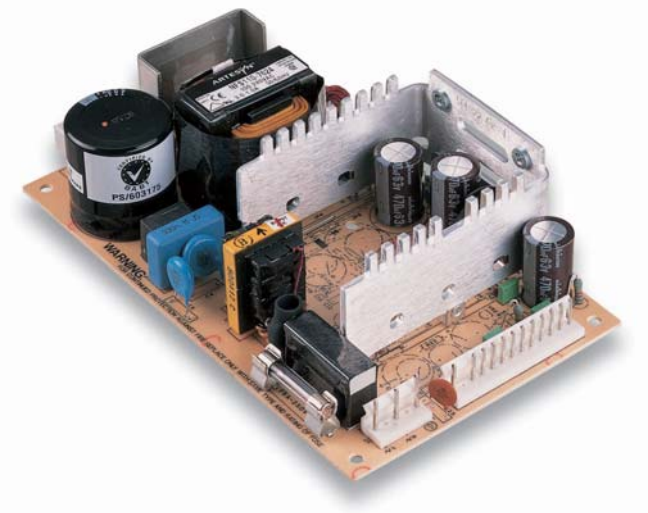
NFS110 Series
Single and quad output



Total Power: 80 - 110W
Input Voltage: 85 - 264VAC
120 - 370VDC
# of Outputs: Single, quad

Special Features

- 7.0 x 4.25 x 1.8 inch package
- Overvoltage and short circuit protection
- 110 W with 20 CFM
- Adjustable outputs
- EN55022, EN55011 conducted emissions level B
- UL, VDE and CSA safety approvals
- CE mark
- Available RoHS compliant
- 2 year warranty

Safety

VDE0805/EN60950/
IEC950/IEC1010
File No. 10401-3336-0213

Licence No. 40014677

UL1950 File No. E136005

CSA C22.2 No. 950
File No. LR41062C

The NFS110 series is a 110 W universal input ac-dc power supply on a 7 x 4.25 inch card. The NFS110 series has four single and three quad output models and 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 NFS110 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 series, with full international safety approval and the CE mark, meets conducted emissions EN55022 level B. The NFS110 series 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.

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Specifications

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

OUTPUT SPECIFICATIONS

Voltage adjustability	+5.1 V o/p on multi's 5.1 V single output 12 V single output 15 V single output 24 V single output	±3.0% ±3.0% 12-14 V 15-18 V 24-30 V
Line regulation	LL to HL, FL All outputs on all units	±0.1% max.
Overshoot/undershoot	At turn-on	0%
Temperature coefficient	All outputs	±0.02%/°C
Overvoltage protection	Multi o/p 5.1 V only 5.1 V single 12 V single 15 V single 24 V single	6.25 V ±0.75 V 6.25 V ±0.75 V 15.75 V ±1.0 V 22 V ±1.5 V 33 V ±2.5 V
Output power limit	Primary power limited	Pin max. 160 W Pout min. 110 W
Minimum output current	(See Note 13)	0 A
Short circuit protection		Burst mode operation

INPUT SPECIFICATIONS

Input voltage range		85-264 Vac 120-370 Vdc
Input frequency range		47-440 Hz
Input surge current	230 Vac	35 A
Safety ground leakage current	110 Vac, 50 Hz 230 Vac, 50 Hz	0.2 mA, max. 0.4 mA, max.

EMC CHARACTERISTICS

Conducted emissions	EN55022, FCC part 15	Level B
Radiated emissions	EN55022, FCC part 15	Level A
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 1

GENERAL SPECIFICATIONS

Hold-up time	110 Vac @ 80 W 110 Vac @ 110 W 230 Vac @ 80 W 230 Vac @ 110 W	35 ms 17 ms 140 ms 100 ms
Efficiency	Multiple outputs +5.1 V single 12 V and 15 V singles 24 V single	70% typical 70% typical 72% typical 75% typical
Isolation voltage	Input/output Input/chassis	3000 Vac 1500 Vac
Switching frequency	At 100 Watts output At zero load	20-70 kHz 100-250 kHz
Approvals and standards (See Note 12)		VDE0805, EN60950, IEC950 IEC1010, UL1950 CSA C22.2 No. 950
Weight	Singles Multiple outputs	550 g (19.4 oz) 600 g (21.2 oz)
MTBF (See Note 9)	MIL-HDBK-217E	125,000 hours

ENVIRONMENTAL SPECIFICATIONS

Thermal performance (See Notes 9, 10)	Operating, see curve Non-operating 0 °C to +50 °C, amb. convection cooled +50 °C to +70 °C, amb. convection cooled 0 °C to +50 °C, 20 CFM forced air +50 °C to +70 °C, 20 CFM forced air Peak, 0 °C to +50 °C, max. 60 seconds	0 °C to +70 °C –40 °C to +85 °C 80 W Derate 2 W/°C 110 W Derate 2.75 W/°C 110 W
Relative humidity	Non-condensing	5% to 95% RH
Altitude	Operating Non-operating	10,000 feet max. 40,000 feet max.
Vibration (See Note 11)	5-500 Hz	2.4 G approx.

Specifications Contd.

OUTPUT VOLTAGE	OUTPUT CURRENTS			RIPPLE [4]	TOTAL REGULATION [5]	MODEL NUMBERS [13,14,F]
	MAX [1]	PEAK [2]	FAN [3]			
+5.1 V	8 A	20 A	10 A	50 mV	±2.0%	NFS110-7601PJ
+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%	
–5 V	0.5 A	1.5 A	1 A	50 mV	±3.0%	
+5.1 V (I_A)	8 A	20 A	10 A	50 mV	±2.0%	NFS110-7602PJ [6]
+24 V (I_B) [6]	3.5 A	4.5 A	4.5 A	240 mV	+10/–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%	
+5.1 V	8 A	20 A	10 A	50 mV	±2.0%	NFS110-7604PJ
+15 V	4 A	7.5 A	5 A	150 mV	±3.0%	
–15 V	0.5 A	1.5 A	1 A	150 mV	±3.0%	
–5 V	0.5 A	1.5 A	1 A	50 mV	±3.0%	
5.1 V	16 A	22 A	20 A	50 mV	±2.0%	NFS110-7605J [7,8]
12 V	7 A	9 A	9 A	120 mV	±2.0%	NFS110-7612J [7,8]
15 V	5 A	7.3 A	7.3 A	150 mV	±2.0%	NFS110-7615J [7,8]
24 V	3.5 A	4.5 A	4.5 A	240 mV	±2.0%	NFS110-7624J [7,8]

Notes

1. Convection cooled, 80 W maximum.
2. Peak outputs lasting less than 60 seconds with duty cycle less than 10%. Total peak power must not exceed 110 W.
3. Forced air, 20 CFM at 1 atmosphere, 110 W maximum.
4. Figure is peak-to-peak. Output ripple is measured across a 50 MHz bandwidth using a 12 inch twisted pair terminated with a 47 µF capacitor.
5. 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.
6. To achieve stated regulation on the 24 V output on the NFS110-7602PJ, the following load condition must be true: $I_A / I_B \leq 5$, where:
   I_A = +5.1 V output current, and
   I_B = +24 V output current
   The +24 V output will maintain ±5.0% regulation under the following additional condition: $I_A \leq 5$ A.
7. Single output models have floating outputs which may be referenced as either positive or negative. Higher voltage supplies may be adjusted over a wide output voltage range, as long as the total output power does not exceed 80 Watts (natural convection) or 110 Watts (forced air).
8. Power fail detect not available on single output models.
9. Derating curve is application specific for ambient temperatures >50 °C, for optimum reliability no part of the heatsink should exceed 90 ºC and no semiconductor case temperature should exceed 100 ºC.
10. Caution: Allow a minimum of 1 second after disconnecting the power when making thermal measurements.
11. Three orthogonal axes, random vibration, 10 minute test for each axis.
12. This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
13. Artesyn Technologies recommends a minimum load of 11 W to achieve the design MTBF. See the derating curve on page 3.
14. 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.
15. 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		
NFS110-7601PJ	+5.1 V (7.5 A to 10 A)	150 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
	-5 V (0.5 A to 1 A)	100 mV peak, 0.5 ms recovery
NFS110-7602PJ	+5.1V (7.5 A to 10 A)	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
NFS110-7604PJ	+5.1 V (7.5 A to 10 A)	150 mV peak, 1 ms recovery
	+15 V (2.5 A to 5 A)	100 mV peak, 0.5 ms recovery
	-15 V (0.5 A to 1 A)	100 mV peak, 0.5 ms recovery
	-5 V (0.5 A to 1 A)	100 mV peak, 0.5 ms recovery
NFS110-7605J	+5.1 V (10 A to 20 A)	250 mV peak, 1 ms recovery
NFS110-7612J	+12 V (4.5 A to 9 A)	360 mV peak, 1 ms recovery
NFS110-7615J	+15 V (3.65 A to 7.3 A)	450 mV peak, 1 ms recovery
NFS110-7624J	+24V (2.25 A to 4.5 A)	720 mV peak, 1 ms recovery

Embedded Power for
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Americas
5810 Van Allen Way
Carlsbad, CA 92008
USA
Telephone: +1 760 930 4600
Facsimile: +1 760 930 0698

Europe (UK)
Waterfront Business Park
Merry Hill, Dudley
West Midlands, DY5 1LX
United Kingdom
Telephone: +44 (0) 1384 842 211
Facsimile: +44 (0) 1384 843 355

Asia (HK)
16th - 17th Floors, Lu Plaza
2 Wing Yip Street, Kwun Tong
Kowloon, Hong Kong
Telephone: +852 2176 3333
Facsimile: +852 2176 3888

For global contact, visit:
www.powerconversion.com
technicalsupport@powerconversion.com

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