Features

ICE Technology*

- Up to 89°C Ambient, no derating (40W)
- 120°C Maximum Case Temperature
- -45°C Minimum OperatingTemperature
- Built-in FCC/EN55022 Class B Filter
- 2:1 Wide Input Voltage Range
- 40/50 Watts Output Power
- Compact 50.8x30.5x11.7mm Package
- Efficiency to 92%
- 3kVDC Isolation
- Fully Protected
- Low Quiescent Current

POWERLINE+
DC/DC-Converter

RECOM

40/50 Watt Single Output

Description

The RPP40 and RPP50 series 2:1 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 converters contains a built-in EN55022 Class B / FCC Level B EMC filter without the need for any external components.

Selection Guide 24V and 48V Input Types

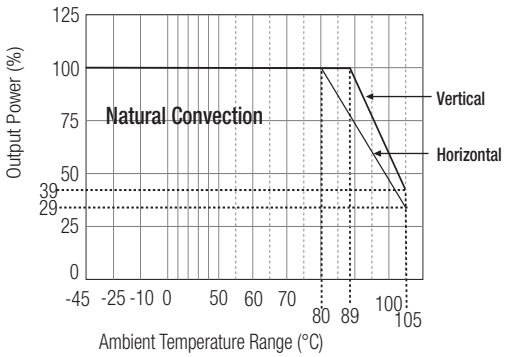
Part Number	Input Range VDC	Output Voltage VDC	Output Current A	Input[1] Current mA	Efficiency[2]	Max[3] Operating Temp
RPP40-243.3S	18-36	3.3	12	58/1885	88.4%	77°C
RPP40-2405S	18-36	5	8	60/1831	91.0%	86°C
RPP40-2412S	18-36	12	3.33	100/1875	87.8%	75°C
RPP40-2415S	18-36	15	2.67	100/1870	89.5%	81°C
RPP40-483.3S	36-75	3.3	12	42/923	90.2%	84°C
RPP40-4805S	36-75	5	8	37/906	92.0%	89°C
RPP40-4812S	36-75	12	3.33	5/930	88.9%	78°C
RPP40-4815S	36-75	15	2.67	5/930	89.7%	81°C
RPP50-243.3S	18-36	3.3	15	58/2405	86.6%	58°C
RPP50-2405S	18-36	5	10	60/2315	90.0%	74°C
RPP50-2412S	18-36	12	4.16	18/2370	88.3%	66°C
RPP50-2415S	18-36	15	3.33	18/2315	90.0%	74°C
RPP50-483.3S	36-75	3.3	15	42/1177	88.6%	68°C
RPP50-4805S	36-75	5	10	37/1140	91.4%	81°C
RPP50-4812S	36-75	12	4.16	11/1165	89.4%	72°C
RPP50-4815S	36-75	15	3.33	11/1141	91.2%	81°C

UL-60950-1 Pending

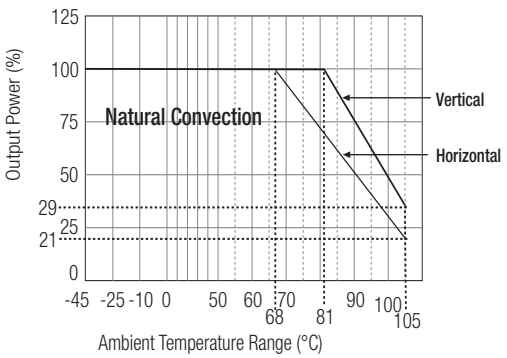
RPP40/ RPP50

Derating Graph (Ambient Temperature)

RPP40-4805S



RPP50-4805S



Derating graphs are valid only for the shown part numbers.
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 temp range to the maximum. Refer to end of section for more details.

Refer to Application Notes

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

Input Voltage Range	24V nominal input		18-36VDC
	48V nominal input		36-75VDC
Under Voltage Lockout	24V input	DC-DC ON (min.)	17.5VDC
		DC-DC OFF (max.)	17VDC
	48V input	DC-DC ON (min.)	35VDC
		DC-DC OFF (max.)	34VDC
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		30mAp-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			50W max.
Output Voltage Accuracy	10% Load and nominal Vin		±1%
Voltage Adjustability			±10%
Minimum Load			0%
Line Regulation	low line, high line at full load		±0.3%
Load Regulation	10% to 100% full load		±0.5%
Ripple and Noise (20MHz bandwith limited)	3.3V, 5V		60mVp-p typ.
(measured with 1µF capacitor across output)	All others		40mVp-p typ.
Temperature Coefficient			±0.04%/°C max.
Transient Response	25% load step change		200µs
Over Load Protection	% of full load at nominal Vin		120% typ.
Short Circuit Protection			Hiccup, automatic recovery
Output Over Voltage Protection (refer to block diagram in Application Notes)			Converter shutdown if Vout > Vout nominal + 20%
Isolation Voltage			Rated at 2250VDC/1 minute, Flash tested at 3000VDC/1 second
Isolation Resistance			10MΩ min.
Isolation Capacitance (refer to block diagram in Application Notes)			3000pF max.
Operating Frequency			260kHz ± 40kHz
RPP40 Operating Temperature Range	Ambient, Free Convection		-45°C to +89°C max (without derating)
RPP50 Operating Temperature Range	Ambient, Free Convection		-45°C to +81°C max (without derating)
			-45°C to +105°C max (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		7.3°C/Watt
(Natural convection	Horizontal		10°C/Watt
Relative Humidity			5% to 95% RH
Case Material [7]			Aluminium
Potting Material			Silicone (UL94-V0)
Weight			39g
Dimensions			2" x 1.2" x 0.48" (50.8 x 30.5 x 11.7mm)

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

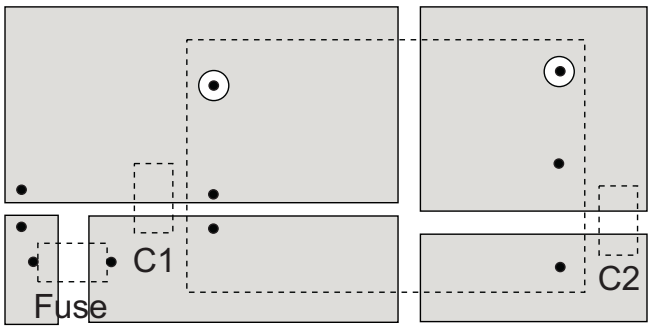
Safety Standards		UL-60950-1 Pending
Thermal Cycling		complies with MIL-STD-810F
Vibration		10-55Hz, 12G, 30 Min. along X, Y and Z
Conducted Emissions	EN55022	Class B
Radiated Emissions	EN55022	Class B
ESD	EN61000-4-2	Perf. Criteria B
Radiated Immunity	EN61000-4-3	Perf. Criteria A
Fast Transient (5)	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)		1989 x 10^3 hours

Notes :

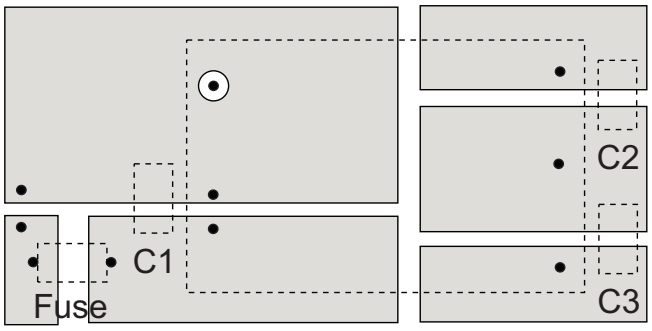
1. Typical values at nominal input voltage and no load/full load.
2. Typical values at nominal input voltage and full load.
3. Typical values at nominal input voltage and full load in vertical orientation and with Eurocard-sized PCB ground planes to assist in heat dissipation. For horizontal orientation, 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. RPP50-2405S)
   Negative logic ON/OFF option has suffix /N (Ex. RPP50-2405S/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



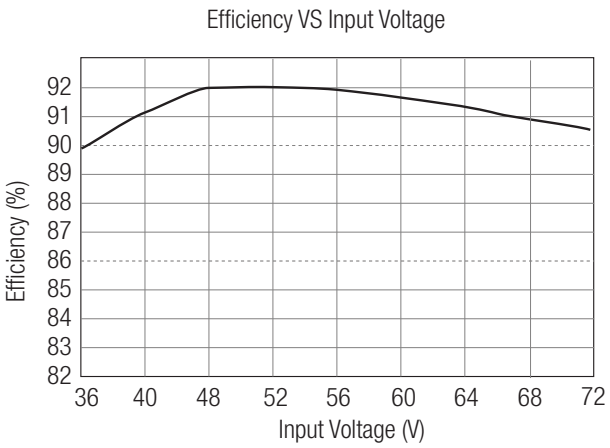
Dual Output



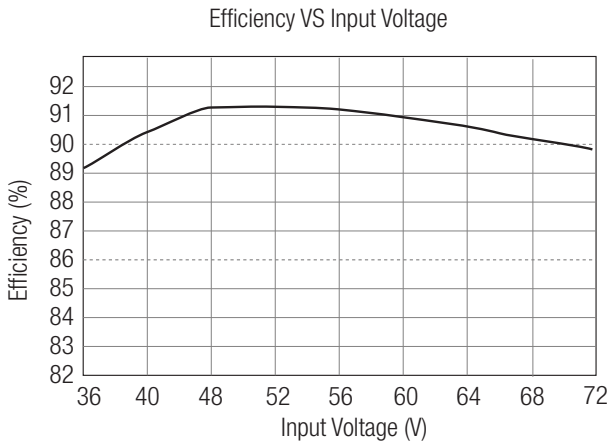
Input Fuse is recommended, but optional. Recommended fuse rating = double maximum input current, time delay type.
Input Capacitor, C1, is required to meet EN61000 Surge and Fast Transient, otherwise it is not required for normal operation.
Output Capacitors C2/C3 are recommended, but not required for 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.

Typical Characteristics

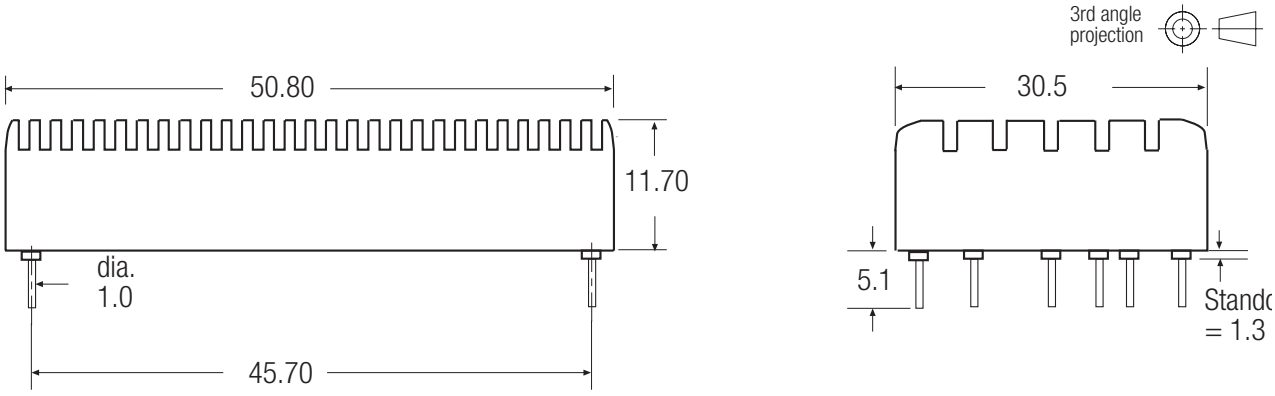
RPP40-4805SW

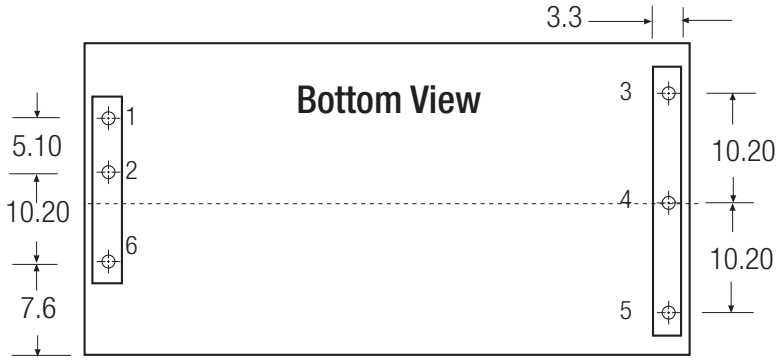


RPP50-4805SW



Package Style and Pinning (mm)





Pin Connections

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

Pin Pitch Tolerance ±0.35 mm

External Output Trimming

Refer to Application Notes for suggested Resistor Values