

# NFS110 Series

查询"NFS110-7602P"供应商

Single and quad output

**ARTESYN**  
TECHNOLOGIES

LOW TO MEDIUM POWER AC/DC POWER SUPPLIES

80-110W AC/DC Universal Input Switch Mode Power Supplies

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



The NFS110 series is a 110W 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 80W of output power with free air convection cooling which can be boosted to 110W with 20CFM 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.

CE (LVD)

2 YEAR WARRANTY

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

## SPECIFICATIONS

### OUTPUT SPECIFICATIONS

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

### INPUT SPECIFICATIONS

Input voltage range	85 to 264VAC 120 to 370VDC
Input frequency range	47Hz to 440Hz
Input surge current	230VAC 35A
Safety ground leakage current	110VAC, 50Hz 0.2mA, max. 230VAC, 50Hz 0.4mA, 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	110VAC @ 80W	35ms
	110VAC @ 110W	17ms
	230VAC @ 80W	140ms
	230VAC @ 110W	100ms
Efficiency	Multiple outputs	70% typical
	+5.1V single	70% typical
	12V and 15V singles	72% typical
	24V single	75% typical
Isolation voltage	Input/output	3000VAC
	Input/chassis	1500VAC
Switching frequency	At 100 Watts output	20 to 70kHz
	At zero load	100 to 250kHz
Approvals and standards (See Note 12)	VDE0805, EN60950, IEC950 IEC1010, UL1950 CSA C22.2 No. 950	
Weight	Singles	550g (19.4oz)
	Multiple outputs	600g (21.2oz)
MTBF (See Note 9)	MIL-HDBK-217E	125,000 hours

### ENVIRONMENTAL SPECIFICATIONS

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

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OUTPUT VOLTAGE	OUTPUT CURRENTS			RIPPLE (4)	TOTAL REGULATION (5)	MODEL NUMBERS (F)
	MAX (1)	PEAK (2)	FAN (3)			
+5.1V	8.0A	20.0A	10.0A	50mV	±2.0%	NFS110-7601P
+12.0V	4.5A	9.0A	5.0A	120mV	±3.0%	
-12.0V	0.5A	1.5A	1.0A	120mV	±3.0%	
-5.0V	0.5A	1.5A	1.0A	50mV	±3.0%	
+5.1V (I <sub>A</sub> )	8.0A	20.0A	10.0A	50mV	±2.0%	NFS110-7602P (6)
+24.0V (I <sub>B</sub> ) (6)	3.5A	4.5A	4.5A	240mV	+10/-5.0%	
+12.0V	4.5A	9.0A	5.0A	120mV	±3.0%	
-12.0V	0.5A	1.5A	1.0A	120mV	±3.0%	
+5.1V	8.0A	20A	10A	50mV	±2.0%	NFS110-7604P
+15.0V	4.0A	7.5A	5A	150mV	±3.0%	
-15.0V	0.5A	1.5A	1.0A	150mV	±3.0%	
-5.0V	0.5A	1.5A	1.0A	50mV	±3.0%	
5.1V	16.0A	22.0A	20.0A	50mV	±2.0%	NFS110-7605 (7,8)
12V	7.0A	9.0A	9.0A	120mV	±2.0%	NFS110-7612 (7,8)
15V	5.0A	7.3A	7.3A	150mV	±2.0%	NFS110-7615 (7,8)
24V	3.5A	4.5A	4.5A	240mV	±2.0%	NFS110-7624 (7,8)

## Notes

- Convection cooled, 80W maximum.
- Peak outputs lasting less than 60 seconds with duty cycle less than 10%. Total peak power must not exceed 110W.
- Forced air, 20CFM at 1 atmosphere, 110W maximum.
- Figure is peak-to-peak. Output ripple is measured across a 50MHz bandwidth using a 12 inch twisted pair terminated with a 47µF 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.
- To achieve stated regulation on the 24V output on the NFS110-7602P, the following load condition must be true:  $I_A / I_B \leq 5$ , where:  
I<sub>A</sub> = +5.1V output current, and  
I<sub>B</sub> = +24V output current  
The +24V output will maintain ±5.0% regulation under the following additional condition: I<sub>A</sub> ≤ 5A.
- 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).
- Power fail detect not available on single output models.
- Derating curve is application specific for ambient temperatures >50°C, for optimum reliability no part of the heatsink should exceed 90°C and no semiconductor case temperature should exceed 100°C.
- Caution: Allow a minimum of 1 second after disconnecting the power when making thermal measurements.
- Three orthogonal axes, random vibration, 10 minute test for each axis.
- This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
- Artesyn Technologies recommends a minimum load of 11W to achieve the design MTBF. See the derating curve on page 3.

## TRANSIENT RESPONSE

NFS110-7601P	+5.1V (7.5A to 10A)	150mV peak, 1ms recovery
	+12V (2.5A to 5A)	100mV peak, 0.5ms recovery
	-12V (0.5A to 1A)	100mV peak, 0.5ms recovery
	-5V (0.5A to 1A)	100mV peak, 0.5ms recovery
NFS110-7602P	+5.1V (7.5A to 10A)	150mV peak, 1ms recovery
	+24V (1.5A to 3A)	300mV peak, 1ms recovery
	+12V (2.5A to 5A)	100mV peak, 0.5ms recovery
	-12V (0.5A to 1A)	100mV peak, 0.5ms recovery
NFS110-7604P	+5.1V (7.5A to 10A)	150mV peak, 1ms recovery
	+15V (2.5A to 5A)	100mV peak, 0.5ms recovery
	-15V (0.5A to 1A)	100mV peak, 0.5ms recovery
	-5V (0.5A to 1A)	100mV peak, 0.5ms recovery
NFS110-7605	+5.1V (10A to 20A)	250mV peak, 1ms recovery
NFS110-7612	+12V (4.5A to 9A)	360mV peak, 1ms recovery
NFS110-7615	+15V (3.65A to 7.3A)	450mV peak, 1ms recovery
NFS110-7624	+24V (2.25A to 4.5A)	720mV peak, 1ms recovery

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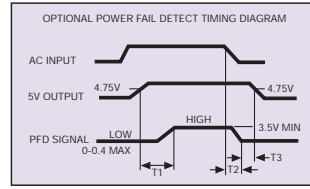
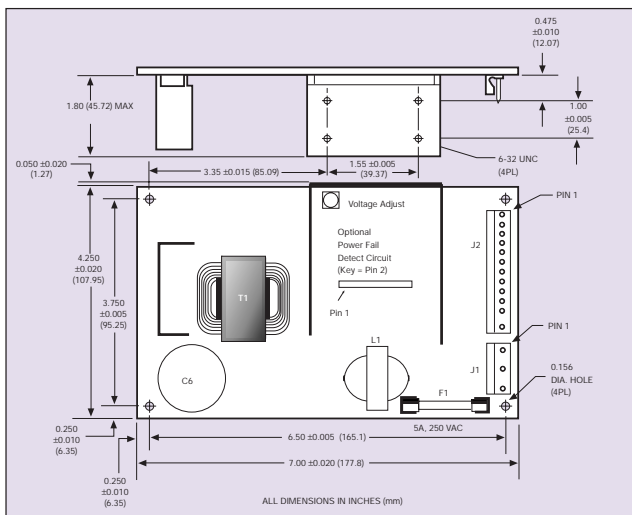
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## AC (J1) mating connector

Molex 09-50-3051 or Molex 09-91-0500 mating connector with 2478 or equivalent crimp terminals.

## DC (J2) mating connector

Molex 09-50-3131 or Molex 09-91-1300 mating connector with 2478 or equivalent crimp terminals.



## Power fail detect signal (Note 8)

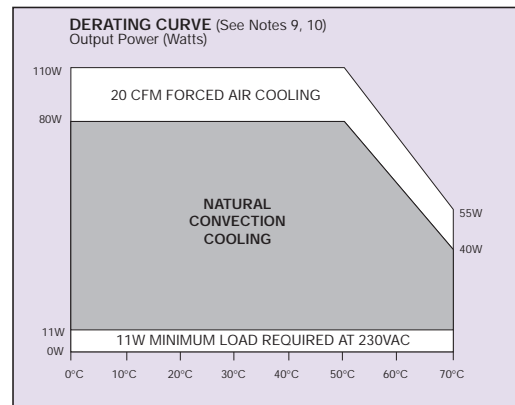
50ms ≤ T1 ≤ 200ms

T2 will vary with line and load

T3 ≥ 3ms

Pout: 110W

PFD output is an open collector which will sink ≤40mA in the low state.



## Mechanical Notes

- A Metallic or non-metallic stand-offs (maximum diameter 5.4mm) can be used in all four mounting holes without effecting safety approval.
- B The ground pad of the mounting hole near J1, allows system grounding through a metal stand-off to the system chassis.
- C The heat sink is grounded, and allows system grounding by mechanical connection to the system chassis.
- D The supply must be mechanically supported using the PCB mounting holes and may be additionally supported by the heatsink mounting holes.
- E It is always advisable to attach the power supply heat sink to another thermal dissipator (such as a chassis or finned heatsink etc). The resulting decrease in heat sink mounted component temperatures will improve power supply lifetime.
- F A standard L-bracket and cover is available for mounting which contains all screws, connectors and necessary mounting hardware. Two different kits are available, order part number 'NFS110 COVER KIT' or 'NFS110C'.

## International Safety Standard Approvals



VDE0805/EN60950/IEC950/IEC1010 File No. 10401-3336-1049  
Licence No. 2874, 1653 and 1049



UL1950 File No. E136005



CSA C22.2 No. 950 File No. LR41062C

## PIN CONNECTIONS

J1	-7601P	-7602P	-7604P	SINGLES
Pin 1	AC Ground	AC Ground	AC Ground	AC Ground
Pin 2	AC Neutral	AC Neutral	AC Neutral	AC Neutral
Pin 3	AC Line	AC Line	AC Line	AC Line
J2				
Pin 1	+5.1V	+5.1V	+5.1V	V <sub>out</sub>
Pin 2	+5.1V	+5.1V	+5.1V	V <sub>out</sub>
Pin 3	+5.1V	+5.1V	+5.1V	V <sub>out</sub>
Pin 4	Return	Return	Return	Return
Pin 5	Return	Return	Return	Return
Pin 6	Return	Return	Return	Return
Pin 7	Return	Return	Return	Return
Pin 8	+12V	+12V	+15V	V <sub>out</sub>
Pin 9	+12V	+12V	+15V	V <sub>out</sub>
Pin 10	PFD	PFD	PFD	N/C
Pin 11	-12V	-12V	-15V	N/C
Pin 12	Removed for Key			
Pin 13	-5V	+24V	-5V	N/C

N/C = no connection.

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