

# Constant Current LED Driver

## SLE 24 SERIES (22 W)

### Description:

SLE-48series is a high efficiency, constant current and step-down DC/DC converter. The LED DRIVER operates from an input voltage range from 9Vdc to 36Vdc and provides an externally adjustable output current of up to 700mA and output power up to 22 watts. It is able to include the function of Over Temperature Protection (OTP), Over Current Protection (OCP), PWM/Digital Dimming and ON/OFF.

The device can extensively be used for Landscape illumination, Special illumination, Back light source, Commercial illumination, Street light illumination, Home use illumination and Automobile illumination etc.

### Features:

- Very High Efficiency 95%
- Constant Current LED Driver
- Wide Input and Output Voltage Range
- Input Voltage Up To 36V
- PWM Diming Control
- Short Circuit and Over Temperature Protected
- Internal SMD Technology
- Fully Isolated Plastic Case with IP67 Level
- UL 94V-0 Package Material
- RoHs Compliant
- 3 Years Warranty



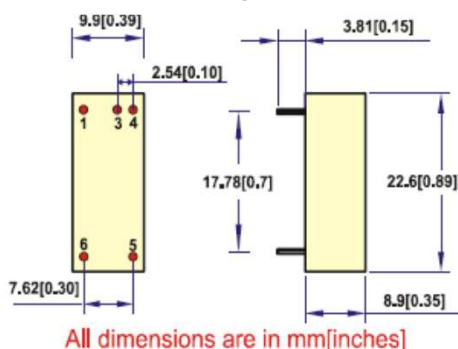
IP67 CE FC

### Temperature & Humidity:

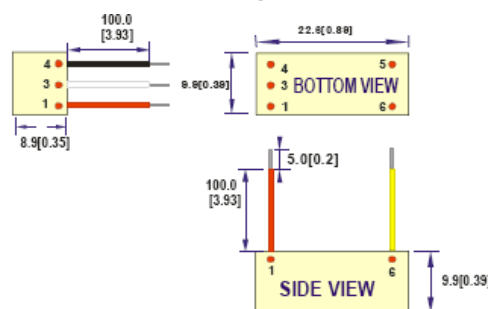
Operating Temperature Range: -40°C ~ +85°C  
Storage Temperature Range: -55°C ~ +125°C

### Dimensions:

#### Package:



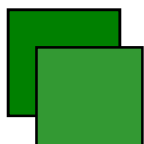
#### Package:



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### **SELECTION GUIDE**

| MODEL<br>NUMBER | INPUT<br>NOMINAL<br>VOLTAGE<br>(VDC) | INPUT<br>VOLTAGE<br>RANGE<br>(VDC) | OUTPUT<br>VOLTAGE<br>RANGE<br>(VDC) | OUTPUT<br>CURRENT<br>RANGE<br>(mA) | DIMMING<br>CONTROL | EFF<br>(%,MAX) |
|-----------------|--------------------------------------|------------------------------------|-------------------------------------|------------------------------------|--------------------|----------------|
| SLE-24-0.30D(W) | 24                                   | 9-36                               | 2-32                                | 0-300                              | PWM                | 95             |
| SLE-24-0.35D(W) | 24                                   | 9-36                               | 2-32                                | 0-350                              | PWM                | 95             |
| SLE-24-0.50D(W) | 24                                   | 9-36                               | 2-32                                | 0-500                              | PWM                | 95             |
| SLE-24-0.60D(W) | 24                                   | 9-36                               | 2-32                                | 0-600                              | PWM                | 95             |
| SLE-24-0.70D(W) | 24                                   | 9-36                               | 2-32                                | 0-700                              | PWM                | 95             |

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### PARTNUMBERS STRUCTURE

| Series        | Coding scheme    |   |
|---------------|------------------|---|
| SLE-24 Series | SLE-x1-x.x2y1zzz | <p>SLE =Series Name</p> <p>x1 = Input voltage</p> <p>x.x2 =Output current</p> <p>y1 = Package Style(D=PINS,W=WIRED)</p> <p>zzz = 0~9 , A~Z or blank for market purpose.</p> |

### SPECIFICATIONS

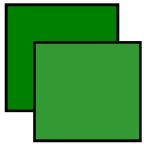
( typical at 25°C, nominal input voltage, rated output current unless otherwise specified )

| Project  | Working Condition          | Min                    | Typ | Max   | Unit  |
|--|----------------------------|------------------------|-----|-------|-------|
| Input Voltage(absolute maximum)                            |                            |                        |     | 36    | VDC   |
| Recommended Input Voltage                                  |                            | 9                      | 24  | 36    | VDC   |
| Input Filter   |                            | Capacitor              |     |       |       |
| Output Voltage range                                       | Vin=36V                    | 2                      |     | 32    | VDC   |
| Output Current Accuracy                                    | Vin=24V,6LEDS              |                        | ±4  | ±6    | %     |
| Output Current Stability                                   | Vin=24V,1LED to 6LEDS      |                        | ±4  | ±6    | %     |
| Maximum Capacitive Load                                    |                            |                        |     | 2.2   | uF    |
| Operating Frequency  |                            | 40                     |     | 1000  | KHz   |
| Short Circuit Protection                                   |                            | Continuous             |     |       |       |
| Temperature Coefficient                                    | -40°C~+71°C ambient        |                        |     | ±0.03 | %°C   |
| Operating Temperature                                      | 300mA/350mA/500mA          | -40                    |     | 85    | °C    |
|  | 600mA/700mA                | -40                    |     | 71    | °C    |
| Storage Temperature  |                            | -55                    |     | 125   | °C    |
| Overtemperature Shutdown<br>(Auto-restart after cool down) | Internal IC Temperature    |                        | 150 |       | °C    |
|  | Temperature Hysteresis     |                        | 20  |       | °C    |
| Maximum Case Temperature                                   |                            |                        |     | 100   | °C    |
| MTBF (using MIL-HDBK 217F)                                 | Operating Temperature 25°C | 2000000                |     |       | Hours |
| Case Material  |                            | Non Conductive plastic |     |       |       |
| Potting Material   |                            | Epoxy (UL94V-0)        |     |       |       |
| Case Size  |                            | 22.6*9.9*8.9           |     |       | mm    |
| Weight   |                            |                        | 4   |       | g     |
| EMI Radiated & Conducted Emissions                         |                            | EN55015                |     |       |       |
| Dust Test & Waterproof Test                                |                            | IP67                   |     |       |       |

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### PWM DIMING AND ON/OFF CONTROL

| Project                                  | Working Condition         | Min | Typ       | Max | Unit |
|--|---------------------------|-----|-----------|-----|------|
| ON/OFF Control                           | ON                        | 3.5 | FLOA<br>T | 10  | VDC  |
|  | OFF                       | 0   |           | 0.5 | VDC  |
| Quiescent Input Current in Shutdown Mode | Vin=24                    |     |           | 1   | mA   |
| PWM Frequency                            | For Linear Operation      | 100 |           | 1K  | Hz   |
|  | (measured 1%~99% Dimming) |     |           |     |      |

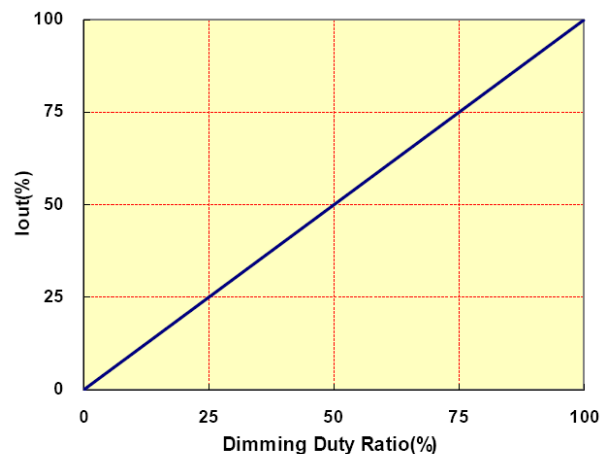
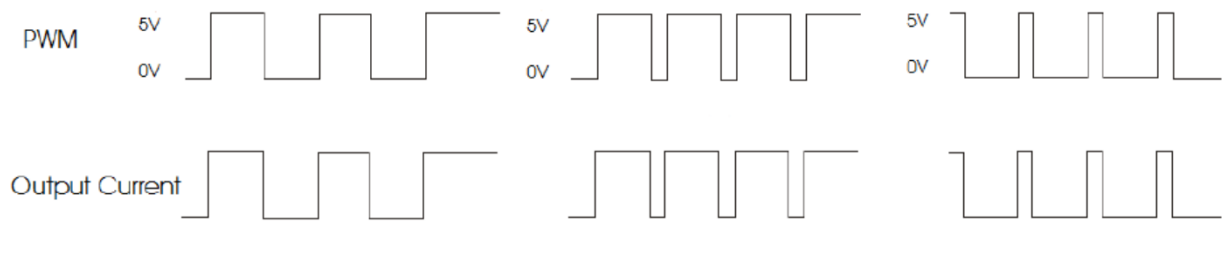


Fig.1 Dimming Duty Cycle:0%-100%

The dimming of LED's can be performed by applying PWM signal to DIM pin.

The following Fig. 1 show good linearity in dimming application of **SLE-24**.

A logic low (below 0.5V) at DIM PIN will disable the device and shut off the current flow to the LED array.

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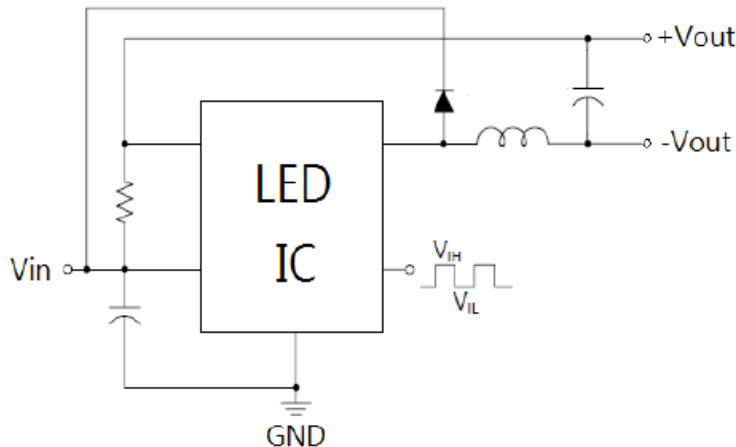
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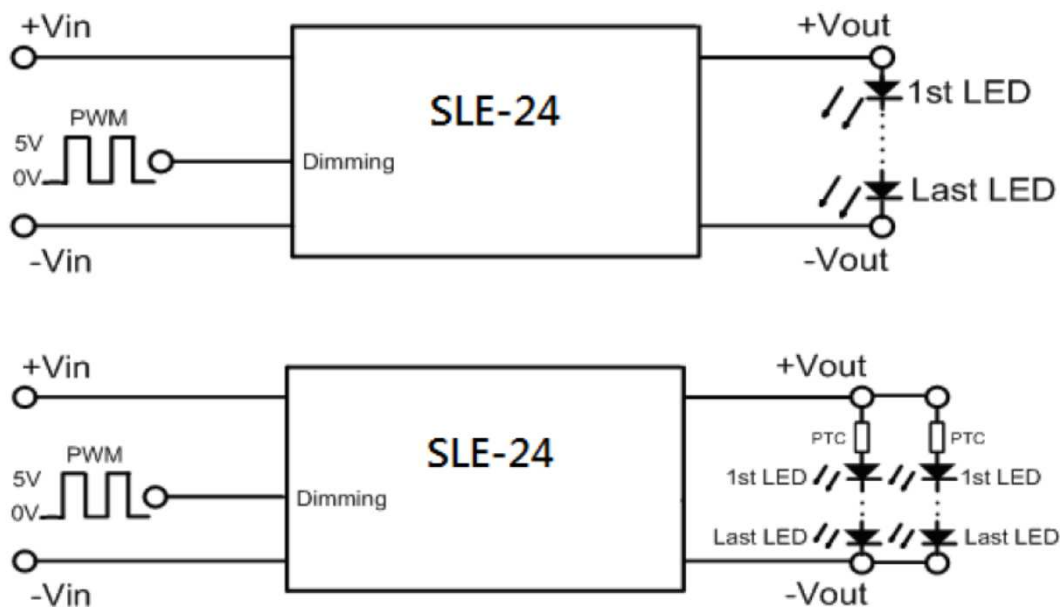
**SLE 24 SERIES (22 W)**

## SIMPLIFIED SCHEMATIC



## TYPICAL APPLICATIONS

### PWM Dimming control circuit



**Fig.2**

In actual use, if necessary to protect LED, a PTC of positive temperature coefficient may be connect to the input end of every channel or all channels, as shown in Fig.2.

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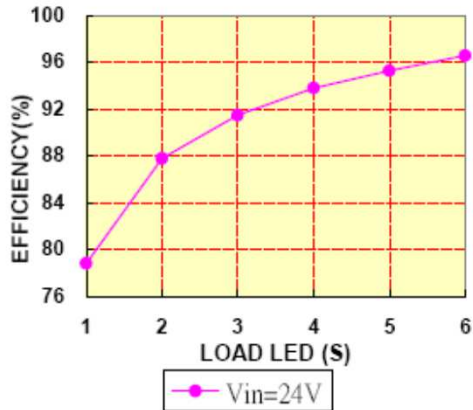
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## EFFICIENCY VS. LOAD LED

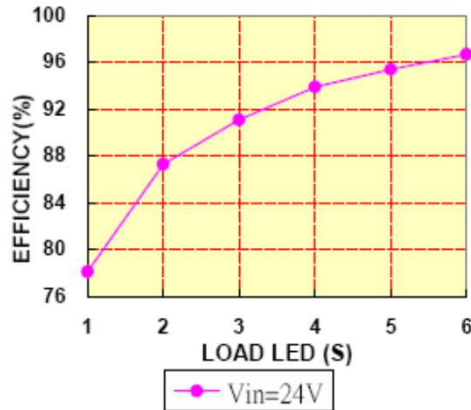
Ta=25 C

1-LED  $V_F=3.6V$ ; 2-LED  $V_F=7.2V$ ; 3-LED  $V_F=10.8V$

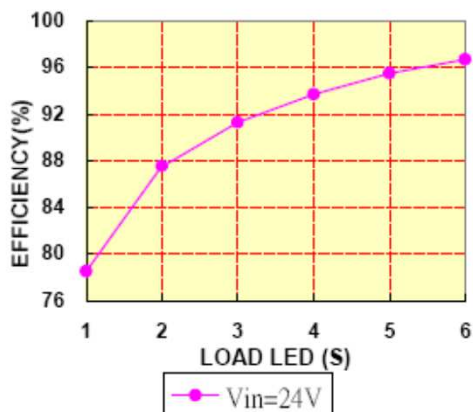
### OUTPUT CURRENT 0.30A



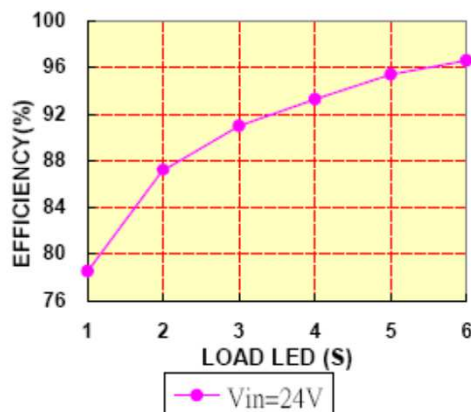
### EFFICIENCY VS. LOAD LED 0.35A



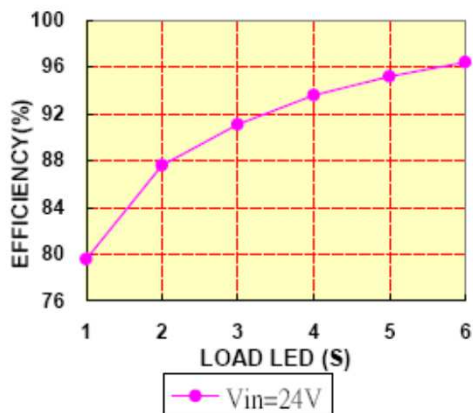
### OUTPUT CURRENT 0.50A



### OUTPUT CURRENT 0.60A



### OUTPUT CURRENT 0.70A



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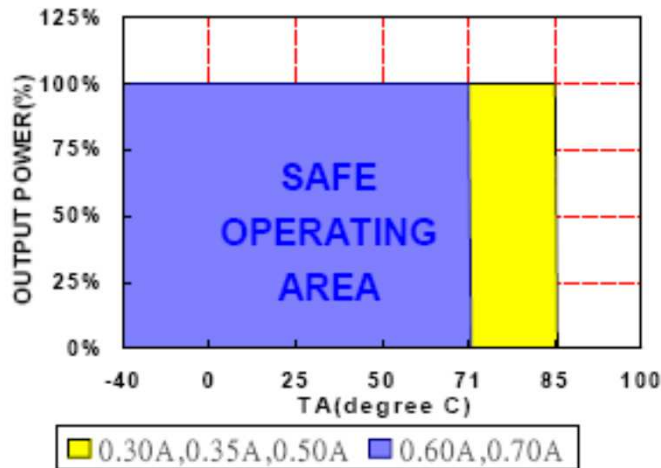
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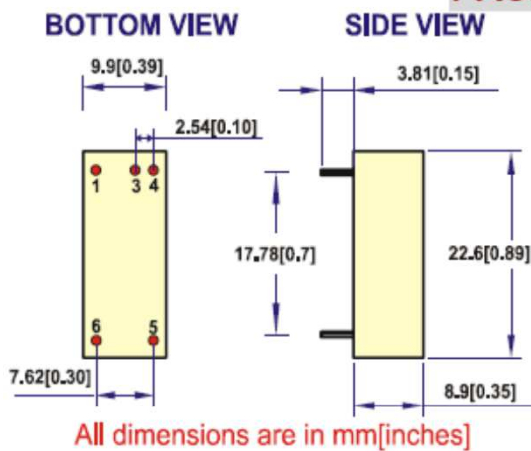
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## DERATING CURVE



## MECHANICAL DIMENSIONS RECOMMENDED FOOTPRINT DETAILS

### PACKAGE

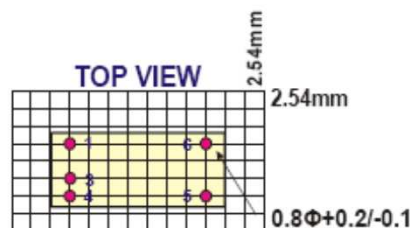


| PIN | OUT     | COMMENT                                      |
|-----|---------|--|
| 1   | +Vin    | DC Supply                                    |
| 3   | PWM DIM | ON/OFF/PWM Dimming<br>Leave open if not used |
| 4   | -Vin    | Don't connect to -Vout                       |
| 5   | -Vout   | LED – Connection                             |
| 6   | +Vout   | LED + Connection                             |

NOTE: Pin Size is Tolerance 0.60Φ ±0.05mm

All Dimensions In mm(Inches)

Tolerance .X or .XX= ±0.5mm



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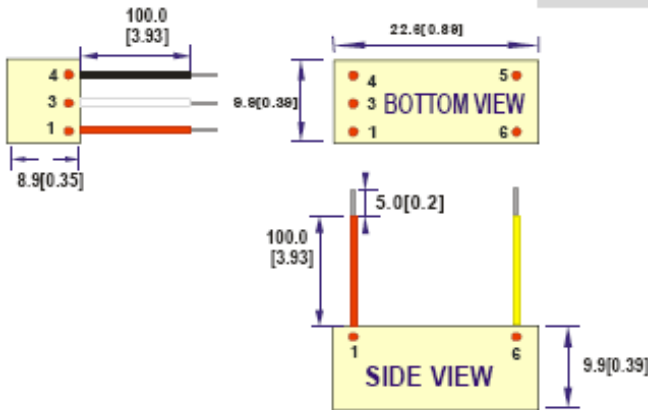
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## PACKAGE



All dimensions are in mm[inches]

| PIN           | OUT     | COMMENT                                      |
|---------------|---------|--|
| 1<br>(Red)    | +Vin    | DC Supply                                    |
| 3<br>(White)  | PWM DIM | ON/OFF/PWM Dimming<br>Leave open if not used |
| 4<br>(Black)  | -Vin    | Don't connect to -Vout                       |
| 5<br>(Blue)   | -Vout   | LED – Connection                             |
| 6<br>(Yellow) | +Vout   | LED + Connection                             |

### NOTE:

All dimensions in mm(Inches)

1. Case Tolerance .X or .XX=±0.5mm

2. Wire length=110mm+10mm Stripped & tinned =110mm ±5

3. Wire outside diameter=1.6mm ±0.1

4. Wire core diameter= 0.75mm ±0.1

5. Wire is UL 3385/CAS TEM listed #22AWG /300V /105°C Rated

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