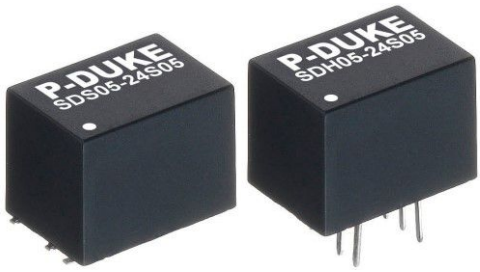
SDS05 • SDH05 Series

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

CE UKCA

3000 VDC Isolation Voltage | 1600 VDC Isolation Voltage | 2 : 1 Input Range | NO Min. Load Required | REMOTE ON OFF | SCP

PART NUMBER STRUCTURE

SDS05 -	48	S	05	H
Series Name	**Input Voltage (VDC)**	**Output Quantity**	**Output Voltage (VDC)**	**Isolation Options**
SDS: SMD type **SDH**: DIP type	**05:**4.5~13.2 **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

Downloaded from Arrow.com.

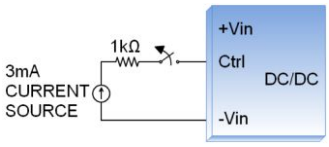
TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25℃ unless otherwise noted

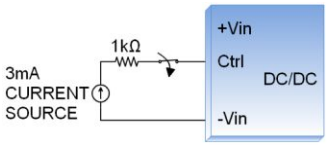
Model Number	Input Range	Output Voltage	Output Current @ Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	μF
SDS(H)05-05S3P3	4.5 ~ 13.2	3.3	1000	50	76	4400
SDS(H)05-05S05	4.5 ~ 13.2	5	1000	60	80	2200
SDS(H)05-05S09	4.5 ~ 13.2	9	555	70	81	1470
SDS(H)05-05S12	4.5 ~ 13.2	12	420	70	83	1220
SDS(H)05-05S15	4.5 ~ 13.2	15	333	75	83	1000
SDS(H)05-05S24	4.5 ~ 13.2	24	210	90	83	470
SDS(H)05-05D05	4.5 ~ 13.2	±5	±500	70	80	±1000
SDS(H)05-05D12	4.5 ~ 13.2	±12	±210	90	83	±680
SDS(H)05-05D15	4.5 ~ 13.2	±15	±168	90	83	±440
SDS(H)05-12S3P3	9 ~ 18	3.3	1000	25	76	4400
SDS(H)05-12S05	9 ~ 18	5	1000	30	81	2200
SDS(H)05-12S09	9 ~ 18	9	555	35	82	1470
SDS(H)05-12S12	9 ~ 18	12	420	35	84	1220
SDS(H)05-12S15	9 ~ 18	15	333	35	85	1000
SDS(H)05-12S24	9 ~ 18	24	210	35	84	470
SDS(H)05-12D05	9 ~ 18	±5	±500	35	81	±1000
SDS(H)05-12D12	9 ~ 18	±12	±210	35	84	±680
SDS(H)05-12D15	9 ~ 18	±15	±168	40	85	±440
SDS(H)05-24S3P3	18 ~ 36	3.3	1000	15	77	4400
SDS(H)05-24S05	18 ~ 36	5	1000	15	81	2200
SDS(H)05-24S09	18 ~ 36	9	555	15	82	1470
SDS(H)05-24S12	18 ~ 36	12	420	15	84	1220
SDS(H)05-24S15	18 ~ 36	15	333	15	86	1000
SDS(H)05-24S24	18 ~ 36	24	210	20	84	470
SDS(H)05-24D05	18 ~ 36	±5	±500	20	82	±1000
SDS(H)05-24D12	18 ~ 36	±12	±210	20	84	±680
SDS(H)05-24D15	18 ~ 36	±15	±168	20	85	±440
SDS(H)05-48S3P3	36 ~ 75	3.3	1000	10	77	4400
SDS(H)05-48S05	36 ~ 75	5	1000	12	81	2200
SDS(H)05-48S09	36 ~ 75	9	555	12	82	1470
SDS(H)05-48S12	36 ~ 75	12	420	12	85	1220
SDS(H)05-48S15	36 ~ 75	15	333	12	85	1000
SDS(H)05-48S24	36 ~ 75	24	210	12	84	470
SDS(H)05-48D05	36 ~ 75	±5	±500	12	82	±1000
SDS(H)05-48D12	36 ~ 75	±12	±210	12	84	±680
SDS(H)05-48D15	36 ~ 75	±15	±168	12	85	±440

Downloaded from Arrow.com.

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range		05Vin(nom)	4.5	5	13.2	VDC
		12Vin(nom)	9	12	18	
		24Vin(nom)	18	24	36	
		48Vin(nom)	36	48	75	
Start up time	Constant resistive load	Power up		10	20	ms
		Remote ON/OFF		10	20	
Input surge voltage	1 second, max.	05Vin(nom)			15	VDC
		12Vin(nom)			25	
		24Vin(nom)			50	
		48Vin(nom)			100	
Input reflected ripple current	With external components	05Vin(nom)		40		mAp-p
		12Vin(nom)		30		
		24Vin(nom)		20		
		48Vin(nom)		15		
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			50		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				2.959×10^6 hrs	

Downloaded from Arrow.com.

ENVIRONMENTAL SPECIFICATIONS

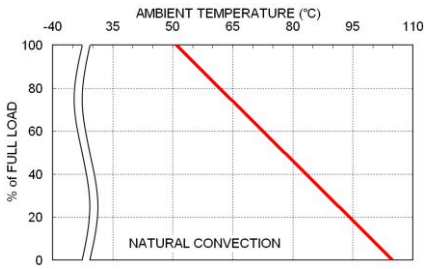
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+105	℃
Maximum case temperature				105	℃
Storage temperature range		-55		+125	℃
Thermal shock				MIL-STD-810F	
Vibration				MIL-STD-810F	
Relative humidity				5% to 95% RH	
Moisture sensitivity level(MSL)	Only for 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

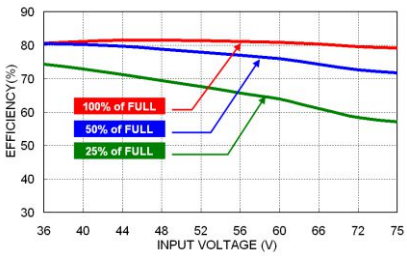
Parameter	Conditions		Level
EMI	EN55032	With external components	Class A, Class B
EMS	EN55035		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV With an external input filter capacitor (Nippon chemi-con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

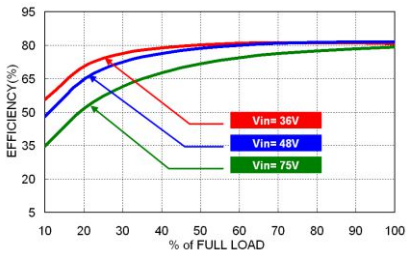
CHARACTERISTIC CURVE



SDS(H)05-48S05 Derating Curve



SDS(H)05-48S05 Efficiency vs. Input Voltage



SDS(H)05-48S05 Efficiency vs. Output Current

Downloaded from Arrow.com.

FUSE CONSIDERATION

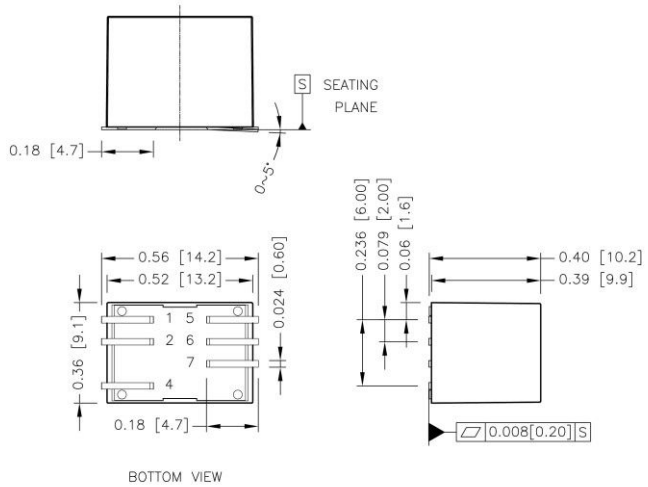
This power module is not internally fused. An input line fuse must always be used.
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.
To maximum flexibility, internal fusing 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)05-05S□□、SDS(H)05-05D□□	2.5	Slow-Blow
SDS(H)05-12S□□、SDS(H)05-12D□□	1.25	Slow-Blow
SDS(H)05-24S□□、SDS(H)05-24D□□	0.63	Slow-Blow
SDS(H)05-48S□□、SDS(H)05-48D□□	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

SDS05: SMD TYPE

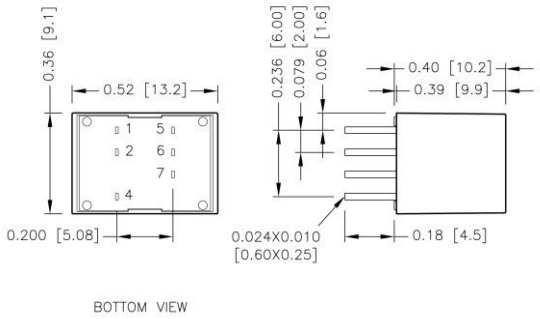


PIN CONNECTION

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]
4. Pin dimension tolerance ±0.004[0.10]

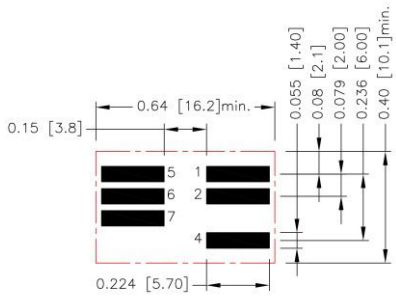
SDH05: DIP TYPE



Downloaded from Arrow.com.

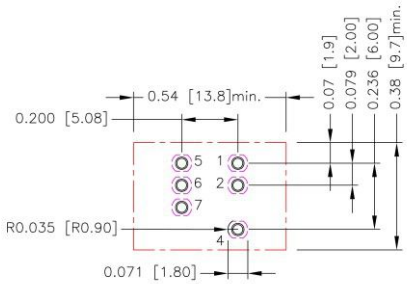
RECOMMENDED PAD LAYOUT

SMD TYPE



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

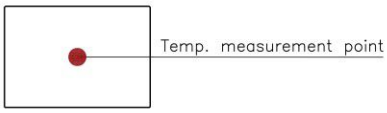
DIP TYPE



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

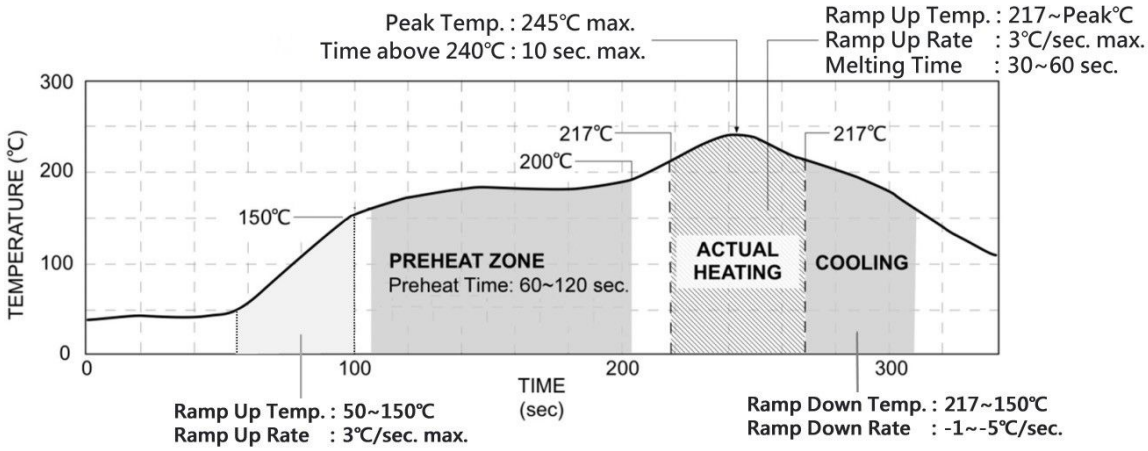
The power module operates in a variety of thermal environments.
However, sufficient cooling should be provided to help ensure reliable operation of the unit.
Heat is removed by conduction, convection, and radiation to the surrounding environment.
Proper cooling can be verified by measuring the point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

Downloaded from Arrow.com.

LEAD FREE REFLOW PROFILE For SMD Type



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

P-DUKE Technology Co., Ltd.

Tel +886-4-2359-0668
Fax +886-4-2359-1337
Email sales@pduke.com
Web www.pduke.com
Add No. 36, 22nd Rd., Taichung Industrial Park, Taichung, Taiwan, R.O.C.

Downloaded from Arrow.com.