

MODEL NO. EPS2115 (ACTIVE PFC,1500W)

This specification describes the requirements of 1500Watts switching power supply with an stretch ATX form-factor and EPS12V, +5V standby voltage, remote on/off control, full range line input capability and forced air cooling characteristics.

1. AC INPUT**1.1 AC input requirements**

The input voltage, current, and frequency requirements for continuous operation are stated below.

Table 1 AC Input Line Requirements

Parameter	Min.	Nom.	Max.	Unit
Vin(Full range)	90	100----240	264	VACrms
Vin Frequency	47	60-----50	63	Hz
Iin		18-----9		Arms

Power factor correction (PF)>0.90 at full load.

The power supply must meet inrush requirements for any rated AC voltage, during turn on at any phase of AC voltage, during a single cycle AC dropout condition, during repetitive ON/OFF cycling of AC, and over the specified temperature range (Top). The peak inrush current shall be less than the ratings of its critical components (including input fuse, bulk rectifiers, and surge limiting device).

2. DC OUTPUT**2.1 DC voltage regulation**

Parameter	Range	Min	Nom.	Max	Unit
+3.3V	+/-3%	+3.20	+3.30	+3.40	Volts
+5V	+/-3%	+4.85	+5.00	+5.15	Volts
+12V1,2	+/-3%	+11.64	+12.00	+12.36	Volts
-12V	+/-10%	-13.20	-12.00	-10.80	Volts
+5VSB	+/-5%	+4.75	+5.00	+5.25	Volts

2.2 Load ranges**Load Range**

Parameter	Min(optional)	Nom.	Max	Unit
+3.3V	0.2	-	25	Amps
+5V	0.2	-	25	Amps
+12V1	0.2	-	70	Amps
+12V2	0.2	-	70	Amps
-12V	0	-	0.3	Amps
+5VSB	0	-	3.5	Amps

1. Maximum combined load on +3.3V and +5V outputs shall not exceed 150W.
2. Maximum combined load on +12V outputs shall not exceed 120A(1440W).
3. Maximum continuous total DC output power should not exceed 1500W.
4. Peak total DC output power should not exceed 1600W.
5. Peak power and current loading shall be supported for 12 second.

2.3 Output Ripple

2.3.1 Ripple regulation

Parameter	Ripple&Noise	Unit
+3.3V	50	mVp-p
+5V	50	mVp-p
+12V1,2	120	mVp-p
-12V	120	mVp-p
+5VSB	50	mVp-p

2.3.2 Definition

The ripple voltage of the outputs shall be measured at the pins of the output connector when terminated in the load impedance specified in figure 1. Ripple and noise are measured at the connectors with a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor to simulate system loading. Ripple shall be measured under any condition of line voltage, output load, line frequency, operation temperature.

2.3.3 Ripple voltage test circuit

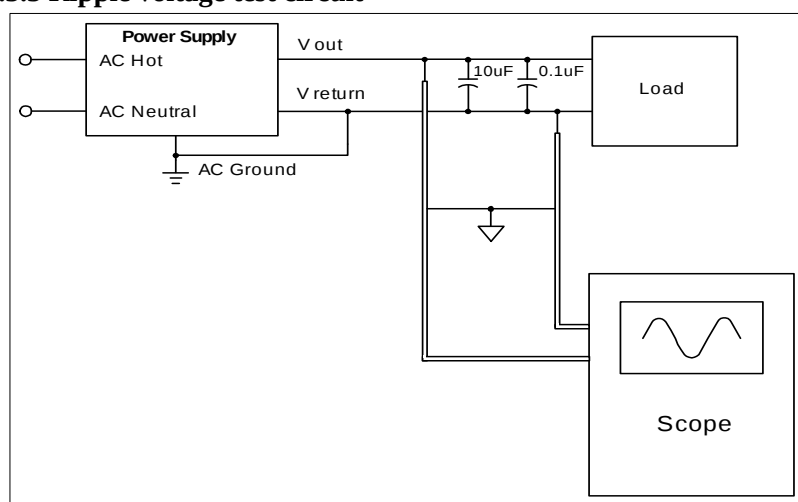


Figure 1. Ripple voltage test circuit

2.4 Overshoot

Any overshoot at turn on or turn off shall be less 10% of the nominal voltage value, all outputs shall be within the regulation limit of section 2.0 before issuing the power good signal of section 4.0.

2.5 Efficiency

Power supply efficiency **20% Loading / 87% , 50% Loading /90% , 100% Loading /87%** at normal AC main voltage (AC input 115V or 230V).

2.6 Remote ON/OFF control

When the logic level "PS-ON" is low, the DC outputs are to be enabled.

When the logic level is high or open collector, the DC outputs are to be disabled.

☞ 3.0 PROTECTION

3.1 Over current protection

The power supply shall have current limit to prevent the +3.3V,+5V,and +12V outputs from exceeding the values shown in the following Table. If the current limits are exceeded the power supply shall shutdown and latch off.

Voltage	Over Current Limit (Iout limit)
+3.3V	28A minimum; 48A maximum
+5V	28A minimum; 48A maximum
+12V1	75A minimum; 100A maximum
+12V2	75A minimum; 100A maximum

3.2 Over Temperature Protection

The power supply will be protected against over temperature conditions caused by loss of fan cooling or excessive ambient temperature. In an OTP condition the PSU will shutdown. When the power supply temperature drops to within specified limits, the power supply shall restore power automatically. The OTP circuit must have built in hysteresis such that the power supply will not oscillate on and off due to temperature recovering condition.

3.3 Over-power protection

The power supply will be shutdown and latch off when output power within 105~150% of rated DC output.

Note: Assurance machine can work at low voltage, full load won't damage machine.

3.4 Under voltage protection.

In an under voltage fault occurs, the supply will latch all DC outputs into a shutdown state when +12V,+5V & +3.3V outputs under 85% of it's maximum value.

3.5 Over voltage protection

The over voltage sense circuitry and reference shall reside in packages that are separate and distinct from the regulator control circuitry and reference. No single point fault shall be able to cause a sustained over voltage condition on any or all outputs. The supply shall provide latch-mode over voltage protection as defined in Table.

output	Minimum	Nominal	Maximum	Unit
+3.3 VDC	3.90	4.20	4.50	Volts
+5 VDC	5.70	6.30	7.00	Volts
+12 VDC	13.3	15.0	16.5	Volts

3.6 Short circuit

An output short circuit is defined as any output impedance of less than 0.1 ohms. The power supply shall shut down and latch off for shorting the +3.3 VDC,+5 VDC,or+12 VDC rails to return or any other rail. Shorts between main output rails and +5VSB shall not cause any damage to the power supply. The power supply shall either shut down and latch off or fold back for shorting the negative rails.+5VSB must be capable of being shorted indefinitely, but when the short is removed, the power supply shall recover automatically or by cycling PS_ON#. The power supply shall be capable of withstanding a continuous short-circuit to the output without damage or overstress to the unit

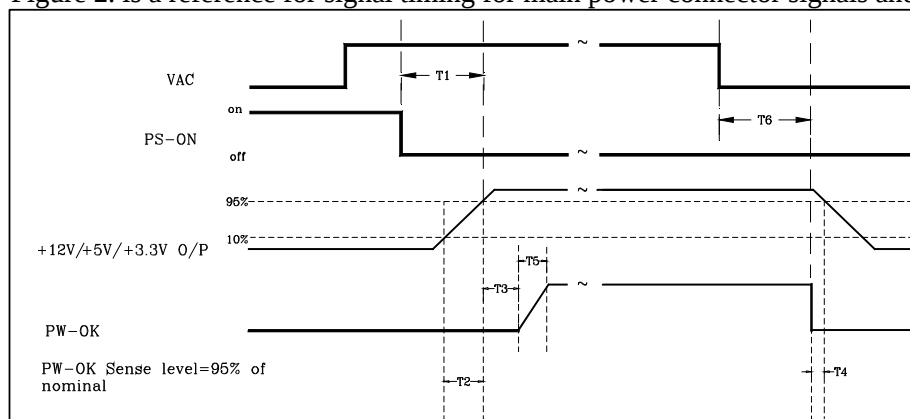
3.7 No load operation

No damage or hazardous condition should occur with all the DC output connectors disconnected from the load. The power supply may latch into the shutdown state.

4. TIMING

4.1 Signal timing drawing

Figure 2. is a reference for signal timing for main power connector signals and rails.



(1)T3: Power good signal turn on delay time (100ms~500ms)

(2)T4: Power good signal turn off delay time (1ms min)

(3)T2: Rise time (0.1~20ms)

(4)T6: Hold up time (17ms min, Tested at 75% Loading)

4.2 Hold up time

When the power loss its input power, it shall maintain **17ms** in regulation limit at normal input voltage. (Tested at 75% of maximum load and 100-240VAC input).

5. ENVIRONMENT

5.1 Operation

Temperature	0 to 40°C
Relative Humidity	10 to 90%, non-condensing

5.2 Shipping and Storage

Temperature	-10 to 50°C
Relative Humidity	5 to 95%, non-condensing

5.3 Altitude

Operating	2000m
Storage	3000m

☞ 6. SAFETY

6.1 The power supply designed to meet IEC62368-1

☞ 7. ELECTROMAGNETIC COMPATIBILITY (EMC)

- 7.1 ELECTROSTATIC DISCHARGE (ESD) – IEC 61000-4-2(EN 61000-4-2).
- 7.2 RADIATED SUSCEPTIBILITY – IEC 61000-4-3(EN 61000-4-3).
- 7.3 ELECTRICAL FAST TRANSIENT / BURST (EFT/B) – IEC 61000-4 -4(EN 61000-4-4).
- 7.4 SURGE – IEC 61000-4-5(EN 61000-4-5).
- 7.5 CONDUCTED SUSCEPTIBILITY – IEC 61000-4-6(EN 61000-4-6).
- 7.6 POWER FREQUENCY MAGNETIC FIELD – IEC 61000-4-8(EN 61000-4-8).
- 7.7 VOLTAGE DIPS – IEC 61000-4-11(EN 61000-4-11).
- 7.8 VOLTAGE FLUCTUATIONS – IEC 61000-3-3 (EN 61000-3-3).
- 7.9 HARMONIC CURRENT EMISSION – IEC61000-3-2(EN 61000-3-2).
- 7.10 EN55032:Class B Radio interference (CISPR 32).
- 7.11 ANSI C63.4-2009 / FCC Part 15 Subpart B / ICES-003 Issue 5 Class B 115VAC operation.

☞ 8. MTBF

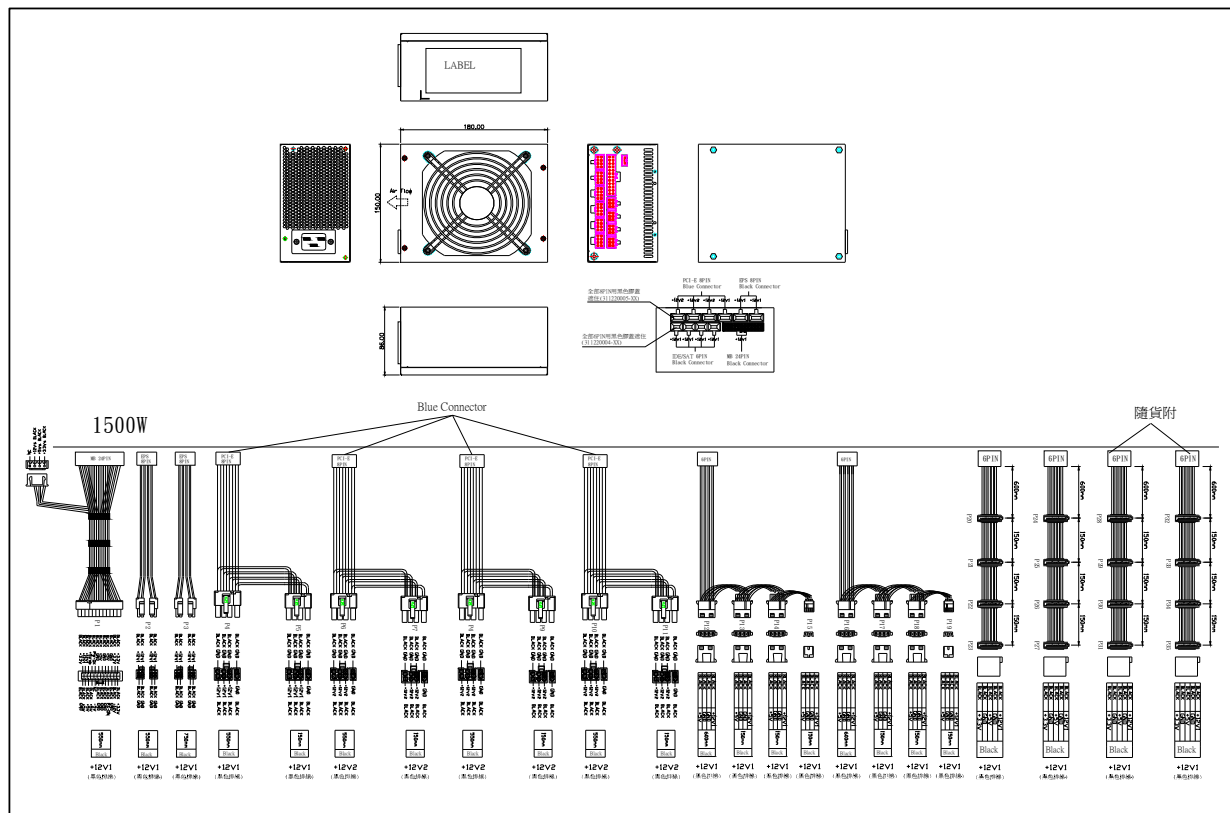
MTBF (mean time between failures) calculation

The demonstrated MTBF shall be 100,000 hours of continuous operation at 25°C, full load, and nominal line. The MTBF of the power supply be calculated in accordance with MIL-HDBK-217F. The DC FAN is not included.

9. MECHANICAL REQUIREMENTS

9.1 Physical dimension (L180*W150*H86mm)

(線材組合 & 外露長度僅供參考，可根據客戶要求更改或新增。)



9.2 Connectors (INTEL approved or equivalent)

P1 Connector (24PIN:Molex 44476-1111 or equivalent)

16AWG wire	Signal	Pin	Pin	Signal	16AWG wire
Orange	+3.3V	13	1	+3.3V	Orange
Brown(22AWG)	+3.3Vsense				
Blue (18AWG)	-12VDC	14	2	+3.3V	Orange
Black	COM	15	3	COM	Black
Green (18AWG)	PS-ON	16	4	+5VDC	Red
				+5Vsence	Red(22AWG)
Black	COM	17	5	COM	Black
Black	COM	18	6	+5VDC	Red
Black	COM	19	7	COM	Black
White	N/C	20	8	PWRGOOD	Gray(18AWG)
Red	+5VDC	21	9	+5Vsb	Purple
Red	+5VDC	22	10	+12V	Yellow
Red	+5VDC	23	11	+12V	Yellow
Black	COM	24	12	+3.3V	Orange

P2,P3 Optional Connector (4+4PIN:Molex 39-01-2060 or equivalent)

16 AWG wire	Signal	Pin	Pin	Signal	16AWG wire
Black	GND	1	3	+12V1	Yellow
Black	GND	2	4	+12V1	Yellow

P4,P5,P6,P7,P8,P9,P10,P11 PCI (6+2)PIN (6+2PIN:Molex AP102XN8T1-204X-RS1 or equivalent)

16AWG wire	Signal	Pin	Pin	Signal	16AWG wire
Black/Yellow	+12V2	1	4	COM	Black
Black/Yellow	+12V2	2	5	COM	Black
Black/Yellow	+12V2	3	6	COM	Black
Black	COM	1	2	COM	Black

P12,P13,P14,P15,P16大4PIN(AMP 1-480424-0 or Molex 8981-04P or equivalent)**P17小4PIN(AMP 171822-4 or equivalent)**

16 AWG wire	Signal	Pin	Pin	Signal	22AWG wire
Yellow	+12V1	1	1	+5VDC	Yellow
Black	COM	2	2	COM	Black
Black	COM	3	3	COM	Black
Red	+5VDC	4	4	+12V	Red

P18-P29 SATA Power Connector (Molex* 88751 or equivalent)(optional)

18AWG wire	Signal	Pin
Yellow	+12V1	1
Black	COM	2
Red	+5V	3
Black	COM	4
Orange	+3.3V	5

10. FAN SPEED CONTROL

Fan voltage varies with the ambient temperature or output power.