

TEST DATA OF PLA600F-15

Regulated DC Power Supply
August 19, 2011

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Prepared by : Shintaro Oki
Shintaro Oki Design Engineer

COSEL CO.,LTD.

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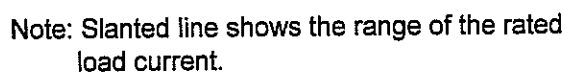
(Final Page 25)

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Model		PLA600F-15		Temperature Testing Circuitry	25°C Figure A																																																			
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Temperature 25°C
Testing Circuitry Figure A

2.Values



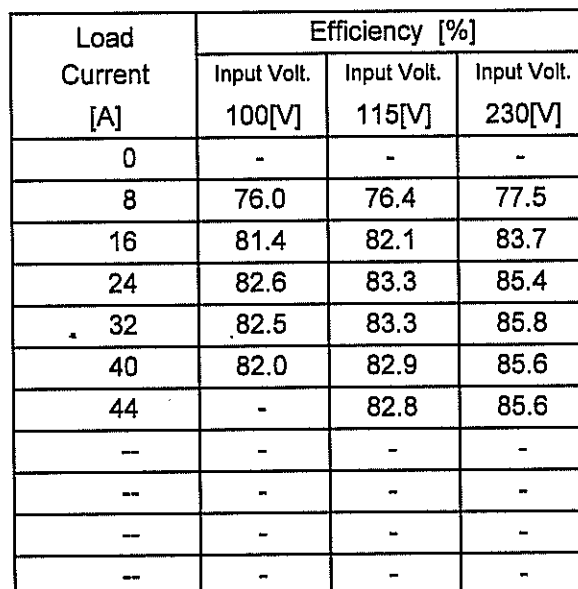
Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0	6.4	6.3	6.7
8	156.4	155.6	153.5
16	292.0	289.8	284.1
24	432.2	429.0	418.3
32	577.1	571.4	555.0
40	726.0	717.9	695.0
44	-	789.7	764.5
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model		PLA600F-15	Temperature Testing Circuitry	25°C Figure A
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Temperature 25°C
Testing Circuitry Figure A

2.Values



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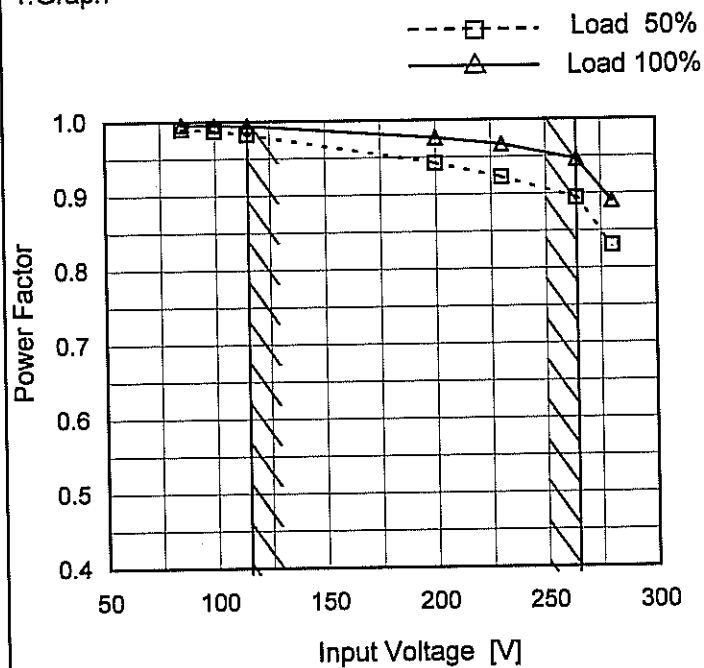
Model PLA600F-15

Item Power Factor (by Input Voltage)

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
85	0.990	0.996 ※1
100	0.988	0.995 ※2
115	0.982	0.994
200	0.942	0.976
230	0.923	0.967
264	0.894	0.947
280	0.830	0.890
--	-	-
--	-	-

※1: Load 80%

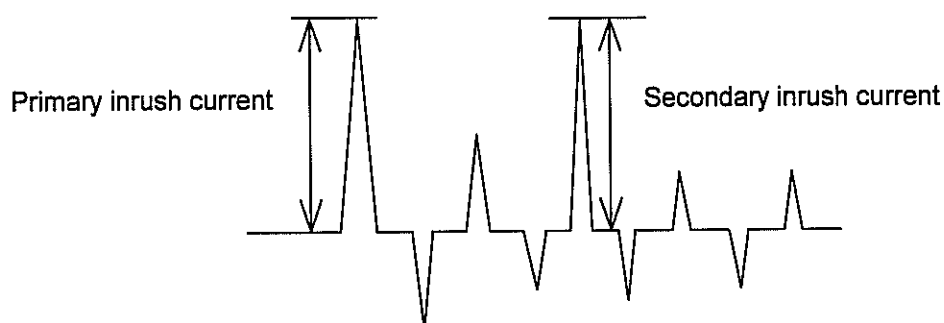
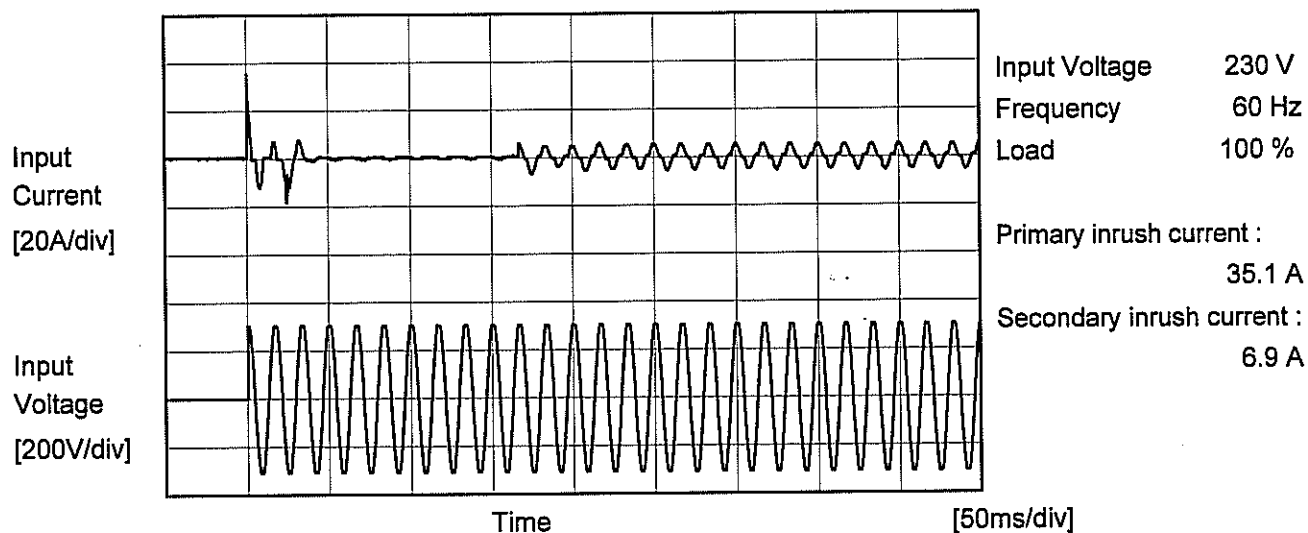
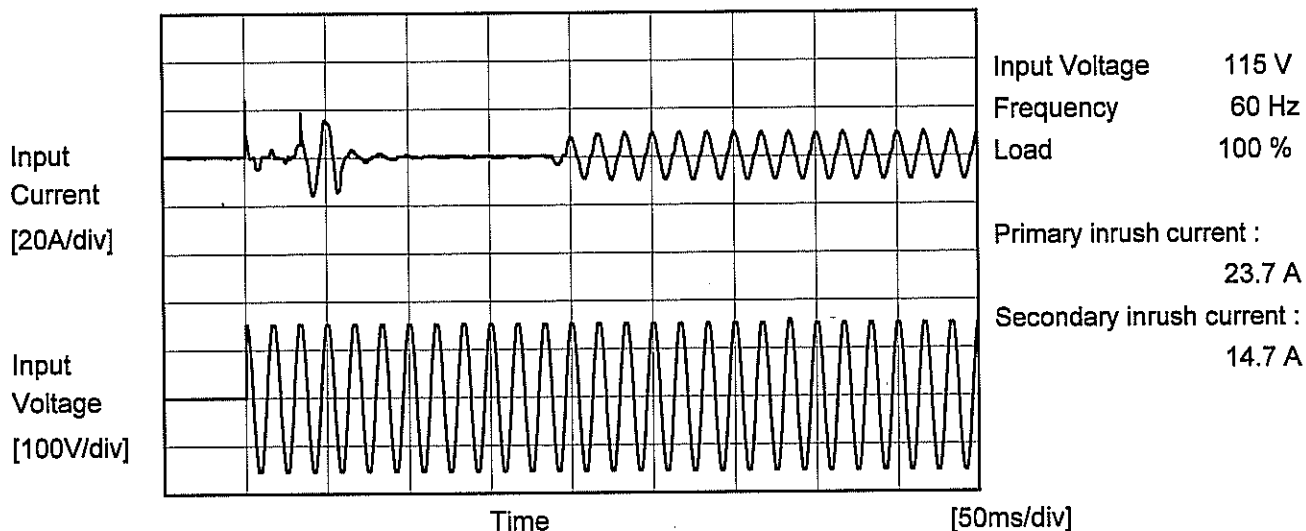
※2: Load 90%

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COSEL

Model	PLA600F-15	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		





Model		PLA600F-15	Temperature 25°C Testing Circuitry Figure B
Item		Leakage Current	
Object			

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
DEN-AN	Both phases	0.31	0.33	0.66	Operation
	One of phases	0.43	0.51	1.10	Stand by
IEC60950-1	Both phases	0.25	0.29	0.64	Operation
	One of phases	0.44	0.50	1.10	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.

COSEL

Model	PLA600F-15																																
Item	Line Regulation	Temperature	25°C																														
Object	+15V40A	Testing Circuitry	Figure A																														
1.Graph		2.Values																															
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Output Voltage [V] Load 50%</th><th>Output Voltage [V] Load 100%</th></tr></thead><tbody><tr><td>85</td><td>15.013</td><td>15.007 ※1</td></tr><tr><td>100</td><td>15.013</td><td>15.004 ※2</td></tr><tr><td>115</td><td>15.013</td><td>15.003</td></tr><tr><td>200</td><td>15.012</td><td>15.002</td></tr><tr><td>230</td><td>15.012</td><td>15.002</td></tr><tr><td>264</td><td>15.012</td><td>15.001</td></tr><tr><td>280</td><td>15.012</td><td>15.001</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%	85	15.013	15.007 ※1	100	15.013	15.004 ※2	115	15.013	15.003	200	15.012	15.002	230	15.012	15.002	264	15.012	15.001	280	15.012	15.001	--	-	-	--	-	-	<div>※1:Load 80%</div> <div>※2:Load 90%</div>	
Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%																															
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230	15.012	15.002																															
264	15.012	15.001																															
280	15.012	15.001																															
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Note: Slanted line shows the range of the rated input voltage.																																	

COSEL

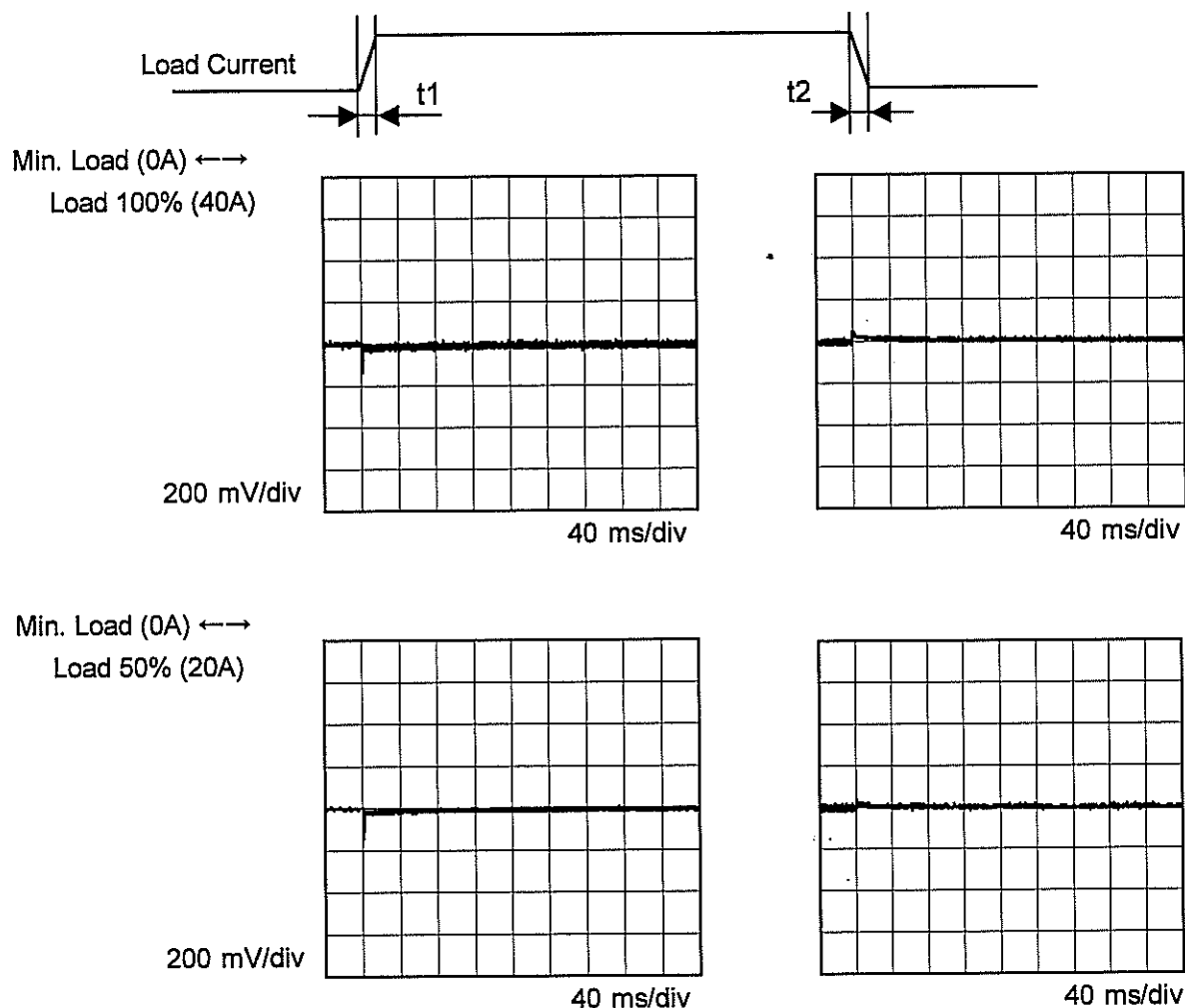
Model	PLA600F-15																																																					
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<div><div>—△—</div><div>Input Volt.</div><div>100V</div></div> <div><div>---□---</div><div>Input Volt.</div><div>115V</div></div> <div><div>---○---</div><div>Input Volt.</div><div>230V</div></div> <div>Output Voltage [V]</div> <div>Load Current [A]</div>		<table><tr><th rowspan="2">Load Current [A]</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><tr><td>0</td><td>15.023</td><td>15.023</td><td>15.022</td></tr><tr><td>8</td><td>15.015</td><td>15.015</td><td>15.014</td></tr><tr><td>16</td><td>15.014</td><td>15.014</td><td>15.013</td></tr><tr><td>24</td><td>15.011</td><td>15.012</td><td>15.011</td></tr><tr><td>32</td><td>15.007</td><td>15.007</td><td>15.007</td></tr><tr><td>40</td><td>15.000</td><td>15.006</td><td>15.006</td></tr><tr><td>44</td><td>-</td><td>15.002</td><td>15.001</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></table>		Load Current [A]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0	15.023	15.023	15.022	8	15.015	15.015	15.014	16	15.014	15.014	15.013	24	15.011	15.012	15.011	32	15.007	15.007	15.007	40	15.000	15.006	15.006	44	-	15.002	15.001	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.																																																						

COSEL

Model	PLA600F-15	Temperature	25° C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+15V40A		

Input Volt. 115 V
Cycle 1000 ms

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



COSEL

Model		PLA600F-15		Temperature 25°C Testing Circuitry Figure C																																						
Item		Ripple Voltage (by Load Current)																																								
Object		+15V40A																																								
1.Graph																																										
<div><div><div>—△—</div><div>Input Volt. 115V</div></div><div><div>-·-○-·-</div><div>Input Volt. 230V</div></div></div> <p>Ripple Voltage [mV]</p> <p>Load Current [A]</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.																																										
2.Values																																										
<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 115 [V]</th><th>Input Volt. 230 [V]</th></tr><tr><td>0</td><td>30</td><td>30</td></tr><tr><td>6</td><td>25</td><td>20</td></tr><tr><td>13</td><td>20</td><td>20</td></tr><tr><td>19</td><td>20</td><td>20</td></tr><tr><td>26</td><td>25</td><td>20</td></tr><tr><td>32</td><td>25</td><td>20</td></tr><tr><td>38</td><td>25</td><td>25</td></tr><tr><td>40</td><td>25</td><td>25</td></tr><tr><td>44</td><td>30</td><td>30</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>					Load Current [A]	Ripple Voltage [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	0	30	30	6	25	20	13	20	20	19	20	20	26	25	20	32	25	20	38	25	25	40	25	25	44	30	30	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																									
	Input Volt. 115 [V]	Input Volt. 230 [V]																																								
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13	20	20																																								
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<div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div> <p>Ripple [mVp-p]</p> <p>T1</p> <p>T2</p>																																										
Fig. Complex Ripple Wave Form																																										

COSEL

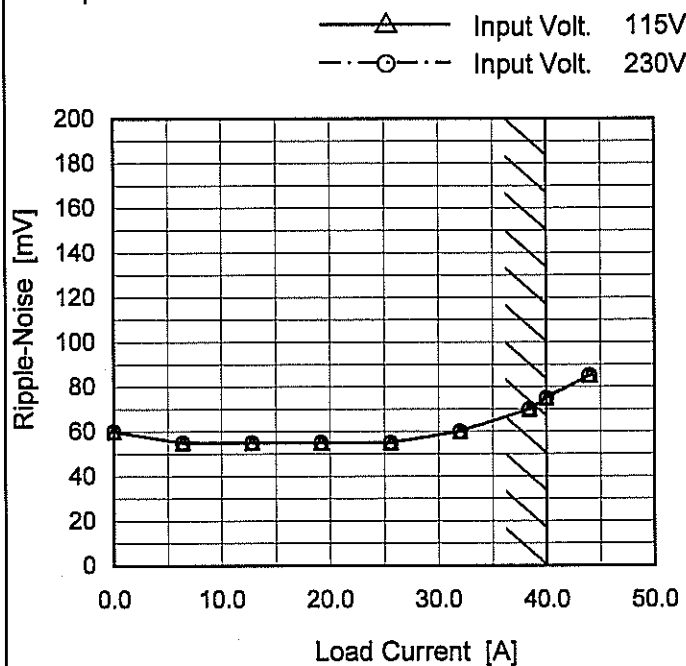
Model PLA600F-15

Item Ripple-Noise

Object +15V40A

Temperature 25°C
Testing Circuitry Figure C

1. Graph



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. 115 [V]	Input Volt. 230 [V]
0	60	60
6	55	55
13	55	55
19	55	55
26	55	55
32	60	60
38	70	70
40	75	75
44	85	85
--	-	-
--	-	-

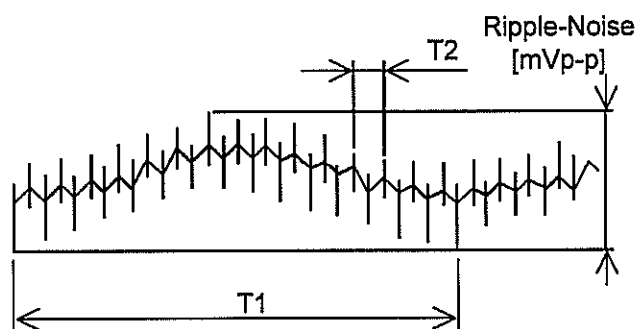
T1: Due to AC Input Line
T2: Due to Switching

Fig. Complex Ripple Wave Form



Model		PLA600F-15																																																				
Item		Ambient Temperature Drift																																																				
Object		+15V40A																																																				
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 115V</div></div><div><div>---○---</div><div>Input Volt. 230V</div></div></div> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<table><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><tr><td>-20</td><td>15.110</td><td>15.094</td><td>15.093</td></tr><tr><td>-10</td><td>15.112</td><td>15.098</td><td>15.098</td></tr><tr><td>0</td><td>15.112</td><td>15.101</td><td>15.101</td></tr><tr><td>10</td><td>15.112</td><td>15.103</td><td>15.102</td></tr><tr><td>20</td><td>15.113</td><td>15.104</td><td>15.103</td></tr><tr><td>25</td><td>15.109</td><td>15.105</td><td>15.105</td></tr><tr><td>30</td><td>15.110</td><td>15.107</td><td>15.106</td></tr><tr><td>40</td><td>15.110</td><td>15.106</td><td>15.105</td></tr><tr><td>50</td><td>15.105</td><td>15.103</td><td>15.104</td></tr><tr><td>60</td><td>-</td><td>15.101</td><td>15.102</td></tr><tr><td>—</td><td>-</td><td>-</td><td>-</td></tr></table> <p>Note: In case of Input Volt. 100V, Load 90%. Other case Load 100%.</p>		Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	-20	15.110	15.094	15.093	-10	15.112	15.098	15.098	0	15.112	15.101	15.101	10	15.112	15.103	15.102	20	15.113	15.104	15.103	25	15.109	15.105	15.105	30	15.110	15.107	15.106	40	15.110	15.106	15.105	50	15.105	15.103	15.104	60	-	15.101	15.102	—	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
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—	-	-	-																																																			



Model		PLA600F-15	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+15V40A	

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 : -20 - 50°C

Input Voltage : 115 - 264V

Load Current : 0 - 40A

* 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	30	230	0	15.129	±18	±0.1
Minimum Voltage	-20	230	40	15.093		

COSEL

Model		PLA600F-15	
Item		Time Lapse Drift	
Object		+15V40A	

1.Graph

Output Voltage [V]

16.000

15.750

15.500

15.250

15.000

14.750

14.500

14.250

14.000

13.750

0

2

4

6

8

10

Time [H]

Input Volt. 230V

Load 100%

2.Values

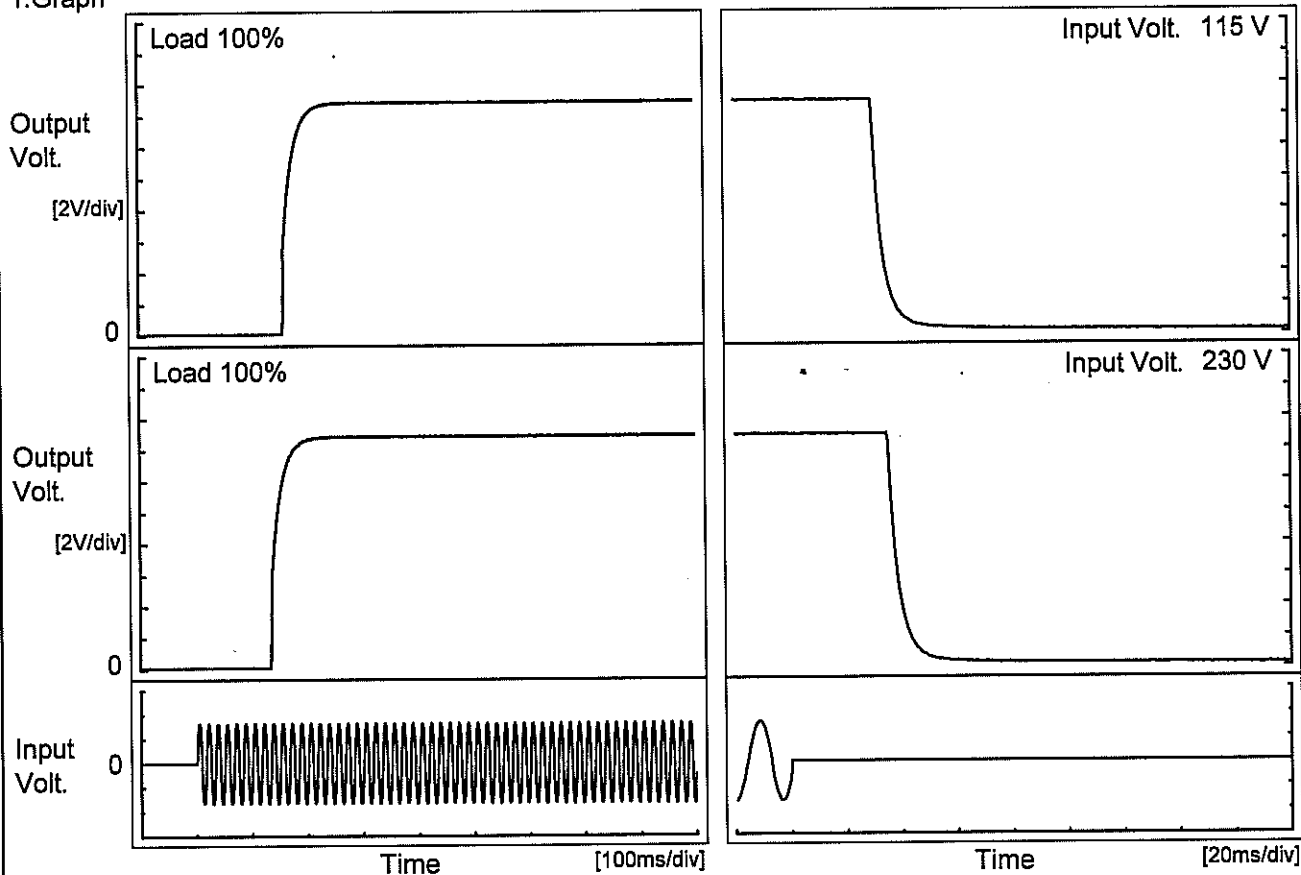
Time since start [H]	Output Voltage [V]
0.0	15.192
0.5	15.191
1.0	15.191
2.0	15.191
* 3.0	15.191
4.0	15.191
5.0	15.191
6.0	15.191
7.0	15.191
8.0	15.191

* The characteristic of AC115V is equal.

COSEL

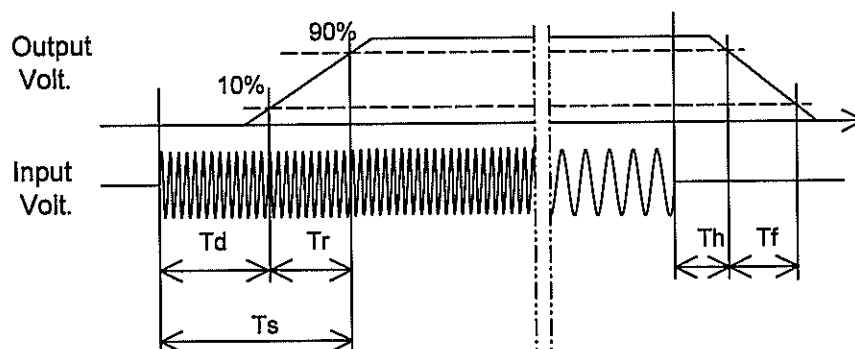
Model	PLA600F-15	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V40A		

1. Graph



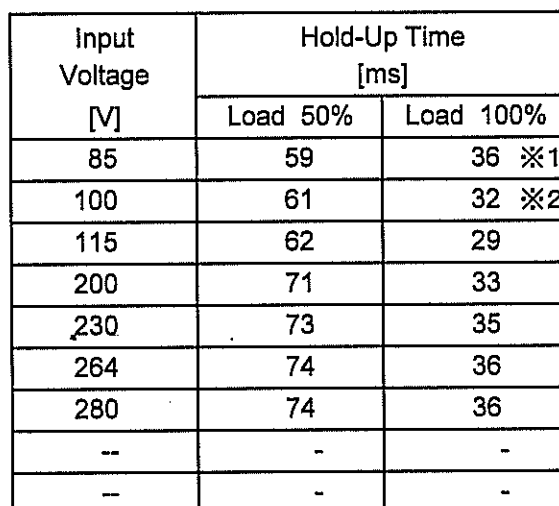
2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
115 V		159.5	33.5	193.0	29.5	9.0
230 V		135.5	33.5	169.0	35.0	9.0



Temperature 25°C
Testing Circuitry Figure A

2.Values



※2: Load 90%

- 19 -

COSEL

Model	PLA600F-15																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+15V40A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 115V</div></div><div><div>---○---</div><div>Input Volt. 230V</div></div></div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><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><tr><td>0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>8</td><td>114</td><td>126</td><td>172</td></tr><tr><td>16</td><td>39</td><td>40</td><td>88</td></tr><tr><td>24</td><td>31</td><td>31</td><td>55</td></tr><tr><td>32</td><td>27</td><td>28</td><td>43</td></tr><tr><td>40</td><td>22</td><td>23</td><td>30</td></tr><tr><td>44</td><td>-</td><td>20</td><td>26</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></table>		Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0	-	-	-	8	114	126	172	16	39	40	88	24	31	31	55	32	27	28	43	40	22	23	30	44	-	20	26	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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COSEL

Model

PLA600F-15

Item

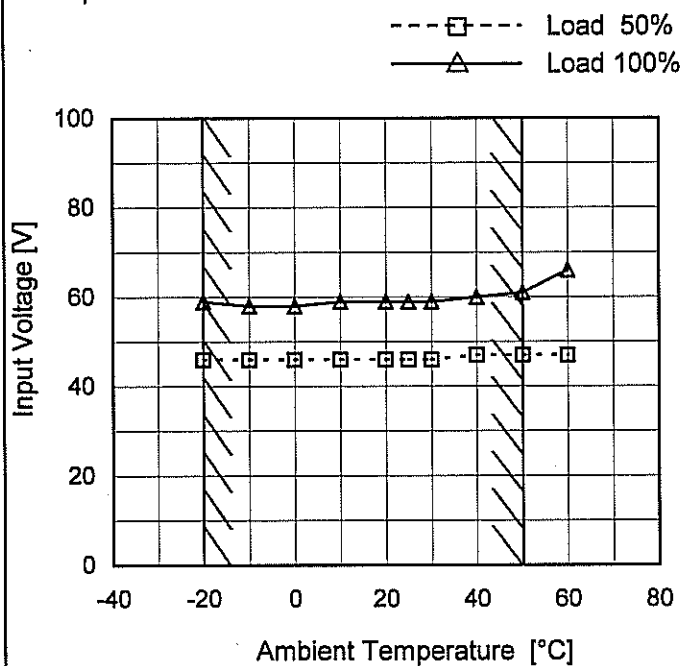
Minimum Input Voltage
for Regulated Output Voltage

Object

+15V40A

Testing Circuitry Figure A

1. Graph



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

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	46	59
-10	46	58
0	46	58
10	46	59
20	46	59
25	46	59
30	46	59
40	47	60
50	47	61
60	47	66
--	-	-

COSEL

Model	PLA600F-15	Temperature 25°C Testing Circuitry Figure A																																										
Item	Overcurrent Protection																																											
Object	+15V40A																																											
1.Graph		2.Values																																										
<div><div><div></div>Input Volt. 115V</div><div><div></div>Input Volt. 230V</div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><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><tr><td>14.25</td><td>46.29</td><td>46.26</td></tr><tr><td>13.50</td><td>46.42</td><td>46.39</td></tr><tr><td>12.00</td><td>46.69</td><td>46.60</td></tr><tr><td>10.50</td><td>46.89</td><td>46.76</td></tr><tr><td>9.00</td><td>46.97</td><td>46.77</td></tr><tr><td>7.50</td><td>47.01</td><td>46.79</td></tr><tr><td>6.00</td><td>46.97</td><td>46.53</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></table>		Output Voltage [V]	Load Current [A]		Input Volt. 115[V]	Input Volt. 230[V]	14.25	46.29	46.26	13.50	46.42	46.39	12.00	46.69	46.60	10.50	46.89	46.76	9.00	46.97	46.77	7.50	47.01	46.79	6.00	46.97	46.53	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Output Voltage [V]	Load Current [A]																																											
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COSEL

Model

PLA600F-15

Item

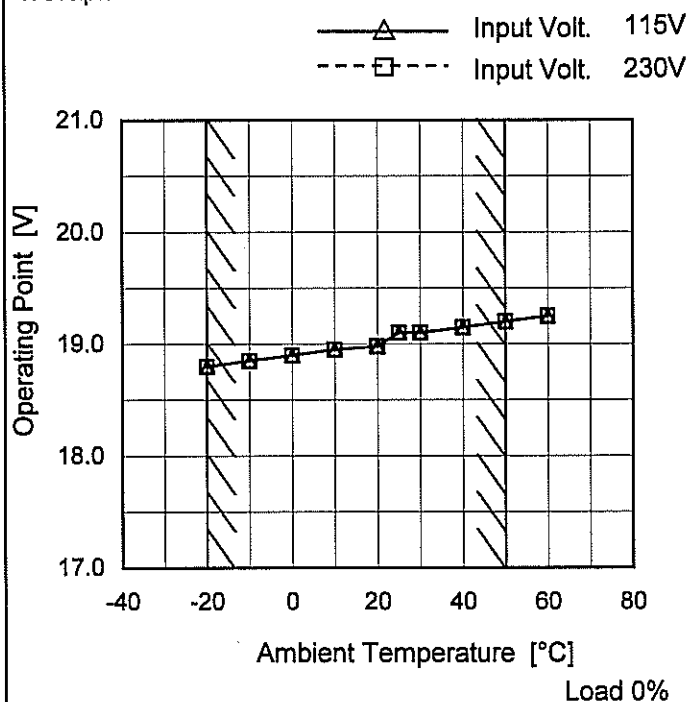
Overvoltage Protection

Object

+15V40A

Testing Circuitry Figure A

1. Graph



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

2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 115[V]	Input Volt. 230[V]
-20	18.80	18.80
-10	18.85	18.85
0	18.90	18.90
10	18.95	18.95
20	18.98	18.98
25	19.10	19.10
30	19.10	19.10
40	19.15	19.15
50	19.20	19.20
60	19.25	19.25
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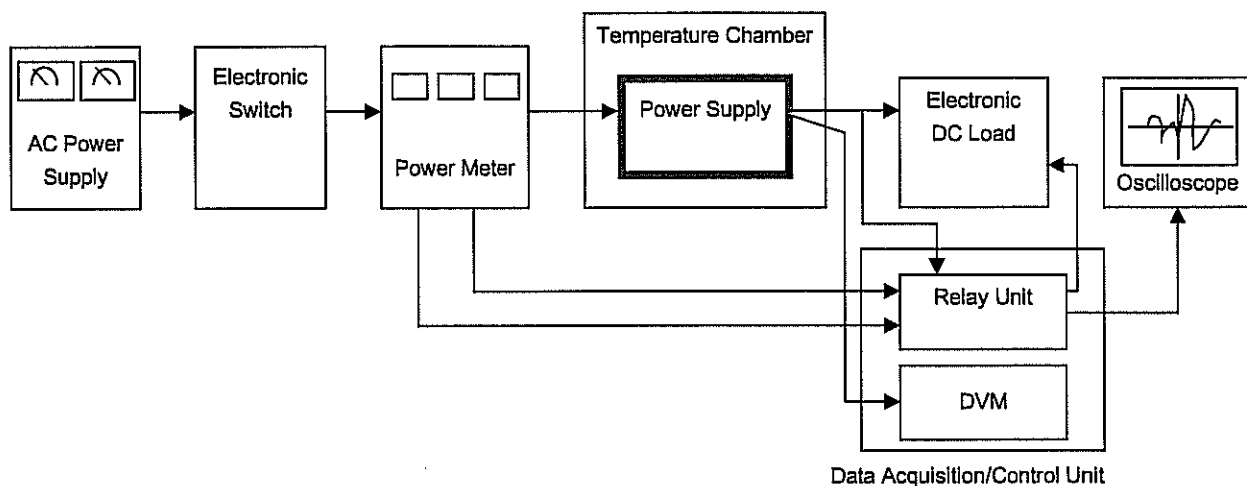


Figure A

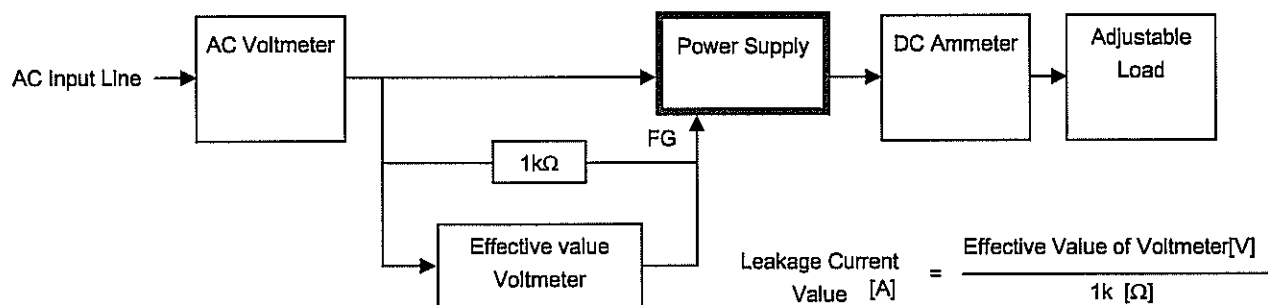


Figure B (DEN-AN)

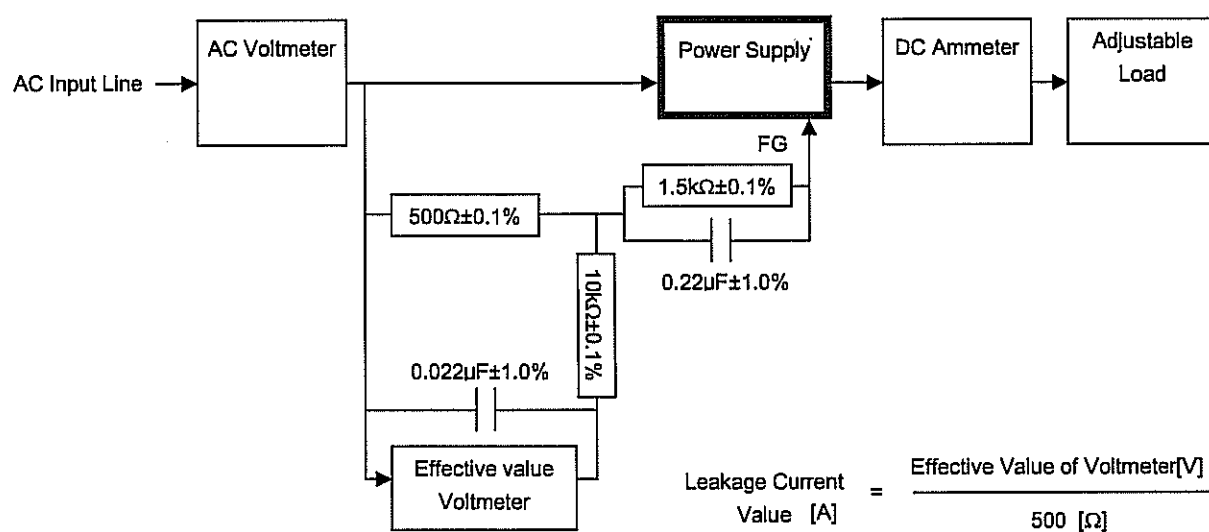


Figure B (IEC60950-1)

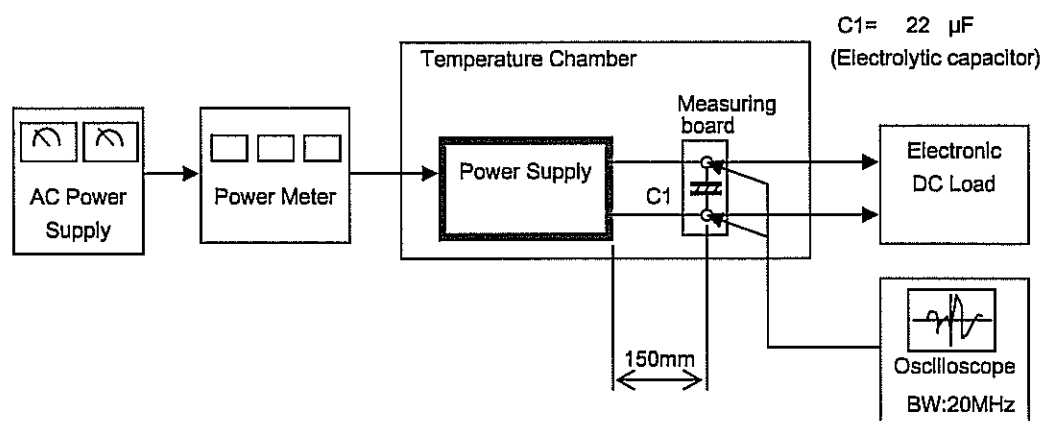


Figure C