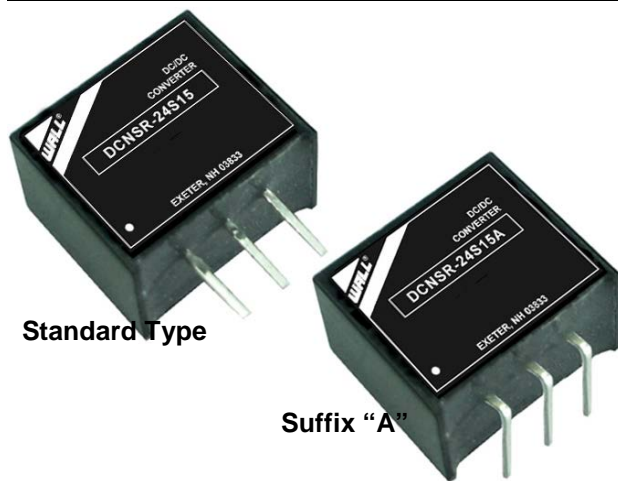


## Wall Industries, Inc.

### DCNSR SERIES

**1.5 to 15 Watts**  
**1A Output Current, 3-Pin SIP Package**  
**Wide Input Voltage Range: 4.6 to 36VDC**  
**Non-Isolated DC/DC Converters**



#### FEATURES

- 1A Output Current
- Single Outputs
- 1.5 to 15 Watts Output Power
- Wide Input Voltage Range: 4.6 to 36VDC
- High Efficiency up to 95.5%
- Small SIP Package: 0.46" x 0.40" x 0.30"
- Fixed Switching Frequency
- Short Circuit, Over Current, and Over Temperature Protection
- Low Standby Current
- Low Output Ripple and Noise
- Negative Output Application
- Pin-out compatible with LM78xx Linear Regulators
- Compliant to RoHS EU Directive 2002/95/EC
- Design Meets UL60950-1, EN60950-1, and IEC60950-1

#### APPLICATIONS

- Wireless Networks
- Telecom / Datacom
- Industry Control Systems
- Semiconductor Equipment
- Distributed Power Architectures
- Microprocessor Power Applications

#### DESCRIPTION

The DCNSR series consists of high performance non-isolated DC/DC converters that can deliver 1A of output current in a small 0.46" x 0.40" x 0.30" 3-Pin SIP package. This series features a wide operating temperature range of -40°C to +85°C, efficiency up to 95.5%, and low ripple and noise. These converters are also protected against over current, over temperature, and short circuit conditions. These converters are suited to replace 78xx linear regulators and can be used to convert a positive voltage into a negative voltage. The DCNSR series is RoHS compliant and has UL60950-1, EN60950-1, and IEC60950-1 safety approvals. These converters are suitable for use in wireless networks, telecom/datacom, industry control systems, semiconductor equipment, distributed power architectures, and microprocessor power applications. The DCNSR series also has two pin types available.

SPECIFICATIONS: DCNSR 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
<b>INPUT SPECIFICATIONS</b>						
Input Voltage Range (See Note 1)			See Table			
No Load Input Current			See Table			
Maximum Input Current	Vin=Vin(min); Io=Io(max)				1	A
Input Filter			C filter			
Input Reflected Ripple Current				100		mA
<b>OUTPUT SPECIFICATIONS</b>						
Output Voltage			See Table			
Voltage Accuracy	Full load		-2.0		+2.0	% Vo
Line Regulation			-0.2		+0.2	% Vo
Load Regulation	1.5V (standard)	10% to 100% of full load	-0.6		+0.6	% Vo
	Others (Standard)		-0.4		+0.4	% Vo
	1.5V & 1.8V (suffix "A")		-1.2		+1.2	% Vo
	Others (suffix "A")		-0.4		+0.4	% Vo
Output Power			1.5 – 15 Watts			
Output Current					1	A
Ripple & Noise	1.5V to 6.5VDC output models	20MHz Bandwidth		50		mVp-p
	9V to 15VDC output models			75		mVp-p
Output Voltage Overshoot -Startup	full load				1	% Vo
Minimum Load				0		%
Capacitive Load (max)	Tested at minimum input voltage and constant resistive load				470	µF
Output Current Limit				2.0		A
Rise Time	Time for Vo to rise from 10% to 90% of Vo			3.5		ms
Start-up Time	Nominal Vin and constant resistive load	power up		5		ms
Temperature Coefficient			-0.015		+0.015	%/°C
<b>DYNAMIC RESPONSE</b>						
Peak Deviation	50% to 100% load step change			150		mV
Recovery Time	50% to 100% load step change			250		µs
<b>PROTECTION</b>						
Short Circuit Protection			Continuous, automatic recovery			
Over Current Protection			yes			
Over Temperature Protection	Internal IC Junction			170		°C
<b>GENERAL SPECIFICATIONS</b>						
Efficiency	Typical value at min or max input voltage and full load		See Table			
Switching Frequency	1.5V to 3.3VDC output models			300		KHz
	5V to 15VDC output models			580		KHz
Isolation Voltage			none			
<b>ENVIRONMENTAL SPECIFICATIONS</b>						
Operating Temperature	With derating (see derating curves)		-40		+85	°C
Storage Temperature			-55		+125	°C
Thermal Shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
Relative Humidity	Non-condensing		0		90	% RH
MTBF (See Note 2)	BELLCORE TR-NWT-000332		26,130,000 hours			
	MIL-HDBK-217F		6,004,000 hours			
<b>PHYSICAL SPECIFICATIONS</b>						
Case Material			Non-conductive black plastic			
Base Material			none			
Potting Material			Silicon (UL94-V0)			
Weight			0.07oz (1.9g)			
Dimensions (L x W x H)			0.46 x 0.40 x 0.30 inches (11.7 x 10.1 x 7.5 mm)			
<b>SAFETY</b>						
Safety Approvals			UL60950-1, IEC60950-1, EN60950-1			

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

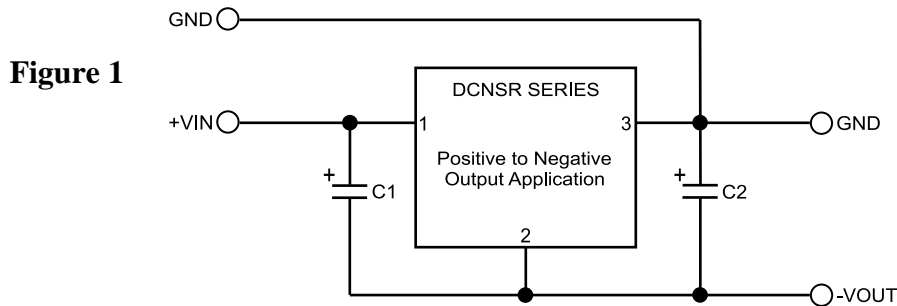
POSITIVE OUTPUT APPLICATION										
Model Number	Input Voltage Range	Nominal Input Voltage	Output Voltage	Output Current		Switching Frequency	No Load Current	Output Power	Efficiency	
				Min Load	Max Load				Min Vin	Max Vin
DCNSR-12S1.5	4.6 – 36 VDC	12 VDC	1.5 VDC	0A	1A	300KHz	1mA	1.5W	77.0%	66.5%
DCNSR-12S1.8	4.6 – 36 VDC	12 VDC	1.8 VDC	0A	1A	300KHz	1mA	1.8W	80.5%	70.0%
DCNSR-12S2.5	4.6 – 36 VDC	12 VDC	2.5 VDC	0A	1A	300KHz	1mA	2.5W	83.5%	75.5%
DCNSR-12S3.0	4.6 – 36 VDC	12 VDC	3.0 VDC	0A	1A	300KHz	1.5mA	3W	86.5%	78.5%
DCNSR-12S3.3	4.6 – 36 VDC	12 VDC	3.3 VDC	0A	1A	300KHz	1.5mA	3.3W	87.5%	79.5%
DCNSR-12S05	6.5 – 36 VDC	12 VDC	5 VDC	0A	1A	580KHz	2.5mA	5W	91.5%	83.0%
DCNSR-12S6.5	8 – 36 VDC	12 VDC	6.5 VDC	0A	1A	580KHz	3mA	6.5W	93.0%	86.0%
DCNSR-12S09	10.5 – 36 VDC	12 VDC	9 VDC	0A	1A	580KHz	3.5mA	9W	94.5%	88.5%
DCNSR-24S12	13.5 – 36 VDC	24 VDC	12 VDC	0A	1A	580KHz	2.5mA	12W	95.0%	91.5%
DCNSR-24S15	16.5 – 36 VDC	24 VDC	15 VDC	0A	1A	580KHz	3.5mA	15W	95.5%	92.5%

NEGATIVE OUTPUT APPLICATION (See Note 1)										
Model Number	Input Voltage Range	Nominal Input Voltage	Output Voltage	Output Current		Switching Frequency	No Load Current	Output Power	Efficiency	
				Min Load	Max Load				Min Vin	Max Vin
DCNSR-12S1.5	4.6 – 32 VDC	12 VDC	-1.5 VDC	0A	-0.6A	300KHz	1mA	0.9W	69.5%	64.5%
DCNSR-12S1.8	4.6 – 32 VDC	12 VDC	-1.8 VDC	0A	-0.6A	300KHz	1mA	1.1W	72.0%	67.5%
DCNSR-12S2.5	4.6 – 32 VDC	12 VDC	-2.5 VDC	0A	-0.6A	300KHz	1mA	1.5W	72.0%	74.0%
DCNSR-12S3.0	4.6 – 32 VDC	12 VDC	-3.0 VDC	0A	-0.6A	300KHz	2mA	1.8W	73.0%	76.5%
DCNSR-12S3.3	4.6 – 32 VDC	12 VDC	-3.3 VDC	0A	-0.6A	300KHz	2mA	2W	74.0%	77.5%
DCNSR-12S05	4.6 – 31 VDC	12 VDC	-5 VDC	0A	-0.4A	580KHz	3mA	2W	79.5%	78.5%
DCNSR-12S6.5	7 – 29 VDC	12 VDC	-6.5 VDC	0A	-0.3A	580KHz	4mA	1.95W	84.5%	80.0%
DCNSR-12S09	7 – 27 VDC	12 VDC	-9 VDC	0A	-0.3A	580KHz	7mA	2.7W	85.0%	82.0%
DCNSR-24S12	7 – 24 VDC	12 VDC	-12 VDC	0A	-0.3A	580KHz	8mA	3.6W	85.0%	85.5%
DCNSR-24S15	7 – 21 VDC	12 VDC	-15 VDC	0A	-0.2A	580KHz	10mA	3W	85.5%	84.5%

**NOTES**

1. The DCNSR series converters can be used to convert a positive voltage into a negative voltage.
2. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C. (Ground, Benign, controlled environment)  
MIL-HDBK-217F Notice2 @Ta=25°C, Full load. (Ground, Benign, controlled environment)

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

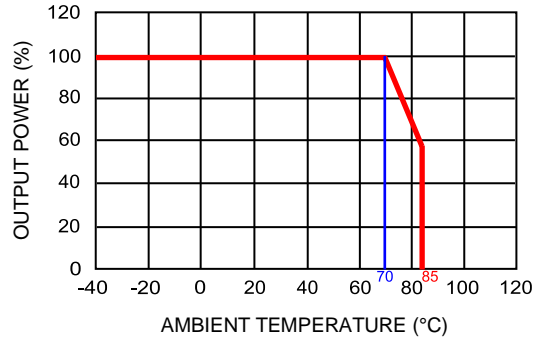


C1 and C2 are required and should be positioned close to the converter pins. Maximum capacitive load including C2 is 470µF.

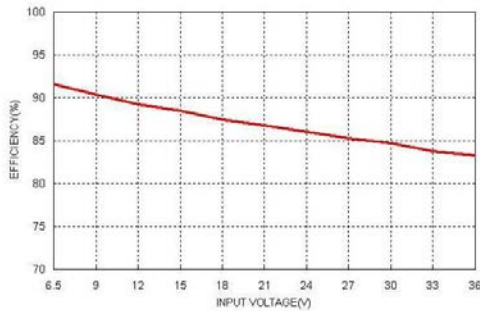
C1	10µF/50V	1210 X5R MLCC
C2	10µF/25V	1206 X5R MLCC

**CHARACTERISTICS (POSITIVE OUTPUT)**

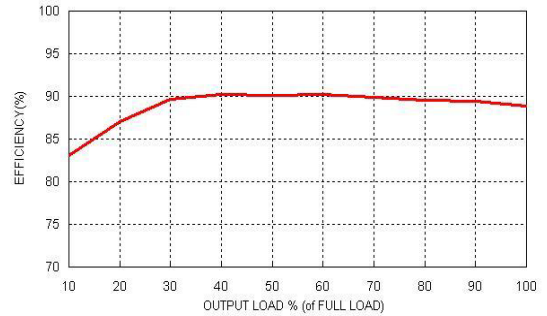
DCNSR-12S05 Derating Curve



DCNSR-12S05 Efficiency vs Input Voltage

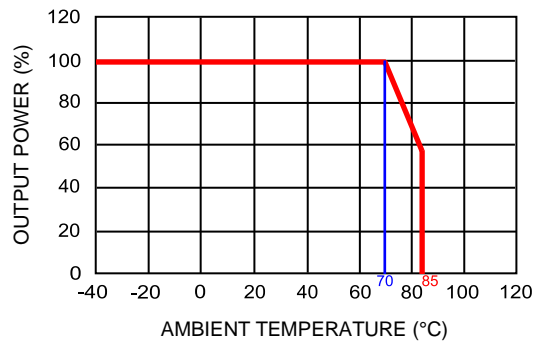


DCNSR-12S05 Efficiency vs Output Load

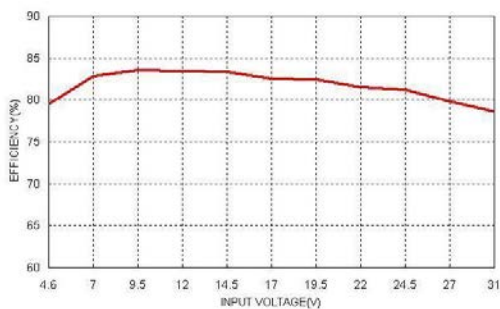


**CHARACTERISTICS (NEGATIVE OUTPUT)**

DCNSR-12S05 Derating Curve



DCNSR-12S05 Efficiency vs Input Voltage



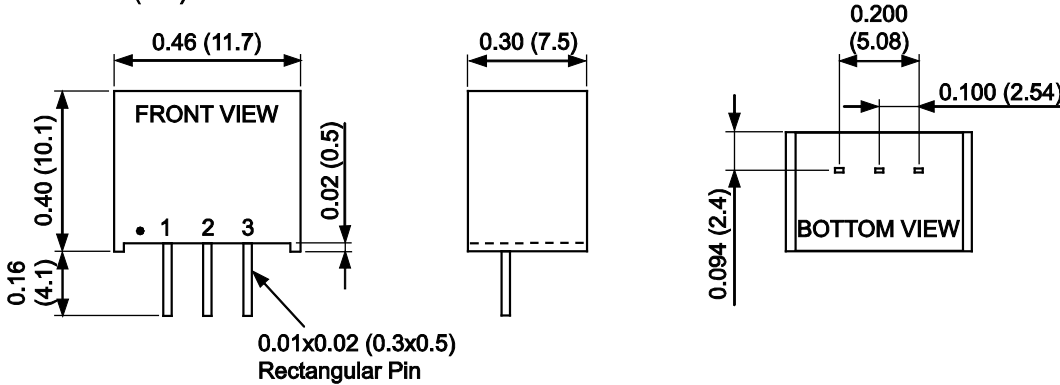
DCNSR-12S05 Efficiency vs Output Load



MECHANICAL DRAWINGS

STANDARD MODELS

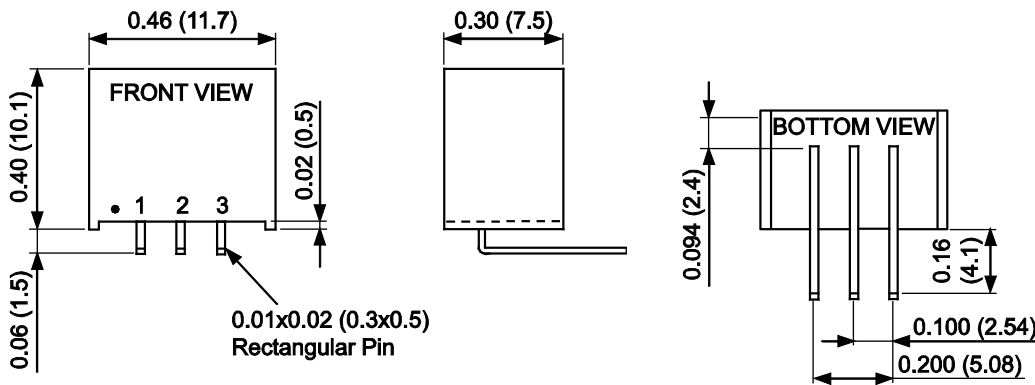
Unit: inches (mm)



PIN CONNECTIONS	
Pin	Assignment
1	+Vin
2	GND
3	+Vout

SUFFIX "A" MODELS

Unit: inches (mm)



Tolerance: X.XX±0.02 (X.X±0.5)  
X.XXX±0.01 (X.XX±0.25)  
Pin Pitch Tolerance: ±0.01 (0.25)  
Pin Dimensions Tolerance: ±0.004 (0.1)  
*All dimensions are for reference only*

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.

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