

# Features

## Regulated Converters

- 4:1 Wide Input Voltage Ranges
- High Input Voltage Range (110VDC)
- 8 Watts Regulated Output Power
- 1.6kVDC Isolation
- Protected Outputs
- Five-Sided Shield
- No Derating to 81°C Ambient
- Standard DIP24 and SMD-Pinning
- Efficiency up to 88%

### Description

The RP08-AW series 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 24V and 110VDC input versions have been especially designed for railway applications. The DIP24 package is available in both pinned and SMD case styles and meets military standards for thermal shock and vibration tolerance.

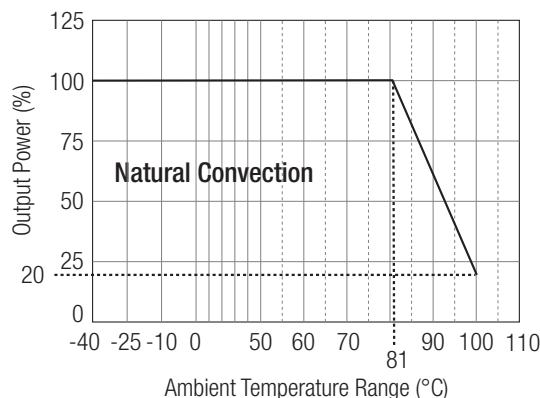
### Selection Guide 24V, 48 and 110V Wide Input Types

Part Number	Input Range VDC	Output Voltage VDC	Output Current mA	Input <sup>(4,5)</sup> Current mA	Efficiency <sup>(6)</sup> %	Capacitive <sup>(7)</sup> Load max.
RP08-243.3SAW**	9-40 <sup>(9)</sup>	3.3	2400	40/407	85	1330µF
RP08-2405SAW**	9-40 <sup>(9)</sup>	5	1600	40/402	87	1330µF
RP08-2412SAW**	9-40 <sup>(9)</sup>	12	666	25/407	86	288µF
RP08-2415SAW**	9-40 <sup>(9)</sup>	15	533	25/407	86	200µF
RP08-483.3SAW**	18-75	3.3	2400	20/204	85	1330µF
RP08-4805SAW**	18-75	5	1600	20/201	87	1330µF
RP08-4812SAW**	18-75	12	666	13/201	87	288µF
RP08-4815SAW**	18-75	15	533	13/198	88	200µF
RP08-1103.3SAW**	43-160	3.3	2400	8/90	85	1330µF
RP08-11005SAW**	43-160	5	1600	8/90	85	1330µF
RP08-11012SAW**	43-160	12	666	4/88	86	288µF
RP08-11015SAW**	43-160	15	533	4/88	86	200µF
RP08-2405DAW**	9-40 <sup>(9)</sup>	±5	±800	20/417	84	±900µF
RP08-2412DAW**	9-40 <sup>(9)</sup>	±12	±333	25/407	86	±133µF
RP08-2415DAW**	9-40 <sup>(9)</sup>	±15	±267	25/407	86	±90µF
RP08-4805DAW**	18-75	±5	±800	10/208	84	±900µF
RP08-4812DAW**	18-75	±12	±333	13/201	87	±133µF
RP08-4815DAW**	18-75	±15	±267	13/201	87	±90µF
RP08-11005DAW**	43-160	±5	±800	5/93	82	±900µF
RP08-11012DAW**	43-160	±12	±333	5/90	85	±133µF
RP08-11015DAW**	43-160	±15	±267	5/90	85	±90µF

\*\* add Suffix SMD for SMD package

### Derating Graph (Ambient Temperature)

#### RP08-4805SAW



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](mailto:info@recom-development.at)

# POWERLINE

## DC/DC-Converter

with 3 year Warranty

# RECOM

## 8 Watt DIP24/SMD, Single & Dual Output



**UL-60950-1 Certified  
E196683  
(Except 110VDC Input  
- UL Pending)**

# RP08-W

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

Input Voltage Range	24VDC Input	9-40 <sup>®</sup> VDC
	48VDC Input	18-75VDC
	110VDC Input	43-160VDC
Input Filter		Pi Type
Input Surge Voltage (100ms max)	24VDC Input	50VDC
	48VDC Input	100VDC
	110VDC Input	170VDC
Undervoltage Lockout	24VDC Input	Startup: 9V, Shutdown 8V
	48VDC Input	Startup: 18V, Shutdown 16V
	110VDC Input	Startup: 43V, Shutdown 42V
Input Reflected Ripple (nominal Vin and full load)		20mA <sub>p-p</sub>
Start Up Time (nominal Vin and constant resistor load)		450ms typ.
Remote ON/OFF (see note 1)	DC-DC ON	Open or 3.0V < Vr < 12V
	DC-DC OFF	Short or 0V < Vr < 1.2V
Remote OFF input current	Nominal input	2.5mA
Output Power		8W max.
Output Voltage Accuracy (full Load and nominal Vin)		±1%
Minimum Load		0%
Line Regulation (low line, high line at full load)		±0.2%
Load Regulation (0% to 100% Load)	Single (0% to 100% Load)	±0.5%
	Dual (0% to 100% Load)	±1.0%
	Single (10% to 90% Load)	±0.3%
	Dual (10% to 90% Load)	±0.8%
Cross Regulation Dual Output (asymmetrical 25% <-> 100% load)		±5%
Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output)		75mV <sub>p-p</sub>
Temperature Coefficient		±0.02%/°C max.
Transient Response (25% load step change)		250µs
Input Voltage Variation, dv/dt	complies with ETS300 132, part 4.4	5V/ms
Over Load Protection (% of full load at nominal Vin)		150% typ
Overvoltage Protection	3.3V	3.9V
	5.1V	6.2V
Single output only		
Zener Diode Clamp	12V	15V
	15V	18V
Undervoltage Lockout		See Application Notes
Short Circuit Protection		Continuous, automatic recovery
Efficiency		see „Selection Guide“ table
Isolation Voltage (rated for one minute)	In to Out and I/O to Case	1600VDC
	I/O to Case (SMD)	1000VDC
Isolation Resistance		1 GΩ min.
Isolation Capacitance		1500pF max.
Operating Frequency		300kHz typ.
Operating Temperature Range (no derating)	5, 12, 15, ±12, ±15V	-40°C to +78°C
	3.3, ±5V	-40°C to +74°C
	(with derating)	All types
Maximum Case Temperature		+105°C
Storage Temperature Range		-55°C to +125°C
Thermal Impedance	Natural convection	20°C/Watt

cont.

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

Case Material	Nickel-coated copper with non-conductive black plastic base	
Potting Material	Epoxy (UL94-V0)	
Weight	18g (DIP), 20g (SMD)	
Packing Quantity	Refer to App Notes for tube dimensions	7pcs per Tube
Packing Quantity	Refer to App Notes for tube dimensions	7pcs per Tube
Conducted Emissions (see note 3)	EN55022	Class A
Radiated Emissions	EN55022	Class B
ESD	EN61000-4-2	Perf. Criteria A
Radiated Immunity	EN61000-4-3	Perf. Criteria A
Fast Transient (Note 8)	EN61000-4-4	Perf. Criteria A
Surge (Note 8)	EN61000-4-5	Perf. Criteria A
Conducted Immunity	EN61000-4-6	Perf. Criteria A
Thermal Shock	MIL-STD-810F	
Vibration	10-55Hz, 10G, 30 Min. along X, Y and Z	
Relative Humidity	5% to 95% RH	
MTBF (see note 2)	Bellcore-TR-NWT-000332	2350 x 10 <sup>3</sup> hours
	MIL-HDBK-217F	1078 x 10 <sup>3</sup> hours

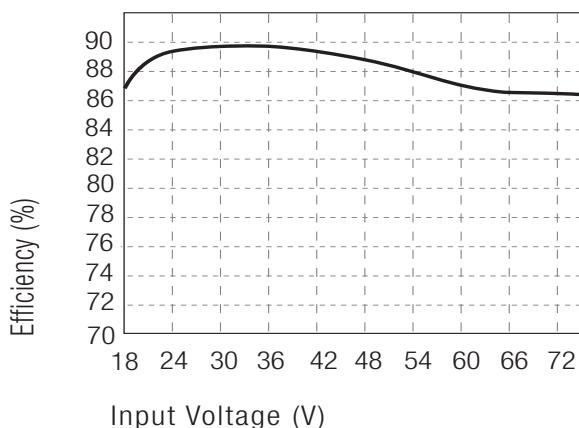
**Notes :**

1. The ON/OFF control pin voltage is referenced to negative input.
2. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground Benign and controlled environment). Mil-HDBK-217F, Notice 2, Full Load, 25°C, Ground Benign.
3. Vin=24V, fit a 1.0µF/50V 1210 MLCC capacitor across the input pins to meet EN55022 Class A.  
Vin=48V, fit a 0.47µF/100V 1810 MLCC capacitor across the input pins to meet EN55022 Class A.  
Vin=110V, fit 2x 0.47µF/250V 1810 MLCC capacitor in parallel across the input pins to meet EN55022 Class A  
See application notes for Class B Filter suggestion.
4. Typical value at nominal input voltage and no load.
5. Maximum value at nominal input voltage and full load
6. Typical value at nominal input voltage and full load.
7. Test by minimum Vin and constant resistor load.
8. Meets EN61000-4-4,-5 with a capacitor across the input. Recom suggests Nippon Chemi-Con KY series, 220µF/100V (24V and 48V) or 150µF/200V (110V)
9. The 24V input voltage range can be used up to 40VDC for 1 second. For a continuous input voltage, 36V is the limit.

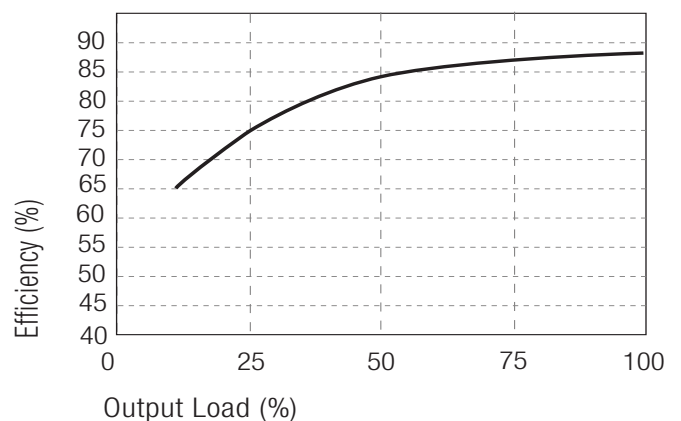
**Typical Performance Graphs**

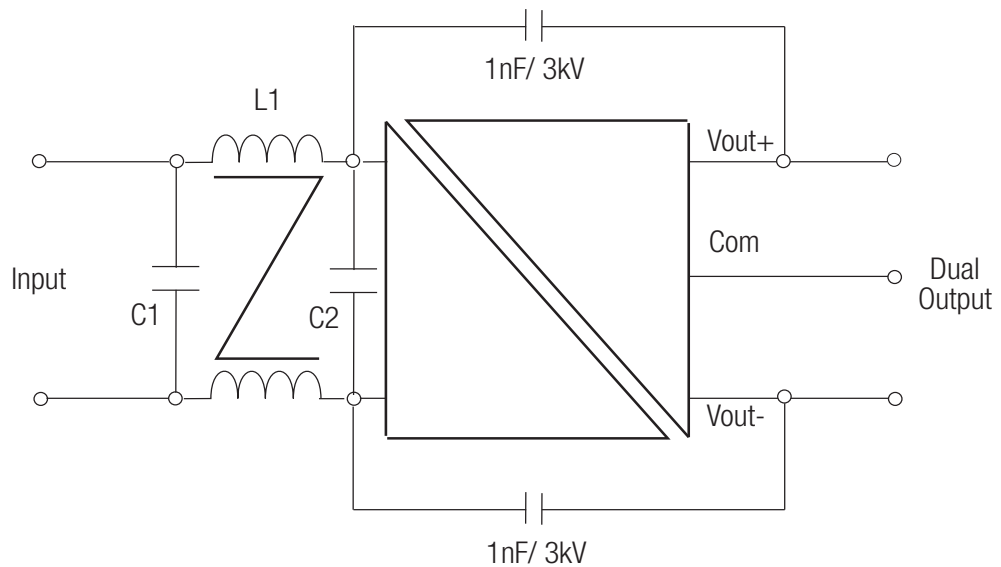
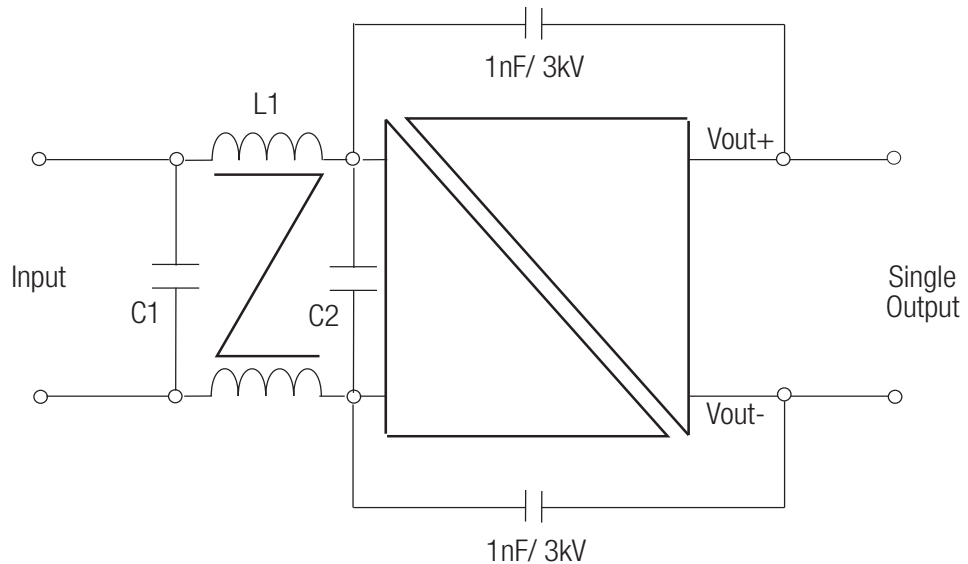
**RP08-4805SAW**

Efficiency VS Input Voltage



Efficiency VS Output load



**Class B Filter**

Vin=24V: C1=4.7 $\mu$ F/50V 1812 MLCC, L1 = CMC-06, C2=omit

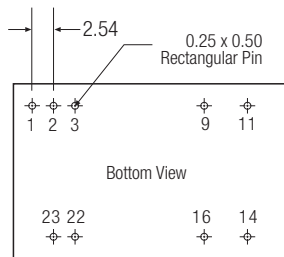
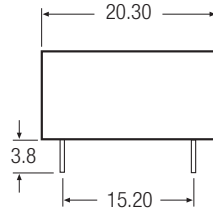
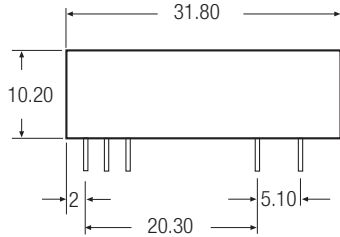
Vin=48V: C1= 1.5 $\mu$ F/100V 1812 MLCC, L1 = CMC-06, C2=1.5 $\mu$ F/100V 1812 MLCC

Vin=110V: C1= 0.47 $\mu$ F/250V 1812 MLCC, L1 = CMC-06, C2=0.47 $\mu$ F/250V 1812 MLCC

CMC-06 = 2x325 $\mu$ H Common Mode Choke, 3.3A rated, 35mOhm DCR.

**Package Style and Pinning (mm)**

**DIP24 Package Style**



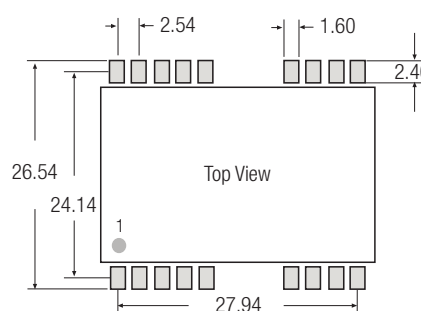
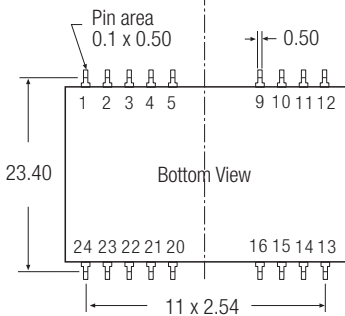
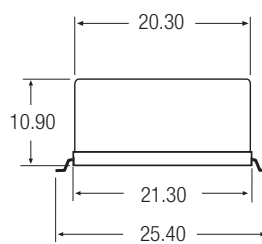
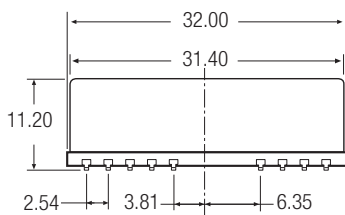
**Pin Connections**

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

NC = No Connection

Pin Pitch Tolerance  $\pm 0.35$  mm

**SMD Package Style**



**SMD Package Style**

Same spec. as the original DIP spec. and pin definition, excl. of the SMD type pin.

**Pin Connections**

Pin #	Single	Dual
1	ON/OFF	ON/OFF
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

NC = No Connection

Pin Pitch Tolerance  $\pm 0.35$  mm