

DIP Package (Standard)



Size: 0.52 x 0.36 x 0.39 inches

SMD Package (Suffix "S")



Size: 0.52 x 0.36 x 0.39 inches

FEATURES

- Ultra small SMD and DIP Packages
- No Minimum Load Required
- High Efficiency up to 83%
- 2:1 Wide Input Voltage Ranges
- 1 Watt Maximum Output Power
- Continuous Short Circuit Protection
- 1600VDC I/O Isolation (Optional 3000VDC Isolation)
- CE Mark
- RoHS & REACH Compliant
- SMD Package Qualified for Lead-Free Reflow Solder Process According to IPC J-STD-020D
- IEC/EN/UL62368-1 Safety Approvals

DESCRIPTION

The DCSD01 series of DC/DC power converters provides 1 watt of output power in a 0.52 x 0.36 x 0.39 inch package. This series has single and dual output models with 2:1 wide input voltage ranges of 4.5-9VDC, 9-18VDC, 18-36VDC, and 36-75VDC. Some features include high efficiency up to 83%, 1600VDC (standard) or 3000VDC (suffix "H") I/O isolation, remote ON/OFF control, and short circuit protection. Both DIP (standard) and SMD (suffix "S") package types are available for this series. All models are RoHS compliant and have IEC/EN/UL62368-1 safety approvals. This series is best suited for use in automation, datacom, IPC, industrial, measurement, and telecom equipment.

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number ⁽¹⁾⁽²⁾	Input Voltage	Output Voltage	Output Current		Output Ripple & Noise	No Load Input Current	Output Power	Efficiency	Maximum Capacitive Load
			Min Load	Max Load					
DCSD01-5S33	5 VDC (4.5 - 9 VDC)	3.3 VDC	0mA	300mA	50mVp-p	20mA	1W	78%	1680µF
DCSD01-5S05		5 VDC	0mA	200mA	50mVp-p	25mA	1W	80%	820µF
DCSD01-5S09		9 VDC	0mA	112mA	50mVp-p	30mA	1W	81%	630µF
DCSD01-5S12		12 VDC	0mA	90mA	50mVp-p	30mA	1W	83%	470µF
DCSD01-5S15		15 VDC	0mA	70mA	50mVp-p	30mA	1W	83%	330µF
DCSD01-5S24		24 VDC	0mA	45mA	50mVp-p	30mA	1W	82%	160µF
DCSD01-12S33	12 VDC (9 - 18 VDC)	3.3 VDC	0mA	300mA	50mVp-p	10mA	1W	78%	1680µF
DCSD01-12S05		5 VDC	0mA	200mA	50mVp-p	10mA	1W	80%	820µF
DCSD01-12S09		9 VDC	0mA	112mA	50mVp-p	13mA	1W	81%	630µF
DCSD01-12S12		12 VDC	0mA	90mA	50mVp-p	13mA	1W	83%	470µF
DCSD01-12S15		15 VDC	0mA	70mA	50mVp-p	13mA	1W	83%	330µF
DCSD01-12S24		24 VDC	0mA	45mA	50mVp-p	15mA	1W	82%	160µF
DCSD01-24S33	24 VDC (18 - 36 VDC)	3.3 VDC	0mA	300mA	50mVp-p	6mA	1W	78%	1680µF
DCSD01-24S05		5 VDC	0mA	200mA	50mVp-p	6mA	1W	81%	820µF
DCSD01-24S09		9 VDC	0mA	112mA	50mVp-p	6mA	1W	82%	630µF
DCSD01-24S12		12 VDC	0mA	90mA	50mVp-p	6mA	1W	83%	470µF
DCSD01-24S15		15 VDC	0mA	70mA	50mVp-p	6mA	1W	83%	330µF
DCSD01-24S24		24 VDC	0mA	45mA	50mVp-p	8mA	1W	82%	160µF
DCSD01-48S33	48 VDC (36 - 75 VDC)	3.3 VDC	0mA	300mA	50mVp-p	5mA	1W	79%	1680µF
DCSD01-48S05		5 VDC	0mA	200mA	50mVp-p	5mA	1W	80%	820µF
DCSD01-48S09		9 VDC	0mA	112mA	50mVp-p	5mA	1W	81%	630µF
DCSD01-48S12		12 VDC	0mA	90mA	50mVp-p	5mA	1W	82%	470µF
DCSD01-48S15		15 VDC	0mA	70mA	50mVp-p	5mA	1W	83%	330µF
DCSD01-48S24		24 VDC	0mA	45mA	50mVp-p	5mA	1W	82%	160µF

DUAL OUTPUT MODELS

Model Number ⁽¹⁾⁽²⁾	Input Voltage	Output Voltage	Output Current		Output Ripple & Noise	No Load Input Current	Output Power	Efficiency	Maximum Capacitive Load
			Min Load	Max Load					
DCSD01-5D05	5 VDC (4.5 - 9 VDC)	±5 VDC	0mA	±100mA	50mVp-p	30mA	1W	81%	±470µF
DCSD01-5D12		±12 VDC	0mA	±45mA	50mVp-p	30mA	1W	82%	±330µF
DCSD01-5D15		±15 VDC	0mA	±35mA	50mVp-p	30mA	1W	82%	±220µF
DCSD01-12D05	12 VDC (9 - 18 VDC)	±5 VDC	0mA	±100mA	50mVp-p	15mA	1W	80%	±470µF
DCSD01-12D12		±12 VDC	0mA	±45mA	50mVp-p	15mA	1W	82%	±330µF
DCSD01-12D15		±15 VDC	0mA	±35mA	50mVp-p	15mA	1W	82%	±220µF
DCSD01-24D05	24 VDC (18 - 36 VDC)	±5 VDC	0mA	±100mA	50mVp-p	8mA	1W	80%	±470µF
DCSD01-24D12		±12 VDC	0mA	±45mA	50mVp-p	8mA	1W	82%	±330µF
DCSD01-24D15		±15 VDC	0mA	±35mA	50mVp-p	8mA	1W	82%	±220µF
DCSD01-48D05	48 VDC (36 - 75 VDC)	±5 VDC	0mA	±100mA	50mVp-p	5mA	1W	80%	±470µF
DCSD01-48D12		±12 VDC	0mA	±45mA	50mVp-p	5mA	1W	82%	±330µF
DCSD01-48D15		±15 VDC	0mA	±35mA	50mVp-p	5mA	1W	81%	±220µF

TECHNICAL SPECIFICATIONS: DCSD01 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Full Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION		TEST CONDITIONS	Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	5VDC nominal input models		4.5	5	9	VDC
	12VDC nominal input models		9	12	18	
	24VDC nominal input models		18	24	36	
	48VDC nominal input models		36	48	75	
Input Surge Voltage (1 sec)	5VDC nominal input models				15	VDC
	12VDC nominal input models				25	
	24VDC nominal input models				50	
	48VDC nominal input models				100	
Input Current	No Load		See Table			
Input Reflected Ripple Current	See Note 3			10		mAp-p
Input Filter			Capacitor type			
Remote ON/OFF	DC/DC ON DC/DC OFF	Referenced to -INPUT pin and CTRL pin applied current (See Application Circuits on page 4)	2.0	3.0	4.0	mA
Remote Off Input Current					2.5	mA
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy	Full load and nominal Vin		-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 Output Models	-1.0		+1.0	%
		Dual Output Models	-1.0		+1.0	%
	10% load to 90% load	Single Output Models	-0.5		+0.5	%
		Dual Output Models	-0.8		+0.8	%
Cross Regulation (Dual Output Models)	Asymmetrical load 25% / 100% FL		-5		+5	%
Output Power					1	W
Output Current			See Table			
Minimum Load			0			%
Maximum Capacitive Load	Minimum input and constant resistive load		See Table			
Ripple & Noise	Measured by 20MHz bandwidth			30		mVp-p
Transient Response Recovery Time	25% load step change			500		µs
Start-Up Time	Power Up	Constant resistive load		10	20	ms
	Remote On/Off			10	20	
Temperature Coefficient			-0.02		+0.02	%/°C
REMOTE ON/OFF CONTROL						
Ctrl Pin Applied Current via 1kΩ	DC-DC ON DC-DC OFF		Open or High Impedance			mA
Remote Off Input Current			2.0	3.0	4.0	
Application Circuit						
PROTECTION						
Short Circuit Protection			Continuous, automatic recovery			
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load		See Table			
Switching Frequency			100			KHz
Isolation Voltage (Input to Output)	1 minute	Standard models	1600			VDC
		Suffix "H" models	3000			
Isolation Resistance	500VDC		1			GΩ
Isolation Capacitance					50	pF
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	Without derating		-40		+90	°C
	With derating		+90		+105	
Storage Temperature			-55		+125	°C
Maximum Case Temperature					105	°C
Relative Humidity			5		95	% RH
Thermal Shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
Lead-Free Reflow Solder Process	For SMD Type		IPC J-STD-020E			
Moisture Sensitivity Level (MSL)	For SMD Type		IPC J-STD-033C Level 2			
MTBF	MIL-HDBK-217F, Full load		8,534,000 hours			

TECHNICAL SPECIFICATIONS: DCSD01 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Full Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
PHYSICAL SPECIFICATIONS						
Weight					0.10oz (2.7g)	
Dimensions (L x W x H)					0.52in x 0.36in x 0.39in (13.2mm x 9.1mm x 9.9mm)	
Case Material					Non-conductive black plastic	
Base Material					Non-conductive black plastic	
Potting Material					Silicone (UL94-V0)	
SAFETY & EMC						
Safety Approvals					IEC/EN/UL62368-1 ⁽⁵⁾	
EMI (See Note 3)	EN55032				Class A, Class B	
EMS	EN55024					
ESD	EN61000-4-2	Air ±8KV Contact ±6KV				Perf. Criteria A
Radiated Immunity	EN61000-4-3	10 V/m				Perf. Criteria A
Fast Transient (See Note 4)	EN61000-4-4	±2KV				Perf. Criteria A
Surge (See Note 4)	EN61000-4-5	±1KV				Perf. Criteria A
Conducted Immunity	EN61000-4-6	10 Vrms				Perf. Criteria A
Power Frequency Magnetic Field	EN61000-4-8	100A/m continuous; 1000A/m 1 second				

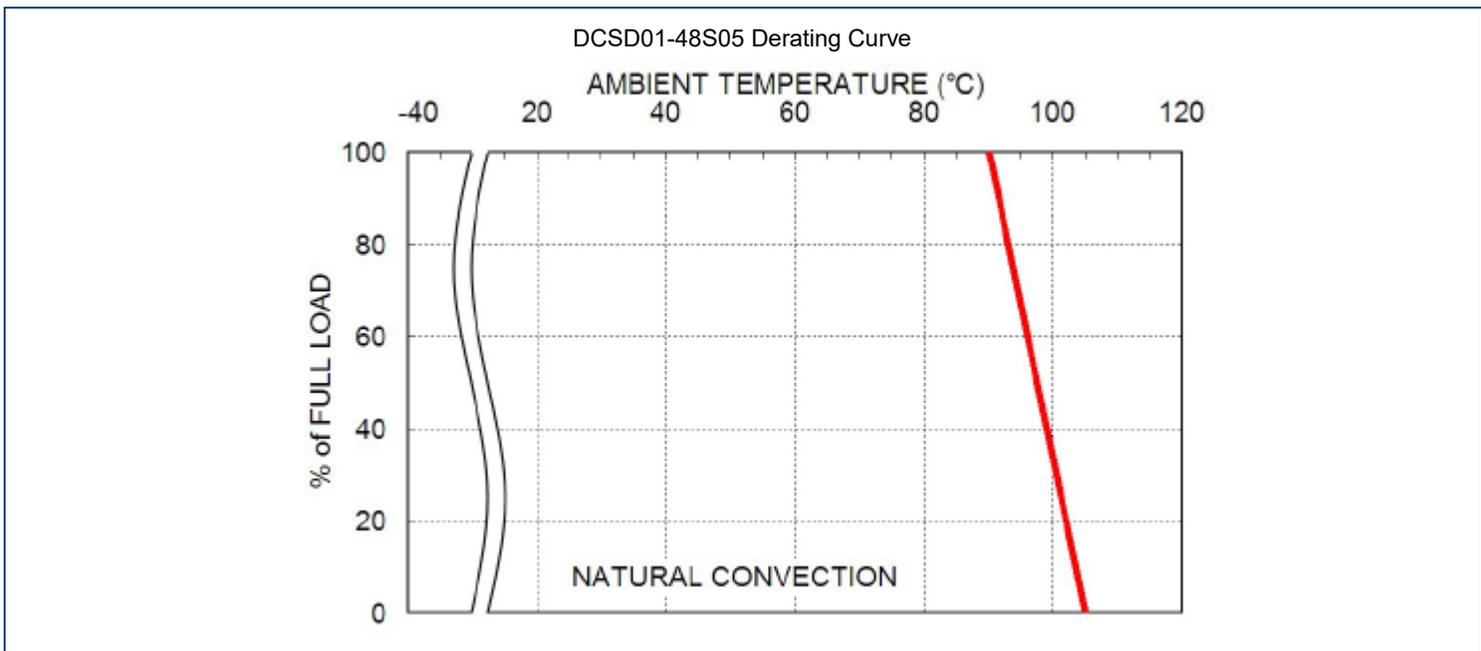
NOTES

- Two package types are available. DIP is standard; for SMD type add the suffix "S" to the model number. See model number setup for ordering details.
- 1600VDC I/O isolation is standard; for 3000VDC I/O isolation add the suffix "H" to the model number. See model number setup for ordering details.
- The DCSD01 series can only meet EMI Class A or Class B and input reflected ripple current with external components added. Please contact factory for more information.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor recommended is Nippon chemi-con KY series, 220µF/100V
- This product is Listed to applicable standards and requirements by UL.

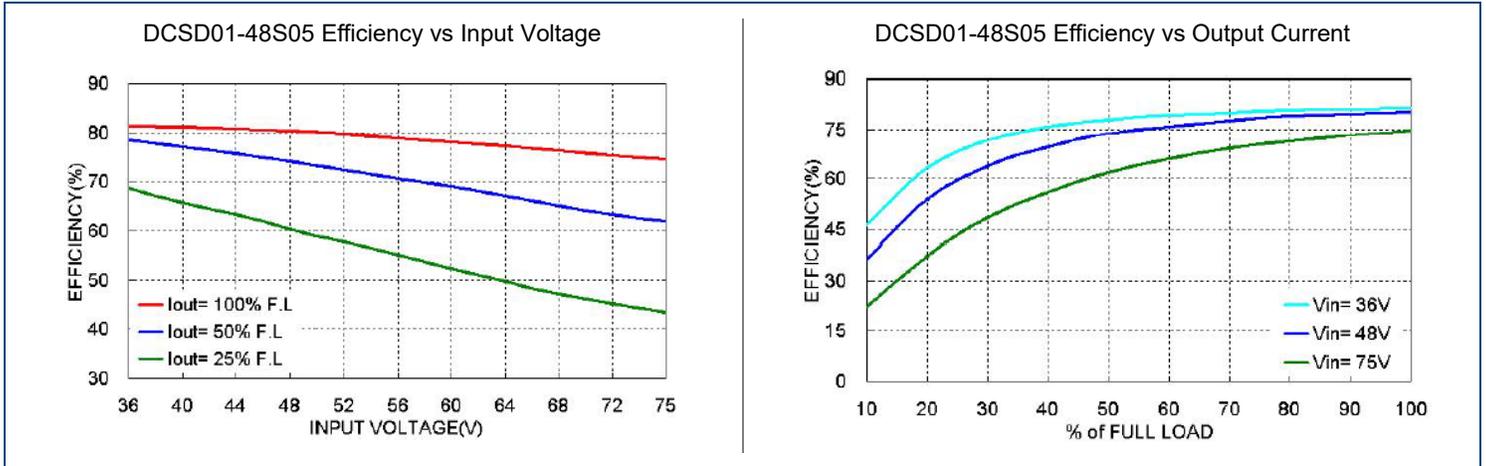
CAUTION: This power module is not internally fused. An input line fuse must always be used.

**Due to advances in technology, specifications are subject to change without notice.*

DERATING CURVE



EFFICIENCY CURVES



MECHANICAL DRAWINGS

DIP Type (Standard)

PIN Connection

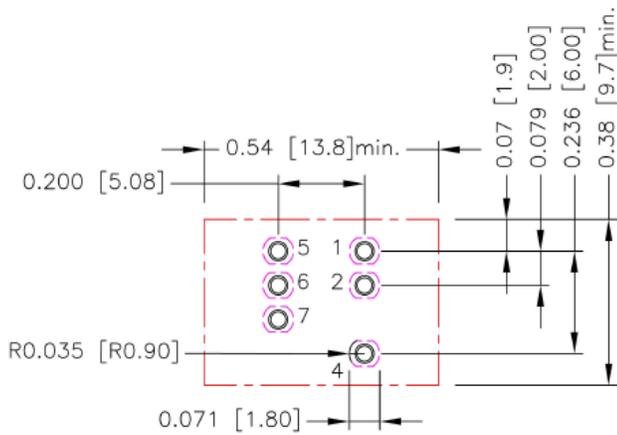
PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
4	Ctrl	Ctrl
5	NC	-Vout
6	-Vout	Common
7	+Vout	+Vout

SMD Type (Suffix "S")

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

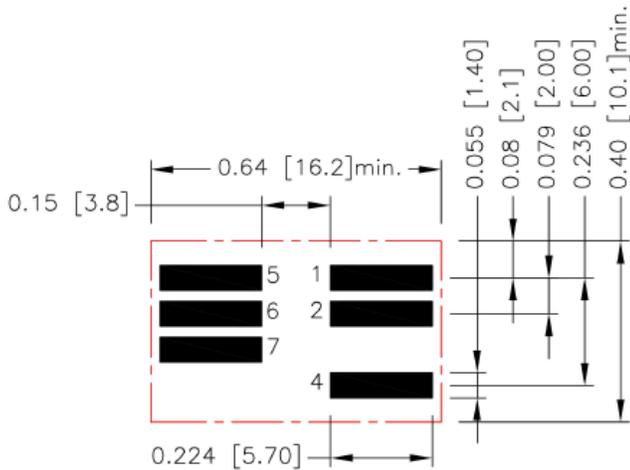
RECOMMENDED PAD LAYOUT

DIP Type (Standard)



All dimensions in inch [mm]
Pad size (lead free recommended)
Through hole 1.2.4.5.6.7: Ø0.035 [0.90]
Top view pad: 1.2.4.5.6.7: Ø0.044[1.13]
Bottom view pad 1.2.4.5.6.7: Groove R0.035[0.90]L-0.07[1.80]

SMD Type (Suffix "S")



All dimensions in inch [mm]
Pad size (lead free recommended)
Top view pad: 0.224 x 0.055 [5.70x1.40]

FUSE CONSIDERATION

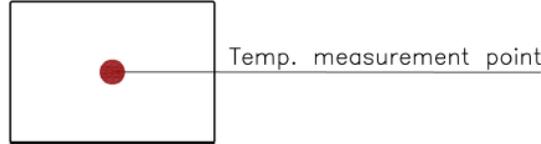
This power module is not internally fused. An input line fuse must always be used. This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture. To maximum flexibility, internal fusing 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
5Vin Models	0.5	Slow-Blow
12Vin Models	0.315	Slow-Blow
24Vin Models	0.16	Slow-Blow
48Vin Models	0.16	Slow-Blow

The table is based on the information provided in the data sheet on inrush energy and maximum DC input current at low Vin.

THERMAL CONSIDERATION

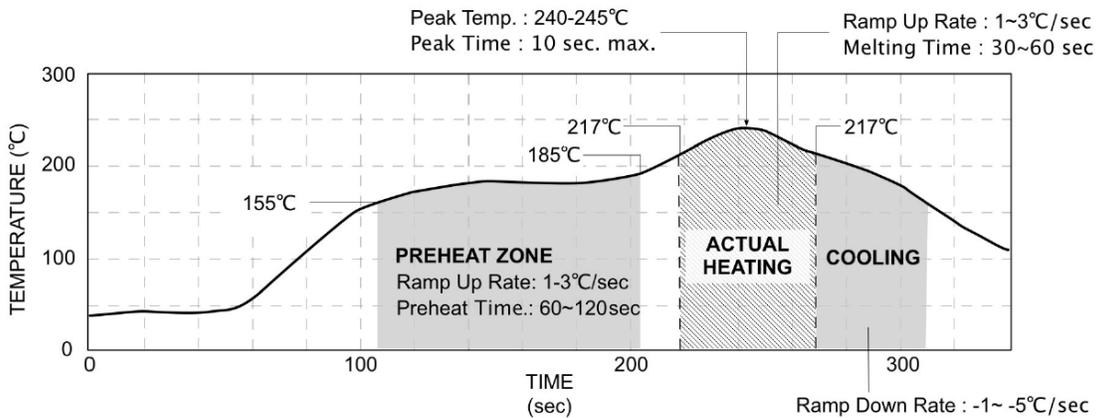
The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding Environment. Proper cooling can be verified by measuring the point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

MODEL NUMBER SETUP

DCSD	01	-	48	S	12	S	H
Series Name	Output Power		Input Voltage	Output Quantity	Output Voltage	Assembly Options	Isolation
	01: 1 Watt		5: 4.5-9 VDC 12: 9-18 VDC 24: 18-36 VDC 48: 36-75 VDC	S: Single Output D: Dual Output	33: 3.3 VDC 05: 5 VDC 09: 9 VDC 12: 12 VDC 15: 15 VDC 24: 24 VDC 05: ±5 VDC 12: ±12 VDC 15: ±15 VDC	None: DIP Type S: SMD Type	None: 1600VDC Isolation H: 3000VDC Isolation

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001: 2015 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

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