

EMF Exposure Report

For

HK ELECHOUSE LIMITED

Test Standards: EN 50663: 2017
EN 62479: 2010

Product Description: 13.56 MHz NFC/RFID Module

Tested Model: PN532 MINI EXT

Brand Name: ELECHOUSE

Report No.: EBSZ2509030154H01

Tested Date: 2025.09.08~2025.09.10

Issued Date: 2025.09.16

Prepared By: 
May Li Engineer

Approved By: 
Jerry Liu Manager

Guangdong Eurber Testing Co., Ltd.

Room 401/402, Building A, Tangxi Zhigu, No.21, Xijing Road, Gushu, Xixiang
Subdistrict, Bao'an District, Shenzhen, Guangdong, China

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2025.09.16	Valid	Original Report

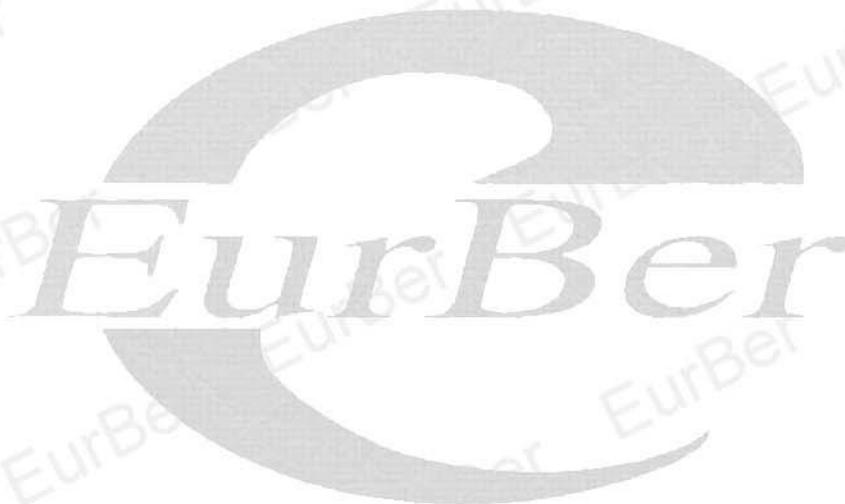


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1 General Information

1.1 Applicant

HK ELECHOUSE LIMITED
Room A516, 5/F, Yik Lee Industrial Building 35 Tai Yau Street, San Po Kong, Kowloon
Hong Kong

1.2 Manufacturer

HK ELECHOUSE LIMITED
Room A516, 5/F, Yik Lee Industrial Building 35 Tai Yau Street, San Po Kong, Kowloon
Hong Kong

1.3 General Description of EUT

Product	13.56 MHz NFC/RFID Module
Model NO.	PN532 MINI EXT
Additional NO.	PN532 MINI EXT-1025, PN532 MINI EXT-4050, PN532 MINI EXT-MX, PN532 MINI EXT-IPX
Difference Description	The model is different, the style is different, the size is different, and the rest is exactly the same
Nominal Voltage	EUTinput: DC5V==1.0A
Extreme Temperature	0°C and 60°C
Frequency Range	13.56Mhz
Geo-location capability	Not Supported
Antenna Type	N/A
Antenna Gain	Internal Antenna, Maximum Gain is 0dB
Modulation Type	NFC
Software Version:	N/A
Hardware Version:	N/A

NOTE:

1. The above EUT information is declared by manufacturer. The laboratory is not responsible for the information provided by the manufacturer. For more detailed feature description, please refer to the manufacturer's specifications or user's manual.

1.4 Support equipment List

Manufacturer	Description	Model	Serial Number
Lenovo	Notebook	TP0083A	PF-0P4YX1
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

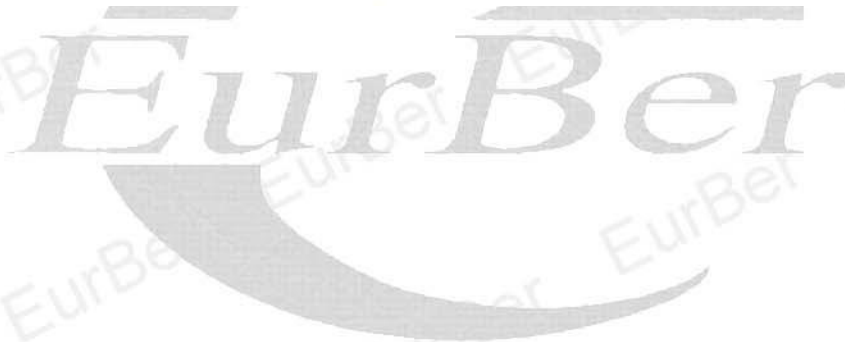
1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of **EN62479:2010** **EN50663:(2017)**

EN50663:Generic standard for assessment of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields(10MHz-300GHz)



2 Conformity Assessment Methods

2.1 General Considerations

Compliance of electromagnetic emissions from electronic and electrical equipment with the basic restrictions usually is determined by measurements and, in some cases, calculation of the exposure level. If the electrical power used by or radiated by the equipment is sufficiently low, the electromagnetic fields emitted will be incapable of producing exposures that exceed the basic restrictions. This standard provides simple EMF assessment procedures for this low power equipment.

For transmitter intended for use with more than one antenna configuration option, the combination of transmitter and antenna(s) which generates the highest available antenna power and/or average total radiated power shall be assessed.

2.2 Low-power exclusion level(P_{max})based on considerations of SAR

Low-power electronic and electrical equipment is deemed to comply with the provisions of this standard if it can be demonstrated using routes B, C or D that the available antenna power and/or the average total radiated power is less than or equal to the applicable low-power exclusion level P_{max} .

When SAR is the basic restriction, a conservative minimum value for P_{max} can be derived, equal to the localized SAR limit (SAR_{max}) multiplied by the average mass (m):

$$P_{max}=SAR_{max}m$$

Example values of P_{max} according to Equation are provided in follows for cases described by the ICNIRP Guidelines, IEEE Std C95.1-1999 and IEEE Std C95.1-2005 where SAR limits are defined. Other exposure guidelines or standards may be applicable depending on national regulations.

Note: Unless otherwise mentioned in other applicable regulations or standards, the most recent edition IEEE C95.1-2005 takes precedence over the previous edition IEEE C95.1-1999.

Example values of SAR-based P_{max}

Guideline/ Standard	SAR limit, SAR_{max} W/kg	Averaging mass, m g	P_{max} mW	Exposure tier	Region of body
ICNIRP	2	10	20	General public	Head and trunk
	4	10	40	General public	Limbs
	10	10	100	Occupational	Head and trunk
	20	10	200	Occupational	Limbs
IEEE Std C95.1-1999	1.6	1	1.6	Uncontrolled environment	Head, trunk, arms, legs
	4	10	40	Uncontrolled environment	Hands, wrists, feet and ankles
	8	1	8	Controlled environment	Head, trunk, arms, legs
	20	10	200	Controlled environment	Hands, wrists, feet and ankles

IEEE Std C95.1-2005	2	10	20	Action level	Body except extremities and pinnae
	4	10	40	Action level	Exremities and pinnae
	10	10	100	Controlled environment	Body except extremities and pinnae
	20	10	200	Controlled environment	Exremities and pinnae

When power density is the basic restriction, a conservative minimum value for P_{max} can be derived, equal to the power density limit (s) multiplied by the averaging area (a);

$$P_{max} = S_a$$

Therefore, equation yields conservative values for P_{max} of 20 mW and 100 mW for general public and occupational exposures, respectively.

3 Test instruments List

Conducted Emission				
Name	Model No:	Manufacturer	Cal Date	Due Date
Spectrum Analyzer	N9020A	Agilent	Jul,05,2025	Jul,04,2026
Signal Generator	N5082A	Agilent	Jul,05,2025	Jul,04,2026
Signal Generator	E4421B	Agilent	Jul,05,2025	Jul,04,2026

3.1 Address of the test laboratory

Guangdong Eurber Testing Co., Ltd.

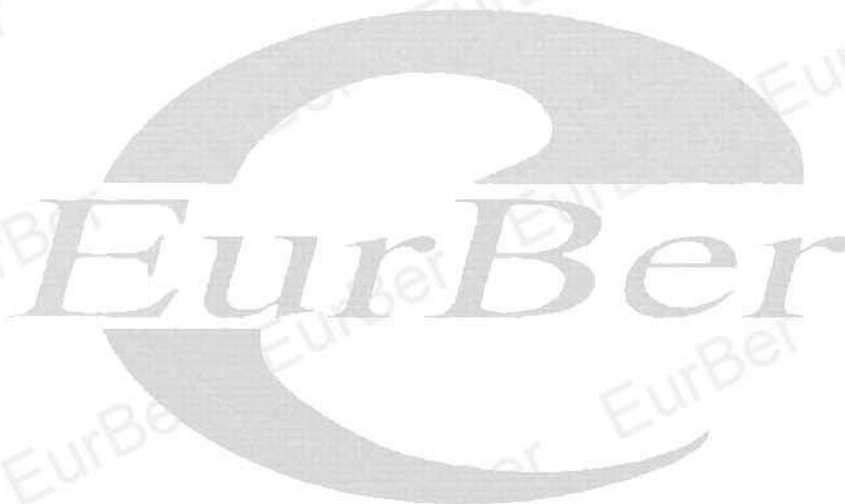
Room 401/402, Building A, Tangxi Zhigu, No.21, Xijing Road, Gushu, Xixiang

Subdistrict, Bao'an District, Shenzhen, Guangdong, China

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4 Measurement Uncertainty

Measurement uncertainty		
No	Item	Measurement uncertainty
1	Temperature	$\pm 0.2^{\circ}\text{C}$
2	Humidity	$\pm 1.0\%$
3	Spurious Emissions, Conducted	$\pm 3.38\text{dB}$
4	All emissions, radiated (<1GHz)	$\pm 4.50\text{dB}$
5	All emissions, radiated (1GHz-18GHz)	$\pm 4.28\text{dB}$



5 Test Results Summary

5.1 Transmit Power

Modulation Type	EIRP(dBm)	Out Power (mW)	Limit(mW)	Result
NFC	-5.17	2.03	20	Pass

5.2. Client Information

The result: PASS

From results of report ETSI EN300 330 &(13.56MHz)ETSI EN 300330 can be assumed that the compliance criteria is Fulfilled (max radiated power is less than 20mW),The assumption is made with an uncertainty of 30%

*EN50663:2017Annex A:Derivation of low-power exclusion level from ICNIRP and IEEE exposure limits

The ICNIRP guidelines provide SAR limits of 2W/kg,and averaging mass 10g,over the 10GHz to 300GHz frequency range for general public and occupational exposures,respectively,and a conservative minimum value for $P_{max}=20mW$.So when the equipment radiated power is less than 20mW,it complies with EMF basic restrictions

-----End of the report-----