



# P-DUKE POWER

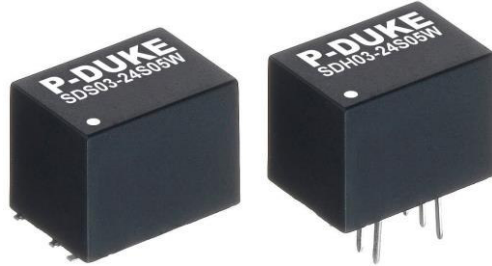
## SDS03W · SDH03W Series

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
<b>SDS</b> : SMD type <b>SDH</b> : 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	mA
	Application circuit	Remote off input current			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		+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					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 <sup>6</sup> hrs

## ENVIRONMENTAL SPECIFICATIONS

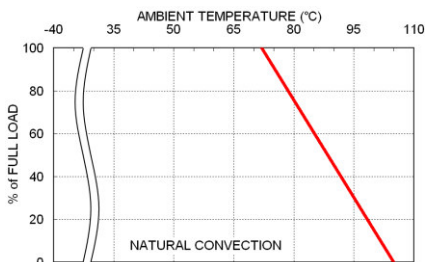
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+71	°C
	With derating	+71		+105	
Maximum case temperature				105	°C
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH
Moisture sensitivity level(MSL)	Only for SMD type Verification according to IPC J-STD-020E				IPC J-STD-033C Level 2
Lead-free reflow solder process	Only for SMD type				The time above 217°C 30~60sec. Peak temperature 245°C max. Time above 240°C 10sec. max.

## EMC SPECIFICATIONS

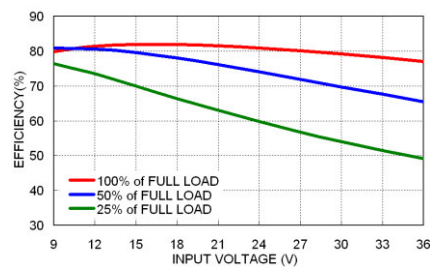
Parameter	Conditions	Level
EMI	EN55032 With external components.	Class A, Class B
EMS	EN55035	
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge	EN61000-4-5 ± 1kV With an external input filter capacitor (Nippon chemi-con KY series, 220 µF/100V.)	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.

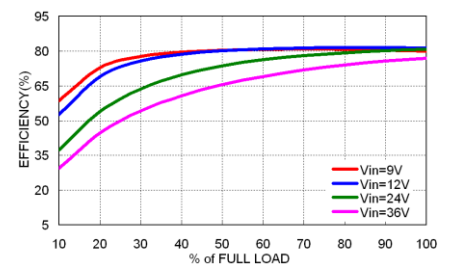
## CHARACTERISTIC CURVE



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.

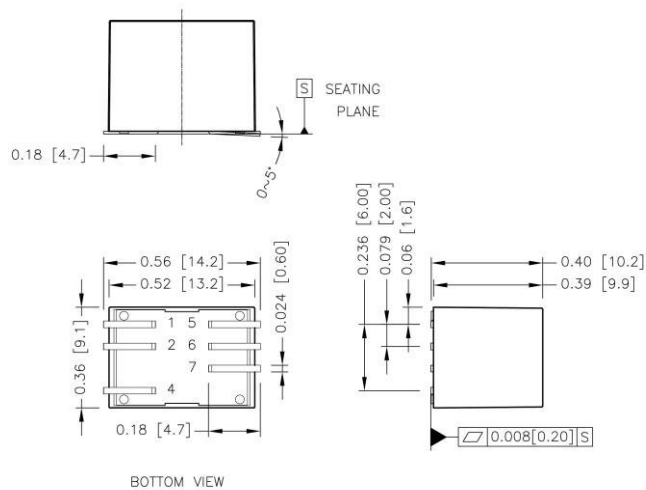
The input line fuse suggest as below :

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

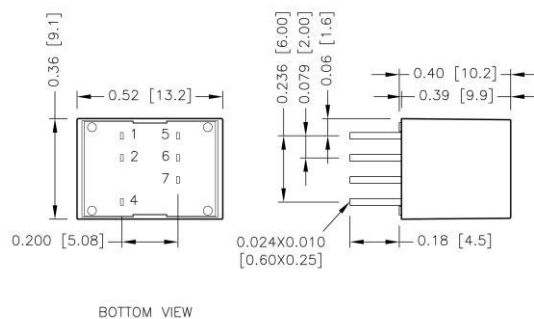


### PIN CONNECTION

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

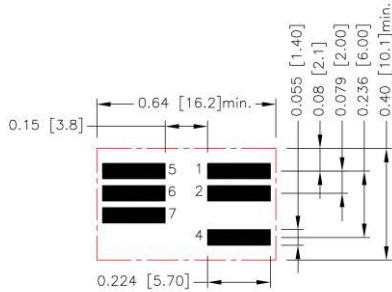
- All dimensions in inch [mm]
- Tolerance :x.xx±0.02 [x.x±0.5]  
x.xxx±0.010 [x.xx±0.25]
- Pin dimension tolerance ±0.004[0.10]

### SDH03W: DIP TYPE



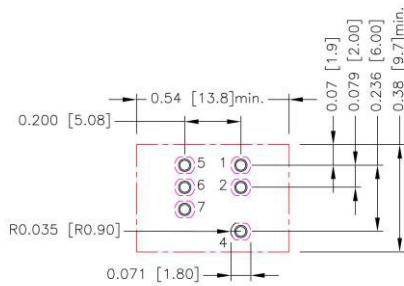
## RECOMMENDED PAD LAYOUT

### SMD TYPE



All dimensions in inch[mm]  
Pad size(lead free recommended)  
Top view pad:0.224x0.055[5.70x1.40]

### DIP TYPE



All dimensions in inch[mm]  
Pad size(lead free recommended)  
Through hole 1.2.4.5.6.7:  $\varnothing 0.035$ [0.90]  
Top view pad 1.2.4.5.6.7:  $\varnothing 0.044$ [1.13]  
Bottom view pad 1.2.4.5.6.7:  
Groove R0.035[0.90]L-0.071[1.80]

## THERMAL CONSIDERATIONS

The power module operates in a variety of thermal environments.

However, sufficient cooling should be provided to help ensure reliable operation of the unit.

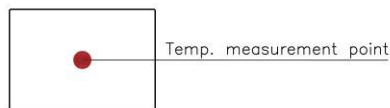
Heat is removed by conduction, convection, and radiation to the surrounding environment.

Proper cooling can be verified by measuring the point as the figure below.

The temperature at this location should not exceed "Maximum case temperature".

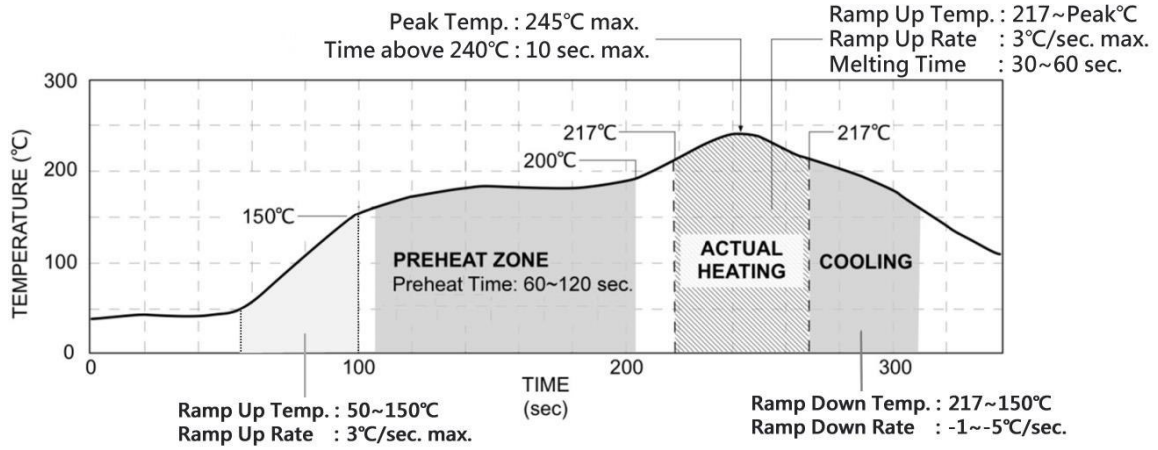
When operating, adequate cooling must be provided to maintain the test point temperature at or below "Maximum case temperature".

You can limit this temperature to a lower value for extremely high reliability.



TOP VIEW

**LEAD FREE REFLOW PROFILE For SMD Type**



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