

電氣規格書



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SPECIFICATION

15W AC ADAPTER Power Supply

FSP015-RCEM

P.E	R/D	APPROVED	REV.
CaoJ	CaoJ	Tony	02



Electrical Specification

History

Rev.	Description	Date	Drawn	Mechanical	Electrical	Approved
01	SPEC ISSUE	2013-1-30	HuYF	HuYF	Zhanghb	Tonyhsieh
02	Update SPEC: 11	2016-8-31	HuYF	HuYF	CaoJ	Tonyhsieh

MODEL NAME: **FSP015-RCEM**

2



Electrical Specification

1. General Description And Scope

This is the specification of Model FSP015-RCEM; part no. 9NA0154000, AC-DC adapter switching power supply designed and manufactured by FSP GROUP, INC. located in Shanghai, 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. Input Specifications

2.1 Input Voltage Range

The operating input voltage range is 90Vac to 264Vac.

	Minimum	Rated	Maximum	Unit
Input range	90	100-240	264	Vac

2.2 Input Frequency

The input frequency range is 47Hz to 63Hz.

2.3 Input Current

The maximum input current shall not exceed 0.5A(rms) for 100Vac at full load; and it shall not exceed 0.3A(rms) for 240Vac at full load.

2.4 AC Inrush Current

It shall be less than the rating of adapter critical component. (including rectifiers, fuse surge and current limiting devise)

3. Output Specifications

3.1 Output Voltage and Current

Under any combinations of line and load variation and environmental conditions, all outputs shall remain within the tolerance defined in the following Table.

Output Voltage	Output Regulation	Tolerance	Min. Load	Max. Load
+12V	+/-5%	11.4V~12.6V	0A	1.25A

MODEL NAME: **FSP015-RCEM**

3



Electrical Specification

3.2 Output Voltage Ripple and Noise

$$\leq 120\text{mVp-p}$$

Measurement is made with an oscilloscope of 20MHz bandwidth and normal temperature (25°C). Output should be bypassed at connector with 0.1uF/50V ceramic capacitor and 47uF/50V electrolytic capacitor simulate system load. If a non-differential type of scope was used, the length of ground wire on probe should be less than 40mm, which the power is at rate Load with rated AC input conditions.

3.3 Transient Response

Maximum excursion of 5% rated output or better on all models, recovering to 1% of final value within 500us after a 25% step load change.

Note: 1.Load change repetition rate: 100Hz-1kHz

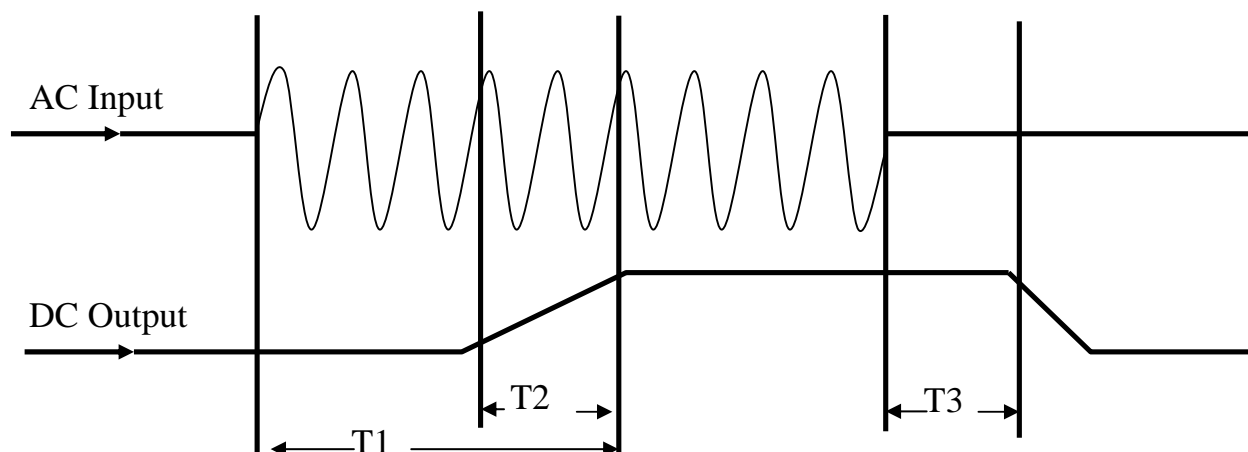
2.Ttransient load slew rate: 0.1A/uS

3.4 Overshoot

The output overshoot at turn-on or turn off shall not exceed 5% of normal voltage value with or without the load connected.

3.5 Hold up time and Rise up time

Figure 1



Symbol Name		Test condition	Minimum	Maximum
T1	Turn on time	100Vac/60Hz	*	3 Second
T2	Soft-Start Delay Time and Rise Time	100Vac/60Hz	*	40mS
T3	Hold Up Time	100Vac/60Hz/Max. Load	8mS	*

MODEL NAME: **FSP015-RCEM**

4



Electrical Specification

4. Protection

The power supply will be auto-recovery while the fault is removed except over voltage protection latch. When the power occurs over voltage protection latch, it needs to return to normal state by AC reset.

4.1 Input Section Protection

4.1.1 AC Fuse Protection

The fuse inside the power supply shall be open when AC input current is over the rated of fuse. The fuse rating of the power supply is 2A/250VAC time lag type.

4.2 Output Section Protection

4.2.1 Over Voltage Protection (OVP)

The output shall be protected to latch off at over-voltage condition. That will be return to normal state by AC reset.

Rated Output	Over Voltage Active Range		Result
	Min.	Max.	
+12V	+14V	20.5V	Latched

4.2.2 Over Current Protection (OCP)

When DC output of the power supply occurs over current, the power supply should be auto-recovery.

When the fault is removed, DC output of the power supply will be restart, and this condition on DC output will cause no damage to the power supply.

Rated Load	Over Current Active Range		Result
	Min.	Max.	
1.25A	*	3A	Auto-recovery

4.2.3 Short Circuit Protection (SCP)

The power supply should be auto-recovery when the power occurs short circuit. Short circuit on DC output will cause no damage to the power supply.

5. Power saving

Maximum Energy Consumption in No-Load Mode meets **Energy Star (Version 2.0)**, it will not exceed 0.3W at rated input voltage.

MODEL NAME: **FSP015-RCEM**

5



Electrical Specification

6. Efficiency

Minimum 80% at any input voltage with full load.

The average efficiency of the power meets **Energy Star (Version 2.0)**, as follows:

Energy Star (Version 2.0)	
Minimum Average Efficiency	$\geq [0.0626 * \ln(P_{no})] + 0.622$

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

Percentage of Nameplate Output Current	
Load Condition 1	100%
Load Condition 2	75%
Load Condition 3	50%
Load Condition 4	25%

115Vac@60Hz	Average Efficiency(for four Load): 79.15% minimum
230Vac@50Hz	Average Efficiency(for four Load): 79.15% minimum

7. Cooling of PSU

The power supply depends on natural air for cooling the plastic case.

8. Dielectric Withstand Voltage

8.1 Hi-Pot

Between AC input and secondary applied 4000Vac/ test time 1 minute , and cut off current shall be less than 10 m A. 4800Vac/ test time 3 sec, For mass production

8.2 Insulation Resistance

The insulation resistance shall be over 100M ohms after application of 500VDC for 1 minute.

8.3 Leakage Current

The leakage current will not exceed 0.1mA when the Power Supply is at rated load with any rated AC input voltage.

9. Environment

9.1 Temperature

Storage -10°C to 70°C

Operating 0°C to 40°C

9.2 Humidity

9.2.1 Storage 5% to 95% RH Without Condensing

9.2.2 Operating 10% to 90% RH

9.3 Altitude

The Power Supply can be operating in the attitude of 2000 meters high above sea level.

MODEL NAME: FSP015-RCEM



Electrical Specification

10. Shock and Vibration

10.1 Shock Test

The subject power supplies will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Storage All 6 sides; 40G, 6 mSec. Half-sine wave pulse in both direction on three mutually perpendicular axes

Operating All sides except top; 10G, 6 mSec. Half-sine wave pulse in both directions on three mutually perpendicular axe.

10.2 Vibration Test

A. Non operation vibration with shipping container shall be 2G`S peak,7-50Hz,4G`S peak 50-500Hz,after test no abnormally to be found.

B. Operation vibration shall be 0.5G`S peak, 10-60Hz, 3Axes, after test no abnormally to be noted.

11. EMS Standards

IEC61000-4-2 EN61000-4-2	Electrostatic Discharge-ESD		
	Contact Discharge	+/-8KV	No function error
	Air Discharge	+/-15KV	No function error
IEC61000-4-3 EN61000-4-3	Radio-Frequency Electro Magnetic Field Susceptibility Test-RS		
IEC61000-4-4 EN61000-4-4	Electrical Fast Transient/Burst+/-2KV		
IEC61000-4-5 EN61000-4-5	Surge Immunity Test		
	Voltage	CWG: +/-1KV, 2 Ohm	
	Phase	0°; 90°; 180°; 270°	
	Model	L—N	
	Each phase apply 3 times surge ,Each apply surge need keep at least 25 Sec		

MODEL NAME: **FSP015-RCEM**

7



Electrical Specification

12. EMI Standards

IEC61000-4-3	
EN55011 Class B FCC Class B	Conduction Test
	Radiation Test
The set box system is 2 pin AC input plug (without ground). Consideration of the real application, the emission testing shall verify by apply ground to chassis.	

13. Safety Standards

PRODUCT SAFETY REQUIREMENTS AND APPROVALS	
Safety agency	Meet
UL	UL60601-1
TUV	EN60601-1
CE/EMC	EN60601-1

14. Reliability

14.1 M.T.B.F.

The power supply shall have a minimum predicted **MTBF** of 100000 hours, calculated utilizing MIL-HDBK-217F with the following assumptions:

Input voltage: 115/230Vac

Output load: Full load

Ambient temperature: 25°C

15. RoHS

All components of power supply have to be **RoHS** compliant.

16. Drawing

MODEL NAME: **FSP015-RCEM**

8