

# DFC6 Series

## Single Output DC-DC Converters

Designed for digital, ECL, and analog application, the DFC6 Series will provide up to 6 watts in an industry standard package. Ultra-wide input voltage range allows operation from battery power as well as system power.

The output is electrically isolated, thereby allowing the output to be configured as a positive or negative output voltage. Fully-isolated and filtered outputs permit usage in sensitive and low noise circuits.

The 100 kHz operating frequency of the DFC6 Series allows an increased power density while including adequate heat sinking and input/output filtering. This eliminates the need for external components in most applications.



RoHS  
Compliant

### Key Features & Benefits

- RoHS compliant
- Ultra-wide 3.5 to 16 volt input range
- Input filtered
- 6 Watts of output power
- Efficiencies to 77%
- 700 V isolation
- Low input-to-output capacitance
- Ultra-wide input range (4:1)



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## 1. MODEL SELECTION

MODEL	INPUT RANGE <sup>4</sup> [VDC]			OUTPUT	
	MIN	MAX	[VDC]	[mA]	POWER [W]
DFC6U5S5	3.5	16	5	1200	6

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

## 2. GENERAL SPECIFICATIONS<sup>1</sup>

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
<i>Isolation</i>					
Isolation Voltage	Input to Output	700			VDC
Leakage Current			10		μA
Capacitance	Input to Output		300		pF
<i>Environmental</i>					
Case Operating Range (T <sub>c</sub> )	No Derating	-40		85	°C
Case Functional Range <sup>2</sup>		-50		100	°C
Storage Range		-55		105	°C
Thermal Impedance <sup>3</sup>			19		°C/W
<i>General</i>					
MTBF	Calculated		800000		hrs
Weight			0.9/25.6		oz/g
Chassis Mounting Kit			CM2B1		

### NOTES

- <sup>1</sup> All parameters measured at T<sub>c</sub> = 25 °C, nominal input voltage and full rated load unless otherwise noted.
- <sup>2</sup> 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.
- <sup>3</sup> The case thermal impedance is specified as the case temperature rise over ambient per package dissipated.
- <sup>4</sup> Reduced output power available with 3.5 V input. Full power is available above 4.6 V input. See input voltage derating curve for more information.

## 3. INPUT SPECIFICATIONS<sup>1</sup>

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
Voltage Range <sup>2</sup>		3.5		16	VDC
Input Current	Full Load / No Load		1680 / 10		mA
Switching Frequency			100		kHz
Maximum Input Overvoltage	100 ms maximum			20	VDC
Turn-on Time	1% Output Error		10		ms

## 4. OUTPUT SPECIFICATIONS<sup>1</sup>

PARAMETER	CONDITIONS / DESCRIPTION	MIN	TYP	MAX	UNITS
Output Voltage			5		VDC
Output Voltage Accuracy		4.95	5.00	5.05	VDC
Rated Load Range <sup>5</sup>		0.0		1200	mA
Load Regulation	25% Max Load - Max Load		0.3	0.7	%
Line Regulation	Vin = Min-Max VDC		0.1	0.2	%
Short Term Stability <sup>4</sup>			< 0.05		% / 24 Hrs
Long Term Stability			< 0.1		% / kHrs
Noise, Peak-Peak <sup>3</sup>			75		mV <sub>pp</sub>
RMS Noise			20		mV <sub>rms</sub>
Temperature Coefficient			50	150	ppm / °C
Short Circuit Protection to Common for all Outputs	Short Term Current Limit				

### NOTES

- All parameters measured at Tc=25 °C, nominal input voltage and full rated load unless otherwise noted.
- Reduced output power available at 3.5 V input. Full output power is available above 4.6 V input. See input voltage derating curve for more information.
- Noise measurement bandwidth is 0-20 MHz for peak-to-peak measurements, 10 kHz to 1 MHz for RMS measurements. Output noise is measured with a 1µF/35V Tantalum capacitor located 1" away from the converter to simulate PCB standard decoupling.
- Short term stability is specified after a 30-minute warmup at full load, constant line, and recording the drift over a 24-hour period.
- No minimum load required for operation. Dynamic regulation may degrade when run with less than 5% load.

## 5. DFC6 SERIES APPLICATION NOTES

### EXTERNAL CAPACITANCE REQUIREMENTS

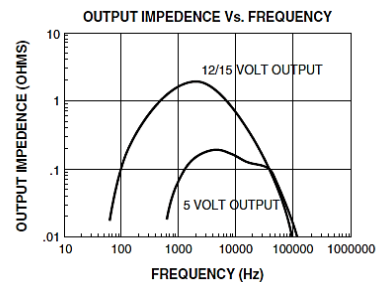
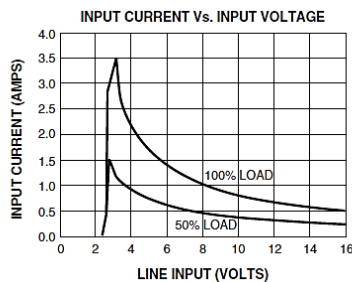
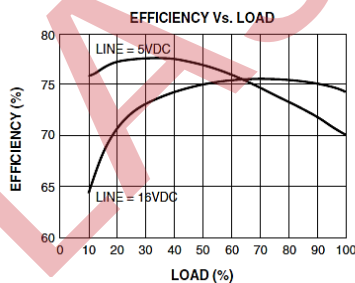
No external capacitance is required for operation of the DFC6 Series. To meet the reflected ripple requirements of the converter, an input impedance of less than 0.15 Ohms from DC to 200 kHz is required. If a capacitive input source is farther than 1" from the converter, an additional capacitor may be required at the input pins for proper operation. 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.

### OUTPUT POWER

The available output power of the DFC6 Series is reduced when operating below 4.6 volts. See Input Voltage Derating curve. Below 4.6 volts the output power is linearly derated from 100% at 4.6 volts to 50% at 3.5 volts.

### NEGATIVE OUTPUTS

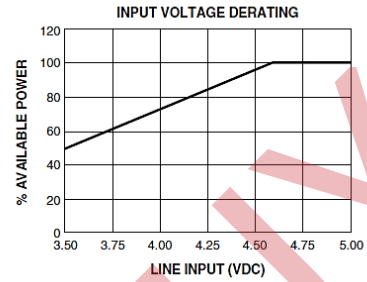
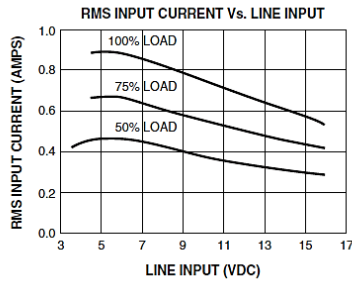
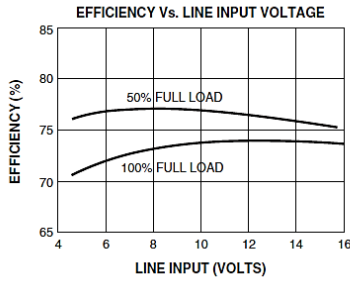
A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.



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

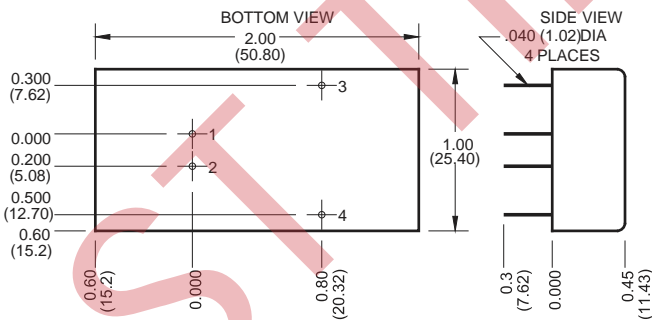
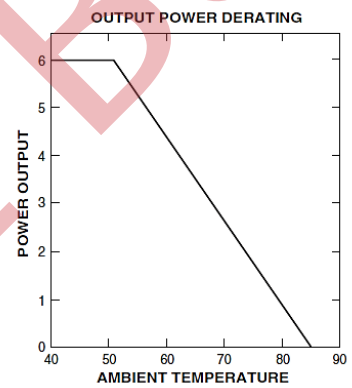
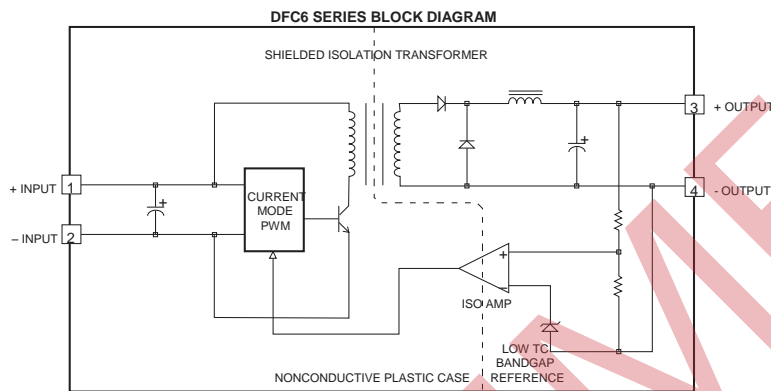


Figure 1. Mechanical Dimensions

PIN	FUNCTION
1	+ INPUT
2	- INPUT
3	+ OUTPUT
4	- OUTPUT

Mechanical tolerances unless otherwise noted:

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

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