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## 1. General Description 产品概述

This specification describes the performance characteristics of a 109W, CCCV output Li-ion battery charger, which is suitable for 13S 48V battery pack and the maximum charging current is 2A.

本规格书描述了一款功率 109W，恒压恒流输出的锂电池充电器的具体规格，其适用于 13 串 48V 电池组，最大充电电流为 2A。

## 2. Electrical Specification 电气规格

### 2.1. Input Characteristics 输入特性

Parameter 参数	Specification 规格			Note 说明
	Min. 最小值	Typ. 典型值	Max. 最大值	
<b>Input Voltage</b> 输入电压	200Vac	220-240Vac	264Vac	
<b>Input Frequency</b> 输入频率	47Hz	50/60Hz	63Hz	
<b>Input Current</b> 输入电流			1.2A	@220Vac, Full Load 输入 220Vac, 满载输出
<b>Inrush Current</b> 冲击电流			100A	@220Vac, Cold Start 输入 220Vac, 冷机启动
<b>Efficiency</b> 效率	91%	92%		@220Vac, Full Load Test at PCB board Terminal 输入 220Vac, 满载输出 PCB 板端效率
<b>Standby Power Consumption</b> 待机功耗			1W	@220Vac, No Load 输入 220Vac, 输出空载
<b>Brownout</b> 输入欠压	The power supply shall not damaged when the input voltage is below 200Vac 在输入电压低于 200Vac 的情况下，电源不会损坏			
<b>Power Factor</b> 功率因数	0.5			@220Vac, Full Load 输入 220Vac, 满载输出
<b>Turn on Delay Time</b> 开机延迟时间			3s	@220Vac, Full Load 输入 220Vac, 满载输出

### 2.2. Output Characteristics 输出特性

Parameter 参数	Specification 规格			Note 说明
	Min. 最小值	Typ. 典型值	Max. 最大值	
<b>Constant Voltage Output</b> 恒压输出电压 (CV)	54.2V	54.6V	54.8V	Test with 0.3A CC load 带 0.3A 恒流负载测试
<b>No Load Output Voltage</b> 空载输出电压			42.4V	RMS Voltage 有效值电压
<b>Output Voltage Range with Trickle Charge Current</b> 预充电电压范围	28V ± 1V		38V ± 1V	
<b>Output Voltage Range with Quick Charge Current</b> 快充充电电压范围	38V ± 1V		53V	

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<b>Trickle Charge Current</b> 预充充电电流 (CC1)	0.3A	0.4A	0.5A	
<b>Fast Charge Current</b> 快充充电电流 (CC2)	1.9A	2.0A	2.1A	
<b>Charging End Current</b> 充电截至电流	0.1A	0.2A	0.3A	
<b>Output Current Ripple</b> 输出电流纹波			0.6A	25°C, Battery Load, 20MHz Bandwidth 25°C 环温, 电池负载, 20MHz 带宽
<b>Battery Reverse Current</b> 电池反向电流			1mA	AC Power off AC 断电
<b>Holdup Time</b> 保持时间	8ms			@230Vac, Full Load 输入 230Vac, 满载输出

## 2.3. LED Indicator LED 指示灯

Red, yellow, blue light LED indicates the battery is on charging, and red light indicates that the battery level is less than 50%, yellow light indicates the battery level is between 50% and 75%, blue light indicates the battery level is between 75% and 100%. And the green light LED indicates the battery is fully charged.

红色, 黄色, 蓝色 LED 灯表示电池正在充电, 其中红色表示电池电量低于 50%, 黄色表示电池电量在 50%和 75%之间, 蓝色表示电池电量在 75%和 100%之间。绿灯表示电池已充满电。

## 2.4. Protection Characteristics 保护特性

### 2.4.1 Over Voltage Protection 过压保护

The output voltage that triggers over voltage protection less than 63Vdc. The power supply will enter auto-recovery mode during OVP, and it will return to normal operation after the fault condition is removed.

过压保护电压小于 63Vdc。产品过压保护模式为自动恢复模式, 当故障排除后产品恢复正常工作。

### 2.4.2 Over Temperature Protection 过温保护

The power supply enters over temperature protection mode when the ambient temperature over 60°C ± 10°C. The protection mode is auto-recovery mode, and it will return to normal operation after the fault condition is removed.

当环境温度高于 60°C ± 10°C 时, 产品进入过温保护状态, 保护模式为自恢复模式。当故障解除后产品恢复正常工作。

### 2.4.3 Short Circuit Protection 短路保护

The power supply will enter protection mode when the output is being shorted. The protection mode is auto-recovery mode, and it will return to normal operation after the fault condition is removed.

当输出短路时, 产品进入保护状态。保护模式为自动恢复模式, 当故障排除后产品恢复正常工作。

### 2.4.4 Reverse Connection Protection 反接保护

The power supply will enter protection mode when the battery is reverse connection. The protection mode is auto-recovery mode, and it will return to normal operation after the fault condition is removed.

当电池反接时, 产品进入保护模式。保护模式为自动恢复模式, 当故障排除后产品恢复正常工作。

## 3. Environmental Requirement 环境要求

### 3.1. Operation Temperature and Relative Humidity 工作温度和湿度

0°C ~ 35°C, 20% RH ~ 80% RH

0 ~ 35 摄氏度, 20%-80%相对湿度

### 3.2. Storage Temperature and Relative Humidity 存储温度与湿度

-10°C ~ 70°C, 10% RH ~ 90% RH, Non-Condensing

-10 ~ 70 摄氏度, 10%-90%相对湿度, 非凝露

### 3.3. Operation Altitude 工作海拔

0 ~ 5,000 meters

0 ~ 5,000 米

### 3.4. Ingress Protection Rating 防护等级

IP52

## 4. Reliability Requirement 可靠性要求

### 4.1. MTBF 平均无故障时间

The MTBF shall be more than 100,000 hours at 25°C, 230Vac input, and full load output.

产品平均无故障时间大于 100,000 小时, 在 25°C 环温, 230Vac 输入和满载输出情况下。

### 4.2. Electrolytic Capacitor Lifetime 电解电容寿命

The lifetime of electrolytic capacitor shall be more than 10,000 hours at 25°C, 230Vac input, and full load output.

产品电解电容寿命大于 10,000 小时, 在 25°C 环温, 230Vac 输入和满载输出情况下。

### 4.3. Drop Test 跌落测试

Drop to concrete surface, 80cm height, 1 drop on each face

水泥材质地面, 80 厘米高度, 每个面 1 次

### 4.4. Vibration Test 振动测试

Frequency: 10-300Hz, Acceleration: 1G, Breadth: 3.5mm, 1hour for each direction of X, Y, Z.

频率: 10-300Hz; 加速度: 1G; 振幅: 3.5mm; X, Y, Z 轴每个方向 1 小时。

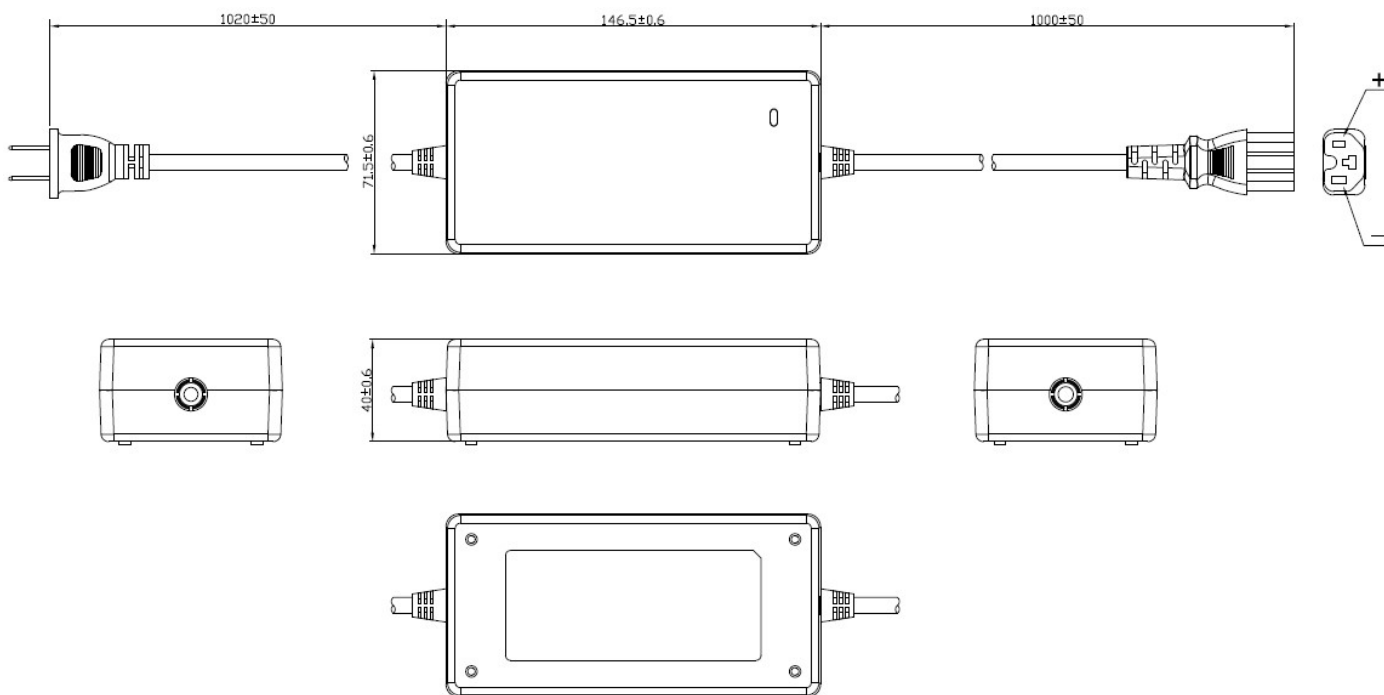
## 5. Acoustic Noise 噪音

<25dB, Measured at the distance of 1m. Test at 230VAC/50Hz input and with all load condition.

小于 25db, 距离电源 1 米处测量, 测试条件为输入 230VAC/50Hz, 输出任意负载。

## 6. Mechanical Specification 机构规格

### 6.1. Dimension and Outline Drawing 尺寸和外观图



Physical size:  $146.5 \pm 0.6\text{mm(L)} * 71.5 \pm 0.6\text{mm(W)} * 40 \pm 0.6\text{mm(H)}$

Material: PC

Color: BLACK

Unit: mm

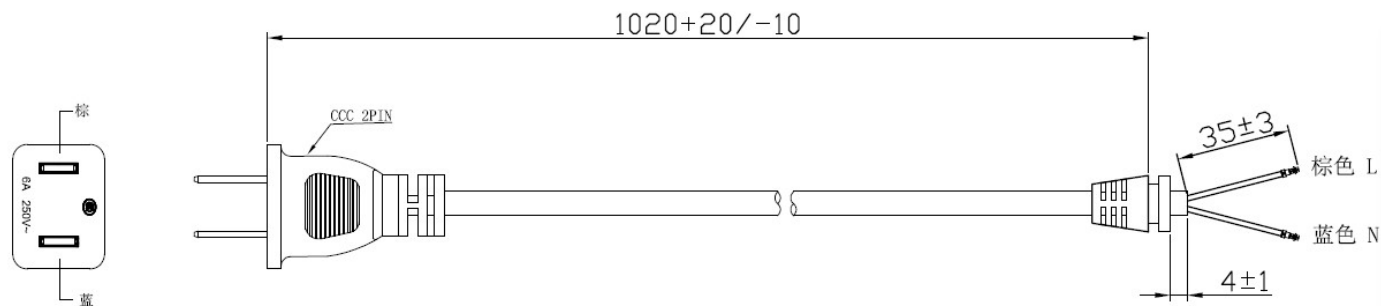
结构尺寸:  $146.5 \pm 0.6\text{mm(L)} * 71.5 \pm 0.6\text{mm(W)} * 40 \pm 0.6\text{mm(H)}$

材质: PC

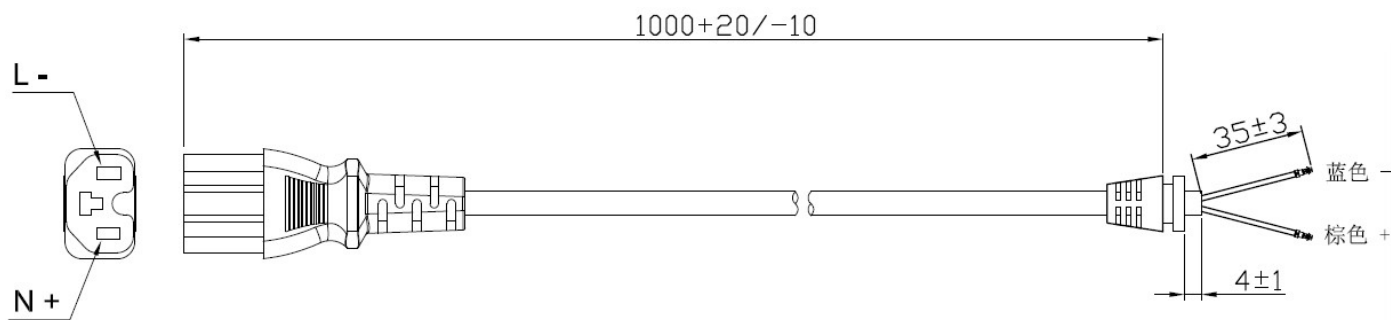
颜色: 黑色

单位: 毫米

### 6.2. AC Cable Specification AC 线规格



### 6.3. DC Cable Specification DC 线规格



## 7. Regulatory Requirement 法规要求

### 7.1. Safety Approval 安规认证

The power supply shall be certified under the following regulatory standards: QB/T2947.3-2008  
 产品符合如下认证标准: QB/T2947.3-2008

### 7.2. Hi-Pot Voltage 耐压

Primary to secondary : 3, 000Vac/5mA/60s (3s for production)  
 原边对副边: 3, 000Vac/5mA max. /60s (生产测试时间: 3s)

### 7.3. Leakage Current 漏电流

0.75mA max. @240Vac/50Hz  
 最大 0.75mA, 在输入 240Vac/50Hz 条件下测试

### 7.4. Insulation Resistance 绝缘阻抗

Primary to secondary: 100Mohm min. @500Vdc test voltage  
 原边对副边: > 100Mohm @500Vdc 测试电压

## 8. Notes 充电器注意事项

- 1). This charger is only suitable for 48V Li-ion battery. 此充电器仅适用于 48V 锂电池。
- 2). Charge for non-chargeable battery is forbidden. 禁止给不可充电电池充电。
- 3). Charging is forbidden if the charger's cable is damaged. 充电器线损坏时, 禁止充电。

## 9. Revision History 版本记录

Revision /版本	Change Description / 变更描述	Date /日期	Author /作者
00	Preliminary release	2020-10-17	
01	型号变更	2021-01-04	