Features

Regulated Converters

- 4:1 Wide Input Voltage Range
- 1.6kVDC Isolation
- UL Certified
- Efficiency up to 84%
- Fixed Operating Frequency
- Six-Sided Continuous Shield

RECOM

DC/DC Converter

RP10-EW

10 Watt 2“ x 1“ Single & Dual Output

3 YEAR Warranty

Description

The RP10-EW series wide input range 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 industry standard 2” x 1” package meets military standards for thermal shock and vibration tolerance and is available with an optional remote on/off control pin.

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]
RP10-243.3SEW[3,4]	9-36	3.3	2500	441	78	6800
RP10-2405SEW[3,4]	9-36	5	2000	521	80	4700
RP10-2412SEW[3,4]	9-36	12	830	494	84	690
RP10-2415SEW[3,4]	9-36	15	670	517	81	470
RP10-483.3SEW[3,4]	18-75	3.3	2500	226	76	6800
RP10-4805SEW[3,4]	18-75	5	2000	322	81	4700
RP10-4812SEW[3,4]	18-75	12	830	247	84	690
RP10-4815SEW[3,4]	18-75	15	670	249	84	470
RP10-2405DEW[3,4]	9-36	±5	±1000	508	82	±680
RP10-2412DEW[3,4]	9-36	±12	±416	520	80	±330
RP10-2415DEW[3,4]	9-36	±15	±333	520	80	±110
RP10-4805DEW[3,4]	18-75	±5	±1000	254	82	±680
RP10-4812DEW[3,4]	18-75	±12	±416	267	78	±330
RP10-4815DEW[3,4]	18-75	±15	±333	257	81	±110

Notes:

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

Note2: Test by minimum Vin and constant resistor load.

Model Numbering

RP10-__ __ _EW/_ _

- Input Voltage
- Output Voltage
- Single or Dual
- Package [4]
- Control Logic[3]

Ordering Examples:

RP10-1205SEW/P = 12V Input, 5V Output, Positive Logic CTRL pin fitted

RP10-4805DEW-HC = 48V Input, 5V Output, No CTRL pin, Heatsink fitted

Notes:

Note3: add suffix “P” for CTRL function with Positive Logic (1=ON, 0=OFF)
add suffix “N” for CTRL function with Negative Logic (0=ON, 1=OFF)

Note4: add suffix -HC for premounted Heat-sink and clips

RoHS 6 from 6 compliant

REACH compliant

c UL us E196683

UL60950-1 Certified

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)					none
Input Filter					Pi-Type
Input Reflected Ripple Current[5]	nominal Vin and full load			30mAp-p	
Input Surge Voltage	Vin = 24V, 100ms max. Vin = 48V, 100 ms max.				50VDC 100VDC
Start-up time	nominal Vin and constant resistor load			20ms	
Operating Frequency Range			270kHz	300kHz	330kHz
Minimum Load[6]	of full load		10%		
Ripple and Noise	20MHz bandwidth	Single Dual		50mVp-p 75mVp-p	
Remote ON/OFF[7]	Positive Logic	DC-DC ON DC-DC OFF			Open or 3.5V < Vr < 12V Short or 0V < Vr < 1.2V
	Negative Logic	DC-DC ON DC-DC OFF			Short or 0V < Vr < 1.2V Open or 3.5V < Vr < 12V
Input current of Remote pin (CTRL)		DC-DC OFF		20mA	
		DC-DC ON	-0.5mA		1.0mA

Notes:

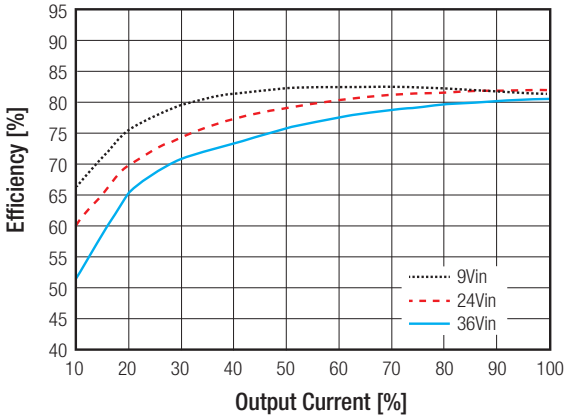
Note5: Simulated source impedance of 12µH. 12µH inductor in series with +Vin.

Note6: The RP10 (W) series required a minimum 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.

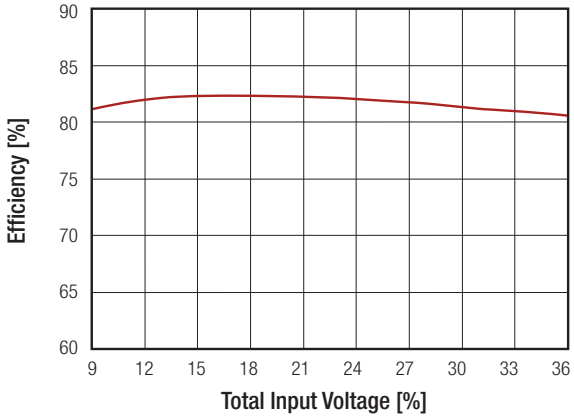
Note7: The ON/OFF control function can be positive or negative logic. The pin voltage is referenced to -Vin pin.
If no suffix is specified, the control pin will be omitted.

RP10-2405SEW

Efficiency vs. Output Current



Efficiency vs. Input Voltage



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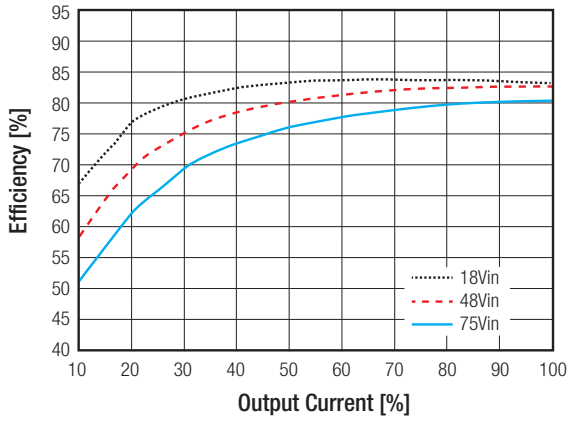
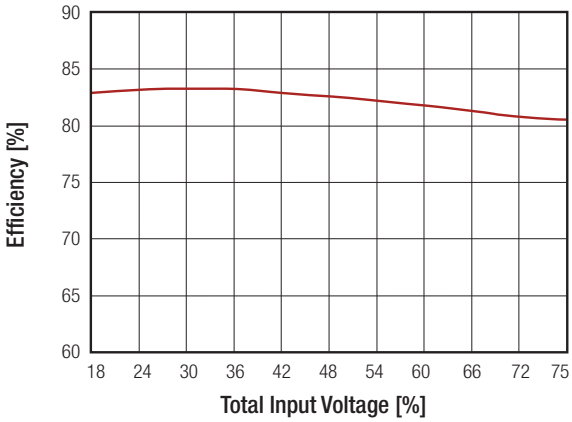
Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

RP10-4805SEW

Efficiency vs. Output Current



Efficiency vs. Input Voltage



REGULATIONS

Parameter	Condition		Value
Output Voltage Accuracy			±1%
Load Voltage Regulation	0% to 100% load	Single Dual	±0.5% ±1.0%
Line Voltage Regulation	low line to high line, full load		±0.2%
Cross Regulation	asymmetrical 25%<>100% load		±5%
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	5Vout 12Vout 15Vout	6.2VDC 15VDC 18VDC
Over Load Protection (OLP)	%of Iout rated		150% typ.
Isolation Voltage	I/P to O/P I/P (O/P) to case		1.6kVDC/1 minute 1.6kVDC/1 minute
Isolation Resistance	500VDC		1GΩ min.
Isolation Capacitance			300pF max.

Notes:

Note8: This power module is not internally fused. An input line fuse must always be used.

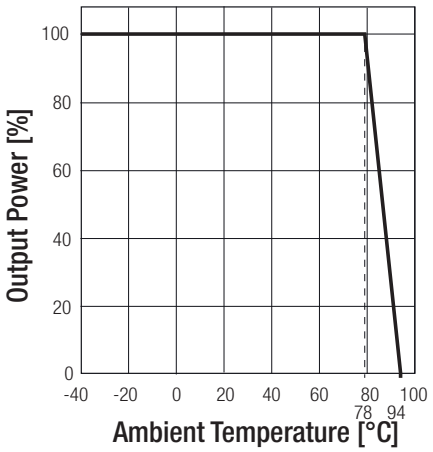
Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

ENVIRONMENTAL

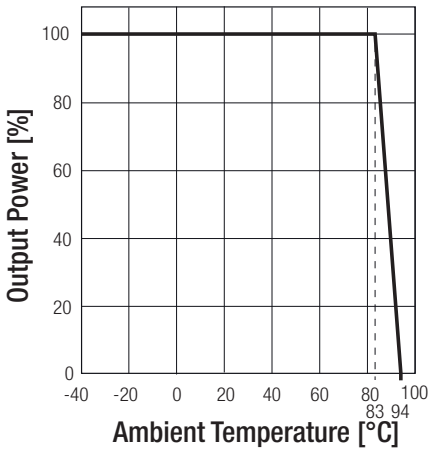
Parameter	Condition	Value
Operating Temperature Range	without derating with derating	-40°C to +78°C -40°C to +94°C
Maximum Case Temperature		+105°C
Temperature Coefficient		±0.02%/°C max.
Thermal Impedance[9]	Natural convection (20LFM) Natural convection (20LFM) with heatsink	12°C/Watt 10°C/Watt
Operating Humidity	non-condensing	5% - 95% RH
Thermal Shock		MIL-STD-810F
Vibration		MIL-STD-810F
MTBF	MIL-HDBK-217F, Full Load Bellcoe TR-NWT-000332[10]	3342 x 10^3 hours 1976 x 10^3 hours

Derating Graph[11]

RP10-2412SEW



RP10-2412SEW with Heat-sink



Notes:

Note9: Heatsink is optional and P/N 7G-0020C. Powerline DC/DC Converters can be ordered with pre-mounted heatsinks including antivibration fixing clips (add suffix -HC). See application notes for further details.

Note10: BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40ºC. (Ground fixed and controlled environment).

Note11: 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[12]	with external filter	EN55022, Class A or B
ESD	Air ±8kV and Contact ± 6kV	EN61000-4-2, Criteria B
Radiated Immunity	10 V/m	EN61000-4-3, Criteria A
Fast Transient [13]	±2kV	EN61000-4-4, Criteria B
Surge[13]	±2kV	EN61000-4-5, Criteria B
Conducted Immunity	10 Vr.m.s	EN61000-4-6, Criteria A

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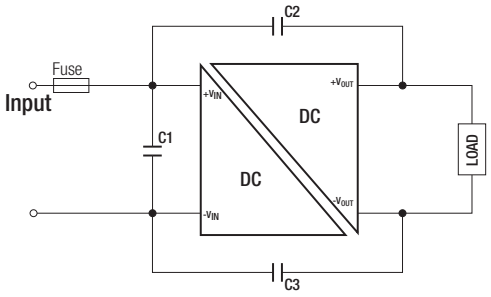
Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

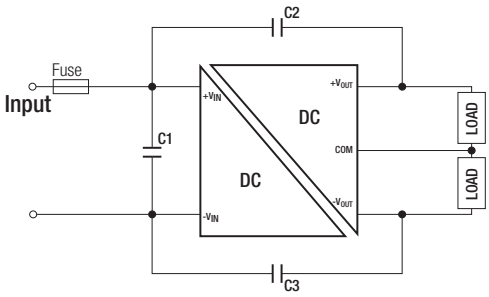
Notes:

Note12: The standard modues meet EMI Class A or Class B with external components, see filter suggestions below.

Note13: 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

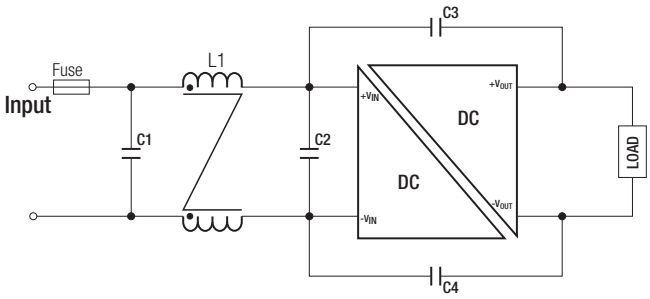
EMC Filtering Class A

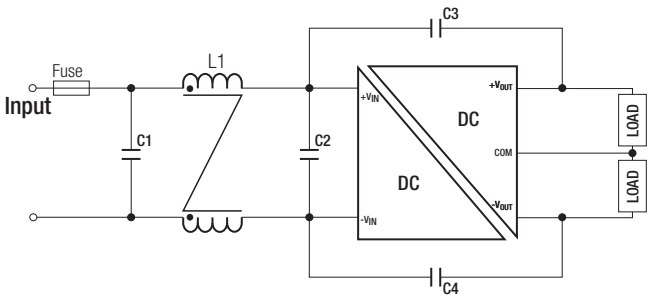




MODEL	C1	C2	L1
RP10-24xxS_DEW	1µF/50V 1210 MLCC	1000pF/2kV 1808 MLCC	1000pF/2kV 1808 MLCC
RP10-48xxS_DEW	1.5µF/100V 1812 MLCC	1000pF/2kV 1808 MLCC	1000pF/2kV 1808 MLCC

EMC Filtering Class B





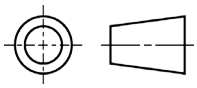
MODEL	C1	C2	C3/C4	L1
RP10-24xxS_DEW	2.2µF/50V 1812 MLCC	N/A	1000pF/2kV 1808 MLCC	CMC: 325µH ref: WE 744290321 ref.: CMC-06
RP10-48xxS_DEW	2.2µF/50V 1812 MLCC	2.2µF/100V 1812 MLCC	1000pF/2kV 1808 MLCC	CMC: 325µH ref: WE 744290321 ref.: CMC-06

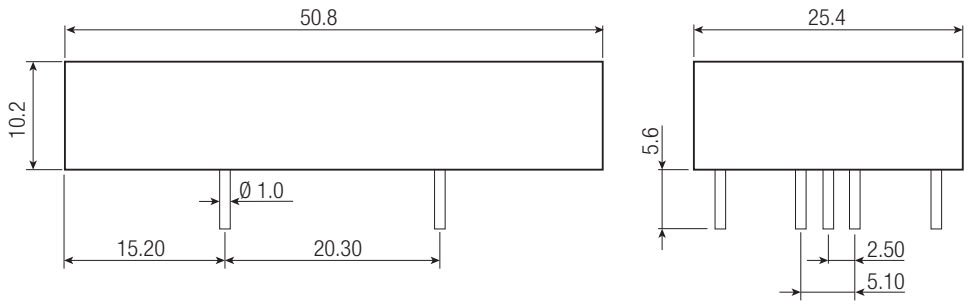
Specifications measured at Ta = 25°C, nominal input voltage, full load otherwise noted

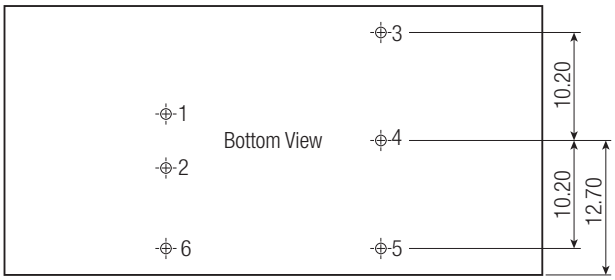
DIMENSIONS and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	Case Base Potting	Nickel coated copper Non-conductive black plastic Epoxy (UL94-V0)
Package Dimensions (LxWxH)	without Heat-sink with Heat-sink	50.8 x 25.4 x 10.2mm 56.8 x 25.4 x 16.8mm
Package Weight	without Heat-sink with Heat-sink	27g 37.89g

Dimension Drawing (mm)





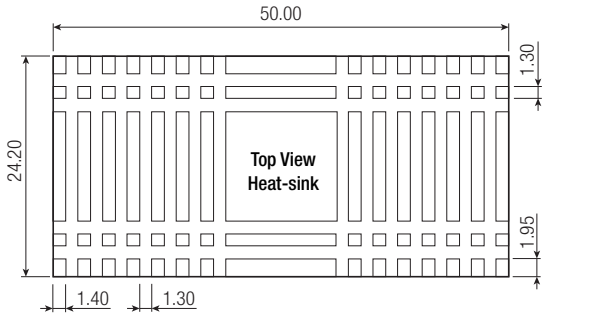


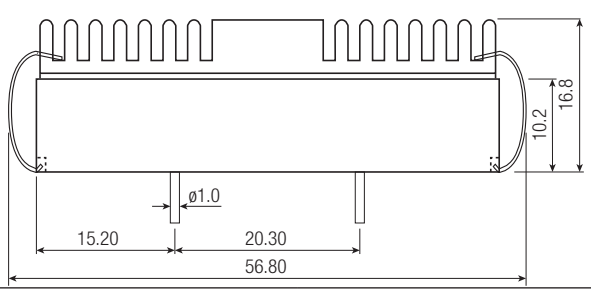
Pin Connections

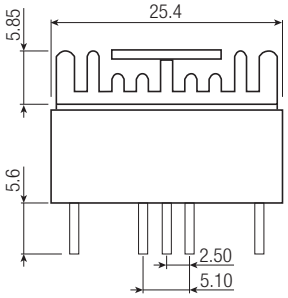
Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No Pin	Com
5	-Vout	-Vout
6*	CTRL*	CTRL*

*optional see Note7
Pin Pitch Tolerance ±0.25mm
Pin Dimension Tolerance ±0.1mm
XX.X ± 0.5mm
XX.XX ± 0.25mm

Dimension Drawing (mm) with Heat-sink







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

PACKAGING INFORMATION			
Parameter	**Type**		**Value**
Packaging Quantity	without Heat-sink	Tube	9pcs.
	with Heat-sink	Foam	20pcs.
Storage Temperature Range			-55°C to +125°C
Storage Humidity			5% - 95% RH

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

RECOM:

RP10-2405DEW RP10-2405DEW/M2 RP10-2405DEW/M2-HC RP10-2405DEW/N RP10-2405DEW/N/M2 RP10-2405DEW/N/M2-HC RP10-2405DEW/N-HC RP10-2405DEW/P RP10-2405DEW/P/M2 RP10-2405DEW/P/M2-HC RP10-2405DEW/P-HC RP10-2405DEW-HC RP10-2405SEW RP10-2405SEW/M2 RP10-2405SEW/M2-HC RP10-2405SEW/N RP10-2405SEW/N/M2 RP10-2405SEW/N/M2-HC RP10-2405SEW/N-HC RP10-2405SEW/P RP10-2405SEW/P/M2 RP10-2405SEW/P/M2-HC RP10-2405SEW/P-HC RP10-2405SEW-HC RP10-2412DEW RP10-2412DEW/M2 RP10-2412DEW/M2-HC RP10-2412DEW/N RP10-2412DEW/N/M2 RP10-2412DEW/N/M2-HC RP10-2412DEW/N-HC RP10-2412DEW/P RP10-2412DEW/P/M2 RP10-2412DEW/P/M2-HC RP10-2412DEW/P-HC RP10-2412DEW-HC RP10-2412SEW RP10-2412SEW/M2 RP10-2412SEW/M2-HC RP10-2412SEW/N RP10-2412SEW/N/M2 RP10-2412SEW/N/M2-HC RP10-2412SEW/N-HC RP10-2412SEW/P RP10-2412SEW/P/M2 RP10-2412SEW/P/M2-HC RP10-2412SEW/P-HC RP10-2412SEW-HC RP10-2415DEW RP10-2415DEW/M2 RP10-2415DEW/M2-HC RP10-2415DEW/N RP10-2415DEW/N/M2 RP10-2415DEW/N/M2-HC RP10-2415DEW/N-HC RP10-2415DEW/P RP10-2415DEW/P/M2 RP10-2415DEW/P/M2-HC RP10-2415DEW/P-HC RP10-2415DEW-HC RP10-2415SEW RP10-2415SEW/M2 RP10-2415SEW/M2-HC RP10-2415SEW/N RP10-2415SEW/N/M2 RP10-2415SEW/N/M2-HC RP10-2415SEW/N-HC RP10-2415SEW/P RP10-2415SEW/P/M2 RP10-2415SEW/P/M2-HC RP10-2415SEW/P-HC RP10-2415SEW-HC RP10-243.3SEW RP10-243.3SEW/M2 RP10-243.3SEW/M2-HC RP10-243.3SEW/N RP10-243.3SEW/N/M2 RP10-243.3SEW/N/M2-HC RP10-243.3SEW/N-HC RP10-243.3SEW/P RP10-243.3SEW/P/M2 RP10-243.3SEW/P/M2-HC RP10-243.3SEW/P-HC RP10-243.3SEW-HC RP10-4805DEW RP10-4805DEW/M2 RP10-4805DEW/M2-HC RP10-4805DEW/N RP10-4805DEW/N/M2 RP10-4805DEW/N/M2-HC RP10-4805DEW/N-HC RP10-4805DEW/P RP10-4805DEW/P/M2 RP10-4805DEW/P/M2-HC RP10-4805DEW/P-HC RP10-4805DEW-HC RP10-4805SEW RP10-4805SEW/M2 RP10-4805SEW/M2-HC RP10-4805SEW/N