

TEST DATA OF PMA30F-3R3

Regulated DC Power Supply
June 4, 2010

Approved by : Katsumi Ishikawa
Katsumi Ishikawa _____ Design Manager

Prepared by : Tsutomu Okano
Tsutomu Okano _____ Design Engineer

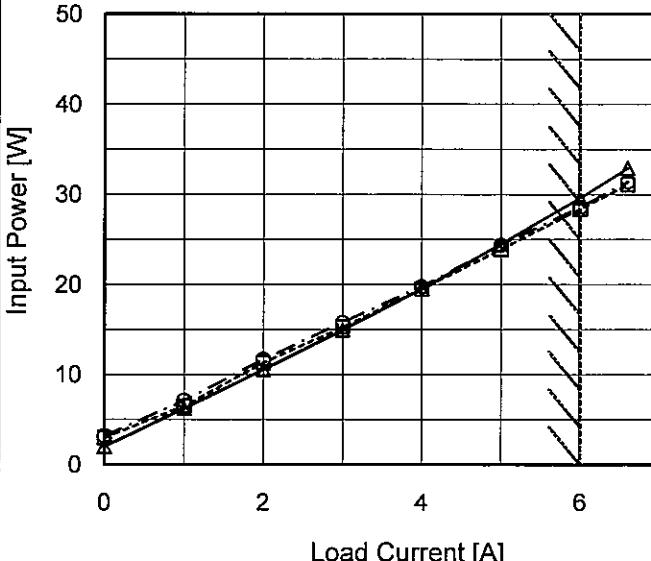
COSEL CO.,LTD.

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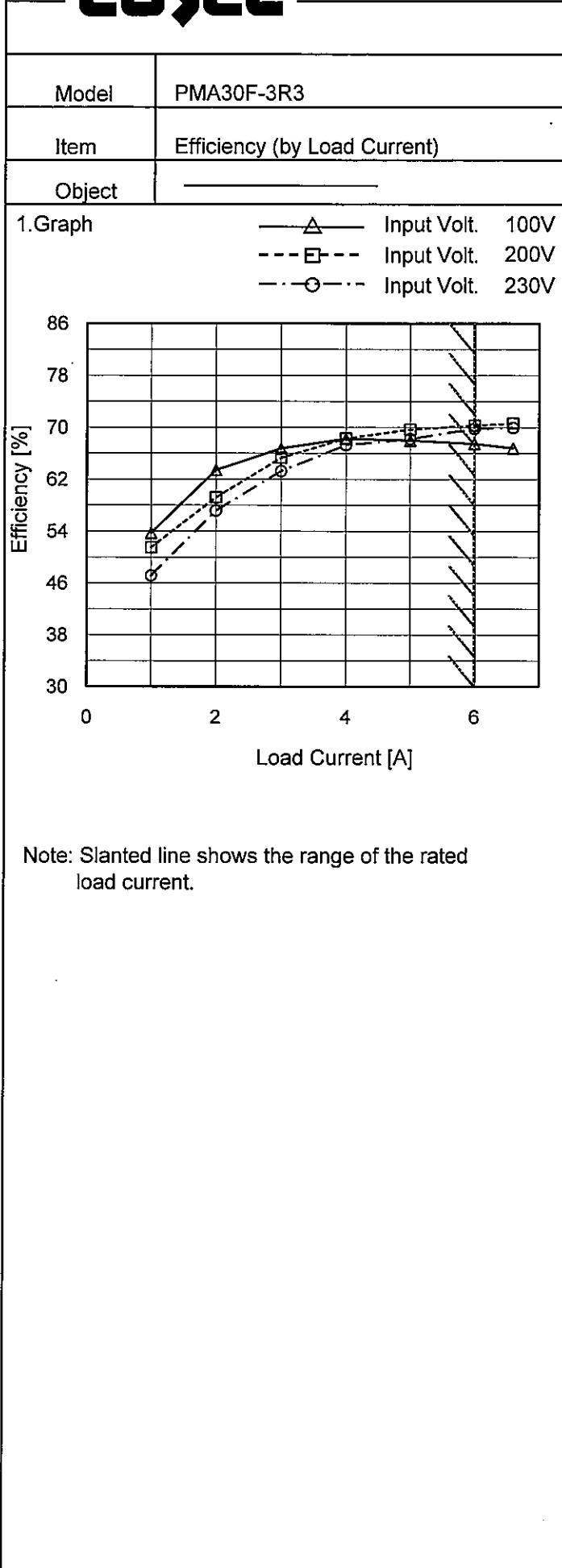
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 Temperature 25°C
 Testing Circuitry Figure A

2. Values

Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
1.0	53.7	51.5	47.1
2.0	63.4	59.2	57.2
3.0	66.8	65.3	63.3
4.0	68.3	68.3	67.3
5.0	68.0	69.7	68.3
6.0	67.5	70.3	69.8
6.6	66.8	70.6	70.0
--	-	-	-
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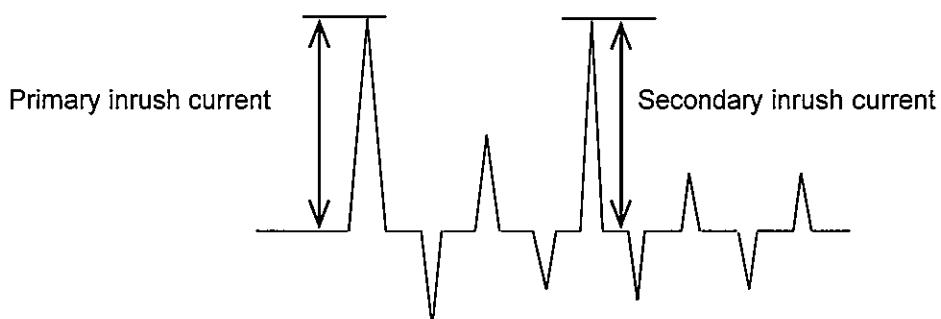
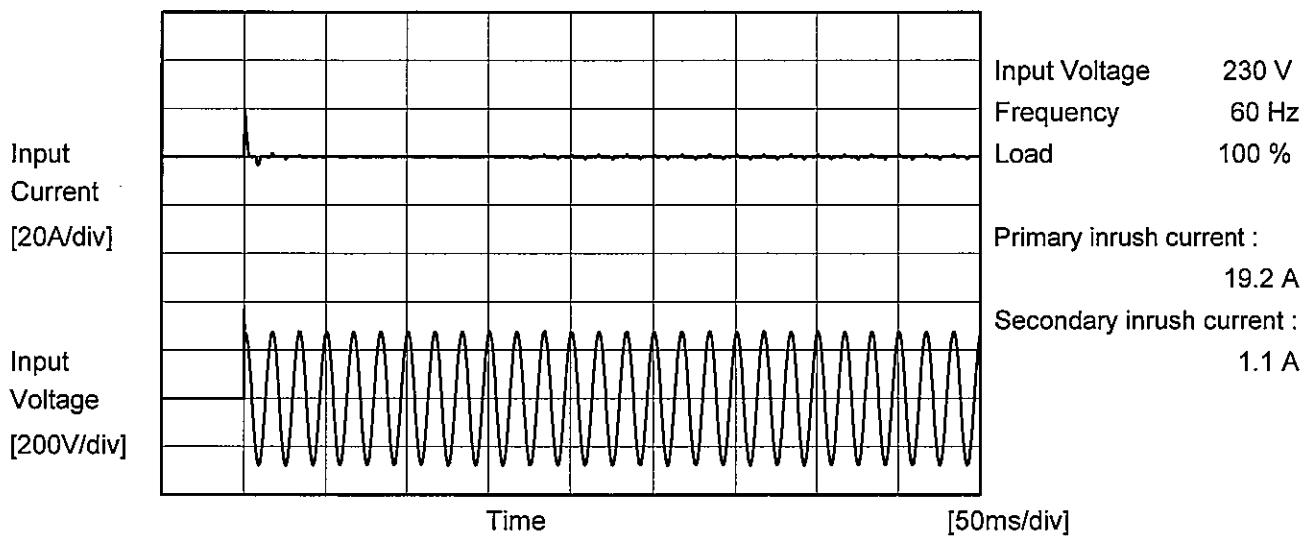
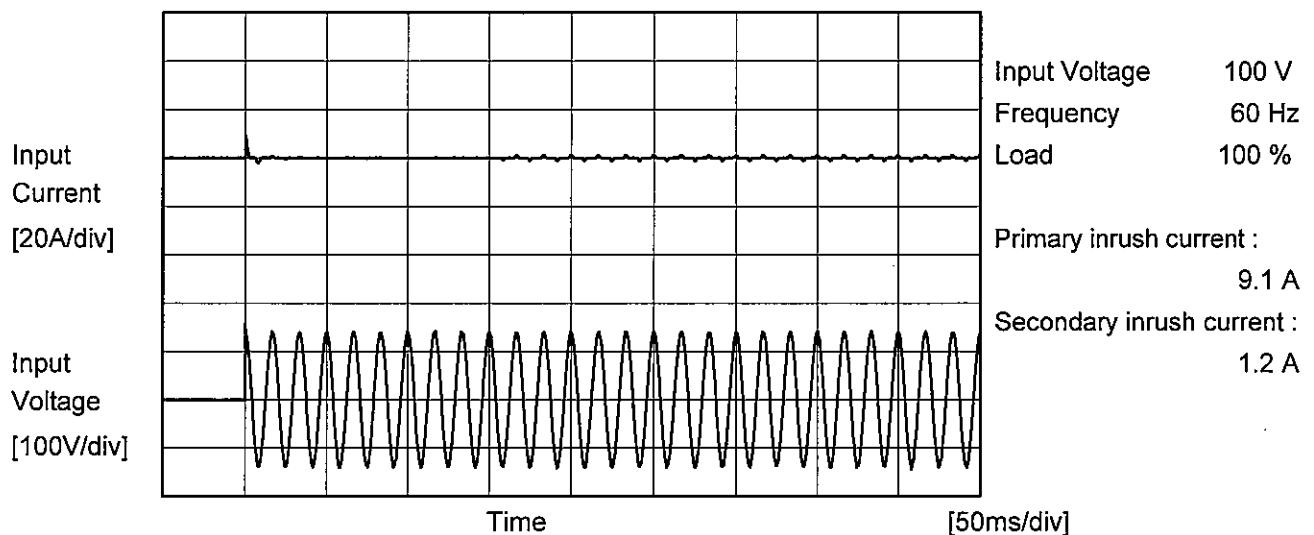
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Model	PMA30F-3R3	Temperature Testing Circuitry Figure A
Item	Inrush Current	
Object	_____	





Model	PMA30F-3R3	Temperature Testing Circuitry	25°C Figure B
Item	Leakage Current		
Object	<hr/>		

1. Results

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
IEC60601	Both phases	0.03	0.06	0.08	Operation
	One of phases	0.04	0.10	0.12	Stand by

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

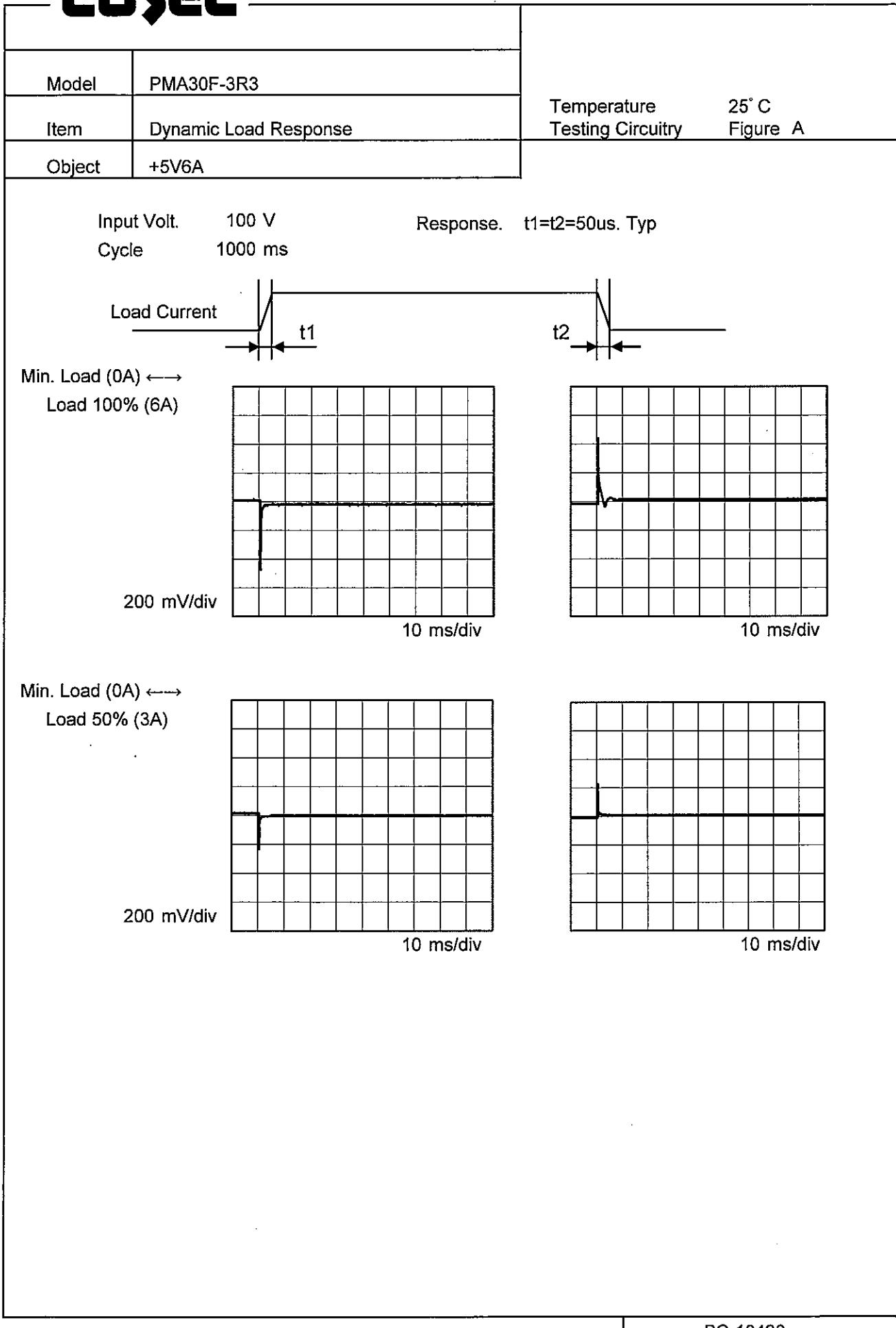
2. Condition

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

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<p>The graph plots Output Voltage [V] on the Y-axis (3.28 to 3.42) against Input Voltage [V] on the X-axis (50 to 300). Two sets of data points are shown: Load 50% (represented by squares) and Load 100% (represented by triangles). A horizontal dashed line at approximately 3.334 V represents the output voltage across the rated input voltage range of 90V to 270V.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Output Voltage [V] (Load 50%)</th> <th>Output Voltage [V] (Load 100%)</th> </tr> </thead> <tbody> <tr><td>90</td><td>3.334</td><td>3.334</td></tr> <tr><td>100</td><td>3.334</td><td>3.334</td></tr> <tr><td>200</td><td>3.334</td><td>3.334</td></tr> <tr><td>270</td><td>3.334</td><td>3.334</td></tr> </tbody> </table>				Input Voltage [V]	Output Voltage [V] (Load 50%)	Output Voltage [V] (Load 100%)	90	3.334	3.334	100	3.334	3.334	200	3.334	3.334	270	3.334	3.334																	
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2.0	3.337	3.337	3.337																																																			
3.0	3.334	3.334	3.334																																																			
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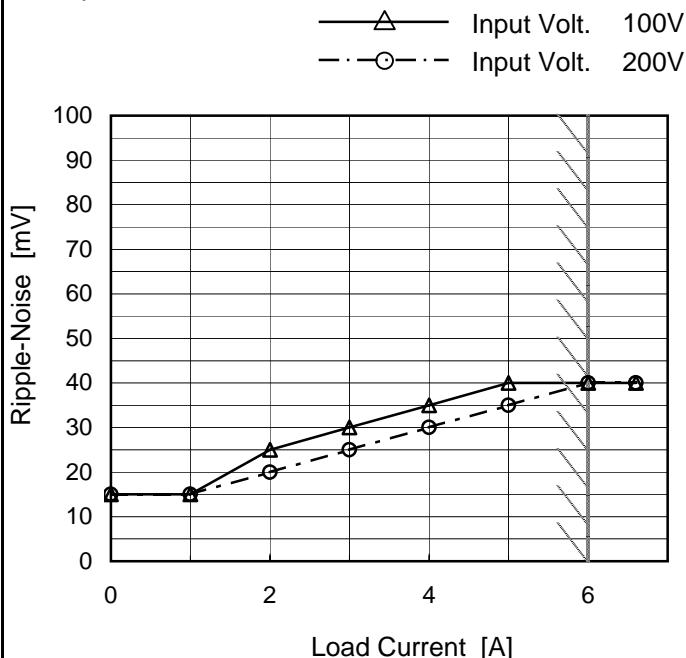
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<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 100 mV, and the X-axis ranges from 0 to 6 A. Two sets of data points are plotted: Input Volt. 100V (solid line with triangles) and Input Volt. 200V (dashed line with circles). Both sets show a slight increase in ripple voltage as load current increases. A slanted line indicates the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Voltage [mV] (Input Volt. 100V)</th> <th>Ripple Voltage [mV] (Input Volt. 200V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>10</td><td>10</td></tr> <tr><td>1.0</td><td>10</td><td>10</td></tr> <tr><td>2.0</td><td>15</td><td>15</td></tr> <tr><td>3.0</td><td>15</td><td>15</td></tr> <tr><td>4.0</td><td>15</td><td>15</td></tr> <tr><td>5.0</td><td>20</td><td>15</td></tr> <tr><td>6.0</td><td>20</td><td>15</td></tr> <tr><td>6.6</td><td>25</td><td>15</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>		Load Current [A]	Ripple Voltage [mV] (Input Volt. 100V)	Ripple Voltage [mV] (Input Volt. 200V)	0.0	10	10	1.0	10	10	2.0	15	15	3.0	15	15	4.0	15	15	5.0	20	15	6.0	20	15	6.6	25	15	--	-	-	--	-	-	--	-	-			
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<p>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.</p> <p>Figure showing a complex ripple wave form. The Y-axis is labeled "Ripple [mVp-p]". Two time intervals are indicated: T1, which is the full width of the waveform, and T2, which is a smaller interval within T1, specifically the period of the switching component.</p> <p>Fig. Complex Ripple Wave Form</p>																																								

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Model	PMA30F-3R3
Item	Ripple-Noise
Object	+3.3V6A

 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]
0.0	15	15
1.0	15	15
2.0	25	20
3.0	30	25
4.0	35	30
5.0	40	35
6.0	40	40
6.6	40	40
--	-	-
--	-	-
--	-	-

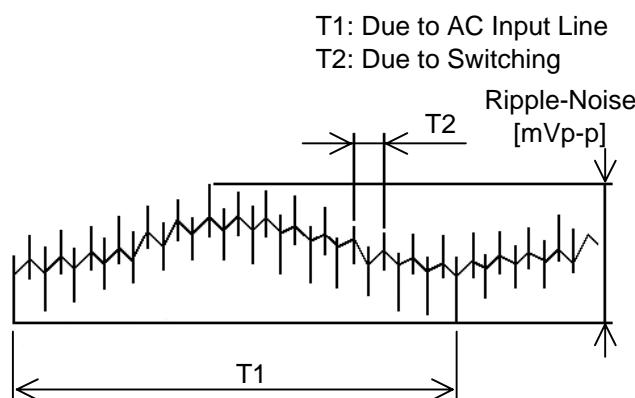
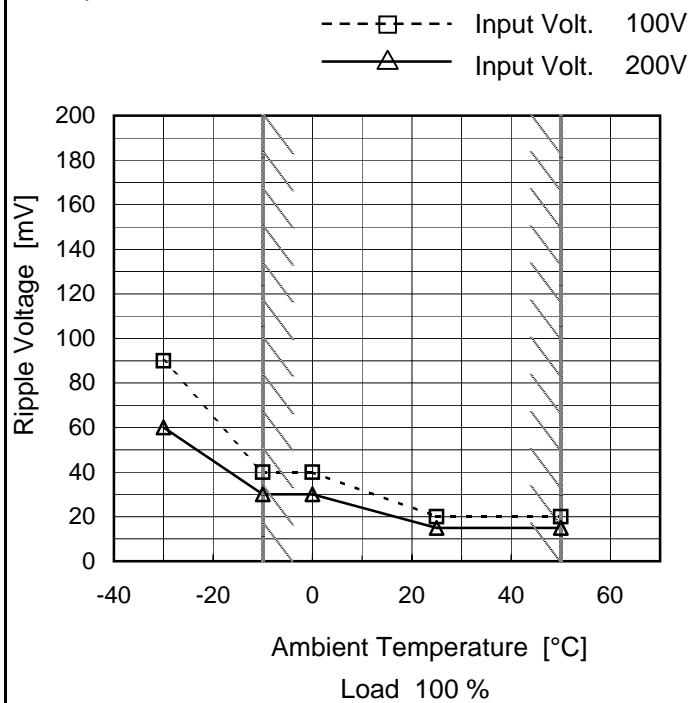


Fig. Complex Ripple Wave Form

COSEL

Model	PMA30F-3R3
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V6A

1. Graph



Measured by 20 MHz Oscilloscope.

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

Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	90	60
-10	40	30
0	40	30
25	20	15
50	20	15
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-



<table border="1"> <tr><td>Model</td><td>PMA30F-3R3</td></tr> <tr><td>Item</td><td>Ambient Temperature Drift</td></tr> <tr><td>Object</td><td>+3.3V6A</td></tr> <tr><td>1.Graph</td><td> <p style="text-align: center;"> —△— Input Volt. 100V ---□--- Input Volt. 200V ---○--- Input Volt. 230V </p> </td></tr> </table>	Model	PMA30F-3R3	Item	Ambient Temperature Drift	Object	+3.3V6A	1.Graph	<p style="text-align: center;"> —△— Input Volt. 100V ---□--- Input Volt. 200V ---○--- Input Volt. 230V </p>	Testing Circuitry Figure A																																										
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Ambient Temperature [°C]		Output Voltage [V]																																																	
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Note: Slanted line shows the range of the rated ambient temperature.



Model	PMA30F-3R3	Testing Circuitry Figure A
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 = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

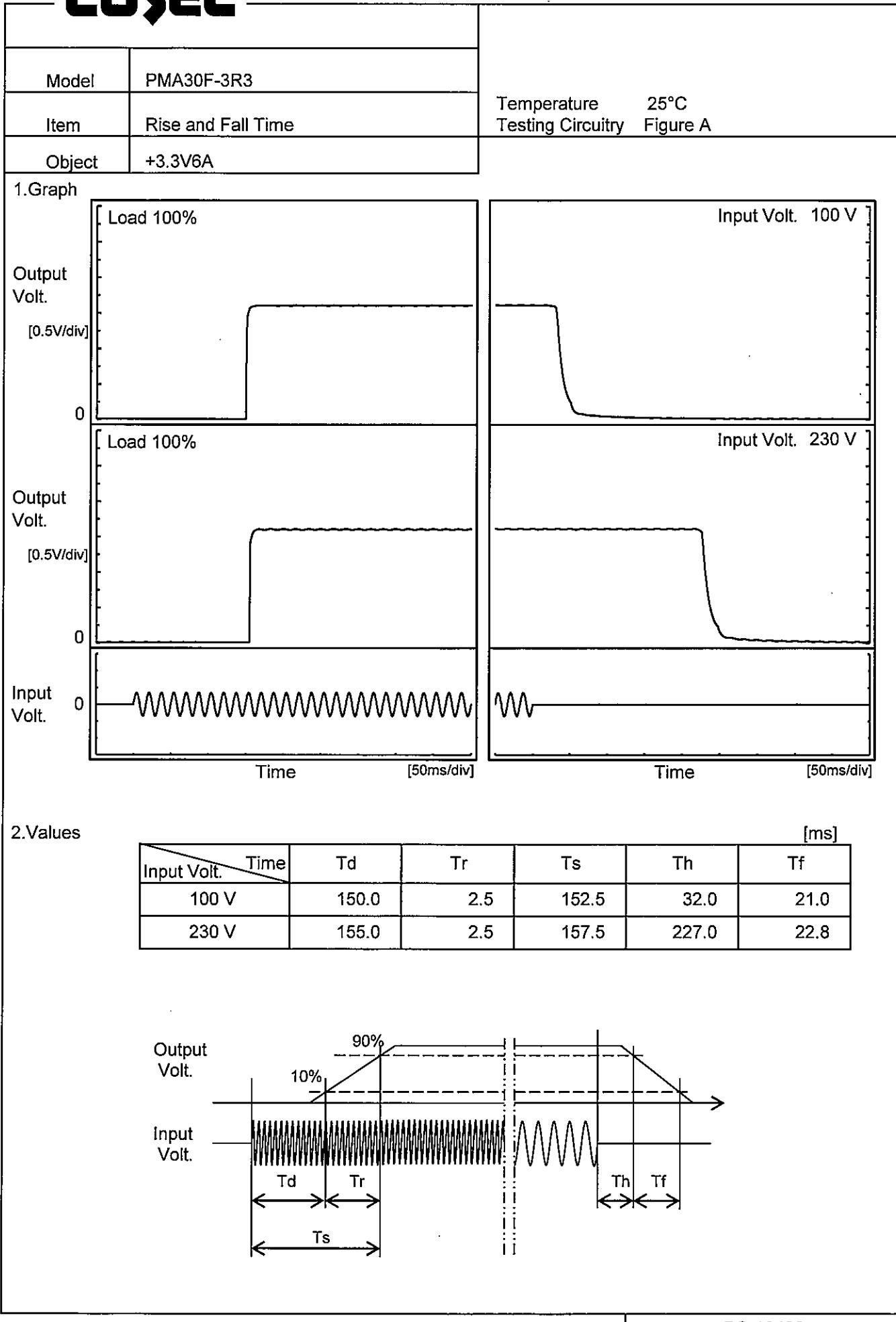
2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	200	0	3.343	± 11	± 0.3
Minimum Voltage	-10	264	6	3.322		

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Model	PMA30F-3R3	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+3.3V6A																								
1.Graph			2.Values																						
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 230V Load 100%</p>			<table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>3.325</td></tr> <tr><td>0.5</td><td>3.326</td></tr> <tr><td>1.0</td><td>3.326</td></tr> <tr><td>2.0</td><td>3.326</td></tr> <tr><td>3.0</td><td>3.326</td></tr> <tr><td>4.0</td><td>3.326</td></tr> <tr><td>5.0</td><td>3.326</td></tr> <tr><td>6.0</td><td>3.326</td></tr> <tr><td>7.0</td><td>3.326</td></tr> <tr><td>8.0</td><td>3.326</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	3.325	0.5	3.326	1.0	3.326	2.0	3.326	3.0	3.326	4.0	3.326	5.0	3.326	6.0	3.326	7.0	3.326	8.0	3.326
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* The characteristic of AC100V is equal.

COSEL

Model	PMA30F-3R3	Temperature	25°C																																
Item	Hold-Up Time	Testing Circuitry	Figure A																																
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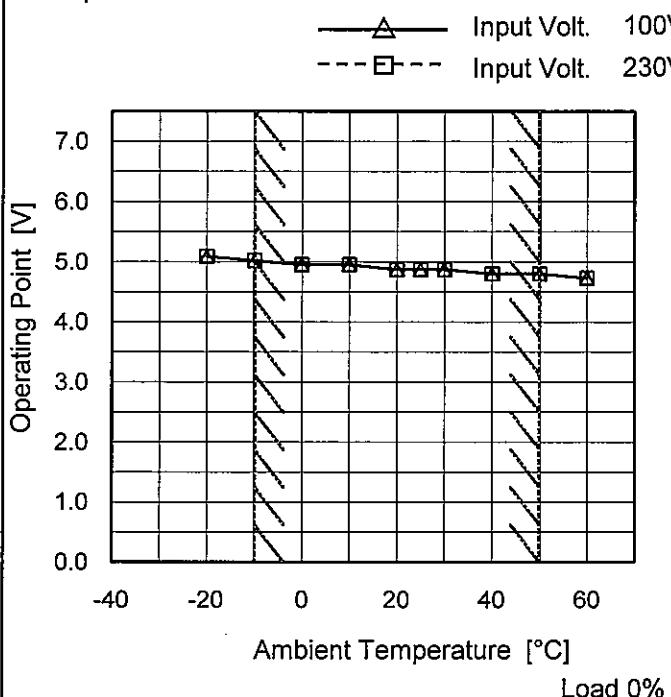
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1.0	190	824	1089																																																				
2.0	106	477	632																																																				
3.0	73	338	450																																																				
4.0	54	257	345																																																				
5.0	40	206	279																																																				
6.0	31	171	231																																																				
6.6	29	154	208																																																				
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Model	PMA30F-3R3	Testing Circuitry Figure A																																						
Item	Minimum Input Voltage for Regulated Output Voltage																																							
Object	+3.3V6A																																							
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<p style="text-align: center;"> --- □ --- Load 50% —△— Load 100% </p>																																								
2.Values																																								
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Model	PMA30F-3R3	Temperature	25°C																																									
Item	Overcurrent Protection	Testing Circuitry	Figure A																																									
Object	+3.3V6A																																											
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<p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="2">Load Current [A]</th> </tr> <tr> <th>Input Volt. 100[V]</th> <th>Input Volt. 230[V]</th> </tr> </thead> <tbody> <tr><td>3.300</td><td>8.13</td><td>8.08</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> </tbody> </table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 230[V]	3.300	8.13	8.08	3.135	-	-	2.970	-	-	2.640	-	-	2.310	-	-	1.980	-	-	1.650	-	-	1.320	-	-	0.990	-	-	0.660	-	-	0.330	-	-	0.000	-	-
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Model	PMA30F-3R3
Item	Overvoltage Protection
Object	+3.3V6A

1.Graph



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

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-20	5.09	5.09
-10	5.02	5.02
0	4.95	4.95
10	4.95	4.95
20	4.87	4.87
25	4.87	4.87
30	4.87	4.87
40	4.80	4.80
50	4.80	4.80
60	4.73	4.73
--	-	-

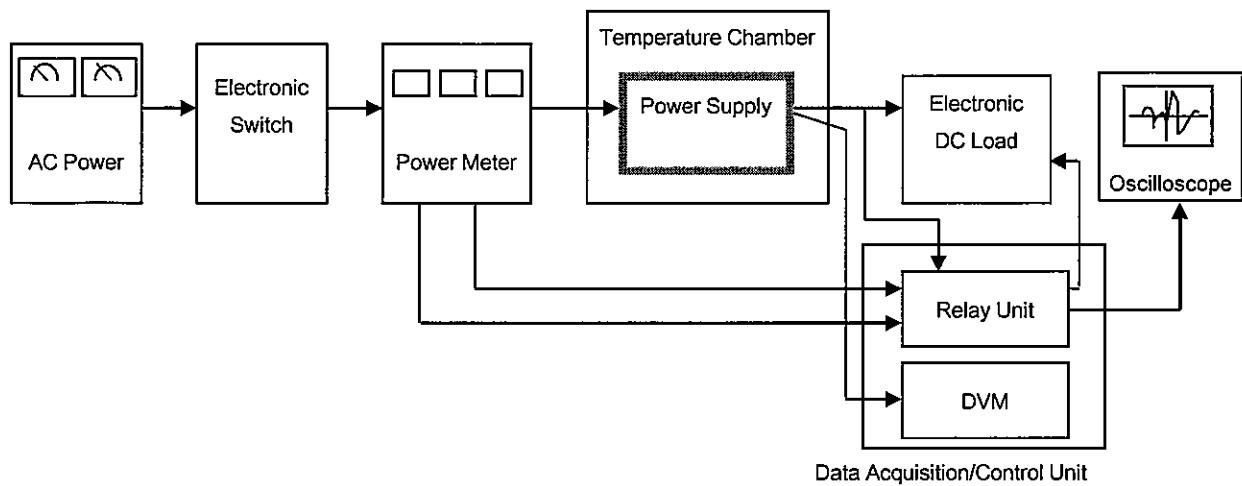


Figure A

