

S1-S/D01(02) Series

SCHMID-M

1W Unregulated Dual Separate output

Features

- 7 Pin SIL / 14 Pin DIL Package
- 1000 VDC Isolation
- Up to 3000 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 1W dual separate 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 Vdc. High performance features include 1000Vdc~3000Vdc 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 $T_a = 25^\circ\text{C}$, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS	
Voltage accuracy	$\pm 3\%$
Line regulation	$\pm 1.2\%$ / Per 1% V_{in} 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

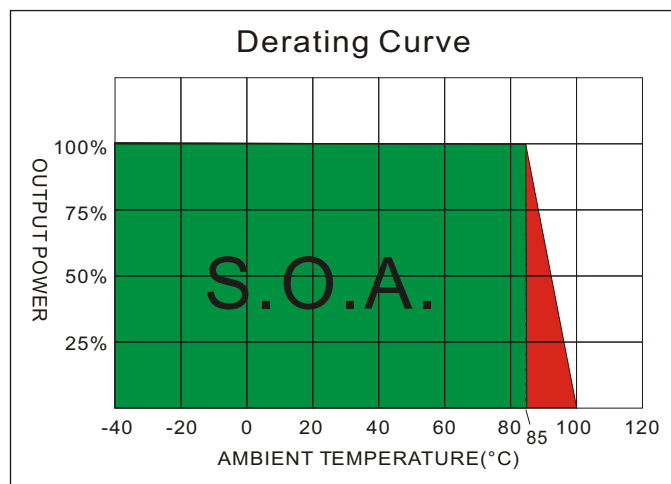
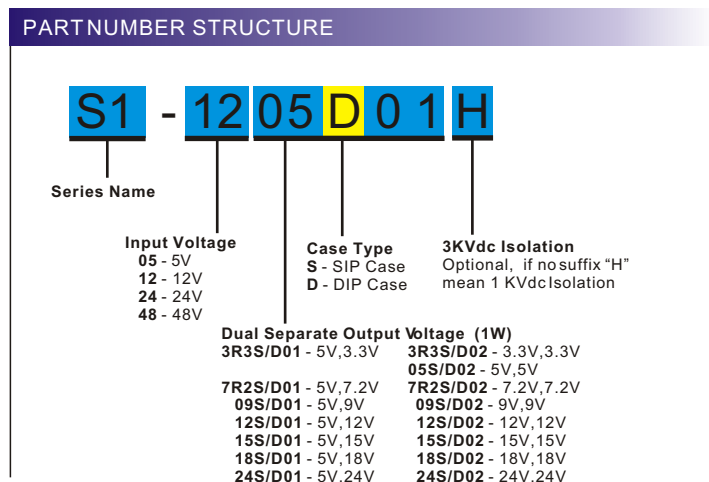
ABSOLUTE MAXIMUM RATINGS(4)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100mS)	
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models	54 Vdc ,max.
Soldering Temperature (1.5mm from case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

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

GENERAL SPECIFICATIONS	
Efficiency	See table
I/O Isolation Voltage(3 sec)	
Input/Output1&Output2	1000~3000Vdc
Output1/Output2	1000Vdc
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

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MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage(Vdc) Output1 Output2	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Full load(mA) Output1 Output2			
S1-053R3S/D01	5	25	259	5, 3.3	100, 152	77	100	
S1-057R2S/D01	5	25	266	5, 7.2	100, 69	75	100	
S1-0509S/D01	5	25	259	5, 9	100, 56	77	100	
S1-0512S/D01	5	25	259	5, 12	100, 42	77	100	
S1-0515S/D01	5	25	256	5, 15	100, 33	78	100	
S1-123R3S/D01	12	15	106	5, 3.3	100, 152	78	100	
S1-127R2S/D01	12	15	111	5, 7.2	100, 69	75	100	
S1-1209S/D01	12	15	108	5, 9	100, 56	77	100	
S1-1212S/D01	12	15	92	5, 12	100, 42	80	100	
S1-1215S/D01	12	15	106	5, 15	100, 33	78	100	
S1-243R3S/D01	24	8	55	5, 3.3	100, 152	75	100	
S1-247R2S/D01	24	8	55	5, 7.2	100, 69	75	100	
S1-2409S/D01	24	8	54	5, 9	100, 56	77	100	
S1-2412SD/01	24	8	53	5, 12	100, 42	78	100	
S1-2415S/D01	24	8	53	5, 15	100, 33	78	100	

Suffix "H" means 3 KVdc isolation

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MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage(Vdc)		OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)	Output1	Output2	Full load(mA)	Output1		
S1-0505S/D02	5	25	266	5 , 5		100 , 100		75	100
S1-057R2S/D02	5	25	259	7.2 , 7.2		69 , 69		77	100
S1-0509S/D02	5	25	253	9 , 9		56 , 56		79	100
S1-0512S/D02	5	25	250	12 , 12		42 , 42		80	100
S1-0515S/D02	5	25	243	15 , 15		33 , 33		82	100
S1-1205S/D02	12	15	111	5 , 5		100 , 100		75	100
S1-127R2S/D02	12	15	108	7.2 , 7.2		69 , 69		77	100
S1-1209S/D02	12	15	108	9 , 9		56 , 56		77	100
S1-1212S/D02	12	15	104	12 , 12		42 , 42		80	100
S1-1215S/D02	12	15	102	15 , 15		33 , 33		81	100
S1-2405S/D02	24	8	55	5 , 5		100 , 100		75	100
S1-247R2S/D02	24	8	54	7.2 , 7.2		69 , 69		77	100
S1-2409S/D02	24	8	52	9 , 9		56 , 56		79	100
S1-2412SD/02	24	8	50	12 , 12		42 , 42		82	100
S1-2415S/D02	24	8	50	15 , 15		33 , 33		82	100

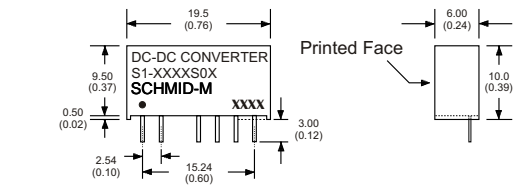
Suffix "H" means 3 KVdc isolation

NOTE

1. Ripple/Noise measured with 20MHz bandwidth.
2. Tested by minimal Vin 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.

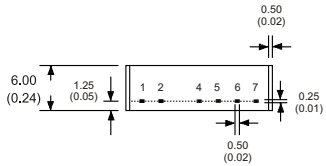
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MECHANICAL SPECIFICATIONS



* The thickness of 48V input voltage model is 7.20(0.28)

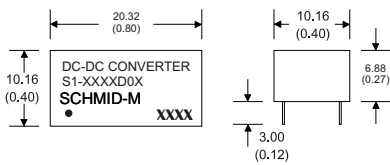
7 Pin SIL Package



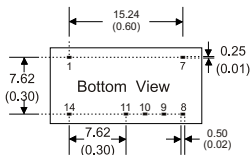
Notes : All dimensions are typical in millimeters (inches).
 1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)

PIN CONNECTIONS	
PIN NUMBER	Dual Separate
1	+V Input
2	-V Input
4	+V1 Output
5	-V1 Output
6	+V2 Output
7	-V2 Output

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



14 Pin DIL Package



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	Dual Separate
1	-V Input
7	N.C
8	-V2 Output
9	+V2 Output
10	-V1 Output
11	+V1 Output
14	+V Input

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