DIP Package (Standard)



Size: 0.52 x 0.36 x 0.39 inches

SMT Package (Suffix "S")



Size: 0.52 x 0.36 x 0.39 inches

FEATURES

- Ultra small SMT and DIP Packages
- No Minimum Load Required
- High Efficiency up to 86%
- 2:1 Wide Input Voltage Ranges
- 2 Watt Maximum Output Power
- Continuous Short Circuit Protection
- 1600VDC I/O Isolation (Optional 3000VDC Isolation)
- CE Mark Meets 2006/95/EC, 2011/95/EC, & 2004/108/EC
- Compliant to RoHS EU Directive 2011/65/EU
- SMT Package Qualified for Lead-Free Reflow Solder Process According to IPC J-STD-020D
- UL60950-1, EN60950-1, & IEC60950-1 Safety Approvals

DESCRIPTION

The DCSD02 series of DC/DC power converters provides 2 watts 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 86%, 1600VDC (standard) or 3000VDC (suffix "H") I/O isolation, remote ON/OFF control, and short circuit protection. Both DIP (standard) and SMT (suffix "S") package types are available for this series. All models are RoHS compliant and have UL60950-1, EN60950-1, and IEC60950-1 safety approvals. This series is best suited for use in industry control systems, wireless networks, telecom/datacom, measurement equipment, and semiconductor 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					
DCSD02-5S33	5 VDC (4.5 - 9 VDC)	3.3 VDC	0mA	500mA	50mVp-p	34mA	1.65W	77%	2200µF
DCSD02-5S05		5 VDC	0mA	400mA	50mVp-p	34mA	2W	81%	1000µF
DCSD02-5S12		12 VDC	0mA	167mA	50mVp-p	42mA	2W	84%	550µF
DCSD02-5S15		15 VDC	0mA	134mA	50mVp-p	42mA	2W	85%	440µF
DCSD02-5S24		24 VDC	0mA	83mA	50mVp-p	42mA	2W	85%	200µF
DCSD02-12S33	12 VDC (9 - 18 VDC)	3.3 VDC	0mA	500mA	50mVp-p	24mA	1.65W	78%	2200µF
DCSD02-12S05		5 VDC	0mA	400mA	50mVp-p	24mA	2W	81%	1000µF
DCSD02-12S12		12 VDC	0mA	167mA	50mVp-p	28mA	2W	84%	550µF
DCSD02-12S15		15 VDC	0mA	134mA	50mVp-p	28mA	2W	85%	440µF
DCSD02-12S24		24 VDC	0mA	83mA	50mVp-p	28mA	2W	85%	200µF
DCSD02-24S33	24 VDC (18 - 36 VDC)	3.3 VDC	0mA	500mA	50mVp-p	10mA	1.65W	78%	2200µF
DCSD02-24S05		5 VDC	0mA	400mA	50mVp-p	10mA	2W	81%	1000µF
DCSD02-24S12		12 VDC	0mA	167mA	50mVp-p	14mA	2W	84%	550µF
DCSD02-24S15		15 VDC	0mA	134mA	50mVp-p	14mA	2W	85%	440µF
DCSD02-24S24		24 VDC	0mA	83mA	50mVp-p	14mA	2W	85%	200µF
DCSD02-48S33	48 VDC (36 - 75 VDC)	3.3 VDC	0mA	500mA	50mVp-p	7mA	1.65W	77%	2200µF
DCSD02-48S05		5 VDC	0mA	400mA	50mVp-p	7mA	2W	81%	1000µF
DCSD02-48S12		12 VDC	0mA	167mA	50mVp-p	8mA	2W	84%	550µF
DCSD02-48S15		15 VDC	0mA	134mA	50mVp-p	8mA	2W	85%	440µF
DCSD02-48S24		24 VDC	0mA	83mA	50mVp-p	8mA	2W	85%	200µF

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					
DCSD02-5D05	5 VDC (4.5 - 9 VDC)	±5 VDC	0mA	±200mA	50mVp-p	42mA	2W	81%	±660µF
DCSD02-5D12		±12 VDC	0mA	±83mA	50mVp-p	42mA	2W	85%	±330µF
DCSD02-5D15		±15 VDC	0mA	±67mA	50mVp-p	42mA	2W	85%	±220µF
DCSD02-12D05	12 VDC (9 - 18 VDC)	±5 VDC	0mA	±200mA	50mVp-p	28mA	2W	81%	±660µF
DCSD02-12D12		±12 VDC	0mA	±83mA	50mVp-p	28mA	2W	85%	±330µF
DCSD02-12D15		±15 VDC	0mA	±67mA	50mVp-p	28mA	2W	86%	±220µF
DCSD02-24D05	24 VDC (18 - 36 VDC)	±5 VDC	0mA	±200mA	50mVp-p	14mA	2W	81%	±660µF
DCSD02-24D12		±12 VDC	0mA	±83mA	50mVp-p	14mA	2W	85%	±330µF
DCSD02-24D15		±15 VDC	0mA	±67mA	50mVp-p	14mA	2W	86%	±220µF
DCSD02-48D05	48 VDC (36 - 75 VDC)	±5 VDC	0mA	±200mA	50mVp-p	8mA	2W	81%	±660µF
DCSD02-48D12		±12 VDC	0mA	±83mA	50mVp-p	8mA	2W	85%	±330µF
DCSD02-48D15		±15 VDC	0mA	±67mA	50mVp-p	8mA	2W	85%	±220µF

TECHNICAL SPECIFICATIONS: DCSD02 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current 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			30		mAp-p
Input Filter				Capacitor type			
Remote ON/OFF	DC/DC ON	Referenced to -INPUT pin and CTRL pin applied current (See Application Circuits on page 4)		Open or high impedance			
	DC/DC OFF			2.0	3.0	4.0	mA
Remote Off Input Current						2.5	mA
OUTPUT SPECIFICATIONS							
Output Voltage				See Table			
Voltage Accuracy		Full load an 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		-5.0		+5.0	%
Output Power				See Table			
Output Current				See Table			
Minimum Load				0			%
Maximum Capacitive Load		Minimum input and constant resistive load		See Table			
Ripple & Noise		Measured at 20MHz BW and with 4.7µF/25V X7R MLCC capacitor			50		mVp-p
Transient Response Recovery Time		25% load step change			250		µs
Start-Up Time	Power Up	Nominal input and constant resistive load			5	10	ms
	Remote On/Off				5	10	
Temperature Coefficient				-0.02		+0.02	%/°C
PROTECTION							
Short Circuit Protection				Continuous, automatic recovery			
GENERAL SPECIFICATIONS							
Efficiency		Nominal input voltage and full load		See Table			
Switching Frequency		Full load to minimum load		100			KHz
Isolation Voltage (Input to Output)		1 minute	Standard models	1600			VDC
			Suffix “H” models	3000			
Isolation Resistance		500VDC		1			GΩ
Isolation Capacitance		Standard models				50	pF
		Suffix “H” models				50	
ENVIRONMENTAL SPECIFICATIONS							
Operating Ambient Temperature		Without derating		-40		+85	°C
Storage Temperature				-55		+125	°C
Relative Humidity				5		95	% RH
Thermal Shock				MIL-STD-810F			
Vibration				MIL-STD-810F			
Lead-Free Reflow Solder Process				IPC J-STD-020D			
Moisture Sensitivity Level (MSL)				IPC J-STD-033B Level 2			
MTBF		MIL-HDBK-217F, Ta=25°C, Full load		6,670,000 hours			
PHYSICAL SPECIFICATIONS							
Weight				0.10oz (2.7g)			
Dimensions (L x W x H)				0.52x0.36x0.39 inches (13.2x9.1x9.9 mm)			
Case Material				Non-conductive black plastic			
Base Material				Non-conductive black plastic			
Potting Material				Silicone (UL94-V0)			

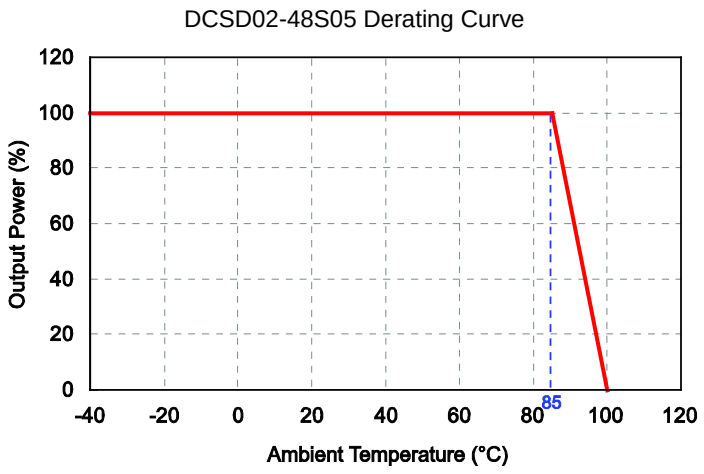
SAFETY & EMC			
Safety Approvals			IEC60950-1, UL60950-1, EN60950-1
EMI (See Note 3)	EN55022		Class A, Class B
ESD	EN61000-4-2	Air ±8KV Contact ±6KV	Perf. Criteria A
Radiated Immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast Transient (See Note 4)	EN61000-4-4	±2KV	Perf. Criteria A
Surge (See Note 4)	EN61000-4-5	±1KV	Perf. Criteria A
Conducted Immunity	EN61000-4-6	10 Vrms	Perf. Criteria A

NOTES

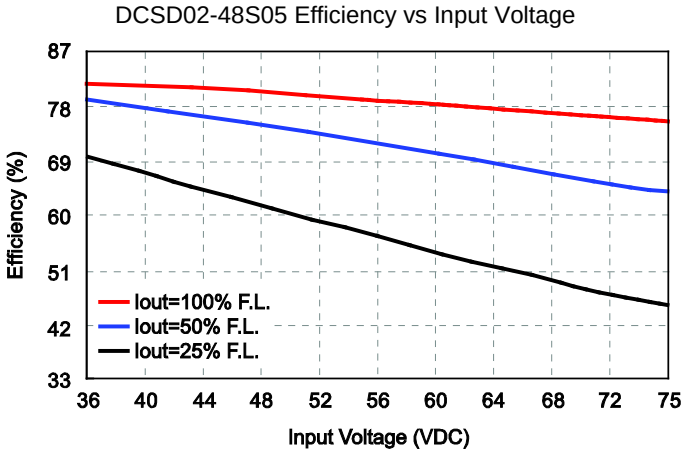
1. Two package types are available. DIP is standard; for SMT type add the suffix “S” to the model number. See model number setup for ordering details.
2. 1600VDC I/O isolation is standard; for 3000VDC I/O isolation add the suffix “H” to the model number. See model number setup for ordering details.
3. The DCSD02 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.
4. 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

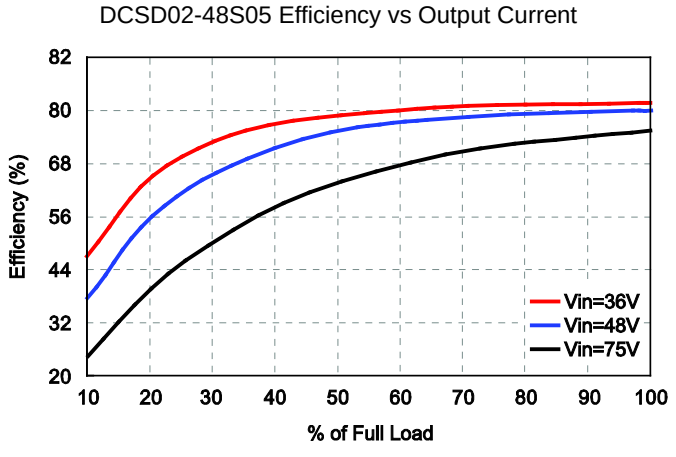
CAUTION: This power module is not internally fused. An input line fuse must always be used.
Due to advances in technology, specifications are subject to change without notice.

DERATING CURVE



EFFICIENCY CURVES

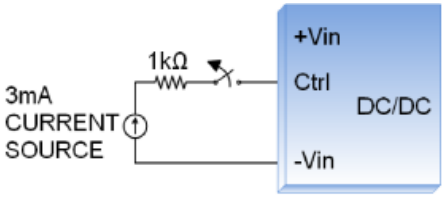




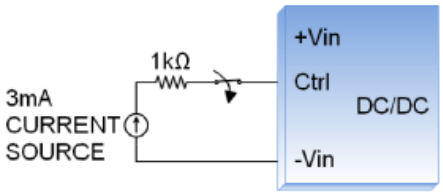
REMOTE ON/OFF APPLICATION CIRCUIT

The positive logic structure turns the DC/DC module ON during a logic High on the CTRL pin and turns the DC/DC module OFF during a logic Low on the CTRL pin. The CTRL pin is an open collector/drain logic input signal (Von/off) that is referenced to GND. When not using the remote ON/OFF feature please open circuit between the CTRL pin and input pin to turn the module ON.

DC/DC ON

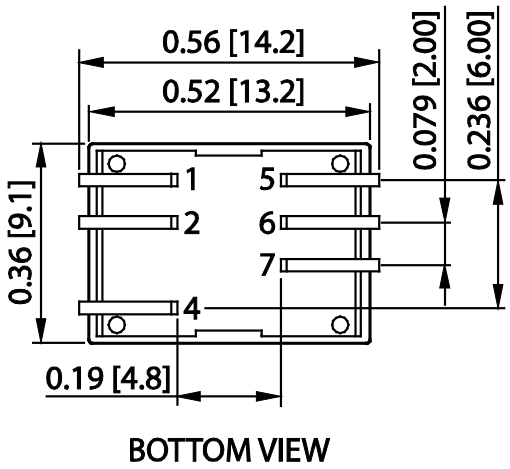


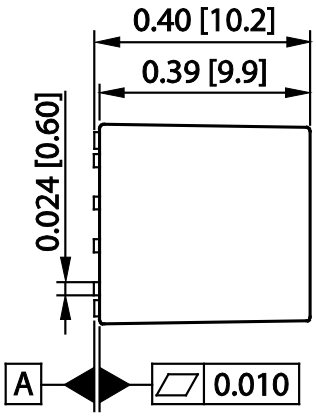
DC/DC OFF



MECHANICAL DRAWINGS

DIP Type (Standard)

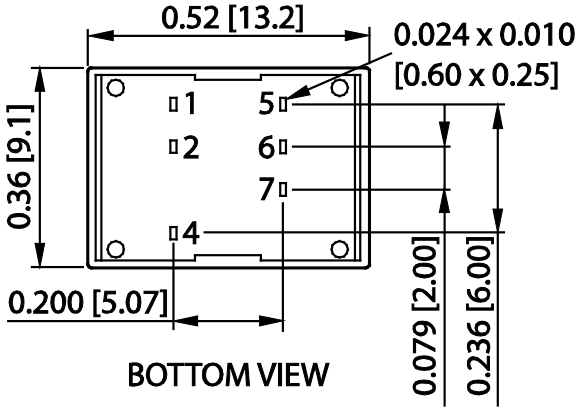


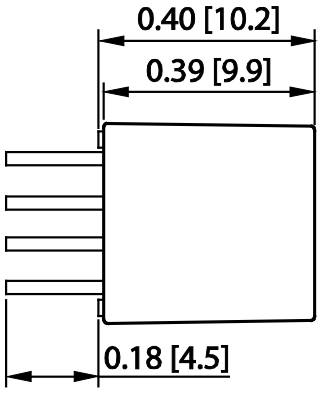


PIN CONNECTIONS		
PIN	SINGLE	DUAL
1	+INPUT	+INPUT
2	-INPUT	-INPUT
4	CTRL	CTRL
5	NC	-OUTPUT
6	-OUTPUT	COMMON
7	+OUTPUT	+OUTPUT

NOTES
1. All dimensions in inches [mm]
2. Tolerance: X.XX±0.02 [X.X±0.5]
X.XXX±0.01 [X.XX±0.25]
3. Pin Pitch Tolerance: ±0.01 [±0.25]
4. Pin Dimension Tolerance: ±0.004 [±0.1]
5. All dimensions are for reference only

SMT Type (Suffix "S")





PIN CONNECTIONS		
PIN	SINGLE	DUAL
1	+INPUT	+INPUT
2	-INPUT	-INPUT
4	CTRL	CTRL
5	NC	-OUTPUT
6	-OUTPUT	COMMON
7	+OUTPUT	+OUTPUT

NOTES
1. All dimensions in inches [mm]
2. Tolerance: X.XX±0.02 [X.X±0.5]
X.XXX±0.01 [X.XX±0.25]
3. Pin Pitch Tolerance: ±0.01 [±0.25]
4. Pin Dimension Tolerance: ±0.004 [±0.1]
5. All dimensions are for reference only

MODEL NUMBER SET

DCSD	02	-	48	S	12	S	H
Series Name	Output Power		Input Voltage	Output Quantity	Output Voltage	Assembly Options	Isolation
	02: 2 Watts		**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 **12:** 12 VDC **15:** 15 VDC **24:** 24 VDC **05:** ±5 VDC **12:** ±12 VDC **15:** ±15 VDC	**None:** DIP Type **S:** SMT 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 ISO9001-2008 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:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833