RF EXPOSURE

Product Name	Telematics Terminal
Model Name	Gen7.05L, Gen7.1L
Applicant	LG Electronics Inc.

ESTECH CO., LTD

Rm. 1015 World Venture Center, 426-5 Gasan-dong, Geumcheon-gu,
Seoul, 153-803, Korea. Tel:82-2-867-3201, Fax:82-2-867-3204

RF EXPOSURE

Report Number	ESTR0704-003			
Applicant	Company Name	LG Electronics Inc.		
	Address	16 Woomyeon-dong, Seocho-gu, Seoul 137-724, Korea		
Product	Product Name	Telematics Terminal		
	Model No.	Gen7.05L, Gen7.1L	Manufacturer	LG Electronics Inc.
	Serial No.	NONE	Country of origin	KOREA
	Issued Date	2007-04-03	Tested Date	2007-03-15 ~ 2007-04-03
Test Result	Complied			
Standard	FCC OET Bulletin 65			
Tested by	Sung Ryul Kim	(Signature)		
Approved by	Jay Kim	(Signature)		

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1. General Information

1.1 EUT Description

FCC ID	**BEJLTGEN71L**
Product Name	**Telematics Terminal**
Model Name	**Gen7.05L, Gen7.1L**
Frequency	**1851.25 ~ 1908.75MHz(PCS), 824.70 ~ 848.31MHz(Cellular), 824.04 ~ 848.97MHz(AMPS)**
	1931.25 ~ 1988.75MHz(PCS), 869.70 ~ 893.31MHz(Cellular), 869.04 ~ 893.97MHz(AMPS)
Channel	**PCS(25/600/1175), Cellular(1013/363/777), AMPS(991/384/799)**
Modulation Type	**CDMA, FM**
Power Rating	**12VDC(9 ~ 16VDC)**
Antenna Gain	**PCS: -1.0dBi(0.794), Cellular/AMPS: 2.15dBi(1.641)**

2. Laboratory Information

2.1 Laboratory Name **Estech Co., Ltd.**

2.2 Location

Head Office **Rm. 1015, World Venture Center II, 426-5 Gasan-dong Geumcheon-gu, Seoul, 153-803. Korea.**

EMC Lab(Ichon) **58-1, Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea**

EMC Lab(Yanggi) **97-1, Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea**

2.3 Quality System **Accredited by KOLAS(ISO/IEC 17025)**

2.4 Major Accredited Mark

1. RF EXPOSURE MEASUREMENT

1. Introduction

Because this deivce is transmitting the high power signal, it is regarded specially as a dangerous band for its heating harmfulness to the human body. The manufacturer whose product is working in this frequency band is obligatory to prove the harmfulness of his product.
In this document, we try to prove the safety of radiation harmfulness to the human body for our product. The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The Gain of the antenna used in this product is measured in a Fully Anechoic Chamber (FAC), and the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

2. Classification

MODE: CDMA, AMPS(FM)

The antenna of the product, under normal use condition, is at least 20cm away from the body of the user. Warning statement for keeping 20cm separation distance and the prohibition of operating next to a person has been printed on the user's manual. So, this product is classified as the Mobile Device.

3. RF Exposure Limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency(RF) radiation as specified in 1.1307(b).

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE) - **Class A**

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm2)	Average Time (minutes)
30 - 300	61.4	0.163	1.0	6
300 - 1500			F/300	6
1500 - 100,000			5	6

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE) - **Class B**

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm2)	Average Time (minutes)
30 - 300	27.5	0.073	0.2	30
300 - 1500			F/1500	30
1500 - 100,000			1.0	30

F = Frequency in MHz

4. Friis Formula

Friis transmission formula : $P_d = (P_{out}*G) / (4*\pi*r^2)$

The maximum Gain measured in Fully Anechoic Chamber is Cellular&AMPS : 2.15dBi(numeric -> 1.641), PCS : -1.0dBi(numeric -> 0.794)

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

MODE: CDMA, FM

- "Pd" is the limit of MPE, 1mW/cm2. If we know the maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance "r" where the MPE limit is reached.

- It was measured for each channel and mode. (lowest, middle, highest channel)

5. Test Results

5.1 Antenna Gain

- Cellular&AMPS : 2.15dBi(numeric -> 1.641), PCS : -1.0dBi(numeric -> 0.794)

5.2 Output Power into Antenna & RF Exposure value at distance 20cm:

MODE: CDMA

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
1013	824.70	239.883	0.07831	0.57
363	835.89	231.739	0.07565	0.57
777	848.31	251.768	0.08219	0.57

MODE: AMPS

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
991	824.04	788.860	0.25754	0.57
384	836.52	792.501	0.25872	0.57
799	848.97	787.046	0.25694	0.57

MODE: PCS

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
25	1851.25	177.828	0.02809	1.0
600	1880.00	25.930	0.00410	1.0
1175	1908.75	248.886	0.03931	1.0

The minimum allowable distance is very close to the enclosure of the antenna and is very far away from the human being under normal use condition.