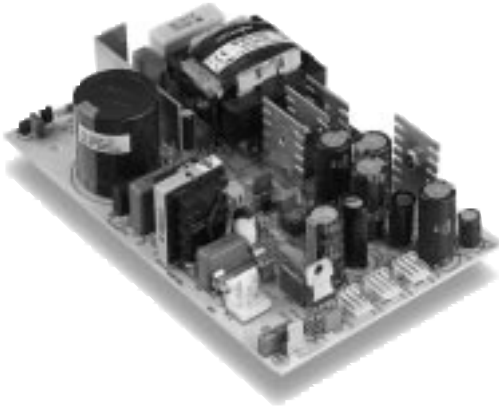


NFS50 SERIES

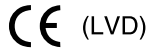
Triple and quad output



- **6.3 x 3.94 x 1.5 inch package (1U applications)**
- **Ovoltage and short circuit protection**
- **50W with free air convection cooling**
- **Regulation to no load**
- **Isolated output option**
- **EN55022, EN55011 conducted emissions level A**
- **UL, VDE, CSA and BABT safety approvals**

The NFS50 series is a 50W universal input AC/DC power supply on a 6.3 x 3.94 inch card with a maximum component height of 1.5 inches for use in 1U applications. The NFS50 series can regulate on the auxiliary outputs down to no load making it suitable for applications that require a heavy logic load on the main 5V output and low nominal loads with high peak capability for drives, relays or switches on the auxiliary outputs. The NFS50 provides 50W of output power with free air convection cooling which can be boosted to 60W 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 A. The NFS50 series is designed for use in low power data networking, computer, telecom and industrial applications such as POS terminals, servers, PABX's, industrial PC's and process automation.

[2 YEAR WARRANTY]



SPECIFICATION All specifications are typical for 110VAC input, 50 watts output at 25°C unless otherwise stated

OUTPUT SPECIFICATIONS		
Voltage adjustability	+5V output +12V tracks the 5V output	±3%
Line regulation	LL to HL at max. load	±0.3%
Total regulation	Main output (output 1) All other outputs See Notes 5 and 6	±2.5% ±5.0%
Overshoot/undershoot	At turn-on	0%
Transient response	5V (2.5A to 5A) 500µs recovery to 0.5%	500mV max. dev.
	12V (1A to 2A) 500µs recovery to 0.5%	300mV max. dev.
Temperature coefficient	All outputs	±0.03%/°C, max.
Overvoltage protection	+5V output	6.25V ±0.65V
Output power limit	Primary power limited	90W Pin max. 60W Pout min.
Short circuit protection		Yes, with auto-restart
INPUT SPECIFICATIONS		
Input voltage range		85 to 264VAC 120 to 370VDC
Input frequency range		47 to 440Hz
Input surge current	110VAC, cold start 230VAC, cold start	10A, max. 20A max.
Safety ground leakage current	132VAC, 60Hz (-76XX) 264VAC, 50Hz (-76XX)	0.2mA, max. 0.4mA, max.
	132VAC, 60Hz (-7908) 264VAC, 50Hz (-7908)	25µA, max. 50µA, max.
EMC CHARACTERISTICS		
Conducted emissions	EN55022, FCC part 15	Level A
Radiated emissions	EN55022, FCC part 15	Level A
ESD air	EN61000-4-2, level 3	Perf. criteria 1

EMC CHARACTERISTICS		
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 2
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	110VAC, 50W output power 230VAC, 50W output power	16ms 100ms
Efficiency		70%, typ.
Isolation voltage	Input/output (NFS50-76xx)	3000VAC
	Input/chassis	1500VAC
	Input/output (NFS50-7908)	4000VAC
Switching frequency	Variable	25kHz to 250kHz
Approvals and standards (-76XX)	VDE0805, EN60950, IEC950 IEC1010, BABT, CSA C22.2 No. 950	
Approvals and standards (-79XX)	IEC601, VDE0750, UL544 EN60601, CSA C22.2 No. 125	
Weight		400g (14oz)
MTBF (See Note 7)	MIL-HDBK-217E, 25°C	160,000 hours
ENVIRONMENTAL SPECIFICATIONS		
Thermal performance	Operating range (See derating curve)	0°C to +70°C
	Non-operating	-40°C to +85°C
	0°C to 50°C ambient temp., Convection cooled	50W
	0°C to 50°C ambient, Forced air @ 20 CFM	60W
50°C to 70°C ambient	Derate linearly to 50% load	
Peak (30 seconds)		60W
Relative humidity	Non-condensing	5% to 95% RH
Altitude	Operating	10,000 feet max.
	Non-operating	30,000 feet max.
Vibration, See Note 10	5Hz to 500Hz	2.4G rms (approx)

50 to 60 Watt AC/DC universal input switch mode power supplies

OUTPUT VOLTAGE	OUTPUT CURRENTS			RIPPLE (4)	TOTAL REGULATION (5,6)	MODEL NUMBERS (A)	
	MAX (1)	PEAK (2)	FAN (3)			COMMS./INDUST.	MEDICAL
+5.1V (I ₁) (6)	5.0A	7.0A	7.0A	50mV	±2.5%	NFS50-7608 (9)	NFS50-7908
+12.0V (I ₂)	2.0A	5.0A	2.5A	120mV	±5.0%		
-12.0V	0.5A	1.0A	0.7A	120mV	±5.0%		
+5.1V (I ₁)	4.5A	6.5A	5.5A	50mV	±2.5%	NFS50-7610	
+15.0V (I ₂)	1.0A	2.0A	1.5A	120mV	±5.0%		
-15.0V	0.6A	1.0A	0.8A	120mV	±5.0%		
+5.1V (I ₁)	5.0A	7.0A	7.0A	50mV	±2.5%	NFS50-7601	
+12.0V (I ₂)	2.0A	5.0A	2.5A	120mV	±5.0%		
-12.0V	0.5A	1.0A	0.7A	120mV	±5.0%		
-5.0V	0.5A	0.5A	0.5A	90mV	±5.0%		

Notes

- 1 Convection cooled, maximum 50W output power.
- 2 Peak outputs lasting less than 30 seconds with duty factor less than 10%. During peak loading output may go outside total regulation limits. Maximum output during peak loading is 60 Watts.
- 3 Forced air, 20 CFM at 1 atmosphere.
- 4 Figure is peak-to-peak. Output noise measurements are across a 50MHz bandwidth made using a 12" twisted pair, terminated with a 47µF 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. Also, for stated I(2) regulation: I(1)/I(2)≤5.
- 6 For NFS50-7X08 a minimum load of 0.5 Amps is required on the +5.1V output to obtain full current from the -12V output.
- 7 Derating curve is application specific for ambient temperatures > 50°C, for optimum reliability no part of the heatsink should exceed 110°C and no semiconductor case temperature should exceed 115°C.
- 8 Caution: Allow a minimum of 1 second after disconnecting the power when making thermal measurements.
- 9 The NFS50-7608 is also available with a vertical 7 pin connector, designated NFS50-7608M. Electrical specifications are the same, with the exception that the third output (12V) is floating. The auxiliaries can therefore be configured as +12V/+12V, +12V/-12V, or +24V.
- 10 Three orthogonal axes, random vibration, ten minute test for each axis.
- 11 A 5 Watt minimum load is recommended to achieve design MTBF.
- 12 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.

PIN CONNECTIONS		
J1	NFS50-7X08	NFS50-7610
Pin 1	AC Line	AC Line
Pin 2	AC Neutral	AC Neutral
J2, J3, J4		
Pin 1	-12V	-15V
Pin 2	+12V	+15V
Pin 3	Return	Return
Pin 4	+5.1V	+5.1V
E1		
Pin 1	Ground	Ground

J1	NFS50-7608M	NFS50-7601
Pin 1	AC Neutral	AC Neutral
Pin 2	AC Line	AC Line
J2		
Pin 1	12V Return	-12V
Pin 2	12V Floating	-5V
Pin 3	+12V	+12V
Pin 4	+5.1V	+5.1V
Pin 5	Return	Return
Pin 6	Return	Return
Pin 7	No Pin	No Pin
E1		
Safety Ground		

MEDICAL MODEL NFS50-7908 SPECIFICATION DIFFERENCES		
Isolation Approvals	Input/output	4000VAC IEC601, EN60601 VDE0750, UL544 CSA C22.2 No. 125
Leakage current	132VAC, 60Hz 264VAC, 50Hz	25µA, max. 50µA, max.
Conducted noise	EN55022, EN55011, FCC	Level A
Radiated noise	EN55022, EN55011, FCC	Level A

Medical safety approved model

The NFS50-7908 is the medical safety approved version of the NFS50-7608. Both are mechanically the same, and differ electrically only in their conducted noise and safety ground leakage current specifications. The NFS50-7908 is approved to UL544, CSA C22.2 No. 125 and IEC601 standards. It is suitable for use in ordinary, patient-connect applications under the UL544 and CSA 22.2 standards, and authorised for use in non-critical, non-patient-connect applications under the IEC601 standard.

50 to 60 Watt AC/DC universal input switch mode power supplies

AC mating connector

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

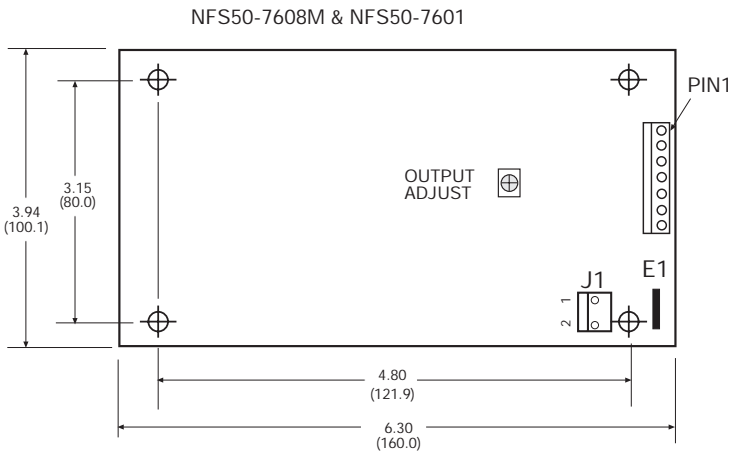
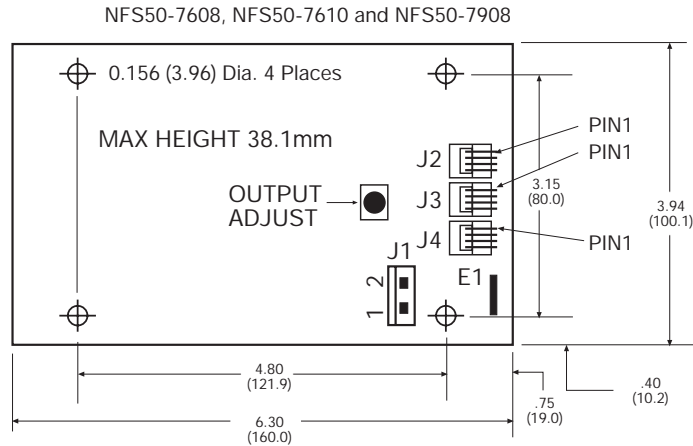
DC mating connector

NFS50-7608/7908/7610: Molex 22-01-1043 or equivalent with Molex 08-50-0031 or equivalent crimp terminal.

NFS50-7601/7608M: Molex 09-91-0600 or equivalent with Molex 08-50-0164 or equivalent crimp terminal.


Mechanical notes


A standard L-bracket and cover is available for mounting which contains all screws, connectors and necessary mounting hardware. Details are on page 65. Order part number 'NFS50 COVERKIT'.




ALL DIMENSIONS ARE IN INCHES (mm)
Maximum component height is 1.5" (38.1)

International Safety Standard Approvals

 NFS50-76XX: VDE0805/EN60950/IEC950/IEC1010
File No. 10401-3336-1036 Licence No 1485 and 1650
NFS50-7908: VDE0750/EN60601-1/IEC601
File No. 10401-3336-1036 Licence No 1485 and 1650

 NFS50-76XX: UL1950 File No. E136005
NFS50-7908: UL544 File No. E147937

 NFS50-76XX: CSA C22.2 No. 950 File No. LR41062C
NFS50-7908: CSA C22.2 No. 125 File No. LR41062C

 NFS50-76XX: Certificate No. PS/603174

