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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



NLP65 Series

Single, Dual and Triple Output

Data Sheet

Total Power: 65 - 75 W
Input Voltage: 85 - 264 Vac
 120 - 370 Vdc*
of Outputs: Single, dual, triple

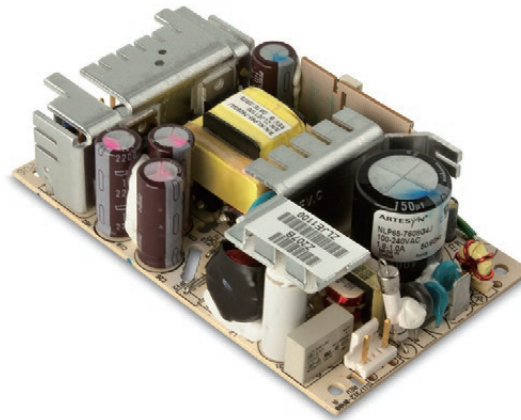
SPECIAL FEATURES

- Universal input
- 3" x 5" footprint
- Low profile fits 1U applications
- EN61000-3-2 compliance option (HCC)
- Overvoltage and short circuit protection
- 65 W with free air convection cooling
- EN55022, EN55011 conducted emissions level B
- EN61000-4-2, -3, -4, -5, -6 immunity compliant
- RoHS compliant
- LPX80 enclosure kit available
- Two year warranty

SAFETY

- VDE0805/EN60950-1
File No. 1040100-3336-0096
- License No. 114404
- UL 60950-1
- cUL 60950-1
- CCC 60950-1
- CE LVD Directive

*NLP65-76xx version only



Electrical Specifications

| Input | | |
|----------------------------------|--|---|
| Input voltage range | Universal input (see Note 2) NLP65-76xx version only | 85 - 264 Vac 120 - 370 Vdc |
| Input frequency range | | 47 - 63 Hz |
| Input current (cold start) | 120 Vac 230 Vac | 17 A max. 32 A max |
| Safety ground leakage current | 120 Vac, 60 Hz 230 Vac, 50 Hz | 0.7 mA 1.4 mA |
| Input current | 120 Vac, with PFC 230 Vac, with PFC 120 Vac, without PFC 230 Vac, without PFC | 1.4 A 0.51 A rms 1.40 A rms 0.80 A rms |
| Input fuse | UL/IEC127 | 5 A, 250 Vac In live and neutral |
| Output | | |
| Total regulation (line and load) | Main output Auxiliary outputs | ±2.0% ±5.0% |
| Rise time | At turn-on | 1.0 s, max |
| Transient response | Main output 25% step at 0.1 A/μs | 5.0% or 250 mV max. dev., 1ms max. recovery to 1% |
| Temperature coefficient | | ±0.02%/°C |
| Overvoltage protection | Main outputs | 125%, ±10% |
| Short circuit protection | Cyclic operation | Continuous |
| Minimum output current | Single and multiple | (See Note 6) |

All specifications are typical at nominal input, full load at 25 °C unless otherwise stated.

EMC Characteristics ^(11, 12)

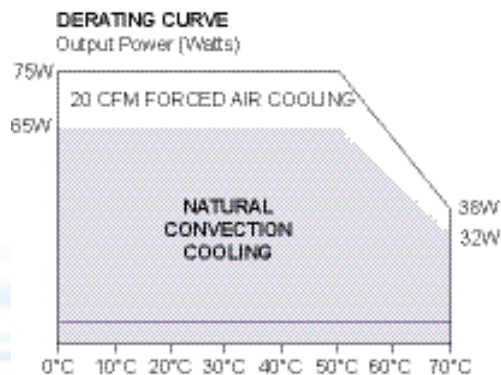
| | | |
|---------------------|----------------------|------------------|
| Conducted emissions | EN55022, FCC part 15 | Level B |
| ESD air | EN61000-4-2, level 3 | Perf. criteria 1 |
| ESD contact | EN61000-4-2, level 4 | Perf. criteria 1 |
| Surge | EN61000-4-5, level 3 | Perf. criteria 1 |
| Fast transients | EN61000-4-4, level 3 | Perf. criteria 1 |
| Radiated immunity | EN61000-4-3, level 3 | Perf. criteria 2 |
| Conducted immunity | EN61000-4-6, level 3 | Perf. criteria 2 |

General Specifications

| | | |
|--|----------------------------------|------------------------------|
| Hold-up time | 120 Vac, 60 Hz 230 Vac, 50 Hz | 16 ms @ 65 W 78 ms @ 65 W |
| Efficiency | 120 Vac, 65 W | 72% typical |
| Isolation voltage | Input/output Input/chassis | 3000 Vac 1500 Vac |
| Switching frequency | Fixed | 100 kHz, ±5 kHz |
| Approvals and standards (see Notes 9, 13) | EN60950-1, IEC60950-1 | |
| Weight | 283 g (10 oz) | |
| MTBF demonstrated | MIL-HDBK-217F | 150,000 hours min |

Environmental Specifications

| | | |
|------------------------|---|--------------------|
| Thermal performance: | Operating (See derating curve) | 0° C to +70 °C |
| (See notes 1, 3, 10) | Non-operating | -40 °C to +85 °C |
| | 50 °C - 70 °C ambient, convection cooled | Derate to 50% load |
| | 0 °C to 50 °C, ambient, convection cooled | 65 W |
| | 0 °C to 50 °C, ambient 20CFM forced air (See Note 10) | 75 W |
| | Peak (0 °C to 50 °C, 60 s) | See table |
| Relative humidity | Non-condensing | 5 to 95% RH |
| Altitude | Operating | 10,000 feet max. |
| | Non-operating | 30,000 feet max. |
| Vibration (See Note 5) | 5-500 Hz | 2.4 G rms peak |
| Shock | per MIL-STD-810E | 516.4 Part IV |



| Output Voltage | Output Current | | | Ripple ⁽⁴⁾ | Total Regulation ⁽⁶⁾ | Non-Harmonic Corrected | Harmonic Corrected | Ground Pin ^(12, 14, 17) |
|----------------|--------------------|---------------------|---------------------|-----------------------|---------------------------------|-----------------------------|----------------------------|------------------------------------|
| | Max ⁽¹⁾ | Peak ⁽³⁾ | Fan ⁽¹⁰⁾ | | | | | |
| +5 V (IA) | 7.5 A | 9.1 A | 8 A | 50 mV | ±2.0% | NLP65-7608J | NLP65-9608J ^(a) | NLP65-X608GJ |
| +12 V (IB) | 2.5 A | 3.3 A | 3 A | 150 mV | ±5.0% | | | |
| -12 V | 0.65 A | 0.81 A | 0.8 A | 120 mV | ±5.0% | | | |
| +5 V (IA) | 7.5 A | 9.1 A | 8 A | 50 mV | ±2.0% | NLP65-7610J | NLP65-9610J | NLP65-X610GJ |
| +15 V (IB) | 2.2 A | 2.9 A | 2.5 A | 150 mV | ±5.0% | | | |
| -15 V | 0.65 A | 0.85 A | 0.8 A | 150 mV | ±5.0% | | | |
| +5 V | 7.0 A | 9.1 A | 8.0 A | 50 mV | ±2.0% | NLP65-3322J ⁽¹⁵⁾ | | |
| +24 V | 1.5 A | 2.6 A | 2.0 A | 240 mV | ±5.0% | | | |
| +12 V | 0.7 A | 1.0 A | 1.0 A | 120 mV | ±5.0% | | | |
| +5 V (IA) | 7 A | 9.1 A | 8 A | 50 mV | ±2.0% | NLP65-7620J | NLP65-9620J | NLP65-X620GJ |
| +24 V (IB) | 2 A | 2.6 A | 2 A | 240 mV | ±5.0% | | | |
| +5 V (IA) | 7 A | 9.1 A | 8 A | 50 mV | ±2.0% | NLP65-7629J | NLP65-9629J | NLP65-X629GJ |
| +12 V (IB) | 2.5 A | 3.3 A | 3 A | 150 mV | ±5.0% | | | |
| +5 V | 10 A | 13 A | 12 A | 50 mV | ±2.0% | NLP65-7605J | NLP65-9605J | NLP65-X605GJ |
| +12 V | 5.4 A | 7 A | 6.5 A | 120 mV | ±2.0% | NLP65-7612J | NLP65-9612J | NLP65-X612GJ |
| +24 V | 2.7 A | 3.5 A | 3.5 A | 240 mV | ±2.0% | NLP65-7624J | NLP65-9624J | NLP65-X624GJ |

Notes

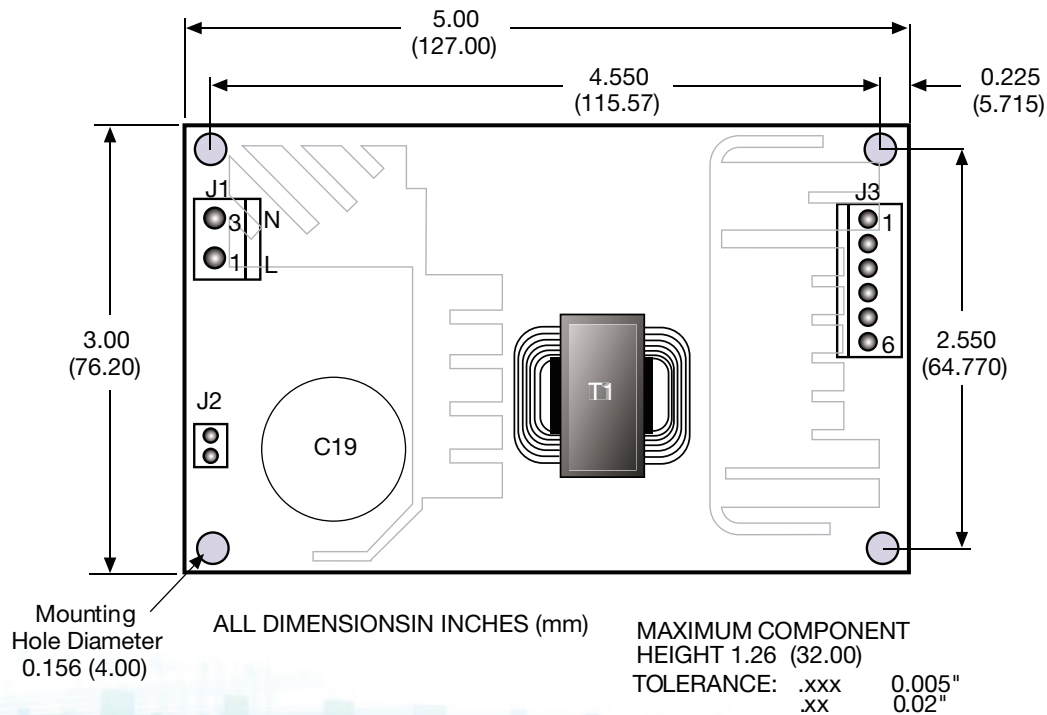
1. Natural convection cooling. Models NLP65-X629J, NLP65-X608J, NLP65-X610J must not exceed 62.5 Watts continuous output power with natural convection. Model NLP65-X620J not to exceed 65 Watts continuous output power with natural convection. Model NLP65-3322J must not exceed 60 Watts continuous output power with natural convection.
2. When the input voltage is less than 90 Vac the operating temperature range is 0 °C to +40 °C. The ripple and regulation specifications may not be met.
3. Peak output current lasting less than 60 seconds with duty cycle less than 5%. During peak loading, output voltage may exceed total regulation limits.
4. Figure is peak-to-peak for convection power rating. Output noise measurements are made across a 20 MHz bandwidth using a 6 inch twisted pair, terminated with a 10 µF electrolytic capacitor and a 0.1 µF ceramic capacitor.
5. Three orthogonal axes, random vibration 10 minutes for each axes, 2.4 G rms 5 Hz to 500 Hz.
6. A minimum load on the main output is required for proper start up. For multiple outputs and single +5V output, the minimum load on the +5 V is 0.2 A. For single outputs greater than +5 V the minimum load is 0.1 A. To maintain stated regulation then:
for single output units
 $I \geq 0.2 \text{ A}$
for multiple output units
 $0.25 \leq I(A)/I(B) \leq 5$, for $I(A) \geq 0.2 \text{ A}$.
7. For optimum reliability, no part of the heatsink should exceed 120 °C, and no semiconductor case temperature should exceed 130 °C.
8. CAUTION: Allow a minimum of 1 second after disconnecting line power when making thermal measurements.
9. This product is a Component Power Supply and is only for inclusion by professional installers within other equipment and must not be operated as a standalone product. EMC compliance to appropriate standards must be verified at the system level. This product is for sale to OEMs and System Integrators, including through Distribution Channels. It is not intended for sale to End Users.
10. Maximum continuous output power for all multiple output models must not exceed 75 Watts (70 watts for NLP65-3322J) with 20 CFM forced air cooling.

11. Conducted emissions testing were performed using the standard EN55022 set-up with a stand alone NLP65 unit placed on a grounded metal plate with a line choke on the AC input and ground wires (i.e. the wires are looped through an EMI suppression toroid).
For system compliance it is usually necessary to install an 'off-the-shelf' AC inlet with an integral line filter in the system chassis or to install a line choke on the input wires as close as possible to AC entry point of the system chassis. Please contact the applications group for assistance with EMI compliance.
12. The NLP65 units with the suffix 'G' is the ground pin and ground choke option. J2, L6 and JP10 are included. J2 is a safety agency approved grounding pin, L6 is a ground choke and JP10 is a jumper. This option is intended for use in non-metallic chassis applications where grounding is not possible via the mounting screws. The ground choke is provided to assist system EMC compliance. When performing conducted emissions testing on stand alone units, the 'G' option is required to meet level B. To order simply add the suffix 'G' to the standard model number, e.g. NLP65-7608GJ, NLP65-9608GJ. This option is available for both the PFC and non-PFC versions.
13. All models require a minimum mounting stand-off of 0.25 inches (6.35 mm) in the end use product.
14. The NLP65-9608J is available with an enclosure. To order an enclosed version, use NLP65-9608EJ.
15. No PFC version, EN61000-3-2 is not applicable to this model.
16. The 'J' suffix indicates that these parts are Pb-free (RoHS 6/6) compliant.
17. NOTICE: Some models do not support all options. Please contact your local Artesyn Embedded Technologies representative or use the on-line model number search tool at <http://www.artesyn.com/power>

Model Numbering Options

- a) The enclosure version NLP65-9608EJ includes: IEC connector, on/off switch, wire harness output connector and fitted cover. To order, please add the suffix 'E' the model number. See NLP65 enclosure for details.
- b) A Safety earth ground pin and ground choke are available as an option.
To order, please add the suffix 'G' the model number, e.g. NLP65-X608GJ.
- c) To order an enclosure kit (unfitted), order the part number LPX80.

Mechanical Drawing



Input Pin Connections

| J1 | |
|-------------------------|---------------|
| Pin 1 | AC Line |
| Pin 2 | No Pin |
| Pin 3 | AC Neutral |
| J2 (On 'G' Suffic Only) | |
| Pin 1 | Safety Ground |

Output Pin Connections

| J3 | SINGLE | DUAL | TRIPLE |
|-------|--------|--------|--------|
| Pin 1 | V (A) | V (B) | V (B) |
| Pin 2 | V (A) | V (A) | V (A) |
| Pin 3 | V (A) | V (A) | V (A) |
| Pin 4 | Return | Return | Return |
| Pin 5 | Return | Return | Return |
| Pin 6 | Return | N/C | V (C) |

Input and Output Connectors

| Input and Output Connectors | | Mating Connectors |
|-----------------------------|-------------------------------------|--|
| AC (J1) | Molex 26-60-4030 type or equivalent | Molex 09-50-3031 or equivalent with Molex 08-52-0113 or equivalent crimp terminals |
| DC (J3) | Molex 26-60-4060 or equivalent | Molex 09-50-3061 with Molex 2478 phosphor bronze crimp terminals or equivalent. |

WORLDWIDE OFFICES

Americas

2900 S.Diablo Way
 Tempe, AZ 85282
 USA
 +1 888 412 7832

Europe (UK)

Waterfront Business Park
 Merry Hill, Dudley
 West Midlands, DY5 1LX
 United Kingdom
 +44 (0) 1384 842 211

Asia (HK)

14/F, Lu Plaza
 2 Wing Yip Street
 Kwun Tong, Kowloon
 Hong Kong
 +852 2176 3333



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