

# 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



## R-78W-0.5

0.5 Amp  
SIP3 Wired  
Single Output



### Description

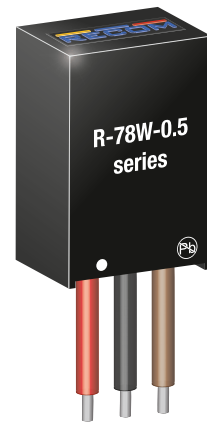
The R-78W series offers wired 0.5A switching regulators which are ideally suited to offer a stable voltage supply without the need for a PCB for applications like high power LED lighting, battery powered systems, cooling systems, or fans. Due to the high efficiencies of up to 96% there is no need for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

### Selection Guide

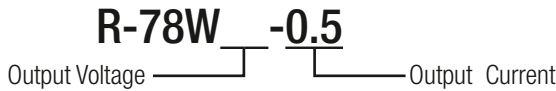
Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [A]	Efficiency @ min Vin [%]	Max. Capacitive Load <sup>(1)</sup> [μF]
R-78W3.3-0.5	6.5 - 32	3.3	0.5	88	220
R-78W5.0-0.5	6.5 - 32	5.0	0.5	93	220
R-78W9.0-0.5	11 - 32	9.0	0.5	95	220
R-78W12-0.5	15 - 32	12.0	0.5	96	220

**Notes:**

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



### Model Numbering



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 <sup>(2)</sup>		0%		
Internal Operating Frequency		280kHz	330kHz	380kHz
Output Ripple and Noise <sup>(3)</sup>	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)

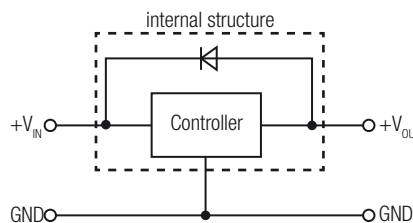
**REGULATIONS**

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/ $\mu$ s 10% - 100% Load, $\Delta I_o/\Delta t$ 25mA/ $\mu$ s	all models	±75mV typ. ±100mV max.

**PROTECTIONS**

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

**Reverse Current Protection**

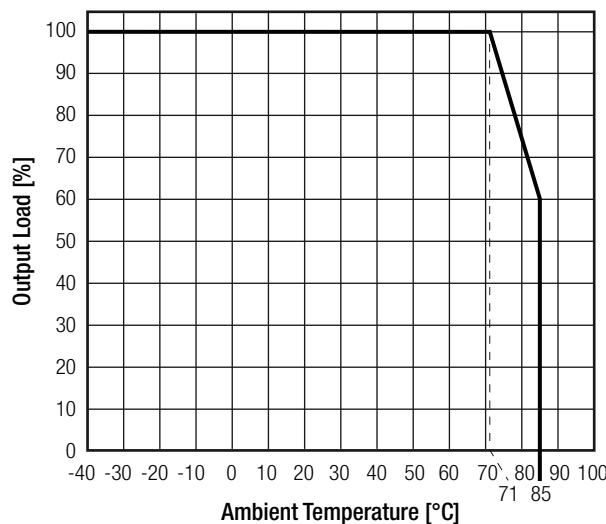


An internal blocking diode can prevent reverse current flow backwards into the output, as this can damage the converter when it is powered down.

**ENVIRONMENTAL**

Parameter	Condition	Value
Operating Temperature Range	with derating @ 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 <sup>3</sup> hours

**Derating Graph**



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

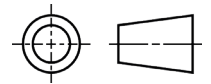
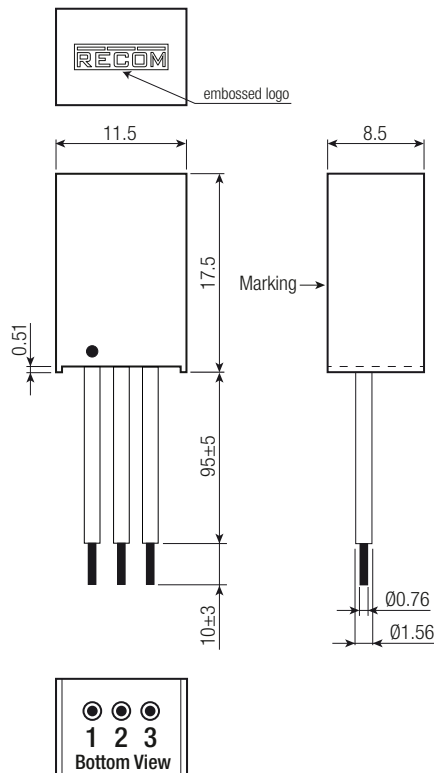
**SAFETY AND CERTIFICATIONS**

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 <sup>(3)</sup>		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

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