

# Features

## Regulated Converters

- 4:1 Wide Input Voltage Range
- 12 Watts Regulated Output Power
- 1.6kVDC Isolation
- Over Current and Over Voltage Protection
- Five-Sided Shield
- No Derating to 61°C
- Standard DIP24 Pinning
- Efficiency to 88 %

### Description

The RP12-AW series wide range input DC/DC converters are certified to UL 60950-1 and cUL 60950-1. This makes them ideal for all telecom and industrial applications where approved safety standards are required. The DIP24 package is available in both pinned and SMD case styles and meets military standards for thermal shock and vibration tolerance.

### Selection Guide 24V and 48V Wide Input Types

| Part Number     | Input Range VDC | Output Voltage VDC | Output Current mA | Input Current (4,5) mA | Efficiency (6) % | Capacitive Load max. (7) |
|-----------------|-----------------|--------------------|-------------------|------------------------|------------------|--------------------------|
| RP12-243.3SAW** | 9-36            | 3.3                | 3500              | 55/602                 | 84               | 2000µF                   |
| RP12-2405SAW**  | 9-36            | 5.1                | 2400              | 55/614                 | 87               | 2000µF                   |
| RP12-2412SAW**  | 9-36            | 12                 | 1000              | 25/610                 | 86               | 430µF                    |
| RP12-2415SAW**  | 9-36            | 15                 | 800               | 25/610                 | 86               | 300µF                    |
| RP12-483.3SAW** | 18-75           | 3.3                | 3500              | 20/301                 | 84               | 2000µF                   |
| RP12-4805SAW**  | 18-75           | 5.1                | 2400              | 20/307                 | 87               | 2000µF                   |
| RP12-4812SAW**  | 18-75           | 12                 | 1000              | 13/302                 | 87               | 430µF                    |
| RP12-4815SAW**  | 18-75           | 15                 | 800               | 13/298                 | 88               | 300µF                    |
| RP12-2405DAW**  | 9-36            | ±5                 | ±1200             | 20/625                 | 84               | ±1250µF                  |
| RP12-2412DAW**  | 9-36            | ±12                | ±500              | 25/610                 | 86               | ±200µF                   |
| RP12-2415DAW**  | 9-36            | ±15                | ±400              | 25/610                 | 86               | ±120µF                   |
| RP12-4805DAW**  | 18-75           | ±5                 | ±1200             | 10/309                 | 85               | ±1250µF                  |
| RP12-4812DAW**  | 18-75           | ±12                | ±500              | 13/301                 | 87               | ±200µF                   |
| RP12-4815DAW**  | 18-75           | ±15                | ±400              | 13/301                 | 87               | ±120µF                   |

\*\* add Suffix SMD for SMD package

# POWERLINE

DC/DC-Converter

with 3 year Warranty

# RECOM

## 12 Watt DIP24 & SMD, Single & Dual Output



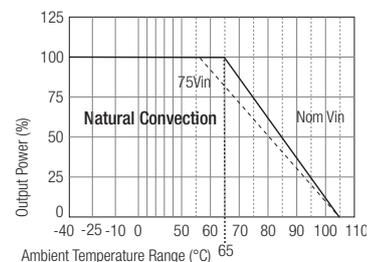
**UL-60950-1 Certified  
E196683**

# RP12-AW

## Derating-Graph

(Ambient Temperature)

### RP12-4805SAW



Derating graphs are valid only for the shown part numbers.

If you need detailed derating information about a part-number not shown here, please contact our technical support service at: [info@recom-development.at](mailto:info@recom-development.at)

**Refer to Application Notes**

**Specifications** (typical at nominal input and 25°C unless otherwise noted)

|   |  |   |
|---|--|---|
| Input Voltage Range   | 24V nominal input<br>48V nominal input | 9-36VDC<br>18-75VDC                                   |
| Input Filter  |  | Pi Type   |
| Input Surge Voltage (100ms max)                             |  | 50VDC (24V Type), 100VDC (48V Type)                   |
| Input Reflected Ripple (nominal Vin and full load)          |  | 20mA <sub>p-p</sub>                                   |
| Start Up Time (nominal Vin and constant resistor load)      |  | 450ms typ.  |
| Remote ON/OFF <sup>(1)</sup>                                | DC-DC ON<br>DC-DC OFF                  | Open or 3.0V < Vr < 12V<br>Short or 0V < Vr < 1.2V    |
| Remote OFF input current                                    | Nominal input                          | 2.5mA   |
| Output Power  |  | 12W max.  |
| Output Voltage Accuracy (full Load and nominal Vin)         |  | ±1.2%   |
| Minimum Load  |  | 0%  |
| Line Regulation (low line, high line at full load)          |  | ±0.2%   |
| Load Regulation (0% to 100% load)                           |  | ±0.5% Single, ±0.5%                                   |
| Cross Regulation Dual Output (asymmetric 25% <>100% Load )  |  | ±5%   |
| Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output) |  | 85mV <sub>p-p</sub>                                   |
| Temperature Coefficient                                     |  | ±0.02%/°C max.  |
| Transient Response (25% load step change)                   |  | 250µs   |
| Input Voltage Variation, dv/dt                              | complies with ETS300 132, part 4.4     | 5V/ms   |
| Over Load Protection (% of full load at nominal Vin)        |  | 150% typ  |
| Overvoltage Protection (Single)                             |  | Zener Diode Clamp                                     |
| Undervoltage Protection                                     |  | See Application Notes                                 |
| Short Circuit Protection                                    |  | Continuous, automatic recovery                        |
| Efficiency  |  | see „Selection Guide“ table                           |
| Isolation Voltage (rated for one minute)                    | In to Out and I/O to case              | 1600VDC   |
| Isolation Resistance  |  | 10 GΩ min.  |
| Isolation Capacitance                                       |  | 1500pF max.   |
| Operating Frequency   |  | 400kHz typ.   |
| Operating Temperature Range (No derating)                   | 5.1, 12, 15, ±12, ±15V<br>3.3, ±5V     | -40°C to +65°C<br>-40°C to +61°C                      |
| Maximum Case Temperature                                    |  | +105°C  |
| Storage Temperature Range                                   |  | -55°C to +125°C                                       |
| Thermal Impedance   | Natural convection                     | 20°C/Watt   |
| Case Material   |  | Nickel plated copper with non-conductive plastic base |
| Potting Material  |  | Epoxy (UL94-V0)                                       |
| Weight  |  | 18g (DIP), 20g (SMD)                                  |
| Packing Quantity  | Refer to App Notes for tube dimensions | 7pcs per Tube   |
| Conducted Emissions <sup>(2)</sup>                          | EN55022                                | Class A   |
| Radiated Emissions <sup>(2)</sup>                           | EN55022                                | Class A   |
| ESD   | EN61000-4-2                            | Perf. Criteria B                                      |
| Radiated Immunity   | EN61000-4-3                            | Perf. Criteria A                                      |
| Fast Transient  | EN61000-4-4                            | Perf. Criteria B                                      |

continued on next page

**Specifications** (typical at nominal input and 25°C unless otherwise noted)

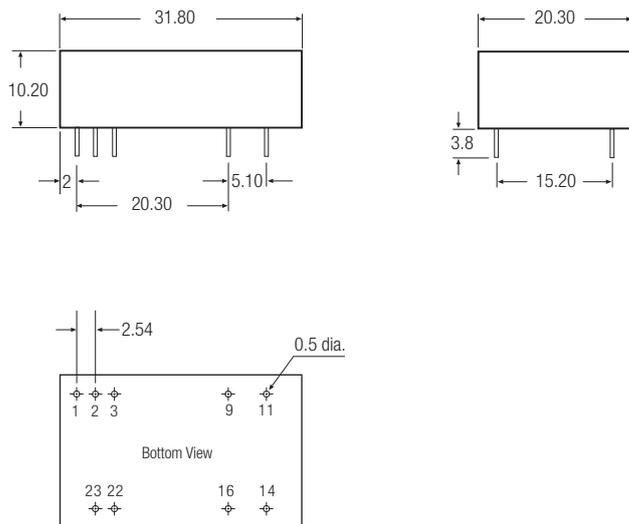
|                     |                        |  |
|---------------------|------------------------|--|
| Surge               | EN61000-4-5            | Pref. Criteria B                       |
| Conducted Immunity  | EN61000-4-6            | Pref. Criteria A                       |
| Thermal Shock       |                        | MIL-STD-810D                           |
| Vibration           |                        | 10-55Hz, 10G, 30 Min. along X, Y and Z |
| Relative Humidity   |                        | 5% to 95% RH                           |
| MTMF <sup>(2)</sup> | Bellcore-TR-NWT-000332 | 2350 x 10 <sup>3</sup> hours           |

**Notes :**

1. The ON/OFF control pin voltage is referenced to negative input.
2. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).
3. Requires external filter to meet EN55022 Class A
4. Typical value at nominal input voltage and no load.
5. Maximum value at nominal input voltage and full load
6. Typical value at nominal input voltage and full load.
7. Test by minimum Vin and constant resistor load.

**Package Style and Pinning (mm)**

**DIP24 Package Style**



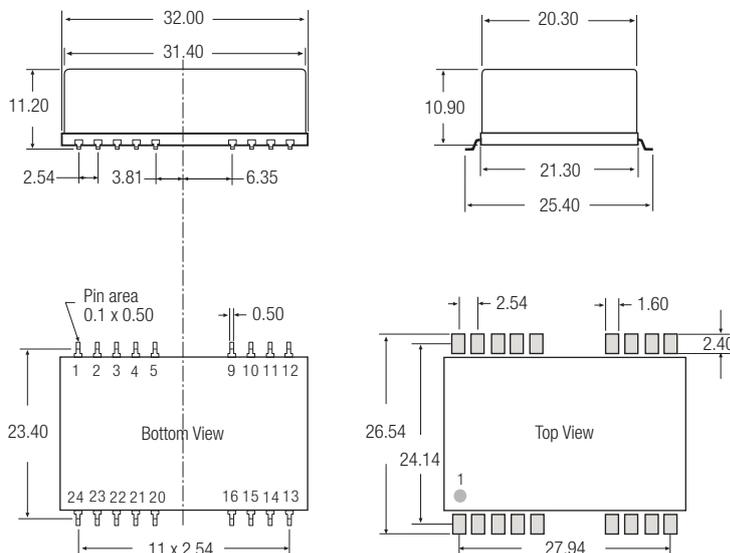
**Pin Connections**

| Pin # | Single | Dual   |
|-------|--------|--------|
| 1     | ON/OFF | ON/OFF |
| 2     | -Vin   | -Vin   |
| 3     | -Vin   | -Vin   |
| 9     | NC     | Com    |
| 11    | NC     | -Vout  |
| 14    | +Vout  | +Vout  |
| 16    | -Vout  | Com    |
| 22    | +Vin   | +Vin   |
| 23    | +Vin   | +Vin   |

NC = No Connection

Pin Pitch Tolerance  $\pm 0.35$  mm

**SMD Package Style and Pinning (mm)** (Same spec. as the original DIP sepc. and pin definition, excl. of the SMD Typ pin.)



**Pin Connections**

| Pin #  | Single | Dual   |
|--------|--------|--------|
| 1      | ON/OFF | ON/OFF |
| 2      | -Vin   | -Vin   |
| 3      | -Vin   | -Vin   |
| 9      | NC     | Com    |
| 11     | NC     | -Vout  |
| 14     | +Vout  | +Vout  |
| 16     | -Vout  | Com    |
| 22     | +Vin   | +Vin   |
| 23     | +Vin   | +Vin   |
| Others | NC     | NC     |

NC = No Connection

Pin Pitch Tolerance  $\pm 0.35$  mm

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.