

TEST DATA OF LHA15F-5

Regulated DC Power Supply
February 2, 2022

Approved by : Tetsukazu Okamoto
Design Manager

Prepared by : Naofumi Nakada
Design Engineer

COSEL CO.,LTD.

CONTENTS

1.Input Current (by Load Current)	1
2.Efficiency (by Load Current)	2
3.Power Factor (by Load Current)	3
4.Inrush Current	4
5.Leakage Current	5
6.Line Regulation	6
7.Load Regulation	7
8.Dynamic Load Response	8
9.Ripple-Noise (by Load Current)	9
10.Ambient Temperature Drift	10
11.Rise and Fall Time	11
12.Hold-Up Time	12
13.Instantaneous Interruption Compensation	13
14.Minimum Input Voltage for Regulated Output Voltage	14
15.Overcurrent Protection	15
16.Overvoltage Protection	16
17.Figure of Testing Circuitry	17

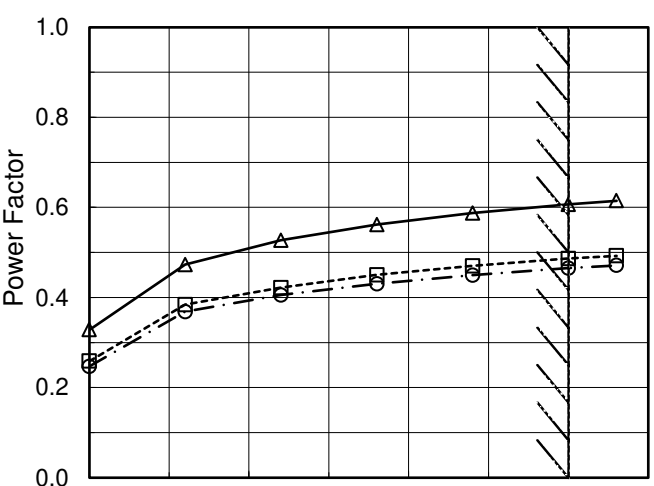
(Final Page 18)

Model		LHA15F-5		Temperature 25°C																																																				
Item		Input Current (by Load Current)		Testing Circuitry Figure A																																																				
Object		_____																																																						
1.Graph		<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><div>Input Current [A]</div><div>Load Current [A]</div></div>		2.Values																																																				
		<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>0.010</td><td>0.008</td><td>0.008</td></tr><tr><td>0.6</td><td>0.086</td><td>0.054</td><td>0.049</td></tr><tr><td>1.2</td><td>0.150</td><td>0.093</td><td>0.086</td></tr><tr><td>1.8</td><td>0.211</td><td>0.131</td><td>0.119</td></tr><tr><td>2.4</td><td>0.270</td><td>0.165</td><td>0.150</td></tr><tr><td>3.0</td><td>0.331</td><td>0.200</td><td>0.182</td></tr><tr><td>3.3</td><td>0.362</td><td>0.217</td><td>0.198</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 Current [A]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	0.010	0.008	0.008	0.6	0.086	0.054	0.049	1.2	0.150	0.093	0.086	1.8	0.211	0.131	0.119	2.4	0.270	0.165	0.150	3.0	0.331	0.200	0.182	3.3	0.362	0.217	0.198	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Input Current [A]																																																							
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																					
0.0	0.010	0.008	0.008																																																					
0.6	0.086	0.054	0.049																																																					
1.2	0.150	0.093	0.086																																																					
1.8	0.211	0.131	0.119																																																					
2.4	0.270	0.165	0.150																																																					
3.0	0.331	0.200	0.182																																																					
3.3	0.362	0.217	0.198																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
Note: Slanted line shows the range of the rated load current.																																																								



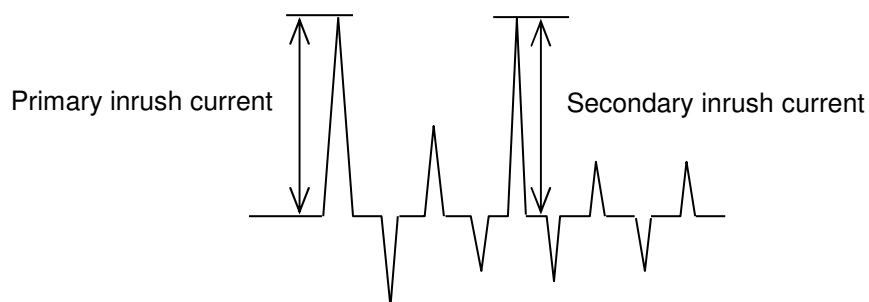
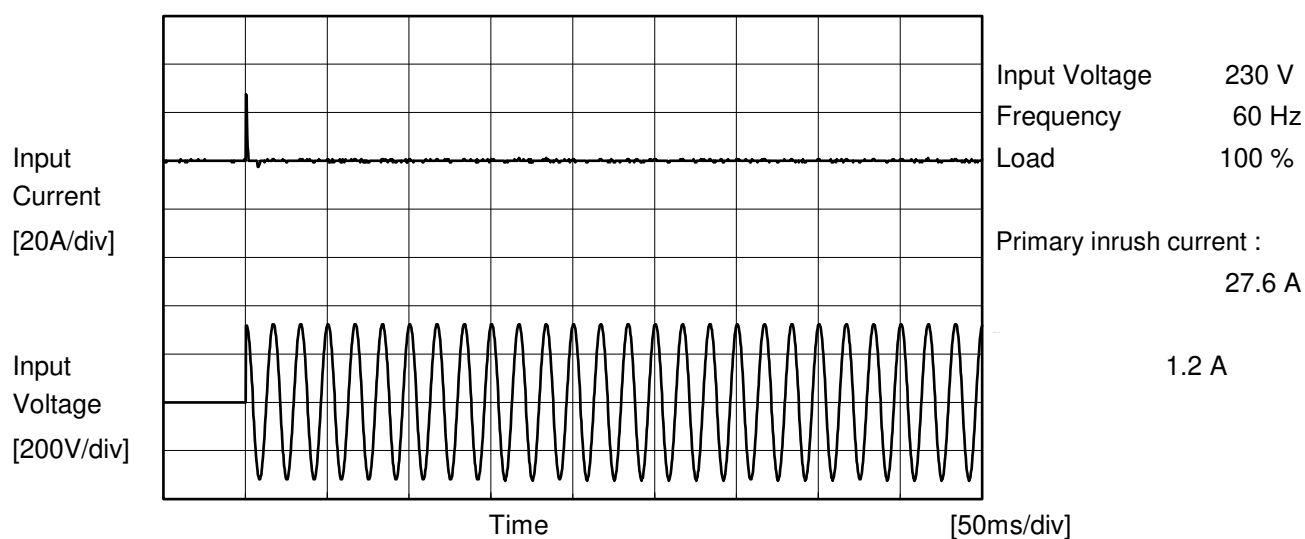
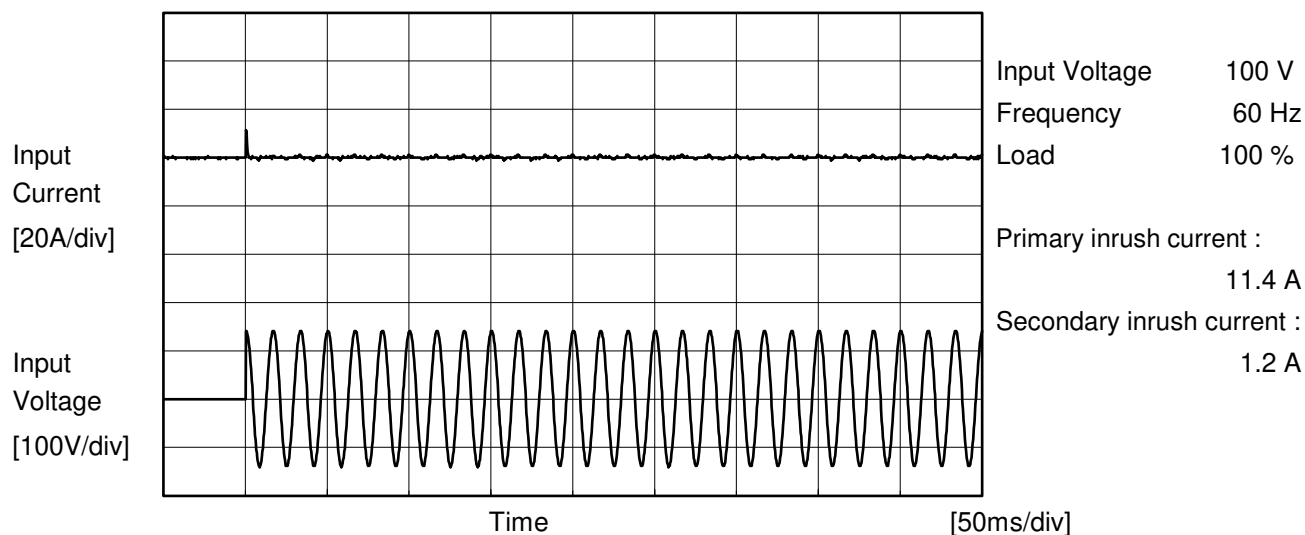
Model		LHA15F-5	Temperature 25°C Testing Circuitry Figure A																																																		
Item		Efficiency (by Load Current)																																																			
Object																																																					
1.Graph		<div><div><div>—△—</div><div>---□---</div><div>---○---</div></div><div><div>Input Volt. 100V</div><div>Input Volt. 200V</div><div>Input Volt. 230V</div></div></div> <div><table><thead><tr><th>Load Current [A]</th><th>100V [%]</th><th>200V [%]</th><th>230V [%]</th></tr></thead><tbody><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.6</td><td>72.9</td><td>72.8</td><td>72.4</td></tr><tr><td>1.2</td><td>75.9</td><td>75.6</td><td>76.0</td></tr><tr><td>1.8</td><td>76.0</td><td>77.1</td><td>77.1</td></tr><tr><td>2.4</td><td>75.9</td><td>77.4</td><td>77.6</td></tr><tr><td>3.0</td><td>75.0</td><td>77.2</td><td>77.2</td></tr><tr><td>3.3</td><td>74.3</td><td>77.3</td><td>77.3</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></tbody></table></div> <div>Note: Slanted line shows the range of the rated load current.</div>	Load Current [A]	100V [%]	200V [%]	230V [%]	0.0	-	-	-	0.6	72.9	72.8	72.4	1.2	75.9	75.6	76.0	1.8	76.0	77.1	77.1	2.4	75.9	77.4	77.6	3.0	75.0	77.2	77.2	3.3	74.3	77.3	77.3	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	2.Values		
Load Current [A]	100V [%]	200V [%]	230V [%]																																																		
0.0	-	-	-																																																		
0.6	72.9	72.8	72.4																																																		
1.2	75.9	75.6	76.0																																																		
1.8	76.0	77.1	77.1																																																		
2.4	75.9	77.4	77.6																																																		
3.0	75.0	77.2	77.2																																																		
3.3	74.3	77.3	77.3																																																		
--	-	-	-																																																		
--	-	-	-																																																		
--	-	-	-																																																		
--	-	-	-																																																		
		<table><thead><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</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>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.6</td><td>72.9</td><td>72.8</td><td>72.4</td></tr><tr><td>1.2</td><td>75.9</td><td>75.6</td><td>76.0</td></tr><tr><td>1.8</td><td>76.0</td><td>77.1</td><td>77.1</td></tr><tr><td>2.4</td><td>75.9</td><td>77.4</td><td>77.6</td></tr><tr><td>3.0</td><td>75.0</td><td>77.2</td><td>77.2</td></tr><tr><td>3.3</td><td>74.3</td><td>77.3</td><td>77.3</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></tbody></table>	Load Current [A]	Efficiency [%]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	-	-	-	0.6	72.9	72.8	72.4	1.2	75.9	75.6	76.0	1.8	76.0	77.1	77.1	2.4	75.9	77.4	77.6	3.0	75.0	77.2	77.2	3.3	74.3	77.3	77.3	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Efficiency [%]																																																				
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																		
0.0	-	-	-																																																		
0.6	72.9	72.8	72.4																																																		
1.2	75.9	75.6	76.0																																																		
1.8	76.0	77.1	77.1																																																		
2.4	75.9	77.4	77.6																																																		
3.0	75.0	77.2	77.2																																																		
3.3	74.3	77.3	77.3																																																		
--	-	-	-																																																		
--	-	-	-																																																		
--	-	-	-																																																		
--	-	-	-																																																		



Model		LHA15F-5	Temperature 25°C Testing Circuitry Figure A																																																			
Item		Power Factor (by Load Current)																																																				
Object		_____																																																				
1.Graph		<div><div>—△—</div>Input Volt. 100V</div> <div><div>---□---</div>Input Volt. 200V</div> <div><div>---○---</div>Input Volt. 230V</div> 	2.Values																																																			
			<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Power Factor</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>0.329</td><td>0.259</td><td>0.247</td></tr><tr><td>0.6</td><td>0.473</td><td>0.384</td><td>0.369</td></tr><tr><td>1.2</td><td>0.527</td><td>0.422</td><td>0.406</td></tr><tr><td>1.8</td><td>0.562</td><td>0.450</td><td>0.430</td></tr><tr><td>2.4</td><td>0.587</td><td>0.470</td><td>0.450</td></tr><tr><td>3.0</td><td>0.607</td><td>0.486</td><td>0.465</td></tr><tr><td>3.3</td><td>0.615</td><td>0.493</td><td>0.471</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]	Power Factor			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	0.329	0.259	0.247	0.6	0.473	0.384	0.369	1.2	0.527	0.422	0.406	1.8	0.562	0.450	0.430	2.4	0.587	0.470	0.450	3.0	0.607	0.486	0.465	3.3	0.615	0.493	0.471	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Power Factor																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
0.0	0.329	0.259	0.247																																																			
0.6	0.473	0.384	0.369																																																			
1.2	0.527	0.422	0.406																																																			
1.8	0.562	0.450	0.430																																																			
2.4	0.587	0.470	0.450																																																			
3.0	0.607	0.486	0.465																																																			
3.3	0.615	0.493	0.471																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
Note: Slanted line shows the range of the rated load current.																																																						

COSEL

Model	LHA15F-5	Temperature Testing Circuitry	25° C Figure A
Item	Inrush Current		
Object	_____		





Model		LHA15F-5	Temperature 25°C Testing Circuitry Figure B
Item		Leakage Current	
Object		_____	

1.Results

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	230 [V]	240 [V]	
DEN-AN	Figure B-1	Both phases	0.02	0.05	0.05	Operation
		One of phases	0.03	0.07	0.07	Stand by
IEC62368-1	Figure B-2	Both phases	0.02	0.05	0.05	Operation
		One of phases	0.03	0.07	0.07	Stand by
	Figure B-3	Both phases	0.02	0.05	0.05	Operation
		One of phases	0.03	0.07	0.07	Stand by

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

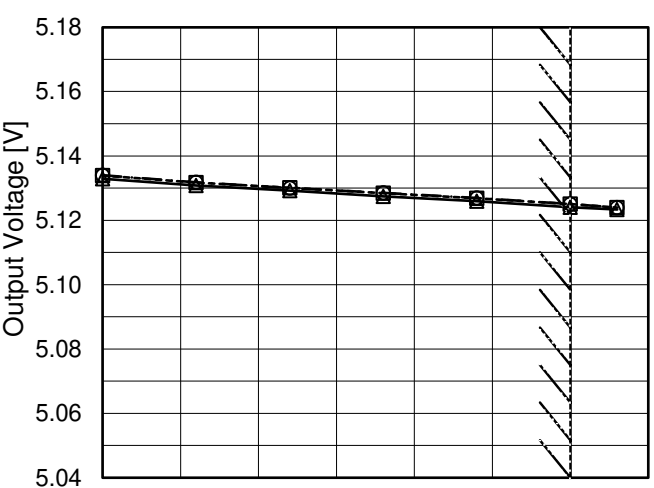
2.Condition

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



Model		LHA15F-5	Temperature25°C Testing CircuitryFigure A																																
Item		Line Regulation																																	
Object		+5V3A																																	
1.Graph		<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> <table><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>85</td><td>5.129</td><td>5.124</td></tr><tr><td>90</td><td>5.130</td><td>5.124</td></tr><tr><td>100</td><td>5.130</td><td>5.124</td></tr><tr><td>120</td><td>5.130</td><td>5.124</td></tr><tr><td>200</td><td>5.131</td><td>5.125</td></tr><tr><td>230</td><td>5.131</td><td>5.125</td></tr><tr><td>264</td><td>5.131</td><td>5.125</td></tr><tr><td>280</td><td>5.131</td><td>5.125</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>	Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	85	5.129	5.124	90	5.130	5.124	100	5.130	5.124	120	5.130	5.124	200	5.131	5.125	230	5.131	5.125	264	5.131	5.125	280	5.131	5.125	--	-	-	2.Values
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
85	5.129	5.124																																	
90	5.130	5.124																																	
100	5.130	5.124																																	
120	5.130	5.124																																	
200	5.131	5.125																																	
230	5.131	5.125																																	
264	5.131	5.125																																	
280	5.131	5.125																																	
--	-	-																																	

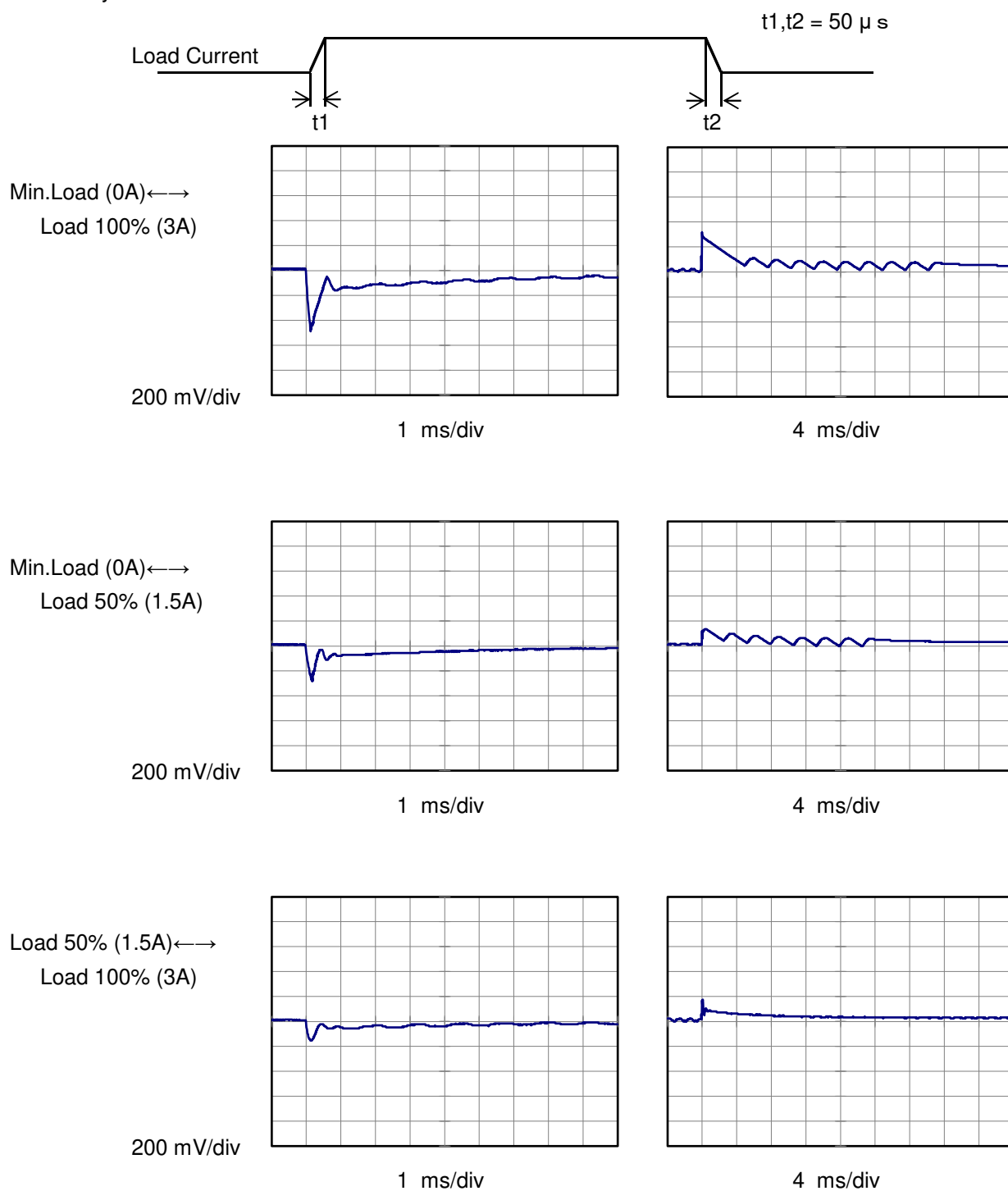


Model		LHA15F-5	Temperature25°C Testing CircuitryFigure A																																																		
Item		Load Regulation																																																			
Object		+5V3A																																																			
1.Graph		<div><div><div>—△—</div><div>Input Volt.</div><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>Load Current [A]</div>	2.Values																																																		
		<table><tr><th rowspan="2">Load Current [A]</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>0.0</td><td>5.133</td><td>5.134</td><td>5.134</td></tr><tr><td>0.6</td><td>5.131</td><td>5.132</td><td>5.132</td></tr><tr><td>1.2</td><td>5.129</td><td>5.130</td><td>5.130</td></tr><tr><td>1.8</td><td>5.127</td><td>5.128</td><td>5.129</td></tr><tr><td>2.4</td><td>5.126</td><td>5.127</td><td>5.127</td></tr><tr><td>3.0</td><td>5.124</td><td>5.125</td><td>5.125</td></tr><tr><td>3.3</td><td>5.123</td><td>5.124</td><td>5.124</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]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	5.133	5.134	5.134	0.6	5.131	5.132	5.132	1.2	5.129	5.130	5.130	1.8	5.127	5.128	5.129	2.4	5.126	5.127	5.127	3.0	5.124	5.125	5.125	3.3	5.123	5.124	5.124	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																				
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																		
0.0	5.133	5.134	5.134																																																		
0.6	5.131	5.132	5.132																																																		
1.2	5.129	5.130	5.130																																																		
1.8	5.127	5.128	5.129																																																		
2.4	5.126	5.127	5.127																																																		
3.0	5.124	5.125	5.125																																																		
3.3	5.123	5.124	5.124																																																		
--	-	-	-																																																		
--	-	-	-																																																		
--	-	-	-																																																		
--	-	-	-																																																		
Note: Slanted line shows the range of the rated load current.																																																					

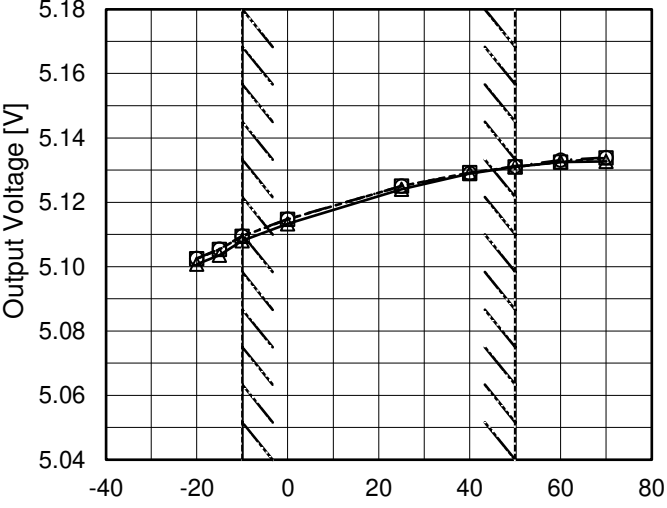
COSEL

Model	LHA15F-5	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+5V3A		

Input Volt. 230 V
Cycle 1000 ms



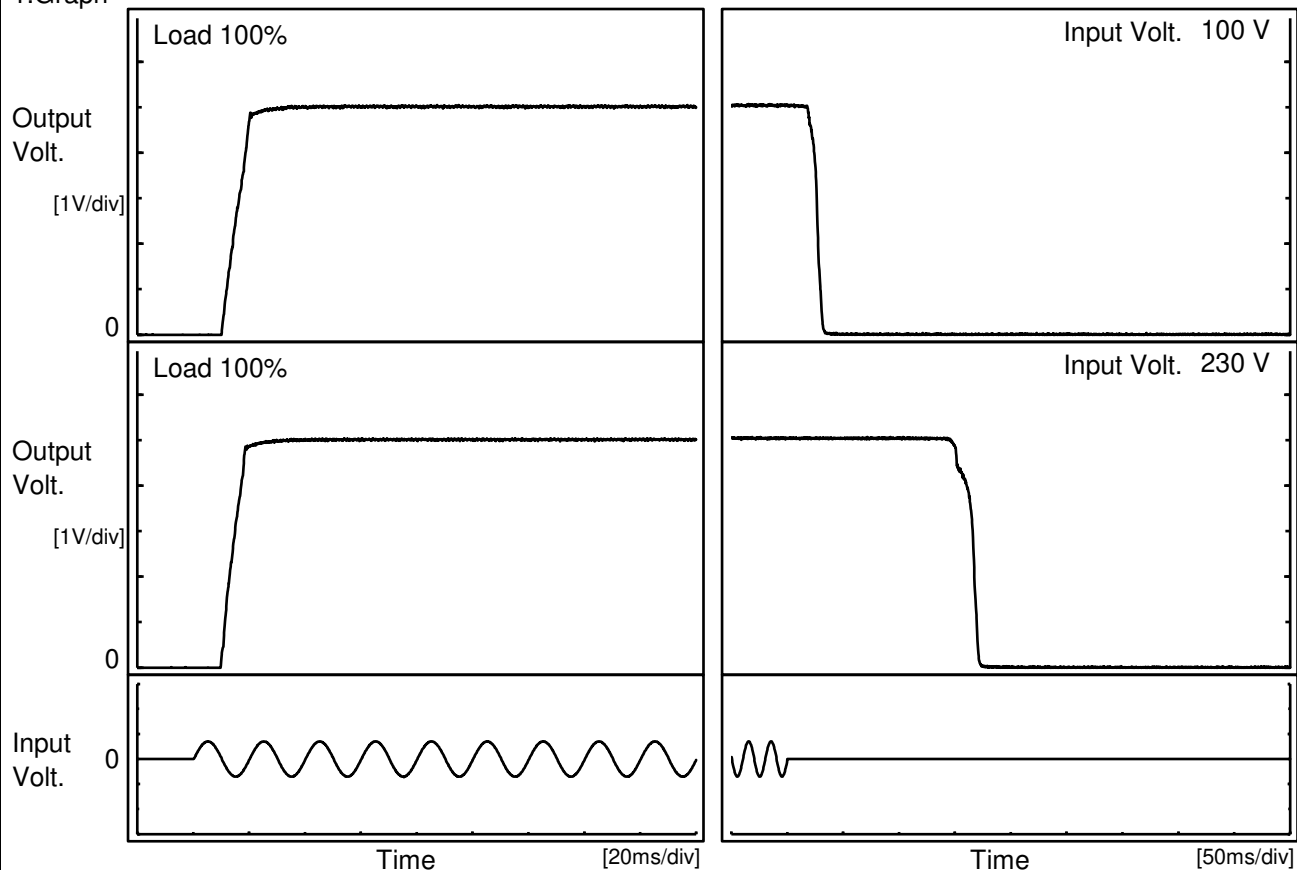
Model		LHA15F-5	Temperature Testing Circuitry	25°C Figure C
Item		Ripple-Noise(by Load Current)		
Object		+5V3A		
1.Graph			2.Values	
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>-·-○-·-</div><div>Input Volt. 230V</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></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></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></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></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></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></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></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></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></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></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></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></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>				

Model		LHA15F-5	Testing Circuitry Figure A																																																				
Item		Ambient Temperature Drift																																																					
Object		+5V3A																																																					
1.Graph		<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>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</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>5.101</td><td>5.103</td><td>5.103</td></tr><tr><td>-15</td><td>5.104</td><td>5.105</td><td>5.105</td></tr><tr><td>-10</td><td>5.108</td><td>5.109</td><td>5.110</td></tr><tr><td>0</td><td>5.113</td><td>5.115</td><td>5.115</td></tr><tr><td>25</td><td>5.124</td><td>5.125</td><td>5.125</td></tr><tr><td>40</td><td>5.129</td><td>5.129</td><td>5.129</td></tr><tr><td>50</td><td>5.131</td><td>5.131</td><td>5.131</td></tr><tr><td>60</td><td>5.133</td><td>5.133</td><td>5.133</td></tr><tr><td>70</td><td>5.133</td><td>5.134</td><td>5.134</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</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	5.101	5.103	5.103	-15	5.104	5.105	5.105	-10	5.108	5.109	5.110	0	5.113	5.115	5.115	25	5.124	5.125	5.125	40	5.129	5.129	5.129	50	5.131	5.131	5.131	60	5.133	5.133	5.133	70	5.133	5.134	5.134	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																						
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																				
-20	5.101	5.103	5.103																																																				
-15	5.104	5.105	5.105																																																				
-10	5.108	5.109	5.110																																																				
0	5.113	5.115	5.115																																																				
25	5.124	5.125	5.125																																																				
40	5.129	5.129	5.129																																																				
50	5.131	5.131	5.131																																																				
60	5.133	5.133	5.133																																																				
70	5.133	5.134	5.134																																																				
--	-	-	-																																																				
--	-	-	-																																																				
Note: Slanted line shows the range of the rated ambient temperature.																																																							

COSEL

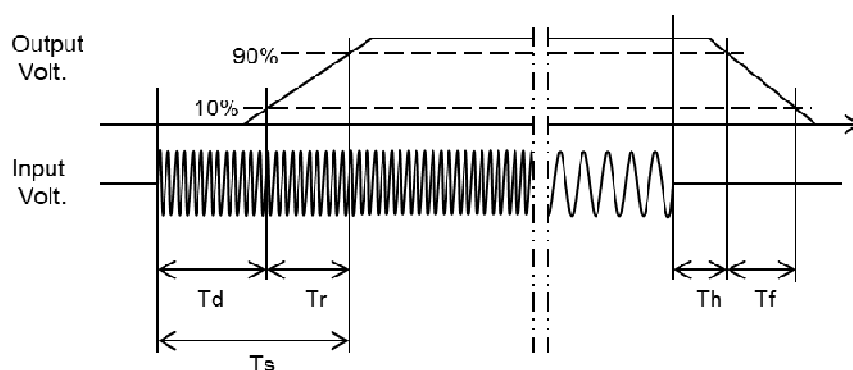
Model	LHA15F-5	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V3A		

1.Graph



2.Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	11.2	8.5	19.7	21.3	9.5
230 V	10.9	7.3	18.2		

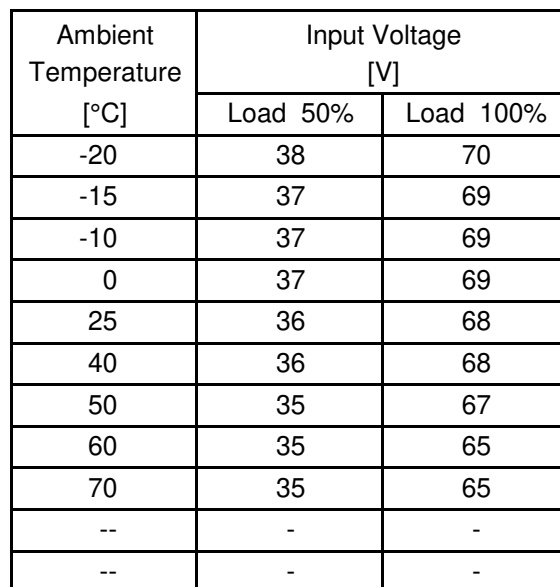


Model		LHA15F-5	Temperature		25°C																																
Item		Hold-Up Time	Testing Circuitry		Figure A																																
Object		+5V3A																																			
1.Graph			2.Values																																		
<div><div><div>---□---</div><div>Load 50%</div></div><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>85</td><td>35</td><td>10</td></tr><tr><td>90</td><td>41</td><td>13</td></tr><tr><td>100</td><td>53</td><td>21</td></tr><tr><td>120</td><td>80</td><td>32</td></tr><tr><td>200</td><td>244</td><td>107</td></tr><tr><td>230</td><td>328</td><td>152</td></tr><tr><td>264</td><td>437</td><td>208</td></tr><tr><td>280</td><td>494</td><td>234</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>			Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	85	35	10	90	41	13	100	53	21	120	80	32	200	244	107	230	328	152	264	437	208	280	494	234	--	-	-			
Input Voltage [V]	Hold-Up Time [ms]																																				
	Load 50%	Load 100%																																			
85	35	10																																			
90	41	13																																			
100	53	21																																			
120	80	32																																			
200	244	107																																			
230	328	152																																			
264	437	208																																			
280	494	234																																			
--	-	-																																			
<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		LHA15F-5	Temperature		25°C																																																			
Item		Instantaneous Interruption Compensation	Testing Circuitry		Figure A																																																			
Object		+5V3A																																																						
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><div><div>Instantaneous Compensation Time [ms]</div><div>10000</div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>0.0</div><div>1.0</div><div>2.0</div><div>3.0</div></div><div><div>Load Current [A]</div><div></div></div></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>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.6</td><td>137</td><td>590</td><td>787</td></tr><tr><td>1.2</td><td>67</td><td>306</td><td>407</td></tr><tr><td>1.5</td><td>54</td><td>245</td><td>327</td></tr><tr><td>1.8</td><td>44</td><td>203</td><td>272</td></tr><tr><td>2.4</td><td>28</td><td>147</td><td>201</td></tr><tr><td>3.0</td><td>21</td><td>107</td><td>152</td></tr><tr><td>3.3</td><td>17</td><td>94</td><td>130</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	-	-	-	0.6	137	590	787	1.2	67	306	407	1.5	54	245	327	1.8	44	203	272	2.4	28	147	201	3.0	21	107	152	3.3	17	94	130	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																							
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																					
0.0	-	-	-																																																					
0.6	137	590	787																																																					
1.2	67	306	407																																																					
1.5	54	245	327																																																					
1.8	44	203	272																																																					
2.4	28	147	201																																																					
3.0	21	107	152																																																					
3.3	17	94	130																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
<div>Note: Slanted line shows the range of the rated load current.</div>																																																								

Testing Circuitry Figure A

2.Values



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



Model		LHA15F-5	Temperature Testing Circuitry	25°C Figure A																																															
Item		Overcurrent Protection																																																	
Object		+5V3A																																																	
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>Note: Slanted line shows the range of the rated load current.</p> <p>Overcurrent protection is Hiccup mode.</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. 230[V]</th></tr><tr><td>5.00</td><td>3.78</td><td>3.84</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><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><tr><td>-</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 230[V]	5.00	3.78	3.84	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Output Voltage [V]	Load Current [A]																																																		
	Input Volt. 100[V]	Input Volt. 230[V]																																																	
5.00	3.78	3.84																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	
-	-	-																																																	

Model		LHA15F-5
Item		Overvoltage Protection
Object		+5V3A

1.Graph

—△—

Input Volt. 100V

---□---

Input Volt. 230V

Operating Point [V]

Ambient Temperature [°C]

Load 0%

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. 230[V]
-20	7.44	7.38
-15	7.44	7.38
-10	7.44	7.36
0	7.42	7.36
25	7.42	7.36
40	7.42	7.36
50	7.42	7.36
60	7.42	7.36
70	7.42	7.36
--	-	-
--	-	-

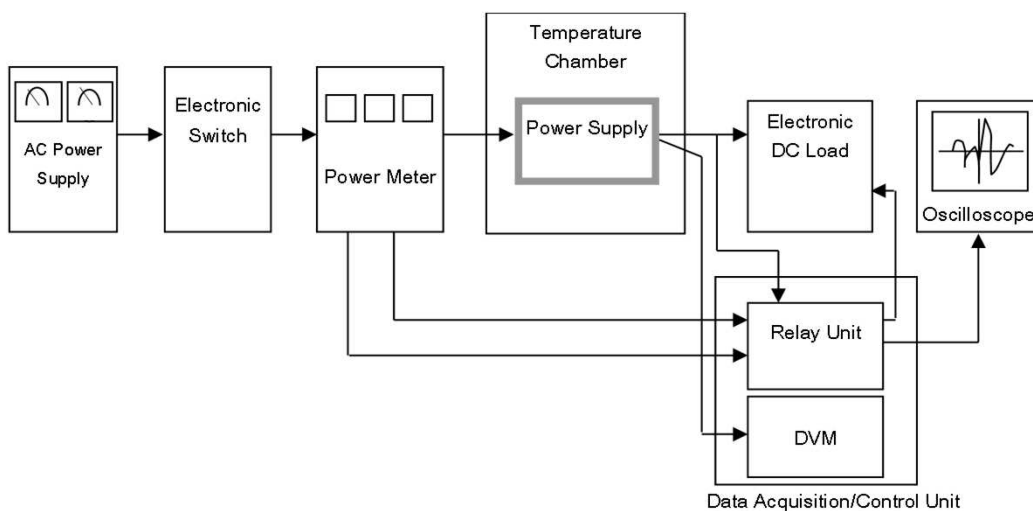


Figure A

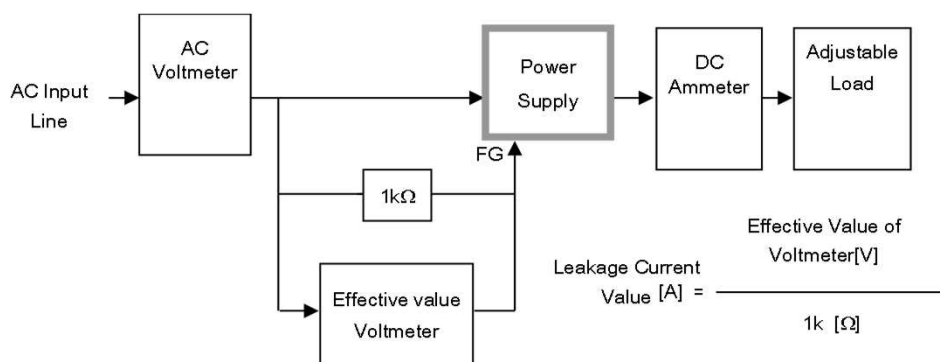


Figure B-1 (DEN-AN)

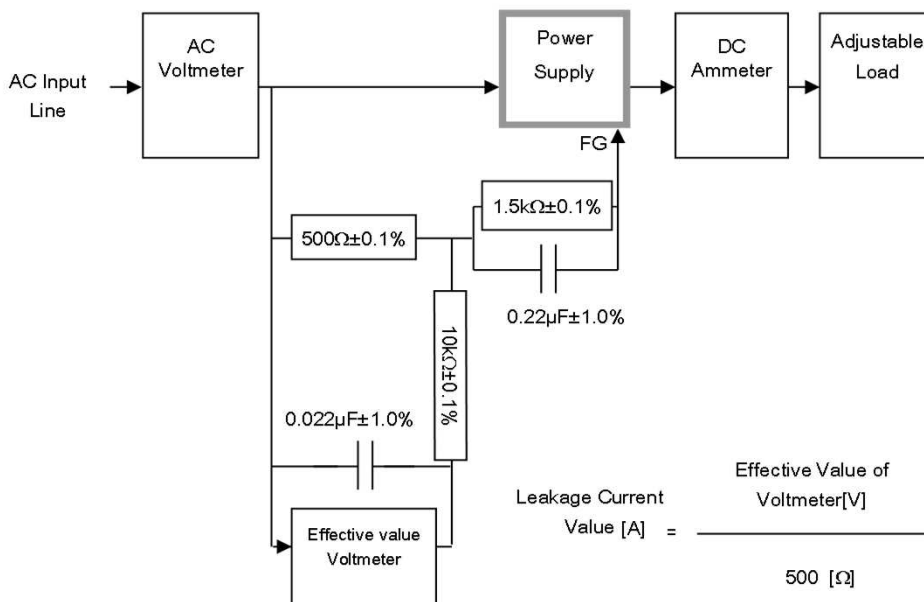


Figure B-2 (IEC62368-1 refer to IEC60990 Fig.4)

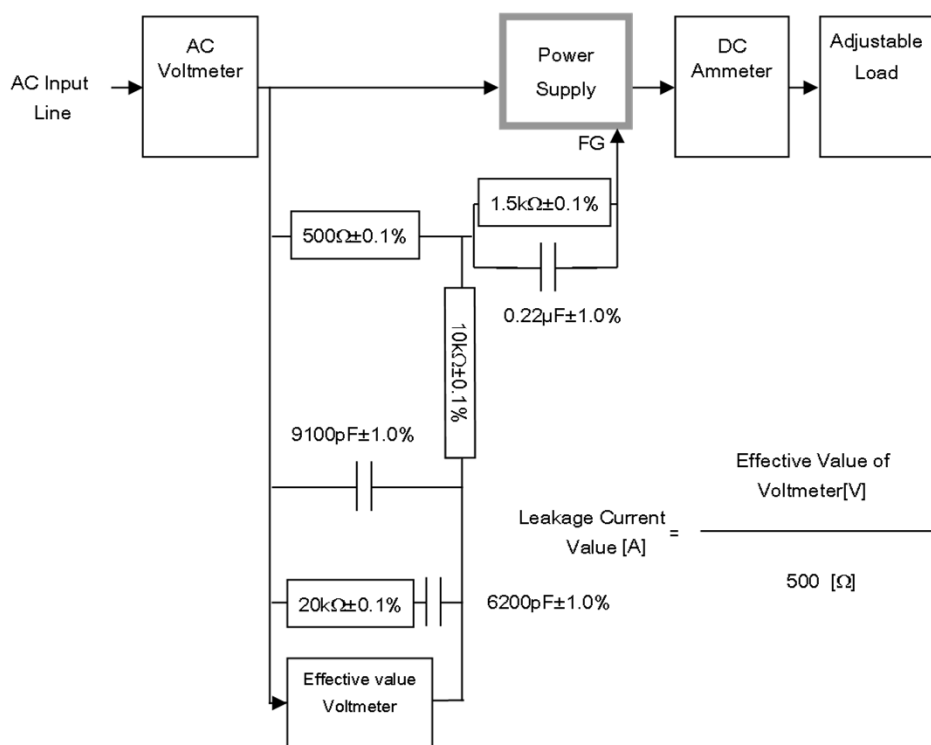


Figure B-3 (IEC62368-1 refer to IEC60990 Fig.5)

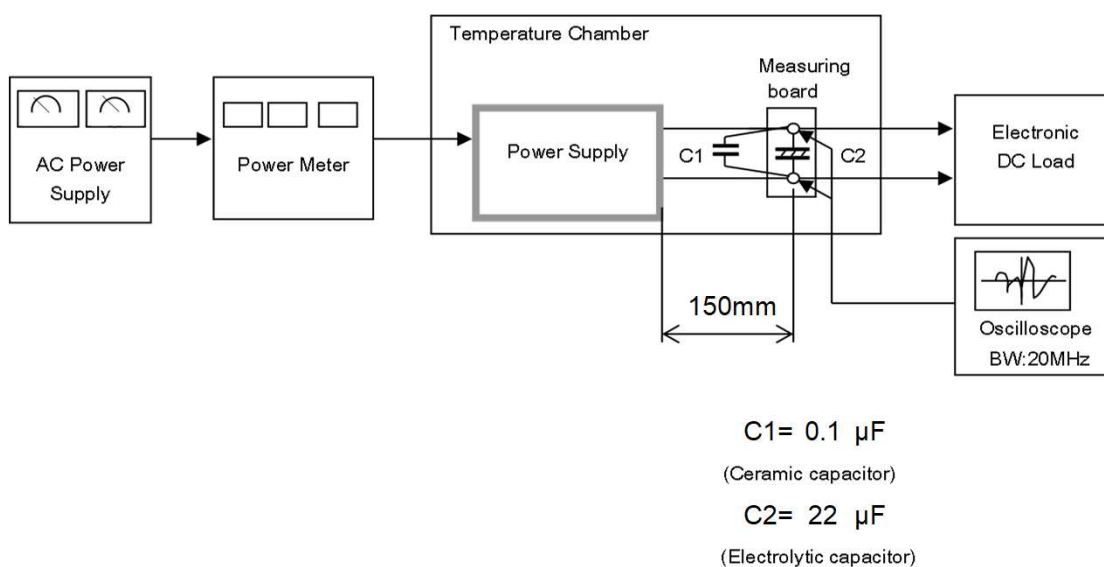


Figure C