S6-2W Series

2W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 78%-40 ~ 85°C Operation
- Temperature Range
- Metal Case Standard, Optional Plastic Case

RoHS

The S6 series is a family of cost effective 2W single & dual output DC-DC converters. These converters are consisted with Nickle-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 12,24 and 48 with output voltage of 3.3,5,9,12,15, 24, ±3.3, ±5, ±9, ±12, ±15 and ±24 Vdc. High performance features include high efficiency operation up to 78% and output voltage accuracy of ±1% maximum.

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

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
	(Output 3.3V / ±3.3V Model) ±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°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(60sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 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 60950-1

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	Φ0.5mm 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°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 Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10sec max.)	260°C, max.

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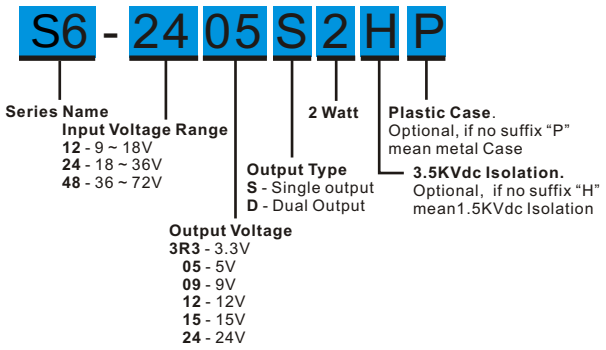
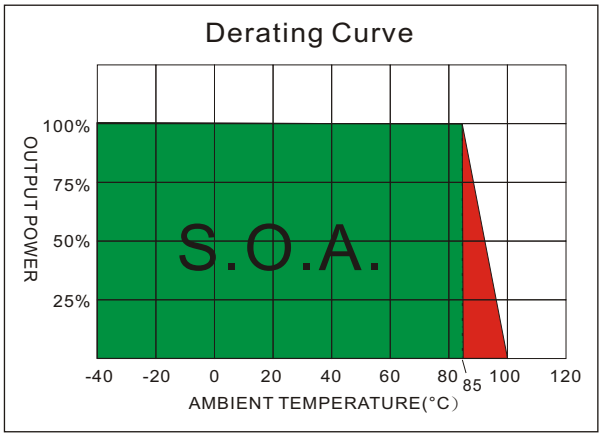
PART NUMBER STRUCTURE





MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
S6-123R3S2	9-18	30	223	3.3	0	600	74	680
S6-1205S2	9-18	30	222	5	0	400	75	680
S6-1209S2	9-18	30	219	9	0	222	76	330
S6-1212S2	9-18	30	219	12	0	167	76	220
S6-1215S2	9-18	30	219	15	0	133	76	100
S6-1224S2	9-18	30	219	24	0	83	76	33
S6-123R3D2	9-18	30	229	±3.3	0	±300	72	±330
S6-1205D2	9-18	30	219	±5	0	±200	75	±330
S6-1209D2	9-18	30	219	±9	0	±111	76	±100
S6-1212D2	9-18	30	219	±12	0	±83	76	±47
S6-1215D2	9-18	30	219	±15	0	±67	76	±33
S6-1224D2	9-18	30	219	±24	0	±42	76	±22
S6-243R3S2	18-36	20	109	3.3	0	600	76	680
S6-2405S2	18-36	20	107	5	0	400	78	680
S6-2409S2	18-36	20	107	9	0	222	78	330
S6-2412S2	18-36	20	107	12	0	167	78	220
S6-2415S2	18-36	20	107	15	0	133	78	100
S6-2424S2	18-36	20	107	24	0	83	78	33
S6-243R3D2	18-36	20	112	±3.3	0	±300	74	±330
S6-2405D2	18-36	20	109	±5	0	±200	76	±330
S6-2409D2	18-36	20	107	±9	0	±111	78	±100
S6-2412D2	18-36	20	107	±12	0	±83	78	±47
S6-2415D2	18-36	20	107	±15	0	±67	78	±33
S6-2424D2	18-36	20	107	±24	0	±42	78	±22
S6-483R3S2	36-72	12	56	3.3	0	600	74	680
S6-4805S2	36-72	12	56	5	0	400	75	680
S6-4809S2	36-72	12	56	9	0	222	75	330
S6-4812S2	36-72	12	56	12	0	167	75	220
S6-4815S2	36-72	12	56	15	0	133	75	100
6-4824S2	36-72	12	56	24	0	83	75	33

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

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MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
S6-483R3D2	36-72	12	56	±3.3	0	±300	74	±330
S6-4805D2	36-72	12	56	±5	0	±200	75	±330
S6-4809D2	36-72	12	56	±9	0	±111	75	±100
S6-4812D2	36-72	12	56	±12	0	±83	75	±47
S6-4815D2	36-72	12	56	±15	0	±67	75	±33
S6-4824D2	36-72	12	56	±24	0	±42	75	±22

Suffix “H” means 3.5KVdc isolation
Suffix “P” means Plastic case instead of standard Metal Case

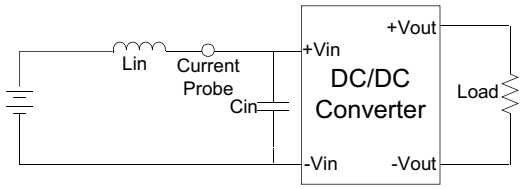
NOTE

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 and a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz).
4. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

TEST CONFIGURATIONS

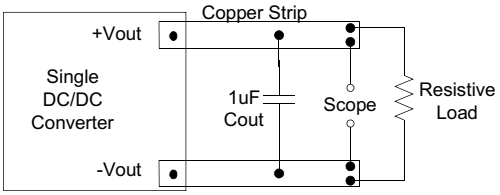
Input Reflected Ripple Current Test Step

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

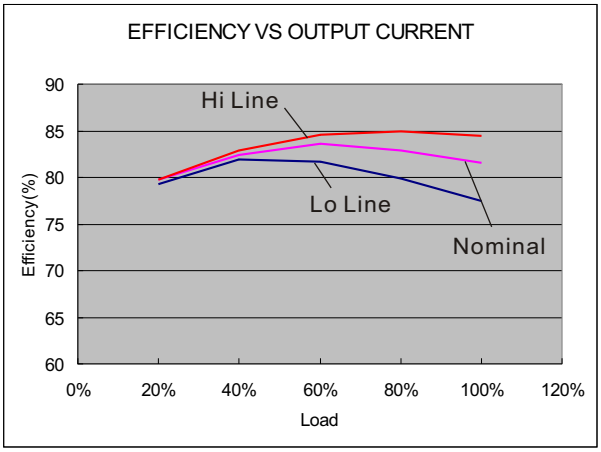


Output Ripple & Noise Measurement Test

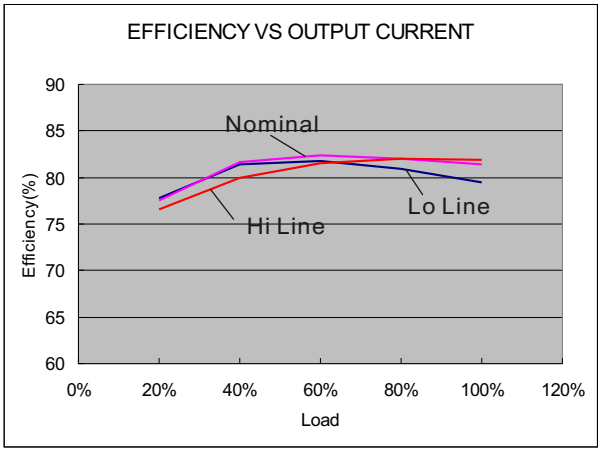
Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.



ELECTRICAL CHARACTERISTIC CURVES



12 Models



24 Models

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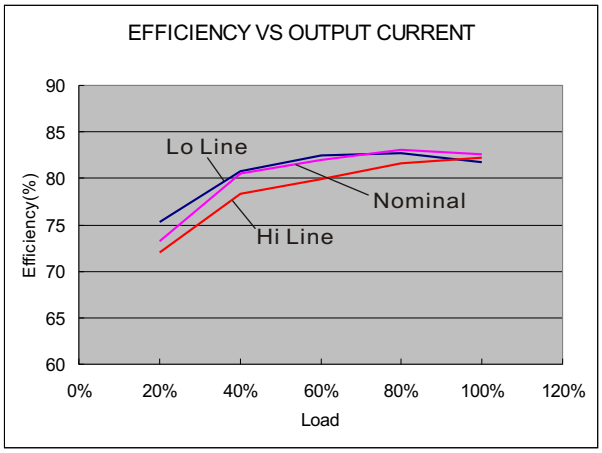
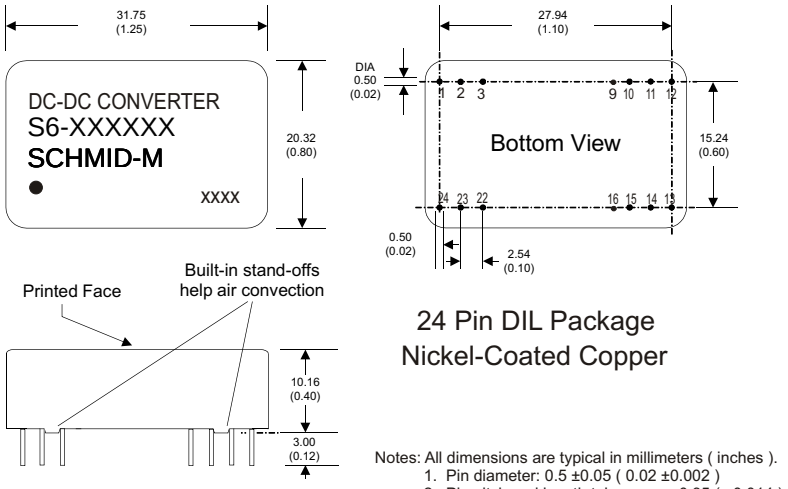


48 Models

MECHANICAL SPECIFICATIONS



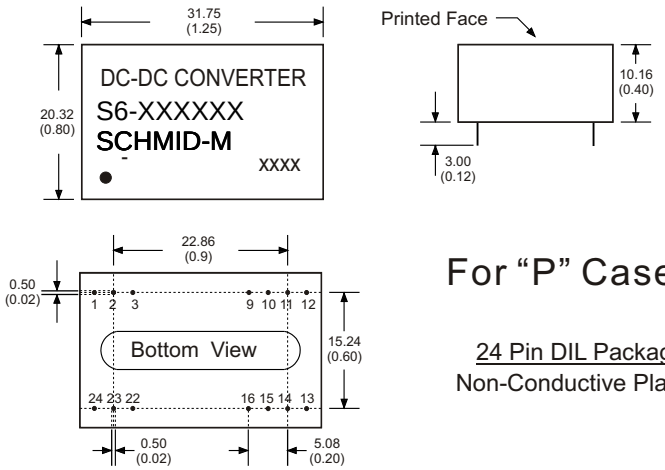
24 Pin DIL Package
Nickel-Coated Copper

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)

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

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

MECHANICAL SPECIFICATIONS



For “P” Case

24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±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	N.P.	N.P.
2	N.C.	－V Output	-V Input	－V Input
3	N.C.	Common	-V Input	－V Input
9	N.P.	N.P.	N.P.	Common
10	－V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	－V Output
12	－V Input	－V Input	N.P.	N.P.
13	－V Input	－V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	－V Output	Common	N.P.	N.P.
16	N.P.	N.P.	－V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	－V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

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