

LED Driver

LDU56 Series



- Constant Current Output
- LED Drive Current up to 1000 mA
- LED Strings from 2 V to 56 V
- PWM & Analog Dimming Control
- High Efficiency – up to 97%
- Open or Short Circuit LED Protection
- 3 Year Warranty

Specification

Input

Input Voltage	• 9-60 VDC
Input Filter	• Capacitor
Input Surge	• 65 VDC for 500 ms

Output

Output Voltage	• 2-56 V (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, measured with 20 MHz bandwidth
Short Circuit Protection	• Current is limited to the rated output
Capacitive Load	• 2.2 μ F max
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 μ A 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	• 40-1000 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 $^{\circ}\text{C}$ for 300/350 mA versions, -40 $^{\circ}\text{C}$ to +70 $^{\circ}\text{C}$ for others
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

Models and Ratings

LDU56 XP

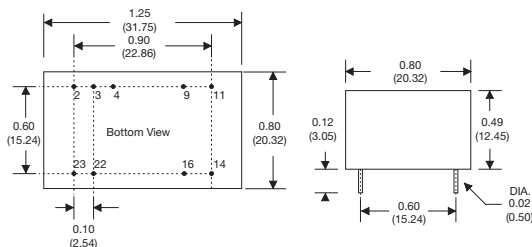
With Dimming Control

Output Power	Input Voltage Range	Output Voltage	Output Ripple & Noise	Output Current	Output Current Accuracy	Efficiency	Model Number ⁽¹⁾
16.8 W	9-60 V	2-56 V	250 mV	300 mA	±5%	97%	LDU5660S300
19.6 W	9-60 V	2-56 V	300 mV	350 mA	±5%	97%	LDU5660S350
28.0 W	9-60 V	2-56 V	350 mV	500 mA	±5%	97%	LDU5660S500
33.6 W	9-60 V	2-56 V	400 mV	600 mA	±5%	97%	LDU5660S600
39.2 W	9-60 V	2-56 V	400 mV	700 mA	±5%	97%	LDU5660S700
50.0 W	9-60 V	2-56 V	450 mV	1000 mA	±5%	97%	LDU5660S1000

1. Add suffix '-W' for wired version, e.g. LDU5660S500-W, or '-WD' for wired version with dimming function e.g. LDU5660S500-WD.

Mechanical Details

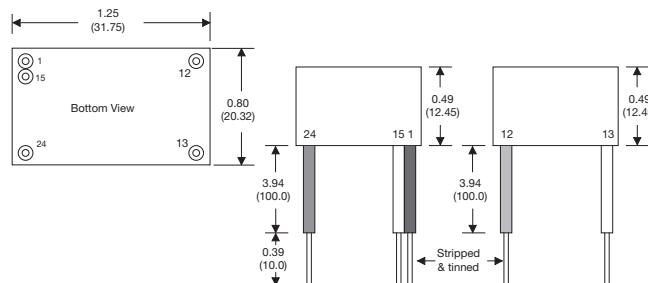
LDU56 - 24 Pin DIL



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

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

LDU56 - Wired versions



Notes

- All dimensions are in inches (mm)
- Weight: LDU56 - 0.04 lbs (17.7 g) approx.
LDU56 (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)

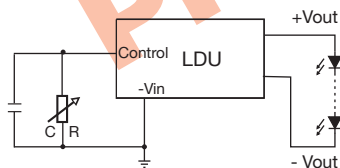
Application Notes

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 Vin-Vout < 20 VDC)



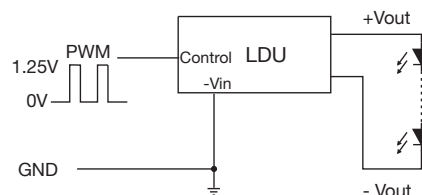
Shorting out the Control pin to GND will turn the output off.

Output Current Adjustment by PWM

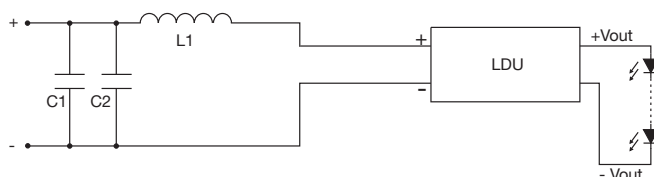
A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied to the control pin.

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

D_{pwm} = PWM duty cycle



Input Filter to meet Class B Conducted Emissions



C1	10 µF
C2	4.7 µF
L1	68 µH