

## 300UR & 500UR Series

Distributed By:  
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### KEY FEATURES

- 4:1 Ultra-Wide Input Voltage Range
- Low Profile, Miniature Packaging
- High Power Density
- Continuous Short Circuit Protection
- Wide -25°C to +75°C Operating Temperature Range
- >900,000 Hours MTBF
- UL 1950 Approved
- CSA 22.2 Approved

### General Description

The 300UR and 500UR modules are a family of 3W and 5W DC/DC converters that offer a cost effective solution for applications that require miniature size, high performance features and high reliability. High performance features include an ultra-wide 4:1 input voltage range, efficiency as high as 80% and short circuit protection by input current limiting. Per MIL-HDBK-217F, the MTBF is over 900,000 hours (for the 300UR).

Twenty-four models operate from ultra-wide (4:1) input voltage ranges of 10 VDC to 40 VDC or 18 VDC to 72 VDC and provide regulated outputs of 5 VDC, 12 VDC, 15 VDC,  $\pm 5$  VDC,  $\pm 12$  VDC or  $\pm 15$  VDC. Standard features include input/output isolation levels up to 1400 VDC, an internal input,  $\pi$  (Pi) filter, tight line/load regulation, and a switching frequency of 180 kHz. Long field life is insured by extensive reliability screening at CDI. As part of the normal production processing, each unit is subjected to burn-in as well as power cycling and load switching.

All 300UR models are packaged in a compact, low profile 1.25 x 0.8 x 0.4 inch, non-conductive, black plastic case that is 24 pin DIP compatible. This miniature size yields a power density as high as 7 W/In<sup>3</sup>. Each 500UR model is packaged in a miniature 1.0 x 2.0 x 0.375 inch case. Operation for all models is specified over the full operating temperature range of -25°C to +75°C with no derating required. Cooling is by free-air convection.

### Model Selection Guide

Model Number	Input					Output		Efficiency @FL (%)
	Voltage (VDC)		Current (mA)		Reflected Ripple (mA P-P)	Voltage (VDC)	Current (mA)	
	Nominal	Range	No-Load	Full-Load				
305S12UR	12	10 - 40	30	330	100	5	600	75
312S12UR	12	10 - 40	30	320	100	12	250	77
315S12UR	12	10 - 40	30	310	100	15	200	80
305D12UR	12	10 - 40	30	330	100	±5	±300	77
312D12UR	12	10 - 40	30	330	100	±12	±125	75
315D12UR	12	10 - 40	30	320	100	±15	±100	77
305S28UR	28	18 - 72	30	140	100	5	600	76
312S28UR	28	18 - 72	30	140	100	12	250	76
315S28UR	28	18 - 72	30	140	100	15	200	76
305D28UR	28	18 - 72	30	140	100	±5	±300	76
312D28UR	28	18 - 72	30	140	100	±12	±125	76
315D28UR	28	18 - 72	30	140	100	±15	±100	76
505S20UR	20	10 - 40	30	340	50	5	1000	73
512S20UR	20	10 - 40	30	350	50	12	416	72
515S20UR	20	10 - 40	30	350	50	15	333	72
505D20UR	20	10 - 40	30	340	50	±5	±500	73
512D20UR	20	10 - 40	30	340	50	±12	±208	73
515D20UR	20	10 - 40	30	340	50	±15	±166	73
505S36UR	36	18 - 72	30	190	40	5	1000	73
512S36UR	36	18 - 72	30	170	40	12	416	81
515S36UR	36	18 - 72	30	170	40	15	333	81
505D36UR	36	18 - 72	30	180	40	±5	±500	77
512D36UR	36	18 - 72	30	180	40	±12	±208	77
515D36UR	36	18 - 72	30	180	40	±15	±166	77

Specifications typical @+25°C with nominal input voltage and under full output load conditions, unless otherwise noted. Specifications subject to change without notice.

**ULTRA-WIDE INPUT VOLTAGE RANGE  
MINIATURE, HIGH PERFORMANCE  
3W & 5W DC/DC CONVERTERS**

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**Electrical Specifications**

**Input Specifications:**

Input Voltage Range .....	4:1, See Table 1
Input Filter .....	$\pi$ (Pi) Network
Reverse Polarity Input Current, 300UR .....	5A, Max.
500UR .....	6A, Max.
Reverse Voltage Protection .....	Parallel Diode
Reflected Ripple Current .....	See Model Selection Guide

**Output Specifications:**

Output Voltage Accuracy .....	$\pm 1\%$ , Max.
Voltage Balance (Dual Outputs) .....	$\pm 2\%$ , Max.
Ripple & Noise (20 MHz BW) <sup>(1)</sup> .....	$\pm 1\%$ Pk-Pk $V_{out}$
Line/Load Regulation <sup>(2),(3)</sup> .....	$\pm 1\%$ , Max.
Minimum Load .....	10% of Full Load
Temperature Coefficient @ FL .....	$\pm 0.02\%/^{\circ}\text{C}$
Transient Response <sup>(4)</sup> .....	<500 $\mu\text{Sec}$ .
Short Circuit Protection .....	Current Limit, Continuous

**General Specifications:**

Efficiency <sup>(5)</sup> .....	See Model Selection Guide
Isolation Voltage (1 min), 300UR .....	500 VDC, Min.
500UR .....	1400 VDC, Min.
Isolation Resistance .....	$10^9\Omega$
Isolation Capacitance .....	100 pF
Switching Frequency .....	>180 kHz

**Environmental Specifications:**

Operating Temperature Range .....	-25°C to +75°C
Storage Temperature Range .....	-40°C to +105°C
Derating .....	None Required
Humidity .....	Up to 95%, Non-Condensing
Cooling .....	Free-air Convection

**Physical Characteristics:**

Size, 300UR .....	1.25 x 0.8 x 0.4 inches (32 x 20.3 x 10.2 mm)
500UR .....	2.0 x 1.0 x .375 inches (50.8 x 25.4 x 9.52 mm)
Weight, 300UR .....	0.5 Oz (14g)
500UR .....	1.5 Oz (42.5g)
Case Material, 300UR .....	Non-Conductive Black Plastic
500UR .....	Metal, Coated

**Shielding Connection (500UR Only)**

20V Input models	Pin 2 (-Input)
36V Input models	Pin 1 (+Input)

**Reliability Specifications:**

MTBF <sup>(6)</sup> , 300UR .....	>900,000 Hours
500UR .....	>800,000 Hours

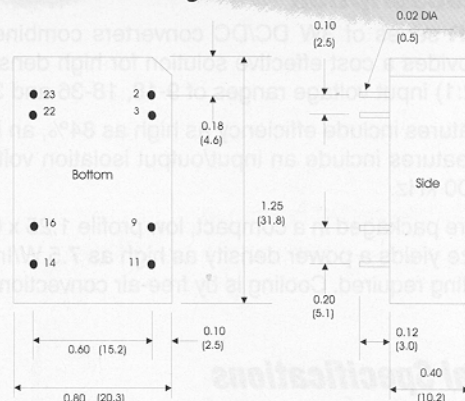
**Absolute Maximum Ratings: <sup>(7)</sup>**

Input Voltage .....	105% of Max. Input Line
Short Circuit Duration .....	Continuous
Internal Power Dissipation, 300UR .....	1.5W
500UR .....	1.7W

**Application Notes:**

1. Modules with  $\pm 12$  VDC or  $\pm 15$  VDC outputs may be connected to provide 24 VDC or 30 VDC respectively. For example, to connect the **312D28UR** for -24 VDC operation, ground the -V input (pins 2 & 3) and connect it to the +V output (pin 14). With this reference, -24 VDC will be available at the -V output (pin 11) and -12 VDC will be available common (pins 9 & 16).
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  $\mu\text{F}$ , 25V tantalum electrolytic capacitor be placed in parallel with a 0.1  $\mu\text{F}$  ceramic capacitor as close to the load possible. This will reduce ripple significantly.

**Mechanical Configuration - 300UR Series**



**Mechanical Configuration - 500UR Series**

