

Features

- High Efficiency (Up to 92 %)
- Full Power at Wide Output Current Range (Constant Power)
- 0-10V/10V PWM Dimmable (DV models)
3 Timer Modes Dimmable (TV models)
- Input Surge Protection: DM 6kV, CM 10kV
- All-Around Protection: OVP, SCP, OTP
- IP67
- SELV Output
- 5 Years Warranty



Description

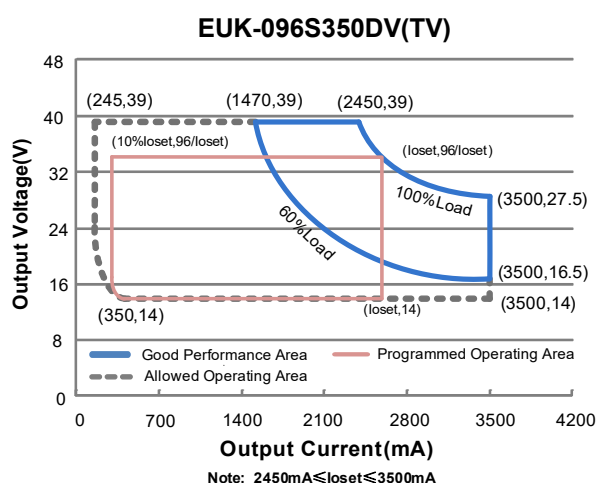
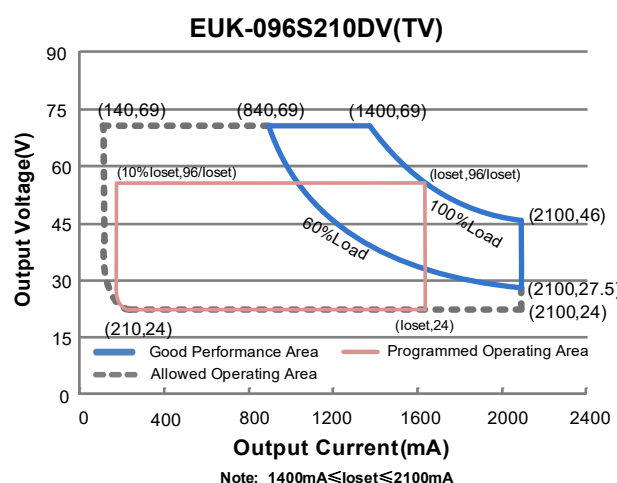
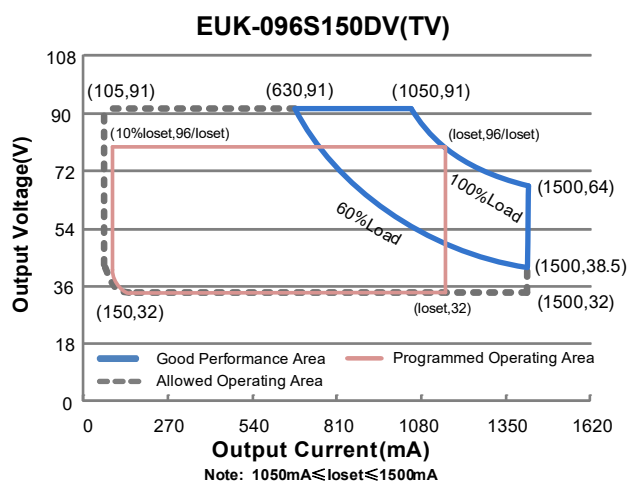
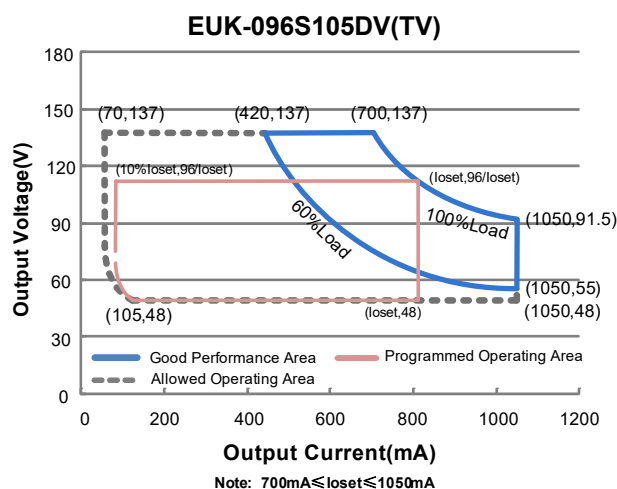
The *EUK-096SxxxDV(TV)* series is a 96W, constant-current, programmable IP67 LED driver that operates from 90-305 Vac input with excellent power factor. It is created for many lighting applications including high bay, tunnel and street. The high efficiency of these drivers and compact metal case enables them to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against input surge, output over voltage, short circuit, and over temperature.

Models

Adjustable Output Current Range	Full-Power Current Range (1)	Default Output Current	Input Voltage Range(2)	Output Voltage Range	Max. Output Power	Typical Efficiency (3)	Typical Power Factor		Model Number (5)
							120Vac	220Vac	
70-1050mA	700-1050mA	700 mA	90~305 Vac/ 127~250 Vdc	48~137Vdc	96 W	92.0%	0.99	0.96	EUK-096S105DV(TV)
105-1500mA	1050-1500mA	1050 mA	90~305 Vac/ 127~250 Vdc	32 ~ 91Vdc	96 W	91.0%	0.99	0.96	EUK-096S150DV(TV)
140-2100mA	1400-2100mA	2100 mA	90~305 Vac/ 127~250 Vdc	24 ~ 69Vdc	96 W	91.0%	0.99	0.96	EUK-096S210DV(TV) ⁽⁴⁾
245-3500mA	2450-3500mA	2800 mA	90~305 Vac/ 127~250 Vdc	14 ~ 39Vdc	96 W	89.0%	0.99	0.96	EUK-096S350DV(TV) ⁽⁴⁾

- Notes:** (1) Output current range with constant power at 96W
 (2) Certified voltage range: 100-240Vac or 127-250Vdc (except CCC, KS and BIS)
 (3) Measured at 100% load and 220Vac input (see below "General Specifications" for details).
 (4) SELV Output.
 (5) For BIS models add suffix -3000.

I-V Operation Area



Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input AC Voltage	90 Vac	-	305 Vac	
Input DC Voltage	127 Vdc	-	250 Vdc	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.70 mA	IEC 60598-1; 240Vac/ 60Hz
Input AC Current	-	-	0.95 A	Measured at 100% load and 120 Vac input.
	-	-	0.51 A	Measured at 100% load and 220 Vac input.
Inrush Current(I _{2t})	-	-	1.20 A ² s	At 220Vac input, 25°C cold start, duration=344 us, 10%I _{pk} -10%I _{pk} . See Inrush Current Waveform for the details.

Input Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
PF	0.9	-	-	At 100-240Vac, 50-60Hz, 60%-100% Load (58-96W)
THD	-	-	20%	
THD	-	-	10%	At 220-240Vac, 50-60Hz, 75%-100% Load (72-96W)

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%loset	-	5%loset	100% load
Output Current Setting(loset) Range				
EUK-096S105DV(TV)	70 mA	-	1050 mA	
EUK-096S150DV(TV)	105 mA	-	1500 mA	
EUK-096S210DV(TV)	140 mA	-	2100 mA	
EUK-096S350DV(TV)	245 mA	-	3500 mA	
Output Current Setting Range with Constant Power				
EUK-096S105DV(TV)	700 mA	-	1050 mA	
EUK-096S150DV(TV)	1050 mA	-	1500 mA	
EUK-096S210DV(TV)	1400 mA	-	2100 mA	
EUK-096S350DV(TV)	2450 mA	-	3500 mA	
Total Output Current Ripple (pk-pk)	-	5%lomax	10%lomax	100% load. 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	2%lomax	-	100% load
Startup Overshoot Current	-	-	10%lomax	100% load
No Load Output Voltage				
EUK-096S105DV(TV)	-	-	160 V	
EUK-096S150DV(TV)	-	-	110 V	
EUK-096S210DV(TV)	-	-	89 V	
EUK-096S350DV(TV)	-	-	49 V	
Line Regulation	-	-	±5%	100% load
Load Regulation	-	-	±5%	
Turn-on Delay Time	-	-	1.0 s	Measured at 120Vac input, 60%-100% Load
	-	-	0.5 s	Measured at 220Vac input, 60%-100% Load
Temperature Coefficient of loiset	-	0.06%/°C	-	Case temperature = 0°C ~Tc max

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input: EUK-096S105DV(TV) Io= 700 mA Io=1050 mA EUK-096S150DV(TV) Io=1050 mA Io=1500 mA EUK-096S210DV(TV) Io=1400 mA Io=2100 mA EUK-096S350DV(TV) Io=2450 mA Io=3500 mA	87.5% 87.5% 87.0% 87.0% 86.5% 87.0% 84.5% 84.5%	89.5% 89.5% 89.0% 89.0% 88.5% 89.0% 86.5% 86.5%	- - - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Efficiency at 220 Vac input: EUK-096S105DV(TV) Io= 700 mA Io=1050 mA EUK-096S150DV(TV) Io=1050 mA Io=1500 mA EUK-096S210DV(TV) Io=1400 mA Io=2100 mA EUK-096S350DV(TV) Io=2450 mA Io=3500 mA	89.5% 90.0% 88.5% 89.0% 88.5% 89.0% 87.0% 86.5%	91.5% 92.0% 90.5% 91.0% 90.5% 91.0% 89.0% 88.5%	- - - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Efficiency at 277 Vac input: EUK-096S105DV(TV) Io= 700 mA Io=1050 mA EUK-096S150DV(TV) Io=1050 mA Io=1500 mA EUK-096S210DV(TV) Io=1400 mA Io=2100 mA EUK-096S350DV(TV) Io=2450 mA Io=3500 mA	89.5% 90.0% 89.5% 90.0% 89.0% 89.0% 87.5% 87.0%	91.5% 92.0% 91.5% 92.0% 91.0% 91.0% 89.5% 89.0%	- - - - - - - -	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	-	380,000 Hours	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	100,000 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 95%RH
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 95%RH
Dimensions Inches (L × W × H) Millimeters (L × W × H)	6.34 × 2.66 × 1.44 161 × 67.5 × 36.5			With mounting ear 7.17 × 2.66 × 1.44 182 × 67.5 × 36.5
Net Weight	-	850 g	-	

Dimming Specifications

Parameter		Min.	Typ.	Max.	Notes
DV Models	Absolute Maximum Voltage on the Vdim (+) Pin	-20 V	-	20 V	
	Source Current on Vdim (+)Pin	200 uA	300 uA	450 uA	Vdim(+) = 0 V
	Recommended Dimming Range for 0-10V	0 V	-	10 V	
	PWM_in High Level	-	10V	-	
	PWM_in Low Level	-	0V	-	
	PWM_in Frequency Range	200 Hz	-	2 KHz	
	PWM_in Duty Cycle	0%	-	100%	
TV Models	Dimming Level	10%	-	100%	Default is Traditional Timer. Dimming mode set to Self-Adapting-Midnight or Self Adapting-Percentage in PC interface.
	Hold Time	0 Hours	-	18 Hours	
	Fade Time	0 Minutes	-	60 Minutes	
	Dimming Step	1	-	6	
Dimming Output Range	EUK-096S105DV(TV) EUK-096S150DV(TV) EUK-096S210DV(TV) EUK-096S350DV(TV)	10%loset	-	loset	700mA ≤ loiset ≤ 1050mA 1050mA ≤ loiset ≤ 1500mA 1400mA ≤ loiset ≤ 2100mA 2450mA ≤ loiset ≤ 3500mA
	EUK-096S105DV(TV) EUK-096S150DV(TV) EUK-096S210DV(TV) EUK-096S350DV(TV)	70 mA 105 mA 140 mA 245 mA	-	loiset	70mA ≤ loiset < 700mA 105mA ≤ loiset < 1050mA 140mA ≤ loiset < 1400mA 245mA ≤ loiset < 2450mA

Safety & EMC Compliance

Safety Category	Standard
ENEC & CE	EN 61347-1, EN 61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
CCC	GB 19510.1, GB 19510.14
KS	KS C 7655
BIS	IS 15885(Part2/Sec13)
EAC	TP TC 004, TP TC 020
EMI Standards	Notes
EN IEC 55015/GB/T 17743 ⁽¹⁾	Conducted emission Test & Radiated emission Test
EN IEC 61000-3-2/GB 17625.1	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker

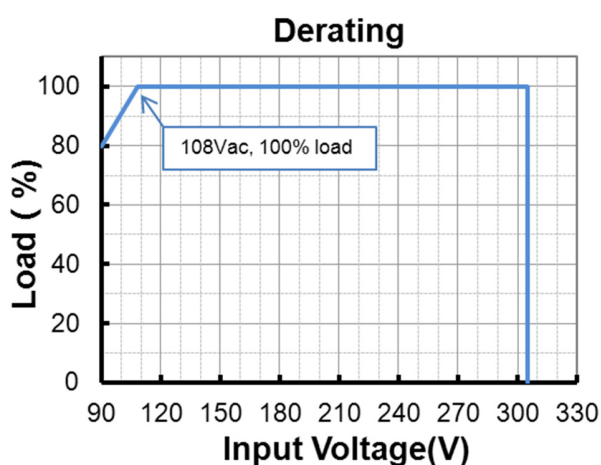
Safety & EMC Compliance (Continued)

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 6 kV, Common Mode 10 kV ⁽²⁾
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

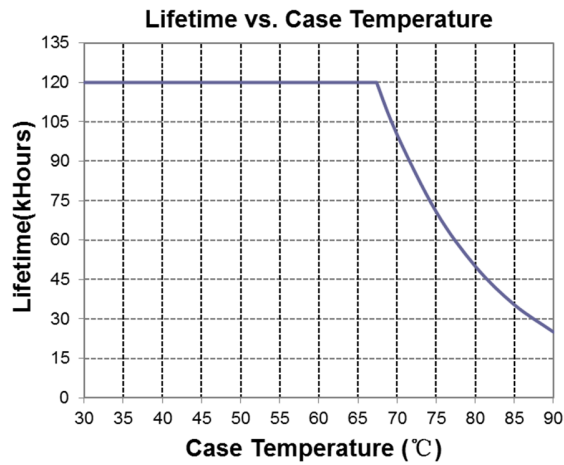
Note: (1) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

(2) 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.

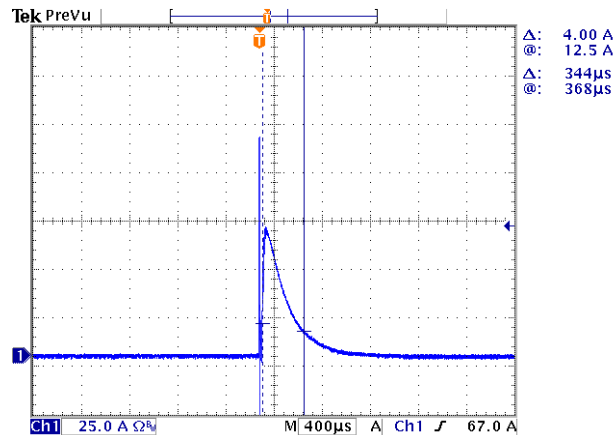
Derating



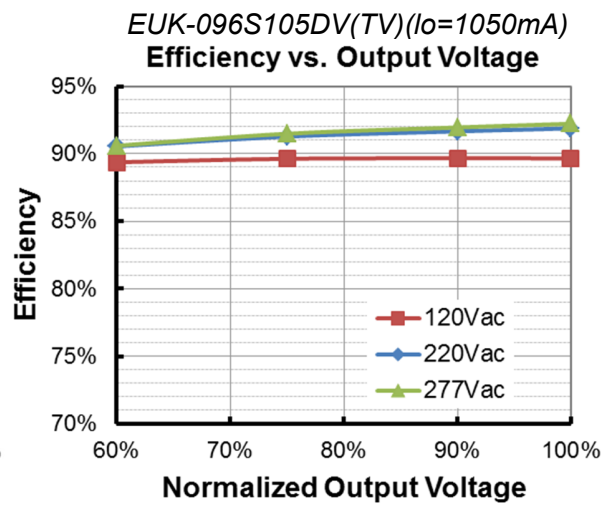
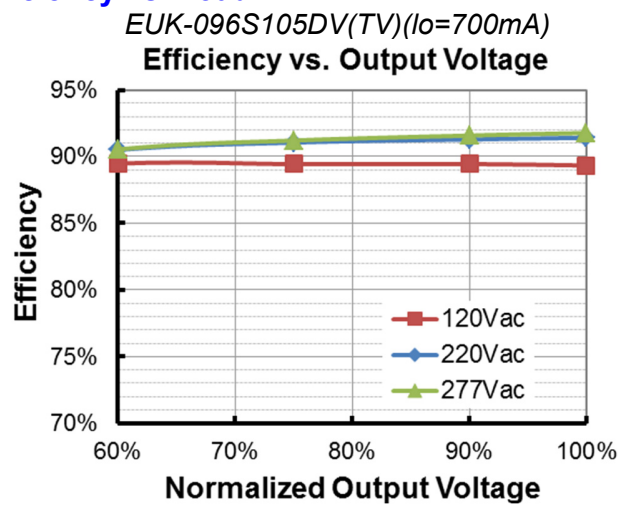
Lifetime vs. Case Temperature

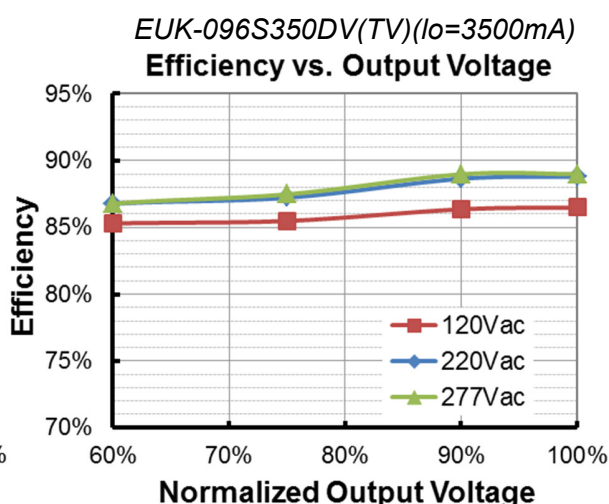
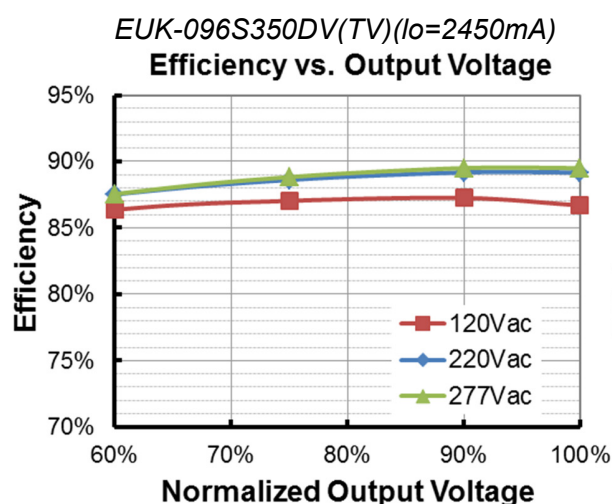
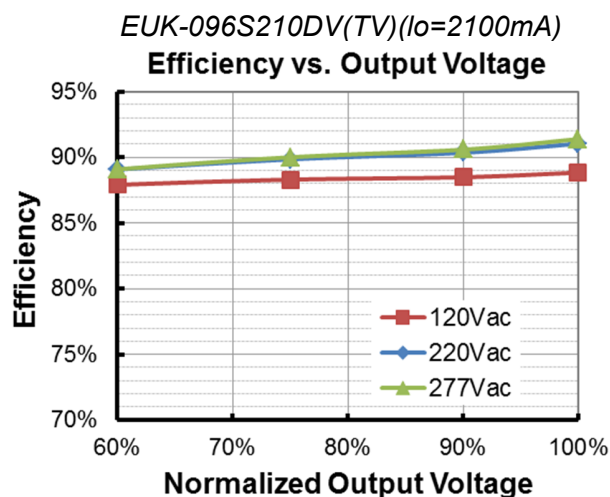
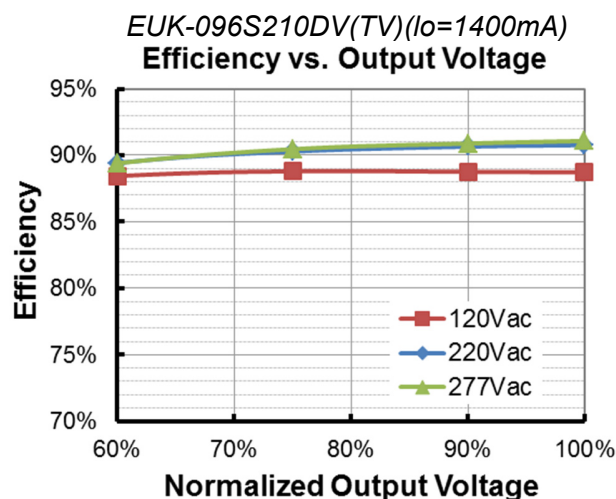
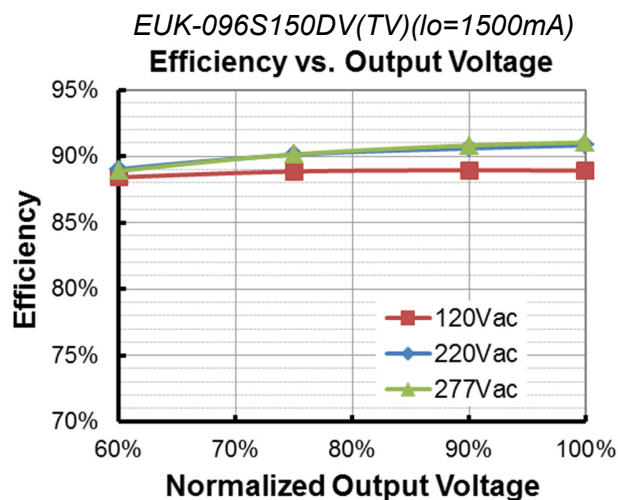
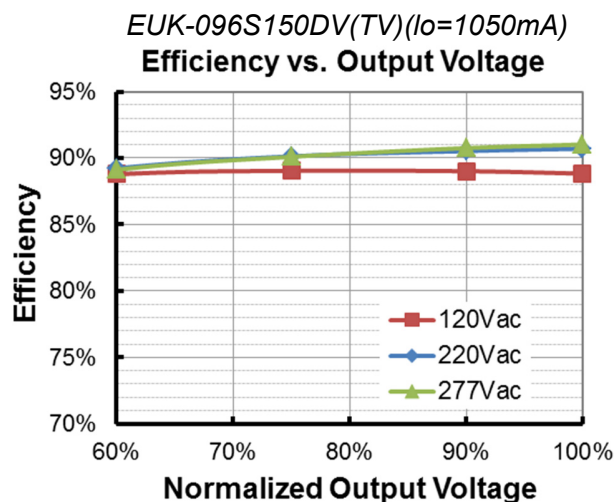


Inrush Current Waveform

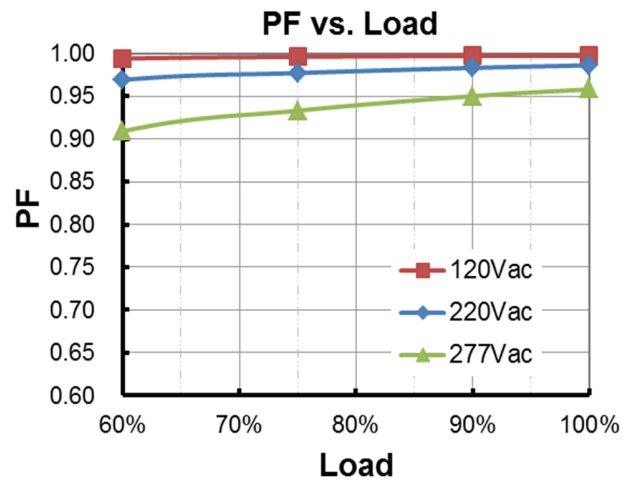


Efficiency vs. Load

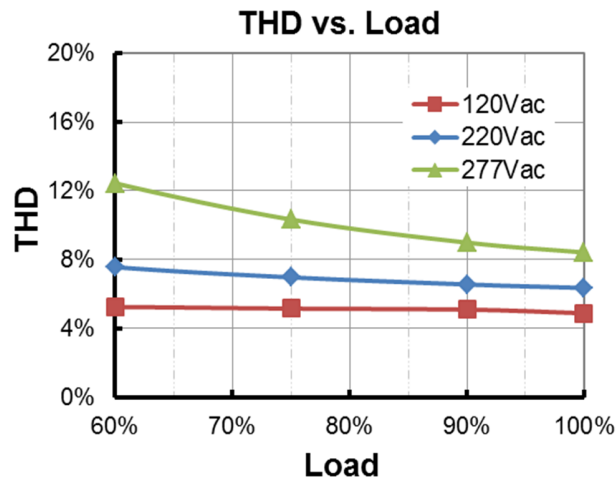




Power Factor



Total Harmonic Distortion



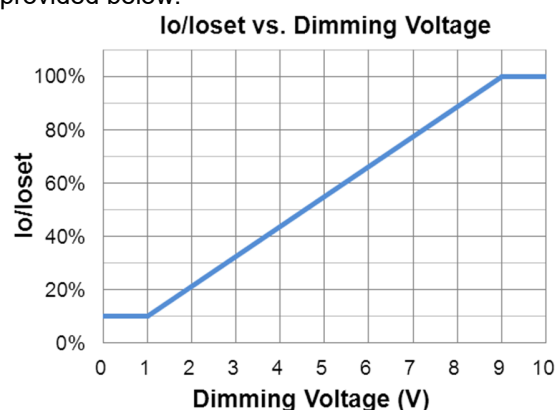
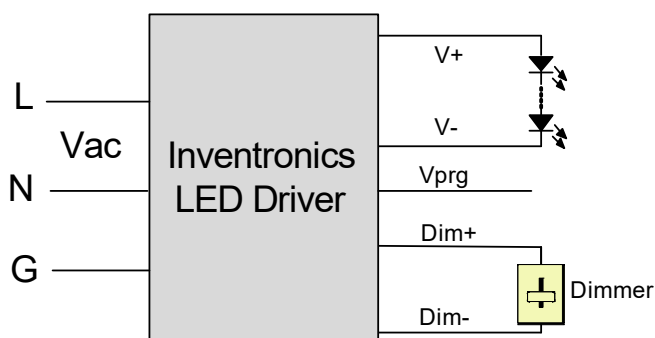
Protection Functions

Parameter	Notes
Over Temperature Protection	Decreases output current, returning to normal after over temperature is removed.
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 Voltage Protection	Limits output voltage at no load and in case the normal voltage limit fails.

Dimming

● 0-10V Dimming (Only DV models)

The recommended implementation of the dimming control is provided below.

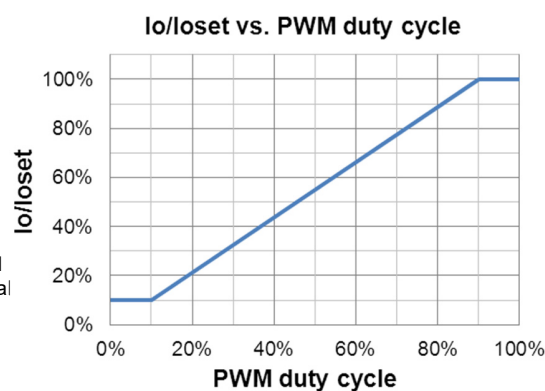
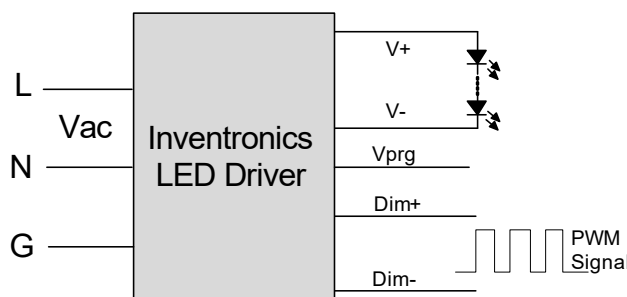


Implementation 1

Notes:

1. Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.
2. The dimmer can also be replaced by an active 0-10V voltage source signal or passive components like zener.

● 10V PWM Dimming (Only DV models)



Implementation 2

Notes: Do NOT connect Dim- to the output V- or V+, otherwise the driver will not work properly.

● Time Dimming (Only TV models)

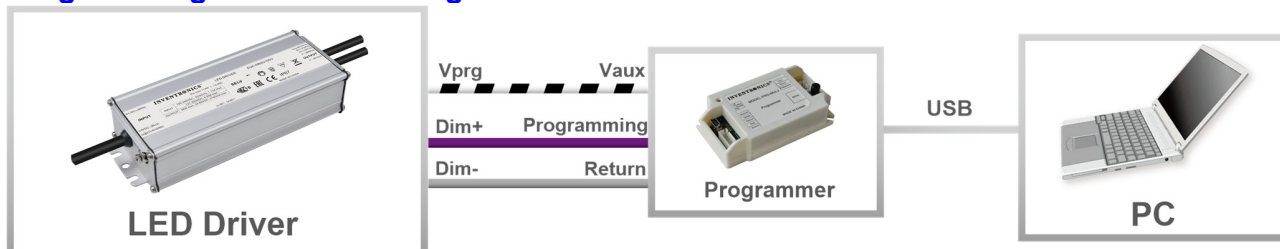
Time dimming control includes 3 kinds of modes, they are Self Adapting-Midnight, Self Adapting-Percentage and Traditional Timer.

- **Self Adapting-Midnight:** Automatically adjusts the dimming curve based on the on-time of past two days (if difference <15 minutes), assuming that the center point of the dimming curve is midnight local time.
- **Self Adapting-Percentage:** Automatically adjusts the on-time of each step by a constant percentage = (actual on-time for the past 2 days if difference <15 min) / (programmed on-time from the dimming curve).
- **Traditional Timer:** Follows the programmed timing curve after power on with no changes.

● Output Lumen Compensation (Only TV models)

Output Lumen Compensation (OLC) may be used to maintain constant light output over the life of the LEDs by driving them at a reduced current when new, then gradually increasing the drive current over time to counteract LED lumen degradation.

Programming Connection Diagram

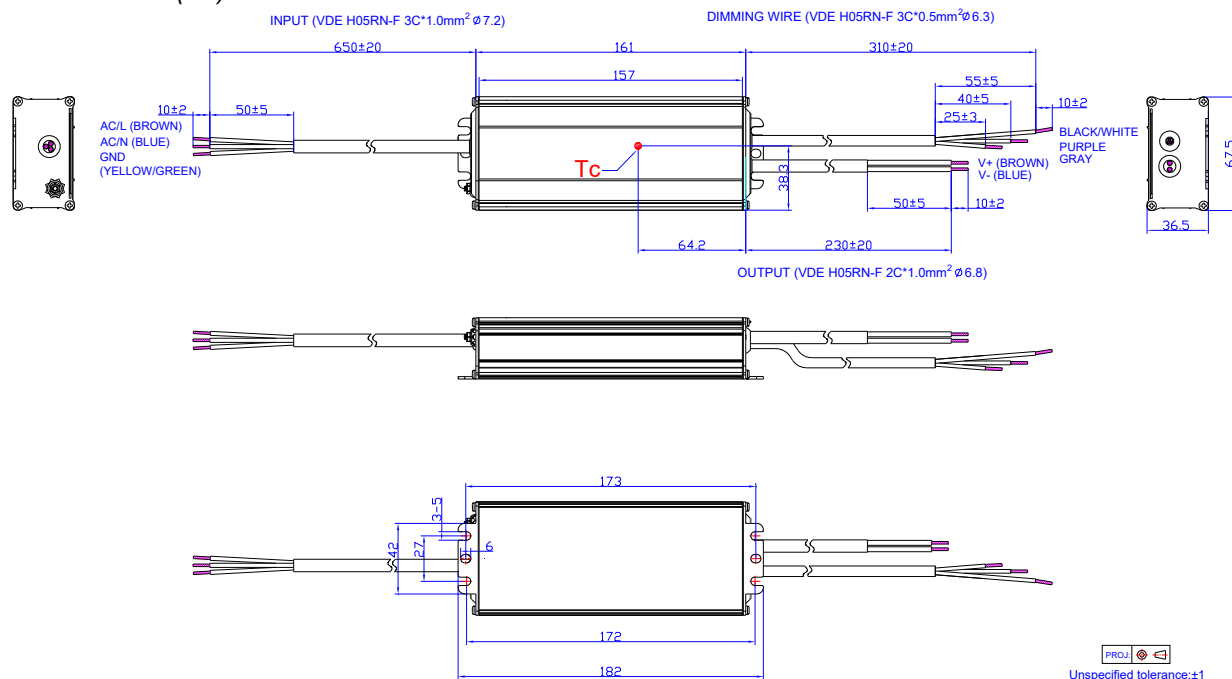


Note: The driver does not need to be powered on during the programming process.

- Please refer to [PRG-MUL2](#) (Programmer) datasheet for details.

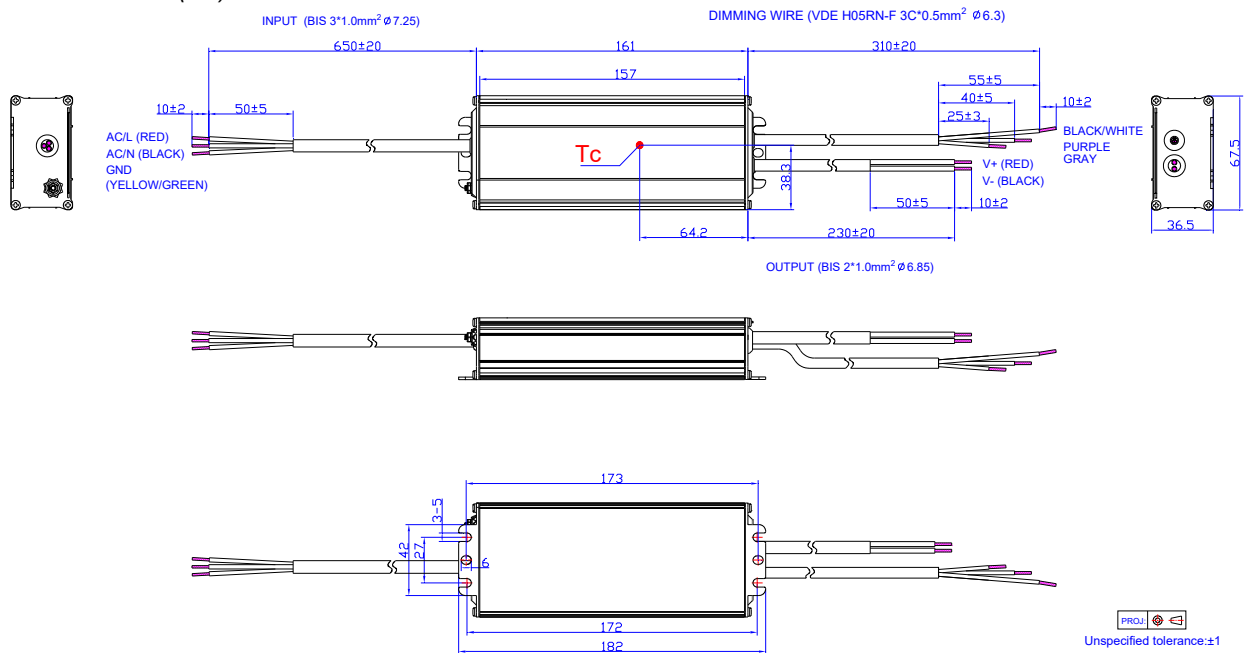
Mechanical Outline

EUK-096SxxxDV(TV)



Unspecified tolerance: ±1

EUK-096SxxxDV(TV)-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
2017-11-01	A	Datasheets Release	/	/
2017/11/17	B	Features	3 Timer Modes Dimmable (TV models)	Updated
		Models	EUK-096SxxxTV	Added
		I-V Operation Area	EUK-096SxxxTV	Added
		Output Current Setting(losset) Range	EUK-096SxxxTV	Added
		Output Current Setting Range with Constant Power	EUK-096SxxxTV	Added
		No Load Output Voltage	EUK-096SxxxTV	Added
		Efficiency at 120 Vac input	EUK-096SxxxTV	Added
		Efficiency at 220 Vac input	EUK-096SxxxTV	Added
		Efficiency at 277 Vac input	EUK-096SxxxTV	Added
		Dimming Specification	TV Models	Added
		Efficiency vs. Load	EUK-096SxxxTV	Added
		Dimming	/	Updated
2018-05-28	C	EAC	/	Added
		Description	/	Updated
		Mechanical Outline	/	Updated
2023-08-04	D	Product Photograph	/	Updated
		TUV/PSE logo	/	Deleted
		Independent logo	/	Added
		CCC logo	/	Updated
		Features	/	Updated
		Models	Notes(5)	Added
		General Specifications	Humidity	Updated
		Safety &EMC Compliance	/	Updated
		Dimming	/	Updated
		Programming Connection Diagram	/	Updated
		Mechanical Outline	EUK-096SxxxDV(TV)-3000	Added
		RoHS Compliance	/	Updated