

## Features

- High Efficiency (Up to 91%)
- Constant Current Output
- 0-10V Dimming Control
- Input Surge Protection: 4kV line-line, 6kV 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



## Description

The ETC-150SxxxDT(ST) series is a 150W, constant-current LED driver that operates from 312 ~ 528 Vac input with excellent power factor. It is created for many lighting applications including high bay, tunnel and roadway. 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

Output Current (1)	Input Voltage Range(2)	Output Voltage Range	Max. Output Power	Typical Efficiency (3)	Power Factor		Model Name
					347Vac	480Vac	
580 mA	312 ~ 528 Vac	129~258Vdc	150 W	91%	0.95	0.90	ETC-150S058DT(ST)
700 mA	312 ~ 528 Vac	107~214Vdc	150 W	91%	0.95	0.90	ETC-150S070DT(ST)
1050 mA	312 ~ 528 Vac	71~142 Vdc	150 W	90%	0.95	0.90	ETC-150S105DT(ST)
1400 mA	312 ~ 528 Vac	53~107 Vdc	150 W	90%	0.95	0.90	ETC-150S140DT(ST) <sup>(4)</sup>
2100 mA	312 ~ 528 Vac	36~71 Vdc	150 W	90%	0.95	0.90	ETC-150S210DT(ST) <sup>(4)</sup>
2800 mA	312 ~ 528 Vac	27~54 Vdc	150 W	90%	0.95	0.90	ETC-150S280DT(ST) <sup>(4)</sup>
3500 mA	312 ~ 528 Vac	21~43 Vdc	150 W	89%	0.95	0.90	ETC-150S350DT(ST) <sup>(4)</sup>
4200 mA	312 ~ 528 Vac	18~36 Vdc	150 W	89%	0.95	0.90	ETC-150S420DT(ST) <sup>(4)</sup>

- Notes:** (1) The output current is adjustable at factory from 50% to 100%.  
 (2) Certified input voltage range: 347-480Vac  
 (3) Measured at 100% load and 347 Vac input.  
 (4) SELV output

## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	312 Vac	-	528 Vac	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	1 mA	At 480Vac/60Hz input; grounding effectively

## Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Input AC Current	-	-	0.70 A	Measured at 100% load and 347 Vac input.
	-	-	0.42 A	Measured at 100% load and 480 Vac input.
Inrush Current(I <sup>2</sup> t)	-	-	0.15 A <sup>2</sup> s	At 480Vac input 25°C cold start, duration=1.5 ms, 10%Ipk-10%Ipk.
PF	0.90	-	-	At 347-480Vac, 50-60Hz, 75%-100% Load (112.5-150W)
THD	-	-	20%	

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%		5%	
Total Output Current Ripple (pk-pk)	-	5%Io	10%Io	At 100% load condition, 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	2%Io	-	At 100% load condition. Only this component of ripple is associated with visible flicker.
Startup Overshoot Current	-	-	10%Io	At 100% load condition.
No load Output Voltage				
Io = 580 mA	-	-	270 V	
Io = 700 mA	-	-	225 V	
Io = 1050 mA	-	-	155 V	
Io = 1400 mA	-	-	120 V	
Io = 2100 mA	-	-	85 V	
Io = 2800 mA	-	-	65 V	
Io = 3500 mA	-	-	50 V	
Io = 4200 mA	-	-	42 V	
Line Regulation	-	-	±1%	
Load Regulation	-	-	±3%	
Turn-on Delay Time	-	-	1.0 s	Measured at 347Vac and 480Vac input, 75%-100% Load
Temperature coefficient	-	0.03%/°C	-	Case temperature = 0°C ~Tc max

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

## Protection Functions

Parameter	Notes
Over Temperature Protection	Decreases output current, returning to normal after over temperature is removed.
Short Circuit Protection	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.

## General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 347 Vac input: $I_o = 580 \text{ mA}$ $I_o = 700 \text{ mA}$ $I_o = 1050 \text{ mA}$ $I_o = 1400 \text{ mA}$ $I_o = 2100 \text{ mA}$ $I_o = 2800 \text{ mA}$ $I_o = 3500 \text{ mA}$ $I_o = 4200 \text{ mA}$	90% 90% 89% 89% 89% 89% 88% 88%	91% 91% 90% 90% 90% 90% 89% 89%	- - - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 1.0% lower if measured immediately after startup.)
Efficiency at 480 Vac input: $I_o = 580 \text{ mA}$ $I_o = 700 \text{ mA}$ $I_o = 1050 \text{ mA}$ $I_o = 1400 \text{ mA}$ $I_o = 2100 \text{ mA}$ $I_o = 2800 \text{ mA}$ $I_o = 3500 \text{ mA}$ $I_o = 4200 \text{ mA}$	89% 89% 88% 88% 88% 88% 87% 87%	90% 90% 89% 89% 89% 89% 88% 88%	- - - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 1.0% lower if measured immediately after startup.)
MTBF	-	250,000 hours	-	Measured at 480Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	145,700 hours	-	Measured at 480Vac input, 80%Load and 60°C Case temperature; See life time vs. Tc curve for the details
Operating Case Temperature for Safety Tc_s	-40°C	-	+90°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)	7.40 x 3.70 x 1.71 188 x 93.9 x 43.5			With mounting ear 8.74x 3.70 x 1.71 222x 93.9 x 43.5
Net Weight	-	1420 g	-	

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

## Safety & EMC Compliance

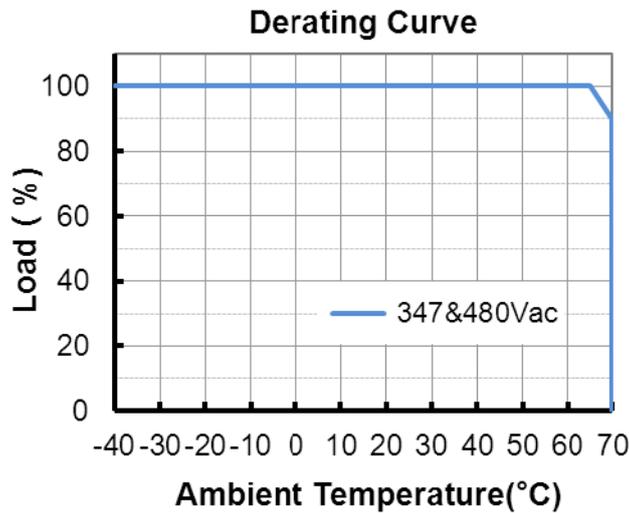
Safety Category	Standard
UL/CUL	UL 8750, CAN/CSA-C22.2 No. 250.13
EMI Standard	Notes
FCC Part 15 <sup>(1)</sup>	ANSI C63.4 Class B This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired Operation.
EMS Standard	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

## Safety & EMC Compliance (Continued)

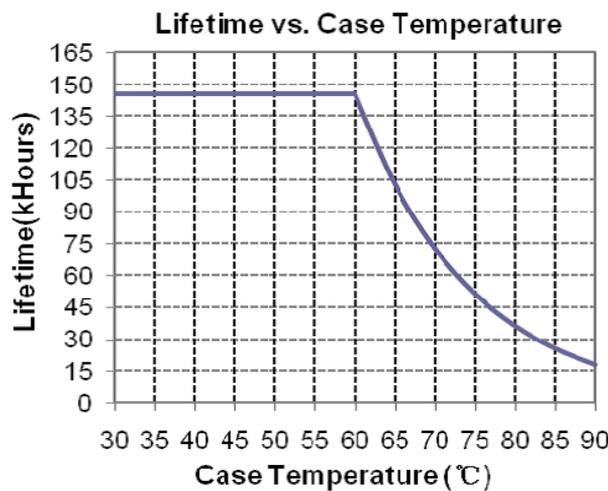
EMS Standard	Notes
EN 61000-4-4	Electrical Fast Transient / Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: line to line 4 kV, line to earth 6 kV
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips
EN 61547	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.

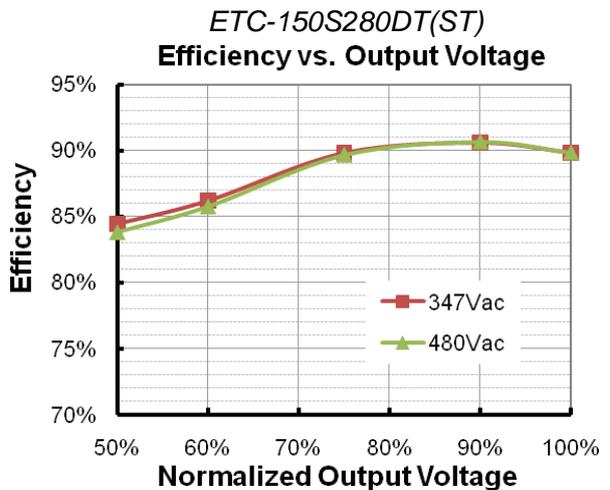
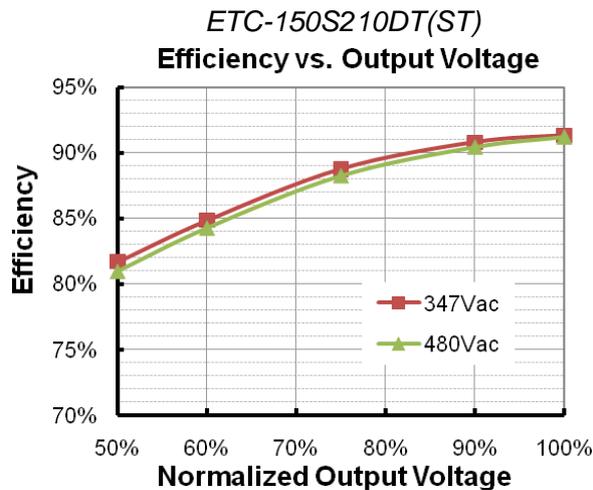
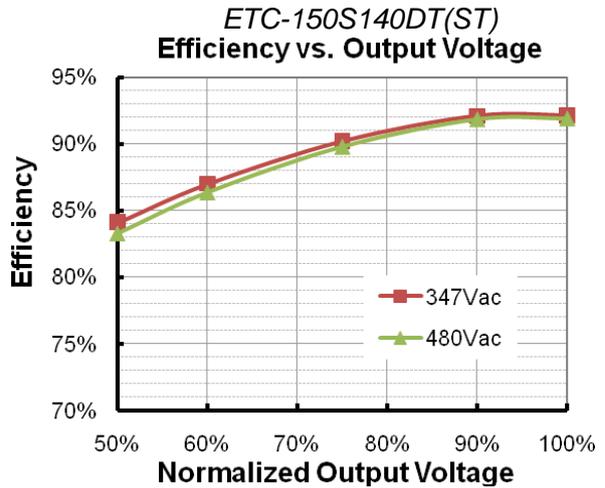
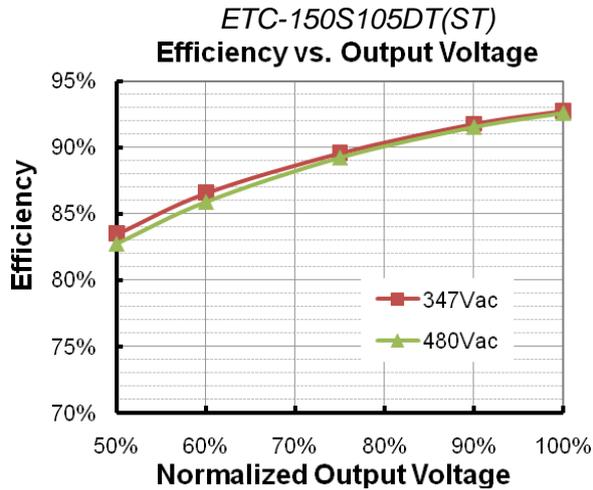
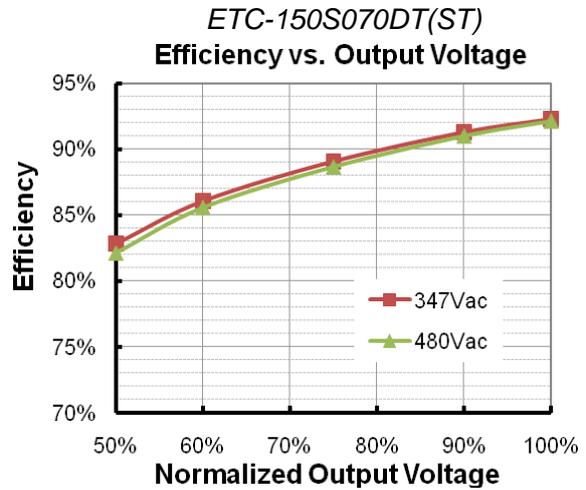
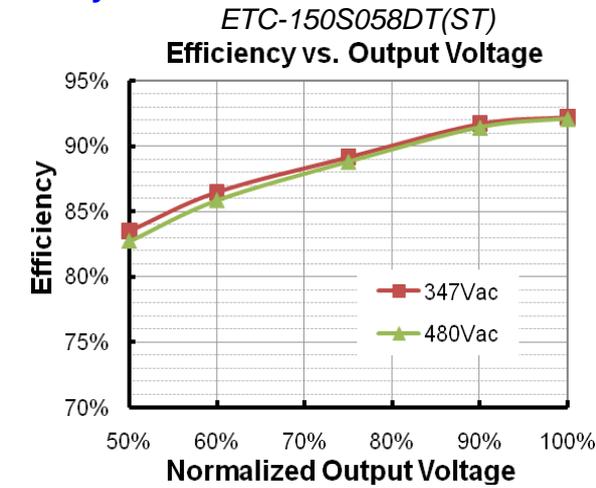
## Derating Curve

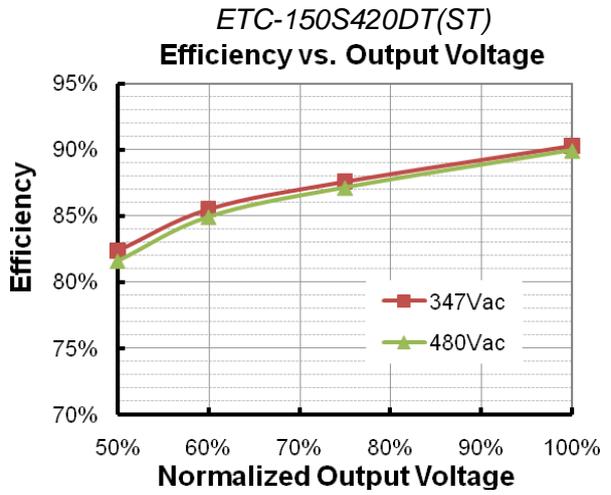
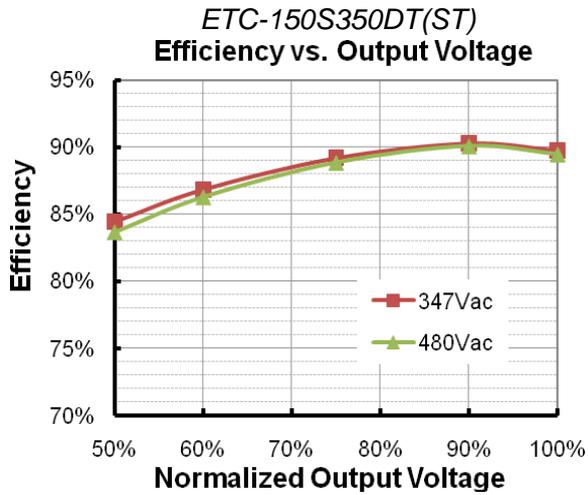


## Lifetime vs. Case Temperature Curve

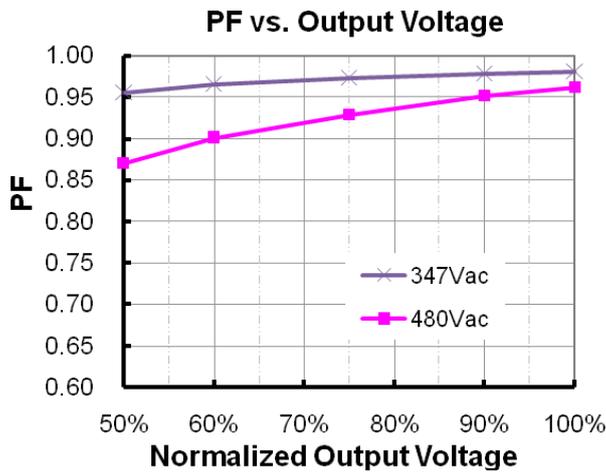


## Efficiency vs. Load

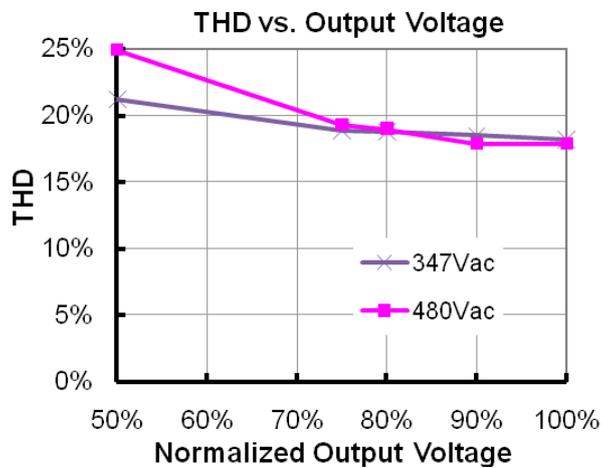




### Power Factor Characteristics



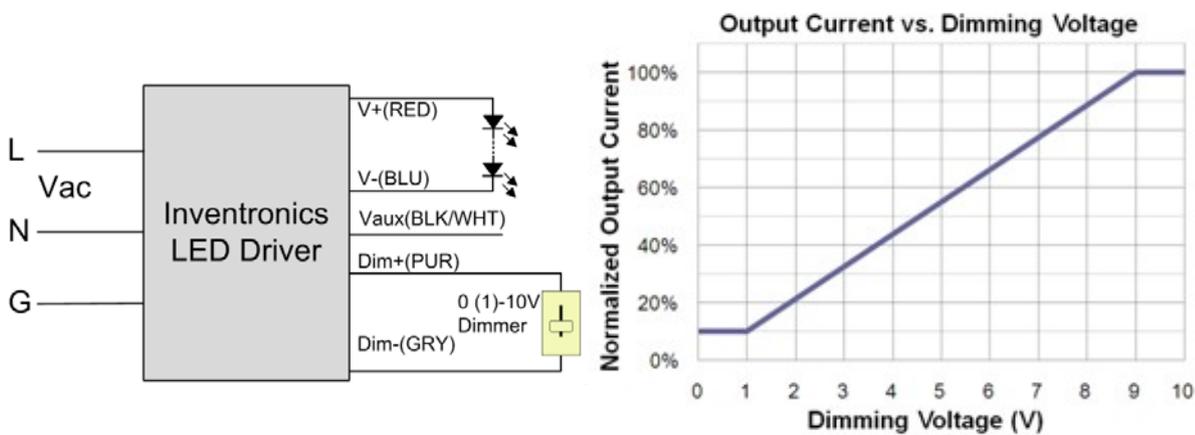
### Total Harmonic Distortion Curve



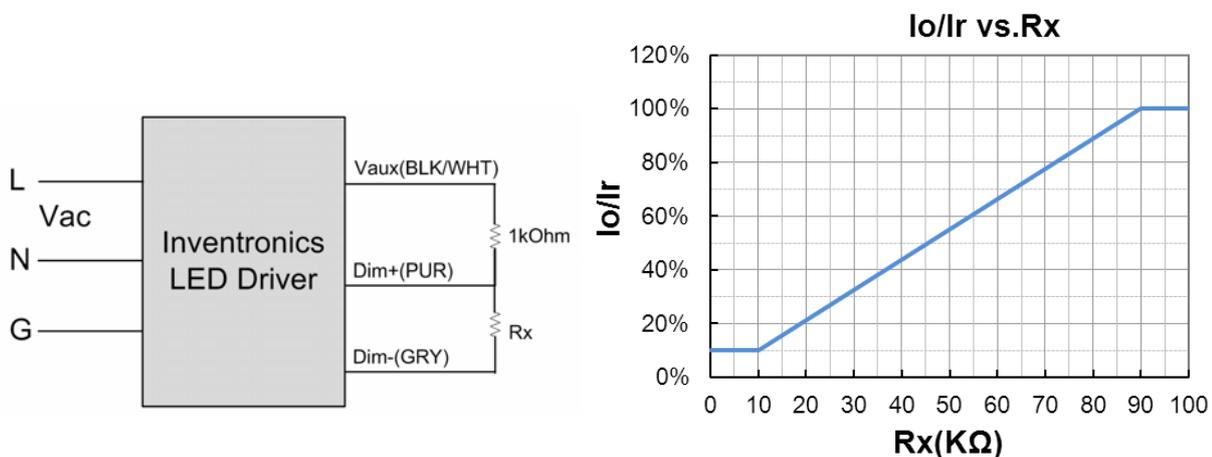
## Dimming Control (On secondary side)

Parameter	Min.	Typ.	Max.	Notes
12V output voltage	10.8 V	12 V	13.2 V	
12V output source current	0 mA	-	20 mA	
Absolute maximum voltage on the 0~10V input pin	-20 V	-	20 V	
Source current on 0~10V input pin	100 uA	140 uA	180 uA	

The dimmer control is operated from an input signal of 1 – 10 Vdc. Recommended implementations are provided below.



Implementation 1: DC Input



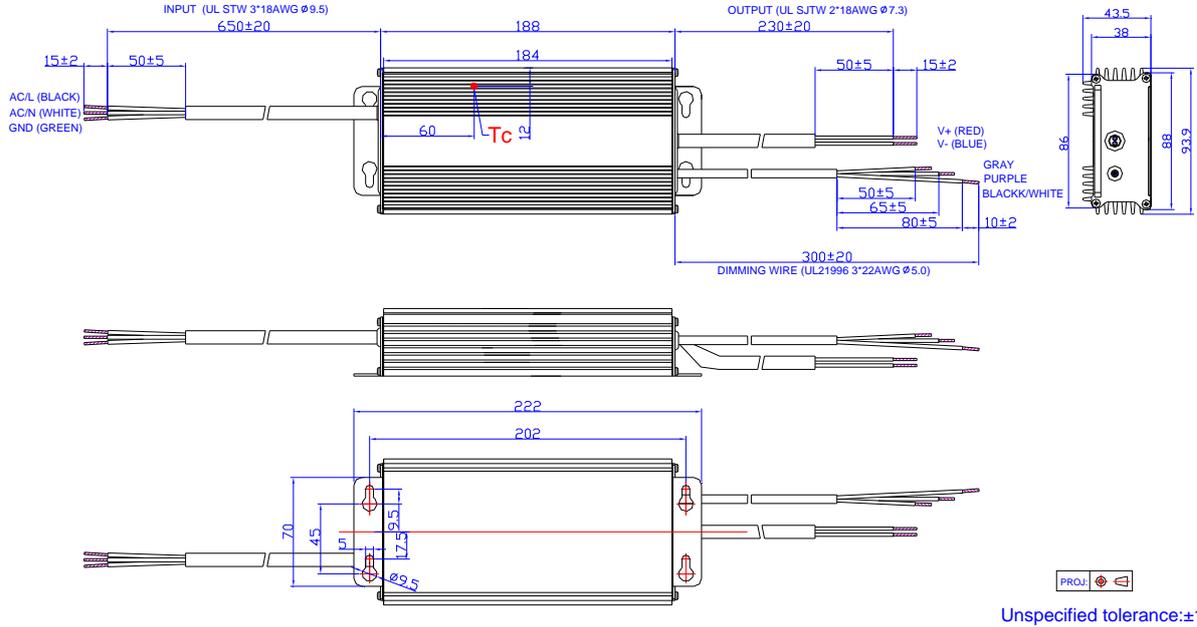
Implementation 2: External Resistor

**Notes:**

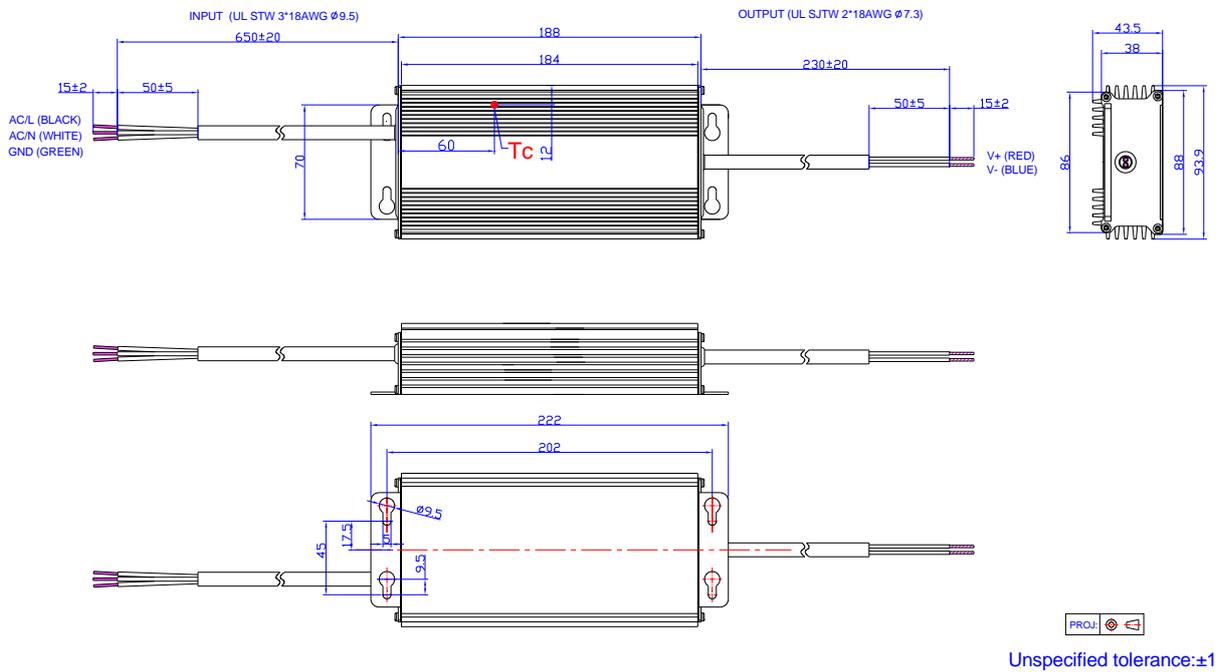
1.  $I_o$  is actual output current and  $I_r$  is rated current without dimming control.
2. For the driver to operate properly, the load voltage must be maintained above the minimum voltage threshold (approx. 50% of the max. output voltage for any given model)
3. If the output voltage is maintained above 50% of the maximum output voltage, the dimming control may be operated over the entire 1-10V range with output current varying from 10% to 100% of  $I_r$ .
4. The dimming signal is allowed to be less than 1V, however, when it is used between 0-1V, the output current is 10% $I_r$ .
5. Do not connect the GND of dimming to the output; otherwise, the LED driver will not work normally.
6. If 0-10V dimming is not used, Dim + can be either open or connected to Vaux.

## Mechanical Outline

### ETC-150SxxxDT



### ETC-150SxxxST



## 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
2012-12-31	A	Datasheets Release	/	/
2013-03-06	B	Io /Ir vs.Rx Curve	/	Added
2013-12-19	C	Mechanical Outline	/	Corrected
2015-11-09	D	Format	/	Updated
		Features	/	Updated
		Description	/	Updated
		Input Specifications	/	Updated
		Output Specifications	Total Output Current Ripple (pk-pk)	Added
		Output Specifications	Output Current Ripple at < 200 Hz (pk-pk)	Added
		General Specifications	Case Temperature	Operating Case Temperature for Safety Tc_s
		General Specifications	Operating Case Temperature for Warranty Tc_w	Added
		Safety & EMC Compliance	/	Updated
2015-11-09	D	Protection Functions	/	Updated
		Dimming Control (On secondary side)	/	Updated
2017-07-26	E	Features	/	Updated
		Input Specifications	PF/ THD	Updated
		Output Specifications	Turn-on Delay Time	Updated
		Output Specifications	Temperature coefficient	Updated
		General Specifications	Storage Temperature	Added
		General Specifications	With mounting ear	Added
		Environmental Specifications	/	Delete
		Safety & EMC Compliance	/	Updated
		Mechanical Outline	/	Updated
2019-02-28	F	Description	/	Updated
		General Specifications - Net Weight	1300g	1420g