P-DUKE POWER

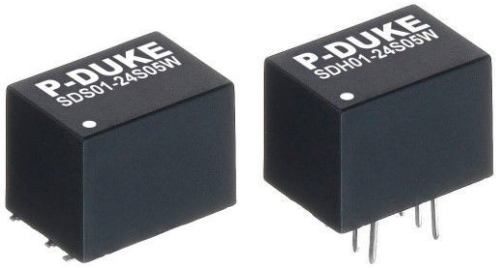
SDS01W · SDH01W Series

DC-DC Converter
Up to 1.08 Watts

3 YEARS WARRANTY

RoHS COMPLIANT

REACH COMPLIANT



Automation | Datacom | IPC

Industry | Measurement | Telecom

Automobile | Boat | Charger

Medical | PV | Railway

CE UKCA

3000 VDC Isolation Voltage

1600 VDC Isolation Voltage

4 : 1 Wide Input Range

NO Min. Load Required

REMOTE ON OFF

SCP

PART NUMBER STRUCTURE

SDS01 - 48 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	**3P3:**3.3 **05:**5 **09:**9 **12:**12 **15:**15 **24:**24	4:1	**□:** 1600VDC isolation **H:** 3000VDC isolation
		D: Dual	**05:**±5 **12:**±12 **15:**±15		

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25℃ unless otherwise noted

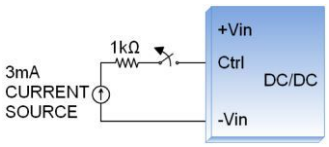
Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	μF
SDS(H)01-12S3P3W	4.5 ~ 18	3.3	300	15	77	1680
SDS(H)01-12S05W	4.5 ~ 18	5	200	20	79	820
SDS(H)01-12S09W	4.5 ~ 18	9	112	20	79	630
SDS(H)01-12S12W	4.5 ~ 18	12	90	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)01-24S09W	9 ~ 36	9	112	10	79	630
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)01-48S09W	18 ~ 75	9	112	5	79	630
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

INPUT SPECIFICATIONS

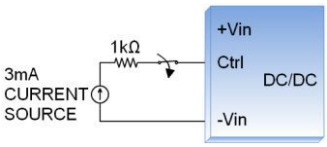
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		12Vin(nom)	4.5	12	18	VDC
		24Vin(nom)	9	24	36	
		48Vin(nom)	18	48	75	
Start up time	Constant resistive load	Power up		10	20	ms
		Remote ON/OFF		10	20	
Input surge voltage	1 second, max.	12Vin(nom)			25	VDC
		24Vin(nom)			50	
		48Vin(nom)			100	
Input reflected ripple current	With external components	12Vin(nom)		15		mAp-p
		24Vin(nom)		10		
		48Vin(nom)		5		
Input filter				Capacitor type		
Remote ON/OFF		DC-DC ON		Open or high impedance		mA
	Ctrl pin applied current via 1kΩ	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			30		mVp-p
Temperature coefficient			-0.02		+0.02	%/℃
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	1600			VDC
		Suffix "H"	3000			
Isolation resistance	500VDC		1			GΩ
Isolation capacitance		Standard			50	pF
		Suffix "H"			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					8.401×10^6 hrs

ENVIRONMENTAL SPECIFICATIONS

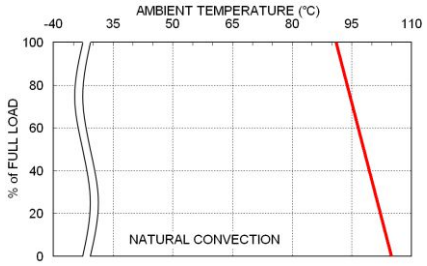
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating With derating	-40 +90		+90 +105	℃
Maximum case temperature				105	℃
Storage temperature range		-55		+125	℃
Thermal shock				MIL-STD-810F	
Vibration				MIL-STD-810F	
Relative humidity				5% to 95% RH	
Moisture sensitivity 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℃ 30~60sec. Peak temperature 245℃ max. Time above 240℃ 10sec. max.	

EMC SPECIFICATIONS

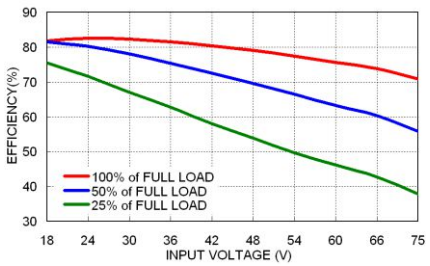
Parameter	Conditions		Level
EMI	EN55032	With external components	Class A, Class B
EMS	EN55035		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV With an external input filter capacitor (Nippon chemi-con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

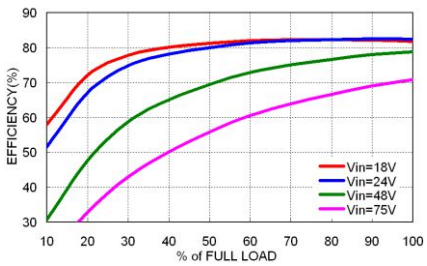
CHARACTERISTIC CURVE



SDS(H)01-48S05W Derating Curve



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



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

FUSE CONSIDERATION

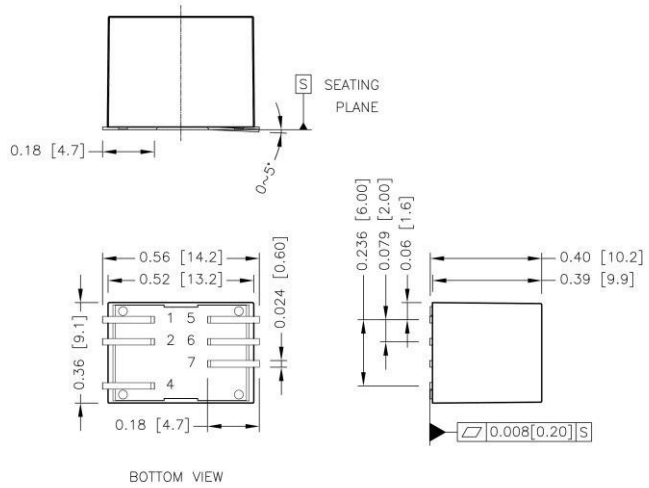
This power module is not internally fused. An input line fuse must always be used.
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.
To maximum flexibility, internal fusing 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)01-12S□□W、SDS(H)01-12D□□W	0.5	Slow-Blow
SDS(H)01-24S□□W、SDS(H)01-24D□□W	0.315	Slow-Blow
SDS(H)01-48S□□W、SDS(H)01-48D□□W	0.16	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

SDS01W: SMD TYPE

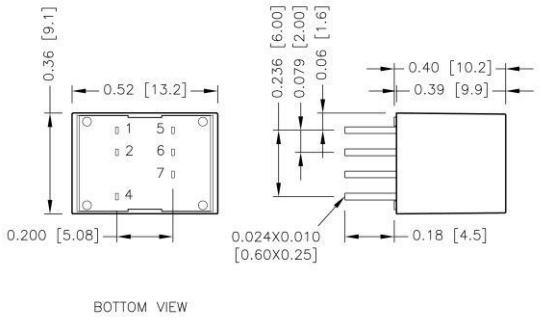


PIN CONNECTION

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

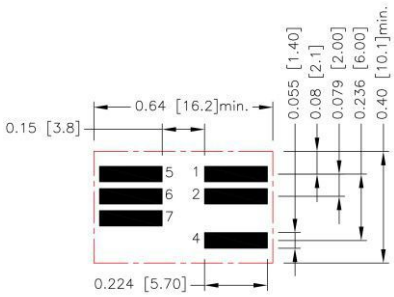
1. All dimensions in inch [mm]
2. Tolerance :x.xx±0.02 [x.x±0.5]
   x.xxx±0.010 [x.xx±0.25]
3. Pin dimension tolerance ±0.004[0.10]

SDH01W: DIP TYPE



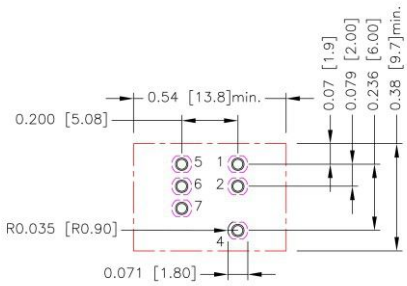
RECOMMENDED PAD LAYOUT

SMD TYPE



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

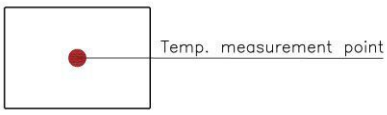
DIP TYPE



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

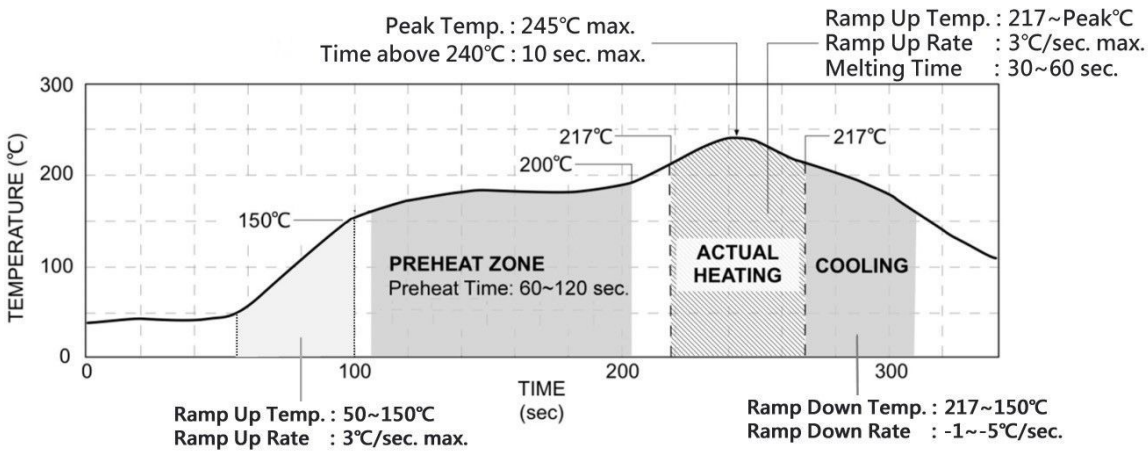
THERMAL CONSIDERATIONS

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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