



全漢企業股份有限公司  
FSP TECHNOLOGY INC.

台灣桃園市建國東路22號 統一編號：84239055  
No. 22, Jianguo East Road., Taoyuan City, Taiwan, R.O.C.  
TEL:+886-3-375-9888 Website : www.FSP-group.com  
FAX:+886-3-375-6966 Email : sales@fsp-group.com.tw

# SPECIFICATION



FSP025-DGAA1 9NA0251700

Released Date:2011/12/16-17:14:23



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## Efficiency Testing Criteria

The Product Meet	Regulation	Output Power	Average Efficiency in Active Mode	Maximum Power in No Load	Total Harmonic Distortion
	Energy Star EPS2.0	$1W \leq P_o \leq 49W$	80.24%	$\leq 0.3W$	THD,V <2%
	ErP Lot 7 Tier2	$1W \leq P_o \leq 51W$	80.24%	$\leq 0.3W$	THD,V <2%

**Electrical Specification Revision History:**

<u>Rev</u>	<u>Description</u>	<u>Date</u>
1.0	SPEC ISSUE	AUG,17,09”
2.0	1.Modify Item 3-1 Output rating-Regulation 2.Modify Item 3-3 OCP Limit : 9.0A(MAX)	SEP,10,09”
2.0	REV:02 Modify Item 2.0 Connect PIN	SEP,13,09”
3.0	Modify Item 6.5 Change CEC to Energy Star Efficiency Modify Item 3.7 Change 4.75~5.25 to 4.70~5.30	OCT.10.09”
4.0	MODIFY Item3.1 regulation(5%→6%)	NOV,18,09”
5.0	DEL ITEM 4.5 MODIFY ITEM 6.5	FEB,01,10”

## Table of Content

### Section

1.0	General Description And Scope-----	(3)
2.0	Connector Pin Designations-----	(3)
3.0	Output Electrical Requirements-----	(3)
3.1	Output Rating-----	(3)
3.2	Short Circuit Protection-----	(3)
3.3	Over Current Protection-----	(4)
3.4	Turn-on Delay Time-----	(4)
3.5	Hold Up Time-----	(4)
3.6	Overshoot-----	(4)
3.7	Over Voltage Protection-----	(4)
3.8	No load Power Consumption-----	(4)
4.0	Input Electrical Specifications-----	(4)
4.1	Input Voltage Range-----	(4)
4.2	Input Frequency-----	(5)
4.3	Inrush Current-----	(5)
4.4	Steady AC Current-----	(5)
5.0	Environmental Requirements-----	(5)
5.1	Temperature Range-----	(5)
5.2	Humidity-----	(5)
5.3	Vibration-----	(5)
5.4	Shock-----	(5)
5.5	Package Drop -----	(6)
6.0	Reliability-----	(6)
6.1	MTBF-----	(6)
6.2	DIELECTRIC WITHSTAND VOLTAGE AND INSULATION RESISTANCE----	(6)
6.3	Leakage Current-----	(6)
6.4	EMC-----	(6)
6.5	Efficiency -----	(7)

ATTACHMENT: ASSY FIGURES

## **1.0 GENERAL DESCRIPTION AND SCOPE**

This is the specification of Model FSP025-DGAA1; part no. 9NA0251700, 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 CONNECTOR PIN DESIGNATIONS**

The pin designations and color codes are defined as outline:

## **3.0 OUTPUT ELECTRICAL REQUIREMENTS**

### **3.1 OUTPUT RATING**

Output	Nominal	Regulation	Ripple/Noise	Min	Max
<b>1</b>	<b>+5.0V</b>	<b>4.70V~5.30V</b>	<b>75mV</b>	<b>0A</b>	<b>5.0A</b>

The total output regulation shall be  $\pm 6\%$ , 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 ,  $V_{in}$ : 115Vac/230Vac, output at Max Current.

### **3.2 SHORT CIRCUIT PROTECTION**

Output can be shorted without damage, and auto recovery.

**3.3 OVER-CURRENT PROTECTION**

Output current limit : 9.0A(Max) at C. C. Mode.

**3.4 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 4.0 seconds under at 115Vac full load and C.C mode test.

**3.5 HOLD UP TIME**

5mS minimum. Tested 115Vac input and max load at output.

**3.6 OVERSHOOT**

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

**3.7 OVER VOLTAGE PROTECTION**

The power supply have over voltage protection function. When the feedback control circuit fault occur(short or open circuit). The power supply will over voltage. The OVP circuit will protect for the switch power supplier such high voltage to avoid damage system.

Output Voltage	Upper trip limit	Remark
4.70Vdc ~ 5.30Vdc	10Vdc MAX.(Reference)	Only internal test(short U2's Pin 1-2).

**3.8 NO LOAD POWER CONSUMPTION**

No Load Power Consumption: Input Power should be under 0.3 W at Vin:115Vac & 230Vac .

**4.0. INPUT ELECTRICAL SPECIFICATIONS****4.1 INPUT VOLTAGE RANGE**

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

**4.2 INPUT FREQUENCY**

47 - 63Hz

**4.3 INRUSH CURRENT**

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

**4.4 STEADY AC CURRENT**

115Vac @Full Load	1.0A (Max)
230Vac @Full Load	0.6A (Max)

**5.0. ENVIRONMENTAL REQUIREMENTS**

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

**5.1 TEMPERATURE RANGE**

Operating	0 to + 40 deg. C
Storage	-20 to +60deg.C

**5.2 HUMIDITY**

Operating	20 – 80% RH, Non-condensing
Storage	10 – 80% RH, Non-condensing

**5.3 VIBRATION**

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

**5.4 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.

## 5.5 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.

## 6.0. RELIABILITY

### 6.1. MTBF

The subject adapter have a minimum predicted MTBF(MIL-STD-217F) of 50000 hours of continuous operation at 25°C, maximum-output load, and nominal AC input voltage.

### 6.2 DIELECTRIC WITHSTAND VOLTAGE AND INSULATION RESISTANCE

L-N To FG: 1800Vac 10mA for 3 second or 2545 VDC 10mA for 3 second.

### 6.3 LEAKAGE CURRENT

The measured reading is less than 0.75 mA at 254Vac 50Hz.

### 6.4 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



**6.5 Efficiency (Warm Up)**

6.5.1 The efficiency of the power supply shall be more than 70% at nominal input voltage; maximum load and measurement shall be made at the end of DC cable.

115Vac @Full Load	70% minimum
230Vac @Full Load	70% minimum

6.5.2 The power supply (Active mode) have to meet ENERGY STAR Version 2.0 standard as below.

Low Voltage models:

Nameplate Output Power (P <sub>no</sub> )	Minimum Average Efficiency in Active Mode (expressed as a decimal)
0 to ≤ 1 watt	$\geq 0.497 * P_{no} + 0.067$
> 1 to ≤ 49 watts	$\geq [0.075 * \ln (P_{no})] + 0.561$
> 49 watts	$\geq 0.860$

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.

Active mode efficiency of the power supply shall be more than 80.24% ; as below.

<b>115Vac @ 60Hz</b>	<b>Average Efficiency(for four Load): 80.24% minimum</b>
<b>230Vac @ 50Hz</b>	<b>Average Efficiency(for four Load): 80.24% minimum</b>