

Description

The DGP20 Series is a high performance, 20-watt triple output DC-DC converter designed for battery and telecom applications. Power densities of up to 11 watts per cubic inch provide system flexibility. The extended 2:1 input voltage range allows operation over a wide variety of sources from 9 to 72 volts.

Features

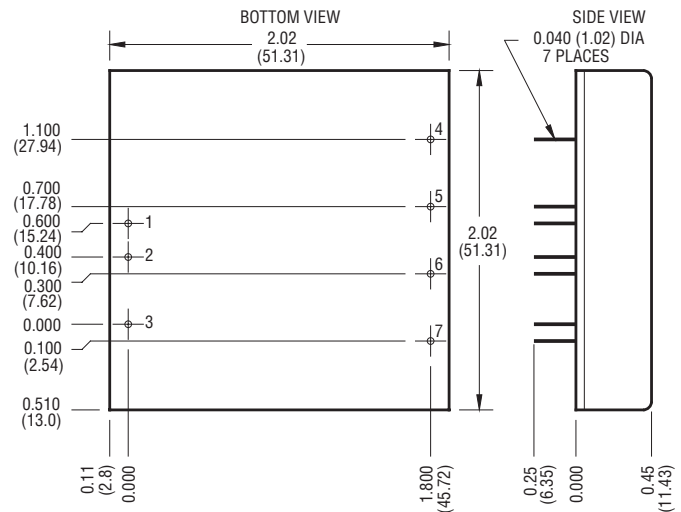
- RoHS lead solder exemption compliant
- Triple outputs
- Five-sided shielded case
- Remote On/Off
- Efficiencies to 84%
- -40 °C to +85 °C operation
- 700 V isolation
- Extended range input (2:1)



Selection Chart				
Model	Input Range VDC (6)		Output VDC	Output mA
	Min	Max		
DGP20E12T5/12	9	18	5, ±12	2500, ±310
DGP20E12T5/15	9	18	5, ±15	2500, ±250
DGP20E24T5/12	18	36	5, ±12	2500, ±310
DGP20E24T5/15	18	36	5, ±15	2500, ±250
DGP20E48T5/12	36	72	5, ±12	2500, ±310
DGP20E48T5/15	36	72	5, ±15	2500, ±250

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

General Specifications (1)				
All Models				Units
Isolation (4)				
Breakdown Voltage				
Input to Output 12V , 24V	MIN	700		VDC
Input to Output 48V	MIN	1544		
10 µA Leakage				
Input to Output Capacitance	TYP	4000		pF
ON/OFF Function				
ON Logic Level or Leave Pin Open	MIN	>1.6		VDC
OFF Logic Level or Tie Pin to -Input	MAX	<0.7		VDC
Open Circuit Voltage	TYP	2.5		VDC
Input Resistance	TYP	20		Kohms
Converter Idle Current				
ON/OFF Pin Low				
12V Models	TYP	3		mA
4V and 48V Models	TYP	5		mA
Environmental				
Case Functional Range, Tc	MIN	-40		°C
No Derating	MAX	85		
Case Functional Range (2)	MIN	-55		°C
	MAX	100		
Storage Range	MIN	-55		°C
	MAX	105		
Thermal Impedance (4)	TYP	9.5		°C/Watt
General				
MTBF (Calculated)	TYP	800,000		HRS
Unit Weight	TYP	<3/85		oz/gm
Chassis Mounting Kit 12V, 24V		CM2B3		
Chassis Mounting Kit 48V		CM2A3		



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	+12/15V OUTPUT
5	+5V OUTPUT
6	COMMON
7	-12/15V OUTPUT

NOTES

- (1) All parameters measured at Tc = 25 °C, nominal input voltage and full rated load unless otherwise noted.
- (2) 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.
- (3) The case thermal impedance is specified as the case temperature rise over ambient per package watt dissipated.
- (4) Case is tied to -Input, Pin 2.

Input Parameters (1)								
Model		DGP20E12T5/12	DGP20E12T5/15	DGP20E24T5/12	DGP20E24T5/15	DGP20E48T5/12	DGP20E48T5/15	Units
Voltage Range	MIN	9.0		18.0		36.0		VDC
	MAX	18.0		36.0		72.0		
Reflected Ripple (2)	TYP	15		10		6		mA _{rms}
Input Current	Full Load	2160		995		510		mA
	No Load	16		10		8		
Efficiency	TYP	77		84		82		%
Switching Frequency	TYP	220						kHz
Maximum Input Overvoltage, 100ms No Damage	MAX	23		45		85		VDC
Turn-on Time	TYP	10						ms

Output Parameters (1)					
Model		DGP20EXXT5/XX	DGP20EXXT5/12	DGP20EXXT5/15	Units
Output Voltage		+5	±12	±15	VDC
Rated Load (3)	MIN	600	75	60	mA
	MAX	2500	310	250	
Voltage Range 100% Load	MIN	4.925	11.700	14.700	VDC
	TYP	5.000	12.000	15.000	
	MAX	5.075	12.300	15.300	
Output Balance (Plus to Minus Output, Full Load)	TYP MAX	N/A	<50	<50	mV
Load Regulation MIN-MAX Load (4)	TYP	<0.5	<1.0	<1.0	%
	MAX	2.0	2.0	2.0	
Cross Regulation (5)	TYP	1.0	5.0	5.0	%
Line Regulation Vin=Min to Max VDC	TYP	0.1	0.4	0.4	%
		1.0	1.5	1.5	
Short Term Stability (6)	TYP	<0.1	<0.02	<0.02	%
Noise, 0-20MHz bw (2)	TYP	50	120	150	mV _{pp}
Temperature Coefficient	TYP	50	50	50	ppm/i C
	MAX	150	200	200	
Short Circuit Protection to Common for all Outputs		Continuous, Current Limit Protection			

NOTES

- (1) All parameters measured at Tc=25 °C, nominal input voltage and full rated load unless otherwise noted.
- (2) Noise measurement bandwidth is 0-20 MHz for peak-peak measurements, 10 kHz to 1 MHz for RMS measurements. Output noise is measured with a 1 μ F tantalum located 1" away from the converter to simulate PCB standard decoupling. Input reflected ripple is measured into a 1 μ H source impedance.
- (3) Optimum performance is obtained when this power supply is operated within the minimum to maximum load specifications.
- (4) Output regulation is specified by simultaneously changing from minimum to maximum load and noting the change in each output.
- (5) Cross regulation is defined as the change in one output when the other output is changed from full load to 25% of full load. The converter can be run at no load on either or both outputs with no damage.
- (6) Short term stability is specified after a 30-minute warmup at full load, constant line and recording the drift over a 24-hour period.

DGP20 Series Application Notes:

External Capacitance Requirements:

No external capacitance is required for operation of the DGP20 Series. However, for maximum performance, it is recommended that the DGP20 Series use a capacitor of sufficient ripple current capacity connected across the input pins if a capacitive input source is farther than 1" from the converter. To meet the reflected ripple requirements of the converter, an input impedance of less than 0.09 Ohms from at 220 kHz is required. External output capacitance is not required for operation, however it is recommended that 1 μ F to 10 μ F of tantalum

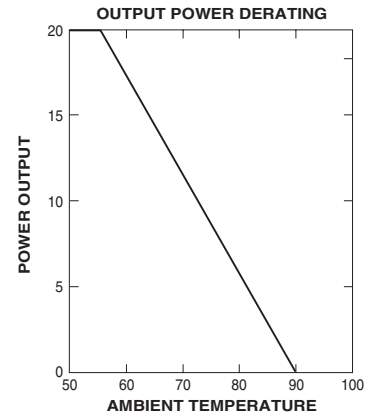
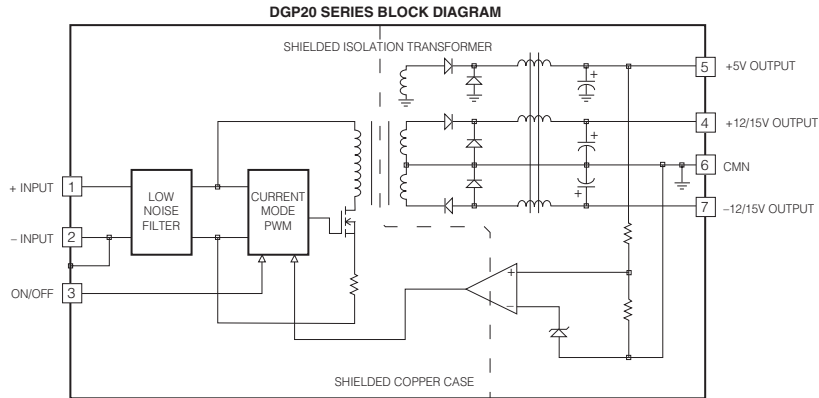
and 0.001 to 0.1 μ F ceramic capacitance be selected for reduced system noise. Additional output capacitance may be added for increased filtering, but should not exceed 400 μ F.

Remote On/Off Operation:

The remote On/Off pin may be left floating if this function is not used. It is recommended to drive this pin with an open collector/drain 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 should never be pulled more than 0.3 volts below -INPUT or have a voltage greater than +8 volts applied.

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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Typical Performance: ($T_c=25^\circ\text{C}$, $V_{in}=\text{Nom VDC}$, Rated Load)

