

## Features

- High Efficiency (Up to 90%)
- Second Generation with Improved Performance
- Active Power Factor Correction (Typical 0.95)
- Constant Current Output
- 0-10V Dimmable
- Input Surge Protection: 4kV line-line, 6kV line-earth
- All-Around Protection: OVP, SCP, OLP, OTP
- Waterproof (IP67) and UL Dry / Damp / Wet Location
- Class 2 and SELV Output
- 5 Years Warranty



## Description

The EUC-052SxxxDT(ST) series is a 52W, constant-current IP67 LED driver that operates from 90~305 Vac input with excellent power factor. It is created for architecture lighting, decorative lighting, tunnel and street lighting. The high efficiency of these drivers and metal case enable 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, over load and over temperature.

## Models

Output Current	Input Voltage Range(1)	Output Voltage Range	Max. Output Power	Typical Efficiency (2)	Power Factor		Model Number
					120Vac	220Vac	
350 mA	90 ~ 305 Vac	75 ~ 149 Vdc	52 W	90%	0.96	0.95	EUC-052S035DT(ST) <sup>(3)</sup>
450 mA	90 ~ 305 Vac	58 ~ 116 Vdc	52 W	89%	0.96	0.95	EUC-052S045DT(ST) <sup>(3)</sup>
700 mA	90 ~ 305 Vac	38 ~ 75 Vdc	52 W	89%	0.96	0.95	EUC-052S070DT(ST) <sup>(3)(7)</sup>
1050 mA	90 ~ 305 Vac	25 ~ 50 Vdc	52 W	88%	0.96	0.95	EUC-052S105DT(ST) <sup>(4)(7)</sup>
1400 mA	90 ~ 305 Vac	19 ~ 37 Vdc	52 W	87%	0.96	0.95	EUC-052S140DT(ST) <sup>(5)(7)</sup>
2100 mA	90 ~ 305 Vac	13 ~ 25 Vdc	52 W	86%	0.96	0.95	EUC-052S210DT(ST) <sup>(6)(7)</sup>

**Notes:** (1) UL, FCC certified input voltage range: 100-277Vac; other certified input voltage range except UL & FCC: 100-240Vac.

(2) Measured at full load and 220 Vac input.

(3) Non-Class 2 output (USR & CNR).

(4) Class 2 output (USR), Non-Class 2 output (CNR).

(5) Class 2 output (USR), Class 2 output (CNR) only for wet location.

(6) Class 2 output (USR) and Class 2 output (CNR) for wet location.

(7) SELV output.

## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	90 Vac	-	305 Vac	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 MIU	UL8750; 277Vac/ 60Hz
	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz
Input AC Current	-	-	0.8 A	Measured at full load and 100 Vac input.
	-	-	0.4 A	Measured at full load and 220 Vac input.
Inrush Current(I <sup>2</sup> t)	-	-	0.35 A <sup>2</sup> s	At 220Vac input 25°C Cold Start. Duration=260 μs, 10%Ipk-10%Ipk.
Power Factor	0.90	-	-	At 100Vac-277Vac, 75%load-100%load (39-52W)
THD	-	-	20%	

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Io	-	5%Io	
No load output voltage				
Io = 350 mA	-	-	162 V	
Io = 450 mA	-	-	125 V	
Io = 700 mA	-	-	82 V	
Io = 1050 mA	-	-	56 V	
Io = 1400 mA	-	-	41 V	
Io = 2100 mA	-	-	30 V	
Total Output Current Ripple (pk-pk)	-	-	50%Io	Related to V-I Curve of the LED
Output Current Overshoot / Undershoot	-	-	10%Io	At full load condition.
Line Regulation	-	-	±1%	Measured at full load condition.
Load Regulation	-	-	±3%	
Turn-on Delay Time	-	0.6 s	1.0 s	Measured at 120Vac input, 75%load-100%load
	-	0.3 s	0.5 s	Measured at 220Vac input, 75%load-100%load
Temperature coefficient	-	0.2%/°C	-	Case temperature = 0°C ~Tc max
12V Auxiliary Output Voltage	10.8 V	12 V	13.2 V	
12V Auxiliary Output Source Current	0 mA	-	20 mA	Return terminal is "Dim-".

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

## General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input: I <sub>O</sub> = 350 mA I <sub>O</sub> = 450 mA I <sub>O</sub> = 700 mA I <sub>O</sub> = 1050 mA I <sub>O</sub> = 1400 mA I <sub>O</sub> = 2100 mA	87% 87% 86% 85% 85% 84%	89% 88% 88% 87% 86% 85%	- - - - - -	Measured at full load and steady-state temperature in 25°C ambient;
Efficiency at 220 Vac input: I <sub>O</sub> = 350 mA I <sub>O</sub> = 450 mA I <sub>O</sub> = 700 mA I <sub>O</sub> = 1050 mA I <sub>O</sub> = 1400 mA I <sub>O</sub> = 2100 mA	88% 87% 87% 86% 86% 85%	90% 89% 89% 88% 87% 86%	- - - - - -	Measured at full load and steady-state temperature in 25°C ambient;
Efficiency at 277 Vac input: I <sub>O</sub> = 350 mA I <sub>O</sub> = 450 mA I <sub>O</sub> = 700 mA I <sub>O</sub> = 1050 mA I <sub>O</sub> = 1400 mA I <sub>O</sub> = 2100 mA	88% 87% 87% 86% 86% 85%	90% 89% 89% 88% 87% 86%	- - - - - -	Measured at full load and steady-state temperature in 25°C ambient;
No Load Power Dissipation	-	-	6 W	
MTBF	321,000 Hours	-	-	Measured at 120Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	93,300 Hours	-	Measured at 120Vac input, 80%Load and 60°C case temperature ; See life time vs. Tc curve for the details
Operating Case Temperature for Safety Tc <sub>s</sub>	-40 °C	-	+90 °C	
Operating Case Temperature for Warranty Tc <sub>w</sub>	-40 °C	-	+70 °C	Case temperature for 5 years warranty. Humidity: 10% RH to 90% RH
Storage Temperature	-40 °C	-	+85 °C	Humidity: 5% RH to 90% RH
Dimensions Inches (L × W × H) Millimeters (L × W × H)	6.77 × 1.77 × 1.38 172 × 45.0 × 35.0			With mounting ear 7.60 × 1.77 × 1.38 193 × 45.0 × 35.0
Net Weight	-	520 g	-	

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

## Dimming Specifications

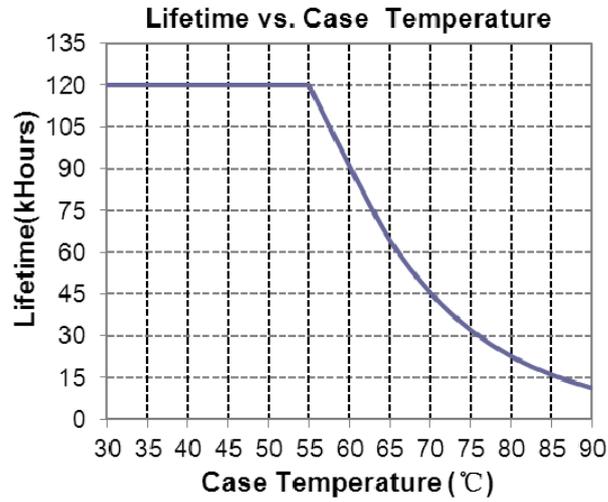
Parameter	Min.	Typ.	Max.	Notes
Absolute Maximum Voltage on the 0~10V Input Pin	0 V	-	15 V	
Source Current on 0~10V Input Pin	0 uA	200 uA	250 uA	
Dimming Output Range	10%I <sub>omax</sub>		100%I <sub>omax</sub>	
Recommended Dimming Input Range	0 V	-	10 V	

## Safety & EMC Compliance

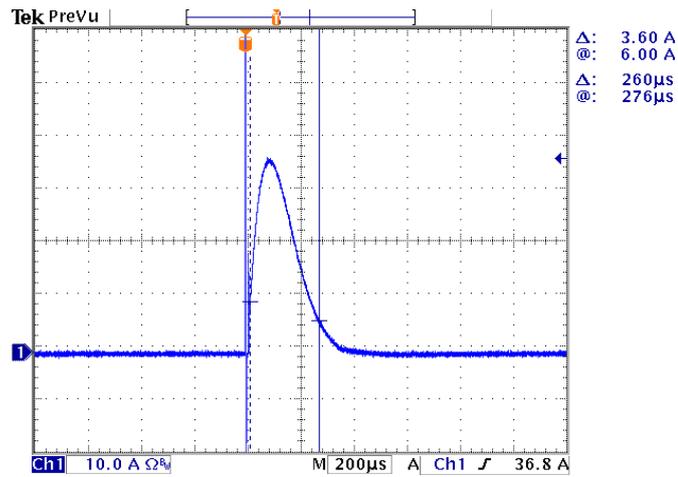
Safety Category	Standard
UL/CUL	UL8750, UL1012, UL1310 Class 2, CSA-C22.2 No. 107.1, CSA C22.2 NO. 223-M91 Class 2
CE	EN 61347-1, EN61347-2-13
KS	KS C 7655
EMI Standards	Notes
EN 55015 <sup>(1)</sup>	Conducted emission Test & Radiated emission Test
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	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: level 3, criteria A
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.

## Lifetime vs. Case Temperature Curve



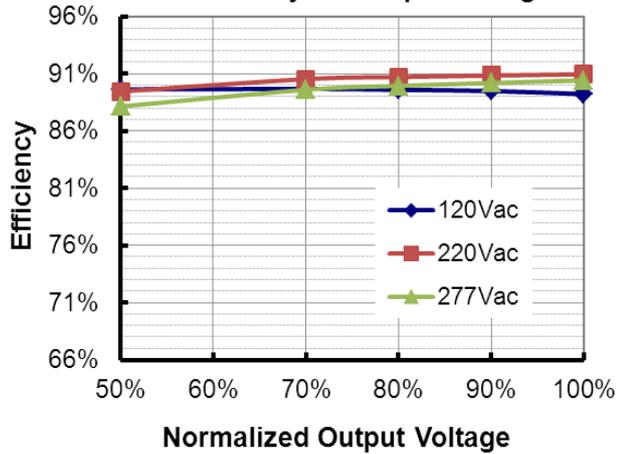
## Inrush Current Waveform



## Efficiency vs. Load

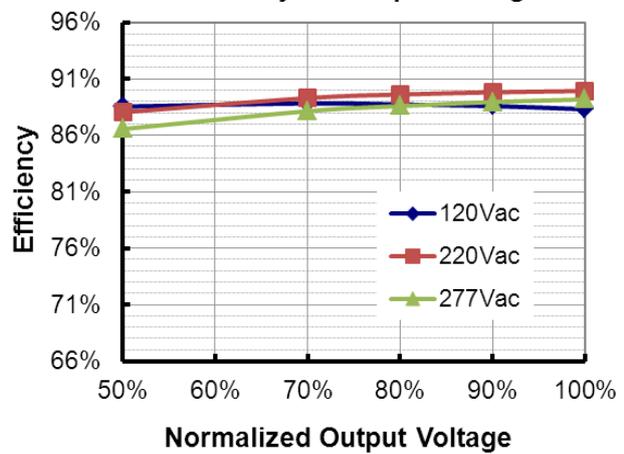
*EUC-052S035DT(ST)*

Efficiency vs. Output Voltage



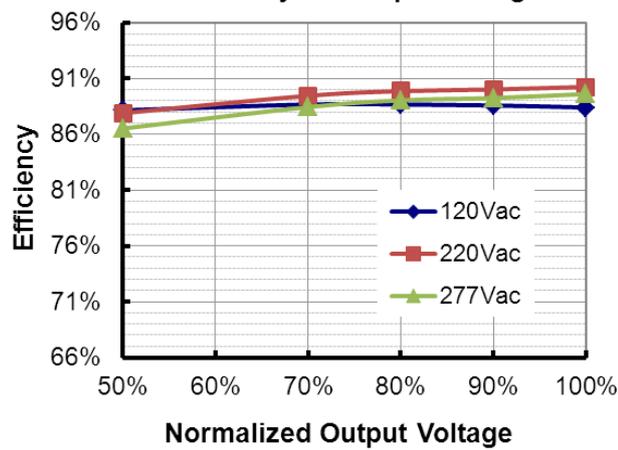
*EUC-052S045DT(ST)*

Efficiency vs. Output Voltage



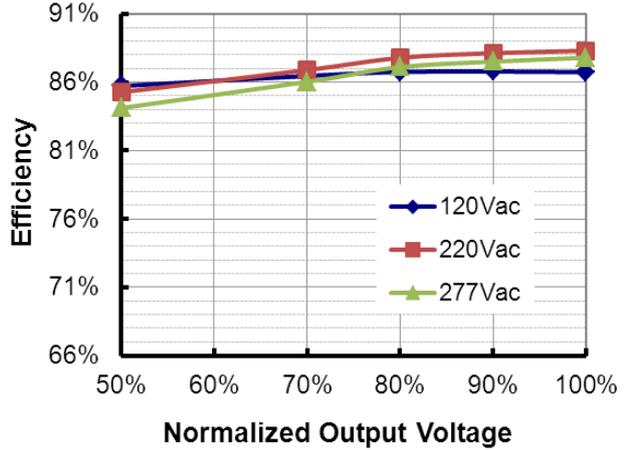
*EUC-052S070DT(ST)*

Efficiency vs. Output Voltage



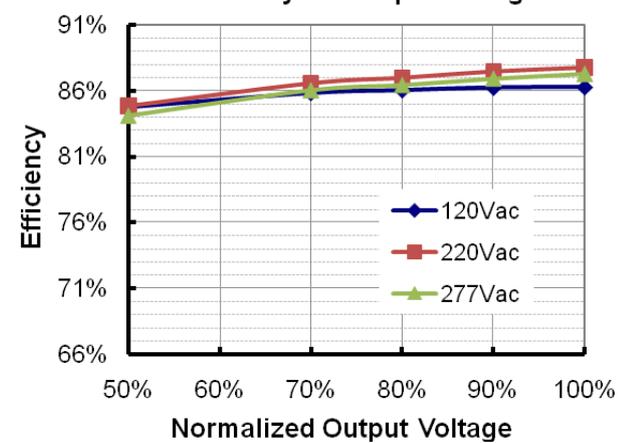
*EUC-052S105DT(ST)*

Efficiency vs. Output Voltage



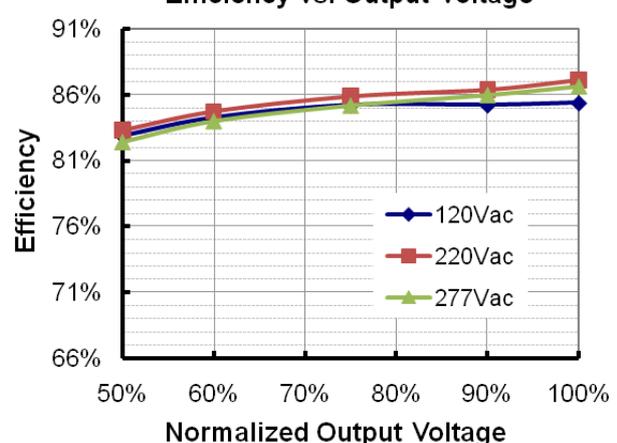
*EUC-052S140DT(ST)*

Efficiency vs. Output Voltage

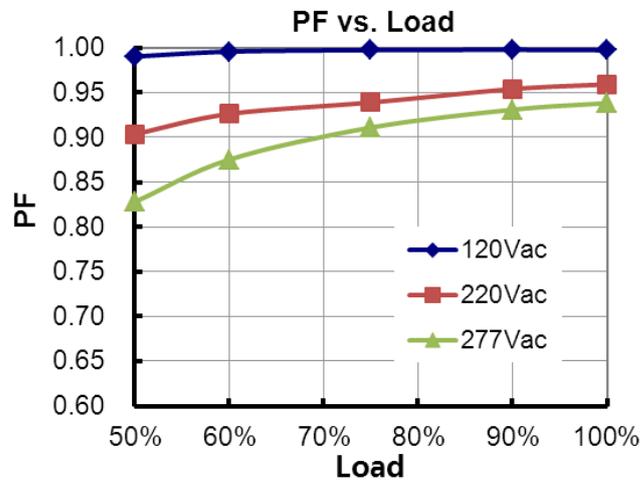


*EUC-052S210DT(ST)*

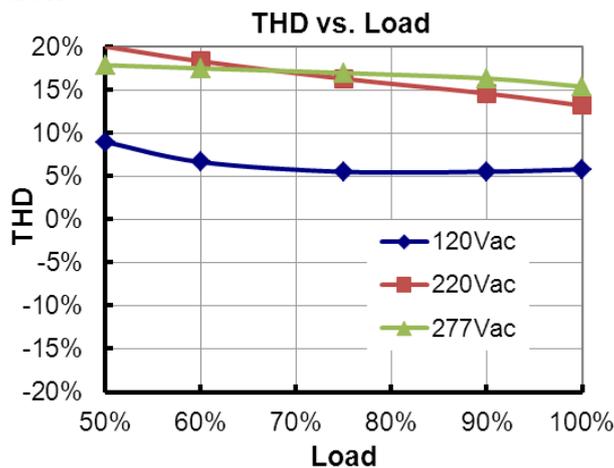
Efficiency vs. Output Voltage



## Power Factor



## Total Harmonic Distortion



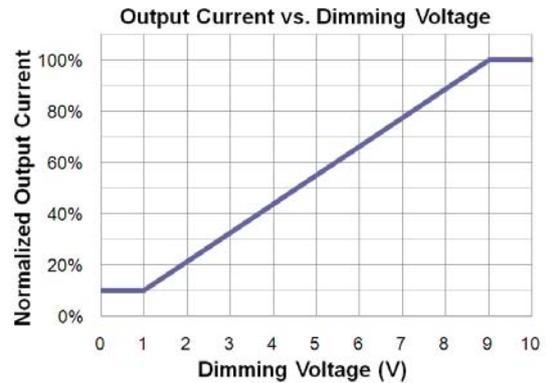
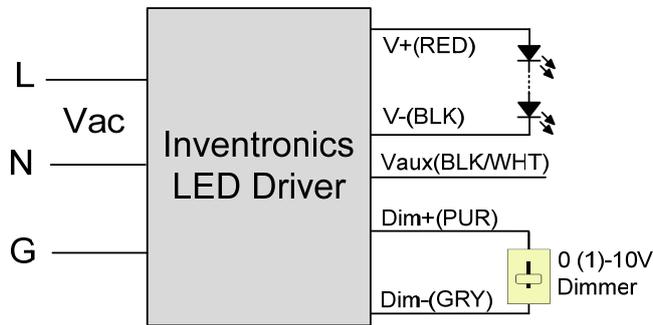
## Protection Functions

Parameter	Min.	Typ.	Max.	Notes
Over Voltage Protection				Limits output voltage at no load and in case the normal voltage limit fails.
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.
Over Temperature Protection				Auto Recovery. Returning to normal after over temperature is removed.

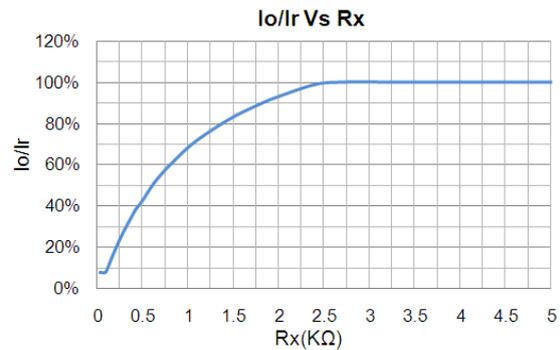
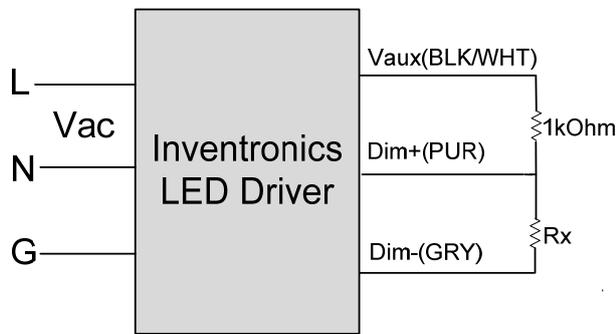
## Dimming (On secondary side)

### ● 0-10V Dimming

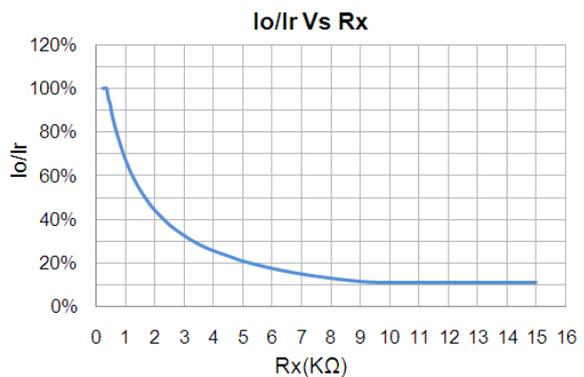
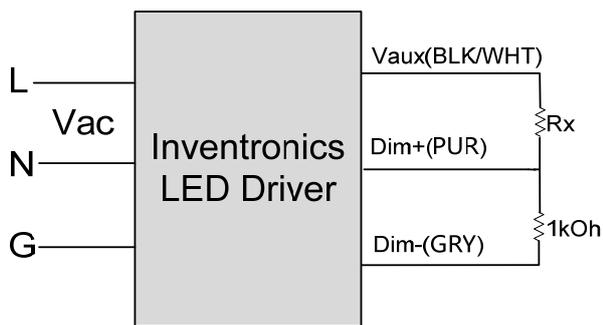
The dimmer control may be operated from either a dimmer or from an input signal of 0 - 10 Vdc. The recommended implementation is provided below.



**Implementation 1: DC Input**



**Implementation 2: External Resistor**



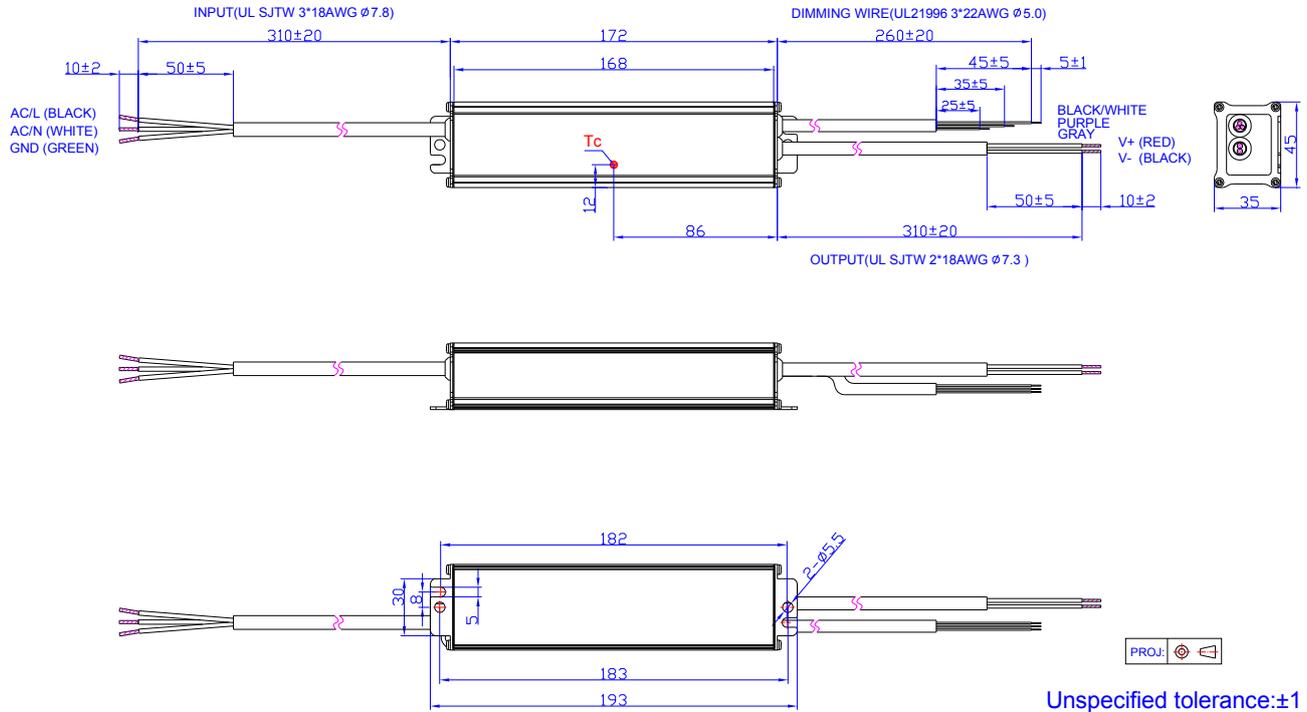
**Implementation 3: External Resistor**

**Notes:**

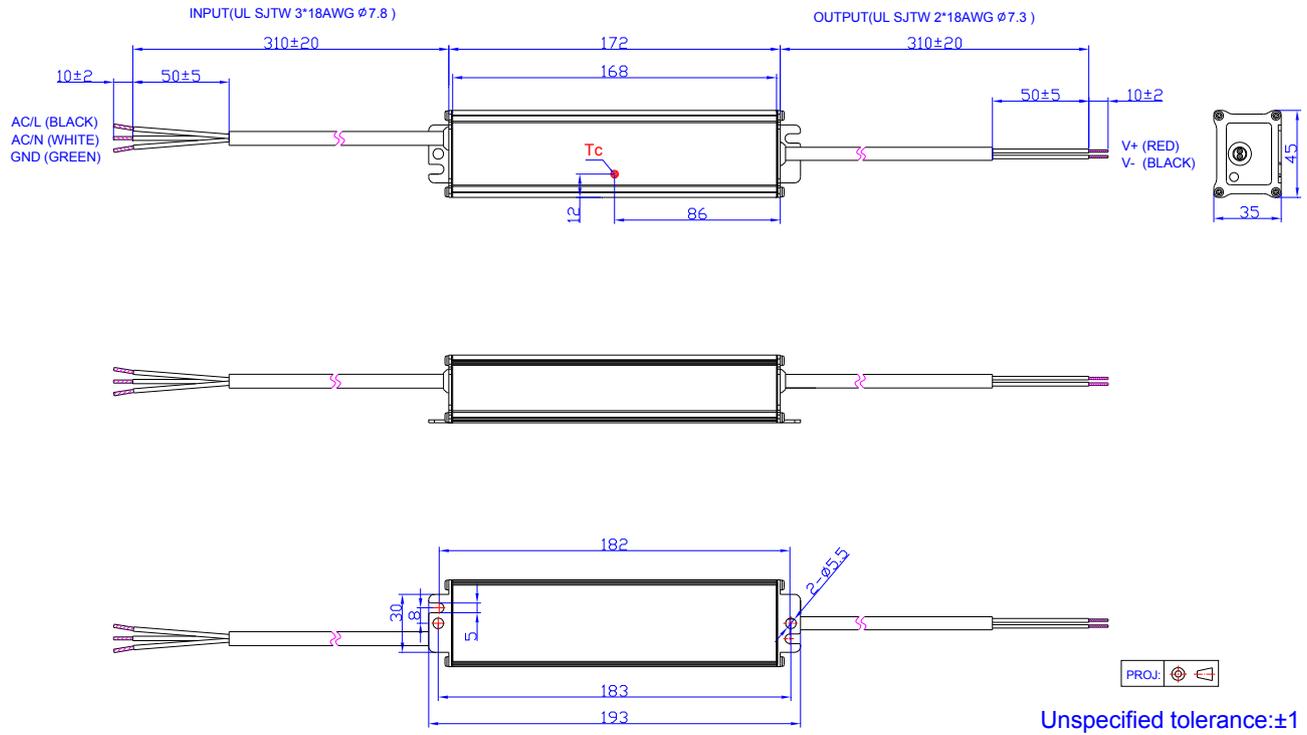
1. Do not connect the GND of dimming to the output; otherwise, the LED driver cannot work normally.
2. If 0-10V dimming is not used, Dim + can be either open or connected to Vaux.

## Mechanical Outline

### EUC-052SxxxDT



### EUC-052SxxxST



## **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
2012-02-20	A	Datasheet Released	/	/
2012-05-25	B	EN 61000-4-5--- line to line 4 kV, line to earth 6 kV	/	Corrected
		Life time	/	50,000 Hours
2012-06-06	C	Notes of life time	/	Updated
		Life time vs. Tc Curve	/	Added
2012-07-02	D	Description of OTP	/	Updated
2012-7-17	E	Max Case Temperature	/	Updated
		Mechanical Outline— wire length 320±20mm	/	Corrected
2012-7-30	F	Min Operating Temperature	-35°C	-40°C
2012-8-20	G	Derating Curve	/	Updated
		THD	/	Updated
		Min PF	/	Added
		Inrush Current(I <sup>2</sup> t)	/	Added
		Temperature co-efficient	/	Added
2012-11-09	H	Life time	Min 50,000hrs	Typical 93,300hrs
		Life time Curve	/	Updated
		Mechanical Outline	/	Updated
		THD Curve	/	Added
		Io/Ir Vs Rx Curve	/	Added
		EFF and PF Curve of other models	/	Added
2015-07-07	I	Warranty Tc_w	/	Added
		Inrush Current(I <sup>2</sup> t)	0.2 A <sup>2</sup> s	0.35 A <sup>2</sup> s
		Power Factor Characteristics	/	Updated
		Total Harmonic Distortion Curve	/	Updated
		Inrush Current Waveform	/	Added
		Dimming Control- Source Current on 0~10V Input Pin Max.	200 uA	250 uA
2016-04-18	J	Net Weight	480 g	520 g
		KS certificate Regulation	/	Added
		Note of EMI Standard	/	Added
2017-02-27	K	Dimensions (L × W × H)	172 × 42.4 × 34.0	172 × 45.0 × 35.0

## Revision History (Continued)

Change Date	Rev.	Description of Change		
		Item	From	To
2017-02-27	K	Mechanical Outline	/	Updated
2017-08-18	L	Features	/	Updated
		Description	/	Updated
		Dimming (On secondary side) - 0-10V Dimming - Implementation	/	Updated
		Mechanical Outline - EUC-052SxxxDT	/	Updated