



全漢企業股份有限公司
FSP TECHNOLOGY INC.

台灣桃園市建國東路22號
No. 22, Jianguo East Road., Taoyuan City, Taiwan, R.O.C.
TEL:+886-3-375-9888
FAX:+886-3-375-6966

統一編號：84239055
Website : www.FSP-group.com
Email : sales@fsp-group.com.tw

SPECIFICATION



ESD08035148

FSP084-DMBA1

Released Date:2008/11/21-14:23:18

Table of Content

Section

| | | |
|------|---|------------|
| 1.0 | General Description And Scope----- | (3) |
| 2.0 | Output Electrical Requirements----- | (3) |
| 2.1 | Output Rating----- | (3) |
| 2.2 | Short Circuit Protection----- | (3) |
| 2.3 | Over Current Protection----- | (3) |
| 2.4 | Turn-on Delay Time----- | (3) |
| 2.5 | Hold Up Time----- | (4) |
| 2.6 | Dynamic Load Regulation----- | (4) |
| 2.7 | Overshoot----- | (4) |
| 2.8 | Over Voltage Protection----- | (4) |
| 2.9 | Power Factor ----- | (4) |
| 2.10 | No load Power Consumption----- | (4) |
| 3.0 | Input Electrical Specifications----- | (4) |
| 3.1 | Input Voltage Range----- | (4) |
| 3.2 | Input Frequency----- | (4) |
| 3.3 | Inrush Current----- | (5) |
| 3.4 | Steady AC Current----- | (5) |
| 3.5 | Efficiency----- | (5) |
| 3.6 | Power Line Harmonic Requirement----- | (5) |
| 4.0 | Environmental Requirements----- | (5) |
| 4.1 | Temperature Range----- | (5) |
| 4.2 | Humidity----- | (5) |
| 4.3 | Vibration----- | (5) |
| 4.4 | Shock----- | (6) |
| 4.5 | Package Drop ----- | (6) |
| 5.0 | Reliability----- | (6) |
| 5.1 | MTBF----- | (6) |
| 5.2 | DIELECTRIC WITHSTAND VOLTAGE AND INSULATION RESISTANCE---- | (6) |
| 5.3 | Leakage Current----- | (6) |
| 5.4 | EMC----- | (7) |
| 5.5 | CEC----- | (7) |
| 5.6 | ENERGY STAR----- | (8) |

ATTACHMENT: ASSY FIGURES

1.0 GENERAL DESCRIPTION AND SCOPE

This is the specification of Model FSP084-DMBA1; part no. 9NA08403XX, AC-DC adapter switching power supply designed and manufactured by FSP GROUP, INC. located in Taiwan, Republic of China.

The specification below is intended to describe as detailedly as possible the functions and performance of the subject power supply. Any comment or additional requirements to this specification from our customers will be highly appreciated and treated as a new target for us to approach.

2.0 OUTPUT ELECTRICAL REQUIREMENTS

2.1 OUTPUT RATING

| Output | Nominal | Regulation | Ripple/Noise | Min | Max |
|----------|---------------|-------------|--------------|-----------|-------------|
| 1 | +12.0V | 11.4V~12.6V | 150mV | 0A | 7.0A |

The total output regulation shall be $\pm 5\%$, including the effects of line voltage variations, load current, ripple and noise, and the AC component of the load current. Ripple and noise measurements shall be made under all specified load conditions through a single Pole low pass filter with 20MHz cutoff frequency. Outputs shall bypass at the connector with a 0.1uF ceramic disk capacitor and a 47uF electrolytic capacitor to simulate system loading.

Ripple Noise test condition: At a static state input voltage ,Vin:90Vac ~ 264Vac,output at Max Current.

2.2 SHORT CIRCUIT PROTECTION

Output can be shorted without damage, and auto recovery.

2.3 OVER-CURRENT PROTECTION

Output current limit : 9.4A(Max) at 115Vac & 230Vac & C. C. Mode.

2.4 TURN-ON DELAY TIME

The turn-on delay from application of AC input power to the establishment of rated DC power voltage should not exceed 3.0 seconds under at 115Vac full load and C.C mode test.

2.5 HOLD UP TIME

20mS minimum. Tested 115Vac input and max load at output.

2.6 DYNAMIC LOAD REGULATION

Output Change between 10% and 50% or 50% and 90% of full load, slew rate is 0.5 ~ 1.0A/uS.
High : 1.0mS, Low : 1.0mS, 11.4Vdc < Vout < 12.6Vdc.

2.7 OVERSHOOT

The output overshoot at turn-on shall not exceed 10% of normal voltage value with or without the load connected.

2.8 OVER VOLTAGE PROTECTION

The voltage will not exceed the upper trip limit with latch up function at full load.

| Output Voltage | Upper trip limit | Remark |
|-------------------|------------------|---|
| 11.4Vdc ~ 12.6Vdc | 17Vdc | Only internal test(short U3's Pin 1-2). |

2.9 POWER FACTOR

The Power Factor should be over 90% at Vin:115Vac & 230Vac and full load .

2.10 NO LOAD POWER CONSUMPTION

No Load Power Consumption:Input Power should be under 0.5W at Vin:115Vac & 230Vac .

3.0. INPUT ELECTRICAL SPECIFICATIONS**3.1 INPUT VOLTAGE RANGE**

| PARAMETER | MIN. | NOM. | MAX. | UNITS |
|------------|------|---------|------|-------|
| V-in Range | 90V | 115/230 | 264V | V-rms |

3.2 INPUT FREQUENCY

47 - 63Hz

3.3 INRUSH CURRENT

The cold inrush current must not cause the input fuse to open or cause damage to components.

3.4 STEADY AC CURRENT

| | |
|-------------------|------------|
| 115Vac @Full Load | 1.3A (Max) |
| 230Vac @Full Load | 0.6A (Max) |

3.5 EFFICIENCY

At cold start.

| | |
|-------------------|-------------|
| 115Vac @Full Load | 83% minimum |
| 230Vac @Full Load | 83% minimum |

3.6 POWER LINE HARMONIC REQUIREMENT

The input current harmonic requirement shall be met with EN-61000-3-2 at nominal line and full load.

4.0. ENVIRONMENTAL REQUIREMENTS

The power supply will be compliant with each item in this specification for the following environmental conditions.

4.1 TEMPERATURE RANGE

| | |
|-----------|------------------|
| Operating | 0 to + 40 deg. C |
| Storage | -30 to +60deg.C |

4.2 HUMIDITY

| | |
|-----------|----------------------------|
| Operating | 8 – 80% RH, Non-condensing |
| Storage | 8 – 80% RH, Non-condensing |

4.3 VIBRATION

10 to 100Hz sweep at a constant acceleration of -0.5G for 10 min. for each of the perpendicular axes X, Y, Z.

4.4 SHOCK

Half-sine: 2ms

Storage All 6 sides; 50 to 90 in/sec in 10 in/sec increments.

Operating All sides except top; 40 to 70 in/sec in 10 in/sec increments.

No mechanical variations permitted. Electrically, the unit is capable of continuous normal operation after test completion.

4.5 PACKAGE DROP

Turn off system.

Follow MIL-STD-810D, 0 - 9.1kg 1m, 9.2 - 18.2kg 90cm.

10 drops: 1 corner, 3 adjacent edges of corner, 6 faces.

At random, repeat the above process 1 more time.

Note: Check for mechanical damage and functional failures.

5.0. RELIABILITY

5.1. MTBF

The subject adapter have a minimum predicted MTBF of 30000 hours of continuous operation at 25°C, maximum-output load, and nominal AC input voltage.

5.2 DIELECTRIC WITHSTAND VOLTAGE AND INSULATION RESISTANCE

L&N To FG : 2545 VDC 10mA for 2 second.

Insulation Resistance: 500Vdc / 1 Sec, 100 M Ω min. between primary and secondary.

5.3 LEAKAGE CURRENT

The measured reaing is less than 0.25 mA at 254Vac 50Hz.

5.4 EMC

The power supply have to meet EMC regulations as below.

| Referring standards | Test specification | IEC standards |
|---------------------|---|-----------------|
| ESD | Contact 4KV | IEC61000-4-2 |
| ESD | Air 8KV | IEC61000-4-2 |
| RS | 3V/M | IEC61000-4-3 |
| CS | 3V/M | IEC61000-4-6 |
| FET | 1KV on AC power line | IEC61000-4-4 |
| SURGE | Differential mode:1KV(2ohm) Common mode:2KV(12ohm) | IEC61000-4-5 |
| DIPS | 0% 250Cycle , 40% 5Cycle 70% 0.5Cycle | IEC61000-4-11 |
| CE | Class B | EN55022,EN55024 |
| RE | Class B | EN55022,EN55024 |

5.5 CEC & ENERGY STAR

The power supply have to meet CEC regulations as below.

| <i>Nameplate Output (W)</i> | <i>Minimum Efficiency in Active Mode of Operation</i> |
|--|--|
| < 1 Watt | 0.50 * Nameplate output (value in Watts) |
| ≥ 1 (W) ≤ 51 Watts | 0.09 * Ln(Nameplate output) + 0.50 |
| > 51 Watts | 0.85 |
| | |
| | <i>Maximum Energy Consumption in No-Load Mode</i> |
| Any output | 0.50 |
| | Watts |
| Where Ln (Nameplate output) = Natural Logarithm of the nameplate output expressed in Watts | |

Test condition :

Input voltages at both 115 volts and 230 volts.

Calculate the model's single average Active Mode efficiency for each test voltage by testing at 100%, 75%, 50%, and 25% of rated current output and then computing the simple arithmetic average of these four values.

The power supply average efficiency should be over 85% .

| Percentage of Nameplate Output Current | |
|---|-------------|
| Load Condition 1 | 100% +/- 2% |
| Load Condition 2 | 75% +/- 2% |
| Load Condition 3 | 50% +/- 2% |
| Load Condition 4 | 25% +/- 2% |
| Load Condition 5 | 0% |

Note: All measurements to be taken after DUT has operated at 100% load for at least 30 minutes.

5.6 ENERGY STAR

The power supply have to meet ENERGY STAR(Version 2.0) regulations as below.

Energy-Efficiency Criteria for Ac-Ac and Ac-Dc External Power Supplies in Active Mode: Standard Models

| Nameplate Output Power (P_{no}) | Minimum Average Efficiency in Active Mode (expressed as a decimal) ² |
|-------------------------------------|---|
| 0 to \leq 1 watt | $\geq 0.480 * P_{no} + 0.140$ |
| > 1 to \leq 49 watts | $\geq [0.0626 * \ln (P_{no})] + 0.622$ |
| > 49 watts | ≥ 0.870 |

Energy Consumption Criteria for No-Load

| Nameplate Output Power (P_{no}) | Maximum Power in No-Load | |
|-------------------------------------|--------------------------|------------------|
| | Ac-Ac EPS | Ac-Dc EPS |
| 0 to $<$ 50 watts | ≤ 0.5 watts | ≤ 0.3 watts |
| ≥ 50 to ≤ 250 watts | ≤ 0.5 watts | ≤ 0.5 watts |

Test condition :

Input voltages at both 115 volts and 230 volts.

Calculate the model's single average Active Mode efficiency for each test voltage by testing at 100%, 75%, 50%, and 25% of rated current output and then computing the simple arithmetic average of these four values.

The power supply average efficiency should be over 87% .

| Percentage of Nameplate Output Current | |
|--|-------------|
| Load Condition 1 | 100% +/- 2% |
| Load Condition 2 | 75% +/- 2% |
| Load Condition 3 | 50% +/- 2% |
| Load Condition 4 | 25% +/- 2% |
| Load Condition 5 | 0% |

Note: All measurements to be taken after DUT has operated at 100% load for at least 30 minutes and according to the DC cable length 14AWG & 1200mm(MAX).