



# TEST DATA OF PBA30F-3R3

Regulated DC Power Supply  
Sep 29, 2005

Approved by : Kuniaki Nagahara Design Manager

Prepared by : Akito Joboji Design Engineer

**COSEL CO.,LTD.**

## CONTENTS

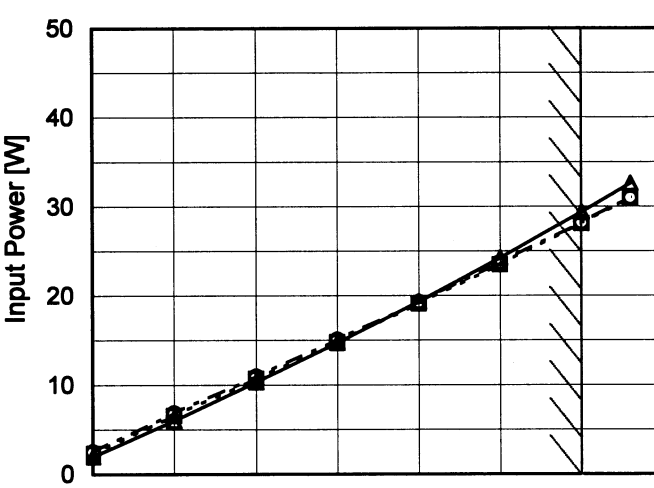
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Model	PBA30F-3R3																																																					
Item	Input Current (by Load Current)	Temperature	25°C																																																			
Object		Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div>—△—</div>Input Volt. 100V</div> <div><div>---□---</div>Input Volt. 200V</div> <div><div>---○---</div>Input Volt. 230V</div> <p>Input Current [A]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>																																																						
		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>0.046</td><td>0.035</td><td>0.033</td></tr><tr><td>1.0</td><td>0.116</td><td>0.082</td><td>0.075</td></tr><tr><td>2.0</td><td>0.187</td><td>0.121</td><td>0.111</td></tr><tr><td>3.0</td><td>0.257</td><td>0.159</td><td>0.145</td></tr><tr><td>4.0</td><td>0.331</td><td>0.198</td><td>0.180</td></tr><tr><td>5.0</td><td>0.407</td><td>0.238</td><td>0.216</td></tr><tr><td>6.0</td><td>0.488</td><td>0.279</td><td>0.252</td></tr><tr><td>6.6</td><td>0.538</td><td>0.305</td><td>0.275</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]	Input Current [A]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	0.046	0.035	0.033	1.0	0.116	0.082	0.075	2.0	0.187	0.121	0.111	3.0	0.257	0.159	0.145	4.0	0.331	0.198	0.180	5.0	0.407	0.238	0.216	6.0	0.488	0.279	0.252	6.6	0.538	0.305	0.275	--	-	-	-	--	-	-	-	--	-	-	-
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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>Note: Slanted line shows the range of the rated load current.</div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Power [W]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>1.97</td><td>2.35</td><td>2.53</td></tr><tr><td>1.0</td><td>5.99</td><td>6.56</td><td>6.86</td></tr><tr><td>2.0</td><td>10.35</td><td>10.70</td><td>10.97</td></tr><tr><td>3.0</td><td>14.71</td><td>14.80</td><td>15.10</td></tr><tr><td>4.0</td><td>19.36</td><td>19.10</td><td>19.30</td></tr><tr><td>5.0</td><td>24.24</td><td>23.50</td><td>23.70</td></tr><tr><td>6.0</td><td>29.39</td><td>28.10</td><td>28.20</td></tr><tr><td>6.6</td><td>32.62</td><td>30.90</td><td>31.00</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]	Input Power [W]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	1.97	2.35	2.53	1.0	5.99	6.56	6.86	2.0	10.35	10.70	10.97	3.0	14.71	14.80	15.10	4.0	19.36	19.10	19.30	5.0	24.24	23.50	23.70	6.0	29.39	28.10	28.20	6.6	32.62	30.90	31.00	--	-	-	-	--	-	-	-	--	-	-	-
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Model

PBA30F-3R3

Item

Efficiency (by Load Current)

Object

1.Graph

—△—

Input Volt.

100V

---□---

Input Volt.

200V

---○---

Input Volt.

230V

Efficiency [%]

86

78

70

62

54

46

38

30

0

2

4

6

Load Current [A]

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

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
1.0	56.1	51.2	49.0
2.0	64.9	62.8	61.2
3.0	68.0	67.6	66.3
4.0	69.0	69.9	69.2
5.0	68.9	71.1	70.5
6.0	68.2	71.3	71.1
6.6	67.6	71.4	71.1
--	-	-	-
--	-	-	-
--	-	-	-

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BC-10009

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Model		PBA30F-3R3		Temperature 25°C																																	
Item		Power Factor (by Input Voltage)		Testing Circuitry Figure A																																	
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<div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div> <p>Power Factor</p> <p>Input Voltage [V]</p>				<table><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><tr><td>85</td><td>0.596</td><td>0.630</td></tr><tr><td>100</td><td>0.568</td><td>0.601</td></tr><tr><td>120</td><td>0.541</td><td>0.573</td></tr><tr><td>200</td><td>0.461</td><td>0.493</td></tr><tr><td>230</td><td>0.448</td><td>0.478</td></tr><tr><td>264</td><td>0.430</td><td>0.460</td></tr><tr><td>280</td><td>0.421</td><td>0.455</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Power Factor		Load 50%	Load 100%	85	0.596	0.630	100	0.568	0.601	120	0.541	0.573	200	0.461	0.493	230	0.448	0.478	264	0.430	0.460	280	0.421	0.455	--	-	-	--	-	-
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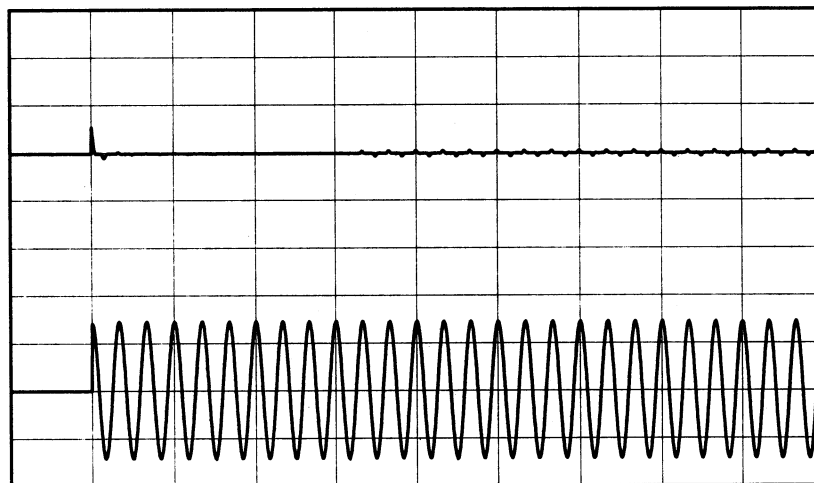


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Model	PBA30F-3R3	Temperature     25°C Testing Circuitry   Figure A	
Item	Inrush Current		
Object	_____		

Input  
Current  
[20A/div]

Input  
Voltage  
[100V/div]



Time

[50mS/div]

Input Voltage     100 V

Frequency         60 Hz

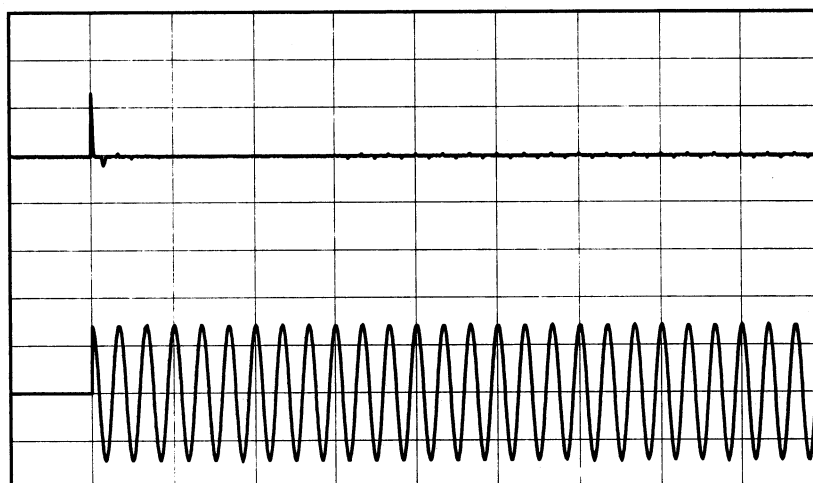
Load                100 %

Primary inrush current :  
                                 10.8 A

Secondary inrush current :  
                                 1.6 A

Input  
Current  
[20A/div]

Input  
Voltage  
[200V/div]



Time

[50mS/div]

Input Voltage     200 V

Frequency         60 Hz

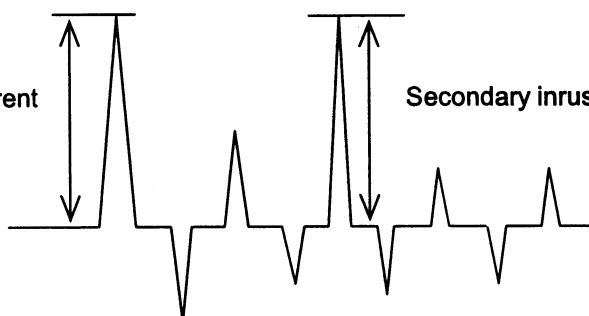
Load                100 %

Primary inrush current :  
                                 26.4 A

Secondary inrush current :  
                                 1.2 A

Primary inrush current

Secondary inrush current



**COSEL**

		Temperature 25°C Testing Circuitry Figure B
Model	PBA30F-3R3	
Item	Leakage Current	
Object	_____	

## 1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.15	0.32	0.39	Operation
	One of phase	0.30	0.64	0.79	stand by
IEC60950	Both phases	0.19	0.44	0.52	Operation
	One of phase	0.29	0.64	0.79	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.



# COSEL

Model	PBA30F-3R3																																																					
Item	Load Regulation	Temperature	25°C																																																			
Object	+3.3V6A	Testing Circuitry	Figure A																																																			
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**COSEL**

Model	PBA30F-3R3	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+3.3V6A		

Input Volt. 100 V

Cycle 1000 ms

Load Current

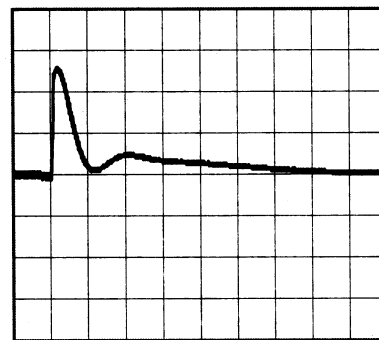
Min. Load (0A) ←→

Load 100% (6A)

200 mV/div



200 μs/div

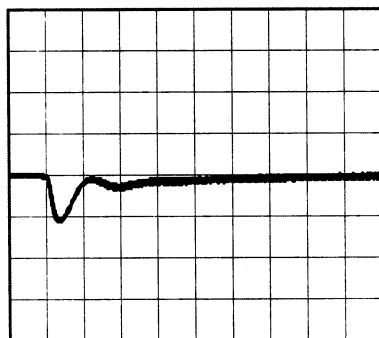


200 μs/div

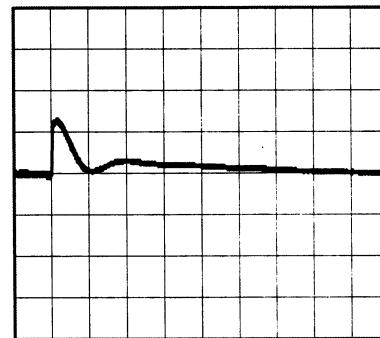
Min. Load (0A) ←→

Load 50% (3A)

200 mV/div



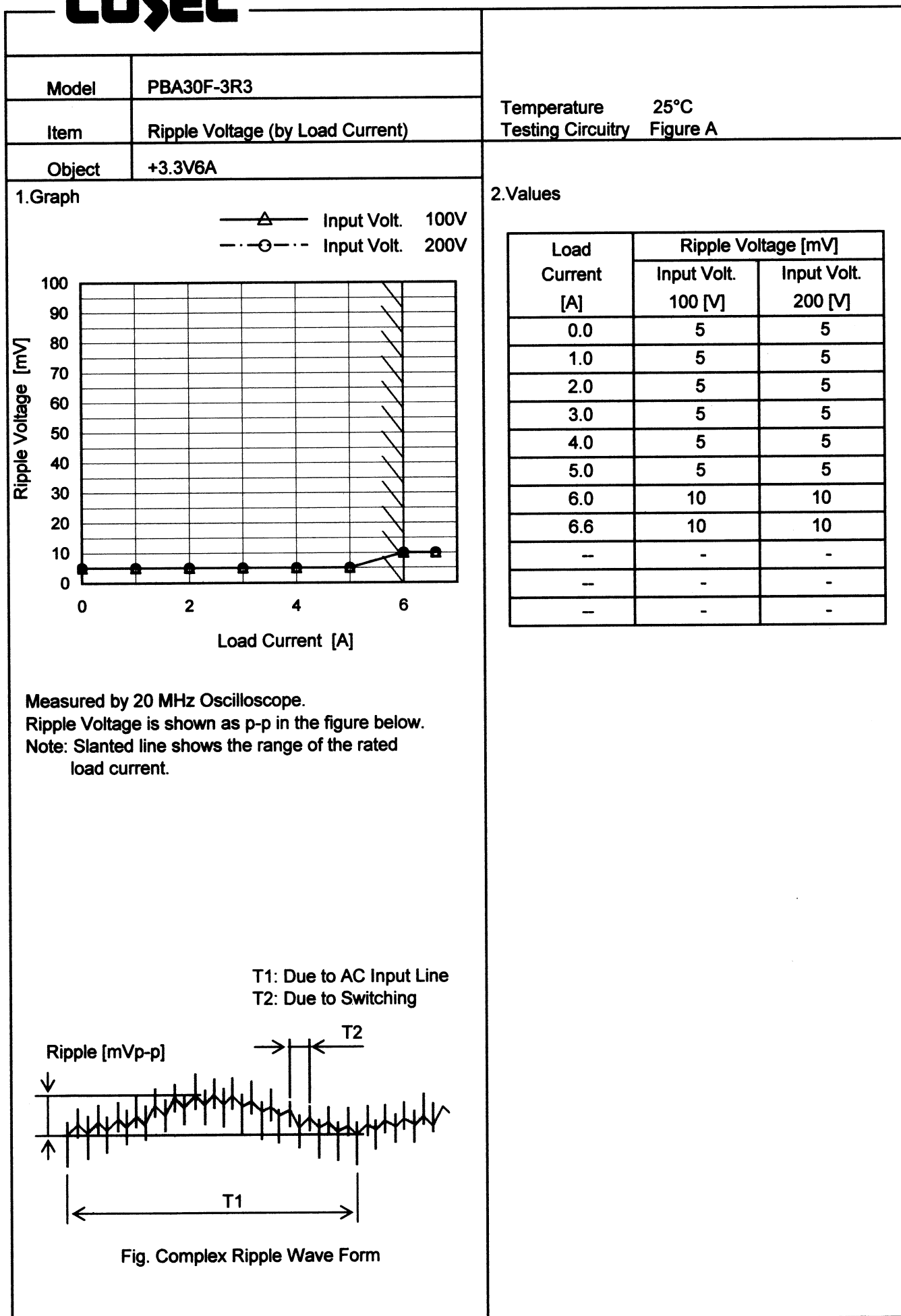
200 μs/div



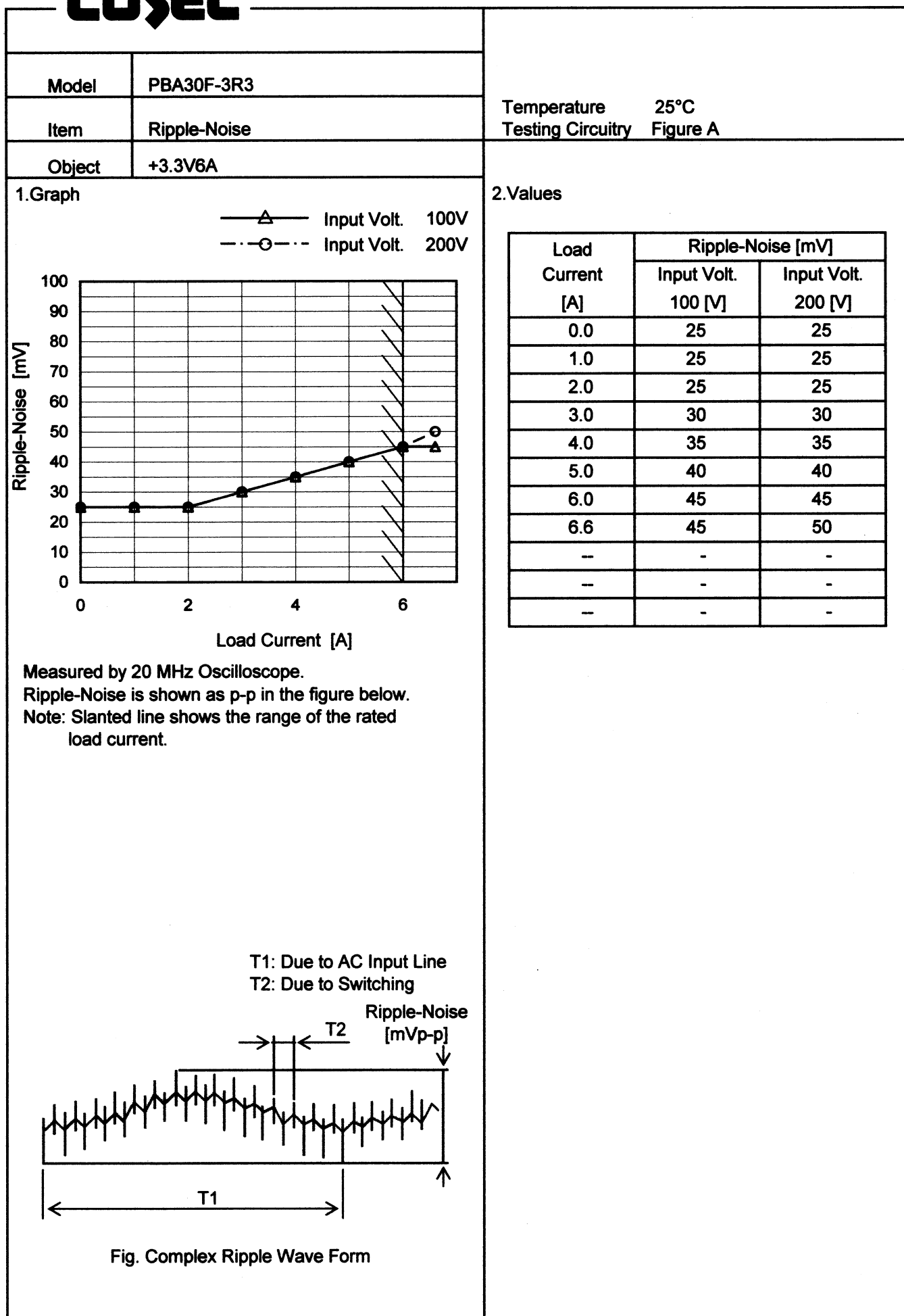
200 μs/div

\* The characteristic of AC200V is equal.

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# COSEL



# COSEL

Model		PBA30F-3R3
Item		Ripple Voltage (by Ambient Temp.)
Object		+3.3V6A
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><div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <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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Model		PBA30F-3R3																																																				
Item		Ambient Temperature Drift																																																				
Object		+3.3V6A																																																				
1.Graph		<div><div><div>—△—</div>Input Volt. 100V</div><div><div>---□---</div>Input Volt. 200V</div><div><div>---○---</div>Input Volt. 230V</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>																																																				
2.Values		<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>3.343</td><td>3.342</td><td>3.342</td></tr><tr><td>-10</td><td>3.346</td><td>3.344</td><td>3.344</td></tr><tr><td>0</td><td>3.348</td><td>3.346</td><td>3.346</td></tr><tr><td>10</td><td>3.350</td><td>3.348</td><td>3.348</td></tr><tr><td>20</td><td>3.351</td><td>3.349</td><td>3.349</td></tr><tr><td>25</td><td>3.352</td><td>3.350</td><td>3.350</td></tr><tr><td>30</td><td>3.353</td><td>3.351</td><td>3.351</td></tr><tr><td>40</td><td>3.355</td><td>3.353</td><td>3.352</td></tr><tr><td>50</td><td>3.356</td><td>3.354</td><td>3.354</td></tr><tr><td>60</td><td>3.357</td><td>3.355</td><td>3.354</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	3.343	3.342	3.342	-10	3.346	3.344	3.344	0	3.348	3.346	3.346	10	3.350	3.348	3.348	20	3.351	3.349	3.349	25	3.352	3.350	3.350	30	3.353	3.351	3.351	40	3.355	3.353	3.352	50	3.356	3.354	3.354	60	3.357	3.355	3.354	--	-	-	-
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		Testing Circuitry Figure A
Model	PBA30F-3R3	
Item	Output Voltage Accuracy	
Object	+3.3V6A	

### 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 - 6A

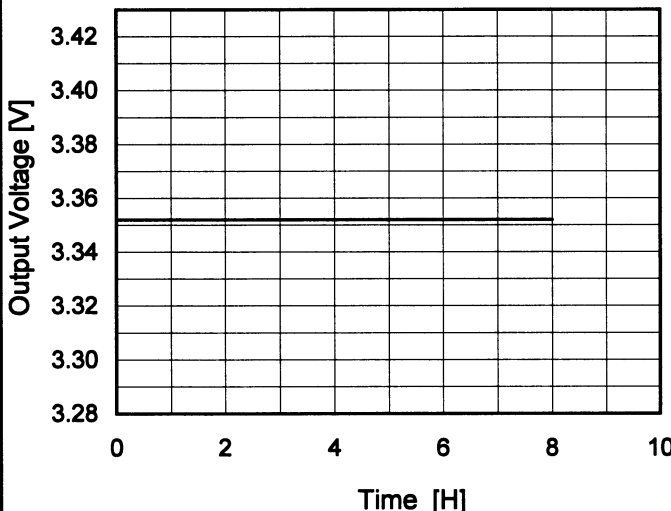
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* 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	264	0	3.359	±8	±0.2
Minimum Voltage	-10	264	6	3.344		

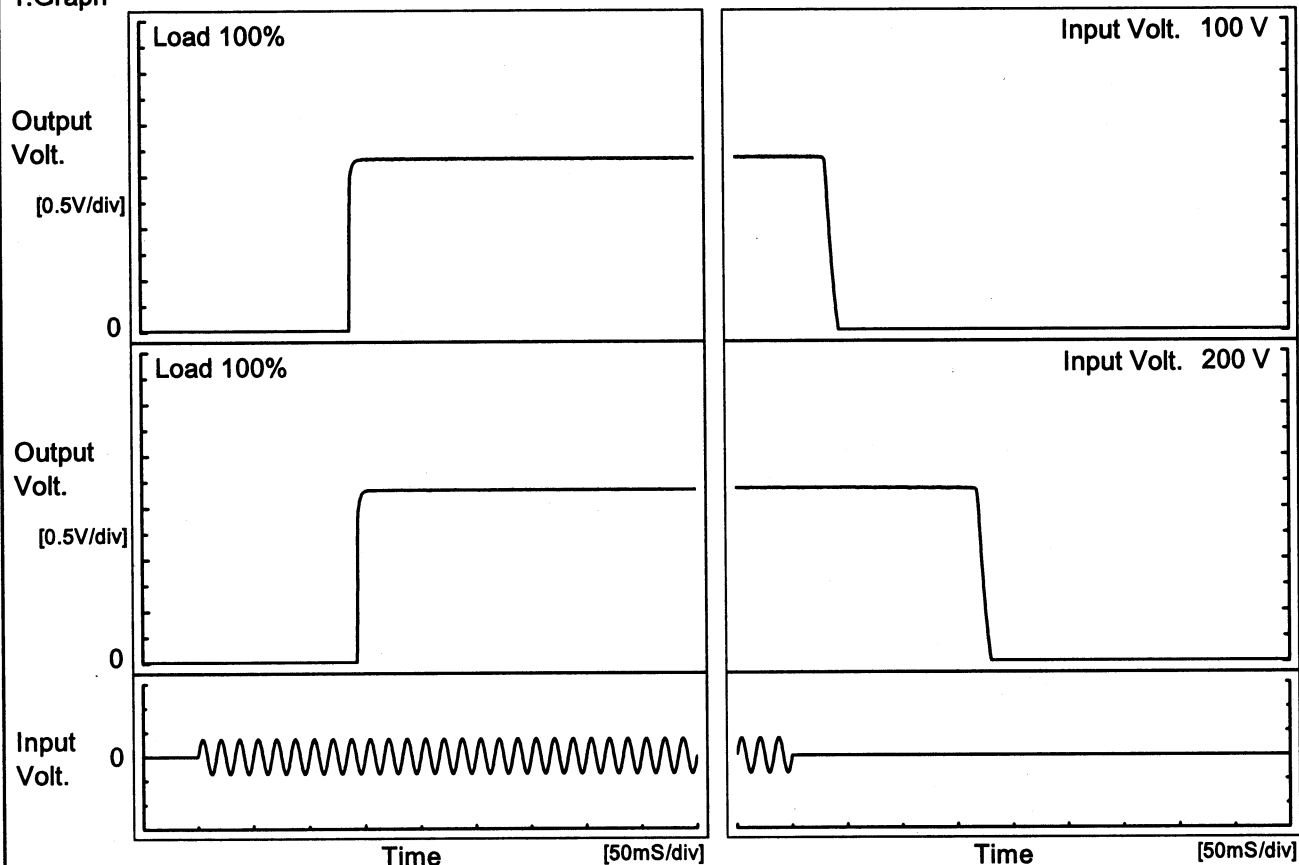
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Model	PBA30F-3R3																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+3.3V6A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 100V</p><p>Load 100%</p></div>		<table><thead><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr></thead><tbody><tr><td>0.0</td><td>3.352</td></tr><tr><td>0.5</td><td>3.352</td></tr><tr><td>1.0</td><td>3.352</td></tr><tr><td>2.0</td><td>3.352</td></tr><tr><td>3.0</td><td>3.352</td></tr><tr><td>4.0</td><td>3.352</td></tr><tr><td>5.0</td><td>3.352</td></tr><tr><td>6.0</td><td>3.352</td></tr><tr><td>7.0</td><td>3.352</td></tr><tr><td>8.0</td><td>3.352</td></tr></tbody></table>		Time since start [H]	Output Voltage [V]	0.0	3.352	0.5	3.352	1.0	3.352	2.0	3.352	3.0	3.352	4.0	3.352	5.0	3.352	6.0	3.352	7.0	3.352	8.0	3.352
Time since start [H]	Output Voltage [V]																								
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7.0	3.352																								
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* The characteristic of AC200V is equal.																									

# COSEL

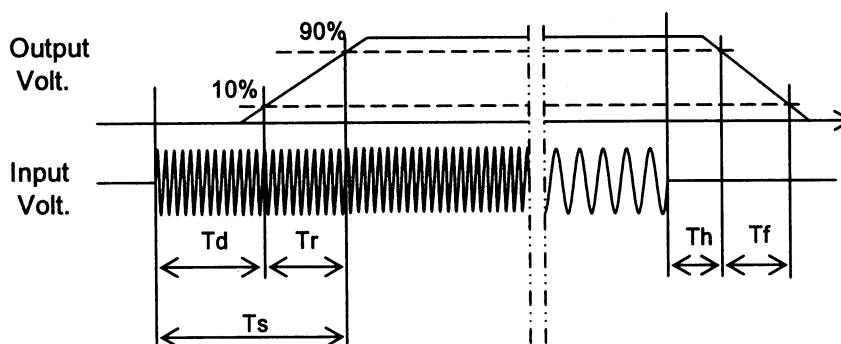
Model	PBA30F-3R3	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+3.3V6A		

## 1. Graph



## 2. Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	137.5	1.8	139.3	32.5	9.3
200 V	143.0	2.0	145.0	169.3	9.5

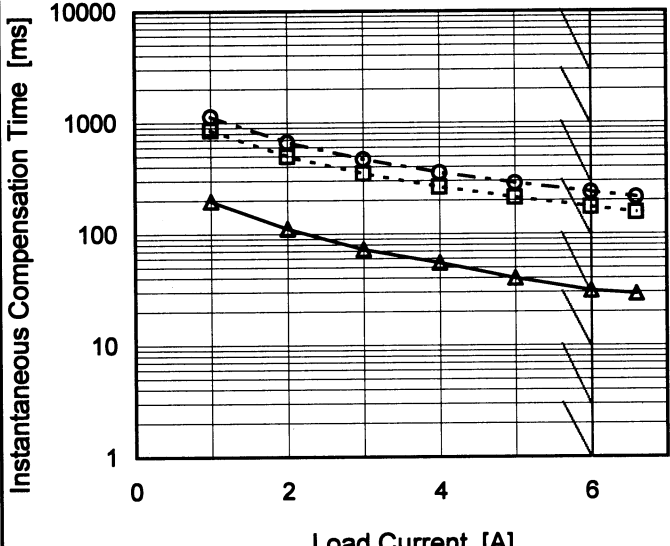


## 2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	48	20
100	72	32
120	110	51
200	339	169
230	456	230
264	609	311
--	-	-
--	-	-
--	-	-

**BC-10009**

# COSEL

Model	PBA30F-3R3	Temperature 25°C Testing Circuitry Figure A																																																					
Item	Instantaneous Interruption Compensation																																																						
Object	+3.3V6A																																																						
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>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.0</td><td>198</td><td>860</td><td>1139</td></tr><tr><td>2.0</td><td>112</td><td>498</td><td>666</td></tr><tr><td>3.0</td><td>73</td><td>349</td><td>471</td></tr><tr><td>4.0</td><td>55</td><td>265</td><td>357</td></tr><tr><td>5.0</td><td>40</td><td>213</td><td>287</td></tr><tr><td>6.0</td><td>31</td><td>174</td><td>238</td></tr><tr><td>6.6</td><td>29</td><td>156</td><td>214</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	-	-	-	1.0	198	860	1139	2.0	112	498	666	3.0	73	349	471	4.0	55	265	357	5.0	40	213	287	6.0	31	174	238	6.6	29	156	214	--	-	-	-	--	-	-	-	--	-	-	-	
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# COSEL

		Testing Circuitry    Figure A																																						
Model	PBA30F-3R3																																							
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+3.3V6A																																							
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 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>-20</td><td>33</td><td>47</td></tr><tr><td>-10</td><td>33</td><td>47</td></tr><tr><td>0</td><td>34</td><td>48</td></tr><tr><td>10</td><td>34</td><td>48</td></tr><tr><td>20</td><td>33</td><td>49</td></tr><tr><td>25</td><td>35</td><td>49</td></tr><tr><td>30</td><td>34</td><td>50</td></tr><tr><td>40</td><td>35</td><td>51</td></tr><tr><td>50</td><td>35</td><td>52</td></tr><tr><td>60</td><td>36</td><td>54</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Ambient Temperature [°C]	Input Voltage [V]		Load 50%	Load 100%	-20	33	47	-10	33	47	0	34	48	10	34	48	20	33	49	25	35	49	30	34	50	40	35	51	50	35	52	60	36	54	--	-	-	
Ambient Temperature [°C]	Input Voltage [V]																																							
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Note: Slanted line shows the range of the rated ambient temperature.																																								

**COSEL**

Model	PBA30F-3R3																																											
Item	Overcurrent Protection	Temperature	25°C																																									
Object	+3.3V6A	Testing Circuitry	Figure A																																									
1.Graph		2.Values																																										
<div><div><div>△</div><div>Input Volt. 100V</div></div><div><div>○</div><div>Input Volt. 200V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is less than rated output voltage.</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>3.300</td><td>11.13</td><td>14.12</td></tr><tr><td>3.135</td><td>-</td><td>-</td></tr><tr><td>2.970</td><td>-</td><td>-</td></tr><tr><td>2.640</td><td>-</td><td>-</td></tr><tr><td>2.310</td><td>-</td><td>-</td></tr><tr><td>1.980</td><td>-</td><td>-</td></tr><tr><td>1.650</td><td>-</td><td>-</td></tr><tr><td>1.320</td><td>-</td><td>-</td></tr><tr><td>0.990</td><td>-</td><td>-</td></tr><tr><td>0.660</td><td>-</td><td>-</td></tr><tr><td>0.330</td><td>-</td><td>-</td></tr><tr><td>0.000</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	3.300	11.13	14.12	3.135	-	-	2.970	-	-	2.640	-	-	2.310	-	-	1.980	-	-	1.650	-	-	1.320	-	-	0.990	-	-	0.660	-	-	0.330	-	-	0.000	-	-
Output Voltage [V]	Load Current [A]																																											
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0.000	-	-																																										



# COSEL

Model		PBA30F-3R3	
Item		Overvoltage Protection	
Object		+3.3V6A	

1.Graph

—△—

Input Volt. 100V

---□---

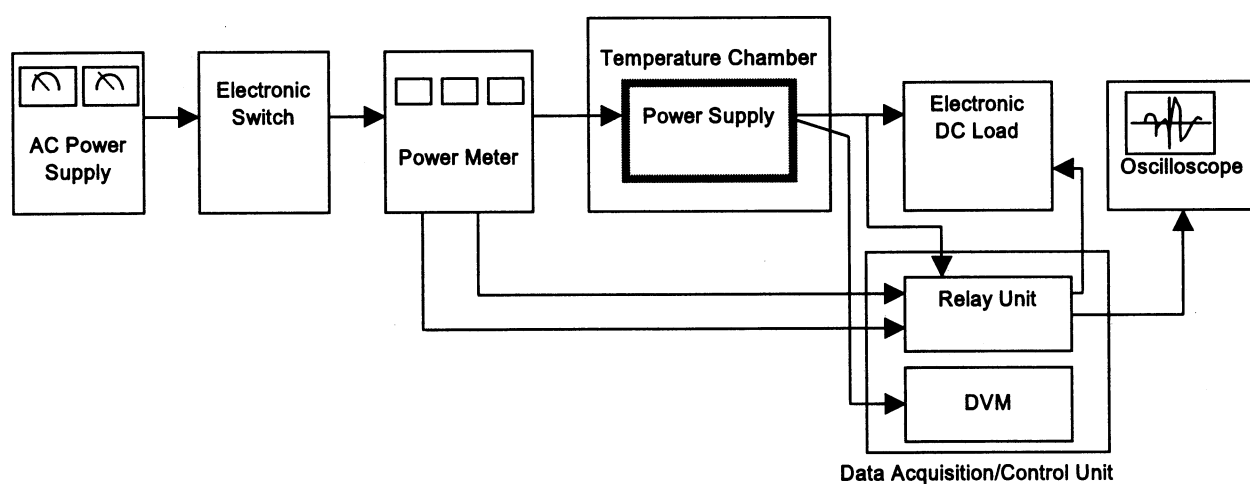
Input Volt. 200V

Ambient Temperature [°C]	Operating Point [V] (100V)	Operating Point [V] (200V)
-20	5.01	5.01
-10	4.95	4.95
0	4.95	4.95
10	4.89	4.89
20	4.83	4.83
25	4.83	4.83
30	4.77	4.77
40	4.77	4.77
50	4.71	4.71
60	4.65	4.65

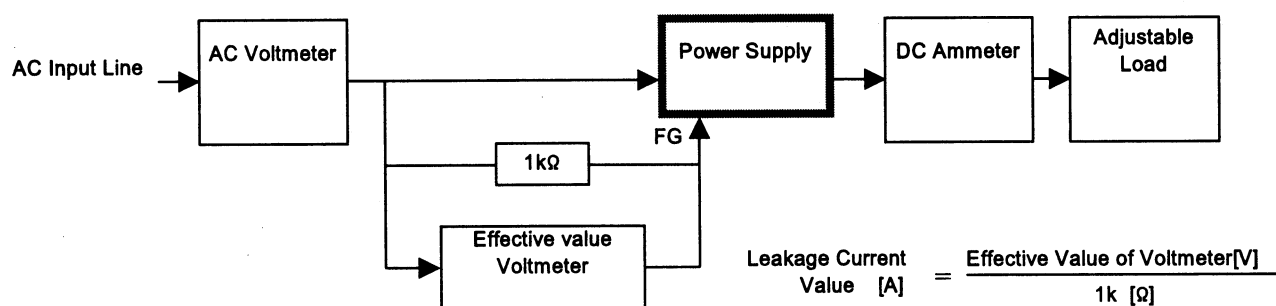
Note: Slanted line shows the range of the rated ambient temperature.

2.Values

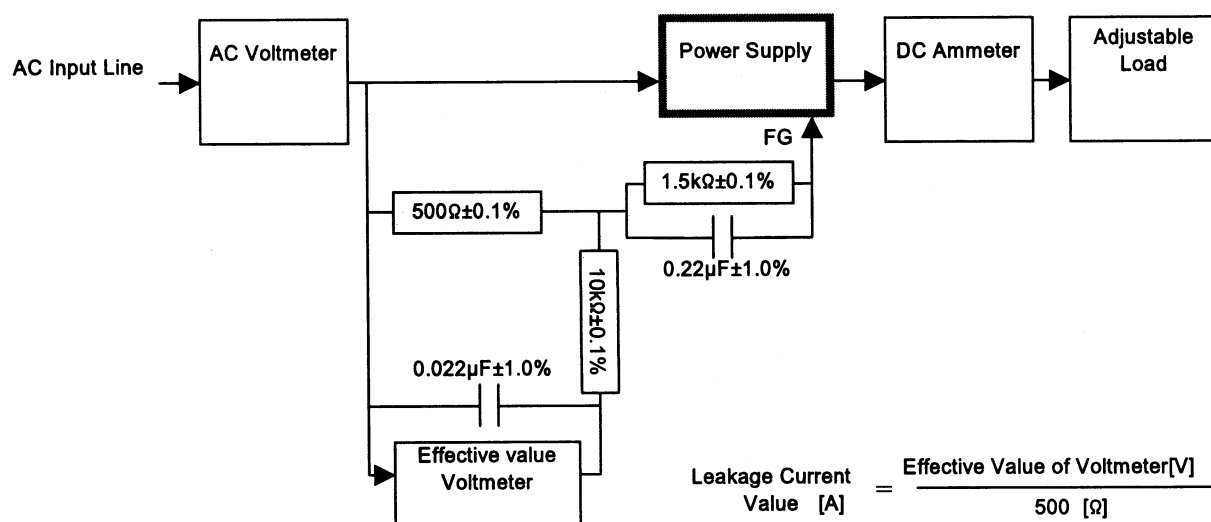
Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	5.01	5.01
-10	4.95	4.95
0	4.95	4.95
10	4.89	4.89
20	4.83	4.83
25	4.83	4.83
30	4.77	4.77
40	4.77	4.77
50	4.71	4.71
60	4.65	4.65
--	-	-



**Figure A**



**Figure B ( DEN-AN )**



**Figure B ( IEC60950 )**