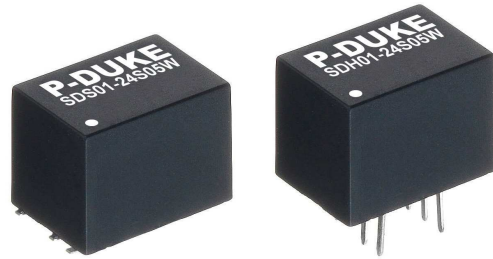


# SDS01W SDH01W SERIES

DC-DC CONVERTER

4:1 ULTRA WIDE INPUT RANGE  
UP TO 1.08WATTS



## FEATURES

- ULTRA SMALL SMD AND DIP PACKAGE, 0.52 x 0.36x 0.40 INCH WITH REGULATED
- SMD PACKAGE QUALIFIED FOR LEADFREE REFLOW SOLDER PROCESS ACCORDING IPC J-STD-020D
- NO MINIMUM LOAD REQUIRED
- CONTINUOUS SHORT CIRCUIT PROTECTION
- 1600VDC INPUT TO OUTPUT ISOLATION AND 3000VDC FOR OPTION
- SAFETY MEETS UL60950-1, EN60950-1, & IEC60950-1
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- MEASUREMENT EQUIPMENT
- SEMICONDUCTOR EQUIPMENT

|                      |                      |                   |     |     |
|----------------------|----------------------|-------------------|-----|-----|
| 3000VDC<br>ISOLATION | 1600VDC<br>ISOLATION | REMOTE<br>CONTROL | OCP | SCP |
|----------------------|----------------------|-------------------|-----|-----|

## TECHNICAL SPECIFICATION

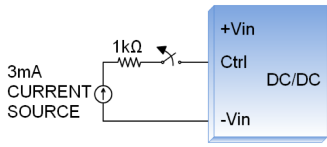
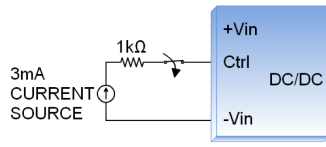
All specifications are typical at nominal input, full load and 25°C otherwise noted

| Model Number     | Input Range | Output Voltage | Output Current @Full Load | Input Current @ No Load | Efficiency | Maximum Capacitor Load |
|------------------|-------------|----------------|---------------------------|-------------------------|------------|------------------------|
|                  | VDC         | VDC            | mA                        | mA                      | %          | µF                     |
| SDS(H)01-12S3P3W | 4.5 ~ 18    | 3.3            | 300                       | 15                      | 77         | 1680                   |
| SDS(H)01-12S05W  | 4.5 ~ 18    | 5              | 200                       | 20                      | 79         | 820                    |
| SDS(H)01-12S12W  | 4.5 ~ 18    | 12             | 90                        | 20                      | 81         | 470                    |
| SDS(H)01-12S15W  | 4.5 ~ 18    | 15             | 70                        | 20                      | 81         | 330                    |
| SDS(H)01-12S24W  | 4.5 ~ 18    | 24             | 45                        | 25                      | 80         | 160                    |
| SDS(H)01-12D05W  | 4.5 ~ 18    | ±5             | ±100                      | 25                      | 77         | ±470                   |
| SDS(H)01-12D12W  | 4.5 ~ 18    | ±12            | ±45                       | 25                      | 80         | ±330                   |
| SDS(H)01-12D15W  | 4.5 ~ 18    | ±15            | ±35                       | 25                      | 81         | ±220                   |
| SDS(H)01-24S3P3W | 9 ~ 36      | 3.3            | 300                       | 10                      | 76         | 1680                   |
| SDS(H)01-24S05W  | 9 ~ 36      | 5              | 200                       | 10                      | 78         | 820                    |
| SDS(H)01-24S12W  | 9 ~ 36      | 12             | 90                        | 10                      | 81         | 470                    |
| SDS(H)01-24S15W  | 9 ~ 36      | 15             | 70                        | 10                      | 81         | 330                    |
| SDS(H)01-24S24W  | 9 ~ 36      | 24             | 45                        | 10                      | 80         | 160                    |
| SDS(H)01-24D05W  | 9 ~ 36      | ±5             | ±100                      | 10                      | 77         | ±470                   |
| SDS(H)01-24D12W  | 9 ~ 36      | ±12            | ±45                       | 10                      | 80         | ±330                   |
| SDS(H)01-24D15W  | 9 ~ 36      | ±15            | ±35                       | 10                      | 81         | ±220                   |
| SDS(H)01-48S3P3W | 18 ~ 75     | 3.3            | 300                       | 5                       | 75         | 1680                   |
| SDS(H)01-48S05W  | 18 ~ 75     | 5              | 200                       | 5                       | 78         | 820                    |
| SDS(H)01-48S12W  | 18 ~ 75     | 12             | 90                        | 5                       | 81         | 470                    |
| SDS(H)01-48S15W  | 18 ~ 75     | 15             | 70                        | 6                       | 81         | 330                    |
| SDS(H)01-48S24W  | 18 ~ 75     | 24             | 45                        | 6                       | 80         | 160                    |
| SDS(H)01-48D05W  | 18 ~ 75     | ±5             | ±100                      | 6                       | 77         | ±470                   |
| SDS(H)01-48D12W  | 18 ~ 75     | ±12            | ±45                       | 6                       | 80         | ±330                   |
| SDS(H)01-48D15W  | 18 ~ 75     | ±15            | ±35                       | 6                       | 81         | ±220                   |

## PART NUMBER STRUCTURE

|   |                                     |                 |   |             |  |
|---|-------------------------------------|-----------------|---|-------------|--|
| <b>SDS01</b> - <b>48</b> <b>S</b> <b>05</b> <b>W</b> <b>H</b> |                                     |                 |   |             |  |
| Series Name   | Input Voltage (VDC)                 | Output Quantity | Output Voltage (VDC)                            | Input Range | Isolation Option                             |
| SDS: SMD type<br>SDH: DIP type                                | 12: 4.5-18<br>24: 9-36<br>48: 18-75 | S: Single       | 3P3: 3.3<br>05: 5<br>12: 12<br>15: 15<br>24: 24 | 4:1         | □: 1600VDC Isolation<br>H: 3000VDC Isolation |
|   |                                     | D: Dual         | 05: ±5<br>12: ±12<br>15: ±15                    |             |  |

**INPUT SPECIFICATIONS**

| Parameter                                     | Conditions   | Min.   | Typ.                   | Max.            | Unit  |
|---|--|--|------------------------|-----------------|-------|
| Operating input voltage range                 | 12Vin(nom)   | 4.5  | 12                     | 18              | VDC   |
|   | 24Vin(nom)   | 9  | 24                     | 36              |       |
|   | 48Vin(nom)   | 18   | 48                     | 75              |       |
| Start up time                                 | Constant resistive load<br>Power up<br>Remote ON/OFF |  | 5<br>5                 | 10<br>10        | ms    |
| Input surge voltage                           | 1 second, max.                                       |  |                        | 25<br>50<br>100 | VDC   |
| Input reflected ripple current <sup>(1)</sup> | 12Vin(nom)   |  | 15                     |                 | mAp-p |
|   | 24Vin(nom)   |  | 10                     |                 |       |
|   | 48Vin(nom)   |  | 5                      |                 |       |
| Input filter                                  |  |  | Capacitor type         |                 |       |
| Remote ON/OFF                                 | Ctrl pin applied current via 1kΩ                     | DC-DC ON   | Open or high impedance |                 | mA    |
|   |  | DC-DC OFF<br>Remote off input current  | 2.0                    | 3.0             |       |
|   | Application circuit                                  |  |                        | 2.5             | mA    |
|   | DC-DC ON   |   |                        |                 |       |
|   | DC-DC OFF  |  |                        |                 |       |

**OUTPUT SPECIFICATIONS**

| Parameter                        | Conditions                         | Min.                           | Typ. | Max.  | Unit  |
|----------------------------------|------------------------------------|--------------------------------|------|-------|-------|
| Voltage accuracy                 |                                    | -1.0                           |      | +1.0  | %     |
| Line regulation                  | Low Line to High Line at Full Load | -0.2                           |      | +0.2  | %     |
| Load regulation                  | No Load to Full Load               | Single                         |      | +1.0  | %     |
|                                  |                                    | Dual                           | -1.0 | +1.0  |       |
|                                  | 10% Load to 90% Load               | Single                         | -0.5 | +0.5  |       |
|                                  | Dual                               | -0.8                           | +0.8 |       |       |
| Cross regulation                 | Asymmetrical load 25%/100% FL      | -5.0                           |      | +5.0  | %     |
| Ripple and noise                 | Measured by 20MHz bandwidth        |                                | 30   |       | mVp-p |
| Temperature coefficient          |                                    | -0.02                          |      | +0.02 | %/°C  |
| Transient response recovery time | 25% load step change               |                                | 500  |       | µs    |
| Short circuit protection         |                                    | Continuous, automatic recovery |      |       |       |

**GENERAL SPECIFICATIONS**

| Parameter             | Conditions               | Min.       | Typ. | Max. | Unit                                 |
|-----------------------|--------------------------|------------|------|------|--------------------------------------|
| Isolation voltage     | 1 minute                 | 1600       |      |      | VDC                                  |
|                       |                          | 3000       |      |      |                                      |
| Isolation resistance  | 500VDC                   | 1          |      |      | GΩ                                   |
| Isolation capacitance |                          | Standard   |      | 50   | pF                                   |
|                       |                          | Suffix "H" |      | 50   |                                      |
| Switching frequency   |                          | 100        |      |      | kHz                                  |
| Design meets          |                          |            |      |      | UL60950-1<br>EN60950-1<br>IEC60950-1 |
| Case material         |                          |            |      |      | Non-conductive black plastic         |
| Base material         |                          |            |      |      | Non-conductive black plastic         |
| Potting material      |                          |            |      |      | Silicone (UL94 V-0)                  |
| Weight                |                          |            |      |      | 2.7g (0.10oz)                        |
| MTBF                  | MIL-HDBK-217F, Full load |            |      |      | 8.401 x 10 <sup>6</sup> hrs          |

**ENVIRONMENTAL SPECIFICATIONS**

| Parameter                       | Conditions       | Min. | Typ. | Max. | Unit                   |
|---------------------------------|------------------|------|------|------|------------------------|
| Operating ambient temperature   | Without derating | -40  |      | +90  | °C                     |
|                                 | With derating    | +90  |      | +105 |                        |
| Storage temperature range       |                  | -55  |      | +125 | °C                     |
| Thermal shock                   |                  |      |      |      | MIL-STD-810F           |
| Vibration                       |                  |      |      |      | MIL-STD-810F           |
| Relative humidity               |                  |      |      |      | 5% to 95% RH           |
| Lead-free reflow solder process |                  |      |      |      | IPC J-STD-020D         |
| Moisture sensitivity level(MSL) |                  |      |      |      | IPC J-STD-033B Level 2 |

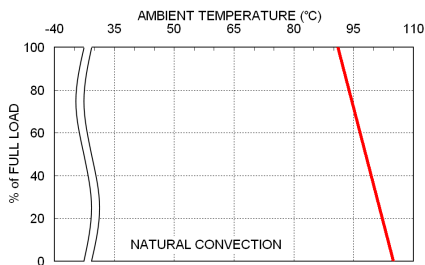
**EMC SPECIFICATIONS**

| Parameter                      | Conditions  |                                     | Level            |
|--------------------------------|-------------|-------------------------------------|------------------|
| EMI <sup>(1)</sup>             | EN55022     |                                     | Class A, Class B |
| ESD                            | EN61000-4-2 | Air ± 8kV<br>Contact ± 6kV          | Perf. Criteria A |
| Radiated immunity              | EN61000-4-3 | 10 V/m                              | Perf. Criteria A |
| Fast transient <sup>(2)</sup>  | EN61000-4-4 | ± 2kV                               | Perf. Criteria A |
| Surge <sup>(2)</sup>           | EN61000-4-5 | ± 1kV                               | Perf. Criteria A |
| Conducted immunity             | EN61000-4-6 | 10 Vr.m.s                           | Perf. Criteria A |
| Power frequency magnetic field | EN61000-4-8 | 100A/m continuous; 1000A/m 1 second | Perf. Criteria A |

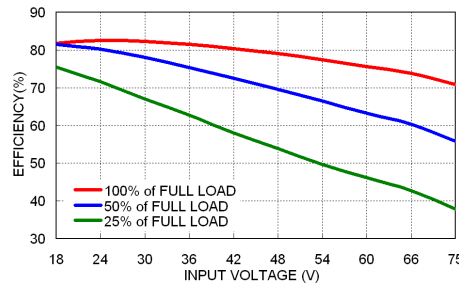
**Note:**

- The standard module meet EMI Class A or Class B and input reflected ripple current with external components. For further information, please contact with P-DUKE.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220 µF/100V.

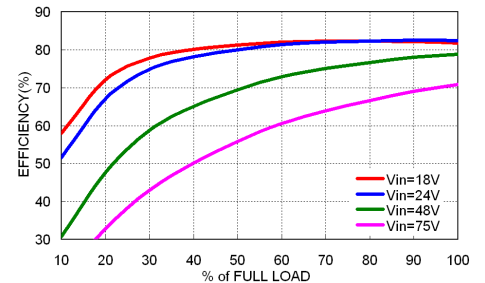
**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

**CHARACTERISTIC CURVE**


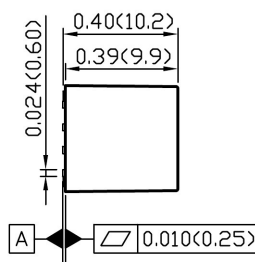
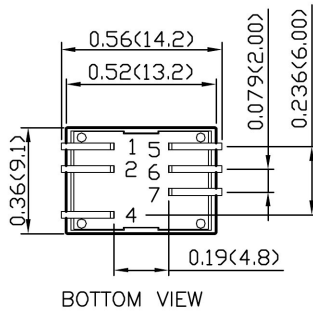
SDS(H)01-48S05W Derating Curve



SDS(H)01-48S05W Efficiency vs. Input Voltage



SDS(H)01-48S05W Efficiency vs. Output Current

**MECHANICAL DRAWING**
**SDS01W: SMD TYPE**

**PIN CONNECTION**

| PIN | SINGLE | DUAL   |
|-----|--------|--------|
| 1   | +Vin   | +Vin   |
| 2   | -Vin   | -Vin   |
| 4   | Ctrl   | Ctrl   |
| 5   | NC     | -Vout  |
| 6   | -Vout  | Common |
| 7   | +Vout  | +Vout  |

- All dimensions in inch (mm)
- Tolerance :x.xx±0.02 (x.x±0.5)  
x.xxx±0.01 (x.xx±0.25)
- Pin pitch tolerance ±0.01 (0.25)
- Pin dimension tolerance ±0.004(0.1)

**SDH01W: DIP TYPE**
