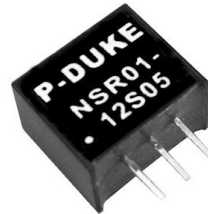


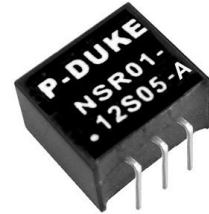
NSR01 SERIES

NON-ISOLATION DC-DC CONVERTER

4.6~36VDC WIDE INPUT RANGE



STANDARD
VERTICAL MOUNTING



SUFFIX -A
HORIZONTAL MOUNTING



FEATURES

- PIN_OUT COMPATIBLE WITH LM78XX LINEAR REGULATORS
- NO MINIMUM LOAD REQUIRED
- SMALL SIZE AND LOW PROFILE: 0.46 X 0.30 X 0.40 INCH
- NEGATIVE OUTPUT APPLICATION
- SAFETY MEETS UL60950-1, EN60950-1, & IEC60950-1
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT
- MICROPROCESSOR POWER APPLICATION

NON ISOLATION	OCP	SCP	OTP	LOW STANDBY POWER
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TECHNICAL SPECIFICATION

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

Positive output application

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load A	Input Current @ No Load mA	Efficiency		Maximum Capacitor Load μF
					Min. Vin	Max. Vin	
NSR01-12S1P5	4.6 ~ 36	1.5	1	1.0	77.0	66.5	470
NSR01-12S1P8	4.6 ~ 36	1.8		1.0	80.5	70.0	
NSR01-12S2P5	4.6 ~ 36	2.5		1.0	83.5	75.5	
NSR01-12S3P0	4.6 ~ 36	3.0		1.5	86.5	78.5	
NSR01-12S3P3	4.6 ~ 36	3.3		1.5	87.5	79.5	
NSR01-12S05	6.5 ~ 36	5.0		2.5	91.5	83.0	
NSR01-12S6P5	8.0 ~ 36	6.5		3.0	93.0	86.0	
NSR01-12S09	10.5 ~ 36	9.0		3.5	94.5	88.5	
NSR01-24S12	13.5 ~ 36	12		2.5	95.0	91.5	
NSR01-24S15	16.5 ~ 36	15		3.5	95.5	92.5	

Negative output application

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load A	Input Current @ No Load mA	Efficiency		Maximum Capacitor Load μF
					Min. Vin	Max. Vin	
NSR01-12S1P5	4.6 ~ 32	-1.5	-0.6	1.0	69.5	64.5	470
NSR01-12S1P8	4.6 ~ 32	-1.8	-0.6	1.0	72.0	67.5	
NSR01-12S2P5	4.6 ~ 32	-2.5	-0.6	1.0	72.0	74.0	
NSR01-12S3P0	4.6 ~ 32	-3.0	-0.6	2.0	73.0	76.5	
NSR01-12S3P3	4.6 ~ 32	-3.3	-0.6	2.0	74.0	77.5	
NSR01-12S05	4.6 ~ 31	-5.0	-0.4	3.0	79.5	78.5	
NSR01-12S6P5	7.0 ~ 29	-6.5	-0.3	4.0	84.5	80.0	
NSR01-12S09	7.0 ~ 27	-9.0	-0.3	7.0	85.0	82.0	
NSR01-24S12	7.0 ~ 24	-12	-0.3	8.0	85.0	85.5	
NSR01-24S15	7.0 ~ 21	-15	-0.2	10	85.5	84.5	

PART NUMBER STRUCTURE

NSR01	-	12	S	05	-	A
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)		Mounting Options
		See table	S:Single	See table		□:Vertical Mounting A:Horizontal Mounting

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	Positive application	4.6		36	VDC
	Negative application	4.6		32	
Start up time	Constant resistive load		5		ms
Rise time	Time for Vout rises from 10% to 90% of Vout		3.5		ms
Input filter					Capacitor type
Input reflected ripple current			100		mAp-p

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit	
Voltage accuracy		-2.0		+2.0	%	
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%	
Load regulation	10% to 100% of Full Load	Vertical mounting	1.5Vout	-0.6	+0.6	%
			Others	-0.4	+0.4	
	Horizontal mounting	1.5Vout, 1.8Vout	-1.2	+1.2		
		Others	-0.4	+0.4		
Ripple and noise	Measured by 20MHz bandwidth		50		mVp-p	
			75			
Temperature coefficient		-0.015		+0.015	%/°C	
Dynamic load response	50% load step change	Peak deviation	150		mV	
		Recovery time	250		µs	
Output start-up overshoot				+1	%	
Over load protection			2		A	
Short circuit protection			Continuous, automatic recovery			

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Switching frequency	Vout ≤ 3.3VDC	240	300	360	kHz
	Vout ≥ 5.0VDC	464	580	696	
Safety meets					UL60950-1 EN60950-1 IEC60950-1
Case material					Non-conducted black plastic
Potting material					Silicone (UL94 V-0)
Weight					1.9g (0.07oz)
MTBF	MIL-HDBK-217F, Full load				2.009 x 10 ⁷ hrs

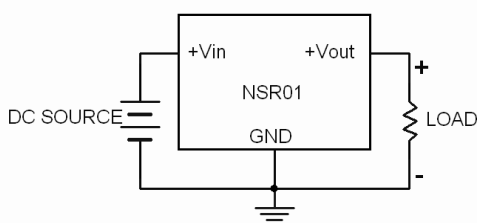
ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+100	°C
Over temperature protection	Internal IC junction		+170		°C
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

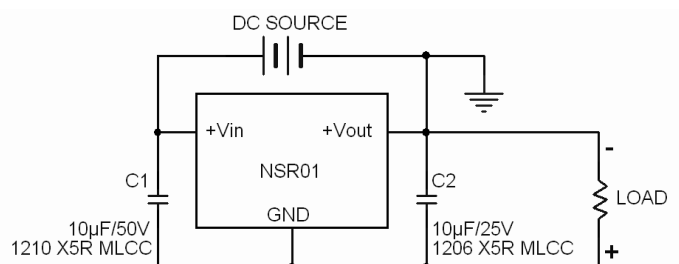
CAUTION: This power module is not internally fused. An input line fuse must always be used.

APPLICATION CIRCUIT

Positive application

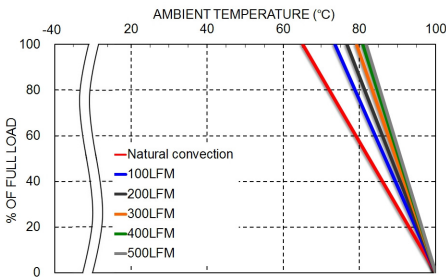


Negative application

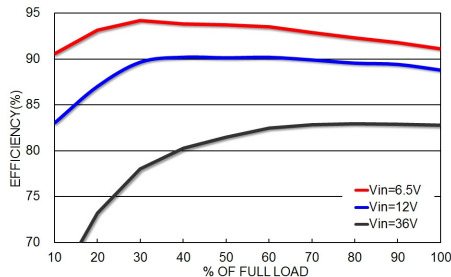


C1 and C2 are required that should be fitted close to the converter's pins. Maximum capacitive load including C2 is 470µF.

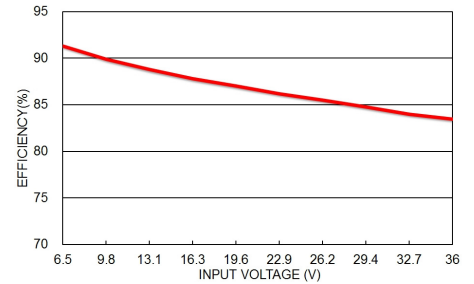
CHARACTERISTIC CURVE



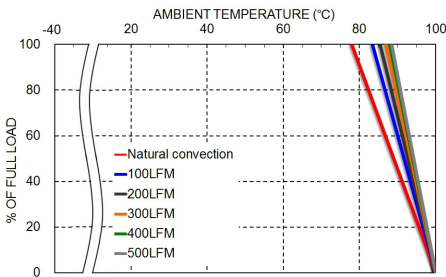
NSR01-12S05; Derating Curve
Positive application



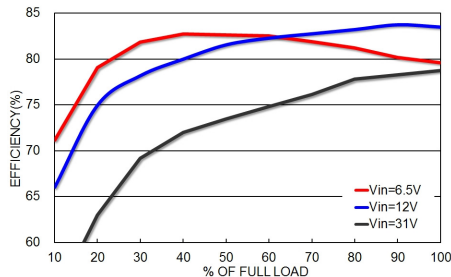
NSR01-12S05; Efficiency vs. load
Positive application



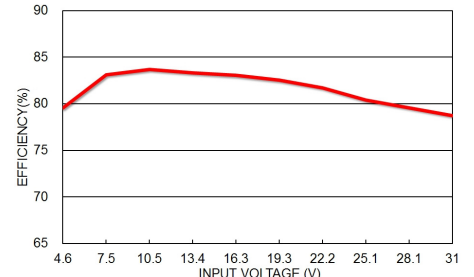
NSR01-12S05; Efficiency vs. line
Positive application



NSR01-12S05; Derating Curve
Negative application



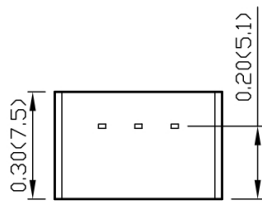
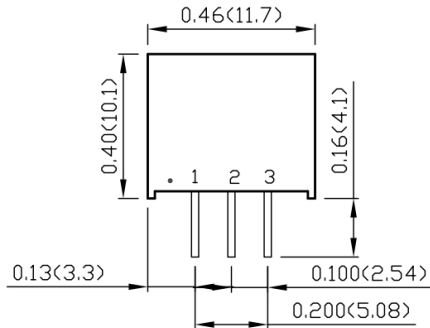
NSR01-12S05; Efficiency vs. load
Negative application



NSR01-12S05; Efficiency vs. line
Negative application

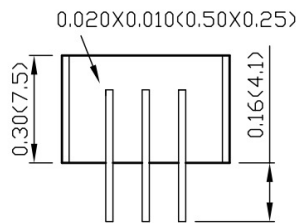
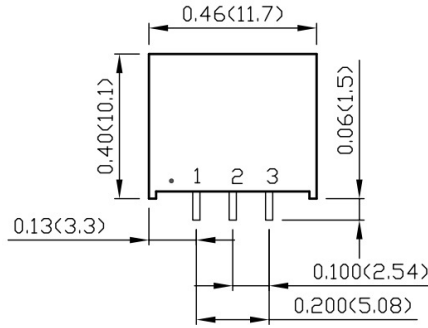
MECHANICAL DRAWING

Standard type: Vertical mounting



BOTTOM VIEW

Suffix-A: Horizontal mounting



BOTTOM VIEW

PIN CONNECTION

PIN	DEFINE
1	+Vin
2	GND
3	+Vout

1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xxx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)