

## **LDP-150M214 150 Watt LED Driver**

CONSTANT CURRENT LED DRIVER WITH ONE 150 Watt OUTPUT

### **1. Scope**

This document defines the electrical, mechanical and environmental specifications of a 150W constant current micro infrared remote control LED driver. The LED driver shall meet the RoHS requirement.

The enclosure of LED driver is:

- LED driver (With AL Case)

### **2. Input Characteristics**

#### **2.1 Input Voltage and Frequency**

The range of input voltage is from 90 to 305Vac single phase.

Item	Minimum	Rated	Maximum
Input Voltage	90Vac	100-277Vac	305Vac
Input Frequency	47Hz	60Hz/50Hz	63Hz

#### **2.2 AC Input Current**

Under 25°C ±10°C ambient temperature, rated input and output range (reference output power - input voltage curve), maximum AC input current is 2.0A.

#### **2.3 Inrush Current (cold start)**

Under 25°C ±10°C ambient temperature, 230Vac input, the peak value of the inrush current is less than 75 A.

#### **2.4 Power Factor**

2.4.1 Under 25°C 10°C ambient temperature, 115Vac input, 100% load, the typical value of power factor is 0.98, the minimum value is 0.97;

2.4.2 Under 25°C ±10°C ambient temperature, 230Vac input, 100% load, the typical value of power factor is 0.96 , the minimum value is 0.95;

2.4.3 Under 25°C ±10°C ambient temperature, 230Vac input, 80% load, the typical value of power factor is 0.95 , the minimum value is 0.95.

#### **2.5. Efficiency**

2.5.1 Under 25°C ±10°C ambient temperature, 115Vac input, 214V output voltage, 100% load, the typical value of efficiency is 90%, the minimum value is 89%;

2.5.2 Under 25°C ±10°C ambient temperature, 230Vac input, 214V output voltage, 100% load, the typical value of efficiency is 92%, the minimum value is 90%;

2.5.3 Under 25°C ±10°C ambient temperature, 230Vac input, 136V output voltage, 100% load, the typical value of efficiency is 92%, the minimum value is 90%;

#### **2.6 THDi**

2.6.1 Under 25°C ±10°C ambient temperature, 115Vac input, 100% load, THDi is less than 15%;

2.6.2 Under 25°C ±10°C ambient temperature, 230Vac input, 100% load, THDi is less than 15%;

2.6.3 Under 25°C ±10°C ambient temperature, 230Vac input, 80% load, THDi is less than 15%.

### 2.7 Standby power consumption

Under 25°C ±10°C ambient temperature, rating input voltage, the average value of standby power consumption is less than 10W.

## 3. Output Characteristics

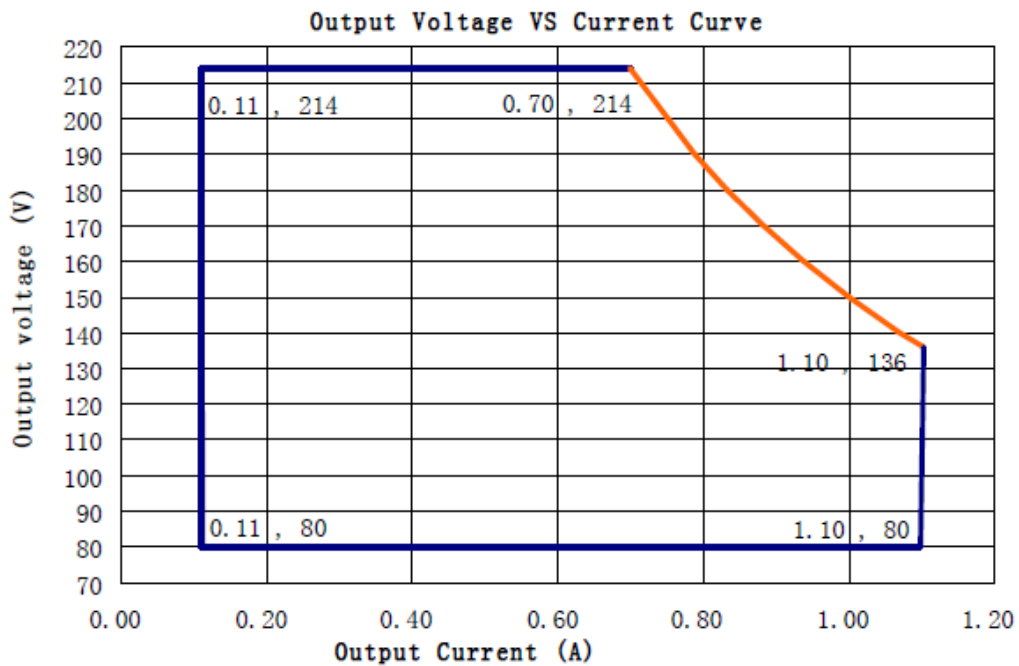
### 3.1 Output Power

Under full input voltage range (reference output power - input voltage curve), the maximum value of output power is 150 W.

### 3.2 Output Voltage and Current

Item ( Unit )	Value	Test Condition ( Under 25°C±10°C Ambient Temperature )
Adjust Range of Output Current ( A )	0.11~1.10	full input voltage range <sup>[1]</sup>
Leave Factor Range of Output Voltage( V )	80~214	full input voltage range
Adjust Range of Output Voltage( V )	80~214	full input voltage range
Error of Output Current	±3% <sup>[2]</sup>	full input voltage range, full load range
No Load Output Voltage ( V )	≤240V	full input voltage range
Leave Factory Default Output	214V <sup>[3]</sup>	full input voltage range
Spec	0.70A <sup>[4]</sup>	full input voltage range

Note: 1. reference output power - input voltage curve;  
2. depended on maximum output current;  
3. leave factory default full load rating output voltage;  
4. Default output current can setting.



### 3.3 Output Current Ripple

Under 25°C ±10°C ambient temperature, 230Vac input, 100% load, the ratio of output current ripple<sup>[1]</sup> peak-peak value and rated output current is less than 16%.

**Note: load is LED, ripple is different with difference LED load.**

### 3.4 Cold Start Turn-On Delay Time

Under 25°C ±10°C ambient temperature, 115-277Vac input, 100% load, turn-on delay time at cold start is less than 3000ms.

### 3.5 Output Current Overshoot

Under 25°C ±10°C ambient temperature, 115-277Vac input, LED full load, the ratio of output current overshoot and rated output current is less than 10%.

### 3.6 Line Regulation (Input Voltage Regulation)

Under 25°C ±10°C ambient temperature, 100% load, change input from 115Vac to 305Vac, the Line Regulation (Input Voltage Regulation) is less than 1%.

### 3.7 Load Regulation

Under 25°C ±10°C ambient temperature, 230Vac input voltage, change load from 50% to 100%, Load Regulation is less than 3%.

## 4 Dimming Control<sup>[1]</sup>

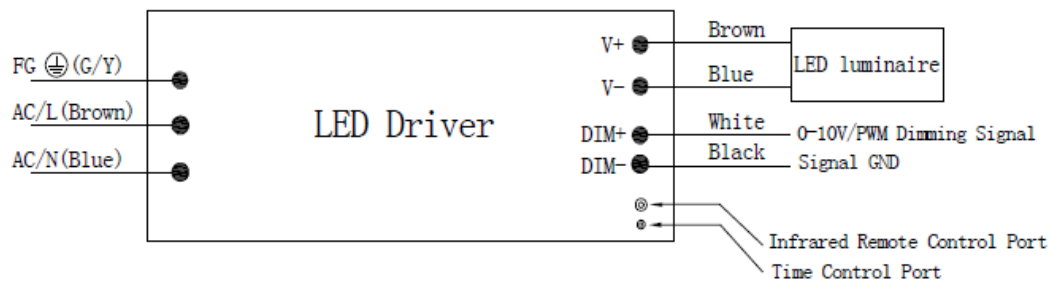
### 4.1 Function

Function	0-10V	PWM	Time Control
Yes or No	√	√	√

Note: 1. Normal leave factory product does not have time control function, MOSO will supply standard setting software for user to program when user need time control.

2. User can setting five time section. Customer can change the output current and the time depend on "Programmer User Manual".

### 4.2 Define of Connect Interface



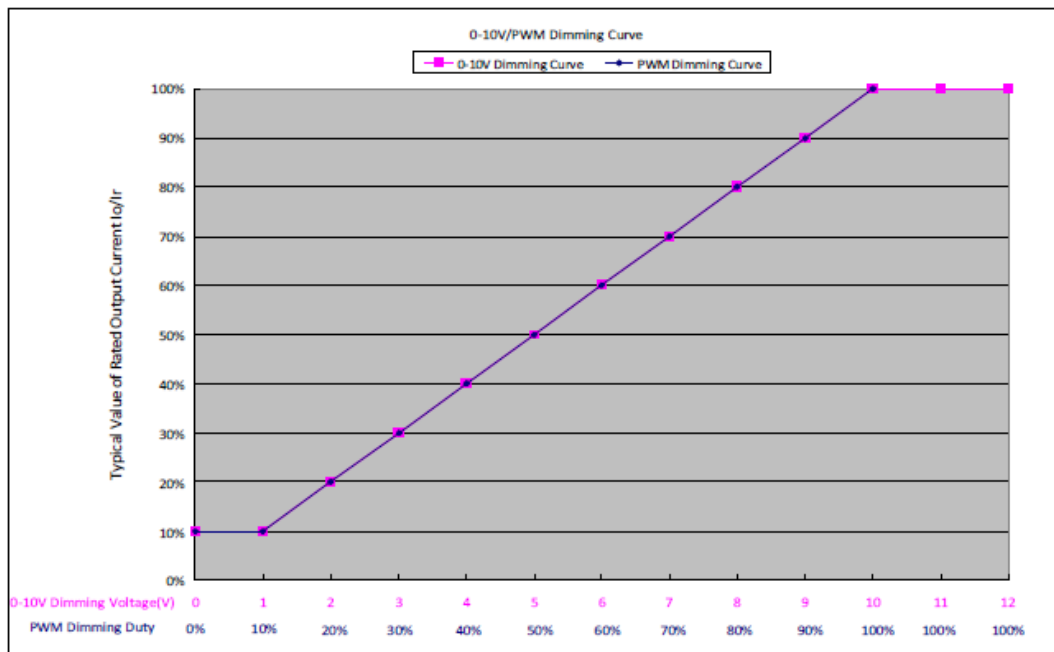
Wire	Color	Note
AC Input	Brown, blue, yellow/green	for CE
	White, black, green	For UL
DC Output	Brown, blue	for CE
	Red, black	For UL
Dimming	White, black	

### 4.3 Dimming Interface

Mode	Electrical Interface	
PWM Dimming	Frequency	250Hz~1000Hz
	High Voltage Level	9.7~10.3V or 4.85~5.15V
	Low Voltage Level	0~0.3V
	Sink Current	<2.0 mA
	Source Current	<2.0 mA
	Open Circuit of Dimming	100% output current
	Linear Dimming Range	10%~100%I <sub>r</sub>
	Short Circuit of Dimming	10% I <sub>r</sub> output current
0-10V Dimming	Dimming Signal Voltage	0~10V <sub>pp</sub> (±1%)
	Sink Current	<2.0 mA
	Source Current	<2.0 mA
	Open Circuit of Dimming	100% output current
	Linear Dimming Range	10%~100%I <sub>r</sub>
	Short Circuit of Dimming	10% I <sub>r</sub> output current

- Note: 1. When connect external dimmer to LED driver, for the external driver, the maximum sink current should  $>70\mu A$ , maximum output current should  $>2mA$ ;  
 2.  $I_r$  is maximum output current;  
 3. PWM dimming mode: detect outside PWM duty, change the output current depend the PWM duty, change the output current depending on proportion;  
 4. 0-10V dimming mode: detect outside voltage level of 0-10V dimming signal, change the output current depend the voltage level; change the output current depending on proportion;  
 5. At two in one dimming mode, the maximum revolution definition is 1% at PWM mode, when voltage level of PWM is less than 10V, 99% duty is 100% $I_r$  output, 100% duty is process as 0-10V dimming signal;  
 6. Can setting to 0-5V dimming by programmer.

#### 4.4 Dimming Curve



#### 5 Protect Function

##### 5.1 Short Circuit Protect

The average value of input power shall less than 10W when the output rail short, the power supply shall be self-recovery when the fault condition is removed.

##### 5.2 Over Output Voltage Protect

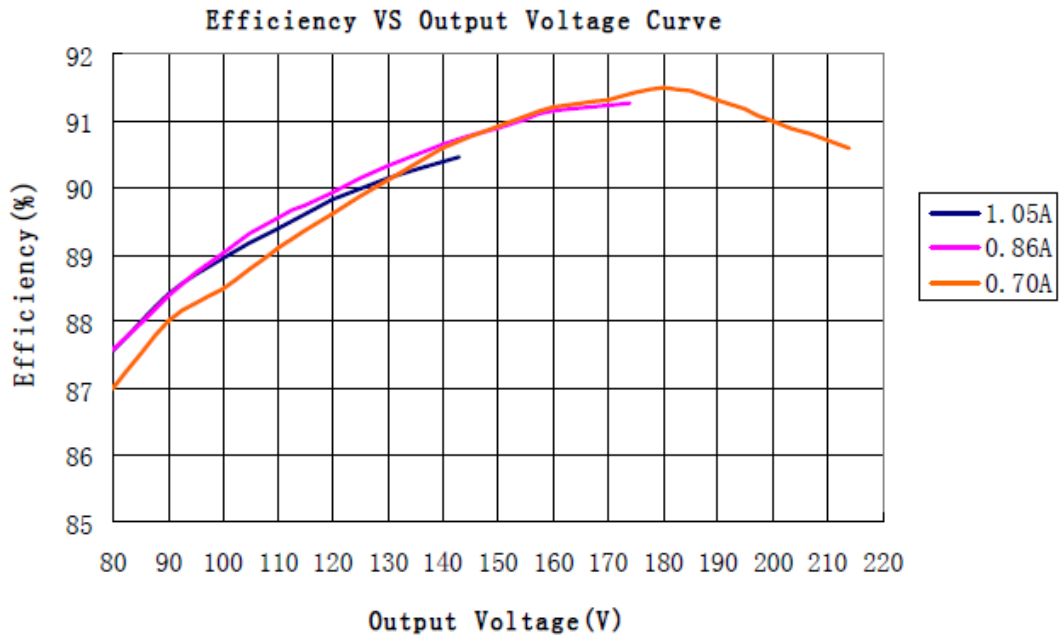
Output voltage is  $235\pm 5V$ , the power supply shall be enter over output voltage protect model, should restart power supply when fault condition is removed.

### 5.3 Over Temperature Protect

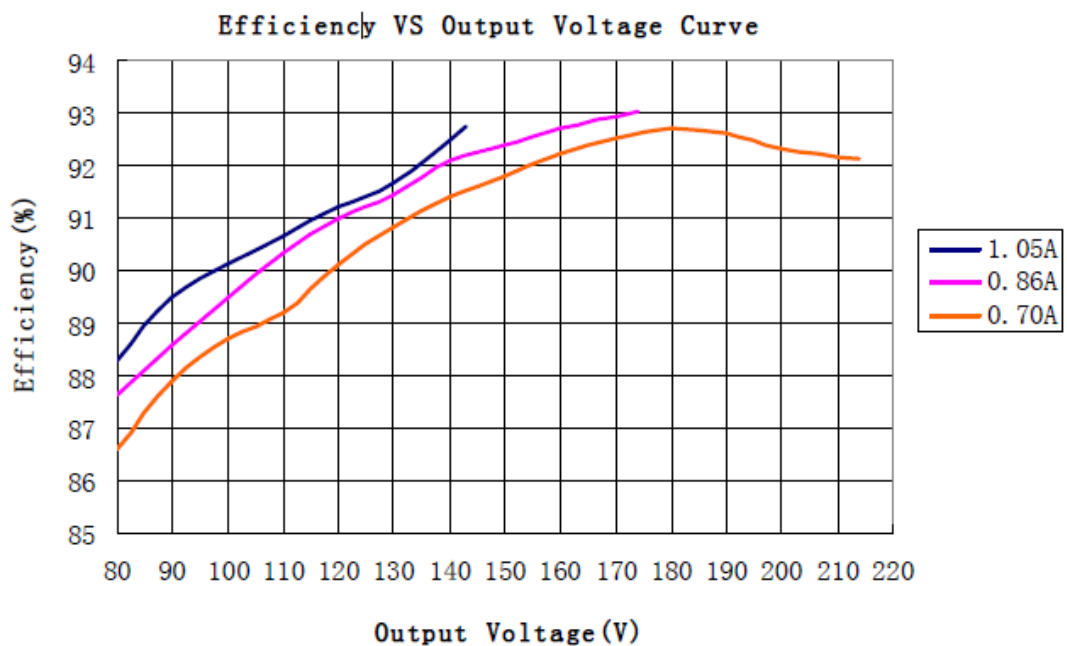
When the temperature of power supply enclosure is over 85°C, the output of power supply shall decrease. Output current is limited in 30% ( typ. ) . meet the demand of double 85, at the maximum operation temperature 125 °C, operate two hours and do not damage.

### 6 Efficiency vs Output Voltage Curve

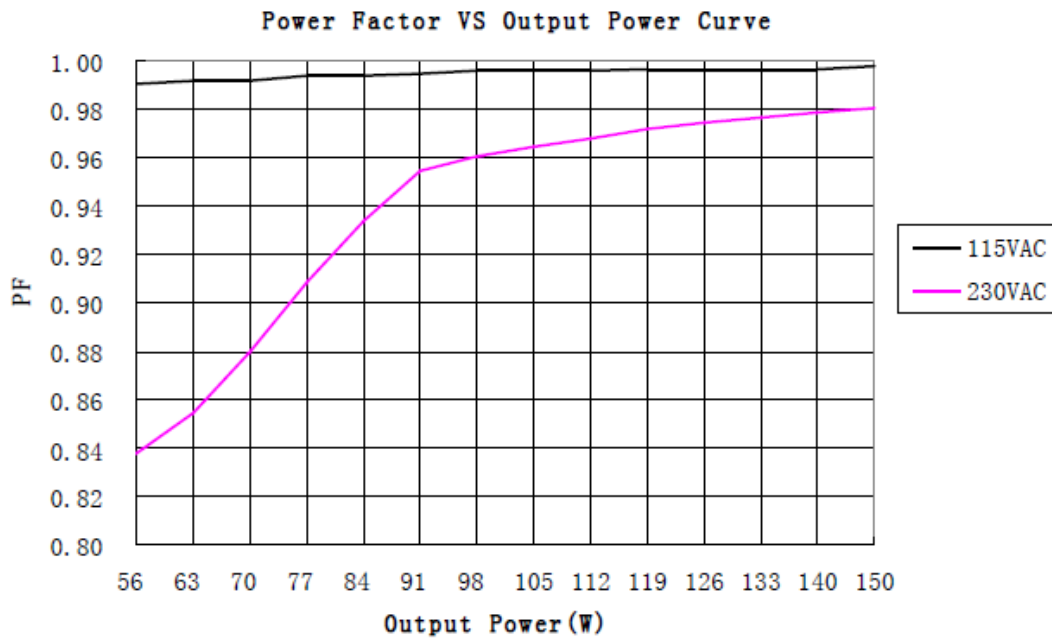
$V_{in} = 115V_{ac}$   $T_a = 25^{\circ}C$



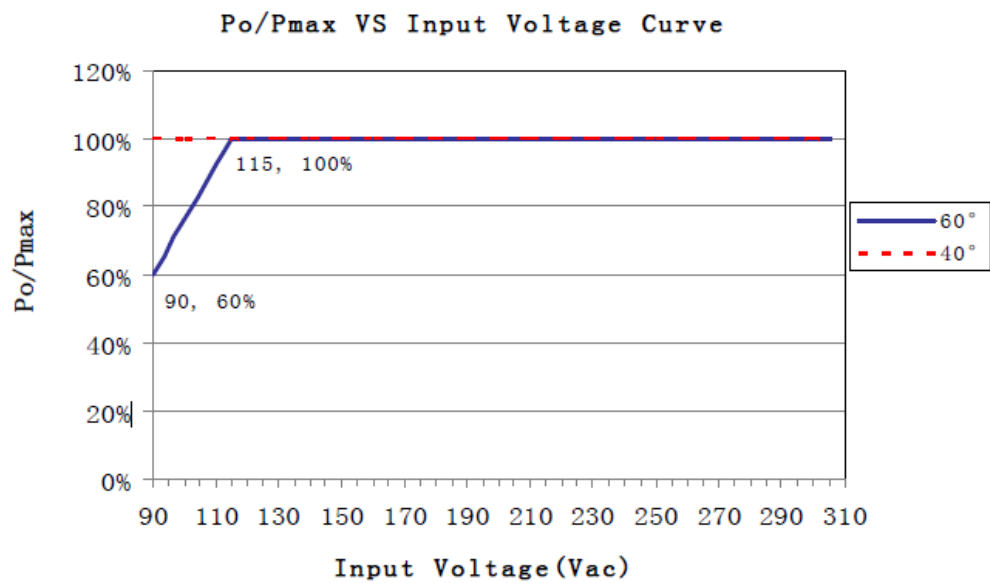
$V_{in} = 230V_{ac}$   $T_a = 25^{\circ}C$



### 7 Power Factor vs Load Power Curve



### 8 Output Power vs Input Voltage Curve



### 9 Safety And Electromagnetic Compatibility

#### 9.1 Safety Standards

Certificates	Country and region	Standards
CCC	China	GB19510.1 GB19510.14
CE	Europe	EN61347-1 EN61347-2-13
CB	CB member	IEC61347-1 IEC61347-2-13
UL	America	UL 8750

## 9.2 Electromagnetic Compatibility Standards

EMC Certification	Country and region	Standards
CCC	China	GB 17743 GB 17625.1
CE	America Europe	EN 55015 CLASSB(input 230Vac) IEC 61000-3-2 IEC 61000-3-3 IEC 61547

## 10 Details Of Safety Specifications

### 10.1 Dielectric Strength

10.1.1 input to output : 3750Vac, 60s, current is less than 10mA;

10.1.2 input to FG: 1600Vac, 60s, current is less than 10mA;

10.1.3 output to FG: 1600Vac, 60s, current is less than 10mA.

**Note:** 25°C ±10°C ambient temperature, I/P: L,N Line; O/P: Vo+, Vo-.

### 10.2 Grounding Resistance

Under 25°C ±10°C ambient temperature, pass 25A current for 60s, the measured grounding resistance is less than 0.1Ω.

### 10.3 Leakage Current

Leakage Current is defined as the current flowing through the ground wire. Under 25°C ±10°C ambient temperature and 230Vac/50Hz input, the leakage current shall be less than 0.75mA.

### 10.4 Insulation Resistance

Under 25°C ±10°C ambient temperature and less than 70% relative humidity, apply 500V dc voltage to each port of Input to output, input to GND, output to GND and last 60s, the insulation resistance at least 50MΩ.

### 10.5 Surge Immunity Test

Under 25°C ±10°C ambient temperature, L line to N line is 4000V, L line to earth is 6000V, N line to earth is 6000V.

Estimate of test result is depending on GB/T 17626.5-2008/IEC 61000-4-5:2005: temporary loss of function or temporary degradation of performance not requiring an operator.

## 11 Environmental Specifications

### 11.1 Operated Temperature And Humidity

11.1.1 Temperature: -40°C to +60°C;

11.1.2 Relative Humidity: 20% to 95%, non-condensing.



## 11.2 Storage Temperature And Humidity

11.2.1 Temperature: -40°C to +85°C

11.2.2 Relative Humidity: 20% to 95%, non-condensing.

## 11.3 Degrees of Protection

IP67

## 12 Reliability

### 12.1 Mean Time Between Failure (MTBF) Qualification (According as MIL-HDBK-217F Standards)

Mean time between failure is at least 200, 000 hours under 25°C ambient temperature, 230Vac input, and 80% load.

### 12.2 Life Time Qualification

The life time is at least 50, 000 hours, under 45°C case temperature, 230Vac input, and 80% load.

### 12.3 Maximum Case Temperature Tc

Under 60°C ambient temperature, 115Vac input and maximum load, the maximum case temperature is 85°C.

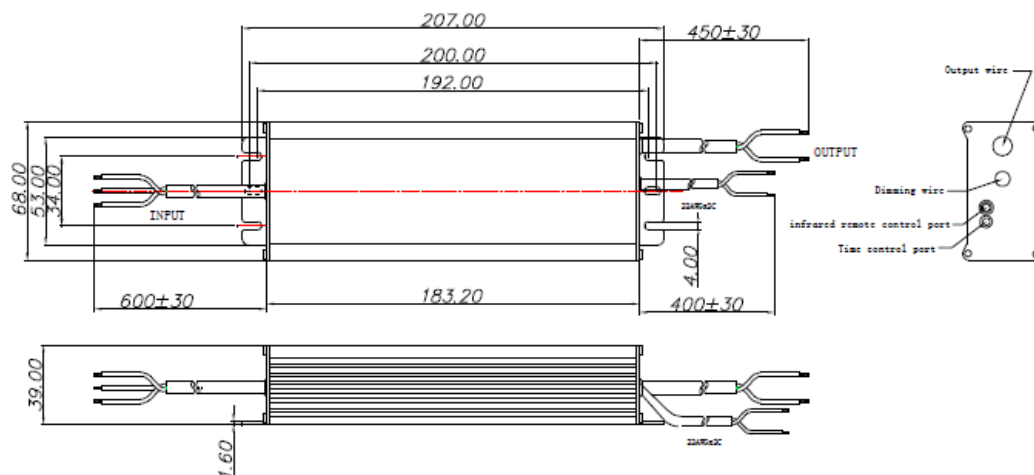
### 12.4 Vibration

10 to 500HZ Sweep at constant acceleration of 1.0G (depth: 3.5mm )for 1 Hour for each of the perpendicular axes X, Y, Z.

### 12.5 Drop Test

Ten times 60cm drop test with one angle three edges and six face of complete package, package shall not damage, product function and dielectric strength should meet the requirement.

## 13 Mechanical Outline Drawing



Note: Model LDP-150R214 no dimming wire.

Wire	Specification	Note
AC Input	CCC+VDE 3x1.0mm <sup>2</sup> L=600mm	for CE, PSE
	18AWG 3C L=600mm	For UL
DC Output	CCC+VDE 2x1.0mm <sup>2</sup> L=450mm	for CE, PSE
	18AWG 2C L=450mm	For UL
Dimming	22AWG 2C L=400mm	

## 14 Label

### 14.1 Label of PSE Marking

**入力**

最大出力電圧: 240V<sup>≒</sup> (無負荷時)

入力 Input	100-277V ~ 50/60Hz, 2.0A Max.
出力 Output	出力電圧: 80-214V <sup>≒</sup> ; Irated: 0.11-1.10A, Prated: 150W Max.

入力: 黒色線 (Black) L, 緑色線 (Green) G, 白色線 (White) N

出力: 茶色 (Brown) +, 青色 (Blue) -

Dimming: 黒色線 (Black) DIM+, 白色線 (White) DIM-

ARISTO electronics+mechanical products R&D and manufacturing

**LDP-150M214**  
Constant current type

IP67 RoHS

Control signal (0-10Vdc, PWM&Resistor)

Dimming Range 10%~100%

Patented Product Copyright reserved

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TÜV SÜD PSB PSE

Infrared Remote Control Port