

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

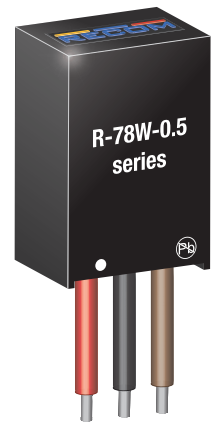
The R-78W series offers wired 0.5A switching regulators which are ideally suited to offer a stable voltage supply without the need for a PCB for applications like high power LED lighting, battery powered systems, cooling systems, or fans. Due to the high efficiencies of up to 96% there is no need for 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 ⁽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:

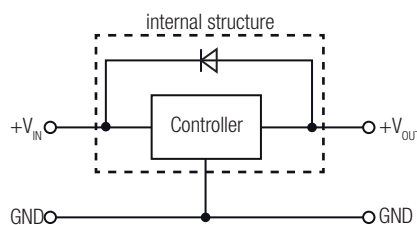
- Note2: Operation under no load will not harm the converter, but specifications may not be met
A minimum load of 6mA is recommended
- Note3: Measurements are made with a 100nF MLCC across output (low ESR)

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 |

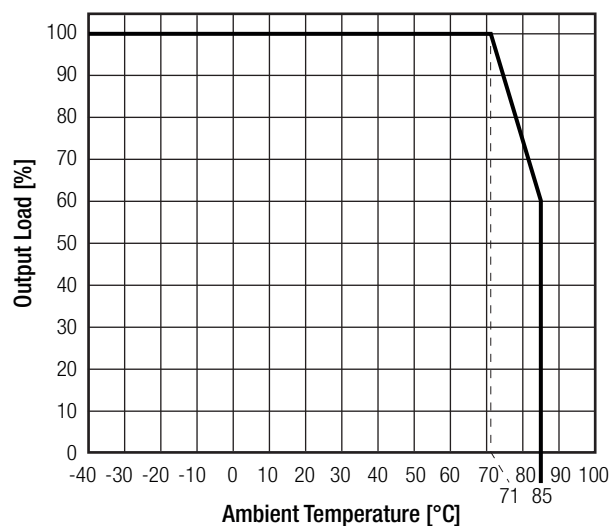
Reverse Current Protection



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 ³ hours |

Derating Graph



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

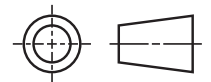
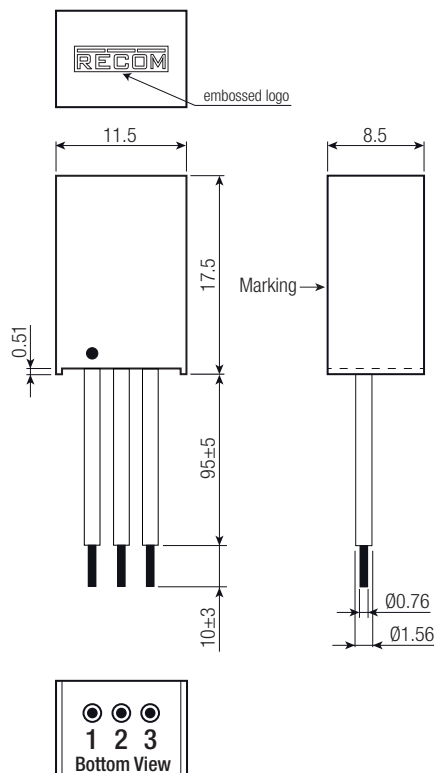
SAFETY AND CERTIFICATIONS

| 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

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