

45/60 Watts

- AC Input LED Driver
- Constant Voltage/Constant Current Operation
- Constant Current Dimming Versions
- High Efficiency
- Water Proof to IP67
- Class 2
- 3 Year Warranty



The DLE series of AC input LED drivers incorporate universal input with active power factor correction in a two power stage design, eliminating flicker while providing a high efficiency solution. Designed as a class II isolation product, without the need for a safety earth, DLE series LED drivers are also approved as a class 2 limited power source, making them suitable for a wide range of applications. Dimmable constant current versions are available with the facility for PWM, voltage and resistance programming.

Dimensions:

DLE45/60:

6.73 x 1.78 x 1.27" (164.1 x 45.3 x 32.5 mm)

Models & Ratings - Constant Voltage / Constant Current Models

| Output Power | Output Voltage | Output Current | Output Voltage Range in Constant Current Mode | OVP Range | Efficiency ⁽¹⁾ | Model Number |
|--------------|----------------|----------------|---|-------------|---------------------------|--------------|
| 45 W | 24 V | 1850 mA | 16 - 24 V | 26.4-31.2 V | 85.0% | DLE45PS24 |
| 45 W | 36 V | 1250 mA | 24 - 36 V | 39.6-46.8 V | 86.0% | DLE45PS36 |
| 48 W | 48 V | 1000 mA | 34 - 48 V | 52.8-62.4 V | 87.0% | DLE45PS48 |
| 40 W | 57 V | 700 mA | 40 - 57 V | 62.9-70.0 V | 87.0% | DLE45PS57 |
| 50 W | 12 V | 4200 mA | 9 - 12 V | 13.2-15.6 V | 86.0% | DLE60PS12 |
| 60 W | 24 V | 2500 mA | 16 - 24 V | 26.4-31.2 V | 86.0% | DLE60PS24 |
| 60 W | 36 V | 1650 mA | 24 - 36 V | 39.6-46.8 V | 87.0% | DLE60PS36 |
| 60 W | 48 V | 1250 mA | 34 - 48 V | 52.8-62.4 V | 88.0% | DLE60PS48 |
| 60 W | 57 V | 1050 mA | 40 - 57 V | 62.9-70.0 V | 88.0% | DLE60PS57 |

Models & Ratings - Dimmable Models

| Output Power | Output Voltage | Output Current | Output Voltage Range in Constant Current Mode | OVP Range | Efficiency ⁽¹⁾ | Model Number |
|--------------|----------------|----------------|---|-------------|---------------------------|----------------|
| 45 W | 24 V | 1850 mA | 16 - 24 V | 26.4-31.2 V | 85.0% | DLE45PS1850-AD |
| 45 W | 36 V | 1250 mA | 24 - 36 V | 39.6-46.8 V | 86.0% | DLE45PS1250-AD |
| 48 W | 48 V | 1000 mA | 34 - 48 V | 52.8-62.4 V | 87.0% | DLE45PS1000-AD |
| 40 W | 57 V | 700 mA | 40 - 57 V | 62.9-70.0 V | 87.0% | DLE45PS700-AD |
| 50 W | 12 V | 4200 mA | 9 - 12 V | 13.2-15.6 V | 86.0% | DLE60PS4200-AD |
| 60 W | 24 V | 2500 mA | 16 - 24 V | 26.4-31.2 V | 86.0% | DLE60PS2500-AD |
| 60 W | 36 V | 1650 mA | 24 - 36 V | 39.6-46.8 V | 87.0% | DLE60PS1650-AD |
| 60 W | 48 V | 1250 mA | 34 - 48 V | 52.8-62.4 V | 88.0% | DLE60PS1250-AD |
| 60 W | 57 V | 1050 mA | 40 - 57 V | 62.9-70.0 V | 88.0% | DLE60PS1050-AD |

Notes

1. Typical efficiency at full load and 230 VAC input.

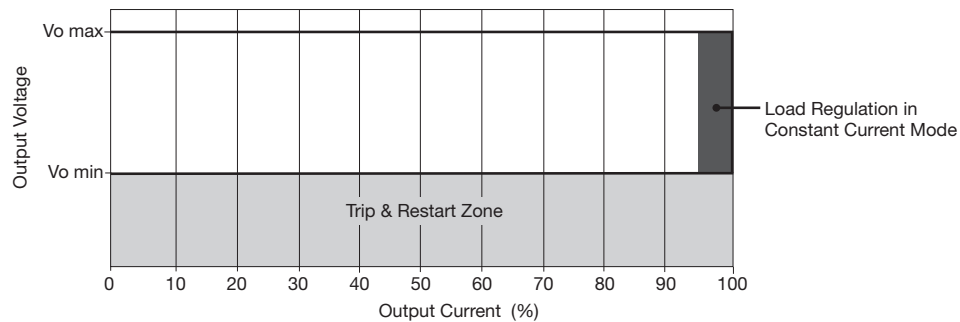
Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|---------------------------|---|---------|---------|-------|--------------------------------|
| Input Voltage - Operating | 90 | | 305 | VAC | See derating curve |
| Input Frequency | 47 | | 63 | Hz | |
| Power Factor | | >0.9 | | | Measured at 230 VAC, full load |
| Input Current | | 0.6 | | A | 115 VAC |
| | | 0.3 | | | 230 VAC |
| Inrush Current | | | 45 | A | 230 VAC cold start, +25 °C |
| Input Protection | Internal T1.0 A/250 V fuse fitted in line | | | | |

Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|--------------------------|---------|---------|---------|----------|---|
| Output Voltage | 12 | | 57 | VDC | See models and ratings table |
| Minimum Load | | | | | No minimum load required |
| Start Up Delay | | | 1.5 | s | Measured at 115 VAC |
| Hold Up Time | 20 | | | ms | |
| Line Regulation | | | ±0.5 | % | |
| Load Regulation | | ±1 | | % | Constant voltage mode |
| | | ±5 | | | Constant current mode |
| Turn On Overshoot | | | 7 | % | Constant voltage mode |
| Transient Response | | | 4 | % | Deviation, recovery to within 1% in 10 ms for a 50% load change |
| Ripple & Noise | | | 200/250 | mV pk-pk | ≤24 V/>24 V. Measured using 12" twisted pair with 0.1 μF and 47 μF capacitors in parallel at 20 MHz bandwidth, at 25 °C |
| Oversvoltage Protection | | | | | See models and ratings table, recycle AC to Reset |
| Overload Protection | 95 | | 105 | % | Auto Recovery |
| Short Circuit Protection | | | | | Trip & restart (hiccup mode) |
| Temperature Coefficient | | 0.04 | | %/°C | |

Constant Current Curve



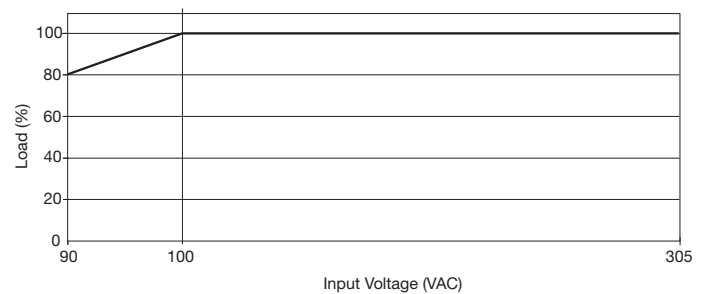
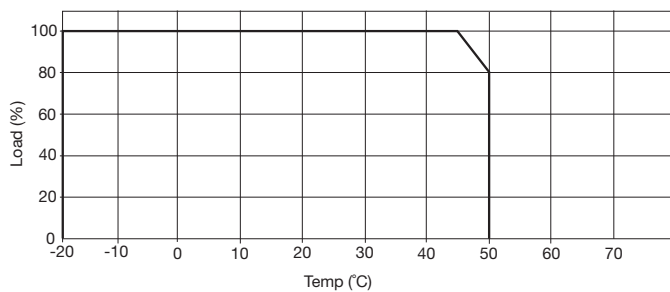
General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|----------------------------|---------|-----------|---------|---------|---------------------------|
| Efficiency | | 87 | | % | See models and tables |
| Isolation: Input to Output | 3750 | | | VAC | |
| Switching Frequency | | 100 | | kHz | |
| Mean Time Between Failure | | >200 | | kHrs | MIL-HDBK-217F at 25 °C GB |
| Weight | | 0.9 (410) | | lb (kg) | |

Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|-----------------------|---------|---------|---------|-------|---|
| Operating Temperature | -20 | | +50 | °C | See derating curve |
| Operating Humidity | 20 | | 90 | % | RH, non-condensing |
| Storage Temperature | -40 | | +80 | °C | Some specification parameters maybe exceeded until after 20 minutes warm up period. |
| Operating Altitude | | | 3000 | m | |
| Shock | | | | | 30 g pk, half sine, 6 axes EN60068-2-27, -2-47 & MIL-STD-810F 514.5 cat 4 |
| Vibration | | | | | 10-500 Hz, 2 g, 10 mins/cycle, 6 cycles in each of axes |

Derating Curves



EMC: Emissions

| Phenomenon | Standard | Test Level | Criteria | Notes & Conditions |
|----------------------|-------------|------------|----------|--------------------|
| Conducted | EN55015 | Class B | | |
| Radiated | EN55015 | Class B | | |
| Harmonic Current | EN61000-3-2 | Class C | | |
| Voltage Fluctuations | EN61000-3-3 | | | |

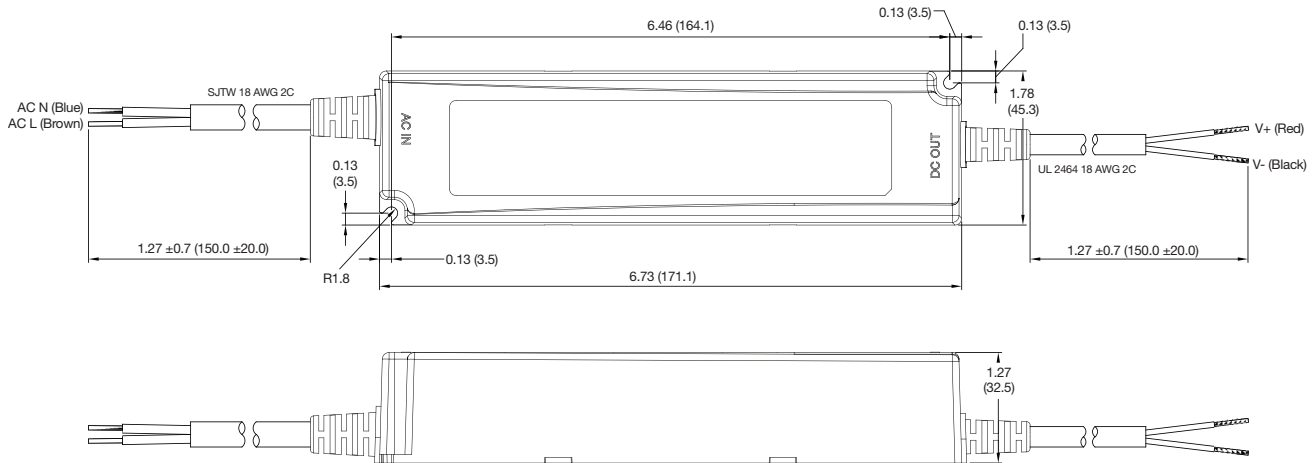
EMC: Immunity

| Phenomenon | Standard | Test Level | Criteria | Notes & Conditions |
|---|--------------|----------------------|----------|---------------------------|
| Equipment for General Lighting Purposes | EN61547 | as below | as below | |
| ESD Immunity | EN61000-4-2 | | A | 8 kV air and 4 kV contact |
| Radiated Immunity | EN61000-4-3 | 2 | A | |
| EFT/Burst | EN61000-4-4 | 2 | A | |
| Surges | EN61000-4-5 | Installation class 3 | A | |
| Conducted | EN61000-4-6 | 2 | A | |
| Magnetic Field | EN61000-4-8 | 2 | A | |
| Dips and Interruptions | EN61000-4-11 | Dip: 30%, 10 ms | A | |
| | | Dip: 30%, 200 ms | A/B | At 230 VAC/100 VAC |
| | | Int: 100%, 8.3 ms | A/B | At 230 VAC/100 VAC |

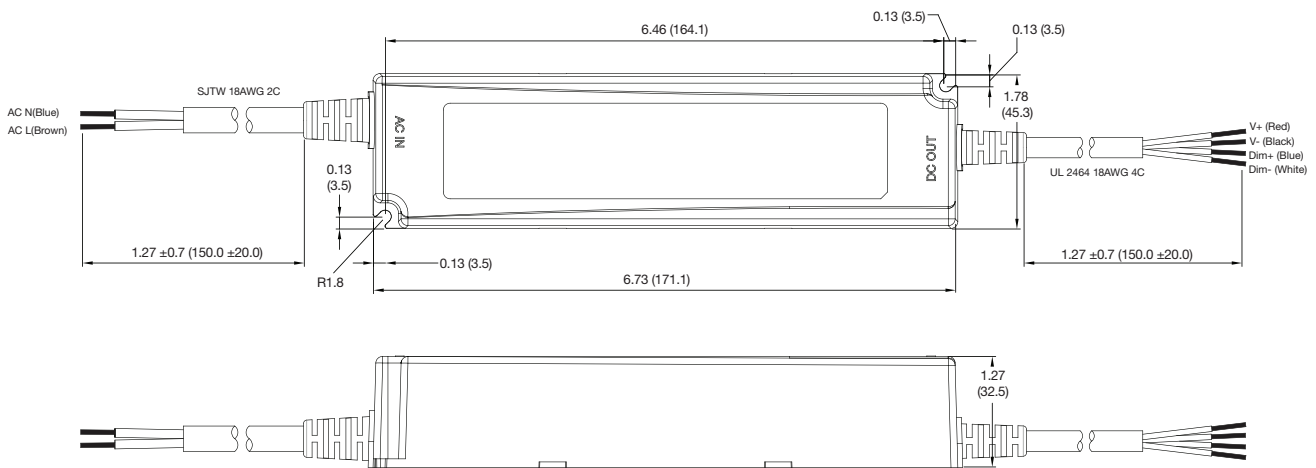
Safety Approvals

| Safety Agency | Safety Standard | Notes & Conditions |
|---------------|---|--------------------|
| UL | UL8750 | |
| TUV | EN61347 | |
| CE | CE Mark | |
| IEC | IEC61347-2-13 used in conjunction with IEC61347-1 | |
| IP | IEC60529 | |

Mechanical Details - Constant Voltage / Constant Current



Mechanical Details - Dimmable Version



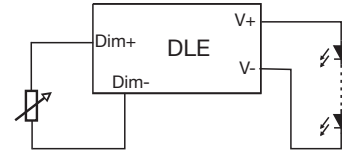
Notes

1. Dimensions shown in inches (mm).
2. Weight: 2.8 lb (1.27 kg).

3. Tolerance: 0.X = ±0.008 (±0.2)
0.XX = ±0.002 (±0.05)

Output Current Adjustment by Variable Resistor

Connect a variable resistor between Dim+ and Dim-.



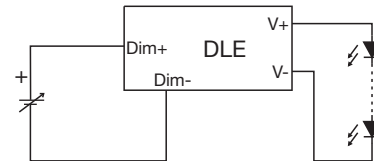
The Dimmed output current can be determined using the equation:

$$\text{Dimmed Current} = \frac{\text{Maximum Current} \times R}{100 \text{ k}}$$

Where the value of R is between 10 kΩ and 100 kΩ. The corresponding range of output current is 10% to 100%

Output Current Adjustment by DC Voltage

Connect a variable voltage between Dim+ and Dim-.



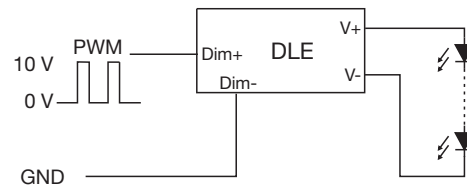
The dimmed output current is given by:

$$\text{Dimmed Current} = \frac{\text{Maximum Current} \times V}{10 \text{ k}}$$

Where V is the value of control voltage in the range of 1.0 V to 10.0 VDC. The corresponding range of output current is 10% to 100%.

Output Current Adjustment by PWM

A Pulse Width Modulated (PWM) signal with duty cycle DPWM can be applied between Dim+ and Dim-.



The dimmed output current is given by:

$$\text{Dimmed Current} = \text{Maximum Current} \times \text{DP}_{\text{PWM}} \%$$

(DP_{PWM} = PWM duty cycle)

Where DP_{PWM} is the % of duty cycle between 10% and 100%. The corresponding range of output current is 10% to 100%. PWM frequency should be in the range 0.5 kHz to 5 kHz