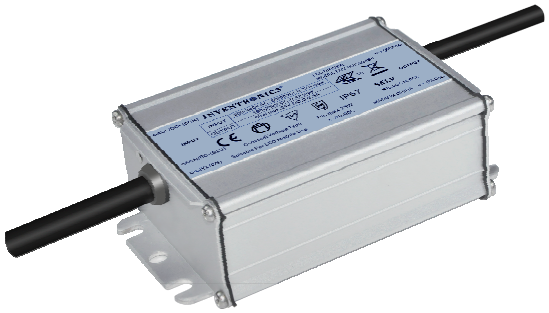
Features

- High Efficiency (up to 90.5%)
- Constant Voltage Output
- No-Load Power < 0.5 W
- Input Surge Protection: 4kV line-line, 6kV line-earth
- All-Around Protection: OCP, OVP, SCP, OTP
- Waterproof (IP67)
- SELV Output
- Suitable for Independent Use
- 5 Years Warranty



Description

The *EBV-060SxxxSV* 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. The high efficiency of the driver 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, 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 220Vac	Model Number(4)(5)
12 V	176~305 Vac 190~250 Vdc	0 ~ 5.0 A	60 W	84.5%	0.96	EBV-060S012SV
24 V	176~305 Vac 190~250 Vdc	0 ~ 2.5 A	60 W	88.5%	0.96	EBV-060S024SV
36 V	176~305 Vac 190~250 Vdc	0 ~ 1.7 A	60 W	89.5%	0.96	EBV-060S036SV
48 V	176~305 Vac 190~250 Vdc	0 ~ 1.3 A	60 W	90.5%	0.96	EBV-060S048SV

Notes: (1) CCC certified input voltage range: 220/230/240 Vac; other certified input voltage range except CCC: 200-240 Vac or 190-250Vdc (except KS and BIS).
(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).
(4) SELV output.
(5) For BIS models add suffix -3000.

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage	176 Vac	-	305 Vac	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.70 mA	IEC60598-1; 240Vac/60Hz

Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Input AC Current	-	-	0.36 A	Measured at 100% load and 220Vac input.
Inrush Current(I^2t)	-	-	0.016 A^2s	At 220Vac input, 25°C cold start, duration=112 μs, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.
PF	0.9	-	-	At 220-240Vac, 50-60Hz, 60%-100%load (36-60W)
THD	-	-	20%	
THD	-	-	12%	At 220-240Vac, 50-60Hz, 75%-100%load (45-60W)

Output Specifications

Parameter		Min.	Typ.	Max.	Notes
Output Voltage Tolerance		-5%	-	5%	At 100% load condition
Total Output Voltage Ripple (pk-avg) EBV-060S012SV EBV-060S024SV EBV-060S036SV EBV-060S048SV		 - - - -	 - - - -	 2.0 V 2.0 V 2.5 V 2.5 V	At 0% - 100% load condition. Measured by 20 MHz bandwidth oscilloscope and the output paralleled a 0.1 μF ceramic capacitor and a 47 μF electrolytic capacitor.
Startup Overshoot / Undershoot		-	-	5%Vo	At 100% load condition
Line Regulation		-	-	±1%	Measured at 100% load
Load Regulation		-	-	±3%	
Turn-on Delay Time		-	-	0.75 s	Measured at 220Vac input, 60%-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: EBV-060S012SV EBV-060S024SV EBV-060S036SV EBV-060S048SV	 82.5% 86.5% 87.5% 88.5%	 84.5% 88.5% 89.5% 90.5%	 - - - -	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	-	671,000 Hours	-	Measured at 220Vac input, 80%load and 25°C ambient temperature (MIL-HDBK-217F)

General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Lifetime	-	96,000 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) Millimeters ((L × W × H)	3.74 x 2.66 x 1.44 95 x 67.5 x 36.5			With mounting ear 4.57 x 2.66 x 1.44 116 x 67.5 x 36.5
Net Weight	-	520 g	-	

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

Safety & EMC Compliance

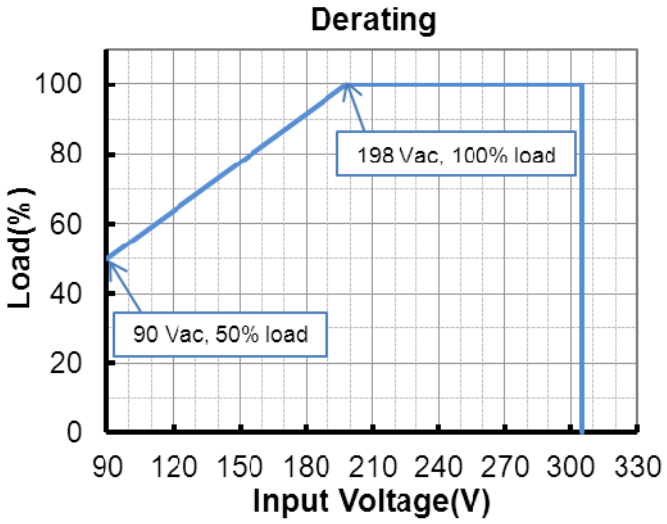
Safety Category	Standard
CE & ENEC	EN 61347-1, EN61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
CCC	GB 19510.1, GB 19510.14
BIS	IS 15885(PART2/SEC13)
KS	KS C 7655
EMI Standards	**Notes**
EN 55015/GB 17743(1)	Conducted emission Test & Radiated emission Test
EN 61000-3-2/GB 17625.1	Harmonic current emissions
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: 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

Safety & EMC Compliance (Continued)

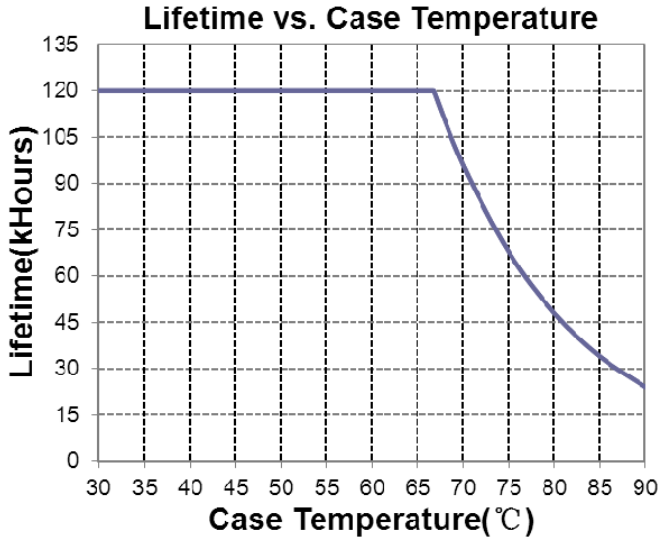
EMS Standards	Notes
EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment

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.

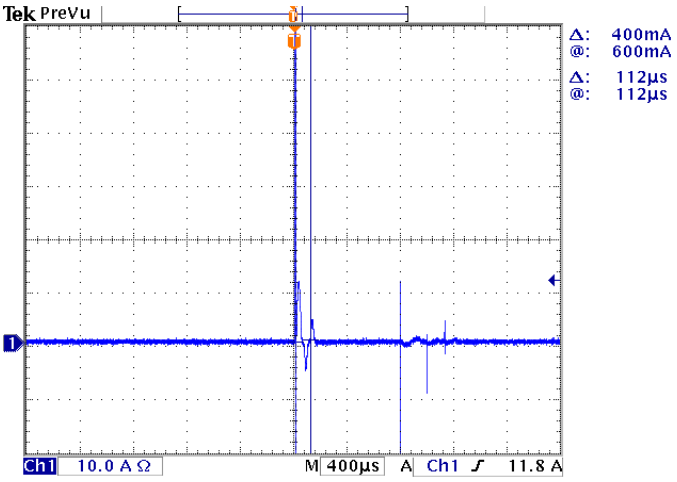
Derating



Lifetime vs. Case Temperature

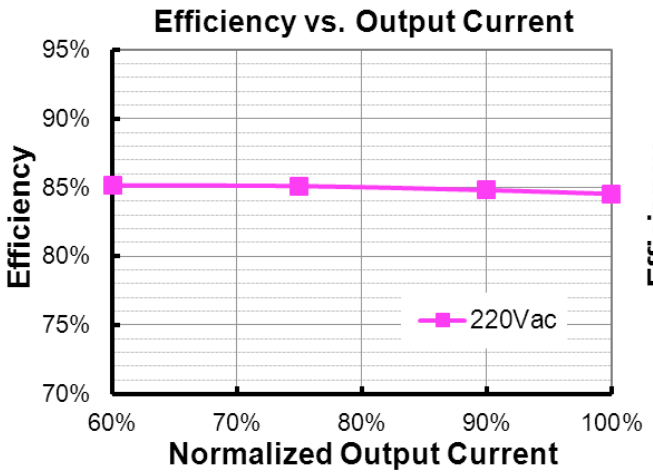


Inrush Current Waveform

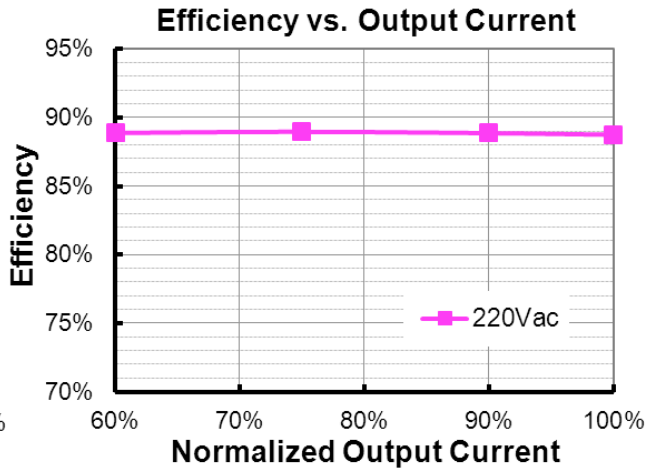


Efficiency vs. Load

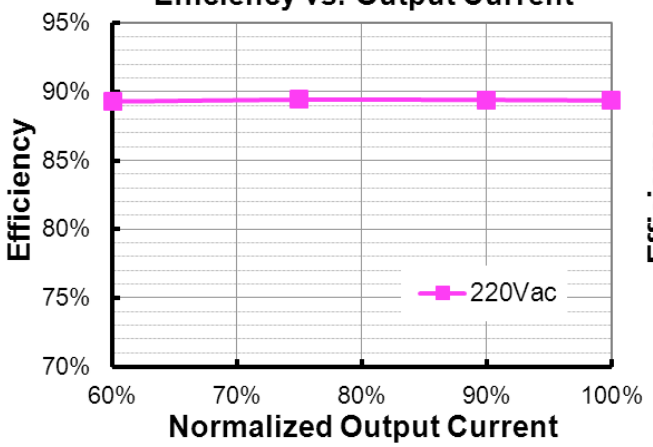
EBV-060S012SV



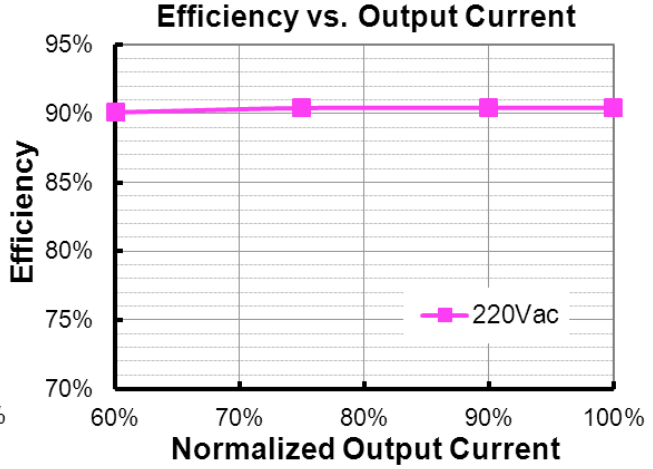
EBV-060S024SV



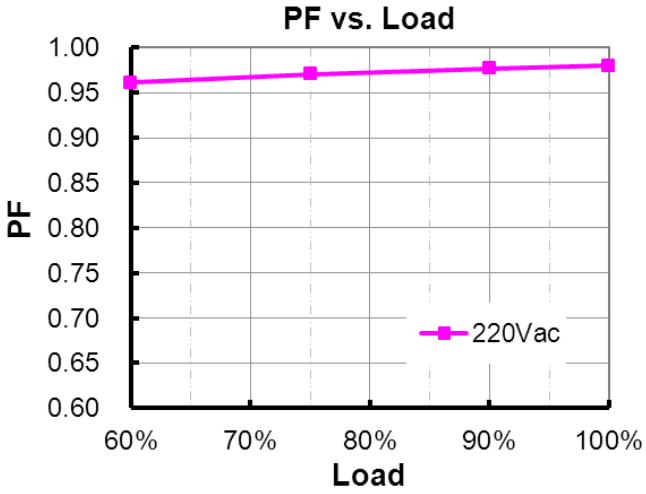
EBV-060S036SV



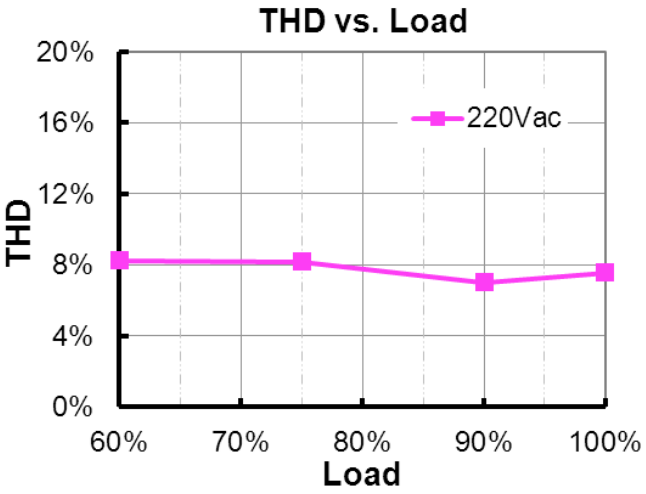
EBV-060S048SV



Power Factor



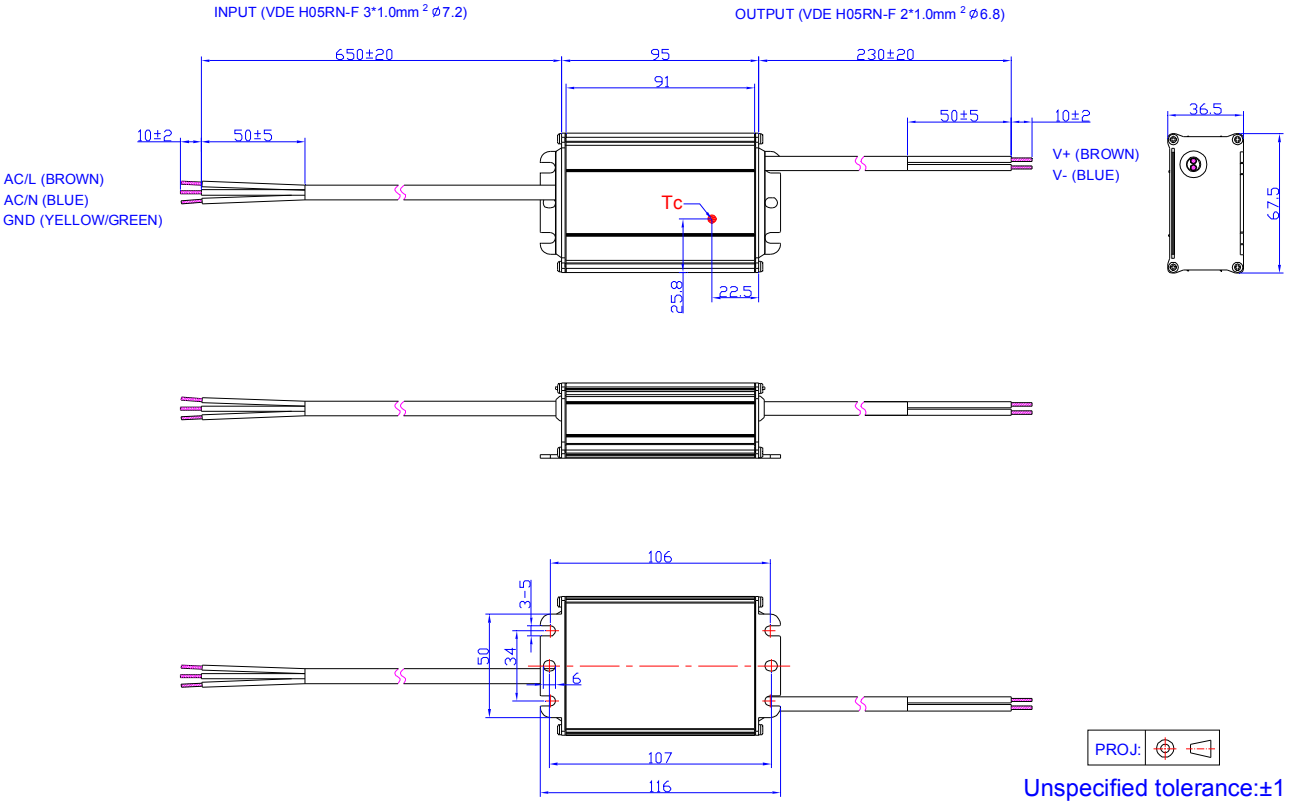
Total Harmonic Distortion



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



Unspecified tolerance:±1

RoHS Compliance

Our products comply with the European Directive 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
2018-07-18	A	Datasheet Release	/	/
2018-12-06	B	Features	High Efficiency (up to 88.5%)	High Efficiency (up to 90.5%)
		Product image	/	Updated
		ENEC certificate	/	Added
		CB certificate	/	Added
		BIS certificate	/	Added
		Models	EBV-060S012SV EBV-060S036SV EBV-060S048SV	Added
		Note of Models	(1) Certified input Voltage range: 200-240Vac or 190-250Vdc (except CCC, KS and BIS).	(1) CCC certified input voltage range: 220/230/240 Vac; other certified input voltage range except CCC: 200-240Vac or 190-250Vdc (except KS and BIS).
		Note of Models	(5) For BIS models add suffix -3000.	Added
		Input AC Current	0.32 A	0.36 A
		Total Output Voltage Ripple(pk-avg)	EBV-060S012SV EBV-060S036SV EBV-060S048SV	Added
		Efficiency at 220Vac input:	EBV-060S012SV EBV-060S036SV EBV-060S048SV	Added
		MTBF	1,145,000Hours	671,000Hours
		Lifetime	91,000 Hours at Tc=75°C	96,000 Hours at Tc=70°C
		Safety & EMC Compliance	/	Updated
		Lifetime vs. Case Temperature	/	Updated
		Efficiency vs. Load	EBV-060S012SV EBV-060S036SV EBV-060S048SV	Added
		Power Factor curve	/	Updated
		Total Harmonic Distortion curve	/	Updated