



# TEST REPORT

**Reference No.**..... : WTF21X04042129R1W-1  
**Manufacturer**..... : Mid Ocean Brands B.V.  
**Address**..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong  
**Product**..... : Round Magnetic Wireless Charger, Bamboo Magnetic Wireless Charger, Magnetic wireless charger with stand  
**Test Model**..... : MO6253, MO6266, MO6369  
**Standards**..... : **ETSI EN 303 417 V1.1.1 (2017-09)**  
**Date of Receipt sample**.... : Apr. 30, 2021  
**Date of Test**..... : Apr. 30, 2021 to May. 24, 2021  
**Date of Issue**..... : Oct. 29, 2021  
**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 compiler and approver.

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## Report version

| Version No. | Date of issue | Description  |
|-------------|---------------|--|
| Rev.00      | May. 24, 2021 | Original report WTF21X04042129W-1.   |
| Rev.01      | Oct. 29, 2021 | Refer the old report WTF21X04042129W-1, updated the EUT appearance photos, model name, but the circuit and the electronic construction do not change, declared by the manufacturer. So the test data from the original report. |
| /           | /             | /  |

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## 1. GENERAL INFORMATION

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### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Manufacturer: Mid Ocean Brands B.V.  
Address of manufacturer: 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan,  
Kowloon, Hong Kong

| General Description of EUT  |   |
|---|---|
| Product Name:   | Round Magnetic Wireless Charger, Bamboo Magnetic Wireless Charger, Magnetic wireless charger with stand |
| Trade Name:   | /   |
| Model No.:  | MO6253  |
| Adding Model(s):  | MO6266, MO6369  |
| Rated Voltage:  | AC230V; Adapter DC5V/9V   |
| Software Version:   | leader 2021.03  |
| Hardware Version:   | wirelesscharging-AB0283   |
| <i>Note: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model MO6253, but the circuit and the electronic construction do not change, declared by the manufacturer.</i> |   |

| Technical Characteristics of EUT |                   |
|----------------------------------|-------------------|
| Frequency Range:                 | 110-205kHz        |
| Radiated H-Field:                | 31.36dBuA/m (@3m) |
| Type of Antenna:                 | Coil Antenna      |



➤ 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. 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. 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 the largest communication distance. The test set-up as described in clause 6.1.3 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>Wanted performance criteria test (RX test) (clause 4.4) |
| Mode3: Communication alignment   | 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.   | 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) |



## 1.2 Test Standards

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, 6 765 - 6 795 kHz ranges; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the immunity should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with ETSI EN 300330,

The equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.

The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

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## 1.4 EUT Setup and Test Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, the EUT was operated in the engineering mode to fix the Tx/Rx frequency that was for the purpose of the measurements, more detailed description as follows:

| Test Mode List |                 |  |
|----------------|-----------------|--|
| Test Mode      | Description     | Remark   |
| TM1            | WPT<br>(127KHz) | TR&CR for EMS testing<br>(Wireless Output:5W)  |
| TM2            | WPT<br>(127KHz) | TR&CR for EMS testing<br>(Wireless Output:10W) |

| Test Conditions    |           |
|--------------------|-----------|
| Temperature:       | 22 ℃      |
| Relative humidity: | 53 %.     |
| ATM Pressure:      | 1019 mbar |

| EUT Cable List and Details |            |                     |                        |
|----------------------------|------------|---------------------|------------------------|
| Cable Description          | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| USB Cable                  | 1.0        | Unshielded          | Without Core           |

| Special Cable List and Details |            |                     |                        |
|--------------------------------|------------|---------------------|------------------------|
| Cable Description              | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| /                              | /          | /                   | /                      |

| Auxiliary Equipment List and Details |              |           |               |
|--------------------------------------|--------------|-----------|---------------|
| Description                          | Manufacturer | Model     | Serial Number |
| Adapter                              | Xiaomi       | MDY-08-ES | /             |



### 1.5 Measurement Uncertainty

| Measurement uncertainty                               |                               |      |
|---|-------------------------------|------|
| Parameter   | Uncertainty                   | Note |
| Radiated H-field                                      | $\pm 3.0\text{dB}$            | (1)  |
| Permitted range of operating frequency                | 10Hz                          | (1)  |
| Permitted frequency range of the modulation bandwidth | $\pm 10\text{Hz}$             | (1)  |
| Radiated spurious emissions                           | 0.9-30MHz $\pm 5.2\text{dB}$  | (1)  |
|   | 30-200MHz $\pm 4.52\text{dB}$ | (1)  |
|   | 0.2-1GHz $\pm 5.56\text{dB}$  | (1)  |
|   | 1-6GHz $\pm 3.84\text{dB}$    | (1)  |
|   | 6-18GHz $\pm 3.92\text{dB}$   | (1)  |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

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## 1.6 Test Equipment List and Details

| Description                          | Manufacturer           | Model       | Serial Number | Cal Date   | Due Date   |
|--------------------------------------|------------------------|-------------|---------------|------------|------------|
| Spectrum Analyzer                    | Agilent                | N9020A      | US47140102    | 2021-03-27 | 2022-03-26 |
| Signal Generator                     | Agilent                | 83752A      | 3610A01453    | 2021-03-27 | 2022-03-26 |
| Vector Signal Generator              | Agilent                | N5182A      | MY47070202    | 2021-03-27 | 2022-03-26 |
| Spectrum Analyzer                    | Agilent                | E4407B      | MY41440400    | 2021-04-27 | 2022-04-26 |
| Spectrum Analyzer                    | Rohde & Schwarz        | FSP30       | 836079/035    | 2021-03-27 | 2022-03-26 |
| Spectrum Analyzer                    | Rohde & Schwarz        | FSP40       | 100612        | 2021-03-27 | 2022-03-26 |
| EMI Test Receiver                    | Rohde & Schwarz        | ESVB        | 825471/005    | 2021-04-12 | 2022-04-11 |
| Amplifier                            | Agilent                | 8447F       | 3113A06717    | 2021-04-12 | 2022-04-11 |
| Amplifier                            | C&D                    | PAP-1G18    | 2002          | 2021-04-12 | 2022-04-11 |
| Trilog Broadband Antenna             | SCHWARZBECK            | VULB9163    | 9163-333      | 2021-03-20 | 2023-03-19 |
| Horn Antenna                         | ETS                    | 3117        | 00086197      | 2021-03-19 | 2023-03-18 |
| Horn Antenna                         | Schwarzbeck            | BBHA 9170   | BBHA9170582   | 2021-03-19 | 2023-03-18 |
| Pre-amplifier                        | Direction Systems Inc. | PAP-2640    | 14145-14153   | 2021-04-27 | 2022-04-26 |
| Loop Antenna                         | Schwarz beck           | FMZB 1516   | 9773          | 2021-03-19 | 2023-03-18 |
| Communication Tester                 | HP                     | 8921A       | /             | 2021-04-12 | 2022-04-11 |
| Temperature&Humidity Chamber         | /                      | KTHC-415TBS | /             | 2020-12-26 | 2021-12-25 |
| Universal Radio Communication Tester | Rohde & Schwarz        | CMW500      | 148650        | 2021-03-27 | 2022-03-26 |

### Software List

| Description                            | Manufacturer | Model  | Version |
|--|--------------|--------|---------|
| EMI Test Software (Radiated Emission)* | Farad        | EZ-EMC | RA-03A1 |

\*Remark: indicates software version used in the compliance certification testing



## 2. SUMMARY OF TEST RESULTS

| Standards   | Reference | Description of Test Item                 | Result |
|---|-----------|--|--------|
| ETSI EN 303 417   | 4.3.2     | Permitted range of operating frequencies | Pass   |
|   | 4.3.3     | Operating frequency ranges               | Pass   |
|   | 4.3.4     | H-field requirements                     | Pass   |
|   | 4.3.5     | Transmitter spurious emissions           | Pass   |
|   | 4.3.6     | Transmitter out of band (OOB) emissions  | Pass   |
|   | 4.3.7     | WPT system unwanted conducted emissions  | N/A    |
|   | 4.4.2     | Receiver blocking                        | Pass   |
| <p>Pass: The EUT complies with the essential requirements in the standard<br/>           Fail: The EUT does not comply with the essential requirements in the standard<br/>           N/A: not applicable</p> |           |  |        |

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### 3. PERMITTED RANGE OF OPERATING FREQUENCY

#### 3.1 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.

#### 3.2 Test Procedure

Please refer to ETSI EN 303 417 subclause 6.2.2

#### 3.3 Summary of Test Results

| 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   |

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## 4. OPERATING FREQUENCY RANGES

### 4.1 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.

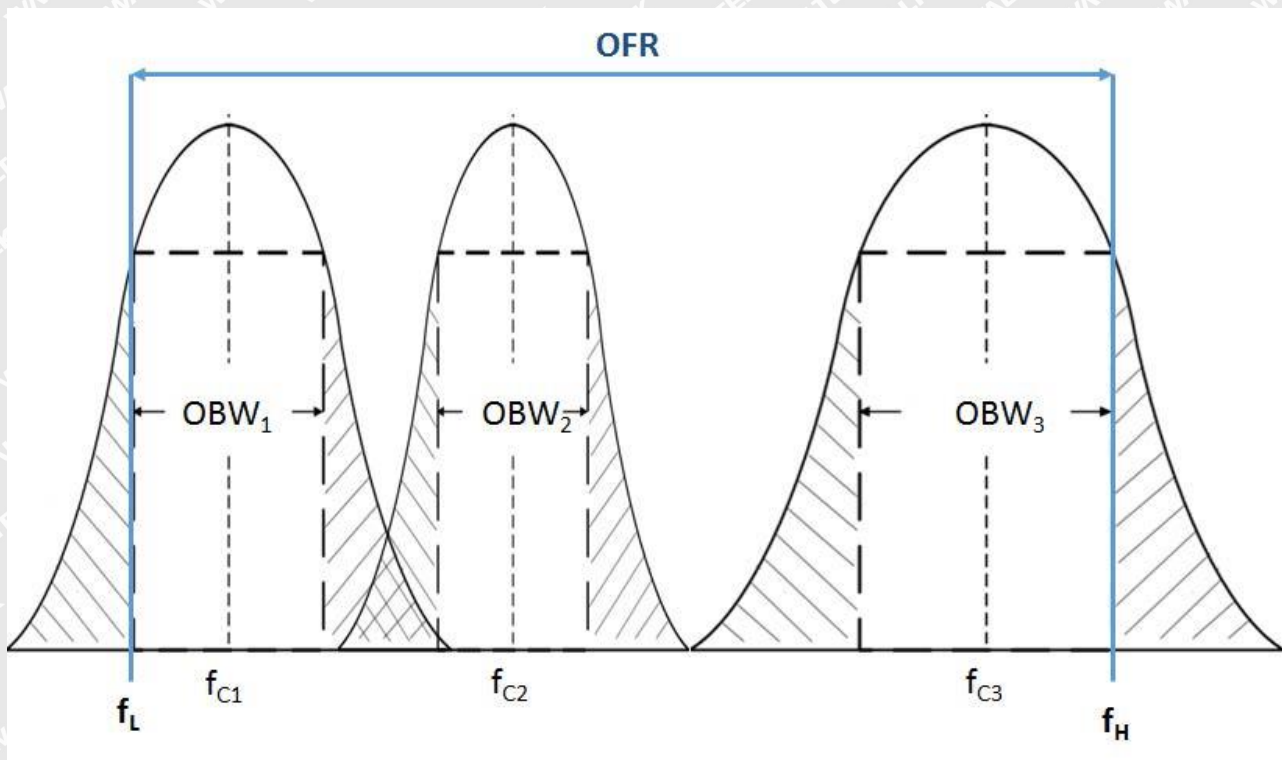


Figure 2: OFR of a multi - frequency WPT system within one frequency range of Table 2 and within one WPT system cycle time

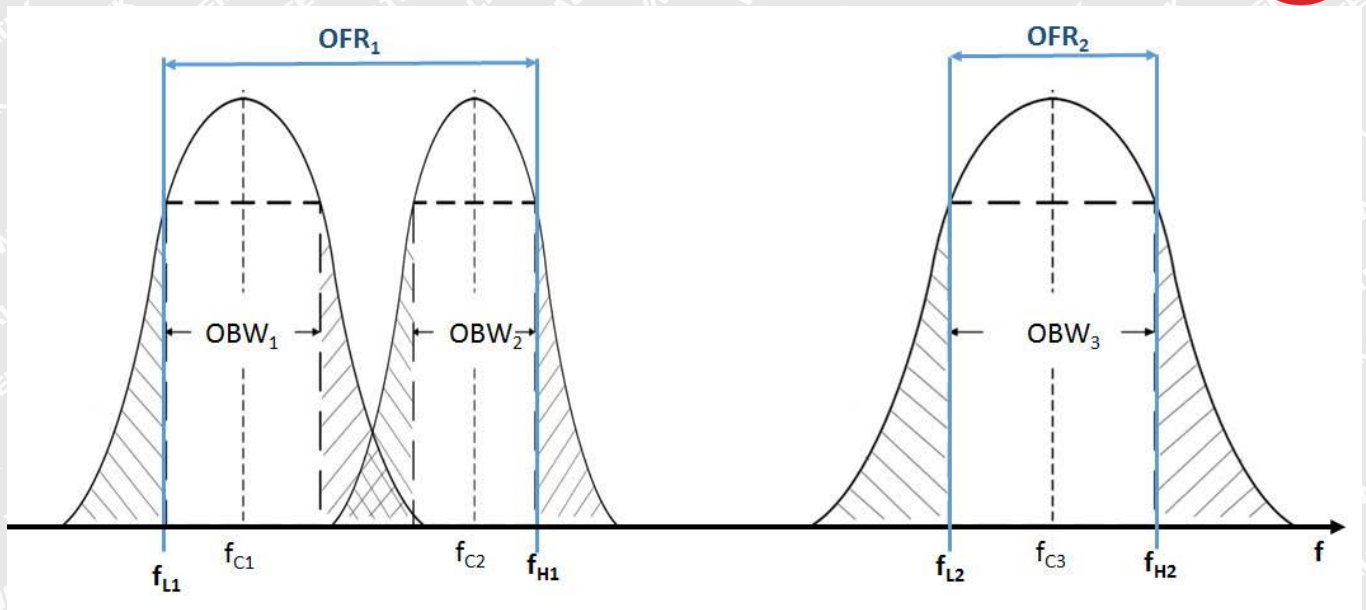


Figure 3: OFR of a multi - frequency WPT system within two frequency ranges of Table 2 and within one WPT system cycle time

#### Limits

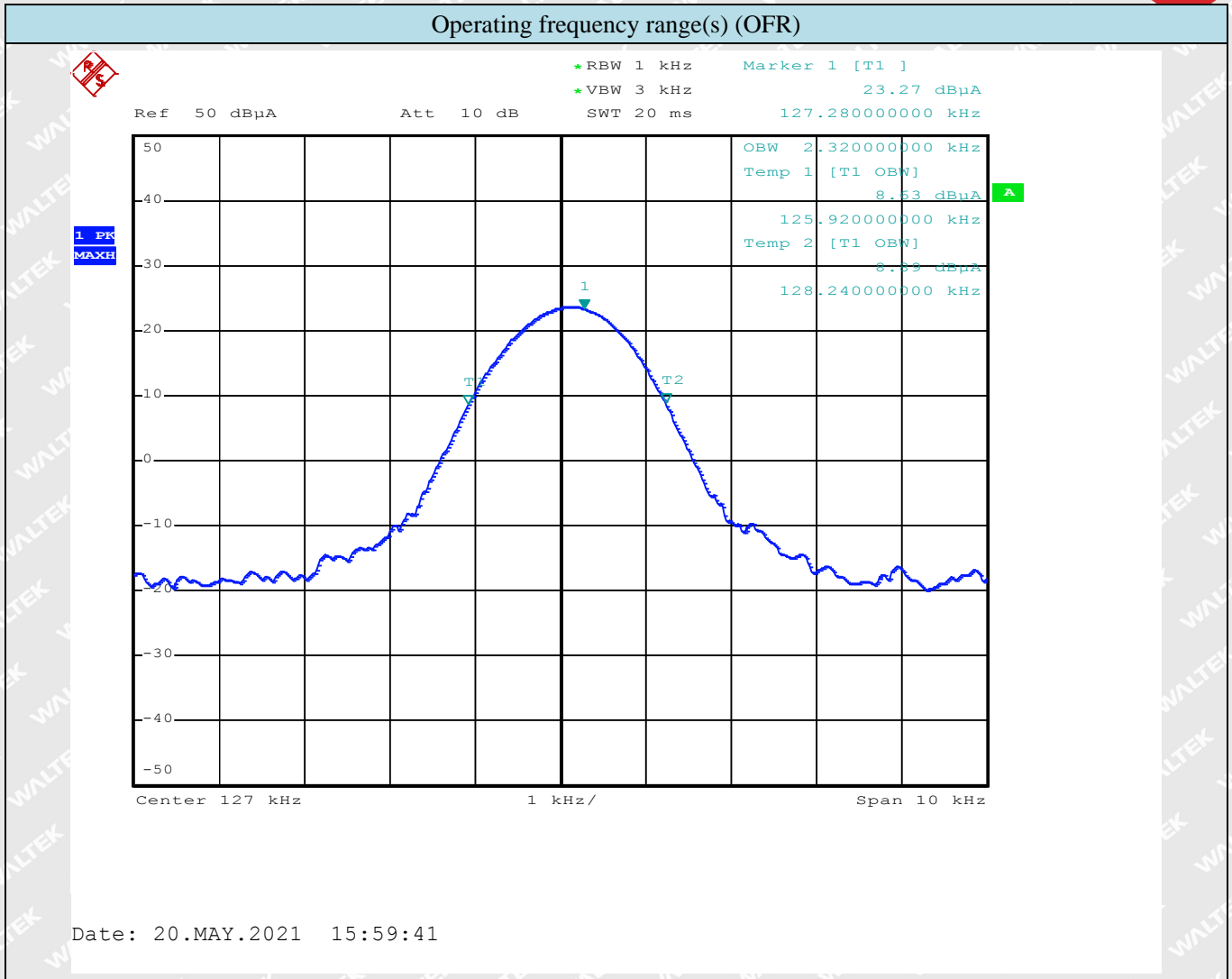
The operating frequency range for emissions shall be within one of the following limits: 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz.

#### 4.2 Test Procedure

Please refer to ETSI EN 303 417 subclause 6.2.2

#### 4.3 Summary of Test Results/Plots

| Operating frequency range(s) (OFR) |             |                |                |        |
|------------------------------------|-------------|----------------|----------------|--------|
| $F_L$ (kHz)                        | $F_H$ (kHz) | Limit (kHz)    |                | Result |
| 125.92                             | 128.24      | $F_L \geq 100$ | $F_H \leq 300$ | PASS   |





## 5. Transmitter H-field requirements

### 5.1 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 [dB $\mu$ A/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 dB  $\mu$ A/m for the following spot frequencies: 60 kHz  $\pm$  250 Hz and 129,1 kHz  $\pm$  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

### 5.2 Test Procedure

Please refer to ETSI EN 303 417 subclause 6.2.2

### 5.3 Summary of Test Results/Plots



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

## TM1

| Frequency (MHz) | Level (dBuA/m)@3m | C <sub>3</sub> Factor (dB) | Level (dBuA/m)@10m | Limit (dBuA/m)@10m | Result |
|-----------------|-------------------|----------------------------|--------------------|--------------------|--------|
| 0.127           | 19.06             | 31.2                       | -12.14             | 65.69              | PASS   |

## TM2

| Frequency (MHz) | Level (dBuA/m)@3m | C <sub>3</sub> Factor (dB) | Level (dBuA/m)@10m | Limit (dBuA/m)@10m | Result |
|-----------------|-------------------|----------------------------|--------------------|--------------------|--------|
| 0.127           | 31.36             | 31.2                       | 0.16               | 65.69              | PASS   |

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

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### 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.

## 6.2 Test Procedure

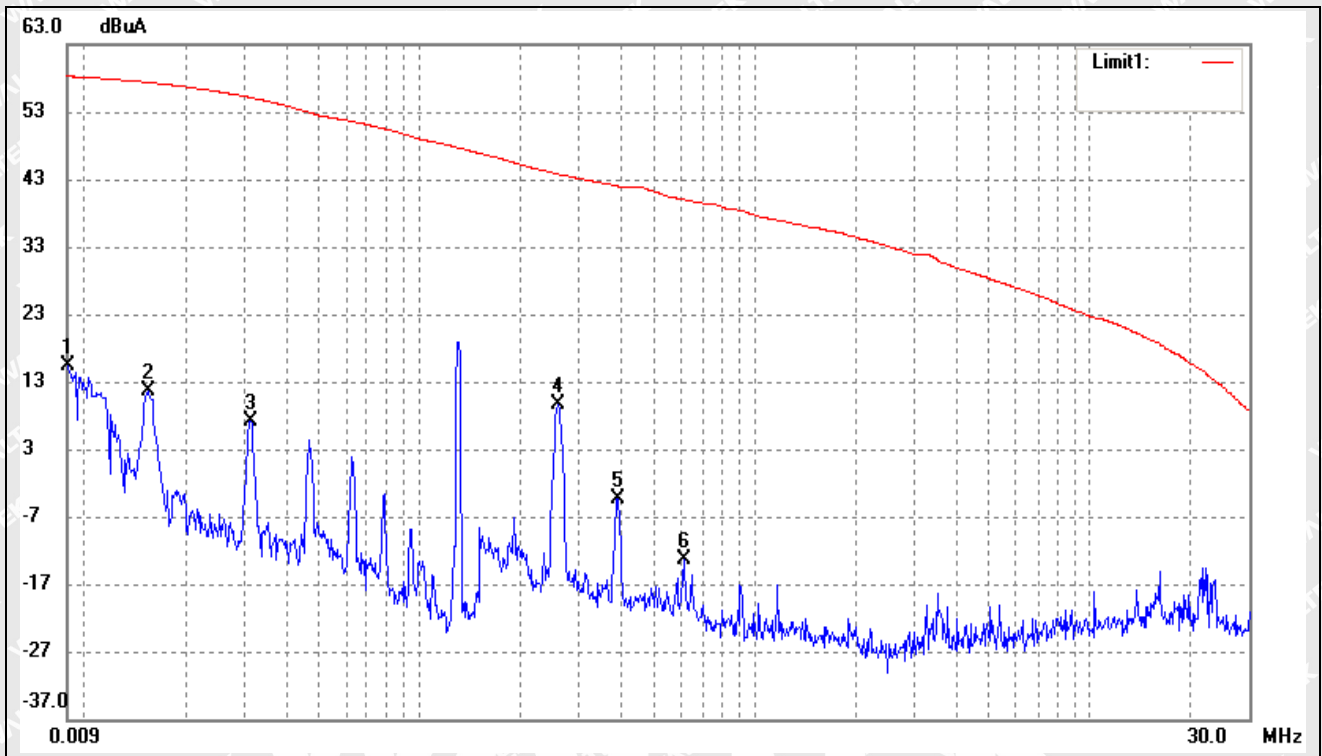
Please refer to ETSI EN 303 417 subclause 6.2.2 and subclause 6.2.3 for the measurement method

## 6.3 Summary of Test Results/Plots



- Pre-scan EUT X,Y,Z axis,and find the worst case at X axis.
- 9kHz-30MHz Emission @3m

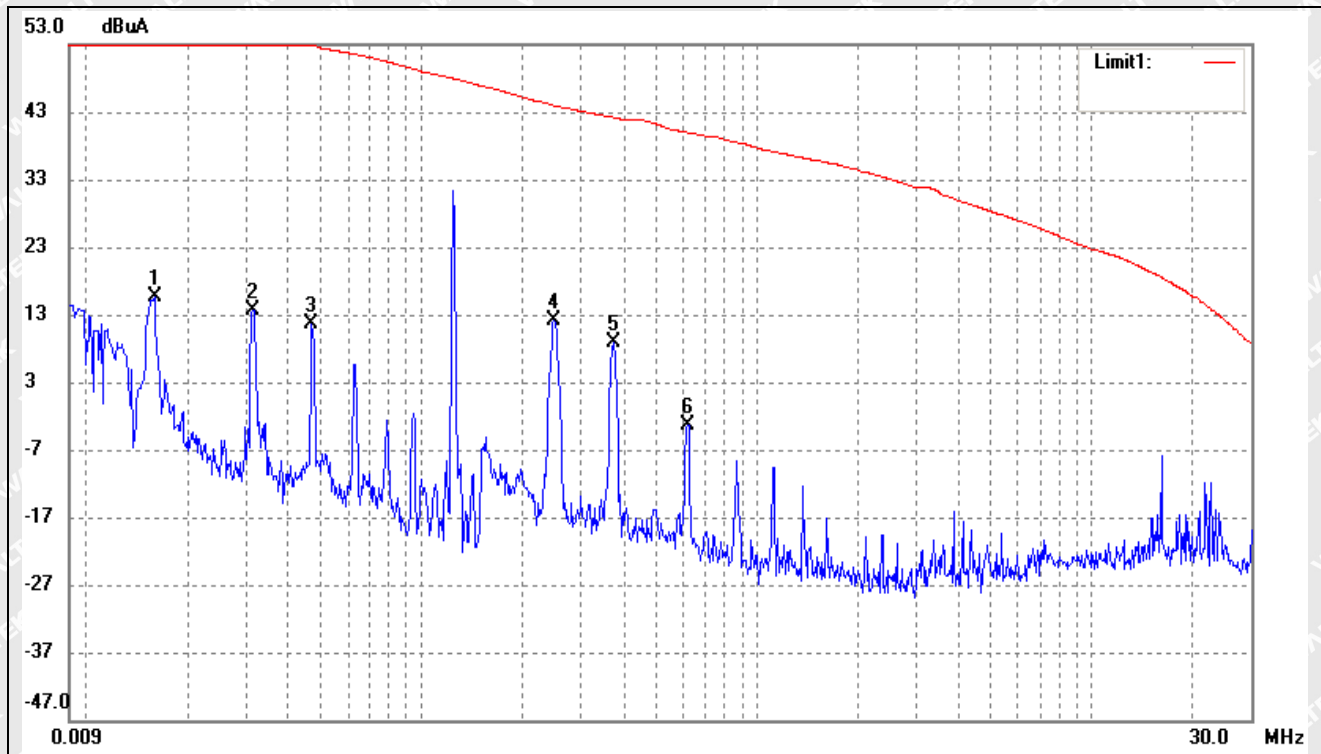
|               |     |           |            |
|---------------|-----|-----------|------------|
| Test Channel: | TM1 | Polarity: | Horizontal |
|---------------|-----|-----------|------------|



| No. | Frequency (MHz) | Reading (dBuA/m) | Correct (dB) | Result (dBuA/m) | Limit (dBuA/m) | Margin (dB) | Remark |
|-----|-----------------|------------------|--------------|-----------------|----------------|-------------|--------|
| 1   | 0.0090          | 43.07            | -27.58       | 15.49           | 58.30          | -42.81      | ERP    |
| 2   | 0.0156          | 39.17            | -27.49       | 11.68           | 57.37          | -45.69      | ERP    |
| 3   | 0.0314          | 34.51            | -27.27       | 7.24            | 55.13          | -47.89      | ERP    |
| 4   | 0.2575          | 38.05            | -28.37       | 9.68            | 43.79          | -34.11      | ERP    |
| 5   | 0.3893          | 24.48            | -28.89       | -4.41           | 42.00          | -46.41      | ERP    |
| 6   | 0.6140          | 15.38            | -28.84       | -13.46          | 40.02          | -53.48      | ERP    |



|               |     |           |            |
|---------------|-----|-----------|------------|
| Test Channel: | TM2 | Polarity: | Horizontal |
|---------------|-----|-----------|------------|



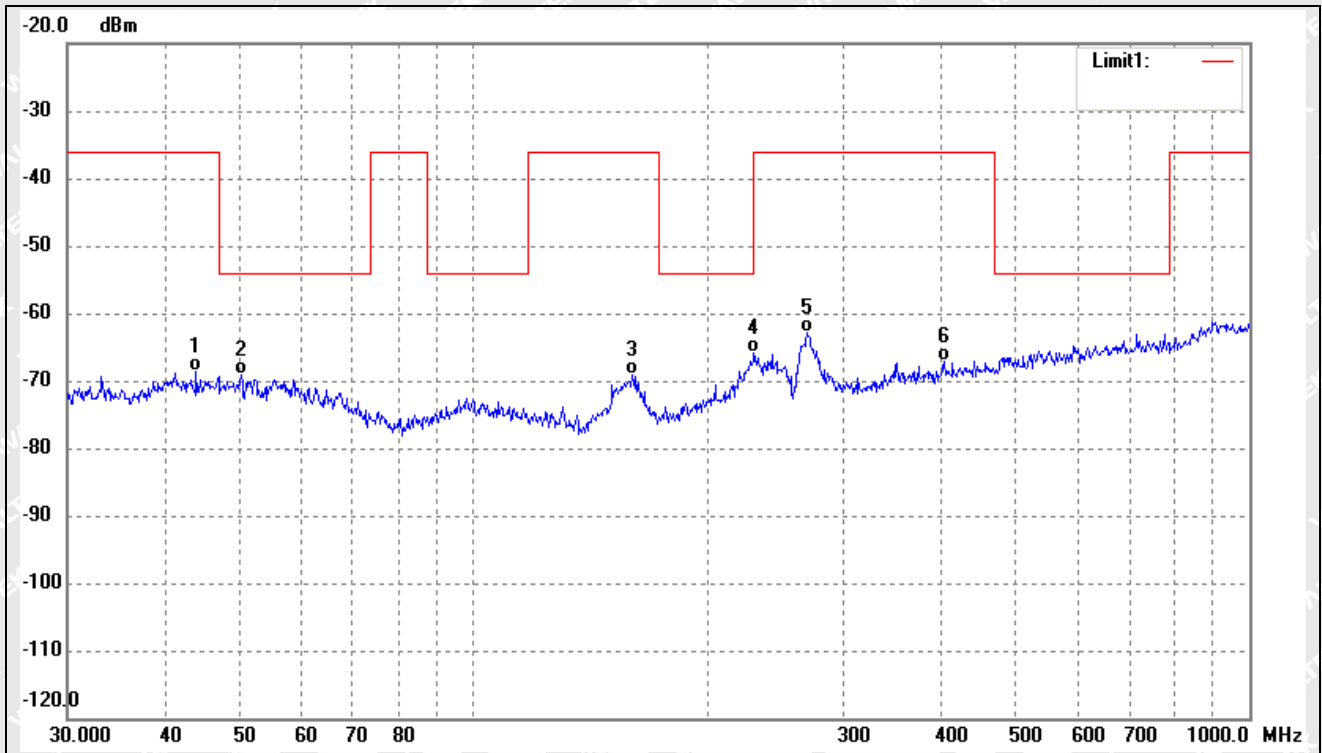
| No. | Frequency<br>(MHz) | Reading<br>(dBuA/m) | Correct<br>dB | Result<br>(dBuA/m) | Limit<br>(dBuA/m) | Margin<br>(dB) | Remark |
|-----|--------------------|---------------------|---------------|--------------------|-------------------|----------------|--------|
| 1   | 0.0159             | 43.22               | -27.49        | 15.73              | 57.32             | -41.59         | ERP    |
| 2   | 0.0314             | 40.97               | -27.27        | 13.70              | 55.13             | -41.43         | ERP    |
| 3   | 0.0472             | 38.78               | -27.07        | 11.71              | 52.90             | -41.19         | ERP    |
| 4   | 0.2481             | 40.50               | -28.25        | 12.25              | 43.96             | -31.71         | ERP    |
| 5   | 0.3712             | 37.87               | -28.90        | 8.97               | 42.21             | -33.24         | ERP    |
| 6   | 0.6205             | 25.49               | -28.84        | -3.35              | 39.98             | -43.33         | ERP    |

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



➤ 30MHz-1GHz Emission

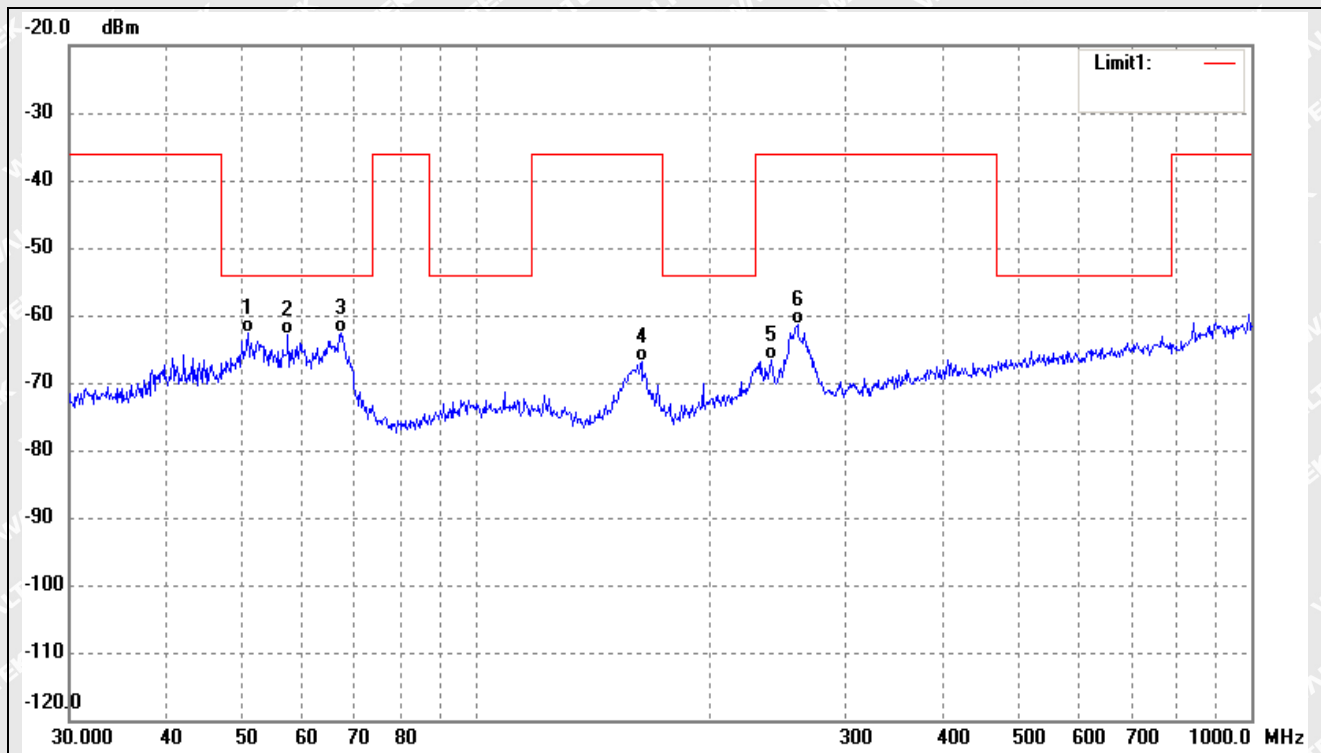
|               |     |           |            |
|---------------|-----|-----------|------------|
| Test Channel: | TM1 | Polarity: | Horizontal |
|---------------|-----|-----------|------------|



| No. | Frequency (MHz) | Reading (dBm) | Correct (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Remark |
|-----|-----------------|---------------|--------------|--------------|-------------|-------------|--------|
| 1   | 43.9658         | -68.52        | -0.03        | -68.55       | -36.00      | -32.55      | ERP    |
| 2   | 50.2325         | -69.26        | 0.20         | -69.06       | -54.00      | -15.06      | ERP    |
| 3   | 160.3457        | -65.45        | -3.73        | -69.18       | -36.00      | -33.18      | ERP    |
| 4   | 230.0985        | -65.79        | -0.09        | -65.88       | -36.00      | -29.88      | ERP    |
| 5   | 269.4284        | -63.84        | 1.01         | -62.83       | -36.00      | -26.83      | ERP    |
| 6   | 404.6665        | -72.46        | 5.44         | -67.02       | -36.00      | -31.02      | ERP    |



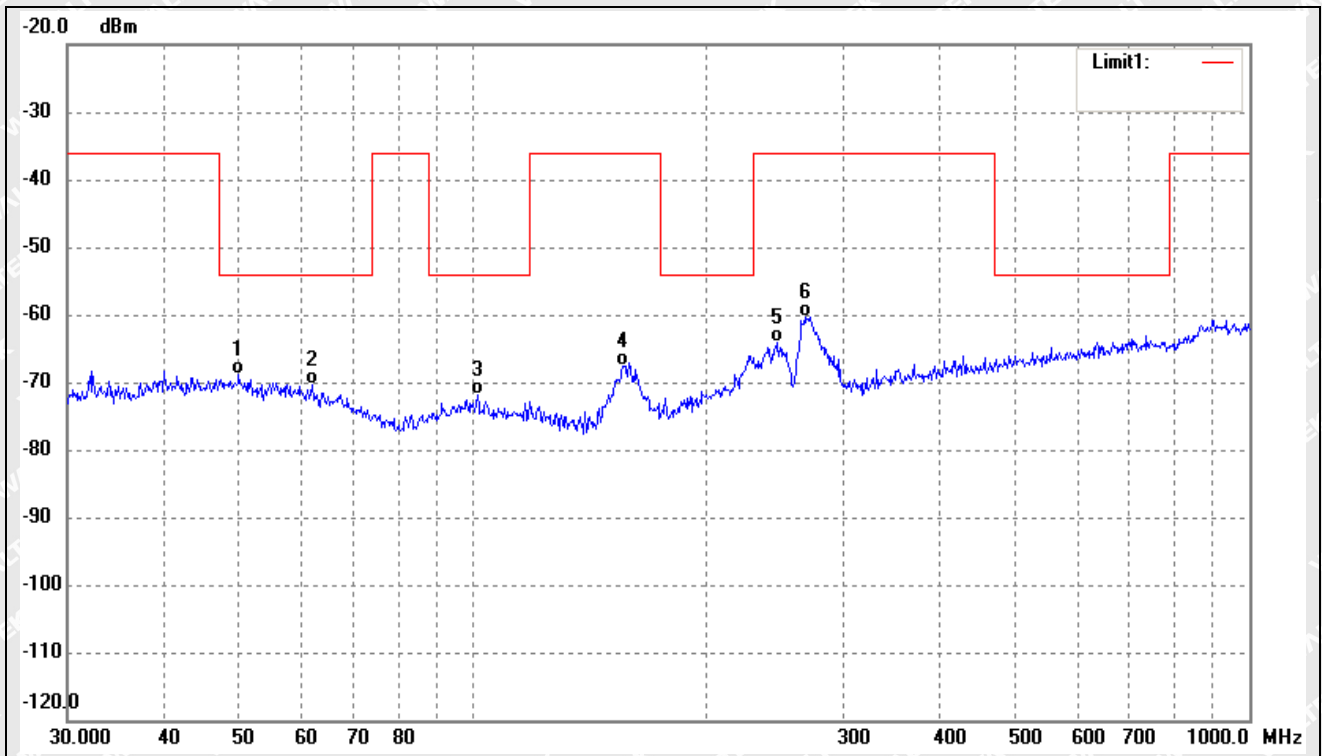
|               |     |           |          |
|---------------|-----|-----------|----------|
| Test Channel: | TM1 | Polarity: | Vertical |
|---------------|-----|-----------|----------|



| No. | Frequency (MHz) | Reading (dBm) | Correct (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Remark |
|-----|-----------------|---------------|--------------|--------------|-------------|-------------|--------|
| 1   | 50.9420         | -62.66        | 0.00         | -62.66       | -54.00      | -8.66       | ERP    |
| 2   | 57.3923         | -61.63        | -1.17        | -62.80       | -54.00      | -8.80       | ERP    |
| 3   | 67.2022         | -60.28        | -2.43        | -62.71       | -54.00      | -8.71       | ERP    |
| 4   | 163.7550        | -63.37        | -3.55        | -66.92       | -36.00      | -30.92      | ERP    |
| 5   | 240.8304        | -67.07        | 0.43         | -66.64       | -36.00      | -30.64      | ERP    |
| 6   | 260.1444        | -62.24        | 0.96         | -61.28       | -36.00      | -25.28      | ERP    |



|               |     |           |            |
|---------------|-----|-----------|------------|
| Test Channel: | TM2 | Polarity: | Horizontal |
|---------------|-----|-----------|------------|



| No. | Frequency (MHz) | Reading (dBm) | Correct (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Remark |
|-----|-----------------|---------------|--------------|--------------|-------------|-------------|--------|
| 1   | 49.8814         | -69.12        | 0.26         | -68.86       | -54.00      | -14.86      | ERP    |
| 2   | 61.9951         | -68.77        | -1.56        | -70.33       | -54.00      | -16.33      | ERP    |
| 3   | 101.2885        | -70.29        | -1.51        | -71.80       | -54.00      | -17.80      | ERP    |
| 4   | 155.9101        | -63.94        | -3.70        | -67.64       | -36.00      | -31.64      | ERP    |
| 5   | 246.8149        | -64.80        | 0.71         | -64.09       | -36.00      | -28.09      | ERP    |
| 6   | 267.5455        | -61.26        | 1.00         | -60.26       | -36.00      | -24.26      | ERP    |



|               |     |           |          |
|---------------|-----|-----------|----------|
| Test Channel: | TM2 | Polarity: | Vertical |
|---------------|-----|-----------|----------|



| No. | Frequency (MHz) | Reading (dBm) | Correct (dB) | Result (dBm) | Limit (dBm) | Margin (dB) | Remark |
|-----|-----------------|---------------|--------------|--------------|-------------|-------------|--------|
| 1   | 50.5860         | -66.64        | 0.11         | -66.53       | -54.00      | -12.53      | ERP    |
| 2   | 58.6126         | -65.34        | -1.18        | -66.52       | -54.00      | -12.52      | ERP    |
| 3   | 66.2662         | -62.49        | -2.32        | -64.81       | -54.00      | -10.81      | ERP    |
| 4   | 159.7844        | -61.10        | -3.74        | -64.84       | -36.00      | -28.84      | ERP    |
| 5   | 241.6763        | -65.86        | 0.46         | -65.40       | -36.00      | -29.40      | ERP    |
| 6   | 261.0583        | -60.43        | 0.97         | -59.46       | -36.00      | -23.46      | ERP    |

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



## 7. Transmitter out of band (OOB) emissions

### 7.1 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.

### 7.2 Test Procedure

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

### 7.3 Summary of Test Results/Plots

#### TM1

| No. | Frequency<br>(MHz)        | Result@3m<br>(dBuA/m) | C <sub>3</sub><br>(dB) | Result@10<br>(dBuA/m) | Limit@10<br>(dBuA/m) | Margin<br>(dB) | Remark |
|-----|---------------------------|-----------------------|------------------------|-----------------------|----------------------|----------------|--------|
| 1   | $F_{cL}-2.5 \times OBW_1$ | 16.87                 | 31.2                   | -14.33                | 65.89                | -80.22         | peak   |
| 2   | F                         | 19.06                 | 31.2                   | -12.14                | 65.69                | -77.83         | peak   |
| 3   | $F_{cH}+2.5 \times OBW_3$ | 15.97                 | 31.2                   | -15.23                | 65.51                | -80.74         | peak   |

#### TM2

| No. | Frequency<br>(MHz)        | Result@3m<br>(dBuA/m) | C <sub>3</sub><br>(dB) | Result@10<br>(dBuA/m) | Limit@10<br>(dBuA/m) | Margin<br>(dB) | Remark |
|-----|---------------------------|-----------------------|------------------------|-----------------------|----------------------|----------------|--------|
| 1   | $F_{cL}-2.5 \times OBW_1$ | 29.47                 | 31.2                   | -1.73                 | 65.89                | -67.62         | peak   |
| 2   | F                         | 31.36                 | 31.2                   | 0.16                  | 65.69                | -65.53         | peak   |
| 3   | $F_{cH}+2.5 \times OBW_3$ | 26.97                 | 31.2                   | -4.23                 | 65.51                | -69.74         | peak   |

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



## 8. Receiver blocking

### 8.1 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 | $f = f_c \pm F$ (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.

### 8.2 Test Procedure

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

### 8.3 Summary of Test Results/Plots

TM1

| Test Frequency               | Blocking Signal(dBuA/m) | Performance Criterion              | Result |
|------------------------------|-------------------------|------------------------------------|--------|
| $f_c - 10 \times \text{OFR}$ | 82                      | without degradation of performance | PASS   |
| $f_c$                        | 72                      | without degradation of performance | PASS   |
| $f_c + \text{OFR}$           | 72                      | without degradation of performance | PASS   |
| $f_c + 10 \times \text{OFR}$ | 82                      | without degradation of performance | PASS   |

TM2

| Test Frequency               | Blocking Signal(dBuA/m) | Performance Criterion              | Result |
|------------------------------|-------------------------|------------------------------------|--------|
| $f_c - 10 \times \text{OFR}$ | 82                      | without degradation of performance | PASS   |
| $f_c$                        | 72                      | without degradation of performance | PASS   |
| $f_c + \text{OFR}$           | 72                      | without degradation of performance | PASS   |
| $f_c + 10 \times \text{OFR}$ | 82                      | without degradation of performance | PASS   |



## EXHIBIT 1 - EUT PHOTOGRAPHS

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Please refer to “ANNEX”.

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## EXHIBIT 2 - TEST SETUP PHOTOGRAPHS

**Radiated Spurious  
Emission Test Setup/  
Radiated H-Field (Below  
30MHz)**



**Radiated Spurious  
Emission Test Setup  
(Above 30MHz)**



\*\*\*\*\* END OF REPORT \*\*\*\*\*

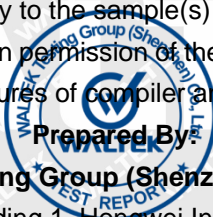


# TEST REPORT

**Reference No.**..... : WTF21X04042129R1W-2  
**Manufacturer**..... : Mid Ocean Brands B.V.  
**Address**..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong  
**Product**..... : Round Magnetic Wireless Charger, Bamboo Magnetic Wireless Charger, Magnetic wireless charger with stand  
**Test Model**..... : MO6253, MO6266, MO6369  
**Standards**..... : **EN IEC 62311:2020**  
                                  : **EN 50665:2017**  
**Date of Receipt sample**.... : Apr. 30, 2021  
**Date of Test**..... : Apr. 30, 2021 to May.24, 2021  
**Date of Issue**..... : Oct. 29, 2021  
**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 compiler and approver.



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Reviewed By:

Approved & Authorized By:

Mike Shi / Project Engineer

Jason Su / RF Manager

Silin Chen / Manager



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## Report version

| Version No. | Date of issue | Description  |
|-------------|---------------|--|
| Rev.00      | May. 24, 2021 | Original report WTF21X04042129W-2.   |
| Rev.01      | Oct. 29, 2021 | Refer the old report WTF21X04042129W-2, updated the EUT appearance photos, model name, but the circuit and the electronic construction do not change, declared by the manufacturer. So the test data from the original report. |
| /           | /             | /  |

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## 1. GENERAL INFORMATION

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### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Manufacturer:

Mid Ocean Brands B.V.

Address of manufacturer:

7/F., Kings Tower, 111 King Lam Street, Cheung  
Sha Wan, Kowloon, Hong Kong

| General Description of EUT   |   |
|--|---|
| Product Name:  | Round Magnetic Wireless Charger, Bamboo Magnetic Wireless Charger, Magnetic wireless charger with stand |
| Trade Name:  | /   |
| Model No.:   | MO6253  |
| Adding Model(s):   | MO6266, MO6369  |
| Rated Voltage:   | AC230V; Adapter DC5V/9V   |
| Power Adaptor Model:   | /   |
| <i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model MO6253, but the circuit and the electronic construction do not change, declared by the manufacturer.</i> |   |

| Technical Characteristics of EUT |                   |
|----------------------------------|-------------------|
| Frequency Range:                 | 110-205kHz        |
| Radiated H-Field:                | 31.36dBuA/m (@3m) |
| Type of Antenna:                 | Coil Antenna      |



## 1.2 Compliance Standards

The tests were performed according to following standards:

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

**EN IEC 62311:2020:** Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz)

*Maintenance of compliance* is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with EN 50665,

The equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.

## 1.4 Test Facility

### **FCC – Registration No.: 125990**

Waltek Testing Group (Shenzhen) Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

### **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.



## 2. RF EXPOSURE BASIC RESTRICTIONS

### 2.1 Standard Applicable

This International Standard applies to electronic and electrical equipment for which no dedicated product- or product family standard regarding human exposure to electromagnetic fields applies. The frequency range covered is 0 Hz to 300 GHz.

The object of this generic standard is to provide assessment methods and criteria to evaluate such equipment against basic restrictions or reference levels on exposure of the general public related to electric, magnetic and electromagnetic fields and induced and contact current.

#### Normative reference

EN 62311:2008, Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz).

Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to the electromagnetic fields (0Hz to 300GHz) (Official Journal L 197 of 30 July 1999) .

Directive 2013/35/EU of 26 June 2013, on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (electromagnetic fields) . Official Journal L179 of 2013-6-29,p. 1-21

### 2.2 Reference Levels Limit

According to the EN 62311:2008, the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified 1999/519/EC.

Reference levels of electric, magnetic, and electromagnetic fields  
(0MHz to 300GHz, imperturbed rms values)

| Frequency range | E-field strength (V/m) | H-field strength ( $\wedge$ /m) | B-field ( $\mu$ T)    | Equivalent plane wave power density $S_{Eq}$ (W/m <sup>2</sup> ) |
|-----------------|------------------------|---------------------------------|-----------------------|--|
| 0-1Hz           | —                      | $3.2 \times 10^4$               | $4 \times 10^4$       | —  |
| 1-8Hz           | 10000                  | $3.2 \times 10^4 / f^2$         | $4 \times 10^4 / f^2$ | —  |
| 8-25Hz          | 10000                  | $4000 / f$                      | $5000 / f$            | —  |
| 0.025-0.8kHz    | $250 / f$              | $4 / f$                         | $5 / f$               | —  |
| 0.8-3kHz        | $250 / f$              | 5                               | 6.25                  | —  |
| 3-150kHz        | 87                     | 5                               | 6.25                  | —  |
| 0.15-1MHz       | 87                     | $0.73 / f$                      | $0.92 / f$            | —  |
| 1-10MHz         | $87 / f^{1/2}$         | $0.73 / f$                      | $0.92 / f$            | —  |
| 10-400MHz       | 28                     | 0.073                           | 0.092                 | 2  |
| 400-2000MHz     | $1,375 f^{1/2}$        | $0.0037 f^{1/2}$                | $0.0046 f^{1/2}$      | $f / 200$  |
| 2-300GHz        | 61                     | 0.16                            | 0.20                  | 10   |

**Note:**

1. f as indicated in the frequency range column
2. For frequencies between 100 kHz and 10 GHz,  $S_{Eq}$ ,  $E^2$ ,  $H^2$ , and  $B^2$  are to be averaged over any sixty-minute period.
3. For frequencies exceeding 10GHz,  $S_{Eq}$ ,  $E^2$ ,  $H^2$ , and  $B^2$  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.

**2.3 Evaluation Methods**

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.

## Far Field Calculation Formula

$$E = \eta_0 H = \frac{\sqrt{30PG(\theta, \phi)}}{r}$$

G=antenna gain relative to an isotropic antenna

$\theta, \phi$ =elevation and azimuth angles to point of investigation

r=distance from observation point to the antenna

$\eta_0$ =Characteristic impedance of free space



## 2.4 Evaluation Results

### Maximum Average Output Power

| Frequency   | Radiated H-Field | Radiated H-Field | Limit | Result    |
|-------------|------------------|------------------|-------|-----------|
| MHz         | dBuA/m           | A/m              | A/m   | Pass/Fail |
| 0.125-0.205 | 31.36            | 0.00003698       | 5     | Pass      |

Since average output power at worse case is: 0.00003698A/m which cannot exceed the exempt condition, 5A/m specified in EN 62311. It is deemed to full fit the requirement of RF exposure basic restriction specified in EC Council Recommendation (1999/519/EC).

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## EXHIBIT 1 - EUT PHOTOGRAPHS

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Please refer to “ANNEX”.

\*\*\*\*\* END OF REPORT \*\*\*\*\*

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