POWERLINE - DC/DC-Converter

G-Series, 40W, 1.6 kV Isolation, 2:1 Wide Input Range (Single, Dual & Triple Output)

RECOM

Features

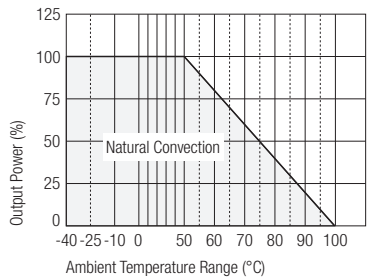
- 40 Watts max. Output Power
- 2:1 Wide Input Voltage Range
- International Safety Standard Design
- Six-Sided Continuous Shield
- High Efficiency up to 90%
- Standard Package, 50.8 mm x 50.8 mm x 10.2 mm
- Fixed Switching Frequency
- UL 1950 Component Recognised

Selection Guide 24V and 48V Input Types

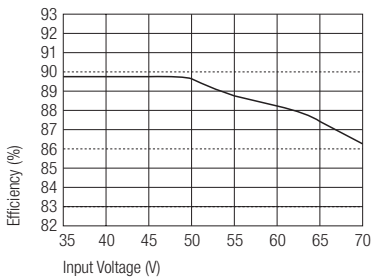
Part Number	Input Voltage VDC	Output Voltage VDC	Output Current mA	Output Ripple & Noise mVp-p	Input Current (see note 4) mA	Efficiency (see note 5) %	Capacitive Load max. µF
RP40-243.3SG	18-36	3.3	8000	50	1325	87	21000
RP40-2405SG	18-36	5	8000	50	1961	89	13600
RP40-2412SG	18-36	12	3400	75	2048	88	2360
RP40-2415SG	18-36	15	2700	75	2008	88	1510
RP40-243.312TG	18-36	3.3 / ± 12	6000 / ±400	50 / 75	1512	85	13000 / ±330
RP40-240512TG	18-36	5 / ± 12	6000 / ±400	50 / 75	1989	87	6800 / ±330
RP40-243.315TG	18-36	3.3 / ± 15	6000 / ±300	50 / 75	1481	85	13000 / ±110
RP40-240515TG	18-36	5 / ± 15	6000 / ±300	50 / 75	1958	87	6800 / ±110
RP40-483.3SG	36-75	3.3	8000	50	655	88	21000
RP40-4805SG	36-75	5	8000	50	969	90	13600
RP40-4812SG	36-75	12	3400	75	1000	89	2360
RP40-4815SG	36-75	15	2700	75	992	89	1510
RP40-483.312TG	36-75	3.3 / ± 12	6000 / ±400	50 / 75	747	86	13000 / ±330
RP40-480512TG	36-75	5 / ± 12	6000 / ±400	50 / 75	982	88	6800 / ±330
RP40-483.315TG	36-75	3.3 / ± 15	6000 / ±300	50 / 75	732	86	13000 / ±110
RP40-480515TG	36-75	5 / ± 15	6000 / ±300	50 / 75	967	88	6800 / ±110

RP40-4805SG: Derating and Efficiency Curves, External Output Trimming

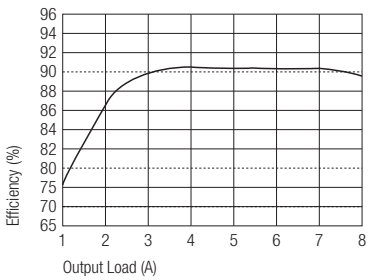
Derating Curve



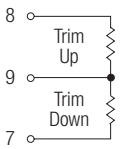
Efficiency vs Input Voltage



Efficiency vs Output Load



External Output Trimming



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

Output Power			40W max.
Voltage Accuracy (full Load and nominal Vin)	Single / Dual		±1%
	Triple	Main	±1%
		Auxilliary	±5%
Voltage Adjustability (single output only)			± 10%
Minimum Load Voltage (see note 1)	Single & Triple		10% of FL
	Dual (3.3V)		800mA
Line Regulation (LL-HL at FL)			±0.5%
Load Regulation (10% to 100% FL)	Single		±0.5%
	Dual		±1%
	Triple	Main	±2%
		Auxilliary	±5%
Ripple and Noise, 20MHz BW (measured with a 104pF/50V MLCC)			See selection guide table
Temperature Coefficient			±0.02%/°C max.
Transient Response Recovery Time (25% load step change)			400µsec
Over Voltage Protection (zener diode clamp):	3.3V Output		3.9V
	5V Output		6.2V
	12V Output		15V
	15V Output		18V
Over Load Protection (% of full load at nominal Vin)			150% max.
Short Circuit Protection			Hiccup, Automatic Recovery
Input Voltage Range	24V types nominal input		18-36VDC
	48V types nominal input		36-75VDC
Under Voltage Lockout	24V Input	DC-DC ON	17.8VDC
		DC-DC OFF	16VDC
	48V Input	DC-DC ON	36VDC
		DC-DC OFF	34VDC
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		40mAp-p
Start Up Time (nominal Vin and constant resistor load)			25ms 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
Approved to Safety Standards			UL 1950, EN60950
Case Material			Nickel-Coated Copper
Base Material			Non-conducted Black FR4
Potting Material			Epoxy (UL94-V0)
Weight			60g (2.11 oz)
Dimensions			50.8 x 50.8 x 10.2 mm
MTBF (MIL-HDBK-217F, TA = 25°C full load)			1.434 x 10^5 Hours

continued on next page

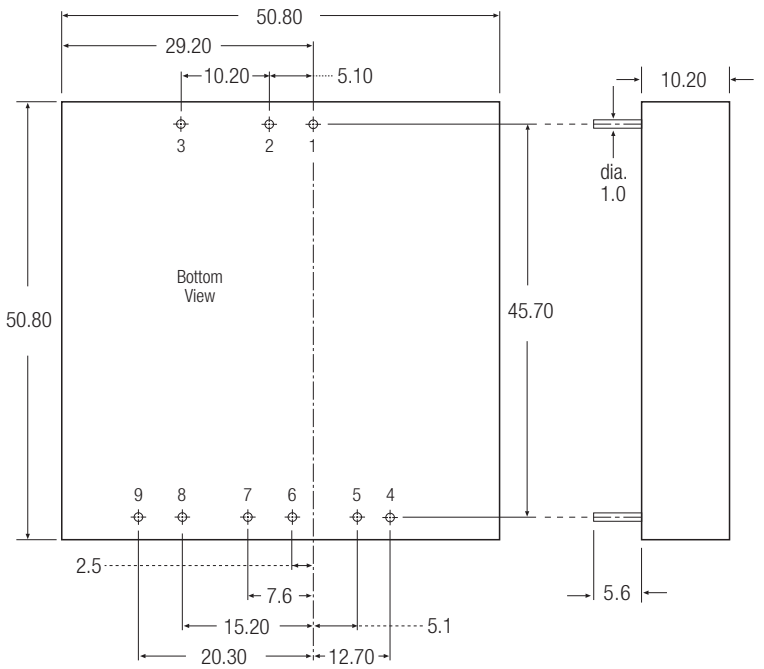
Specifications continued (typical at nominal input and 25°C unless otherwise noted)

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	Natural convection	9.2°C/Watt
Thermal Shock		MIL-STD-810D
Vibration		10-55Hz, 2G, 3 Min. Period, 30 Min. along X, Y and Z
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 Air	EN61000-4-2	Perf. Criteria 2

Notes:

1. The RP40 G-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 pin voltage is referenced to negative input.
4. Maximum value at nominal input voltage and full load.
5. Typical value at nominal input voltage and full load.
6. It will compensate for up to 0.5V line drop voltage between converter and load. If remote sense is not being used, the +sense should be connected to its corresponding +OUTPUT and likewise the –sense should be connected to its corresponding –OUTPUT.

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	3.3V	+Aux
5	-Sense (see note 6)	3.3V RTN	Common
6	+Sense (see note 6)	NC	–Aux
7	+Vout	NC	+Vout
8	–Vout	5V	–Vout
9	Trim	5V RTN	NC

Pin Pitch Tolerance ±0.35 mm