EMC TEST REPORT

Project No.	LBE20114473	**Issue No.**	1
Applicant	**Name of organization**	Samsung Electronics Co., Ltd.	
	Address	416, Maetan 3-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742, Republic of Korea	
	Date of application	August 23, 2011	
EUT	**Type of device**	Class B personal computers and peripherals	
	Equipment authorization	☐ Declaration of Conformity ☒ Certification ☐ Verification	
	FCC ID	A3LGTB5510	
	Kind of product	Mobile Phone	
	Model No.	GT-B5510	
	Variant Model No.	Refer to clause 3.5	
	Manufacturer	SAMSUNG ELECTRONICS CO., LTD. 94-1, Imsu-dong, Gumi-si, Gyengsangbuk-do, 730-722, Republic of Korea TIANJIN SAMSUNG TELECOM TECHNOLOGY CO., LTD. 300385 China Tianjin No.9, WeiWu Rd., Micro Electronic Industrial Park, Xiqing Dist, Tianjin, China	
Applied Standards		FCC Part 15, Subpart B, Class B / ANSI C63.4-2003	
Test Period		August 24, 2011 ~ August 26, 2011	
Issue date		August 29, 2011	

Test result : **Complied**

The equipment under test has found to be compliant with the applied standards.
(Refer to the attached test result for more detail.)

Tested by : Jong-Sup Jeong	**Reviewed by** : Tae-Young Jang

SAMSUNG

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1. Summary of test results

1.1 Emission

The EUT has been tested according to the following specifications:

Applied	Test type	Applied standard	Result	Remarks
☒	Conducted Disturbance (Mains port)	FCC Part 15 Subpart B / ANSI C63.4-2003	Complied	Meets Class B Limit
☒	Radiated Disturbance		Complied	Meets Class B Limit

2. General Information

2.1 Test facility

The CS & Environment center is located on Samsung Electronics Co., Ltd. at 416, Maetan 3-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, Republic of Korea.
All testing are performed in Semi-anechoic chambers conforming to the site attenuation Characteristics defined by ANSI C63.4, CISPR 22, 16-1 and 16-2. and Shielded rooms.

The CS & Environment center is operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:2005.

3. Test Setup configuration

3.1 Test Peripherals

The cables used for these peripherals are either permanently attached by the peripheral manufacturer or coupled with an assigned cable as defined below.
The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Description	Model No.	Serial No.	Manufacturer/ Trademark	FCC ID / DoC
Mobile Phone	GT-B5510	-	SAMSUNG	A3LGTB5510
Battery	EB454357VU	THaB719AS/4-B	SAMSUNG	-
Headset	EHS49AS0ME	-	SAMSUNG	-
Data Cable	ECC1DU0BBK	-	SAMSUNG	-
microSD Card	2GB	-	SANDISK	-
Note PC	NT-P530	-	SAMSUNG	DoC
AC Adapter	AD-6019	CNBA4400162ABJ6F65 51560	SAMSUNG	-
USB mouse	MOARUO	MS-S5-AR03-01	SAMSUNG	DoC
USB Keyboard	GP-K5000U	15000099	SAMSUNG	DoC

3.2 EUT operating mode

To achieve compliance applied standard specification, the following mode(s) were made during compliance testing:

Operating Mode 1	USB Mode (Data Communication)

3.3 Details of Sampling

Customer selected, single unit.

3.4 Used cable description

The EUT is configured, installed, arranged and operated in a manner consistent with typical applications. Interface cables/loads/devices are connected to at least one of each type of interface port of the EUT, and where practical, each cable shall be terminated in a device typical of actual usage. The type(s) of interconnecting cables to be used and the interface port (of the EUT) to which these were connected;

Connected cable	Length [m]	Shielded [Y/N]	Note
Data Cable	0.8	Yes	From EUT to Note PC
Headset	1.6	No	For Headset
Power	1.8	No	For AC Adapter
USB	1.8	Yes	From Note PC to Mouse
USB	1.5	Yes	From Note PC to Keyboard

3.5 EUT Description

1. The following features describe EUT represented by this report:

Item	Specification	
Frequency Range	GSM850	TX : 824.2 ~ 848.8 MHz RX : 869.2 ~ 893.8 MHz
	GSM900	TX : 880.2 ~ 914.8 MHz RX : 925.2 ~ 959.8 MHz
	GSM1800	TX : 1 710.2 ~ 1 784.8 MHz RX : 1 805.2 ~ 1 879.8 MHz
	GSM1900	TX : 1 850.2 ~ 1 909.8 MHz RX : 1 930.2 ~ 1 989.8 MHz
	WCDMA (FDD1)	TX : 1 922.4 ~ 1 977.6 MHz RX : 2 112.4 ~ 2 167.4 MHz
	WCDMA (FDD8)	TX : 880.2 ~ 914.8 MHz RX : 925.2 ~ 959.8 MHz
Size (Standard Battery)	110.8 (L) * 63.5 (W) * 11.65 (H) (mm)	
Weight (Standard Battery)	108 g (±1 g)	
LCD Specification	Main 2.6 Inch, TFT (320 X 240)	
Operating Temperature (℃)	-20 ~ +50	
Operating Humidity (%)	0 ~ 95	
Bluetooth	TX/RX Frequency : 2 402 ~ 2 480 MHz Version : 3.0	
Memory	Internal Memory : 110 MB External Memory : microSD (Max. 32 GB)	

2. The variant models

- None

3.6 Clock Frequencies

Kind of Clocks	Frequency [MHz]
CPU	**832**
USB 2.0	48

3.7 Test configuration and condition

The EUT exercise program which is the samsung standardized emission test program for windows was used during all EMC measurements were tested.

This program was contained on the PC hard disk drive.

Once loaded, the program sequentially exercises each system component in turn.

The system was configured for testing in a typical fashion that a customer would normally use, and was tested while in an automated non-attendant mode.

Power source for the EUT operating was supplied by CVCF made by the Pacific Power Source Corp.

- Test Voltage : AC 120 V, 60 Hz

3.8 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus: (According to CISPR 16-4 and UKAS Lab 34.)

3.8.1 Emission

Test type		Measurement uncertainty (C.L. 95 %, k = 2)
Conducted disturbance	AC Mains	±3.03 dB
Radiated Disturbance (30 MHz ~ 1 GHz)	Horizontal	±4.61 dB
	Vertical	±4.60 dB
Radiated Disturbance (1 GHz ~ 6 GHz)		±4.09 dB

4. Results of individual test

4.1 Conducted disturbance

Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in standards.

Limits for conducted disturbance at the mains ports

Frequency range Limits MHz	Resolution Bandwidth	Limits dB(μV)	
		Quasi-peak	Average
0,15 to 0,50	9 kHz	66 to 56	56 to 46
0,50 to 5	9 kHz	56	46
5 to 30	9 kHz	60	50

4.1.1 Test instrumentation

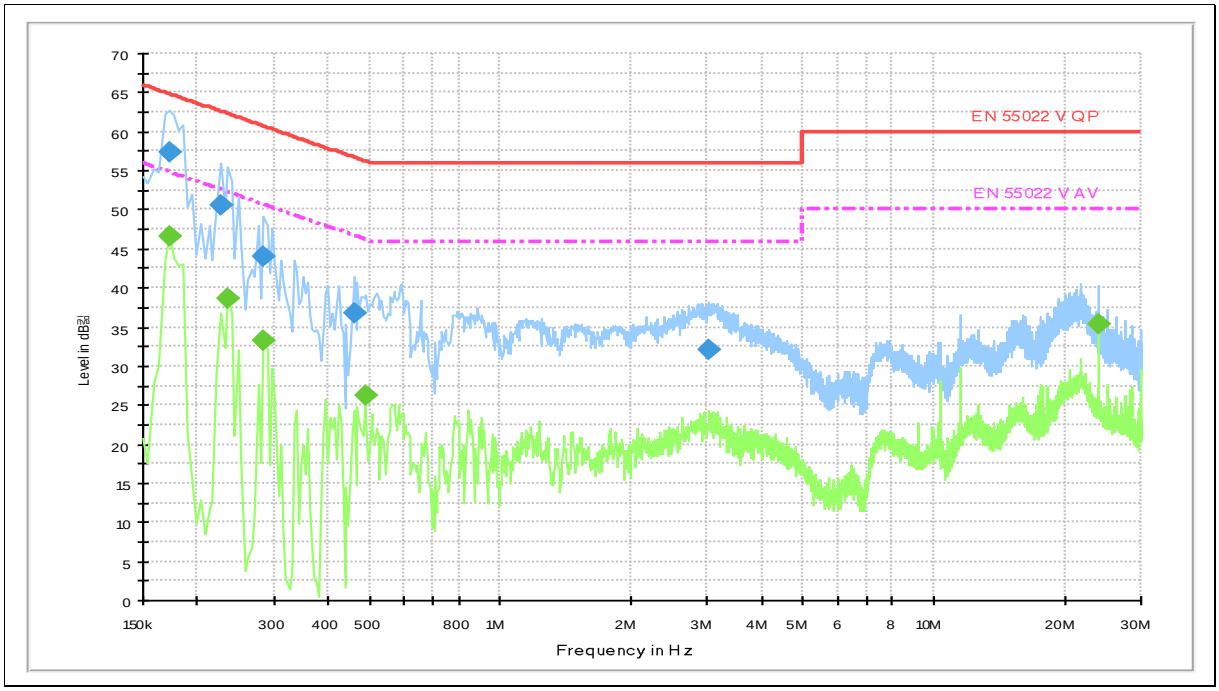
EMC No.	Test Instrument	Model name	Manufacturer	Serial No.	Calibration	
					Date	Interval (Month)
E4I-093	Test Receiver	ESCI	R&S	100086	2010-12-20	12
E3I-049	LISN	ESH3-Z5	R&S	100263	2010-10-19	12
E3I-050	LISN	ESH3-Z5	R&S	100260	2011-01-13	12

4.1.2 Temperature and humidity condition

Test date	2011-08-26	**Test engineer**	Jong-Sup Jeong
Climate condition	Ambient temperature	23.8 ℃	Limit (15.0 to 35.0) ℃
	Relative humidity	39.0 % R.H.	Limit (25.0 to 75.0) % R.H.
	Atmospheric pressure	101.3 kPa	Limit (86.0 to 106.0) kPa
Test place	Shield Room (SR8)		

4.1.3 Test results

- Operating Mode 1: AC Mains



Note 1) Two graphs measured for both Live(L1) and Neutral(N) of the LISN are combined into one graph.

Quasi-peak final measurement results table:

Frequency (MHz)	Level (dBµV)	Corr. (dB)	Limit (dBµV)	Margin (dB)	Line
0.172 500	57.5	0.2	64.80	7.30	N
0.226 500	50.6	0.2	62.60	12.00	L1
0.285 000	43.9	0.2	60.70	16.80	L1
0.460 500	36.7	0.2	56.70	20.00	L1
3.030 000	32.1	0.3	56.00	23.90	N

Average final measurement results table:

Frequency (MHz)	Level (dBµV)	Corr. (dB)	Limit (dBµV)	Margin (dB)	Line
0.172 500	46.7	0.2	54.80	8.10	N
0.235 500	38.5	0.2	52.30	13.80	L1
0.285 000	33.3	0.2	50.70	17.40	L1
0.487 500	26.2	0.2	46.50	20.30	L1
23.905 500	35.4	0.8	50.00	14.60	N

Note 2) Level (QP and/or AV) = Meter Reading (QP and/or AV) + Corr. (LISN Insertion Loss + Cable Loss)
Margin (QP and/or AV) = Limit – Level (QP and/or AV)
QP = Quasi-Peak, AV = Average

4.2 Radiated disturbance

Of those disturbances above (*L* - 20dB), where *L* is the limit level in logarithmic units, record at least the disturbance levels and the frequencies of the six highest disturbances.
The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin.

Peak measurements were made over the changeable frequency range 30 MHz to 1 GHz at a measurement distance of 3 m for the following antenna and turntable arrangements:

Antenna Height [cm]	Antenna Polarisation	Turntable position [degrees]
100 ~ 400	Horizontal, Vertical	Continuous

Measurements within 20 dB of the limit were then maximized by adjusting turntable position.
Final measurements were made using quasi-peak detectors.

Peak/Average measurements were made over the changeable frequency range 1 GHz to 40 GHz or 5th harmonics of the highest frequency in accordance with internal maximum operating frequency at a measurement distance of 3 m for the following antenna and turntable arrangements:

Antenna Height [cm]	Antenna Polarisation	Turntable position [degrees]
100	Horizontal, Vertical	Continuous

Measurements within 20 dB of the limit were then maximized by adjusting turntable position.
Final measurements were made using peak and average detectors.

Limits for radiated disturbance of ITE at a measuring distance of 3 m

Frequency range Limits [MHz]	Field Strength	
	µV/m	dB(µV/m)
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

Results checked manually; and points close to the limit line were re-measured.

4.2.1 Test instrumentation

EMC No.	Test Instrument	Model name	Manufacturer	Serial No.	Calibration	
					Date	Interval (Month)
E3I-130	BILOG Antenna	CBL6112D	TESEQ	25513	2010-11-12	24
E3I-165	EMI Test Receiver	ESI-26	R&S	100010	2011-02-22	12
E3I-170	Double-Ridged Waveguide Horn Antenna	R&S	HF906	100028	2010-10-07	24
E3I-213	Preamplifier	317	Sonoma	282424	2010-12-01	12

4.2.2 Temperature and humidity condition

Test date	2011-08-24	Test engineer	Jong-Sup Jeong
Climate condition	Ambient temperature	23.7 ℃	Limit (15.0 to 35.0) ℃
	Relative humidity	42.0 % R.H.	Limit (25.0 to 75.0) % R.H.
	Atmospheric pressure	101.2 kPa	Limit (86.0 to 106.0) kPa
Test place	Semi-Anechoic Chamber (SAC4)		

4.2.3 Test results

☐ Operating Mode 1

- Frequency range: 30 ~ 1 000 MHz

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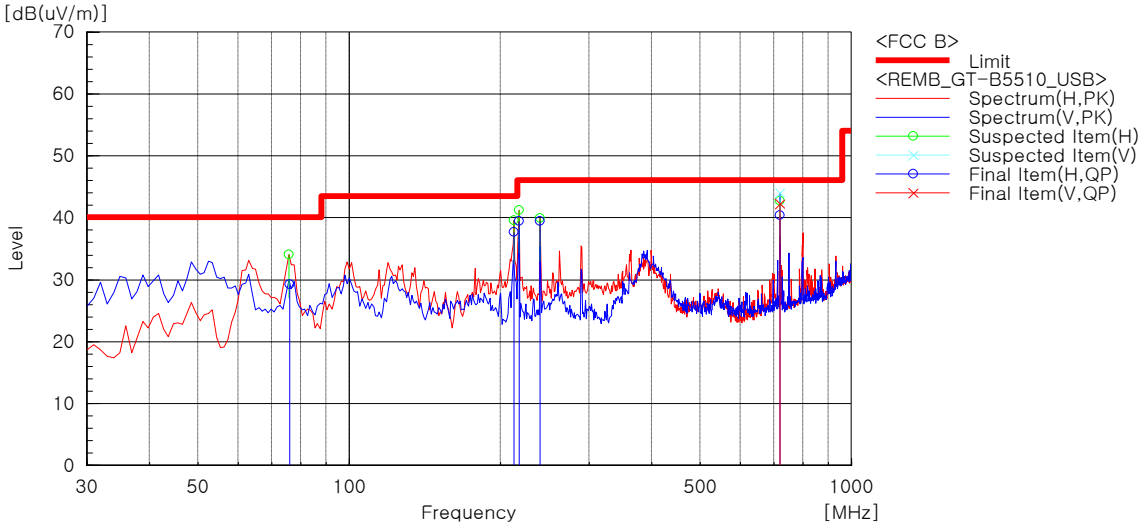
<<RADIATED EMISSION>>

REMB_GT-B5510_USB.dat

Model :
Serial :
Operator :
AC Power :
Temp,Humidity :

Standard : FCC Part.15 Class B 3m
Remark1 :
Remark2 :
Remark3 :
Remark4 :



Final Result

--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]	System
1	76.075	52.4	-23.1	29.3	40.0	10.7	395.0	127.0	1
2	212.546	57.4	-19.7	37.7	43.5	5.8	168.0	15.0	1
3	217.542	59.0	-19.5	39.5	46.0	6.5	114.0	167.0	1
4	240.023	57.4	-17.9	39.5	46.0	6.5	119.0	290.0	1
5	720.007	46.6	-6.2	40.4	46.0	5.6	100.0	36.0	1

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(uV)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Height [cm]	Angle [deg]	System
1	720.017	48.5	-6.2	42.3	46.0	3.7	100.0	1.0	1

Note) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 to 4 meters

Level (QP) = Reading (QP) + c.f (Antenna Factor + Cable Loss - Amp. Gain)

Margin (QP) = Limit – Level (QP)

QP = Quasi-Peak

☐ Operating Mode 1

- Frequency range: 1 000 ~ 6 000 MHz

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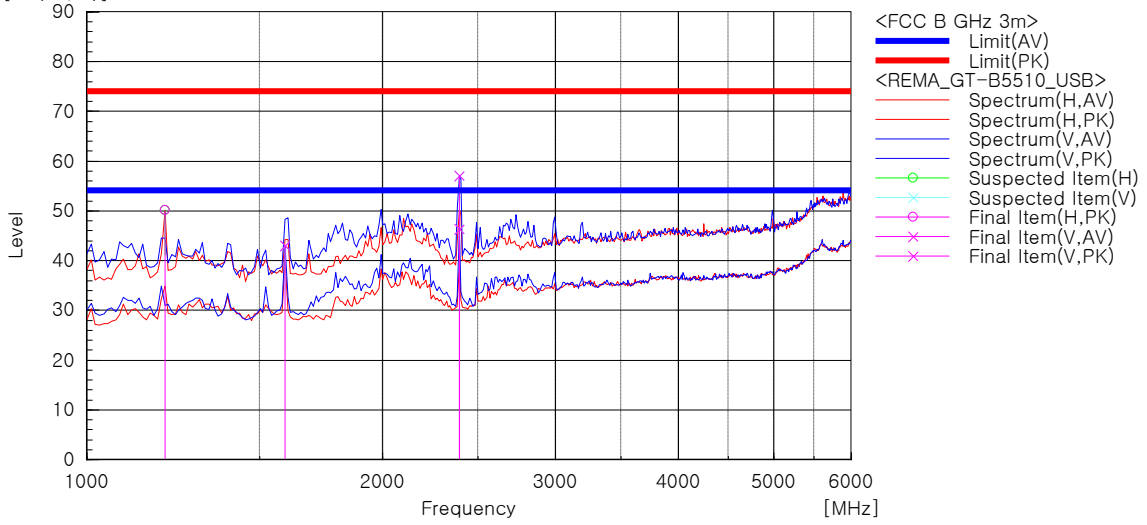
REMA_GT-B5510_USB.dat

Model :
Serial :
Operator :
AC Power :
Temp,Humidity :

Standard : FCC Class B GHz 3m
Remark1 :
Remark2 :
Remark3 :
Remark4 :



Final Result

--- AV Measurement ---

No.	Frequency [MHz]	Reading [dB(uV)][H/V]	c.f [dB(1/m)][H/V]	Result [dB(uV/m)][H/V]	Limit [dB(uV/m)]	Margin [dB][H/V]
1	1591.182	-------/ 54.1	-------/ -11.1	-------/ 43.0	54.0	-------/ 11.0
2	2392.786	-------/ 54.5	-------/ -8.1	-------/ 46.4	54.0	-------/ 7.6

--- PK Measurement ---

No.	Frequency [MHz]	Reading [dB(uV)][H/V]	c.f [dB(1/m)][H/V]	Result [dB(uV/m)][H/V]	Limit [dB(uV/m)]	Margin [dB][H/V]
1	1200.401	63.4/-------	-13.2/-------	50.2/-------	74.0	23.8/-------
2	2392.786	-------/ 65.2	-------/ -8.1	-------/ 57.1	74.0	-------/ 16.9

Note) Receiving antenna polarization : Horizontal, Vertical

Test Distance : 3 m, Antenna Height : 1 meters

Level (AV) = Reading (AV) + c.f (Antenna Factor + Cable Loss - Amp. Gain)

Margin (AV) = Limit – Level (AV)

AV = Average