

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 %

Rev. 2

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, Heatsink fitted

POWERLINE

DC/DC-Converter

RP15-S_DAW Series

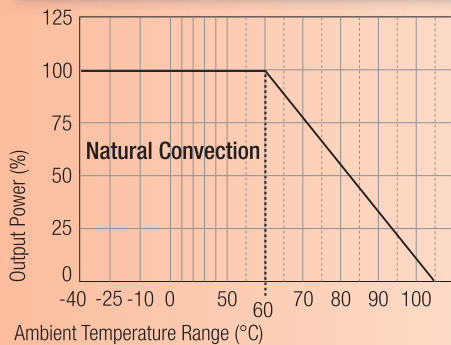
15 Watt Single & Dual Output



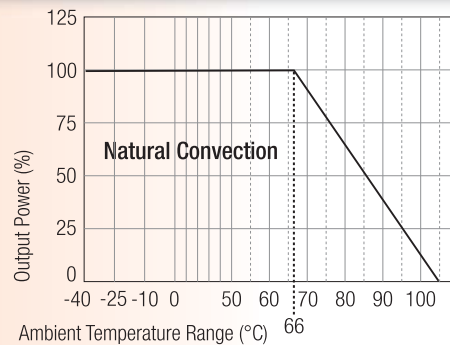
UL-60950-1 Certified

RECOM

Typical Characteristics



RP15-4805SAW



RP15-4805SAW
With Heat Sink

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

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

Input Voltage Range	24V nominal input 48V nominal input	9-36VDC 18-75VDC
Input Filter		Pi Type
Input Surge Voltage (100 ms max.)	24V Input 48V Input	50VDC 100VDC
Input Reflected Ripple (nominal Vin and full load) (see Note 4)		30mA _{p-p}
Start Up Time (nominal Vin and constant resistor load)		30ms max.
Optional Remote ON/OFF (See Note 5) (Negative logic)	DC-DC ON DC-DC OFF	Short or 0V < Vr < 1.2V 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 _{p-p} 100mV _{p-p}
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)

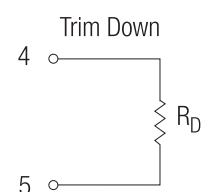
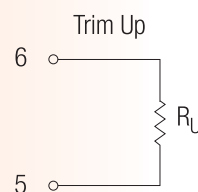
Operating Frequency	400kHz typ	
Operating Temperature Range	-40°C to +85°C(with derating)	
Maximum Case Temperature	+105°C	
Storage Temperature Range	-55°C to +125°C	
Thermal Impedance (see Note 6)	Natural convection	18.2°C/Watt
	Natural convection with Heat Sink	15.8°C/Watt
Thermal Shock	MIL-STD-810F	
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
Conducted Immunity	EN61000-4-6	Perf. Criteria A
Weight	15g	
Dimensions	25.4 x 25.4 x 9.9mm	
MTBF (see Note 9)	Bellcore TR-NWT-000332	1330 x 10 ³ hours
	MIL-HDBK 217F	563 x 10 ³ 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-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)

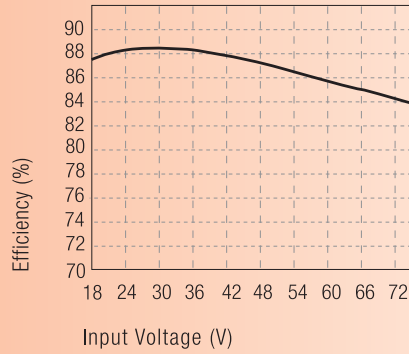
With /CTRL suffix, output can be externally trimmed by using the method shown here.
See Application Notes for details.



Typical Characteristics

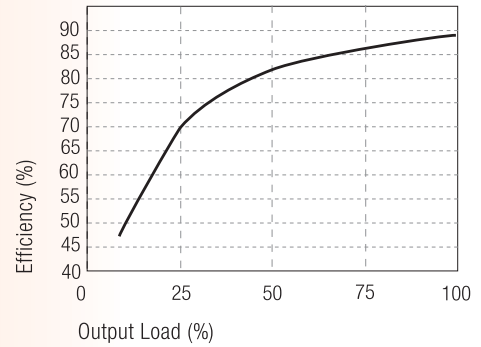
RP15-4805SAW

Efficiency VS Input Voltage

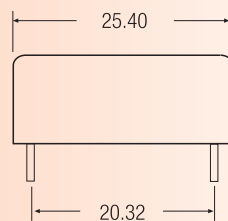
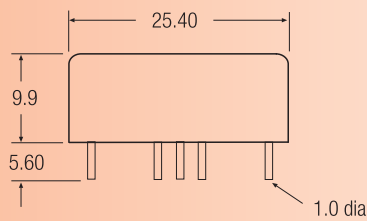


RP15-4805SAW

Efficiency VS Output load



Package Style and Pinning (mm)

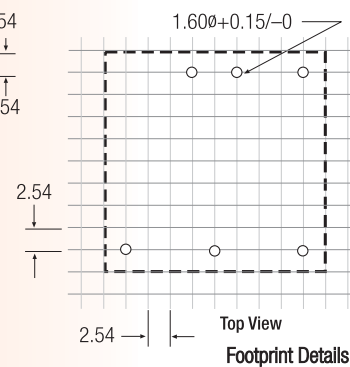
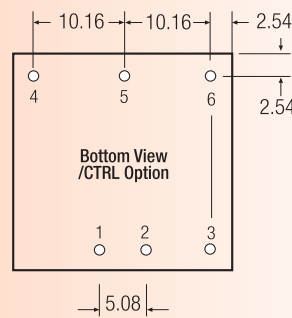
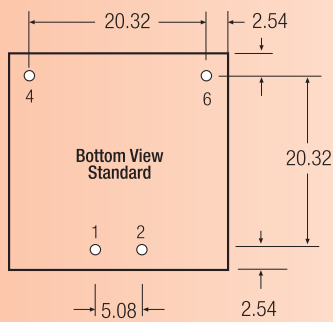


Pin Connections

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 ± 0.5 mm

Pin Pitch Tolerance ± 0.25 mm



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

Class A Filter

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

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

