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检测
TESTING
CNAS L4062

TEST REPORT

Reference No.	:	WTF23X11233558W001
Manufacturer	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	:	114538
Product Name	:	Wireless Powerbank
Model No.	:	MO2185
Standards	:	**ETSI EN 303 417 V1.1.1 (2017-09)**
Date of Receipt sample	:	2023-11-01
Date of Test	:	2023-11-01 to 2023-11-24
Date of Issue	:	2023-11-24
Test Report Form No.	:	WTX_ETSI EN 303 417_2017W
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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Report version

Version No.	Date of issue	Description
Rev.00	2023-11-24	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Wireless Powerbank
Trade Name:	/
Model No.:	MO2185
Adding Model(s):	/
Rated Voltage:	Input(Type-C):DC5V,9V,12V Output(Type-C):DC5V,9V,12V Output(USB-A):DC5V,9V,12V
Wireless output:	Output: 15W(MAX)
Software Version:	/
Hardware Version:	/
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT	
Frequency Range:	110-205kHz
Radiated H-Field:	28.68dBuA/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) H-Field emission (clause 4.3.4) TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7) Performance criteria test (RX
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	Operating frequency range (clause 4.3.3) H-Field emission (clause 4.3.4) TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7) Wanted performance criteria test (RX test) (clause 4.4)
Mode3: Communication	WPT system alignment	TX and RX	TX and RX	Worst case alignment 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) H-Field emission (clause 4.3.4) TX spurious (clauses 4.3.5, 4.3.6 and 4.3.7) Wanted Performance criteria test (RX test) (clause 4.4)
Mode 4: energy transmission	WPT system alignment	TX and RX	TX and RX		

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 - 21kHz, 59 - 61kHz, 79 - 90kHz, 100 - 300kHz, 6765 - 6795kHz 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.

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	Transmitting	Output: 15W(MAX)

Test Conditions	
Temperature:	25 °C
Relative humidity:	45 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Type-C Cable	0.3	Unshielded	Without Ferrite

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-11-EX	/

1.5 Measurement Uncertainty

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

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

1.6 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	N9020A	US47140102	2023-02-25	2024-02-24
Signal Generator	Agilent	83752A	3610A01453	2023-02-25	2024-02-24
Vector Signal Generator	Agilent	N5182A	MY47070202	2023-02-25	2024-02-24
Communication Tester	HP	8921A	/	2023-02-25	2024-02-24
Temperature&Humidity Chamber	/	HTC-1	/	2023-02-25	2024-02-24
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
☐Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☐Chamber A: Above 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐Chamber B:Below 1GHz					
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
Amplifier	Agilent	8447D	2944A10457	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☒Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Amplifier	HP	8447F	2944A03869	2023-02-25	2024-02-24

☒Chamber C: Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2023-02-25	2024-02-24
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24

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	N/A

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.

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 - 90kHz, 100 - 300kHz, 6765 - 6 795kHz, 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

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.

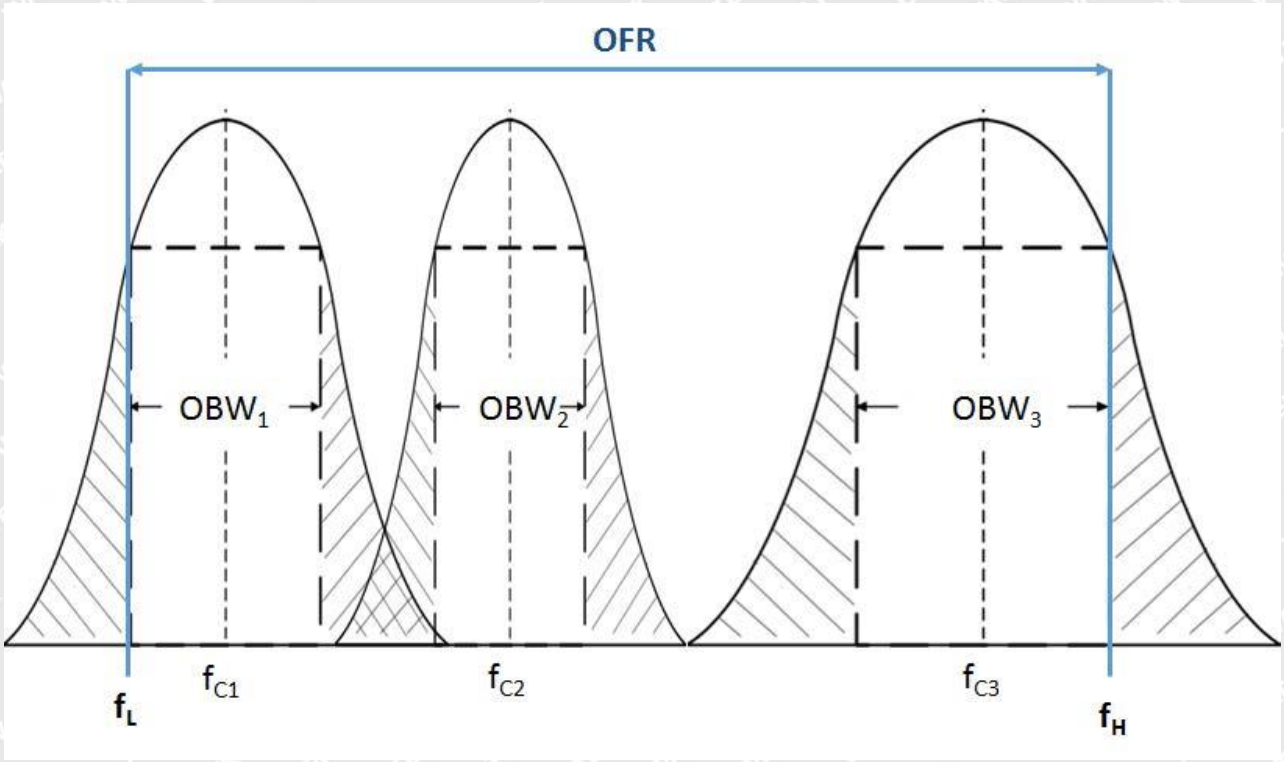


Figure 2: OFR of a multi - frequency WPT system within one frequency range of Table 2 and within one WPT system cycle time

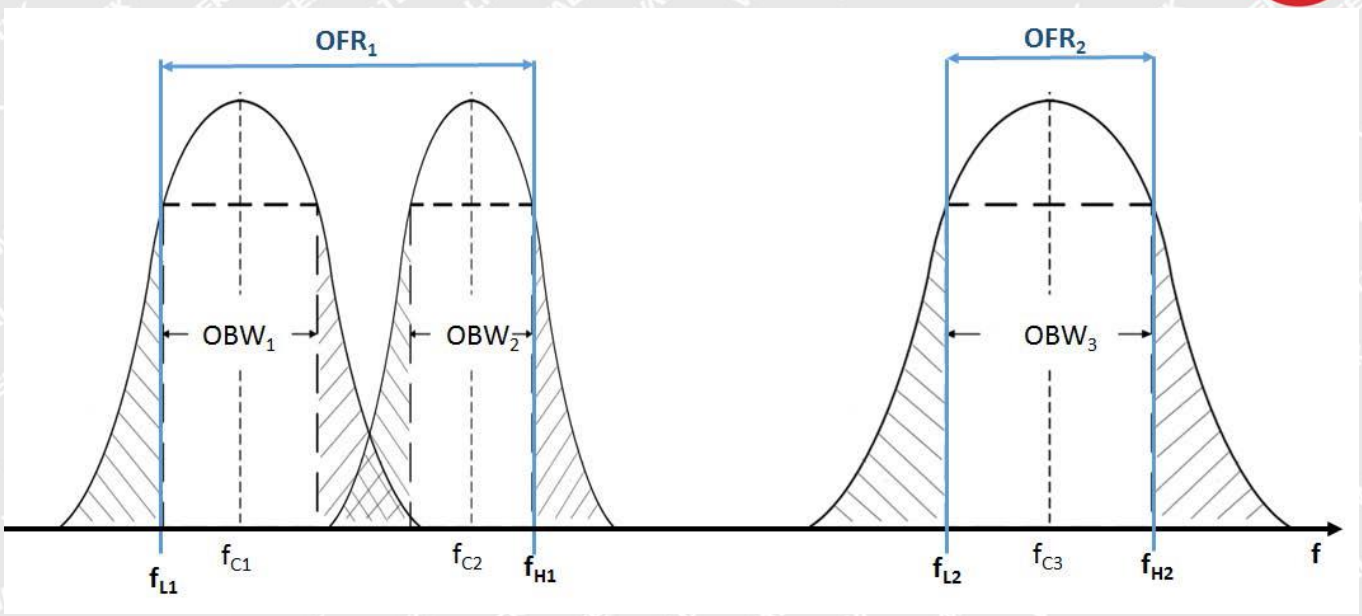


Figure 3: OFR of a multi - frequency WPT system within two frequency ranges of Table 2 and within one WPT system cycle time

Limits

The operating frequency range for emissions shall be within one of the following limits: 19 - 21kHz, 59 - 61kHz,

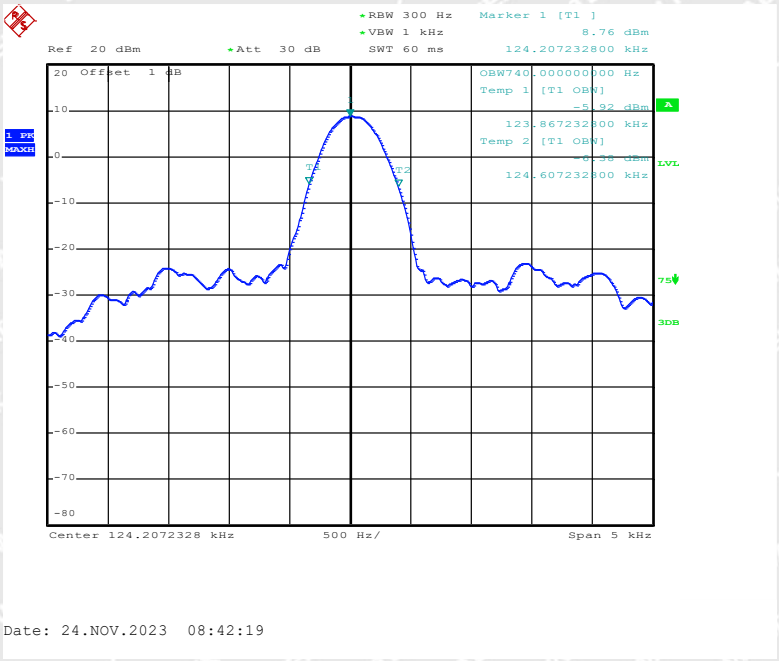
79 - 90kHz, 100 - 300kHz, 6765 - 6795kHz.

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
123.867	124.607	$F_L \geq 100$	$F_H \leq 300$	PASS

Operating frequency range(s) (OFR)

F_L

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 [dBµA/m at 10 m]	Comments
0.019 ≤ f < 0.021	72	
0.059 ≤ f < 0.061	69,1 descending 10 dB/dec above 0,059 MHz	See note 1
0.079 ≤ f < 0.090	67,8 descending 10 dB/dec above 0,079 MHz	See note 2
0.100 ≤ f < 0.119	42	
0.119 ≤ f < 0.135	66 descending 10 dB/dec above 0,119 MHz	See note 1
0.135 ≤ f < 0.140	42	
0.140 ≤ f < 0.1485	37.7	
0.1485 ≤ f < 0.30	-5	
6.765 ≤ f < 6.795	42	

NOTE 1: Limit is 42 dBµA/m for the following spot frequencies: 60kHz ± 250Hz and 129.1kHz ± 500Hz.
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 - 90kHz 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.

Frequency (MHz)	Level (dBuA/m)@3m	C_3 Factor (dB)	Level (dBuA/m)@10m	Limit (dBuA/m)@10m	Result
0.1278	28.68	31.20	-2.52	65.69	PASS

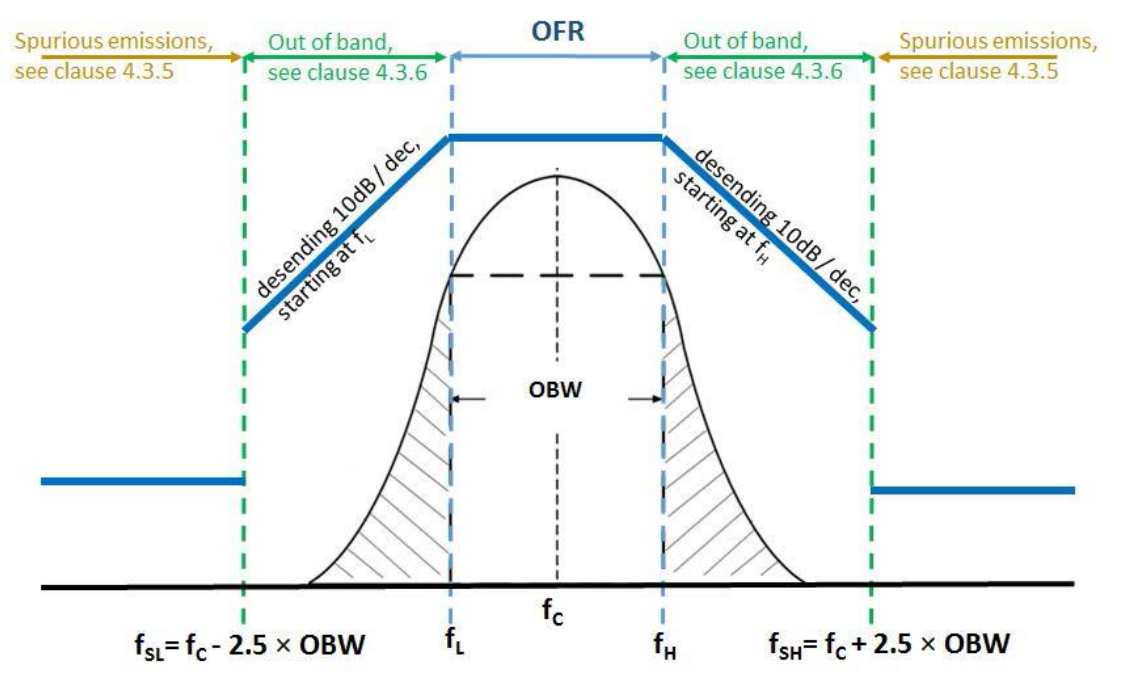
Note 1:$H_{3m}=H_{10m}+C_3$ refer to ETSI EN300 330 Annex H.2

6. Transmitter spurious emissions

6.1 Standard Applicable

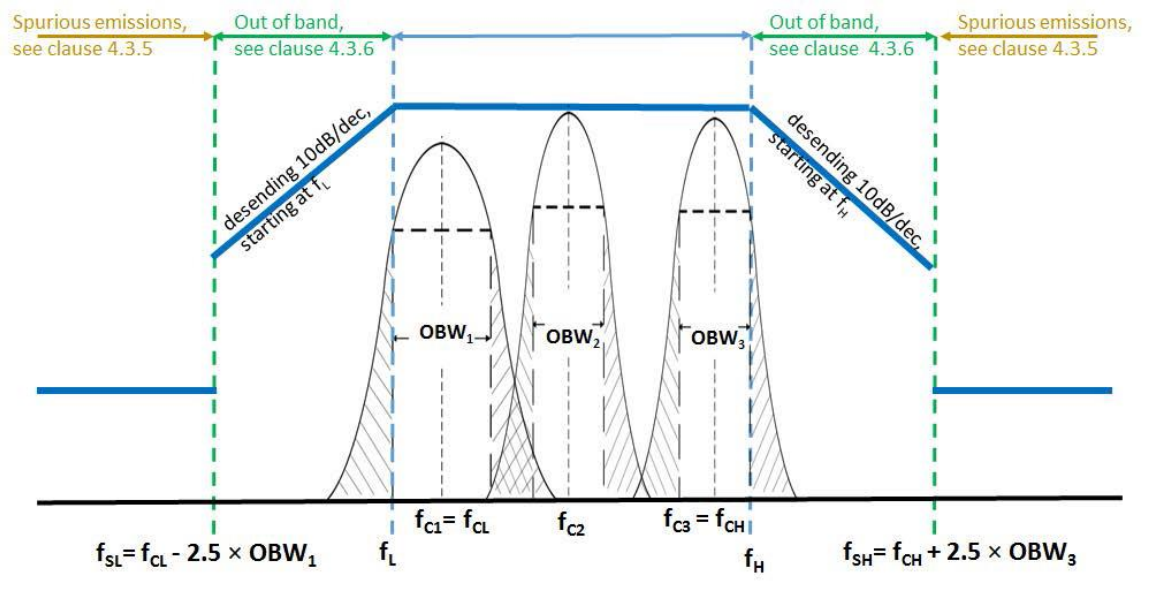
The transmitter spurious emissions for a single frequency system are to be considered in frequency ranges defined in Figure 4 ($f < f_{SL}$ and $f > f_{SH}$).

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 30MHz shall not exceed the generated H-field given in Table 4.

State (see note)	Frequency 9kHz ≤ f < 10MHz	Frequency 10MHz ≤ f < 30MHz
Operating	27dBμA/m at 9kHz descending 10dB/dec	-3.5dBμA/m
Standby	5.5dBμA/m at 9kHz descending 10dB/dec	-25dBμA/m
NOTE: "Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table		

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

State (see note)	47MHz to 74MHz 87.5MHz to 118MHz 174MHz to 230MHz 470MHz to 790MHz	Other frequencies between 30MHz to 1 000MHz
Operating	4nW	250nW
Standby	2nW	2nW
NOTE:"Operating" means mode 2, 3 and 4 according to Table 2; "standby" means mode 1 according to Table		

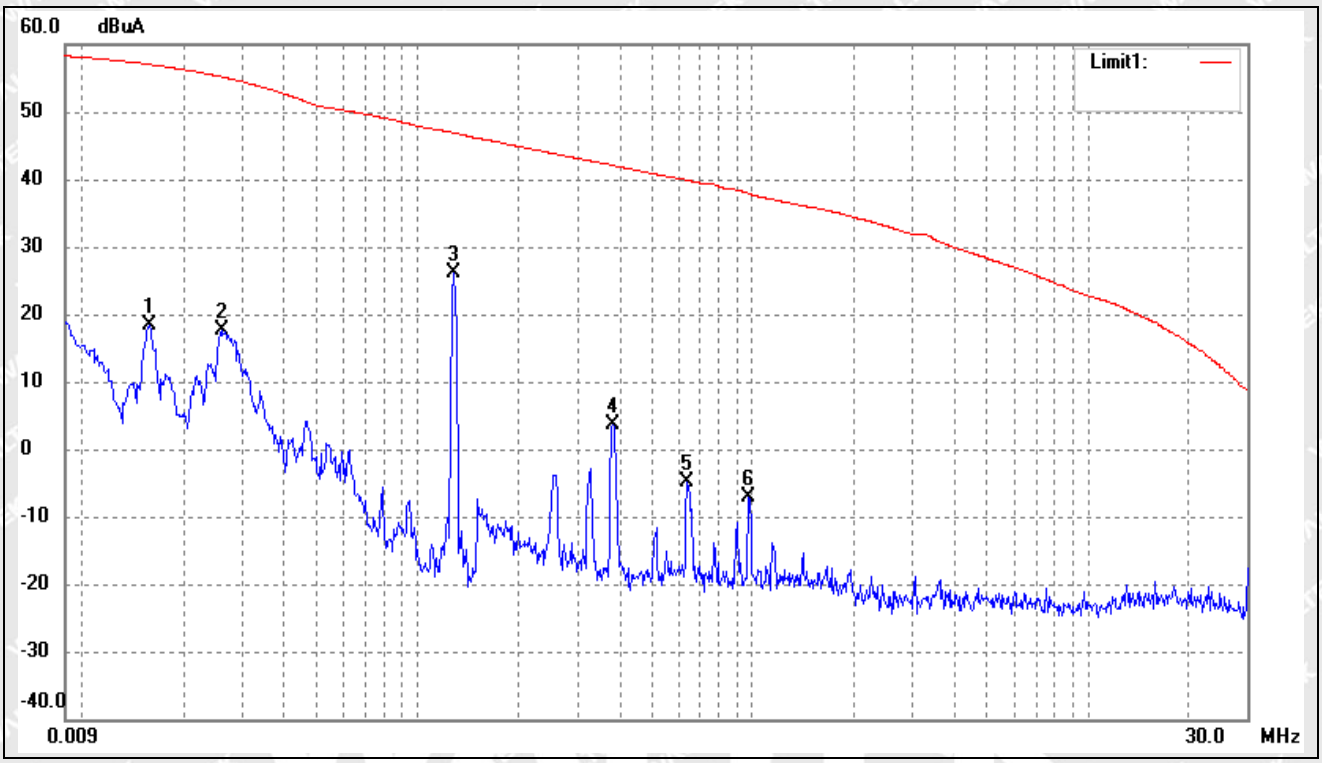
6.2 Test Procedure

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:	/	Polarity:	Vertical

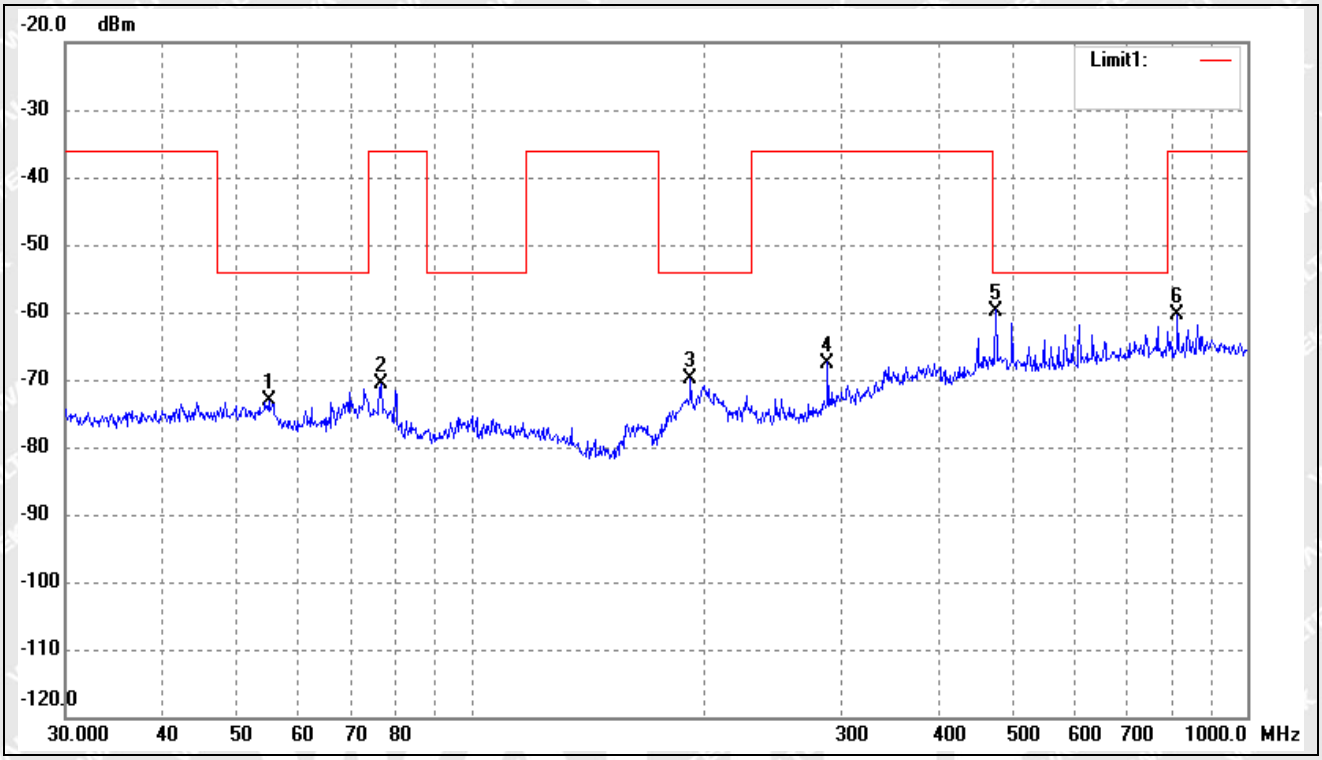


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuA/m)	dB	(dBuA/m)	(dBuA/m)	(dB)	
1	0.0158	75.50	-57.08	18.42	57.07	-38.65	ERP
2	0.0261	74.35	-56.72	17.63	55.21	-37.58	ERP
3	0.1278	82.06	-55.92	26.14	46.90	-20.76	ERP
4	0.3811	59.73	-56.22	3.51	42.10	-38.59	ERP
5	0.6338	50.38	-55.28	-4.90	39.89	-44.79	ERP
6	0.9735	47.32	-54.38	-7.06	37.89	-44.95	ERP

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

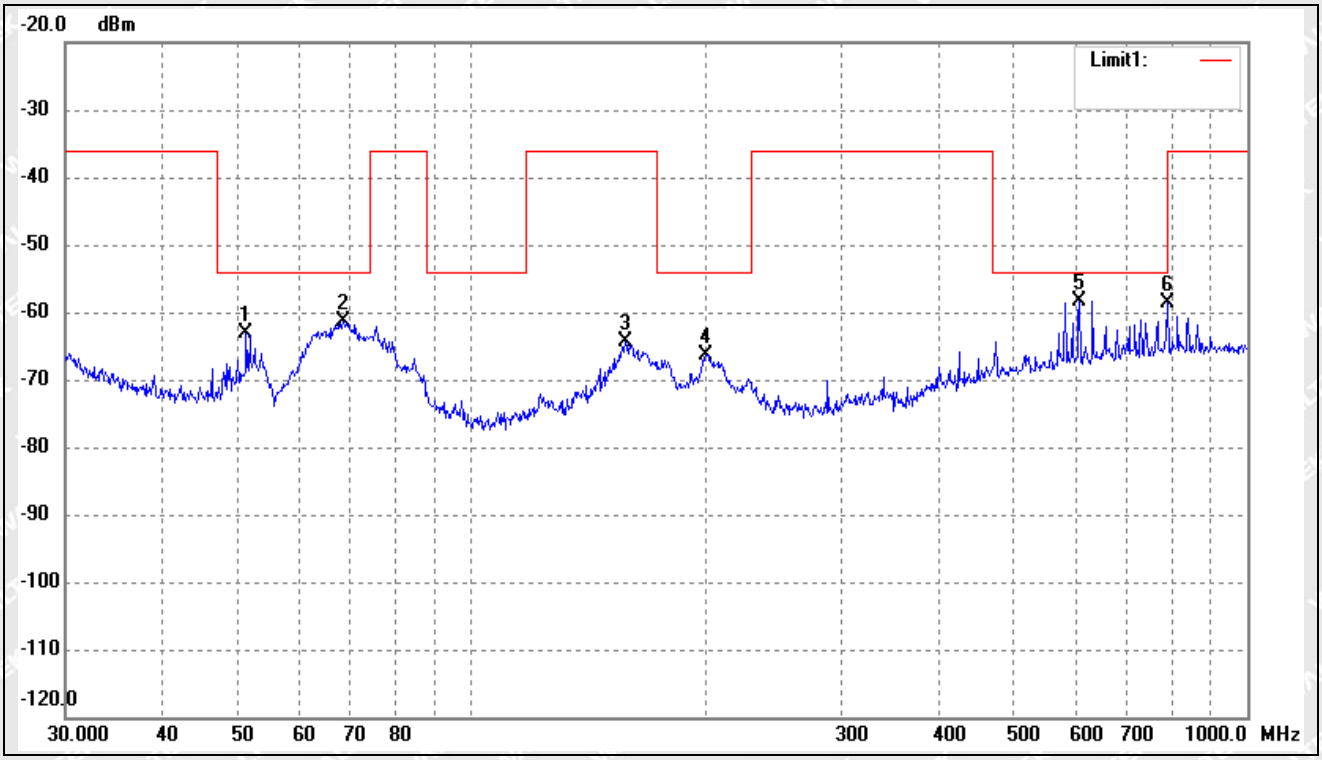
➢ 30MHz-1GHz Emission

Test Channel:	/	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	54.8348	-77.77	4.77	-73.00	-54.00	-19.00	ERP
2	76.5121	-72.41	1.87	-70.54	-36.00	-34.54	ERP
3	191.7450	-72.09	2.25	-69.84	-54.00	-15.84	ERP
4	287.9904	-72.37	4.87	-67.50	-36.00	-31.50	ERP
5	473.8347	-69.80	10.05	-59.75	-54.00	-5.75	ERP
6	813.1116	-74.59	14.13	-60.46	-36.00	-24.46	ERP

Test Channel:	/	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	51.3005	-68.33	5.29	-63.04	-54.00	-9.04	ERP
2	68.3908	-63.95	2.54	-61.41	-54.00	-7.41	ERP
3	158.1123	-64.41	0.00	-64.41	-36.00	-28.41	ERP
4	200.6881	-68.84	2.55	-66.29	-54.00	-12.29	ERP
5	607.7867	-70.73	12.44	-58.29	-54.00	-4.29	ERP
6	790.6188	-72.60	13.98	-58.62	-36.00	-22.62	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

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 x OBW_1	-8.85	31.2	-40.05	65.75	-105.91	peak
2	F_L	26.55	31.2	-4.65	65.70	-70.79	peak
3	F_H	26.45	31.2	-4.75	65.68	-70.76	peak
4	F_{cH}+2.5 x OBW_3	-10.42	31.2	-41.62	65.63	-107.47	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)	$f = fc \pm 10 \times F$ (see note)
Signal level field strength at the EUT	72dBμA/m	72dBμA/m	82dBμA/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

Not applicable

EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to “ANNEX”.

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 *******

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CNAS L4062

TEST REPORT

Reference No.	:	WTF23X11233558W002
Manufacturer	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	:	114538
Product Name	:	Wireless Powerbank
Model No.	:	MO2185
Standards	:	**EN IEC 62311:2020** **EN 50665:2017**
Date of Receipt sample	:	2023-11-01
Date of Test	:	2023-11-01 to 2023-11-24
Date of Issue	:	2023-11-24
Test Report Form No.	:	WTX_ EN 50665_2017W
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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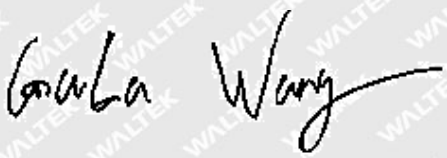
Tested by:



Gala Wang

Approved by:

Silin Chen

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Report version

Version No.	Date of issue	Description
Rev.00	2023-11-24	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Wireless Powerbank
Trade Name:	/
Model No.:	MO2185
Adding Model(s):	/
Rated Voltage:	Input(Type-C):DC5V,9V,12V Output(Type-C):DC5V,9V,12V Output(USB-A):DC5V,9V,12V
Wireless output:	Output: 15W(MAX)
Software Version:	/
Hardware Version:	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Frequency Range:	110-205kHz
Radiated H-Field:	28.68dBuA/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 (0Hz - 300GHz).
EN IEC 62311:2020: Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0Hz to 300GHz)

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

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990
Waltek Testing Group (Shenzhen) 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. 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 62311:2020, Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz).

2.2 Reference Levels Limit

According to the EN 62311:2020, the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation.

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

Frequency range	E-field strength (V/m)	H-field strength (∧/m)	B-field (uT)	Equivalent plane wave power density S_{Eq} (W/m^2)
0-1Hz	—	$3.2X10^4$	$4X10^4$	—
1-8Hz	10000	$3.2X10^4/f^2$	$4X10^4/f^2$	—
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
θ ,Ø=elevation and azimuth angles to point of investigation
r=distance from observation point to the antenna
ŋ0=Characteristic impedance of free space

2.4Evaluation Results

Maximum Average Output Power

Frequency	Radiated H-Field	Radiated H-Field	Limit	Result
KHz	dBuA/m	A/m	A/m	Pass/Fail
110-205	28.68	0.00002716	5	Pass

Since average output power at worse case is: 0.00002716A/m which cannot exceed the exempt condition, 5A/m specified in EN 62311.

EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to “ANNEX”.

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