### Features

- On/Off Pin
- 1kVDC Isolation
- UL94V-0 Package Material
- Optional Continuous Short Circuit Protected
- Internal linear regulator
- Efficiency to 70%

### ECONOLINE

DC/DC-Converter

with 3 year Warranty

### 1 Watt

SIP7

Single & Dual Output

### Selection Guide

<table>
<thead>
<tr>
<th>Part Number SIP 7</th>
<th>Input Voltage (VDC)</th>
<th>Output Voltage (VDC)</th>
<th>Output Current (mA)</th>
<th>Efficiency (%)</th>
<th>Max Capacitive Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>RY-xx05S</td>
<td>5, 9, 12, 15, 24</td>
<td>5</td>
<td>200</td>
<td>58-60</td>
<td>1200µF</td>
</tr>
<tr>
<td>RY-xx09S</td>
<td>5, 9, 12, 15, 24</td>
<td>9</td>
<td>111</td>
<td>56-62</td>
<td>1200µF</td>
</tr>
<tr>
<td>RY-xx12S</td>
<td>5, 9, 12, 15, 24</td>
<td>12</td>
<td>84</td>
<td>60-66</td>
<td>680µF</td>
</tr>
<tr>
<td>RY-xx15S</td>
<td>5, 9, 12, 15, 24</td>
<td>15</td>
<td>66</td>
<td>60-66</td>
<td>680µF</td>
</tr>
<tr>
<td>RY-xx24S</td>
<td>5, 9, 12, 15, 24</td>
<td>24</td>
<td>42</td>
<td>60-68</td>
<td>220µF</td>
</tr>
<tr>
<td>RY-xx09D</td>
<td>5, 9, 12, 15, 24</td>
<td>±5</td>
<td>±100</td>
<td>50-58</td>
<td>±470µF</td>
</tr>
<tr>
<td>RY-xx12D</td>
<td>5, 9, 12, 15, 24</td>
<td>±9</td>
<td>±55</td>
<td>52-60</td>
<td>±470µF</td>
</tr>
<tr>
<td>RY-xx15D</td>
<td>5, 9, 12, 15, 24</td>
<td>±12</td>
<td>±42</td>
<td>58-68</td>
<td>±330µF</td>
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<tr>
<td>RY-xx24D</td>
<td>5, 9, 12, 15, 24</td>
<td>±24</td>
<td>±21</td>
<td>64-70</td>
<td>±100µF</td>
</tr>
</tbody>
</table>

xx = Input Voltage. Other input and output voltage combinations available on request.
* add Suffix “P” for Continuous Short Circuit Protection, e.g. RY-0505S/P, RY-0505D/P

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

- Input Voltage Range ±5%
- Output Voltage Accuracy ±5%
- Line Voltage Regulation ±1% max.
- Load Voltage Regulation (10% to 100% full load) ±1% max.
- Minimum Load 10% (2)
- Output Ripple and Noise (20MHz limited) 100mVp-p max.
- Operating Frequency 30kHz min. / 50kHz typ. / 88kHz max.
- Efficiency at Full Load 54% min. / 60% typ.
- Isolation Voltage (tested for 1 second) 1000VDC (rated for 1 minute**)
- Isolation Capacitance Single output types 30pF min. / 150pF max. Dual output types 40pF min. / 72pF max.
- Isolation Resistance 10 GΩ min.
- Short Circuit Protection 1 Second Continuous
- Operating Temperature Range (free air convection) -40°C to +70°C (see Graph)
- Storage Temperature Range -55°C to +125°C
- Relative Humidity 95% RH
- Package Weight RY Single & Dual output types 2.8g
- Packing Quantity 25 pcs per Tube
- MTBF (+25°C) Detailed Information see Application Notes chapter "MTBF" using MIL-HDBK 217F 924 x 10⁶ hours (+70°C) using MIL-HDBK 217F 135 x 10⁶ hours

### Certifications


continued on next page

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*Any data referred to in this datasheet are of indicative nature and based on our practical experience only. For further details, please refer to our Application Notes.*
ECONOLINE
DC/DC-Converter

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

Notes

Note 1: Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

Note 2: The RY series requires a minimum of 10% load on the output to maintain specified regulation. Operating under no-load conditions will not damage these devices; however, they may not meet all listed specifications.

Typical Characteristics

RY-xx05S
RY-xx12S
RY-xx15S

Package Style and Pinning (mm)

SIP7 Package

RY-xx05D
RY-xx12D
RY-xx15D

Pin Connections

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Single</th>
<th>Dual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>2</td>
<td>–Vin</td>
<td>–Vin</td>
</tr>
<tr>
<td>4</td>
<td>–Vout</td>
<td>–Vout</td>
</tr>
<tr>
<td>5</td>
<td>CTRL</td>
<td>Com</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
</tbody>
</table>

Recommended Footprint Details

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.