



## FEATURES

- ◆ Wide Input Voltage Range
- ◆ High Efficiency for Extended Operating Range
- ◆ Input-Output isolation
- ◆ Independent Circuit Protection for Each Output
- ◆ Compact Size
- ◆ 90 Days warranty
- ◆ UL1950, CSA22.2-950 and EN60950 Approved
- ◆ Backward compatible with the PD-NPM-0308<sup>1</sup>



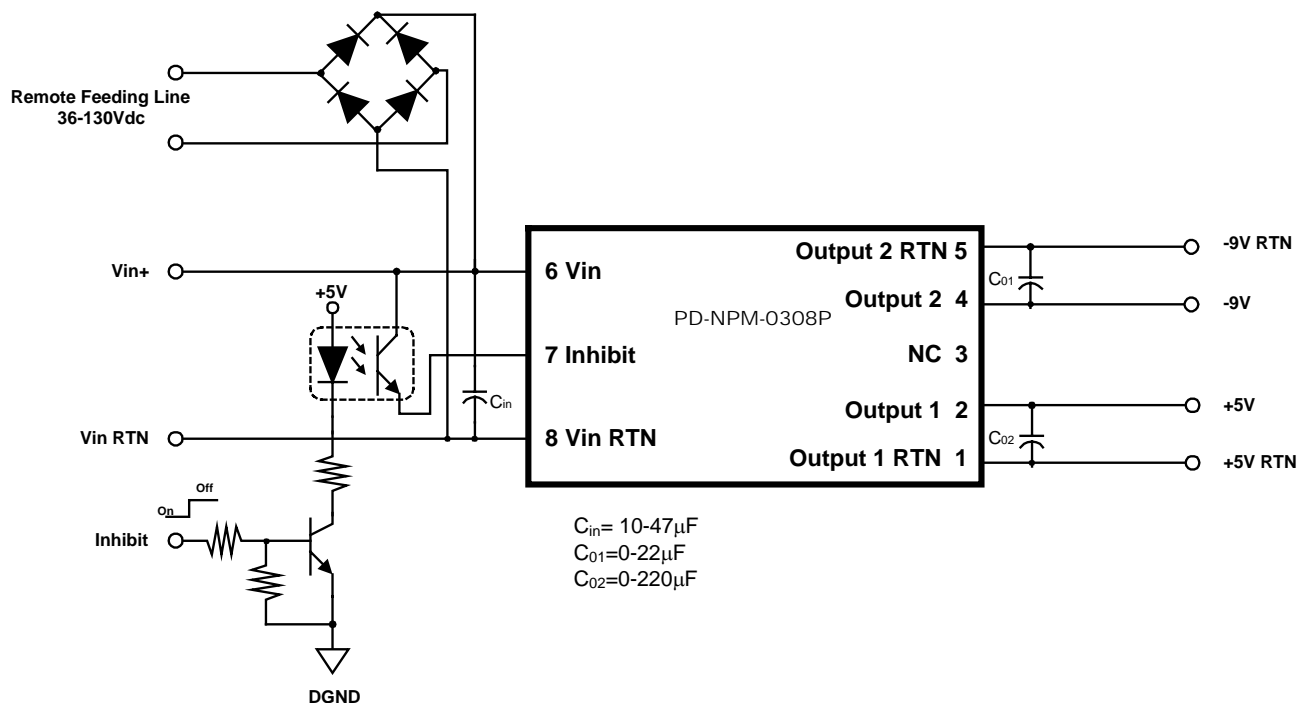
## APPLICATIONS

- ◆ HDSL/xDSL Systems
- ◆ HDSL Pair Gain Systems
- ◆ Remote Power Feeding Communication Systems
- ◆ Wide Input Range DC/DC Applications
- ◆ 48Vdc or 60Vdc TNV line to +5Vdc, -9Vdc Power converter

## DESCRIPTION

The PD-NPM-0308P module is a high-voltage input DC/DC converter. The module employs advanced power topologies which enable high efficiency, wide input range and compact size. It is especially designed to work as the remote (NTU) power module in remotely fed HDSL systems. The module has a shutdown mode, which when activated ("High" level on Inhibit pin), reduces the input current to sleep-mode level, approximately 1mA. The module is designed to perform optimally while working in conjunction with the PowerDsign PD-LPM-0xxx module series, but it may be used in a wide range of other applications. One of the PD-NPM-0308P's most valuable features is its ability to work with input voltages as low as 36Vdc. This feature enables the use of the module in systems that are locally powered from a TNV 48Vdc line. In these cases, there is no need to use any additional DC/DC converters, thereby reducing system costs and complexity. The PD-NPM-0308P version of the module offers a plastic cover with a reduced unit weight.

## TYPICAL APPLICATION



<sup>1</sup> The "P" suffix to the part number indicates a plastic cover without epoxy potting.



PD-NPM-0308P

**DSL NTU POWER MODULE: 36-130Vdc INPUT, +5Vdc, -9Vdc OUTPUT****ABSOLUTE MAXIMUM RATINGS\***

Input Voltage	.....	- 0.5 to 140V
Inhibit Input Voltage	.....	- 0.5 to 130V
Storage Temperature	.....	- 40°C to 100°C
Isolation Voltage (Input to Output 1, Output 2)	.....	1500V

\* The specified are stress ratings. Exposure of the device to any of these conditions may adversely effect long-term reliability.  
Proper operation other than those specified in the PERFORMANCE / FUNCTIONAL SPECIFICATIONS is not implied.

**PERFORMANCE / FUNCTIONAL SPECIFICATIONS**

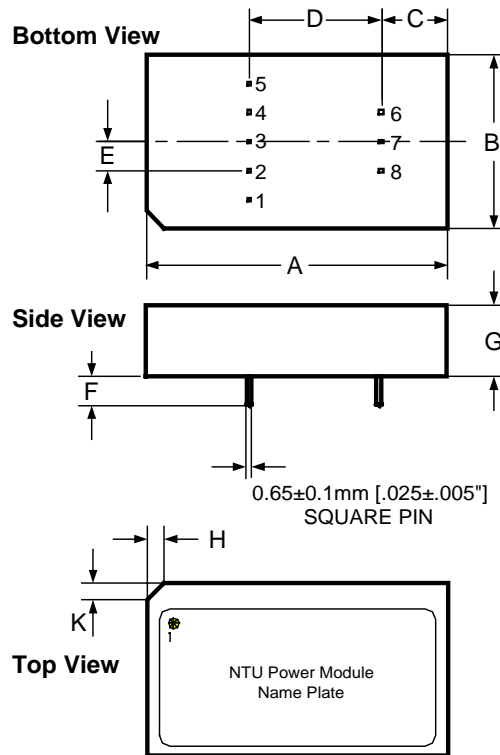
Unless otherwise indicated, the data below applies to the specified operating input voltage, load (resistive), and temperature range.  $C_{in}=10\mu F$ .

Parameter	Conditions	Min	Typ	Max	Units
<b>Input Data</b>					
Input Voltage <sup>3</sup>		36		130	V
Inhibit Threshold		0.4		2.4	V
Input Current	At Minimum Input Voltage, Full Load			280	mA
Input Reflected Ripple	Measured on 10 $\mu F$ ESR $\leq 1\Omega$ external capacitor. BW=20MHz			200	mV
<b>Output Data</b>					
Output Voltages	Maximum Load				
Output 1		4.95	5.05	5.15	Vdc
Output 2		-9.50	-9.0	-8.50	Vdc
Total Output Power				6.5	W
Output Currents					
Output 1		0.2		1.1	A
Output 2		0.03		0.1	A
Output 1 Cross Regulation	Output1=Full Load, $I_{min} \leq$ Output 2 $\leq I_{max}$			$\pm 1.0$	%
Output 2 Cross Regulation	Output2=Full Load, $I_{min} \leq$ Output 1 $\leq I_{max}$			$\pm 10.0$	%
Total Regulation <sup>1</sup>					
Line/Load/Temperature	Outputs are proportionally loaded: $I_{min} < I_{load} < I_{max}$ $I_{min} < I_{load} < I_{max}$			$\pm 1$ $\pm 5$	% %
Ripple and Noise	Measured on 0.1 $\mu F$ ceramic capacitor BW=20MHz @25°C Ambient Temperature				
Output 1			50	70	mVp-p
Output 2			100	130	mVp-p
Hold-Up Time	Measured with external input capacitor $C_{in} = 47\mu F$ , Output Power = 6W. $V_{in} Min = 70V$ , Maximum Load	10			mSec
Efficiency	$V_{in} = 72V$ , Maximum Load		75		%
Switching Frequency			125		KHz
Circuit Protection					
Output Short Circuit	Safe period for short circuit on either or both outputs.			$\infty$	Sec
<b>Reliability</b>					
MTBF	Continuous Operation @30°C Ambient Temperature. Prediction method: Relex Bellcore TR-332 Issue 5, Method 1 Case III Software Version 5.30	1,000,000			Hours
<b>Environmental Data</b>					
Ambient Temperature					
PD-NPM-0308P	Continuous Operation. No Derating	-10		+70	°C
Relative Humidity	Non-Condensing, Per IEC 68-2-56			93	%

1. Output currents below the minimum rate may cause total regulation to divert from rated specifications. In cases where Output 1 and Output 2 are not in use, the unused output should be loaded for minimal current consumption with a resistor.
2. The unit is designed to meet EN55022 Class B Standard, with an external EMI filter. For filter design recommendations, refer to the PowerDsine xDSL Power Modules Application Note.
3. In order to comply with EN60950 standards in telecommunications networks, the unit's input voltage must not exceed 120Vdc.
4. When the Inhibit function is not used it is recommended to permanently connect the Inhibit terminal to  $V_{in}$  RTN (pin 8).



## MECHANICAL DETAILS



### DIMENSIONS

	mm	Inch
A	$52.00 \pm 0.50$	$2.05" \pm 0.02"$
B	$30.00 \pm 0.50$	$1.18" \pm 0.02"$
C	$11.42 \pm 0.50$	$.45" \pm 0.02"$
D	$22.86 \pm 0.25$	$.90" \pm 0.01"$
E	$5.08 \pm 0.25$	$.20" \pm 0.01"$
F	$5.00 \pm 0.50$	$.196" \pm 0.02"$
G	12.50 MAX	.492" MAX
H	$3.00 \pm 0.25$	$0.117" \pm 0.01"$
K	$3.00 \pm 0.25$	$0.117" \pm 0.01"$

## PIN CONNECTIONS

Pin #	Function	Description
1	Output 1 RTN	Return line for Output 1
2	Output 1	Primary output, regulated, 5.05V/1.1 Amp maximum
3	NC	Not connected
4	Output 2	Auxiliary output, -9V/100mA
5	Output 2 RTN	Return line for Output 2
6	Vin	Positive supply terminal. Typically feeds from the line through bridge rectifier to prohibit voltage reversal.
7	Inhibit	Logic input, relative to Vin RTN (pin 8) with an internal pull down resistor. High logic level will inhibit operation of the module, and the device's current consumption will drop to an idle level. Leaving this pin unconnected, or connecting it to a low logic level, will enable the outputs. When the Inhibit function is not used it is recommended to permanently connect the Inhibit terminal to Vin RTN (pin 8).
8	Vin RTN	Negative supply terminal pin. Typically feeds from the line through the bridge rectifier prohibit voltage reversal.