

RF TEST REPORT

Report No: FCS202411753W01

Issued for

Applicant:	Mid Ocean Brands B.V.			
Address:	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.			
Product Name:	Wireless charger			
Brand Name:	N/A			
Model Name:	MO2450			
Series Model:	N/A			
Test Standard:	ETSI EN 303417 V1.1.1(2017-09)			
Jesued By: Dongguan Funas Testing Technology Co. Ltd.				

Issued By: Dongguan Funas Testing Technology Co.,Ltd.

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TEST REPORT CERTIFICATION

Applicant's name...... Mid Ocean Brands B.V.

Kowloon, Hong Kong.

Manufacture's Name...... Mid Ocean Brands B.V.

Kowloon, Hong Kong.

Product description

Product Name.....: Wireless charger

Brand Name: N/A

Model Name:....: MO2450

Series Model...... N/A

Test Standards..... ETSI EN 303417 V1.1.1(2017-09)

This device described above has been tested by FCS, and the test results show that the equipment under test (EUT) is in compliance with the 2014/53/EU RED Directive Art.3.2 requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test.....

Date (s) of performance of tests...... Nov. 26, 2024~ Dec. 06, 2024

Date of Issue...... Dec. 06, 2024

Test Result..... Pass

Tested by :

(Scott Shen)

Reviewed by :

(Duke Qian

Approved by

(Jack Wang)





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Revision history

Rev.	Revisions	Issue Date	Revised By
	N/A	Dec. 06, 2024	



1. Summary of test results

1.1. Standard description

ETSI EN 303417 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

1.2. Test result

	ETSI EN 303417 V1.1.1(2017-09)						
No	Test Parameter	Clause No	Condition	Results			
1	1 Permitted range of operating frequencies		U	PASS			
2	Operating frequency ranges	4.3.3	U	PASS			
3	H-field requirements	4.3.4	U	PASS			
4	Transmitter spurious emissions	4.3.5	U	PASS			
5	Transmitter out of band (OOB) emissions	4.3.6	U	PASS			
6	WPT system unwanted conducted emissions	4.3.7	Only for equipment which has a cable between the off board power supply and the primary coil which is longer than 3 m	Ν/Δ			
7	Receiver blocking	4.4.2	Only for Mode 1, Mode 2 and Mode 3 (see Table 2)	N/A			

Note 1: N/A is an abbreviation for not applicable, means according technology of EUT, this test item is not applicable for this reported device.

Note 2: U means unconditionally applicable.



2. General test information

2.1. Description of EUT

EUT* Name	:	Wireless charger
Model Number	:	MO2450
EUT function description	:	Please reference user manual of this device
Power supply	:	Input:DC 9V=2A 5V=2A
		Output:DC 5V=1A 7.5V=1A 9V=1.1A 9V=1.67A
		Wireless Output Power:15W Max.
Wireless charging Operation frequency	:	110kHz-205kHz
Antenna Type	:	Inductive loop coil antenna
WPT operational modes	:	Mode 4: energy transmission
Sample Type	:	Series production

Note: EUT is the ab. of equipment under test.

2.2. Accessories of EUT

Description of	Manufacturer	Model number	Serial No.	Other
Accessories AC Adapter	Wentong	WT0903500G	N/A	N/A

2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	Other
Simulation load	/	/	/

2.4. Block diagram of EUT configuration for test

TX mode:



2.5. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

1	Normal Conditions	Extreme Conditions
Temperature range	15℃-35℃	-20℃-55℃
Humidity range	20%-75%	20%-75%
Power supply	DC 5V Low voltage: DC 4.5V, High v 5.5V (±10% of nominal vo	



2.6. Test laboratory

Company Name: Dongguan Funas Testing Technology Co.,Ltd.

Address: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye

West Road Hi-Tech Industrial, Song shan lake Dongguan, China

Telephone: +86-769-27280901

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FCC Test Firm Registration Number: 514908

Designation number: CN0127

A2LA accreditation number: 5545.01

2.7. Measurement uncertainty

Test Item	Uncertainty
RF frequency	3×10 ⁻⁸
Radiated RF power	±3.57dB
Peak Output Power (Conducted)/ Spectrum analyzer)	0.86 dB (10 MHz ≤ f < 3.6GHz);
Peak Output Power (Conducted)(Spectrum analyzer)	1.38 dB (3.6GHz≤ f < 8GHz)
Peak Output Power (Conducted)(Power Sensor)	0.74dB
Maximum frequency deviation -within 300Hz and 6kHz of audio frequency -within 6kHz and 25kHz of audio frequency	2.1% 1.5dB
Adjacent channel power	1.2dB
	0.86 dB (10 MHz ≤ f < 3.6GHz);
Conducted spurious emission	1.40 dB (3.6GHz≤ f < 8GHz)
	1.66 dB (8GHz≤ f < 22GHz)
Radiated Emissions	±3.57dB (f<26GHz)
Temperature	±0.4℃
Humidity	±2%

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



3. Equipment used during test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP 3	FCS-E001	2024.08.28	2025.08.27
Signal Analyzer	R&S	FSV40-N	FCS-E012	2024.08.28	2025.08.27
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2024.08.28	2025.08.27
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2024.08.28	2025.08.27
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2024.08.28	2025.08.27
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2024.08.28	2025.08.27
Pre-Amplifier(0.1M- 3GHz)	EMCI	EM330N	FCS-E004	2024.08.28	2025.08.27
Pre-Amplifier (1G- 18GHz)	N/A	TSAMP-0518SE	FCS-E014	2024.08.28	2025.08.27
Pre-Amplifier (18G- 40GHz)	TERA-MW	TRLA-0400	FCS-E019	2024.08.28	2025.08.27
Temperature & Humidity	HTC-1	victor	FCS-E005	2024.08.28	2025.08.27
Spectrum Analyzer	Keysight	N9020A	FCS-E015	2024.08.28	2025.08.27
Spectrum Analyzer	Agilent	E4447A	MY50180039	2024.08.28	2025.08.27
Spectrum Analyzer	R&S	FSV-40	101499	2024.08.28	2025.08.27



4. Permitted range of operating frequencies and Operating frequency ranges

4.1. Limits

The limit specified in EN 300 417 V1.1.1, Sub clause 4.3.2.3 or 4.3.3.3 as applied, the permitted range of operating frequencies and operating frequency ranges shall be within 100-300 kHz.

4.2. Block diagram of test setup

Spectrum analyzer			
analyzer			

4.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer though suitable attenuator.
- (2) Configure EUT work in carrier trasmit mode.
- (3) Set the spectrum analyzer as follows: Start frequency: lower than the lower edge of the permitted frequency range. Stop frequency: higher than the upper edge of the permitted frequency range. RBW= 300Hz; VBW=1kHz; Detector mode: Quasi Peak; Display mode: Maxhold
- (4) The 99% OBW function shall be used to determine the operating frequency range: f_H is determined. f_H is the frequency of the upper marker resulting from the OFR. f_L is determined. f_L is the frequency of the lower marker resulting from the OFR.
- (5) For multi-frequency systems the OFR is described in Figure 2.

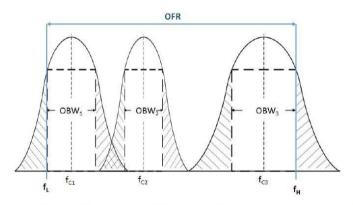


Figure 2: OFR of a multi - frequency WPT system within one frequency range of Table 2 and within one WPT system cycle time



4.4. Test result

Test Condition	Test Conditions		F _H [kHz]	Assigned Frequency Band	Result
Volt	Temp			Limit (kHz)	
Normal Volt DC 12V	25℃	115.120	205.260	100-300	PASS
Low Volt DC 10.8V	-20℃	115.391	205.360	100-300	PASS
Low Volt DC 10.8V	55℃	115.488	205.550	100-300	PASS
High Volt DC 13.2V	-20℃	115.692	205.392	100-300	PASS
High Volt DC 13.2V	55℃	115.538	205.516	100-300	PASS



5. H-field requirements

5.1. Limits

Table 3:

Frequency range [MHz]	H-field strength limit [dBµA/m at 10 m]	Comments
0.100 < f ≤ 0.119	42	
0.119 ≤ f < 0.135	66 descending 10 dB/dec above 0.119MHz	See note 1
0.135 ≤ f < 0.140	42	
0.140 ≤ f < 0.1485	37.7	
NOTE 4 1: 'C' 40 ID A	f # f #	11 1400 4

NOTE 1: Limit is 42 dBuA/m for the following spot frequencies: 60 kHz ± 250 Hz and 129,1 kHz ± 500 Hz.

Note:

Refer to EN 300 417 V1.1.1, Subclause 6.1.1, An alternative measurement distance (e.g. 3 m) may be used as long as the measured values at the actual test distance are extrapolated to 10 m according to ETSI EN 300 330 [1], Annex H.

1) Refer to EN 300 330 V2.1.1, Annex H.2, the H-field limit in $dB\mu A/m$ at 3 m, H3m, is determined by the following equation:

$$H_{3m} = H_{10m} + C_3$$

where:

H10m is the H-field limit in dBµA/m at 10m distance according to the present document; and C3 is a conversion factor in dB determined from figure H.2.



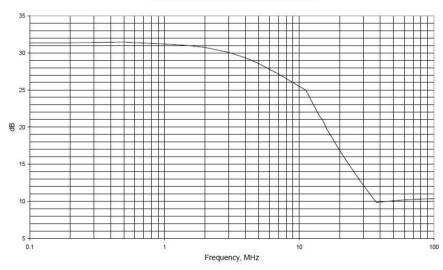


Figure H.2: Conversion factor C₃ versus frequency

2) For 115kHz, C₃=31.2

 $H_{3m} = H_{10m} + C_3 = 42 + 31.3 = 73.3 \text{ dB}\mu\text{A/m}$

For 119kHz, C₃=31.2

 $H_{3m} = H_{10m} + C_3 = 66 + 31.3 = 97.3 \text{ dB}\mu\text{A/m}$

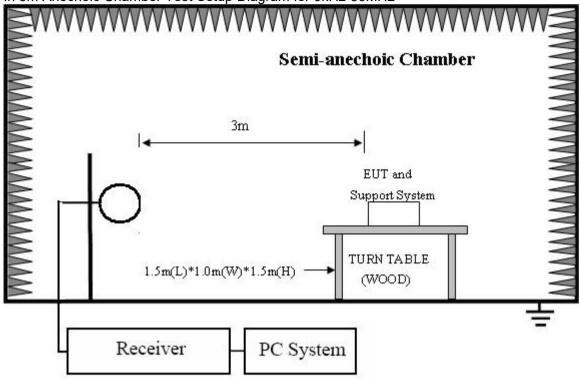
For 140kHz, C₃=31.2

 $H_{3m} = H_{10m} + C_3 = 42 + 31.3 = 73.3 \text{ dB}\mu\text{A/m}$

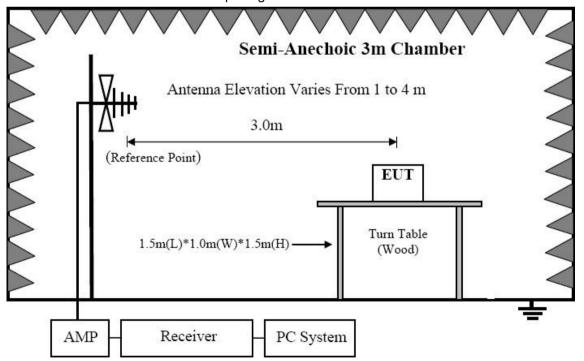


5.2. Block diagram of test setup

In 3m Anechoic Chamber Test Setup Diagram for 9kHz-30MHz



In 3m Anechoic Chamber Test Setup Diagram for below 1GHz





5.3. Test procedure

- 1) Scan from 9kHz to 150kHz, find the maximum H-field frequency to measure.
- 2) The measuring bandwidth and detector type of the measurement receiver see below:

Frequency: (f)	Detector type	Measurement receiver bandwidth	Spectrum analyser bandwidth
9 kHz ≤ f < 150 kHz	Quasi Peak	200 Hz	300 Hz
150 kHz ≤ f < 30 MHz	Quasi Peak	9 kHz	10 KHz
30 MHz ≤ f ≤ 1 000 MHz	Quasi Peak	120 kHz	100 kHz
	강하는 이 경기를 하는 것이 하는 것이 없는 것이 없어 없다면 없다.	s 6,765 MHz ≤ f ≤ 6,795 MHz and 11,8 2 200 Hz respectively 300 Hz.	110 MHz ≤ f ≤ 15,310 MHz, the

3) Refer to ETSI EN 300 330 V2.1.1 Clause 6.2.4 and Annex C

5.4. Test result

Test Cor Mod		Frequency	Measured power	Corr. (dB)	Limit (dBuA/m)	
Volt	Temp	[kHz]	(dBµA/m) @3m	(42)	(dBµA/m) @3m	Result
Normal Volt	25 ℃	115	33.26	31.3	73.3	PASS
Normal Volt	25℃	130	26.54	31.3	97.3	PASS
Normal Volt	25℃	205	40.32	31.3	73.3	PASS



6. Transmitter spurious emissions

6.1. Limits

Below 30MHz (at 10m)

State (see note)	Frequency 9 kHz ≤ f < 10 MHz	Frequency 10 MHz ≤ f < 30 MHz
Operating	27 dBµA/m at 9 kHz descending 10 dB/dec	-3.5 dBμA/m
Standby	5.5 dBµA/m at 9 kHz descending 10 dB/dec	-25 dBµA/m

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

Above 30MHz (at 3m)

State (see note)	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz	Other frequencies between 30 MHz to 1 000 MHz		
Operating	4 nW (-54dBm)	250 nW (-36dBm)		
Standby	2 nW (-57dBm)	2 nW (-57dBm)		
NOTE: "Operating" means mode 2, 3 and 4 according to Table 2: "standby" means mode 1				

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

6.2. Block diagram of test setup

The same as clause 5.2

6.3. Test procedure

- 1) Scan from 9kHz to 1GHz, find the maximum radiation frequency to measure.
- 2) The measuring bandwidth and detector type of the measurement receiver see below:

Frequency: (f)	Detector type	Measurement receiver bandwidth	Spectrum analyser bandwidth
9 kHz ≤ f < 150 kHz	Quasi Peak	200 Hz	300 Hz
150 kHz ≤ f < 30 MHz	Quasi Peak	9 kHz	10 KHz
30 MHz ≤ f ≤ 1 000 MHz	Quasi Peak	120 kHz	100 kHz
		es 6,765 MHz ≤ f ≤ 6,795 MHz and 11,8 e 200 Hz respectively 300 Hz.	10 MHz ≤ f ≤ 15,310 MHz, the

3) Refer to ETSI EN 300 330 V2.1.1 Clause 6.2.8, 6.2.9 and Annex C



6.4. Test result

9 kHz-30MHz:

Mode 4:						
Frequency (MHz)	Result @3m (dBuA/m)	Limit (dBµA/m) @10m	Corr. (dB)	Limit @3m (dBuA/m)	Antenna polarization	Conclusion
0.01	33.70	25.54	31.3	56.84	Н	PASS
0.02	29.35	23.46	31.3	54.76	Н	PASS
0.04	26.04	20.50	31.3	51.80	Н	PASS
0.70	4.69	8.10	31.3	39.40	Н	PASS
1.64	0.54	4.40	31.0	35.40	Н	PASS
5.00	-1.98	-0.42	28.6	28.18	Н	PASS
0.02	28.23	22.62	31.3	53.92	V	PASS
0.04	23.06	20.43	31.3	51.73	V	PASS
0.06	20.98	18.50	31.3	49.80	V	PASS
0.26	11.15	12.47	31.3	43.77	V	PASS
1.30	-1.93	5.43	31.1	36.53	V	PASS
3.15	-3.89	1.59	29.7	31.29	V	PASS

30MHz-1GHz:

Frequency (MHz)	Result (dBm)	Limit (dBm)	Antenna polarization	Conclusion
49.88	-73.58	-53.99	Н	PASS
100.93	-62.54	-53.99	Н	PASS
123.70	-62.18	-35.99	Н	PASS
217.54	-62.38	-53.99	Н	PASS
406.09	-69.35	-35.99	Н	PASS
675.21	-64.06	-53.99	Н	PASS
47.16	-59.97	-53.99	V	PASS
77.05	-58.46	-35.99	V	PASS
135.98	-68.72	-35.99	V	PASS
218.31	-66.79	-53.99	V	PASS
295.15	-65.66	-35.99	V	PASS
709.18	-62.95	-53.99	V	PASS

Note: All the emissions are measured with PK detector.



7. Transmitter out of band (OOB) emissions

7.1. Limits

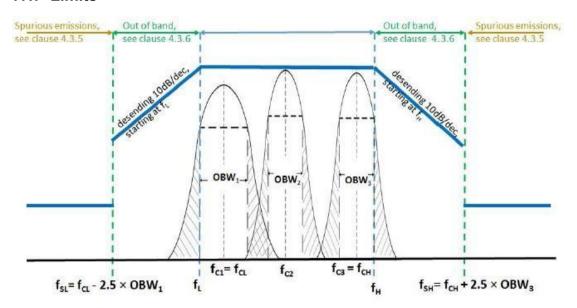


Figure 5: Out of band and spurious domain of a multi - frequency system (during one WPT system cycle time)

7.2. Block diagram of test setup

The same as clause 5.2

7.3. Test procedure

- 1) Scan from 9kHz to 150kHz, find the maximum H-field frequency to measure.
- 2) The measuring bandwidth and detector type of the measurement receiver see below:

Frequency: (f)	Detector type	Measurement receiver bandwidth	Spectrum analyser bandwidth
9 kHz ≤ f < 150 kHz	Quasi Peak	200 Hz	300 Hz
150 kHz ≤ f < 30 MHz	Quasi Peak	9 kHz	10 KHz
30 MHz ≤ f ≤ 1 000 MHz	Quasi Peak	120 kHz	100 kHz
	[1]	es 6,765 MHz ≤ f ≤ 6,795 MHz and 11,8 e 200 Hz respectively 300 Hz.	10 MHz ≤ f ≤ 15,310 MHz, the

3) Refer to ETSI EN 300 330 V2.1.1 Annex C

7.4. Test result

The equipment met the requirement of this clause.



8. WPT system unwanted conducted emissions

Not applicable

Since this requirement applies to all WPT systems where the cable to the primary coil exceeds a length of 3m and where the cable is not installed in the ground or any metallic structures.

9. Receiver blocking

Not applicable

Since this requirement applies to all WPT systems operation in Mode 1, Mode 2 and Mode 3,but the EUT only operated in Mode

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



EN62311: TEST Report

Report No: FCS202411753H01

Issued for

Applicant:	Mid Ocean Brands B.V.		
Address:	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.		
Product Name:	Wireless charger		
Brand Name:	N/A		
Model Name:	MO2450		
Series Model:	N/A		
Test Standard:	EN 62311:2020		
Issued By: Dongguan Funas Testing Technology Co.,Ltd			

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Applicant's Name....:

TEST RESULT CERTIFICATION

Mid Ocean Brands B.V.

Address:	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.
Manufacture's Name:	Mid Ocean Brands B.V.
Address:	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong.
Product Description	
Product Name:	Wireless charger
Brand Name:	N/A
Model Name:	MO2450
Series Model:	N/A
Test Standards:	EN 62311:2020
	been tested by FCS, and the test results show that the equipment ce with the 2014/53/EU RED Directive requirements. And it is ble identified in the report.
·	d except in full, without the written approval of FCS, this document, personal only, and shall be noted in the revision of the document.
Date (s) of performance of tests.:	Nov. 26, 2024~ Dec. 06, 2024
Date of Issue:	Dec. 06, 2024
Test Result:	Pass
Tested by	: Karl. Huang
Reviewed by	(Karl. Huang)
Approved by	: Jack Wang

(Jack Wang)



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1. Testing laboratory

······································			
Company Name:	Dongguan Funas Testing Technology Co.,Ltd.		
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan, China		
Telephone:	+86-769-27280901		
Fax:	+86-769-27280901		

Laboray Accreditations

FCC Test Firm Registration Number: 514908

CNAS Number: L15566
Designation number: CN0127

A2LA accreditation number: 5545.01

ISED Number: 25801

2. GENERAL INFORMATION

Equipment	Wireless charger		
Brand Name	N/A		
Model Name.	MO2450		
Serial Model	N/A		
Model Difference	N/A		
	The is a Wireless Phone Charger 15W .		
	Operation Frequency	110kHz-205kHz	
	Antenna Designation	Coil Antenna	
Product Description	Antenna Gain(Peak)	-0.58 dBi	
	Power Rating	DC 5V	
	More details of EUT technical specification, please refer to the User's Manual.		
	Input:DC 9V=2A 5V=2A		
Ratings	Output:DC 5V:::1A 7.5V:::1A 9V:::1.1A 9V:::1.67A		
	Wireless Output Power:15W Max.		
Battery	N/A		

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

GENERAL DESCRIPTION OF EUT



3.EN 62311 REQUIREMENT

GENERAL INFORMATION

According to its specifications, the EUT must comply with the requirements of the following standards:

EN 62311: 2020 [Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)]

LIMIT

A. Typical usage, installation and the physical characteristics of equipment make it inherently compliant with the applicable EMF exposure levels such as those listed in the

bibliography. This low-power equipment includes unintentional (or non-intentional) radiators, for example incandescent light bulbs and audio/visual (A/V) equipment, information technology equipment (ITE) and multimedia equipment (MME) that does not

contain radio transmitters.

NOTE Equipment is described as A/V equipment, ITE or MME if its main use is playback/recording of music, voice or images, or processing of digital information.

- B. The input power level to electrical or electronic components that are capable of radiating
- electromagnetic energy in the relevant frequency range is so low that the available antenna power and/or the average total radiated power cannot exceed the low-power exclusion level defined in 4.2.
- C. The available antenna power and/or the average total radiated power are limited by

product standards for transmitters to levels below the low-power exclusion level defined

in 4.2.

D. Measurements or calculations show that the available antenna power and/or the average

total radiated power are below the low-power exclusion level defined in 4.2.



It is found that the max result is 1.89 dBm (1.55mW) less than 20 mW (please refer to the test report "FCS202411753W01". The SAR-based Pmax follows Guideline / Standard: ICNIRP. Therefore, the EUT is deemed to comply with EMF basic restrictions.