Features

LED DRIVER

- 70W Buck LED Driver
- Constant Current Output (350 to 1200mA)
- Digital PWM and Analogue Voltage Dimming
- High Efficiency to 96%
- EN, UL and RAILWAYS Certified
- Metal or Plastic Case Version
- IP67 Rated for /W, Plastic Case Version

Description

The RCD-48 series is a step-down constant current source designed for driving high power LED applications. Four output currents are available. The maximum output voltage is 56V. The buck drivers have digital PWM and/or analogue voltage dimming control and are special featured with very high efficiency. Typical applications are 48V bus lighting solutions or high voltage LED arrays (e.g. high bay lights).

Selection Guide

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Range (VDC)</th>
<th>Output Current (mA)</th>
<th>Output Voltage (VDC)</th>
<th>Dimming Control</th>
<th>Efficiency Typ. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCD-48-0.35*</td>
<td>9-60</td>
<td>0-350</td>
<td>2-56</td>
<td>Digital + Analogue</td>
<td>96</td>
</tr>
<tr>
<td>RCD-48-0.50*</td>
<td>9-60</td>
<td>0-500</td>
<td>2-56</td>
<td>Digital + Analogue</td>
<td>96</td>
</tr>
<tr>
<td>RCD-48-0.70*</td>
<td>9-60</td>
<td>0-700</td>
<td>2-56</td>
<td>Digital + Analogue</td>
<td>96</td>
</tr>
<tr>
<td>RCD-48-1.00*</td>
<td>9-60</td>
<td>0-1000</td>
<td>2-56</td>
<td>Digital + Analogue</td>
<td>96</td>
</tr>
<tr>
<td>RCD-48-1.20/M</td>
<td>9-60</td>
<td>0-1200</td>
<td>2-56</td>
<td>Digital + Analogue</td>
<td>96</td>
</tr>
</tbody>
</table>

*add suffix "/W" for wired version with Vref output and analogue + PWM dimming control (seven wires)

Note: Add suffix "/M" for metal case (RCD-48-1.20/M only). No metal case with wires available.

Standard version (no suffix) and wired version (suffix /W) only in plastic case.

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

Operating Input Voltage Range: 9-60VDC

Absolute Maximum Input Voltage: 65VDC max.

Output LED String Voltage Range: 2V min. / 56V max.

(depend on the input voltage, defined by the output impedance, see Safe Operating Area)

Input Filter: Capacitor

Output Current Accuracy: ±3% typ. / ±5% max.

Internal Power Dissipation:
- 350mA: 0.8W typ.
- 500mA: 1.0W typ.
- 700mA: 1.1W typ.
- 1000mA: 1.3W typ.
- 1200mA: 1.4W typ.

Output Current Stability:
- Vin=60V, Vout=2-56V, Iout=350-1200mA ±1% max.

Output Ripple and Noise (20MHz BW):
- Vin=60V, Vout=2-56V, Iout=350-1200mA 300mVp-p max.

Maximum Capacitive Load: 100μF max.

Switching Frequency: 50kHz min. / 1000kHz max.

Efficiency at Full Load: 96% typ.

PWM DIMMING CONTROL & REMOTE ON/OFF CONTROL

Input Voltage Range: 5V typ. / 10V max.

Threshold Voltage:
- Device ON: 0.5V max.
- Device OFF: 2.0V min.

PWM Frequency:
- For Linear Operation: 200Hz max.
- Frequency Limit: 1000Hz max.

ANALOGUE DIMMING CONTROL (Leave open if not used - do not tie to +Vin)

Input Voltage Range: 0V min. / 10V max.

Control Voltage Range: 0V min. / 5.1V max.

Note: The analogue dimming range is from 0% to 100%, but the output can be unstable below 10%, when using the analogue dimming function.

Analogue Pin Drive Current: Voc=5V 0.2mA max.

Vref Version:
- Vref Voltage: 5V ±5% to +10%
- Vref Output Current: 0.15mA max.
- Vref Output Short Circuit Current: 2mA typ.

Ambient Temperature (free air convection):
- 350mA: -40°C to +80°C
- 500mA: -40°C to +80°C
- 700mA: -40°C to +75°C
- 1000mA: -40°C to +60°C
- 1200mA: -40°C to +50°C

Analogue and PWM Dimming Control Note: Leave open if not used - do not tie to +Vin continued on next page

LIGHTLINE
DC/DC-Converter
with 5 year Warranty

Constant Current
Buck LED Driver

RCD-48

Derating-Graph

(Ambient Temperature)

Refer to Application Notes
**Lightline DC/DC Converter**

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature</td>
<td>-55°C to +125°C</td>
</tr>
<tr>
<td>Case Thermal Impedance</td>
<td>10°C/W typ.</td>
</tr>
<tr>
<td>Soldering Temperature</td>
<td>265°C / 10sec. max.</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>95% RH</td>
</tr>
<tr>
<td>Input Filter</td>
<td>Capacitor only</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Continuous, Auto Recovery</td>
</tr>
<tr>
<td>Case Material</td>
<td>Non Conductive Black Plastic/Metal Case</td>
</tr>
<tr>
<td>Potting Material</td>
<td>Silicone Potting Material (UL94V-0)</td>
</tr>
<tr>
<td>Case Dimensions</td>
<td></td>
</tr>
<tr>
<td>Plastic Case</td>
<td>32.6 x 16.65 x 11.10 mm</td>
</tr>
<tr>
<td>Metal Case</td>
<td>32.6 x 16.0 x 11.2 mm</td>
</tr>
<tr>
<td>Package Weight</td>
<td></td>
</tr>
<tr>
<td>Pinned (Plastic Case)</td>
<td>13g</td>
</tr>
<tr>
<td>Wired (Plastic Case)</td>
<td>16g</td>
</tr>
<tr>
<td>Pinned (Metal Case)</td>
<td>16g</td>
</tr>
<tr>
<td>Packing Quantity</td>
<td></td>
</tr>
<tr>
<td>Pinned (Plastic/Metal Case)</td>
<td>29 pcs.</td>
</tr>
<tr>
<td>Wired (Plastic Case)</td>
<td>12 pcs.</td>
</tr>
<tr>
<td>MTBF (using MIL-HDBK217F)</td>
<td>+25°C 1700 x 10⁶ hours</td>
</tr>
<tr>
<td>(Nominal Vin at Full Load)</td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td></td>
</tr>
<tr>
<td>All LED Drivers may not be used without a load. They must be switched on the primary side only. Noncompliance may damage the LED or reduce its lifetime.</td>
<td></td>
</tr>
</tbody>
</table>

**Package Style and Pinning**

**Through Hole Case (Plastic)**

```
+---+---+
|   |   |
| 6 | 15|
|   |   |
+---+---+
```

```
Bottom View
```

```
Through Hole Case (Metal)
```

```
+---+---+
|   |   |
| 6 | 15|
|   |   |
+---+---+
```

```
Bottom View
```

**Pin Connections**

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Function</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin</td>
<td>DC Supply</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Do not connect to -Vout</td>
</tr>
<tr>
<td>3</td>
<td>Vref</td>
<td>Vref Voltage 4.8-5.5V typ.</td>
</tr>
<tr>
<td>4</td>
<td>PWM/ON/OFF</td>
<td>Leave open if not used</td>
</tr>
<tr>
<td>5</td>
<td>Analogue Dimming</td>
<td>Leave open if not used</td>
</tr>
<tr>
<td>6</td>
<td>-Vout</td>
<td>LED Cathode Connection</td>
</tr>
<tr>
<td>7</td>
<td>+Vout</td>
<td>LED Anode Connection</td>
</tr>
</tbody>
</table>

**Unit:** mm

**Tolerance:**

- XXX = 0.5 mm
- XXX = 0.25 mm

**Note:**

Detailed information see Application Notes chapter "MTBF"
**LIGHTLINE**
DC/DC-Converter

**RCD-48 Series**

**Package Style and Pinning**

**Wired Version (Plastic)**

Wire Connections

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Function</th>
<th>Wire color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin</td>
<td>Red</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Black</td>
</tr>
<tr>
<td>3</td>
<td>Vref</td>
<td>Yellow</td>
</tr>
<tr>
<td>4</td>
<td>PWM/ON/OFF</td>
<td>Blue</td>
</tr>
<tr>
<td>5</td>
<td>Analogue Dimming</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>LED-</td>
<td>Brown</td>
</tr>
<tr>
<td>7</td>
<td>LED+</td>
<td>Yellow</td>
</tr>
</tbody>
</table>

Wires: UL/CSA approved (22AWG/300V)

**EMI Filter Suggestions**

**Class B**

Filter Suggestion

**Top Layer**

**Bottom Layer**

**Unit:** mm

**Tolerance:**
- XXX ± 1.0 mm
- XXXX ± 0.25 mm

**RCD-48-xx/x**

L1: 1mH (e.g. WE744272102)

C1: 10μF

C2: 1μF

C3: 100nF close to Pins

C4-C9: 10nF

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REV: 2/2017
Standard Application

Single String Application

PWM Dimming Controlled

Dimming Controlled by Analog Voltage

Lighting/Backlighting Wall Application

High Efficiency Lighting

Note:
It is not possible to parallel the drivers to increase the current.

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