

Features

Regulated Converters

Rev.1

- Constant Current Output
- Power LED Driver
- Wide Input Voltage Range
- PWM/Digital Dimming and Analogue Voltage Dimming
- Short Circuit Protected
- 96% Efficiency

Description

The RCD series is a step-down constant current source designed for driving high power white LEDs. Standard output currents available are 300mA, 350mA, 500mA, 600mA and 700mA to make this driver compatible with a wide range of LEDs from many different manufacturers without the need for any external components. Despite its compact size, the RCD series is fully featured with very high efficiency, wide input voltage range, high ambient operating temperature and two means of LED dimming: PWM/digital control and analogue voltage dimming. Both dimming controls are independent and can be combined. The driver is also designed to be as reliable as the LEDs it is driving, even at the full operating temperature of 85°C.

Selection Guide

Part Number	Input Range (VDC)	Output Current (mA)	Output Voltage (V)	Dimming Control	Efficiency max. (%)
RCD-24-0.30	4.5-36V	0-300	2-32	Digital + Analogue	96
RCD-24-0.35	4.5-36V	0-350	2-32	Digital + Analogue	96
RCD-24-0.50	4.5-36V	0-500	2-32	Digital + Analogue	96
RCD-24-0.60	4.5-36V	0-600	2-32	Digital + Analogue	96
RCD-24-0.70	4.5-36V	0-700	2-32	Digital + Analogue	96

Specifications

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

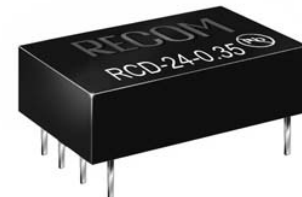
Input Voltage (absolute maximum)	36VDC max.	
Recommended Input Voltage	5V min. / 24V typ. / 36VDC max.	
Input Filter	Capacitor	
Output Voltage Range	Vin=36V	2V min. / 32V max.
Output Current Range	Vin - Vout > 1.5~4V	300mA-700mA
Output Current Accuracy	300mA-700mA	±2% typ.
Internal Power Dissipation	Load of 5 LEDs	700mW
Output Current Stability	Vin=36V, Vout =2~32V	±1% max
Output Ripple and Noise (20MHz limited)	Vin=36V, Vout =2~32V	120mVp-p max
Temperature Coefficient	-40~+85°C ambient	±0.015%/°C max.
Maximum Capacitive Load	100µF	
Operating Frequency	210 kHz min/ 260kHz typ./ 300kHz max	
Efficiency at Full Load	96% max.	
Short Circuit Protection	Regulated at rated output current	
Operating Temperature Range (free air convection)	300mA/350mA	-40°C to +85°C
	500mA	-40°C to +80°C
	600mA	-40°C to +75°C
	700mA	-40°C to +71°C
Storage Temperature Range	-55°C to +125°C	
Maximum Case Temperature	100°C	
Thermal Impedance	Natural Convection	55°C/Watt
Case Material	Non Conductive Black Plastic	
Potting Material	Epoxy (UL94-V0)	
Dimensions	22.1 x 12.6 x 8.5mm	
Weight	4.5g	
Wave Soldering Profile	Max. 265°C/10 sec.	

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INNOLINE
DC/DC-Converter

RCD-24 Series

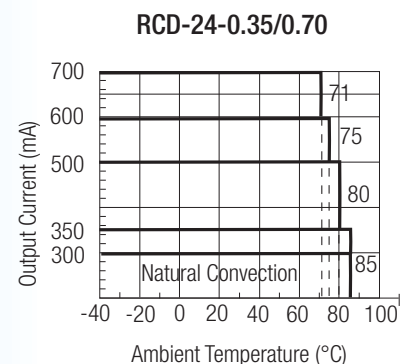
Constant Current Single Output



RECOM

Derating Graph

(Ambient Temperature)



Specifications -Continued

PWM Dimming and ON/OFF Control (Leave open if not used)

Remote ON/OFF	DC/DC ON	Open or $0V < V_r < 0.6V$
	DC/DC OFF (Standby)	$0.6 < V_r < 2.9V$
	DC/DC OFF (Shutdown)	$2.9V < V_r < 6V$
Remote Pin Drive Current	$V_r = 5V$	1mA max.
Quiescent Input Current in Shutdown Mode	$V_{in} = 36V, V_r > 2.9V$	200µA max.
Maximum PWM Frequency for Linear Operation (measured 10%~90% Dimming)		200Hz

Analogue Dimming Control (leave open if not used)

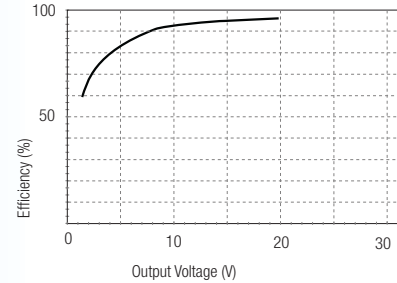
Input Voltage Range		0 - 15V
Control Voltage Range Limits (see Graph)	Full On	$0.13V \pm 50mV$
	Full Off	$4.5V \pm 50mV$
Analogue Pin Drive Current	$V_c = 5V$	0.2mA max.

Environmental

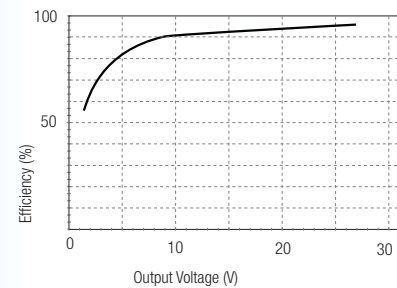
Relative Humidity	5% to 95% RH, non-condensing	
Conducted Emissions	(all series, see note) EN55022	Class B
Radiated Emissions	(all series except 700mA) EN55022	Class B
ESD	(all series) EN61000-4-2	Class A
Radiated Immunity	(all series) EN61000-4-3	Class A
Fast Transient	(all series) EN61000-4-4	Class A
Conducted Immunity	(all series) EN61000-4-6	Class A
MTBF (RCD-24-0.70, Nominal V_{in} , Full Load)	+25°C	605×10^3 hours
using MIL-HDBK 217F	+71°C	516×10^3 hours

Note: Requires an input filter to meet EN55022 ClassB conducted emissions, see below.

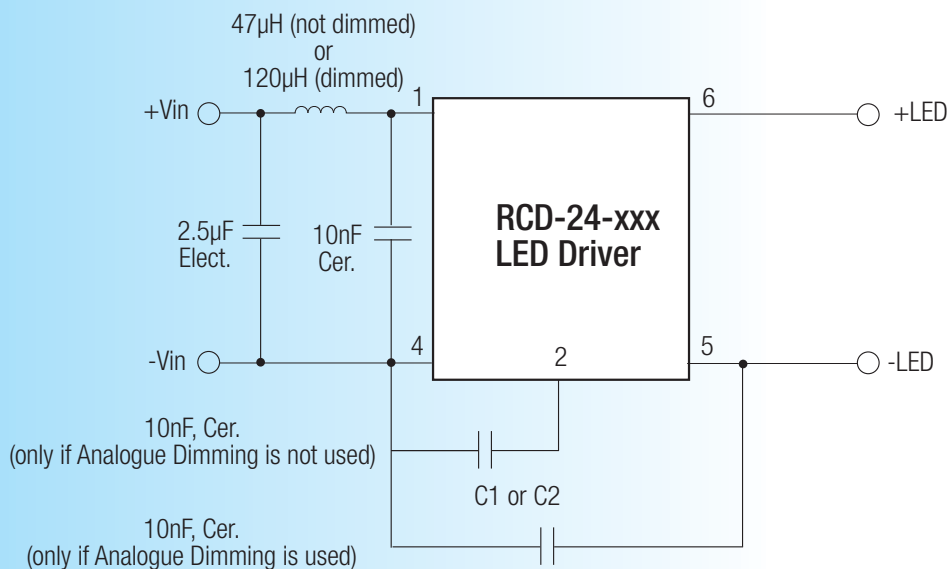
$V_{in} = 24V, I_{out} = 300-700mA$



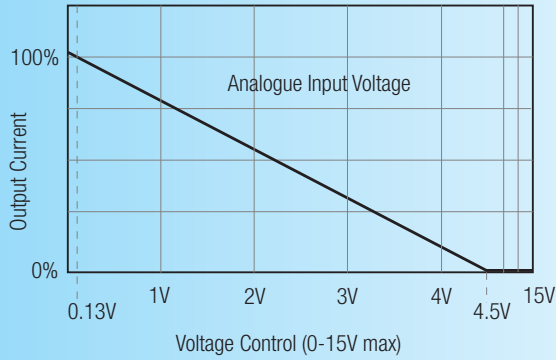
$V_{in} = 32V, I_{out} = 300-700mA$



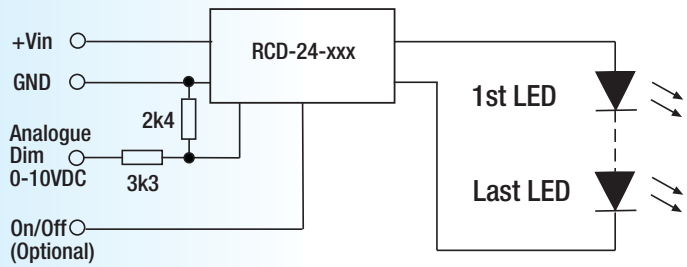
Class B Filter Suggestion



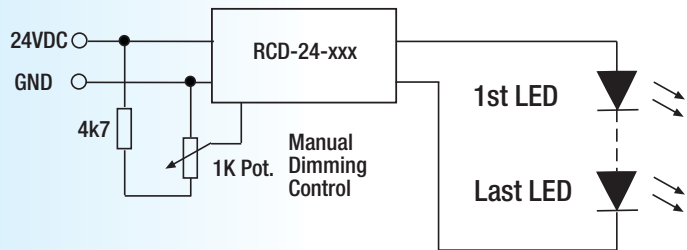
Analogue Dimming Control and Application Circuit Examples



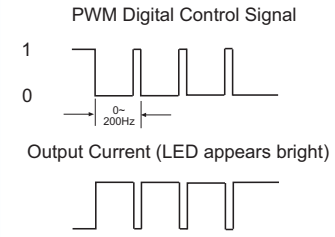
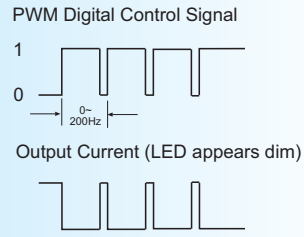
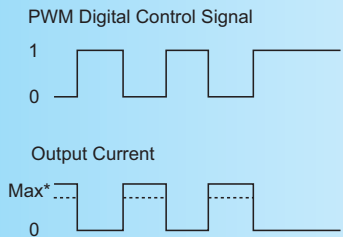
LED DRIVER with 0-10V Interface



LED DIMMER for up to 7 white LEDs



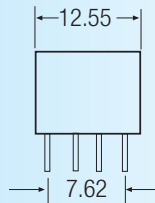
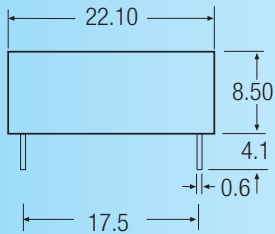
Digital Dimming Control



* Max output current can also be set using Analogue input

Package Style and Pinning

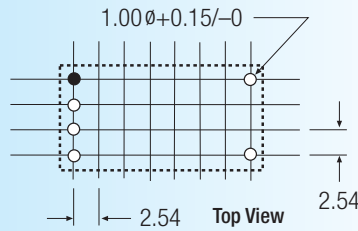
Through Hole Case Style



Leave 1 mm space around case on pcb



Recommended Footprint Details

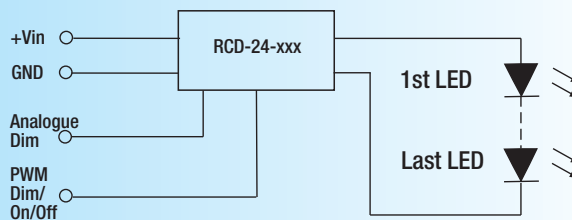


Pin Connections		RCD-24 Series
Pin #	Out	Comments
1	+Vin	DC Supply
2	Analogue Dimming	Leave open if not used
3	PWM/ON/OFF	Leave open if not used
4	GND	Do not connect to -Vout
5	-Vout	LED Cathode Connection
6	+Vout	LED Anode Connection

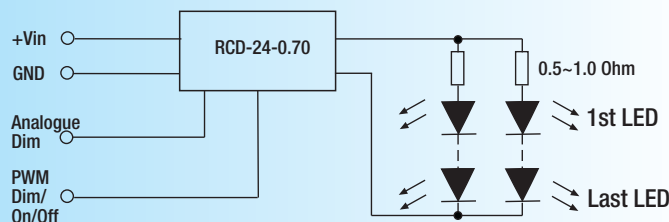
XX.X ± 0.5 mm
XX.XX ± 0.25 mm
Pin Tolerance ± 0.1 mm

Standard Application Circuits

LED DRIVER



MULTIPLE LED DRIVER (up to 20 LEDs)



Driving Two Strings of 350mA LEDs with one 700mA Driver.