

# VKA150MS

## 150 Watt Single Output Half Brick DC/DC Converter



- 33 - 75V Input Range
- High Efficiency: 85% Typical at 5V
- 100µS Transient Response 50-100% Load Step
- 420 kHz Fixed-Frequency Operation
- Remote Sense
- UL/CUL 1950, VDE EN60950
- Operation to +100°C Baseplate Temperature
- Primary Remote On/Off, Choice of Pos/Neg Logic
- Adjustable Output Voltage
- Continouot Short-Circuit Protection
- Thermal Shutdown
- Case Ground Pin

The VKA150MS Series DC/DC converters present an economical and practical solution for distributed power system architectures which require high power density and efficiency while maintaining system modularity and upgradeability. With the ability to operate over a wide input voltage range of 33 to 75 volts, these

modules are ideal for use in battery backup applications common in today's telecommunication and electronic data processing applications. The output is fully isolated from the input, allowing for a variety of polarity and grounding configurations.

The VKA150MS's proprietary control circuitry responds to 50-

100% load steps in 100µSeconds to within 1% nominal Vout.

The patented fixed frequency architecture combined with surface mount technology results in a compact, efficient and reliable solution to DC/DC conversion requirements. Safety approvals per UL/CUL 1950, EN 60950

### PRODUCT SELECTION CHART

MODEL	INPUT VOLTAGE	VOUT (VDC)	IOUT (A)	EFFICIENCY	
				MIN	TYP
VKA150MS05	48VDC	5.0V	30.0	84	85
VKA150MS12	48VDC	12.0V	12.5	88	89
VKA150MS15	48VDC	15.0V	10.0	88	89
VKA150MS24	48VDC	24.0V	6.25	89	90

ORDERING INFORMATION

**VKA150 MSzz -**

Device Family \_\_\_\_\_  
Indicates 150 Watt Regulated Unit

Model Number \_\_\_\_\_  
Selected from Table of Electrical Characteristics

Where:  
zz = Output Voltage (05=5V, 12=12V, 15=15V, etc.)

Lead Length \_\_\_\_\_  
0.200" - No Number  
0.145" - (6)  
0.110" - (8)

Remote On-Off Logic: \_\_\_\_\_  
Positive - No Number  
Negative - (1)

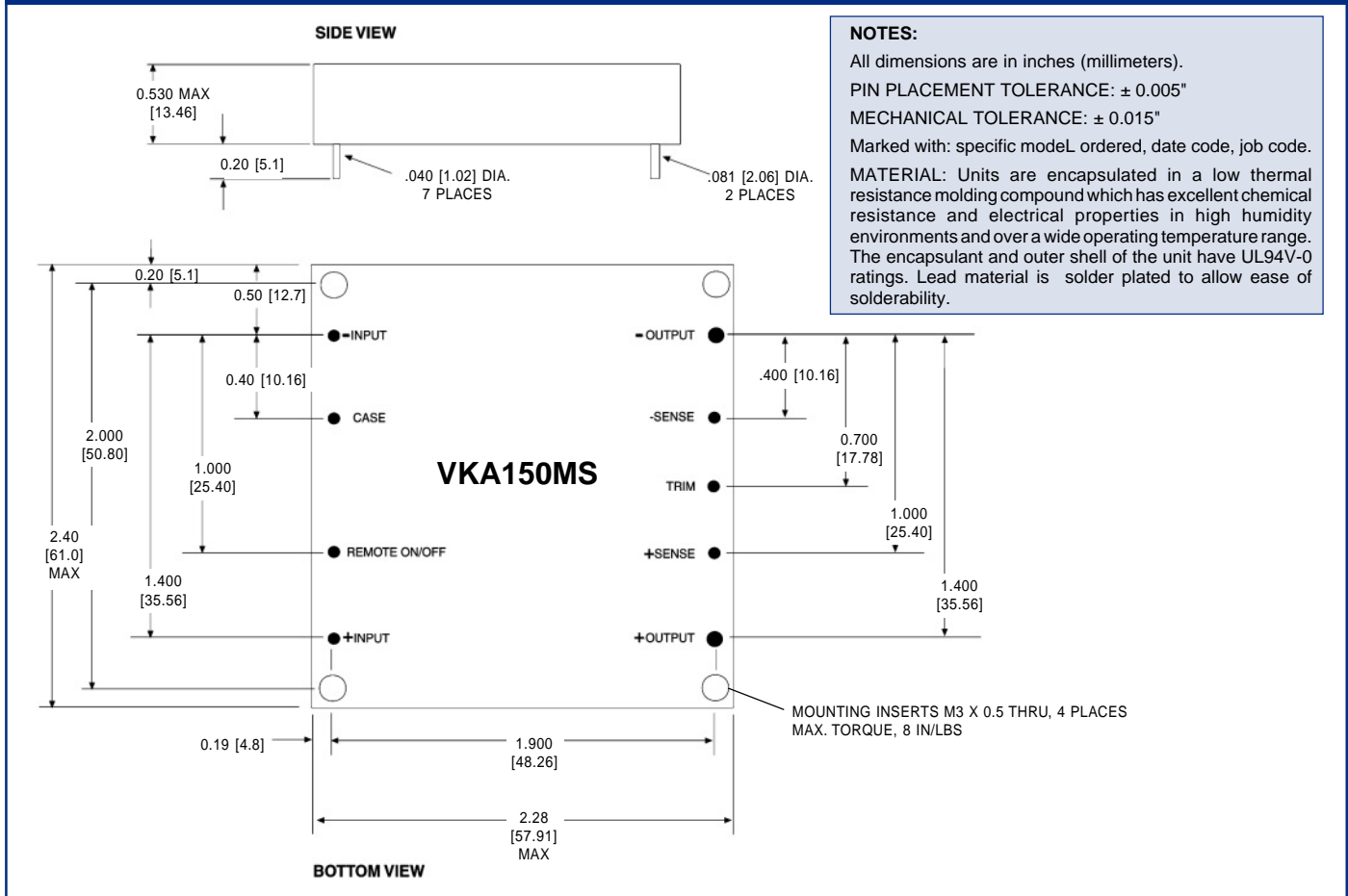
# SPECIFICATIONS, ALL MODELS

Specifications are at  $T_{CASE} = +40^{\circ}\text{C}$  Nominal Input Voltage unless otherwise specified.

	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>INPUT</b>	<b>INPUT</b>					
	Voltage Range			48	75	V <sub>DC</sub>
	Maximum Input Current	V <sub>IN</sub> = 30V <sub>DC</sub>			6.6	A
	Reflected Ripple Current	Peak - Peak			550	mA
	Input Ripple Rejection	DC to 1KHz	50	60		dB
	No Load Input Current MS			100		mA
	Power Dissipation MS					
	No Load			4.8		W
	Standby, Primary On/Off Disabled MS			0.4		W
	Inrush Charge	V <sub>IN</sub> = V <sub>INmax</sub>			0.360	mC
Quiescent Operating Current			8	12	mA	
Primary On/Off Disabled						
<b>OUTPUT</b>	<b>PARAMETER</b>					
	<b>CONDITIONS</b>					
	<b>MIN</b>					
	<b>TYP</b>					
	<b>MAX</b>					
	<b>UNITS</b>					
	<b>OUTPUT</b>					
	Rated Power				150	W
	Set point Accuracy				1	%
	Line Regulation	High Line to Low Line		0.02	0.05	%
Load Regulation	No Load to Rated Load		0.2	0.5	%	
Output Temperature Drift			±0.2	±0.5	%/°C	
Output Ripple, p-p	DC to 20MHz BW			1.5%	V <sub>OUT, Nom</sub>	
Output Current Limit Inception		105%		130%	I <sub>OUT, Nom</sub>	
Output Short-Circuit Current		120%		135%	I <sub>OUT, Nom</sub>	
Output Overvoltage Limit		120%		140%	V <sub>OUT, Nom</sub>	
Transient Response	50 to 100% Load Step					
Peak Deviation	di/dt = 0.1A/μSec		2	3%	V <sub>OUT, Nom</sub>	
Settling Time	V <sub>OUT</sub> , 1% of Nominal Output		75	100	μSec	
<b>GENERAL</b>	<b>PARAMETER</b>					
	<b>CONDITIONS</b>					
	<b>MIN</b>					
	<b>TYP</b>					
	<b>MAX</b>					
	<b>UNITS</b>					
	<b>ISOLATION</b>					
	Input to Output	Peak Test for 2 Seconds	1500			V <sub>DC</sub>
	Input to Baseplate		1500			V <sub>DC</sub>
	Output to Baseplate		500			V <sub>DC</sub>
Resistance		10			MΩ	
Capacitance			2000		pF	
Leakage Current	V <sub>ISO</sub> = 240V <sub>AC</sub> , 60Hz		180		μA, rms	
<b>GENERAL</b>						
Switching Frequency		400	420	440	KHz	
Remote Sense Compensation				0.5	V	
Output Voltage Adjust Range	5V		-40% / +10%		V <sub>OUT, Nom</sub>	
	12V		-50% / +10%		V <sub>OUT, Nom</sub>	
	15V		-50% / +10%		V <sub>OUT, Nom</sub>	
	24V		-50% / +10%		V <sub>OUT, Nom</sub>	
Remote On/Off Control Inputs						
Primary	Open Collector/Drain					
Sink Current-Logic Low				1.0	mA	
V <sub>low</sub>				0.4	V	
V <sub>high</sub>				Open Collector		
Turn-on Time	Within 1% of Rated Output		5.0	8.0	mSec	
Weight				3 (85)	oz (g)	
<b>TEMPERATURE</b>						
Operation/Specification	Case Temperature	-40	+25	+100	°C	
Storage	Case Temperature	-55	+25	+125	°C	
Shutdown Temperature	Case Temperature	+100		+115	°C	
Thermal Impedance, case-ambient			8.2		°C/W	
Lead Solder Temperature	10 Seconds max			+300	°C	

- NOTES:** (1) See Typical Performance Curves, page 3  
(2) Continuous Mode  
(3) See graphs for Efficiency vs. Output Load, V<sub>IN</sub>, T<sub>CASE</sub>  
(4) 3.3V Models Limited in Trim Down Range  
(5) Consult Factory for Details

# MECHANICAL



## OUTPUT ADJUST VOLTAGE

This feature allows the user to accurately adjust the module's output voltage set point to a specified level. This is achieved by connecting a resistor or potentiometer from the TRIM terminal to either the +Vout terminal (for increased Vout) or the -Vout terminal (for decreased Vout). The formulae below describe the trim resistor value to obtain a Vout change of Δ%. Vo is output voltage prior to adjustment (3.3V, 5V, 12V, 15V, or 24V).

$$R_{adj - up} = \left( \frac{V_o(100 + \Delta\%)}{1.225\Delta\%} - \frac{(100 + 2\Delta\%)}{\Delta\%} \right) k\Omega$$

$$R_{adj - down} = \left( \frac{100}{\Delta\%} - 2 \right) k\Omega$$

## OVP NOTE

Special attention should be given to the peak voltage deviation during a dynamic load step when trimming the output above the original set point to avoid tripping the overvoltage protection circuit. Should an OVP condition occur, the converter will go into a latch condition and must be externally reset before it will return to normal operation.

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