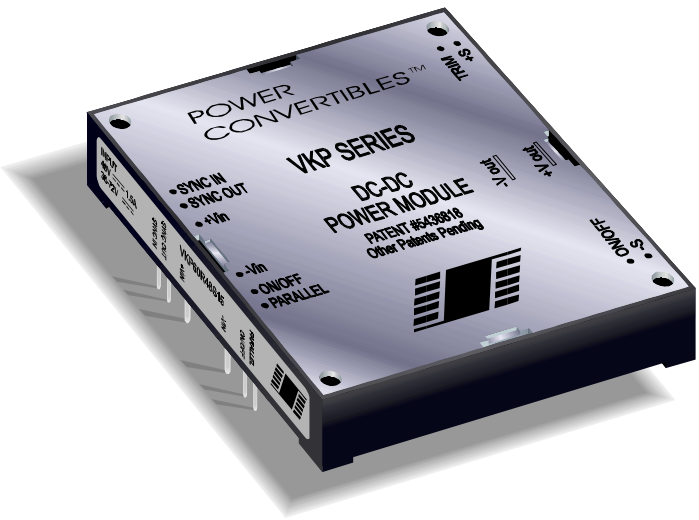
C&D TECHNOLOGIES

Product Data Sheet

SINGLE OUTPUT 60 WATT DC/DC CONVERTER

VKP60MS Series



FEATURES

- 36 - 72V INPUT RANGE
- SMALL SIZE: 2.3" X 2.4" X 0.500"
- HIGH EFFICIENCY: 88% TYPICAL AT 5V
- FIXED-FREQUENCY OPERATION
- OPERATION TO +100°C BASEPLATE TEMPERATURE
- PRIMARY & SECONDARY REMOTE ON/OFF
- SYNCHRONIZATION INPUT/OUTPUT
- ADJUSTABLE OUTPUT VOLTAGE
- REMOTE SENSE
- PARALLEL/LOAD SHARING CAPABILITY
- CONFORMS TO SAFETY PER UL1950, EN 60950 AND CSA 22.2 #234

APPLICATIONS

- DISTRIBUTED POWER ARCHITECTURES
- TELECOMMUNICATIONS
- BATTERY POWERED SYSTEMS
- WORKSTATIONS

DESCRIPTION

The VKP60MS 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 36 to 72 volts, these modules are ideal for telecommunications and battery backup applications where input flexibility must be combined with output voltage regulation. In addition, the outputs are fully isolated from the inputs, allowing for a variety of polarity and grounding configurations.

Innovative circuit design using surface mount components results in a compact, efficient and reliable solution to DC/DC conversion needs. Internal power dissipation is minimized by the VKP60MS Series' high efficiency and is aided by a metal baseplate, to which all heat dissipative elements are attached. Through holes are also provided to simplify unit mounting or the addition of a heatsink for high temperature applications.

The control circuitry of the VKP60MS Series has been designed to provide overvoltage protection as well as current limiting for continuous short-circuit protection. All VKP60MS models are operation specified from rated load to zero load.

3400 E Britannia Drive ● Tucson, Arizona 85706 ● Phone: 520.295.4100 ● Fax: 520.770.9369 ● Internet: http://www.cdpowerelectronics.com

ELECTRICAL SPECIFICATIONS

Specifications typical at T_{CASE} = +40°C, nominal input voltage, rated output current unless otherwise specified.

MODEL	NOMINAL INPUT VOLTAGE (VDC)	RATED OUTPUT VOLTAGE (VDC)	RATED OUTPUT CURRENT (A)	INPUT CURRENT TYP (A)	INPUT CURRENT MAX (A)	EFFICIENCY (1) MIN (%)	EFFICIENCY (1) TYP (%)
VKP60MS03	48	3.3	18	1.47	2.00	83	84
VKP60MS05	48	5	12	1.42	1.92	87	88
VKP60MS12	48	12	5	1.39	1.88	89	90
VKP60MS15	48	15	4	1.37	1.86	90	91
VKP60MS24	48	24	2.5	1.37	1.86	90	91
VKP60MS28	48	28	2.2	1.41	1.90	90	91

COMMON SPECIFICATIONS

Specifications typical at T_{CASE} = +40°C, nominal input voltage, rated output current unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT					
Voltage Range		36	48	72	VDC
Reflected Ripple Current (2)	Peak - Peak		220		mA
Reflected Ripple Current (3)	Peak - Peak		10		mA
Input Ripple Rejection	DC to 1KHz	50	60		dB
No Load Input Current			40		mA
Power Dissipation					
No Load			2		W
Standby, Primary On/Off Disabled			0.25		W
Standby, Second On/Off Disabled			0.5		W
Maximum Input Current	Rated Load, Low Input Line			2	A
Inrush Charge	V_{IN} = 72VDC			0.37	mC
Quiescent Operating Current					
Primary On/Off Disabled			5	7	mA
Secondary On/Off Disabled			10	14	mA
OUTPUT					
Rated Power		0		60	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			±.02		%/°C
Output Ripple, p-p (4)	DC to 20MHz BW		1%		V_{OUT}, Nom
Output Current Limit Inception				125%	I_{OUT}, Nom
Output Short-Circuit Current (5)				100%	I_{OUT}, Nom
Output Overvoltage Limit	3.3V Output	4		5	V
	5V Output			6.6	V
	All Other Outputs		125%	130%	V_{OUT}, Nom
Transient Response	50 to 100% Load Step				
Peak Deviation	di/dt = 75A/µSec			5%	V_{OUT}, Nom
Settling Time	V_{OUT}, 1% of Nominal Output		35	50	µSec
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					
Efficiency, Line, Load, Temp. (6)					
Switching Frequency		390	400	415	KHz
Remote Sense Compensation				0.5	V
Output Voltage Adjust Range (7)			±10%		V_{OUT}, Nom
Remote On/Off Control Inputs					
Primary	Open Collector/Drain				
Sink Current-Logic Low				2.5	mA
Vlow				1	V
Vhigh				6	V
Secondary (8)	Open Collector/Drain				
Sink Current-Logic Low				600	µA
Vlow				0.7	V
Vhigh				2	V
Turn-on Time	Within 1% of Rated Output		2.5	4	mSec
External Synchronization Input (8)					
Frequency		350	400	450	KHz
Pulse Width	See Figure 7 of Feature Characteristics	350	400	450	nSec
Input High Voltage		4		5	V
Input Low Voltage		0		1	V
Input Impedance			470		Ω
Weight				85 (3.0)	g (oz.)

( ) See NOTES on page 3.

COMMON SPECIFICATIONS (cont.)

Specifications typical at T_{CASE} = +40°C, nominal input voltage, rated output current unless otherwise specified.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
TEMPERATURE					
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

NOTES:

(1) See Typical Performance Curves, page 5
(2) See Design Considerations, figure 11
(3) See Design Considerations, figure 12
(4) See Design Considerations, figure 10
(5) Continuous Mode
(6) See graphs for Efficiency vs. Output Load, V_{IN}, T_{CASE}
(7) 3.3, 5V Models Limited in Trim Down Range
(8) Available only on package "A"

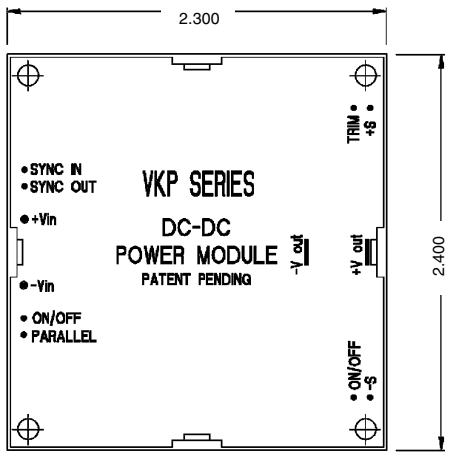
ORDERING INFORMATION

VKP60 xyzz A/B 1 /H

Device Family
Indicates 60 Watt Regulated Unit
Model Number
Selected from Table of Electrical Characteristics
Where: x = Input Voltage (M = 48VDC)
y = Number of Outputs (Single "S")
zz = Output Voltage
Package Option
A or B (See Mechanical Section)
Primary Remote On/Off Logic
"No Number" Pos Logic, "1" Neg Logic
Screening Option

MECHANICAL PACKAGE/PINOUT "A"

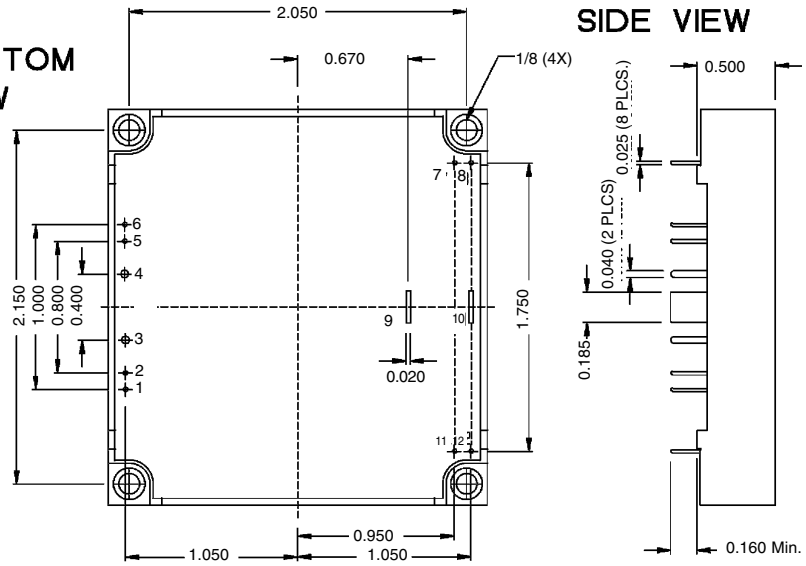
TOP VIEW



PIN CONNECTIONS	
1	SYNC IN
2	SYNC OUT
3	+VIN
4	-VIN
5	PRIMARY ON/OFF
6	PARALLEL
7	SEC. ON/OFF
8	-S
9	-VOUT
10	+VOUT
11	TRIM
12	+S

BOTTOM VIEW

SIDE VIEW

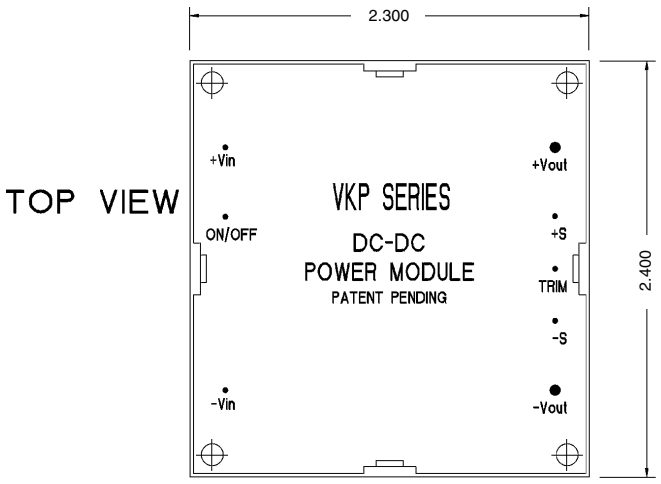


NOTES:
All dimensions are in inches.
PIN PLACEMENT TOLERANCE: ± 0.005"
MECHANICAL TOLERANCE: ± 0.015"
Marked with: specific model ordered, date code, job code.

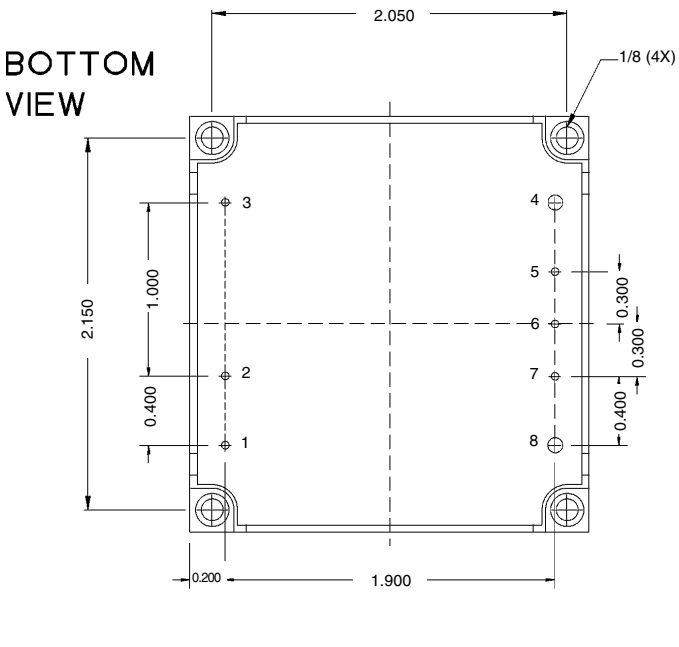
ABSOLUTE MAXIMUM RATINGS

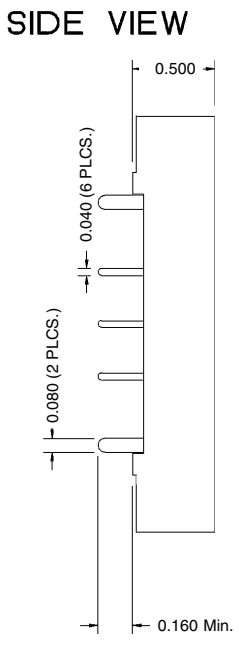
Output Short-Circuit Duration	Continuous
Internal Power Dissipation	12 Watts
Lead Temperature (soldering, 10 seconds max	+300°C
Maximum Baseplate Temperature	+100°C
Continuous Input Voltage	72 VDC
Storage Temperature	+125°C
Input to Output Isolation Voltage	1500 VDC

MECHANICAL PACKAGE/PINOUT "B"



PIN CONNECTIONS	
1	+VIN
2	ON/OFF
3	-VIN
4	-VOUT
5	-S
6	TRIM
7	+S
8	+VOUT





NOTES:

All dimensions are in inches.

PIN PLACEMENT TOLERANCE: ± 0.005"

MECHANICAL TOLERANCE: ± 0.015"

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