# 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  add -R for Tape and Reel Packaging  e.g. RCD-24-0.35/PL/B-R
* /B for EMC Class B input Filter

*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

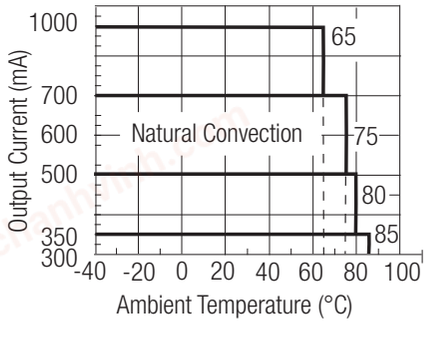
E358085

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

# RCD-24-PL

## Derating Graph

(Ambient Temperature)




**Refer to Application Notes**

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# LIGHTLINE
DC/DC-Converter

# RCD-24-PL Series

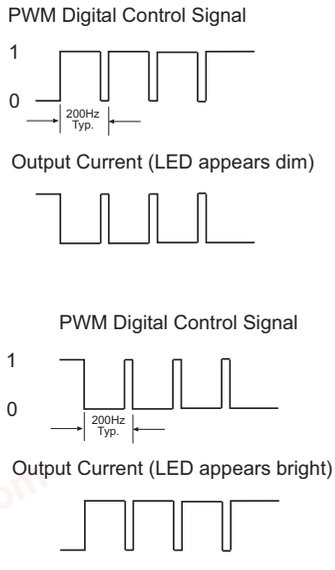
## Specifications (typical at 25°C, nominal input voltage, rated output current unless otherwise specified )

| | | | |
|---|---|---|---|
| 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 (using MIL HDBK 217F) | | 25°C | >600 khours |
| **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 |

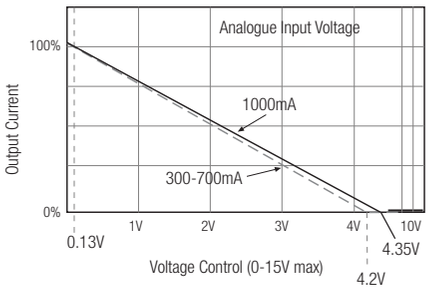
Note:

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

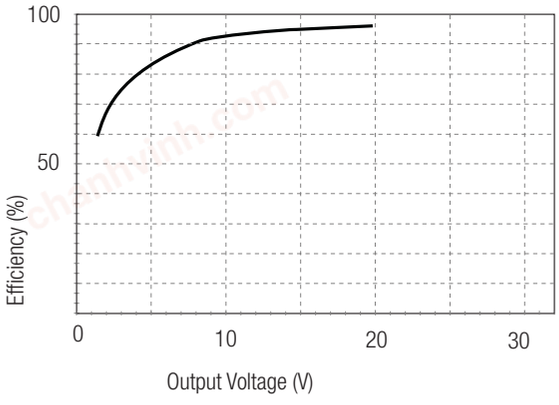



### Analogue Dimming

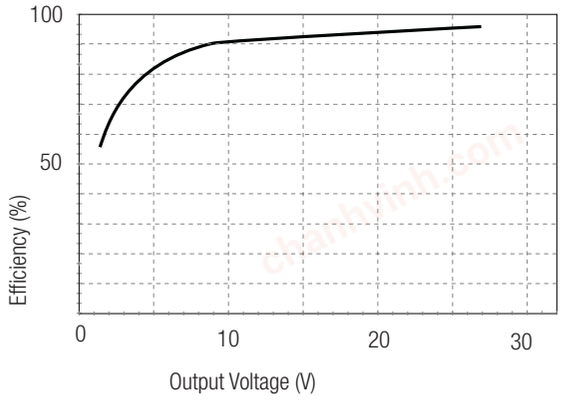



## Typical Characteristics

Vin = 24V, Iout = 300~1000mA




Vin = 32V, Iout = 300~1000mA




RCD-PL

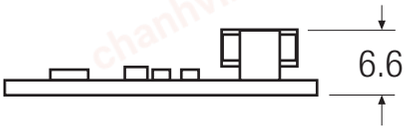
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# LIGHTLINE
DC/DC-Converter

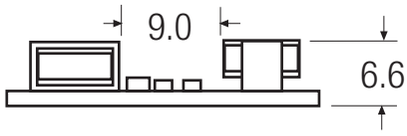
# RCD-24-PL Series

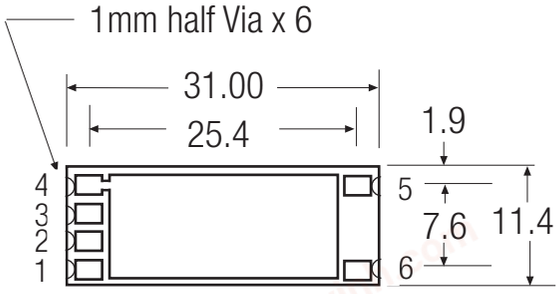
## Package Style and Pinning

Class A Version



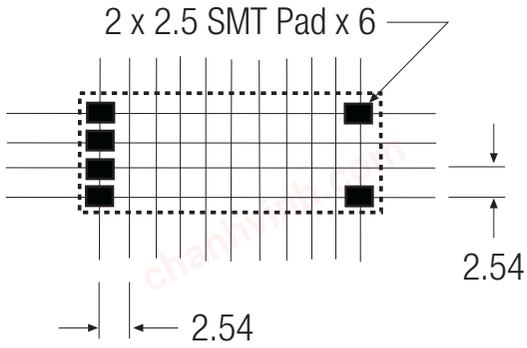

Class A (1.00A-Version)
Class B Version




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



The product information and specifications are subject to change without prior notice. All products are designed for non-safety critical commercial and industrial applications.
The Buyer agrees to implement safeguards that anticipate the consequences of any failures that might cause harm, loss of life and/or damage property.