

DFC15 SERIES SINGLE OUTPUT

DESCRIPTION

The DFC15 Series of DC/DC converters are designed to provide a wide range of PCB power solutions. The converter features 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.

| Selection Chart | | | | |
|--------------------|-----------------|-----|------------|-----------|
| Model | Input Range VDC | | Output VDC | Output mA |
| | Min | Max | | |
| DFC15U48S5 | 20 | 60 | 5 | 3000 |
| DFC15U48S12 | 20 | 60 | 12 | 1250 |
| DFC15U48S15 | 20 | 60 | 15 | 1000 |

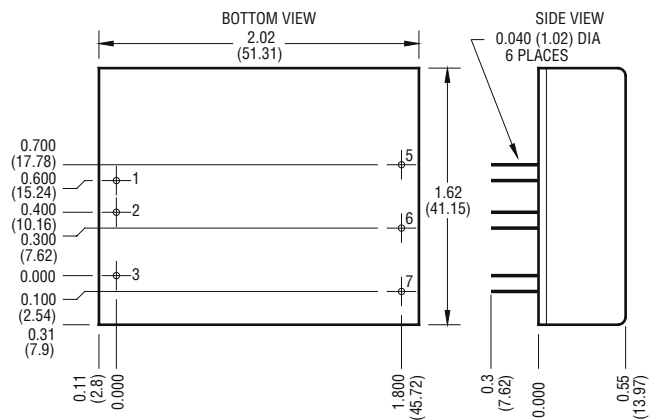
| General Specifications (1) | | | | |
|---|------------|------------|----------|-------|
| All Models | | | | Units |
| ON/OFF Function (2) | | | | |
| OFF Logic Level or Pin Open | MIN | 8.0 | VDC | |
| OFF Logic Level | MAX | 2.0 | VDC | |
| Input Resistance | TYP | 100 | Kohms | |
| Converter Idle Current ON/OFF Pin Low | TYP | <1 | mA | |
| Isolation (3) | | | | |
| Isolation Voltage Input to Output 10 µA Leakage | MIN | 700 | VDC | |
| Input to Output Capacitance | TYP | 300 | pF | |
| Output Trim Function | | | | |
| Input Resistance | TYP | 20 | Kohms | |
| Open Circuit Voltage | MIN | ±5 | % | |
| Environmental | | | | |
| Case Operating Range, Tc No Derating | MIN MAX | -40 90 | ° C | |
| Storage Range | MIN MAX | -55 105 | ° C | |
| Thermal Impedance (5) | TYP | 10 | ° C/Watt | |
| General | | | | |
| MTBF (Calculated) | TYP | 800,000 | HRS | |
| Unit Weight | TYP | 2/57 | oz/gm | |
| Chassis Mounting Kit | CM2A1 | | | |

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 ON/OFF pin is the Open Collector TTL, CMOS, and relay compatible. The input to this pin is referenced to Pin 2 (-Input) and is protected to +75VDC.
- (3) The Case is tied to Pin 3, +Input pin.
- (4) The case thermal impedance is specified as the case temperature rise over ambient per package watt dissipated.

FEATURES

- Up to 15 Watts Output Power
- Efficiencies to 83%
- Very Low OFF Current
- 700V Isolation
- Dual Stage Output filter
- -40°C to +90°C Operation
- Ultra-Wide Range Input (3:1)
- Remote ON/OFF and TRIM



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 | NO PIN |
| 5 | +OUT |
| 6 | -OUT |
| 7 | TRIM |

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24 Hours/Day—7 Days/Week

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| Input Parameters (1) | | | | | |
|--|-----------|------------|-------------|-------------|-------|
| Model | | DFC15U48S5 | DFC15U48S12 | DFC15U48S15 | Units |
| Voltage Range | MIN | 20.0 | | | VDC |
| | TYP | 48.0 | | | |
| | MAX | 60.0 | | | |
| Input Current | Full Load | 950 | 915 | 905 | mA |
| | No Load | 2 | 4 | 4 | |
| Efficiency | TYP | 79 | 82 | 83 | % |
| Switching Frequency | TYP | 120 | | | kHz |
| Maximum Input Overvoltage, 100ms No Damage | MAX | 75 | | | VDC |
| Turn-on Time, 1% Output Error | TYP | 5 | 10 | | ms |

| Output Parameters (1) | | | | | |
|--|--------------------------|------------|-------------|-------------|-------------------|
| Model | | DFC15U48S5 | DFC15U48S12 | DFC15U48S15 | Units |
| Output Voltage | | 5 | 12 | 15 | VDC |
| Rated Load (3) | MIN | 0 | 0 | 0 | mA |
| | MAX | 3000 | 1250 | 1000 | |
| Voltage Range 100% Load | MIN | 4.95 | 11.90 | 14.90 | VDC |
| | TYP | 5.00 | 12.00 | 15.00 | |
| | MAX | 5.05 | 12.10 | 15.10 | |
| Load Regulation 25-100% Full Load | TYP | 0.5 | 0.1 | 0.1 | % |
| | MAX | 0.75 | 0.2 | 0.2 | |
| Line Regulation Vin = Min-Max VDC | TYP | 0.1 | 0.01 | 0.01 | % |
| | MAX | 0.15 | 0.1 | 0.1 | |
| Short Term Stability (4) | TYP | < 0.02 | | | %/24Hrs |
| Long Term Stability | TYP | < 0.05 | | | %/kHrs |
| Input Ripple Rejection (5) | TYP | > 60 | | | dB |
| Noise, 0-20MHz bw (2) | TYP | 75 | 60 | 60 | mV _{pp} |
| RMS Noise | TYP | 3 | 2 | 2 | mV _{rms} |
| Temperature Coefficient | TYP | 50 | | | ppm/°C |
| | MAX | 150 | | | |
| 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. 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. 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 warm-up at full load, and with constant line, load and ambient conditions.
- (5) The input ripple rejection is specified for DC to 120Hz ripple with a modulation amplitude of 1% Vin.



DFC15 SERIES APPLICATION NOTES:

External Capacitance Requirements

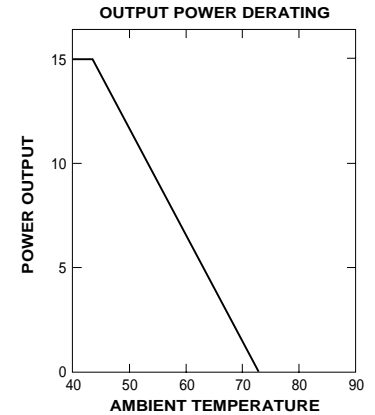
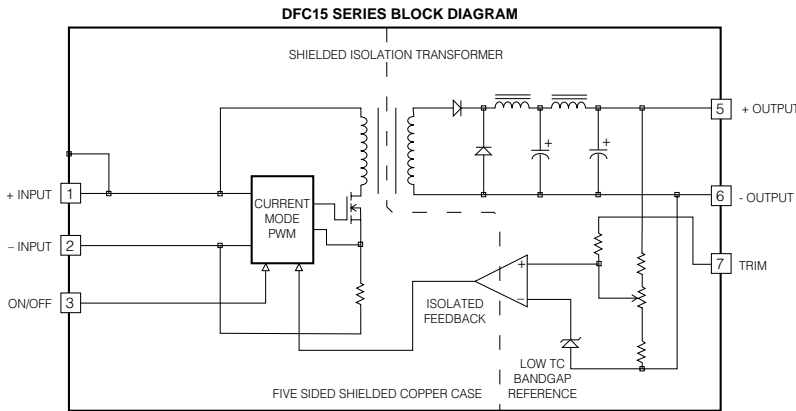
No external capacitance is required for operation of the DFC15 Series. However, for maximum performance, it is recommended that the DFC15 Series use a capacitor of sufficient ripple current capacity connected across the input pins if a capacitive input source is farther than 1" from the converter. To meet the reflected ripple requirements of the converter, an input impedance of less than 0.05 Ohms from DC to 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.

Negative Outputs

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

(continued)

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APPLICATION NOTES (cont'd):

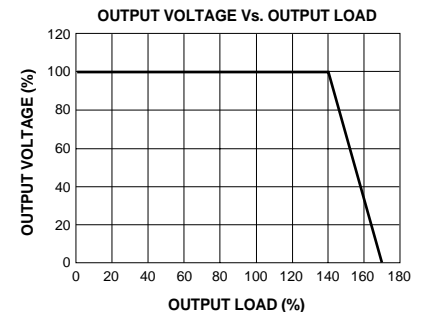
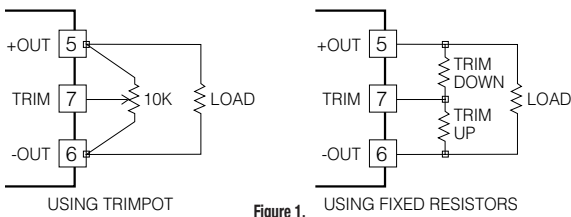
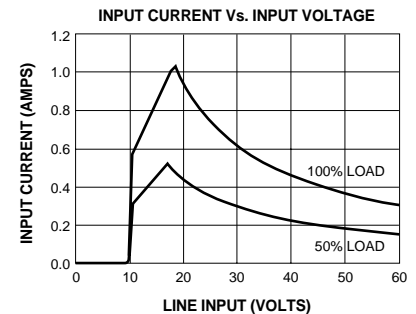
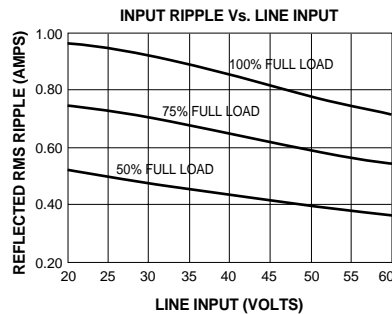
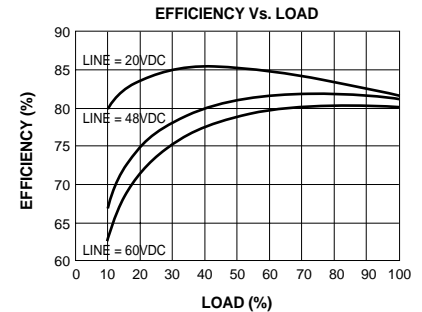
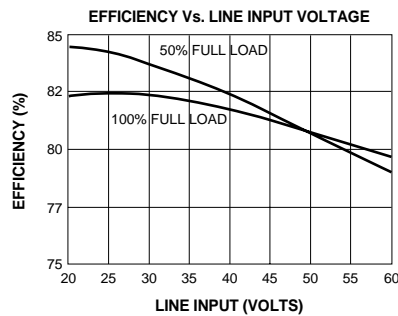
Remote ON/OFF Operation

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

Output TRIM

The TRIM pin may be used to adjust the output ±5% from the nominal setting. This function allows adjustment for voltage drops in the system wiring, as well as 5.2 volt outputs for ECL applications. Figure 1 shows the proper connections to use this function. A trimpot value of 10KΩ should be used for 5 volt outputs. A trimpot value of 20KΩ should be used for 12 and 15 volt outputs. If the TRIM function is not required the pin may be left floating.

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



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