



FCC RF EXPOSURE REPORT

For

2K 4ch 1HDD wireless Recorder

MODEL NUMBER: W2K4NVR

PROJECT NUMBER: 4788689317

REPORT NUMBER: 4788689317-2

FCC ID: SMHW2K4NVR

IC: 4593A-W2K4NVR

ISSUE DATE: Nov. 17, 2018

Prepared for

Circus World Displays Limited

Prepared by

**UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch
Room 101, Building 10, Innovation Technology Park,
Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
Tel: +86 769 33817100
Fax: +86 769 33244054
Website: www.ul.com**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	11/17/2018	Initial Issue	

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS.....	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION.....	5
4. REQUIREMENT	6

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Circus World Displays Limited
Address: 4080 Montrose Rd., Niagara Falls, ON, L2H1J9, Canada


Manufacturer Information

Company Name: Circus World Displays Limited
Address: 4080 Montrose Rd., Niagara Falls, ON, L2H1J9, Canada


EUT Description

Product Name: 2K 4ch 1HDD wireless Recorder
Model Name: W2K4NVR
Trademark: DEFENDER
Sample Number: 1830071
Data of Receipt Sample: Sep 26, 2018
Date Tested: Sep 26, 2018~ Nov. 16, 2018


APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC Guidelines for Human Exposure IEEE C95.1	Complies

Test By: 

Denny Huang
Engineer Project Associate

Check By: 

Shawn Wen
Laboratory Leader

Approved By: 

Stephen Guo
Laboratory Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 447498 D01 General RF Exposure Guidance v06.

3. FACILITIES AND ACCREDITATION

Test Location	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
Address	Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
Accreditation Certificate	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. The Certificate Registration Number is 4102.01. UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The Designation Number is CN1187. UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320.

Note: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites.

4. REQUIREMENT

LIMIT

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
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
300-1500	--	--	f/150	30
1500-100,000	--	--	1.0	30

Note 1: f = frequency in MHz, * means Plane-wave equivalent power density

Note 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Note 3: The limit value 1.0mW/cm² is available for this EUT.

MPE CALCULATION METHOD

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

where: S = power density (in appropriate units, e.g. mW/ cm²)

P = power input to the antenna (in appropriate units, e.g., mW) (the measured power value refer to the tune-up procedure or OP document)

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 (appropriate units, e.g., cm)

CALCULATED RESULTS

Radio Frequency Radiation Exposure Evaluation

1) For SISO

WIFI (Worst case)-Antenna 1+2							
Test Mode	Output Power to Antenna		Antenna Gain		Power Density	Limit	Test Result
	(dBm)	(mW)	(dBi)	(Numeric)			
11g	17.0	50.12	8.01	6.32	0.0630	1	Complies
							--

2) For MIMO

WIFI (Worst case)- 802.11n20 MIMO							
Test Mode	Output Power to Antenna		Antenna Gain		Power Density	Limit	Test Result
	(dBm)	(mW)	(dBi)	(Numeric)			
11n20MIMO	16.5	44.67	8.01	6.32	0.0561	1	Complies
							--

Note:

- 1) Remark: For this product, it has two antennas, antenna1 and antenna2, the 802.11B SISO&802.11G SISO modes are use the SISO technical, but the ant1 and ant2 can transmitter in the same time under these modes. The 802.11N(HT20) is use both the SISO and MIMO technical.
- 2) the calculated distance is 20cm.
- 3) Directional gain = $10\log [(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}] = 8.01$ dBi

END OF REPORT