

VK-6W Series

6W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 84%
- -40 ~ 85°C Operation Temperature Range



The VK series is a family of cost effective 6.0W single & dual output DC-DC converters. These converters are consisted with Nickel-coated copper in a 24-pin DIL package with high performance features such as 1500 VDC ~ 3500VDC input/output isolation voltage, continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 24 and 48 with output voltage of 3.3, 5, 7.2, 9, 12, 15, 18, 24, ± 3.3 , ± 5 , ± 7.2 , ± 9 , ± 12 , ± 15 , ± 18 and ± 24 Vdc. High performance features include high efficiency operation up to 84% and output voltage accuracy of $\pm 1\%$ maximum.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

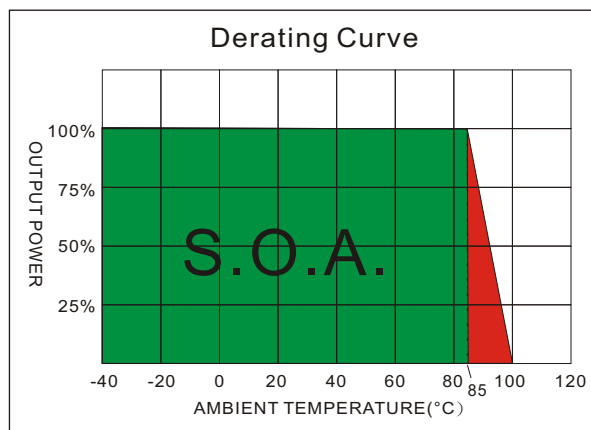
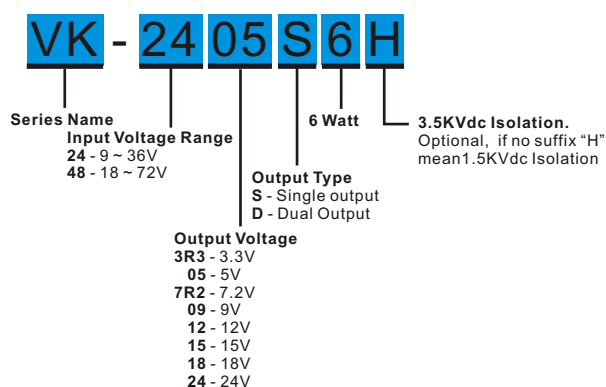
OUTPUT SPECIFICATIONS		EMC SPECIFICATIONS		
Voltage accuracy	$\pm 1\%$	Radiated Emissions	EN55032	CLASS A
Line regulation	$\pm 0.5\%$	Conducted Emissions (4)	EN55032	CLASS A
Load regulation	$\pm 0.5\%$	ESD	IEC 61000-4-2	Perf. Criteria A
(Output 3.3V / ± 3.3 V Model)	$\pm 1.5\%$	RS	IEC 61000-4-3	Perf. Criteria A
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk	EFT	IEC 61000-4-4	Perf. Criteria A
Short circuit protection	Indefinite(Automatic Recovery)	Surge (5)	IEC 61000-4-5	Perf. Criteria A
Temperature coefficient	$\pm 0.02\%/^{\circ}\text{C}$	CS	IEC 61000-4-6	Perf. Criteria A
Capacitor load(2)	See table	PFMF	IEC 61000-4-8	Perf. Criteria A

INPUT SPECIFICATIONS		PHYSICAL SPECIFICATIONS	
Voltage Range	See table	Case Material	Nickel-coated Copper
Max. Input Current	See table	Pin Material	$\Phi 0.5\text{mm}$ Brass Solder-coated
No-Load Input Current	See table	Potting Material	Epoxy (UL94V-0 rated)
Input Filter	PI Type	Weight	17.0g
Input Reflected Ripple Current(3)	35mA pk-pk	Dimensions	1.25"x0.8"x0.4"

GENERAL SPECIFICATIONS		ENVIRONMENT SPECIFICATIONS	
Efficiency	See table, typ	Operating Temperature	-40°C~85°C
I/O Isolation Voltage(60sec)		Maximum Case Temperature	100°C
Input/Output	1500~3500Vdc	Storage Temperature	-40°C~125°C
Case/Input & Output	1000Vdc	Cooling	Nature Convection
I/O Isolation Capacitance	500 pF Typ.		
I/O Isolation Resistance	1000M Ohm		
Switching Frequency	266kHz, typ		
Humidity	95% rel H		
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs		
Safety Standard : (designed to meet)	IEC/EN 60950-1 , 62368-1 UL/cUL 60950-1 , 62368-1		

ABSOLUTE MAXIMUM RATINGS(6)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100mS)	
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature	260°C, max.
(1.5mm from case 10sec max.)	

PART NUMBER STRUCTURE



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL (% , typ.)	Capacitor Load @FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
VK-243R3S6	9-36	20	253.3	3.3	0	1400	76	1000
VK-2405S6	9-36	20	312.5	5	0	1200	80	1000
VK-247R2S6	9-36	20	304.9	7.2	0	833	82	330
VK-2409S6	9-36	20	301.2	9	0	666	83	220
VK-2412S6	9-36	20	301.2	12	0	500	83	220
VK-2415S6	9-36	20	301.2	15	0	400	83	220
VK-2418S6	9-36	20	304.9	18	0	333	82	47
VK-2424S6	9-36	20	304.9	24	0	250	82	47
VK-243R3D6	9-36	15	337.8	±3.3	0	±909	74	±470
VK-2405D6	9-36	15	312.5	±5	0	±600	80	±470
VK-247R2D6	9-36	15	304.9	±7.2	0	±416	82	±470
VK-2409D6	9-36	15	308.64	±9	0	±333	81	±470
VK-2412D6	9-36	15	301.2	±12	0	±250	83	±330
VK-2415D6	9-36	15	304.9	±15	0	±200	82	±100
VK-2418D6	9-36	15	304.9	±18	0	±166	82	±10
VK-2424D6	9-36	15	308.64	±24	0	±125	81	±10
VK-483R3S6	18-72	15	126.4	3.3	0	1400	76	1000
VK-4805S6	18-72	15	156.25	5	0	1200	80	1000
VK-487R2S6	18-72	15	156.25	7.2	0	833	80	470
VK-4809S6	18-72	15	152.43	9	0	666	82	470
VK-4812S6	18-72	15	150.6	12	0	500	83	470
VK-4815S6	18-72	15	148.8	15	0	400	84	100
VK-4818S6	18-72	15	150.6	18	0	333	83	10
VK-4824S6	18-72	15	150.6	24	0	250	83	10
VK-483R3D6	18-72	15	162.3	±3.3	0	±909	77	±330
VK-4805D6	18-72	15	158.22	±5	0	±600	79	±330
VK-487R2D6	18-72	15	156.25	±7.2	0	±416	80	±220
VK-4809D6	18-72	15	152.4	±9	0	±333	82	±220
VK-4812D6	18-72	15	152.4	±12	0	±250	82	±220
VK-4815D6	18-72	15	148.8	±15	0	±200	84	±47
VK-4818D6	18-72	15	156.25	±18	0	±166	80	±22
VK-4824D6	18-72	15	154.3	±24	0	±125	81	±22

Suffix "H" means 3.5KVdc isolation

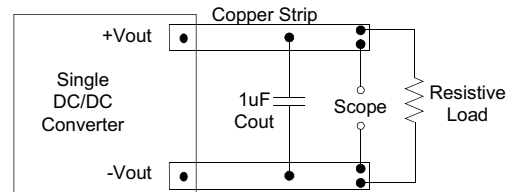
NOTE

1. Ripple/Noise measured with a 1uF ceramic capacitor.
2. Test by nominal input voltage and constant resistor load.
3. Measured Input reflected ripple current with a simulated source inductance of 12uH a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz).
4. It's recommended to add (C1, C2, L) in input end to achieve EN55032 conducted Class A.
5. An external filter capacitor is required if the module has to meet IEC61000-4-5.
The filter capacitor Motien suggest: Nippon - chemi - con KY series, 220uF/100V.
6. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

TEST CONFIGURATIONS

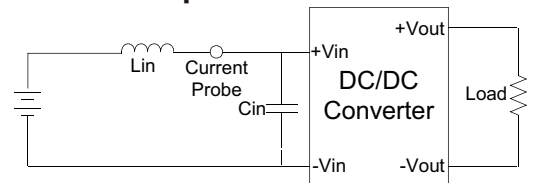
Output Ripple & Noise Measurement Test

Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.



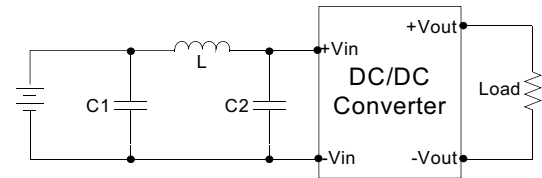
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12uH) and a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



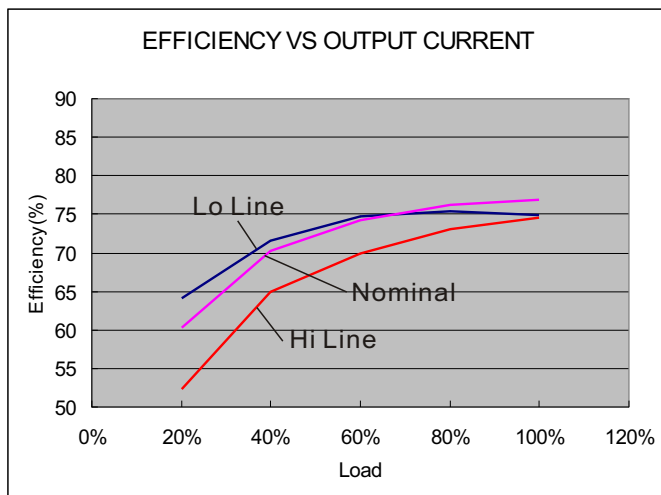
EMI Filter

Input filter components (C1,C2, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

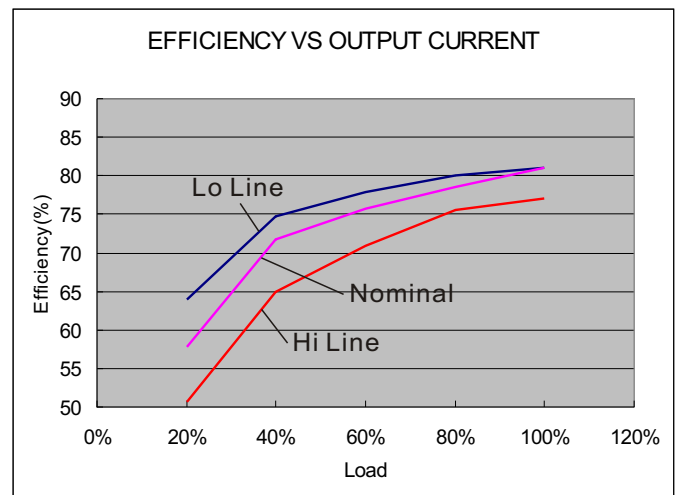


C1	L	C2
68uF, 100V	12uH	33uF, 100V

ELECTRICAL CHARACTERISTIC CURVES



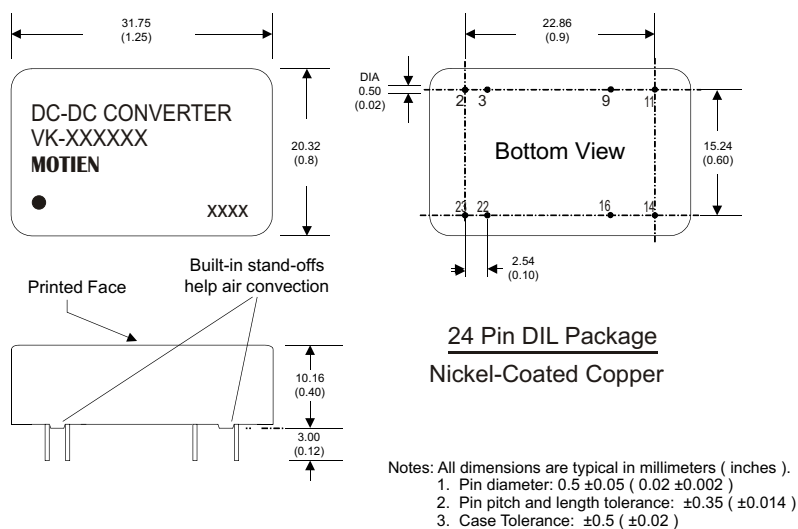
24 Models



48 Models

The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw

MECHANICAL SPECIFICATIONS



PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	-V Input	-V Input
3	-V Input	-V Input
9	N.P.	Common
11	N.C.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)