

SPARKLE POWER INT'L LTD.



FSP040-RAC
19V@2.1A
(meet CEC Level V)
Adapter Power Supply

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1 ELECTRICAL

1.1 Input Characteristics:

1.1.1 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

1.1.2 Input Voltage Range

The Adapter shall be capable of operate over the input range of **90 ~ 264Vac**.

1.1.3 Rated Frequency

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

1.1.4 Frequency Range

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

1.1.5 Input Current

Maximum steady state input current shall be less than **1.5A at 90Vac, and less than 0.8A at 264Vac, full load.**

1.1.6 Inrush Current

The cold and hot inrush current shall not cause the input fuse to open or cause damage to components.

1.1.7 Efficiency (Warm Up)

Active mode efficiency of the power supply shall be more than 85.3%
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

from Load 100%-->75%-->50%-->25% Load

1.1.8 No Load Power Consumption(Power saving)

Maximum no-load power consumption shall be less than **0.3W**.

1.2 Output Characteristics:

1.2.1 Output Rated Voltage

The rated output voltage is specified at **19V**.

1.2.2 Output Current

This Adapter can work from **0 A** to **2.1A** and output voltage is in section 1.2.3 specified range

1.2.3 Output Voltage Range

The output voltage will be performed within **18.05~ 19.95V** when the load current is **0A ~ 2.1A** steadily, measurement shall be made at the end of DC cable.

1.2.4 Output Ripple and Noise

Output ripple voltage is **150 mV** peak to peak or less(tested at 25 Degree C).

Measured methods:

T1. Performed by **20M Hz** bandwidth in oscilloscope.

T2. Applied **0.1uF** high ceramic capacitor and **35V/47uF** aluminum capacitor across output connector terminals

T3. Measured at the end of DC cable.

T4. Testing condition **100Vac-240Vac, 0A ~ 2.1A**.

1.2.5 Turn On delay time

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

1.2.6 Hold –up time

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

1.2.7 Rise time

DC output rise time from 5% to 95% of output voltage shall be **greater than 2ms and less than 40ms** at nominal line and full load.

1.2.8 Load transient response

The adapter must within 5% of rated output voltage when applied a step load 0.1A-2.1A changes for increasing or decreasing at **0.1A/us** slew rate, **200Hz change frequency and 50% duty**

1.2.9 Reverse Inrush Current

With the input voltage source disconnected and the output connected to an 18.5 volt source, peak inrush current into the output capacitor of this power supply shall not exceed 90 Amperes.

1.2.10 System Capacitive Load

The system load capacitance is **1600uF**. And Shall be capable of start up with a 1600uF

load. And must not shut down when plugging a live Ac adapter into the system

1.2.11 Protection

1.2.11.1 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 **30V**.

1.2.11.2 Over Current Protection

The adapter will limit the output steady state current to be less than an average current of 3.78A.

1.2.11.3 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.

1.2.11.4 Over Temperature Protection

A temperature sensor and associated protection circuitry are installed inside the AC adapter to detect the case internal temperature and provide protection against damage to the AC adapter.

No deformation and no discoloration on case and will be shut down. The power supply no broken and no smoke .

1.2.11.5 Overshoot

From 40W load to no load, the output over shoot voltage shall not large than **105%** of output voltage.And shall be back to regulation not more than **10mS**.

2 Environmental

2.1 Temperature

2.1.1 Operating

The AC Adapter shall be capable of operating at full load with an ambient temperature range of **0°C** to **+35°C**.

2.1.2 Shipping/Storage

The AC Adapter shall be capable of withstanding ambient temperature from **-20°C** to **+80°C**.

2.2 Humidity

2.2.1 Operating

The AC Adapter shall be capable of operation in relative humidity of **20%** to **80%** relative humidity, non-condensing .

2.2.2 Shipping/storage

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

2.3 Altitude

The AC Adapter can be operated at **2,000** feet below sea level

2.4 Immunity

2.4.1 Electric Fast Transients (EFT)

This is to follow the norm of IEC-61000-4-4/1995; Level 3 requirements

Impulse: **±1kV** applied differential mode, pulse duration **50nS**, period **5 min**.

Impulse: **±2kV** applied common mode, pulse duration **50nS**, period **5 min**.

Normal operation shall be continued.

2.4.2 Surge Immunity

This is to follow the norm of IEC-61000-4-5; Level 4 requirements

Bi-Wave

±1KV applied between line and Neutral, pulse rise time 1.2µs and duty time 50µs, 10times each one.

Ring-Wave

±2KV applied between line and Neutral, pulse rise time 0.5us and frequency 100KHz, 10times each one.

normal operation shall be continued.

2.5 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 **±8kV** contact discharge and restart & damage error are not allowed.

After applied **±10kV** air discharge and restart & damage error are not allowed.

2.6 Dielectric Withstand Voltage (HI – POT)

Between AC input and secondary applied 3000Vac/ test time 1 minute (secondary and FG are connected), and cut off current shall be less than 10 m A.3600Vac/ test time 3 sec, For mass production

2.7 Leakage Current :

The AC leakage current is less than **3.5mA** when adapter is connected to **264Vac/60Hz**

2.8 Insulation Resistance

The insulation resistance shall be not less than **100M** ohms after application of 500Vac for **1 minute**.

2.9 R.F

FR:80MHz-1.0GHz, FIELD strength:3V/M, 61000-4-3

2.10 Conducted RF

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

2.11 Electromagnetic Interference(EMI)

The adapter shall comply with the following national standards.

Test condition:100Vac/240Vac and full load.

(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].

2.12 Reliability

2.12.1 Life

a, Average life expectancy of 5 year.

b. Environment ambient: 25°C,

2.12.2 M.T.B.F

The calculated MTBF shall be 50,000 hours of continuous operation at 25°C, maximum load and normal voltage.

2.12.3 Burn-in

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

2.12.4 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.

2.12.5 Drop-Test

Test height 80cm/6faces,after drop test no function abnormally to be noted.

2.12.6 AC Power On/Off

Input voltage: 220Vac,full load,10,000times.,after test no abnormally to be noted.

2.12.7 Input Voltage Drop Out(Power Line Disturbance)

The output voltage shall be remained within the specified regulation limit, in the absence of line input during 0.5 cycle, at full load and 240Vac input.

3 Mechanical

3.1 Outline Dimension: 86*36*26 mm ,
Color : Black

3.2 Weight

<300g

3.3 AC Inlet type:

2.5A 250V IEC-320 AC receptacle pin appliance inlet type C8.2PIN