COSEL

TEST DATA OF PJA300F-5

Regulated DC Power Supply
August 4, 2017

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Model	PJA300F-5
Item	Input Current (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   100V
---⊟--- Input Volt.   115V
—·—○—·— Input Volt.   230V

Input Current [A] (vertical axis)
Load Current [A] (horizontal axis)

Note: Slanted line shows the range of the rated
      load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	0.112	0.105	0.101
8	0.699	0.611	0.349
16	1.170	1.020	0.548
24	1.672	1.461	0.759
32	2.207	1.906	0.978
40	2.742	2.384	1.209
48	3.326	2.873	1.443
50	3.466	2.995	1.502
55	3.825	3.316	1.652
--	-	-	-
--	-	-	-

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Model	PJA300F-5
Item	Input Power (by Load Current)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   100V
– – –⊟– – – Input Volt.   115V
—·—○—··— Input Volt.   230V
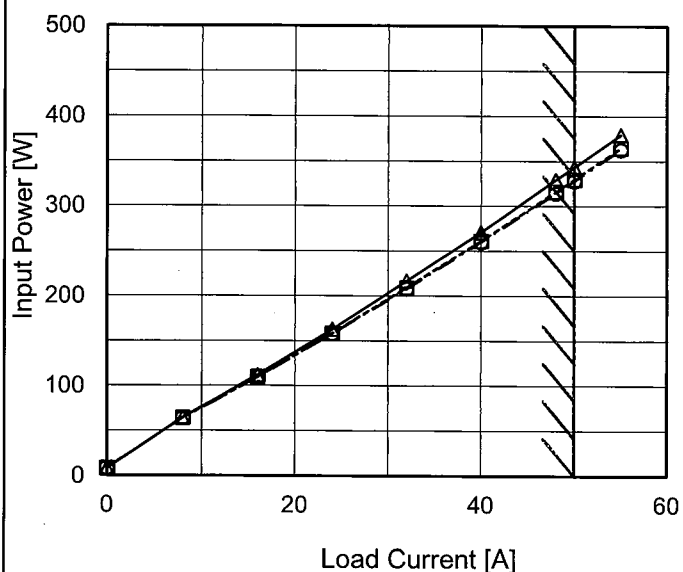
Load Current [A]

Note: Slanted line shows the range of the rated
        load current.

2.Values

Load Current	Input Power [W]		
[A]	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	8.0	8.3	8.3
8	64.7	64.3	64.3
16	112.0	109.7	109.4
24	162.8	158.3	158.1
32	216.7	209.0	207.9
40	270.7	261.1	260.0
48	329.2	315.9	314.4
50	343.3	329.6	328.1
55	379.5	364.9	362.9
--	-	-	-
--	-	-	-

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Model	PJA300F-5
Item	Efficiency (by Input Voltage)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

- - -⊟- - - Load 50%
———△——— Load 100%

Note: Slanted line shows the range of the rated
input voltage.

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
85	74.0	72.5 ※1
100	75.3	73.8
115	75.4	74.7
200	77.0	76.6
230	77.0	77.0
264	77.3	77.2
280	77.2	77.2
--	-	-
--	-	-

※1：Load 80%

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Model	PJA300F-5
Item	Efficiency (by Load Current)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.   100V
- - -☐- - - Input Volt.   115V
—·—○—·— Input Volt.   230V
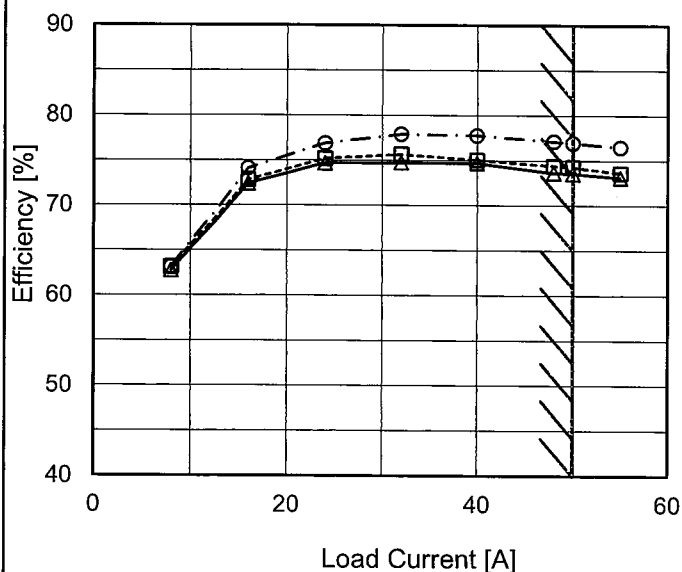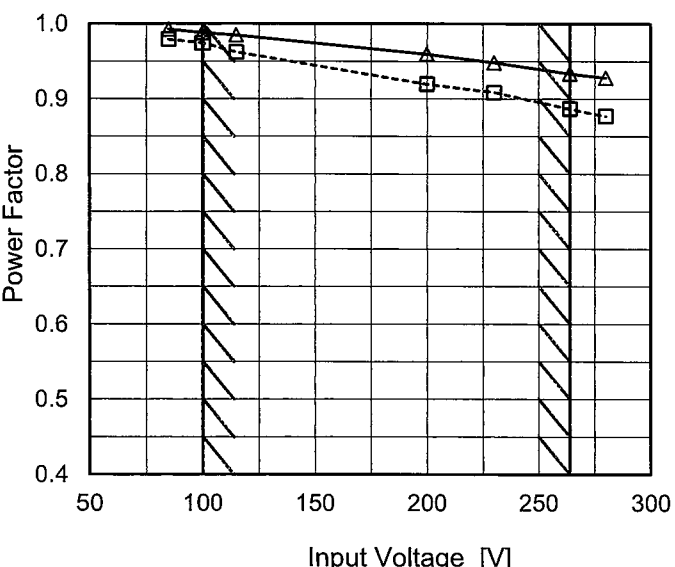
Load Current [A]

Note: Slanted line shows the range of the rated
       load current.

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	-	-	-
8	62.7	63.1	63.2
16	72.4	72.8	74.1
24	74.7	75.2	76.9
32	74.7	75.7	77.9
40	74.7	75.0	77.8
48	73.6	74.4	77.1
50	73.6	74.3	77.0
55	73.1	73.6	76.5
--	-	-	-
---	-	-	-

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Model	PJA300F-5
Item	Power Factor (by Input Voltage)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

```
- - - ⊟ - -    Load  50%
——— △ ———    Load 100%
```


Power Factor vs Input Voltage [V]

Note: Slanted line shows the range of the rated
      input voltage.

2.Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
85	0.980	0.993 ※1
100	0.975	0.988
115	0.962	0.985
200	0.920	0.960
230	0.909	0.949
264	0.887	0.934
280	0.877	0.928
--	-	-
--	-	-

※1：Load 80%

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Model	PJA300F-5
Item	Power Factor (by Load Current)
Object	————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

—△— Input Volt. 100V
---□--- Input Volt. 115V
—·—○—·— Input Volt. 230V

Power Factor vs Load Current [A]

Note: Slanted line shows the range of the rated
load current.

2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	0.718	0.430	0.360
8	0.924	0.831	0.799
16	0.955	0.895	0.868
24	0.972	0.920	0.906
32	0.980	0.939	0.924
40	0.986	0.947	0.934
48	0.988	0.958	0.946
50	0.988	0.960	0.949
55	0.991	0.966	0.955
---	-	-	-
---	-	-	-

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Model	PJA300F-5
Item	Inrush Current
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

Input
Current
[20A/div]

Input
Voltage
[100V/div]

Time   [100ms/div]

Input Voltage   100 V
Frequency   60 Hz
Load   100 %

Primary inrush current :
                    12.0 A
Secondary inrush current :
                    8.7 A

Input
Current
[20A/div]

Input
Voltage
[200V/div]

Time   [100ms/div]

Input Voltage   230 V
Frequency   60 Hz
Load   100 %

Primary inrush current :
                    30.6 A
Secondary inrush current :
                    4.2 A

Primary inrush current   Secondary inrush current

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Model	PJA300F-5
Item	Leakage Current
Object	————————

Temperature   25°C
Testing Circuitry   Figure B

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	115 [V]	240 [V]	
DEN-AN	Figure B-1	Both phases	0.13	0.15	0.33	Operation
		One of phases	0.24	0.27	0.60	Stand by
IEC62368-1	Figure B-2	Both phases	0.14	0.16	0.35	Operation
		One of phases	0.25	0.29	0.65	Stand by
	Figure B-3	Both phases	0.14	0.16	0.32	Operation
		One of phases	0.24	0.27	0.59	Stand by

The value for "One of phases" is the reference value only.

2.Condition

Leakage current value is concluded after measuring both phases of
AC input and by choosing the larger one.

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Model	PJA300F-5
Item	Line Regulation
Object	+5V50A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

```
--- ⊟ --- Load  50%
—— △ —— Load 100%
```

Output Voltage [V] vs Input Voltage [V]

Note: Slanted line shows the range of the rated
        input voltage.

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	5.073	5.057 ※1
100	5.073	5.057
115	5.073	5.057
200	5.073	5.057
230	5.073	5.057
264	5.073	5.058
280	5.073	5.058
--	-	-
--	-	-

※1：Load 80%

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Model	PJA300F-5
Item	Load Regulation
Object	+5V50A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   100V
- - -⊟- - - Input Volt.   115V
—·—○—·· Input Volt.   230V
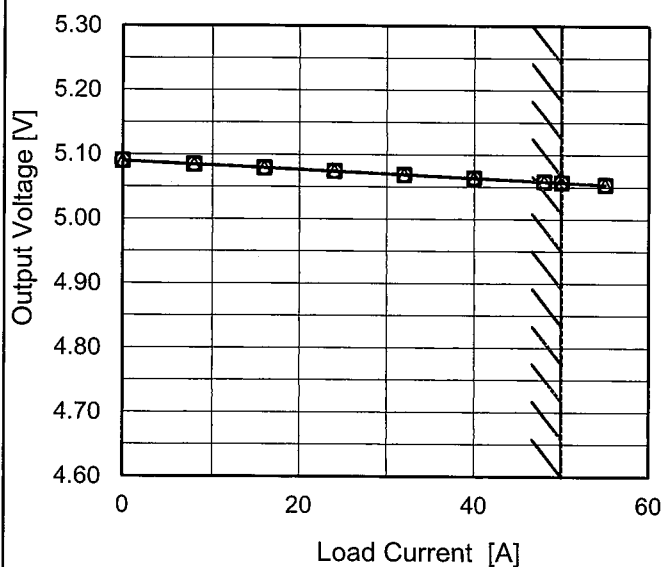
Note: Slanted line shows the range of the rated
load current.

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	5.090	5.091	5.090
8	5.084	5.085	5.085
16	5.079	5.080	5.080
24	5.074	5.075	5.075
32	5.069	5.069	5.069
40	5.064	5.064	5.064
48	5.058	5.059	5.059
50	5.057	5.057	5.058
55	5.054	5.054	5.054
--	-	-	-
--	-	-	-

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Model	PJA300F-5
Item	Dynamic Load Response
Object	+5V50A

Temperature	25° C
Testing Circuitry	Figure A

Input Volt.   100 V   Response.   t1=t2=50us. Typ
Cycle   1000 ms

Load Current

t1   t2

Min. Load (0A) ←—→
Load 100% (50A)

200 mV/div

20ms/div

20ms/div

Min. Load (0A) ←—→
Load 50% (25A)

200 mV/div

20ms/div

20ms/div

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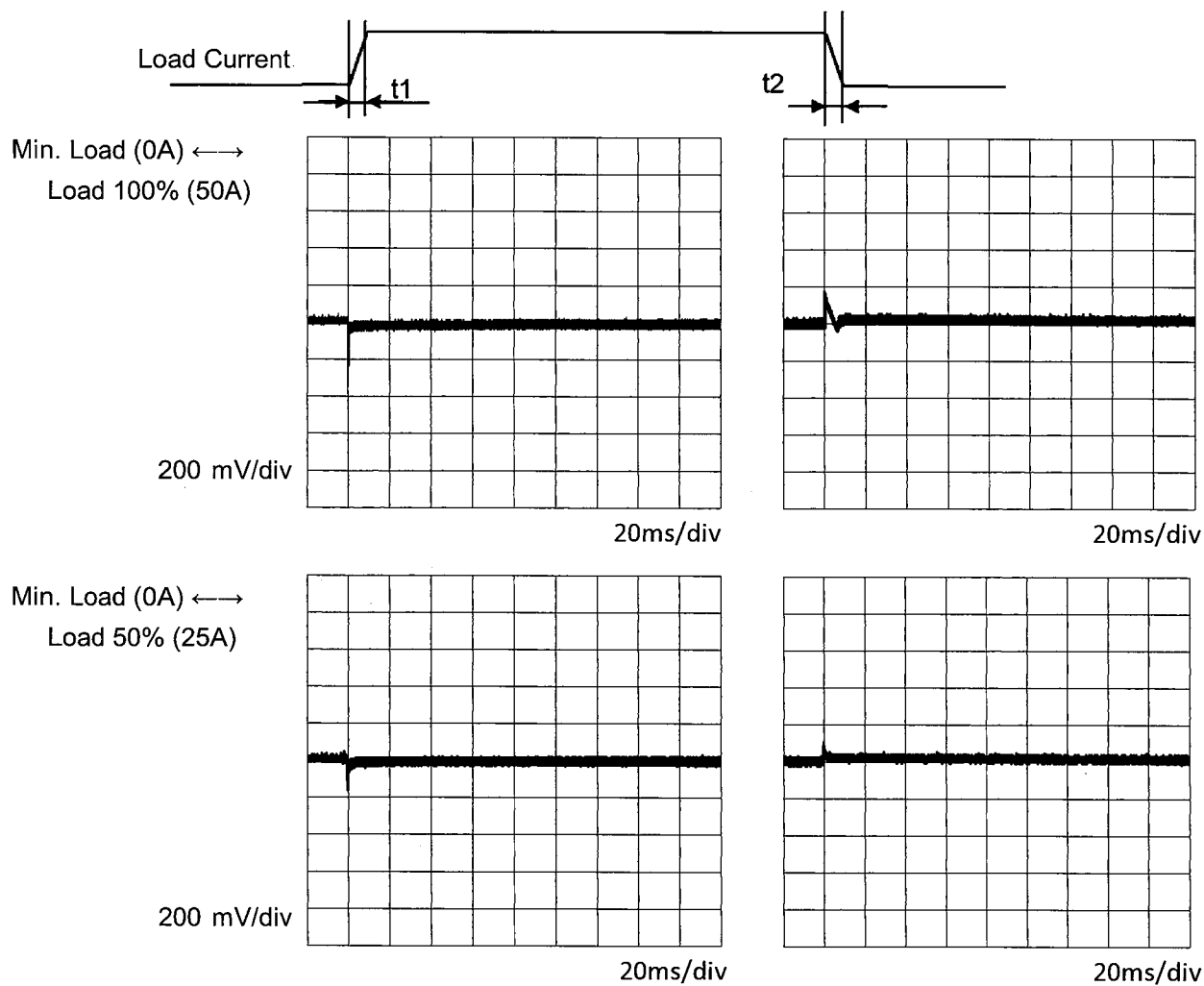
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Model	PJA300F-5
Item	Ripple Voltage (by Load Current)
Object	+5V50A

Temperature 25°C
Testing Circuitry Figure C

1.Graph

———△——— Input Volt. 100V
—··—○—·· Input Volt. 230V

Load Current [A]

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0	10	15
8	10	15
16	10	15
24	15	20
32	15	20
40	15	20
48	20	25
50	20	25
55	25	30
--	-	-
--	-	-

Measured by 20 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated
load current.

T1: Due to AC Input Line
T2: Due to Switching

Fig. Complex Ripple Wave Form

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Model	PJA300F-5
Item	Ripple-Noise
Object	+5V50A

Temperature 25°C
Testing Circuitry Figure C

1.Graph

———△——— Input Volt. 100V
— · —○— · · — Input Volt. 230V
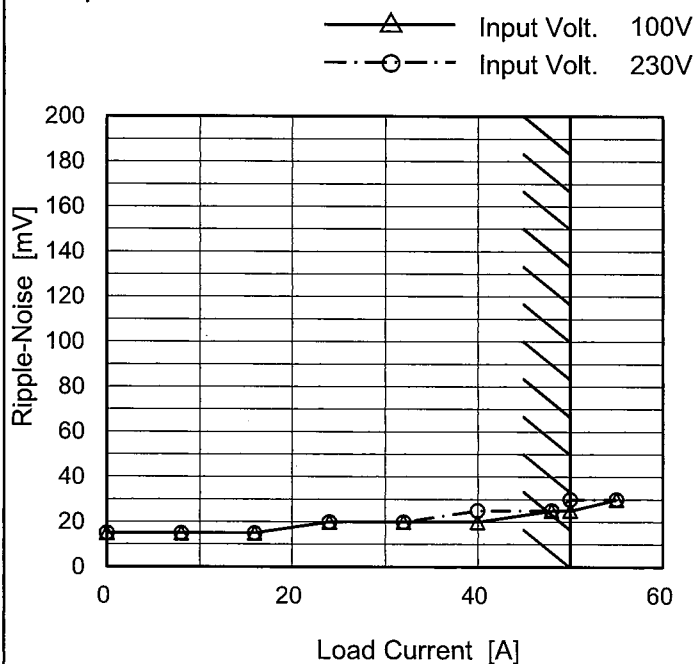
Load Current [A]

Measured by 20 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated
      load current.
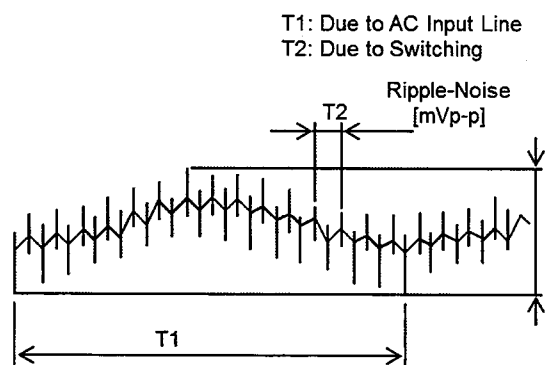
2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0	15	15
8	15	15
16	15	15
24	20	20
32	20	20
40	20	25
48	25	25
50	25	30
55	30	30
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching

Ripple-Noise
[mVp-p]

Fig. Complex Ripple Wave Form

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Model	PJA300F-5
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V50A

Testing Circuitry   Figure C

1.Graph

———△——— Input Volt.   100V
—·—○—·— Input Volt.   230V

Ambient Temperature [°C]

Load 100%
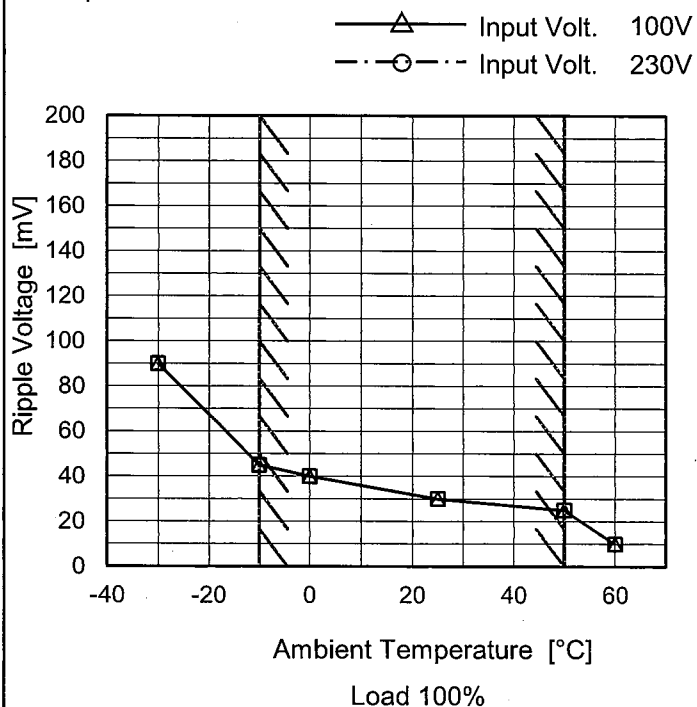
Measured by 20 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
ambient temperature.

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	90	90
-10	45	45
0	40	40
25	30	30
50	25	25
60	10	10
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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Model	PJA300F-5
Item	Ambient Temperature Drift
Object	+5V50A

Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   100V
---⊟--- Input Volt.   115V
—·—◯—·— Input Volt.   230V

Ambient Temperature [°C]
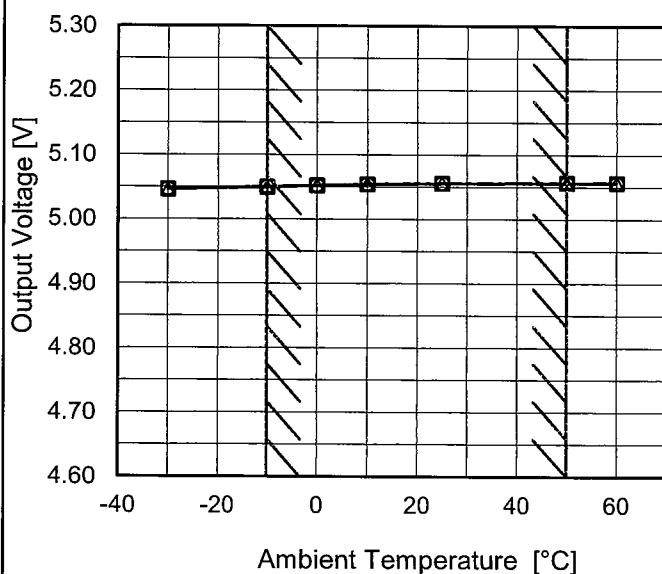
Note: Slanted line shows the range of the rated ambient temperature.

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
-30	5.046	5.046	5.047
-10	5.050	5.050	5.051
0	5.052	5.052	5.053
10	5.054	5.054	5.055
25	5.056	5.056	5.056
50	5.057	5.057	5.057
60	5.057	5.057	5.057
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	PJA300F-5
Item	Output Voltage Accuracy
Object	+5V50A

Testing Circuitry   Figure A

1.Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

Temperature   : -10 - 50°C
Input Voltage : 100 - 264V
Load Current   : 0 - 50A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

* Output Voltage Accuracy (Ratio) = $\dfrac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output Current[A]	Output Voltage[V]	Output Voltage Accuracy Value [mV]	Output Voltage Accuracy Ratio [%]
Maximum Voltage	25	115	0	5.091	±21	±0.4
Minimum Voltage	-10	100	50	5.050		

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Model	PJA300F-5
Item	Time Lapse Drift
Object	+5V50A

Temperature　25°C
Testing Circuitry　Figure A

1.Graph

Time [H]

Input Volt.　230V
Load　100%

* The characteristic of AC100V is equal.

2.Values

Time since start [H]	Output Voltage [V]
0.0	5.055
0.5	5.059
1.0	5.060
2.0	5.060
3.0	5.060
4.0	5.061
5.0	5.061
6.0	5.061
7.0	5.061
8.0	5.061

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Model	PJA300F-5
Item	Rise and Fall Time
Object	+5V50A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

Load 100%   Output Volt. [1V/div]   0   Input Volt. 100 V

Load 100%   Output Volt. [1V/div]   0   Input Volt. 230 V

Input Volt. 0

Time   [100ms/div]   Time   [10ms/div]
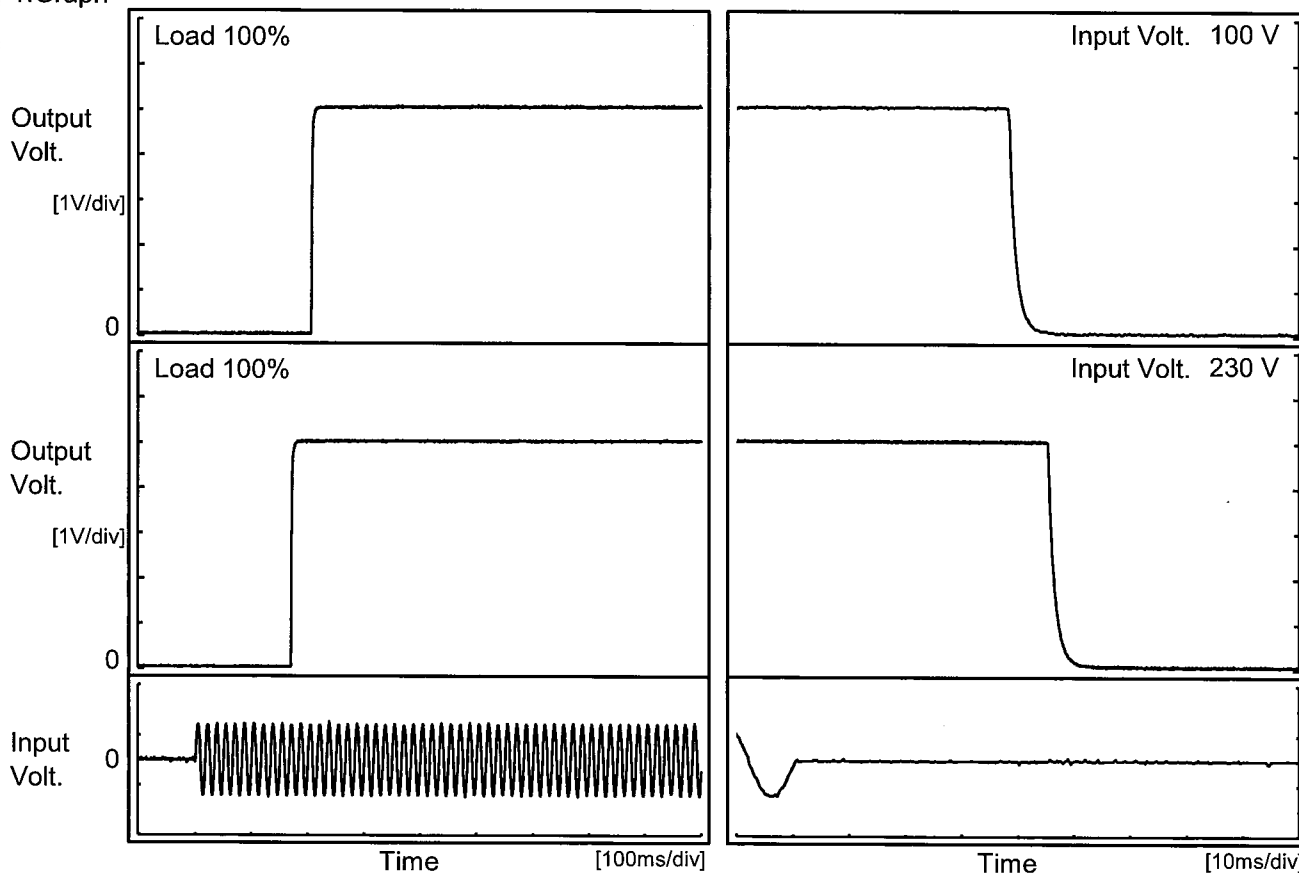
2.Values

[ms]

Input Volt. Time	Td	Tr	Ts	Th	Tf
100 V	206.0	2.5	208.5	38.8	2.7
230 V	171.0	2.0	173.0	45.5	2.7

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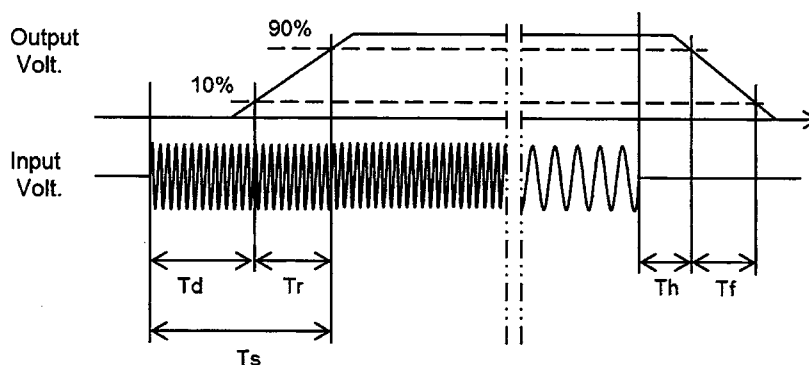
Model	PJA300F-5
Item	Hold-Up Time
Object	+5V50A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

```
- - -⊟- - -  Load 50%
——△——  Load 100%
```

Hold-Up Time [ms] vs Input Voltage [V]

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	78	38 ※1
100	81	39
115	84	40
200	92	44
230	94	46
264	96	48
280	97	48
--	-	-
--	-	-

※1：Load 80%
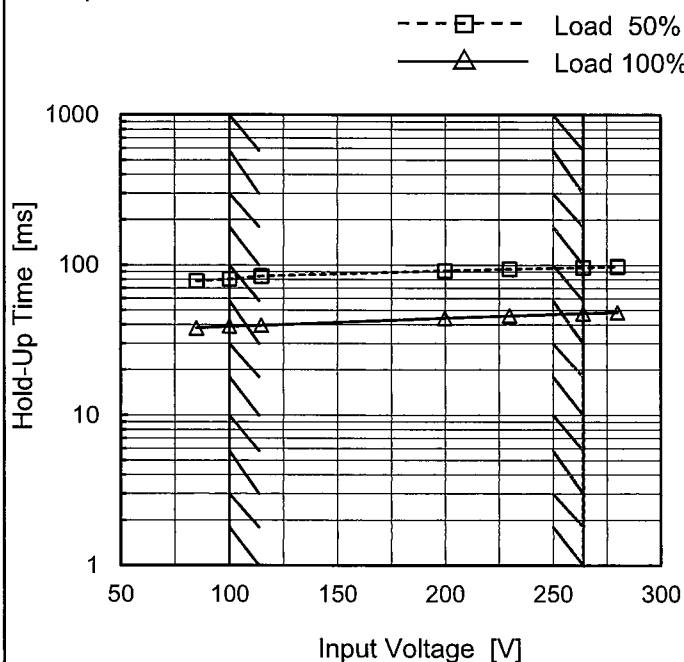
This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.
Note: Slanted line shows the range of the rated input voltage.

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Model	PJA300F-5
Item	Instantaneous Interruption Compensation
Object	+5V50A

Temperature　　25°C
Testing Circuitry　　Figure A

1.Graph

———△——— Input Volt. 100V
– – –◻– – – Input Volt. 115V
—·–○—·· Input Volt. 230V

Load Current [A]

Note: Slanted line shows the range of the rated
load current.

2.Values

Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	-	-	-
8	229	232	263
16	121	122	146
24	79	80	97
32	63	65	73
40	48	48	57
48	39	39	48
50	38	39	46
55	34	35	40
--	-	-	-
--	-	-	-

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Model	PJA300F-5
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V50A

Testing Circuitry   Figure A

1.Graph

--- ⊟ --- Load 50%
——— △ ——— Load 100%

Input Voltage [V] vs Ambient Temperature [°C]

Note: Slanted line shows the range of the rated ambient temperature.

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	36	53
-10	36	53
0	36	53
25	36	52
50	36	53
60	36	53
---	-	-
---	-	-
---	-	-
---	-	-
---	-	-

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Model	PJA300F-5
Item	Overcurrent Protection
Object	+5V50A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

——— Input Volt. 100V

——— Input Volt. 230V

Load Current [A]

Note: Slanted line shows the range of the rated load current.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
4.75	64.32	63.61
4.50	64.51	63.86
4.00	64.89	64.30
3.50	65.27	64.73
3.00	65.70	65.20
2.50	66.16	65.69
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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Model	PJA300F-5
Item	Overvoltage Protection
Object	+5V50A

Testing Circuitry   Figure A
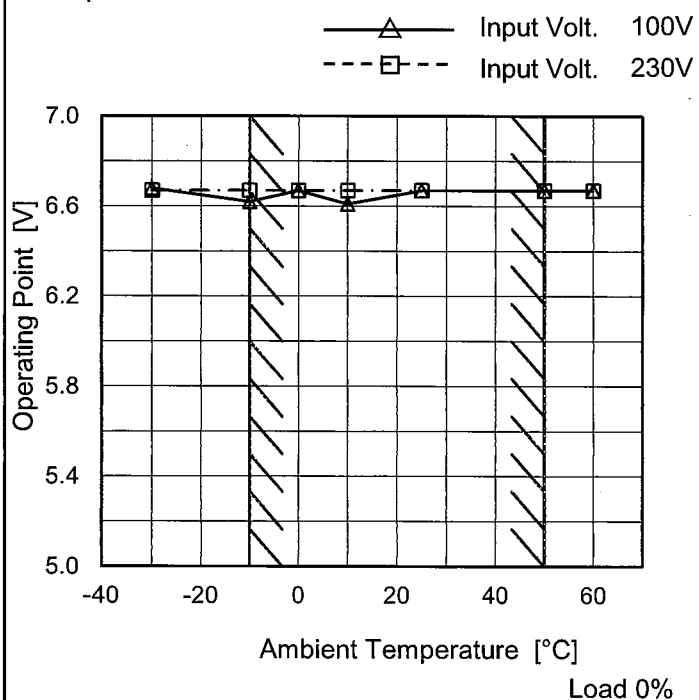
1.Graph

——△—— Input Volt.   100V

‐‐‐❑‐‐‐ Input Volt.   230V

Ambient Temperature [°C]

Load 0%

Note: Slanted line shows the range of the rated
ambient temperature.

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-30	6.68	6.67
-10	6.62	6.67
0	6.67	6.67
10	6.61	6.67
25	6.67	6.67
50	6.67	6.67
60	6.67	6.67
--	-	-
--	-	-
--	-	-
--	-	-

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Figure A

$$\text{Leakage Current Value [A]} = \frac{\text{Effective Value of Voltmeter[V]}}{1k \ [\Omega]}$$

Figure B-1 (DEN-AN)

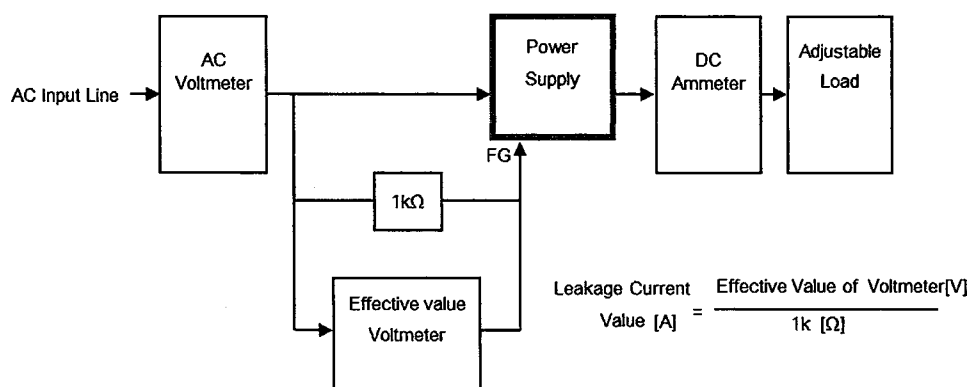$$\text{Leakage Current Value [A]} = \frac{\text{Effective Value of Voltmeter[V]}}{500 \ [\Omega]}$$
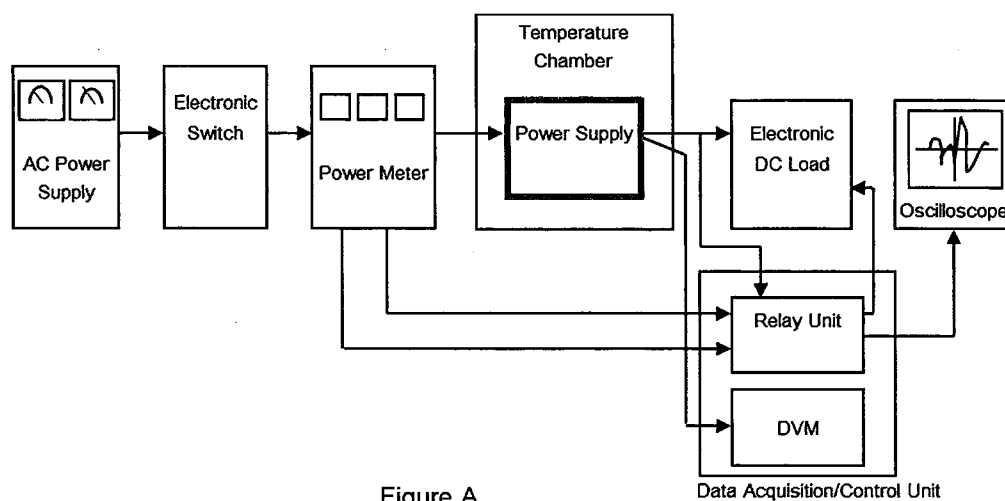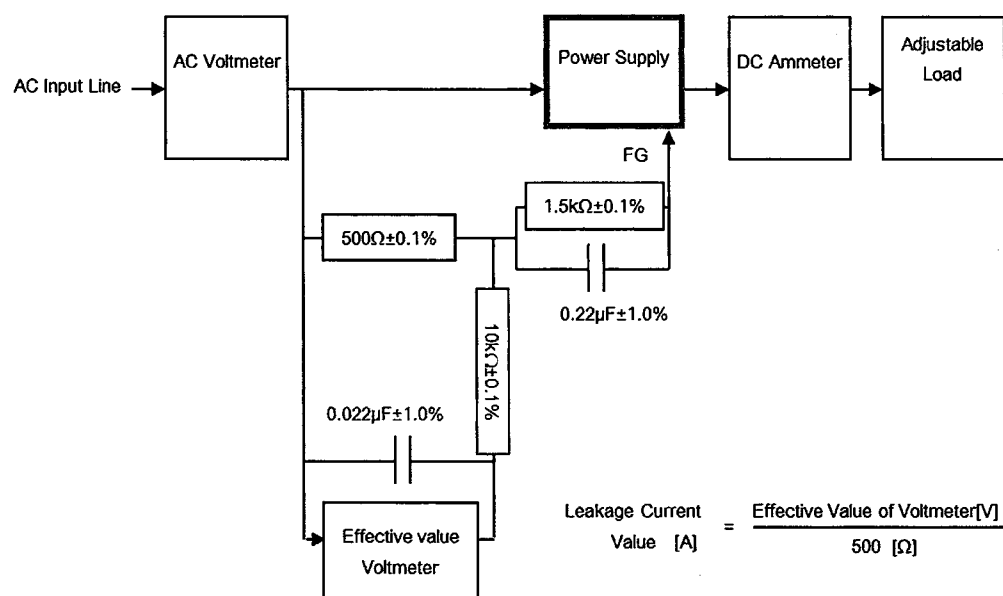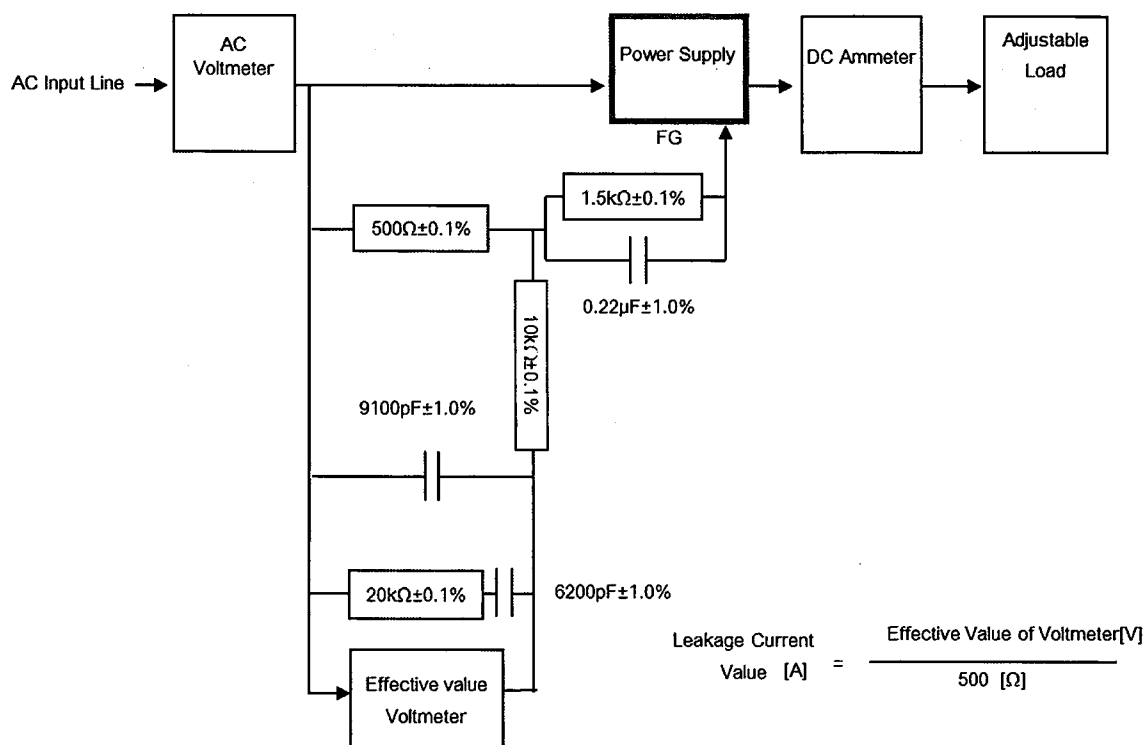
Figure B-2 (IEC62368-1 refer to IEC60990 Fig.4)

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Figure B-3 (IEC62368-1 refer to IEC60990 Fig.5)

$$\text{Leakage Current Value} \ [A] = \frac{\text{Effective Value of Voltmeter[V]}}{500 \ [\Omega]}$$

Figure C

C1= 0.1 μF
(Ceramic capacitor)

C2= 22 μF
(Electrolytic capacitor)

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