Digital Power®
Flexible Power Solutions

(877) 634-0982
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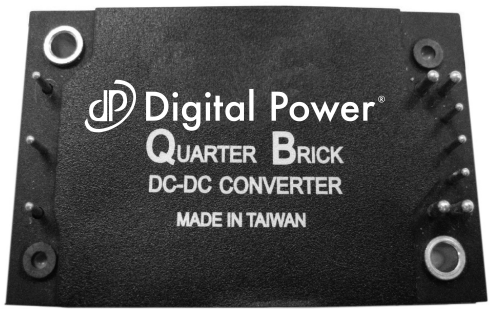
DPQB24-3.3-150
150 Watt

Product Specification
DC-DC Converter



Key Product Features

- Industry Standard Quarter Brick: 57.9mm x 36.8mm x 12.7mm (2.28in. x 1.45in. x 0.50in.)(Typical)
- High Power Density: Up to 90W/in.^3
- High Efficiency: 91% Typical
- Low Output Noise
- Metal Baseplate
- Thermal Protection
- Input Under Voltage Protection
- Output Over Voltage Protection
- Current Limit/Short Circuit Protection
- Adjustable Output Voltage: 90% to 110% of Vo,set
- Remote Sense
- Remote ON/OFF Control: Positive Logic
- RoHS Compliant

Description

Quarter Brick modules are DC-DC converter designed for use in distributed power architectures, workstations, EDP equipment and telecommunications. The Quarter Brick modules may be used as from, fit and function replacements for industry standard Quarter brick modules. All use planar transformer and surface mount constructions to produce up to 150W in a Quarter brick package.

Options

Remote On/Off Logic Configuration.

Absolute Maximum Ratings

Parameter	MIN	TYP	MAX	UNITS	CONDITIONS
Input Voltage (+In to -In)	-0.3		50	V	<100ms
	-0.3		36	V	Continous
Logic On/Off Voltage (On/Off to -In)	-0.3		5	V	
Storage Temperature	-40		125	°C	
Storage Humidity	10		95	%	
Operating Temperature	-40		100		Temperature measure shall be taken from the baseplate (Tb)
Operating Humidity	30		95	%	

Product Specification

Input

Parameter	MIN	TYP	MAX	UNITS	CONDITIONS
Operation Input Voltage (Vi)	18	24	36	V	
Maximum Input Current (Ii, max)			10	A	Vi=18V, Io=Io, max
Inrush Transient			1	A^2s	
Input Reflected-Ripple Current: Peak-Peak		40	60	mAp-p	5HZ to 20MHZ, Vin=24Vdc ; Io=Full Load, 12uH source impedance ; Cin=220uF ; Tb=25 degC
Input Ripple Rejection		60		dB	120Hz
Input Under Voltage Protection: Turn-on Threshold Turn-off Threshold Hysteresis	 15 1	 17.5 16 1.5	 18	 V V V	Vo=3.3V, Io =Io, max.

Output

Parameter	MIN	TYP	MAX	UNITS	CONDITIONS
Output Set Point (Vo, set)	3.267	3.3	3.333	V	Initial Adjusted Tb=25°C, Vi=24V, Io=Io, max
Output Voltage Tolerance Band	-3		3	%	All Operating Condition
Line Regulation			20	mV	Vi=18V to 36V
Load Regulation			20	mV	Io= Io, min to Io, max.
Temperature Drift			0.02	%/°C	Tb= -40 to 100°C
Output Ripple and Noise Voltage Peak to Peak			100	mVp-p	Bandwidth 5Hz to 20MHz and with 0.1uF MLCC. Vin=24Vdc ; Io= Full Load ; Tb=25degC ; Output Capacitor with 220uF*3EA
Output Current Io, min Io, max	 0		 45.45	 A A	At Vo<=3.3V, if Vo>3.3V, Output Power (Po) should be less than its rating power.
Output Current Limit	105		145	%Io, max	Current limit inception point Vo=90% of Vo, set
Output Short Circuit Current			45.45	Arms	Hiccup Mode
Output Over Voltage Protection	112		140	%Vo, set	Io=0.5A
External Capacitance		660	5000	uF	
Output Power			150	W	
Efficiency		91		%	Vi=24V, Vo=3.3V, Io=80% of Io, max, Tb=25°C
Dynamic Response: Peak Deviation Settling Time		6	 300	%Vo, set us	Vi=24V, Tb=25°C 25% - 50% - 75% load, Δ Io/Δ t=0.1 A/us; with Output Capacitor 220uF*3EA Duration outside of Vo, set +/- 1.0% error band

Control Specifications

Parameter	MIN	TYP	MAX	UNITS	CONDITIONS
Logic ON/OFF Remote: Positive: Off-State Voltage On-State Voltage Negative: Off-State Voltage On-State Voltage	 2.0 2.0		 0.8 0.8	 V V V V	
Turn-On Time		40		ms	Vo=90% of Vo, set
Output Voltage Trim Range	90		110	%Vo, set	Refer to Trim Circuit.
Over Temperature Protection Shutdown Recovery	100	105 90	115	°C °C	Refer to Fig.3 for location definition Auto. Recovery

Isolation Specifications

Parameter	MIN	TYP	MAX	UNITS	CONDITIONS
Input to Output		1500		Vdc	60 seconds
Input to Case		1500		Vdc	60 seconds
Output to Case		500		Vdc	60 seconds
Input to Output Capacitance		2000		pF	
Isolation Resistance	100			Mohm	At Tb=25°C, 70%RH, Output to Baseplate 500VDC

Structural Dynamics

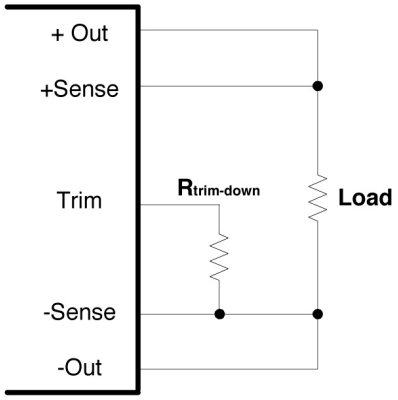
Parameter	CONDITIONS
Vibration	Sine Wave, 10-55Hz (Sweep for 1 min.), Amplitude 0.825mm Constant (Maximum 5g) X, Y, Z 1 Hour each, At No Operating.
Shock	20g, 166 in/sec, Square Wave

General Specifications

Parameter	MIN	TYP	MAX	UNITS	CONDITIONS
MTBF		1.8		Mhrs	Tb=40°C, Io=80% of Io, max
Weight		65		g	
Size (WxHxD)		2.28 x 1.45 x 0.50		in.^3	

Trim Circuit

A. Trim down: The resistor for output voltage trim-down function could be calculated with the following formula:

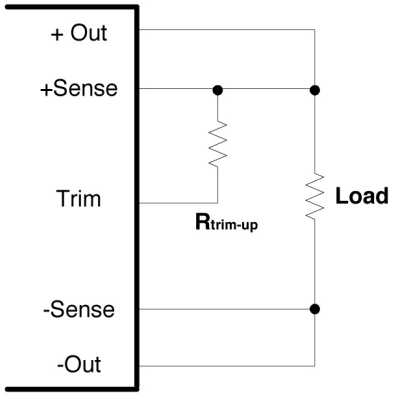


$$R_{trim\text{-}down} = \left(\frac{100\%}{\Delta\%} - 2\right) \ (\text{k}\Omega)$$

Δ %: Output voltage change rate against nominal output voltage

Fig. 1 The schematic for output voltage trim down.

B. Trim up: The resistor for output voltage trim-up function could be calculated with the following formula:



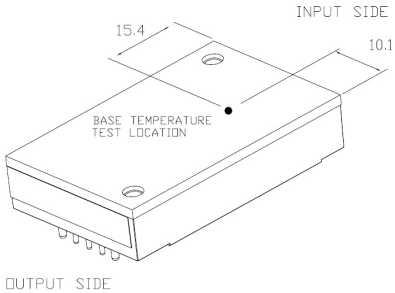
$$R_{trim\text{-}up} = \left[\frac{Vo(100\%+\Delta\%}{1.225\Delta\%} - \frac{100\%+2\Delta\%}{\Delta\%}\right] \ (\text{k}\Omega)$$

Vo: The nominal output voltage.

Δ %: Output voltage change rate against nominal output voltage.

Fig. 2 The schematic for output voltage trim up.

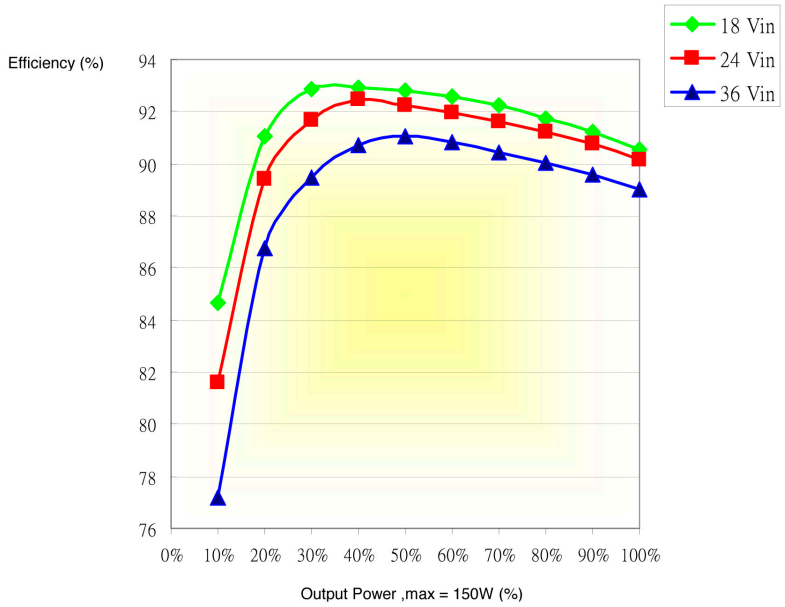
Baseplate Measure Point



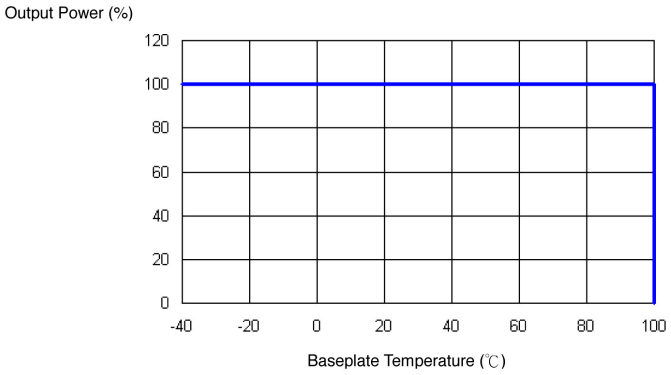
UNIT: mm

Fig. 3 Baseplate Temperature Measure Point.

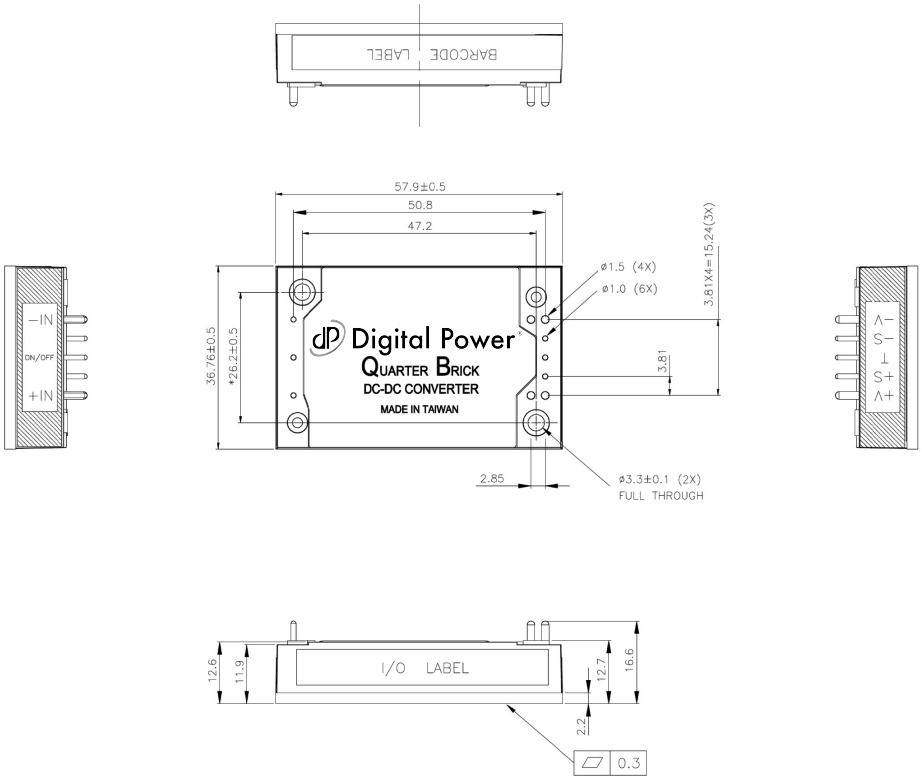
Efficiency Curve



Derating Curve

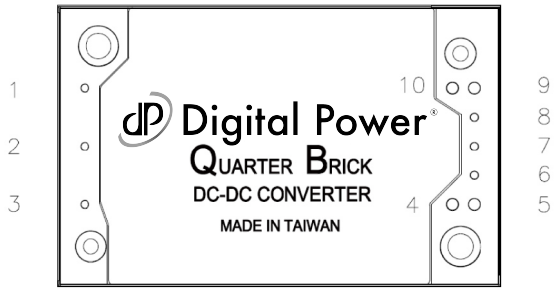


Outline Drawing



Outline Pin Assignment

PIN#	Signal name
1	Input (-)
2	On/Off Control
3	Input (+)
4	Output (+)
5	Output (+)
6	Sense (+)
7	Trim
8	Sense (-)
9	Output (-)
10	Output (-)



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Digital Power Corporation designs and manufactures flexible power supply solutions for the most demanding applications in the defense, healthcare, telecom, and industrial markets. With headquarters in Fremont, California, Digital Power is publically traded on the NYSE (symbol: DPW). The company was founded in 1969 incorporated in California.