

TEST DATA OF PLA300F-5

Regulated DC Power Supply
August 28, 2017

Approved by : Yukihiro Takehashi
Yukihiro Takehashi Design Manager

Prepared by : Atsushi Nishikawa
Atsushi Nishikawa Design Engineer

COSEL CO.,LTD.

CONTENTS

1.Input Current (by Load Current) 1

2.Input Power (by Load Current) 2

3.Efficiency (by Input Voltage) 3

4.Efficiency (by Load Current) 4

5.Power Factor (by Input Voltage) 5

6.Power Factor (by Load Current) 6

7.Inrush Current 7

8.Leakage Current 8

9.Line Regulation 9

10.Load Regulation 10

11.Dynamic Load Response 11

12.Ripple Voltage (by Load Current) 12

13.Ripple-Noise 13

14.Ripple Voltage (by Ambient Temperature) 14

15.Ambient Temperature Drift 15

16.Output Voltage Accuracy 16

17.Time Lapse Drift 17

18.Rise and Fall Time 18

19.Hold-Up Time 19

20.Instantaneous Interruption Compensation 20

21.Minimum Input Voltage for Regulated Output Voltage 21

22.Overcurrent Protection 22

23.Overvoltage Protection 23

24.Figure of Testing Circuitry 24

(Final Page 25)



Model		PLA300F-5		Temperature 25°C Testing Circuitry Figure A																																																				
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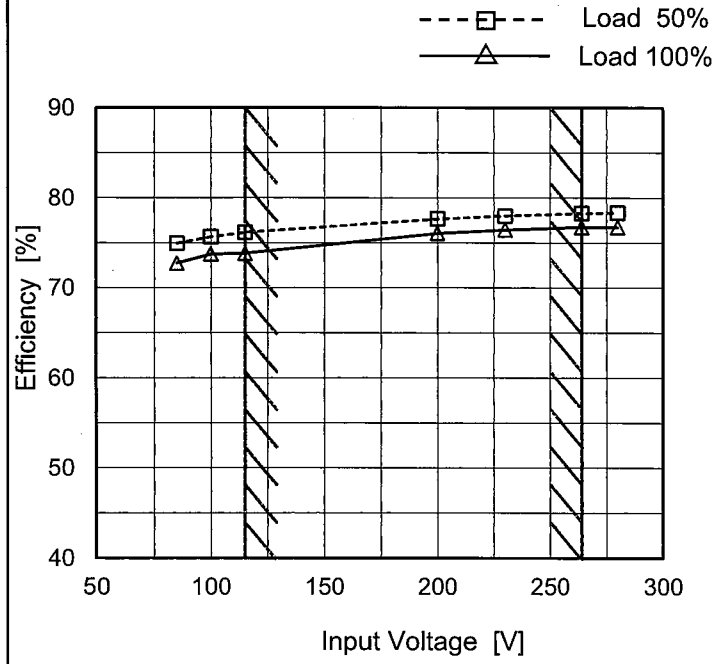
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Model	PLA300F-5
Item	Efficiency (by Input Voltage)
Object	_____

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
85	75.0	72.7 ※1
100	75.7	73.8 ※2
115	76.2	73.8
200	77.7	76.1
230	78.0	76.5
264	78.3	76.8
280	78.3	76.7
--	-	-
--	-	-

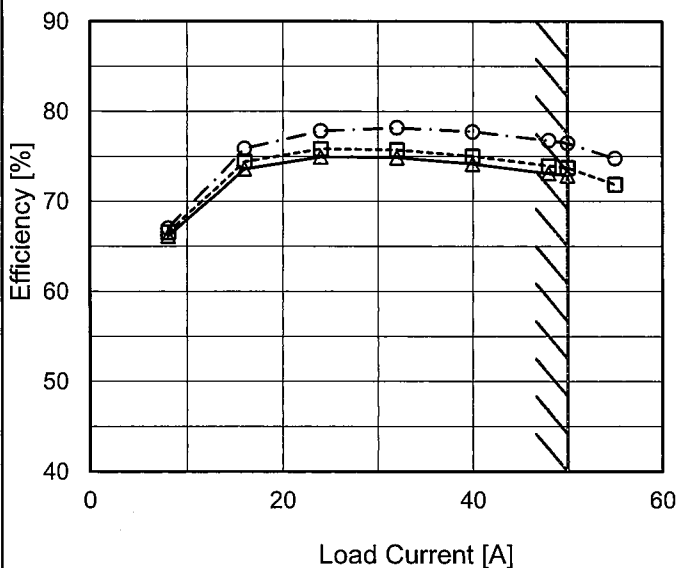
※1: Load 80%
※2: Load 90%



Model	PLA300F-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



2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	-	-	-
8	66.2	66.6	67.1
16	73.6	74.4	75.9
24	74.9	75.8	77.8
32	74.9	75.7	78.2
40	74.2	75.0	77.7
48	73.1	73.9	76.8
50	72.9	73.7	76.5
55	-	71.9	74.8
--	-	-	-
--	-	-	-

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



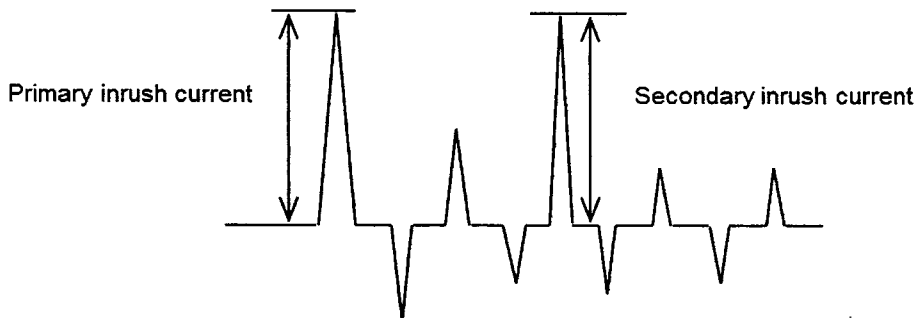
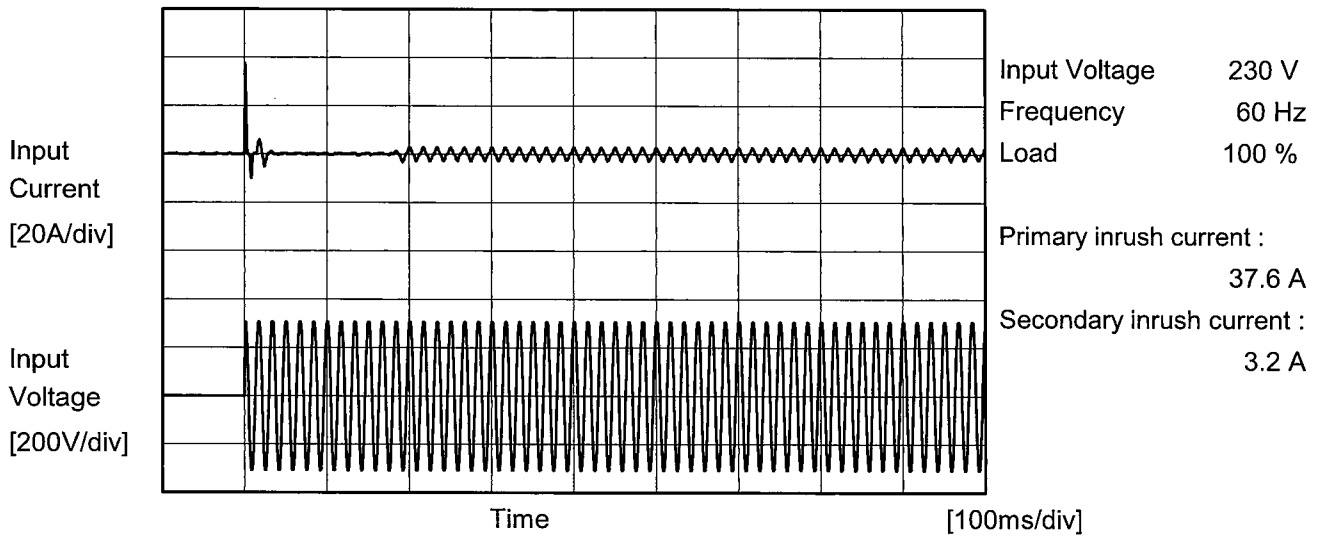
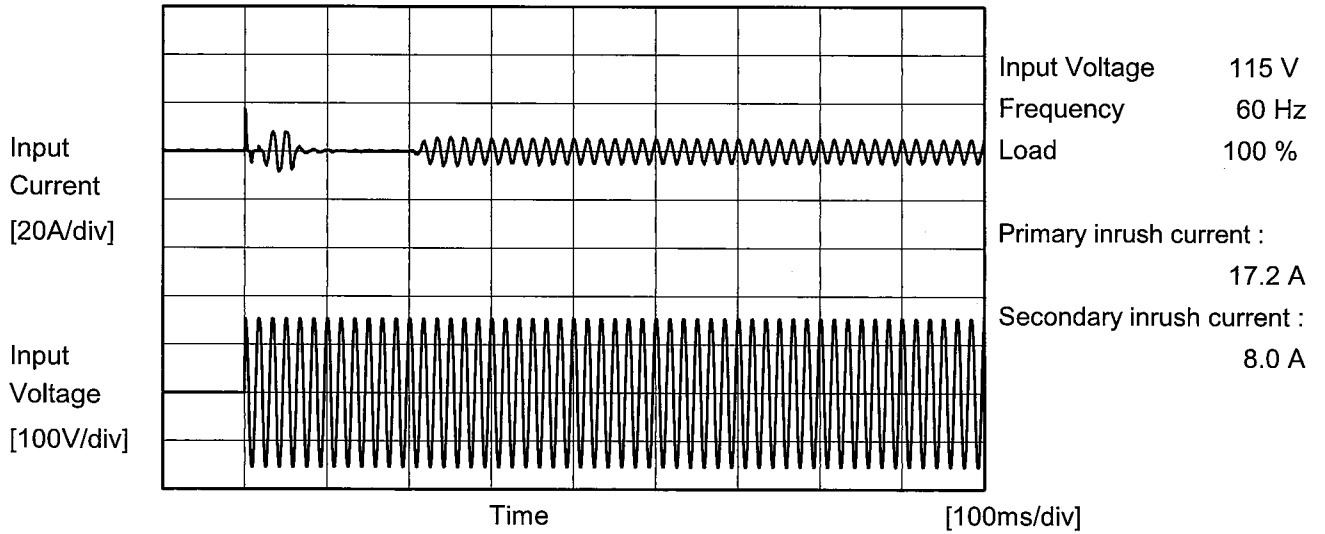
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COSEL

Model		PLA300F-5	Temperature		25°C
Item		Inrush Current	Testing Circuitry		Figure A
Object		_____			





COSEL		Temperature 25°C Testing Circuitry Figure B
Model	PLA300F-5	
Item	Leakage Current	
Object	_____	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
DEN-AN	Both phases	0.24	0.28	0.44	Operation
	One of phases	0.30	0.30	0.60	Stand by
IEC60950-1	Both phases	0.17	0.18	0.40	Operation
	One of phases	0.24	0.28	0.60	Stand by

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

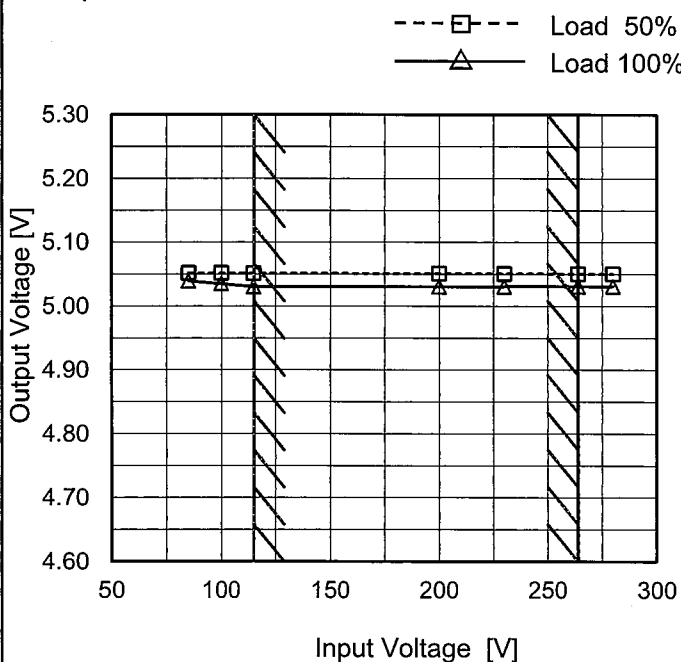
2.Condition

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



Model	PLA300F-5	Temperature	25°C
Item	Line Regulation	Testing Circuitry	Figure A
Object	+5V50A		

1. Graph



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

2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	5.052	5.039 ※1
100	5.052	5.035 ※2
115	5.052	5.030
200	5.051	5.031
230	5.051	5.031
264	5.051	5.031
280	5.051	5.031
--	-	-
--	-	-

※1: Load 80%

※2: Load 90%



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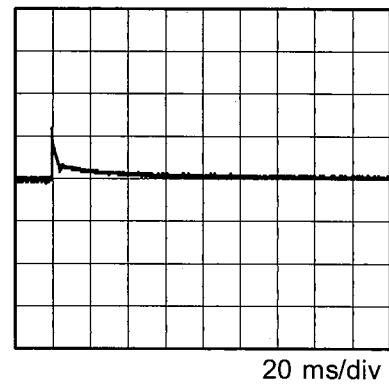
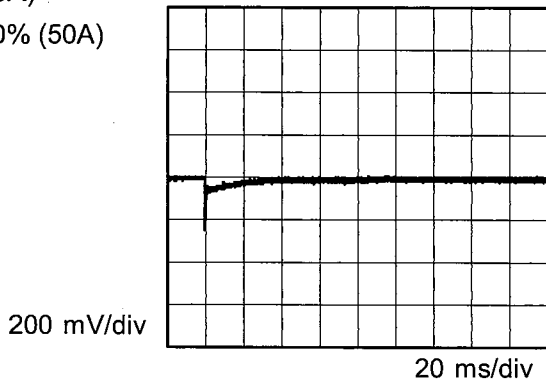
Model	PLA300F-5	Temperature	25° C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+5V50A		

Input Volt. 115 V
Cycle 1000 ms

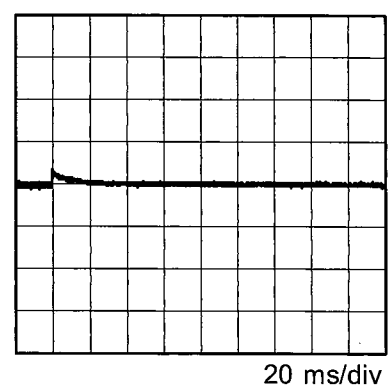
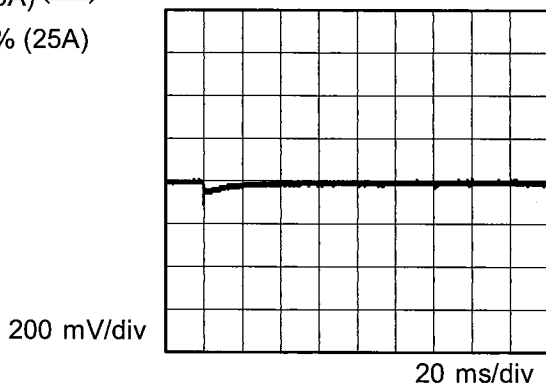
Response. $t_1=t_2=50\mu\text{s}$. Typ



Min. Load (0A) \longleftrightarrow
Load 100% (50A)



Min. Load (0A) \longleftrightarrow
Load 50% (25A)





<p>Model PLA300F-5</p>		<p>Temperature 25°C Testing Circuitry Figure C</p>																																						
Item	Ripple Voltage (by Load Current)																																							
Object	+5V50A																																							
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<p>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.</p> <div style="display: flex; justify-content: space-around;"> <div> <p>T1: Due to AC Input Line</p> <p>T2: Due to Switching</p> </div> </div>																																								
<p>Fig. Complex Ripple Wave Form</p>																																								



<p>Model PLA300F-5</p>		<p>Temperature 25°C</p>																																							
<p>Item Ripple-Noise</p>		<p>Testing Circuitry Figure C</p>																																							
<p>Object +5V50A</p>																																									
<p>1. Graph</p> <div style="text-align: right;"> <p>—△— Input Volt. 115V</p> <p>-·-○-·- Input Volt. 230V</p> </div> <p>Y-axis: Ripple-Noise [mV] (0 to 200)</p> <p>X-axis: Load Current [A] (0 to 60)</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple-Noise [mV]</th> </tr> <tr> <th>Input Volt. 115 [V]</th> <th>Input Volt. 230 [V]</th> </tr> </thead> <tbody> <tr><td>0</td><td>25</td><td>25</td></tr> <tr><td>8</td><td>40</td><td>40</td></tr> <tr><td>16</td><td>50</td><td>50</td></tr> <tr><td>24</td><td>50</td><td>50</td></tr> <tr><td>32</td><td>65</td><td>65</td></tr> <tr><td>40</td><td>70</td><td>70</td></tr> <tr><td>48</td><td>75</td><td>75</td></tr> <tr><td>50</td><td>75</td><td>75</td></tr> <tr><td>55</td><td>80</td><td>80</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	0	25	25	8	40	40	16	50	50	24	50	50	32	65	65	40	70	70	48	75	75	50	75	75	55	80	80	--	-	-	--	-	-
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COSEL																																								
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Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry Figure C																																						
Object	+5V50A																																							
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Item		Ambient Temperature Drift																																																						
Object		+5V50A																																																						
1.Graph			—△— Input Volt. 100V - - - □ - - - Input Volt. 115V - · - ○ - · - - Input Volt. 230V	2.Values																																																				
			<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 115[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>-30</td><td>5.032</td><td>5.027</td><td>5.028</td></tr> <tr><td>-10</td><td>5.035</td><td>5.030</td><td>5.031</td></tr> <tr><td>0</td><td>5.037</td><td>5.032</td><td>5.033</td></tr> <tr><td>25</td><td>5.039</td><td>5.034</td><td>5.035</td></tr> <tr><td>50</td><td>5.042</td><td>5.037</td><td>5.037</td></tr> <tr><td>60</td><td>5.042</td><td>5.037</td><td>5.037</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>			Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	-30	5.032	5.027	5.028	-10	5.035	5.030	5.031	0	5.037	5.032	5.033	25	5.039	5.034	5.035	50	5.042	5.037	5.037	60	5.042	5.037	5.037	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																							
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Note: Slanted line shows the range of the rated ambient temperature.			Note: In case of Input Volt. 100V, Load 90%. Other case Load 100%.																																																					



COSEL		Testing Circuitry Figure A
Model	PLA300F-5	
Item	Output Voltage Accuracy	
Object	+5V50A	

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 : 115 - 264V

Load Current : 0 - 50A

* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	25	230	0	5.075	±23	±0.5
Minimum Voltage	-10	115	50	5.030		

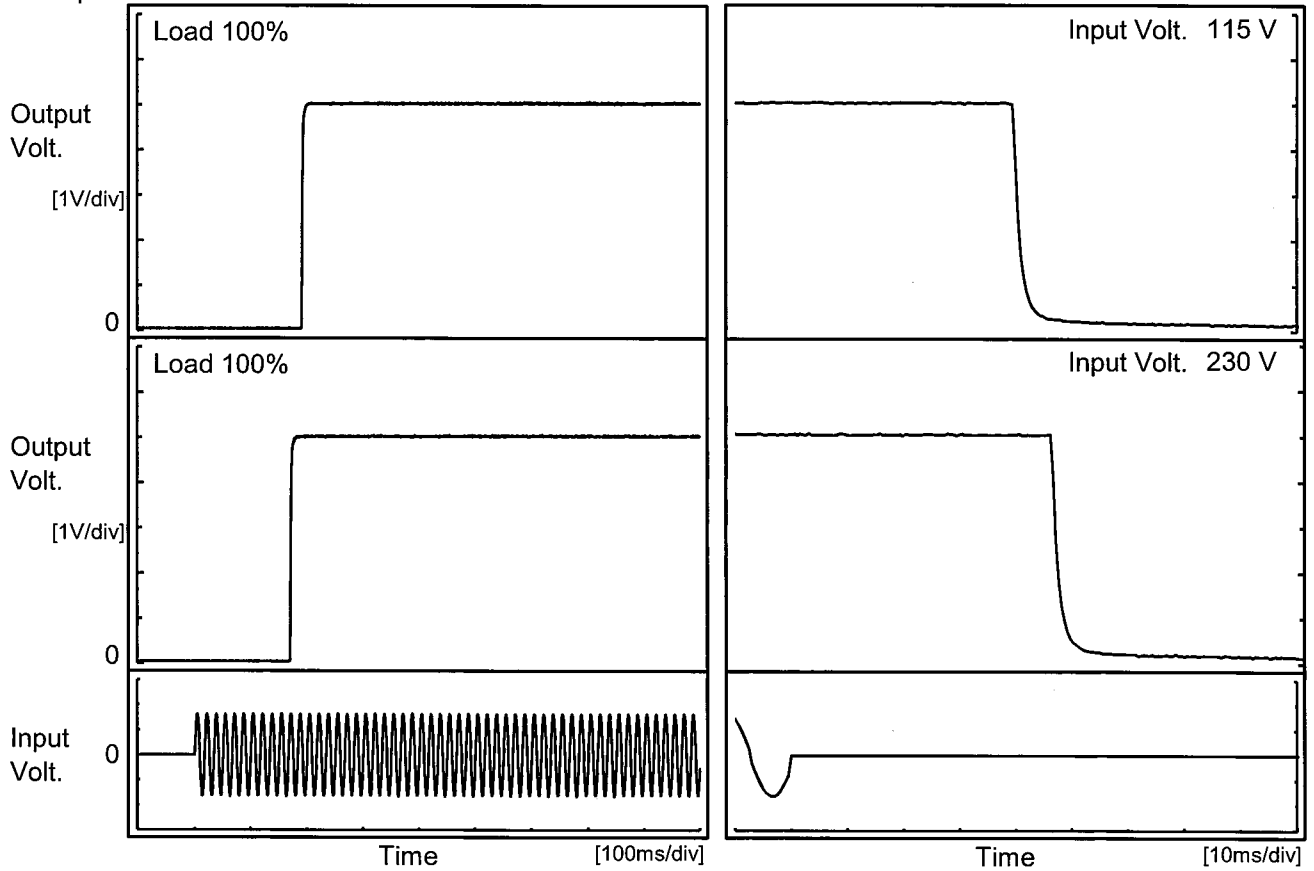


COSEL																								
Model	PLA300F-5																							
Item	Time Lapse Drift	Temperature 25°C Testing Circuitry Figure A																						
Object	+5V50A																							
<p>1.Graph</p> <p style="text-align: center;">Time [H]</p> <p>Input Volt. 230V Load 100%</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5.038</td></tr> <tr><td>0.5</td><td>5.048</td></tr> <tr><td>1.0</td><td>5.048</td></tr> <tr><td>2.0</td><td>5.048</td></tr> <tr><td>3.0</td><td>5.047</td></tr> <tr><td>4.0</td><td>5.047</td></tr> <tr><td>5.0</td><td>5.047</td></tr> <tr><td>6.0</td><td>5.046</td></tr> <tr><td>7.0</td><td>5.047</td></tr> <tr><td>8.0</td><td>5.047</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	5.038	0.5	5.048	1.0	5.048	2.0	5.048	3.0	5.047	4.0	5.047	5.0	5.047	6.0	5.046	7.0	5.047	8.0	5.047
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7.0	5.047																							
8.0	5.047																							
<p>* The characteristic of AC115V is equal.</p>																								



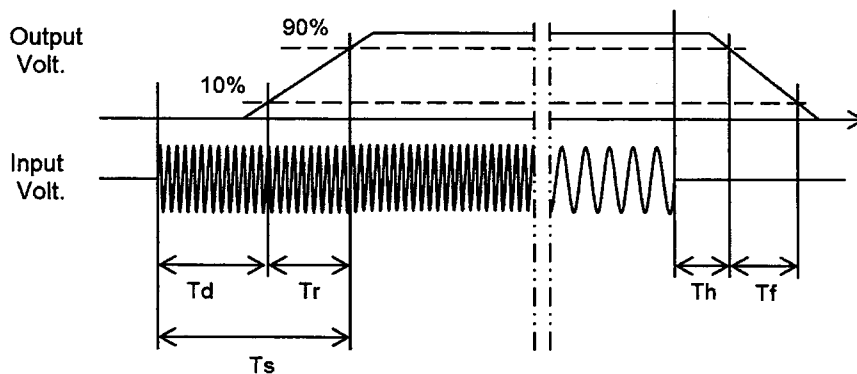
Model	PLA300F-5	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V50A		

1. Graph



2. Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
115 V	191.5	2.0	193.5	39.5	3.5
230 V	171.0	2.0	173.0	45.5	3.5





Model		PLA300F-5	Temperature 25°C Testing Circuitry Figure A																																
Item		Hold-Up Time																																	
Object		+5V50A																																	
1.Graph			2.Values																																
			<table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="2">Hold-Up Time [ms]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr> <td>85</td> <td>80</td> <td>49 ※1</td> </tr> <tr> <td>100</td> <td>82</td> <td>44 ※2</td> </tr> <tr> <td>115</td> <td>85</td> <td>39</td> </tr> <tr> <td>200</td> <td>95</td> <td>44</td> </tr> <tr> <td>230</td> <td>97</td> <td>46</td> </tr> <tr> <td>264</td> <td>99</td> <td>47</td> </tr> <tr> <td>280</td> <td>101</td> <td>48</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> <tr> <td>--</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	85	80	49 ※1	100	82	44 ※2	115	85	39	200	95	44	230	97	46	264	99	47	280	101	48	--	-	-	--	-	-
Input Voltage [V]	Hold-Up Time [ms]																																		
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115	85	39																																	
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230	97	46																																	
264	99	47																																	
280	101	48																																	
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<p>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.</p>			<p>※1: Load 80% ※2: Load 90%</p>																																



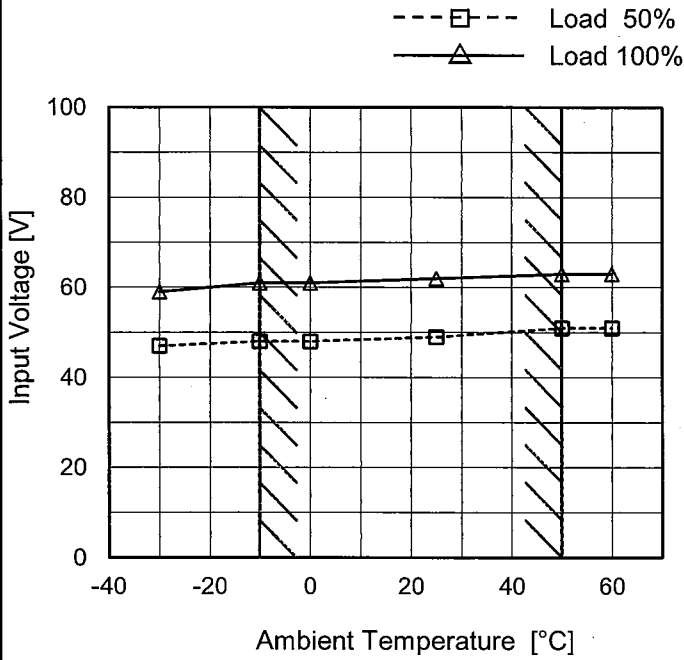
Model		PLA300F-5		Temperature 25°C																																																				
Item		Instantaneous Interruption Compensation		Testing Circuitry Figure A																																																				
Object		+5V50A																																																						
1. Graph			2. Values																																																					
<p> —△— Input Volt. 100V - - □ - - Input Volt. 115V - · ○ - · - Input Volt. 230V </p> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p>			<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Time [ms]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 115[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>0</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>8</td><td>240</td><td>248</td><td>285</td></tr> <tr><td>16</td><td>130</td><td>132</td><td>153</td></tr> <tr><td>24</td><td>87</td><td>89</td><td>102</td></tr> <tr><td>32</td><td>63</td><td>64</td><td>75</td></tr> <tr><td>40</td><td>47</td><td>49</td><td>56</td></tr> <tr><td>48</td><td>38</td><td>39</td><td>47</td></tr> <tr><td>50</td><td>38</td><td>38</td><td>45</td></tr> <tr><td>55</td><td>-</td><td>32</td><td>30</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>			Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0	-	-	-	8	240	248	285	16	130	132	153	24	87	89	102	32	63	64	75	40	47	49	56	48	38	39	47	50	38	38	45	55	-	32	30	--	-	-	-	--	-	-	-
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<p>Note: Slanted line shows the range of the rated load current.</p>																																																								



Model	PLA300F-5
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V50A

Testing Circuitry Figure A

1.Graph



2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	47	59
-10	48	61
0	48	61
25	49	62
50	51	63
60	51	63
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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



<p>Model PLA300F-5</p> <p>Item Overcurrent Protection</p> <p>Object +5V50A</p>		<p>Temperature 25°C</p> <p>Testing Circuitry Figure A</p>																																												
<p>1. Graph</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>— Input Volt. 115V</p> <p>— Input Volt. 230V</p> </div> </div> <p>Note: Slanted line shows the range of the rated load current.</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="2">Load Current [A]</th> </tr> <tr> <th>Input Volt. 115[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>4.75</td><td>56.62</td><td>56.53</td></tr> <tr><td>4.50</td><td>56.80</td><td>56.72</td></tr> <tr><td>4.00</td><td>57.20</td><td>57.18</td></tr> <tr><td>3.50</td><td>57.66</td><td>57.72</td></tr> <tr><td>3.00</td><td>58.23</td><td>58.36</td></tr> <tr><td>2.50</td><td>58.90</td><td>59.06</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Output Voltage [V]	Load Current [A]		Input Volt. 115[V]	Input Volt. 230[V]	4.75	56.62	56.53	4.50	56.80	56.72	4.00	57.20	57.18	3.50	57.66	57.72	3.00	58.23	58.36	2.50	58.90	59.06	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Model		PLA300F-5	Testing Circuitry Figure A																																						
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Note: Slanted line shows the range of the rated ambient temperature.																																									

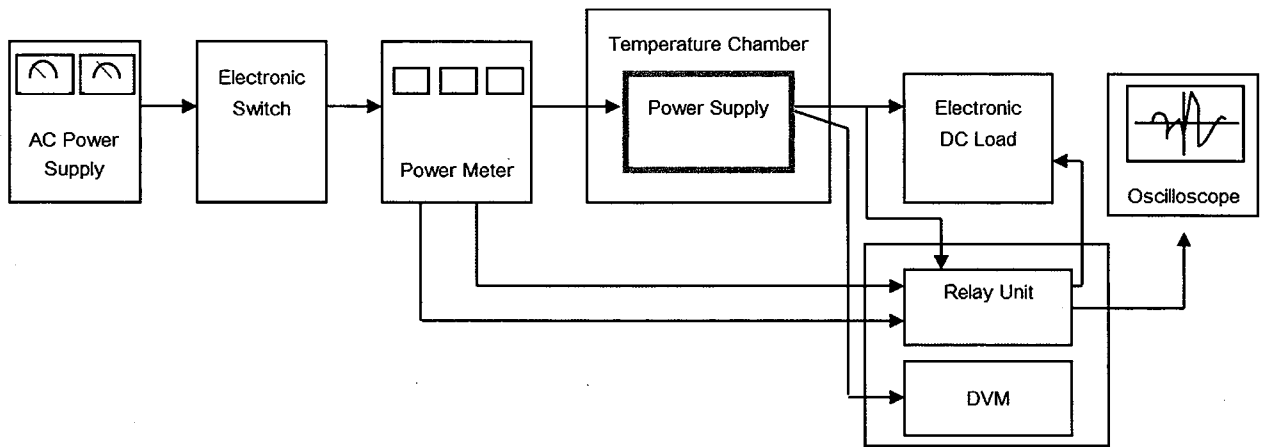


Figure A

Data Acquisition/Control Unit

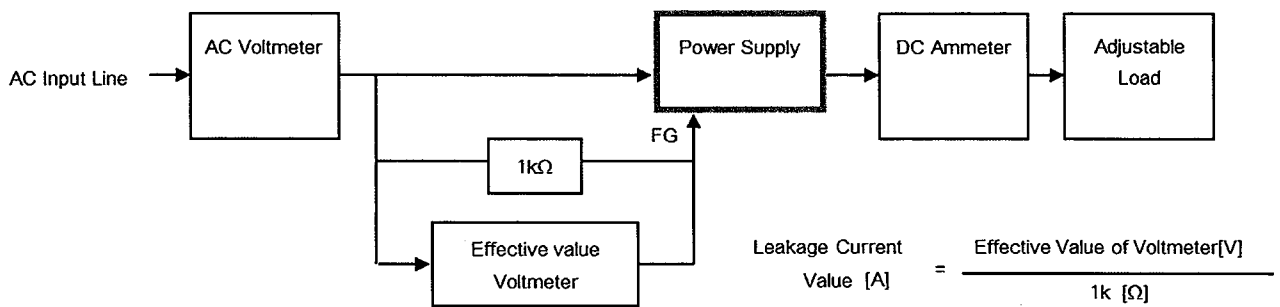


Figure B (DEN-AN)

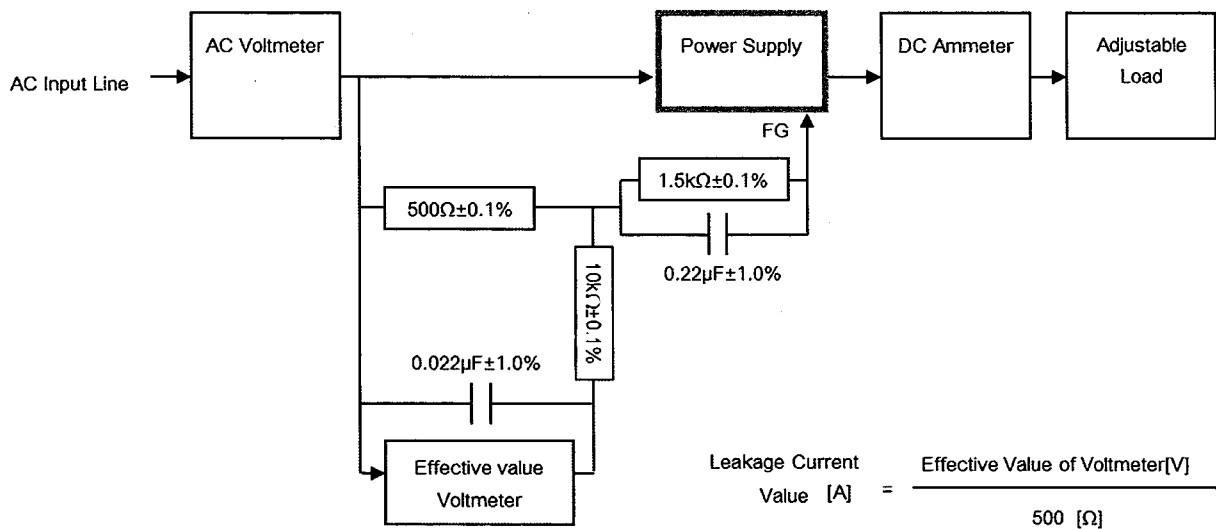


Figure B (IEC60950-1)

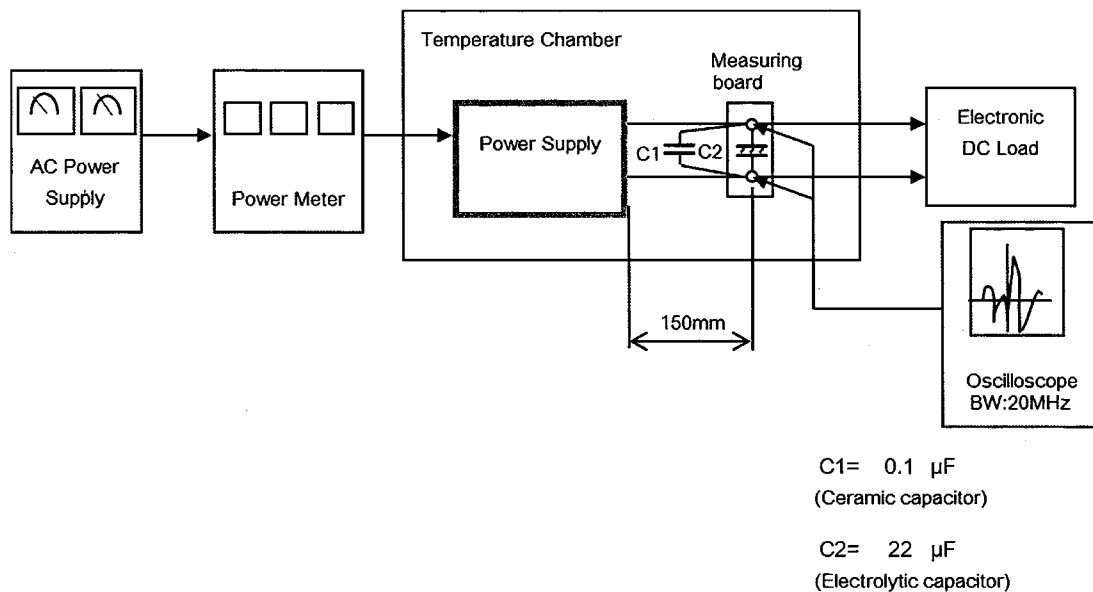


Figure C