TELSTAR ELECTRONICS CORP.

ATEC-68F508

Meet 80 Plus Platinum

Active PFC Circuit / Full Range Input

Safety Meet 62368

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MODEL: ATEC-68F508

Revision History

Rev	Description	Date	Author
0.0	Original	2023.6.12	T.K.

1. GENERAL DESCRIPTION AND SCOPE

This is the specification of Model ATEC-68F508 ; AC-line powered switching power supply with active PFC (Power Factor Correction) circuit, meet EN61000-3-2 and with Full Range Input features. .

Input Power is less than 0.5W at 5Vsb/45mA & 230Vac input at power off mode (PS_ON input at high state) which is comply with EuP Lot 6 year 2013 requirement.

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. REFERENCE DOCUMENTS

The subject power supply will meet 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 indicate 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.

4. ELECTRICAL REQUIREMENTS

4.1 OUTPUT ELECTRICAL REQUIREMENTS

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

4.1.1. OUTPUT RATING

Output	Nominal	Regulation	Ripple/Noise	Min	Max
1	+3.3V	±5%	50mV	0 A	18.0 A
2	+5V	±5%	50mV	0 A	18.0 A
3	+12V	±5%	120mV	0A	40.0A
4	-12V	±10%	120mV	0 A	0.5 A
5	+5VSB	±5%	50mV	0 A	2.5A

(1) The +3.3V and +5V total output shall not exceed 120watts.
(2) total output for this subject power supply is 500 watts.
(3) 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 bypassed at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.

4.1.2. STANDBY STATE

When the power supply is in standby mode; only the 5VSB output is powered on , the power supply should meet the following requirements for meet Energy Star* and to help reduce power in server systems.

Standby State Efficiency

Load	Efficiency
45mA	≧ 45%
550mA	≧ 55%
≧ 1A	≧ 70%

Cable	Output Cable			
1	20+4 Pin			
2	PCIE 6 + 2	PCIE 6 + 2		
3	EPS 8 Pin	EPS 4 + 4		
4	SATA	SATA	SATA	Molex 4 Pin

4.1.3. HOLD-UP TIME (@FULL LOAD)

115V / 60Hz : 17 mSec. Minimum.

230V / 50Hz : 17 mSec. Minimum.

4.1.4.OUTPUT RISE TIME
(10% TO 90% OF FINAL OUTPUT VALUE, @FULL LOAD)

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

4.1.5.OVER VOLTAGE PROTECTION

Voltage Source	Protection Point
+ $3.3V_{dc}$	3.7V-4.8V
+$5.0V_{dc}$	5.7V-7.0V
+$12V_{dc}$	13.4V-16.0V

4.1.6.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 +3.3V, +5V or +12V output, the power supply will shutdown and latch off without damage to the power supply. The power supply shall return to normal operation after the short circuit has been removed and the power switch has been turned off for no more than 2 seconds.

In the event of an output short circuit condition on -12V output, the power supply will not be damaged. The power supply shall return to normal operation as soon as the short circuit has been removed. and the power switch has been turned off for no more than 2 seconds.

4.1.7.OVER CURRENT PROTECTION

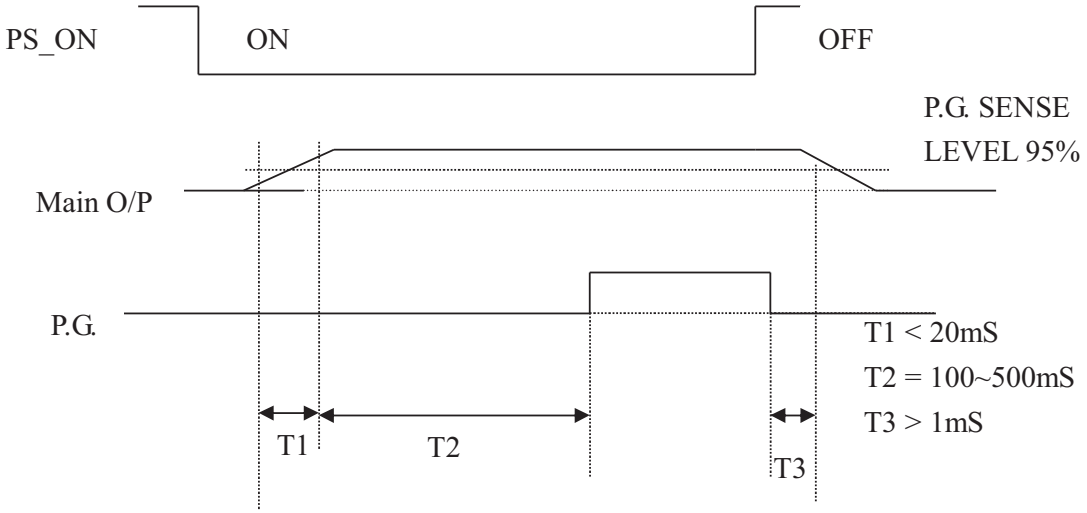
	O.C.P
+5V	35A~50A
+3.3V	30A~50A
+12V	70A~87A

4.1.8.POWER GOOD SIGNAL

The power good signal is a TTL compatible signal for the purpose of initiating an orderly star-up procedure under normal input operating conditions. This signal is asserted (low) until +5Vdc has reached 4.75 volts during power up. Characteristics:

TTL signal asserted (low state) : less than 0.5V while sinking 10mA.
TTL signal asserted (high state): greater than 4.75V while sourcing 500uA.
High state output impedance: less or equal to 1Kohm from output to common.

POWER GOOD @ 115/230V,FULL LOAD	100 –500mSec.
POWER FAIL @115/230V, FULL LOAD	1 mSec. minimum



4.2 Transient Load Requirement

Output	△Step Load Size	Load Slew Rate	Capacitive Load
+3.3V	30% of max load	0.5 A/μs	3300μF
+5V	30% of max load	0.5 A/μs	3300μF
+12V	65% of max load	1.0 A/μs	6600μF
+5Vsb	25% of max load	0.5 A/μs	330μF

4.3. INPUT ELECTRICAL SPECIFICATIONS

4.3.1. VOLTAGE RANGE

PARAMETER		UNITS
V-in Range	90 - 264	V-rms

4.3.2. INPUT FREQUENCY

INPUT FREQUENCY	47–63Hz

4.3.3. INRUSH CURRENT

(Cold start – 25 deg. C)

115V	40A
230V	80A

(No damage)

4.3.4. INPUT LINE CURRENT

115V	6.0 Amps – rms maximum
230V	3.0 Amps – rms maximum

4.4. EFFICIENCY

	Full load (100%)	Typical load (50%)	Light load (20%)
115VAC	89%	92%	90%

4.5. Standby Power Consumption (5Vsb):

Efficiency > 45% @ 5Vsb/45mA &230Vac input (2013 Lot 6)
Efficiency > 55% @ 5Vsb/550mA &230Vac input
Efficiency > 70% @ 5Vsb/1A &230Vac input
Efficiency > 70% @ 5Vsb/4A &230Vac input

4.6.PS_ ON#

PS_ON# is an active-low, TTL-compatible signal that allows a motherboard to remotely control the power supply in conjunction with features such as soft on/off, Wake on LAN+, or wake-on-modem.
When PS_ON# is pulled to TTL low, the power supply should turn on the five main DC output rails: +12VDC,+5VDC,+3.3VDC,-5VDC,and –12VDC. When PS_ON# is pulled to TTL high or open-circuited, the DC output rails should not deliver current and should be held at zero potential with respect to ground. PS_ON# has no effect on the +5VSB output, which is always enabled whenever the AC power is present. Table 15 lists PS_ON# signal characteristics.

The power supply shall provide an internal pull-up to TTL high. The power supply shall also provide debounce circuitry on PS_ON# to prevent it from oscillating on/off at startup when activated by a mechanical switch. The DC output enable circuitry must be SELV-compliant.

Table 15. PS_ON# Signal Characteristics

	Min.	Max.
V_{IL}, Input Low Voltage	0.0V	0.8V
I_{IL}, Input Low Current (Vin = 0.4V)		-1.6mA
V_{IH}, Input High Voltage (Iin = -200 μ A)	2.0V	
V_{IH} OPEN circuit, Iin = 0		5.25V

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	500W	0 to +50 deg. C
Storage		-20 to +80 deg. C

5.2. HUMIDITY

Operating	5 –85% 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 – 0.01g2/ Hz at 5 Hz, sloping to 0.02g2/ Hz at 20 Hz, and maintaining 0.02g2/ Hz from 20Hz to 500Hz. The area under the PSD curve is 3.13gRMS. The duration shall be 20 minutes per axis for all three axes on all samples.

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, 9 mSec. half-sine wave pulse in both directions on three mutually perpendicular axes.

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

6. SAFETY

6.1. LEAKAGE CURRENT

The leakage current from AC to safety ground will not exceed 3.5 mA-rms at 264Vac, 63 Hz.

7. ELECTORMAGNETIC COMPATIBILITY

7.1. RADIATED EMI

The subject power suppy will meet FCC and CISPR 22 requirements under normal load conditions.

8. LABELLING

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

8.1. 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.

8.2. DC OUTPUT IDENTIFICATION

Each output connector will be labeled.

9. RELIABILITY

9.1. MTBF

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