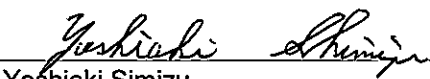
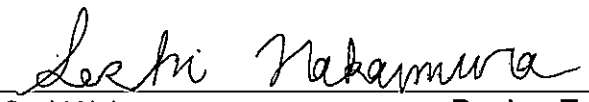




# TEST DATA OF LFP240F-36-Y

Regulated DC Power Supply  
December 25, 2012

Approved by :   
Yoshiaki Simizu Design Manager

Prepared by :   
Soshi Nakamura Design Engineer

**COSEL CO.,LTD.**

## CONTENTS

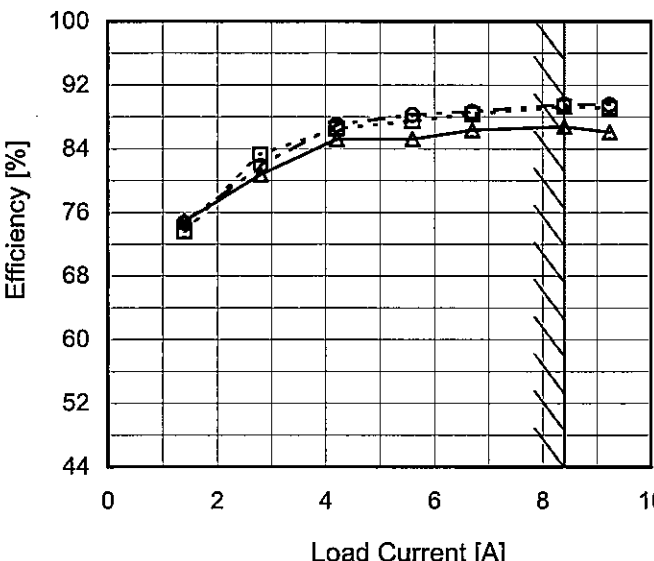
1.Input Current (by Load Current) . . . . .	1
2.Input Power (by Load Current) . . . . .	2
3.Efficiency (by Input Voltage) . . . . .	3
4.Efficiency (by Load Current) . . . . .	4
5.Power Factor (by Input Voltage) . . . . .	5
6.Power Factor (by Load Current) . . . . .	6
7.Inrush Current . . . . .	7
8.Leakage 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		LFP240F-36-Y		Temperature 25°C																																																				
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Model		LFP240F-36-Y		Temperature		25°C																															
Item		Power Factor (by Input Voltage)		Testing Circuitry		Figure A																															
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Model		LFP240F-36-Y	
Item		Power Factor (by Load Current)	
Object			

1.Graph

—△—

Input Volt.

100V

---□---

Input Volt.

200V

-·-○-·-

Input Volt.

230V

Power Factor

1.0

0.9

0.8

0.7

0.6

0.5

0.4

0

2

4

6

8

10

Load Current [A]

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

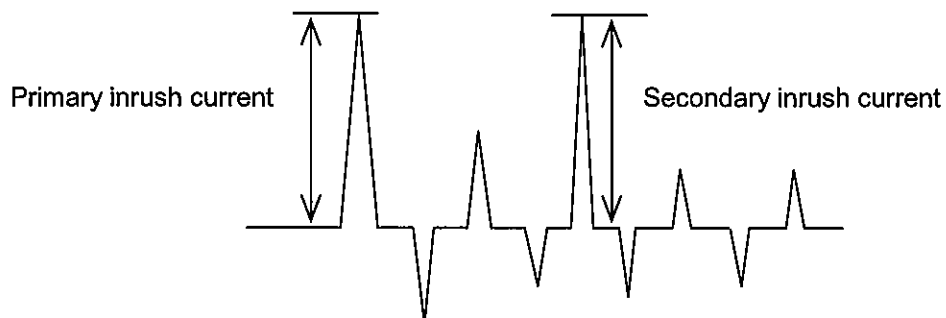
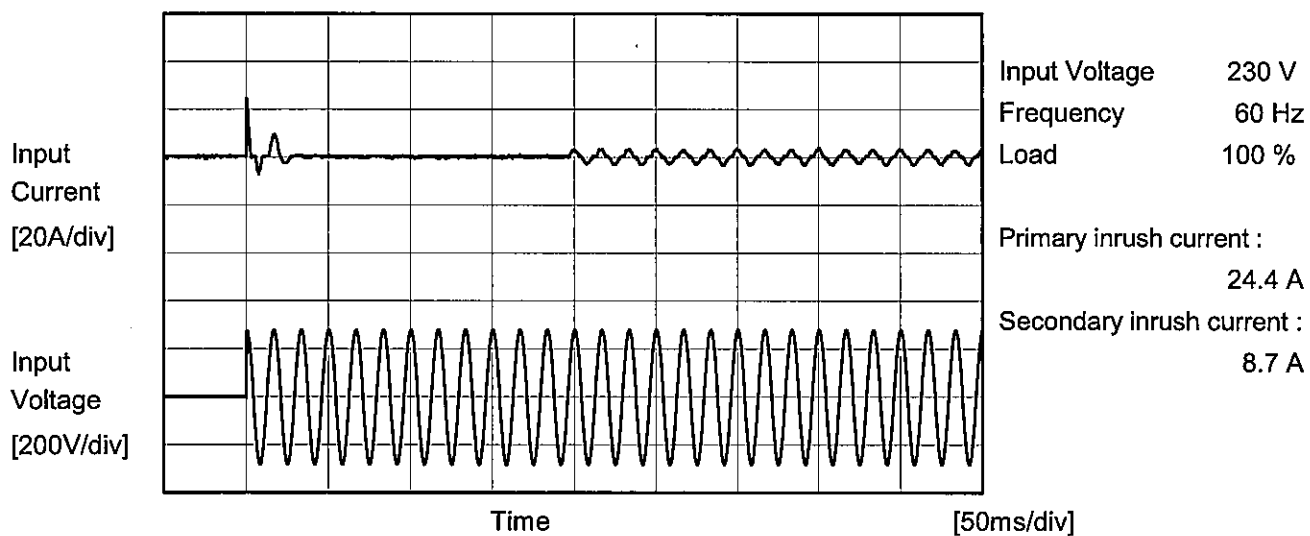
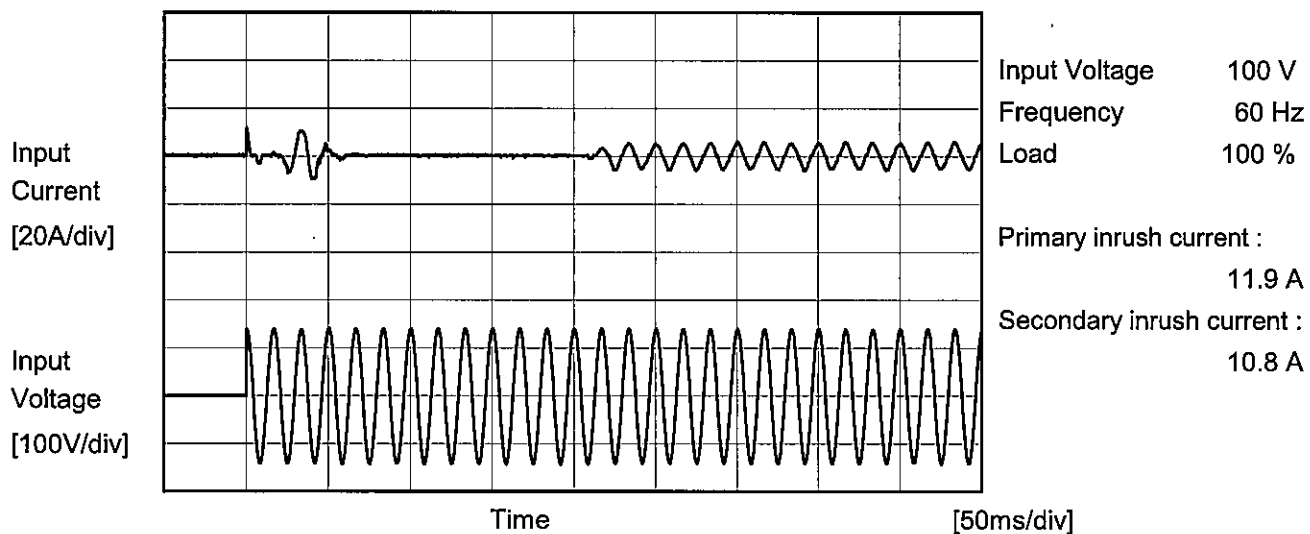
2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	0.735	0.500	0.400
1.40	0.946	0.863	0.810
2.80	0.974	0.904	0.892
4.20	0.987	0.921	0.917
5.60	0.990	0.931	0.920
6.70	0.992	0.942	0.929
8.40	0.995	0.953	0.952
9.24	0.995	0.962	0.954
--	-	-	-
--	-	-	-
--	-	-	-



# COSEL

Model	LFP240F-36-Y	Temperature Testing Circuitry	25°C Figure A
Item	Inrush Current		
Object			



**COSEL**

		Temperature 25°C Testing Circuitry Figure B
Model	LFP240F-36-Y	
Item	Leakage Current	
Object	_____	

## 1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.20	0.35	0.45	Operation
	One of phases	0.30	0.65	0.80	Stand by
IEC60950-1	Both phases	0.19	0.40	0.46	Operation
	One of phases	0.31	0.66	0.77	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	LFP240F-36-Y																																
Item	Line Regulation	Temperature	25°C																														
Object	+36V8.4A	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>75</td><td>36.474</td><td>36.474</td></tr><tr><td>85</td><td>36.476</td><td>36.473</td></tr><tr><td>100</td><td>36.476</td><td>36.473</td></tr><tr><td>120</td><td>36.475</td><td>36.471</td></tr><tr><td>200</td><td>36.471</td><td>36.467</td></tr><tr><td>230</td><td>36.470</td><td>36.465</td></tr><tr><td>264</td><td>36.469</td><td>36.463</td></tr><tr><td>280</td><td>36.468</td><td>36.462</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table> <p>Note: Slanted line shows the range of the rated input voltage.</p>		Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%	75	36.474	36.474	85	36.476	36.473	100	36.476	36.473	120	36.475	36.471	200	36.471	36.467	230	36.470	36.465	264	36.469	36.463	280	36.468	36.462	--	-	-		
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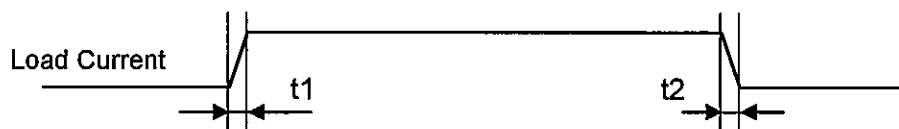
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# COSEL

Model	LFP240F-36-Y	Temperature Testing Circuitry	25° C Figure A
Item	Dynamic Load Response		
Object	+36V8.4A		

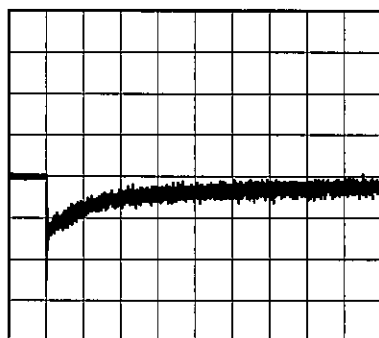
Input Volt. 100 V  
Cycle 1000 ms

Response.  $t_1=t_2=50\mu s$ . Typ

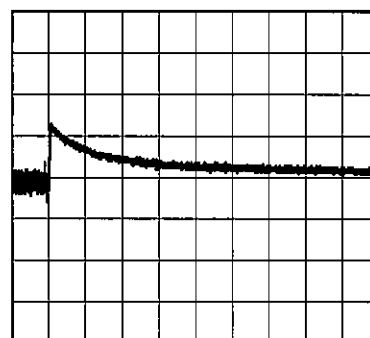


Min. Load (0A)  $\longleftrightarrow$   
Load 100% (8.4A)

100 mV/div



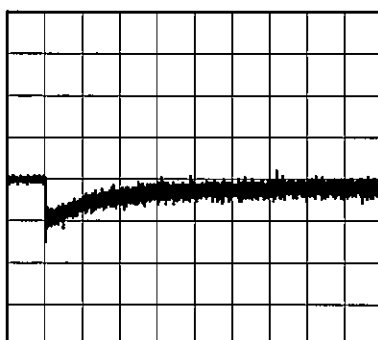
20 ms/div



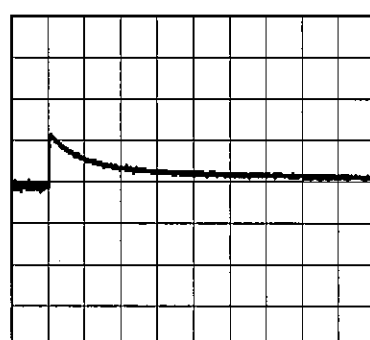
20 ms/div

Min. Load (0A)  $\longleftrightarrow$   
Load 50% (4.2A)

100 mV/div



20 ms/div

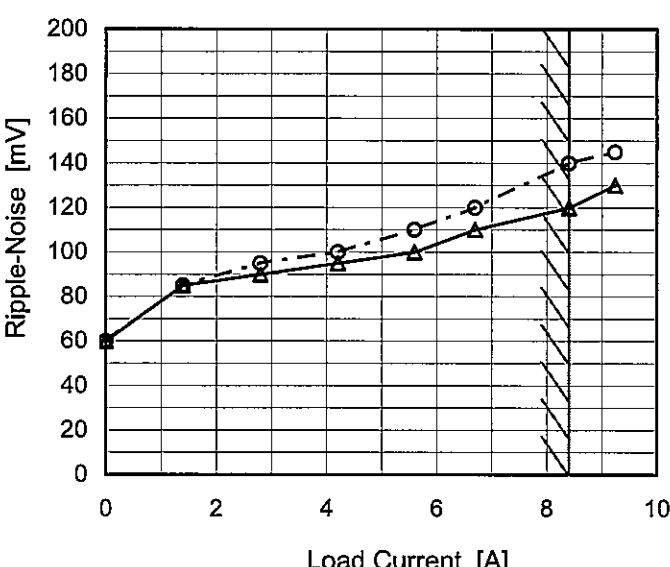
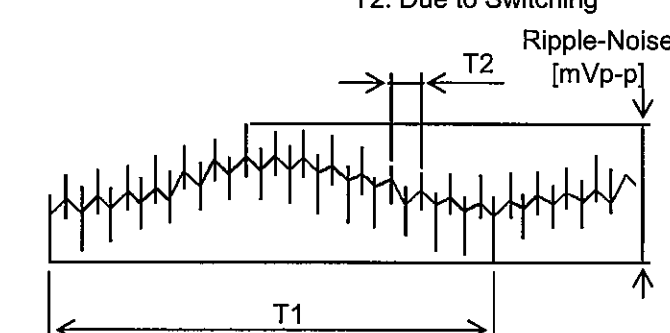


20 ms/div

# COSEL

Model		LFP240F-36-Y		Temperature 25°C																																					
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure C																																					
Object		+36V8.4A																																							
1.Graph				2.Values																																					
<div><div><div><div><div></div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---○---</div><div>Input Volt. 230V</div></div></div><div><table><thead><tr><th>Load Current [A]</th><th>Input Volt. 100 [V]</th><th>Input Volt. 230 [V]</th></tr></thead><tbody><tr><td>0.00</td><td>35</td><td>40</td></tr><tr><td>1.40</td><td>60</td><td>60</td></tr><tr><td>2.80</td><td>70</td><td>70</td></tr><tr><td>4.20</td><td>70</td><td>70</td></tr><tr><td>5.60</td><td>75</td><td>75</td></tr><tr><td>6.70</td><td>80</td><td>80</td></tr><tr><td>8.40</td><td>85</td><td>85</td></tr><tr><td>9.24</td><td>90</td><td>90</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></div></div><div><p>Measured by 20 MHz Oscilloscope.</p><p>Ripple Voltage is shown as p-p in the figure below.</p><p>Note: Slanted line shows the range of the rated load current.</p></div><div><div><div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div><div></div></div><div>Fig. Complex Ripple Wave Form</div></div></div>				Load Current [A]	Input Volt. 100 [V]	Input Volt. 230 [V]	0.00	35	40	1.40	60	60	2.80	70	70	4.20	70	70	5.60	75	75	6.70	80	80	8.40	85	85	9.24	90	90	--	-	-	--	-	-	--	-	-		
Load Current [A]	Input Volt. 100 [V]	Input Volt. 230 [V]																																							
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9.24	90	90																																							
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# COSEL

Model		LFP240F-36-Y																																							
Item		Ripple-Noise																																							
Object		+36V8.4A																																							
1.Graph		2.Values																																							
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>Input Volt. 100V</div><div>Input Volt. 230V</div></div></div><p>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.</p></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 100 [V]</th><th>Input Volt. 230 [V]</th></tr><tr><td>0.00</td><td>60</td><td>60</td></tr><tr><td>1.40</td><td>85</td><td>85</td></tr><tr><td>2.80</td><td>90</td><td>95</td></tr><tr><td>4.20</td><td>95</td><td>100</td></tr><tr><td>5.60</td><td>100</td><td>110</td></tr><tr><td>6.70</td><td>110</td><td>120</td></tr><tr><td>8.40</td><td>120</td><td>140</td></tr><tr><td>9.24</td><td>130</td><td>145</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>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 100 [V]	Input Volt. 230 [V]	0.00	60	60	1.40	85	85	2.80	90	95	4.20	95	100	5.60	100	110	6.70	110	120	8.40	120	140	9.24	130	145	--	-	-	--	-	-	--	-	-
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Model		LFP240F-36-Y	
Item		Ripple Voltage (by Ambient Temp.)	
Object		+36V8.4A	
1.Graph		2.Values	



Model		LFP240F-36-Y																																																				
Item		Ambient Temperature Drift																																																				
Object		+36V8.4A																																																				
1.Graph		2.Values																																																				
<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>		<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>36.384</td><td>36.383</td><td>36.382</td></tr><tr><td>-10</td><td>36.403</td><td>36.401</td><td>36.400</td></tr><tr><td>0</td><td>36.422</td><td>36.419</td><td>36.419</td></tr><tr><td>10</td><td>36.442</td><td>36.440</td><td>36.439</td></tr><tr><td>20</td><td>36.461</td><td>36.458</td><td>36.457</td></tr><tr><td>25</td><td>36.473</td><td>36.467</td><td>36.465</td></tr><tr><td>30</td><td>36.483</td><td>36.479</td><td>36.479</td></tr><tr><td>40</td><td>36.503</td><td>36.498</td><td>36.497</td></tr><tr><td>50</td><td>36.520</td><td>36.515</td><td>36.514</td></tr><tr><td>60</td><td>36.530</td><td>36.525</td><td>36.524</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	36.384	36.383	36.382	-10	36.403	36.401	36.400	0	36.422	36.419	36.419	10	36.442	36.440	36.439	20	36.461	36.458	36.457	25	36.473	36.467	36.465	30	36.483	36.479	36.479	40	36.503	36.498	36.497	50	36.520	36.515	36.514	60	36.530	36.525	36.524	--	-	-	-
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**COSEL**

		Testing Circuitry Figure A
Model	LFP240F-36-Y	
Item	Output Voltage Accuracy	
Object	+36V8.4A	

### 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 - 60°C

Input Voltage : 85 - 264V

Load Current : 0 - 8.4A

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

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

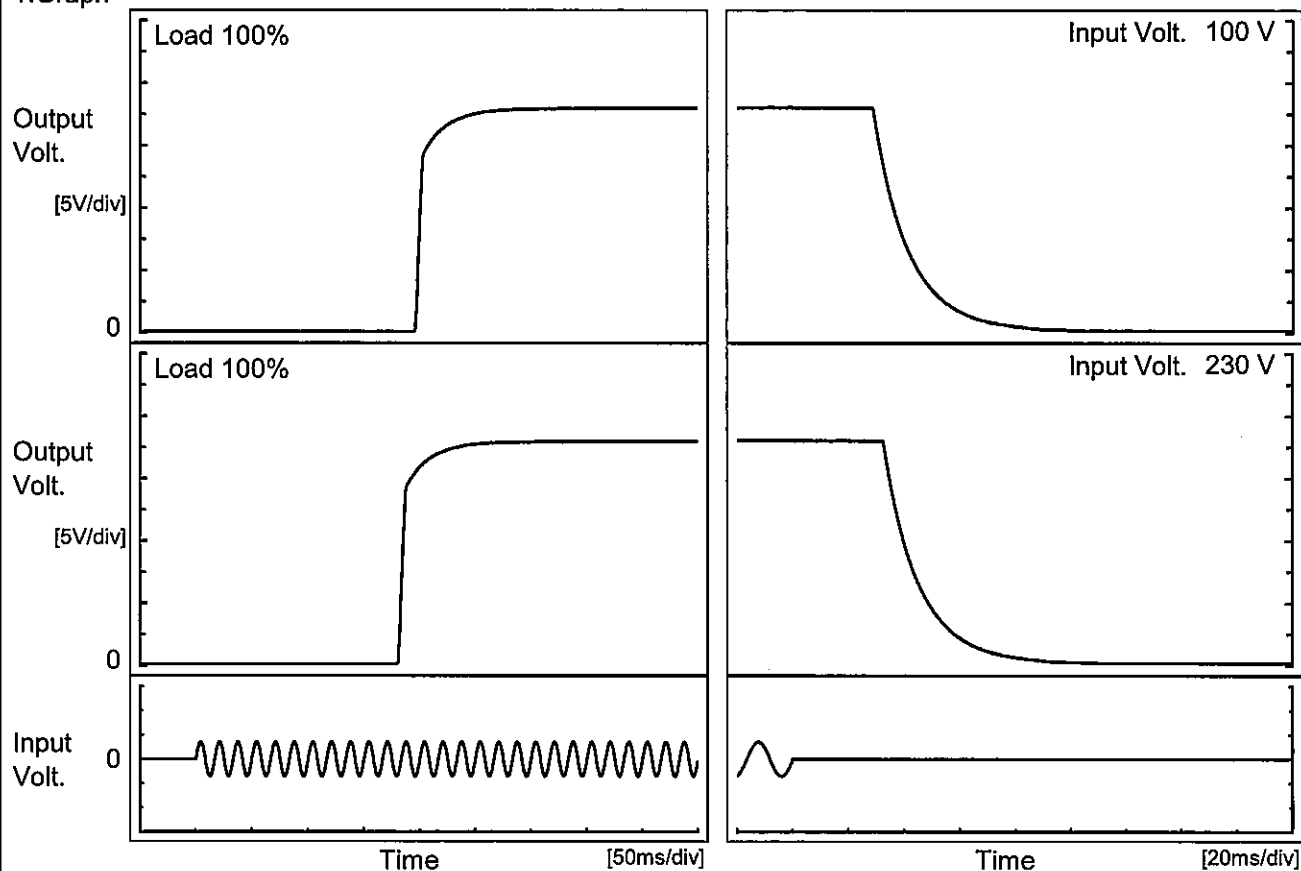
### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	85	0	36.524	±63	±0.2
Minimum Voltage	-10	264	8.4	36.398		



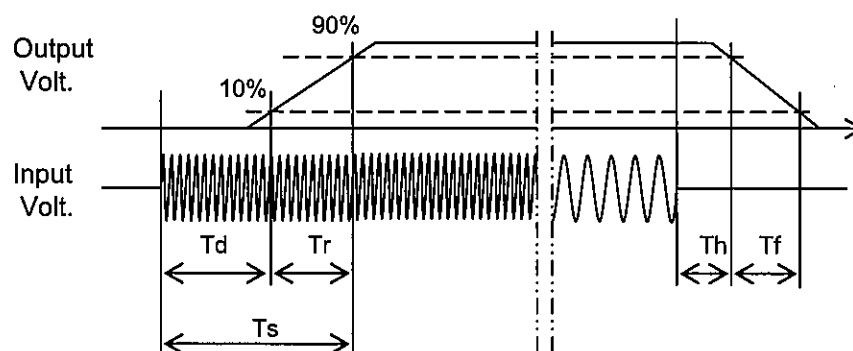
Model	LFP240F-36-Y	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+36V8.4A		

## 1. Graph

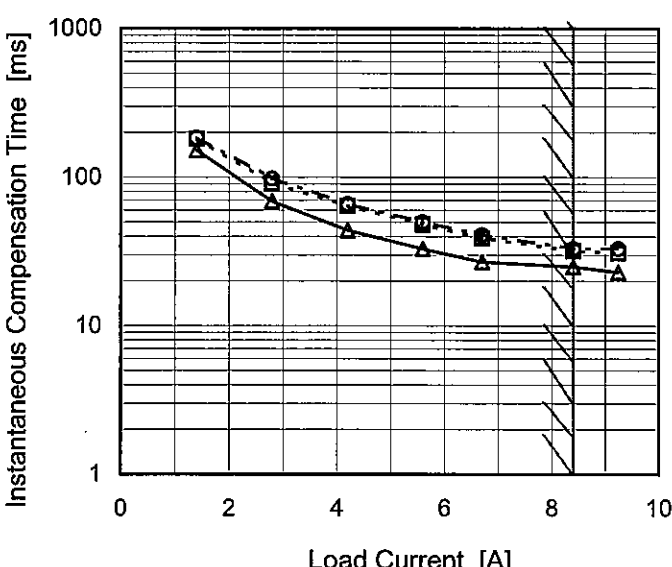


## 2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		218.3	22.0	240.3	30.3	25.1
230 V		199.0	22.0	221.0	35.3	25.2



Model	LFP240F-36-Y																																
Item	Hold-Up Time	Temperature	25°C																														
Object	+36V8.4A	Testing Circuitry	Figure A																														
1.Graph		2.Values																															
<div><div><div>---</div><div>□</div><div>---</div></div><div>Load 50%</div><div>---</div><div>△</div><div>---</div></div> <div>Load 100%</div> <table><thead><tr><th>Input Voltage [V]</th><th>Load 50% [ms]</th><th>Load 100% [ms]</th></tr></thead><tbody><tr><td>75</td><td>55</td><td>29</td></tr><tr><td>85</td><td>56</td><td>29</td></tr><tr><td>100</td><td>57</td><td>29</td></tr><tr><td>120</td><td>59</td><td>30</td></tr><tr><td>200</td><td>66</td><td>34</td></tr><tr><td>230</td><td>68</td><td>34</td></tr><tr><td>264</td><td>70</td><td>36</td></tr><tr><td>280</td><td>71</td><td>37</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Load 50% [ms]	Load 100% [ms]	75	55	29	85	56	29	100	57	29	120	59	30	200	66	34	230	68	34	264	70	36	280	71	37	--	-	-		
Input Voltage [V]	Load 50% [ms]	Load 100% [ms]																															
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100	57	29																															
120	59	30																															
200	66	34																															
230	68	34																															
264	70	36																															
280	71	37																															
--	-	-																															
<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>																																	

Model	LFP240F-36-Y																																																						
Item	Instantaneous Interruption Compensation																																																						
Object	+36V8.4A																																																						
1.Graph		2.Values																																																					
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Load Current [A]	Time [ms]																																																						
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Note: Slanted line shows the range of the rated load current.																																																							

Model		LFP240F-36-Y	Testing Circuitry    Figure A
Item		Minimum Input Voltage for Regulated Output Voltage	
Object		+36V8.4A	
1.Graph			
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Model	LFP240F-36-Y																																														
Item	Overcurrent Protection	Temperature	25°C																																												
Object	+36V8.4A	Testing Circuitry	Figure A																																												
1.Graph		2.Values																																													
<div><div><div></div>Input Volt. 100V</div><div><div></div>Input Volt. 230V</div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is from 30V to 0V.</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. 230[V]</th></tr><tr><td>34.2</td><td>16.15</td><td>16.07</td></tr><tr><td>32.4</td><td>16.21</td><td>16.12</td></tr><tr><td>30.0</td><td>16.29</td><td>16.22</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><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. 100[V]	Input Volt. 230[V]	34.2	16.15	16.07	32.4	16.21	16.12	30.0	16.29	16.22	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Model		LFP240F-36-Y
Item		Overvoltage Protection
Object		+36V8.4A

1.Graph

—△—

Input Volt. 100V

---□---

Input Volt. 230V

Operating Point [V]

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]
-20	44.92	44.86
-10	45.22	45.22
0	45.63	45.63
10	45.92	45.92
20	46.33	46.33
25	46.56	46.45
30	46.74	46.62
40	47.04	47.04
50	47.45	47.44
60	47.74	47.74
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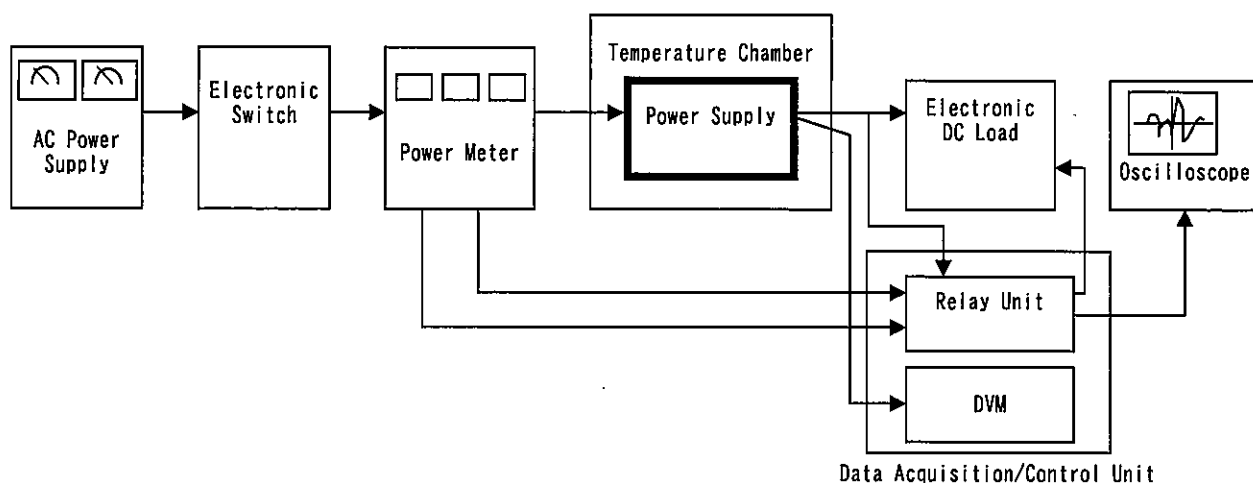


Figure A

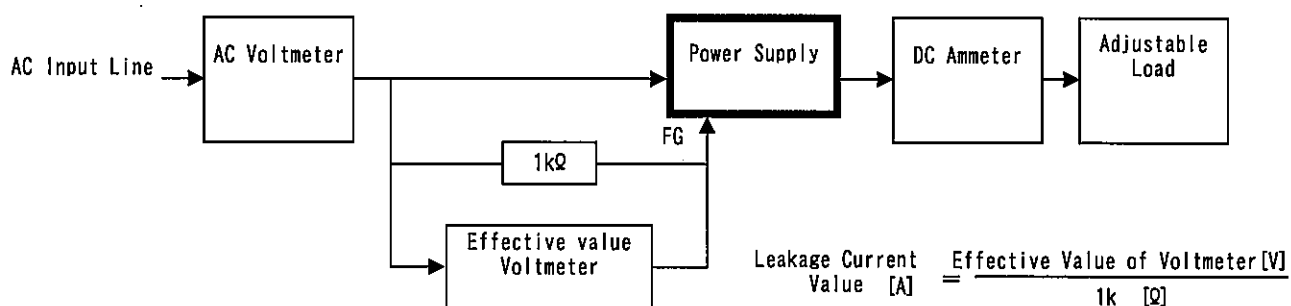


Figure B ( DEN-AN )

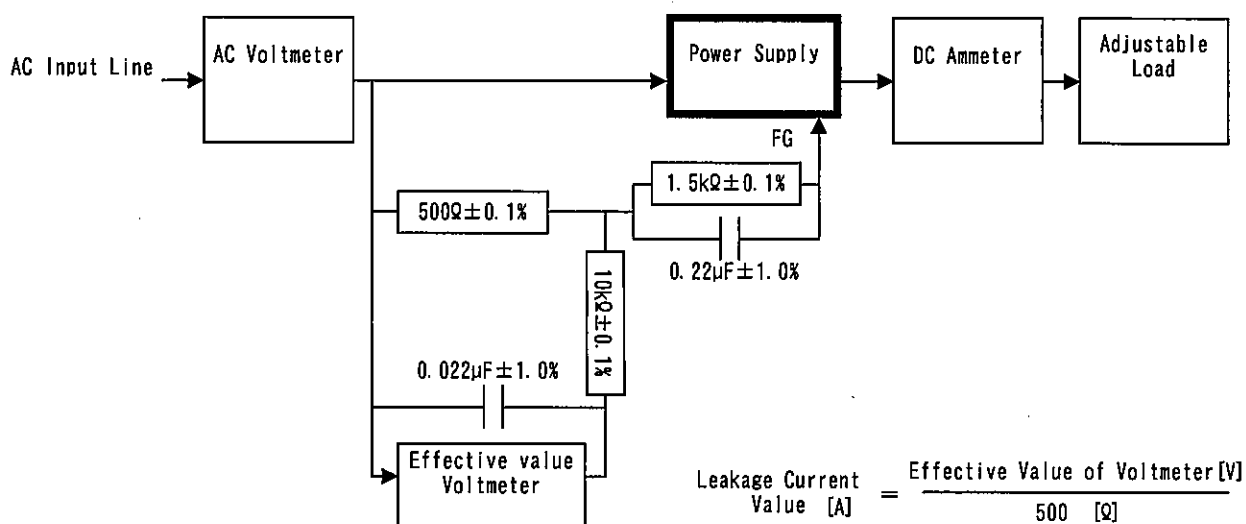


Figure B ( IEC60950-1 )

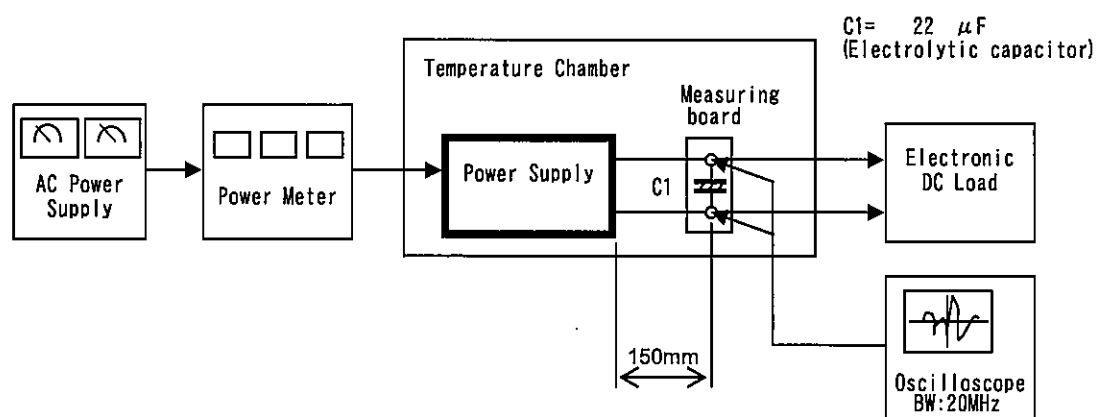


Figure C