ECONOLINE
DC/DC-Converter
with 3 year Warranty

6 Watt DIP24
Reinforced
Single & Dual Output

Features
- 8kVDC & 10kVDC Reinforced Isolation
- Industry Standard DIP24 Package
- 6W Regulated Output
- Continuous Short Circuit Protection
- Wide Input 2:1
- Medical Approved
- EN, CSA and CB Certificates
- 2 Pinout Options
- Control Pin Option
- Efficiency to 86%

Regulated Converters

The REC6 series uses a reinforced isolation transformer to offer exceptionally high isolation of 8kVDC (4kVAC/1 minute) or 10kVDC (5kVAC/1 minute) making it suitable for HT monitoring circuits, mains power meters, IGBT isolated power supplies and other sophisticated industrial and medical applications. The isolation capacitance of only 20pF makes them also suitable for low leakage applications. The isolation transformer is recognized by CSA as reinforced isolated with a minimum internal clearance of 2.4mm and a minimum internal creepage clearance of 4.6mm. The REC6 is available in two industry-standard pinouts (=’/A’ or ‘/C’). Remote on/off control is possible with the /CTRL option (A pinning only) and an optional undervoltage lockout function is also available (=/X1). The converters can deliver 140% rated power for short periods of time to cope with applications with large capacitive loads or high start up currents.

Description

<table>
<thead>
<tr>
<th>Part Number DIP24</th>
<th>Input Voltage (VDC)</th>
<th>Output Voltage (VDC)</th>
<th>Output Current (mA)</th>
<th>Efficiency (%)</th>
<th>Max Capacitive Load (µF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REC6-xx05SRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>5</td>
<td>1000</td>
<td>80, 81, 82</td>
<td>6800µF</td>
</tr>
<tr>
<td></td>
<td>4.5-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>REC6-xx09SRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>9</td>
<td>667</td>
<td>81, 82, 83</td>
<td>6800µF</td>
</tr>
<tr>
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<tr>
<td>REC6-xx12SRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>12</td>
<td>500</td>
<td>82, 83, 84</td>
<td>6800µF</td>
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<td>REC6-xx15SRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>15</td>
<td>400</td>
<td>84, 85, 86</td>
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<tr>
<td>REC6-xx24SRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>24</td>
<td>250</td>
<td>83, 84, 85</td>
<td>4700µF</td>
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</tr>
<tr>
<td>REC6-xx05DRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>±5</td>
<td>±500</td>
<td>80, 81, 82</td>
<td>±2200µF</td>
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<td>4.5-9</td>
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<td></td>
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</tr>
<tr>
<td>REC6-xx09DRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>±9</td>
<td>±335</td>
<td>81, 82, 83</td>
<td>±2200µF</td>
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<td>4.5-9</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REC6-xx12DRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>±12</td>
<td>±250</td>
<td>81, 82, 83</td>
<td>±2200µF</td>
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<td>4.5-9</td>
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<td></td>
<td></td>
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<tr>
<td>REC6-xx15DRW/R*</td>
<td>9-18, 18-36, 36-75</td>
<td>±15</td>
<td>±200</td>
<td>82, 83, 84</td>
<td>±2200µF</td>
</tr>
<tr>
<td></td>
<td>4.5-9</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

R* = R8 or R10 for 8kVDC or 10kVDC isolation.

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.

* add suffix ‘/A’ or ‘/C’ for pinning options, see next page for details.
* add suffix ‘/CTRL’ for control pin option (A Pinning only)
* add suffix ‘/X1’ for Undervoltage Lockout

Ordering Examples:
REC6-0512DRW/R8/A/CTRL = 5V Vin, ±12V Vout, 8kVDC isolation, pinout “A”, control pin
REC6-480SSRW/R10/A = 48V Vin, 5V Vout, 10kVDC isolation, pinout “A”
REC6-1212DRW/R8/C/X1 = 12V Vin, ±12V Vout, 8kVDC isolation, pinout “C”, UVL
REC6-0505SRW/R10/A/CTRL/X1 = 5V Vin, 5V Vout, 10kVDC isolation, pinout “A”, control pin, UVL
Specifications (measured at $T_A = 25^\circ C$, nominal input voltage, full load and after warm-up)

- **Input Voltage Range**: 2:1
- **Output Voltage Accuracy**: $\pm 2\%$ max.
- **Line Regulation** (HL-LL): $\pm 0.3\%$ max.
- **Load Regulation** (for output load current change from 20% to 100%): $\pm 0.6\%$ max.
- **Input Surge**: (1 minute) 5V types: 16V max., 12V types: 25V max., 24V types: 50V max., 48V types: 100V max.
- **Undervoltage Lockout** (/X1 Versions): 5V types: 3.5V typ. ($\pm 20\%$), 12V types: 7V typ. ($\pm 20\%$), 24V types: 15V typ. ($\pm 10\%$), 48V types: 32V typ. ($\pm 10\%$)
- **Output Ripple and Noise** (0.1µF capacitor on output, 20MHz BW limited): 200mVp-p max.
- **Transient Response** (25% step change): 1ms typ.
- **Switching Frequency** (Full load and nominal input voltage): 100kHz min. / 350kHz max.
- **Input Filter**: Pi Network
- **Capacitors**: All types MLCC capacitors only
- **Minimum Load** (Operation under no-load will not damage the converter, but it may not meet all specifications): 20% Full Load
- **No Load Power Consumption**: 400mW max.
- **Isolation Voltage** R8-Suffix: tested for 1 second, rated for 1 minute**: 8000VDC / 4000VAC / 60Hz
- **Isolation Voltage** R10-Suffix: tested for 1 second, rated for 1 minute**: 10000VDC / 5000VAC / 60Hz
- **Isolation Capacitance**: 20pF typ.
- **Isolation Resistance**: 10 G$\Omega$ min.
- **Short Circuit Protection** (Max operating temp. = 50$^\circ$C during short circuit conditions): Continuous, Auto Restart
- **Operating Temperature Range** (free air convection): -40$^\circ$C to +75$^\circ$C (see Graph)
- **Case Temperature**: 105$^\circ$C max.
- **Storage Temperature Range**: -55$^\circ$C to +125$^\circ$C
- **Relative Humidity**: 95% RH
- **Case Material**: Non-Conductive Plastic
- **Potting Material**: Silicone
- **Thermal Impedance**: Natural convection 20$^\circ$C/W
- **Package Weight**: 14g
- **Packing Quantity**: 15 pcs per Tube
- **MTBF** (+25$^\circ$C) (+75$^\circ$C) using MIL-HDBK 217F 953 x 10$^3$ hours 234 x 10$^3$ hours
- **Detailed Information see Application Notes chapter “MTBF”**
- **Conducted Emissions**: EN55022 Class A
- **Radiated Emissions**: EN55022 Class A
- **Transformer Creepage & Clearance**: /R8 and /R10 Types 4.6 mm min.
- **PCB Creepage & Clearance**: /R8 and /R10 Types 2.4 mm min.
- **Optocoupler Creepage**: /R8 and /R10 Types 6.0 mm min.
- **External Creepage and Clearance**: Plastic Case Input <> Output pins 14.2 mm min.
- **Certifications**
  - **EN Medical Safety**: Report: MD01207051 + RM1207051 EN 60601-1 3rd Edition
  - **CSA Medical Safety**: Report: 2202478 C22.2 601-2 2nd Ed.
  - **UL Medical Safety**: E314885-A4 UL 60601-1 3rd Edition
  - **General Safety**: Report: 2219431 C22.2 No. 60950-1-03
  - **UL 60950-1 1st Ed.**: Recognised as Reinforced Isolation Supplement to Report: 2219431

*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.*
Efficiency vs Load

Efficiency vs Vin

REC6-xx05SRW/R*
REC6-xx05DRW/R*

REC6-xx12SRW/R*

REC6-xx24SRW/R*
REC6-xx12DRW/R*

www.recom-power.com
**“A” Pinning**
/R8 & /R10

**“C” Pinning**
/R8 & /R10

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**CTRL Option**

ON = Open or 0V < $V_{ctrl}$ < 1.2V
OFF = 2.2V < $V_{ctrl}$ < 12V

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The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM’s explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer 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.

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**Pin Connections**

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Single</th>
<th>Dual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (option)</td>
<td>CTRL</td>
<td>CTRL</td>
</tr>
<tr>
<td>2</td>
<td>–Vin</td>
<td>–Vin</td>
</tr>
<tr>
<td>11</td>
<td>NC</td>
<td>–Vout</td>
</tr>
<tr>
<td>14</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>16</td>
<td>–Vout</td>
<td>Com</td>
</tr>
<tr>
<td>22</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>23</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>NC = No Connection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Recommended Footprint Details**

XX.X ± 0.5 mm
XX.XX ± 0.25 mm