



# RF Exposure Report

Applicant : Protop International Inc.

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Address : 10F-8, No.237, Sec.,1, Datong Rd., Xizhi Dist., 22161New Taipei  
City, Taiwan

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Equipment : Wireless Charging Stand

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Model No. : OBFTC-0097-A, 78-80734, 78-80735, 78-80736, 78-80737,  
78-80738, 78-80739, 78-80740

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Trade Name : OTTERBOX

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FCC ID. : 2AAYX0097A

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Standard : FCC CFR 47 part1, 1.1310  
KDB680106 D01v03

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**I HEREBY CERTIFY THAT :**

The sample was received on Feb. 23, 2022 and the test items were conducted during Mar. 30, 2022 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Leevin Li / Supervisor



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## 1. Test Configuration of Equipment under Test

### 1.1. Feature of Equipment under Test

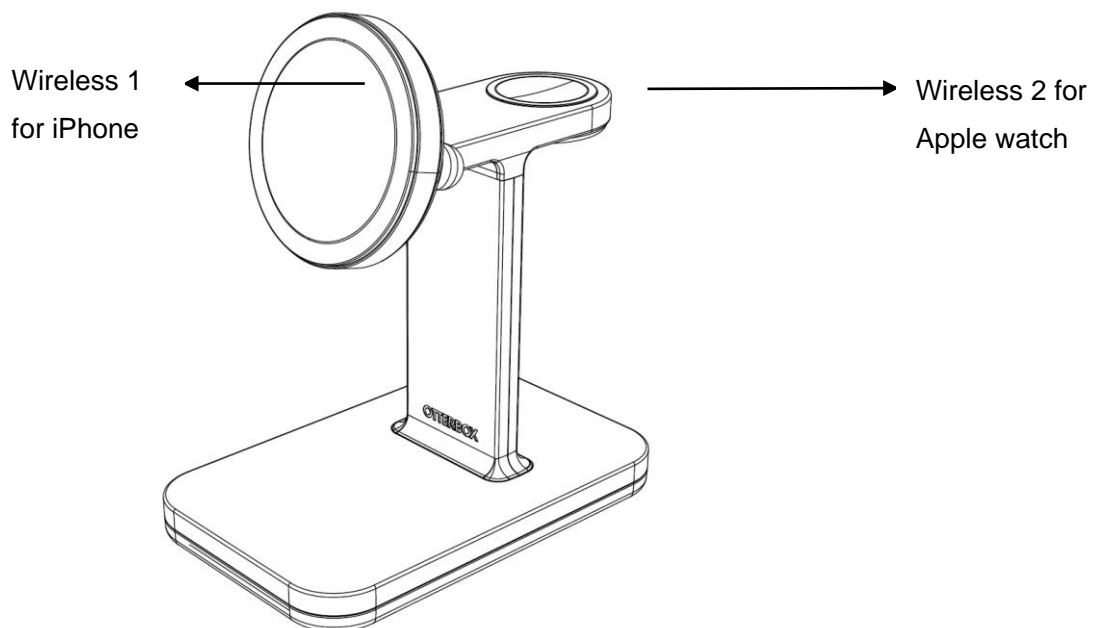
|                   |   |
|-------------------|---|
| Product           | Wireless Charging Stand   |
| Test Model        | OBFTC-0097-A, 78-80734, 78-80735, 78-80736, 78-80737, 78-80738, 78-80739, 78-80740                                    |
| Model Discrepancy | All models are identical except for the name and housing color.<br>The tested model: OBFTC-0097-A                     |
| Frequency Range   | iPhone Wireless Charging:127.7KHz and 360KHz<br>Watch Wireless Charging:326.5KHz and 1.778MHz                         |
| Antenna Type      | Coil antenna  |
| Power Rating      | Input:12V $\overline{\text{---}}$ 3A<br>Input power: 36W Max<br>Output Wireless 1:15W Max<br>Output Wireless 2:5W Max |
| Temperature       | Operating Temp:0 $^{\circ}$ C~+35 $^{\circ}$ C<br>Storage Temp:-20 $^{\circ}$ C~+40 $^{\circ}$ C                      |

Note: For more details, please refer to the User's manual of the EUT.

### 1.2. Test Mode and Test Software

| Test Mode | Operating Description   |
|-----------|---|
| Mode 1    | Wireless Charging for Wireless 1(Standby mode) +Wireless 2(Standby mode)  |
| Mode 2    | Wireless Charging for Wireless 1(15W for iPhone 12, Operating @360KHz)<br>+Wireless 2(5W for Apple watch 3, Operating @326.5KHz)  |
| Mode 3    | Wireless Charging for Wireless 1(15W for iPhone X, Operating @127.7KHz)<br>+Wireless 2(5W for Apple watch 7, Operating @1.778MHz) |

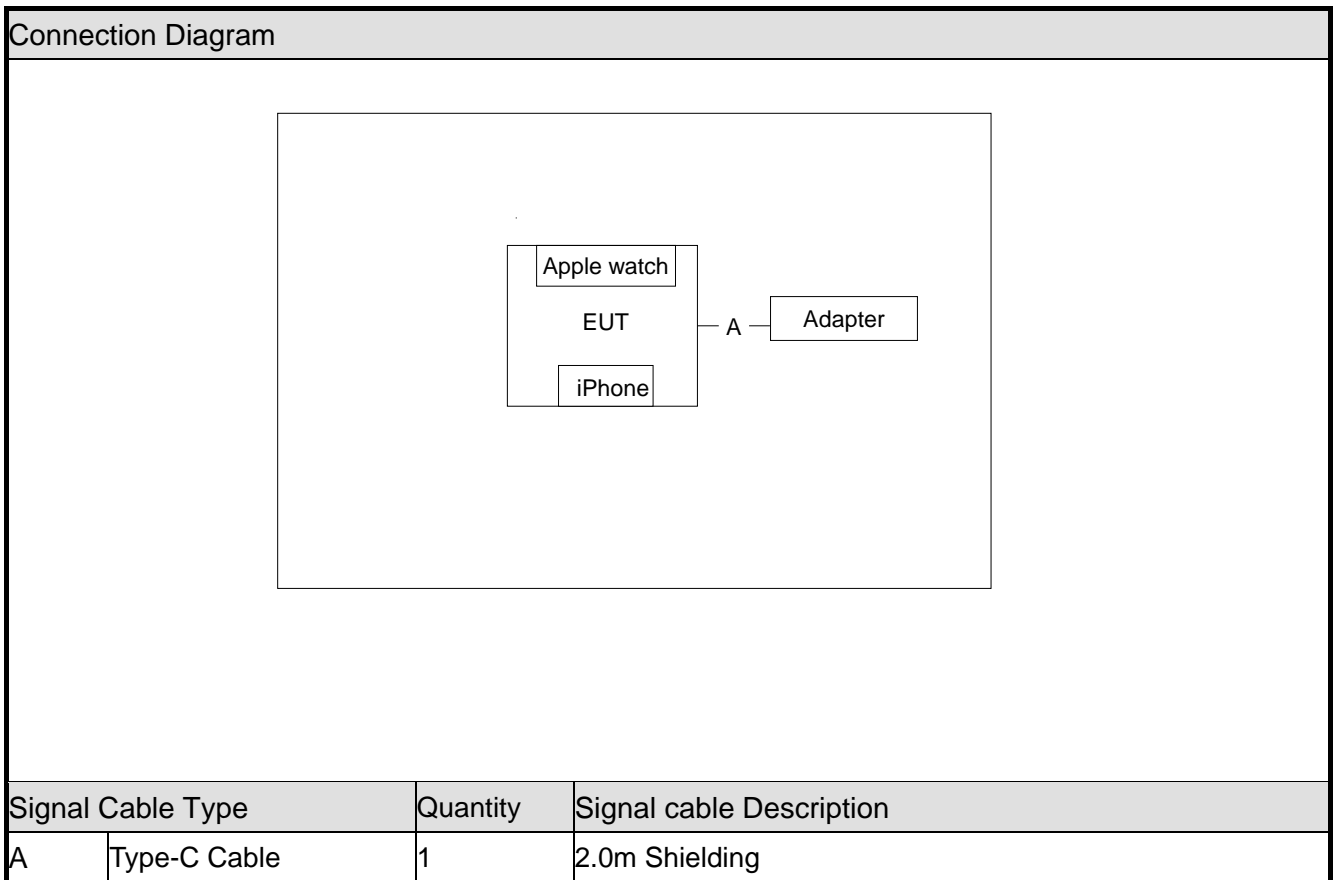
Note: The EUT Have two coils, the specific location is shown below:





### 1.3. Description of Test System

| Product       | Manufacturer | Model No.     | Power Cord |
|---------------|--------------|---------------|------------|
| 1 Adapter     | Protop       | OBFTC-0067-A  | N/A        |
| 2 Apple watch | Apple        | Apple watch 7 | N/A        |
| 3 Apple watch | Apple        | Apple watch 3 | N/A        |
| 4 iPhone      | Apple        | iPhone 12     | N/A        |
| 5 iPhone      | Apple        | iPhone X      | N/A        |





1.4. General Information of Test

|                      |  |
|----------------------|--|
| Test Site            | <b>CerpPASS Technology Corporation(CerpPASS Laboratory)</b><br>Address: Room 102, No. 5, Xing'an Road, Chang'an Town,<br>Dongguan City, Guangdong Province<br>Tel: +86-769-8547-1212<br>Fax: +86-769-8547-1912 |
| FCC Designation No.: | CN1288   |

| Test Item   | Test Site | Test period           | Environmental Conditions | Tested By  |
|-------------|-----------|-----------------------|--------------------------|------------|
| RF Exposure | 3M02-DG   | 2022/03/11~2022/03/29 | 23°C~25°C/<br>48%~55%    | Amos Zhang |



## 2. Summary Of Standards And Results

### 2.1. Measuring Standard

The EUT have been tested according to the applicable standards as referenced below:

| Test Item   | Normative References                         | Remarks |
|-------------|--|---------|
| RF Exposure | FCC CFR 47 part1, 1.1310<br>KDB680106 D01v03 | PASS    |

### 2.2. Requirements

According to the item 5 of KDB 680106 D01v03:

| Requirements of KDB 680106 D01 v03r01 section 5b  | Yes/No | Description   |
|---|--------|---|
| Power transfer frequency is less than 1 MHz   | No     | The maximum operating frequency is 1.778MHz   |
| Output power from each primary coil is less than or equal to 15 watts   | Yes    | The maximum output power for each primary coil is 15W   |
| The system may consist of more than one source primary coils, charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.        | Yes    | The transfer system includes two separated individual coils and each of them only allows for capable wireless power transfer between one source and one client at any given time.         |
| Client device is inserted in or placed directly in contact with the transmitter   | Yes    | Client device is inserted in or placed directly in contact with the transmitter   |
| Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion)  | Yes    | Mobile exposure conditions only   |
| The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit. | Yes    | The EUT H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit. |



### 2.3. Duty cycle

#### Limits

None; for reporting purposes only.

#### Procedure

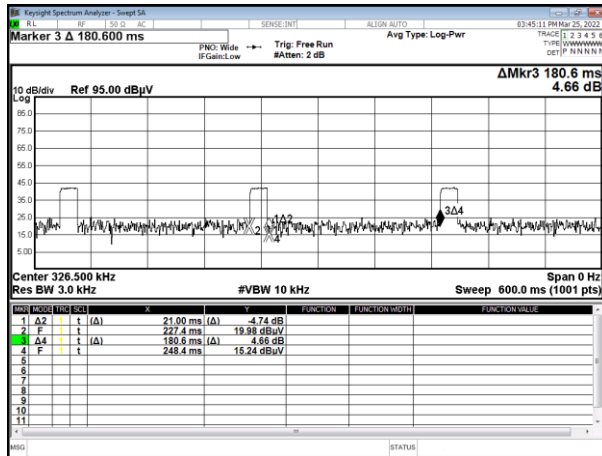
Duty cycle zero-span mode Method

#### Result

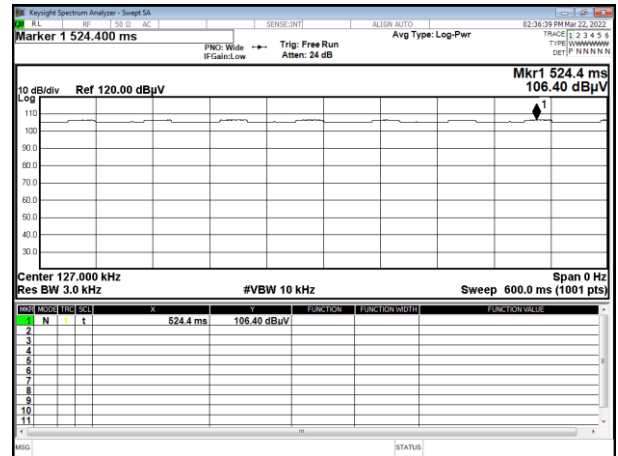
| Mode                                  | On Time (msec) | Period Time (msec) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) |
|---------------------------------------|----------------|--------------------|----------------|-----------------------------------|
| Mode1: Standby @326.5KHz              | 21.00          | 201.60             | 10.42%         | 9.82                              |
| Mode3: Operating Frequency @ 127.7kHz | 100.00         | 100.00             | 100.00%        | 0.00                              |
| Mode2: Operating Frequency @ 360kHz   | 100.00         | 100.00             | 100.00%        | 0.00                              |
| Mode2: Operating Frequency @ 326.5kHz | 100.00         | 100.00             | 100.00%        | 0.00                              |
| Mode3: Operating Frequency @ 1.778MHz | 100.00         | 100.00             | 100.00%        | 0.00                              |



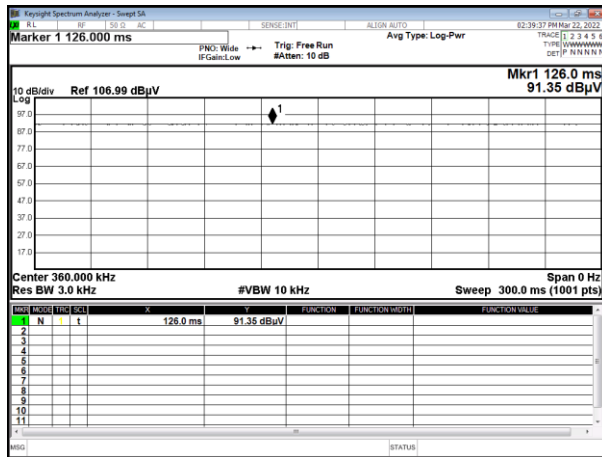
Standby @326.5KHz



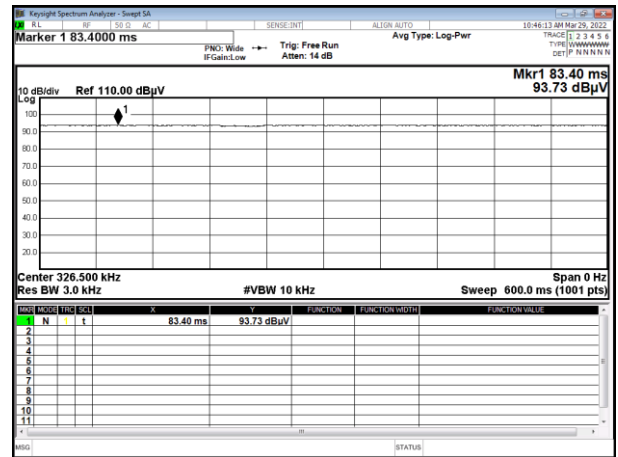
Operating Frequency @ 127.7kHz



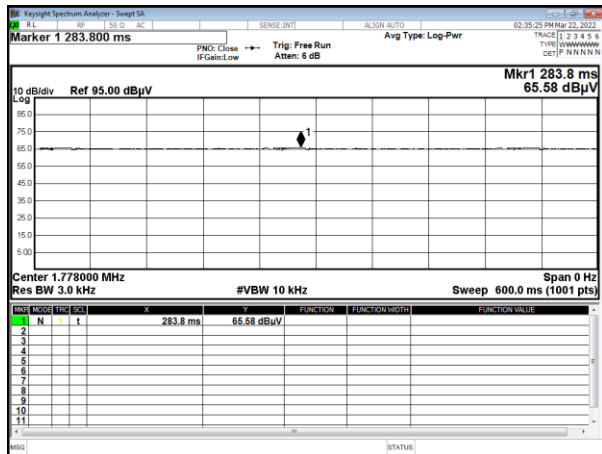
Operating Frequency @ 360kHz



Operating Frequency @ 326.5kHz



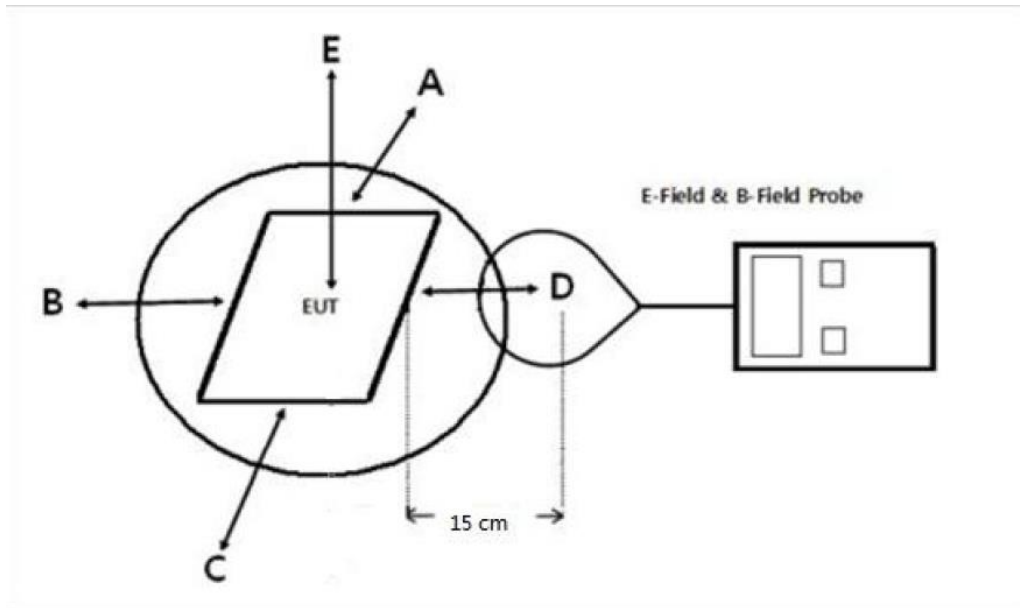
Operating Frequency @ 1.778MHz







### 2.4. Typical test Setup



Note: Position A: Front of EUT; Position B: Left of EUT; Position C: back of EUT; Position D: Right of EUT; Position E: Top of EUT(20 cm measure distance);

### 2.5. Specification Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b) Limits for Maximum Permissible Exposure (MPE)

| Frequency Range (MHz)                                   | Electric field strength (V/m) | Magnetic field Strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled Exposure         |                               |                               |                                     |                          |
| 0.3-3.0   | 614                           | 1.63                          | *100                                | 6                        |
| 3.0-30  | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                        |
| 30-300  | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1,500   |                               |                               | f/300                               | 6                        |
| 1,500-100,000   |                               |                               | 5                                   | 6                        |
| (B) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
| 0.3-1.34  | 614                           | 1.63                          | *100                                | 30                       |
| 1.34-30   | 824/f                         | 2.19/f                        | *180/f <sup>2</sup>                 | 30                       |
| 30-300  | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1,500   |                               |                               | f/1500                              | 30                       |
| 1,500-100,000   |                               |                               | 1.0                                 | 30                       |

Note 1: f = frequency in MHz ; \*Plane-wave equivalent power density

Note 2: For the applicable limit, see FCC 1.1310

**2.6. Test Equipment List and Details**

| Instrument                                 | Manufacturer | Model No  | Serial No  | Calibration Date | Valid Date |
|--|--------------|-----------|------------|------------------|------------|
| Electric and Magnetic field probe-analyzer | Narda        | EHP-200AC | 180ZX00632 | 2021.08.19       | 2022.08.18 |
| MXA Signal Analyzer                        | KEYSIGHT     | N9020A    | US46220290 | 2021.05.14       | 2022.05.13 |

**2.7. Test Result****Mode 1: Wireless Charging for Wireless 1(Standby mode) +Wireless 2(Standby mode)**

Standby @326.5KHz

## a) Electric Field Strength Measurement

| Measured Side | Distance (cm) | Measured Value (V/m) |              |      | 50% of Limit (V/m) | Limit (V/m) |
|---------------|---------------|----------------------|--------------|------|--------------------|-------------|
|               |               | Peak                 | Duty Cycle % | AVG  |                    |             |
| A             | 15            | 0.57                 | 10.42        | 0.18 | 307.00             | 614.00      |
| B             | 15            | 0.54                 | 10.42        | 0.17 | 307.00             | 614.00      |
| C             | 15            | 0.55                 | 10.42        | 0.18 | 307.00             | 614.00      |
| D             | 15            | 0.58                 | 10.42        | 0.19 | 307.00             | 614.00      |
| E             | 20            | 0.50                 | 10.42        | 0.16 | 307.00             | 614.00      |

## b) Magnetic Field Strength Measurement

| Measured Side | Distance (cm) | Measured Value (A/m) |              |       | 50% of Limit (A/m) | Limit (A/m) |
|---------------|---------------|----------------------|--------------|-------|--------------------|-------------|
|               |               | Peak                 | Duty Cycle % | AVG   |                    |             |
| A             | 15            | 0.078                | 10.42        | 0.025 | 0.815              | 1.63        |
| B             | 15            | 0.074                | 10.42        | 0.024 | 0.815              | 1.63        |
| C             | 15            | 0.072                | 10.42        | 0.023 | 0.815              | 1.63        |
| D             | 15            | 0.079                | 10.42        | 0.026 | 0.815              | 1.63        |
| E             | 20            | 0.075                | 10.42        | 0.024 | 0.815              | 1.63        |

Note: Peak measurements were performed. RMS values were calculated from the peak measurement.

Please refer to the formula for calculating the RMS values: [Filed Strength\* $\sqrt{\text{Duty cycle}}$ ]



**Mode 2: Wireless Charging for Wireless 1(15W for iPhone 12, Operating @360KHz) +Wireless 2(5W for Apple watch 3, Operating @326.5KHz)**

Operating @326.5KHz

a) Electric Field Strength Measurement

| Power ~10% Charging |               |                      |              |      |                    |             |
|---------------------|---------------|----------------------|--------------|------|--------------------|-------------|
| Measured Side       | Distance (cm) | Measured Value (V/m) |              |      | 50% of Limit (V/m) | Limit (V/m) |
|                     |               | Peak                 | Duty Cycle % | AVG  |                    |             |
| A                   | 15            | 0.91                 | 100          | 0.91 | 307.00             | 614.00      |
| B                   | 15            | 0.90                 | 100          | 0.90 | 307.00             | 614.00      |
| C                   | 15            | 0.87                 | 100          | 0.87 | 307.00             | 614.00      |
| D                   | 15            | 0.92                 | 100          | 0.92 | 307.00             | 614.00      |
| E                   | 20            | 0.95                 | 100          | 0.95 | 307.00             | 614.00      |

| Power 20%~60% Charging |               |                      |              |      |                    |             |
|------------------------|---------------|----------------------|--------------|------|--------------------|-------------|
| Measured Side          | Distance (cm) | Measured Value (V/m) |              |      | 50% of Limit (V/m) | Limit (V/m) |
|                        |               | Peak                 | Duty Cycle % | AVG  |                    |             |
| A                      | 15            | 0.92                 | 100          | 0.92 | 307.00             | 614.00      |
| B                      | 15            | 0.90                 | 100          | 0.90 | 307.00             | 614.00      |
| C                      | 15            | 0.89                 | 100          | 0.89 | 307.00             | 614.00      |
| D                      | 15            | 0.94                 | 100          | 0.94 | 307.00             | 614.00      |
| E                      | 20            | 0.96                 | 100          | 0.96 | 307.00             | 614.00      |

| Power >75% Charging |               |                      |              |      |                    |             |
|---------------------|---------------|----------------------|--------------|------|--------------------|-------------|
| Measured Side       | Distance (cm) | Measured Value (V/m) |              |      | 50% of Limit (V/m) | Limit (V/m) |
|                     |               | Peak                 | Duty Cycle % | AVG  |                    |             |
| A                   | 15            | 0.93                 | 100          | 0.93 | 307.00             | 614.00      |
| B                   | 15            | 0.89                 | 100          | 0.89 | 307.00             | 614.00      |
| C                   | 15            | 0.90                 | 100          | 0.90 | 307.00             | 614.00      |
| D                   | 15            | 0.95                 | 100          | 0.95 | 307.00             | 614.00      |
| E                   | 20            | 0.96                 | 100          | 0.96 | 307.00             | 614.00      |

Note: Peak measurements were performed. RMS values were calculated from the peak measurement.

Please refer to the formula for calculating the RMS values:  $[Field\ Strength \cdot \sqrt{Duty\ cycle}]$



b) Magnetic Field Strength Measurement

| Power ~10% Charging |               |                      |              |       |                    |             |
|---------------------|---------------|----------------------|--------------|-------|--------------------|-------------|
| Measured Side       | Distance (cm) | Measured Value (A/m) |              |       | 50% of Limit (A/m) | Limit (A/m) |
|                     |               | Peak                 | Duty Cycle % | AVG   |                    |             |
| A                   | 15            | 0.094                | 100          | 0.094 | 0.815              | 1.63        |
| B                   | 15            | 0.092                | 100          | 0.092 | 0.815              | 1.63        |
| C                   | 15            | 0.091                | 100          | 0.091 | 0.815              | 1.63        |
| D                   | 15            | 0.092                | 100          | 0.092 | 0.815              | 1.63        |
| E                   | 20            | 0.095                | 100          | 0.095 | 0.815              | 1.63        |

| Power 20%~60% Charging |               |                      |              |       |                    |             |
|------------------------|---------------|----------------------|--------------|-------|--------------------|-------------|
| Measured Side          | Distance (cm) | Measured Value (A/m) |              |       | 50% of Limit (A/m) | Limit (A/m) |
|                        |               | Peak                 | Duty Cycle % | AVG   |                    |             |
| A                      | 15            | 0.096                | 100          | 0.096 | 0.815              | 1.63        |
| B                      | 15            | 0.093                | 100          | 0.093 | 0.815              | 1.63        |
| C                      | 15            | 0.092                | 100          | 0.092 | 0.815              | 1.63        |
| D                      | 15            | 0.094                | 100          | 0.094 | 0.815              | 1.63        |
| E                      | 20            | 0.097                | 100          | 0.097 | 0.815              | 1.63        |

| Power >75% Charging |               |                      |              |       |                    |             |
|---------------------|---------------|----------------------|--------------|-------|--------------------|-------------|
| Measured Side       | Distance (cm) | Measured Value (A/m) |              |       | 50% of Limit (A/m) | Limit (A/m) |
|                     |               | Peak                 | Duty Cycle % | AVG   |                    |             |
| A                   | 15            | 0.093                | 100          | 0.093 | 0.815              | 1.63        |
| B                   | 15            | 0.094                | 100          | 0.094 | 0.815              | 1.63        |
| C                   | 15            | 0.095                | 100          | 0.095 | 0.815              | 1.63        |
| D                   | 15            | 0.093                | 100          | 0.093 | 0.815              | 1.63        |
| E                   | 20            | 0.096                | 100          | 0.096 | 0.815              | 1.63        |

Note: Peak measurements were performed. RMS values were calculated from the peak measurement.

Please refer to the formula for calculating the RMS values:  $[Filed\ Strength \cdot \sqrt{Duty\ cycle}]$



**Mode 3: Wireless Charging for Wireless 1(15W for iPhone X, Operating @127.7KHz) +Wireless 2(5W for Apple watch 7, Operating @1.778MHz)**

Operating @1.778MHz

a) Electric Field Strength Measurement

| Power ~10% Charging |               |                      |              |      |                    |             |
|---------------------|---------------|----------------------|--------------|------|--------------------|-------------|
| Measured Side       | Distance (cm) | Measured Value (V/m) |              |      | 50% of Limit (V/m) | Limit (V/m) |
|                     |               | Peak                 | Duty Cycle % | AVG  |                    |             |
| A                   | 15            | 0.83                 | 100          | 0.83 | 213.72             | 463.44      |
| B                   | 15            | 0.80                 | 100          | 0.80 | 213.72             | 463.44      |
| C                   | 15            | 0.78                 | 100          | 0.78 | 213.72             | 463.44      |
| D                   | 15            | 0.75                 | 100          | 0.75 | 213.72             | 463.44      |
| E                   | 20            | 0.76                 | 100          | 0.76 | 213.72             | 463.44      |

| Power 20%~60% Charging |               |                      |              |      |                    |             |
|------------------------|---------------|----------------------|--------------|------|--------------------|-------------|
| Measured Side          | Distance (cm) | Measured Value (V/m) |              |      | 50% of Limit (V/m) | Limit (V/m) |
|                        |               | Peak                 | Duty Cycle % | AVG  |                    |             |
| A                      | 15            | 0.80                 | 100          | 0.80 | 213.72             | 463.44      |
| B                      | 15            | 0.79                 | 100          | 0.79 | 213.72             | 463.44      |
| C                      | 15            | 0.76                 | 100          | 0.76 | 213.72             | 463.44      |
| D                      | 15            | 0.78                 | 100          | 0.78 | 213.72             | 463.44      |
| E                      | 20            | 0.77                 | 100          | 0.77 | 213.72             | 463.44      |

| Power >75% Charging |               |                      |              |      |                    |             |
|---------------------|---------------|----------------------|--------------|------|--------------------|-------------|
| Measured Side       | Distance (cm) | Measured Value (V/m) |              |      | 50% of Limit (V/m) | Limit (V/m) |
|                     |               | Peak                 | Duty Cycle % | AVG  |                    |             |
| A                   | 15            | 0.82                 | 100          | 0.82 | 213.72             | 463.44      |
| B                   | 15            | 0.80                 | 100          | 0.80 | 213.72             | 463.44      |
| C                   | 15            | 0.78                 | 100          | 0.78 | 213.72             | 463.44      |
| D                   | 15            | 0.77                 | 100          | 0.77 | 213.72             | 463.44      |
| E                   | 20            | 0.75                 | 100          | 0.75 | 213.72             | 463.44      |

Note: Peak measurements were performed. RMS values were calculated from the peak measurement.

Please refer to the formula for calculating the RMS values: [Filed Strength\*√Duty cycle]



## b) Magnetic Field Strength Measurement

| Power ~10% Charging |               |                      |              |       |                    |             |
|---------------------|---------------|----------------------|--------------|-------|--------------------|-------------|
| Measured Side       | Distance (cm) | Measured Value (A/m) |              |       | 50% of Limit (A/m) | Limit (A/m) |
|                     |               | Peak                 | Duty Cycle % | AVG   |                    |             |
| A                   | 15            | 0.086                | 100          | 0.086 | 0.626              | 1.23        |
| B                   | 15            | 0.086                | 100          | 0.086 | 0.626              | 1.23        |
| C                   | 15            | 0.084                | 100          | 0.084 | 0.626              | 1.23        |
| D                   | 15            | 0.083                | 100          | 0.083 | 0.626              | 1.23        |
| E                   | 20            | 0.083                | 100          | 0.083 | 0.626              | 1.23        |

| Power 20%~60% Charging |               |                      |              |       |                    |             |
|------------------------|---------------|----------------------|--------------|-------|--------------------|-------------|
| Measured Side          | Distance (cm) | Measured Value (A/m) |              |       | 50% of Limit (A/m) | Limit (A/m) |
|                        |               | Peak                 | Duty Cycle % | AVG   |                    |             |
| A                      | 15            | 0.085                | 100          | 0.085 | 0.626              | 1.23        |
| B                      | 15            | 0.086                | 100          | 0.086 | 0.626              | 1.23        |
| C                      | 15            | 0.083                | 100          | 0.083 | 0.626              | 1.23        |
| D                      | 15            | 0.085                | 100          | 0.085 | 0.626              | 1.23        |
| E                      | 20            | 0.084                | 100          | 0.084 | 0.626              | 1.23        |

| Power >75% Charging |               |                      |              |       |                    |             |
|---------------------|---------------|----------------------|--------------|-------|--------------------|-------------|
| Measured Side       | Distance (cm) | Measured Value (A/m) |              |       | 50% of Limit (A/m) | Limit (A/m) |
|                     |               | Peak                 | Duty Cycle % | AVG   |                    |             |
| A                   | 15            | 0.085                | 100          | 0.085 | 0.626              | 1.23        |
| B                   | 15            | 0.087                | 100          | 0.087 | 0.626              | 1.23        |
| C                   | 15            | 0.085                | 100          | 0.085 | 0.626              | 1.23        |
| D                   | 15            | 0.083                | 100          | 0.083 | 0.626              | 1.23        |
| E                   | 20            | 0.083                | 100          | 0.083 | 0.626              | 1.23        |

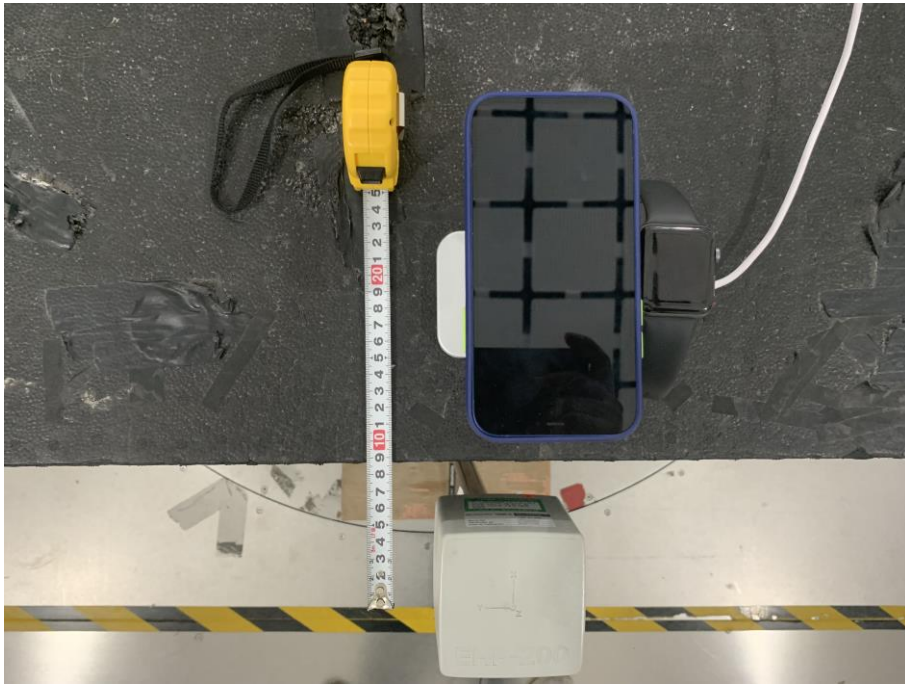
Note: Peak measurements were performed. RMS values were calculated from the peak measurement.

Please refer to the formula for calculating the RMS values:  $[\text{Filed Strength} \times \sqrt{\text{Duty cycle}}]$



## 2.8. Photographs of test setup

Measured Side A



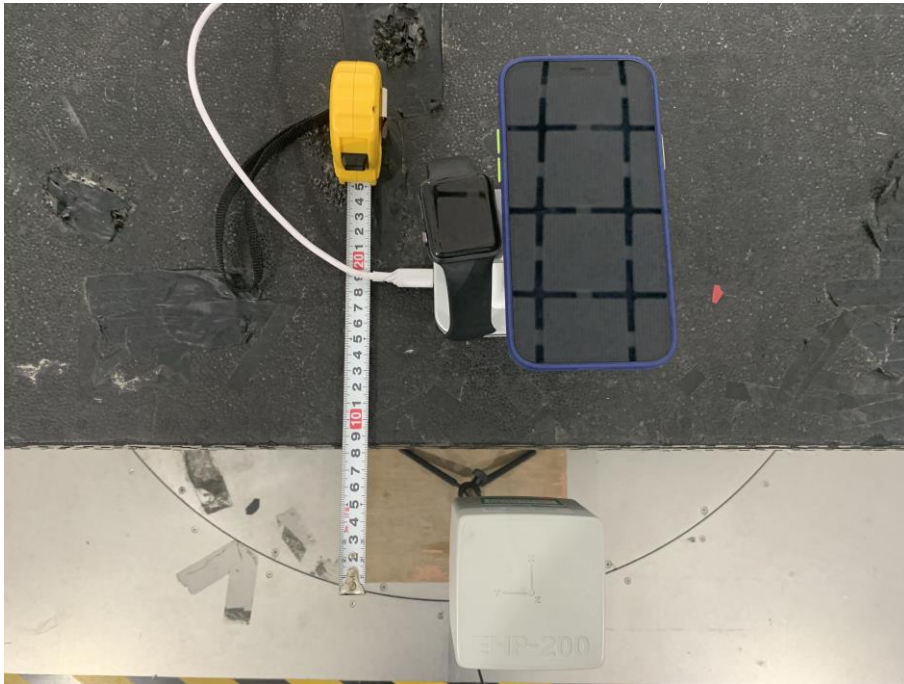
Measured Side B







Measured Side C



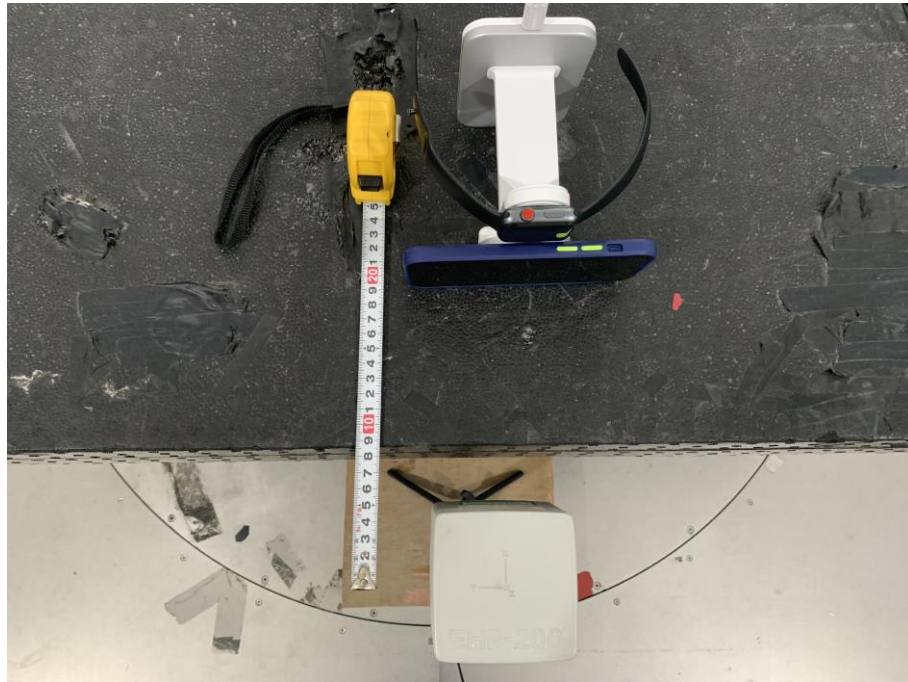
Measured Side D







Measured Side E



-----THE END OF REPORT-----