Features

Regulated Converter

- 4:1 wide input voltage range
- 2.25kVDC isolation
- UL certified
- Efficiency up to 87%
- Ultraminiature open frame SMD
- No minimum load required

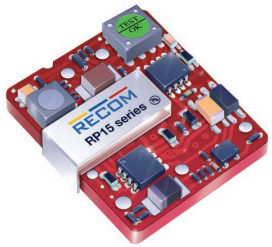
RECOM
DC/DC Converter

RP15-OFW

15 Watt SMD Open Frame Single Output

Description

The RP15-OFW 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-OFW 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-OFW series will find many uses in telecommunications and other demanding applications where price, board space or board height is at a premium.



Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Input (1) Current [mA]	Efficiency (1) typ. [%]	Max. Capacitive Load (2) [µF]
RP15-243.3SOFW (3)	9-36	3.3	4000	647	85	12000
RP15-2405SOFW (3)	9-36	5	3000	718	87	6000
RP15-2412SOFW (3)	9-36	12	1300	756	86	1000
RP15-2415SOFW (3)	9-36	15	1000	727	86	660
RP15-483.3SOFW (3)	18-75	3.3	4000	324	85	12000
RP15-4805SOFW (3)	18-75	5	3000	359	87	6000
RP15-4812SOFW (3)	18-75	12	1300	378	86	1000
RP15-4815SOFW (3)	18-75	15	1000	363	86	660

Notes:

Note1: Maximum values at nominal input and full load at +25°C ambient
Note2: Max. Cap Load is tested at nominal input and constant resistive load

UL60950-1 certified

Model Numbering

Notes:

Note3: no suffix for standard part without Trim or CTRL pin
add suffix "P" for CTRL function with positive logic (1=ON, 0=OFF) and Trim pin
add suffix "N" for CTRL function with negative logic (0=ON, 1=OFF) and Trim pin

Ordering Examples

RP15-4805SOFW = 48V 4:1 input, 5V output, single, without Trim and CTRL pin
RP15-4805SOFW/P = 48V 4:1 input, 5V output, single, positive logic CTRL pin and Trim pin fitted
RP15-243.3SOFW/N = 24V 4:1 input, 3.3V output, single, negative logic CTRL pin and Trim pin fitted

Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

BASIC CHARACTERISTICS

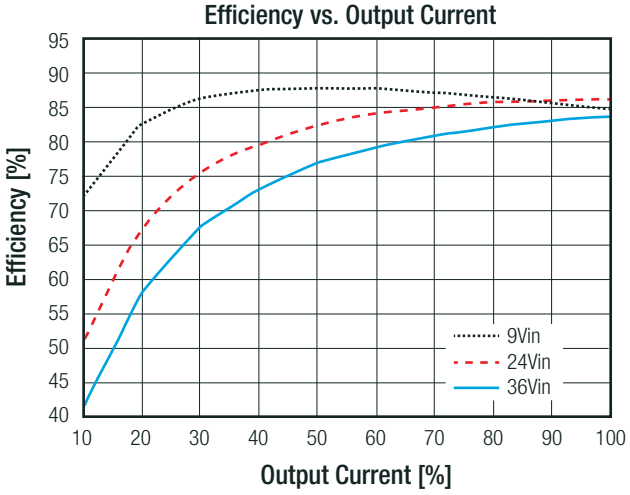
Parameter	Condition		Min.	Typ.	Max.
Input Filter					Pi-Type
Input Voltage Range	nom. Vin = 24VDC nom. Vin = 48VDC		9DC 18VDC	24VDC 48VDC	36VDC 75VDC
Input Surge Voltage	100ms max.	nom. Vin = 24VDC nom. Vin = 48VDC			50VDC 100VDC
Under Voltage Lockout (UVLO)	nom. Vin = 24VDC	DC-DC ON DC-DC OFF		8VDC	9VDC
	nom. Vin = 48VDC	DC-DC ON DC-DC OFF		16VDC	18VDC
Output Voltage Trimming	refer to ***„OUTPUT VOLTAGE TRIMMING“***		-10%		+10%
Input Reflected Ripple [4]	nominal Vin and full load			30mAp-p	
Minimum Load			0%		
Start-up time	Power up Remote ON/OFF				30ms 30ms
ON/OFF CTRL [5]	Positive Logic	DC-DC ON DC-DC OFF	Open or 3.0VDC < V_{CTRL} < 15VDC Short or 0VDC < V_{CTRL} < 1.2VDC		
	Negative Logic	DC-DC ON DC-DC OFF	Short or 0VDC < V_{CTRL} < 1.2VDC Open or 3.0VDC < V_{CTRL} < 15VDC		
Input Current of CTRL pin	DC-DC ON		-0.5mA		+1.0mA
Standby Current	DC-DC OFF			2.5mA	
Internal Operating Frequency	3.3Vout, 5Vout 12Vout, 15Vout		315kHz 360kHz	350kHz 400kHz	385kHz 440kHz
Ripple and Noise	measured at 20MHz BW with a 1µF M/C X7R and 10µF T/C			100mVp-p	

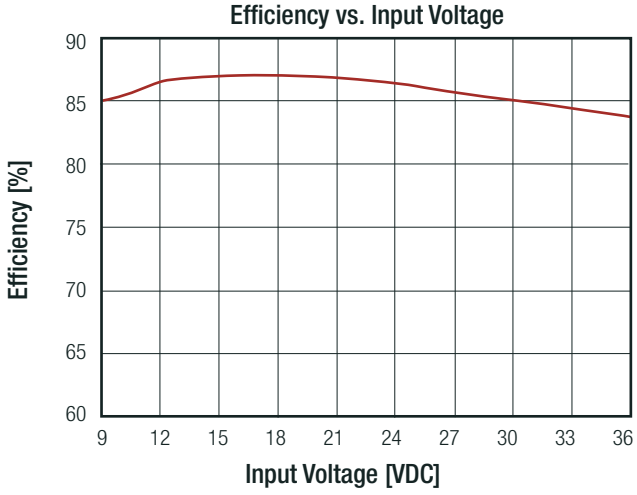
Notes:

Note4: Simulated source impedance of 12µH. 12µH inductor in series with +Vin.

Note5: 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 -Vin

RP15-2405SOFW





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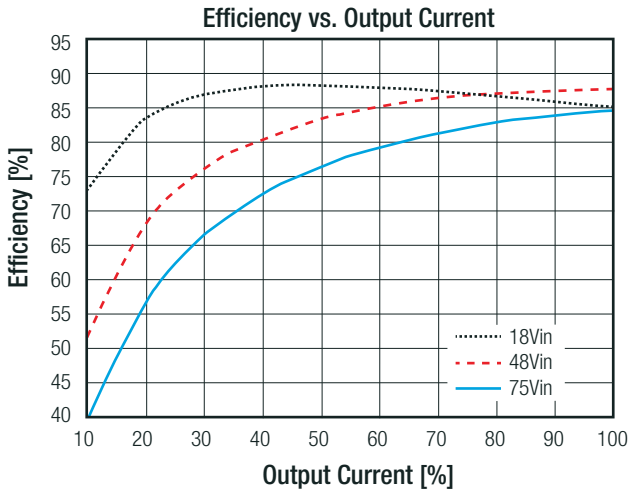
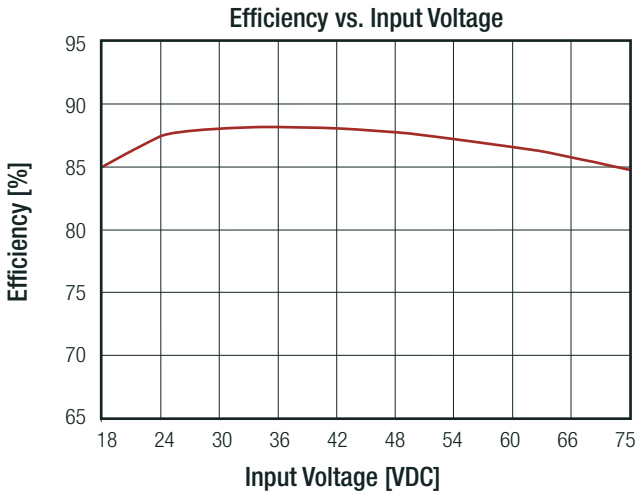
Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

RP15-4805SOFW

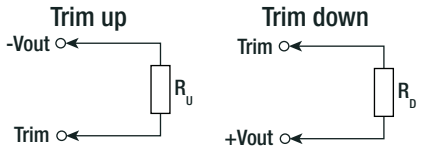




OUTPUT VOLTAGE TRIMMING

Output Voltage Trimming

Single output Powerline converters offer the feature of trimming the output voltage over a certain range around the nominal value by using external trim resistors. No general equation can be given for calculating the trim resistors, but the following trimtables give typical values for choosing these trimming resistors. If voltages between the given trim points are required, extrapolate between the two nearest given values to work out the resistor required or use a variable resistor to set the output voltage. Output can be externally trimmed by using the method shown below.



RP15-xx3.3SOFW

Trim up	1	2	3	4	5	6	7	8	9	10	[%]
Vout =	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.63	[VDC]
R_U =	385.07	191.51	126.99	94.73	75.37	62.47	53.25	46.34	40.96	36.66	[kΩ]

Trim down	1	2	3	4	5	6	7	8	9	10	[%]
Vout =	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.97	[VDC]
R_D =	116.72	54.78	34.13	23.81	17.62	13.49	10.54	8.32	6.60	5.23	[kΩ]

RP15-xx05SOFW

Trim up	1	2	3	4	5	6	7	8	9	10	[%]
Vout =	5.05	5.10	5.15	5.20	5.25	5.30	5.35	5.4	5.45	5.50	[VDC]
R_U =	253.45	125.70	83.12	61.82	49.05	40.53	34.45	29.89	26.34	23.50	[kΩ]

Trim down	1	2	3	4	5	6	7	8	9	10	[%]
Vout =	4.95	4.90	4.85	4.80	4.75	4.70	4.65	4.60	4.55	4.50	[VDC]
R_D =	248.34	120.59	78.01	56.71	43.94	35.42	29.34	24.78	21.23	18.39	[kΩ]

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Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

RP15-xx12SOFW

Trim up	1	2	3	4	5	6	7	8	9	10	[%]
Vout =	12.12	12.24	12.36	12.48	12.60	12.72	12.84	12.96	13.08	13.20	[VDC]
R_U =	203.22	99.06	64.33	46.97	36.56	29.61	24.65	20.93	18.04	15.72	[kΩ]
Trim down	1	2	3	4	5	6	7	8	9	10	[%]
Vout =	11.88	11.76	11.64	11.52	11.40	11.28	11.16	11.04	10.92	10.8	[VDC]
R_D =	776.56	380.72	248.78	182.81	143.22	116.83	97.98	83.85	72.85	64.06	[kΩ]

RP15-xx15SOFW

Trim up	1	2	3	4	5	6	7	8	9	10	[%]
Vout =	15.15	15.3	15.45	15.60	15.75	15.90	16.05	16.20	16.35	16.50	[VDC]
R_U =	161.56	78.22	50.45	36.56	28.22	22.67	18.70	15.72	13.41	11.56	[kΩ]
Trim down	1	2	3	4	5	6	7	8	9	10	[%]
Vout =	14.85	14.70	14.55	14.40	14.25	14.10	13.95	13.80	13.65	13.50	[VDC]
R_D =	818.22	401.56	262.67	193.22	151.56	123.78	103.94	89.06	77.48	68.22	[kΩ]

REGULATIONS

Parameter	Condition	Value
Output Accuracy		±1.0%
Line Regulation	low line to high line, full load	±0.2%
Load Regulation	0% to 100% load	±0.2%
Transient Response Recovery Time	25% load step change	250µs

PROTECTIONS

Parameter	Condition		Value
Short Circuit Protection (SCP)			continuous, automatic recovery
Over Voltage Protection (OVP)	zener diode clamp	3.3Vout 5Vout 12Vout 15Vout	3.7 - 5.4VDC 5.6 - 7.0VDC 13.8 - 17.5VDC 16.8 - 20.5VDC
Over Load Protection (OLP)	% of Iout rated		150% typ., Hiccup mode
Isolation Voltage (6)	I/P to O/P		2.25kVDC/1 minute
Isolation Resistance	Viso= 500VDC		1GΩ min.
Isolation Capacitance			1500pF typ.

Notes:

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

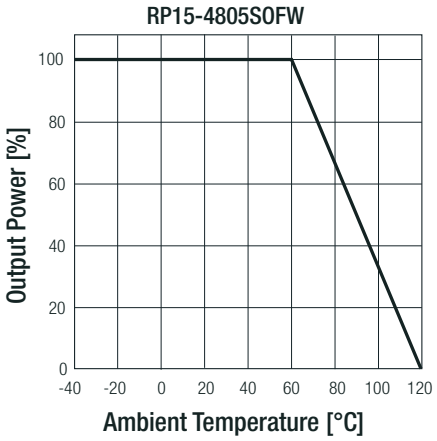
Note7: This power module is not internally fused. An input line fuse must always be used

Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

ENVIRONMENTAL

Parameter	Condition	Value
Lead-free reflow solder process		IPC J-STD-020D
Moisture sensitivity level (MSL)		IPC J-STD-03B level 2a
Operating Temperature Range	without derating with derating	-40°C to +70°C -40°C to +120°C
Temperature Coefficient		±0.02%/K max.
Thermal Impedance		18.2K/W
Operating Humidity	non-condensing	5% - 95% RH
Thermal Shock		according to MIL-STD-810F
Vibration		according to MIL-STD-810F
MTBF	MIL-HDBK-217F, G.B. (8) Bellcore TR-NWT-000332 (8)	2444 x 10^3 hours 1322 x 10^3 hours

Derating Graph (9)



Notes:

Note8: 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)

Note9: 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 RECOM Techsupport for detailed information

SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Condition	Standard
Information Technology Equipment, General Requirements for Safety	E196683	UL60950-1, 1st Edition, 2007 CAN/CSA-C22.2 No. 60950-1-03, 1st Edition, 2006
EAC	RU-AT.49.09571	TP TC 004/2011
RoHS 2		RoHS-2011/65/EU + AM-2015/863

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	with external filter (see filter suggestion below)	EN55032, Class A and B
Radiated, radio-frequency, electromagnetic field immunity test	10 V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity (10)	±2kV	EN61000-4-4, Criteria B
Surge Immunity (10)	±1kV	EN61000-4-5, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	10 Vr.m.s	EN61000-4-6, Criteria A
Power Magnetic Field Immunity	100A/m continuous; 1000A/m 1s	EN61000-4-8, Criteria A

Notes:

Note10: An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5
Recom suggests Nippon chemi-con KY series 220µF/100V

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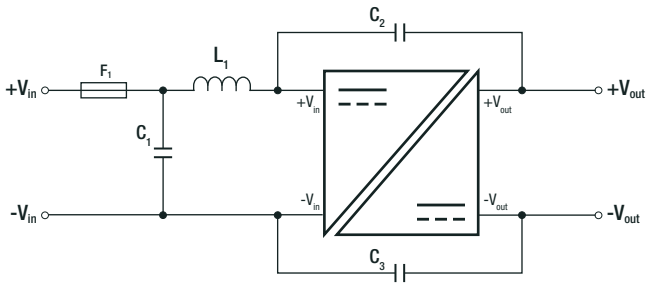
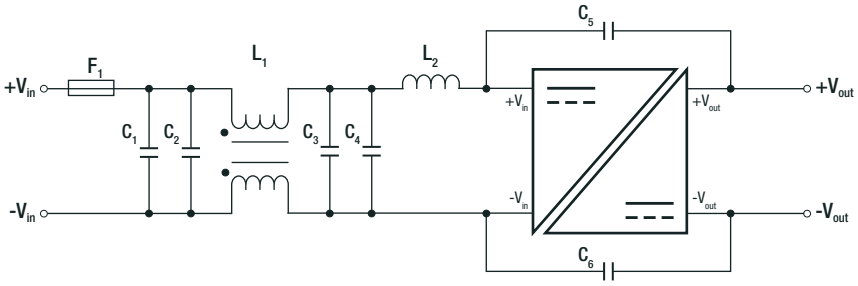
Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

EMC Filtering Suggestions according to EN55032



Component List Class A

MODEL	C1	C2/C3	L1
RP15-24xxSOFW	6.8µF/50V, 1812 MLCC	470pF/3kV, 1808 MLCC	10µH 2.6A 0.04Ω 0705 SMD Inductor ref.: WE 744787330
RP15-48xxSOFW	2.2µF/100V, 1812 MLCC	470pF/3kV, 1808 MLCC	18µH 1.6A 0.1Ω 0705 SMD Inductor ref.: WE 744053180



Component List Class B

MODEL	C1	C2	C3/C4	C5/C6	L1	L2
RP15-24xxSOFW	N/A	6.8µF/50V 1812 MLCC	6.8µF/50V 1812 MLCC	470pF/3kV 1808 MLCC	CMC: 145µH ref.: WE 7482210002 ref.: CMC-07	10µH 2.6A 0.04Ω 0705 SMD Inductor ref.: WE 744787330
RP15-48xxSOFW	2.2µF/100V 1812 MLCC	2.2µF/100V 1812 MLCC	2.2µF/100V 1812 MLCC	470pF/3kV 1808 MLCC	CMC: 325µH ref.: WE 744290321 ref.: CMC-06	33µH 1.2A 0.13Ω 0504 SMD Inductor ref.: WE 744787100

DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Material	base	FR4 PCB
Dimensions (LxWxH)		27.9 x 23.9 x 8.5mm
Weight		10.5g

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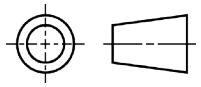
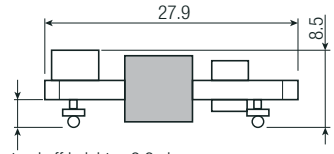
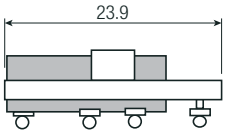
Specifications (measured @ Ta= 25°C, nom. Vin, full load otherwise stated)

Dimension Drawing (mm)

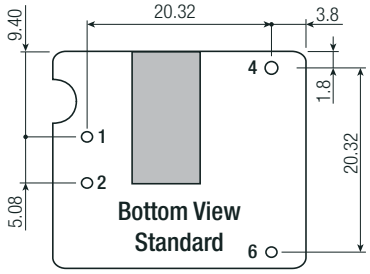


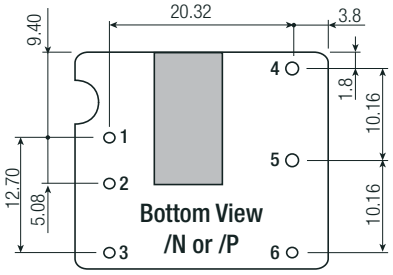


stand off height = 2.3min.



Recommended Pads = 2.8mm dia.





Pinning Information

Pin #	Standard	with Suffix /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 ±0.5mm
SMD Pin Pitch Tolerance ±0.25mm

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	tube	255.0 x 29.0 x 12.0mm
Packaging Quantity		20pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	5% - 95% RH

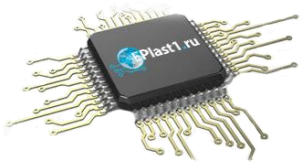
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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