Features

Regulated Converters

- SMD Constant Current LED Driver
- Built-in Class A or Class B EMC Filter
- Wide Input and Output Voltage Range
- Digital PWM and Analogue Voltage Dimming
- Short Circuit and Overtemperature Protected
- Low Cost
- EN/RAILWAYS Certified
- 5 Year Warranty

Description

The RCD-24-xxx/PL series is a step-down constant current source designed for driving high power LEDs. The converter uses a pinless SMD open frame design to reduce cost and size. Output currents available are 300mA, 350mA, 500mA, 600mA, 700mA and 1000mA with either Class A (Suffix /A) or Class B (suffix /B) built-in EMC filtering. Despite its compact size, the RCD-PL 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 ambient operating temperature and is designed for strip lighting, wall washers and flourescent tube replacement designs, where a low profile and narrow width are demanded.

Selection Guide

Part Number	Input Range (VDC)	Output Current (mA)	Output Voltage (Vmin-Vmax)	Dimming Control	Mounting Style
RCD-24-0.30/PL*	4.5-36V	0-300	2-35	Digital + Analogue	Pinless SMD
RCD-24-0.35/PL*	4.5-36V	0-350	2-35	Digital + Analogue	Pinless SMD
RCD-24-0.50/PL*	4.5-36V	0-500	2-35	Digital + Analogue	Pinless SMD
RCD-24-0.60/PL*	4.5-36V	0-600	2-35	Digital + Analogue	Pinless SMD
RCD-24-0.70/PL*	4.5-36V	0-700	2-35	Digital + Analogue	Pinless SMD
RCD-24-1.00/PL/A	6-36V	0-1000	2-32	Digital + Analogue	Pinless SMD

* /A for EMC Class A input Filter
* /B for EMC Class B input Filter

add -R for Tape and Reel Packaging e.g. RCD-24-0.35/PL/B-R

Note: RCD-24-1.00/PL/A only available with Class A Filter

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

Input Voltage (absolute maximum)		40VDC max
Recommended Input Voltage		6V min. / 24V typ. / 36VDC max
Input Filter	Suffix /A	Capacitor
	Suffix /B	Class B with Pi Filter
	RCD-24-1.00/PL/A	Class A with Pi Filter
Output Current Accuracy (Vin=24V)	300-700mA	±2% typ, ±3% max
	1000mA	±3% typ, ±5% max
Internal Power Dissipation	Worst case load of 5 LEDs (300-700mA)	700mW max.
	Worst case load of 8 LEDs (1000mA), Vin=36V	1.6W typ.
Output Current Stability	Vin = 36V, Vout = 1-9 LEDs (300-700mA)	±1% max
	Vin = 36V, Vout = 1-8 LEDs (1000mA)	± 1.5% max.
Output Ripple and Noise (20MHz BW)	Vin=36V, Vout =1-9 LEDs (300-700mA)	
	Vin=36V, Vout =1-8 LEDs (1000mA)	300mVp-p max
Temperature Coefficient	-40°C to +85°C ambient	±0.015%/°C max
Maximum Capacitive Load		100µF
Operating Frequency	300-1000mA	212kHz min/ 250kHz typ/ 280kHz max
Efficiency at Full Load	300-700mA	96% typ.
	Vin=36V, Vout=8 LEDs (1000mA)	94% typ.
Short Circuit Protection		Regulated at rated output current
Operating Temperature Range	300/350mA	-40°C to +85°C
	500mA	-40°C to +80°C
	600/700mA	-40°C to +75°C
	1000mA	-40°C to +65°C
Storage Temperature Range		-55°C to +125°C
Relative Humidity		5% to 95% RH, non-condensing

continued on next page

LIGHTLINE

DC/DC-Converter

with 5 year Warranty

RECOM

Constant Current LED Driver

RoHS 2011/65/EU 6/6

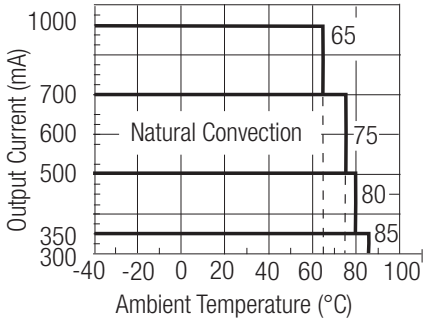
E358085

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

RCD-24-PL

Derating Graph

(Ambient Temperature)



Refer to Application Notes

RCD-24-PL Series

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

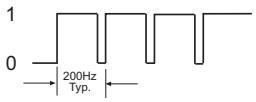
Dimensions			31.0 x 11.4 x 6.6mm
Weight			1.9g
Packing Quantity			12 pcs per Tube / 400 pcs per Reel
Reflow Soldering Profile			265°C/10 sec max
MTBF		25°C	>600 khours
(using MIL HDBK 217F)			
PWM Dimming and ON/OFF Control (Leave open if not used)			
Remote ON/OFF	DC/DC ON		Open or 0V<Vr<0.6V
Threshold Voltages	DC/DC OFF (Standby)		0.6<Vr<2.9V
	DC/DC OFF (Full Shutdown)	2.9V<Vr<6V	
Remote Pin Drive Current		Vr=5V	1mA max
Quiescent Input Current in Shutdown Mode		Vin=36V	200µA max
Recommended PWM Frequency		For Linear Operation	200Hz
(measured 10%~90% Dimming)		Maximum Frequency	1000Hz
Analogue Dimming Control (leave open if not used)			
Input Voltage Range		300-1000mA	-0.3V - 15V
Control Voltage Range Limits (see Graph)		300-1000mA / Full On	0.13V ± 50mV
		300-700mA / Full Off	4.2V ± 150mV
		1000mA / Full Off	4.35V ±100mV
Analogue Pin Drive Current		300-1000mA / Vc=5V	0.2mA max.
Environmental			
Shock / Vibration		EN61373	
EMC Railways		EN50121-3-2:2006	
Conducted Emissions	300-1000mA (/A Suffix)	EN55022	Class A
	300-700mA (/B Suffix)	EN55022	Class B
Radiated Emissions		EN55022	Class B
ESD		EN61000-4-2	Class A
Radiated Immunity		EN61000-4-3	Class A
Fast Transient		EN61000-4-4	Class A
Conducted Immunity		EN61000-4-6	Class A

Note:

1. 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.
2. It is not possible to parallel the drivers to increase the current.

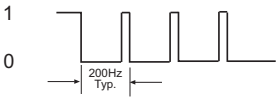
Digital Dimming

PWM Digital Control Signal

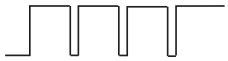


Output Current (LED appears dim)

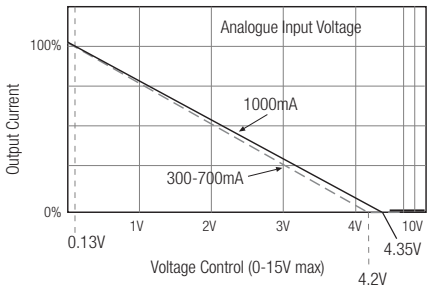
PWM Digital Control Signal



Output Current (LED appears bright)

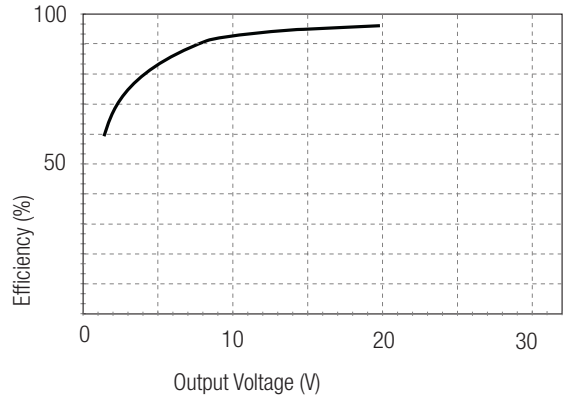


Analogue Dimming

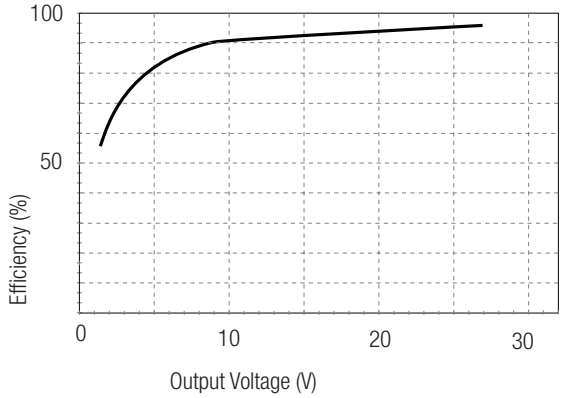


Typical Characteristics

Vin = 24V, Iout = 300~1000mA

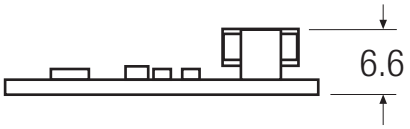


Vin = 32V, Iout = 300~1000mA

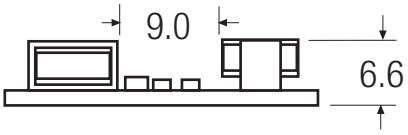


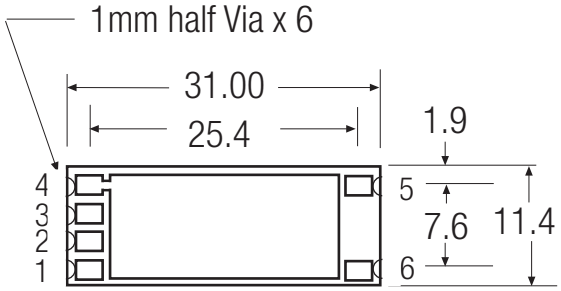
Package Style and Pinning

Class A Version



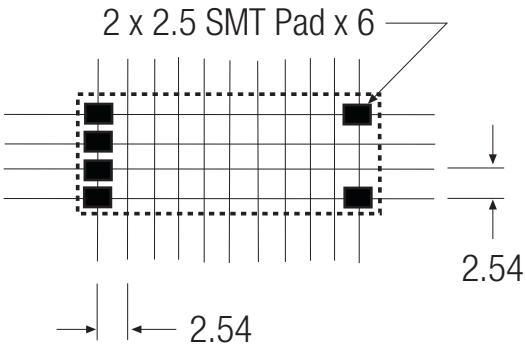
Class A (1.00A-Version)
Class B Version





Bottom View

PCB Layout Top View



Pad Connections	RCD-24-PL Series	
Pad #	**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