

## 1800W Li-Ion Diamond™ Series Battery Charger Data Sheet



### Description:

Green Watt Power's 1800W Diamond™ Series universal Li-ion battery on-board and off board chargers are designed with ultra-high efficiency. The extraordinary performance of low power dissipation provides the charger high reliability and long lifetime. This series of chargers offer solid and safe power conversions for applications such as e-vehicles, e-motorcycles, e-boat, e-machines, etc.

### Features:

- On-board and off-board option with handle
- Universal AC Input: 90~264Vac
- Ultra wide output voltage: 50~86V
- Output power: 1800W @ high-line; 1200W @ low-line
- High efficiency: Up to 92%
- All-Around Protections: OVP, OCP, SCP, OTP
- High temperature ambient @ 60°C
- CAN communication
- IP65 waterproof rating (Contact factory for IP67)



Model Number	Output Power	Input Voltage Range (Vac)	Output Voltage Range (Vdc)	Output Current	IP Rating	Notes
<b>EVC-84-1800F</b> (PLD1800-EVCP04-84M)	1800W	90~264Vac	50~86V	0~21.2A	IP65	Fan-type, No Handle
<b>EVC-84-1800FH</b> includes handle (PLD1800-EVCP04-84)	1800W	90~264Vac	50~86V	0~21.2A	IP65	Fan-type, with Handle

Note: Model numbers in parenthesis are factory numbers

<b>Input &amp; Output Specifications (Below Are for All Models)</b>	
Output Voltage	50~86V
Output Current	0~21.2A
Voltage Accuracy	±0.5V
Output Power	1200W @ low-line (90~150Vac); 1800W @ high-line (150~264Vac)
Input Voltage	90~264Vac
Aux. 12Vo	0.5A (isolated from main power output)
Input Frequency	47~63Hz
Max. Input Current	12.3A@115Vac 8.6A@230Vac
Max. Input Power	2000W@230Vac
Power Factor	>0.99@115Vac >0.98@230Vac
Efficiency (Typical)	89%@115Vac 92%@230Vac
Current Ripple	±15% Iout max., during constant current mode. Measurement is done by 20MHz bandwidth oscilloscope. (Test under the condition of rated input and rated output).

<b>Communication</b>	CAN
<b>Turn On Delay</b>	5.0s max. @ Full Load
<b>Ingress Protection</b>	IP65 (Consult factory for IP66/67)
<b>Protections</b>	OVP, OCP, SCP, OTP
<b>Over Voltage Protection (OVP)</b>	The charger enters latch mode when the output voltage is above 95V max. After the fault is removed, the charger will resume normal operation
<b>Short Current Protection (SCP)</b>	When the output is shorted, the power supply will not be damaged. After the fault is removed, the charger will resume normal operation.
<b>Anti-Reverse Polarity Protection</b>	When the battery polarity is reversely connected to the charger, the charger will go into protection mode. After the fault is removed, the charger will resume normal operation.
<b>Over Temperature Protection</b>	The charger shall go into thermal protection when the maximum temperature of the case exceeds 85±5°C. The charger shall enter auto recovery mode, and shall self-recover when the case temperature goes down to 75±5°C.
<b>Output overcurrent protection</b>	When the output current exceeds 24A and lasts for more than 2 seconds, the output overcurrent protection is triggered. After the fault is removed, the charger will resume normal operation.
<b>Timing protection</b>	The maximal charging times for the CC and CV stages are 7 and 4 hours respectively (settable through CAN). When the stage lasts longer than the above number, the charger will enter the timing protection mode.
<b>Battery Under Voltage Protection</b>	When the battery voltage is lower than 48 ± 2V, the charger will not work. After the fault is removed, the charger will resume normal operation.
<b>Cooling</b>	Fan Cooling
<b>Max. Case Temperature</b>	<60°C@25°C Ambient Temperature
<b>Surge Protection</b>	1kV DM / 2kV CM
<b>Isolation</b>	Prim. to Sec.: 3000Vac/10mA max./60s Prim. to Earth: 1500Vac/10mA max./60s Sec. to Earth: 500Vac/10mA max./60s

	<b>Fan-type No Handle</b>	<b>Fan-type with Handle</b>	<b>No-Fan-type, No Handle</b>
<b>Dimensions (LxWxH)</b>	286x154x88mm	322x154x88mm	TBD
<b>Weight</b>	3.8kg	4kg	TBD

Note: Unless otherwise noted, the data are based on 25°C ambient temperature, 230Vac input voltage and full load.

## Immunity (Designed to meet):

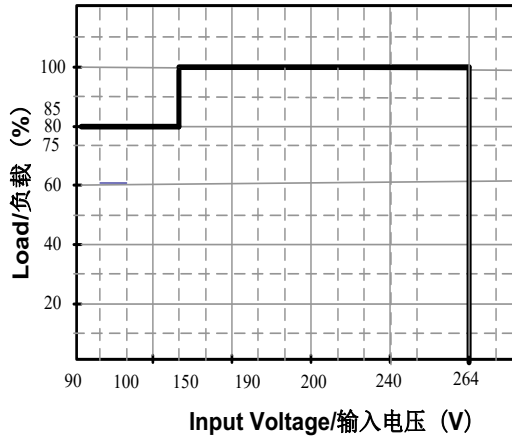
- EN61000-3-2: Harmonic Current Emission.
- EN61000-3-3: Voltage Fluctuations and Flicker.
- EN61000-4-2: ESD 8kV Air Discharge, 4kV Contact Discharge, Criteria B.
- EN61000-4-3: Radio-Frequency Electromagnetic Field Susceptibility Test-Rs Level 3, Criteria A.
- EN61000-4-4: Electrical Fast Transient/Burst-EFT 1KV, Criteria B.
- EN61000-4-5: Surge Immunity Test, AC Power Line: Line to Line 1kV; Line to Earth 2kV Criteria B.
- EN61000-4-6: Conducted Radio Frequency Disturbance Test-CS Level 3, Criteria A.
- EN61000-4-8: Power Frequency Magnetic Field Test 3A/m, Criteria A.
- EN61000-4-11: Voltage Dips, Criteria B.
- EMI: Test with the system.

## Safety (Designed to meet):

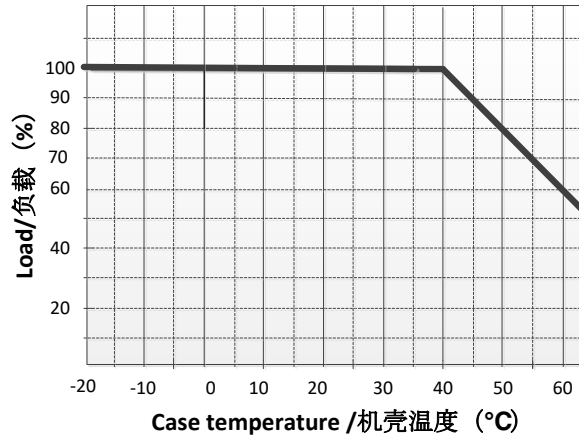
EN60335 & UL62368

## Derating Curves

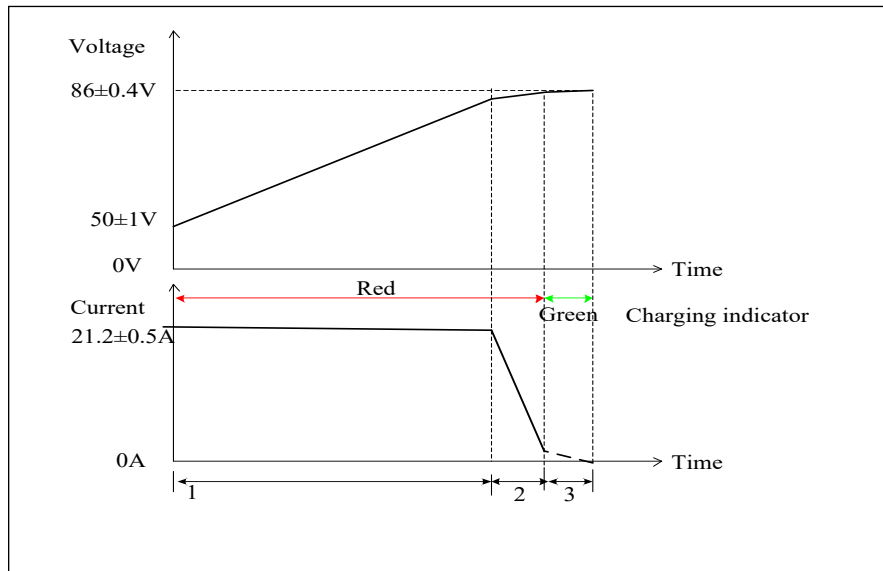
### Input Voltage vs. Load



### Temp vs. Load



## Typical Charge Curves

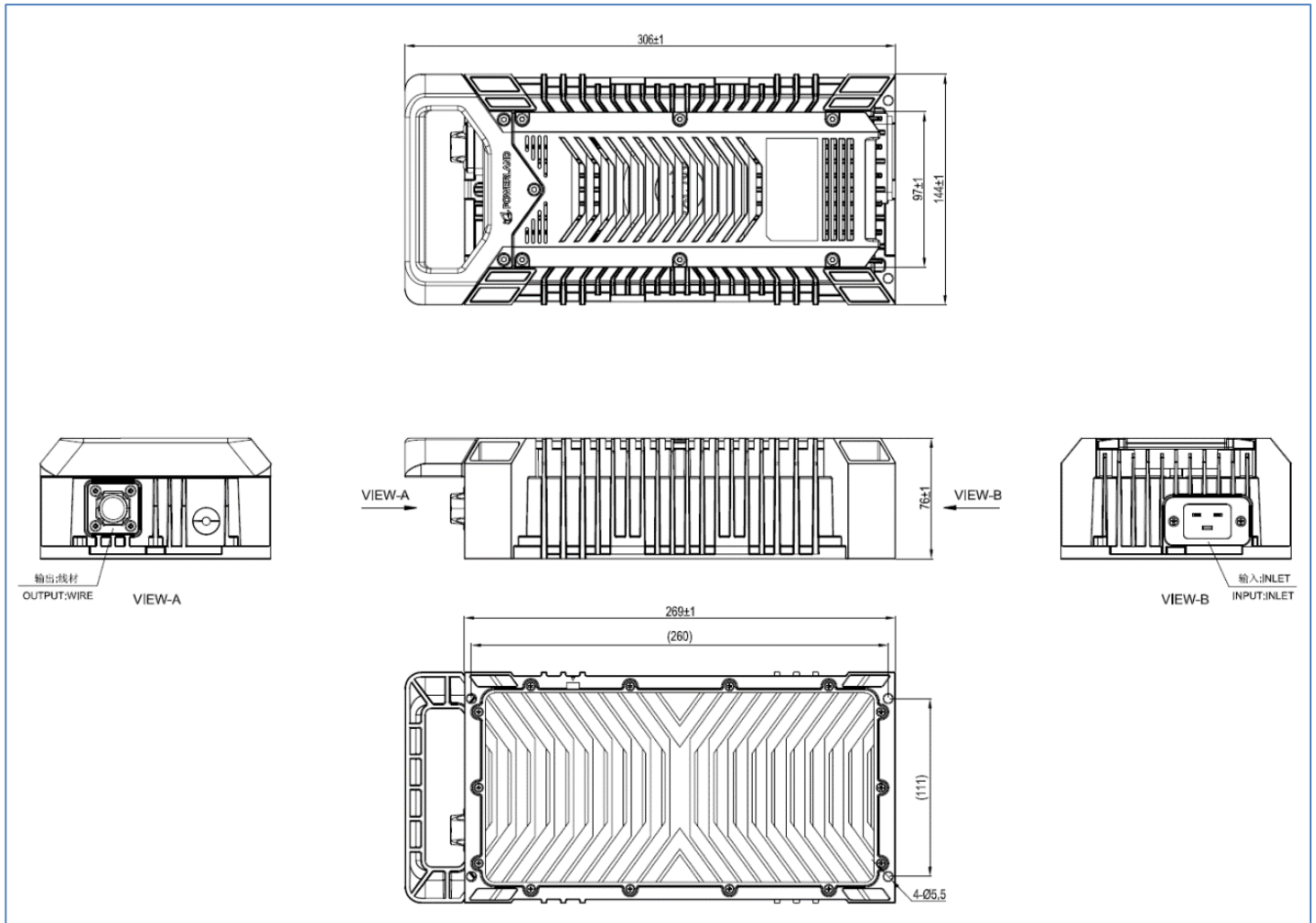


Note:

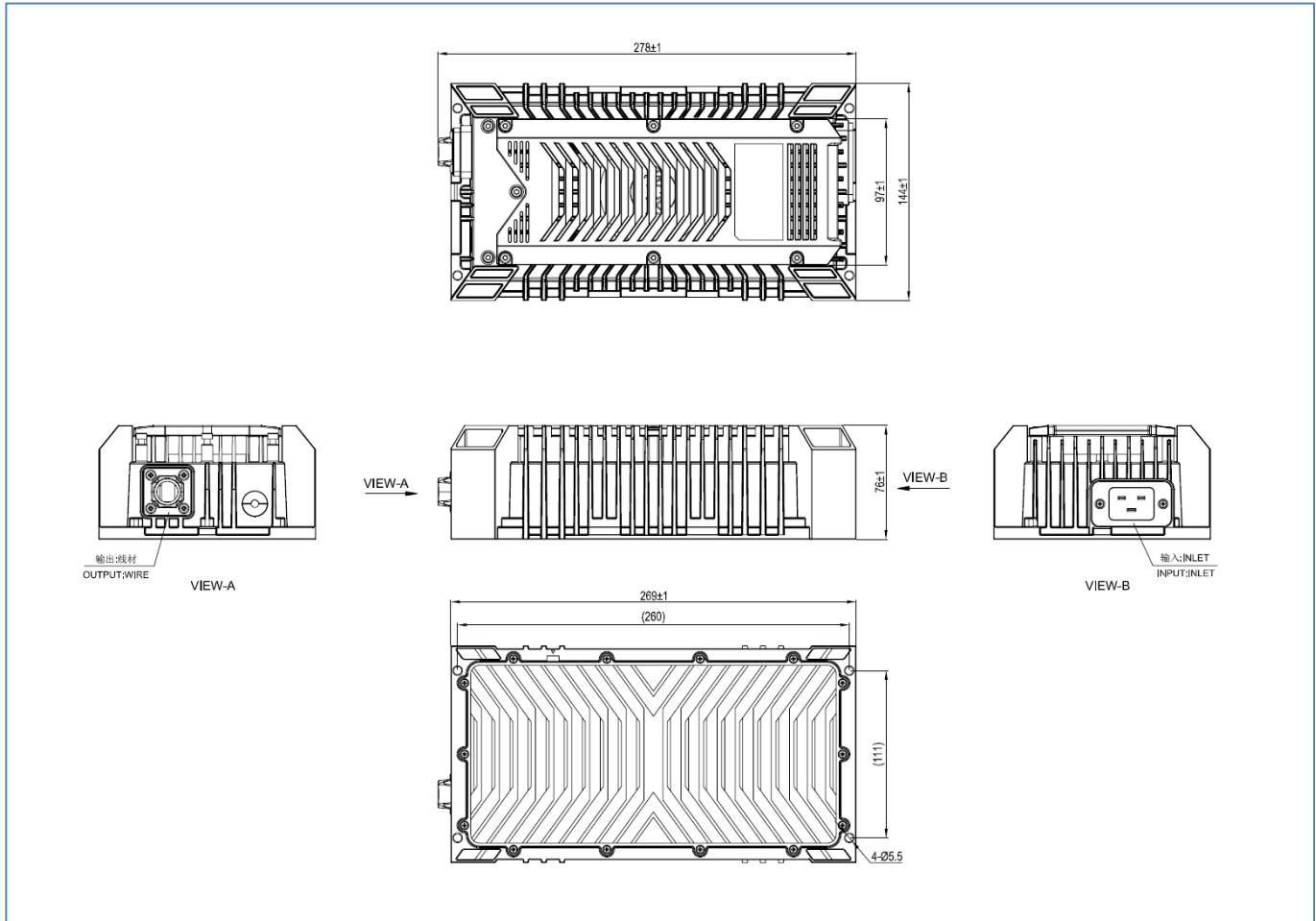
1. Charging curve is based on the charging request output current and voltage sent by the BMS. When the requested current and voltage received are higher than the maximum output capacity of the charger, the charger outputs the current and voltage based on its own maximum output capacity.
2. When the BMS board sends a command to inform the completion of charging, the charge finish charging, the LED color shall change to continuous green.
3. When the battery voltage is at  $85 \pm 1V$ , it enters the constant voltage state, When the battery voltage is  $50 \sim 85 \pm 1V$ , it operates in the constant current state

**MECHANICAL (See notes on what connectors are supplied)**

**On-Board fan version (Handle Version):**

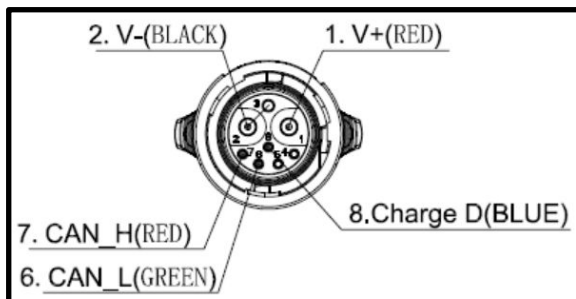


**On-Board fan version (No Handle):**



Unit: mm.

**Connectors:**



NO.	FUNCTION	COLOR	NOTES
1	V+	RED	10AWG
2	V-	BLACK	10AWG
3	EMPTY		WITH PIN
4	12V+	RED	22AWG
5	12V-	BLACK	22AWG
6	CAN_L	GREEN	22AWG
7	CAN_H	RED	22AWG
8	Chareg D	BLUE	22AWG

**Connector info:**

- DC/Signal connector on charger: Chogori 38215133-02-001
- DC/Signal mating connector needed by customer: Chogori 38215636-02
- AC Socket: Standard C20

**LED Lights:**

<b>Color</b>	<b>Description</b>	<b>Flashing Frequency</b>
Green	Charging (Constant Current)	2Hz
Green	Charging over 80%	5Hz
Green	Fully Charged (Float then Standby)	Steady
Red	Low battery Voltage Error/Warning – battery under voltage	Flashing Red 1 time at 5Hz and then off for 1 second, repeatedly
Red	OVP (Over Voltage Protection):	Flashing Red 5 times at 5Hz and then off for 1 second, repeatedly
Red	SCP (Short Circuit Protection):	Flashing Red 3 times at 5Hz and then off for 1 second, repeatedly
Red	OTP (Over Temperature Protection):	Flashing Red 4 times at 5Hz and then off for 1 second, repeatedly