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## uV24-15-164 MICROVERTER® 164 DC-DC Converter

24/28 VDC Input  
 300 Watts  
 3/4 Brick

The MICROVERTER® 164 Series is a second generation product which combines high efficiency electrical power design and proprietary advanced thermal management techniques including insulated metal substrate technology, specialty dielectrics and formulated thermally conductive potting to produce small, ruggedized DC/DC converters with reduced temperature rise and increased reliability. This series is ideal for use in rugged, thermally challenged applications requiring baseplate cooled operation such as military systems, RF/power amplifiers, commercial avionics and industrial control. All RO products are normally manufactured using a tin-lead soldering process. The MICROVERTER® 164 Series is also available in both full RoHS compliant (utilizing lead free solder) and full tin-lead (no pure tin) configurations. All models are designed to meet international safety standards.



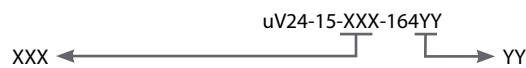
MADE IN U.S.A.

### OPERATIONAL FEATURES

- Encapsulated & Environmentally Rugged Package
- Extremely Low Thermal Resistance
- -40 ~ 100°C Baseplate Operation – Standard
- -55 ~ 125°C Baseplate Operation – Optional
- Constant Frequency Operation for Reduced Noise
- Remote On/Off, Parallel and Remote Sense Functions
- Auto-Recovery from OTP / OCP / OVP Circuits
- Trimable Output
- Synchronizable from 330-400KHz (Optional)
- 2 Year Warranty

### ORDERING INFORMATION

Model Number	Input Voltage Range	Output Voltage	Output Current
uV24-15-164	18-36 VDC	15 (10.0-16.5VDC)	20A



S= Synchronization 330-400KHz  
 T= -55°C to 100°C Operating Temperature  
 C= Conformal Coating  
 E= -55°C to 125°C (Consult the factory for output power rating) standard tin-lead finish

RL= No Pure Tin  
 LF= RoHS Compliant  
 no suffix is required for

Part Number Example: uV24-15-STC-164RL  
 Synchronization, -55°C to 100°C, Conformal Coating, No Pure Tin



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ABSOLUTE MAXIMUM RATINGS Exceeding absolute maximum ratings may cause permanent damage or reduce reliability					
Parameter	Option	Minimum	Maximum	Units	Conditions
Input Voltage (+In to -In)		-0.3	36	Vdc	Continuous
Transient Input Voltage (+In to -In)		-0.3	50	Vdc	100ms max.
Parallel Pin Voltage (Parallel-On/Off to -In)		-0.3	6.0	Vdc	
Input-to-Output Voltage			1500	Vdc	
Input-to-Case Voltage			1500	Vdc	
Output-to-Case Voltage			500	Vdc	
Storage Temperature	Standard	-40	110	°C	
	T	-55	110	°C	
	E	-55	125	°C	
Operating Temperature	Standard	-40	100	°C	Baseplate
	T	-55	100	°C	Baseplate
	E	-55	125	°C	Baseplate
Soldering Temperature			260	°C	< 5 sec

ELECTRICAL SPECIFICATIONS Electrical specifications apply for Vin=28VDC, Vout=12VDC, Full Load, Tc=25 °C unless specified otherwise					
Input	Minimum	Typical	Maximum	Units	Conditions
Input Voltage Range	18	24 / 28	36	Vdc	
Maximum Input Current		19.4		Adc	Vin = 18V, Tc = 25°C
			19.8	Adc	Vin = 18V, Tc = 100°C
Input Ripple Rejection		60		dB	f = 120Hz
Output	Minimum	Typical	Maximum	Units	Conditions
Voltage Set Point	14.85	15.01	15.15	Vdc	
Load Regulation		0.05	0.2	%	0 to Full Load
Line Regulation		0.05	0.2	%	Vin min to Vin max
Voltage Drift with Temperature			0.02	%/°C	Tc min to Tc max
Ripple (PARD)		100	300	mV p-p	Vin = 28V, Tc = 25°C
			450	mV p-p	18V ≤ Vin ≤ 36V, -40°C ≤ Tc ≤ +100°C
Rated Current	0		20	A	
Overcurrent Inception Point	105	115	130	% Rated	Vout = 95% Vout nominal
Short Circuit Current			170	% Rated	18V ≤ Vin ≤ 36V, Rshort = 15 mOhm
Transient Response Deviation		750		mV	20-80% Rated Current, 0.5A/μs
Transient Response Settling Time		200		μs	20-80% Rated Current, 0.5A/μs
Efficiency		88.0		%	Vin = 28V, Iout = 75% Rated
Isolation	Minimum	Typical	Maximum	Units	Conditions
Input-to-Output Isolation	1500			Vdc	Consult factory for procedure
Input-to-Case Isolation	1500			Vdc	
Output-to-Case Isolation	500			Vdc	
Input-to-Output Capacitance		2500		pF	
Input-to-Output Resistance	10			M Ohm	500V

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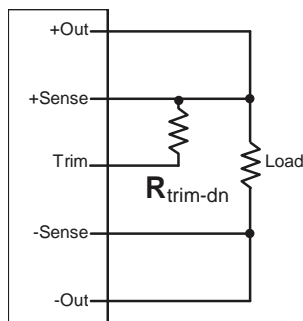
24/28 VDC Input / 300 Watts / 3/4 Brick



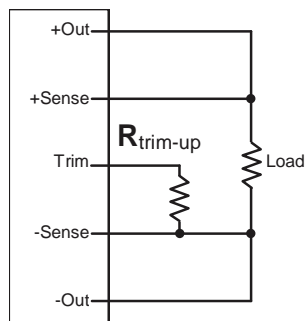
## ELECTRICAL SPECIFICATIONS *Continued*

Control	Option	Minimum	Typical	Maximum	Units	Conditions
Over Temperature Shutdown Temp.	Standard and T		105		°C	
	E		130			
Over Temperature Restart Temp.	Standard and T		85		°C	
	E		105			
Start-up Voltage		16.5	17.0	17.5	V	
Input Under Voltage Lock Out		15.0	15.5	16.0	V	
Turn-on Time			5	10	ms	18V ≤ Vin ≤ 36V, Tc = 25°C
				12	ms	18V ≤ Vin ≤ 36V, -40°C < Tc < +100°C
Logic On/Off Enable Signal			Open		V	Positive Logic, open collector enables. Do not pull up.
Logic On/Off Disable Signal				0.6	V	I On/Off = 1mA.
Logic On/Off Turn-on Time			5	10	ms	
Trim Range		10.0		16.5	V	See Trim Formula and Diagrams
OVP Trip Point		16.7	17.9	19.8	V	Non-shutdown, Auto Recovery, Iout = 50% Rated
Remote Sense Compensation				0.5	V	
Current Sharing (Parallel Operation)			5		%	Using Parallel Pin Connection or PDM
Switching Frequency			370		kHz	Standard Model
			300		kHz	-S Sync Option Model
Synchronization Frequency Range		330		440	kHz	Using Optional Sync Pin and External Sync Signal
Thermal / Mechanical Parameters		Minimum	Typical	Maximum	Units	Conditions
Thermal Resistance, Case to Ambient			4.2		°C/W	Free Air, No Heatsink, Tc=100°C
Size, HxWxL			0.5 x 2.4 x 3.6 (12.7 x 61.0 x 91.4)		in (mm)	3/4 Brick, See Outline Drawing
Weight			5.7 (161)		oz. (gm)	

## TRIM



Trim Down



Trim Up

$$R_{\text{trim-up}} = \frac{29.84\text{K}\Omega}{\Delta V}$$

$$R_{\text{trim-down}} = \frac{268.5 - 19.89 \Delta V}{\Delta V} \text{ K}\Omega$$

$\Delta V =$  | Desired Output Voltage Change (Volts) |

$R_{\text{trim-up}} =$  External Resistor Value to Increase  $V_{\text{out}}$

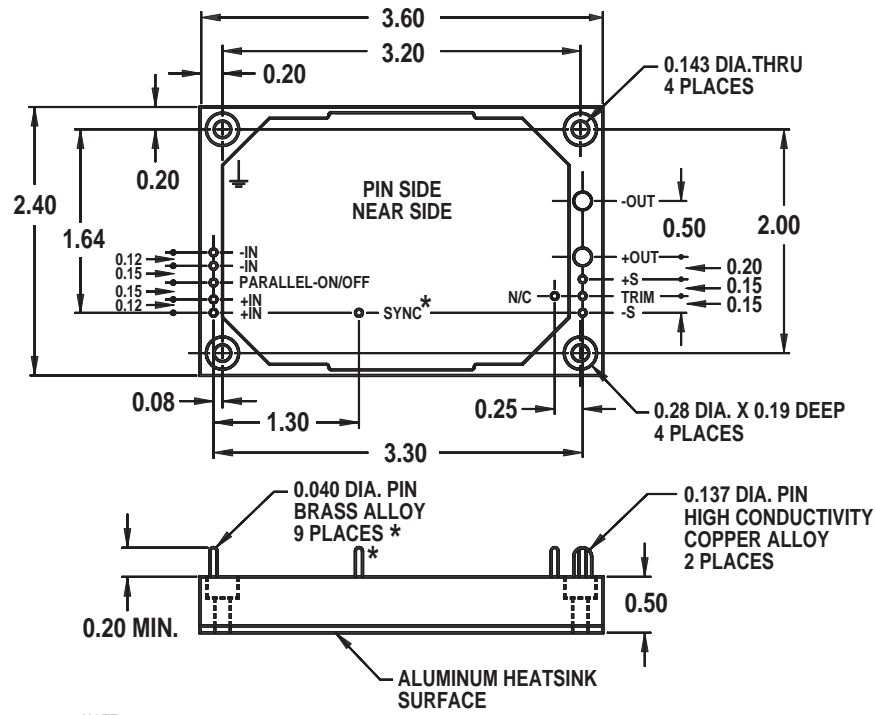
$R_{\text{trim-down}} =$  External Resistor Value to Decrease  $V_{\text{out}}$

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## OUTLINE DRAWING Dimensions in Inches



NOTE:  
Pin finish is gold over nickel, JE5D97  
2nd level interconnect category e4.  
\* 10 places when ordering sync option.  
Location of optional sync pin shown.

## NOTES