



Radio Test Report

For

HK ELECHOUSE LIMITED

Test Standards: ETSI EN 300 330 V2.1.1 (2017-02)

Product Description: 13.56 MHz NFC/RFID Module

Tested Model: PN532 MINI EXT

Brand Name: ELECHOUSE

Report No.: EBSZ2509030154E01

Tested Date: 2025.09.08~2025.09.10

Issued Date: 2025.09.16

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Report Revise Record

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

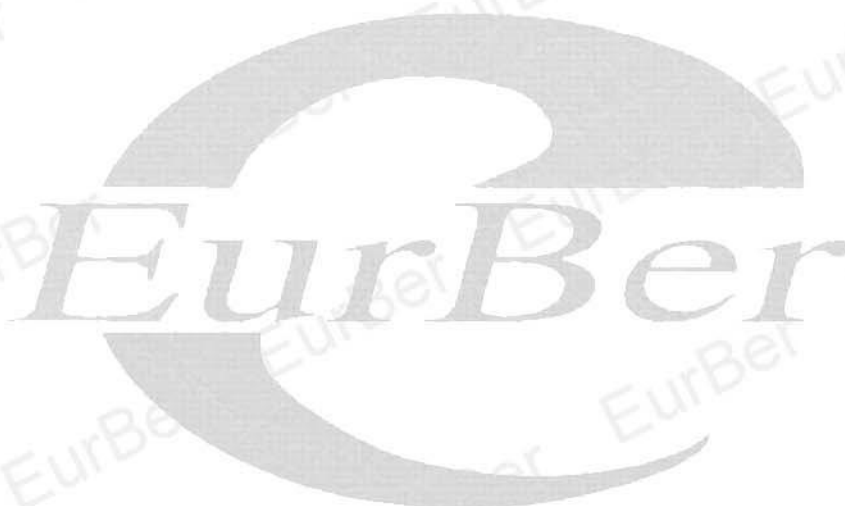


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SUMMARY OF TEST RESULT

| CLAUSE (EN300330) | DESCRIPTION OF TEST ITEM | REMARKS | RESULTS |
|------------------------|---|---|---------|
| Transmitter Parameters | | | |
| 4.3.1 | Permitted range of operating frequencies | | N/A |
| 4.3.2 | Operating frequency ranges | | N/A |
| 4.3.3 | Modulation bandwidth | | N/A |
| 4.3.4 | Transmitter H-field requirements | Only for equipment under class 1 and class 2, in clause 6.1.2 | N/A |
| 4.3.5 | Transmitter RF carrier current | Only for equipment under class 3 in clause 6.1.2 | N/A |
| 4.3.6 | Transmitter radiated E-field | Only for equipment under class 4 in clause 6.1.2 | N/A |
| 4.3.7 | Transmitter conducted spurious emissions | Only for equipment under class 3 in clause 6.1.2 | N/A |
| 4.3.8 | Transmitter radiated spurious domain emission limits < 30 MHz | | N/A |
| 4.3.9 | Transmitter radiated spurious domain emission limits > 30 MHz | For equipment under class 1, 2 and 4 in clause 6.1.2 | N/A |
| 4.3.10 | Transmitter Frequency stability | Only for channelized systems | N/A |
| Receiver Parameters | | | |
| 4.4.2 | Receiver spurious emissions | Does only apply to receivers which are not co-located with transmitters | PASS |
| 4.4.3 | Adjacent channel selectivity | Only for channelized systems in clause 4.4.1 | N/A |
| 4.4.4 | Receiver blocking or desensitization | Not for tagging systems in clause 4.4.1 | N/A |

1. General Description

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 |
| MODULATION TYPE | NFC |
| OPERATING FREQUENCY | 13.56Mhz |
| HW Version | N/A |
| SW Version | N/A |
| Sample Received Date | 2025.09.03 |
| I/O PORTS | Refer to user's manual |
| ACCESSORY DEVICES | Refer to note as below |
| Number of channels | / |

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. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

1.4 Support equipment List

| Manufacturer | Description | Model | Serial Number | Certificate |
|--------------|----------------------------|-----------------|------------------------|-------------|
| Lenovo | Notebook | Xiaoxinchao5000 | PF0QPQMH | DOC |
| NETGEAR | Dual band WiFi AP | R7800 | N/A | CE |
| TP-LINK | WLAN AP | TL-WR842N | 1165109031426 | DOC |
| Lenovo | Notebook | V30-15ISK | LR07JMJMQ8 | DOC |
| N/A | Monitor | FT121M | XK-FT121M-20180110-016 | DOC |
| FN-LINK | Host Device | N/A | N/A | N/A |
| KEYSIGHT | USB flash disk | N/A | N/A | N/A |
| Lenovo | Wired Keyboard | LXH-JME2209U | 60937461 | DOC |
| Logitech | Wired Mouse | M-U0026 | 1826HS0070D8 | DOC |
| GMTC | WiFi ANT/FPC /L=55mm x2 | IP15A3 | 304WIFI0094 | N/A |
| SWITHCHING | Adapter | FJ-SW0502000U | N/A | DOC |

1.5 Product Specification of Equipment Under Test

| Product Specification subjective to this standard | |
|---|----------------------------------|
| Tx / Rx Frequency Range | N/A |
| Channel Spacing | N/A |
| Maximum EIRP Average Power | <2402 MHz ~ 24800MHz> : 0 dBm |
| Antenna Type | Internal Antenna |
| Antenna Gain | Maximum Gain is 0dBi |
| Receiver Category | Category 1 |
| Type of Modulation | NFC |

Remark:

- For other wireless features of this EUT, test report will be issued separately.
- The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
- Receiver Category was declared by manufacturer

1.6 Modification of EUT

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

1.7 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of **ETSI EN 300 330 V2.1.1 (2017-02)**

Note: All test items were verified and recorded according to the standards and without any deviation during the test.

1.8 Extreme Test Condition

| | | | | | |
|--------------------------|------|-------------|-----|---------|--------|
| Normal Condition | NTNV | Temperature | 25℃ | Voltage | 5.0Vdc |
| Extreme Condition | LTHV | Temperature | 0℃ | Voltage | 4.5Vdc |
| | HTHV | Temperature | 0℃ | Voltage | 5.0Vdc |
| | LTLV | Temperature | 70℃ | Voltage | 4.5Vdc |
| | HTLV | Temperature | 70℃ | Voltage | 5.0Vdc |
| | | | | | |

1.9 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
www.eurber.com

2. Test Configuration of Equipment under Test

2.1 Test Consideration

- During testing, the interface cables and equipment positions were varied according to ETSI EN 300 330 V2.1.1(2017-02)
- The complete test system included EUT for RF test.
- Preliminary tests were checked in different data rate and recorded worse in the following tables:

Single Antenna

| Modulation | Data Rate |
|----------------|-----------|
| 802.11a | 6 Mbps |
| 802.11n HT20 | MCS0 |
| 802.11n HT40 | MCS0 |
| 802.11ac VHT20 | Nssi MCS0 |
| 802.11ac VHT40 | Nssi MCS0 |
| 802.11ac VHT80 | Nssi MCS0 |

2.2 Test Mode

Frequency range of radiation was investigated from 25 MHz to 40GHz.

For the test result of frequency above 18GHz is far below the limit, so it is not listed in the report

The following test modes were performed for Unwanted Emissions and Spurious Emissions:

Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

The following tables are showing the test modes as the worst cases and recorded in this report.

Remark:

- All test modes of the Transmitter and Receiver Radiated Spurious Emission (RSE) were tested; only the test worse data in bold of these modes were reported.
- The bandwidth of n20 and ac20 is consistent with the modulation mode, so only the worst mode data is listed in the report, and n40 is the same as ac40

3. ETSI EN 300 330 Test Result of Receiver parameters

3.1 Spurious emissions

3.1.1 Limits

1. Radiated emissions below 30 MHz

| Table 12: Receiver spurious radiation limits | |
|--|---|
| Frequency $9\text{KHz} \leq f \leq 10\text{MHz}$ | Frequency $10\text{MHz} \leq f \leq 30\text{MHz}$ |
| 5.5dB μ A/m at 9KHz descending 3 dB/oct | -25dB μ A/m |

2. Radiated emissions above 30 MHz

The power of any spurious emission shall not exceed 2 nW

3.1.2 Test procedure

1.1.1.1 Radiated method

- (1) Put the EUT on the support in its standard position with associated equipment and switched on.
- (2) The test antenna shall be raised or lowered, the transmitter shall be rotated through 360° until a higher maximum signal is received, and shall be performance at vertical and horizontal

polarization.

This level shall be recorded.

- (3) the substitution antenna shall replace the transmitter antenna in the same position and in same polarization. The frequency of the signal generator shall be adjusted to the measurement

frequency.

The test antenna shall be raised or lowered, if necessary, to ensure that the maximum signal is still received. The input signal to the substitution antenna shall be adjusted in level until an equal or a known

related level to that detected from the transmitter is obtained in the test receiver;

- (4) The above procedure shall be repeated at the lowest, the middle, and the highest frequency of the stated frequency range.

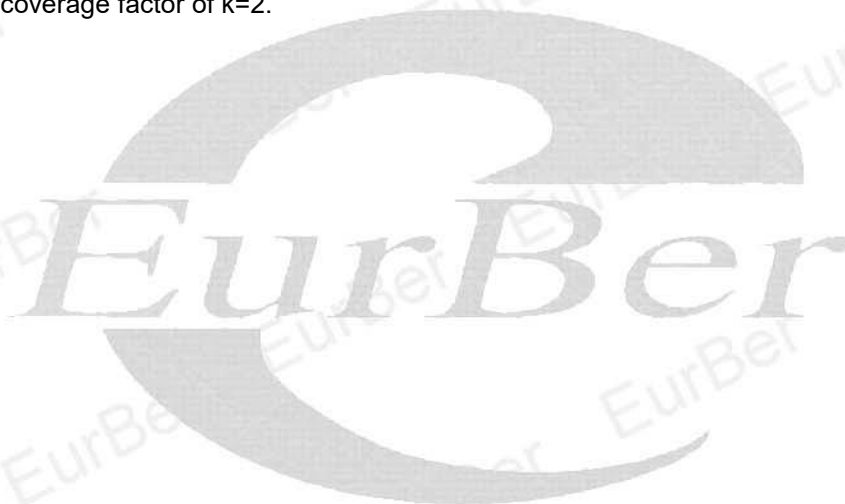
3.1.3 Test result

| RX | | | | |
|-----------------|-------------------|---------------|----------------|-------------|
| Frequency (MHz) | Spurious Emission | | Limit (dBuA/m) | Test Result |
| | polarization | Level(dBuA/m) | | |
| 0.26 | V | -65.22 | -42.63 | Pass |
| 0.39 | V | -72.55 | -40.37 | |
| 0.41 | V | -72.19 | -40.39 | |
| 0.39 | V | -75.33 | -38.43 | |
| 0.54 | V | -71.51 | -35.30 | |
| 0.94 | V | -71.12 | -34.39 | |
| 1.13 | V | -68.46 | -27.46 | |
| 0.34 | H | -67.93 | -43.81 | |
| 0.41 | H | -71.27 | -42.37 | |
| 0.49 | H | -70.48 | -40.34 | |
| 0.61 | H | -72.23 | -39.64 | |
| 0.71 | H | -69.47 | -37.15 | |
| 1.02 | H | -68.17 | -35.26 | |

4. Uncertainty Evaluation

| Test Item | Measurement Uncertainty | Notes |
|-------------------------------------|-------------------------|-------|
| Occupied Channel Bandwidth | $\pm 71.333\text{Hz}$ | (1) |
| RF output power, conducted | $\pm 0.78\text{ dB}$ | (1) |
| Power density, conducted | $\pm 2.02\text{dB}$ | (1) |
| Radiated emissions 30MHz-1000MHz | 2.49 dB | (1) |
| Radiated emissions 1GHz-18GHz | 3.24 dB | (1) |
| Radiated emissions 18GHz-40GHz | 4.08 dB | (1) |

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



5.List of Measuring Equipment

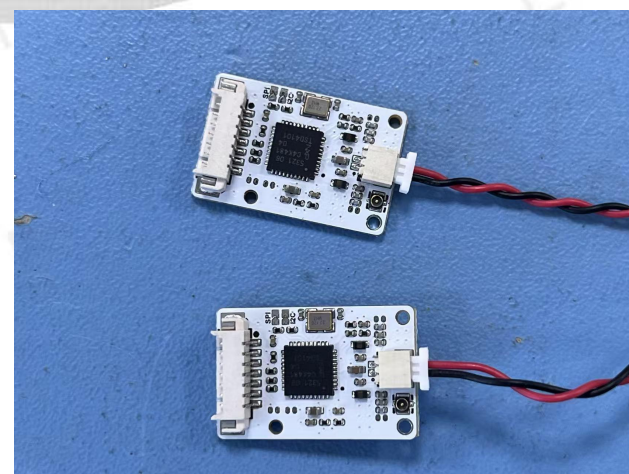
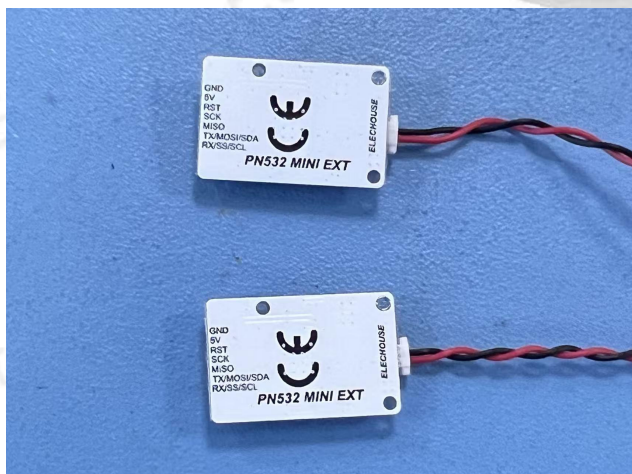
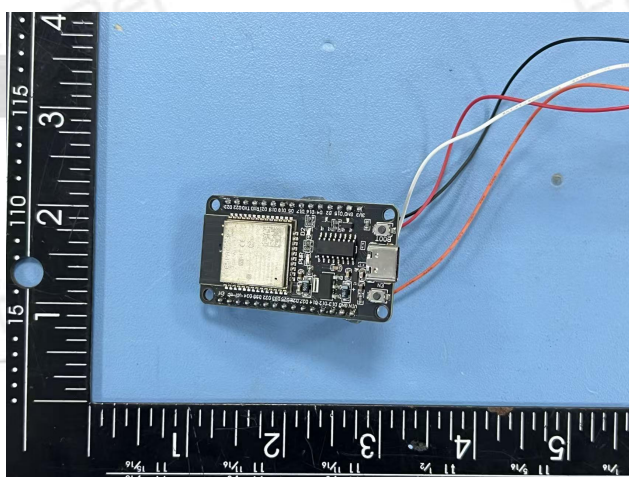
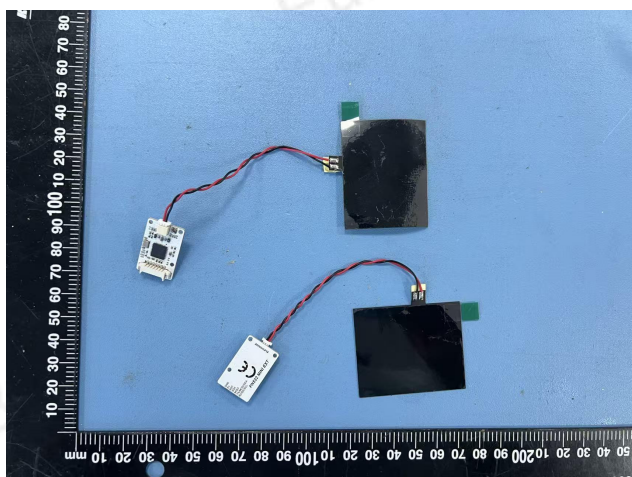
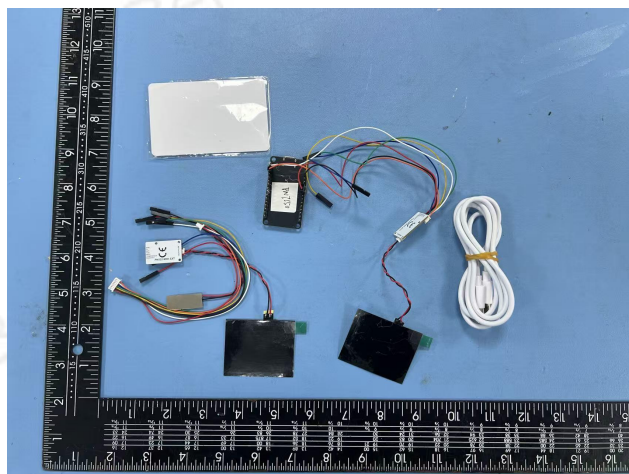
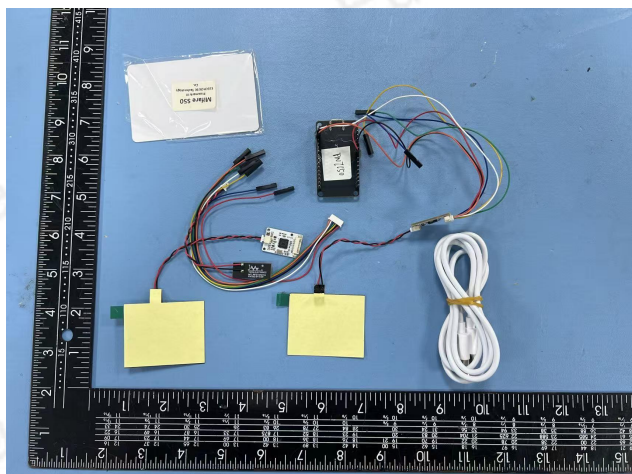
| Instrument | Manufacturer | Model No. | Serial No. | Calibration Date | Due Date | Remark |
|-------------------------------|--------------|-----------|------------|------------------|------------|-----------|
| Spectrum Analyzer | Keysight | N9010A | MY56070788 | 2024-12-19 | 2025-12-18 | Conducted |
| Power Sensor | Keysight | U2021XA | MY56510025 | 2024-12-19 | 2025-12-18 | Conducted |
| Power Sensor | Keysight | U2021XA | MY57030005 | 2024-12-19 | 2025-12-18 | Conducted |
| Power Sensor | Keysight | U2021XA | MY56510018 | 2024-12-19 | 2025-12-18 | Conducted |
| Power Sensor | Keysight | U2021XA | MY56480002 | 2024-12-19 | 2025-12-18 | Conducted |
| Thermal Chamber | Howkin | UHL-34 | 19111801 | 2024-12-18 | 2025-12-17 | Conducted |
| Base Station | R&S | CMW 270 | 101231 | 2024-12-19 | 2025-12-18 | Conducted |
| Signal Generator (Interferer) | Keysight | N5182B | MY56200384 | 2024-12-19 | 2025-12-18 | Conducted |
| Signal Generator (Blocker) | Keysight | N5171B | MY56200661 | 2024-12-19 | 2025-12-18 | Conducted |

| Instrument | Manufacturer | Model No. | Serial No. | Calibration Date | Due Date | Remark |
|-------------------|---------------|---------------|------------|------------------|------------|-----------|
| Spectrum Analyzer | R&S | FSV 30 | 103728 | 2024-12-19 | 2025-12-18 | Radiation |
| Amplifier | Sonoma | 310 | 363917 | 2024-12-19 | 2025-12-18 | Radiation |
| Amplifier | Schwarzbeck | BBV 9718 | 327 | 2024-12-19 | 2025-12-18 | Radiation |
| Amplifier | Narda | TTA1840-35-HG | 2034380 | 2024-12-14 | 2025-12-13 | Radiation |
| Loop Antenna | Schwarzbeck | FMZB 1519B | 1519B-051 | 2023-02-12 | 2026-02-11 | Radiation |
| Broadband Antenna | Schwarzbeck | VULB 9168 | 9168-757 | 2023-09-17 | 2026-09-16 | Radiation |
| Horn Antenna | Schwarzbeck | BBHA 9120 D | 1677 | 2023-02-12 | 2026-02-11 | Radiation |
| Horn Antenna | COM-POWER | AH-1840 | 101117 | 2023-12-05 | 2026-12-04 | Radiation |
| Test Software | Audix | E3 | 6.111221a | N/A | N/A | Radiation |
| Filter | Micro-Tronics | BRM 50702 | G266 | N/A | N/A | Radiation |

Note:

1. Test equipment calibration is traceable to the procedure of ISO17025.
2. N/A: No Calibration Required.

1. Photos of the EUT



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