

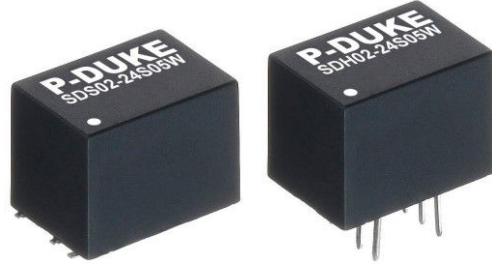


# 3

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

SDS02 -	48	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	<b>3P3</b> : 3.3 <b>05</b> : 5 <b>09</b> : 9 12: 12 15: 15 24: 24  <b>05</b> : ±5 <b>12</b> : ±12 <b>15</b> : ±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)02-12S3P3W	4.5 ~ 18	3.3	500	25	77	2200
SDS(H)02-12S05W	4.5 ~ 18	5	400	30	80	1000
SDS(H)02-12S09W	4.5 ~ 18	9	222	30	81	660
SDS(H)02-12S12W	4.5 ~ 18	12	167	30	83	550
SDS(H)02-12S15W	4.5 ~ 18	15	134	30	84	440
SDS(H)02-12S24W	4.5 ~ 18	24	83	30	84	200
SDS(H)02-12D05W	4.5 ~ 18	±5	±200	30	80	±660
SDS(H)02-12D12W	4.5 ~ 18	±12	±83	30	84	±330
SDS(H)02-12D15W	4.5 ~ 18	±15	±67	30	84	±220
SDS(H)02-24S3P3W	9 ~ 36	3.3	500	15	76	2200
SDS(H)02-24S05W	9 ~ 36	5	400	18	79	1000
SDS(H)02-24S09W	9 ~ 36	9	222	18	80	660
SDS(H)02-24S12W	9 ~ 36	12	167	18	82	550
SDS(H)02-24S15W	9 ~ 36	15	134	18	83	440
SDS(H)02-24S24W	9 ~ 36	24	83	18	82	200
SDS(H)02-24D05W	9 ~ 36	±5	±200	18	80	±660
SDS(H)02-24D12W	9 ~ 36	±12	±83	18	82	±330
SDS(H)02-24D15W	9 ~ 36	±15	±67	18	81	±220
SDS(H)02-48S3P3W	18 ~ 75	3.3	500	8	75	2200
SDS(H)02-48S05W	18 ~ 75	5	400	8	81	1000
SDS(H)02-48S09W	18 ~ 75	9	222	11	81	660
SDS(H)02-48S12W	18 ~ 75	12	167	11	83	550
SDS(H)02-48S15W	18 ~ 75	15	134	11	82	440
SDS(H)02-48S24W	18 ~ 75	24	83	11	82	200
SDS(H)02-48D05W	18 ~ 75	±5	±200	11	79	±660
SDS(H)02-48D12W	18 ~ 75	±12	±83	11	82	±330
SDS(H)02-48D15W	18 ~ 75	±15	±67	11	82	±220

INPUT SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		12Vin(nom) 24Vin(nom) 48Vin(nom)	4.5 9 18	12 24 48	18 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.	12Vin(nom) 24Vin(nom) 48Vin(nom)			25 50 100	VDC
Input reflected ripple current	With external components.	12Vin(nom) 24Vin(nom) 48Vin(nom)		20 20 20		mAp-p
Input filter					Capacitor type	
Remote ON/OFF	Ctrl pin applied current via 1kΩ	DC-DC ON DC-DC OFF Remote off input current	Open or high impedance 2.0	3.0	4.0 2.5	mA 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 Dual	-1.0 -1.0		+1.0 +1.0	%
	10% Load to 90% Load	Single Dual	-0.5 -0.8		+0.5 +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 50	pF
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				6.204 x 10 <sup>6</sup>	hrs

## ENVIRONMENTAL SPECIFICATIONS

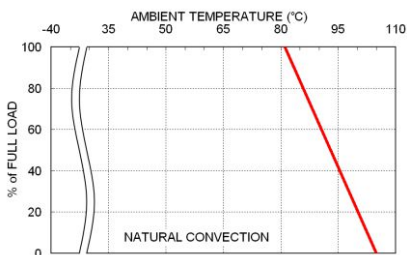
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating With derating	-40 +80		+80 +105	°C
Maximum case temperature				105	°C
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH
Lead-free reflow solder process	Only for SMD type				IPC J-STD-020E
Moisture sensitivity level(MSL)	Only for SMD type				IPC J-STD-033C Level 2

## EMC SPECIFICATIONS

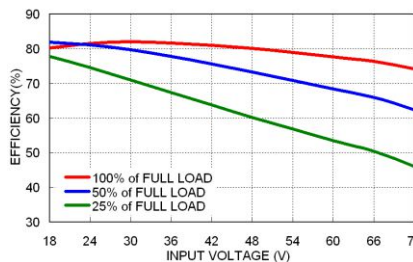
Parameter	Conditions	Level
EMI	EN55032 With external components.	Class A, Class B
EMS	EN55035	
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge	EN61000-4-5 ± 1kV  With an external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

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

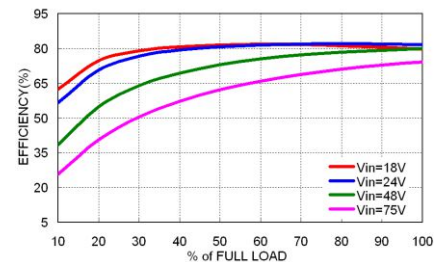
## CHARACTERISTIC CURVE



SDS(H)02-48S05W Derating Curve



SDS(H)02-48S05W Efficiency vs. Input Voltage



SDS(H)02-48S05W 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.

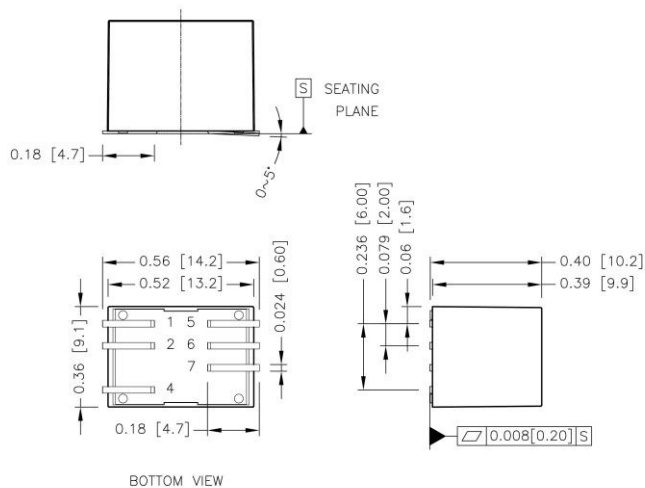
The input line fuse suggest as below :

Modules	Fuse Rating (A)	Fuse Type
SDS(H)02-12S□□W · SDS(H)02-12D□□W	1	Slow-Blow
SDS(H)02-24S□□W · SDS(H)02-24D□□W	0.5	Slow-Blow
SDS(H)02-48S□□W · SDS(H)02-48D□□W	0.315	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

### SDS02W: SMD TYPE

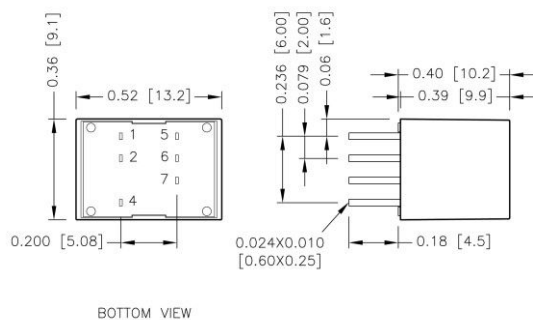


### PIN CONNECTION

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

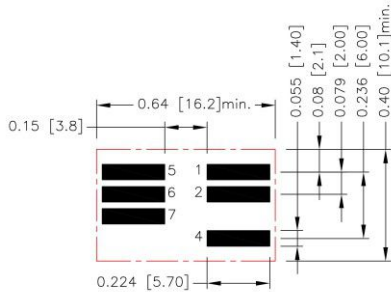
- All dimensions in inch [mm]
- Tolerance :x.xx±0.02 [x.x±0.5]  
x.xxx±0.010 [x.xx±0.25]
- Pin dimension tolerance ±0.004[0.10]

### SDH02W: DIP TYPE



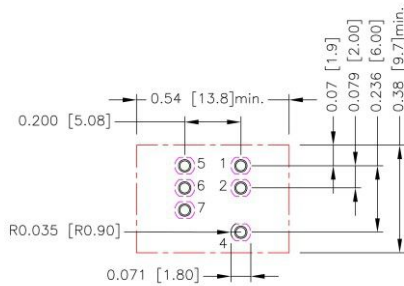
**RECOMMENDED PAD LAYOUT**

**SMD TYPE**



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

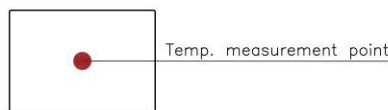
**DIP TYPE**



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**

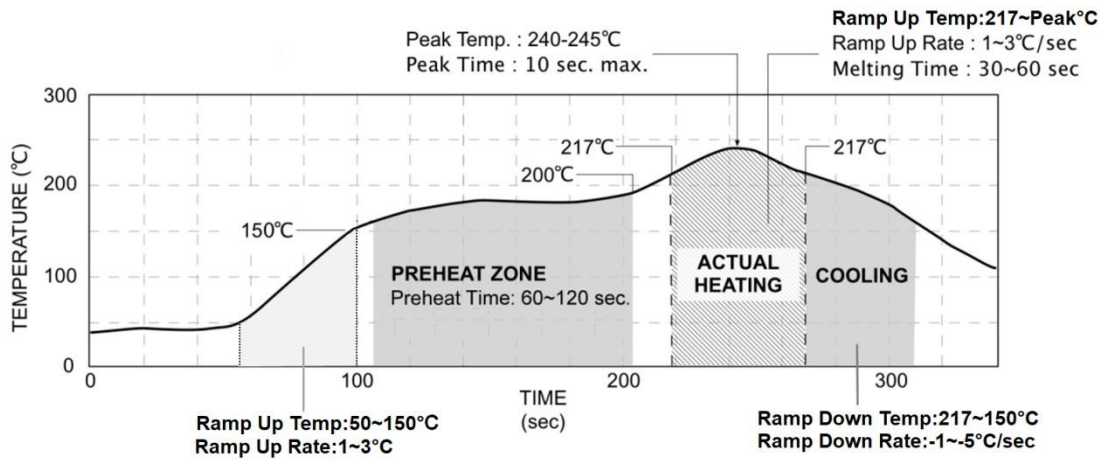
The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point 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.



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