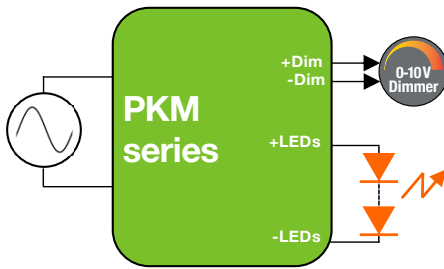
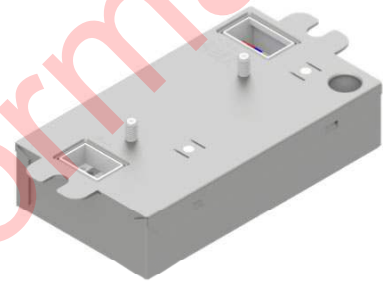


## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

Nominal Input Voltage	Max. Output Power	Efficiency	Max. Case Temperature	THD	Power Factor	Dimming Method	Dimming Range	Startup Time
120 & 277 Vac	50 W	up to 90% typical	90°C (measured at the hot spot)	< 20%	> 0.9	Programmable 0 - 10 V	1 - 100% (% of Iout)	300 ms typical



**Terminal Blocks, Metal Case**  
L 106.5 x W 60.3 x H 25.5 mm  
(L 4.19 x W 2.37 x H 1.00 in)



**Bottom Leads, Metal Case**  
L 106.7 x W 60.3 x H 25.2 mm  
(L 4.20 x W 2.37 x H 0.99 in)



### FEATURES

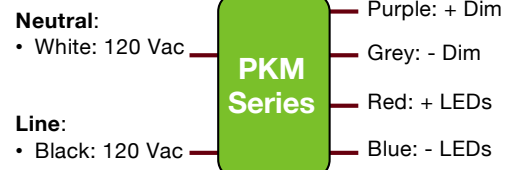
- UL Class P
- Class 2 output
- Standby power consumption: 1.4 W @ 120, 240 Vac; 1.7 W @ 277 Vac
- Lifetime: 5 years @  $T_c \leq XX^\circ C$
- 90°C maximum case hot spot temperature
- Surge protection:
  - IEC61000-4-5: 2 kV line to line/2 kV line to earth
  - 2.5 kV ring wave: ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A
- Complies with DLC (DesignLight Consortium®) and CA Title 24 technical requirements

### PROGRAMMING

- Audio jack programming
- Current: see page 2 for current range
- 0-10V dimming profiles: Linear, Non-linear, Logarithmic
- Data log read: SKU, S/N, lot code, hours of operation, FW rev., power cycles

### APPLICATIONS

- Commercial & residential lighting
- Architectural lighting
- Indoor Lighting

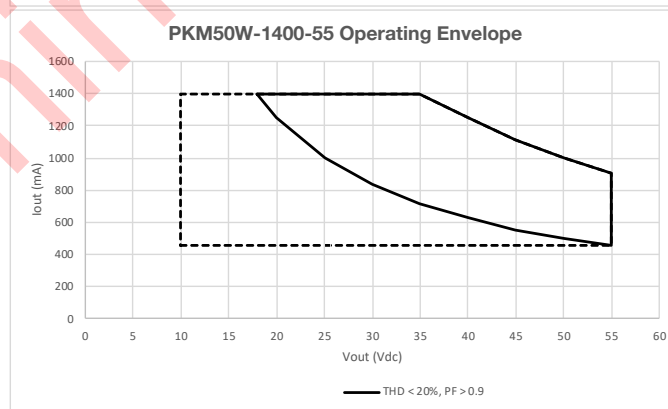
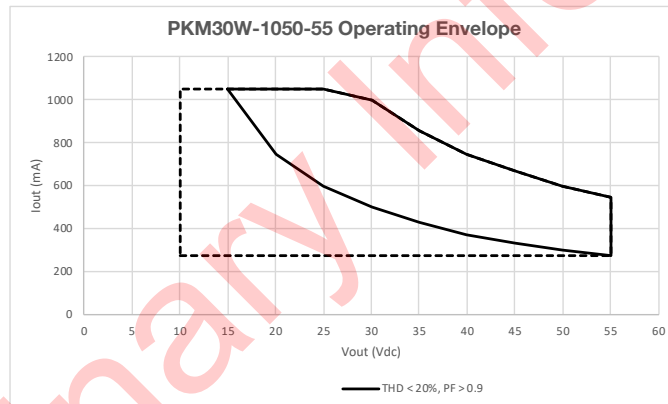


**Wiring Diagrams**

## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 1 - ORDERING INFORMATION

Part Number	Nominal Input Voltage (Vac)	Max Output Power (W)	I <sub>out</sub> (mA)	Default Programmed Current (mA)	V <sub>out</sub> Min. (Vdc)	V <sub>out</sub> Nom. (Vdc)	V <sub>out</sub> Max. (Vdc)	Open Loop (No Load) Voltage (Vdc)	Notes
<b>PKM30W</b>									
PKM30W-1050-55-SD	120 & 277	30	275 to 1050	500	10	49.5	55	60	Bottom Leads
PKM30W-1050-55-TD	120 & 277	30	275 to 1050	500	10	49.5	55	60	Terminal Blocks
<b>PKM50W</b>									
PKM50W-1400-55-SD	120 & 277	50	455 to 1400	700	10	49.5	55	60	Bottom Leads
PKM50W-1400-55-TD	120 & 277	50	455 to 1400	700	10	49.5	55	60	Terminal Blocks



**Notes:**

- For additional options of output current and output voltage, contact your sales representative or send an email to: [SaveEnergy@erp-power.com](mailto:SaveEnergy@erp-power.com)
- Please order the programming wand using the part number PROG-JACK-USB.

**Programming Cable**

Part number: PROG-JACK-USB



## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 2 - INPUT SPECIFICATION (@25° C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Input Voltage Range (Vin)	Vac	90	120, 277	305	<ul style="list-style-type: none"> <li>The rated output current for each model is achieved at Vin ≥ 108 Vac, &amp; at Vin ≥ 249 Vac.</li> <li>At nominal load</li> </ul>
Input Frequency Range	Hz	47	50/60	63	
Input Current (Iin)	A			1.25 A @ 120 Vac 0.56 A @ 277 Vac	
Power Factor (PF)		0.9	> 0.9		<ul style="list-style-type: none"> <li>At nominal input voltage</li> <li>From 100% to XX% of output current</li> </ul>
Inrush Current	A	Meets NEMA-410 requirements			<ul style="list-style-type: none"> <li>At any point on the sine wave and 25°C</li> <li>Active limiting inrush current is available as an option. Please contact your ERP representative or send an email to SaveEnergy@erp-power.com.</li> </ul>
Leakage Current	mA			0.4 mA @ 120 Vac 0.92 mA @ 277 Vac	Measured per IEC60950-1
Input Harmonics	Complies with IEC61000-3-2 for Class C equipment				
Total Harmonics Distortion (THD)				20%	<ul style="list-style-type: none"> <li>At nominal input voltage</li> <li>From 100% to XX% of output current</li> <li>Complies with DLC (Design Light Consortium) technical requirements</li> </ul>
Efficiency	%	-	up to 90%	-	Measured with nominal input voltage, a full sinusoidal wave form and without dimmer attached.
Standby Power	W			1.4 1.7	<ul style="list-style-type: none"> <li>At 120 Vac</li> <li>At 277 Vac</li> </ul>
Isolation	The AC input to the main DC output is isolated.				

### 3 - MAIN OUTPUT SPECIFICATION (@25° C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Output Voltage (Vout)	Vdc				<ul style="list-style-type: none"> <li>See ordering information for details</li> </ul>
Output Current (Iout)	mA				<ul style="list-style-type: none"> <li>See ordering information for details</li> <li>Output voltage and current combination cannot exceed max power output. See page XX for operating window</li> <li>The rated output current for each model is achieved at Vin ≥ 108 Vac &amp; Vin ≥ 207 Vac.</li> </ul>
Output Current Regulation	%	-5	±2.5	5	<ul style="list-style-type: none"> <li>At nominal AC line voltage</li> <li>Includes load and current set point variations</li> </ul>
Output Current Overshoot	%	-	-	20	The driver does not operate outside of the regulation requirements for more than 500 ms during power on with nominal LED load and without dimmer.
Ripple Current	≤ 20% of rated output current for each model				<ul style="list-style-type: none"> <li>Measured at nominal LED voltage and nominal input voltage without dimming</li> <li>Calculated in accordance with the IES Lighting Handbook, 9th edition</li> </ul>
Dimming Range (% of Iout)	%	1		100	<ul style="list-style-type: none"> <li>The dimming range is dependent on each specific dimmer. It may not be able to achieve 1% dimming with some dimmers.</li> <li>Dimming performance is optimal when the driver is operated at its nominal output voltage matching the LED nominal Vf (forward voltage). Dimming performance may vary when the driver is operated near its minimum output voltage.</li> </ul>
Start-up Time	ms		300	500	<ul style="list-style-type: none"> <li>Without any dimmer attached, and at nominal input voltages and nominal load</li> <li>Measured from application of AC line voltage to 100% light output</li> <li>Complies with ENERGY STAR® luminaire specification and CA Title 24</li> </ul>
Isolation	The main DC output is certified and tested per UL8750 Class 2 or LED Class 2, and is supplement SF compliant				

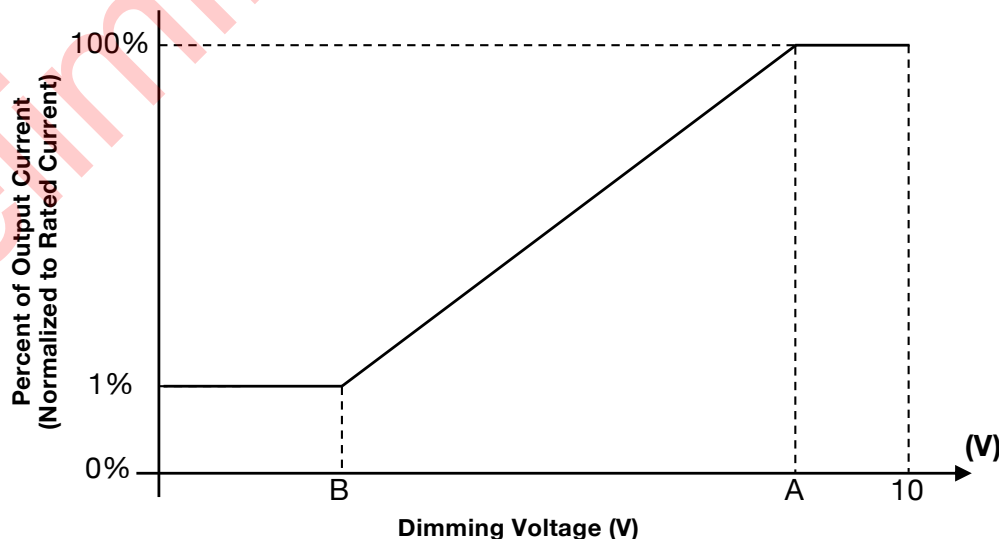
## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 4 - 0-10 V DIMMING CONTROL (@25° C ambient temperature)

In the PKM series, several 0-10V dimming profiles can be selected, such as a logarithmic profile, a non-linear profile with 1% minimum dimming, and a non-linear profile with 10% minimum dimming. Furthermore, every point in the non-linear dimming profile can be programmed using the programming software.

By default, the non-linear profile with 1% minimum dimming (shown in figure 1) is pre-loaded in the PKM series.

	Units	Minimum	Typical	Maximum	Notes
<b>+Dim Signal, -Dim Signal</b>		The PKM series operate only with 0-10 V dimmers that sink current. The method to dim the output current of the driver is done via the +Dim/-Dim Signal pins. The +Dim/-Dim signal pins can be used to adjust the output setting via a standard commercial wall dimmer, an external control voltage source (0 to 10 Vdc), or a variable resistor when using the recommended number of LEDs. The dimming input permits 1% to 100% dimming.			
<b>Dimming Profile (see figure 1)</b>		100% of output current between 10 V and 8.5 V, Linear between 8.5 V and 1.5 V, 1% of output current below 1.5 V.			
<b>Dimming Range</b>	%	0.1		100	As a percent of the output current
<b>High Level Voltage - A</b>	V	8.4	8.5	8.6	
<b>Low Level Voltage - B</b>	V		1.5		
<b>Current Supplied by the +Dim Signal Pin</b>	mA			1	
<b>Output Current Tolerance While Being Dimmed</b>	%			±8	The tolerance of the output current while being dimmed is ≤ ±8% until down to 1.5V.
<b>Minimum Dimming Tolerance</b>	%	0.8	1	2	
<b>Isolation</b>	The 0-10 V circuit is isolated from both the AC input and the main DC output and meets UL8750 SF supplement requirement				



**Figure 1**

## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 5 - ENVIRONMENTAL CONDITIONS

	Units	Minimum	Typical	Maximum	Notes
<b>Operating Ambient Temperature (Ta)</b>	°C	-20		50	50°C is the non-derated temperature (Refer to section 8 "Output power de-rating at higher temperatures".
<b>Maximum Case Temperature (Tc)</b>	°C			+90	Case temperature measured at the hot spot •tc (see label in page 11)
<b>Storage Temperature</b>	°C	-40		+85	
<b>Humidity</b>	%	5	-	95	Non-condensing
<b>Cooling</b>	Convection cooled				
<b>Acoustic Noise</b>	dBA			24	Measured at a distance of 1 meter, without dimmer
<b>Mechanical Shock Protection</b>	per EN60068-2-27				
<b>Vibration Protection</b>	per EN60068-2-6 & EN60068-2-64				
<b>MTBF</b>	> 200,000 hours when operated at nominal input and output conditions, and at Tc ≤ XX°C				
<b>Lifetime</b>	50,000 hours at Tc ≤ XX°C maximum case hot spot temperature (see hot spot •tc on label in page 11)				

### 6 - EMC COMPLIANCE AND SAFETY APPROVALS

#### EMC Compliance

<b>Conducted and Radiated EMI</b>	•Compliant with FCC CFR Title 47 Part 15 Class A		
<b>Harmonic Current Emissions</b>	IEC61000-3-2	For Class C equipment	
<b>Voltage Fluctuations &amp; Flicker</b>	IEC61000-3-3		
<b>Immunity Compliance</b>	<b>ESD (Electrostatic Discharge)</b>	IEC61000-4-2	6 kV contact discharge, 8 kV air discharge, level 3
	<b>RF Electromagnetic Field Susceptibility</b>	IEC61000-4-3	3 V/m, 80 - 1000 MHz, 80% modulated at a distance of 3 meters
	<b>Electrical Fast Transient</b>	IEC61000-4-4	± 2 kV on AC power port for 1 minute, ±1 kV on signal/control lines
	<b>Surge</b>	IEC61000-4-5	± 2 kV line to line (differential mode) /± 2 kV line to common mode ground
		ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A, 2.5 kV ring wave	
	<b>Conducted RF Disturbances</b>	IEC61000-4-6	3V, 0.15-80 MHz, 80% modulated
<b>Voltage Dips</b>	IEC61000-4-11	>95% dip, 0.5 period; 30% dip, 25 periods; 95% reduction, 250 periods	

#### Safety Agency Approvals

<b>UL</b>	UL8750 listed Class 2, supplement SF, SREC
<b>cUL</b>	CAN/CSA C22.2 No. 250.13-14 LED equipment for lighting applications
<b>NOM</b>	

#### Safety

	Units	Minimum	Typical	Maximum	Notes
<b>Hi Pot (High Potential) or Dielectric voltage-withstand</b>	Vdc	2200			•Tested at the RMS voltage equivalent of 1556 Vac •Insulation between the input (AC line and Neutral) and the output

## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 7 - PROTECTION FEATURES

#### Input Over Current Protection

The PKM series incorporates a primary AC line fuse for input over current protection to prevent damage to the LED driver and meet product safety requirements as outlined in Section 6.

#### Short Circuit and Over Current Protection

The PKM series is protected against short-circuit such that a short from any output to return shall not result in a fire hazard or shock hazard. The driver shall hiccup as a result of a short circuit or over current fault. Removal of the fault will return the driver to within normal operation. The driver shall recover, with no damage, from a short across the output for an indefinite period of time.

#### Internal Over temperature Protection

The PKM series is equipped with internal temperature sensor on the primary power train. Failure to stay within the convection power rating will result in the power supply reducing the available current (fold back) below the programmed amount. The main output current will be restored to the programmed value when the temperature of the built-in temperature sensor cools adequately.

#### Output Open Load Protection

When the LED load is removed, the output voltage of the PKM series is typically limited to 1.3 times the maximum output voltage of each model.

### 8 - OUTPUT POWER DE-RATING AT ELEVATED TEMPERATURES

The PKM series can be operated with cooling air temperatures above 50°C by linearly de-rating the total maximum output power (or current) by 2.5%/°C until internal over temperature protection activates.

## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 9 - 0-10 V DIMMING

The PKM series operate only with 0-10 V dimmers that sink current. They are not designed to operate with 0-10 V control systems that source current, as used in theatrical/entertainment systems. Developed in the 1980's, the 0-10 V sinking current control method is adopted by the International Electrotechnical Commission (IEC) as part of its IEC Standard 60929 Annex E.

The method to dim the output current of the driver is done via the +Dim/-Dim Signal pins. The +Dim/-Dim Signal pins respond to a 0 to 10 V signal, delivering 1% to 100% of the output current based on rated current for each model. A pull-up resistor is included internal to the driver. If the +Dim input is > 10 V or open circuited, the output current is programmed to 100% of the rated current.

The maximum source current (flowing from the driver to the 0-10 V dimmer) supplied by the +Dim Signal pin is  $\leq 1$  mA. The tolerance of the output current while being dimmed shall be  $\pm 8\%$  typical until down to 1.5 V.

In the PKM series, several 0-10 V dimming profiles can be selected, such as a logarithmic profile, a non-linear profile with 0% minimum dimming, and a non-linear profile with 10% minimum dimming.

By default, the non-linear profile with 1% minimum dimming (shown in figure 5) is pre-loaded in the PKM50/30 series. In this non-linear 0-10 V dimming profile, 10 V to 8.5 V = 100% of the output current,  $< 1.5$  V = 1%,

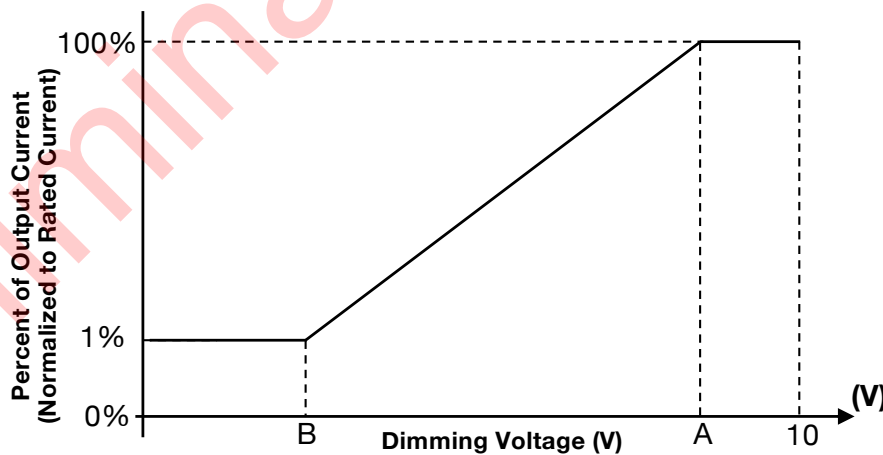


Figure 5

### 10 - COMPATIBLE 0-10 V DIMMERS

- Lutron, Nova series (part number NFTV)
- Lutron, Diva series (part number DVTV)
- Leviton, IllumaTech series (part number IP710-DL)

## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 11 - PROGRAMMING

The PKM series can be programmed by inserting the audio jack of the cable shown in figure 6 into the driver and by plugging the USB other end of the cable into a computer. **The driver does not need to be powered on during the programming process.**

When ordering the PKM series, please make sure you order a programming cable. The part number for the programming cable is “PROG-JACK-USB”.

Programming is done by using the ERP GUI (Graphical User Interface), which enables the user to adjust output current and dimming profile.

Please note that, for each model, the **default output current setting is listed on page 2 of this datasheet.**

Furthermore, when connecting the driver to a computer using the programming cable, you can access the driver’s internal data log and read the following information: SKU, serial number, manufacturing lot code, hours of operation, firmware revision, and power cycles.

While programming drivers in a lot, the ERP GUI can interface with a label printer, which enables the user to add configuration labels to driver labels in order to highlight programmed output current. Listed below is the equipment needed to print labels.

Equipment	Part Number	Where to buy
Printer	TSC TC210	<a href="https://www.barcodefactory.com/tsc/printers/tc210/99-059a001-54lf">https://www.barcodefactory.com/tsc/printers/tc210/99-059a001-54lf</a>
Ribbon	TSC Prem. Resin, 60mm x 110mm	<a href="https://www.barcodefactory.com/tsc/35-r060110-23cf">https://www.barcodefactory.com/tsc/35-r060110-23cf</a>
Labels	BAR-.81x.28-1-TT	<a href="https://www.barcodefactory.com/barcodefactory/labels/bar-.81x.28-1-tt">https://www.barcodefactory.com/barcodefactory/labels/bar-.81x.28-1-tt</a>

For more information, please refer to the GUI user’s manual at:  
<https://www.erp-power.com/our-products/programming-software/>



Figure 6



## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 12 - PREDICTED LIFETIME VERSUS CASE AND AMBIENT TEMPERATURE

Lifetime is defined by the measurement of the temperatures of all the electrolytic capacitors whose failure would affect light output under the nominal LED load and worst case AC line voltage. The graphs in figures 7 and 8 are determined by the electrolytic capacitor with the shortest lifetime, among all electrolytic capacitors. It represents a worst case scenario in which the LED driver is powered 24 hours/day, 7 days/week. The lifetime of an electrolytic capacitor is measured when any of the following changes in performance are observed:

- |  |  |
|--|--|
| 1) Capacitance changes more than 20% of initial value                          | 2) Dissipation Factor ( $\tan \delta$ ): 150% or less of initial specified value |
| 3) Equivalent Series Resistance (ESR): 150% or less of initial specified value | 4) Leakage current: less of initial specified value                              |

Figure 7

Figure 8

**Notes:**

- The ambient temperature  $T_{ambient}$  and the differential between  $T_{ambient}$  and  $T_{case}$  mentioned in the above graphs are relevant only as long as both the driver and the light fixture are exposed to the same ambient room temperature. If the LED driver is housed in an enclosure or covered by insulation material, then the ambient room temperature is no longer valid. In this situation, please refer only to the case temperature  $T_{case}$ .
- It should be noted the graph "Lifetime vs. Ambient Temperature" may have an error induced in the final application if the mounting has restricted convection flow around the case. For applications where this is evident, the actual case temperature measured at the  $T_c$  point in the application should be used for reliability calculations.

## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 13 - MECHANICAL DETAILS

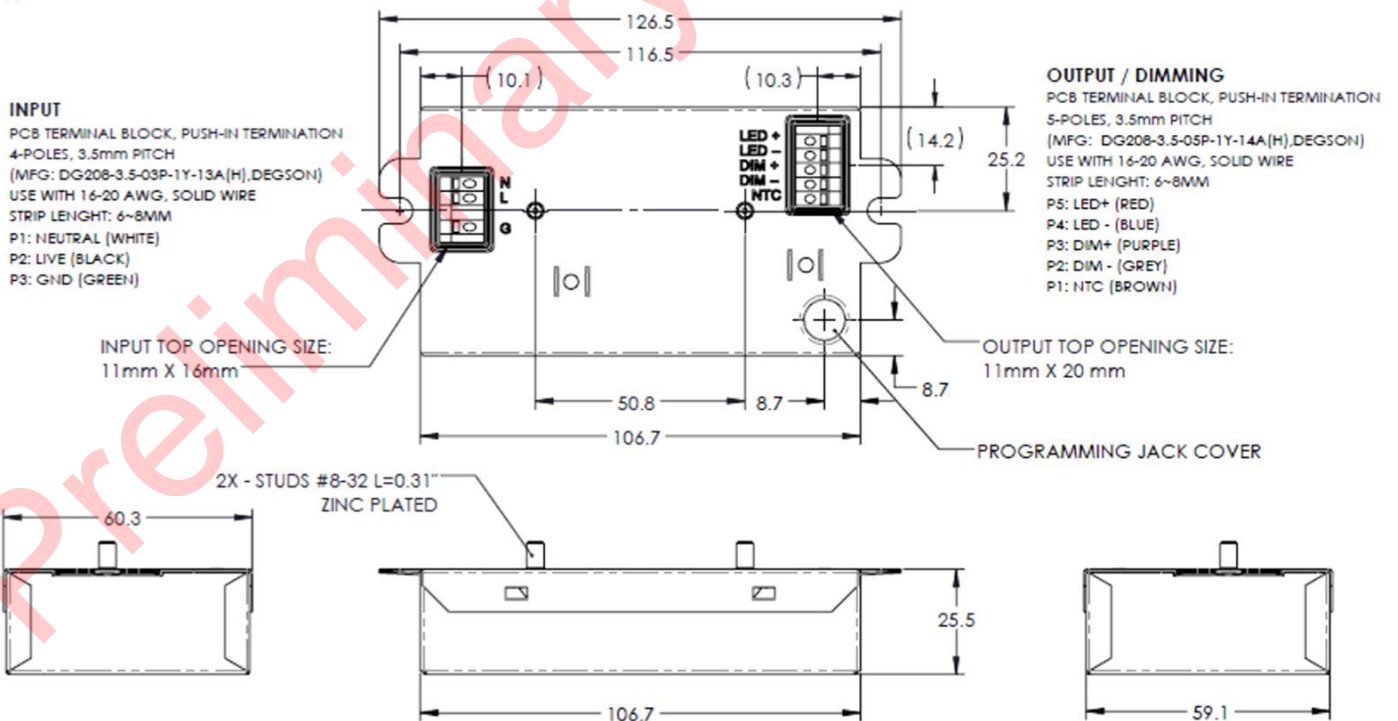
- **Packaging:** Aluminum case
- **I/O Connections:**
  - **Models with "TD" suffix:** Terminal Blocks
- **Ingress Protection:** IP20 rated
- **Mounting Instructions:** The PKM driver case must be secured on a flat surface through the two mounting tabs, shown here below in the case outline drawings.

### 14 - OUTLINE DRAWINGS (MODELS WITH "-TD" SUFFIX)

**Dimensions:** L 106.5 x W 60.3 x H 25.5 mm (L 4.19 x W 2.37 x H 1.00 in.)

**Volume:** XX cm<sup>3</sup> (XX in<sup>3</sup>)

**Weight:**



All dimensions are in mm

**Figure XX**

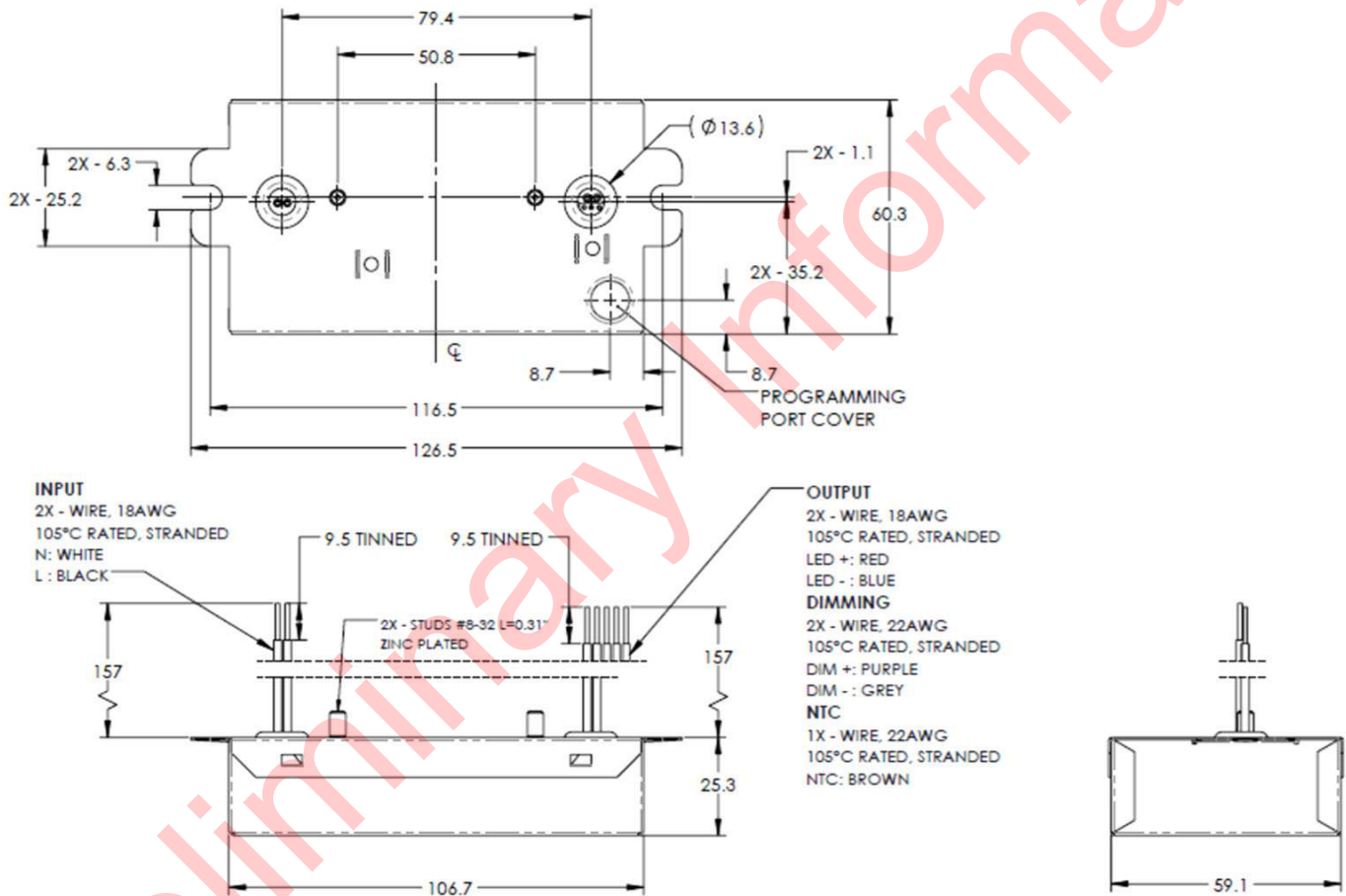
## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

14 - OUTLINE DRAWINGS (MODELS WITH "-SD" SUFFIX)

**Dimensions:** L 106.7 x W 60.3 x H 25.3 mm (L 4.20 x W 2.37 x H 1.00 in.)

**Volume:** XX cm<sup>3</sup> (XX in<sup>3</sup>)

**Weight:**



All dimensions are in mm

**Figure XX**

## 50 & 30 W Programmable Constant Current Class 2 LED Driver with 0-10 V Dimming

### 15 - LABELING

The PKM50W-1400-55-SD is used in figure XX as an example to illustrate a typical label.

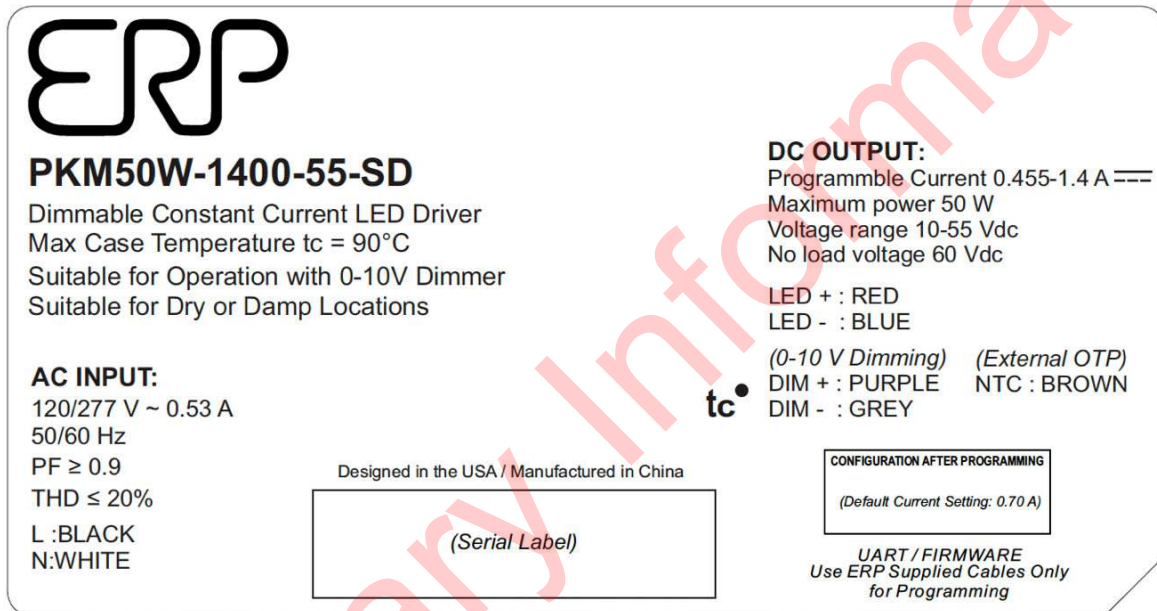


Figure XX

#### USA Headquarters

Tel: +1-805-517-1300  
Fax: +1-805-517-1411  
893 Patriot Drive, Suite E,  
Moorpark, CA 93021, USA

#### CHINA Operations

Tel: +86-756-6266298  
Fax: +86-756-6266299  
No. 8 Pingdong Road 2  
Zhuhai, Guangdong, China 519060

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