

Maximum Permissible Exposure Report

Product : EV Charging Connectors

Model Name : VCPNXD350A0

Series Model : VCPNXD080A0, VCPNXD200A0, VCPNXD250A0, VCPN2A032A0, VCPN2A050A0, VCPN2A080A0

FCC ID : 2BF7W-VCNA0

Test Regulation : 47 CFR FCC Part 2.1093

Received Date : 2024/3/6

Test Date : 2024/3/19 ~ 2024/3/21

Issued Date : 2024/8/27

Applicant : K.S. Terminals Inc
No.08, Zhangbin E. 3rd Road., Xianxi Township, Changhua County 507 Taiwan

Issued By : Underwriters Laboratories Taiwan Co., Ltd.
Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd.,
Zhudong Township, Hsinchu County, Taiwan



The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.

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Doc No: Form-ULID-004725 (DCS:17-EM-F0864) / 5.2



Test report No. : 4791194982-US-R1-V0
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Issued date : 2024/8/27
FCC ID : 2BF7W-VCNA0

REVISION HISTORY

Original Test Report No.: 4791194982-US-R1-V0

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1. Attestation of Test Results

APPLICANT: K.S. Terminals Inc
No.08, Zhangbin E. 3rd Road., Xianxi Township, Changhua County
507 Taiwan

MANUFACTURER: K.S. Terminals Inc
No.08, Zhangbin E. 3rd Road., Xianxi Township, Changhua County
507 Taiwan

EUT DESCRIPTION: EV Charging Connectors

BRAND: 

MODEL: VCPNXD350A0

SERIES MODEL: VCPNXD080A0, VCPNXD200A0, VCPNXD250A0,
VCPN2A032A0, VCPN2A050A0, VCPN2A080A0

SAMPLE STAGE: Pilot-run Verification Test sample

APPLICABLE STANDARDS	
STANDARD	Test Results
47 CFR FCC Part 2.1093	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:



Sally Lu
Project Handler

Date : 2024/8/27

Approved and Authorized By:



Kent Liu
Senior Laboratory Engineer

Date : 2024/8/27

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2. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with KDB 447498 D04 Interim General RF Exposure Guidance v01.

3. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

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4. Equipment Under Test

4.1. Description of EUT

Product	EV Charging Connectors
Brand Name	KST™
Model Name	VCPNXD350A0
Series Model	VCPNXD080A0, VCPNXD200A0, VCPNXD250A0, VCPN2A032A0, VCPN2A050A0, VCPN2A080A0
Normal Voltage	10Vdc to RF Module from DC supply 120Vac/ 60Hz
Operating Frequency	315 MHz
Sample ID	6985064

Note:

1. The models difference table as below:

Type	Model	Rated Current	Difference
AC Charging Connectors	VCPN2A032A0	32A	240V AC
	VCPN2A050A0	50A	
	VCPN2A080A0	80A	
DC Charging Connectors	VCPNXD080A0	16A	1000V DC
	VCPNXD200A0	200A	
	VCPNXD250A0	250A	
	VCPNXD350A0	350A	

2. For this report measurement uncertainty, statement of conformity, determining compliance, it is necessary to refer to the original measurement report of EUT.
3. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual, the laboratory shall not be held responsible.

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4.2. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)	N/A	N/A	PCB	-17.14

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual, the laboratory shall not be held responsible.

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5. Requirement

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/1500	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.

Power Density (S) is calculated by the following formula:

$$S = (P * G) / 4\pi R^2$$

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

P = power input to the antenna (in appropriate units, e.g., mW)

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)

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6. General RF Exposure Test Exemption

The corresponding Exclusion Threshold condition, listed below:

- 1) Blanket Exempt: Following 47 CFR 1.1307(b)(3)(i)(A), the available maximum time-averaged power is no more than 1 mW.
- 2) SAR Exempt: Following 47 CFR 1.1307(b)(3)(i)(B), the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

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3) MPE Exempt: Following 47 CFR 1.1307(b)(3)(i)(C), using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to [§ 1.1307\(b\)\(3\)\(i\)\(C\)](#) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.

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7. Radio Frequency Radiation Exposure Evaluation

(1) General RF Exposure Test Exemption

Option	Evaluation Method	Clause
<input checked="" type="checkbox"/>	Blanket Exempt	47 CFR 1.1307(b)(3)(i)(A)
<input type="checkbox"/>	SAR Exempt	47 CFR 1.1307(b)(3)(i)(B)
<input type="checkbox"/>	MPE Exempt	47 CFR 1.1307(b)(3)(i)(C)

Note: Max. ERP (dBm) = Max. Average power (dBm) + Antenna Gain (dBi) - 2.15 (dB)

Evaluation Frequency (MHz)	Radiated Field Strength (dB μ V/m)@3m	Max. EIRP (dBm)	Max. EIRP (mW)	Threshold EIRP (mW)
315	75.72	-19.44	0.01138	1

Note:

1. Calculate the EIRP from the radiated field strength in the far field using Equation:

$$\text{EIRP} = E_{\text{Meas}} + 20\log d_{\text{Meas}} - 104.7$$

Where,

EIRP is the equivalent isotropically radiated power, in dBm.

E_{Meas} is the field strength of the emission at the measurement distance, in dB μ V/m.

d_{Meas} is the measurement distance, in m.

2. For Example $\text{EIRP} = 75.72 + 20\log(3) - 104.7 = -19.44 \text{ dBm}$

Conclusion:

Since maximum time-averaged power or ERP/EIRP is below SAR exempt power thresholds, the SAR evaluation is not required.

END OF REPORT

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