

Features

- High Efficiency (up to 93%)
- Constant Voltage Output
- Input Surge Protection: DM 4kV , CM 6kV
- All-Around Protection: OCP, OVP, SCP, OTP
- IP67
- SELV Output
- 5 Years Warranty



Description

The EBV-400SxxxSV series is a 400W, 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 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	Model Number(4)(5)
					220Vac	
12 V	176 ~ 305 Vac 190 ~ 250 Vdc	0 ~ 28.4 A	340 W	91.0%	0.96	EBV-400S012SV
24 V	176 ~ 305 Vac 190 ~ 250 Vdc	0 ~ 16.7 A	400 W	93.0%	0.96	EBV-400S024SV
36 V	176 ~ 305 Vac 190 ~ 250 Vdc	0 ~ 11.2 A	400 W	93.0%	0.96	EBV-400S036SV
48 V	176 ~ 305 Vac 190 ~ 250 Vdc	0 ~ 8.4 A	400 W	92.5%	0.96	EBV-400S048SV

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 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	190-250 Vdc
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.70 mA	IEC60598-1; 240Vac/60Hz
Input AC Current	-	-	2.2 A	Measured at 100% load and 220Vac input.
Inrush Current(I ² t)	-	-	3.776 A ² s	At 220Vac input, 25°C cold start, duration=1.38 ms, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.

Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
PF	0.9	-	-	At 220-240Vac, 50-60Hz, 60%-100% load
THD	-	-	20%	
THD	-	-	10%	At 220-240Vac, 50-60Hz, 75%-100% load

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Voltage Tolerance	-2.5%Vo	-	2.5%Vo	At 100% load condition
Total Output Voltage Ripple (pk-pk)	-	-	2%Vo	Measured at 220Vac input, 0% - 100% load condition. Measured by 20 MHz bandwidth oscilloscope and the output paralleled a 0.1 μ F ceramic capacitor and a 10 μ F electrolytic capacitor.
Startup Overshoot / Undershoot	-	-	5%Vo	At 100% load condition
Line Regulation	-	-	\pm 0.5%	Measured at 100% load
Load Regulation	-	-	\pm 1%	
Turn-on Delay Time	-	-	0.5 s	Measured at 220Vac input, 100% load
Load Dynamic Response	Output Deviation	-	5%Vo	R/S: 1 A/ μ s Load: 25%~100% load
	Settling Time	-	10 ms	
Temperature Coefficient of Vo	-	0.03%/ $^{\circ}$ C	-	Case temperature = 0 $^{\circ}$ C~Tc max

Note: All specifications are typical at 25 $^{\circ}$ C unless otherwise stated.

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 220Vac input: EBV-400S012SV EBV-400S024SV EBV-400S036SV EBV-400S048SV	89.0% 91.0% 91.0% 90.5%	91.0% 93.0% 93.0% 92.5%	- - - -	Measured at 100% load and steady-state temperature in 25 $^{\circ}$ C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
MTBF	-	217,000 Hours	-	Measured at 220Vac input, 80%load and 25 $^{\circ}$ C ambient temperature (MIL-HDBK-217F)
Lifetime	-	97,000 Hours	-	Measured at 220Vac input, 80%load and 70 $^{\circ}$ C case temperature; See lifetime vs. Tc curve for the details
Operating Case Temperature for Safety Tc_s	-40 $^{\circ}$ C	-	+90 $^{\circ}$ C	
Operating Case Temperature for Warranty Tc_w	-40 $^{\circ}$ C	-	+75 $^{\circ}$ C	Case temperature for 5 years warranty. Humidity: 10% RH to 100% RH.
Storage Temperature	-40 $^{\circ}$ C	-	+85 $^{\circ}$ C	Humidity: 5%RH to 100%RH

General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Dimensions Inches (L x W x H) Millimeters ((L x W x H)	7.87 x 3.15 x 1.65 200 x 80 x 42			With mounting ear 8.94 x 3.15 x 1.65 227 x 80 x 42
Net Weight	-	1350 g	-	

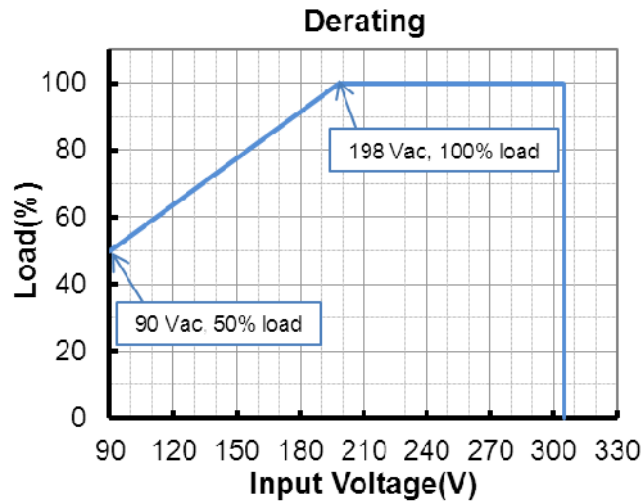
Note: All specifications are typical at 25°C unless otherwise stated.

Safety & EMC Compliance

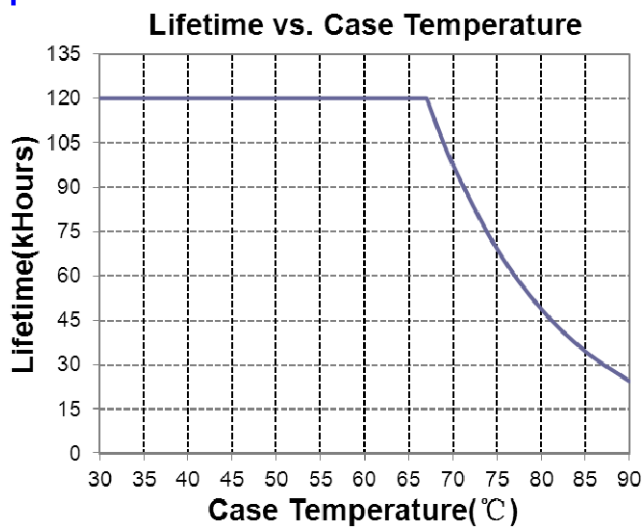
Safety Category	Standard
ENEC & CE	EN 61347-1, EN61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
CCC	GB 19510.1, GB 19510.14
BIS	IS 15885(PART2/SEC13)
KC	K 61347-1, K 61347-2-13
EMI Standards	Notes
EN 55015/GB 17743/KN 15 ⁽¹⁾	Conducted emission Test & Radiated emission Test
EN 61000-3-2/GB 17625.1	Harmonic 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.

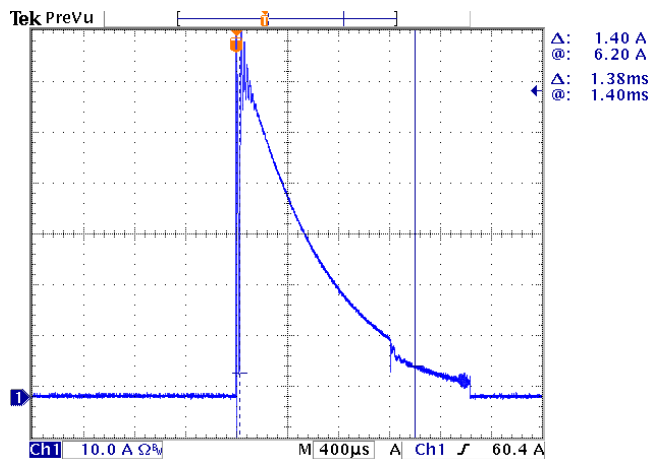
Derating



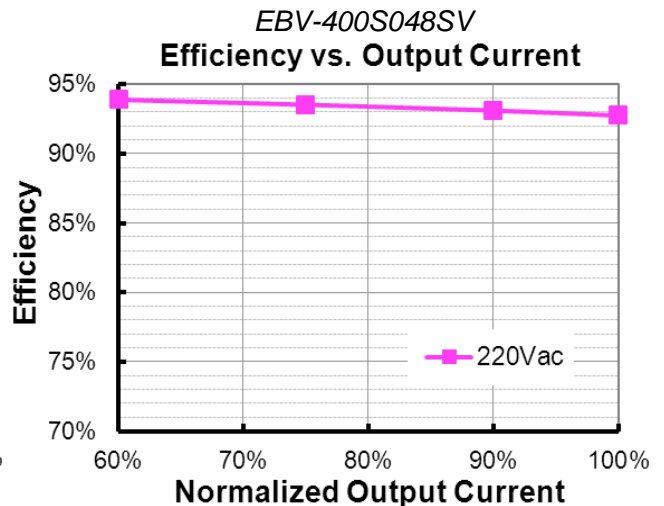
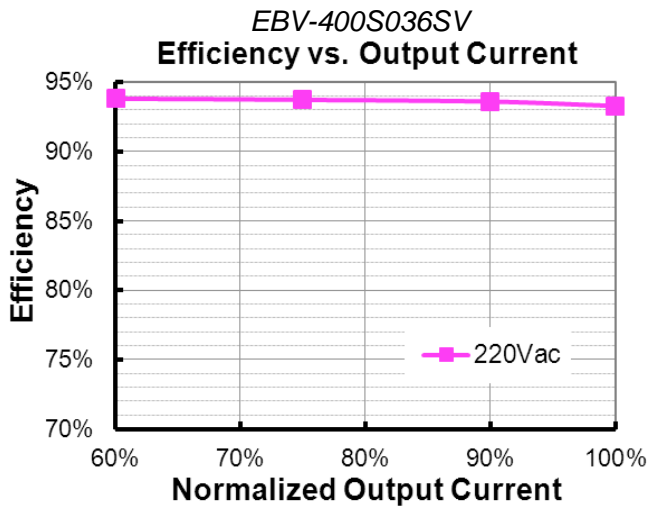
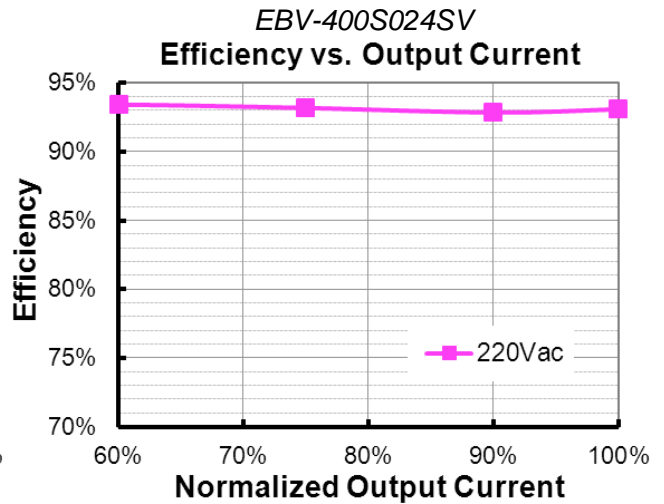
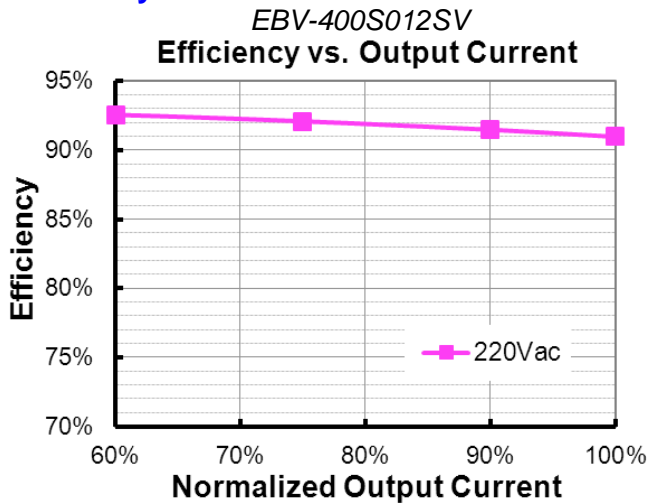
Lifetime vs. Case Temperature



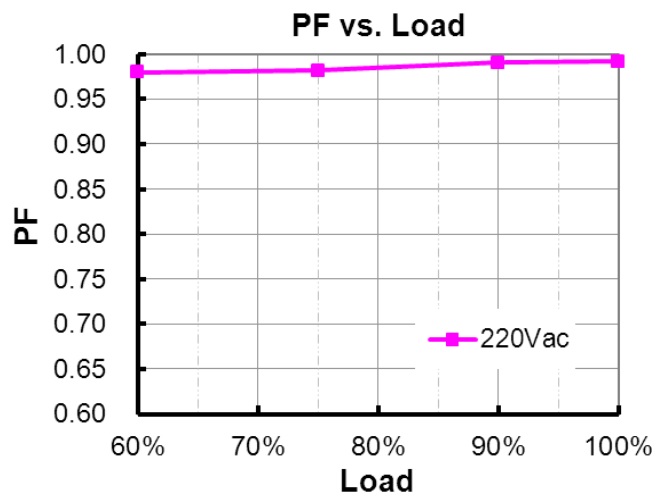
Inrush Current Waveform



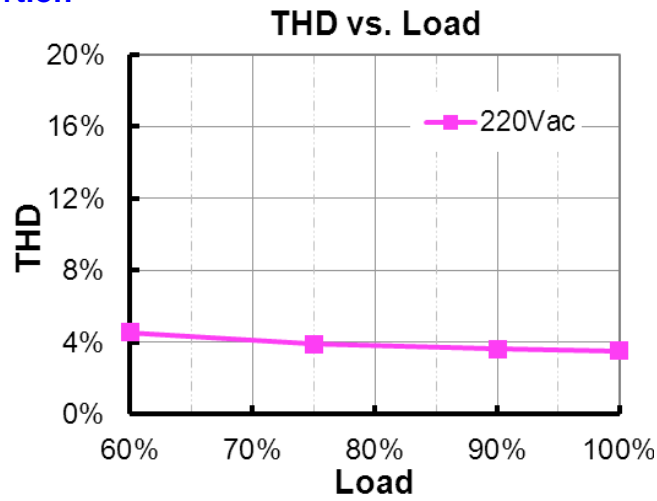
Efficiency vs. Load



Power Factor



Total Harmonic Distortion

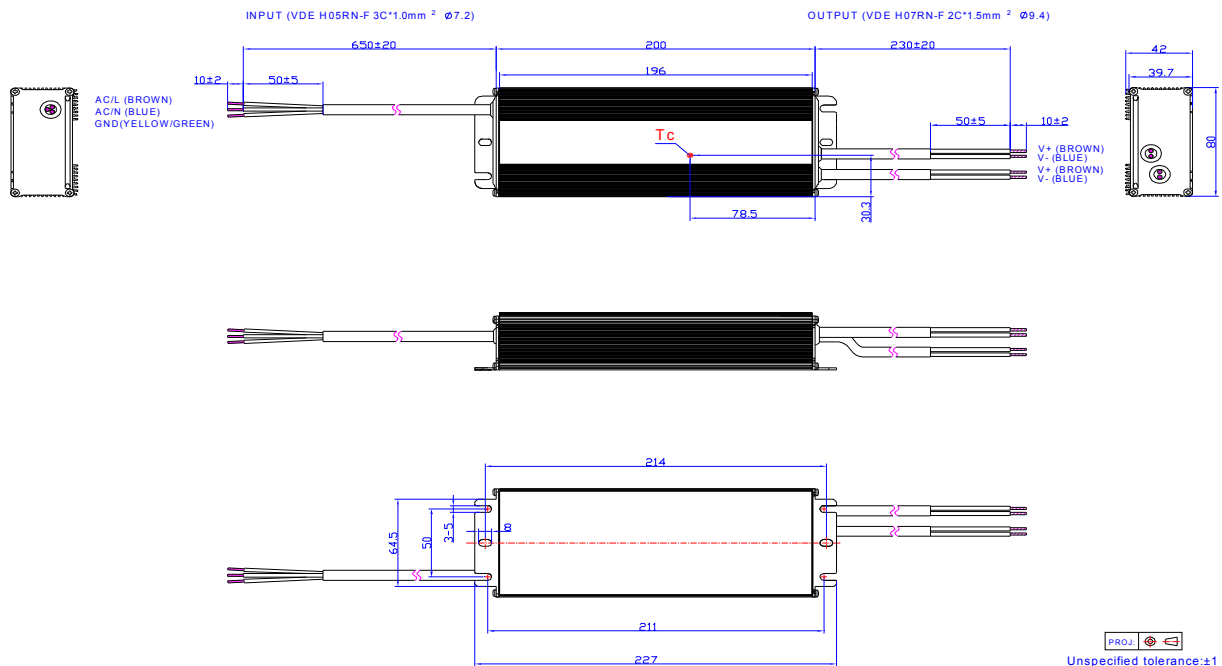


Protection Functions

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.

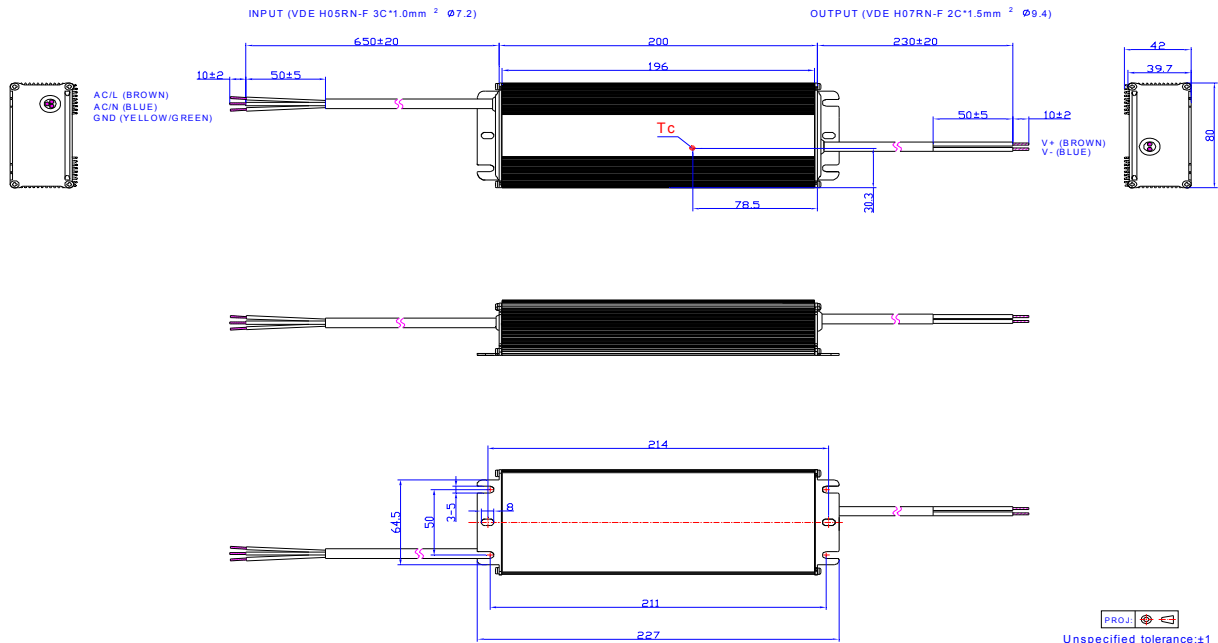
Mechanical Outline

EBV-400S012/024SV

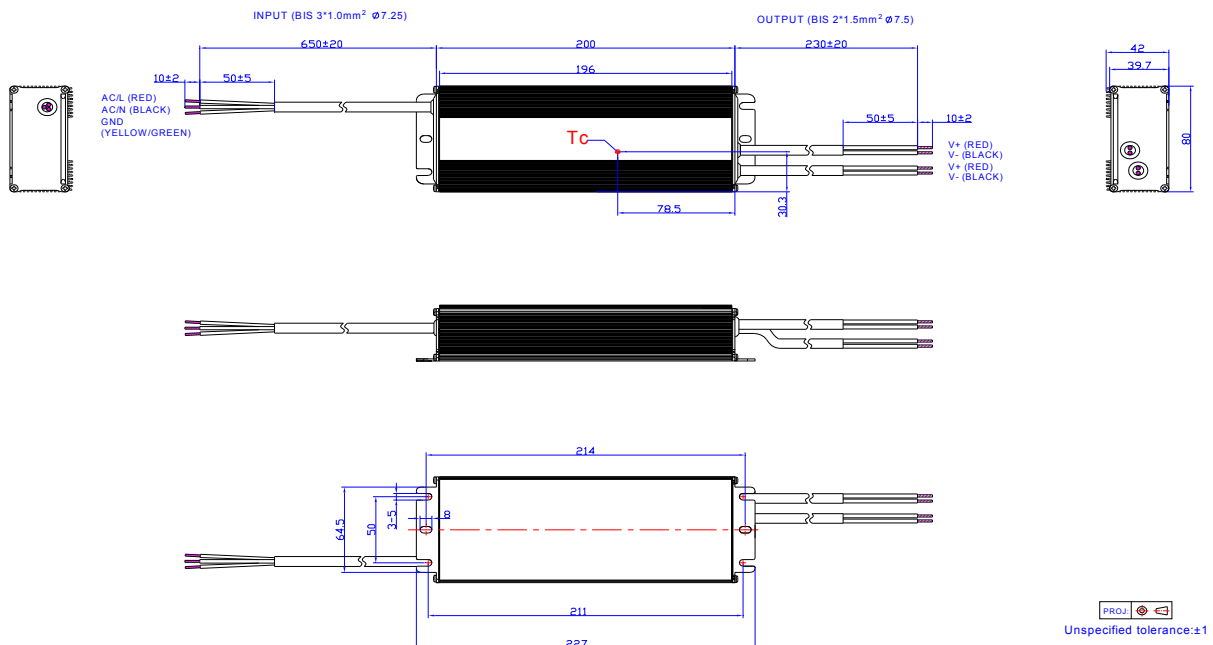


Note: The 2 DC output cables are connected in parallel internally because one 1.5mm² wire can only carry 14.5A. Please connect the 2 brown wires together and 2 blue wires together in application, or ensure each cable carries same current.

EBV-400S036/048SV



EBV-400S024SV-3000



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
2018-07-23	A	Datasheet Release	/	/
2018-12-29	A	Product image	/	Updated
		CE certificate	/	Added
		CB certificate	/	Added
		ENEC certificate	/	Added
		BIS certificate	/	Added
		Models	EBV-400S012SV EBV-400S036SV EBV-400S048SV	Added
		Notes of Models	(1) Certified input Voltage range: 200-240Vac or 190-250Vdc (except CCC and BIS).	(1) CCC certified input voltage range: 220/230/240 Vac; other certified input voltage range except CCC: 200-240 Vac or 190-250Vdc (except BIS).
		Notes of Models	(5) For BIS models add suffix - 3000.	Added
		Input AC Current	2.42 A	2.2 A
	B	Hold Up Time	/	Deleted
		Efficiency at 220Vac input:	EBV-400S012SV EBV-400S036SV EBV-400S048SV	Added
		MTBF	240,000Hours	217,000Hours
		Lifetime	104,000Hours	97,000Hours
		Safety & EMC Compliance	/	Updated
		Efficiency vs. Load curve	EBV-400S012SV EBV-400S036SV EBV-400S048SV	Added
		Power Factor curve	/	Updated
		Total Harmonic Distortion curve	/	Updated
		Mechanical Outline	EBV-400S012SV EBV-400S024SV	Updated
Mechanical Outline – note of EBV-400S012/024SV	/	Added		
Mechanical Outline	EBV-400S036SV EBV-400S048SV	Added		

Revision History (Continued)

Change Date	Rev.	Description of Change		
		Item	From	To
2019-12-17	C	KC / KCC Logo	/	Added
		Independent Logo	/	Added
		Features	4kV line-line, 6kV line-earth	DM 4kV , CM 6kV
		Features	Waterproof (IP67)	IP67
		Features	Suitable for Independent Use	Deleted
		Safety &EMC Compliance	KC	Added
		Safety &EMC Compliance	EN 55015/GB 17743	EN 55015/GB 17743/KN 15 ⁽¹⁾
		Safety &EMC Compliance	EN 61000-4-5	Updated
		Mechanical Outline	EBV-400S024SV-3000	Added
		RoHS Compliance	/	Updated