

# Recom RP20f Series

## 20W DC/DC Converters, 2:1, Standard Package

CoolPower  
Solutions

- 20 Watts max. Output Power
- 2:1 Wide Input Voltage Range
- International Safety Standard Design
- Six-Sided Continuous Shield
- High Efficiency up to 88%
- Standard Package, 50.8 mm x 25.4 mm x 10.2 mm
- Fixed Switching Frequency

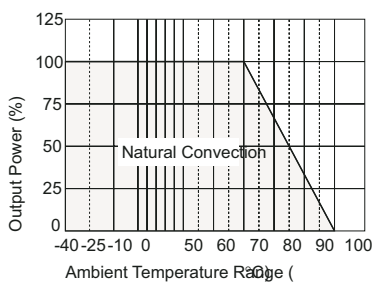


### Selection Guide (24V and 48V Input Types)

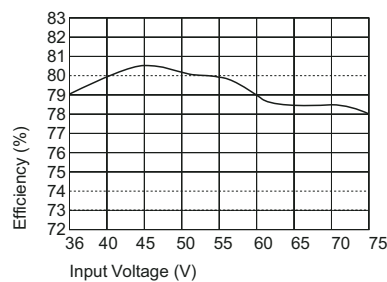
Part Number	Input Voltage VDC	Output Voltage VDC	Output Current mA	Input Current (see note 5) mA	Efficiency (see note 6) %	Max. Capacitive Load (see note 7) $\mu$ F
RP20-241.5SF	18-36	1.5	6000	500	79	65000
RP20-241.8SF	18-36	1.8	6000	577	82	65000
RP20-242.5SF	18-36	2.5	6000	781	84	33000
RP20-243.3SF	18-36	3.3	5000	838	86	13000
RP20-2405SF	18-36	5	4000	992	88	6800
RP20-2412SF	18-36	12	1670	1006	87	2200
RP20-2415SF	18-36	15	1330	1001	87	755
RP20-481.5SF	36-75	1.5	6000	247	80	65000
RP20-481.8SF	36-75	1.8	6000	285	83	65000
RP20-482.5SF	36-75	2.5	6000	386	85	33000
RP20-483.3SF	36-75	3.3	5000	414	87	13000
RP20-4805SF	36-75	5	4000	490	89	6800
RP20-4812SF	36-75	12	1670	497	88	2200
RP20-4815SF	36-75	15	1330	500	87	755

### RP20-481.5SF: Derating and Efficiency Curves, External Output Trimming

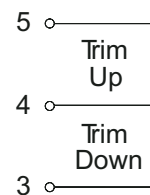
Derating Curve without Heat-Sink



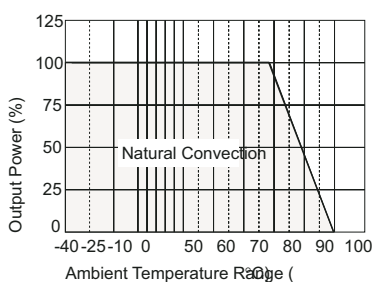
Efficiency vs Input Voltage



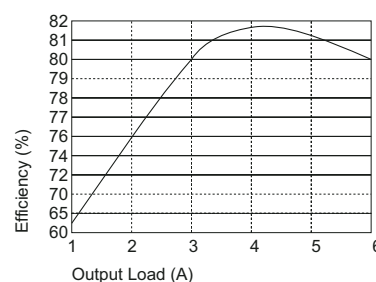
External Output Trimming



Derating Curve with Heat-Sink



Efficiency vs Output Load



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

Output Power		20W max.
Voltage Accuracy (full Load and nominal Vin)		±1%
Voltage Adjustability		±10%
Minimum Load (see note 1)		10% of FL
Line Regulation (LL-HL at FL)		±0.2% max.
Load Regulation (10% to 100% FL)		±0.5%
Ripple and Noise, 20MHz BW (measured with a 104pF/50V MLCC)		75mVp-p
Temperature Coefficient		±0.02%/°C max.
Transient Response Recovery Time, 25% Load Step Change		300µsec
Over Voltage Protection (zener diode clamp):	1.5V Output	TBD
	1.8V Output	TBD
	2.5V Output	3.6V
	3.3V Output	3.9V
	5V Output	6.2V
Over Load Protection (% of full load at nominal Vin)		150% typ.
Short Circuit Protection		Hiccup, Automatic Recovery
Input Voltage Range	24V types nominal input	18-36VDC
	48V types nominal input	36-75VDC
Input Filter		L-C Type
Input Surge Voltage (100 ms max.)	24V Input	50VDC
	48V Input	100VDC
Input Reflected Ripple (see note 2)	Nominal Vin and full load	100mA <sub>p-p</sub>
Start Up Time (nominal Vin and constant resistor load)		20ms typ.
Remote ON/OFF (see note 3)	DC-DC ON	Open or 3.5V < Vr < 12V
	DC-DC OFF	Short or 0V < Vr < 1.2V
Remote off Input Current	Nominal Vin	2.5 mA
Isolation Voltage		1600VDC
Isolation Resistance		10 <sup>9</sup> Ω
Isolation Capacitance		1000pF
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 (0.95 oz)
Dimensions		50.8 x 25.4 x 10.2 mm
MTBF (MIL-HDBK-217F, TA = 25°C full load)		3.369 x 10 <sup>5</sup> 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 4)	Natural convection	12°C/Watt
Thermal Shock		MIL-STD-810D
Vibration		10-55Hz, 2G, 3 Min. Period, 30 Min. along X, Y and Z

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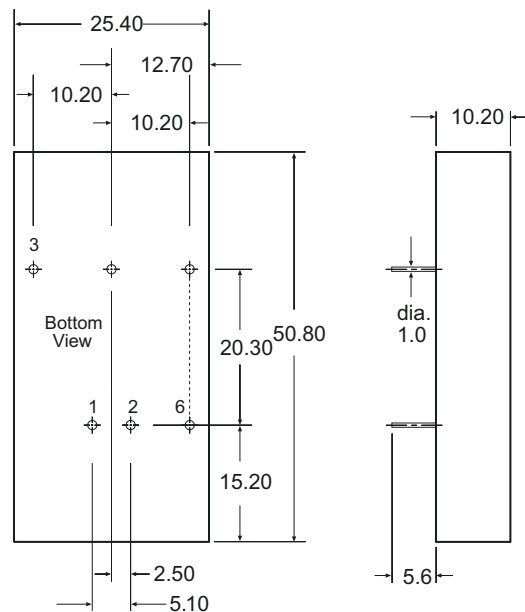
Specifications continued (typical at nominal input and 25°C unless otherwise noted)

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
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 F-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. Simulated source impedance of 12uH, 12uH inductor in series with +Vin.
3. The ON/OFF control function. There is positiv logic (standard) and negative logic (option). The pin voltage is referenced to negative input. To order negative logic ON-OFF control add the suffix 'N' (Ex: RP20-2405SFN)
4. Heat sink is optional and P/N: 7G-0020A. Thermal impedance is 10°C/Watt for natural convection
5. Maximum value at nominal input voltage and full load.
6. Typical value at nominal input voltage and full load.
7. Tested at minimum Vin and constant resistor load.

## Package Style and Pinning (mm)



Pin Connections

Pin #	Single
1	+Vin
2	-Vin
3	+Vout
4	Tim Pin
5	-Vout
6	CTRL

in Pitch Tolerance  $\pm 0.35$  mm