FCC 47 CFR PART 15 SUBPART B

TEST REPORT

FOR

GSM + BLUETOOTH PHONE

MODEL NUMBER: SM-B360E

FCC ID: A3LSMB360E

REPORT NUMBER: 14I18850-E3 Revision A

ISSUE DATE: SEPTEMBER 26, 2014

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	9/22/14	Initial Issue	P. Zhang
A	9/26/14	Add AC line conducted emission setup photo	P. Zhang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO. LTD

EUT DESCRIPTION: GSM + BLUETOOTH PHONE

MODEL: SM-B360E

SERIAL NUMBER: RV1F923GP8Z

DATE TESTED: SEPTEMBER 19-22, 2014

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

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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
	☐ Chamber G
	☐ Chamber H

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:

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

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 GSM + BLUETOOTH PHONE.

GENERAL INFORMATION

Power Requirements	Input: 150-300VAC / 50-60Hz Output: 4.75V, 0.55A
List of frequencies generated or used by the EUT	312MHz

SUBASSEMBLIES

The EUT was constructed using the following sub-assemblies:

Subassembly Description	Manufacturer	Part Number
USB cable	SAMSUNG	N/A

4.2. PRELIMINARY TEST CONFIGURATIONS

The following configurations were investigated during preliminary testing:

EUT Configuration	Description
1	EUT with USB adapter and headset

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

4.3. MODE(S) OF OPERATION

Mode	Description
1	EUT with headset in standby mode , charging via USB cable plugged into laptop,

4.4. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
USB drive	Monster	N/A	N/A	N/A
Ethernet Switch	CISCO	EZXS55W	R9160K909280	N/A
Laptop	Lenovo	T440s	N/A	TP00490A
AC Charger	Lenovo	ADLX65NLT2A	11S45N0319Z1ZLZF2BT4X9	N/A

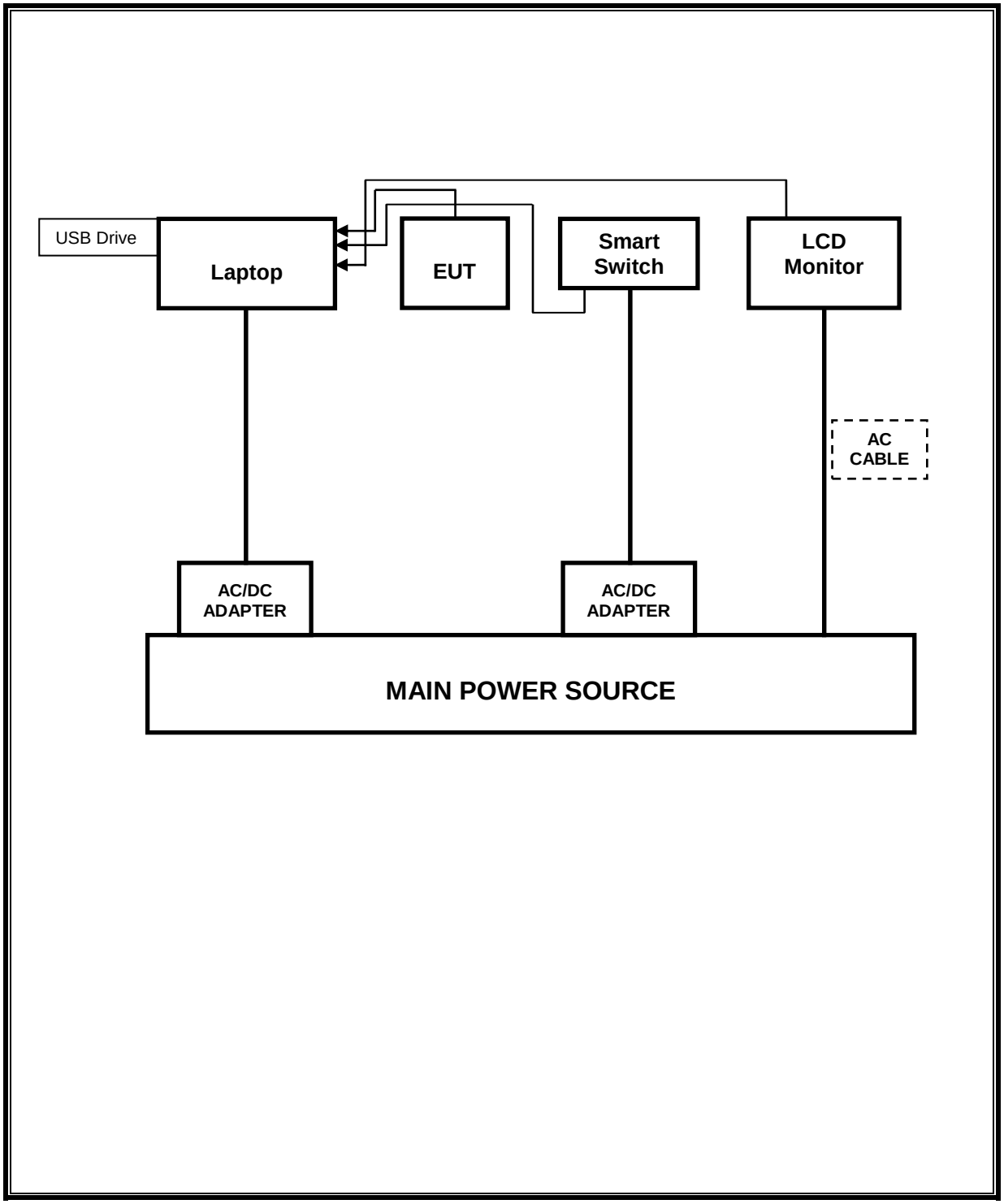
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**No. of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB(Laptop)	1	mini USB	USB	1	
1	RJ 45 (Laptop)	1	RJ45	RJ45	1.5	

TEST SETUP

The EUT with headset is in standby mode while connected to the laptop via USB cable.

TEST SETUP DIAGRAM



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
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/12/15
Spectrum Analyzer, 44 GHz	Agilent	N9030A	F00127	02/21/15
Antenna, Horn, 18 GHz	ETS	3117	29301	01/06/15
EMI Test Receiver, 9 kHz-7GHz	R&S	ESCI 7	100935	08/14/15
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/15

5. APPLICABLE LIMITS AND TEST RESULTS

5.1. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4: 2009

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.

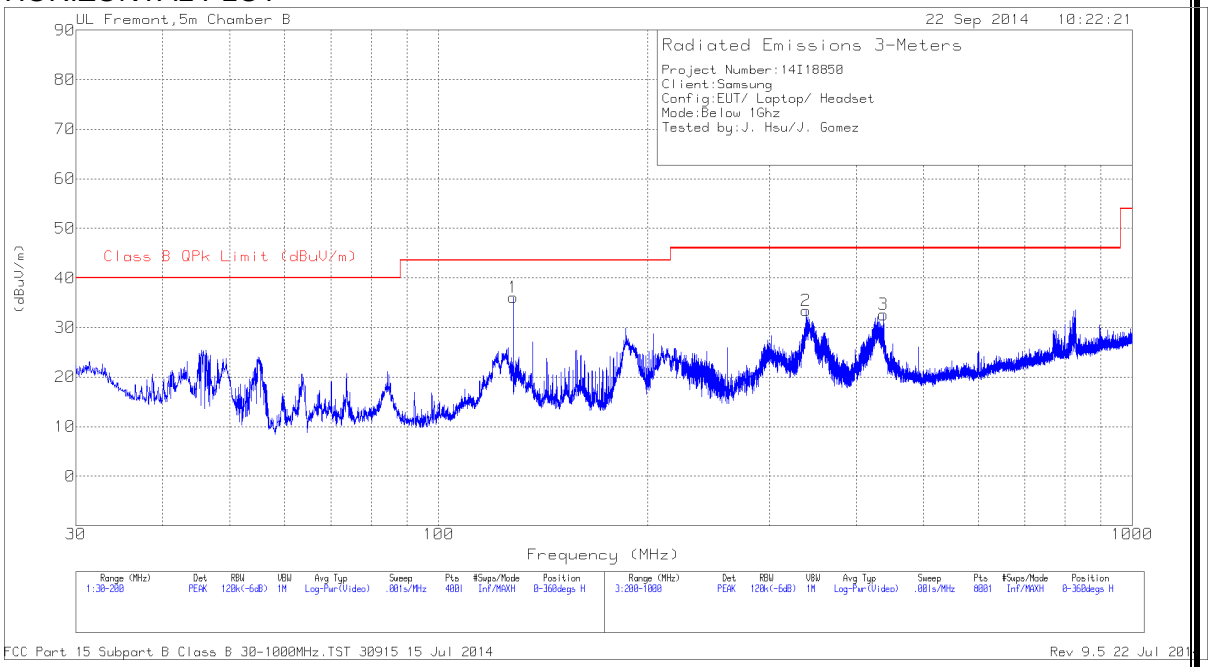
LIMIT

§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:

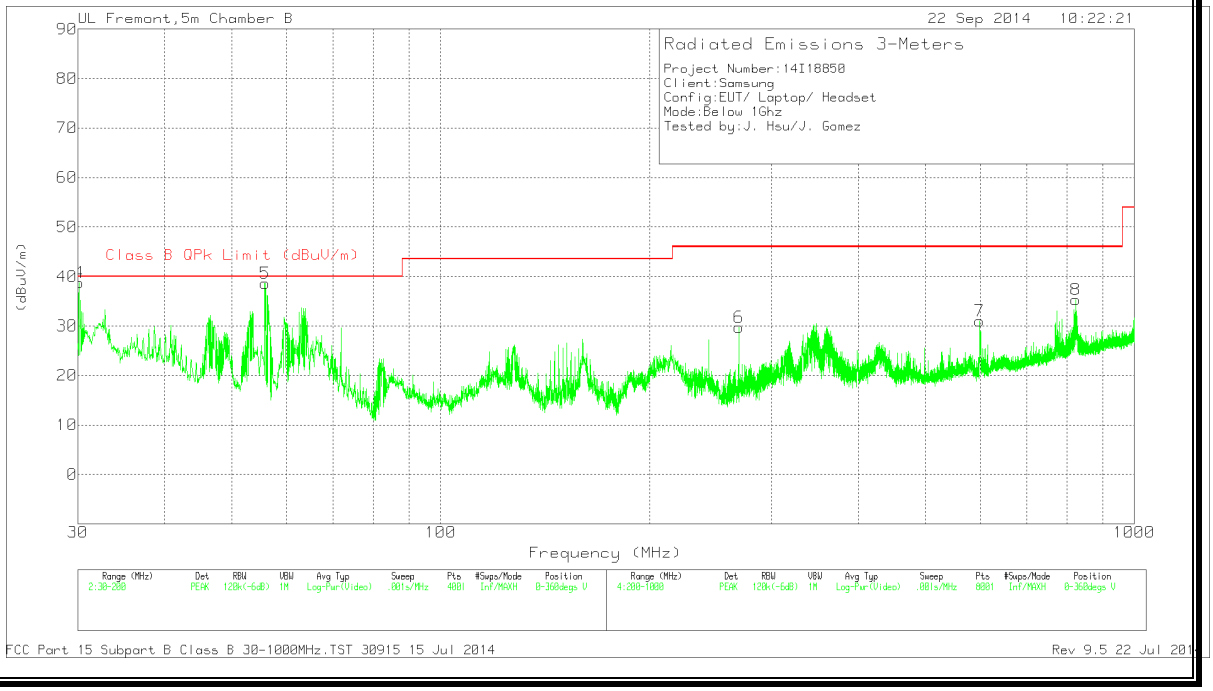
Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dBµV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54
Note: The lower limit shall apply at the transition frequency.	

EUT WITH LAPTOP BELOW 1GHZ RESULTS

HORIZONTAL PLOT



VERTICAL PLOT



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Class B QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	30.1275	46.26	PK	21.3	-28.8	38.76	40	-1.24	0-360	101	V
5	55.7975	59.97	PK	7.2	-28.5	38.67	40	-1.33	0-360	101	V
1	128.005	49.82	PK	14	-27.7	36.12	43.52	-7.4	0-360	200	H
6	269	42.78	PK	13.2	-26.2	29.78	46.02	-16.24	0-360	101	V
2	338.8	45.25	PK	14	-25.8	33.45	46.02	-12.57	0-360	101	H
3	438	41.9	PK	16.6	-25.9	32.6	46.02	-13.42	0-360	101	H
7	597.9	38.13	PK	18.3	-25.4	31.03	46.02	-14.99	0-360	101	V
8	824.1	37.46	PK	21.6	-23.7	35.36	46.02	-10.66	0-360	300	V

PK - Peak detector

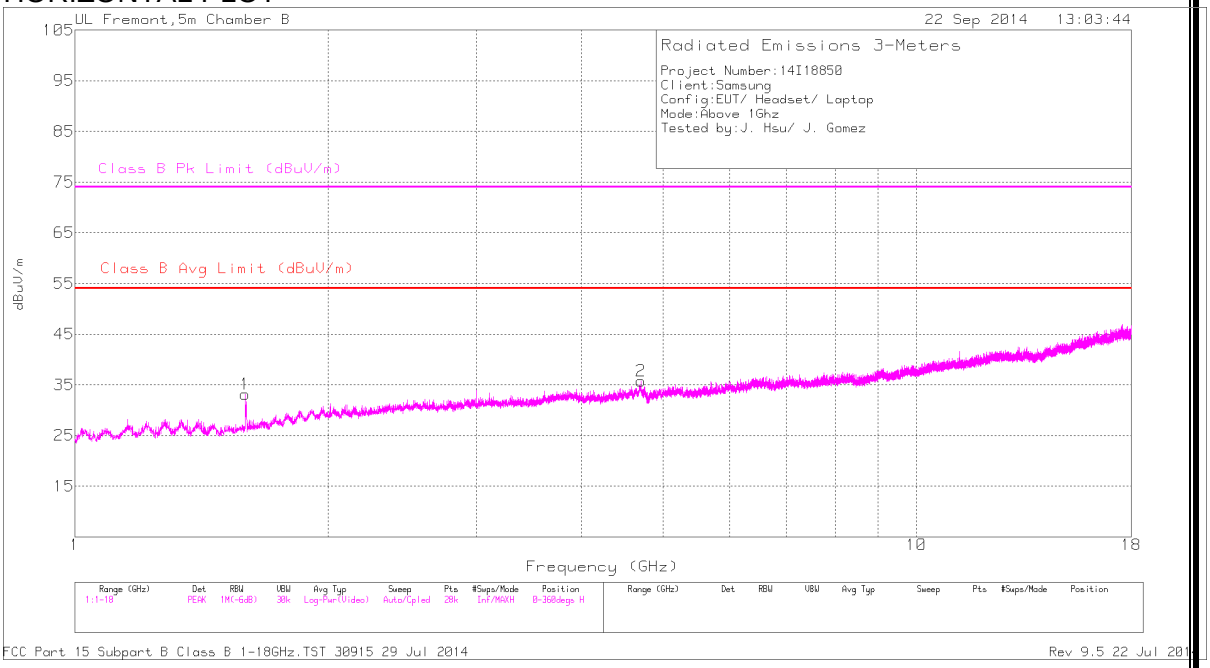
Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Class B QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
30.4259	32.66	QP	21.1	-28.8	24.96	40	-15.04	188	111	V
54.7991	36.48	QP	7.2	-28.5	15.18	40	-24.82	215	205	V

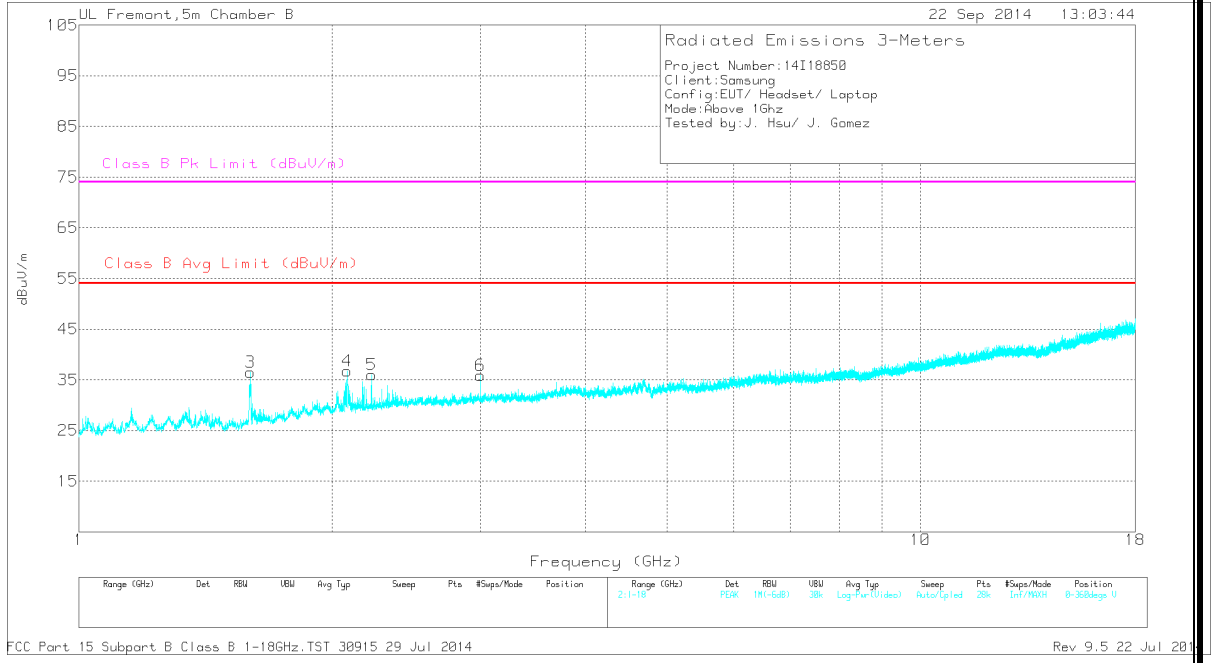
QP - Quasi-Peak detector

EUT WITH LAPTOP ABOVE 1GHZ RESULTS

HORIZONTAL PLOT



VERTICAL PLOT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl (dB)	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Av(CISPR) Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.594	38.53	PK	28.5	-33.9	33.13	-	-	74	-40.87	0-360	99	H
3	1.599	41.75	PK	28.5	-33.8	36.45	-	-	74	-37.55	0-360	102	V
4	2.085	38.83	PK	31.3	-33.4	36.73	-	-	74	-37.27	0-360	199	V
5	2.227	37.85	PK	31.4	-33.3	35.95	-	-	74	-38.05	0-360	199	V
6	3	35.6	PK	32.8	-32.5	35.9	-	-	74	-38.1	0-360	199	V
2	4.706	32.51	PK	34.2	-31	35.71	-	-	74	-38.29	0-360	199	H

PK - Peak detector

5.2. AC MAINS LINE CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.4: 2009

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.		

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	.168	58.59	PK	1.2	0	59.79	65.1	-5.31	-	-
2	.168	39.2	Av	1.2	0	40.4	-	-	55.1	-14.7
3	5.361	38.89	PK	.2	.1	39.19	60	-20.81	-	-
4	5.361	23.67	Av	.2	.1	23.97	-	-	50	-26.03
5	17.8845	39	PK	.3	.2	39.5	60	-20.5	-	-
6	17.8845	22.17	Av	.3	.2	22.67	-	-	50	-27.33

Line-L2 .15 - 30MHz

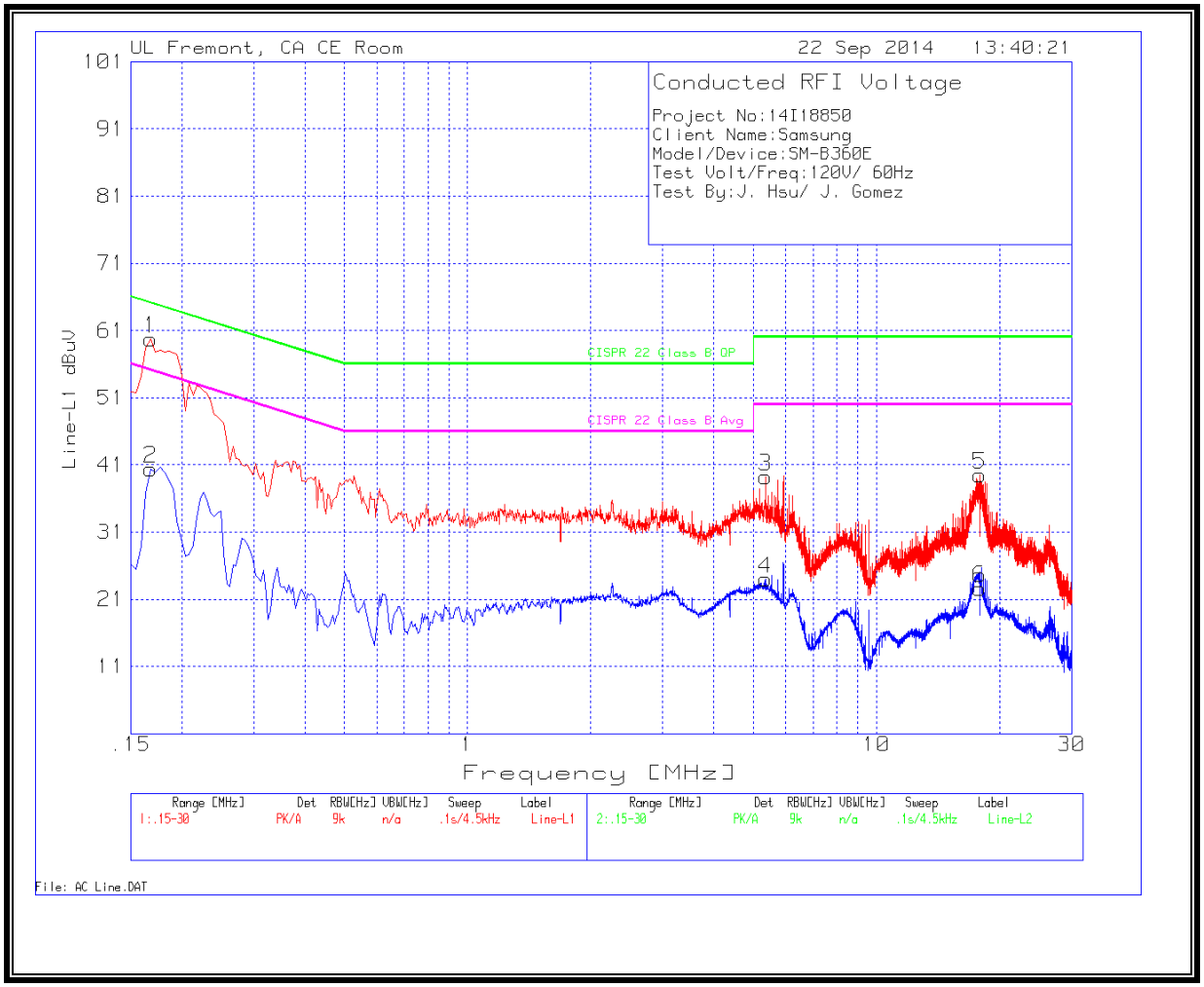
Trace Markers

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)
7	.177	58.3	PK	1.2	0	59.5	64.6	-5.1	-	-
8	.177	31.71	Av	1.2	0	32.91	-	-	54.6	-21.69
9	4.6545	38.41	PK	.2	.1	38.71	56	-17.29	-	-
10	4.6545	24.28	Av	.2	.1	24.58	-	-	46	-21.42
11	18.051	39.62	PK	.3	.2	40.12	60	-19.88	-	-
12	18.051	21.28	Av	.3	.2	21.78	-	-	50	-28.22

PK - Peak detector

Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS