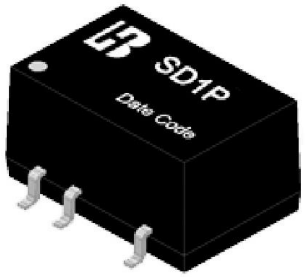
SD1P Series

SMD Package, 1 Watt, Isolated, Regulated

BOTHHAND

Features

- Compact SMD package
- Input / Output Isolation Voltage: 1.5kVDC
- High Efficiency
- Lead Free Design, RoHS Compliant
- Operating temperature: -40°C to +105°C
- Continuous Short -Circuit Protection
- Meet Safety Standard / Approval: IEC / EN60950-1



Applications

These converters are well suitable for battery operated equipment, measurement equipment, telecom, wireless network, Industry control system, everywhere where isolated, tightly regulated voltages and compact size are required.

Technical Specification

All specifications are typical at nominal input, full load and 25°C unless otherwise stated.

Model Number	Input Voltage Range(V)	Output Voltage (V)	Output Current (mA)	Efficiency .(2) (%)	Capacitive Load, max. (uF)
			Full Load		
SD1-05S0P	4.5 ~ 5.5 Nominal: 5	3.3	303	71	1000
SD1-05S1P		5	200	71	220
SD1-05SAP		9	110	73	100
SD1-05S2P		12	84	72	100
SD1-05S3P		15	67	72	47

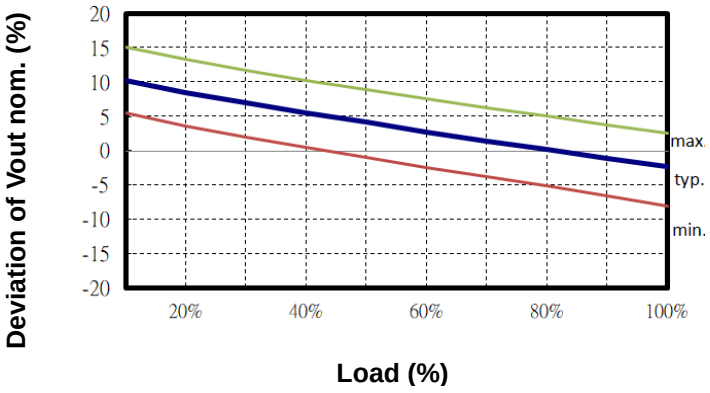
Note

1. Io below this value will not damage these converters, however, they may not meet all listed specifications.
2. Typical value, tested at nominal input and full load.
3. In case of long input lines or hot plug-in requirements, we recommended to use an external low ESR capacitor (22uF) near to the converter's input pins.
4. Specifications subject to change without notice.

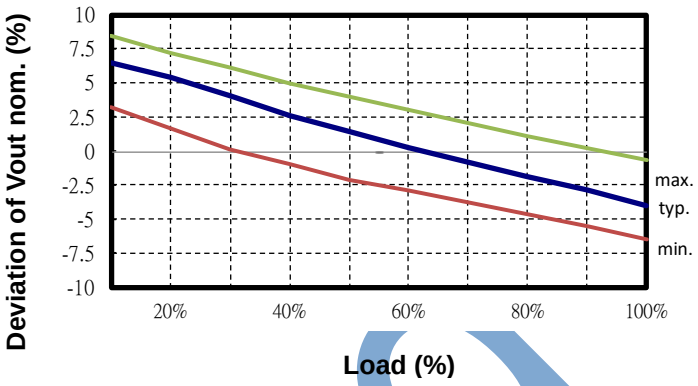
Input Specifications		
Input voltage	5 Vin models	4.5~5.5V
Input current at no load	5 Vin models	40mA typ.
Surge voltage (1 s max.)	5 Vin models	9V max.
Recommended input fuse	5 Vin models	0.5A (slow-blow fuse)
Input filter		Capacitor
Environmental Specifications		
Operating ambient temperature		-40°C to +105°C
Maximum case temperature		+105°C
Storage temperature range		-55°C to +125°C
Relative humidity		95% RH max.
Output Specifications		
Output power		1 Watts max.
Voltage accuracy (Nominal Vin and full load)	5VDC models other models	±3% at 60% load ±3% at 80% load
Minimum load		0A
Regulation	Input variation Load variation	±1.5% max./ 1% charge Vin. See graphs below
Ripple and Noise (20MHz Bandwidth)		100mVp-p typ. 200mVp-p max.
Maximum capacitive load		See table
Temperature coefficient		±0.03%/°C max.
Output short circuit protection	Automatic recovery	Continuous
General Specifications		
Efficiency	Nominal input and full load	See table
Isolation voltage	Input to output, with the test time of 1minute and the leak current lower than 0.5mA.	1500VDC min.
Isolation resistance	500VDC	1GΩ min.
Isolation capacitance		30pF max.
Switching frequency		50kHz min. 190kHz max.
Start-up time	Nominal Vin and full load	30ms max.
Reliability, calculated MTBF		2×10^{6} Hrs
Physical Specifications		
Case material		Black flame-retardant and heat-resistant plastic(UL94 V-0)
Cooling Method		Free air convection
Dimensions		0.54 × 0.45 × 0.35 Inch
Weight		1.5g (0.05oz) typ.

Output voltage variation dependent on load (at nominal input voltage)

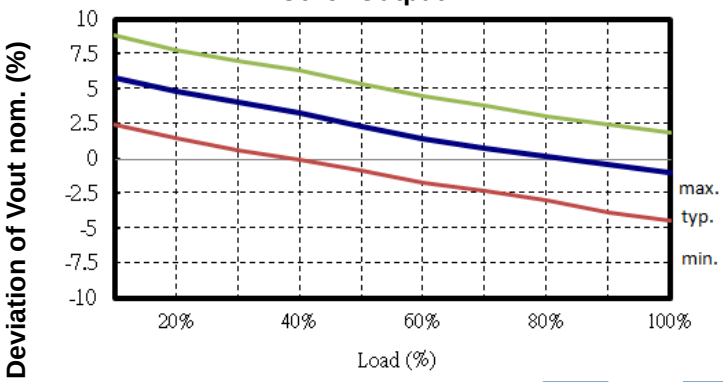
3.3VDC Output



5VDC Output



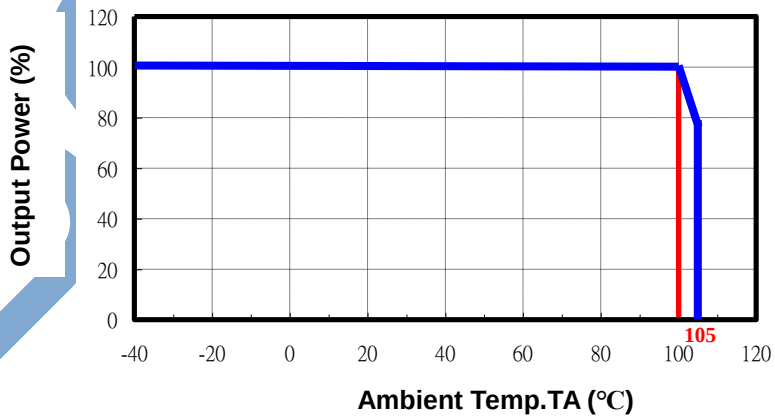
Other Output



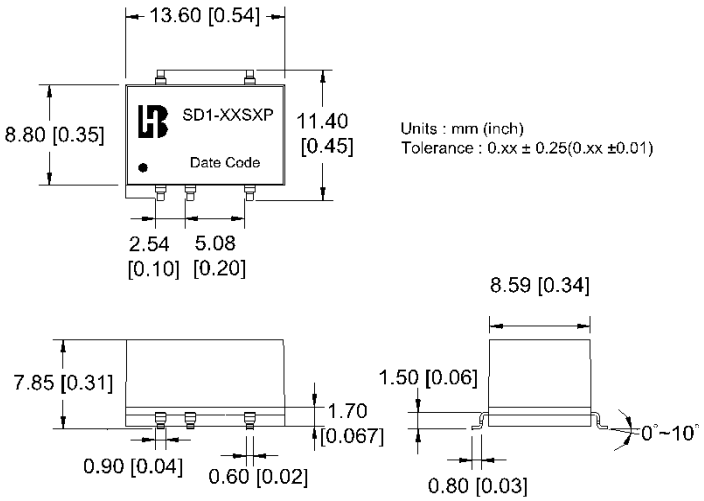
Load (%)

Power Derating Curve

Power Derating Curve



Mechanical Dimensions

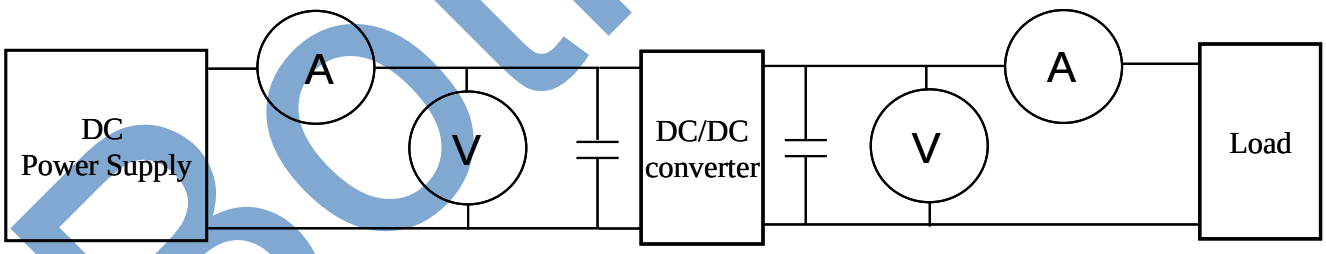


Unit: mm (inch)
Tolerance: 0.XX ±0.25 (0.XX±0.01)

Pin	1.5KVdc - Single		Pin
1	-Vin	NC	14
3	+Vin	---	12
5	---	---	10
7	Vo (-)	Vo (+)	8

Test Configurations

All specifications are typical at nominal input, full load and 25°C unless otherwise stated.



◎DC Power Supply: It offers a wide voltage and current range precisely.

◎Current meter (A): Accuracy➔ 200μA ~ 200mA 4 ranges±(0.2% rdg + 2 digits)

2000mA ~ 20A 2 ranges±(0.3% rdg + 2 digits).

◎Voltage meter (V): Accuracy➔ ±(0.03% rdg + 4 digits).

◎Load: At full load.

◎Wires: The resistance of the wires must be small.

1. Input voltage range: Narrow input voltage range（±10%）、wide input voltage range (2:1 and 4:1)。

EX: Narrow input voltage range（±10%）

5V nominal input ➔ 4.5~5.5V
12V nominal input ➔ 10.8~13.2V
24V nominal input ➔ 21.6~26.4V

Wide input voltage range 2:1

5V nominal input ➔ 4.5~9V
12V nominal input ➔ 9~18V
24V nominal input ➔ 18~36V
48V nominal input ➔ 36~75V

Wide input voltage range 4:1 (W)

24V nominal input ➔ 9~36V
48V nominal input ➔ 18~75V

2. Input power :

Pin = Vin x Iin

Vin：Input voltage
Iin：Input current

3. Output power :

Pout = Vout x Iout

Vout：Output voltage
Iout：Output current

4. Efficiency :

$$\text{Efficiency} = \frac{Pout}{Pin} \times 100\%$$

Pout: Output power
Pin: Input power

5. Voltage accuracy:

$$\frac{|\,Vout-Vout(nominal)\,|}{Vout} \times 100\%$$

Vout：Output voltage
Vout(nominal)：Nominal output voltage

6. Line regulation:

Narrow input voltage range（±10%）and unregulated output voltage series.

$$\text{Line regulation} = \frac{\Delta Vout}{\Delta Vin}$$

$$\Delta Vout = \frac{Vout(+10\%)-Vout(-10\%)}{Vout} \times 100\%$$

Vout(+10%)：Output voltage at Vin = 1.1xVin(nominal)&full load

Vout(-10%)：Output voltage at Vin = 0.9xVin(nominal)&full load

Vout：Output voltage at Vin = Vin(nominal)&full load

$$\Delta Vin = \frac{Vin(+10\%)-Vin(-10\%)}{Vin(nominal)} \times 100\%$$

Vin(+10%)：Input voltage = 1.1xVin(nominal)

Vin(-10%)：Input voltage = 0.9xVin(nominal)

Vin(nominal)：Nominal Input voltage

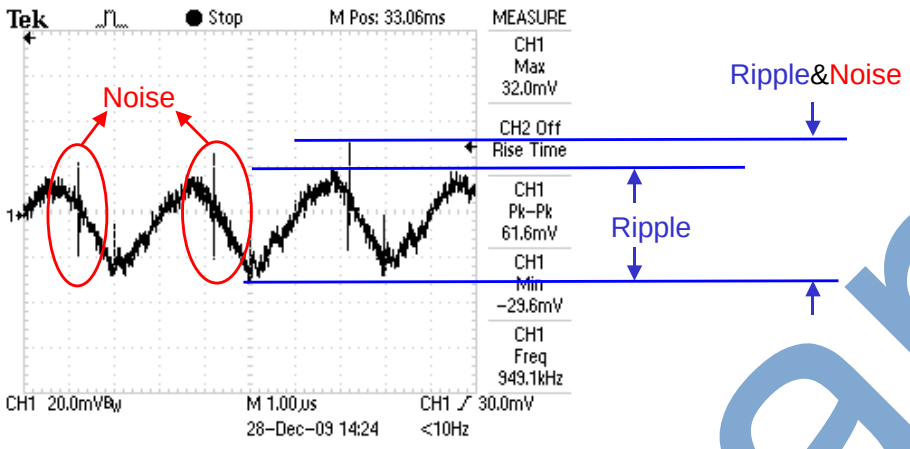
7. Load regulation :

$$\frac{|\,Vout(FL)-Vout(NL)\,|}{Vout(FL)} \times 100\%$$

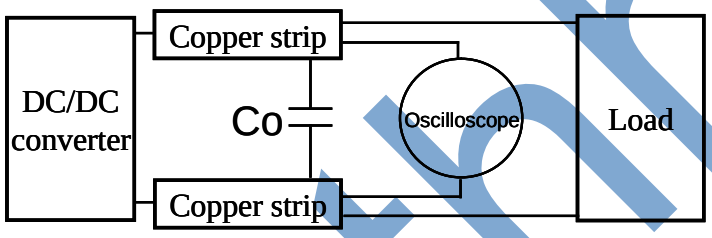
Vout(FL): Output voltage at full load

Vout(NL): Output voltage at 10% full load

8. Ripple and Noise: as shown below. The bandwidth is 0-20MHz.

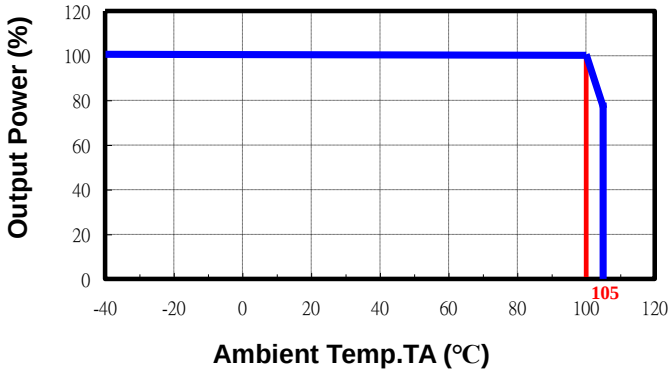


Output Ripple&Noise measurement test circuit: as shown below.



Co: usually 0.47uF.

9. Temperature derating curve: The DC-DC converter will operate over a wider temperature range if less power is drawn from the output and the device is already running. The temperature derating curve shows the operating power-temperature range. As shown below.



10. Switching frequency: The nominal operating frequency of the DC-DC converters.

11. Input to output isolation: The dielectric breakdown strength test between input and output circuits. This is the isolation voltage the device is capable of withstanding for a specified time, usually 1 second or 1 minute.

12. Input souce impedance: The power module should be connected to low ac-impedance input souce. Highly inductive souce impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high , it maybe necessary to use a capacitor at the input to ensure startup. Capacitor mounted close to the power module helps ensure stability of the unit , it is commended to use a good quality low Equivalent Series Resistance (ESR < 0.1Ω at 100KHz) capacitor of a 22uF for the power module.