

EMF TEST REPORT

Test Report No. : OT-23N-RWD-028

Reception No. : 2310003522

Applicant : LG Electronics USA, Inc.

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

Manufacturer : LG Electronics Inc.

Address : 222 LG-ro, Jinwi-Myeon, Pyeongtaek -Si, Gyeonggi-Do, 451-713, Korea

Type of Equipment : Car Navigation

FCC ID. : BEJICAS3MEB4CHINA

Model Name : ICAS3 MEB4_China

Multiple Model Name : N/A

Serial number : N/A

Total page of Report : 7 pages (including this page)

Date of Incoming : November 02, 2023

Date of issue : November 15, 2023

SUMMARY

The equipment complies with the regulation; **FCC CFR 47 PART 2.1091**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

This report is not correlated with the "KS Q ISO/IEC 17025 and KOLAS accreditation" of Korean Laboratory Accreditation Scheme.



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CONTENTS

	Page
1. VERIFICATION OF COMPLIANCE	4
2. GENERAL INFORMATION	5
2.1 Product Description	5
2.2 Alternative type(s)/model(s); also covered by this test report.....	5
3. EUT MODIFICATIONS.....	5
4. MAXIMUM PERMISSIBLE EXPOSURE	6
4.1 RF Exposure Calculation	6
4.2 EUT Description	6
4.3 Calculated MPE Safe Distance for Bluetooth	7

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-23N-RWD-028	November 15, 2023	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : LG Electronics USA, Inc.

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

Contact Person : Heejae, Cho / Director, Regulatory and Environmental Affairs

Telephone No. : +201-470-2696

FCC ID : BEJICAS3MEB4CHINA

Model Name : ICAS3 MEB4_China

Brand Name : LG

Serial Number : N/A

Date : November 15, 2023

EQUIPMENT CLASS	DSS – PART 15 SPREAD SPECTRUM TRANSMITTER
E.U.T. DESCRIPTION	Car Navigation
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	KDB 447498 D01 General RF Exposure Guidance v06
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
Modifications on the Equipment to Achieve Compliance	None

- . The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. GENERAL INFORMATION

2.1 Product Description

The LG Electronics USA, Inc., Model ICAS3 MEB4_China (referred to as the EUT in this report) is a Car Navigation. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Car Navigation
OPERATING FREQUENCY	2 402 MHz ~ 2 480 MHz
MODULATION TYPE	GFSK for 1 Mbps, $\pi/4$ -DQPSK for 2 Mbps, 8-DPSK for 3 Mbps
RF OUTPUT POWER	2.01 dBm (1 Mbps) 1.13 dBm (2 Mbps) 1.41 dBm (3 Mbps)
ANTENNA TYPE	PCB Antenna
ANTENNA GAIN	4.39 dBi
List of each Osc. or crystal Freq.(Freq. ≥ 1 MHz)	27 MHz, 25 MHz, 55.46667 MHz, 32.768 kHz, 40 MHz, 27 MHz
RATED SUPPLY VOLTAGE	DC 12.0 V

2.2 Alternative type(s)/model(s); also covered by this test report.

-. None

3. EUT MODIFICATIONS

-. None

4. MAXIMUM PERMISSIBLE EXPOSURE

4.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are $f/1500$ mW/cm² for the frequency range between 300 MHz and 1 500 MHz and 1.0 mW/cm² for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm² exposure is calculated as follows:

$$E = \sqrt{(30 * P * G) / d}, \text{ and } S = E^2 / Z = E^2 / 377, \text{ because } 1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$$

Where

S = Power density in mW/cm², Z = Impedance of free space, 377 Ω

E = Electric field strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combining equations and rearranging the terms to express the distance as a function of the remaining variable

$$d = \sqrt{(30 * P * G) / (377 * 10 S)}$$

Changing to units of mW and cm, using P (mW) = P (W) / 1 000, d (cm) = 0.01 * d (m)

$$d = 0.282 * \sqrt{(P * G) / S}$$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

4.2 EUT Description

Kind of EUT	Car Navigation
Device Category	☐ Portable (< 20 cm separation) ☐ Mobile (> 20 cm separation) ☒ Others
Exposure Evaluation Applied	☒ MPE ☐ SAR ☐ N/A

4.3 Calculated MPE Safe Distance for Bluetooth

According to above equation, the following result was obtained.

Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance (dBm)	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm ²) @ 20 cm Separation	Limit (mW/cm ²)
			(dBm)	(mW)	Log	Linear			
2 402 ~ 2 480	1 Mbps	2.01 ± 0.5	2.51	1.78	4.39	2.75	0.62	0.001 0	1
	2 Mbps	1.13 ± 0.5	1.63	1.46			0.56	0.000 8	1
	3 Mbps	1.41 ± 0.5	1.91	1.55			0.58	0.000 8	1

According to above table, for 2 402 ~ 2 480 MHz Band(1 Mbps), safe distance,

$$D = 0.282 * \sqrt{(1.78 * 2.75)/1.00} = 0.62 \text{ cm.}$$

sFor getting power density at 20 cm separation in above table, following formula was used.

$$S = P * G / (4\pi * R^2) = 1.78 * 2.75 / (4 * \pi * 20^2) = 0.001 0$$

Where:

S = Power Density,

P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),

G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna