

Features

Regulated Converters

- 2:1 Wide Input Voltage Range
- 1.6kVDC Isolation
- UL Certified
- Efficiency up to 87%
- Low Profile, 10.2mm Height
- Over Current Protection

RECOM
DC/DC Converter

RP08-A

8 Watt
DIP24/SMD
Single & Dual
Output



Description

The RP08-A series 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.

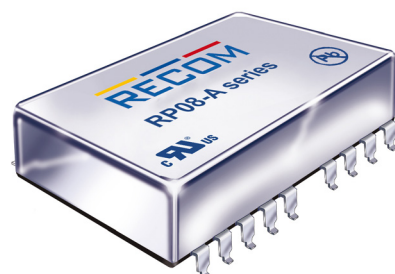
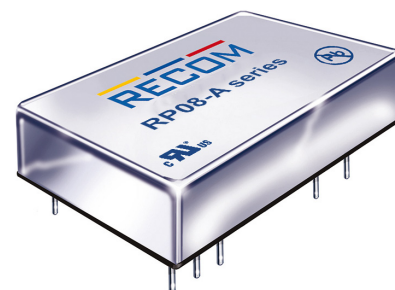
Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Input ⁽¹⁾ Current [mA]	Efficiency ⁽¹⁾ typ. [%]	Max. Capacitive Load ⁽²⁾ [μF]
RP08-123.3SA ⁽³⁾	9-18	3.3	2000	688	80	3300
RP08-1205SA ⁽³⁾	9-18	5	1500	753	83	1600
RP08-1212SA ⁽³⁾	9-18	12	666	757	88	350
RP08-1215SA ⁽³⁾	9-18	15	533	766	87	240
RP08-243.3SA ⁽³⁾	18-36	3.3	2000	344	80	3300
RP08-2405SA ⁽³⁾	18-36	5	1500	377	83	1600
RP08-2412SA ⁽³⁾	18-36	12	666	387	86	350
RP08-2415SA ⁽³⁾	18-36	15	533	392	85	240
RP08-483.3SA ⁽³⁾	36-75	3.3	2000	172	80	3300
RP08-4805SA ⁽³⁾	36-75	5	1500	188	83	1600
RP08-4812SA ⁽³⁾	36-75	12	666	194	86	350
RP08-4815SA ⁽³⁾	36-75	15	533	194	86	240
RP08-1205DA ⁽³⁾	9-18	±5	±800	803	83	±1000
RP08-1212DA ⁽³⁾	9-18	±12	±333	766	87	±160
RP08-1215DA ⁽³⁾	9-18	±15	±267	785	85	±100
RP08-2405DA ⁽³⁾	18-36	±5	±800	407	82	±1000
RP08-2412DA ⁽³⁾	18-36	±12	±333	387	86	±160
RP08-2415DA ⁽³⁾	18-36	±15	±267	393	85	±100
RP08-4805DA ⁽³⁾	36-75	±5	±800	196	85	±1000
RP08-4812DA ⁽³⁾	36-75	±12	±333	191	87	±160
RP08-4815DA ⁽³⁾	36-75	±15	±267	192	87	±100

Notes:

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

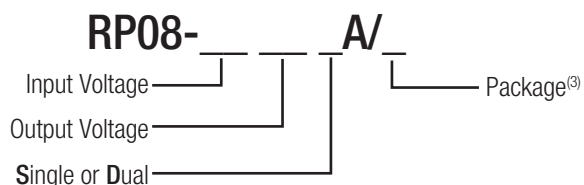
Note2: Test by minimum Vin and constant resistor load.



UL
E196683

UL60950-1 Certified

Model Numbering



Ordering Examples

RP08-4805SA/SMD = 48V Input, 5V Output, Single, SMD Package

RP08-1205DA = 12V Input, 5V Output, Dual, DIP24 Package

Notes:

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

Specifications measured at $T_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted

BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range	nom. Vin = 12V nom. Vin = 24V nom. Vin = 48V	9VDC 18VDC 36VDC	12VDC 24VDC 48VDC	18VDC 36VDC 75VDC
Under Voltage Lockout (UVLO)				none
Input Filter				Pi-Type
Input Reflected Ripple Current	nominal Vin and full load		20mA _{p-p}	
Input Surge Voltage	Vin = 12V, 100ms max. Vin = 24V, 100ms max. Vin = 48V, 100ms max.			36VDC 50VDC 100VDC
Start-up time	Power up Remote ON/OFF		700ms 5ms	
Operating Frequency Range		270kHz	300kHz	330kHz
Minimum Load ⁽⁴⁾	full load	10%		
Ripple and Noise	20MHz Bandwidth		50mV _{p-p}	
Remote ON/OFF ⁽⁵⁾	Positive Logic	DC-DC ON DC-DC OFF	Open or $3.0\text{V} < V_r < 12\text{V}$ Short or $0\text{V} < V_r < 1.2\text{V}$	
Input current of Remote pin (CTRL)		DC-DC OFF	2.5mA	
		DC-DC ON	-0.5mA	+0.5mA

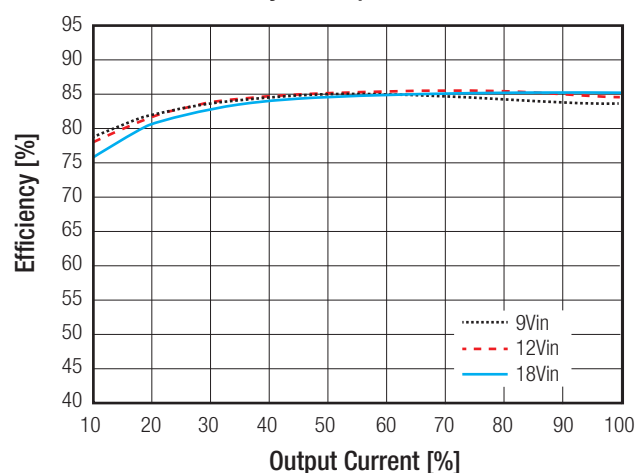
Notes:

Note4: The RP08 series requires a minimum of 10% loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.

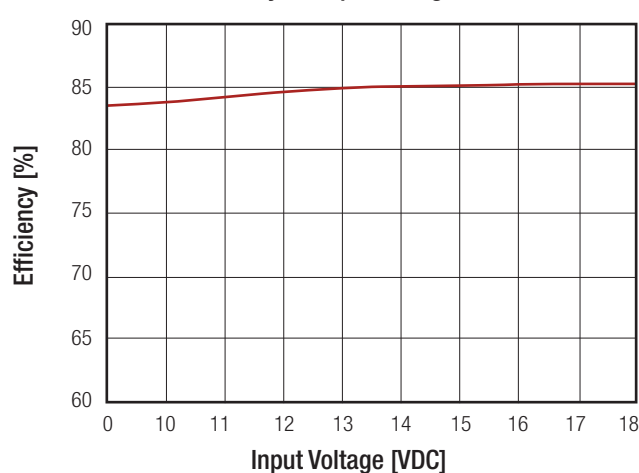
Note5: The ON/OFF control pin voltage is referenced to -Vin pin.

RP08-1205SA

Efficiency vs. Output Current



Efficiency vs. Input Voltage

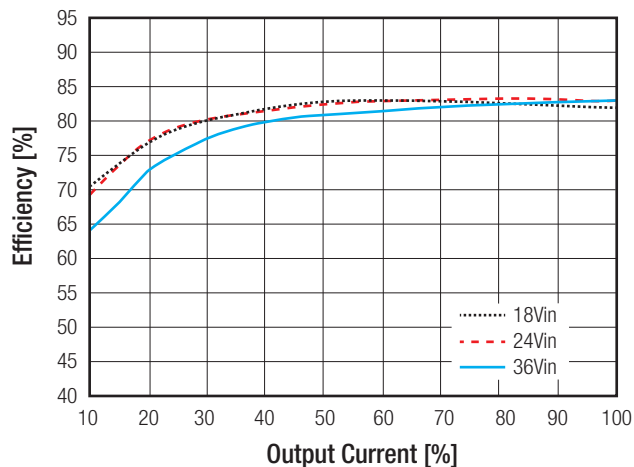


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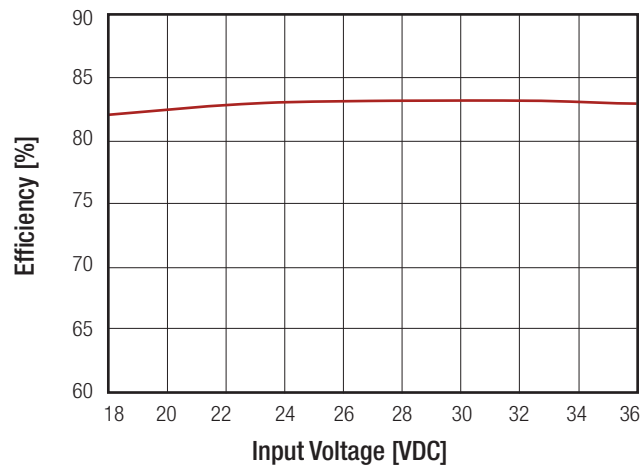
Specifications measured at $T_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted

RP08-2405SA

Efficiency vs. Output Current

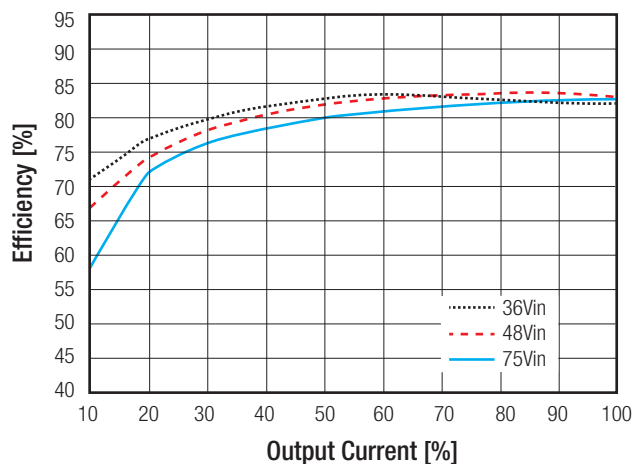


Efficiency vs. Input Voltage

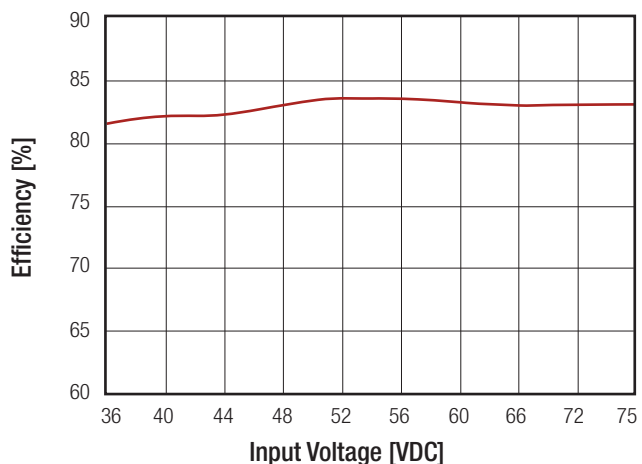


RP08-4805SA

Efficiency vs. Output Current



Efficiency vs. Input Voltage



REGULATIONS

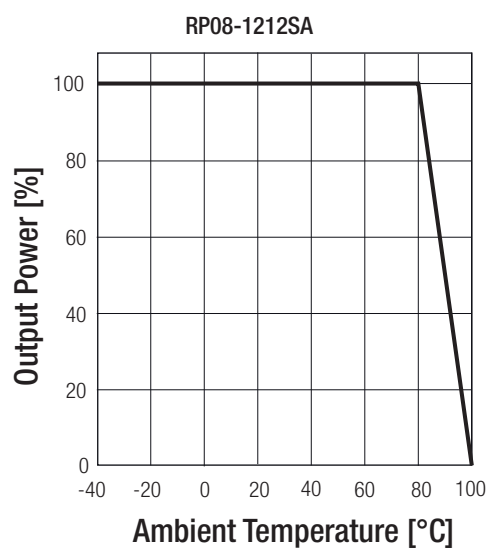
Parameter	Condition		Value
Output Voltage Accuracy			$\pm 1.0\%$ max.
Line Voltage Regulation	low line to high line		$\pm 0.2\%$ max.
Load Voltage Regulation	Single (0% to 100% load)	DIP24 SMD	$\pm 0.5\%$ $\pm 1\%$
	Dual (0% to 100% load)	DIP24, SMD	$\pm 1\%$
Cross Regulation	asymmetrical 25% <-> 100% load		$\pm 5\%$
Transient Response recovery time	25% load step change		200 μs typ.

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

PROTECTIONS		
Parameter	Condition	Value
Short Circuit Protection (SCP)		continuous, automatic recovery
Over Load Protection (OLP)	% of Iout rated	150% typ.
Isolation Voltage	DIP24 I/P to O/P	1.6kVDC/1 minute
	I/P (O/P) to case	1.6kVDC/1 minute
	SMD I/P to O/P	1.6kVDC/1 minute
	I/P (O/P) to case	1.0kVDC/1 minute
Isolation Resistance	500VDC	1GΩ min.
Isolation Capacitance		300pF max.
Notes: Note6: This power module is not internally fused. An input line fuse must always be used.		

ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range	without derating with derating	-40°C to +80°C -40°C to +100°C
Maximum Case Temperature		+100°C
Temperature Coefficient		±0.02%/°C max.
Thermal Impedance	Natural convection (20LFM)	20°C/Watt typ.
Operating Humidity	non-condensing	5% - 95% RH
Shock		MIL-STD-810F
Vibration		MIL-STD-810F
MTBF	MIL-HDBK-217F BELLCORE TR-NWT-000332 ⁽⁷⁾	3543 x 10 ³ hours 3165 x 10 ³ hours

Derating Graph⁽⁸⁾



Notes:

Note7: BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).

Note8: 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.

Specifications measured at $T_a = 25^\circ\text{C}$, nominal input voltage, full load otherwise noted

SAFETY AND CERTIFICATIONS

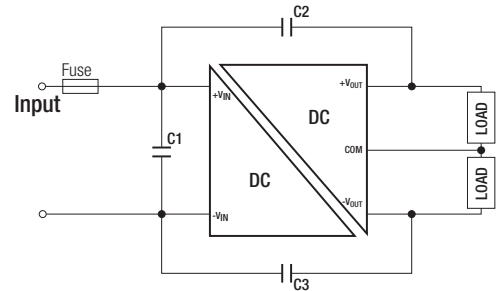
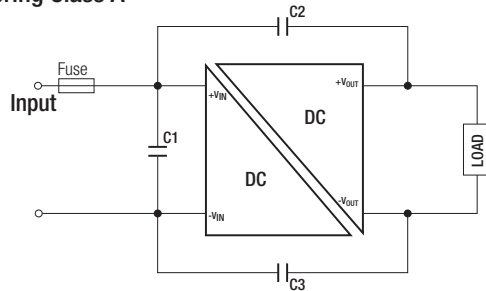
Certificate Type	Report / File Number	Standard
UL General Safety	E196683	UL60950-1 1st Ed.: 2003 C22.2 No. 60950 1st. Ed.: 2003
EMC Compliance	Condition	Standard / Criterion
EMI Standard ⁽⁹⁾	with external filter	EN55022, Class A or B
ESD	Air $\pm 8\text{kV}$ and Contact $\pm 6\text{kV}$	EN61000-4-2, Criteria A
Radiated Immunity	10 V/m	EN61000-4-3, Criteria A
Fast Transient ⁽¹⁰⁾	$\pm 2\text{kV}$	EN61000-4-4, Criteria A
Surge	$\pm 1\text{kV}$	EN61000-4-5, Criteria A
Conducted Immunity	10 Vr.m.s	EN61000-4-6, Criteria A

Notes:

Note9: The standard modules meet EMI Class A or Class B with external components, see filter suggestions below.

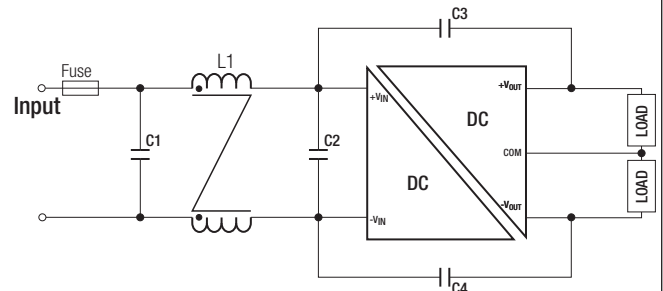
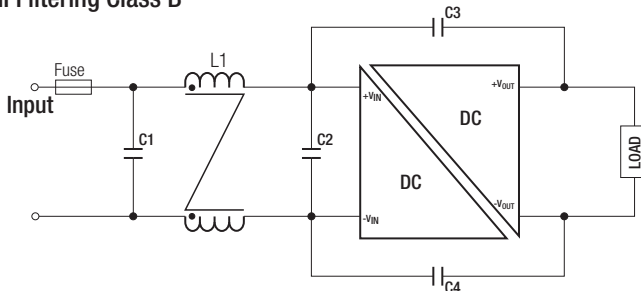
Note10: An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The suggested capacitor: Nippon chemi-con KY series 200 $\mu\text{F}/100\text{V}$.

EMI Filtering Class A



MODEL	C1	C2/C3
RP08-12xxS_D	4.7 $\mu\text{F}/25\text{V}$	1000pF/2kV
RP08-12xxS_D/SMD	1210 MLCC	1206 MLCC
RP08-24xxS_D	N/A	1000pF/2kV
RP08-24xxS_D/SMD	N/A	1206 MLCC
RP08-48xxS_D	N/A	1000pF/2kV
RP08-48xxS_D/SMD	N/A	1206 MLCC

EMI Filtering Class B



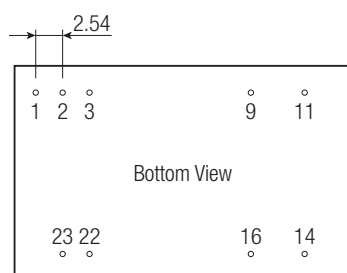
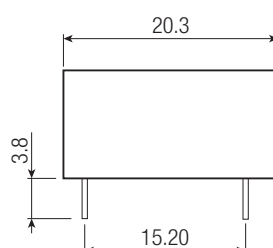
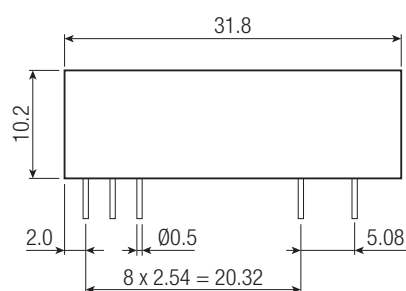
MODEL	C1	C2	C3/C4	L1
RP08-12xxS_D	4.7 $\mu\text{F}/25\text{V}$	N/A	1000pF/2kV	CMC :325 μH
RP08-12xxS_D/SMD	1210 MLCC	N/A	1206 MLCC	ref: WE 744290321
RP08-24xxS_D	6.8 $\mu\text{F}/50\text{V}$	N/A	1000pF/2kV	ref.: CMC-06
RP08-24xxS_D/SMD	1812 MLCC	N/A	1206 MLCC	CMC: 325 μH
RP08-48xxS_D	2.2 $\mu\text{F}/100\text{V}$	2.2 $\mu\text{F}/100\text{V}$	1000pF/2kV	ref: WE 744290321
RP08-48xxS_D/SMD	1812 MLCC	1812 MLCC	1206 MLCC	ref.: CMC-06

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

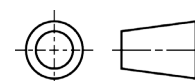
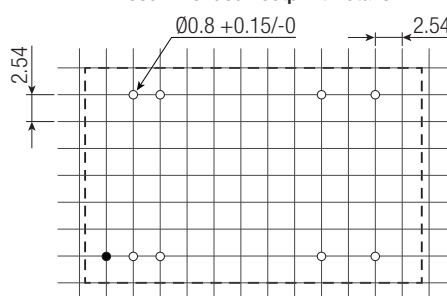
DIMENSIONS and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case	Nickel coated copper
	Base	Non-conductive black plastic
	Potting	Epoxy (UL94-V0)
Package Dimensions (LxWxH)	DIP24	31.8 x 20.3 x 10.2mm
	SMD	32.0 x 20.5 x 11.2mm
Package Weight	DIP24	16g
	SMD	18g

DIP Dimension Drawing (mm)



Recommended Footprint Details

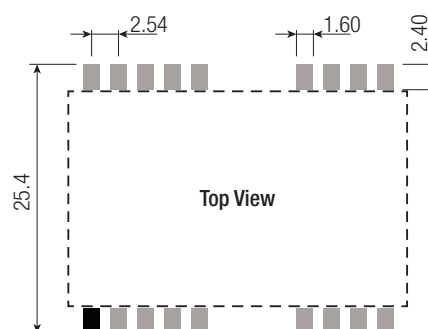
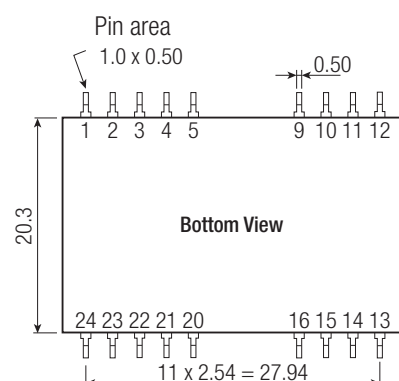
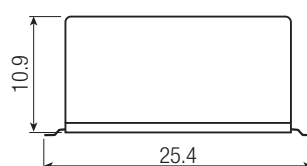
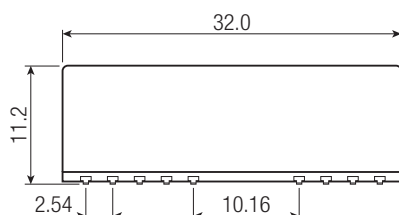


Pin Connections

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 $\pm 0.25\text{mm}$
Pin Dimension Tolerance $\pm 0.1\text{mm}$
XX.X $\pm 0.5\text{mm}$
XX.XX $\pm 0.25\text{mm}$
NC = No Connection

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 $\pm 0.25\text{mm}$
Pin Dimension Tolerance $\pm 0.1\text{mm}$
XX.X $\pm 0.5\text{mm}$
XX.XX $\pm 0.25\text{mm}$
NC = No Connection

Specifications measured at $T_a = 25^{\circ}\text{C}$, nominal input voltage, full load otherwise noted

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