Features

- 2:1 Wide Input Voltage Range
- 40 Watts Output Power
- 1.6kVDC Isolation
- UL Certified
- Fixed Operating Frequency
- Six-Sided Continuous Shield
- Design Meet Safety Standard
- Standard 50.8 x50.8x10.2mm Package
- Efficiency to 90 %
- Available as Power Module (RPM40-G)

Description

The RP40-G series DC/DC converters are certified to UL 60950-1 and to cUL 60950-1. This makes them ideal for all telecom and industrial applications where approved safety standards are required. The industry standard 2" x 2" package meets military standards for thermal shock and vibration tolerance.

Selection Guide Single and Dual Outputs

Part Number	Input Range VDC	Output Voltage VDC	Output Current mA	Input [4] Current mA	Efficiency [5] %	Capacitive [6] Load max.
RP40-123.3SG	9-18	3.3	8000	2750	84	21000µF
RP40-1205SG	9-18	5	8000	4065	86	13600µF
RP40-1212SG	9-18	12	3333	4065	86	2360µF
RP40-1215SG	9-18	15	2666	4015	87	1510µF
RP40-243.3SG	18-36	3.3	8000	1325	87	21000µF
RP40-2405SG	18-36	5	8000	1961	89	13600µF
RP40-2412SG	18-36	12	3333	2048	88	2360µF
RP40-2415SG	18-36	15	2666	1985	89	1510µF
RP40-483.3SG	36-75	3.3	8000	655	88	21000µF
RP40-4805SG	36-75	5	8000	969	90	13600µF
RP40-4812SG	36-75	12	3333	1000	89	2360µF
RP40-4815SG	36-75	15	2666	992	89	1510µF
RP40-1212DG	9-18	±12	±1800	4444	85	±1200µF
RP40-1215DG	9-18	±15	±1400	4321	85	±750µF
RP40-2412DG	18-36	±12	±1800	2169	87	±1200µF
RP40-2415DG	18-36	±15	±1400	2108	87	±750µF
RP40-4812DG	36-75	±12	±1800	1084	87	±1200µF
RP40-4815DG	36-75	±15	±1400	1054	87	±750µF
RP40-120512TG	9-18	5 / ±12	6000 / ±400	4024	86	6800µF/±330µF
RP40-120515TG	9-18	5 / ±15	6000 / ±300	3963	86	6800µF/±110µF
RP40-240512TG	18-36	5 / ±12	6000 / ±400	1989	87	6800µF/±330µF
RP40-240515TG	18-36	5 / ±15	6000 / ±300	1958	87	6800µF/±110µF
RP40-480512TG	36-75	5 / ±12	6000 / ±400	982	88	6800µF/±330µF
RP40-480515TG	36-75	5 / ±15	6000 / ±300	967	88	6800µF/±110µF

* no suffix for CTRL function with Positive Logic (1=ON, 0=OFF), this is standard
* add suffix **-HC** for premounted heatsink and clips

Ordering Examples

RP40-2405SG = 24V Input, 5V Output, Positive Logic CTRL pin.
RP20-4812DG-HC = 48V Input, ±12V Output, Positive Logic CTRL pin, Heatsink fitted
RP20-120512TG-HC = 24V Input, 5V and ±12V Outputs, Positive Logic CTRL pin, Heatsink fitted

POWERLINE
DC/DC-Converter
with 3 year Warranty

RECOM

40 Watt Single, Dual & Triple Output

RoHS 2011/65/EU 6/6

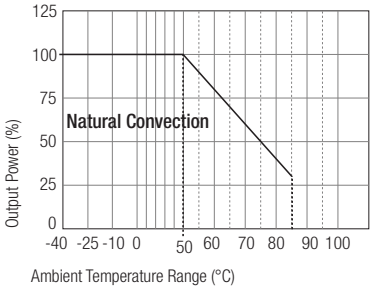
UL-60950-1 Certified
E196683

RP40-G

Derating-Graph

(Ambient Temperature)

RP40-4805SG



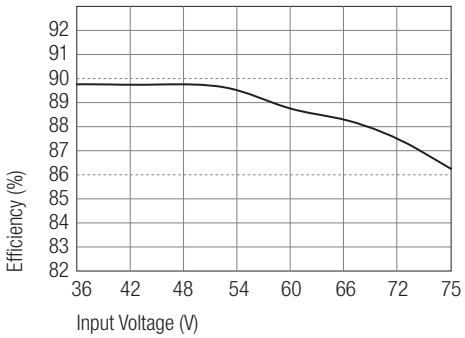
Derating graphs are valid only for the shown part numbers. If you need detailed derating information about a part-number not shown here please contact our technical support service at info@recom-development.at

Refer to Application Notes

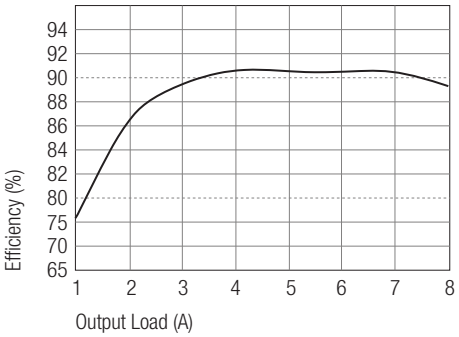
Typical Characteristics

RP40-4805SG

Efficiency VS Input Voltage



Efficiency VS Output Load



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

Input Voltage Range	12V nominal input		9-18VDC
	24V nominal input		18-36VDC
	48V nominal input		36-75VDC
Under Voltage Lockout	12V input	DC-DC ON	9VDC
		DC-DC OFF	8VDC
	24V input	DC-DC ON	17.8VDC
		DC-DC OFF	16VDC
	48V input	DC-DC ON	36VDC
		DC-DC OFF	34VDC
Input Filter [13]			L-C Type
Input Voltage Variation dv/dt	(Complies with ETS300 132 part 4.4)		5V/ms max
Input Surge Voltage (100 ms max.)	12V Input		36VDC
	24V Input		50VDC
	48V Input		100VDC
Input Reflected Ripple (nominal Vin and full load [3])			40mAp-p
Start Up Time (nominal Vin and constant resistor load)			25ms typ.
Remote ON/OFF [7]	DC-DC ON		Open or 3.5V < Vr < 12V
(Positive logic)	DC-DC OFF		Short or 0V < Vr < 1.2V
Remote OFF input current	Nominal input		2.5mA
Output Power			40W max.
Output Voltage Accuracy (full Load and nominal Vin)	Single & Dual		±1%
	Triple Main		±1%
	Auxiliary		±5%
Voltage Adjustability			±10%
Minimum Load	Single and Dual Positive		0%
	Dual and Triple		10% of full load
Line Regulation (low line, high line at full load)	Single & Dual		±0.5%
	Triple Main		±1%
	Triple Auxiliary		±5%
Load Regulation (10% to 100% full load see Note [9, 10])	Single		±0.5%
	Dual		±1%
	Triple Main		±2%
	Auxiliary		±5%

continued on next page

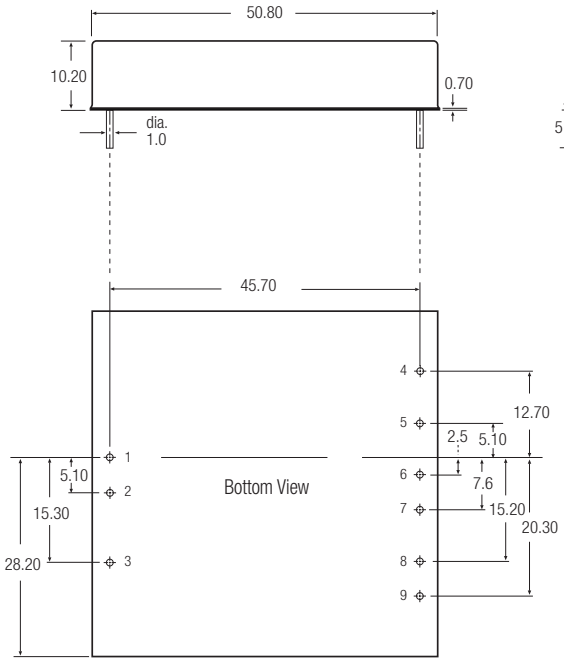
Specifications (typical at nominal input and 25°C unless otherwise noted)

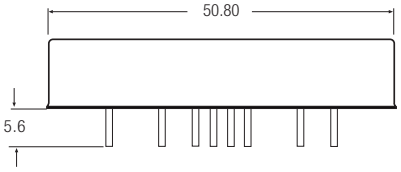
Cross Regulation [11]	Triple Main	±1%
(Asymmetrical 25% <> 100% load)	Dual / Triple Auxiliary	±5%
Ripple and Noise (20MHz bandwidth, with 1µF MLCC on output)	Single 3.3, 5V	50mVp-p
(Measured with a 1004pF/50V MLCC)	Single 12, 15V	75mVp-p
	Dual 12V	120mVp-p
	Dual 15V	150mVp-p
	RP40-xxxxxxTG [12]	50 / 75mVp-p
Temperature Coefficient		±0.02%/°C max.
Transient Response (25% load step change)		300µs
Over Voltage Protection	3.3V	3.9V
Zener diode clamp (only single)	5V	6.2V
	12V	15V
	15V	18V
Over Load Protection (% of full load at nominal Vin)		150% max
Undervoltage Lockout		See Application Notes
Short Circuit Protection		Hiccup, automatic recovery
Efficiency		see „Selection Guide“ table
Isolation Voltage (rated for one minute)		1600VDC
Isolation Resistance		1 GΩ min.
Isolation Capacitance		1000pF max.
Operating Frequency [14]		300kHz typ.
Approved to Safety Standards	Single, Triple	UL 1950, EN60950
	Dual	EN60950
Operating Temperature Range		-40°C to +85°C(with derating)
Maximum Case Temperature		100°C
Storage Temperature Range		-55°C to +125°C
Thermal Impedance [8]	Natural convection	9.2°C/Watt
	Heat Sink with 20LFM	7.6°C/Watt
	Heat Sink with 500LFM	2.8°C/Watt
Thermal Shock		MIL-STD-810D
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z
Relative Humidity		5% to 95% RH
Case Material		Nickel plated copper
Base Material		Non-conductive black plastic FR4
Potting Material		Epoxy (UL94-V0)
Conducted Emissions [16]	EN55022	Class A
Radiated Emissions	EN55022	Class A
ESD	EN61000-4-2	Perf. Criteria B
Radiated Immunity	EN61000-4-3	Perf. Criteria B
Fast Transient	EN61000-4-4	Perf. Criteria B
Surge	EN61000-4-5	Perf. Criteria B
Conducted Immunity	EN61000-4-6	Perf. Criteria B
Weight		60g
Packing Quantity	Refer to App Notes for tube dimensions	4 pcs per Tube
Dimensions		50.8 x 50.8 x 10.2mm
MTBF [2]		1398 x 10^3 hours

Notes :

1. Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used, the +Vsense should be connected to its corresponding +OUTPUT and likewise the sense should be connected to its corresponding -OUTPUT
2. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).
3. Simulated source impedance of 12µH. 12µH inductor in series with +Vin.
4. Maximum value at nominal input voltage and full load of standard type.
5. Typical value at nominal input voltage and full load.
6. Test by minimum Vin and constant resistor load.
7. The ON/OFF control pin voltage is referenced to negative input.
8. Heat sink is optional and P/N: 7G-0026-C. Powerline DC/DC Converters can be ordered with pre-mounted heatsinks including antivibration fixing clips (add suffix -HC). See Application Notes for heatsink details.
9. The triple output required a minimum 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.
10. Load regulation for triple output: Main output(V1):10 to 100% with 10% to 100% balanced on auxiliaries. Auxiliary outputs(V2 and V3):10% to 100% balanced on all outputs.
11. Cross regulation for triple output: Main output 100% load, auxiliary 100%,other auxiliary 25% to 100%. Auxiliary outputs(V2 and V3):main output 100% load, auxiliary 100%, other auxiliary 25% to 100% or main output 25%, auxiliary 25%, other auxiliary 25% to 100%.
12. The models of RP40-XX3.305DG are specified with a 1uF ceramic output capacitors.
13. An external filter capacitor is required for normal operation. The capacitor should be capable of handing 1A ripple current for 48V/24V models. RECOM suggest: Nippon chemi-con KY series, 220µF/100V, ESR 90m Ω.
14. Operating frequency for dual output: master (5Vo) 300KHz slave (3.3Vo) 500KHz.
15. Any condition of dual output (3.3V/5V) rated Iout current, not to exceed 8A of total output currents. The product safety approval pending.
16. See application notes for Class B common mode filter suggestion

Package Style and Pinning (mm)





Pin Connections

Pin #	Single	Dual	Triple
1	+Vin	+Vin	+Vin
2	-Vin	-Vin	-Vin
3	CTRL	CTRL	CTRL
4	NC	No Pin	+Aux
5	-Sense (Note1)	+Vout	Com
6	+Sense (Note1)	Com	-Aux
7	+Vout	Com	+Vout
8	-Vout	-Vout	-Vout(Com)
9	Trim	Trim	NC

NC = No Connection

Pin Pitch Tolerance ±0.35 mm

External Output Trimming

Output can be externally trimmed by using the method shown below. ( ) for dual output trim.
See Application Notes for more details