

# SOSEN LED Driver, Your Smart Choice

## Specifications

### SS-60VH-PXX\* LED Driver

Model: SS-60VH-PXX\*

Description: 60W LED Driver

Rev.: V00

Release Date: 2023-09-20

DRAFT

# SS-60VH-PXX\* LED Driver



## Features:

- Efficiency up to 89%
- Programmable isolation dimming: voltage(positive or negative logic) , PWM, Resistor, Timing
- Surge protection: CM: 6kV, DM: 6kV
- CLO, ELA, SSA
- Suitable for Class I and Class II applications
- IP65
- Protections: SCP/OVP
- Warranty: 5 years

## Description:

SS-60VH-PXX\*\* is 60W waterproof constant current LED drive power supply, adapts to global voltage input, is compatible with a variety of dimming, has high power factor, high reliability, high efficiency, and a compact housing. Good heat dissipation and comprehensive protection are conducive to the design of LED lamps and reduce the cost of LED lamp manufacturers.

### Applications:

Tunnel lighting, Wall washer lighting, Street lighting, Stage lighting, Plant lighting, Venue lighting

## Model List:

Model	AC Input Range	Max. Pout	Vout Range	Full Power Vo Range	Iout	THD(Typ.)	PF(Typ.)	Eff.(Typ.)	Max.Tc
SS-60VH-P54*	90-305Vac	60W	27-54V	36-54V	0.35-1.67A	12%	0.97	88.0%	90°C
SS-60VH-P86*	90-305Vac	60W	43-86V	54-86V	0.35-1.1A	12%	0.97	89.0%	90°C

Note:

1.Default Tested: at 220Vac, full load, Ta 25°C.

2.The performance of the LED Driver can be guaranteed within the full power Vo range.The voltage lower than full power Vo range, it is need to test the performance with the LED module.

# SS-60VH-PXX\* LED Driver

## “\*” Means Additional Function

“*”	0-10V/PWM Dim /Resistor Or 10-0V (suffix:B)	DALI (suffix:D)	NFC	Class I	Class II	Remark
B	✓			✓		
BE	✓				✓	

## Input Characteristics:

Parameter	Min.	Typ.	Max.	Remark
Rated AC Input Range	100Vac		277Vac	
AC Input Range	90Vac		305Vac	Reference derating curve
Input Frequency Range	47Hz	50/60Hz	63Hz	
Max Input Current			0.8A	100Vac, Full load
			0.3A	277Vac, Full load
Max Input Power			75W	100Vac, Full load
Max Inrush Current(120Vac)			50A	Cold start
Max Inrush Current(220Vac)			65A	Cold start
Max Inrush Current(277Vac)			75A	Cold start
No Load Power			3W	220Vac/50Hz
Power Factor	0.95	0.97		220Vac/50Hz, Full load
	0.90			100-277Vac/50Hz, 80-100% load
THD		12%	15%	220Vac/50Hz, Full load
			20%	100-277Vac/50Hz, 80-100% load

# SS-60VH-PXX\* LED Driver

## O/P Characteristics(SS-60VH-P54\*):

Parameter	Min.	Typ.	Max.	Remark
O/P Voltage Range	27V		54V	Power derated @27-36V
Rated O/P Voltage	36V		54V	Po=Vo*Io=60W, Full load
Rated O/P Current	1.11A		1.67A	1.67A for 36V,1.11A for 54V
Adj. O/P Current (AOC)Range	0.35A		1.67A	
No Load Voltage			75V	
Efficiency @120Vac	85.0%	87.0%		O/P 54V/1.11A
Efficiency @220Vac	87.0%	89.0%		O/P 54V/1.11A
Efficiency @277Vac	86.0%	88.0%		O/P 54V/1.11A
O/P Current Tolerance	-8%		+8%	
O/P Current Ripple(PK-AV)		60%	90%	Full load
Start-up Current Overshoot			10%	Full load
Start-up Time			1.0S	120Vac,Full load
			0.5S	220Vac,Full load
Line Regulation	-8%		+8%	Full load
Load Regulation	-8%		+8%	
Temperature Coefficient	-0.07%/°C		+0.07%/°C	Tc:0°C~90°C
OTP	90°C	100°C	110°C	>Tc Typ., Current derating <Tc Min., Current recovery
Short Circuit Protection				Driver will not be damaged

# SS-60VH-PXX\* LED Driver

## O/P Characteristics(SS-60VH-P86\*):

Parameter	Min.	Typ.	Max.	Remark
O/P Voltage Range	43V		86V	Power derated @43-54V
Rated O/P Voltage	54V		86V	Po=Vo*Io=60W, Full load
Rated O/P Current	0.7A		1.1A	1.1A for 54V,0.7A for 86V
Adj. O/P Current (AOC)Range	0.35A		1.1A	
No Load Voltage			115V	
Efficiency @120Vac	86.5%	88.5%		O/P 86V/0.7A
Efficiency @220Vac	88.0%	90.0%		O/P 86V/0.7A
Efficiency @277Vac	88.0%	90.0%		O/P 86V/0.7A
O/P Current Tolerance	-8%		+8%	
O/P Current Ripple(PK-AV)		70%	100%	Full load
Start-up Current Overshoot		10%	15%	Full load
Start-up Time			1.0S	120Vac,Full load
			0.5S	220Vac,Full load
Line Regulation	-8%		+8%	Full load
Load Regulation	-8%		+8%	
Temperature Coefficient	-0.05%/°C		+0.05%/°C	Tc:0°C~90°C
OTP	90°C	100°C	110°C	>Tc Typ., Current derating <Tc Min., Current recovery
Short Circuit Protection				Driver will not be damaged

# SS-60VH-PXX\* LED Driver

## Other Characteristics:

Parameter	Min.	Typ.	Max.	Remark	
1-10V Dimming (Optional)	Dim Vmax	0V		12V	DIM+ source current 110uA.
	Dim Range	10%Iomax		100%Ioset	Dimming prohibits reverse connection
	Rec.Dim Range	1V		10V	
PWM Dimming (Optional)	PWM High	9.8V		10.2V	DIM+ source current 110uA.
	PWM Low	0V		0.3V	Dimming prohibits reverse connection
	Frequency	1KHz		2KHz	
	PWM Duty	10%		100%	
Resistor Dimming (Optional)	Resistance	10Kohm		100Kohm	DIM+ source current 110uA.
	Dim Range	10%Iomax		100%Ioset	
Dim to Off	Dim off	0.6V	0.8V	1.0V	
	Dim on	0.7V	0.9V	1.1V	
Timing Curve(Optional)	By programming			Set by program (Externally programmable)	
Lifetime(Tc≤75°C)	≥62,000 hours			80% load	
MTBF	262,000 hours			220Vac, Full load, Ta=25°C (MIL-HDBK-217F)	
IP Grade	Ip65				
Tc	90°C				
Warranty	5 years			Tc: 75°C	
Net Weight	440g				
Dimension	105mm*66mm*35mm			L x W x H	

NOTE: All the parameters above are tested Ta 25°C and LED load, unless specified.

# SS-60VH-PXX\* LED Driver

## Environmental Requirements

Parameter	Min.	Typ.	Max.	Remark
Operating Temperature(Tcase)	-40°C	25°C	+90°C	
Storage Temperature	-40°C	25°C	+90°C	
Operation Humidity	10%RH		90%RH	
Storage Humidity	5%RH		95%RH	
Altitude	-65m		4000m	

## Safety and EMI/EMS Standards

Certification	Standard	Status	Remark
UL/cUL	UL8750		
ENEC	EN 61347-1:2015 EN 61347-2-13:2014 EN 61347-2-13:2014/A1:2017		
RCM	AS/NZS61347.2.13		
CCC	GB 19510.14-2009		
CE	EN 61347-2-13:2014 EN61347-1:2008+A1:2011+A2:2013		

EMI/EMS	Criterion	Remark
Conduction Emission	EN55015:2013+A1:2015	Class B
Radiation Emission	EN55015:2013+A1:2015	Class B
Harmonic Current Emissions	IEC/EN 61000-3-2	Class C
Surge	IEC/EN61000-4-5	DM: 6kV,CM: 10kV,Criterion B
Ring Wave	IEC/EN 61000-4-12	DM: 6kV,CM: 6kV,Criterion B

# SS-60VH-PXX\* LED Driver

## Safety Test Items(Class I equipment):

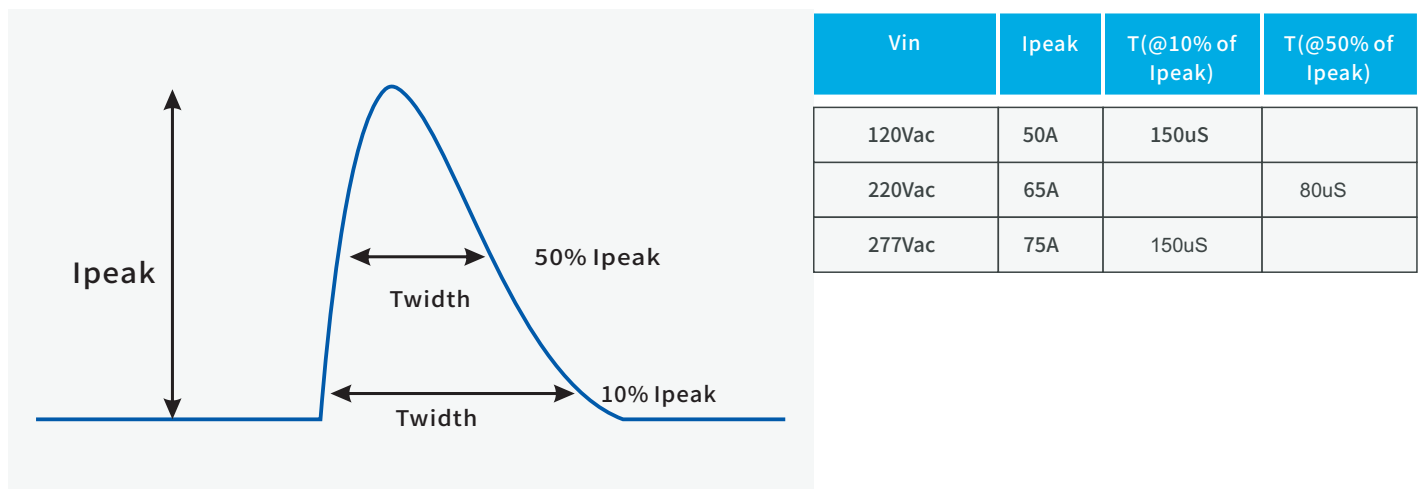
Safety Test Items	Technical Indicators			Remark
Insulation Requirements	UL Insulation Requirements	ENEC Insulation Requirements	CCC Insulation Requirements	
Input-O/P	/	/	3750Vac	Reinforced insulation
Input-Case	/	/	1875Vac	Basic insulation
Input-Dim	/	/	3750Vac	Reinforced insulation
O/P-Dim	/	/	1000Vac	Basic insulation
O/P-Case	/	/	1000Vac	Basic insulation
Dim-Case	/	/	500Vac	Basic insulation
Insulation Resistance	$\geq 10M\Omega$			Input-O/P,Test voltage:500Vdc
Ground Resistance	$\leq 0.1\Omega$			25A/1min
Leakage Current	$\leq 0.75mA$			277Vac
Touch Current(IEC Class II)	$\leq 0.7mA(\text{peak})$			

### NOTE:

1. SOSEN warrants the LED Driver itself complies with EMC standard. However, LED Driver's EMC should be re-checked when integrated into lighting systems due to unexpected interference of components.
2. Please short (ACL and ACN), (V+ and V-), (Dim+ and Dim - and VPP+) when Hi-pot test.
- 3.The CCC withstand voltage test needs to disconnect the built-in lightning protection tube.According to the IEC 60598-1:14 standard section 10.2, the “built-in lightning protection tube” can be marked on the nameplate to disconnect the discharge tube on testing.

## Performance Curves:

### Input Inrush Current





# SS-60VH-PXX\* LED Driver

## Safety Test Items(Class II equipment):

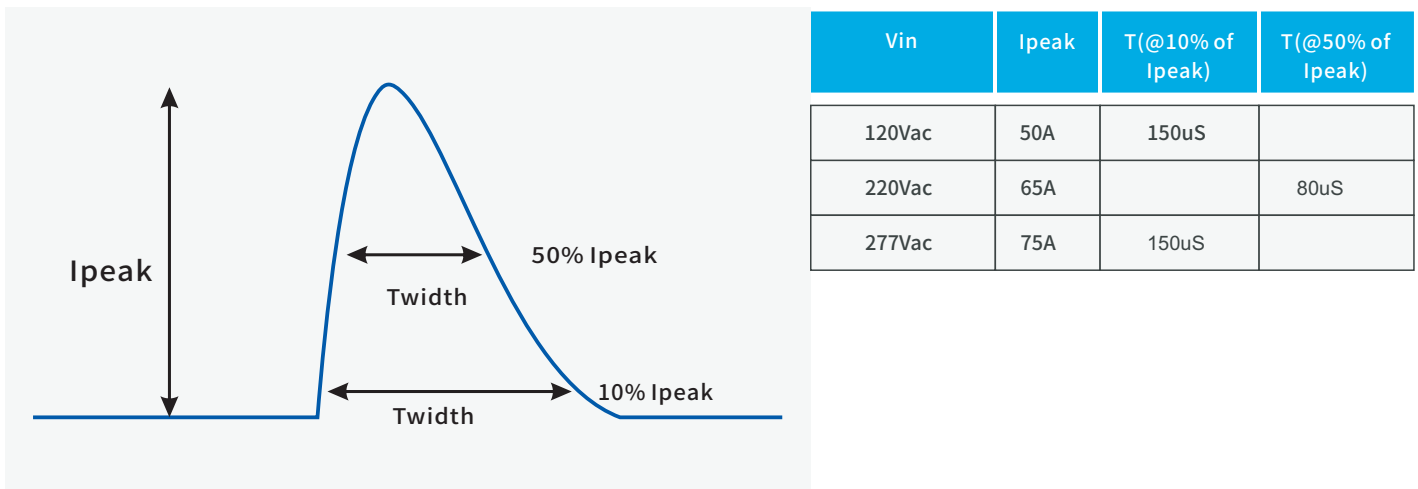
Safety Test Items	Technical Indicators			Remark
Insulation Requirements	UL Insulation Requirements	ENEC Insulation Requirements	CCC Insulation Requirements	
Input-O/P	/	/	3750Vac	Reinforced insulation
Input-Case	/	/	3750Vac	Reinforced insulation
Input-Dim	/	/	3750Vac	Reinforced insulation
O/P-Dim	/	/	1000Vac	Basic insulation
O/P-Case	/	/	1000Vac	Basic insulation
Dim-Case	/	/	500Vac	Basic insulation
Insulation Resistance	$\geq 10M\Omega$			Input-O/P,Test voltage:500Vdc
Ground Resistance	$\leq 0.1\Omega$			25A/1min
Leakage Current	$\leq 0.75mA$			277Vac
Touch Current(IEC Class II)	$\leq 0.7mA(\text{peak})$			

### NOTE:

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## Performance Curves:

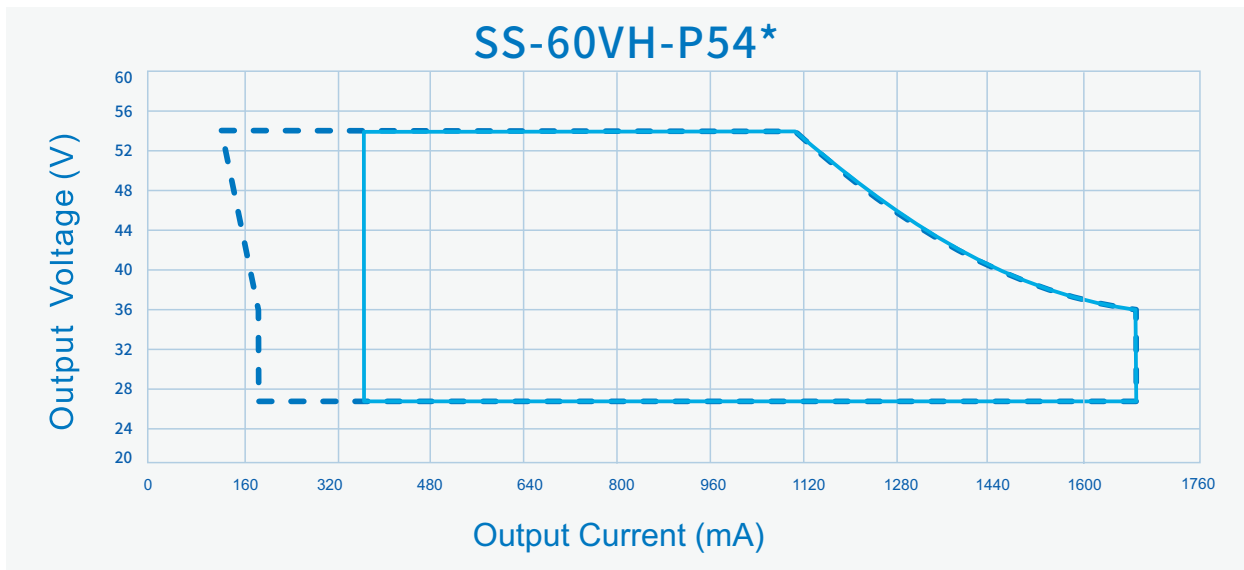
### Input Inrush Current



# SS-60VH-PXX\* LED Driver

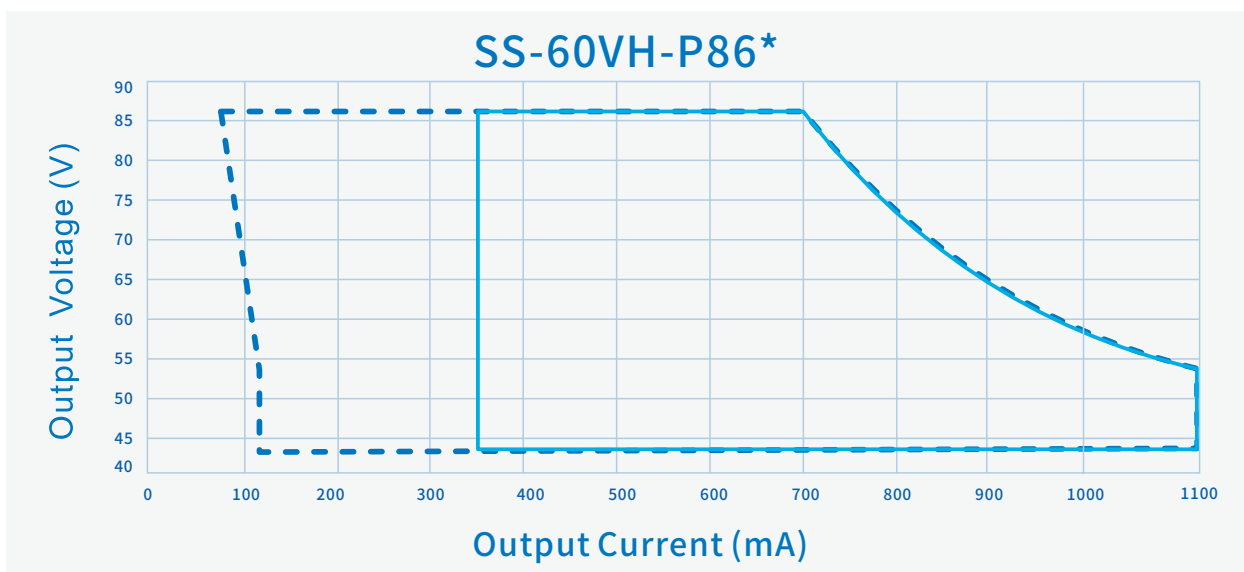
## Performance Curves:

O/P Voltage Vs. O/P Current(Dim/AOC Window)



----- Dimming Window      ————— AOC Window

O/P Voltage Vs. O/P Current(Dim/AOC Window)

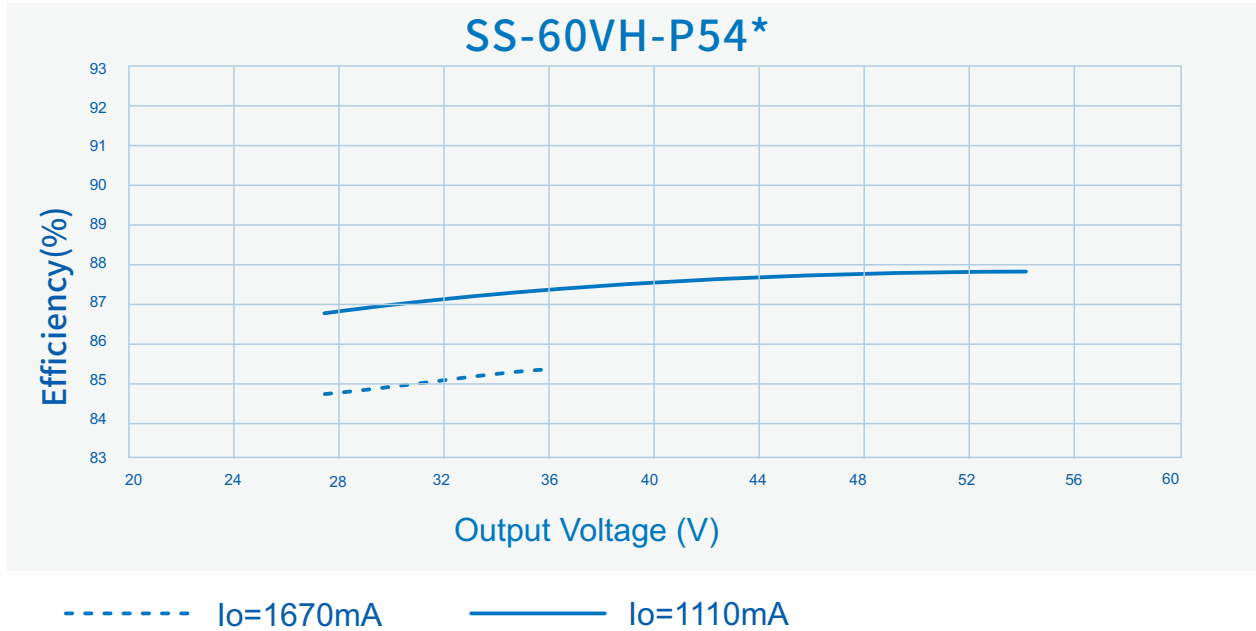


----- Dimming Window      ————— AOC Window

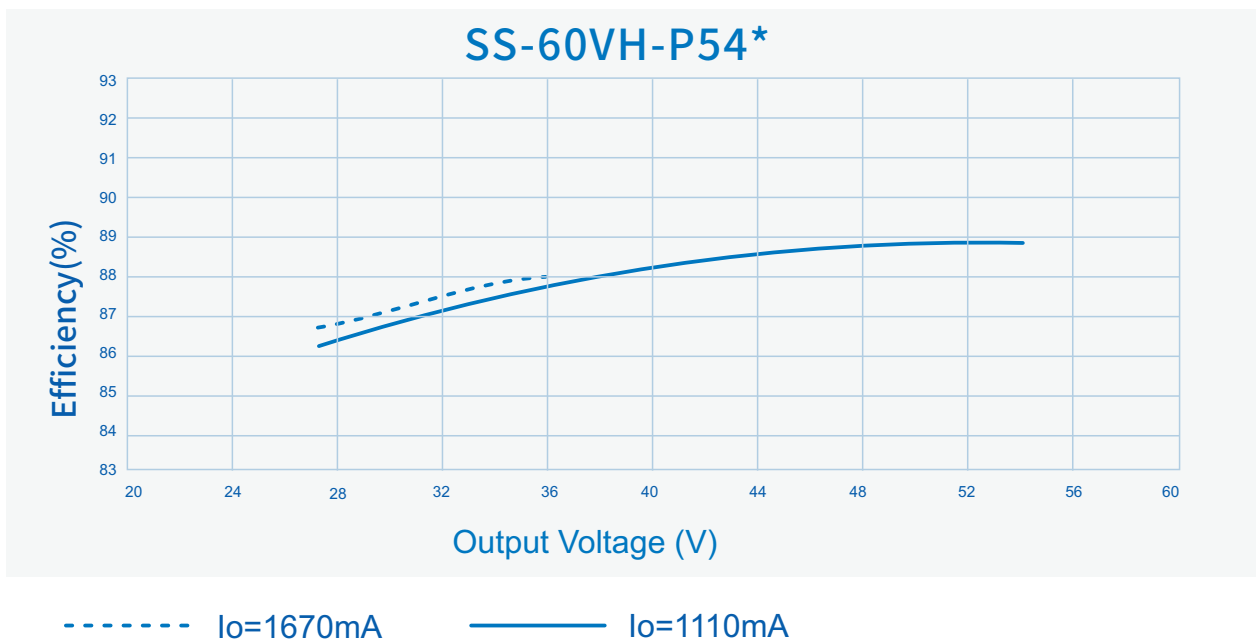
# SS-60VH-PXX\* LED Driver

## Performance Curves:

Efficiency Vs. O/P Voltage ( $V_{in}=120Vac$ )



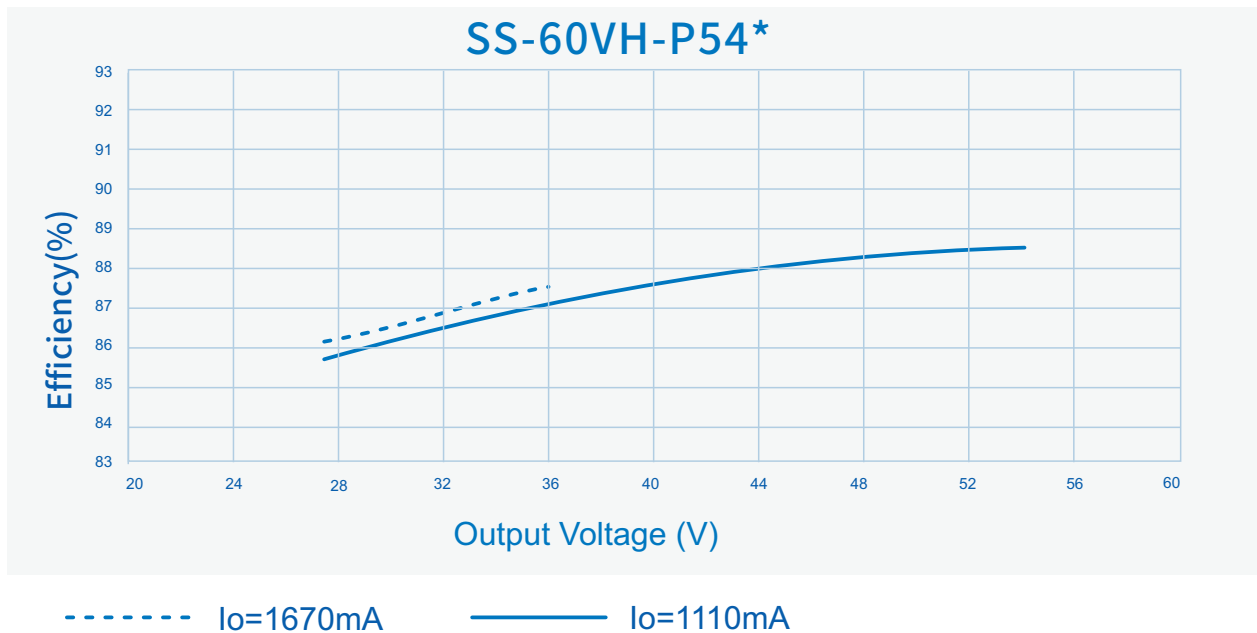
Efficiency Vs. O/P Voltage ( $V_{in}=220Vac$ )



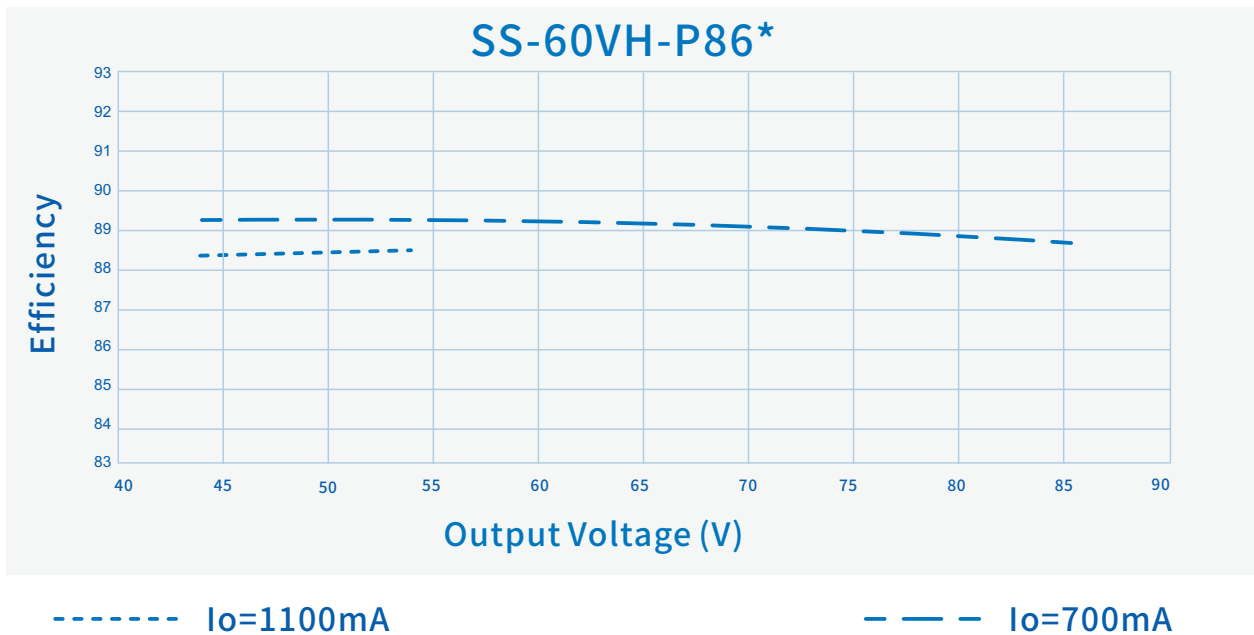
# SS-60VH-PXX\* LED Driver

## Performance Curves:

Efficiency Vs. O/P Voltage ( $V_{in}=277V_{ac}$ )



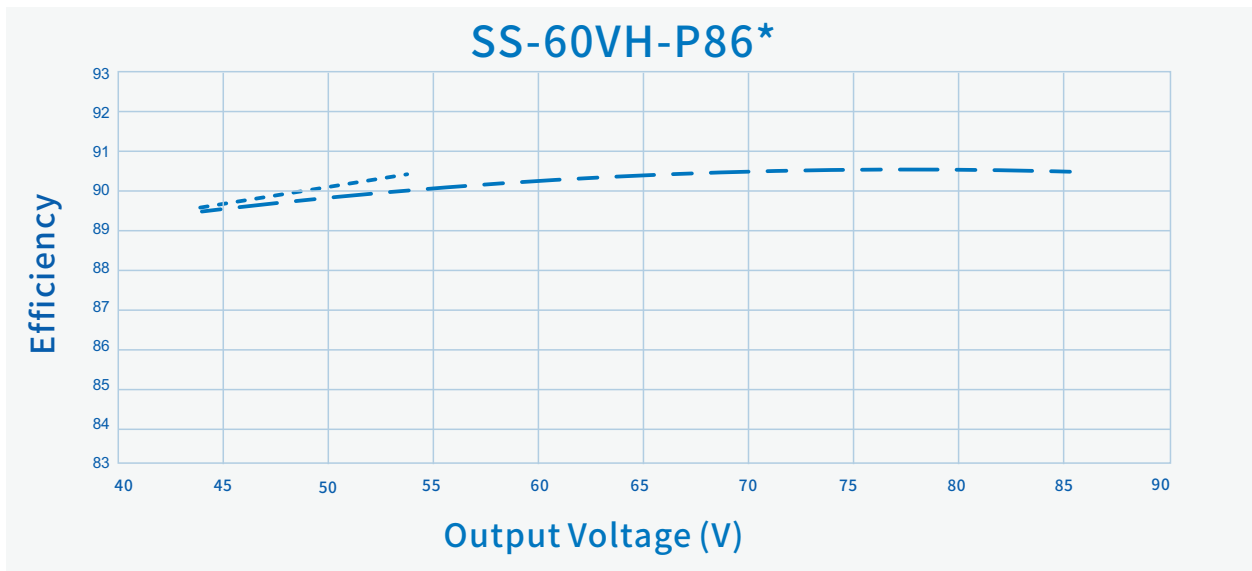
Efficiency Vs. O/P Voltage ( $V_{in}=120V_{ac}$ )



# SS-60VH-PXX\* LED Driver

## Performance Curves:

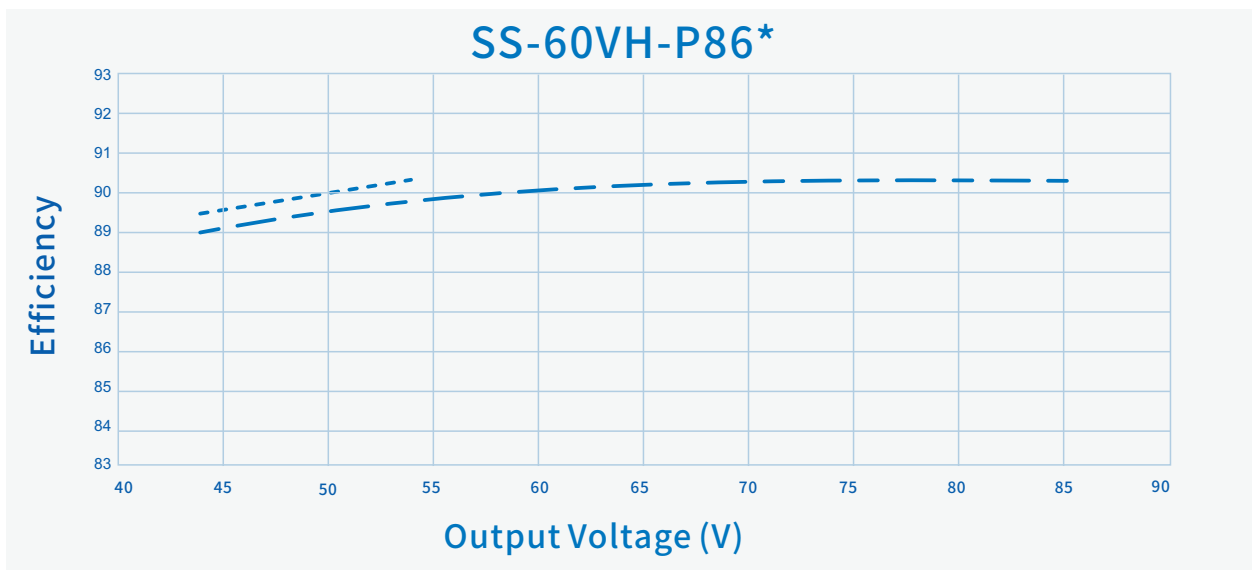
Efficiency Vs. O/P Voltage ( $V_{in}=220V_{ac}$ )



-----  $I_o=1100mA$

- - - -  $I_o=700mA$

Efficiency Vs. O/P Voltage ( $V_{in}=277V_{ac}$ )



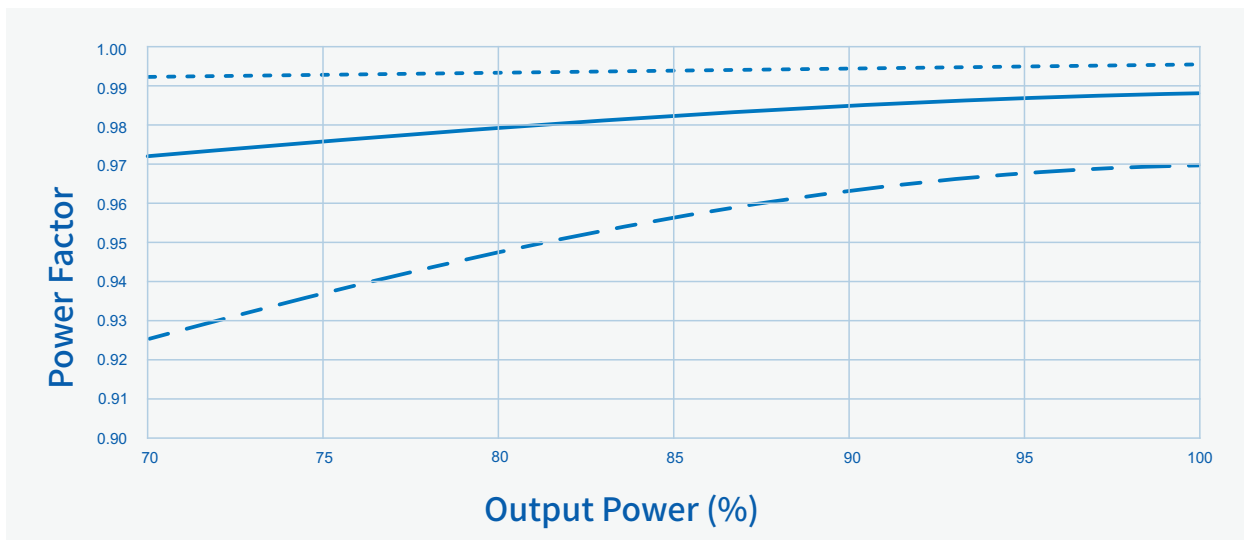
-----  $I_o=1100mA$

- - - -  $I_o=700mA$

# SS-60VH-PXX\* LED Driver

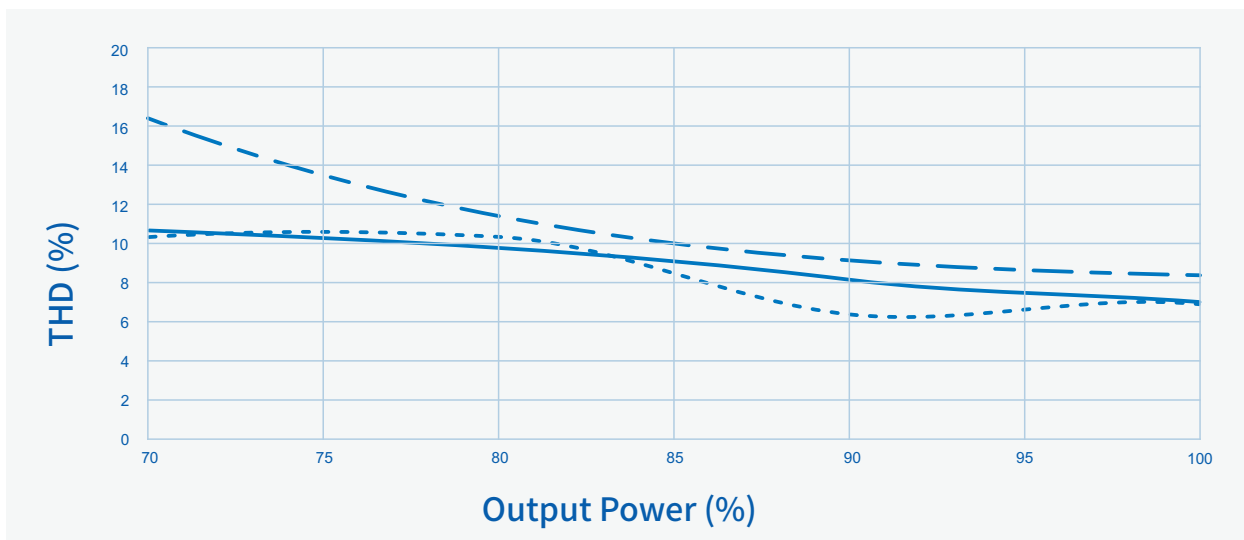
## Performance Curves(SS-60VH-P54\*):

### Power Factor Vs. O/P Power



----- Vin=120Vac      \_\_\_\_\_ Vin=220Vac      - - - - Vin=277Vac

### THD Vs. O/P Power

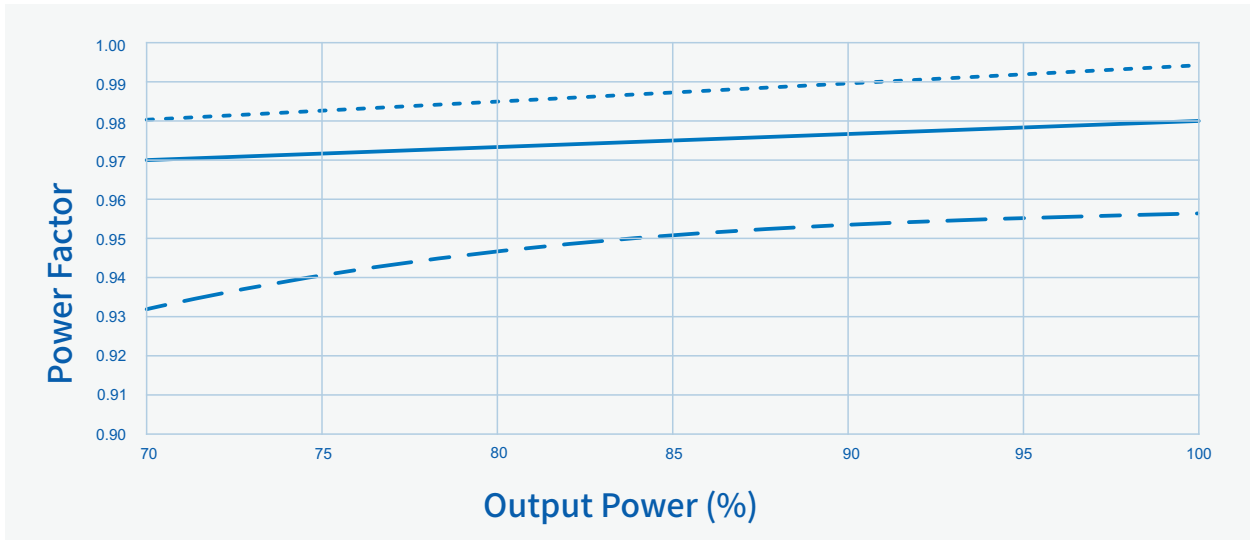


----- Vin=120Vac      \_\_\_\_\_ Vin=220Vac      - - - - Vin=277Vac

# SS-60VH-PXX\* LED Driver

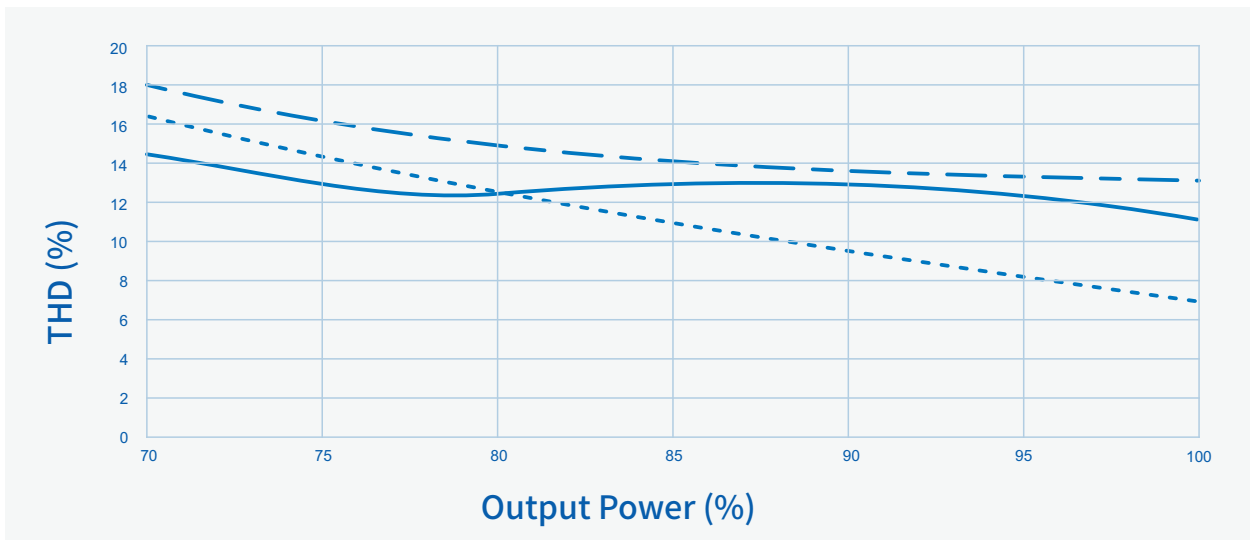
## Performance Curves(SS-60VH-P86\*):

### Power Factor Vs. O/P Power



----- Vin=120Vac      ————— Vin=220Vac      - - - - Vin=277Vac

### THD Vs. O/P Power

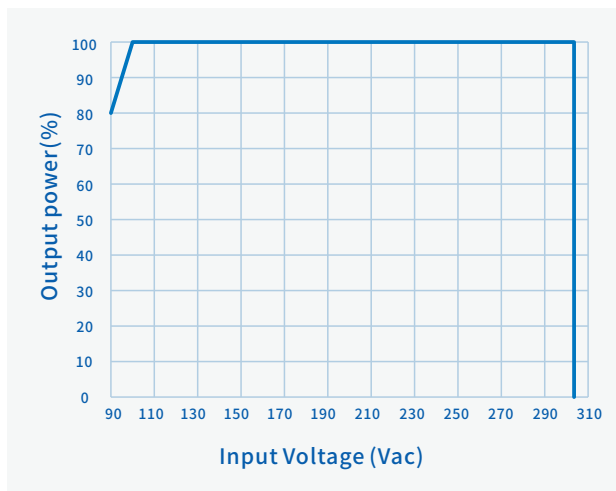


----- Vin=120Vac      ————— Vin=220Vac      - - - - Vin=277Vac

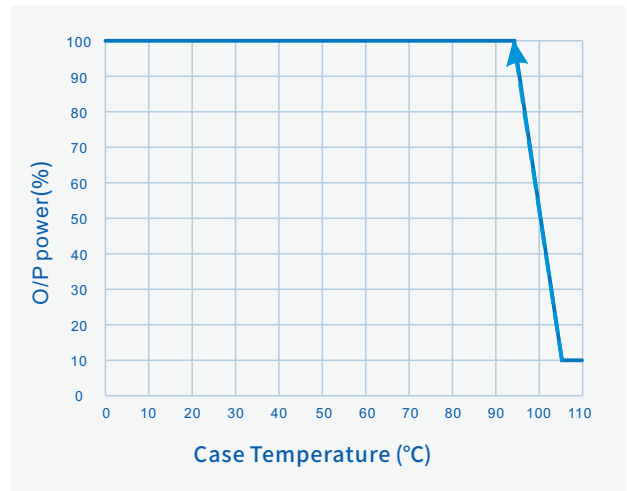
# SS-60VH-PXX\* LED Driver

## Performance Curves:

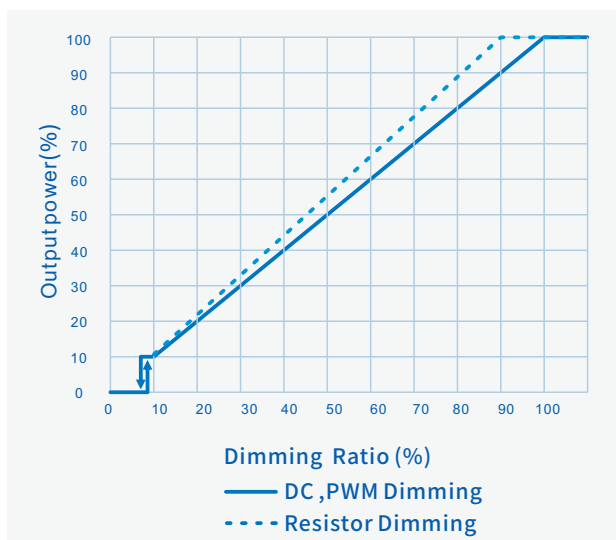
### O/P Power Vs. Input Voltage



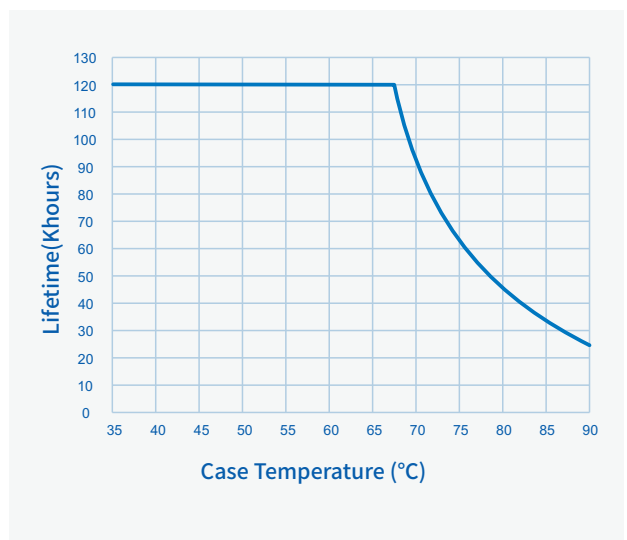
### Output power Vs. Case Temperature



### O/P Power Vs. Dimming



### Lifetime Vs. Case Temperature





# SS-60VH-PXX\* LED Driver

## Constant Lumen Output

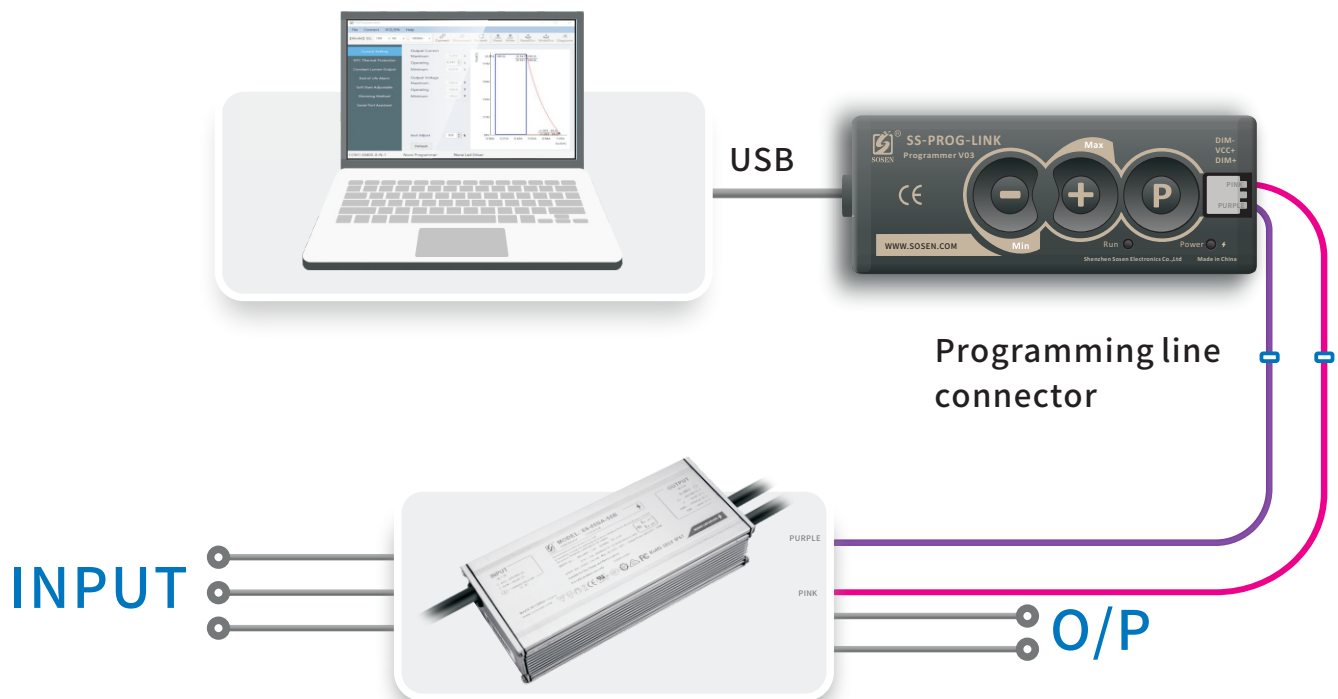
Constant Lumen output are design to maintain fixture's stable output lumen by increasing driver's output current within driver's life span to counteract LED lumen degradation.

## Programming connection diagram:

Legacy Timer: Driver's O/P follows the pre-programmed timing curve after turn-on.

Auto-Adjust by Percentage: Driver's O/P will be adjusted by automatically changed dimming curve by the period percentage based on the latest 5 dimming curve.

Auto-Adjust by Mid-point: Driver's O/P will be adjusted by automatically changed dimming curve by mid-point based on the latest 5 dimming curve.



### Note:

Programming could be completed by off-line mode either without turn on the driver or without PC, other than the traditional on-line mode.

# SS-60VH-PXX\* LED Driver

## Mechanical Characteristics(Class I equipment)

**LED DRIVER**

**AC Input Cable(Exposed Length 450±10mm):**  
EU model: H05RN-F, 3\*1.0mm<sup>2</sup>,O.D: 7.3mm,Brown:L,Blue:N,Yellow/Green: ⊕

**PE Ground Wire With Copper Ear (Exposed Length 60±10mm):**  
UL model: 21996, 18AWG,O.D: 2.7-2.85mm,600V,Yellow/Green: ⊕

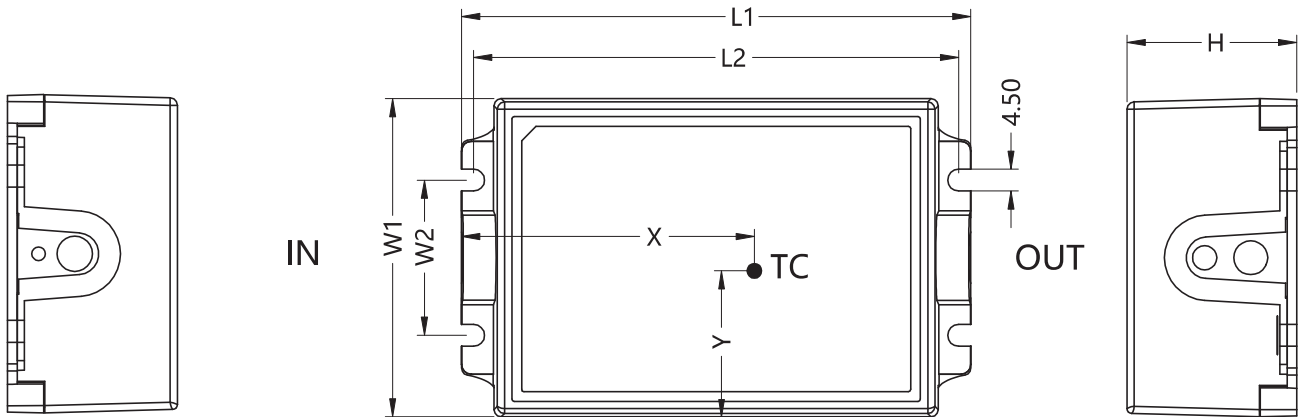
**DC O/P Cable(Exposed Length 250±10mm):**  
EU model: H05RN-F, 2\*1.0mm<sup>2</sup>,O.D: 7.0mm,Red:V+, Black:V-

**DIM/Timing Cable(Exposed Length 220±10mm):**  
UL model: UL 21996, 3\*22AWG , O.D: 4.7mm, Purple: DIM+, Pink: DIM-

Name Description	Standard Code	mm(In.)
Case Length	L3	92(3.62)
Case Width	W1	66(2.6)
Case Height	H	35(1.38)
Overall Length	L1	105(4.13)
Mounting Hole Length	L2	100(3.94)
Mounting Hole Width	W2	32(1.26)
TC Point Position	X	35(1.38)
TC Point Position	Y	30(1.18)

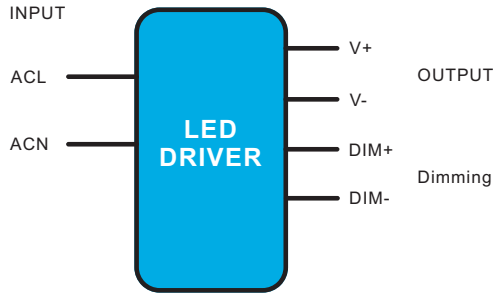
**Note:**

- Please follow the "LED Driver User Manual" obtained from SOSEN's official website for assembly.
- AC Input Cable,DC O/P Cable,DIM/AUX Power/Programming Cable: Peeled length of cable:43±5mm, Tinned length of wire:10±2mm



# SS-60VH-PXX\* LED Driver

## Mechanical Characteristics(Class II equipment)



### AC Input Cable(Exposed Length $450 \pm 10\text{mm}$ ):

EU model: H05RN-F,  $3 \times 1.0\text{mm}^2$ , O.D: 7.3mm, Brown:L, Blue:N

### DC O/P Cable(Exposed Length $250 \pm 10\text{mm}$ ):

EU model: H05RN-F,  $2 \times 1.0\text{mm}^2$ , O.D: 7.0mm, Red:V+, Black:V-

### DIM/Timing Cable(Exposed Length $220 \pm 10\text{mm}$ ):

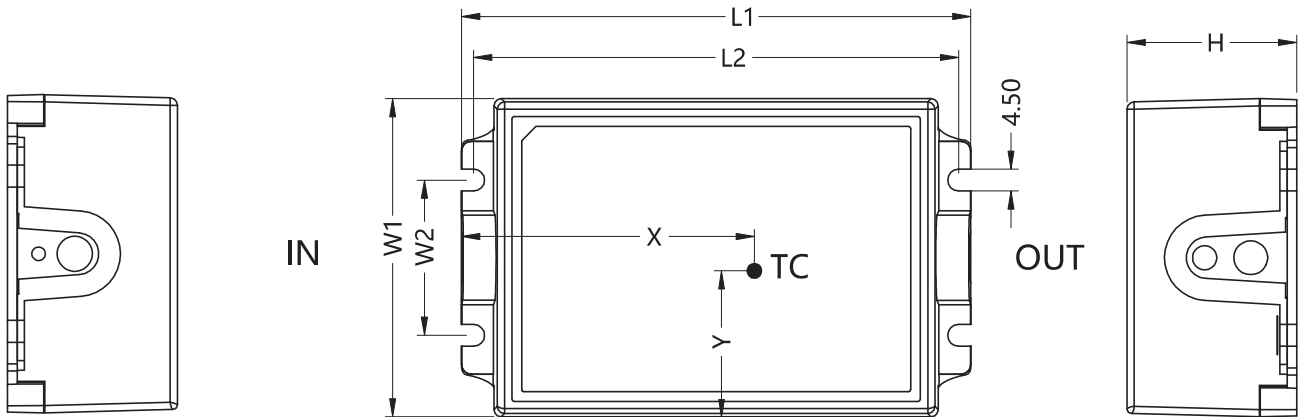
UL model: UL 21996,  $3 \times 22\text{AWG}$ , O.D: 4.7mm, Purple: DIM+, Pink: DIM-

Name Description	Standard Code	mm(In.)
Case Length	L3	92(3.62)
Case Width	W1	66(2.6)
Case Height	H	35(1.38)
Overall Length	L1	105(4.13)
Mounting Hole Length	L2	100(3.94)
Mounting Hole Width	W2	32(1.26)
TC Point Position	X	35(1.38)
TC Point Position	Y	30(1.18)

#### Note:

1, Please follow the "LED Driver User Manual" obtained from SOSEN's official website for assembly.

2, AC Input Cable, DC O/P Cable, DIM/AUX Power/Programming Cable: Peeled length of cable:  $43 \pm 5\text{mm}$ , Tinned length of wire:  $10 \pm 2\text{mm}$



# SS-60VH-PXX\* LED Driver



## Assembly Tips

1. Please take isolation and waterproof measures if the dimming cable is not in use.

## Package

- Outside carton dimension: L × W × H = 495mm × 385mm × 162mm;
- 28PCS/Carton;
- Net weight/Piece: 0.44kg; Gross weight/Carton: 13.8kg;
- Please refer to the product name, model number, manufacturer identification, QC PASS, manufacturing date on the package.

## Transportation

Packaging is designed suitable for transportation by trucks, vessels and flights. The products should be avoided direct sunlight and rain, loaded/unloaded with caution.

## Storage

The product storage meets the standard of the GB 3873—83.  
Products should be rechecked if stored for over 1 year before assembly.

## RoHS

Products comply with RoHS Directive (2011/65/EU) and amendment 2015/863/EU.

## Revision History

Version	Description of Update	Updated Date	Remark
V00	Original Release	2023/09/20	