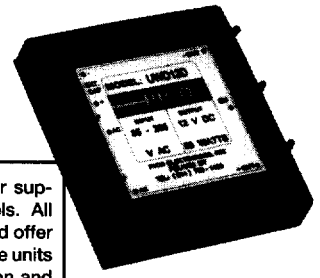
SERIES UWD UNIVERSAL AC-DC Switching Power Supplies

Hi Reliability
Industrial Grade
Input Voltage
(85 - 265V AC, 47 - 440Hz)
Isolated 1500 VRMS
Fully Regulated -- up to 50 Watts
Short Circuit Protected

Expanded Operating Temperature Available
Consult Factory



This series of switching AC-DC power supplies are available in 13 different models. All single and dual outputs are isolated and offer excellent line and load regulation. These units have continuous short circuit protection and will operate from 0°C to +70°C baseplate. The hi-reliability UWD Series, up to 50 Watts, is the design choice for your most stringent industrial applications.

Thermal Considerations Formula

$T_c - T_a = \Delta T = T_{rca}\, P_{out} \left(\frac{1}{\eta} - 1\right)$ where,

T_{rca} = Thermal Resistance of case to air

P_{out} = Output power in watts

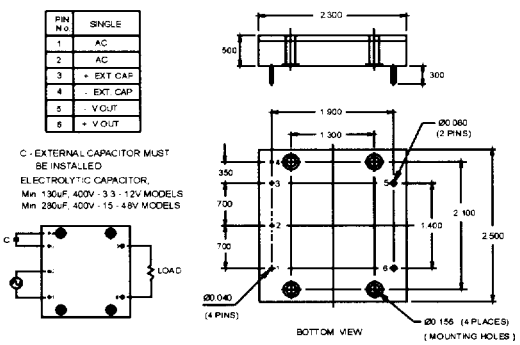
η = Efficiency

T_c = Case temperature in Degrees C

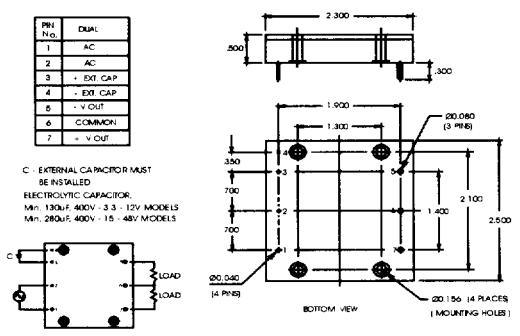
T_a = Ambient Temperature in Degrees C

Trca	UWD Series		
	Baseplate	Heatsink LCV	Heatsink LCH
Free Air	7.9	4.2	4.0
200 LFM	4.9	1.6	1.6
400 LFM	2.5	1.6	1.3
600 LFM	2.2	0.9	0.9
800 LFM	1.5	0.7	0.7
1000 LFM	1.2	0.6	0.6

SERIES UWD SINGLE OUTPUT



SERIES UWD DUAL OUTPUT



C - EXTERNAL CAPACITOR MUST BE INSTALLED
ELECTROLYTIC CAPACITOR
*1- MODULES 12 VDC OUT AND UNDER 130 µF, 400 VDC MINIMUM
*2- MODULES 15 VDC OUT AND OVER 280 µF, 400 VDC MINIMUM

See Heat Sink LCH / LCV page 144

TYPICAL CHARACTERISTICS:
Test condiditons: 25°C Ambient
Input voltage: 85 - 265V AC, 47 to 440Hz
Converter frequency: 100KHz
Operating temperature: -0°C to +85°C baseplate
Storage temperature: -55°C to +105°C
Output voltage temperature coefficient:
0.02% per °C
Isolation: 1500 VRMS

FEATURES:
- Excellent line regulation ±1% (85-265V AC)
- Excellent load regulation, from 10% to 100%, ±2%
- Continuous short circuit protection
- Encapsulated semiconductors, conservatively rated for maximum reliability
- Isolation: 1500 VRMS
- Wide input range: 85-265V AC, 47 to 440Hz

SERIES UWD-SINGLE OUTPUT-50 WATTS MAX

PICO PART NUMBER	OUTPUT VOLTAGE (VDC)	MAX. LOAD CURRENT (A)	MAX. OUTPUT POWER (WATTS)***	EFF.@ FULL LOAD TYPICAL (%)*	OUTPUT VOLT TOLERANCE (±%)* *	LOAD REGULATION 10% - 100% LOAD (±%)**	LINE REGULATION @ FULL LOAD (±%)	OUTPUT VOLTAGE RIPPLE TYPICAL (mv p-p)*	PRICE 1-24
UWD3.3S	3.3	9.09	30	68	2	2	1	200 *1	149.00
UWD5S	5	8.00	40	73	2	2	1	250 *1	149.00
UWD5.2S	5.2	7.70	40	73	2	2	1	250 *1	149.00
UWD12S	12	4.16	50	75	2	2	1	300 *1	149.00
UWD15S	15	3.33	50	77	2	2	1	300 *2	149.00
UWD24S	24	2.08	50	78	1	1	1	300 *2	149.00
UWD28S	28	1.79	50	78	1	1	1	300 *2	149.00
UWD48S	48	1.04	50	78	1	1	1	600 *2	149.00

* Measurement taken at 115V AC at 60Hz **10% minimum load required at all times
*** Using proper thermal management, maximum baseplate temperature of +85 C

Expanded Operating Temperature Available
Consult Factory for details 1-800-431-1064

SERIES UWD-DUAL OUTPUT-50 WATTS MAX

PICO PART NUMBER	OUTPUT VOLTAGE (VDC)	MAX. LOAD CURRENT PER OUTPUT (A)	MAX. OUTPUT POWER PER OUTPUT (WATTS)***	EFF.@* FULL LOAD TYPICAL (±%)*	OUTPUT VOLT TOLERANCE (±%)* *	LOAD REGULATION 10% - 100% LOAD (±%)**	LINE REGULATION @ FULL LOAD (±%)	OUTPUT VOLTAGE RIPPLE TYPICAL (mv p-p)*	PRICE 1-24
UWD5D	±5	4.00	20	75	2	2	1	200 *1	162.00
UWD12D	±12	2.08	25	75	2	2	1	300 *1	162.00
UWD15D	±15	1.66	25	77	2	2	1	300 *2	162.00
UWD24D	±24	1.04	25	78	2	2	1	300 *2	162.00
UWD28D	±28	0.892	25	78	2	2	1	300 *2	162.00

* Measurement taken at 115V AC at 60Hz **10% minimum load required at all times
*** Using proper thermal management, maximum baseplate temperature of +85 C
****Balanced load

EXAMPLE 1:
A UWD24S module has an efficiency of 78%. What is the maximum ambient temperature if 50 Watts of power is needed?

A) In free air.

From Table 1: Trca=7.9
Using Relation (2)

$$\Delta T = 7.9(50)\left[\frac{1}{.78} - 1\right] = 111.4°C$$

Ta=85°C-114.4°C= -26.4°C

B) In free air with heatsink (LCV).

Trca=4.2

$$\Delta T = 4.2(50)\left[\frac{1}{0.78} - 1\right] = 59.2°C$$

Ta = 85-59.23=25.8°C

C) With 400 LFM of air flow.

Trca = 2.5

$$\Delta T = 2.5(50)\left[\frac{1}{.78} - 1\right] = 35.3°C$$

Ta=85-35.3 = 49.7°C

EXAMPLE 2:
What would be the maximum output power for a UWD24S module at an ambient termperature of 50°C with and efficiency of 78%?

A) If the module is used in free air.

From Table 1: Trca=7.9
Using Relation (2)

$$85 - 50 = 7.9\ P_{out}\left[\frac{1}{.78} - 1\right]$$

$$P_{out} = \frac{35}{7.9(.282)} = 16W$$

B) If the module with heatsink (LCV) is used with free air.

Trca = 4.2

$$P_{out} = \frac{35}{4.2(.282)} = 30W$$

C) If the module is used in an area with forced air at 400 LFM with no heatsink.

Trca=2.5

$$P_{out} = \frac{35}{2.5(.282)} = 49.6W$$