

DFC15 Series

Single Output DC-DC Converters

The DFC15 Series of DC-DC converters is designed to provide a wide range of PCB power solutions. The converters feature dual-output filters for low noise.

Trim and remote On/Off features give flexibility to designs. The output of the converter is electrically isolated, thereby allowing the output to be configured as a positive or negative output voltage. The ultra-wide input range, from 20 to 60 volts, allows use in many industrial and communication applications.



RoHS
Compliant

Key Features & Benefits

- RoHS compliant
- Up to 15 watts output power
- Efficiencies to 83%
- Very low Off current
- 700 V isolation
- Dual-stage output filter
- -40 °C to +90 °C operation
- Ultra-wide range input (3:1)
- Remote On/Off and Trim



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1. MODEL SELECTION

MODEL	INPUT RANGE [VDC]			OUTPUT	
	MIN	MAX	[VDC]	[mA]	POWER [W]
DFC15U48S12	20	60	12	1250	15

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

2. GENERAL SPECIFICATIONS¹

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
ON/OFF Function²					
ON Logic Level or Leave Pin Floating		8.0			VDC
Off Logic Level				2.0	VDC
Input Resistance			100		kΩ
Converter Idle Current ON/OFF Pin Low			< 1		mA
Isolation³					
Isolation Voltage	Input to Output	700			VDC
Leakage Current			10		μA
Capacitance	Input to Output		300		pF
Output Trim Function					
Input Resistance			20		kΩ
Programming Range		±5			%
Environmental					
Case Operating Range (T _c)	No Derating	-40		90	°C
Storage Range		-55		105	°C
Thermal Impedance ⁴			10		°C/W
General					
MTBF	Calculated		800000		hrs
Weight			2/57		oz/g
Chassis Mounting Kit			CM2A1		

NOTES

- All parameters measured at T_c = 25 °C, nominal input voltage and full rated load unless otherwise noted.
- 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 +75 VDC.
- Case is tied to Pin 3, + Input pin.
- The case thermal impedance is specified as the case temperature rise over ambient per package watt dissipated.

3. INPUT SPECIFICATIONS¹

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
Voltage Range		20	48	60	VDC
Input Current	Full Load / No Load		915 / 4		mA
Efficiency			82		%
Switching Frequency			120		kHz
Maximum Input Overvoltage	100 ms; No Damage			75	VDC
Turn-on Time, 1% Output Error			10		ms

4. OUTPUT SPECIFICATIONS¹

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
Output Voltage			12		VDC
Output Voltage Range	100% load	±11.90	±12.00	±12.10	VDC
Rated Load Range ³		0.0		1250	mA
Load Regulation	25% -100% Full Load		0.1	0.2	%
Line Regulation	Vin = Min-Max VDC		0.01	0.1	%
Short Term Stability ⁴			< 0.02		% / 24 Hrs
Long Term Stability			< 0.05		% / kWhrs
Input Ripple Rejection ⁵			> 60		dB
Noise ² , 0-20 MHz bw			60		mV _{pp}
RMS Noise			2		mV _{rms}
Temperature Coefficient			50	150	ppm / °C
Short Circuit Protection +OUT to -OUT	Continuous current limit				

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. RMS noise is measured over a 0.01-1 MHz bandwidth. To simulate standard PCB decoupling practices, output noise is measured with a 1µF/35V tantalum capacitor located 1 inch away from the converter.
- ³ Minimum load required for rated regulation only. Dynamic response may degrade if run at less than 25% full load.
- ⁴ Short term stability is specified after a 30-minute warmup at full load, and with constant line, load and ambient conditions.
- ⁵ The input ripple rejection is specified for DC to 120 Hz ripple with a modulation amplitude of 1% Vin.

5. DFC10 SERIES APPLICATION NOTES

EXTERNAL CAPACITANCE REQUIREMENTS

No external capacitance is required for operation of the DFC15 Series. However, for maximum performance, it is recommended that the DFC15 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 0.05 Ohms from DC to 200 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.

NEGATIVE OUTPUTS

A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.



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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 100 kV internal pull-up resistor to a 9 volt source.

OUTPUT TRIM

The TRIM pin may be used to adjust the output $\pm 5\%$ from the nominal setting. This function allows adjustment for voltage drops in the system wiring, as well 5.2 volt outputs for ECL applications. Figure 2 shows the proper connections to use this function. A trimpot value of 10 kV should be used for 5 volt outputs. A trimpot value of 20 kV should be used for 12 and 15 volt outputs. If the TRIM function is not required, the pin may be left floating.

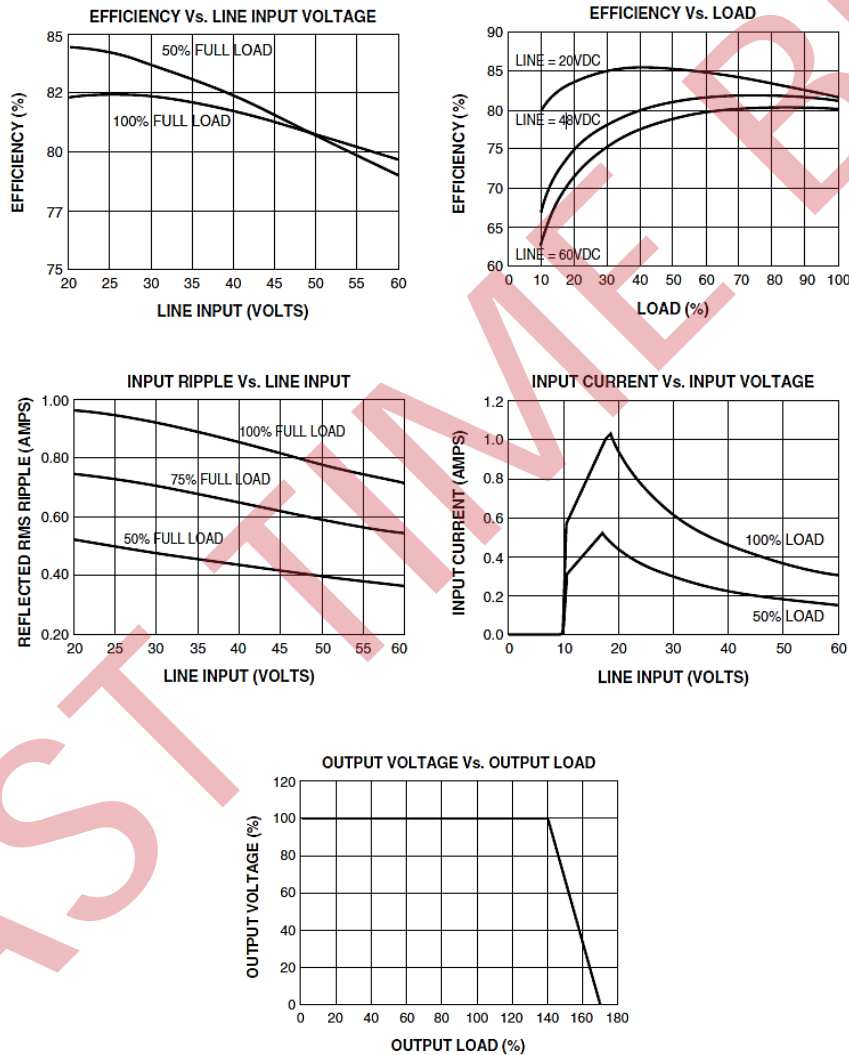


Figure 1. Typical Performance ($T_c = 25^\circ C$, $V_{in} = \text{Nom VDC}$, Rated Load)

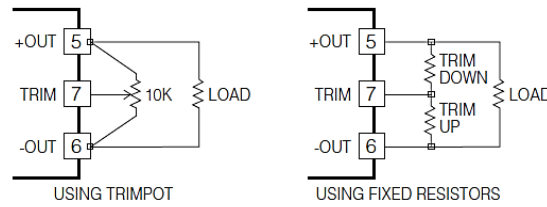


Figure 2. Output Trim

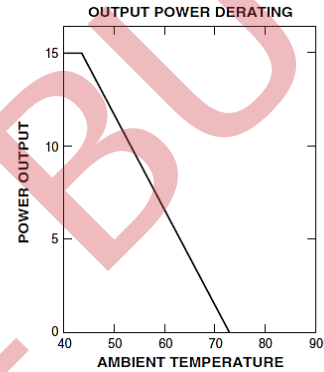
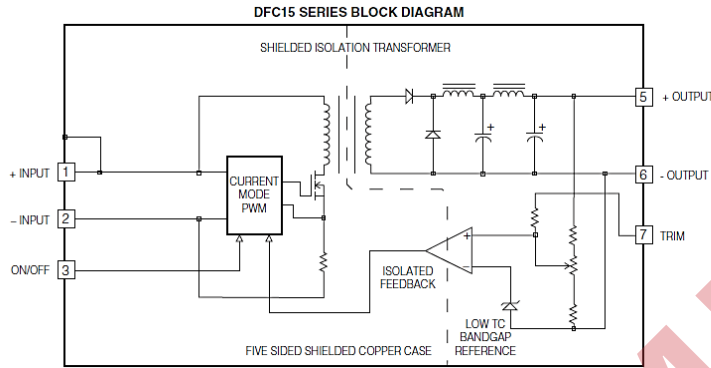
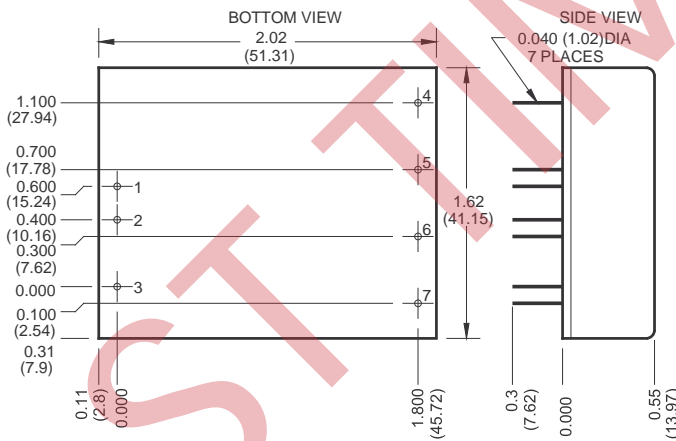


Figure 3. Typical Performance: ($T_c = 25^\circ\text{C}$, $V_{in} = \text{Nom VDC}$, Rated Load)



PIN	FUNCTION
1	+INPUT
2	-INPUT
3	ON/OFF
4	NO PIN
5	+OUT
6	-OUT
7	TRIM

Mechanical tolerances unless otherwise noted:

X.XX dimensions: ± 0.020 inches
 X.XXX dimensions: ± 0.005 inches

Figure 4. Mechanical Dimensions

For more information on these products consult: tech.support@psbel.com

NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

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.



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