Nipron

Date of issue: Feb. 13, 2006

# Test Data

Model Number: PCSFE-250P-X2S

Model Name: DC Power Supply

Option: None

INPUT: 90V –120V AC, 50 / 60 Hz

OUTPUT:

| | | |
|---|---|---|
| 5 V | 10.0 A | (12 A $_{max}$) |
| 3.3 V | 6.0 A | (12 A $_{max}$) |
| 12 V | 10.0 A | (12 A $_{max}$, 14 A $_{peak}$) |
| -12 V | 0.3 A | |
| 5 $V_{Sb}$ | 1.0 A | (1.5 A $_{peak}$) |

Maximum continuous output power: 198.4W
Peak output power: 248.9W

Approved by : Kazuo Imai (QA manager)

Designed by : Kazuhiro Yamada (R&D engineer)

Tested by : Masao Nagatani (Evaluation test engineer)

Nipron Co., Ltd.

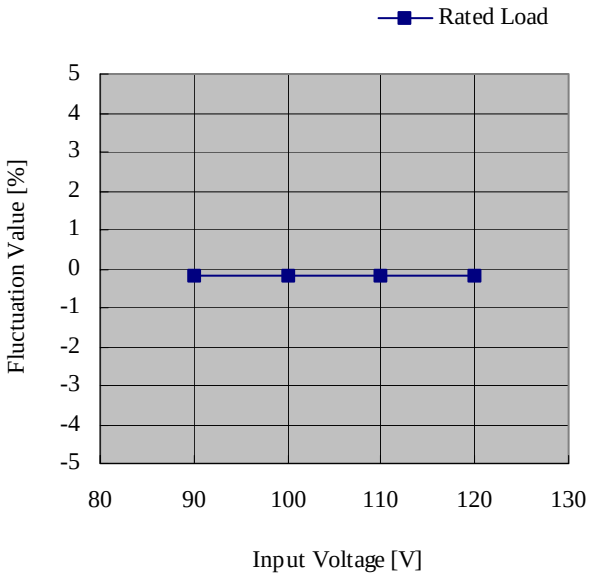
# CONTENTS


1. **Line Regulation** ‥‥‥

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Line Regulation |

## V1：5V 10A

at AC Input

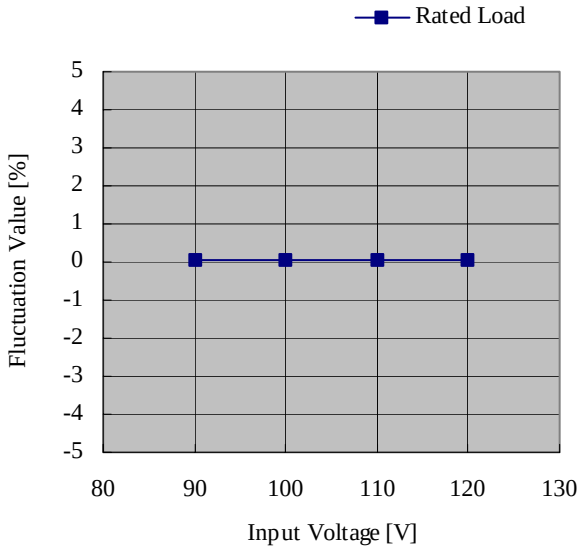



at AC Input

| Input Voltage [V] | Output Voltage [V] | Fluctuation Value [%] |
|---|---|---|
| 90V AC | 4.991 | -0.18 |
| 100V AC | 4.991 | -0.18 |
| 110V AC | 4.990 | -0.20 |
| 120V AC | 4.990 | -0.20 |

## V2：3.3V 6A

at AC Input



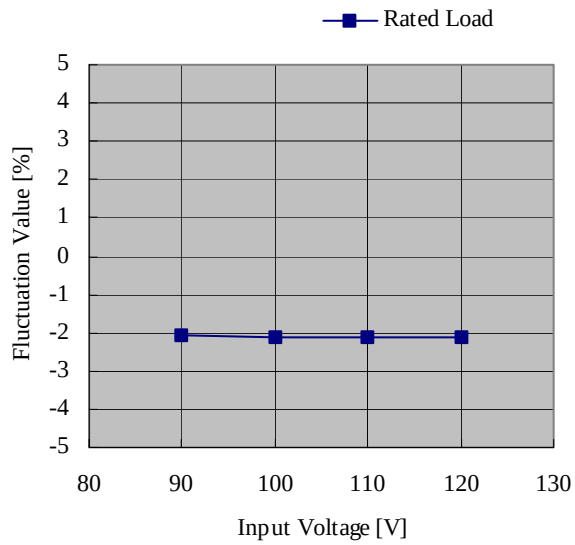

at AC Input

| Input Voltage [V] | Output Voltage [V] | Fluctuation Value [%] |
|---|---|---|
| 90V AC | 3.301 | 0.03 |
| 100V AC | 3.301 | 0.03 |
| 110V AC | 3.301 | 0.03 |
| 120V AC | 3.301 | 0.03 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Line Regulation |

## V3：12V 10A

at AC Input

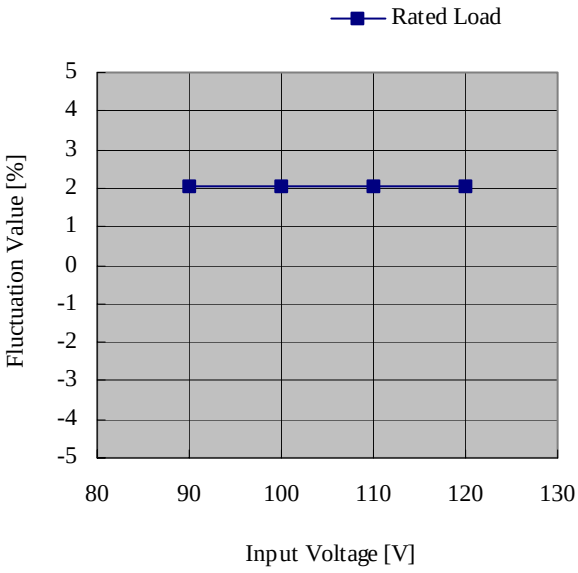



at AC Input

| Input Voltage [V] | Output Voltage [V] | Fluctuation Value [%] |
|---|---|---|
| 90V AC | 11.750 | -2.08 |
| 100V AC | 11.748 | -2.10 |
| 110V AC | 11.744 | -2.13 |
| 120V AC | 11.743 | -2.14 |

## V4：-12V 0.3A

at AC Input



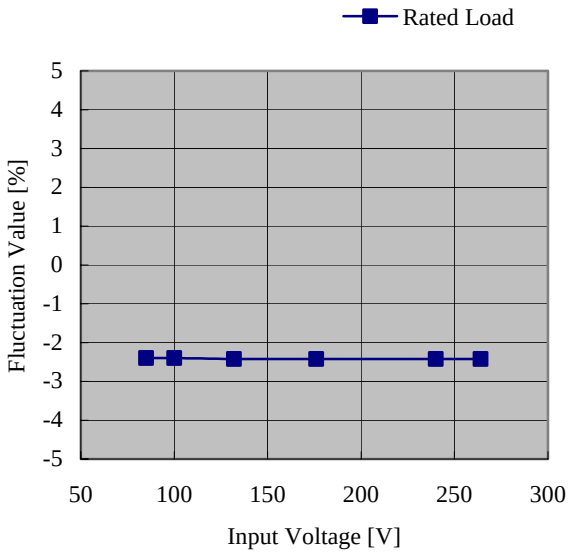

at AC Input

| Input Voltage [V] | Output Voltage [V] | Fluctuation Value [%] |
|---|---|---|
| 90V AC | -12.244 | 2.03 |
| 100V AC | -12.245 | 2.04 |
| 110V AC | -12.247 | 2.06 |
| 120V AC | -12.247 | 2.06 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Line Regulation |

V5：5Vsb 1A

at AC Input

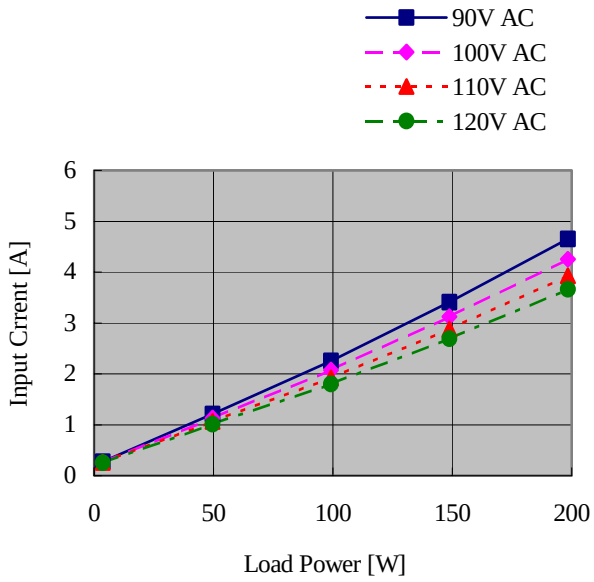



at AC Input

| Input Voltage [V] | Output Voltage [V] | Fluctuation Value [%] |
|---|---|---|
| 90V AC | 4.860 | -2.80 |
| 100V AC | 4.859 | -2.82 |
| 110V AC | 4.859 | -2.82 |
| 120V AC | 4.859 | -2.82 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Input Current (by Load Power) |

at AC Input

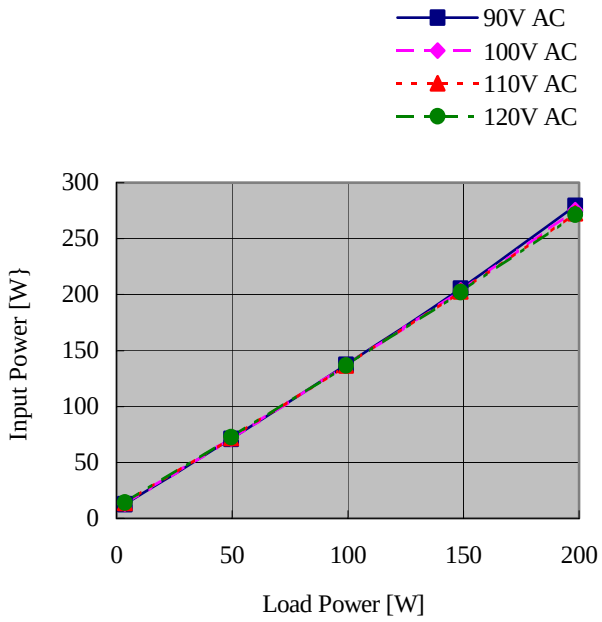



at AC Input

| Load Power [W] | Input Current [A rms] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 3.6 | 0.27 | 0.26 | 0.26 | 0.25 |
| 49.6 | 1.21 | 1.13 | 1.06 | 1.01 |
| 99.2 | 2.25 | 2.07 | 1.92 | 1.80 |
| 148.8 | 3.41 | 3.12 | 2.88 | 2.69 |
| 198.4 | 4.65 | 4.25 | 3.93 | 3.66 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Input Power (by Load Power) |

at AC Input

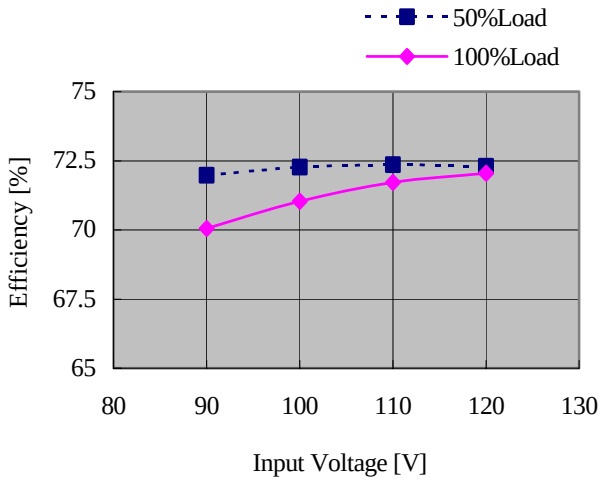



at AC Input

| Load Power [W] | Input Power [W] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 3.6 | 12.56 | 13.26 | 13.96 | 14.28 |
| 49.6 | 71.15 | 71.42 | 72.05 | 72.49 |
| 99.2 | 137.36 | 136.79 | 136.62 | 136.73 |
| 148.8 | 205.24 | 203.75 | 202.74 | 202.13 |
| 198.4 | 279.16 | 275.26 | 272.56 | 271.30 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Efficiency |

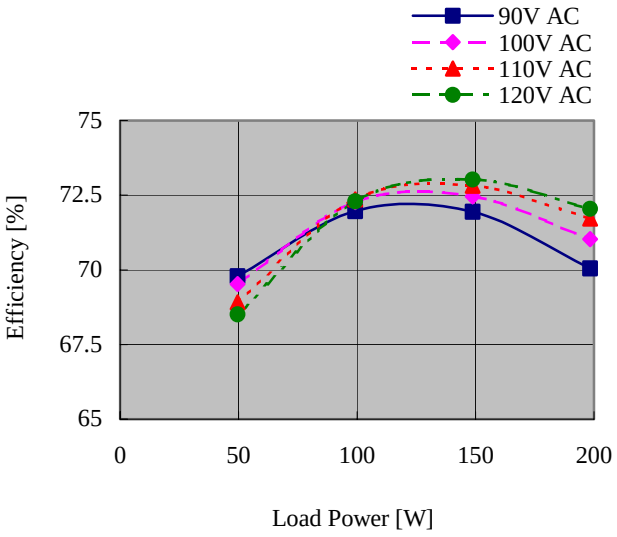
at AC Input




at AC Input

| Input Voltage [V] | Efficiency [%] | |
|---|---|---|
| | 50% Load | 100% Load |
| 90V AC | 71.92 | 70.05 |
| 100V AC | 72.27 | 71.03 |
| 110V AC | 72.36 | 71.72 |
| 120V AC | 72.30 | 72.05 |

at AC Input

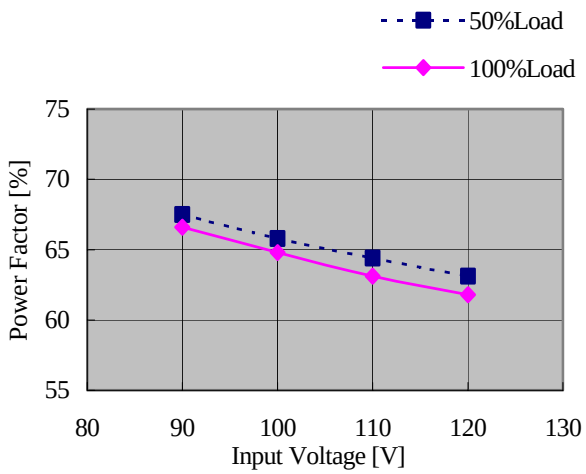



at AC Input

| Load Power [W] | Efficiency [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 49.6 | 69.79 | 69.52 | 68.91 | 68.51 |
| 99.2 | 71.97 | 72.27 | 72.46 | 71.03 |
| 148.8 | 68.91 | 72.36 | 72.82 | 71.72 |
| 198.4 | 68.51 | 72.30 | 73.03 | 72.05 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Power Factor |

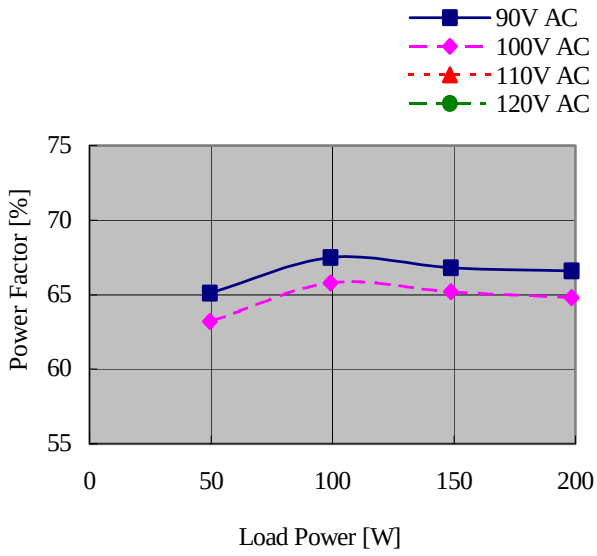
at AC Input




at AC Input

| Input Voltage [V] | Power Factor [%] | |
|---|---|---|
| | 50%Load | 100% Load |
| 90V AC | 67.50 | 66.60 |
| 100V AC | 65.80 | 64.80 |
| 110V AC | 64.40 | 63.10 |
| 120V AC | 63.10 | 61.80 |

at AC Input

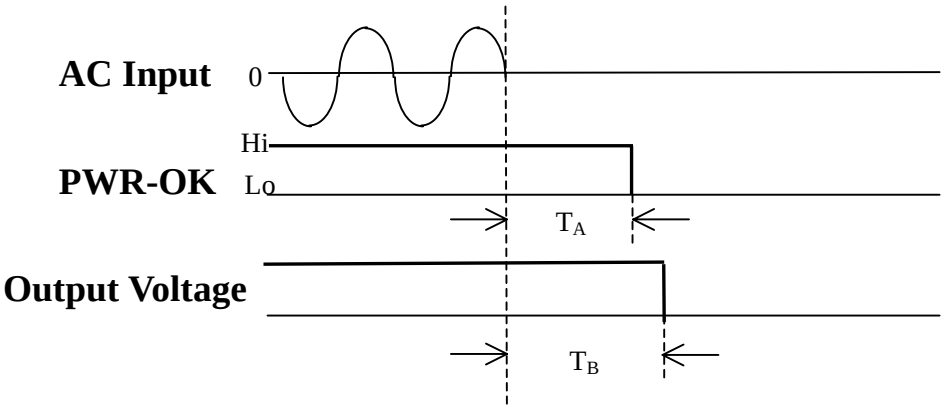


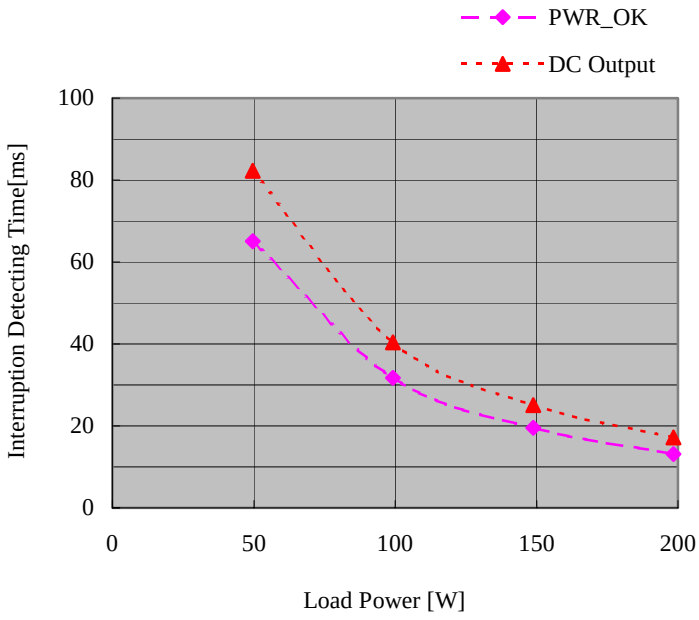

at AC Input

| Load Power [W] | Power Factor [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 49.6 | 65.10 | 63.20 | 61.70 | 59.80 |
| 99.2 | 67.50 | 65.80 | 64.40 | 63.10 |
| 148.8 | 66.80 | 65.20 | 63.70 | 62.40 |
| 198.4 | 66.60 | 64.80 | 63.10 | 61.80 |

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Instantaneous Interruption Compensation (by Load Power) | |

at AC Input: 100V AC



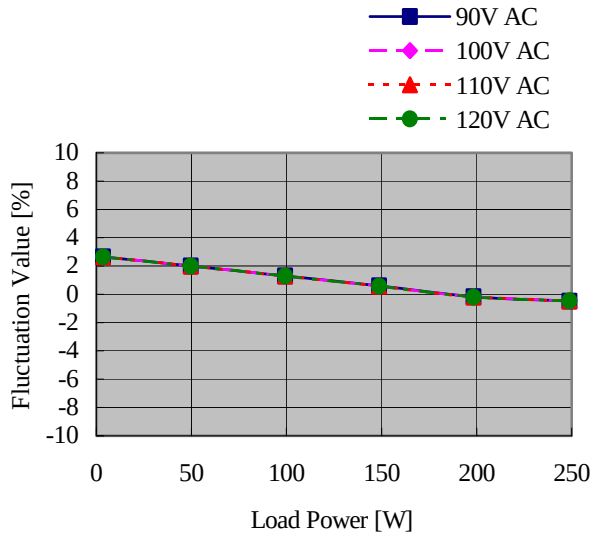




| Load Power [W] | Interruption Detecting Time (ms) | |
|---|---|---|
| | PWR-OK $T_A$ | DC Output $T_B$ |
| 49.6 | 65.1 | 82.3 |
| 99.2 | 31.8 | 40.4 |
| 148.8 | 19.5 | 25.1 |
| 198.4 | 13.1 | 17.2 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Load Regulation |

## V1:5V 10A

at AC Input




at AC Input

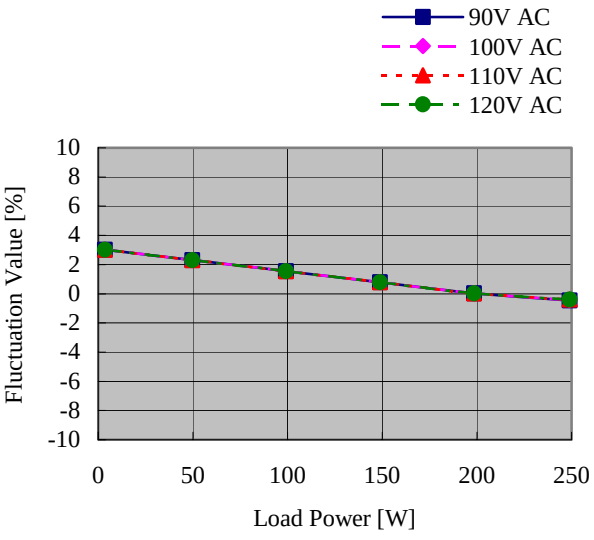
| Load Power [W] | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 3.6 | 2.66 | 2.66 | 2.66 | 2.66 |
| 49.6 | 2.00 | 2.00 | 2.00 | 2.00 |
| 99.2 | 1.30 | 1.30 | 1.30 | 1.30 |
| 148.8 | 0.60 | 0.58 | 0.58 | 0.58 |
| 198.4 | -0.18 | -0.18 | -0.20 | -0.20 |
| 248.9 | -0.48 | -0.46 | -0.46 | -0.46 |

Load Condition

| Load Power [W] | Load Current [A] | | | | |
|---|---|---|---|---|---|
| | 5V | 3.3V | 12V | -12V | 5Vs |
| 3.6 | 0 | 0 | 0.3 | 0 | 0 |
| 49.6 | 2.5 | 1.5 | 2.5 | 0.075 | 0.25 |
| 99.2 | 5 | 3 | 5 | 0.15 | 0.5 |
| 148.8 | 7.5 | 4.5 | 7.5 | 0.225 | 0.75 |
| 198.4 | 10 | 6 | 10 | 0.3 | 1 |
| 248.9 | 10 | 6 | 14 | 0.3 | 1.5 |

## V2:3.3V 6A

at AC Input




at AC Input

| Load Power [W] | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 3.6 | 3.03 | 3.03 | 3.03 | 3.03 |
| 49.6 | 2.30 | 2.30 | 2.30 | 2.30 |
| 99.2 | 1.55 | 1.55 | 1.55 | 1.55 |
| 148.8 | 0.79 | 0.79 | 0.79 | 0.79 |
| 198.4 | 0.03 | 0.03 | 0.03 | 0.03 |
| 248.9 | -0.45 | -0.42 | -0.39 | -0.39 |

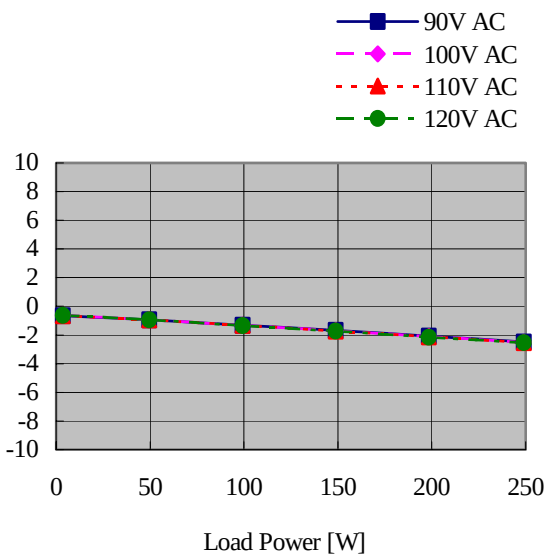
Load Condition

| Load Power [W] | Load Current [A] | | | | |
|---|---|---|---|---|---|
| | 5V | 3.3V | 12V | -12V | 5Vs |
| 3.6 | 0 | 0 | 0.3 | 0 | 0 |
| 49.6 | 2.5 | 1.5 | 2.5 | 0.075 | 0.25 |
| 99.2 | 5 | 3 | 5 | 0.15 | 0.5 |
| 148.8 | 7.5 | 4.5 | 7.5 | 0.225 | 0.75 |
| 198.4 | 10 | 6 | 10 | 0.3 | 1 |
| 248.9 | 10 | 6 | 14 | 0.3 | 1.5 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Load Regulation |

## V3：12V 10A

at AC Input




at AC Input

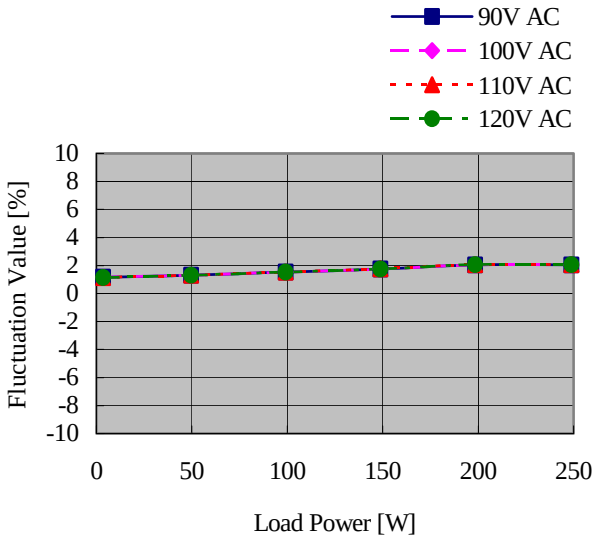
| Load Power [W] | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 3.6 | -0.65 | -0.64 | -0.65 | -0.64 |
| 49.6 | -0.93 | -0.94 | -0.94 | -0.94 |
| 99.2 | -1.32 | -1.32 | -1.33 | -1.33 |
| 148.8 | -1.68 | -1.70 | -1.72 | -1.73 |
| 198.4 | -2.08 | -2.10 | -2.13 | -2.14 |
| 248.9 | -2.49 | -2.51 | -2.53 | -2.54 |

Load Condition

| Load Power [W] | Load Current [A] | | | | |
|---|---|---|---|---|---|
| | 5V | 3.3V | 12V | -12V | 5Vs |
| 3.6 | 0 | 0 | 0.3 | 0 | 0 |
| 49.6 | 2.5 | 1.5 | 2.5 | 0.075 | 0.25 |
| 99.2 | 5 | 3 | 5 | 0.15 | 0.5 |
| 148.8 | 7.5 | 4.5 | 7.5 | 0.225 | 0.75 |
| 198.4 | 10 | 6 | 10 | 0.3 | 1 |
| 248.9 | 10 | 6 | 14 | 0.3 | 1.5 |

## V4：-12V 0.3A

at AC Input




at AC Input

| Load Power [W] | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 3.6 | 1.17 | 1.16 | 1.15 | 1.15 |
| 49.6 | 1.32 | 1.32 | 1.32 | 1.31 |
| 99.2 | 1.54 | 1.53 | 1.54 | 1.53 |
| 148.8 | 1.75 | 1.76 | 1.77 | 1.76 |
| 198.4 | 2.03 | 2.04 | 2.06 | 2.06 |
| 248.9 | 2.04 | 2.05 | 2.06 | 2.06 |

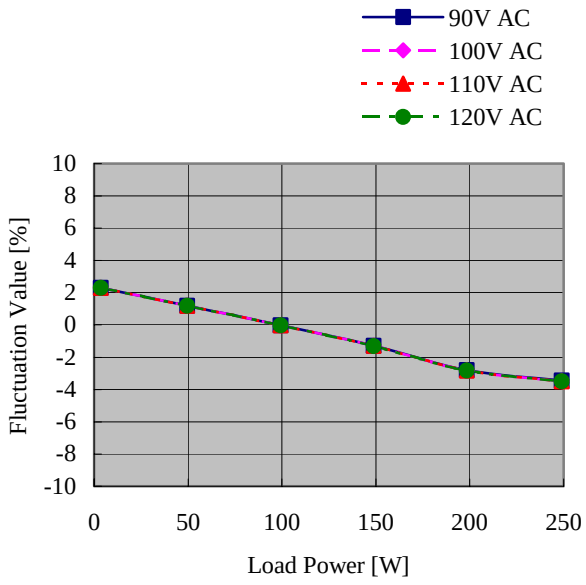
Load Condition

| Load Power [W] | Load Current [A] | | | | |
|---|---|---|---|---|---|
| | 5V | 3.3V | 12V | -12V | 5Vs |
| 3.6 | 0 | 0 | 0.3 | 0 | 0 |
| 49.6 | 2.5 | 1.5 | 2.5 | 0.075 | 0.25 |
| 99.2 | 5 | 3 | 5 | 0.15 | 0.5 |
| 148.8 | 7.5 | 4.5 | 7.5 | 0.225 | 0.75 |
| 198.4 | 10 | 6 | 10 | 0.3 | 1 |
| 248.9 | 10 | 6 | 14 | 0.3 | 1.5 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Load Regulation |

**V5：5Vsb　1A**

at AC Input




at AC Input

| Load Power [W] | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| 3.6 | 2.32 | 2.32 | 2.32 | 2.32 |
| 49.6 | 1.20 | 1.20 | 1.20 | 1.20 |
| 99.2 | 0.00 | 0.00 | 0.00 | 0.00 |
| 148.8 | -1.28 | -1.28 | -1.28 | -1.30 |
| 198.4 | -2.80 | -2.82 | -2.82 | -2.82 |
| 248.9 | -3.44 | -3.48 | -3.48 | -3.48 |

Load Condition

| Load Power [W] | Load Current [A] | | | | |
|---|---|---|---|---|---|
| | 5V | 3.3V | 12V | -12V | 5Vs |
| 3.6 | 0 | 0 | 0.3 | 0 | 0 |
| 49.6 | 2.5 | 1.5 | 2.5 | 0.075 | 0.25 |
| 99.2 | 5 | 3 | 5 | 0.15 | 0.5 |
| 148.8 | 7.5 | 4.5 | 7.5 | 0.225 | 0.75 |
| 198.4 | 10 | 6 | 10 | 0.3 | 1 |
| 248.9 | 10 | 6 | 14 | 0.3 | 1.5 |

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Ripple / Noise Voltage Test | |

[Test conditions] Ambient temperature: -5℃, 25℃, 45℃, 65℃
Input voltage: 90V, 100V, 120 AC
Load: Rated load
At 65℃, the derating factor (80%) specified for 60℃ is applied to this test.

| | | V1 | | 5V | V2 | | 3.3V | V3 | | 12V |
|---|---|---|---|---|---|---|---|---|---|---|
| Temperature | Input Voltage | Ripple (mV) | / | Noise (mV) | Ripple (mV) | / | Noise (mV) | Ripple (mV) | / | Noise (mV) |
| -5℃ | 90 V | 18.1 | / | 22.3 | 13.9 | / | 18.9 | 64.8 | / | 77.6 |
| | 100 V | 18.7 | / | 22.6 | 14.1 | / | 19.5 | 64.2 | / | 74.6 |
| | 120 V | 20.1 | / | 16.2 | 24.4 | / | 22.3 | 62.9 | / | 70.7 |
| 25℃ | 90 V | 12.2 | / | 16.4 | 12.9 | / | 17.3 | 44.3 | / | 58.6 |
| | 100 V | 13.6 | / | 18.4 | 13.7 | / | 18.5 | 46.8 | / | 57.5 |
| | 120 V | 15.3 | / | 20.2 | 16.1 | / | 22.2 | 47.5 | / | 55.6 |
| 45℃ | 90 V | 12.4 | / | 17.5 | 13.4 | / | 17.8 | 44.7 | / | 57.6 |
| | 100 V | 13.0 | / | 18.4 | 13.8 | / | 18.5 | 43.9 | / | 56.6 |
| | 120 V | 14.9 | / | 20.8 | 16.1 | / | 23.0 | 45.5 | / | 55.2 |
| 65℃ | 90 V | 12.3 | / | 17.2 | 12.8 | / | 18.2 | 38.3 | / | 49.7 |
| | 100 V | 12.6 | / | 17.0 | 13.5 | / | 19.1 | 38.3 | / | 47.9 |
| | 120 V | 14.7 | / | 19.8 | 16.5 | / | 22.8 | 40.3 | / | 47.7 |
| Specification | | ≤ 50 | / | ≤ 100 | ≤ 50 | / | ≤ 100 | ≤ 120 | / | ≤ 170 |
| Judgment | | Good | | | Good | | | Good | | |

| | | V4 | | -12V | V5 | | 5Vsb |
|---|---|---|---|---|---|---|---|
| Temperature | Input Voltage | Ripple (mV) | / | Noise (mV) | Ripple (mV) | / | Noise (mV) |
| -5℃ | 90 V | 15.1 | / | 22.3 | 31.0 | / | 40.4 |
| | 100 V | 16.2 | / | 25.9 | 32.1 | / | 40.1 |
| | 120 V | 18.3 | / | 18.7 | 31.7 | / | 26.3 |
| 25℃ | 90 V | 14.5 | / | 21.6 | 21.3 | / | 27.8 |
| | 100 V | 17.1 | / | 26.3 | 25.1 | / | 32.0 |
| | 120 V | 20.7 | / | 32.1 | 16.4 | / | 23.1 |
| 45℃ | 90 V | 16.2 | / | 23.1 | 21.1 | / | 26.6 |
| | 100 V | 18.4 | / | 27.0 | 22.6 | / | 29.3 |
| | 120 V | 22.2 | / | 33.3 | 16.8 | / | 23.1 |
| 65℃ | 90 V | 17.0 | / | 23.1 | 28.3 | / | 35.0 |
| | 100 V | 19.0 | / | 26.4 | 14.6 | / | 20.3 |
| | 120 V | 22.3 | / | 32.1 | 13.6 | / | 19.6 |
| Specification | | ≤ 120 | / | ≤ 170 | ≤ 50 | / | ≤ 100 |
| Judgment | | Good | | | Good | | |

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Over-Current Protection | |

● Test conditions

Ambient temperature: -5℃, 25℃, 45℃, 65℃
Input voltage: 90V, 100V, 120V AC
Load: All loads other than measurement channel are set to the ratings.
At 65℃, the derating factor (80%) specified for 60℃ is applied to this test.

| Temperature | AC Input voltage | CH1 5V | CH2 3.3V | CH3 12V |
|---|---|---|---|---|
| -5℃ | 90 V | 17.40 A | 20.91 A | 18.62 A |
| | 100 V | 17.30 A | 20.91 A | 20.14 A |
| | 120 V | 17.20 A | 20.81 A | 22.64 A |
| 25℃ | 90 V | 16.81 A | 20.31 A | 18.12 A |
| | 100 V | 16.70 A | 20.21 A | 19.32 A |
| | 120 V | 16.61 A | 20.12 A | 21.93 A |
| 45℃ | 90 V | 16.20 A | 19.71 A | 17.63 A |
| | 100 V | 16.00 A | 19.51 A | 18.73 A |
| | 120 V | 15.90 A | 19.41 A | 20.94 A |
| 65℃ | 90 V | 16.90 A | 20.31 A | 18.12 A |
| | 100 V | 18.30 A | 21.02 A | 19.24 A |
| | 120 V | 18.70 A | 19.21 A | 21.34 A |
| Specification | | ≥ 13.2A | ≥ 13.2A | ≥ 14.0A |
| Judgment | | PASS | PASS | PASS |

| Temperature | AC Input voltage | CH4 -12V | CH5 5Vs |
|---|---|---|---|
| -5℃ | 90 V | 1.07 A | 1.83 A |
| | 100 V | 1.05 A | 1.91 A |
| | 120 V | 1.03 A | 2.18 A |
| 25℃ | 90 V | 0.93 A | 1.87 A |
| | 100 V | 0.91 A | 1.95 A |
| | 120 V | 0.90 A | 2.11 A |
| 45℃ | 90 V | 0.74 A | 1.89 A |
| | 100 V | 0.76 A | 1.95 A |
| | 120 V | 0.71 A | 1.99 A |
| 65℃ | 90 V | 0.69 A | 1.83 A |
| | 100 V | 0.71 A | 1.82 A |
| | 120 V | 0.65 A | 1.98 A |
| Specification | | Short-circuit Protection | |
| Judgment | | PASS | PASS |

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Over-Voltage Protection | |

● Test conditions

Ambient temperature: -5°C, 25°C, 45°C, 65°C

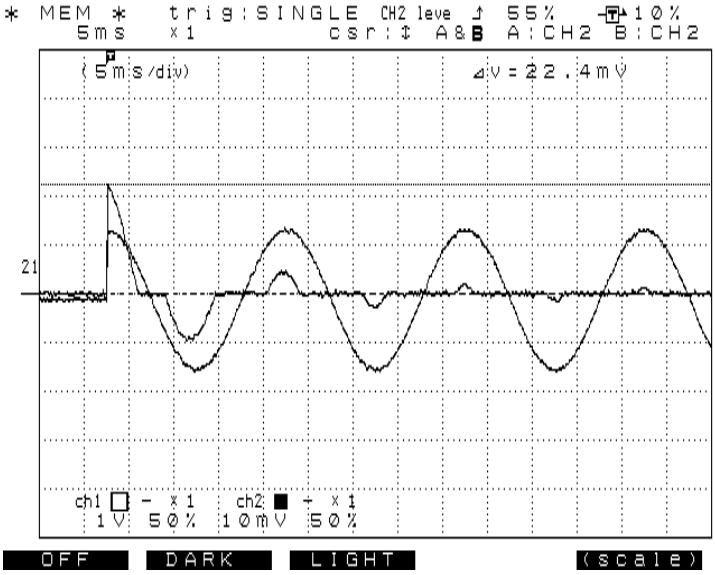
Input voltage: 100V AC

Load: Minimum load

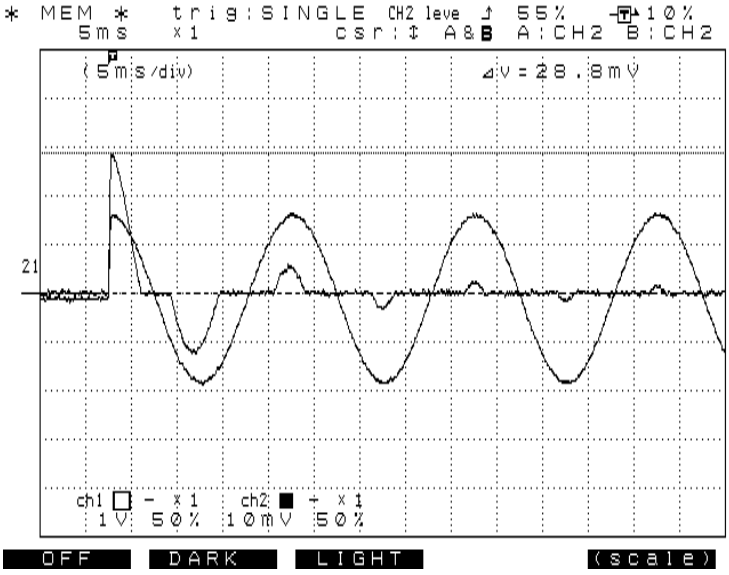
| Temperature | Input voltage | CH1<br>5 V | CH2<br>3.3 V | CH3<br>12 V |
|---|---|---|---|---|
| -5 ℃ | 100V AC | 6.90 V | 4.16 V | 15.00 V |
| 25 ℃ | 100V AC | 6.73 V | 3.97 V | 15.04 V |
| 45 ℃ | 100V AC | 6.62 V | 3.76 V | 15.03 V |
| 65 ℃ | 100V AC | 6.41 V | 3.71 V | 15.12 V |
| Specification | | 3.76 - 4.3V | 5.74 - 7.0V | 13.4 - 15.6V |
| Judgment | | PASS | PASS | PASS |

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Inrush Current | |

## Inrush Current Waveforms




| DATA 1 | |
|---|---|
| CH1 | Measuring Point: AC Input Voltage |
| | Range: 100V/DIV |
| CH2 | Measuring Point: AC Input Current |
| | Range: 10A/DIV |
| Sweep time | 5ms/DIV |
| Conditions | Input: 100V AC, 50Hz<br>Load: Rated Load |
| Note:<br>Inrush Current: 22.4A | |




| DATA 2 | |
|---|---|
| CH1 | Measuring Point: AC Input Voltage |
| | Range: 100V/DIV |
| CH2 | Measuring Point: AC Input Current |
| | Range: 10A/DIV |
| Sweep time | 5ms/DIV |
| Conditions | Input: 100V AC, 50Hz<br>Load: Rated Load |
| Note:<br>Inrush Current: 28.8A | |

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Dynamic Load Response | |

■ Test Conditions

Ambient Temperature 25±5℃ (Room Temperature)
Input Voltage 100V AC
Load-change repetition rate 50 Hz – 10 kHz (No capacitive load)
Note 1: Test limits are derived from the specified DC output voltage accuracy.
Note 2: Vm is measured voltage

Table 1. +5 V DC Output transient response result

| Test Item | Rated Load ⇌ 4.2 A | Test limits | Judgment |
|---|---|---|---|
| Voltage variance | High: 88 mV<br>Low: - 88mV | +250 mV ≥ Vm ≥ -250 mV | PASS |
| Load-change repetition rate from 50Hz to 10kHz. | Normal | No failure and damages. | PASS |

Table 2. +3.3 V DC Output transient response result

| Test Item | Rated Load ⇌ 7 A | Test limits | Judgment |
|---|---|---|---|
| Voltage variance | High: 50 mV<br>Low: -60 mV | +165 mV ≥ Vm ≥ -165 mV | PASS |
| Load-change repetition rate from 50Hz to 10kHz. | Normal | No failure and damages. | PASS |

Table 3. +12 V DC Output transient response result

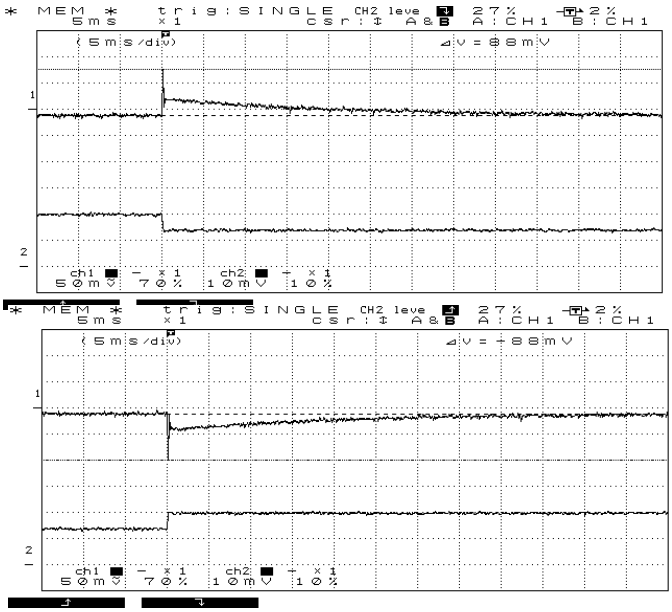
| Test Item | Rated Load ⇌ 5A | Test limits | Judgment |
|---|---|---|---|
| Voltage variance | High: 90 mV<br>Low: -74 mV | +600 mV ≥ Vm ≥ -600 mV | PASS |
| Load-change repetition rate from 50Hz to 10kHz. | Normal | No failure and damages. | PASS |

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Dynamic Load Response | |

（CH1）+5V DC output response waveforms

DC Output Voltage

Load Current



DC Output Voltage

Load Current

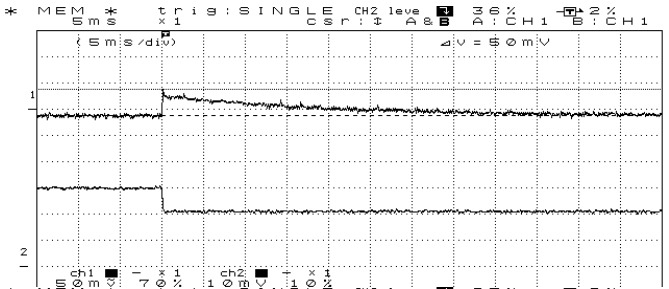


| Waveform 1 | |
|---|---|
| CH1 | Measuring Point: DC Output Voltage |
| | Range: 100mV/DIV |
| CH2 | Measuring Point: DC Output Current |
| | Range: 5A/DIV |
| Sweep time | 5ms/DIV |
| Condition | Input: 100V AC<br>Load: Rated Load<br>(Other output) |
| Note: Rated Load ≒ 7 A | |

（CH2）+3.3V DC output response waveforms

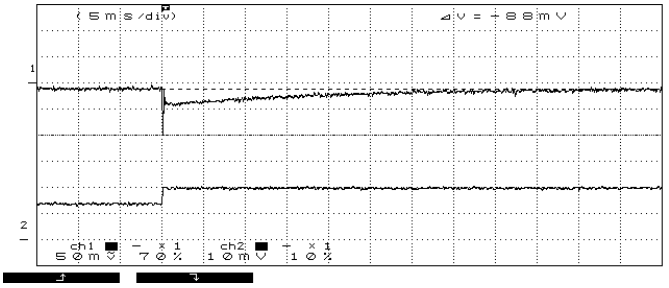
DC Output Voltage

Load Current



DC Output Voltage

Load Current



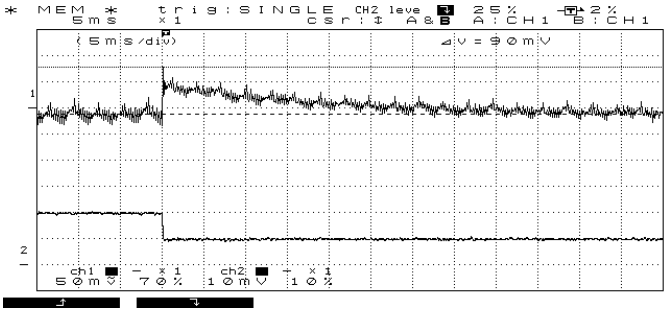
| Waveform 2 | |
|---|---|
| CH1 | Measuring Point: DC Output Voltage |
| | Range: 100mV/DIV |
| CH2 | Measuring Point: DC Output Current |
| | Range: 2A/DIV |
| Sweep time | 5ms/DIV |
| Condition | Input: 100 V AC<br>Load: Rated Load<br>(Other output) |
| Note: Rated Load ≒ 4.2 A | |

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Dynamic Load Response | |

(CH3) +12V DC output response waveforms

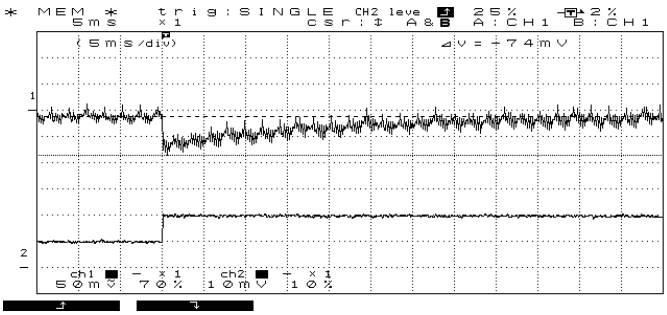
DC Output Voltage

Load Current




DC Output Voltage

Load Current

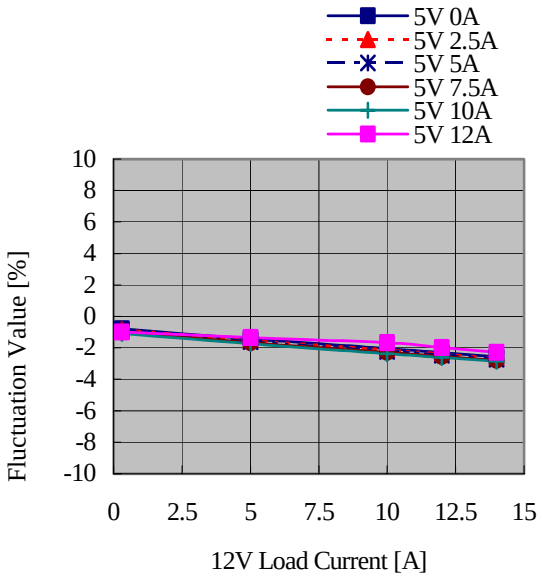



| Waveform 3 | |
|---|---|
| CH1 | Measuring Point: DC Output Voltage |
| | Range: 100mV/DIV |
| CH2 | Measuring Point: DC Output Current |
| | Range: 5A/DIV |
| Sweep time | 5ms/DIV |
| Condition | Input: 100 V AC<br>Load: Rated Load (other output) |

Note: Rated Load ≒ 5 A

| Model | PCSFE-250P-X2S |
|---|---|
| Item | 12V Cross Regulation |

at AC Input

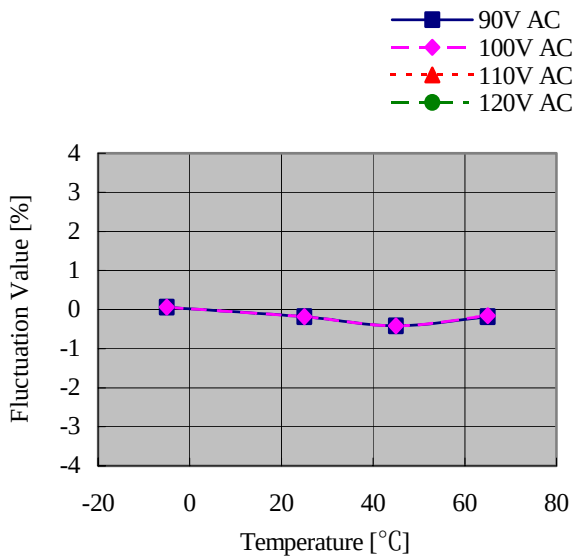



| 12V Load Current | 12V Voltage Value [V] | | | | | |
|---|---|---|---|---|---|---|
| | 5V 0A | 5V 2.5A | 5V 5A | 5V 7.5A | 5V 10A | 5V 10A |
| 0A | 11.906 | 11.900 | 11.89 | 11.881 | 11.871 | 11.882 |
| 5A | 11.829 | 11.819 | 11.809 | 11.799 | 11.791 | 11.839 |
| 10A | 11.754 | 11.744 | 11.735 | 11.726 | 11.716 | 11.800 |
| 12A | 11.724 | 11.713 | 11.705 | 11.695 | 11.686 | 11.764 |
| 14A | 11.693 | 11.682 | 11.674 | 11.665 | 11.657 | 11.726 |

| 12V Load Current | Fluctuation Value [%] | | | | | |
|---|---|---|---|---|---|---|
| | 5V 0A | 5V 2.5A | 5V 5A | 5V 7.5A | 5V 10A | 5V 10A |
| 0A | -0.78 | -0.83 | -0.92 | -0.99 | -1.07 | -0.98 |
| 5A | -1.43 | -1.51 | -1.59 | -1.68 | -1.74 | -1.34 |
| 10A | -2.05 | -2.13 | -2.21 | -2.28 | -2.37 | -1.67 |
| 12A | -2.30 | -2.39 | -2.46 | -2.54 | -2.62 | -1.97 |
| 14A | -2.56 | -2.65 | -2.75 | -2.79 | -2.86 | -2.28 |

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Ambient Temperature Drift |

**V1：5V 10A**



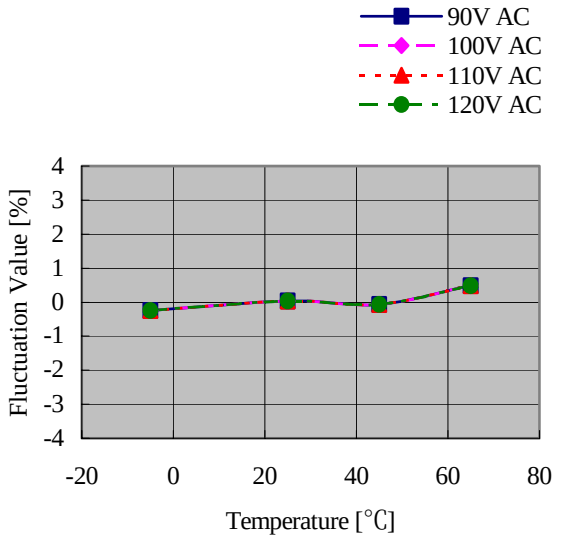

at AC Input

| Temperature (℃) | Output Voltage [V] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | 5.003 | 5.003 | 5.003 | 5.003 |
| 25 | 4.991 | 4.991 | 4.990 | 4.990 |
| 45 | 4.979 | 4.979 | 4.979 | 4.979 |
| 65(1) | 4.991 | 4.992 | 4.992 | 4.992 |

| Temperature (℃) | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | 0.06 | 0.06 | 0.06 | 0.06 |
| 25 | -0.18 | -0.18 | -0.20 | -0.20 |
| 45 | -0.42 | -0.42 | -0.42 | -0.42 |
| 65(1) | -0.18 | -0.16 | -0.16 | -0.16 |

(1) 80% of Rated Load

**V2：3.3V 6A**




at AC Input

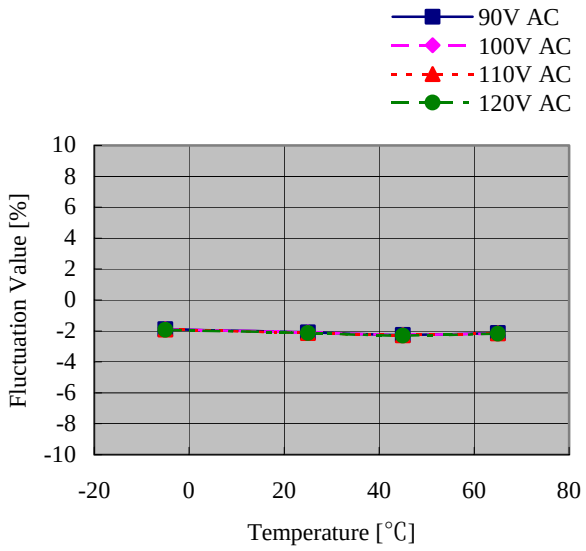
| Temperature (℃) | Output Voltage [V] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | 3.292 | 3.292 | 3.292 | 3.292 |
| 25 | 3.301 | 3.301 | 3.301 | 3.301 |
| 45 | 3.298 | 3.298 | 3.298 | 3.298 |
| 65(1) | 3.316 | 3.316 | 3.316 | 3.316 |

| Temperature (℃) | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | -0.24 | -0.24 | -0.24 | -0.24 |
| 25 | 0.03 | 0.03 | 0.03 | 0.03 |
| 45 | -0.06 | -0.06 | -0.06 | -0.06 |
| 65(1) | 0.48 | 0.48 | 0.48 | 0.48 |

(1) 80% of Rated Load

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Ambient Temperature Drift |

**V3：12V 10A**



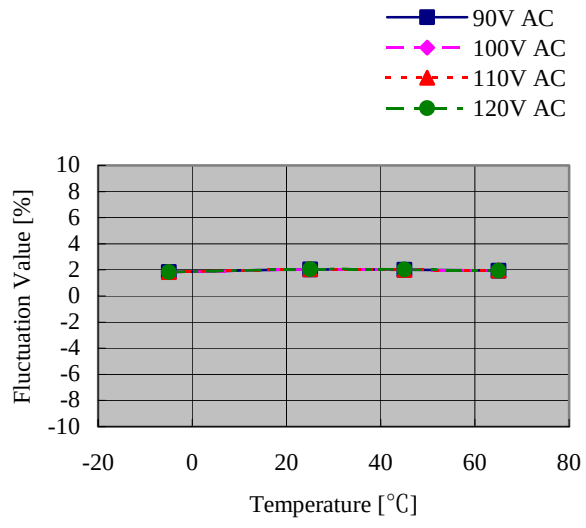

at AC Input

| Temperature (℃) | Output Voltage [V] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | 11.775 | 11.773 | 11.771 | 11.769 |
| 25 | 11.750 | 11.748 | 11.744 | 11.743 |
| 45 | 11.730 | 11.729 | 11.726 | 11.741 |
| 65(1) | 11.744 | 11.742 | 11.724 | 11.740 |

| Temperature (℃) | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | -1.88 | -1.89 | -1.91 | -1.93 |
| 25 | -2.08 | -2.10 | -2.13 | -2.14 |
| 45 | -2.25 | -2.26 | -2.28 | -2.30 |
| 65(1) | -2.13 | -2.15 | -2.16 | -2.17 |

(1) 80% of Rated Load

**V4：-12V 0.3A**




at AC Input

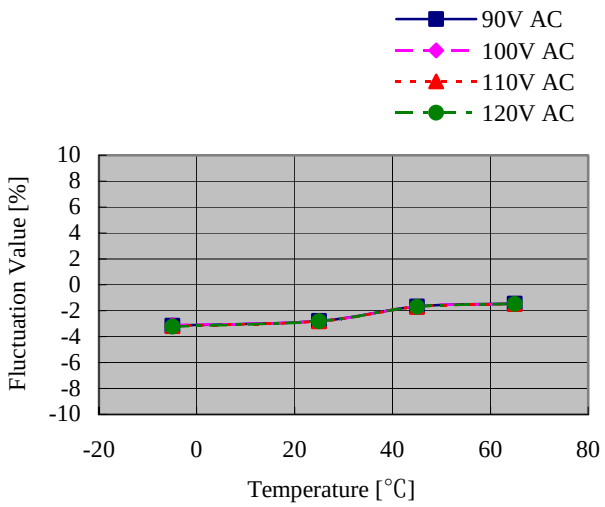
| Temperature (℃) | Output Voltage [V] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | -12.220 | -12.221 | -12.222 | -12.222 |
| 25 | -12.244 | -12.245 | -12.247 | -12.247 |
| 45 | -12.242 | -12.242 | -12.242 | -12.243 |
| 65(1) | -12.232 | -12.232 | -12.234 | -12.232 |

| Temperature (℃) | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | 1.83 | 1.84 | 1.85 | 1.85 |
| 25 | 2.03 | 2.04 | 2.06 | 2.06 |
| 45 | 2.02 | 2.02 | 2.02 | 2.03 |
| 65(1) | 1.93 | 1.93 | 1.95 | 1.93 |

(1) 80% of Rated Load

| Model | PCSFE-250P-X2S |
|---|---|
| Item | Ambient Temperature Drift |

**V5∶5Vsb 1A**




at AC Input

| Temperature (℃) | Output Voltage [V] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | 4.842 | 4.844 | 4.841 | 4.838 |
| 25 | 4.860 | 4.859 | 4.859 | 4.859 |
| 45 | 4.916 | 4.916 | 4.915 | 4.915 |
| 65(1) | 4.927 | 4.926 | 4.926 | 4.926 |

| Temperature (℃) | Fluctuation Value [%] | | | |
|---|---|---|---|---|
| | Input Voltage 90V AC | Input Voltage 100V AC | Input Voltage 110V AC | Input Voltage 120V AC |
| -5 | -3.16 | -3.12 | -3.18 | -3.24 |
| 25 | -2.80 | -2.82 | -2.82 | -2.82 |
| 45 | -1.68 | -1.68 | -1.70 | -1.70 |
| 65(1) | -1.46 | -1.48 | -1.48 | -1.48 |

(1) 80% of Rated Load

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Leakage Current | |

## [Test Conditions]

| | |
|---|---|
| Ambient temperature | 25˚ ±5℃ (Room Temperature) |
| Input voltage | 100V AC, 60Hz |
| Load | Rated load, Minimum load |
| Measuring Instrument | YEW.TYPE 3226 or equivalent (Input resistance: 1kΩ) |

## [Test results]

| Input voltage | Rated load | Minimum load |
|---|---|---|
| 100V AC | 0.28mA | 0.30mA |

Specification: ≤ 0.5mA

Judgment : PASS

| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Line Noise Tolerance | |

## [Test Conditions]

| | |
|---|---|
| Ambient temperature | 25° ±5℃ (Room Temperature) |
| Input Voltage | 100V AC |
| Load | Rated load |
| Applied Noise Voltage | ±2000V |
| Repetitive Cycle | 30 - 100Hz |
| Pulse Width | 100, 1000ns |

Measuring Instrument: INS420 (Noise Laboratory Co.,Ltd.)

## [Test results]

| | | | | |
|---|---|---|---|---|
| Normal mode | Pulse width and polarity | | | |
| | 100ns | | 1000ns | |
| | Polarity + | Polarity - | Polarity + | Polarity - |
| | ✓ | ✓ | ✓ | ✓ |
| Common mode R Phase | Pulse width and polarity | | | |
| | 100ns | | 1000ns | |
| | Polarity + | Polarity - | Polarity + | Polarity - |
| | ✓ | ✓ | ✓ | ✓ |
| Common mode S Phase | Pulse width and polarity | | | |
| | 100ns | | 1000ns | |
| | Polarity + | Polarity - | Polarity + | Polarity - |
| | ✓ | ✓ | ✓ | ✓ |

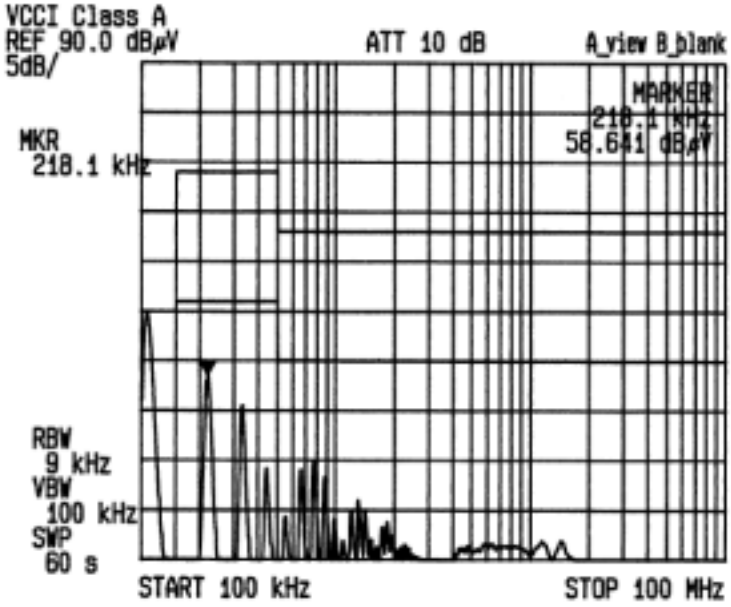
Symbol notes ✓ →Normal
× →Power Supply Breakdown

Judgment: PASS

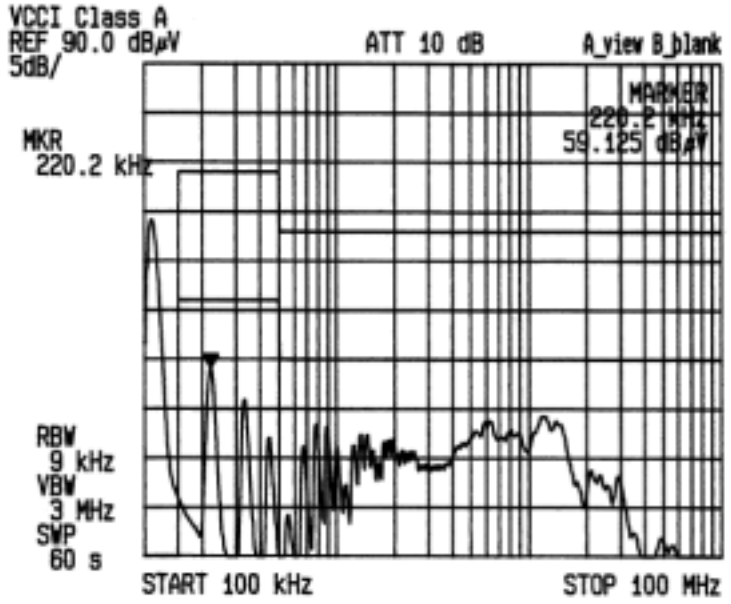
| Model | PCSFE-250P-X2S | |
|---|---|---|
| Item | Conducted Emission | |

## [Test conditions]

| | |
|---|---|
| Temperature | 25 °C ±5°C Room Temperature |
| Input | 100V AC |
| Load | Rated Load |
| Measuring Point | L-FG, N-FG |
| Measuring Instrument | R3261A (Advantest) |




| |
|---|
| Temp: 25 °C ±5°C |
| Input: 100V AC, 60Hz |
| Load: Rated load |
| Phase: L |
| Measured mode: QP |
| Spec: VCCI Class A |
| Test result:<br>59.125 dBuV (at 220.2kHz) |
| Judgment: PASS |




| |
|---|
| Temp: 25 °C ±5°C |
| Input: 100V AC, 60Hz |
| Load: Rated load |
| Phase: N |
| Measured mode: QP |
| Spec: VCCI Class A |
| Test result:<br>64.172 dBuV (at 218.1kHz) |
| Judgment: PASS |