SOSEN
LED DRIVER

SOSEN LED Driver, Your Smart Choice

Specifications

165W Class I/II NFC Driver with DALI-2 and D4i

Model: SS-165PA-XXF

Description: 165W Class I/II NFC Driver with DALI-2 and D4i

Rev.: V01

Release Date: 2024-06-01

165W Class I/II NFC Driver with DALI-2 and D4i

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PA Series

Features:

- Efficiency up to 94%
- Adjusted by NFC
- DALI-2 & D4i certification
- Dim-to-off & Standby power≤0.5W
- Surge Protection: CM: 10kV, DM: 6kV
- AUX Power: 24V/125mA
- Low Inrush Current≤17A
- Built-in 16Vdc DALI-2 bus power supply
- Built-in AC power metering with up to ±1% accuracy
- AC Dimming/Timing/ELA/CLO/NTC
- Protections: SCP/OTP/OVP/OPP
- Suitable for Class I /II luminaires
- IP20
- Installation dimensions conform to Zhaga standards
- Warranty: 8 years

Description:

SS-165PA-XXF is a 165W NFC intelligent LED driver. It can realize interconnection with intelligent lighting system to achieve fine control and management, as well as being compatible and connected with a wide variety of intelligent lighting systems and controllers. Our product has multiple intelligent functions, such as real-time adjustment of the power, brightness and color of the luminaires, supporting intelligent lighting scene settings and adjustments, as well as monitoring the status and faults of the luminaires, and carry out remote management and maintenance,etc. In addition, it also has a full range of protection mechanism, highly efficient electrical power conversion and consistent output performance, which can provide stable, safe and reliable power supply support for LED luminaires.

Application:

Street lights, tunnel lights, sports lights.

Model List:

Model	Input Range	Max. Pout	Vout Range	Full Power Vo Range	Iout Range	Default Output Current	THD(Typ.)	PF(Typ.)	Eff.(Typ.)	Max.Tc
SS-165PA-157F	80-264Vac 168-280Vdc	165W	54-157V	110-157V	0.2-1.5A	1.05A	6%	0.98	93.5%	90℃
SS-165PA-236F	80-264Vac 168-280Vdc	165W	79-236V	157-236V	0.2-1.05A	0.7A	6%	0.98	94%	90℃
SS-165PA-367F	80-264Vac 168-280Vdc	165W	118-367V	236-367V	0.2-0.7A	0.7A	6%	0.98	94%	90℃

Note:
1.Default Tested: at 230Vac, full load, Ta 25℃。
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;
3.Low inrush current due to istart, which enables a single MCB to control more LED drivers.

SHENZHEN SOSEN ELECTRONICS CO.,LTD
A3 Building,Gonghe Fourth Industrial Area, Shajing Street, Bao' an District, Shenzhen, China 518104
86-755-29358800
86-755-29358816
info@szsosen.com
www.szsosen.com

Input Characteristics:

Parameter	Min.	Typ.	Max.	Remark
Rated AC Input Range	220Vac		240Vac	
Input AC Voltage Range	80Vac		264Vac	Including AC dimming function
Input DC Voltage Range	168Vdc		280Vdc	
Input Frequency Range	47Hz	50/60Hz	63Hz	
Max Input Current			1.0A	200Vac, Full load
Max Inrush Current(230Vac)			17A	Cold start
Power metering	-1%		+1%	230Vac, Full load
Standby Power			0.5W	230Vac/50Hz, Dim to off, Turn off DALI-2 bus power
Power Factor	0.96	0.98		230Vac/50Hz, Full load
	0.9			220-240Vac/50Hz, 30-100% load
THD		6%	10%	230Vac/50Hz, Full load
			20%	220-240Vac/50Hz, 30-100% load

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O/P Characteristics(SS-165PA-157F):

Parameter	Min.	Typ.	Max.	Remark
O/P Voltage Range	54V		157V	Power derated @54-110V
Rated O/P Voltage	110V		157V	Po=Vo*Io=165W, Full load
Rated O/P Current	1.05A		1.5A	1.5A for 110V,1.05A for 157V
Adj. O/P Current (AOC)Range	0.2A		1.5A	Output current can be adjusted by NFC
No Load Voltage			200V	
Efficiency @230Vac	91.5%	93.5%		O/P 157V/1.05A
O/P Current Tolerance	-5%		+5%	
O/P Current Ripple(PK-AV)		5%	10%	Full load
Output $P_{st}LM$			1	Full load
Output SVM			0.4	Full load
Start-up Current Overshoot			10%	Full load
Start-up Time			0.7S	230Vac, Full load
Line Regulation	-1%		+1%	Full load
Load Regulation	-3%		+3%	
Temperature Coefficient	-0.03%/°C		+0.03%/°C	Tc:0°C~90°C
OTP	90°C	95°C	100°C	Drop current when OTP, and it can be automatically restored after the abnormality is removed.
Short Circuit Protection				Driver will not be damaged, CC mode

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O/P Characteristics(SS-165PA-236F):

Parameter	Min.	Typ.	Max.	Remark
O/P Voltage Range	79V		236V	Power derated @79-157V
Rated O/P Voltage	157V		236V	Po=Vo*Io=165W, Full load
Rated O/P Current	0.7A		1.05A	1.05A for 157V,0.7A for 236V
Adj. O/P Current (AOC)Range	0.2A		1.05A	Output current can be adjusted by NFC
No Load Voltage			250V	
Efficiency @230Vac	92.0%	94.0%		O/P 236V/0.7A
O/P Current Tolerance	-5%		+5%	
O/P Current Ripple(PK-AV)		5%	10%	Full load
Output $P_{st}LM$			1	Full load
Output SVM			0.4	Full load
Start-up Current Overshoot			10%	Full load
Start-up Time			0.7S	230Vac, Full load
Line Regulation	-1%		+1%	Full load
Load Regulation	-3%		+3%	
Temperature Coefficient	-0.03%/°C		+0.03%/°C	Tc:0°C~90°C
OTP	90°C	95°C	100°C	Drop current when OTP, and it can be automatically restored after the abnormality is removed.
Short Circuit Protection				Driver will not be damaged, CC mode

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O/P Characteristics(SS-165PA-367F):

Parameter	Min.	Typ.	Max.	Remark
O/P Voltage Range	118V		367V	Power derated @118-236V
Rated O/P Voltage	236V		367V	Po=Vo*Io=165W, Full load
Rated O/P Current	0.45A		0.7A	0.7A for 236V,0.45A for 367V
Adj. O/P Current (AOC)Range	0.2A		0.7A	Output current can be adjusted by NFC
No Load Voltage			400V	
Efficiency @230Vac	92.0%	94.0%		O/P 367V/0.45A
O/P Current Tolerance	-5%		+5%	
O/P Current Ripple(PK-AV)		5%	10%	Full load
Output $P_{st}LM$			1	Full load
Output SVM			0.4	Full load
Start-up Current Overshoot			10%	Full load
Start-up Time			0.7S	230Vac, Full load
Line Regulation	-1%		+1%	Full load
Load Regulation	-3%		+3%	
Temperature Coefficient	-0.03%/°C		+0.03%/°C	Tc:0°C~90°C
OTP	90°C	95°C	100°C	Drop current when OTP, and it can be automatically restored after the abnormality is removed.
Short Circuit Protection				Driver will not be damaged, CC mode

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Dimming Characteristics:

Parameter		Min.	Typ.	Max.	Remark
DALI-2	DA+, DA- High Level	9.5V	16V	22.5V	
	DA+, DA- Low Level	-6.5V	0V	6.5V	
	DA+, DA- Current	0mA		2mA	
AC Dim	Start Input Voltage	180Vac		264Vac	Default 200Vac
	Start Output Level	100%			
	Stop Input Voltage	80Vac		244Vac	Default 160Vac
	Stop Output Level	10%		40%	Default 30%
	Gap between Start and Stop Input Voltage	20Vac			
Dimming Output Range	SS-165PA-367F	10%Ioset		Ioset	450mA ⩽ Ioset ⩽ 700mA
	SS-165PA-236F				700mA ⩽ Ioset ⩽ 1050mA
	SS-165PA-157F				1050mA ⩽ Ioset ⩽ 1500mA
	SS-165PA-367F	45mA		Ioset	45mA ⩽ Ioset ⩽ 450mA
	SS-165PA-236F	70mA			70mA ⩽ Ioset ⩽ 700mA
	SS-165PA-157F	105mA			105mA ⩽ Ioset ⩽ 1050mA

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Other Characteristics:

Parameter		Min.	Typ.	Max.	Remark
Aux Power	Rated O/P Voltage	21.6V	24V	26.4V	The reference ground is "DA-"
	No Load O/P Voltage			30V	The reference ground is "DA-"
	Rated O/P Current	0		125mA	The reference ground is "DA-"
	Peak O/P Current	0		250mA	The reference ground is "DA-". During a 6ms period, maximum duration of 250mA peak output current 2.2ms, and the average value cannot exceed 125mA.
Integrated DALI-2 Bus Power Supply Voltage		12V	16V	20V	
Integrated DALI-2 Bus Power Supply Current		50mA		60mA	
Life Time(Tc≤80℃)		≥100,000 hours			80% load
MTBF		250,000 hours			230Vac,Full load, Ta=25℃ (MIL-HDBK-217F)
IP Grade		IP20			
Tc		90℃			
Warranty		8 years			Tc: 80℃
Net Weight		790g			
Dimension		171mm*101mm*35mm			L x W x H

NOTE:
1. All the parameters above are tested Ta 25℃ and LED load, unless specified.
2. The DALI-2 bus power supply is enabled by default and can be disabled through the programming interface.

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Environmental Requirements

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

Safety and EMI/EMS Standards

Certification	Standard	Status	Remark
ENEC	EN 61347-1:2015+A1:2021 EN 61347-2-13:2014+A1:2017 EN IEC 62384:2020	✓	
UKCA	EN 61347-1:2015/A1:2021 EN 61347-2-13:2014/A1:2017 EN 62493:2015/A1:2022	✓	
EAC	EN 61347-2-13:2014+A1:2017 EN61347-1:2015+A1:2021	✓	
CE	EN 61347-1:2015/A1:2021 EN 61347-2-13:2014/A1:2017 EN 62493:2015/A1:2022	✓	

EMI/EMS	Criterion	Remark
Conduction Emission	EN IEC 55015:2019/A11:2020	Class B
Radiation Emission	EN IEC 55015:2019/A11:2020	Class B
Harmonic Current Emissions	EN IEC 61000-3-2:2019/A1:2021	Class C
Surge	IEC/EN61000-4-5	DM: 6kV,CM: 8kV,Criterion B
	EN61547:2009	DM: 6kV,CM: 10kV,Criterion B

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Safety Test Items:

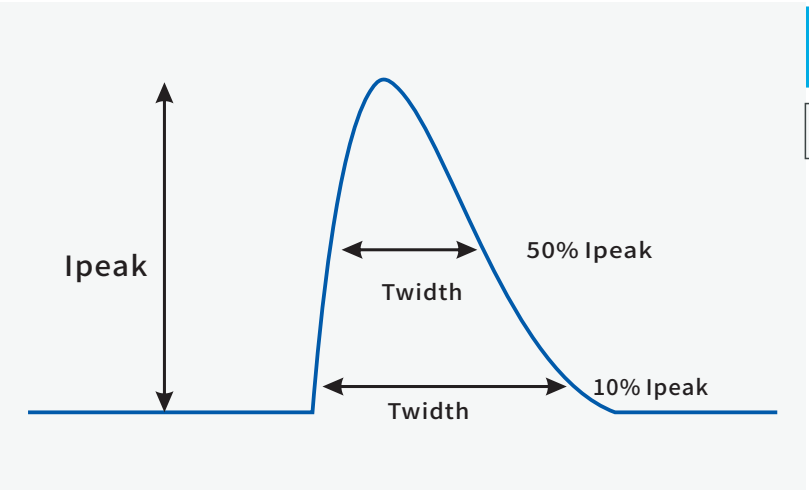
Safety Test Items	Technical Indicators	Remark
Insulation Requirements	ENEC Insulation Requirements	
Input to EQUI	4U+2000	Reinforced insulation
Input-Dim	4U+2000	Reinforced insulation
Dim to EQUI	2U+1000	Basic insulation
Insulation Resistance	⩾10MΩ	Input-Output,Test voltage:500Vdc
Leakage Current	⩽0.7mApk	240Vac

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), (LED+ and LED- and NTC+ and NTC-), (DA+ and DA - and Vaux+)when Hi-pot test.

Performance Curves:

Input Inrush Current



Vin	Ipeak	T(@10% of Ipeak)	T(@50% of Ipeak)
220Vac	17A	3.5mS	1.6mS

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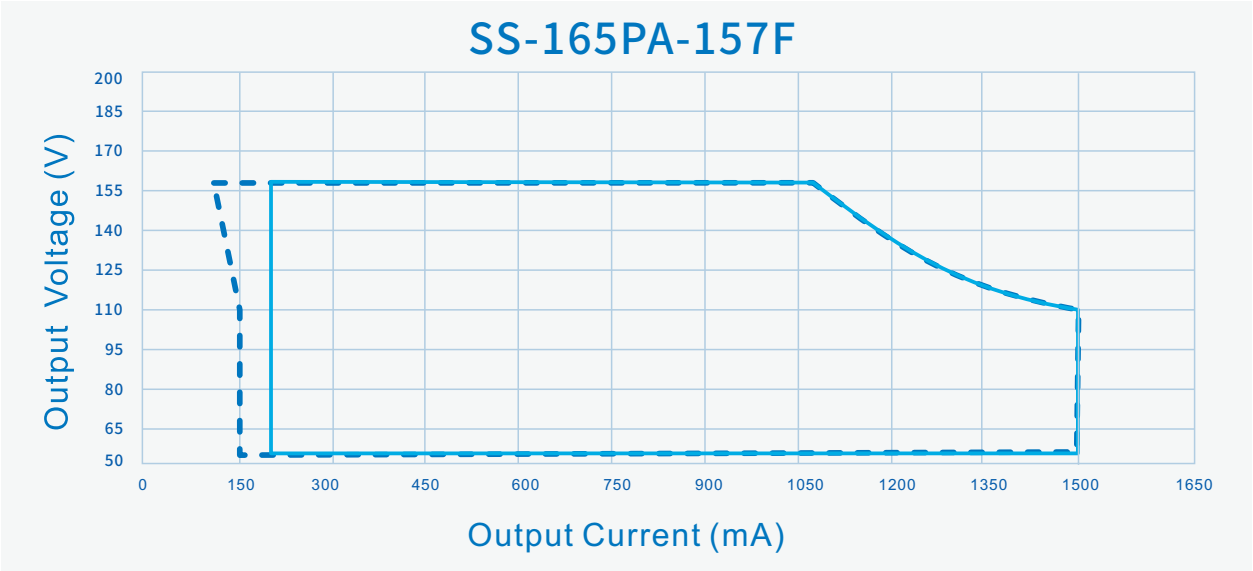
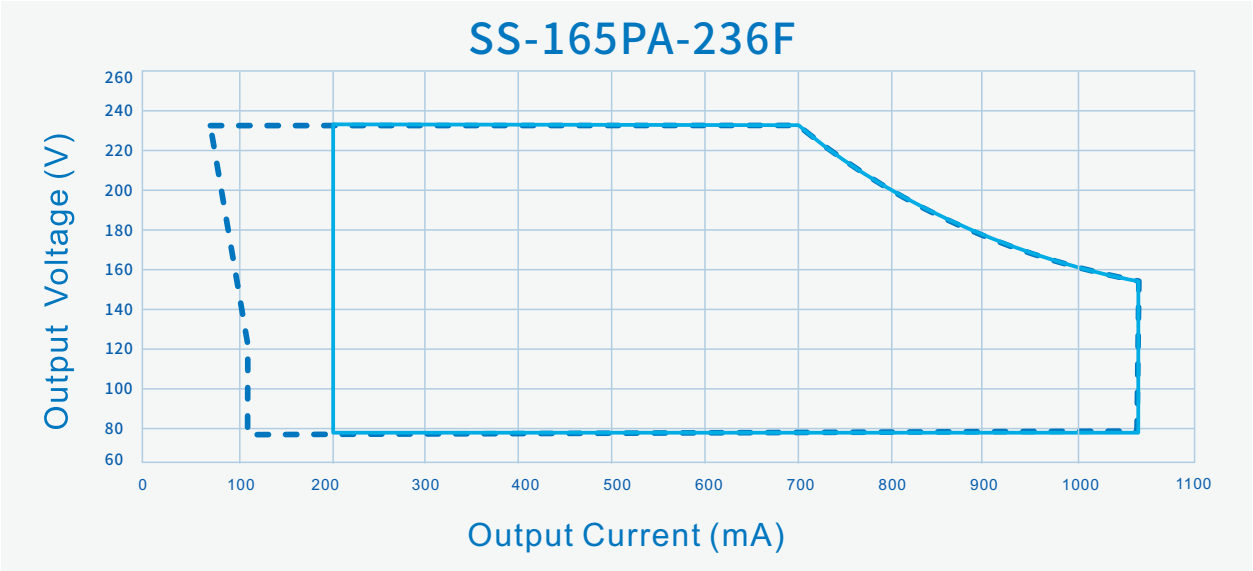
Performance Curves:

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

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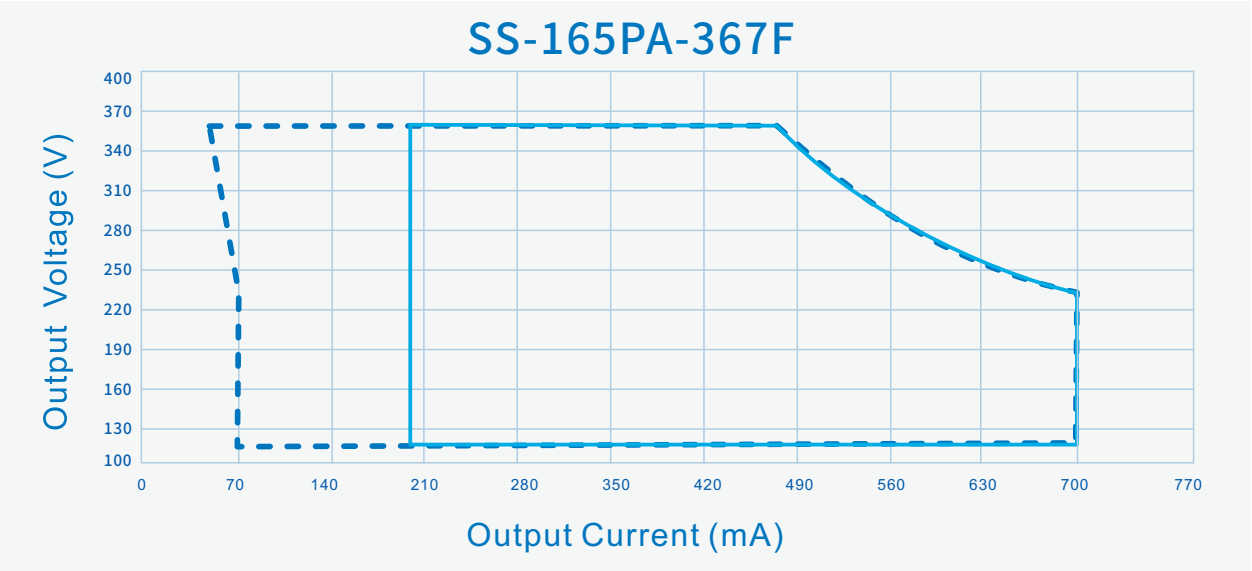
A3 Building,Gonghe Fourth Industrial Area, Shajing Street, Bao' an District, Shenzhen, China 518104
86-755-29358800
86-755-29358816
info@szsosen.com
www.szsosen.com

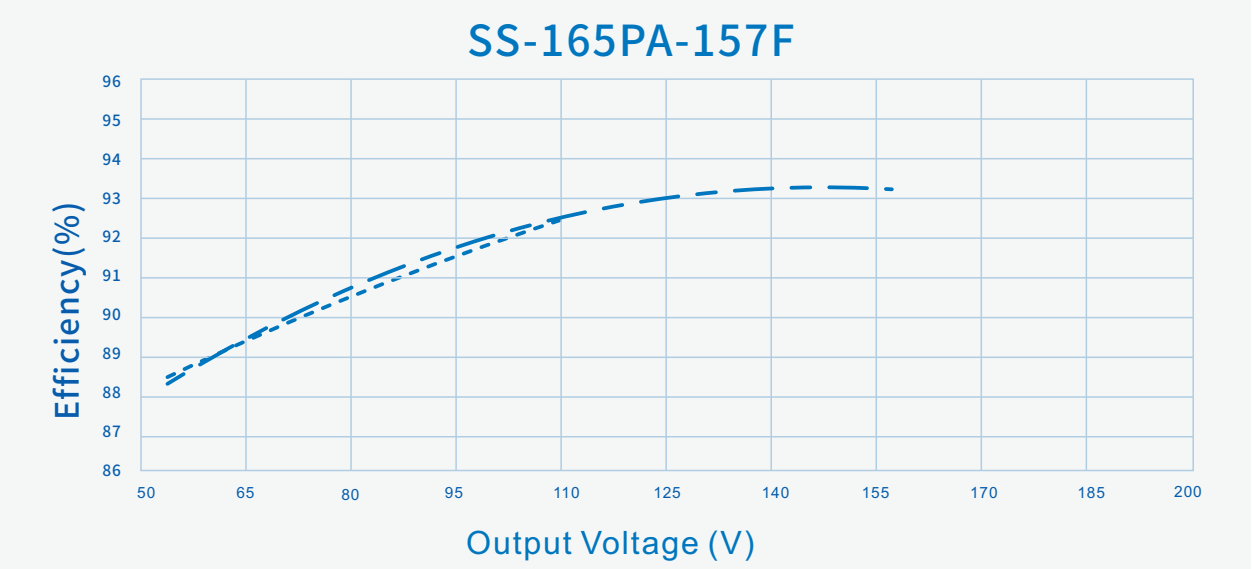
Performance Curves:

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



Dimming Window AOC Window

Efficiency Vs. O/P Voltage (Vin=230Vac)



Io=1500mA Io=1050mA

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86-755-29358800
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info@szsosen.com
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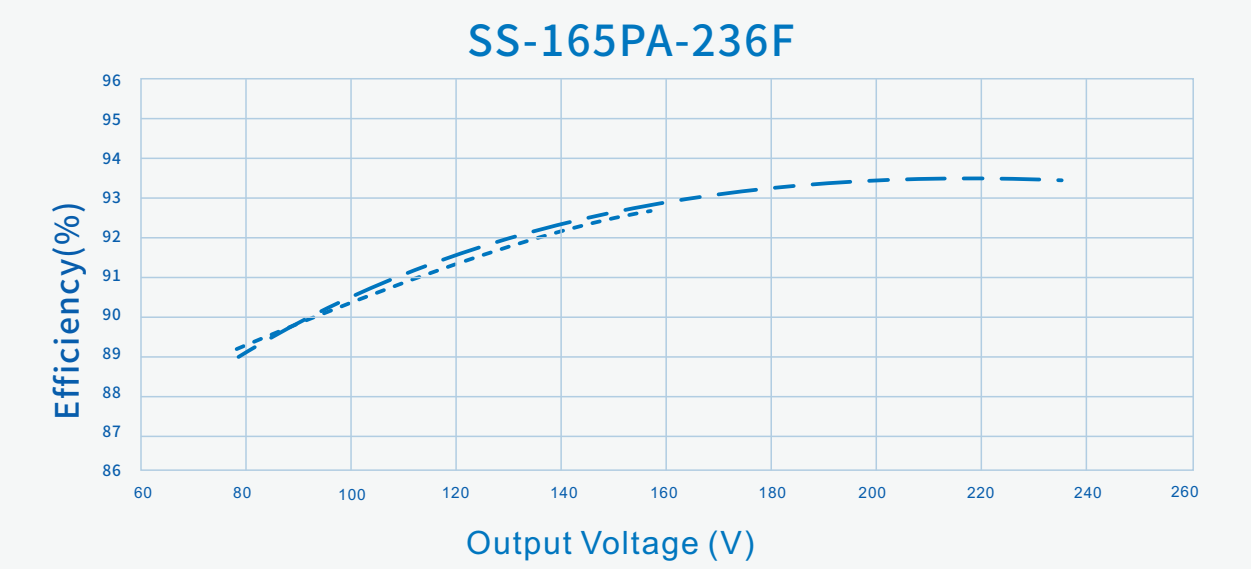
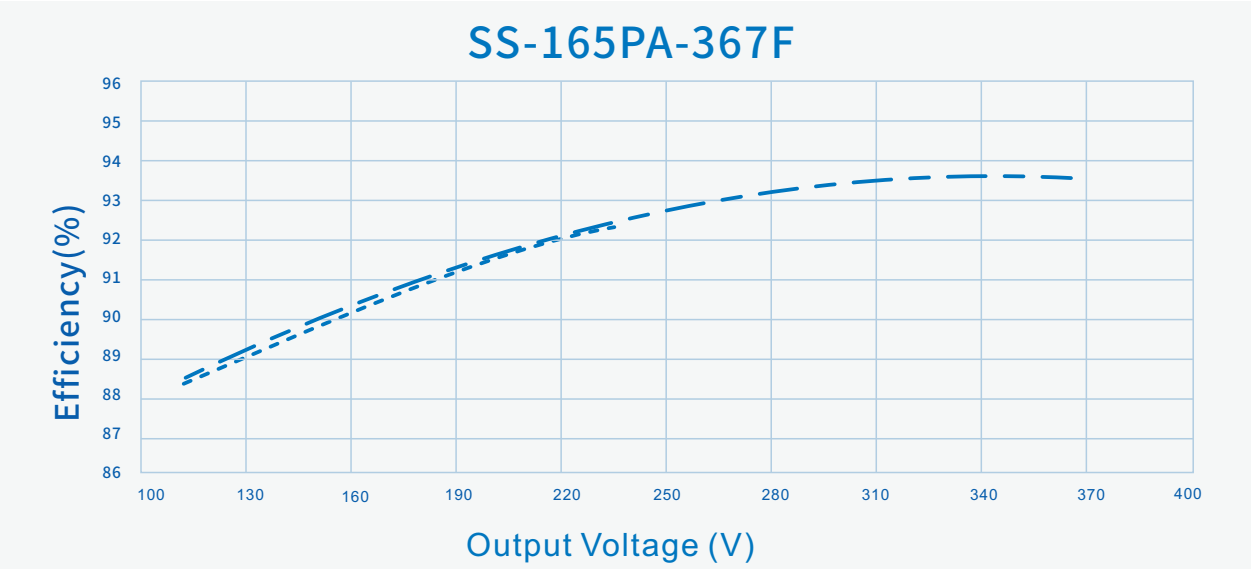
Performance Curves:

Efficiency Vs. O/P Voltage (Vin=230Vac)



------- Io=1050mA — — — Io=700mA

Efficiency Vs. O/P Voltage (Vin=230Vac)



------- Io=700mA — — — Io=450mA

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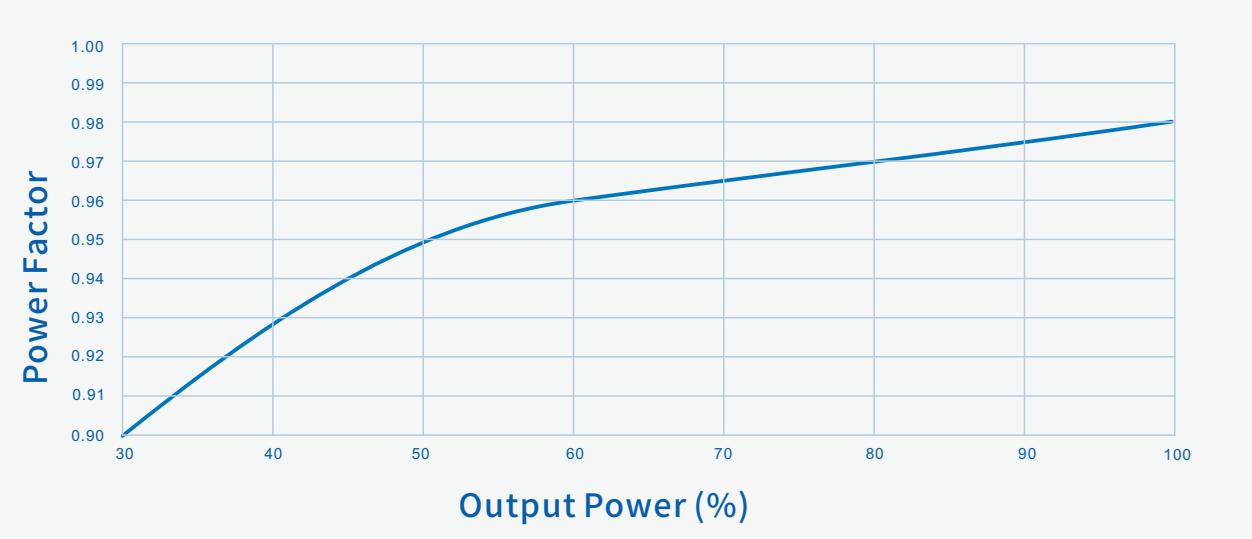
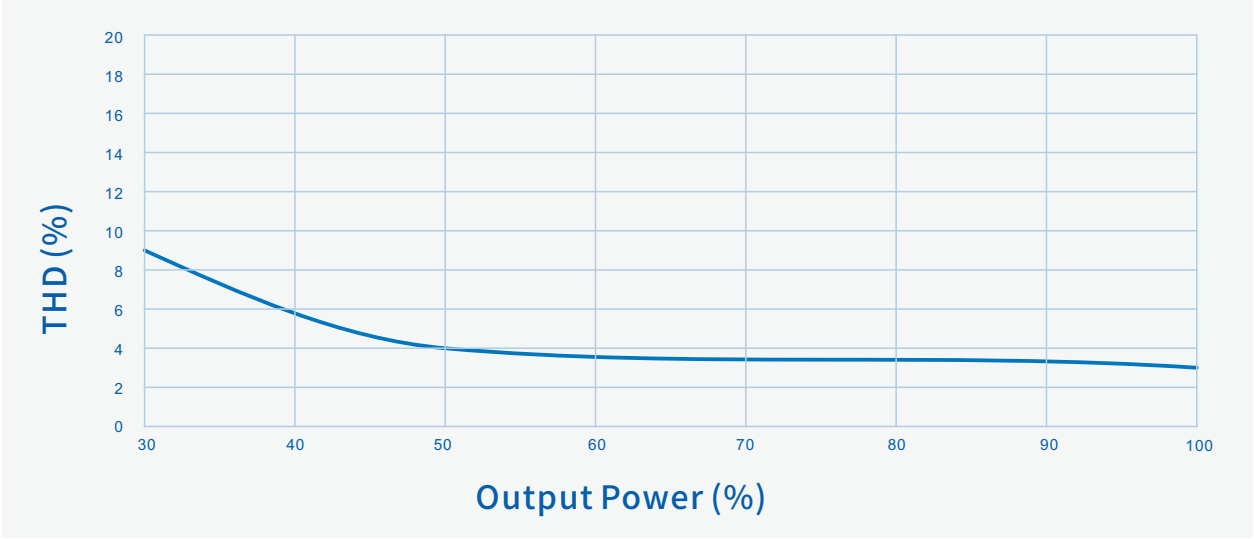
Performance Curves:

Power Factor Vs. O/P Power



Vin=230Vac

THD Vs. O/P Power



Vin=230Vac

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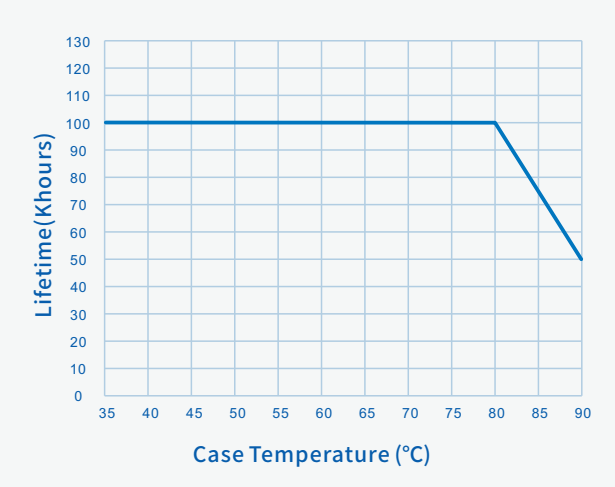
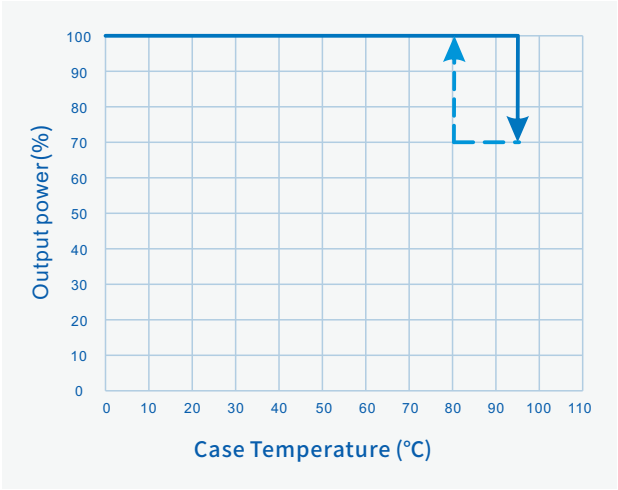
Performance Curves:

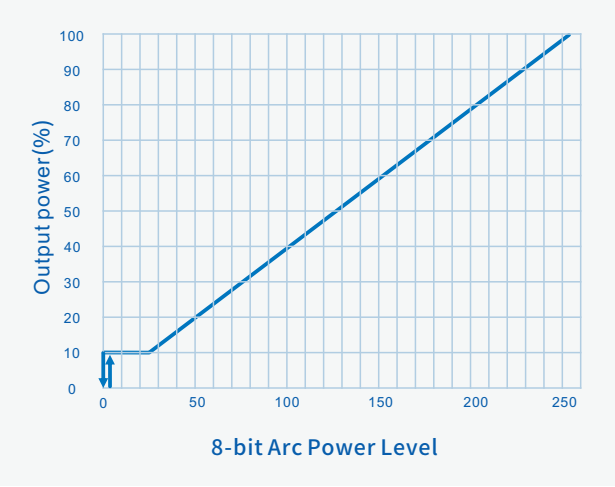
Lifetime Vs. Case Temperature



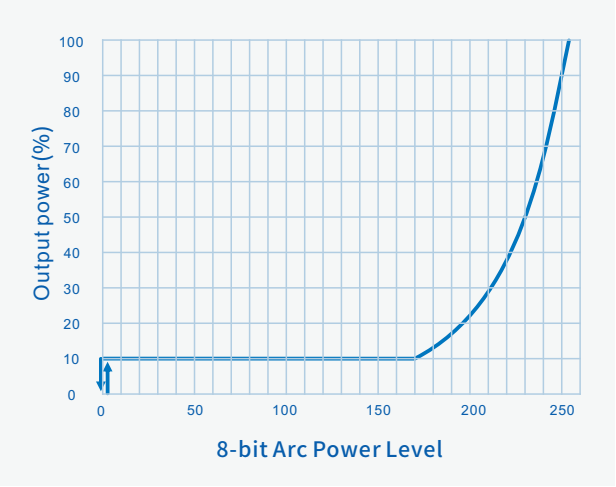
O/P power Vs. Case Temperature



Linear Dimming Curve



Logarithmic Dimming Curve



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NTC Functions:

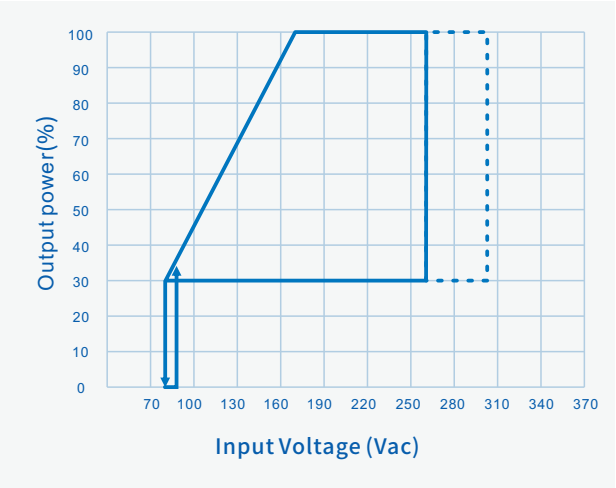
Parameter		Min.	Typ.	Max.	Remark
External Thermal Protection (NTC)	T1 (Start derating)		60℃		The default value can be set through software, When the temperature of the LED module is ⩾ T1, the output current gradually decreases
	T2 (Stop derating)		70℃		The default value can be set through software, when the temperature of the LED module is ⩾ T2, the output current remains unchanged
	T3 (off)		90℃		The default value can beset through software, When the temperature of the LED module is ⩾ T3, the power is turned off
	Protection Current Setting Range	10%Ioset	20%Ioset	100%Ioset	Default setting is 20%

Note: The recommended NTC is 10K-3950B/3435B

AC Dimming:

The default range of AC Dim is 160-264Vac. The range can be adjusted via the programming page. Also, the Start Input Voltage, Start Output Level, Stop Input Voltage and Stop Output Level can be set. There needs to be a minimum of 20V gap between Start and Stop Input Voltage settings when programming the driver.

There must be a minimum voltage gap of 10V from the Stop Input Voltage before the driver starts AC Dimming.



Notes:

1. In the solid line, the driver will operate normally.
2. In the dashed line, the driver will operate safely but not fulfill requirements.

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A3 Building,Gonghe Fourth Industrial Area, Shajing Street, Bao' an District, Shenzhen, China 518104
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Software OTP Function:

Software OTP is an optional feature, OTP can be set through the software page.

Timer Dimming:

Automatic conversion between DST and Standard Time.Traditional Timer Dimming, Self-Adapt-Midnight Timer, Self-Adapt-Percentage Timer. The time dimming percentage can be set by setting 8 curves.

Traditional timer: After power-on, it works according to the set timing curve (Increasing fade time allows for slow changes between different dimming levels, preventing sudden changes in brightness and causing dazzle)

Self Adapting-Midnight: Automatically save power-on times and use 2 valid timers to assume that the center point of the dimming curve is local midnight time.

Self Adapting-Percentage: Runs the initially set dimming curve according to an automatically calculated adaptive cycle time.

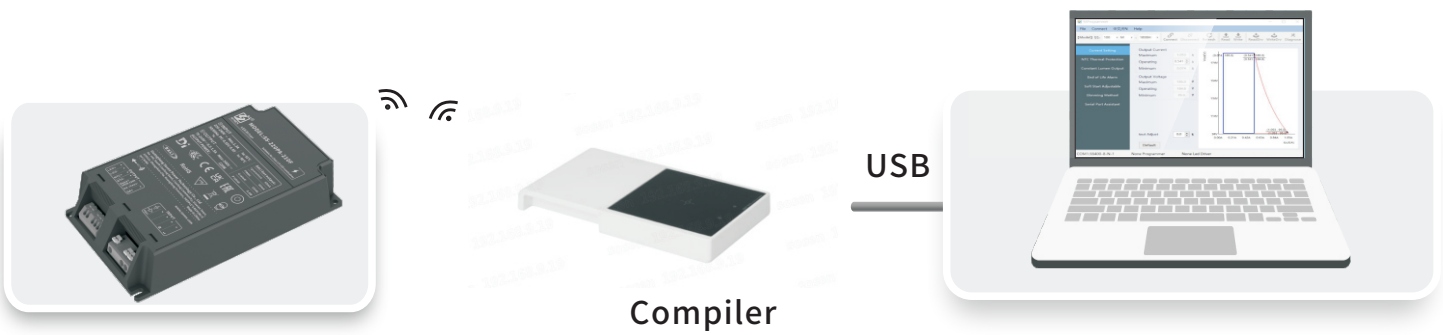
CLO Constant Lumen Output:

Light failure compensation function, in the Luminaire life cycle, by gradually increasing the output current, to achieve a constant output of LED luminous flux, the overall luminous effect remains unchanged.

ELA End-of-Life Alert:

By presetting a LED driver life time, such as 50KH, after the luminaire has accumulated 50KH of light-up time, every time the luminaire is powered on, it will blink 4 times to remind the user to replace the LED driver.

NFC Programming connection diagram:



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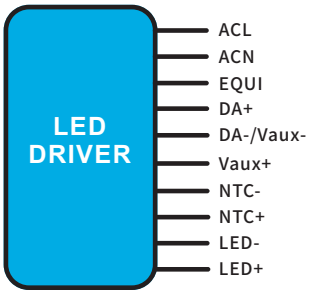
Mechanical Characteristics



AC Input Cable:

0.2-1.5mm²,16-24AWG, Solid/Stranded Wire
Strip length 8.5-9.5mm

DC O/P Cable:

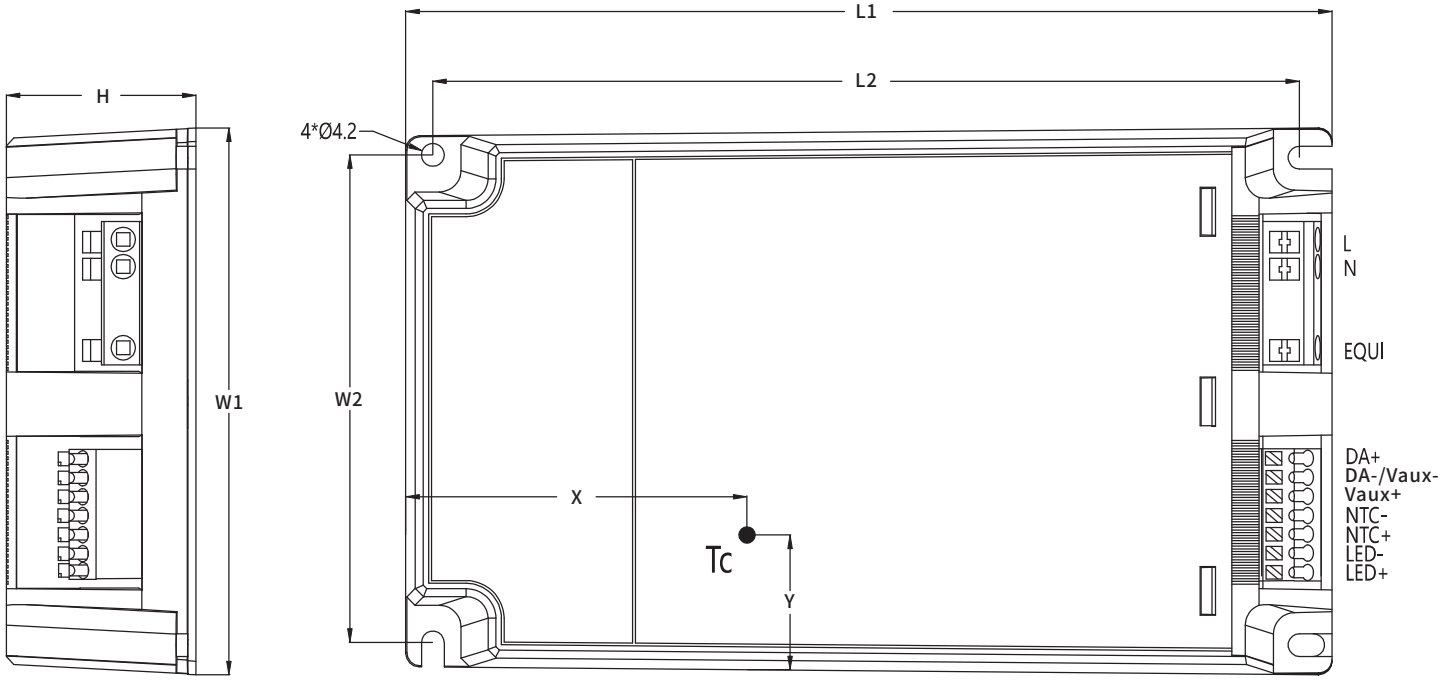
0.2-1.5mm²,16-24AWG, Solid/Stranded Wire
Strip length 8.5-9.5mm

DIM Cable:

0.2-1.5mm²,16-24AWG, Solid/Stranded Wire
Strip length 8.5-9.5mm

Name Description	Standard Code	mm(In.)
Case Length	L1	171(6.73)
Mounting Hole Length	L2	160(6.3)
Case Width	W1	101(3.98)
Mounting Hole Width	W2	90(3.54)
Case Height	H	36(1.42)
TC Point Position	X	63(2.48)
TC Point Position	Y	25(0.98)

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



SHENZHEN SOSEN ELECTRONICS CO.,LTD
A3 Building,Gonghe Fourth Industrial Area, Shajing Street, Bao' an District, Shenzhen, China 518104
86-755-29358800
info@info.com
86-755-29358816
www.szsosen.com

Package

- Outside carton dimension: L×W×H =445mm×225mm×145mm;
- 12PCS/Carton;
- Net weight/Piece: 0.79kg;Gross weight/Carton: 10.49kg;
- 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.

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Revision History

Version	Description of Update	Updated Date	Remark
V00	Original Release	2024/01/12	
V01	Update SafetyTestItems	2024/06/01	

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