

The logo for DONE, featuring the word "DONE" in a bold, teal, sans-serif font. The letter "D" is stylized with a white circular element on its left side. The logo is contained within a white rounded rectangle with a thin teal border.

# **MXC SERIES LED DRIVERS**

---

**DL-60H-A/P-MXC SPECV V1.1**

## Features

- Class I structure
- Input voltage:100-305V ~ 50/60Hz  
 Rated input voltage: 200-277V ~ 50/60Hz
- Efficiency :89%(Typ.)
- Constant power drive and constant current output control mode
- Metal shell structure, protection grade: IP67
- Lightning protection level: differential mode 6kV, common mode 15kV
- Function selection:  
 Output current is adjusted by external potentiometer (A version only)  
 Isolation dimming function: 3-in-1 dimming( P version only )
- Lifetime design: 5 years



## Applications

Road lighting、 Industrial lighting、 Venue lighting  
 Floodlight lighting、 Landscape lighting、 Plant lighting



## Model list

Model NO.	Input voltage	Output power	Output voltage	The default current	Eff.	T.H.D	PF
DL-60H-56A/P-MXC	100-277V 50/60Hz	60W	25-56Vdc	1.6A	89%	≤10%	≥0.95
DL-60H-86A/P-MXC	100-277V 50/60Hz	60W	40-86Vdc	0.7A	89%	10%	0.95

- Note:**
1. Test conditions of the above parameters: Ta=25°C, 230Vac input, full load operation for 30 minutes;
  2. The input is less than 165±15Vac, and the output power is reduced to 30W±20%; When the input is 200-277Vac, the rated power is 60W, and special attention should be paid to the application; For details, see input voltage VS output power diagram.

## Input characteristics

Parameter	Min	Typ.	Max	Note
Rated input voltage	200Vac	230Vac	277Vac	
Input voltage range	100Vac		305Vac	Voltage below 165V±15VAC, derated output half power
Rated frequency	47Hz	50/60Hz	63Hz	
Power factor	0.95	-	-	@230Vac full load, rated input voltage
T.H.D.	-	-	10%	100% load, 230Vacinput
Input current	-	-	0.45A	100% load, 230Vacinput
Inrush current	-	-	70A	230Vac, cold start (25°C)

## Output characteristic

Parameter	Min	Typ.	Max	Note
Rated current DL-60H-56A/P-MXC DL-60H-86A/P-MXC	-	1.07A 0.7A	-	
Output current range DL-60H-56A/P-MXC DL-60H-86A/P-MXC	0.715A 0.5A	-	2.0A 1.05A	-
Output voltage range DL-60H-56A/P-MXC DL-60H-86A/P-MXC	25V 40V	-	56V 86V	Constant power range: 30-56V 57-86V
Rated power(100-180Vac)	-	30W	-	The derating begins when the input voltage is less than 165V±15VAC
Rated power(200-277Vac)	-	60W	-	-
No-load voltage DL-60H-56A/P-MXC DL-60H-86A/P-MXC	-	-	75V 105V	
Efficiency@200Vac DL-60H-56A/P-MXC DL-60H-86A/P-MXC	87%	88%	-	full load@200Vac
Efficiency@230Vac DL-60H-56A/P-MXC DL-60H-86A/P-MXC	88%	89%	-	full load@230Vac

## Output characteristic

Parameter	Min	Typ.	Max	Note
Output Current Ripple	-	5%Iomax	-	100% load,20 MHz BW; Ripple =rms/ average
Accuracy of output current	-5%	-	+5%	full load Constant power range
Line regulation	-3%	-	+3%	full load Constant power range
Load regulation	-3%	-	+3%	full load Constant power range
Starting time	-	-	500ms	full load@230Vac

**Note:**

1. The output current range is limited by the input and output voltage, please refer to "I-V WORKING AREA" for details.
2. When the input voltage is between 150 and 180VAC, Because of the conversion threshold deviation, The output power may be between half load and full load. Please pay special attention to.

## Dimming characteristic

Parameter		Min	Typ.	Max	Note
1-10V Dimming (Optional)	Safe applied voltage range	0V	-	12V	When the external voltage is $\geq 12V$ , the dimming will fail
	Dimming output range	10%	-	100%	-
	Rated dimming voltage range	1V	-	10V	It can be set to negative dimming mode through program setting
PWM Dimming (Optional)	PWM high level	9.5V	-	10.5V	-
	PWM low level	0	-	0.3V	-
	PWM frequency band	300Hz	-	2000Hz	-
	PWM duty cycle	10%	-	99%	Output full power at 99% duty cycle
Resistor Dimming (Optional)	External resistance value	10K $\Omega$	-	100K $\Omega$	-
	Dimming output range	10%	-	100%	-
Multiple time-controlled dimming (optional)	MCU control	Set segment dimming function through program		Working mode	
	Timer control	It is divided into six segments by default and can be customized		24H to achieve a cycle	

- Note:**
- Output current of dimming port: 100uA (typical value);
  - The P version is 1-10V dimming (0V can be turned off). The maximum voltage of the dimming port is 12V. If the external power supply voltage exceeds 12V or the signal cable is inverted, the power supply will be damaged;
  - Dimming default setting is three in one positive logic dimming (programmable software can be set to timing dimming, 0-5V or other voltage dimming);
  - When set to positive logic dimming function, the 0V dimming is turned off, and the output voltage is  $0.46 \cdot V_{omax}$  after the dimming is turned off. Be careful when using this function, but customers are advised to use 1-10V dimming.
  - When setting negative logic dimming, The default output when the light is suspended is 100%. Negative logic dimming cannot be turned off, When the voltage of the light dimmer port is greater than 10.5V, Maximum power output;

## Protection

Function	Function instructions
Input under-voltage protection	When the input voltage is less than $165 \pm 15\text{Vac}$ , the output power gradually decreases. See derating curve for details
Output overload protection	Protection mode: hiccup mode, recovers automatically after fault condition is removed.
Output short circuit protection	Hiccup mode: recovers automatically after fault condition is removed
Over temperature protection	Self-recovery type: When the housing temperature is greater than $90^{\circ}\text{C}$ , the output power decreases gradually.
Output over-voltage protection	Protection mode: Hiccup mode or clamped in output highest voltage, the product is not damaged, LED driver works normally after fault condition is removed.

**Note:**

1. Unless otherwise specified, all specifications and parameters shall be measured at the conditions of 230Vac (50Hz), rated load and  $25^{\circ}\text{C}$  of ambient temperature;
2. Including setting error, line regulation and load regulation.

## Environmental

Environmental categories	Parameter
Working temperature	$-40 \sim +55^{\circ}\text{C}@200-277\text{Vac}$
Max.Case Temp.	$-40 \sim 90^{\circ}\text{C}$
Working humidity	20 ~ 95% RH, non condensing
Storage temperature、humidity	$-40 \sim +80^{\circ}\text{C}$ , 10 ~ 95% RH
Resistant to vibration	10 ~ 500Hz, 5G 12 min/cycle, X, Y, Z axis 72 min each
MTBF	230Khrs min. MIL-HDBK-217F ( $T_a=25^{\circ}\text{C}$ )
Lifetime	50000 hours @ $T_{\text{case}} \leq 75^{\circ}\text{C}$ , 230Vac, 80% Load, Please refer to "Tcase VS Lifetime" section

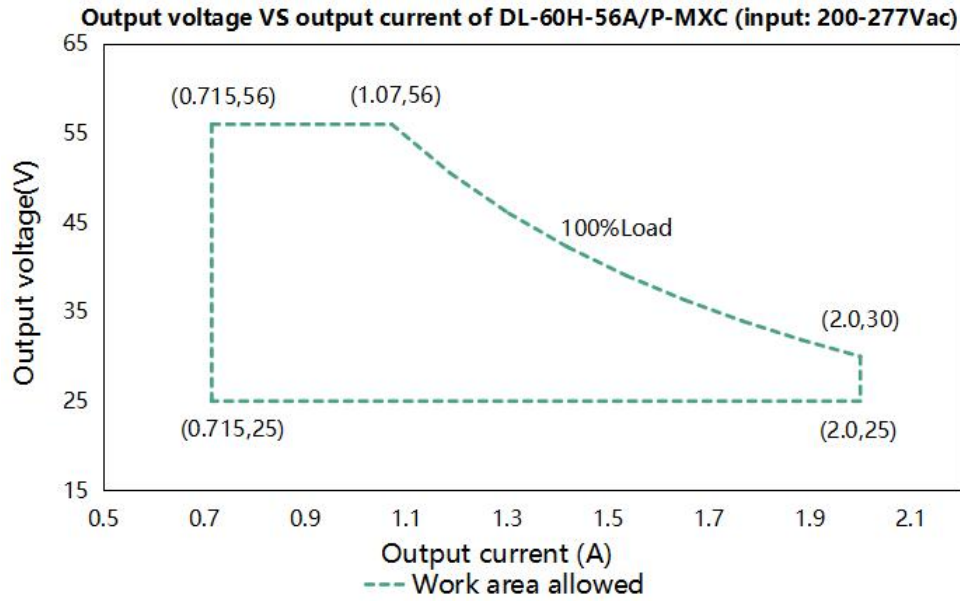


## Safety and EMC

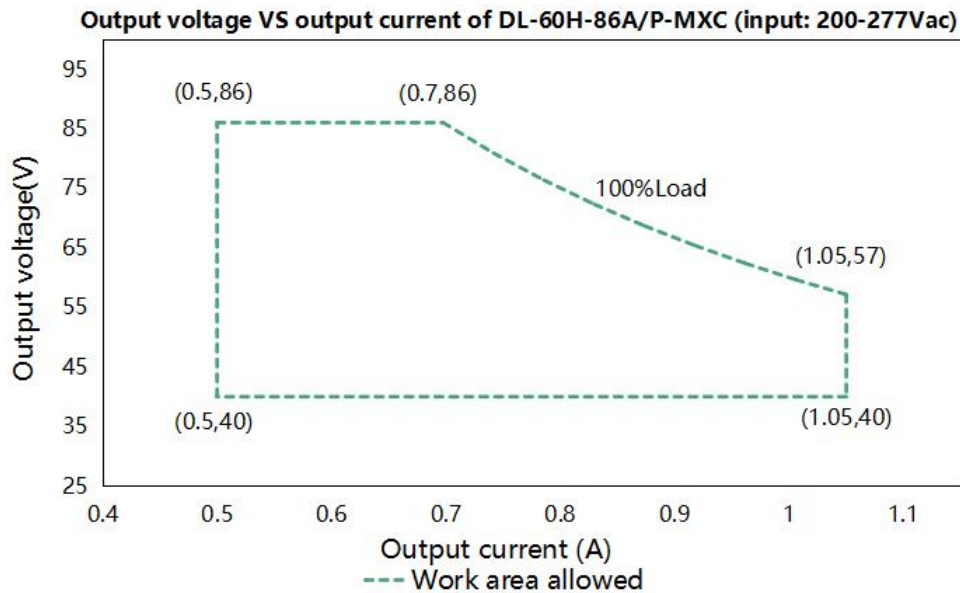
Safety categories	Standard
Safety	GB19510.1、GB19510.14、EN61347-1、EN61347-2-13、IEC61347-1、IEC61347-2-13、AS/NZS61347.1、AS61347.2.13、EN 62384、UL8750
EMC	EN 55015、EN 61000-3-2 、GB/T 17743、GB17625.1、 EN 61000-3-3
Surge protection	Differential mode L-N $\pm 6KV$ (2 ohm) ,common mode L, N-PE $\pm 15 KV$ ( 12 ohm ); Refer to IEC61000-4-5 2014 Criterion B
High-pot test	I/P-O/P:3.858KVac I/P-PE :1.554KVac I/P-DIM:1.554KVac O/P-PE : 1.15KVac(DL-60H-56A/P-MXC) O/P-PE : 1.21KVac(DL-60H-86A/P-MXC) O/P-DIM:1.15KVac(DL-60H-56A/P-MXC) O/P-DIM:1.21KVac(DL-60H-86A/P-MXC)
Insulation impedance	I/P-PE:100M $\Omega$ / 500VDC; I/P-O/P:100M $\Omega$ / 500VDC / 25°C/ 70% RH
Leakage current	<0.7mA@277Vac

**Note:** The driver is considered as a component that will be operated in combination with the final equipment. Since EMC performance will be affected by the complete installation,the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.

## I-V Working area

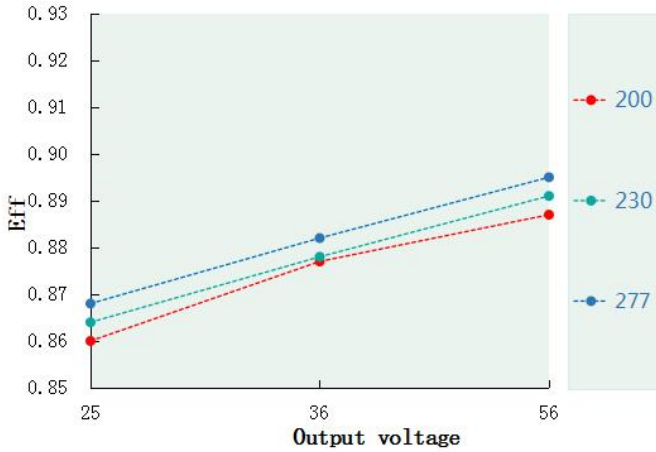


Load	Output								
Load working Voltage	25V	30V	33V	36V	40V	44V	48V	52V	56V
Io_MAX	2A	2A	1.82A	1.67A	1.5A	1.36A	1.25A	1.15A	1.07A
Po_MAX	50W	60W	60W	60W	60W	60W	60W	60W	60W

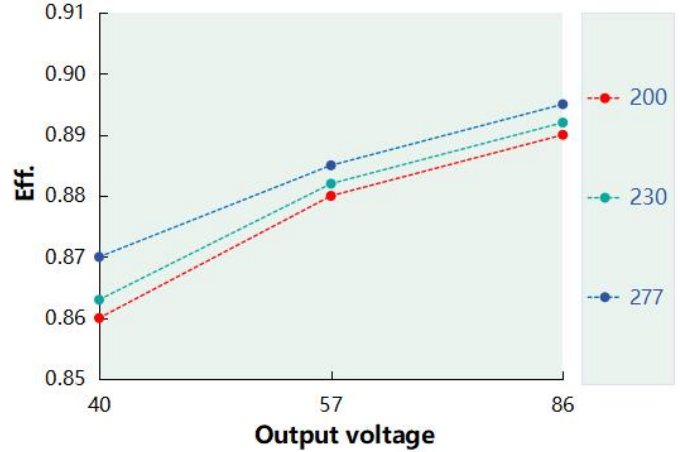


Load	Output								
Load working Voltage	40V	45V	57V	60V	67V	70V	75V	80V	86V
Io_MAX	1.05A	1.05A	1.05A	1.0A	0.9A	0.86A	0.8A	0.75A	0.7A
Po_MAX	40W	47W	60W	60W	60W	60W	60W	60W	60W

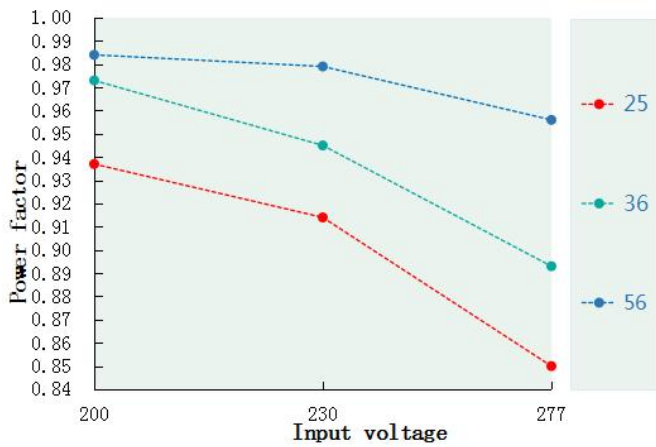
**Eff. VS Output voltage(DL-60H-56A/P-MXC)**



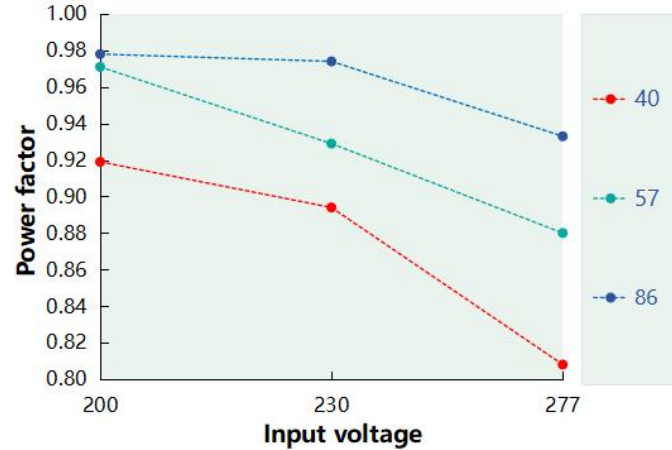
**Eff. VS Output voltage(DL-60H-86A/P-MXC)**



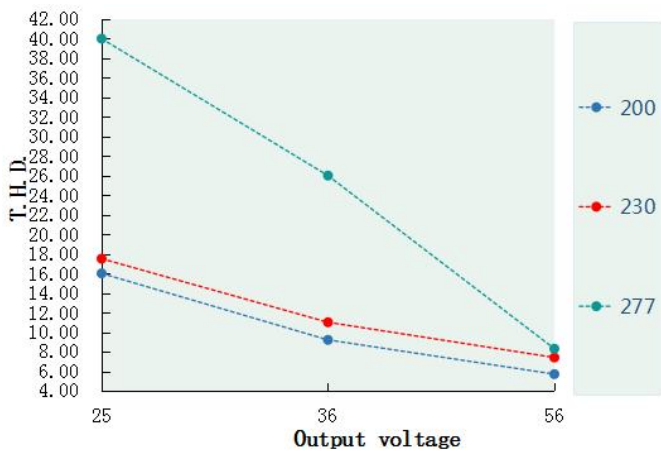
**Power factor VS Input voltage(DL-60H-56P/A-MXC)**



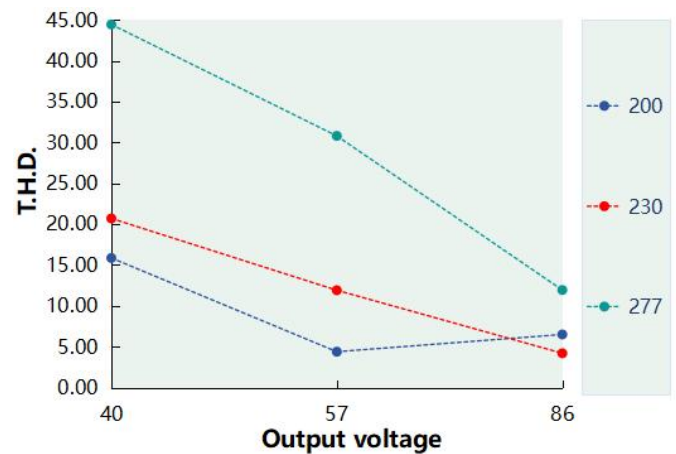
**Power factor VS Input voltage(DL-60H-86P/A-MXC)**



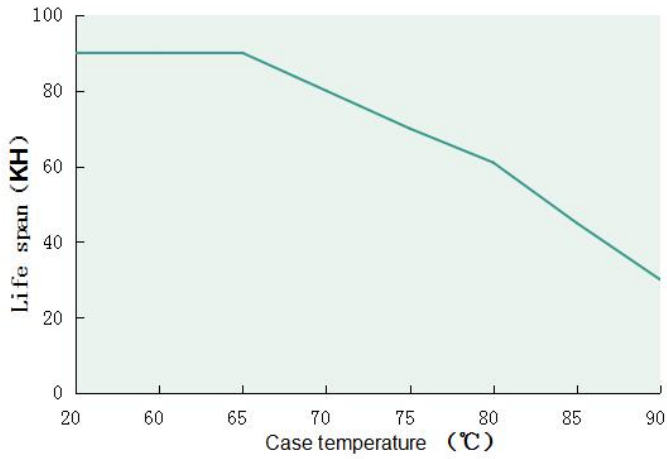
**T.H.D. VS Output voltage(DL-60H-56A/P-MXC)**



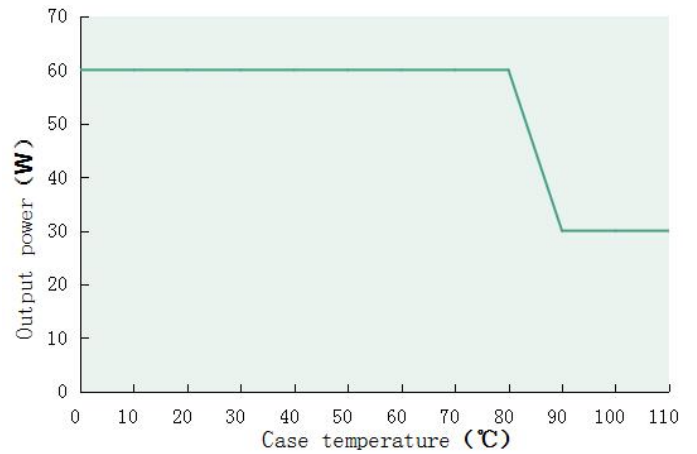
**T.H.D. VS Output voltage(DL-60H-86A/P-MXC)**



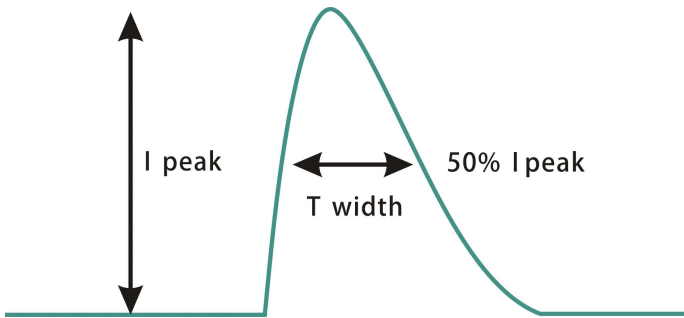
**Tcase VS Lifetime(DL-60H-56A/P-MXC)**



**Output power VS Tcase (DL-60H-56A/P-MXC)**

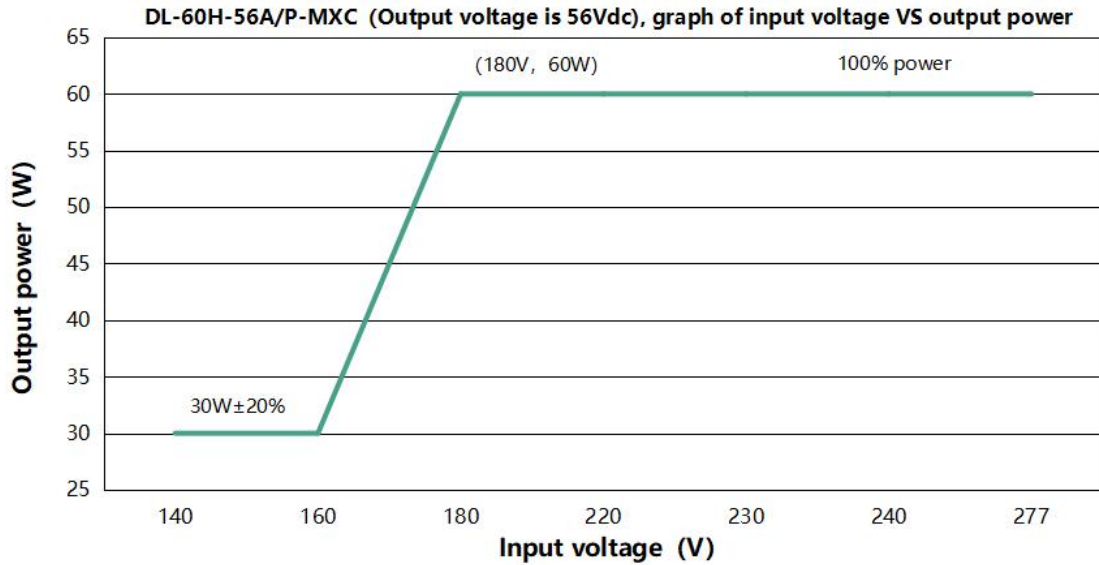


**Inrush Current(DL-60H-56A/P-MXC)**



Input voltage	Peak current	T(@50% Peak current)
200Vac	40.5A	148us
230Vac	60.33A	172us
277Vac	60.5A	194us

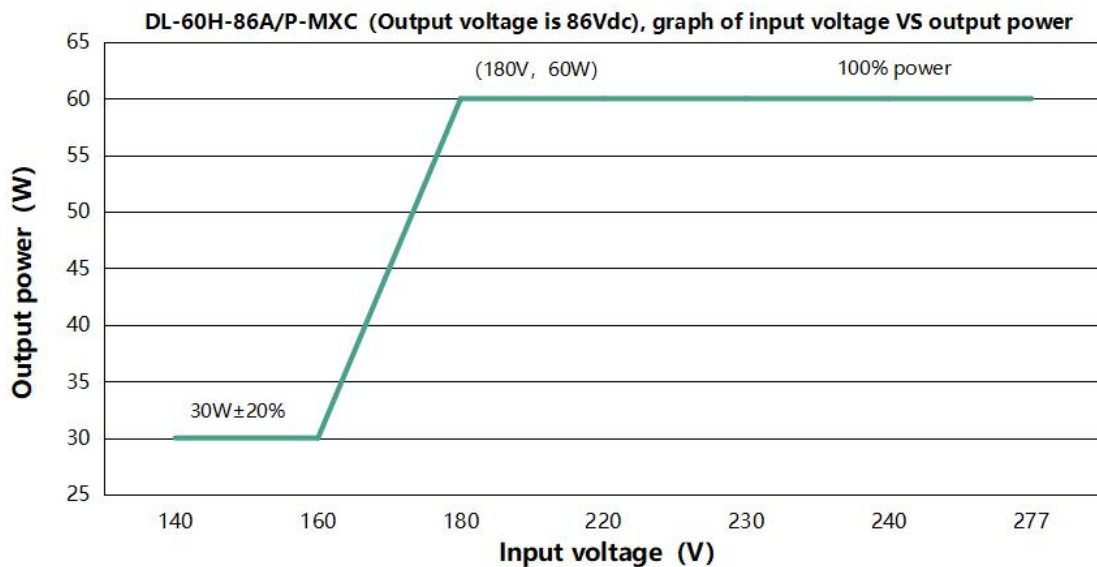
**Output power VS Input voltage**



**DL-60H-56A/P-MXC(When the output voltage is 56Vdc, the rated output current value and output power corresponding to different input voltage)**

Input Voltage	140Vac	160Vac	180Vac	220Vac	230Vac	240Vac	277Vac
Iout	0.67A	0.67A	1.07A	1.07A	1.07A	1.07A	1.07A
Pout	30W	30W	60W	60W	60W	60W	60W

**Note:** When the input voltage is less than 180Vac, the output power will decrease gradually to 30W ± 20%.



**DL-60H-86A/P-MXC(When the output voltage is 86Vdc, the rated output current value and output power corresponding to different input voltage)**

Input Voltage	140Vac	160Vac	180Vac	220Vac	230Vac	240Vac	277Vac
Iout	0.67A	0.67A	1.07A	1.07A	1.07A	1.07A	1.07A
Pout	30W	30W	60W	60W	60W	60W	60W

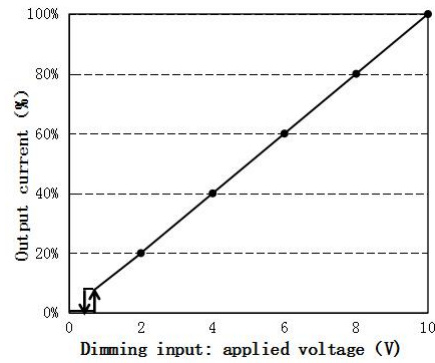
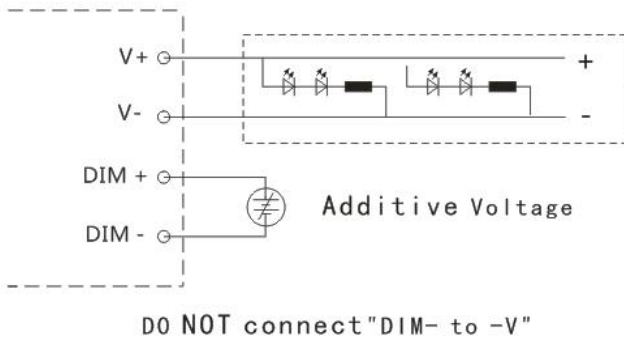
**Note:** When the input voltage is less than 180Vac, the output power will decrease gradually to 30W ± 20%.

## Dimming operation

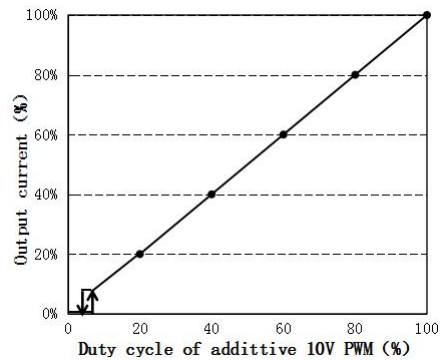
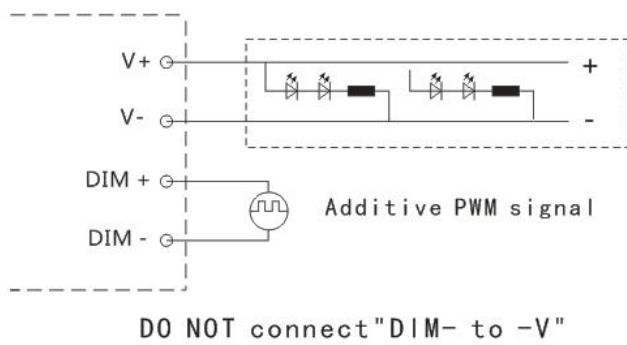
### ※ Three-in-one dimming function (P version only)

- A. Connect a resistor 10-100K or 1-10V DC voltage or 10V PWM signal between DIM+ and DIM- to adjust the output current.
- B. Output current of dimming port: 100uA (typical value).

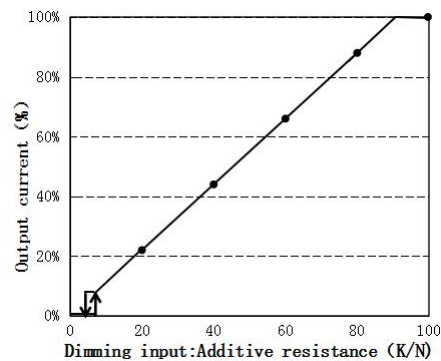
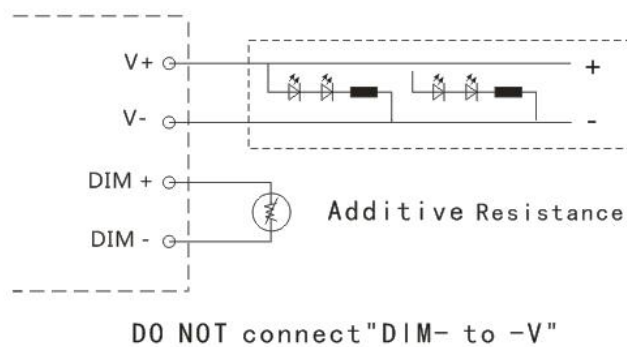
#### ◎ With an applied voltage of 1-10V:



#### ◎ Applying additive 10V PWM signal (Frequency range: 300Hz-2K Hz) :



#### ◎ With an additional 10-100K resistor:



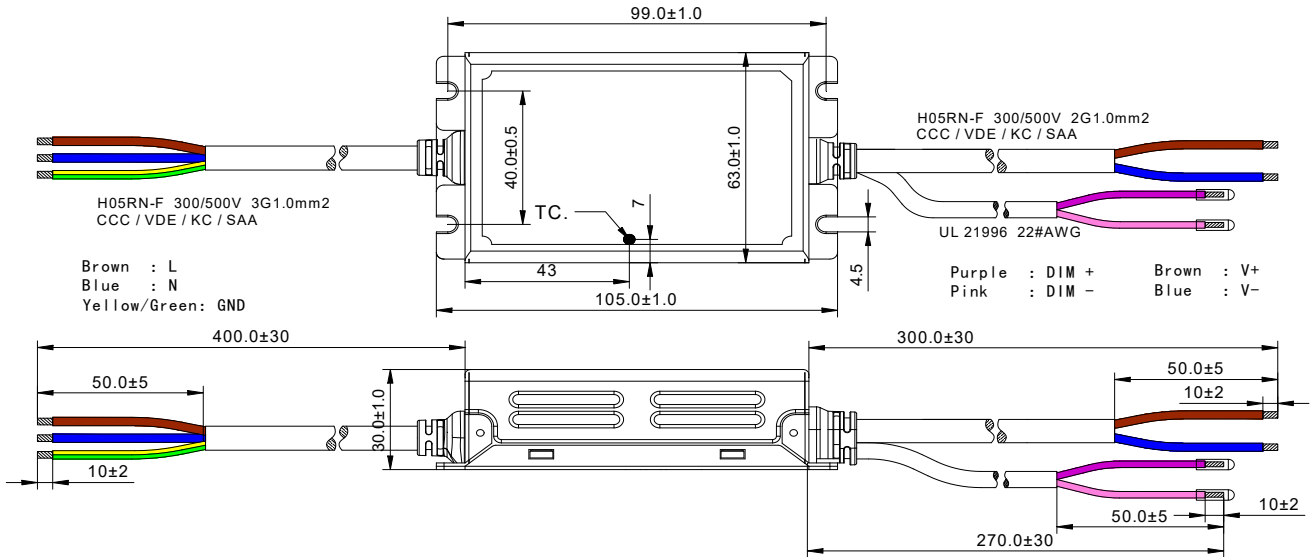
### Note:

1. Positive and negative logic dimming can be programmed.
2. Dimming off only applies to positive logic. For other requirements, please contact technical personnel.

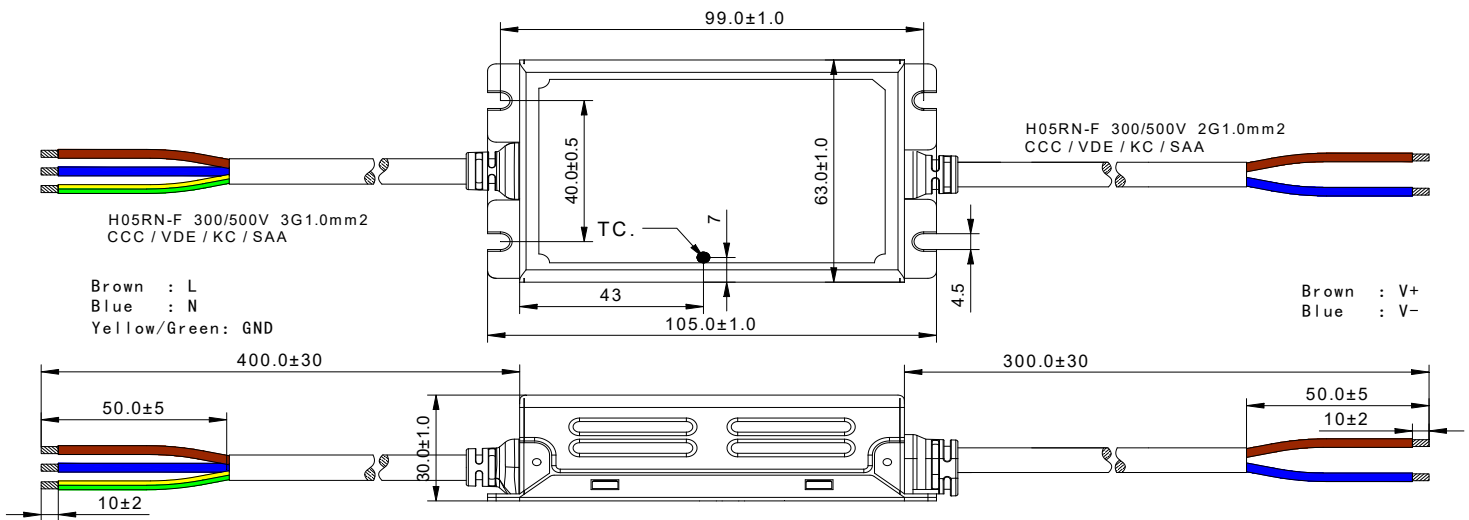
# Mechanical specification

Size (mm) L105\*W63\*H30

## DL-60H-56P/86P-MXC



## DL-60H-56A/86A-MXC

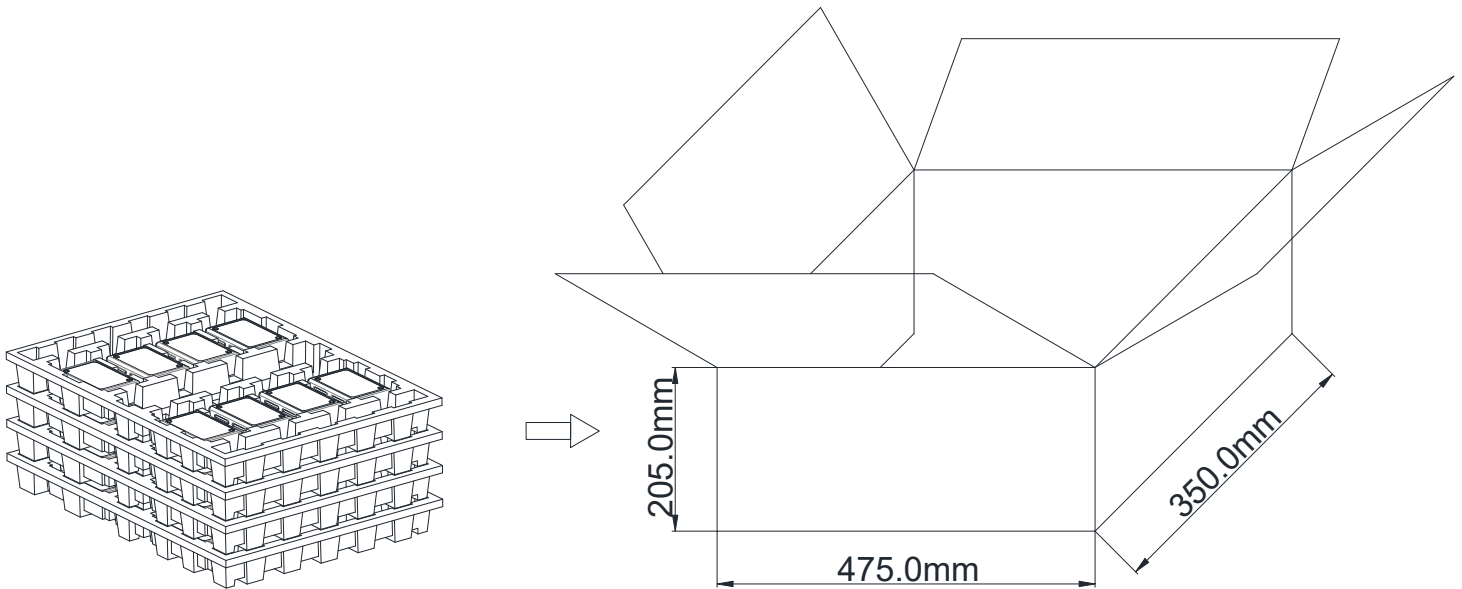


# Weight

Weight 405g

## Packaging

Packaging (mm) L475\*W350\*H205



Note: One Carton 4 layers and 8 pcs each layer, total 32pcs/carton.

**Note:**

1. According to the certificate obtained by the LED DRIVER, the LED DRIVER with the English label is sold in Europe, America and India.
2. The LED DRIVER with Chinese label is only used for China market.

## Version

DATE	DESCRIPTION	REV.	CHECK
2023.12.14	Initial version.	V1.0	
2024.12.27	Add DL-60H-86A/P-MXC model	V1.1	
2025.1.6	Modify DL-60H-86A/P-MXC no-load voltage		
2025.1.15	Modify input voltage on page 2 and High-pot test on page 7.		

### MANUFACTURER

EDIT

CHECK

APPROVE

