

## Description

The dual-output DFC10 Series provides power solutions to meet commercial and industrial requirements. With power densities above 11 watts per cubic inch (0.67 watts per cm<sup>3</sup>), overcurrent protection, and five-sided shielded case, the DFC10 meets rigorous needs in an industry-standard case size. The 120 kHz operating frequency of the DFC10 Series allows an increased power density while including adequate heatsinking and input/output filtering. This eliminates the need for external components in most applications. Full overload protection is provided by pulse-by-pulse current limiting on models with 48V input.

Selection Chart					
Model	Input Range VDC		Output		
	Min	Max	VDC	mA	Power W
DFC10U24D5	9	36	±5	±850	9
DFC10U24D12	9	36	±12	±400	10
DFC10U24D15	9	36	±15	±320	10
DFC10U48D5	18	72	±5	±800	8
DFC10U48D12	18	72	±12	±415	10
DFC10U48D15	18	72	±15	±330	10

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

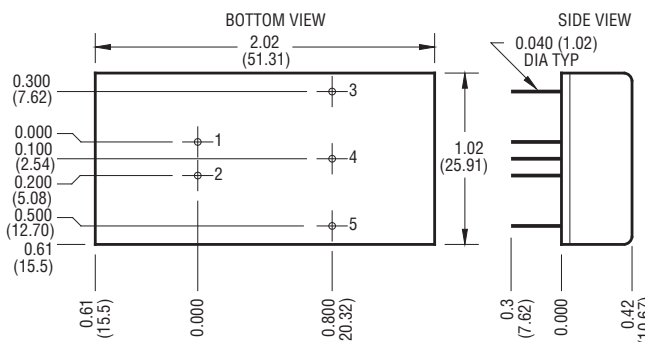
General Specifications (1)				
All Models				Units
<b>Isolation (2)</b>				
Isolation Voltage Input to Output 10 µA Leakage	MIN	700		VDC
Input to Output Capacitance	TYP	350		pF
<b>Environmental</b>				
Case Operating Range, Tc	MIN MAX	-40 85		°C
Case Functional Range (3)	MIN MAX	-50 100		°C
Storage Range	MIN MAX	-55 105		°C
<b>General</b>				
MTBF (Calculated)	TYP	800,000		HRS
Thermal Impedance (4)	TYP	16		°C/Watt
Unit Weight	TYP	1.2/34		oz/gm
<b>Mounting Options</b>				

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.

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.

## Features

- RoHS lead solder exemption compliant
- High power density, up to 11 watts per cubic inch
- Efficiencies to 79%
- Fully-isolated, fully-filtered design
- Greater than 700V isolation
- Overcurrent protection
- Five-sided, shielded copper case
- Ultra-wide range input (4:1)



Mechanical tolerances unless otherwise noted:

X.XX dimensions: ±0.03 inches

X.XXX dimensions: ±0.005 inches

Pin	Function
1	+ INPUT
2	- INPUT
3	+ OUTPUT
4	COMMON
5	- OUTPUT

## NOTES

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

Input Parameters (1)								
Model		DFC10U24D5	DFC10U24D12	DFC10U24D15	DFC10U48D5	DFC10U48D12	DFC10U48D15	Units
Voltage Range	MIN	9			18			VDC
	MAX	36			72			
Input Current	Full Load	450	510	510	210	265	260	mA
	No Load	10	15	15	2	4	4	
Efficiency	TYP	79	78	78	79	78	79	%
Switching Frequency	TYP	100			120			kHz
Maximum Input Overvoltage, 100ms Maximum	MAX	45			85			VDC
Turn-on Time, 1% Outout Error	TYP	20						ms

Output Parameters (1)								
Model		DFC10U24D5	DFC10U24D12	DFC10U24D15	DFC10U48D5	DFC10U48D12	DFC10U48D15	Units
Output Voltage		±5	±12	±15	±5	±12	±15	VDC
Output Voltage Accuracy	MIN	±4.95	±11.90	±14.90	±4.95	±11.90	±14.90	VDC
	TYP	±5.00	±12.00	±15.00	±5.00	±12.00	±15.00	
	MAX	±5.05	±12.10	±15.10	±5.05	±12.10	±15.10	
Rated Load Range (3)	MIN	0	0	0	0	0	0	mA
	MAX	±850	±400	±320	±800	±415	±330	
Load Regulation (4) 25% Max load to Max Load	TYP	0.1	0.1	0.1	0.3	0.2	0.2	%
	MAX	0.5	0.5	0.5	1.0	1.0	1.0	
Cross Regulation (5)	TYP	3	3	3	3	3	3	%
Line Regulation	TYP	0.1	0.1	0.1	0.3	0.1	0.1	%
	MAX	0.7	0.3	0.3	0.75	0.5	0.5	
Short Term Stability (6)	TYP	< 0.01			< 0.01			%/24Hrs
Long Term Stability	TYP	< 0.1			< 0.1			%/kHrs
Noise, Peak - Peak (2)	TYP	100						mV <sub>pp</sub>
RMS Noise	TYP	35						mV <sub>rms</sub>
Temperature Coefficient	TYP	50						ppm/°C
	MAX	250						
Short Circuit Protection		Short Term Current Limit			Pulse by Pulse Current Limit			

## NOTES

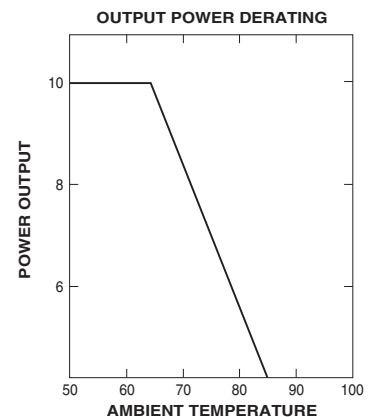
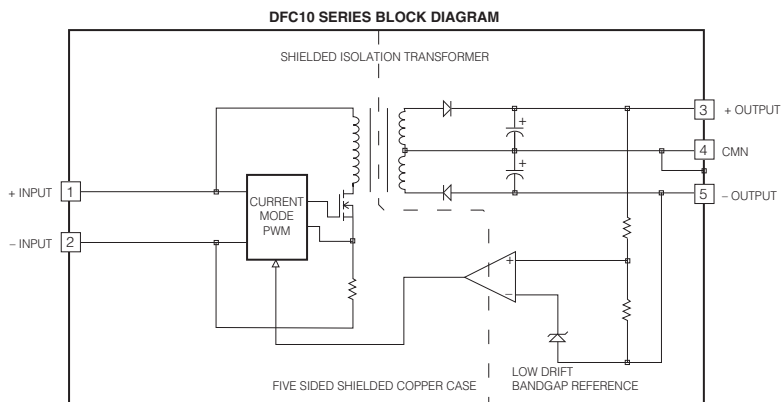
- (1) All parameters measured at T<sub>c</sub> = 25°C, nominal input voltage and full rated load unless otherwise noted.
- (2) Noise measurement bandwidth is 0-20 MHz. RMS noise is measured over a 0.01-1 MHz bandwidth. To simulate standard PCB decoupling practices, output noise is measured with a 10μF tantalum and 0.01μF ceramic capacitor located 1 inch away from the converter.
- (3) The converter may be safely operated at any load from zero to the full rating. Dynamic response of the converter may degrade if the converter is operated with less than 25% output load.
- (4) Load regulation is defined for loading/unloading both outputs simultaneously. Load range is 25 to 100%.
- (5) Cross regulation is defined for loading/unloading one output while the other output is kept at full load. Load range is 25 to 100%.
- (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.

## DFC10 SERIES APPLICATION NOTES:

### External Capacitance Requirements

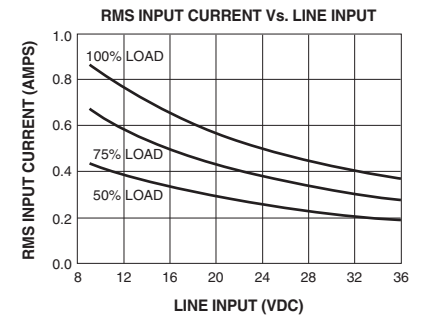
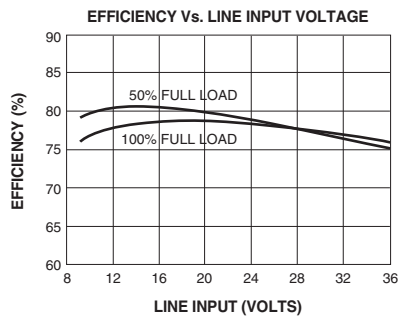
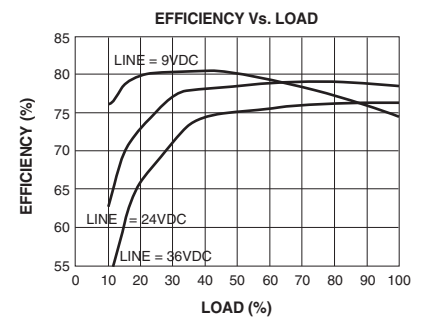
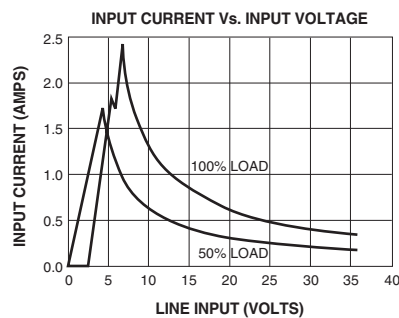
No external capacitance is required for operation of the DFC10 Series. If a capacitive input source is farther than 1" from the converter, an additional capacitor may be required at the input pins for proper operation. This input capacitor should have an ESR greater than 0.25 ohms. Input capacitors with an ESR less than 0.25 ohms may cause peaking of the input filter and actually degrade circuit performance.

External output capacitance is not required for operation, however it is recommended that 1μF to 10μF of tantalum and 0.001 to 0.1μF ceramic capacitance be selected for reduced system noise. Additional output capacitance may be added for increased filtering, but should not exceed 400μF.



## 24 Volt Input

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



## 48 Volt Input

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

