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FCC MPE REPORT

Certification

Applicant Name:
LG Electronics Inc.

Address:
222, LG-ro, Jinwi-myeon, Pyeongtaek-si,
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Date of Issue:

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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-E005

HCT FRN: 0005866421

FCC ID: BEJTL3LNBN

APPLICANT: LG Electronics Inc.

Model(s): TL3LNB-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-E005	December 12, 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	-4.550	dBm
Average Peak output Power at antenna input terminal	0.351	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)	0.00018	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	16.140	dBm
Average Peak output Power at antenna input terminal	41.115	mW
Prediction distance	20.000	cm
Prediction frequency	2412.000	MHz
Antenna Gain(typical)	6.010	dBi
Antenna Gain(numeric)	3.990	-
Power density at prediction frequency(S)	0.03264	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	17.820	dBm
Average Peak output Power at antenna input terminal	60.534	mW
Prediction distance	20.000	cm
Prediction frequency	2412.000	MHz
Antenna Gain(typical)	6.010	dBi
Antenna Gain(numeric)	3.990	-
Power density at prediction frequency(S)	0.04805	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	17.790	dBm
Average Peak output Power at antenna input terminal	60.117	mW
Prediction distance	20.000	cm
Prediction frequency	2412.000	MHz
Antenna Gain(typical)	6.010	dBi
Antenna Gain(numeric)	3.990	-
Power density at prediction frequency(S)	0.04772	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-15. WLAN 802.11n(HT40)

Average Peak output Power at antenna input terminal	13.400	dBm
Average Peak output Power at antenna input terminal	21.878	mW
Prediction distance	20.000	cm
Prediction frequency	2422.000	MHz
Antenna Gain(typical)	3.040	dBi
Antenna Gain(numeric)	2.014	-
Power density at prediction frequency(S)	0.00876	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

[UNII 1 Band]

3-16. WLAN 802.11a (5180 ~ 5240)

Average Peak output Power at antenna input terminal	14.010	dBm
Average Peak output Power at antenna input terminal	25.177	mW
Prediction distance	20.000	cm
Prediction frequency	5240.000	MHz
Antenna Gain(typical)	7.400	dBi
Antenna Gain(numeric)	5.495	-
Power density at prediction frequency(S)	0.02753	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-17. WLAN 802.11n (HT20) - (5180 ~ 5240)

Average Peak output Power at antenna input terminal	13.140	dBm
Average Peak output Power at antenna input terminal	20.606	mW
Prediction distance	20.000	cm
Prediction frequency	5200.000	MHz
Antenna Gain(typical)	7.400	dBi
Antenna Gain(numeric)	5.495	-
Power density at prediction frequency(S)	0.02253	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-18. WLAN 802.11ac (VHT20) - (5180 ~ 5240)

Average Peak output Power at antenna input terminal	14.020	dBm
Average Peak output Power at antenna input terminal	25.235	mW
Prediction distance	20.000	cm
Prediction frequency	5200.000	MHz
Antenna Gain(typical)	4.400	dBi
Antenna Gain(numeric)	2.754	-
Power density at prediction frequency(S)	0.01383	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-19. WLAN 802.11n (HT40) - (5190 ~ 5230)

Average Peak output Power at antenna input terminal	10.480	dBm
Average Peak output Power at antenna input terminal	11.169	mW
Prediction distance	20.000	cm
Prediction frequency	5230.000	MHz
Antenna Gain(typical)	4.400	dBi
Antenna Gain(numeric)	2.754	-
Power density at prediction frequency(S)	0.00612	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-20. WLAN 802.11ac (VHT40) - (5190 ~ 5230)

Average Peak output Power at antenna input terminal	8.780	dBm
Average Peak output Power at antenna input terminal	7.551	mW
Prediction distance	20.000	cm
Prediction frequency	5230.000	MHz
Antenna Gain(typical)	4.400	dBi
Antenna Gain(numeric)	2.754	-
Power density at prediction frequency(S)	0.00414	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-21. WLAN 802.11ac (VHT80) - (5210)

Average Peak output Power at antenna input terminal	8.360	dBm
Average Peak output Power at antenna input terminal	6.855	mW
Prediction distance	20.000	cm
Prediction frequency	5210.000	MHz
Antenna Gain(typical)	4.400	dBi
Antenna Gain(numeric)	2.754	-
Power density at prediction frequency(S)	0.00376	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

[UNII 3 Band]

3-22. WLAN 802.11a (5745 ~ 5825)

Average Peak output Power at antenna input terminal	10.690	dBm
Average Peak output Power at antenna input terminal	11.722	mW
Prediction distance	20.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	7.740	dBi
Antenna Gain(numeric)	5.943	-
Power density at prediction frequency(S)	0.01386	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-23. WLAN 802.11n (HT20) - (5745 ~ 5825)

Average Peak output Power at antenna input terminal	10.820	dBm
Average Peak output Power at antenna input terminal	12.078	mW
Prediction distance	20.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	7.740	dBi
Antenna Gain(numeric)	5.943	-
Power density at prediction frequency(S)	0.01428	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-24. WLAN 802.11ac (VHT20) - (5745 ~ 5825)

Average Peak output Power at antenna input terminal	10.750	dBm
Average Peak output Power at antenna input terminal	11.885	mW
Prediction distance	20.000	cm
Prediction frequency	5745.000	MHz
Antenna Gain(typical)	4.730	dBi
Antenna Gain(numeric)	2.972	-
Power density at prediction frequency(S)	0.00703	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-25. WLAN 802.11n (HT40) - (5755 ~ 5795)

Average Peak output Power at antenna input terminal	7.300	dBm
Average Peak output Power at antenna input terminal	5.370	mW
Prediction distance	20.000	cm
Prediction frequency	5755.000	MHz
Antenna Gain(typical)	4.730	dBi
Antenna Gain(numeric)	2.972	-
Power density at prediction frequency(S)	0.00317	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-26. WLAN 802.11ac (VHT40) - (5755 ~ 5795)

Average Peak output Power at antenna input terminal	7.990	dBm
Average Peak output Power at antenna input terminal	6.295	mW
Prediction distance	20.000	cm
Prediction frequency	5755.000	MHz
Antenna Gain(typical)	4.730	dBi
Antenna Gain(numeric)	2.972	-
Power density at prediction frequency(S)	0.00372	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.000	mW/cm ²

3-27. WLAN 802.11ac (VHT80) - (5775)

Average Peak output Power at antenna input terminal	8.130	dBm
Average Peak output Power at antenna input terminal	6.501	mW
Prediction distance	20.000	cm
Prediction frequency	5775.000	MHz
Antenna Gain(typical)	4.730	dBi
Antenna Gain(numeric)	2.972	-
Power density at prediction frequency(S)	0.00384	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 **0.00018 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 **0.04805 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm² at DTS(802.11g)**.
4. The power density level at 20 cm is **0.02753 mW/cm²**, which is below the uncontrolled exposure limit of **1.0 mW/cm² at UNII 1(802.11a)**.

->Simultaneous MPE 20cm is $(0.298 / 1.0) + (0.04805 / 1.0) < 1$

* The Worst case GSM 1900: 30.5 dBm , DTS: 17.820 dBm is Highest Power