EMF TEST REPORT

Test Report No. : **OT-244-RWD-033**

Reception No. : **2404001339**

Applicant : **LG Electronics USA**

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

Manufacturer : **LG Electronics Inc.**

Address : **222, LG-ro, Jinwi-myeon, Pyeontaek-si, Gyeonggi-do 17709, Republic of Korea**

Type of Equipment : **Electric Vehicle Charger**

FCC ID : **BEJ-EVD175SK**

Model Name : **EVD175SK-PN**

Multiple Model Name : **N/A**

Serial number : **N/A**

Total page of Report : **8 pages (including this page)**

Date of Incoming : **April 12, 2024**

Date of Issuing : **April 28, 2024**

SUMMARY

The equipment complies with the requirements of ***FCC CFR 47 § 1.1307***

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

It is not a general 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.

Tested by	Reviewed by	Approved by
Dong-Yeon, Han / Prj. Engineer	Tae-Ho, Kim / Chief Engineer	Jae-Ho, Lee / Chief Engineer
ONETECH Corp.	ONETECH Corp.	ONETECH Corp.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

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ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-244-RWD-033	April 28, 2024	Initial Release	All

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

1. VERIFICATION OF COMPLIANCE

Applicant : LG Electronics USA

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

Contact Person : David, Kim / Team leader, LGEUS NA Policy & Regulatory Affairs

Telephone No. : +201-470-2696

FCC ID : BEJ-EVD175SK

Model Name : EVD175SK-PN

Brand Name : -

Serial Number : N/A

Date : April 28, 2024

DEVICE TYPE	DXX – Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	Electric Vehicle Charger
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	KDB 447498 D01 Interim 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.

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2. GENERAL INFORMATION

2.1 Product Description

The LG Electronics USA, Model EVD175SK-PN (referred to as the EUT in this report) is a Electric Vehicle Charger. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Electric Vehicle Charger
TRANSMITTING FREQUENCY	13.560 3 MHz
MODULATION	ASK
ANTENNA TYPE	PCB Antenna
LIST OF EACH OSC. or CRY. FREQ.(FREQ. >= 1 MHz)	8 MHz

2.3 Model Differences

-. None

3. EUT MODIFICATIONS

-. None

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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 $180/f^2$ mW/cm² for the frequency range between 1.34 MHz and 30 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:

$E = \sqrt{(30 * P * G)} / d$, and $S = E^2 / Z = E^2 / 377$, because 1 mW/cm² = 10 W/m²

Where

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

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

Combing 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	Electric Vehicle Charger
MAX. RF OUTPUT POWER	53.80 dBμV/m
Device Category	☐ Portable (< 20 cm separation) ■ Mobile (> 20 cm separation) ☐ Others
Exposure Evaluation Applied	■ MPE ☐ SAR ☐ N/A

4.3 Calculated MPE Safe Distance

Calculated MPE Safe Distance(13.56 MHz RFID)

Frequency (MHz)	Operating Mode	Target Power W/tolerance (dBm)	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
			(dBm)	(mW)	Log	Linear			
13.56	RFID	-41.40 ± 0.5	-40.90	0.000 082	-	-	0.002 4	0.000 000 016	0.98

E.I.R.P[dBm] = Field strength (dBμV/m)-95.2= 53.80 dBμV/m – 95.2 = -41.40 dBm

Limit = $(180/f^2)$ =$(180/13.56^2)$ = 0.98 (mW/cm²)

According to above table, for 13.56 MHz, safe distance,

D = 0.282 * $\sqrt{(0.000\ 072 * 1)/1.00}$ = 0.002 4 cm.

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

$S = P * G / (4\pi * R^2) = 0.000\ 082 * 1 / (4 * \pi * 20\text{^}2) = 0.000\ 000\ 016$

Where:

S = Power Density,
P = Radiated Power (Field strength (dBμV/m)-95.2)
G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna

Calculated MPE Safe Distance(RFID_VPOS Touch)

Frequency (MHz)	Operating Mode	Target Power W/tolerance (dBm)	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
			(dBm)	(mW)	Log	Linear			
13.56	RFID	-27.56 ± 0.5	-27.06	0.002	-	-	0.013	0.000 000 4	0.98

E.I.R.P[dBm] = Field strength (dBμV/m)-95.2= 67.64 dBμV/m – 95.2 = -27.56dBm

Limit = $(180/f^2)$ =$(180/13.56^2)$ = 0.98 (mW/cm²)

According to above table, for 13.56 MHz, safe distance,

D = 0.282 * $\sqrt{(0.002 * 1)/1.00}$ = 0.013 cm.

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

$S = P * G / (4\pi * R^2) = 0.002 * 1 / (4 * \pi * 20\text{^}2) = 0.000\ 000\ 4$

Where:

S = Power Density,
P = Radiated Power (Field strength (dBμV/m)-95.2)
G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna

Calculated MPE Safe Distance(LTE & WCDMA)

Operating Mode	Prediction Frequency	Max EIRP Power		Prediction distance	Power density at prediction Frequency (S)	MPE Limit
	(MHz)	(dBm)	(mW)	(cm)	(mW/cm²)	(mW/cm²)
WCDMA Band 2	1852.4 ~ 1907.6	24.01	251.77	20.00	0.05009	1.00000
WCDMA Band 4	1712.4 ~ 1752.6	24.00	251.19	20.00	0.04997	1.00000
WCDMA Band 5	826.4 ~ 846.6	26.05	402.72	20.00	0.08012	1.00000
LTE Band 4	1720 ~ 1745	24.30	269.15	20.00	0.05355	1.00000
LTE Band 7	2502.5 ~ 2567.5	22.26	168.27	20.00	0.03348	1.00000
LTE Band 12	699.7 ~ 715.3	24.82	303.39	20.00	0.06036	1.00000
LTE Band 13	779.5 ~ 784.5	24.93	311.17	20.00	0.06191	1.00000
LTE Band 25	1850.7 ~ 1914.3	24.48	280.54	20.00	0.05581	1.00000
LTE Band 26	814.7 ~ 848.3	26.52	448.75	20.00	0.08928	1.00000
LTE Band 30	2307.5 ~ 2312.5	23.22	209.89	20.00	0.04176	1.00000
LTE Band 41	2498.5 ~ 2687.5	22.20	165.96	20.00	0.03302	1.00000

DATA for Intermodulation Transmit

According to above equation, the following result was obtained.

Simultaneous transmission operations	Operating Mode	Simultaneous MPE (mW/cm²)	Sum Ratios	Simultaneous MPE Limit
LTE + 13.56 MHz(RFID)	LTE Band 26	0.089 28	0.089 28	< 1
	13.56 MHz(RFID)	0.000 000 016		
	13.56 MHz(RFID)	0.000 000 4		