

TEST DATA OF PMA100F-3R3

Regulated DC Power Supply
June 4, 2010

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Prepared by : Shintaro Oki
Shintaro Oki Design Engineer

COSEL CO.,LTD.

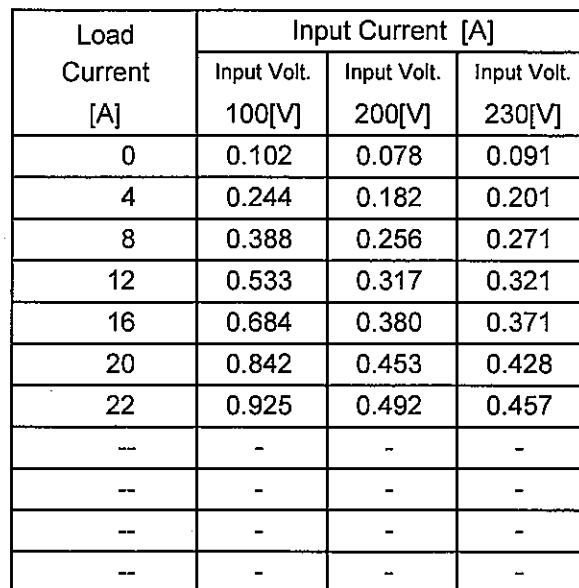
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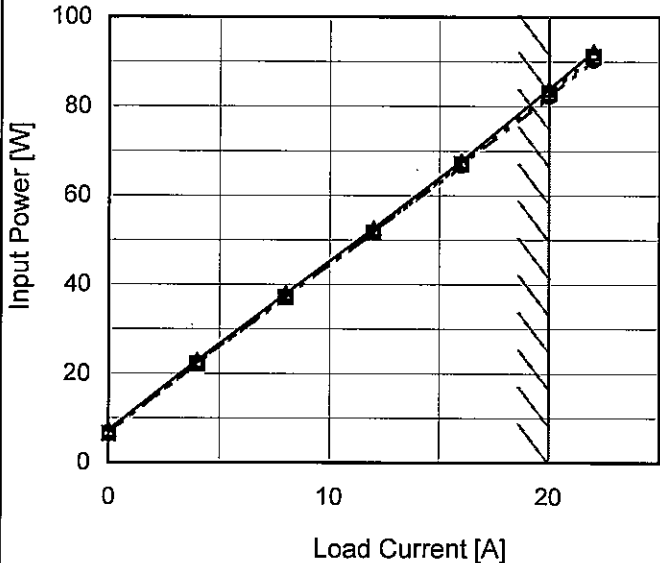
Temperature 25°C
Testing Circuitry Figure A

2.Values



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

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<div><div><div><div><div></div></div><div>Input Volt. 100V</div></div><div><div><div></div></div><div>Input Volt. 200V</div></div><div><div><div></div></div><div>Input Volt. 230V</div></div></div><p>Input Power [W]</p><p>Load Current [A]</p></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</td><td>7.27</td><td>6.50</td><td>6.70</td></tr><tr><td>4</td><td>22.95</td><td>22.10</td><td>22.30</td></tr><tr><td>8</td><td>37.90</td><td>37.10</td><td>37.20</td></tr><tr><td>12</td><td>52.60</td><td>51.70</td><td>51.70</td></tr><tr><td>16</td><td>67.70</td><td>67.10</td><td>66.70</td></tr><tr><td>20</td><td>83.90</td><td>82.90</td><td>82.20</td></tr><tr><td>22</td><td>92.20</td><td>91.10</td><td>90.30</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><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	7.27	6.50	6.70	4	22.95	22.10	22.30	8	37.90	37.10	37.20	12	52.60	51.70	51.70	16	67.70	67.10	66.70	20	83.90	82.90	82.20	22	92.20	91.10	90.30	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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		Temperature 25°C Testing Circuitry Figure A																																
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Item	Efficiency (by Input Voltage)																																	
Object																																		
1. Graph <div style="text-align: right; margin-right: 50px;"> ---□--- Load 50% —△— Load 100% </div> <p style="text-align: center;">Input Voltage [V]</p>		2. Values <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th><th colspan="2">Efficiency [%]</th></tr> <tr> <th>Load 50%</th><th>Load 100%</th></tr> </thead> <tbody> <tr><td>75</td><td>72.5</td><td>77.2</td></tr> <tr><td>85</td><td>72.8</td><td>78.0</td></tr> <tr><td>100</td><td>73.1</td><td>78.8</td></tr> <tr><td>120</td><td>73.1</td><td>79.4</td></tr> <tr><td>200</td><td>74.0</td><td>79.5</td></tr> <tr><td>230</td><td>74.2</td><td>80.3</td></tr> <tr><td>264</td><td>74.1</td><td>80.5</td></tr> <tr><td>280</td><td>74.2</td><td>80.4</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Input Voltage [V]	Efficiency [%]		Load 50%	Load 100%	75	72.5	77.2	85	72.8	78.0	100	73.1	78.8	120	73.1	79.4	200	74.0	79.5	230	74.2	80.3	264	74.1	80.5	280	74.2	80.4	--	-	-
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Model

PMA100F-3R3

Item

Power Factor (by Load Current)

Object

1.Graph

—△—

Input Volt. 100V

---□---

Input Volt. 200V

-○-

Input Volt. 230V

Power Factor

Load Current [A]

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

Temperature

25°C

Testing Circuitry

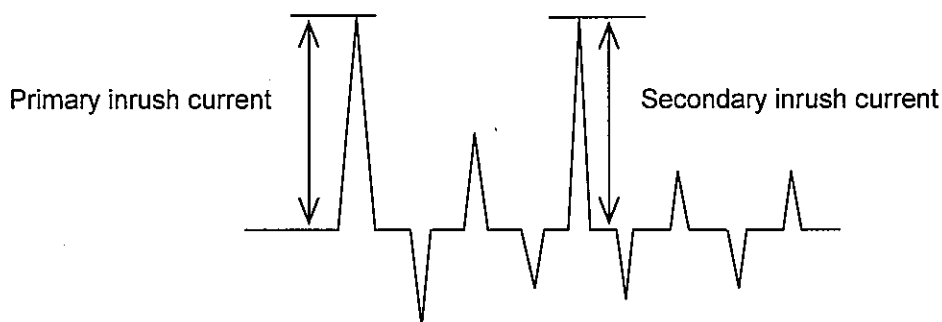
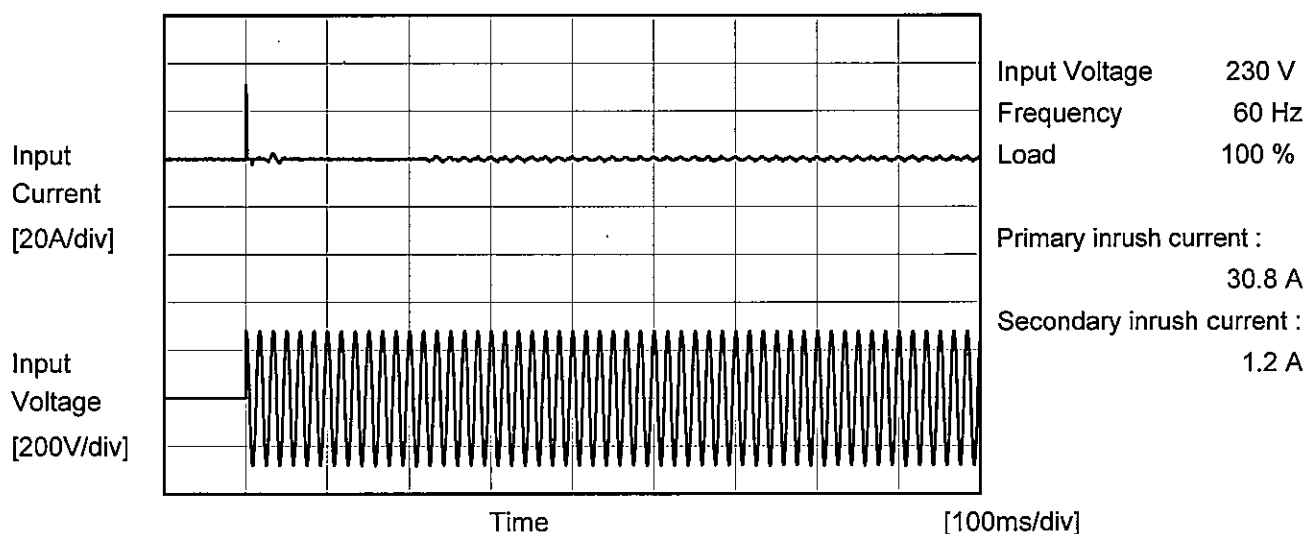
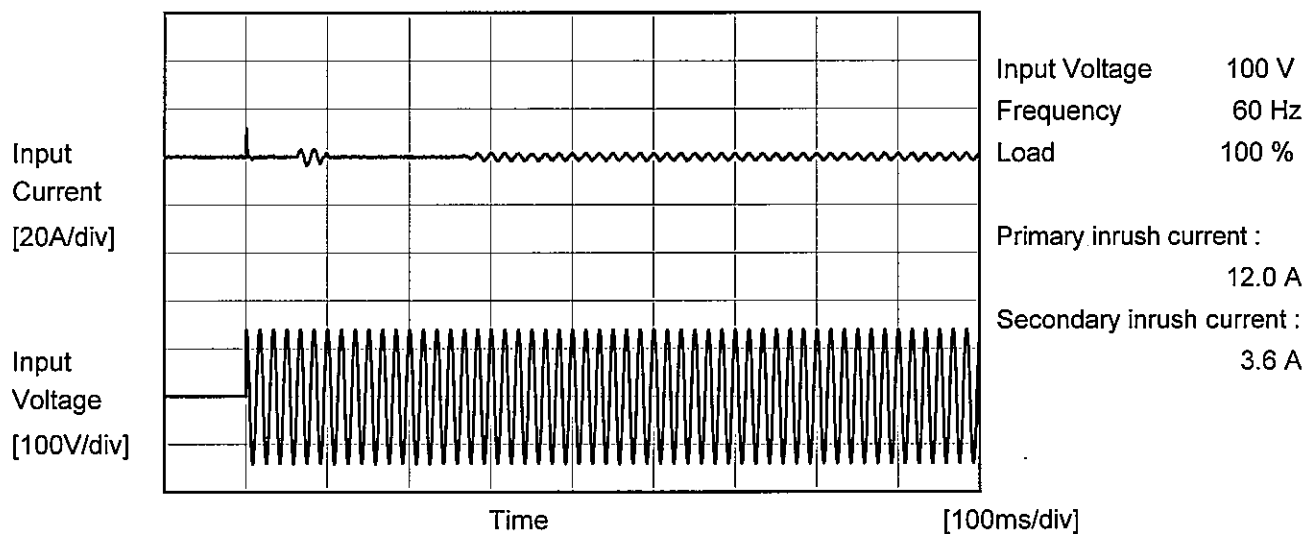
Figure A

2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.711	0.414	0.321
4	0.940	0.607	0.482
8	0.974	0.723	0.597
12	0.987	0.815	0.700
16	0.990	0.882	0.781
20	0.996	0.915	0.835
22	0.997	0.926	0.859
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	PMA100F-3R3	Temperature 25°C Testing Circuitry Figure A	
Item	Inrush Current		
Object			





		Temperature 25°C Testing Circuitry Figure B
Model	PMA100F-3R3	
Item	Leakage Current	
Object		

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
IEC60601	Both phases	0.04	0.10	0.16	Operation
	One of phases	0.09	0.19	0.22	Stand by

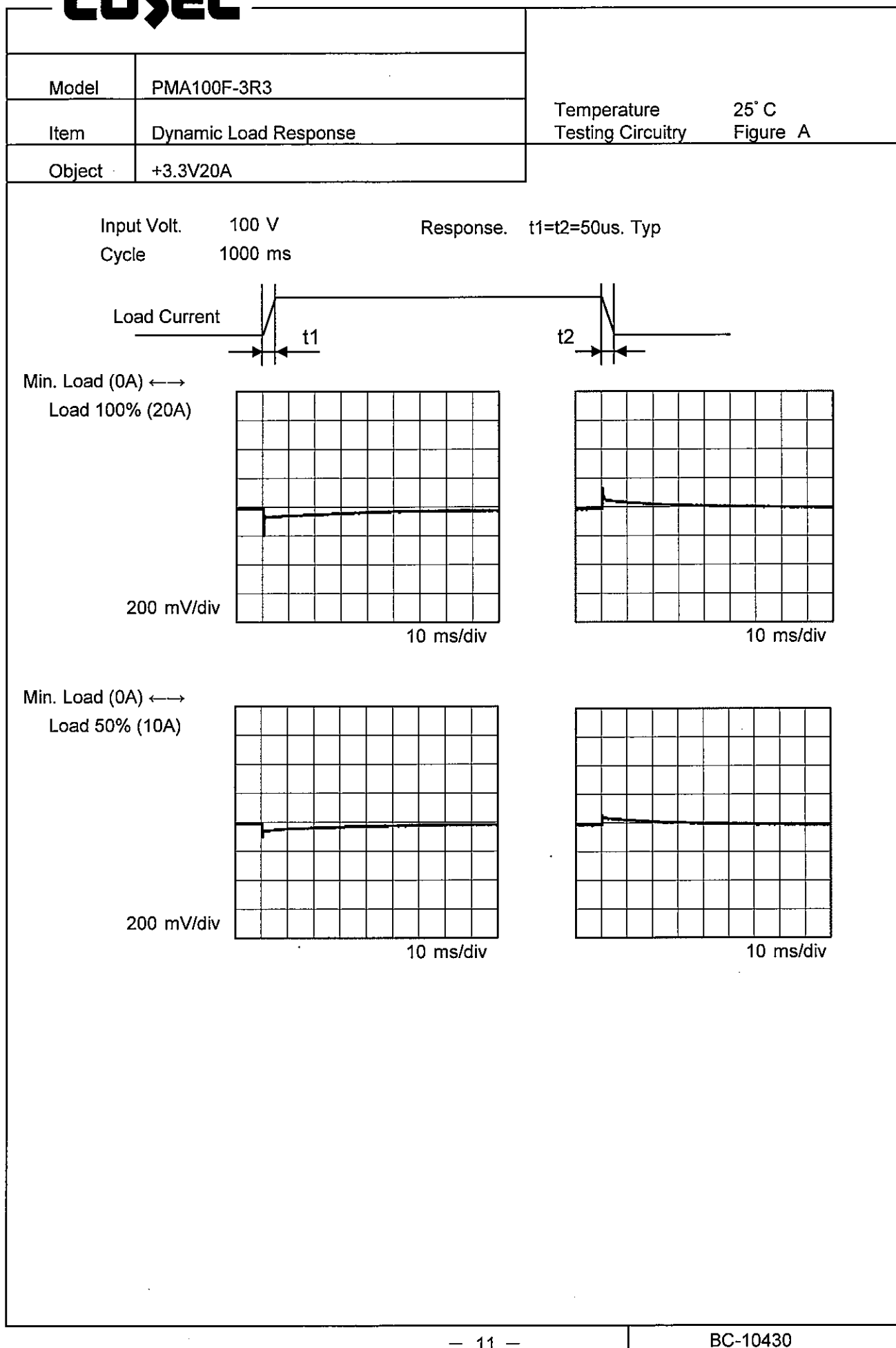
The value for "One of phases" is the reference value only.

2.Condition

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

Model	PMA100F-3R3																																
Item	Line Regulation	Temperature	25°C																														
		Testing Circuitry	Figure A																														
Object	+3.3V20A																																
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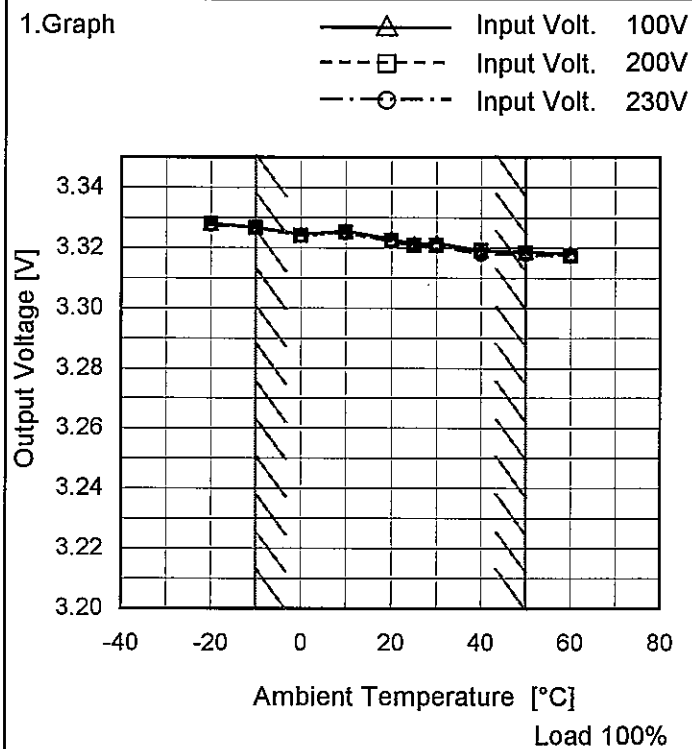
Model	PMA100F-3R3																																								
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																						
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Object	+3.3V20A	Testing Circuitry	Figure A
1.Graph		2.Values	
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BC-10430

Model	PMA100F-3R3
Item	Ambient Temperature Drift
Object	+3.3V20A

1. Graph



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

Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	3.328	3.328	3.328
-10	3.327	3.327	3.327
0	3.324	3.324	3.324
10	3.325	3.325	3.325
20	3.323	3.322	3.322
25	3.321	3.321	3.321
30	3.322	3.321	3.321
40	3.319	3.319	3.318
50	3.319	3.318	3.318
60	3.318	3.317	3.317
--	-	-	-

Model		PMA100F-3R3	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+3.3V20A	

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 : 100 - 230V

Load Current : 0 - 20A

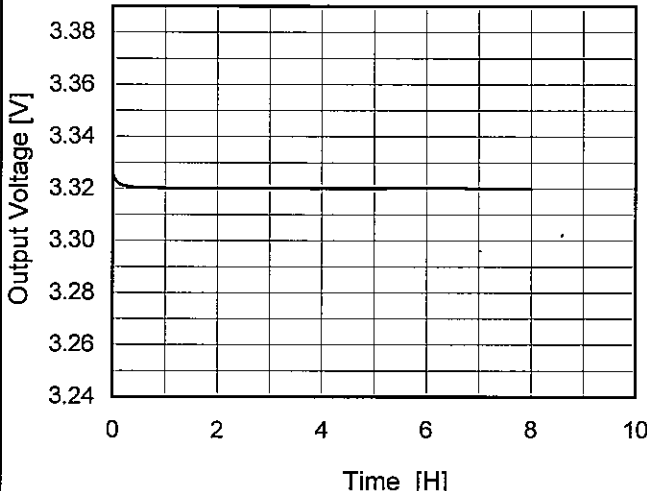
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

* 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	0	200	0	3.341	±29	±0.9
Minimum Voltage	0	85	0	3.283		

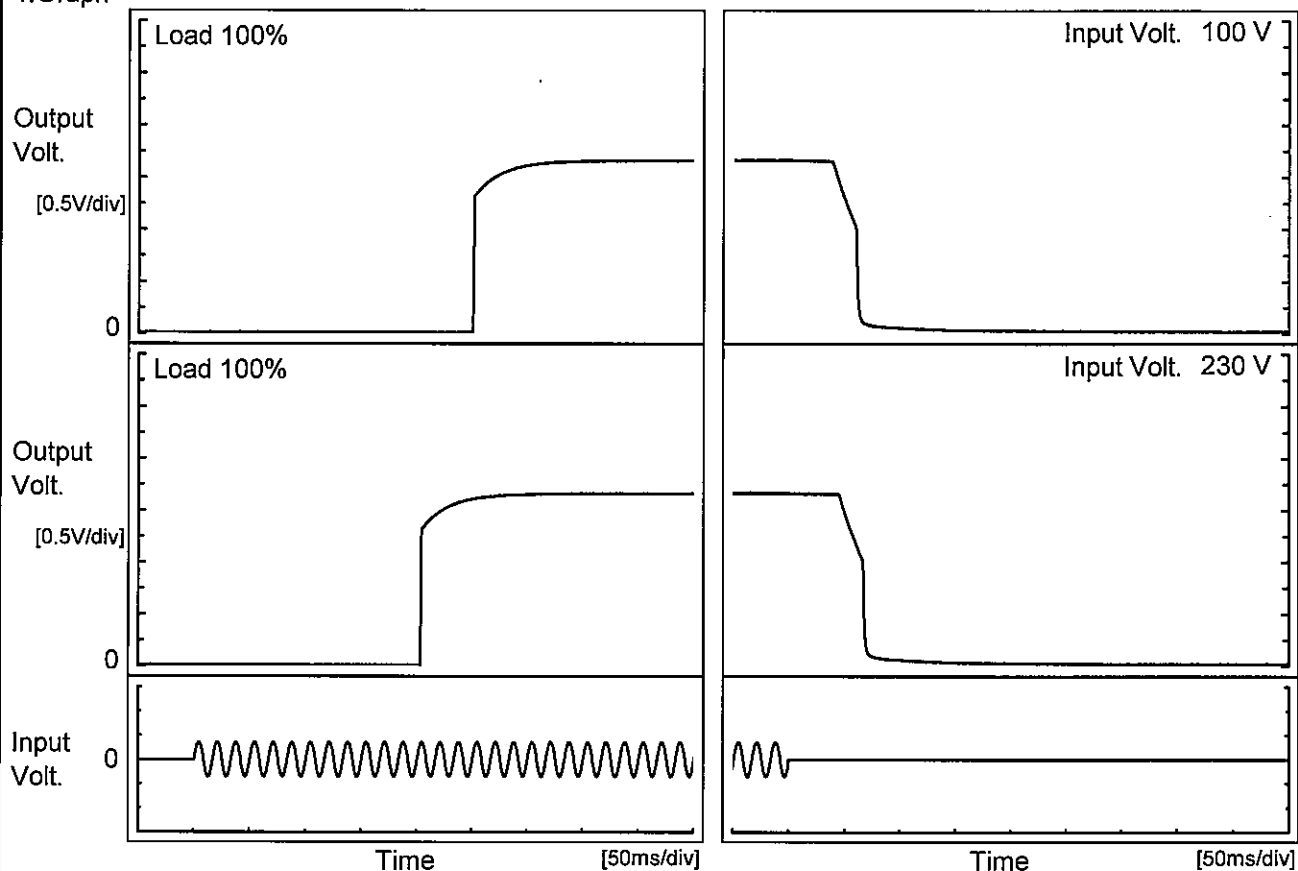
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Model		PMA100F-3R3		Temperature		25°C																							
Item		Time Lapse Drift		Testing Circuitry		Figure A																							
Object		+3.3V20A																											
1.Graph				2.Values																									
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 200V</p><p>Load 100%</p></div>				<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>3.326</td></tr><tr><td>0.5</td><td>3.320</td></tr><tr><td>1.0</td><td>3.320</td></tr><tr><td>2.0</td><td>3.320</td></tr><tr><td>3.0</td><td>3.320</td></tr><tr><td>4.0</td><td>3.320</td></tr><tr><td>5.0</td><td>3.320</td></tr><tr><td>6.0</td><td>3.320</td></tr><tr><td>7.0</td><td>3.320</td></tr><tr><td>8.0</td><td>3.320</td></tr></table>				Time since start [H]	Output Voltage [V]	0.0	3.326	0.5	3.320	1.0	3.320	2.0	3.320	3.0	3.320	4.0	3.320	5.0	3.320	6.0	3.320	7.0	3.320	8.0	3.320
Time since start [H]	Output Voltage [V]																												
0.0	3.326																												
0.5	3.320																												
1.0	3.320																												
2.0	3.320																												
3.0	3.320																												
4.0	3.320																												
5.0	3.320																												
6.0	3.320																												
7.0	3.320																												
8.0	3.320																												

COSEL

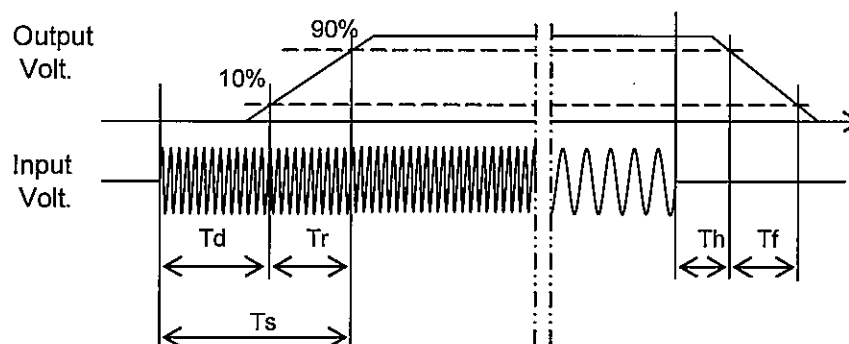
Model	PMA100F-3R3	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+3.3V20A		

1. Graph



2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		251.5	18.5	270.0	43.0	20.0
230 V		204.0	18.5	222.5	49.5	20.0

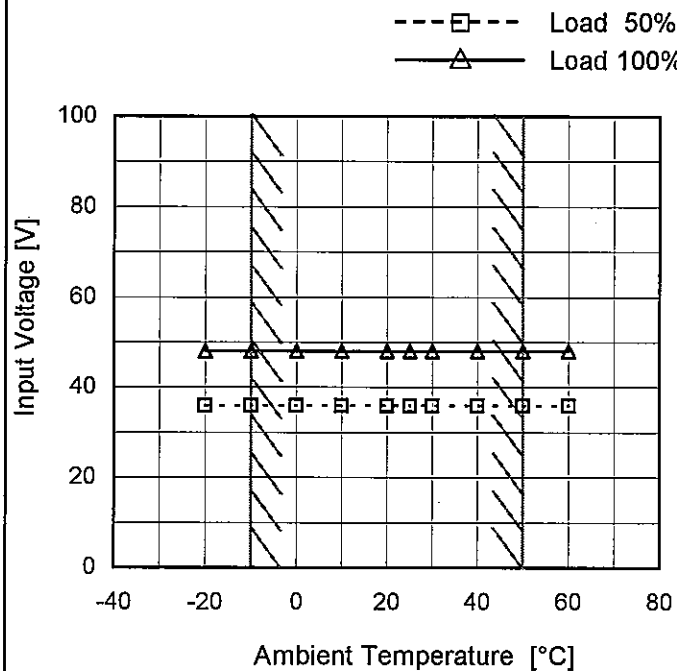


Model	PMA100F-3R3																																		
Item	Hold-Up Time	Temperature	25°C																																
		Testing Circuitry	Figure A																																
Object	+3.3V20A																																		
1.Graph		2.Values																																	
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Hold-Up Time [ms]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>75</td><td>77</td><td>33</td></tr><tr><td>85</td><td>80</td><td>36</td></tr><tr><td>100</td><td>83</td><td>39</td></tr><tr><td>120</td><td>86</td><td>41</td></tr><tr><td>200</td><td>93</td><td>45</td></tr><tr><td>230</td><td>97</td><td>47</td></tr><tr><td>264</td><td>94</td><td>48</td></tr><tr><td>280</td><td>95</td><td>48</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	77	33	85	80	36	100	83	39	120	86	41	200	93	45	230	97	47	264	94	48	280	95	48	--	-	-		
Input Voltage [V]	Hold-Up Time [ms]																																		
	Load 50%	Load 100%																																	
75	77	33																																	
85	80	36																																	
100	83	39																																	
120	86	41																																	
200	93	45																																	
230	97	47																																	
264	94	48																																	
280	95	48																																	
--	-	-																																	
<p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p> <p>Note: Slanted line shows the range of the rated input voltage.</p>																																			

Model	PMA100F-3R3																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+3.3V20A	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><div>-·-○-·-</div><div>Input Volt. 230V</div></div></div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</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</td><td>-</td><td>-</td><td>-</td></tr><tr><td>4</td><td>147</td><td>213</td><td>213</td></tr><tr><td>8</td><td>85</td><td>120</td><td>122</td></tr><tr><td>12</td><td>73</td><td>80</td><td>87</td></tr><tr><td>16</td><td>55</td><td>63</td><td>65</td></tr><tr><td>20</td><td>41</td><td>48</td><td>50</td></tr><tr><td>22</td><td>38</td><td>45</td><td>47</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><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	-	-	-	4	147	213	213	8	85	120	122	12	73	80	87	16	55	63	65	20	41	48	50	22	38	45	47	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
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16	55	63	65																																																			
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22	38	45	47																																																			
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Note: Slanted line shows the range of the rated load current.																																																						

Model	PMA100F-3R3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V20A

1. Graph



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

Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	36	48
-10	36	48
0	36	48
10	36	48
20	36	48
25	36	48
30	36	48
40	36	48
50	36	48
60	36	48
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Model	PMA100F-3R3																																								
Item	Oversvoltage Protection	Testing Circuitry Figure A																																							
Object	+3.3V20A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 230V</div></div></div> <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</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="2">Operating Point [V]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>-20</td><td>4.92</td><td>4.92</td></tr><tr><td>-10</td><td>4.80</td><td>4.92</td></tr><tr><td>0</td><td>4.80</td><td>4.81</td></tr><tr><td>10</td><td>4.80</td><td>4.81</td></tr><tr><td>20</td><td>4.69</td><td>4.81</td></tr><tr><td>25</td><td>4.68</td><td>4.69</td></tr><tr><td>30</td><td>4.68</td><td>4.69</td></tr><tr><td>40</td><td>4.68</td><td>4.69</td></tr><tr><td>50</td><td>4.68</td><td>4.69</td></tr><tr><td>60</td><td>4.62</td><td>4.63</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]		Input Volt. 100[V]	Input Volt. 230[V]	-20	4.92	4.92	-10	4.80	4.92	0	4.80	4.81	10	4.80	4.81	20	4.69	4.81	25	4.68	4.69	30	4.68	4.69	40	4.68	4.69	50	4.68	4.69	60	4.62	4.63	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																								
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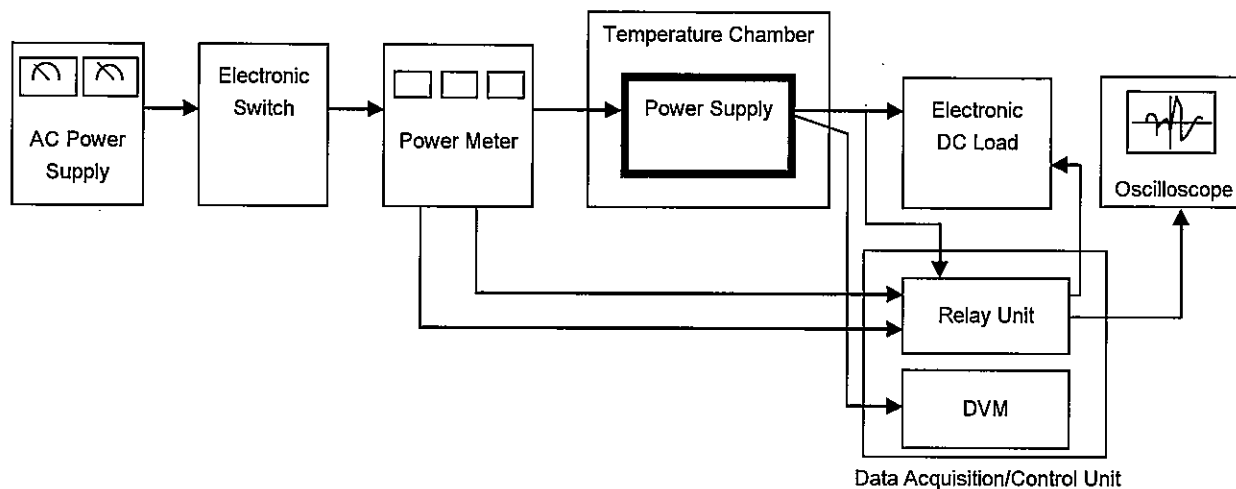


Figure A

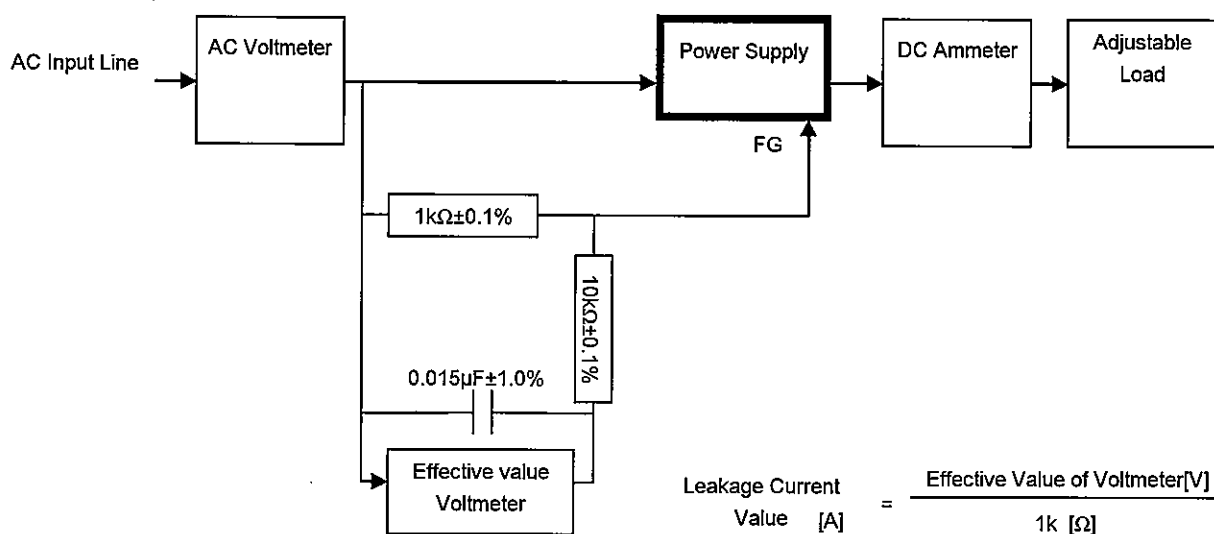


Figure B (IEC60601-1)