

# Features

# Switching Regulator

- Efficiency up to 96%, no need for heatsinks!
- Build-in Diode Protection Circuit
- Low Profile (LxWxH= 11.5 x 8.5 x 17.5mm)
- Continuous Short Circuit Protection
- RoHS compliant
- IEC/EN-60950 Certified

## Description

The R-78W series offers wired 0.5A switching regulators which are ideally suited to offer a stable voltage supply without the need for a PCB for applications like high power LED lighting, battery powered systems, cooling systems, or fans. Due to the high efficiencies of up to 96% there is no need for a heat sink. The compact modules feature fully protected outputs and draw only 1mA under no load conditions.

## Selection Guide

Part Number	Input Voltage Range (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency @ min. Vin (%)	Max. Capacitive Load <sup>(1)</sup> (µF)
R-78W3.3-0.5	6.5 - 32	3.3	500	88	220
R-78W5.0-0.5	6.5 - 32	5.0	500	93	220
R-78W9.0-0.5	11 - 32	9.0	500	95	220
R-78W12-0.5	15 - 32	12.0	500	96	220

### Notes:

Note1: 6800µF with <1sec start-up time

## Specifications (measured at T<sub>A</sub>= 25°C, full load, nominal input voltage and after warm-up)

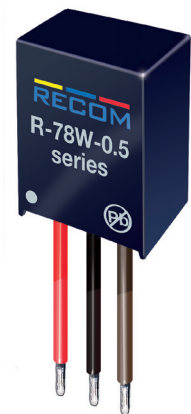
BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range		6.5VDC	24VDC	32VDC
Output Current <sup>(2)</sup>		6mA		500mA
Quiescent Current	0% Load		5mA	7mA
Switching Frequency		280kHz	330kHz	380kHz
Efficiency		see Selection Guide		
Internal Power Dissipation				0.4W
Output Ripple and Noise	20MHz BW limited		50mVp-p	75mVp-p
<b>Notes:</b>				
Note2:	Operation under no load will not damage the device, however they may not meet all specifications. A minimum load of 6mA is recommended.			

REGULATIONS			
Parameter	Condition	Type	Value
Output Voltage Accuracy		all models	±2% typ. / ±3% max.
Line Voltage Regulation	low line to high line, full load	3.3V, 5V 9V, 12V	±0.2% typ. / ±0.4% max. ±0.1% typ. / ±0.2% max.
Load Voltage Regulation	10% to 100% load	3.3V, 5V 9V, 12V	±0.4% typ. / ±0.6% max. ±0.25% typ. / ±0.4% max.
Transient Response	50% - 100% Load, ΔI <sub>o</sub> /Δt 25mA/µs 10% - 100% Load, ΔI <sub>o</sub> /Δt 25mA/µs	all models	±75mV typ. ±100mV max.

**RECOM**  
DC/DC Converter

## R-78W-0.5

**0.5 AMP**  
**SIP3**  
**Single Output**



IEC-60950-1 Certified  
EN-60950-1 Certified

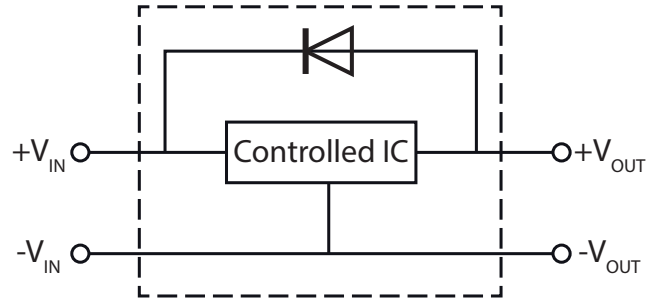
Refer to Applications Notes

Specifications (measured at  $T_A = 25^\circ\text{C}$ , full load, nominal input voltage and after warm-up)

### PROTECTIONS

Parameter	Type	Value
Short Circuit Protection (SCP)		continuous, automatic recovery

Reverse Current Protection:

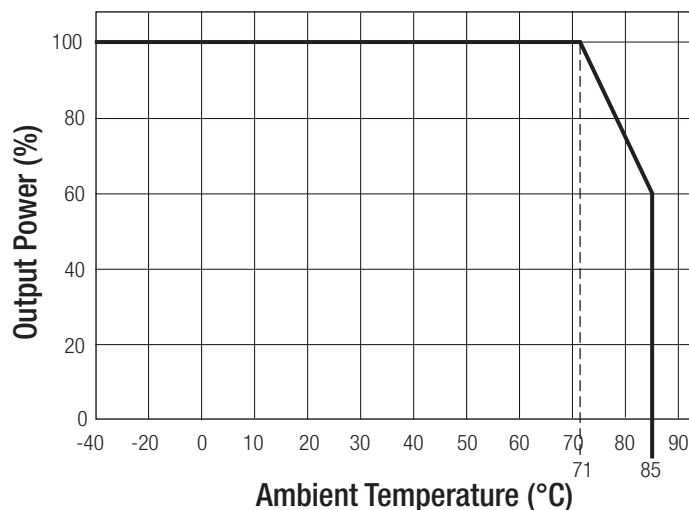


An internal blocking diode can prevent reverse current flow backwards into the output, as this can damage the converter when it is powered down.

### ENVIRONMENTAL

Parameter	Condition	Value
Operating Temperature Range	with derating	$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Maximum Case Temperature		$+100^\circ\text{C}$
Storage Temperature Range		$-55^\circ\text{C}$ to $+125^\circ\text{C}$
Temperature Coefficient	$-40^\circ\text{C}$ to $+85^\circ\text{C}$ ambient	$0.015\%/^\circ\text{C}$
Thermal Impedance	surface of case	$70^\circ\text{C/W}$ typ.
Humidity	non-condensing	95%, RH max.
MTBF		$9368 \times 10^3$ hours

Derating Graph



### SAFETY AND CERTIFICATIONS

Certificate Type	Report / File Number	Standard
IEC General Safety	SPCLVD1407030-1	IEC-60950-1, 2nd Edition
EN General Safety	SPCLVD1407030-1	EN-60950-1, 3rd Edition

**Specifications** (measured at  $T_A=25^\circ\text{C}$ , full load, nominal input voltage and after warm-up)

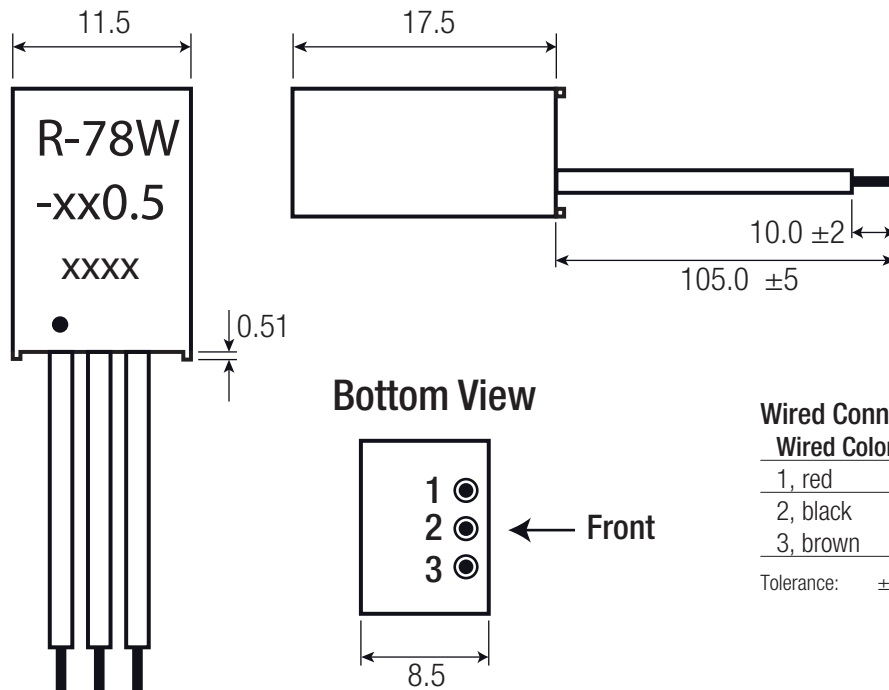
### DIMENSIONS and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case Potting	non-conductive black plastic UL94V-0, Epoxy
Dimensions (LxWxH)		17.5 x 11.5 x 8.5mm
Weight		4.8g typ.
Packaging Dimensions (LxWxH)	Cardboard Box	140 x 130 x 65mm
Packaging Quantity <sup>(3)</sup>	Cardboard Box	25pcs.

**Notes:**

Note3: 5 bubble packs each containing 5pcs in a cardboard box.

**Mechanical Dimensions (mm)**



**Wired Connections**

Wired Color	Type	Single
1, red	UL-1430, AWG#22	+Vin
2, black	UL-1430, AWG#22	GND
3, brown	UL-1430, AWG#22	+Vout

Tolerance: ±0.5mm