HCT CO., LTD.

CERTIFICATION DIVISION
105-1, JANGAM-RI, MAJANG-MYEON, ICHEON-SI, KYOUNGKI-DO, REPUBLIC OF KOREA
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EMI CERTIFICATION REPORT

Applicant:
LG Electronics MobileComm U.S.A., Inc.
10101 Old Grove Road, San Diego, CA 92131

Date of Issue: December 27, 2011
Test Report No.: HCTE1111FE16-1
Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID: **ZNFVS840**

Rule Part(s) / Standard(s)	: FCC PART 15 Subpart B Class B
Equipment Type	: LTE/CDMA Phone
Model Name(s)	: VS840, LG-VS840, LGVS840
Port / Connector(s)	: USB 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

Report prepared by
: Jeong Hyeon Choi
Test Engineer of EMC Team

Approved by
: Sang Jun Lee
Manager of EMC Team

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ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test (E.U.T) is **LTE/CDMA Phone, Model: VS840** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

Model	VS840
Additional Model	LG-VS840, LGVS840
FCC ID	ZNFVS840
E.U.T Type	LTE/CDMA Phone
TX Frequency	824.70 ㎒ to 848.31 ㎒ (CDMA 835) 1 851.25 ㎒ to 1 908.75 ㎒ (PCS CDMA) 777 ㎒ to 787 ㎒ (LTE B13)
RX Frequency	869.70 ㎒ to 893.31 ㎒ (CDMA 835) 1 931.25 ㎒ to 1 988.75 ㎒ (PCS CDMA) 746 ㎒ to 756 ㎒ (LTE B13)

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
LTE/CDMA Phone	LG	VS840	ZNFVS840	Notebook PC
Notebook PC	LG	X140-02	DoC	E.U.T Notebook PC adaptor
Notebook PC adaptor	DELTA (JIANG SU)	ADP-40PH AD	-	Notebook PC
Mouse	PRIMAX ELECTRONICS	MOARUO	DoC	Notebook PC
USB cable	-	-	-	E.U.T Notebook PC
Headset	-	-	-	E.U.T
SD card (2 GB)	SanDisk	-	-	E.U.T
Router	-	HIGATE PLUS K12L012.00	-	Notebook PC
RJ45 cable	-	-	-	Notebook PC Router
Wireless charging cover	-	-	-	E.U.T
Base station	LG	WCP-700	TA120027953	E.U.T Base station TA
Base station TA	-	WCA-D01WT	-	Base station

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
LTE/CDMA Phone	Micro USB	Y	Y	(P,D)1.2
	Headset jack	-	N	(D)1.1
	Base station	-	-	-
Base station	Base station TA	N	-	(P)1.5
Notebook PC	RJ 45	-	N	(D)1.5
	USB (Mouse)	-	Y	(D)1.8

* 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
LTE/CDMA Phone	Micro USB	N	-	Y	Both End
	Headset jack	N	-	Y	E.U.T End
	Base station	-	-	-	-
Base station	Base station TA	Y	E.U.T End	Y	E.U.T End
Notebook PC	RJ 45	N	-	N	Router
	USB (Mouse)	-	-	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 test is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyoungki-Do, Republic of 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

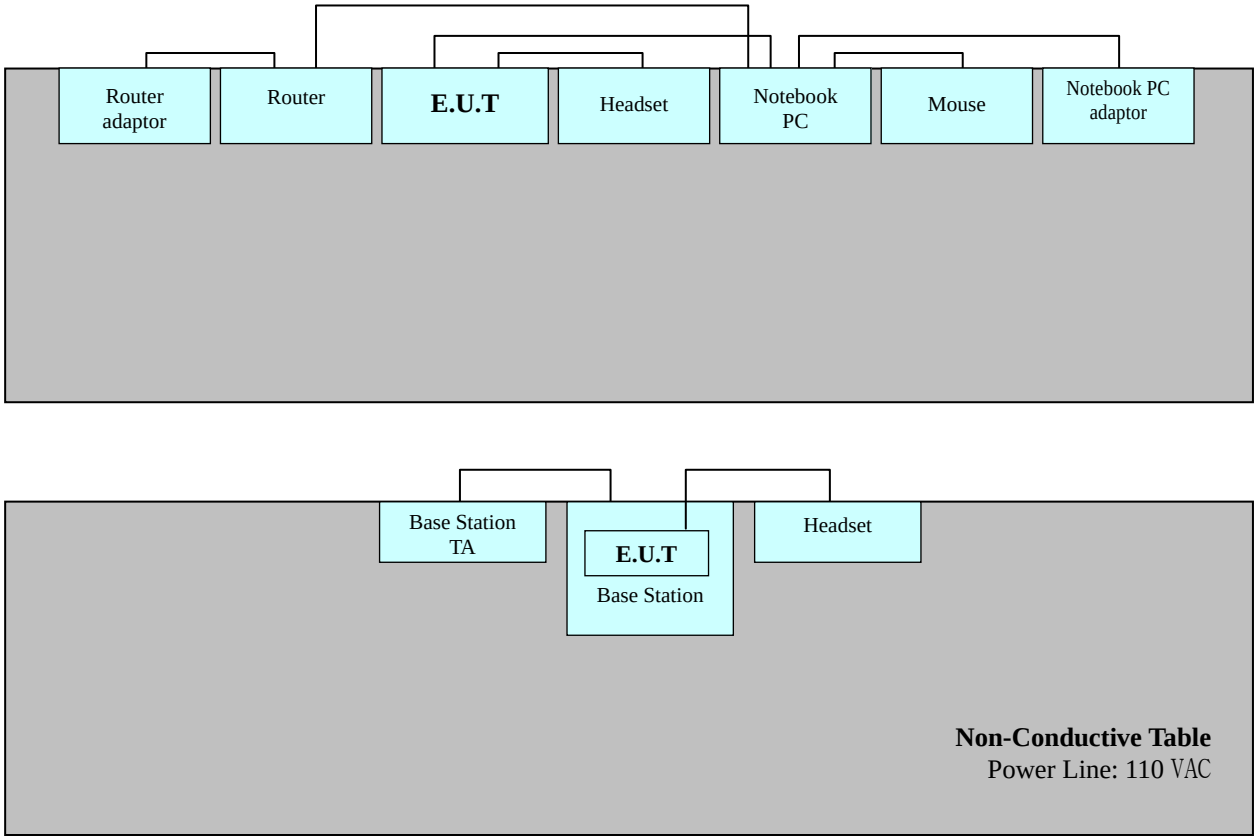
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

Power Line Conducted test : E.U.T was connected to LISN via Notebook PC adaptor and Base Station. 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]



3. PRELIMINARY TEST

3.1 Conducted Emission Test

■ During preliminary tests, the following operating mode was investigated:

- **Configuration of Test:** ☒ Standard cover
  ☒ Wireless charging cover
  Operation Mode: ☒ Data Communication mode
  *** The Worst Operating Condition: Standard cover**

- **Configuration of Test:** ☒ Base Station
  Operation Mode: ☒ Idle mode
  ☒ Camera (VGA, MEGA) mode
  ☒ MP3 mode
  *** The Worst Operating Condition: Camera (VGA)**

3. 2 Radiated Emission Test

■ During preliminary tests, the following operating mode was investigated:

- **Configuration of Test:** ☒ Standard cover
  ☒ Wireless charging cover
  Operation Mode: ☒ Data Communication mode
  *** The Worst Operating Condition: Standard cover**

- **Configuration of Test:** ☒ Base Station
  Operation Mode: ☒ Idle mode
  ☒ Camera (VGA, MEGA) mode
  ☒ MP3 mode
  *** The Worst Operating Condition: Camera (VGA)**

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 ㏈ Bandwidth: 9 ㎑)
Operation Mode	: Data Communication mode
Temperature	: 22.1 °C
Humidity Level	: 50.5 %
Test Date	: December 27, 2011

Detector	: Quasi-Peak, Average (6 ㏈ Bandwidth: 9 ㎑)
Operation Mode	: Base Station _ Camera(VGA) mode
Temperature	: 22.6 °C
Humidity Level	: 49.2 %
Test Date	: November 09, 2011

※ **NOTE:** Refer to page 10 to page 17 for details.

a. Standard Cover _ Data Communication Mode

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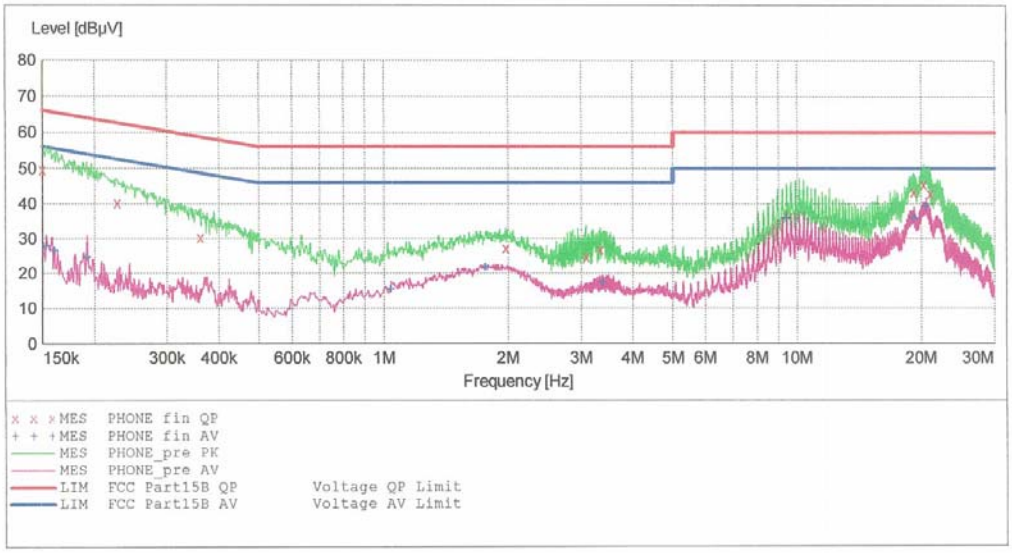
EUT: VS840
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART15 CLASS B
Comment: H

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

Short Description: FCC PART 15 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	1.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

12/27/2011 8:41AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150010	49.50	10.1	66	16.5	---	---
0.227010	40.30	10.1	63	22.3	---	---
0.361010	30.50	10.1	59	28.2	---	---
1.972000	27.40	10.2	56	28.6	---	---
3.084000	24.80	10.3	56	31.2	---	---
3.344000	26.90	10.3	56	29.1	---	---
19.096000	43.40	11.8	60	16.6	---	---
20.252000	45.60	11.9	60	14.4	---	---
20.992000	43.00	11.9	60	17.0	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

12/27/2011 8:41AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.153010	27.90	10.1	56	27.9	---	---
0.160010	26.70	10.1	56	28.8	---	---
0.192010	24.70	10.1	54	29.2	---	---
1.044000	15.50	10.1	46	30.5	---	---
1.760000	21.90	10.2	46	24.1	---	---
3.392000	17.40	10.3	46	28.6	---	---
9.448000	35.90	10.9	50	14.1	---	---
19.176000	36.00	11.8	50	14.0	---	---
20.508000	39.30	11.9	50	10.7	---	---

HCT

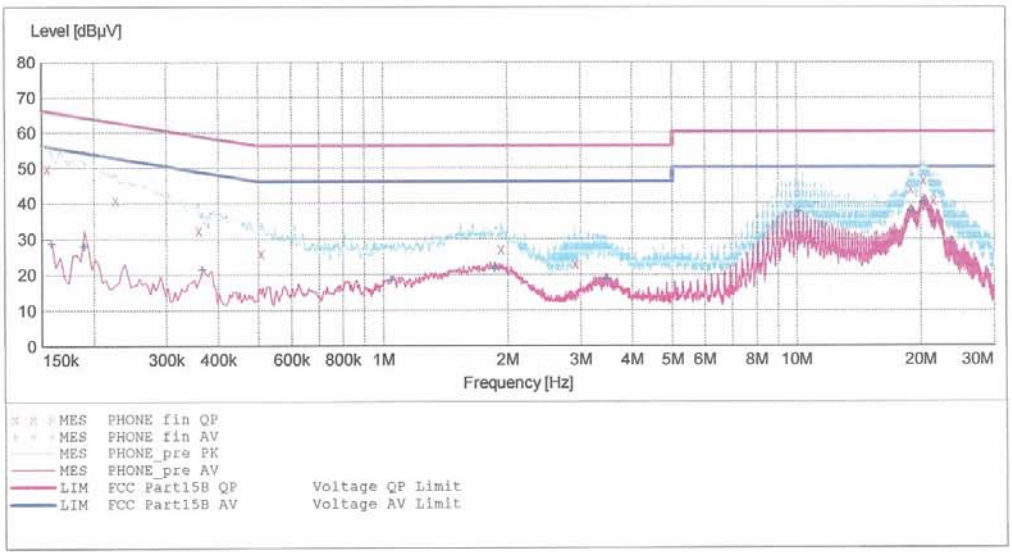
EMC

EUT: VS840
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART15 CLASS B
Comment: N

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

Short Description: FCC PART 15 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

12/27/2011 8:34AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.154010	49.80	10.3	66	16.0	---	---
0.226010	40.80	10.3	63	21.8	---	---
0.358010	32.30	10.3	59	26.5	---	---
0.508000	25.90	10.3	56	30.1	---	---
1.932000	27.10	10.4	56	28.9	---	---
2.916000	23.00	10.5	56	33.0	---	---
18.884000	43.80	11.6	60	16.2	---	---
20.284000	46.30	11.7	60	13.7	---	---
21.396000	40.50	11.7	60	19.5	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

12/27/2011 8:34AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.158010	28.50	10.3	56	27.1	---	---
0.190010	27.70	10.3	54	26.4	---	---
0.366010	21.30	10.3	49	27.3	---	---
1.048000	18.50	10.4	46	27.5	---	---
1.860000	21.60	10.4	46	24.4	---	---
3.460000	18.80	10.6	46	27.2	---	---
10.132000	37.20	11.0	50	12.8	---	---
18.892000	37.80	11.6	50	12.2	---	---
20.328000	40.00	11.7	50	10.0	---	---

b. Base Station _ Camera(VGA) Mode

HCT

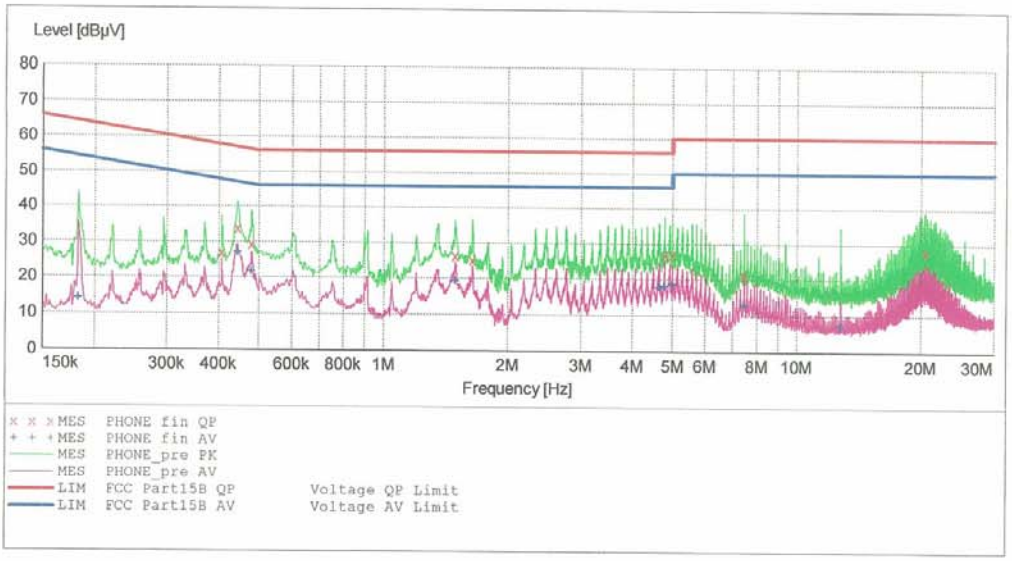
EMC

EUT: VS840
Manufacturer: LG
Operating Condition: CAMERA MODE(VGA)
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART15 CLASS B
Comment: H(BASE STATION)

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

Short Description: FCC PART 15 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	1.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

11/9/2011 1:15PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.406010	26.90	10.1	58	30.8	---	---
0.444010	33.70	10.1	57	23.3	---	---
0.480010	29.40	10.1	56	27.0	---	---
1.492000	26.30	10.2	56	29.7	---	---
1.640000	25.20	10.2	56	30.8	---	---
4.788000	27.00	10.5	56	29.0	---	---
5.000000	27.00	10.5	56	29.0	---	---
7.456000	21.20	10.8	60	38.8	---	---
20.480000	28.00	11.9	60	32.0	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

11/9/2011 1:15PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.183010	14.20	10.1	54	40.2	---	---
0.444010	27.10	10.1	47	19.9	---	---
0.480010	21.70	10.1	46	24.6	---	---
1.492000	19.30	10.2	46	26.7	---	---
4.648000	17.70	10.5	46	28.3	---	---
4.788000	18.10	10.5	46	27.9	---	---
5.000000	18.70	10.5	46	27.3	---	---
7.456000	12.90	10.8	50	37.1	---	---
12.780000	7.30	11.2	50	42.7	---	---

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HCT

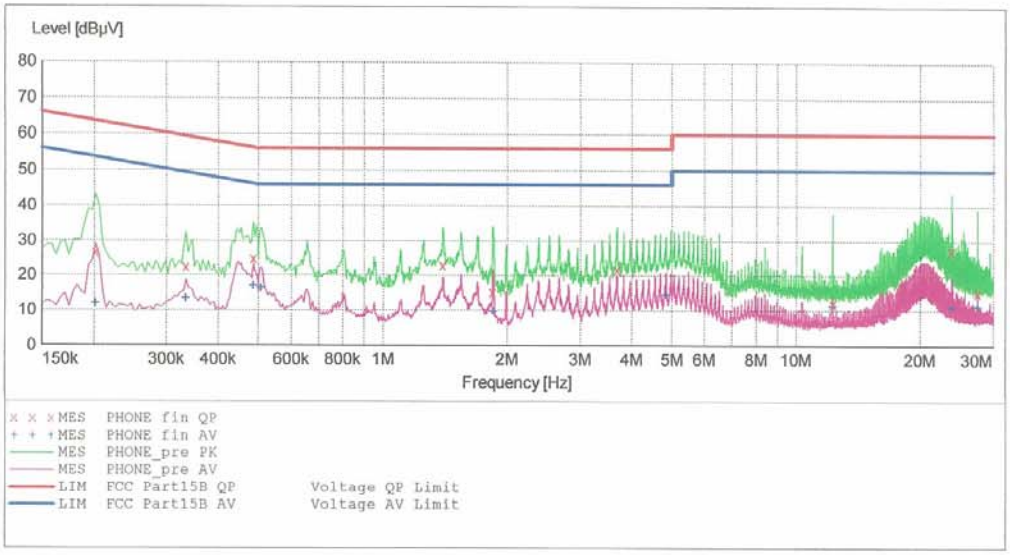
EMC

EUT: VS840
Manufacturer: LG
Operating Condition: CAMERA MODE(VGA)
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART15 CLASS B
Comment: N(BASE STATION)

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

Short Description: FCC PART 15 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.202010	26.80	10.3	64	36.7	---	---
0.334010	22.50	10.3	59	36.9	---	---
0.486010	24.90	10.3	56	31.3	---	---
1.396000	22.90	10.4	56	33.1	---	---
1.844000	15.20	10.4	56	40.8	---	---
3.692000	21.80	10.6	56	34.2	---	---
12.244000	12.10	11.2	60	47.9	---	---
23.780000	27.30	11.8	60	32.7	---	---
27.504000	15.20	11.9	60	44.8	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

11/9/2011 1:19PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.202010	11.90	10.3	54	41.6	---	---
0.334010	13.50	10.3	49	35.8	---	---
0.486010	17.00	10.3	46	29.3	---	---
0.508000	16.50	10.3	46	29.5	---	---
1.848000	9.70	10.4	46	36.3	---	---
4.836000	14.60	10.7	46	31.4	---	---
12.244000	11.40	11.2	50	38.6	---	---
23.780000	10.90	11.8	50	39.1	---	---
27.504000	11.10	11.9	50	38.9	---	---

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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 ㎓

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

Operation Mode : Standard Cover _ Data Communication mode

-For measurement above 1 ㎓

Detector : Peak mode: Peak (RBW: 1 ㎒ / VBW: 1 ㎒)

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

Operation Mode : Standard Cover _ Data Communication mode

Temperature : 22.6 °C

Humidity Level : 47.1 %

Test Date : December 26, 2011

Frequency (MHz)	Reading (dBuV)	Polarity (H/V)	Antenna Height (m)	Correction Factor		Limit (dBuV/m)	Level (dBuV/m)	Margin (dB)
				Antenna (dB/m)	Cable (dB)			
39.3	18.38	V	1.0	11.58	1.04	40.0	31.0	9.0
199.9	22.53	V	1.2	9.41	2.46	43.5	34.4	9.1
299.9	24.93	H	1.0	13.42	3.05	46.0	41.4	4.6
706.5	16.12	H	1.2	21.28	4.80	46.0	42.2	3.8
777.1	14.10	H	1.0	22.34	5.06	46.0	41.5	4.5
847.9	12.74	H	1.0	23.16	5.29	46.0	41.2	4.8

Limit Apply to : FCC PART 15 Subpart B Class B

-For measurement below 1 ㎓

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

Operation Mode : Base Station _ Camera(VGA) mode

-For measurement above 1 ㎓

Detector : Peak mode: Peak (RBW: 1 ㎒ / VBW: 1 ㎒)

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

Operation Mode : Base Station _ Camera(VGA) mode

Temperature : 23.4 °C

Humidity Level : 49.6 %

Test Date : November 11, 2011

Frequency (MHz)	Reading (dBuV)	Polarity (H/V)	Antenna Height (m)	Correction Factor		Limit (dBuV/m)	Level (dBuV/m)	Margin (dB)
				Antenna (dB/m)	Cable (dB)			
31.9	20.96	V	1.0	11.09	0.95	40.0	33.0	7.0
34.3	16.91	V	1.0	11.11	0.97	40.0	29.0	11.0
38.9	18.32	V	1.0	11.54	1.03	40.0	30.9	9.1
51.3	16.46	V	1.0	11.93	1.20	40.0	29.6	10.4
87.3	13.33	V	1.0	8.08	1.59	40.0	23.0	17.0
130.9	13.24	V	1.0	11.99	1.97	43.5	27.2	16.3

※ **NOTE:**

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

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 dBμV is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dBμV/m value is mathematically converted to its corresponding level in μV/m.

FS = 21.5 + 7.4 + 1.1 = 30 dBμV/m

[Radiated Emission Limits]

Frequency of Emission (㎒)	Field Strength	
	μV/m	dBμV/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

	Type	Manufacturer	Model Number	Serial Number	Next CAL Date
	Conducted Emission				
☐	EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	2012.05.26
☒	EMI Test Receiver	Rohde & Schwarz	ESCI	100584	2012.05.03
☒	LISN	Rohde & Schwarz	ESH3-Z5	100282	2012.02.01
☐	LISN	Rohde & Schwarz	ENV216	100073	2012.04.01
☒	Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	2012.08.01
	Radiated Emission				
☒	EMI Test Receiver	Rohde & Schwarz	ESU26	100241	2012.08.02
☐	EMI Test Receiver	Rohde & Schwarz	ESI 40	831564103	2012.05.26
☒	Trilog Antenna	Schwarzbeck	VULB9160	3125	2013.05.03
☐	Trilog Antenna	Schwarzbeck	VULB9160	3301	2012.09.13
☐	Antenna master	HD GmbH	MA240	240/520	-
☒	Antenna master	INNCO Systems	MA4000-EP	MA4000/283	-
☐	Turn Table	HD GmbH	2090	9702/1224	-
☒	Turn Table	INNCO Systems	DT3000-3T	DT3000/69	-
☐	Antenna master controller	HD GmbH	HD100	100/637BJ:00	-
☐	Communication Antenna	Schwarzbeck	USLP9142	9142-248	-
☒	Horn Antenna	Schwarzbeck	BBHA 9120D	-	2012.04.13
☒	Power Amplifier	Rohde & Schwarz	SCU-18	10094	2012.09.19
☐	Power Amplifier	Rohde & Schwarz	CBL01188035-01	16074B	2012.04.28

7. CONCLUSION

The data collected shows that the **LTE/CDMA Phone, Model: VS840, FCC ID: ZNFVS840** complies with §15.107 and §15.109 of the FCC rules.