

# CASING MACRON TECHNOLOGY CO., LTD

## SPECIFICATIONS FOR 400W ATX SWITCHING POWER SUPPLIES

---

MODEL: MPT-4002P

DATE: 2006/06/07

REV: A3

CHECK BY: Rocky

### GENERAL REQUIRMENTS

This specification describes the requirements of 400 watts switching power supply. With 5V stand-by remote ON/OFF control for ATX-12V Rev:2.2 form factor system. With Passive Power Factor Correction circuit

TABLE OF CONTENTS	PAGE
1. INPUT REQUIREMENTS	3
1-1 AC INPUT VOLTAGE	
1-2 AC INPUT FREQUENCY	
1-3 AC INPUT CURRENT	
1-4 MAXIMUM INRUSH CURRENT	
2. OUTPUT REQUIREMENTS	3
2-1 VOLTAGE	
2-2 RIPPLE & NOISE	
2-3 LINE REGULATION	
2-4 TOLERANCE	
2-5 OUTPUT VOLTAGE	
2-6 MAXIMUM CURRENT	
2-7 MINIMUM CURRENT	
2-8 +3.3V & +5V MAX WATTS	
2-9 OUTPUT RIPPLE DEFINITION	
3. PROTECTION	3
3-1 SHORT CIRCUIT PROTECTION	
3-2 OVER POWER PROTECTION	
3-3 OVER VOLTAGE PROTECTION	
3-4 OVER LOAD PROTECTION	
3-5 NO LOAD OPERATION	
3-6 OVER TEMPERATURE PROTECTION	
4. OVERALL PERFORMANCE	4
4-1 TOTAL OUTPUT POWER	

4-2	EFFICIENCY	
4-3	HOLD UP TIME	
4-4	STABILITY	
4-5	POWER GOOD	
4-6	REMOTE ON/OFF CONTROL	
4-7	OVERSHOOT	
5.	TIMING/CONTROL	5
6.	ENVIRONMENTAL CONDITIONS	6
6-1	OPERATING TEMPERATURE	
6-2	COOLING	
6-3	STORAGE TEMPERATURE	
6-4	STORAGE HUMIDITY	
6-5	VIBRATION	
7.	SAFETY STANDARD	6
7-1	UL	
7-2	TUV	
7-4		
7-5		
8.	ELECTROMAGNETIC COMPATIBILITY (EMC)	6
8-1~8-9	CE	
8-10	FCC	
8-11		
9.	DIELECTRIC WITHSTAND VOLTAGE	7
10.	INSULATION RESISTANCE	
11.	GROUND LEAKAGE CURRENT	7
12.	RELIABILITY	7
12-1	MTBF	
13.	DC OUTPUT WIRE CONFIGURATION	8
13-1	MAIN POWER CONNECTOR 24PIN	
13-2	SATA CONNECTOR 5PIN	
13-3	+12V POWER CONNECTOR (CPU) 4PIN	
13-4	HDD/CD ROM CONNECTOR 4PIN	
13-5	FLOPPY CONNECTOR 4PIN	
14.	DC OUTPUT WIRE LENGTH -1	9
15.	DC OUTPUT WIRE LENGTH -2	10
16.	CHASSIS MECHANICAL DIMENSION AND WIRE LENGTH	11

## 1. INPUT

1-1	AC INPUT VOLTAGE	200 TO 264 VAC
1-2	AC INPUT FREQUENCY	50 HZ
1-3	AC INPUT CURRENT	4.5A RMS MAX. FOR 230 VAC
1-4	MAXIMUM INRUSH CURRENT	80A FOR 220 VAC COLD START

## 2. OUTPUT

		OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4	OUTPUT 5	OUTPUT 6
2-1	VOLTAGE	+5V DC	+12V1DC	+12V2DC	-12V DC	+3.3V DC	+5V SB
2-2	RIPPLE & NOISE	50mV	120mV	120mV	120mV	50mV	50mV
2-3	LINE REGULATION	±1%	±1%	±1%	±1%	±1%	±1%
2-4	TOLERANCE	±5%	-5+5%	-5+5%	±10%	±5%	±5%
2-5	OUTPUT VOLTAGE	4.75~5.25	11.4~12.6	11.4~12.6	-10.8~-13.2	3.14~3.46	4.75~5.25
2-6	MAXIMUM CURRENT	30A	14A	15A	0.8A	28A	2.5A
2-7	MINIMUM CURRENT	0.3A	1A	1A	0A	0.5A	0A
2-8	+3.3V & +5V 200W MAX.						

### 2-9 OUTPUT RIPPLE DEFINITION

The ripple voltage of the output shall be measured at the pins of the output connector when terminated in load impedance specified in Sec 2.

Ripple and noise are measured at the connectors with a 0.1uF ceramic capacitor and a 10 uF electrolytic capacitor to simulate system loading.

## 3. PROTECTION

### 3-1 SHORT CIRCUIT PROTECTION

The power supply shall shutdown and latch off for shorting +5V, +12V1,+12V2,+3.3V ,-12Vrails.

The main output short circuit of any impedance shall less than 0.05 ohms.

### 3-2 OVER POWER PROTECTION

The power supply will be shutdown and latch off when total power over 110%~150% of rated DC output.

Notes:5VSB will be auto-recovery when the fault removed.

### 3-3 OVER VOLTAGE PROTECTION

The power supply shall provide latch-mode over voltage protection as define in below

+12V1/+12V2=13.4V~15.6V, +5V=5.7V~7.0V, +3.3V=3.7V~4.3V

### 3-4 OVER LOAD PROTECTION

There shall be protection from an output over current event. The supply may shutdown form such an event and require power on restart. Testing consists of application of the listed over current value with maximum load on all other outputs.

Over current test values:

+5V : 48A maximum ; +12V1/+12V2 : 20A maximum ; +3.3V : 50A maximum

### 3-5 NO LOAD OPERATION

No damage or hazardous will occur with any output disconnected from load.

### 3-6 OVER TEMPERATURE PROTECTION

The power supply will be shutdown and latch off when fan stop or over temperature situation.

## OVERALL PERFORMANCE

### 4-1 TOTAL OUTPUT POWER

400W continue maximum at full load.

### 4-2 EFFICIENCY

70% minimum at normal AC input voltage and full load.

### 4-3 HOLD UP TIME

14ms at maximum load and normal AC input voltage.

### 4-4 STABILITY

+0.5% after 24 hours warm up.

#### 4-5 POWER GOOD

TTL compatible signal out with 100 mS to 500 mS delay after power setup,  
Power good signal turn to low at least 1 mS before +5V drop below 4.75V.

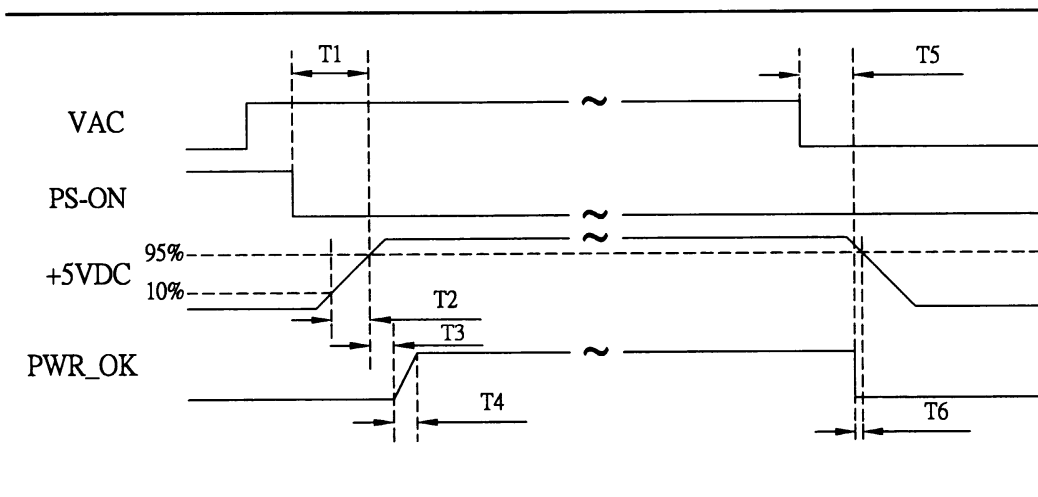
#### 4-6 REMOTE ON/OFF CONTROL

When the logic level “PS-ON” is low, the DC outputs are to be enabled.  
When the logic level “PS-ON” is high or open collector, the DC outputs are to be disabled.

#### 4-7 OVERSHOOT

Any overshoot at turn on or turn off shall be less 10% of the normal voltage value on all DC outputs.

### 5. TIMING/CONTROL



- T1 : POWER ON TIME ( $T1 < 500\text{MS}$ )
- T2 : RISE TIME ( $0.1\text{MS} \leq T2 \leq 20\text{MS}$ )
- T3 : PWR\_OK DELAY ( $100\text{MS} < T3 < 500\text{MS}$ )
- T4 : PWR\_OK RISE TIME ( $T4 \leq 10\text{MS}$ )
- T5 : HOLD UP TIME ( $T5 \geq 14\text{MS}$ )
- T6 : POWER DOWN WARNING ( $T6 \geq 1\text{MS}$ )

## 6. ENVIRONMENTAL CONDITIONS

6-1	OPERATING TEMPERATURE	0 TO 40 DEGREE C
6-2	COOLING	TEMPERATURE CONTROLLER 8+9 CM ONE BALL BEARING FAN
6-3	STORAGE TEMPERATURE	-40°C TO+ 70°C
6-4	STORAGE HUMIDITY	OPERATING TO 85% RELATIVE HUMIDITY NON-OPERATING TO 95% RELATIVE HUMIDITY
6-5	VIBRATION	1.0GRMS,IRIENTATION:X,Y,Z(3 AXES) 30 MIN. IN EACH AXIS FREQUENCY:5~500Hz

## 7. SAFETY STANDARD

7-1 Underwrites Laboratory (UL) recognition.

The power supply designed to meet UL 1950

7-3 The power supply must bear the German Bauart Mark from TUV.

7-4

7-5

## 8. ELECTROMAGNETIC COMPATIBILITY (EMC)

8-1 EN 55022 Class B 1998 Conducted and Radiated

8-2 EN 61000-4-2 1995/A1:1998 ESD

8-3 EN 61000-4-3 1995 RS

8-4 EN 61000-4-4 1995/A1:2001 EFT/Burst

8-5 EN 61000-4-5 1995/A1:2001 Surge

8-6 EN61000-4-6 1996/A1:2001 Injected Current

- 8-7 EN 61000-4-8 1993/A1:2001 Power Magnetic
- 8-8 EN 61000-4-11 1994/A1:2001 Voltage Dips
- 8-9 EN 61000-3-2 2000 Harmonic
- 8-10 EN61000-3-3 1995/A1:2001
- 8-11 The 47 CFR, Part 2 and Part 15 of FCC Rules  
Test procedures: ANSI C63.4 1992

## 9. DIELECTRIC WITHSTAND VOLTAGE

9-1	INPUT TO GROUND	2121 VDC 1 min 10 mA
9-2	INPUT TO OUTPUT	4242 VDC 1 min 10 mA

## 10. INSULATION RESISTANCE

10-1	INPUT TO GROUND	>50 M $\Omega$ MINIMUM
10-2	INPUT TO OUTPUT	>50 M $\Omega$ MINIMUM

## 11. GROUND LEAKAGE CURRENT

The power supply ground leakage current shall be less than 3.5mA.

## 12. RELIABILITY

### 12-1 MEAN TIME BETWEEN FAILURE:

The demonstrated MTBF shall be 100000 hours of continuous operation at 25 Deg Celsius Ambient.

Full load, 80% confidence limit and normal line. The MTBF of the power supply shall be calculation in accordance with MIL-STD-217D/E. The DC FAN is not included.

### 13. DC OUTPUT WIRE CONFIGURATION

#### 13-1 MAIN POWER CONNECTOR 20+4PIN

PIN	OUTPUT	COLOR	COLOR	OUTPUT	PIN
1	+3.3VDC	ORANGE	ORANGE	+3.3V DC	13
2	+3.3VDC	ORANGE	BLUE	-12V DC	14
3	COM	BLACK	BLACK	COM	15
4	+5VDC	RED	GREEN	PS-ON	16
5	COM	BLACK	BLACK	COM	17
6	+5VDC	RED	BLACK	COM	18
7	COM	BLACK	BLACK	COM	19
8	POK	GRAY	N.C	---	20
9	+5Vsb	PURPLE	RED	+5V DC	21
10	+12V1DC	YELLOW	RED	+5V DC	22
11	+12V1DC	YELLOW	RED	+5V DC	23
12	+3.3VDC	ORANGE	BLACK	COM	24

#### 13-2 SERIAL ATA POWER CONNECTOR 5WIRE

WIRE	OUTPUT	COLOR
5	+3.3VDC	ORANGE
4	COM	BLACK
3	+5VDC	RED
2	COM	BLACK
1	+12V1DC	YELLOW

#### 13-3 +12V POWER CONNECTOR (CPU) 4PIN

PIN	OUTPUT	COLOR	COLOR	OUTPUT	PIN
1	COM	BLACK	YEL/BLK	+12V2	3
2	COM	BLACK	YEL/BLK	+12V2	4

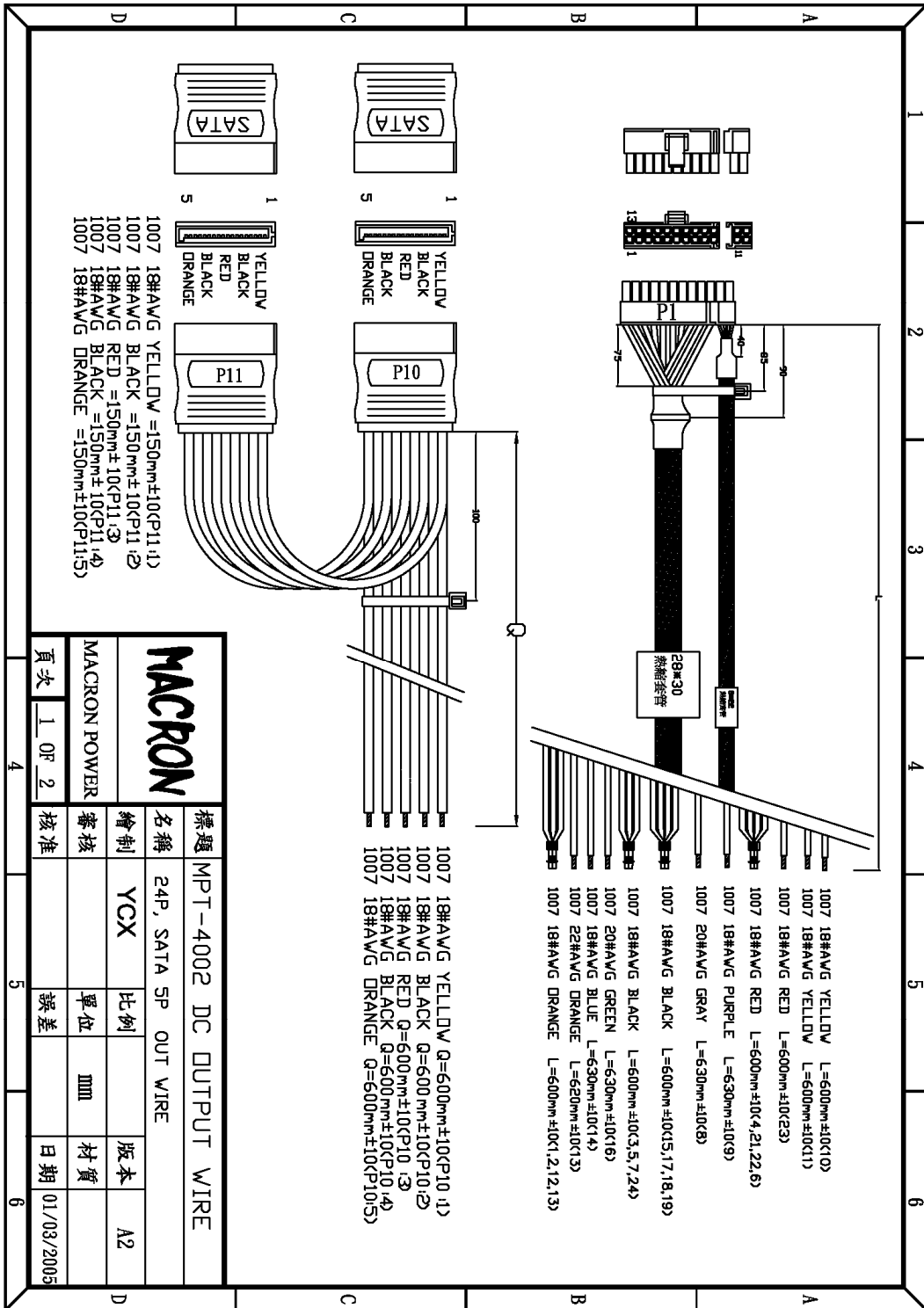
#### 13-4 HDD/CD ROM CONNECTOR 4PIN

PIN	OUTPUT	COLOR
1	+12V1	YELLOW
2	COM	BLACK
3	COM	BLACK
4	+5V	RED

#### 13-5 FLOPPY CONNECTOR 4PIN

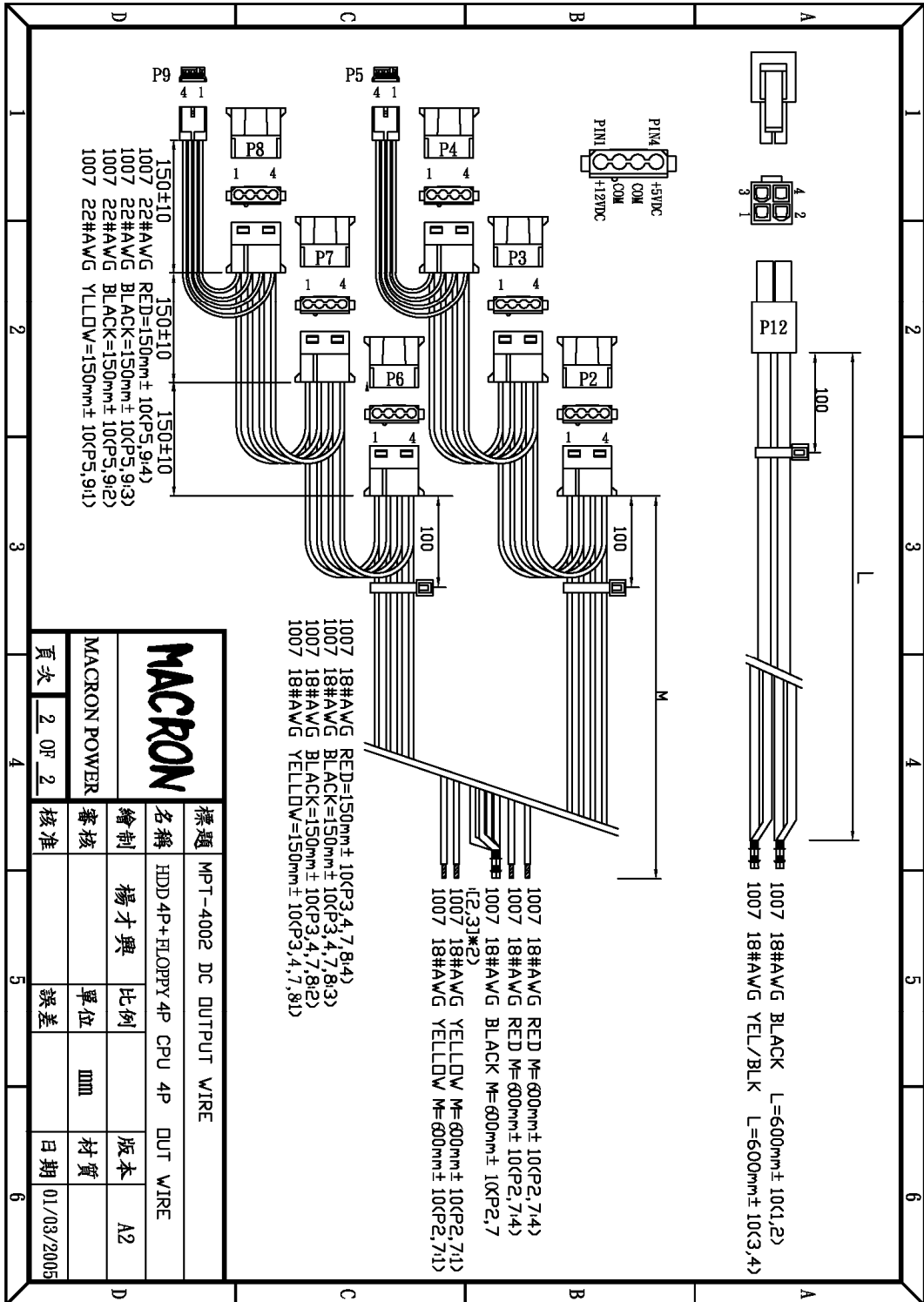
PIN	OUTPUT	COLOR
1	+12V1	YELLOW
2	COM	BLACK
3	COM	BLACK
4	+5V	RED

# 14.DC OUTPUT WIRE LENGTH -1



<b>MACRON</b>		標題	MPT-4002 DC OUTPUT WIRE		
		名稱	24P, SATA SP OUT WIRE		
MACRON POWER		繪制	YCX	比例	版本
頁次		審核		單位	A2
1_0F_2		核准		mm	日期
4				誤差	01/03/2005
					6

# 15.DC OUTPUT WIRE LENGTH -2



		標題	MP-T-4002 DC OUTPUT WIRE		
		名稱	HDD 4P+ FLOPPY 4P CPU 4P OUT WIRE		
繪制	楊才興	比例		版本	A2
審核		單位	mm	材質	
頁次	2 OF 2	核准		日期	01/03/2005
			誤差		

