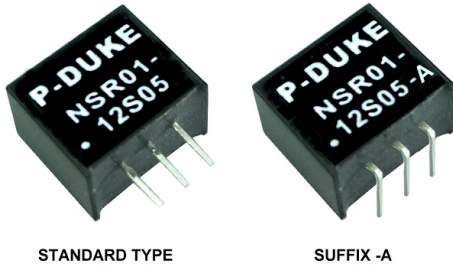


FEATURES


STANDARD TYPE
SUFFIX -A

APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Distributed Power Architectures
Semiconductor Equipment
Microprocessor Power Applications

- PIN-OUT COMPATIBLE WITH LM78XX LINEAR REGULATORS
- SMALL SIZE AND LOW PROFILE :
SIP3 L X W X H = 0.46" X 0.30" X 0.40"
- HIGH EFFICIENCY UP TO 95.5%
- LOW STANDBY CURRENT
- WIDE INPUT RANGE: 4.6 ~ 36VDC
- OVER-CURRENT PROTECTION
- SHORT CIRCUIT PROTECTION
- OVER-TEMPERATURE PROTECTION
- LOW OUTPUT RIPPLE AND NOISE
- FIXED SWITCHING FREQUENCY
- NEGATIVE OUTPUT APPLICATION
- SAFETY MEETS UL60950-1, EN60950-1 AND IEC60950-1
- COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU

DESCRIPTION

The NSR01-SERIES are high performance switching regulators are suited to replace 78xx linear regulators and pin compatible. It provides 1A output current and high efficiency up to 95.5%. The NSR01 series also can be used to converter a positive voltage into negative voltage.

TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25°C otherwise noted

OUTPUT SPECIFICATIONS			
Output current	See table	1000mA, max.	
Voltage accuracy	±2%Vo		
Minimum load	0%		
Line regulation	± 0.2%Vo		
Load regulation	10% to 100% of F.L	1.5VDC (Standard)	± 0.6%Vo
		Others (Standard)	± 0.4%
		1.5VDC, 1.8VDC (Suffix-A)	± 1.2%Vo
		Others (Suffix-A)	± 0.4%Vo
Ripple and noise	Vout = 1.5VDC to 6.5VDC	50mVp-p	
	20MHz bandwidth	Vout = 9VDC to 15VDC	75mVp-p
Temperature coefficient	±0.015%/°C, max.		
Dynamic load response	Load change step	Peak deviation	150mV
	50%↔100% of F.L.	Recovery time	250µs
Output current limit	2.0A		
Output short-circuit	Continuous, automatic recovery		
Capacitor Load (Note 4)	470µF, max.		
Output voltage overshoot-startup	Full Load	1%Vo, max.	
GENERAL SPECIFICATIONS			
Efficiency (Note 3)	See table		
Isolation voltage	None		
Switching frequency	See table		
Design meet safety standard	IEC60950-1, UL60950-1, EN60950-1		
Case material	Non-conductive black plastic		
Base material	None		
Potting material	Silicon (UL94-V0)		
Dimensions	0.46 X 0.30 X 0.40 Inch (11.7 X 7.5 X 10.1 mm)		
Weight	1.9g(0.07oz)		
MTBF (Note 1)	BELLCORE-TR-NWT-000332	2.613 x 10 ⁷ hrs	
	MIL-HDBK-217F	6.004 x 10 ⁶ hrs	

INPUT SPECIFICATIONS			
Input voltage range for Positive output	See table	4.6 ~ 36VDC	
Input voltage range for Negative output	See table	4.6 ~ 32VDC	
Maximum input current	Vin=Vin(min), Io=Io(max)	1A	
Input filter	C filter		
Input reflected ripple current	100mA		
ENVIRONMENTAL SPECIFICATIONS			
Operating temperature range	-40°C ~ +85°C(with derating)		
Storage temperature range	-55°C ~ +125°C		
Thermal shock	MIL-STD-810F		
Vibration	MIL-STD-810F		
Relative humidity(non-condensing)	0% to 90% RH		
Over temperature protection	(Internal IC junction)	170 °C	
FEATURE SPECIFICATIONS			
Start up time	Nominal Input and constant resistive load	Power up	5ms
Rise time	Time for Vo to rise from 10% to 90%of Vo		3.5ms

Note

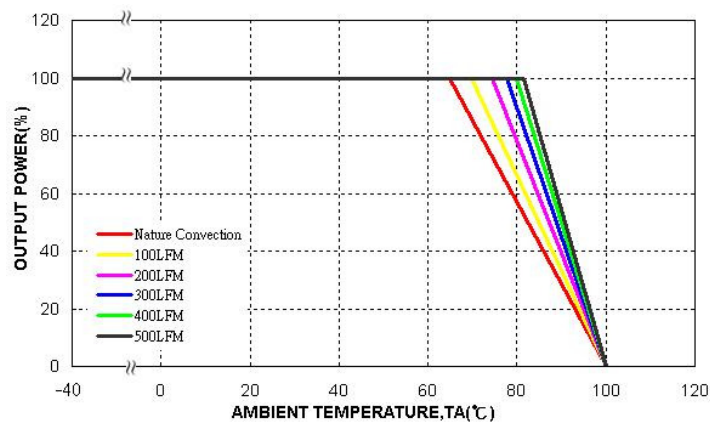
1. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment)
MIL-HDBK-217F Notice2 @Ta=25 °C, Full load (Ground, Benign, controlled environment)
2. Typical value at nominal input and no load.
3. Typical value at minimum input or maximum input voltage and full load.
4. Tested with minimum input and constant resistive load.

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

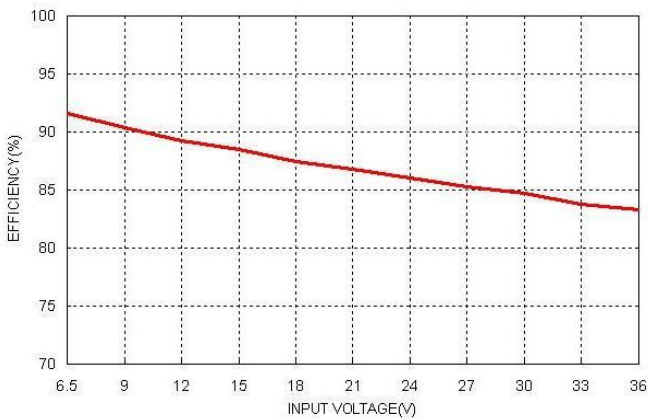
Positive output

Model Name	Input Voltage	Nominal Input	Output Voltage	Frequency	Output Current		No Load Current(2)	Efficiency (%) (3)	
					Min. Load	Max. Load		Min. Vin	Max. Vin
NSR01-12S1P5	4.6 ~ 36VDC	12VDC	1.5VDC	300kHz	0A	1A	1.0mA	77.0	66.5
NSR01-12S1P8	4.6 ~ 36VDC	12VDC	1.8VDC	300kHz			1.0mA	80.5	70.0
NSR01-12S2P5	4.6 ~ 36VDC	12VDC	2.5VDC	300kHz			1.0mA	83.5	75.5
NSR01-12S3P3	4.6 ~ 36VDC	12VDC	3.3VDC	300kHz			1.5mA	87.5	79.5
NSR01-12S05	6.5 ~ 36VDC	12VDC	5.0VDC	580kHz			2.5mA	91.5	83.0
NSR01-12S6P5	8.0 ~ 36VDC	12VDC	6.5VDC	580kHz			3.0mA	93.0	86.0
NSR01-12S09	10.5 ~ 36VDC	12VDC	9.0VDC	580kHz			3.5mA	94.5	88.5
NSR01-24S12	13.5 ~ 36VDC	24VDC	12VDC	580kHz			2.5mA	95.0	91.5
NSR01-24S15	16.5 ~ 36VDC	24VDC	15VDC	580kHz			3.5mA	95.5	92.5

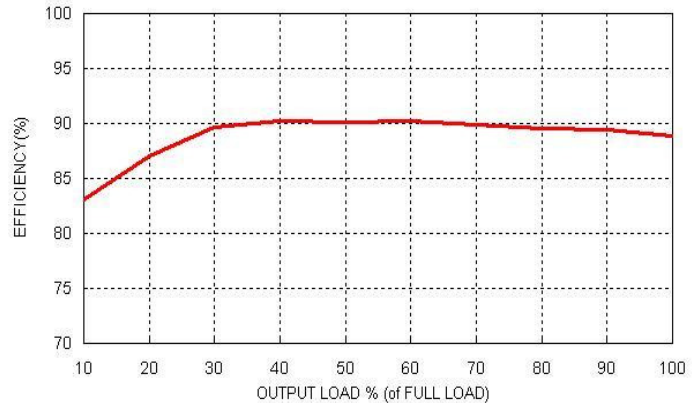
NSR01-12S05 DERATING CURVE



NSR01-12S05 EFFICIENCY VS INPUT VOLTAGE



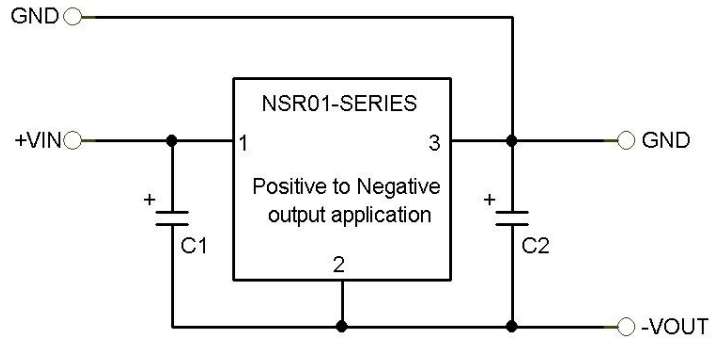
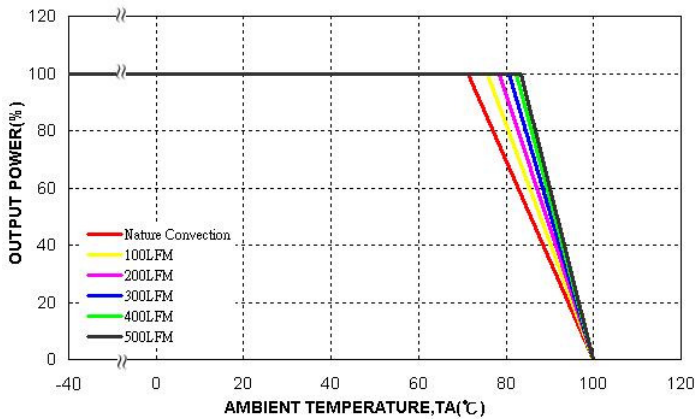
NSR01-12S05 EFFICIENCY VS OUTPUT LOAD



Negative output application

Model Name	Input Voltage	Nominal Input	Output Voltage	Frequency	Output Current		No Load Current(2)	Efficiency (%) (3)	
					Min. Load	Max. Load		Min. Vin	Max. Vin
NSR01-12S1P5	4.6 ~ 32VDC	12VDC	-1.5VDC	300kHz	0 A	0.6A	1mA	69.5	64.5
NSR01-12S1P8	4.6 ~ 32VDC	12VDC	-1.8VDC	300kHz	0 A	0.6A	1mA	72.0	67.5
NSR01-12S2P5	4.6 ~ 32VDC	12VDC	-2.5VDC	300kHz	0 A	0.6A	1mA	72.0	74.0
NSR01-12S3P3	4.6 ~ 32VDC	12VDC	-3.3VDC	300kHz	0 A	0.6A	2mA	74.0	77.5
NSR01-12S05	4.6 ~ 31VDC	12VDC	-5.0VDC	580kHz	0 A	0.4A	3mA	79.5	78.5
NSR01-12S6P5	7 ~ 29VDC	12VDC	-6.5VDC	580kHz	0 A	0.3A	4mA	84.5	80.0
NSR01-12S09	7 ~ 27VDC	12VDC	-9.0VDC	580kHz	0 A	0.3A	7mA	85.0	82.0
NSR01-24S12	7 ~ 24VDC	12VDC	-12VDC	580kHz	0 A	0.3A	8mA	85.0	85.5
NSR01-24S15	7 ~ 21VDC	12VDC	-15VDC	580kHz	0 A	0.2A	10mA	85.5	84.5

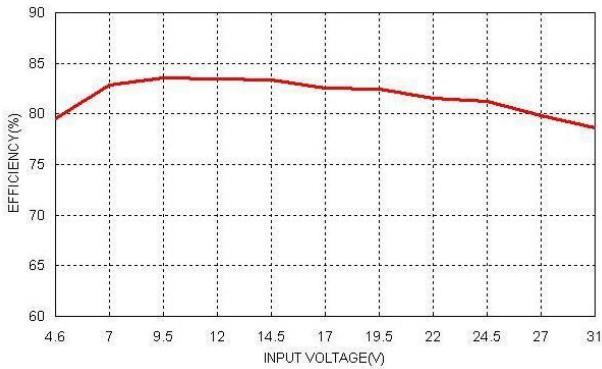
NSR01-12S05 -5Vout DERATING CURVE



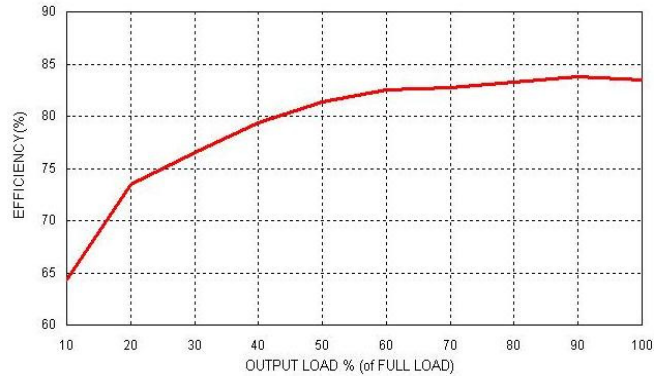
C1 and C2 are required and should be fitted close to the converter pins. Maximum capacitive load including C2 is 470uF.

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

NSR01-12S05 -5Vout EFFICIENCY VS INPUT VOLTAGE

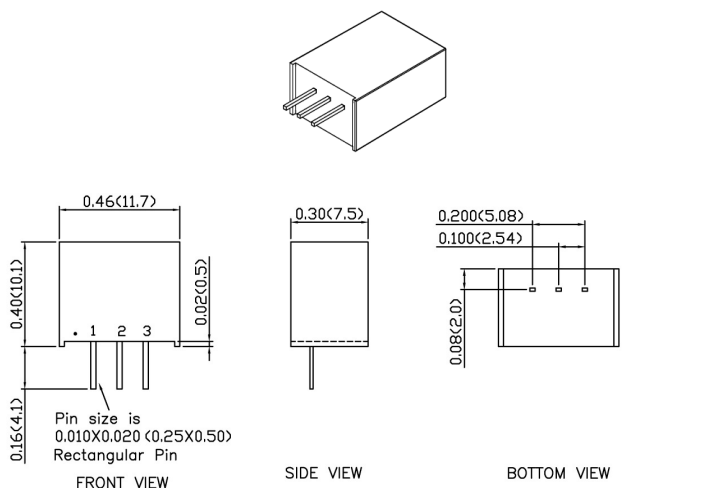


NSR01-12S05 -5Vout EFFICIENCY VS OUTPUT LOAD



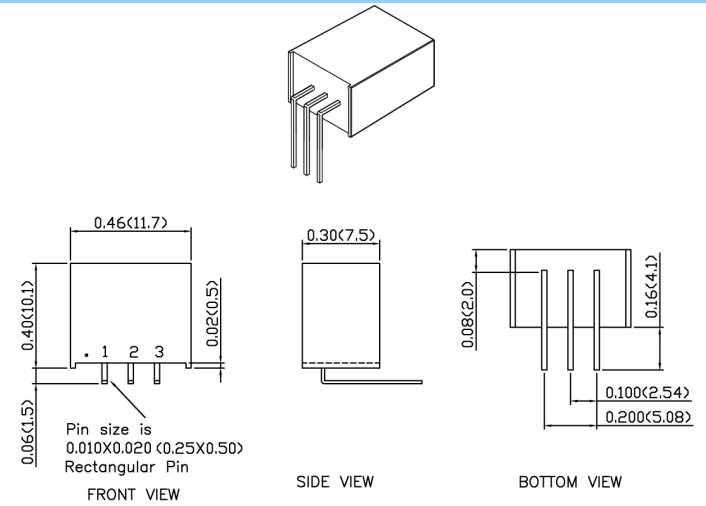
MECHANICAL DRAWING FOR STARDANDS

MECHANICAL DRAWING FOR SUFFIX-A



PIN CONNECTION	
PIN	DEFINE
1	+VIN
2	GND
3	+VOUT

- All dimensions in Inch (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 dimension tolerance ±0.004 (0.1)



PIN CONNECTION	
PIN	DEFINE
1	+VIN
2	GND
3	+VOUT