



# P-DUKE POWER

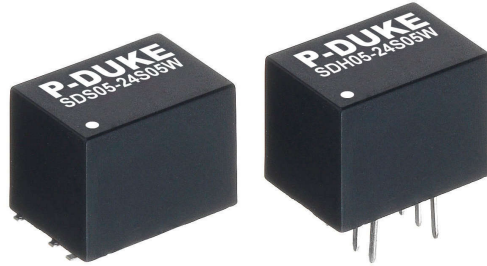
## SDS05W · SDH05W Series

DC-DC Converter  
Up to 5.04 Watts

**3**  
YEARS  
WARRANTY

ROHS  
COMPLIANT

REACH  
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway



**3000**  
VDC  
Isolation  
Voltage

**1600**  
VDC  
Isolation  
Voltage

**4 : 1**  
Wide  
Input  
Range

**NO**  
Min. Load  
Required

REMOTE  
**ON**  
**OFF**

**SCP**

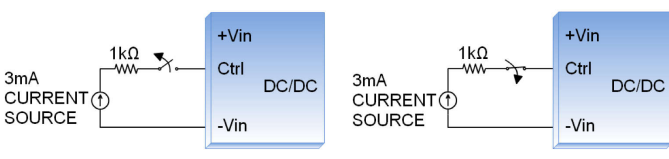
### PART NUMBER STRUCTURE

SDS05 - 48	S	05	W	H	
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range	Isolation Option
<b>SDS</b> : SMD type <b>SDH</b> : DIP type	<b>24</b> :9~36 <b>48</b> :18~75	<b>S</b> : Single  <b>D</b> : Dual	<b>3P3</b> :3.3 <b>05</b> :5 <b>09</b> :9 <b>12</b> :12 <b>15</b> :15 <b>24</b> :24  <b>05</b> :±5 <b>12</b> :±12 <b>15</b> :±15	4:1	<input type="checkbox"/> : Standard type 1600VDC isolation <input checked="" type="checkbox"/> : <b>H</b> :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)05-24S3P3W	9 ~ 36	3.3	1000	20	76	4400
SDS(H)05-24S05W	9 ~ 36	5	1000	30	80	2200
SDS(H)05-24S09W	9 ~ 36	9	555	30	81	1470
SDS(H)05-24S12W	9 ~ 36	12	420	30	83	1220
SDS(H)05-24S15W	9 ~ 36	15	333	30	83	1000
SDS(H)05-24S24W	9 ~ 36	24	210	30	83	470
SDS(H)05-24D05W	9 ~ 36	±5	±500	30	80	±1000
SDS(H)05-24D12W	9 ~ 36	±12	±210	30	83	±680
SDS(H)05-24D15W	9 ~ 36	±15	±168	30	84	±440
SDS(H)05-48S3P3W	18 ~ 75	3.3	1000	10	76	4400
SDS(H)05-48S05W	18 ~ 75	5	1000	12	81	2200
SDS(H)05-48S09W	18 ~ 75	9	555	15	81	1470
SDS(H)05-48S12W	18 ~ 75	12	420	15	83	1220
SDS(H)05-48S15W	18 ~ 75	15	333	15	83	1000
SDS(H)05-48S24W	18 ~ 75	24	210	15	83	470
SDS(H)05-48D05W	18 ~ 75	±5	±500	15	80	±1000
SDS(H)05-48D12W	18 ~ 75	±12	±210	15	83	±680
SDS(H)05-48D15W	18 ~ 75	±15	±168	15	84	±440

## INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	24Vin(nom) 48Vin(nom)	9 18	24 48	36 75	VDC
Start up time	Constant resistive load Power up Remote ON/OFF		10 10	20 20	ms
Input surge voltage	1 second, max. 24Vin(nom) 48Vin(nom)			50 100	VDC
Input reflected ripple current	With external components. 24Vin(nom) 48Vin(nom)		20 15		mA <sub>p-p</sub>
Input filter				Capacitor type	
Remote ON/OFF	DC-DC ON DC-DC OFF Remote off input current	Open or high impedance	2.0 3.0	4.0 4.0	mA
	Ctrl pin applied current via 1kΩ			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		-5.0		+5.0	%
Ripple and noise	Measured by 20MHz bandwidth			75		mVp-p
Temperature coefficient			-0.02		+0.02	%/°C
Transient response recovery time	25% load step change			500		µs
Short circuit protection						Continuous, automatics recovery

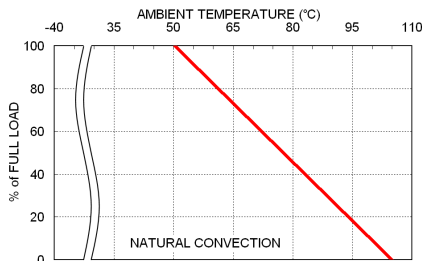
GENERAL SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Standard Suffix "H"	1600 3000			VDC
Isolation resistance	500VDC		1			GΩ
Isolation capacitance		Standard Suffix "H"			50 50	pF
Switching frequency			100			kHz
Safety meets						IEC/ UL/ EN60950-1
Case material						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					2.281 x 10 <sup>6</sup> hrs

ENVIRONMENTAL SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating		-40		+105	°C
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						IPC J-STD-020E
Moisture sensitivity level(MSL)						IPC J-STD-033C Level 2

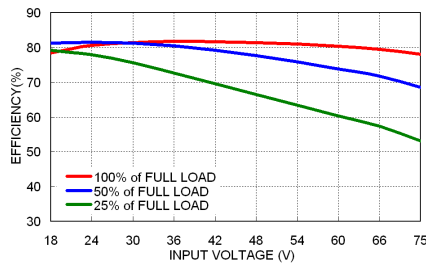
**EMC SPECIFICATIONS**

Parameter	Conditions		Level
EMI	EN55032	With external components.	Class A, Class B
ESD	EN61000-4-2	Air $\pm$ 8kV and Contact $\pm$ 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	$\pm$ 2kV	Perf. Criteria A
Surge	EN61000-4-5	With an external input filter capacitor (Nippon chemi-con KY series, 220 $\mu$ F/100V)	Perf. Criteria A
		$\pm$ 1kV	
Conducted immunity	EN61000-4-6	With an external input filter capacitor (Nippon chemi-con KY series, 220 $\mu$ F/100V)	Perf. Criteria A
		10 Vr.m.s	
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

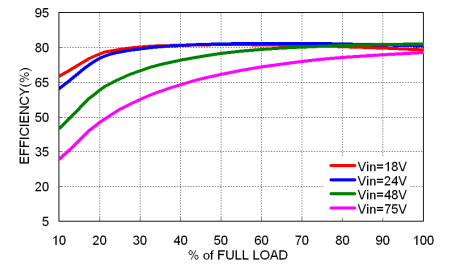
**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

**CHARACTERISTIC CURVE**


SDS(H)05-48S05W Derating Curve



SDS(H)05-48S05W Efficiency vs. Input Voltage



SDS(H)05-48S05W 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.

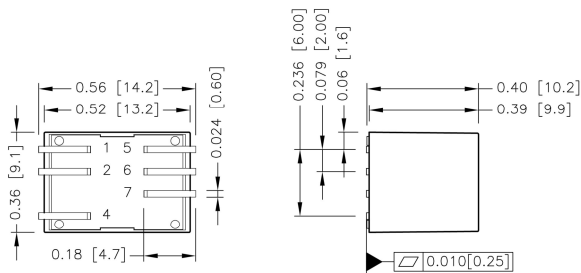
The input line fuse suggest as below :

Modules	Fuse Rating (A)	Fuse Type
SDS(H)05-24S□□W、SDS(H)05-24D□□W	1.25	Slow-Blow
SDS(H)05-48S□□W、SDS(H)05-48D□□W	0.63	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

### SDS05W: SMD TYPE



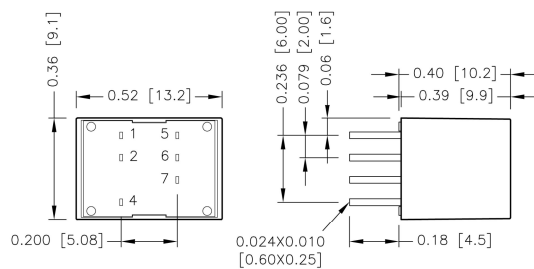
BOTTOM VIEW

### 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[0.10]

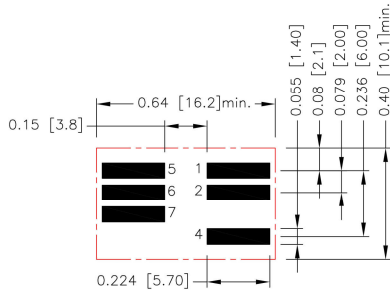
### SDH05W: DIP TYPE



BOTTOM VIEW

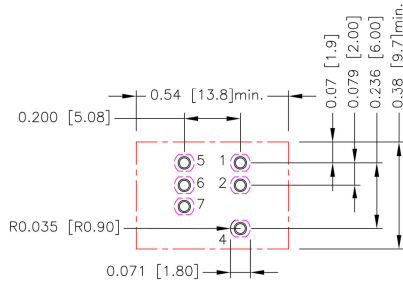
## RECOMMENDED PAD LAYOUT

### SMD TYPE



All dimensions in inch[mm]  
Pad size(lead free recommended)  
Top view pad:0.224x0.059[5.70x1.50]

### 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.

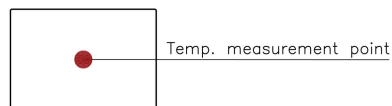
Heat is removed by conduction, convection, and radiation to the surrounding Environment.

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