

6000UR Series



Distributed By:
B. J. Wolfe Enterprises
 (800) 554-1224
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- **4:1 Ultra-Wide Input Voltage Range**
- **Miniature 2.56 x 3.0 x 0.75 Inch Case**
- **Wide -30°C to +70°C Operating Temperature Range**
- **Efficiency to 83%**
- **Minimum 1400 VDC Input/Output Isolation**
- **600,000 Hour MTBF**

General Description

The **6000UR** series is a family of miniature 50W and 60W DC/DC converters specifically designed for board mount power distribution applications where high power density is required, but performance and reliability cannot be sacrificed. Standard features include an ultra-wide 4:1 input voltage range, efficiency as high as 83% and continuous short circuit protection.

Eighteen models operate from ultra-wide (4:1) input voltage ranges of 9 to 36 VDC or 18 to 72 VDC and provide tightly regulated output combinations of 3.3, 5, 12, 15, ± 5 , ± 12 , ± 15 , 5 ± 12 and 5 ± 15 VDC. Standard features include an input π (PI) filter to reduce reflected ripple current, output voltage accuracy of $\pm 1\%$, and an input/output isolation voltage of 1400 VDC.

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 with input power cycling and output load switching.

All models are packaged in a compact, low profile 2.56 x 3 x 0.375 inch metal case. This miniature size yields a power density as high as 10.4 W/In³. Six-sided continuous shielding virtually eliminates radiated emissions. Operation is specified over wide operating temperature range of -30°C to +71°C with no derating required.

Electrical Specifications

Input Specifications:

Input Voltage Range	See Model Selection Guide
Input Filter	π (Pi) Network.
Reverse Polarity Input Current	12A, Max.
Short Circuit Current Limit	Input Current Limiting
Over Voltage Shutdown	42 or 74 VDC
Under Voltage Shutdown	8.5 VDC
Remote On/Off Control	
Supply OFF	0.8 VDC to 5.5 VDC
Supply ON	0 VDC to 0.6 VDC
Logic Input Reference	Negative (-) Input

Output Specifications:

Output Voltage Accuracy:	
Single, Dual Output Models	$\pm 1\%$, Max.
Triple Output Models; Primary	$\pm 1\%$, Adj to Zero
Auxiliaries	$\pm 6\%$, Max.
Voltage Adjustment ⁽²⁾	$\pm 10\%$, Max.
Voltage Balance:	
Dual Outputs	$\pm 2.0\%$, Max.
Triple Outputs	± 150 mV
Ripple & Noise ⁽³⁾	1% Pk-Pk of V_{out}
Line Regulation ⁽⁴⁾ :	
Single, Dual Output Models	$\pm 1.0\%$, Max.
Triple Output Models; Primary	$\pm 0.5\%$, Max.
Auxiliaries	$\pm 6.0\%$, Max.
Load Regulation ⁽⁵⁾ :	
Single, Dual Output Models	$\pm 1.0\%$, Max. ($1/4$ Load to Full Load)
Triple Output Units; Primary	$\pm 1.0\%$, Max. (No Load to Full Load)
Auxiliaries	$\pm 2.0\%$, Max. ($1/4$ Load to Full Load)
Minimum Load	10% of Full Load
Temperature Coefficient @ FL	$\pm 0.02\%/^{\circ}\text{C}$

Temperature Coefficient Balance	$\pm 1\%$
Transient Recovery Time ⁽⁶⁾	250 μs Max.
Short Circuit Protection	Continuous by Input Current Limiting

General Specifications:

Efficiency	See Model Selection Guide
Isolation Voltage	1400 VDC, Min.
Isolation Resistance	$> 10^9 \Omega$
Switching Frequency	125 kHz, Min.

Environmental Specifications:

Operating Temperature Range	-30°C to +71°C Ambient
Storage Temperature Range	-40°C to +125°C
Derating	None
Humidity	Up to 95% Non-Condensing
Cooling ⁽⁷⁾	See Specification Note #7

Physical Characteristics:

Case Size	2.56 x 3.0 x 0.75 inches (65 x 76.2 x 19.0 mm)
Case Material	Coated Copper
Weight	5.0 Oz
Shielding	Six-sided, Continuous
Shielding Connection	
24V Input Models	Pin 3 (- Input)
48V Input Models	Pin 2 (+ Input)

Reliability Specifications:

MTBF ⁽⁸⁾	600,000 Hours
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Accessories:

Mounting Socket	MS-2
Heat Sink (5.4°C/W)	CD-HS13

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, 4:1 INPUT RANGE
MINIATURE, HIGH EFFICIENCY
50W - 60W DC/DC CONVERTERS**

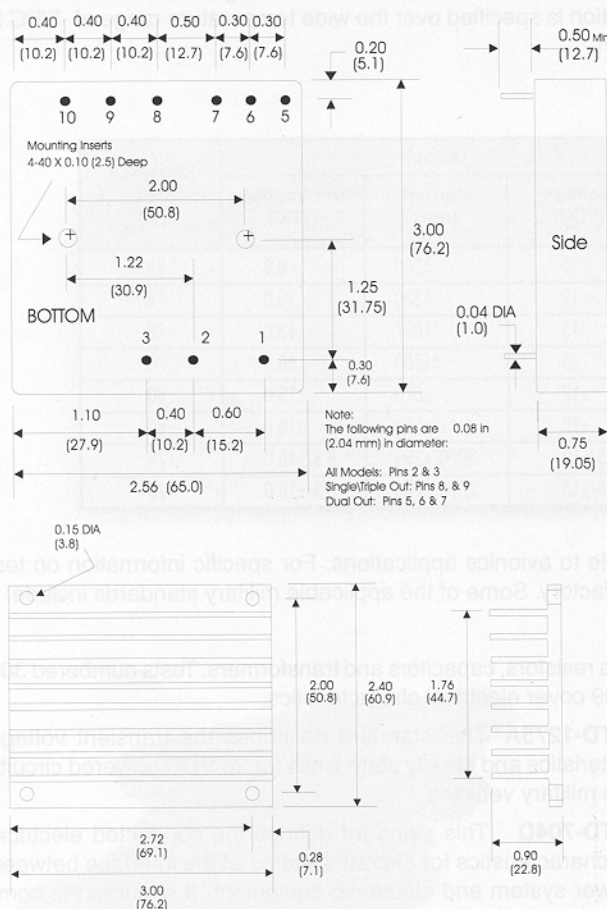
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Model Selection Guide

Model Number	Input					Output			Efficiency @FL (%)	Fuse A
	Voltage (VDC)		Current (mA)		Reflected Ripple (mA Pk-Pk)	Voltage (VDC)	Current (mA)	Over Voltage (VDC)		
	Nominal	Range	No-Load	Full-Load						
6003S24UR	24	9 - 36	40	2610	300	3.3	15000	5.8	79	10.0
6005S24UR	24	9 - 36	40	2670	240	5.0	10000	6.8	78	10.0
6012S24UR	24	9 - 36	40	2610	240	12.0	4166	16.0	79	10.0
6015S24UR	24	9 - 36	40	2610	240	15.0	3333	18.0	79	10.0
6003S48UR	48	18 - 72	40	1420	300	3.3	16580	5.8	80	6.0
6005S48UR	48	18 - 72	40	1360	240	5.0	10000	8.2	76	6.0
6012S48UR	48	18 - 72	40	1580	240	12.0	5000	16.0	79	6.0
6015S48UR	48	18 - 72	40	1670	240	15.0	4280	18.0	80	6.0
6005D24UR	24	9 - 36	40	2540	260	±5.0	±5000	±6.8	80	10.0
6012D24UR	24	9 - 36	40	2600	260	±12.0	±2000	±16.0	77	10.0
6015D24UR	24	9 - 36	40	2670	260	±15.0	±1660	±18.0	77	10.0
6005D48UR	48	18 - 72	40	1540	240	±5.0	±6250	±6.8	83	6.0
6012D48UR	48	18 - 72	40	1580	150	±12.0	±2500	±16.0	79	6.0
6015D48UR	48	18 - 72	40	1550	150	±15.0	±2000	±18.0	80	6.0
6005/12T24UR	24	9 - 36	40	2600	240	5/±12.0	5000/±1040	6.8/±15.0	83	10.0
6005/15T24UR	24	9 - 36	40	2430	240	5/±15.0	5000/±833	6.8/±18.0	83	10.0
6005/12T48UR	48	18 - 72	40	1200	240	5/±12.0	5000/±1040	6.8/±15.0	84	10.0
6005/15T48UR	48	18 - 72	40	1400	240	5/±15.0	5000/±1000	6.8/±18.0	85	10.0

Mechanical Configuration:



Specification Notes:

1. It is recommended that an external slow-blow fuse (see Model Selection Guide for appropriate size) be used to provide further input protection.
2. To trim the output voltage DOWN, connect a 5%, 1/4 W resistor between the plus (+) output and trim pins of the converter. To trim the output voltage UP, connect a 5%, 1/4 W resistor between the minus (-) output and trim pins. For UP/DOWN trimming capability, connect a 10k potentiometer between the plus (+) and minus (-) outputs, with the wiper arm connected to the trim pin. The voltage adjustment range for 3.3 VDC output models is ±100 mV.
3. For 3.3 VDC output models, the ripple and noise is 100 mV Pk-Pk. For 5 VDC output models, the ripple and noise is 75 mV Pk-Pk. For the primary output of triple output models, the ripple and noise is 125 mV Pk-Pk.
4. For 3.3 VDC output models, line regulation is 100 mV Pk-Pk.
5. For 3.3 VDC models, load regulation is 100mV.
6. Transient response is measured to within a 1% error band with a 50% load step applied (50% load to full load).
7. For proper thermal management, the 6000UR series requires a Heatsink and 400 LFM of airflow. Using a converter in a sealed application, or one in which air movement is restricted, could cause thermal runaway.
8. MTBF is calculated per MIL HDBK-217F. Conditions are ground benign @ 25°C.

Pin-Out

Pin	Single Output	Dual Output	Triple Output
1	Remote On/Off	Remote On/Off	Remote On/Off
2	+ Input	+ Input	+ Input
3	- Input	- Input	- Input
5	+ Output Sense	+ Output	+ Output (Aux)
6	Output Trim	Common	Common (Aux)
7	- Output Sense	- Output	- Output (Aux)
8	+ Output	Output Trim	+5V Output
9	- Output	No Pin	-5V Output
10	No Pin	No Pin	Output Trim (Primary)

Application Notes:

For proper operation of single output units without load sensing or external trimming, connect pin 5 (+Output Sense) to pin 8 (+Output) and pin 7 (-Output Sense) to pin 9 (-Output) externally.

Note: All dimensions are typical in inches (mm).
Tolerance: X.XX = ± 0.02, (± 0.05)
X.XXX = ± 0.010, (± 0.25)
Mounting inserts: 4-40X .10 (2.5) Deep

For Easy Ordering Use

