Features

- 2:1 Wide Input Voltage Range
- 10 Watts Output Power
- 1.6kVDC Isolation
- UL Certified
- Fixed Operating Frequency
- Six-Sided Continuous Shield
- Standard 50.8 x25.4x10.2mm Package
- Efficiency to 86%

POWERLINE
DC/DC-Converter
with 3 year Warranty

RECOM

10 Watt 2" x 1" Single & Dual Output

RoHS 2011/65/EU 6/6

c UL us

UL-60950-1 Certified
E196683

RP10-E

Description

The RP10-E 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 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.
This series is also available with the /M1 option which is particularly suitable for extended temperature range applications.

Selection Guide 12V, 24V and 48V Input Types

Part Number	Input Range VDC	Output Voltage VDC	Output Current mA	Input [4] Current mA	Efficiency [5] %	Capacitive [6] Load max.
RP10-1205SE	9-18	5	2000	1082	81	4700µF
RP10-1212SE	9-18	12	830	1064	82	690µF
RP10-1215SE	9-18	15	670	1088	81	470µF
RP10-2405SE	18-36	5	2000	534	82	4700µF
RP10-2412SE	18-36	12	830	519	84	690µF
RP10-2415SE	18-36	15	670	523	84	470µF
RP10-4805SE	36-75	5	2000	260	84	4700µF
RP10-4812SE	36-75	12	830	253	86	690µF
RP10-4815SE	36-75	15	670	258	85	470µF
RP10-1205DE	9-18	±5	±1000	1068	82	±680µF
RP10-1212DE	9-18	±12	±416	1053	83	±330µF
RP10-1215DE	9-18	±15	±333	1041	84	±110µF
RP10-2405DE	18-36	±5	±1000	548	80	±680µF
RP10-2412DE	18-36	±12	±416	520	84	±330µF
RP10-2415DE	18-36	±15	±333	520	84	±110µF
RP10-4805DE	36-75	±5	±1000	267	82	±680µF
RP10-4812DE	36-75	±12	±416	254	86	±330µF
RP10-4815DE	36-75	±15	±333	260	84	±110µF

* add suffix /**M1** for higher efficiencies and extended temperature range.
* 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)
* add suffix **-HC** for premounted heatsink and clips

Ordering Examples

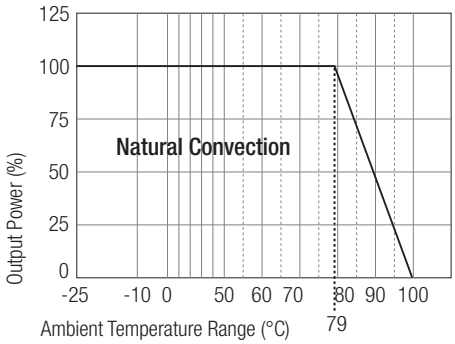
RP10-1205SE/P = 12V Input, 5V Output, Standard Temp. Range, Positive Logic CTRL pin fitted

RP10-4805DE/M1-HC = 48V Input, ±5V Output, Extended Temp. Range, No CTRL pin, Heatsink fitted

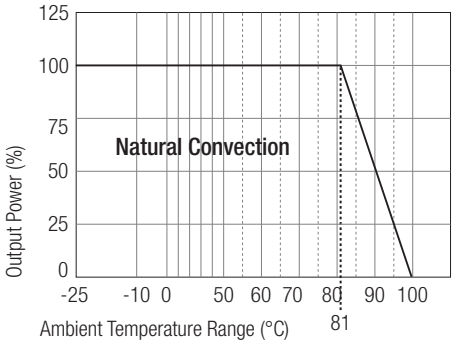
Refer to Application Notes

Derating Graph (Ambient Temperature)

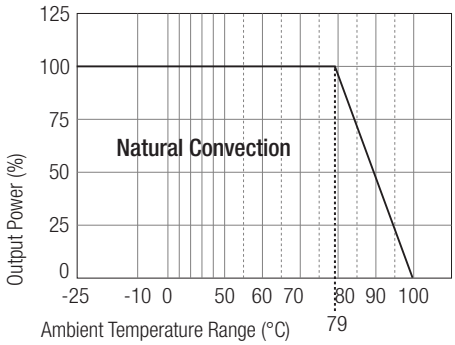
RP10-2405SE



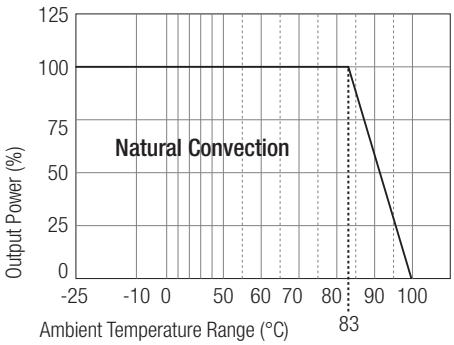
RP10-2405SE With Heat Sink



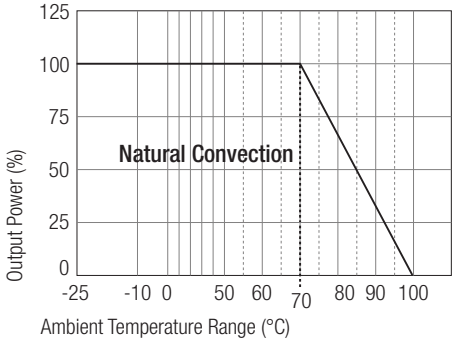
RP10-2405DE



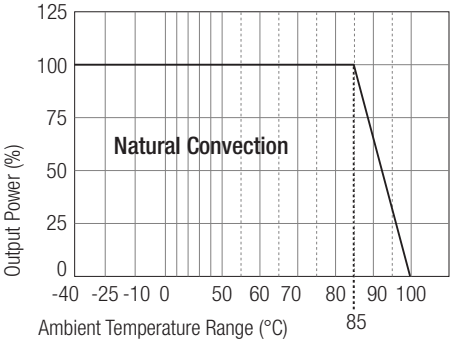
RP10-2405DE With Heat Sink



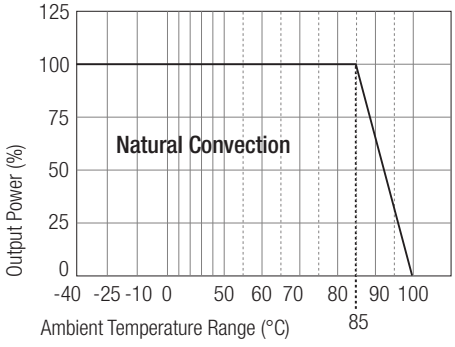
RP10-4805SE



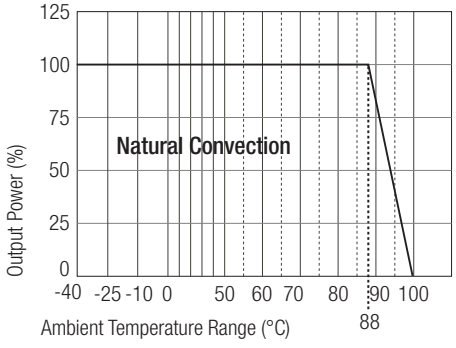
RP10-2405SE_DE/M1



RP10-4805SE/M1



RP10-2405SE_DE/M1 With Heat Sink



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

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

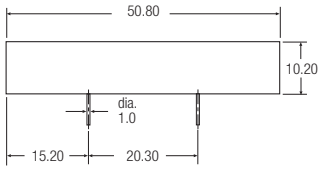
Input Voltage Range	12V nominal input	9-18VDC
	24V nominal input	18-36VDC
	48V nominal input	36-75VDC
Input Filter		Pi Type
Input Surge Voltage (100 ms max.)	12V Input	36VDC
	24V Input	50VDC
	48V Input	100VDC
Input Reflected Ripple (nominal Vin and full load) [3]		30mAp-p
Start Up Time (nominal Vin and constant resistor load)		20ms typ.
Remote ON/OFF [7]		
(Positive logic)	DC-DC ON	Open or 3.5V < Vr < 12V
	DC-DC OFF	Short or 0V < Vr < 1.2V
(Negative logic)	DC-DC ON	Short or 0V < Vr < 1.2V
	DC-DC OFF	Open or 3.5V < Vr < 12V
Remote OFF input current	Nominal input	20mA
Output Power		10W max.
Output Voltage Accuracy (full Load and nominal Vin)		±2%
Minimum Load [1]		10% of full load
Line Regulation (low line, high line at full load)		±1%
Load Regulation (25% to 100% full load)	Single	±1%
	Dual	±2%
Cross Regulation (asymmetrical25% <>100% load)		±5%
Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output)	Single	50mVp-p
	Dual	75mVp-p
Temperature Coefficient		±0.02%/°C max.
Transient Response (25% load step change)		500µs
Over Voltage Protection	3.3V output	3.9V
Zener diode clamp	5V output	6.2V
	12V output	15V
	15V output	18V
Over Load Protection (% of full load at nominal Vin)		150% typ
Undervoltage Lockout		none
Short Circuit Protection		Hiccup, automatic recovery
Efficiency		see „Selection Guide“ table
Isolation Voltage (rated for one minute)		1600VDC
Isolation Resistance		1 GΩ min.
Isolation Capacitance		300pF max.
Operating Frequency		300kHz typ.
Approved to Safety Standards [9]		UL 1950, EN60950
Operating Temperature Range	Standard	-25°C to +85°C(with derating)
(Reference Derating Curve) [10]	M1	-40°C to +85°C(non derating)
Maximum Case Temperature		+100°C
Storage Temperature Range		-55°C to +125°C

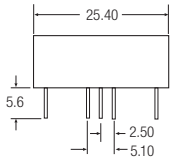
continued on next page

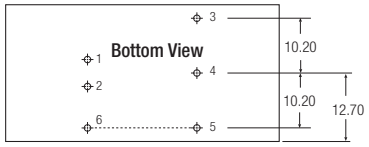
Specifications (typical at nominal input and 25°C unless otherwise noted)

Thermal Impedance [8]	Natural convection	12°C/Watt
	Natural convection with Heat Sink	10°C/Watt
Thermal Shock		MIL-STD-810D
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z
Relative Humidity		5% to 95% RH
Case Material		Nickel plated copper
Base Material		Non-conductive black plastic
Potting Material		Epoxy (UL94-V0)
Conducted Emissions [11]	EN55022	Level A
Radiated Emissions	EN55022	Level A
ESD	EN61000-4-2	Perf. Criteria B
Radiated Immunity	EN61000-4-3	Perf. Criteria B
Fast Transient	EN61000-4-4	Perf. Criteria B
Surge	EN61000-4-5	Perf. Criteria B
Conducted Immunity	EN61000-4-6	Perf. Criteria B
Weight		27g
Packing Quantity	Refer to App Notes for tube dimensions	9 pcs per Tube
Dimensions		50.8 x 25.4 x 10.2mm
MTBF [2]		1976 x 10^3 hours

Package Style and Pinning (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 Note 7.

Pin Pitch Tolerance ±0.35 mm

Notes :

1. 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.
2. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40ºC. (Ground fixed and controlled environment).
3. Simulated source impedance of 12µH. 12µH inductor in series with +Vin.
4. Maximum value at nominal input voltage and full load of standard type.
5. Typical value at nominal input voltage and full load.
6. Test by minimum Vin and constant resistor load.
7. The ON/OFF control function can be positive or negative logic. The pin voltage is referenced to negative input.
   Positive logic ON/OFF is marked with suffix-P (eg. RP10-2405SE/P), Negative logic ON/OFF is marked with suffix-N (eg. RP10-2405SE/N).
   If no suffix is specified, the control pin will be omitted.
8. Heat sink 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 heatsink details.
9. The M1 version (RP10-xxxxSE/M1, RP10-xxxxDE/M1) does not carry the UL certification.
10. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard version.
11. See application notes for EMI-filtering.

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.

Mouser Electronics

Authorized Distributor

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RECOM:

RP10-1205DE RP10-1205DE/M1 RP10-1205DE/M1-HC RP10-1205DE/N RP10-1205DE/N/M1 RP10-1205DE/N/M1-HC RP10-1205DE/N-HC RP10-1205DE/P/M1 RP10-1205DE/P/M1-HC RP10-1205DE/P-HC RP10-1205DE-HC RP10-1205SE RP10-1205SE/M1 RP10-1205SE/M1-HC RP10-1205SE/N RP10-1205SE/N/M1 RP10-1205SE/N/M1-HC RP10-1205SE/N-HC RP10-1205SE/P/M1 RP10-1205SE/P/M1-HC RP10-1205SE/P-HC RP10-1205SE-HC RP10-1212DE RP10-1212DE/M1 RP10-1212DE/M1-HC RP10-1212DE/N RP10-1212DE/N/M1 RP10-1212DE/N/M1-HC RP10-1212DE/N-HC RP10-1212DE/P/M1 RP10-1212DE/P/M1-HC RP10-1212DE/P-HC RP10-1212DE-HC RP10-1212SE RP10-1212SE/M1 RP10-1212SE/M1-HC RP10-1212SE/N RP10-1212SE/N/M1 RP10-1212SE/N/M1-HC RP10-1212SE/N-HC RP10-1212SE/P/M1 RP10-1212SE/P/M1-HC RP10-1212SE/P-HC RP10-1212SE-HC RP10-1215DE RP10-1215DE/M1 RP10-1215DE/M1-HC RP10-1215DE/N RP10-1215DE/N/M1 RP10-1215DE/N/M1-HC RP10-1215DE/N-HC RP10-1215DE/P/M1 RP10-1215DE/P/M1-HC RP10-1215DE/P-HC RP10-1215DE-HC RP10-1215SE RP10-1215SE/M1 RP10-1215SE/M1-HC RP10-1215SE/N RP10-1215SE/N/M1 RP10-1215SE/N/M1-HC RP10-1215SE/N-HC RP10-1215SE/P/M1 RP10-1215SE/P/M1-HC RP10-1215SE/P-HC RP10-1215SE-HC RP10-123.3SE RP10-123.3SE/M1 RP10-123.3SE/M1-HC RP10-123.3SE/N RP10-123.3SE/N/M1 RP10-123.3SE/N/M1-HC RP10-123.3SE/N-HC RP10-123.3SE/P RP10-123.3SE/P/M1 RP10-123.3SE/P/M1-HC RP10-123.3SE/P-HC RP10-123.3SE-HC RP10-2405DE RP10-2405DE/M1 RP10-2405DE/M1-HC RP10-2405DE/N RP10-2405DE/N/M1 RP10-2405DE/N/M1-HC RP10-2405DE/N-HC RP10-2405DE/P/M1 RP10-2405DE/P/M1-HC RP10-2405DE/P-HC RP10-2405DE-HC RP10-2405SE RP10-2405SE/M1 RP10-2405SE/M1-HC RP10-2405SE/N RP10-2405SE/N/M1 RP10-2405SE/N/M1-HC RP10-2405SE/N-HC RP10-2405SE/P/M1 RP10-2405SE/P/M1-HC RP10-2405SE/P-HC RP10-2405SE-HC