

## Features

### Regulated Converters

- 2:1 Wide Input Voltage Range
- Safety standards and approvals: EN 60950 certified, rated for 250VAC (LVD test report)
- 3 Watts Regulated Output Power
- 500VDC Isolation
- Over Current Protection
- Also Available with Isolated Outputs, Output 1/Output 2 (DS) Isolation
- Five-Sided Shield
- Standard DIP24 and SMD-Pinning
- UL 1950 Component Recognized
- High Efficiency to 80%

### Selection Guide 12V, 24V and 48V Input Types

| Part Number<br>for DB/DS(V1 & V2) | Input<br>Range | Output<br>Voltage<br>V1 & V2 | Output<br>Current<br>V1 & V2 | Input <sup>(4)</sup><br>Current | Efficiency <sup>(5)</sup> | Capacitive <sup>(6)</sup><br>Load max.<br>V1 & V2 |
|-----------------------------------|----------------|------------------------------|------------------------------|---------------------------------|---------------------------|---------------------------------------------------|
| DIP24 (SMD)                       | VDC            | VDC                          | mA                           | mA                              | %                         | µF                                                |
| RP03-123.3SB**                    | 9-18           | 3.3                          | 500                          | 196                             | 74                        | 2200                                              |
| RP03-1205SB**                     | 9-18           | 5                            | 500                          | 286                             | 77                        | 1000                                              |
| RP03-1212SB**                     | 9-18           | 12                           | 250                          | 333                             | 79                        | 220                                               |
| RP03-1215SB**                     | 9-18           | 15                           | 200                          | 329                             | 80                        | 150                                               |
| RP03-243.3SB**                    | 18-36          | 3.3                          | 500                          | 101                             | 72                        | 2200                                              |
| RP03-2405SB**                     | 18-36          | 5                            | 500                          | 149                             | 74                        | 1000                                              |
| RP03-2412SB**                     | 18-36          | 12                           | 250                          | 169                             | 78                        | 220                                               |
| RP03-2415SB**                     | 18-36          | 15                           | 200                          | 169                             | 78                        | 150                                               |
| RP03-483.3SB**                    | 36-75          | 3.3                          | 500                          | 50                              | 73                        | 2200                                              |
| RP03-4805SB**                     | 36-75          | 5                            | 500                          | 75                              | 74                        | 1000                                              |
| RP03-4812SB**                     | 36-75          | 12                           | 250                          | 84                              | 79                        | 220                                               |
| RP03-4815SB**                     | 36-75          | 15                           | 200                          | 84                              | 79                        | 150                                               |
| RP03-1205DB**                     | 9-18           | ±5                           | ±250                         | 293                             | 75                        | ±470                                              |
| RP03-1212DB**                     | 9-18           | ±12                          | ±125                         | 329                             | 80                        | ±100                                              |
| RP03-1215DB**                     | 9-18           | ±15                          | ±100                         | 329                             | 80                        | ±68                                               |
| RP03-2405DB**                     | 18-36          | ±5                           | ±250                         | 147                             | 75                        | ±470                                              |
| RP03-2412DB**                     | 18-36          | ±12                          | ±125                         | 169                             | 78                        | ±100                                              |
| RP03-2415DB**                     | 18-36          | ±15                          | ±100                         | 169                             | 78                        | ±68                                               |
| RP03-4805DB**                     | 36-75          | ±5                           | ±250                         | 75                              | 74                        | ±470                                              |
| RP03-4812DB**                     | 36-75          | ±12                          | ±125                         | 86                              | 77                        | ±100                                              |
| RP03-4815DB**                     | 36-75          | ±15                          | ±100                         | 169                             | 77                        | ±68                                               |
| RP03-1205DB/DS**                  | 9-18           | 5 / 5                        | 250 / 250                    | 293                             | 75                        | 470 / 470                                         |
| RP03-1212DB/DS**                  | 9-18           | 12 / 12                      | 125 / 125                    | 329                             | 80                        | 100 / 100                                         |
| RP03-1215DB/DS**                  | 9-18           | 15 / 15                      | 100 / 100                    | 329                             | 80                        | 68 / 68                                           |
| RP03-2405DB/DS**                  | 18-36          | 5 / 5                        | 250 / 250                    | 147                             | 75                        | 470 / 470                                         |
| RP03-2412DB/DS**                  | 18-36          | 12 / 12                      | 125 / 125                    | 169                             | 78                        | 100 / 100                                         |
| RP03-2415DB/DS**                  | 18-36          | 15 / 15                      | 100 / 100                    | 169                             | 78                        | 68 / 68                                           |
| RP03-4805DB/DS**                  | 36-75          | 5 / 5                        | 250 / 250                    | 75                              | 74                        | 470 / 470                                         |
| RP03-4812DB/DS**                  | 36-75          | 12 / 12                      | 125 / 125                    | 86                              | 77                        | 100 / 100                                         |
| RP03-4815DB/DS**                  | 36-75          | 15 / 15                      | 100 / 100                    | 86                              | 77                        | 68 / 68                                           |

\*\* add Suffix SMD for SMD package

### Description

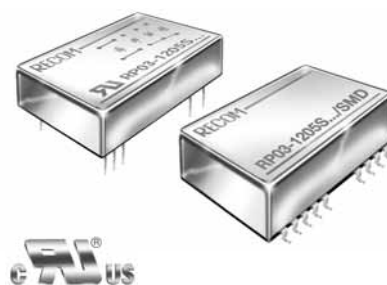
The B-Series of DC/DC Converters are fully certified to EN 60950: 2000. This makes them ideal for all Telecom and safety applications where approved isolation is required. They also meet UL 1950 and CSA 950 standards (®).

**POWERLINE**

DC/DC-Converter

## RP03-S\_DB (DB/DS) Series

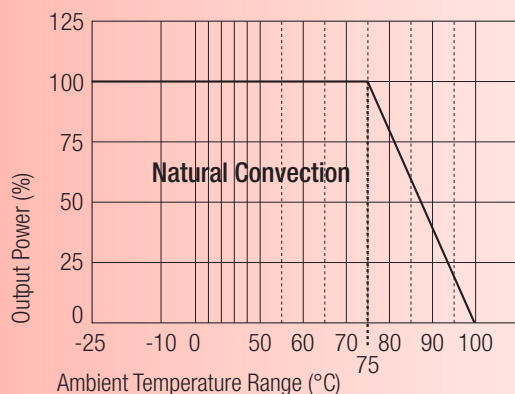
**3 Watt  
DIP24 & SMD,  
Single, Dual &  
Dual Isolated  
Output**



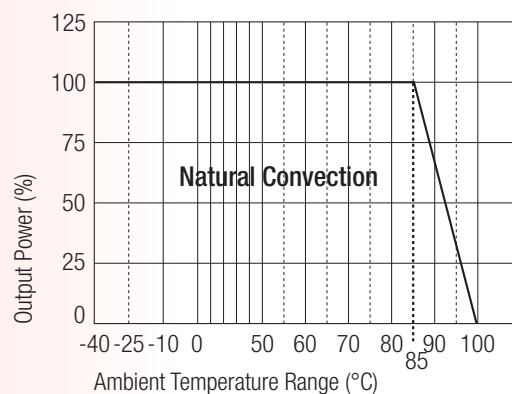
**RECOM**

## Derating-Graph (Ambient Temperature)

**RP03-4805SB**



**RP03-4805SB/M1**



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 customer service at [info@recom-development.at](mailto:info@recom-development.at)

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

|                                                        |                                |          |
|--------------------------------------------------------|--------------------------------|----------|
| Input Voltage Range                                    | 12V nominal input              | 9-18VDC  |
|                                                        | 24V nominal input              | 18-36VDC |
|                                                        | 48V nominal input              | 36-75VDC |
| Input Filter                                           | Pi Type                        |          |
| Input Surge Voltage (100 ms max.)                      | 12V Input                      | 36VDC    |
|                                                        | 24V Input                      | 50VDC    |
|                                                        | 48V Input                      | 100VDC   |
| Input Reflected Ripple (nominal Vin and full load)     | 20mA <sub>p-p</sub>            |          |
| Start Up Time (nominal Vin and constant resistor load) | 350ms typ.                     |          |
| Output Power                                           | 3W max.                        |          |
| Output Voltage Accuracy (full Load and nominal Vin)    | ±2%                            |          |
| Minimum Load (see Note 1)                              | 10% of FL                      |          |
| Line Regulation (LL-HL at full load)                   | ±0.2%                          |          |
| Load Regulation (25% to 100% FL)                       | Single                         | ±0.2%    |
|                                                        | Dual at DS                     | ±1%      |
| Cross Regulation (asymmetrical load 25%/100% FL)       | ±5%                            |          |
| Ripple and Noise (20MHz bandwidth)                     | 50mV <sub>p-p</sub>            |          |
| Temperature Coefficient                                | ±0.02%/°C, max.                |          |
| Transient Response (25% load step change)              | 200μs                          |          |
| Over Load Protection (% of full load at nominal Vin)   | 180% typ                       |          |
| Short Circuit Protection                               | Continuous, automatic recovery |          |
| Efficiency                                             | see „Selection Guide“ table    |          |

continued on next page

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

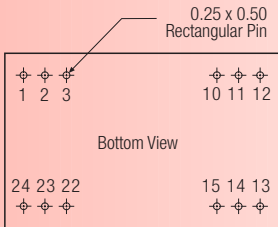
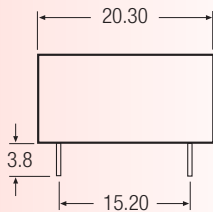
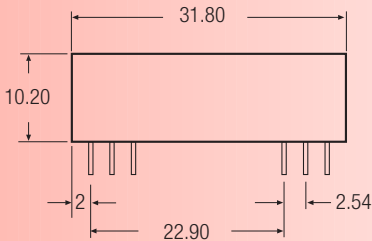
|                              |                    |                                       |
|------------------------------|--------------------|---------------------------------------|
| Isolation Voltage            | In to out          | 500VDC min.                           |
|                              | I/O to case        | DIP at SMD type 500VDC min.           |
|                              | Output to Output   | /DS type 500VDC min.                  |
| Isolation Resistance         |                    | 10 <sup>9</sup> Ω min.                |
| Isolation Capacitance        |                    | 300pF max.                            |
| Operating Frequency          |                    | 300kHz typ.                           |
| Approved to Safety Standards |                    | UL 1950, EN60950                      |
| Operating Temperature Range  | Standard           | -25°C to +85°C (with derating)        |
|                              | M1 (see note 3)    | -40°C to +85°C (non-derating)         |
| Maximum Case Temperature     |                    | +100°C                                |
| Storage Temperature Range    |                    | -55°C to +105°C                       |
| Thermal Impedance            | Natural convection | 20°C/Watt                             |
| Thermal Shock                |                    | MIL-STD-810D                          |
| Vibration                    |                    | 10-55Hz, 2G, 30 Min. along X, Y and Z |
| Relative Humidity            |                    | 5% to 95% RH                          |
| Case Material                |                    | Nickel-Coated copper                  |
| Base Material                |                    | Non-conductive black plastic          |
| Potting Material             |                    | Epoxy (UL94-V0)                       |
| Conducted Emissions          | EN55022            | Level A                               |
| Radiated Emissions           | EN55022            | Level A                               |
| ESD                          | EN61000-4-2        | Perf. Criteria 2                      |
| Radiated Immunity            | EN61000-4-3        | Perf. Criteria 2                      |
| Fast Transient               | EN61000-4-4        | Perf. Criteria 2                      |
| Surge                        | EN61000-4-5        | Perf. Criteria 2                      |
| Conducted Immunity           | EN61000-4-6        | Perf. Criteria 2                      |
| Weight                       | DIP                | 16g                                   |
|                              | SMD                | 18g                                   |
| Dimensions                   | DIP                | 31.8 x 20.3 x 10.2mm                  |
|                              | SMD                | 32.0 x 20.3 x 10.9mm                  |
| MTBF (see note 2)            |                    | 3.069 x 10 <sup>6</sup> Hours         |

**Notes :**

1. The RP03 series requires a minimum of 10% loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
2. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).
3. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard version.
4. Maximum value at nominal input voltage and full load of standard type.
5. Typical value at nominal input voltage and full load.
6. Test by minimum Vin and constant resistor load.
7. Should an O/O isolation be required, please order the converter with the following part number: RP03-XXXXDB/DS.
8. The "M1" version (RP03-xxxxSB-M1 / RP03-xxxxDB-M1) and the dual-isolated-output-version (RP03-xxxxDS) do not carry the UL certification.
9. See application notes for EMI-filtering.

Package Style and Pinning (mm)

DIP24 Package Style



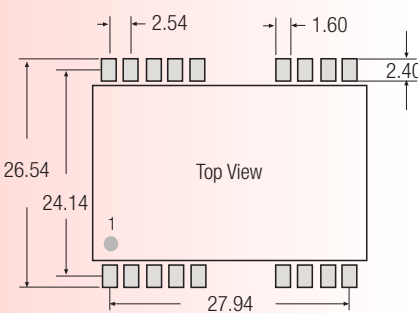
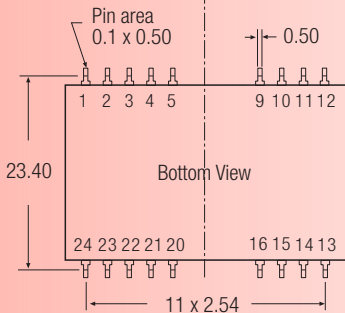
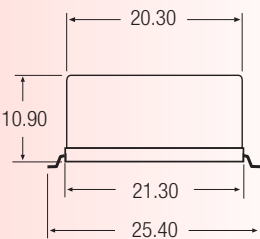
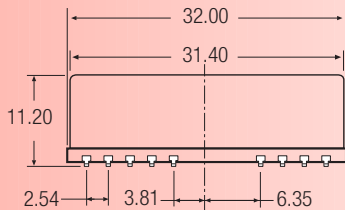
SMD Pin Connections out in

| Pin # | Single | Dual  | Dual Separated Outputs |
|-------|--------|-------|------------------------|
| 1     | +Vin   | +Vin  | +Vin                   |
| 2     | NC     | -Vout | -V1 out                |
| 3     | NC     | Com   | +V1 out                |
| 10    | -Vout  | Com   | -V2 out                |
| 11    | +Vout  | +Vout | +V2 out                |
| 12    | -Vin   | -Vin  | -Vin                   |
| 13    | -Vin   | -Vin  | -Vin                   |
| 14    | +Vout  | +Vout | +V2 out                |
| 15    | -Vout  | Com   | -V2 out                |
| 22    | NC     | Com   | +V1 out                |
| 23    | NC     | -Vout | -V1 out                |
| 24    | +Vin   | +Vin  | +Vin                   |

NC = No Connection

Pin Pitch Tolerance  $\pm 0.35$  mm

SMD Package Style



SMD Package Style

Same spec. as the original DIP spec. and pin definition, excl. of the SMD type pin.

SMD Pin Connections out in

| Pin #  | Single | Dual  | Dual Separated Outputs |
|--------|--------|-------|------------------------|
| 1      | +Vin   | +Vin  | +Vin                   |
| 2      | NC     | -Vout | -V1 out                |
| 3      | NC     | Com   | +V1 out                |
| 10     | -Vout  | Com   | -V2 out                |
| 11     | +Vout  | +Vout | +V2 out                |
| 12     | -Vin   | -Vin  | -Vin                   |
| 13     | -Vin   | -Vin  | -Vin                   |
| 14     | +Vout  | +Vout | +V2 out                |
| 15     | -Vout  | Com   | -V2 out                |
| 22     | NC     | Com   | +V1 out                |
| 23     | NC     | -Vout | -V1 out                |
| 24     | +Vin   | +Vin  | +Vin                   |
| Others | NC     | NC    | NC                     |

NC = No Connection

Pin Pitch Tolerance  $\pm 0.35$  mm

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