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FCC MPE REPORT

Certification

Applicant Name:
LG Electronics Inc.

Address:
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Date of Issue:

December 13, 2016

Test Site/Location:

HCT CO., LTD., 74, Seoicheon-ro 578beon-gil,
Majang-myeon, Icheon-si, Gyeonggi-do, 17383,
Rep. of KOREA

Report No.: HCT-R-1612-E008

HCT FRN: 0005866421

FCC ID: BEJTL3HEBN

APPLICANT: LG Electronics Inc.

Model(s): TL3HEB-N

EUT Type: Car Telematics Device

The measurements shown in this report were made in accordance with the procedures specified in §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S.C. 853(a)

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1612-E008	December 13, 2016	- First Approval Report

RF Exposure Statement

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	*(100)	30
1.34 - 30.....	824/f	2.19/f	*(180/ f ²)	30
30 - 300.....	27.5	0.073	0.2	30
300 - 1500.....			f/1500	30
1500 - 100.000.....			1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

3.RESULTS

3-1. GSM 850 BAND

Average Peak output Power at antenna input terminal	33.500	dBm
Average Peak output Power at antenna input terminal	2238.721	mW
Prediction distance	20.000	cm
Prediction frequency	824.200	MHz
Antenna Gain(typical)	-3.250	dBi
Antenna Gain(numeric)	0.473	-
Power density at prediction frequency(S)	0.211	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.549	mW/cm ²

3-2. GSM 1900 BAND

Average Peak output Power at antenna input terminal	30.500	dBm
Average Peak output Power at antenna input terminal	1122.018	mW
Prediction distance	20.000	cm
Prediction frequency	1850.200	MHz
Antenna Gain(typical)	1.260	dBi
Antenna Gain(numeric)	1.337	-
Power density at prediction frequency(S)	0.298	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-3. WCDMA 850 BAND

Average Peak output Power at antenna input terminal	24.200	dBm
Average Peak output Power at antenna input terminal	263.027	mW
Prediction distance	20.000	cm
Prediction frequency	826.400	MHz
Antenna Gain(typical)	-3.250	dBi
Antenna Gain(numeric)	0.473	-
Power density at prediction frequency(S)	0.025	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.551	mW/cm ²

3-4. WCDMA 1900 BAND

Average Peak output Power at antenna input terminal	24.200	dBm
Average Peak output Power at antenna input terminal	263.027	mW
Prediction distance	20.000	cm
Prediction frequency	1852.400	MHz
Antenna Gain(typical)	1.260	dBi
Antenna Gain(numeric)	1.337	-
Power density at prediction frequency(S)	0.070	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-5. WCDMA 1700 BAND

Average Peak output Power at antenna input terminal	24.200	dBm
Average Peak output Power at antenna input terminal	263.027	mW
Prediction distance	20.000	cm
Prediction frequency	1712.400	MHz
Antenna Gain(typical)	-0.130	dBi
Antenna Gain(numeric)	0.971	-
Power density at prediction frequency(S)	0.051	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-6. LTE BAND 2

Average Peak output Power at antenna input terminal	26.200	dBm
Average Peak output Power at antenna input terminal	416.869	mW
Prediction distance	20.000	cm
Prediction frequency	1850.700	MHz
Antenna Gain(typical)	1.260	dBi
Antenna Gain(numeric)	1.337	-
Power density at prediction frequency(S)	0.111	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-7. LTE BAND 5

Average Peak output Power at antenna input terminal	26.200	dBm
Average Peak output Power at antenna input terminal	416.869	mW
Prediction distance	20.000	cm
Prediction frequency	824.700	MHz
Antenna Gain(typical)	-3.250	dBi
Antenna Gain(numeric)	0.473	-
Power density at prediction frequency(S)	0.039	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.550	mW/cm ²

3-8. LTE BAND 4

Average Peak output Power at antenna input terminal	26.200	dBm
Average Peak output Power at antenna input terminal	416.869	mW
Prediction distance	20.000	cm
Prediction frequency	1710.700	MHz
Antenna Gain(typical)	-0.130	dBi
Antenna Gain(numeric)	0.971	-
Power density at prediction frequency(S)	0.080	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-9. LTE BAND 17

Average Peak output Power at antenna input terminal	26.200	dBm
Average Peak output Power at antenna input terminal	416.869	mW
Prediction distance	20.000	cm
Prediction frequency	706.500	MHz
Antenna Gain(typical)	-3.030	dBi
Antenna Gain(numeric)	0.498	-
Power density at prediction frequency(S)	0.041	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.471	mW/cm ²

3-10. LTE BAND 7

Average Peak output Power at antenna input terminal	26.200	dBm
Average Peak output Power at antenna input terminal	416.869	mW
Prediction distance	20.000	cm
Prediction frequency	2502.500	MHz
Antenna Gain(typical)	-0.220	dBi
Antenna Gain(numeric)	0.951	-
Power density at prediction frequency(S)	0.079	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-11. BT LE

Average Peak output Power at antenna input terminal	-3.490	dBm
Average Peak output Power at antenna input terminal	0.448	mW
Prediction distance	20.000	cm
Prediction frequency	2402.000	MHz
Antenna Gain(typical)	4.030	dBi
Antenna Gain(numeric)	2.529	-
Power density at prediction frequency(S)	0.00023	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-12. WLAN 802.11b

Average Peak output Power at antenna input terminal	15.900	dBm
Average Peak output Power at antenna input terminal	38.905	mW
Prediction distance	20.000	cm
Prediction frequency	2437.000	MHz
Antenna Gain(typical)	3.440	dBi
Antenna Gain(numeric)	2.208	-
Power density at prediction frequency(S)	0.01709	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-13. WLAN 802.11g

Average Peak output Power at antenna input terminal	14.390	dBm
Average Peak output Power at antenna input terminal	27.479	mW
Prediction distance	20.000	cm
Prediction frequency	2437.000	MHz
Antenna Gain(typical)	3.440	dBi
Antenna Gain(numeric)	2.208	-
Power density at prediction frequency(S)	0.01207	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-14. WLAN 802.11n(HT20)

Average Peak output Power at antenna input terminal	14.460	dBm
Average Peak output Power at antenna input terminal	27.925	mW
Prediction distance	20.000	cm
Prediction frequency	2437.000	MHz
Antenna Gain(typical)	3.440	dBi
Antenna Gain(numeric)	2.208	-
Power density at prediction frequency(S)	0.01227	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

[UNII1 Band]

3-15. WLAN 802.11a (5180 ~ 5240)

Average Peak output Power at antenna input terminal	11.620	dBm
Average Peak output Power at antenna input terminal	14.521	mW
Prediction distance	20.000	cm
Prediction frequency	5240.000	MHz
Antenna Gain(typical)	5.540	dBi
Antenna Gain(numeric)	3.581	-
Power density at prediction frequency(S)	0.01034	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-16. WLAN 802.11n (HT20) - (5180 ~ 5240)

Average Peak output Power at antenna input terminal	11.620	dBm
Average Peak output Power at antenna input terminal	14.521	mW
Prediction distance	20.000	cm
Prediction frequency	5200.000	MHz
Antenna Gain(typical)	5.540	dBi
Antenna Gain(numeric)	3.581	-
Power density at prediction frequency(S)	0.01034	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-17. WLAN 802.11n (HT40) - (5190 ~ 5230)

Average Peak output Power at antenna input terminal	7.290	dBm
Average Peak output Power at antenna input terminal	5.358	mW
Prediction distance	20.000	cm
Prediction frequency	5230.000	MHz
Antenna Gain(typical)	5.540	dBi
Antenna Gain(numeric)	3.581	-
Power density at prediction frequency(S)	0.00382	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

[UNII2A Band]

3-18. WLAN 802.11a (5260 ~ 5320)

Average Peak output Power at antenna input terminal	11.640	dBm
Average Peak output Power at antenna input terminal	14.588	mW
Prediction distance	20.000	cm
Prediction frequency	5320.000	MHz
Antenna Gain(typical)	5.900	dBi
Antenna Gain(numeric)	3.890	-
Power density at prediction frequency(S)	0.01129	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-19. WLAN 802.11n (HT20) - (5260 ~ 5320)

Average Peak output Power at antenna input terminal	11.640	dBm
Average Peak output Power at antenna input terminal	14.588	mW
Prediction distance	20.000	cm
Prediction frequency	5300.000	MHz
Antenna Gain(typical)	5.900	dBi
Antenna Gain(numeric)	3.890	-
Power density at prediction frequency(S)	0.01129	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-20. WLAN 802.11n (HT40) - (5270 ~ 5310)

Average Peak output Power at antenna input terminal	7.510	dBm
Average Peak output Power at antenna input terminal	5.636	mW
Prediction distance	20.000	cm
Prediction frequency	5310.000	MHz
Antenna Gain(typical)	5.900	dBi
Antenna Gain(numeric)	3.890	-
Power density at prediction frequency(S)	0.00436	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

[UNII2C Band]

3-21. WLAN 802.11a (5500 – 5720)

Average Peak output Power at antenna input terminal	8.240	dBm
Average Peak output Power at antenna input terminal	6.668	mW
Prediction distance	20.000	cm
Prediction frequency	5720.000	MHz
Antenna Gain(typical)	5.520	dBi
Antenna Gain(numeric)	3.565	-
Power density at prediction frequency(S)	0.00473	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-22. WLAN 802.11n (HT20) - (5500 – 5720)

Average Peak output Power at antenna input terminal	8.260	dBm
Average Peak output Power at antenna input terminal	6.699	mW
Prediction distance	20.000	cm
Prediction frequency	5720.000	MHz
Antenna Gain(typical)	5.520	dBi
Antenna Gain(numeric)	3.565	-
Power density at prediction frequency(S)	0.00475	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-23. WLAN 802.11n (HT40) - (5510 – 5710)

Average Peak output Power at antenna input terminal	6.280	dBm
Average Peak output Power at antenna input terminal	4.246	mW
Prediction distance	20.000	cm
Prediction frequency	5710.000	MHz
Antenna Gain(typical)	5.520	dBi
Antenna Gain(numeric)	3.565	-
Power density at prediction frequency(S)	0.00301	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

[UNII3 Band]

3-24. WLAN 802.11a (5745 – 5825)

Average Peak output Power at antenna input terminal	10.060	dBm
Average Peak output Power at antenna input terminal	10.139	mW
Prediction distance	20.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	4.920	dBi
Antenna Gain(numeric)	3.105	-
Power density at prediction frequency(S)	0.00626	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-25. WLAN 802.11n (HT20) - (5745 – 5825)

Average Peak output Power at antenna input terminal	10.110	dBm
Average Peak output Power at antenna input terminal	10.257	mW
Prediction distance	20.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	4.920	dBi
Antenna Gain(numeric)	3.105	-
Power density at prediction frequency(S)	0.00633	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-26. WLAN 802.11n (HT40) - (5755 – 5795)

Average Peak output Power at antenna input terminal	8.030	dBm
Average Peak output Power at antenna input terminal	6.353	mW
Prediction distance	20.000	cm
Prediction frequency	5755.000	MHz
Antenna Gain(typical)	4.920	dBi
Antenna Gain(numeric)	3.105	-
Power density at prediction frequency(S)	0.00392	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

1. The power density level at 20 cm is **0.298 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm² at GSM 1900**.
2. The power density level at 20 cm is **0.00023 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm² at BT LE**.
3. The power density level at 20 cm is **0.01709 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm² at DTS(802.11b)**.
4. The power density level at 20 cm is **0.01129 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm² at UNII 2A(802.11a)**.

->Simultaneous MPE 20cm is $(0.298 / 1.0) + (0.01709 / 1.0) < 1$

* The Worst case GSM 1900: 30.5 dBm , DTS: 15.90 dBm is Highest Power