

FCC PART 15C TEST REPORT FOR CERTIFICATION

On Behalf of

mophie LLC

magsafe wireless stand-extendable-arm

Model Number: MAGSFE-3IN1-EXT-STND

FCC ID: 2ACWB-EXTSTND

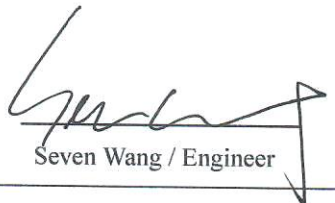
|              |                                                                     |
|--------------|---------------------------------------------------------------------|
| Applicant:   | mophie LLC                                                          |
| Address:     | 6244 Technology Ave. Kalamazoo, MI 49009, United States of America. |
|              |                                                                     |
| Prepared By: | EST Technology Co., Ltd.                                            |
|              | Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China |
|              | Tel: 86-769-83081888-808                                            |

|                 |                 |
|-----------------|-----------------|
| Report Number:  | ESTE-R2305099   |
| Date of Test:   | May 09~22, 2023 |
| Date of Report: | May 24, 2023    |

## TABLE OF CONTENTS

| Description                                  | Page |
|----------------------------------------------|------|
| TEST REPORT VERIFICATION.....                | 3    |
| 1. GENERAL INFORMATION.....                  | 4    |
| 1.1. Description of Device (EUT) .....       | 4    |
| 2. SUMMARY OF TEST .....                     | 5    |
| 2.1. Summary of test result.....             | 5    |
| 2.2. Test Facilities .....                   | 6    |
| 2.3. Measurement uncertainty .....           | 7    |
| 2.4. Assistant equipment used for test ..... | 7    |
| 2.5. Block Diagram .....                     | 7    |
| 2.6. Test Mode.....                          | 8    |
| 2.7. Test Equipment List .....               | 8    |
| 3. RADIATED EMISSION .....                   | 9    |
| 3.1. Limit .....                             | 9    |
| 3.2. Test Setup.....                         | 10   |
| 3.3. Spectrum Analyzer Setting.....          | 11   |
| 3.4. Test Procedure .....                    | 11   |
| Test Result.....                             | 12   |
| 4. AC POWER LINE CONDUCTED EMISSIONS .....   | 18   |
| 4.1. Limit .....                             | 18   |
| 4.2. Test Setup.....                         | 18   |
| 4.3. Spectrum Analyzer Setting.....          | 18   |
| 4.4. Test Procedure .....                    | 18   |
| 4.5. Test Result.....                        | 19   |
| 5. ANTENNA REQUIREMENTS .....                | 21   |
| 5.1. Limit .....                             | 21   |
| 5.2. Test Result.....                        | 21   |
| 6. TEST SETUP PHOTO .....                    | 22   |
| 7. EUT PHOTO.....                            | 24   |

**EST Technology Co., Ltd.**

|                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                       |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------|
| <b>Applicant:</b>                                                                                                                                                                                 | mophie LLC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                       |                 |
| <b>Address:</b>                                                                                                                                                                                   | 6244 Technology Ave. Kalamazoo, MI 49009, United States of America.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |                 |
| <b>Manufacturer:</b>                                                                                                                                                                              | mophie LLC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                       |                 |
| <b>Address:</b>                                                                                                                                                                                   | 6244 Technology Ave. Kalamazoo, MI 49009, United States of America.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |                 |
| <b>Factory 1:</b>                                                                                                                                                                                 | Shenzhen Reflying Electronic Co., Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                       |                 |
| <b>Address:</b>                                                                                                                                                                                   | Second Floor of Building 4, Floor 201-501, Building B6, Gaoxin Industrial Park, Fuyuan First Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen City                                                                                                                                                                                                                                                                                                                                                                             |                                                                                       |                 |
| <b>Factory 2:</b>                                                                                                                                                                                 | RX Tech Electronic Vina Co., Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                       |                 |
| <b>Address:</b>                                                                                                                                                                                   | 355 Yen Phong Industrial Zone, Yen Trung Village, Yen Phong District, Bac Ninh Province. Vietnam                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                       |                 |
| <b>E.U.T:</b>                                                                                                                                                                                     | magsafe wireless stand-extendable-arm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                 |
| <b>Model Number:</b>                                                                                                                                                                              | MAGSFE-3IN1-EXT-STND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                       |                 |
| <b>Power Supply:</b>                                                                                                                                                                              | Input: 12V==3A, 36W<br>Output 1: AirPods/ AirPods Pro (Qi 5W), Output2: iwatch 3.5W<br>Output3: Magsafe Charger 15W                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |                 |
| <b>Trade Name:</b>                                                                                                                                                                                | mophie                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Serial No.:</b>                                                                    | -----           |
| <b>Date of Receipt:</b>                                                                                                                                                                           | May 09, 2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Date of Test:</b>                                                                  | May 09~22, 2023 |
| <b>Test Specification:</b>                                                                                                                                                                        | FCC Part 15 Subpart C<br>ANSI C63.10:2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                       |                 |
| <b>Test Result:</b>                                                                                                                                                                               | <p>The device described above is tested by EST Technology Co., Ltd. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements.</p> <p>This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd.</p> |                                                                                       |                 |
| <b>Prepared by:</b>                                                                                                                                                                               | <b>Reviewed by:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Date:</b> May 24, 2023                                                             |                 |
|                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                 |
| Ring Yang / Assistant                                                                                                                                                                             | Seven Wang / Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Iceman Hu / Manager                                                                   |                 |
| <b>Other Aspects:</b>                                                                                                                                                                             | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                       |                 |
| Abbreviations: OK/P=passed    fail/F=failed    n.a/N=not applicable    E.U.T=equipment under tested                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                       |                 |
| This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                       |                 |

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                                   |   |                                       |
|-----------------------------------|---|---------------------------------------|
| Product Name                      | : | magsafe wireless stand-extendable-arm |
| Model Number                      | : | MAGSFE-3IN1-EXT-STND                  |
| Operation Frequency               | : | 110.5KHz-360KHz                       |
| Max Wireless Charge Power         | : | 23.5W(Qi:5W,Magsafe:15W,iwatch:3.5W)  |
| Max Field Strength of Fundamental | : | 69.85dBuV/m                           |
| Modulation Type                   | : | FSK                                   |
| Antenna Type                      | : | Induction coil                        |
| Sample Type                       | : | Prototype production                  |

Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

## 2. SUMMARY OF TEST

### 2.1. Summary of test result

| No. | Description of Test Item          | FCC Standard Section | Results |
|-----|-----------------------------------|----------------------|---------|
| 1   | Radiated Emission                 | 15.205<br>15.209     | PASS    |
| 2   | AC Power Line Conducted Emissions | 15.207               | PASS    |
| 3   | Antenna Requirement               | 15.203               | PASS    |

Note:“N/A” denotes test is not applicable in this test report.

## 2.2. Test Facilities

EMC Lab : Certificated by CNAS, CHINA  
Registration No.: L5288  
This Certificate is valid until: November 12, 2023

Certificated by FCC, USA  
Designation Number: CN1215  
This Certificate is valid until: January 31, 2024

Certificated by A2LA, USA  
Registration No.: 4366.01  
This Certificate is valid until: January 31, 2024

Certificated by Industry Canada  
CAB identifier No.: CN0035  
This Certificate is valid until: January 31, 2024

Certificated by VCCI, Japan  
Registration No.: C-14103; T-20073; R-13663;  
R-20103; G-20097  
Date of registration: Apr. 20, 2020  
This Certificate is valid until: Apr. 19, 2023

Certificated by TUV Rheinland, Germany  
Registration No.: UA 50413872 0001  
Date of registration: July 31, 2018

Certificated by Intertek  
Registration No.: 2011-RTL-L2-64  
Date of registration: November 08, 2018

Name of Firm : EST Technology Co., Ltd.

Site Location : Chilingxiang, Qishantou, Santun, Houjie, Dongguan,  
Guangdong, China

### 2.3. Measurement uncertainty

| Test Item                                                  | Uncertainty                       |
|------------------------------------------------------------|-----------------------------------|
| Uncertainty for Conduction emission test                   | $\pm 3.48\text{dB}$               |
| Uncertainty for spurious emissions test<br>(30MHz-1GHz)    | $\pm 4.60\text{ dB(Polarize: H)}$ |
|                                                            | $\pm 4.68\text{ dB(Polarize: V)}$ |
| Uncertainty for spurious emissions test<br>(1GHz to 18GHz) | $\pm 4.96\text{dB}$               |
| Uncertainty for radio frequency                            | $7 \times 10^{-8}$                |
| Uncertainty for conducted RF Power                         | 1.08dB                            |
| Uncertainty for Power density test                         | 0.26dB                            |

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

### 2.4. Assistant equipment used for test

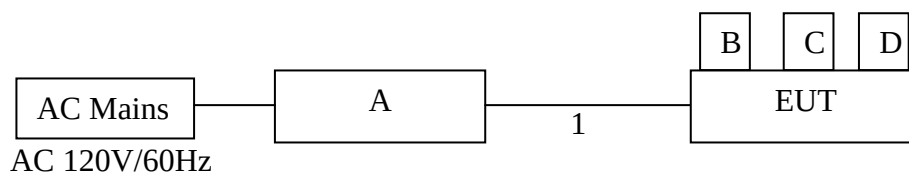
| Item | Equipment         | Brand  | Model Name/Type No. | FCC ID | Series No. |
|------|-------------------|--------|---------------------|--------|------------|
| A    | Adapter           | MOPHIE | PSD1203000UW        | -      | -          |
| B    | iPhone 13 Pro max | APPLE  | -                   | -      | -          |
| C    | Air Pods          | APPLE  | A1938               | -      | -          |
| D    | Watch             | APPLE  | Apple iwatch S7     | -      | -          |

| Item | Shielded Type | Ferrite Core | Length | Note     |
|------|---------------|--------------|--------|----------|
| 1    | NO            | NO           | 1.5m   | DC Cable |

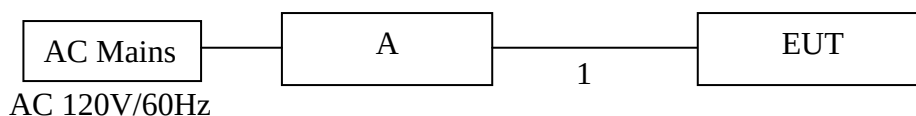
### 2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 meter high above ground.

#### For Mode 1(charging)



#### For Mode 2(stand by)



(EUT: magsafe wireless stand-extendable-arm)

## 2.6. Test Mode

The test mode was selected for the final test as listed below.

| Test Item                         | Test Mode                         |
|-----------------------------------|-----------------------------------|
| Radiated Emission                 | Wireless Charging with Empty Load |
|                                   | Wireless Charging with Half Load  |
|                                   | Wireless Charging with Full Load  |
| AC Power Line Conducted Emissions | Wireless Charging with Empty Load |
|                                   | Wireless Charging with Half Load  |
|                                   | Wireless Charging with Full Load  |

Note: The Full Load is worst case, will be recorded in the report.

## 2.7. Test Equipment List

| For AC Power Line Conducted Emissions Test |                 |              |            |                  |            |           |
|--------------------------------------------|-----------------|--------------|------------|------------------|------------|-----------|
| Equipment                                  | Manufacturer    | Model No.    | Serial No. | Calibration Body | Last Cal.  | Next Cal. |
| EMI Test Receiver                          | Rohde & Schwarz | ESHS30       | EST-E001   | LISAI            | June 13,22 | 1 Year    |
| Artificial Mains Network                   | Rohde & Schwarz | ENV216       | EST-E002   | LISAI            | June 13,22 | 1 Year    |
| Pulse Limiter                              | Rohde & Schwarz | ESH3-Z2      | EST-E078   | LISAI            | June 13,22 | 1 Year    |
| Test Software                              | Audix           | e3-6.111221a | N/A        | N/A              | N/A        | N/A       |

| For Radiated Emission Test(9kHz-30MHz) |                 |              |            |                  |            |           |
|----------------------------------------|-----------------|--------------|------------|------------------|------------|-----------|
| Equipment                              | Manufacturer    | Model No.    | Serial No. | Calibration Body | Last Cal.  | Next Cal. |
| EMI Test Receiver                      | Rohde & Schwarz | ESR7         | EST-E047   | LISAI            | June 13,22 | 1 Year    |
| Active Loop Antenna                    | SCHWABE ECK     | FMZB 1519B   | EST-E054   | LISAI            | June 13,22 | 1 Year    |
| Test Software                          | Audix           | e3-6.111221a | N/A        | N/A              | N/A        | N/A       |
| 9kHz-30MHz Cable                       | N/A             | EST-001      | N/A        | N/A              | N/A        | N/A       |

| For Radiated Emission Test (30MHz-1000MHz) |                 |              |            |                  |            |           |
|--------------------------------------------|-----------------|--------------|------------|------------------|------------|-----------|
| Equipment                                  | Manufacturer    | Model No.    | Serial No. | Calibration Body | Last Cal.  | Next Cal. |
| EMI Test Receiver                          | Rohde & Schwarz | ESR7         | EST-E047   | LISAI            | June 13,22 | 1 Year    |
| Bilog Antenna                              | Teseq           | CBL 6111D    | EST-E034   | LISAI            | June 13,22 | 1 Year    |
| Test Software                              | Audix           | e3-6.111221a | N/A        | N/A              | N/A        | N/A       |
| 30-1000MHz Cable                           | N/A             | EST-002      | N/A        | N/A              | N/A        | N/A       |



### 3. RADIATED EMISSION

#### 3.1. Limit

##### 15.209 Radiated emission limits

| Frequency (MHz) | Field Strength( $\mu\text{V/m}$ ) | Distance(m) |
|-----------------|-----------------------------------|-------------|
| 0.009-0.490     | 2400/F(kHz)                       | 300         |
| 0.490-1.705     | 24000/F(kHz)                      | 30          |
| 1.705-30        | 30                                | 30          |
| 30-88           | 100                               | 3           |
| 88-216          | 150                               | 3           |
| 216-960         | 200                               | 3           |
| Above 960       | 500                               | 3           |

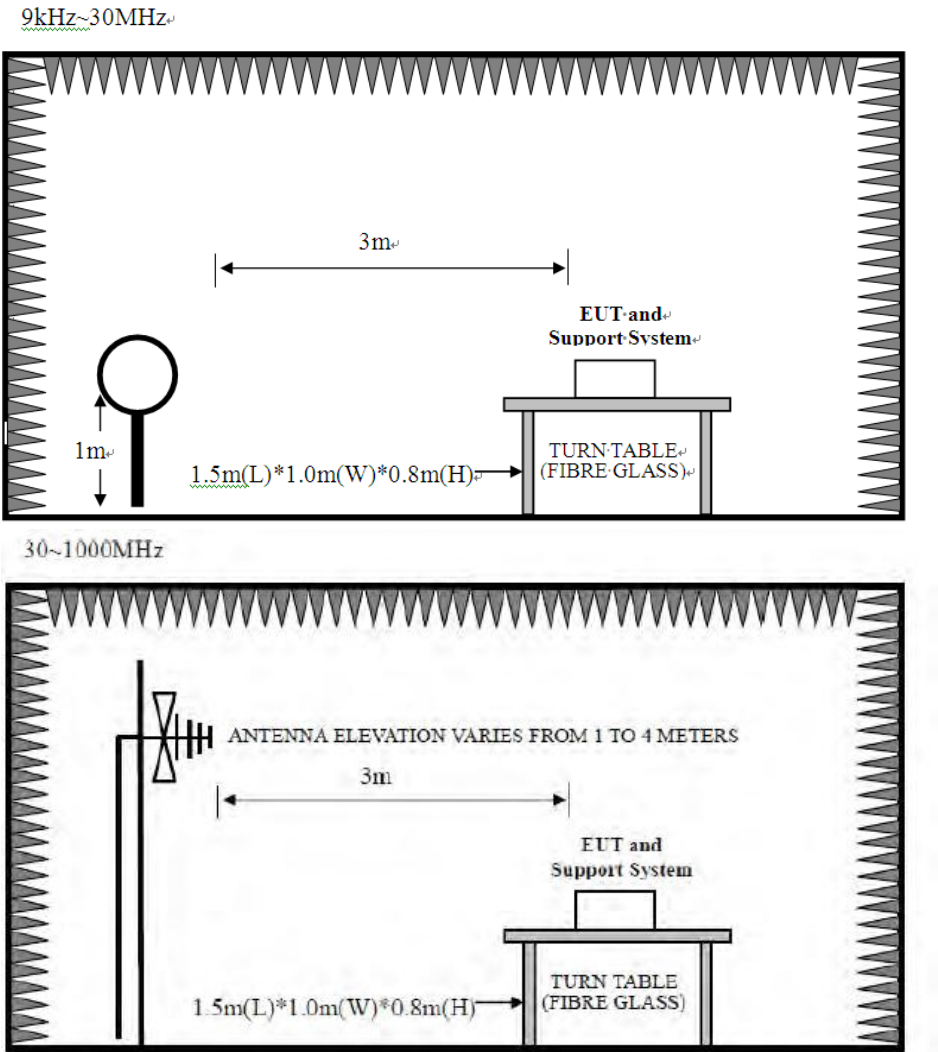
Note:

1. Emission level  $\text{dB}\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$ .
2. The smaller limit shall apply at the cross point between two frequency bands.
3. Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system

##### 15.205 Restricted frequency band

| MHz                        | MHz                   | MHz             | GHz              |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138             | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.7 - 156.9         | 2690 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 322 - 335.4           | 3600 - 4400     | ( <sup>2</sup> ) |

3.2. Test Setup



### 3.3. Spectrum Analyzer Setting

For 9KHz-150KHz

| Spectrum Parameters | Setting                                 |
|---------------------|-----------------------------------------|
| RBW                 | 300Hz(for Peak&AVG)/CISPR 200Hz(for QP) |
| VBW                 | 300Hz(for Peak&AVG)/CISPR 200Hz(for QP) |
| Start frequency     | 9KHz                                    |
| Stop frequency      | 150KHz                                  |
| Sweep Time          | Auto                                    |
| Detector            | PEAK/QP/AVG                             |
| Trace Mode          | Max Hold                                |

For 150KHz-30MHz

| Spectrum Parameters | Setting  |
|---------------------|----------|
| RBW                 | 9KHz     |
| VBW                 | 9KHz     |
| Start frequency     | 150KHz   |
| Stop frequency      | 30MHz    |
| Sweep Time          | Auto     |
| Detector            | QP       |
| Trace Mode          | Max Hold |

For 30MHz-1000MHz

| Spectrum Parameters | Setting  |
|---------------------|----------|
| RBW                 | 120KHz   |
| VBW                 | 300KHz   |
| Start frequency     | 30MHz    |
| Stop frequency      | 1000MHz  |
| Sweep Time          | Auto     |
| Detector            | QP       |
| Trace Mode          | Max Hold |

### 3.4. Test Procedure

- EUT was placed on a turn table, which is 0.8 meter high above ground.
- EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
- Set the EUT transmit continuously with maximum output power.
- Spectrum analyzer setting parameters in accordance with section 3.3.
- The turn table can rotate 360 degrees to determine the position of the maximum emission level.
- For below 30MHz test, the center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates both coaxial and coplanar polarization to find out the maximum emission level.
- For above 30MHz test, the antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both coaxial and coplanar polarization of the antenna are set on test.
- Record the results in the test report.

Note:

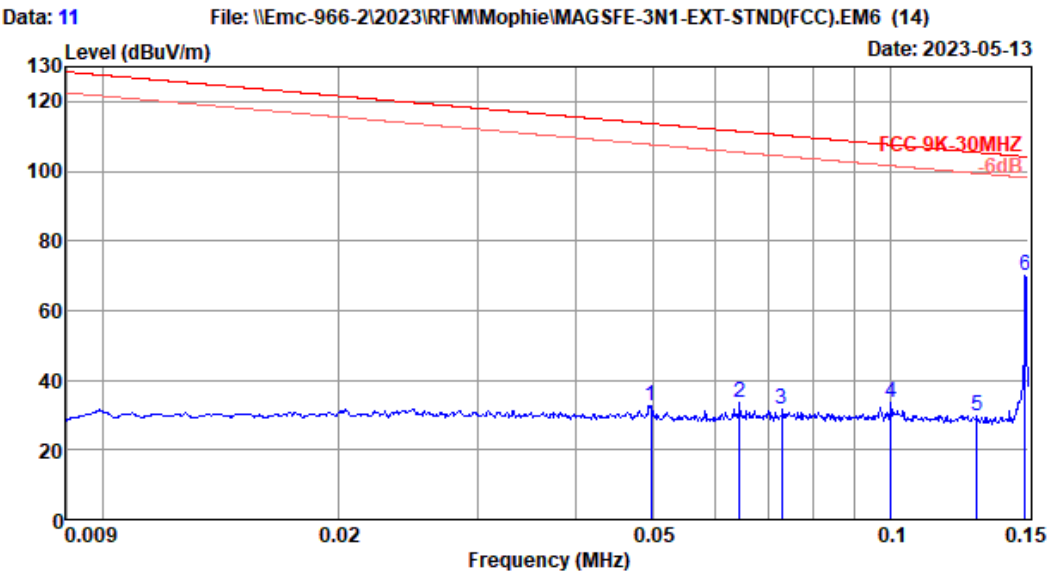
- For emissions below 30MHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
- For emissions below 30MHz, if peak level comply with QP limit, then the QP level is deemed to comply with QP limit.

Test Result

Radiated Emission Below 30MHz

EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878

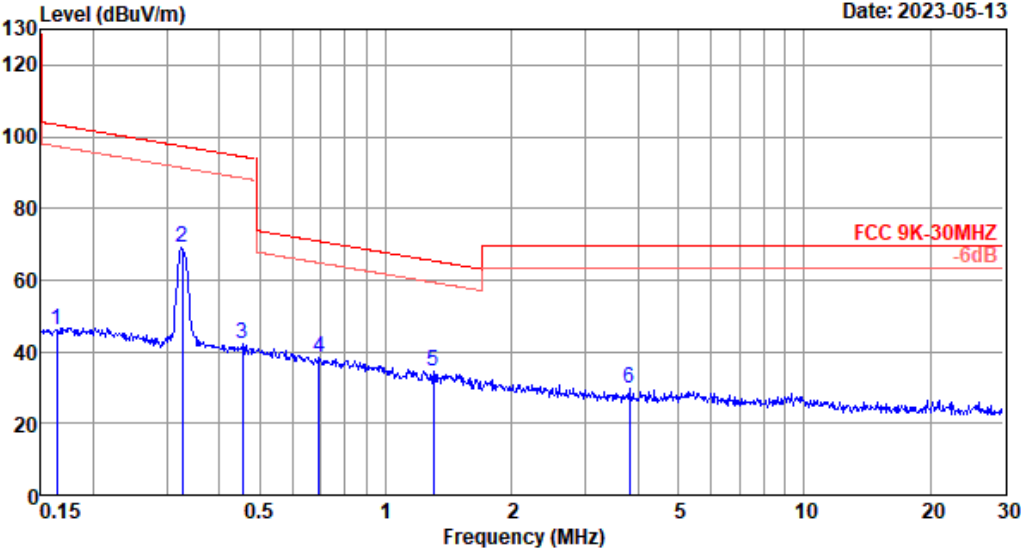


Site no. : 2# 966 chamber Data no. : 11  
Dis. / Ant. : 3m FMZB 1519B Ant. pol. : COAXIAL  
Limit : FCC 9K-30MHZ  
Env. / Ins. : Temp:21.3C;Humi:50.2%;Press:101.52kPa  
Engineer : JBR  
EUT : magsafe wireless stand-extendable-arm  
Power : DC 12V From Adapter Input AC 120V/60Hz  
M/N : MAGSFE-3IN1-EXT-STND  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 0.0497         | 20.60                   | 0.10                  | 11.85             | 32.55                         | 125.58            | 93.03          | Peak   |
| 2 | 0.0644         | 20.20                   | 0.10                  | 13.17             | 33.47                         | 124.52            | 91.05          | Peak   |
| 3 | 0.0729         | 20.20                   | 0.10                  | 11.58             | 31.88                         | 123.91            | 92.03          | Peak   |
| 4 | 0.1004         | 20.70                   | 0.10                  | 12.74             | 33.54                         | 107.57            | 74.03          | Peak   |
| 5 | 0.1289         | 20.40                   | 0.10                  | 9.20              | 29.70                         | 119.87            | 90.17          | Peak   |
| 6 | 0.1483         | 20.20                   | 0.10                  | 49.55             | 69.85                         | 118.46            | 48.61          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.

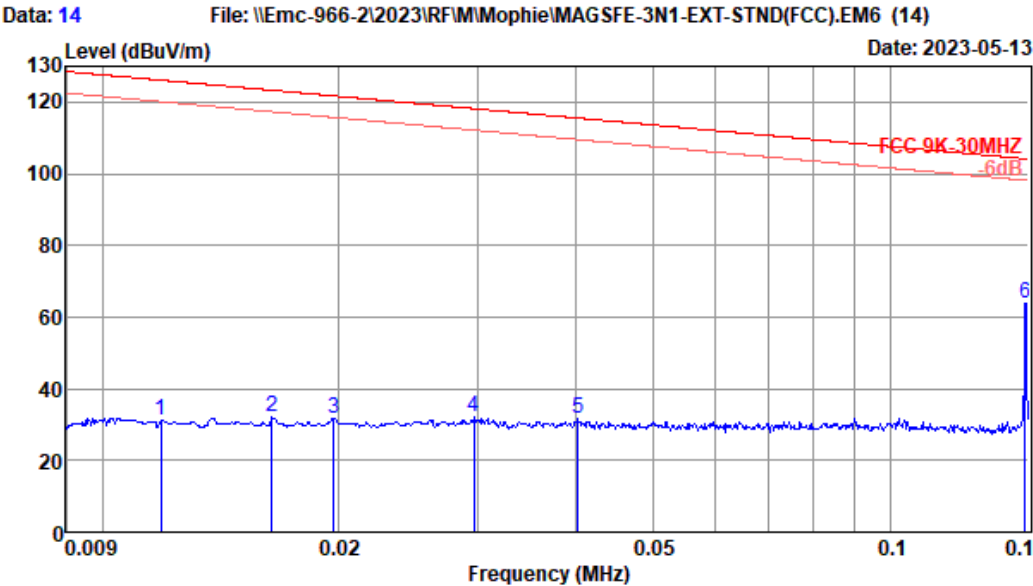
Data: 12                      File: \\Emc-966-2\\2023\\RF\\M\\Mophie\\MAGSFE-3N1-EXT-STND(FCC).EM6 (14)                      Date: 2023-05-13



Site no. : 2# 966 chamber                      Data no. : 12  
Dis. / Ant. : 3m FMZB 1519B                      Ant. pol. : COAXIAL  
Limit : FCC 9K-30MHZ  
Env. / Ins. : Temp:21.3C;Humi:50.2%;Press:101.52kPa  
Engineer : JBR  
EUT : magsafe wireless stand-extendable-arm  
Power : DC 12V From Adapter Input AC 120V/60Hz  
M/N : MAGSFE-3IN1-EXT-STND  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 0.1633         | 20.20                   | 0.10                  | 25.79             | 46.09                         | 103.35            | 57.26          | Peak   |
| 2 | 0.3265         | 20.53                   | 0.10                  | 48.47             | 69.10                         | 97.33             | 28.23          | Peak   |
| 3 | 0.4539         | 20.75                   | 0.10                  | 21.40             | 42.25                         | 94.46             | 52.21          | Peak   |
| 4 | 0.6936         | 20.84                   | 0.10                  | 17.53             | 38.47                         | 70.78             | 32.31          | Peak   |
| 5 | 1.3029         | 20.83                   | 0.10                  | 13.52             | 34.45                         | 65.31             | 30.86          | Peak   |
| 6 | 3.8196         | 20.28                   | 0.11                  | 9.24              | 29.63                         | 69.54             | 39.91          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.



Site no. : 2# 966 chamber      Data no. : 14  
Dis. / Ant. : 3m FMZB 1519B      Ant. pol. : COPLANAR  
Limit : FCC 9K-30MHZ  
Env. / Ins. : Temp:21.3C;Humi:50.2%;Press:101.52kPa  
Engineer : JBR  
EUT : magsafe wireless stand-extendable-arm  
Power : DC 12V From Adapter Input AC 120V/60Hz  
M/N : MAGSAFE-3IN1-EXT-STND  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 0.0119         | 20.60                   | 0.10                  | 10.48             | 31.18                         | 126.10            | 94.92          | Peak   |
| 2 | 0.0164         | 20.60                   | 0.10                  | 11.23             | 31.93                         | 123.29            | 91.36          | Peak   |
| 3 | 0.0197         | 20.60                   | 0.10                  | 11.12             | 31.82                         | 121.73            | 89.91          | Peak   |
| 4 | 0.0297         | 20.60                   | 0.10                  | 11.43             | 32.13                         | 118.16            | 86.03          | Peak   |
| 5 | 0.0402         | 20.60                   | 0.10                  | 10.85             | 31.55                         | 115.52            | 83.97          | Peak   |
| 6 | 0.1483         | 20.20                   | 0.10                  | 43.50             | 63.80                         | 104.18            | 40.38          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.

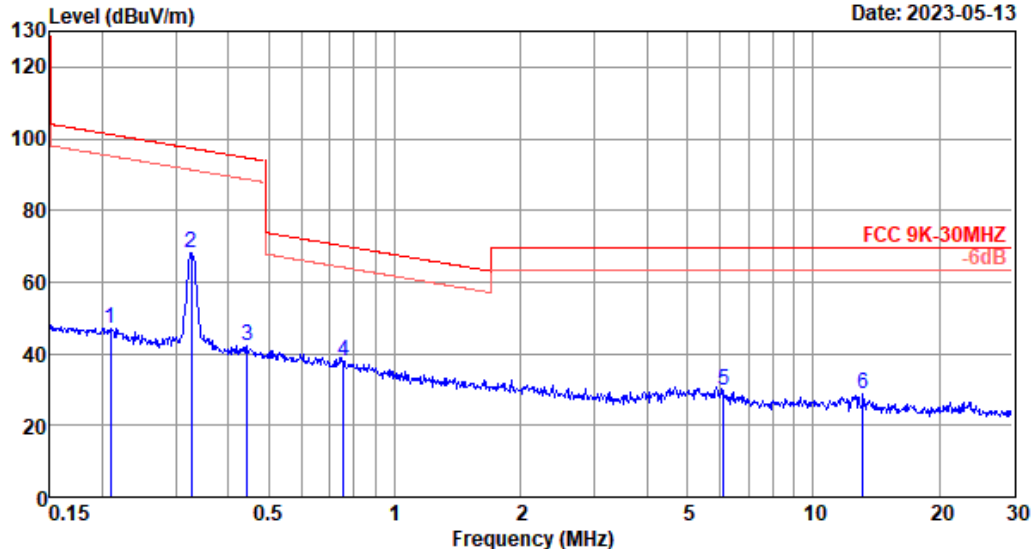
## EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878

Data: 13

File: \\Emc-966-2\2023\RFIM\Mophie\MAGSFE-3N1-EXT-STND(FCC).EM6 (14)

Date: 2023-05-13



Site no. : 2# 966 chamber Data no. : 13  
 Dis. / Ant. : 3m FMZB 1519B Ant. pol. : COPLANAR  
 Limit : FCC 9K-30MHz  
 Env. / Ins. : Temp:21.3C;Humi:50.2%;Press:101.52kPa  
 Engineer : JBR  
 EUT : magsafe wireless stand-extendable-arm  
 Power : DC 12V From Adapter Input AC 120V/60Hz  
 M/N : MAGSFE-3IN1-EXT-STND  
 Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 0.2094         | 20.31                   | 0.10                  | 26.63             | 47.04                         | 101.18            | 54.14          | Peak   |
| 2 | 0.3265         | 20.53                   | 0.10                  | 47.51             | 68.14                         | 97.33             | 29.19          | Peak   |
| 3 | 0.4444         | 20.75                   | 0.10                  | 21.35             | 42.20                         | 94.65             | 52.45          | Peak   |
| 4 | 0.7549         | 20.85                   | 0.10                  | 17.14             | 38.09                         | 70.05             | 31.96          | Peak   |
| 5 | 6.1209         | 20.10                   | 0.12                  | 9.59              | 29.81                         | 69.54             | 39.73          | Peak   |
| 6 | 13.1269        | 19.68                   | 0.14                  | 8.79              | 28.61                         | 69.54             | 40.93          | Peak   |

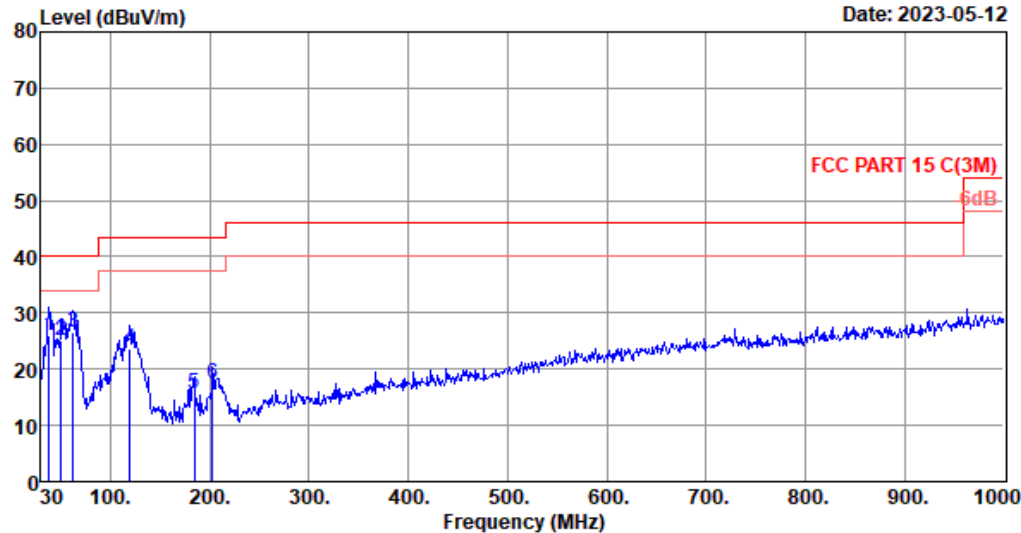
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. Margin= Limit - Emission Level.  
 3. The emission levels that are 20dB below the official limit are not reported.

Radiated Emission Above 30MHz

EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan,Guangdong,China  
Tel:+86-769-83081888  
Fax:+86-769-83081878

Data: 1 File: \\Emc-966-2\\2023\\RF\\M\\Mophie\\MAGSFE-3N1-EXT-STND(FCC).EM6 (14) Date: 2023-05-12



Site no. : 2# 966 chamber Data no. : 1  
Dis. / Ant. : 3m 47018 Ant. pol. : VERTICAL  
Limit : FCC PART 15 C(3M)  
Env. / Ins. : Temp:21.3C;Humi:50.2%;Press:101.52kPa  
Engineer : qqz  
EUT : magsafe wireless stand-extendable-arm  
Power : DC 12V From Adapter Input AC 120V/60Hz  
M/N : MAGSFE-3IN1-EXT-STND  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 37.76          | 12.90                   | 0.22                  | 12.96             | 26.08                         | 40.00             | 13.92          | QP     |
| 2 | 50.37          | 8.50                    | 0.30                  | 16.17             | 24.97                         | 40.00             | 15.03          | QP     |
| 3 | 62.01          | 5.16                    | 0.41                  | 20.89             | 26.46                         | 40.00             | 13.54          | QP     |
| 4 | 119.24         | 11.44                   | 0.84                  | 11.46             | 23.74                         | 43.50             | 19.76          | QP     |
| 5 | 184.23         | 9.44                    | 1.10                  | 5.20              | 15.74                         | 43.50             | 27.76          | QP     |
| 6 | 202.66         | 8.72                    | 1.17                  | 7.38              | 17.27                         | 43.50             | 26.23          | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.



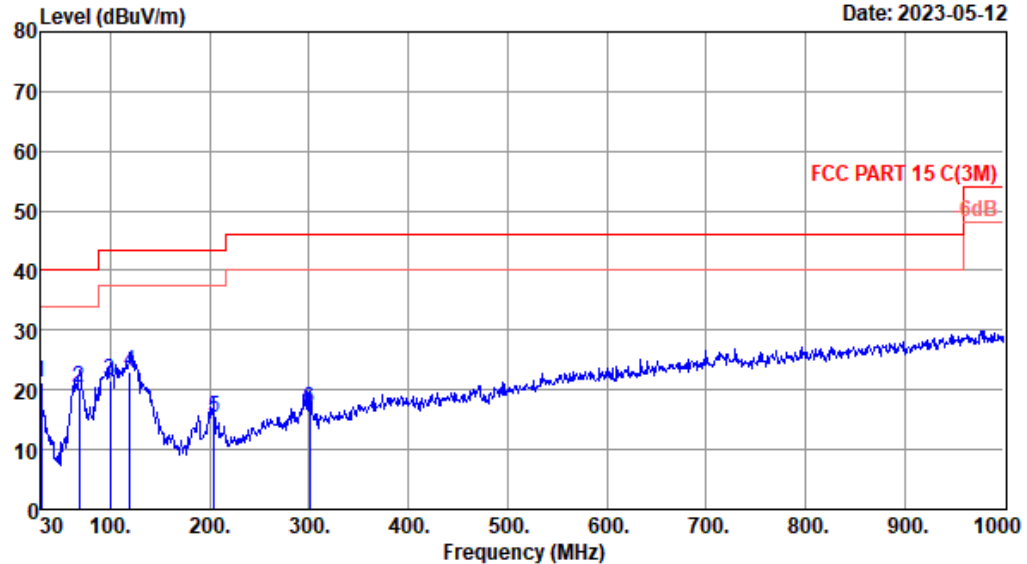
## EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878

Data: 2

File: \\Emc-966-2\\2023\\RF\\M\\Mophie\\MAGSAFE-3N1-EXT-STND(FCC).EM6 (14)

Date: 2023-05-12



Site no. : 2# 966 chamber Data no. : 2  
Dis. / Ant. : 3m 47018 Ant. pol. : HORIZONTAL  
Limit : FCC PART 15 C(3M)  
Env. / Ins. : Temp:21.3C;Humi:50.2%;Press:101.52kPa  
Engineer : qqz  
EUT : magsafe wireless stand-extendable-arm  
Power : DC 12V From Adapter Input AC 120V/60Hz  
M/N : MAGSAFE-3IN1-EXT-STND  
Test Mode : TX Mode

|   | Freq.<br>(MHz) | ANT<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|---|----------------|-------------------------|-----------------------|-------------------|-------------------------------|-------------------|----------------|--------|
| 1 | 30.00          | 18.80                   | 0.19                  | 2.18              | 21.17                         | 40.00             | 18.83          | QP     |
| 2 | 68.80          | 6.28                    | 0.53                  | 13.43             | 20.24                         | 40.00             | 19.76          | QP     |
| 3 | 99.84          | 9.90                    | 0.80                  | 10.86             | 21.56                         | 43.50             | 21.94          | QP     |
| 4 | 119.24         | 11.44                   | 0.84                  | 10.88             | 23.16                         | 43.50             | 20.34          | QP     |
| 5 | 204.60         | 8.80                    | 1.13                  | 5.52              | 15.45                         | 43.50             | 28.05          | QP     |
| 6 | 300.63         | 13.90                   | 1.62                  | 1.21              | 16.73                         | 46.00             | 29.27          | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. The emission levels that are 20dB below the official limit are not reported.

## 4. AC POWER LINE CONDUCTED EMISSIONS

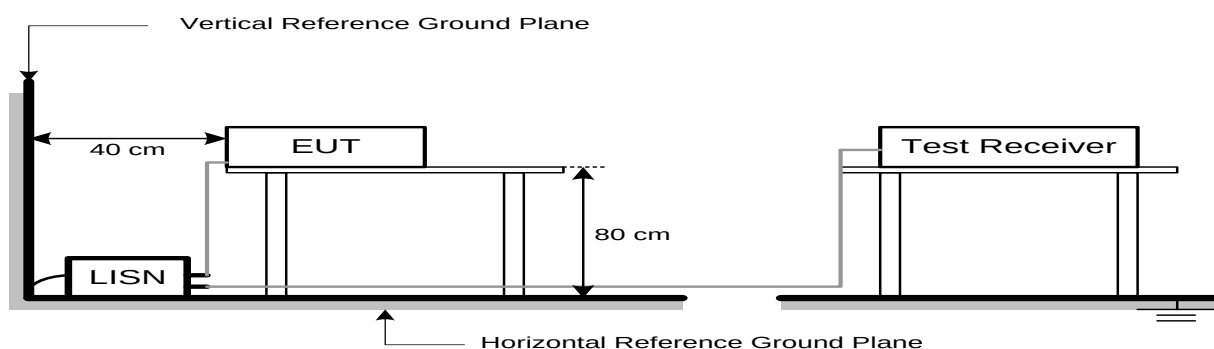
### 4.1. Limit

| Frequency |   |        | Maximum RF Line Voltage          |                               |
|-----------|---|--------|----------------------------------|-------------------------------|
|           |   |        | Quasi-Peak Level<br>dB( $\mu$ V) | Average Level<br>dB( $\mu$ V) |
| 150kHz    | ~ | 500kHz | 66 ~ 56*                         | 56 ~ 46*                      |
| 500kHz    | ~ | 5MHz   | 56                               | 46                            |
| 5MHz      | ~ | 30MHz  | 60                               | 50                            |

Note:

1. \* Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

### 4.2. Test Setup



### 4.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting  |
|---------------------|----------|
| RBW                 | 9KHz     |
| VBW                 | 9KHz     |
| Start frequency     | 150KHz   |
| Stop frequency      | 30MHz    |
| Sweep Time          | Auto     |
| Detector            | QP/AVG   |
| Trace Mode          | Max Hold |

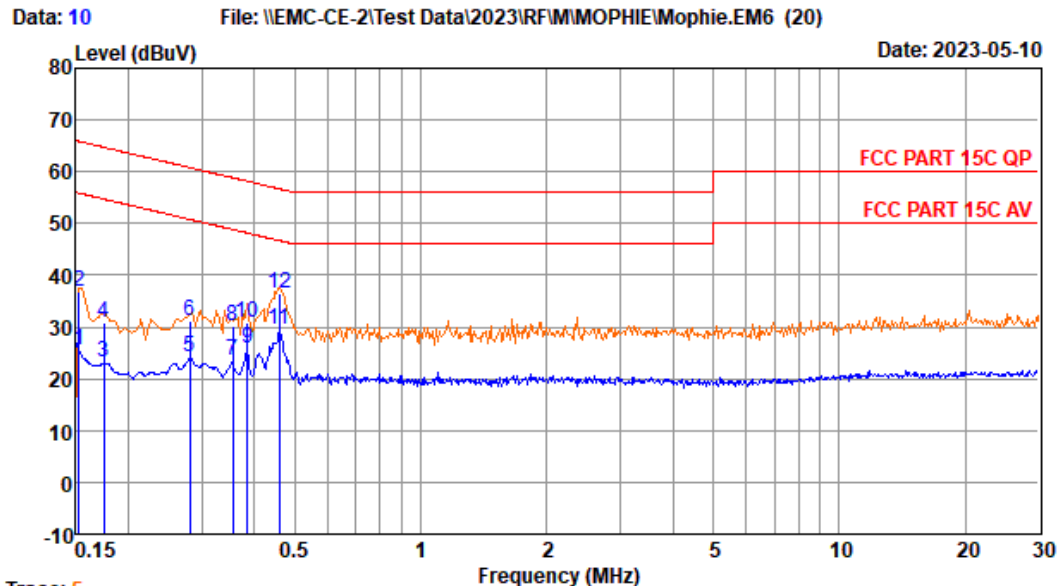
### 4.4. Test Procedure

- a. The EUT was placed on a non-metallic table, 80cm above the ground plane.
- b. The EUT Power connected to the power mains through a line impedance stabilization network.
- c. Provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
- d. Set the EUT transmit continuously with maximum output power.
- e. Spectrum analyzer setting parameters in accordance with section 4.3.
- f. The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.
- g. Record the results in the test report.

## 4.5. Test Result

EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878



Trace: 5

Site no : 2#CE Shield Room Data no. : 10

Env. / Ins. : Temp:23.9°C Humi:70% Press:101.50kPa LINE Phase : LINE

Limit : FCC PART 15C QP

Engineer : MRS

EUT : magsafe wireless stand-extendable-arm

Power : DC 12V From Adapter Input AC 120V/60Hz

M/N : MAGSFE-3IN1-EXT-STND

Test Mode : Charging

|    | Freq.<br>(MHz) | LISN<br>Factor<br>(db) | Cable<br>Loss<br>(db) | Reading<br>dBuV | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|----|----------------|------------------------|-----------------------|-----------------|-----------------------------|------------------|----------------|---------|
| 1  | 0.152          | 9.82                   | 9.69                  | 6.11            | 25.62                       | 55.87            | 30.25          | Average |
| 2  | 0.152          | 9.82                   | 9.69                  | 17.22           | 36.73                       | 65.87            | 29.14          | QP      |
| 3  | 0.175          | 9.84                   | 9.77                  | 3.53            | 23.14                       | 54.72            | 31.58          | Average |
| 4  | 0.175          | 9.84                   | 9.77                  | 11.33           | 30.94                       | 64.72            | 33.78          | QP      |
| 5  | 0.280          | 9.77                   | 9.92                  | 4.59            | 24.28                       | 50.81            | 26.53          | Average |
| 6  | 0.280          | 9.77                   | 9.92                  | 11.52           | 31.21                       | 60.81            | 29.60          | QP      |
| 7  | 0.356          | 9.81                   | 9.92                  | 3.66            | 23.39                       | 48.83            | 25.44          | Average |
| 8  | 0.356          | 9.81                   | 9.92                  | 10.55           | 30.28                       | 58.83            | 28.55          | QP      |
| 9  | 0.385          | 9.85                   | 9.92                  | 6.08            | 25.85                       | 48.17            | 22.32          | Average |
| 10 | 0.385          | 9.85                   | 9.92                  | 11.15           | 30.92                       | 58.17            | 27.25          | QP      |
| 11 | 0.459          | 9.84                   | 9.92                  | 9.92            | 29.68                       | 46.71            | 17.03          | Average |
| 12 | 0.459          | 9.84                   | 9.92                  | 16.86           | 36.62                       | 56.71            | 20.09          | QP      |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.  
2. Margin= Limit - Emission Level.  
3. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

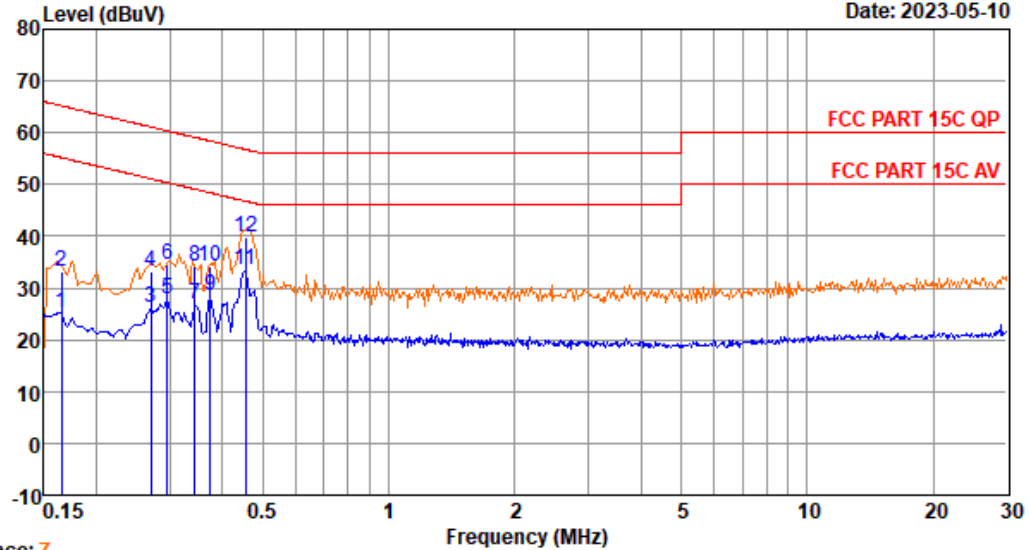
## EST Technology

Chilingxiang, Qishantou, Santun,  
Houjie, Dongguan, Guangdong, China  
Tel: +86-769-83081888  
Fax: +86-769-83081878

Data: 12

File: \\EMC-CE-2\Test Data\2023\RF\MI\MOPHIE\Mophie.EM6 (20)

Date: 2023-05-10



Site no : 2#CE Shield Room Data no. : 12  
 Env. / Ins. : Temp:23.9°C Humi:70% Press:101.50kPa LINE Phase : NEUTRAL  
 Limit : FCC PART 15C QP  
 Engineer : MRS  
 EUT : magsafe wireless stand-extendable-arm  
 Power : DC 12V From Adapter Input AC 120V/60Hz  
 M/N : MAGSFE-3IN1-EXT-STND  
 Test Mode : Charging

|    | Freq.<br>(MHz) | LISN<br>Factor<br>(db) | Cable<br>Loss<br>(db) | Reading<br>dBuV | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|----|----------------|------------------------|-----------------------|-----------------|-----------------------------|------------------|----------------|---------|
| 1  | 0.165          | 9.78                   | 9.69                  | 5.77            | 25.24                       | 55.21            | 29.97          | Average |
| 2  | 0.165          | 9.78                   | 9.69                  | 13.55           | 33.02                       | 65.21            | 32.19          | QP      |
| 3  | 0.270          | 9.84                   | 9.92                  | 6.60            | 26.36                       | 51.12            | 24.76          | Average |
| 4  | 0.270          | 9.84                   | 9.92                  | 13.25           | 33.01                       | 61.12            | 28.11          | QP      |
| 5  | 0.296          | 9.83                   | 9.92                  | 8.26            | 28.01                       | 50.37            | 22.36          | Average |
| 6  | 0.296          | 9.83                   | 9.92                  | 14.64           | 34.39                       | 60.37            | 25.98          | QP      |
| 7  | 0.345          | 9.76                   | 9.92                  | 7.05            | 26.73                       | 49.09            | 22.36          | Average |
| 8  | 0.345          | 9.76                   | 9.92                  | 14.55           | 34.23                       | 59.09            | 24.86          | QP      |
| 9  | 0.375          | 9.74                   | 9.92                  | 8.88            | 28.54                       | 48.39            | 19.85          | Average |
| 10 | 0.375          | 9.74                   | 9.92                  | 14.52           | 34.18                       | 58.39            | 24.21          | QP      |
| 11 | 0.454          | 9.75                   | 9.92                  | 13.81           | 33.48                       | 46.80            | 13.32          | Average |
| 12 | 0.454          | 9.75                   | 9.92                  | 20.24           | 39.91                       | 56.80            | 16.89          | QP      |

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.  
 2. Margin= Limit - Emission Level.  
 3. If the average limit is met when using a quasi-peak detector,  
 the EUT shall be deemed to meet both limits and measurement  
 with average detector is unnecessary.

## 5. ANTENNA REQUIREMENTS

### 5.1. Limit

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 5.2. Test Result

The antennas used for this product is Coil antenna, so compliance with antenna requirements. ( Please refer to the EUT photo for details)

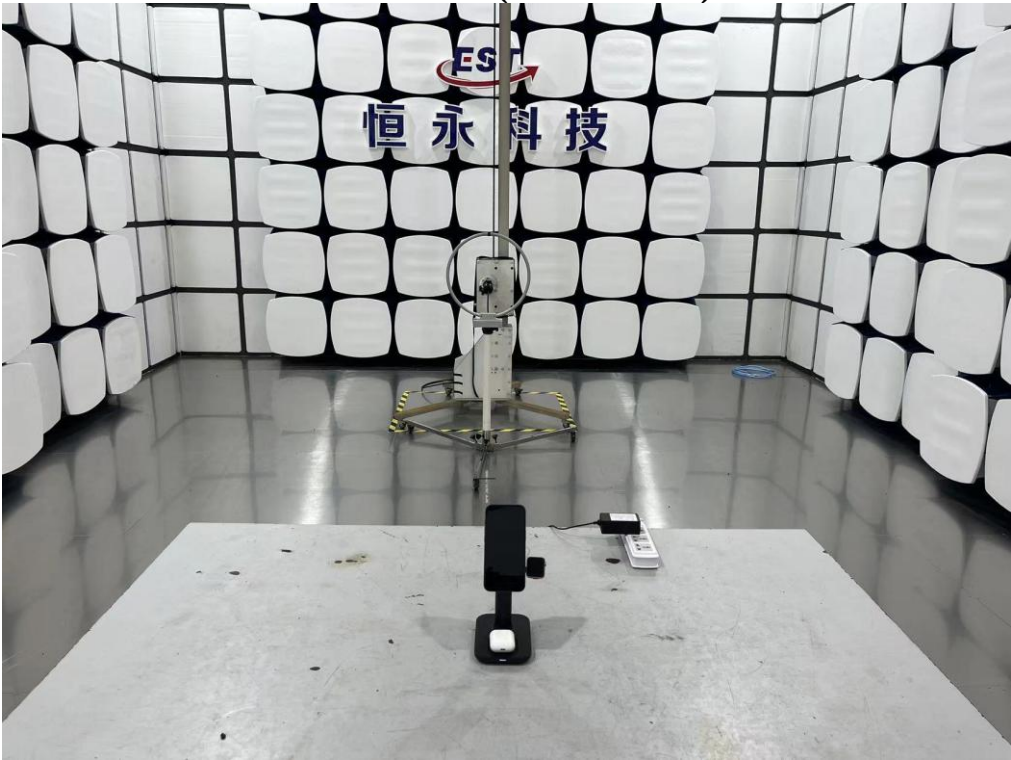
6. TEST SETUP PHOTO

Conducted Emissions Test

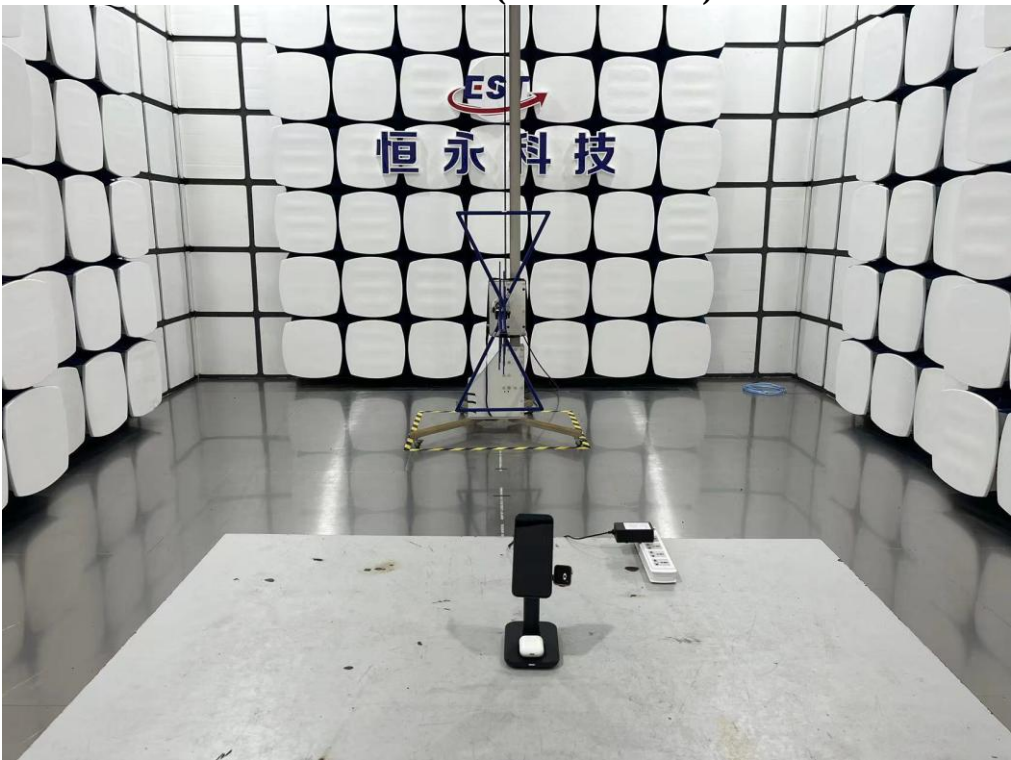




Radiated Test (Below 30MHz)



Radiated Test (Above 30MHz)



7. EUT PHOTO

External Photos  
M/N: MAGSFE-3IN1-EXT-STND

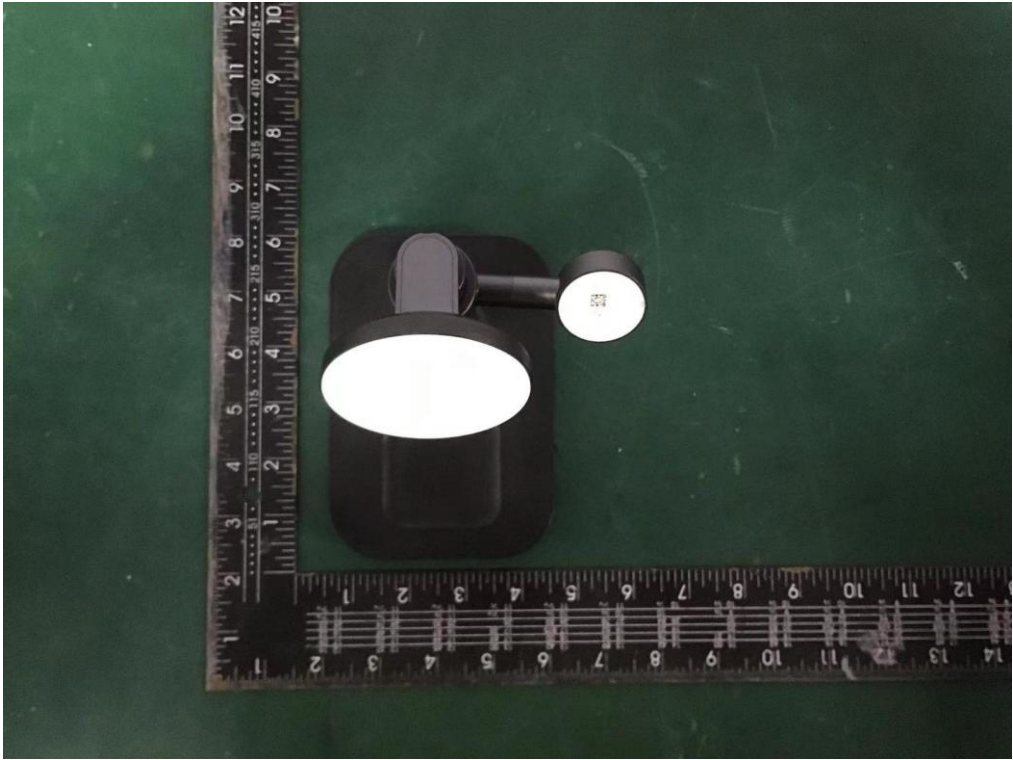




**External Photos**  
M/N: MAGSFE-3IN1-EXT-STND



External Photos  
M/N: MAGSFE-3IN1-EXT-STND

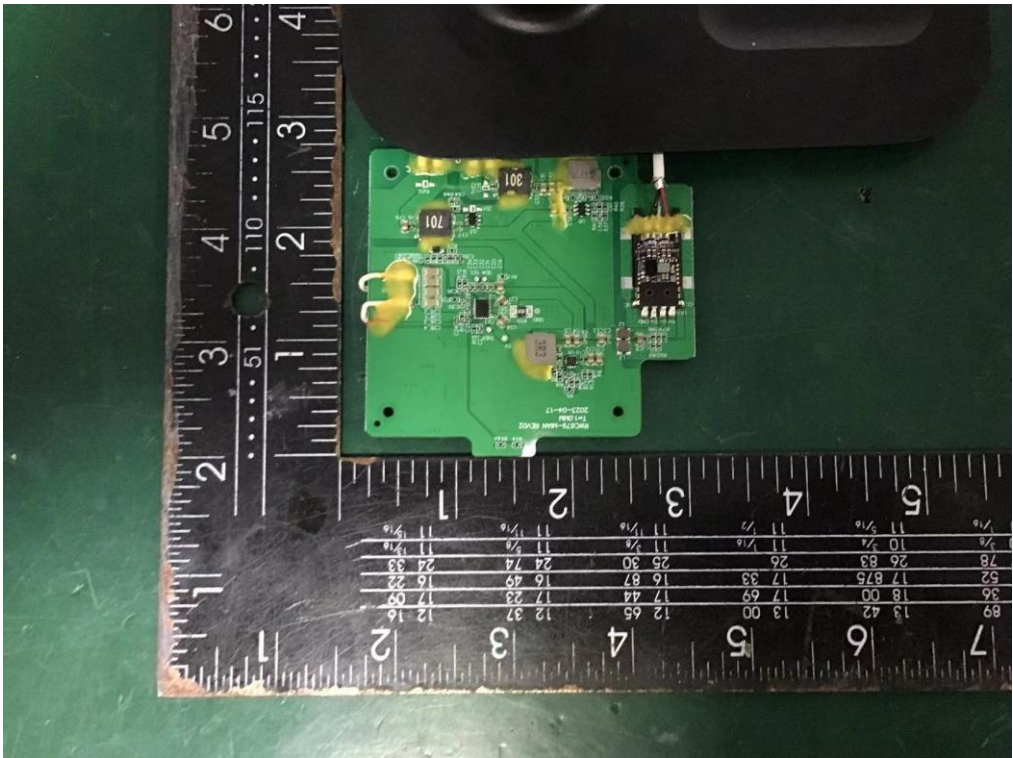


**External Photos**  
M/N: MAGSFE-3IN1-EXT-STND



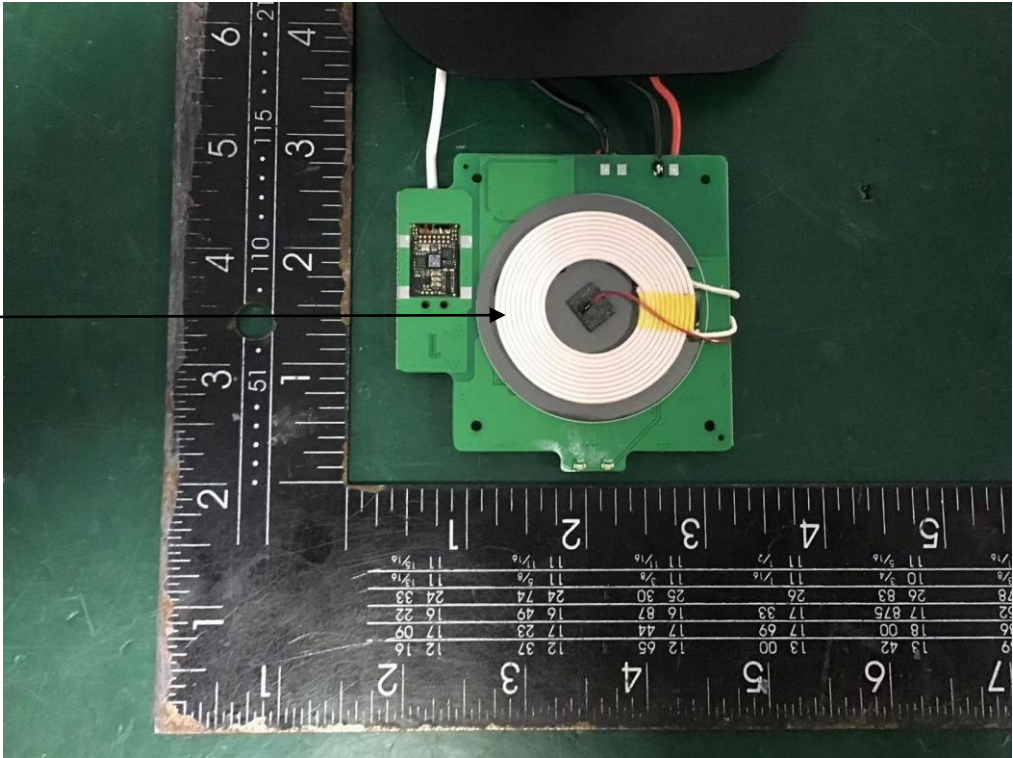


Internal Photos  
M/N: MAGSFE-3IN1-EXT-STND



Internal Photos  
M/N: MAGSFE-3IN1-EXT-STND

Coil Antenna



Coil Antenna  
Magsafe



**Internal Photos**  
M/N: MAGSFE-3IN1-EXT-STND

Coil Antenna  
Magsafe



**End of Test Report**