

# Features

- Ultraminiature 25.4 x 25.4 x 9.9mm Package
- 15 Watts Output Power
- Single or Dual Outputs
- Wide 4:1 Input Voltage Range
- 1.6kVDC Isolation
- Fixed Operating Frequency
- Six-Sided Continuous Shield
- Industry Standard Pinout
- Remote On/Off and Trim pins
- Efficiency to 87%

## Description

The RP15-SAW series are ultraminiature wide input voltage range power DC/DC converters in a case half the size of industry standard 15W converters. Despite their small size, the RP15-SAW converters are fully specified devices with output currents up to 4 Amps, no minimum load, 1600VDC isolation and low ripple/noise figures. The outputs are also fully protected against short circuits, overcurrent and overvoltage. The RP15-SAW series will find many uses in applications where board space and/or board height is at a premium.

## Selection Guide 24V and 48V Input Types

| Part Number     | Input Range VDC | Output Voltage VDC | Output Current mA | Input <sup>(1)</sup> Current mA | Efficiency <sup>(2)</sup> % | Capacitive <sup>(3)</sup> Load max. |
|-----------------|-----------------|--------------------|-------------------|---------------------------------|-----------------------------|-------------------------------------|
| RP15-243.3SAW** | 9-36            | 3.3                | 4000              | 50/688                          | 86                          | 1000µF                              |
| RP15-2405SAW**  | 9-36            | 5                  | 3000              | 70/762                          | 86                          | 1000µF                              |
| RP15-2412SAW**  | 9-36            | 12                 | 1300              | 20/783                          | 87                          | 330µF                               |
| RP15-2415SAW**  | 9-36            | 15                 | 1000              | 20/753                          | 87                          | 220µF                               |
| RP15-483.3SAW** | 18-75           | 3.3                | 4000              | 40/336                          | 86                          | 1000µF                              |
| RP15-4805SAW**  | 18-75           | 5                  | 3000              | 40/382                          | 86                          | 1000µF                              |
| RP15-4812SAW**  | 18-75           | 12                 | 1300              | 15/392                          | 87                          | 330µF                               |
| RP15-4815SAW**  | 18-75           | 15                 | 1000              | 15/377                          | 87                          | 220µF                               |
| RP15-2405DAW**  | 9-36            | ±5                 | ±1500             | 20/772                          | 85                          | ±500µF                              |
| RP15-2412DAW**  | 9-36            | ±12                | ±625              | 25/753                          | 87                          | ±150µF                              |
| RP15-2415DAW**  | 9-36            | ±15                | ±500              | 25/744                          | 88                          | ±100µF                              |
| RP15-4805DAW**  | 18-75           | ±5                 | ±1500             | 15/386                          | 85                          | ±500µF                              |
| RP15-4812DAW**  | 18-75           | ±12                | ±625              | 15/382                          | 86                          | ±150µF                              |
| RP15-4815DAW**  | 18-75           | ±15                | ±500              | 15/377                          | 87                          | ±100µF                              |

\*\* Standard part is without suffixes and Trim and CTRL pins are not fitted.

\* add suffix /P for CTRL function with positive logic (1=ON, 0=OFF) including trim pin for single output

\* add suffix /N for CTRL function with negative logic (0=ON, 1=OFF) including trim pin for single output

\* add suffix -HC for premounted heatsink and clips

## Ordering Examples

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

RP15-4805DAW-HC = 48V 4:1 Input, ±5V Output, Premounted Heatsink

RP15-483.3DAW/N = 48V 4:1 Input, ±5V Output, Negative Logic CTRL pin  
(no trim pin with dual output)

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)

# POWERLINE

## DC/DC-Converter

with 3 year Warranty

# RECOM

# 15 Watt Single & Dual Output

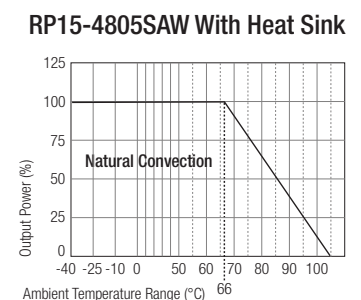
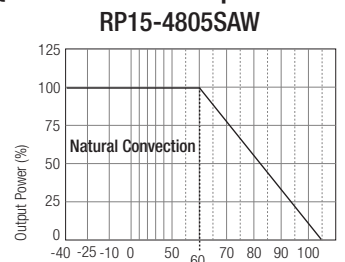


**UL-60950-1 Certified  
E196683**

# RP15-AW

## Derating-Graph

(Ambient Temperature)



**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) <sup>(4)</sup> |                                   | 30mA <sub>p-p</sub>                           |
| Start Up Time (nominal Vin and constant resistor load)            |                                   | 30ms max.                                     |
| Optional Remote ON/OFF <sup>(5)</sup><br>(Negative logic)         | DC-DC ON                          | Short or 0V < Vr < 1.2V                       |
|   | DC-DC OFF                         | Open or 3.0V < Vr < 12V                       |
| Remote Pin drive current  | Nominal Vin                       | -0.5mA~1.0mA                                  |
| Remote OFF input current  | Nominal Vin                       | 2.5mA   |
| Output Voltage Accuracy (full Load and nominal Vin)               |                                   | ±1%   |
| Optional Output Trim <sup>(6)</sup>                               |                                   | ±10%  |
| Minimum Load  |                                   | 0%  |
| Line Regulation (low line, high line at full load)                | Single                            | ±0.2%   |
|   | Dual                              | ±0.5%   |
| Load Regulation (0% to full load)                                 | Single                            | ±0.2%   |
|   | Dual                              | ±1%   |
| Cross Regulation (Asymmetrical 25% <> 100% load)                  | Dual Output                       | ±5%   |
| Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output)       | 3.3, 5V Outputs                   | 75mV <sub>p-p</sub>                           |
|   | Others                            | 100mV <sub>p-p</sub>                          |
| Temperature Coefficient   |                                   | ±0.02%/°C max.                                |
| Transient Response (25% load step change)                         |                                   | 250µs   |
| Over Voltage Protection   | 3.3V                              | 3.7-5.4V                                      |
| Zener diode clamp (only single)                                   | 5V                                | 5.4-7.0V                                      |
|   | 12V                               | 13.5-19.6V                                    |
|   | 15V                               | 16.8-20.5V                                    |
|   |                                   |   |
| Over Load Protection (% of full load at nominal Vin)              |                                   | 150% typ                                      |
| Undervoltage Lockout  |                                   | See Application Notes                         |
| 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   |                                   | 1000pF max. Operating Frequency<br>400kHz typ |
| Operating Temperature Range                                       |                                   | -40°C to +85°C(with derating)                 |
| Maximum Case Temperature  |                                   | +105°C  |
| Storage Temperature Range   |                                   | -55°C to +125°C                               |
| Thermal Impedance <sup>(8)</sup>                                  | Natural convection                | 18.2°C/Watt                                   |
|   | Natural convection with Heat Sink | 15.8°C/Watt                                   |
| Thermal Shock   |                                   | MIL-STD-810F                                  |

continued on next page

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

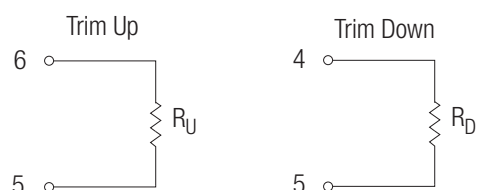
|                                    |   |   |
|------------------------------------|---|---|
| Vibration                          | 10-55Hz, 10G, 30 Min. along X, Y and Z  |   |
| Relative Humidity                  | 5% to 95% RH                            |   |
| Case Material                      | Nickel plated copper                    |   |
| Base Material                      | FR4 PCB                                 |   |
| Potting Material                   | Epoxy (UL94-V0)                         |   |
| Conducted Emissions <sup>(7)</sup> | EN55022                                 | Class A   |
| Radiated Emissions                 | EN55022                                 | Class A   |
| ESD                                | EN61000-4-2                             | Perf. Criteria A  |
| Radiated Immunity                  | EN61000-4-3                             | Perf. Criteria A  |
| Fast Transient                     | EN61000-4-4                             | Perf. Criteria A  |
| Surge <sup>(8)</sup>               | EN61000-4-5                             | Perf. Criteria A  |
| Conducted Immunity                 | EN61000-4-6                             | Perf. Criteria A  |
| Weight                             | 15g                                     |   |
| Packing Quantity                   | Refer to App Notes for tube dimensions  | 8 pcs per Tube  |
| Dimensions                         | 25.4 x 25.4 x 9.9mm                     |   |
| MTBF <sup>(9)</sup>                | Bellcore TR-NWT-000332<br>MIL-HDBK 217F | 1330 x 10 <sup>3</sup> hours<br>563 x 10 <sup>3</sup> hours |

**Notes :**

1. Values at nominal input voltage and no load/full load.
2. Typical Value at nominal input voltage and full load.
3. Test by minimum Vin and constant resistor load.
4. Simulated source impedance of 12μH. 12μH inductor in series with +Vin.
5. 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. RP15-2405SAW/P)  
Negative logic ON/OFF is marked with suffix-N (eg. RP15-2405SAW/N).  
If no suffix is specified, the control pin will be omitted.
6. Optional Heat-sink P/N is 7G-0047-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.
7. Meets Class A with external input capacitors shown below. Will meet Class B with external common mode filter (see Application Notes)
8. Requires external capacitor to meet EN61000-4-5: 220μF/100V, low ESR (48mOhm)
9. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C.  
MIL-HDBK 217F Notice 2. Ta = 25°C, full load, (Ground Benign, controlled environment).

## External Output Trimming (optional)

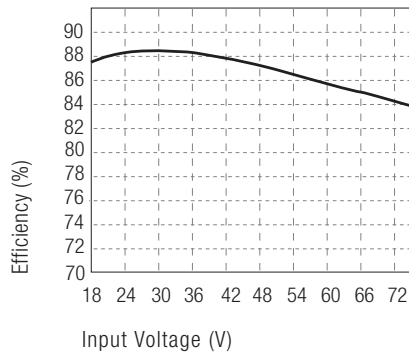
With /CTRL suffix, output can be externally trimmed by using the method shown here.  
See Application Notes for details.



**Typical Characteristics**

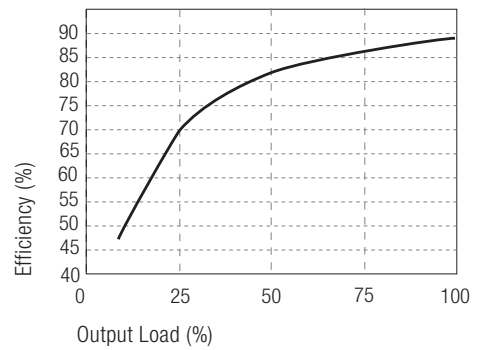
### RP15-4805SAW

Efficiency VS Input Voltage

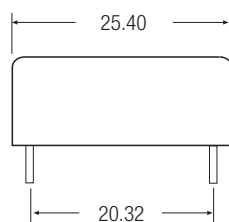
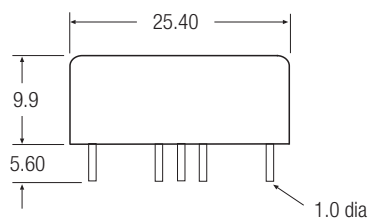


### RP15-4805SAW

Efficiency VS Output load



**Package Style and Pinning (mm)**

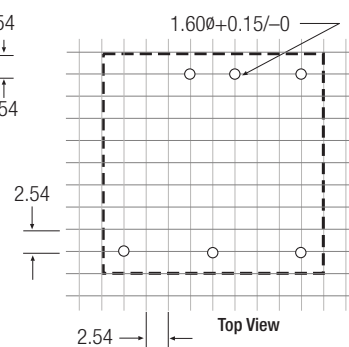
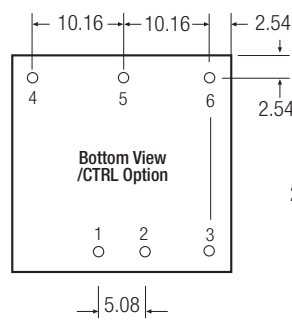
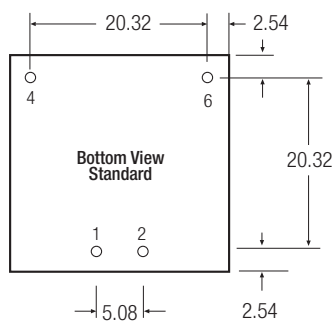


**Pin Connections**

| Pin # | Single | Single/<br>P or /N | Dual   | Dual/<br>P or /N |
|-------|--------|--------------------|--------|------------------|
| 1     | +Vin   | +Vin               | +Vin   | +Vin             |
| 2     | -Vin   | -Vin               | -Vin   | -Vin             |
| 3     | no pin | CTRL               | no pin | CTRL             |
| 4     | +Vout  | +Vout              | +Vout  | +Vout            |
| 5     | no pin | Trim               | Com    | Com              |
| 6     | -Vout  | -Vout              | -Vout  | -Vout            |

Case Tolerance ±0.5 mm

Pin Pitch Tolerance ±0.25 mm



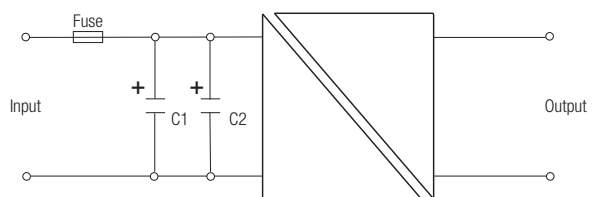
Footprint Details

**EMC Filtering - For Class B filter suggestion, see Application Notes**

### Class A Filter

Vin=24V: C1=6.8µF/50V 1812 MLCC, C2 omitted.

Vin=48V: C1, C2 = 2.2µF/100V 1812 MLCC



The product information and specifications are subject to change without prior notice. All products are designed for non-safety critical commercial and industrial applications. The Buyer agrees to implement safeguards that anticipate the consequences of any failures that might cause harm, loss of life and/or damage property.

RP15-AW