

VKA100xS

100 Watt Single Output Half Brick DC/DC Converter



- 18-36V and 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 VKA100xS 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 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 VKA100xS'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 Per UL1950, EN 60950 and CSA 22.2 #234

PRODUCT SELECTION CHART

MODEL	INPUT VOLTAGE	VOUT (VDC)	IOUT (A)	EFFICIENCY	
				MIN	TYP
VKA100LS02	(18-36)	2.0V	20.0	75	76
VKA100LS02F		2.0V	30.0	73	74
VKA100LS2V5F		2.5V	30.0	75	76
VKA100LS03		3.3V	20.0	80	81
VKA100LS03F		3.3V	30.0	80	81
VKA100LS05		5.0V	20.0	85	86
VKA100LS12		12.0V	8.3	87	88
VKA100LS15		15.0V	6.7	88	89
VKA100LS24		24.0V	4.2	89	90
VKA100MS02	(33-75)	2.0V	20.0	76	77
VKA100MS02F		2.0V	30.0	74	75
VKA100MS2V5F		2.5V	30.0	77	78
VKA100MS03		3.3V	20.0	81	82
VKA100MS03F		3.3V	30.0	81	82
VKA100MS05		5.0V	20.0	86	87
VKA100MS12		12.0V	8.3	88	89
VKA100MS15		15.0V	6.7	89	90
VKA100MS24		24.0V	4.2	89	90

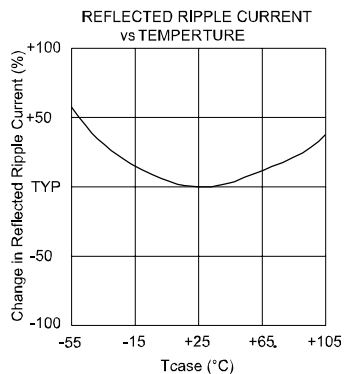
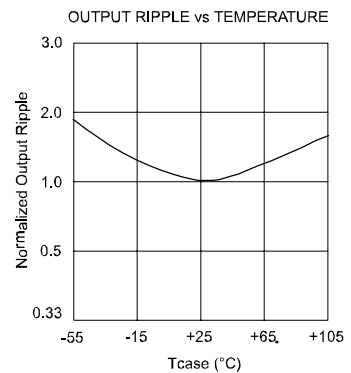
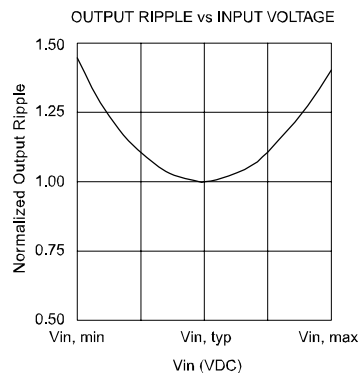
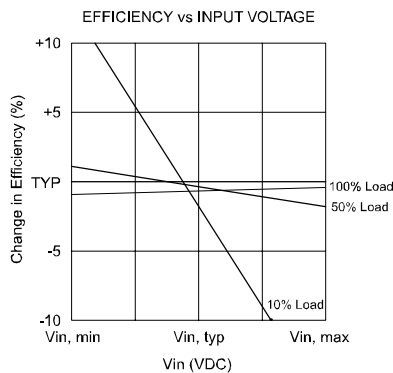
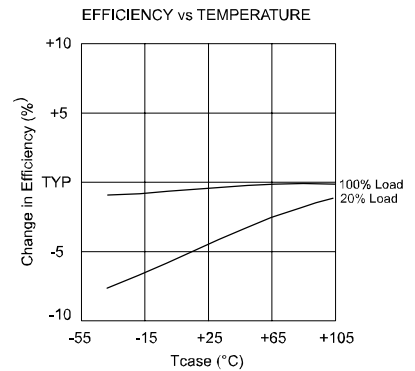
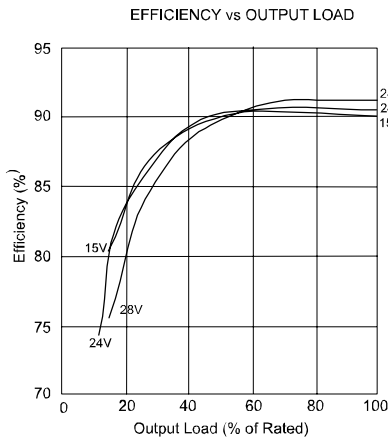
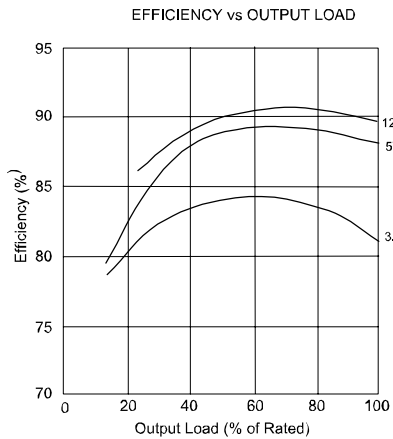
SPECIFICATIONS, ALL MODELS

Specifications are at $T_{CASE} = +40^{\circ}\text{C}$ nominal input voltage unless otherwise specified.

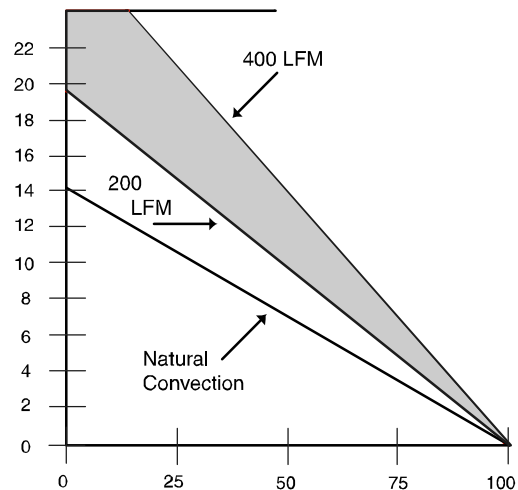
	INPUT					
	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT	INPUT					
	Voltage Range					
	VKA100LS		18	24	36	VDC
	VKA100MS		33	48	75	VDC
	Maximum Input Current					
	VKA100LS	$V_{IN} = 16\text{VDC}$			7.4	A
	VKA100MS	$V_{IN} = 27\text{VDC}$			4.4	A
	Reflected Ripple Current	Peak - Peak		20		mA
	Input Ripple Rejection	DC to 1KHz	50	60		dB
	No Load Input Current LS/MS			50/100		mA
	Power Dissipation LS/MS					
	No Load			3.6/4.8		W
	Standby, Primary On/Off Disabled LS/MS			0.18/0.4		W
	Inrush Charge	$V_{IN} = V_{IN\text{ max.}}$				
OUTPUT	VKA100LS				0.520	mC
	VKA100MS				0.360	mC
	Quiescent Operating Current			8	12	mA
	Primary On/Off Disabled					
	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	Rated Power		0		100	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			± 0.02		$^{\circ}\text{C}$
	Output Ripple, p-p	DC to 20MHz BW		1%		V_{OUT} , Nom
	Output Current Limit Inception			130%	150%	I_{OUT} , Nom
	Output Short-Circuit Current (2)	test		120%	150%	I_{OUT} , Nom
	Output Overvoltage Limit			125%	135%	V
GENERAL	Transient Response	50 to 100% Load Step				
	Peak Deviation	$di/dt = 0.1\text{A}/\mu\text{Sec}$		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			$\text{M}\Omega$
	Capacitance			2000		pF
	Leakage Current	$V_{ISO} = 240\text{VAC}, 60\text{Hz}$		180		$\mu\text{A}, \text{rms}$
	GENERAL					
	Efficiency, Line, Load, Temp. (3)					
	Switching Frequency		400	420	440	KHz
	Remote Sense Compensation				0.5	V
	Output Voltage Adjust Range	12 V & higher(4)		-50% / +25%		V_{OUT} , Nom
	Remote On/Off Control Inputs					
	Primary	Open Collector/Drain				
	Sink Current-Logic Low				1.0	mA
	Vlow				0.4	V
	Vhigh0				Open Collector	
	Turn-on Time	Within 1% of Rated Output		10.0	12.5	mSec
	Weight				85 (3.0)	g (oz.)
	TEMPERATURE					
	Operation/Specification	Case Temperature	-40	+25	+100	$^{\circ}\text{C}$
	Storage	Case Temperature	-55	+25	+125	$^{\circ}\text{C}$
	Shutdown Temperature	Case Temperature	+100		+115	$^{\circ}\text{C}$
	Thermal Impedance, case-ambient			7.1		$^{\circ}\text{C}/\text{W}$
	Lead Solder Temperature	10 Seconds max			+300	$^{\circ}\text{C}$

- 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

TYPICAL PERFORMANCE CURVES T_{CASE} = +40°C nominal input voltage unless otherwise specified.



POWER DERATING WTH NO HEATSINK



ORDERING INFORMATION

Device Family VKA100 xSzz -

Indicates 100 Watt Regulated Unit

Model Number _____

Selected from Table of Electrical Characteristics

Where:

x = Input Voltage (L = 24VDC; M = 48VDC)

zz = Output Voltage (03=3.3V, 05=5V, etc.)

Lead Length _____

0.200" - No Number

0.145" - (6)

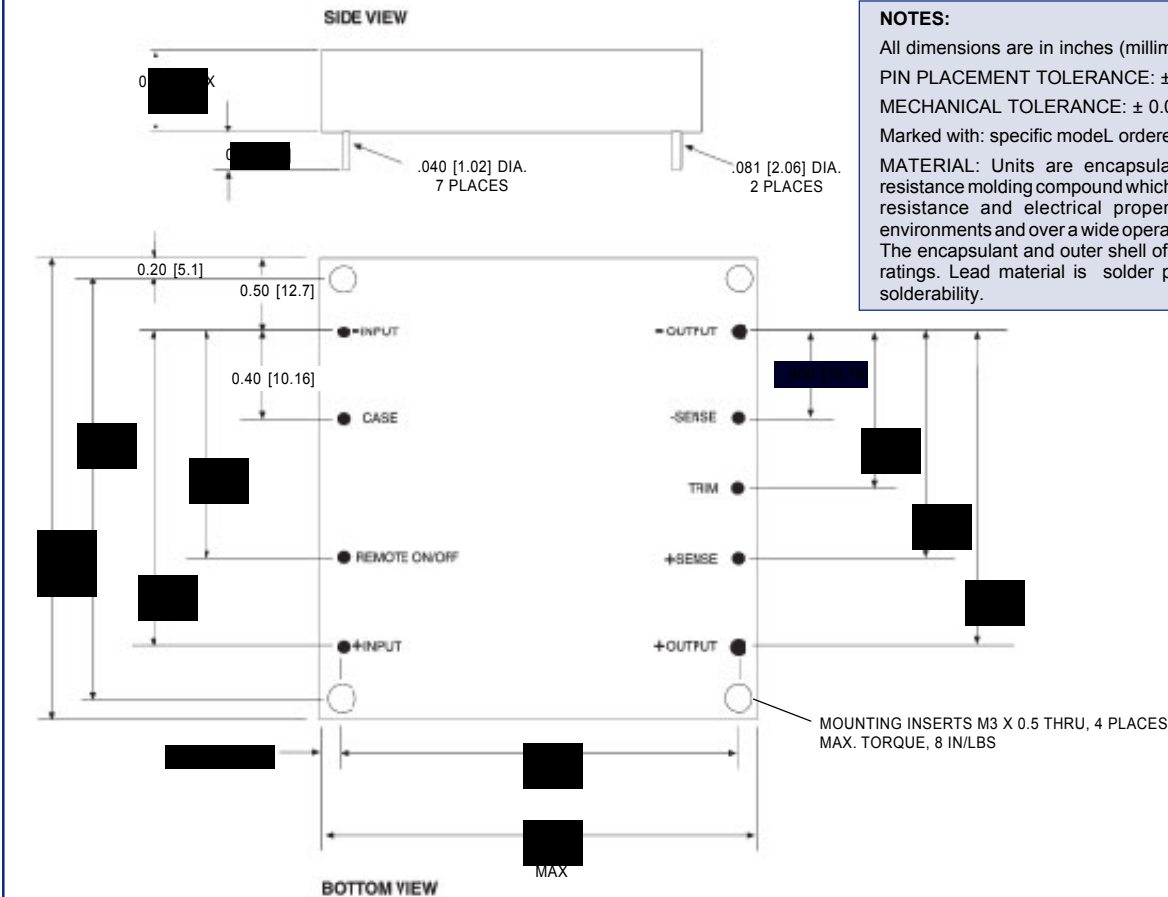
0.110" - (8)

Remote On-Off Logic: _____

Positive - No Number

Negative - (1)

MECHANICAL



NOTES:

All dimensions are in inches (millimeters).

PIN PLACEMENT TOLERANCE: ± 0.005 "

MECHANICAL TOLERANCE: ± 0.015 "

Marked with: specific model, ordered, date code, job code.

MATERIAL: Units are encapsulated in a low thermal resistance molding compound which has excellent chemical resistance and electrical properties in high humidity environments and over a wide operating temperature range. The encapsulant and outer shell of the unit have UL94V-0 ratings. Lead material is solder plated to allow ease of solderability.

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

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

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

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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