

Features

- Ultra High Efficiency (Up to 94.5%)
- High Power Factor (0.99 Typical)
- Constant Voltage Output
- Lightning Protection
- All-Around Protection: SCP, OTP, OVP, OCP
- Suitable for UL Dry / Damp / Wet Location
- TYPE HL, for use in a Class I, Division 2 hazardous (Classified) location



Description

The ETV-500SxxxST series is a 500W, constant-voltage LED driver that operates from 312-528 Vac input with excellent power factor. It is created for many lighting applications including high bay, high mast and roadway, etc. The high efficiency of these drivers enables them to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against short circuit, over temperature, over voltage, and over current.

Models

Output Voltage	Input Voltage Range	Output Current Range	Max. Output Power	Typical Efficiency (1)	Power Factor		Model Number
					347Vac	480Vac	
24 Vdc	312~ 528 Vac	0~20 A	480 W	93.5%	0.99	0.96	ETV-500S024ST
28 Vdc	312~ 528 Vac	0~17.85 A	500 W	94.0%	0.99	0.96	ETV-500S028ST
36 Vdc	312~ 528 Vac	0~13.88 A	500 W	94.5%	0.99	0.96	ETV-500S036ST
42 Vdc	312~ 528 Vac	0~11.90 A	500 W	94.5%	0.99	0.96	ETV-500S042ST
48 Vdc	312~ 528 Vac	0~10.41 A	500 W	94.5%	0.99	0.96	ETV-500S048ST

Notes: Measured at 100% load and 480 Vac input.

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	312 Vac	-	528 Vac	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 mA	At 480Vac/60Hz input; grounding effectively
Input AC Current	-	-	1.75 A	Measured at 100% load and 347 Vac input.
	-	-	1.25 A	Measured at 100% load and 480 Vac input.
Inrush Current(I ² t)	-	-	11.6 A ² s	At 480Vac input 25°C Cold start, Duration= 0.84 ms, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.
PF	0.90	-	-	Measured at 347-480Vac, 50-60Hz, 75%-100% load (375-500W)
THD	-	-	20%	

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Voltage Tolerance	-5%Vo	-	5%Vo	At 100% load condition
Output Voltage Ripple(pk-pk)	-	-	2%Vo	At 100% load condition
Startup Overshoot Voltage	-	-	5%Vo	At 100% load condition
Line Regulation	-	-	±0.5%	Measured at 100% load
Load Regulation	-	-	±1.0%	
Turn-on Delay Time	-	-	3.0 s	Measured at 347Vac and 480Vac input.
Temperature Coefficient of Vo	-	0.03%/°C	-	Case temperature = 0°C ~Tc max

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 347 Vac input: Vo = 24 V Vo = 28 V Vo = 36 V Vo = 42 V Vo = 48 V	91.0% 91.5% 92.0% 92.0% 92.0%	93.0% 93.5% 94.0% 94.0% 94.0%	- - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Efficiency at 480 Vac input: Vo = 24 V Vo = 28 V Vo = 36 V Vo = 42 V Vo = 48 V	91.5% 92.0% 92.5% 92.5% 92.5%	93.5% 94.0% 94.5% 94.5% 94.5%	- - - - -	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	-	215,000 Hours	-	Measured at 480Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	119,000 Hours	-	Measured at 480Vac input, 80%Load and 60°C case temperature; See lifetime vs. Tc curve for the details
Operating Case Temperature for Safety Tc_s	-40°C	-	+86°C	
Operating Case Temperature for Warranty Tc_w	-40°C	-	+70°C	Case temperature for 5 years warranty
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 100%RH
Dimensions Inches (L × W × H) Millimeters (L × W × H)	10.4 × 4.25 × 1.8 264 × 108 × 45.5			With mounting ear 11.46 × 4.25 × 1.8 291 × 108 × 45.5
Net Weight	-	2750 g	-	

Safety & EMC Compliance

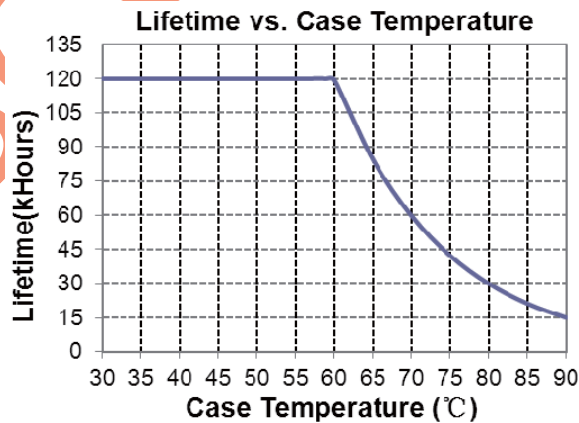
Safety Category	Standard
UL/CUL	UL8750,CAN/CSA-C22.2 No. 250.13
CE	EN 61347-1, EN 61347-2-13
EAC	ГОСТ Р МЭК 61347-1, ГОСТ IEC 61347-2-13

Safety & EMC Compliance(Continued)

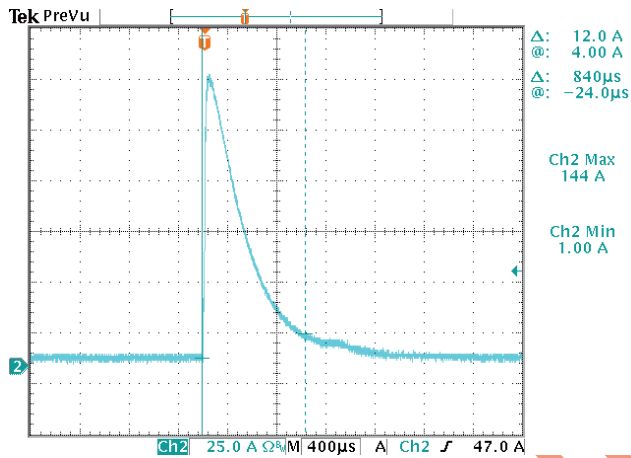
EMI Standards	Notes
EN 55015 ⁽¹⁾	Conducted emission Test & Radiated emission Test
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
FCC Part 15 ⁽¹⁾	ANSI C63.4 Class B
	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired Operation.
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient / Burst-EFT: level 3, criteria A
EN 61000-4-5	Surge Immunity Test: AC Power Line: Differential Mode 4 kV, Common Mode 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

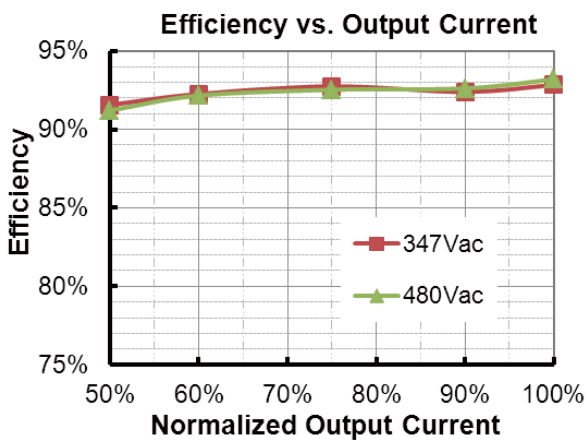


Inrush Current Waveform

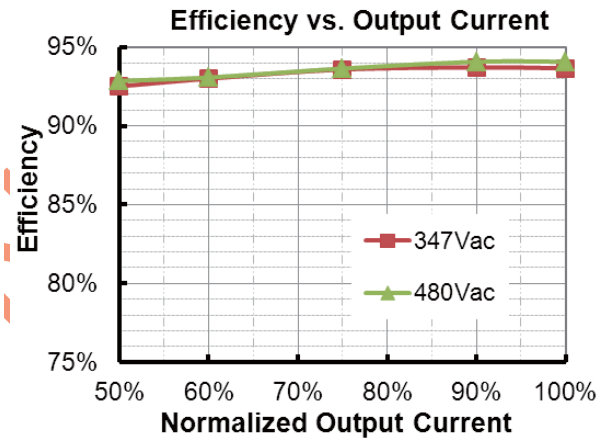


Efficiency vs. Load

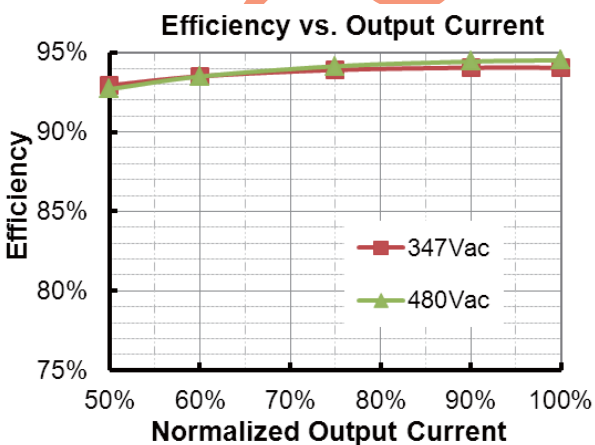
ETV-500S024ST



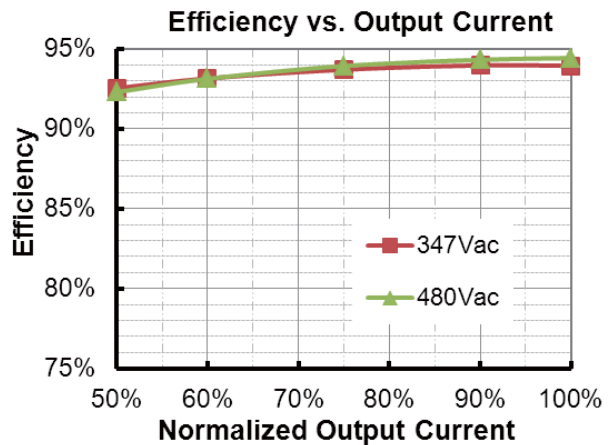
ETV-500S028ST



ETV-500S036ST

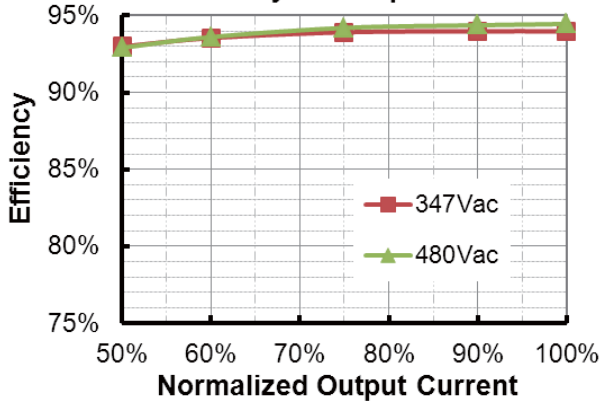


ETV-500S042ST



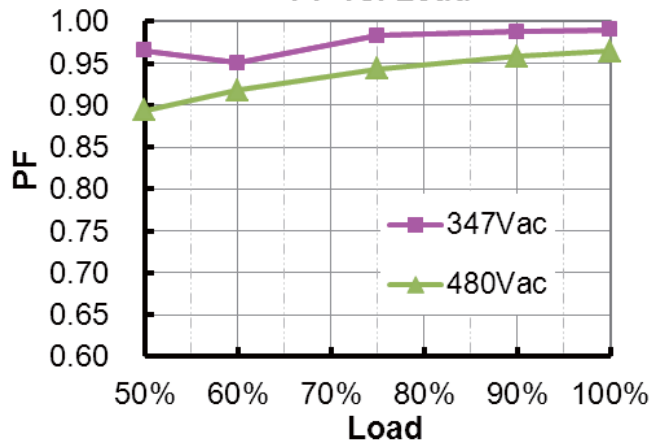
ETV-500S048ST

Efficiency vs. Output Current



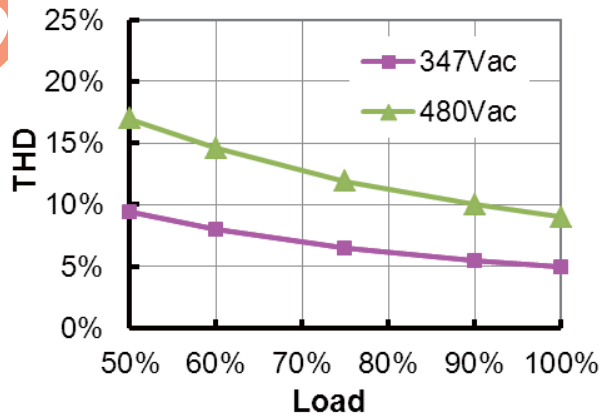
Power Factor

PF vs. Load



Total Harmonic Distortion

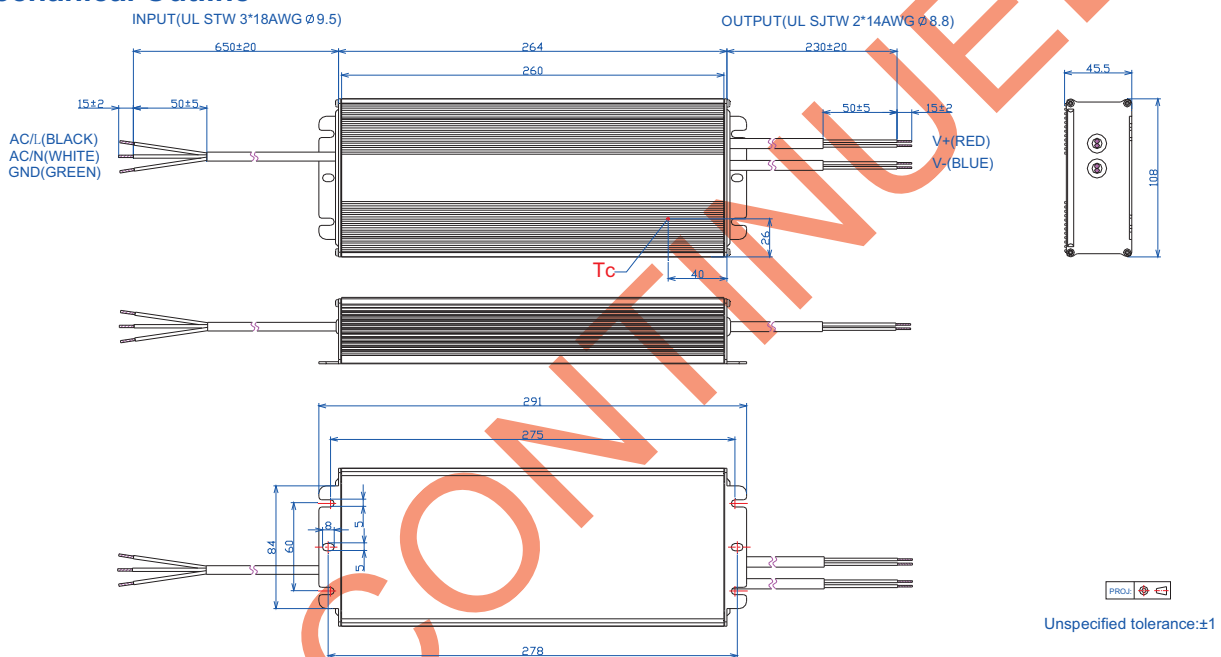
THD vs. Load



Protection Functions

Parameter	Min.	Typ.	Max.	Notes
Over Current Protection	110%I _O	160%I _O	200%I _O	Hiccup mode. The power supply shall be self-recovery when the fault condition is removed.
Over Temperature Protection	Auto recovery. The power supply shall be self-recovery after the case temperature becomes normal.			
Short Circuit Protection	Hiccup mode. The power supply shall be self-recovery when the fault condition is removed.			
Over Voltage Protection	Latch mode. The power supply shall return to normal operation only after the power is turn-on again.			

Mechanical Outline



RoHS Compliance

Our products comply with reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU, calling for the elimination of lead and other hazardous substances from electronic products.

Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2014-09-30	A	Datasheets Release	/	/
2019-03-18	B	Header	Outdoor	IP67
		CE		Added
		EAC		Added
		Description	/	Updated
		Models	Note(2)	Delet
		Input Specifications -Leakage Current	/	Updated
		Input Specifications-PF/THD	50-60Hz	Added
		General Specifications - Net Weight	2500g	2750g
		General Specifications	/	Updated
		Environmental Specifications	/	Delet
2020-01-18	C	Safety &EMC Compliance	EAC	Updated
		Safety &EMC Compliance	EN 55015 ⁽¹⁾	Added
		Safety &EMC Compliance	EN 61000-3-2	Added
		Safety &EMC Compliance	EN 61000-3-3	Added
		Safety &EMC Compliance	FCC	Updated
		Safety &EMC Compliance	EN 61000-4-5	Updated
		Derating	/	Deleted
		Mechanical Outline	/	Updated
		RoHS Compliance	/	Updated
		Format	Page footer	Updated