

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/EN60950 certified

RECOM DC/DC Converter

R-78W-0.5

0.5 Amp
SIP3 Wired
Single Output



Description

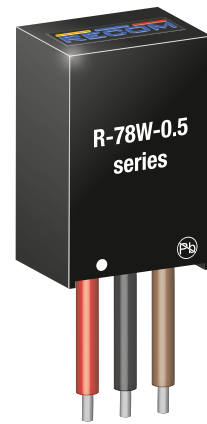
The R-78W series offers wired 0.5A switching regulators which are ideally suited to offer a stable voltage supply without the need for a PCB for applications like high power LED lighting, battery powered systems, cooling systems, or fans. Due to the high efficiencies of up to 96% there is no need for 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 [A]	Efficiency @ min Vin [%]	Max. Capacitive Load ⁽¹⁾ [μF]
R-78W3.3-0.5	6.5 - 32	3.3	0.5	88	220
R-78W5.0-0.5	6.5 - 32	5.0	0.5	93	220
R-78W9.0-0.5	11 - 32	9.0	0.5	95	220
R-78W12-0.5	15 - 32	12.0	0.5	96	220

Notes:

Note1: Max. Cap Load is tested at nominal input and full resistive load 6800μF with <1sec start-up time



Model Numbering

R-78W -0.5

Output Voltage _____ Output Current _____

IEC60950-1 certified
EN60950-1 certified

Specifications (measured at Ta= 25°C, full load, nominal input voltage and after warm-up)

BASIC CHARACTERISTICS				
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range	nom. Vin = 24VDC	6.5VDC	24VDC	32VDC
Quiescent Current			5mA	7mA
Internal Power Dissipation				0.4W
Minimum Load ⁽²⁾		0%		
Internal Operating Frequency		280kHz	330kHz	380kHz
Output Ripple and Noise ⁽³⁾	20MHz BW limited		50mVp-p	75mVp-p

Notes:

- Note2: Operation under no load will not harm the converter, but specifications may not be met
A minimum load of 6mA is recommended
- Note3: Measurements are made with a 100nF MLCC across output (low ESR)

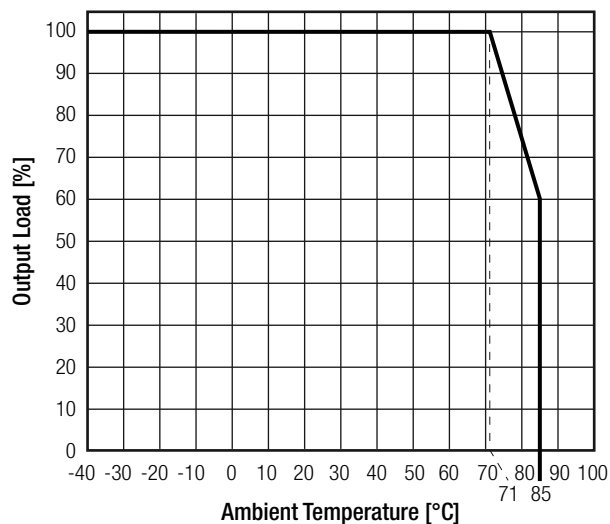
Specifications (measured at Ta= 25°C, full load, nominal input voltage and after warm-up)

REGULATIONS			
Parameter	Condition	Type	Value
Output Accuracy		all models	±2% typ. / ±3% max.
Line Voltage Regulation	low line to high line, full load	3.3VDC, 5VDC 9VDC, 12VDC	±0.2% typ. / ±0.4% max. ±0.1% typ. / ±0.2% max.
Load Voltage Regulation	10% to 100% load	3.3VDC, 5VDC 9VDC, 12VDC	±0.4% typ. / ±0.6% max. ±0.25% typ. / ±0.4% max.
Transient Response	50% - 100% Load, $\Delta I_o/\Delta t$ 25mA/ μ s 10% - 100% Load, $\Delta I_o/\Delta t$ 25mA/ μ s	all models	±75mV typ. ±100mV max.

PROTECTIONS		
Parameter	Type	Value
Short Circuit Protection (SCP)		continuous, automatic recovery
Reverse Current Protection		
<p>The diagram shows a dashed box labeled 'internal structure' containing a diode and a 'Controller' block. The diode is oriented with its cathode towards the output (+V_OUT) and its anode towards the input (+V_IN). The Controller block is connected to both the input and output lines. Ground (GND) is connected to the bottom of the Controller block.</p>		
<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 @ natural convection 0.1m/s (see graph)	-40°C to +85°C	
Maximum Case Temperature		+100°C	
Temperature Coefficient	-40°C to +85°C ambient	0.015%/°C	
Thermal Impedance	0.1m/s, vertical	70°C/W typ.	
Operating Altitude		2000m	
Operating Humidity	non-condensing	95% RH max.	
Pollution Degree		PD2	
MTBF	according to MIL-HDBK-217F, G.B.	+ 25°C	9368 x 10 ³ hours

Derating Graph



Specifications (measured at Ta= 25°C, full load, nominal input voltage and after warm-up)

SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety (LVD)	LVD1407030-1	IEC60950-1:2005, 2nd Edition + AM 2:2013 EN60950-1:2006 + AM:2013
EAC	RU-AT.49.09571	TP TC 004/2011
RoHs 2+		RoHS 2011/65/EU + AM2015/863

DIMENSION and PHYSICAL CHARACTERISTICS		
Parameter	Type	Value
Material	case potting	non-conductive black plastic, (UL94 V-0) epoxy, (UL94 V-0)
Package Dimension (LxWxH)		17.5 x 11.5 x 8.5mm
Package Weight		4.8g typ.

Dimension Drawing (mm)

Wire/cable information

#	Function	Wire color	Type	AWG	Strands
1	+Vin	red	UL-1430	22	14/0.16
2	GND	black	UL-1430	22	14/0.16
3	+Vout	brown	UL-1430	22	14/0.16

Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

PACKAGING INFORMATION		
Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	140.0 x 130.0 x 65.0mm
Packaging Quantity ⁽³⁾		25pcs.
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.

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

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.