

## Features

- Ultraminiature 25.4 x25.4x9.9mm 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 (1) Current mA	Efficiency (2) %	Capacitive (3) 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

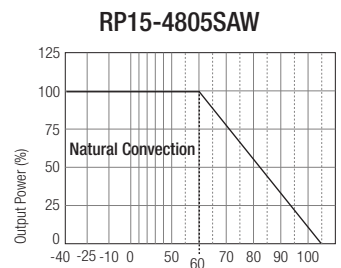
## 15 Watt Single & Dual Output



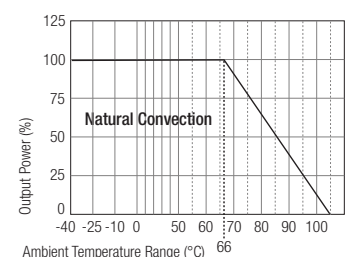
**UL-60950-1 Certified  
E196683**

## RP15-AW

## Derating Graph (Ambient Temperature)



## RP15-4805SAW With Heat Sink



**Please Read 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> (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 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)

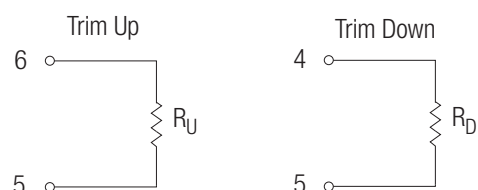
Vibration	10-55Hz, 10G, 30 Min. along X, Y and Z	
Relative Humidity	5% to 95% RH	
Case Material	Nickel plated copper	
Base Material	FR4 PCB	
Potting Material	Epoxy (UL94-V0)	
Conducted Emissions <sup>(7)</sup>	EN55022	Class A
Radiated Emissions	EN55022	Class A
ESD	EN61000-4-2	Perf. Criteria A
Radiated 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 MIL-HDBK 217F	1330 x 10 <sup>3</sup> hours 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  $V_{in}$  and constant resistor load.
4. Simulated source impedance of 12 $\mu$ H. 12 $\mu$ H inductor in series with + $V_{in}$ .
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: 220 $\mu$ F/100V, low ESR (48mOhm)
9. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C.  
MIL-HDBK 217F Notice 2.  $T_a = 25^\circ\text{C}$ , full load, (Ground Benign, controlled environment).

## External Output Trimming (optional)

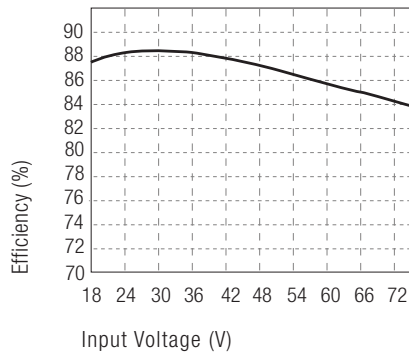
With /CTRL suffix, output can be externally trimmed by using the method shown here.  
See Application Notes for details.



**Typical Characteristics**

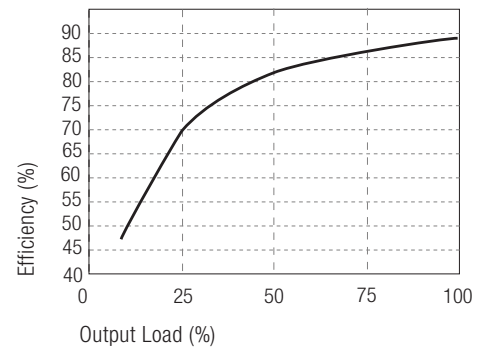
### RP15-4805SAW

Efficiency VS Input Voltage

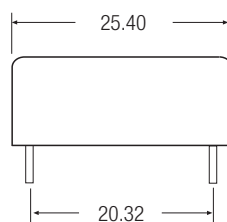
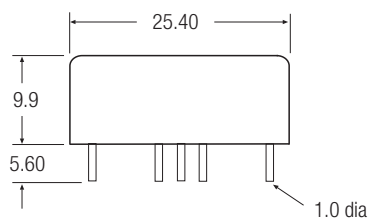


### RP15-4805SAW

Efficiency VS Output load



**Package Style and Pinning (mm)**

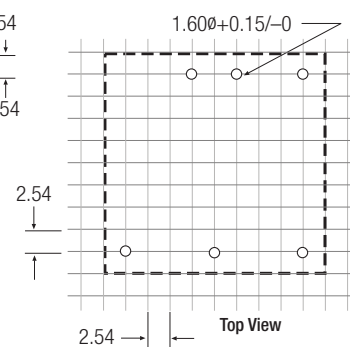
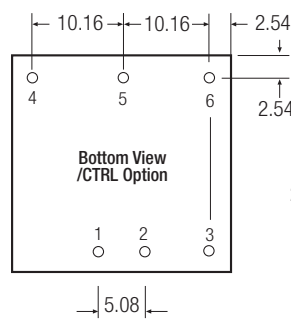
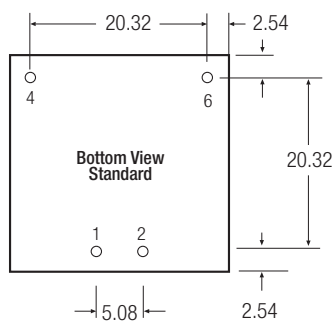


**Pin Connections**

Pin #	Single	Single/ P or /N	Dual	Dual/ 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  $\pm 0.5$  mm

Pin Pitch Tolerance  $\pm 0.25$  mm



Footprint Details

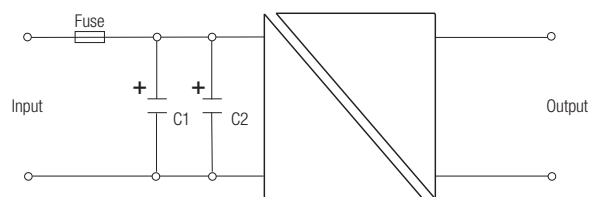
RP15-AW

**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.