



P-DUKE POWER

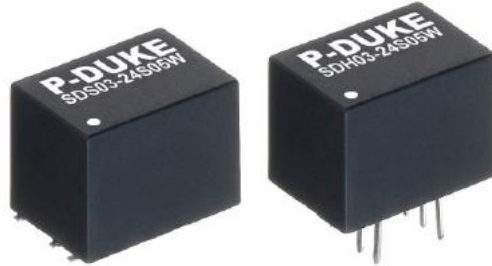
SDS03W · SDH03W Series

DC-DC Converter
Up to 3 Watts

3
YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway

CE UK
CA

3000
VDC
Isolation
Voltage

1600
VDC
Isolation
Voltage

4 : 1
Wide
Input
Range

NO
Min. Load
Required

REMOTE
ON
OFF

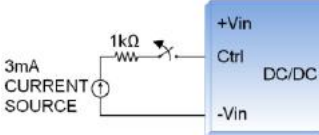
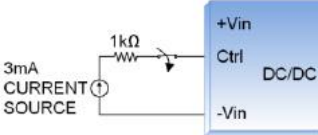
SCP

PART NUMBER STRUCTURE

| SDS03 - | 24 | S | 05 | W | H |
|--|----------------------------------|--------------------------|--|-------------|--|
| Series Name | Input Voltage (VDC) | Output Quantity | Output Voltage (VDC) | Input Range | Isolation Options |
| SDS : SMD type SDH : DIP type | 12:4.5~18 24:9~36 48:18~75 | S: Single D: Dual | 3P3 : 3.3 05 : 5 09 : 9 12: 12 15: 15 24: 24 05 : ±5 12 : ±12 15 : ±15 | 4:1 | □: 1600VDC isolation H: 3000VDC isolation |

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C unless 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)03-12S3P3W | 4.5 ~ 18 | 3.3 | 700 | 35 | 76 | 4700 |
| SDS(H)03-12S05W | 4.5 ~ 18 | 5 | 600 | 40 | 80 | 2530 |
| SDS(H)03-12S09W | 4.5 ~ 18 | 9 | 333 | 40 | 81 | 1470 |
| SDS(H)03-12S12W | 4.5 ~ 18 | 12 | 250 | 40 | 83 | 1220 |
| SDS(H)03-12S15W | 4.5 ~ 18 | 15 | 200 | 40 | 84 | 1000 |
| SDS(H)03-12S24W | 4.5 ~ 18 | 24 | 125 | 40 | 82 | 470 |
| SDS(H)03-12D05W | 4.5 ~ 18 | ±5 | ±300 | 40 | 80 | ±1470 |
| SDS(H)03-12D12W | 4.5 ~ 18 | ±12 | ±125 | 40 | 82 | ±680 |
| SDS(H)03-12D15W | 4.5 ~ 18 | ±15 | ±100 | 40 | 82 | ±470 |
| SDS(H)03-24S3P3W | 9 ~ 36 | 3.3 | 700 | 20 | 77 | 4700 |
| SDS(H)03-24S05W | 9 ~ 36 | 5 | 600 | 20 | 80 | 2530 |
| SDS(H)03-24S09W | 9 ~ 36 | 9 | 333 | 25 | 81 | 1470 |
| SDS(H)03-24S12W | 9 ~ 36 | 12 | 250 | 25 | 83 | 1220 |
| SDS(H)03-24S15W | 9 ~ 36 | 15 | 200 | 25 | 83 | 1000 |
| SDS(H)03-24S24W | 9 ~ 36 | 24 | 125 | 25 | 82 | 470 |
| SDS(H)03-24D05W | 9 ~ 36 | ±5 | ±300 | 25 | 80 | ±1470 |
| SDS(H)03-24D12W | 9 ~ 36 | ±12 | ±125 | 25 | 82 | ±680 |
| SDS(H)03-24D15W | 9 ~ 36 | ±15 | ±100 | 25 | 82 | ±470 |
| SDS(H)03-48S3P3W | 18 ~ 75 | 3.3 | 700 | 12 | 77 | 4700 |
| SDS(H)03-48S05W | 18 ~ 75 | 5 | 600 | 12 | 80 | 2530 |
| SDS(H)03-48S09W | 18 ~ 75 | 9 | 333 | 13 | 81 | 1470 |
| SDS(H)03-48S12W | 18 ~ 75 | 12 | 250 | 13 | 83 | 1220 |
| SDS(H)03-48S15W | 18 ~ 75 | 15 | 200 | 14 | 83 | 1000 |
| SDS(H)03-48S24W | 18 ~ 75 | 24 | 125 | 14 | 82 | 470 |
| SDS(H)03-48D05W | 18 ~ 75 | ±5 | ±300 | 14 | 80 | ±1470 |
| SDS(H)03-48D12W | 18 ~ 75 | ±12 | ±125 | 14 | 82 | ±680 |
| SDS(H)03-48D15W | 18 ~ 75 | ±15 | ±100 | 14 | 82 | ±470 |

| 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 | Power up | | 10 | 20 | ms |
| | | Remote ON/OFF | | 10 | 20 | |
| Input surge voltage | 1 second, max. | 12Vin(nom) | | | 25 | VDC |
| | | 24Vin(nom) | | | 50 | |
| | | 48Vin(nom) | | | 100 | |
| Input reflected ripple current | With external components. | 12Vin(nom) | | 20 | | mAp-p |
| | | 24Vin(nom) | | 20 | | |
| | | 48Vin(nom) | | 20 | | |
| Input filter | Capacitor type | | | | | |
| Remote ON/OFF | Ctrl pin applied current via 1kΩ | DC-DC ON | Open or high impedance | | | mA |
| | | DC-DC OFF | 2.0 | 3.0 | 4.0 | |
| | | Remote off input current | | | 2.5 | mA |
| Application circuit | | | | | | |
| | 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 | | +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 | Dual | -5.0 | | +5.0 | % |
| Ripple and noise | Measured by 20MHz bandwidth | | | 50 | | 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 | Standard Suffix "H" | 1600 3000 | | | VDC |
| Isolation resistance | 500VDC | | 1 | | | GΩ |
| Isolation capacitance | | Standard Suffix "H" | | | 50 | pF |
| | | | | | 50 | |
| Switching frequency | | | 100 | | | kHz |
| Safety meets | | | IEC/ EN/ UL62368-1 | | | |
| 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 | | 5.627 x 10 ⁶ hrs | | | |

ENVIRONMENTAL SPECIFICATIONS

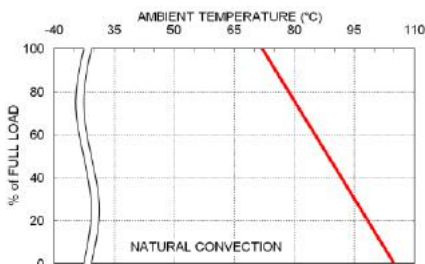
| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------|-------------------|------|------|------|---------------------------|
| Operating ambient temperature | Without derating | -40 | | +71 | °C |
| | With derating | +71 | | +105 | |
| Maximum case temperature | | | | 105 | °C |
| 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 | Only for SMD type | | | | IPC J-STD-020E |
| Moisture sensitivity level(MSL) | Only for SMD type | | | | IPC J-STD-033C Level 2 |

EMC SPECIFICATIONS

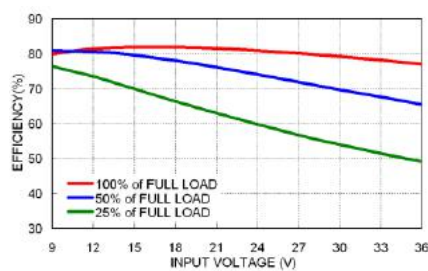
| Parameter | Conditions | Level |
|--------------------------------|---|------------------|
| EMI | EN55032 With external components. | Class A, Class B |
| EMS | EN55024 | |
| ESD | EN61000-4-2 Air ± 8kV and Contact ± 6kV | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 10 V/m | Perf. Criteria A |
| Fast transient | EN61000-4-4 ± 2kV | Perf. Criteria A |
| | With an external input filter capacitor (Nippon chemi-con KY series, 220 µF/100V.) | |
| Surge | EN61000-4-5 ± 1kV | Perf. Criteria A |
| | With an external input filter capacitor (Nippon chemi-con KY series, 220 µF/100V.) | |
| 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 |

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

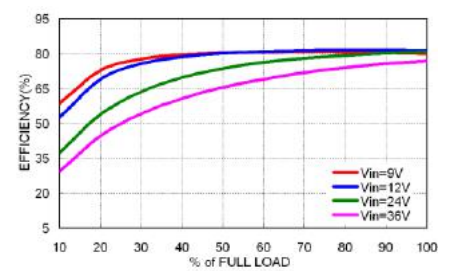
CHARACTERISTIC CURVE



SDS(H)03-24S05W Derating Curve



SDS(H)03-24S05W Efficiency vs. Input Voltage



SDS(H)03-24S05W Efficiency vs. Output Current

FUSE CONSIDERATION

This power module is not internally fused.

An input line fuse must always be used.

This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.

To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.

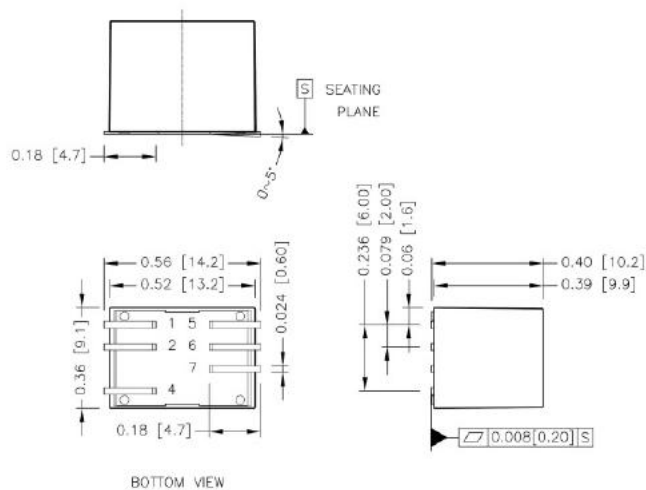
The input line fuse suggest as below :

| Modules | Fuse Rating (A) | Fuse Type |
|-----------------------------------|-----------------|-----------|
| SDS(H)03-12S□□W · SDS(H)03-12D□□W | 1.6 | Slow-Blow |
| SDS(H)03-24S□□W · SDS(H)03-24D□□W | 0.8 | Slow-Blow |
| SDS(H)03-48S□□W · SDS(H)03-48D□□W | 0.5 | Slow-Blow |

The table based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin..

MECHANICAL DRAWING

SDS03W: SMD TYPE

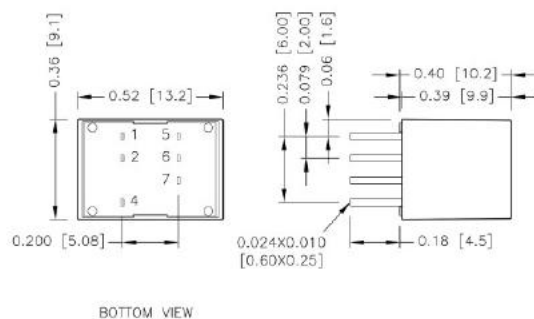


PIN CONNECTION

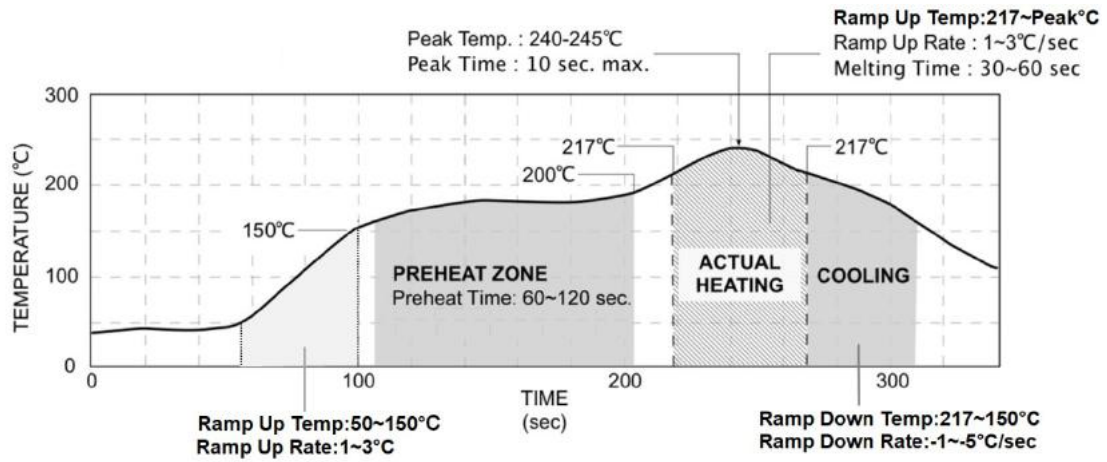
| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 4 | Ctrl | Ctrl |
| 5 | NC | -Vout |
| 6 | -Vout | Common |
| 7 | +Vout | +Vout |

- All dimensions in inch [mm]
- Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.010 [x.xx±0.25]
- Pin dimension tolerance ±0.004[0.10]

SDH03W: DIP TYPE



LEAD FREE REFLOW PROFILE For SMD Type



*The curves define the maximum peak reflow temperature permissible measured on pin1 or Vin pin.