



FCC 47 CFR PART 15 SUBPART B

TEST REPORT

FOR

GSM Phone + Bluetooth & WLAN 2.4GHz b/g/n

MODEL NUMBER: SM-G130E

FCC ID: A3LSMG130E

REPORT NUMBER: 14I17842-5

ISSUE DATE: June 9, 2014

**Prepared for
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Revision History

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM Phone + Bluetooth & WLAN 2.4GHz b/g/n

MODEL: SM-G130E

SERIAL NUMBER: RV1F50PX3TT, RV1F50PX3XJ, RV1F50PX3WZ (Radiated),
RV1F52W0HMX (Conducted)

DATE TESTED: June 9, 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 Benicia Street, Fremont, California, USA.

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

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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 GSM Phone + Bluetooth & WLAN 2.4GHz b/g/n.

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	1GHz , 26MHz

SUBASSEMBLIES

The EUT was constructed using the following subassemblies:

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Lenovo	T430	N/A	N/A
Earphone	Samsung	SM-G130E	N/A	N/A
Laptop	Lenovo	T430	N/A	N/A
Headset	Samsung	GH-59	N/A	N/A
USB drive	Kingstone	16GB	N/A	N/A

4.2. PRELIMINARY TEST CONFIGURATIONS

The following configurations were investigated during preliminary testing:

EUT Configuration	Description
1	EUT with Laptop

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

4.3. MODE(S) OF OPERATION

Mode	Description
1	Enabled WLAN, BT, NFC and WWAN under standby mode; USB data communication

4.4. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	SM-G130E	N/A	N/A
Earphone	Samsung	SM-G130E	N/A	N/A

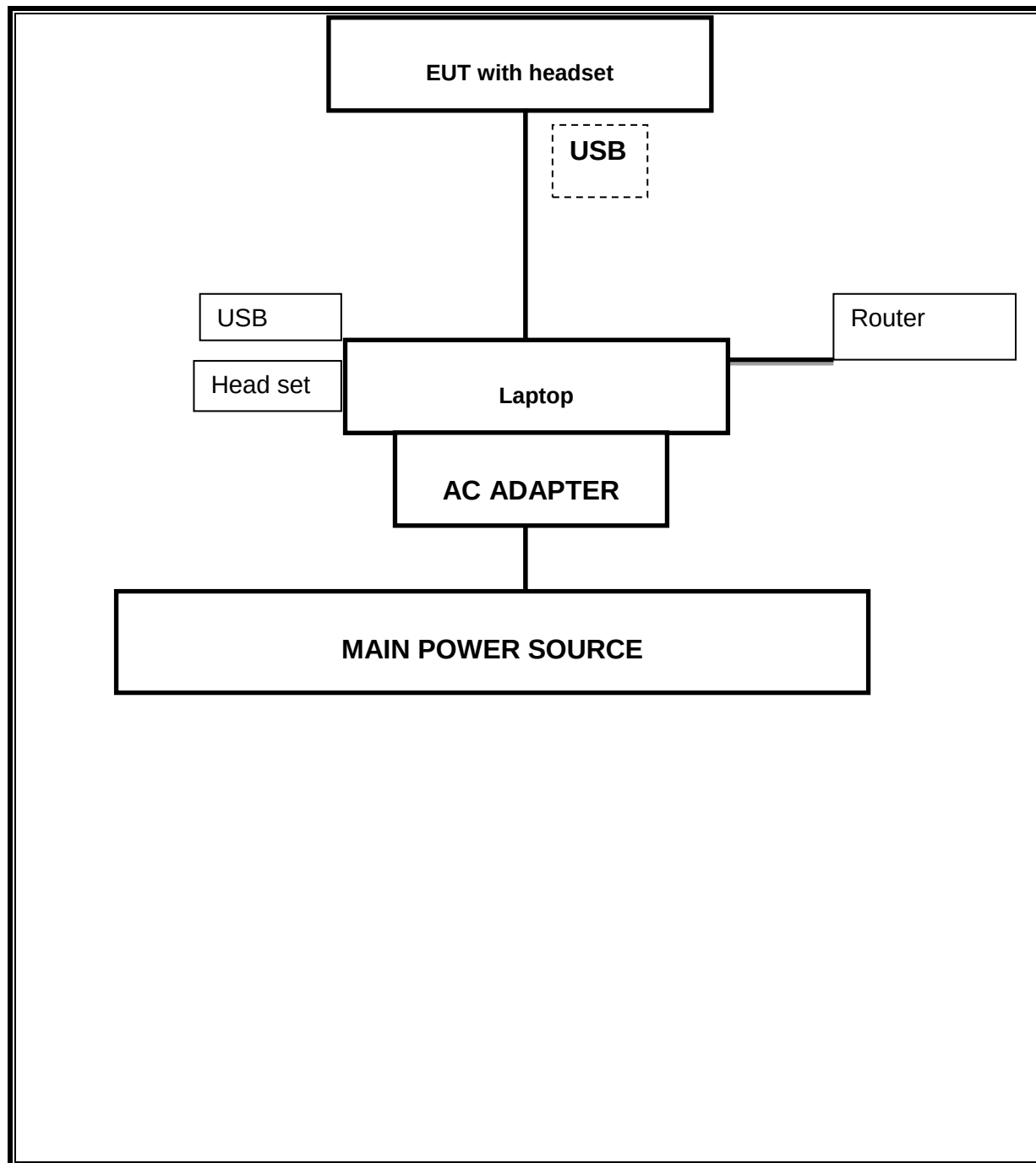
I/O CABLES

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	
2	USB(Laptop)	1	mini USB	USB	1	
3	DC(Laptop)	1	DC	DC cable	1	
4	AC adaptor	1	AC	AC cable	1.5	
5	Head set	2	head set	head set	1.5	
6	LAN(laptop)	1	RJ45	Ethernet	4	

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. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4

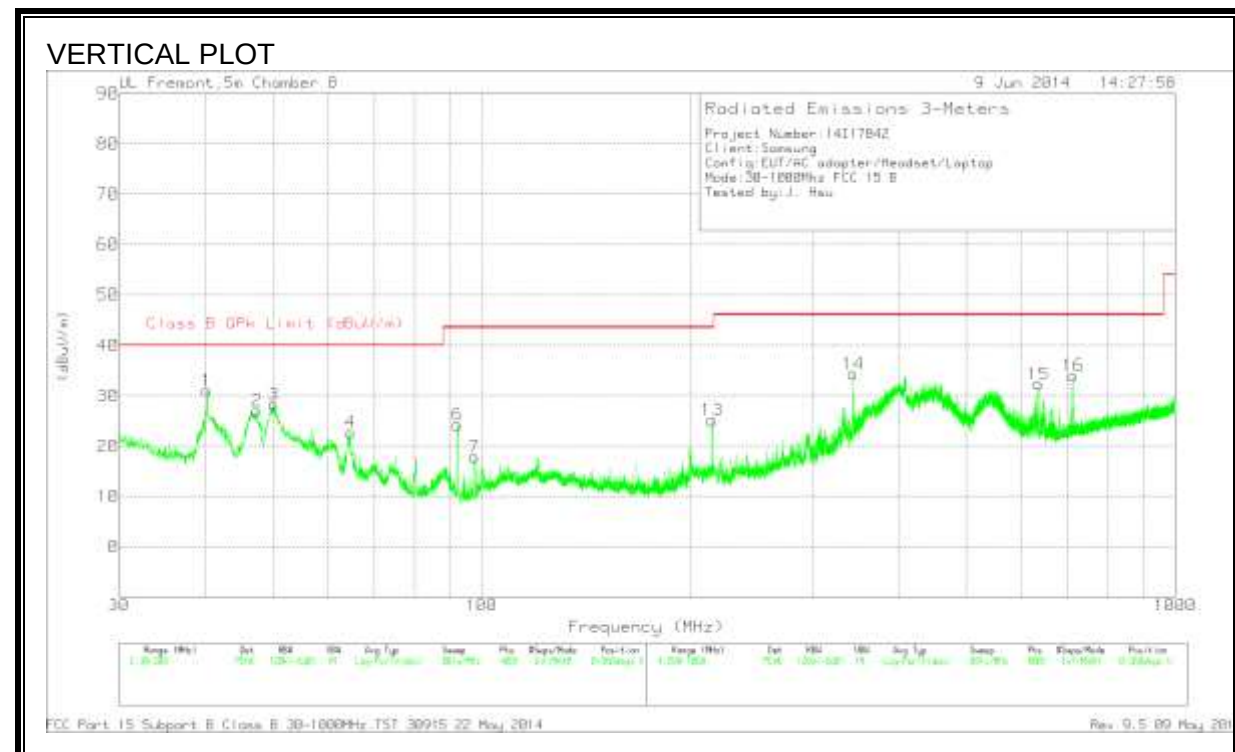
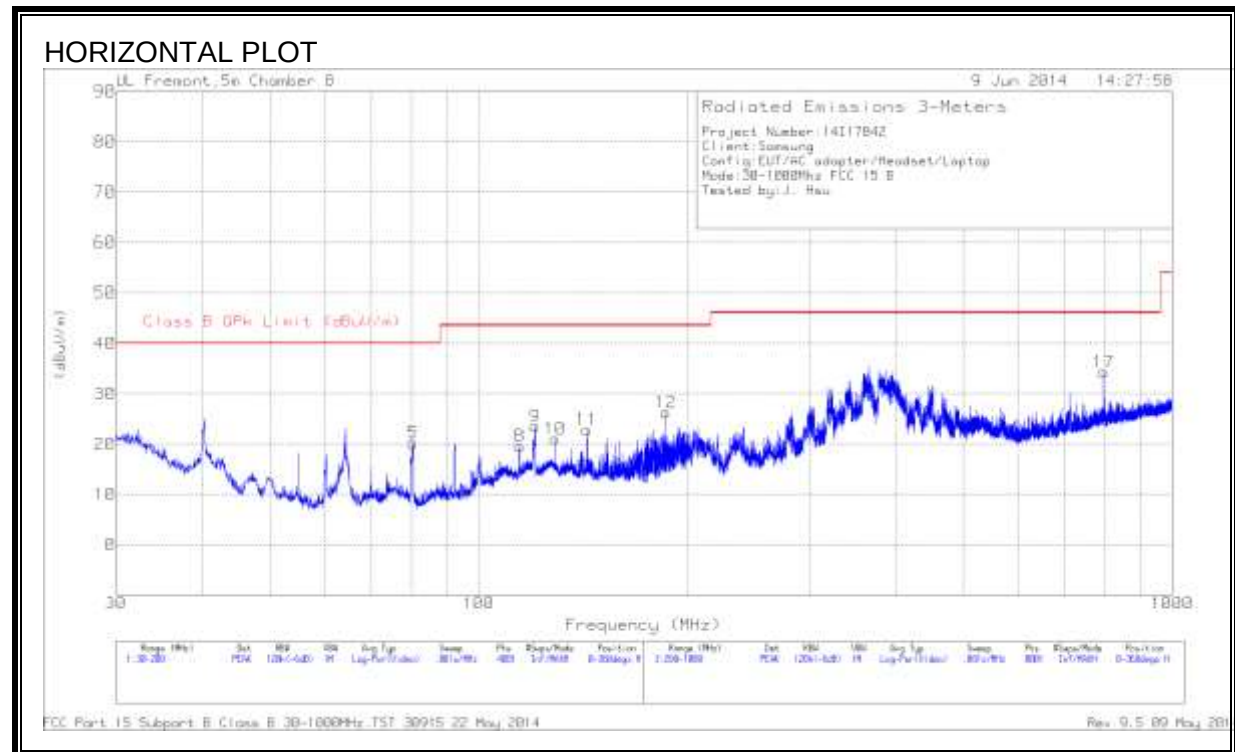
The highest clock frequency generated or used in the EUT is 26 MHz, therefore the frequency range was investigated from 30 MHz to 5000 MHz.

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 LAPTOP BELOW 1GHZ RESULTS

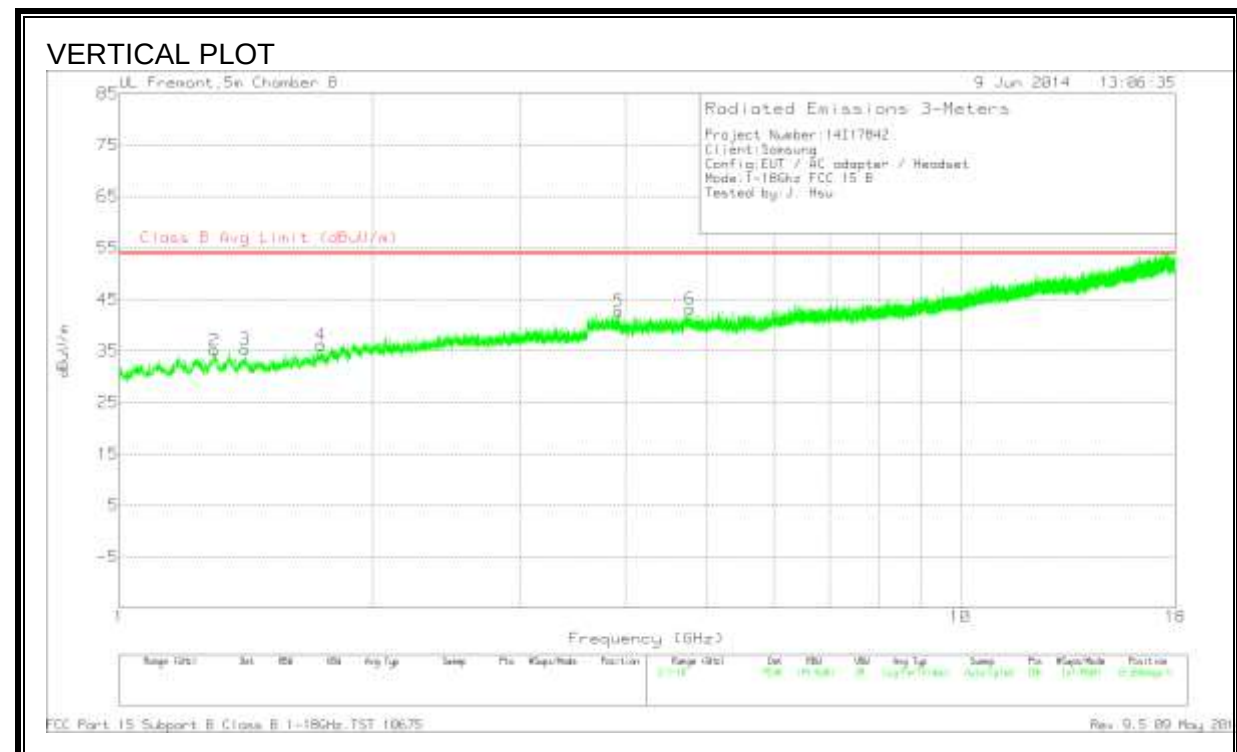
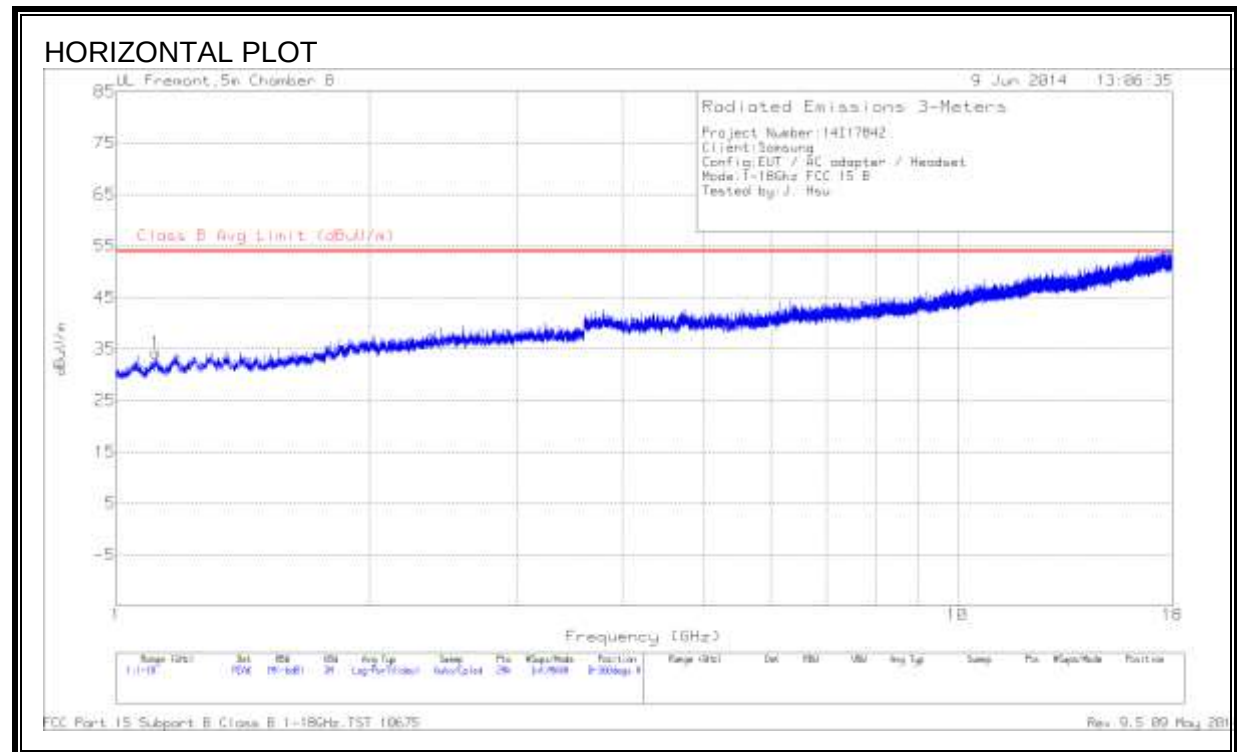


DATA

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
1	40.1575	45.91	PK	13.8	-28.7	31.01	40	-8.99	0-360	101	V
2	47.3825	46.53	PK	9.1	-28.6	27.03	40	-12.97	0-360	101	V
3	50.1875	48.87	PK	7.9	-28.5	28.27	40	-11.73	0-360	101	V
4	64.68	43.3	PK	7.8	-28.4	22.7	40	-17.3	0-360	101	V
5	80.3625	40.72	PK	7.7	-28.2	20.22	40	-19.78	0-360	200	H
6	92.2838	44.13	PK	8.2	-28.1	24.23	43.52	-19.29	0-360	101	V
7	97.7025	36.45	PK	9.5	-28.1	17.85	43.52	-25.67	0-360	101	V
8	114.5325	34.08	PK	13.4	-27.9	19.58	43.52	-23.94	0-360	200	H
9	120.4825	37.41	PK	13.9	-27.8	23.51	43.52	-20.01	0-360	200	H
10	128.855	34.72	PK	14	-27.7	21.02	43.52	-22.5	0-360	101	H
11	143.22	37.62	PK	12.7	-27.5	22.82	43.52	-20.7	0-360	200	H
12	186.145	42.35	PK	10.9	-27	26.25	43.52	-17.27	0-360	101	H
13	214.8	41.3	PK	10.6	-26.8	25.1	43.52	-18.42	0-360	200	V
14	343.5	46.08	PK	14	-25.8	34.28	46.02	-11.74	0-360	101	V
15	634.8	37.74	PK	19.6	-25.1	32.24	46.02	-13.78	0-360	101	V
16	713.1	38.14	PK	20.3	-24.5	33.94	46.02	-12.08	0-360	200	V
17	796.6	37.06	PK	21.1	-23.9	34.26	46.02	-11.76	0-360	200	H

PK - Peak detector

EUT WITH LAPTOP ABOVE 1GHZ RESULTS



DATA

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)M argin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.115	41.55	PK	27.5	-34.8	34.25	-	-	0-360	101	H
2	1.298	41.12	PK	28.8	-34.8	35.12	-	-	0-360	101	V
3	1.412	41.4	PK	28.4	-34.5	35.3	-	-	0-360	101	V
4	1.738	40.51	PK	29.5	-33.8	36.21	-	-	0-360	200	V
5	3.924	40.56	PK	33.7	-31.6	42.66	-	-	0-360	101	V
6	4.773	39.87	PK	34.2	-30.9	43.17	-	-	0-360	101	V

PK - Peak detector

6.1. 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.		

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	.231	44.82	PK	.8	0	45.62	62.4	-16.78	-	-
2	.231	30.08	Av	.8	0	30.88	-	-	52.4	-21.52
3	.4875	43.88	PK	.4	0	44.28	56.2	-11.92	-	-
4	.4875	31.18	Av	.4	0	31.58	-	-	46.2	-14.62
5	.645	43.7	PK	.3	0	44	56	-12	-	-
6	.645	26.56	Av	.3	0	26.86	-	-	46	-19.14
7	.753	43.91	PK	.3	0	44.21	56	-11.79	-	-
8	.753	25.12	Av	.3	0	25.42	-	-	46	-20.58
9	18.8385	34.92	PK	.3	.2	35.42	60	-24.58	-	-
10	18.8385	13.98	Av	.3	.2	14.48	-	-	50	-35.52
11	24.486	36.49	PK	.3	.2	36.99	60	-23.01	-	-
12	24.486	20.1	Av	.3	.2	20.6	-	-	50	-29.4

Line-L2 .15 - 30MHz

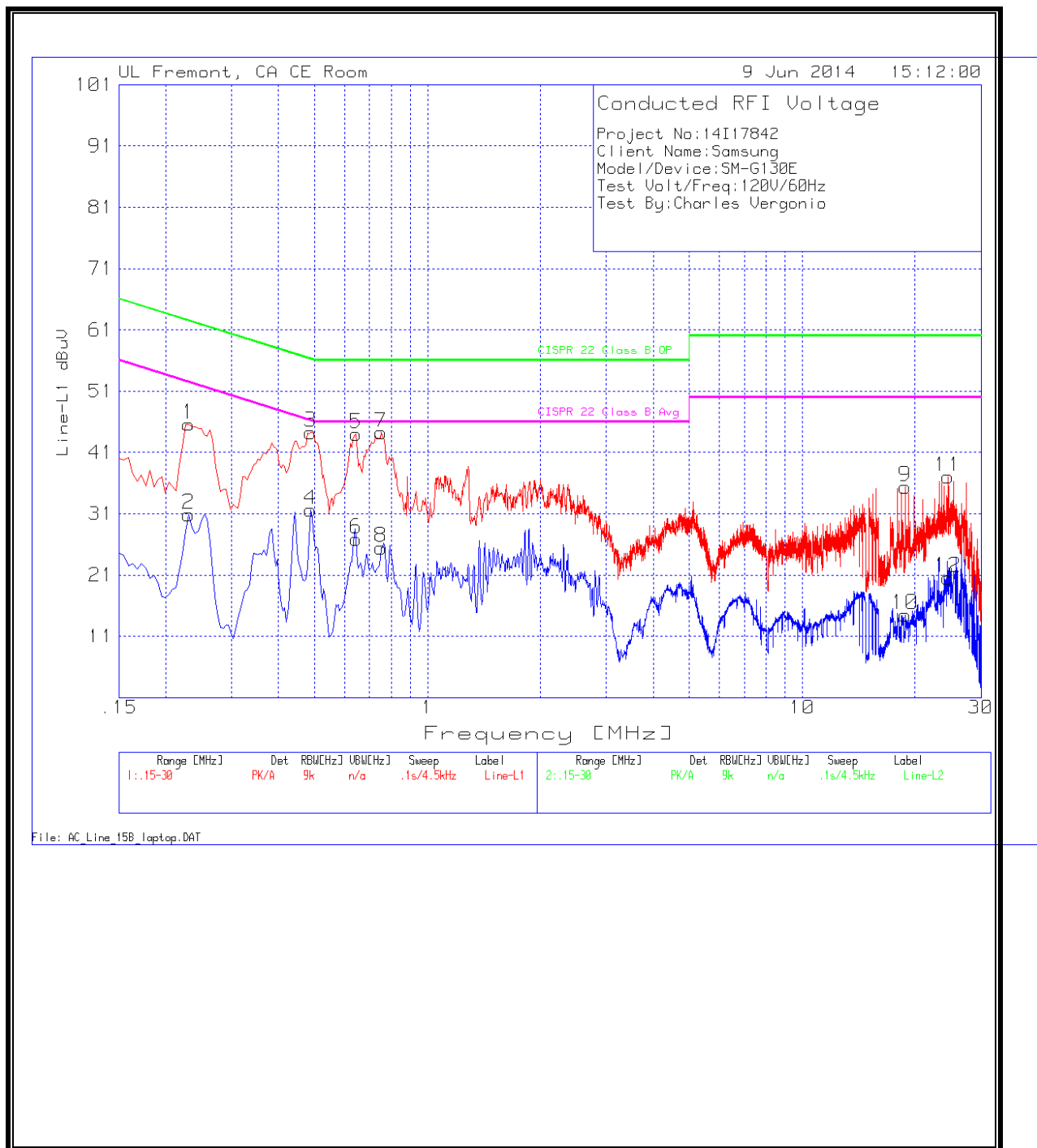
Trace Markers

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	.231	39.62	PK	.8	0	40.42	62.4	-21.98	-	-
14	.231	19.15	Av	.8	0	19.95	-	-	52.4	-32.45
15	.4155	37.44	PK	.4	0	37.84	57.5	-19.66	-	-
16	.4155	29.69	Av	.4	0	30.09	-	-	47.5	-17.41
17	.564	42.76	PK	.3	0	43.06	56	-12.94	-	-
18	.564	17.88	Av	.3	0	18.18	-	-	46	-27.82
19	.663	42.57	PK	.3	0	42.87	56	-13.13	-	-
20	.663	27.72	Av	.3	0	28.02	-	-	46	-17.98
21	1.32	38.37	PK	.2	.1	38.67	56	-17.33	-	-
22	1.32	21.7	Av	.2	.1	22	-	-	46	-24
23	15.234	34.81	PK	.3	.2	35.31	60	-24.69	-	-
24	15.234	18.75	Av	.3	.2	19.25	-	-	50	-30.75
25	25.926	35.28	PK	.3	.3	35.88	60	-24.12	-	-
26	25.926	17.72	Av	.3	.3	18.32	-	-	50	-31.68

PK - Peak detector

Av - average detection

LINE 1 RESULTS



LINE 2 RESULTS

