

規格書


SPECIFICATION

品名
STYLE NAME : SWITCHING POWER SUPPLY

型號
MODEL NO. : MP1T-1AF0V48

料號
PART NO. :

版次
REVISION : A2

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Revision

Rev.	Page	Item	Date	Description
A2	12	8.0	APR-25-2019	Modify Mechanical requirements



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1.0 Scope

This specification defines the performance characteristics of a grounded, AC input, 1600watts, 1 output level power supply. This specification also defines world wide safety requirements and manufactures process test requirements.

2.0 Input requirements

2.1 AC Input Voltage, Frequency and Current (Rating: 110V-240Vac, 47-63Hz, 20-10A)

Parameter	Description		
	Min	Typ	Max
Vin(High Line)	180Vac	220Vac (200~240Vac)	264Vac
Vin(Low Line)	90Vac	110Vac (100~127Vac)	140Vac
Input Frequency	47Hz	50/60Hz	63Hz
Max Input Current(High Line)	10A	8A	--
Max Input Current(Low Line)	20A	15A	--
Vin Brown in level	81Vac	85Vac	89Vac
Vin Brown out level	70Vac	75Vac	80Vac

Table 1 – AC Input Voltage , Frequency and Current

2.2 AC Inrush Current

AC line inrush current shall not damage any component nor cause the AC line fuse to blow under any DC conditions and with any specified AC line input voltage and frequency. Repetitive On/Off cycling of the AC input voltage shall not damage the power supply.

20/40 amps @115/230 VAC (at 25 degrees ambient cold start for each power unit)

2.3 Power factor correction / Current Harmonics

PFC can reach the target of 95% @230V,full load, following the standard Of EN 61000-3-2

2.4 Efficiency

The minimum power supply system efficiency shall be > 90%, measured at nominal input voltage 230 V and full loading.

NOTE:

(The different harness conditions and/or the accuracy of measurement instruments affect the test result of output voltage and efficiency. Harness conditions are such as cable length, wire gauge, the connector types, total harness amounts.)

2.5 AC Line Dropout

An AC line dropout of 12ms or less shall not cause any tripping of control signals or protection circuits.

If the AC dropout lasts longer than 16mS the power supply should recover and meet all turn on requirements. The power supply shall meet the regulation requirement over all rated AC voltages, frequencies, and output loading conditions. Any dropout of the AC line shall not cause damage to the power supply. An AC line dropout is defined as a drop in AC line to 0VAC at any phase of the AC line for any length of time.

2.6 AC Line Transient Specification

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

Sag conditions (also referred to as “brownout” conditions) will be defined as the AC line voltage dropping below nominal voltage. Surge will be defined as the AC line voltage rising above nominal voltage.

2.7 AC Line Fast Transient Specification

The power supply shall meet the EN61000-4-5 directive and any additional requirements in IEC1000-4-5:1995 and the Level 3 requirements for surge-withstand capability, with the following conditions and exceptions:

- These input transients must not cause any out-of-regulation conditions, such as overshoot and undershoot, nor must it cause any nuisance trips of any of the power supply protection circuits.
- The surge-withstand test must not produce damage to the power supply.
- The supply must meet surge-withstand test conditions under maximum and minimum DC-output load conditions.

3.0 Output requirements

3.1 Output Current / Loading

The Table 2 define and current rating. The power supply shall meet both static and dynamic voltage regulation requirements for minimum load condition.

Output Voltage	+48V
Max. Load	33.3A(High Line) 30A(Low Line)
Min. Load	0A

Table 2 – Output Current:

Total power:1600W (High Line)

1440W (Low Line)

3.2 DC Voltage Regulation

The power supply output voltages must stay within the following voltage limits when operating at steady state and dynamic loading conditions. All outputs are measured with reference to the return remote sense (ReturnS) signal.

Output Voltage	+48V
Load Reg.	+5/-5%
Line Reg.	±1%

Table 3 – Regulation

3.3 Ripple and noise

The maximum allowed ripple/noise output of the power supply is defined in Table 4.

This is measured over a bandwidth of 0 Hz to 20 MHz at the power supply output connectors. A 10 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor are placed at the point of measurement.

Output Volatage	Ripple	Ripple+Noise
+48V	180mV(P-P)	200mV(P-P)

Table 4 - Ripple and noise

3.4 Dynamic Loading

The output voltages shall remain within the limits specified in Table 5 for the step loading and within the limits specified in Table 6 for the capacitive loading. The load transient repetition rate shall be tested between 50Hz and 5kHz at duty cycle ranging from 10%-90%. The load transient repetition rate is only a test specification. The Δ step load may occur anywhere within the MIN load to the MAX load range.

Note: For dynamic voltage regulation requirements +48V min Loading is 1A.

Output	Δ Step Load Size	Load Slew Rate	Capacitive Load
+48V	65% of max load	0.5 A/ μ s	2200 μ F

Table 5 – Transient Load Requirements

3.5 Capacitive Loading

The power supply shall be stable and meet all requirements with the Table 6 capacitive loading ranges.

Output	MIN	MAX	Units
+48 V	10	12,000	μF

Table 6 – Capacitive Loading Conditions

3.6 Timing Requirements

Item	Description	MIN	MAX	UNITS
Tac_on_delay	Delay from AC being applied to all output voltages being within regulation.		2500	ms
Tvout_rise	Output voltage rise time		20	ms
Tpwok_on	Delay from output voltages within regulation limits to PWOK asserted at turn on.	100	500	ms
Tpwok_holdup	Delay from loss of AC to deassertion of PWOK.	13		ms
Tvout_holdup	Time all output voltages stay within regulation after loss of AC.	16		ms
Tpwok_off	Delay from PWOK deasserted to output voltages dropping out of regulation limits.	1		ms
Tpson_on_delay	Delay from PSON# active to output voltages within regulation limits.	5	400	ms
Tpson_pwok	Delay from PSON# deactive to PWOK being deasserted.		100	ms

Table 8 – Turn On/Off Timing

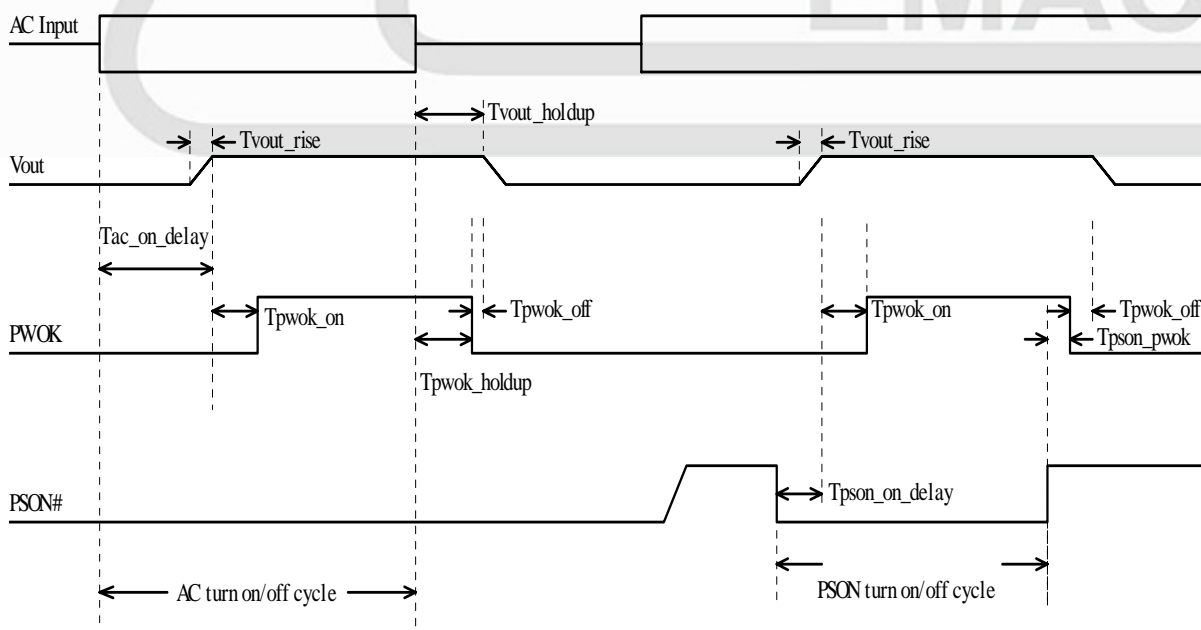


Figure 2: Turn On/Off Timing(Power Supply)

3.7 Remote on/off control

The PSON# signal is required to remotely turn on/off the power supply. PSON# is an active low signal that turns on the +48V power rails. When this signal is not pulled low by the system, or left open, the outputs turn off. This signal is pulled to a standby voltage by a pull-up resistor internal to the power supply. Refer to Figure 2 for timing diagram.

Signal Type	Accepts an open collector/drain input from the system. Pull-up to VSB located in power supply.	
PSON [#] = Low	ON	
PSON [#] = Open or High	OFF	
	MIN	MAX
Logic level low (power supply ON)	0 V	1.0 V
Logic level high (power supply OFF)	2.0 V	5.25 V
Source current, Vpson = low		4 mA
Power up delay: Tpson_on_delay	5 ms	400 ms

Table 9 – PSON[#] Signal Characteristic

3.8 Overshoot at Turn-on / Turn-off

Any output overshoot at turn on shall be less than 10% of the nominal output value.

Any overshoot shall recover to within regulation in less than 10ms.

4.0 Protection

Protection circuits inside the power supply shall cause only the power supply's main outputs to shutdown. If the power supply latches off due to a protection circuit tripping, either a AC cycle OFF for 15 sec, or PSON# cycle HIGH for 1 sec must be able to restart the power supply.

4.1 Over power protection

The power supply shall provide over power protection on the power supply latches all DC output into a shutdown state. Over power of this type shall cause no damage to power supply, after over load is removed and a power on/off cycle is initiated, the power supply will restart.

Trigger point total power min. 110%, max. 150%.

4.2 Over voltage protection

The power supply shall shut down in a latch off mode when the output voltage exceeds the over voltage limit shown in Table 10.

Voltage	Minimum	Maximum	Shutdown
+48	+57V	+65V	Latch Off

Table 10 -Over Voltage Protection

4.3 Short Circuit Protecton

A short circuit placed on any DC output to DC return shall cause no damage.

5.0 Environmental Requirements

5.1 Temperature

Operating Temperature Range:	0°C ~ 50°C
Non-Operating Temperature Range:	-20°C ~ 80°C

5.2 Humidity

Operating Humidity Range:	20% ~ 80%RH non-condensing
Non-Operating Humidity Range:	10% ~ 90%RH non-condensing

5.3 Altitude

Operating Altitude Range:	Sea level to 10,000 ft
Non-Operating Altitude Range:	Sea level to 40,000 ft

6.0 Safety

6.1 Underwriters laboratory (UL).

The power supply designed to meet UL 60601

6.2 Canadian standards association (CUL)

The power supply designed to meet CSA C22.2 No. 60601

6.3 TUV

The power supply shall be designed to meet TUV EN-60601

6.4 CCC Standards

The power supply shall be designed to meet GB/T9254-2008, GB4943.1-2011, GB17625.1-2012.

6.5 Power Line Transient.

The power supply shall be designed to meet the following standards

- a.) EN 61000-4-2(ESD) Criterion B, $\pm 4KV$ by contact, $\pm 8KV$ by air.
- b.) EN 61000-4-4(EFT) Criterion B, $\pm 1KV$.
- c.) EN 61000-4-5(SURGE) Criterion B, Line-Line $\pm 1KV$
Line-Earth $\pm 2KV$.

6.6 RFI / EMI Standards

The power supply shall comply with the following radiated and conducted Emissions standards,

- a.) FCC part 15. class B.
- b.) CISPR 22 (EN 55032). class B.

6.7 Leakage current

Input leakage current from line to ground will be less than 0.35mA rms. Measurement will be made at 240 VAC and 60Hz.

6.8 Production Line Testing

100% of the power supply production must have the following test performed.

Each power shall be marked indicating the testing was done and passed. Typically this is done by stamping or labeling the power supply with "Hi-pot test OK".

6.9 Hi-Pot Testing

Primary to secondary : 3000 VAC for 60 sec.

Primary to FG : 1500 VAC for 60 sec.

For production purpose:

Primary to FG :1500VAC for 1 sec.

6.10 Insulation resistance

Primary to secondary : 20 meg. Ohm min. 500 VDC

Primary to FG : 20 meg. Ohm min. 500VDC

7.0 Reliability

7.1 Burn in

All products shipped to customer must be burn in. The burn in shall be performed at high line voltage

7.2 MTBF (Mean Time Between Failures) :

The MTBF of the power supply shall be calculated utilizing the Part-Count Analysis method of MIL-HDBK-217F.

The calculated MTBF of the power supply is 127,000 hours at ambient temperature 25 degree.

8.0 Mechanical requirements

Physical dimension : 265mm (D) x 103mm (W) x 40mm (H)

9.0 LED Marking and Identification

The power supply is using a bi-color LED: Amber and Green for status indication. Below are table showing the LED states for each power supply operating state.

Table-18 LED Status

Power Supply Condition	LED State
Output ON and OK.	Solid Green
No AC power to all power supplies.	OFF
AC present/ PS off	1Hz Blink Green
AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power.	Solid Amber
Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan.	1Hz Blink Amber
Power supply critical event causing a shutdown; failure, OCP, OVP, Fan fail.	Solid Amber