

# 300WFR series



www.martekpower.com

## Single & Dual Output DC/DC Converter



### DESCRIPTIONS

The 300WFR series 3 watts power modules are 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 3.3V, 5V, 12V, 15V,  $\pm 5V$ ,  $\pm 12V$  and  $\pm 15V$ .

The  $-40^{\circ}\text{C}$  to  $+71^{\circ}\text{C}$  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
Output Voltage Set Point	$\pm 0.5$	$\pm 1.0$		% Output voltage at nominal line & FL
Output Voltage Balance (Duals)	$\pm 0.5$	$\pm 2.0$		% Equal Output Loads
Line Regulation	$\pm 0.2$	$\pm 0.5$		% Output voltage measured from min. input line to maximum
Load Regulation	$\pm 0.2$	$\pm 0.5$		% Output voltage measured from FL to 10% load
Ripple/Noise		45	60	mV p-p, Nom.Line @FL, 20MHz B.W., using 1 $\mu\text{f}$ bypass capacitor
Ripple/Noise			100	mV p-p, Over Line, Load & Temp., 20 MHz B.W., using 1 $\mu\text{f}$ bypass capacitor
Short Circuit Protection				Continuous, Automatic Recovery
Transient Response Deviation	$\pm 3$	$\pm 5$		% deviation of $V_{out}$ for a 25% load change
Over Power Protection	120			%
Transient Recovery Time		300	500	$\mu\text{s}$ for 25% load change
Temperature Coefficient	$\pm 0.01$	$\pm 0.02$		% per degree C

### FEATURES

- Up to 84% Efficiency
- Single & Dual Output, 2 to 3 watt converter
- 2 - 1 Input Range
- 1000 VDC Input / Output Isolation
- Short Circuit Protection
- MTBF > 1,000,000 Hours

### INPUT CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Start 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		1500		mA; Slow blow type
12 VDC Input Models		700		mA; Slow blow type
24 VDC Input Models		350		mA; Slow blow type
48 VDC Input Models		135		mA; Slow blow type
Reverse Polarity Input Current			1	A
Short Circuit Input Power		1000	2000	mW
Input Filter				Pi Filter

### GENERAL CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Switching Frequency		300		kHz
Isolation Voltage	1500			VDC, 1 minute
Isolation Resistance	1000			Mohm, 500VDC
Isolation Capacitance		65	100	pF, 100kHz, 1Volt
MTBF (MIL-HBK-217F)	1			Million Hours, +25°C, Ground Benign

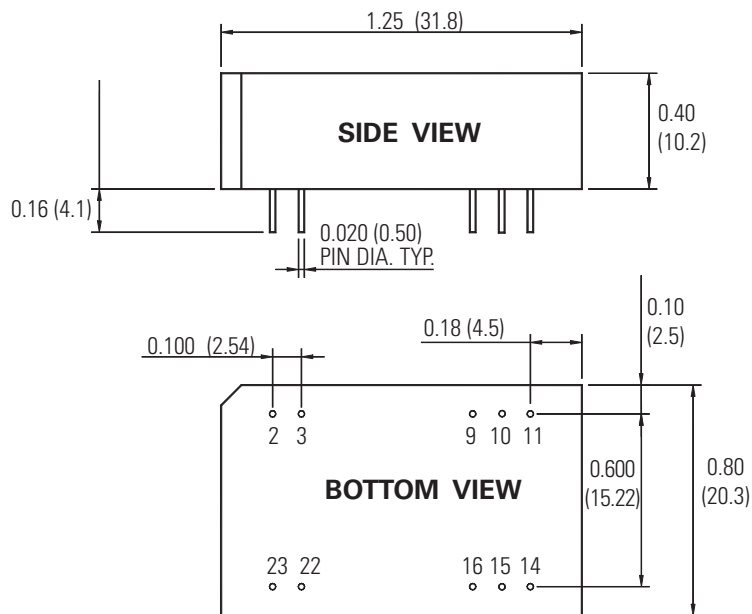
## ENVIRONMENTAL SPECIFICATIONS

	Min	Typ	Max	Unit/Comments
Operating Temp. Range	-40		+71	°C; Ambient
Operating Temp. Range	-40		+90	°C; Case
Storage Temp. Range	-40		+125	°C
Relative Humidity			95	% Humidity; non-condensing
Cooling				Free-Air Convection

## PHYSICAL CHARACTERISTICS

	Unit/Comments
Case Size	1.25 X 0.8 X 0.4 inches (31.8 X 20.3 X 10.2 mm)
Case Material	Non-conductive Black Plastic
Flammability	UL94V-0
Weight	12 Grams

## OUTLINE DRAWING



## PIN OUT CHART

Pins	Single	Dual
2	- Vin	- Vin
3	- Vin	- Vin
9	NC	Common
10	NC	NC
11	NC	- Vout
14	+ Vout	+ Vout
15	NC	NC
16	- Vout	Common
22	+ Vin	+ Vin
23	+ Vin	+ Vin

NC = No Connection

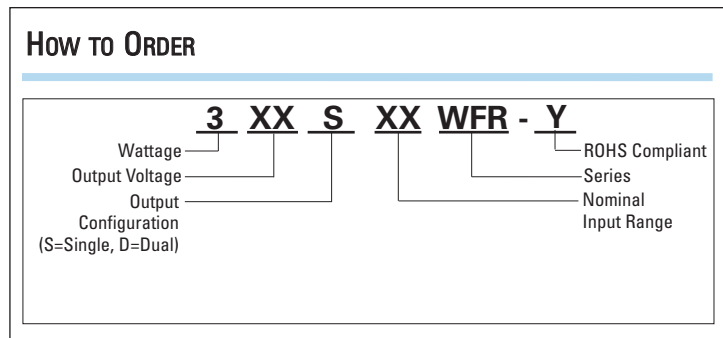
### Notes:

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

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



## MODEL SELECTION CHART

Model	Nominal Input Voltage (VDC)	Input Voltage Range (VDC)	Output Voltage (VDC)	Full Load Output Current (mA)	Input Current No Load Typ. (mA)	Efficiency @ FL (%)
303S5WFR	5	4.5 - 9.0	3.3	600	40	70
305S5WFR	5	4.5 - 9.0	5.0	500	40	73
312S5WFR	5	4.5 - 9.0	12.0	250	40	77
315S5WFR	5	4.5 - 9.0	15.0	200	40	77
305D5WFR	5	4.5 - 9.0	±5.0	±250	40	72
312D5WFR	5	4.5 - 9.0	±12.0	±125	40	75
315D5WFR	5	4.5 - 9.0	±15.0	±100	40	75
303S12WFR	12	9 - 18	3.3	600	20	74
305S12WFR	12	9 - 18	5.0	500	20	78
312S12WFR	12	9 - 18	12.0	250	20	82
315S12WFR	12	9 - 18	15.0	200	20	82
305D12WFR	12	9 - 18	±5.0	±250	20	77
312D12WFR	12	9 - 18	±12.0	±125	20	80
315D12WFR	12	9 - 18	±15.0	±100	20	80
303S24WFR	24	18 - 36	3.3	600	5	76
305S24WFR	24	18 - 36	5.0	500	5	79
312S24WFR	24	18 - 36	12.0	250	5	84
315S24WFR	24	18 - 36	15.0	200	5	84
305D24WFR	24	18 - 36	±5.0	±250	5	79
312D24WFR	24	18 - 36	±12.0	±125	5	82
315D24WFR	24	18 - 36	±15.0	±100	5	82
303S48WFR	48	36 - 72	3.3	600	3	76
305S48WFR	48	36 - 72	5.0	500	3	79
312S48WFR	48	36 - 72	12.0	250	3	84
315S48WFR	48	36 - 72	15.0	200	3	84
305D48WFR	48	36 - 72	±5.0	±250	3	80
312D48WFR	48	36 - 72	±12.0	±125	3	84
315D48WFR	48	36 - 72	±15.0	±100	3	84

## MAXIMUM CAPACITIVE LOAD

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### SINGLE OUTPUT UNITS

Module Output Voltage	3.3V	5V	12V	15V
Maximum Capacitive Load	4000 $\mu$ F	4000 $\mu$ F	4000 $\mu$ F	4000 $\mu$ F

### DUAL OUTPUT UNITS

Module Output Voltage	$\pm$ 5V	$\pm$ 12V	$\pm$ 15V
Max. Capacitive Load for each Output	1000 $\mu$ F	1000 $\mu$ F	1000 $\mu$ F

## DERATING CURVES

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**MODEL 300WFR**

