

# LED Driver

## LDU Series



- Constant Current Output
- LED Drive Current up to 1000 mA
- LED Strings from 2 V to 57 V
- PWM & Analog Dimming Control
- High Efficiency – up to 95%
- Open or Short Circuit LED Protection
- 3 Year Warranty

## Specification

### Input

|               |   |
|---------------|---|
| Input Voltage | <ul style="list-style-type: none"> <li>• LDU08 &amp; 24: 7-30 VDC</li> <li>• LDU48: 7-60 VDC</li> </ul>                 |
| Input Filter  | <ul style="list-style-type: none"> <li>• Capacitor</li> </ul>   |
| Input Surge   | <ul style="list-style-type: none"> <li>• LDU08 &amp; 24: 40 VDC for 0.5 s</li> <li>• LDU48: 65 VDC for 0.5 s</li> </ul> |

### Output

|                              |   |
|------------------------------|---|
| Output Voltage               | <ul style="list-style-type: none"> <li>• See tables<br/>(<math>V_{in}</math> must be at least 2 V greater than <math>V_{out}</math>)</li> </ul>   |
| Output Current               | <ul style="list-style-type: none"> <li>• See tables</li> </ul>  |
| Output Current Trim          | <ul style="list-style-type: none"> <li>• 25-100%</li> </ul>   |
| Output Current Accuracy      | <ul style="list-style-type: none"> <li>• LDU08: <math>\pm 6.0\%</math> max</li> <li>• LDU24: <math>\pm 8.0\%</math> max</li> <li>• LDU48: <math>\pm 8.0\%</math> max</li> </ul>   |
| Ripple & Noise               | <ul style="list-style-type: none"> <li>• LDU08: 200 mV pk-pk max</li> <li>• LDU24: 250 mV pk-pk max<br/>(except 1000 mA units: 300 mV pk-pk max)</li> <li>• LDU48: See tables<br/>measured with 20 MHz bandwidth</li> </ul>   |
| Short Circuit Protection     | <ul style="list-style-type: none"> <li>• Current is limited to the rated output</li> </ul>  |
| Temperature Coefficient      | <ul style="list-style-type: none"> <li>• LDU08: <math>\pm 0.03\%/^{\circ}\text{C}</math> max</li> <li>• LDU24: <math>\pm 0.08\%/^{\circ}\text{C}</math> max</li> <li>• LDU48: <math>\pm 0.03\%/^{\circ}\text{C}</math> max</li> </ul>   |
| Remote On/Off                | <ul style="list-style-type: none"> <li>• On = 0.3-1.25 V or open circuit</li> <li>• Off = <math>\leq 0.15</math> V (applied to control pin)</li> <li>• LDU08 &amp; 24: Quiescent input current is 25 <math>\mu\text{A}</math> max,</li> <li>• LDU48: Quiescent input current is 100 <math>\mu\text{A}</math> max</li> </ul> |
| Remote On/Off Signal Current | <ul style="list-style-type: none"> <li>• 1 mA max</li> </ul>  |

### Dimming

|                      |   |
|----------------------|---|
| <b>PWM</b>           |   |
| Output Current Range | <ul style="list-style-type: none"> <li>• 25% to 100%</li> </ul> |
| Operating Frequency  | <ul style="list-style-type: none"> <li>• 1 kHz max</li> </ul>   |
| On Time              | <ul style="list-style-type: none"> <li>• 200 ns min</li> </ul>  |
| Off Time             | <ul style="list-style-type: none"> <li>• 200 ns min</li> </ul>  |
| Amplitude            | <ul style="list-style-type: none"> <li>• 1.25 V max</li> </ul>  |

### DC Voltage Control

|                      |   |
|----------------------|---|
| Output Current Range | <ul style="list-style-type: none"> <li>• 25% to 100%</li> </ul>       |
| Control Input        | <ul style="list-style-type: none"> <li>• 0.3 to 1.25 V max</li> </ul> |

### Variable Resistor

|                      |   |
|----------------------|---|
| Output Current Range | <ul style="list-style-type: none"> <li>• 25% to 100%</li> </ul> |
|----------------------|---|

### General

|                     |   |
|---------------------|---|
| Efficiency          | <ul style="list-style-type: none"> <li>• See tables</li> </ul>  |
| Switching Frequency | <ul style="list-style-type: none"> <li>• LDU08: 40-380 kHz variable</li> <li>• LDU24: 50-330 kHz variable</li> <li>• LDU48: 20-500 kHz variable</li> </ul>              |
| MTBF                | <ul style="list-style-type: none"> <li>• LDU08: &gt;1.6 Mhrs</li> <li>• LDU24: &gt;1.6 Mhrs</li> <li>• LDU48: &gt;950 KHrs<br/>to MIL-HDBK-217F at 25 °C, GB</li> </ul> |

### Environmental

|                           |   |
|---------------------------|---|
| Operating Temperature     | <ul style="list-style-type: none"> <li>• LDU08: -40 °C to +85 °C,</li> <li>• LDU24: -40 °C to +85 °C,</li> <li>• LDU24 1000 mA unit: -40 °C to +70 °C,</li> <li>• LDU48: See derating curves</li> </ul> |
| Case Temperature          | <ul style="list-style-type: none"> <li>• LDU08 &amp; 24: +100 °C max</li> <li>• LDU48: +110 °C max</li> </ul>   |
| Storage Temperature       | <ul style="list-style-type: none"> <li>• -40 °C to +125 °C</li> </ul>   |
| Humidity                  | <ul style="list-style-type: none"> <li>• Up to 95%, non-condensing</li> </ul>   |
| Thermal Impedance         | <ul style="list-style-type: none"> <li>• 35-50 °C/W model dependant</li> </ul>  |
| Ingress Protection Rating | <ul style="list-style-type: none"> <li>• IP67 (wired versions)</li> </ul>   |

### EMC

|                    |   |
|--------------------|---|
| Emissions          | <ul style="list-style-type: none"> <li>• EN55022 class B conducted &amp; radiated with external components - see application notes</li> </ul> |
| ESD Immunity       | <ul style="list-style-type: none"> <li>• EN61000-4-2, level 2 Perf Criteria A</li> </ul>  |
| Radiated Immunity  | <ul style="list-style-type: none"> <li>• EN61000-4-3, level 2 Perf Criteria A</li> </ul>  |
| EFT/Burst          | <ul style="list-style-type: none"> <li>• EN61000-4-4, level 2 Perf Criteria A</li> </ul>  |
| Surge              | <ul style="list-style-type: none"> <li>• EN61000-4-5, level 2 Perf Criteria A</li> </ul>  |
| Conducted Immunity | <ul style="list-style-type: none"> <li>• EN61000-4-6, level 2 Perf Criteria A</li> </ul>  |

# Models and Ratings

**LDU08/24 XP**

## With Dimming Control

| Output Power | Input Voltage Range | Output Voltage | Output Current | Efficiency | Model Number |
|--------------|---------------------|----------------|----------------|------------|--------------|
| 8.0 W        | 7 - 30 V            | 2 - 28 V       | 300 mA         | 95%        | LDU0830S300  |
| 8.0 W        | 7 - 30 V            | 2 - 28 V       | 350 mA         | 95%        | LDU0830S350  |
| 14.0 W       | 7 - 30 V            | 2 - 28 V       | 500 mA         | 95%        | LDU2430S500  |
| 17.0 W       | 7 - 30 V            | 2 - 28 V       | 600 mA         | 95%        | LDU2430S600  |
| 20.0 W       | 7 - 30 V            | 2 - 28 V       | 700 mA         | 95%        | LDU2430S700  |
| 24.0 W       | 7 - 30 V            | 2 - 28 V       | 1000 mA        | 95%        | LDU2430S1000 |

## Wired Versions (No Dimming Control)

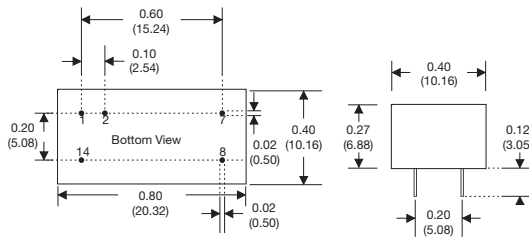
| Output Power | Input Voltage Range | Output Voltage | Output Current | Efficiency | Model Number   |
|--------------|---------------------|----------------|----------------|------------|----------------|
| 8.0 W        | 7 - 30 V            | 2 - 28 V       | 350 mA         | 95%        | LDU0830S350-W  |
| 14.0 W       | 7 - 30 V            | 2 - 28 V       | 500 mA         | 95%        | LDU2430S500-W  |
| 20.0 W       | 7 - 30 V            | 2 - 28 V       | 700 mA         | 95%        | LDU2430S700-W  |
| 24.0 W       | 7 - 30 V            | 2 - 28 V       | 1000 mA        | 95%        | LDU2430S1000-W |

## Wired Version with Dimming Control

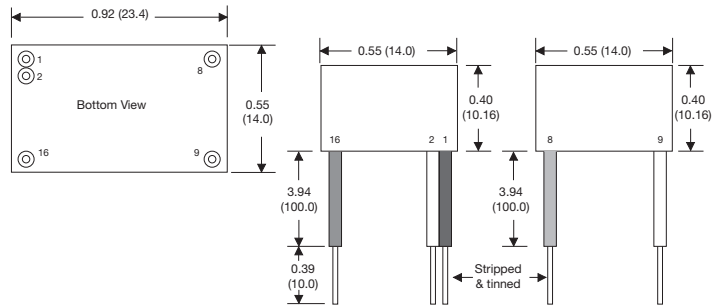
| Output Power | Input Voltage Range | Output Voltage | Output Current | Efficiency | Model Number    |
|--------------|---------------------|----------------|----------------|------------|-----------------|
| 8.0 W        | 7 - 30 V            | 2 - 28 V       | 350 mA         | 95%        | LDU0830S350-WD  |
| 14.0 W       | 7 - 30 V            | 2 - 28 V       | 500 mA         | 95%        | LDU2430S500-WD  |
| 20.0 W       | 7 - 30 V            | 2 - 28 V       | 700 mA         | 95%        | LDU2430S700-WD  |
| 24.0 W       | 7 - 30 V            | 2 - 28 V       | 1000 mA        | 95%        | LDU2430S1000-WD |

## Mechanical Details

### LDU08: 14 Pin DIL



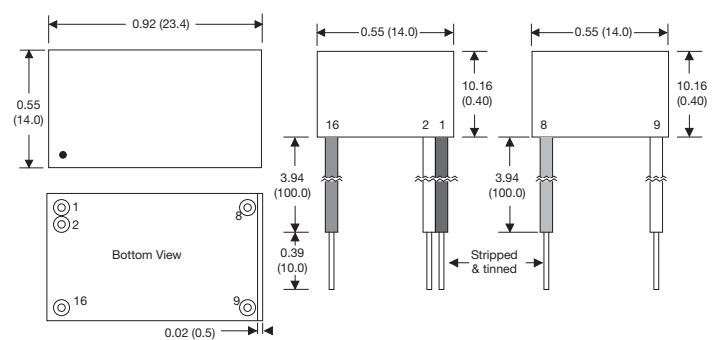
### LDU08 - Wired Versions



### LDU24- 16 Pin DIL



### LDU24 - Wired Versions



### Notes

- All dimensions are in inches (mm)
- Weight: LDU08 - 0.006 lbs (2.6 g) approx.  
LDU08 (wired version) - 0.02 lbs (11.1 g) approx.  
LDU24 - 0.014 lbs (6.2 g) approx.  
LDU24 (wired version) - 0.02 lbs (11.1 g) approx.
- Pin diameter: 0.02±0.002 (0.5±0.05)
- Pin pitch tolerance: ±0.014 (±0.35)
- Case tolerance: ±0.02 (±0.5)

| LDU Connections |            |            |         |            |            |                               |
|-----------------|------------|------------|---------|------------|------------|-------------------------------|
| LDU08           | LDU08-W    | LDU08-WD   | LDU24   | LDU24-W    | LDU24-WD   | Function                      |
| 1               | 1 (Black)  | 1 (Black)  | 1 & 2   | 1 (Black)  | 1 (Black)  | -Vin: -DC supply              |
| 2               | No Wire    | 2 (White)  | 3       | No Wire    | 2 (White)  | Control                       |
| 7               | 8 (Blue)   | 8 (Blue)   | 7 & 8   | 8 (Blue)   | 8 (Blue)   | -Vout: LED cathode connection |
| 8               | 9 (Yellow) | 9 (Yellow) | 9 & 10  | 9 (Yellow) | 9 (Yellow) | +Vout: LED anode connection   |
| 14              | 16 (Red)   | 16 (Red)   | 15 & 16 | 16 (Red)   | 16 (Red)   | +Vin: +DC supply              |

Note: LDU08: Do not connect Pin 1 (-Vin) to Pin 7 (-Vout).  
LDU24: Do not connect Pins 1 & 2 (-Vin) to Pins 7 & 8 (-Vout).



# Models and Ratings

## With Dimming Control

| Output Power | Input Voltage Range | Output Voltage | Output Current | Ripple & Noise (pk-pk) | Efficiency | Model Number |
|--------------|---------------------|----------------|----------------|------------------------|------------|--------------|
| 9.0 W        | 7 - 60 V            | 2 - 57 V       | 150 mA         | 150 mV                 | 97%        | LDU4860S150  |
| 14.0 W       | 7 - 60 V            | 2 - 57 V       | 250 mA         | 200 mV                 | 97%        | LDU4860S250  |
| 17.0 W       | 7 - 60 V            | 2 - 57 V       | 300 mA         | 250 mV                 | 97%        | LDU4860S300  |
| 20.0 W       | 7 - 60 V            | 2 - 57 V       | 350 mA         | 300 mV                 | 97%        | LDU4860S350  |
| 29.0 W       | 7 - 60 V            | 2 - 57 V       | 500 mA         | 400 mV                 | 97%        | LDU4860S500  |
| 34.0 W       | 7 - 60 V            | 2 - 57 V       | 600 mA         | 450 mV                 | 97%        | LDU4860S600  |
| 40.0 W       | 7 - 60 V            | 2 - 57 V       | 700 mA         | 500 mV                 | 97%        | LDU4860S700  |
| 48.0 W       | 7 - 60 V            | 2 - 48 V       | 1000 mA        | 800 mV                 | 97%        | LDU4860S1000 |

## Wired Versions (No Dimming Control)

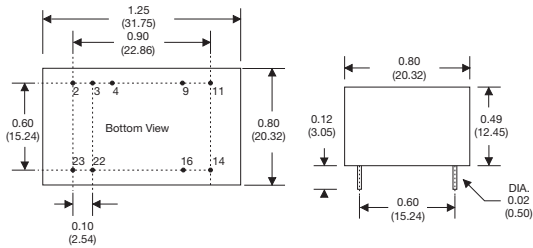
| Output Power | Input Voltage Range | Output Voltage | Output Current | Ripple & Noise (pk-pk) | Efficiency | Model Number   |
|--------------|---------------------|----------------|----------------|------------------------|------------|----------------|
| 9.0 W        | 7 - 60 V            | 2 - 57 V       | 150 mA         | 150 mV                 | 97%        | LDU4860S150-W  |
| 14.0 W       | 7 - 60 V            | 2 - 57 V       | 250 mA         | 200 mV                 | 97%        | LDU4860S250-W  |
| 17.0 W       | 7 - 60 V            | 2 - 57 V       | 300 mA         | 250 mV                 | 97%        | LDU4860S300-W  |
| 20.0 W       | 7 - 60 V            | 2 - 57 V       | 350 mA         | 300 mV                 | 97%        | LDU4860S350-W  |
| 29.0 W       | 7 - 60 V            | 2 - 57 V       | 500 mA         | 400 mV                 | 97%        | LDU4860S500-W  |
| 34.0 W       | 7 - 60 V            | 2 - 57 V       | 600 mA         | 450 mV                 | 97%        | LDU4860S600-W  |
| 40.0 W       | 7 - 60 V            | 2 - 57 V       | 700 mA         | 500 mV                 | 97%        | LDU4860S700-W  |
| 48.0 W       | 7 - 60 V            | 2 - 48 V       | 1000 mA        | 800 mV                 | 97%        | LDU4860S1000-W |

## Wired Version with Dimming Control

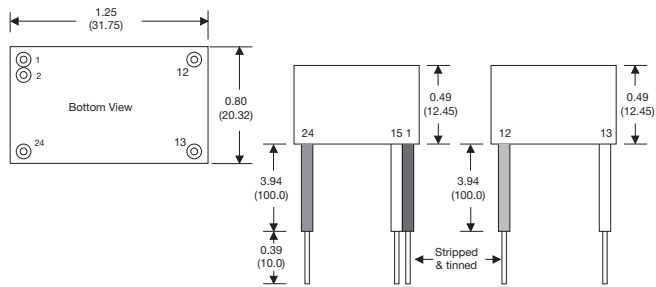
| Output Power | Input Voltage Range | Output Voltage | Output Current | Ripple & Noise (pk-pk) | Efficiency | Model Number    |
|--------------|---------------------|----------------|----------------|------------------------|------------|-----------------|
| 9.0 W        | 7 - 60 V            | 2 - 57 V       | 150 mA         | 150 mV                 | 97%        | LDU4860S150-WD  |
| 14.0 W       | 7 - 60 V            | 2 - 57 V       | 250 mA         | 200 mV                 | 97%        | LDU4860S250-WD  |
| 17.0 W       | 7 - 60 V            | 2 - 57 V       | 300 mA         | 250 mV                 | 97%        | LDU4860S300-WD  |
| 20.0 W       | 7 - 60 V            | 2 - 57 V       | 350 mA         | 300 mV                 | 97%        | LDU4860S350-WD  |
| 29.0 W       | 7 - 60 V            | 2 - 57 V       | 500 mA         | 400 mV                 | 97%        | LDU4860S500-WD  |
| 34.0 W       | 7 - 60 V            | 2 - 57 V       | 600 mA         | 450 mV                 | 97%        | LDU4860S600-WD  |
| 40.0 W       | 7 - 60 V            | 2 - 57 V       | 700 mA         | 500 mV                 | 97%        | LDU4860S700-WD  |
| 48.0 W       | 7 - 60 V            | 2 - 48 V       | 1000 mA        | 800 mV                 | 97%        | LDU4860S1000-WD |

## Mechanical Details

### LDU48 - 24 Pin DIL



### LDU48 - Wired Versions



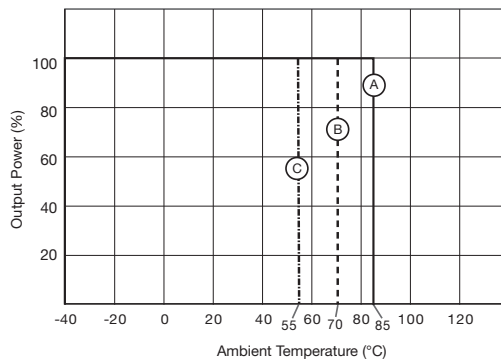
| LDU48 Connections |             |             |                               |
|-------------------|-------------|-------------|-------------------------------|
| LDU48             | LDU48-W     | LDU48-WD    | Function                      |
| 2 & 3             | 1 (Black)   | 1 (Black)   | -Vin: -DC supply              |
| 4                 | No Wire     | 15 (White)  | Control                       |
| 9 & 11            | 12 (Blue)   | 12 (Blue)   | -Vout: LED cathode connection |
| 14 & 16           | 13 (Yellow) | 13 (Yellow) | +Vout: LED anode connection   |
| 22 & 23           | 24 (Red)    | 24 (Red)    | +Vin: +DC supply              |

### Notes

- All dimensions are in inches (mm)
- Weight: LDU48 - 0.04 lbs (17.7 g) approx.  
LDU48 (wired version) - 0.04 lbs (18.0 g) approx.
- Pin diameter: 0.02±0.002 (0.5±0.05)
- Pin pitch tolerance: ±0.014 (±0.35)
- Case tolerance: ±0.02 (±0.5)

Note: Do not connect pins 1 & 2 (-Vin) to pins 9 & 11 (-Vout)

## Derating Curve for LDU48



### LDU48 Models

- (A) 150 mA, 250 mA, 300 mA, 350 mA
- (B) 500 mA, 600 mA, 700 mA
- (C) 1000 mA

### Notes

For LDU08 & LDU24 please see Operating Temperature Spec.

Output Current Adjustment by Variable Resistor

By connecting a variable resistor between control and GND, simple dimming can be achieved. Capacitor is optional for HF noise rejection. Recommended value is 0.22 μF.



The output current can be determined using the equation:

For LDU08-24  $I_{out} = \frac{I_{out\ nom} \times R}{(R + 200\ k)}$  For LDU48  $I_{out} = \frac{I_{out\ nom} \times R}{(R + 50\ k)}$

Where the value of R is between 0 and 2 MΩ, the maximum adjustment range of output current is 25% to 90% (For Vin-Vout, LDU08 & 24: <20 VDC, LDU48: <30 VDC)

Output Current Adjustment by DC Voltage

Control Voltage Range: 0.3 V to 1.25 VDC



The output current is given by:

$$I_{out} = \frac{I_{out\ nom} \times Control}{1.25}$$

Output Current Adjustment by PWM

Directly driving control input

A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied to the control pin, as shown:

$$I_{out} = I_{out\ nom} \times D_{pwm} \text{ (} D_{pwm} = \text{PWM duty cycle)}$$



Input Filter to meet Class B Conducted Emissions



|    | LDU08      | LDU24      | LDU48      |
|----|------------|------------|------------|
| C1 | 10 μF      | 10 μF      | 4.7 μF     |
| C2 | Not Fitted | Not Fitted | 4.7 μF     |
| C3 | 47 μF      | 47 μF      | Not Fitted |
| L1 | 68 μH      | 68 μH      | 47 μH      |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.