

Features

- High Efficiency (up to 91.5%)
- Constant Voltage Output
- Input Surge Protection: DM 4kV, CM 6kV
- All-Around Protection: OCP, OVP, OTP, SCP
- Waterproof (IP67)
- SELV Output
- 5 Years Warranty



Description

The EBV-060SxxxSVF series is a 60W, constant-voltage IP67 LED driver that operates from 176-305 Vac input with excellent power factor. It is created for many lighting applications including architectural, decorative and signage, etc. The high efficiency of the driver and compact 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, over current, output over voltage, short circuit, and over temperature.

Models

Output Voltage	Input Voltage Range(1)	Output Current Range	Max. Output Power(2)	Typical Efficiency (3)	Power Factor	Model Number
					220Vac	
24 V	176 ~ 305 Vac 190 ~ 250 Vdc	0 ~ 2.5 A	60 W	88.5%	0.96	EBV-060S024SVF
36 V	176 ~ 305 Vac 190 ~ 250 Vdc	0 ~ 1.7 A	60 W	89.5%	0.96	EBV-060S036SVF
48 V	176 ~ 305 Vac 190 ~ 250 Vdc	0 ~ 1.25 A	60 W	91.5%	0.96	EBV-060S048SVF

Notes: (1) CCC certified input voltage range: 220/230/240 Vac; other certified input voltage range except CCC: 200-240 Vac.

(2) Operating input voltage range: 90-305Vac, and 90-176Vac is for safety operation (see below “Derating” curve for details)

(3) Measured at 100% load and 220Vac input (see below “General Specifications” for details).

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	176 Vac	-	305 Vac	190 ~ 250 Vdc
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz
Input AC Current	-	-	0.34 A	Measured at 100% load and 220Vac input.
Inrush Current(I ² t)	-	-	0.03 A ² s	At 220Vac input, 25°C cold start, duration=1.6 μs, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.
PF	0.9	-	-	At 220-240Vac, 50-60Hz, 75%-100% load(45~60W)
THD	-	-	10%	

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Voltage Tolerance	-5%Vo	-	5%Vo	At 100% load condition
Total Output Voltage Ripple (pk-avg)				At 0% - 100% load condition. Measured by 20 MHz bandwidth oscilloscope and the output paralleled a 0.1µF ceramic capacitor and a 47µF electrolytic capacitor.
EBV-060S024SVF	-	-	2.0 V	
EBV-060S036SVF	-	-	2.5 V	
EBV-060S048SVF	-	-	2.5 V	
Startup Overshoot / Undershoot	-	-	5%Vo	At 100% load condition
Line Regulation	-	-	±1%	Measured at 100% load
Load Regulation	-	-	±3%	
Turn-on Delay Time	-	-	0.5 s	Measured at 220Vac input, 100% load
Load Dynamic Response	Output Deviation	-	8%Vo	R/S: 1 A/µs Load: 25% ~ 100% load
	Settling Time	-	10 ms	
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 220Vac input:				Measured at 100% load and steady-state temperature in 25°C ambient;
EBV-060S024SVF	86.5%	88.5%	-	
EBV-060S036SVF	87.5%	89.5%	-	
EBV-060S048SVF	89.5%	91.5%	-	
MTBF	-	1171,000 Hours	-	Measured at 220Vac input, 80%load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	99,000 Hours	-	Measured at 220Vac input, 80%load and 70°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	-	+75°C	Case temperature for 5 years warranty. Humidity: 10% RH to 100% RH.
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 100%RH
Dimensions				
Inches (L × W × H)	6.46 x 1.57 x 0.98			7.28 x 1.57 x 0.98
Millimeters (L × W × H)	164 x 40.0 x 25.0			185 x 40.0 x 25.0
Net Weight	-	390 g	-	

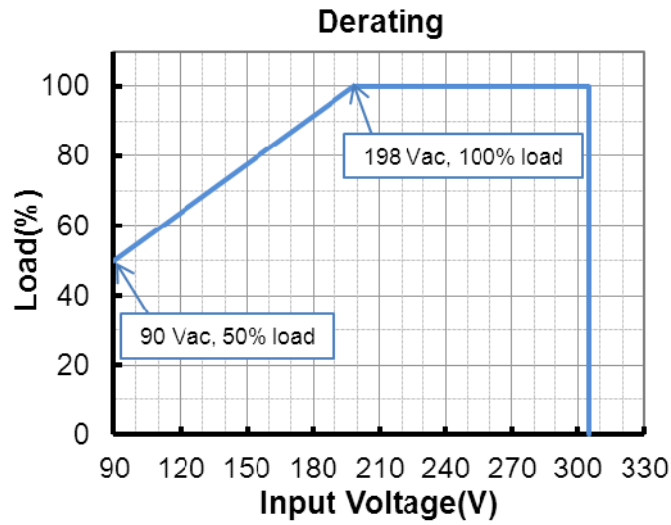
Note: All specifications are typical at 25°C unless otherwise stated.

Safety & EMC Compliance

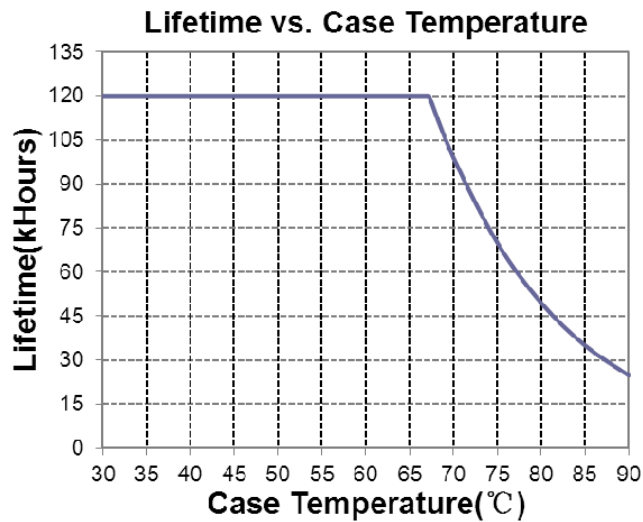
Safety Category	Standard
CE	EN 61347-1, EN61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
CCC	GB 19510.1, GB 19510.14
KS	KS C 7655
EMI Standards	Notes
EN 55015/GB 17743 ⁽¹⁾	Conducted emission Test & Radiated emission Test
EN 61000-3-2/GB 17625.1	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & 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: 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.

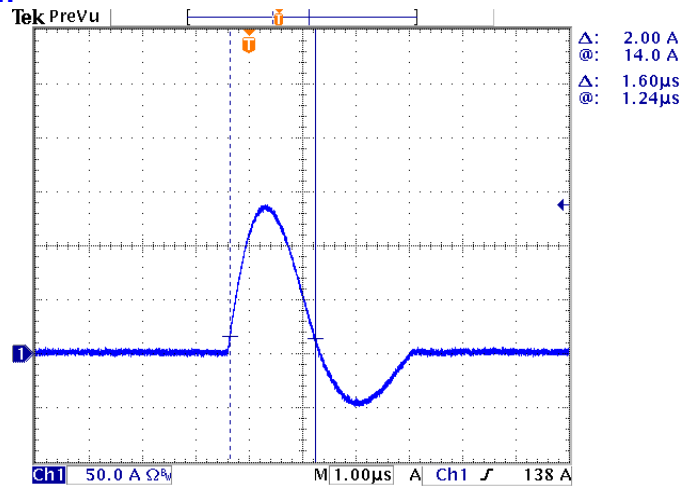
Derating



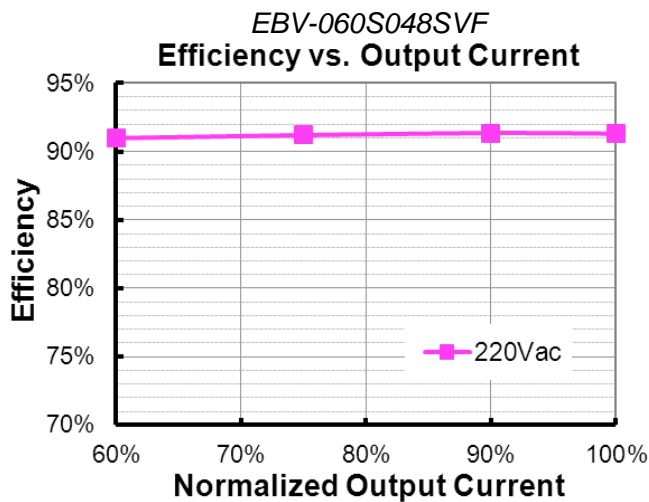
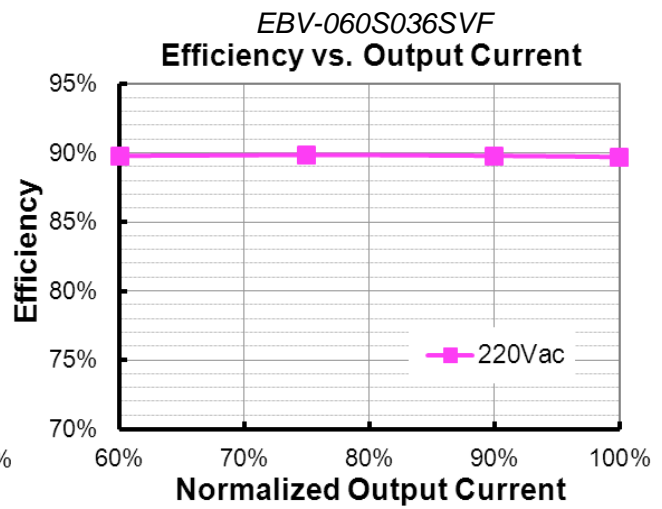
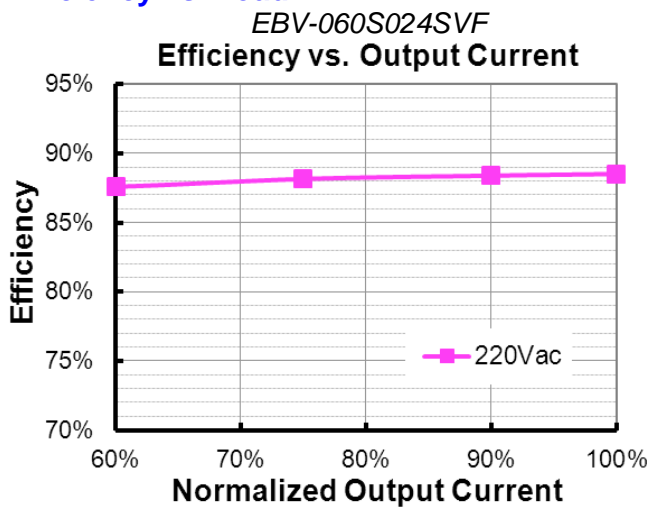
Lifetime vs. Case Temperature



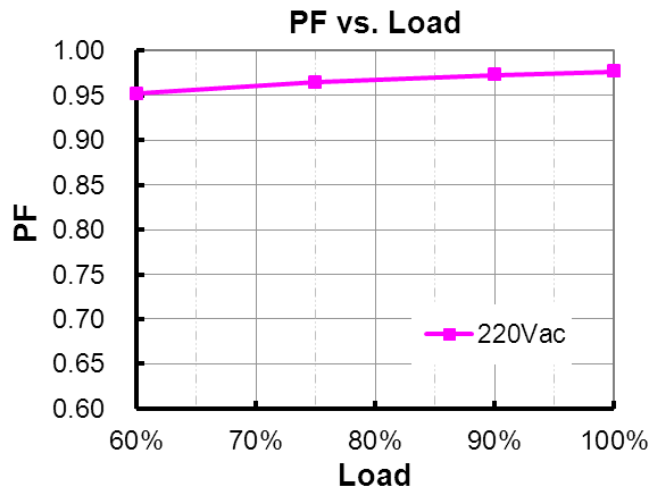
Inrush Current Waveform



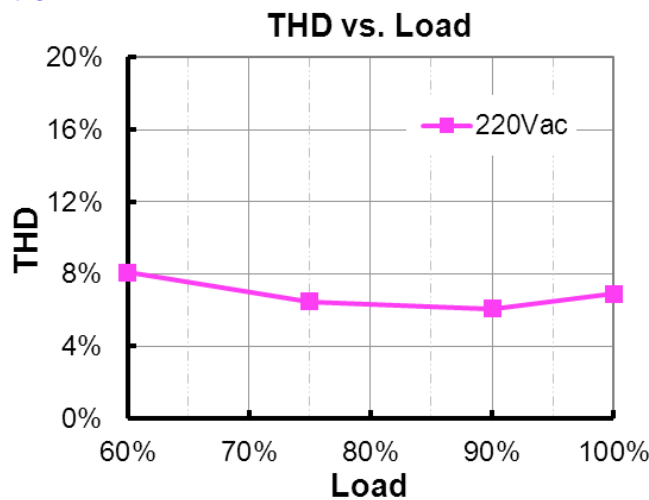
Efficiency vs. Load



Power Factor



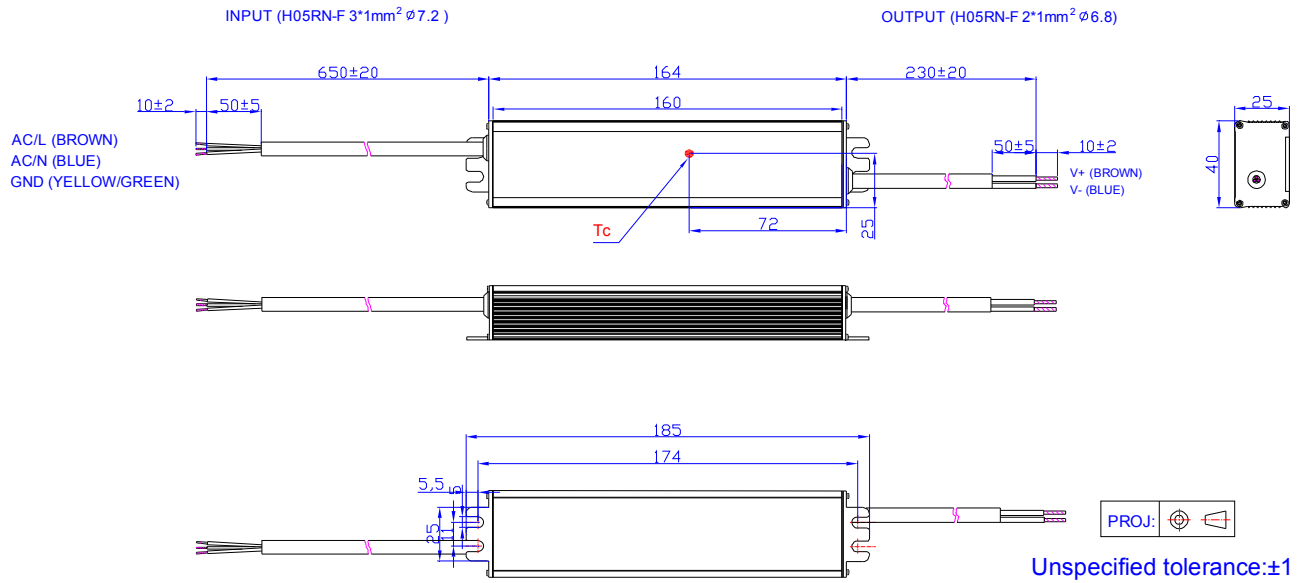
Total Harmonic Distortion



Protection Functions

Parameter	Notes
Over Current Protection	Auto Recovery. The driver shall be self-recovery when the fault condition is removed.
Over Voltage Protection	Limits output voltage at no load and in case the normal voltage limit fails.
Short Circuit Protection	Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed.
Over Temperature Protection	Auto Recovery. Returning to normal after over temperature is removed.

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
2019-08-09	A	Datasheet Release	/	/
2019-08-14	B	MTBF	871,000Hours	1171,000Hours