

## Features

- Ultra High Efficiency (Up to 91%)
- Active Power Factor Correction (0.99 Typical)
- Constant Current Output
- Lightning Protection
- All-Around Protection: SCP, OTP, OVP
- Waterproof (IP67) and Damp & Wet Location



## Description

The EUC-120SxxxDV(SV) Series operate from a 90 ~ 305 Vac input range. They are designed to be highly efficient and highly reliable. The standard features include dimming control, lightning protection, over voltage protection, short circuit protection, and over temperature protection.

## Models

| Output Current | Input Voltage Range | Output Voltage Range | Max. Output Power | Typical Efficiency (1) | Power Factor |        | Model Number (2)     |
|----------------|---------------------|----------------------|-------------------|------------------------|--------------|--------|----------------------|
|                |                     |                      |                   |                        | 120Vac       | 220Vac |                      |
| 350 mA         | 90 ~ 305 Vac        | 206~343Vdc           | 120 W             | 91.0%                  | 0.99         | 0.96   | EUC-120S035DV(SV)    |
| 450 mA         | 90 ~ 305 Vac        | 160~266Vdc           | 120 W             | 91.0%                  | 0.99         | 0.96   | EUC-120S045DV(SV)    |
| 700 mA         | 90 ~ 305 Vac        | 103~171Vdc           | 120 W             | 91.0%                  | 0.99         | 0.96   | EUC-120S070DV(SV)    |
| 1050 mA        | 90 ~ 305 Vac        | 68~114Vdc            | 120 W             | 90.5%                  | 0.99         | 0.96   | EUC-120S105DV(SV)    |
| 1400 mA        | 90 ~ 305 Vac        | 52~86 Vdc            | 120 W             | 90.5%                  | 0.99         | 0.96   | EUC-120S140DV(SV)(3) |
| 1750 mA        | 90 ~ 305 Vac        | 41~68 Vdc            | 120 W             | 90.5%                  | 0.99         | 0.96   | EUC-120S175DV(SV)(3) |
| 2100 mA        | 90 ~ 305 Vac        | 34~57 Vdc            | 120 W             | 90.5%                  | 0.99         | 0.96   | EUC-120S210DV(SV)(3) |
| 2450 mA        | 90 ~ 305 Vac        | 29~49 Vdc            | 120 W             | 90.5%                  | 0.99         | 0.96   | EUC-120S245DV(SV)(3) |
| 2800 mA        | 90 ~ 305 Vac        | 26~43 Vdc            | 120 W             | 90.5%                  | 0.99         | 0.96   | EUC-120S280DV(SV)(3) |
| 3150 mA        | 90 ~ 305 Vac        | 23~38 Vdc            | 120 W             | 90.0%                  | 0.99         | 0.96   | EUC-120S315DV(SV)(3) |
| 3500 mA        | 90 ~ 305 Vac        | 20~34 Vdc            | 120 W             | 90.0%                  | 0.99         | 0.96   | EUC-120S350DV(SV)(3) |
| 4200 mA        | 90 ~ 305 Vac        | 17~28 Vdc            | 120 W             | 90.0%                  | 0.99         | 0.96   | EUC-120S420DV(SV)(3) |
| 4900 mA        | 90 ~ 305 Vac        | 14~24 Vdc            | 120 W             | 89.0%                  | 0.99         | 0.96   | EUC-120S490DV(SV)(3) |

**Notes:** (1) Measured at full load and 220 Vac input.

(2) A suffix -xxxx may be added to denote variations or modifications to the base product, where x can be any alphanumeric character or blank.

(3) SELV

## Input Specifications

| Parameter     | Min. | Typ. | Max.  | Notes |
|---------------|------|------|-------|-------|
| Input Voltage | 90 V | -    | 305 V |       |

## Input Specifications (Continued)

| Parameter                        | Min.  | Typ. | Max.               | Notes                                                                                     |
|----------------------------------|-------|------|--------------------|-------------------------------------------------------------------------------------------|
| Input Frequency                  | 47 Hz | -    | 63 Hz              |                                                                                           |
| Leakage Current                  | -     | -    | 1 mA               | At 277Vac 60Hz input                                                                      |
| Input AC Current                 | -     | -    | 1.5 A              | Measured at full load and 100 Vac input.                                                  |
|                                  | -     | -    | 0.75 A             | Measured at full load and 220 Vac input.                                                  |
| Inrush current                   | -     | -    | 65 A               | At 220Vac input, 25°C cold start, duration=1 ms, 10%I <sub>pk</sub> -10%I <sub>pk</sub> . |
| Inrush Current(I <sup>2</sup> t) | -     | -    | 1 A <sup>2</sup> s |                                                                                           |
| Power Factor                     | 0.90  | -    | -                  | At 100Vac-220Vac, 75%load-100%load                                                        |
| THD                              | -     | -    | 20%                | At 100Vac-277Vac, 75%load-100%load                                                        |

## Output Specifications

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Min.                                                                                                                                    | Typ.                                                                                                                                     | Max.                                                                                                                                     | Notes                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Output Current Range<br><i>I</i> <sub>o</sub> = 350 mA<br><i>I</i> <sub>o</sub> = 450 mA<br><i>I</i> <sub>o</sub> = 700 mA<br><i>I</i> <sub>o</sub> = 1050 mA<br><i>I</i> <sub>o</sub> = 1400 mA<br><i>I</i> <sub>o</sub> = 1750 mA<br><i>I</i> <sub>o</sub> = 2100 mA<br><i>I</i> <sub>o</sub> = 2450 mA<br><i>I</i> <sub>o</sub> = 2800 mA<br><i>I</i> <sub>o</sub> = 3150 mA<br><i>I</i> <sub>o</sub> = 3500 mA<br><i>I</i> <sub>o</sub> = 4200 mA<br><i>I</i> <sub>o</sub> = 4900 mA | 332 mA<br>427 mA<br>665 mA<br>997 mA<br>1330 mA<br>1662 mA<br>1995 mA<br>2327 mA<br>2660 mA<br>2992 mA<br>3325 mA<br>3990 mA<br>4655 mA | 350 mA<br>450 mA<br>700 mA<br>1050 mA<br>1400 mA<br>1750 mA<br>2100 mA<br>2450 mA<br>2800 mA<br>3150 mA<br>3500 mA<br>4200 mA<br>4900 mA | 368 mA<br>473 mA<br>735 mA<br>1102 mA<br>1470 mA<br>1837 mA<br>2205 mA<br>2572 mA<br>2940 mA<br>3307 mA<br>3675 mA<br>4410 mA<br>5145 mA | V dim=10 V                                                                                                                         |
| Ripple and Noise (pk-pk)                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -                                                                                                                                       | -                                                                                                                                        | 3% V <sub>O</sub>                                                                                                                        | Measured by 20 MHz bandwidth oscilloscope and the output paralleled a 0.1 uF ceramic capacitor and a 10 uF electrolytic capacitor. |
| Line Regulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                       | -                                                                                                                                        | ±1%                                                                                                                                      |                                                                                                                                    |
| Load Regulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                       | -                                                                                                                                        | ±3%                                                                                                                                      |                                                                                                                                    |
| Turn-on Delay Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -                                                                                                                                       | 1.2 s                                                                                                                                    | 2.0 s                                                                                                                                    | Measured at 120Vac input.                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -                                                                                                                                       | 0.6 s                                                                                                                                    | 1.2 s                                                                                                                                    | Measured at 220Vac input.                                                                                                          |

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

## Protection Functions

| Parameter                   | Min.                                                                                                                                                       | Typ.   | Max. | Notes            |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------|------------------|
| Over Temperature Protection | -                                                                                                                                                          | 100 °C | -    | Case temperature |
| Short Circuit Protection    | No damage shall occur when any output operating in a short circuit condition. The power supply shall be self-recovery when the fault condition is removed. |        |      |                  |

Specifications are subject to changes without notice.

## Protection Functions (Continued)

| Parameter               | Min.  | Typ.  | Max.  | Notes                                                                                                |
|-------------------------|-------|-------|-------|------------------------------------------------------------------------------------------------------|
| Over Voltage Protection |       |       |       |                                                                                                      |
| Io = 350 mA             | 411 V | 446 V | 480 V | Latch mode. The power supply shall return to normal operation only after the power is turn-on again. |
| Io = 450 mA             | 319 V | 346 V | 373 V |                                                                                                      |
| Io = 700 mA             | 205 V | 222 V | 240 V |                                                                                                      |
| Io = 1050 mA            | 136 V | 148 V | 160 V |                                                                                                      |
| Io = 1400 mA            | 103 V | 112 V | 121 V |                                                                                                      |
| Io = 1750 mA            | 81 V  | 88 V  | 96 V  |                                                                                                      |
| Io = 2100 mA            | 68 V  | 74 V  | 80 V  |                                                                                                      |
| Io = 2450 mA            | 58 V  | 64 V  | 69 V  |                                                                                                      |
| Io = 2800 mA            | 51 V  | 56 V  | 61 V  |                                                                                                      |
| Io = 3150 mA            | 45 V  | 49 V  | 54 V  |                                                                                                      |
| Io = 3500 mA            | 40 V  | 44 V  | 48 V  |                                                                                                      |
| Io = 4200 mA            | 33 V  | 36 V  | 40 V  |                                                                                                      |
| Io = 4900 mA            | 28 V  | 31 V  | 34 V  |                                                                                                      |

## General Specifications

| Parameter               | Min.               | Typ.          | Max. | Notes                                                                                                                                                                           |
|-------------------------|--------------------|---------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency              |                    |               |      |                                                                                                                                                                                 |
| Io = 350 mA             | 88.0%              | 89.0%         | -    | Measured at full load, 120Vac input, 25°C ambient temperature, after the unit is thermally stabilized.<br><br>It will be lower about 1%, if measured immediately after startup. |
| Io = 450 mA             | 88.0%              | 89.0%         | -    |                                                                                                                                                                                 |
| Io = 700 mA             | 88.0%              | 89.0%         | -    |                                                                                                                                                                                 |
| Io = 1050 mA            | 87.5%              | 88.5%         | -    |                                                                                                                                                                                 |
| Io = 1400 mA            | 87.5%              | 88.5%         | -    |                                                                                                                                                                                 |
| Io = 1750 mA            | 87.5%              | 88.5%         | -    |                                                                                                                                                                                 |
| Io = 2100 mA            | 87.5%              | 88.5%         | -    |                                                                                                                                                                                 |
| Io = 2450 mA            | 87.5%              | 88.5%         | -    |                                                                                                                                                                                 |
| Io = 2800 mA            | 87.5%              | 88.5%         | -    |                                                                                                                                                                                 |
| Io = 3150 mA            | 87.0%              | 88.0%         | -    |                                                                                                                                                                                 |
| Io = 3500 mA            | 87.0%              | 88.0%         | -    |                                                                                                                                                                                 |
| Io = 4200 mA            | 87.0%              | 88.0%         | -    |                                                                                                                                                                                 |
| Io = 4900 mA            | 86.0%              | 87.0%         | -    |                                                                                                                                                                                 |
| Efficiency              |                    |               |      |                                                                                                                                                                                 |
| Io = 350 mA             | 90.0%              | 91.0%         | -    | Measured at full load, 220Vac input, 25°C ambient temperature, after the unit is thermally stabilized.<br><br>It will be lower about 1%, if measured immediately after startup. |
| Io = 450 mA             | 90.0%              | 91.0%         | -    |                                                                                                                                                                                 |
| Io = 700 mA             | 90.0%              | 91.0%         | -    |                                                                                                                                                                                 |
| Io = 1050 mA            | 89.5%              | 90.5%         | -    |                                                                                                                                                                                 |
| Io = 1400 mA            | 89.5%              | 90.5%         | -    |                                                                                                                                                                                 |
| Io = 1750 mA            | 89.5%              | 90.5%         | -    |                                                                                                                                                                                 |
| Io = 2100 mA            | 89.5%              | 90.5%         | -    |                                                                                                                                                                                 |
| Io = 2450 mA            | 89.5%              | 90.5%         | -    |                                                                                                                                                                                 |
| Io = 2800 mA            | 89.5%              | 90.5%         | -    |                                                                                                                                                                                 |
| Io = 3150 mA            | 89.0%              | 90.0%         | -    |                                                                                                                                                                                 |
| Io = 3500 mA            | 89.0%              | 90.0%         | -    |                                                                                                                                                                                 |
| Io = 4200 mA            | 89.0%              | 90.0%         | -    |                                                                                                                                                                                 |
| Io = 4900 mA            | 88.0%              | 89.0%         | -    |                                                                                                                                                                                 |
| MTBF                    | -                  | 250,000 hours | -    | Measured at 120Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)                                                                                                  |
| Life Time               | -                  | 67,200 hours  | -    | Measured at 220Vac input, 80%Load, Case temperature=60°C @ Tc point. See life time vs. Tc curve for the details                                                                 |
| Case Temperature        | -                  | -             | 90°C |                                                                                                                                                                                 |
| Dimensions              |                    |               |      |                                                                                                                                                                                 |
| Inches (L × W × H)      | 7.64 × 2.66 × 1.44 |               |      |                                                                                                                                                                                 |
| Millimeters (L × W × H) | 194 × 67.5 × 36.5  |               |      |                                                                                                                                                                                 |
| Net Weight              | -                  | 1000 g        | -    |                                                                                                                                                                                 |

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

Specifications are subject to changes without notice.

## Environmental Specifications

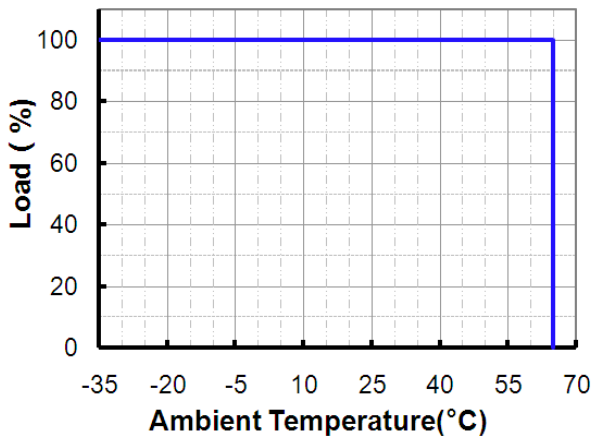
| Parameter             | Min.   | Typ. | Max.   | Notes                                                              |
|-----------------------|--------|------|--------|--------------------------------------------------------------------|
| Operating Temperature | -35 °C | -    | +65 °C | Humidity: 10% RH to 100% RH<br>See Derating Curve for more details |
| Storage Temperature   | -40 °C | -    | +85 °C | Humidity: 5% RH to 100% RH                                         |

## Safety & EMC Compliance

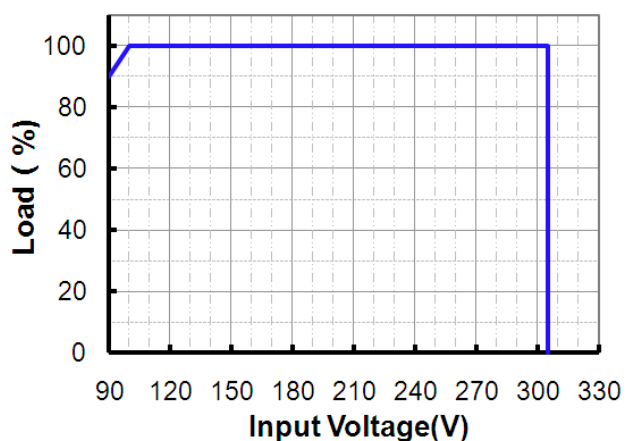
| Safety Category | Standard                                                                  |
|-----------------|---------------------------------------------------------------------------|
| CE              | EN 61347-1, EN61347-2-13                                                  |
| EMI Standards   | Notes                                                                     |
| EN 55015        | Conducted emission Test & Radiated emission Test                          |
| EN 61000-3-2    | Harmonic current emissions                                                |
| EN 61000-3-3    | Voltage fluctuations & flicker                                            |
| 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       |

## Derating Curve

Derating Curve

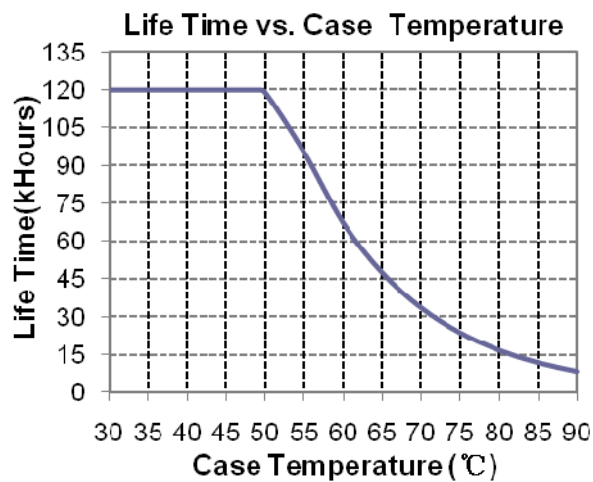


Derating Curve

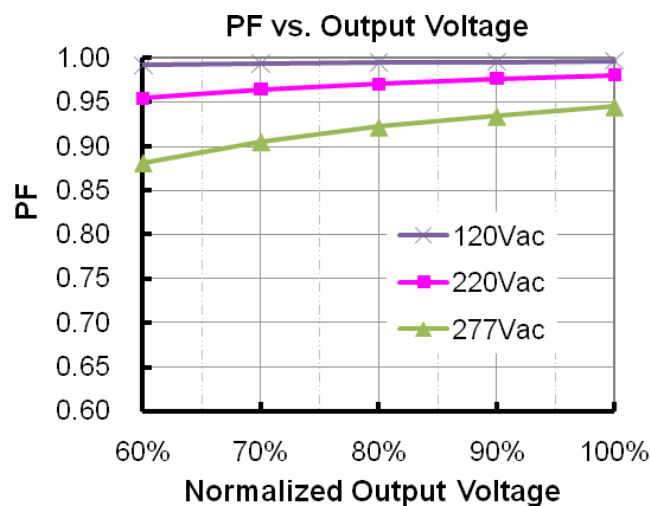


Specifications are subject to changes without notice.

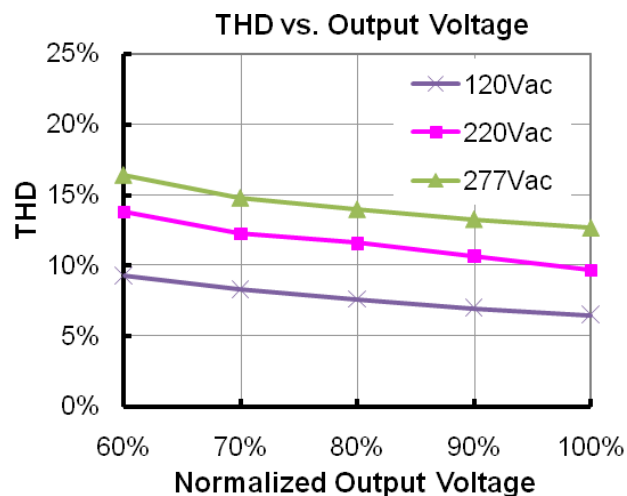
## Life Time vs. Case Temperature Curve



## Power Factor Characteristics



## Total Harmonic Distortion

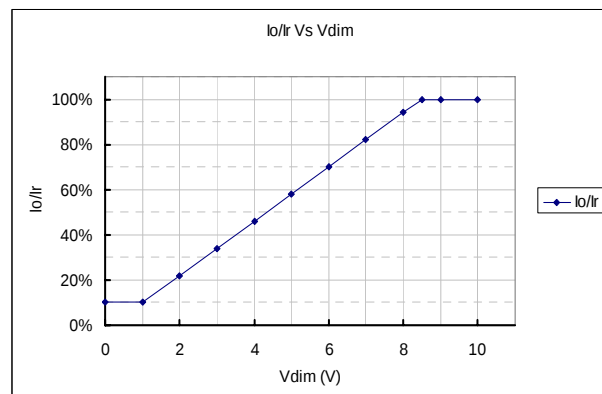
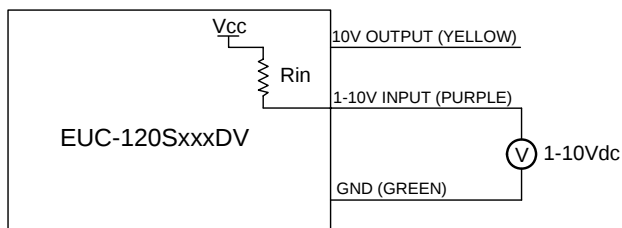


## Dimming Control (On the secondary Side)

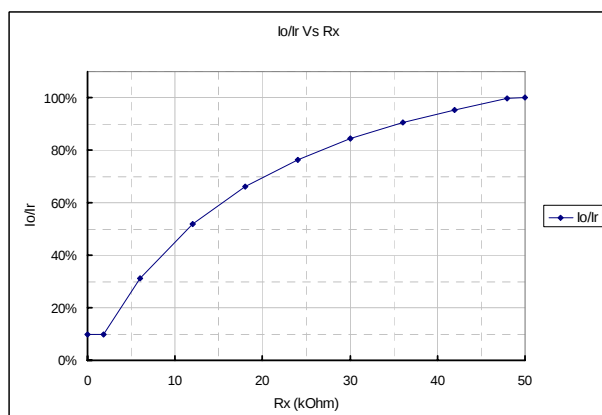
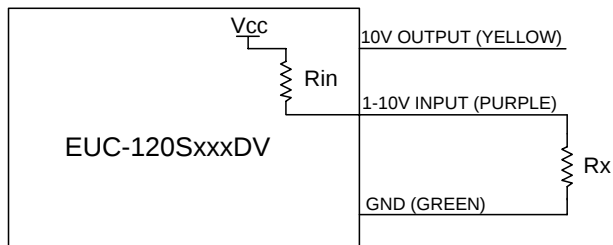
The function has two versions. One is with internal pull-up resistor; the output is full load when the dimming leads are floated. Another is with internal pull-down resistor; the output is 10% full load when the dimming leads are floated.

1. With pull-up resistor (Default, without suffix):

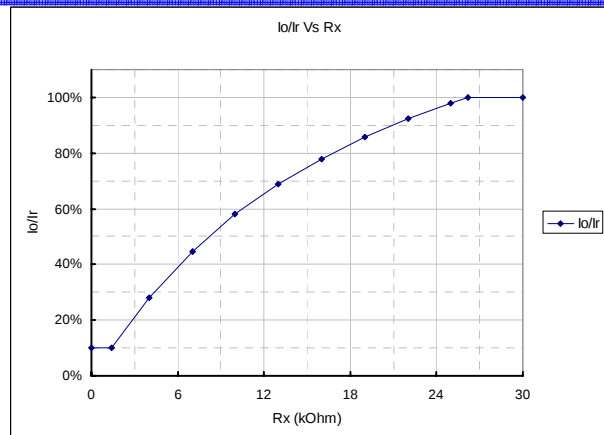
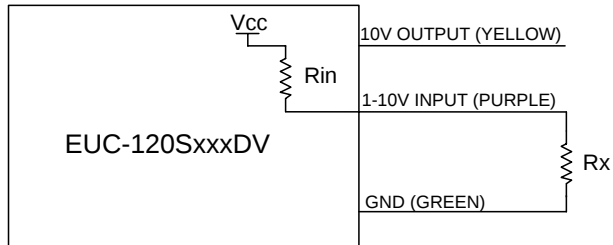
| Parameter                                                                                                  | Min.   | Typ. | Max.   | Notes |
|------------------------------------------------------------------------------------------------------------|--------|------|--------|-------|
| Vcc                                                                                                        | 9.5 V  | 10 V | 10.5 V |       |
| 10V output source current                                                                                  | 0 mA   | -    | 10 mA  |       |
| Absolute maximum voltage on the 1~10V input pin                                                            | -2 V   | -    | 12 V   |       |
| Source current on 1~10V input pin                                                                          | 0 mA   | -    | 0.5 mA |       |
| Value of Rin ( the resistor inside the LED driver which locate between the 1-10V input and 10V output pin) | 19.8 K | 20 K | 20.2 K |       |



Implementation 1: DC input



Implementation 2: External resistor (Vcc=12V) 【EUC-120S490DV】



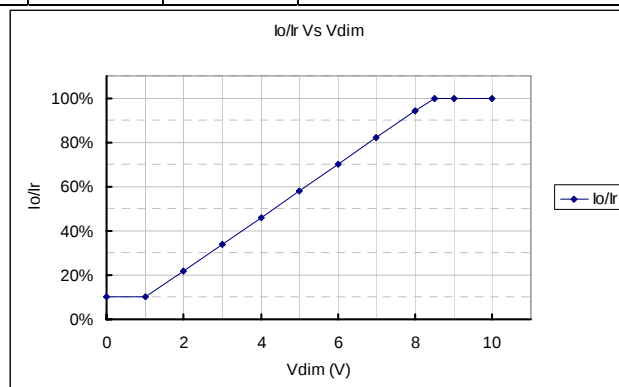
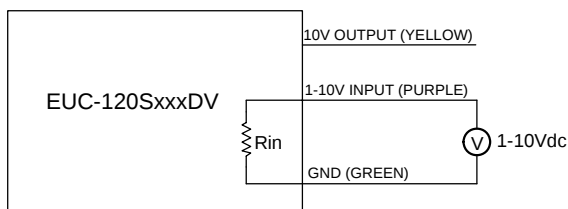
### Implementation 3: External resistor (Vcc=15V) 【Other Models】

#### Notes:

1. If the dimming function is not used, please let the dimming leads floated.
2. Io is actual output current and Ir is rated current without dimming control.
3. For the driver to operate properly, the load voltage must be maintained above the minimum voltage threshold (approx.60% of the max. output voltage for any given model).
4. If the output voltage is maintained above 60% of the maximum output voltage, the dimming control may be operated over the entire 1-10V range with output current varying from 100% down to practically 10%.
5. The dimming signal is allowed to be less than 1V, however, when it for 0-1V, the output current can maintain about 10%Ir. When it for 8.5-10V, the output current can maintain about 100%Ir.
6. Do not connect the GND of dimming to the output; otherwise, the LED driver can not work normally.

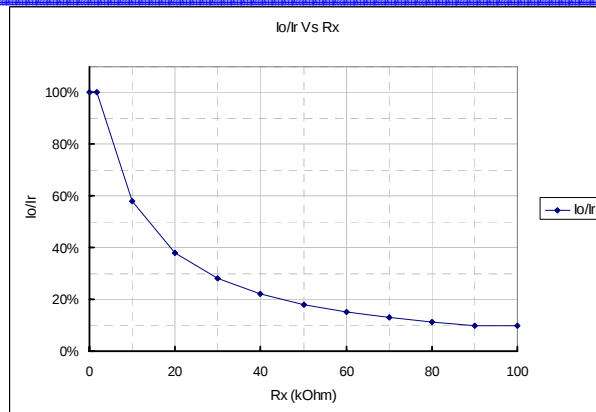
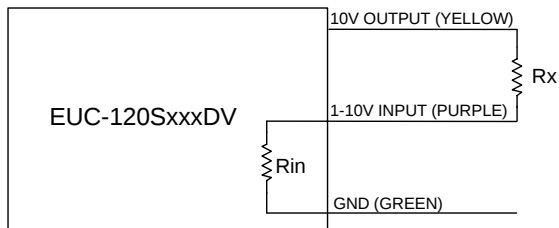
2. With pull-down resistor: (The model number has a suffix -0040)

| Parameter                                                                                       | Min.  | Typ. | Max.   | Notes |
|-------------------------------------------------------------------------------------------------|-------|------|--------|-------|
| 10V output voltage                                                                              | 9.5 V | 10 V | 10.5 V |       |
| 10V output source current                                                                       | 0 mA  | -    | 10 mA  |       |
| Absolute maximum voltage on the 1~10V input pin                                                 | -2 V  | -    | 12 V   |       |
| Sink current on 1~10V input pin                                                                 | 0 mA  | -    | 1 mA   |       |
| Value of Rin ( the resistor inside the LED driver which locate between the 1-10V input and GND) | 9.9 K | 10 K | 10.1 K |       |

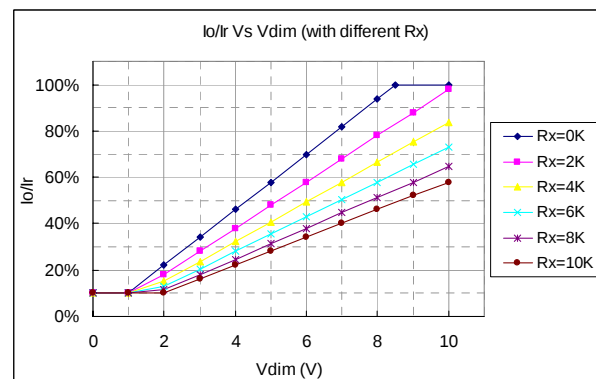
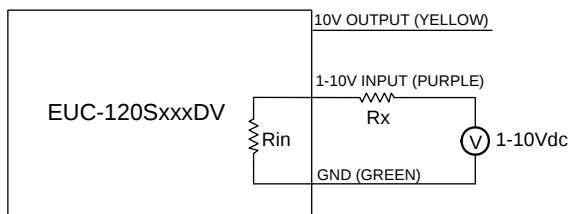


### Implementation 1: DC input

Specifications are subject to changes without notice.



**Implementation 2: External resistor**



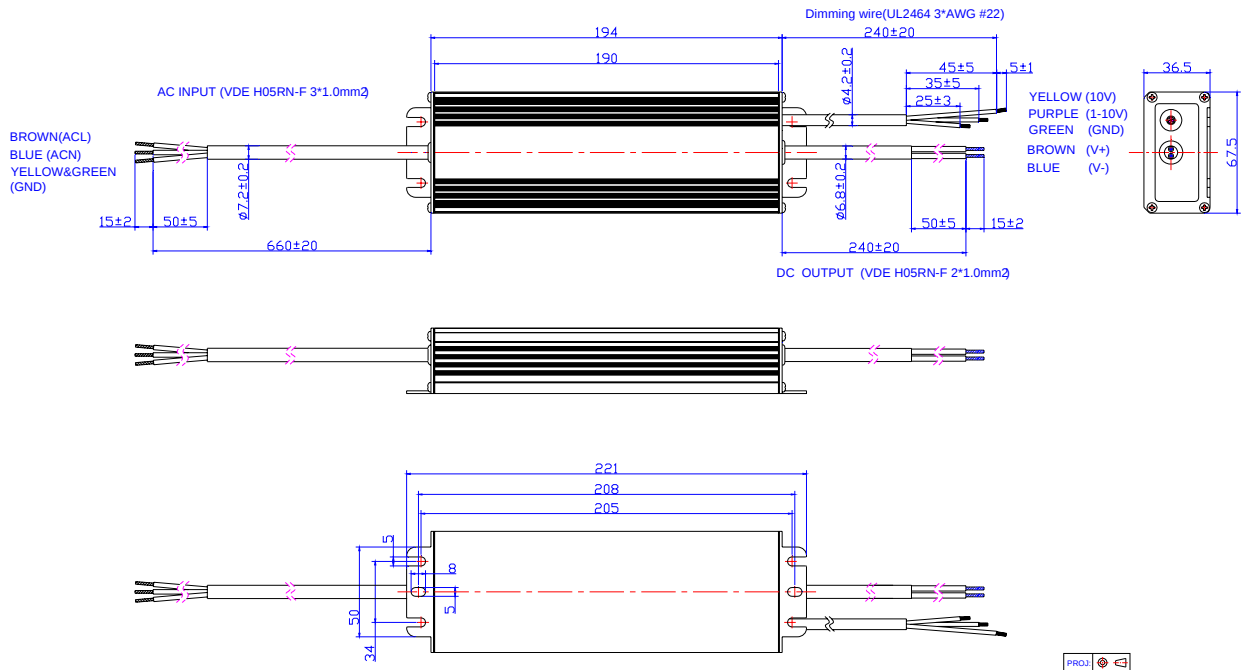
**Implementation 3: External resistor and 1-10V DC Input**

**Notes:**

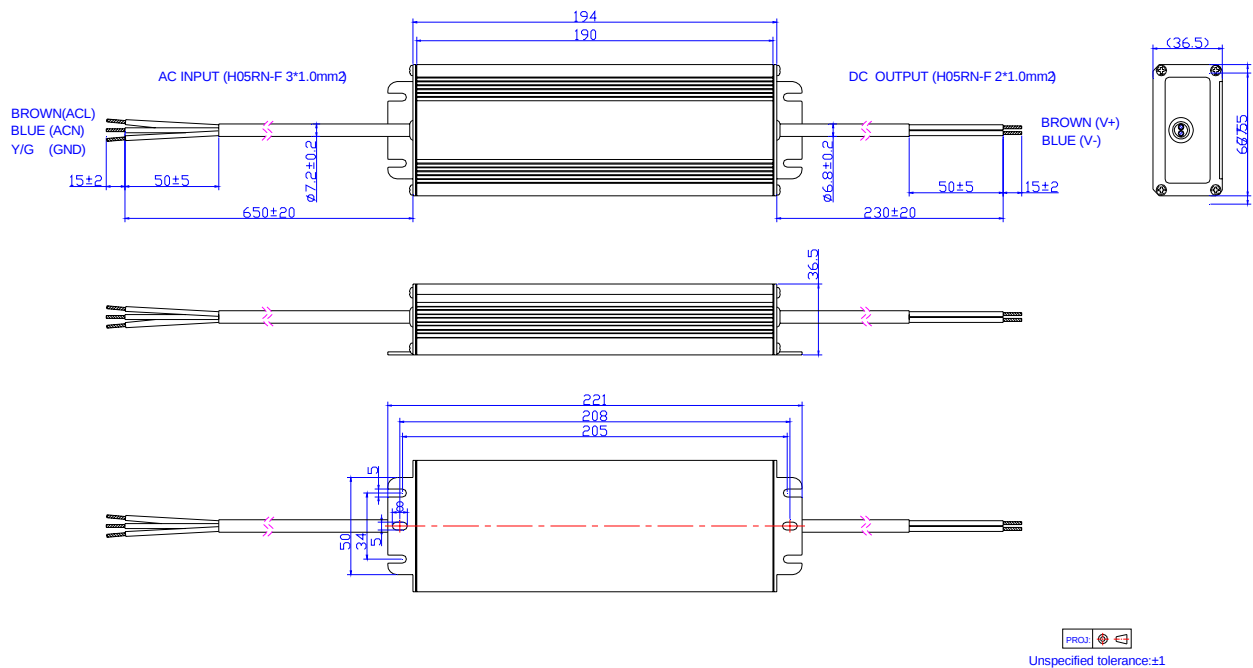
1. If the dimming function is not used, please short 10V output pin (yellow) and 1-10 input pin (purple).
2.  $I_o$  is actual output current and  $I_r$  is rated current without dimming control.
3. For the driver to operate properly, the load voltage must be maintained above the minimum voltage threshold (approx. 60% of the max. output voltage for any given model).
4. If the output voltage is maintained above 60% of the maximum output voltage, the dimming control may be operated over the entire 1-10V range with output current varying from 100% down to practically 10%.
5. The dimming signal is allowed to be less than 1V, however, when it for 0-1V, the output current can maintain about 10% $I_r$ . When it for 8.5-10V, the output current can maintain about 100% $I_r$ .
6. Do not connect the GND of dimming to the output; otherwise, the LED driver cannot work normally.

## Mechanical Outline

### EUC-120SxxxDV



### EUC-120SxxxSV



## 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.

Specifications are subject to changes without notice.

## Revision History

| Change Date | Rev. | Description of Change                                 |                                               |                                                                                                      |
|-------------|------|-------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------|
|             |      | Item                                                  | From                                          | To                                                                                                   |
| 2010-03-23  | A    | Add Leakage Current in Input Specifications           | /                                             | Max. 1 mA At 277Vac 50Hz input                                                                       |
|             |      | Change the Max. value of Operating Temperature        | +70 °C                                        | +65 °C                                                                                               |
|             |      | Change the Max. Ambient Temperature in Derating Curve | +70 °C                                        | +65 °C                                                                                               |
|             |      | Change the MTBF data and testing condition            | 460,000 hours / Measured at EUC-120S140DV(SV) | 320,000 hours / Measured at EUC-120S280DV(SV)                                                        |
|             |      | Change the Life Time testing condition                | Measured at EUC-120S140DV(SV)                 | Measured at EUC-120S280DV(SV)                                                                        |
|             |      | Add one note in Dimming Control                       | /                                             | 7. Do not connect the GND of dimming to the output; otherwise, the LED driver can not work normally. |
|             |      | Change the dimming control line in Mechanical Outline | /                                             | /                                                                                                    |
| 2010-10-22  | B    | Update the part of dimming control                    | /                                             | /                                                                                                    |
| 2010-10-18  | C    | Add another dimming version with pull-down resistor   | /                                             | /                                                                                                    |
| 2011-01-14  | D    | Update MTBF & Life Time Date                          | For One Model                                 | For Two Models                                                                                       |
| 2011-09-07  | E    | Dimming Control                                       | /                                             | /                                                                                                    |
| 2012-06-11  | F    | Mechanical Outline                                    | /                                             | Updated                                                                                              |
|             |      | Life time curve                                       | /                                             | Added                                                                                                |
| 2012-7-17   | G    | Max Case Temperature                                  | /                                             | Updated                                                                                              |
|             |      | Surge Immunity Test: AC Power Line                    | line to line 2 kV, line to earth 4 kV         | line to line 4 kV, line to earth 6 kV                                                                |
| 2012-7-24   | H    | External resistor in pull-up resistor                 | /                                             | Updated                                                                                              |
| 2012-9-21   | I    | Inrush Current(I <sup>2</sup> t)                      | /                                             | Added                                                                                                |
|             |      | MTBF, Life time                                       | /                                             | Typical Value added                                                                                  |
|             |      | Life time Curve                                       | /                                             | Updated                                                                                              |
|             |      | Min PF, THD Max                                       | /                                             | Added                                                                                                |
| 2013-03-25  | J    | Efficiency of Model 4900mA                            | /                                             | 1% lower                                                                                             |
|             |      | Turn-on delay time @120Vac                            | Typ 0.6s; Max1.5s                             | Typ 1.2s; Max 2.0s                                                                                   |
|             |      | Turn-on delay time @220Vac                            | Typ 0.6s; Max1.0s                             | Typ 0.6s; Max 1.2s                                                                                   |
|             |      | PF Curve                                              | /                                             | Added                                                                                                |
|             |      | THD Curve                                             | /                                             | Added                                                                                                |
|             |      | OTP                                                   | /                                             | Updated                                                                                              |
|             |      | Mechanical Outline                                    | /                                             | Updated                                                                                              |

Specifications are subject to changes without notice.