

S1-0.75W Series

0.75W Unregulated Single & Dual output

SCHMID-M[®]
DC/DC - Converter



Features

- 7 Pin SIL / 14 Pin DIL Package
- 1000 VDC Isolation
- Up to 6000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 80%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case

The S1 series is a family of cost effective 0.75W single & dual output DC-DC converters. These converters achieve low cost and ultra-miniature SIP 7 pin or DIP 14 pin size. Devices are encapsulated using flame retardant resin. The models operate from input voltage of 5, 12, 24, 48 Vdc with output voltage of 3.3, 5, 7.2, 9, 12, 15, 18, 24, ± 3.3 , ± 5 , ± 7.2 , ± 9 , ± 12 , ± 15 , ± 18 , ± 24 Vdc. High performance features include 1000Vdc~6000Vdc input/output isolation, high efficiency operation and output voltage accuracy of $\pm 3\%$ maximum. Standard features include an input range of $\pm 10\%$ 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	$\pm 3\%$
Line regulation	$\pm 1.2\%$ / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) $\pm 10\%$ (Output 3.3V Model) $\pm 20\%$
Ripple & noise(20 MHz bandwidth)(1)	75mV pk-pk
Temperature coefficient	$\pm 0.02\%/^{\circ}\text{C}$
Capacitor load(2)	See table

INPUT SPECIFICATIONS	
Voltage Range	$\pm 10\%$
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	20mA pk-pk

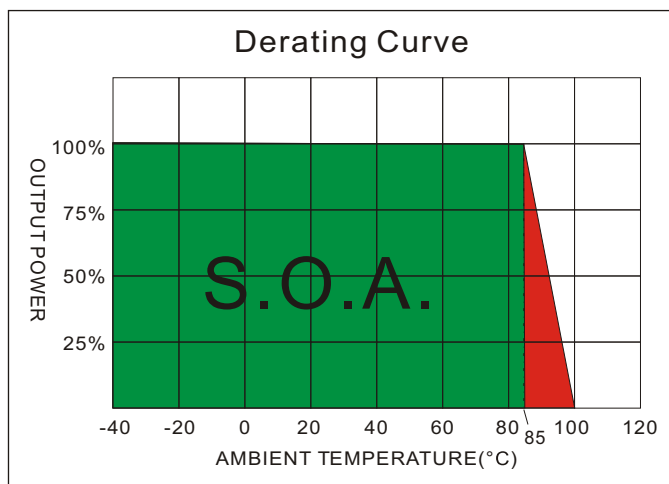
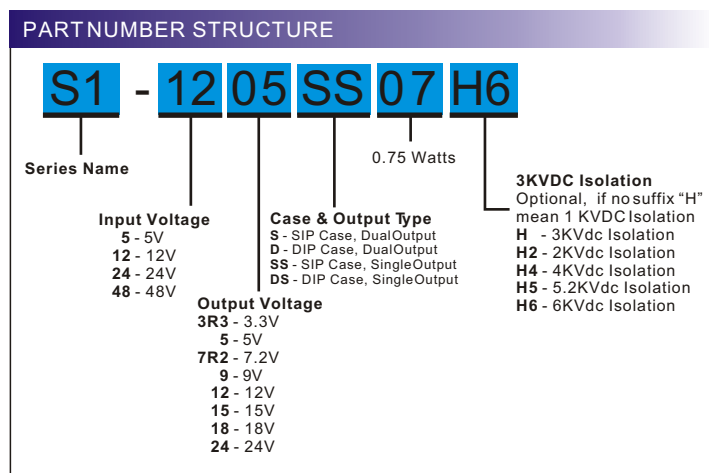
GENERAL SPECIFICATIONS	
Efficiency	See table
I/O Isolation Voltage(3 sec)	
Input/Output	1000~6000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS	
Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/2.3g) (DIP/2.6g)
Dimensions	SIP Case 0.76"x0.24"x0.39" DIP Case 0.80"x0.40"x0.27"

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(4)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Voltage(100mS)	
5 Modes	0~7 Vdc
12 Modes	0~15 Vdc
24 Modes	0~28 Vdc
48 Modes	0~54 Vdc
Soldering Temperature	260°C
(1.5mm from case 10sec.)	

S1 - 0.75W Unregulated Single & Dual output



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)		Full load (mA)			
S1-053R3S07	5	30	230	±3.3	±113.6	65	±100	
S1-0505S07	5	30	211	±5	±75	71	±100	
S1-057R2S07	5	30	202	±7.2	±52	74	±100	
S1-0509S07	5	30	202	±9	±41.6	74	±100	
S1-0512S07	5	30	197	±12	±31.2	76	±100	
S1-0515S07	5	30	197	±15	±25	76	±100	
S1-0518S07	5	30	189	±18	±20.8	79	±100	
S1-0524S07	5	30	189	±24	±15.6	79	±100	
S1-123R3S07	12	20	126	±3.3	±113.6	65	±100	
S1-1205S07	12	20	85	±5	±75	73	±100	
S1-127R2S07	12	20	84	±7.2	±52	74	±100	
S1-1209S07	12	20	84	±9	±41.6	74	±100	
S1-1212S07	12	20	80	±12	±31.2	78	±100	
S1-1215S07	12	20	78	±15	±25	80	±100	
S1-1218S07	12	20	78	±18	±20.8	80	±100	
S1-1224S07	12	20	80	±24	±15.6	78	±100	
S1-243R3S07	24	10	46	±3.3	±113.6	67	±100	
S1-2405S07	24	10	42	±5	±75	74	±100	
S1-247R2S07	24	10	41	±7.2	±52	76	±100	
S1-2409S07	24	10	41	±9	±41.6	76	±100	
S1-2412S07	24	10	40	±12	±31.2	78	±100	
S1-2415S07	24	10	40	±15	±25	78	±100	
S1-2418S07	24	10	40	±18	±20.8	78	±100	
S1-2424S07	24	10	40	±24	±15.6	78	±100	
S1-483R3S07	48	6	25	±3.3	±113.6	62	±100	
S1-4805S07	48	6	24	±5	±75	65	±100	
S1-487R2S07	48	6	22	±7.2	±52	70	±100	
S1-4809S07	48	6	21	±9	±41.6	72	±100	
S1-4812S07	48	6	21	±12	±31.2	74	±100	
S1-4815S07	48	6	21	±15	±25	74	±100	
S1-4818S07	48	6	21	±18	±20.8	72	±100	
S1-4824S07	48	6	22	±24	±15.6	70	±100	

Suffix "H" means 3 KVdcisolation
Suffix "H5" means 5.2 KVdcisolation

Suffix "H2" means 2 KVdcisolation
Suffix "H6" means 6 KVdcisolation

Suffix "H4" means 4 KVdcisolation

S1 - 0.75W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)				
S1-053R3D07	5	30	230	±3.3	±113.6	65	±100
S1-0505D07	5	30	211	±5	±75	71	±100
S1-057R2D07	5	30	202	±7.2	±52	74	±100
S1-0509D07	5	30	202	±9	±41.6	74	±100
S1-0512D07	5	30	197	±12	±31.2	76	±100
S1-0515D07	5	30	197	±15	±25	76	±100
S1-0518D07	5	30	189	±18	±20.8	79	±100
S1-0524D07	5	30	189	±24	±15.6	79	±100
S1-123R3D07	12	20	126	±3.3	±113.6	65	±100
S1-1205D07	12	20	85	±5	±75	73	±100
S1-127R2D07	12	20	84	±7.2	±52	74	±100
S1-1209D07	12	20	84	±9	±41.6	74	±100
S1-1212D07	12	20	80	±12	±31.2	78	±100
S1-1215D07	12	20	78	±15	±25	80	±100
S1-1218D07	12	20	78	±18	±20.8	80	±100
S1-1224D07	12	20	80	±24	±15.6	78	±100
S1-243R3D07	24	10	46	±3.3	±113.6	67	±100
S1-2405D07	24	10	42	±5	±75	74	±100
S1-247R2D07	24	10	41	±7.2	±52	76	±100
S1-2409D07	24	10	41	±9	±41.6	76	±100
S1-2412D07	24	10	40	±12	±31.2	78	±100
S1-2415D07	24	10	40	±15	±25	78	±100
S1-2418D07	24	10	40	±18	±20.8	78	±100
S1-2424D07	24	10	40	±24	±15.6	78	±100
S1-483R3D07	48	6	25	±3.3	±113.6	62	±100
S1-4805D07	48	6	24	±5	±75	65	±100
S1-487R2D07	48	6	22	±7.2	±52	70	±100
S1-4809D07	48	6	21	±9	±41.6	72	±100
S1-4812D07	48	6	21	±12	±31.2	74	±100
S1-4815D07	48	6	21	±15	±25	74	±100
S1-4818D07	48	6	21	±18	±20.8	72	±100
S1-4824D07	48	6	22	±24	±15.6	70	±100
S1-053R3SS07	5	30	205	3.3	227.3	73	100
S1-0505SS07	5	30	200	5	150	75	100
S1-057R2SS07	5	30	202	7.2	104.2	74	100
S1-0509SS07	5	30	200	9	83.3	75	100
S1-0512SS07	5	30	197	12	62.5	76	100
S1-0515SS07	5	30	197	15	50	76	100
S1-0518SS07	5	30	197	18	41.7	76	100
S1-0524SS07	5	30	194	24	31.2	77	100
S1-123R3SS07	12	20	85	3.3	227.3	73	100
S1-1205SS07	12	20	84	5	150	74	100
S1-127R2SS07	12	20	84	7.2	104.2	74	100
S1-1209SS07	12	20	83	9	83.3	75	100
S1-1212SS07	12	20	81	12	62.5	77	100
S1-1215SS07	12	20	80	15	50	78	100
S1-1218SS07	12	20	80	18	41.7	78	100
S1-1224SS07	12	20	80	24	31.2	78	100

Suffix "H" means 3 KVdc isolation
 Suffix "H5" means 5.2 KVdc isolation

Suffix "H2" means 2 KVdc isolation
 Suffix "H6" means 6 KVdc isolation

Suffix "H4" means 4 KVdc isolation

S1 - 0.75W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Full load (mA)			
S1-243R3SS07	24	10	42	3.3	227.3	74	100	
S1-2405SS07	24	10	42	5	150	74	100	
S1-247R2SS07	24	10	41	7.2	104.2	75	100	
S1-2409SS07	24	10	41	9	83.3	75	100	
S1-2412SS07	24	10	40	12	62.5	78	100	
S1-2415SS07	24	10	40	15	50	78	100	
S1-2418SS07	24	10	40	18	41.7	78	100	
S1-2424SS07	24	10	39	24	31.2	80	100	
S1-483R3SS07	48	6	21	3.3	227.3	72	100	
S1-4805SS07	48	6	21	5	150	72	100	
S1-487R2SS07	48	6	21	7.2	104.2	72	100	
S1-4809SS07	48	6	21	9	83.3	74	100	
S1-4812SS07	48	6	21	12	62.5	74	100	
S1-4815SS07	48	6	20	15	50	75	100	
S1-4818SS07	48	6	20	18	41.7	75	100	
S1-4824SS07	48	6	21	24	31.2	73	100	
S1-053R3DS07	5	30	205	3.3	227.3	73	100	
S1-0505DS07	5	30	200	5	150	75	100	
S1-057R2DS07	5	30	202	7.2	104.2	74	100	
S1-0509DS07	5	30	200	9	83.3	75	100	
S1-0512DS07	5	30	197	12	62.5	76	100	
S1-0515DS07	5	30	197	15	50	76	100	
S1-0518DS07	5	30	197	18	41.7	76	100	
S1-0524DS07	5	30	194	24	31.2	77	100	
S1-123R3DS07	12	20	85	3.3	227.3	73	100	
S1-1205DS07	12	20	84	5	150	74	100	
S1-127R2DS07	12	20	84	7.2	104.2	74	100	
S1-1209DS07	12	20	83	9	83.3	75	100	
S1-1212DS07	12	20	81	12	62.5	77	100	
S1-1215DS07	12	20	80	15	50	78	100	
S1-1218DS07	12	20	80	18	41.7	78	100	
S1-1224DS07	12	20	80	24	31.2	78	100	
S1-243R3DS07	24	10	42	3.3	227.3	74	100	
S1-2405DS07	24	10	42	5	150	74	100	
S1-247R2DS07	24	10	41	7.2	104.2	75	100	
S1-2409DS07	24	10	41	9	83.3	75	100	
S1-2412DS07	24	10	40	12	62.5	78	100	
S1-2415DS07	24	10	40	15	50	78	100	
S1-2418DS07	24	10	40	18	41.7	78	100	
S1-2424DS07	24	10	39	24	31.2	80	100	
S1-483R3DS07	48	6	21	3.3	227.3	72	100	
S1-4805DS07	48	6	21	5	150	72	100	
S1-487R2DS07	48	6	21	7.2	104.2	72	100	
S1-4809DS07	48	6	21	9	83.3	74	100	
S1-4812DS07	48	6	21	12	62.5	74	100	
S1-4815DS07	48	6	20	15	50	75	100	
S1-4818DS07	48	6	20	18	41.7	75	100	
S1-4824DS07	48	6	21	24	31.2	73	100	

Suffix "H" means 3 KVdc isolation
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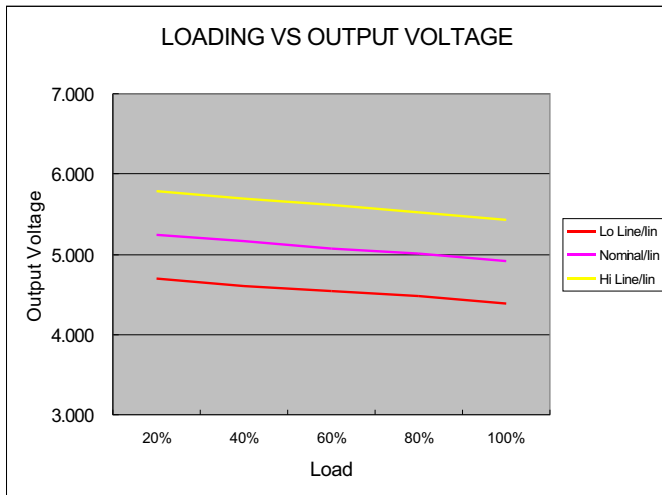
Suffix "H2" means 2 KVdc isolation
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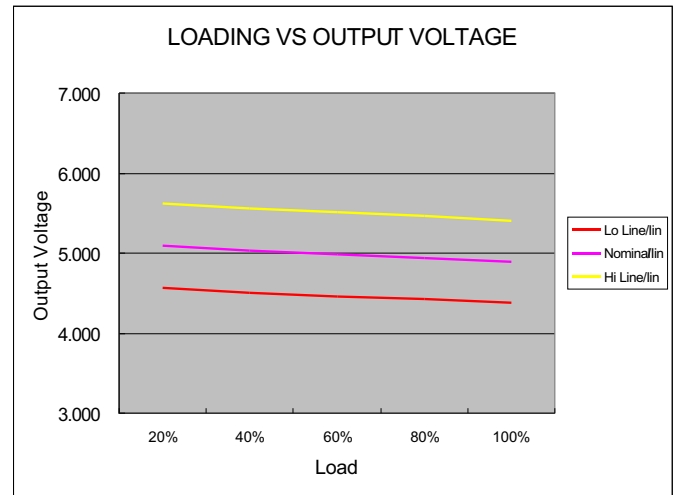
S1 - 0.75W Unregulated Single & Dual output

NOTE

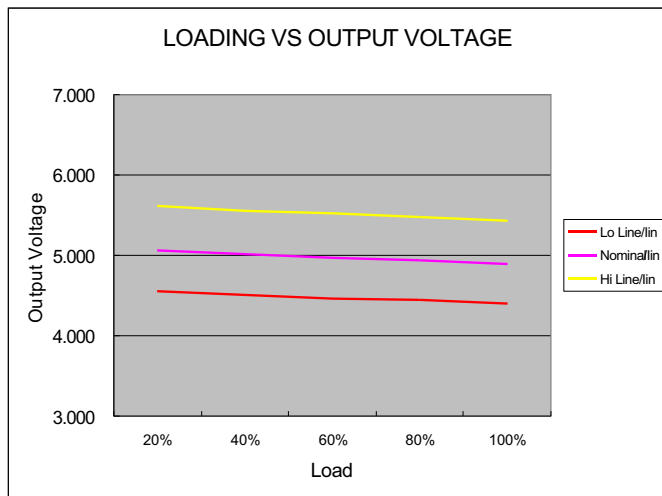
1. Ripple/Noise measured with 20MHz bandwidth.
2. Tested by minimal V_{in} and constant resistive load.
3. Measured Input reflected ripple current with a simulated source inductance of 12uH.
4. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
5. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
6. For reduce converter's ripple & noise, it is recommended to add a $4.7\mu\text{F} \sim 100\mu\text{F}$ ($\pm 4.7\mu\text{F} \sim \pm 68\mu\text{F}$ for dual output) capacitor in output end. For EMI performance improvement, it is recommended to add a $12\mu\text{H}$ inductor and a $10\mu\text{F} \sim 100\mu\text{F}$ capacitor in input end.



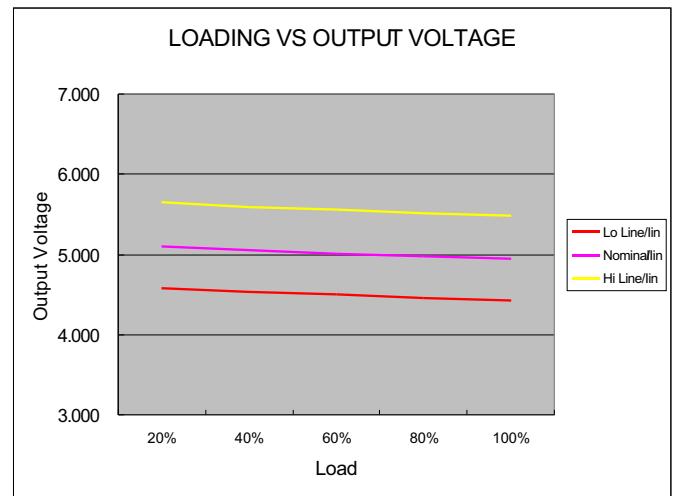
5 Models



12 Models



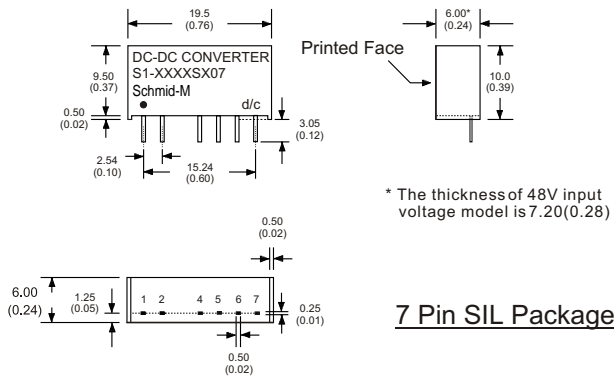
24 Models



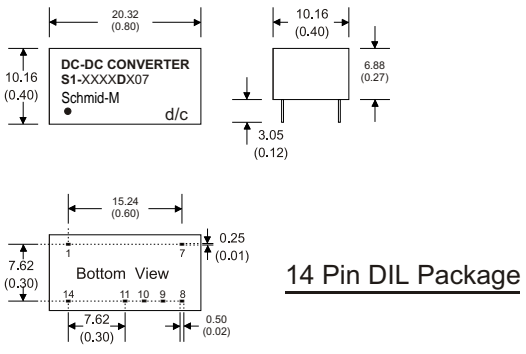
48 Models

S1 - 0.75W Unregulated Single & Dual output

MECHANICAL SPECIFICATIONS



PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	-V Input	-V Input	-V Input	-V Input
4	-V Output	-V Output	N.P.	N.P.
5	N.P.	Common	-V Output	-V Output
6	+V Output	+V Output	N.P.	Common
7	N.P.	N.P.	+V Output	+V Output



PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	-V Input	-V Input	-V Input	-V Input
7	N.C.	N.C.	N.C.	N.C.
8	N.P.	Common	+V Output	+V Output
9	+V Output	+V Output	N.P.	Common
10	N.P.	N.P.	-V Output	-V Output
11	-V Output	-V Output	N.P.	N.P.
14	+V Input	+V Input	+V Input	+V Input

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