

## Features

- 4:1 Wide Input Voltage Range
- 10 Watts Output Power
- 1.6kVDC Isolation
- Fixed Operating Frequency
- Six-Sided Continuous Shield
- Standard 50.8 x 25.4 x 10.2mm Package
- Efficiency to 84%

Rev. 1

## POWERLINE

DC/DC-Converter

# RP10-S\_DEW Series

**10 Watt  
2" x 1" Package  
Single & Dual  
Output**



**RECOM**

### Description

The RP10-EW series wide input range DC/DC converter 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

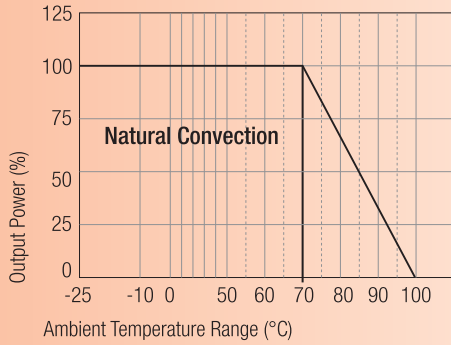
### Ordering Examples

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

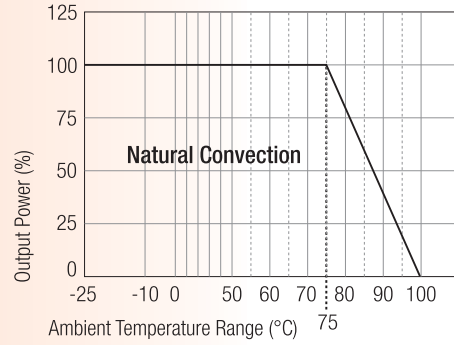
RP10-4805DE/M1-HC = 48V 4:1 Input, ±5V Output, Extended Temp. Range, No CTRL, Heatsink fitted

**Derating Graph (Ambient Temperature)**

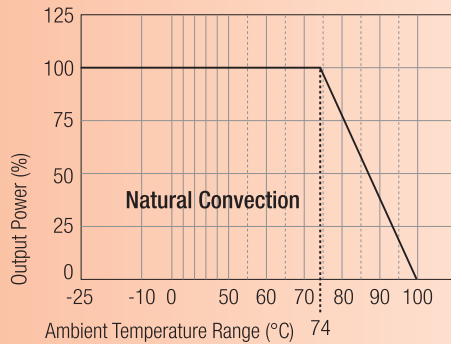
**RP10-2405SEW**



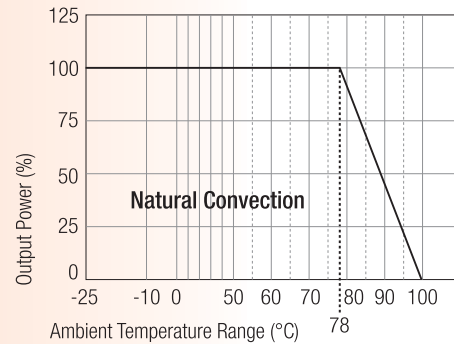
**RP10-2405SEW With Heat Sink**



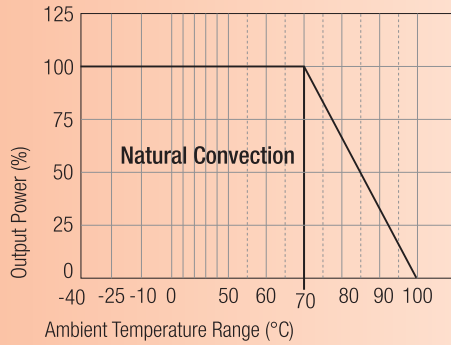
**RP10-2405DEW**



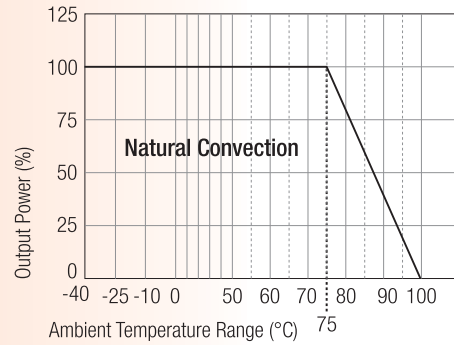
**RP10-2405DEW With Heat Sink**



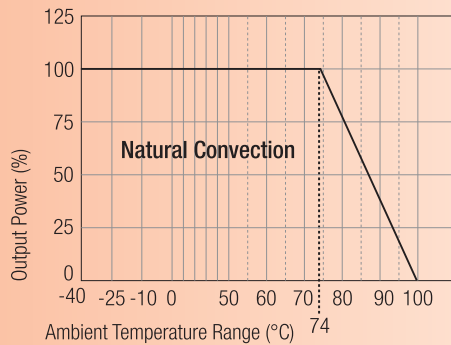
**RP10-2405SEW/M2**



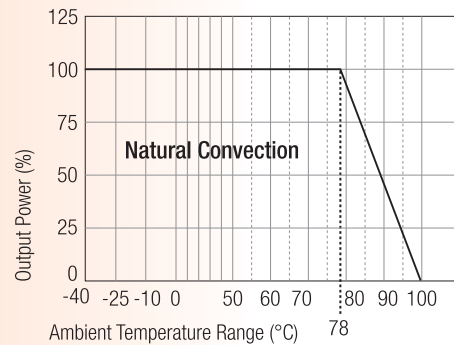
**RP10-2405SEW/M2 With Heat Sink**



**RP10-2405DEW/M2**



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



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)

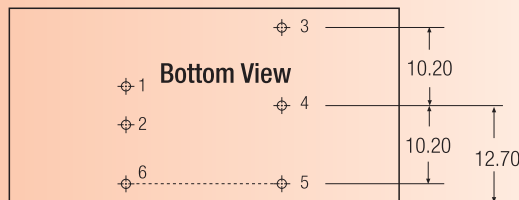
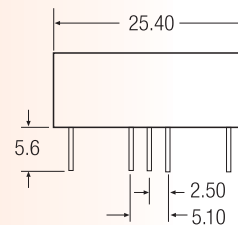
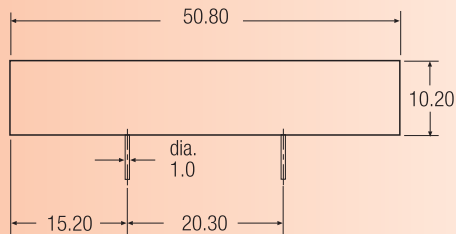
Input Voltage Range	24V nominal input 48V nominal input	9-36VDC 18-75VDC
Input Filter		Pi Type
Input Surge Voltage (100 ms max.)	24V Input 48V Input	50VDC 100VDC
Input Reflected Ripple (nominal Vin and full load)		30mA <sub>p-p</sub>
Start Up Time (nominal Vin and constant resistor load)		20ms typ.
Remote ON/OFF (Optional. See Note 7) (Positive logic)	DC-DC ON DC-DC OFF	Open or 3.5V < Vr < 12V Short or 0V < Vr < 1.2V
(Negative logic)	DC-DC ON DC-DC OFF	Short or 0V < Vr < 1.2V 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 (see Note 1)		10% of full load
Line Regulation (low line, high line at full load)		±1%
Load Regulation (25% to 100% full load)	Single Dual	±1% ±2%
Cross Regulation (asymmetrical load 25%/100% full load)		±5%
Ripple and Noise (20MHz bandwidth)	Single Dual	50mV <sub>p-p</sub> 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 output	15V 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		1600VDC min.
Isolation Resistance		1 GΩ min.
Isolation Capacitance		300pF max.
Operating Frequency		300kHz typ.
Operating Temperature Range (Reference Derating Curve) (see Note 9)	Standard M2	-25°C to +85°C(with derating) -40°C to +85°C(with derating)
Maximum Case Temperature		+100°C
Storage Temperature Range		-55°C to +105°C
Thermal Impedance (see Note 8)	Natural convection Natural convection with Heat Sink	12°C/Watt 10°C/Watt
Thermal Shock		MIL-STD-810D
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z
Relative Humidity		5% to 95% RH
Case Material		Nickel plated copper
Base Material		Non-conductive black plastic
Potting Material		Epoxy (UL94-V0)

continued on next page

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

Conducted Emissions (see Note 10)	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
Dimensions		50.8 x 25.4 x 10.2mm
MTBF (see Note 2)		1976 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 (W) 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-0020A. 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.