

Description

Providing outputs from 5 to 15 volts, the DGP12 series delivers up to 12 watts with power densities up to 7 watts per cubic inch (0.43 watts per cm³). Designed to operate on ultra-wide input voltages from 3.5 to 16 volts, and with remote On/Off capability, the DGP12 supplies power from battery or system sources. The output of the converter is electrically isolated, thereby allowing the output to be configured as a positive or negative output voltage. The fully-isolated, shielded case allows precise operation in sensitive environments.

Features

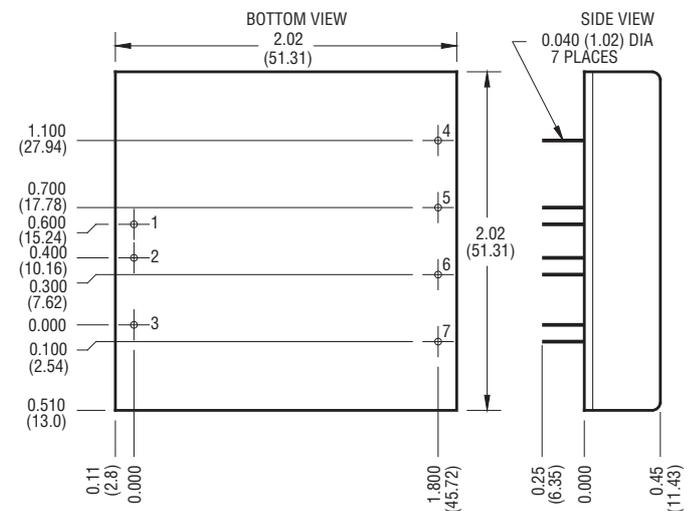
- RoHS lead solder exemption compliant
- Up to 12 watts output power
- 5-Sided shielded isolated copper case
- Ultra-wide 3.5 to 16V input range
- Efficiencies to 82%
- Fully-isolated and filtered
- 700 V isolation
- Remote On/Off and trim



Selection Chart				
Model	Input Range VDC (6)		Output VDC	Output mA
	Min	Max		
DGP12U5S5	3.5	16	5	2000
DGP12U5S12	3.5	16	12	1000
DGP12U5S15	3.5	16	15	800

Model numbers highlighted in yellow or shaded are not recommended for new designs.

General Specifications (1)				
All Models				Units
ON/OFF Function (2)				
OFF Logic Level	MAX	<0.4	VDC	
Open Circuit On Level Voltage	TYP	1.4	VDC	
Input Resistance	TYP	2	Kohms	
Converter Idle Current ON/OFF Pin Low	TYP	6	mA	
Isolation (3)				
Breakdown Voltage Input to Output 10 μA Leakage	MIN	700	VDC	
Input to Output Capacitance	TYP	375	pF	
Output Trim Function				
Trim Range	MIN	±10	%	
Input Resistance	MIN	10	Kohms	
Open Circuit Voltage	TYP	2.5	VDC	
Environmental				
Case Functional Range, Tc No Derating	MIN MAX	-40 85	°C	
Case Functional Range (4)	MIN MAX	-50 100	°C	
Storage Range	MIN MAX	-55 105	°C	
Thermal Shutdown Case Temperature	TYP	105	°C	
Thermal Impedance (5)	TYP	9.5	°C/Watt	
General				
MTBF (Calculated)	TYP	800,000	HRS	
Unit Weight	TYP	2.3/65	oz/gm	
Chassis Mounting Kit	CM2B2			



Mechanical tolerances unless otherwise noted:

X.XX dimensions: ±0.020 inches

X.XXX dimensions: ±0.005 inches

Pin	Function
1	+INPUT
2	-INPUT
3	ON/OFF
4	NO PIN
5	+OUT
6	-OUT
7	TRIM

NOTES:

- (1) All parameters measured at Tc = 25 °C, nominal input voltage and full-rated load unless otherwise noted.
- (2) See DGP12 application notes for more information regarding the On/Off function.
- (3) The case is tied to the -output pin.
- (4) The functional temperature range is intended to give an additional data point for use in evaluating this power supply. At the low functional temperature the power supply will function with no side effects. However, sustained operation at the high functional temperature will reduce expected operational life. The data sheet specifications are not guaranteed beyond the case operating range.
- (5) The case thermal impedance is specified as the case temperature rise over ambient per package watt dissipated.
- (6) Reduced output power is available at 3.5 V input. Full power is available above 4.6 volts.

Input Parameters (1)					
Model		DGP12U5S5	DGP12U5S12	DGP12U5S15	Units
Voltage Range (1)	MIN	3.5			VDC
	MAX	16			
Input Current	Full Load	2880	3500	3470	mA
	No Load	10	16	20	
Switching Frequency	TYP	60			kHz
Maximum Input Overvoltage, 100ms Maximum	MAX	20			VDC
Turn-on Time, 1% Output Error	TYP	10			ms

Output Parameters (1)					
Model		DGP12U5S5	DGP12U5S12	DGP12U5S15	Units
Output Voltage		5	12	15	VDC
Output Voltage Accuracy	MIN	4.95	11.90	14.90	VDC
	TYP	5.00	12.00	15.00	
	MAX	5.05	12.10	15.10	
Rated Load Range (5)	MIN	0.0	0.0	0.0	A
	MAX	2.0	1.0	0.8	
Load Regulation 25% Max Load - Max Load	TYP	0.3	0.1		%
	MAX	0.7	0.5		
Line Regulation Vin = Min-Max VDC	TYP	0.1			%
	MAX	0.2			
Short Term Stability (4)	TYP	< 0.05			%/24Hrs
Long Term Stability	TYP	< 0.1			%/kHrs
Noise, Peak - Peak (3)	TYP	50			mV _{pp}
RMS Noise	TYP	10			mV _{rms}
Temperature Coefficient	TYP	50			ppm/°C
	MAX	150			
Short Circuit Protection +OUT to -OUT (6)		Short Term Current Limit			

NOTES:

- (1) All parameters measured at Tc = 25 °C, nominal input voltage and full-rated load unless otherwise noted.
- (2) Reduced output power available at 3.5 V input. Full output power is available above 4.6 V input.
- (3) Noise measurement bandwidth is 0-20 MHz for peak-to-peak measurements; 10 kHz to 1 MHz for RMS measurements. Output noise is measured with a 0.01 µF ceramic capacitor in parallel with a 1µF, 35V Tantalum capacitor located 1" away from the converter to simulate your PCB's standard decoupling. Input reflected ripple is measured into a 10VµH source impedance.
- (4) Short-term stability is specified after a 30-minute warmup at full load, constant line, and recording the drift over a 24-hour period.
- (5) No minimum load required for operation. Dynamic regulation may degrade when run with less than 5% load.
- (6) Less than 30 seconds.

DGP12 SERIES APPLICATION NOTES:

External Capacitance Requirements

No external capacitance is required for operation of the DGP12 Series. The use of input capacitors with less than 0.5 Ohms ESR may cause peaking in the input filter and degrade filter performance. External output capacitance is not required for operation. However, it is recommended that 1 µF to 10 µF of tantalum and 0.001 to 0.1 µF ceramic capacitance be selected for reduced system noise. Additional output capacitance may be added for increased filtering, but should not exceed 400 µF.

Negative Outputs

A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.

(Continued on page 3)

DGP12 SERIES APPLICATION NOTES: (Cont.)

Remote ON/OFF Operation

The remote On/Off pin must be left floating if this function is not used. It is recommended to drive this pin with an open collector arrangement or a relay contact. When the On/Off pin is pulled low with respect to the -INPUT, the converter is placed in a low power drain state. The input capacitors are kept fully charged in the Off mode. For proper operation, do not drive this input from a logic gate directly.

The On/Off pin must be left floating for proper operation. Be aware that this input may be noise sensitive; use proper PCB design guidelines. The On/Off pin should never be pulled more than 0.3 volts below the negative input or have a voltage greater than 2 volts applied.

Output Trim

The TRIM pin may be used to adjust the output $\pm 10\%$ from the nominal setting. This function allows adjustment for voltage drops in the system wiring, as well as the 5.2 volt outputs for ECL applications. Figure 1 shows the proper connections to use this function. A trimpot value of 10 kOhms should be used for 5 volt outputs. A trimpot value of 20 kOhms should be used for 12 and 15 volt outputs. If the TRIM function is not required, the pin may be left floating.

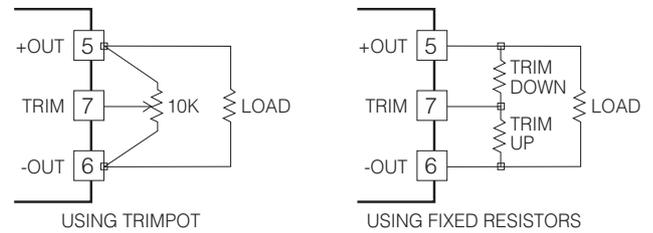
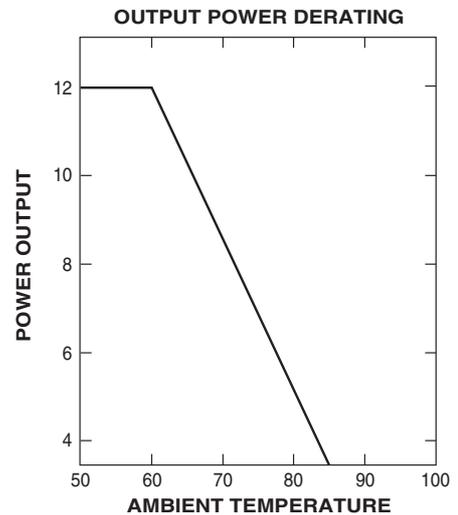
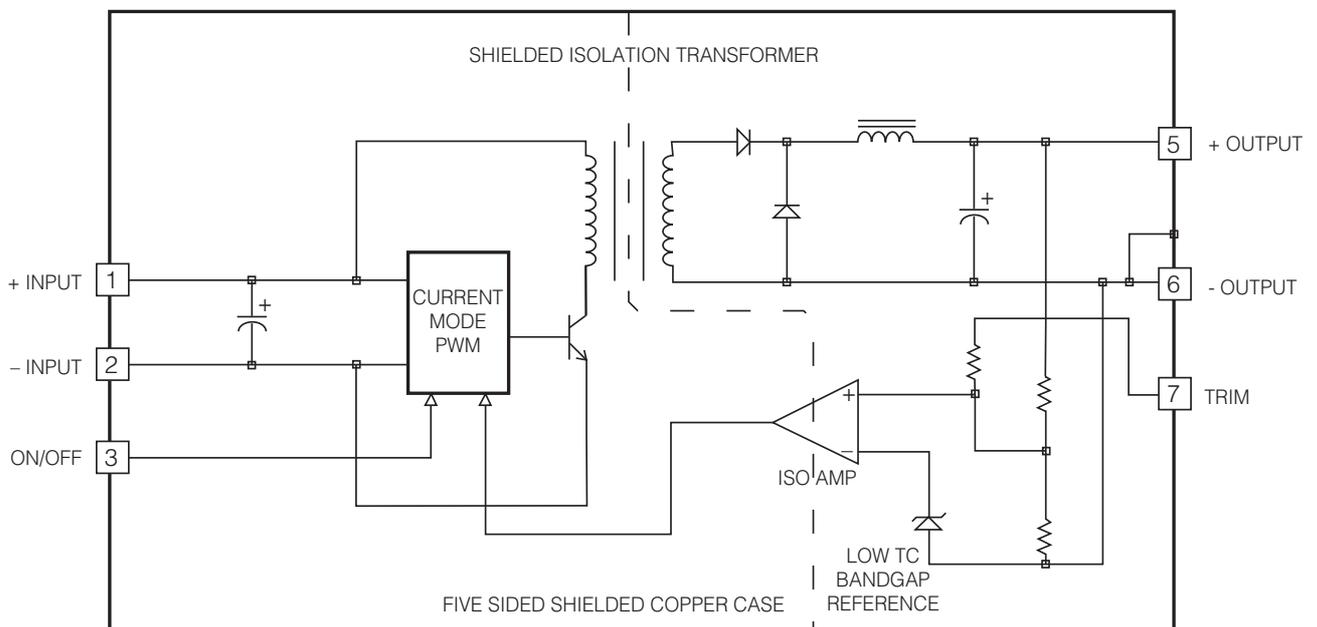


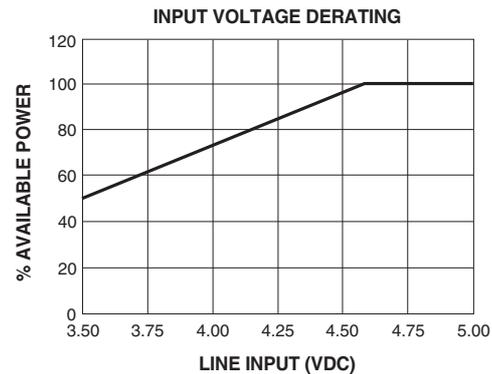
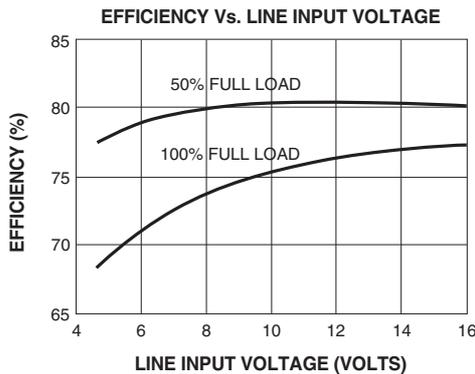
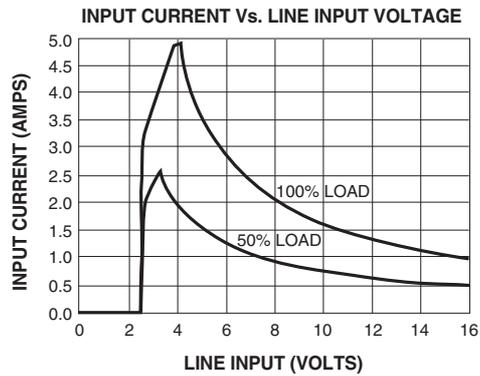
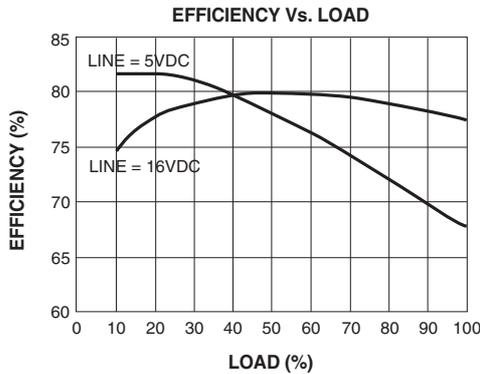
Figure 1.



DGP12 SERIES BLOCK DIAGRAM



Typical Performance: (Tc=25 °C, Vin=Nom VDC, Rated Load)



NOTES ON USING THE CURVES

- 1) The input currents are for 12 watts of input power. For 5 volt output models the current is approximately 16% less.
- 2) The efficiency curves are for 12 volt output. To use the curves for other models adjust as follows:
 5 volt models subtract approximately 2%.
 15 volt models subtract approximately 1%.

NUCLEAR AND MEDICAL APPLICATIONS - Power-One products are not designed, intended for use in, or authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of the respective divisional president of Power-One, Inc.

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