

## 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

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### Input

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

### Output

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|------------------------------|---|
| 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 $\mu$ F max   |
| Temperature Coefficient      | • $\pm 0.03\%/^{\circ}\text{C}$ max   |
| Remote On/Off                | • On = 2.5-5.0 V or open circuit<br>Off = $\leq 0.8$ V (applied to control pin)<br>Quiescent input current is 3 mA max, |
| Remote On/Off Signal Current | • 1 mA max  |

### Dimming

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

### General

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|---------------------|---|
| Efficiency          | • See tables  |
| Switching Frequency | • 40-1000 kHz variable  |
| MTBF                | • $> 2.0$ Mhrs to MIL-HDBK-217F at 25 $^{\circ}\text{C}$ , GB |

### Environmental

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|-----------------------|---|
| 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

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|--------------------|---|
| 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  |

### Safety

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|------------------|---|
| Safety Approvals | • CE (Meets all applicable directives), UKCA (Meets all applicable legislation) |
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## Models and Ratings

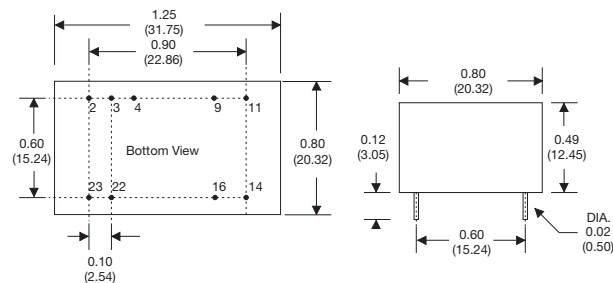
### With Dimming Control

Output Power	Input Voltage Range	Output Voltage	Output Ripple & Noise	Output Current	Output Current Accuracy	Efficiency	Model Number <sup>(1)</sup>
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

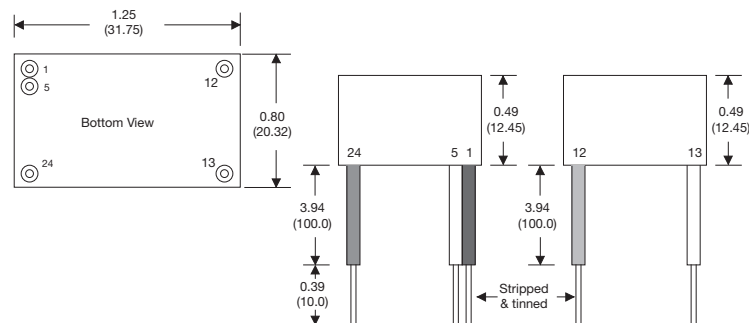
1. Add suffix '-W' for wired version, e.g. LDU5660S500-W, or '-WD' for wired version with dimming function e.g. LDU5660S500-WD.

## 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)

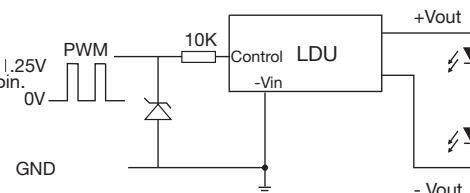
## Application Notes

### Output Current Adjustment by PWM

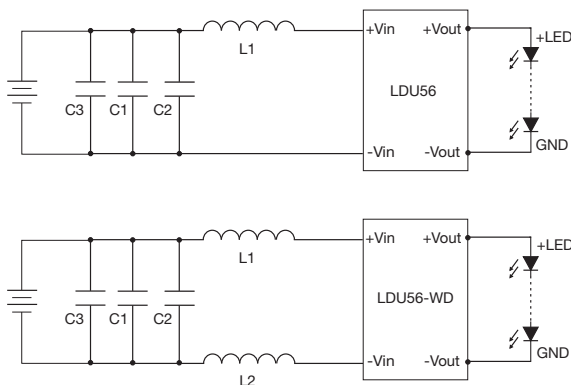
A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied to the control pin.

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