

## Features

- Ultraminiature 25.4 x25.4x9.9mm Package
- 15 Watts Output Power
- Single and Dual Outputs
- 1.6kVDC Isolation
- Fixed Operating Frequency
- Six-Sided Continuous Shield
- Industry Standard Pinout
- Remote On/Off and Trim pins
- Efficiency to 88 %

Rev. 2

## Description

The RP15-SA series are ultraminiature power DC/DC converters in a case half the size of industry standard 15W converters. Despite their small size, the RP15-SA 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-SA 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.
RP15-123.3SA**	9-18	3.3	4000	120/1375	84	1000µF
RP15-1205SA**	9-18	5	3000	90/1524	86	1000µF
RP15-1212SA**	9-18	12	1300	40/1605	85	330µF
RP15-1215SA**	9-18	15	1000	40/1506	87	220µF
RP15-243.3SA**	18-36	3.3	4000	50/671	86	1000µF
RP15-2405SA**	18-36	5	3000	65/763	86	1000µF
RP15-2412SA**	18-36	12	1300	20/783	87	330µF
RP15-2415SA**	18-36	15	1000	20/744	88	220µF
RP15-483.3SA**	36-75	3.3	4000	40/336	86	1000µF
RP15-4805SA**	36-75	5	3000	40/372	88	1000µF
RP15-4812SA**	36-75	12	1300	15/387	88	330µF
RP15-4815SA**	36-75	15	1000	15/372	88	220µF
RP15-1205DA**	9-18	±5	±1500	30/1543	85	±500µF
RP15-1212DA**	9-18	±12	±625	30/1506	87	±150µF
RP15-1215DA**	9-18	±15	±500	30/1488	87	±100µF
RP15-2405DA**	18-36	±5	±1500	20/772	85	±500µF
RP15-2412DA**	18-36	±12	±625	15/744	88	±150µF
RP15-2415DA**	18-36	±15	±500	25/744	88	±100µF
RP15-4805DA**	36-75	±5	±1500	15/386	85	±500µF
RP15-4812DA**	36-75	±12	±625	15/368	89	±150µF
RP15-4815DA**	36-75	±15	±500	20/372	88	±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

RP15-2405SA/P = 24V Input, 5V Output, Positive Logic CTRL pin and Trim pin fitted

RP15-4805DA-HC = 48V nput, ±5V Output, Heatsink fitted

## POWERLINE

DC/DC-Converter

# RP15- S\_DA Series

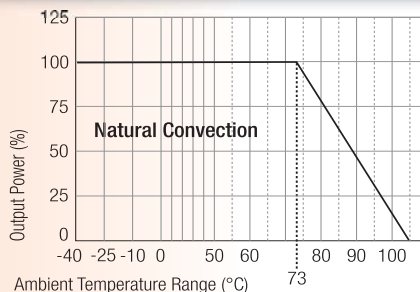
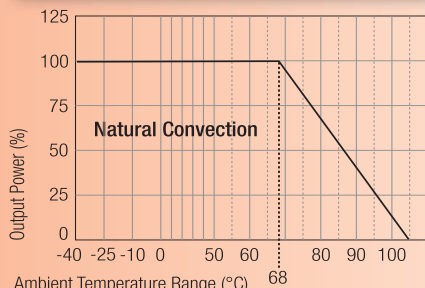
## 15 Watt Single & Dual Output



**UL-60950-1 Certified**



**Derating Graphs (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 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	12V nominal input 24V nominal input 48V nominal input	9-18VDC 18-36VDC 36-75VDC
Input Filter		Pi Type
Input Surge Voltage (100 ms max.)	12V Input 24V Input 48V Input	36VDC 50VDC 100VDC
Input Reflected Ripple (nominal Vin and full load) (see Note 4)		30mA <sub>p-p</sub>
Start Up Time (nominal Vin and constant resistor load)		30ms max.
Optional Remote ON/OFF (See Note 5)	DC-DC ON	Short or 0V < Vr < 1.2V
(Negative logic)	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 (see Note 5)		±10%
Minimum Load		0%
Line Regulation (low line, high line at full load)	Single Dual	±0.2% ±0.5%
Load Regulation (0% to full load)	Single Dual	±0.2% ±1%
Cross Regulation (Asymmetric Load 25% / 100%)	Dual Output	±5%
Ripple and Noise (20MHz bandwidth)	3.3, 5V Outputs Others	75mV <sub>p-p</sub> 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 12V 15V	5.4-7.0V 13.5-19.6V 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		1600VDC min.
Isolation Resistance		1 GΩ min.
Isolation Capacitance		1000pF max.

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

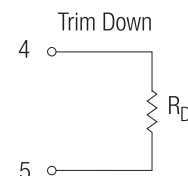
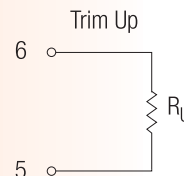
Operating Frequency	400kHz typ.	
Operating Temperature Range	-40°C to +85°C(with derating)	
Maximum Case Temperature	+105°C	
Storage Temperature Range	-55°C to +125°C	
Thermal Impedance (see Note 6)	Natural convection	18.2°C/Watt
	Natural convection with Heat Sink	15.8°C/Watt
Thermal Shock	MIL-STD-810F	
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 (see Note 7)	EN55022	Level A
Radiated Emissions	EN55022	Level 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 (see note 8)	EN61000-4-5	Perf. Criteria A
EN61000-4-6	Perf. Criteria A	Conducted Immunity
Weight	15g	
Dimensions	25.4 x 25.4 x 9.9mm	
MTBF (see Note 9)	Bellcore TR-NWT-000332	1330 x 10 <sup>3</sup> hours
	MIL-HDBK 217F	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. RP15-2405SA/P)  
Negative logic ON/OFF is marked with suffix-N (eg. RP15-2405SA/N).  
If no suffix is specified, the control pin will be omitted.
6. Optional Heat-sink P/N is 7G-0047-F. 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. Will meet Class B with external 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).

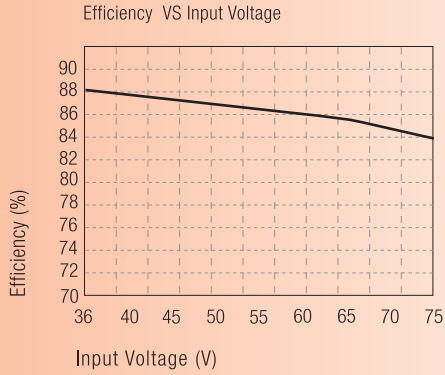
**External Output Trimming (optional)**

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

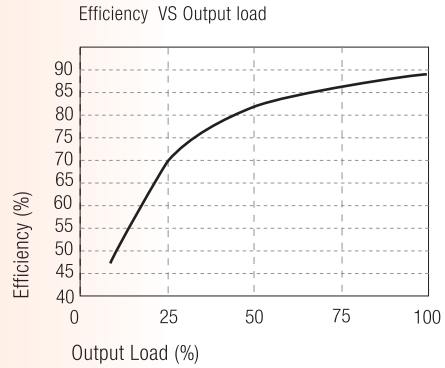


**Typical Characteristics**

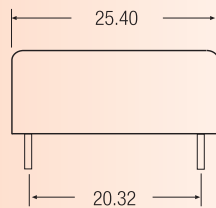
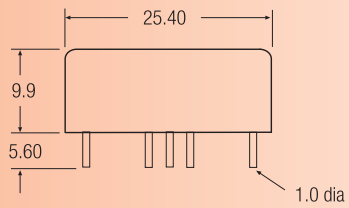
**RP15-4805SA**



**RP15-4805SA**



**Package Style and Pinning (mm)**

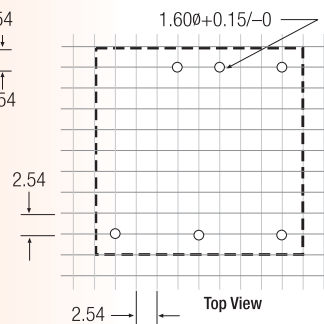
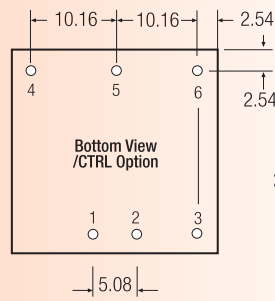
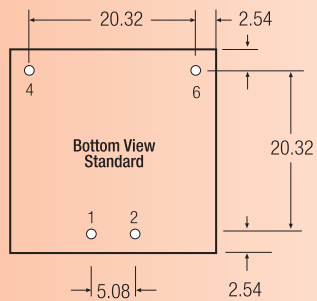


**Pin Connections**

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**

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

## Class A Filter

Vin=12V: C1=10 $\mu$ F/25V 1812 MLCC, C2 omitted.  
 Vin=24V: C1=6.8 $\mu$ F/50V 1812 MLCC, C2 omitted.  
 Vin=48V: C1, C2 = 2.2 $\mu$ F/100V 1812 MLCC

