

# **TELSTAR ELECTRONICS CORP.**

9025 ETON AVE. STE A, CANOGA PARK, CA91304  
TEL 818-882-2018 FAX 818-882-5137

Email Address: [sales@telstarcorp.com](mailto:sales@telstarcorp.com)  
Web Address : [www.telstarcorp.com](http://www.telstarcorp.com)

## **1. GENERAL DESCRIPTION AND SCOPE**

This specification is for Model# ATEC-24V700-D01 , AC-line powered switching power supply. It features Active PFC (Power Factor Correction) circuits with Full Range Input features, and meets EN61000-3-2.

The specification contained is intended to describe in detail the functions and performance of this product. Any comment or additional requirements to this specification from our customers will be highly appreciated and treated as new target for us to approach.

## **2. REFERENCE DOCUMENTS**

The subject power supply meets the EMI requirements and obtain main safety approvals as following:

### **2.1 EMI REGULATORY**

- FCC Part 15 Subpart J, Class 'B' 115 Vac operation.
- CISPR 22 Class 'B' 230 Vac operation.

## **3. PHYSICAL REQUIREMENTS**

### **3.1 MECHANICAL SPECIFICATIONS**

The mechanical drawing of the subject power supply, which indicates the form factor, location of the mounting holes, location, the length of the connectors, and other physical specifications of the subject power supply. (Please refer to the attachment drawing).

### **3.2 CONNECTOR SPECIFICATIONS**

| <b>Connector</b>    | <b>Qty</b> |
|---------------------|------------|
| <b>20+4 Pin ATX</b> | <b>1</b>   |
| <b>+24V</b>         | <b>3</b>   |
| <b>Molex</b>        | <b>5</b>   |
| <b>+12V 4 + 4</b>   | <b>1</b>   |
| <b>+12V 6+2 Pin</b> | <b>1</b>   |
| <b>+12V 12 Pin</b>  | <b>1</b>   |
| <b>SATA 15 Pin</b>  | <b>1</b>   |

### 3.3 CONNECTOR PIN DESIGNATIONS

The pin designations and color codes are defined as follows:

| Ref ID | Pin No | Wire Color | Signal | Cable Length                   |
|--------|--------|------------|--------|--------------------------------|
| SATA   | 15     | Yellow     | +12V   | 635 +/- 20mm<br>(24" +/- 0.8") |
|        | 14     | Yellow     | +12V   |                                |
|        | 13     | Yellow     | +12V   |                                |
|        | 12     | Black      | GND    |                                |
|        | 11     | Black      | GND    |                                |
|        | 10     | Black      | GND    |                                |
|        | 9      | Red        | +5V    |                                |
|        | 8      | Red        | +5V    |                                |
|        | 7      | Red        | +5V    |                                |
|        | 6      | Black      | GND    |                                |
|        | 5      | Black      | GND    |                                |
|        | 4      | Black      | GND    |                                |
|        | 3      | Orange     | +3.3V  |                                |
|        | 2      | Orange     | +3.3V  |                                |
|        | 1      | Orange     | +3.3V  |                                |

| Ref ID       | Pin No | Wire Color | Signal | Cable Length                   |
|--------------|--------|------------|--------|--------------------------------|
| +12V         | 12     | Green      | PS_ON  | 635 +/- 20mm<br>(24" +/- 0.8") |
|              | 11     | Gray       | PFD    |                                |
|              | 10     | Black      | GND    |                                |
|              | 9      | Black      | GND    |                                |
|              | 8      | Black      | GND    |                                |
|              | 7      | Black      | GND    |                                |
|              | 6      | Purple     | +5VSB  |                                |
|              | 5      | Gray       | PGD    |                                |
|              | 4      | Yellow     | +12V   |                                |
|              | 3      | Yellow     | +12V   |                                |
|              | 2      | Yellow     | +12V   |                                |
|              | 1      | Yellow     | +12V   |                                |
| +12V 6+2 Pin | 2      | Black      | GND    |                                |
|              | 1      | Black      | GND    |                                |
|              | 6      | Black      | GND    |                                |
|              | 5      | Black      | GND    |                                |
|              | 4      | Black      | GND    |                                |
|              | 3      | Yellow     | +12V   |                                |
| +12V 4 + 4   | 2      | Black      | GND    |                                |
|              | 1      | Black      | GND    |                                |
|              | 4      | Yellow     | +12V   |                                |
|              | 3      | Yellow     | +12V   |                                |
|              | 2      | Black      | GND    |                                |
|              | 1      | Black      | GND    |                                |

| Ref ID | Pin No | Wire Color | Signal | Cable Length   |
|--------|--------|------------|--------|--|
| +24V   | 2      | Black      | GND    | Each 635 +/- 20mm<br>(24" +/- 0.8")  |
|        | 1      | Brown      | +24V   |  |
| +24V   | 2      | Black      | GND    |  |
|        | 1      | Brown      | +24V   |  |
| +24V   | 2      | Black      | GND    |  |
|        | 1      | Brown      | +24V   |  |
| Molex  | 4      | Red        | +5V    | 686 +/- 20mm<br>(27" +/- 0.8")   |
|        | 3      | Black      | GND    |  |
|        | 2      | Black      | GND    |  |
|        | 1      | Yellow     | +12V   |  |
| Molex  | 4      | Red        | +5V    |  |
|        | 3      | Black      | GND    |  |
|        | 2      | Black      | GND    |  |
|        | 1      | Yellow     | +12V   |  |
| Molex  | 4      | Red        | +5V    | 762 +/- 20mm, daisy chain each<br>150mm<br>30" +/- 0.8", daisy chain each 6" |
|        | 3      | Black      | GND    |  |
|        | 2      | Black      | GND    |  |
|        | 1      | Yellow     | +12V   |  |
| Molex  | 4      | Red        | +5V    |  |
|        | 3      | Black      | GND    |  |
|        | 2      | Black      | GND    |  |
|        | 1      | Yellow     | +12V   |  |
| Molex  | 4      | Red        | +5V    |  |
|        | 3      | Black      | GND    |  |
|        | 2      | Black      | GND    |  |
|        | 1      | Yellow     | +12V   |  |

| Ref ID       | Pin No | Wire Color      | Signal                      | Cable Length                   |
|--------------|--------|-----------------|-----------------------------|--------------------------------|
| 20+4 Pin ATX | 24     | Black           | GND                         | 635 +/- 20mm<br>(24" +/- 0.8") |
|              | 23     | Red             | +5V                         |                                |
|              | 22     | Red             | +5V                         |                                |
|              | 21     | Red             | +5V                         |                                |
|              | 20     | NA              | NA                          |                                |
|              | 19     | Black           | GND                         |                                |
|              | 18     | Black           | GND                         |                                |
|              | 17     | Black           | GND                         |                                |
|              | 16     | Green           | PS_ON                       |                                |
|              | 15     | Black           | GND                         |                                |
|              | 14     | Blue            | -12V                        |                                |
|              | 13     | Orange<br>Brown | +3.3V<br>+3.3V <sup>1</sup> |                                |
|              | 12     | Orange          | +3.3V                       |                                |
|              | 11     | Yellow          | +12V                        |                                |
|              | 10     | Yellow          | +12V                        |                                |
|              | 9      | Purple          | +5VSB                       |                                |
|              | 8      | Gray            | PG                          |                                |
|              | 7      | Black           | GND                         |                                |
|              | 6      | Red             | +5V                         |                                |
|              | 5      | Black           | GND                         |                                |
|              | 4      | Red             | +5V                         |                                |
|              | 3      | Black           | GND                         |                                |
|              | 2      | Orange          | +3.3V                       |                                |
|              | 1      | Orange          | +3.3V                       |                                |

## **4. ELECTRICAL REQUIREMENTS**

### **4.1 OUTPUT ELECTRICAL REQUIREMENTS**

The subject power supply will meet all electrical specifications as below, over the full operation temperature range and dynamic load regulation.

#### **4.1.1. OUTPUT RATING**

| AC Input  | 100 - 240V 10 - 5A 60 / 50 Hz |       |     |      |      |      |     |       |
|-----------|-------------------------------|-------|-----|------|------|------|-----|-------|
| DC Output |                               | +3.3V | +5V | +12V | +24V | -12V | -5V | +5Vsb |
| 700w      | Max                           | 18A   | 18A | 30A  | 12A  | 1A   | NA  | 3A    |
|           | Min                           | 0A    | 0A  | 0A   | 0A   | 0A   | 0A  | 0A    |
|           | Total                         | 700W  |     |      |      |      |     |       |

(1) Total output for this subject power supply is 700 watts.

(2) 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 be passed at the connector with a 0.1uF ceramic disk capacitor and a 47uF electrolytic capacitor to simulate system loading.

#### **4.1.2. HOLD-UP TIME (@FULL LOAD)**

115V / 60Hz : 16.5 Sec. Minimum.

230V / 50Hz: 17 mSec. Minimum

#### **4.1.3.OUTPUT RISE TIME**

(10% TO 90% OF FINAL OUTPUT VALUE, @FULL LOAD)

115V rms or 230V rms + 5Vdc : 20ms Maximum

#### **4.1.4.SHORT CIRCUIT PROTECTION**

Output short circuit is defined to be a short circuit load of less than 0.1 ohm.

In the event of an output short circuit condition on +24V, +5V or +12V, -12V output, the power supply will shut down and latch off without damage to the power supply. The power supply shall return to normal operation after the short circuit has been removed. Meanwhile, after disconnecting the AC power to draw a line on the time of not less than 5 seconds.

## 4.1.5.OVERLOAD PROTECTION

OPP protection, protection for the full load range of 110% - 150%

The overload protection must be such that the power supply is protected from damage by entering a shutdown condition.

## 4.2. INPUT ELECTRICAL SPECIFICATIONS

### 4.2.1. VOLTAGE RANGE

| PARAMETER  |           | UNITS |
|------------|-----------|-------|
| V-in Range | 100 - 240 | V-rms |

### 4.3.2. INPUT FREQUENCY

|                 |         |
|-----------------|---------|
| INPUT FREQUENCY | 50-60Hz |
|-----------------|---------|

### 4.3.3. INRUSH CURRENT

(Cold start -25 deg. C)

|      |           |
|------|-----------|
| 115V | No damage |
| 230V | No damage |

(No damage)

### 4.3.4. INPUT LINE CURRENT

|      |                        |
|------|------------------------|
| 115V | 10.0 Amps -rms maximum |
| 230V | 5.0 Amps —rms maximum  |

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## 4.3.5 AC Line Transient Specification

AC line transient conditions shall be defined as “sag” and “surge” conditions.

“Sag” conditions are also commonly referred to as “brownout”,

these conditions will be defined as the AC line voltage dropping below nominal voltage conditions.

“Surge” will be defined to refer to conditions when the AC line voltage rises above nominal voltage.

The power supply shall meet the requirements under the following AC line sag and surge conditions.

### AC Line SAG transient performance.

| AC Line Sag (10sec interval between each sagging) |      |                      |                |   |
|---|------|----------------------|----------------|---|
| Duration  | Sag  | Operating AC voltage | Line frequency | Performance criteria                          |
| 0 to 1/2 AC cycle                                 | 95%  | Nominal AC voltage   | 50/60Hz        | No loss of function or performance            |
| >1 AC cycles                                      | >30% | Nominal AC voltage   | 50/60Hz        | Loss of function acceptable, self-recoverable |

### AC Line SURGE transient performance.

| AC Line Surge     |       |                                 |                |                                    |
|-------------------|-------|---------------------------------|----------------|------------------------------------|
| Duration          | Surge | Operating ac voltage            | Line frequency | Performance criteria               |
| Continuous        | 10%   | Nominal AC voltage              | 50/60Hz        | No loss of function or performance |
| 0 to 1/2 AC cycle | 30%   | mid-point of nominal AC voltage | 50/60Hz        | No loss of function or performance |

## 4.4. EFFICIENCY

|        | Full load (100%) | Typical load (50%) | Light load 20% |
|--------|------------------|--------------------|----------------|
| 115VAC | 80%              | 80%                | 80%            |
| 230VAC | 80%              | 80%                | 80%            |

## 5.ENVIRONMENTAL REQUIREMENTS

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

### 5.1. TEMPERATURE RANGE

|           |      |                   |
|-----------|------|-------------------|
| Operating | 700W | 0 to +50 deg. C   |
| Storage   |      | -20 to +80 deg. C |

### 5.2. HUMIDITY

|           |                          |
|-----------|--------------------------|
| Operating | 5-90% RH, Non-condensing |
| Storage   | 5-95% RH, Non-condensing |

### 5.3. VIBRATION

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

Vibration Operating - Sine wave excited, 0.25 G maximum acceleration, 10-250 Hz swept at one octave / min. Fifteen minute dwell at all resonant points, where resonance is defined as those exciting frequencies at which the device under test experiences excursions two times large than non-resonant excursions.

Plane of vibration to be along three mutually perpendicular axes.

### 5.4. SHOCK

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

Storage 40G, 11 mSec. half-sine wave pulse in both directions on three mutually perpendicular axes.

Operating 10G,11 mSec. half-sine wave pulse in both directions on three mutually Perpendicular axes.

## **6. LABELLING**

Label marking will be permanent, legible and complied with all agency requirements.

### **6.1. MODEL NUMBER LABEL**

Labels will be affixed to the sides of the power supply showing the following:

- Manufacturer's name and logo.
- Model no., serial no., revision level, location of manufacturer. - The total power output and the maximum load for each output. - AC input rating.

### **6.2 DC OUTPUT IDENTIFICATION**

Each output connector will be labeled.

## **7. RELIABILITY**

### **7.1. MTBF**

The power supply have a minimum predicted MTBF(MIL-HDBK-217) of 100,000 hours of continuous operation at 25°C, maximum-output load, and nominal AC input voltage.

# ATEC-24V700-D01 Rev-03 Drawing

