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NFS40 and NFN40 SERIES

Single and triple output



- **85VAC to 264VAC universal input**
- **40W in 5.00” x 3.0” x 1.20”**
- **50W in 20CFM environment**
- **Fixed frequency operation (NFN Series)**
- **UL, CSA, VDE and BABT approved**
- **NFS40 meets EN55022 class A and FCC limit A**
- **NFN40 meets EN55022 class B and FCC limit B**

2 YEAR WARRANTY

CE (LVD)

The NFS40 and NFN40 are industry standard 40 Watt power supplies with the capability to supply 50W in a forced air ambient and to automatically operate from any voltage between 85VAC and 264VAC. Use of MOSFET based switching circuits allows for enhanced features such as output regulation down to zero load (NFN40). Universal input voltage eliminates the need to change jumpers or switch settings to cater for different or widely varying line voltages. In addition to the input voltage range, VDE, UL, CSA, EN60950 and IEC950 approvals make the NFS40 and NFN40 ideal for use in equipment installed throughout the world. The fixed frequency operation of the NFN40 further reduces noise below VDE class B and significantly reduces leakage current. These low profile switchers with high power density are intended for use in small, digital systems. Both series carry BABT approval.

SPECIFICATION

ALL SPECIFICATIONS ARE TYPICAL AT NOMINAL INPUT, FULL LOAD AND 25°C UNLESS OTHERWISE STATED

OUTPUT SPECIFICATIONS		
Output voltage adjustability	+5V output on triples Vout on singles	±5.0%
Line regulation LL to HL, FL	Main output Auxiliary outputs	±0.2% ±1.0%
Load regulation FL to NL	Main output Auxiliary outputs	±2.0% ±5.0%
Transient response	+5V (1.5A to 3A)	±120mV max. dev. 500µs recovery
Temperature coefficient	All outputs	±0.02%/°C
Overvoltage protection	+5V output	125% ±15% Vout
Output power limit	Primary power limited	90W input power limit
Short circuit protection	Single outputs Multiple outputs	Indefinite Short term
INPUT SPECIFICATIONS		
Input voltage range		85 to 264VAC 120 to 370VDC
Input frequency range		47 to 440Hz
Max. input surge current	132VAC, cold start 264VAC, cold start	12A max. 24A max.
Safety ground leakage current	NFS: 110VAC, 60Hz 230VAC, 50Hz NFN: 132VAC, 60Hz 240VAC, 50Hz	0.13mA max. 0.32mA max. 155µA max. 261µA max.

ELECTROMAGNETIC COMPATIBILITY SPECIFICATIONS		
Radiated noise	EN55022, FCC	Level B
Conducted noise, NFS	EN55022, FCC, VDE0871	Level A
Conducted noise, NFN	EN55022, FCC, VDE0871	Level B
RF field susceptibility	IEC801-3	Level 3
Electrical fast transients/bursts	EN61000-4-4	Level 3
Surge susceptibility	EN61000-4-5	Level 3
GENERAL SPECIFICATIONS		
Hold-up time	110VAC, 40 Watts 230VAC, 40 Watts	14ms 110ms
Efficiency		70% typical
Isolation voltage	Input/output Input/chassis	3000VAC 1500VAC
Switching frequency	NFS NFN	Variable Fixed, 45kHz ±5kHz
Approvals and standards	Safety	VDE0805, EN60950, IEC950 IEC1010, UL1950, BS6301 CSA22.2-234/950
Weight		280g (9.88oz)
MTBF	MIL-HDBK-217E	170,000 hours
ENVIRONMENTAL SPECIFICATIONS		
Thermal performance	Operating Non-operating 50°C ambient temp., Convection cooled Forced air cooling 50°C to 70°C ambient Peak (60 seconds)	0°C to +70°C –40°C to +85°C 40W 50W @ 20CFM Derate linearly to 50% load 60W
Relative humidity	Non-condensing	5% to 80% RH
Altitude	Operating Non-operating	10,000 feet max. 40,000 feet max.
Vibration (See Note 11)	5Hz to 500Hz,	2.4G rms peak

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

OUTPUT VOLTAGE	OUTPUT CURRENTS			RIPPLE (4)	TOTAL REGULATION (5)	MODEL NUMBER (D)	
	MAX (1)	PEAK (2)	FAN (3)				
+5.1V (A)	3A	7A	5A	50mV	±2.0%	NFS40-7608(6)	NFN40-7608(6)
+12.0V (B)	2A	3A	2A	120mV	±5.0%		
–12.0V	0.35A	1A	0.5A	120mV	±5.0%		
+5.1V (A)	4A	7A	5A	50mV	±2.0%	NFS40-7628(12)	NFN40-7628(12)
+12.0V (B)	0.35A	1A	0.5A	120mV	±5.0%		
–12.0V	0.35A	1A	0.5A	120mV	±5.0%		
+5.1V (A)	3A	7A	5A	50mV	±2.0%	NFS40-7607(6)	NFN40-7607(6)
+12.0V (B)	2A	3A	2A	120mV	±5.0%		
–5.0V	0.35A	1A	0.5A	50mV	±5.0%		
+5.1V (A)	3A	7A	5A	50mV	±2.0%	NFS40-7610(6)	NFN40-7610(6)
+15.0V (B)	2A	2.5A	2A	150mV	+10.0%/–3.0%		
–15.0V	0.35A	1A	0.5A	150mV	±5.0%		
+5.1V	6A	12A	8A	100mV	±2.0%	NFS40-7605	NFN40-7605
+12.0V	3.3A	5A	4A	120mV	±2.0%	NFS40-7612	NFN40-7612
+15.0V	2.6A	4A	3.3A	150mV	±2.0%	NFS40-7615	NFN40-7615
+24.0V	1.6A	2.5A	2A	240mV	±2.0%	NFS40-7624	NFN40-7624

Notes

1 Natural convection cooled, 40W maximum.
2 Peak output current lasting less than 30 seconds with duty cycle less than 10%. During peak loading, outputs may go outside of total regulation limits. Peak total power must not exceed 60W.
3 Forced air, 20 CFM at 1 atmosphere, 50W maximum.
4 Figure is peak-to-peak. Output noise is measured across a 50MHz bandwidth 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, load currents within stated limits, and output voltages adjusted to their factory settings. Also, 0.25<I(A)/I(B)<5.0 to maintain stated regulation. This does not apply to NFS40-7628 and NFN40-7628 power supplies as both have regulated auxiliary outputs.
6 A minimum load of 0.5A is required on the +5V output to obtain full current from the negative output.
7 The NFS40 offers the possibility of power sharing between outputs. Consult factory for details.
8 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.
9 A 4W minimum load is recommended to achieve the NFS design MTBF. This restriction does not apply to the NFN series.
10 Caution: Allow a minimum of 1 second after disconnecting the power when making thermal measurements.
11 Three orthogonal axes, sweep at 1 octave/minute, 5 minute dwell at four major resonances.
12 The NFS40-7628 and NFN40-7628 have separately linear regulated +12V and -12V outputs. The loading conditions in Note 5 do not apply.
13 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.

AC mating connector

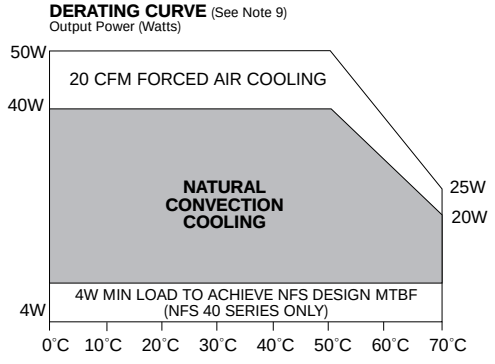
Molex 09-50-3031 or equivalent with Molex 08-50-0105 or equivalent crimp terminals.

DC mating connector

Molex 09-91-0600 or equivalent with Molex 08-50-0164 or equivalent crimp terminals.

NFS40 AND NFN40 PIN CONNECTIONS				
J1	-7608, -7628	-7607	-7610	SINGLES
Pin 1	AC Live	AC Live	AC Live	AC Live
Pin 2	AC Neutral	AC Neutral	AC Neutral	AC Neutral
J2				
Pin 1	+12V	+12V	+15V	+Vout
Pin 2	+5.1V	+5.1V	+5.1V	+Vout
Pin 3	+5.1V	+5.1V	+5.1V	+Vout
Pin 4	Return	Return	Return	Return
Pin 5	Return	Return	Return	Return
Pin 6	–12V	–5V	–15V	Return
P1				
Pin 1	Safety Earth Ground			

DERATING CURVE (See Note 9)



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

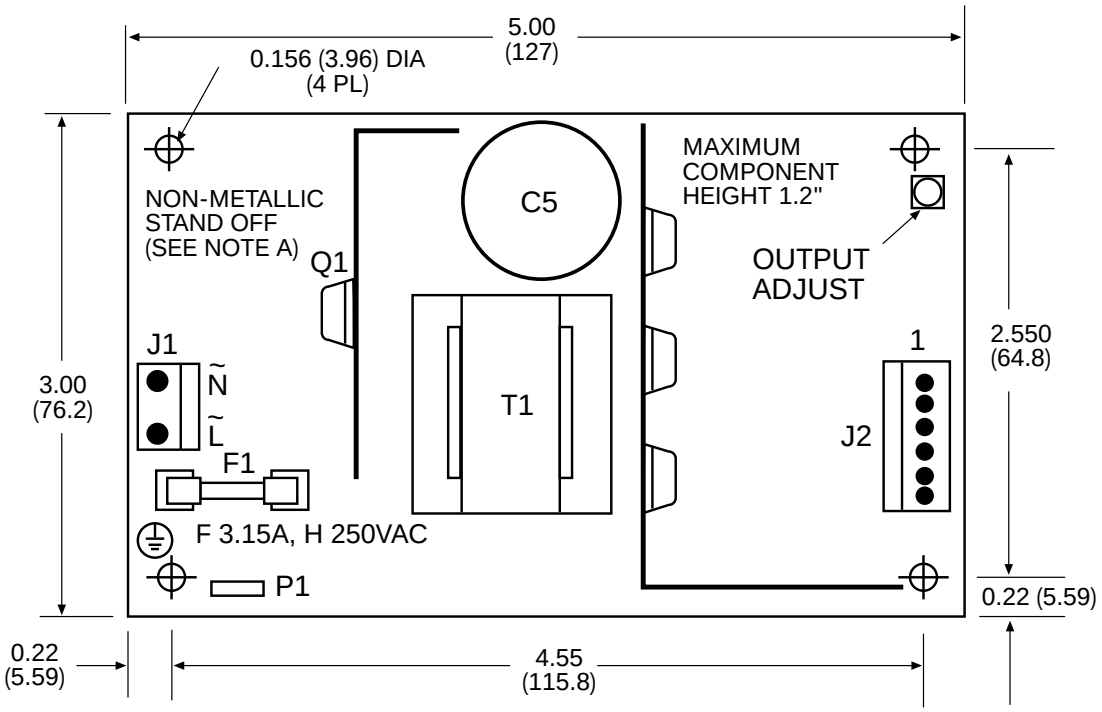
Mechanical notes

A In order to meet safety requirements, a non-metallic stand-off is mandatory for one hole as specified in the mechanical drawing.

B The ground pad of the mounting hole near P1 allows system grounding through a metal stand-off.

C To improve conducted noise, the ground pad of the mounting hole near the output connector should be connected with the ground pad of the mounting hole near P1. Use metal stand-offs attached to a common metal chassis. This connection also significantly attenuates common mode noise.

D A standard L-bracket and cover is available for mounting which contains all screws, connectors and necessary mounting hardware. Details are on page 58. Order part number NFS40C for the NFS40 series and NFN40C for the NFN40 series.



DIMENSIONS IN INCHES (mm)

International Safety Standard Approvals

NFS40: VDE0805/EN60950/IEC950/IEC1010 File No. 10401-3336-1044
License No. 4389, 2559, 1651 and 1044
NFN40: VDE0805/EN60950/IEC950/IEC1010 File No. 10401-3336-1067
License No. 4389, 2559, 1651 and 1044

UL1950 File No. E136005

CSA22.2-234/950 File No. LR41062C/LR50913

Certificate Numbers PS/603772 and 604078

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