

## Features LED DRIVER

- Buck-Boost LED Driver up to  $V_{out}=40V$
- Constant Current Output (350 or 500mA)
- Digital PWM and Analogue Voltage Dimming
- High Efficiency to 92%
- EN60950-1 and UL60950-1 Certified
- EMC Class A Without Extern Components
- Pinned or Wired Version
- 5 Year Warranty

### Description

The RBD-12 series is a Buck-Boost constant current source designed for driving high power LED applications. Two output currents are available, 350mA and 500mA, and the maximum output voltage is 40V. The drivers have digital and analogue voltage dimming control and a regulated reference 5V output. Typical applications are solar, off-grid lighting, mobile traffic signs and battery-powered lighting. The wired version is IP67 rated.

### Selection Guide

Part Number	Input Range (VDC)	Output Current (mA)	Output Voltage (VDC)	Dimming Control	Efficiency typ. (%)
RBD-12-0.35*	8-36	0-350	2-40	Digital + Analogue	92
RBD-12-0.50*	8-36	0-500	2-40	Digital + Analogue	92

\*add suffix "/W" for wired version with Vref output and analogue + PWM dimming control (seven wires)

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

Operating Input Voltage Range	8-36VDC	
Absolute Maximum Input Voltage	38VDC	
Output LED String Voltage Range (depending on the input voltage, see Safe Operating Area)	2V min. / 40V max.	
Input Filter	Capacitor	
Max. Capacitance Load	100µF max.	
Output Current Accuracy	(Note 1)	±5% typ. / ±6.5% max.
Internal Power Dissipation	350mA (Vin=36V, Vout=40V)	1.63W typ.
	500mA (Vin=36V, Vout=40V)	2.33W typ.
Output Current Stability (Note 2)	Vin=24V, Vout=2-40V	±2% max.
Output Current Ripple and Noise (20MHz BW)	350mA (Vin=24V, Vout=40V)	35mAp-p typ.
	500mA (Vin=24V, Vout=40V)	45mAp-p typ.
Reflected Back Ripple Current (20MHz BW)	Vin=24V, Vout=6-40V	70mAp-p max.
Switching Frequency	350kHz typ.	
Efficiency at Full Load	Vin=24V	92% typ.
Vref	Nominal 5V	0.8mA max.
PWM DIMMING CONTROL & REMOTE ON/OFF CONTROL		
Input Voltage Range	0V min. / 5V typ. / 10V max.	
Threshold Voltage	Device ON	2V min.
	Device OFF	0.1V max.
Frequency	1000Hz max.	
ANALOGUE DIMMING CONTROL		
Input Voltage Range	0V min. / 10V max.	
Control Voltage Range	0.2±0.1V min. / 1.5±0.1V max.	
Operating Temperature (see Derating Graph)	350mA	-40°C to +75°C
	500mA	-40°C to +65°C
Case Temperature	115°C max.	
Storage Temperature	-55°C to +125°C	
Case Thermal Impedance	10°C/W	
Soldering Temperature	Pinned Version	265°C/10sec. max.
Relative Humidity	95% RH max.	
Short Circuit Protection	Continuous	Auto Recovery
Overtemperature Protection	(Auto Recovery)	125°C ± 5°C (MOSFET)
Case Material	Non Conductive Black Plastic	

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**LIGHTLINE**  
DC/DC-Converter  
with 5 year Warranty

**RECOM**

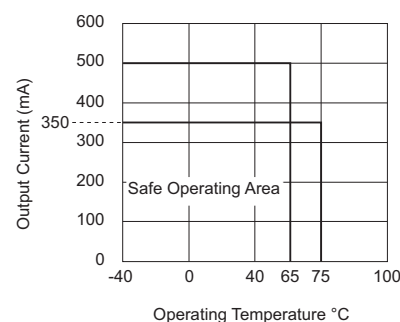
## Constant Current Buck-Boost LED Driver



**EN-60950-1 certified**  
**UL-60950-1 certified**

## RBD-12

### Derating-Graph (Ambient Temperature)



Refer to Application Notes

**LIGHTLINE**  
DC/DC-Converter

**RBD-12**  
**Series**

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

Potting Material	Silicone Potting Material (UL94V-0)	
Case Dimensions	32.60 x 16.65 x 11.10 mm	
Package Weight	pinned version	13g
	wired version	17g
Packing Quantity	pinned version	29 pcs.
	wired version	12 pcs.
MTBF (using MIL-HDBK217F at 25°C)	1700 x 10 <sup>3</sup> hours	
Certification		
EN General Safety	Report: SPCLVD1111102	EN60950-1:2006 + A12:2011
IEC General Safety	Report: SPCLVD1111102	IEC60950-1:2005
UL General Safety	Report: E224736	UL60950-1, 2nd Edition

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.

Note 1: Output Current Accuracy is defined as:  

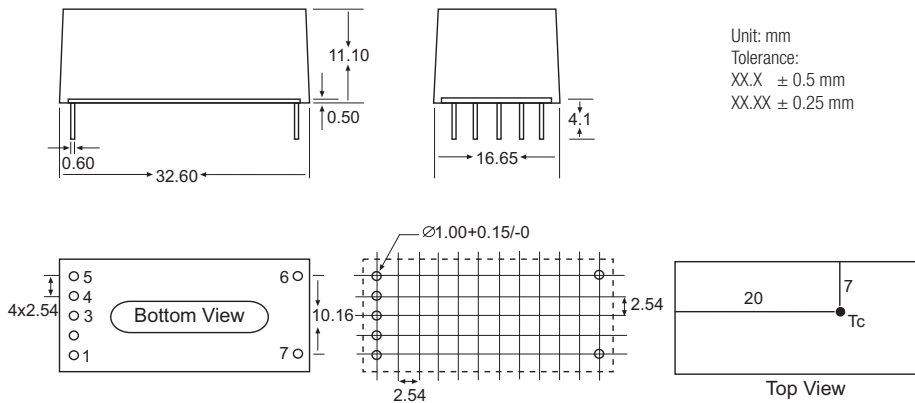
$$\left[ \frac{I_{out} - I_{out} \text{ "rated"}}{I_{out} \text{ "rated"}} \right] \times 100$$

Note 2: Output Current Stability is defined as:  

$$\left[ \frac{I_{out} \text{ "deviation"} - I_{out} \text{ "nominal"}}{I_{out} \text{ "nominal"}} \right] \times 100$$
 I<sub>out</sub> (deviation) = maximum Deviation (min. Load, max. Load)

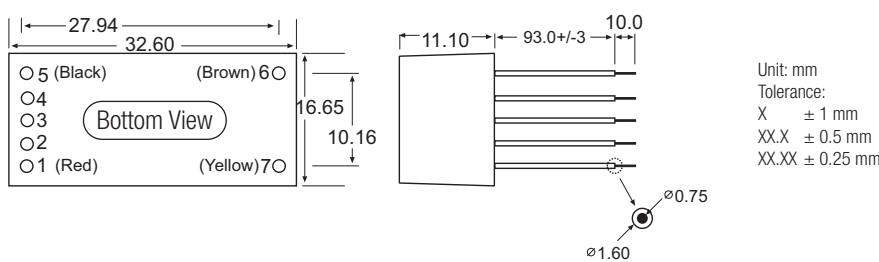
**Package Style and Pinning**

**RBD-12-x.xx - Through Hole Case**



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

**RBD-12-x.xx/W - Wired Version**



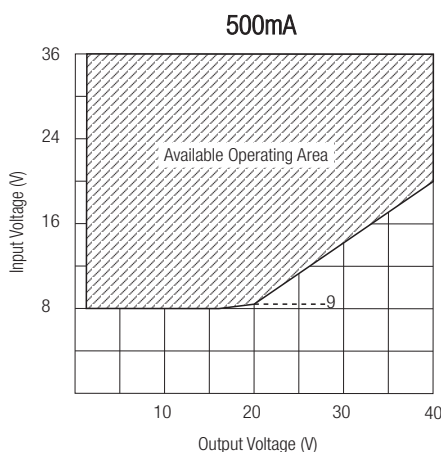
Wire Pin#	Function	RBD-12-x.xx/W Wire color
1	+Vin	Red
2	Vref (5V typ.)	Yellow
3	Analogue Dimming	Green
4	PWM/ON/OFF	Blue
5	GND	Black
6	LED-	Brown
7	LED+	Yellow

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

**Safe Operating Area**

**500mA**

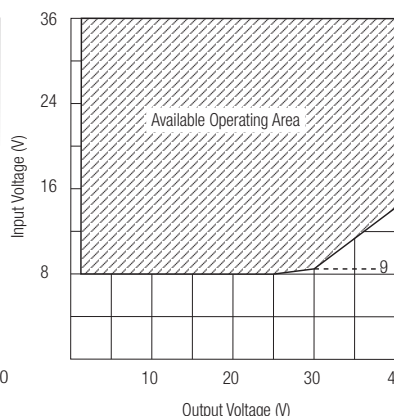
V<sub>in</sub> 8V up to V<sub>out</sub> = 17V  
 V<sub>in</sub> 9V up to V<sub>out</sub> = 20V  
 V<sub>in</sub> 12V up to V<sub>out</sub> = 24V  
 V<sub>in</sub> 16V up to V<sub>out</sub> = 32V



**350mA**

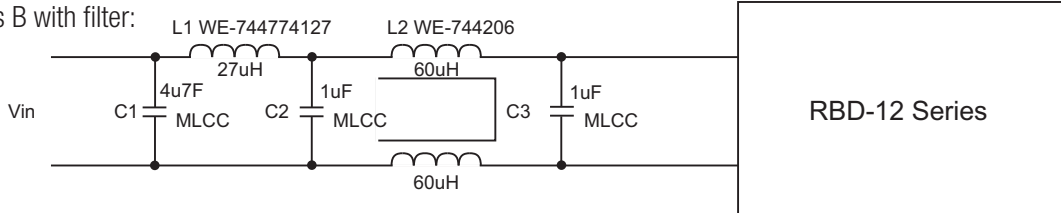
**350mA**

V<sub>in</sub> 8V up to V<sub>out</sub> = 25V  
 V<sub>in</sub> 9V up to V<sub>out</sub> = 27V  
 V<sub>in</sub> 12V up to V<sub>out</sub> = 36V

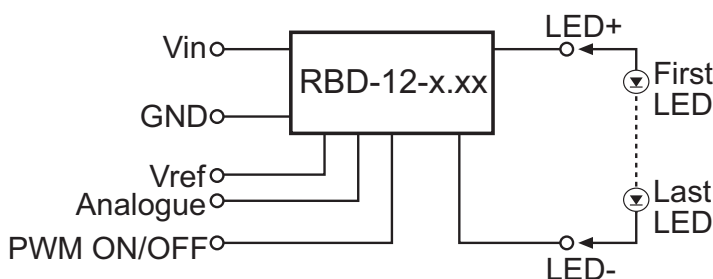


**Standard Application**

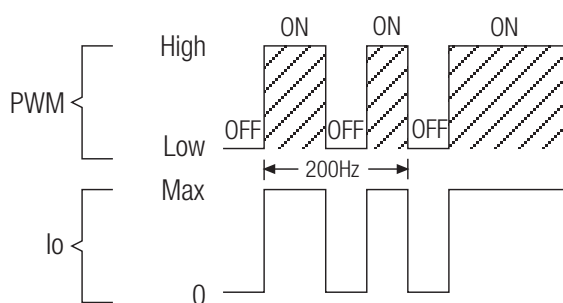
- EN55022 Class A without external filter
- EN55015 without filter
- EN55022 Class B with filter:



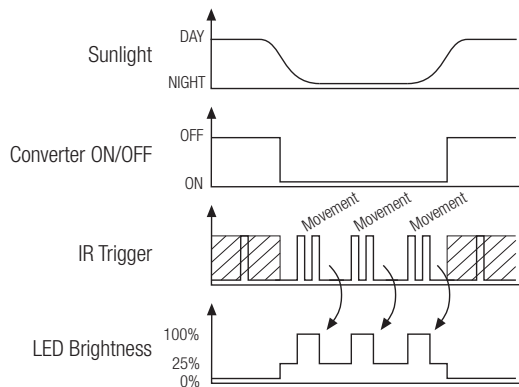
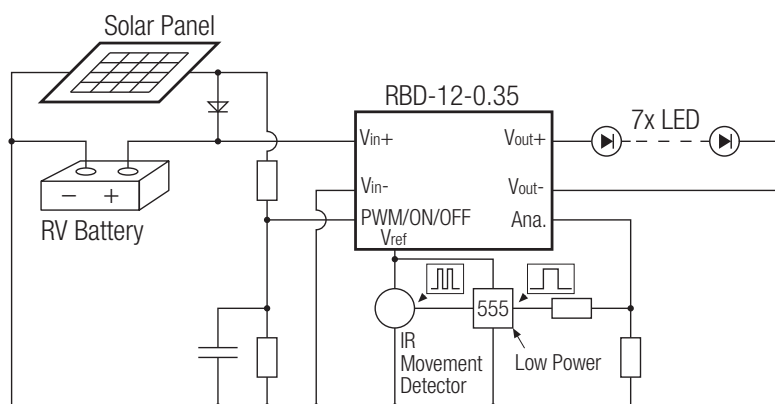
**Single String Application**



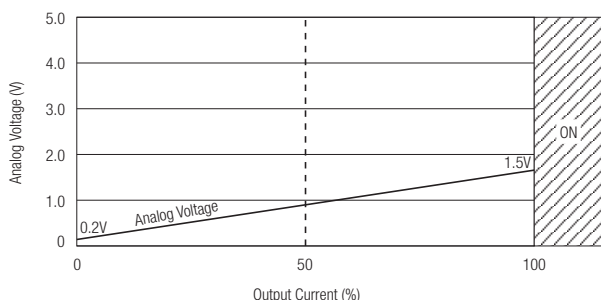
**PWM Dimming Controlled**



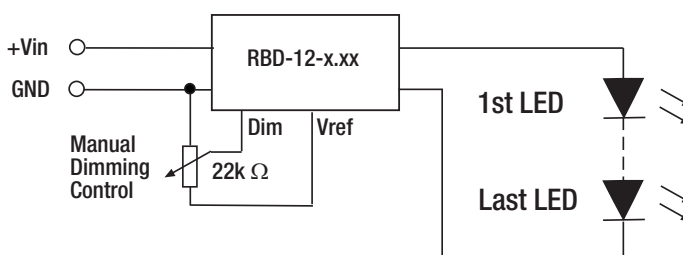
**Solar Lighting Application**



**Dimming Controlled by Analog Voltage**



**LED DIMMER for up to 10 white LEDs**



**Note:**

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

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