Features

- Ultra High Efficiency (Up to 95.0%)
- Constant Voltage Output
- Input surge protection: 4kV line-line, 6kV line-earth
- All-Around Protection: SCP, OTP, OVP, OCP
- Waterproof (IP67) and UL Dry / Damp / Wet Location
- SELV Output
- TYPE HL, for use in a Class I, Division 2 hazardous (Classified) location

E328335

Description

The *EBV-500SxxxST* series is a 500W, constant-voltage outdoor LED driver that operates from 176-305 Vac input with excellent power factor. It is created for high bay, high mast, arena and roadway lights. 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 input surge, output short circuit, over temperature, over voltage, and over current.

Models

Output Voltage	Input Voltage Range(1)	Output Current Range	Max. Output Power	Typical Efficiency (2)	Power Factor		Model Number (3)
					220Vac	277Vac	
24 Vdc	176 ~ 305 Vac	0~20.83 A	500 W	94.0%	0.99	0.96	EBV-500S024ST
28 Vdc	176 ~ 305 Vac	0~17.85 A	500 W	94.0%	0.99	0.96	EBV-500S028ST
36 Vdc	176 ~ 305 Vac	0~13.88 A	500 W	94.5%	0.99	0.96	EBV-500S036ST
42 Vdc	176 ~ 305 Vac	0~11.90 A	500 W	95.0%	0.99	0.96	EBV-500S042ST
48 Vdc	176 ~ 305 Vac	0~10.41 A	500 W	95.0%	0.99	0.96	EBV-500S048ST

Notes: (1) UL, FCC certified input voltage range: 200-277Vac; other certified input voltage range except UL & FCC:200-240Vac
(2) Measured at full load and 277 Vac input.
(3) SELV output

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	176 Vac	-	305 Vac	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 MIU	UL8750; 277Vac/ 60Hz, grounding effectively
	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz, grounding effectively
Input AC Current	-	-	2.75 A	Measured at full load and 220 Vac input.
Inrush Current(I^2t)	-	-	1.6 A^2s	At 220Vac input 25℃ Cold start, Duration= 3.26 ms, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.

Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
PF	0.90	-	-	At 200-277Vac, 75%-100% Load (375-500W)
THD	-	-	20%	

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Voltage Tolerance	-5%Vo	-	5%Vo	At full load condition
Output Voltage Ripple(pk-pk)	-	-	2%Vo	At full load condition, 20 MHz BW
Startup Overshoot Voltage	-	-	5%Vo	At full load condition
Line Regulation	-	-	±0.5%	Measured at full load
Load Regulation	-	-	±1.0%	
Turn-on Delay Time	-	-	2.0 s	Measured at 220Vac and 277Vac input.
Temperature Coefficient of Vo	-	-	0.03%/°C	Case temperature = 0°C ~Tc max

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

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 220 Vac input: V_O = 24 V V_O = 28 V V_O = 36 V V_O = 42 V V_O = 48 V	 91.5% 91.5% 92.0% 92.5% 92.5%	 93.5% 93.5% 94.0% 94.5% 94.5%	 - - - - -	Measured at full load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Efficiency at 277 Vac input: V_O = 24 V V_O = 28 V V_O = 36 V V_O = 42 V V_O = 48 V	 92.0% 92.0% 92.5% 93.0% 93.0%	 94.0% 94.0% 94.5% 95.0% 95.0%	 - - - - -	Measured at full load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
MTBF	-	232,000 Hours	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	117,000 Hours	-	Measured at 220Vac 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	-	+90°C	
Operating Case Temperature for Warranty Tc_w	-40°C		+70°C	
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			
Net Weight	-	2500 g	-	

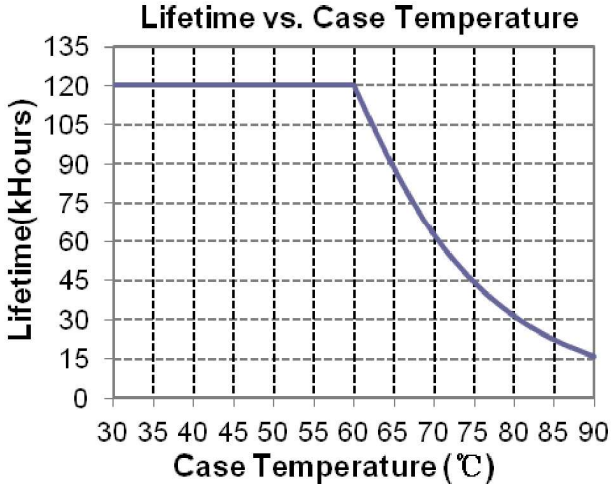
Note: All specifications are typical at 25°C unless otherwise stated.

Safety & EMC Compliance

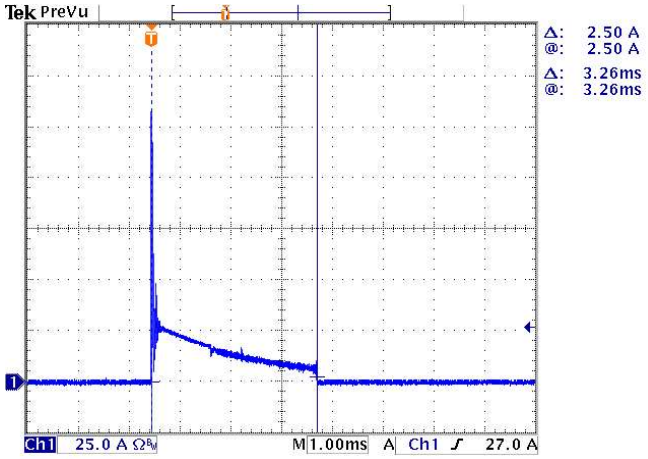
Safety Category	Standard
UL/CUL	UL 8750, CAN/CSA-C22.2 No. 250.13-12
CE	EN 61347-1, EN61347-2-13
EMI Standards	**Notes**
EN 55015	Conducted emission Test & Radiated emission Test
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
FCC Part15	ANSI C63.4:2009 Class B
	This 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 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**: 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.

Lifetime vs. Case Temperature

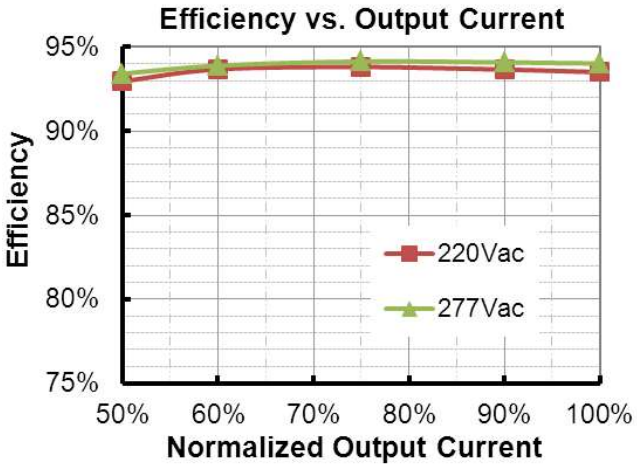


Inrush Current Waveform

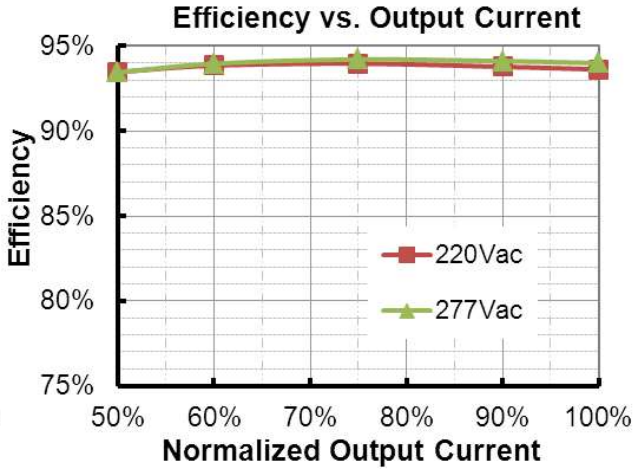


Efficiency vs. Load

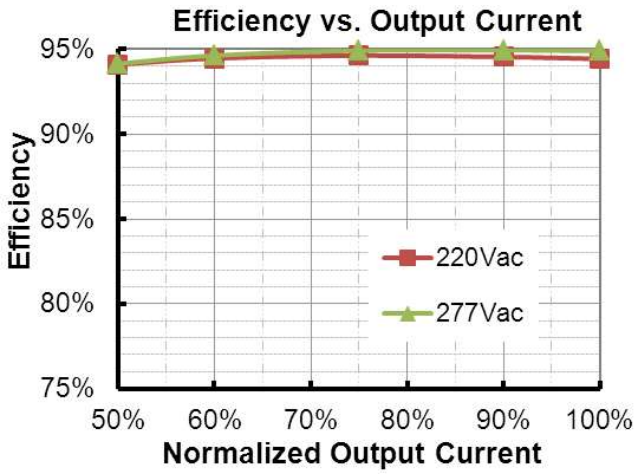
EBV-500S024ST



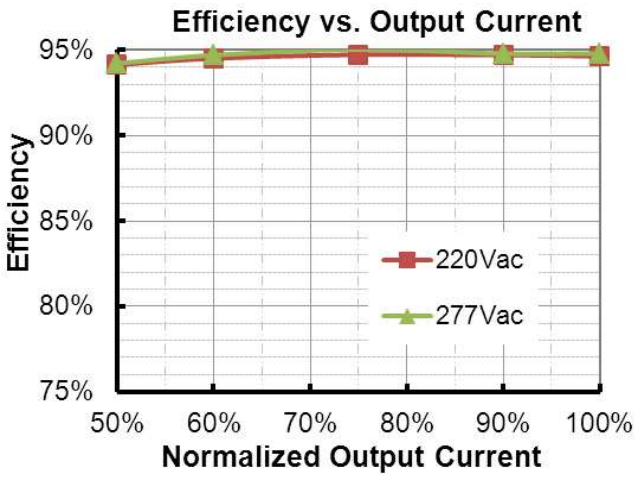
EBV-500S028ST



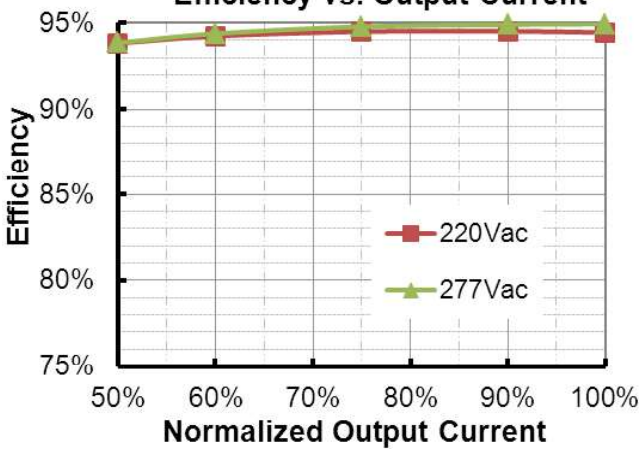
EBV-500S036ST



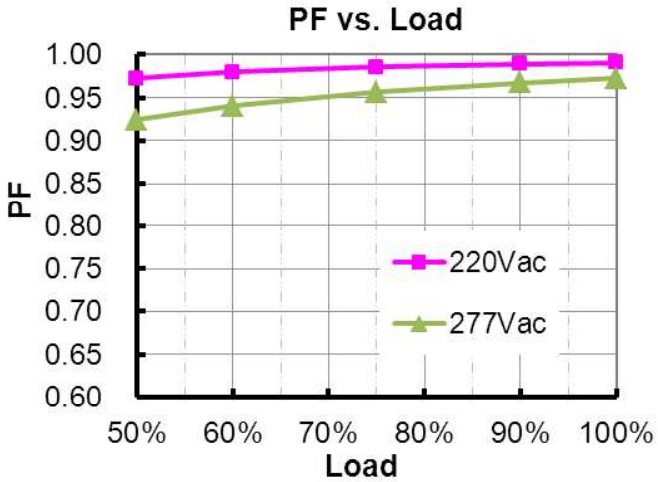
EBV-500S042ST



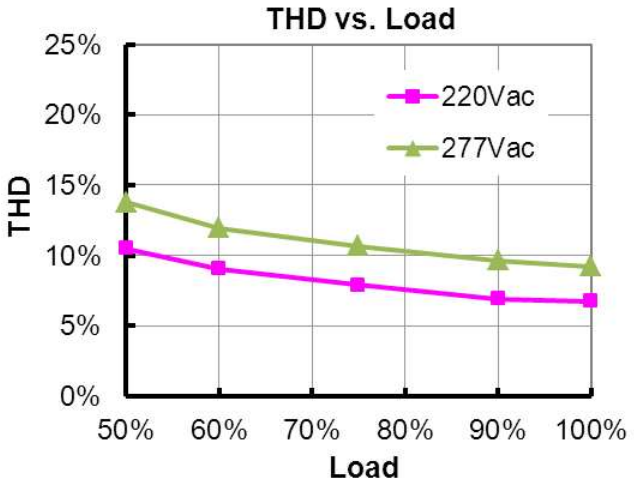
EBV-500S048ST



Power Factor



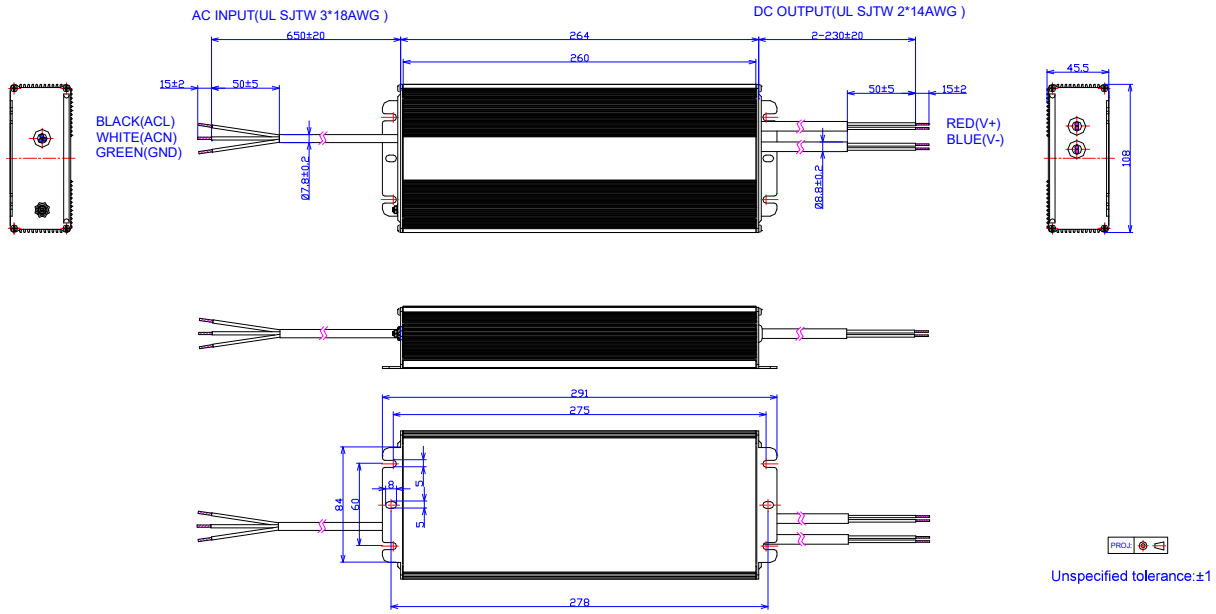
Total Harmonic Distortion



Protection Functions

Parameter	Min.	Typ.	Max.	Notes
Over Current Protection	110% I_O	145% I_O	180%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 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
2014-09-30	A	Datasheets Release	/	/
2015-5-28	B	Features	/	Update
		Description	/	Update
		Models	/	Update
		Input Specifications	Leakage Current	Update
		General Specifications	Case Temperature	Operating Case Temperature for Safety Tc_s
		General Specifications	Operating Case Temperature for Warranty Tc_w	Added
		General Specifications	Storage Temperature	
		Environmental Specifications	/	Delete
		Derating	/	Delete
		Safety & EMC Compliance	UL/CUL	Update
2015-11-27	C	CE	/	Added
		External Grounding Screw Solution	/	/
		Safety & EMC Compliance	/	Update
		Mechanical Outline	/	Update