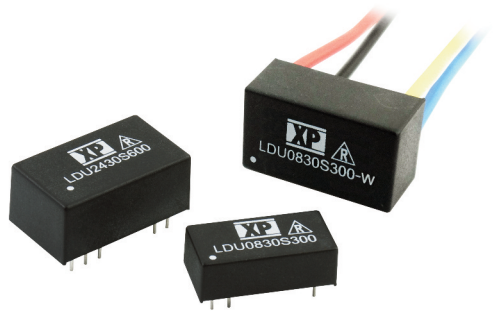
LED Driver
LDU Series



- Constant Current Output
- LED Drive Current up to 1000 mA
- LED Strings from 2 V to 57 V
- PWM & Analog Dimming Control
- High Efficiency – up to 95%
- Open or Short Circuit LED Protection
- 3 Year Warranty

Specification

Input

Input Voltage	• LDU08 & 24: 7-30 VDC LDU48: 7-60 VDC
Input Filter	• Capacitor
Input Surge	• LDU08 & 24: 40 VDC for 0.5 s LDU48: 65 VDC for 0.5 s

Output

Output Voltage	• See tables (Vin must be at least 2 V greater than Vout)
Output Current	• See tables
Output Current Trim	• 25-100%
Output Current Accuracy	• LDU08: ±6.0% max LDU24: ±8.0% max LDU48: ±8.0% max
Ripple & Noise	• LDU08: 200 mV pk-pk max LDU24: 250 mV pk-pk max (except 1000 mA units: 300 mV pk-pk max) LDU48: See tables measured with 20 MHz bandwidth
Short Circuit Protection	• Current is limited to the rated output
Temperature Coefficient	• LDU08: ±0.03%/°C max LDU24: ±0.08%/°C max LDU48: ±0.03%/°C max
Remote On/Off	• On = 0.3-1.25 V or open circuit Off = ≤0.15 V (applied to control pin) LDU08 & 24: Quiescent input current is 25 µA max, LDU48: Quiescent input current is 100 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	• LDU08: 40-380 kHz variable LDU24: 50-330 kHz variable LDU48: 20-500 kHz variable
MTBF	• LDU08: >1.6 MHrs LDU24: >1.6 MHrs LDU48: >950 KHrs to MIL-HDBK-217F at 25 °C, GB

Environmental

Operating Temperature	• LDU08: -40 °C to +85 °C, LDU24: -40 °C to +85 °C, LDU24 1000 mA unit: -40 °C to +70 °C, LDU48: See derating curves
Case Temperature	• LDU08 & 24: +100 °C max LDU48: +110 °C max
Storage Temperature	• -40 °C to +125 °C
Humidity	• Up to 95%, non-condensing
Thermal Impedance	• 35-50 °C/W model dependant
Ingress Protection Rating	• IP67 (wired versions)

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

With Dimming Control

Output Power	Input Voltage Range	Output Voltage	Output Current	Efficiency	Model Number
8.0 W	7 - 30 V	2 - 28 V	300 mA	95%	LDU0830S300
8.0 W	7 - 30 V	2 - 28 V	350 mA	95%	LDU0830S350
14.0 W	7 - 30 V	2 - 28 V	500 mA	95%	LDU2430S500
17.0 W	7 - 30 V	2 - 28 V	600 mA	95%	LDU2430S600
20.0 W	7 - 30 V	2 - 28 V	700 mA	95%	LDU2430S700
24.0 W	7 - 30 V	2 - 28 V	1000 mA	95%	LDU2430S1000

Wired Versions (No Dimming Control)

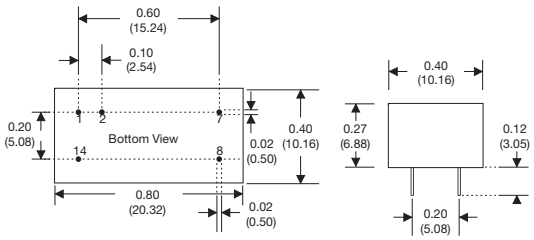
Output Power	Input Voltage Range	Output Voltage	Output Current	Efficiency	Model Number
8.0 W	7 - 30 V	2 - 28 V	350 mA	95%	LDU0830S350-W
14.0 W	7 - 30 V	2 - 28 V	500 mA	95%	LDU2430S500-W
20.0 W	7 - 30 V	2 - 28 V	700 mA	95%	LDU2430S700-W
24.0 W	7 - 30 V	2 - 28 V	1000 mA	95%	LDU2430S1000-W

Wired Version with Dimming Control

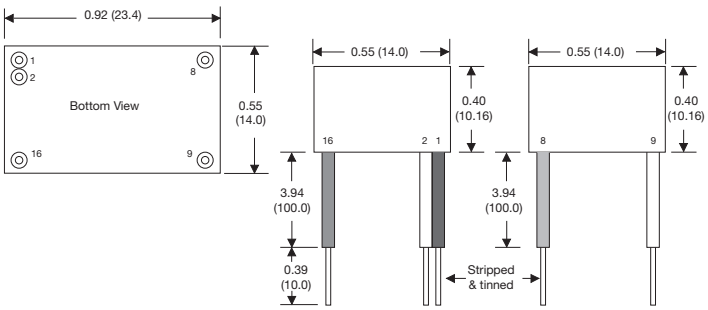
Output Power	Input Voltage Range	Output Voltage	Output Current	Efficiency	Model Number
8.0 W	7 - 30 V	2 - 28 V	350 mA	95%	LDU0830S350-WD
14.0 W	7 - 30 V	2 - 28 V	500 mA	95%	LDU2430S500-WD
20.0 W	7 - 30 V	2 - 28 V	700 mA	95%	LDU2430S700-WD
24.0 W	7 - 30 V	2 - 28 V	1000 mA	95%	LDU2430S1000-WD

Mechanical Details

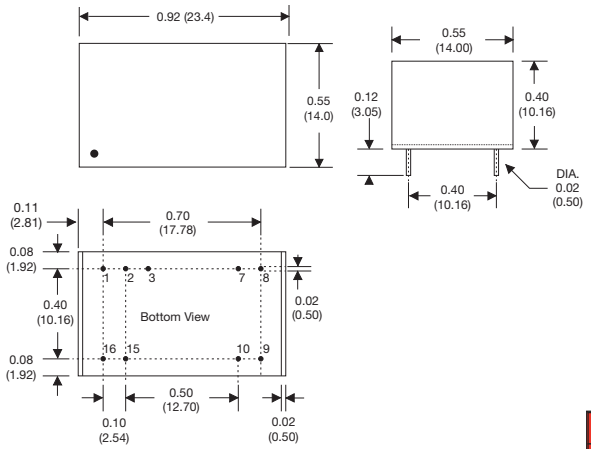
LDU08: 14 Pin DIL



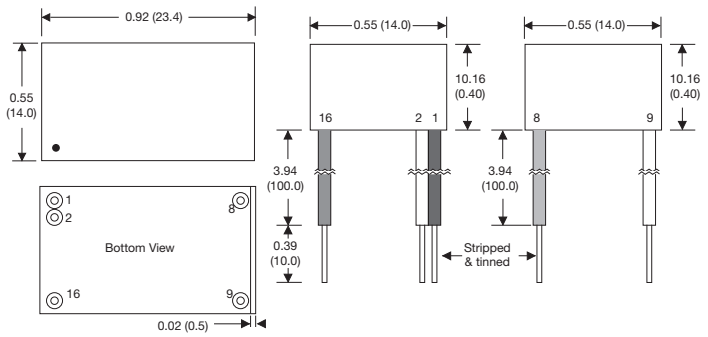
LDU08 – Wired Versions



LDU24– 16 Pin DIL



LDU24 – Wired Versions



LDU Connections						
LDU08	LDU08-W	LDU08-WD	LDU24	LDU24-W	LDU24-WD	Function
1	1 (Black)	1 (Black)	1 & 2	1 (Black)	1 (Black)	-Vin: -DC supply
2	No Wire	2 (White)	3	No Wire	2 (White)	Control
7	8 (Blue)	8 (Blue)	7 & 8	8 (Blue)	8 (Blue)	-Vout: LED cathode connection
8	9 (Yellow)	9 (Yellow)	9 &10	9 (Yellow)	9 (Yellow)	+Vout: LED anode connection
14	16 (Red)	16 (Red)	15 & 16	16 (Red)	16 (Red)	+Vin: +DC supply

Note: LDU08: Do not connect Pin 1 (-Vin) to Pin 7 (-Vout).
LDU24: Do not connect Pins 1 & 2 (-Vin) to Pins 7 & 8 (-Vout).

Notes

1. All dimensions are in inches (mm)
2. Weight: LDU08 - 0.006 lbs (2.6 g) approx.
   LDU08 (wired version) - 0.02 lbs (11.1 g) approx.
   LDU24 - 0.014 lbs (6.2 g) approx.
   LDU24 (wired version) - 0.02 lbs (11.1 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)

Models and Ratings

With Dimming Control

Output Power	Input Voltage Range	Output Voltage	Output Current	Ripple & Noise (pk-pk)	Efficiency	Model Number
9.0 W	7 - 60 V	2 - 57 V	150 mA	150 mV	97%	LDU4860S150
14.0 W	7 - 60 V	2 - 57 V	250 mA	200 mV	97%	LDU4860S250
17.0 W	7 - 60 V	2 - 57 V	300 mA	250 mV	97%	LDU4860S300
20.0 W	7 - 60 V	2 - 57 V	350 mA	300 mV	97%	LDU4860S350
29.0 W	7 - 60 V	2 - 57 V	500 mA	400 mV	97%	LDU4860S500
34.0 W	7 - 60 V	2 - 57 V	600 mA	450 mV	97%	LDU4860S600
40.0 W	7 - 60 V	2 - 57 V	700 mA	500 mV	97%	LDU4860S700
48.0 W	7 - 60 V	2 - 48 V	1000 mA	800 mV	97%	LDU4860S1000

Wired Versions (No Dimming Control)

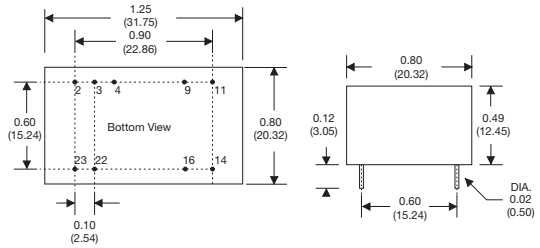
Output Power	Input Voltage Range	Output Voltage	Output Current	Ripple & Noise (pk-pk)	Efficiency	Model Number
9.0 W	7 - 60 V	2 - 57 V	150 mA	150 mV	97%	LDU4860S150-W
14.0 W	7 - 60 V	2 - 57 V	250 mA	200 mV	97%	LDU4860S250-W
17.0 W	7 - 60 V	2 - 57 V	300 mA	250 mV	97%	LDU4860S300-W
20.0 W	7 - 60 V	2 - 57 V	350 mA	300 mV	97%	LDU4860S350-W
29.0 W	7 - 60 V	2 - 57 V	500 mA	400 mV	97%	LDU4860S500-W
34.0 W	7 - 60 V	2 - 57 V	600 mA	450 mV	97%	LDU4860S600-W
40.0 W	7 - 60 V	2 - 57 V	700 mA	500 mV	97%	LDU4860S700-W
48.0 W	7 - 60 V	2 - 48 V	1000 mA	800 mV	97%	LDU4860S1000-W

Wired Version with Dimming Control

Output Power	Input Voltage Range	Output Voltage	Output Current	Ripple & Noise (pk-pk)	Efficiency	Model Number
9.0 W	7 - 60 V	2 - 57 V	150 mA	150 mV	97%	LDU4860S150-WD
14.0 W	7 - 60 V	2 - 57 V	250 mA	200 mV	97%	LDU4860S250-WD
17.0 W	7 - 60 V	2 - 57 V	300 mA	250 mV	97%	LDU4860S300-WD
20.0 W	7 - 60 V	2 - 57 V	350 mA	300 mV	97%	LDU4860S350-WD
29.0 W	7 - 60 V	2 - 57 V	500 mA	400 mV	97%	LDU4860S500-WD
34.0 W	7 - 60 V	2 - 57 V	600 mA	450 mV	97%	LDU4860S600-WD
40.0 W	7 - 60 V	2 - 57 V	700 mA	500 mV	97%	LDU4860S700-WD
48.0 W	7 - 60 V	2 - 48 V	1000 mA	800 mV	97%	LDU4860S1000-WD

Mechanical Details

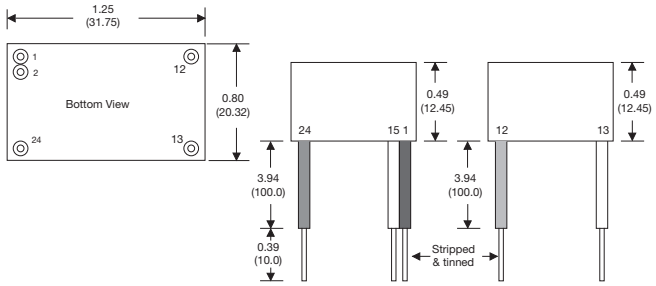
LDU48 – 24 Pin DIL



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)

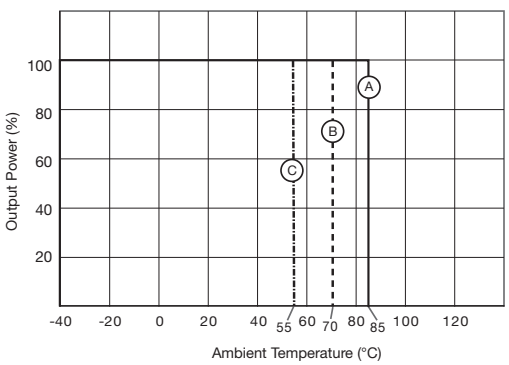
LDU48 – Wired Versions



Notes

1. All dimensions are in inches (mm)
2. Weight: LDU48 - 0.04 lbs (17.7 g) approx.
   LDU48 (wired version) - 0.04 lbs (18.0 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)

Derating Curve for LDU48



LDU48 Models

(A) 150 mA, 250 mA, 300 mA, 350 mA

(B) 500 mA, 600 mA, 700 mA

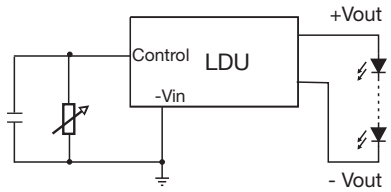
(C) 1000 mA

Notes

For LDU08 & LDU24 please see Operating Temperature Spec.

Output Current Adjustment by Variable Resistor

By connecting a variable resistor between control and GND, simple dimming can be achieved. Capacitor is optional for HF noise rejection. Recommended value is 0.22 µF.



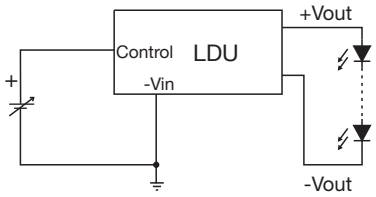
The output current can be determined using the equation:

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, LDU08 & 24: <20 VDC, LDU48: <30 VDC)

For LDU08-24 $Iout = \frac{Iout\ nom \times R}{(R + 200\ k)}$ For LDU48 $Iout = \frac{Iout\ nom \times R}{(R + 50\ k)}$

Output Current Adjustment by DC Voltage

Control Voltage Range: 0.3 V to 1.25 VDC



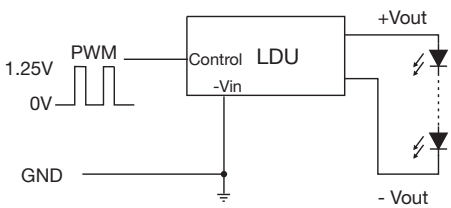
The output current is given by:

$$Iout = Iout\ nom \times \frac{Control}{1.25}$$

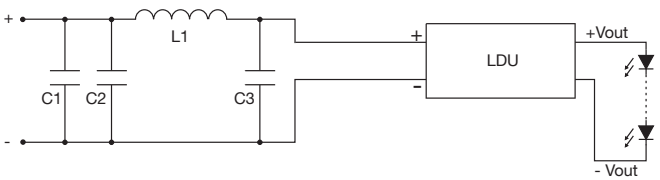
Output Current Adjustment by PWM

Directly driving control input
A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied to the control pin, as shown:

Iout = Iout nom x Dpwm (Dpwm = PWM duty cycle)



Input Filter to meet Class B Conducted Emissions



	LDU08	LDU24	LDU48
C1	10 µF	10 µF	4.7 µF
C2	Not Fitted	Not Fitted	4.7 µF
C3	47 µF	47 µF	Not Fitted
L1	68 µH	68 µH	47 µH

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