



MPE Report

Report No.: STS2512374H01

Issued for

Shenzhen Elecrow Limited

Elecrow, 5th Floor, Fengze Building B, Nanchang Huafeng
Industrial Park, Hangcheng Street Hangkong Road, Baoan
District, Shenzhen city, China

Product Name: ThinkNode-M3

Brand Name: N/A

Model Name: ThinkNode-M3(Meshtastic)
ThinkNode-M3(Tracker)

Series Model(s): N/A

FCC ID: 2BDNA-TNM3-ELE

Test Standard: FCC 47CFR §2.1093

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Shenzhen STS Test Services Co., Ltd.



TEST REPORT

Applicant's Name Shenzhen Elecrow Limited
Address Elecrow, 5th Floor, Fengze Building B, Nanchang Huafeng Industrial Park, Hangcheng Street Hangkong Road, Baoan District, Shenzhen city, China
Manufacturer's Name Shenzhen Elecrow Limited
Address Elecrow, 5th Floor, Fengze Building B, Nanchang Huafeng Industrial Park, Hangcheng Street Hangkong Road, Baoan District, Shenzhen city, China

Product Description

Product Name ThinkNode-M3
Brand Name N/A
Model Name ThinkNode-M3(Meshtastic)
Series Model(s) ThinkNode-M3(Tracker)

Test Standards FCC 47CFR §2.1093
447498 D01 Interim General RF Exposure Guidance v06

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Date of Test

Date of receipt of test item 03 Dec. 2025
Date (s) of performance of tests 03 Dec. 2025 to 20 Dec. 2025
Date of Issue 20 Dec. 2025

Test Result **Pass**

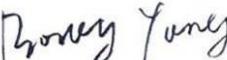
Testing Engineer : 

(Aaron Bu)

Technical Manager : 

(Skylar Li)



Authorized Signatory : 

(Bovey Yang)



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**Revision History**

| Rev. | Issue Date | Report No. | Effect Page | Contents |
|------|--------------|---------------|-------------|---------------|
| 00 | 20 Dec. 2025 | STS2512374H01 | ALL | Initial Issue |
| | | | | |



1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|---|----------------------|---------------|------------------|---------------------|-------------------|-----|--------------------------|-----|--------------------|----|---------------|-----------------|--------------------|------|----------|--|----------------------|---------|------------------|------|--------------------|---|---------------|-----------------|--------------------|-------|
| Product Name | ThinkNode-M3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brand Name | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Model Name | ThinkNode-M3(Meshtastic) ThinkNode-M3(Tracker) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Series Model(s) | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Model Difference | All the model are the same circuit and RF module, except model names. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Product Description | The EUT is a ThinkNode-M3 BLE <table border="1"><tr><td>Operation Frequency:</td><td>2402~2480 MHz</td></tr><tr><td>Modulation Type:</td><td>GFSK (1Mbps, 2Mbps)</td></tr><tr><td>Radio Technology:</td><td>BLE</td></tr><tr><td>Bluetooth Configuration:</td><td>N/A</td></tr><tr><td>Number Of Channel:</td><td>40</td></tr><tr><td>Antenna Type:</td><td>Ceramic antenna</td></tr><tr><td>Antenna Gain (dBi)</td><td>2.95</td></tr><tr><td colspan="2"> LoRa</td></tr><tr><td>Operation Frequency:</td><td>915 MHz</td></tr><tr><td>Modulation Type:</td><td>LoRa</td></tr><tr><td>Number Of Channel:</td><td>1</td></tr><tr><td>Antenna Type:</td><td>Ceramic antenna</td></tr><tr><td>Antenna Gain (dBi)</td><td>-0.84</td></tr></table> | Operation Frequency: | 2402~2480 MHz | Modulation Type: | GFSK (1Mbps, 2Mbps) | Radio Technology: | BLE | Bluetooth Configuration: | N/A | Number Of Channel: | 40 | Antenna Type: | Ceramic antenna | Antenna Gain (dBi) | 2.95 | LoRa | | Operation Frequency: | 915 MHz | Modulation Type: | LoRa | Number Of Channel: | 1 | Antenna Type: | Ceramic antenna | Antenna Gain (dBi) | -0.84 |
| Operation Frequency: | 2402~2480 MHz | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Modulation Type: | GFSK (1Mbps, 2Mbps) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Radio Technology: | BLE | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bluetooth Configuration: | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Number Of Channel: | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Antenna Type: | Ceramic antenna | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Antenna Gain (dBi) | 2.95 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LoRa | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operation Frequency: | 915 MHz | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Modulation Type: | LoRa | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Number Of Channel: | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Antenna Type: | Ceramic antenna | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Antenna Gain (dBi) | -0.84 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Power Rating | DC 3.7V from battery, DC 5V from USB | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adapter | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Battery | DC 3.7V | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hardware Version | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Software Version | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | |



1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01



2. FCC 47CFR §2.1093 REQUIREMENT

2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in KDB 447498 D01 General RF Exposure Guidance v06 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

2.2 LIMIT

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

| MHz | 5 | 10 | 15 | 20 | 25 | mm |
|------|-----|-----|-----|-----|-----|-----------------------------------|
| 150 | 39 | 77 | 116 | 155 | 194 | SAR Test Exclusion Threshold (mW) |
| 300 | 27 | 55 | 82 | 110 | 137 | |
| 450 | 22 | 45 | 67 | 89 | 112 | |
| 835 | 16 | 33 | 49 | 66 | 82 | |
| 900 | 16 | 32 | 47 | 63 | 79 | |
| 1500 | 12 | 24 | 37 | 49 | 61 | |
| 1900 | 11 | 22 | 33 | 44 | 54 | |
| 2450 | 10 | 19 | 29 | 38 | 48 | |
| 3600 | 8 | 16 | 24 | 32 | 40 | |
| 5200 | 7 | 13 | 20 | 26 | 33 | |
| 5400 | 6 | 13 | 19 | 26 | 32 | |
| 5800 | 6 | 12 | 19 | 25 | 31 | |
| MHz | 30 | 35 | 40 | 45 | 50 | mm |
| 150 | 232 | 271 | 310 | 349 | 387 | SAR Test Exclusion Threshold (mW) |
| 300 | 164 | 192 | 219 | 246 | 274 | |
| 450 | 134 | 157 | 179 | 201 | 224 | |
| 835 | 98 | 115 | 131 | 148 | 164 | |
| 900 | 95 | 111 | 126 | 142 | 158 | |
| 1500 | 73 | 86 | 98 | 110 | 122 | |
| 1900 | 65 | 76 | 87 | 98 | 109 | |
| 2450 | 57 | 67 | 77 | 86 | 96 | |
| 3600 | 47 | 55 | 63 | 71 | 79 | |
| 5200 | 39 | 46 | 53 | 59 | 66 | |
| 5400 | 39 | 45 | 52 | 58 | 65 | |
| 5800 | 37 | 44 | 50 | 56 | 62 | |



The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances \leq 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where } f(\text{GHz}) \text{ is the RF channel transmit frequency in GHz.}$

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is \leq 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is $<$ 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.



2.3 TEST RESULT

Maximum measured transmitter power.

Worst Case

| Mode | frequency | Maximum Output Power | Tune up tolerance | Max Tune up |
|------------------|-----------|----------------------|-------------------|-------------|
| | GHz | dBm | dBm | dBm |
| GFSK (BLE) | 2.402 | -1.12 | -1±1 | 0 |
| LoRa (915MHz) | 0.915 | 8.845 | 8±1 | 9 |

Evaluation Result

| Mode | Frequency | Antenna Distance | RF output power including tune up (dBm) | | SAR Test Exclusion Threshold | SAR Test Exclusion | Estimated SAR |
|------------------|-----------|------------------|---|-------|------------------------------|--------------------|---------------|
| | GHz | mm | dBm | mw | | | |
| GFSK (BLE) | 2.48 | 5 | 0 | 1 | 0.315 | Yes | / |
| LoRa (915MHz) | 0.915 | 5 | 9 | 7.943 | 1.52 | Yes | / |

Multiple transmission:

$$\text{BLE} + \text{LoRa} = 0.315/3 + 1.52/3 = 0.61 < 1$$

Note: Threshold at which no SAR required is $1.52 \leq 3.0$ for 1-g SAR, Separation distance $\leq 5\text{mm}$.

*****END OF THE REPORT*****