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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)

RoHS Compliant

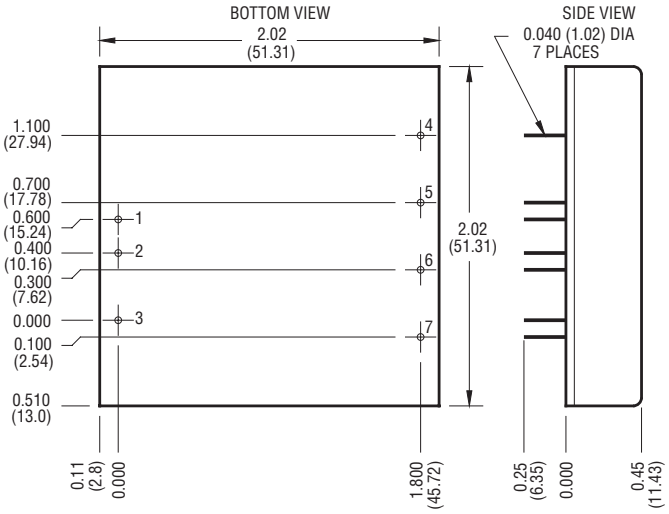
Selection Chart

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 Input to Output 48V 10 µA Leakage	 MIN MIN	 700 1544	VDC
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 4V and 48V Models	 TYP TYP	 3 5	 mA mA
Enviromental			
Case Functional Range, Tc No Derating	MIN MAX	-40 85	¡ C
Case Functional Range (2)	MIN MAX	-55 100	¡ C
Storage Range	MIN MAX	-55 105	¡ C
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 MAX	9.0 18.0				18.0 36.0			36.0 72.0			VDC
Reflected Ripple (2)	TYP	15				10			6			mA_{rms}
Input Current Full Load No Load	TYP TYP	2160 16				995 10			510 8			mA
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 MAX	600 2500	75 310	60 250	mA
Voltage Range 100% Load	MIN TYP MAX	4.925 5.000 5.075	11.700 12.000 12.300	14.700 15.000 15.300	VDC
Output Balance (Plus to Minus Ouput, Full Load)	TYP MAX	N/A	<50	<50	mV
Load Regulation MIN-MAX Load (4)	TYP MAX	<0.5 2.0	<1.0 2.0	<1.0 2.0	%
Cross Regulation (5)	TYP	1.0	5.0	5.0	%
Line Regulation Vin=Min to Max VDC	TYP	0.1 1.0	0.4 1.5	0.4 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 MAX	50 150	50 200	50 200	ppm/¡ C
Short Circut 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 µF tantalum located 1" away from the converter to simulate PCB standard decoupling. Input reflected ripple is measured into a 1 µH 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:

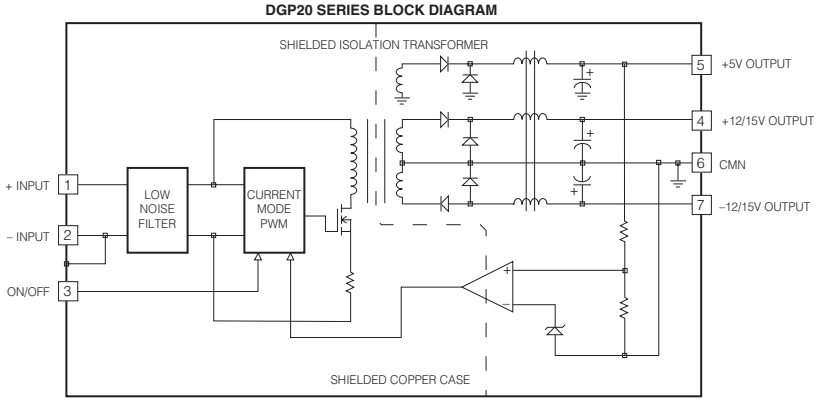
External Capacitance Requirements:
No external capacitance is required for operation of the DGP20 Series. However, for maximum performance, it is recommended that the DGP20 Series use a capacitor of sufficient ripple current capacity connected across the input pins if a capacitive input source is farther 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 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.

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.

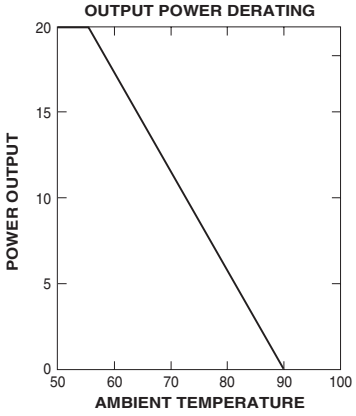
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TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

DGP20 SERIES BLOCK DIAGRAM

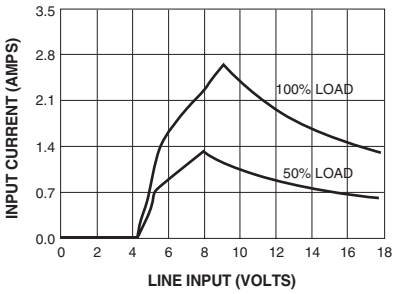


OUTPUT POWER DERATING

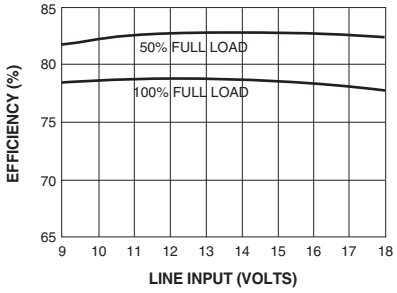


Typical Performance: (Tc=25°C, Vin=Nom VDC, Rated Load)

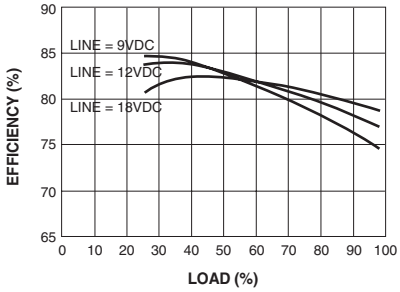
12 VOLT INPUT CURRENT Vs. LINE INPUT VOLTAGE



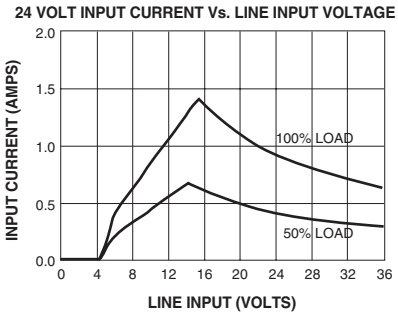
12 VOLT EFFICIENCY Vs. LINE INPUT VOLTAGE



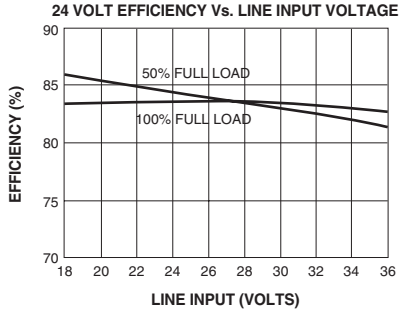
12 VOLT EFFICIENCY Vs. LOAD



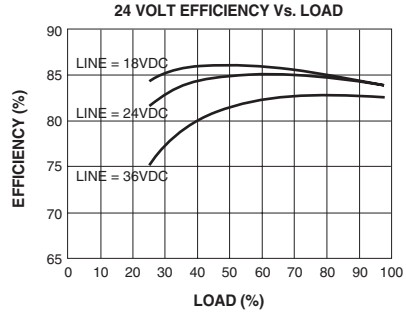
24 VOLT INPUT CURRENT Vs. LINE INPUT VOLTAGE



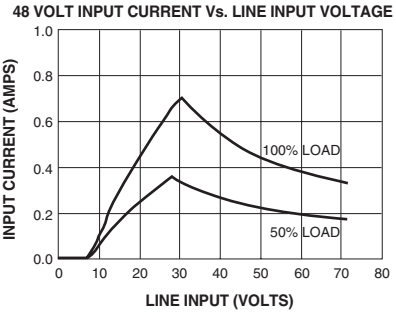
24 VOLT EFFICIENCY Vs. LINE INPUT VOLTAGE



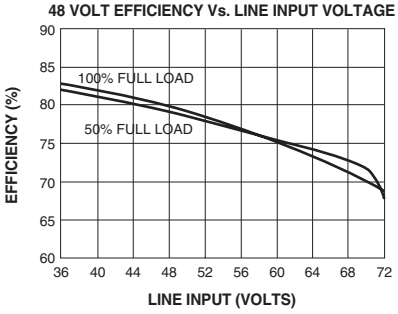
24 VOLT EFFICIENCY Vs. LOAD



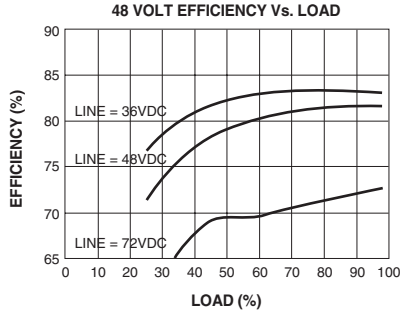
48 VOLT INPUT CURRENT Vs. LINE INPUT VOLTAGE



48 VOLT EFFICIENCY Vs. LINE INPUT VOLTAGE



48 VOLT EFFICIENCY Vs. LOAD



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