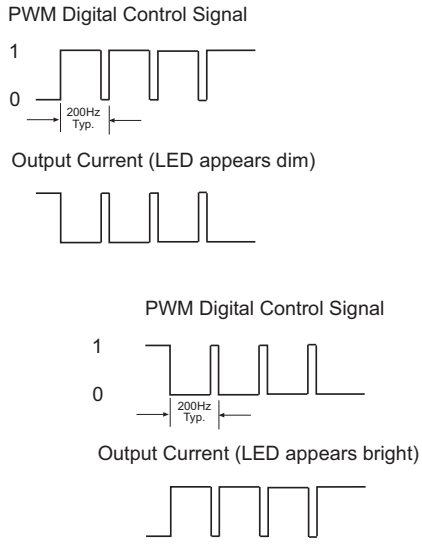
Specifications (typical at 25°C, nominal input voltage, rated output current unless otherwise specified)

Operating Temperature Range		300mA-350mA	-40°C to +85°C
(free air convection)		500mA	-40°C to +80°C
		600mA	-40°C to +75°C
		700mA-1000mA	-40°C to +71°C
		1200mA	-40°C to +65°C
Storage Temperature Range			-55°C to +125°C
Maximum Case Temperature			100°C
Thermal Impedance		Natural Convection	55°C/Watt
Case Material (Pinned or Wired Versions)			Non Conductive Black Plastic
Potting Material (Pinned or Wired Versions)			Epoxy (UL94-V0)
Dimensions		Pinned/Wired	22.1 x 12.6 x 8.5mm
Weight		Pinned/Wired	4.5g/6.8g
Soldering Profile		Pinned	265°C/10 sec. max
Packing Quantities		Pinned Versions	39pcs per Tube
(Refer to App Notes for Tube sizes)		Wired Versions	5pcs per Bag
PWM Dimming and ON/OFF Control	(Leave open if not used - do not tie to +Vin)		
Remote ON/OFF	DC/DC ON	300mA-700mA	Open or 0V<Vr<0.6V
Threshold Voltages		1000mA-1200mA	Open or 0V<Vr<0.8V
	DC/DC OFF (Standby)	300mA-700mA	0.6<Vr<2.9V
		1000mA-1200mA	1.4<Vr<2.2V
	DC/DC OFF (Shutdown)	300mA-700mA	2.9V<Vr<6V
		1000mA-1200mA	2.2V<Vr<15V
Remote Pin Drive Current		Vr=5V	1mA max
Quiescent Input Current in Shutdown Mode		Vin=36V	200µA max
Maximum 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 Limits		Standard	-0.3V - 15V
		Vref Version	-0.3V - 5V
Control Voltage Range		Full On	0.13V ± 50mV
(see Graphs)		300, 700, 1200mA: Full Off	4.2V ± 150mV
		1000mA: Full Off	4.35V ± 100mV
		Vref Version: Full Off	2.6V ± 100mV
Analogue Pin Drive Current		Vc=5V	0.2mA max.
Vref Version		Vref Voltage	3.3V± 70mV
		Vref Output Current	5mA
		Vref Output Short Circuit Current	18mA typ.
Environmental			
Relative Humidity			5% to 95% RH, non-condensing
/W Versions			IP67
Shock / Vibration		EN61373	
EMC Railways		EN50121-3-2:2006	
Conducted Emissions	(with filter, see note)	EN55022	Class B
Radiated Emissions	(all series except >700mA)	EN55022	Class B
ESD		EN61000-4-2	Criterion A
Radiated Immunity		EN61000-4-3	Criterion A
Fast Transient		EN61000-4-4	Criterion A
Conducted Immunity		EN61000-4-6	Criterion A
MTBF (RCD-24-0.70, Nominal Vin, Full Load)		+25°C	605 x 10^3 hours
using MIL-HDBK 217F		+71°C	516 x 10^3 hours
Safety Standards	EN General Safety	Report: SPCLVD1109081	EN60950-1 2nd Edition
	EMC Railway	Report: 12A082105E-C	EN50121-3-2
	UL General Safety	Report: E358085-A3	UL60950-1
			CSA C22.2 No 60950-1-03

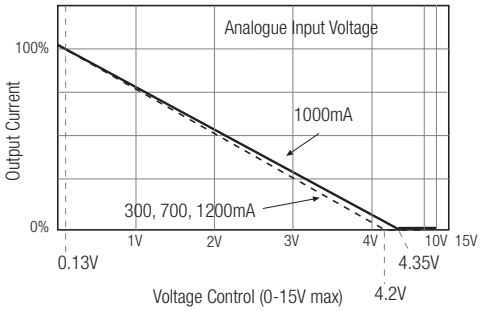
Note:
1. Requires an input filter to meet EN55022 Class B conducted emissions - see next page
2. All LED Drivers may not be used without a load. They must be switched on the primary side only. Noncompliance may damage the LED or reduce its lifetime.

Digital Dimming

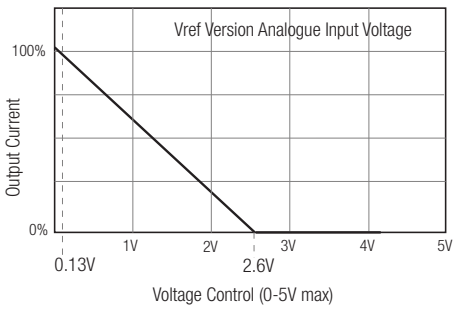


Analogue Dimming

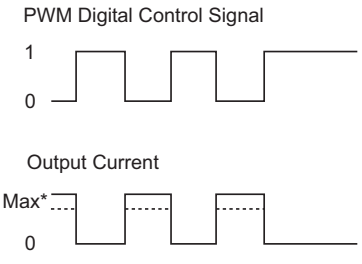
Standard Version:



Vref Version:



Combined PWM and Analogue Dimming

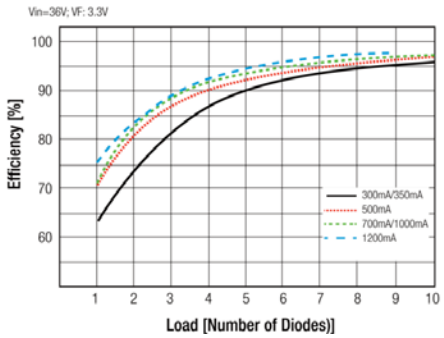


* Max output current can also be set using Analogue input

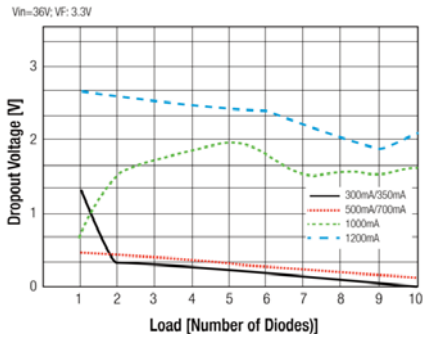
RCD-24 Series

Typical Characteristics

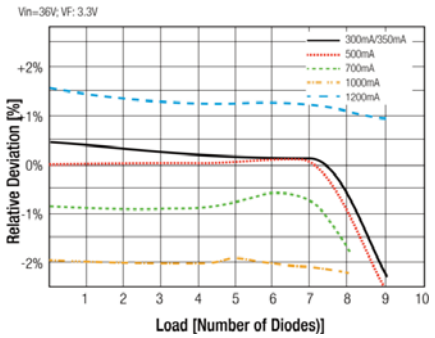
Efficiency/Load



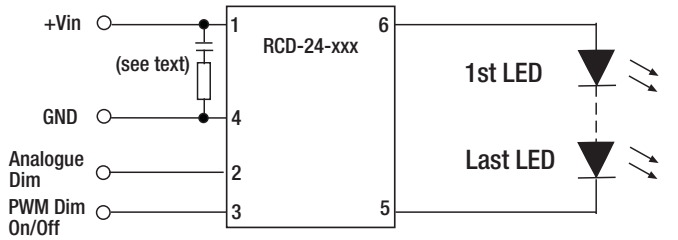
Dropout Voltage/Load



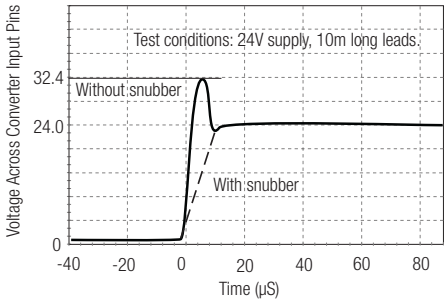
Output Current/Accuracy/Load



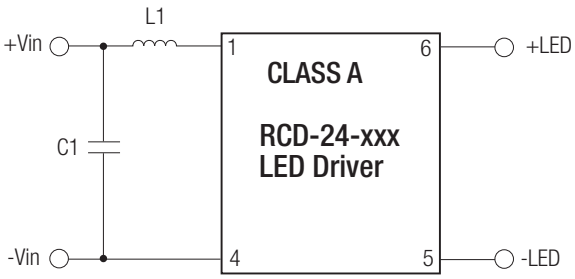
Standard Application Circuit (no external components required for normal use)

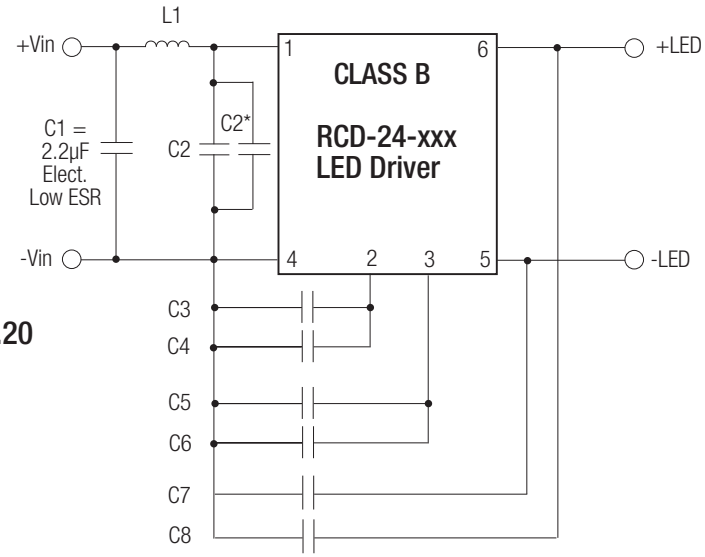


Snubber circuit optional (needed only for long supply leads or low impedance sources).
Recommended component values = 10µF MLCC + 1R



EMI Filter Suggestions

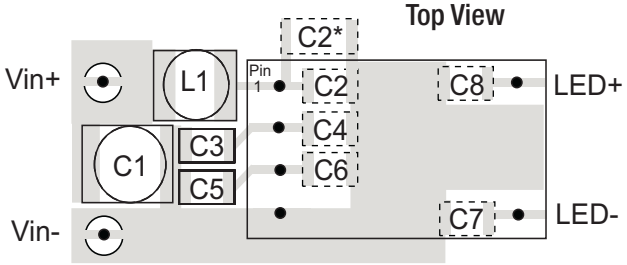




RCD-24-0.30 - RCD-24-0.70
C1=1µF MLCC
L1 = 22µH

RCD-24-1.00 - RCD-24-1.20
C1=2.2µF MLCC
L1 = 47µH

Recommended Class B PCB Layout for Pinned Version

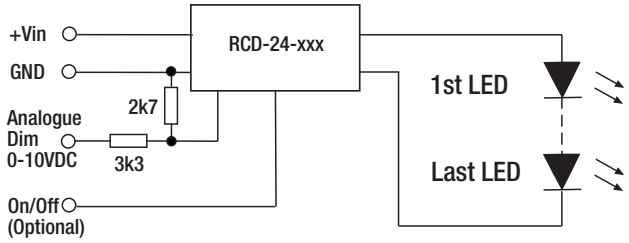


RCD-24-0.30 - RCD-24-0.70
No dimming or PWM dimming:
L1 = 47µH
C2 = C3 = 10nF MLCC
Other caps not required
Analogue Dimming used:
L1 = 120µH
C2 = C7 = 10nF MLCC
Other caps not required

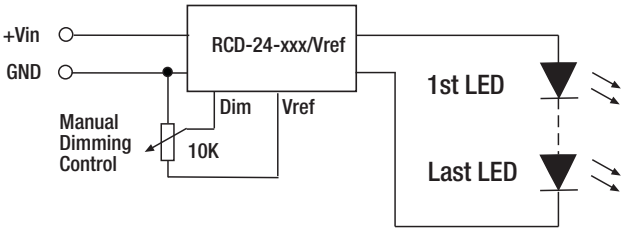
RCD-24-1.00 - RCD-24-1.20
L1 = 220µH
C2 = 10nF
C3 = C5 = 2.2nF
C4 = C6 = C7 = C8 = 100nF
All capacitors MLCC
C2* = optional 2µ2 MLCC only if L1 starts to resonate with the back ripple current.

Application Examples

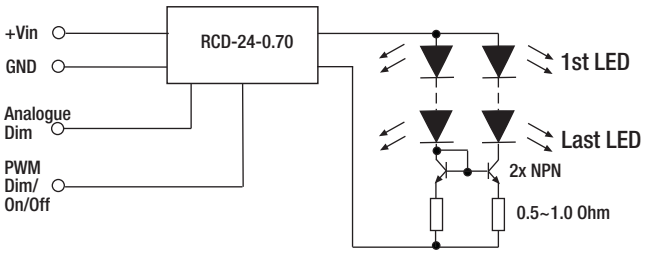
LED DRIVER with 0-10V Interface



LED DIMMER for up to 10 white LEDs

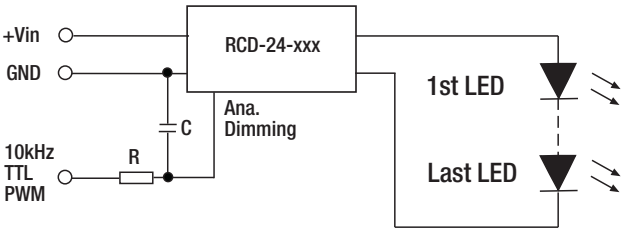


MULTIPLE LED DRIVER (up to 20 LEDS)



Driving Two Strings of 350mA LEDs with one 700mA Driver using a current mirror

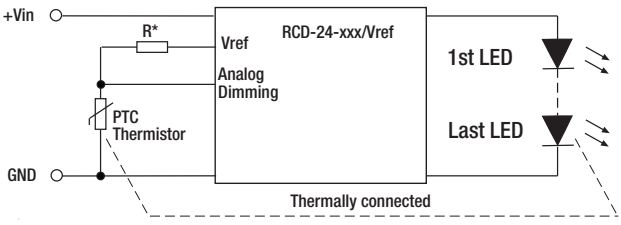
LED DIMMER with high frequency PWM control



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

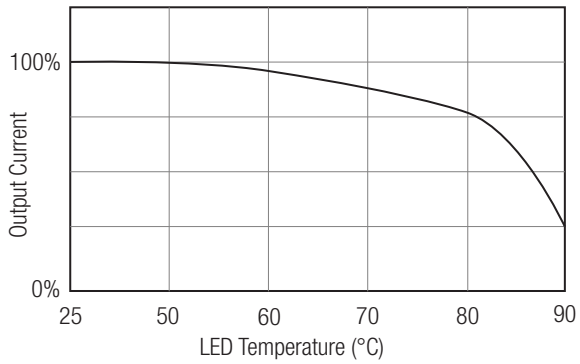
LED Temperature Monitoring

Automatic LED Overtemperature Protection



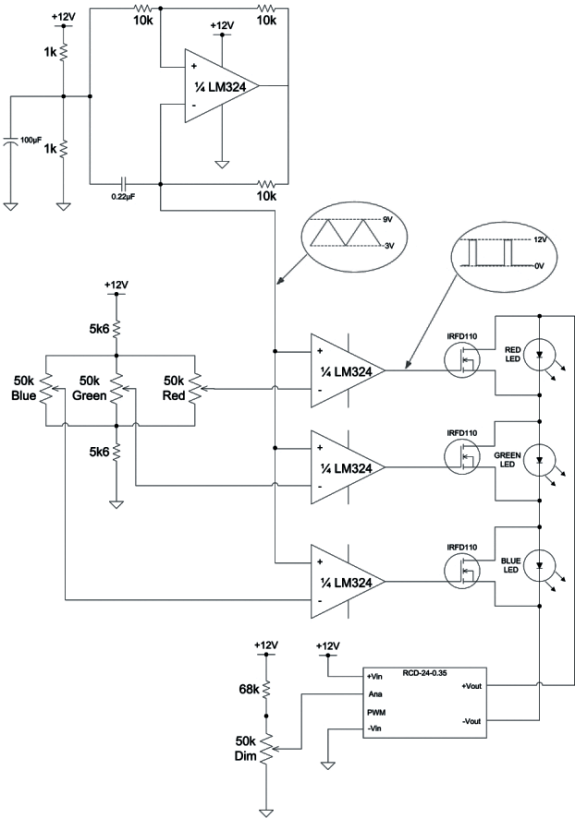
*Typically, choose R so that R=Rptc @ 85°C and R>660 Ohm.

Typical Response Curve (PTC = 500 Ohm @ 70°C)



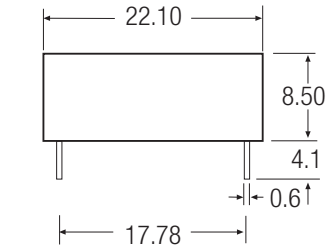
RGB Driver

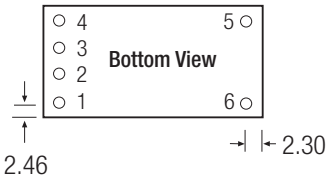
SIMPLE RGB Mixer



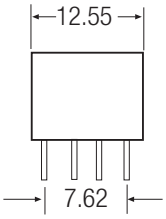
Package Style and Pinning

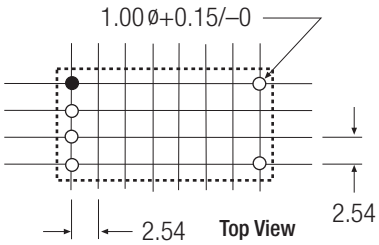
Pinned Version





Leave >1mm space arround case on PCB for air circulation

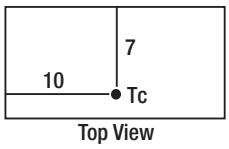




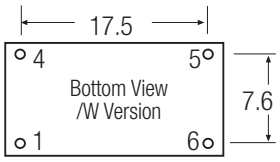
Recommended Footprint Details

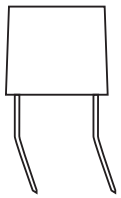
Pin Connections	RCD-24 Series	
Pin #	**Out**	**Comments**
1	+Vin	DC Supply
2	Analogue Dimming	Leave open if not used
3	PWM/ON/OFF	Leave open if not used
(3	Vref	Vref Version only)
4	GND	Do not connect to -Vout
5	-Vout	LED Cathode Connection
6	+Vout	LED Anode Connection

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



Wired Versions



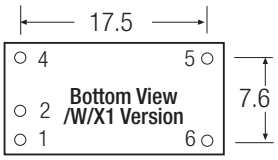


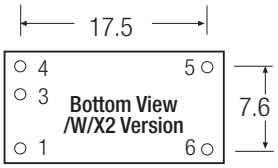
Wire Connections	RCD-24/W Series	
Wire #	**Function**	**Comments**
1 (Red)	+Vin	DC Supply
4 (Black)	GND	Do not connect to -Vout
5 (Brown)	-Vout	LED Cathode Connection
6 (Yellow)	+Vout	LED Anode Connection

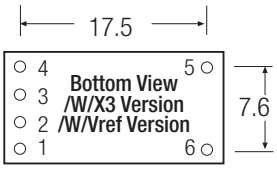
Wire length = 100mm + 10mm stripped & tinned = 110mm total
Wire outside diameter = 1.6mm
Wire core diameter = 0.75mm
Wire is UL/CSA listed/ 22AWG / 300V Rated

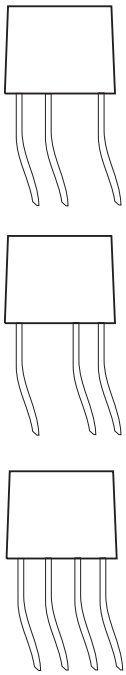
Package Style and Pinning

Wired Versions









Wire Connections	RCD-24/W/X Series	
Wire #	**Function**	**Comments**
2 (Green)	Ana Dimming	/X1
3 (Blue)	PWM Dimming	/X2
2 + 3 (Green + Blue)	Ana + PWM Dimming	/X3
2 + 3 (Green + Yellow)	Ana Dimming + Vref	/Vref

Wire length = 100mm + 10mm stripped & tinned = 110mm total
Wire outside diameter = 1.6mm
Wire core diameter = 0.75mm
Wire is UL/CSA listed/ 22AWG / 300V Rated

Wired Versions are packed in bags - 5pcs per bag.

Warning: Do not connect or disconnect the LED load while the converter is powered on.
This may damage or reduce the lifetime of the LED.