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VKA50xS

50 Watt Single Output Half Brick DC/DC Converter



- 18-36 V & 33 75V Input Range
- High Efficiency: 87% Typical at 5V
- 100μS Transient Response 50-100% Load Step
- 420 kHz Fixed-Frequency Operation
- Remote Sense

- Operation to +100°C Baseplate Temperature
- Primary Remote On/Off, Choice of Pos/Neg Logic
- Adjustable Output Voltage
- Continuout Short-Circuit Protection
- Thermal Shutdown
- Case Ground Pin

The VKA50xS 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 18 to 36 and 33 to 75 volts, these modules are

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

The VKA50xS's proprietary control circuitry responds to 50-100%

load steps in $100\mu Seconds$ to within 1% nominal Vout.

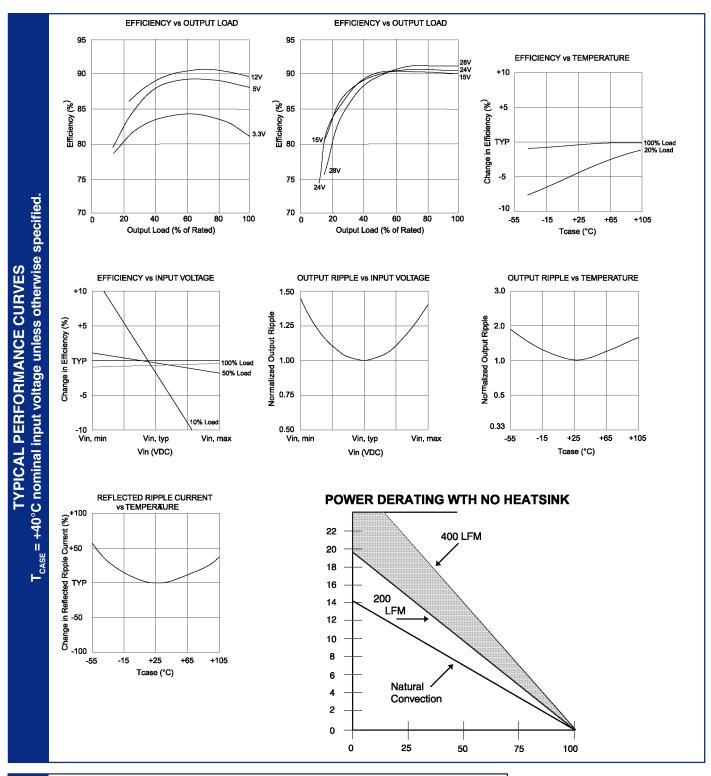
The patented fixed frequency architecture combined with surface mount technology results in a compact, efficient and reliable solution to DC/DC conversion requirements. Safety per UL1950, EN 60950 and CSA 22.2 #234

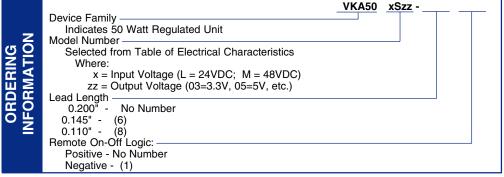
PRODUCT SELECTION CHART										
MODEL	INPUT VOLTAGE	VOUT (VDC)	IOUT (A)	EFFICIE MIN	TYP					
VKA50LS03		3.3V	10.0	80	81					
VKA50LS05	24VDC	5.0V	10.0	85	86					
VKA50LS12		12.0V	4.2	87	88					
VKA50LS15	(18-36)	15.0V	3.3	88	89					
VKA50LS24		24.0V	2.1	89	90					
VKA50MS03		3.3V	10.0	81	82					
VKA50MS05	48VDC	5.0V	10.0	86	87					
VKA50MS12		12.0V	4.2	88	89					
VKA50MS15	(33-75)	15.0V	3.3	89	90					
VKA50MS24		24.0V	2.1	89	90					

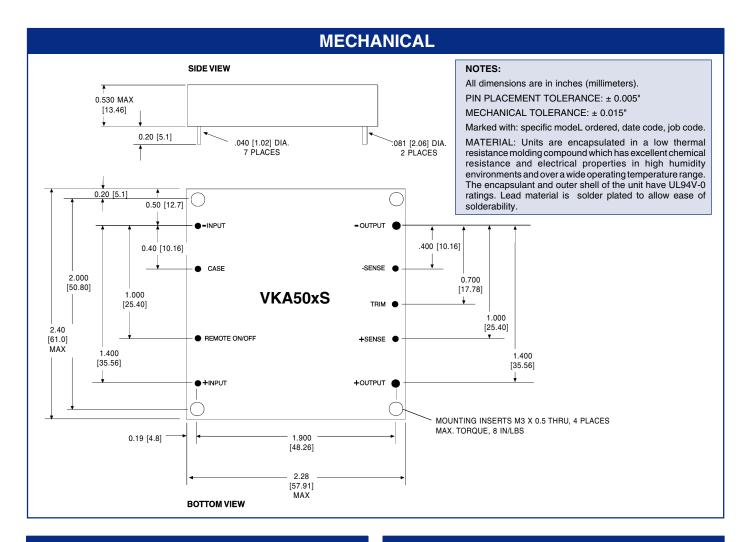
SPECIFICATIONS, ALL MODELS Specifications are at T_{CASE} = +40°C nominal input voltage unless otherwise specified.

	CASE - 1 IO	COMPUTIONS				
	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	INPUT					
	Voltage Range					
	VKA50LS		18	24	36	VDC
	VKA50MS		33	48	75	VDC
	Maximum Input Current			70	7.5	VDO
	VKA50LS	V _{IN} = 16VDC			3.7	Α
	VKA50MS	$V_{IN} = 10VDC$ $V_{IN} = 27VDC$			2.2	A A
	Reflected Ripple Current	Peak - Peak		20	2.2	mA
占	Input Ripple Rejection	DC to 1KHz	50	60		dB
7	No Load Input Current LS/MS	DC to TKHZ	50	50/100		mA
NPUT	Power Dissipation LS/MS			50/100		IIIA
	No Load			3.6/4.8		w
	Standby, Primary On/Off Disable	d L C/MC		0.18/0.4		W
	Inrush Charge	$V_{IN} = V_{IN} max.$		0.16/0.4		
	VKA50LS	$\mathbf{v}_{IN} = \mathbf{v}_{IN}max.$			0.520	mC
	VKA50LS VKA50MS					mC mC
	Quiescent Operating Current				0.360	mC
	, ,			0	40	^
	Primary On/Off Disabled			8	12	mA
	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	OUTPUT					
	Rated Power		0		50	W
	Set point Accuracy				1	%
	Line Regulation	High Line to Low Line		0.02	0.05	%
ᆫ	Load Regulation	No Load to Rated Load		0.02	0.05	%
	Output Temperature Drift			±.02		%/°C
Ė	Output Ripple, p-p	DC to 20MHz BW		1%		V_{OUT} , Nom
OUTPUT	Output Current Limit Inception				130%	I _{оит} , Nom
Ō	Output Short-Circuit Current (2)	test			110%	I _{OUT} , Nom
	Output Overvoltage Limit			125%	130%	V
	Transient Response	50 to 100% Load Step				
	Peak Deviation	di/dt = 1.0A/μSec		2%		V _{out} , Nom
	Settling Time	V _{OUT} , 1% of Nominal Output		100		μSec
	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	ISOLATION					
	Input to Output	Peak Test for 2 Seconds	1500			VDC
	Input to Baseplate		1500			VDC
	Output to Baseplate		500			VDC
	Resistance		10			MΩ
	Capacitance			2000		pF
	Leakage Current	V _{ISO} = 240VAC, 60Hz		180		μA, rms
	GENERAL	V _{ISO} = 2 10 V/10, 001 i2		100		μο τ, 11110
	Efficiency, Line, Load, Temp. (3)					
_	Switching Frequency		400	420	440	KHz
\exists	Remote Sense Compensation		100	120	0.5	V
2	Output Voltage Adjust Range	12V & higher(4)		-50% / +25%	0.0	V _{OUT} , Nom
**	Remote On/Off Control Inputs	12 V & Higher(1)		00707 12070		OUT, I COIII
۳	Primary	Open Collector/Drain				
GENERAL	Sink Current-Logic Low	Open Comoden/Brain			1.0	mA
G	Vlow				0.4	V
	Vhigh				Open Collector	·
	Turn-on Time	Within 1% of Rated Output		10.0	12.5	mSec
	Weight	Thim. 170 of Fiction Output		10.0	85 (3.0)	g (oz.)
	TEMPERATURE	+			33 (0.0)	9 (02.)
	Operation/Specification	Case Temperature	-40	+25	+100	°C
	Storage	Case Temperature Case Temperature	-55	+25	+125	°C
	Shutdown Temperature	Case Temperature	+100	120	+115	°C
	Thermal Impedance, case-ambient	- Case Temperature	FIOU	7.1	FIIO	°C/W
	Lead Solder Temperature	10 Seconds max		7.1	+300	°C
				1	1000	_

NOTES: (1) See Typical Performance Curves, page 3
(2) Continuous Mode
(3) See graphs for Efficiency vs. Output Load, V_{IN}, T_{CASE}
(4) 3.3V Models Limited in Trim Down Range
(5) Consult Factory for Details







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 $\Delta\%$. Vo is output voltage prior to adjustment (3.3V, 5V, 12V, 15V, or 24V).

Radj - up =
$$\left(\frac{\text{Vo}(100 + \Delta\%)}{1.225\Delta\%} - \frac{(100 + 2\Delta\%)}{\Delta\%}\right) k\Omega$$

Radj - 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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