POWER MATE TECHNOLOGY CO., LTD.

NSR01 SERIES

NON-ISOLATION DC-DC CONVERTER

4.6~36VDC WIDE INPUT RANGE



STANDARD
VERTICAL MOUNTING



SUFFIX -A
HORIZONTAL MOUNTING

CE

RoHS Compliant

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

TECHNICAL SPECIFICATION

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

Positive output application

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency		Maximum Capacitor Load
					Min. Vin	Max. Vin	
	VDC	VDC	A	mA	%		μF
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	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency		Maximum Capacitor Load
					Min. Vin	Max. Vin	
	VDC	VDC	A	mA	%		μF
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 Negative application	See table	4.6 4.6		36 32	VDC
Start up time	Constant resistive load	Power up		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	Vout≦6.5VDC		50		mVp-p
		Vout≧9.0VDC		75		
Temperature coefficient			-0.015		+0.015	%/℃
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, automatics 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

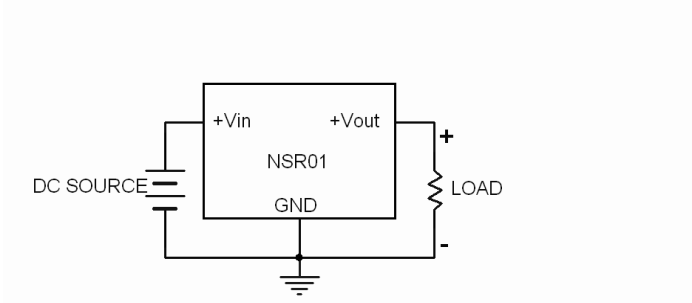
ENVIRONMENTAL SPECIFICATIONS

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

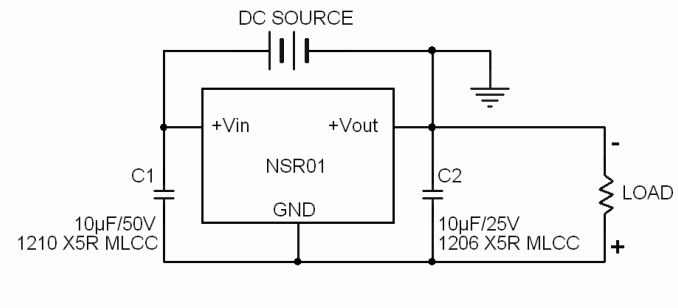
CAUTION: This power module is not internally fused. An input line fuse must always be used.

APPLICATION CIRCUIT

Positive application

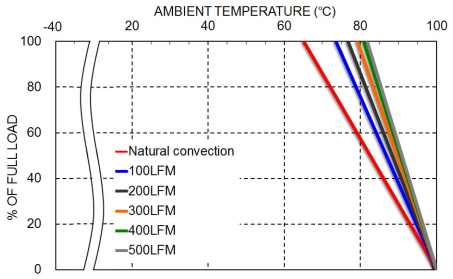


Negative application

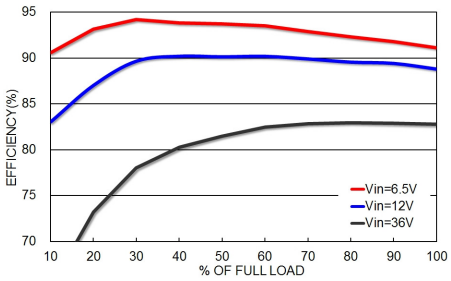


C1 and C2 are required that should be fitted close to the converter's pins.
Maximum capacitive load including C2 is 470μF.

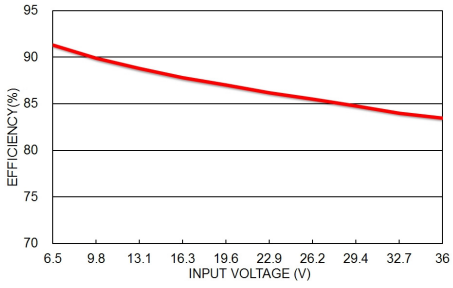
CHARACTERISTIC CURVE



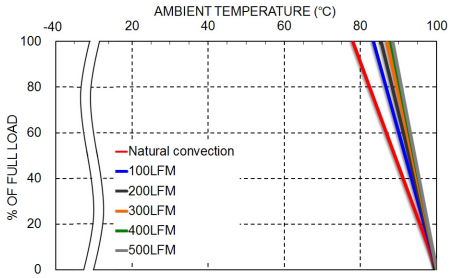
NSR01-12S05; Derating Curve
Positive application



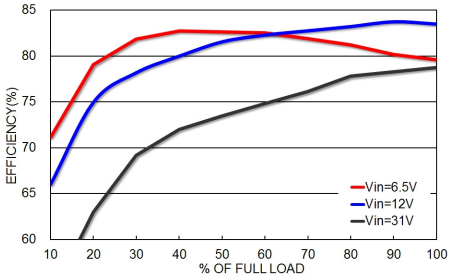
NSR01-12S05; Efficiency vs. load
Positive application



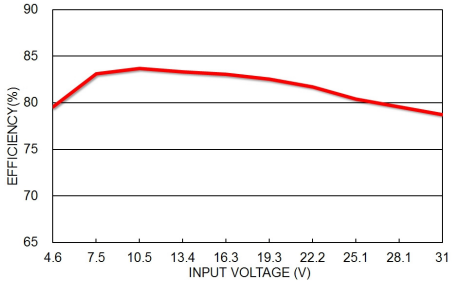
NSR01-12S05; Efficiency vs. line
Positive application



NSR01-12S05; Derating Curve
Negative application



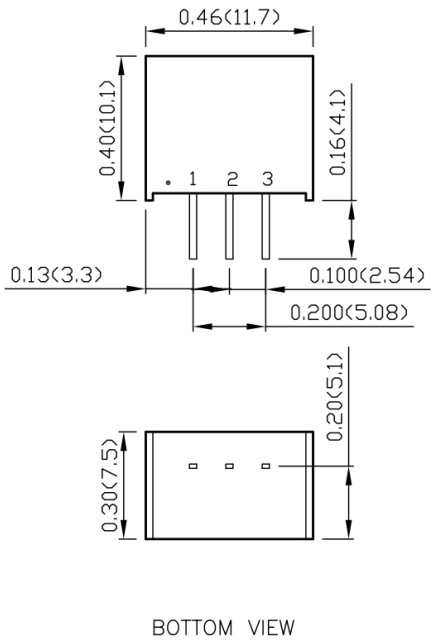
NSR01-12S05; Efficiency vs. load
Negative application



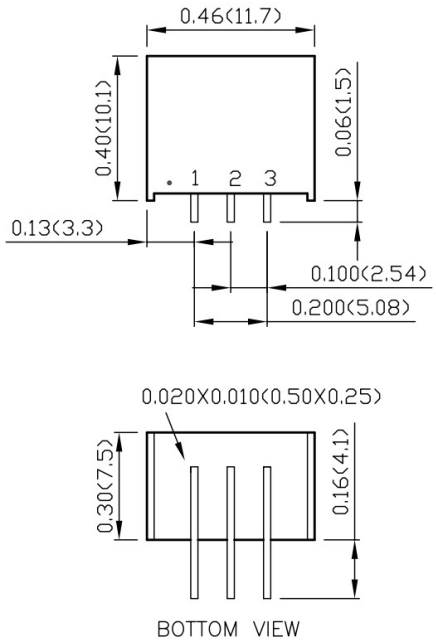
NSR01-12S05; Efficiency vs. line
Negative application

MECHANICAL DRAWING

Standard type: Vertical mounting



Suffix-A: Horizontal mounting



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.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)