



## DFC15 SERIES

### DUAL OUTPUT

#### DESCRIPTION

The dual output DFC15 Series of DC/DC converters are designed to provide a wide range of PCB power solutions where positive and negative outputs are required. The converter features fully isolated and filtered input and outputs for low noise. Trim and remote ON/OFF features give flexibility to designs. The ultra-wide input range, from 20 to 72 volts, allows use in most industrial and communication applications.

Selection Chart

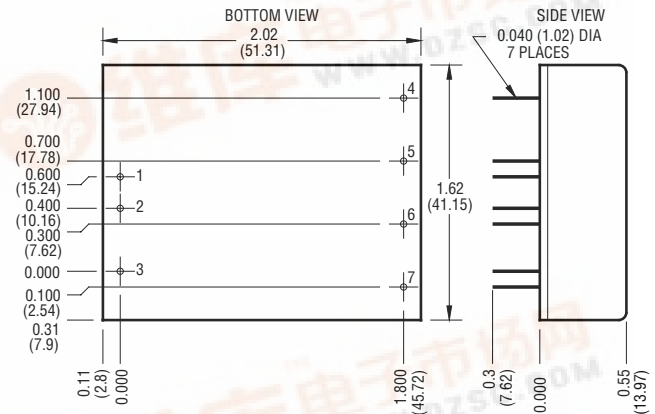
Model	Input Range VDC		Output VDC	Output mA
	Min	Max		
DFC15U48D12	20	72	±12	625
DFC15U48D15	20	72	±15	500

General Specifications (1)

All Models			Units
<b>ON/OFF Function (2)</b>			
ON Logic Level or Leave Pin Floating	MIN	8.0	VDC
Off Logic Level	MAX	2.0	VDC
Input Resistance	TYP	100	Kohms
Converter Idle Current ON/OFF Pin Low	TYP	2	mA
<b>Isolation (3)</b>			
Breakdown Voltage 10 $\mu$ A Leakage Input to Output	MIN	1544	VDC
Input to Output Capacitance	TYP	450	pF
<b>Output Trim Function</b>			
Input Resistance	TYP	40	Kohms
Programming Range	MIN	+5, -34	%
<b>Environmental</b>			
Case Functional Range, Tc No Derating	MIN MAX	-40 100	°C
Storage Range	MIN MAX	-55 105	°C
Thermal Impedance (4)	TYP	10	°C/Watt
Thermal Shutdown Case Temperature	TYP	105	°C
<b>General</b>			
MTBF (Calculated)	TYP	800,000	HRS
Unit Weight	TYP	2.3/65	oz/gm
Chassis Mounting Kit	CM2B2		

#### FEATURES

- Remote ON/OFF and TRIM
- Overcurrent and Overtemperature Protected
- Water Washable Case
- Efficiencies to 82%
- 1544V Isolation
- Ultra-Wide Range Input (>3:1)



Mechanical tolerances unless otherwise noted:

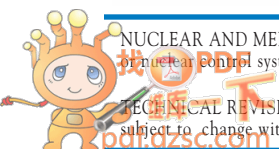
X.XX dimensions:  $\pm 0.010$  inches

X.XXX dimensions:  $\pm 0.005$  inches

Pin	Function
1	+INPUT
2	-INPUT
3	ON/OFF
4	+OUTPUT
5	COMMON
6	-OUTPUT
7	TRIM

#### NOTES

- (1) All parameters measured at Tc = 25°C, nominal input voltage and full rated load unless otherwise noted. Refer to the Technical Reference Section for the definition of terms, measurement circuits and other information.
- (2) The logic ON/OFF pin is Open Collector TTL, CMOS, and relay compatible. The input to this pin is referenced to Pin 2, -Input and is protected to +100 VDC.
- (3) Case is tied to Pin 1, + Input.
- (4) The case thermal impedance is specified as the case temperature rise over ambient per package watt dissipated.



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Input Parameters (1)					
Model		DFC15U48D12		DFC15U48D15	Units
Voltage Range	MIN	20.0		VDC	
	TYP	48.0			
	MAX	72.0			
Reflected Ripple (2) (3)		TYP	660		mA <sub>PP</sub>
Input Current	Full Load	TYP	384	381	mA
	No Load	TYP	5	5	
Efficiency		TYP	81	82	%
Switching Frequency		TYP	120		kHz
Maximum Input Overvoltage 100ms		MAX	85		VDC
Turn-on Time, 1% Output Error		TYP	20		ms

Output Parameters (1)					
Model		DFC15U48D12		DFC15U48D15	Units
Output Voltage		±12		±15	VDC
Rated Load Range	MIN	0		0	mA
	MAX	625		500	
Voltage Range	MIN	11.900		14.900	VDC
	TYP	12.000		15.000	
	MAX	12.100		15.100	
Load Regulation (4) 0% -100% Full Load	TYP	0.15			%
	MAX	0.4			
Cross Regulation (5) 25%-100% Load	TYP	3.0			%
Line Regulation Vin = Min-Max VDC	TYP	0.04			%
	MAX	0.2			
Short Term Stability (6)	TYP	< 0.02			%/24Hrs
Long Term Stability	TYP	< 0.2			%/kHrs
Input Ripple Rejection (7)	TYP	>60			dB
Noise, 0-20MHz bw (2) with 0.1µF External Capacitor with no External Capacitor	TYP	30			mV <sub>PP</sub>
	TYP	70			mV <sub>PP</sub>
	TYP	50			
Temperature Coefficient	MAX	150			ppm/°C
Overvoltage Clamp	TYP	18			VDC
Short Circuit Protection to Common for all Outputs		Continuous protection with current limiting and thermal overload techniques			

### NOTES

- (1) All Parameters measured at Tc=25°C, nominal input voltage and full rated load unless otherwise noted. Refer to the Technical Reference Section for the definition of terms, measurement circuits and other information.
- (2) Noise is measured per Technical Reference Section. Measurement bandwidth is 0-20 MHz.
- (3) An input capacitor must be used for proper operation of the converter. See the DFC15 Series Application Notes on sizing the input capacitor.
- (4) Load regulation for the outputs is specified as the voltage change when both outputs are changed from maximum to minimum at the same time.
- (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 60 minute warmup at full load, constant line and recording the drift over a 24 hour period.
- (7) The input ripple rejection is specified for DC to 120 Hz ripple with a modulation amplitude of 1% of Vin.

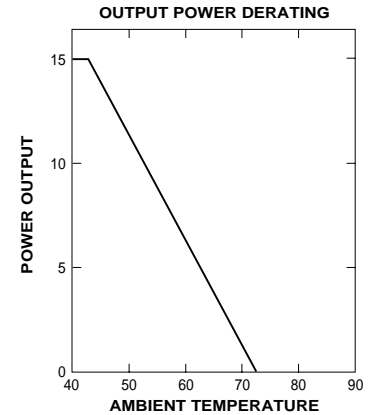
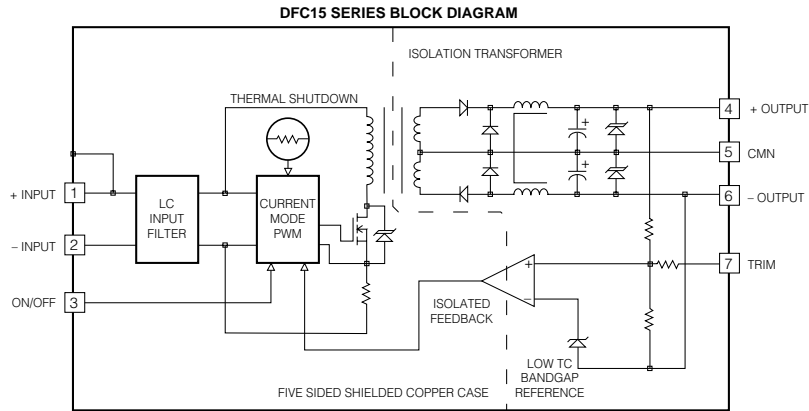
### DFC15 SERIES APPLICATION NOTES:

#### External Capacitance Requirements

An external capacitance is required for operation of the DFC15 Series. For maximum performance, it is recommended that the DFC15 Series use a capacitor of sufficient ripple current capacity connected across the input pins. To meet the reflected ripple requirements of the converter, an input impedance of less than 0.05 Ohms from DC to 200kHz is required. 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.

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### APPLICATION NOTES (cont'd):

#### 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 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. Do not drive this input from a logic gate directly; there is a 100K $\Omega$  internal pull-up resistor to a 9 volt source.

#### Output TRIM

The TRIM pin may be used to adjust the output +5% to -34% from the nominal setting. This function allows adjustment for voltage drops in the system wiring. As well 5.2 volt Figure 1 shows the proper connections to use this function. A trimpot value of 10K $\Omega$  or a fixed resistor may be used. If the TRIM function is not required the pin may be left floating.

Typical Performance: (T<sub>c</sub>=25°C, V<sub>in</sub>=Nom VDC, Rated Load)

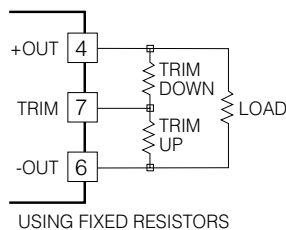
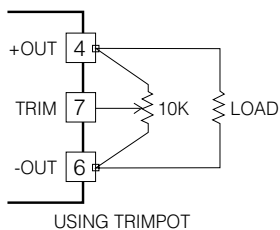
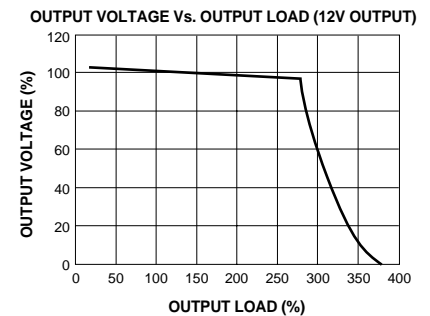
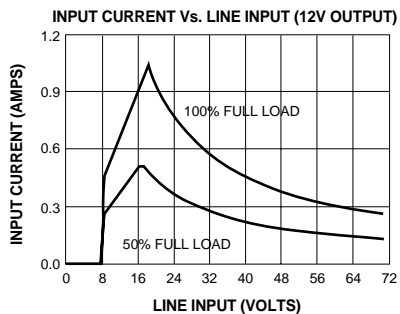
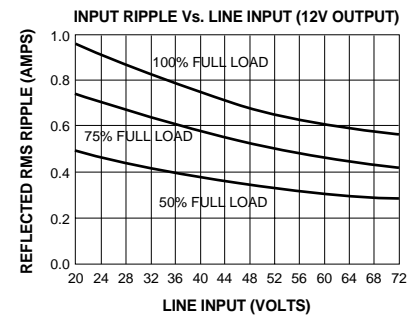
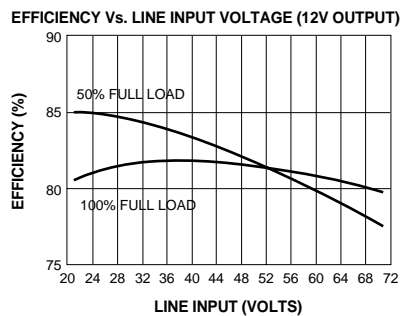


Figure 1.

