Features

ICE Technology*

- Up to 97°C Ambient, no derating
- 120°C Maximum Case Temperature
- -45°C Minimum Operating Temperature
- Built-in FCC/EN55022 Class B Filter
- 4:1 Wide Input Voltage Range
- Six Sided Shielded Enclosure
- Compact 40.6x25.4x11.7mm Package
- Efficiency to >89%
- 2kVDC Isolation
- Fully Protected
- Low Quiescent Current

POWERLINE+
DC/DC-Converter

RECOM

20 Watt Single & Dual Output

Description

The RPP20-W series 4:1 input range DC/DC converters are ideal for high end industrial applications and COTS Military applications where a high ambient operating temperature converter is required.
Although the case size is compact, the converter contains a built-in EN55022 Class B / FCC Level B EMC filter without the need for any external components.

Selection Guide 24V and 48V 4:1 Input Types

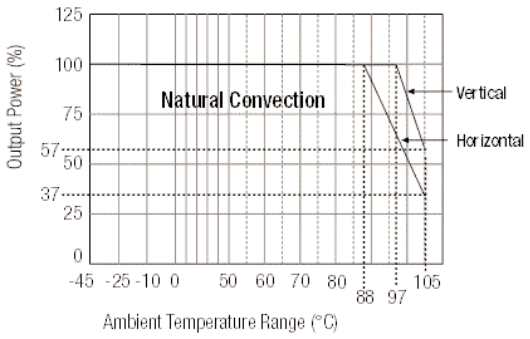
Part Number	Input Range VDC	Output Voltage VDC	Output Current mA	Input[1] Current mA	Efficiency[2]	Max[3] Operating Temp
RPP20-243.3SW	9-36	3.3	6000	59/955	87.2%	93°C
RPP20-2405SW	9-36	5	4000	65/946	88.1%	95°C
RPP20-2412SW	9-36	12	1666	23/946	88.1%	95°C
RPP20-2415SW	9-36	15	1333	25/931	89.5%	97°C
RPP20-483.3SW	18-75	3.3	6000	28/465	89.6%	97°C
RPP20-4805SW	18-75	5	4000	33/465	89.6%	97°C
RPP20-4812SW	18-75	12	1666	13/470	88.6%	96°C
RPP20-4815SW	18-75	15	1333	12/466	89.3%	97°C
RPP20-2405DW	9-36	±5	±2000	23/946	88.1%	95°C
RPP20-2412DW	9-36	±12	±833	28/930	89.6%	97°C
RPP20-2415DW	9-36	±15	±666	24/946	88.0%	95°C
RPP20-4805DW	18-75	±5	±2000	13/470	88.6%	96°C
RPP20-4812DW	18-75	±12	±833	16/472	88.2%	95°C
RPP20-4815DW	18-75	±15	±666	13/466	89.4%	97°C

UL-60950-1 Pending

RPP20-W

Derating Graph (Ambient Temperature)

RPP20-2405SW



Derating graphs are valid only for the shown part number. Please contact Technical Support for more information:
info@recom-development.at

*** ICE Technology**

ICE (Innovation in Converter Excellence) uses state-of-the-art techniques to minimise internal power dissipation and to increase the internal temperature limits to extend the ambient operating temperature range to the maximum.
Refer to end of section for more details.

Refer to Application Notes

RPP20-S_DW Series

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

Input Voltage Range	24V nominal input	9-36VDC
	48V nominal input	18-75VDC
Under Voltage Lockout	24V input DC-DC ON (min.)	8.5VDC
	24V input DC-DC OFF (max.)	8VDC
	48V input DC-DC ON (min.)	17.5VDC
	48V input DC-DC OFF (max.)	17VDC
Input Filter		Common Mode EMC Filter
Input Voltage Variation dv/dt (Complies with ETS300 132 part 4.4)		5V/ms max
Input Surge Voltage (100 ms max.)	24V Input	50VDC
	48V Input	100VDC
Input Reflected Ripple	nominal Vin and full load	20mAp-p
Start Up Time	nominal Vin and constant resistor load	2ms typ., 5ms max.
Remote ON/OFF [4]	DC-DC ON	Open or 3.0V < Vr < 5.5V
	DC-DC OFF	Short or 0V < Vr < 1.2V
Remote OFF input current	Nominal input	2mA typ.
Output Power		20W max.
Output Voltage Accuracy	50% Load and nominal Vin	±1.5%
Voltage Adjustability	Single Output only	±5%
Minimum Load		0%
Line Regulation	low line, high line at full load	±0.3%
Load Regulation	10% to 100% full load	±0.5%
Cross Regulation (10% <> 100% Load)	Dual Outputs only	3% typ. / 5% max.
Ripple and Noise (20MHz bandwith limited)	3.3V	100mVp-p typ.
(measured with 1µF capacitor across outputs)	All others	40mV-75mVp-p typ.
Temperature Coefficient		±0.04%/°C max.
Transient Response	25% load step change	800µs
Over Load Protection	% of full load at nominal Vin	120% typ.
Short Circuit Protection		Current limit, automatic recovery
Output Over Voltage Protection (refer to block diagram in Application Notes)		Converter shutdown if Vout > Vout nominal + 20%
Isolation Voltage		Rated at 1600VDC/1 minute, Flash tested at 2000VDC/1 second
Isolation Resistance		10MΩ min.
Isolation Capacitance (refer to block diagram in Application Notes)		1500pF max.
Operating Frequency		260kHz ± 40kHz
Operating Temperature Range	Ambient, Free Convection	-45°C to +97°C (without derating)
		-45°C to +105°C (with derating)
Maximum Case Temperature		+120°C
Storage Temperature Range		-55°C to +125°C
Over Temperature Protection (refer to block diagram in Application Notes)		internal thermistor
Thermal Impedance	Vertical	7.5°C/Watt
(Natural convection)	Horizontal	11.5°C/Watt
Relative Humidity		5% to 95% RH
Case Material [7]		Aluminium
Potting Material		Silicone (UL94-V0)
Weight		26g
Dimensions		1.6" x 1" x 0.48" (40.6 x 25.4 x 11.7mm)

RPP20-S_DW Series

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

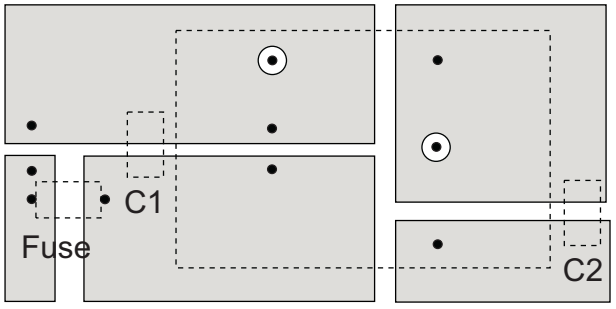
Safety Standards		UL-60950-1 Pending
Thermal Cycling		complies with MIL-STD-810F
Vibration		10-55Hz, 12G, 30 Min. along X, Y and Z
Conducted Emissions	EN55022	Class B
Radiated Emissions	EN55022	Class B
ESD	EN61000-4-2	Perf. Criteria B
Radiated Immunity	EN61000-4-3	Perf. Criteria A
Fast Transient[5]	EN61000-4-4	Perf. Criteria B
Surge[5]	EN61000-4-5	Perf. Criteria B
Conducted Immunity	EN61000-4-6	Perf. Criteria A
MTBF calculated according to BELLCORE TR-NWT-000332[6]		2195 x 10^3 hours

Notes :

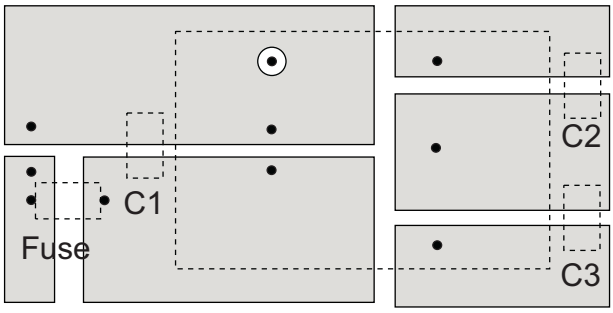
1. Typical values at nominal input voltage and no load/full load.
2. Typical values at nominal input voltage and full load.
3. Typical values at nominal input voltage and full load in vertical orientation and with Eurocard-sized PCB ground planes to assist in heat dissipation. For horizontal orientation, reduce the maximum temperatures by 10°C.
4. The ON/OFF control function can be positive or negative logic. The pin voltage is referenced to negative input.
   Positive logic ON/OFF is standard, no suffix (Ex. RPP20-2405SW)
   Negative logic ON/OFF option has suffix /N (Ex. RPP20-2405SW/N)
5. Requires an external 100µF/100V low ESR capacitor to meet EN61000-4-4 and EN61000-4-5
6. Case I: 50% Stress, Temperature at 50°C (Ground Benign).
7. To ensure a good all-round electrical contact, the baseplate is pressed firmly into place within the aluminium housing.The hydraulic press can leave tooling marks and deformations to both the housing and baseplate. The case is anodised aluminium, so there will be natural variations in the case colour and the aluminium is not scratch resistant. Any resultant marks, scratches and colour varations are cosmetic only and do not affect the operation or performance of the converters.

Recommended PCB Layout

Single Output



Dual Output



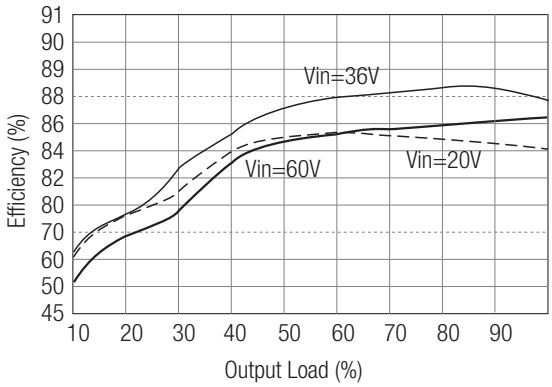
Input Fuse is recommended, but optional. Recommended fuse rating = double maximum input current, time delay type.
Input Capacitor, C1, is required to meet EN61000 Surge and Fast Transient, otherwise it is not required for normal operation.
Output Capacitors C2/C3 are recommended, but not required for normal operation. Typical capacitor values are 1µF/100V MLCC
To ensure optimum thermal performance, use large areas of copper on the PCB to assist with heat dissipation and mount the converter vertically.

RPP20-S_DW Series

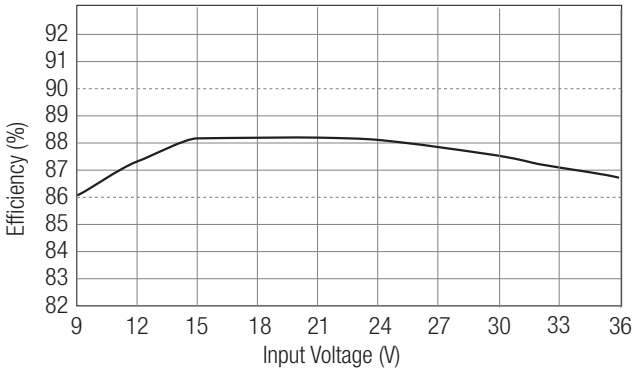
Typical Characteristics

RPP20-2405SW

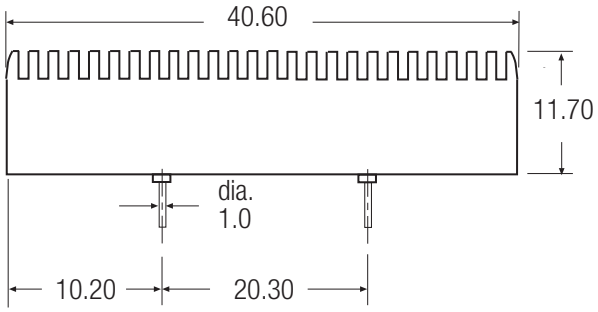
Efficiency VS Output Load

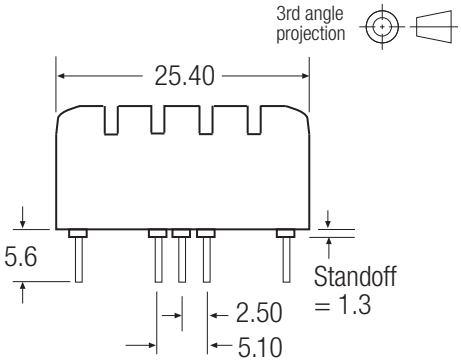


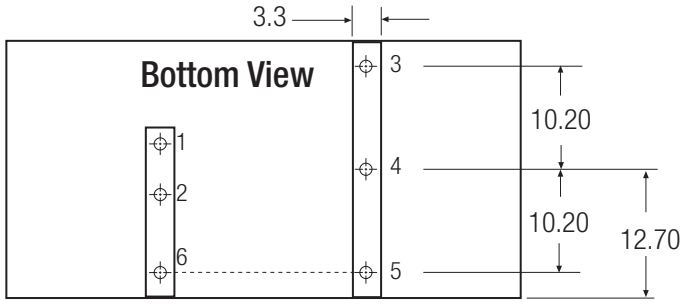
Efficiency VS Input Voltage



Package Style and Pinning (mm)







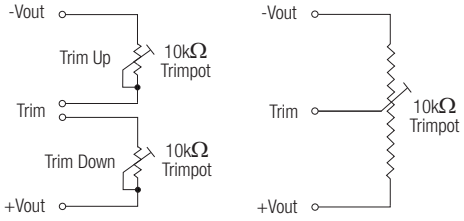
Pin Connections

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

Pin Pitch Tolerance ±0.35 mm

External Output Trimming

Refer To Application Notes for recommended resistor Values



RPP20-W