

Features

- Ultraminiature Open Frame SMD
- 15 Watts Output Power
- 4:1 Input Voltage Range
- Single Output
- 2.25kVDC Isolation
- Fixed Operating Frequency
- Optional Remote On/Off and Trim pins
- Efficiency to 87%

Description

The RP15-SOFW series are SMD open frame ultraminiature power DC/DC converters in a case half the size of industry standard 15W converters. The converters use solder ball pins to enable SMD mounting and can be reflow soldered. Despite their small size, the RP15-SOFW converters are fully specified devices with output currents up to 4 Amps, no minimum load, 2250VDC isolation and low ripple/noise figures. The outputs are also fully protected against short circuits, overcurrent and overvoltage. The RP15-SOFW series will find many uses in telecommunications and other demanding applications where price, board space 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.
RP15-243.3SOFW**	9-36	3.3	4000	60/680	85	1000µF
RP15-2405SOFW**	9-36	5	3000	70/754	87	1000µF
RP15-2412SOFW**	9-36	12	1300	10/793	86	330µF
RP15-2415SOFW**	9-36	15	1000	10/763	86	220µF
RP15-483.3SOFW**	18-75	3.3	4000	40/340	85	1000µF
RP15-4805SOFW**	18-75	5	3000	40/377	87	1000µF
RP15-4812SOFW**	18-75	12	1300	10/397	86	330µF
RP15-4815SOFW**	18-75	15	1000	10/382	86	220µF

** Standard part is without suffix and has no Trim or CTRL connections

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

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

. * add suffix **-R** for Tape and Reel Packaging

Ordering Examples

RP15-4805SOFW = 48V 4:1 Input, 5V Output, No CTRL pin, No Trim Pin

RP15-4805SOFW/P = 48V 4:1 Input, 5V Output, Positive Logic CTRL pin and Trim pin fitted.

RP15-243.3SOFW/N = 24V 4:1 Input, 3.3V Output, Negative Logic CTRL pin and Trim pin fitted

POWERLINE

DC/DC-Converter

with 3 year Warranty

RECOM

15 Watt Single Output Open Frame SMD



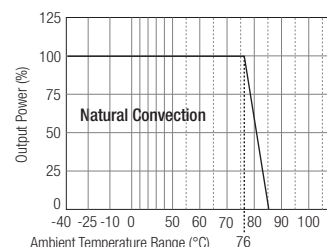
UL-60950-1 Certified
E196683

RP15-SOFW

Derating-Graph

(Ambient Temperature)

RP15-4805SOFW



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

Refer to Application Notes

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) ⁽⁴⁾		30mA _{p-p}
Start Up Time (nominal Vin and constant resistor load)		30ms max.
Optional Remote ON/OFF ⁽⁵⁾	DC-DC ON	Short or 0V < Vr < 1.2V
Negative logic (/N)	DC-DC OFF	Open or 3.0V < Vr < 15V
	DC-DC ON	Open or 3.0V < Vr < 15V
Positive logic (/P)	DC-DC OFF	Short or 0V < Vr < 1.2V
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 ⁽⁶⁾		±10%
Minimum Load		0%
Line Regulation (low line, high line at full load)	All Output voltages	±0.2%
Load Regulation (0% to full load)	All Output voltages	±0.2%
Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output)	All Output voltages	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	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)	Basic Isolation	2250VDC
Isolation Resistance		1 GΩ min.
Isolation Capacitance		1500pF max.
Operating Frequency	3.3V, 5V All others	350kHz typ 400kHz typ
Operating Temperature Range		-40°C to +85°C (with derating)
Storage Temperature Range		-55°C to +125°C
Thermal Impedance	Natural convection	18.2°C/Watt
Thermal Shock		MIL-STD-810F
Vibration		10-55Hz, 2G, 30 Min. along X, Y and Z
Relative Humidity		5% to 95% RH
Base Material		FR4 PCB
Weight		10.5g
Packing Quantity	Refer to App Notes for tube dimensions	20 pcs per Tube 120 pcs per Reel
Dimensions		27.9 x 23.9 x 8.5mm

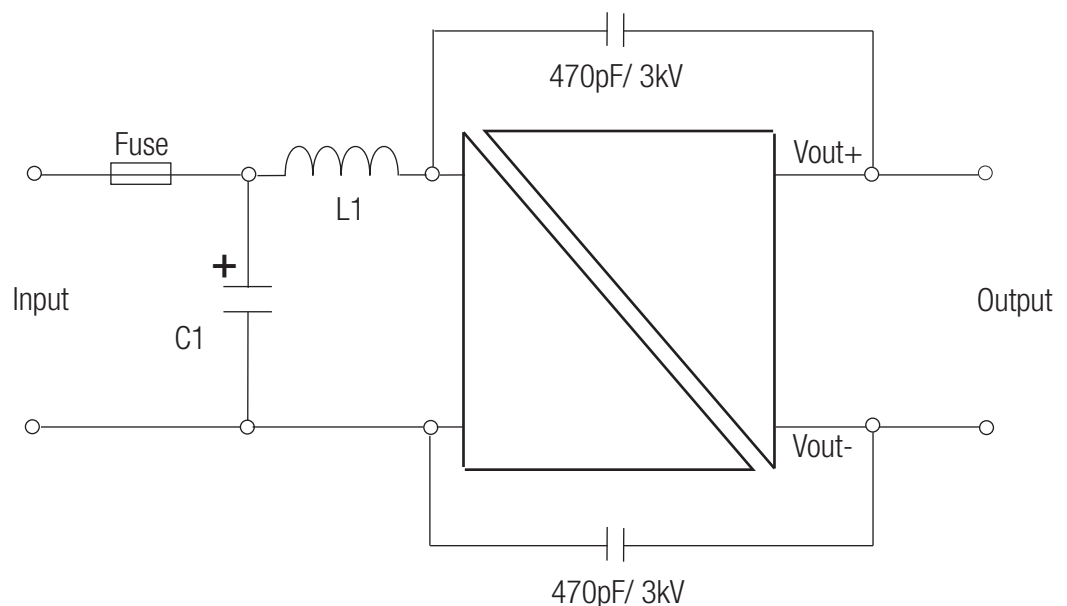
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Specifications (typical at nominal input and 25°C unless otherwise noted)

Conducted Emissions ⁽⁶⁾	EN55022	Class A/B
Radiated Emissions	EN55022	ClassB
Radiated Immunity	EN61000-4-3	Perf. Criteria A
Fast Transient ⁽⁷⁾	EN61000-4-4	Perf. Criteria A
Surge ⁽⁷⁾	EN61000-4-5	Perf. Criteria A
Conducted Immunity	EN61000-4-6	Perf. Criteria A
MTBF ⁽⁸⁾	Bellcore TR-NWT-000332	1322 x 10 ³ hours
	MIL-HDBK 217F	515 x 10 ³ hours

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

Class A Filter



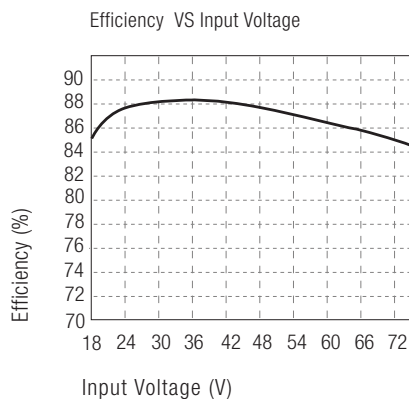
Vin=24V: C1=6.8μF/50V 1812 MLCC, L1 = 10μH, 2.6A, 40mOhm, 0705 SMD
Vin=48V: C1= 2.2μF/100V 1812 MLCC, L1 = 18μH, 1.6A, 10hm, 0705 SMD

Notes :

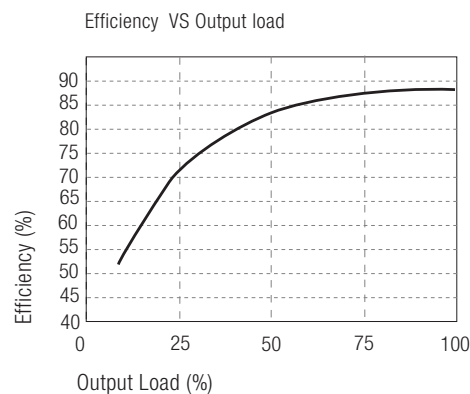
- Values at nominal input voltage and no load/full load.
- Typical Value at nominal input voltage and full load.
- Test by minimum Vin and constant resistor load.
- Simulated source impedance of 12μH. 12μH inductor in series with +Vin.
- If no suffix is specified, the control and trim pins will be omitted. If fitted, 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. RP15-2405SOFW/P)
Negative logic ON/OFF is marked with suffix-N (eg. RP15-2405SOFW/N).
- Meets Class A with external components shown above. Will meet Class B with external common mode filter (see Application Notes)
- Requires external capacitor to meet EN61000-4-4_5: 220μF/100V, low ESR (48mOhm)
- 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).

Typical Characteristics

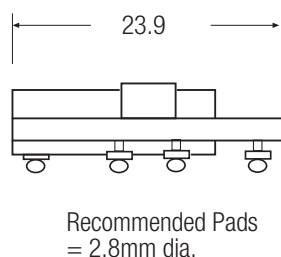
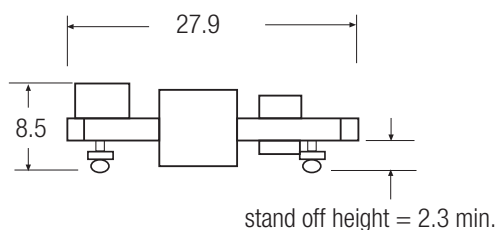
RP15-4805SOFW



RP15-4805SOFW



Package Style and Pinning (mm)

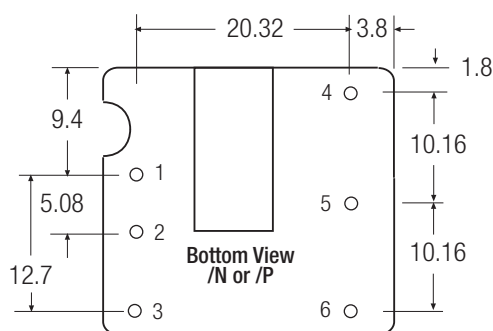
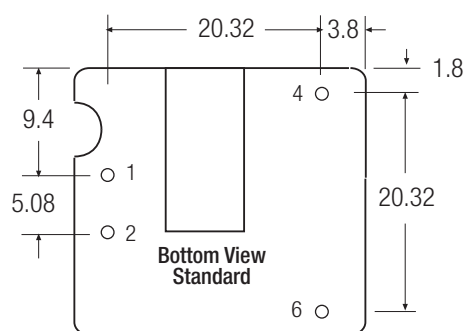


Pin Connections

Pin #	Standard	/P or /N
1	+Vin	+Vin
2	-Vin	-Vin
3	no pin	CTRL
4	+Vout	+Vout
5	no pin	Trim
6	-Vout	-Vout

PCB Tolerance ± 0.5 mm

SMD Pin Pitch Tolerance ± 0.25 mm



External Output Trimming (optional)

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

