

## Features

- 2:1 Wide Input Range
- Operating Temperature Range: -40~105°C
- Approved to UKCA, CE, RoHS & REACH
- Approved to IEC/UL/EN62368-1
- Efficiency up to 86%
- EMC Class A
- Single & Dual W Output Models



Ideal Power's 43SDH05-xyz 5W Series DIP DC/DC Converters are certified to UKCA, CE, RoHS, REACH & IEC/UL/EN 62368-1 Standards and comply with the relevant Efficiency Regulations. These are primarily used in ITE, Video & Audio Industries and customised solutions are available upon request.

### Part Number Structure

SDS(H)	-	48	S	05	H
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Isolation Options
SDS: SMD type		0.5:4.5 ~ 13.2	S: Single	3P3: 3.3	□: Standard type
SDH: DIP type		12: 9 ~ 18		05:5	1600V DC Isolation
		24: 18 ~ 36		09:9	H:3000V DC Isolation
		48: 136 ~ 75		12:12	
				15:15	
				24:24	
			D: Dual	05:±5	
				12:±12	
				15:±15	

**Models**

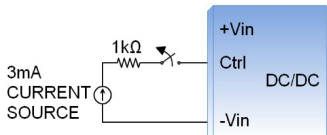
Model Number	Input Range V DC	Output Voltage V DC	Output current @Full Load A	Input Current @ No Load A	Efficiency %	Maximum Capacitor Load μF
43SDS(H)05-05S3P3	4.5 ~ 13.2	3.3	1000	50	76	4400
43SDS(H)05-05S05	4.5 ~ 13.2	5	1000	60	80	2200
43SDS(H)05-05S09	4.5 ~ 13.2	9	555	70	81	1470
43SDS(H)05-05S12	4.5 ~ 13.2	12	420	70	83	1220
43SDS(H)05-05S15	4.5 ~ 13.2	15	333	75	83	1000
43SDS(H)05-05S24	4.5 ~ 13.2	24	210	90	83	470
43SDS(H)05-05D05	4.5 ~ 13.2	±5	±500	70	80	±1000
43SDS(H)05-05D12	4.5 ~ 13.2	±12	±210	90	83	±680
43SDS(H)05-05D15	4.5 ~ 13.2	±15	±168	90	83	±440
43SDS(H)05-12S3P3	9 ~ 18	3.3	1000	25	76	4400
43SDS(H)05-12S05	9 ~ 18	5	1000	30	81	2200
43SDS(H)05-12S09	9 ~ 18	9	555	35	82	1470
43SDS(H)05-12S12	9 ~ 18	12	420	35	84	1220
43SDS(H)05-12S15	9 ~ 18	15	333	35	85	1000
43SDS(H)05-12S24	9 ~ 18	24	210	35	84	470
43SDS(H)05-12D05	9 ~ 18	±5	±500	35	81	±1000
43SDS(H)05-12D12	9 ~ 18	±12	±210	35	84	±680
43SDS(H)05-12D15	9 ~ 18	±15	±168	40	85	±440
43SDS(H)05-24S3P3	18 ~ 36	3.3	1000	15	77	4400
43SDS(H)05-24S05	18 ~ 36	5	1000	15	81	2200
43SDS(H)05-24S09	18 ~ 36	9	555	15	82	1470
43SDS(H)05-24S12	18 ~ 36	12	420	15	84	1220
43SDS(H)05-24S15	18 ~ 36	15	333	15	86	1000
43SDS(H)05-24S24	18 ~ 36	24	210	20	84	470
43SDS(H)05-24D05	18 ~ 36	±5	±500	20	82	±1000
43SDS(H)05-24D12	18 ~ 36	±12	±210	20	84	±680
43SDS(H)05-24D15	18 ~ 36	±15	±168	20	85	±440
43SDS(H)05-48S3P3	36 ~ 75	3.3	1000	10	77	4400
43SDS(H)05-48S05	36 ~ 75	5	1000	12	81	2200
43SDS(H)05-48S09	36 ~ 75	9	555	12	82	1470
43SDS(H)05-48S12	36 ~ 75	12	420	12	85	1220
43SDS(H)05-48S15	36 ~ 75	15	333	12	85	1000
43SDS(H)05-48S24	36 ~ 75	24	210	12	84	470
43SDS(H)05-48D05	36 ~ 75	±5	±500	12	82	±1000
43SDS(H)05-48D12	36 ~ 75	±12	±210	12	84	±680
43SDS(H)05-48D15	36 ~ 75	±15	±168	12	85	±440

**Input Specifications**

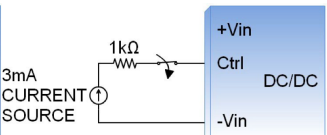
Parameter	Conditions		Min	Typ	Max	Unit
Operating input voltage range	05Vin(nom)		4.5	5	13.2	V DC
	12Vin(nom)		9	12	18	
	24Vin(nom)		18	24	36	
	48Vin(nom)		36	48	75	
Start-up time	Constant resistive load	Power up		10	20	ms
		Remote ON/OFF		10	20	
Input surge voltage	1 second, max	05Vin(nom)	--	--	15	V DC
		12Vin(nom)	--	--	25	
		24Vin(nom)	--	--	50	
		48Vin(nom)	--	--	100	
Input reflected ripple current	With external components	05Vin(nom)	--	40	--	mA <sub>p-p</sub>
		12Vin(nom)	--	30	--	
		24Vin(nom)	--	20	--	
		48Vin(nom)	--	15	--	
Input filter	Capacitor type					
Remote ON/OFF	Ctrl pin applied current via 1kΩ	DC-DC ON		Open or high impedance		
		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			50		mV <sub>p-p</sub>
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			V DC
Isolation resistance	500V DC		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					2.959 x 10 <sup>6</sup> hrs

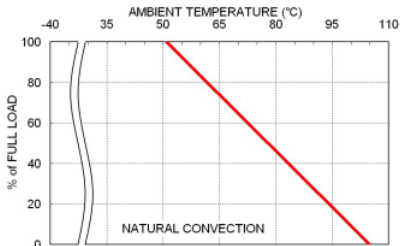
**Environmental Specifications**

Parameter	Conditions		Min	Typ	Max	Unit
Operating ambient temperature		With derating	-40		+105	°C
Maximum case temperature					105	
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

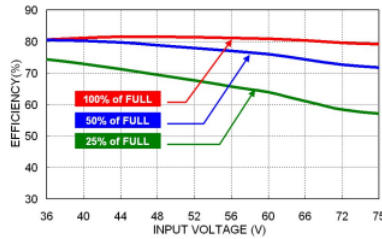
**EMC Specifications**

Parameter	Conditions		Level
EMI	EN55032		Class B
EMS	EN55024		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV	Perf. Criteria A
Surge	EN61000-4-5	± 0.5kV With an external input filter capacitor (Nippon chemi-con KY series, 220 μF/100V.)	Perf. Criteria A
Conducted immunity	EN61000-4-6	10Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

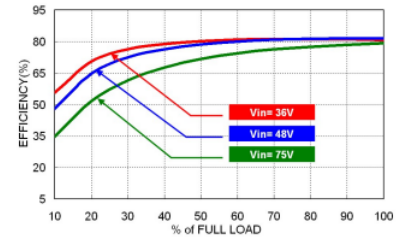
### Characteristic Curve



43SDS(H)05-48S05 Derating Curve



43SDS(H)05-48S05 Efficiency vs. Input Voltage



43SDS(H)05-48S05 Efficiency vs. Output Current

### Fuse Consideration

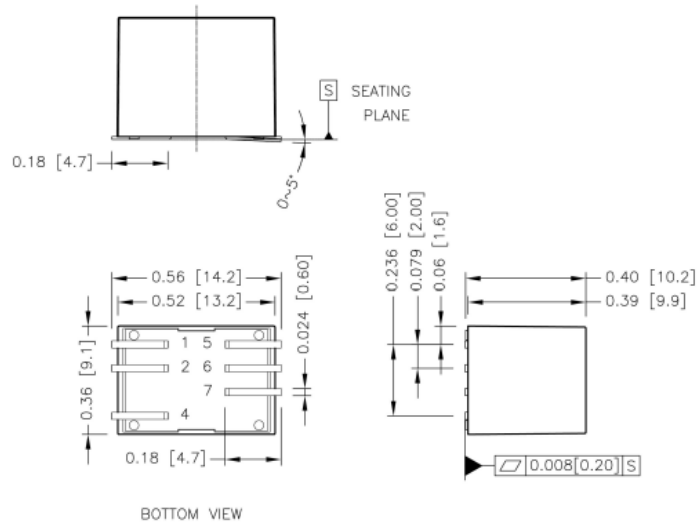
This power module is not internally fused. An input line fuse must always be used. This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture. To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse. The input line fuse suggest as below :

Modules	Fuse Rating (A)	Fuse Type
43SDS(H)05-05S□□、43SDS(H)05-05D□□	2.5	Slow-Blow
43SDS(H)05-12S□□、43SDS(H)05-12D□□	1.25	Slow-Blow
43SDS(H)05-24S□□、43SDS(H)05-24D□□	0.63	Slow-Blow
43SDS(H)05-48S□□、43SDS(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..

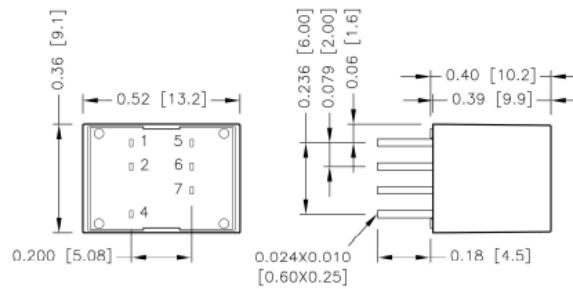
## Mechanical Drawing

43SDS05: SMD TYPE



BOTTOM VIEW

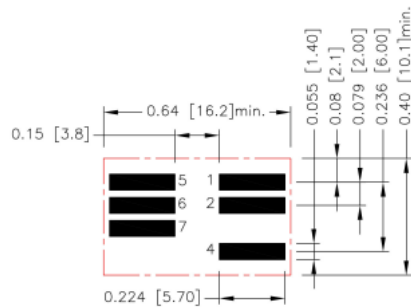
43SDH05: DIP TYPE



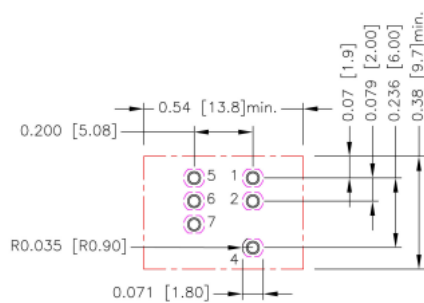
BOTTOM VIEW

### Terminal Connection

No.	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	Ctrl	Ctrl
5	NC	-Vout
6	-Vout	Common
7	+Vout	+Vout

**Recommended Pad Layout**
**SMD TYPE**


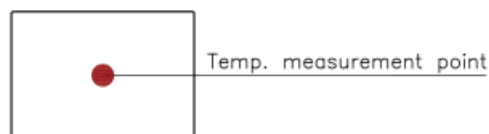
All dimensions in inch[mm]  
 Pad size(lead free recommended)  
 Top view pad:0.224x0.055[5.70x1.40]

**DIP TYPE**


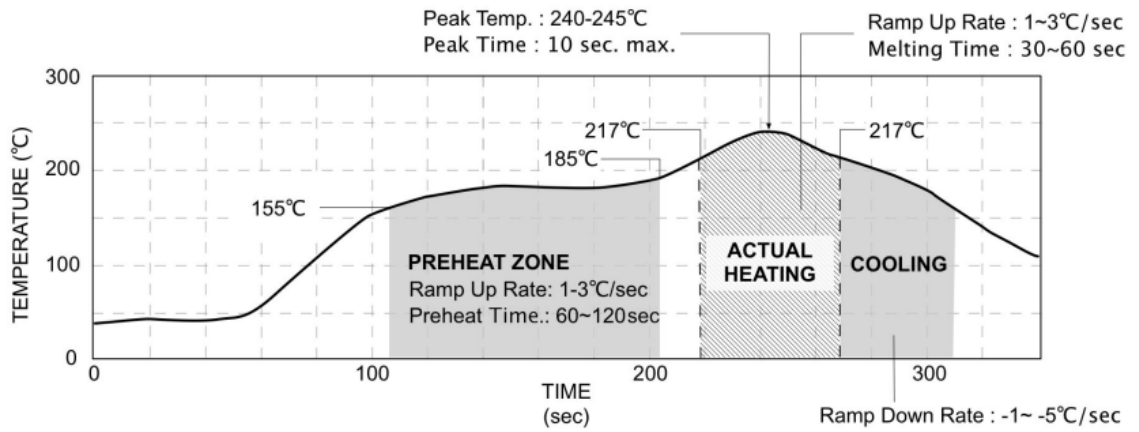
All dimensions in inch[mm]  
 Pad size(lead free recommended)  
 Through hole 1.2.4.5.6.7:  $\varnothing$ 0.035[0.90]  
 Top view pad 1.2.4.5.6.7:  $\varnothing$ 0.044[1.13]  
 Bottom view pad 1.2.4.5.6.7:  
 Groove R0.035[0.90]L-0.071[1.80]

**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.