

Description

The DFC25 Series dc-dc converter provides three output voltages from a single 12, 24, or 48 volt nominal input for industrial and datacom equipment. Available output power ranges up to 25 watts. Excellent noise performance is attained via an aluminum case, toroidal magnetics, and double shielded transformers. Common mode and differential mode input filtering is integral to the design. Selected models provides 1544 volts isolation from input to output.

The input and output sections of the DFC25 Series are protected from overvoltage transients via internal circuitry. Same voltage single output units of the DFC25 family may be connected in parallel to achieve additional output current.

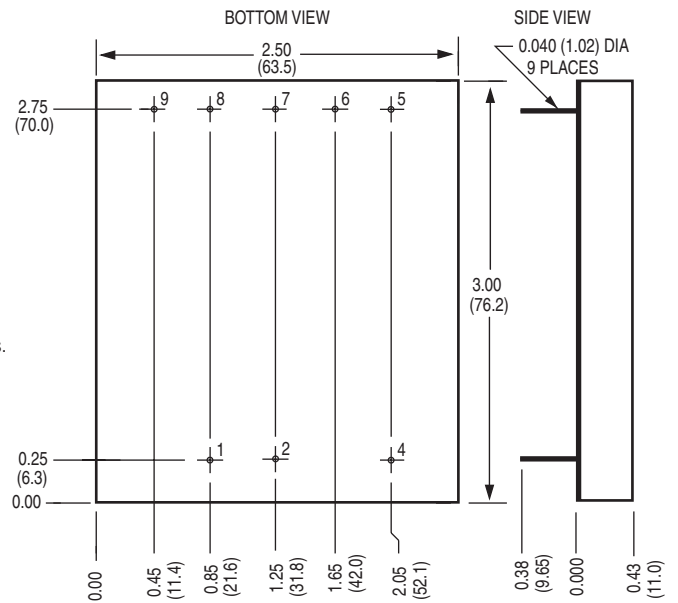
Features

- Up to 25 watts with triple outputs
- +3.3V or +5V main outputs
- Remote On/Off
- Common and differential mode input filters
- Main output trim
- Efficiencies to 81%
- Operation from -25°C up to 85°C
- 700/1544V isolation
- Two-year warranty
- UL/CSA/TÜV pending

Selection Chart - Up to 25 Watts Output Power				
Model	Input Range VDC		Output VDC	Output mA MAX
	Min	Max	Nominal	
DFC25E24T3.3/15	18	36	3.3, ±15	5000, ±800
DFC25E24T5/12	18	36	5.0, ±12	5000, ±1000
DFC25E24T5/15	18	36	5.0, ±15	5000, ±800
DFC25E48T3.3/12	36	72	3.3, ±12	5000, ±1000
DFC25E48T5/12	36	72	5.0, ±12	5000, ±1000
DFC25E48T5/15	36	72	5.0, ±15	5000, ±800

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

General Specifications (1)			
All Models			Units
Isolation (3)			
Isolation Voltage			
Input to Output			
12V, 24V Input	MIN	700	Volts
48V Input	MIN	1544	
10µA Leakage			
Input to Output Capacitance	TYP	700	pF
Remote ON/OFF			
ON Logic Level or Pin Open	MIN	2.5	Volts
Off Logic Level or Tie to -Input	MAX	0.7	Volts
Converter Idle Current	TYP	10	mA
Output Trim Function			
Input Resistance	TYP	40	k
Programming Range	MIN	±10	%
Environmental			
Case Operating Range (2)	MIN	-25	°C
	MAX	+60	
Case Functional Range	MIN	-40	°C
	MAX	+105	
Storage Range	MIN	-45	°C
	MAX	+105	
Thermal Impedance	TYP	10	°C/Watt
General			
MTBF (Calculated)	TYP	1,000,000	Hours
Unit Weight	TYP	2.6/71	oz/gm



PIN CONNECTIONS	
PIN NUMBER	PIN OUT
1	-INPUT
2	+INPUT
3	N/C
4	ON/OFF
5	TRIM
6	+3.3V OR +5V
7	COMMON
8	+12V OR +15V
9	-12V OR -15V

NOTE: All pins are 0.040" diameter brass with tin plating.

Mechanical tolerances unless otherwise noted:
X.XX dimensions: ±0.020 inches
X.XXX dimensions: ±0.005 inches

NOTES

- (1) All parameters measured at 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) Derate linearly to 0 Watts at 105°C ambient. Operation to +70°C ambient with externally supplied forced air cooling, 100LFM. Consult the factory for -40°C operation.
- (3) Case is tied to -Input, Pin 1.

Input Parameters (1)								
Model		DFC25E24T3.3/15	DFC25E24T5/12	DFC25E24T5/15	DFC25E48T3.3/12	DFC25E48T5/12	DFC25E48T5/15	Units
Reflected Ripple (2)	TYP	230	230	230	150	150	150	mAPP
Input Current Full Load	TYP	1780	1563	1563	890	781	781	mA
	TYP	10	10	10	10	10	10	
Inrush Current (5)	MAX	50	50	50	50	50	50	APK
Efficiency	TYP	78	80	80	78	80	80	%
Switching Frequency	TYP	150	150	150	150	150	150	kHz
Maximum Input Overvoltage, 100ms Maximum	MAX	45	45	45	85	85	85	VDC
Turn-on Time, 1% Output Error	TYP	10	10	10	10	10	10	mS

Output Parameters (1)						
Model		DFC25EXXT3.3/XX	DFC25EXXT5/XX	DFC25EXXTX/12	DFC25EXXTX/15	Units
Output (8)		V1	V1	V2,V3	V2,V3	
Output Voltage		3.3	5	12	15	VDC
Output Voltage Accuracy	MIN	3.27	5.05	11.88	14.85	VDC
	TYP	3.30	5.10	12.00	15.00	
	MAX	3.33	5.15	12.12	15.15	
Rated Load Range	MIN	0.5	0.5	0.0	0.0	A
	MAX	5.0	5.0	1.0	0.8	
Load Regulation 25% Load - Max Load	TYP	1.0	1.0	8.0	8.0	%
Line Regulation Vin = Min-Max VDC	TYP	0.2	0.2	3.0	3.0	%
Cross Regulation 25% Load - Max Load (6)	TYP	3.0	3.0	8.0	8.0	%
Transient Response 25% Load Step (7)	TYP	2	2	2	2	%
Short Term Stability (3)	TYP	<0.05	<0.05	<0.05	<0.05	%/24Hrs
Long Term Stability	TYP	<0.1	<0.1	<0.1	<0.1	%/kHrs
Input Ripple Rejection (4)	TYP	>40	>40	>40	>40	dB
Noise, Peak - Peak (2)	TYP	75	75	120	150	mVPP
Temperature Coefficient	TYP	100	100	300	300	ppm/°C
Short Circuit Protection from +OUT to -OUT	Continuous, Current Limit Protection					

NOTES

- (1) All parameters measured at Tc=25°C, nominal input voltage and full rated load unless otherwise noted. Refer to the Reference Section for the definition of terms, measurement circuits and other information.
- (2) Noise is measured per the Technical Reference Section. Measurement bandwidth is 0-20 MHz for peak-peak measurements, 10 kHz to 1 MHz for RMS measurements. Output noise is measured with a 0.01µF/100V ceramic capacitor in parallel with a 1µF/35V Tantalum capacitor, 1 inch from the output pins to simulate standard PCB decoupling capacitance.
- (3) Short term stability is specified after a 30 minute warm-up at full load, constant line and recording the drift over a 24 hour period.
- (4) The transient response is specified as the time required to settle from a 50 to 75% step load change (rise time of step = 2µSec) to a 1% error band.
- (5) Per ETSI-300-132
- (6) Change to main channel output for a 25% to 100% change on dual outputs or change on dual channel outputs due to a 25% to 100% change on the main channel output.
- (7) Recovery to within 1% in less than 1 millisecond after transient has been applied.
- (8) V3 is defined as the minus, or negative output. Values in the chart are shown as positive for V2, and can be assumed negative for V3.

DFC25 SERIES APPLICATION NOTES:

External Capacitance Requirements

A low ESR external capacitance is required for operation of the DFC25 Series. For maximum performance, it is recommended that the DFC25 Series use a capacitor of sufficient ripple current capacity connected across the input pins, especially 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 0.09 Ohms at 200 kHz 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 each output to reduce system noise. Additional output capacitance may be added for increased filtering, but should not exceed 400µF.

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 TTL compatible circuitry. When the ON/OFF pin is pulled low with respect to the -INPUT, the converter is placed in a low power drain state. The input capacitors are kept fully charged in the OFF mode. For proper operation, this input may be driven from a logic gate directly. The ON/OFF pin should never be pulled more than 0.3 volts below -INPUT or have a voltage greater than +6 volts applied.

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.

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