# Desktop PC Power Supply eNSP-300P Series


| Model | Description | Stock |
|---|---|---|
| eNSP-300P-S20-00S | ——— | Standard stock |
| eNSP-300P-S24-00S | The fan stops at standby (at remote OFF) | Standard stock |
| eNSP-300P-S29-00S | SG and FG are separated, coated PCB (solder side) | Contact us |
| eNSP-300P-L20-00S | With 24-pin main and S-ATA connector | Standard stock |

■Model Name Coding

**eNSP - 300 P - S 2 ∗ - 0 0 S**

① ② ③ ④⑤⑥ ⑦⑧⑨

1. Series name
2. Output power
3. Peak output compliant
4. S: standard, L: 20+4-pin main and S-ATA connector
5. DC input voltage (battery voltage) 24V type
6. Modification code
7. No nonstop unit
8. No signal unit
9. Silent type (thermal-sensing variable speed fan embedded)

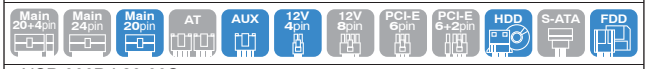
## Features

This unit can be used as a regular ATX power supply at first with low introduction cost. If backup function is needed later on, the unit can be converted to a nonstop power supply (with UPS function) simply by adding an optional nonstop unit (BU-300P-24P).

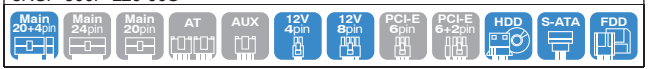
- Backup function can be added by installing a nonstop unit and a signal unit.
- 300W peak output and 12V connector embedded
- Active filter (PFC) is mounted. Power factor: 98% (100 VAC)
- By building in the thermal-sensing variable speed fan, noise reduction can be realised.
- Fan can be replaced.
- For eNSP-300P-S24-00S, the fan shuts down at standby (at remote OFF).
  Note: output of +5VSB shall be 0.8A
- For eNSP-300P-S29-00S, the output GND and FG are separated. Also, the chip side of the PCBs is coated.

## Output connector

eNSP-300P-S20-00S/ eNSP-300P-S24-00S/ eNSP-300P-S29-00S




eNSP-300P-L20-00S




Refer to “Product Page Guideline” on p.13

| Safety standard / Approval | UL | CSA | EN | CE | CCC |
|---|---|---|---|---|---|
| Reliability Grade | HFA | FA | HOA | OA | |

## Function

| DC start | RS 232C | USB | TTL | PFC | Silence | 5VSB FAN | TSFC FAN | Connection | RoHS |
|---|---|---|---|---|---|---|---|---|---|

*eNSP-300P-S24-00S does not have 5VSB FAN function.

## Input

| | |
|---|---|
| *AC input* | 85 - 264V (worldwide range) |

## Output

| *Output voltage* | *+3.3V* | *+5V* | *+12V* | *-5V* | *-12V* | *+5VSB* |
|---|---|---|---|---|---|---|
| *Max. current/ max. power (continuous)* | 14A | 21A | 10A | 0.3A | 0.8A | 1.5A* |
| | Total 125W | | | | | |
| | Total 185W | | | | | |
| | Total 203.6W | | | | | |
| *Peak current/ peak power (5 sec max.)* | 28A | 30A | 15A | 0.3A | 0.8A | 2.5A |
| | Total 180W | | | | | |
| | Total 280W | | | | | |
| | Total 303.6W | | | | | |
| *Min. current* | 0A | 1A | 0A | 0A | 0A | 0A |

*0.8A for eNSP-300P-S24-00S

## Dimensions

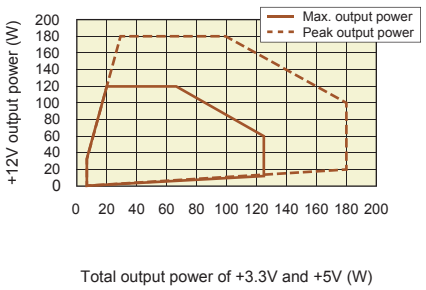
| | |
|---|---|
| W×H×D (mm) | 150×86×120 (PS/2 - size) |

# General Specification Condition: at normal temperature and humidity unless otherwise specified

| | Items | | Specification | | | | | | Measurement conditions, etc. |
|---|---|---|---|---|---|---|---|---|---|
| AC Input | Rated Voltage | | 100 - 240 VAC (85 - 264 VAC) | | | | | | Worldwide range |
| | Input Frequency | | 50 / 60Hz | | | | | | 47-63Hz |
| | Efficiency | | 68% typ. (100 VAC), 71% typ. (240 VAC) *Characteristic data: Fig.3 | | | | | | At rated input/output |
| | Power Factor | | 98% typ. (100 VAC), 92% typ. (240 VAC) *Characteristic data: Fig.4 | | | | | | |
| | Inrush Current | | 50A peak (100 VAC), 100A peak (240 VAC) *Characteristic data: Fig.5 | | | | | | At rated input/output at cold start (25°C) |
| | Input VA | | 330VA max. *Characteristic data: Fig.4 | | | | | | At rated input and max. output |
| | | | 495VA max. | | | | | | At rated input and peak output |
| Output | Rated Voltage | | +3.3V | +5V | +12 | -5V | -12V | +5VSB | |
| | Rated Current | | 9.4A | 14A | 7A | 0.3A | 0.8A | 1.5A | |
| | Max. Current / Power | | 14A | 21A | 10A | 0.3A | 0.8A | 1.5A | Max output power: 203.6W *Refer to Fig.1 |
| | | | 125W max. | | | | | | |
| | | | 185W max. | | | | | | |
| | Peak Current / Power | | 28A | 30A | 15A | 0.3A | 0.8A | 2.5A | Peak output power: 303.6W Time: 5 sec or less, The interval between peak loads shall be at least 3 minutes *Refer to Fig.1 |
| | | | 180W max. | | | | | | |
| | | | 280W max. | | | | | | |
| | Min. Current | | 0A | 1A | 0A | 0A | 0A | 0A | |
| | Total Voltage Accuracy (%) | | ±4 max. | ±4 max. | ±10 max. | ±5 max. | ±5 max. | ±5 max. | Total accuracy at temperature, input, and load fluctuations |
| | Max. Ripple Voltage (mVp-p) | | 50 max. | 50 max. | 150 max. | 50 max. | 100 max. | 50 max. | Two wires are coming out from the output connector and connected into one at the edge. 47µF is placed on it and it is measured. *Characteristic data: Fig.16 |
| | Max. Spike Voltage (mVp-p) | | 100 max. | 100 max. | 200 max. | 100 max. | 200 max. | 100 max. | |
| Protection | Overcurrent Protection | OCP Point (A) | 32.5 min. | 37 min. | 16 min. | 105% min. of peak current | | | All other outputs are rated loads at rated input voltage. |
| | | Method | All outputs except for +5VSB shutdown | | | Foldback current limiting | | All outputs shutdown | |
| | | Recovery | Reclosing AC input, or switching PS_ON# signal from 'OPEN' to 'L' | | | Automatic recovery | | | |
| | Overvoltage Protection | OVP Point (V) | 3.76 - 4.3 | 5.74 - 7.0 | 13.4 - 15.6 | - | - | - | |
| | | Method | All outputs except for +5VSB shutdown | | | - | - | - | |
| | | Recovery | Reclosing AC input, or switching PS_ON# signal from 'OPEN' to 'L' | | | - | - | - | |
| Environment | Operating Temp. / Humidity | | 0 to 50°C* / 10 to 90% | | | | | | *Refer to Fig.2 No condensation |
| | Storage Temp. / Humidity | | -25 to 70°C / 10 to 95% | | | | | | No condensation |
| | Vibration | | Displacement amplitude: 0.15mm (10-55Hz), Sweep cycles: 10, Test duration: 45 minutes each axis | | | | | | JIS-C-60068-2-6 (JIS-C-0040-1995) |
| | Mechanical Shock | | Acceleration of 150m/s² for 11ms one time each in the X, Y and Z directions. No malfunction, damage, loosening or coming-off | | | | | | JIS-C-60068-2-27 (JIS-C-0041-1995) |
| Insulation | Dielectric Strength | | AC input - DC output/FG: 1500 VAC for 1 minute | | | | | | |
| | Insulation Resistance | | AC input - DC output/FG: 50MΩ min. | | | | | | At 500 VDC |
| | Leakage Current | | 0.5mA max. (100 VAC) / 1mA max. (240 VAC) *Characteristic data: Fig.6 | | | | | | YEW. TYPE3226 (1kΩ) or equivalent |
| EMC | Line Noise Immunity | | ± 2000V (pulse width: 100-800ns, repetitive cycle: 10-50ms) | | | | | | Measured by INS-410 No fluctuation of DC output or malfunction |
| | Electrostatic Discharge | | EN61000-4-2 compliant | | | | | | |
| | Radiated, Radio-Frequency EM Field | | EN61000-4-3 compliant | | | | | | |
| | Fast Transient Burst | | EN61000-4-4 compliant | | | | | | |
| | Lightning Surge | | EN61000-4-5 compliant | | | | | | |
| | RF Conducted Immunity | | EN61000-4-6 compliant | | | | | | |
| | Magnetic Field Immunity | | EN61000-4-8 compliant | | | | | | |
| | Voltage Dip / Regulation | | EN61000-4-11 compliant | | | | | | |
| | Conducted Emission | | VCCI-B, FCC-B, EN55022-B, CISPR22-B compliant *Characteristic data: Fig.7 and 8 | | | | | | Measured by single unit, At rated output |
| | Harmonic Current Regulation | | IEC61000-3-2 Class A, EN61000-3-2 Class A compliant | | | | | | At rated input/output |
| Others | Safety Standard | | UL60950, CSA C22.2 No. 60950 (c-UL), EN60950, CE Marking (LVD, EMC) | | | | | | |
| | Cooling System | | Forced-air cooling: thermal-sensing variable speed fan embedded | | | | | | At PS_ON# 'H', fan rotates at low speed |
| | Output Grounding | | Connected to chassis (FG)* | | | | | | *It can be customized to connect to capacitor |
| | Output Hold-up Time | | PWR_OK holds up 20ms min. after AC failure *Characteristic data: Fig.13 | | | | | | At rated output |
| | Reliability Grade | | FA (industrial equipment grade, double-sided through hole PCB) | | | | | | Follow our standard |
| | MTBF | | 135,000 H min. | | | | | | Based on EIAJ RCR-9102 |
| | Weight | | 1.6 kg typ. | | | | | | |
| | Warranty | | 3 years after delivery. If any faults belong to us, the defective unit shall be repaired or replaced at our cost. | | | | | | Except for errors caused by operation not listed |

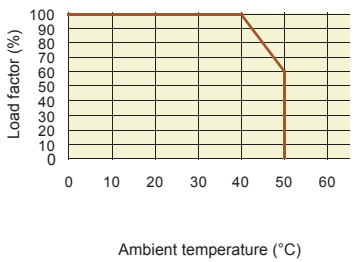
### Fig.1 Output power Cross Regulation

Follow the graph below for the power distribution of the total power of +3.3V and +5V vs. +12V output power.

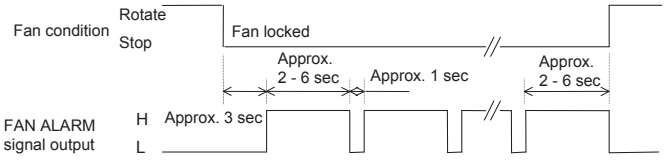



### Fig.2 Temperature Derating

When the ambient temperature (near the airflow inlet) exceeds 40°C, follow the derating curve to derate rated current/power, max. current/power, and peak current/power.

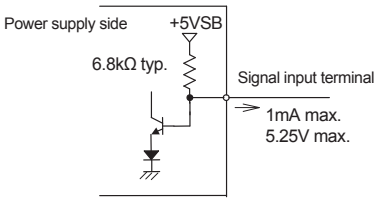


## Signal Input / Output Specification Condition: at normal temperature and humidity unless otherwise specified

| | Items | Specification | Note |
|---|---|---|---|
| Input Signal | Output ON / OFF Control Signal (PS_ON#) | +3.3V, +5V, +12V, -5V, and -12V outputs shutdown with 'OPEN' input. | Signal input between the pin 14 of P1 connector (eNSP-300P-S20 series) or the pin 16 of MA20P connector (eNSP-300P-L20 series) and COM pin |
| | +3.3V SENSE | The input terminal to detect the voltage of +3.3V output; by connecting to the load terminal, only the line drop of the + side of the output cable is compensated. | The pin 11 of P1 connector (eNSP-300P-S20 series) The pin 13 of MA20P connector (eNSP-300P-L20 series) |
| Output Signal | Normal Output Signal (PWR_OK) | 'H'signal is delivered when the +5V output is normal (detection delay time: 200 - 400ms). | The pin 8 of P1 connector (eNSP-300P-S20 series) The pin 8 of MA20P connector (eNSP-300P-L20 series) |
| | Fan Alarm Signal (FAN ALARM) | When the fan lock status continues, square waves, as shown below, are delivered constantly.   | The pin 2 of SIG2P connector (only eNSP-300P-L20 series) |

### Signal Circuit

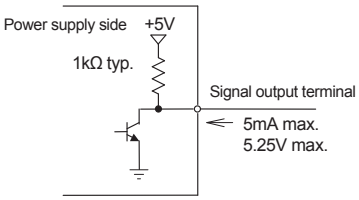
**Input Signal Circuit** — *(PS_ON#)*




('L'≤0.8V)

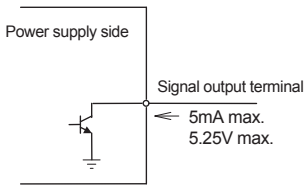
**Output Signal Circuit**

*(PWR_OK)*



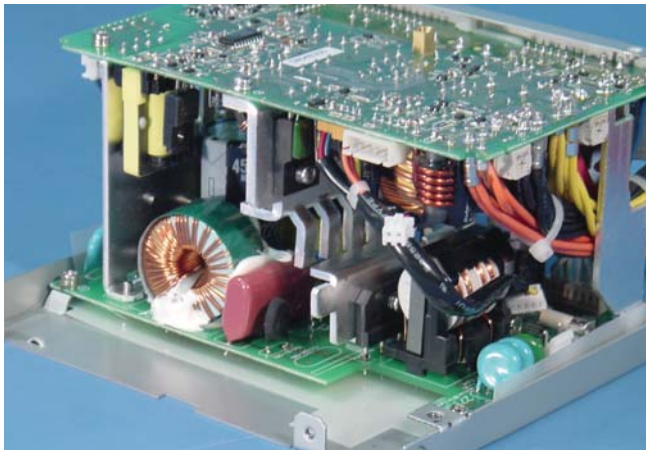

('L'<0.4V)

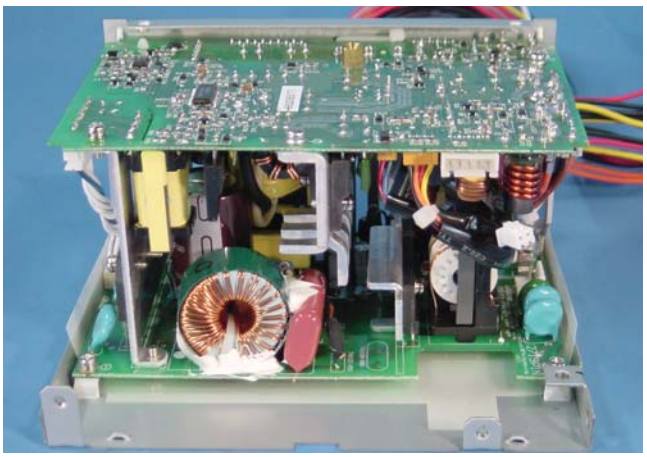
*(FAN ALARM) *Only eNSP-300P-L20 series*



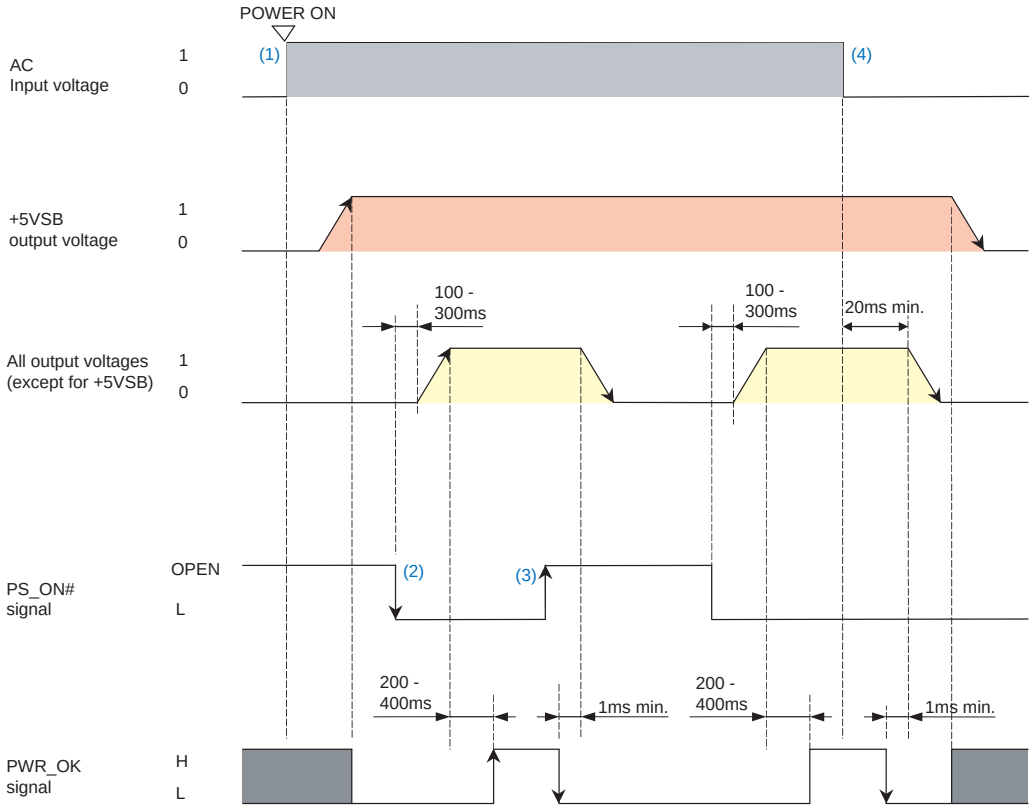

('L'<0.4V)

## Internal Structure



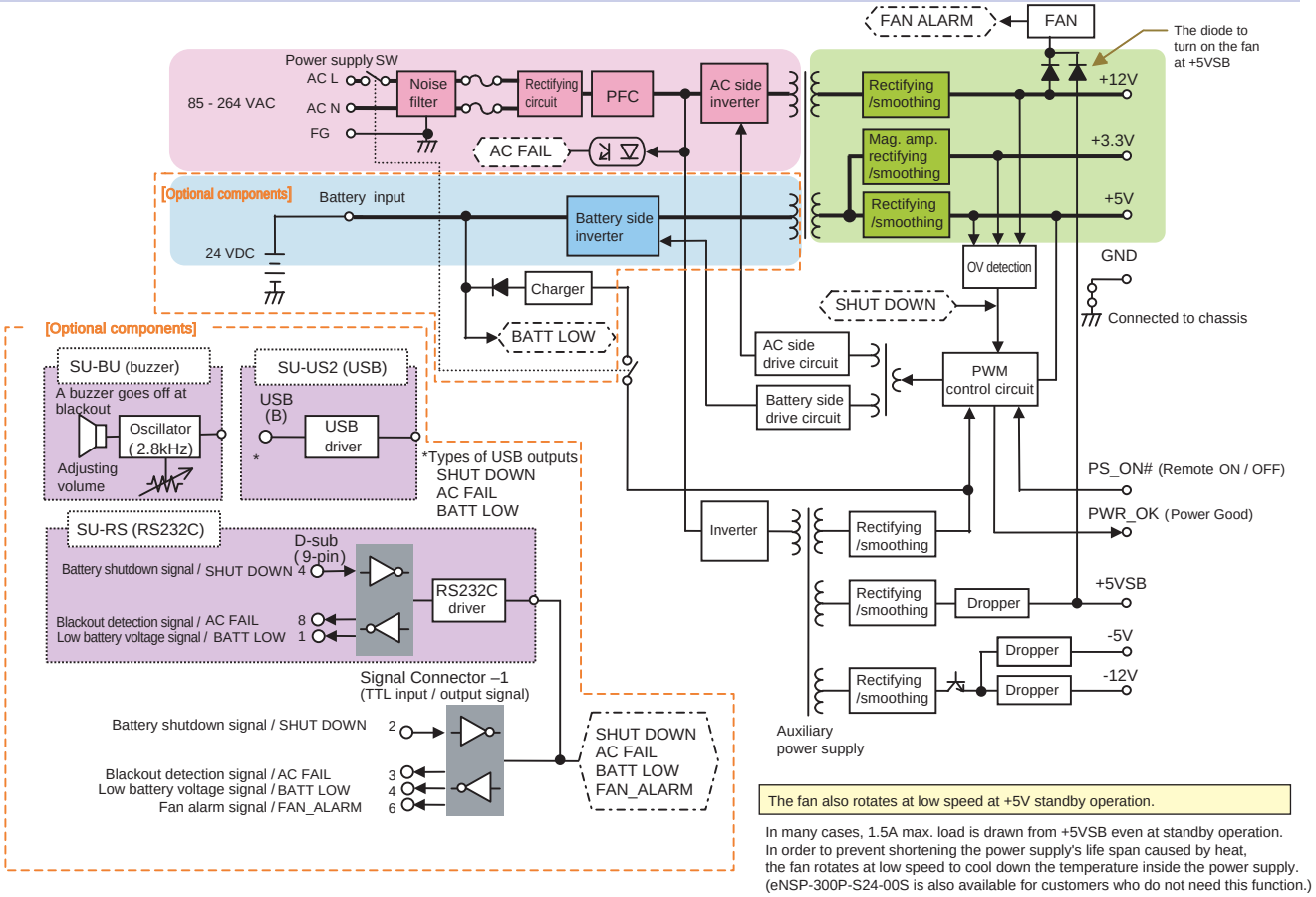


## Sequence Diagram




(1)When the PS_ON# signal is 'OPEN', only +5VSB starts up with AC input.
(2)With PS_ON# 'L' input, all outputs start up. 200 - 400ms after +5V starts up, PWR_OK goes 'H'.
(3)With PS_ON# 'OPEN' input, outputs except for +5VSB shutdown.
(4)All outputs except for +5VSB shutdown 20ms min. after blackout. PWR_OK signal goes 'L' 1ms min. before the shutdown.

## Block Diagram

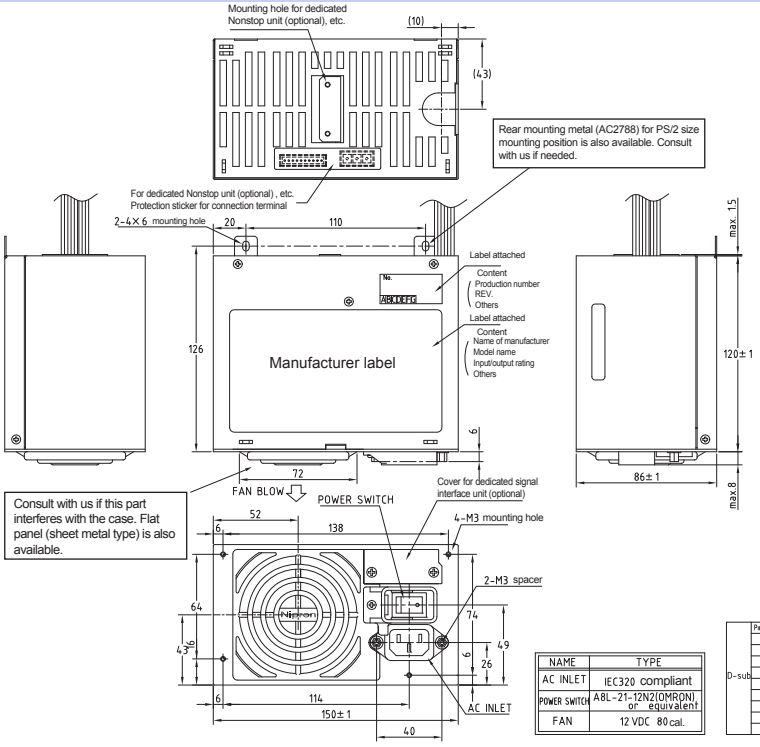



The fan also rotates at low speed at +5V standby operation.

In many cases, 1.5A max. load is drawn from +5VSB even at standby operation.
In order to prevent shortening the power supply's life span caused by heat, the fan rotates at low speed to cool down the temperature inside the power supply.
(eNSP-300P-S24-00S is also available for customers who do not need this function.)

# Outline Drawing / Output Harness

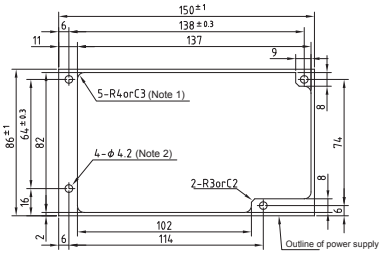
## eNSP-300P-*20-00S



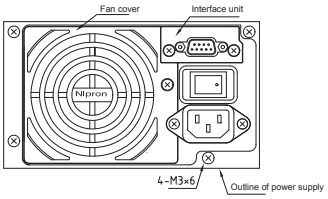

| NAME | TYPE |
|---|---|
| AC INLET | IEC320 compliant |
| POWER SWITCH | A8L-21-12N2(OMRON) or equivalent |
| FAN | 12 VDC 80cal. |

| | Pin No | Function | Conector type |
|---|---|---|---|
| D-sub | 1 | BATT LOW | JEY-9P-1A0A (JST) or equivalent |
| | 2 | N.C. | |
| | 3 | N.C. | |
| | 4 | SHUT DOWN | |
| | 5 | N.C. | |
| | 6 | N.C. | |
| | 7 | N.C. | |
| | 8 | AC FAIL | |
| | 9 | N.C. | |

How to process the mounting holes (recommended)




Note 1: The value for R4 or C3 can be smaller.
Note 2: Mounting hole

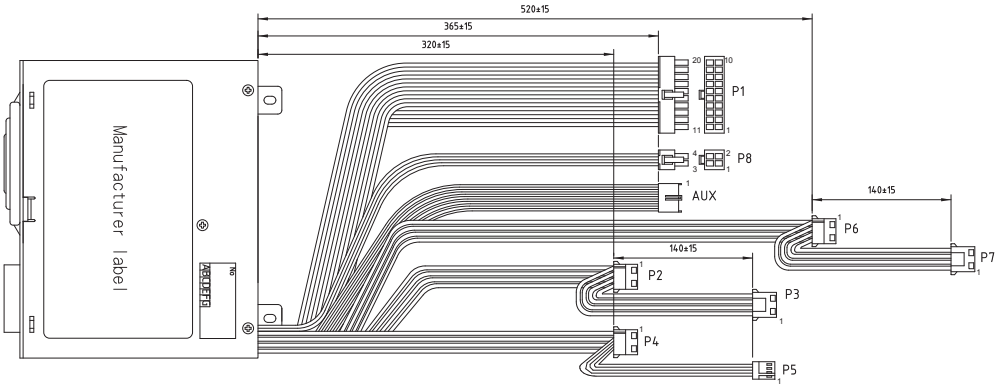



When replacing the fan, adding or replacing the interface unit with the power supply mounted to chassis of PC, etc., make sure to process the mounting holes as specified.

Dimensional tolerance shall be ±0.5 unless other wise specified.

■Installation direction
The unit can be installed in any directions.

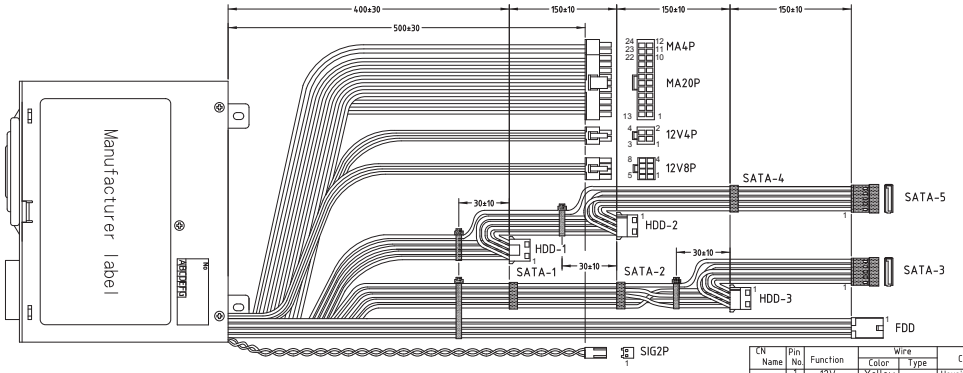
## eNSP-300P-S20-00S




| CN Name | Pin No. | Function | Wire Color | Wire Type | Conector Type |
|---|---|---|---|---|---|
| P1 | 1 | +3.3V DC | Orange | UL1007 AWG#18 | Housing 5557-20R (molex) |
| | 2 | +3.3V DC | Orange | | |
| | 3 | COM | Black | | |
| | 4 | +5V DC | Red | | |
| | 5 | COM | Black | | |
| | 6 | +5V DC | Red | | |
| | 7 | COM | Black | | |
| | 8 | PWR-OK | Gray | UL1007 AWG#22 | |
| | 9 | +5V SB | Purple | UL1007 AWG#18 | |
| | 10 | +12V DC | Yellow | | |
| | 11 | +3.3V default sense | Brown | UL1007 AWG#22 | Terminal 5556(molex) |
| | | +3.3V DC | Orange | UL1007 AWG#18 | |
| | 12 | -12V DC | Blue | | |
| | 13 | COM | Black | | |
| | 14 | PS-ON# | Green | UL1007 AWG#22 | |
| | 15 | COM | Black | UL1007 AWG#18 | |
| | 16 | COM | Black | | |
| | 17 | COM | Black | | |
| | 18 | -5V DC | White | | |
| | 19 | +5V DC | Red | | |
| | 20 | +5V DC | Red | | |

| CN Name | Pin No. | Function | Wire Color | Wire Type | Conector Type |
|---|---|---|---|---|---|
| P2~P4 P6,P7 | 1 | +12V DC | Yellow | UL1007 AWG#18 | Housing:1-480424-0 (AMP) Terminal: 170120-1(AMP) or equivalent |
| | 2 | COM | Black | | |
| | 3 | COM | Black | | |
| | 4 | +5V DC | Red | | |
| P5 | 1 | +5V DC | Red | UL1007 AWG#22 | Housing: 171822-04(AMP) Terminal: 170204-1(AMP) or equivalent |
| | 2 | COM | Black | | |
| | 3 | COM | Black | | |
| | 4 | +12V DC | Yellow | | |
| P8 | 1 | COM | Black | UL1007 AWG#18 | Housing: 5557-04R(molex) Terminal: 5556(molex) or equivalent |
| | 2 | COM | Black | | |
| | 3 | +12V DC | Yellow | | |
| | 4 | +12V DC | Yellow | | |
| AUX | 1 | COM | Black | UL1007 AWG#18 | Housing: **8500-06(ALEX)** Terminal: **23T-8204(ALEX)** or equivalent |
| | 2 | COM | Black | | |
| | 3 | COM | Black | | |
| | 4 | +3.3V DC | Orange | | |
| | 5 | +3.3V DC | Orange | | |
| | 6 | +5V DC | Red | | |

## eNSP-300P-L20-00S




| CN Name | Pin No. | Function | Wire Color | Wire Type | Conector Type |
|---|---|---|---|---|---|
| SATA-1 SATA-2 SATA-4 | 1 | 12V | Yellow | UL1007 AWG#18 | Housing: CI94PPJA1A0(CviLux) or equivalent CoVer: CI94PFIC010(CviLux) or equivalent |
| | 2 | COM | Black | | |
| | 3 | 5V | Red | | |
| | 4 | COM | Black | | |
| | 5 | 3.3V | Orange | | |
| HDD-1 ~HDD-3 | 1 | 12V | Yellow | UL1007 AWG#18 | Housing:LCP-04(JST) or equivalent Terminal: SLC22T-2.0(JST) or equivalent |
| | 2 | COM | Black | | |
| | 3 | COM | Black | | |
| | 4 | 5V | Red | | |
| SATA-3 SATA-5 | 1 | 12V | Yellow | UL1007 AWG#18 | Housing: CI94PP00100(CviLux) or equivalent Terminal: CI9LT03APP0(CviLux) or equivalent |
| | 2 | COM | Black | | |
| | 3 | 5V | Red | | |
| | 4 | COM | Black | | |
| | 5 | 3.3V | Orange | | |
| FDD | 1 | 5V | Red | UL1007 AWG#20 | Housing: 171822-4(AMP) Terminal: 170204-1(AMP) |
| | 2 | COM | Black | | |
| | 3 | COM | Black | | |
| | 4 | 12V | Yellow | | |

| CN Name | Pin No. | Function | Wire Color | Wire Type | Conector Type |
|---|---|---|---|---|---|
| 12V4P | 1 | COM | Black | UL1007 AWG#18 | Housing: 5557-04R(Molex) or equivalent Terminal: 5556(Molex) or equivalent |
| | 2 | COM | Black | | |
| | 3 | 12V | Yellow | | |
| | 4 | 12V | Yellow | | |
| 12V8P | 1 | COM | Black | UL1007 AWG#18 | Housing: 5557-08R(Molex) or equivalent Terminal: 5556(Molex) or equivalent |
| | 2 | COM | Black | | |
| | 3 | COM | Black | | |
| | 4 | COM | Black | | |
| | 5 | 12V | Yellow | | |
| | 6 | 12V | Yellow | | |
| | 7 | 12V | Yellow | | |
| | 8 | 12V | Yellow | | |
| SIG2P | 1 | COM | Black | UL1007 AWG#24 | Housing:CI31102S000(CviLux) Terminal:CI31T021BE0(CviLux) or equivalent |
| | 2 | FAN ALARM | Violet | | |

| CN Name | Pin No. | Function | Wire Color | Wire Type | Conector Type |
|---|---|---|---|---|---|
| MA20P | 1 | +3.3V | Orange | UL1007 AWG#18 | Housing: CP-01120030-C (CviLux) Terminal: 13PIN CP-01100105 (CviLux) Other: CP-01100102 (CviLux) |
| | 2 | +3.3V | Orange | | |
| | 3 | COM | Black | | |
| | 4 | +5V | Red | | |
| | 5 | COM | Black | | |
| | 6 | +5V | Red | | |
| | 7 | COM | Black | | |
| | 8 | PWR-OK | Gray | UL1007 AWG#22 | |
| | 9 | +5V SB | Violet | UL1007 AWG#18 | |
| | 10 | +12V | Yellow | | |
| | 13 | +3.3V RS | Brown | UL1007 AWG#22 | |
| | | +3.3V | Orange | UL1007 AWG#18 | |
| | 14 | -12V | Blue | | |
| | 15 | COM | Black | | |
| | 16 | PS_ON# | Green | UL1007 AWG#22 | |
| | 17 | COM | Black | UL1007 AWG#18 | |
| | 18 | COM | Black | | |
| | 19 | COM | Black | | |
| | 20 | -5V | White | | |
| | 21 | +5V | Red | | |
| | 22 | +5V | Red | | |
| MA4P | 11 | +12V | Yellow | UL1007 AWG#18 | Housing: CP-01104030-C (CviLux) Terminal: CP-01100102 (CviLux) |
| | 12 | +3.3V | Orange | | |
| | 23 | +5V | Red | | |
| | 24 | COM | Black | | |
| | — | — | — | — | |

# Optional Components Sold Separately

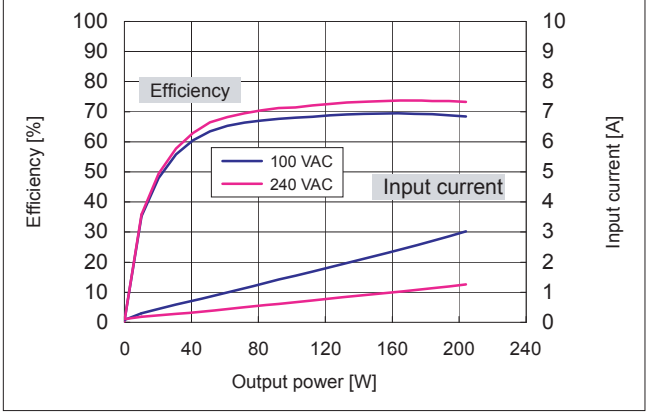
| Cable | | | |
|---|---|---|---|
| *Picture* | *Model* | *Type* | *Description* |
|  | WH2753 | AC power cord | 125 VAC 12A<br>[PSE] |
|  | WH2753-02 | AC power cord | 125 VAC 12A (tracking resistance type)<br>[PSE] |

| Parts / Unit | | | |
|---|---|---|---|
| *Picture* | *Model* | *Type* | *Description* |
|  | BU-300P-24P | Nonstop unit | If connected to a eNSP-300P series, the unit can be used as Nonstop power supply |
|  | BU-300P-24P3 | Nonstop unit | If connected to a eNSP-300P series, the unit can be used as Nonstop power supply. SG and FG are separated.<br>The solder side of the PCB is coated |
|  | SU-RS | RS232C signal unit | Automatic shutdown is possible with RS232C *1 |
|  | SU-US2 | USB signal unit | Automatic shutdown is possible with USB*1 |
|  | SU-BU | Buzzer unit | Buzzer noise is delivered at blackout (the volume can be adjusted) *1 |
|  | ACC2734 | AC power cord retention clamp | It prevents the slipping of AC power cord (WH2753, WH2753-02) and operational mistakes of power switch. *In some cases, the clamp (ACC2734) might not be possible mounted to a commercial AC power cord. |
| *1 Nonstop unit, BU-300P-24P / BU-300P-24P3, and a battery package need to be connected for backup operation. | | | |

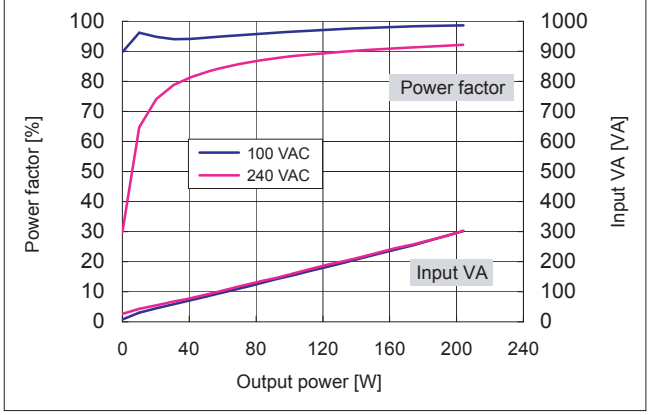
| Other Optional Components | | | |
|---|---|---|---|
| *Model* | *Description* | *Model* | *Description* |
| ACC2637 | Automatic startup unit | WH5105 | 12V 4-pin connector conversion harness (80mm) |
| WH2820 | 20-pin extension harness (600mm) | WH5105-02 | 12V 4-pin connector conversion harness (320mm) |
| WH2747 | 20-pin extension harness (450mm) | WH5055 | AT connector conversion harness |
| WH2892-02 | 20-pin extension harness (200mm) | ACC5046 | Harness with PS_ON switch |
| WH2812 | PCI-E 6-pin connector conversion harness | ACC5077 | PS_ON terminal short connector |
| | | WH5073 | PS_ON terminal short 20-pin harness |

# Characteristics Data eNSP-300P-S20-00S (Examples of actual measurement)

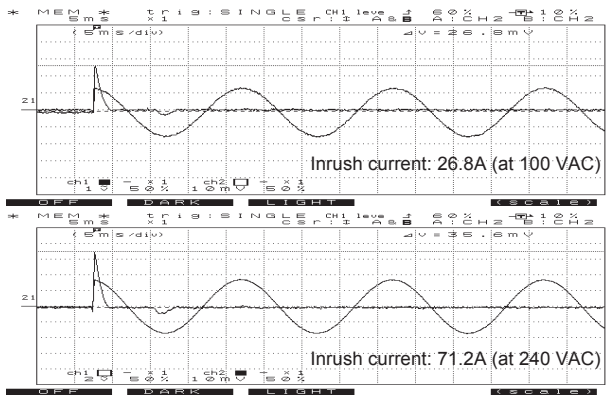
## ● Fig.3 Efficiency / Input Current vs. Output Power




## ● Fig.4 Power Factor / Input VA vs. Output Power




## ● Fig.5 Inrush Current



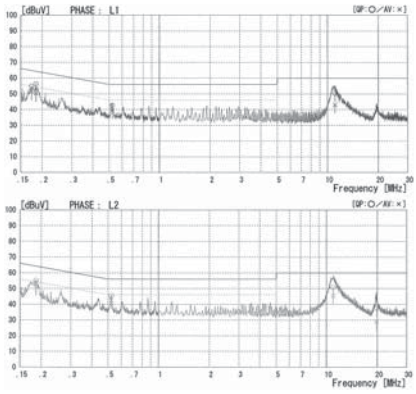

## ● Fig.6 Leakage Current

Input: 100 / 240 VAC
Load: Rated and min. load

| | Rated load | Min. load |
|---|---|---|
| 100 VAC | 0.39mA | 0.30mA |
| 240 VAC | 0.74mA | 0.74mA |

## ● Fig.7 Conducted Emission at 100 VAC

Input: 100 VAC
Load: Rated
Mode: Peak

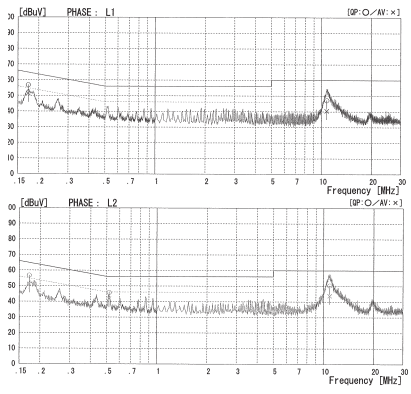



Measuring point: L1-FG

Measuring point: L2-FG

## ● Fig.8 Conducted Emission at 230 VAC

Input: 230 VAC
Load: Rated
Mode: Peak

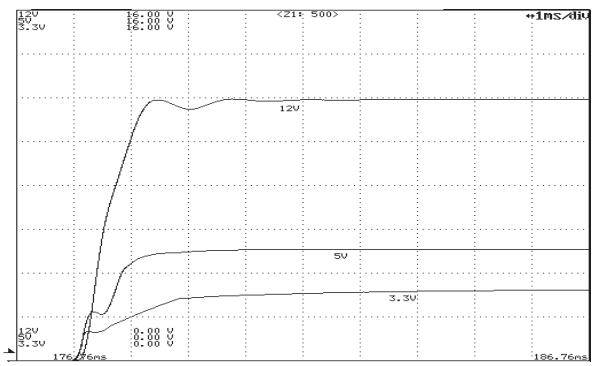



Measuring point: L1-FG

Measuring point: L2-FG

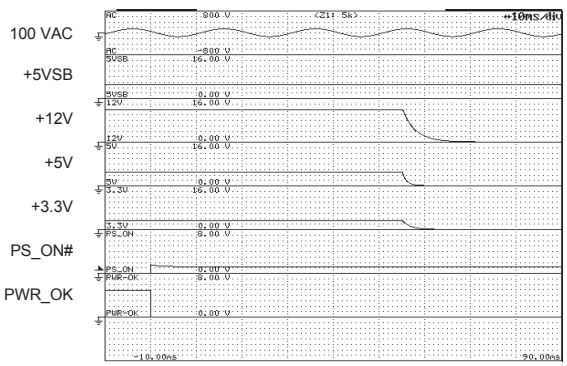
## ● Fig.9 Rising Characteristics at 100 VAC

Input: 100 VAC
Load: Rated
Time axis: 1ms/DIV




## ● Fig.10 Falling Characteristics at 100 VAC when REMOTE goes Off

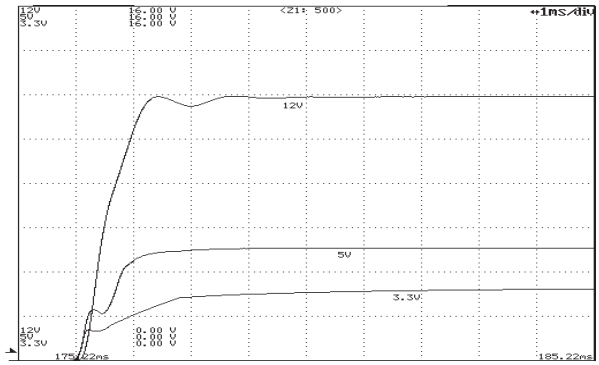
Input: 100 VAC
Load: Rated
Time axis: 10ms/DIV



# Characteristics Data eNSP-300P-S20-00S (Examples of actual measurement)

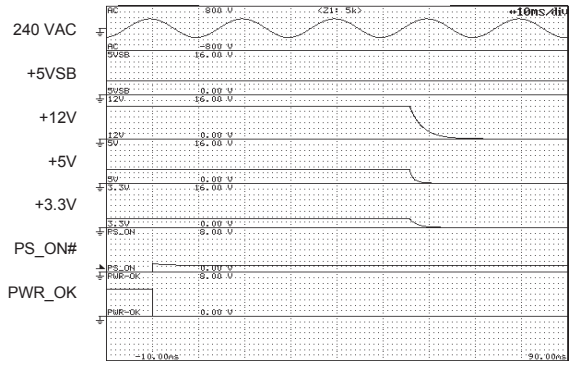
## ● Fig.11 Rising Characteristics at 240 VAC

Input: 240 VAC
Load: Rated
Time axis: 1ms/DIV



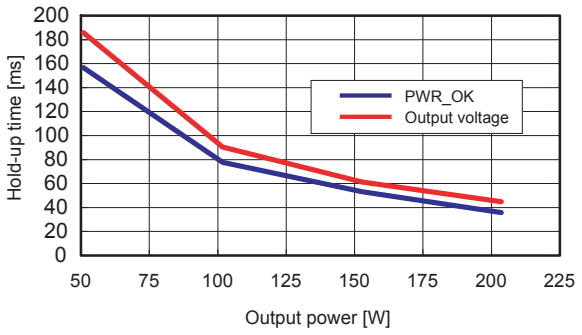

## ● Fig.12 Falling Characteristics at 240 VAC when REMOTE goes Off

Input: 240 VAC
Load: Rated
Time axis: 10ms/DIV



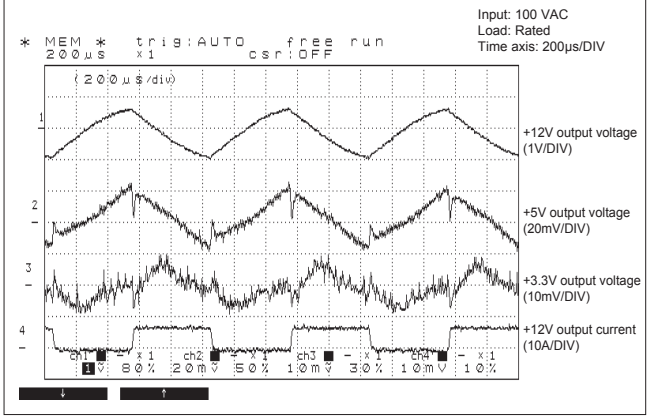

## ● Fig.13 Output Hold-up Time vs. Output Power

PWR_OK: the point that PWR_OK signal goes to "L"
Output voltage: the point any output voltage decreases to 95% except +5VSB




## ● Fig.14 Dynamic Load Fluctuation Characteristics at 1kHz

Input: 100 VAC
Load: Rated
Time axis: 200µs/DIV



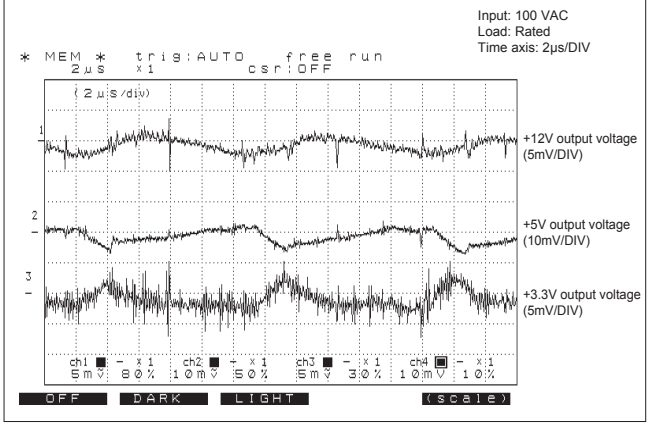

## ● Fig.15 Output Voltage Regulation

| Output | Min. load | Rated load | Peak load |
|---|---|---|---|
| +12V output | 0A | 7A | 15A |
| +5V output | 1A | 14A | 30A |
| +3.3V output | 0A | 9.4A | 28A |

| AC input voltage | 85 VAC | 100 VAC | 132 VAC | 176 VAC | 240 VAC | 264 VAC |
|---|---|---|---|---|---|---|
| +12V output (min. load) | 12.363 V | 12.351 V | 12.347 V | 12.347 V | 12.343 V | 12.345 V |
| +12V output (rated load) | 11.942 V | 11.939 V | 11.934 V | 11.930 V | 11.929 V | 11.927 V |
| +12V output (peak load) | 11.416 V | 11.408 V | 11.400 V | 11.394 V | 11.391 V | 11.389 V |
| +5V output (min. load) | 5.181 V | 5.177 V | 5.175 V | 5.173 V | 5.172 V | 5.172 V |
| +5V output (rated load) | 5.073 V | 5.070 V | 5.068 V | 5.066 V | 5.065 V | 5.064 V |
| +5V output (peak load) | 4.993 V | 4.989 V | 4.987 V | 4.986 V | 4.985 V | 4.984 V |
| +3.3V output (min. load) | 3.349 V | 3.349 V | 3.349 V | 3.348 V | 3.348 V | 3.348 V |
| +3.3V output (rated load) | 3.296 V | 3.295 V | 3.295 V | 3.295 V | 3.295 V | 3.295 V |
| +3.3V output (peak load) | 3.224 V | 3.224 V | 3.224 V | 3.224 V | 3.223 V | 3.223 V |

## ● Fig.16 Ripple and Spike Voltage

Input: 100 VAC
Load: Rated
Time axis: 2µs/DIV




## ● Fig.17 Ambient Temperature vs. Expected Service Life

■ Electrolytic capacitors

Input: 85 VAC
Load: Rated
Operating time: 24 consecutive hours

| Intake air temp. | 20°C | 30°C | 40°C |
|---|---|---|---|
| Expected service life (yr) | approx. 34 | approx. 17 | approx. 8.5 |

※ Lifetime shall be 15 years at longest due to deterioration of sealing plates.

■ Fan

| Ambient temp. | 20°C | 30°C | 40°C | 50°C |
|---|---|---|---|---|
| Expected service life (yr) | approx. 8.1 | approx. 8.1 | approx. 8.1 | approx. 8.1 |

## ● Fig.18 Over Current Protection (V-I Characteristic)

Input: 100 VAC