

Features

- Ultra High Efficiency (Up to 91%)
- Ultra High Input Voltage (249~528Vac)
- Constant Voltage Output
- Input Surge Protection: 4kV line-line, 6kV line-earth
- All-Around Protection: SCP, OTP, OVP and Open Lamp
- Waterproof (IP67) and UL Dry / Damp / Wet Location
- SELV output
- TYPE HL, for use in a Class I, Division 2 hazardous (classified) location



Description

The *ESV-300SxxxST* series is a 300W, constant-voltage IP67 LED driver that operates from 249~528 Vac input with excellent power factor. It is created for many lighting applications including high bay, high mast, horticultural and roadway lights. The high efficiency of these drivers enables them to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against short circuit, over temperature, over voltage, and over current.

Models

| Output Voltage | Input Voltage Range | Output Current Range | Max. Output Power | Typical Efficiency (1) | Power Factor | | Model Number (2) |
|----------------|---------------------|----------------------|-------------------|------------------------|--------------|--------|------------------|
| | | | | | 277Vac | 480Vac | |
| 24 Vdc | 249~ 528 Vac | 0 ~ 12.5 A | 300 W | 89% | 0.95 | 0.90 | ESV-300S024ST |
| 28 Vdc | 249~ 528 Vac | 0 ~ 10.7 A | 300 W | 90% | 0.95 | 0.90 | ESV-300S028ST |
| 36 Vdc | 249~ 528 Vac | 0 ~ 8.33 A | 300 W | 90% | 0.95 | 0.90 | ESV-300S036ST |
| 42 Vdc | 249~ 528 Vac | 0 ~ 7.14 A | 300 W | 90% | 0.95 | 0.90 | ESV-300S042ST |
| 48 Vdc | 249~ 528 Vac | 0 ~ 6.25 A | 300 W | 90% | 0.95 | 0.90 | ESV-300S048ST |

Notes: (1) Measured at 25 °C, 100% load and 480 Vac input.

(2) SELV output

Input Specifications

| Parameter | Min. | Typ. | Max. | Notes |
|----------------------------------|-------|------|--------------------|--|
| Input Voltage | 249 V | - | 528 V | |
| Input Frequency | 47 Hz | - | 63 Hz | |
| Leakage Current | - | - | 0.75 mA | At 480Vac 60Hz input |
| Input AC Current | - | - | 1.4 A | Measured at 100% load and 277 Vac input. |
| | - | - | 0.8 A | Measured at 100% load and 480 Vac input. |
| Inrush Current | - | - | 135 A | At 480Vac input 25°C Cold start, Duration= 1.2 ms, 10%Ipk-10%Ipk |
| Inrush Current(I ² t) | - | - | 9 A ² s | |
| PF | 0.90 | - | - | Measured at 100% load and 277~480 Vac input. |

Output Specifications

| Parameter | Min. | Typ. | Max. | Notes | |
|---------------------------------------|-------|----------|-------------------|--|-----------------------|
| Output Voltage Tolerance | -2.5% | - | 2.5% | ESV-300S042ST | |
| | -3% | - | 3% | Other models except ESV-300S042ST | |
| Output Voltage Ripple (pk-pk) | - | - | 2% V _O | At 100% load condition | |
| Output Voltage Overshoot / Undershoot | - | - | 2% V _O | ESV-300S042ST | When power on and off |
| | - | - | 5% V _O | Other models except ESV-300S042ST | |
| Line Regulation | - | - | ±1.0% | | |
| Load Regulation | - | - | ±1.5% | | |
| Turn-on Delay Time | - | 1.0 s | 3.0 s | Measured at 100% load, 277Vac input | |
| | - | 1.0 s | 3.0 s | Measured at 100% load, 480Vac input | |
| Temperature Coefficient | - | 0.03%/°C | - | Case temperature = 0°C ~T _c max | |

Note: All specifications are typical at 25 °C unless otherwise stated.

Protection Functions

| Parameter | Min. | Typ. | Max. | Notes |
|-----------------------------|--|---------------------|--------------------|---|
| Over Current Protection | 110% I _O | 145% I _O | 180%I _O | Hiccup mode. The power supply shall be self-recovery when the fault condition is removed. |
| Over Temperature Protection | - | 110°C | - | Auto Recovery, returning to normal after over temperature is removed. |
| Short Circuit Protection | Hiccup and no damage shall occur when any output operating in a short circuit condition. | | | |

General Specifications

| Parameter | Min. | Typ. | Max. | Notes | | |
|---------------------------|---|---|---|---|--|---|
| Efficiency | V _O = 24 V V _O = 28 V V _O = 36 V V _O = 42 V V _O = 48 V | 89.0% 90.0% 90.0% 90.0% 90.0% | 90.0% 90.5% 91.0% 91.0% 91.0% | - - - - - | Measured at 100% load, 277Vac input, 25°C ambient temperature, after the unit is thermally stabilized. | |
| Efficiency | V _O = 24 V V _O = 28 V V _O = 36 V V _O = 42 V V _O = 48 V | 88.0% 89.0% 89.0% 89.0% 89.0% | 89.0% 90.0% 90.0% 90.0% 90.0% | - - - - - | | |
| No Load Power Dissipation | - | - | 3 W | | | |
| MTBF | - | 201,000 Hours | - | ESV-300S042ST | | Measured at 480Vac input, 80%Load and <25°C ambient temperature (MIL-HDBK-217F) |
| | - | 250,000 Hours | - | Other models except ESV-300S042ST | | |
| Lifetime | - | 79,000 Hours | - | Measured at 480Vac input, 80%load; Case temperature=70°C @ Tc point. See life time vs. Tc curve for the details | | |

General Specifications (Continued)

| Parameter | Min. | Typ. | Max. | Notes |
|---|---|--------|--------|--|
| Operating Case Temperature for Safety Tc_s | -40°C | - | +83°C | |
| Operating Case Temperature for Warranty Tc_w | -40°C | - | +75°C | |
| Storage Temperature | -40 °C | - | +85 °C | Humidity: 5% RH to 100% RH |
| Dimensions Inches (L x W x H) Millimeters (L x W x H) | 8.82 x 3.70 x 1.71 224 x 93.9 x 43.5 | | | With mounting ear 9.88 x 3.70 x 1.71 251 x 93.9 x 43.5 |
| Net Weight | | 1710 g | | |

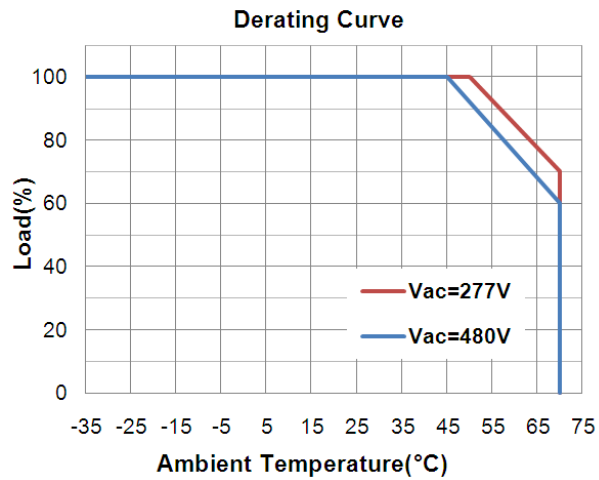
Note: All specifications are typical at 25 °C unless otherwise stated.

Safety & EMC Compliance

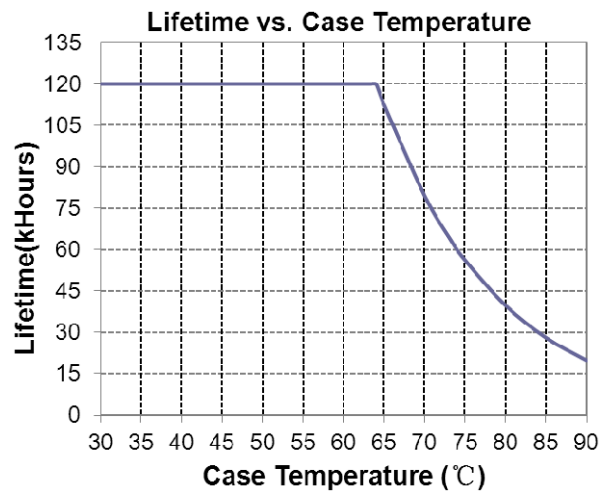
| Safety Category | Standard |
|---------------------------|---|
| UL/CUL | UL 8750, CAN/CSA-C22.2 No. 250.13 |
| CE | EN61347-1, EN61347-2-13 |
| EMI Standards | Notes |
| EN 55015 ⁽¹⁾ | Conducted emission Test & Radiated emission Test |
| EN 61000-3-2 | Harmonic current emissions |
| EN 61000-3-3 | Voltage fluctuations & flicker |
| FCC Part15 ⁽¹⁾ | ANSI C63.4 Class B This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired operation. |
| EMS Standards | Notes |
| EN 61000-4-2 | Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge |
| EN 61000-4-3 | Radio-Frequency Electromagnetic Field Susceptibility Test-RS |
| EN 61000-4-4 | Electrical Fast Transient / Burst-EFT |
| EN 61000-4-5 | Surge Immunity Test: AC Power Line: line to line 4 kV, line to earth 6 kV |
| EN 61000-4-6 | Conducted Radio Frequency Disturbances Test-CS |
| EN 61000-4-8 | Power Frequency Magnetic Field Test |
| EN 61000-4-11 | Voltage Dips |
| EN 61547 | Electromagnetic Immunity Requirements Applies To Lighting Equipment |

Note: (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

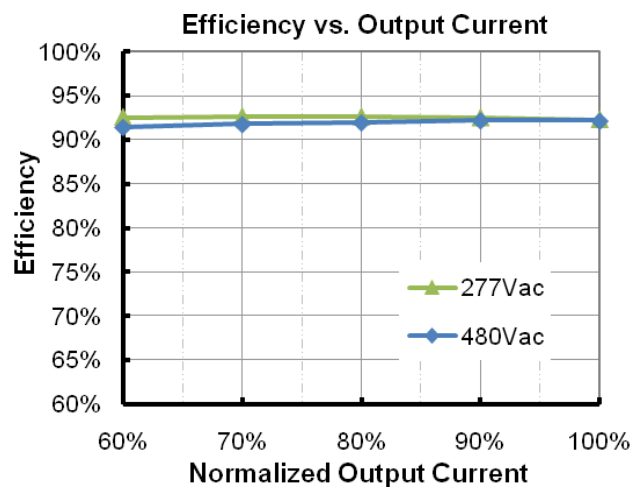
Derating Curve



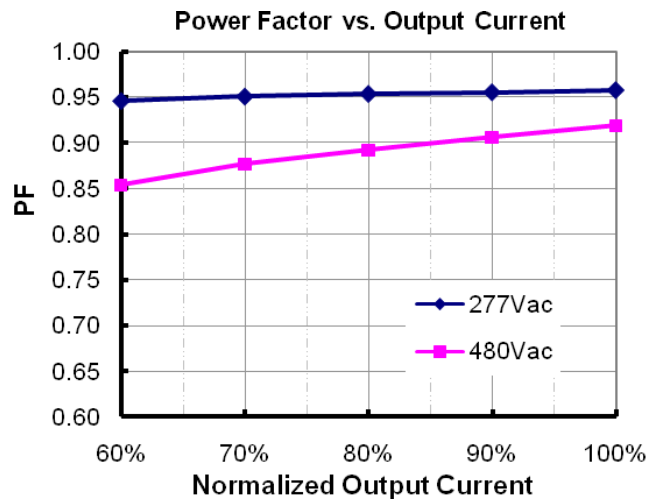
Lifetime vs. Case Temperature Curve



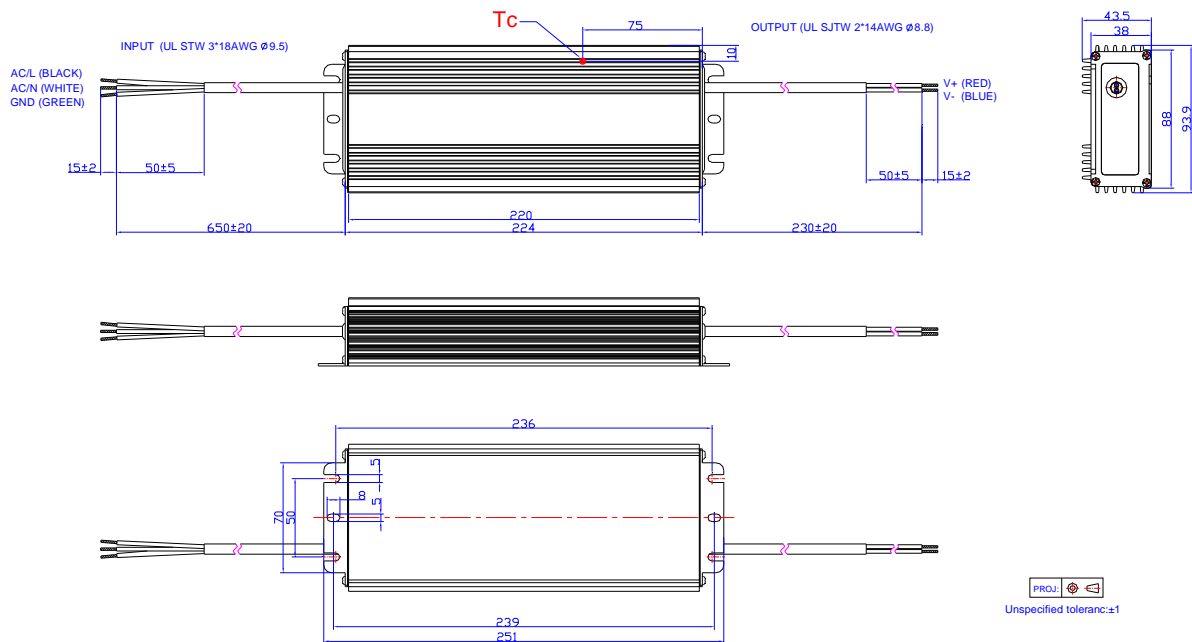
Efficiency vs. Load (24V Model)



Power Factor Characteristics



Mechanical Outline



RoHS Compliance

Our products comply with the European Directive 2011/65/EC, calling for the elimination of lead and other hazardous substances from electronic products.

Revision History

| Change Date | Rev. | Description of Change | | |
|-------------|------|--|---------------------------------------|---------------------------------------|
| | | Item | From | To |
| 2011-06-22 | A | Datasheet Released | | |
| 2011-08-05 | B | Output Specifications-Turn-on Delay Time | 2 s | 3 s |
| 2011-09-22 | C | UL,CE,FCC | / | Added |
| 2011-10-12 | D | PF,EFF Curve | / | Added |
| 2012-06-06 | E | Life Time Curve | / | Added |
| | | Notes of life time | / | Updated |
| | | EN61000-4-5 | line to line 2 kV, line to earth 4 kV | line to line 4 kV, line to earth 6 kV |
| 2012-07-17 | F | Max Case Temperature | / | Updated |
| 2012-08-02 | G | Safety Details | / | Updated |
| | | Inrush Current | 60 A | 135 A |
| 2012-09-28 | H | Inrush Current(I2t) | / | Added |
| | | Min PF | / | Added |
| | | Temperature coefficient | / | Added |
| | | MTBF & Life time Typical | / | Added |
| | | Life time curve | / | Added |
| 2012-12-27 | I | Mechanical Outline | / | Updated |
| | | Dimensions-height | 44.5mm | 43.5mm |
| 2013-03-25 | J | Efficiency | / | 1% lower |
| | | Output Voltage Overshoot/ Undershoot | 2%Vo | 5%Vo |
| | | Mechanical Outline | / | Updated |
| 2013-05-31 | K | OTP | Latch mode | Auto recovery mode |
| 2016-01-25 | L | Format | / | Updated |
| | | Features | / | Updated |
| | | Description | / | Added |
| | | Models | ESV-300S042ST | Added |
| | | Output Specifications | Output Voltage Tolerance | Updated |
| | | Output Specifications | Output Voltage Overshoot / Undershoot | Updated |
| | | General Specifications | MTBF | Updated |
| | | General Specifications | Lifetime | Updated |
| | | General Specifications | Net Weight | Updated |
| | | Lifetime vs. Case Temperature Curve | / | Updated |

Revision History (Continued)

| Change Date | Rev. | Description of Change | | |
|-------------|------|------------------------------|---------------------|---------|
| | | Item | From | To |
| 2016-01-25 | L | Mechanical Outline | / | Updated |
| 2017-06-08 | M | Features | / | Updated |
| | | Description | / | Updated |
| | | Models | SELV output | Added |
| | | Temperature Coefficient | / | Updated |
| | | General specifications | Storage Temperature | Added |
| | | General specifications | With mounting ear | Added |
| | | Environmental Specifications | / | Deleted |
| | | Safety & EMC Compliance | / | Updated |
| | | Mechanical Outline | / | Updated |
| 2019-01-04 | N | Description | / | Updated |
| | | General Specifications | Net Weight | Updated |