



TEST DATA OF PBA300F-36

Regulated DC Power Supply
May 27, 2004

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Approved by : Takahiro Yoneda
Takahiro Yoneda Design Manager

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Prepared by : Hajime Goto
Hajime Goto Design Engineer

COSEL CO.,LTD.



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Model	PBA300F-36																																				
Item	Input Current (by Load Current)																																				
Object	—																																				
1. Graph																																					
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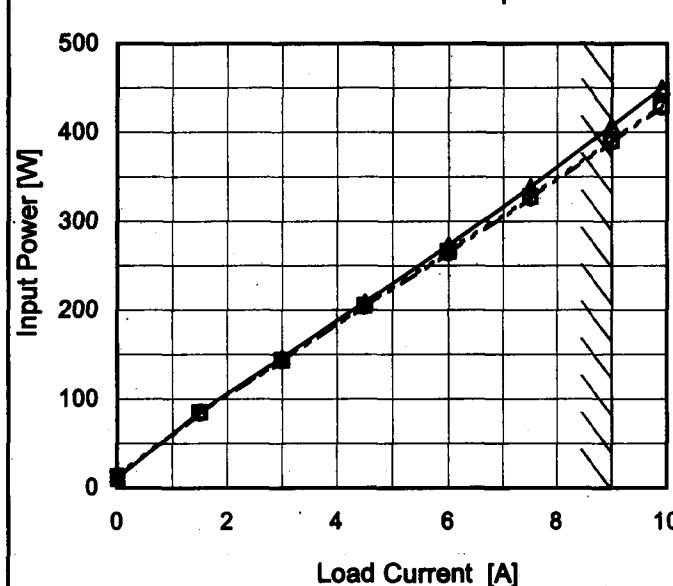
Temperature 25°C
 Testing Circuitry Figure A

2. Values

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

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<p>The graph plots Efficiency [%] on the y-axis (30 to 86) against Input Voltage [V] on the x-axis (50 to 300). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show efficiency increasing slightly with input voltage. A slanted line indicates the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Efficiency Load 50% [%]</th> <th>Efficiency Load 100% [%]</th> </tr> </thead> <tbody> <tr><td>80</td><td>77.1</td><td>78.4</td></tr> <tr><td>85</td><td>77.6</td><td>79.1</td></tr> <tr><td>100</td><td>78.5</td><td>80.9</td></tr> <tr><td>120</td><td>79.1</td><td>82.2</td></tr> <tr><td>200</td><td>80.1</td><td>84.1</td></tr> <tr><td>230</td><td>80.5</td><td>84.3</td></tr> <tr><td>264</td><td>81.3</td><td>84.8</td></tr> <tr><td>280</td><td>82.1</td><td>85.7</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>			Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]	80	77.1	78.4	85	77.6	79.1	100	78.5	80.9	120	79.1	82.2	200	80.1	84.1	230	80.5	84.3	264	81.3	84.8	280	82.1	85.7	-	-	-		
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Temperature 25°C
Testing Circuitry Figure A

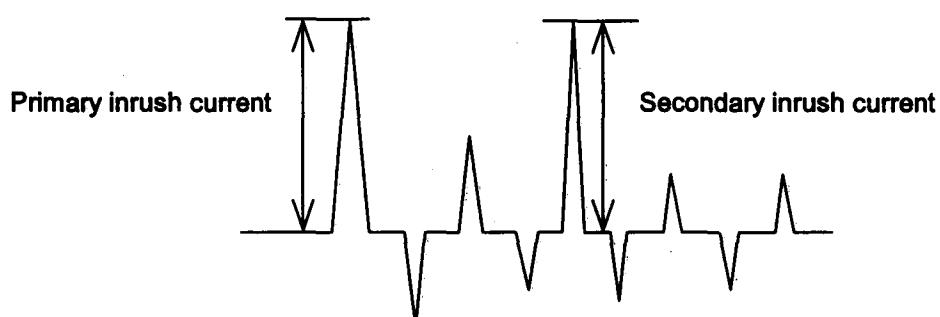
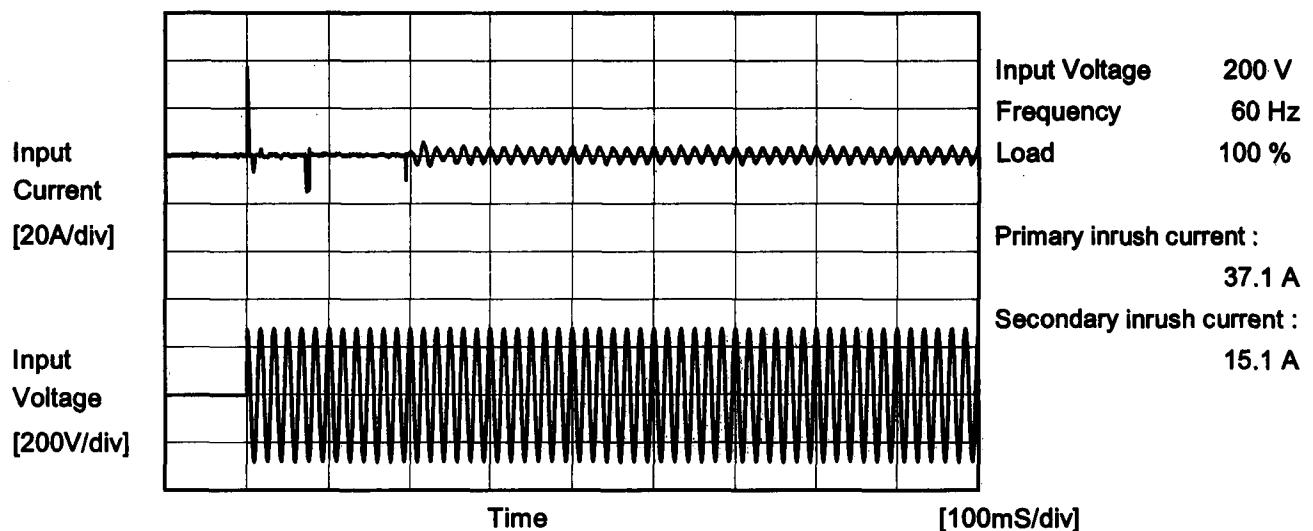
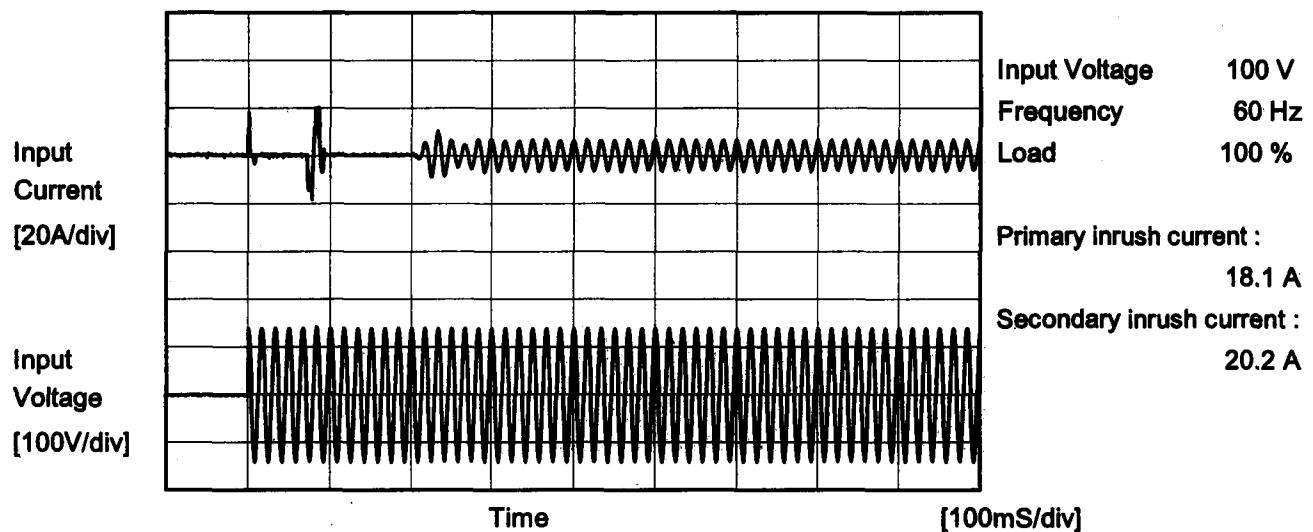
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Model	PBA300F-36	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		





Model	PBA300F-36	Temperature	25°C
Item	Leakage Current	Testing Circuitry	Figure B
Object	_____		

1. Results

[mA]

Standards		Input Volt.			Note
		100[V]	200[V]	240[V]	
DEN-AN	Both phases	0.14	0.25	0.29	Operation
	One of phase	0.23	0.45	0.54	stand by
IEC60950	Both phases	0.14	0.25	0.29	Operation
	One of phase	0.23	0.45	0.54	stand by

The value for "One phase" is the reference value only.

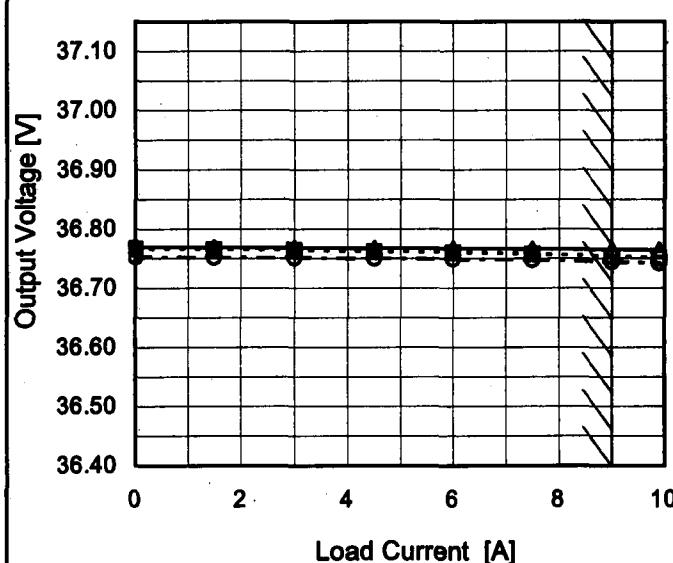
2. Condition

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

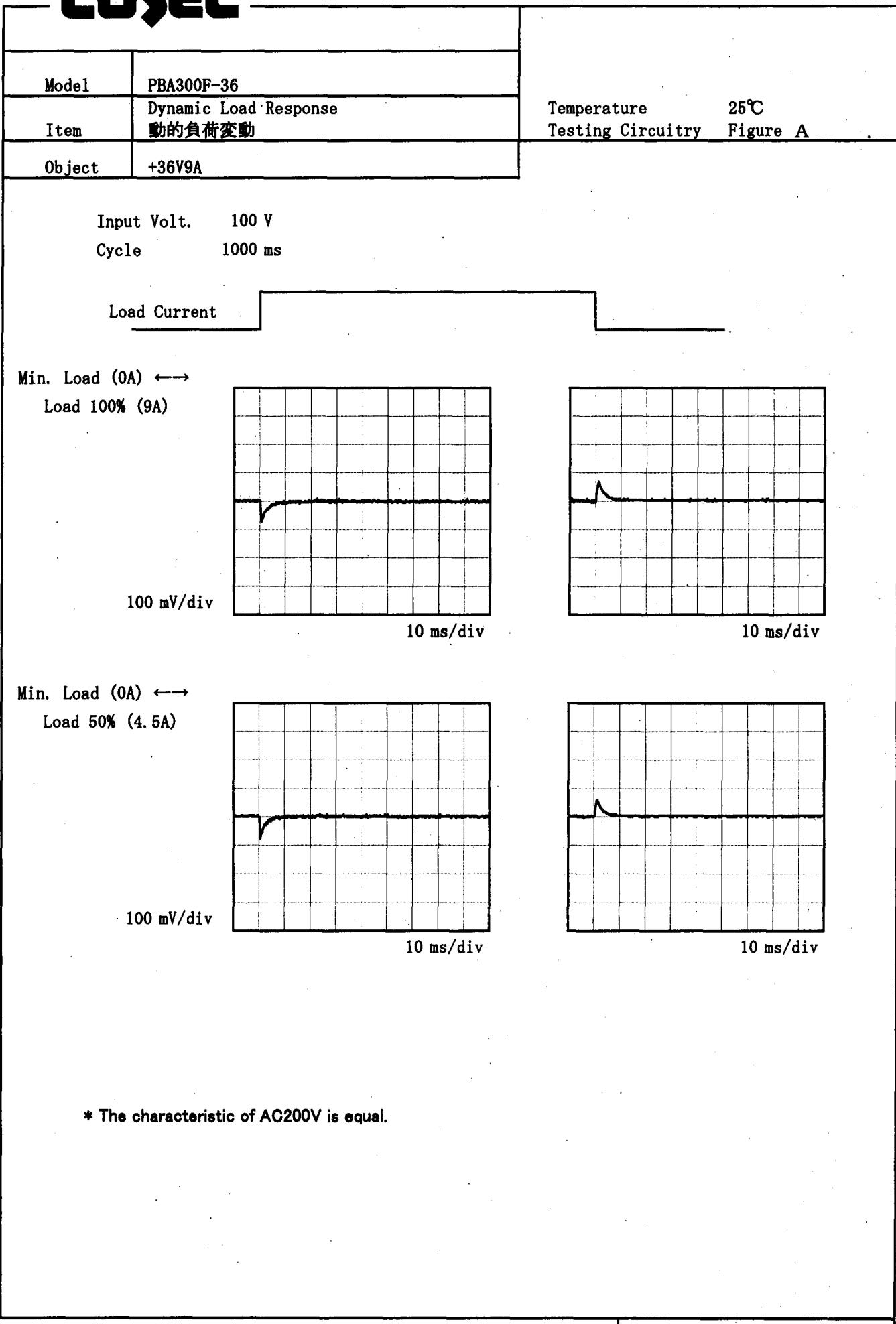
COSEL

Model	PBA300F-36																																	
Item	Line Regulation	Temperature 25°C Testing Circuitry Figure A																																
Object	+36V9A																																	
1. Graph																																		
<p style="text-align: center;">---□--- Load 50% —△— Load 100%</p>																																		
2. Values																																		
<table border="1"> <thead> <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> </thead> <tbody> <tr><td>80</td><td>36.733</td><td>36.739</td></tr> <tr><td>85</td><td>36.734</td><td>36.739</td></tr> <tr><td>100</td><td>36.735</td><td>36.738</td></tr> <tr><td>120</td><td>36.736</td><td>36.737</td></tr> <tr><td>200</td><td>36.735</td><td>36.734</td></tr> <tr><td>230</td><td>36.737</td><td>36.734</td></tr> <tr><td>264</td><td>36.738</td><td>36.733</td></tr> <tr><td>280</td><td>36.741</td><td>36.732</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>			Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	80	36.733	36.739	85	36.734	36.739	100	36.735	36.738	120	36.736	36.737	200	36.735	36.734	230	36.737	36.734	264	36.738	36.733	280	36.741	36.732	--	-	-
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Note: Slanted line shows the range of the rated input voltage.																																		

COSEL

Model	PBA300F-36					
Item	Load Regulation					
Object	+36V9A					
1.Graph						
	—△— Input Volt. 100V - -□--- Input Volt. 200V - -○--- Input Volt. 230V					
Output Voltage [V]						
Load Current [A]						
Note: Slanted line shows the range of the rated load current.						
Temperature 25°C Testing Circuitry Figure A						
2.Values						
Load Current [A]	Output Voltage [V]					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]			
0.0	36.770	36.767	36.753			
1.5	36.769	36.766	36.752			
3.0	36.769	36.764	36.751			
4.5	36.768	36.762	36.750			
6.0	36.768	36.761	36.749			
7.5	36.766	36.758	36.747			
9.0	36.766	36.754	36.744			
9.9	36.765	36.751	36.742			
—	—	—	—			
—	—	—	—			
—	—	—	—			

COSEL

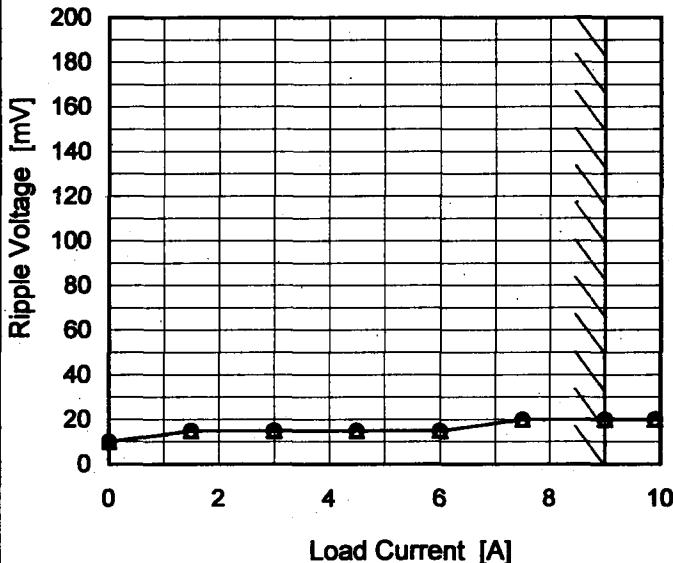


COSEL

Model	PBA300F-36
Item	Ripple Voltage (by Load Current)
Object	+36V9A

1. Graph

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


 Temperature 25°C
 Testing Circuitry Figure A
2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	10	10
1.5	15	15
3.0	15	15
4.5	15	15
6.0	15	15
7.5	20	20
9.0	20	20
9.9	20	20
-	-	-
-	-	-
-	-	-

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.

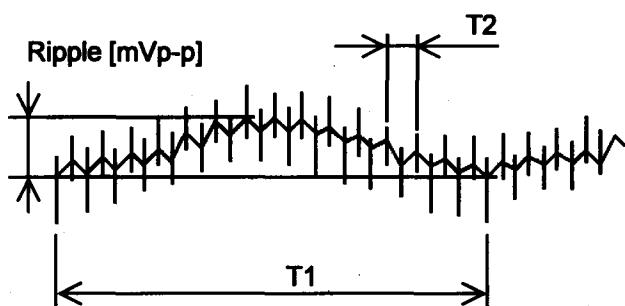
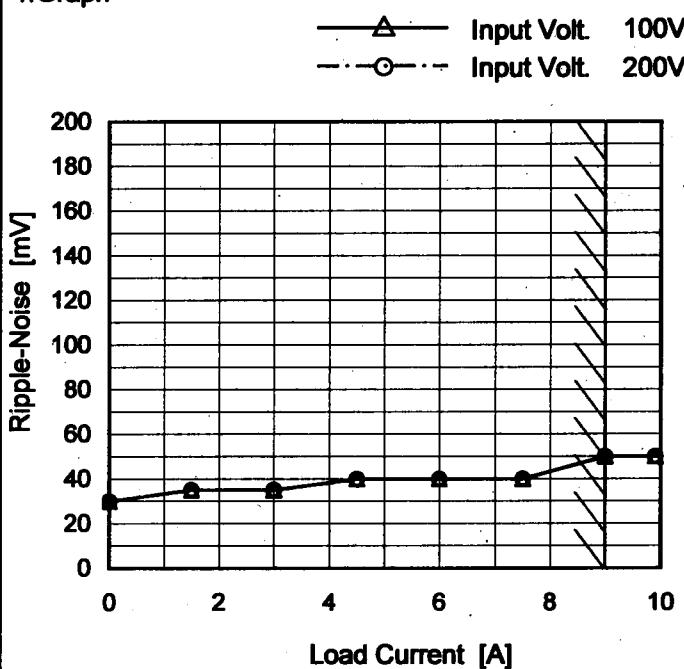
 T1: Due to AC Input Line
 T2: Due to Switching


Fig. Complex Ripple Wave Form

COSEL

Model	PBA300F-36
Item	Ripple-Noise
Object	+36V9A

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.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	30	30
1.5	35	35
3.0	35	35
4.5	40	40
6.0	40	40
7.5	40	40
9.0	50	50
9.9	50	50
-	-	-
-	-	-
-	-	-

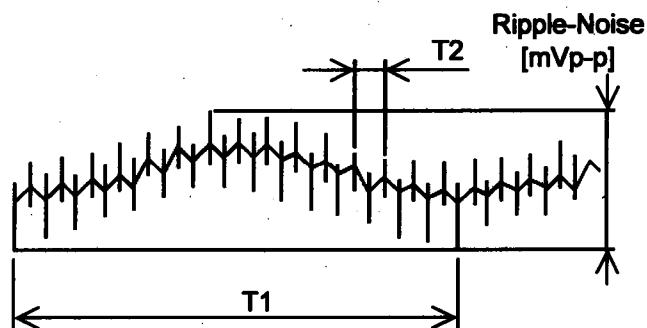
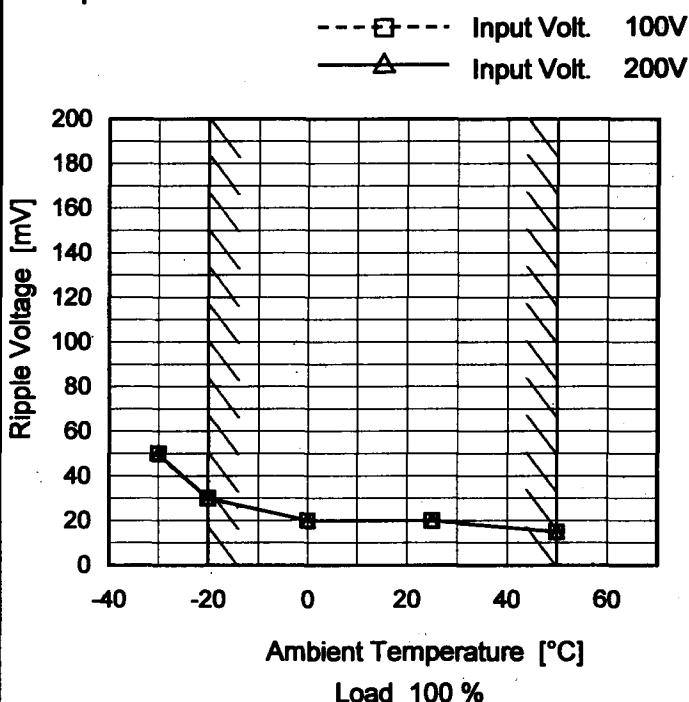
T1: Due to AC Input Line
T2: Due to Switching

Fig. Complex Ripple Wave Form

COSEL

Model	PBA300F-36
Item	Ripple Voltage (by Ambient Temp.)
Object	+36V9A

1. Graph



Testing Circuitry Figure A

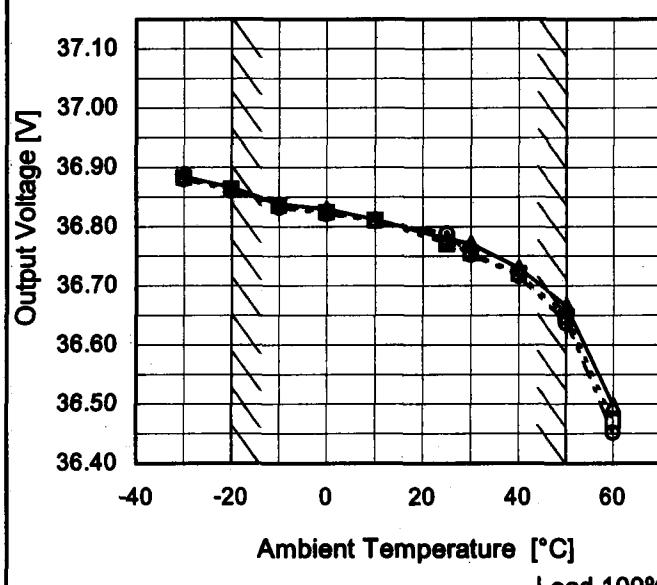
2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	50	50
-20	30	30
0	20	20
25	20	20
50	15	15
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Measured by 20 MHz Oscilloscope.

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

COSEL

Model	PBA300F-36	Testing Circuitry Figure A																																																					
Item	Ambient Temperature Drift																																																						
Object	+36V9A																																																						
1.Graph	<p>—△— Input Volt. 100V - - -□- - Input Volt. 200V - - ○- - Input Volt. 230V</p>  <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>																																																						
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. 200[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr> <td>-30</td> <td>36.885</td> <td>36.883</td> <td>36.881</td> </tr> <tr> <td>-20</td> <td>36.867</td> <td>36.864</td> <td>36.861</td> </tr> <tr> <td>-10</td> <td>36.839</td> <td>36.837</td> <td>36.833</td> </tr> <tr> <td>0</td> <td>36.830</td> <td>36.824</td> <td>36.822</td> </tr> <tr> <td>10</td> <td>36.812</td> <td>36.811</td> <td>36.810</td> </tr> <tr> <td>25</td> <td>36.780</td> <td>36.771</td> <td>36.789</td> </tr> <tr> <td>30</td> <td>36.772</td> <td>36.756</td> <td>36.753</td> </tr> <tr> <td>40</td> <td>36.730</td> <td>36.721</td> <td>36.717</td> </tr> <tr> <td>50</td> <td>36.666</td> <td>36.648</td> <td>36.637</td> </tr> <tr> <td>60</td> <td>36.498</td> <td>36.472</td> <td>36.452</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. 200[V]	Input Volt. 230[V]	-30	36.885	36.883	36.881	-20	36.867	36.864	36.861	-10	36.839	36.837	36.833	0	36.830	36.824	36.822	10	36.812	36.811	36.810	25	36.780	36.771	36.789	30	36.772	36.756	36.753	40	36.730	36.721	36.717	50	36.666	36.648	36.637	60	36.498	36.472	36.452	--	-	-	-
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Note:	Slanted line shows the range of the rated ambient temperature.																																																						



Model	PBA300F-36	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+36V9A	

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 : 85 - 264V

Load Current : 0 - 9A

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

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

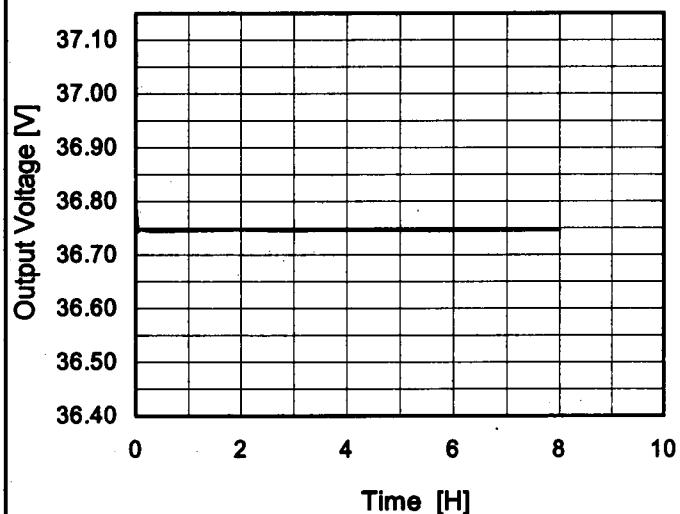
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-20	264	0	36.867	±124	±0.3
Minimum Voltage	50	264	9	36.619		

cozel

Model	PBA300F-36
Item	Time Lapse Drift
Object	+36V9A

1.Graph



Input Volt. 100V
Load 100%

* The characteristic of AC200V is equal.

Temperature 25°C
Testing Circuitry Figure A

2.Values

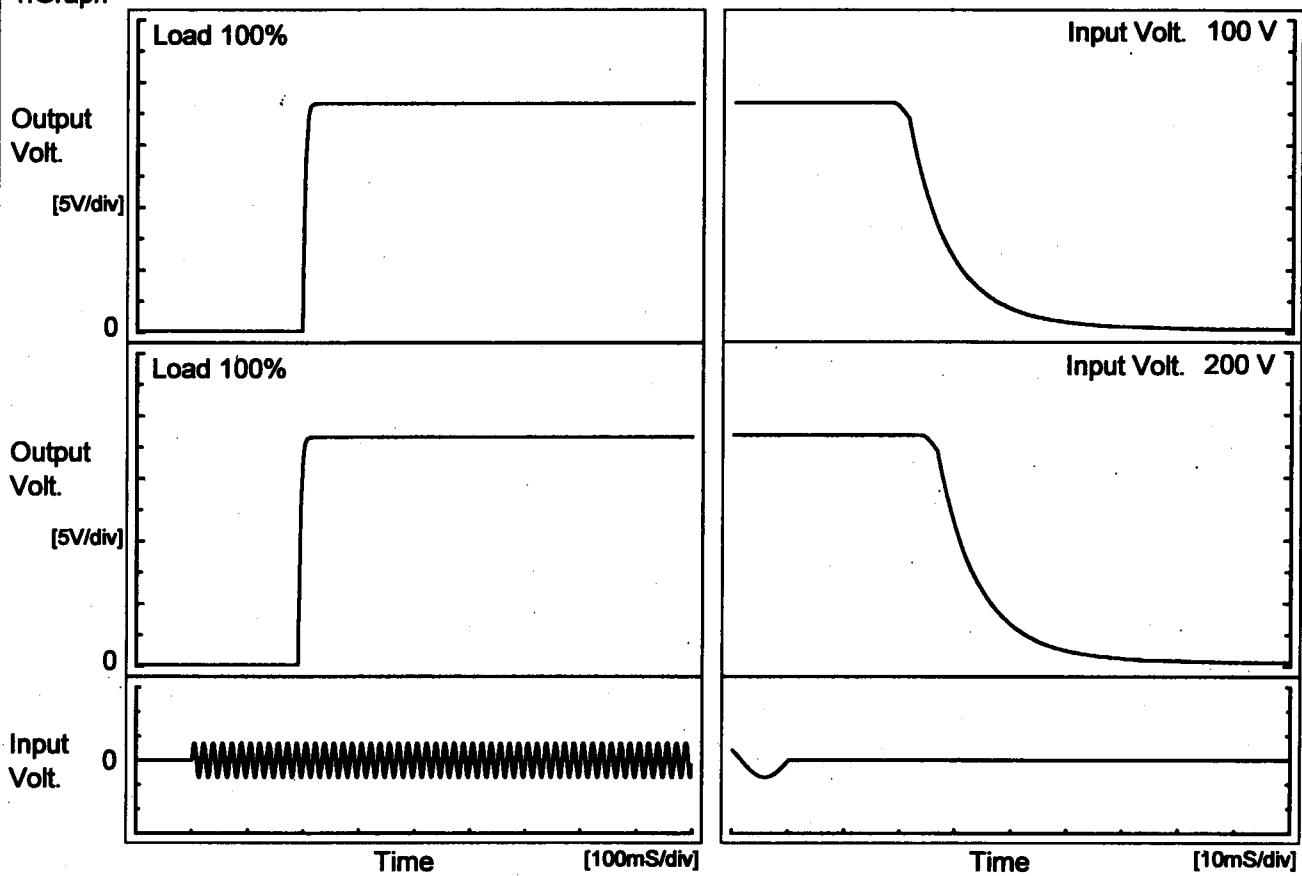
Time since start [H]	Output Voltage [V]
0.0	36.787
0.5	36.745
1.0	36.746
2.0	36.747
3.0	36.746
4.0	36.747
5.0	36.747
6.0	36.746
7.0	36.747
8.0	36.747

COSEL

Model	PBA300F-36
Item	Rise and Fall Time
Object	+36V9A

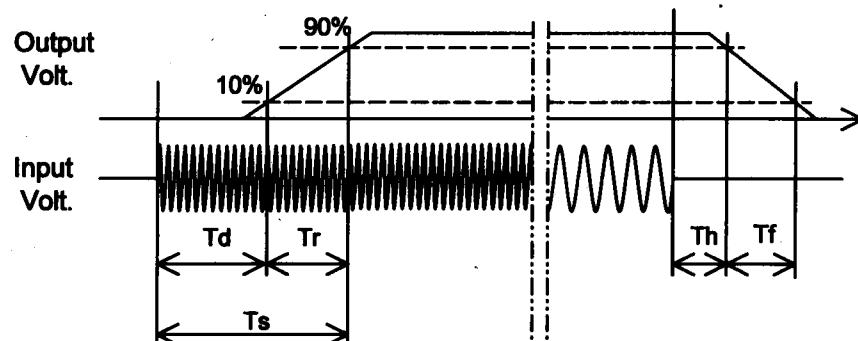
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf	[mS]
100 V		196.5	8.5	205.0	21.6	18.2	
200 V		190.0	8.5	198.5	27.1	18.1	



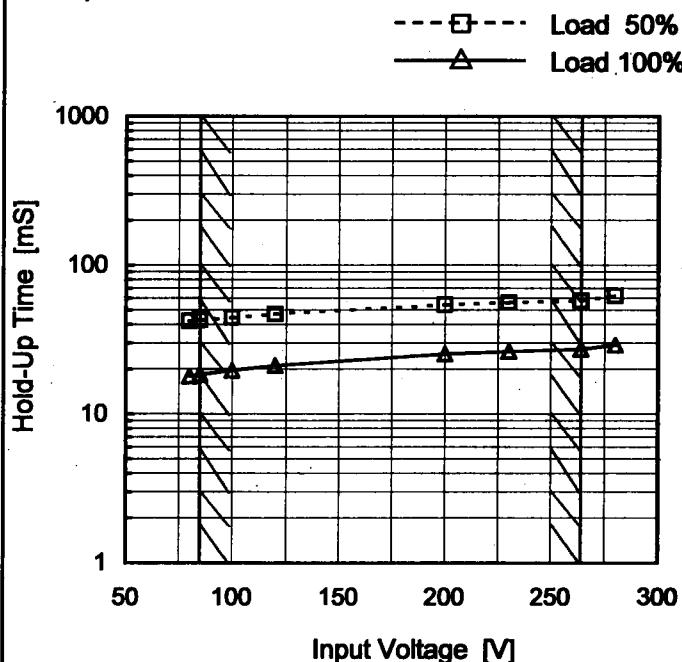
COSEL

Model PBA300F-36

Item Hold-Up Time

Object +36V9A

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.

 Temperature 25°C
 Testing Circuitry Figure A

2. Values

Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
80	42	18
85	43	18
100	45	20
120	47	21
200	54	25
230	56	26
264	58	27
280	62	29
-	-	-

COSEL

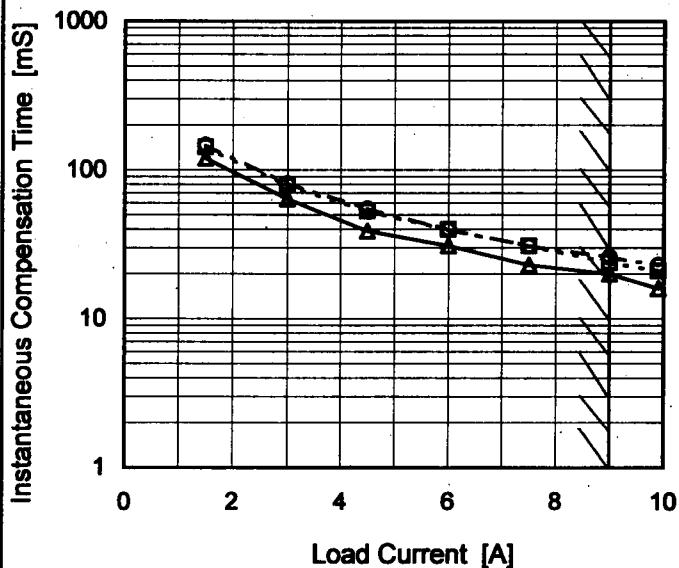
Model PBA300F-36

Item Instantaneous Interruption Compensation

Object +36V9A

1. Graph

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



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

Temperature 25°C
 Testing Circuitry Figure A

2. Values

Load Current [A]	Time [mS]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
1.5	120	143	147
3.0	64	79	81
4.5	39	53	55
6.0	31	40	40
7.5	23	31	31
9.0	20	24	26
9.9	16	21	23
-	-	-	-
-	-	-	-
-	-	-	-

COSEL

Model	PBA300F-36	Testing Circuitry Figure A																																						
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+36V9A																																							
1. Graph		2. Values																																						
<p>Input Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>---□--- Load 50%</p> <p>—△— Load 100%</p>		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Input Voltage [V]</th> </tr> <tr> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>-30</td><td>73</td><td>75</td></tr> <tr><td>-20</td><td>73</td><td>74</td></tr> <tr><td>-10</td><td>72</td><td>74</td></tr> <tr><td>0</td><td>70</td><td>73</td></tr> <tr><td>10</td><td>71</td><td>72</td></tr> <tr><td>25</td><td>69</td><td>71</td></tr> <tr><td>30</td><td>69</td><td>71</td></tr> <tr><td>40</td><td>68</td><td>70</td></tr> <tr><td>50</td><td>67</td><td>70</td></tr> <tr><td>60</td><td>66</td><td>69</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-30	73	75	-20	73	74	-10	72	74	0	70	73	10	71	72	25	69	71	30	69	71	40	68	70	50	67	70	60	66	69	--	-	-
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Note: Slanted line shows the range of the rated ambient temperature.

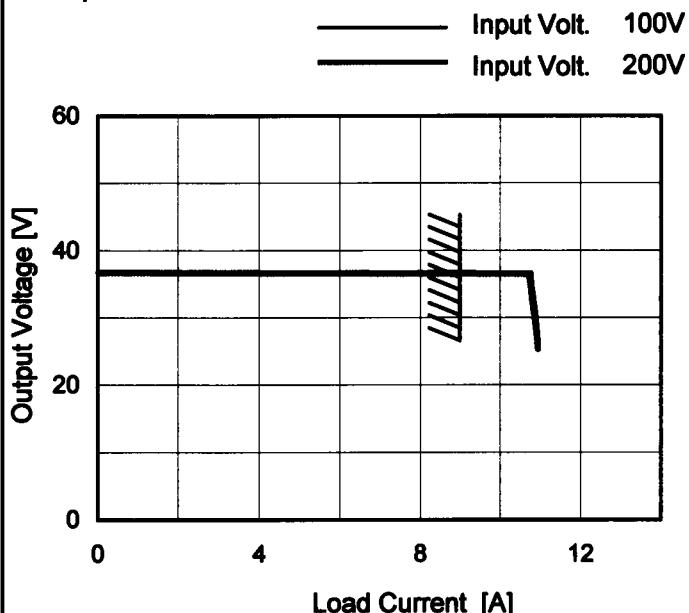
COSEL

Model PBA300F-36

Item Overcurrent Protection

Object +36V9A

1. Graph



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

Intermittent operation occurs when the output voltage is from 25.2V to 0V.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
36.0	10.73	10.75
34.2	10.75	10.78
32.4	10.78	10.83
28.8	10.87	10.89
25.2	10.93	10.95
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	PBA300F-36	Testing Circuitry Figure A																																							
Item	Overvoltage Protection																																								
Object	+36V9A																																								
1.Graph			2.Values																																						
<p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Legend:</p> <ul style="list-style-type: none"> Input Volt. 100V (Solid Line with ▲) Input Volt. 200V (Dashed Line with □) 			<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Operating Point [V]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 200[V]</th> </tr> </thead> <tbody> <tr><td>-30</td><td>47.63</td><td>47.63</td></tr> <tr><td>-20</td><td>48.04</td><td>48.04</td></tr> <tr><td>-10</td><td>48.45</td><td>48.45</td></tr> <tr><td>0</td><td>48.86</td><td>48.86</td></tr> <tr><td>10</td><td>49.33</td><td>49.33</td></tr> <tr><td>25</td><td>49.86</td><td>49.86</td></tr> <tr><td>30</td><td>50.15</td><td>50.15</td></tr> <tr><td>40</td><td>50.56</td><td>50.56</td></tr> <tr><td>50</td><td>50.97</td><td>50.97</td></tr> <tr><td>60</td><td>51.38</td><td>51.38</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Operating Point [V]		Input Volt. 100[V]	Input Volt. 200[V]	-30	47.63	47.63	-20	48.04	48.04	-10	48.45	48.45	0	48.86	48.86	10	49.33	49.33	25	49.86	49.86	30	50.15	50.15	40	50.56	50.56	50	50.97	50.97	60	51.38	51.38	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																								
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-20	48.04	48.04																																							
-10	48.45	48.45																																							
0	48.86	48.86																																							
10	49.33	49.33																																							
25	49.86	49.86																																							
30	50.15	50.15																																							
40	50.56	50.56																																							
50	50.97	50.97																																							
60	51.38	51.38																																							
--	-	-																																							

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

COSEL

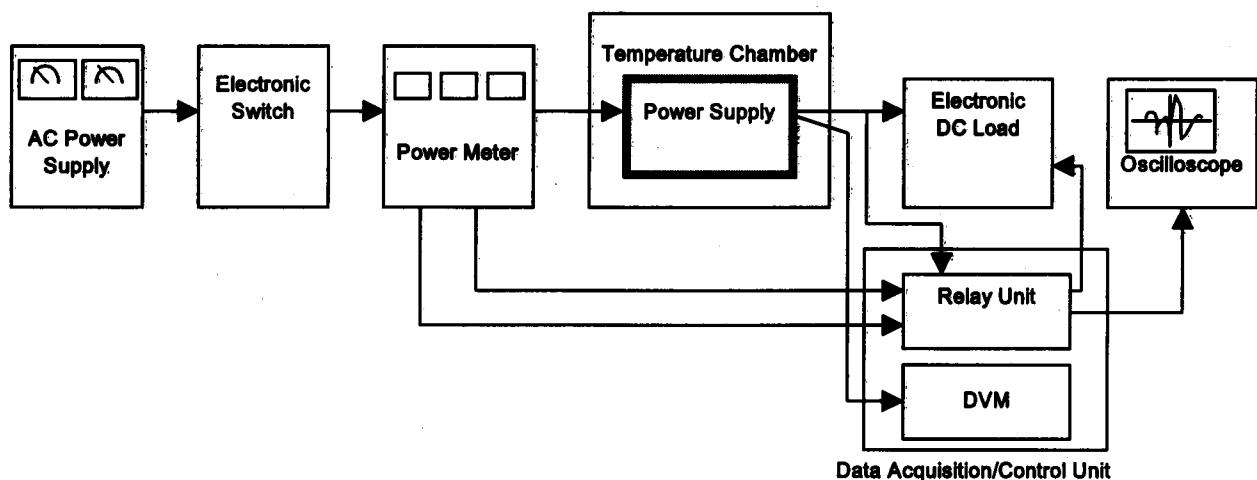


Figure A

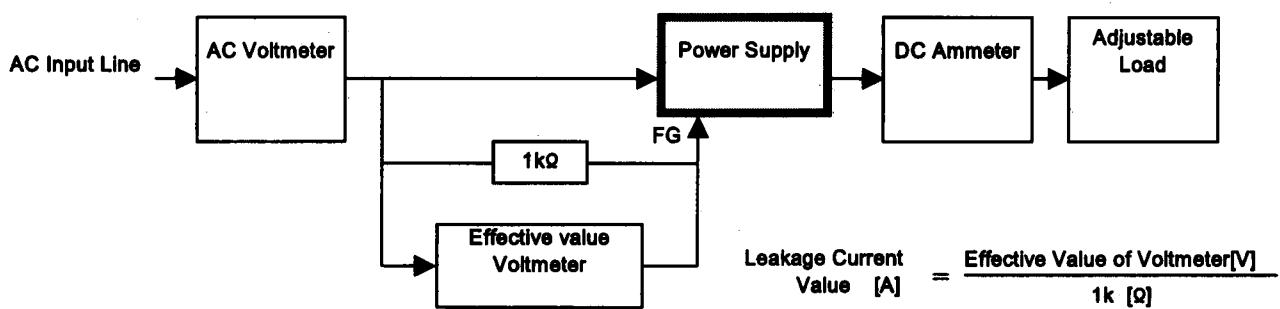


Figure B (DEN-AN)

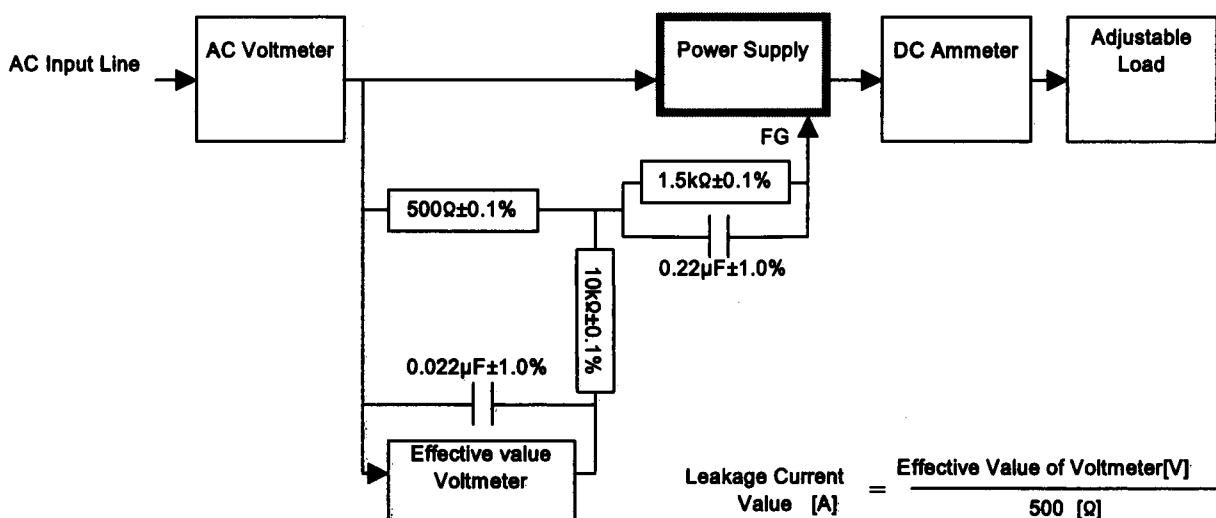


Figure B (IEC60950)