



# TEST DATA OF PBW50F-12

Regulated DC Power Supply  
Sep 29, 2005

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Atsushi Yoshiyama Design Engineer

**COSEL CO.,LTD.**

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Model		PBW50F-12	
Item		Input Current (by Load Current)	
Object		_____	

1.Graph

—△—

Input Volt.

100V

---□---

Input Volt.

200V

-○-

Input Volt.

230V

1.0

0.8

0.6

0.4

0.2

0.0

0

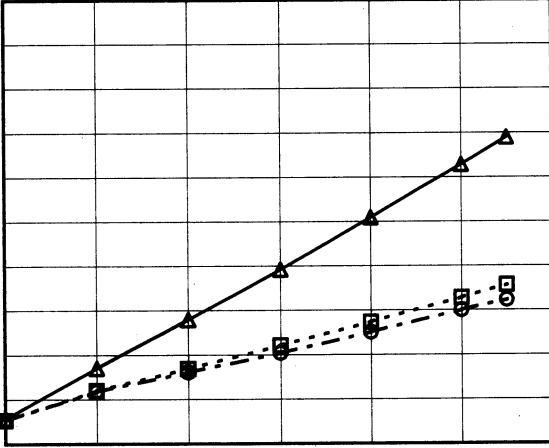
40

80

120

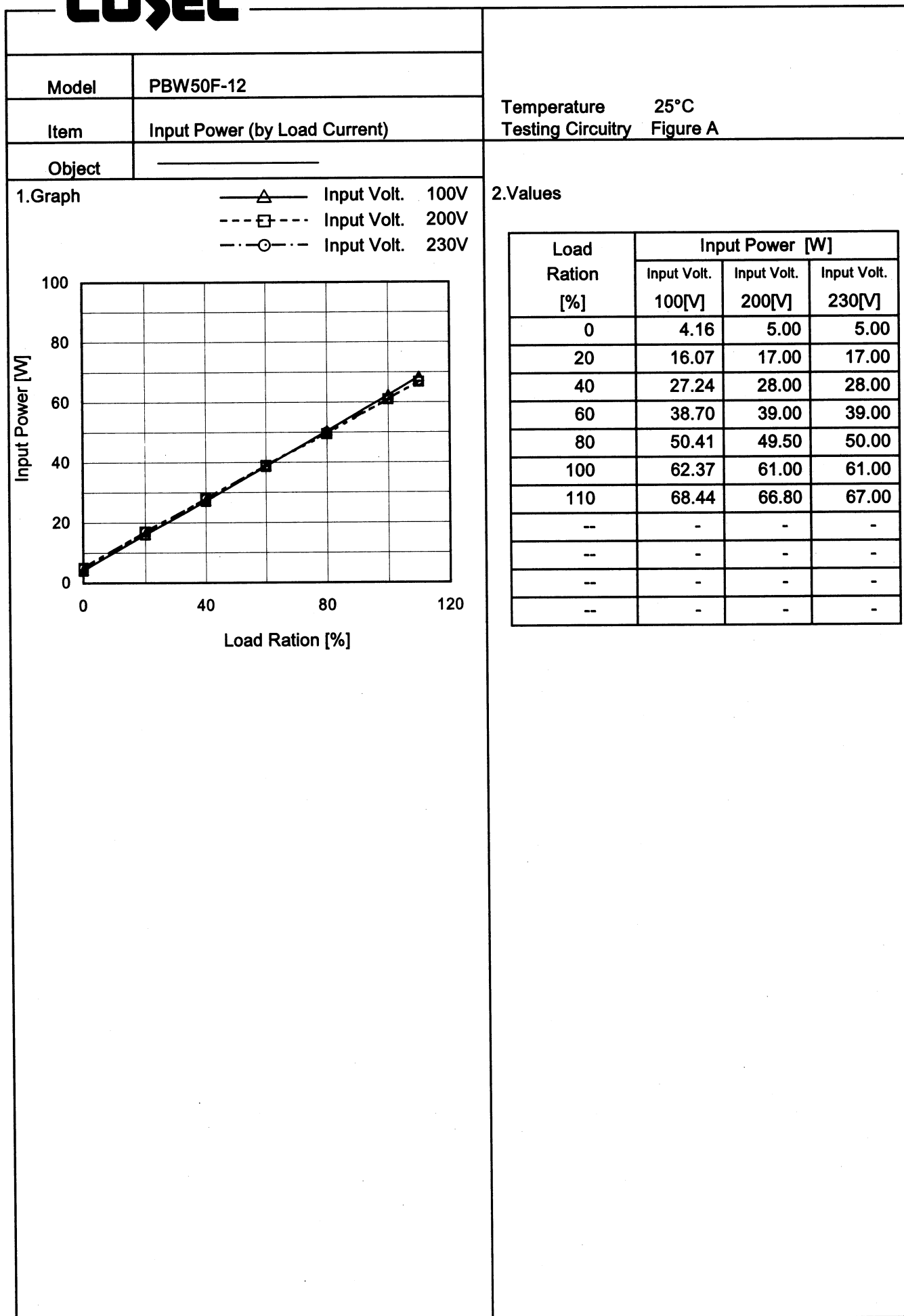
Input Current [A]

Load Ratio [%]



2.Values

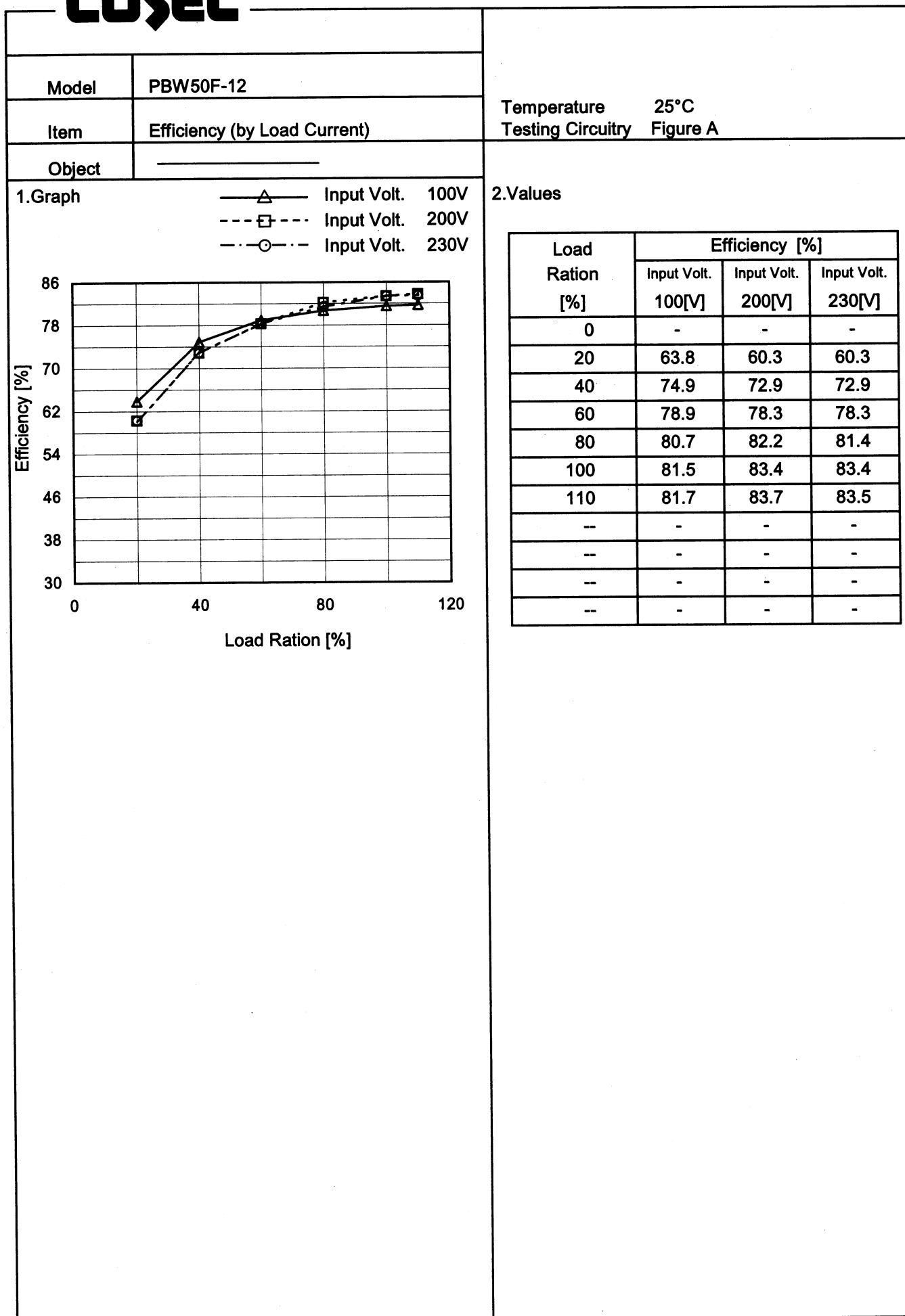
Load Ration [%]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.057	0.053	0.053
20	0.170	0.120	0.118
40	0.279	0.169	0.161
60	0.393	0.221	0.204
80	0.509	0.274	0.251
100	0.629	0.329	0.300
110	0.689	0.357	0.323
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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# COSEL

Model		PBW50F-12		Temperature Testing Circuitry	25°C Figure A
Item		Efficiency (by Input Voltage)			
Object					
1.Graph					
<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div>---</div><div>□</div><div>---</div></div><div>Load 50%</div></div> <div><div>---</div><div>△</div><div>---</div></div> <div>Load 100%</div> <div><div><div>86</div><div>78</div><div>70</div><div>62</div><div>54</div><div>46</div><div>38</div><div>30</div></div><div><div>Efficiency [%]</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div> <div><div><div>50</div><div>100</div><div>150</div><div>200</div><div>250</div><div>300</div></div><div><div>Input 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> 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# COSEL



# COSEL

Model		PBW50F-12		Temperature 25°C																																	
Item		Power Factor (by Input Voltage)		Testing Circuitry Figure A																																	
Object																																					
1.Graph				2.Values																																	
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div>Load 50%</div></div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div>Load 100%</div></div></div> <table border="1"><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Power Factor</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>75</td><td>0.993</td><td>0.989</td></tr><tr><td>85</td><td>0.971</td><td>0.995</td></tr><tr><td>100</td><td>0.971</td><td>0.992</td></tr><tr><td>120</td><td>0.971</td><td>0.986</td></tr><tr><td>200</td><td>0.846</td><td>0.927</td></tr><tr><td>230</td><td>0.786</td><td>0.884</td></tr><tr><td>264</td><td>0.717</td><td>0.847</td></tr><tr><td>280</td><td>0.635</td><td>0.744</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>				Input Voltage [V]	Power Factor		Load 50%	Load 100%	75	0.993	0.989	85	0.971	0.995	100	0.971	0.992	120	0.971	0.986	200	0.846	0.927	230	0.786	0.884	264	0.717	0.847	280	0.635	0.744	--	-	-		
Input Voltage [V]	Power Factor																																				
	Load 50%	Load 100%																																			
75	0.993	0.989																																			
85	0.971	0.995																																			
100	0.971	0.992																																			
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230	0.786	0.884																																			
264	0.717	0.847																																			
280	0.635	0.744																																			
--	-	-																																			
Note: Slanted line shows the range of the rated input voltage.																																					

# COSEL

Model		PBW50F-12	
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

40

80

120

Load Ration [%]

Load Ration [%]	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.734	0.455	0.417
20	0.945	0.708	0.630
40	0.975	0.824	0.757
60	0.985	0.886	0.830
80	0.990	0.903	0.862
100	0.993	0.927	0.884
110	0.994	0.934	0.893
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

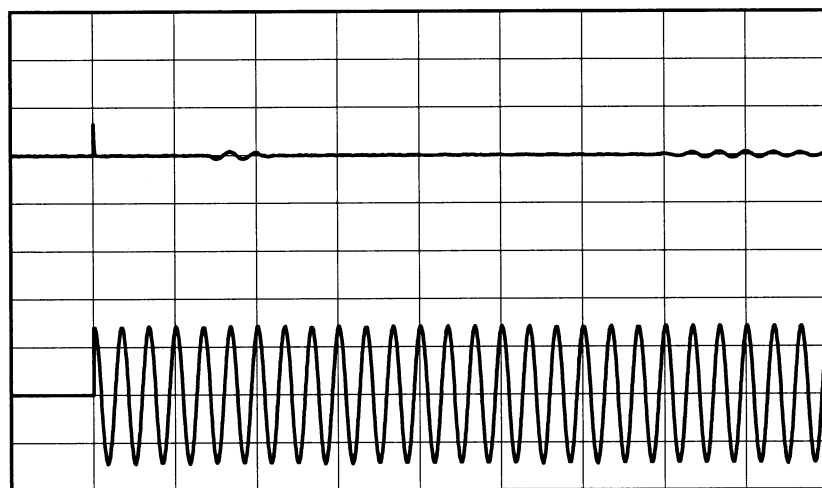
2.Values

Load Ration [%]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.734	0.455	0.417
20	0.945	0.708	0.630
40	0.975	0.824	0.757
60	0.985	0.886	0.830
80	0.990	0.903	0.862
100	0.993	0.927	0.884
110	0.994	0.934	0.893
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-



**COSEL**

Model	PBW50F-12	Temperature    25°C Testing Circuitry   Figure A	
Item	Inrush Current		
Object	_____		

Input  
Current  
[20A/div]Input  
Voltage  
[100V/div]

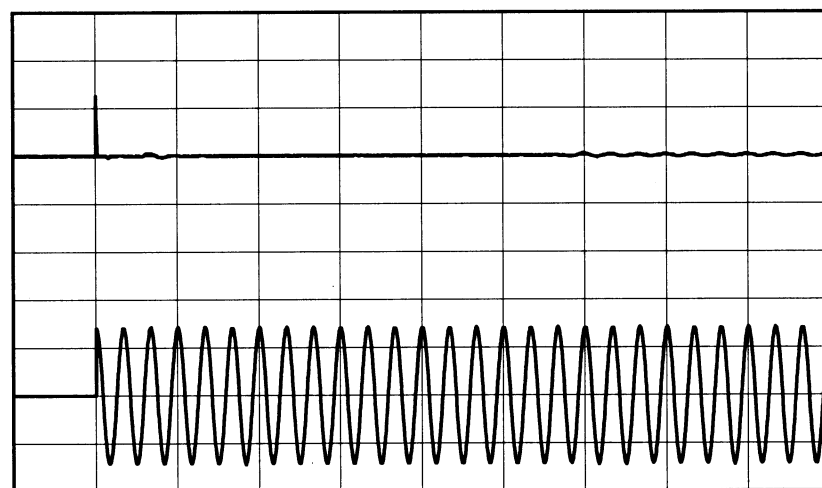
Time

[50mS/div]

Input Voltage    100 V

Frequency        60 Hz

Load              100 %

Primary inrush current :  
13.1 ASecondary inrush current :  
1.7 AInput  
Current  
[20A/div]Input  
Voltage  
[200V/div]

Time

[50mS/div]

Input Voltage    200 V

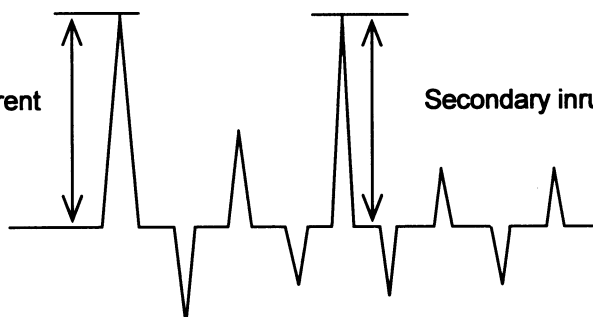
Frequency        60 Hz

Load              100 %

Primary inrush current :  
25.0 ASecondary inrush current :  
1.0 A

Primary inrush current

Secondary inrush current



**COSEL**

		Temperature 25°C Testing Circuitry Figure B
Model	PBW50F-12	
Item	Leakage Current	
Object	_____	

## 1.Results

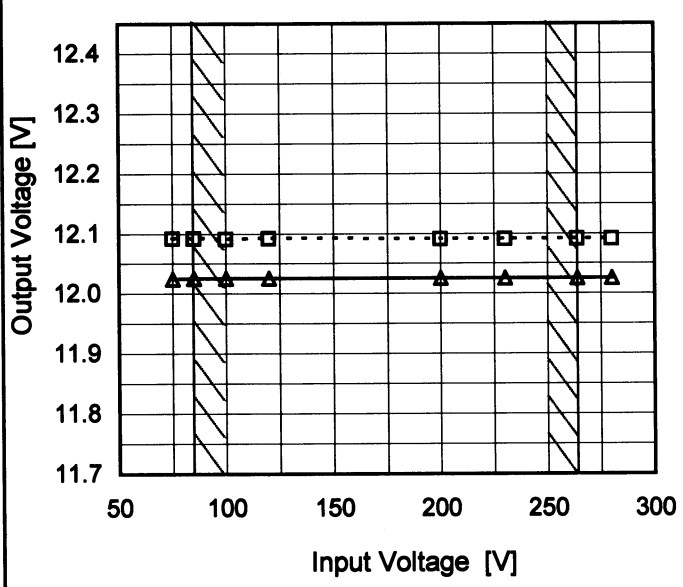
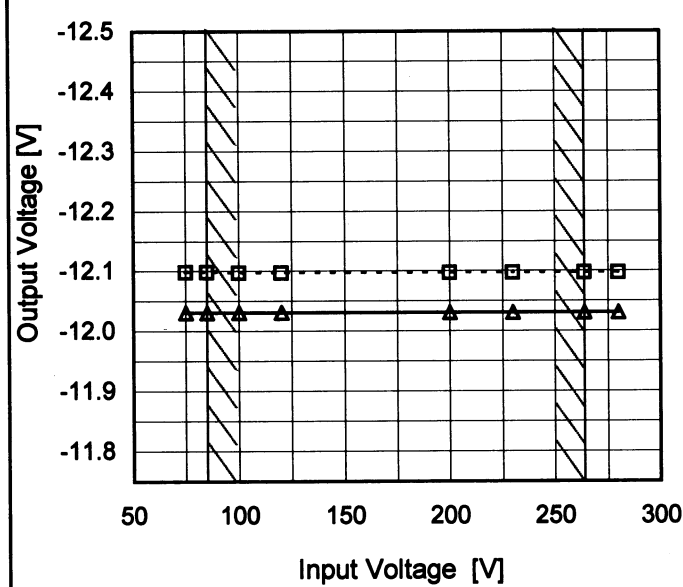
[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.18	0.40	0.54	Operation
	One of phase	0.27	0.54	0.63	stand by
IEC60950	Both phases	0.18	0.40	0.54	Operation
	One of phase	0.27	0.54	0.63	stand by

The value for "One of 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.

Model	PBW50F-12	Temperature 25°C Testing Circuitry Figure A																																	
Item	Line Regulation																																		
Object	+12V2.1A																																		
1.Graph		2.Values																																	
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></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>12.092</td><td>12.025</td></tr><tr><td>85</td><td>12.092</td><td>12.026</td></tr><tr><td>100</td><td>12.092</td><td>12.026</td></tr><tr><td>120</td><td>12.092</td><td>12.026</td></tr><tr><td>200</td><td>12.091</td><td>12.026</td></tr><tr><td>230</td><td>12.091</td><td>12.026</td></tr><tr><td>264</td><td>12.091</td><td>12.026</td></tr><tr><td>280</td><td>12.091</td><td>12.026</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	12.092	12.025	85	12.092	12.026	100	12.092	12.026	120	12.092	12.026	200	12.091	12.026	230	12.091	12.026	264	12.091	12.026	280	12.091	12.026	--	-	-
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		BC-10004																																	

# COSEL

Model PBW50F-12

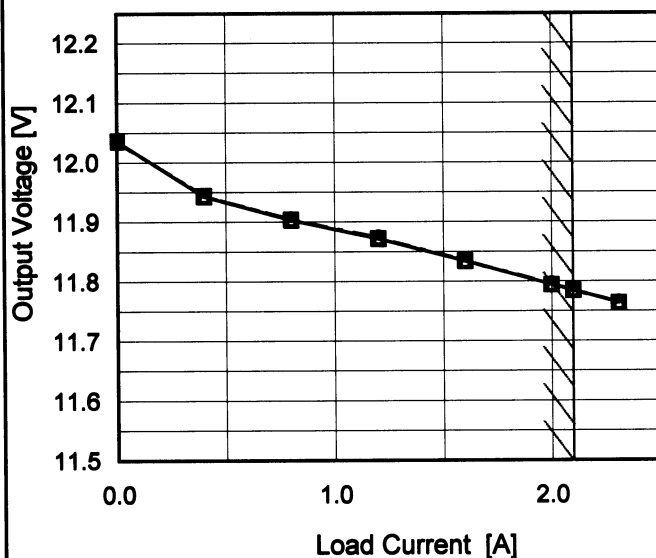
Item Load Regulation

Object +12V2.1A

Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph

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



## 2. Values

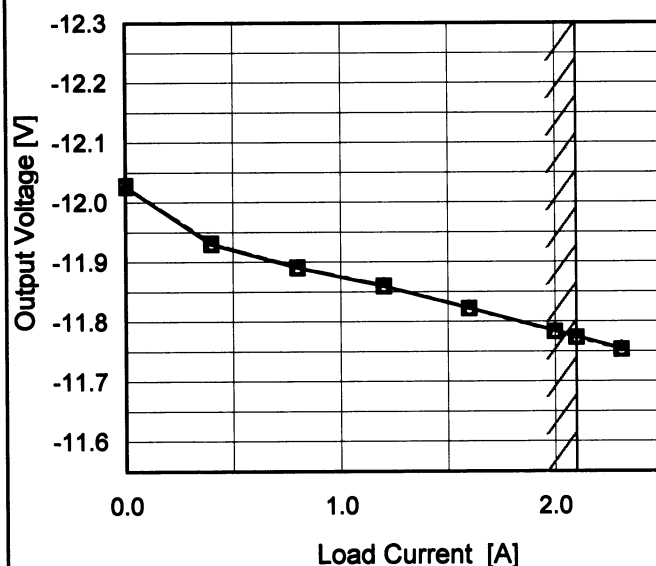
Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	12.036	12.037	12.037
0.40	11.943	11.944	11.944
0.80	11.903	11.904	11.904
1.20	11.872	11.872	11.873
1.60	11.834	11.834	11.835
2.00	11.795	11.794	11.795
2.10	11.785	11.784	11.785
2.31	11.764	11.763	11.764
--	-	-	-
--	-	-	-
--	-	-	-

-12V : Rated output current 1

Object -12V2.1A

## 1. Graph

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



## 2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-12.026	-12.028	-12.028
0.40	-11.930	-11.932	-11.931
0.80	-11.891	-11.891	-11.891
1.20	-11.860	-11.860	-11.861
1.60	-11.823	-11.822	-11.823
2.00	-11.785	-11.783	-11.784
2.10	-11.775	-11.774	-11.774
2.31	-11.755	-11.753	-11.754
--	-	-	-
--	-	-	-
--	-	-	-

+12V : Rated output current 1

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

# COSEL

Model	PBW50F-12	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Response		
Object	+12V2.1A		

Input Volt. 100 V  
Cycle 1000 ms

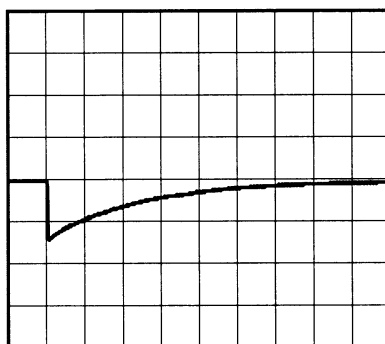
Load Current

Min. Load (0A)  $\longleftrightarrow$

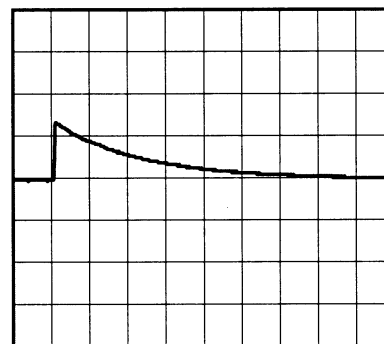
Output current 2 (2.7A)

★-12V : 1.5A

200 mV/div



100 ms/div



100 ms/div

Min. Load (0A)  $\longleftrightarrow$

Output current 1 (2.1A)

★-12V : 2.1A

200 mV/div

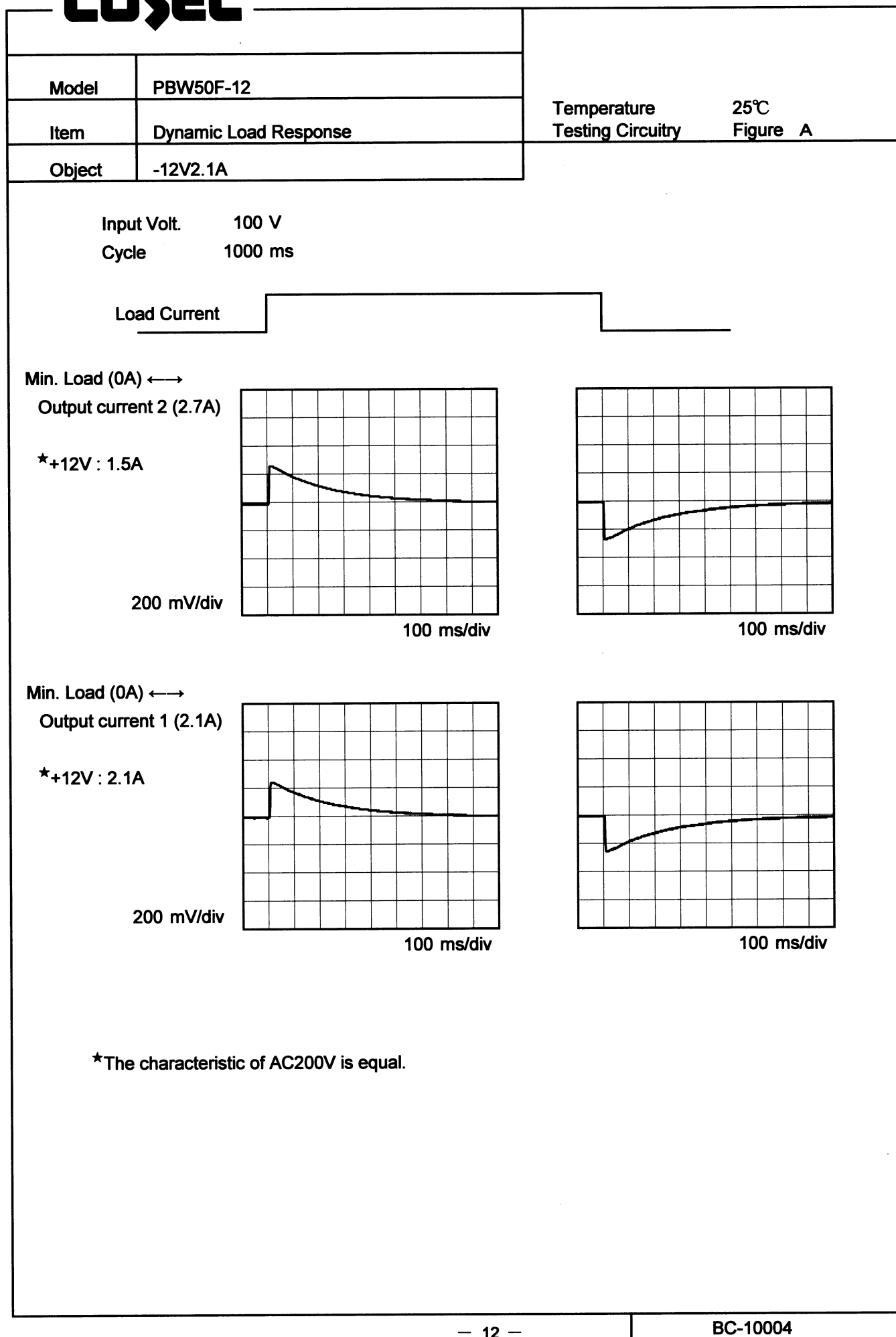


100 ms/div

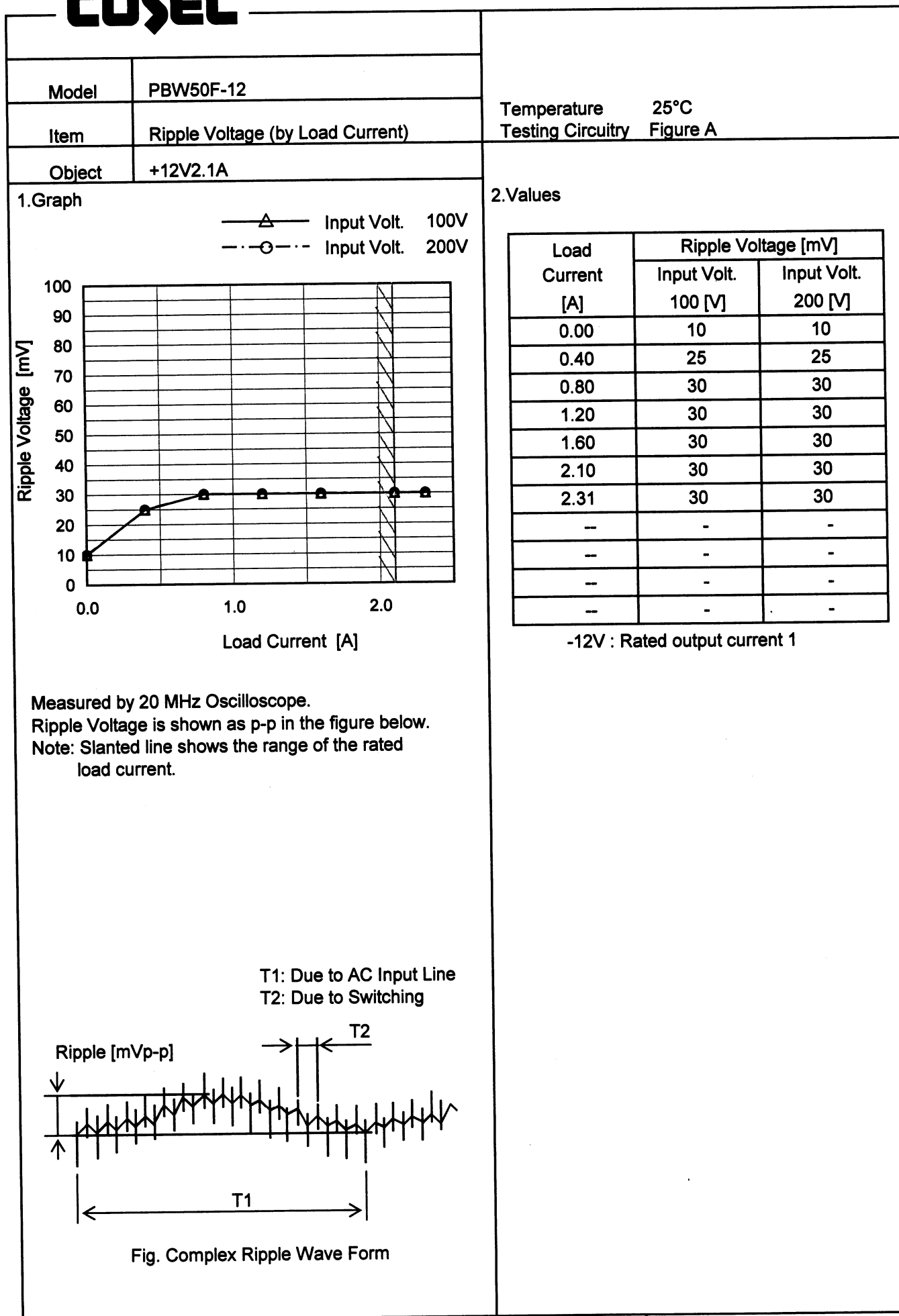


100 ms/div

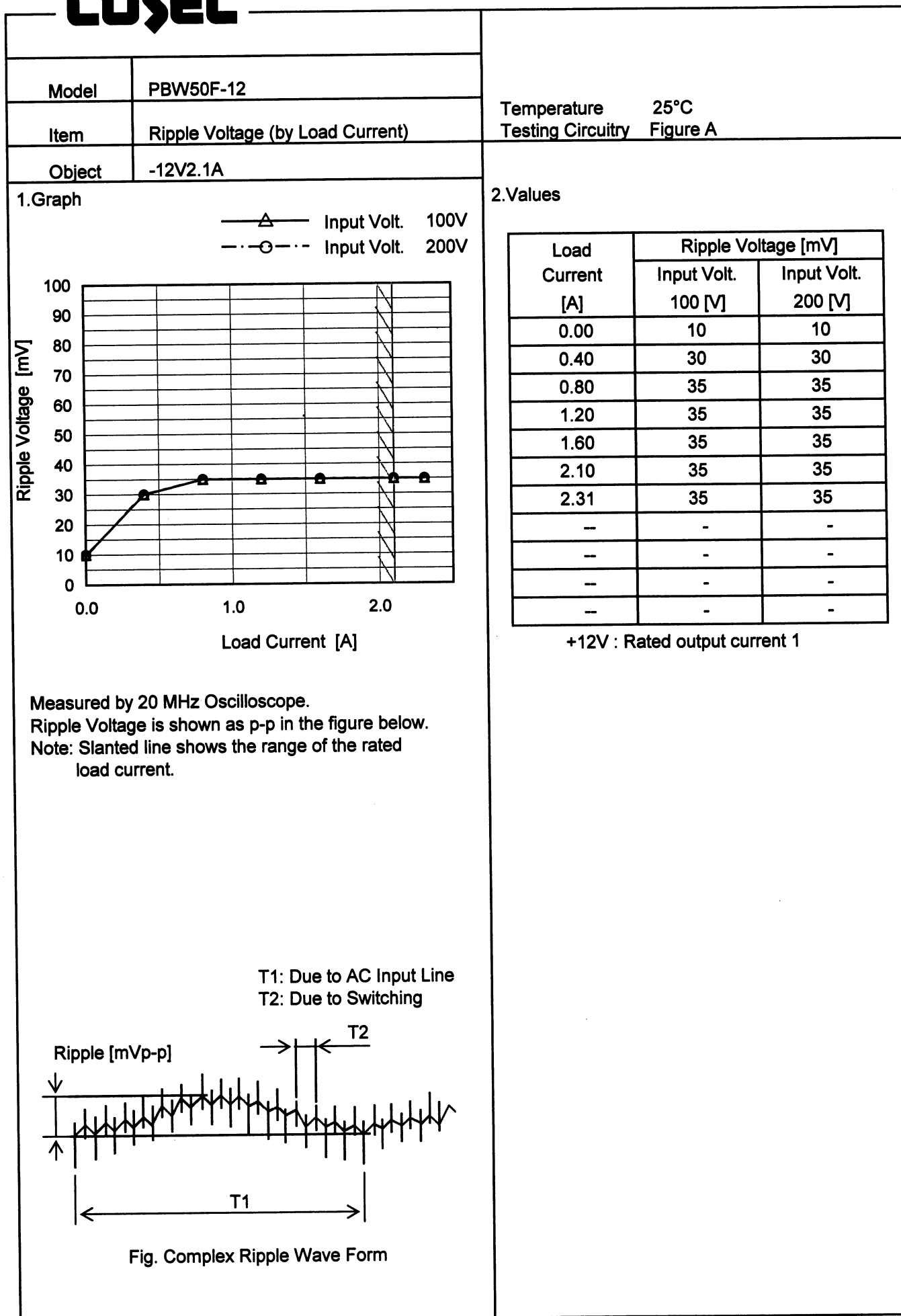
★The characteristic of AC200V is equal.

**COSEL**

# COSEL

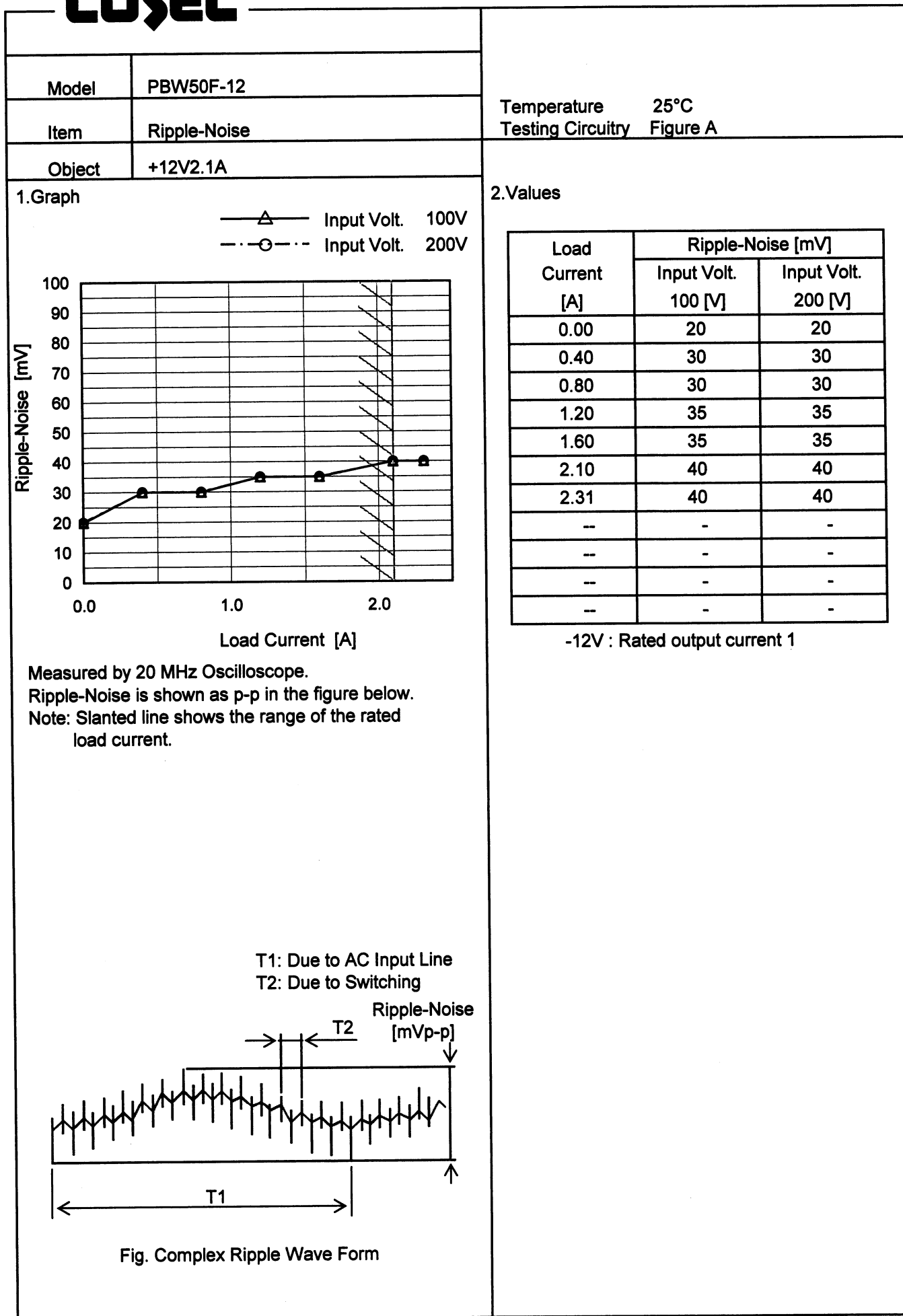


# COSEL





# COSEL



# COSEL

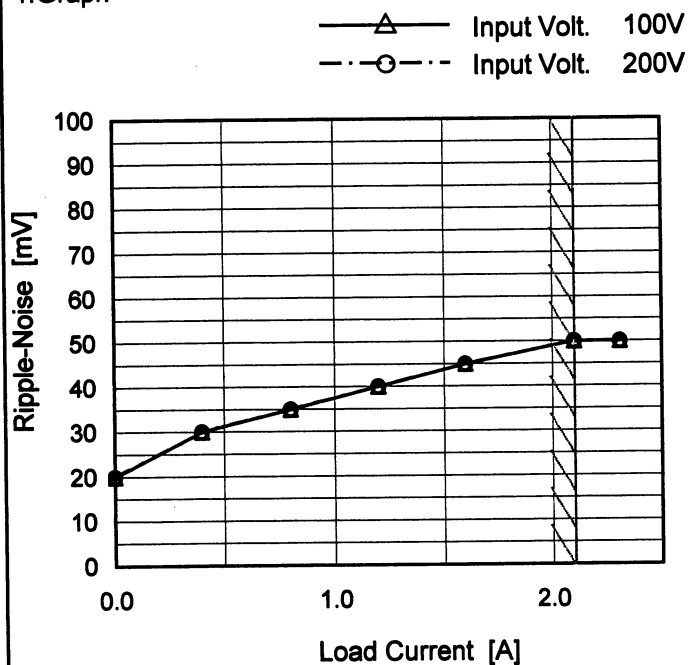
Model PBW50F-12

Item Ripple-Noise

Object -12V2.1A

Temperature 25°C  
Testing Circuitry Figure A

## 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. 100 [V]	Input Volt. 200 [V]
0.00	20	20
0.40	30	30
0.80	35	35
1.20	40	40
1.60	45	45
2.10	50	50
2.31	50	50
--	-	-
--	-	-
--	-	-
--	-	-

+12V : Rated output current 1

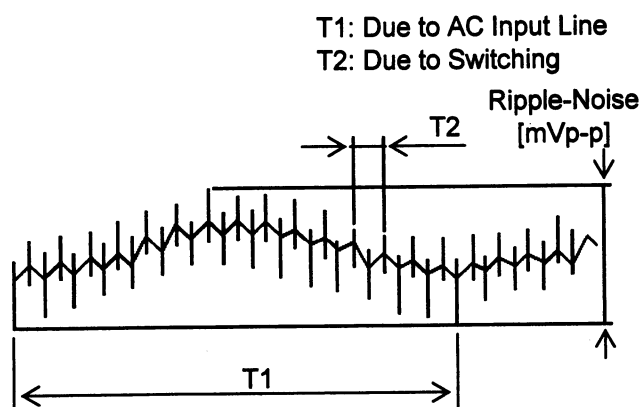
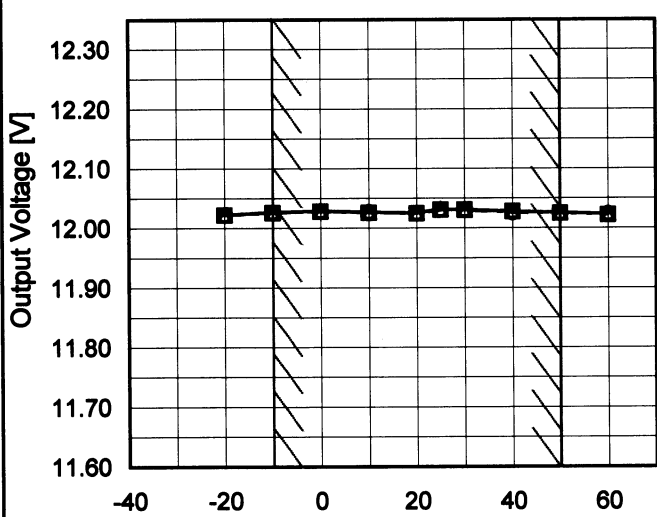
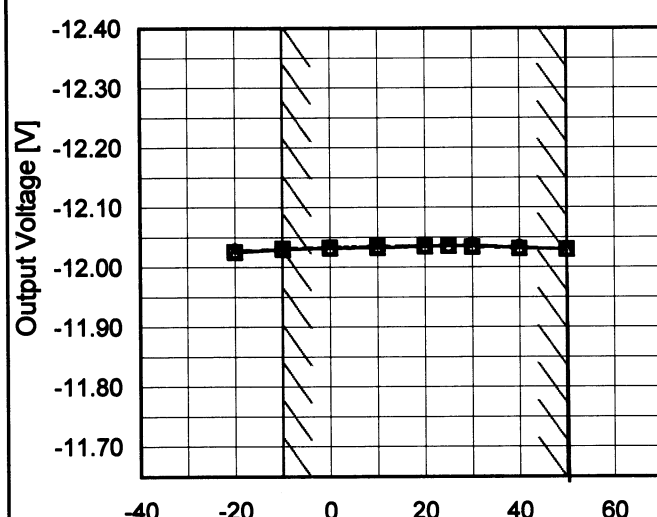


Fig. Complex Ripple Wave Form

# COSEL

Model	PBW50F-12																																								
Item	Ripple Voltage (by Ambient Temp.)		Testing Circuitry    Figure A																																						
Object	+12V2.1A																																								
1.Graph																																									
<div><div><div>---□---</div><div>Input Volt. 100V</div></div><div><div>—△—</div><div>Input Volt. 200V</div></div></div> <table><thead><tr><th>Ambient Temperature [°C]</th><th>Input Volt. 100 [V]</th><th>Input Volt. 200 [V]</th></tr></thead><tbody><tr><td>-30</td><td>125</td><td>130</td></tr><tr><td>-10</td><td>60</td><td>55</td></tr><tr><td>0</td><td>40</td><td>40</td></tr><tr><td>25</td><td>30</td><td>30</td></tr><tr><td>50</td><td>25</td><td>20</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> <p>-12V : Rated output current 1</p>				Ambient Temperature [°C]	Input Volt. 100 [V]	Input Volt. 200 [V]	-30	125	130	-10	60	55	0	40	40	25	30	30	50	25	20	—	-	-	—	-	-	—	-	-	—	-	-	—	-	-	—	-	-		
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# COSEL

Model	PBW50F-12																																																						
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Object	+12V2.1A																																																						
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<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>200V</div></div><div><div>---○---</div><div>Input Volt.</div><div>230V</div></div></div>  <div>Output Voltage [V]</div> <div>Ambient Temperature [°C]</div> <div>Load 100%</div>		<table><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>-20</td><td>12.023</td><td>12.022</td><td>12.022</td></tr><tr><td>-10</td><td>12.027</td><td>12.026</td><td>12.026</td></tr><tr><td>0</td><td>12.029</td><td>12.028</td><td>12.028</td></tr><tr><td>10</td><td>12.027</td><td>12.026</td><td>12.027</td></tr><tr><td>20</td><td>12.026</td><td>12.025</td><td>12.025</td></tr><tr><td>25</td><td>12.032</td><td>12.031</td><td>12.031</td></tr><tr><td>30</td><td>12.031</td><td>12.031</td><td>12.030</td></tr><tr><td>40</td><td>12.028</td><td>12.028</td><td>12.026</td></tr><tr><td>50</td><td>12.026</td><td>12.025</td><td>12.025</td></tr><tr><td>60</td><td>12.024</td><td>12.022</td><td>12.024</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]	-20	12.023	12.022	12.022	-10	12.027	12.026	12.026	0	12.029	12.028	12.028	10	12.027	12.026	12.027	20	12.026	12.025	12.025	25	12.032	12.031	12.031	30	12.031	12.031	12.030	40	12.028	12.028	12.026	50	12.026	12.025	12.025	60	12.024	12.022	12.024	--	-	-	-
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Object	-12V2.1A																																																						
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<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>200V</div></div><div><div>---○---</div><div>Input Volt.</div><div>230V</div></div></div>  <div>Output Voltage [V]</div> <div>Ambient Temperature [°C]</div> <div>Load 100%</div>		<table><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>-20</td><td>-12.025</td><td>-12.026</td><td>-12.027</td></tr><tr><td>-10</td><td>-12.030</td><td>-12.031</td><td>-12.031</td></tr><tr><td>0</td><td>-12.032</td><td>-12.033</td><td>-12.033</td></tr><tr><td>10</td><td>-12.033</td><td>-12.035</td><td>-12.034</td></tr><tr><td>20</td><td>-12.035</td><td>-12.035</td><td>-12.036</td></tr><tr><td>25</td><td>-12.036</td><td>-12.036</td><td>-12.037</td></tr><tr><td>30</td><td>-12.036</td><td>-12.034</td><td>-12.036</td></tr><tr><td>40</td><td>-12.032</td><td>-12.031</td><td>-12.033</td></tr><tr><td>50</td><td>-12.030</td><td>-12.030</td><td>-12.030</td></tr><tr><td>60</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. 200[V]	Input Volt. 230[V]	-20	-12.025	-12.026	-12.027	-10	-12.030	-12.031	-12.031	0	-12.032	-12.033	-12.033	10	-12.033	-12.035	-12.034	20	-12.035	-12.035	-12.036	25	-12.036	-12.036	-12.037	30	-12.036	-12.034	-12.036	40	-12.032	-12.031	-12.033	50	-12.030	-12.030	-12.030	60	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																						
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																				
-20	-12.025	-12.026	-12.027																																																				
-10	-12.030	-12.031	-12.031																																																				
0	-12.032	-12.033	-12.033																																																				
10	-12.033	-12.035	-12.034																																																				
20	-12.035	-12.035	-12.036																																																				
25	-12.036	-12.036	-12.037																																																				
30	-12.036	-12.034	-12.036																																																				
40	-12.032	-12.031	-12.033																																																				
50	-12.030	-12.030	-12.030																																																				
60	-	-	-																																																				
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Note: Slanted line shows the range of the rated ambient temperature.																																																							

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BC-10004

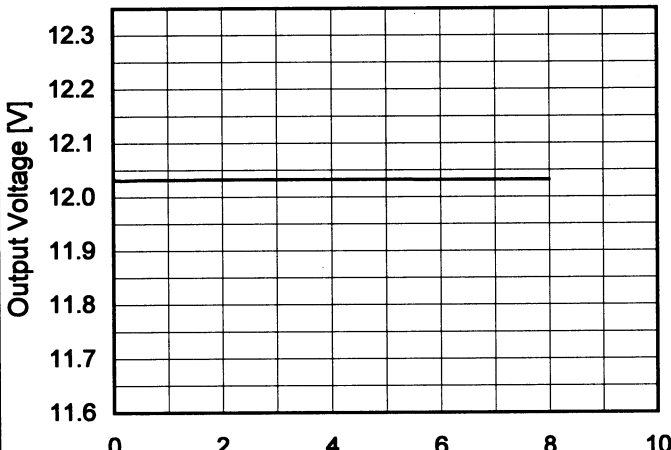
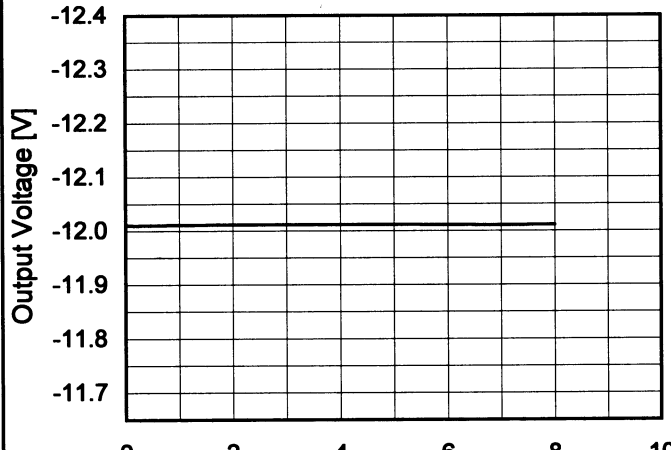


Model	PBW50F-12					
Item	Output Voltage Accuracy			Testing Circuitry    Figure A		
1.Output Voltage Accuracy						
This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.						
Temperature            : -10 - 50°C						
Input Voltage         : 85 - 264V						
Load Current (AVR 1) : 0 - 2.1A      (AVR 2) : 0 - 2.1A						
* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2						
* Output Voltage Accuracy (Ration) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$						
2.Values						
Object		+12V2.1A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	264	0	12.308	±136	±1.1
Minimum Voltage	-10	85	2.1	12.036		
Object		-12V2.1A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	85	0	-12.302	±137	±1.1
Minimum Voltage	-10	85	2.1	-12.028		

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BC-10004

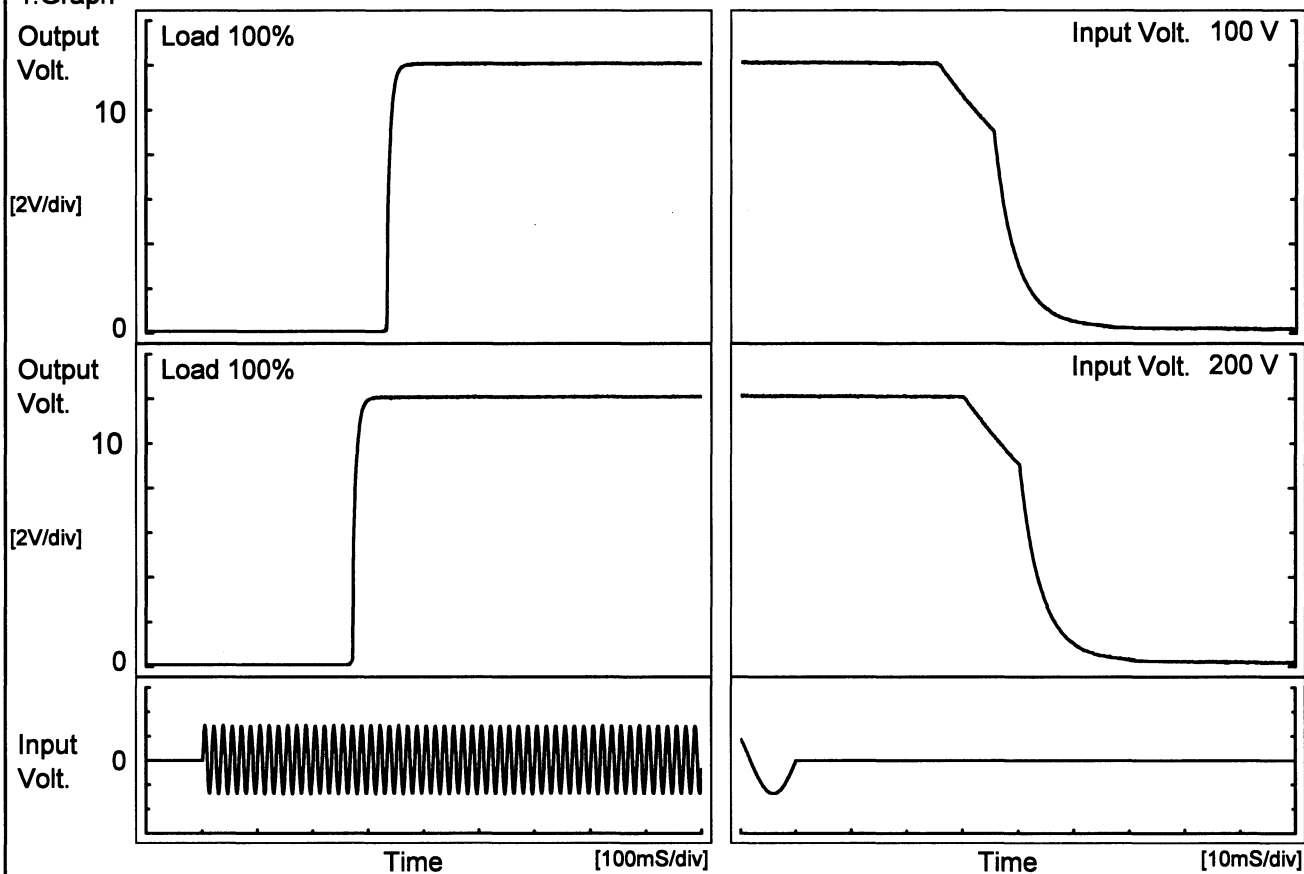
# COSEL

Model	PBW50F-12	Temperature 25°C Testing Circuitry Figure A																							
Item	Time Lapse Drift																								
Object	+12V2.1A																								
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 100V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.033</td></tr><tr><td>0.5</td><td>12.032</td></tr><tr><td>1.0</td><td>12.032</td></tr><tr><td>2.0</td><td>12.033</td></tr><tr><td>3.0</td><td>12.033</td></tr><tr><td>4.0</td><td>12.033</td></tr><tr><td>5.0</td><td>12.033</td></tr><tr><td>6.0</td><td>12.032</td></tr><tr><td>7.0</td><td>12.032</td></tr><tr><td>8.0</td><td>12.032</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.033	0.5	12.032	1.0	12.032	2.0	12.033	3.0	12.033	4.0	12.033	5.0	12.033	6.0	12.032	7.0	12.032	8.0	12.032
Time since start [H]	Output Voltage [V]																								
0.0	12.033																								
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<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 100V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>-12.012</td></tr><tr><td>0.5</td><td>-12.011</td></tr><tr><td>1.0</td><td>-12.011</td></tr><tr><td>2.0</td><td>-12.012</td></tr><tr><td>3.0</td><td>-12.012</td></tr><tr><td>4.0</td><td>-12.012</td></tr><tr><td>5.0</td><td>-12.012</td></tr><tr><td>6.0</td><td>-12.011</td></tr><tr><td>7.0</td><td>-12.011</td></tr><tr><td>8.0</td><td>-12.011</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	-12.012	0.5	-12.011	1.0	-12.011	2.0	-12.012	3.0	-12.012	4.0	-12.012	5.0	-12.012	6.0	-12.011	7.0	-12.011	8.0	-12.011
Time since start [H]	Output Voltage [V]																								
0.0	-12.012																								
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7.0	-12.011																								
8.0	-12.011																								
★The characteristic of AC200V is equal.																									

# COSEL

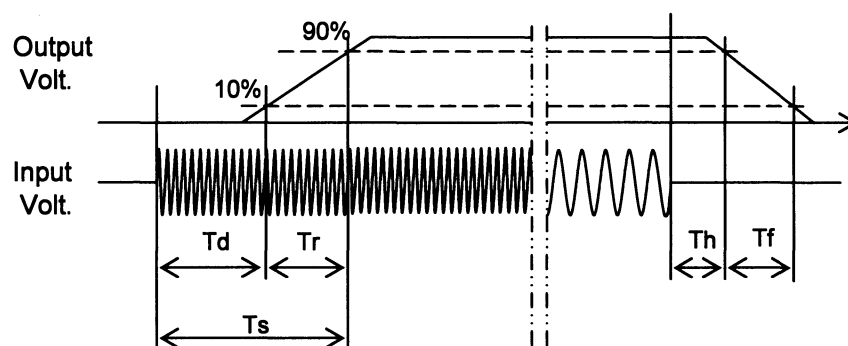
Model	PBW50F-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V2.1A		

## 1. Graph



## 2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		333.5	13.0	346.5	29.2	15.1
200 V		271.5	13.0	284.5	33.9	15.0



# COSEL

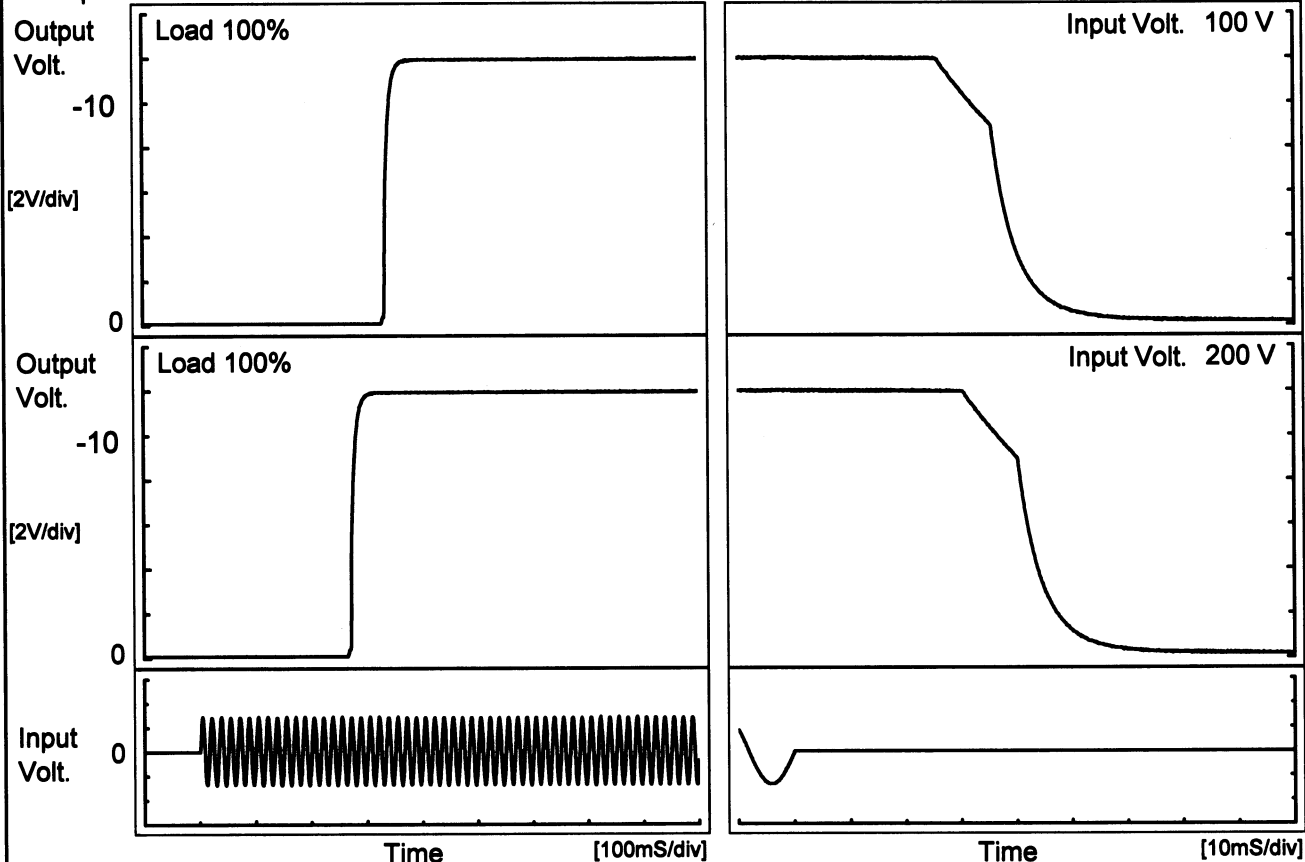
Model PBW50F-12

Item Rise and Fall Time

Object -12V2.1A

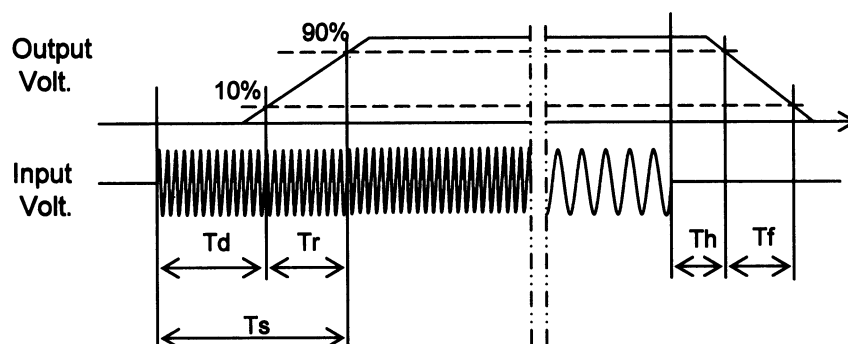
Temperature 25°C  
Testing Circuitry Figure A

## 1. Graph



## 2. Values

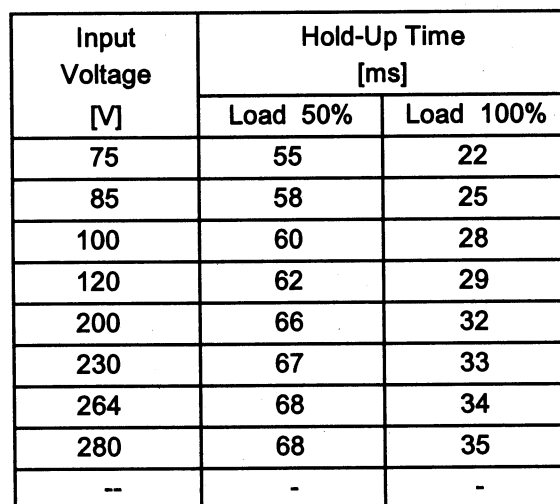
		[mS]				
Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		333.5	14.0	347.5	28.8	16.3
200 V		271.5	14.0	285.5	33.5	16.3





Temperature 25°C  
Testing Circuitry Figure A

## 2.Values



**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.**

**COSEL**

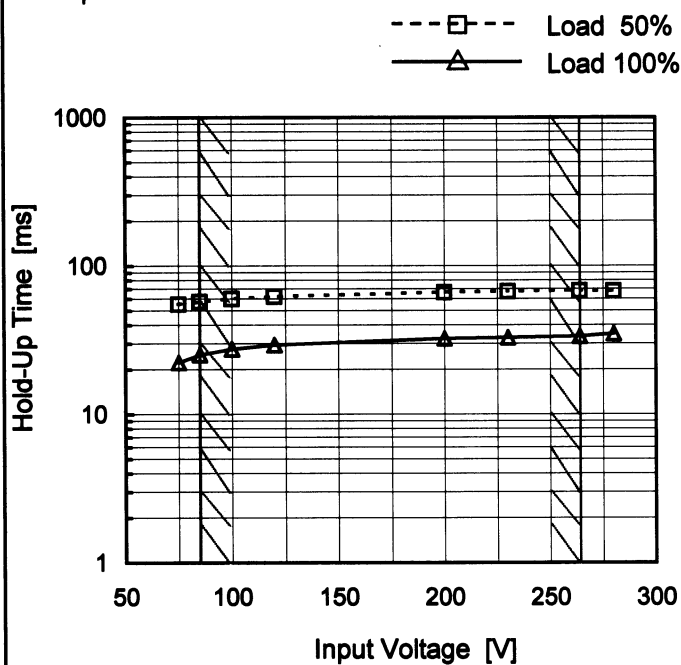
Model PBW50F-12

Item Hold-Up Time

Object -12V2.1A

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	55	22
85	58	25
100	60	28
120	62	29
200	66	32
230	67	33
264	68	34
280	68	35
--	-	-

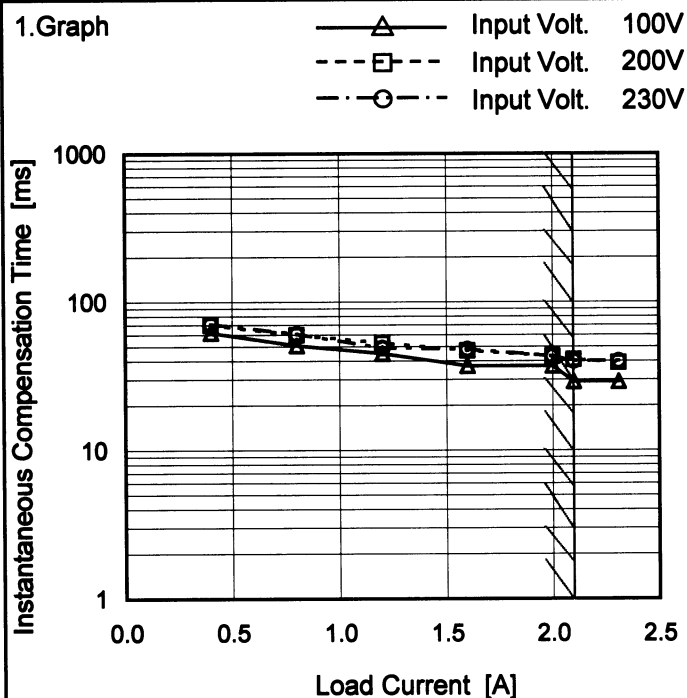
# COSEL

**Model** PBW50F-12

**Item** Instantaneous Interruption Compensation

**Object** +12V2.1A

**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]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.40	62	70	71
0.80	51	60	61
1.20	45	53	49
1.60	37	47	48
2.00	37	43	43
2.10	29	41	40
2.31	29	39	40
--	-	-	-
--	-	-	-
--	-	-	-

-12V : Rated output current 1

# COSEL

Model	PBW50F-12																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	-12V2.1A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>200V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>230V</div></div></div> <div>Instantaneous Compensation Time [ms]</div> <div>Load Current [A]</div> <div>Note: Slanted line shows the range of the rated load current.</div>		<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. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.40</td><td>62</td><td>70</td><td>71</td></tr><tr><td>0.80</td><td>51</td><td>60</td><td>61</td></tr><tr><td>1.20</td><td>45</td><td>53</td><td>49</td></tr><tr><td>1.60</td><td>37</td><td>47</td><td>48</td></tr><tr><td>2.00</td><td>37</td><td>43</td><td>43</td></tr><tr><td>2.10</td><td>29</td><td>41</td><td>40</td></tr><tr><td>2.31</td><td>29</td><td>39</td><td>40</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> <div>+12V : Rated output current 1</div>		Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.00	-	-	-	0.40	62	70	71	0.80	51	60	61	1.20	45	53	49	1.60	37	47	48	2.00	37	43	43	2.10	29	41	40	2.31	29	39	40	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
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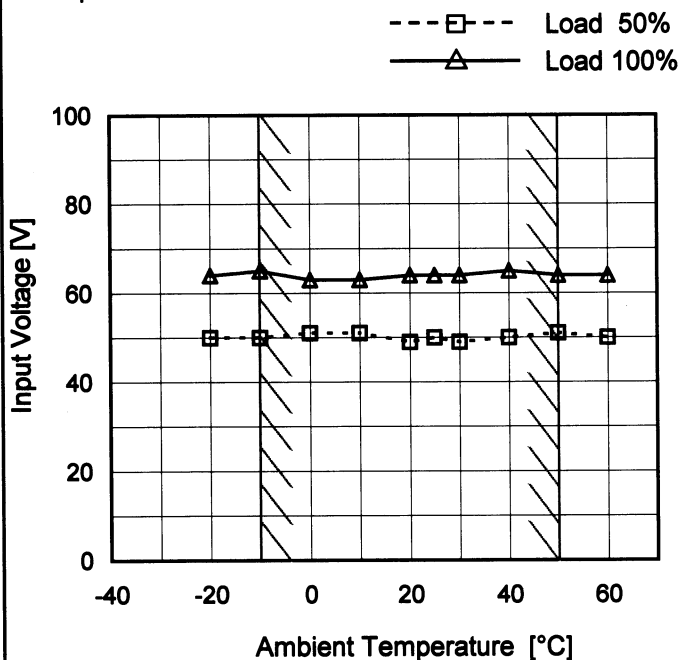
# COSEL

**Model** PBW50F-12

**Item** Minimum Input Voltage  
for Regulated Output Voltage

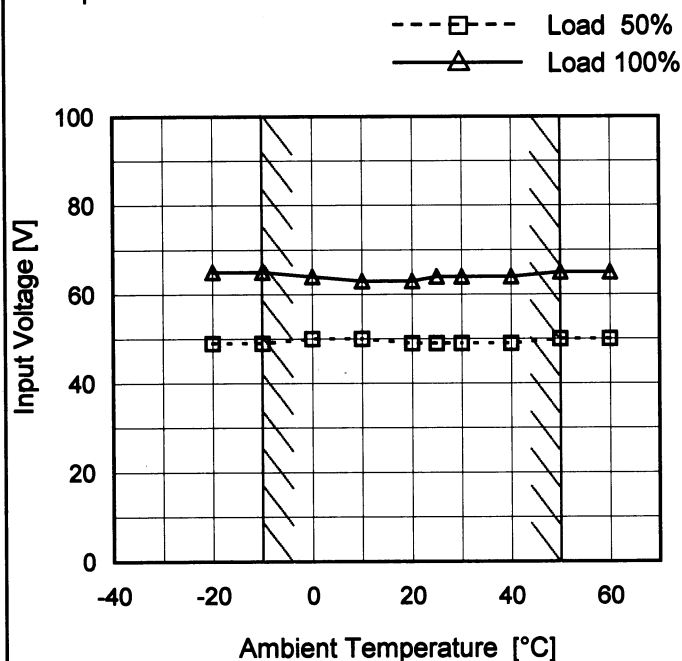
**Object** +12V2.1A

**Testing Circuitry** Figure A

**1.Graph**

**2.Values**

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	50	64
-10	50	65
0	51	63
10	51	63
20	49	64
25	50	64
30	49	64
40	50	65
50	51	64
60	50	64
--	-	-

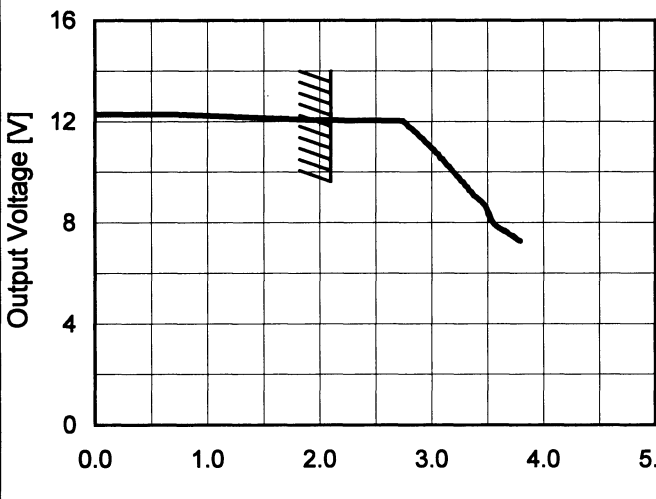
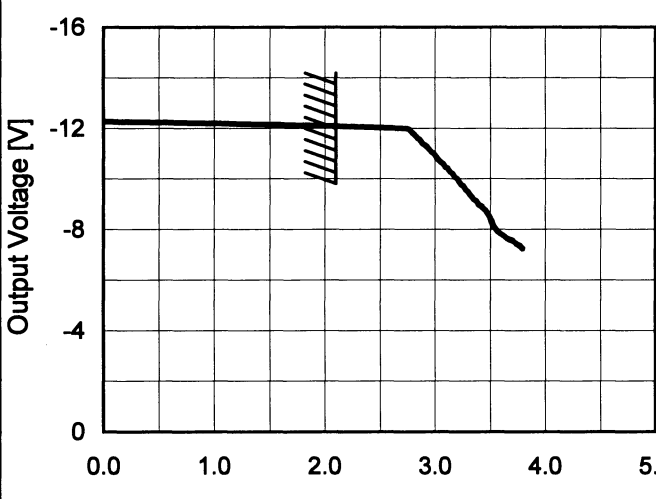
**Object** -12V2.1A

**1.Graph**

**2.Values**

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	49	65
-10	49	65
0	50	64
10	50	63
20	49	63
25	49	64
30	49	64
40	49	64
50	50	65
60	50	65
--	-	-

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

# COSEL

Model	PBW50F-12		
Item	Overcurrent Protection		Temperature 25°C Testing Circuitry Figure A
Object	+12V2.1A		
1.Graph			
		Input Volt. 100V	
		Input Volt. 200V	
Output Voltage [V]			
	Load Current [A]		
Intermittent operation occurs when the output voltage is from 7.2V to 0V.			
2.Values			
Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	
12.0	2.74	2.74	
11.4	2.89	2.89	
10.8	3.03	3.04	
9.6	3.28	3.28	
8.4	3.52	3.50	
7.2	3.78	3.81	
--	-	-	
--	-	-	
--	-	-	
--	-	-	
--	-	-	
--	-	-	
--	-	-	
Object	-12V2.1A		
1.Graph			
		Input Volt. 100V	
		Input Volt. 200V	
Output Voltage [V]			
	Load Current [A]		
Note: Slanted line shows the range of the rated load current.			
Intermittent operation occurs when the output voltage is from -7.2V to 0V.			
2.Values			
Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	
-12.0	2.74	2.74	
-11.4	2.89	2.89	
-10.8	3.03	3.03	
-9.6	3.28	3.28	
-8.4	3.51	3.51	
-7.2	3.78	3.79	
--	-	-	
--	-	-	
--	-	-	
--	-	-	
--	-	-	
--	-	-	
--	-	-	
--	-	-	

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BC-10004

# COSEL

Model		PBW50F-12																																							
Item		Overvoltage Protection																																							
Object		+12V2.1A																																							
1.Graph		<div><div><div>—△—</div>Input Volt. 100V</div><div><div>---□---</div>Input Volt. 200V</div></div> <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p>																																							
2.Values		<table><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><tr><td>-20</td><td>21.64</td><td>21.70</td></tr><tr><td>-10</td><td>21.75</td><td>21.74</td></tr><tr><td>0</td><td>21.86</td><td>21.87</td></tr><tr><td>10</td><td>22.09</td><td>22.10</td></tr><tr><td>20</td><td>22.22</td><td>22.14</td></tr><tr><td>25</td><td>22.20</td><td>22.25</td></tr><tr><td>30</td><td>22.34</td><td>22.39</td></tr><tr><td>40</td><td>22.66</td><td>22.61</td></tr><tr><td>50</td><td>22.89</td><td>22.87</td></tr><tr><td>60</td><td>23.07</td><td>23.09</td></tr><tr><td>—</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]		Input Volt. 100[V]	Input Volt. 200[V]	-20	21.64	21.70	-10	21.75	21.74	0	21.86	21.87	10	22.09	22.10	20	22.22	22.14	25	22.20	22.25	30	22.34	22.39	40	22.66	22.61	50	22.89	22.87	60	23.07	23.09	—	-	-
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Ambient Temperature [°C]	Operating Point [V]																																								
	Input Volt. 100[V]	Input Volt. 200[V]																																							
-20	-20.43	-20.48																																							
-10	-20.55	-20.59																																							
0	-20.73	-20.77																																							
10	-20.90	-20.94																																							
20	-21.02	-21.06																																							
25	-21.14	-21.14																																							
30	-21.20	-21.26																																							
40	-21.32	-21.44																																							
50	-21.50	-21.56																																							
60	-21.62	-21.68																																							
—	-	-																																							
Note: Slanted line shows the range of the rated ambient temperature.																																									

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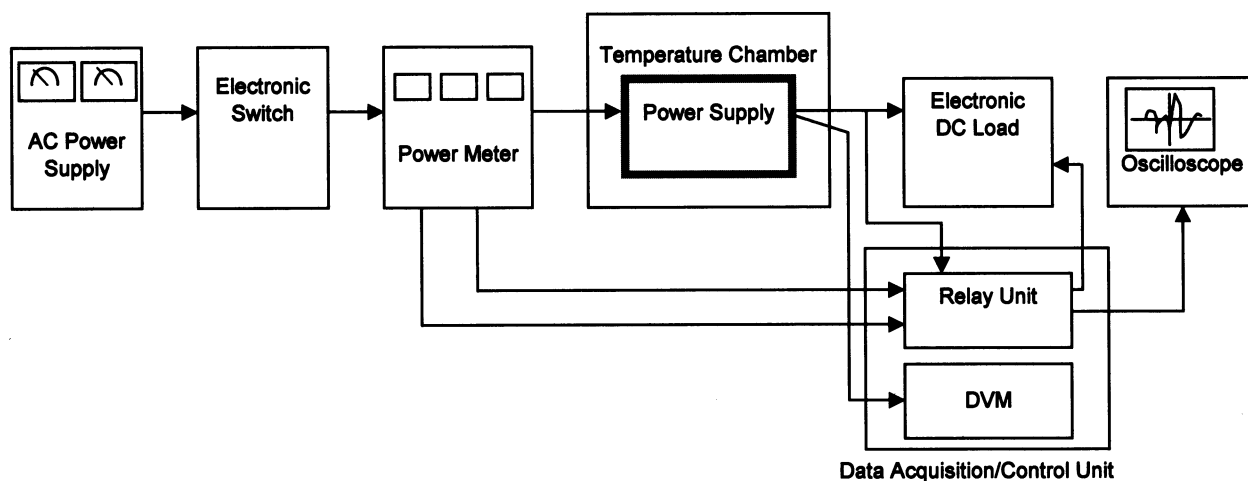


Figure A

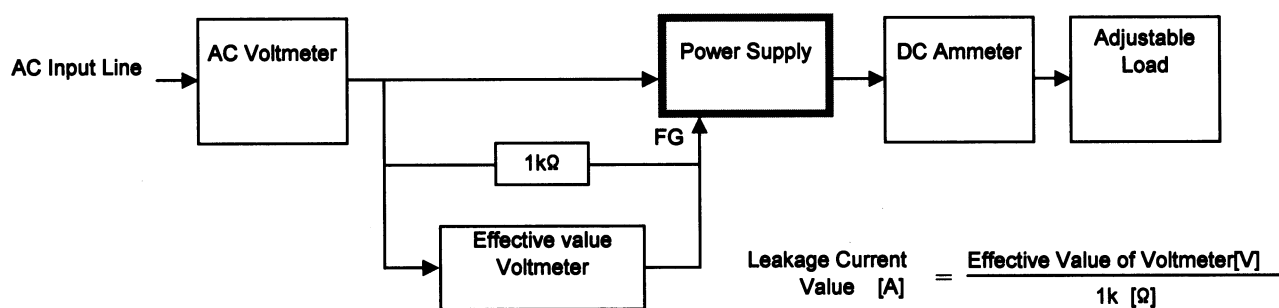


Figure B ( DEN-AN )

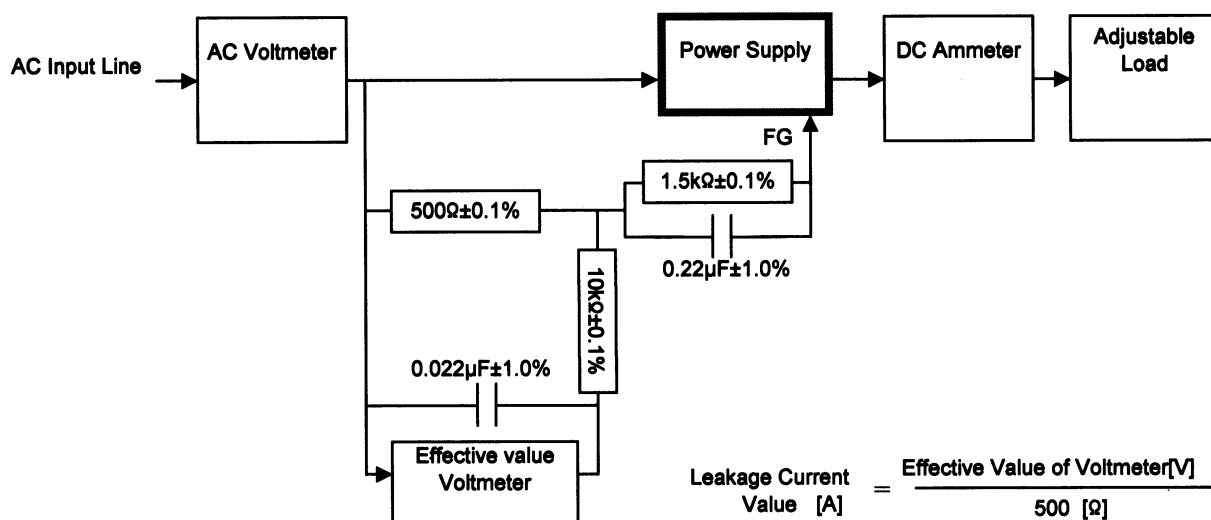


Figure B ( IEC60950 )