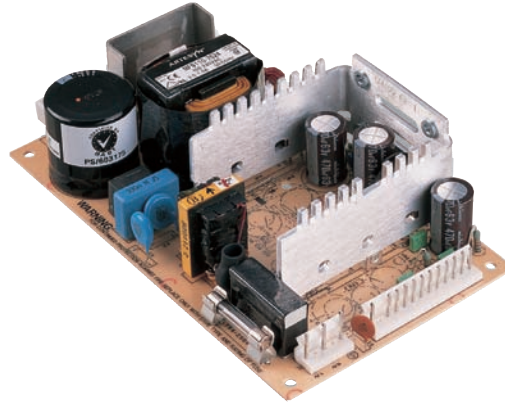


NFS110 Series

Single & quad output

Total Power: 80 - 110 W
Input Voltage: 85 - 264 Vac
120 - 370 Vdc
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. 4001467 7
- UL1950 File No. E132002
- CSA C22.2 No. 950
File No. LR41062C

Electrical Specifications

| Output | | |
|--------------------------------|--|---|
| 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 output 12 V single output 15 V single output 24 V single output | 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 | | |
| 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. |

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

| 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: | EN61000-4-3, level 3 | Perf. criteria 1 |
| Fast transients: | EN61000-4-4, level 3 | Perf. criteria 1 |
| Radiated immunity: | EN61000-4-5, 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 @ 100 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 |
| 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 (@25 °C): | MIL-HDBK-217E | 125,000 hours min. |

Environmental Specifications

| | | |
|-----------------------------|---------------------------------------|------------------|
| Thermal performance: | Operating ambient | 0 °C to +70 °C |
| (See notes 9, 10) | Non-operating | -40 °C to +85 °C |
| | 0 °C to 50 °C convection cooled | 80 W |
| | +50 °C to +70 °C, convection cooled | Derate 2 W/°C |
| | 0 °C to +50 °C, 20 CFM forced air | 110 W |
| | +50 °C to +70 °C, 20CFM forced air | Derate 2.75 W/°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) | 5 - 500 Hz | 2.4 G rms peak |

Ordering Information

| 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 | ± 4.0% | |
| -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% | |
| 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

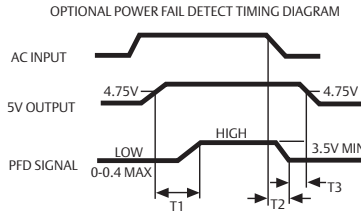
- 1 Convection cooled, 80 W maximum.
- 2 Peak outputs lasting less than 60 seconds with duty cycle less than 10%. Total peak power must not exceed 110 W.
- 3 Forced air, 20 CFM at 1 atmosphere, 110 W maximum.
- 4 Figure is peak-to-peak. Output ripple is measured across a 50 MHz bandwidth using a 12 inch 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 ≤ 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 °C and no semiconductor case temperature should exceed 100 °C.
- 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.
- 15 NOTICE: Some models do not support all options. Please contact your local Emerson Network Power representative or use the on-line model number search tool at <http://www.PowerConversion.com> to find a suitable alternative.

Transient Response

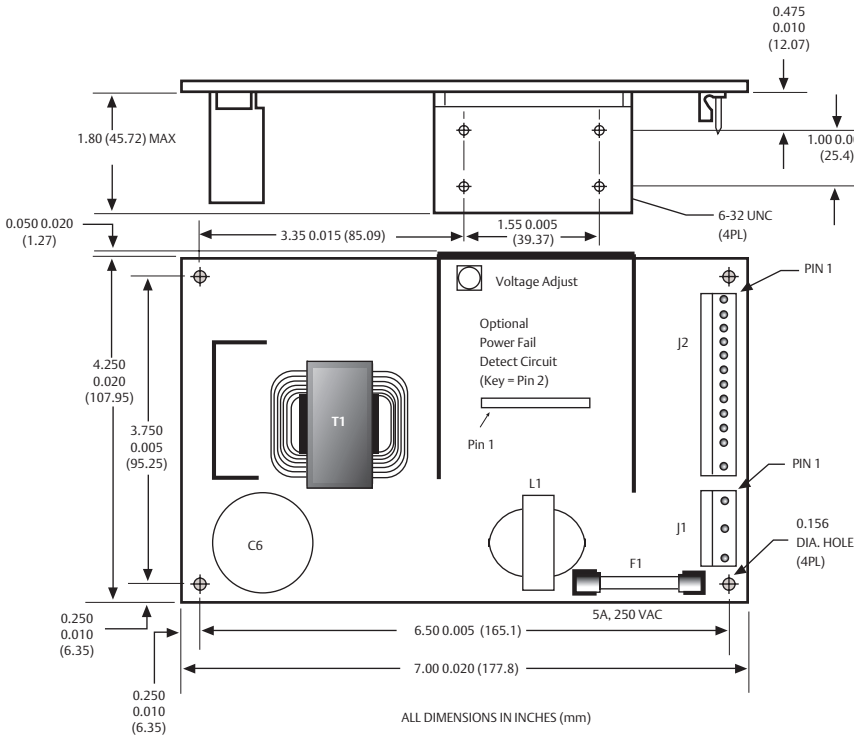
| | | |
|---------------|--|--|
| NFS110-7601PJ | +5.1 V (7.5 A to 10 A) +12 V (2.5 A to 5 A) -12 V (0.5 A to 1 A) -5 V (0.5 A to 1 A) | 150 mV peak, 1 ms recovery 100 mV peak, 0.5 ms recovery 100 mV peak, 0.5 ms recovery 100 mV peak, 0.5 ms recovery |
| NFS110-7602PJ | +5.1 V (7.5 A to 10 A) +24 V (1.5 A to 3 A) +12 V (2.5 A to 5 A) -12 V (0.5 A to 1 A) | 150 mV peak, 1 ms recovery 300 mV peak, 1 ms recovery 100 mV peak, 0.5 ms recovery 100 mV peak, 0.5 ms recovery |
| NFS110-7604PJ | +5.1 V (7.5 A to 10 A) +15 V (2.5 A to 5 A) -15 V (0.5 A to 1 A) -5 V (0.5 A to 1 A) | 150 mV peak, 1 ms recovery 100 mV peak, 0.5 ms recovery 100 mV peak, 0.5 ms recovery 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 | +24 V (2.25 A to 4.5 A) | 720 mV peak, 1 ms recovery |

AC (J1) mating connector
Molex 09-50-3051 or Molex 09-91-0500 mating connector with 2478 or equivalent crimp terminals.

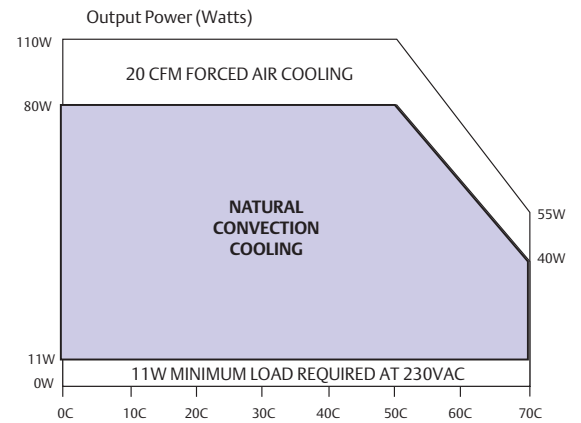
DC (J2) mating connector
Molex 09-50-3131 or Molex 09-91-1300 mating connector with 2478 or equivalent crimp terminals.



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.



DERATING CURVE (See Notes 9, 10)



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. The kit is available, order part number "NFS110CJ".

Pin Connections

| | -7601PJ | -7602 P | -7604PJ | 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 | +5.1 V | +5.1 V | +5.1 V | V _{out} |
| Pin 2 | +5.1 V | +5.1 V | +5.1 V | V _{out} |
| Pin 3 | +5.1 V | +5.1 V | +5.1 V | V _{out} |
| 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 | +12 V | +12 V | +15 V | V _{out} |
| Pin 9 | +12 V | +12 V | +15 V | V _{out} |
| Pin 10 | PFD | PFD | PFD | N/C |
| Pin 11 | -12 V | -12 V | -15 V | N/C |
| Pin 12 | Removed for Key | | | |
| Pin 13 | -5 V | +24 V | -5 V | N/C |

N/C = no connection

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)

14/F, 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
techsupport.embeddedpower@emerson.com

While every precaution has been taken to ensure accuracy and completeness in this literature, Emerson Network Power assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

Emerson Network Power.
The global leader in enabling
business-critical continuity.

- AC Power
- Connectivity
- DC Power
- Embedded Computing
- **Embedded Power**
- Monitoring
- Outside Plant
- Power Switching & Controls
- Precision Cooling
- Racks & Integrated Cabinets
- Services
- Surge Protection

EmersonNetworkPower.com

Emerson Network Power and the Emerson Network Power logo are trademarks and service marks of Emerson Electric Co.
©2009 Emerson Electric Co.