

## Features

- Ultra High Efficiency (Up to 93.5%)
- Full Power at Wide Output Current Range (Constant Power)
- 0-10V/10V PWM Dimmable
- Input Surge Protection: 6kV line-line, 10kV line-earth
- All-Around Protection: OVP, SCP, OTP
- Waterproof (IP67) and UL Dry / Damp / Wet Location
- SELV Output
- TYPE HL, for use in a Class I, Division 2 hazardous (Classified) location
- 5 Years Warranty



## Description

The EUK-320SxxxDT series is a 320W, constant-current, programmable IP67 LED driver that operates from 90-305 Vac input with excellent power factor. It is created for many lighting applications including high bay, high mast, aquaculture and sport. The high efficiency of these drivers and compact metal case enables them to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against input surge, output over voltage, short circuit, and over temperature.

## Models

| Adjustable Output Current Range | Full-Power Current Range (1) | Default Output Current | Input Voltage Range(2)     | Output Voltage Range | Max. Output Power | Typical Efficiency (3) | Power Factor |        | Model Number                 |
|---------------------------------|------------------------------|------------------------|----------------------------|----------------------|-------------------|------------------------|--------------|--------|------------------------------|
|                                 |                              |                        |                            |                      |                   |                        | 120Vac       | 220Vac |                              |
| 105-1500mA                      | 1050-1500mA                  | 1400 mA                | 90~305 Vac/<br>127~300 Vdc | 107~305Vdc           | 320 W             | 93.5%                  | 0.99         | 0.96   | EUK-320S150DT                |
| 154-2200mA                      | 1540-2200mA                  | 2100 mA                | 90~305 Vac/<br>127~300 Vdc | 73~208Vdc            | 320 W             | 93.5%                  | 0.99         | 0.96   | EUK-320S220DT                |
| 224-3200mA                      | 2240-3200mA                  | 2800 mA                | 90~305 Vac/<br>127~300 Vdc | 50~143Vdc            | 320 W             | 92.5%                  | 0.99         | 0.96   | EUK-320S320DT                |
| 322-4600mA                      | 3220-4600mA                  | 4200 mA                | 90~305 Vac/<br>127~300 Vdc | 35~100Vdc            | 320 W             | 92.5%                  | 0.99         | 0.96   | EUK-320S460DT <sup>(4)</sup> |
| 469-6700mA                      | 4690-6700mA                  | 6700 mA                | 90~305 Vac/<br>127~300 Vdc | 24 ~ 68Vdc           | 320 W             | 92.5%                  | 0.99         | 0.96   | EUK-320S670DT <sup>(4)</sup> |

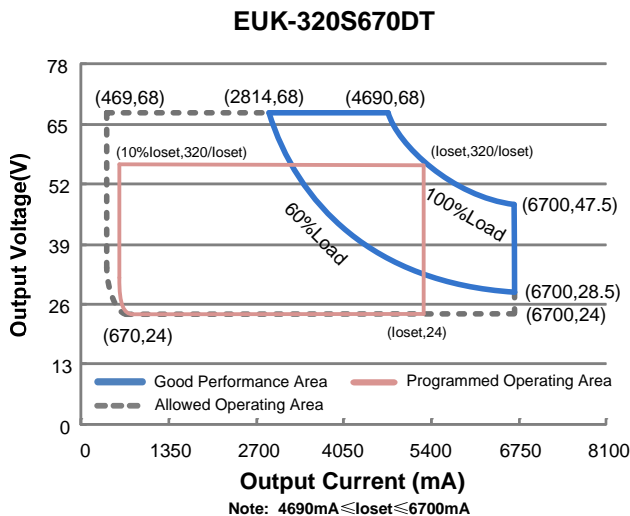
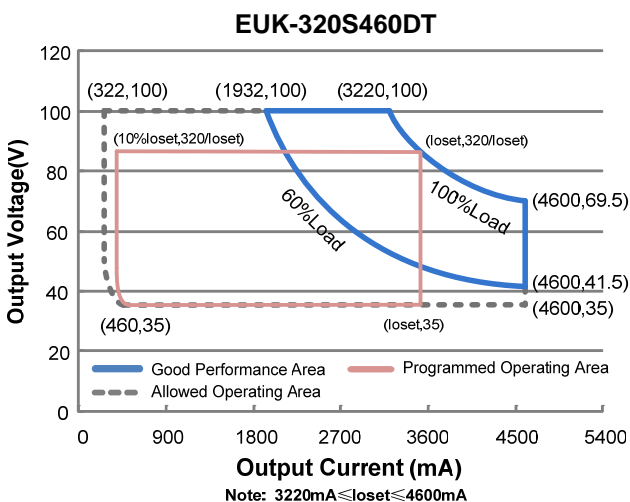
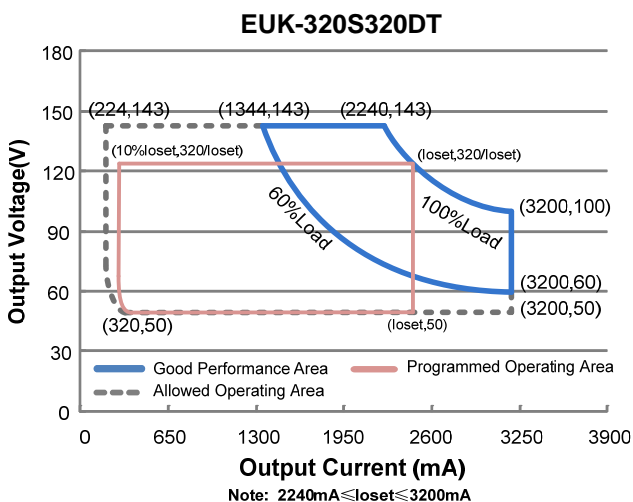
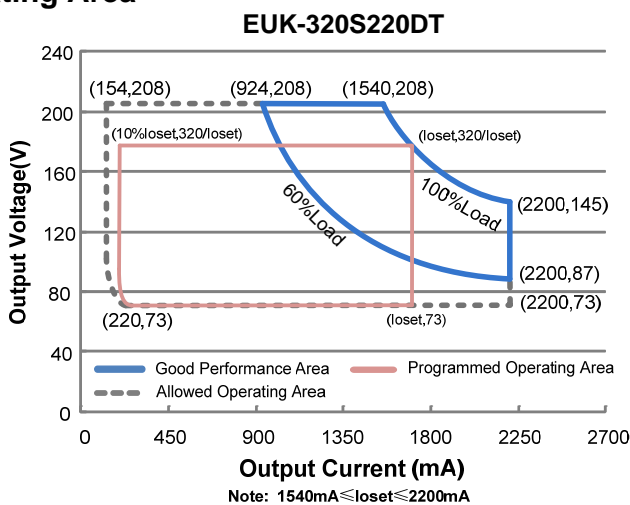
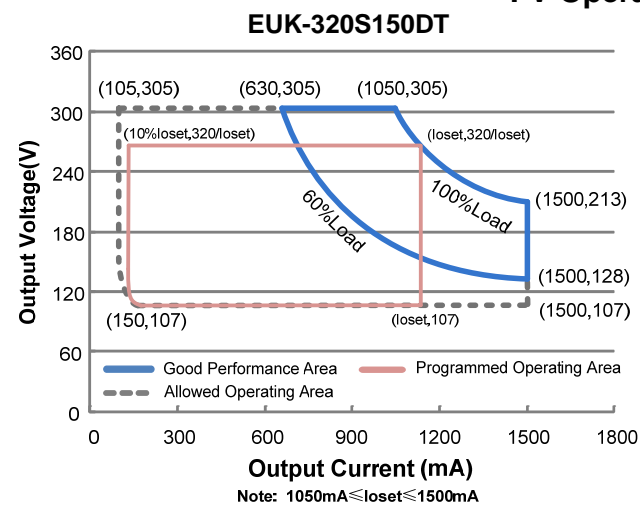
**Notes:** (1) Output current range with constant power at 320W

(2) Certified input voltage range: UL, FCC 100-277Vac or 127-300Vdc; otherwise: 100-240Vac or 127-250Vdc.

(3) Measured at 100% load and 220Vac input (see below "General Specifications" for details).

(4) SELV Output.

## I-V Operating Area



## Input Specifications

| Parameter                        | Min.   | Typ. | Max.                  | Notes   |
|----------------------------------|--------|------|-----------------------|---|
| Input Voltage                    | 90 Vac | -    | 305 Vac               | 127~300 Vdc   |
| Input Frequency                  | 47 Hz  | -    | 63 Hz                 |   |
| Leakage Current                  | -      | -    | 0.75 MIU              | UL8750; 277Vac/ 60Hz  |
|                                  | -      | -    | 0.70 mA               | IEC60598-1; 240Vac/ 60Hz,   |
| Input AC Current                 | -      | -    | 3.20 A                | Measured at 100% load and 120 Vac input.  |
|                                  | -      | -    | 1.70 A                | Measured at 100% load and 220 Vac input.  |
| Inrush Current(I <sup>2</sup> t) | -      | -    | 1.30 A <sup>2</sup> s | At 220Vac input, 25°C cold start, duration=3.92 ms, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details. |
| PF                               | 0.9    | -    | -                     | At 100-277Vac, 50-60Hz, 60%-100%Load (192-320W)   |
| THD                              | -      | -    | 20%                   |   |
| THD                              | -      | -    | 10%                   | At 220-240Vac, 50-60Hz, 75%-100% Load (240-320W)  |

## Output Specifications

| Parameter  | Min.     | Typ.   | Max.    | Notes   |
|--|----------|--------|---------|---|
| Output Current Tolerance                         | -5%loset | -      | 5%loset | At 100% load condition  |
| Output Current Setting(loset) Range              |          |        |         |   |
| EUK-320S150DT                                    | 105 mA   | -      | 1500 mA |   |
| EUK-320S220DT                                    | 154 mA   | -      | 2200 mA |   |
| EUK-320S320DT                                    | 224 mA   | -      | 3200 mA |   |
| EUK-320S460DT                                    | 322 mA   | -      | 4600 mA |   |
| EUK-320S670DT                                    | 469 mA   | -      | 6700 mA |   |
| Output Current Setting Range with Constant Power |          |        |         |   |
| EUK-320S150DT                                    | 1050 mA  | -      | 1500 mA |   |
| EUK-320S220DT                                    | 1540 mA  | -      | 2200 mA |   |
| EUK-320S320DT                                    | 2240 mA  | -      | 3200 mA |   |
| EUK-320S460DT                                    | 3220 mA  | -      | 4600 mA |   |
| EUK-320S670DT                                    | 4690 mA  | -      | 6700 mA |   |
| Total Output Current Ripple (pk-pk)              | -        | 5%lmax | 10%lmax | At 100% load condition. 20 MHz BW   |
| Output Current Ripple at < 200 Hz (pk-pk)        | -        | 2%lmax | -       | At 100% load condition. Only this component of ripple is associated with visible flicker. |
| Startup Overshoot Current                        | -        | -      | 10%lmax | At 100% load condition  |
| No Load Output Voltage                           |          |        |         |   |
| EUK-320S150DT                                    | -        | -      | 350 V   |   |
| EUK-320S220DT                                    | -        | -      | 250 V   |   |
| EUK-320S320DT                                    | -        | -      | 170 V   |   |
| EUK-320S460DT                                    | -        | -      | 120 V   |   |
| EUK-320S670DT                                    | -        | -      | 85 V    |   |
| Line Regulation                                  | -        | -      | ±0.5%   | Measured at 100% load   |

## Output Specifications (Continued)

| Parameter                                     | Min. | Typ.     | Max.  | Notes                                      |
|---|------|----------|-------|--|
| Load Regulation                               | -    | -        | ±1.5% |  |
| Turn-on Delay Time                            | -    | -        | 1.0 s | Measured at 120Vac input, 60%-100% Load    |
|   | -    | -        | 0.5 s | Measured at 220Vac input, 60%-100% Load    |
| Temperature Coefficient of I <sub>o</sub> set | -    | 0.03%/°C | -     | Case temperature = 0°C ~T <sub>c</sub> max |

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

## General Specifications

| Parameter                                     | Min.   | Typ.   | Max. | Notes  |
|---|--------|--------|------|--|
| Efficiency at 120 Vac input:<br>EUK-320S150DT |        |        |      | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| I <sub>o</sub> =1050mA                        | 89.50% | 91.50% | -    |  |
| I <sub>o</sub> =1500mA                        | 89.00% | 91.00% | -    |  |
| EUK-320S220DT                                 |        |        |      |  |
| I <sub>o</sub> =1540mA                        | 89.00% | 91.00% | -    |  |
| I <sub>o</sub> =2200mA                        | 89.00% | 91.00% | -    |  |
| EUK-320S320DT                                 |        |        |      |  |
| I <sub>o</sub> =2240mA                        | 88.00% | 90.00% | -    |  |
| I <sub>o</sub> =3200mA                        | 88.00% | 90.00% | -    |  |
| EUK-320S460DT                                 |        |        |      |  |
| I <sub>o</sub> =3220mA                        | 88.50% | 90.50% | -    |  |
| I <sub>o</sub> =4600mA                        | 88.00% | 90.00% | -    |  |
| EUK-320S670DT                                 |        |        |      |  |
| I <sub>o</sub> =4690mA                        | 88.00% | 90.00% | -    |  |
| I <sub>o</sub> =6700mA                        | 87.00% | 89.00% | -    |  |
| Efficiency at 220 Vac input:<br>EUK-320S150DT |        |        |      | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| I <sub>o</sub> =1050mA                        | 91.50% | 93.50% | -    |  |
| I <sub>o</sub> =1500mA                        | 91.50% | 93.50% | -    |  |
| EUK-320S220DT                                 |        |        |      |  |
| I <sub>o</sub> =1540mA                        | 91.50% | 93.50% | -    |  |
| I <sub>o</sub> =2200mA                        | 91.50% | 93.50% | -    |  |
| EUK-320S320DT                                 |        |        |      |  |
| I <sub>o</sub> =2240mA                        | 90.50% | 92.50% | -    |  |
| I <sub>o</sub> =3200mA                        | 90.00% | 92.00% | -    |  |
| EUK-320S460DT                                 |        |        |      |  |
| I <sub>o</sub> =3220mA                        | 90.50% | 92.50% | -    |  |
| I <sub>o</sub> =4600mA                        | 90.00% | 92.00% | -    |  |
| EUK-320S670DT                                 |        |        |      |  |
| I <sub>o</sub> =4690mA                        | 90.50% | 92.50% | -    |  |
| I <sub>o</sub> =6700mA                        | 89.50% | 91.50% | -    |  |

## General Specifications (Continued)

| Parameter   | Min.   | Typ.   | Max.   | Notes  |
|---|--|--|--|--|
| Efficiency at 277 Vac input:<br>EUK-320S150DT<br>I <sub>o</sub> =1050mA<br>I <sub>o</sub> =1500mA<br>EUK-320S220DT<br>I <sub>o</sub> =1540mA<br>I <sub>o</sub> =2200mA<br>EUK-320S320DT<br>I <sub>o</sub> =2240mA<br>I <sub>o</sub> =3200mA<br>EUK-320S460DT<br>I <sub>o</sub> =3220mA<br>I <sub>o</sub> =4600mA<br>EUK-320S670DT<br>I <sub>o</sub> =4690mA<br>I <sub>o</sub> =6700mA | 92.00%<br>91.50%<br>92.00%<br>91.50%<br>90.50%<br>90.50%<br>90.50%<br>90.50%<br>91.00%<br>90.00% | 94.00%<br>93.50%<br>94.00%<br>93.50%<br>92.50%<br>92.50%<br>92.50%<br>92.50%<br>93.00%<br>92.00% | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- | Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.) |
| MTBF  | -  | 282,000 Hours  | -  | Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)   |
| Lifetime  | -  | 86,000 Hours   | -  | Measured at 220Vac input, 80%Load and 70°C case temperature; See lifetime vs. T <sub>c</sub> curve for the details                               |
| Operating Case Temperature for Safety T <sub>c_s</sub>  | -40°C  | -  | +85°C  |  |
| Operating Case Temperature for Warranty T <sub>c_w</sub>  | -40°C  | -  | +75°C  | Case temperature for 5 years warranty  |
| Storage Temperature   | -40°C  | -  | +85°C  | Humidity: 5%RH to 100%RH   |
| Dimensions<br>Inches (L x W x H)<br>Millimeters (L x W x H)   | 8.82 x 3.15 x 1.57<br>224 x 80 x 39.7  |  |  | With mounting ear<br>9.89 x 3.15 x 1.57<br>251 x 80 x 39.7   |
| Net Weight  | -  | 1530 g   | -  |  |

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

## Dimming Specifications

| Parameter  | Min.   | Typ.   | Max.   | Notes                      |
|--|--------|--------|--------|----------------------------|
| Absolute Maximum Voltage on the V <sub>dim</sub> (+) Pin | -20 V  | -      | 20 V   |                            |
| Source Current on V <sub>dim</sub> (+)Pin                | 200 uA | 300 uA | 450 uA | V <sub>dim</sub> (+) = 0 V |
| Recommended Dimming Range for 0-10V                      | 0 V    | -      | 10 V   |                            |
| PWM_in High Level  | -      | 10V    | -      |                            |
| PWM_in Low Level   | -      | 0V     | -      |                            |
| PWM_in Frequency Range                                   | 200 Hz | -      | 2 KHz  |                            |
| PWM_in Duty Cycle  | 0%     | -      | 100%   |                            |

## Dimming Specifications (Continued)

| Parameter            |   | Min.   | Typ. | Max.  | Notes   |
|----------------------|---|--|------|-------|---|
| Dimming Output Range | EUK-320S150DT<br>EUK-320S220DT<br>EUK-320S320DT<br>EUK-320S460DT<br>EUK-320S670DT | 10%loset                                       | -    | loset | 1050 mA ≤ loset ≤ 1500 mA<br>1540 mA ≤ loset ≤ 2200 mA<br>2240 mA ≤ loset ≤ 3200 mA<br>3220 mA ≤ loset ≤ 4600 mA<br>4690 mA ≤ loset ≤ 6700 mA |
|                      | EUK-320S150DT<br>EUK-320S220DT<br>EUK-320S320DT<br>EUK-320S460DT<br>EUK-320S670DT | 105 mA<br>154 mA<br>224 mA<br>322 mA<br>469 mA | -    | loset | 105 mA ≤ loset < 1050 mA<br>154 mA ≤ loset < 1540 mA<br>224 mA ≤ loset < 2240 mA<br>322 mA ≤ loset < 3220 mA<br>469 mA ≤ loset < 4690 mA      |

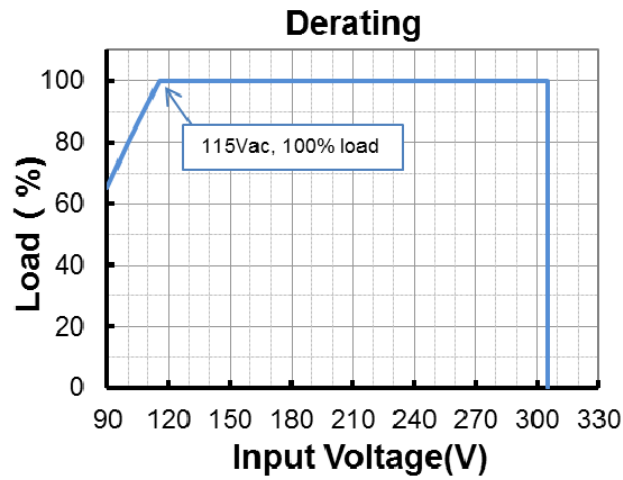
## Safety & EMC Compliance

| Safety Category            | Standard  |
|----------------------------|---|
| UL/CUL                     | UL8750,CAN/CSA-C22.2 No. 250.13   |
| CE                         | EN 61347-1, EN61347-2-13  |
| EMI Standards              | Notes   |
| EN 55015 <sup>(1)</sup>    | Conducted emission Test & Radiated emission Test  |
| EN 61000-3-2               | Harmonic current emissions  |
| EN 61000-3-3               | Voltage fluctuations & flicker  |
| FCC Part 15 <sup>(1)</sup> | 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 6 kV, line to earth 10 kV <sup>(2)</sup>   |
| 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   |

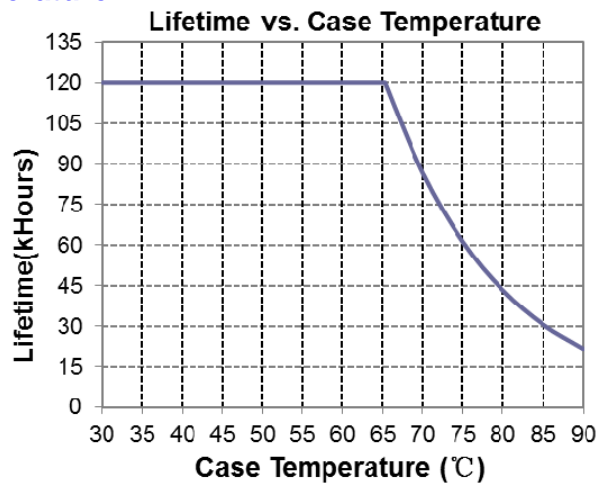
**Note:** (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

(2) To perform electric strength (hi-pot) testing, the “GDT ground disconnect” (nut and metal lock sheet) on the driver end-cap should be removed temporarily to prevent the internal gas discharge tube from conducting (as allowed by IEC 60598-1 Clause 10.2). After testing is completed, these items must be reinstalled to restore line-to-earth surge protection and secure the end cap.

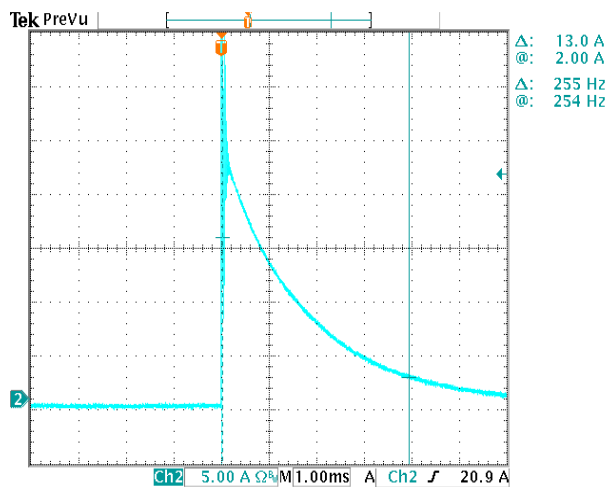
## Derating



## Lifetime vs. Case Temperature

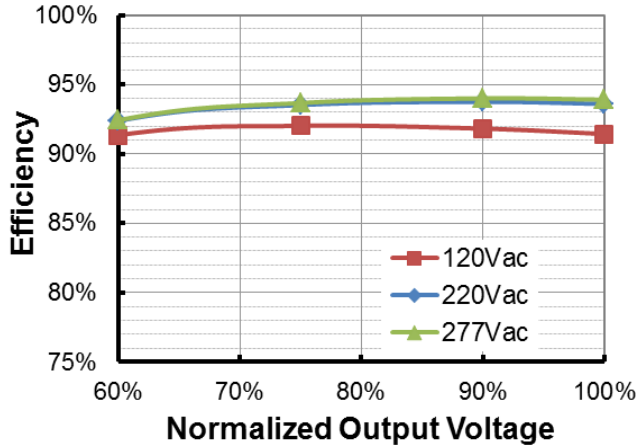


## Inrush Current Waveform

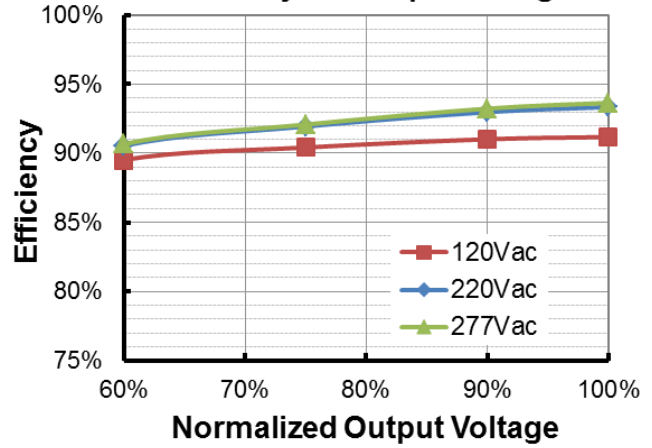


## Efficiency vs. Load

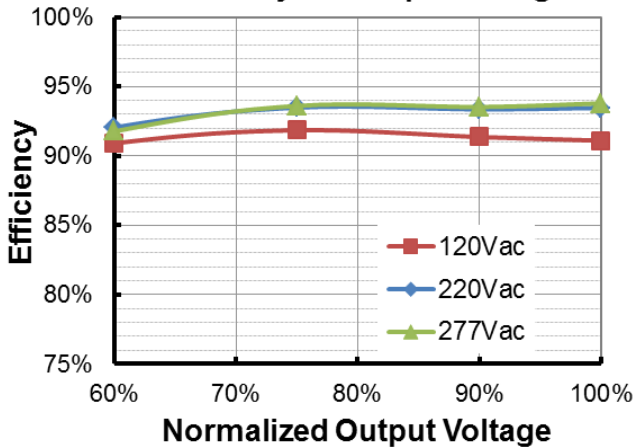
*EUK-320S150DT* ( $I_o=1050mA$ )  
Efficiency vs. Output Voltage



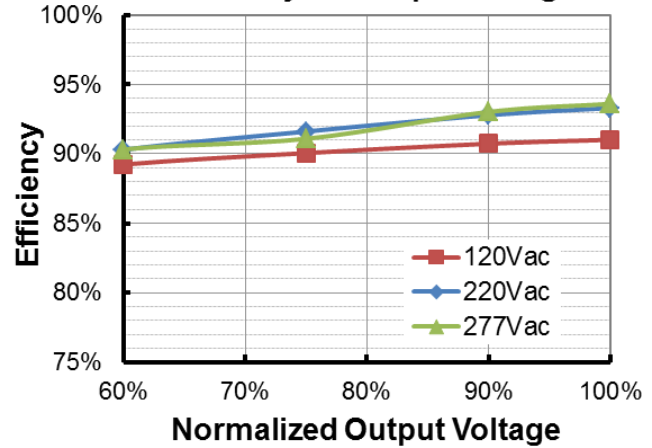
*EUK-320S150DT* ( $I_o=1500mA$ )  
Efficiency vs. Output Voltage



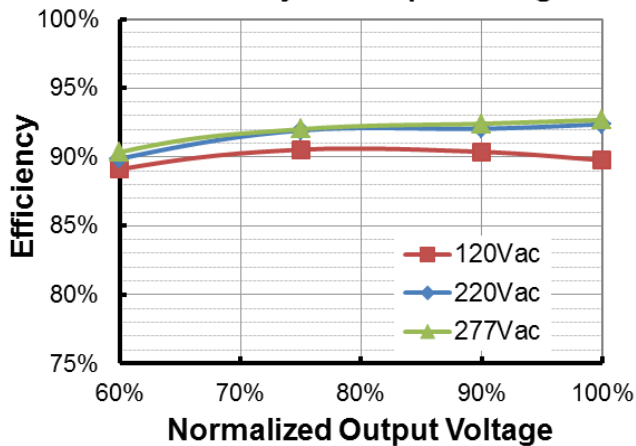
*EUK-320S220DT* ( $I_o=1540mA$ )  
Efficiency vs. Output Voltage



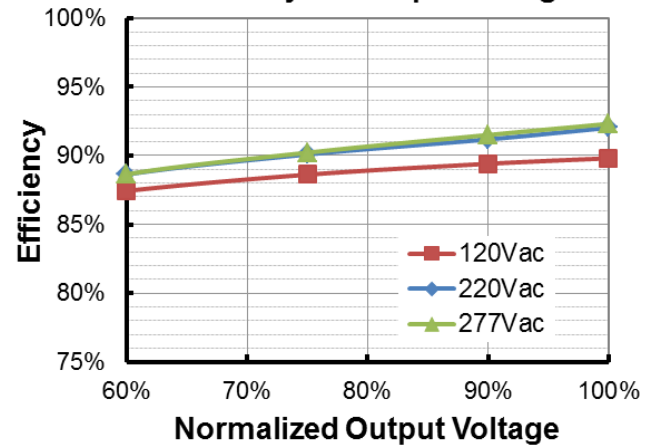
*EUK-320S220DT* ( $I_o=2200mA$ )  
Efficiency vs. Output Voltage



*EUK-320S320DT* ( $I_o=2240mA$ )  
Efficiency vs. Output Voltage

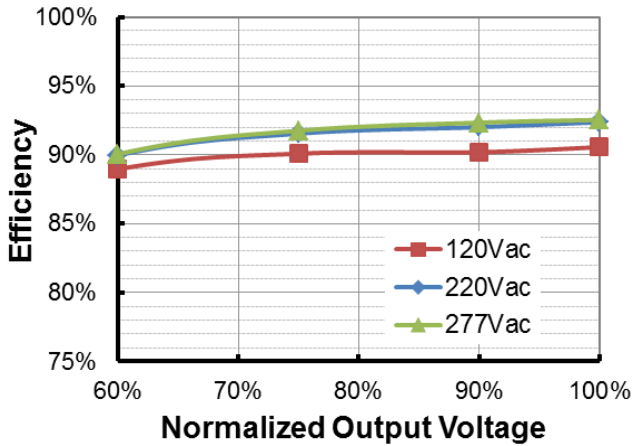


*EUK-320S320DT* ( $I_o=3200mA$ )  
Efficiency vs. Output Voltage

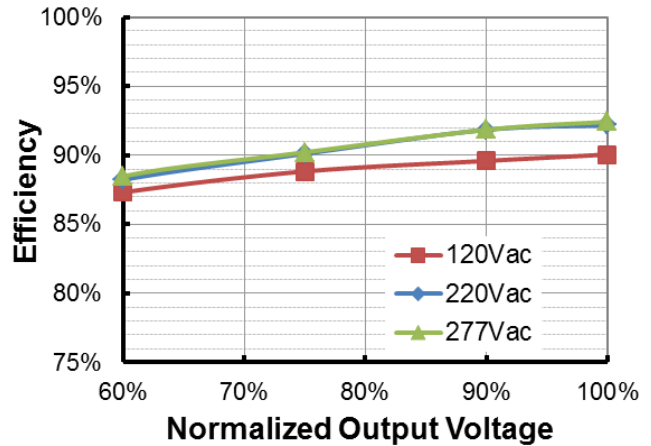




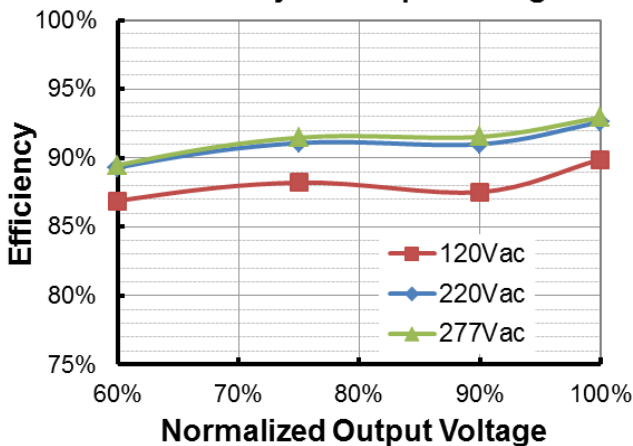
*EUK-320S460DT (Io=3220mA)*  
**Efficiency vs. Output Voltage**



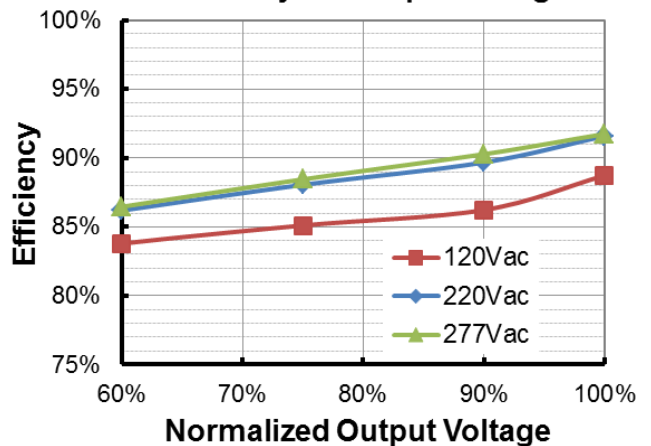
*EUK-320S460DT (Io=4600mA)*  
**Efficiency vs. Output Voltage**



*EUK-320S670DT (Io=4690mA)*  
**Efficiency vs. Output Voltage**

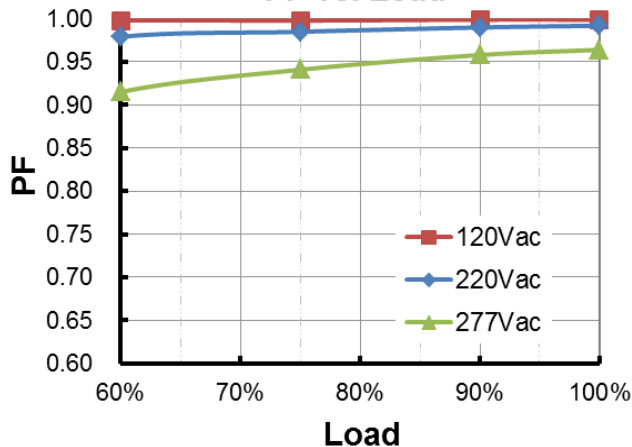


*EUK-320S670DT (Io=6700mA)*  
**Efficiency vs. Output Voltage**

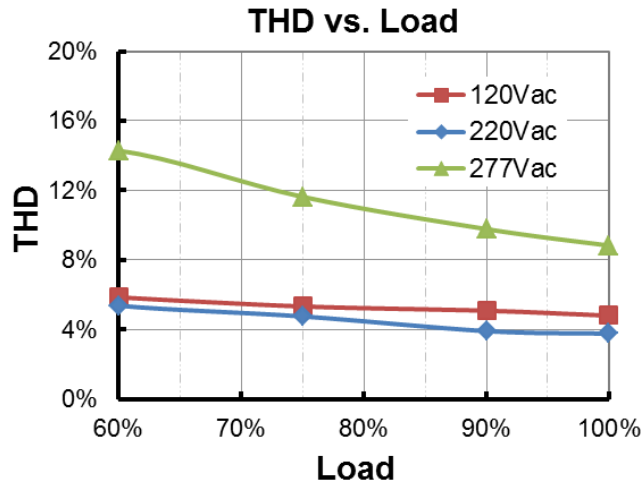


## Power Factor

**PF vs. Load**



## Total Harmonic Distortion



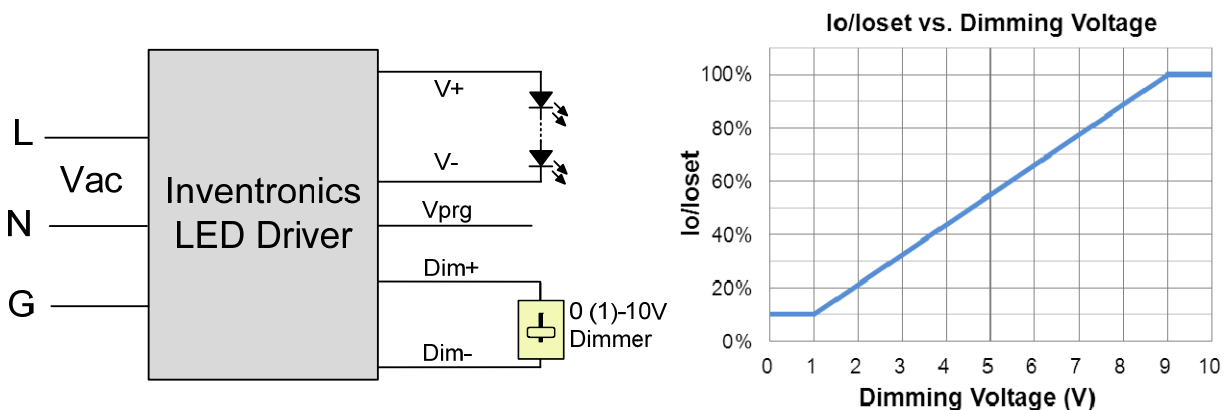
## Protection Functions

| Parameter                   | Notes  |
|-----------------------------|--|
| Over Temperature Protection | Decreases output current, returning to normal after over temperature is removed.   |
| Short Circuit Protection    | Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed. |
| Over Voltage Protection     | Limits output voltage at no load and in case the normal voltage limit fails.   |

## Dimming

### ● 0-10V Dimming

The recommended implementation of the dimming control is provided below.



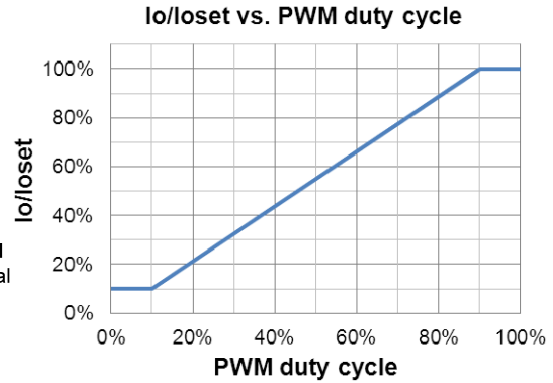
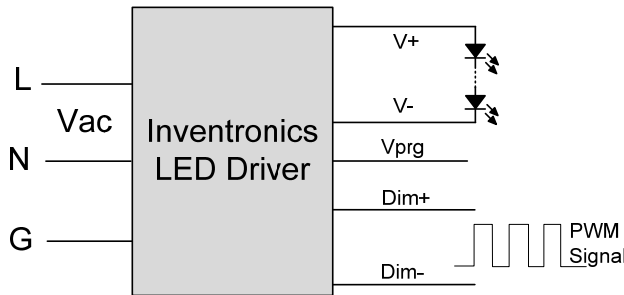
Implementation 1: Positive logic

### Notes:

1. The dimmer can also be replaced by an active 0-10V voltage source signal or passive components like resistors and zener.
2. If 0-10V dimming is not used, Dim + should be open.

● **10V PWM Dimming**

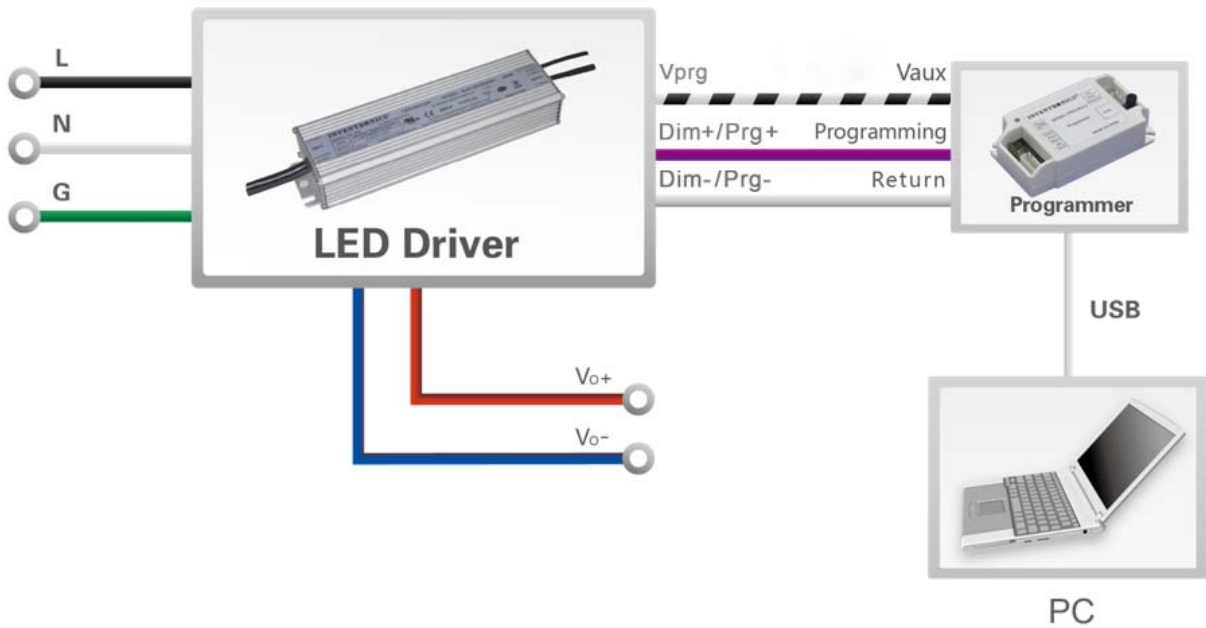
The recommended implementation of the dimming control is provided below.



**Implementation 2: Positive logic**

**Notes:** If PWM dimming is not used, Dim + should be open.

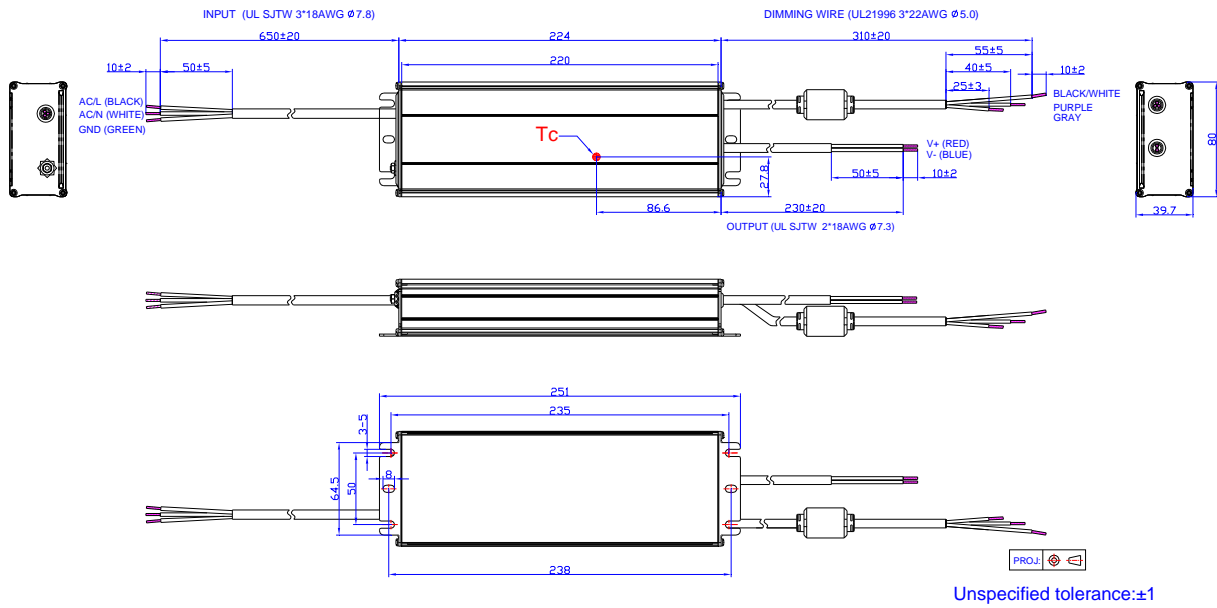
**Programming Connection Diagram**



**Note:** The driver does not need to be powered on during the programming process.

- Please refer to [PRG-MUL2](#) Multi-Programmer datasheet for details.

## 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 |
| 2018-12-14  | A    | Datasheets Release    | /    | /  |