

# POWERLINE - DC/DC-Converter

B-Series, 3W, 1.6 kV Isolation, Regulated, 2:1 Wide Input Range (Single & Dual Output)

# RECOM

## Features

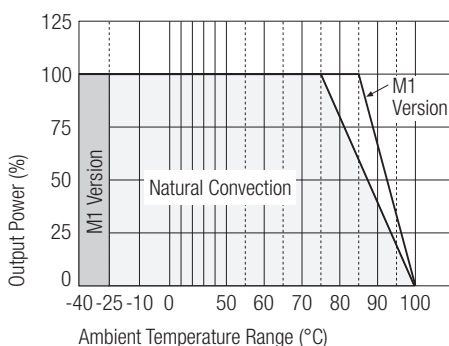
- 3 Watts Regulated Output Power
- 2:1 Wide Input Voltage Range
- Five-Sided Shield
- High Efficiency up to 80%
- Standard DIP24 & SMD Package
- Over Current Protection
- Also Available with Isolated Outputs, Output 1/Output 2 (DS) Isolation 500 VDC min. \*6
- International Safety Standard Approvals
- UL 1950 Component Recognised



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

Part Number	SMD Suffix	Input Range	Output Voltage	Output Current	Input Current (see note 4)	Efficiency (see note 5)	Capacitive Load max. $\mu$ F
DIP24		VDC	VDC	mA	mA	%	$\mu$ F
RP03-123.3SB	(SMD)	9-18	3.3	500	196	74	2200
RP03-1205SB	(SMD)	9-18	5	500	286	77	1000
RP03-1212SB	(SMD)	9-18	12	250	333	79	220
RP03-1215SB	(SMD)	9-18	15	200	329	80	150
RP03-1205DB	(SMD)	9-18	$\pm$ 5	$\pm$ 250	293	75	$\pm$ 470
RP03-1212DB	(SMD)	9-18	$\pm$ 12	$\pm$ 125	329	80	$\pm$ 100
RP03-1215DB	(SMD)	9-18	$\pm$ 15	$\pm$ 100	329	80	$\pm$ 68
RP03-243.3SB	(SMD)	18-36	3.3	500	101	72	2200
RP03-2405SB	(SMD)	18-36	5	500	149	74	1000
RP03-2412SB	(SMD)	18-36	12	250	169	78	220
RP03-2415SB	(SMD)	18-36	15	200	169	78	150
RP03-2405DB	(SMD)	18-36	$\pm$ 5	$\pm$ 250	147	75	$\pm$ 470
RP03-2412DB	(SMD)	18-36	$\pm$ 12	$\pm$ 125	169	78	$\pm$ 100
RP03-2415DB	(SMD)	18-36	$\pm$ 15	$\pm$ 100	169	78	$\pm$ 68
RP03-483.3SB	(SMD)	36-75	3.3	500	50	73	2200
RP03-4805SB	(SMD)	36-75	5	500	75	74	1000
RP03-4812SB	(SMD)	36-75	12	250	84	79	220
RP03-4815SB	(SMD)	36-75	15	200	84	79	150
RP03-4805DB	(SMD)	36-75	$\pm$ 5	$\pm$ 250	75	74	$\pm$ 470
RP03-4812DB	(SMD)	36-75	$\pm$ 12	$\pm$ 125	86	77	$\pm$ 100
RP03-4815DB	(SMD)	36-75	$\pm$ 15	$\pm$ 100	86	77	$\pm$ 68

## RP03-4805SB: Derating Curve



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

Output Power		3W max.
Voltage Accuracy (full load and nominal Vin)		±2%
Minimum Load Voltage (see note 1)		10% of FL
Line Regulation (LL-HL at full load)		±0.2%
Load Regulation (25% to 100% FL)	Single Dual	±0.2% ±1%
Cross Regulation (asymmetrical load 25%/100% FL)		±5%
Ripple and Noise (20MHz bandwidth)		50mVp-p
Temperature Coefficient		±0.02%/°C, max.
Transient Response (25% load step change)		200µsec
Over Load Protection (% of full load at nominal Vin)		180% typ.
Short Circuit Protection		Continuous, automatic recovery
Input Voltage Range	12V nominal input 24V nominal input 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)		20mAp-p
Start Up Time (nominal Vin and constant resistor load)		350ms typ.
Efficiency		see „Selection Guide“ table
Isolation Voltage	I/O „DS“ Dual separate type, O/O	500VDC min. 500VDC 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	DIP SMD	16g 18g
Dimensions	DIP SMD	31.8 x 20.3 x 10.2mm 32.0 x 20.3 x 10.9mm
MTBF (see note 2)		3.069 x 10 <sup>6</sup> Hours
Operating Temperature Range	Standard M1 (see note 3)	-25°C to +85°C (with derating) -40°C to +85°C (non-derating)
Maximum Case Temperature		+100°C
Storage Temperature Range		-55°C to +105°C
Thermal Impedance	Natural convection	20°C/Watt
Thermal Shock		MIL-STD-810D
Vibration		10-55Hz, 2G, 30 Min. along X, Y and Z

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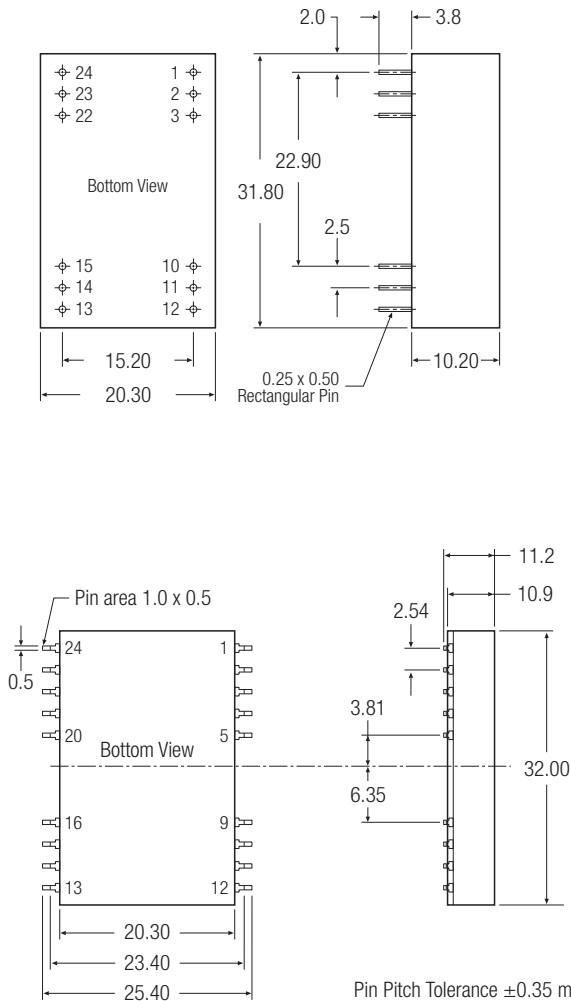
## Specifications continued (typical at nominal input and 25°C unless otherwise noted)

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
Fast Transient	EN61000-4-4	Perf. Criteria 2
ESD	EN61000-4-2	Perf. Criteria 2

### Notes

1. The RP03 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.
2. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).
3. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard.
4. Maximum value at nominal input voltage and full load of standard type.
5. Typical value at nominal input voltage and full load.
6. Should an O/O isolation be required, please order the converter with the following part number: RP03-XXXXDB/DS

## Package Style and Pinning (mm)



### DIP Pin Connections

Pin #	Single	Dual	Dual Separated Outputs
1	+Vin	+Vin	+Vin
2	NC	-Vout	-V1 out
3	NC	Common	+V1 out
10	-Vout	Common	-V2 out
11	+Vout	+Vout	+V2 out
12	-Vin	-Vin	-Vin
13	-Vin	-Vin	-Vin
14	+Vout	+Vout	+V2 out
15	-Vout	Common	-V2 out
22	NC	Common	+V1 out
23	NC	-Vout	-V1 out
24	+Vin	+Vin	+Vin

### SMD Pin Connections out in

Pin #	Single	Dual	Dual Separated Outputs
1	+Vin	+Vin	+Vin
2	NC	-Vout	-V1 out
3	NC	Common	+V1 out
10	-Vout	Common	-V2 out
11	+Vout	+Vout	+V2 out
12	-Vin	-Vin	-Vin
13	-Vin	-Vin	-Vin
14	+Vout	+Vout	+V2 out
15	-Vout	Common	-V2 out
22	NC	Common	+V1 out
23	NC	-Vout	-V1 out
24	+Vin	+Vin	+Vin
Others	NC	NC	NC