

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

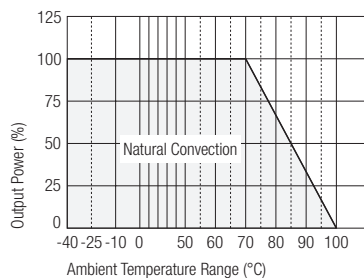
Part Number	Input Voltage	Output Voltage	Output Current	Input Current (see note 5)	Efficiency % (see note 6)
RP20-241.5SF	18-36VDC	1.5VDC	6000mA	0.500A	79
RP20-241.8SF	18-36VDC	1.8VDC	6000mA	0.577A	82
RP20-242.5SF	18-36VDC	2.5VDC	6000mA	0.781A	84
RP20-243.3SF	18-36VDC	3.3VDC	5000mA	0.838A	86
RP20-2405SF	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

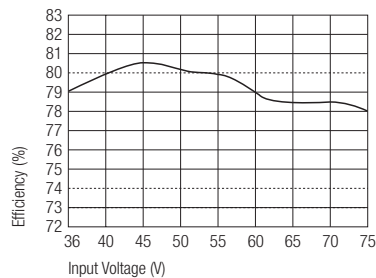
RP20-xx1.5SF	65000µF
RP20-xx1.8SF	65000µF
RP20-xx2.5SF	33000µF
RP20-xx3.3SF	13000µF
RP20-xx05SF	6800µF

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

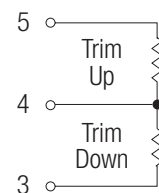
Derating Curve without Heat-Sink



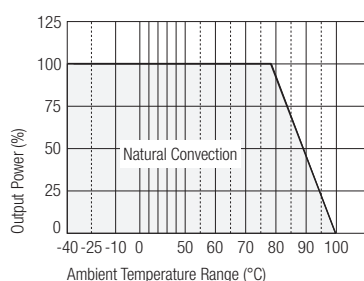
Efficiency vs Input Voltage



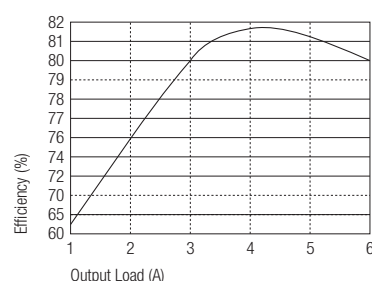
External Output Trimming



Derating Curve with Heat-Sink



Efficiency vs Output Load



POWERLINE - DC/DC-Converter

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



RECOM

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	100mAp-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 (JL94-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

POWERLINE - DC/DC-Converter

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



RECOM

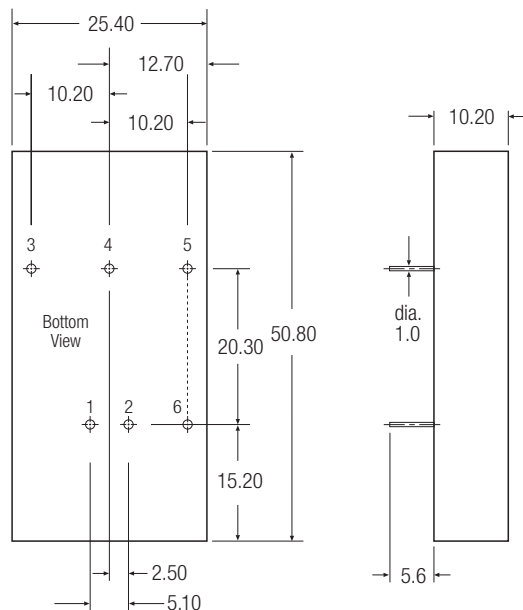
Specifications continued (typical at nominal input and 25°C unless otherwise noted)

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)



Pin Connections

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

Pin Pitch Tolerance ± 0.35 mm