

RF TEST REPORT

Report No: FCS202312153W01

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:	MO2242				
Series Model:	N/A				
Test Standard:	EN 303417 V1.1.1(2017-09)				
Issued By: Dongguan Funas Testing Technology Co., Ltd. Add: Room 105, 1/F Baohao Technology Building 1, No.15, Gongye West Road.Songshan Lake Hi-Tech Industrial Area, Dongguan, Guangdong, China					



TEST REPORT CERTIFICATION

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

7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan,

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: MO2242

Series Model...... N/A

Test Standards..... 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:

Dec 10, 2023 ~ Dec 15 2023

Date of Issue.....: Dec 15, 2023

Test Result.....: Pass

Tested by : Scott Shen

(Scott Shen)

Reviewed by : Scott Shen

(Scott Shen)

Approved by : Jack-Wang

(Jack Wang)



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Revision history

Rev.	Revisions	Issue Date	Revised By
	Initial issue	Dec 15. 2023	



1. Summary of test results

1.1. Standard description

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

	EN 303417 V1.1.1(2017-09)							
No	Test Parameter	Clause No	Condition	Results				
1	Permitted range of operating frequencies	4.3.2	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	N/A				
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

:	Wireless Charger
:	MO2242
:	Please reference user manual of this device
	Input: 5V2A 9V/2A Output:(phone):5W/7.5W/10W/15W(Max)
:	105kHz-205kHz
:	Inductive Loop Antenna
:	Mode 1: energy transmission
:	Series production
	:

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

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Serial No.	Other
N/A	N1/A	N/A	N/A	.
	N/A			N/A

2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	Other
Adapter	Xiaomi	AD652G	1
Phone	iPhone	13	1

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 9V	Low voltage: DC 9V, High voltage: DC
i ower supply		9.9V (±10% of nominal voltage)



2.6. Test laboratory

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

Address: Room 105, 1/F.. Baohao Technology Building 1, No.15, Gongye West

Road.Songshan Lake Hi-Tech Industrial Area, Dongguan, Guangdong, China

Telephone: +86-769-27280901

Fax: +86-769-27280901

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

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval			
RF Connected Test (Tonscend RF Measurement System)								
Spectrum analyzer	R&S	FSU26	200071	2024.08.28	1 Year			
Wideband Radio Communication tester	R&S	CMW500	117491	2024.08.28	1 Year			
Vector Signal Generator	Agilent	E8267D	US49060192	2024.08.28	1 Year			
Vector Signal Generator	Agilent	N5182A	MY48180737	2024.08.28	1 Year			
Power Sensor	Agilent	U2021XA	MY55150010	2024.08.28	1 Year			
Power Sensor	Agilent	U2021XA	MY55150011	2024.08.28	1 Year			
DC Power Source	MATRIS	MPS-3005L-3	D813058W	2024.08.28	1 Year			
Attenuator	Mini-Circuits	BW-S10W2	101109	2024.08.28	1 Year			
RF Cable	Micable	C10-01-01-1	100309	2024.08.28	1 Year			
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2024.08.28	1 Year			
Test Software	JS Tonscend	JS1120-3	Ver.2.7	N/A	N/A			
Radiated Emission	on Test Chamb	per 1#						
EMI Test Receiver	R&S	ESU8	100316	2024.08.28	1 Year			
Spectrum analyzer	Agilent	E4447A	MY50180031	2024.08.28	1 Year			
Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2024.08.28	1 Year			
Double Ridged Horn Antenna	R&S	HF907	100276	2024.08.28	1 Year			
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	2024.08.28	1 Year			
Pre-amplifier	A.H.	PAM-0118	360	2024.08.28	1 Year			
Pre-amplifier	TERA-MW	TRLA-0040G35	101303	2024.08.28	1 Year			
RF Cable	HUBSER	CP-X2+ CP-X1	W11.03+ W12.02	2024.08.28	1 Year			
RF Cable	N/A	SMAJ-SMAJ-1M + 11M	17070133+1707 0131	2024.08.28	1 Year			
MI Cable	HUBSER	C10-01-01-1M	1091629	2024.08.28	1 Year			
Test software	Audix	E3	V 6.11111b	N/A	N/A			



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

' .			
Spectrumanalyzer			

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.

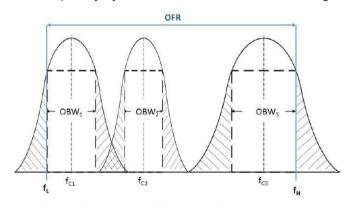


Figure 2: OFR of a multi - frequency WPT system within one frequency range of Table 2 and within one WPT system cycle time



4.4. Test result

Test Conditions		F _L [kHz]	F _H [kHz]	Assigned Frequency Band	Result
Volt	Temp			Limit (kHz)	
Normal Volt DC 5V	25℃	115.820	205.820	100-300	PASS
Low Volt DC 4.5V	-20℃	115.671	205.780	100-300	PASS
Low Volt DC 4.5V	55℃	115.378	205.760	100-300	PASS
High Volt DC 5.5V	-20℃	115.692	205.442	100-300	PASS
High Volt DC 5.5V	55℃	115.648	205.446	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 1: Limit is 42 dBuA/m for the following spot frequencies: $60 \text{ kHz} \pm 250 \text{ Hz}$ and $129,1 \text{ kHz} \pm 500 \text{ Hz}$.

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.

Correction factor, C₃, for limits at 3 m distance, dB

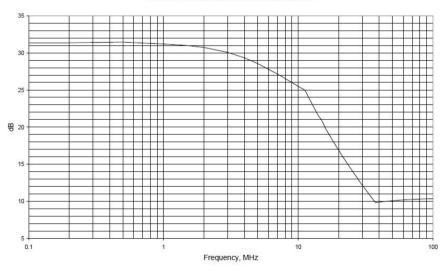


Figure H.2: Conversion factor C₃ versus frequency

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

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

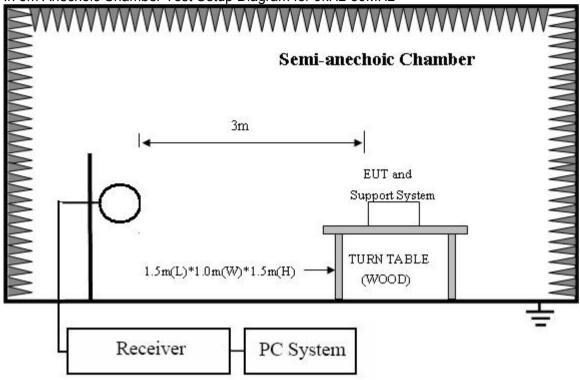
For 140kHz, C₃=31.2

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

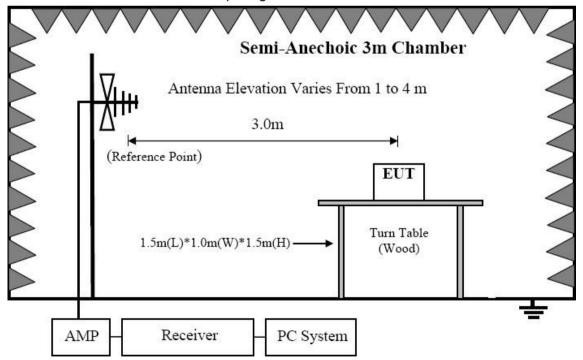


5.2. Block diagram of test setup

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
		s 6,765 MHz ≤ f ≤ 6,795 MHz and 11,8 ≥ 200 Hz respectively 300 Hz.	10 MHz ≤ f ≤ 15,310 MHz, the

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

5.4. Test result

Test Cor Mod		Frequency Measured power		Corr. (dB)	Limit (dBµA/m)	
Volt	Temp	[kHz]	(dBµA/m) @3m	(42)	@3m	Result
Normal Volt	25 ℃	115	33.13	31.3	73.3	PASS
Normal Volt	25℃	130	27.70	31.3	97.3	PASS
Normal Volt	25℃	205	41.61	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" records good 2, 2 and 4 according to Table 2: "stondby," record good 4				

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
		s 6,765 MHz ≤ f ≤ 6,795 MHz and 11,8 ≥ 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

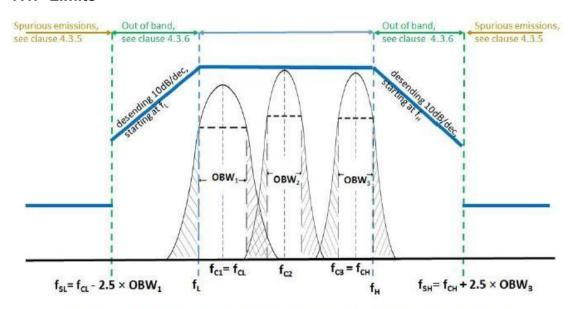


Figure 5: Out of band and spurious domain of a multi - frequency system (during one WPT system cycle time)

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
NOTE: For the measure	ment of the range	es 6,765 MHz ≤ f ≤ 6,795 MHz and 11,8 e 200 Hz respectively 300 Hz.	1.0011112

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: 2020 TEST Report

Report No: FCS202312153H01

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:	MO2242
Series Model:	N/A
Test Standard:	EN 62311:2020



TEST RESULT CERTIFICATION

Applicant's Name:	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:	MO2242			
Series Model:	N/A			
Test Standards:	EN62311:2020			
(EUT) is in compliance with the CE re report. This report shall not be reproduced of	en tested by FCS, the test results show that the equipment under test equirements. And it is applicable only to the tested sample identified in the except in full, without the written approval of FCS, this document may be only, and shall be noted in the revision of the document			
Date of Test				
Date (s) of performance of tests.:	Dec 10, 2023 ~ Dec 15 2023			
Date of Issue:	,			
Test Result	Pass			
Tested by	: Sam Wang (Sam Wang)			
Reviewed by	: Duke Qian)			
Approved by	: Jack-Wang			
	(Jack Wang)			



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GENERAL INFORMATIONLIMIT	_
4. RESULT	



1.Testing laboratory

coming ions or ontory			
Company Name:	Dongguan Funas Testing Technology Co., Ltd.		
Address:	Room 105, 1/F Baohao Technology Building 1, No.15, Gongye West Road.Songshan Lake Hi-Tech Industrial Area, Dongguan, Guangdong, 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

http://www.fcs-lab.com



2. GENERAL INFORMATION

Equipment	Wireless Charger		
Brand Name	N/A		
Model Name	MO2242		
Serial Model	N/A		
Model Difference	N/A		
	The EUT is Wireless Charger		
	Operation	_	
	Frequency:	105-205kHz	
	Modulation Type:	⊠MSK	
	Antenna		
Product Description	Designation:	Inductive Loop Antenna	
	Antenna Gain(Peak)	1.0dBi	
	More details of EUT technical specification, please refer to the User's Manual.		
Power Supply	Input: 5V2A 9V/2A		
	Output:(phone):5W/7.5W/10W/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 1.90dBm (1.548mW) less than 20 mW (please refer to the test report "FCS202312153W01". The SAR-based Pmax follows Guideline / Standard: ICNIRP. Therefore, the EUT is deemed to comply with EMF basic restrictions