

# NLS110-9602J

## Quad output

- 7.0 x 4.25 x 1U package
- Overvoltage and short circuit protection
- 110 W with 20 CFM
- 90 Vac to 264 Vac universal input range
- EN55022 conducted emissions level B, radiated emissions level A
- UL, VDE and CSA safety approvals
- CE mark
- Available RoHS compliant



The NLS110-9602J is a 110 W universal input ac-dc power supply on a 7 x 4.25 inch card. The NLS110-9602J has proven itself to be highly reliable and versatile product for a wide range of communication and industrial applications, with a very high peak current capability on each output for drive and motor applications. The NLS110-9602J provides 80 W of output power with free air convection cooling which can be boosted to 110 W with 20 CFM of air. Standard features include overvoltage and short circuit protection. The NLS110-9602J with full international safety approval and the CE mark, meets conducted emissions EN55022 level B. The NLS110-9602J is designed for use in low power data networking, computer, telecom and industrial applications such as servers, thermal printers, storage devices, vending machines and POS equipment.

**CE** (LVD)

**2 YEAR WARRANTY**

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

### SPECIFICATIONS

#### OUTPUT SPECIFICATIONS

Total regulation	Line and load	(See table)
Rise Time	At turn-on	1.0 s, max.
Transient response		(See table)
Temperature coefficient		±0.02%/°C
Overvoltage protection	+5.1 V	125%, ±10%
Short circuit protection	Cyclic operation	Yes with auto recovery

#### INPUT SPECIFICATIONS

Input voltage range	Universal input	90-264 Vac
Input frequency range		47-440 Hz
Input surge current (cold start)	120 Vac 230 Vac	18 A max. 35 A max.
Safety ground leakage current	120 Vac, 60 Hz 230 Vac, 50 Hz	0.45 mA 0.75 mA
Input current	120 Vac @ 80 W 120 Vac @ 110 W 230 Vac @ 80 W 230 Vac @ 110 W	0.95 A rms 1.35 A rms 0.53 A rms 0.75 A rms
Input fuse	UL/IEC127	F3.15A H, 250 Vac

#### EMC CHARACTERISTICS <sup>(11)</sup>

Conducted emissions	EN55022, FCC part 15	Level B
Radiated emissions	EN55022, FCC part 15	Level A
Harmonic current emission correction	EN61000-3-2	Compliant
ESD air	EN61000-4-2	Level 3
ESD contact	EN61000-4-2	Level 3
Surge	EN61000-4-5	Level 3
Fast transients	EN61000-4-4	Level 3
Radiated immunity	EN61000-4-3	Level 3
Conducted immunity	EN61000-4-6	Level 3

#### GENERAL SPECIFICATIONS

Hold-up time	120 Vac @ 60 Hz	35 ms @ 80 W 25 ms @ 110 W
Efficiency	120 Vac @ 110 W	70% min.
Isolation voltage	Input/output Input/chassis	3000 Vac 1500 Vac
Approvals and standards		EN60950, VDE0805, IEC950 UL1950, CSA C22.2 No. 950
Weight		383 g (13.5 oz.)
MTBF (@ 25 °C)	MIL-HDBK-217F	220,000 hours min.

#### ENVIRONMENTAL SPECIFICATIONS <sup>(6,8)</sup>

Thermal performance	Operating ambient, (see derating curve)	0 °C to +50 °C
	Non-operating	-40 °C to +85 °C
	+50 °C to +70 °C, Derate to amb. convection cooled	50% load
	0 °C to +50 °C, amb. convection cooled	80 W
	0 °C to +50 °C ambient, 150 LFM forced air	110 W
	Peak (0 °C to +50 °C, 60 s) (See Note 4)	
Relative humidity	Non-condensing	5% to 95% RH
Altitude	Operating	10,000 feet max.
	Non-operating	30,000 feet max.
Vibration (See Note 7)	5-500 Hz	2.4 G rms peak
Shock	per MIL-STD-810E	516.4 Part IV

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For the most current data and application support visit [www.artesyn.com/powergroup/products.htm](http://www.artesyn.com/powergroup/products.htm)

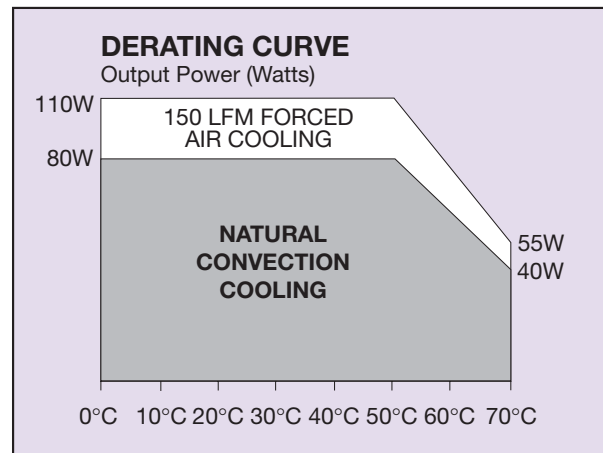
OUTPUT VOLTAGE	OUTPUT CURRENTS			RIPPLE (4)	TOTAL REGULATION (5)	MODEL NUMBERS (12,13,14)
	MAX (1)	PEAK (2)	FAN (3)			
+5.1 V	8 A	20 A	10 A	50 mV	±2.0%	NLS110-9602J
+24 V	3.5 A	4.5 A	4.5 A	240 mV	±5.0%	
+12 V	4.5 A	9 A	5 A	120 mV	±3.0%	
-12 V	0.5 A	1.5 A	1 A	120 mV	±3.0%	

### Notes

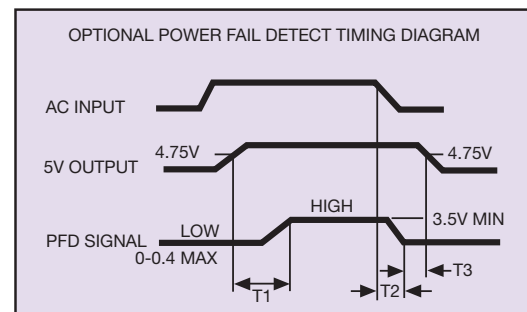
- Convection cooled, 80 W maximum.
- Peak outputs lasting less than 60 seconds with duty cycle less than 10%. Total peak power must not exceed 110 W.
- Forced air, 20 CFM at 1 atmosphere, 110 W maximum.
- Amplitude is peak-to-peak. Output ripple is measured across a 20 MHz bandwidth using a 12 inch twisted pair terminated with a 10  $\mu$ F capacitor.
- Total regulation is defined as the static output regulation at 25 °C, including initial tolerance, line voltage within stated limits and output voltages adjusted to their factory settings.
- Derating curve is application specific for ambient temperatures >50 °C.
- Three orthogonal axes, random vibration, 10 minute test for each axis.
- For optimum reliability no part of the heatsink should exceed 100 °C and no semiconductor case temperature should exceed 115 °C.
- Caution: Allow a minimum of 1 second after disconnecting the power when making thermal measurements.
- This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
- The EMI specifications reference measurements made with the power supply mounted on a grounded metal sheet extending 1 inch beyond each edge, using an unshielded cable. No external filtering is required during conducted emissions testing but some applications may require additional filtering to achieve system compliance. A line choke, (ac input cords looped twice through an EMI suppression toroid) was used during radiated emissions testing. Considerable radiated testing in 1U six-sided boxes has shown that units can meet level B in typical systems. Application support is available from the factory to assist with EMI compliance.
- Requires a minimum mounting stand-off of 6.35 mm (0.25 inches) in the end use product.
- The 'J' suffix indicates that these parts are Pb-free (RoHS 6/6) compliant. TSE RoHS 5/6 (non Pb-free) compliant versions may be available on special request, please contact your local sales representative for details.
- NOTICE: Some models do not support all options. Please contact your local Artesyn representative or use the on-line model number search tool at <http://www.artesyn.com/powergroup/products.htm> to find a suitable alternative.

### TRANSIENT RESPONSE

NLS110-9602J	+5.1 V (7.5 A to 1 0A)	150 mV peak, 1 ms recovery
	+24 V (1.5 A to 3 A)	300 mV peak, 1 ms recovery
	+12 V (2.5 A to 5 A)	100 mV peak, 0.5 ms recovery
	-12 V (0.5 A to 1 A)	100 mV peak, 0.5 ms recovery



OUTPUT PIN CONNECTIONS		INPUT PIN CONNECTIONS	
J2	FUNCTION	J1	
Pin 1	+5.1 V	Pin 1	AC Neutral
Pin 2	+5.1 V	Pin 2	No Connection
Pin 3	Return	Pin 3	AC Line
Pin 4	Return	J4	
Pin 5	Return		
Pin 6	Return	Pin 1	Safety Earth
Pin 7	+12 V		
Pin 8	+12 V		
Pin 9	+24 V		
Pin 10	PFD		
Pin 11	-12 V Return		
Pin 12	-12 V		



### Power fail detect signal

50 ms  $\leq$  T1  $\leq$  200 ms  
T2 will vary with line and load  
T3  $\geq$  3 ms  
Pout: 110 W  
PFD output is an open collector which will sink  $\leq$ 40 mA in the low state.

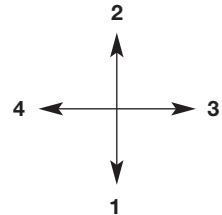
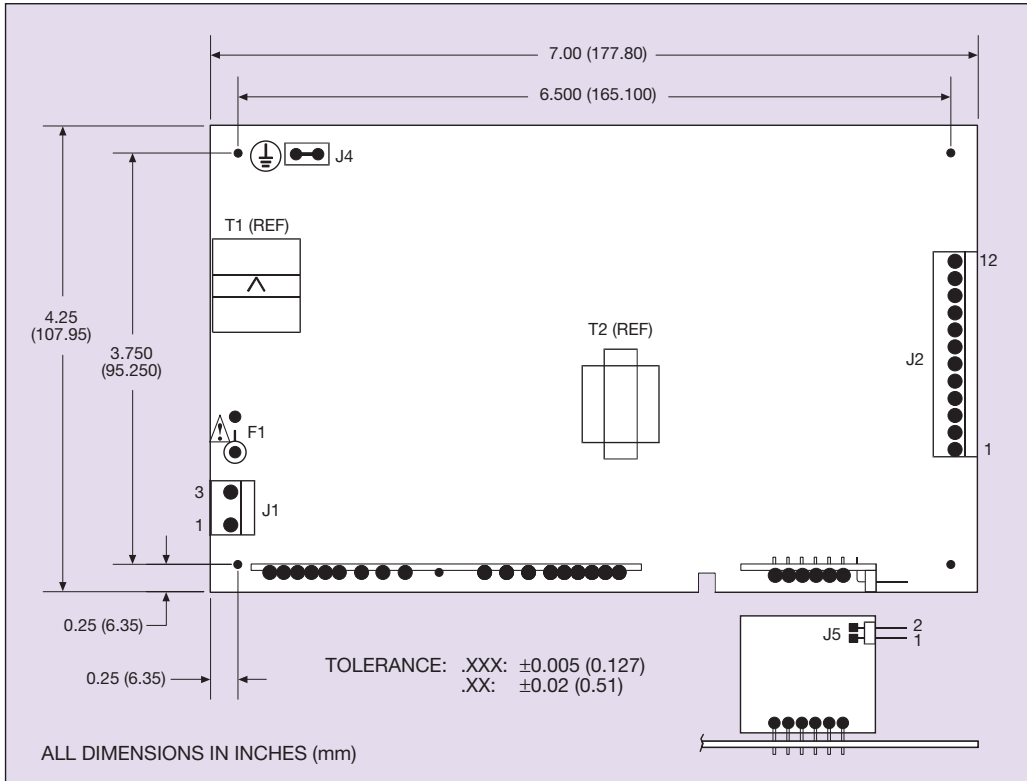
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### Mechanical Notes

A All dimensions are in inches (mm).



**Recommended direction for forced air relative to power supply orientation shown below.**

- 1 Optimum.
- 2 Very good.
- 3 Not recommended.
- 4 Not recommended.

### Input and output connectors

#### AC (J1) connector type

Molex 26-60-4030 or equivalent.

#### DC (J2) connector type

12 position Molex Spox type 26-48-1125 or equivalent.

#### Earth (J4) connector type

Male 0.250 quick disconnect.

### Mating connectors

#### AC (J1) mating connector type

Molex 09-50-3031 or equivalent with Molex 08-50-0105 or equivalent crimp terminals.

#### DC (J2) mating connector type

Molex Spox type 26-03-3121 and contact 08-52-0113.

#### Earth (J4) mating connector type

Molex 90028.

### International Safety Standard Approvals



VDE0805/EN60950/IEC950/IEC1010 File No. 10401-3336-0186  
Licence No.130253



UL1950 File No. E136005



CSA C22.2 No. 950 File No. LR41062C

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Please consult our website for the following items: ✓ Application Note

[www.artesyn.com](http://www.artesyn.com)