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Designing Inspiration

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Issue date: April, 2011

NO:G11214010

NIGHTJAR SERIES

ST50NF

Industrial-class fanless power supply

- Fan-less thermal solution, 0 dBA acoustics
- Efficiency 82%~85% at 20%~100% loading
- 500W continuous power output
- Strict $\pm 3\%$ voltage regulation
- PCI-E 8pin and PCI-E 6pin connector support
- Powerful class-leading single +12V rail
- Aluminum construction
- Server-level components
- Support ATX 12V 2.3 & EPS 12V
- Active PFC

SPECIFICATION

Silverstone Nightjar ST50NF

ATX12V / EPS 12V Switching Power Supply
With Active PFC
Fan-less Thermal Solution
80Plus Bronze
PS/2

1. Input Requirements

1-1. Input Voltage

The power supply shall be operated at universal input voltage defined in the following table.

Input Voltage	MIN	NOM	MAX
Voltage	99	110-240	264

1-2. Frequency

The input frequency range is from 47Hz to 63Hz.

1-3. Inrush Current

The max inrush current is 100A for 115/230VAC.

1-3-1. Cold Start

Conditions	Limits
115/230VAC, full load. 25°C ambient.	No component over stress or damage should occur to the power supply. Input fuse shall not blow.

1-3-2. Warm Start

Conditions	Limits
Turn off at 132/264VAC full load for 1 sec then turn on at the peak of the input voltage cycle at 25°C ambient.	No component over stress or damage should occur to the power supply. Input fuse shall not blow.

1-4. AC Input Current

AC Input	MAX	Units
115V	6.5	AMPS
230V	4	AMPS

1-5. Efficiency

The minimum power supply system efficiency shall be >82%, measured at nominal input voltage 115V or 230V and full loading.

1-6. Leakage current

3.5ma max, At 240Vac/60Hz

2. Output Requirements

2-1. Output Regulations

Output Voltage	Range	MIN	Nominal	MAX	Units
+5V	±5%	+4.75	+5.00	+5.25	Volts
+12V	±5%	+11.40	+12.00	+12.60	Volts
-12V	±10%	-10.80	-12.00	-13.20	Volts
+3.3V	±5%	+3.135	+3.30	+3.465	Volts
+5Vsb	±5%	+4.75	+5.00	+5.25	Volts

Note:

- The above voltage range should also include ripple and noise.
- The output voltage should be measured at the terminals of output connector.

2-12. Hold Up Time (T5)

MIN.	Units
16	Ms

The test environment is 25°C & full load condition @ nominal input.

2-13. Power Fail Signal (T6)

Power good signal shall go to a down level 1ms before +5V output voltage falls below the regulation limits during PS-ON signal pull high.

MIN.	Units
1	Ms

3. Protections

3-1. Over Voltage Protection

When the DC outputs (+5V, +12V, +3.3V) have over voltage condition, the power supply shall provide latch mode over voltage protection.

DC output	Max	Unit
+12V	16.0	V
+5V	7.0	V
+3.3V	4.5	V

3-2. Short Circuit Protection

A short circuit placed to ground shall cause no damage or power supply shall be shutdown. (The contact resistance is 0.05 ohm when the outputs short circuit.)

3-3. Protection Reset

When the power supply latches into shutdown condition due to a fault on an +5V, +3.3V, +12V, output (OVP, UVP, OCP) and OTP, the protection shall reset after the fault has been removed, use remote on/off control or recycle the AC power again for a typical of 5 seconds.

3-4. Over Shoot

Any output overshoot at turn on shall be less than 15% of the nominal output value (with resistive load) as described in sec. 2.1.

3-5. Over Power Protection

At 115/230Vac input the power supply will shut down all DC output within max. 150% of full load.

3-6. Over Current Protection

Max.160% for +5V, +12V, +3.3V dc output rail.

3-7. Over Temperature Protection(Optional)

When power supply temperature over 90°C (typ.) The power supply will be shutdown.

4. Environment

4-1. Operation/Storage Temperature Range

Operation:

115V: 0°C to 35°C (Need to increase external forced air cooling) -P1(Note.)

230V: 0°C to 45°C (Need to increase external forced air cooling) -P2(Note.)

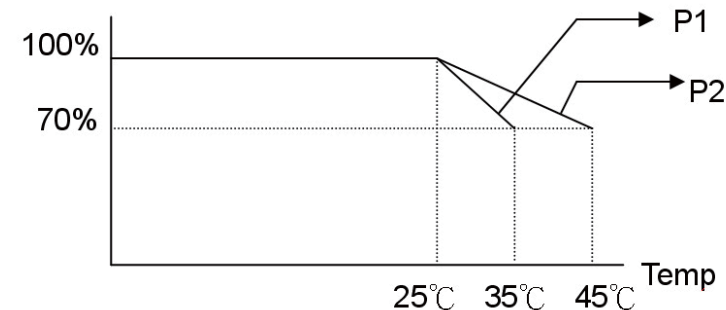


FIGURE 3. Operation/Storage Temperature Range

Caution: Fanless power supply recommends the systems require additional external forced circulation cooling fan to extend product life.

4-2. Humidity (none condensing)

Operation: 20% to 90% RH(nominal input)

Storage: 5% to 95% RH

5. Safety

- 5-1. UL 60950-1, 2005 (2nd Edition.)
- 5-2. BSMI (CNS14336: 94)
- 5-3. TUV EN 60950-1: 2006+A11
- 5-4. CB

6. EMI Requirements

- 6-1. CE
- 6-2. BSMI (CNS13438: 95)
- 6-3. FCC Part 15 Subpart B, Class B at system load
- 6-4. CISPR 22 AS/NZS CISPR 22: 2006, CLASS B

7. Dielectric Voltage Withstand (HI-POT)

The power supply shall withstand for 3 seconds without breakdown the application of an 1800Vac-supply voltage applied between both input line and chassis (10ma AC Cutoff current). Isolating transformers shall similarly withstand 4242Vdc applied between both primary and secondary windings for a minimum of one minute.

8. PFC

Active Power Factor Correction, complies with EN 61000-3-2: 1995 + A1 + A2: 1998, Class D.

9. Electrostatic Discharge (ESD)

Comply with IEC 61000-4-2.

10. EFT/ Burst

Comply with IEC 61000-4-4.

11. Surge

Comply with IEC 61000-4-5.

12. Burn-In

Applying 115 Vac $\pm 10\%$ or 230 Vac $\pm 10\%$ input voltage and maximum load (60%) for this product in $45 \pm 5^\circ\text{C}$ chamber.

13. M.T.B.F.

The power supply shall have a minimum mean time between failure greater than 80,000 hours Minimum (Without Cooling Fan) at continuous operation of 100% load and an ambient temperature of 25°C .

14. LED Indicators

There are two leds for the monitoring the status of the power supply, which allows users to perceive a full awareness of the working condition of the power supply.

- The temperature LED indicates surface temperature of the power supply's housing cage.

Caution: DO NOT TOUCH THE SURFACE OF POWER SUPPLY WHEN THE TEMP-LED INDICATES RED, IT MIGHT BE DANGEROUS.

Temp. Status	LED Color
High $\geq 55^\circ\text{C}$	Red
Low $> 55^\circ\text{C}$	Green

Power Status	LED Color
Standby	Amber
Power ON	Green
Power Fault	Red

- The Status-LED indicates power supply's working.

15. MECHANICAL REQUIREMENTS

15.1. Physical Dimension

Dimension (W x H x D): 150mm (5.90") x 86mm (3.38") x 160mm (6.29")

M/B 24PIN connector

	Signal	Pin	Pin	Signal	
Orange	+3.3V	13	1	+3.3V	Orange
Blue	-12VDC	14	2	+3.3V	Orange
Black	COM	15	3	COM	Black
Green	PS-ON	16	4	+5VDC	Red
Black	COM	17	5	COM	Black
Black	COM	18	6	+5VDC	Red
Black	COM	19	7	COM	Black
White	N/C	20	8	PWRGOOD	Grey
Red	+5VDC	21	9	+5Vsb	Purple
Red	+5VDC	22	10	+12V	Yellow
Red	+5VDC	23	11	+12V	Yellow
Black	COM	24	12	+3.3V	Orange

EPS 12V 8PIN connector

	Signal	Pin	Pin	Signal	
Yellow	+12V	5	1	COM	Black
Yellow	+12V	6	2	COM	Black
Yellow	+12V	7	3	COM	Black
Yellow	+12V	8	4	COM	Black

8PIN PCI Express connector

	Signal	Pin	Pin	Signal	
Yellow	+12V	1	5	COM	Black
Yellow	+12V	2	6	COM	Black
Yellow	+12V	3	7	COM	Black
Black sense1	COM	4	8	COM	Black

ATX 12V 4PIN (4+4PIN EPS 12V in split mode)

	Signal	Pin	Pin	Signal	
Black	GND	1	3	+12V	Yellow
Black	GND	2	4	+12V	Yellow

6PIN PCI Express connector

	Signal	Pin	Pin	Signal	
Yellow	+12V	1	4	COM	Black
Yellow	+12V	2	5	COM	Black
Yellow	+12V	3	6	COM	Black

4PIN peripheral connector (HDD) 4PIN floppy connector (FDD)

	Signal	Pin	Pin	Signal	
Yellow	+12V	1	1	+5VDC	Red
Black	COM	2	2	COM	Black
Black	COM	3	3	COM	Black
Red	+5VDC	4	4	+12V	Yellow

SATA connector

	Signal	Pin
Orange	+3.3V	5
Black	COM	4
Red	+5V	3
Black	COM	2
Yellow	+12V	1