

## Features

- 4:1 Wide Input Voltage Range
- 10 Watts Output Power
- 1.6kVDC Isolation
- Fixed Operating Frequency
- Six-Sided Continuous Shield
- Standard 50.8 x25.4x10.2mm Package
- Efficiency to 84%

## Description

The RP10-EW series wide input range 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 industry standard 2" x 1" package meets military standards for thermal shock and vibration tolerance and is available with an optional remote on/off control pin.

This series is also available with the /M2 option which is particularly suitable for extended temperature range applications.

## Selection Guide 24V and 48V Input Types

| Part Number  | Input Range VDC | Output Voltage VDC | Output Current mA | Input <sup>(4)</sup> Current mA | Efficiency <sup>(5)</sup> % | Capacitive <sup>(6)</sup> Load max. |
|--------------|-----------------|--------------------|-------------------|---------------------------------|-----------------------------|-------------------------------------|
| RP10-2405SEW | 9-36            | 5                  | 2000              | 548                             | 80                          | 4700µF                              |
| RP10-2412SEW | 9-36            | 12                 | 830               | 532                             | 82                          | 690µF                               |
| RP10-2415SEW | 9-36            | 15                 | 670               | 551                             | 80                          | 470µF                               |
| RP10-4805SEW | 18-75           | 5                  | 2000              | 274                             | 80                          | 4700µF                              |
| RP10-4812SEW | 18-75           | 12                 | 830               | 259                             | 84                          | 690µF                               |
| RP10-4815SEW | 18-75           | 15                 | 670               | 262                             | 84                          | 470µF                               |
| RP10-2405DEW | 9-36            | ±5                 | ±1000             | 548                             | 80                          | ±680µF                              |
| RP10-2412DEW | 9-36            | ±12                | ±416              | 547                             | 80                          | ±330µF                              |
| RP10-2415DEW | 9-36            | ±15                | ±333              | 548                             | 80                          | ±110µF                              |
| RP10-4805DEW | 18-75           | ±5                 | ±1000             | 271                             | 81                          | ±680µF                              |
| RP10-4812DEW | 18-75           | ±12                | ±416              | 281                             | 78                          | ±330µF                              |
| RP10-4815DEW | 18-75           | ±15                | ±333              | 270                             | 81                          | ±110µF                              |

\* add suffix /M2 for higher efficiencies and extended temperature range.

\* add suffix /P for CTRL function with Positive Logic (1=ON, 0=OFF)

\* add suffix /N for CTRL function with Negative Logic (0=ON, 1=OFF)

\* add suffix -HC for premounted heatsink and clips

## Ordering Examples

RP10-2405SE/P = 24V 4:1 Input, 5V Output, Standard Temp. Range, Positive Logic CTRL pin fitted

RP10-4805DE/M1-HC = 48V 4:1 Input, ±5V Output, Extended Temp. Range, No CTRL, Heatsink fitted

## POWERLINE

DC/DC-Converter

with 3 year Warranty

RECOM

10 Watt

2" x 1"

Single &

Dual Output



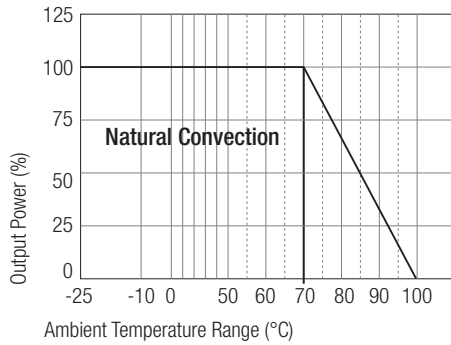
UL-60950-1 Certified  
E196683

**RP10-EW**

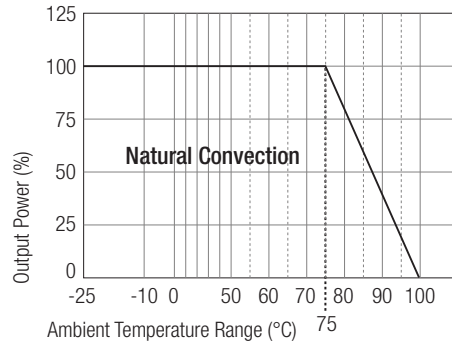
Refer to Application Notes

**Derating Graph (Ambient Temperature)**

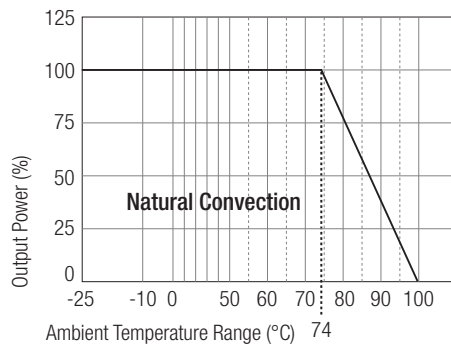
**RP10-2405SEW**



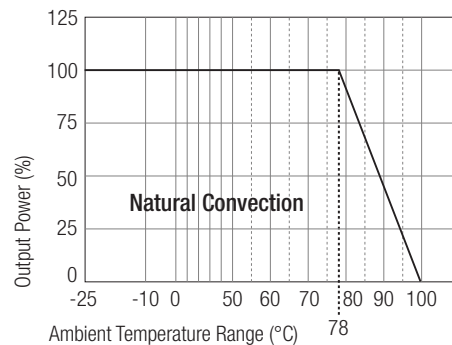
**RP10-2405SEW With Heat Sink**



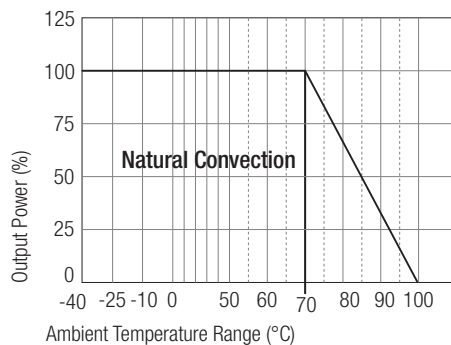
**RP10-2405DEW**



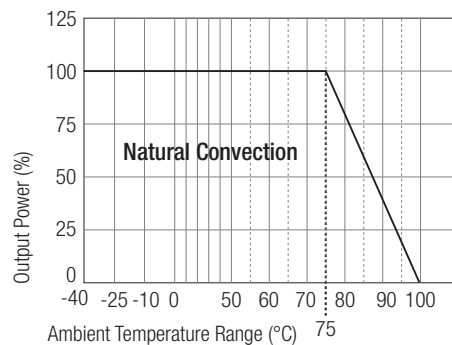
**RP10-2405DEW With Heat Sink**



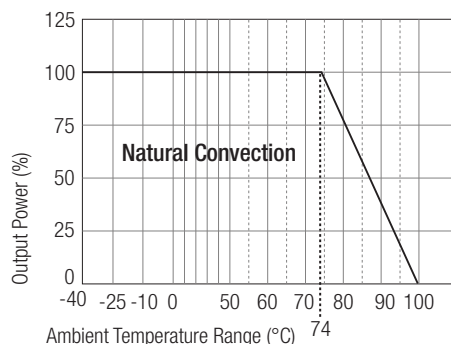
**RP10-2405SEW/M2**



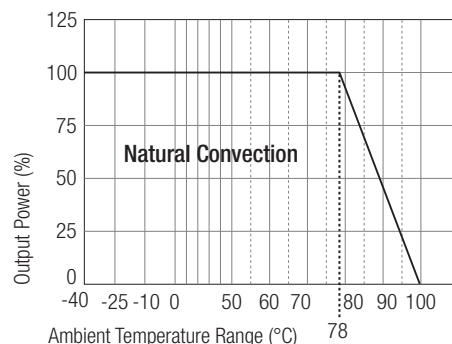
**RP10-2405SEW/M2 With Heat Sink**



**RP10-2405DEW/M2**



**RP10-2405DEW/M2 With Heat Sink**



**RP10-EW**

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)

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

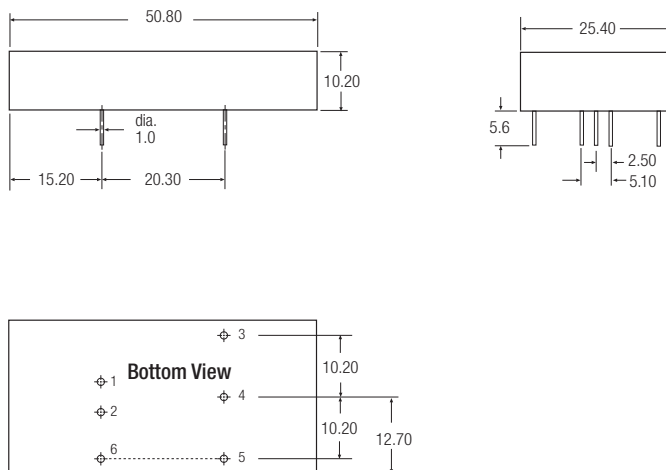
|  |                                   |  |
|--|-----------------------------------|--|
| Input Voltage Range  | 24V nominal input                 | 9-36VDC                                |
|  | 48V nominal input                 | 18-75VDC                               |
| Input Filter   |                                   | Pi Type                                |
| Input Surge Voltage (100 ms max.)  | 24V Input                         | 50VDC                                  |
|  | 48V Input                         | 100VDC                                 |
| Input Reflected Ripple (nominal Vin and full load)                       |                                   | 30mA <sub>p-p</sub>                    |
| Start Up Time (nominal Vin and constant resistor load)                   |                                   | 20ms typ.                              |
| Remote ON/OFF <sup>(7)</sup>   |                                   |  |
| (Positive logic)   | DC-DC ON                          | Open or 3.5V < Vr < 12V                |
|  | DC-DC OFF                         | Short or 0V < Vr < 1.2V                |
| (Negative logic)   | DC-DC ON                          | Short or 0V < Vr < 1.2V                |
|  | DC-DC OFF                         | Open or 3.5V < Vr < 12V                |
| Remote OFF input current   | Nominal input                     | 20mA                                   |
| Output Power   |                                   | 10W max.                               |
| Output Voltage Accuracy (full Load and nominal Vin)                      |                                   | ±2%                                    |
| Minimum Load <sup>(1)</sup>  |                                   | 10% of full load                       |
| Line Regulation (low line, high line at full load)                       |                                   | ±1%                                    |
| Load Regulation (25% to 100% full load)                                  | Single                            | ±1%                                    |
|  | Dual                              | ±2%                                    |
| Cross Regulation (asymmetrical 25%<->100% load)                          |                                   | ±5%                                    |
| Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output)              | Single                            | 50mV <sub>p-p</sub>                    |
|  | Dual                              | 75mV <sub>p-p</sub>                    |
| Temperature Coefficient  |                                   | ±0.02%/°C max.                         |
| Transient Response (25% load step change)                                |                                   | 500µs                                  |
| Over Voltage Protection  | 5V output                         | 6.2V                                   |
| Zener diode clamp  | 12V output                        | 15V                                    |
|  | 15V output                        | 18V                                    |
| Over Load Protection (% of full load at nominal Vin)                     |                                   | 150% typ                               |
| Undervoltage Lockout   |                                   | none                                   |
| Short Circuit Protection   |                                   | Hiccup, automatic recovery             |
| Efficiency   |                                   | see „Selection Guide“ table            |
| Isolation Voltage (rated for one minute)                                 |                                   | 1600VDC                                |
| Isolation Resistance   |                                   | 1 GΩ min.                              |
| Isolation Capacitance  |                                   | 300pF max.                             |
| Operating Frequency  |                                   | 300kHz typ.                            |
| Operating Temperature Range <sup>(9)</sup><br>(Reference Derating Curve) | Standard                          | -25°C to +85°C(with derating)          |
|  | M2                                | -40°C to +85°C(with derating)          |
| Maximum Case Temperature   |                                   | +100°C                                 |
| Storage Temperature Range  |                                   | -55°C to +125°C                        |
| Thermal Impedance <sup>(8)</sup>   | Natural convection                | 12°C/Watt                              |
|  | Natural convection with Heat Sink | 10°C/Watt                              |
| Thermal Shock  |                                   | MIL-STD-810D                           |
| Vibration  |                                   | 10-55Hz, 10G, 30 Min. along X, Y and Z |

continued on next page

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

|                                     |  |                              |
|-------------------------------------|--|------------------------------|
| Relative Humidity                   |  | 5% to 95% RH                 |
| Case Material                       |  | Nickel plated copper         |
| Base Material                       |  | Non-conductive black plastic |
| Potting Material                    |  | Epoxy (UL94-V0)              |
| Conducted Emissions <sup>(10)</sup> | EN55022                                | Level A                      |
| Radiated Emissions                  | EN55022                                | Level A                      |
| ESD                                 | EN61000-4-2                            | Perf. Criteria B             |
| Radiated Immunity                   | EN61000-4-3                            | Perf. Criteria B             |
| Fast Transient                      | EN61000-4-4                            | Perf. Criteria B             |
| Surge                               | EN61000-4-5                            | Perf. Criteria B             |
| Conducted Immunity                  | EN61000-4-6                            | Perf. Criteria B             |
| Weight                              |  | 27g                          |
| Packing Quantity                    | Refer to App Notes for tube dimensions | 9pcs per Tube                |
| Dimensions                          |  | 50.8 x 25.4 x 10.2mm         |
| MTBF <sup>(2)</sup>                 | BELLCORE TR-NWT-000332                 | 1976 x 10 <sup>3</sup> hours |
|                                     | MIL-HDBK-217F                          | 1416 x 10 <sup>3</sup> hours |

**Package Style and Pinning (mm)**



**Pin Connections**

| Pin # | Single | Dual  |
|-------|--------|-------|
| 1     | +Vin   | +Vin  |
| 2     | -Vin   | -Vin  |
| 3     | +Vout  | +Vout |
| 4     | No Pin | Com   |
| 5     | -Vout  | -Vout |
| 6*    | CTRL*  | CTRL* |

\* Optional. See Note 7

Pin Pitch Tolerance  $\pm 0.35$  mm

**Notes :**

- The RP10 (M) series required a minimum 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.
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment).
- Simulated source impedance of 12 $\mu$ H. 12 $\mu$ H inductor in series with +Vin.
- Maximum value at nominal input voltage and full load of standard type.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistor load.
- The ON/OFF control function can be positive or negative logic. The pin voltage is referenced to negative input.  
Positive logic ON/OFF is marked with suffix-P (eg. RP10-2405SEW/P)  
Negative logic ON/OFF is marked with suffix-N (eg. RP10-2405SEW/N).  
If no suffix is specified, the control pin will be omitted.
- Heat sink is optional and P/N: 7G-0020C. Powerline DC/DC Converters can be ordered with pre-mounted heatsinks including antivibration fixing clips (add suffix -HC). See Application Notes for heatsink details.
- M2 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard version.
- See application notes for EMI-filtering.

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