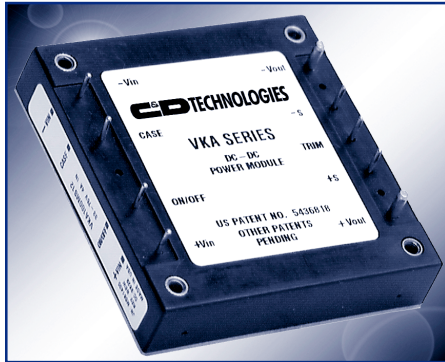


VKA100xS

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
- Continouout 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 | | 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 | 24VDC | 5.0V | 20.0 | 85 | 86 |
| VKA100LS12 | | 12.0V | 8.3 | 87 | 88 |
| VKA100LS15 | (18-36) | 15.0V | 6.7 | 88 | 89 |
| VKA100LS24 | | 24.0V | 4.2 | 89 | 90 |
| VKA100MS02 | | 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 | 48VDC | 5.0V | 20.0 | 86 | 87 |
| VKA100MS12 | | 12.0V | 8.3 | 88 | 89 |
| VKA100MS15 | (33-75) | 15.0V | 6.7 | 89 | 90 |
| VKA100MS24 | | 24.0V | 4.2 | 89 | 90 |

SPECIFICATIONS, ALL MODELS

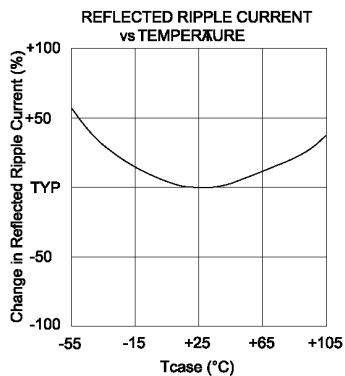
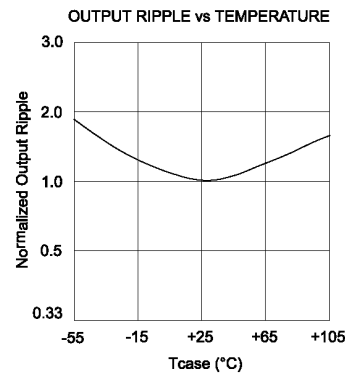
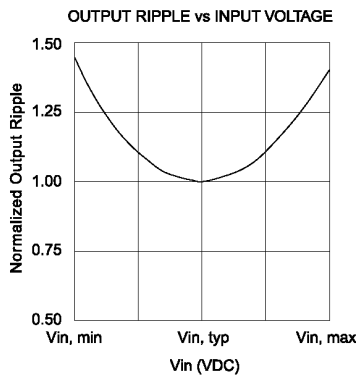
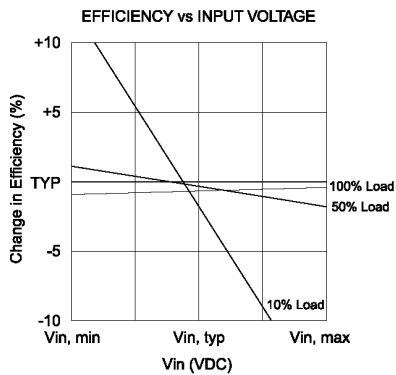
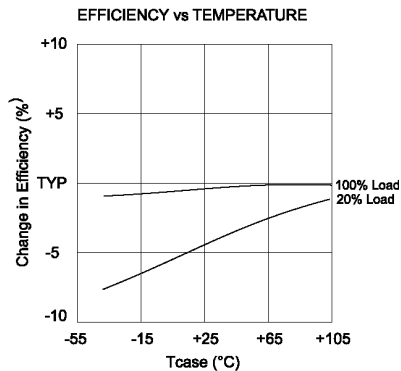
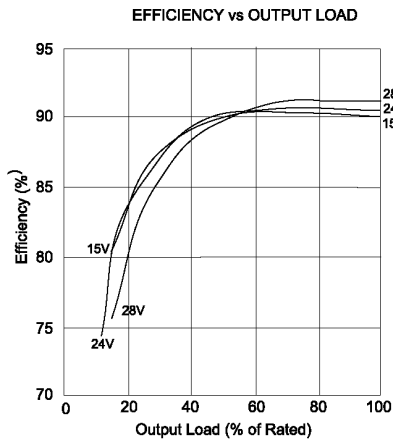
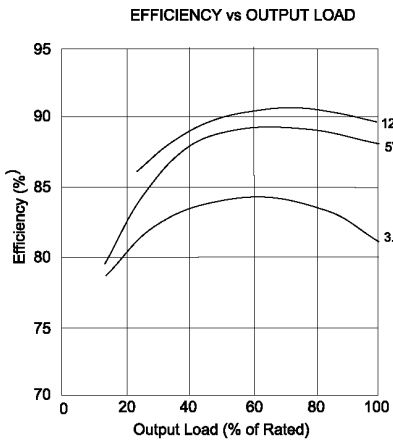
Specifications are at $T_{CASE} = +40^{\circ}C$ nominal input voltage unless otherwise specified.

| | PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------------------|--|---------------------------|------|-------------|----------------|----------------|
| INPUT | INPUT | | | | | |
| | Voltage Range | | | | | |
| | VKA100LS | | 18 | 24 | 36 | VDC |
| | VKA100MS | | 33 | 48 | 75 | VDC |
| | Maximum Input Current | | | | | |
| | VKA100LS | $V_{IN} = 16VDC$ | | | 7.4 | A |
| | VKA100MS | $V_{IN} = 27VDC$ | | | 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 | $V_{IN} = V_{IN} max.$ | | | | |
| VKA100LS | | | | 0.520 | mC | |
| VKA100MS | | | | 0.360 | mC | |
| Quiescent Operating Current | | | 8 | 12 | mA | |
| Primary On/Off Disabled | | | | | | |
| OUTPUT | 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 | | 0.02 | 0.05 | % |
| | Output Temperature Drift | | | ± 0.02 | | %/ $^{\circ}C$ |
| | Output Ripple, p-p | DC to 20MHz BW | | 1% | | V_{OUT}, Nom |
| | Output Current Limit Inception | | | | 130% | I_{OUT}, Nom |
| | Output Short-Circuit Current (2) | test | | | 110% | I_{OUT}, Nom |
| Output Overvoltage Limit | | | 125% | 135% | V | |
| Transient Response | 50 to 100% Load Step | | | | | |
| Peak Deviation | $di/dt = 0.1A/\mu Sec$ | | 2% | | V_{OUT}, Nom | |
| Settling Time | $V_{OUT}, 1\%$ of Nominal Output | | 100 | | μSec | |
| GENERAL | 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 | | | $M\Omega$ |
| | Capacitance | | | 2000 | | pF |
| | Leakage Current | $V_{ISO} = 240VAC, 60Hz$ | | 180 | | $\mu A, rms$ |
| | 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 | $^{\circ}C$ | |
| Storage | Case Temperature | -55 | +25 | +125 | $^{\circ}C$ | |
| Shutdown Temperature | Case Temperature | +100 | | +115 | $^{\circ}C$ | |
| Thermal Impedance, case-ambient | | | 7.1 | | $^{\circ}C/W$ | |
| Lead Solder Temperature | 10 Seconds max | | | +300 | $^{\circ}C$ | |

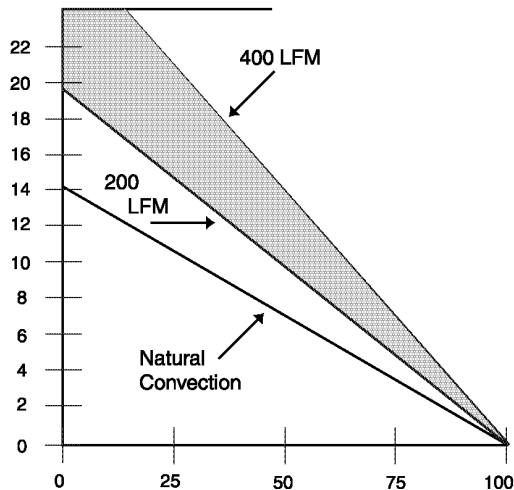
- NOTES:** (1) See Typical Performance Curves, page 3
 (2) Continuous Mode
 (3) See graphs for Efficiency vs. Output Load, V_{IN}, T_{CASE}
 (4) 3.3V Models Limited in Trim Down Range
 (5) Consult Factory for Details

TYPICAL PERFORMANCE CURVES

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



POWER DERATING WITH 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)

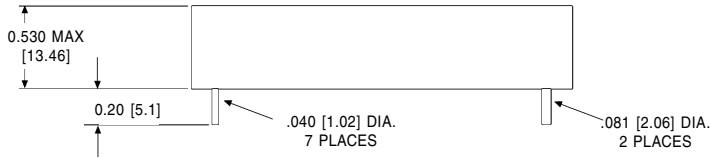
Remote On-Off Logic: _____

Positive - No Number

Negative - (1)

MECHANICAL

SIDE VIEW



NOTES:

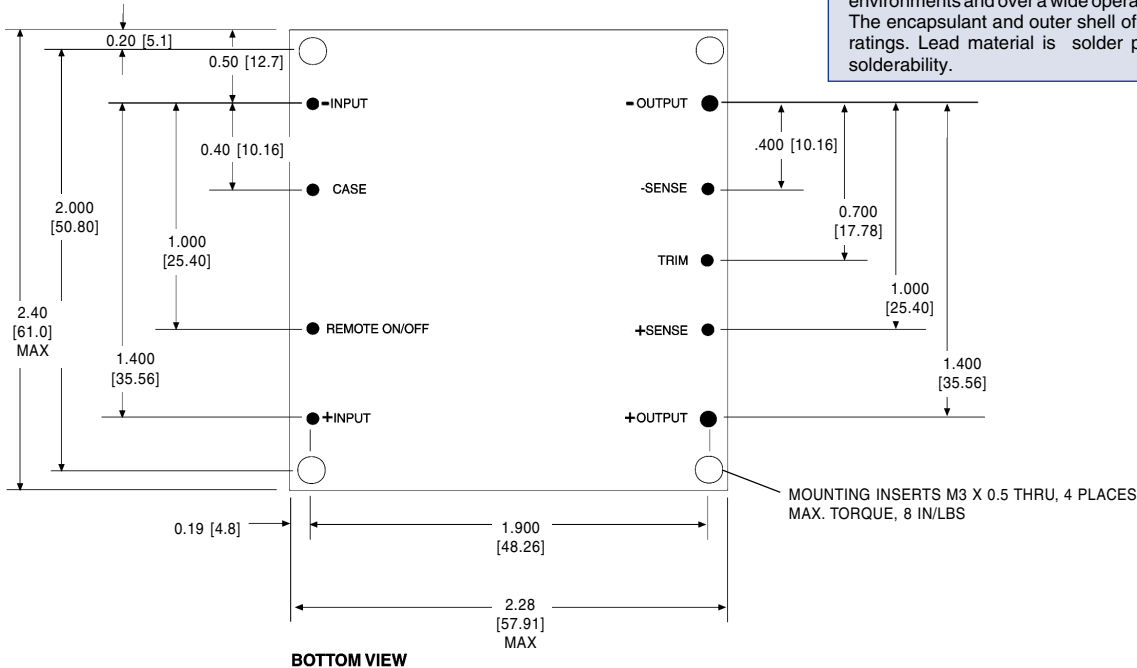
All dimensions are in inches (millimeters).

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.



BOTTOM VIEW

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 +V_{out} terminal (for increased V_{out}) or the -V_{out} terminal (for decreased V_{out}). The formulae below describe the trim resistor value to obtain a V_{out} change of Δ%. V_o 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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