

# 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

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

\*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 (Vin=60V, Vout=56V)	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	Vc=5V	0.2mA max.
Vref Version	Vref Voltage	5V -5%/+10%
	Vref Output Current	0.15mA max.
	Vref Output Short Circuit Current	2mA typ.
	Ambient Temperature	350mA
(free air convection)	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

**RECOM**

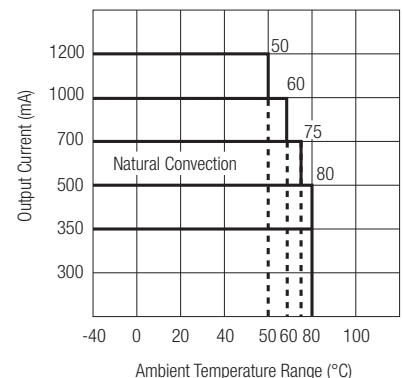
## Constant Current Buck LED Driver



**EN-50121-3-2 Certified**  
**EN-60950-1 Certified**  
**UL-60950-1 Certified**

# RCD-48

## Derating-Graph (Ambient Temperature)

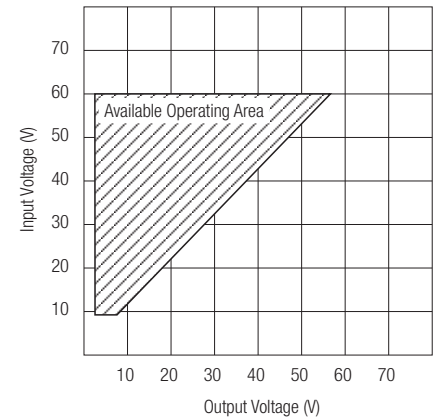


Refer to Application Notes

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

Storage Temperature	-55°C to +125°C	
Case Thermal Impedance	10°C/W typ.	
Soldering Temperature	265°C / 10sec. max.	
Relative Humidity	95% RH	
Input Filter	Capacitor only	
Short Circuit Protection	Continuous, Auto Recovery	
Case Material	Non Conductive Black Plastic Metal Case	
Potting Material	Silicone Potting Material (UL94V-0)	
Case Dimensions	Plastic Case	32.6 x 16.65 x 11.10 mm
	Metal Case	32.6 x 16.0 x 11.2 mm
Package Weight	Pinned (Plastic Case)	13g
	Wired (Plastic Case)	16g
	Pinned (Metal Case)	16g
Packing Quantity	Pinned (Plastic/Metal Case)	29 pcs.
	Wired (Plastic Case)	12 pcs.
MTBF (using MIL-HDBK217F)	+25°C	1700 x 10 <sup>3</sup> hours
(Nominal Vin at Full Load)	<i>Note: Detailed Information see Application Notes chapter "MTBF"</i>	
Safety	Shock / Vibration	EN61373
	EMC RAILWAYS	EN50121-3-2:2006
	Conducted	EN55011
	Radiated	EN55011
	ESD	EN61000-4-2
	Radiated Immunity	EN61000-4-3
	Fast Transient	EN61000-4-4
	Surge	EN61000-4-5
	Conducted Immunity	EN61000-4-6

### Safe Operating Area

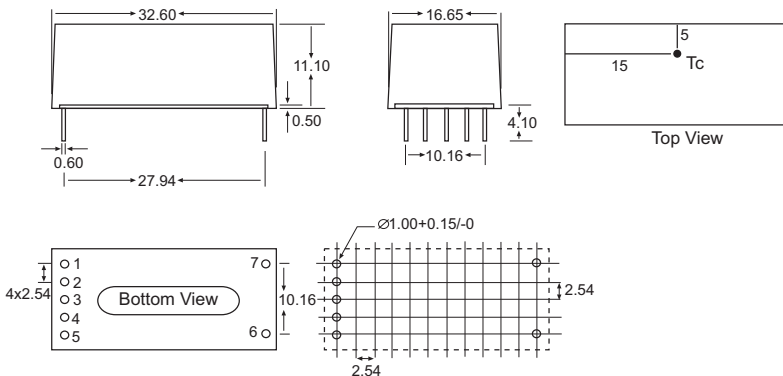


#### Note:

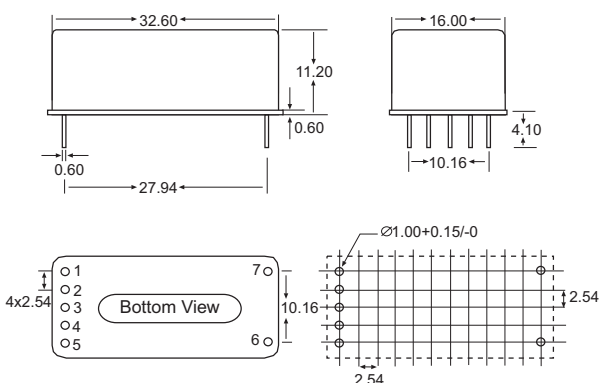
All LED Drivers may not be used without a load. They must be switched on the primary side only. Noncompliance may damage the LED or reduce its lifetime.

### Package Style and Pinning

#### Through Hole Case (Plastic)



#### Through Hole Case (Metal)

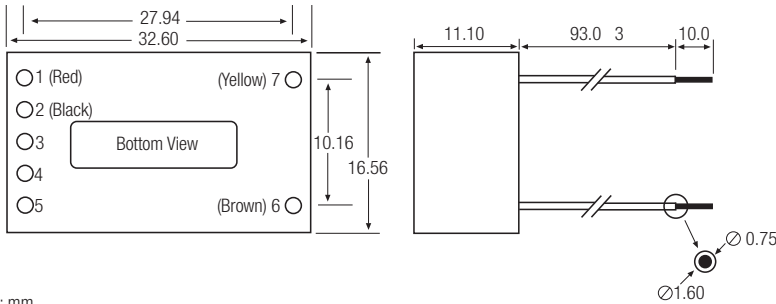


Pin Connections	RCD-48-x.xx	
Pin#	Function	Comments
1	+Vin	DC Supply
2	GND	Do not connect to -Vout
3	Vref	Vref Voltage 4.8-5.5V typ.
4	PWM/ON/OFF	Leave open if not used
5	Analogue Dimming	Leave open if not used
6	-Vout	LED Cathode Connection
7	+Vout	LED Anode Connection

Unit: mm  
Tolerance:  
XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

**Package Style and Pinning**

**Wired Version (Plastic)**



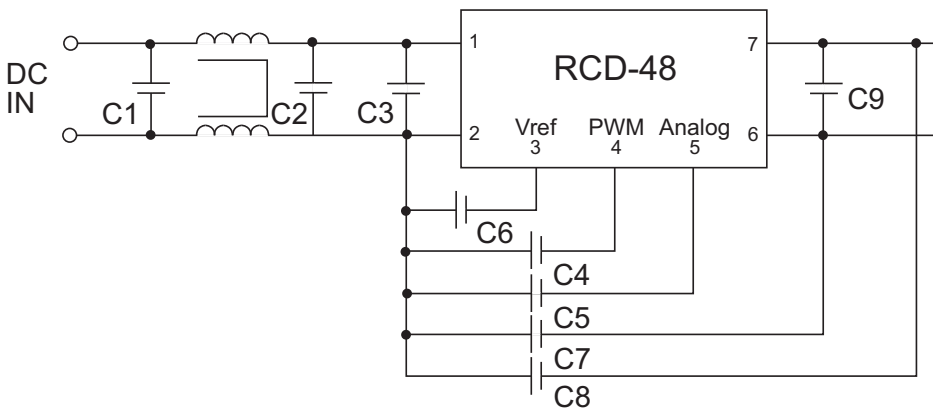
Unit: mm  
Tolerance:  
XX.X ± 1.0 mm  
XX.XX ± 0.25 mm

Wire Connections Pin#	Function	RCD-48-x.xx/W Wire color
1	+Vin	Red
2	GND	Black
3	Vref	Yellow
4	PWM/ON/OFF	Blue
5	Analogue Dimming	Green
6	LED-	Brown
7	LED+	Yellow

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

**EMI Filter Suggestions**

**Class B**

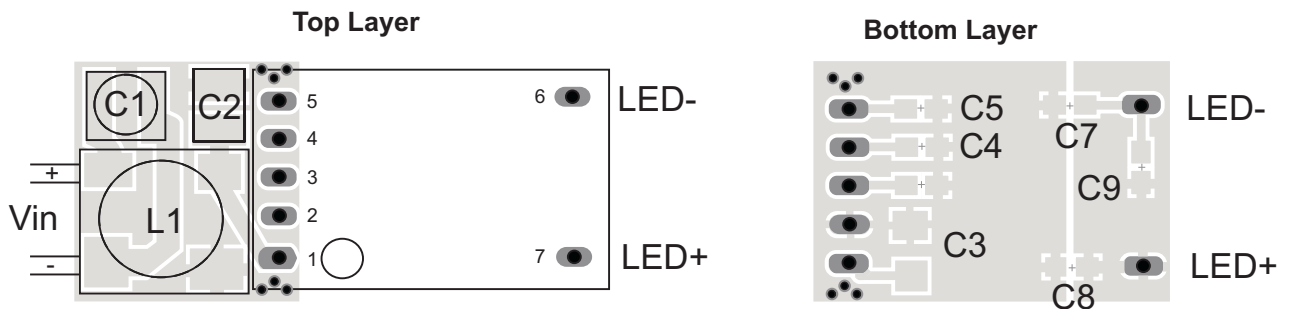


LOAD

L1	1mH (e.g. WE744272102)
C1	10µF
C2	1µF
C3	100nF close to Pins
C4 - C9	10nF

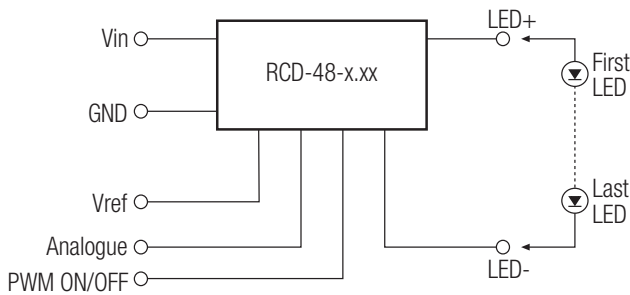
**RCD-48**

**Filter Suggestion**

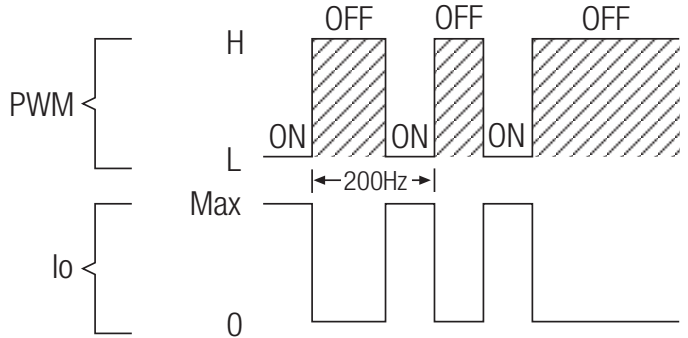


**Standard Application**

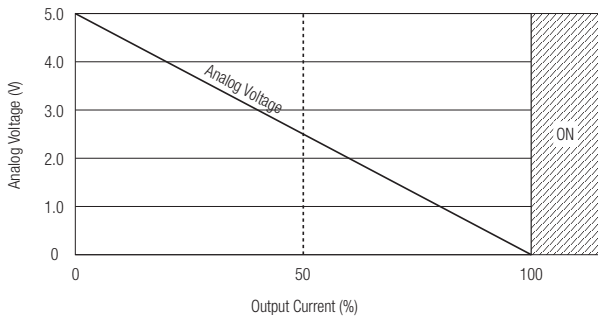
### Single String Application



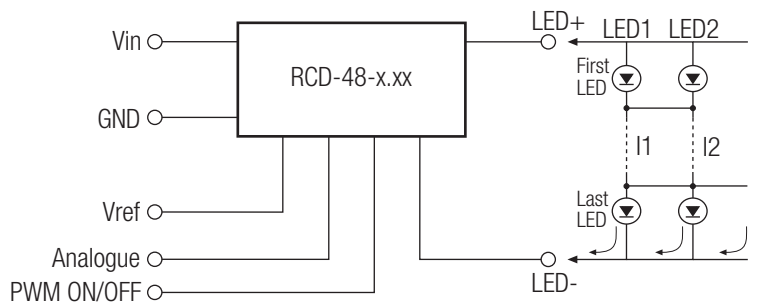
### PWM Dimming Controlled



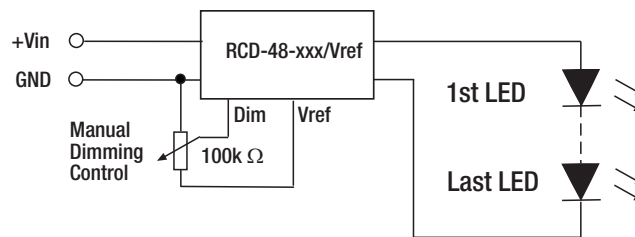
### Dimming Controlled by Analog Voltage



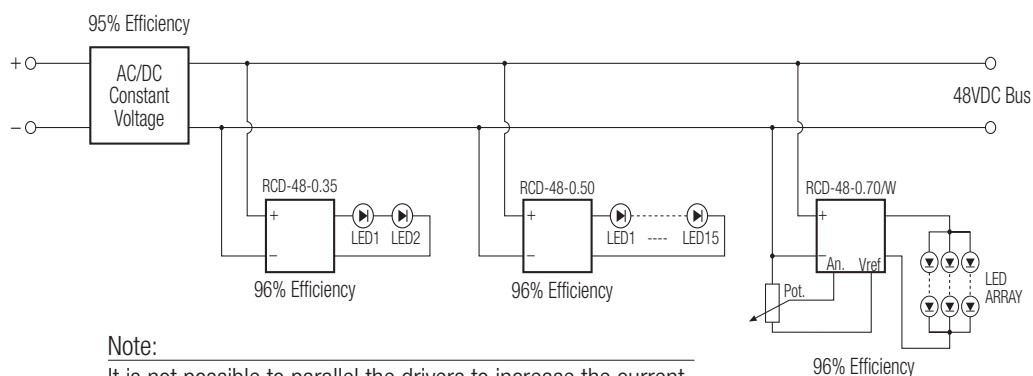
### Lighting/Backlighting Wall Application



### LED DIMMER for up to 10 white LEDs



### High Efficiency Lighting



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

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.