



RF Exposure Evaluation

For

ORPHEK LIMITED

Orphek iCon dim driver

Test Model: ZL-S075CW-1500MA

Additional Model No.: Please Refer to Page 6

Prepared for : ORPHEK LIMITED
Address : UNIT A7, 12/F, ASTORIA BUILDING, 34 ASHLEY ROAD, TSIM SHA TSUI, HONG KONG

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : June 27, 2023
Number of tested samples : 2
Sample number : A062723001-1, A062723001-2
Serial number : Prototype
Date of Test : June 27, 2023 ~ July 22, 2023
Date of Report : July 24, 2023



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**RF Exposure Evaluation****Report Reference No. : LCSA01066075EA**

Date of Issue : July 24, 2023

Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Testing Location/ Procedure : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □**Applicant's Name : ORPHEK LIMITED**

Address : UNIT A7, 12/F, ASTORIA BUILDING, 34 ASHLEY ROAD, TSIM SHA TSUI, HONG KONG

Test SpecificationStandard..... : FCC KDB publication 447498 D01 General RF Exposure Guidance v06
FCC CFR 47 part1 1.1310
FCC CFR 47 part2 2.1091**Test Report Form No. : TRF-4-E-214 A/0**

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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EUT Description. : Orphek iCon dim driver

Trade Mark : ORPHEK

Test Model..... : ZL-S075CW-1500MA

Ratings : INPUT: 120-277V~, 50/60Hz, 0.65A
OUTPUT: DC 28-48V, 1500mA, Max.75WResult : **Positive****Compiled by:**

Jack Liu/ Administrator

Supervised by:

Cary Luo/ Technique principal

Approved by:

Gavin Liang/ Manager



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RF Exposure Evaluation

Test Report No. :	LCSA01066075EA	<u>July 24, 2023</u> Date of issue
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EUT..... : Orphek iCon dim driver

Test Model..... : ZL-S075CW-1500MA

Applicant..... : ORPHEK LIMITED

Address..... : UNIT A7, 12/F, ASTORIA BUILDING, 34 ASHLEY ROAD, TSIM
SHA TSUI, HONG KONG

Telephone..... : /

Fax..... : /

Manufacturer..... : ORPHEK LIMITED

Address..... : UNIT A7, 12/F, ASTORIA BUILDING, 34 ASHLEY ROAD, TSIM
SHA TSUI, HONG KONG

Telephone..... : /

Fax..... : /

Factory..... : ORPHEK LIMITED

Address..... : UNIT A7, 12/F, ASTORIA BUILDING, 34 ASHLEY ROAD, TSIM
SHA TSUI, HONG KONG

Telephone..... : /

Fax..... : /

Test Result	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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Revision History

Report Version	Issue Date	Revision Content	Revised By
000	July 24, 2023	Initial Issue	---





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1. Product Information

Product name	Orphek iCon dim driver
Model number	ZL-S075CW-1500MA
Additional Model No.	ZL-S030CW-0500MA, ZL-S040CW-1000MA,ZL-S060CW-1000MA
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Power supply	INPUT: 120-277V~, 50/60Hz, 0.65A OUTPUT: DC 28-48V, 1500mA, Max.75W
Hardware version	/
Software version	/
FCC Operation frequency	2412~2462 MHz
Channel Number	11 Channels for 20MHz bandwidth (2412~2462MHz)
Modulation Type	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK)
Antenna Type	External Antenna
Antenna Gain	2.0dBi(Max.)
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Mobile Devices

Note: For a more detailed antenna description, please refer to the antenna specifications or the antenna report provided by the customer.

2. Evaluation Method

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.



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3. Limit

3.1 Refer Evaluation Method

[ANSI C95.1-1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices

3.2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100)*	30
3.0 – 30	824/f	2.19/f	(180/f ²)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

4. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

5. Antenna Information

EUT can only use antennas certificated as follows provided by manufacturer;

Internal Identification	Antenna type and antenna number	Operate frequency band	Maximum antenna gain	Note
External	External Antenna	2400MHz-2500MHz	2.0dBi	WIFI Antenna



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6. Conducted Power

<2.4G WIFI>

Mode	Channel	Frequency(MHz)	Max Conducted Power (dBm)
IEEE 802.11b	1	2412	14.44
	6	2437	14.76
	11	2462	14.11
IEEE 802.11g	1	2412	14.04
	6	2437	14.33
	11	2462	14.23
IEEE 802.11n HT20	1	2412	14.49
	6	2437	14.21
	11	2462	14.35

7. Manufacturing Tolerance

<2.4G WIFI>

11B (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.0	14.0	14.0
Tolerance ±(dB)	1.0	1.0	1.0
11G (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.0	14.0	14.0
Tolerance ±(dB)	1.0	1.0	1.0
11N20SISO (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	14.0	14.0	14.0
Tolerance ±(dB)	1.0	1.0	1.0



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8. Measurement Results

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r=20\text{cm}$, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

<2.4G WIFI>

Band/Mode	RF output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
IEEE 802.11b	15	31.6228	2	1.5849	0.009976	1.0000
IEEE 802.11g	15	31.6228	2	1.5849	0.009976	1.0000
IEEE 802.11n HT20	15	31.6228	2	1.5849	0.009976	1.0000

Remark:

1. Output power including tune-up tolerance;
2. Output power was adjusted to duty cycle at 100% if measured duty cycle less than 98%;
3. MPE evaluate distance is 20cm from user manual provide by manufacturer.

9. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

10. Description of Test Facility

NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.
Test Firm Registration Number: 254912.

11. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Output power	1GHz-40GHz	$\pm 0.57\text{dB}$	(1)

- (1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

.....THE END OF REPORT.....



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