Features

- Full Power at Wide Output Current Range (Constant Power)
- Adjustable Output Current (AOC) with Programmability
- Isolated 1(0)-5V/1(0)-10V/10V PWM/3-Timer-Modes
- Adjustable Dimming Curve
- High Reliability & Long Lifetime: 119,000 hrs. at 70°C Case Temperature
- Dim-to-Low-Voltage with Standby Power ⩽ 0.5W
- Output Lumen Compensation
- End-of-Life Indicator
- Input Surge Protection: DM 4kV, CM 6kV
- All-Around Protection: OVP, SCP, OTP
- IP66/IP67 (HV models)
- IP66 and UL Dry/Damp Location (HF models)
- SELV Output
- TYPE HL, for use in a Class I, Division 2 Hazardous (Classified) Location
- Suitable for Class I Luminaires
- 5 Years Warranty

Description

The *EUC-040SxxxHx* series is a 40W, constant-current IP66/IP67 LED driver that operates from 90-305Vac input with excellent power factor. It is created for many lighting applications including 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, output over voltage, short circuit, and over temperature.

Models

Adjustable Output Current Range(mA)	Full-Power Current Range(mA)(1)	Default Output Current(mA)	Output Voltage Range(Vdc)	Max. Output Power(W)	Typical Efficiency(2)	Typical Power Factor		Model Number(3)(4)(5)
						120Vac	220Vac	
50-700	500-700	700	40-80	40	88.5%	0.99	0.96	EUC-040S070Hx
70-1050	700-1050	1050	28-57	40	87.5%	0.99	0.96	EUC-040S105Hx

Notes: (1) Output current range with constant power at 40W
(2) Measured at 100% load and 220Vac input (see below “General Specifications” for details).
(3) Certified input voltage range: UL, FCC 100-277Vac; otherwise 100-240Vac.
(4) SELV output.
(5) x = V are ENEC and CCC, etc. models; x = F are UL Recognized, ENEC and CCC, etc. models with flying leads. See below "Mechanical Outline" for details.

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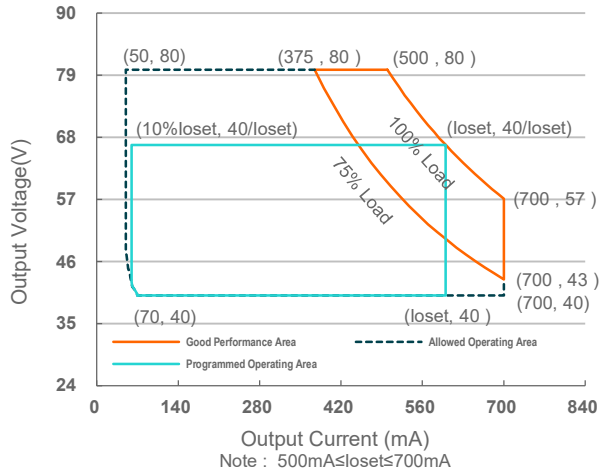
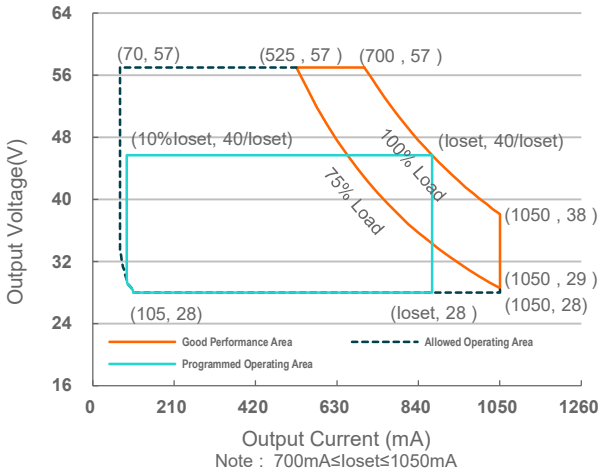
I-V Operation Area

EUC-040S070Hx



Note : 500mA≤Ioset≤700mA

EUC-040S105Hx



Note : 700mA≤Ioset≤1050mA

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input AC Voltage	90 Vac	-	305 Vac	
Input DC Voltage	127 Vdc	-	300 Vdc	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 MIU	UL 8750; 277Vac/60Hz
	-	-	0.70 mA	IEC 60598-1; 240Vac/60Hz
Input AC Current	-	-	0.43 A	Measured at 100% load and 120 Vac input.
	-	-	0.24 A	Measured at 100% load and 220 Vac input.
Inrush Current(I^2t)	-	-	0.001 A^2s	At 220Vac input, 25°C cold start, duration= 37.6 μs, 10%Ipk-10%Ipk.
Power Factor	0.90	-	-	120-277Vac, 50-60Hz,75%-100%Load (30~40W)
THD	-	-	20%	
THD	-	-	15%	120-240Vac, 50-60Hz,80%-100%Load (32~40W)

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Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-8%Io	-	8%Io	At 100% load condition, at 120-277Vac
Output Current Setting(Ioset) Range EUC-040S070Hx EUC-040S105Hx	 50 mA 70 mA	 - -	 700 mA 1050 mA	
Output Current Setting Range with Constant Power EUC-040S070Hx EUC-040S105Hx	 500 mA 700 mA	 - -	 700 mA 1050 mA	
Total Output Current Ripple (pk-avg)	-	50%Io	75%Io	At 100% load condition
Startup Overshoot Current	-	5%Io	10%Io	At 100% load condition
No Load Output Voltage EUC-040S070Hx EUC-040S105Hx	 - -	 - -	 100 V 80 V	
Line Regulation	-	-	±5.0%	Measured at 100% load, at 120-277Vac
Load Regulation	-	-	±5.0%	At 120-277Vac
Turn-on Delay Time	-	-	1 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 unless otherwise stated.

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input: EUC-040S070Hx Io= 500 mA Io= 700 mA EUC-040S105Hx Io= 700 mA Io=1050 mA	 86.0% 85.5% 85.0% 83.5%	 88.0% 87.5% 87.0% 85.5%	 - - - -	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: EUC-040S070Hx Io= 500 mA Io= 700 mA EUC-040S105Hx Io= 700 mA Io=1050 mA	 86.5% 86.5% 85.5% 84.5%	 88.5% 88.5% 87.5% 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 277 Vac input: EUC-040S070Hx Io= 500 mA Io= 700 mA EUC-040S105Hx Io= 700 mA Io=1050 mA	 85.5% 86.0% 85.0% 84.0%	 87.5% 88.0% 87.0% 86.0%	 - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Standby Power	-	-	0.5 W	Measured at 230Vac/50Hz; Dimming to low voltage
MTBF	-	1120,000 Hours	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)

General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Lifetime	-	119,000 Hours	-	Measured at 220Vac input, 100%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)	3.74 x 2.52 x 1.26 95 x 64 x 32			With mounting ear 4.41 x 2.52 x 1.26 112 x 64 x 32
Net Weight	-	425 g	-	

Note: All specifications are tested by Cree XLamp XP-G2 unless otherwise stated.

Dimming Specifications

Parameter		Min.	Typ.	Max.	Notes
Absolute Maximum Voltage on the Vdim (+) Pin		-20 V	-	20 V	
Source Current on Vdim (+)Pin		200 μA	300 μA	450 μA	Vdim(+) = 0 V
Dimming Output Range	EUC-040S070Hx EUC-040S105Hx	10%Ioset	-	Ioset	500 mA ≤ Ioset ≤ 700 mA 700 mA ≤ Ioset ≤ 1050 mA
	EUC-040S070Hx EUC-040S105Hx	50 mA 70 mA	-	Ioset	50 mA ≤ Ioset ≤ 500 mA 70 mA ≤ Ioset ≤ 700 mA
Recommended Dimming Input Range		1 V	-	9 V	Default positive 1-10V dimming mode. DTLV can be enable in Inventronics Programing Software.
Hysteresis		-	0.2 V	-	
Dimming Curve Adjustable		0V	-	10V	Dimming mode set to Adjustable Dimming Curve in Inventronics Programing Software.
PWM_in High Level		-	10 V	-	
PWM_in Low Level		-	0 V	-	
PWM_in Frequency Range		200 Hz	-	3 KHz	
PWM_in Duty Cycle		0%	-	100%	
Hysteresis		-	2%	-	

Safety &EMC Compliance

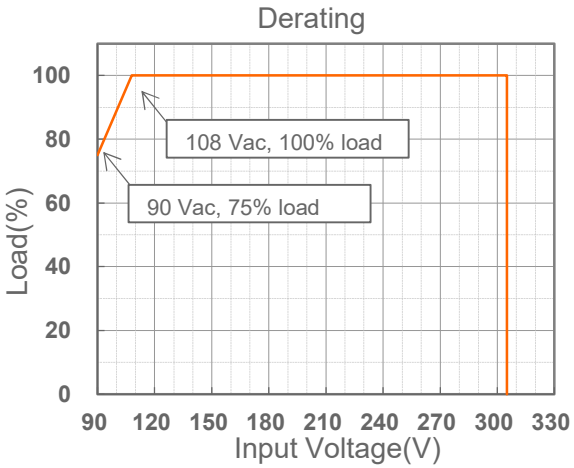
Safety Category	Standard
UL/CUL	UL 8750,CAN/CSA-C22.2 No. 250.13
ENEC & CE	EN 61347-1, EN 61347-2-13
CB	IEC 61347-1, IEC 61347-2-13

Safety &EMC Compliance (Continued)

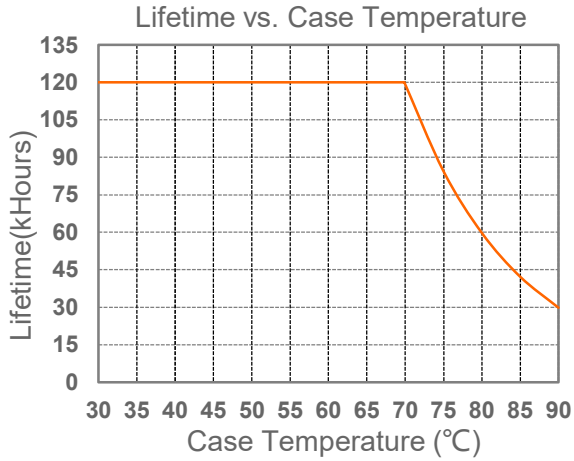
Safety Category	Standard
CCC	GB 19510.1, GB 19510.14
KS	KS C 7655
Performance	**Standard**
ENEC	EN IEC 62384
EMI Standards	**Notes**
EN IEC 55015/GB/T 17743(1)	Conducted emission Test &Radiated emission Test
EN IEC 61000-3-2/GB 17625.1	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
FCC Part 15(1)	ANSI C63.4 Class B
	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired Operation.
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.

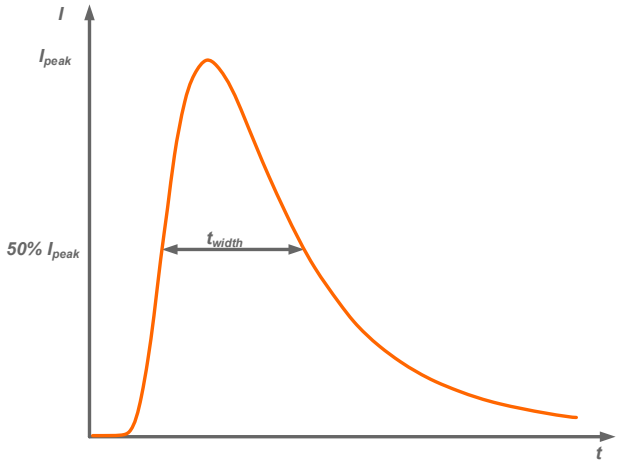
Derating



Lifetime vs. Case Temperature



Inrush Current Waveform



Input AC Voltage	I_{peak}	t_{width} (@ 50% Ipeak)
120Vac	3.23A	45.6μs
220Vac	5.16A	32.0μs
277Vac	7.23A	37.2μs

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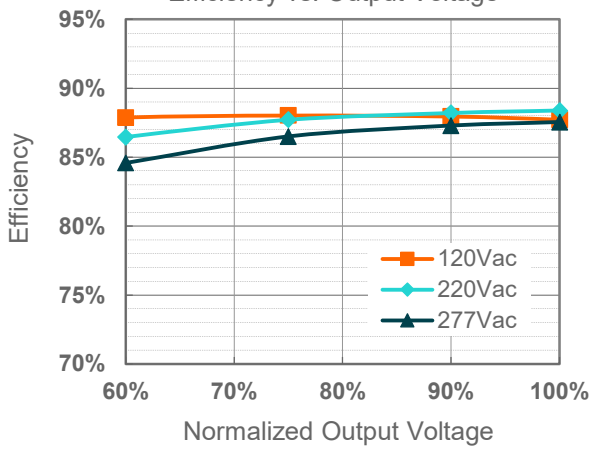
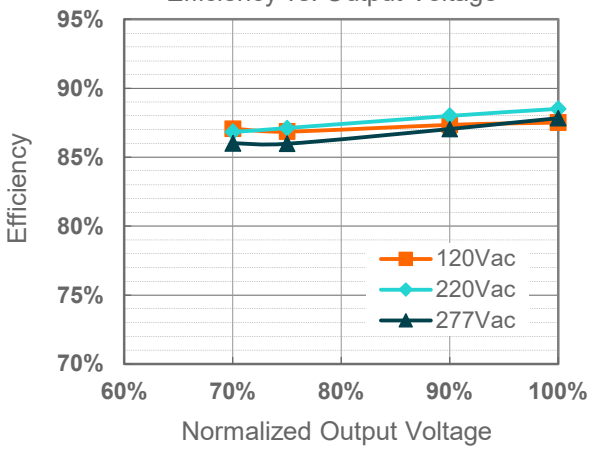
MCB	Tripping Curves	B	B	B	B	C	C	C	C
	Rated Current	10A	16A	20A	25A	10A	16A	20A	25A
The Number of LED Driver can be Configured	120Vac	15	24	30	38	17	28	35	44
	220Vac	28	45	56	70	32	52	65	82
	277Vac	34	54	68	85	39	63	79	99

Efficiency vs. Load

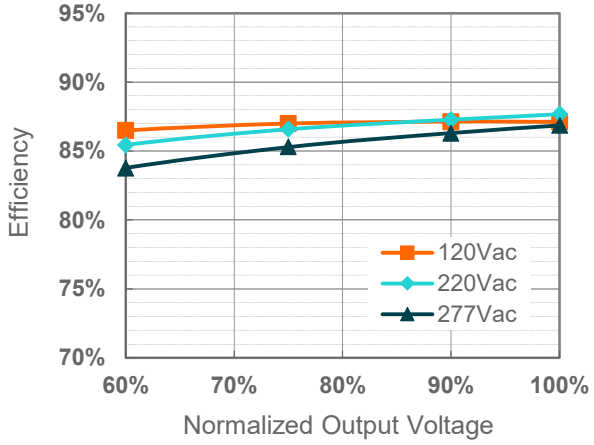
EUC-040S070Hx(Io=500mA)



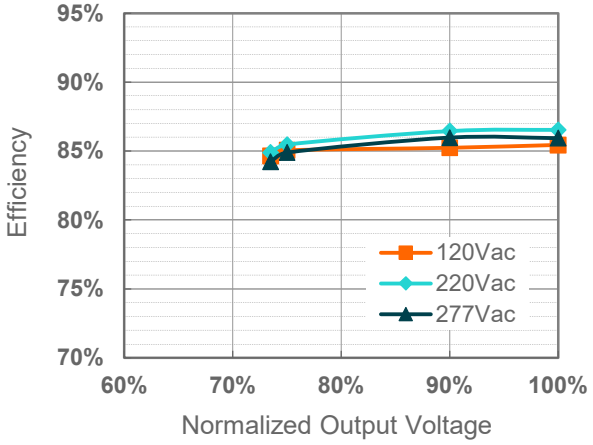
EUC-040S070Hx(Io=700mA)



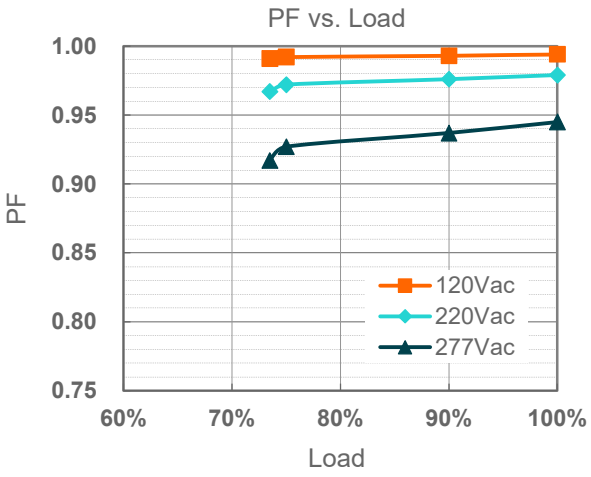
EUC-040S105Hx(Io=700mA)



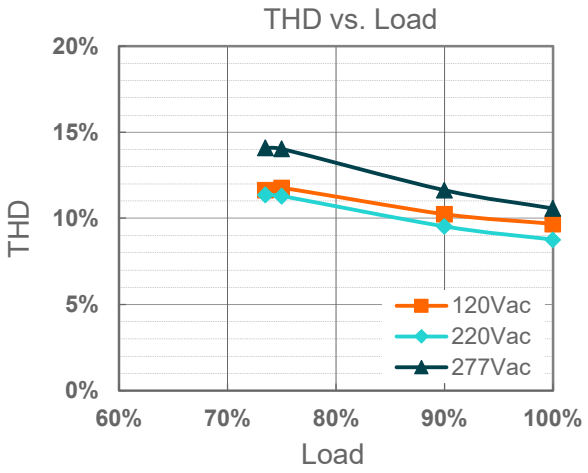
EUC-040S105Hx(Io=1050mA)



Power Factor



Total Harmonic Distortion



Protection Functions

Parameter	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.

Dimming

- **1(0)-5V Dimming**

The recommended implementation of the dimming control is provided below.

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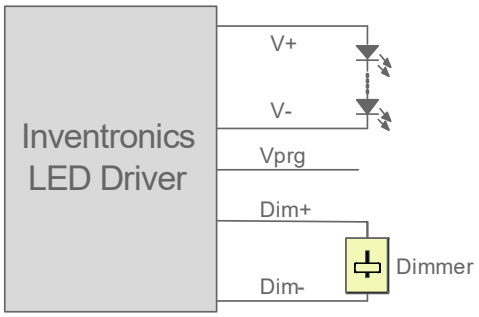
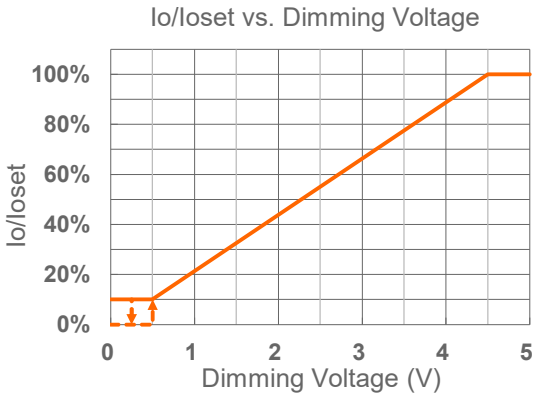
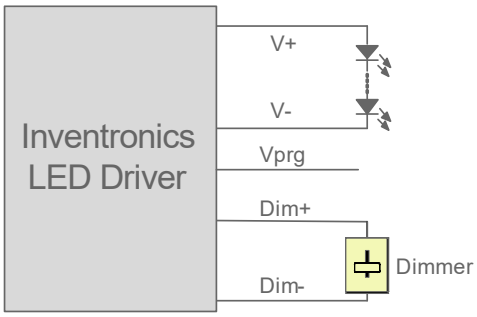
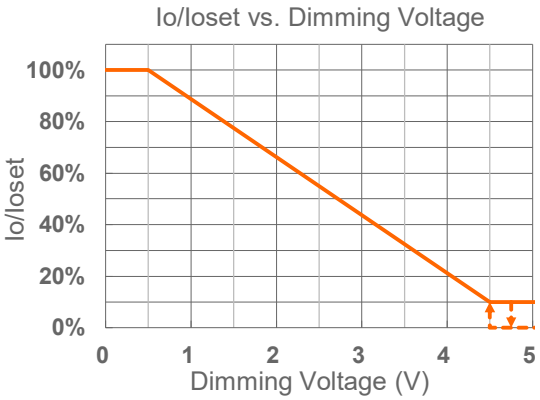




Implementation 1: Positive logic





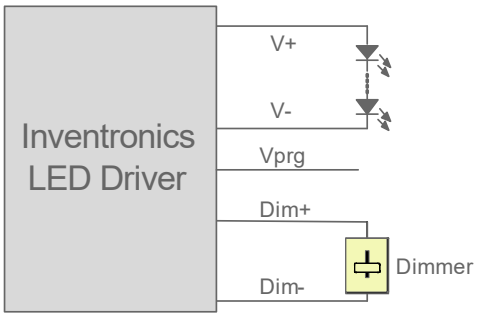
Implementation 2: Negative logic

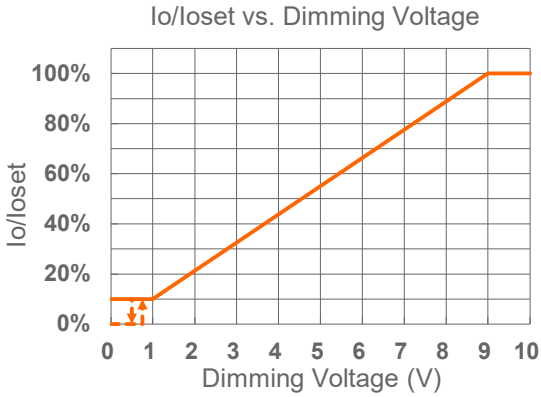
Notes:

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 1(0)-5V voltage source signal or passive components like zener.
3. Dimming mode can be set as 0-5V or 1-5V by Inventronics Multi Programmer.

● 1(0)-10V Dimming

The recommended implementation of the dimming control is provided below.



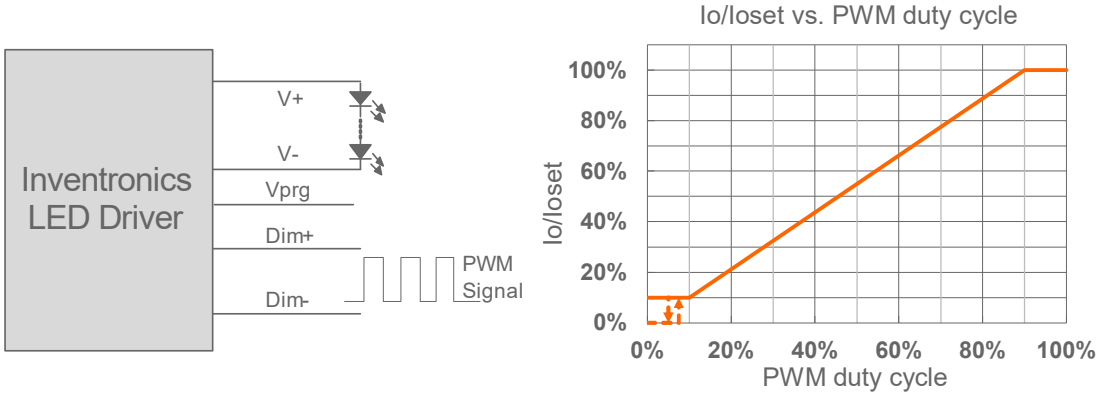


Implementation 3: Positive logic (Default)

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 1(0)-10V voltage source signal or passive components like zener.
3. Dimming mode can be set as 0-10V or 1-10V by Inventronics Multi Programmer,1-10V is default.

● 10V PWM Dimming

The recommended implementation of the dimming control is provided below.

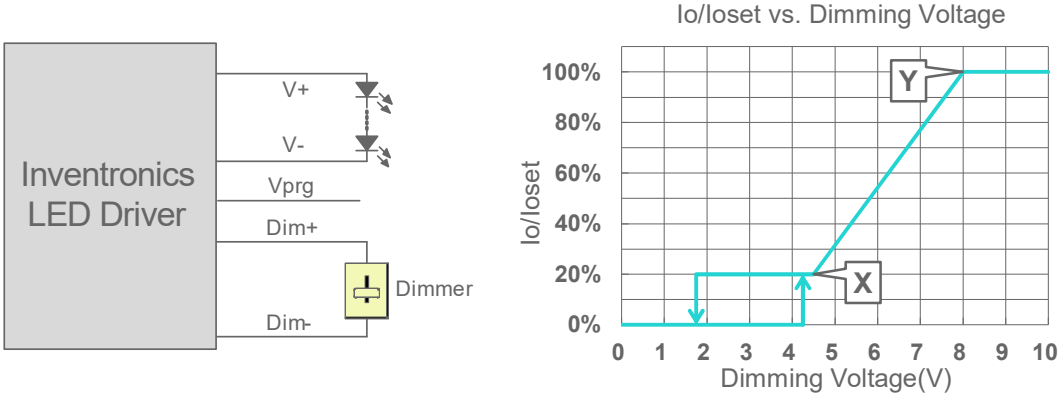


Implementation 4: Positive logic

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

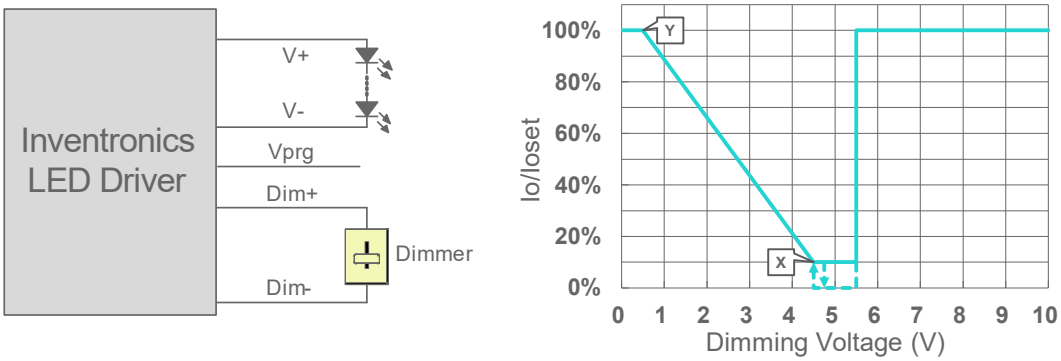
● Adjustable Dimming Curve

0-10V curve can be set as corresponding dimming voltage by Inventronics Multi Programmer. The recommended implementation of the dimming control is provided below.
When dimming voltage X point is set to be smaller than Y point, the dimming curve is positive logic.



Implementation 5: Positive logic

When X point is set to be bigger than Y point, the dimming curve is negative logic, and dimming voltage ＞ 5.5V, the driver will output maximum current. If Dim+ is open, the driver will output maximum current.



Implementation 6: Negative logic

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.
3. For best dimming accuracy, the difference between X point and Y point is advised not less than 4V.

Time Dimming

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.
- **Override Timer**: When the integrated timer is enabled, it is possible to override the dimming mode from 'Timer' into '1(0)-10V' by applying a voltage of 1(0)-10V between DIM+ and DIM-. Once a voltage ⩽10.5 Vdc is detected the output current will coincide with the dimming voltage. By opening the DIM+ and DIM- circuitry, the LED driver will switch again to timer mode. During override, our product continues to count while the timer is being overridden. Once the override is removed, the output current returns to the same point in its timer cycle.

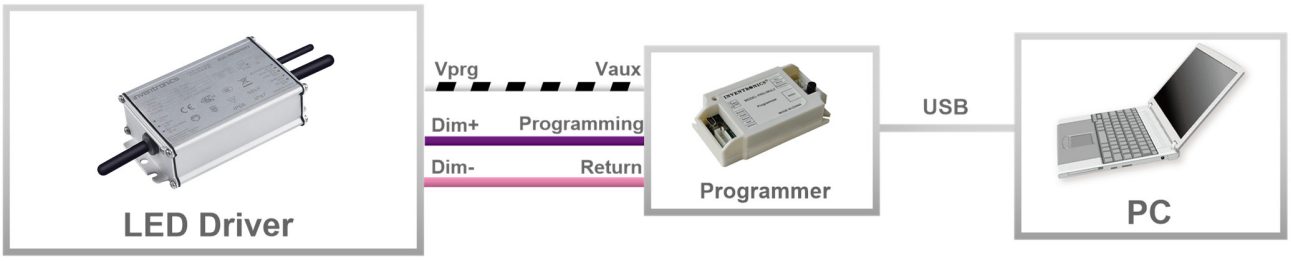
Output Lumen Compensation

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.

End of Life

End-of-Life (EOL) is providing a visual notification to a user that the LED module has reached the end of manufacturer-specified life and that the replacement is recommended. Once active, an indication is given at each power-up of the driver, which the driver indicates this through a lower light output during the first 1 minute before normal operation is continued.

Programming Connection Diagram

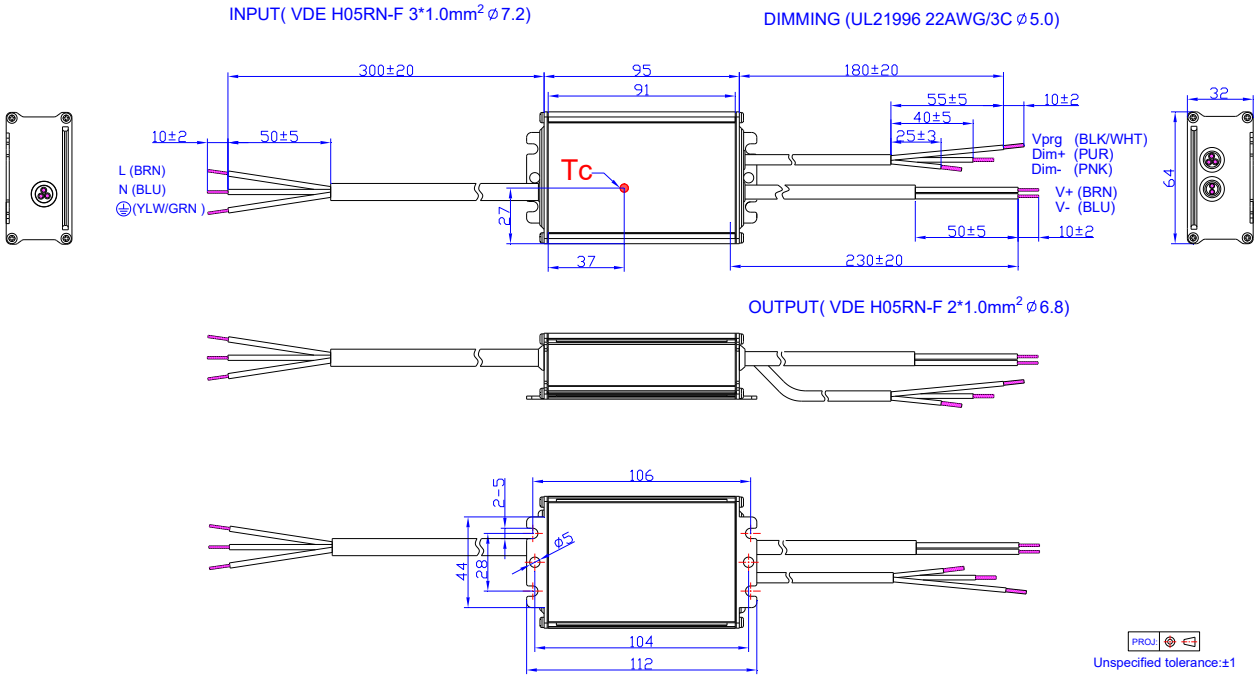


Note: The driver does not need to be powered on during the programming process.

- **Please refer to PRG-MUL2 (Programmer) datasheet for details.**

Mechanical Outline

EUC-040SxxxHV



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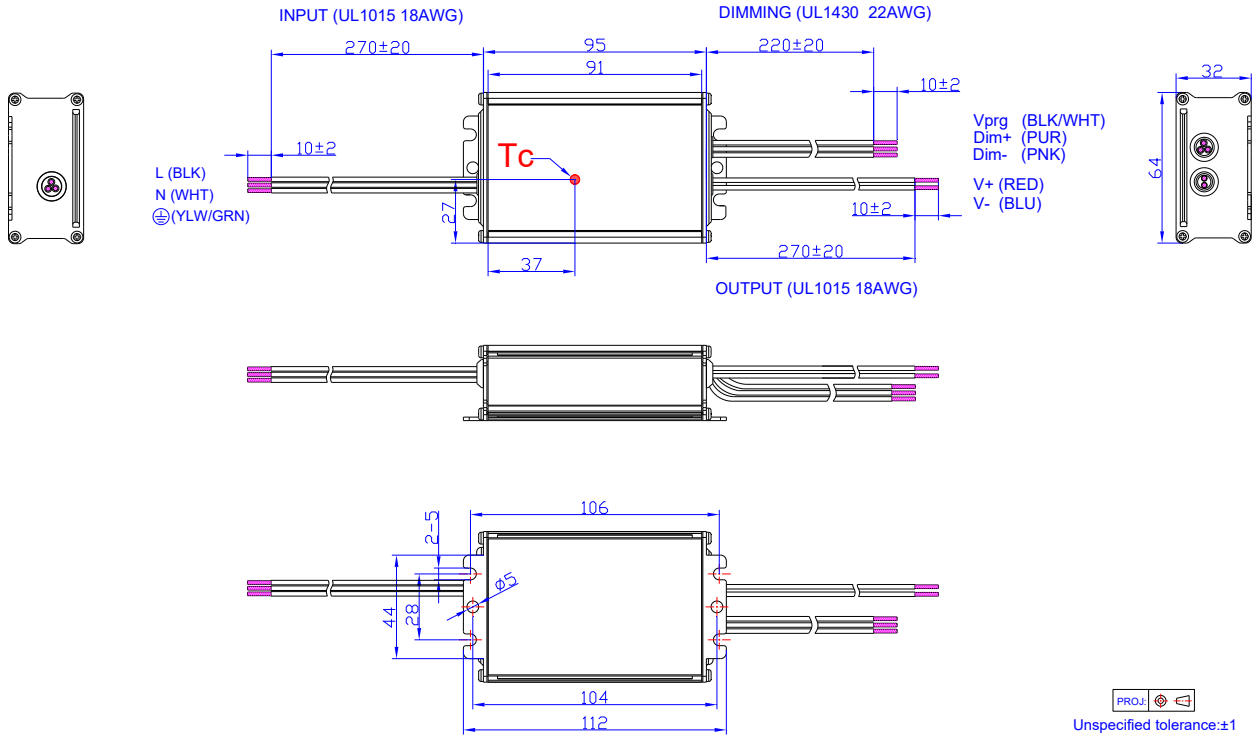
EUC-040SxxxHF



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 Date	Rev.	Description of Change		
		Item	From	To
2024-11-07	A	Datasheet Release	/	/

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