

POWERLINE - DC/DC-Converter

E-Series, 20W, 1.6 kV Isolation, 2:1 Wide Input Range (Single, Dual & Triple Output)

RECOM

Features

- 20 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 40.6 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 7) mA	Efficiency (see note 8) %	Capacitive Load max. µF
RP20-123.3SE	9-18	3.3	4000	1507	77	13000
RP20-1205SE	9-18	5	4000	2193	80	6800
RP20-1212SE	9-18	12	1670	2136	82	2200
RP20-1215SE	9-18	15	1330	2136	82	755
RP20-1205DE	9-18	±5	±2000	2193	80	±3400
RP20-1212DE	9-18	±12	±833	2136	82	±680
RP20-1215DE	9-18	±15	±666	2136	82	±450
RP20-123.312TE	9-18	3.3 / ±12	3000 / ±300	1926	78	4700 / ±220
RP20-123.315TE	9-18	3.3 / ±15	3000 / ±250	1959	78	4700 / ±220
RP20-120512TE	9-18	5 / ±12	2000 / ±300	1885	80	4700 / ±220
RP20-120515TE	9-18	5 / ±15	2000 / ±250	1919	80	4700 / ±220
RP20-243.3SE	18-36	3.3	4000	743	78	13000
RP20-2405SE	18-36	5	4000	1082	81	6800
RP20-2412SE	18-36	12	1670	1054	83	2200
RP20-2415SE	18-36	15	1330	1054	83	755
RP20-2405DE	18-36	±5	±2000	1082	81	±3400
RP20-2412DE	18-36	±12	±833	1054	83	±680
RP20-2415DE	18-36	±15	±666	1041	84	±450
RP20-243.312TE	18-36	3.3 / ±12	3000 / ±300	950	79	4700 / ±220
RP20-243.315TE	18-36	3.3 / ±15	3000 / ±250	967	79	4700 / ±220
RP20-240512TE	18-36	5 / ±12	2000 / ±300	931	81	4700 / ±220
RP20-240515TE	18-36	5 / ±15	2000 / ±250	947	81	4700 / ±220
RP20-483.3SE	36-75	3.3	4000	367	79	13000
RP20-4805SE	36-75	5	4000	543	82	6800
RP20-4812SE	36-75	12	1670	527	83	2200
RP20-4815SE	36-75	15	1330	527	83	755
RP20-4805DE	36-75	±5	±2000	541	81	±3400
RP20-4812DE	36-75	±12	±833	514	85	±680
RP20-4815DE	36-75	±15	±666	508	86	±450
RP20-483.312TE	36-75	3.3 / ±12	3000 / ±300	468	80	4700 / ±220
RP20-483.315TE	36-75	3.3 / ±15	3000 / ±250	477	80	4700 / ±220
RP20-480512TE	36-75	5 / ±12	2000 / ±300	459	82	4700 / ±220
RP20-480515TE	36-75	5 / ±15	2000 / ±250	467	82	4700 / ±220

RP20-243.305DE
RP20-483.305DE, output 3.3V(3A)/5V(2A), for detailed spec. contact Recom

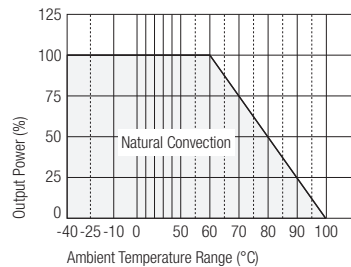
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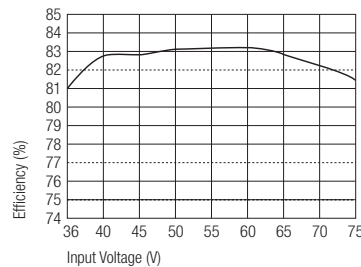
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RP20-4805SE: Derating & Efficiency Curves

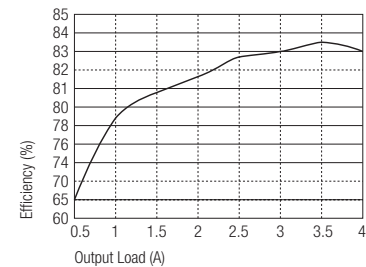
RP20-4805SE Derating Curve



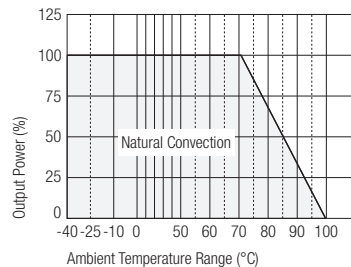
RP20-4805SE Efficiency vs Input Voltage



RP20-4805SE Efficiency vs Output Load



RP20-4805SE Derating Curve with Heat Sink (see note 3)



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

Output Power		20W max.
Voltage Accuracy (full Load and nominal Vin)	Single & Dual Triple 3.3V / 5V Auxiliary	±2% ±2% ±5%
Voltage Adjustability		±10%
Minimum Load (see note 1)		10% of FL
Line Regulation (LL-HL at FL)	Single & Dual Triple 3.3V / 5V Auxiliary	±0.2% ±1% ±5%
Load Regulation (10% to 100% FL)	Single Dual Triple 3.3V / 5V Auxiliary	±0.5% ±3% ±2% ±5%
Cross Regulation (see note 2)	Dual Triple 3.3V / 5V Auxiliary	±5% ±2% ±5%
Ripple and Noise (20MHz BW)	Single Dual Triple 3.3V / 5V Auxiliary	75mVp-p 100mVp-p 50mVp-p 1% of Vout
Temperature Coefficient		±0.02% / °C max.
Transient Response Recovery Time (25% load step change)		500µsec
Over Voltage (zener diode clamp)	3.3V output 5V output 12V output 15V output	3.9V 6.2V 15V 18V
Short Circuit Protection		Hiccup, automatic recovery

continued on next page

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

Input Voltage Range	12V types nominal input 24V types nominal input 48V types 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 (see note 3)	Nominal Vin and full load	25mAp-p
Start Up Time (nominal Vin and constant resistor load)		20ms typ.
Remote ON/OFF (see note 4)	DC-DC ON DC-DC OFF Remote off input current	Open or $3.5V < V_r < 12V$ Short or $0V < V_r < 1.2V$ 20mA
Efficiency		See „Selection Guide“ table
Isolation Voltage		1600VDC
Isolation Resistance		$10^9 \Omega$
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		48g
Dimensions		50.8 x 40.6 x 10.2 mm
MTBF (see note 5)		1.928×10^6 Hours
Operating Temperature Range		-40°C to +85°C (with derating)
Maximum Case Temperature		+100°C
Storage Temperature Range		-55°C to +105°C
Thermal Impedance (see note 6)	Natural convection	10°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:

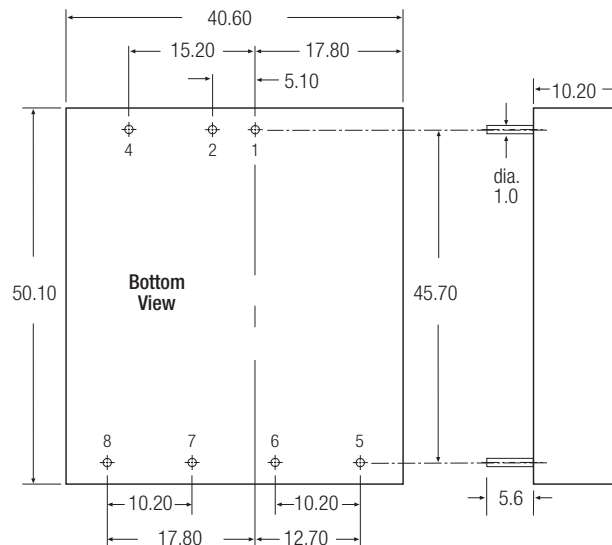
1. The RP20 series requires a minimum of 10% loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
2. Cross regulation: Dual output – Asymmetrical load 25% to 100% full load.
Triple output – 3.3V/ 5V 100% load and one of auxiliary 100% load, other auxiliary load change from 25% to 100% load.
3. Simulated source impedance of 12uH. 12uH inductor in series with +Vin.
4. The ON/OFF control pin voltage is referenced to negative input.
5. BELLCORE TR-NWT-00332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment).
6. Heat sink is optional and P/N: 7G-0011A. Operation temperature range please see curve.
7. Maximum value at nominal input voltage and full load.
8. Typical value at nominal input voltage and full load.
9. The RP20-243.305DE and RP20-483.305DE are safety approval pending.

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Package Style and Pinning (mm)



Pin Connections

Pin #	Single	Dual	Triple
1	+Vin	+Vin	+Vin
2	-Vin	-Vin	-Vin
4	Ctrl	Ctrl	Ctrl
5	No Pin	+Vout	+Aux
6	+Vout	Common	+3.3V / +5V
7	-Vout	-Vout	Common
8	Trim	Trim	-Aux

Pin Pitch Tolerance ± 0.35 mm

External Output Trimming

Single	Dual
7	7
8	8
6	5

