

# **SPARKLE POWER INT'L LTD.**



## **FSP065-RAC**

**(19V, 3.42A)**

**High Efficiency**

**CEC Compliant**

**Meet Energy Star 2.0**

**Adapter**

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**10/15/2008**



# Electrical Specification

REV.	Description	Date	Drawn	Mechanical	Electrical	Approved
01	SPEC ISSUE	9/20/08	JR Zeng	RL Cao	YH Shuai	Tony Xie
02	(Change ITEM 4.1):change Plastic Case material from PC-945 to SE-1or PC-945	10/8/08	JR Zeng	RL Cao	YH Shuai	Tony Xie
03	(Change ITEM 3.1.1):change ambient temperature range from 0°C to +35°C to 0°C to +40°C	10/8/08	JR Zeng	RL Cao	YH Shuai	Tony Xie
04	Add ITEM 4.5: OUTLINE	10/9/08	JR Zeng	RL Cao	YH Shuai	Tony Xie

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## 1 Description

The product is a AC to DC power transfer device with lead free, it can provide for a 65W single DC output with constant voltage source.

## 2 ELECTRICAL

### 2.1 Input Characteristics:

#### 2.1.1 Nominal Voltage

The nominal voltage of power supply is 100/240Vac input AC voltage.  
And power supply shall be capable of start up at 90V/50Hz

#### 2.1.2 Input Voltage Range

The Adapter shall be capable of operate over the input range of 90 ~ 265Vac.

#### 2.1.3 Rated Frequency

It is normal for 50Hz - 60Hz and single phase.

#### 2.1.4 Frequency Range

The Adapter shall operate with an input frequency from 47 Hz to 63 Hz.

#### 2.1.5 Input Current

Maximum steady state input current shall be less than 1.7A at 90Vac and full load.

#### 2.1.6 Input Power Rating

The supply true input power is less than 80 watts. For reference only

#### 2.1.7 Power factor

The power factor ,when measured at 120Vac and maximum load, shall be greater than 0.5,the source impedance shall be less than 0.1 ohm. For reference only

#### 2.1.8 Inrush Current

1. less than 220A at cold-start, DC output full loading and 230V input,
- 2.Input fuse and bridge are less than  $I^2t$  energy criteria and no damage at cold-start

#### 2.1.9 Efficiency (Warm Up)

2.1.9.1 **The efficiency of the power supply shall be more than 83 %** at nominal input voltage; maximum load and measurement shall be made at the end of DC cable.

2.1.9.2 Active mode efficiency

Active mode efficiency of the power supply shall be more than 85%

Active mode efficiency are defined as the average efficiency of 25% of maximum load,50%, 75% and 100% maximum load and tested at 115Vac and

230Vac

*The UUT shall be operated at 100% of nameplate current output for at least 1 hour immediately prior to conducting efficiency measurements.*

***Efficiency measurements shall be conducted in sequence***

<b>Load point:</b>	100%	75%	50%	25%
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2.1.9.3 No Load Power Consumption(Power saving)

Maximum no-load power consumption shall be less than 0.5W.

2.2 Output Characteristics:

2.2.1 Output Rated Voltage

The rated output voltage is specified at 19V.

2.2.2 Output Current

a. This Adapter can work from 0 A to 3.42A and output voltage is in section 2.2.3-a specified range

2.2.3 Output Voltage Range

a. The output voltage will be performed within 18.05~ 19.95V when the load current is 0A ~ 3.42A steadily, measurement shall be made at the end of DC cable.

2.2.4 Output Ripple and Noise

Low frequency ripple( $\leq 100\text{KHz}$ ) $\leq 150\text{mVpp}$ ,and total composite Ripple and Noise, Less than 380mVpp

Measured methods:

- Performed by 20M Hz bandwidth in oscilloscope.
- Applied 0.1uF high ceramic capacitor and 35V/47uF aluminum capacitor across output connector terminals
- Measured at the end of DC cable.
- Testing condition 100Vac-240Vac,full load.

2.2.5 Turn On delay time

The Adapter shall switch on in less than 3 seconds at full load and 90Vac voltage input.

2.2.6 Hold –up time

The output voltage shall be sustained 8mS(min) within regulation requirement after loss 100Vac and full load

2.2.7 Rise time

DC output rise time from 5% to 95% of output voltage shall be less than 50ms at nominal line and full load

## 2.2.8 Load transient response

Dynamic loading condition

DC output	I1(A)	I2(A)	dVmax(V)	Time max	di/dt
19.00	0.00	0.855	$\pm 1.0$	10 msec	$\geq 50\text{mA}/\text{usec}$
19.00	0.855	1.710	$\pm 1.0$	10 msec	$\geq 50\text{mA}/\text{usec}$
19.00	1.710	3.420	$\pm 1.0$	10 msec	$\geq 50\text{mA}/\text{usec}$

## 2.2.9 System Capacitive Load

The system load capacitance is 2200uF. And Shall be capable of start up with a 2200uF load. And must not shut down when plugging a live Ac adapter into the system

## 2.3 Protection

### 2.3.1 Over Voltage Protection

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

The maximum voltage can't be over 25V with a maximum duration of 250mS

### 2.3.2 Over Current Protection

Over-current protection, auto-recovery, range 5.5A max.

### 2.3.3 Short Circuit protection

The adapter can withstand continuous short at DC output and no damage, it will enter into normal condition, if the fault condition is removed.

### 2.3.4 Over Temperature Protection

The adapter shall use electronic circuitry to limit the unit temperature from entering a dangerous range.

### 2.3.5 Overshoot

From 65W load to no load, the output over shoot voltage shall not large than 20Vp-p. And shall be back to regulation not more than 10mS.

## 3 Environmental

### 3.1 Temperature

#### 3.1.1 Operating



The AC Adapter shall be capable of operating at full load with an ambient temperature range of 0°C to +40°C

### 3.1.2 Shipping/Storage

The AC Adapter shall be capable of withstanding ambient temperature from -25°C to +70°C.

### 3.1.3 Case surface temperature

The case of AC adapter shall not exceed a surface temperature of 85 degree at nominal operating environment.

## 3.2 Humidity

### 3.2.1 Operating

The AC Adapter shall be capable of operation in relative humidity up to 80% relative humidity, non-condensing .

### 3.2.2 Shipping/storage

The AC Adapter shall be capable of withstanding ambient relative humidity of 10% to 90% relative humidity, non-condensing

## 3.3 Altitude

From sea lever to 2,000m(operation)and 2.000m above(non-operation)

## 3.4 Immunity

### 3.4.1 Electric Fast Transients (EFT)

This is to follow the norm of IEC-61000-4-4/1995;  $\pm 1\text{KV}$  on AC power port for 1 minute;  $\pm 0.5\text{KV}$  on signal/control lines.

### 3.4.2 Surge Immunity

This is to follow the norm of IEC-61000-4-5; Level 3 requirements  
1KV (L-N)

### 3.4.3 Electrostatic Discharge ( ESD )

This Adapter is capable to withstand ESD test voltage at any point around the enclosure as below.

It is refer to IEC61000-4-2

After applied  $\pm 4\text{kV}$  contact discharge and Adapter is no allowed error.

After applied  $\pm 6\text{kV}$  contact discharge and restart & damage error are not allowed.

After applied  $\pm 8\text{kV}$  contact discharge and restart & damage error are not allowed.

After applied  $\pm 4\text{kV}$  air discharge and Adapter is no allowed error.

After applied  $\pm 8\text{kV}$  air discharge and restart & damage error are not allowed.

After applied  $\pm 15\text{kV}$  air discharge and damage error is not allowed

### 3.4.4 Dielectric Withstand Voltage ( HI – POT )

100% of line products of this Adapter shall be applied 3000Vac for 1 minute between AC input terminals and output terminals. The cut off current is specified as 3mA. The test time in production line shall be more than 2S.

#### 3.4.5 Leakage Current :

The AC leakage current is less than 0.2mA when adapter is connected to 240Vac/60Hz at normal condition.

#### 3.4.6 Insulation Resistance

The insulation resistance shall be not less than 20M ohms after application of 500Vac for 1 minute.

#### 3.4.7 R.F

FR:26MHz-1.0GHz, FIELD strength:3V/M, IEC 61000-4-3:1995 RF Fields at distance of 3 meters

#### 3.4.8 Conducted RF

3V,0.15-80MHz,80% modulated,IEC61000-4-6:1996 Conducted RF

#### 3.4.9 DIPS.

>95% dip,0.5period;30% dip.25periods;>95%reduction,250periods.IEC61000-4-11:1994 Voltage variation

### 3.5 Electromagnetic Interference(EMI)

The adapter shall comply with the following national standards.

- (a) FCC Rules and regulation, CFR47 Part 15 Class B limit.[USA]
- (b) CISPR 22 Class B requirements [Scandinavia].
- (c) VCCI Class II requirements[Japan].

### 3.6 Reliability

#### 3.6.1 Life

- a, Average life expectancy of 5 year.  $8(H)*300(D)*5(Y)$
- b. Environment ambient: 25°C,

#### 3.6.2 M.T.B.F

The calculated MTBF shall be 60,000 hours of continuous operation at 25°C, maximum load and normal voltage.

#### 3.6.3 Burn-in

100%Burn-in with 80-100% loading & 35-40°C Environment temperature

#### 3.6.4 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.

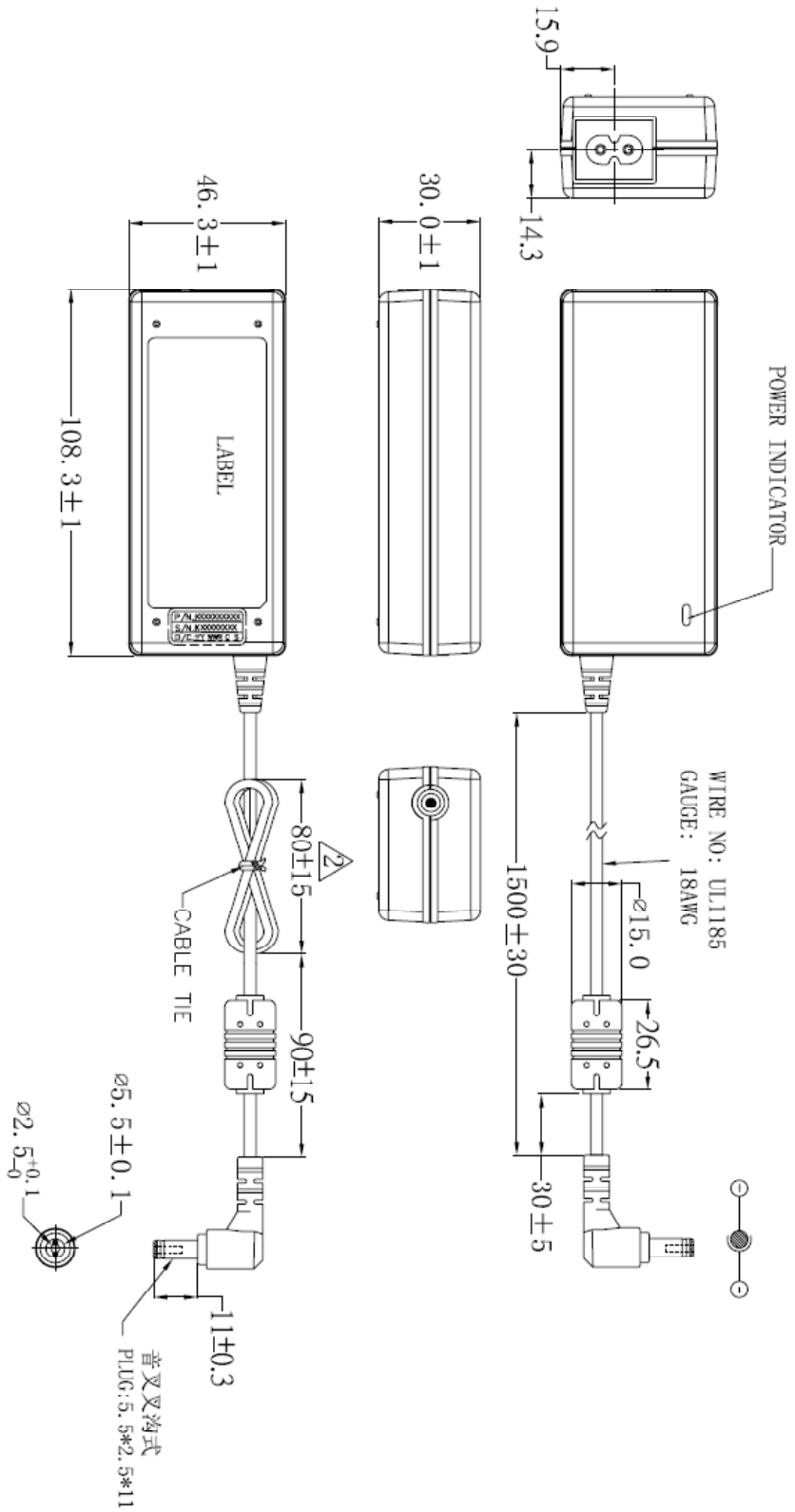
#### 3.6.5 Drop-Test

Test height 100cm/6faces,after drop test no function abnormally to be noted.

## 4 Mechanical

- 4.1 Outline Dimension: 108\*46\*30 mm , Color : Black  
Plastic Case: Case with UL SE-1 or PC-945 material
- 4.2 AC Inlet type: IEC 320 Socket C8 type
- 4.3 DC Cable with UL1185,18AWG wires and two pins right angle dc jack plug
- 4.4 DC Connector Dimension:  
OD = 5.5mm  
ID = 2.5m
- 4.5 OUTLINE:

UNIT:mm



- NOTES:
1. AC INLET: SUPERCOM SC-12S-LC2SL-P OR EQU
  2. CASE & CABLE COLOR: BLACK
  3. 未注公差为: ±0.5
  4. 超音波熔接

REV	修改内容	日期
2	修改 2 处尺寸	2008.10.09

P/N: 9NA0651300

MODEL NO.: FSP065-RAC	OUTLINE	P E	DRAWN	SHEET: 1 OF 1	REV: 2
R&D(SH)			caoruling		
INTERIOR COUNTERSIGN:				DATE	2008.10.09