

Rev. B

#### **Features**

- Low THD, 10% Max up to 240 Vac
- Compact Metal Case with Excellent Thermal Performance
- Isolated 0-10V Dimmable
- Input Surge Protection: DM 4kV, CM 6kV
- High Reliability & Long Lifetime: 95,900 hrs. at 70°C Case Temperature
- Suitable for Class I Luminaires
- Input UVP and Input OVP
- **IP67**
- **SELV Output**
- 5 Years Warranty

















### **Description**

The EUC-060SxxxDVM000x series is a 60W, constant-current IP67 LED driver that operates from 90-305Vac input with excellent power factor and THD feature. It is created for many lighting applications including low bay, tunnel and street, etc. The high efficiency of these drivers 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, input under voltage, input over voltage, output over voltage, short circuit, and over temperature.

#### **Models**

Output	Output Input Output Max.		Typical	Power	Factor	Model Number	
Current	Voltage Range(1)	Voltage Range	Output Power	Efficiency (2)	120Vac	220Vac	(3)
500 mA	90 ~ 305 Vac 127 ~ 250 Vdc	60 ~ 120 Vdc	60W	90%	0.99	0.96	EUC-060S070DVM0004
700 mA	90 ~ 305 Vac 127 ~ 250 Vdc	48 ~ 86 Vdc	60W	89%	0.99	0.96	EUC-060S070DVM
860 mA	90 ~ 305 Vac 127 ~ 250 Vdc	35 ~ 70 Vdc	60W	89%	0.99	0.96	EUC-060S105DVM0004 <sup>(4)</sup>
1050 mA	90 ~ 305 Vac 127 ~ 250 Vdc	34 ~ 57 Vdc	60W	89%	0.99	0.96	EUC-060S105DVM <sup>(4)</sup>
1200 mA	90 ~ 305 Vac 127 ~ 250 Vdc	25 ~ 50 Vdc	60W	89%	0.99	0.96	EUC-060S180DVM0006 <sup>(4)</sup>
1400 mA	90 ~ 305 Vac 127 ~ 250 Vdc	21 ~ 43 Vdc	60W	88%	0.99	0.96	EUC-060S180DVM0004 <sup>(4)</sup>
1800 mA	90 ~ 305 Vac 127 ~ 250 Vdc	20 ~ 33 Vdc	60W	87%	0.99	0.96	EUC-060S180DVM <sup>(4)</sup>

Notes: (1) Certified input voltage range: 120-240Vac/127-250Vdc (except CCC, BIS and KS).

- (2) Measured at 100% load and 220 Vac input.
- (3) For BIS models please click here see the: BIS Models List.
- (4) SELV output.

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**Input Specifications** 

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Parameter	Min.	Тур.	Max.	Notes		
Input Voltage	90 Vac	ı	305 Vac 127 ~ 250 Vdc			
Input Frequency	47 Hz	-	63 Hz			
Leakage Current	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz		
Innut AC Current	-	-	0.66 A	Measured at 100% load and 120 Vac input.		
Input AC Current	-	-	0.35 A	Measured at 100% load and 220 Vac input.		
Inrush Current(I <sup>2</sup> t)	-	-	0.26 A <sup>2</sup> s	At 220Vac input, 25°C cold start, duration= 236 μs, 10%lpk-10%lpk. See Inrush Current Waveform for the details.		
Power Factor	0.90	-	-	120-240Vac, 50-60Hz,75%-100%Load (45~60W)		
THD	-	-	10%			

**Output Specifications** 

Output Specifications					
Parameter	Min.	Тур.	Max.	Notes	
Output Current Tolerance	-8%lo	-	8%lo	At 100% load condition	
Total Output Current Ripple (pkavg)	-	50%lo	75%lo	At 100% load condition	
Startup Overshoot Current	-	5%lo	10%lo	At 100% load condition	
No Load Output Voltage EUC-060S070DVM0004 EUC-060S070DVM EUC-060S105DVM0004 EUC-060S105DVM EUC-060S180DVM0006 EUC-060S180DVM0004 EUC-060S180DVM	- - - - -	- - - - - -	160V 160V 100V 100V 63V 63V 63V		
Line Regulation	-	-	±5.0%	Measured at 100% load	
Load Regulation	-	-	±5.0%		
Turn on Dolov Time	-	1.5 s	2.0 s	Measured at 120Vac input.	
Turn-on Delay Time	-	1.0 s	1.5 s	Measured at 220Vac input.	
Temperature Coefficient of Iomax	-	0.06%/°C	-	Case temperature = 0°C ~Tc max	

Note: All specifications are tested by Cree XLamp XP-G2 and typical measured at 220Vac and 25°C unless otherwise stated.



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**General Specifications** 

Parameter	Min.	Тур.	Max.	Notes	
Efficiency at 120 Vac input: EUC-060S070DVM0004 EUC-060S070DVM EUC-060S105DVM0004 EUC-060S105DVM EUC-060S180DVM0006 EUC-060S180DVM0004 EUC-060S180DVM	86.0% 85.0% 85.0% 85.0% 85.0% 84.0%	88.0% 87.0% 87.0% 87.0% 87.0% 86.0% 85.0%	- - - - -	Measured at 100% load and steady-state temperature in 25°C ambient.	
Efficiency at 220 Vac input: EUC-060S070DVM0004 EUC-060S070DVM EUC-060S105DVM0004 EUC-060S105DVM EUC-060S180DVM0006 EUC-060S180DVM0004 EUC-060S180DVM	88.0% 87.0% 87.0% 87.0% 87.0% 86.0%	90.0% 89.0% 89.0% 89.0% 89.0% 88.0% 87.0%	- - - - -	Measured at 100% load and steady-state temperature in 25°C ambient.	
Efficiency at 277 Vac input: EUC-060S070DVM0004 EUC-060S070DVM EUC-060S105DVM0004 EUC-060S105DVM EUC-060S180DVM0006 EUC-060S180DVM0004 EUC-060S180DVM	88.0% 87.0% 87.0% 87.0% 87.0% 86.0% 85.0%	90.0% 89.0% 89.0% 89.0% 89.0% 88.0% 87.0%	- - - - -	Measured at 100% load and steady-state temperature in 25°C ambient.	
MTBF	-	475,000 Hours	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)	
Lifetime	-	95,900 Hours	-	Measured at 120Vac 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 2.52 x 1.26 95 x 64 x 32		26	With mounting ear 4.41 x 2.52 x 1.26 112 x 64 x 32	
Net Weight	-	410 g	-		

Note: All specifications are tested by Cree XLamp XP-G2 and typical at 25°C unless otherwise stated.

#### **Dimming Specifications**

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Parameter	Min.	Тур.	Max.	Notes	
Absolute Maximum Voltage on the 0~10V Input Pin	0 V	-	20 V		
Source Current on 0~10V Input Pin	0 μΑ	200 μΑ	250 μΑ		

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**Dimming Specifications (Continued)** 

Parameter	Min.	Тур.	Max.	Notes
Dimming Output Range	10%lomax	-	100%lomax	
Recommended Dimming Input Range	0 V	-	10 V	

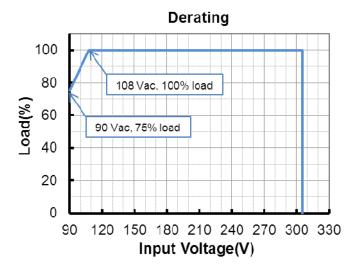
**Safety &EMC Compliance** 

Safety Category	Standard
ENEC & TUV & CE	EN 61347-1, EN61347-2-13
СВ	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 <sup>(1)</sup>	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

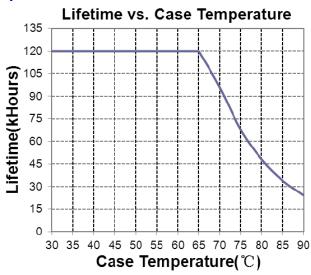
**Note:** (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

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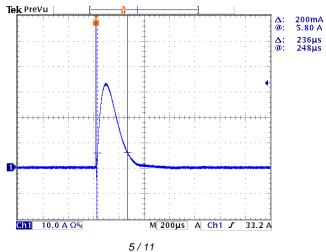
## **Derating**



## Lifetime vs. Case Temperature



#### **Inrush Current Waveform**



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#### Efficiency vs. Load EUC-060S070DVM(Io=700mA) EUC-060S070DVM0004(Io=500mA) Efficiency vs. Output Voltage Efficiency vs. Output Voltage 95% 95% 90% 90% Efficiency **Efficiency** 85% 85% 80% 80% 120Vac 120Vac -220Vac -220Vac 75% 75% 277Vac 277Vac 70% 70% 60% 70% 80% 90% 100% 60% 70% 80% 90% 100% **Output Voltage Output Voltage** EUC-060S105DVM(Io=1050mA) EUC-060S105DVM0004(Io=860mA) Efficiency vs. Output Voltage Efficiency vs. Output Voltage 95% 95% 90% 90% Efficiency **∃fficiency** 85% 85% 80% 80% 120Vac -120Vac 220Vac -220Vac 75% 75% 277Vac 277Vac 70% 70% 60% 70% 80% 90% 100% 60% 70% 80% 90% 100% **Output Voltage Output Voltage** EUC-060S180DVM(Io=1800mA) EUC-060S180DVM0004(Io=1400mA) Efficiency vs. Output Voltage Efficiency vs. Output Voltage 95% 95% 90% 90% **Efficiency** Efficiency 85% 85% 80% 80% 120Vac -120Vac -220Vac -220Vac 75% 75% 277Vac 277Vac 70% 70% 70% 70% 60% 80% 90% 100% 60% 80% 90% 100%

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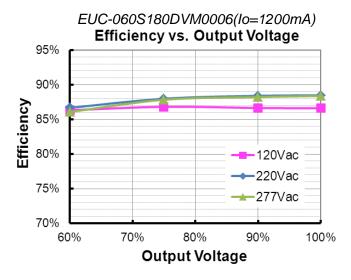
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Specifications are subject to changes without notice.

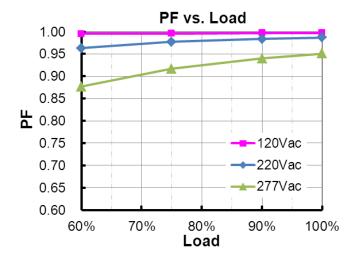
**Output Voltage** 

**Output Voltage** 

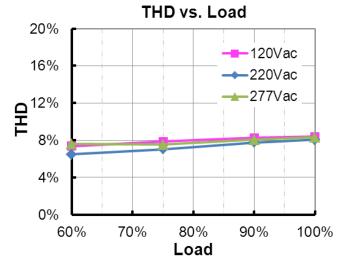
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#### **Power Factor**



## **Total Harmonic Distortion**



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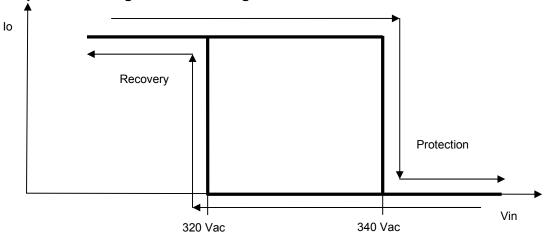
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#### **Protection Functions**

Parameter		Min.	Тур.	Max.	Notes	
Over Voltage Protection		Limits output voltage at no load and in case the normal voltage limit fails.				
Short Circuit Protection		Auto Recovery. No damage shall occur when any output operating in a short circuit condition. The power supply shall be self-recovery when the fault condition is removed.				
Over Temperature Protection		Decreases output current. Returning to normal after over temperature is removed.				
Input Under Voltage Protection		Auto Recovery. Turn off the output when the input voltage falls below $80\pm10$ V. And the driver will restart when the input voltage exceeds $85\pm10$ V.				
Input Protection Voltage		330 Vac	340 Vac	350 Vac	Turn off the output when the input voltage exceeds protection voltage.	
Input Over Voltage Protection	Input Recovery Voltage	300 Vac	320 Vac	340 Vac	Auto Recovery. The driver will restart when the input voltage falls below recovery voltage.	
	Max. of Input Over Voltage	-	-	380 Vac		

# Input Over Voltage Protection Diagram

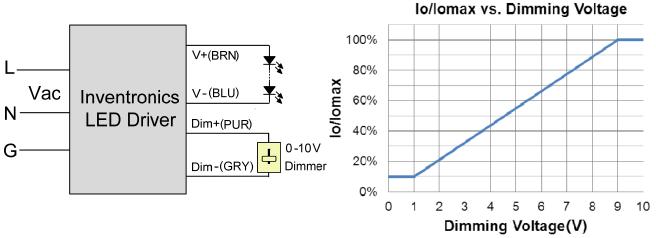


# **Dimming**

## 0-10V Dimming

The recommended implementation is provided below.

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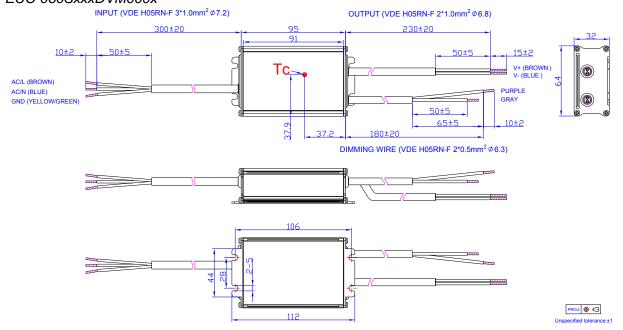
Implementation 1: DC Input

#### Notes:

- The dimmer can also be replaced by an active 0-10V voltage source signal or passive components like resistors and zener.
- 2. Do not connect Dim- to the output V- or V+, otherwise the driver will not work properly.
- 3. If 0-10V dimming is not used, Dim + should be open.

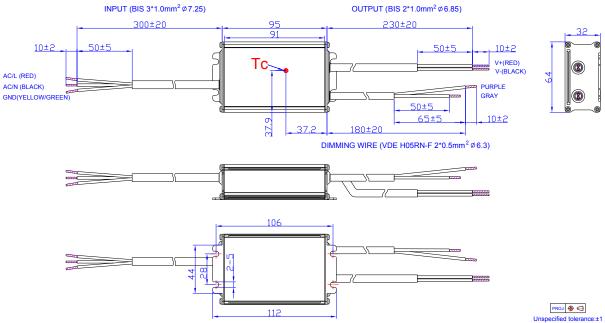
#### **Mechanical Outline**

EUC-060SxxxDVM000x



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#### EUC-060SxxxDVM300x



# **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.





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**Revision History** 

Change		Description of Change						
Date	Rev.	Item	From	То				
2017-03-06	Α	Datasheet Release	/	/				
		ENEC Logo	/	Added				
		TUV Logo	I	Updated				
		BIS Logo	I	Added				
		Independent Logo		Added				
		Features	4kV line-line, 6kV line-earth	DM 4kV, CM 6kV				
		Features	Suitable for Independent Use and Class I Luminaires	Suitable for Class I Luminaires				
		Features	Waterproof(IP67)	IP67				
	В	Description	Application environment	Updated				
		Models	Notes(1)	Updated				
2019-09-05		Models	Notes(3)	Added				
2010 00 00		Input Specifications(PF/THD)	50-60Hz	Added				
		Safety &EMC Compliance	ENEC	Added				
		Safety &EMC Compliance	TUV	Added				
		Safety &EMC Compliance	СВ	Added				
		Safety &EMC Compliance	BIS	Added				
		Safety &EMC Compliance	EN 55015	Updated				
		Safety &EMC Compliance	EN 61000-3-2	Updated				
		Safety &EMC Compliance	EN 61000-4-5	Updated				
		Mechanical Outline	EUC-060SxxxDVM300x	Added				
		RoHS Compliance	/	Updated				