



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

Reference No..... : WTF24F11264300W002  
Applicant..... : Mid Ocean Brands B.V.  
Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon,  
Hong Kong  
Manufacturer ..... : 114538  
Address..... : ---  
Product Name..... : Foldable charging station  
Model No..... : MO2145  
Test specification..... : ETSI EN 300 330 V2.1.1 (2017-02)  
Date of Receipt sample .... : 2024-11-18  
Date of Test ..... : 2024-11-27  
Date of Issue..... : 2024-11-29  
Test Report Form No. .... : WEW-300330A-01B  
Test Result..... : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

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## 1 Test Summary

| Test Requirements                                       |                        |           |                    |
|---------------------------------------------------------|------------------------|-----------|--------------------|
| Test                                                    | Test Method            | Reference | Result             |
| Permitted range of operating frequency                  | ETSI EN 300 330 V2.1.1 | 4.3.1     | Pass               |
| Operating frequency range                               | ETSI EN 300 330 V2.1.1 | 4.3.2     | Pass               |
| Modulation bandwidth                                    | ETSI EN 300 330 V2.1.1 | 4.3.3     | Pass <sup>a)</sup> |
| Radiated H-field                                        | ETSI EN 300 330 V2.1.1 | 4.3.4     | Pass               |
| Radiated spurious emissions at frequencies below 30 MHz | ETSI EN 300 330 V2.1.1 | 4.3.8     | Pass               |
| Radiated spurious emissions at frequencies above 30 MHz | ETSI EN 300 330 V2.1.1 | 4.3.9     | Pass               |
| Receiver spurious emissions                             | ETSI EN 300 330 V2.1.1 | 4.4.2     | N/A                |
| Adjacent channel selectivity                            | ETSI EN 300 330 V2.1.1 | 4.4.3     | N/A                |
| Receiver blocking or desensitization                    | ETSI EN 300 330 V2.1.1 | 4.4.4     | N/A                |

Remark:

Pass Test item meets the requirement

N/A Not Applicable

<sup>a)</sup> According to standard section 4.4.1, this equipment belongs to other equipment (WPT system) and only has a single working channel, so it is not necessary to meet section 4.3.3.



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### 3 General Information

#### 3.1 General Description of E.U.T.

**Product Name** ..... : Foldable charging station  
**Model No.** ..... : MO2145  
**Remark** ..... : ---  
**Rating** ..... : Input: DC 9V/3A, DC 9V/2.22A, DC 5V/2A  
Output: DC 5V/0.3A, DC 5V/1A, DC 9V/1.66A  
Wireless output power:  
Magnetic charging pad: Max 15W  
Apple Watch only: Max 1.5W  
Wireless charging pad: Max 5W  
  
**Power Adapter Model**..... : ---  
**Battery Capacity** ..... : ---

#### 3.2 Technical Specification

**Permitted Range of Operating Frequency** ..... : 148.5 kHz to 5MHz  
(Manufacturer's declared frequency of product operation: 325kHz – 330kHz for the apple watch charging pad)  
**Operating Frequency** ..... : 326.5kHz  
**Radiated H-Field** ..... : 11.43dBuA/m(@3m) for apple watch charging pad  
**Antenna installation** ..... : Coil Antenna  
**Antenna Gain** ..... : 0dBi  
**Product Class** ..... : 1

| Product Class |                                 |                                                                                                                      |                 |                    |                                                                                 |                                         |                                   |                           |
|---------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|---------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------|---------------------------|
| Product Class | Description of transmitter      | Antenna to be tested                                                                                                 | Frequency range | Loop antenna area  | Length of antenna                                                               | Customization of antenna design allowed | Transmitter carrier Output limits | Spurious emissions limits |
| 1             | Inductive loop coil transmitter | Integral antenna ( antenna type 1) or dedicated antenna supplied with the equipment ( antenna type 2); ( see note 1) | 9kHz to 30MHz   | < 30m <sup>2</sup> | < $\lambda/4$<br>( 75metre s/f where f is in MHz )or <30m, whichever is shorter | No                                      | H-field at 10m                    | H-field at 10m            |



|   |                                           |                                                                      |                |                    |                                                                              |                   |                               |                               |
|---|-------------------------------------------|----------------------------------------------------------------------|----------------|--------------------|------------------------------------------------------------------------------|-------------------|-------------------------------|-------------------------------|
| 2 | Inductive loop coil transmitter           | Two representative Antennas supplied with the equipment (see note 2) | 9kHz to 30MHz  | < 30m <sup>2</sup> | < $\lambda/4$ ( 75metre s/f where f is in MHz )or <30m, whichever is shorter | Yes ( see note 3) | H-field at 10m                | H-field at 10m                |
| 3 | Customize d large size loop antennas only | Test without an antenna by using an artificial antenna               | 9kHz to 135kHz | >30m <sup>2</sup>  | n.a                                                                          | Yes               | Current in artificial antenna | Current in artificial antenna |
| 4 | E-field transmitter                       | Each type of antenna to be used                                      | 9kHz to 30MHz  | n.a                | n.a                                                                          | n.a               | H-field at 10m                | H-field at 10m                |

NOTE 1: Where a manufacturer provides a range of standard antennas, the equipment will be tested as Product Class 1 equipment, with the antenna(s) attached. The measurements shall be repeated for each antenna.

NOTE 2: The two antennas shall meet the manufacturer's design rules published in the equipment manual and shall have maximum and minimum loop areas respectively. Both antennas shall have the maximum magnetic dipole moment as declared by the manufacturer.

NOTE 3: Customization is only allowed according to the manufacturer's antenna design rules published in the equipment manual.

NOTE 4: On-site measurements may be required.

### 3.3 Standards Applicable for Testing

The tests were performed according to following standards:

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

Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

### 3.4 Test Facility

The test facility has a test site registered with the following organizations:

- **ISED – Registration No.: 21895**

Waltek Testing Group (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science and Economic Development Canada (ISED). The acceptance letter from the ISED is maintained in our files. Registration ISED number: 21895, March 12, 2019

- **FCC – Registration No.: 820106**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 820106, August 16, 2018

- **NVLAP – Lab Code: 600191-0**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



### 3.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test items: ---

Lab information: ---

### 3.6 Abnormalities from Standard Conditions

None.

### 3.7 Disclaimer

The antenna gain information is provided by the customer. The laboratory is not responsible for the accuracy of the antenna gain information.

# WALTEK



## 4 Equipment Used during Test

### 4.1 Equipment List

| <input checked="" type="checkbox"/> 3m Semi-anechoic Chamber for Spurious Emission |                                     |                 |                |             |                       |                      |
|------------------------------------------------------------------------------------|-------------------------------------|-----------------|----------------|-------------|-----------------------|----------------------|
| Item                                                                               | Equipment                           | Manufacturer    | Model No.      | Serial No.  | Last Calibration Date | Calibration Due Date |
| 1                                                                                  | 3m Semi-anechoic Chamber            | CHANGCHUANG     | 9m×6m×6m       | -           | 2024-01-05            | 2025-01-04           |
| 2                                                                                  | EMI TEST RECEIVER                   | RS              | ESR7           | 101566      | 2024-01-06            | 2025-01-05           |
| 3                                                                                  | Spectrum Analyzer                   | Agilent         | N9020A         | MY48011796  | 2024-01-04            | 2025-01-03           |
| 4                                                                                  | Trilog Broadband Antenna            | SCHWARZBECK     | VULB9162       | 9162-117    | 2024-01-05            | 2025-01-04           |
| 5                                                                                  | Coaxial Cable (below 1GHz)          | H+S             | CBL3-NN-12+3 m | 214NN320    | 2024-01-06            | 2025-01-05           |
| 6                                                                                  | Broad-band Horn Antenna             | SCHWARZBECK     | BBHA 9120 D    | 01561       | 2024-01-05            | 2025-01-04           |
| 7                                                                                  | Broadband Preamplifier (Above 1GHz) | Lunar E M       | LNA1G18-40     | 20160501002 | 2024-01-04            | 2025-01-03           |
| 8                                                                                  | Coaxial Cable (above 1GHz)          | Times-Microwave | CBL5-NN        | -           | 2024-01-04            | 2025-01-03           |
| <input checked="" type="checkbox"/> RF Conducted test                              |                                     |                 |                |             |                       |                      |
| Item                                                                               | Equipment                           | Manufacturer    | Model No.      | Serial No.  | Last Calibration Date | Calibration Due Date |
| 1                                                                                  | Environmental Chamber               | GERUI           | GR-HWS-1000L   | GR24061818  | 2024-07-02            | 2025-07-01           |
| 2                                                                                  | Spectrum Analyzer                   | Agilent         | N9020A         | MY48011796  | 2024-01-04            | 2025-01-03           |
| 3                                                                                  | EXG Analog Signal Generator         | Agilent         | N5181A         | MY48180720  | 2024-01-04            | 2025-01-03           |
| 4                                                                                  | RF Control Unit                     | CHANGCHUANG     | JS0806-2       | -           | 2024-01-04            | 2025-01-03           |

☐: Not Used

☒: Used



## 4.2 Software List

| Description                              | Manufacturer | Model    | Version   |
|------------------------------------------|--------------|----------|-----------|
| EMI Test Software<br>(Radiated Emission) | FARATRONIC   | EZ-EMC   | RA-03A1-2 |
| RF Conducted Test                        | TONSCEND     | JS1120-2 | 2.6       |

## 4.3 Special Accessories and Auxiliary Equipment

| Item | Equipment | Technical Data | Manufacturer | Model No. | Serial No. |
|------|-----------|----------------|--------------|-----------|------------|
| 1.   | /         | /              | /            | /         | /          |

## 4.4 Measurement Uncertainty

| Parameter                     | Uncertainty                         | Note |
|-------------------------------|-------------------------------------|------|
| RF Output Power               | $\pm 2.2\text{dB}$                  | (1)  |
| Occupied Bandwidth            | $\pm 1.5\%$                         | (1)  |
| Transmitter Spurious Emission | $\pm 3.8\text{dB}$ (for 25MHz-1GHz) | (1)  |
|                               | $\pm 5.0\text{dB}$ (for 1GHz-18GHz) | (1)  |

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

## 4.5 Decision Rule

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

**If  $U_{\text{LAB}}$  is less than or equal to  $U_{\text{cispr}}$  then**

- Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

**If  $U_{\text{LAB}}$  is greater than  $U_{\text{cispr}}$  then**

- Compliance is deemed to occur if no measured disturbance level, increased by  $(U_{\text{LAB}} - U_{\text{cispr}})$ , exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{\text{LAB}} - U_{\text{cispr}})$ , exceeds the disturbance limit.



## 5 Permitted Range of Operating Frequency

### 5.1 Standard Applicable

#### 1. Permitted range of operating frequencies

According to EN 300330 section 4.3.1, The permitted range of operating frequencies is the frequency range over which the equipment is authorized to operate.

#### 2. Operating frequency range

The operating frequency range (OFR) is the frequency range over which the EUT is transmitting. The operating frequency range of the EUT is determined by the lowest (fL) and highest frequency (fH) as occupied by the power envelope.

With the centre frequency of the OFR as:  $F_C = (F_H + F_L)/2$ .

An EUT could have more than one operating frequency range

### 5.2 Test Procedure

The permitted range of operating frequencies used by the EUT shall be declared by the manufacturer. The operating frequency range(s) will be tested considered under in clause 4.3.2.

The operating frequency ranges for intentional emissions shall be entirely within the frequency bands in table 1.

Table 1: Short Range Devices within the 9 kHz to 30 MHz permitted frequency bands

|                      | Frequency Bands/frequencies                                     | Applications                            |
|----------------------|-----------------------------------------------------------------|-----------------------------------------|
| Transmit and Receive | 9 kHz to 90 kHz                                                 | Inductive devices, Generic use          |
| Transmit and Receive | 90 kHz to 119 kHz                                               | Inductive devices, Generic use          |
| Transmit and Receive | 119 kHz to 140 kHz                                              | Inductive devices, Generic use          |
| Transmit and Receive | 140 kHz to 148,5 kHz                                            | Inductive devices, Generic use          |
| Transmit and Receive | 148,5 kHz to 5 MHz                                              | Inductive devices, Generic use          |
| Transmit and Receive | 400 kHz to 600 kHz                                              | RFID only                               |
| Transmit and Receive | 5 MHz to 30 MHz                                                 | Inductive devices, Generic use          |
| Transmit and Receive | 3 155 kHz to 3 400 kHz                                          | Inductive devices, Generic use          |
| Transmit and Receive | 984 kHz to 7 484 kHz<br>(Note 3, Centre frequency is 4 234 kHz) | Inductive devices, Railway applications |
| Transmit and Receive | 4 516 kHz                                                       | Inductive devices, Railway applications |
| Transmit and Receive | 6 765 kHz to 6 795 kHz                                          | Inductive devices, Generic use          |
| Transmit and Receive | 7 400 kHz to 8 800 kHz                                          | Inductive devices, Generic use          |
| Transmit and Receive | 10 200 kHz to 11,000 MHz                                        | Inductive devices, Generic use          |
| Transmit and Receive | 11,810 MHz to 15,310 MHz<br>(Centre frequency is 13,56 MHz)     | RFID only                               |
| Transmit and Receive | 12,5 MHz to 20 MHz                                              | Inductive devices, Wireless healthcare  |
| Transmit and Receive | 13,553 MHz to 13,567 MHz                                        | Inductive devices, Generic use          |
| Transmit and Receive | 26,957 MHz to 27,283 MHz                                        | Inductive devices, Generic use          |
| Transmit and Receive | 27,090 MHz to 27,100 MHz                                        | Inductive devices, Railway applications |



NOTE 1: In addition, it should be noted that other frequency bands may be available in a country within the frequency range 9 kHz to 30 MHz.

NOTE 2: On non-harmonised parameters, national administrations may impose certain conditions such as the type of modulation, frequency, channel/frequency separations, maximum transmitter radiated power, duty cycle, and the inclusion of an automatic transmitter shut-off facility, as a condition for the issue of an Individual Rights for use of spectrum or General Authorization, or as a condition for use under "licence exemption" as it is in most cases for Short Range Devices.

NOTE 3: Transmitting only on receipt of a Balise/Eurobalise tele-powering signal from a train.

### 5.3 Test Condition

|                                   |                                     |
|-----------------------------------|-------------------------------------|
| <b>Operating Mode</b> .....       | TX mode                             |
| <b>Test Environment</b> .....     | Normal Condition, Extreme Condition |
| <b>Test Voltage</b> .....         | DC 8.1V to 9.9V                     |
| <b>Ambient temperature</b> .....  | 25°C                                |
| <b>Humidity</b> .....             | 54%RH                               |
| <b>Atmospheric Pressure</b> ..... | 101.2kPa                            |

| Test Condition |      | Test Temperature | Test Voltage (Vdc) |
|----------------|------|------------------|--------------------|
| Normal         | NTNV | 25°C             | 9.0                |
| Extreme        | LTLV | 0°C              | 8.1                |
|                | LTHV | 0°C              | 9.9                |
|                | HTLV | 40°C             | 8.1                |
|                | HTHV | 40°C             | 9.9                |

### 5.4 Test Result

| Test Condition | Lower Frequency (kHz) | Upper Frequency (kHz) | Limit                                              |
|----------------|-----------------------|-----------------------|----------------------------------------------------|
| NTNV           | 325.116               | 327.421               | Low Frequency≥148.5kHz<br>Upper Frequency:≤5000kHz |
| LTLV           | 325.125               | 327.409               |                                                    |
| LTHV           | 325.123               | 327.408               |                                                    |
| HTLV           | 325.131               | 327.416               |                                                    |
| HTHV           | 325.127               | 327.421               |                                                    |
| Results        | Pass                  |                       |                                                    |



## 6 Radiated H-Field

### 6.1 Standard Applicable

The Transmitter H-field requirements only applies for equipment under product class 1 and class 2 as defined in clause 6.1.2 and clause B.2.

The frequency ranges and limits of the present document are shown in table 2. The limits are based on the European Commission Decision for SRDs [i.10], CEPT/ERC/REC 70-03 [i.1].

Table 2: H-field limits at 10 m

| Frequency range (MHz)                                  | H-field strength limit (Hf) dBμA/m at 10 m or specified in mW e.r.p.              |
|--------------------------------------------------------|-----------------------------------------------------------------------------------|
| $0,009 \leq f < 0,090$                                 | 72 descending 3 dB/oct above 0,03 MHz or according to note 1 (see note 5)         |
| $0,09 \leq f < 0,119$                                  | 42                                                                                |
| $0,119 \leq f < 0,135$                                 | 66 descending 3 dB/oct above 0,119 MHz or according to note 1 (see notes 3 and 5) |
| $0,135 \leq f < 0,140$                                 | 42                                                                                |
| $0,140 \leq f < 0,1485$                                | 37,7                                                                              |
| $0,1485 \leq f < 30$                                   | -5 (see note 4)                                                                   |
| $0,315 \leq f < 0,600$                                 | -5                                                                                |
| $3,155 \leq f < 3,400$                                 | 13,5                                                                              |
| 4,234                                                  | 9 (see note 9)                                                                    |
| 4,516                                                  | 7                                                                                 |
| $7,400 \leq f < 8,800$                                 | 9                                                                                 |
| $10,2 \leq f < 11,00$                                  | 9                                                                                 |
| $12,5 \leq f < 20$                                     | -7                                                                                |
| $6,765 \leq f \leq 6,795$                              | 42 (see notes 3 and 7)                                                            |
| $26,957 \leq f \leq 27,283$                            | 42 (see note 3)                                                                   |
| $13,410 \leq f \leq 13,553, 13,567 \leq f \leq 13,710$ | 9 (see note 6)                                                                    |
| $13,110 \leq f \leq 13,410, 13,710 \leq f \leq 14,010$ | -3,5 (see note 6)                                                                 |
| $12,660 \leq f \leq 13,110, 14,010 \leq f \leq 14,460$ | -10 (see note 6)                                                                  |
| $11,810 \leq f \leq 12,660, 14,460 \leq f \leq 15,310$ | -16 (see note 6)                                                                  |
| $13,460 \leq f \leq 13,553, 13,567 \leq f \leq 13,660$ | 27 (see note 6)                                                                   |
| $13,360 \leq f \leq 13,460, 13,660 \leq f \leq 13,760$ | Linear transition from 27 to -3,5 (see note 6)                                    |
| $13,110 \leq f \leq 13,360, 13,760 \leq f \leq 14,010$ | -3,5 (see note 6)                                                                 |
| $12,660 \leq f \leq 13,110, 14,010 \leq f \leq 14,460$ | -5 (see note 6)                                                                   |
| $13,553 \leq f \leq 13,567$                            | 42 (see note 3) or 60 (see notes 2 and 3)                                         |
| 27,095                                                 | 42                                                                                |



| Frequency range (MHz)                                  | H-field strength limit (Hf) dBμA/m at 10 m or specified in mW e.r.p. |
|--------------------------------------------------------|----------------------------------------------------------------------|
| 26,995, 27,045, 27,095, 27,145, 27,195<br>(see note 8) | 100 mW                                                               |

NOTE 1: For the frequency ranges 9 kHz to 135 kHz, the following additional restrictions apply to limits above 42 dBμA/m:  
 -for loop coil antennas with an area  $\geq 0,16 \text{ m}^2$  this table and table B.1 with the antenna limitations apply;  
 -for loop coil antennas with an area between  $0,05 \text{ m}^2$  and  $0,16 \text{ m}^2$  table B.1 applies with a correction factor.  
 The limit is: table value +  $10 \times \log(\text{area}/0,16 \text{ m}^2)$ ;  
 -for loop coil antennas with an area  $< 0,05 \text{ m}^2$  the limit is 10 dB below table B.1.  
 NOTE 2: For RFID (incl. NFC) and EAS applications only.  
 NOTE 3: Spectrum mask limit, see annex I.  
 NOTE 4: For further information see annex G.  
 NOTE 5: Limit is 42 dBμA/m for the following spot frequencies:  
 60 kHz  $\pm$  250 Hz, 66,6 kHz  $\pm$  750 Hz, 75 kHz  $\pm$  250 Hz, 77,5 kHz  $\pm$  250 Hz, and 129,1 kHz  $\pm$  500 Hz.  
 NOTE 6: Only in conjunction with spectrum mask, see annex I.  
 NOTE 7: The frequency range 6,765 MHz - 6,795 MHz is not a harmonised ISM frequency band according article 5.138 of the ITU Radio Regulations [i.13].  
 NOTE 8: Center frequencies for channelized systems by using  $\leq 10 \text{ kHz}$  bandwidth.  
 NOTE 9: The limit is valid in the range 984 kHz - 7 484 kHz for Transmitting only on receipt of a Balise/Eurobalise tele-powering signal from a train.

## 6.2 Test Procedure

The measurements of the transmitter radiated H-field shall be made on an open field test site as specified in clause C.1.3. Any measured values shall be at least 6 dB above the ambient noise level.

The H-field produced by the equipment shall be measured at standard distance of 10 m. Where this is not practical, e.g. due to physical size of the equipment including the antenna or with use of special field cancelling antenna, then other distances may be used. When another distance is used, the distance used and the field strength value measured shall be stated in the test report. In this case, the measured value at actual test distance shall be extrapolated to 10 m according to annex H and these calculations shall be stated in the test report.

The H-field is measured with a shielded loop antenna connected to a measurement receiver. The measuring bandwidth and detector type of the measurement receiver shall be in accordance with clause 5.12.

The equipment under test shall operate where possible, with modulation. Where this is not possible, it shall be stated in the test report.

For transmitters using a continuous wideband swept carrier, the measurement shall be made with the sweep off. When it is not possible to turn the sweep off the measurements shall be made with the sweep on and this shall be stated in the test report.

For measuring equipment calibrated in dBμV/m, the reading should be reduced by 51,5 dB to be converted to dBμA/m.



### 6.3 Test Condition

|                                   |                                     |
|-----------------------------------|-------------------------------------|
| <b>Operating Mode</b> .....       | TX mode                             |
| <b>Test Environment</b> .....     | Normal Condition, Extreme Condition |
| <b>Test Voltage</b> .....         | DC 8.1V to 9.9V                     |
| <b>Ambient temperature</b> .....  | 25°C                                |
| <b>Humidity</b> .....             | 54%RH                               |
| <b>Atmospheric Pressure</b> ..... | 101.2kPa                            |

| Test Condition |                      | Test Temperature | Test Voltage (Vdc) |
|----------------|----------------------|------------------|--------------------|
| Normal         | NTNV<br>(worst case) | 25°C             | 9.0                |
| Extreme        | LTLV                 | 0°C              | 8.1                |
|                | LTHV                 | 0°C              | 9.9                |
|                | HTLV                 | 40°C             | 8.1                |
|                | HTHV                 | 40°C             | 9.9                |

### 6.4 Test Result

| Frequency<br>(kHz) | Level<br>(dBuA/m)@3m | C3<br>Factor<br>(dB) | Level<br>(dBuA/m)@10m | Limit<br>(dBuA/m)@10m | Result |
|--------------------|----------------------|----------------------|-----------------------|-----------------------|--------|
| 326.5              | 11.43                | 31.65                | -20.22                | 66                    | Pass   |

Note 1: Pre-scan EUT X,Y,Z axis, and find the worst case at X axis.

Note 2:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN300 330 Annex H.2

Note 3: All extreme conditions were considered for test, but only record the worst case.



## 7 Radiated Spurious Emission Below 30MHz

### 7.1 Standard Applicable

According to EN 300330 section 4.3.8, the radiated field strength of the spurious domain emissions below 30 MHz shall not exceed the generated H-field dB $\mu$ A/m at 10 m given in table 5.

| State     | Frequency 9 kHz $\leq f < 10$ MHz             | Frequency 10 MHz $\leq f < 30$ MHz |
|-----------|-----------------------------------------------|------------------------------------|
| Operating | 27 dB $\mu$ A/m at 9 kHz descending 3 dB/oct  | -3,5 dB $\mu$ A/m                  |
| Standby   | 5,5 dB $\mu$ A/m at 9 kHz descending 3 dB/oct | -25 dB $\mu$ A/m                   |

### 7.2 Test Procedure

The field strength shall be measured for frequencies below 30 MHz. The equipment under test shall be measured at a distance of 10 m on an outdoor test site. The test antenna shall be a calibrated shielded magnetic field antenna. The equipment under test and test antenna shall be arranged as stated in clause A.1.

For Product Class 3 the transmitter antenna connector of the equipment under test shall be connected to an artificial antenna (see clause 6.2) and the output connector terminated.

The equipment under test shall be switched on with normal modulation. The characteristics of the modulation signal used shall be stated on the test report. The measuring receiver shall be tuned over the frequency range 9 kHz to 30 MHz, except for the frequency band on which the transmitter is intended to operate.

At each frequency at which a relevant spurious signal is detected the equipment under test and the test antenna shall be rotated until maximum field strength is indicated on the measuring receiver. This level shall be noted.

If the transmitter can be operated in the standby mode, then the measurements shall be repeated in the standby mode.

For measuring equipment calibrated in dB $\mu$ V/m, the reading should be reduced by 51,5 dB to be converted to dB $\mu$ A/m.

### 7.3 Test Condition

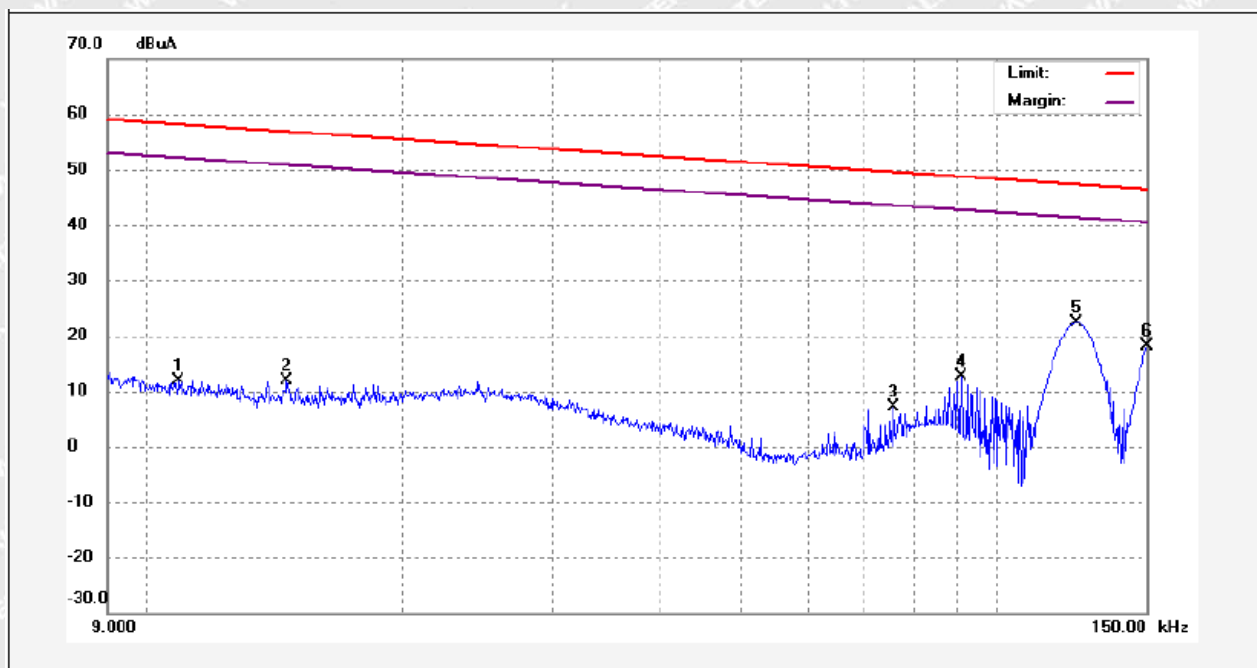
|                            |                    |
|----------------------------|--------------------|
| Operating Mode .....       | : TX mode          |
| Test Environment .....     | : Normal Condition |
| Test Voltage .....         | : DC 9V            |
| Ambient temperature .....  | : 25°C             |
| Humidity .....             | : 54%RH            |
| Atmospheric Pressure ..... | : 101.2kPa         |



## 7.4 Test Result

Frequency Range: 9kHz-150kHz

Polarization: Horizontal

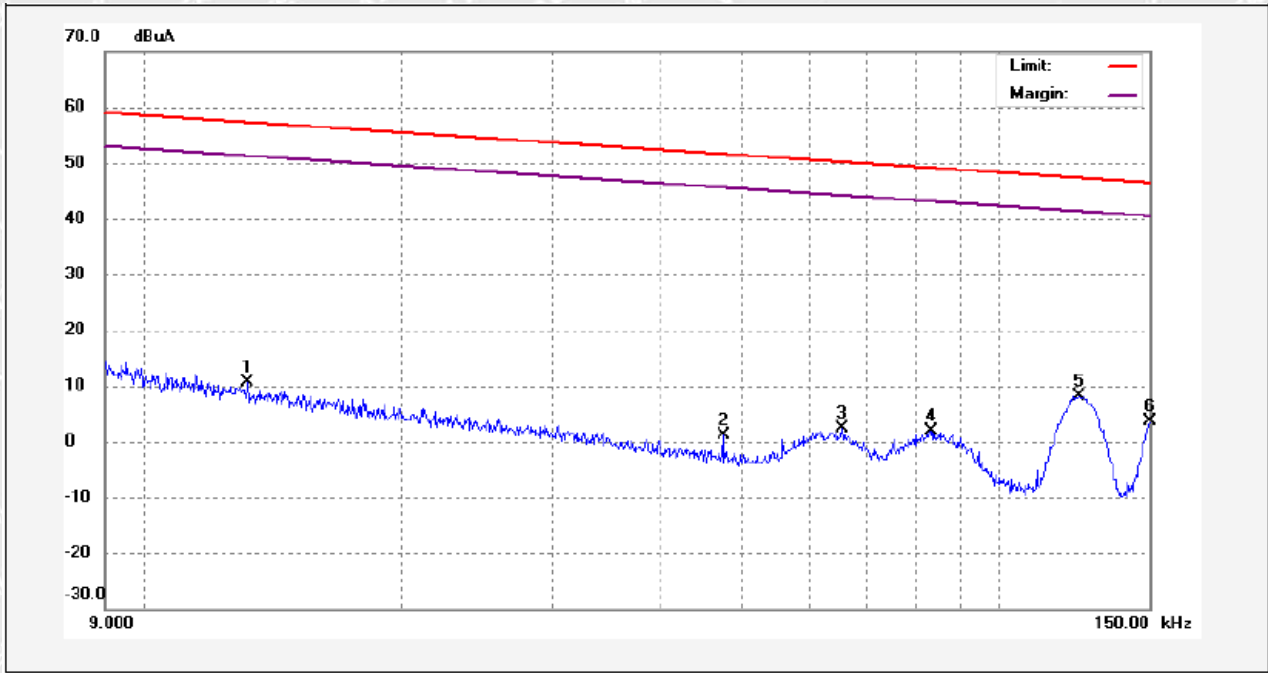


| No. | Freq. (MHz) | Reading (dBuA) | Factor (dB) | Result (dBuA) | Limit (dBuA) | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-------------|----------|--------|
| 1   | 0.0109      | 13.93          | -2.06       | 11.87         | 58.10        | -46.23      | peak     |        |
| 2   | 0.0146      | 13.84          | -2.03       | 11.81         | 56.80        | -44.99      | peak     |        |
| 3   | 0.0757      | 9.55           | -2.36       | 7.19          | 49.48        | -42.29      | peak     |        |
| 4   | 0.0909      | 14.96          | -2.31       | 12.65         | 48.67        | -36.02      | peak     |        |
| 5   | 0.1242      | 24.58          | -2.25       | 22.33         | 47.28        | -24.95      | peak     |        |
| 6   | 0.1500      | 20.38          | -2.24       | 18.14         | 46.44        | -28.30      | peak     |        |

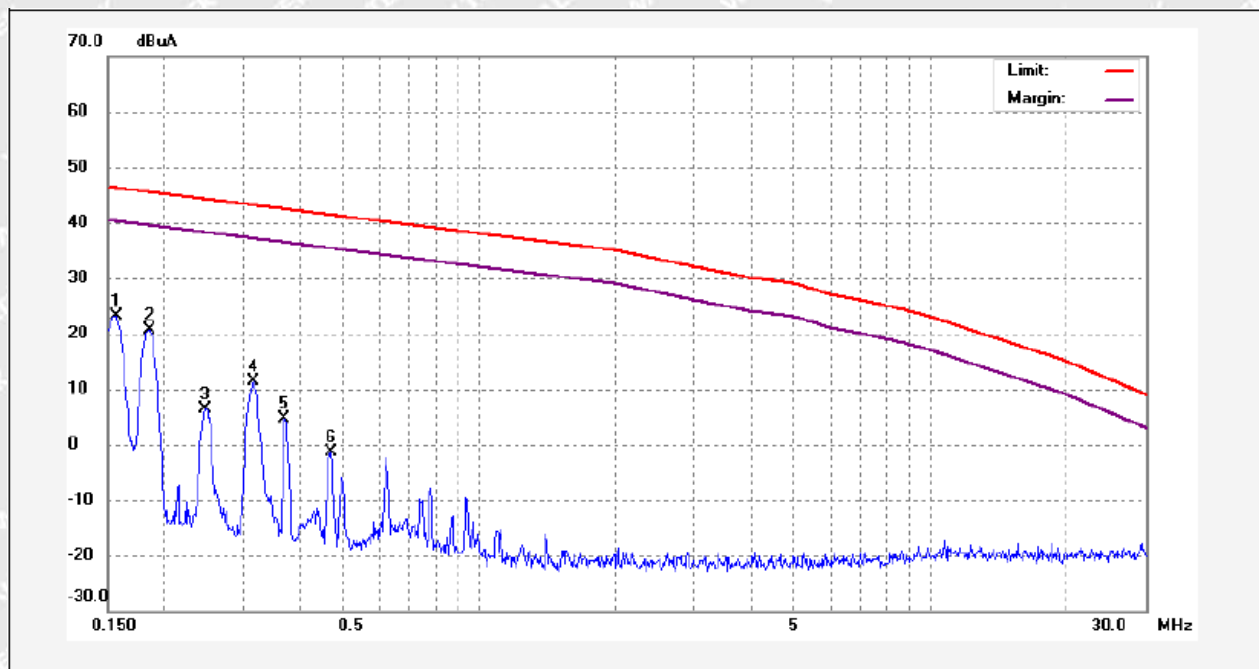


Frequency Range: 9kHz-150kHz

Polarization: Vertical



| No. | Freq. (MHz) | Reading (dBuA) | Factor (dB) | Result (dBuA) | Limit (dBuA) | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-------------|----------|--------|
| 1   | 0.0132      | 12.67          | -2.04       | 10.63         | 57.25        | -46.62      | peak     |        |
| 2   | 0.0476      | 3.26           | -2.22       | 1.04          | 51.54        | -50.50      | peak     |        |
| 3   | 0.0656      | 4.72           | -2.32       | 2.40          | 50.12        | -47.72      | peak     |        |
| 4   | 0.0831      | 4.18           | -2.35       | 1.83          | 49.06        | -47.23      | peak     |        |
| 5   | 0.1239      | 10.43          | -2.25       | 8.18          | 47.29        | -39.11      | peak     |        |
| 6   | 0.1500      | 5.88           | -2.24       | 3.64          | 46.44        | -42.80      | peak     |        |

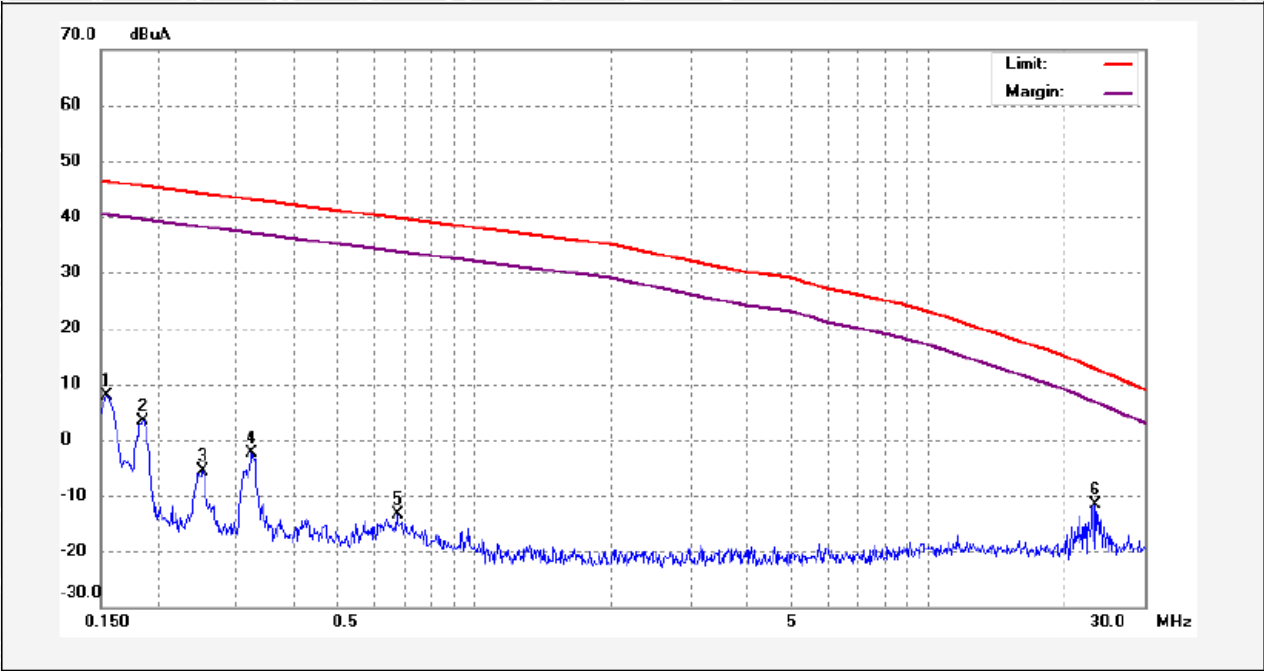
**Frequency Range:** 150kHz-30MHz**Polarization:** Horizontal

| No. | Freq. (MHz) | Reading (dBuA) | Factor (dB) | Result (dBuA) | Limit (dBuA) | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-------------|----------|--------|
| 1   | 0.1565      | 25.37          | -2.23       | 23.14         | 46.25        | -23.11      | peak     |        |
| 2   | 0.1853      | 22.81          | -2.22       | 20.59         | 45.50        | -24.91      | peak     |        |
| 3   | 0.2468      | 8.59           | -2.19       | 6.40          | 44.22        | -37.82      | peak     |        |
| 4   | 0.3149      | 13.59          | -2.16       | 11.43         | 43.14        | -31.71      | peak     |        |
| 5   | 0.3692      | 6.81           | -2.22       | 4.59          | 42.43        | -37.84      | peak     |        |
| 6   | 0.4686      | 0.88           | -2.32       | -1.44         | 41.37        | -42.81      | peak     |        |



Frequency Range: 150kHz-30MHz

Polarization: Vertical



| No. | Freq. (MHz) | Reading (dBuA) | Factor (dB) | Result (dBuA) | Limit (dBuA) | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-------------|----------|--------|
| 1   | 0.1548      | 10.10          | -2.23       | 7.87          | 46.30        | -38.43      | peak     |        |
| 2   | 0.1853      | 5.68           | -2.22       | 3.46          | 45.50        | -42.04      | peak     |        |
| 3   | 0.2521      | -3.41          | -2.18       | -5.59         | 44.13        | -49.72      | peak     |        |
| 4   | 0.3234      | -0.29          | -2.17       | -2.46         | 43.02        | -45.48      | peak     |        |
| 5   | 0.6753      | -10.89         | -2.47       | -13.36        | 39.75        | -53.11      | peak     |        |
| 6   | 23.2633     | -8.71          | -2.86       | -11.57        | 12.76        | -24.33      | peak     |        |



## 8 Radiated Spurious Emission Above 30MHz

### 8.1 Standard Applicable

According to EN 300330 section 4.3.9, the power of any radiated emission shall not exceed the values given in table 6.

| State     | 47 MHz to 74 MHz<br>87,5 MHz to 118 MHz<br>174 MHz to 230 MHz<br>470 MHz to 790 MHz | Other frequencies between 30 MHz to<br>1 000 MHz |
|-----------|-------------------------------------------------------------------------------------|--------------------------------------------------|
| Operating | 4 nW                                                                                | 250 nW                                           |
| Standby   | 2 nW                                                                                | 2 nW                                             |

### 8.2 Test Procedure

EUT was placed on a nonmetal table which is 1.5 meter above the grounded reference plane and set to work in normal operation mode. Details refer to EN 300 330 subclause 6.2.9.

### 8.3 Test Condition

Operating Mode ..... : TX mode

Test Environment ..... : Normal Condition

Test Voltage ..... : DC 9V

Ambient temperature ..... : 25°C

Humidity ..... : 54%RH

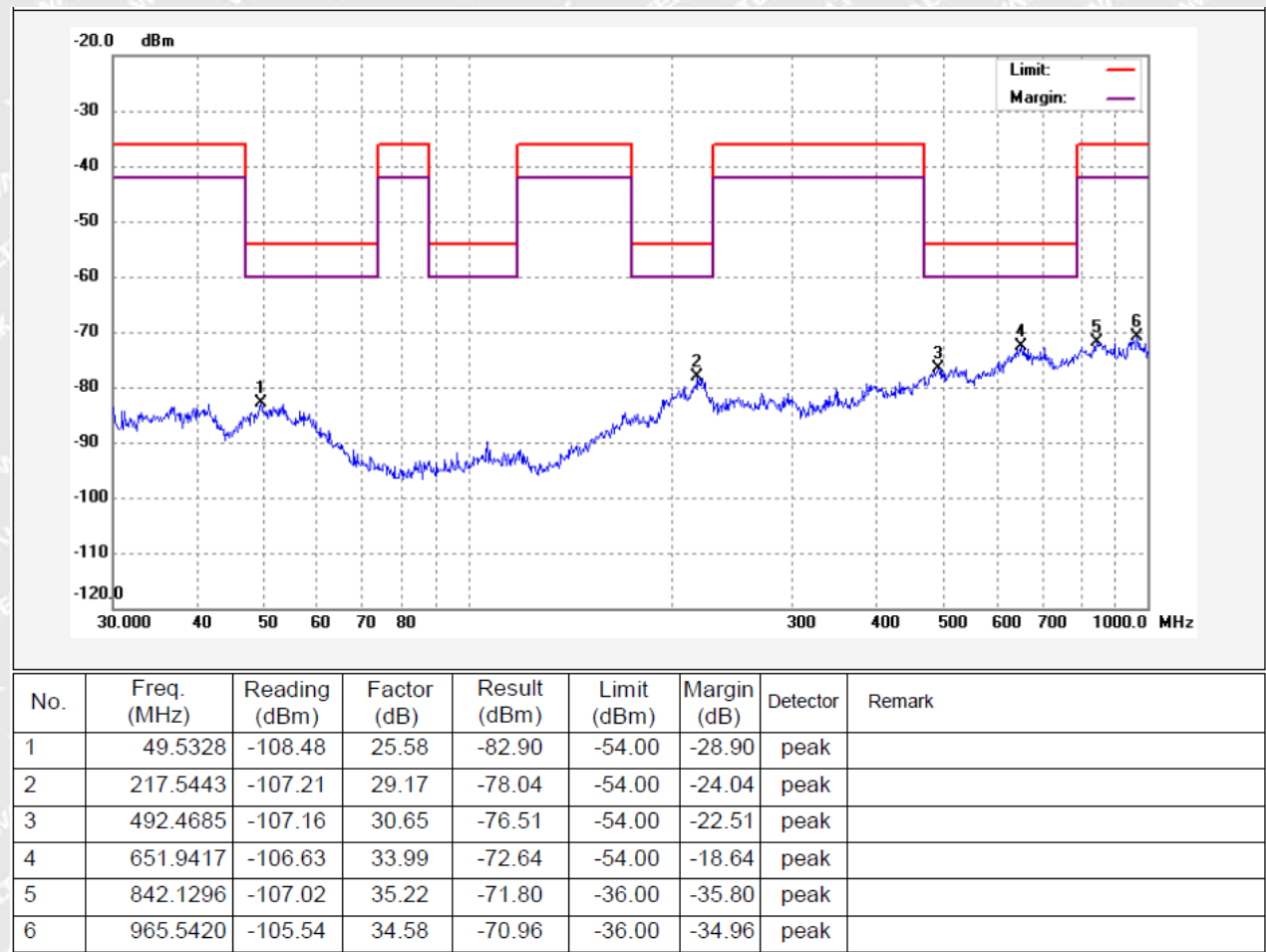
Atmospheric Pressure ..... : 101.2kPa



8.4 Test Results

Frequency Range: 30MHz to 1GHz

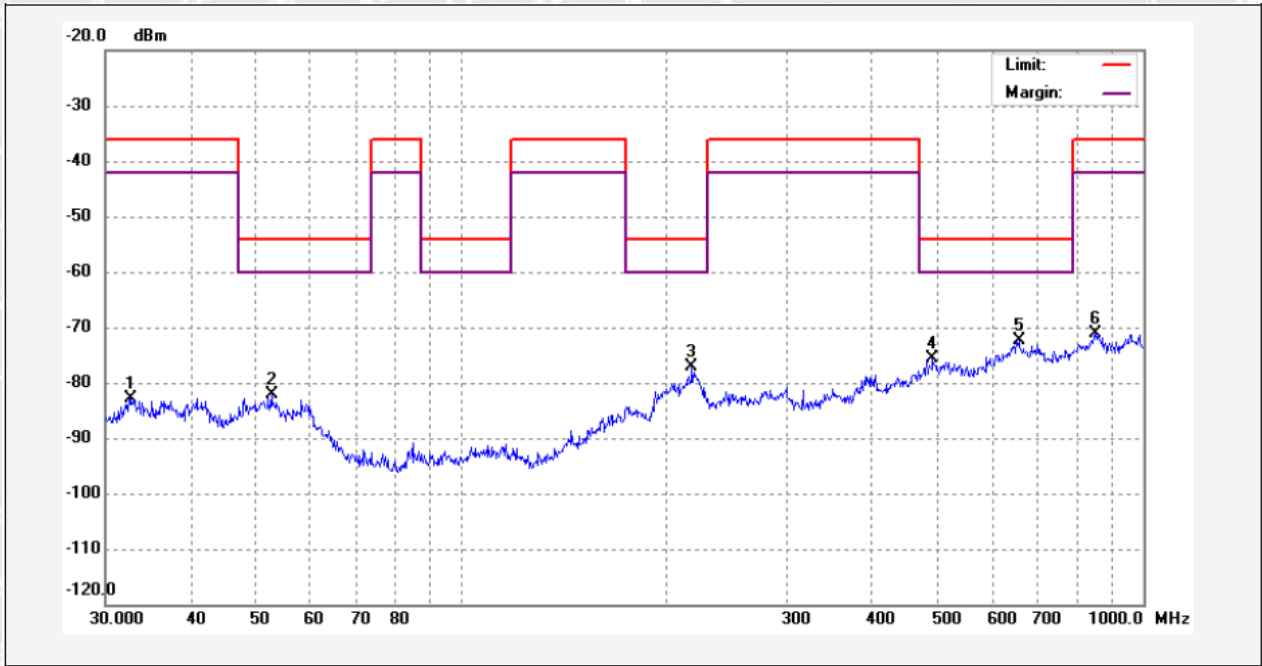
Polarization: Horizontal





Frequency Range: 30MHz to 1GHz

Polarization: Vertical



| No. | Freq. (MHz) | Reading (dBm) | Factor (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Detector | Remark |
|-----|-------------|---------------|-------------|--------------|-------------|-------------|----------|--------|
| 1   | 32.6340     | -106.15       | 23.38       | -82.77       | -36.00      | -46.77      | peak     |        |
| 2   | 52.5753     | -107.23       | 25.13       | -82.10       | -54.00      | -28.10      | peak     |        |
| 3   | 217.5443    | -106.36       | 29.17       | -77.19       | -54.00      | -23.19      | peak     |        |
| 4   | 490.7447    | -106.37       | 30.76       | -75.61       | -54.00      | -21.61      | peak     |        |
| 5   | 656.5300    | -106.23       | 33.74       | -72.49       | -54.00      | -18.49      | peak     |        |
| 6   | 851.0353    | -106.82       | 35.66       | -71.16       | -36.00      | -35.16      | peak     |        |

Note1: Standby mode does not produce any emission, which no emission been detected.



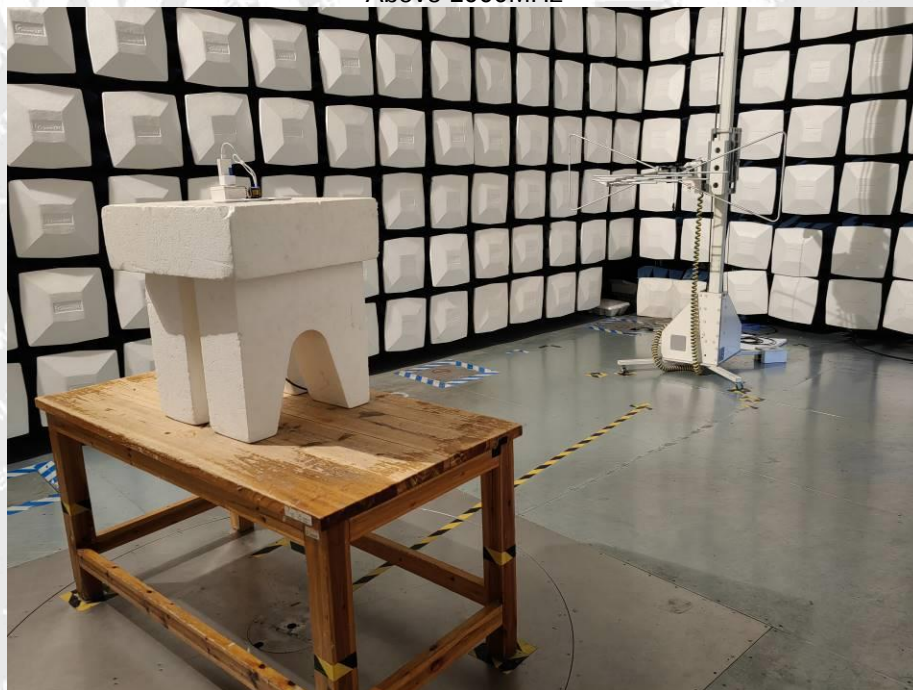
## 9 Photographs —Test Setup

### 9.1 Photograph - Spurious Emissions Radiated Test Setup

Below 1000MHz



Above 1000MHz





## 10 Photographs – EUT Constructional Details

Please refer to “ANNEX”.

=====End of Report=====

# WALTEK



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

**Reference No.**..... : WTF24F11264300W001  
**Applicant**..... : Mid Ocean Brands B.V.  
**Address**..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon,  
Hong Kong  
**Manufacturer** ..... : 114538  
**Address**..... : ---  
**Product Name**..... : Foldable charging station  
**Model No.**..... : MO2145  
**Test specification**..... : ETSI EN 303 417 V1.1.1 (2017-09)  
**Date of Receipt sample** .... : 2024-11-18  
**Date of Test** ..... : 2024-11-27  
**Date of Issue**..... : 2024-11-29  
**Test Report Form No.** ..... : WEW-303417A-01B  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

**Prepared By:**

**Waltek Testing Group (Foshan) Co., Ltd.**

Address: 1/F., Building 19, Sunlink Machinery City, Xingye 4 Road,  
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Fax:+86-757-23811381

E-mail:info@waltek.com.cn

Tested by:

Approved by:

Roy Hong

Danny Zhou



## 1 Test Summary

| Radio Spectrum                           |                        |           |        |
|------------------------------------------|------------------------|-----------|--------|
| Test                                     | Test Requirement       | Reference | Result |
| Permitted range of operating frequencies | ETSI EN 303 417 V1.1.1 | 4.3.2     | Pass   |
| Operating frequency ranges               | ETSI EN 303 417 V1.1.1 | 4.3.3     | Pass   |
| H-field requirements                     | ETSI EN 303 417 V1.1.1 | 4.3.4     | Pass   |
| Transmitter spurious emissions           | ETSI EN 303 417 V1.1.1 | 4.3.5     | Pass   |
| Transmitter out of band (OOB) emissions  | ETSI EN 303 417 V1.1.1 | 4.3.6     | Pass   |
| WPT system unwanted conducted emissions  | ETSI EN 303 417 V1.1.1 | 4.3.7     | N/A    |
| Receiver blocking                        | ETSI EN 303 417 V1.1.1 | 4.4.2     | Pass   |

Remark:

Pass The EUT complies with the essential requirements in the standard

Fail The EUT does not comply with the essential requirements in the standard

N/A Not Applicable

# WALTEK



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# WALTEK



### 3 General Information

#### 3.1 General Description of E.U.T.

**Product Name** ..... : Foldable charging station  
**Model No.** ..... : MO2145  
**Remark** ..... : ---  
**Rating** ..... : Input: DC 9V/3A, DC 9V/2.22A, DC 5V/2A  
Output: DC 5V/0.3A, DC 5V/1A, DC 9V/1.66A  
Wireless output power:  
Magnetic charging pad: Max 15W  
Apple Watch only: Max 1.5W  
Wireless charging pad: Max 5W  
**Battery Capacity** ..... : ---  
**Adapter Model** ..... : ---

#### 3.2 Details of E.U.T.

**Frequency Bands** ..... : 110-205kHz (for Magnetic charging pad and Wireless charging pad)  
**Radiated H-Field** ..... : 17.79 dBuA/m(@3m) for Wireless charging pad  
27.04 dBuA/m(@3m) for Magnetic charging pad  
**Antenna Type** ..... : Coil Antenna  
**Antenna Gain** ..... : 0dBi

#### Overview of operational modes within a WPT system

| Operational Mode                                                           | Set-up         | Function of base station | Function of mobile device | Test scenario                                                                                                                                                                                                                              | Conformance Requirements                                                                                                                                                               |
|----------------------------------------------------------------------------|----------------|--------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mode 1: base station in stand-by, idle mode                                | Single device  | Transmitter              | Not applicable            | Single radiation test (TX) with the base station/charging pad.<br>The test set-up as described in clause 6.1.2 shall be used.                                                                                                              | Operating frequency range (clause 4.3.3)<br>H-Field emission (clause 4.3.4)<br>TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7)<br>Performance criteria test (RX test) (clause 4.4)        |
| Mode 2: Communication before charging, adjustment charging mode / position | In combination | TX and RX                | TX and RX                 | Specific test setup, declared by the manufacturer.<br>Manufacturer shall declare the maximal distance between base station and mobile device the WPT system is able to communicate (distance D).The test setup- up shall be performed with | Operating frequency range (clause 4.3.3)<br>H-Field emission (clause 4.3.4)<br>TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7)<br>Wanted performance criteria test (RX test) (clause 4.4) |



| Operational Mode            | Set-up               | Function of base station | Function of mobile device | Test scenario                                                                                                                    | Conformance Requirements                                                                                                                                                               |
|-----------------------------|----------------------|--------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |                      |                          |                           | the largest communication distance. The test set-up as described in clause 6.1.3 shall be used.                                  |                                                                                                                                                                                        |
| Mode3: Communication        | WPT system alignment | TX and RX                | TX and RX                 | Worst case alignment                                                                                                             | Operating frequency range (clause 4.3.3)<br>H-Field emission (clause 4.3.4)<br>TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7)<br>Wanted Performance criteria test (RX test) (clause 4.4) |
| Mode 4: energy transmission | WPT system alignment | TX and RX                | TX and RX                 | Both tests can be performed within one set-up, worst-case alignment. The test set-up as described in clause 6.1.4 shall be used. |                                                                                                                                                                                        |

### 3.3 Standards Applicable for Testing

The tests were performed according to following standards:

ETSI EN 303 417 V1.1.1 (2017-09) Wireless power transmission systems, using technologies other than radio frequency beam in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6765 - 6795 kHz ranges; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

### 3.4 Test Facility

The test facility has a test site registered with the following organizations:

- **ISED – Registration No.: 21895**

Waltek Testing Group (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science and Economic Development Canada (ISED). The acceptance letter from the ISED is maintained in our files. Registration ISED number: 21895, March 12, 2019

- **FCC – Registration No.: 820106**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 820106, August 16, 2018

- **NVLAP – Lab Code: 600191-0**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



### 3.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test items: ---

Lab information: ---

### 3.6 Abnormalities from Standard Conditions

None.

### 3.7 Disclaimer

The antenna gain information is provided by the customer. The laboratory is not responsible for the accuracy of the antenna gain information.

# WALTEK



## 4 Equipment Used during Test

### 4.1 Equipment List

| <input checked="" type="checkbox"/> 3m Semi-anechoic Chamber for Spurious Emission |                                     |                 |                |             |                       |                      |
|------------------------------------------------------------------------------------|-------------------------------------|-----------------|----------------|-------------|-----------------------|----------------------|
| Item                                                                               | Equipment                           | Manufacturer    | Model No.      | Serial No.  | Last Calibration Date | Calibration Due Date |
| 1                                                                                  | 3m Semi-anechoic Chamber            | CHANGCHUANG     | 9m×6m×6m       | -           | 2024-01-05            | 2025-01-04           |
| 2                                                                                  | EMI TEST RECEIVER                   | RS              | ESR7           | 101566      | 2024-01-06            | 2025-01-05           |
| 3                                                                                  | Spectrum Analyzer                   | Agilent         | N9020A         | MY48011796  | 2024-01-04            | 2025-01-03           |
| 4                                                                                  | Trilog Broadband Antenna            | SCHWARZBECK     | VULB9162       | 9162-117    | 2024-01-05            | 2025-01-04           |
| 5                                                                                  | Coaxial Cable (below 1GHz)          | H+S             | CBL3-NN-12+3 m | 214NN320    | 2024-01-06            | 2025-01-05           |
| 6                                                                                  | Broad-band Horn Antenna             | SCHWARZBECK     | BBHA 9120 D    | 01561       | 2024-01-05            | 2025-01-04           |
| 7                                                                                  | Broadband Preamplifier (Above 1GHz) | Lunar E M       | LNA1G18-40     | 20160501002 | 2024-01-04            | 2025-01-03           |
| 8                                                                                  | Coaxial Cable (above 1GHz)          | Times-Microwave | CBL5-NN        | -           | 2024-01-04            | 2025-01-03           |
| <input checked="" type="checkbox"/> RF Conducted test                              |                                     |                 |                |             |                       |                      |
| Item                                                                               | Equipment                           | Manufacturer    | Model No.      | Serial No.  | Last Calibration Date | Calibration Due Date |
| 1                                                                                  | Environmental Chamber               | GERUI           | GR-HWS-1000L   | GR24061818  | 2024-07-02            | 2025-07-01           |
| 2                                                                                  | Spectrum Analyzer                   | Agilent         | N9020A         | MY48011796  | 2024-01-04            | 2025-01-03           |
| 3                                                                                  | EXG Analog Signal Generator         | Agilent         | N5181A         | MY48180720  | 2024-01-04            | 2025-01-03           |
| 4                                                                                  | RF Control Unit                     | CHANGCHUANG     | JS0806-2       | -           | 2024-01-04            | 2025-01-03           |

☐: Not Used

☒: Used



## 4.2 Software List

| Description                              | Manufacturer | Model    | Version   |
|------------------------------------------|--------------|----------|-----------|
| EMI Test Software<br>(Radiated Emission) | FARATRONIC   | EZ-EMC   | RA-03A1-2 |
| RF Conducted Test                        | TONSCEND     | JS1120-2 | 2.6       |

## 4.3 Special Accessories and Auxiliary Equipment

| Item | Equipment | Technical Data | Manufacturer | Model No. |
|------|-----------|----------------|--------------|-----------|
| 1.   | /         | /              | /            | /         |

## 4.4 Measurement Uncertainty

| Parameter                     | Uncertainty                         | Note |
|-------------------------------|-------------------------------------|------|
| RF Output Power               | $\pm 2.2\text{dB}$                  | (1)  |
| Occupied Bandwidth            | $\pm 1.5\%$                         | (1)  |
| Transmitter Spurious Emission | $\pm 3.8\text{dB}$ (for 25MHz-1GHz) | (1)  |
|                               | $\pm 5.0\text{dB}$ (for 1GHz-18GHz) | (1)  |

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

## 4.5 Decision Rule

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

**If  $U_{\text{LAB}}$  is less than or equal to  $U_{\text{cispr}}$  then**

- Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

**If  $U_{\text{LAB}}$  is greater than  $U_{\text{cispr}}$  then**

- Compliance is deemed to occur if no measured disturbance level, increased by  $(U_{\text{LAB}} - U_{\text{cispr}})$ , exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{\text{LAB}} - U_{\text{cispr}})$ , exceeds the disturbance limit.



## 5 Permitted Range of Operating Frequency

### 5.1 Standard Applicable

1. This applies to all WPT systems.
2. The permitted range of operating frequencies denotes the frequency ranges set out in Table 1. It likewise denotes the respective frequency range for accommodation of the fundamental WPT frequency of the EUT within its operating frequency range (OFR).
3. Limits

The permitted range of operating frequency range(s) for intentional emissions shall be within 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz, see Table 2.

### 5.2 Test Procedure

Please refer to ETSI EN 303 417 subclause 6.2.2.

### 5.3 Test Condition

|                            |                    |
|----------------------------|--------------------|
| Operating Mode .....       | : TX mode          |
| Test Environment .....     | : Normal Condition |
| Test Voltage .....         | : DC 9V            |
| Ambient temperature .....  | : 25°C             |
| Humidity .....             | : 54%RH            |
| Atmospheric Pressure ..... | : 101.2kPa         |

### 5.4 Test Result

For Wireless charging pad

| Permitted range of operating frequencies |             |                |                |        |
|------------------------------------------|-------------|----------------|----------------|--------|
| $F_L$ (kHz)                              | $F_H$ (kHz) | Limit (kHz)    |                | Result |
| 110                                      | 205         | $F_L \geq 100$ | $F_H \leq 300$ | Pass   |

For Magnetic charging pad

| Permitted range of operating frequencies |             |                |                |        |
|------------------------------------------|-------------|----------------|----------------|--------|
| $F_L$ (kHz)                              | $F_H$ (kHz) | Limit (kHz)    |                | Result |
| 110                                      | 205         | $F_L \geq 100$ | $F_H \leq 300$ | Pass   |



## 6 Operating Frequency Ranges

### 6.1 Standard Applicable

The operating frequency range is the frequency range over which the WPT system is intentionally transmitting (all operational modes, see clause 4.2.3, Table 2).

The operating frequency range(s) of the WPT system are determined by the lowest ( $f_L$ ) and highest frequency ( $f_H$ ) as occupied by the power envelope.

The WPT system could have more than one operating frequency range.

For a single frequency systems the OFR is equal to the occupied bandwidth (OBW) of the WPT system.

For multi-frequency systems the OFR is described in Figures 2 and 3.

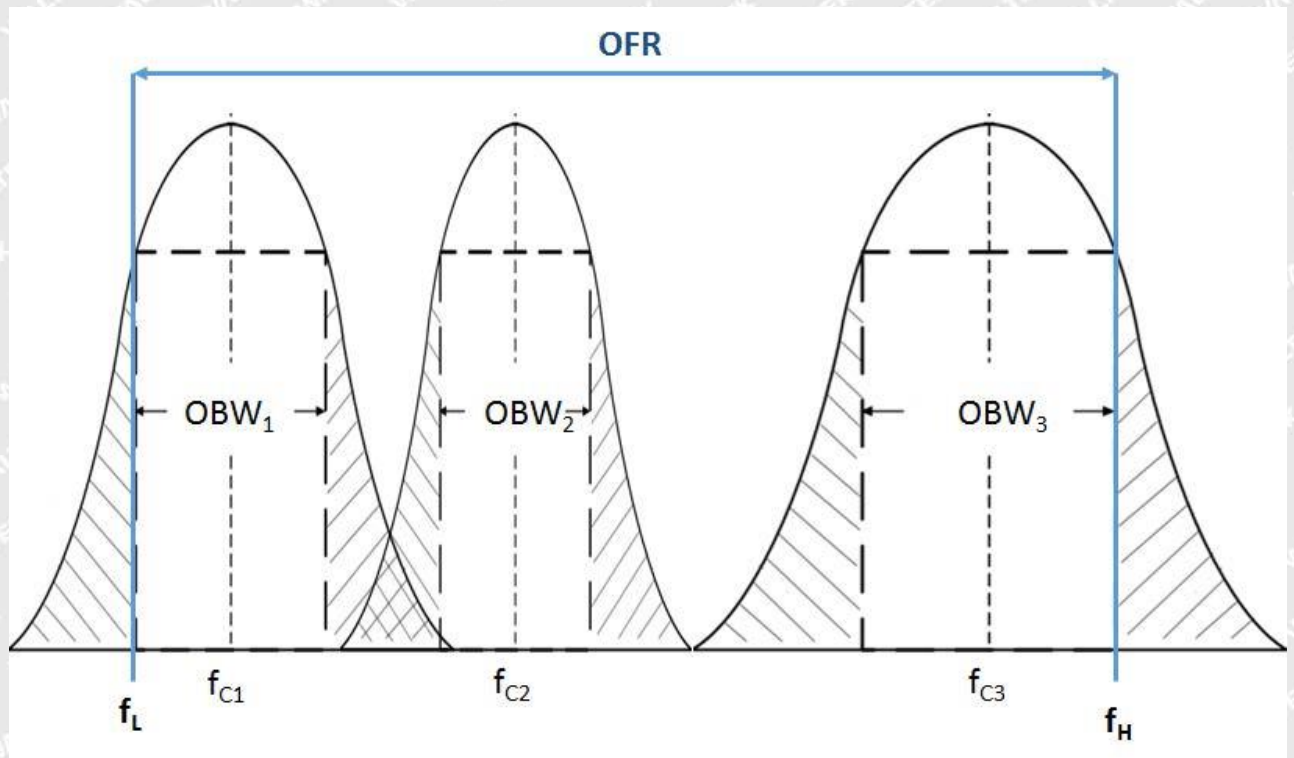


Figure 2: OFR of a multi - frequency WPT system within one frequency range of Table 2 and within one WPT system cycle time

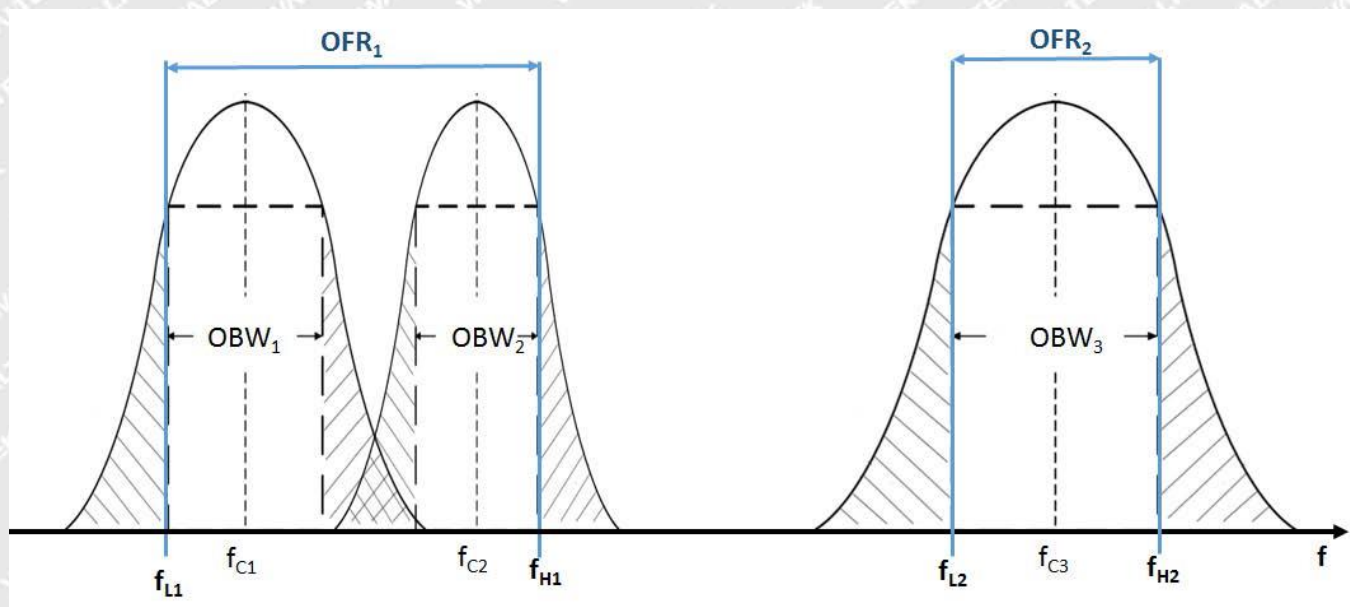


Figure 3: OFR of a multi - frequency WPT system within two frequency ranges of Table 2 and within one WPT system cycle time

#### Limits

The operating frequency range for emissions shall be within one of the following limits: 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz.

### 6.2 Test Procedure

Please refer to ETSI EN 303 417 subclause 6.2.2.

### 6.3 Test Condition

|                            |                  |
|----------------------------|------------------|
| Operating Mode .....       | TX mode          |
| Test Environment .....     | Normal Condition |
| Test Voltage .....         | DC 9V            |
| Ambient temperature .....  | 25°C             |
| Humidity .....             | 54%RH            |
| Atmospheric Pressure ..... | 101.2kPa         |

### 6.4 Test Result

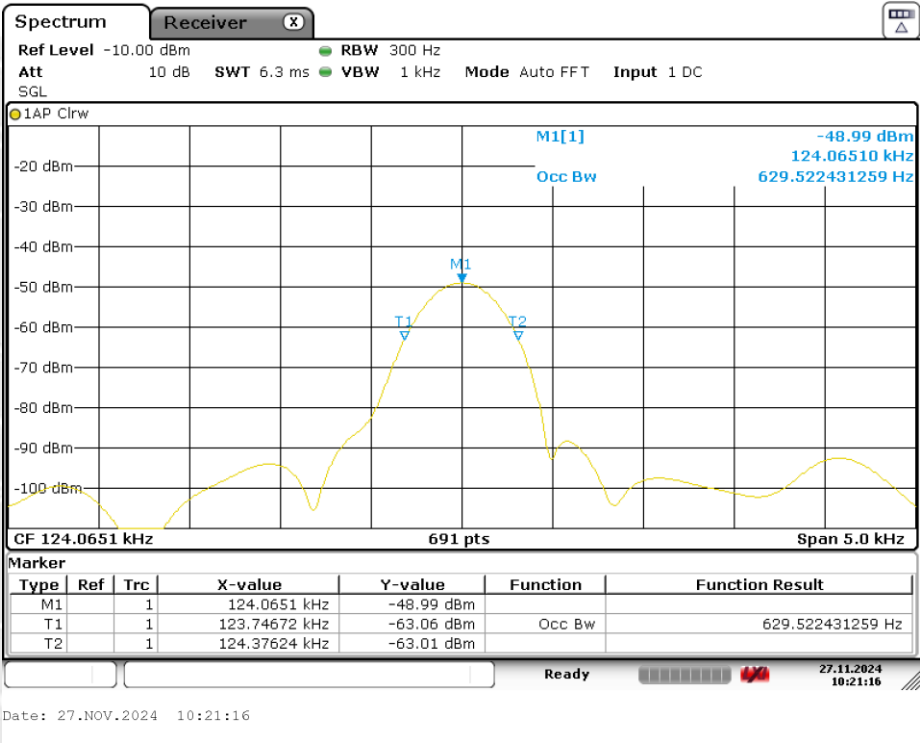
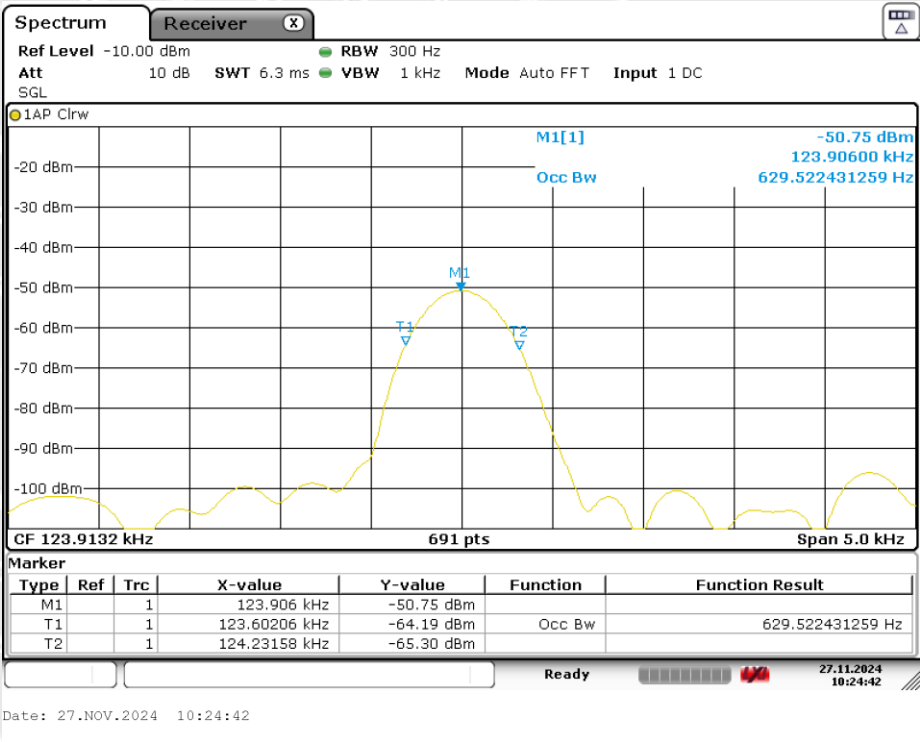
For Wireless charging pad

| Operating frequency range(s) (OFR) |             |                |                |        |
|------------------------------------|-------------|----------------|----------------|--------|
| $F_L$ (kHz)                        | $F_H$ (kHz) | Limit (kHz)    |                | Result |
| 123.60                             | 124.38      | $F_L \geq 100$ | $F_H \leq 300$ | Pass   |



Test Plots:

Operating frequency range(s) (OFR)



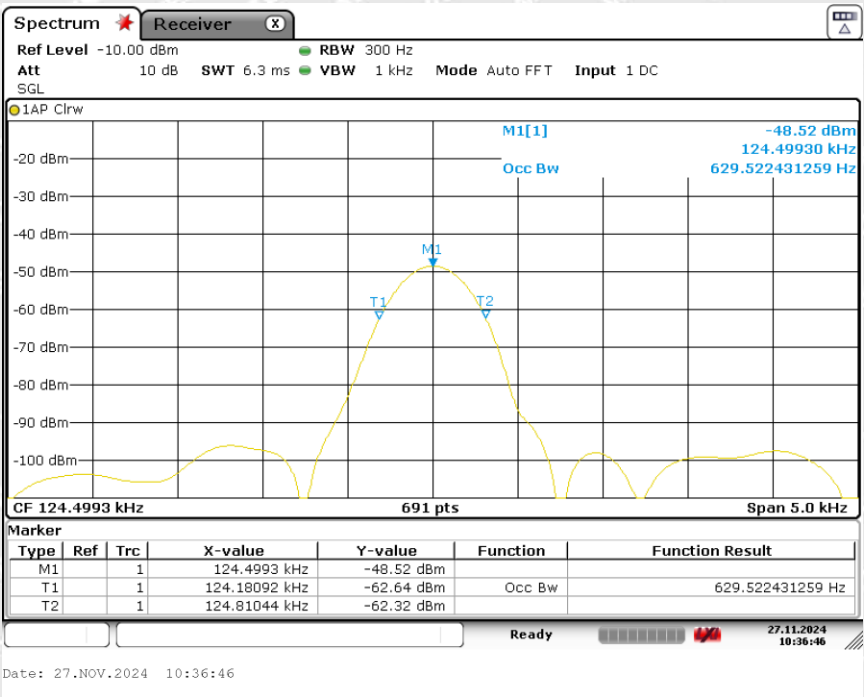
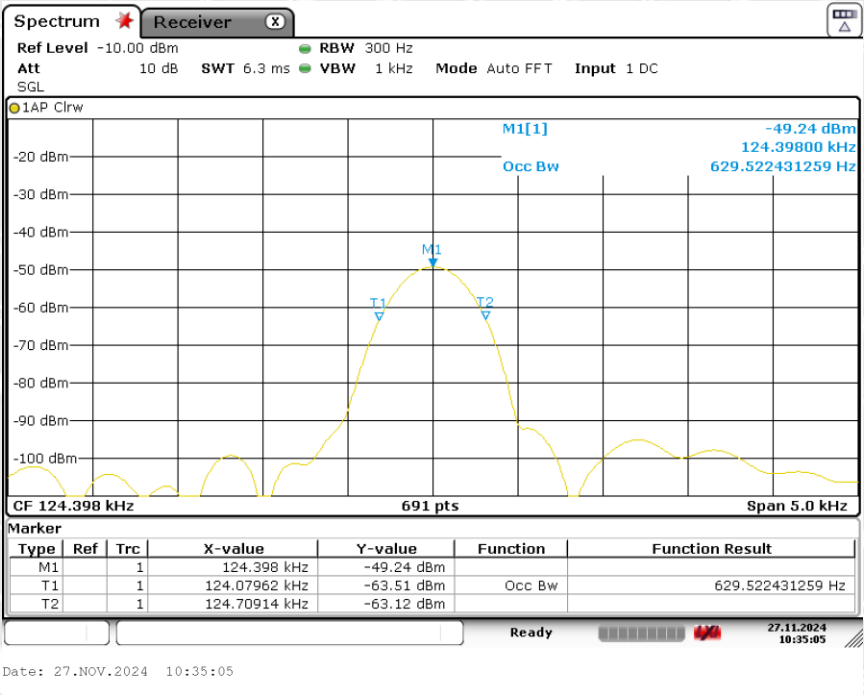


For Magnetic charging pad

| Operating frequency range(s) (OFR) |                      |                      |                      |        |
|------------------------------------|----------------------|----------------------|----------------------|--------|
| F <sub>L</sub> (kHz)               | F <sub>H</sub> (kHz) | Limit (kHz)          |                      | Result |
| 124.08                             | 124.81               | F <sub>L</sub> ≥ 100 | F <sub>H</sub> ≤ 300 | Pass   |

Test Plots:

Operating frequency range(s) (OFR)





## 7 Transmitter H-field Requirements

### 7.1 Standard Applicable

The radiated H-field is defined in the direction of maximum field strength under specified conditions of measurement.

The H-field limits are provided in Table 3.

They have been specified for control of any radiated emissions within the OFR originating from the WPT system (power transmission and accompanying data communication).

The H-field limits in Table 3 are EU wide harmonised according to EC Decision 2013/752/EU [i.2]. Further information is available in CEPT/ERC/REC 70-03 [i.1].

**Table 3: H-field limits**

| Frequency range [MHz]   | H-field strength limit [dBμA/m at 10 m]   | Comments   |
|-------------------------|-------------------------------------------|------------|
| $0,019 \leq f < 0,021$  | 72                                        |            |
| $0,059 \leq f < 0,061$  | 69,1 descending 10 dB/dec above 0,059 MHz | See note 1 |
| $0,079 \leq f < 0,090$  | 67,8 descending 10 dB/dec above 0,079 MHz | See note 2 |
| $0,100 \leq f < 0,119$  | 42                                        |            |
| $0,119 \leq f < 0,135$  | 66 descending 10 dB/dec above 0,119 MHz   | See note 1 |
| $0,135 \leq f < 0,140$  | 42                                        |            |
| $0,140 \leq f < 0,1485$ | 37,7                                      |            |
| $0,1485 \leq f < 0,30$  | -5                                        |            |
| $6,765 \leq f < 6,795$  | 42                                        |            |

NOTE 1: Limit is 42 dBμA/m for the following spot frequencies: 60 kHz ± 250 Hz and 129,1 kHz ± 500 Hz.  
 NOTE 2: At the time of preparation of the present document the feasibility of increased limits for high power wireless power transmission systems to charge vehicles [i.4] was prepared. New specific requirements for such systems (e.g. higher H-field emission limits in the 79 - 90 kHz band) will be reflected within a future revision of the present document.

### 7.2 Test Procedure

Please refer to ETSI EN 303 417 subclause 6.2.2

### 7.3 Test Condition

|                                   |                  |
|-----------------------------------|------------------|
| <b>Operating Mode</b> .....       | TX mode          |
| <b>Test Environment</b> .....     | Normal Condition |
| <b>Test Voltage</b> .....         | DC 9V            |
| <b>Ambient temperature</b> .....  | 25°C             |
| <b>Humidity</b> .....             | 54%RH            |
| <b>Atmospheric Pressure</b> ..... | 101.2kPa         |



## 7.4 Test Result

### For Wireless charging pad

| Frequency (MHz) | Level (dBuA/m)@3m | C <sub>3</sub> Factor (dB) | Level (dBuA/m)@10m | Limit (dBuA/m)@10m | Result |
|-----------------|-------------------|----------------------------|--------------------|--------------------|--------|
| 0.12            | 17.79             | 31.2                       | 66                 | -5                 | Pass   |

### For Magnetic charging pad

| Frequency (MHz) | Level (dBuA/m)@3m | C <sub>3</sub> Factor (dB) | Level (dBuA/m)@10m | Limit (dBuA/m)@10m | Result |
|-----------------|-------------------|----------------------------|--------------------|--------------------|--------|
| 0.12            | 27.04             | 31.2                       | 66                 | -5                 | Pass   |

Note 1: Pre-scan EUT X,Y,Z axis, and find the worst case at X axis.

Note 2:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN 300 330 Annex H.2

# WALTEK

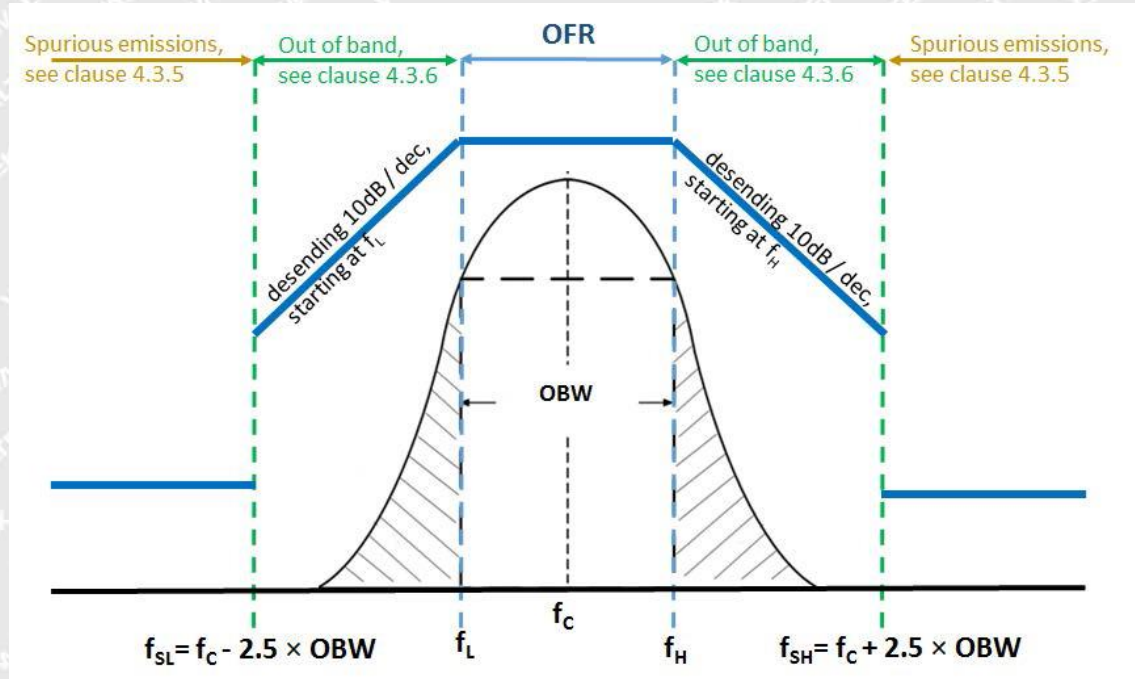


## 8 Transmitter Spurious Emissions

### 8.1 Standard Applicable

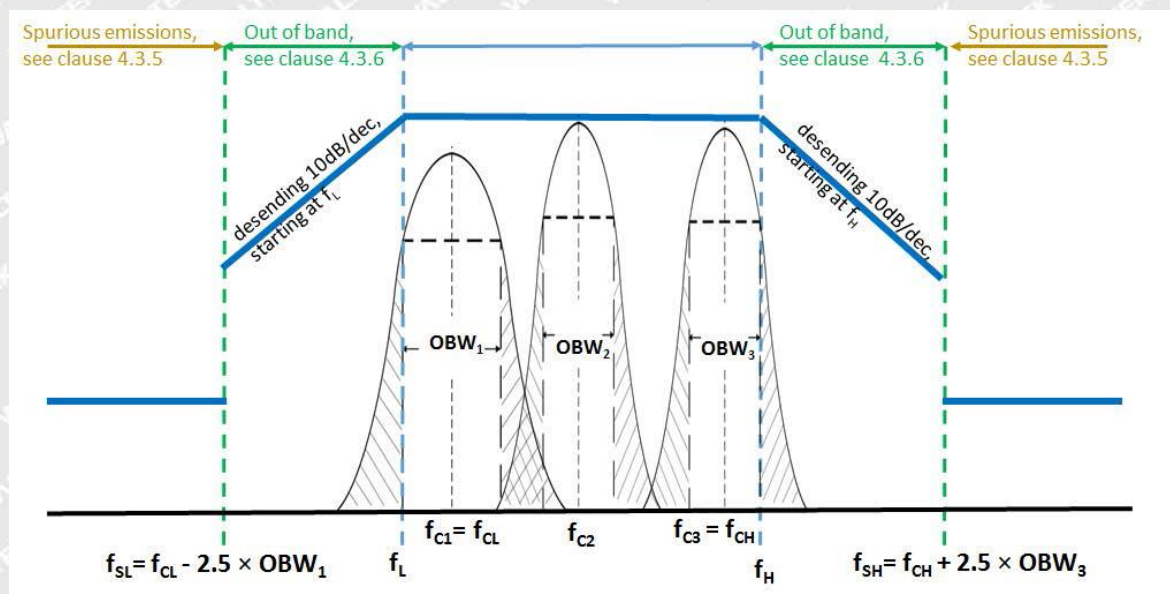
The transmitter spurious emissions for a single frequency system are to be considered in frequency ranges defined in Figure 4 ( $f < f_{SL}$  and  $f > f_{SH}$ ).

Figure 4: Out of band and spurious domain of a single frequency WPT system.



The transmitter spurious emissions for a multi frequency system (within one WPT frequency range from Table 2) are to be considered in frequency ranges defined in Figure 5 ( $f < f_{SL}$  and  $f > f_{SH}$ ).

Figure 5: Out of band and spurious domain of a multi - frequency system (during one WPT system cycle time).





### Limit

The radiated field strength of spurious emissions below 30 MHz shall not exceed the generated H-field given in Table 4.

| State (see note) | Frequency $9 \text{ kHz} \leq f < 10 \text{ MHz}$ | Frequency $10 \text{ MHz} \leq f < 30 \text{ MHz}$ |
|------------------|---------------------------------------------------|----------------------------------------------------|
| Operating        | 27 dB $\mu$ A/m at 9 kHz descending 10 dB/dec     | -3,5 dB $\mu$ A/m                                  |
| Standby          | 5,5 dB $\mu$ A/m at 9 kHz descending 10 dB/dec    | -25 dB $\mu$ A/m                                   |

NOTE: "Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table 2.

The power of any radiated spurious emission between 30 MHz and 1 GHz shall not exceed the values given in Table 5.

| State (see note) | 47 MHz to 74 MHz<br>87,5 MHz to 118 MHz<br>174 MHz to 230 MHz<br>470 MHz to 790 MHz | Other frequencies between 30 MHz to 1 000 MHz |
|------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|
| Operating        | 4 nW                                                                                | 250 nW                                        |
| Standby          | 2 nW                                                                                | 2 nW                                          |

NOTE: "Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table 2.

## 8.2 Test Procedure

Please refer to ETSI EN 303 417 subclause 6.2.2 and subclause 6.2.3 for the measurement method

## 8.3 Test Condition

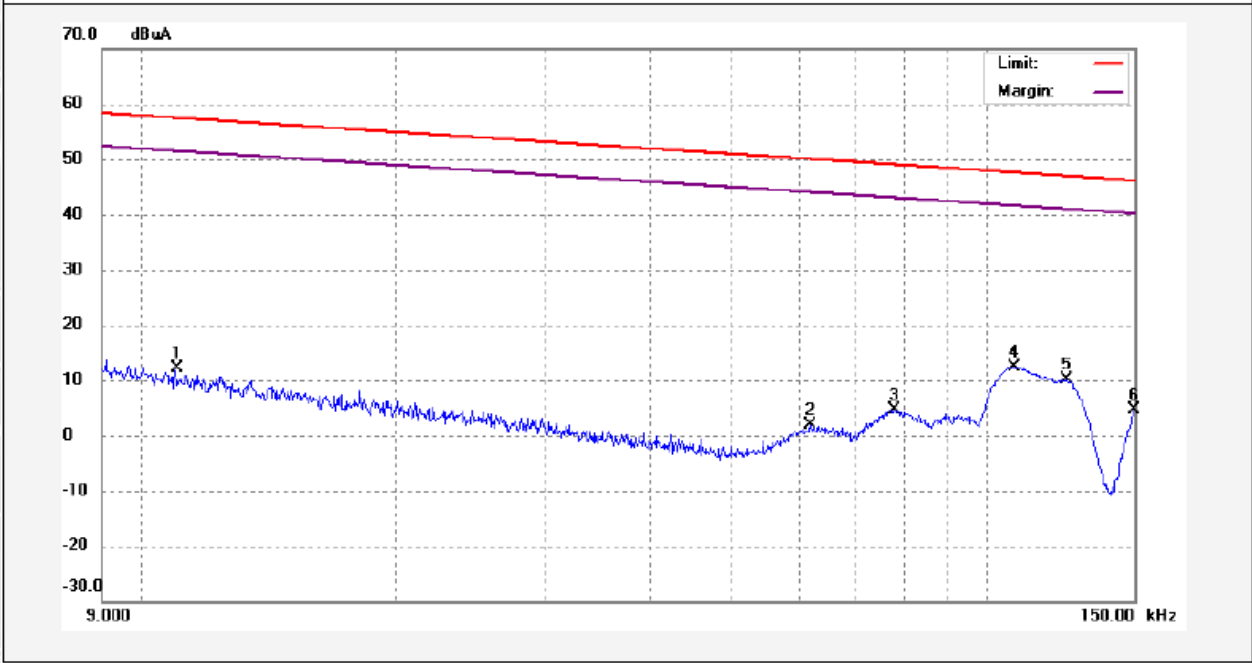
|                            |                  |
|----------------------------|------------------|
| Operating Mode .....       | TX mode, RX mode |
| Test Environment .....     | Normal Condition |
| Test Voltage .....         | DC 9V            |
| Ambient temperature .....  | 25°C             |
| Humidity .....             | 54%RH            |
| Atmospheric Pressure ..... | 101.2kPa         |



8.4 Test Result

Pre-scan EUT X,Y,Z axis,and find the worst case at X axis.

Frequency Range: 9kHz-150kHz Emission@3m      Area: Wireless charging pad  
Vertical Polarization

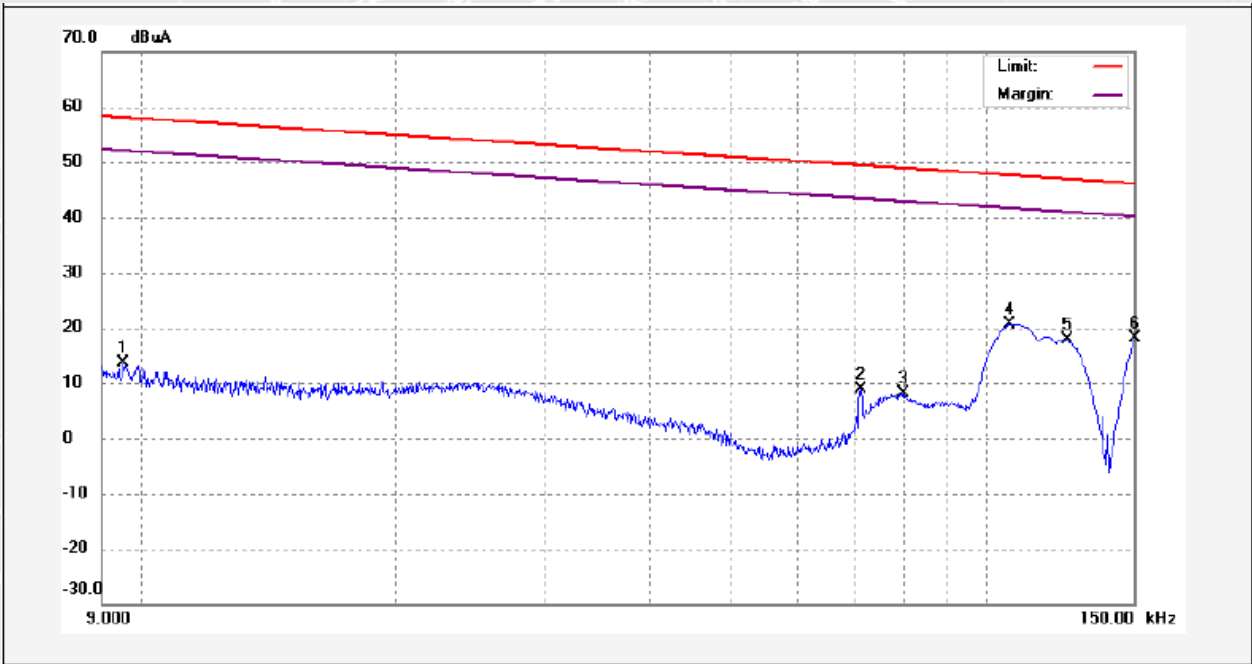


| No. | Freq.<br>(MHz) | Reading<br>(dBuA) | Factor<br>(dB) | Result<br>(dBuA) | Limit<br>(dBuA) | Margin<br>(dB) | Detector | Remark |
|-----|----------------|-------------------|----------------|------------------|-----------------|----------------|----------|--------|
| 1   | 0.0110         | 14.29             | -2.06          | 12.23            | 57.48           | -45.25         | peak     |        |
| 2   | 0.0620         | 4.17              | -2.31          | 1.86             | 50.01           | -48.15         | peak     |        |
| 3   | 0.0779         | 7.06              | -2.36          | 4.70             | 49.02           | -44.32         | peak     |        |
| 4   | 0.1079         | 14.64             | -2.26          | 12.38            | 47.59           | -35.21         | peak     |        |
| 5   | 0.1246         | 12.26             | -2.25          | 10.01            | 46.95           | -36.94         | peak     |        |
| 6   | 0.1496         | 6.97              | -2.24          | 4.73             | 46.15           | -41.42         | peak     |        |

Note 1:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN 300 330 Annex H.2



Frequency Range: 9kHz-150kHz Emission@3m      Area: Wireless charging pad  
Horizontal Polarization



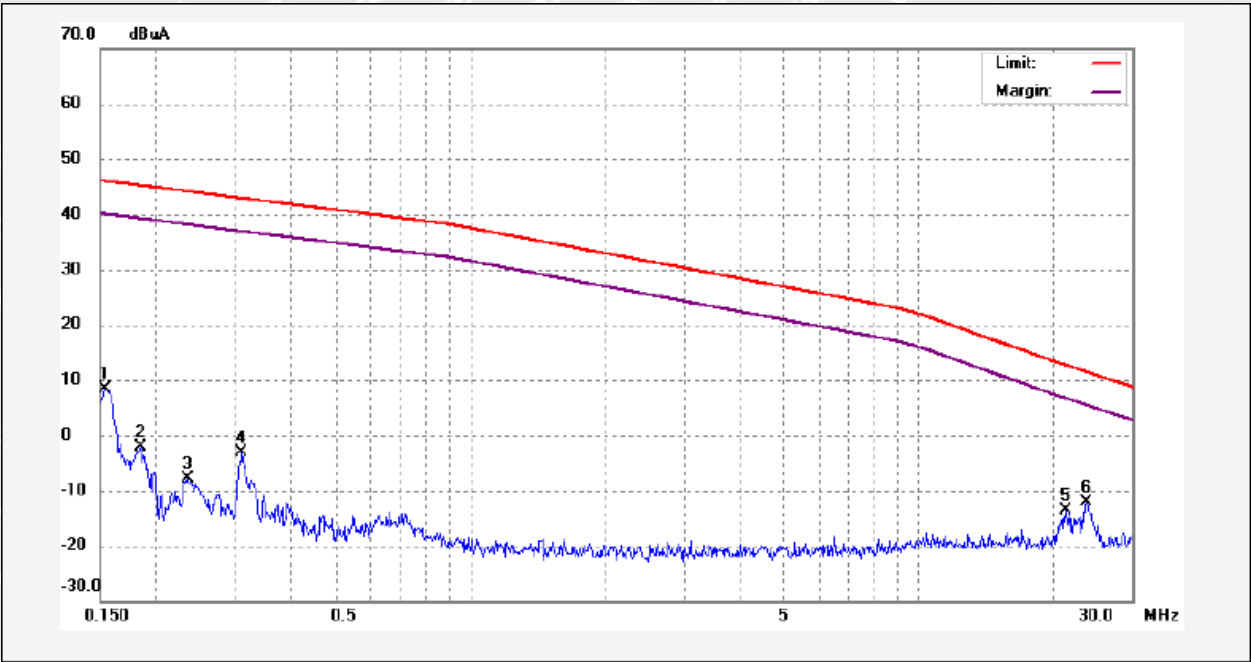
| No. | Freq. (MHz) | Reading (dBuA) | Factor (dB) | Result (dBuA) | Limit (dBuA) | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-------------|----------|--------|
| 1   | 0.0095      | 15.73          | -2.07       | 13.66         | 58.12        | -44.46      | peak     |        |
| 2   | 0.0711      | 11.13          | -2.34       | 8.79          | 49.41        | -40.62      | peak     |        |
| 3   | 0.0799      | 10.55          | -2.37       | 8.18          | 48.91        | -40.73      | peak     |        |
| 4   | 0.1067      | 22.98          | -2.26       | 20.72         | 47.64        | -26.92      | peak     |        |
| 5   | 0.1249      | 20.04          | -2.25       | 17.79         | 46.94        | -29.15      | peak     |        |
| 6   | 0.1500      | 20.48          | -2.24       | 18.24         | 46.13        | -27.89      | peak     |        |

Note 1:  $H_{3m} = H_{10m} + C_3$  refer to ETSI EN 300 330 Annex H.2



Frequency Range:150kHz-30MHz Emission@3m  
Vertical Polarization

Area: Wireless charging pad



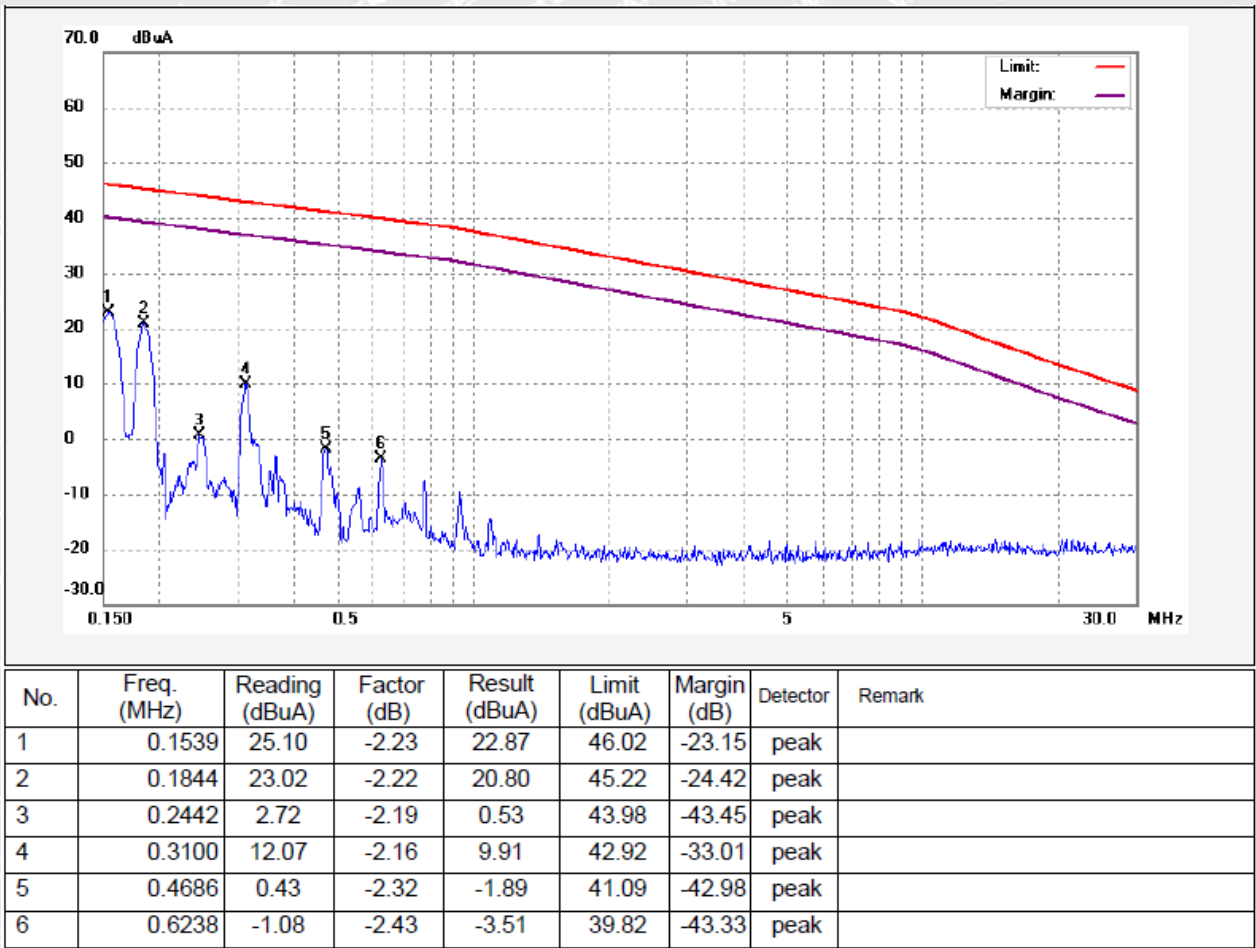
| No. | Freq. (MHz) | Reading (dBuA) | Factor (dB) | Result (dBuA) | Limit (dBuA) | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-------------|----------|--------|
| 1   | 0.1539      | 10.66          | -2.23       | 8.43          | 46.02        | -37.59      | peak     |        |
| 2   | 0.1844      | 0.06           | -2.22       | -2.16         | 45.22        | -47.38      | peak     |        |
| 3   | 0.2341      | -5.65          | -2.19       | -7.84         | 44.16        | -52.00      | peak     |        |
| 4   | 0.3100      | -1.01          | -2.16       | -3.17         | 42.92        | -46.09      | peak     |        |
| 5   | 21.2595     | -10.88         | -2.73       | -13.61        | 12.69        | -26.30      | peak     |        |
| 6   | 23.6360     | -9.18          | -2.89       | -12.07        | 11.46        | -23.53      | peak     |        |

Note 1:H<sub>3m</sub>=H<sub>10m</sub>+C<sub>3</sub> refer to ETSI EN 300 330 Annex H.2



Frequency Range:150kHz-30MHz Emission@3m  
Horizontal Polarization

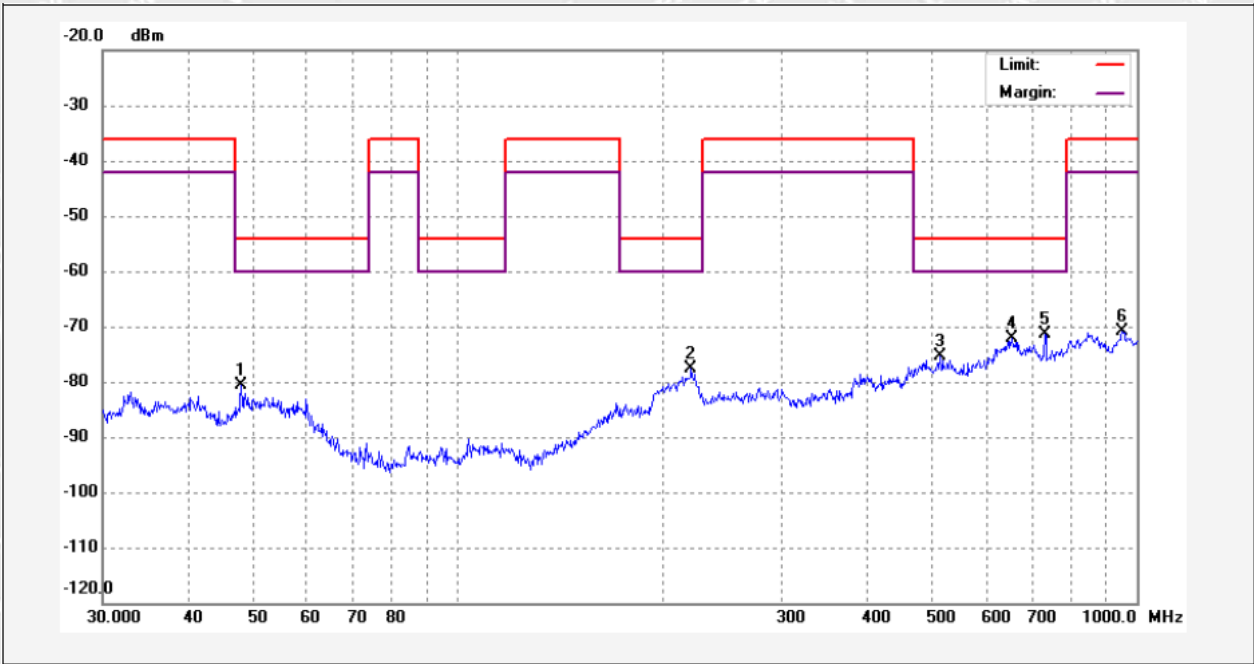
Area: Wireless charging pad



Note 1:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN 300 330 Annex H.2



Frequency Range: 30MHz-1GHz Emission For TX      Area: Wireless charging pad  
Vertical Polarization

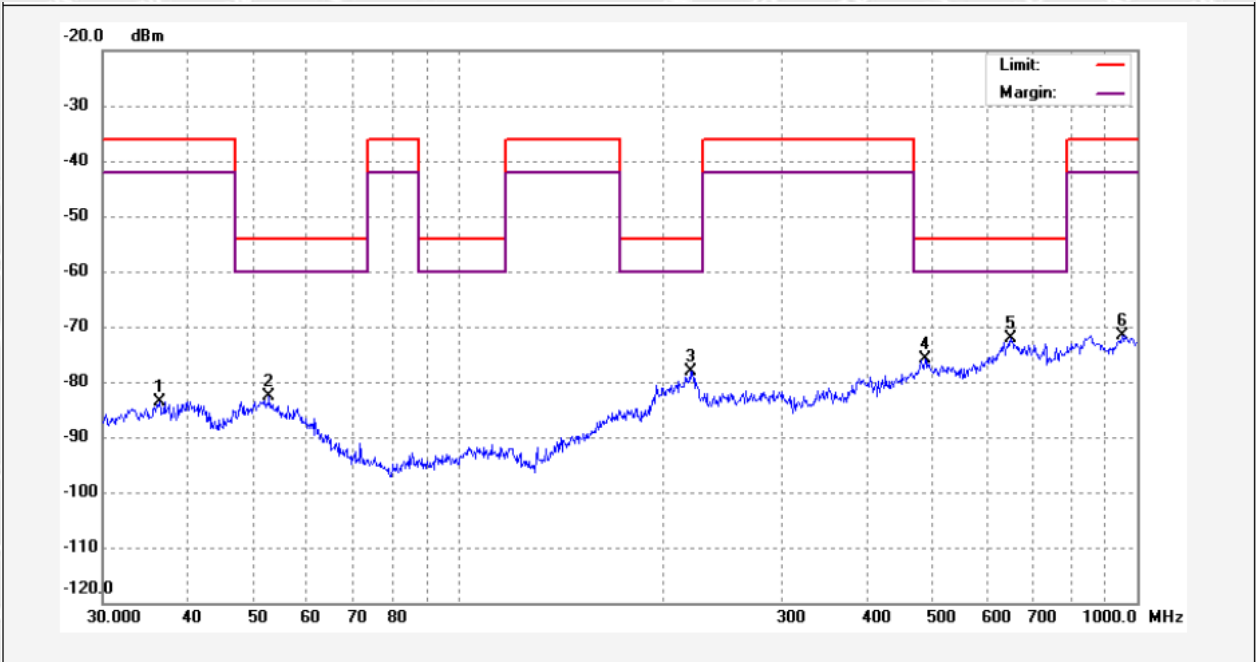


| No. | Freq. (MHz) | Reading (dBm) | Factor (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Detector | Remark |
|-----|-------------|---------------|-------------|--------------|-------------|-------------|----------|--------|
| 1   | 47.9940     | -105.24       | 24.54       | -80.70       | -54.00      | -26.70      | peak     |        |
| 2   | 220.6171    | -107.07       | 29.43       | -77.64       | -54.00      | -23.64      | peak     |        |
| 3   | 513.6331    | -105.84       | 30.39       | -75.45       | -54.00      | -21.45      | peak     |        |
| 4   | 654.2318    | -106.07       | 33.86       | -72.21       | -54.00      | -18.21      | peak     |        |
| 5   | 731.9202    | -102.79       | 31.41       | -71.38       | -54.00      | -17.38      | peak     |        |
| 6   | 952.0937    | -105.96       | 35.15       | -70.81       | -36.00      | -34.81      | peak     |        |



Frequency Range: 30MHz-1GHz Emission For TX  
Horizontal Polarization

Area: Wireless charging pad



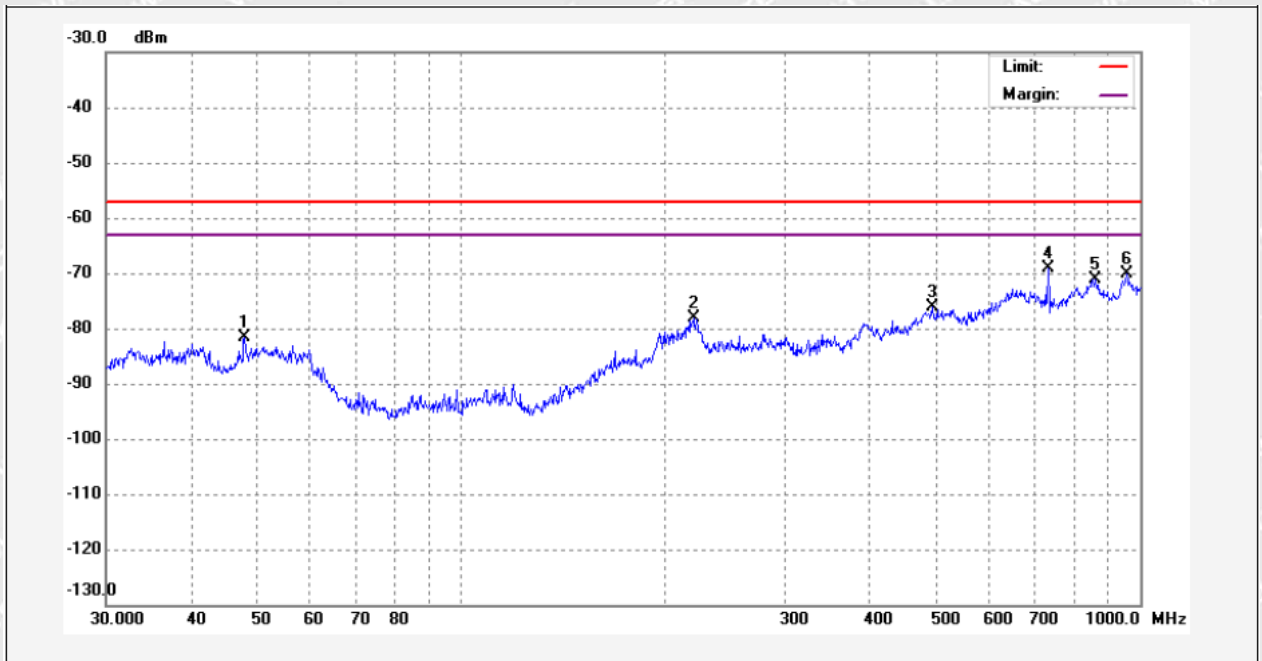
| No. | Freq. (MHz) | Reading (dBm) | Factor (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Detector | Remark |
|-----|-------------|---------------|-------------|--------------|-------------|-------------|----------|--------|
| 1   | 36.3814     | -107.73       | 24.23       | -83.50       | -36.00      | -47.50      | peak     |        |
| 2   | 52.7599     | -107.74       | 25.08       | -82.66       | -54.00      | -28.66      | peak     |        |
| 3   | 219.8448    | -107.77       | 29.69       | -78.08       | -54.00      | -24.08      | peak     |        |
| 4   | 487.3150    | -106.71       | 30.74       | -75.97       | -54.00      | -21.97      | peak     |        |
| 5   | 651.9417    | -106.05       | 33.99       | -72.06       | -54.00      | -18.06      | peak     |        |
| 6   | 952.0937    | -106.68       | 35.15       | -71.53       | -36.00      | -35.53      | peak     |        |



Frequency Range: 30MHz-1GHz Emission For RX

Area: Wireless charging pad

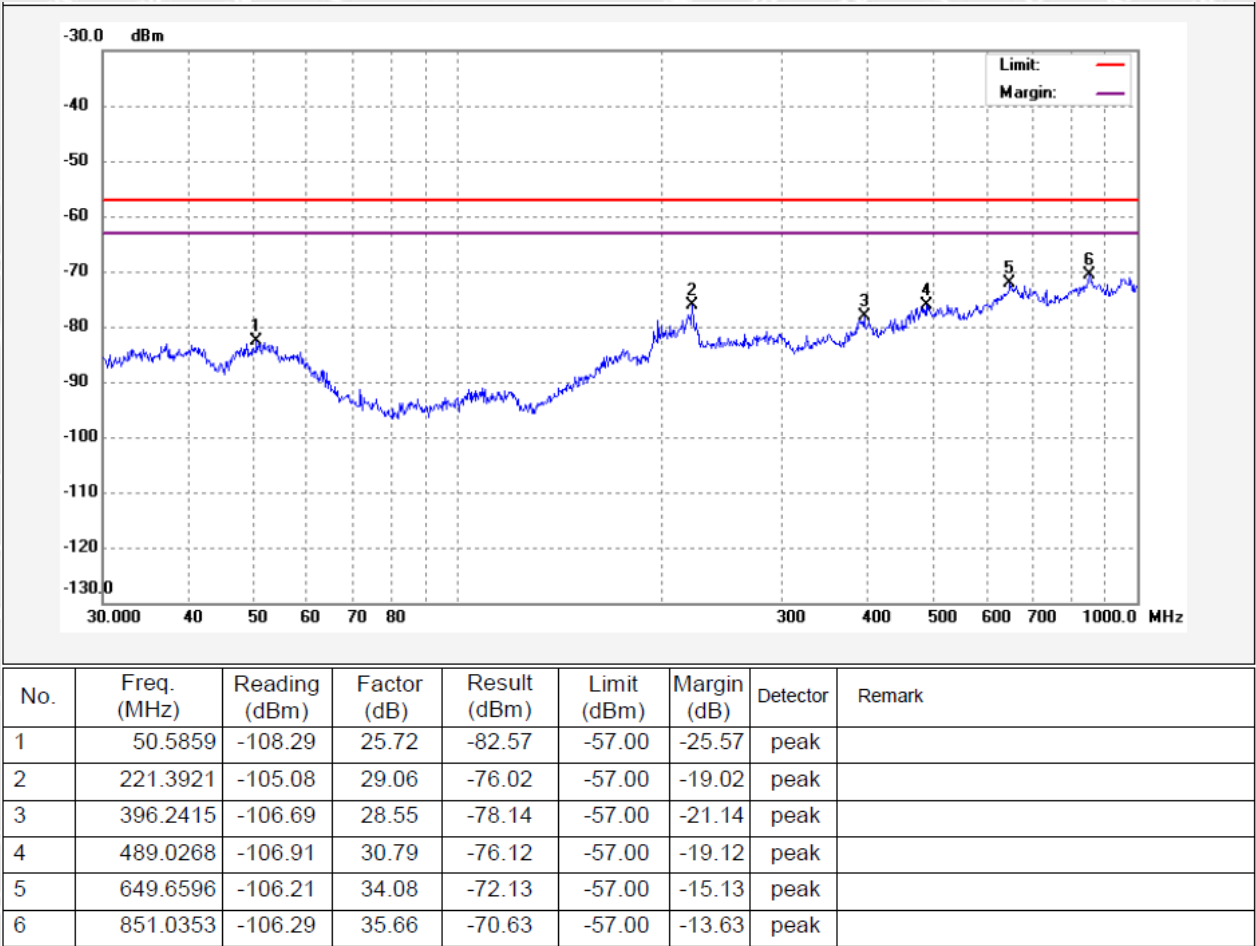
Vertical Polarization



| No. | Freq. (MHz) | Reading (dBm) | Factor (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Detector | Remark |
|-----|-------------|---------------|-------------|--------------|-------------|-------------|----------|--------|
| 1   | 47.9940     | -106.07       | 24.54       | -81.53       | -57.00      | -24.53      | peak     |        |
| 2   | 219.8449    | -107.82       | 29.69       | -78.13       | -57.00      | -21.13      | peak     |        |
| 3   | 494.1984    | -106.69       | 30.54       | -76.15       | -57.00      | -19.15      | peak     |        |
| 4   | 731.9203    | -100.54       | 31.41       | -69.13       | -57.00      | -12.13      | peak     |        |
| 5   | 857.0247    | -106.29       | 35.11       | -71.18       | -57.00      | -14.18      | peak     |        |
| 6   | 955.4381    | -105.22       | 35.01       | -70.21       | -57.00      | -13.21      | peak     |        |



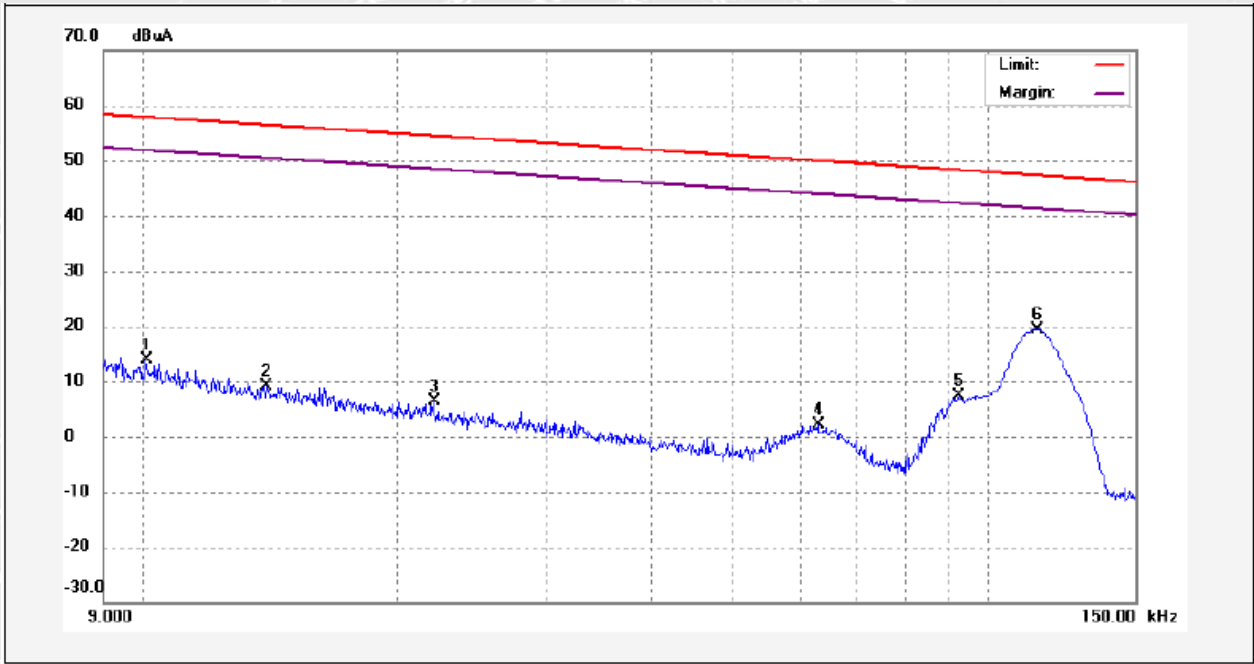
Frequency Range: 30MHz-1GHz Emission For RX      Area: Wireless charging pad  
Horizontal Polarization



Note1: Standby mode dose not produce any emission, which no emission been detected.



Frequency Range: 9kHz-150kHz Emission@3m      Area: Magnetic charging pad  
Vertical Polarization

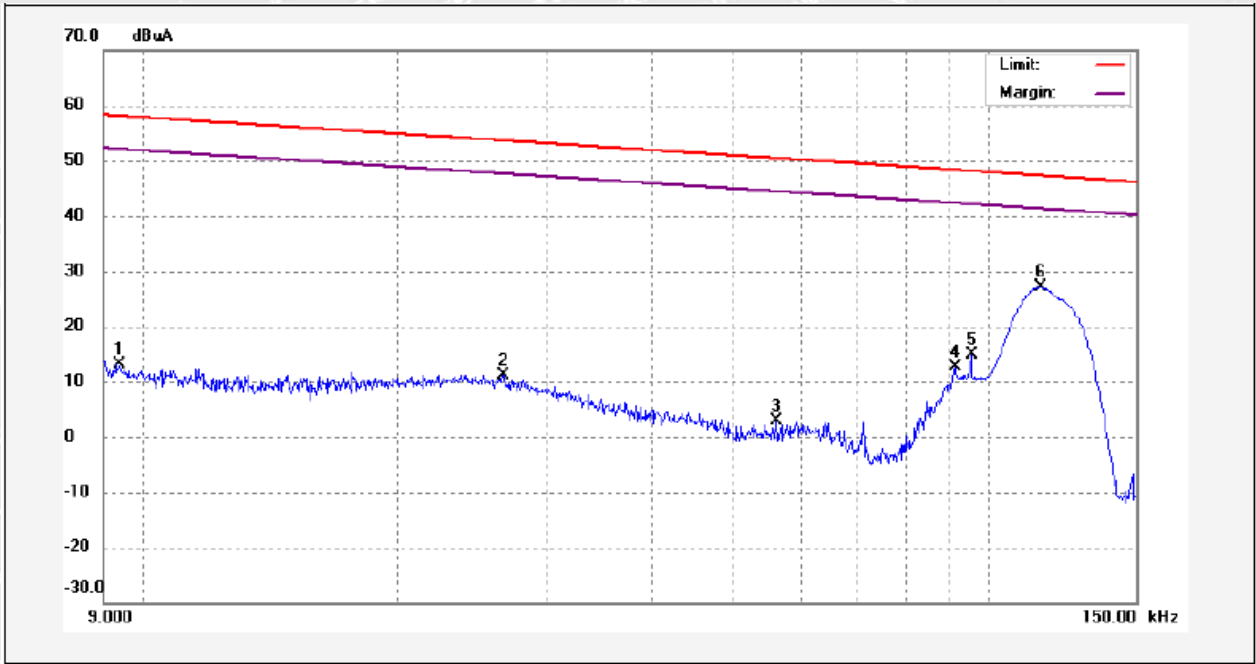


| No. | Freq. (MHz) | Reading (dBuA) | Factor (dB) | Result (dBuA) | Limit (dBuA) | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-------------|----------|--------|
| 1   | 0.0101      | 15.85          | -2.07       | 13.78         | 57.85        | -44.07      | peak     |        |
| 2   | 0.0140      | 11.18          | -2.03       | 9.15          | 56.44        | -47.29      | peak     |        |
| 3   | 0.0221      | 8.38           | -1.95       | 6.43          | 54.47        | -48.04      | peak     |        |
| 4   | 0.0631      | 4.50           | -2.31       | 2.19          | 49.93        | -47.74      | peak     |        |
| 5   | 0.0925      | 9.56           | -2.30       | 7.26          | 48.27        | -41.01      | peak     |        |
| 6   | 0.1145      | 21.65          | -2.25       | 19.40         | 47.33        | -27.93      | peak     |        |

Note 1:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN 300 330 Annex H.2



Frequency Range: 9kHz-150kHz Emission@3m      Area: Magnetic charging pad  
Horizontal Polarization



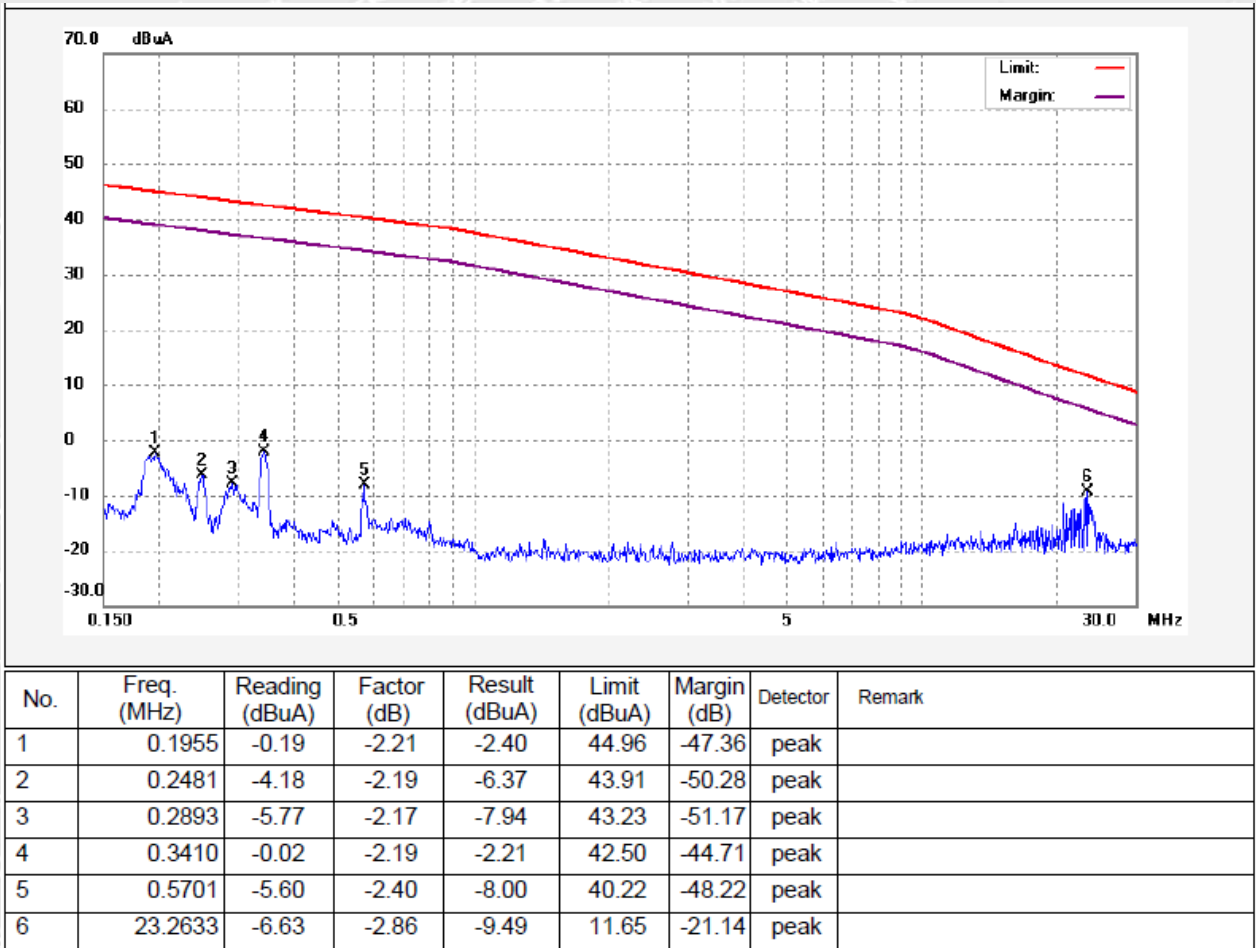
| No. | Freq. (MHz) | Reading (dBuA) | Factor (dB) | Result (dBuA) | Limit (dBuA) | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-------------|----------|--------|
| 1   | 0.0093      | 15.13          | -2.08       | 13.05         | 58.16        | -45.11      | peak     |        |
| 2   | 0.0266      | 13.00          | -1.91       | 11.09         | 53.64        | -42.55      | peak     |        |
| 3   | 0.0561      | 5.08           | -2.29       | 2.79          | 50.43        | -47.64      | peak     |        |
| 4   | 0.0914      | 14.90          | -2.30       | 12.60         | 48.33        | -35.73      | peak     |        |
| 5   | 0.0956      | 17.04          | -2.28       | 14.76         | 48.13        | -33.37      | peak     |        |
| 6   | 0.1154      | 29.29          | -2.25       | 27.04         | 47.29        | -20.25      | peak     |        |

Note 1:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN 300 330 Annex H.2



Frequency Range:150kHz-30MHz Emission@3m  
Vertical Polarization

Area: Magnetic charging pad

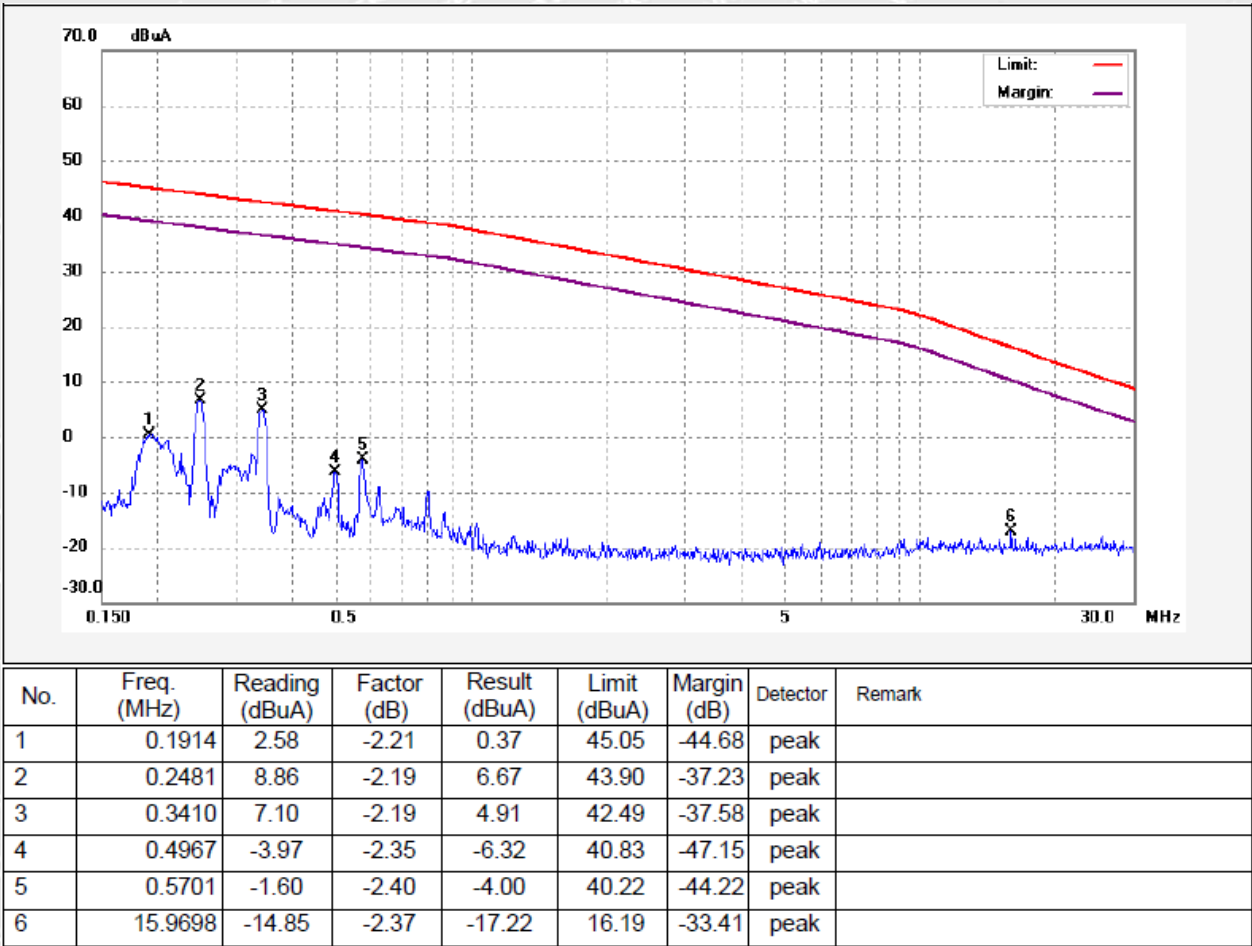


Note 1:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN 300 330 Annex H.2



Frequency Range:150kHz-30MHz Emission@3m  
Horizontal Polarization

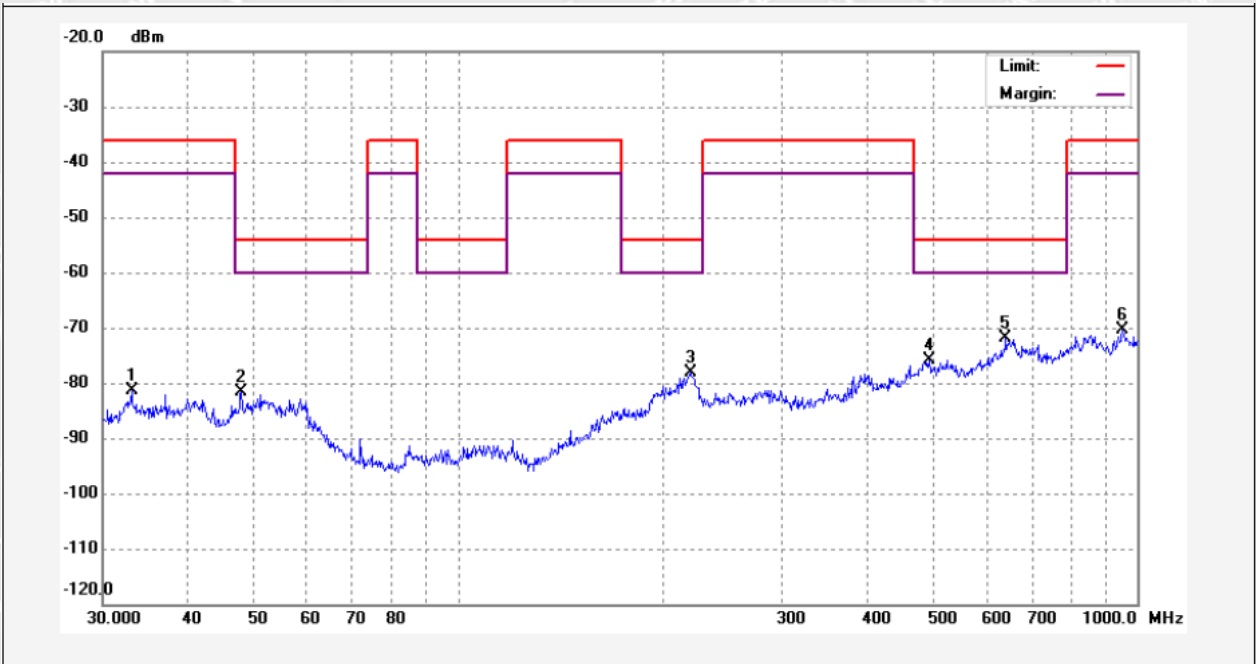
Area: Magnetic charging pad



Note 1:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN 300 330 Annex H.2



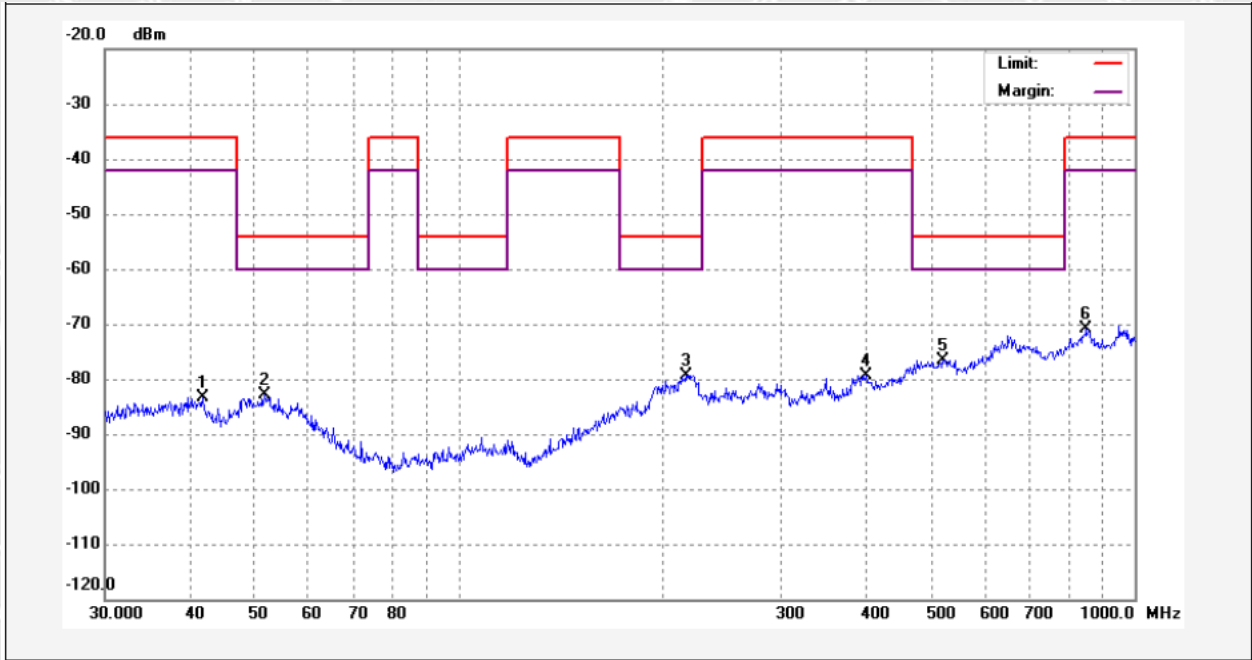
**Frequency Range:** 30MHz-1GHz Emission For TX      **Area:** Magnetic charging pad  
**Vertical Polarization**



| No. | Freq. (MHz) | Reading (dBm) | Factor (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Detector | Remark |
|-----|-------------|---------------|-------------|--------------|-------------|-------------|----------|--------|
| 1   | 33.0949     | -104.94       | 23.69       | -81.25       | -36.00      | -45.25      | peak     |        |
| 2   | 47.9940     | -106.13       | 24.54       | -81.59       | -54.00      | -27.59      | peak     |        |
| 3   | 219.8448    | -107.84       | 29.69       | -78.15       | -54.00      | -24.15      | peak     |        |
| 4   | 494.1984    | -106.33       | 30.54       | -75.79       | -54.00      | -21.79      | peak     |        |
| 5   | 640.6110    | -105.41       | 33.51       | -71.90       | -54.00      | -17.90      | peak     |        |
| 6   | 952.0937    | -105.60       | 35.15       | -70.45       | -36.00      | -34.45      | peak     |        |



Frequency Range: 30MHz-1GHz Emission For TX      Area: Magnetic charging pad  
Horizontal Polarization



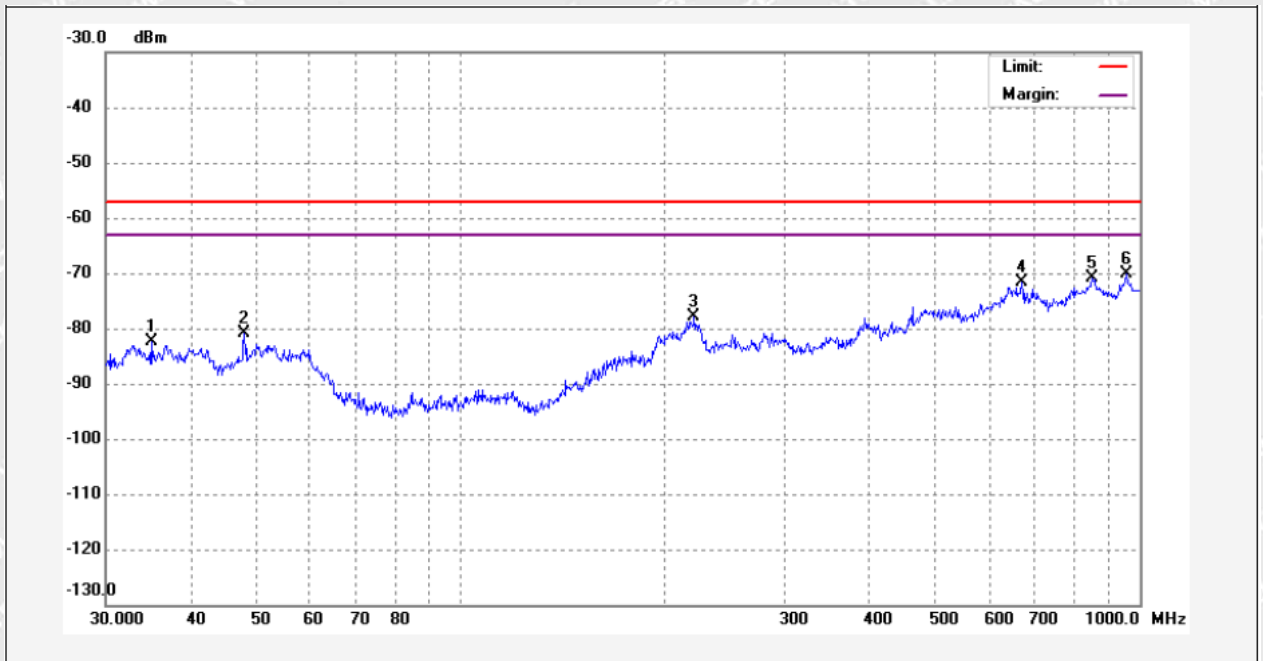
| No. | Freq. (MHz) | Reading (dBm) | Factor (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Detector | Remark |
|-----|-------------|---------------|-------------|--------------|-------------|-------------|----------|--------|
| 1   | 41.8596     | -107.64       | 24.35       | -83.29       | -36.00      | -47.29      | peak     |        |
| 2   | 51.6616     | -108.33       | 25.40       | -82.93       | -54.00      | -28.93      | peak     |        |
| 3   | 216.7828    | -108.26       | 29.01       | -79.25       | -54.00      | -25.25      | peak     |        |
| 4   | 400.4319    | -107.80       | 28.52       | -79.28       | -36.00      | -43.28      | peak     |        |
| 5   | 520.8882    | -107.03       | 30.52       | -76.51       | -54.00      | -22.51      | peak     |        |
| 6   | 848.0563    | -106.55       | 35.63       | -70.92       | -36.00      | -34.92      | peak     |        |



Frequency Range: 30MHz-1GHz Emission For RX

Area: Magnetic charging pad

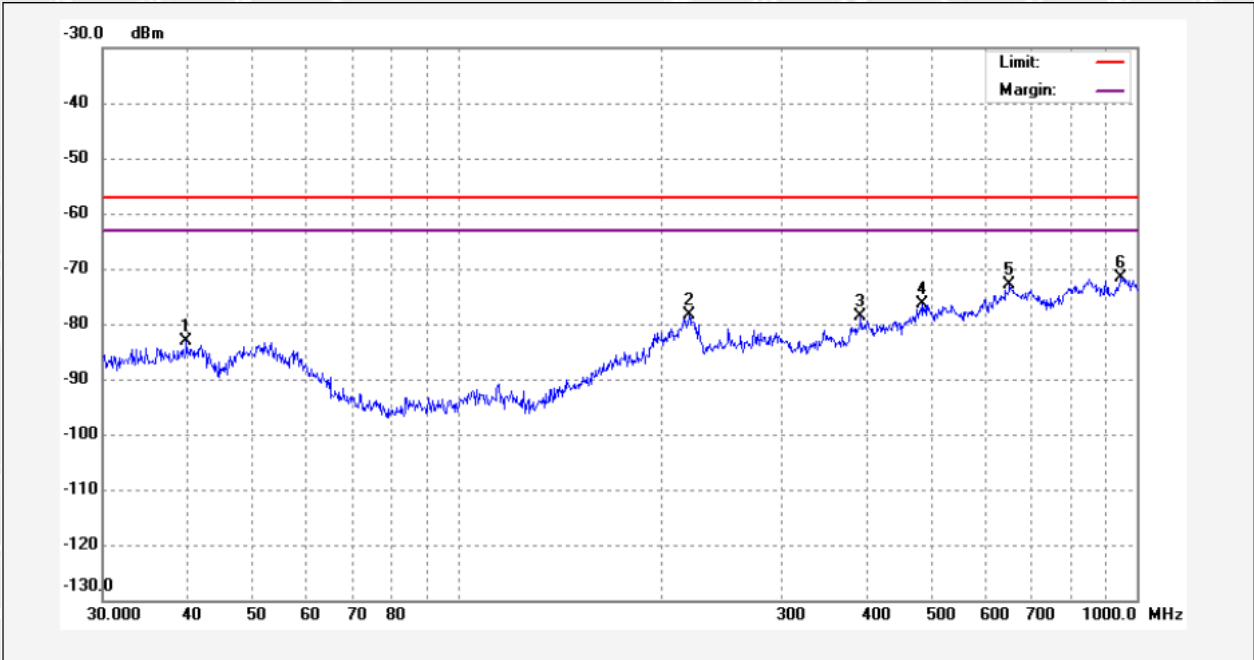
Vertical Polarization



| No. | Freq. (MHz) | Reading (dBm) | Factor (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Detector | Remark |
|-----|-------------|---------------|-------------|--------------|-------------|-------------|----------|--------|
| 1   | 35.0048     | -106.69       | 24.23       | -82.46       | -57.00      | -25.46      | peak     |        |
| 2   | 47.9940     | -105.47       | 24.54       | -80.93       | -57.00      | -23.93      | peak     |        |
| 3   | 220.6171    | -107.41       | 29.43       | -77.98       | -57.00      | -20.98      | peak     |        |
| 4   | 670.4892    | -104.65       | 32.96       | -71.69       | -57.00      | -14.69      | peak     |        |
| 5   | 851.0353    | -106.48       | 35.66       | -70.82       | -57.00      | -13.82      | peak     |        |
| 6   | 955.4381    | -105.16       | 35.01       | -70.15       | -57.00      | -13.15      | peak     |        |



**Frequency Range: 30MHz-1GHz Emission For RX      Area: Magnetic charging pad**  
**Horizontal Polarization**



| No. | Freq. (MHz) | Reading (dBm) | Factor (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Detector | Remark |
|-----|-------------|---------------|-------------|--------------|-------------|-------------|----------|--------|
| 1   | 39.8542     | -108.52       | 25.36       | -83.16       | -57.00      | -26.16      | peak     |        |
| 2   | 219.0753    | -107.93       | 29.51       | -78.42       | -57.00      | -21.42      | peak     |        |
| 3   | 392.0950    | -107.25       | 28.51       | -78.74       | -57.00      | -21.74      | peak     |        |
| 4   | 483.9094    | -106.99       | 30.66       | -76.33       | -57.00      | -19.33      | peak     |        |
| 5   | 649.6596    | -107.06       | 34.08       | -72.98       | -57.00      | -15.98      | peak     |        |
| 6   | 948.7609    | -106.68       | 35.13       | -71.55       | -57.00      | -14.55      | peak     |        |

Note1: Standby mode dose not produce any emission, which no emission been detected.



## 9 Transmitter Out of Band(OOB) Emissions

### 9.1 Standard Applicable

The WPT system out of band emissions are to be considered in frequency ranges defined in Figure 4 and Figure 5 (between  $f_{SL}$  and  $f_L$  and between  $f_H$  and  $f_{SH}$ ).

Limit

The OOB limits are visualized in Figures 4 and 5; they are descending from the intentional limits from Table 3 at  $f_H/f_L$  with 10 dB/decade.

### 9.2 Test Procedure

Please refer to ETSI EN 303 417 subclause 6.2.2 for the measurement method

### 9.3 Test Condition

Operating Mode ..... : TX mode

Test Environment ..... : Normal Condition

Test Voltage ..... : DC 9V

Ambient temperature ..... : 25°C

Humidity ..... : 54%RH

Atmospheric Pressure ..... : 101.2kPa

### 9.4 Test Result

For Wireless charging pad

| No. | Frequency                 | Result@3m | $C_3$ | Result@10 | Limit@10 | Margin | Remark |
|-----|---------------------------|-----------|-------|-----------|----------|--------|--------|
|     | (MHz)                     | (dBuA/m)  | (dB)  | (dBuA/m)  | (dBuA/m) | (dB)   |        |
| 1   | $F_{cL}-2.5 \times OBW_1$ | 13.14     | 31.2  | -18.06    | -5       | -13.06 | peak   |
| 2   | $F_L$                     | 16.32     | 31.2  | -14.88    | -5       | -9.88  | peak   |
| 3   | $F_H$                     | 16.28     | 31.2  | -14.92    | -5       | -9.92  | peak   |
| 4   | $F_{cH}+2.5 \times OBW_3$ | 13.38     | 31.2  | -17.82    | -5       | -12.82 | peak   |

Note 1:  $H_{3m}=H_{10m}+C_3$  refer to ETSI EN300 330 Annex H.2



## For Magnetic charging pad

| No. | Frequency                               | Result@3m | C <sub>3</sub> | Result@10 | Limit@10 | Margin | Remark |
|-----|-----------------------------------------|-----------|----------------|-----------|----------|--------|--------|
|     | (MHz)                                   | (dBuA/m)  | (dB)           | (dBuA/m)  | (dBuA/m) | (dB)   |        |
| 1   | F <sub>CL</sub> -2.5 × OBW <sub>1</sub> | 22.51     | 31.2           | -8.69     | -5       | -3.69  | peak   |
| 2   | F <sub>L</sub>                          | 26.52     | 31.2           | -4.68     | -5       | 0.32   | peak   |
| 3   | F <sub>H</sub>                          | 26.37     | 31.2           | -4.83     | -5       | 0.17   | peak   |
| 4   | F <sub>CH</sub> +2.5 × OBW <sub>3</sub> | 22.39     | 31.2           | -8.81     | -5       | -3.81  | peak   |

Note 1: H<sub>3m</sub>=H<sub>10m</sub>+C<sub>3</sub> refer to ETSI EN300 330 Annex H.2

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## 10 Receiver Blocking

### 10.1 Standard Applicable

This requirement applies to all WPT systems operation in Mode 1, Mode 2 and Mode 3.

Blocking is a measure of the capability of the receiver to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted input signal at any frequencies other than those of the receiver spurious responses.

The test shall be performed in the relevant operational modes (see clause 4.2.3).

The wanted performance criteria from clause 4.2.2 shall be used as criterion for the receiver blocking tests.

Limit

Table 6: Receiver blocking limits

|                                        | In-band signal                                                  | OOB signal                 | Remote-band signal                   |
|----------------------------------------|-----------------------------------------------------------------|----------------------------|--------------------------------------|
| Frequency                              | Centre frequency ( $f_c$ ) of the WPT system (see clause 4.3.3) | $f = f_c \pm F$ (see note) | $f = f_c \pm 10 \times F$ (see note) |
| Signal level field strength at the EUT | 72 dB $\mu$ A/m                                                 | 72 dB $\mu$ A/m            | 82 dB $\mu$ A/m                      |
| NOTE: F = OFR see clause 4.3.3.        |                                                                 |                            |                                      |

The EUT shall achieve the wanted performance criterion, see clause 4.2.2, in the presence of the blocking signal.

### 10.2 Test Procedure

Please refer to ETSI EN 303 417 Sub-clause 6.2.3 for the measurement method

### 10.3 Test Condition

Operating Mode ..... : RX mode

Test Environment ..... : Normal Condition

Test Voltage ..... : DC 9V

Ambient temperature ..... : 25°C

Humidity ..... : 54%RH

Atmospheric Pressure ..... : 101.2kPa



## 10.4 Test Result

### For Wireless charging pad

| Test Frequency | Blocking Signal(dBuA/m) | Performance Criterion              | Result |
|----------------|-------------------------|------------------------------------|--------|
| fc -10 ×OFR    | 82                      | without degradation of performance | Pass   |
| Fc+OFR         | 72                      | without degradation of performance | Pass   |
| Fc             | 72                      | without degradation of performance | Pass   |
| Fc+OFR         | 72                      | without degradation of performance | Pass   |
| fc +10 ×OFR    | 82                      | without degradation of performance | Pass   |

### For Magnetic charging pad

| Test Frequency | Blocking Signal(dBuA/m) | Performance Criterion              | Result |
|----------------|-------------------------|------------------------------------|--------|
| fc -10 ×OFR    | 82                      | without degradation of performance | Pass   |
| Fc+OFR         | 72                      | without degradation of performance | Pass   |
| Fc             | 72                      | without degradation of performance | Pass   |
| Fc+OFR         | 72                      | without degradation of performance | Pass   |
| fc +10 ×OFR    | 82                      | without degradation of performance | Pass   |



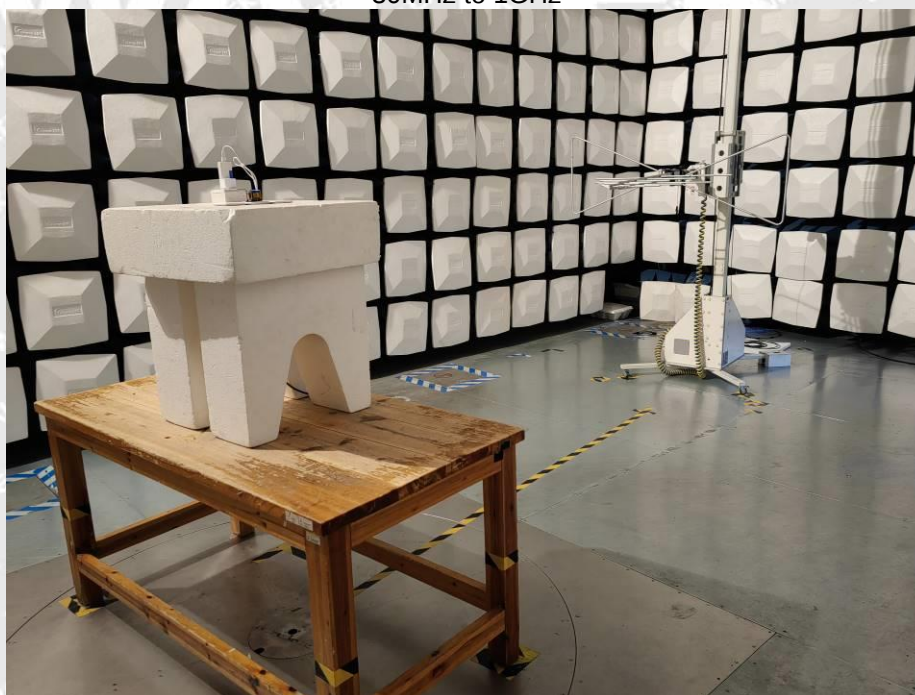
## 11 Photographs – Test Setup

### 11.1 Photograph – Spurious Emissions Test Setup

9kHz to 30MHz



30MHz to 1GHz





## 12 Photographs – EUT Constructional Details

Please refer to “ANNEX”.

=====End of Report=====

# WALTEK



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

**Reference No.**..... : WTF24F11264300W003  
**Applicant**..... : Mid Ocean Brands B.V.  
**Address**..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong  
**Manufacturer** ..... : 114538  
**Address**..... : ---  
**Product Name**..... : Foldable charging station  
**Model No.**..... : MO2145  
**Test specification**..... : EN IEC 62311:2020  
EN 50665:2017  
**Date of Receipt sample** .... : 2024-11-18  
**Date of Test** ..... : 2024-11-27  
**Date of Issue**..... : 2024-11-29  
**Test Report Form No.** ..... : WEW-62311A-01B  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

**Prepared By:**

**Waltek Testing Group (Foshan) Co., Ltd.**

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E-mail:info@waltek.com.cn

Tested by:

Approved by:

Roy Hong

Danny Zhou



1 Test Summary

| HEALTH      |                                    |                  |        |
|-------------|------------------------------------|------------------|--------|
| Test        | Test Method                        | Class / Severity | Result |
| RF Exposure | EN IEC 62311:2020<br>EN 50665:2017 | -                | Pass   |

Remark:

Pass      Test item meets the requirement

N/A      Not Applicable

WALTEK



## 2 Contents

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# WALTEK



### 3 General Information

#### 3.1 General Description of E.U.T.

**Product Name** ..... : Foldable charging station

**Model No.** ..... : MO2145

**Remark** ..... : ---

**Rating** ..... : Input: DC 9V/3A, DC 9V/2.22A, DC 5V/2A  
Output: DC 5V/0.3A, DC 5V/1A, DC 9V/1.66A  
Wireless output power:  
Magnetic charging pad: Max 15W  
Apple Watch only: Max 1.5W  
Wireless charging pad: Max 5W

**Battery Capacity** ..... : ---

**Adapter Model** ..... : ---

#### 3.2 Technical Specification

##### For Wireless charging pad and magnetic charging pad

**Frequency Bands** ..... : 110-205kHz (for Magnetic charging pad and Wireless charging pad)

**Radiated H-Field** ..... : 17.79 dBuA/m(@3m) for Wireless charging pad  
27.04 dBuA/m(@3m) for Magnetic charging pad

**Antenna Type** ..... : Coil Antenna

**Antenna Gain** ..... : 0dBi

##### For Apple watch charging pad

**Permitted Range of Operating Frequency** ..... : 148.5 kHz to 5MHz  
(Manufacturer's declared frequency of product operation: 325kHz – 330kHz for the apple watch charging pad)

**Operating Frequency** ..... : 326.5kHz

**Radiated H-Field** ..... : 11.43dBuA/m(@3m) for middle apple watch charging pad

**Antenna installation** ..... : Coil Antenna

**Antenna Gain** ..... : 0dBi

#### 3.3 Standards Applicable

The tests were performed according to following standards:

|                   |                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN IEC 62311:2020 | Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)                       |
| EN 50665:2017     | Generic standard for assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz). |



#### 4 Health Requirements

According to Council Recommendation: the criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation.

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz, unperturbed RMS values)

| Frequency range | E-field strength (V/m) | H-field strength (A/m)  | B-field (μT)          | Equivalent plane wave power density Seq (W/m <sup>2</sup> ) |
|-----------------|------------------------|-------------------------|-----------------------|-------------------------------------------------------------|
| 0-1 Hz          | -                      | $3.2 \times 10^4$       | $4 \times 10^4$       | -                                                           |
| 1-8 Hz          | 10000                  | $3.2 \times 10^4 / f^2$ | $4 \times 10^4 / f^2$ | -                                                           |
| 8-25 Hz         | 10000                  | $4000 / f$              | $5000 / f$            | -                                                           |
| 0.025-0.8 kHz   | $250 / f$              | $4 / f$                 | $5 / f$               | -                                                           |
| 0.8-3 kHz       | $250 / f$              | 5                       | 6.25                  | -                                                           |
| 3-150 kHz       | 87                     | 5                       | 6.25                  | -                                                           |
| 0.15-1 MHz      | 87                     | $0.73 / f$              | $0.92 / f$            | -                                                           |
| 1-10 MHz        | $87 / f^{1/2}$         | $0.73 / f$              | $0.92 / f$            | -                                                           |
| 10-400 MHz      | 28                     | 0.073                   | 0.095                 | 2                                                           |
| 400-2000 MHz    | $1.375 f^{1/2}$        | $0.0037 f^{1/2}$        | $0.0046 f^{1/2}$      | $f / 200$                                                   |
| 2-300 GHz       | 61                     | 0.16                    | 0.2                   | 10                                                          |

Note:

1. f as indicated in the frequency range column.
2. For frequencies between 100 kHz and 10 GHz, Seq, E2, H2 and B2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10 GHz, Seq, E2, H2 and B2 are to be averaged over any 68 /  $f^{1.05}$  minute period (f in GHz).
4. No E-field value is provided for frequencies  $< 1$  Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.



#### 4.1 RF Exposure Evaluations

$$E = \sqrt{30PG_{(\theta,\phi)}} / r$$

Antenna gain in numeric (G):

10<sup>^</sup> (Antenna gain in dBi /10)

Distance from EUT to Human (r):

0.20 m

#### 4.2 RF Exposure test procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

#### 4.3 Test Result of RF Exposure Evaluation

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user. Warning statement to the user to keeping at least 20 cm separation distance and the prohibition of operating to a person has been printed on the user's manual. So, this product under normal use is located on electromagnetic far field between the human body.

| Charging Area                                                                                                                                                                               | Frequency (kHz) | Radiated H-Field (dBμA/m) | Radiated H-Field (A/m) | Limit (A/m) | Result |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------|------------------------|-------------|--------|
| Wireless charging pad                                                                                                                                                                       | 120             | 17.79                     | 0.0000077535           | 5           | Pass   |
| Apple watch charging pad                                                                                                                                                                    | 326.5           | 11.43                     | 0.0000037282           | 2.24        | Pass   |
| Magnetic charging pad                                                                                                                                                                       | 120             | 27.04                     | 0.0000224905           | 5           | Pass   |
| Remark:<br>1) For details of Radiated H-Field refer to report No. WTF24F11264300W001 and WTF24F11264300W002 .<br>2) Radiated H-Field (A/m)= 10 <sup>^</sup> [(dBuA/m)/20]/10 <sup>^</sup> 6 |                 |                           |                        |             |        |

Since average output power at worst case is: 0.0000224905A/m which cannot exceed the exempt condition, 5A/m specified in EN IEC 62311. It is deemed to full fit the requirement of RF exposure basic restriction specified in EC Council Recommendation (1999/519/EC).



## 5 Photographs – EUT Constructional Details

Please refer to “ANNEX”.

=====End of Report=====

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