

# POWERLINE - DC/DC-Converter

E-Series, 10W, 1.6 kV Isolation, 2:1 Wide Input Range (Single & Dual Output)

# RECOM

## Features

- 10 Watts Output Power
- 2:1 Wide Input Voltage Range
- International Safety Standard Approvals
- Six-Sided Continuous Shield
- High Efficiency up to 86%
- Standard 50.8 x 25.4 x 10.2mm Package
- Fixed Switching Frequency
- UL 1950 Component Recognised

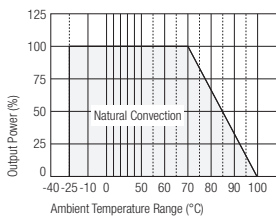


## Selection Guide 12V, 24V and 48V Input Types

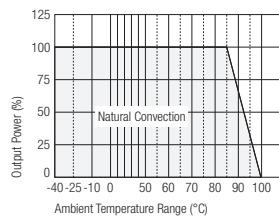
Part Number	Input Voltage VDC	Output Voltage VDC	Output Current mA	Input Current (see note 6) mA	Efficiency (see note 7) %	Capacitive Load max. µF
RP10-123.3SE	9-18	3.3	2000	724	80	6800
RP10-1205SE	9-18	5	2000	1082	81	4700
RP10-1212SE	9-18	12	830	1064	82	690
RP10-1215SE	9-18	15	670	1088	81	470
RP10-1205DE	9-18	±5	±1000	1068	82	±680
RP10-1212DE	9-18	±12	±416	1053	83	±330
RP10-1215DE	9-18	±15	±333	1041	84	±110
RP10-243.3SE	18-36	3.3	2000	362	80	6800
RP10-2405SE	18-36	5	2000	534	82	4700
RP10-2412SE	18-36	12	830	519	84	690
RP10-2415SE	18-36	15	670	523	84	470
RP10-2405DE	18-36	±5	±1000	548	80	±680
RP10-2412DE	18-36	±12	±416	520	84	±330
RP10-2415DE	18-36	±15	±333	520	84	±110
RP10-483.3SE	36-75	3.3	2000	183	79	6800
RP10-4805SE	36-75	5	2000	260	84	4700
RP10-4812SE	36-75	12	830	253	86	690
RP10-4815SE	36-75	15	670	258	85	470
RP10-4805DE	36-75	±5	±1000	267	82	±680
RP10-4812DE	36-75	±12	±416	254	86	±330
RP10-4815DE	36-75	±15	±333	260	84	±110

## RP10-4805SE: Derating & Efficiency Curves

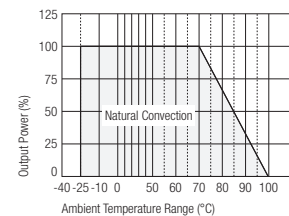
RP10-4805SE Derating Curve



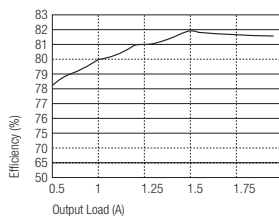
RP10-4805SE-M1 Derating Curve



RP10-4805SE-M2



RP10-4805S Efficiency vs Output Load



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

Output Power		10W max.	
Voltage Accuracy (full Load and nominal Vin)		±2%	
Minimum Load		10% of FL	
Line Regulation (LL-HL at full load)		±1%	
Load Regulation (10% to 100% FL)	Single Dual	±1% ±2%	
Cross Regulation (asymmetrical load 25%/100% FL)	Dual	±5%	
Ripple and Noise (20MHz bandwidth)	Single Dual	50mVp-p 75mVp-p	
Temperature Coefficient		±0.02%/°C, max.	
Transient Response (25% load step change)		500µsec	
Over Voltage Protection (with zener diode clamp)	3.3V output 5V output 12V output 15V output	3.9V 6.2V 15V 18V	
Over Load Protection (% of full load at nominal Vin)		150% max.	
Short Circuit Protection		Hiccup, automatic recovery	
Input Voltage Range	RP10 12V nominal input RP10 24V nominal input RP10 48V nominal input	9-18VDC 18-36VDC 36-75VDC	
Input Filter		Pi Type	
Input Surge Voltage (100 ms max.)	12V input 24V input 48V input	36VDC 50VDC 100VDC	
Input Reflected Ripple (nominal Vin and full load, see note 1)		30mA <sub>p-p</sub>	
Start Up Time (nominal Vin and constant resistor load)		20ms typ.	
Remote ON/OFF (see note 2)	Positive logic Negative logic	DC-DC ON DC-DC OFF DC-DC ON DC-DC OFF	Open or 3.5V < Vr < 12V Short or 0V < Vr < 1.2V Open or 3.5V < Vr < 12V Short or 0V < Vr < 1.2V
Remote Off Input Current	Nominal input		2.5mA
Efficiency		see „Selection Guide“ table	
Isolation Voltage		1600VDC min.	
Isolation Resistance		10 <sup>9</sup> Ω min.	
Isolation Capacitance		300pF max.	
Switching Frequency		300kHz typ.	
Approved to Safety Standards		UL 1950, EN60950	
Case Material		Nickel-coated copper	
Base Material		Non-conducted black plastic	
Potting Material		Epoxy (UL94-V0)	
Weight		27g	
Dimensions		50.8 x 25.4 x 10.2 mm	
MTBF (see note 3)		1.976 x 10 <sup>6</sup> Hours	

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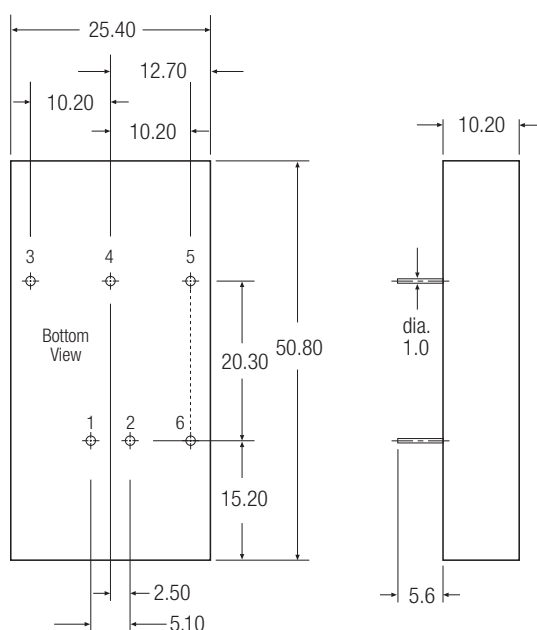
## Specifications continued (typical at nominal input and 25°C unless otherwise noted)

Operating Temperature Range (see derating curves on previous page)	Standard M1 (see note 4) M2	-25°C to +85°C (with derating) -40°C to +85°C (non-derating) -40°C to +85°C (with derating)
Maximum Case Temperature		+100°C
Storage Temperature Range		-55°C to +105°C
Thermal Impedance (see note 5)	Natural convection	12°C/Watt
Thermal Shock		MIL-STD-810D
Vibration		10-55Hz, 2G, 30 Min. along X, Y and Z
Relative Humidity		5% to 95% RH
Conducted Emissions	EN55022	Level A
Radiated Emissions	EN55022	Level A
Conducted Immunity	EN61000-4-6	Perf. Criteria 2
Radiated Immunity	EN61000-4-3	Perf. Criteria 2
Surge	EN61000-4-5	Perf. Criteria 2
Fast Transient	EN61000-4-4	Perf. Criteria 2
ESD	EN61000-4-2	Perf. Criteria 2

### Notes

1. Simulated source impedance of 12uH. 12uH inductor in series with +Vin.
2. The ON/OFF control is an optional function. There are positive logic and negative logic. The pin voltage is referenced to negative input.  
To order positive logic ON-OFF control add the suffix ' P ' (Ex: RP10-2405P)  
To order negative logic ON-OFF control add the suffix ' N ' (Ex: RP10-2405N)
3. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40 °C. (Ground fixed and controlled environment).
4. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard and M2 version.
5. Heat sink is optional and P/N: 7G -0020A, Thermal impedance is 10°C/Watt for natural convection.
6. Maximum value at nominal input Voltage and full load of standard type.
7. Typical value at nominal input voltage and full load.

## Package Style and Pinning (mm)



### Pin Connections

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No Pin	Common
5	-Vout	-Vout
6	CTRL (Optional)	CTRL (Optional)

Pin Pitch Tolerance  $\pm 0.35$  mm