

EMI CERTIFICATION REPORT

Applicant:

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416. Maetan-3dong, Yeongtong-gu, Suwon-si,
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Date of Issue: JUNE 02, 2011

Test Report No.: HCTE1106FE01

Test Site: HCT CO., LTD.

HCT FRN: 0005-8664-21

FCC ID:

A3LGTS5820

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
Equipment Type : PCS GSM Phone with Bluetooth & WLAN
Trade Name : SAMSUNG ELECTRONICS CO., LTD
Model(s) : GT-S5820
Port / Connector(s) : USB Data Port / Headset Port

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003. (See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT certifies that no party to application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862



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ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test (E.U.T) is **PCS GSM Phone with Bluetooth & WLAN, Model: GT-S5820** manufactured by **SAMSUNG ELECTRONICS CO., LTD.** Its basic purpose is used for communications.

Model (s)	GT-S5820
FCC ID	A3LGTS5820
E.U.T Type	PCS GSM Phone with Bluetooth & WLAN
TX Frequency	824.20 MHz to 848.80 MHz (GSM 850) 1 850.20 MHz to 1 909.80 MHz (GSM 1 900)
RX Frequency	869.20 MHz to 893.80 MHz (GSM 850) 1 930.20 MHz to 1 989.80 MHz (GSM 1 900)

1.2 Related Submittal(s) / Grant(s)

Original submittal only.

1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Manufacturer	Model Number	FCC ID / DoC	Connected To
PCS GSM Phone with Bluetooth & WLAN	SAMSUNG	GT-S5820	A3LGTS5820	Notebook PC
Notebook PC	SAMSUNG	NT-R519	DoC	E.U.T Notebook PC adaptor
Notebook PC adaptor	DELTA (JIANG SU)	SADP-90EH BAD-9019S	-	Notebook PC
Mouse	Microsoft	Intellimouse optical USB and PS/2 compatible	DoC	Notebook PC
Headset	-	-	-	E.U.T
USB cable	-	APCBU10BBE	-	E.U.T Notebook PC
SD card (2 GB)	SanDisk	-	-	E.U.T
Keypad	LG	LK3200	DoC	Notebook PC

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
PCS GSM Phone with Bluetooth & WLAN	Headset jack	-	N	(D)1.6
	USB data	N	N	(P,D)0.8
Notebook PC	USB (Mouse)	-	Y	(D)1.8
	USB (Keypad)	-	Y	(D)0.6

* The marked "(D)" means the data cable and "(P)" means the power cable.

1.5 Noise Suppression Parts on Cable. (I/O cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
PCS GSM Phone with Bluetooth & WLAN	Headset jack	N	-	Y	E.U.T End
	USB data	N	-	Y	Both End
Notebook PC	USB (Mouse)	Y	Notebook PC End	Y	Notebook PC End
	USB (Keypad)	N	-	Y	Notebook PC End

1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 m

1.7 Test Facility

The 10 m semi anechoic chamber used to collect the Conducted and Radiated is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyoungki-Do, Korea.

Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4. Detailed description of test facilities was submitted to the Commission and accepted dated Sep. 03, 2010 (Registration Number: 90661)

1.8 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

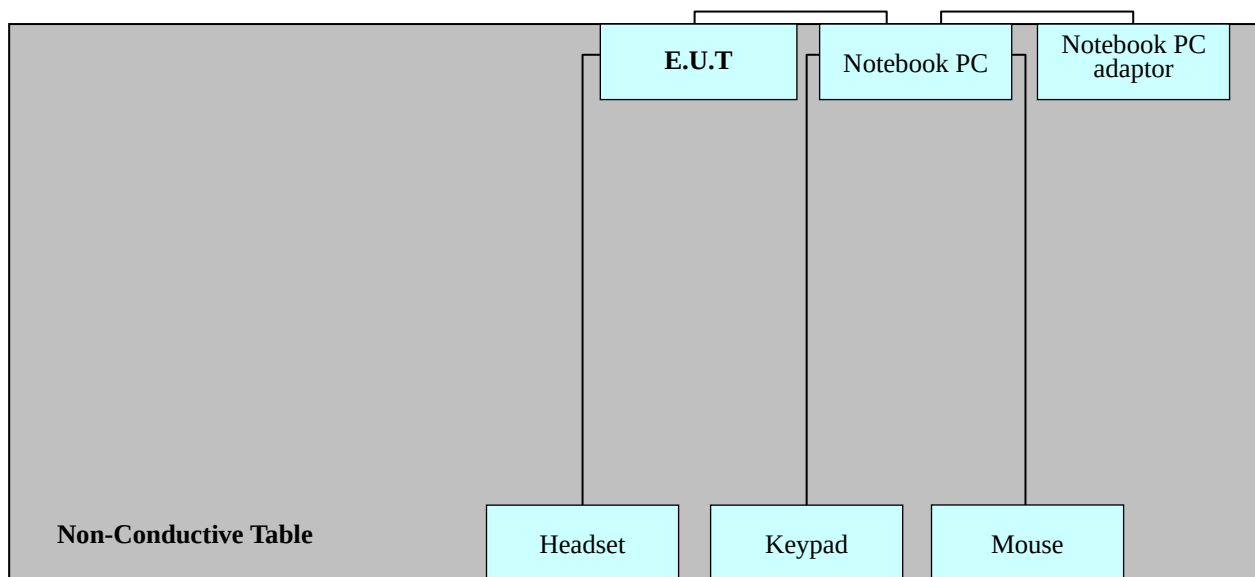
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

- Power Line Conducted test : E.U.T was connected to LISN via Notebook PC adaptor.
Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.
- Radiated Emission test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 10 m semi-anechoic chamber.

[Configuration of Tested System]



Power Line: 110 VAC

3. PRELIMINARY TEST

3.1 Conducted Emission Test

■ It was tested Data Communication mode, after connecting all peripheral devices.

Operation Mode	The Worst Operating Condition
Data Communication	○

3. 2 Radiated Emission Test

■ It was tested Data Communication mode, after connecting all peripheral devices.

Operation Mode	The Worst Operating Condition
Data Communication	○

4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit apply to	: FCC PART 15 Subpart B Class B
Detector	: Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)
Operation Mode	: Data Communication mode
Temperature	: 23.7 °C
Humidity level	: 53.5 %
Test date	: May 31, 2011

※ **NOTE:** Refer to page 10 to page 13 for details.

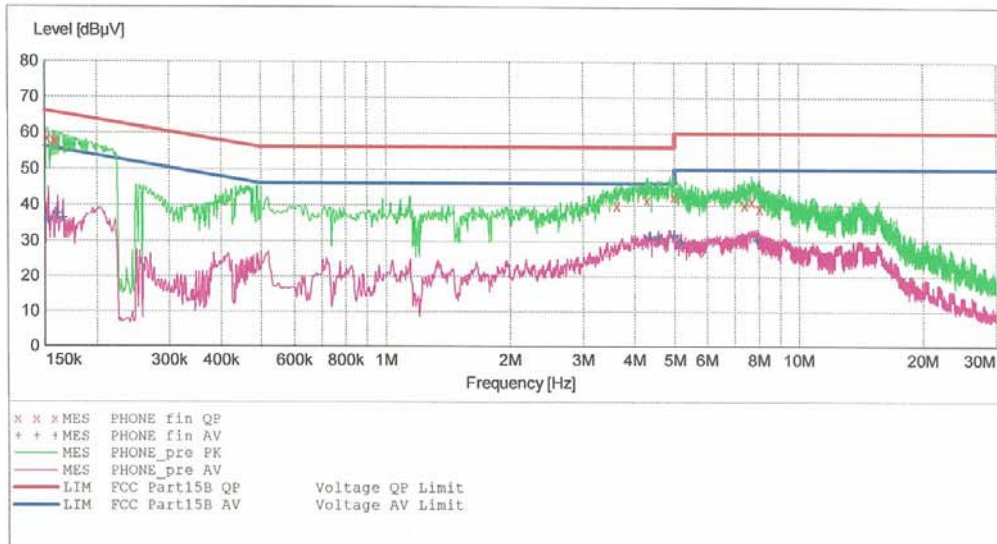
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EUT: GT-S5820
Manufacturer: SAMSUNG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: DH-RYU
Test Specification: H
Comment:

SCAN TABLE: "FCC PART 15 B(H)"

Short Description:			FCC PART 15 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	1.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin_QP"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.152010	58.50	10.1	66	7.4	---	---
0.157010	57.90	10.1	66	7.8	---	---
0.159010	57.70	10.1	66	7.8	---	---
3.632000	40.00	10.4	56	16.0	---	---
4.288000	41.40	10.4	56	14.6	---	---
4.996000	42.40	10.5	56	13.6	---	---
7.388000	40.30	10.8	60	19.7	---	---
7.712000	41.20	10.8	60	18.8	---	---
8.056000	39.20	10.8	60	20.8	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

5/31/2011 3:16PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.153010	35.50	10.1	56	20.3	---	---
0.161010	37.50	10.1	55	18.0	---	---
0.166010	36.20	10.1	55	18.9	---	---
4.380000	31.10	10.4	46	14.9	---	---
4.576000	31.20	10.5	46	14.8	---	---
5.000000	31.70	10.5	46	14.3	---	---
5.000000	31.60	10.5	46	14.4	---	---
5.184000	29.70	10.5	50	20.3	---	---
7.916000	30.40	10.8	50	19.6	---	---

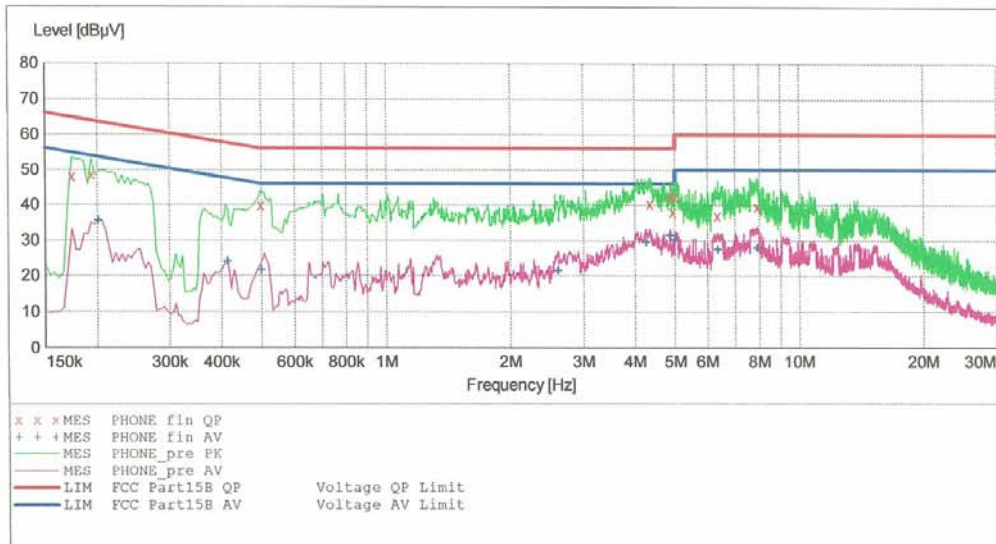
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EMC

EUT: GT-S5820
Manufacturer: SAMSUNG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: DH-RYU
Test Specification: N
Comment:

SCAN TABLE: "FCC PART 15 B(N)"

Short Description:			FCC PART 15 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.174010	48.10	10.3	65	16.6	---	---
0.194010	48.60	10.3	64	15.2	---	---
0.498010	39.80	10.3	56	16.2	---	---
4.364000	40.30	10.7	56	15.7	---	---
4.892000	42.60	10.7	56	13.4	---	---
4.948000	38.00	10.7	56	18.0	---	---
5.000000	42.20	10.7	56	13.8	---	---
6.364000	37.00	10.9	60	23.0	---	---
7.924000	39.40	11.0	60	20.6	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

5/31/2011 3:11PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.202010	35.60	10.3	54	17.9	---	---
0.414010	24.00	10.3	48	23.6	---	---
0.500000	21.60	10.3	46	24.4	---	---
2.608000	21.40	10.5	46	24.6	---	---
4.264000	29.40	10.6	46	16.6	---	---
4.888000	31.30	10.7	46	14.7	---	---
5.000000	30.20	10.7	46	15.8	---	---
6.364000	27.40	10.9	50	22.6	---	---
7.916000	27.90	11.0	50	22.1	---	---

4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Limit Apply to : FCC PART 15 Subpart B Class B

-For measurement below 1 GHz

Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)

Operation Mode : Data Communication mode

-For measurement above 1 GHz

Setting : Peak mode: Detector- Peak(RBW: 1 MHz / VBW: 1 MHz)
: Average mode: Detector- Peak (RBW: 1 MHz / VBW: 10 Hz)

Temperature : 25.7 °C

Humidity Level : 45.1 %

Test Date : May 27, 2011

Frequency	Reading	Ant. Factor Cable Loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB/m(dB)	(H/V)	dB μ V/m	dB μ V/m	dB
41.6	14.7	13.9	V	28.6	40.0	11.4
75.4	18.6	11.3	H	29.9	40.0	10.1
171.4	17.7	13.8	H	31.5	43.5	12.0
178.2	22.8	13.4	H	36.2	43.5	7.3
359.9	18.6	16.8	H	35.4	46.0	10.6
480.0	18.3	20.1	V	38.4	46.0	7.6

※ NOTE:

1. Measurement Above 1 GHz performed from 1 GHz to the 5th harmonic of highest fundamental frequency. The highest fundamental frequency is GSM 1 900 center frequency.
2. For measurement above 1 GHz, noise over ambient noise was not founded.

5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the antenna factor and cable factor.
The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dB μ V is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dB μ V/m value is mathematically converted to its corresponding level in μ V/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V/m}$$

[Radiated Emission Limits]

Frequency of Emission (MHz)	Field Strength	
	μ V/m	dB μ V/m
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

6. TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u>	<u>Next CAL Date</u>
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Conducted Emission

☒ EMI Test Receiver	Rohde & Schwarz	ESCI	100033	2012.02.15
☒ LISN	Rohde & Schwarz	ESH3-Z5	100282	2012.02.01
☐ LISN	Rohde & Schwarz	ENV216	100073	2012.04.01
☒ Attenuator	Rohde & Schwarz	ESH3-Z2	375.8810.352	2011.10.25

Radiated Emission

☐ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	2011.10.29
☒ EMI Test Receiver	Rohde & Schwarz	ESU26	100241	2011.09.01
☒ Trilog Antenna	Schwarzbeck	VULB9168	255	2011.05.28
☐ Trilog Antenna	Schwarzbeck	VULB9160	3125	2013.05.03
☒ Antenna master	INNCO Systems	MA4000-EP	MA4000/283	-
☒ Turn Table	INNCO Systems	DT3000-3T	DT3000/69	-
☒ Communication Antenna	Schwarzbeck	USLP9142	9142-248	-
☒ Power Amplifier	Rohde & Schwarz	SCU-18	10094	2011.09.29
☐ Base Station	Rohde & Schwarz	CMU 200	1100000802	2012.02.16
☒ Horn Antenna	Schwarzbeck	BBHA 9120D	-	2012.04.13

7. CONCLUSION

The data collected shows that the **PCS GSM Phone with Bluetooth & WLAN, Model: GT-S5820, FCC ID: A3LGTS5820** complies with §15.107 and §15.109 of the FCC rules.