

**TITLE****5V AC TO DC adaptor to Nano-fit**[TOC](#)

REVISION: <b>A</b>	ECR/ECN INFORMATION: EC No: DATE: <b>06/28/2018</b>	TITLE: <b>5V AC TO DC adaptor to Nano-fit</b>	SHEET No. <b>1 of 7</b>
DOCUMENT NUMBER: <b>PS-206108-0001</b>	CREATED / REVISED BY: <b>CISSY WANG</b>	CHECKED BY: <b>LIU LIHUA</b>	APPROVED BY: <b>FRED NIE</b>

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## 1.0 SCOPE

This is a series of general purpose AC/DC adapters which convert 100Vac ~240Vac to a stabilized DC voltage of 5V with rated output current of 2.5A.

## 2.0 PRODUCT DESCRIPTION

See the sales drawing for product shape; dimension and materials, the other section of this specification for the necessary referenced document and specification. The part number serial covered in this specification are as follow table:

Molex Series	Detail
206108	5V AC TO DC adaptor to Nano-fit

## 3.0 PRODUCT SPECIFICATIONS

- 3.1 Rated Input voltage (Maximum): 100 ~ 240V AC
- 3.2 Rated current (Maximum): 0.5A
- 3.3 Temperature
  - Operating temperature range: 0°C to +60°C
  - Storage temperature range: -20°C to +80°C

## 4.0 SAFETY AGENCY APPROVALS

### 4.1 SAFETY STANDARD

UL 60950-1

### 4.2 ELECTROMAGNETIC COMPATIBILITY (EMC)

#### 4.2.1 EMI

This power supply shall compliance with the following Criterion

#### 4.2.1.1 Conduction Emission

EN55014

#### 4.2.1.2 Radiated Emission

EN55014

#### 4.2.2.1 ESD

Standard: IEC61000-4-2

AIR DISCHARGE at 8KV, CONTACT DISCHARGE at 4KV.

#### 4.2.2.2 EFT

Standard: IEC61000-4-4 ±1KV

#### 4.2.2.3 Surge

Standard: \* IEC61000-4-5 different mode: 1KV

Remarks: EMC-SPECIFICATION test with the Pure resistance as load to test, and we only responsible for the product we supplied.

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## 5.0 ELECTRICAL CHARACTERISTICS

### 5.1 AC INPUT VOLTAGE AND FREQUENCY

- 5.1.1 5.1.1 Rated Input Voltage: AC100-240V
- 5.1.2 5.1.2 Reliable Input Voltage: AC90-264V
- 5.1.3 5.1.3 Rated Input Frequency: 50/60Hz
- 5.1.4 5.1.4 Reliable Input Frequency: 47-63Hz

### 5.2 MAXIMUM AC CURRENT

Input rated voltage, Output rated load. Input AC Current 0.5Amps Maximum

### 5.3 INPUT INRUSH CURRENT

Input 115/230VAC 50-60Hz, Output rated load (cold start) inrush Current 30Amps peak.

### 5.4 NO-LOAD LOSS POWER

Input 115/230Vac, Output no load. Maximum loss power 0.1Watts.

### 5.5 OUTPUT VOLTAGE

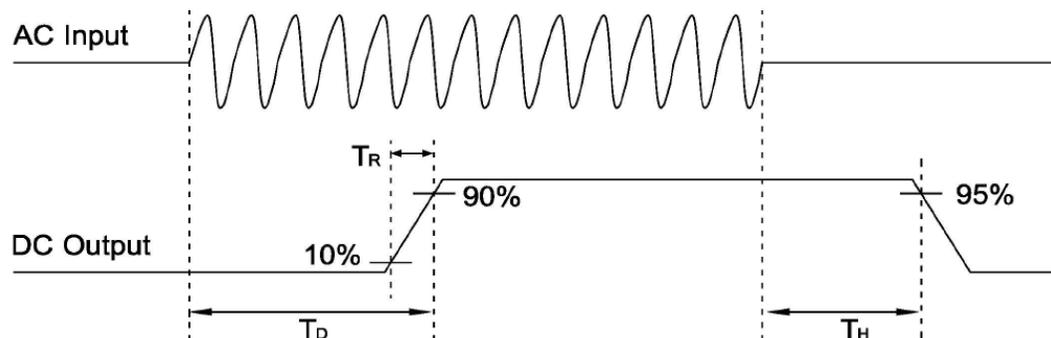
Load	Min. Load	Max. Load
Current	0A	2.5A
Voltage	5V DC±5%	5V DC±5%

### 5.6 OUTPUT RIPPLE VOLTAGE

- 5.6.1 Output ripple test condition: input rated voltage and output rated load @ 25 °C.
- 5.6.2 Peak to peak ripple is measured with an oscilloscope with a bandwidth of 20MHz.
- 5.6.3 Measurement of ripple should include a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor at the input of the measuring oscilloscope.

Input	Output Rated Voltage	Output Current	Output Ripple & Noise
100V-240V AC	+5V	2.5A	200mVp-p Max.

### 5.7 TIME SEQUENCE



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- 5.7.1 Turn-On Delay Time(TD)  
The maximum cold start turn-on delay shall not exceed 3 second at input 230VAC and the rated load condition.
- 5.7.2 Hold-Up Time(TH)  
The maximum turn-off hold-up time shall be least 10mS at input 230V AC. and the rated load condition.
- 5.7.3 Output Rise Time(TR)  
Input 115Vac/230Vac and rated load. The rise time shall not exceed 100mS that the output voltage rise from 10% to 90% rated voltage.

## 5.8 OUTPUT OVERSHOOT

- 5.8.1 15% Rated Voltage Max. when the power turn on.
- 5.8.2 15% Rated Voltage Max. when the power turn off.

Output Rated Voltage	Overshoot Voltage(V)	
	Turn on	Turn off
+5V	15%	15%

## 5.9 OUTPUT TRANSIENT RESPONSE

Output Voltage Tolerance Limited	Rate Slew	Load change
5Vdc±10%	0.25A/ $\mu$ s	20%-80%Load

Transient response measurements shall be made with a load changing repetition rate of 100Hz to 10kHz.

## 5.10 PROTECTION FUNCTION

- 5.10.1 Over Voltage Protection  
Over voltage protection YES.
- 5.10.2 Over Current Protection  
The power adaptor can be automatically protected during the overcurrent condition, it can be automatically restored to be normal when the overcurrent condition removed, the Overcurrent output current is between 1.1~1.6 times.
- 5.10.3 Short Circuit Protection  
Shorting of output will not cause power supply to damage, or any safety hazard. The power supply shall resume normal operation after the short is removed.
- 5.10.4 Input Protection  
The power supply has a current fuse to protect itself.

## 5.11 AVERAGE EFFICIENCY

Input 115Vac. and 100%,75%,50%,25% Rated Load condition. Average efficiency ( $\eta$ ): 80.21% Min(Level VI).  
Input 230Vac. and 100%,75%,50%,25% Rated Load condition. Average efficiency ( $\eta$ ): 80.21% Min(Level VI).

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## 6.0 MECHANICAL CHARACTERISTICS

Test Description	Test Condition	Performance Requirement
Bending Test	Test the metallurgical equipment with fixed plug, handing weight is 300g, $\pm 90$ degrees from side to side, swing 45 times per minute, swing more than 1000 times ( Remark: +/-90 degrees, that is to say 180 degrees for a cycle counting 1 times) (ANSI/EIA-364-41, Condition I )	No discontinuity over 1 microsecond during flexing shall occur to the cable assembly
Tensile Strength Test	EIA 364-38 Test Condition A Put the weight of 4 kg on SR for 1 minute,	SR shift less than 2mm.
Drop Test	The adapter shall exhibit no abnormality in mechanical or electrical performance when it is dropped 6 times to hardwood (20mm thickness) from a height of 0.75m, with each of the 6 different sides of the adapter 1 times. (at: $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ).	The electrical and mechanical performance should be normal after the tested. Small nicks or slight deformations in the corners of the housing, or cracks not penetrating the inside may be accepted.
Vibration test specifications non-operating with packing	10Hz to 50Hz with sweep at a breadth 2.0mm for 20 Minutes for each of the perpendicular axes X,Y,Z.	After the test the electrical performance shall be normal.
Salt spray test	The most typical of sample surface exposed, Sample pretreatment at $35^{\circ}\text{C}$ for 2 hours in front of the salt spray test; Concentration of 5% NACL solution, 35 degrees under the conditions of continuous spray 8 hours, and then moved out for 16 hours to dry.	The electrical performance should be normal.

## 7.0 RELIABILITY

### 7.1 MTBF: MEAN TIME BETWEEN FAILURE

The power supply shall be designed and manufactured to have more than 20,000 operating hours (about 2.28 years for 24-hour-operation a day) of mean time between failure (MTBF) at 99% of confidence level while operating under the prevailing conditions below.

AC Input Voltage: 115/230V AC

Output Load: of Rated load

Ambient Temperature at  $25^{\circ}\text{C}$  Room Temperature

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## 7.2 INSULATION RESISTANCE

Test Points	Condition & Specification
Input to Output	DC500V 30MΩ min. ( at ambient temperature 25 °C, humidity 90%)
Input to Case	DC500V 30MΩ min. ( at ambient temperature 25 °C, humidity 90%)

## 7.3 HI-POT

Test Points	Condition & Specification
Input to Output	3750Vac 50Hz, 2S, ≤10mA.

When AC voltage of 3.75KV is applied, and the voltage applied to the insulation under test is gradually raised from zero to the prescribed voltage in 2s, and held at that value for 60s between the input and output , the current sensitivity shall be less than 10mA. After this test, the adapter shall exhibit no electrical and mechanical abnormalities. (AC voltage of 3.75KV, 2s and sensitivity current 10mA shall be applied to the product line).

## 7.4 EAKAGE CURRENT

The leakage current shall not exceed 3.5mA for Class II when power supply is operated maximum input voltage and maximum load.

## 7.5 LOW TEMPERATURE STORAGE

Keep the parts unpacked without connecting to the power for 96 hours at -30°C. Eelectrical character tested and appearance after resuming 1 hours at room temperature. The electrical performance and appearance should be normal.

## 7.6 HIGH TEMPERATURE STORAGE

Keep the parts unpacked without connecting to the power for 96 hours at 70°C. Eelectrical character tested and appearance after resuming 1 hours at room temperature. The electrical performance and appearance should be normal.

## 7.7 LOW TEMPERATURE OPERATING

Keep the parts unpacked without connecting to the power, Adjust the temperature of the incubator by the speed of 1 ° C / min. to -40 ° C for 48 hours, 3 times a power-on test, and then continued to maintain the power-on State, to the end of the experiment; test time about 48 hours (load about 46 hours), check the electrical function after resuming 2 hours at room temperature. The electrical performance should be normal.

## 7.8 HIGH TEMPERATURE OPERATING

Keep the parts unpacked without connecting to the power, Adjust the temperature of the incubator by the speed of 1 ° C / min. to 45 ° C for 48 hours, 3 times a power-on test, and then continued to maintain the power-on State, to the end of the experiment; test time about 48 hours (load about 46 hours), check the electrical function after resuming 2 hours at room temperature. The electrical performance should be normal.

## 7.9 HIGH & LOWER TEMPERATURE CYCLE

Sample connecting to the power incubator humidity rose to 95% within 1 hour, the temperature maintained at 0°C; Within three hours the temperature rose to 40 °C, humidity 95%, to maintain 9 hours; Then drop the temperature within 3 hours to 0 °C, humidity 95% to maintain 9 hours; The above is a cycle, a total of two cycles. The indicators & functions shall be normal in the testing process and the end of the test.

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