

# EMF TEST REPORT

**Test Report No.** : OT-24O-RWD-022  
**Reception No.** : 2409003267  
**Applicant** : gninth Co. Ltd.  
**Address** : 2120, 122, Jomaru-ro 385beon-gil, Wonmi-gu, Bucheon-si, Gyeonggi-do, South Korea  
**Manufacturer** : gninth Co. Ltd.  
**Address** : 2120, 122, Jomaru-ro 385beon-gil, Wonmi-gu, Bucheon-si, Gyeonggi-do, South Korea  
**Type of Equipment** : SMART DOORLOCK  
**FCC ID** : 2BLBY-DELOCK-R20  
**Model Name** : DELOCK-R20  
**Multiple Model Name** : DELOCK-R10, DELOCK-R101, DELOCK-R201  
**Serial number** : N/A  
**Total page of Report** : 7 pages (including this page)  
**Date of Incoming** : September 09, 2024  
**Date of Issuing** : October 08, 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.

한동연




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**Revision History**

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-24O-RWD-022	October 08, 2024	Initial Release	All

## 1. VERIFICATION OF COMPLIANCE

Applicant : gninth Co. Ltd.

Address : 2120, 122, Jomaru-ro 385beon-gil, Wonmi-gu, Bucheon-si, Gyeonggi-do, South Korea

Contact Person : Lee Ho Sub / Manager

Telephone No. : +82-10-2325-9990

FCC ID : 2BLBY-DELOCK-R20

Model Name : DELOCK-R20

Brand Name : -

Serial Number : N/A

Date : October 08, 2024

DEVICE TYPE	DXX – Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	SMART DOORLOCK
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.

## 2. GENERAL INFORMATION

### 2.1 Product Description

The gninth Co. Ltd., Model DELOCK-R20 (referred to as the EUT in this report) is a SMART DOORLOCK. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	SMART DOORLOCK
OPERATING FREQUENCY	13.56 MHz
MODULATION TYPE	ASK
ANTENNA TYPE	PCB Antenna
POWER REQUIREMENT	DC 6.0 V
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1 MHz)	26 MHz, 27.12 MHz

### 2.3 Model Differences

-. The following lists consist of the added model and their differences.

Model Name	Differences	Tested
DELOCK-R20	Basic Model	<input checked="" type="checkbox"/>
DELOCK-R10, DELOCK-R101, DELOCK-R201	The model is identical to basic model except for the model name only.	<input type="checkbox"/>

Note: 1. Applicant consigns only basic model to test. Therefore this test report just guarantees the units, which have been tested.

2. The Applicant/manufacture is responsible for the compliance of all variants.

## 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  $180/\text{f}^2$  mW/cm<sup>2</sup> for the frequency range between 1.34 MHz and 30 MHz and 1.0 mW/cm<sup>2</sup> for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm<sup>2</sup> 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/cm<sup>2</sup>, Z = Impedance of free space, 377  $\Omega$

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/cm<sup>2</sup>

### 4.2 EUT Description

Kind of EUT	SMART DOORLOCK
MAX. RF OUTPUT POWER	34.88 dB $\mu$ V/m
Device Category	<input type="checkbox"/> Portable (< 20 cm separation) <input checked="" type="checkbox"/> Mobile (> 20 cm separation) <input type="checkbox"/> Others
Exposure Evaluation Applied	<input checked="" type="checkbox"/> MPE <input type="checkbox"/> SAR <input type="checkbox"/> N/A

#### 4.3 Calculated MPE Safe Distance

Frequency (MHz)	Operating Mode	Target Power W/tolerance (dBm)	Max tune up power		Antenna Gain		Safe Distance (cm)	Power Density (mW/cm <sup>2</sup> ) @ 20 cm Separation	Limit (mW/cm <sup>2</sup> )
			(dBm)	(mW)	Log	Linear			
13.56	RFID	-60.32 ± 0.5	-60.27	0.000 000 94	-	-	0.022 9	0.000 000 000 2	0.98

E.I.R.P[dBm] = Field strength (dBμV/m)-95.2= 34.88 dBμV/m – 95.2 = -60.32 dBm

Limit = (180/f<sup>2</sup>) =(180/13.56<sup>2</sup>) = 0.98(mW/cm<sup>2</sup>)

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

$$D = 0.282 * \sqrt{(0.000\ 000\ 94 * 1)/1.00} = 0.000\ 3\ \text{cm}.$$

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

$$S = P * G / (4\pi * R^2) = 0.000\ 000\ 94 * 1 / (4 * \pi * 20^2) = 0.000\ 000\ 000\ 2$$

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