

## Features

- Ultraminiature Open Frame SMD
- 15 Watts Output Power
- 2:1 Input Voltage Range
- Single Outputs
- 2.25kVDC Isolation
- Fixed Operating Frequency
- Optional Remote On/Off and Trim pins
- Efficiency to 88%

## Description

The RP15-SOF 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, these converters are fully specified devices with output currents up to 3.5 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-SOF series will find many uses in telecommunications and other demanding applications where cost, 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 <sup>(1)</sup> Current mA	Efficiency <sup>(2)</sup> %	Capacitive <sup>(3)</sup> Load max.
RP15-243.3SOF**	18-36	3.3	3500	20/587	86	1000µF
RP15-2405SOF**	18-36	5	3000	20/753	87	1000µF
RP15-2412SOF**	18-36	12	1250	15/753	87	330µF
RP15-2415SOF**	18-36	15	1000	15/744	88	220µF
RP15-483.3SOF**	36-75	3.3	3500	15/297	85	1000µF
RP15-4805SOF**	36-75	5	3000	15/377	87	1000µF
RP15-4812SOF**	36-75	12	1250	10/377	87	330µF
RP15-4815SOF**	36-75	15	1000	10/372	88	220µF

\*\* 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

## Ordering Examples

RP15-2405SOF = 24 Input, 5V Output, No CTRL or trim connections

RP15-2412SOF/P = 24V Input, 12V Output, Positive logic. CTRL and trim SMD pins fitted

## POWERLINE

DC/DC-Converter

with 3 year Warranty

RECOM

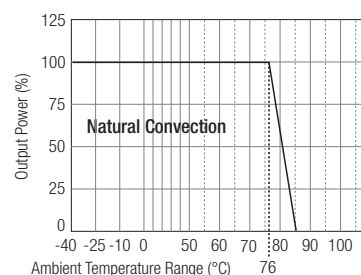
## 15 Watt Single Output Open Frame SMD



UL-60950-1 Certified  
E196683

## RP15-SOF

## Derating-Graph (Ambient Temperature) RP15-4805SOF



Derating graphs are valid only for the shown part number. 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)

Refer to Application Notes

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

Input Voltage Range	24V nominal input	18-36VDC
	48V nominal input	36-75VDC
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> typ.
Start Up Time (nominal Vin and constant resistor load)		30ms max.
Optional Remote ON/OFF <sup>(5)</sup>	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	20mA max.
Output Voltage Accuracy (full Load and nominal Vin)		±1%
Optional Output Trim <sup>(5)</sup>		±10%
Minimum Load		0%
Line Regulation (low line, high line at full load)	Single	±0.2%
Load Regulation (0% to full load)	Single	±0.2%
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)	Basic Isolation	2225VDC
Isolation Resistance		1 GΩ min.
Isolation Capacitance		1000pF typ.
Operating Frequency	3.3V , 5V	270kHz typ.
	All others	400kHz typ.
Operating Temperature Range		-40°C to +85°C (with derating)
Storage Temperature Range		-55°C to +125°C
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

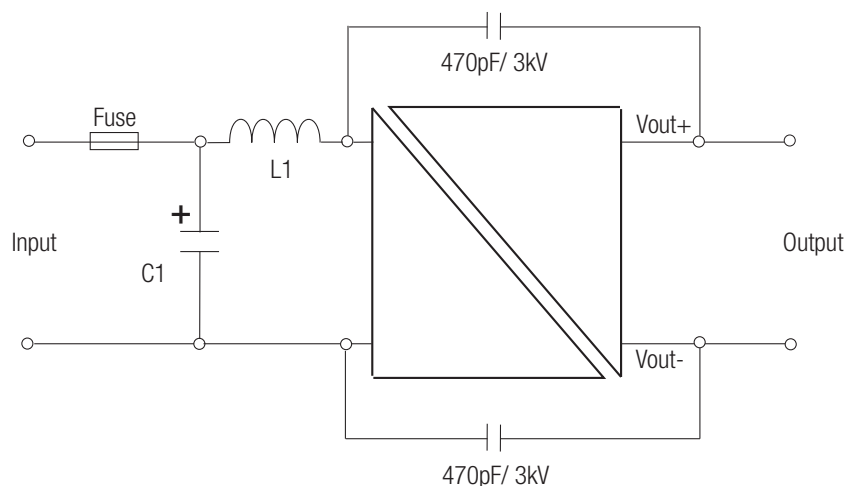
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**Specifications** (typical at nominal input and 25°C unless otherwise noted)

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
Conducted Emissions <sup>(6)</sup>	EN55022	Class A/B
Radiated Emissions	EN55022	Class A/B
Radiated Immunity	EN61000-4-3	Perf. Criteria A
Fast Transient <sup>(7)</sup>	EN61000-4-4	Perf. Criteria A
Surge <sup>(7)</sup>	EN61000-4-5	Perf. Criteria A
Conducted Immunity	EN61000-4-6	Perf. Criteria A
MTBF <sup>(8)</sup>	Bellcore TR-NWT-000332 MIL-HDBK 217F	2200 x 10 <sup>3</sup> hours 1314 x 10 <sup>3</sup> hours

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

## Class A Filter



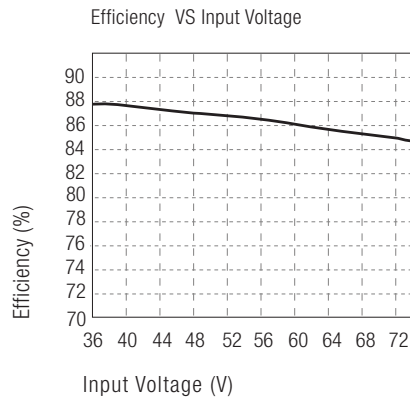
Vin=24V: C1=6.8μF/50V 1812 MLCC, L1 = 10μH, 1.4A, 100mOhm, 0504 SMD  
Vin=48V: C1= 2.2μF/100V 1812 MLCC, L1 = 10μH, 1.4A, 100mOhm, 0504 SMD

**Notes :**

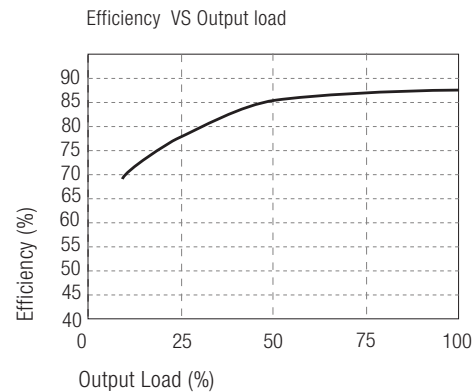
- Values at nominal input voltage and no load/full load.
- Typical Value at nominal input voltage and full load.
- Test by minimum Vin and constant resistor load.
- Simulated source impedance of 12μH. 12μH inductor in series with +Vin.
- If no suffix is specified, the control pin will be omitted. If 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. RP15-2405SOF/P).  
Negative logic ON/OFF is marked with suffix-N (eg. RP15-2405SOF/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 EN61000-4-5: 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

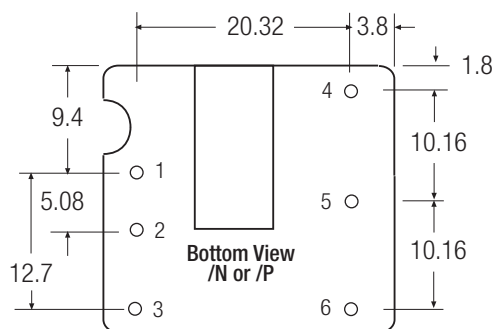
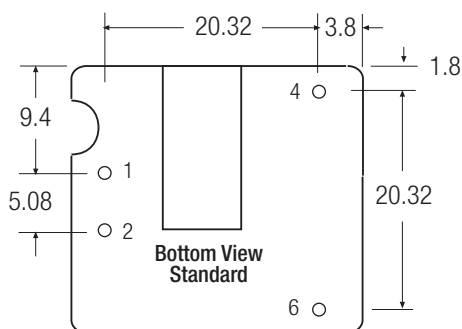
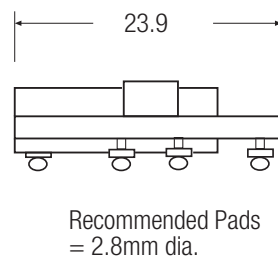
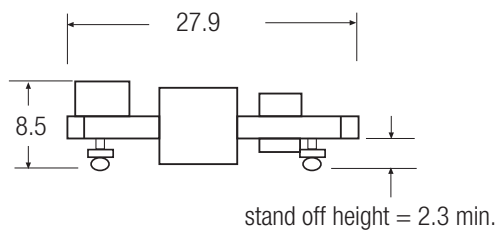
### RP15-4805SOF



### RP15-4805SOF



## 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  $\pm 0.5$  mm  
SMD Pin Pitch Tolerance  $\pm 0.25$  mm

## External Output Trimming (optional)

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

