



# 500WFR series

## Dual Output DC/DC Converter



### DESCRIPTIONS

The 500WFR series dual output power modules are 5 to 6 watts high efficiency, low profile dc-dc converters that operate over a wide input voltage range of 4.5 - 9 VDC, 9 - 18 VDC, 18 - 36 VDC and 36 - 72 VDC and provide precisely regulated output voltages of  $\pm 5V$ ,  $\pm 12V$ , and  $\pm 15V$ .

The  $-25^{\circ}C$  to  $+71^{\circ}C$  operating temperature range makes it ideal for data communication equipment, mobile battery driven equipment, distributed power systems, telecommunication equipment, mixed analog/digital subsystems, process/machine control equipment, computer peripheral systems and industrial robot systems.

### OUTPUT CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Line Regulation				
500WFR, 500WFR-H			$\pm 0.5$	%; LL to HL @ FL
500WFR-M			$\pm 0.3$	%; LL to HL @ FL
Load Regulation				
500WFR, 500WFR-H		$\pm 1$		%; 25% load to FL @ Nom.Line
500WFR-M		$\pm 1$		%; 20% load to FL @ Nom.Line
Output Voltage Accuracy				
500WFR, 500WFR-H		$\pm 2$		%
500WFR-M		$\pm 1$		%
Output Voltage Balance				
500WFR, 500WFR-H		$\pm 1$		%; Equal Loads
500WFR-M		$\pm 2$		%; Equal Loads
Temperature Coefficient				
500WFR, 500WFR-H		$\pm 0.05$		% per degree C
500WFR-M		$\pm 0.02$		% per degree C
Ripple/Noise				
				p-p, Nom.Line @FL, 20MHz B.W.,
500WFR, 500WFR-H		100		mV 5.5V Outputs)
500WFR, 500WFR-H		1		% of Vout (12 & 15V Outputs)
500WFR-M		100		mV
Short Circuit Protection				
				Continuous, Automatic Recovery

### FEATURES

- Up to 86% Efficiency
- Dual Output, 5 to 6 watt converter
- 2 - 1 Input Voltage Range
- Up to 3,000 VDC Input / Output Isolation
- Short Circuit Protection
- Industry Standard Pinout

### INPUT CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Input Voltage				
5 VDC Input Models	4.5	5	9	VDC
12 VDC Input Models	9	12	18	VDC
24 VDC Input Models	18	24	36	VDC
48 VDC Input Models	36	48	72	VDC
Input Fuse Requirements				
5 VDC Input Models		3000		mA; Slow blow type
12 VDC Input Models		1500		mA; Slow blow type
24 VDC Input Models		700		mA; Slow blow type
48 VDC Input Models		350		mA; Slow blow type
Reverse Polarity Input Current			1	A
Short Circuit Input Power		1000	3000	mW
Input Filter				Pi Filter

### GENERAL CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Agency Approval				
500WFR, 500WFR-H				UL/CUL 1950, Rheinland, TUV, EN60950
Isolation Voltage				
500WFR		500		VDC
500WFR-H		3000		VDC
500WFR-M		1500		VDC
Isolation Resistance				
500WFR, 500WFR-H		10		GOhms
500WFR-M		1		GOhms
Switching Frequency				
500WFR, 500WFR-H		100		kHz
500WFR-M		300		kHz



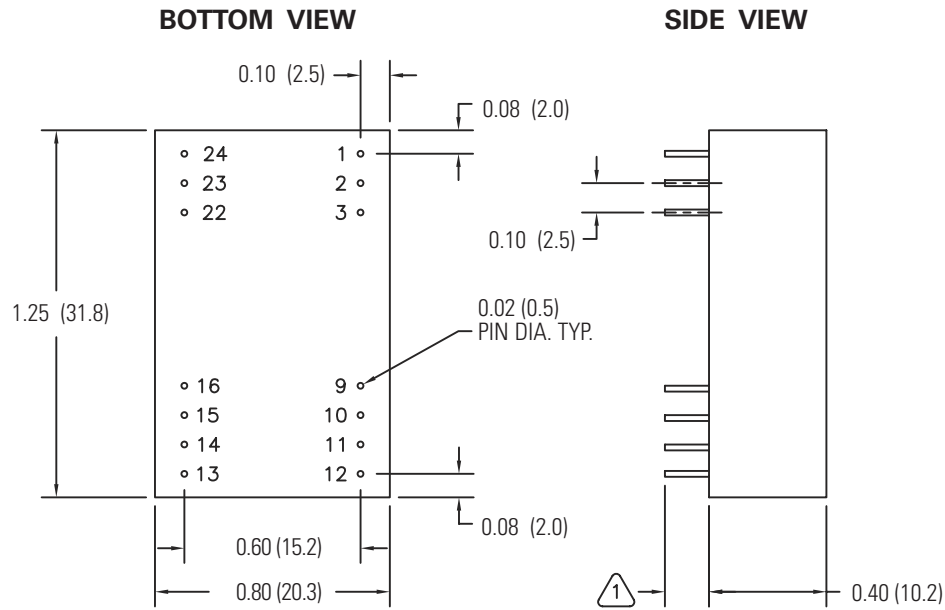
**ENVIRONMENTAL SPECIFICATIONS**

	Min	Typ	Max	Unit/Comments
Operating Temp. Range				
500WFR, 500WFR-H	-25		+71	°C; Ambient
500WFR-M	-40		+71	°C; Ambient
Operating Temp. Range				
500WFR, 500WFR-H	-25		+95	°C; Case
500WFR-M	-40		+90	°C; Case
Storage Temp. Range				
500WFR, 500WFR-H	-40		+100	°C
500WFR-M	-45		+100	°C
Relative Humidity			95	% Humidity; non-condensing
Cooling				Free-Air Convection

**PHYSICAL CHARACTERISTICS**

	Unit/Comments
Case Size	1.25 x .80 x .40 inches (31.8 x 20.3 x 10.2 mm)
Case Material	500WFR, 500WFR-H: Black Plastic 500WFR-M: Metal with non-conductive baseplate
Flammability	UL94V-0
Weight	14.2 Grams

**OUTLINE DRAWING**



**PIN OUT CHART (500WFR DUAL OUTPUT)**

Pins	500WFR	500WFR-H	500WFR-M
1	+ Vin	No Pin	No Pin
2	- Vout	- Vin	-Vin
3	Common	-Vin	-Vin
9	No Pin	Common	Common
10	Common	NC	No Pin
11	+ Vout	- Vout	-Vout
12	- Vin	No Pin	No Pin
13	- Vin	No Pin	No Pin
14	+ Vout	+ Vout	+Vout
15	Common	NC	No Pin
16	No Pin	Common	Common
22	Common	+Vin	+V in
23	- Vout	+Vin	+V in
24	+Vin	No Pin	No Pin

**Notes:**

- 500WFR, 500WFR-H = 0.150 (3.8)  
500WFR-M = 0.160 (4.1)
- Unless otherwise specified dimensions are in inches (mm).

Tolerances	Inches	mm
	X.XX = ±0.02	X.X = ±0.5
	X.XXX = ±0.010	X.XX = ±0.25
Pin :	±0.002	±0.05

NC = No Connection

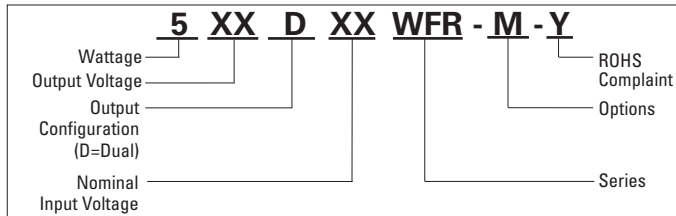
All specifications are typical at nominal input, nominal load and 25° C unless otherwise specified.  
External, low ESR, 10 microfarad (minimum) capacitor across output is recommended for operation.



## HOW TO ORDER

## OPTIONAL FEATURES

### HOW TO ORDER



**-M Option, Metal Case:** To choose the metal case option to the converter please add a "-M" at the end of the part number.  
Example: 503D12WFR-M.

**-H Option, High Voltage Plastic Isolation Case:** To choose the high voltage plastic isolation option, please add a "-H" at the end of the part number. Example: 503D12WFR-H.

## MODEL SELECTION CHART

Model	Nominal Input Voltage (VDC)	Input Voltage Range (VDC)	Input Current @ No-Load Typ. (mA)	Input Current @ Full Load Typ. (mA)	Output Voltage (VDC)	Full Load Output Current (mA)	Efficiency @ FL (%)
505D12WFR	12	9 - 18	12	545	±5	±500	76
512D12WFR	12	9 - 18	12	575	±12	±230	80
515D12WFR	12	9 - 18	12	590	±15	±190	80
505D24WFR	24	18 - 36	7.5	265	±5	±500	78
512D24WFR	24	18 - 36	7.5	285	±12	±230	81
515D24WFR	24	18 - 36	7.5	295	±15	±190	81
505D48WFR	48	36 - 72	3	134	±5	±500	78
512D48WFR	48	36 - 72	3	142	±12	±230	81
515D48WFR	48	36 - 72	3	147	±15	±190	81
505D12WFR-H	12	9 - 18	12	545	±5	±500	76
512D12WFR-H	12	9 - 18	12	575	±12	±230	80
515D12WFR-H	12	9 - 18	12	590	±15	±190	80
505D24WFR-H	24	18 - 36	7.5	265	±5	±500	78
512D24WFR-H	24	18 - 36	7.5	285	±12	±230	81
515D24WFR-H	24	18 - 36	7.5	295	±15	±190	81
505D48WFR-H	48	36 - 72	3	134	±5	±500	78
512D48WFR-H	48	36 - 72	3	142	±12	±230	81
515D48WFR-H	48	36 - 72	3	147	±15	±190	81
505D5WFR-M	5	4.5 - 9	70	1265	±5	±500	79
512D5WFR-M	5	4.5 - 9	70	1463	±12	±250	82
515D5WFR-M	5	4.5 - 9	70	1463	±15	±190	82
505D12WFR-M	12	9 - 18	20	514	±5	±500	81
512D12WFR-M	12	9 - 18	20	595	±12	±250	84
515D12WFR-M	12	9 - 18	20	595	±15	±200	84
505D24WFR-M	24	18 - 36	5	251	±5	±500	83
512D24WFR-M	24	18 - 36	5	291	±12	±250	86
515D24WFR-M	24	18 - 36	5	291	±15	±200	86
505D48WFR-M	48	36 - 72	3	126	±5	±500	83
512D48WFR-M	48	36 - 72	3	145	±12	±250	86
515D48WFR-M	48	36 - 72	3	145	±15	±200	86



## DERATING CURVES

MODELS 500WFR-M

