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**PRELIMINARY
DATASHEET**

uV300-12-164LF MICROVERTER® -164 DC/DC Converter

**300 VDC Input
300 Watts
3/4 Brick**

The MICROVERTER® uV300-12-164LF DC/DC Converter Module combines high efficiency electrical power design and advanced thermal management techniques including insulated metal substrate technology and thermally conductive potting to produce a small, ruggedized DC/DC converter with reduced temperature rise and increased reliability. Operating over the entire 220-400VDC input range, the MICROVERTER® uV300-12-164LF series is ideal for use in rugged and high reliability applications requiring baseplate cooled operation such as military, telecom, civil avionics and industrial control. This series is designed for Lead Free and RoHS compliance with international safety approvals and CE Mark¹ compliance.

OPERATIONAL FEATURES

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

TYPICAL APPLICATIONS

- Aerospace
- Civil Avionics
- Military / COTS
- Industrial Control
- Telecommunication Equipment



MODEL SELECTION (220-400VDC Input)

Model Number	Output Voltage	Output Current
uV300-12-164LF	12 (10.8-13.2)	25A
add S to part number to designate SYNC option. eg: uV300-12- S -164LF		



CE Mark (LVD)¹



UL / cUL 60950¹



Lead Free



RoHS
Compliant

www.roassoc.com

Note 1: CE Mark (LVD) & UL / cUL 60950 pending

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ABSOLUTE MAXIMUM RATINGS Exceeding absolute maximum ratings may cause permanent damage or reduce reliability

Parameter	Minimum	Maximum	Units	Conditions
Input Voltage (+In to -In)	-0.3	400	VDC	Continuous
Transient Input Voltage (+In to -In)	-0.3	450	VDC	100 msec. Max.
Input/Output Isolation		4500	VDC	
Input/Case Isolation		2500	VDC	
Output/Case Isolation		500	VDC	
Storage Temperature	-40	+110	°C	
Operating Temperature	-40	+100	°C	Baseplate
Soldering Temperature (Wave Solder)		260	°C	< 5 sec.

ELECTRICAL SPECIFICATIONS Electrical specifications apply for Vin=300VDC, Vout=12VDC, Full Load, Tc=25°C unless specified otherwise

Input	Minimum	Typical	Maximum	Units	Conditions
Input Voltage	220	300	400	VDC	
Maximum Input Current		1.6	1.9	ADC	Vin=220V, Tc=25°C
				ADC	Vin=220V, Tc=100°C
Input Ripple Rejection		70		dB	f=120Hz, Vin ripple=15V p-p
Output	Minimum	Typical	Maximum	Units	Conditions
Voltage Set Point	11.88	12.01	12.12	VDC	
Load Regulation		0.05	0.2	%	0 to Full Load
Line Regulation		0.05	0.2	%	Vin min to Vin max
Voltage Drift w/Temperature			0.02	% / °C	Tc min to Tc max
Ripple (PARD)		130	240	mV p-p	Vin=300V, Tc=25°C
			360	mV p-p	220V < Vin < 400V, -40°C < Tc < +100°C
Rated Current			25	A	
Overcurrent Inception Point	105	115	130	% Rated	Vout=95% of Vout nominal
Short Circuit Current			170	% Rated	220V < Vin < 400V, Rshort=15 mohm
Transient Response Deviation		800		mV	20-80% Rated Current, 0.5A/μs
Transient Response Settling Time		200		μs	20-80% Rated Current, 0.5A/μs
Efficiency		85		%	Vin=300V, Iout=75% Rated
External Load Capacitance			470	μF	
Isolation	Minimum	Typical	Maximum	Units	Conditions
Input-to-Output	4500			VDC	Special Test Method Required
Input-to-Case	2500			VDC	
Output-to-Case	500			VDC	
Input-to-Output Capacitance		5600		pF	
Input-to-Output Resistance	10			M ohm	500V

uV300-12-164LF

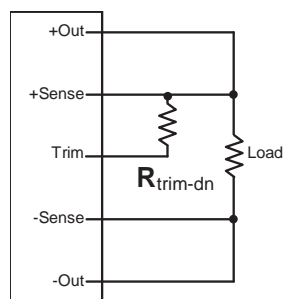
300 VDC Input / 300 Watts / 3/4 Brick



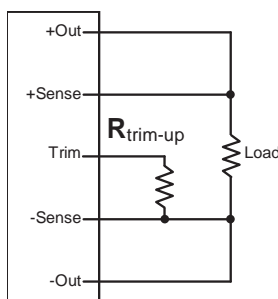
ELECTRICAL SPECIFICATIONS Continued

Control	Minimum	Typical	Maximum	Units	Conditions
Over Temperature Shutdown Temp (Tc)		105		°C	
Over Temperature Restart Temp (Tc)		85		°C	
Start-up Voltage		175	200	VDC	
Input Under Voltage Lock Out		130		VDC	
Turn-on Time		18	30	msec	220 < Vin < 400V, Tc = 25°C
			40	msec	220 < Vin < 400V, -40°C < Tc < +100°C
Logic On/Off Enable Signal		Open		VDC	Positive Logic, open collector enables. Do not pull up.
Logic On/Off Disable Signal			0.6	VDC	I On/Off = 1mA
Logic On/Off Turn-on Time		5	10	msec	
Trim Range	10.8		13.2	VDC	See Trim Formula and Diagrams
OVP Trip Point	14.7	14.9	15.8	VDC	Non-shutdown, Auto Recovery, Iout = 50% Rated
Remote Sense Compensation			0.5	VDC	
Current Sharing (Parallel Operation)		5		%	Using Parallel Pin Connection or PDM
Switching Frequency		370		KHz	Standard Model
		300		KHz	-S Sync Option Model
Switching 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 4.6 (12.7 x 61.0 x 91.4)		in (mm)	3/4 Brick, See Outline Drawing
Weight		5.7 (161)		oz. (g)	

TRIM



Trim Down



Trim Up

$$R_{\text{trim-up}} = \frac{29.01\text{K}\Omega}{\Delta V}$$

$$R_{\text{trim-down}} = \frac{203.0 - 19.34\Delta V}{\Delta V} \text{ K}\Omega$$

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

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

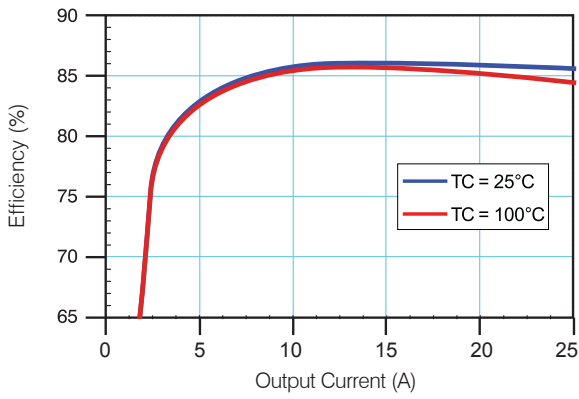
$R_{\text{trim-down}}$ = External Resistor Value to Decrease V_{out}

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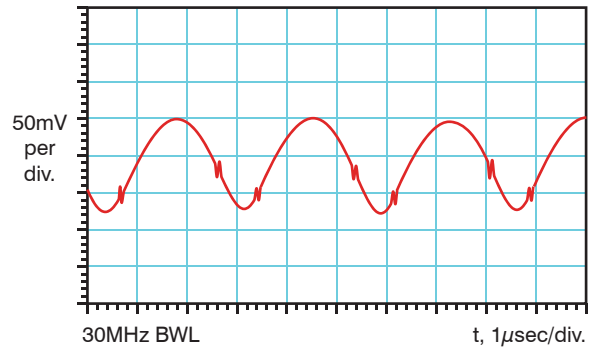
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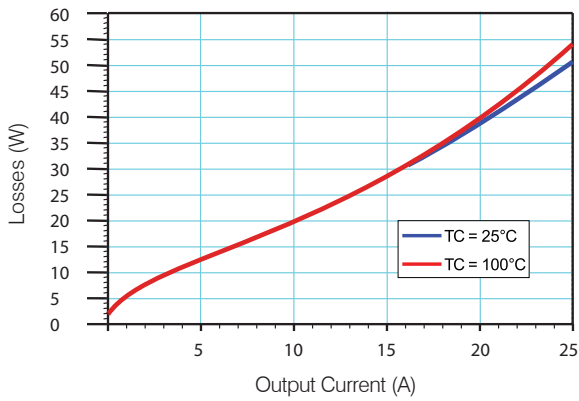
EFFICIENCY VS. LOAD, $V_{in}=300V$



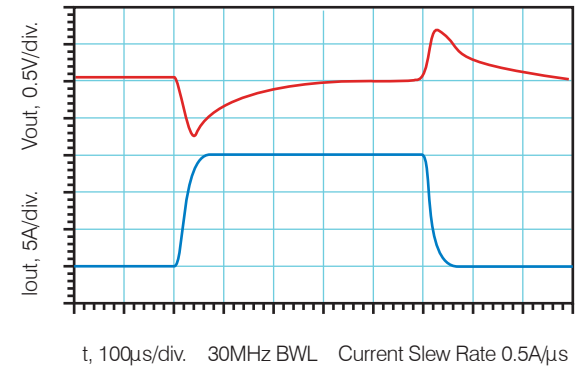
OUTPUT RIPPLE, $V_{in}=300V, I_{out}=25A, T_c=25^\circ C$



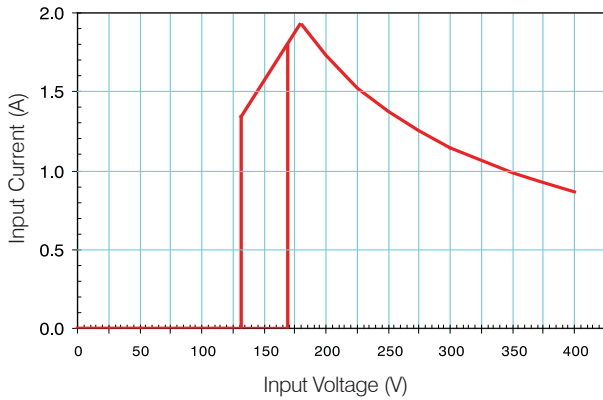
LOSSES VS. LOAD, $V_{in}=300V$



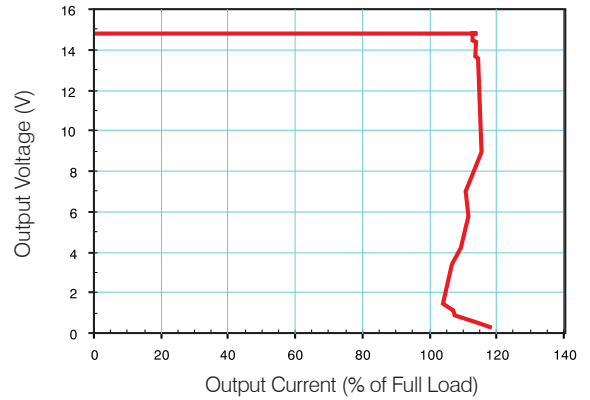
TRANSIENT RESPONSE, $V_{in}=300V, I_{out}=5A-20A-5A, T_c=25^\circ C$



INPUT CHARACTERISTIC, $I_{out} = 25A, T_c=25^\circ C$



OUTPUT CHARACTERISTIC, $V_{in}=300V, T_c=25^\circ C$

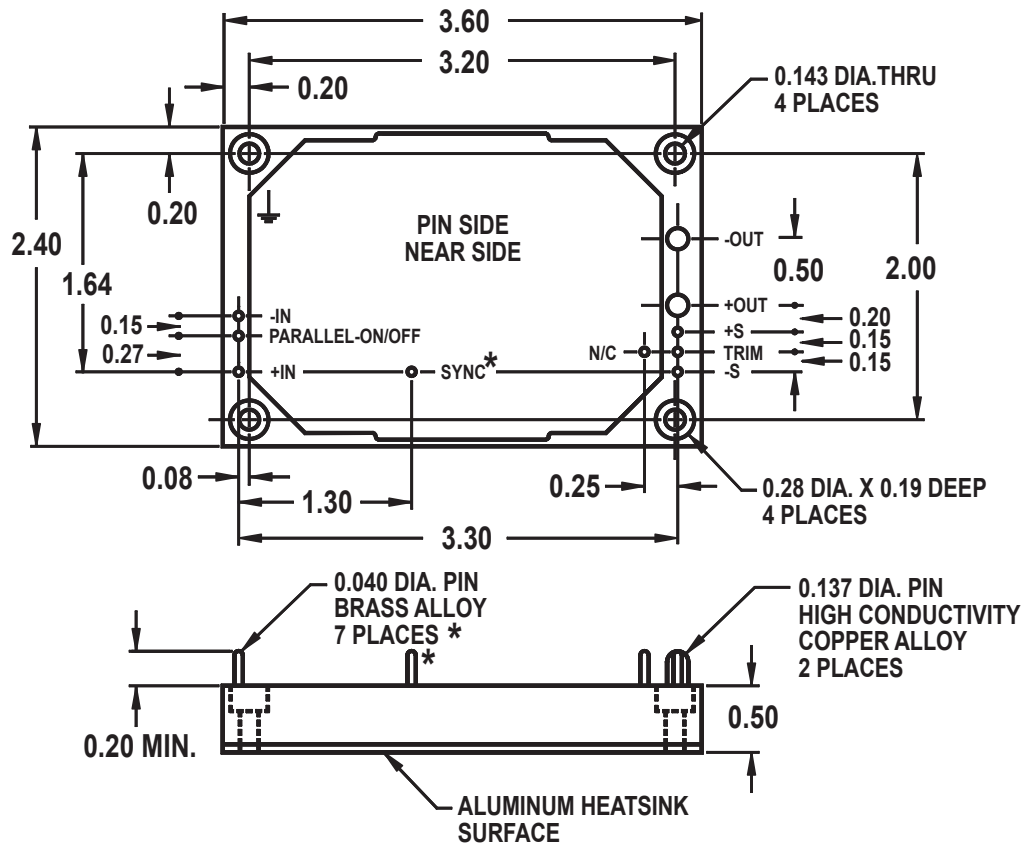


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OUTLINE DRAWING Dimensions in Inches



NOTE:
Pin finish is gold over nickel, JESD97
2nd level interconnect category e4.
* 8 places when ordering sync option.
Location of optional sync pin shown.

NOTES

REV 080320-A