

LED Driver

LDU20 Series



- Constant Current Output
- LED Drive Current up to 700 mA
- LED Strings from 2 V to 28 V
- PWM & Analog Dimming Control
- High Efficiency – up to 95%
- Open or Short Circuit LED Protection
- 3 Year Warranty

Specification

Input

Input Voltage	• 7-30 VDC
Input Filter	• Capacitor
Input Surge	• 40 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	• ± 10
Ripple & Noise	• 450 mV pk-pk max, measured with 20 MHz bandwidth
Short Circuit Protection	• Current is limited to the rated output
Temperature Coefficient	• $\pm 0.05\%/^{\circ}\text{C}$ 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	• 70-450 kHz variable
MTBF	• >1.6 Mhrs to MIL-HDBK-217F at 25 $^{\circ}\text{C}$, GB

Environmental

Operating Temperature	• -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	• 40 $^{\circ}\text{C}/\text{W}$

EMC

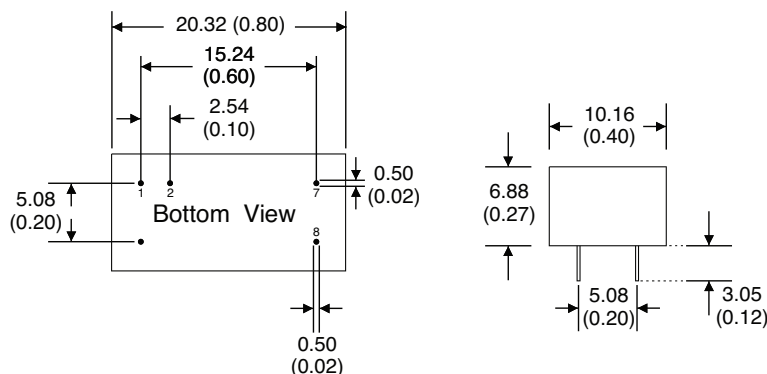
Emissions	• EN55022 class B conducted & radiated with external components - see application notes
ESD Immunity	• EN61000-4-2, level 2 Perf Criteria A
Radiated Immunity	• EN61000-4-3, level 2 Perf Criteria A
EFT/Burst	• EN61000-4-4, level 2 Perf Criteria A
Surge	• EN61000-4-5, level 2 Perf Criteria A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

Models and Ratings

LDU20 XP

Output Power	Input Voltage Range	Output Voltage	Output Current	Efficiency	Model Number
14 W	7-30 V	2-28 V	500 mA	95%	LDU2030S500
17 W	7-30 V	2-28 V	600 mA	95%	LDU2030S600
20 W	7-30 V	2-28 V	700 mA	95%	LDU2030S700

Mechanical Details



Pin Connections		
1	-V Input	-DC supply
2	Control	PWM/ON/OFF or not used
7	-V Output	LED cathode connection
8	+V Output	LED anode connection
14	+V Input	+DC supply

Note: Do not connect pin 1 (-Vin) to pin 7 (-Vout)

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.006 lbs (2.6 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)

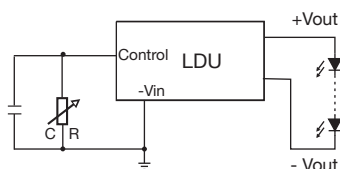
Application Notes

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 $0.22 \mu\text{F}$.

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

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

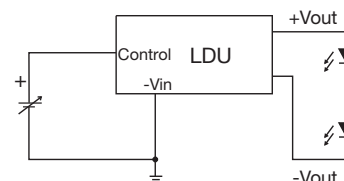


Shorting out the Control pin to GND will turn the output off.

Output Current Adjustment by DC Voltage

Control Voltage Range: 0.3 V to 1.25 VDC

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



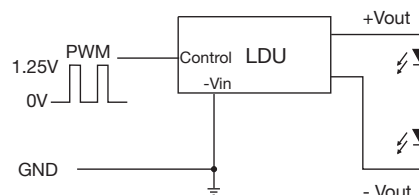
A Control Voltage lower than 0.15 V will turn the output off

Output Current Adjustment by PWM

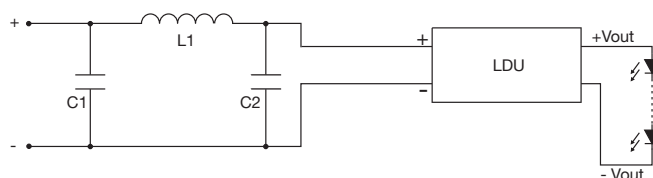
A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied to the control pin.

The output current can be determined using the equation: $I_{\text{out}} = \text{Rated Max } I \times D_{\text{pwm}}$

D_{pwm} = PWM duty cycle



Input Filter to meet Class B Conducted Emissions



C1	10 μF
C2	47 μF
L1	68 μH