

LDU56 Series



- Constant Current Output
- LED Drive Current up to 1000 mA
- LED Strings from 2 V to 56 V
- PWM 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 4 V greater than Vout) |
| Output Current | • See tables |
| 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 = 2.5-5.0 V or open circuit Off = ≤ 0.8 V (applied to control pin) Quiescent input current is 3 mA max, |
| Remote On/Off Signal Current | • 1 mA max |

Dimming

| | |
|----------------------|------------------|
| PWM | |
| Output Current Range | • 1% to 100% |
| Operating Frequency | • 1 kHz max |
| On Time | • 50 μ s min |
| Off Time | • 50 μ s min |
| Amplitude | • 2.5 V, 5 V max |

General

| | |
|---------------------|---|
| Efficiency | • See tables |
| Switching Frequency | • 40-1000 kHz variable |
| MTBF | • > 2.0 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 | • 16.7 $^{\circ}\text{C}/\text{W}$ model dependant |

EMC

| | |
|--------------------|---|
| Emissions | • EN55015 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 |
| Conducted Immunity | • EN61000-4-6, level 2 Perf Criteria A |
| Magnetic Field | • EN61000-4-8, level 2 Perf Criteria A |

Models and Ratings

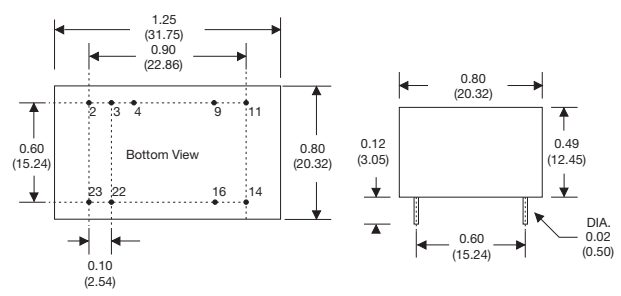
With Dimming Control

| Output Power | Input Voltage Range | Output Voltage | Output Ripple & Noise | Output Current | Output Current Accuracy | Efficiency | Model Number ⁽¹⁾ |
|--------------|---------------------|----------------|-----------------------|----------------|-------------------------|------------|-----------------------------|
| 16.8 W | 9-60 V | 2-56 V | 250 mV | 300 mA | ±6% | 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 |

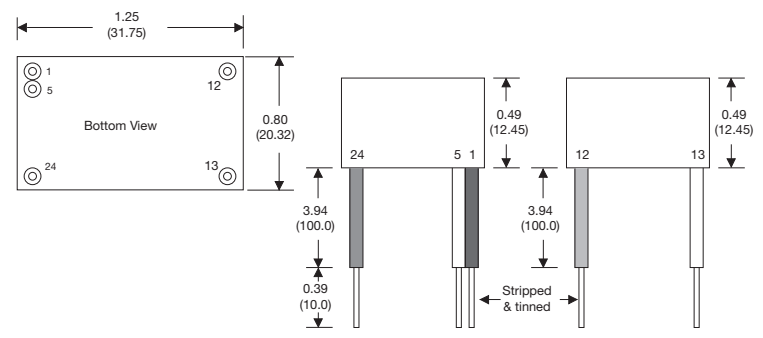
1. Add suffix '-W' for wired version, e.g. LDU5660S500-W, or '-WD' for wired version with dimming function e.g. LDU5660S500-WD.

Mechanical Details

LDU56 - 24 Pin DIL



LDU56 - Wired versions



| LDU56 Connections | | | |
|-------------------|-------------|-------------|-------------------------------|
| LDU56 | LDU56-W | LDU56-WD | Function |
| 2 & 3 | 1 (Black) | 1 (Black) | -Vin: -DC supply |
| 4 | No Wire | 5 (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 2 & 3 (-Vin) to pins 9 & 11 (-Vout)

Notes

- All dimensions are in inches (mm)
- Weight: LDU56 - 0.04 lbs (17.7 g) approx.
LDU56 (wired version) - 0.05 lbs (22.0 g) approx.
- Pin diameter: 0.02±0.002 (0.5±0.05)
- Pin pitch & length tolerance: ±0.014 (±0.35)
- Case tolerance: ±0.02 (±0.5)

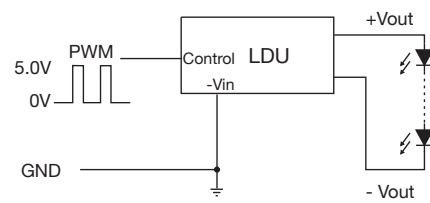
Application Notes

Output Current Adjustment by PWM

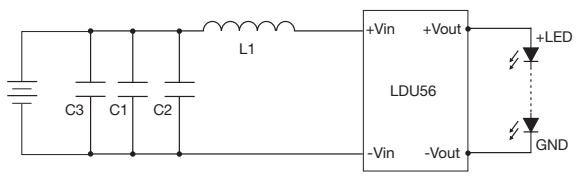
A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied to the control pin.

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

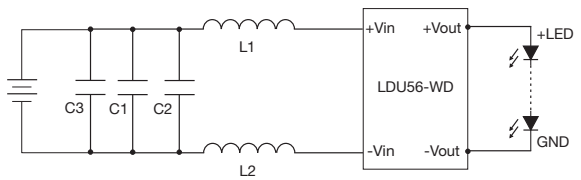
D_{pwm} = PWM duty cycle



Input Filter to meet Class B Conducted Emissions



| | C1 | C2 | L | C3 |
|-------------|--------------------|--------------------|-------|--------------|
| LDU5660Sxxx | 2220,475K,100V,X7R | 2220,475K,100V,X7R | 68 μH | 100 μF/100 V |



| | C1 | C2 | L1, L2 | C3 |
|----------------|--------------------|--------------------|--------|--------------|
| LDU5660Sxxx-WD | 2220,475K,100V,X7R | 2220,475K,100V,X7R | 47 μH | 100 μF/100 V |