

EMF TEST REPORT

Test Report No.	: OT-249-RWD-034
Reception No.	: 2407002353
Applicant	: INFAC ELECS CO., LTD.
Address	: 16648, 53, Saneop-ro 155beon-gil, Gwonseon-gu, Suwon-si, Gyeonggi-do, Republic of Korea
Manufacturer	: INFAC ELECS CO., LTD.
Address	: 16648, 53, Saneop-ro 155beon-gil, Gwonseon-gu, Suwon-si, Gyeonggi-do, Republic of Korea
Type of Equipment	: ME Vehicle project Door Handle Sensor Module
FCC ID	: 2A93T-ME-DHS-NFC
Model Name	: ME DHS NFC
Multiple Model Name	: ME DHS NFC-R
Serial number	: N/A
Total page of Report	: 7 pages (including this page)
Date of Incoming	: August 18, 2024
Date of Issuing	: September 27, 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.



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

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OTC-TRF-RF-001(0)

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Page 2 of 7

CONTENTS

Page

1. VERIFICATION OF COMPLIANCE	4
2. GENERAL INFORMATION	5
2.1 PRODUCT DESCRIPTION	5
2.3 MODEL DIFFERENCES	5
3. EUT MODIFICATIONS	5
4. MAXIMUM PERMISSIBLE EXPOSURE	6
4.1 RF Exposure Calculation	
4.2 EUT DESCRIPTION	6
4.3 CALCULATED MPE SAFE DISTANCE	7



Revision History

Rev. No.	Issue Report No.	Issue Report No. Issued Date Revisions		Section Affected
0	OT-249-RWD-034	September 27, 2024	Initial Release	All



1. VERIFICATION OF COMPLIANCE

Applicant : INFAC ELECS CO., LTD.

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FCC ID : 2A93T-ME-DHS-NFC

Model Name : ME DHS NFC

Brand Name : -

Serial Number : N/A

Date : September 27, 2024

DEVICE TYPE	DXX – Low Power Communication Device Transmitter		
E.U.T. DESCRIPTION	ME Vehicle project Door Handle Sensor Module		
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 INFAC ELECS CO., LTD., Model ME DHS NFC (referred to as the EUT in this report) is a ME Vehicle project Door Handle Sensor Module. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	ME Vehicle project Door Handle Sensor Module		
OPERATING FREQUENCY	13.56 MHz		
MODULATION TYPE	ASK		
ANTENNA TYPE	PCB Antenna		
POWER REQUIREMENT	DC 12.0 V		
LIST OF EACH OSC. OR			
CRY. FREQ.(FREQ.>=1 MHz)	16 MHz, 27.12 MHz, 48 MHz		

2.3 Model Differences

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

Model Name	Differences	Tested
ME DHS NFC	Basic Model (Vehicle left door)	V
ME DHS NFC-R	The model is identical to basic model except for the door. (Vehicle right door)	

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

2. The Applicant/manufacturer 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 $180/f^2$ 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	ME Vehicle project Door Handle Sensor Module			
MAX. RF OUTPUT POWER	68.11 dBµV/m			
	□ Portable (< 20 cm separation)			
Device Category	■ Mobile (> 20 cm separation)			
	□ Others			
	■ MPE			
Exposure	□ SAR			
Evaluation Applied				



4.3 Calculated MPE Safe Distance

Frequency (MHz)	Operating Mode	Target Power W/tolerance	Max tune up power		Anteni	na Gain	Safe Distance	Power Density (mW/cm ²) @ 20 cm	Limit (mW/
× ,		(dBm)	(dBm)	(mW)	Log	Linear	(cm)	Separation	cm²)
13.56	RFID	-27.09 ± 0.5	-26.59	0.002 2	-	-	0.013 2	0.000 000 4	0.98

 $E.I.R.P[dBm] = Field \ strength \ (dB\mu V/m) - 95.2 = 68.11 \ dB\mu V/m - 95.2 = -27.09 \ dBm$

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

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

 $D = 0.282 * \sqrt{(0.0022 * 1)/1.00} = 0.013 2 \text{ cm}.$

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

 $S = P * G / (4\pi * R^2) = 0.0022 * 1 / (4 * \pi * 20^2) = 0.000 000 4$

Where:

S = Power Density,

 $P = Radiated Power (Field strength (dB\mu V/m)-95.2)$

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