



P-DUKE POWER

SDS01 • SDH01 Series

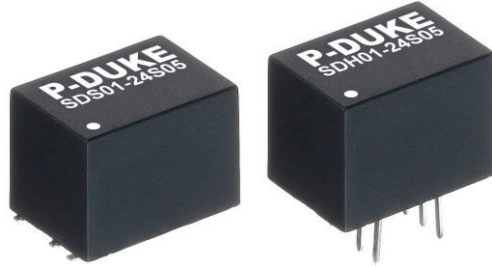
DC-DC Converter
Up to 1.08 Watts

3

YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway

CE UK
CA

3000
VDC
Isolation
Voltage

1600
VDC
Isolation
Voltage

2 : 1
Input
Range

NO
Min. Load
Required

REMOTE
ON
OFF

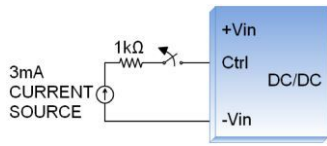
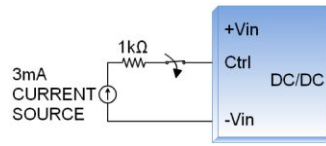
SCP

PART NUMBER STRUCTURE

SDS01 -	48	S	05	H
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Isolation Options
SDS : SMD type SDH : DIP type	05:4.5-9 12:9-18 24:18-36 48:36-75	S: Single D: Dual	3P3:3.3 05:5 09:9 12:12 15:15 24:24 05:±5 12:±12 15:±15	□: Standard type 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)01-05S3P3	4.5 ~ 9	3.3	300	20	78	1680
SDS(H)01-05S05	4.5 ~ 9	5	200	25	80	820
SDS(H)01-05S09	4.5 ~ 9	9	112	30	81	630
SDS(H)01-05S12	4.5 ~ 9	12	90	30	83	470
SDS(H)01-05S15	4.5 ~ 9	15	70	30	83	330
SDS(H)01-05S24	4.5 ~ 9	24	45	30	82	160
SDS(H)01-05D05	4.5 ~ 9	±5	±100	30	81	±470
SDS(H)01-05D12	4.5 ~ 9	±12	±45	30	82	±330
SDS(H)01-05D15	4.5 ~ 9	±15	±35	30	82	±220
SDS(H)01-12S3P3	9 ~ 18	3.3	300	10	78	1680
SDS(H)01-12S05	9 ~ 18	5	200	10	80	820
SDS(H)01-12S09	9 ~ 18	9	112	13	81	630
SDS(H)01-12S12	9 ~ 18	12	90	13	83	470
SDS(H)01-12S15	9 ~ 18	15	70	13	83	330
SDS(H)01-12S24	9 ~ 18	24	45	15	82	160
SDS(H)01-12D05	9 ~ 18	±5	±100	15	80	±470
SDS(H)01-12D12	9 ~ 18	±12	±45	15	82	±330
SDS(H)01-12D15	9 ~ 18	±15	±35	15	82	±220
SDS(H)01-24S3P3	18 ~ 36	3.3	300	6	78	1680
SDS(H)01-24S05	18 ~ 36	5	200	6	81	820
SDS(H)01-24S09	18 ~ 36	9	112	6	82	630
SDS(H)01-24S12	18 ~ 36	12	90	6	83	470
SDS(H)01-24S15	18 ~ 36	15	70	6	83	330
SDS(H)01-24S24	18 ~ 36	24	45	8	82	160
SDS(H)01-24D05	18 ~ 36	±5	±100	8	80	±470
SDS(H)01-24D12	18 ~ 36	±12	±45	8	82	±330
SDS(H)01-24D15	18 ~ 36	±15	±35	8	82	±220
SDS(H)01-48S3P3	36 ~ 75	3.3	300	5	79	1680
SDS(H)01-48S05	36 ~ 75	5	200	5	80	820
SDS(H)01-48S09	36 ~ 75	9	112	5	81	630
SDS(H)01-48S12	36 ~ 75	12	90	5	82	470
SDS(H)01-48S15	36 ~ 75	15	70	5	83	330
SDS(H)01-48S24	36 ~ 75	24	45	5	82	160
SDS(H)01-48D05	36 ~ 75	±5	±100	5	80	±470
SDS(H)01-48D12	36 ~ 75	±12	±45	5	82	±330
SDS(H)01-48D15	36 ~ 75	±15	±35	5	81	±220

INPUT SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range	5Vin(nom)		4.5	5	9	VDC
	12Vin(nom)		9	12	18	
	24Vin(nom)		18	24	36	
	48Vin(nom)		36	48	75	
Start up time	Constant resistive load	Power up Remote ON/OFF		10 10	20 20	ms
Input surge voltage	1 second, max.	5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)			15 25 50 100	VDC
Input reflected ripple current	With external components.	5Vin(nom) 12Vin(nom) 24Vin(nom) 48Vin(nom)		10 10 10 10		mAp-p
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
		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	%/°C
Transient response recovery time	25% load step change			500		μs
Short circuit protection	Continuous, automatic recovery					

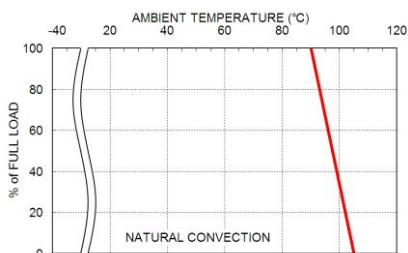
GENERAL SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Standard Suffix "H"	1600 3000			VDC
Isolation resistance	500VDC		1			GΩ
Isolation capacitance					50 50	pF
Switching frequency			100			kHz
Safety meets	IEC/ EN/ UL62368-1					
Case material	Non-conductive 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		8.534 x 10 ⁶ hrs			

ENVIRONMENTAL SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating With derating	-40 +90		+90 +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	
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.	

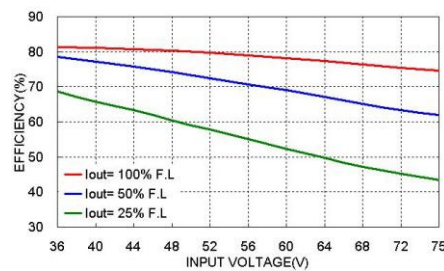
EMC SPECIFICATIONS			
Parameter	Conditions	Level	
EMI	EN55032 With external components.		Class A, Class B
EMS	EN55035		
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV		Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m		Perf. Criteria A
Fast transient	EN61000-4-4 ± 2kV		Perf. Criteria A
Surge	EN61000-4-5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

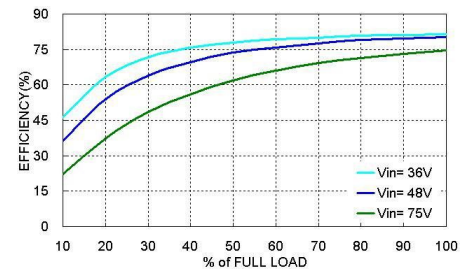
CHARACTERISTIC CURVE



SDS(H)01-48S05 Derating Curve



SDS(H)01-48S05 Efficiency vs. Input Voltage



SDS(H)01-48S05 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.

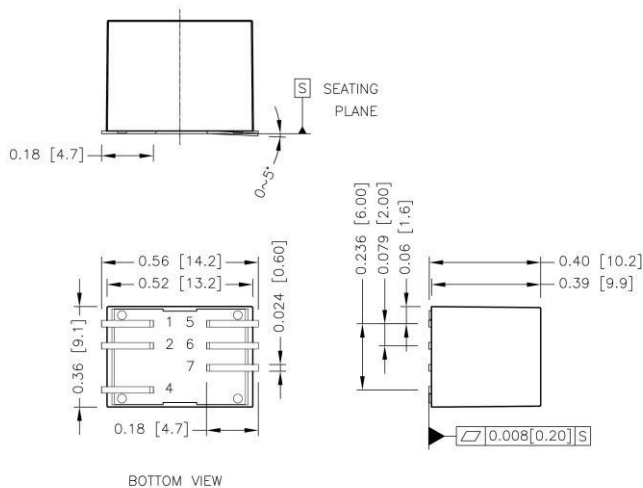
The input line fuse suggest as below:

Model	Fuse Rating (A)	Fuse Type
SDS(H)01-05S□□、SDS(H)01-05D□□	0.5	Slow-Blow
SDS(H)01-12S□□、SDS(H)01-12D□□	0.315	Slow-Blow
SDS(H)01-24S□□、SDS(H)01-24D□□	0.16	Slow-Blow
SDS(H)01-48S□□、SDS(H)01-48D□□	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

SDS01: SMD TYPE

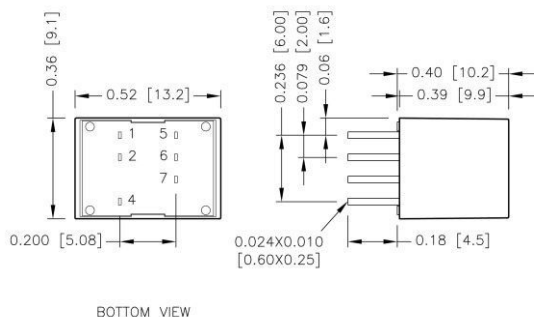


PIN CONNECTION

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

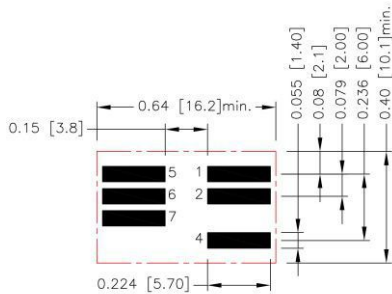
- All dimensions in inch [mm]
- Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.010 [x.xx±0.25]
- Pin dimension tolerance ±0.004[0.10]

SDH01: DIP TYPE



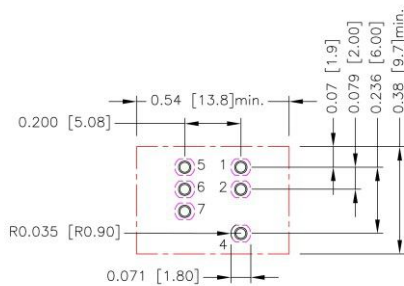
RECOMMENDED PAD LAYOUT

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.

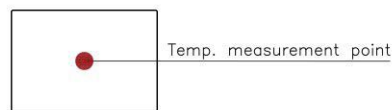
Heat is removed by conduction, convection, and radiation to the surrounding environment.

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

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

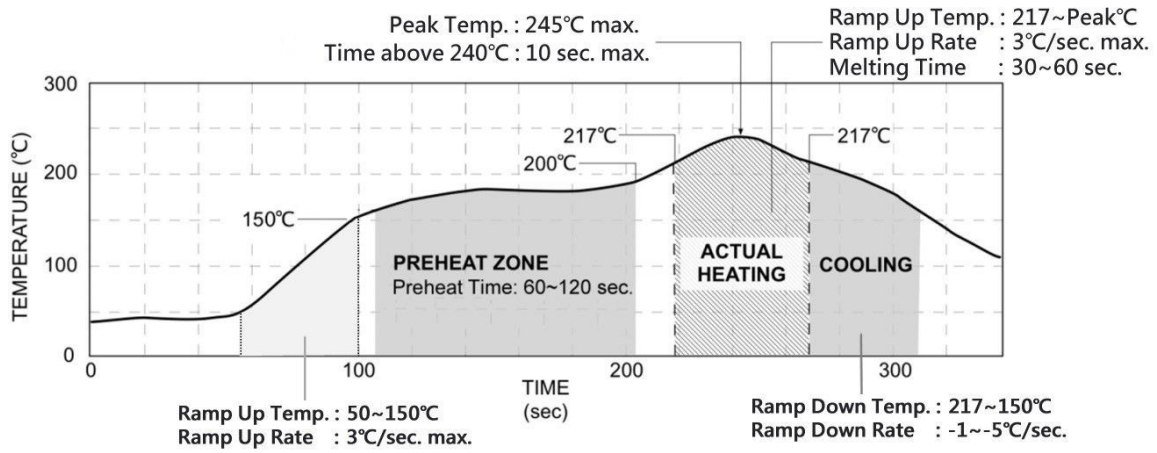
When operating, adequate cooling must be provided to maintain the test point temperature at or below "Maximum case temperature".

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.