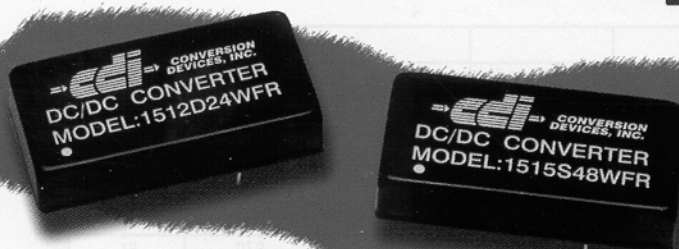


## 1500WFR Series

Distributed By:  
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### KEY FEATURES

- 15W Continuous Output Power
- Compact 1" x 2" x 0.4" Case
- Industry Standard Pin-Out
- 82% Efficiency
- -25°C to 71°C Operating Temperature Range
- 18.75W/In<sup>3</sup> Power Density
- Low Cost
- >750,000 Hours MTBF

### General Description

The 1500WFR is a family of low cost single and dual output 15W DC/DC converters specifically designed for space-critical applications. These modules combine high power density; high performance features; and compact, industry standard packaging; with low cost.

Eleven models operate from wide (2:1) input voltage ranges of 18 VDC to 36 VDC or 36 VDC to 72 VDC; and provide regulated outputs of 5 VDC, 12 VDC, 15 VDC,  $\pm 12$  VDC or  $\pm 15$  VDC. Standard features include 500 VDC input/output isolation, an internal input filter, line/load regulation of  $\pm 1.0\%$  and a switching frequency of 190 kHz.

All models are packaged in a compact, low profile 1.0 x 2.0 x 0.4 inch metal case. This miniature size yields a power density as high as 18.75 W/In<sup>3</sup>. Operation is specified over the full operating temperature range of -25°C to +71°C. Cooling is by free-air convection.

### Electrical Specifications

#### Input Specifications:

Input Voltage Range .....	2:1, See Model Selection Guide
Input Filter .....	$\pi$ (Pi) Network, Conductive
Reflected Ripple Current .....	EMI Meets VDE 0871 Class A
	See Model Selection Guide

#### Output Specifications:

Output Voltage Accuracy .....	$\pm 1\%$ , Max.
Voltage Balance (Dual Outputs) .....	$\pm 1\%$ , Max.
Minimum Load .....	10% of Full Load
Ripple & Noise (20 MHz BW) .....	$\pm 100$ mV Pk-Pk of $V_{out}$ , Max.
Line Regulation <sup>(1)</sup> .....	$\pm 0.2\%$ , Max.
Load Regulation <sup>(2)</sup> .....	$\pm 1.0\%$ , Max.
Transient Response <sup>(3)</sup> .....	<500 $\mu$ Sec.
Temperature Coefficient @ FL .....	$\pm 0.02\%/^{\circ}\text{C}$
Short Circuit Protection .....	Current Limit, Continuous

#### General Specifications:

Efficiency <sup>(4)</sup> .....	See Model Selection Guide
Isolation Voltage (1 min) .....	500 VDC, Min.
Isolation Resistance .....	$10^9\Omega$

Switching Frequency .....	>190 kHz
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#### Environmental Specifications:

Operating Temperature Range <sup>(5)</sup> .....	-25°C to +71°C
Storage Temperature Range .....	-40°C to +100°C
Maximum Case Temperature .....	+100°C
Derating .....	None Required
Humidity .....	Up to 95%, Non-Condensing
Cooling <sup>(6)</sup> .....	Free-air Convection

#### Physical Characteristics:

Size .....	1.0 x 2.0 x 0.4 inches (25.4 x 50.8 x 10.2 mm)
Weight .....	0.5 Oz (14g)
Shielding .....	Six Sided Continuous
Case Material .....	Black Coated Copper with Non-Conductive Base

#### Reliability Specifications <sup>(8)</sup> :

MTBF; Ground Benign, @ +25°C Ambient .....	>750,000 Hours
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Specifications typical @ +25°C with nominal input voltage and under full output load conditions, unless otherwise noted. Specifications subject to change without notice.

#### Specification Notes:

1. Line regulation is measured by monitoring the output voltage while the module input voltage is varied from low line to high line.
2. Load regulation is measured at nominal input voltage while the output load is varied from 25% load to full load. Dual output models are loaded equally.
3. Transient response is measured to within a 1% error band with a 25% step load change applied.
4. Efficiency is specified at nominal input line and full load.
5. At higher temperature elevations, a heatsink or airflow may be required to ensure a case temperature of less than +100°C.
6. Free-air convection cooling requires the application be properly ventilated. Using a converter in a sealed application or one in which air movement is severely restricted could cause thermal runaway.
7. Total output power should not exceed the specified output ratings for any particular model.
8. MTBF calculations are made per MIL-HDBK-217F.

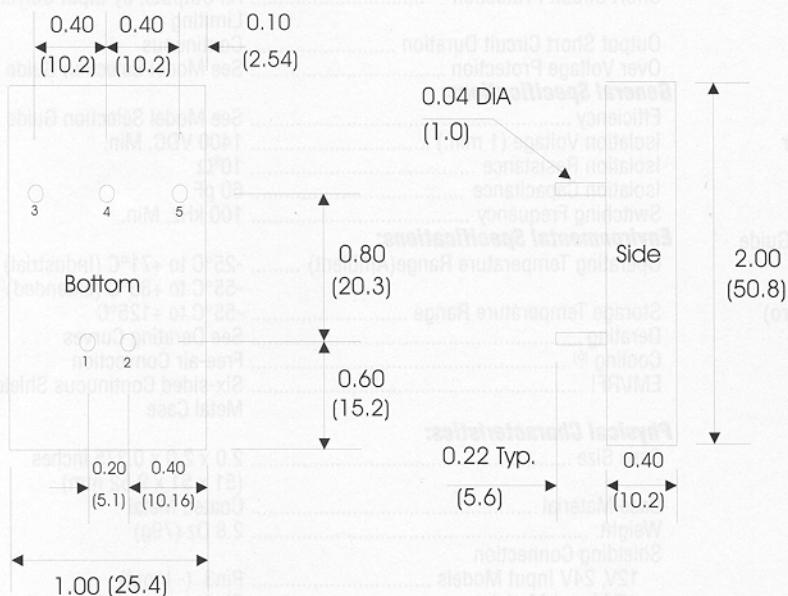
**Model Selection Guide**

Model Number	Input				Reflected Ripple (mA P-P)	Output		Efficiency @FL (%)
	Voltage (VDC)		Current (mA)			Voltage (VDC)	Current (mA)	
	Nominal	Range	No-Load	Full-Load				
1505S24WFR	24	18 - 36	20	800	250	5	3000	78
1512S24WFR	24	18 - 36	20	780	250	12	1250	80
1515S24WFR	24	18 - 36	20	780	250	15	1000	80
1512D24WFR	24	18 - 36	30	780	250	±12	±625	80
1515D24WFR	24	18 - 36	30	780	250	±15	±500	80
1505S48WFR	48	36 - 72	10	390	200	5	3000	80
1512S48WFR	48	36 - 72	10	380	200	12	1250	82
1515S48WFR	48	36 - 72	10	380	200	15	1000	82
1505D48WFR	48	36 - 72	10	400	200	±5	±1500	80
1512D48WFR	48	36 - 72	10	380	200	±12	±625	82
1515D48WFR	48	36 - 72	10	380	200	±15	±500	82

**Application Notes:**

1. Modules with ±12 VDC or ±15 VDC outputs may be connected to provide 24 VDC or 30 VDC respectively. For example, to connect the **1512D24WFR** for -24 VDC operation, ground the -V input (pin 2) and connect it to the +V output (pin 3). With this reference, -24 VDC will be available at the -V output (pin 5) and -12 VDC will be available at the output common (pin 4).
2. These units operate as complete modules with no need for external components. However, in some noise sensitive analog applications it is recommended that a 15 µF, 25V tantalum electrolytic capacitor be placed in parallel with a 0.1 µF ceramic capacitor as close to the load as possible. This will reduce ripple significantly.

**Mechanical Configuration:**



**Pin-Out**

Pin	Single Output	Dual Output
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	No Pin	Common
5	-V Output	-V Output

Note: All dimensions are typical in inches (mm).  
Tolerance X.XX = ± 0.02, (± 0.5)  
X.XXX = ± 0.010, (± 0.25)