

## Features

### Regulated Converters

Rev. 0

- 60 Watts Regulated Output Power
- 2:1 Wide Input Voltage Range
- 1.6kVDC Isolation (Basic Insulation)
- Overload and Over Temperature Protection
- Six-Sided Shield
- No Derating to 40°C
- Standard 2" x 2" Package and Pinning
- Efficiency to 90 %

## POWERLINE

DC/DC-Converter

# RP60-SG Series

60 Watt

2" x 2"

Single Output

### Description

The RP60-G series DC/DC converters deliver 60W of power in an industry standard 2" x 2" package, which also meets military standards for thermal shock and vibration tolerance. Sense pins allow the output voltage at the point of load to be tightly regulated and automatically compensate for any voltage drops that may occur across any connections.

### Selection Guide 24V and 48V Wide Input Types

Part Number	Input Range VDC	Output Voltage VDC	Output Current mA	Input <sup>(5,4)</sup> Current mA	Efficiency <sup>(5)</sup> %	Capacitive <sup>(6)</sup> Load max.
RP60-243.3SG	18-36	3.3	14000	100/2264	89	36000µF
RP60-2405SG	18-36	5	12000	130/2941	90	20400µF
RP60-2412SG	18-36	12	5000	150/2907	90	3550µF
RP60-2415SG	18-36	15	4000	150/2907	90	2300µF
RP60-483.3SG	36-75	3.3	14000	80/1132	89	36000µF
RP60-4805SG	36-75	5	12000	90/1453	90	20400µF
RP60-4812SG	36-75	12	5000	100/1453	90	3550µF
RP60-4815SG	36-75	15	4000	100/1453	90	2300µF

\* no suffix for CTRL function with Positive Logic (1=ON, 0=OFF), this is standard

\* add /N for CTRL function with Negative Logic (0=ON, 1=OFF)

\* add suffix **-HC** for premounted heatsink and clips

### Ordering Examples

RP60-2405SG = 24V Input, 5V Output, Positive Logic CTRL pin.

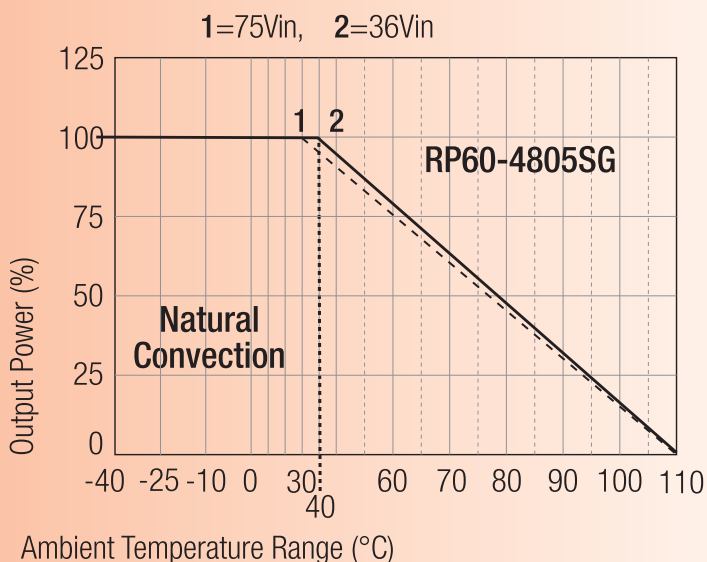
RP20-4812SG/N-HC = 48V Input, 12V Output, Negative Logic CTRL pin, Heatsink fitted



UL-60950-1 Certified



### Derating Graph (Ambient Temperature)

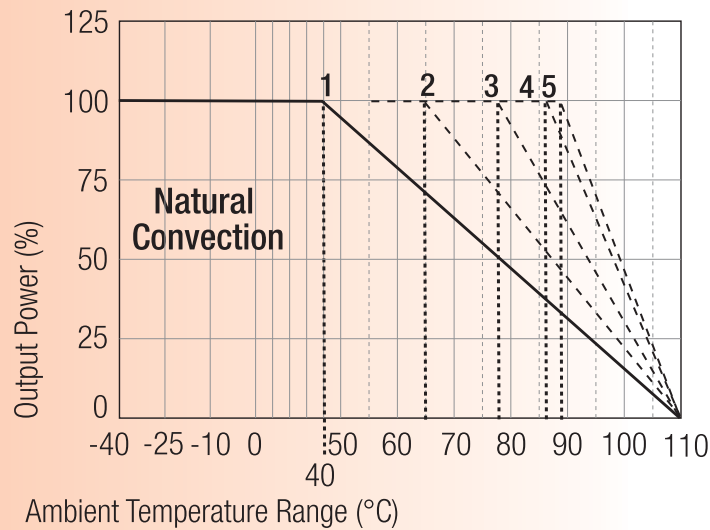


Derating graphs are valid only for the shown part numbers. If you need detailed derating information about a part number not shown here please contact our technical customer service at [info@recom-development.at](mailto:info@recom-development.at)

**Derating Graph (Ambient Temperature)**

RP60-4805SG

1=Natural Convection, 2=200LFM, 3=300LFM,  
4=400LFM, 5=500LFM



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

Input Voltage Range	24V nominal input	18-36VDC	
	48V nominal input	36-75VDC	
Undervoltage Protection	24V Input	DC-DC ON = 17VDC, DC-DC OFF = 15VDC	
	48V Input	DC-DC ON = 34VDC, DC-DC OFF = 32VDC	
Input Filter		Pi Type	
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)(see Note 3)		20mA <sub>p-p</sub>	
Start Up Time (nominal Vin and constant resistor load)		20ms max.	
Remote ON/OFF (see Note 7)	Positive logic - Standard	DC-DC ON	Open or 3V < Vr < 12V
		DC-DC OFF	Short or 0V < Vr < 1.2V
	Negative logic - /N Option	DC-DC ON	Short or 0V < Vr < 1.2V
		DC-DC OFF	Open or 3V < Vr < 12V
Remote Pin Drive Current	Nominal Vin	-0.5 -1.0mA	
Remote OFF input current	Nominal Vin	4mA	
Output Power		60W max.	
Output Voltage Accuracy (full Load and nominal Vin)		±1%	

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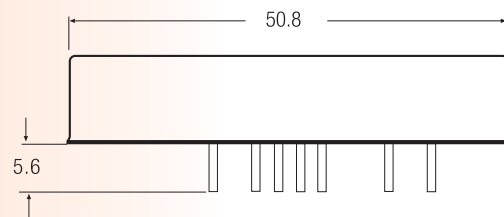
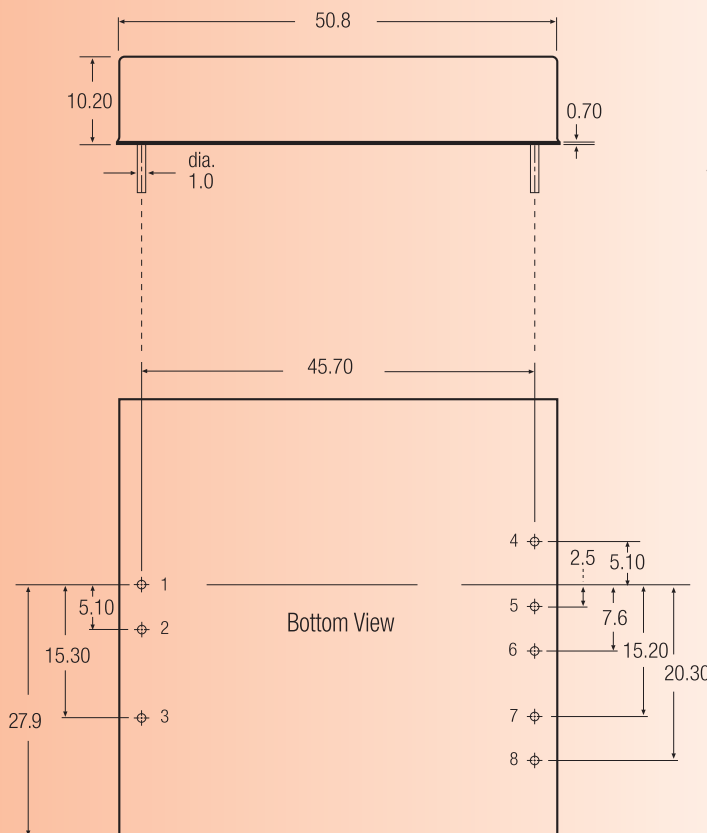
**Specifications, cont.** (typical at nominal input and 25°C unless otherwise noted)

Voltage Adjustability (see Note 1)		±10%
Line Regulation	LL to HL at Full Load	±0.2%
Load Regulation (see Note 3)	0% to 100% Load	±0.5%
Temperature Coefficient		±0.02%/°C max.
Ripple and Noise (20MHz bandwidth)	3.3,5V 12,15V	75mVp-p 100mVp-p
Transient Response (25% load step change)		250µs
Over Voltage Protection	3.3 Vout	3.7-5.4V
Zener diode clamp (only single)	5 Vout 12 Vout 15 Vout	5.6-7.0V 13.7-17.5V 16.8-20.5V
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		1600VDC min.
Isolation Resistance		1 GΩ min.
Isolation Capacitance		1500pF max.
Operating Frequency		300kHz typ.
Designed to meet Safety Standards		IEC60950-1, UL60950-1, EN60950-1
Operating Temperature Range		-40°C to +40°C(without derating) +55°C to +110°C(with derating)
Maximum Case Temperature		110°C
Storage Temperature Range		-55°C to +125°C
Over Temperature Protection		120°C typ.
Thermal Impedance (see Note 11)	Without Heat-Sink With Heat-Sink	10.5°C/Watt 8.4°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 (see Notes 9, 10)	EN55022	Class A
Radiated Emissions	EN55022	Class A
ESD	EN61000-4-2	Perf. Criteria B
Radiated Immunity	EN61000-4-3	Perf. Criteria A
Fast Transient	EN61000-4-4	Perf. Criteria B
Surge	EN61000-4-5	Perf. Criteria B
Conducted Immunity	EN61000-4-6	Perf. Criteria A
Weight		60g
Dimensions		50.8 x 50.8 x 10.2mm
MTBF (see Note 2)	Bellcore TR-NWT-00332 MIL-STD-217F	1093 x 10 <sup>3</sup> hours 1096 x 10 <sup>3</sup> hours

**Notes :**

1. Maximum output deviation is 10% inclusive of remote sense and trim. 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.
2. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment).
3. No minimum loading on the output is required to maintain specified regulation. Operation under no-load condition will not damage these devices
4. Maximum value at nominal input voltage and full load.
5. Typical value at nominal input voltage and full load.
6. Test by minimum  $V_{in}$  and constant resistive load.
7. The ON/OFF control pin voltage is referenced to the negative input (-Vin).  
To order negative logic ON/OFF control add the suffix-N (Example: RP60-4805SG-N).
8. Heat sink is optional and P/N: 7G-0026A. 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 RP60-SG series meets EN55022 Class A with an external capacitor across the input pins (24Vin:6.8 $\mu$ F/50V MLCC, 48Vin:2x2,2 $\mu$ F/100V MLCC)
10. See also application notes for EMI-filtering.
11. Vertical orientation and natural convection.

**Package Style and Pinning (mm)**



**Pin Connections**

Pin #	Single
1	+Vin
2	-Vin
3	CTRL
4	-SENSE (Note 1)
5	+SENSE (Note 1)
6	+Vout
7	-Vout
8	TRIM

Pin Pitch Tolerance  $\pm 0.35$  mm

Output can be externally trimmed by using the method shown below.  
See Application Notes for more details.

