

Power supply for NP4201MF02**DESCRIPTION**

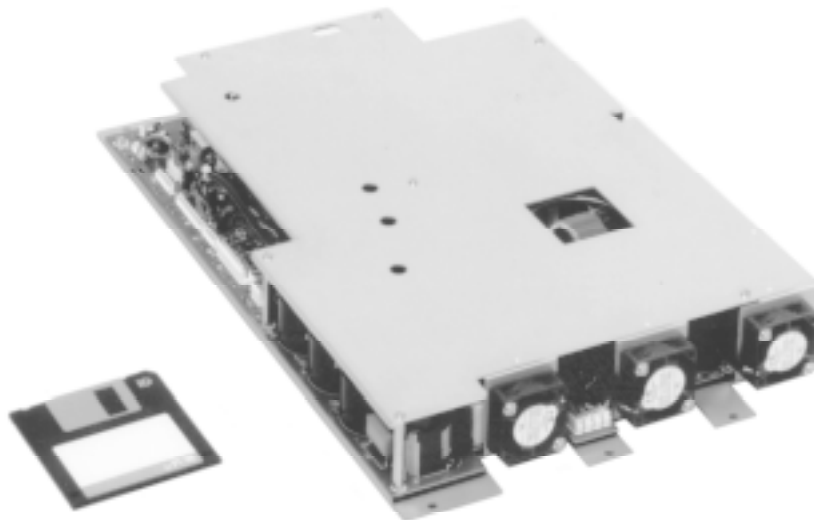
The power supply NP01PS has been developed for evaluation purpose of NP4201MF02 (42-inch PDP module). The input voltage ranges from 100 Vac to 240 Vac, which covers most specifications throughout the world. The NP01PS has power outputs for a PDP module, video signal interface and audio circuits. The NP01PS has been developed with the priority to realize a better characteristic performance rather than cost.

FEATURES

- Specially designed power supply for the NP4201MF02
- Power sources for analog processing and audio circuits are included.
- Compact size match with the power supply space in the NP4201MF02
- High power conversion efficiency

APPLICATION

- Power source of the NP4201MF02



The information in this document is subject to change without any notice

INPUT CHARACTERISTICS

1) Input voltage

AC 100 / 120 / 220 / 240 V \pm 10%, 50 / 60 Hz
(Voltage range: AC 90 to 264 V)

2) Input rush current

Less than 50 A_{0-P (max.)} at 264 V

OUTPUT

1) Output voltage characteristics

No.	Output	Symbol	Rated Voltage (V)	Adjustable range (V)	Voltage stability ^{Note 7}	Rated output current (A)	Output current range (A)	Ripple/noise ^{Note 8} (mVp-p)	Rated power (W)	Maximum power (W)
1	PDP sustain voltage ^{Note 1}	Vs	-180	-160 to -190	\pm 5 V	1.8	0.1 to 2.1	500/---	324	399
2	PDP data write voltage ^{Note 2}	Vd	+75	+65 to +80	\pm 2 V	1.07	0.005 to 1.7	250/ 500	80	136
3	Logic (+5 V) ^{Note 3}	D+5	+5	+5 to +5.5	\pm 5%	8.0	4.0 to 9.0	30/300	40	49.5
4	Analog (+14 V) ^{Note 4}	A+14	+14	Fixed	\pm 5%	1.0	0.1 to 1.5	50/400	14	21
5	Analog (+7 V) ^{Note 5}	A+7	+7	Fixed	+6.5 V to +9.0 V	1.0	0.1 to 1.5	30/100	7	10.5
6	Fan	F+12	+12	+8 to +13	\pm 10%	1.0	0.8 to 1.6	50/500	12	20.8
7	Stand by ^{Note 6}	M+5	+5	Fixed	\pm 5%	0.3	0.1 to 0.5	50/400	1.5	2.5
8	Audio	S+13	+13	Fixed	+13 V to +19.2 V	2.5	0.1 to 3.5	50/500	20 ^{Note 9}	45.5
	Total maximum power	---	---	---	---	---	---	---	---	500 ^{Note 10}

- Notes**
1. Set the voltage to the specified voltage value on the label affixed to each PDP module.
 2. Set the voltage to the specified voltage value on the label affixed to each PDP module.
 3. Power source shared by the PDP module and the external interface circuit.
 4. The voltage is utilized to make +12 V low noise power source for the analogue circuit through the series regulator.
 5. The voltage is utilized to make +5 V low noise power source for the analogue circuit through the series regulator.
 6. Power source for the stand by control circuit, which always outputs a voltage of +5 V, after connection with the AC input.
 7. Includes input fluctuation, load fluctuation and temperature drift.
 8. Connect a dummy load which consumes the rated current and a capacitor (47 μ F) to the end of the 700-mm AWG #20 wire, and measure the noise level at both ends of the capacitor.
 9. Rated power. Set the peak power to 45.5 W (upper limit) or less.
 10. Operation over the upper limit may cause power supply failure. Design the PLE external circuit characteristic in accordance with the PDP module PLE design rules, so that the total power (W) does not exceed the upper limit.

2) Output protection

No.	Power output	Symbol	Overcurrent protector	Overvoltage protector	Lower voltage protector
1	PDP sustain voltage	Vs	Current limiter operates over 3.0 A	Shutdown operates under 220 V	Shutdown operates under 150 V
2	PDP data write voltage	Vd	Current limiter operates over 1.8 A	Shutdown operates between 85 V to 96 V	Shutdown operates under 58 V
3	Logic (+5 V)	D+5	Current limiter operates under 13 A	Shutdown operates under 6.8 V	Shutdown operates under 4.5 V
4	Analog (+14 V)	A+14	No protection	No protection	No protection
5	Analog (+7 V)	A+7	No protection	No protection	No protection
6	Fan	F+12	No protection	No protection	No protection
7	Stand-by	M+5	No protection	No protection	No protection
8	Audio	S+13	Current limiter operates over 3.5 A	No protection	No protection

3) Stand-by power consumption

Condition: Stand-by load current = 0.3 A

AC100 V input: 5 W rms. max.

AC230 V input (TCO 95 standard power off mode): 8 W rms. max.

CONTROL AND PROTECTION SIGNALS

1) Functions of control and protection signals

“POWER” signal: Turn the low voltage power (D+5, A+14, A+7, F+12, S+13) ON/OFF and the high voltage power (Vs, Vd) OFF.

“POSAVE” signal: Turn the high voltage power (Vs, Vd) ON/OFF.

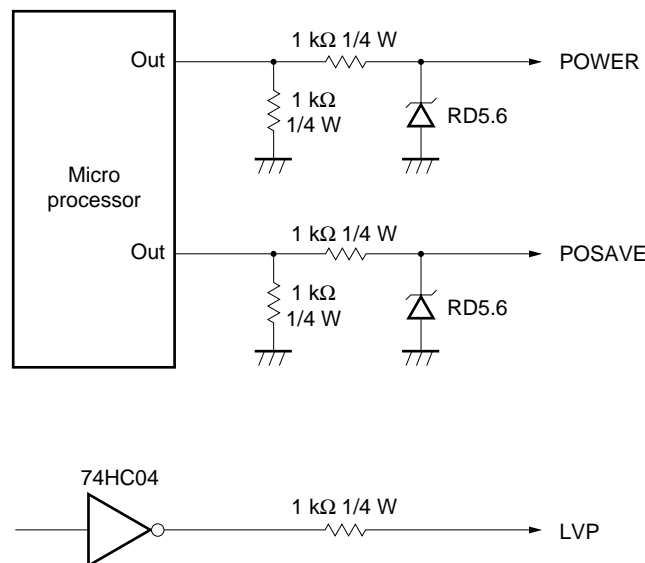
“LVP” signal: Shut down the output voltage other than Stand-by power (M+5).

This signal is disable for about a second after turning the high voltage power ON.

2) Electrical characteristics

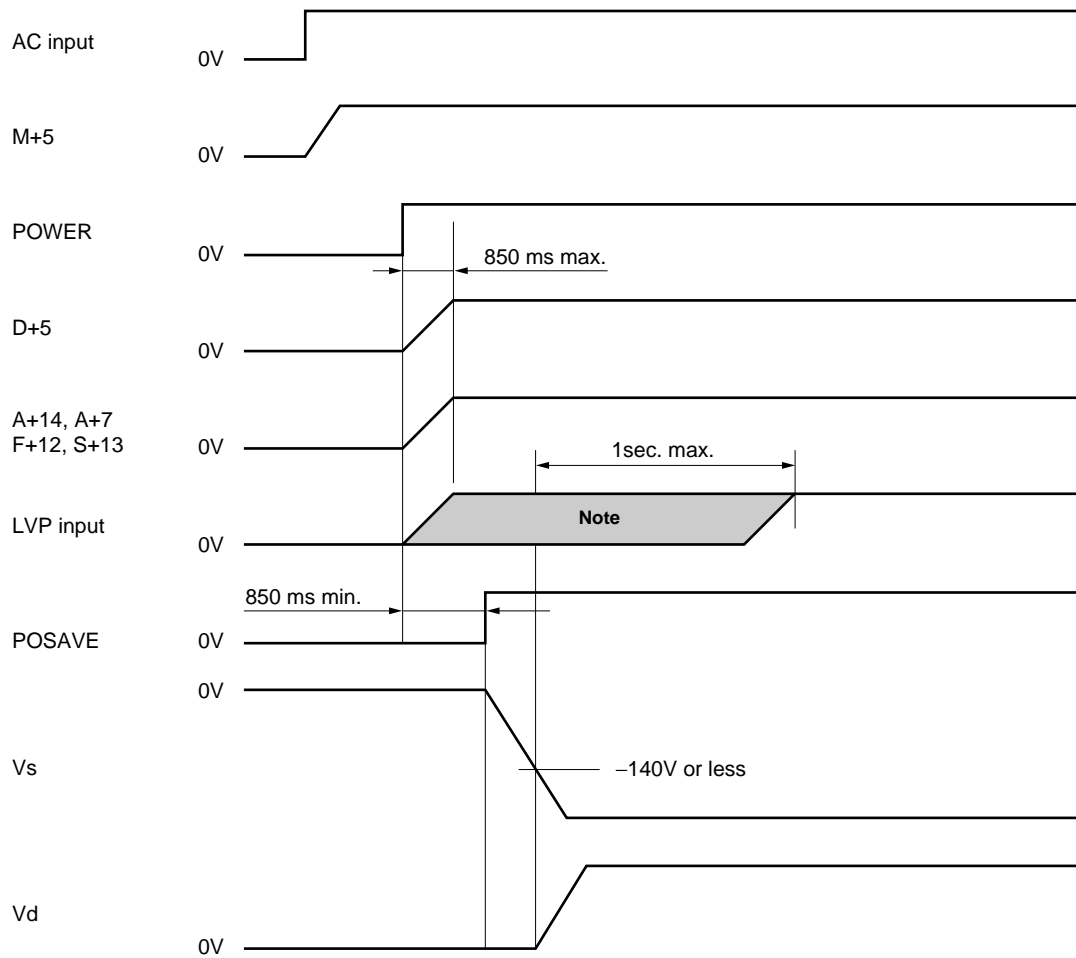
Signal	Item	Symbol	Min.	Typ.	Max.	units	I/O current	Operating mode
POWER	High level input voltage	V _{IH}	4.5	–	5.5	V	2 to 5 mA input (SINK)	Low voltage power ON
	Low level input voltage	V _{IL}	0	–	0.3	V	---	Low voltage power OFF, High voltage power OFF
POSAVE	High level input voltage	V _{IH}	4.5	–	5.5	V	---	High voltage power ON
	Low level input voltage	V _{IL}	0	–	0.3	V	2 mA max. output (SOURCE)	High voltage power OFF
LVP	High level input voltage	V _{IH}	4.5	–	5.5	V	---	Normal operation
	Low level input voltage	V _{IL}	0	–	0.3	V	3 mA max. output (SOURCE)	Shutdown

3) Example of control signal driver circuits



POWER ON/OFF SEQUENCE

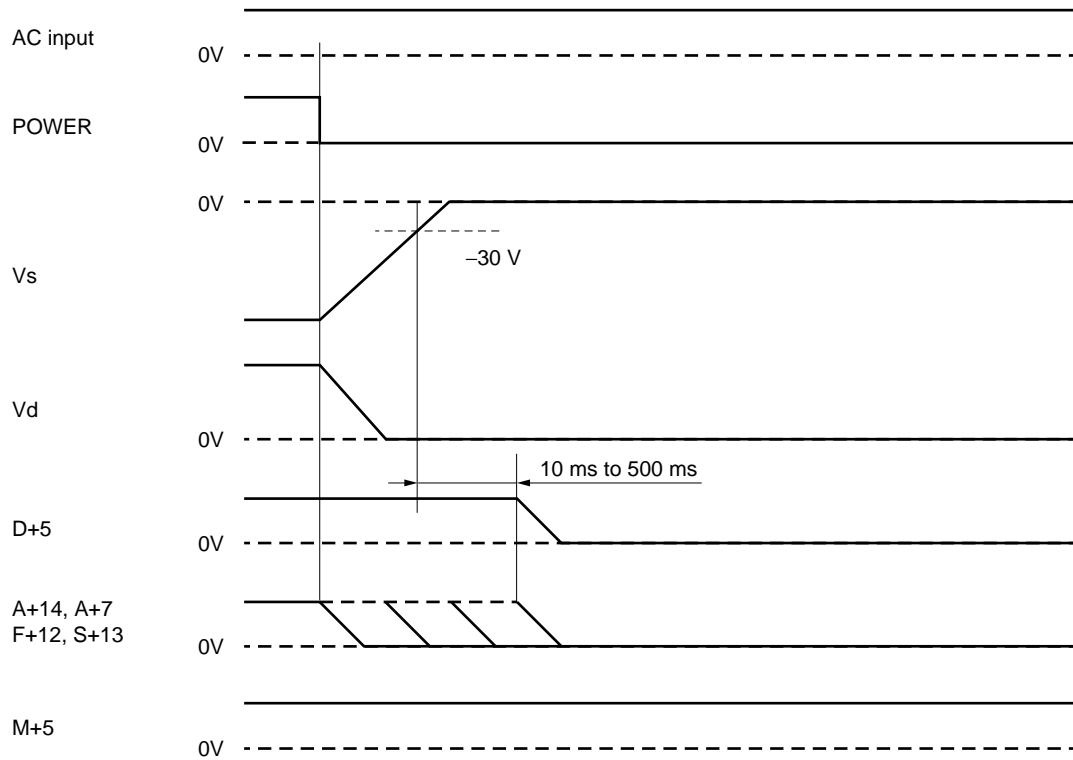
1) Power ON sequence



Note LVP signal is disable while the shadowed period.

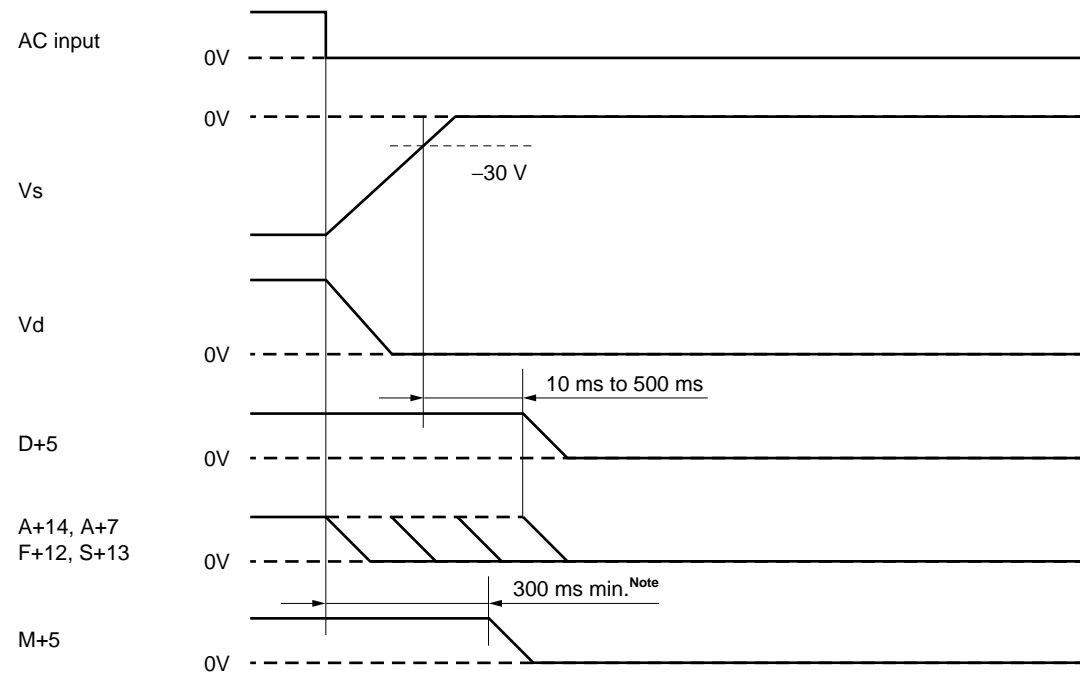
2) Power OFF sequence

(when turning power off using POWER signal without disconnect the AC input)



3) Power OFF sequence

(by turning the AC input off)



Note When output current is 0.2 A.

CONNECTOR PIN ASSIGNMENT

As for the location of the connectors, please refer to the Figure 3.

1) AC power inputs connectors

Name	Function	Input terminal	Terminal for connecting cable
AC-L	AC input	250 TAB	250 receptacle
AC-N	AC input	250 TAB	250 receptacle
FG1	Frame ground	187 TAB	187 receptacle
FG2	Signal ground	187 TAB	187 receptacle

Input terminal: Fasten terminal (AMP)

2) Connector PM (Power output for Analog Interface circuit, and control signal input)

Pin number	Signal name	Comment
1	F.GND	FAN GND
2	N.C.	N.C.
3	N.C.	N.C.
4	F.+12	FAN +12 V
5	D+5.GND	Digital GND
6	D+5.GND	Digital GND
7	D+5.GND	Digital GND
8	D+5	Digital +5 V
9	D+5	Digital +5 V
10	D+5	Digital +5 V
11	N.C.	N.C.
12	POSAVE	Remote control input for turning the High voltage power ON/OFF.
13	POWER	Remote control input for turning the Low voltage power ON/OFF and turning the High voltage power OFF.
14	M+5	Power for the Stand-by circuit.

Power supply side connector: B14B-EH (J.S.T TRADING COMPANY, LTD)

Mating connector: EHR-14 (housing), SHE-001T-P0.6 (contact)

Note The N.C. terminals must be kept open.

3) Connector PQ (Power output for the Remote control circuit)

Pin number	Signal name	Comment
1	A+7.GND	Analog +7 V. GND
2	A+7	Analog +7 V
3	N.C.	N.C.
4	M+5.GND	Stand-by power +5 V. GND
5	M+5	Stand-by power +5 V

Power supply side connector: B5B-EH (J.S.T TRADING COMPANY, LTD)

Mating connector: EHR-5 (housing), SHE-001T-P0.6 (contact)

Note The N.C. terminal must be kept open.

4) Connector PA (Power output for the Audio circuit)

Pin number	Signal name	Comment
1	A+14.GND	Analog +14 V. GND
2	A+14	Analog +14 V
3	S+13.GND	Audio. GND
4	S+13.GND	Audio. GND
5	S+13	Audio +13 V
6	S+13	Audio +13 V

Power supply side connector: B6B-EH (J.S.T TRADING COMPANY, LTD)

Mating connector: HER-6 (housing), SHE-001T-P0.6 (contact)

5) Connector PD (Power output for the PDP module)

Pin number	Signal name	Comment
1	D+5.GND	Digital. GND
2	D+5.GND	Digital. GND
3	D+5	Digital +5 V
4	D+5	Digital +5 V

Power supply side connector: B4B-VH (J.S.T TRADING COMPANY, LTD)

Mating connector: VHR-4N (housing), BVH-21T-P1.1 or SVH-21T-P1.1 (contact)

6) Connector PN (Power output for the Analog interface circuit)

Pin number	Signal name	Comment
1	A+7.GND	Analog +7 V. GND
2	A+7.GND	Analog +7 V. GND
3	A.+7	Analog +7 V
4	A.+7	Analog +7 V
5	A+14.GND	Analog +14 V. GND
6	A+14.GND	Analog +14 V. GND
7	A.+14	Analog +14 V
8	A.+14	Analog +14 V

Power supply side connector: B8B-EH (J.S.T TRADING COMPANY, LTD)

Mating connector: EHR-8 (housing), SHE-001T-P0.6 (contact)

7) Connector PV (Power output for another analog circuit)

Pin number	Signal name	Comment
1	A+7.GND	Analog +7 V. GND
2	A+7	Analog +7 V
3	A+14.GND	Analog +14 V. GND
4	A+14	Analog +14 V

Power supply side connector: B4B-EH (J.S.T TRADING COMPANY, LTD)

Mating connector: EHR-4 (housing), SHE-001T-P0.6 (contact)

8) Connector PH (Power output for the PDP module)

Pin number	Signal name	Comment
1	Vs	PDP sustain voltage
2	Vs	PDP sustain voltage
3	N.C.	N.C.
4	Vd	PDP data write voltage
5	Vs.GND	Vs. GND
6	Vs.GND	Vs. GND
7	LVP	When an abnormal status occurs in the PDP module, this signal shuts down all the power outputs except M+5. Normally this pin connected with ALARM2 in PDP module.
8	Vd.GND	Vd. GND
9	N.C.	N.C.
10	N.C.	N.C.

Power supply side connector: B10P-VH (J.S.T TRADING COMPANY, LTD)

Mating connector: VHR-10N (housing), BVH-21T-P1.1 or SVH-21T-P1.1 (contact)

Figure 1. POWER SUPPLY CONNECTOR INTERNAL CONNECTIONS

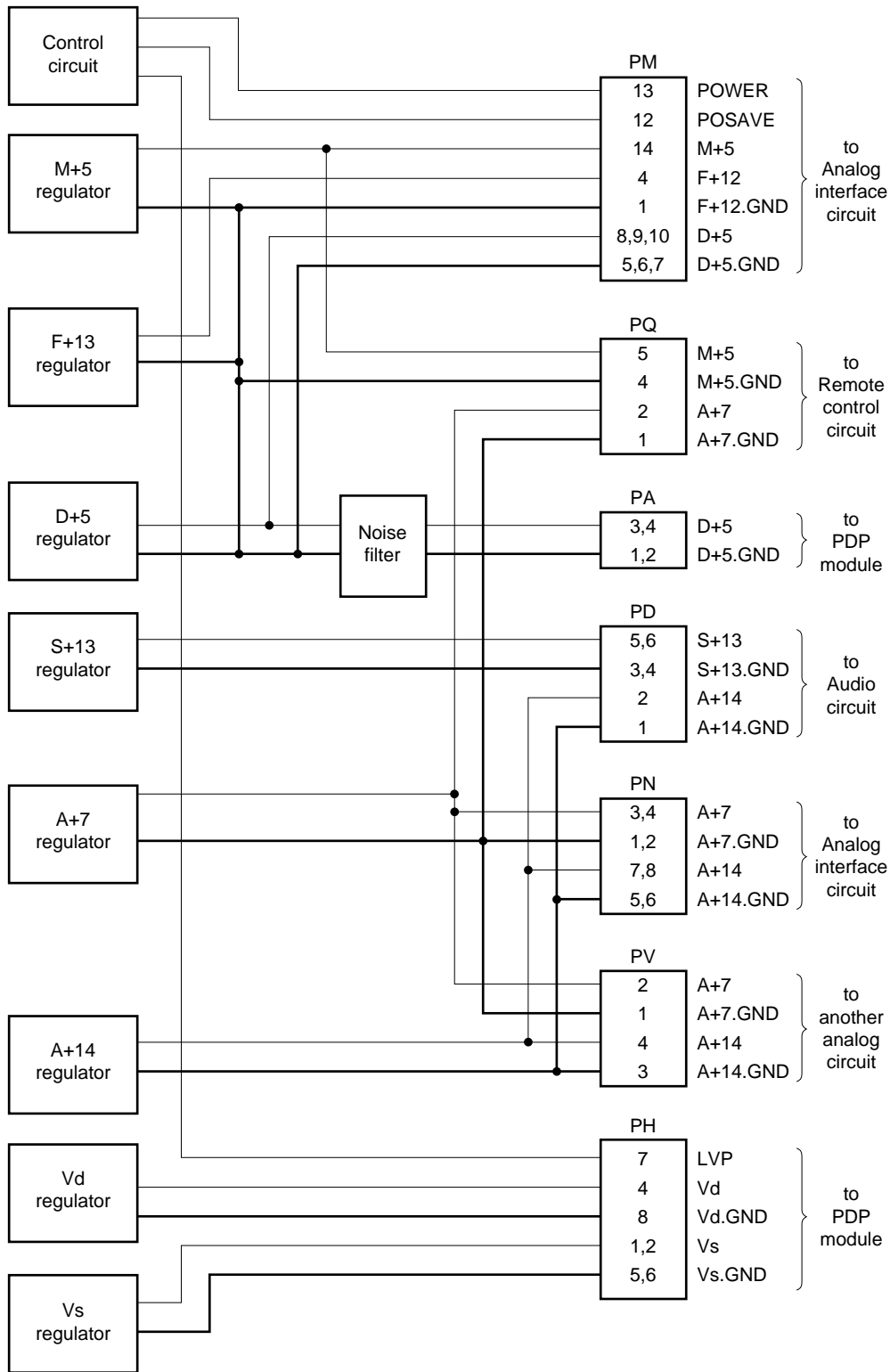
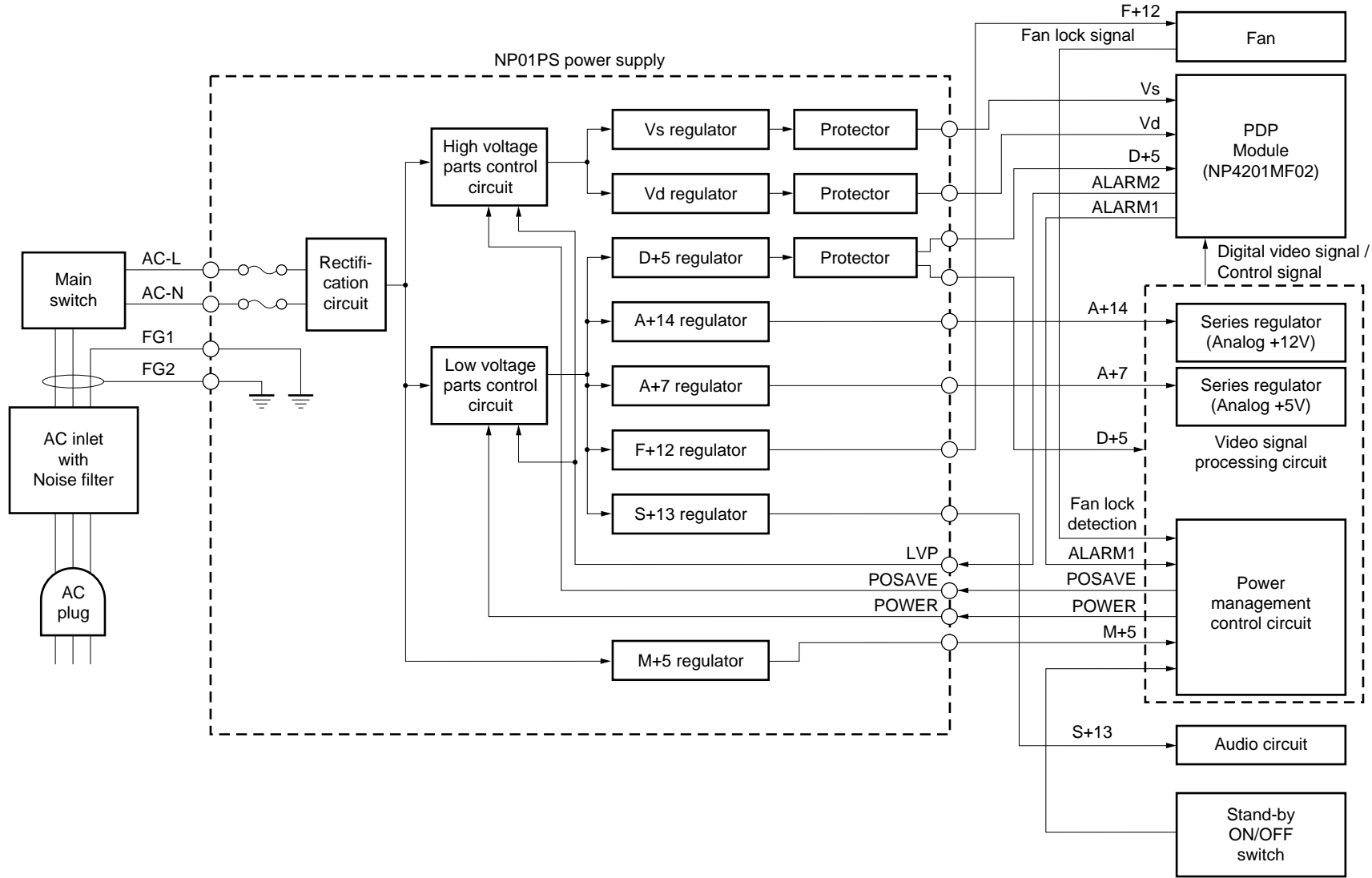


Figure 2. NP01PS Power Supply Connection Block Diagram



GENERAL SPECIFICATIONS

1) External dimensions

437(W) × 280(D) × 55(H) mm

(Refer to the attached drawing Figure 3.)

2) Weight

4.5 kg

OPERATING CONDITIONS

1) Operating environment conditions

1-1) Temperature: 0 to +50 degree centigrade

1-2) Humidity: 20 to 80 % RH (without condensation)

1-3) Atmospheric pressure: 800 to 1100 hPa

2) Storage environment conditions

2-1) Temperature: -20 to +60 degree centigrade

2-2) Humidity: 10 to 90 %RH (without condensation)

2-3) Atmospheric pressure: 700 to 1100 hPa

MECHANICAL SPECIFICATIONS

1) Vibration (Operating)

1 G, 5 to 100 Hz (sweep time:4 minutes), 3-directions, 30 minutes each

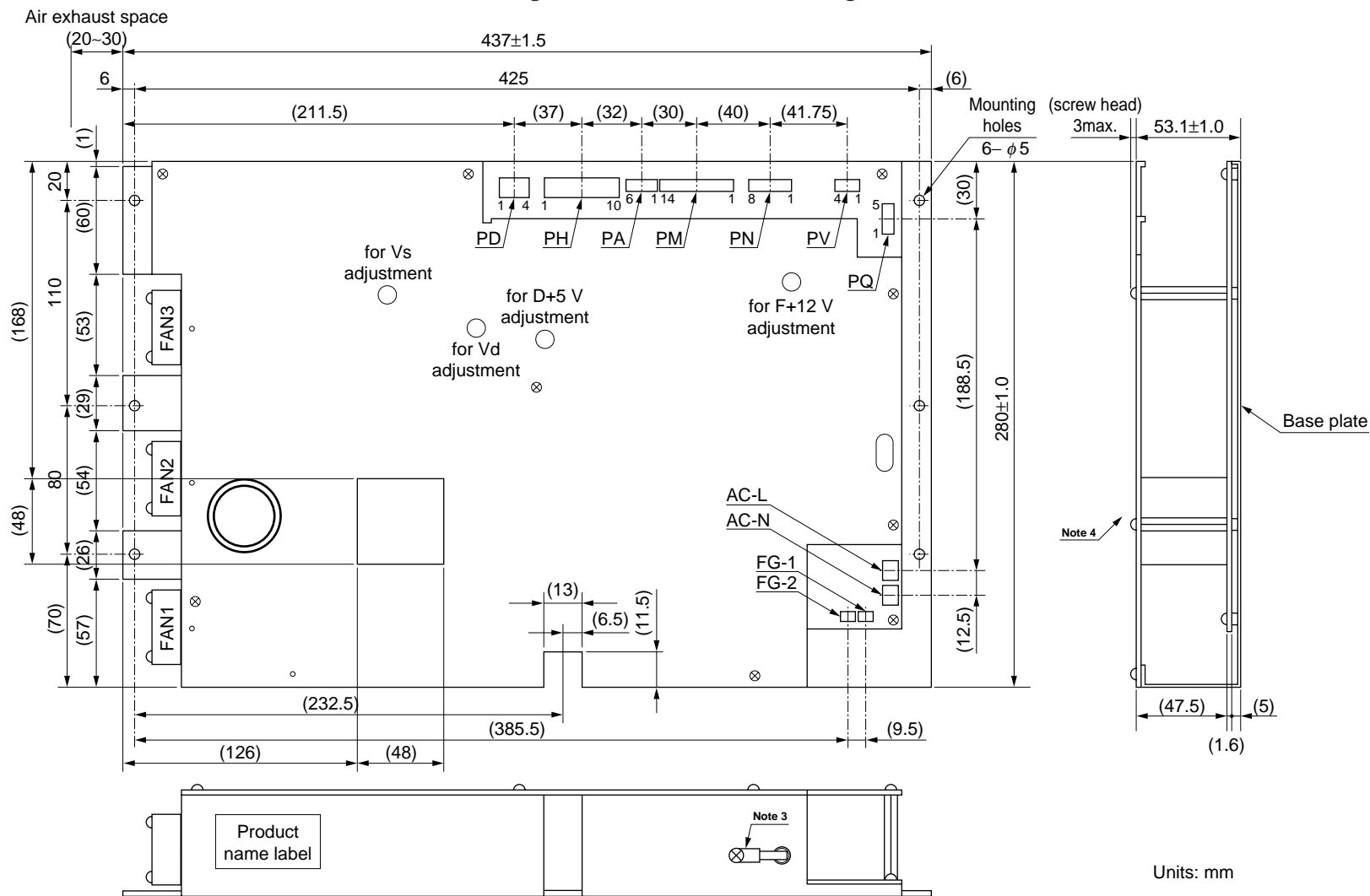
2) Impact

10 G max. (Tested by dropping it on a hard wood three times)

GENERAL CAUTION

1. Please use this power supply within the input and output ranges of specifications.
2. When this power supply is connected with other plasma display than NP4201MF02, the specification of this power supply can not be guaranteed. It might cause the failure of the power supply and the accident.
3. Please use the PDP module connected with this power supply with the power controlled status by the PLE function.
4. Do not touch the circuit parts in the power supply while powered on or immediately after powered off. If touch, It may causes the serious electric shock. Please confirm the voltage decreases enough before touch it.
5. When connect or disconnect the cables, or move the power supply, please confirm the power is turned off and voltage in the power supply is decreased enough.
6. Please secure enough ventilation space for cooling fan, because the heat of this power supply is radiated by the forced-air-cooled.

Figure 3. NP01PS Outline Drawing



Units: mm

- Notes**
1. The allowances for dimensions with no description are ± 0.5 mm.
 2. The sizes in parentheses are for reference only.
 3. Remove the screw during the withstand voltage test or isolation resistance measurement.
 4. For mounting the power supply, keep allowance of more than 5 mm for the insulation.

[MEMO]

[MEMO]

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