

TEST DATA OF SPLFA50F-12

Regulated DC Power Supply
May 18, 2011

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COSEL CO.,LTD.

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Model		SPLFA50F-12	
Item		Input Current (by Load Current)	
Object			
1. Graph		2. Values	

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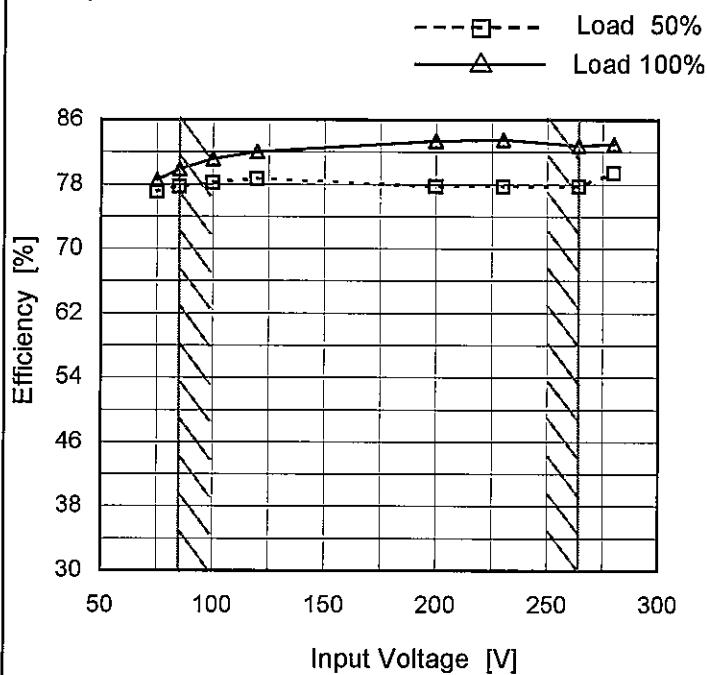
Model SPLFA50F-12

Item Efficiency (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]	Efficiency [%]	
	Load 50%	Load 100%
75	77.1	78.6
85	77.7	79.9
100	78.2	81.1
120	78.7	82.0
200	77.7	83.4
230	77.7	83.5
264	77.7	82.8
280	79.4	83.0
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Model		SPLFA50F-12		Temperature 25°C																																																		
Item		Efficiency (by Load Current)		Testing Circuitry Figure A																																																		
Object																																																						
1.Graph		<div><div>—△—</div><div>---□---</div><div>---○---</div></div> <div><div>Input Volt. 100V</div><div>Input Volt. 200V</div><div>Input Volt. 230V</div></div>		2.Values																																																		
<div><div>Efficiency [%]</div><div></div><div>Load Current [A]</div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.000</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.800</td><td>68.9</td><td>66.5</td><td>66.0</td></tr><tr><td>1.600</td><td>75.9</td><td>74.1</td><td>75.0</td></tr><tr><td>2.400</td><td>78.9</td><td>78.9</td><td>78.7</td></tr><tr><td>3.200</td><td>80.4</td><td>81.9</td><td>81.2</td></tr><tr><td>4.000</td><td>81.0</td><td>82.9</td><td>82.9</td></tr><tr><td>4.300</td><td>81.0</td><td>83.2</td><td>83.4</td></tr><tr><td>4.730</td><td>81.0</td><td>83.5</td><td>83.6</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]	Efficiency [%]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.000	-	-	-	0.800	68.9	66.5	66.0	1.600	75.9	74.1	75.0	2.400	78.9	78.9	78.7	3.200	80.4	81.9	81.2	4.000	81.0	82.9	82.9	4.300	81.0	83.2	83.4	4.730	81.0	83.5	83.6	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.																																																						

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Model	SPLFA50F-12
Item	Power Factor (by Input Voltage)
Object	_____

1.Graph

□

Load 50%

△

Load 100%

Power Factor

Input Voltage [V]

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

Temperature
25°C

Testing Circuitry
Figure A

2.Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.985	0.992
85	0.979	0.991
100	0.974	0.986
120	0.959	0.978
200	0.872	0.936
230	0.847	0.921
264	0.814	0.860
280	0.514	0.725
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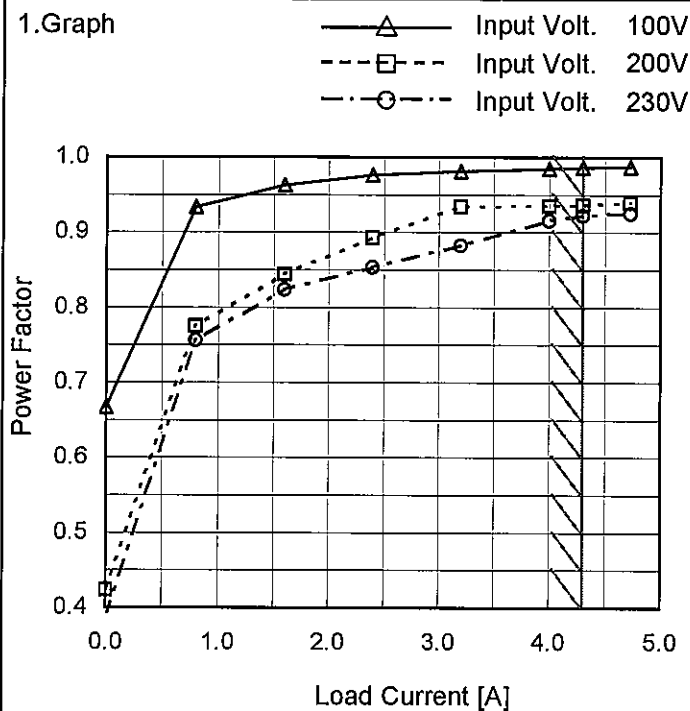
Model SPLFA50F-12

Item Power Factor (by Load Current)

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph

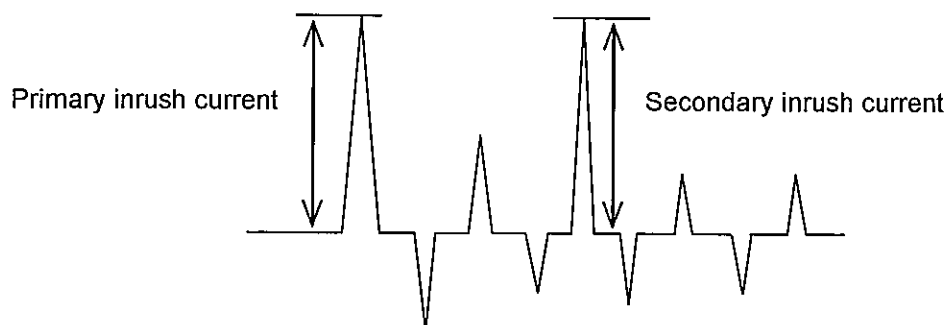
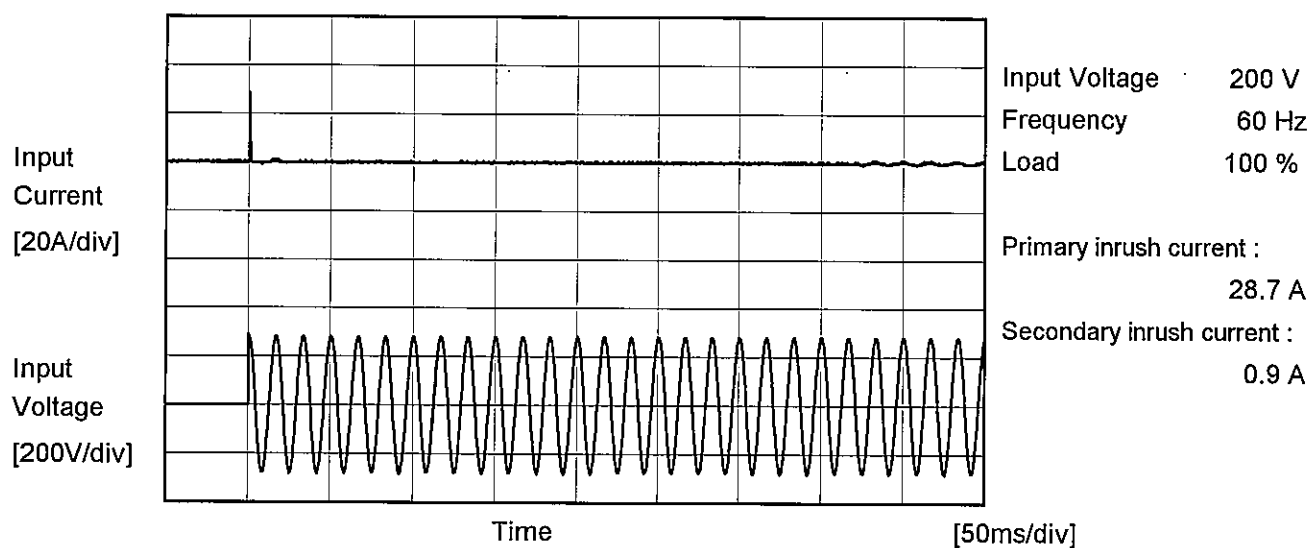
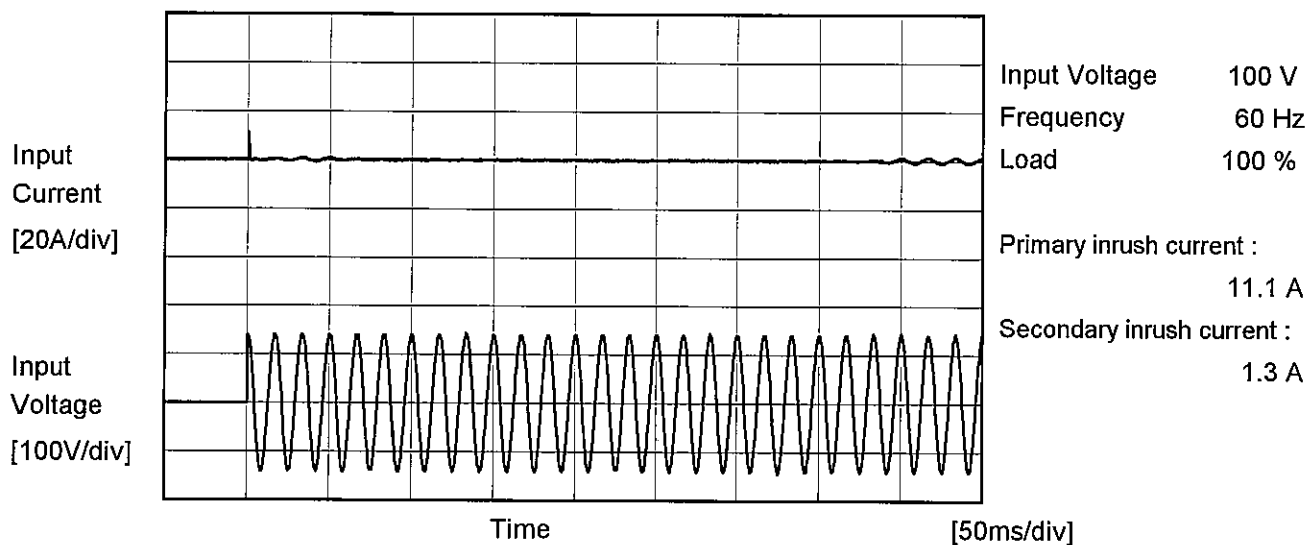


Note: Slanted line shows the range of the rated load current.

2. Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.667	0.424	0.387
0.80	0.933	0.775	0.756
1.60	0.962	0.844	0.824
2.40	0.976	0.893	0.853
3.20	0.981	0.934	0.882
4.00	0.985	0.935	0.916
4.30	0.986	0.936	0.922
4.73	0.987	0.939	0.925
--	-	-	-
--	-	-	-
--	-	-	-

Model	SPLFA50F-12	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		



Model		SPLFA50F-12	Temperature 25°C Testing Circuitry Figure B
Item		Leakage Current	
Object		_____	

1.Results

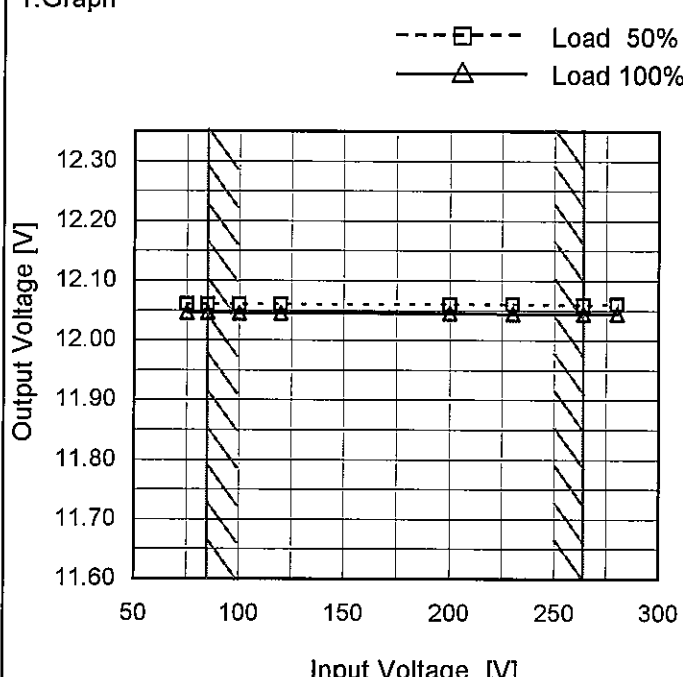
[mA]

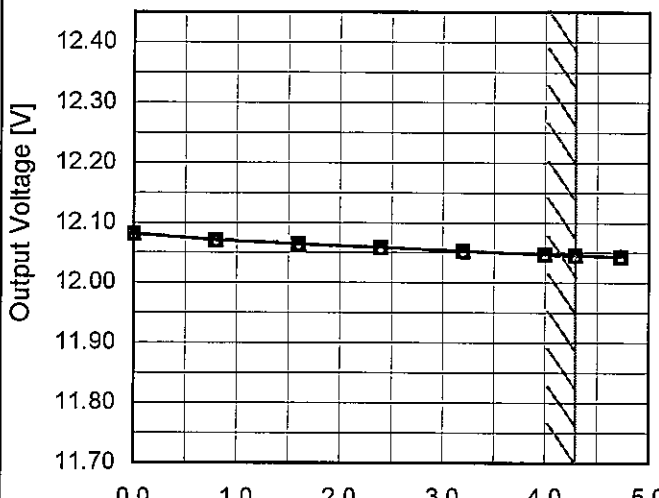
Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.15	0.25	0.31	Operation
	One of phases	0.20	0.47	0.57	Stand by
IEC60950-1	Both phases	0.17	0.28	0.33	Operation
	One of phases	0.22	0.45	0.53	Stand by

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	SPLFA50F-12																																		
Item	Line Regulation	Temperature	25°C																																
Object	+12V4.3A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
<div><div>---□--- Load 50%</div><div>—△— Load 100%</div><p>Output Voltage [V]</p><p>Input Voltage [V]</p><p>Note: Slanted line shows the range of the rated input voltage.</p></div>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>75</td><td>12.060</td><td>12.046</td></tr><tr><td>85</td><td>12.060</td><td>12.046</td></tr><tr><td>100</td><td>12.060</td><td>12.046</td></tr><tr><td>120</td><td>12.060</td><td>12.045</td></tr><tr><td>200</td><td>12.060</td><td>12.045</td></tr><tr><td>230</td><td>12.060</td><td>12.045</td></tr><tr><td>264</td><td>12.060</td><td>12.045</td></tr><tr><td>280</td><td>12.060</td><td>12.045</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	12.060	12.046	85	12.060	12.046	100	12.060	12.046	120	12.060	12.045	200	12.060	12.045	230	12.060	12.045	264	12.060	12.045	280	12.060	12.045	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
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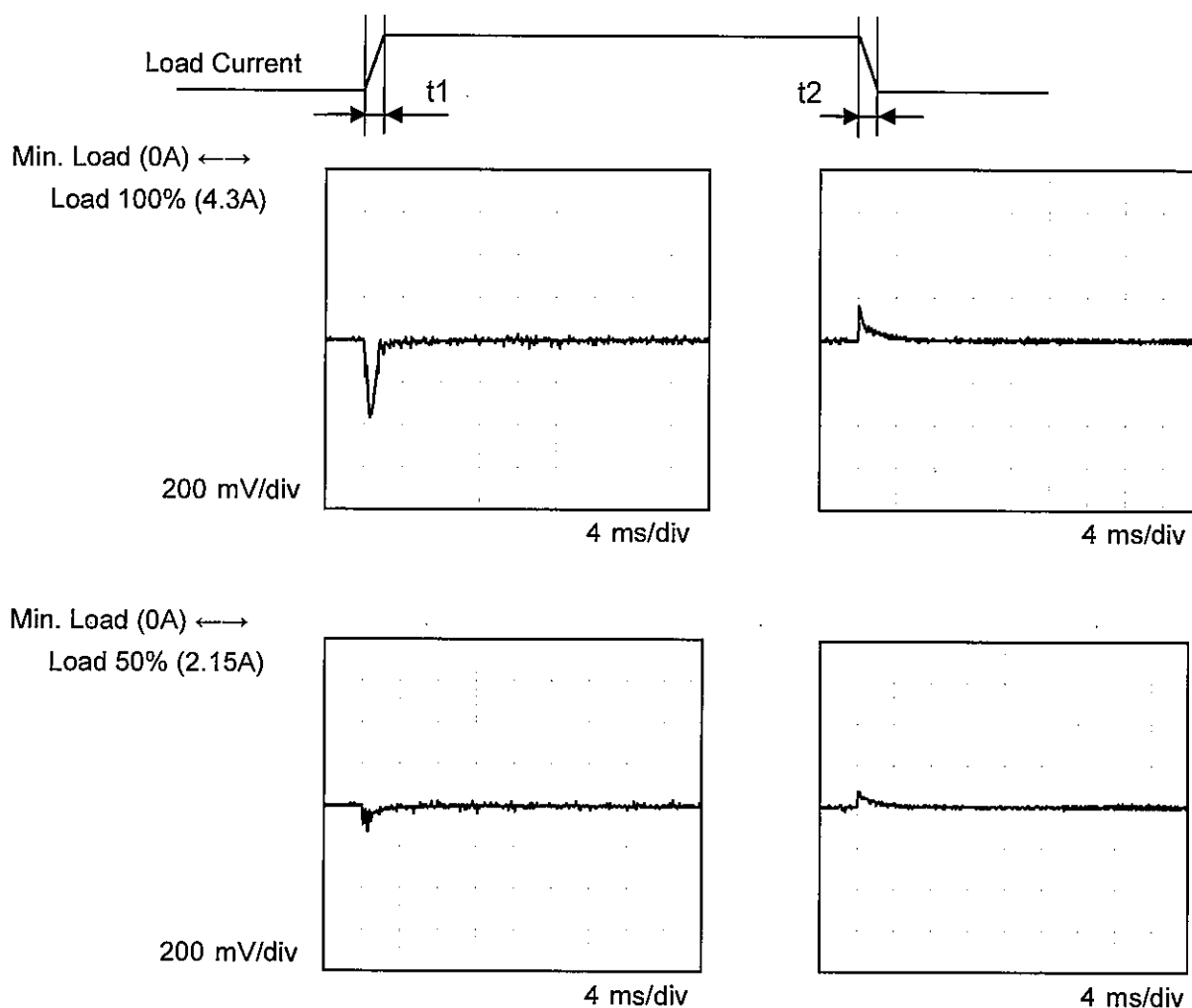
Model	SPLFA50F-12																																																					
Item	Load Regulation		Temperature 25°C Testing Circuitry Figure A																																																			
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Load Current [A]	Output Voltage [V]																																																					
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4.73	12.044	12.043	12.043																																																			
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Model	SPLFA50F-12	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V4.3A		

Input Volt. 100 V
Cycle 1000 ms

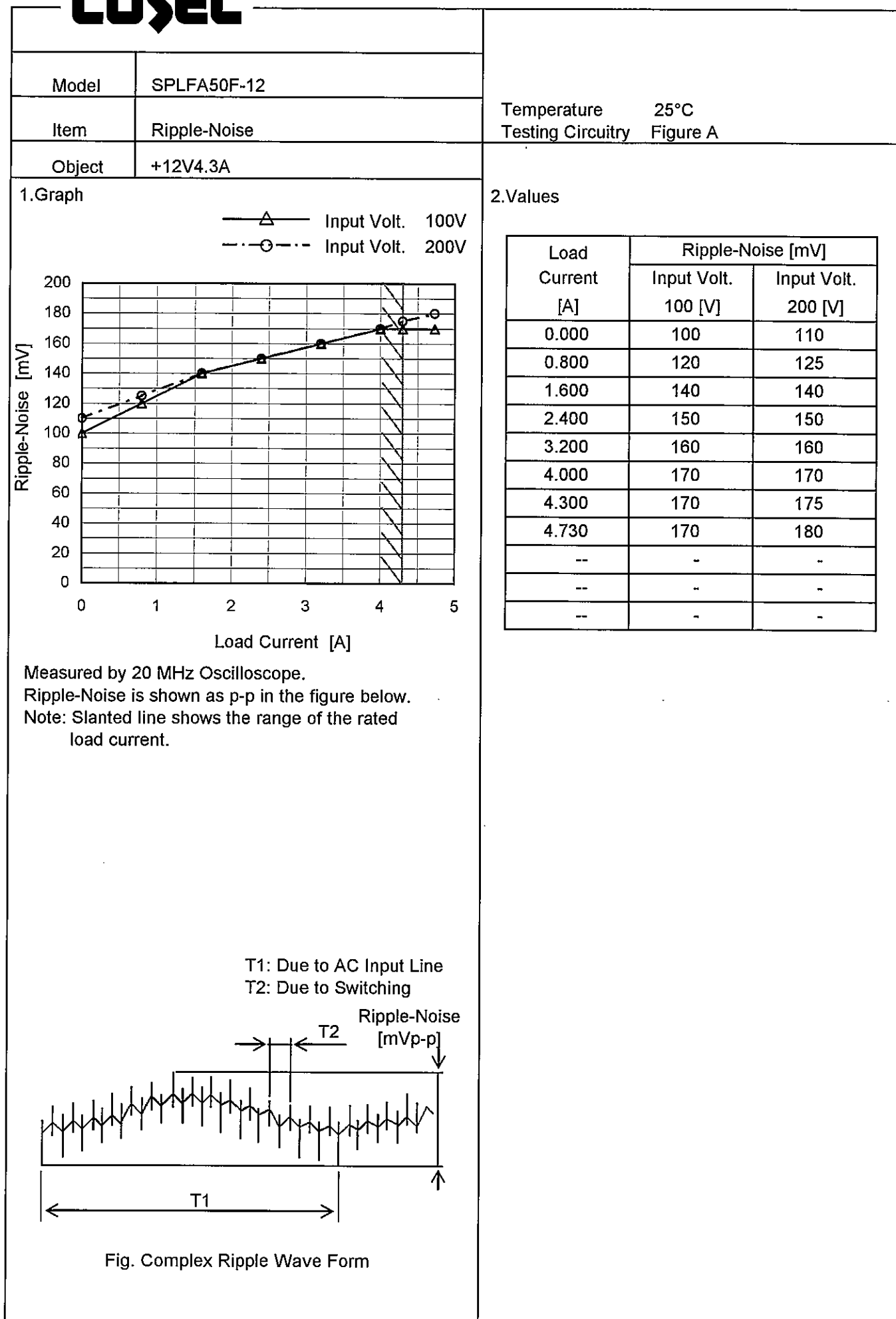
Response. $t_1=t_2=50\mu\text{s}$. Typ



Model		SPLFA50F-12	
Item		Ripple Voltage (by Load Current)	
Object		+12V4.3A	
1.Graph		2.Values	

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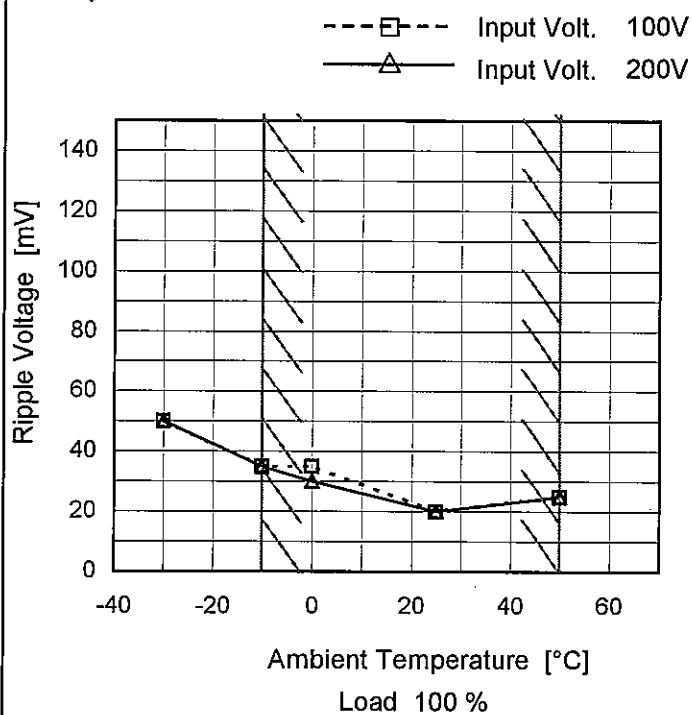
Model SPLFA50F-12

Item Ripple Voltage (by Ambient Temp.)

Object +12V4.3A

Testing Circuitry Figure A

1. Graph

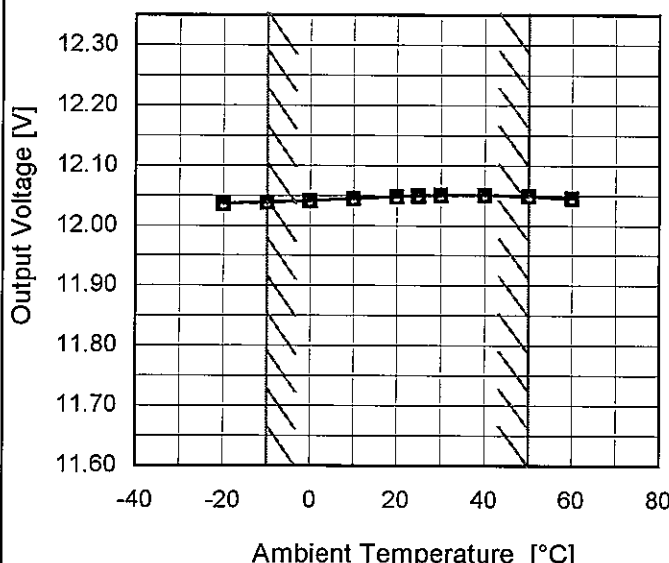


Measured by 20 MHz Oscilloscope.

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. 200 [V]
-30	50	50
-10	35	35
0	35	30
25	20	20
50	25	25
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Model		SPLFA50F-12																																																				
Item		Ambient Temperature Drift																																																				
Object		+12V4.3A																																																				
1.Graph		2.Values																																																				
<div><div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 200V</div></div><div><div>---○---</div><div>Input Volt. 230V</div></div></div><p>Output Voltage [V]</p><p>Ambient Temperature [°C]</p><p>Load 100%</p><p>Note: Slanted line shows the range of the rated ambient temperature.</p></div>		<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. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>-20</td><td>12.036</td><td>12.036</td><td>12.036</td></tr><tr><td>-10</td><td>12.039</td><td>12.038</td><td>12.038</td></tr><tr><td>0</td><td>12.041</td><td>12.041</td><td>12.041</td></tr><tr><td>10</td><td>12.045</td><td>12.044</td><td>12.044</td></tr><tr><td>20</td><td>12.048</td><td>12.048</td><td>12.048</td></tr><tr><td>25</td><td>12.050</td><td>12.049</td><td>12.049</td></tr><tr><td>30</td><td>12.051</td><td>12.050</td><td>12.050</td></tr><tr><td>40</td><td>12.051</td><td>12.051</td><td>12.050</td></tr><tr><td>50</td><td>12.049</td><td>12.049</td><td>12.049</td></tr><tr><td>60</td><td>12.046</td><td>12.045</td><td>12.045</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	-20	12.036	12.036	12.036	-10	12.039	12.038	12.038	0	12.041	12.041	12.041	10	12.045	12.044	12.044	20	12.048	12.048	12.048	25	12.050	12.049	12.049	30	12.051	12.050	12.050	40	12.051	12.051	12.050	50	12.049	12.049	12.049	60	12.046	12.045	12.045	--	-	-	-
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Model		SPLFA50F-12	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+12V4.3A	

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 : 85 - 264V

Load Current : 0 - 4.3A

* 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	40	264	0	12.087	±25	±0.2
Minimum Voltage	-10	264	4.3	12.038		

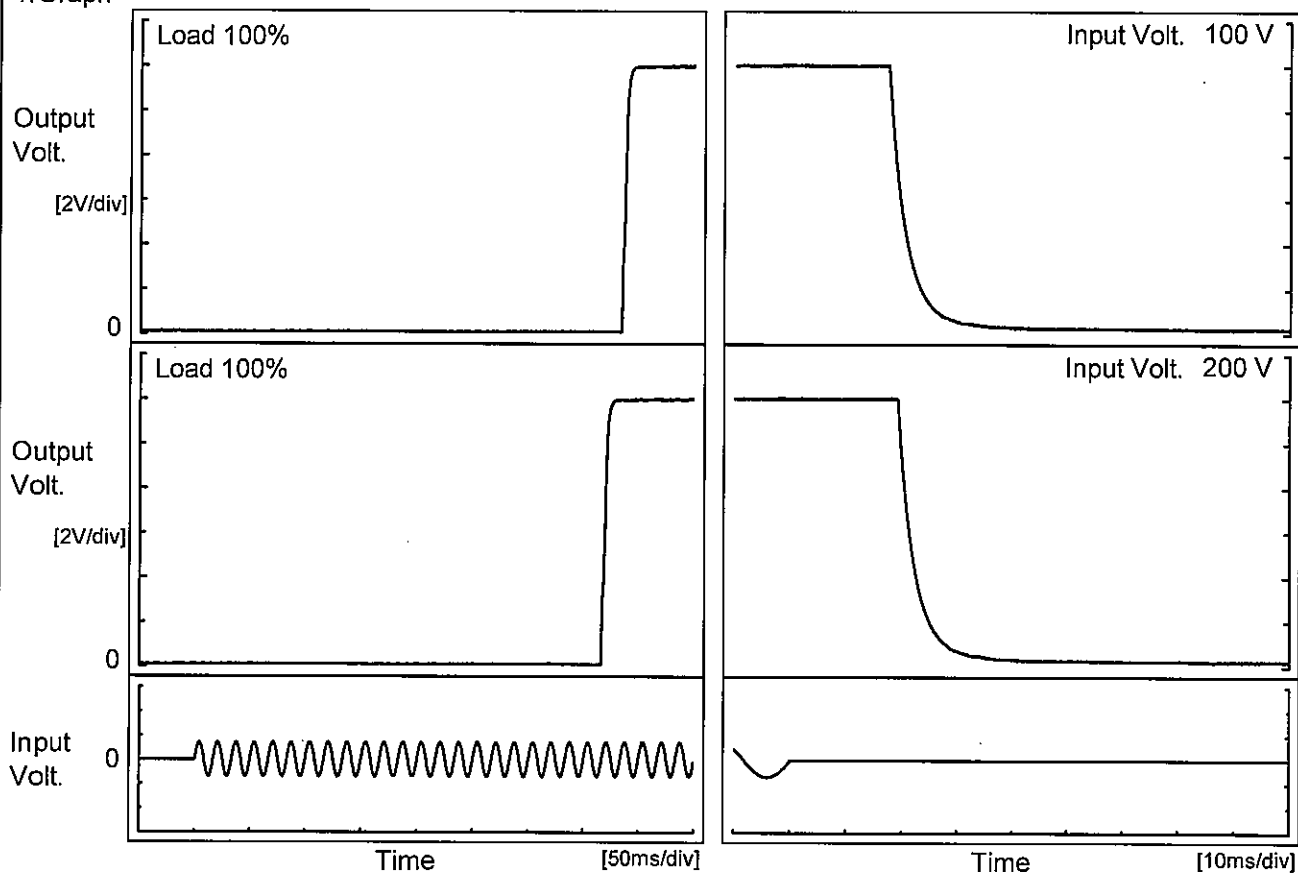
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Model		SPLFA50F-12	Temperature 25°C Testing Circuitry Figure A
Item		Time Lapse Drift	
Object		+12V4.3A	
1.Graph			2.Values
<div><div><div>Output Voltage [V]</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></di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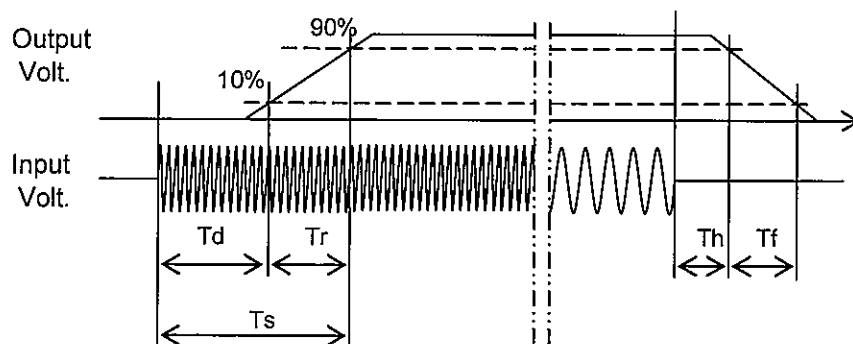
Model	SPLFA50F-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V4.3A		

1. Graph



2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		384.8	6.0	390.8	17.8	7.4
200 V		367.3	5.8	373.1	19.6	7.3



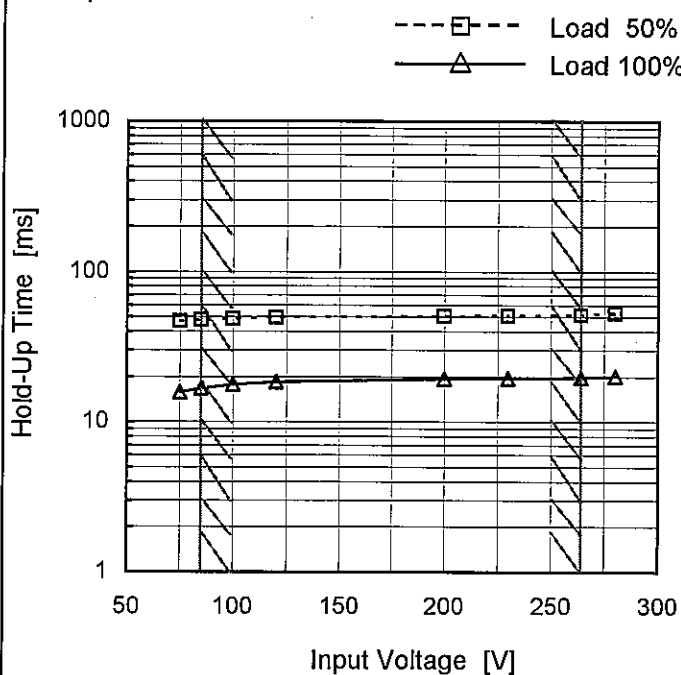
Model SPLFA50F-12

Item Hold-Up Time

Object +12V4.3A

 Temperature 25°C
 Testing Circuitry Figure A

1. Graph



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.

2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	47	16
85	48	17
100	49	18
120	50	18
200	51	19
230	51	20
264	52	20
280	53	20
--	-	-

Model SPLFA50F-12

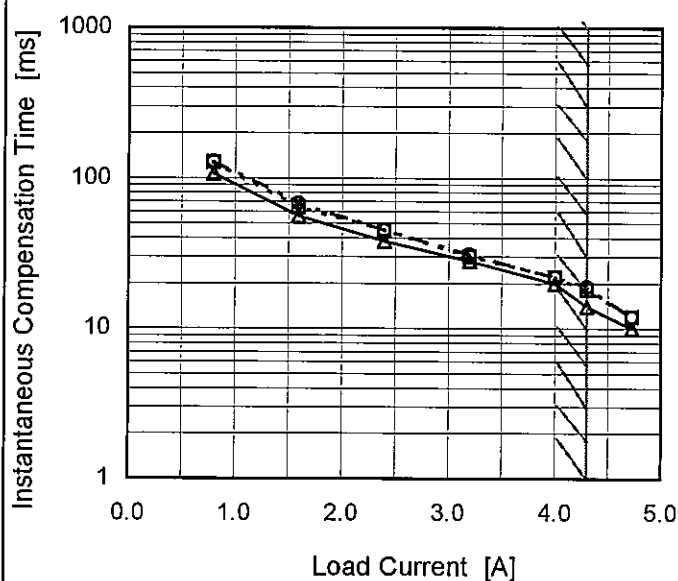
Item Instantaneous Interruption Compensation

Object +12V4.3A

Temperature 25°C
Testing Circuitry Figure A

1. Graph

—△— Input Volt. 100V
---□--- Input Volt. 200V
---○--- Input Volt. 230V



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

2. Values

Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.80	107	128	129
1.60	56	64	68
2.40	38	45	45
3.20	28	30	31
4.00	20	22	22
4.30	14	18	19
4.73	10	12	12
--	-	-	-
--	-	-	-
--	-	-	-

Model

SPLFA50F-12

Item

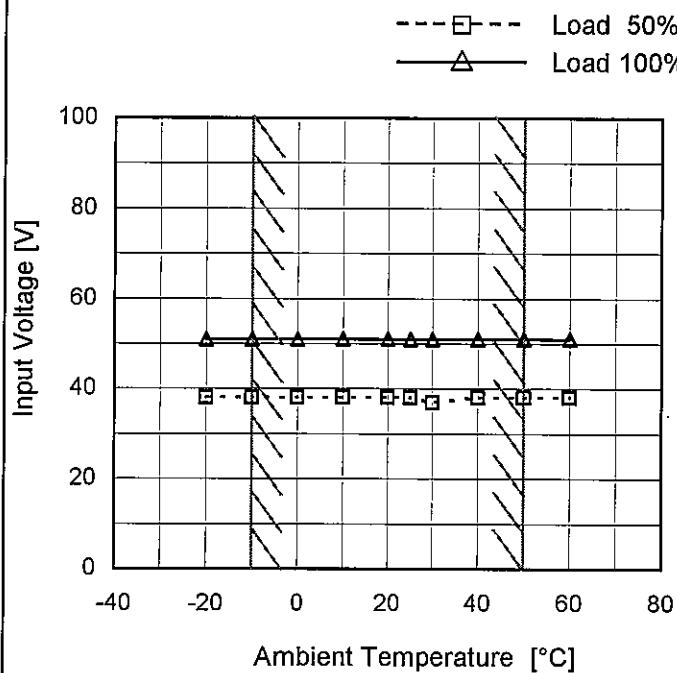
Minimum Input Voltage
for Regulated Output Voltage

Object

+12V4.3A

Testing Circuitry Figure A

1. Graph



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	38	51
-10	38	51
0	38	51
10	38	51
20	38	51
25	38	51
30	37	51
40	38	51
50	38	51
60	38	51
--	-	-

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

Model	SPLFA50F-12																																											
Item	Overcurrent Protection	Temperature	25°C																																									
Object	+12V4.3A	Testing Circuitry	Figure A																																									
1.Graph		2.Values																																										
<div><div><div></div>Input Volt. 100V</div><div><div></div>Input Volt. 200V</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. 100[V]</th><th>Input Volt. 200[V]</th></tr><tr><td>12.0</td><td>4.90</td><td>4.89</td></tr><tr><td>11.4</td><td>-</td><td>-</td></tr><tr><td>10.8</td><td>-</td><td>-</td></tr><tr><td>9.6</td><td>-</td><td>-</td></tr><tr><td>8.4</td><td>-</td><td>-</td></tr><tr><td>7.2</td><td>-</td><td>-</td></tr><tr><td>6.0</td><td>-</td><td>-</td></tr><tr><td>4.8</td><td>-</td><td>-</td></tr><tr><td>3.6</td><td>-</td><td>-</td></tr><tr><td>2.4</td><td>-</td><td>-</td></tr><tr><td>1.2</td><td>-</td><td>-</td></tr><tr><td>0.0</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	12.0	4.90	4.89	11.4	-	-	10.8	-	-	9.6	-	-	8.4	-	-	7.2	-	-	6.0	-	-	4.8	-	-	3.6	-	-	2.4	-	-	1.2	-	-	0.0	-	-
Output Voltage [V]	Load Current [A]																																											
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1.2	-	-																																										
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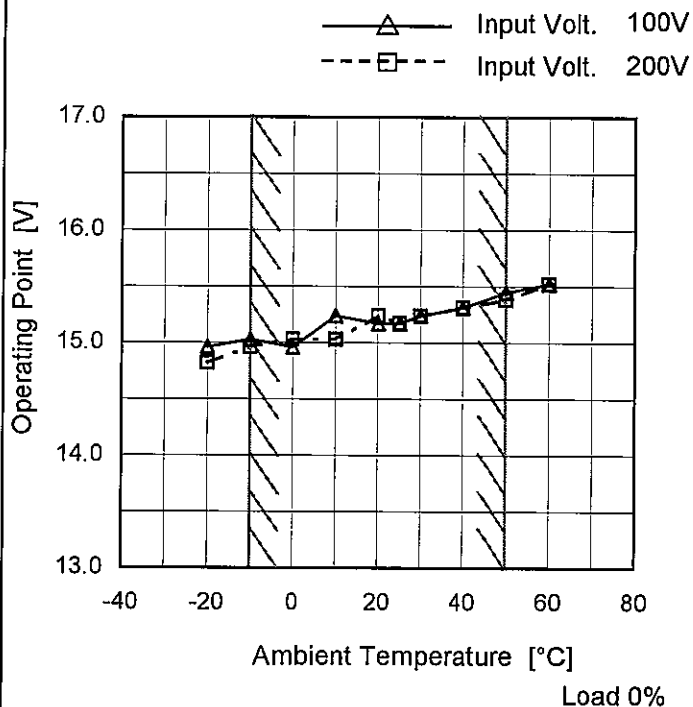
Model SPLFA50F-12

Item Overvoltage Protection

Object +12V4.3A

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. 100[V]	Input Volt. 200[V]
-20	14.96	14.82
-10	15.03	14.96
0	14.96	15.03
10	15.24	15.03
20	15.17	15.24
25	15.17	15.17
30	15.24	15.24
40	15.31	15.31
50	15.45	15.38
60	15.52	15.52
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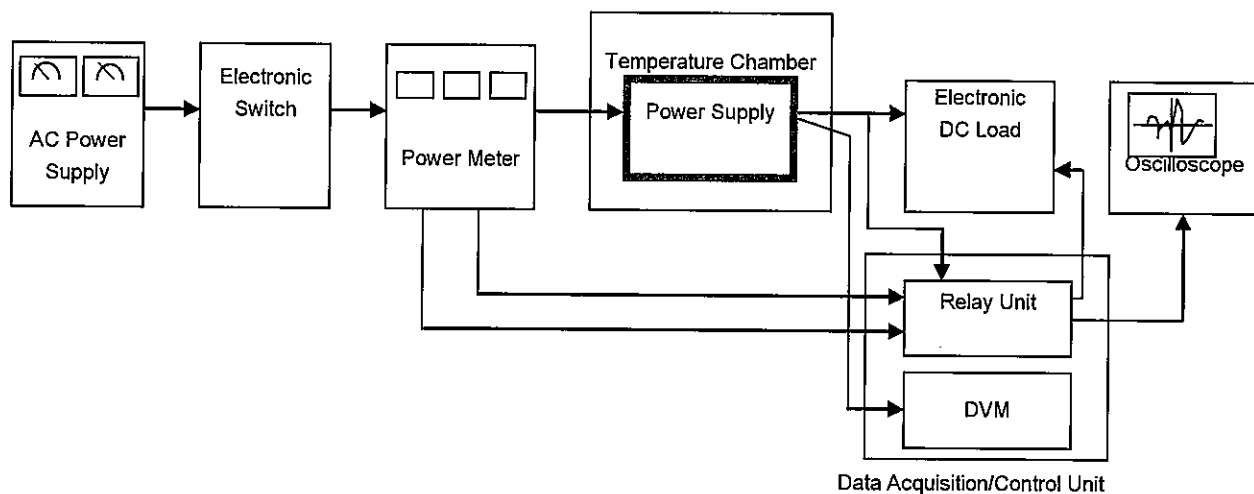


Figure A

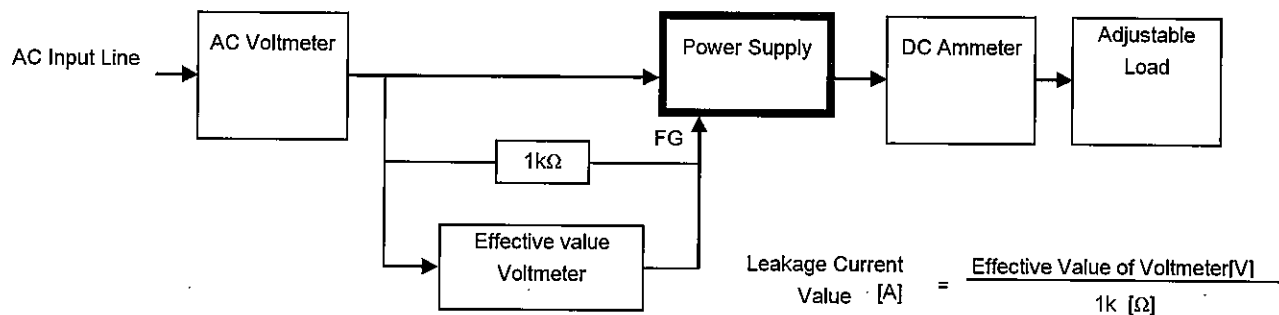


Figure B (DEN-AN)

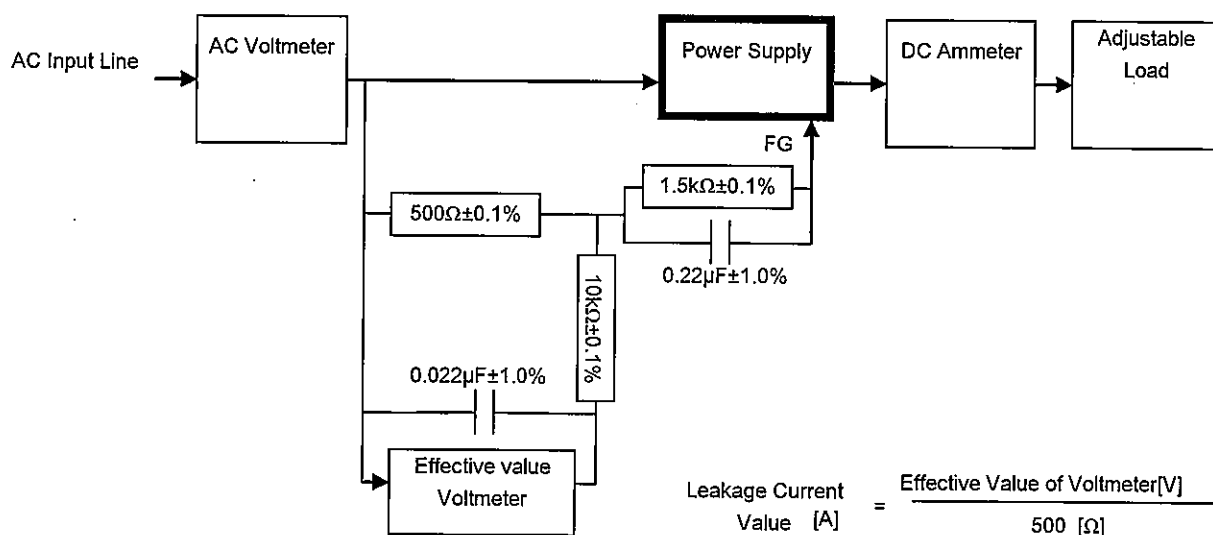


Figure B (IEC60950-1)