

POWERLINE - DC/DC-Converter

F-Series, 20W, 1.6 kV Isolation, 2:1 Wide Input Range (Single Output)



RECOM

Features

- 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

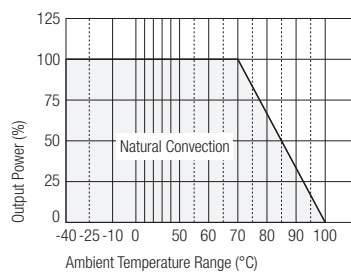
Part Number	Input Voltage	Output Voltage	Output Current	Input Current (see note 5)	Efficiency % (see note 6)
RP20-241.5SF	18-36VDC	1.5VDC	6000mA	0.500A	79
RP20-241.8SF	18-36VDC	1.8VDC	6000mA	0.577A	82
RP20-242.5SF	18-36VDC	2.5VDC	6000mA	0.781A	84
RP20-243.3SF	18-36VDC	3.3VDC	5000mA	0.838A	86
RP20-2405SF	18-36VDC	5VDC	4000mA	0.992A	88
RP20-481.5SF	36-75VDC	1.5VDC	6000mA	0.247A	80
RP20-481.8SF	36-75VDC	1.8VDC	6000mA	0.285A	83
RP20-482.5SF	36-75VDC	2.5VDC	6000mA	0.386A	85
RP20-483.3SF	36-75VDC	3.3VDC	5000mA	0.414A	87
RP20-4805SF	36-75VDC	5VDC	4000mA	0.490A	89

Maximum Capacitive Load

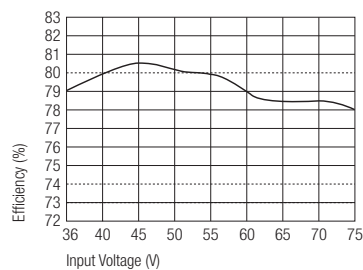
RP20-xx1.5SF	65000 μ F
RP20-xx1.8SF	65000 μ F
RP20-xx2.5SF	33000 μ F
RP20-xx3.3SF	13000 μ F
RP20-xx05SF	6800 μ F

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

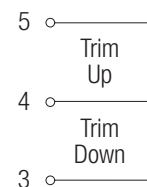
Derating Curve without Heat-Sink



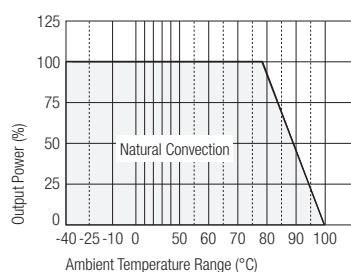
Efficiency vs Input Voltage



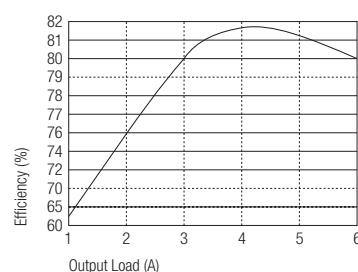
External Output Trimming



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 _{p-p}
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 ⁹ 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 ⁵ 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

continued on next page

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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.

Package Style and Pinning (mm)

