



## LEDW10\_24\_A Series

Constant current power LED Driver with analogue dimming - Wide Input - Non-Isolated & Regulated

## LED Driver

- ⊕ Ultra wide range voltage input (5.5-48VDC)
- ⊕ High efficiency up to 96%
- ⊕ Short Circuit Protection (SCP)
- ⊕ Remote ON/OFF
- ⊕ Lead wire package, simple and convenient
- ⊕ Waterproof Level IP67
- ⊕ With large capacitive loads (1000 $\mu$ F)
- ⊕ AC-DC, EMC recommended circuit
- ⊕ Analogue dimming
- ⊕ Low ripple & noise (<100mV)
- ⊕ RoHS Compliance

The LEDW10\_24 is a high-power LED driver designed for the step-down constant current source. With high efficiency, wide input voltage range, high-temperature environment, functional and so on. Contains analogue dimming and remote shutdown capabilities.

It can be widely used in backlight and 12V, 24V, 36V landscape lighting, special lighting controls, commercial lighting, street lighting, home lighting, automotive lighting and other lighting systems. Use of lead type package, allowing customers to use more convenient.



| Specifications                 |                                                                         |                                      |         |                                    |                       |
|--------------------------------|-------------------------------------------------------------------------|--------------------------------------|---------|------------------------------------|-----------------------|
| Item                           | Test condition                                                          | Min                                  | Typ     | Max                                | Units                 |
| Input voltage limit            | $\leq 10$ seconds                                                       | 5                                    |         | 55                                 | VDC                   |
| Input voltage range            |                                                                         | 5.5                                  | 24      | 48                                 | VDC                   |
| Min. Input-output Voltage Drop | Vin=5.5~48V, 1~10LEDs                                                   | 2                                    |         | 4                                  | VDC                   |
| Input filter                   | Capacitor                                                               |                                      |         |                                    |                       |
| Internal power dissipation     | Vin=24V, 5LEDS                                                          |                                      |         | 700                                | mW                    |
| Output voltage range           | Vin=48V                                                                 | 3.3                                  |         | 36                                 | VDC                   |
| Output power                   | • Io: 300mA<br>• Io: 350mA<br>• Io: 500mA<br>• Io: 600mA<br>• Io: 700mA | 0.99<br>1.16<br>1.65<br>1.98<br>2.31 |         | 10.8<br>12.6<br>18<br>21.6<br>25.2 | W<br>W<br>W<br>W<br>W |
| Output current accuracy        |                                                                         |                                      | $\pm 2$ | $\pm 5$                            | %                     |
| Output current stability       | Vin=48V, Vo=3.3V~36V                                                    |                                      |         | $\pm 1$                            | %                     |
| Temperature coefficient        | -40°C to +71°C ambient                                                  |                                      |         | $\pm 0.015$                        | %/°C                  |
| Ripple & Noise*                | 20MHz bandwidth                                                         |                                      |         | 100                                | mV                    |
| Thermal impedance              |                                                                         |                                      | 60      |                                    | °C/W                  |
| Short circuit protection       | Continuous, automatic recovery                                          |                                      |         |                                    |                       |
| Operating temperature range    | • 300mA/350mA<br>• 500mA/600mA/<br>700mA                                | -40<br>-40                           |         | 85<br>71                           | °C<br>°C              |
| Storage temperature            |                                                                         | -55                                  |         | 105                                | °C                    |
| Maximum case temperature       |                                                                         |                                      |         | 100                                | °C                    |
| Lead temperature               | 1.5mm away from the casing, 10 seconds                                  |                                      |         | 265                                | °C                    |
| Humidity                       |                                                                         |                                      |         | 95                                 | %                     |
| Switching frequency            |                                                                         | 320                                  | 370     | 420                                | kHz                   |
| MTBF                           | MIL-HDBK-217F(+25°C)                                                    |                                      | 1500    |                                    |                       |
| Case Material                  | Epoxy Resin (UL94-V0)                                                   |                                      |         |                                    |                       |
| Dimensions                     |                                                                         | 22.30*12.55*9.10                     |         |                                    | mm                    |
| Weight                         |                                                                         |                                      | 8.2     |                                    | g                     |

\* Ripple and noise tested with "parallel cable" method, please see DC-DC Converter Application Notes for specific operation methods.

| Analogue dimming (leave open if not used) |                         |     |     |                                     |       |
|-------------------------------------------|-------------------------|-----|-----|-------------------------------------|-------|
| Item                                      | Test condition          | Min | Typ | Max                                 | Units |
| Input voltage range                       | Vin=5.5-48V             |     |     | 0-15V                               |       |
| Output current range                      | Vin=5.5-48V             |     |     | 0%-100%                             |       |
| Control voltage range                     | • Full on<br>• Full off |     |     | 0.2V $\pm$ 50mV<br>4.5V $\pm$ 200mV |       |
| Driving current                           | Vc=5V                   |     |     | 0.6mA (max)                         |       |

### Model selection:

LED<sub>C</sub>\_xx-###  
LED=Type; C=Case; yy=Vin; ###= Output Current

### Example:

LEDW10\_24-300A  
LED= Series W= wired; yy= 24VDC nominal; 300= 0,3A;  
A= Analogue dimming

### Note:

1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
2. The maximum capacitive load offered were tested at nominal input voltage and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75% with nominal input voltage and rated output load;
4. All index testing methods are based on our Company's corporate standards;
5. We can provide product customization service;
6. Specifications are subject to change without prior notice.

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| EMC specifications |                                                        |                                    |                              |                                       |
|--------------------|--------------------------------------------------------|------------------------------------|------------------------------|---------------------------------------|
| EMI                | Conducted disturbance                                  | EN55022 /CISPR22                   | CLASS B                      | EN55015 power port*                   |
| EMI                | Radiated Emission                                      | EN55022 /CISPR22                   | CLASS B*                     |                                       |
| EMS                | Electrostatic Discharge                                | IEC/EN61000-4-2<br>IEC/EN61000-4-2 | Contact ±2KV<br>Contact ±6KV | perf. Criteria B<br>perf. Criteria B* |
| EMS                | Radiation Immunity                                     | IEC/EN61000-4-3                    | 10V/m                        | perf. Criteria A                      |
| EMS                | EFT                                                    | IEC/EN61000-4-4                    | ±1KV                         | perf. Criteria B*                     |
| EMS                | Surge Immunity                                         | IEC/EN61000-4-5                    | ±1KV                         | perf. Criteria B*                     |
| EMS                | CS                                                     | IEC/EN61000-4-6                    | 3 Vr.m.s                     | perf. Criteria A                      |
| EMS                | Immunities of voltage dip, drop and short interruption | IEC/EN61000-4-29                   | 0%-70%                       | perf. Criteria B                      |

\* Refer to EMC solution-recommended circuit

| Part Number    | Input Voltage [VDC]<br>Nominal (Range) | Output Voltage [VDC] | Output Current [mA] | Max. capacitive load [µF] | Efficiency [% , typ] |
|----------------|----------------------------------------|----------------------|---------------------|---------------------------|----------------------|
| LEDW10_24-300A | 24 (5.5-48)                            | 3.3-36               | 0-300               | 1000                      | 96                   |
| LEDW10_24-350A | 24 (5.5-48)                            | 3.3-36               | 0-350               | 1000                      | 96                   |
| LEDW10_24-500A | 24 (5.5-48)                            | 3.3-36               | 0-500               | 1000                      | 96                   |
| LEDW10_24-600A | 24 (5.5-48)                            | 3.3-36               | 0-600               | 1000                      | 96                   |
| LEDW10_24-700A | 24 (5.5-48)                            | 3.3-36               | 0-700               | 1000                      | 96                   |

## Input vs. Output

| Input voltage | Output voltage range [VDC] | Output constant current [mA] | Output power [W, max] |
|---------------|----------------------------|------------------------------|-----------------------|
| 48            | 3.3-36.0                   | 300                          | 10.80                 |
| 36            | 3.3-32.0                   | 300                          | 9.60                  |
| 24            | 3.3-21.0                   | 300                          | 6.30                  |
| 20            | 3.3-17.0                   | 300                          | 5.10                  |
| 15            | 3.3-13.2                   | 300                          | 3.96                  |
| 12            | 3.3-10.0                   | 300                          | 3.00                  |
| 5.5           | 3.3-4.0                    | 300                          | 1.20                  |

| Input voltage | Output voltage range [VDC] | Output constant current [mA] | Output power [W, max] |
|---------------|----------------------------|------------------------------|-----------------------|
| 48            | 3.3-36.0                   | 600                          | 21.60                 |
| 36            | 3.3-32.0                   | 600                          | 19.20                 |
| 24            | 3.3-21.0                   | 600                          | 12.60                 |
| 20            | 3.3-17.0                   | 600                          | 10.20                 |
| 15            | 3.3-13.2                   | 600                          | 7.92                  |
| 12            | 3.3-10.0                   | 600                          | 6.00                  |
| 5.5           | 3.3-4.0                    | 600                          | 2.40                  |

| Input voltage | Output voltage range [VDC] | Output constant current [mA] | Output power [W, max] |
|---------------|----------------------------|------------------------------|-----------------------|
| 48            | 3.3-36.0                   | 350                          | 12.60                 |
| 36            | 3.3-32.0                   | 350                          | 11.20                 |
| 24            | 3.3-21.0                   | 350                          | 7.35                  |
| 20            | 3.3-17.0                   | 350                          | 5.95                  |
| 15            | 3.3-13.2                   | 350                          | 4.62                  |
| 12            | 3.3-10.0                   | 350                          | 3.50                  |
| 5.5           | 3.3-4.0                    | 350                          | 1.40                  |

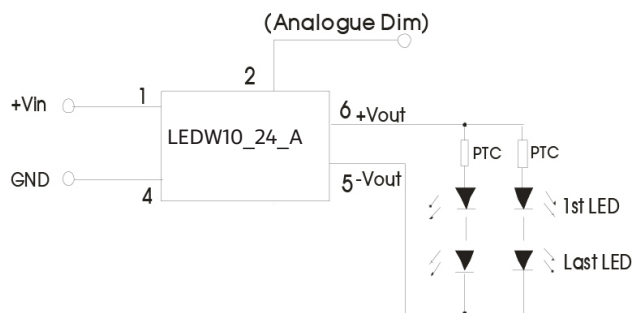
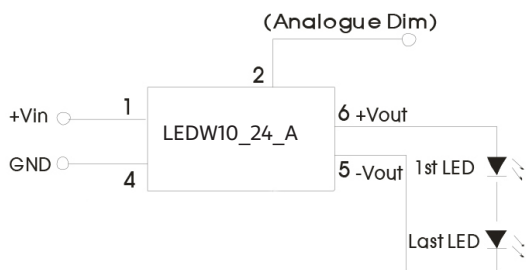
| Input voltage | Output voltage range [VDC] | Output constant current [mA] | Output power [W, max] |
|---------------|----------------------------|------------------------------|-----------------------|
| 48            | 3.3-36.0                   | 700                          | 25.20                 |
| 36            | 3.3-32.0                   | 700                          | 22.40                 |
| 24            | 3.3-21.0                   | 700                          | 14.70                 |
| 20            | 3.3-17.0                   | 700                          | 11.90                 |
| 15            | 3.3-13.2                   | 700                          | 9.24                  |
| 12            | 3.3-10.0                   | 700                          | 7.00                  |
| 5.5           | 3.3-4.0                    | 700                          | 2.80                  |

| Input voltage | Output voltage range [VDC] | Output constant current [mA] | Output power [W, max] |
|---------------|----------------------------|------------------------------|-----------------------|
| 48            | 3.3-36.0                   | 500                          | 18.00                 |
| 36            | 3.3-32.0                   | 500                          | 16.00                 |
| 24            | 3.3-21.0                   | 500                          | 10.50                 |
| 20            | 3.3-17.0                   | 500                          | 8.50                  |
| 15            | 3.3-13.2                   | 500                          | 6.60                  |
| 12            | 3.3-10.0                   | 500                          | 5.00                  |
| 5.5           | 3.3-4.0                    | 500                          | 2.00                  |

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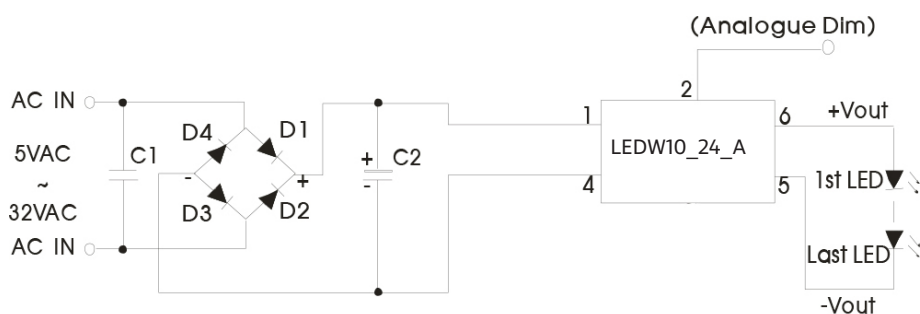
### Typical application circuits



If it is necessary to protect LED in actual application, you could connect a PTC to the input of every channel or all channels, as shown in Recommended AC input circuit.

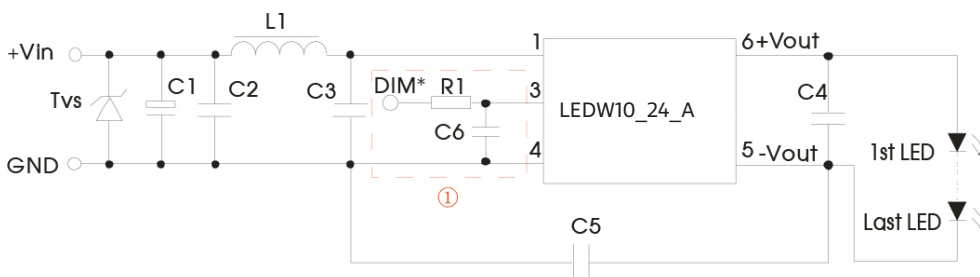
Note: The negative output terminal can't connect GND, or the module may be damaged.

### Recommended AC input circuit



| Components     | Specifications                                   |
|----------------|--------------------------------------------------|
| C1             | X1 Safety capacitor, 0.1 $\mu$ F /300VAC (QIYA)  |
| C2             | 100 $\mu$ F /63V Electrolytic capacitor (CapXon) |
| D1, D2, D3, D4 | Rectifier diode 1N4007 1A/1000V DO-41(PANJIT)    |

### EMC solution-recommended circuit

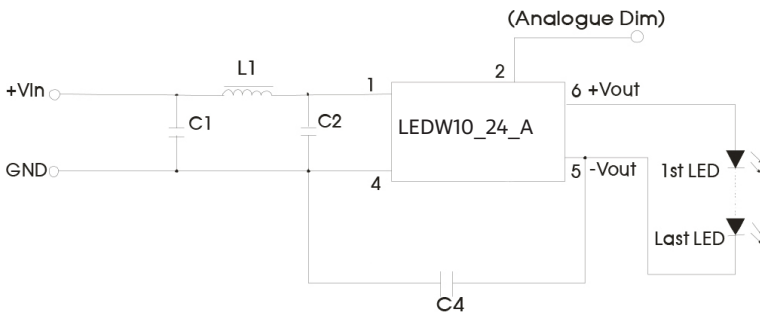


| Components | Specifications                                                     |
|------------|--------------------------------------------------------------------|
| Tvs        | SMC51A,1500W (Bringtking)                                          |
| L1         | CD53-82 $\mu$ H (CEAIYA)                                           |
| C1         | 470 $\mu$ F/100V (CapXon)                                          |
| C2         | 225K/50V 1210 X7R (TORCH)                                          |
| C3         | 104K/50V 0805 X7R (TORCH)                                          |
| C4         | 105K/50V 1210 X7R (TORCH)                                          |
| C5         | 102K/2000V 1210 (TDK) (choose)                                     |
| C6         | 470pF/100V 0805 (TORCH)                                            |
| R1         | 680 $\Omega$ 0805 (can be replaced by inductance or magnetic bead) |

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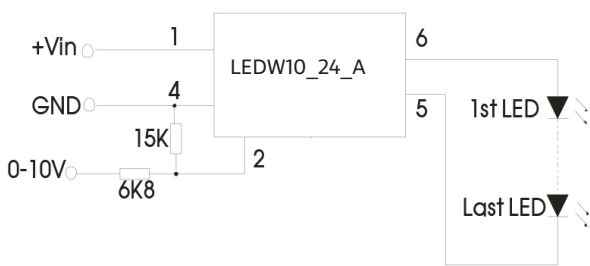
### EMI/RFI conducted EN55022 Class B recommended circuit



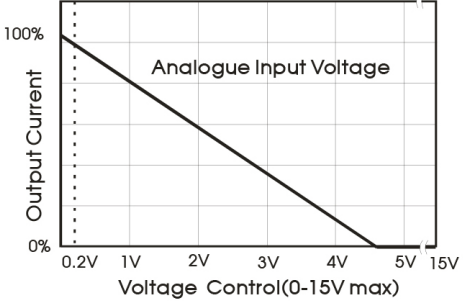
| Components | Specifications                |
|------------|-------------------------------|
| C1         | 225K/50V 1210 ×7R (TORCH)     |
| C2, C4     | 104K/50V 1210 ×7R (TORCH)     |
| L1         | PI043-131MT (SHENZHEN CEAIYA) |

### Analogue dimming control and application sample

Analogue dimming circuit



Analogue input voltage and output current

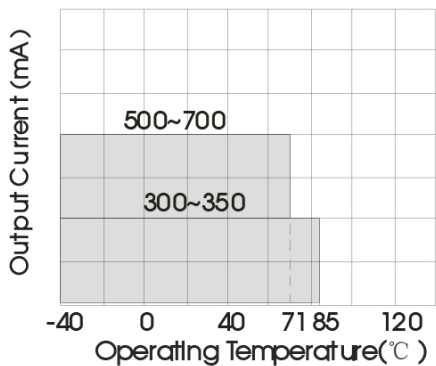


**Note:**

The voltage drop of all LEDs in the datasheet is 3.3-3.8V during actual application, the number of LEDs can be confirmed based on the actual voltage drop and output voltage of LEDs. This product does not support hot-Plug use.

### Typical characteristics

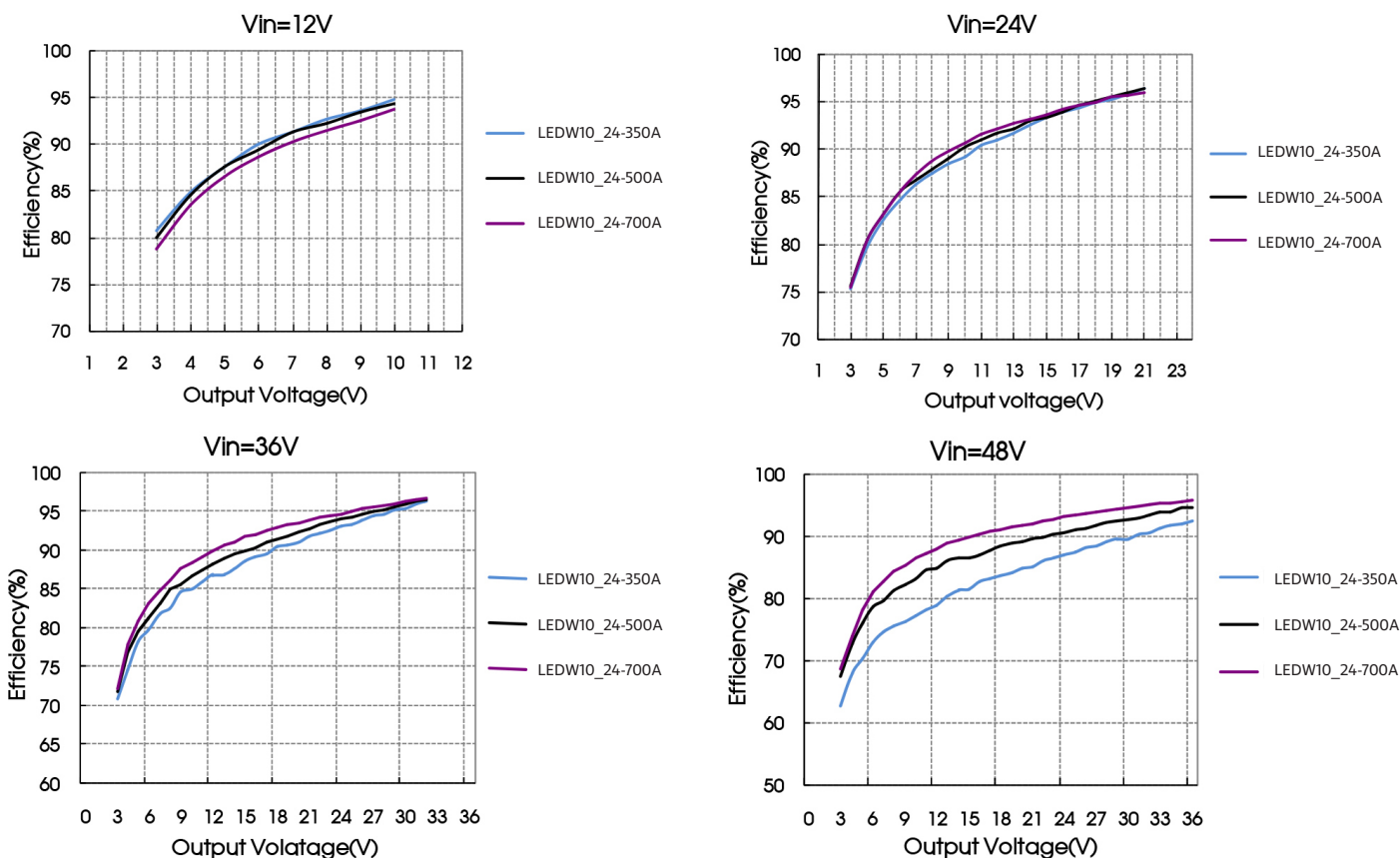
Temperature Derating Curve



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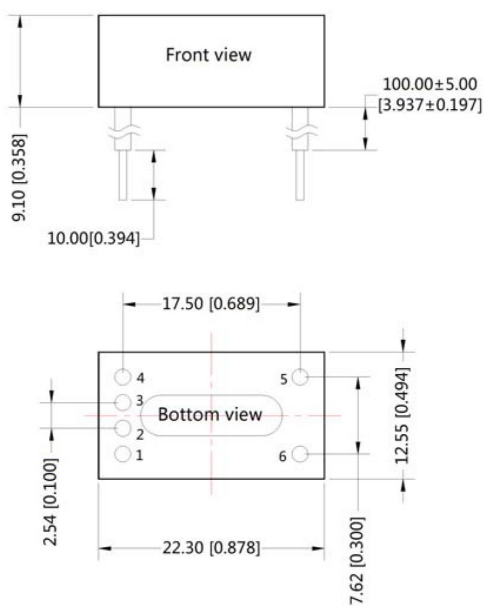
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### Efficiency



### Mechanical dimensions and footprint

THIRD ANGLE PROJECTION



| Pin       | Function      | Comments                |
|-----------|---------------|-------------------------|
| 1(red)    | Vin           | DC Supply               |
| 2(yellow) | AnalogDimming | Leave open if not use   |
| 3(white)  | n.c.          | not connected           |
| 4(black)  | GND           | Do not connect to -Vout |
| 5(white)  | -Vout         | LED Cathode connection  |
| 6(yellow) | +Vout         | LED Anode connection    |

Note:  
 Unit :mm[inch]  
 General tolerances:±0.25[±0.010]  
 Lead internal diameter: 0.76[0.030]  
 Lead external diameter: 1.60[0.063]  
 Lead wire spec: UL1569 300V 105°C