

SK-5W Series

5W 4:1 Regulated Single & Dual output

SCHMID-M[®]
DC/DC - Converter



Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 82%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case
- EMI Complies With EN55022 Class A



The SK series is a family of cost effective 5.0W 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 78% and output voltage accuracy of $\pm 1\%$ maximum.

All specifications typical at $T_a=25^\circ\text{C}$, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS	
Voltage accuracy	$\pm 1\%$
Line regulation	$\pm 0.5\%$
Load regulation	$\pm 0.5\%$ (Output 3.3V / ± 3.3 V Model) $\pm 1.5\%$
Ripple & noise(20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	$\pm 0.02\%/^\circ\text{C}$
Capacitor load(2)	See table

INPUT SPECIFICATIONS	
Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current(3)	35mA pk-pk

GENERAL SPECIFICATIONS	
Efficiency	See table, typ
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 266kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

EMC SPECIFICATIONS		
Radiated Emissions	EN55022	CLASS A
Conducted Emissions (4)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria B
RS	IEC 61000-4-3	Perf. Criteria A
EFT	IEC 61000-4-4	Perf. Criteria B
CS	IEC 61000-4-6	Perf. Criteria A
PfMF	IEC 61000-4-8	Perf. Criteria A

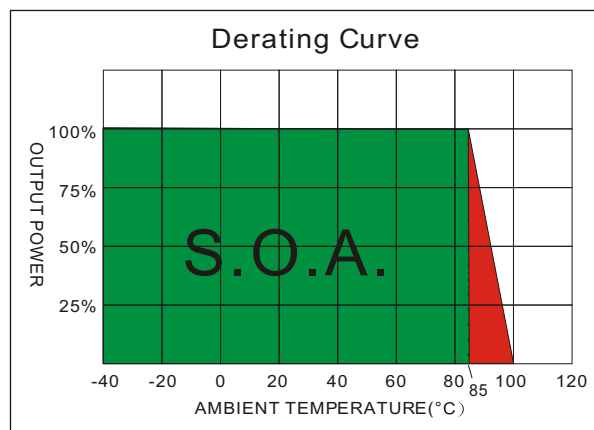
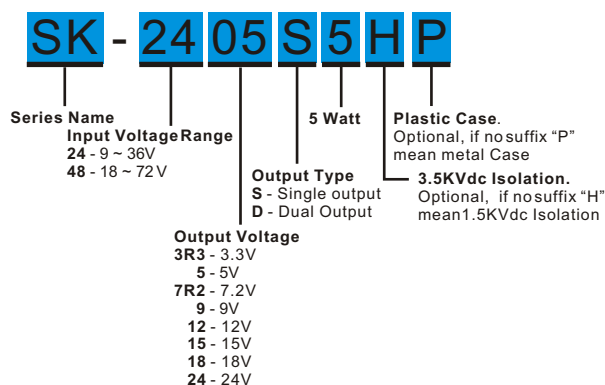
PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	$\varnothing 0.5\text{mm}$ Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g(Metal Case)/13.5g(Plastic Case)
Dimensions	1.25"x0.8"x0.4"

ENVIRONMENT SPECIFICATIONS	
Operating Temperature	$-40^\circ\text{C} \sim 85^\circ\text{C}$ (See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	$-40^\circ\text{C} \sim 125^\circ\text{C}$
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(5)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Voltage(100ms)	
24 Modes	-0.7~40 Vdc
48 Modes	-0.7~80 Vdc
Soldering Temperature (1.5mm from case 10sec.)	260°C

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PARTNUMBER STRUCTURE



MODEL SELECTION GUIDE

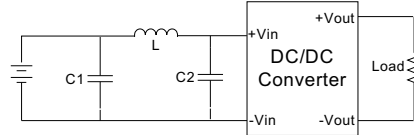
MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Min. load (mA)	Full load (mA)		
SK-243R3S5	9-36	18	238.3	3.3	0	1300	75	1000
SK-2405S5	9-36	18	260.4	5	0	1000	80	680
SK-247R2S5	9-36	18	260.4	7.2	0	694	80	470
SK-2409S5	9-36	18	257.2	9	0	555	81	220
SK-2412S5	9-36	18	257.2	12	0	416	81	100
SK-2415S5	9-36	18	254.1	15	0	333	82	100
SK-2418S5	9-36	18	260.4	18	0	277	80	68
SK-2424S5	9-36	18	260.4	24	0	208	80	47
SK-243R3D5	9-36	18	281.5	±3.3	0	±757	74	±470
SK-2405D5	9-36	18	260.4	±5	0	±500	80	±330
SK-247R2D5	9-36	18	260.4	±7.2	0	±347	80	±100
SK-2409D5	9-36	18	257.2	±9	0	±277	81	±68
SK-2412D5	9-36	18	257.2	±12	0	±208	81	±47
SK-2415D5	9-36	18	254.1	±15	0	±166	82	±47
SK-2418D5	9-36	18	260.4	±18	0	±138	80	±22
SK-2424D5	9-36	18	260.4	±24	0	±104	80	±22
SK-483R3S5	18-72	15	119.2	3.3	0	1300	75	1000
SK-4805S5	18-72	15	130.2	5	0	1000	80	680
SK-487R2S5	18-72	15	130.2	7.2	0	694	80	470
SK-4809S5	18-72	15	128.6	9	0	555	81	220
SK-4812S5	18-72	15	128.6	12	0	416	81	100
SK-4815S5	18-72	15	127	15	0	333	82	100
SK-4818S5	18-72	15	130.2	18	0	277	80	68
SK-4824S5	18-72	15	130.2	24	0	208	80	47
SK-483R3D5	18-72	15	140.7	±3.3	0	±757	74	±470
SK-4805D5	18-72	15	130.2	±5	0	±500	80	±330
SK-487R2D5	18-72	15	130.2	±7.2	0	±347	80	±100
SK-4809D5	18-72	15	128.6	±9	0	±277	81	±68
SK-4812D5	18-72	15	128.6	±12	0	±208	81	±47
SK-4815D5	18-72	15	127	±15	0	±166	82	±47
SK-4818D5	18-72	15	130.2	±18	0	±138	80	±22
SK-4824D5	18-72	15	130.2	±24	0	±104	80	±22

Suffix "H" means 3.5KVdc isolation

Suffix "P" means Plastic case instead of standard Metal Case

NOTE

1. Typical value at nominal input voltage and full load.
2. Test by nominal input voltage and constant resistor load.
3. Measured Input reflected ripple current with a simulated source inductance of 12uH.
4. It's recommended to add C1(68 F), C2(33 F), L(12 H) in input end to achieve EN55022 conducted Class A.

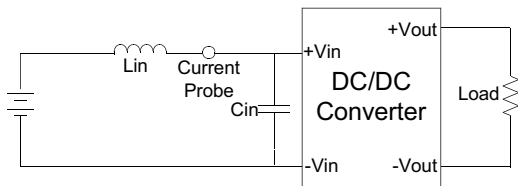


5. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

TEST CONFIGURATIONS

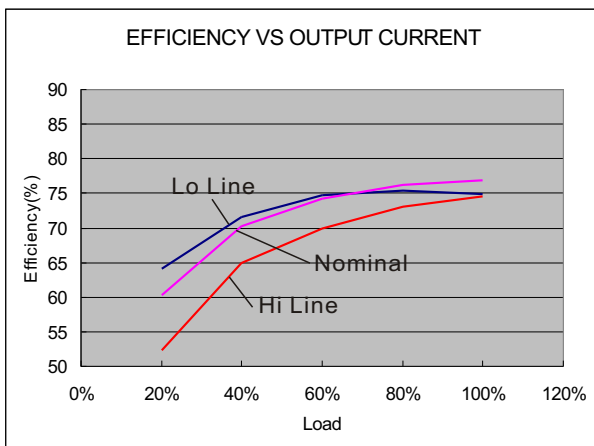
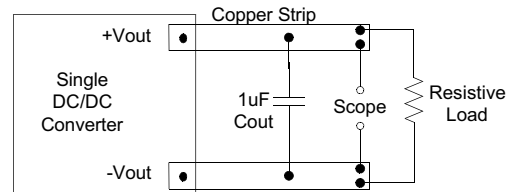
Input Reflected Ripple Current Test Step

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

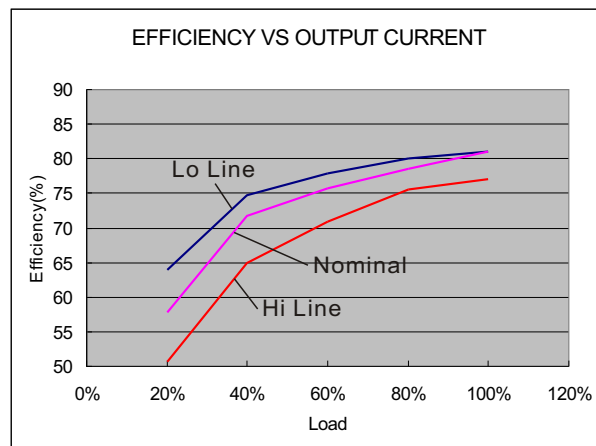


Output Ripple & Noise Measurement Test

Use a capacitor C_{out} (1.0uF) measurement. The Scope measurement bandwidth is 0-20MHz.



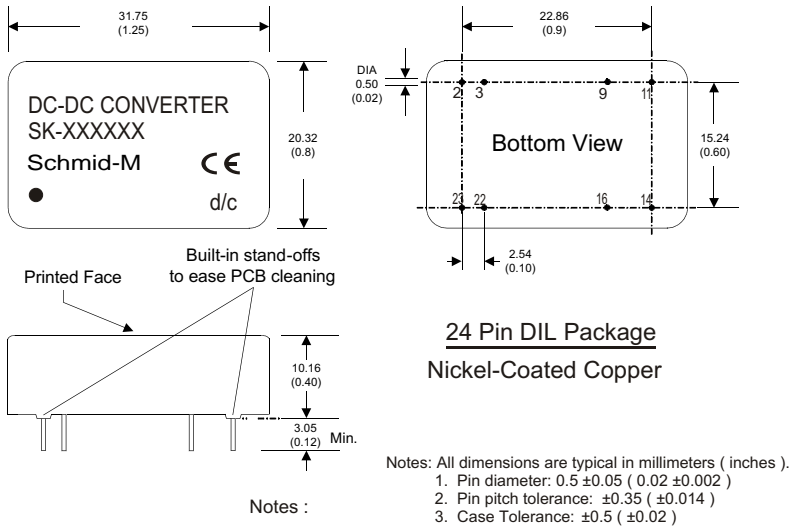
24 Models



48 Models

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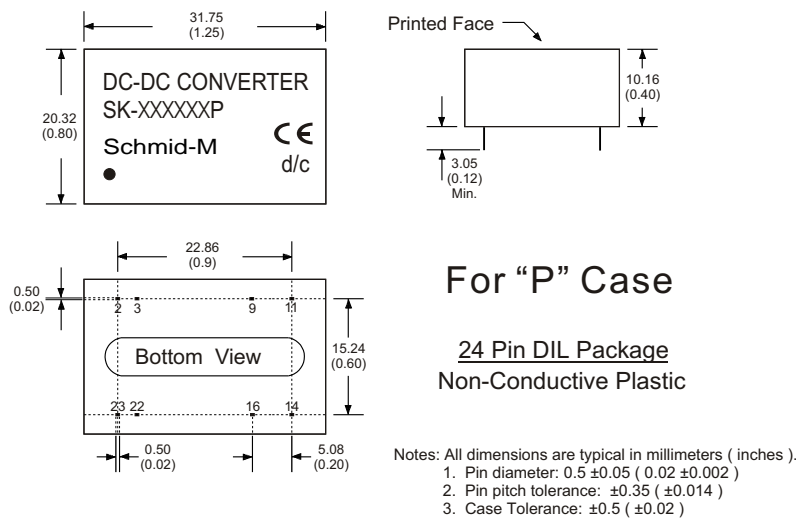
MECHANICAL SPECIFICATIONS



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.)

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.)