Features

Regulated Converters

- 4:1 Wide Input Voltage Range
- 1.6kVDC Isolation
- UL Certified
- Efficiency up to 88%
- Over Current and Over Voltage Protection
- No Minimum Load Required

RECOM

DC/DC Converter

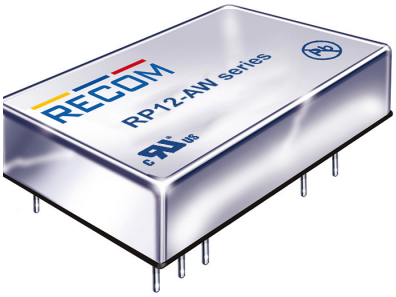
RP12-AW

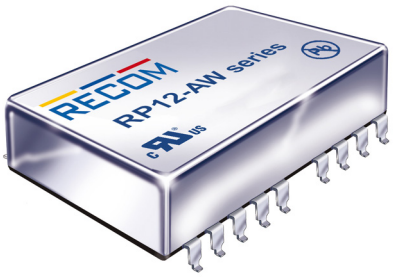
12 Watt DIP24/SMD Single & Dual Output

3 YEAR 3 Warranty

Description

The RP12-AW wide range input DC/DC converters are certified to UL 60950-1 and cUL 60950-1. This makes them ideal for all telecom and industrial applications where approved safety standards are required. The DIP24 package is available in both pinned and SMD case styles and meets military standards for thermal shock and vibration tolerance.





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]
RP12-243.3SAW[3]	9-36	3.3	3500	573	84	2000
RP12-2405SAW[3]	9-36	5.1	2400	575	87	2000
RP12-2412SAW[3]	9-36	12	1000	575	87	430
RP12-2415SAW[3]	9-36	15	800	575	87	300
RP12-483.3SAW[3]	18-75	3.3	3500	286	84	2000
RP12-4805SAW[3]	18-75	5.1	2400	293	87	2000
RP12-4812SAW[3]	18-75	12	1000	287	87	430
RP12-4815SAW[3]	18-75	15	800	284	88	300
RP12-2405DAW[3]	9-36	±5	±1200	595	84	±1250
RP12-2412DAW[3]	9-36	±12	±500	575	87	±200
RP12-2415DAW[3]	9-36	±15	±400	575	87	±120
RP12-4805DAW[3]	18-75	±5	±1200	294	85	±1250
RP12-4812DAW[3]	18-75	±12	±500	287	87	±200
RP12-4815DAW[3]	18-75	±15	±400	287	87	±120

Notes:

Note1: Maximum value at nominal input voltage and full load.

Note2: Test by minimum Vin and constant resistor load.

c UL us E196683

UL60950-1 Certified

Model Numbering

RP12-____AW/_

- Input Voltage
- Output Voltage
- Single or Dual
- Package[3]

Ordering Examples:

RP12-2412SAW/SMD = 24V Input, 12V Output, Single, SMD Package.

Notes:

Note3: no suffix for standard package (DIP24), add suffix „SMD“ for SMD package

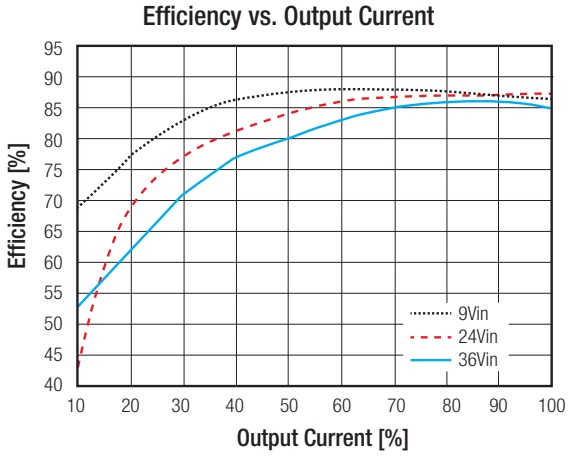
Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

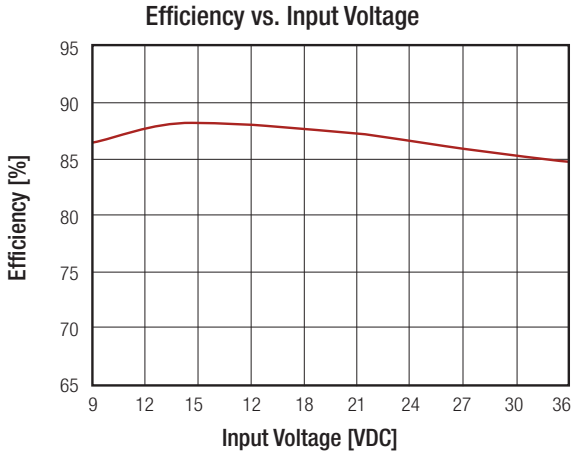
BASIC CHARACTERISTICS					
Parameter	**Condition**		**Min.**	**Typ.**	**Max.**
Input Voltage Range	nom. Vin = 24V nom. Vin = 48V		9VDC 18VDC	24VDC 48VDC	36VDC 75VDC
Under Voltage Lockout (UVLO)	Vin = 24V	DC-DC ON DC-DC OFF		 8VDC	9VDC
	Vin = 48V	DC-DC ON DC-DC OFF		 16VDC	18VDC
Input Filter					Pi-Type
Input Reflected Ripple Current	nominal Vin and full load			20mAp-p	
Input Surge Voltage	Vin = 24V, 100ms max. Vin = 48V, 100ms max.				50VDC 100VDC
Start-up time	Power up Remote ON/OFF			450ms 5ms	
Operating Frequency Range			360kHz	400kHz	440kHz
Minimum Load	of full load		0%		
Ripple and Noise	20MHz bandwidth			85mVp-p	
Remote ON/OFF (4)	Positive Logic	DC-DC ON DC-DC OFF			Open or 3.0V < Vr < 12V Short or 0V < Vr < 1.2V
Input current of Remote pin (CTRL)		DC-DC OFF		2.5mA	
		DC-DC ON	-0.5mA		+0.5mA

Notes:

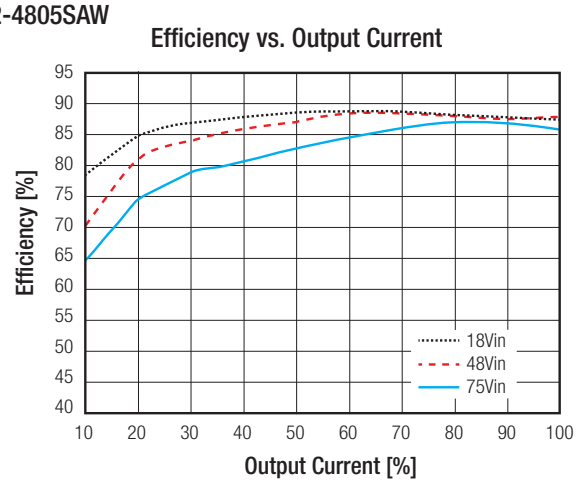
Note4: The ON/OFF control pin voltage is referenced to -Vin pin.

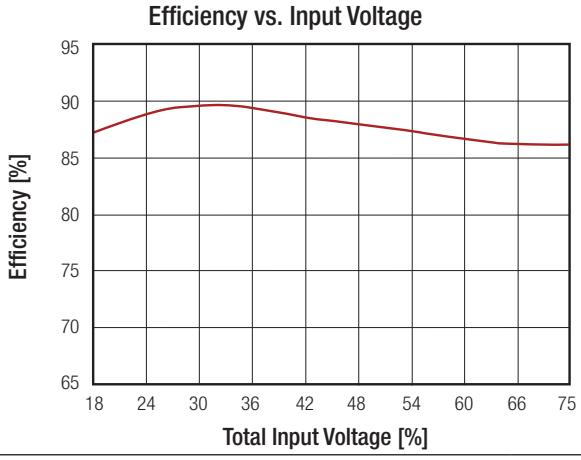
RP12-2405SAW





RP12-4805SAW





Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

REGULATIONS

Parameter	Condition		Value
Output Voltage Accuracy			±1.2%
Line Voltage Regulation	low line to high line at full load		±0.2%
Load Voltage Regulation	0% load to 100% load DIP typ	Single Dual	±0.5% ±1.0%
	0% load to 100% load SMD	Single Dual	±1.0% ±1.0%
Cross Regulation	asymmetrical 25%<>100% load		±5%
Transient Response recovery time	25% load step change		250µs typ.

PROTECTIONS

Parameter	Condition		Value
Short Circuit Protection (SCP)			continuous, automatic recovery
Over Voltage Protection (OVP)	Zener Diode Clamp	3.3Vout 5.1Vout 12Vout 15Vout	3.9VDC 6.2VDC 15VDC 18VDC
Over Load Protection (OLP)	% of Iout rated		150% typ.
Isolation Voltage	DIP24	I/P to O/P I/P (O/P) to case	1.6kVDC/1 minute 1.6kVDC/1 minute
	SMD	I/P to O/P I/P (O/P) to case	1.6kVDC/1 minute 1.0kVDC/1 minute
Isolation Resistance	500VDC		1GΩ min.
Isolation Capacitance			1500pF max.

Notes:

Note5: This power module is not internally fused. An input line fuse must always be used.

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	3.3Vout, ±5Vout	without derating with derating	-40°C to +64°C -40°C to +105°C
	Others	without derating with derating	-40°C to +70°C -40°C to +100°C
Maximum Case Temperature			+105°C
Temperature Coefficient			±0.02%/°C max.
Thermal Impedance	Natural convection (20LFM)		20°C/Watt
Operating Humidity			5% - 95% RH
Thermal Shock			MIL-STD-810F
Vibration			MIL-STD-810F
MTBF	MIL-HDBK-217F Bellcore TR-NWT-000332[6]		2087 x 10^3 hours 2350 x 10^3 hours

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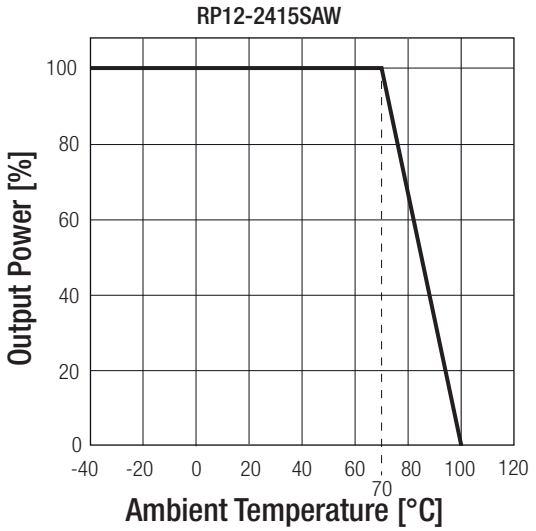
Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

Derating Graph(7)



Notes:

Note6: BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).

Note7: 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 techsupportAT@recom-power.com.

SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
UL General Safety	E196683	UL60950-1 1st Ed.: 2003 C22.2 No. 60950 1st. Ed.: 2003

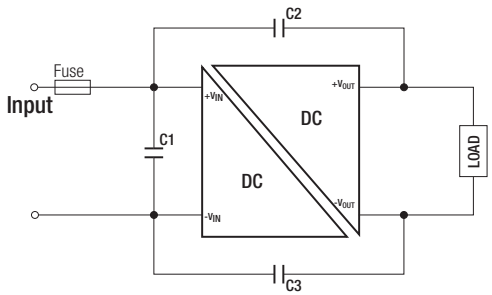
EMC Compliance	Condition	Standard / Criterion
EMI Standard(8)	with external filter	EN55022, Class A or B
ESD	Air ±8kV and Contact ± 6kV	EN61000-4-2, Criteria A
Radiated Immunity	10 V/m	EN61000-4-3, Criteria A
Fast Transient (9)	±2kV	EN61000-4-4, Criteria A
Surge(9)	±1kV	EN61000-4-5, Criteria A
Conducted Immunity	10 Vr.m.s	EN61000-4-6, Criteria A

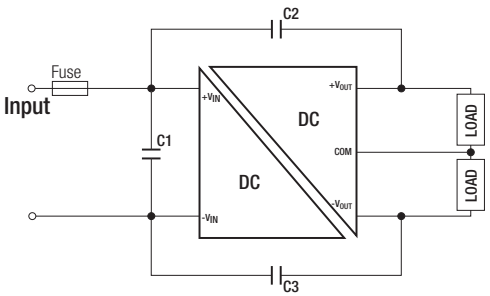
Notes:

Note8: The standard modules meet EMI Class A or Class B with external components, see filter suggestions below.

Note9: An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Recom suggests: Nippon chemi-con KY series, 220µF/100V.

EMC Filtering Class A





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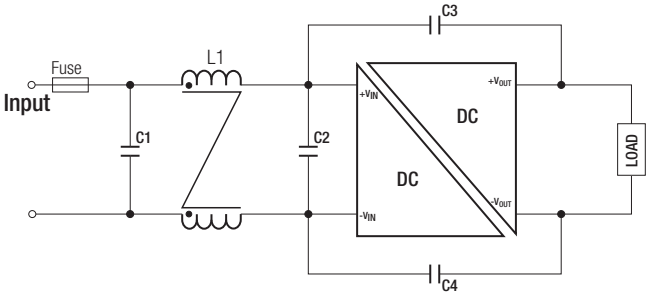
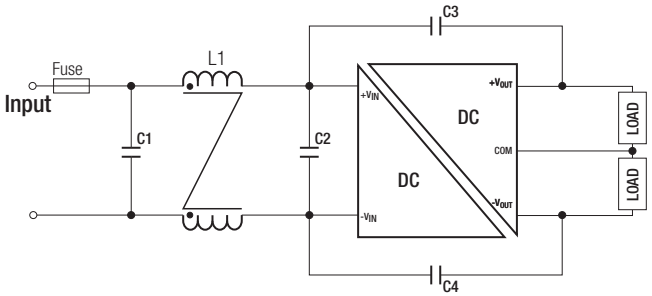
Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

MODEL	C1	C2/C3
RP12-24xxS_DA	3.3µF/50V 1210 MLCC	1000pF/2kV 1206 MLCC
RP12-48xxS_DA	1.5µF/100V 1812 MLCC	1000pF/2kV 1206 MLCC

EMC Filtering Class B



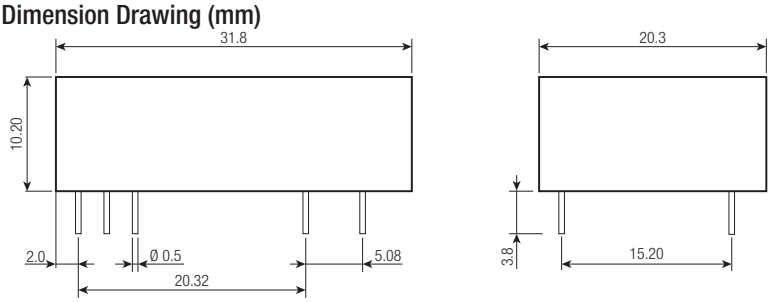


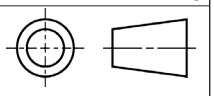
MODEL	C1	C2	C3/C4	L1
RP12-24xxS_DA	3.3µF/50V 1812 MLCC	N/A	1000pF/2kV 1206 MLCC	CMC: 325µH ref: WE 744290321 ref.: CMC-06
RP12-48xxS_DA	2.2µF/100V 1812 MLCC	2.2µF/100V 1812 MLCC	1000pF/2kV 1206 MLCC	CMC: 145µH ref: WE 74482210002 ref.: CMC-07

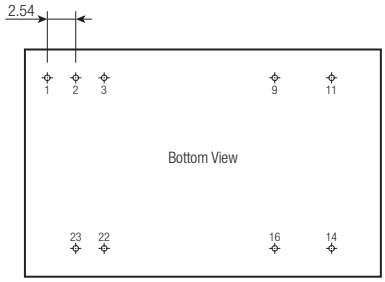
DIMENSIONS and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case Base Potting	Nickel coated copper Non-conductive black plastic Epoxy (UL94-V0)
Package Dimensions (LxWxH)	DIP SMD	31.8 x 20.3 x 10.2mm 32.0 x 20.3 x 11.2mm
Package Weight	DIP SMD	18g 20g

DIP Dimension Drawing (mm)







Pin Connections

Pin #	Single	Dual
1	Ctrl	Ctrl
2	-Vin	-Vin
3	-Vin	-Vin
9	NC	Com
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin

Pin Pitch Tolerance ±0.25mm
Pin Dimension Tolerance ±0.1mm
XX.X ± 0.5mm
XX.XX ± 0.25mm
NC = No Connection

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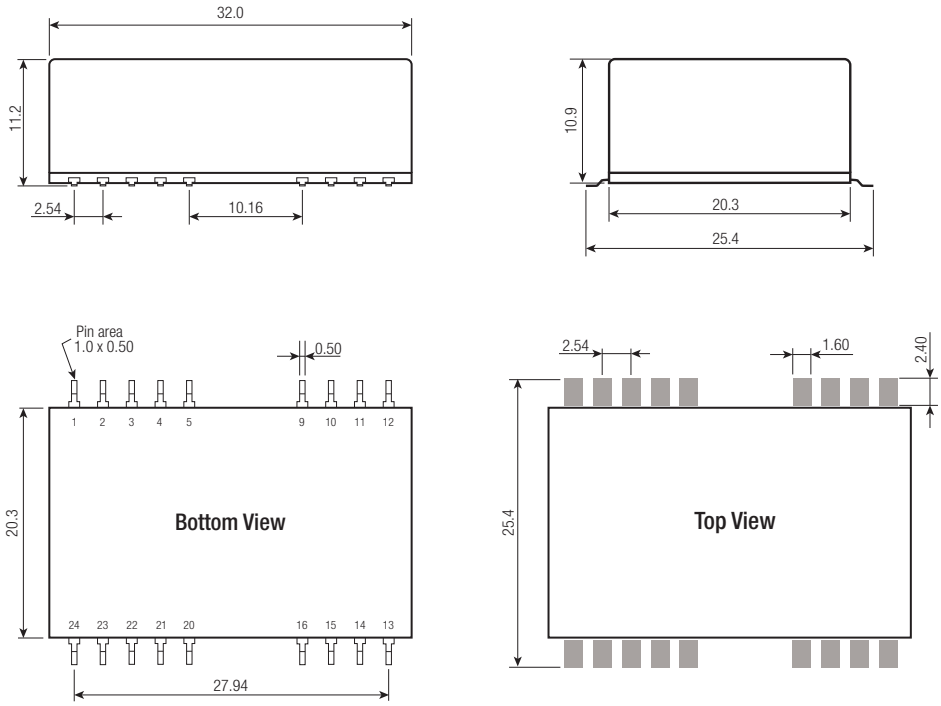
Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

SMD Dimension Drawing (mm)



Pin Connections

Pin #	Single	Dual
1	Ctrl	Ctrl
2	-Vin	-Vin
3	-Vin	-Vin
9	NC	Com
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Com
22	+Vin	+Vin
23	+Vin	+Vin
Others	NC	NC

Pin Pitch Tolerance ±0.25mm
Pin Dimension Tolerance ±0.1mm
XX.X ± 0.5mm
XX.XX ± 0.25mm
NC = No Connection

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Quantity	Tube	7pcs.
Storage Temperature Range		-55°C to +125°C
Storage Humidity		5% - 95% RH

The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM's explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.