

## Features

### Regulated Converters

- 4:1 Wide Input Voltage Range
- 15 Watts Regulated Output Power
- 1.6kVDC Isolation
- Over Current and Over Voltage Protection
- Six-Sided Shield
- No Derating to 65°C
- Standard 2" x 1" Package and Pinning
- Efficiency to 86 %

### Description

The RP15-FW series wide range input DC/DC converters are certified to UL 60950-1 and to 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.

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

| Part Number   | Input Range VDC | Output Voltage VDC | Output Current mA | Input <sup>(4,5)</sup> Current mA | Efficiency <sup>(6)</sup> % | Capacitive <sup>(7)</sup> Load max. $\mu$ F |
|---------------|-----------------|--------------------|-------------------|-----------------------------------|-----------------------------|---------------------------------------------|
| RP15-243.3SFW | 9-36            | 3.3                | 4500              | 60/773                            | 84                          | 14750 $\mu$ F                               |
| RP15-2405SFW  | 9-36            | 5                  | 3000              | 60/777                            | 86                          | 7200 $\mu$ F                                |
| RP15-2412SFW  | 9-36            | 12                 | 1250              | 75/771                            | 85                          | 1250 $\mu$ F                                |
| RP15-2415SFW  | 9-36            | 15                 | 1000              | 75/762                            | 86                          | 800 $\mu$ F                                 |
| RP15-483.3SFW | 18-75           | 3.3                | 4500              | 30/422                            | 84                          | 14750 $\mu$ F                               |
| RP15-4805SFW  | 18-75           | 5                  | 3000              | 30/381                            | 86                          | 7200 $\mu$ F                                |
| RP15-4812SFW  | 18-75           | 12                 | 1250              | 40/385                            | 85                          | 1250 $\mu$ F                                |
| RP15-4815SFW  | 18-75           | 15                 | 1000              | 40/381                            | 86                          | 800 $\mu$ F                                 |
| RP15-2405DFW  | 9-36            | $\pm$ 5            | $\pm$ 1500        | 85/801                            | 82                          | $\pm$ 3600 $\mu$ F                          |
| RP15-2412DFW  | 9-36            | $\pm$ 12           | $\pm$ 625         | 100/771                           | 85                          | $\pm$ 625 $\mu$ F                           |
| RP15-2415DFW  | 9-36            | $\pm$ 15           | $\pm$ 500         | 100/762                           | 86                          | $\pm$ 400 $\mu$ F                           |
| RP15-4805DFW  | 18-75           | $\pm$ 5            | $\pm$ 1500        | 45/400                            | 82                          | $\pm$ 3600 $\mu$ F                          |
| RP15-4812DFW  | 18-75           | $\pm$ 12           | $\pm$ 625         | 50/385                            | 85                          | $\pm$ 625 $\mu$ F                           |
| RP15-4815DFW  | 18-75           | $\pm$ 15           | $\pm$ 500         | 50/381                            | 86                          | $\pm$ 400 $\mu$ F                           |

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

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

\* add suffix -HC for premounted heatsink and clips

### Ordering Examples

RP15-2405SFW/P = 24V 4:1 Input, 5V Output, Positive Logic CTRL pin fitted

RP15-4805DFW-HC = 48V 4:1 Input,  $\pm$ 5V Output, No CTRL pin, Heatsink fitted

## POWERLINE

### DC/DC-Converter

with 3 year Warranty

RECOM

## 15 Watt 2" x 1" Single & Dual Output



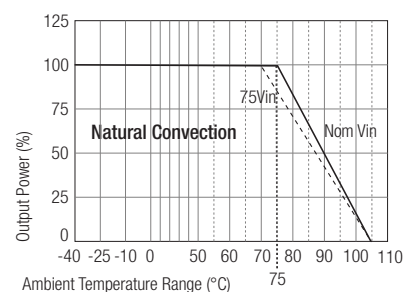
**UL-60950-1 Certified  
E196683**

## RP15-FW

## Derating-Graph

(Ambient Temperature)

RP15-4805SFW



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)

**Refer to Application Notes**

**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)                                                               |                                    | 20mA <sub>p-p</sub>            |
| Start Up Time (nominal Vin and constant resistor load)                                                           |                                    | 20ms typ.                      |
| Remote ON/OFF <sup>(1)</sup>                                                                                     | DC-DC ON                           | Open or 3.0V < Vr < 12V        |
|                                                                                                                  | DC-DC OFF                          | Short or 0V < Vr < 1.2V        |
| Remote OFF input current                                                                                         | Nominal input                      | 2.5mA                          |
| Output Power                                                                                                     |                                    | 15W max.                       |
| Output Voltage Accuracy (full Load and nominal Vin)                                                              |                                    | ±1%                            |
| Minimum Load                                                                                                     |                                    | 0%                             |
| Line Regulation (low line, high line at full load)                                                               |                                    | ±0.2%                          |
| Load Regulation (0% to 100% full load)                                                                           | Single                             | ±0.5%                          |
|                                                                                                                  | Dual                               | ±1%                            |
| Cross Regulation Dual Output (asymmetrical 25% <> 100% load)                                                     | Dual                               | ±5%                            |
| Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output)<br>(measured with a 104pF ceramic across the output) | 3.3, 5.0V                          | 50mV <sub>p-p</sub>            |
|                                                                                                                  | 12, 15, ±5, ±12, ±15V              | 75mV <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 min.                   |
| Isolation Resistance                                                                                             |                                    | 10 GΩ min.                     |
| Isolation Capacitance                                                                                            |                                    | 1500pF max.                    |
| Operating Frequency                                                                                              |                                    | 400kHz typ.                    |
| Operating Temperature Range                                                                                      | 5.1, 12, 15, ±12, ±15V             | -40°C to +75°C                 |
|                                                                                                                  | 3.3, ±5V                           | -40°C to +65°C                 |
|                                                                                                                  | with derating                      | -40°C to +105°C                |
| Maximum Case Temperature                                                                                         |                                    | +105°C                         |
| Storage Temperature Range                                                                                        |                                    | -55°C to +125°C                |
| Thermal Impedance <sup>(8)</sup>                                                                                 | Natural convection                 | 12°C/Watt                      |
|                                                                                                                  | with Heatsink                      | 10°C/Watt                      |
| Case Material                                                                                                    |                                    | Nickel plated copper           |
| Base Material                                                                                                    |                                    | Non-conductive black plastic   |
| Potting Material                                                                                                 |                                    | Epoxy (UL94-V0)                |
| Weight                                                                                                           |                                    | 27g                            |

continued on next page

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

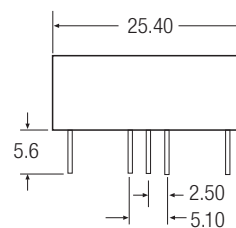
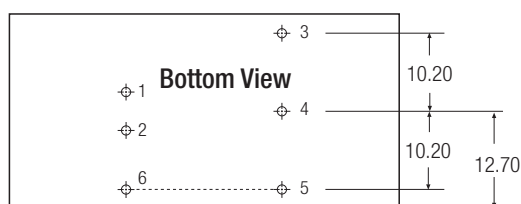
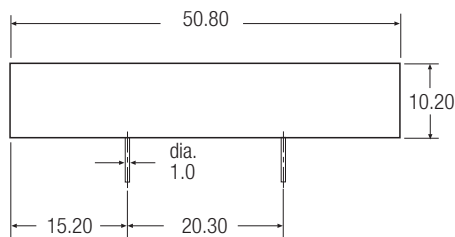
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|------------------------------------|----------------------------------------|----------------------------------------|
| Packing Quantity                   | Refer to App Notes for tube dimensions | 9 pcs per TubeC                        |
| Conducted Emissions <sup>(3)</sup> | EN55022                                | Class A                                |
| Radiated Emissions <sup>(3)</sup>  | EN55022                                | Class A                                |
| ESD                                | EN61000-4-2                            | Perf. Criteria B                       |
| Radiated Immunity                  | EN61000-4-3                            | Perf. Criteria A                       |
| Fast Transient <sup>(3)</sup>      | EN61000-4-4                            | Perf. Criteria B                       |
| Surge <sup>(3)</sup>               | EN61000-4-5                            | Perf. Criteria B                       |
| Conducted Immunity                 | EN61000-4-6                            | Perf. Criteria A                       |
| Thermal Shock                      |                                        | MIL-STD-810D                           |
| Vibration                          |                                        | 10-55Hz, 10G, 30 Min. along X, Y and Z |
| Relative Humidity                  |                                        | 5% to 95% RH                           |
| MTBF <sup>(2)</sup>                | Bellcore-TR-NWT-000332                 | 2350 x 10 <sup>3</sup> hours           |

## Notes :

- 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. RP15-2405SFW/P)  
Negative logic ON/OFF is marked with suffix-N (eg. RP15-2405SFW/N).  
If no suffix is specified, the control pin will be omitted.
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).
- RP15-24xxW meets Class A. RP15-48xxW requires 1μF MLCC across input to meet Class A.  
An external capacitor (220μF/Low ESR) is required to meet EN61000-4-4 and -5  
See application notes for Class B common mode filter suggestion.
- Typical value at nominal input voltage and no load.
- Maximum value at nominal input voltage and full load
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistor load.
- Optional Heatsink Part Number 7G-0020-C. Powerline DC/DC Converters can be ordered with pre-mounted heatsinks including antivibration fixing clips (add suffix -HC). See Application Notes for heatsink details.

## Package Style and Pinning (mm)

### 2" x 1" Package Style



### 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 1.

Pin Pitch Tolerance  $\pm 0.25$  mm  
Pin dimension tolerance  $\pm 0.1$  mm  
Tolerance: X.X  $\pm 0.5$  mm  
X.XX  $\pm 0.25$  mm

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