Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!


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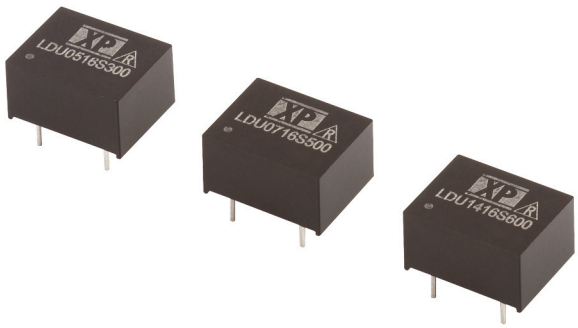
# LED Driver
# LDU05/07/14 Series






- Constant Current Output
- LED Drive Current up to 1000 mA
- LED Strings from 2 V to 14 V
- PWM & Analog Dimming Control
- High Efficiency – up to 93%
- Open or Short Circuit LED Protection
- 3 Year Warranty

## Specification

### Input

| | |
|---|---|
| Input Voltage | • 7-16 VDC |
| Input Filter | • Capacitor |
| Input Surge | • 20 VDC for 0.5 s |

### Output

| | |
|---|---|
| Output Voltage | • See tables<br>(Vin must be at least 2 V greater than Vout) |
| Output Current | • See tables |
| Output Current Trim | • 25-100% |
| Output Current Accuracy | • See tables |
| Ripple & Noise | • See tables,<br>measured with 20 MHz bandwidth |
| Short Circuit Protection | • Current is limited to the rated output |
| Temperature Coefficient | • ±0.03%/°C max |
| Remote On/Off | • On = 0.3-1.25 V or open circuit<br>Off = ≤0.15 V (applied to control pin)<br>Quiescent input current is 25 µA max, |
| Remote On/Off Signal Current | • 1 mA max |

### Dimming

**PWM**

| | |
|---|---|
| Output Current Range | • 25% to 100% |
| Operating Frequency | • 1 kHz max |
| On Time | • 200 ns min |
| Off Time | • 200 ns min |
| Amplitude | • 1.25 V max |

**DC Voltage Control**

| | |
|---|---|
| Output Current Range | • 25% to 100% |
| Control Input | • 0.3 to 1.25 V max |

**Variable Resistor**

| | |
|---|---|
| Output Current Range | • 25% to 100% |

### General

| | |
|---|---|
| Efficiency | • See tables |
| Switching Frequency | • LDU05: 60-300 kHz variable<br>LDU07: 120-350 kHz variable<br>LDU14: 90-400 kHz variable |
| MTBF | • >3.3 MHrs to MIL-HDBK-217F at 25 °C, GB |

### Environmental

| | |
|---|---|
| Operating Temperature | • -40 °C to +85 °C except LDU14<br>1000 mA unit: -40 °C to +70 °C, |
| Storage Temperature | • -40 °C to +125 °C |
| Humidity | • Up to 95%, non-condensing |
| Thermal Impedance | • 35 °C/W model dependant |

### EMC

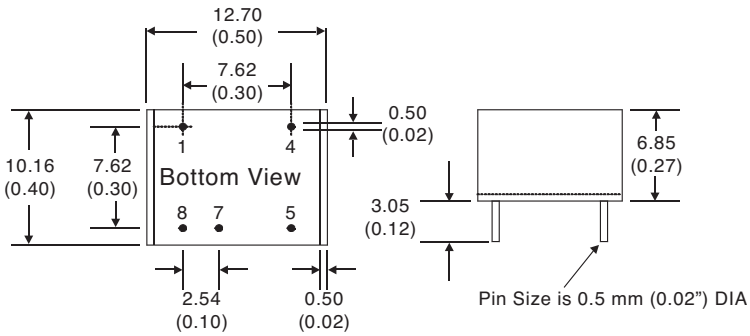
| | |
|---|---|
| Emissions | • EN55022 class B conducted & radiated with external components - see application notes |
| ESD Immunity | • EN61000-4-2, level 2 Perf Criteria A |
| Radiated Immunity | • EN61000-4-3, level 2 Perf Criteria A |
| EFT/Burst | • EN61000-4-4, level 2 Perf Criteria A |
| Surge | • EN61000-4-5, level 2 Perf Criteria A |
| Conducted Immunity | • EN61000-4-6, level 2 Perf Criteria A |

## Models and Ratings

### With Dimming Control

| Output Power | Input Voltage Range | Output Voltage | Output Ripple & Noise | Output Current | Output Current Accuracy | Efficiency | Model Number |
|---|---|---|---|---|---|---|---|
| 4.2 W | 7-16 V | 2-14 V | 120 mV | 300 mA | ±5% | 93% | LDU0516S300 |
| 4.9 W | 7-16 V | 2-14 V | 150 mV | 350 mA | ±6% | 93% | LDU0516S350 |
| 7.0 W | 7-16 V | 2-14 V | 200 mV | 500 mA | ±7% | 93% | LDU0716S500 |
| 8.4 W | 7-16 V | 2-14 V | 200 mV | 600 mA | ±7% | 93% | LDU1416S600 |
| 9.8 W | 7-16 V | 2-14 V | 250 mV | 700 mA | ±7% | 93% | LDU1416S700 |
| 14.0 W | 7-16 V | 2-14 V | 250 mV | 1000 mA | ±8% | 93% | LDU1416S1000 |

## Mechanical Details




| Pin Connections | | |
|---|---|---|
| 1 | +V Input | +DC supply |
| 4 | +V Output | LED anode connection |
| 5 | -V Output | LED cathode connection |
| 7 | V Adj | Dimming Control |
| 8 | -V Input | -DC supply |

### Notes

1. All dimensions are in inches (mm)
2. Weight: 0.003 lbs (1.8 g) approx.
3. Pin diameter: 0.02±0.002 (0.5±0.05)
4. Pin pitch tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)

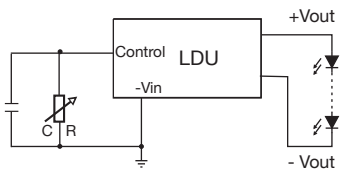
## Application Notes

### Output Current Adjustment by Variable Resistor

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

The output current can be determined using the equation: $Iout = \frac{\text{Rated Max I} \times R}{(R + 200\ k)}$

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 <20 VDC)

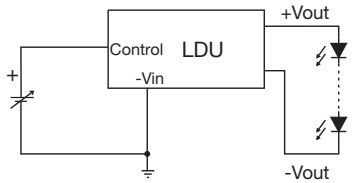



Shorting out the Control pin to GND will turn the output off.

### Output Current Adjustment by DC Voltage

Control Voltage Range: 0.3 V to 1.25 VDC

The output current is given by: $Iout\ nom = \text{Rated Max I} \times \frac{\text{Control Voltage}}{1.25}$



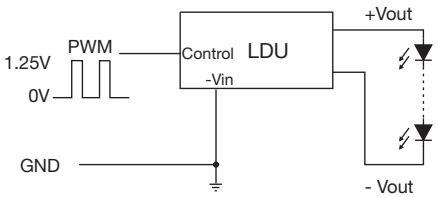

A Control Voltage lower than 0.15 V will turn the output off

### Output Current Adjustment by PWM

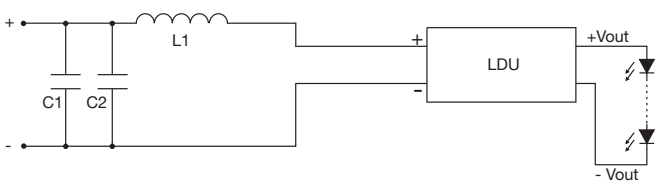
A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied to the control pin.

The output current can be determined using the equation : Iout = Rated Max I x Dpwm

Dpwm = PWM duty cycle




### Input Filter to meet Class B Conducted Emissions




| | |
|---|---|
| C1 | 10 µF |
| C2 | 4.7 µF |
| L1 | 68 µH |