EMF TEST REPORT

Test Report No. : **OT-247-RWD-020**

Reception No. : **2406002128**

Applicant : **LG Innotek Co., Ltd.**

Address : **30, Magokjungang 10-ro, Gangseo-gu, 07796, Seoul, South Korea**

Manufacturer : **LG Innotek Co., Ltd.**

Address : **30, Magokjungang 10-ro, Gangseo-gu, 07796, Seoul, South Korea**

Type of Equipment : **CSC (Cell Supervisory Circuit)**

FCC ID. : **YZP-APBS200L01**

Model Name : **APBS200L01**

Multiple Model Name : **N/A**

Serial number : **N/A**

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

Date of Incoming : **June 18, 2024**

Date of issue : **July 25, 2024**

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.

Tested by	Reviewed by	Approved by
Su-Min, You / Project 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-247-RWD-020	July 25, 2024	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

Applicant : LG Innotek Co., Ltd.

Address : 30, Magokjungang 10-ro, Gangseo-gu, 07796, Seoul, South Korea

Contact Person : Inchang Jeong / Senior Research Engineer

Telephone No. : +82-10-2326-9972

FCC ID : YZP-APBS200L01

Model Name : APBS200L01

Brand Name : -

Serial Number : N/A

Date : July 25, 2024

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	CSC (Cell Supervisory Circuit)
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.

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2. GENERAL INFORMATION

2.1 Product Description

The LG Innotek Co., Ltd., Model APBS200L01 (referred to as the EUT in this report) is a CSC (Cell Supervisory Circuit).

The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	CSC (Cell Supervisory Circuit)
Temperature Range	-40 °C ~ +85 °C
OPERATING FREQUENCY	2 410 MHz ~ 2 475 MHz
MODULATION TYPE	DSSS
RF OUTPUT POWER	7.25 dBm
ANTENNA TYPE	PCB Pattern Antenna
ANTENNA GAIN	2.03 dBi
RATED SUPPLY VOLTAGE	DC 40.7 V
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	40 MHz

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

-. 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 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:

$E = \sqrt{(30 * P * G)} / d$, 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	CSC (Cell Supervisory Circuit)
Device Category	☐ Portable (< 20 cm separation) ■ Mobile (> 20 cm separation) ☐ Others
Exposure Evaluation Applied	■ MPE ☐ SAR ☐ N/A

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4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

Operating Freq. (MHz)	Operating Mode	Target Power W/tolerance	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/cm²)
		(dBm)	(dBm)	(mW)	Log	Linear			
2 475	DSSS	7.25 ± 1.0	8.25	6.68	2.03	1.60	0.92	0.002 1	1.00

According to above table, for 2 400 ~ 2 483.5 MHz Band, safe distance,

$D = 0.282 * \sqrt{(6.68 * 1.60)/1.00} = 0.92$ cm

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

$S = P * G / (4\pi * R^2) = 6.68 * 1.60 / (4 * 3.14 * 20\text{^}2) = 0.002\ 1$

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