

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

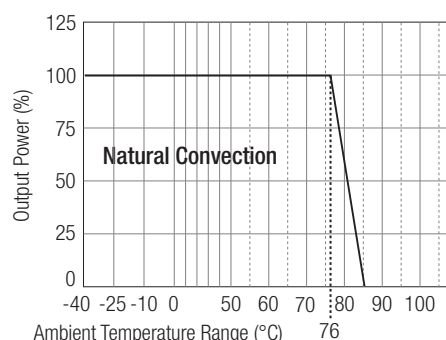
RP15-4805SOFW/P = 48V 4:1 Input, 5V Output, Positive Logic CTRL pin and Trim pin fitted.

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

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



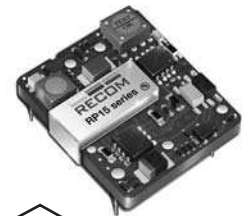
POWERLINE

DC/DC-Converter

with 3 year Warranty

RECOM

**15 Watt
Single
Output
Open Frame
SMD**



**UL-60950-1 Certified
E196683**

RP15-SOFW

Please Read 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) (see Note 4) | | 30mA _{p-p} |
| 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 (/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 (see Note 5) | | ±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) | 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 |

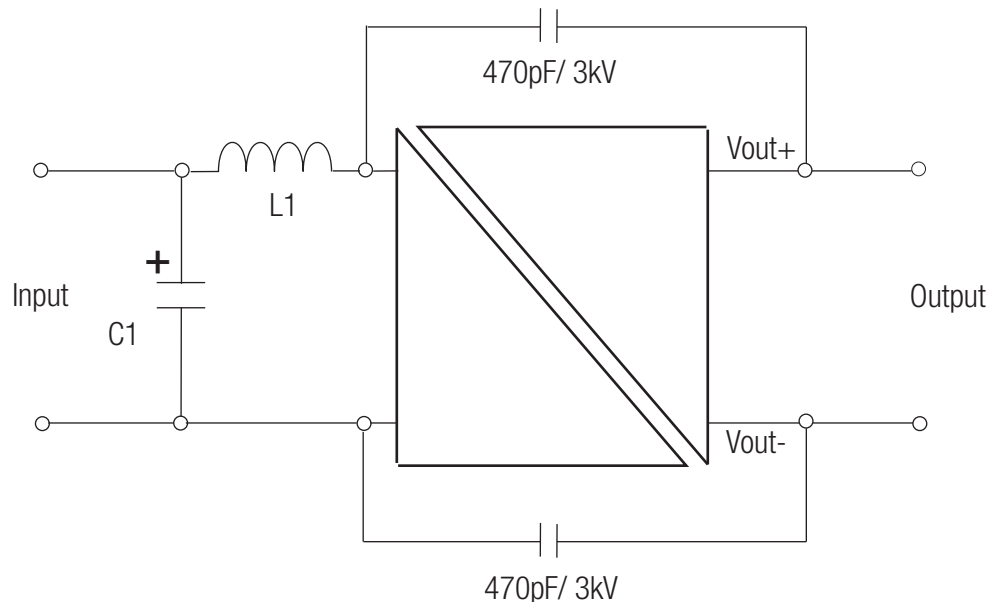
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Specifications (typical at nominal input and 25°C unless otherwise noted)

| | | |
|----------------------------------|------------------------|------------------------------|
| Conducted Emissions (see Note 6) | EN55022 | Class A/B |
| Radiated Emissions | EN55022 | ClassB |
| Radiated Immunity | EN61000-4-3 | Perf. Criteria A |
| Fast Transient (see note 7) | EN61000-4-4 | Perf. Criteria A |
| Surge (see note 7) | EN61000-4-5 | Perf. Criteria A |
| Conducted Immunity | EN61000-4-6 | Perf. Criteria A |
| MTBF (see Note 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



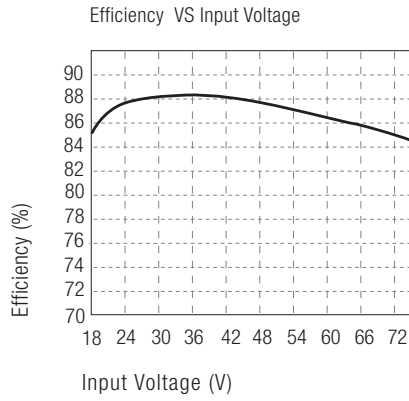
Vin=24V: C1=6.8μF/50V 1812 MLCC, L1 = 10μH, 2.6A, 40mOhm, 0705 SMD
 Vin=48V: C1= 2.2μF/100V 1812 MLCC, L1 = 18μH, 1.6A, 10hm, 0705 SMD

Notes :

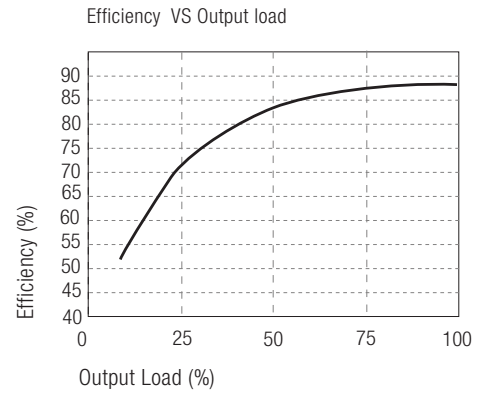
1. Values at nominal input voltage and no load/full load.
2. Typical Value at nominal input voltage and full load.
3. Test by minimum Vin and constant resistor load.
4. Simulated source impedance of 12μH. 12μH inductor in series with +Vin.
5. If no suffix is specified, the control and trim pins will 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).
6. Meets Class A with external components shown above. Will meet Class B with external common mode filter (see Application Notes)
7. Requires external capacitor to meet EN61000-4-4_5: 220μF/100V, low ESR (48mOhm)
8. 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

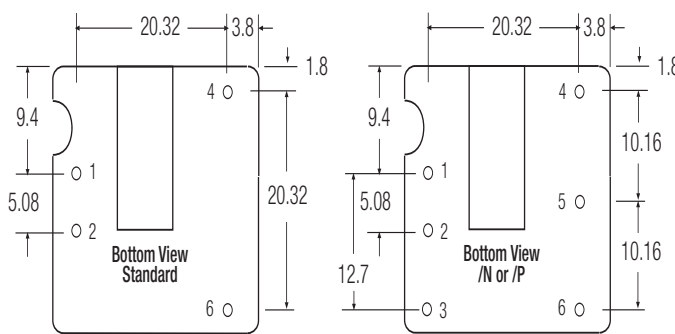
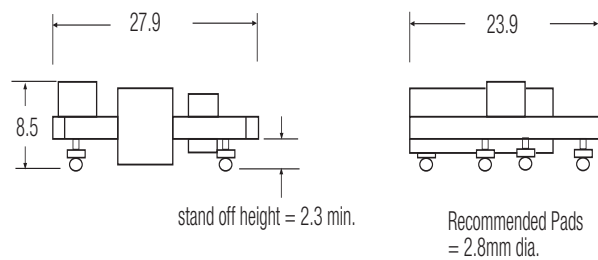
RP15-4805SOFW



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.

