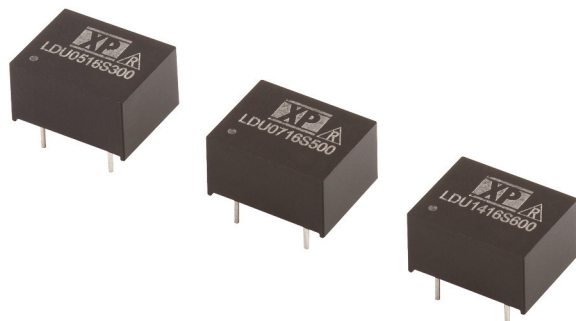


LDU05/07/14 Series



- 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 (V_{in} must be at least 2 V greater than V_{out}) |
| Output Current | • See tables |
| Output Current Trim | • 25-100% |
| Output Current Accuracy | • See tables |
| Ripple & Noise | • See tables, measured with 20 MHz bandwidth |
| Short Circuit Protection | • Current is limited to the rated output |
| Temperature Coefficient | • $\pm 0.03\%/^{\circ}\text{C}$ max |
| Remote On/Off | • On = 0.3-1.25 V or open circuit Off = ≤ 0.15 V (applied to control pin) 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 LDU07: 120-350 kHz variable LDU14: 90-400 kHz variable |
| MTBF | • > 3.3 Mhrs to MIL-HDBK-217F at 25 $^{\circ}\text{C}$, GB |

Environmental

| | |
|-----------------------|---|
| Operating Temperature | • -40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$ except LDU14 1000 mA unit: -40 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$, |
| Storage Temperature | • -40 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$ |
| Humidity | • Up to 95%, non-condensing |
| Thermal Impedance | • 35 $^{\circ}\text{C}/\text{W}$ 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 |

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

- All dimensions are in inches (mm)
- Weight: 0.003 lbs (1.8 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)

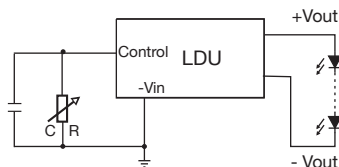
Application Notes

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: $I_{out} = \frac{\text{Rated Max } I \times R}{(R + 200 \text{ k})}$

Where the value of R is between 0 and 2 MΩ, the maximum adjustment range of output current is 25% to 90% (For $V_{in} - V_{out} < 20 \text{ VDC}$)



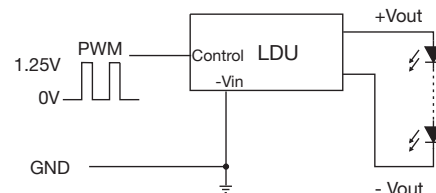
Shorting out the Control pin to GND will turn the output off.

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: $I_{out} = \text{Rated Max } I \times D_{pwm}$

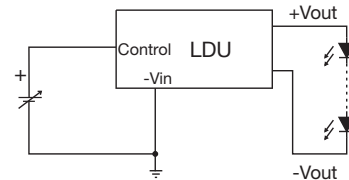
D_{pwm} = PWM duty cycle



Output Current Adjustment by DC Voltage

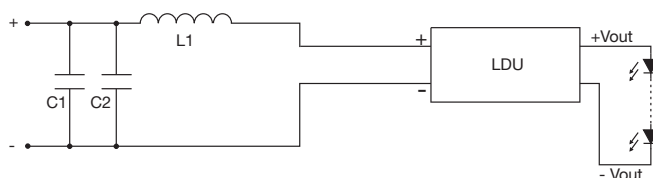
Control Voltage Range: 0.3 V to 1.25 VDC

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



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

Input Filter to meet Class B Conducted Emissions



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