corrected dBuV/m	Class B 3m limit	QP Margin	Height [cm]	Polarity
56.3629	54.08	PK	-29	7.9	32.98	40	-7.02	400	Horz
57.7198	48.7	PK	-29	7.9	27.6	40	-12.4	400	Horz
284.5184	38.44	PK	-26.9	12.8	24.34	46	-21.66	100	Horz
398.1115	41.45	PK	-26.9	15	29.55	46	-16.45	100	Horz
55.7814	53	PK	-29	7.9	31.9	40	-8.1	100	Vert
61.5967	52.05	PK	-28.9	7.9	31.05	40	-8.95	100	Vert
93.1934	52.43	PK	-28.6	8.3	32.13	43.5	-11.37	200	Vert
141.4608	45.21	PK	-28.1	13.1	30.21	43.5	-13.29	100	Vert
177.3221	46.13	PK	-27.8	10.4	28.73	43.5	-14.77	100	Vert
971.5048	39.63	PK	-24.3	22.3	37.63	54	-16.37	100	Vert

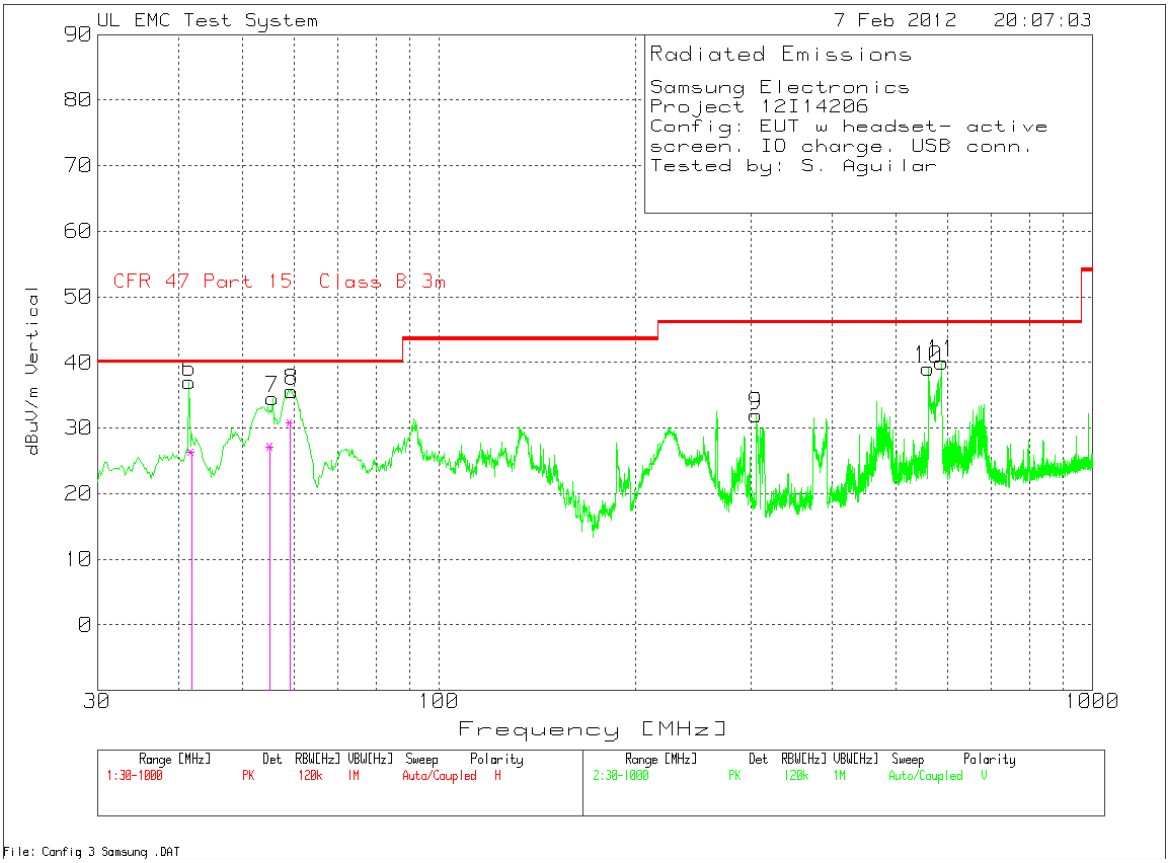
PK - Peak detector
QP - Quasi-peak detector

CONFIGURATION 3

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Samsung Electronics
12I14206
2/7/2012
Test Engineer: S.Aguilar
Configuration: EUT with headset and Laptop connection
Mode: Acive monitoir and audio while in charging mode.

Test Frequency	Meter Reading	Detector	Amplifier [dB]	T130 Bilog [dB]	Corrected dBuV/m	Class B 3m limit	QP Margin	Height [cm]	Polarity
101.9165	44.72	PK	-28.5	10.4	26.62	43.5	-16.88	100	Horz
187.0144	48.12	PK	-27.7	11.1	31.52	43.5	-11.98	100	Horz
278.1215	51.1	PK	-26.9	12.6	36.8	46	-9.2	100	Horz
326.0012	53.31	PK	-26.7	13.7	40.31	46	-5.69	100	Horz
374.0747	47.88	PK	-26.8	14.6	35.68	46	-10.32	100	Horz
41.4369	53.01	PK	-29.2	13.2	37.01	40	-2.99	100	Vert
41.8079	42.52	QP	-29.2	13	26.32	40	-13.68	101	Vert
55.5875	55.64	PK	-29	7.9	34.54	40	-5.46	100	Vert
55.1486	48.2	QP	-29	7.9	27.1	40	-12.9	106	Vert
59.4644	56.74	PK	-29	7.9	35.64	40	-4.36	100	Vert
59.1956	51.9	QP	-29	7.9	30.8	40	-9.2	101	Vert
305.4536	45.38	PK	-26.8	13.4	31.98	46	-14.02	100	Vert
560.7474	48.18	PK	-26.8	17.7	39.08	46	-6.92	100	Vert
587.6918	48.51	PK	-26.6	18.1	40.01	46	-5.99	100	Vert

PK - Peak detector
QP - Quasi-peak detector

RADIATED EMISSIONS ABOVE 1000 MHz – WORST-CASE

CONFIGURATION 3:

HORIZONTAL AND VERTICAL DATA

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber-B

Company: Samsung Electronics
Project #: 12I14206
Date: 02/07/2012
Test Engineer: S.Aguilar
Configuration: EUT with headset and Laptop connection
Mode: Acive monitoir and audio while in charging mode.

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A0056			FCC Class B

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
1.076	3.0	54.2	36.7	24.2	2.7	-35.9	0.0	0.0	45.1	27.6	74	54	-28.9	-26.4	V
1.211	3.0	53.4	36.3	24.8	2.9	-35.8	0.0	0.0	45.2	28.1	74	54	-28.8	-25.9	V
1.605	3.0	52.8	35.2	26.6	3.3	-35.6	0.0	0.0	47.1	29.5	74	54	-26.9	-24.5	V
2.125	3.0	55.5	35.8	28.4	3.9	-35.4	0.0	0.0	52.5	32.8	74	54	-21.5	-21.2	V
1.028	3.0	54.1	37.1	23.9	2.7	-35.9	0.0	0.0	44.8	27.8	74	54	-29.2	-26.2	H
1.442	3.0	52.5	35.4	25.8	3.2	-35.7	0.0	0.0	45.8	28.7	74	54	-28.2	-25.3	H
1.494	3.0	51.4	35.1	26.1	3.2	-35.7	0.0	0.0	45.0	28.7	74	54	-29.0	-25.3	H
2.130	3.0	54.1	35.2	28.4	3.9	-35.4	0.0	0.0	51.1	32.2	74	54	-22.9	-21.8	H
3.120	3.0	50.0	33.6	30.8	4.9	-35.2	0.0	0.0	50.5	34.1	74	54	-23.5	-19.9	H
															H

Rev. 07.08.11

Note: No other emissions up to 6 GHz were detected above the system noise floor.

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		

7.2. 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 μH/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 (dBμV)	
	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.		

RESULTS – CONFIGURATION 2

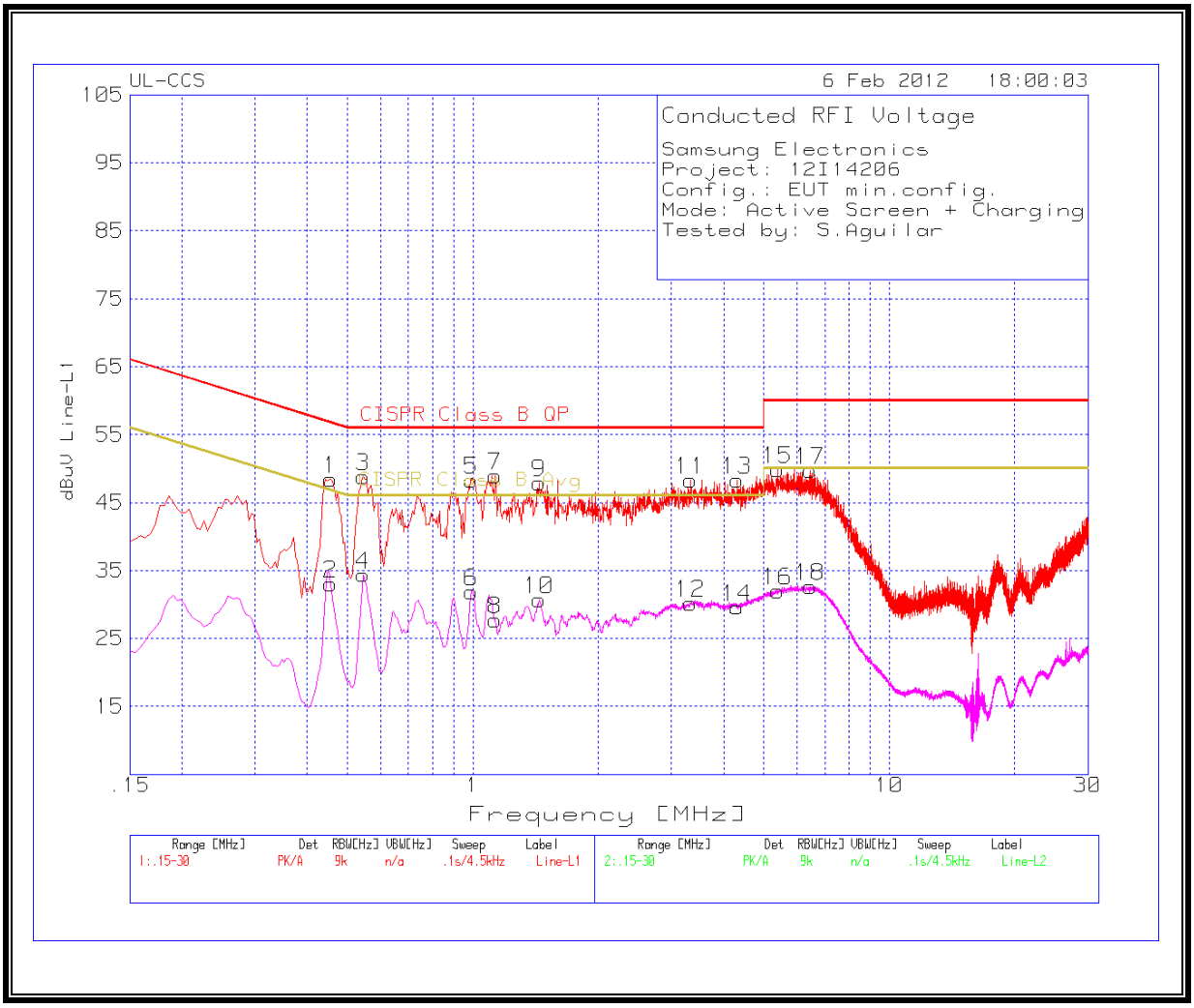
6 WORST EMISSIONS

Samsung Electronics
Project: 12I14206
Config.: EUT min.config.
Mode: Active Screen + Charging
Tested by: S.Aguilar

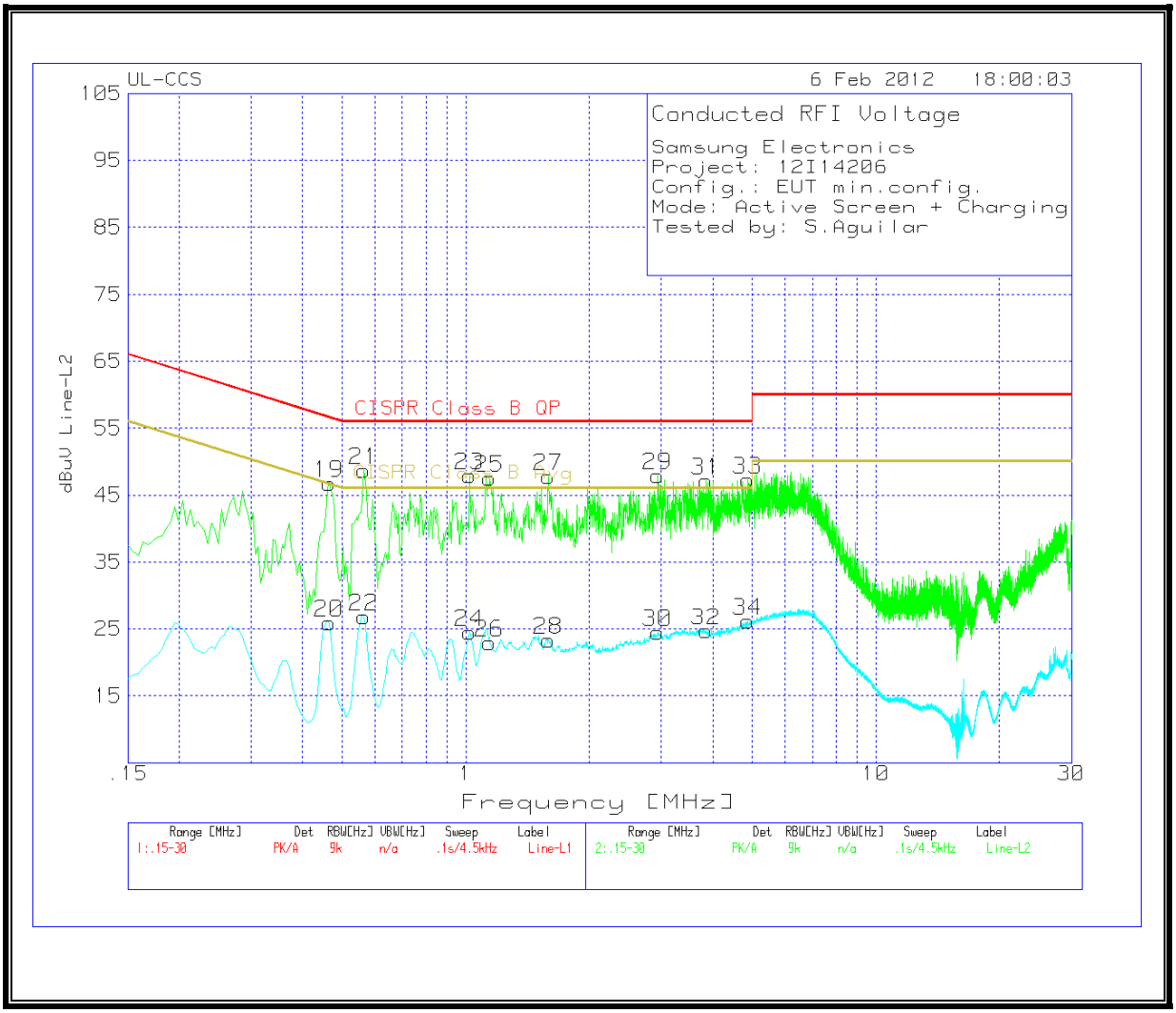
Test Frequency	Meter Reading	Detector	T24 LISN [dB]	Cables [dB]	Corrected dBuV	CISPR Class B QP Limit	QP Margin	CISPR Class B Av Limit	Av Margin
Line-L1 .15 - 30MHz									
0.546	48.69	PK	0.1	0	48.79	56	-7.21	-	-
0.546	34.29	Av	0.1	0	34.39	-	-	46	-11.61
0.9915	48.2	PK	0.1	0	48.3	56	-7.7	-	-
0.9915	31.74	Av	0.1	0	31.84	-	-	46	-14.16
1.131	48.8	PK	0.1	0	48.9	56	-7.1	-	-
1.131	27.64	Av	0.1	0	27.74	-	-	46	-18.26
Line-L2 .15 - 30MHz									
0.564	48.61	PK	0.1	0	48.71	56	-7.29	-	-
0.564	26.68	Av	0.1	0	26.78	-	-	46	-19.22
1.023	47.77	PK	0.1	0	47.87	56	-8.13	-	-
1.023	24.35	Av	0.1	0	24.45	-	-	46	-21.55
1.1445	47.41	PK	0.1	0	47.51	56	-8.49	-	-
1.1445	22.89	Av	0.1	0	22.99	-	-	46	-23.01

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector

LINE 1 RESULTS



LINE 2 RESULTS



RESULTS – CONFIGURATION 3

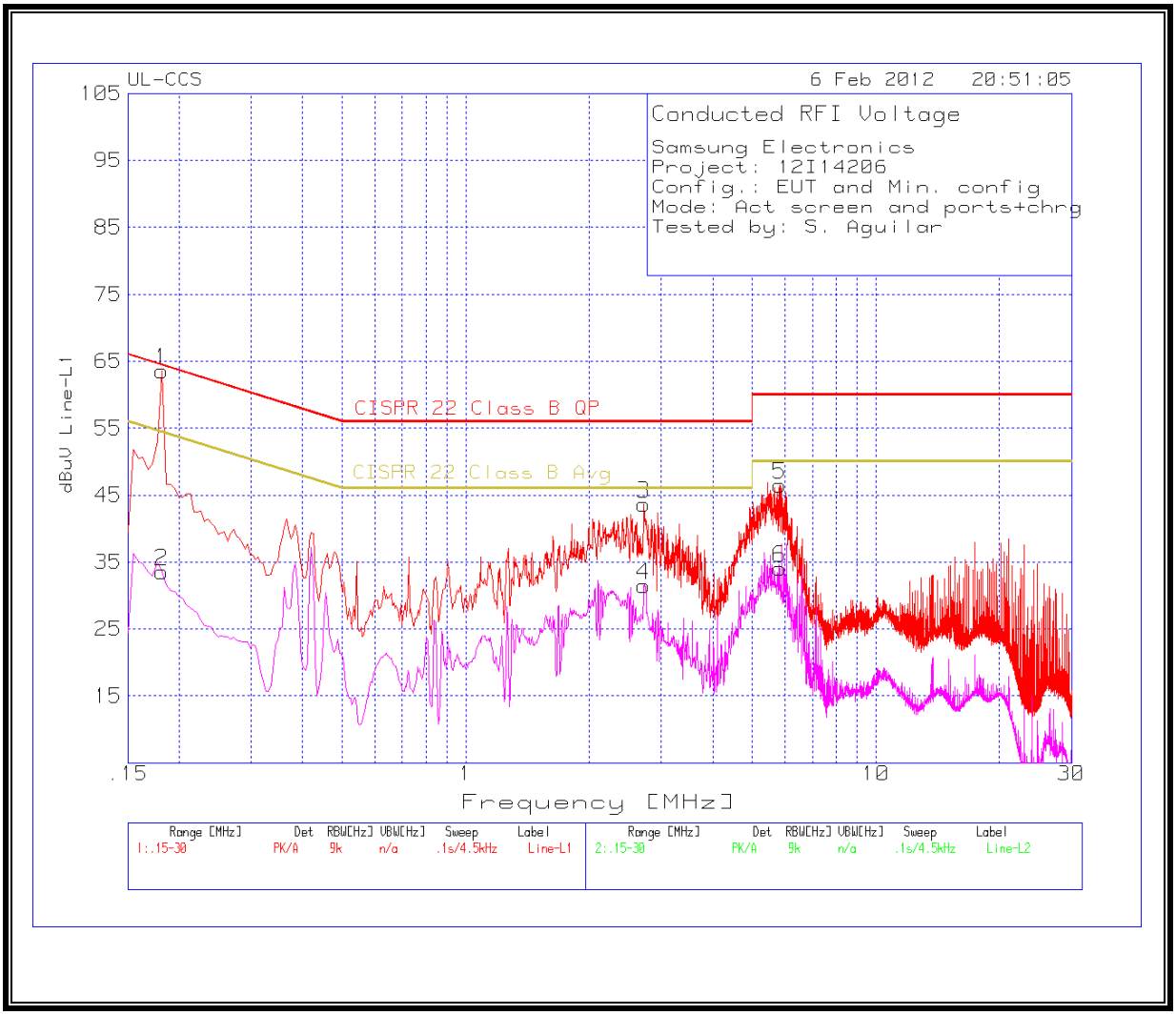
6 WORST EMISSIONS

Samsung Electronics
Project: 12I14206
Config.: EUT and Laptop Min. config
Mode: Act screen and ports+chrg
Tested by: S. Aguilar

Test Frequency	Meter Reading	Detector	T24 LISN [dB]	Cables [dB]	Corrected dBuV	CISPR 22 Class B QP Limit	QP Margin	CISPR 22 Class B Av limit	Av Margin
Line-L1 .15 - 30MHz									
0.1815	63.44	PK	0.1	0	63.54	64.4	-0.86	-	-
0.1815	33.43	Av	0.1	0	33.53	-	-	54.4	-20.87
2.7195	43.43	PK	0.1	0.1	43.63	56	-12.37	-	-
2.7195	31.32	Av	0.1	0.1	31.52	-	-	46	-14.48
5.8335	46.32	PK	0.1	0.1	46.52	60	-13.48	-	-
5.8335	33.82	Av	0.1	0.1	34.02	-	-	50	-15.98
Line-L2 .15 - 30MHz									
0.1725	62.33	PK	0.1	0	62.43	64.8	-2.37	-	-
0.1725	35.16	Av	0.1	0	35.26	-	-	54.8	-19.54
3.444	42.66	PK	0.1	0.1	42.86	56	-13.14	-	-
3.444	29.63	Av	0.1	0.1	29.83	-	-	46	-16.17
5.289	48.08	PK	0.1	0.1	48.28	60	-11.72	-	-
5.289	37.17	Av	0.1	0.1	37.37	-	-	50	-12.63

PK - Peak detector
QP - Quasi-Peak detector
Av - Average detector

LINE 1 RESULTS



LINE 2 RESULTS