

TEST REPORT

of

RF Exposure Evaluation

FCC ID: BEJCCIC2US

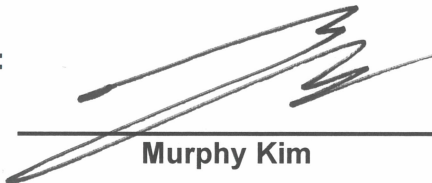
Equipment Under Test : Car Navigation System
Model Name : CCIC2
Variant Model Name(s) : Refer to the page 3
Applicant : LG Electronics USA
Manufacturer : LG Electronics Inc.
Date of Receipt : 2022.12.09
Date of Test(s) : 2022.12.14 ~ 2023.03.31
Date of Issue : 2023.03.31

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

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- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
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- 4) The data marked ※ in this report was provided by the customer and may affect the validity of the test results.

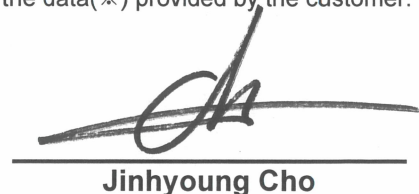
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Tested by:



Murphy Kim

Technical
Manager:



Jinhyoung Cho

SGS Korea Co., Ltd. Gunpo Laboratory



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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- CAB Identifier: KR0150

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1.2. Details of Applicant

Applicant : LG Electronics USA

Address : 111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, United States, 07632

Contact Person : Cho, Hee-jae

Phone No. : +1 201 266 2215

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	Car Navigation System	
Model Name	CCIC2	
Variant Model Names	Refer to the clause 1.8	
Serial Number	Conducted Sample: C-001 Radiated Sample: R-001	
Power Supply	DC 12 V	
Frequency Range	2 402 MHz ~ 2 480 MHz (Bluetooth) 2 402 MHz ~ 2 480 MHz (Bluetooth Low Energy) 2 412 MHz ~ 2 462 MHz (11b/g/n_HT20) 5 180 MHz ~ 5 240 MHz (Band 1: 11a/n_HT20, 11ac_VHT20) 5 190 MHz ~ 5 230 MHz (Band 1: 11n_HT40, 11ac_VHT40) 5 210 MHz (Band 1: 11ac_VHT80) 5 745 MHz ~ 5 825 MHz (Band 3: 11a/n_HT20, 11ac_VHT20) 5 755 MHz ~ 5 795 MHz (Band 3: 11n_HT40, 11ac_VHT40) 5 775 MHz (Band 3: 11ac_VHT80)	
Modulation Technique	DSSS, OFDM, GFSK, $\pi/4$ DQPSK, 8DPSK	
Number of Channels	79 channels (Bluetooth) 40 channels (Bluetooth Low Energy) 11 channels (11b/g/n_HT20) 4 channels (Band 1: 11a/n_HT20, 11ac_VHT20) 2 channels (Band 1: 11n_HT40, 11ac_VHT40) 1 channel (Band 1: 11ac_VHT80) 5 channels (Band 3: 11a/n_HT20, 11ac_VHT20) 2 channels (Band 3: 11n_HT40, 11ac_VHT40) 1 channel (Band 3: 11ac_VHT80)	
Antenna Type	PCB & Cable Assembly antenna	
Antenna Gain *	Port 1	2 400 MHz ~ 2 483.5 MHz: 0.94 dB i (Bluetooth) 5 150 MHz ~ 5 250 MHz: -1.05 dB i (WLAN 5 G) 5 725 MHz ~ 5 850 MHz: -0.78 dB i (WLAN 5 G)
	Port 2	2 400 MHz ~ 2 483.5 MHz: 0.69 dB i (WLAN 2.4 G) 5 150 MHz ~ 5 250 MHz: -0.97 dB i (WLAN 5 G) 5 725 MHz ~ 5 850 MHz: -0.88 dB i (WLAN 5 G)
H/W Version	1.0	
S/W Version	1.0	
FVIN	N/A	

1.5. Declarations by the manufacturer

- The EUT has two ports (Port1, Port 2).

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 2		
Section	Test Item(s)	Result
2.1091	RF Exposure Evaluation	Complied

1.7. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL004008	2023.03.31	Initial

1.8. Information of Variant Models

Model Name		Description					
		HMC P/N	Vehicle Type	LG P/N	Navigation	Tuner	Market
Basic Model		96560-T1AD0	RG3 FL	NSHKJNNG2D6	O	SXM/HD	USA
		96560-T6EA0	JX FL	NSHKJNNG2C1	O	DMB	Korea
Variant Models	CCIC2	96560-T6EB0	JX FL	NSHKJNNG2CY	O	DAB	Australia
		96560-T6EC0	JX FL	NSHKJNNG2C5	O	SXM/HD	Canada
		96560-T6ED0	JX FL	NSHKJNNG2CM	O	SXM/HD	USA
		96560-T6EE0	JX FL	NSHKJNNG2CN	O	X	China
		96560-T6FA0	JX FL	ASHKJNNG2C1	X	X	RoW
		96560-T6FB0	JX FL	ASHKJNNG2C2	X	DRM	India
		96560-T6FD0	JX FL	ASHKJNNG2C3	X	HD	Mexico
		96560-T6FE0	JX FL	ASHKJNNG2C4	X	X	Iran
		96560-T6FF0	JX FL	ASHKJNNG2C5	X	X	Israel
		96560-T6GA0	JX FL	NSHKJNNG2C2	O	X	Middle East
		96560-T6GB0	JX FL	NSHKJNNG2CZ	O	DAB	UAE/Saudi Arabia
		96560-T6GC0	JX FL	ASHKJNNG2C6	X	X	Middle East
		96560-T6HA0	JX FL	NSHKJNNG2CJ	O	DAB	Europe
		96560-T6HB0	JX FL	ASHKJNNG2C7	X	DAB	Europe
		96560-T6HC0	JX FL	NSHKJNNG2C0	O	X	Europe
		96560-T6HD0	JX FL	ASHKJNNG2C8	X	X	Europe
		96560-T6FC0	JX FL	ASHKJNNG2CH	X	X	Brazil
		96560-T1AA0	RG3 FL	NSHKJNNG2D1	O	DMB	Korea
		96560-T1AB0	RG3 FL	NSHKJDNG2D1	O	DAB	Australia
		96560-T1AC0	RG3 FL	NSHKJNNG2D5	O	SXM/HD	Canada
		96560-T1AE0	RG3 FL	NSHKJNNG2D7	O	X	China
		96560-T1BA0	RG3 FL	ASHKJNNG2D1	X	X	RoW
		96560-T1BB0	RG3 FL	ASHKJNNG2D2	X	DRM	India
		96560-T1FC0	RG3 FL	NSHKJNNG2DI	X	X	Brazil
		96560-T1BD0	RG3 FL	ASHKJNNG2D3	X	HD	Mexico
		96560-T1BE0	RG3 FL	ASHKJNNG2D4	X	X	Iran
		96560-T1BF0	RG3 FL	ASHKJNNG2D5	X	X	Israel
		96560-T1CA0	RG3 FL	NSHKJNNG2D2	O	X	Middle East
		96560-T1CB0	RG3 FL	NSHKJDNG2D2	O	DAB	UAE/Saudi Arabia
		96560-T1CC0	RG3 FL	ASHKJNNG2D6	X	X	Middle East
		96560-T1DA0	RG3 FL	NSHKJNNG2D3	O	DAB	Europe
		96560-T1DB0	RG3 FL	ASHKJNNG2D7	X	DAB	Europe
		96560-T1DC0	RG3 FL	NSHKJNNG2D8	O	X	Europe_Russia
		96560-T1DD0	RG3 FL	ASHKJNNG2D8	X	X	Europe_Kazakhstan
		96560-ARKA0	JK FL	NSHKJNNG2DJ	O	DMB	Korea
		96560-ARAA0	JK FL	NSHKJDNG2D5	O	DAB	Australia
		96560-ARNB0	JK FL	NSHKJNNG2DN	O	SXM/HD	Canada
		96560-ARCA0	JK FL	NSHKJNNG2DP	O	X	China
		96560-ARGA0	JK FL	ASHKJNNG2DH	X	X	General
		96560-ARGB0	JK FL	ASHKJNNG2DI	X	DRM	India
		96560-AREDO	JK FL	ASHKJNNG2DJ	X	HD	Mexico
		96560-AREE0	JK FL	ASHKJNNG2DK	X	X	Iran
96560-AREFO	JK FL	ASHKJNNG2DL	X	X	Israel		
96560-ARMA0	JK FL	NSHKJNNG2DK	O	X	Middle East		
96560-ARMB0	JK FL	NSHKJDNG2D6	O	DAB	UAE/Saudi Arabia		
96560-ARMC0	JK FL	ASHKJNNG2DM	X	X	Middle East		
96560-AREA0	JK FL	NSHKJNNG2DL	O	DAB	Europe		
96560-AREB0	JK FL	ASHKJDNG2D1	X	DAB	Europe		
96560-ARRA0	JK FL	NSHKJNNG2DQ	O	X	Russia		
96560-AREC0	JK FL	ASHKJNNG2DN	X	X	Europe		
96560-IYNA0	JK FL	NSHKJNNG2DO	O	SXM/HD	USA		

Note;

- All the test was performed with basic model.
- Basic model and Variant model have the same name, but they are classified by P/N for internal management.
- HMC P/N: 96560-#####, the symbol "#" in the Variant P/N can be 0 to 9 or A to Z.
- LG P/N: NSHKJ#NG2## and ASHKJ#NG2##, the symbol "#" in the Variant P/N can be 0 to 9 or A to Z.

- Monitor Information

Vehicle Type	Product	AV/AVN/Monitor	Market	HKMC P/N	LG P/N	Note
JX FL	CCIC27 POLED Monitor	LHD	Canada/USA	940M3-T6000	COHK27DG1C0	SPK O
JX FL	CCIC27 POLED Monitor	LHD	Outside of North America	940M3-T6100	COHK27DG1C0	SPK X
JX FL	CCIC27 POLED Monitor	LHD	Outside of North America	940M3-T6150	COHK27DG1C0	SPK X
JX FL	CCIC27 POLED Monitor	RHD	Outside of North America	940M3-T6200	COHK27DG1C1	SPK X
JX FL	CCIC27 POLED Monitor	RHD	Outside of North America	940M3-T6250	COHK27DG1C1	SPK X
RG3 FL	CCIC27 POLED Monitor	LHD	North America	940M3-T1AB0	COHK27DG1D0	SPK O
RG3 FL	CCIC27 POLED Monitor	LHD	Outside of North America	940M3-T1AA0	COHK27DG1D0	SPK X
RG3 FL	CCIC27 POLED Monitor	LHD	Outside of North America	940M3-T1AC0	COHK27DG1D0	SPK X
RG3 FL	CCIC27 POLED Monitor	RHD	Outside of North America	940M3-T1BA0	COHK27DG1D1	SPK X
RG3 FL	CCIC27 POLED Monitor	RHD	Outside of North America	940M3-T1BB0	COHK27DG1D1	SPK X
JX FL	CCIC27 POLED Monitor	LHD	North America	96525-AR700	COHK27DG1D0	SPK X
JX FL	CCIC27 POLED Monitor	LHD	Outside of North America	96525-AR500	COHK27DG1D0	SPK X
JX FL	CCIC27 POLED Monitor	LHD	Outside of North America	96525-AR550	COHK27DG1D0	SPK X
JX FL	CCIC27 POLED Monitor	RHD	Outside of North America	96525-AR600	COHK27DG1D2	SPK X
JX FL	CCIC27 POLED Monitor	RHD	Outside of North America	96525-AR650	COHK27DG1D2	SPK X
JX FL	CCIC27 POLED Monitor	LHD	North America	-	COHK27DE1D0	SPK O
JX FL	CCIC27 POLED Monitor	LHD	Outside of North America	-	COHK27DE1D0	SPK X
JX FL	CCIC27 POLED Monitor	RHD	Outside of North America	-	COHK27DG1D3	SPK X

Note;

- LG P/N: COHK27D#1##, the symbol “#” in the part number can be 0 to 9 or A to Z
- Models other than those listed above are subject to Fuel type, production year.

2. RF Exposure Evaluation

Test exemptions apply for devices used in general population/uncontrolled exposure environments, according to the SAR-based, or MPE-based exemption thresholds.

2.1. Blanket 1 mW Blanket Exemption

The 1 mW Blanket Exemption of § 1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

The 1 mW blanket exemption applies at separation distances less than 0.5 cm, including where there is no separation. This exemption shall not be used in conjunction with other exemption criteria other than those for multiple RF sources in paragraph § 1.1307(b)(3)(ii)(A).

The 1 mW exemption is independent of service type and covers the full range of 100 kHz to 100 GHz, but it shall not be used in conjunction with other exemption criteria or in devices with higher-power transmitters operating in the same time-averaging period. Exposure from such higher-power transmitters would invalidate the underlying assumption that exposure from the lower-power transmitter is the only contributor to SAR in the relevant volume of tissue.

2.2. MPE-based Exemption

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

**Table 1: THRESHOLDS FOR SINGLE RF SOURCES
 SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION**

RF Source Frequency			Minimum Distance			Threshold ERP
f_L (MHz)		f_H (MHz)	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	-	1.34	159 m	-	35.6 m	1 920 R ²
1.34	-	30	35.6 m	-	1.6 m	3 450 R ² /f ²
30	-	300	1.6 m	-	159 mm	3.83 R ²
300	-	1 500	159 mm	-	31.8 mm	0.012 8 R ² f
1 500	-	100 000	31.8 mm	-	0.5 mm	19.2 R ²

Subscripts L and H are low and high; λ is wavelength.
 From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.

The table applies to any RF source (i.e., single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits. These criteria apply at separation distances from any part of the radiating structure of at least $\lambda/2\pi$. The thresholds are based on the general population MPE limits with a single perfect reflection, outside of the reactive near-field, and in the main beam of the radiator.

For mobile devices that are not exempt per Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20 cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

2.3. SAR-based Exemption

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of $\lambda/4$.

As for devices with antennas of length greater than $\lambda/4$ where the gain is not well defined, but always less than that of a half-wave dipole (length $\lambda/2$), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}}(d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B. 2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

2.4. Simultaneous Transmission SAR Test Exemption with Respect to Multiple Exemption Criteria

Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluated_k term) shall be used to determine exemption for simultaneous transmission according to Formula (C.1) [repeated from § 1.1307(b)(3)(ii)(B)].

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

3. Test Result

3.1. RF Exposure Test Exemptions for Single Source

Mode	Frequency Range (MHz)	Minimum Separation Distance (cm)	Maximum Average Target Power (dB m)	Maximum Tune up (dB)	Maximum Average Power (dB m)	Antenna Gain (dB i)	ERP		Threshold ERP (mW)	Ratio	Result
							(dB m)	(mW)			
Bluetooth_Ant.1	2 400 ~ 2 483.5	20	1.5	1	2.5	0.94	1.29	1.35	768	0.002	Pass
Bluetooth BLE_Ant.1	2 400 ~ 2 483.5	20	-9	1	10	0.94	8.79	7.57	768	0.010	Pass
WLAN (2.4G)_Ant.2	2 400 ~ 2483.5	20	13	1	14	0.69	12.54	17.95	768	0.023	Pass
WLAN (5G)_Ant.1	5 150 ~ 5 250	20	7	2	9	-1.05	5.80	3.80	768	0.005	Pass
WLAN (5G)_Ant.1	5 725 ~ 5 850	20	9	2	11	-0.78	8.07	6.41	768	0.008	Pass
WLAN (5G)_Ant.2	5 150 ~ 5 250	20	7	2	9	-0.97	5.88	3.87	768	0.005	Pass
WLAN (5G)_Ant.2	5 725 ~ 5 850	20	9	2	11	-0.88	7.97	6.27	768	0.008	Pass

Note ;

- Maximum average target power is the manufacturer's declared rated power.
- Maximum average power = Maximum average target power (dB m) + Maximum tune up (dB).
- ERP (dB m) = Maximum average Power (dB m) + Antenna Gain (dB i) -2.15

3.2. RF Exposure Test Exemptions for Simultaneous Transmission

Mode	P _i /P _{th} Ratio Mode A	P _i /P _{th} Ratio Mode B	Σ P _i /P _{th} Ratio Mode A+B	Result
Bluetooth_Ant.1 + WLAN(2G)_Ant.2	0.002	0.023	0.025	Pass
WLAN(5G)_Ant.1 + WLAN(5G)_Ant.2	0.008	0.017	0.025	Pass

Conclusion: No SAR is required.

- End of the Test Report -