

## Features

- 2:1 Wide Input Voltage Range
- 10 Watts Output Power
- 1.6kVDC Isolation
- UL Certified
- Fixed Operating Frequency
- Six-Sided Continuous Shield
- Standard 50.8 x25.4x10.2mm Package
- Efficiency to 86%

## POWERLINE

DC/DC-Converter

# RP10- S\_DE Series

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

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

| Part Number  | Input Range | Output Voltage | Output Current | Input <sup>(4)</sup> Current | Efficiency <sup>(5)</sup> | Capacitive <sup>(6)</sup> Load max. |
|--------------|-------------|----------------|----------------|------------------------------|---------------------------|-------------------------------------|
|              | VDC         | VDC            | mA             | mA                           | %                         | µF                                  |
| RP10-123.3SE | 9-18        | 3.3            | 2000           | 724                          | 80                        | 6800                                |
| RP10-1205SE  | 9-18        | 5              | 2000           | 1082                         | 81                        | 4700                                |
| RP10-1212SE  | 9-18        | 12             | 830            | 1064                         | 82                        | 690                                 |
| RP10-1215SE  | 9-18        | 15             | 670            | 1088                         | 81                        | 470                                 |
| RP10-243.3SE | 18-36       | 3.3            | 2000           | 362                          | 80                        | 6800                                |
| RP10-2405SE  | 18-36       | 5              | 2000           | 534                          | 82                        | 4700                                |
| RP10-2412SE  | 18-36       | 12             | 830            | 519                          | 84                        | 690                                 |
| RP10-2415SE  | 18-36       | 15             | 670            | 523                          | 84                        | 470                                 |
| RP10-483.3SE | 36-75       | 3.3            | 2000           | 183                          | 79                        | 6800                                |
| RP10-4805SE  | 36-75       | 5              | 2000           | 260                          | 84                        | 4700                                |
| RP10-4812SE  | 36-75       | 12             | 830            | 253                          | 86                        | 690                                 |
| RP10-4815SE  | 36-75       | 15             | 670            | 258                          | 85                        | 470                                 |
| RP10-1205DE  | 9-18        | ±5             | ±1000          | 1068                         | 82                        | ±680                                |
| RP10-1212DE  | 9-18        | ±12            | ±416           | 1053                         | 83                        | ±330                                |
| RP10-1215DE  | 9-18        | ±15            | ±333           | 1041                         | 84                        | ±110                                |
| RP10-2405DE  | 18-36       | ±5             | ±1000          | 548                          | 80                        | ±680                                |
| RP10-2412DE  | 18-36       | ±12            | ±416           | 520                          | 84                        | ±330                                |
| RP10-2415DE  | 18-36       | ±15            | ±333           | 520                          | 84                        | ±110                                |
| RP10-4805DE  | 36-75       | ±5             | ±1000          | 267                          | 82                        | ±680                                |
| RP10-4812DE  | 36-75       | ±12            | ±416           | 254                          | 86                        | ±330                                |
| RP10-4815DE  | 36-75       | ±15            | ±333           | 260                          | 84                        | ±110                                |

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

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

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

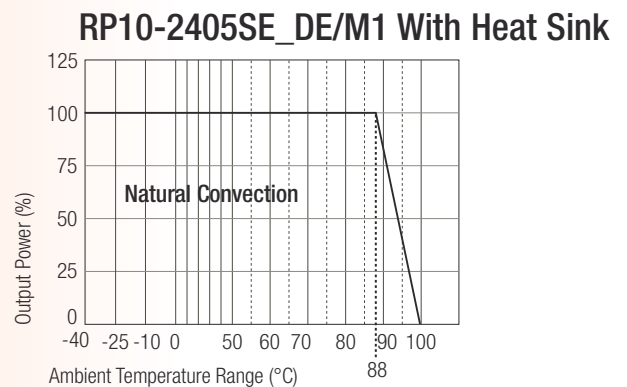
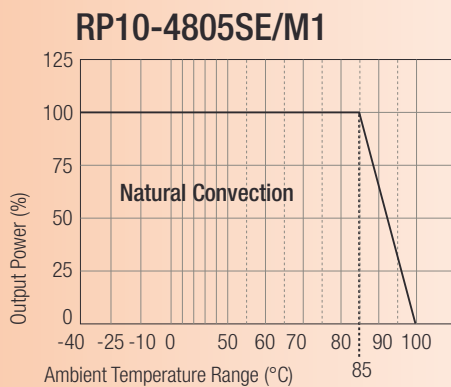
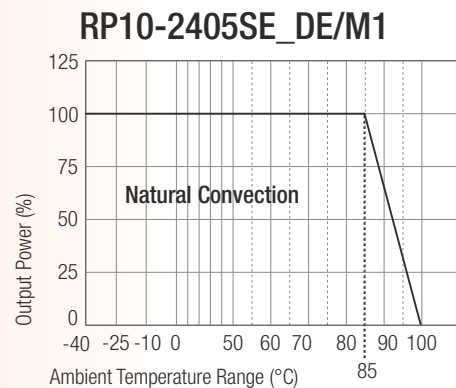
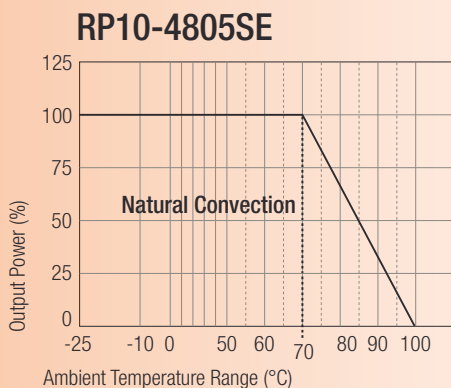
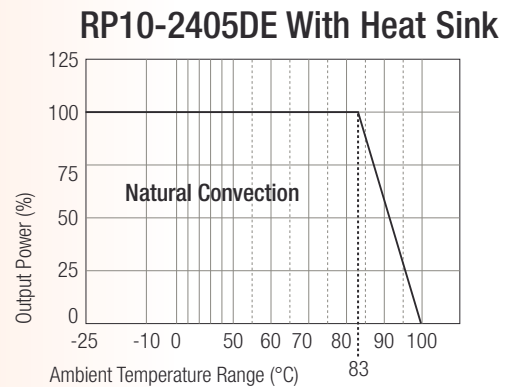
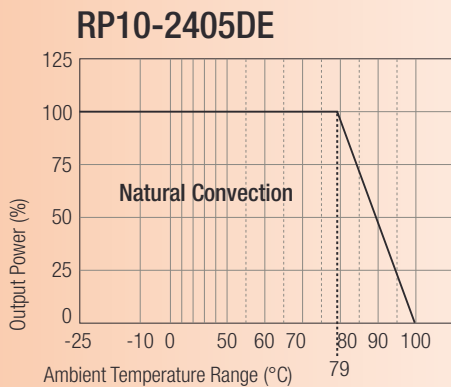
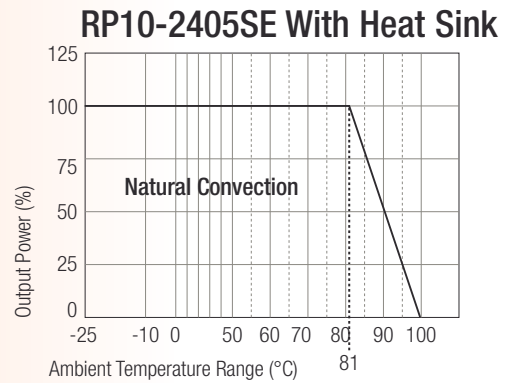
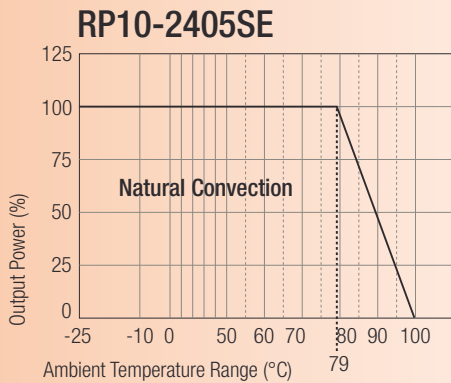
### Description

The E-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 <sup>(9)</sup>.



**UL-60950-1 Certified**

**Derating-Graph (Ambient Temperature)**



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) (see Note 3)         |                   | 30mA <sub>p-p</sub>           |
| Start Up Time (nominal Vin and constant resistor load)                  |                   | 20ms typ.                     |
| Remote ON/OFF (Optional. See Note 7)<br>(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 (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            | ±1%                           |
|   | Dual              | ±2%                           |
| Cross Regulation (asymmetrical load 25%/100% full load)                 |                   | ±5%                           |
| Ripple and Noise (20MHz bandwidth)                                      | 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   | 3.3V output       | 3.9V                          |
| Zener diode clamp   | 5V output         | 6.2V                          |
|   | 12V output        | 15V                           |
|   | 15V output        | 18V                           |
|   |                   |                               |
| Over Load Protection (% of full load at nominal Vin)                    |                   | 150% typ                      |
| 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.                   |
| Approved to Safety Standards (see Note 9)                               |                   | UL 1950, EN60950              |
| Operating Temperature Range<br>(Reference Derating Curve) (see Note 10) | Standard          | -25°C to +85°C(with derating) |
|   | M1                | -40°C to +85°C(non derating)  |
| Maximum Case Temperature  |                   | +100°C                        |
| Storage Temperature Range   |                   | -55°C to +105°C               |

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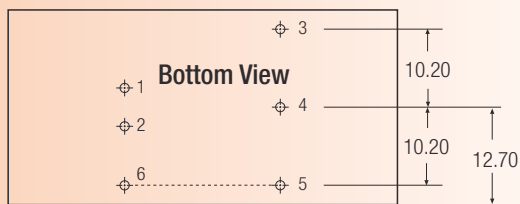
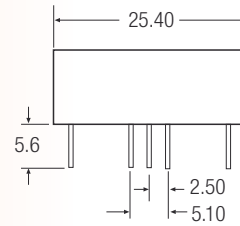
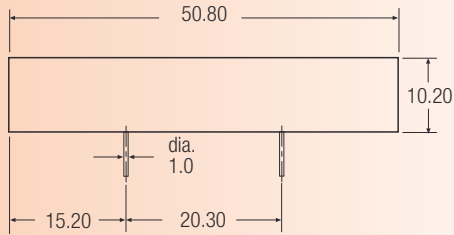
**Specifications** (typical at nominal input and 25°C unless otherwise noted)

|                                   |                                   |                                       |
|-----------------------------------|-----------------------------------|---------------------------------------|
| Thermal Impedance<br>(see Note 8) | Natural convection                | 12°C/Watt                             |
|                                   | Natural convection with Heat Sink | 10°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 plated copper                  |
| Base Material                     |                                   | Non-conductive black plastic          |
| Potting Material                  |                                   | Epoxy (UL94-V0)                       |
| Conducted Emissions (see Note 11) | 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                            |                                   | 27g                                   |
| Dimensions                        |                                   | 50.8 x 25.4 x 10.2mm                  |
| MTBF (see Note 2)                 |                                   | 1976 x 10 <sup>3</sup> hours          |

**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 12µH. 12µH 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. RP10-2405SE/P)  
Negative logic ON/OFF is marked with suffix-N (eg. RP10-2405SE/N).  
If no suffix is specified, the control pin will be omitted.
- Heat sink is optional and P/N: 7G-0020A.
- The M1 version (RP10-xxxxSE/M1, RP10-xxxxDE/M1) does not carry the UL certification.
- M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard version.
- See application notes for EMI-filtering.

**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