

RF EXPOSURE REPORT



Applicant: Opticon sensors Europé B.V.
Opaallaan 35, 2132 XV Hoofddorp, The Netherlands

Product Name: Companion scanner

Brand Name: Opticon

Model No.: RS-3000

Model Difference: N/A

Report Number: E2/2021/60102

FCC ID Q2Q-RS3000

Issue Date: Aug.11,2021

Date of Test: Jun.30,2021~ Aug.11,2021

Date of EUT Received: Jun.30,2021

Approved By _____

John Teh

John Yeh

We hereby certify that:

The above equipment was verified by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC Rule Part §2.1091.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By
E2/2021/60102	Rev.00	Original.	Aug. 11, 2021	Viola Su

Note:

- 1、Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

Product Name:	Companion scanner
Brand Name:	Opticon
Model No.:	RS-3000
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	000028
Power Supply:	3.7V DC

1.2 Test Facility

Laboratory		Test Site Address	FCC Designation number
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	<input type="checkbox"/>	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	TW0027
	<input checked="" type="checkbox"/>	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	TW0028

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2 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

2.1 Standard Applicable

According to KDB 680106 D01 RF Exposure Wireless Charging App v03

RF exposure potential to users and bystanders is expected to vary according to factors inherent to the design of individual systems, which generally requires different evaluation considerations to show compliance.

When exposure concerns arise; for example, due to evolving products and operations, RF exposure evaluation may be requested under the provisions of Sections 1.1307 (c) and (d) to determine compliance. Because of significant variations in design and operating characteristics, the procedures required to evaluate RF exposure compliance for wireless power transfer are considered according to the exposure potentials of individual implementations

The RF exposure requirements must be determined in conjunction with the device operating characteristics, according to the mobile and portable exposure requirements in Sections 2.1091 and 2.1093 of the rules. SAR and MPE limits do not cover the frequency range for wireless power transfer applications which operate below 100 kHz and 300 kHz respectively; therefore, RF exposure compliance needs to be determined with respect to Sections 1.1307 (c) and (d) of the FCC rules.

2.2 Limits for Maximum Permissive Exposure (MPE)

Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

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2.3 The Worst Charging Condition:

Ancillary Equipment	Charging Condition	Verdict
Load	Full Loading	PASS
Load	99% Loading	PASS
Load	50% Loading	PASS
Load	1% Loading	PASS

Note: For Wireless Power Consortium Qi specification, a lower operating frequency or high duty cycle result in the transfer of a higher amount of power and charging current.

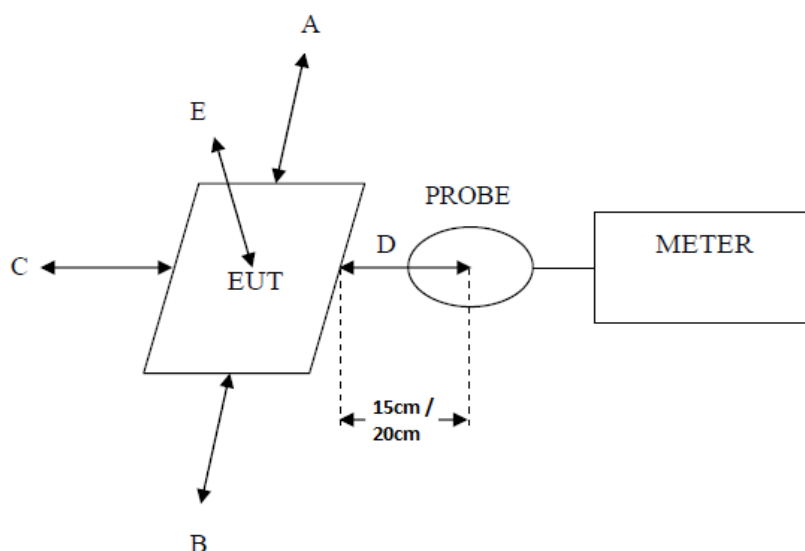
2.4 Measurement Procedure:

For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with proper distances measured from the center of the probe(s) to the edge of the device as per KDB 680106 D01.

2.5 Measurement Equipment Used:

Conducted Emission Test Site: Conducted B					
EQUIPMENT TYPE	MFR/BRAND	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EM RADIATION METER	Wandel&Goltermann	EMR-30	M-0006	2020/10/08	2021/10/07

2.6 Test Set-up:



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2.7 Maximum Permissible Exposure (MPE) Evaluation:

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full	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	10 cm	1.85	0.0056
	Back	10 cm	1.02	0.0028
	Left	10 cm	2.12	0.0058
	Right	10 cm	2.46	0.0060
	Top	10 cm	5.52	0.1450
	Bottom	10 cm	2.49	0.0065
	Limit		614	1.63

99%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	10 cm	1.83	0.0056
	Back	10 cm	1.03	0.0025
	Left	10 cm	2.11	0.0060
	Right	10 cm	2.45	0.0062
	Top	10 cm	5.53	0.1452
	Bottom	10 cm	2.50	0.0065
	Limit		614	1.63

50%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	10 cm	1.87	0.0054
	Back	10 cm	1.01	0.0029
	Left	10 cm	2.10	0.0058
	Right	10 cm	2.47	0.0058
	Top	10 cm	5.50	0.1449
	Bottom	10 cm	2.48	0.0066
	Limit		614	1.63

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10%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	10 cm	1.85	0.0058
	Back	10 cm	1.02	0.0027
	Left	10 cm	2.11	0.0057
	Right	10 cm	2.45	0.0060
	Top	10 cm	5.51	0.1453
	Bottom	10 cm	2.49	0.0067
	Limit		614	1.63

1%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	10 cm	1.83	0.0055
	Back	10 cm	1.04	0.0029
	Left	10 cm	2.13	0.0060
	Right	10 cm	2.45	0.0061
	Top	10 cm	5.51	0.1449
	Bottom	10 cm	2.47	0.0068
	Limit		614	1.63

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full	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	15 cm	0.92	0.0025
	Back	15 cm	0.69	0.0018
	Left	15 cm	1.04	0.0027
	Right	15 cm	1.23	0.0032
	Top	15 cm	2.31	0.0065
	Bottom	15 cm	1.27	0.0036
	Limit		614	1.63

99%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	15 cm	0.91	0.0027
	Back	15 cm	0.69	0.0016
	Left	15 cm	1.05	0.0025
	Right	15 cm	1.25	0.0029
	Top	15 cm	2.32	0.0065
	Bottom	15 cm	1.27	0.0034
	Limit		614	1.63

50%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	15 cm	0.91	0.0024
	Back	15 cm	0.68	0.0020
	Left	15 cm	1.04	0.0024
	Right	15 cm	1.24	0.0029
	Top	15 cm	2.32	0.0066
	Bottom	15 cm	1.27	0.0036
	Limit		614	1.63

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10%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	15 cm	0.90	0.0026
	Back	15 cm	0.70	0.0018
	Left	15 cm	1.04	0.0027
	Right	15 cm	1.22	0.0030
	Top	15 cm	2.33	0.0066
	Bottom	15 cm	1.29	0.0034
	Limit		614	1.63

1%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	15 cm	0.90	0.0024
	Back	15 cm	0.69	0.0017
	Left	15 cm	1.03	0.0026
	Right	15 cm	1.24	0.0031
	Top	15 cm	2.31	0.0065
	Bottom	15 cm	1.29	0.0036
	Limit		614	1.63

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full	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	20 cm	0.44	0.0012
	Back	20 cm	0.52	0.0013
	Left	20 cm	0.62	0.0016
	Right	20 cm	0.73	0.0018
	Top	20 cm	1.22	0.0034
	Bottom	20 cm	0.79	0.0021
	Limit		614	1.63

99%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	20 cm	0.43	0.0014
	Back	20 cm	0.52	0.0010
	Left	20 cm	0.62	0.0016
	Right	20 cm	0.74	0.0018
	Top	20 cm	1.20	0.0032
	Bottom	20 cm	0.78	0.0023
	Limit		614	1.63

50%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	20 cm	0.45	0.0013
	Back	20 cm	0.52	0.0011
	Left	20 cm	0.61	0.0016
	Right	20 cm	0.71	0.0018
	Top	20 cm	1.23	0.0033
	Bottom	20 cm	0.80	0.0024
	Limit		614	1.63

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10%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	20 cm	0.45	0.0012
	Back	20 cm	0.52	0.0012
	Left	20 cm	0.60	0.0017
	Right	20 cm	0.74	0.0015
	Top	20 cm	1.21	0.0032
	Bottom	20 cm	0.78	0.0020
	Limit		614	1.63

1%	Maximum Permissible Exposure			
	Probe from EUT Side	Test Distance	V/m	A/m
	Front	20 cm	0.42	0.0011
	Back	20 cm	0.53	0.0013
	Left	20 cm	0.61	0.0018
	Right	20 cm	0.72	0.0017
	Top	20 cm	1.21	0.0032
	Bottom	20 cm	0.79	0.0023
	Limit		614	1.63

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