

TEST REPORT

of

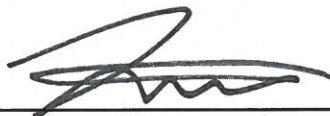
FCC CFR 47 part 1, 1.1307(b), 1.1310

FCC ID: BEJ-TTA20ANEBR

Equipment Under Test : Telematics
Model Name : TTA20ANEBR
Variant Model Names : TTA20ANENR, TTA20ANEBS, TTA20ANENS,
TTA20GNEBS, TTA20GNENS, TTA20BNEBR,
TTA20BNENR, TTA20GNEBR, TTA20GNENR,
TTA20BNEBS, TTA20BNENS
Applicant : LG Electronics USA.
Manufacturer : LG Electronics Inc.
Date of Receipt : 2018.12.05
Date of Test(s) : 2018.03.16 ~ 2018.03.21
Date of Issue : 2018.12.06

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Nancy park

Date:

2018.12.06

Technical
Manager:



Harim Lee

Date:

2018.12.06

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SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)0

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

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1. General information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

-Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Phone No. : +82 31 688 0901

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1.2. Details of applicant

Applicant : LG Electronics USA.

Address : 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States, 07632

Contact Person : Han, Kyung-Su

Phone No. : +1 201 816 2003

1.3. Details of manufacturer

Company : LG Electronics Inc.

Address : 10, Magokjungang 10-ro, Gangseo-gu, Seoul, Korea, 07796

1.4. Description of EUT

Kind of Product	Telematics
Model Name	TTA20ANEBr
Variant Model Names	TTA20ANENR, TTA20ANEBS, TTA20ANENS, TTA20GNEBS, TTA20GNENS, TTA20BNEBr, TTA20BNENR, TTA20GNEBr, TTA20GNENR, TTA20BNEBS, TTA20BNENS
Power Supply	DC 12 V
Frequency Range	GSM 850: 824 MHz ~ 849 MHz GSM 1 900: 1 850 MHz ~ 1 910 MHz WCDMA 2: 1 850 MHz ~ 1 910 MHz WCDMA 5: 824 MHz ~ 849 MHz LTE Band 2: 1 850 MHz ~ 1 910 MHz LTE Band 4: 1 710 MHz ~ 1 755 MHz LTE Band 5: 824 MHz ~ 849 MHz
Antenna Gain	824 MHz ~ 849 MHz: -0.7 dB i 1 850 MHz ~ 1 910 MHz: 1.2 dB i 1 710 MHz ~ 1 755 MHz: -0.1 dB i

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1.5. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL012490	2018.03.22	Initial
1	F690501/RF-RTL012490-1	2018.12.06	Added variant model names

1.6. Information of Variant Models

	-		CAN	-	Ethernet	BUB(B/N)	Region
TT	A	20	A	N	E	B	R
TT	A	20	A	N	E	N	R
TT	A	20	B	N	E	B	R
TT	A	20	B	N	E	N	R
TT	A	20	G	N	E	B	R
TT	A	20	G	N	E	N	R
TT	A	20	A	N	E	B	S
TT	A	20	A	N	E	N	S
TT	A	20	B	N	E	B	S
TT	A	20	B	N	E	N	S
TT	A	20	G	N	E	B	S
TT	A	20	G	N	E	N	S

CAN: Vehicle communication interface A: High/Low Speed support B: High Speed support G: High Speed support	Ethernet: Vehicle Network G: 1Gb Speed support E: 100Mb Speed support
BUB: B: Backup Battery N: Non-Backup Battery	Region R: Rest of World S: South America

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2. RF Exposure Evaluation

2.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time
(A) Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	*100	6
3.0 – 30	1842/f	4.89/f	*900/f ²	6
30 – 300	61.4	0.163	1.0	6
300 – 1 500	-	-	f/300	6
1 500 – 100 000	-	-	5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
<u>300 – 1 500</u>	-	-	<u>f/1500</u>	<u>30</u>
<u>1 500 – 100 000</u>	-	-	<u>1.0</u>	<u>30</u>

2.1.1. Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1 mW/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 where the MPE limit is reached.

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2.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation

2.1.3. Test information of Cable Loss and Antenna Gain

Test Item	Frequency (MHz)	Cable Loss (dB)	Antenna Gain of EUT (dB i)	Final Antenna Gain (dB i)
GSM 850	836.6	-5.45	-0.7	-6.15
GSM 1900	1 850.2	-8.29	1.2	-7.09
WCDMA 2	1 852.4	-8.29	1.2	-7.09
WCDMA 5	826.4	-5.45	-0.7	-6.15
LTE 2	1 850.7	-8.29	1.2	-7.09
LTE 4	1 710.7	-7.95	-0.1	-8.05
LTE 5	824.7	--5.45	-0.7	-6.15

Note :

-The cable used for normal operation is 6.8 m.

-Final Antenna Gain = Cable Loss(dB) + Antenna Gain of EUT(dB i)

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2.1.4. Output Power into Antenna & RF Exposure Evaluation Distance

GSM 850

- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Final Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
128	824.2	35.5	-6.15	0.171 289	0.549 467

GSM 1 900

- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Final Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
512	1 850.2	32.5	-7.09	0.069 140	1

WCDMA Band 2

- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Final Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
9262	1 852.4	25.7	-7.09	0.014 445	1

WCDMA Band 5

- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Final Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
4132	826.4	25.7	-6.15	0.017 936	0.550 933

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LTE Band 2
- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Final Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
18607	1 850.7	25.7	-7.09	0.014 445	1

LTE Band 4
- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Final Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
19957	1 710.7	25.7	-8.05	0.011 581	1

LTE Band 5
- Maximum tune up tolerance

Channel	Frequency (MHz)	Output Average Power to Antenna (dB m)	Final Antenna Gain (dB i)	Power Density at 20 cm (mW/cm ²)	Limits (mW/cm ²)
20407	824.7	25.7	-6.15	0.017 936	0.549 800

- The power density Pd (5th column) at a distance of 20 cm calculated from the friis transmission formula is far below the limit of 1 mW/cm².

- End of the Test Report -

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