S5-3W Series

3W Regulated Single & Dual output

Features

- Regulated 24 Pin DIL Package
- Full SMD Technology
- 1000 VDC Isolation, Up to 6000 VDC(Metal Case Up To 3000Vdc)
- Continuous Short Circuit Protection
- Efficiency up to 83%
- -40 ~ 85°C Operation Temperature Range
- Plastic Case Standard, Optional Metal Case

The S5 series is a family of cost effective 3W single & dual output DC-DC converters. These converters combine miniature package in a 24-pin DIL compatible case with high performance features such as 1000 VDC~6000 VDC input/output isolation voltage, continuous short circuit protection with automatic restart and high line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 5, 12, 24 with output voltage of 3.3, 5, 7.2, 9, 12, 15, 24, ±3.3, ±5 , ±7.2, ±9, ±12, ±15 and ±24 Vdc. High performance features include high efficiency operation up to 83% and output voltage accuracy of ±2% maximum. Standard features include an input range of ±10% tolerance and low output noise and ripple.

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

OUTPUT SPECIFICATIONS

Voltage accuracy	±2%
Line regulation	Single & Dual : ±0.5%,max.
Load regulation	Single (0% to 100%) : ±1.0%,max.
	Dual (0% to 100%) : ±0.5%,max(balanced load)
	Single & Dual (Output 3.3V Model) : ±2.0%,max.
Ripple & noise (20 MHz bandwidth)(1)	75mV pk-pk,max.
Short Circuit Protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table
Transient Recovery Time(3)	±3%, max.
Transient Response	(3.3V Output ±5%, max.)

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI type
Input Reflected Ripple Current(4)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation Voltage(3 sec)	
Input/Output	1000~6000Vdc
Metal Case/Input&Ouput	1000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Single 40kHz typ
	Dual 250kHz typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
	Ø0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	12.5g(Plastic Case)/15.0g(Metal Case)
Dimensions	1.25"x0.8"x0.4"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C (See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(5)

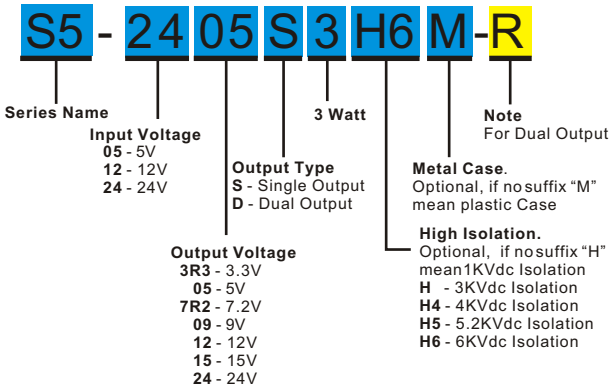
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

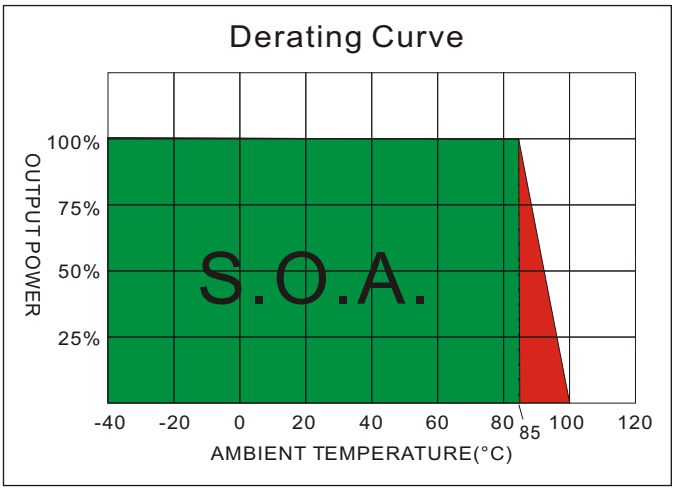
Input Surge Voltage(100mS)	
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
24 Models	28 Vdc ,max.
Soldering Temperature (1.5mm from case 10sec. max.)	260°C ,max.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (7)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (8)	IEC 61000-4-4	Perf. Criteria A
Surge (8)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PART NUMBER STRUCTURE





MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
S5-053R3S 3	5	62	683	3.3	600	58	470
S5-0505S 3	5	65	909	5	600	66	470
S5-057R2S 3	5	65	923	7.2	417	65	470
S5-0509S 3	5	70	882	9	333	68	470
S5-0512S 3	5	60	845	12	250	71	470
S5-0515S 3	5	70	833	15	200	72	470
S5-0518S 3	5	70	857	18	167	70	470
S5-0524S 3	5	100	896	24	125	67	470
S5-123R3S 3	12	30	232	3.3	600	71	470
S5-1205S 3	12	36	253	5	600	66	470
S5-127R2S 3	12	32	235	7.2	417	71	470
S5-1209S 3	12	32	235	9	333	71	470
S5-1212S 3	12	37	231	12	250	72	470
S5-1215S 3	12	35	225	15	200	74	470
S5-1218S 3	12	35	222	18	167	75	470
S5-1224S 3	12	55	235	24	125	71	470
S5-243R3S 3	24	10	158	3.3	700	61	470
S5-2405S 3	24	23	187	5	600	67	470
S5-247R2S 3	24	25	189	7.2	417	66	470
S5-2409S 3	24	27	184	9	333	68	470
S5-2412S 3	24	30	181	12	250	69	470
S5-2415S 3	24	28	179	15	200	70	470
S5-2418S 3	24	16	169	18	167	74	470
S5-2424S 3	24	20	167	24	125	75	470
S5-053R 3D3-R	5	15	776	±3.3	±400	68	±1000
S5-0505 D3-R	5	20	845	±5	±300	71	±470
S5-057R 2D3-R	5	20	811	±7.2	±417	74	±470
S5-0509 D3-R	5	25	789	±9	±167	76	±470
S5-0512 D3-R	5	40	822	±12	±125	73	±470
S5-0515 D3-R	5	30	811	±15	±100	74	±470
S5-0518D3 -R	5	45	822	±18	±167	73	±220

Suffix "H" means 3KVdc isolation Suffix "H4" means 4KVdc isolation Suffix "H5" means 5.2KVdc isolation
Suffix "H6" means 6KVdc isolation
Suffix "M" means Metal Case Up To 3KVdc isolation

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 : info@schmid-m.com

S5 - 3W Regulated Single & Dual output

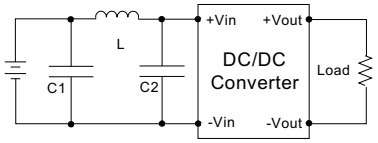
MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
S5-0524 D3-R	5	45	800	±24	±62.5	75	±220
S5-123R 3D3-R	12	7	306	±3.3	±400	72	±1000
S5-1205 D3-R	12	8	321	±5	±300	78	±1000
S5-127R 2D3-R	12	8	313	±7.2	±417	80	±470
S5-1209 D3-R	12	10	313	±9	±167	80	±470
S5-1212 D3-R	12	10	321	±12	±125	78	±470
S5-1215 D3-R	12	15	309	±15	±100	81	±470
S5-1218D3 -R	12	15	309	±18	±167	81	±220
S5-1224 D3-R	12	20	316	±24	±62.5	79	±220
S5-243R 3D3-R	24	5	174	±3.3	±455	72	±1000
S5-2405 D3-R	24	6	158	±5	±300	79	±470
S5-247R 2D3-R	24	5	158	±7.2	±417	79	±470
S5-2409 D3-R	24	7	152	±9	±167	82	±470
S5-2412 D3-R	24	8	151	±12	±125	83	±470
S5-2415 D3-R	24	10	154	±15	±100	81	±470
S5-2418D3 -R	24	15	156	±18	±167	80	±220
S5-2424 D3-R	24	15	154	±24	±62.5	81	±220

Suffix "H" means 3KVdc isolation Suffix "H4" means 4KVdc isolation Suffix "H5" means 5.2KVdc isolation
Suffix "H6" means 6KVdc isolation
Suffix "M" means Metal Case Up To 3KVdc isolation

TEST CONFIGURATIONS

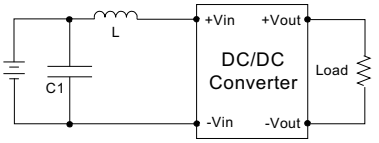
EMI Filter

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
S5-05XXXXX	220uF/100V	12uH	220uF/100V
S5-12XXXXX	220uF/100V	12uH	220uF/100V
S5-24XXXXX	220uF/100V	12uH	220uF/100V

Single Output



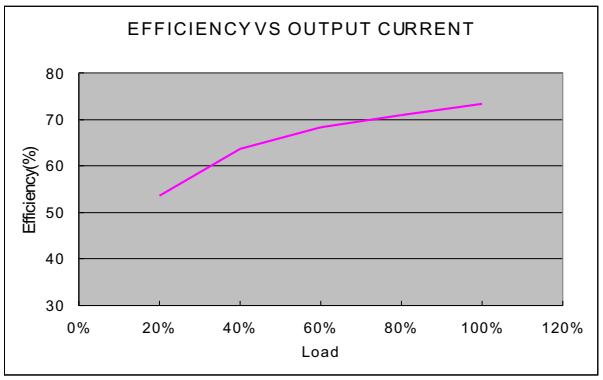
	C1	L
S5-05XXXXX	220uF/100V	12uH
S5-12XXXXX	220uF/100V	12uH
S5-24XXXXX	220uF/100V	12uH

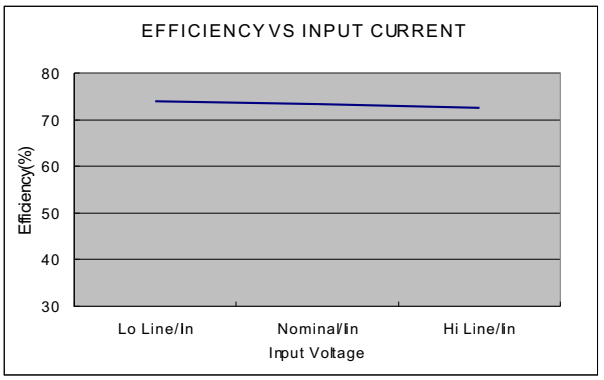
Dual Output

NOTE

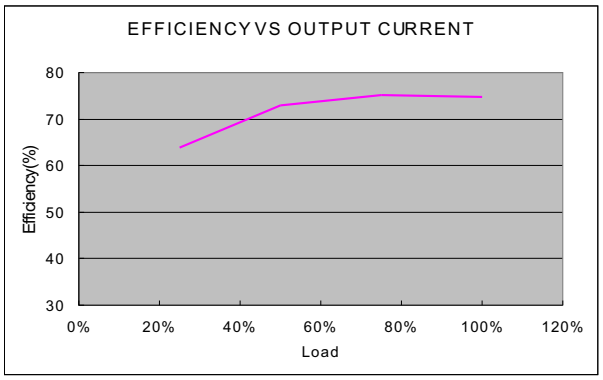
1.Ripple/Noise measured with 20MHz bandwidth.
2.Tested by minimal Vin and constant resistive load.
3.Tested by normal Vin and 25% load step change (75%-50%-25% of Io)
4.Measured Input reflected ripple current with a simulated source inductance of 12uH.
5.Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
6.Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
7.Input filter components are be required to help meet conducted emission class A,
which application refer to the EMI Filter of design & feature configuration.
8.An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
The filter capacitor Schmid-M suggest: Nippon - chemi - con KY series, 220uF/100V.

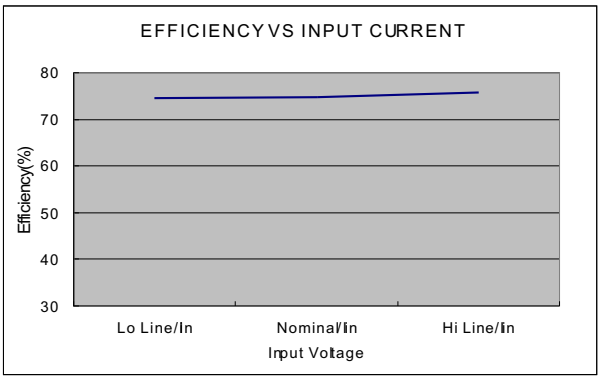
The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : info@schmid-m.com



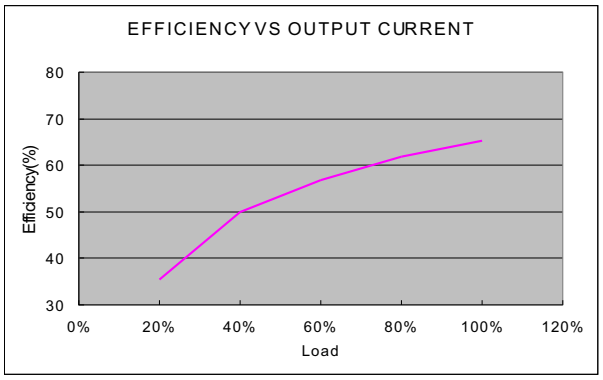


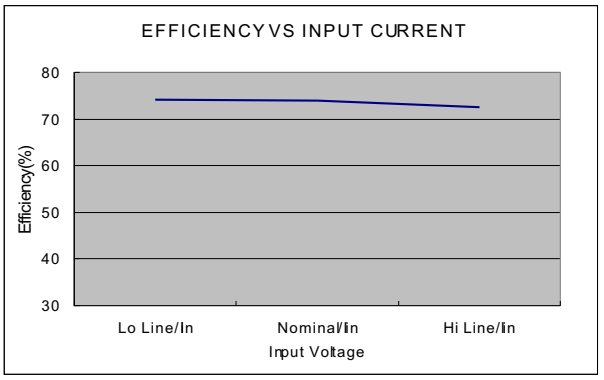
05 Single Output Models



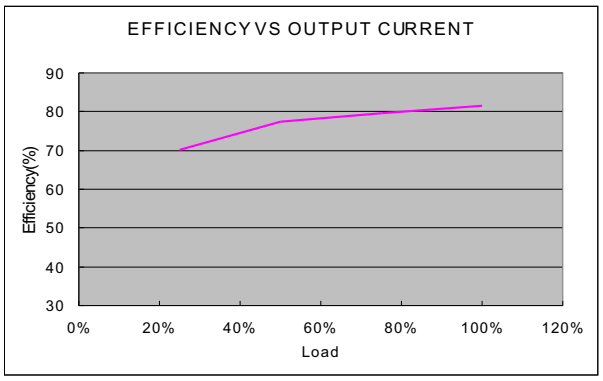


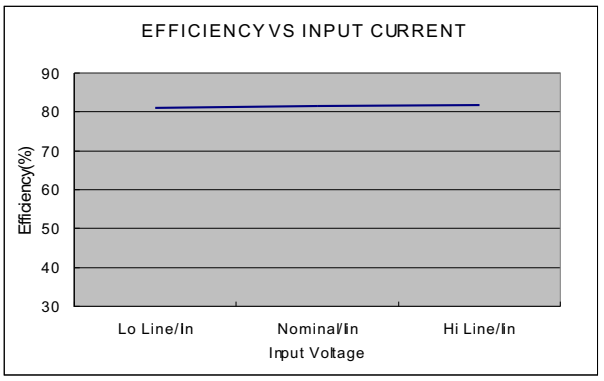
05 Dual Output Models





24 Single Output Models

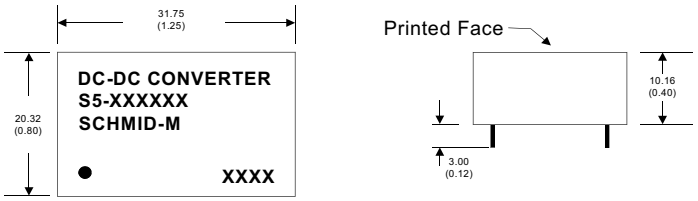


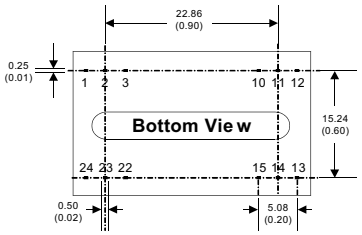


24 Dual Output Models

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 : info@schmid-m.com

MECHANICAL SPECIFICATIONS

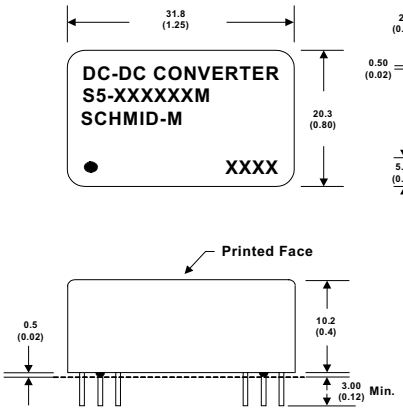




24 Pin DIL Package
Non-Conductive Plastic

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	N.C.	−V Output	+V Input	+V Input
3	N.C.	Common	N.P.	N.P.
10	−V Output	Common	N.P.	Common
11	+V Output	+V Output	N.P.	Common
12	−V Input	−V Input	−V Output	N.P.
13	−V Input	−V Input	+V Output	−V Output
14	+V Output	+V Output	N.P.	N.P.
15	−V Output	Common	N.P.	+V Output
22	N.C.	Common	N.P.	N.P.
23	N.C.	−V Output	−V Input	−V Input
24	+V Input	+V Input	−V Input	−V Input



For “M” Case

24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	N.C.	−V Output	+V Input	+V Input
3	N.C.	Common	N.P.	N.P.
10	−V Output	Common	N.P.	Common
11	+V Output	+V Output	N.P.	Common
12	−V Input	−V Input	−V Output	N.P.
13	−V Input	−V Input	+V Output	−V Output
14	+V Output	+V Output	N.P.	N.P.
15	−V Output	Common	N.P.	+V Output
22	N.C.	Common	N.P.	N.P.
23	N.C.	−V Output	−V Input	−V Input
24	+V Input	+V Input	−V Input	−V Input