

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 ⁽¹⁾ (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_A= 25°C, full load, nominal input voltage and after warm-up)

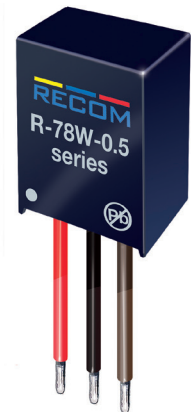
BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range		6.5VDC	24VDC	32VDC
Output Current ⁽²⁾		6mA		500mA
Quiescent Current	0% Load		5mA	7mA
Switching Frequency		280kHz	330kHz	380kHz
Efficiency		see Selection Guide		
Internal Power Dissipation				0.4W
Output Ripple and Noise	20MHz BW limited		50mVp-p	75mVp-p
Notes:				
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 _o /Δt 25mA/µs 10% - 100% Load, ΔI _o /Δt 25mA/µs	all models	±75mV typ. ±100mV max.

RECOM
DC/DC Converter

R-78W-0.5

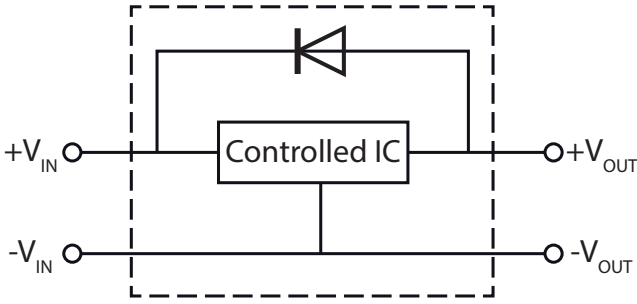
0.5 AMP
SIP3
Single Output



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

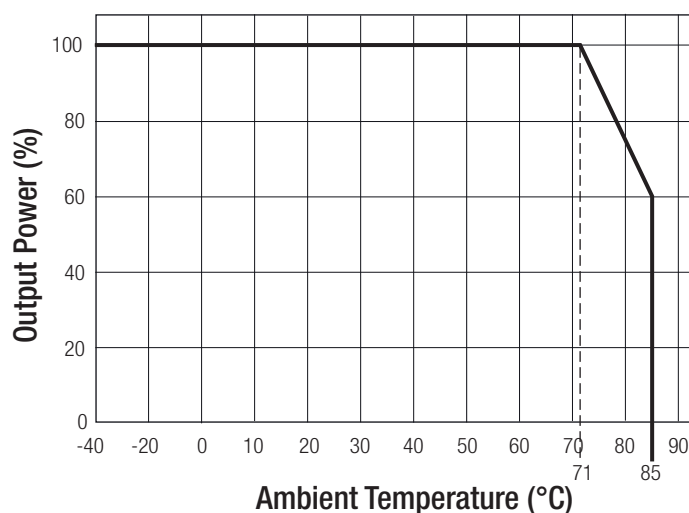
Refer to Applications Notes

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

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

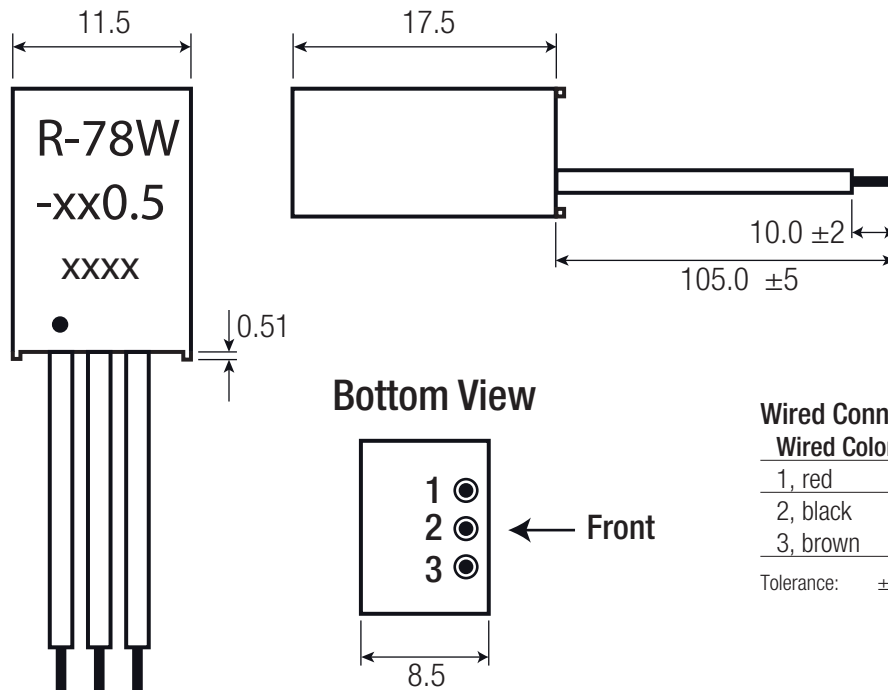
DIMENSIONS and PHYSICAL CHARACTERISTICS

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 ⁽³⁾	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