

## 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  |

## Models and Ratings

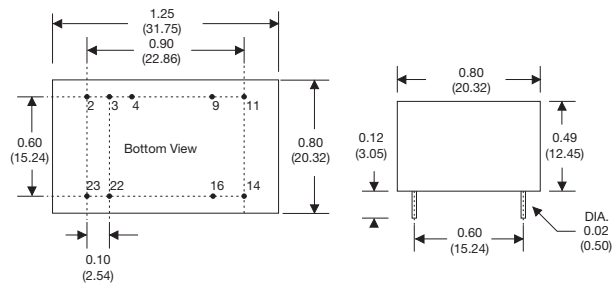
### With Dimming Control

| 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                |

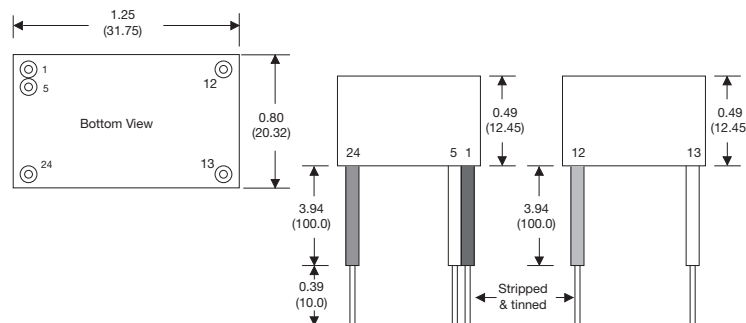
1. Add suffix '-W' for wired version, e.g. LDU5660S500-W, or '-WD' for wired version with dimming function e.g. LDU5660S500-WD.

## 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)

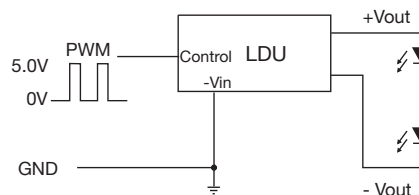
## Application Notes

### Output Current Adjustment by PWM

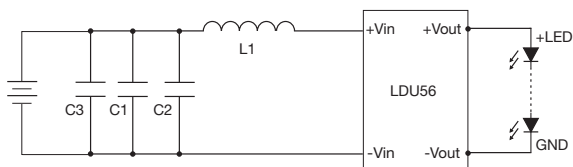
A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied to the control pin.

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

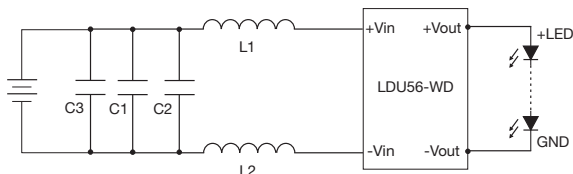
$D_{pwm}$  = PWM duty cycle



### 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 |