



# TEST DATA OF LHA300F-12-Y

Regulated DC Power Supply  
September 6, 2019

Approved by : Junya Kaneda  
Junya Kaneda Design Manager

Prepared by : Tomoyuki Sakuma  
Tomoyuki Sakuma Design Engineer

**COSEL CO.,LTD.**

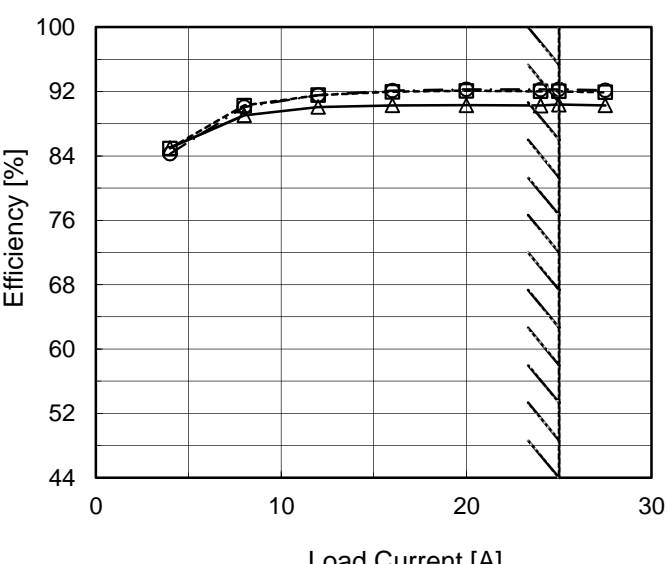
## CONTENTS

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		LHA300F-12-Y		Temperature 25°C																																																				
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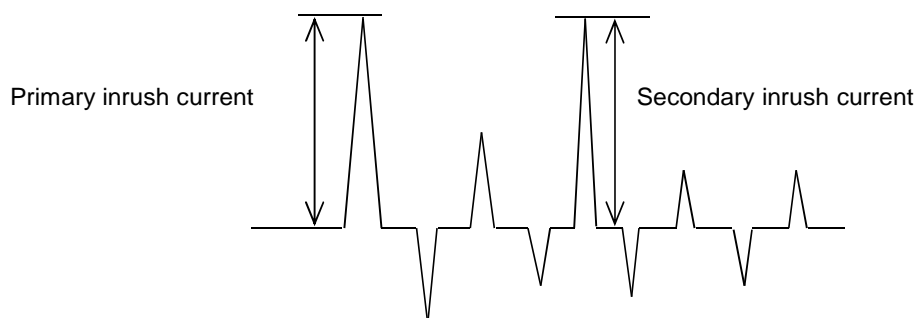
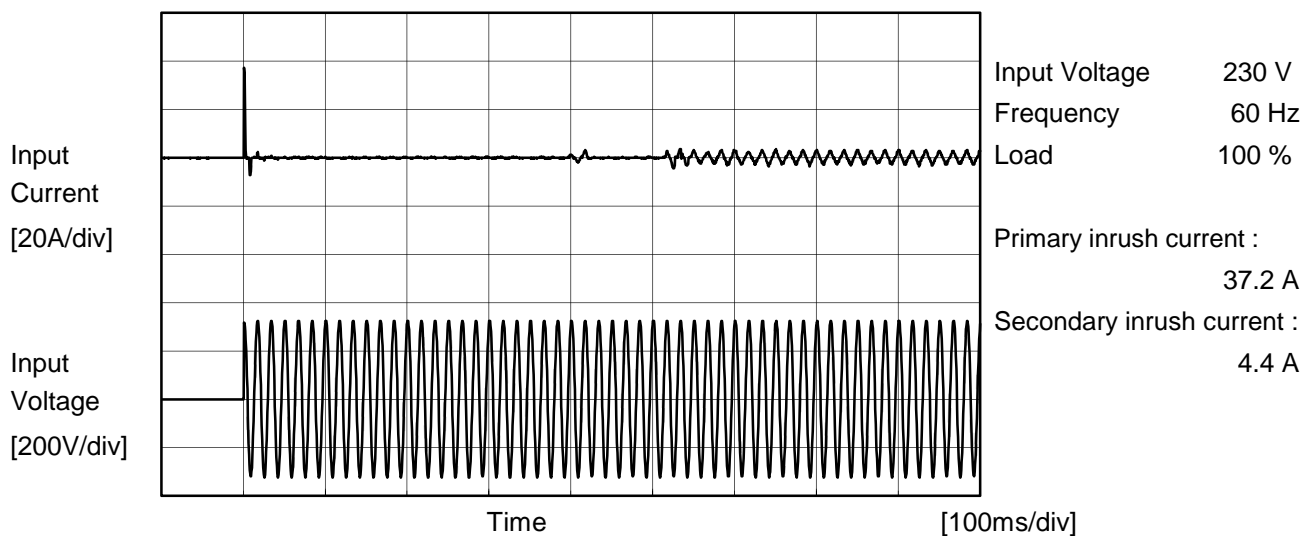
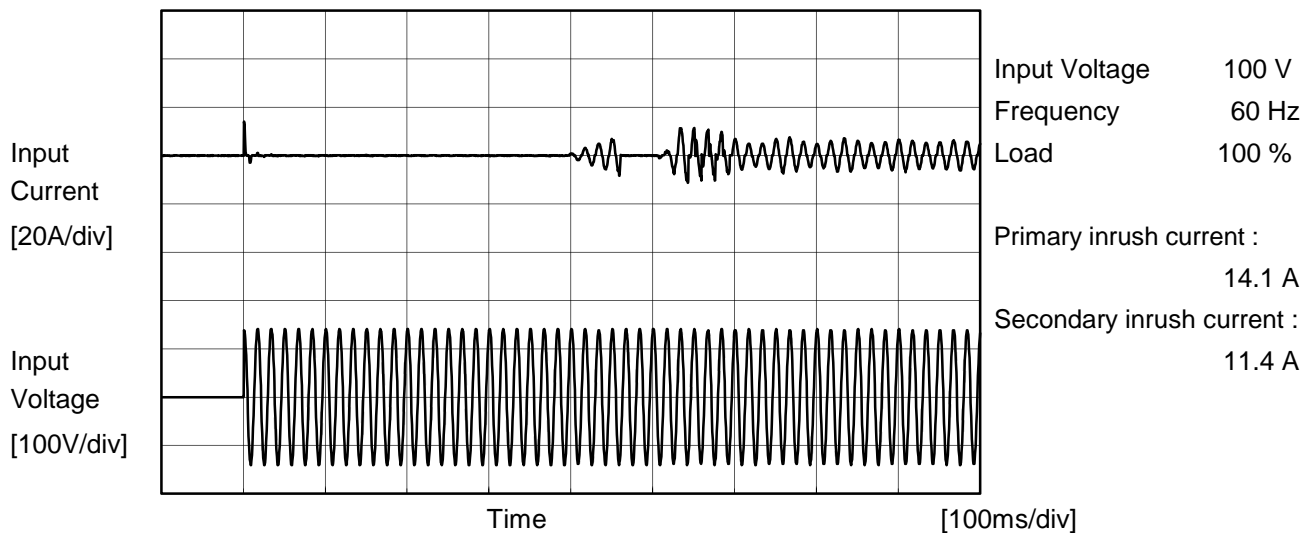
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Model		LHA300F-12-Y	Temperature 25°C Testing Circuitry Figure A
Item		Inrush Current	
Object		_____	





COSEL		Temperature 25°C Testing Circuitry Figure B
Model	LHA300F-12-Y	
Item	Leakage Current	
Object	_____	

# 1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	230 [V]	240 [V]	
DEN-AN	Figure B-1	Both phases	0.16	0.39	0.41	Operation
		One of phases	0.27	0.69	0.72	Stand by
IEC62368-1	Figure B-2	Both phases	0.16	0.38	0.39	Operation
		One of phases	0.27	0.67	0.70	Stand by
	Figure B-3	Both phases	0.16	0.38	0.39	Operation
		One of phases	0.27	0.66	0.70	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		LHA300F-12-Y	Temperature25°C Testing CircuitryFigure A
Item		Line Regulation	
Object		+12V25A	
1.Graph			2.Values
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Model		LHA300F-12-Y		Temperature Testing Circuitry	25°C Figure A																																																			
Item		Load Regulation																																																						
Object		+12V25A																																																						
1.Graph				2.Values																																																				
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>—△—</div><div>---□---</div><div>---○---</div></div><div><div>Input Volt.</div><div>Input Volt.</div><div>Input Volt.</div></div><div><div>100V</div><div>200V</div><div>230V</div></div></div><div><p>Output Voltage [V]</p><p>Load Current [A]</p><p>Note: Slanted line shows the range of the rated load current.</p></div></div>				<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>12.356</td><td>12.355</td><td>12.356</td></tr><tr><td>4.0</td><td>12.355</td><td>12.355</td><td>12.355</td></tr><tr><td>8.0</td><td>12.355</td><td>12.355</td><td>12.354</td></tr><tr><td>12.0</td><td>12.354</td><td>12.354</td><td>12.354</td></tr><tr><td>16.0</td><td>12.354</td><td>12.354</td><td>12.354</td></tr><tr><td>20.0</td><td>12.354</td><td>12.353</td><td>12.353</td></tr><tr><td>24.0</td><td>12.353</td><td>12.353</td><td>12.353</td></tr><tr><td>25.0</td><td>12.353</td><td>12.353</td><td>12.353</td></tr><tr><td>27.5</td><td>12.353</td><td>12.353</td><td>12.353</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	12.356	12.355	12.356	4.0	12.355	12.355	12.355	8.0	12.355	12.355	12.354	12.0	12.354	12.354	12.354	16.0	12.354	12.354	12.354	20.0	12.354	12.353	12.353	24.0	12.353	12.353	12.353	25.0	12.353	12.353	12.353	27.5	12.353	12.353	12.353	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																							
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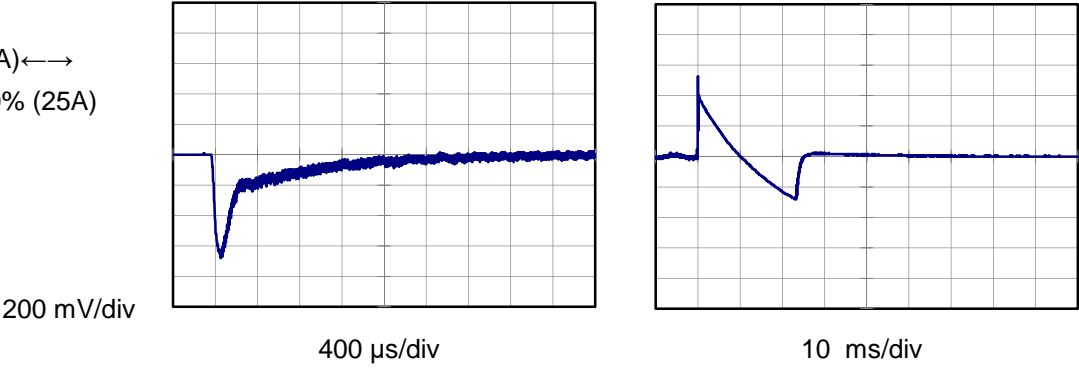


Model	LHA300F-12-Y		
Item	Dynamic Load Response	Temperature	25°C
Object	+12V25A	Testing Circuitry	Figure A

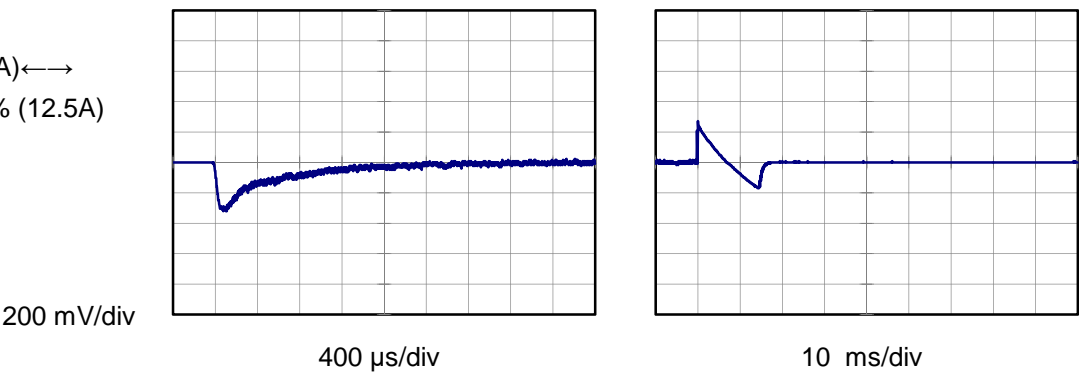
Input Volt. 230 V  
Cycle 1000 ms



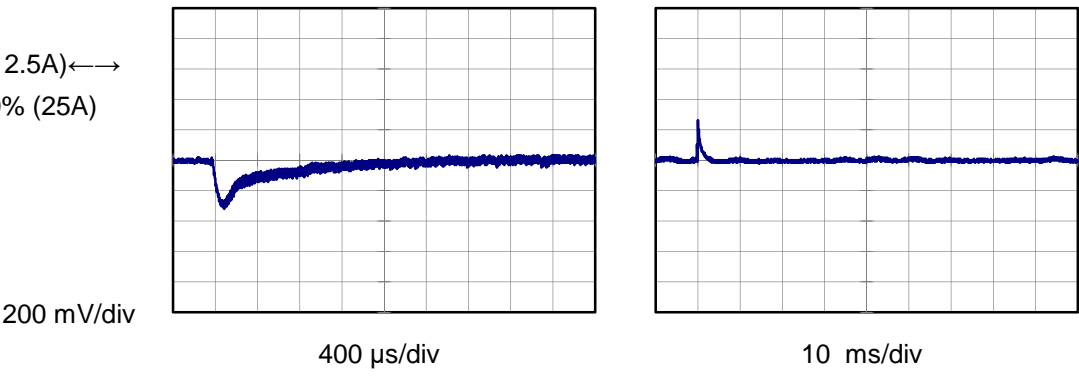
Min.Load (0A)  $\longleftrightarrow$   
Load 100% (25A)



Min.Load (0A)  $\longleftrightarrow$   
Load 50% (12.5A)

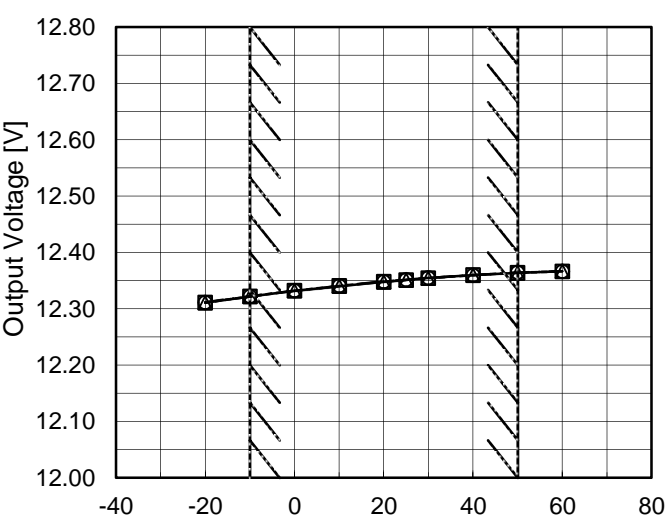


Load 50% (12.5A)  $\longleftrightarrow$   
Load 100% (25A)



COSEL																																									
Model	LHA300F-12-Y	Temperature	25°C																																						
Item	Ripple-Noise (by Load Current)	Testing Circuitry	Figure C																																						
Object	+12V25A																																								
1.Graph		2.Values																																							
<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><p>Ripple-Noise [mV]</p><p>Load Current [A]</p></div></div><div><div>Measured by 20 MHz Oscilloscope.</div><div>Ripple-Noise is shown as p-p in the figure below.</div><div>Note: Slanted line shows the range of the rated load current.</div></div><div><div><div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div><div><p>Ripple-Noise [mVp-p]</p><p>T1</p><p>T2</p></div></div><div>Fig. Complex Ripple Wave Form</div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 100 [V]</th><th>Input Volt. 230 [V]</th></tr><tr><td>0.0</td><td>50</td><td>50</td></tr><tr><td>4.0</td><td>100</td><td>100</td></tr><tr><td>8.0</td><td>80</td><td>80</td></tr><tr><td>12.0</td><td>95</td><td>95</td></tr><tr><td>16.0</td><td>100</td><td>100</td></tr><tr><td>20.0</td><td>105</td><td>105</td></tr><tr><td>24.0</td><td>105</td><td>105</td></tr><tr><td>25.0</td><td>105</td><td>105</td></tr><tr><td>27.5</td><td>120</td><td>120</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 100 [V]	Input Volt. 230 [V]	0.0	50	50	4.0	100	100	8.0	80	80	12.0	95	95	16.0	100	100	20.0	105	105	24.0	105	105	25.0	105	105	27.5	120	120	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 100 [V]	Input Volt. 230 [V]																																							
0.0	50	50																																							
4.0	100	100																																							
8.0	80	80																																							
12.0	95	95																																							
16.0	100	100																																							
20.0	105	105																																							
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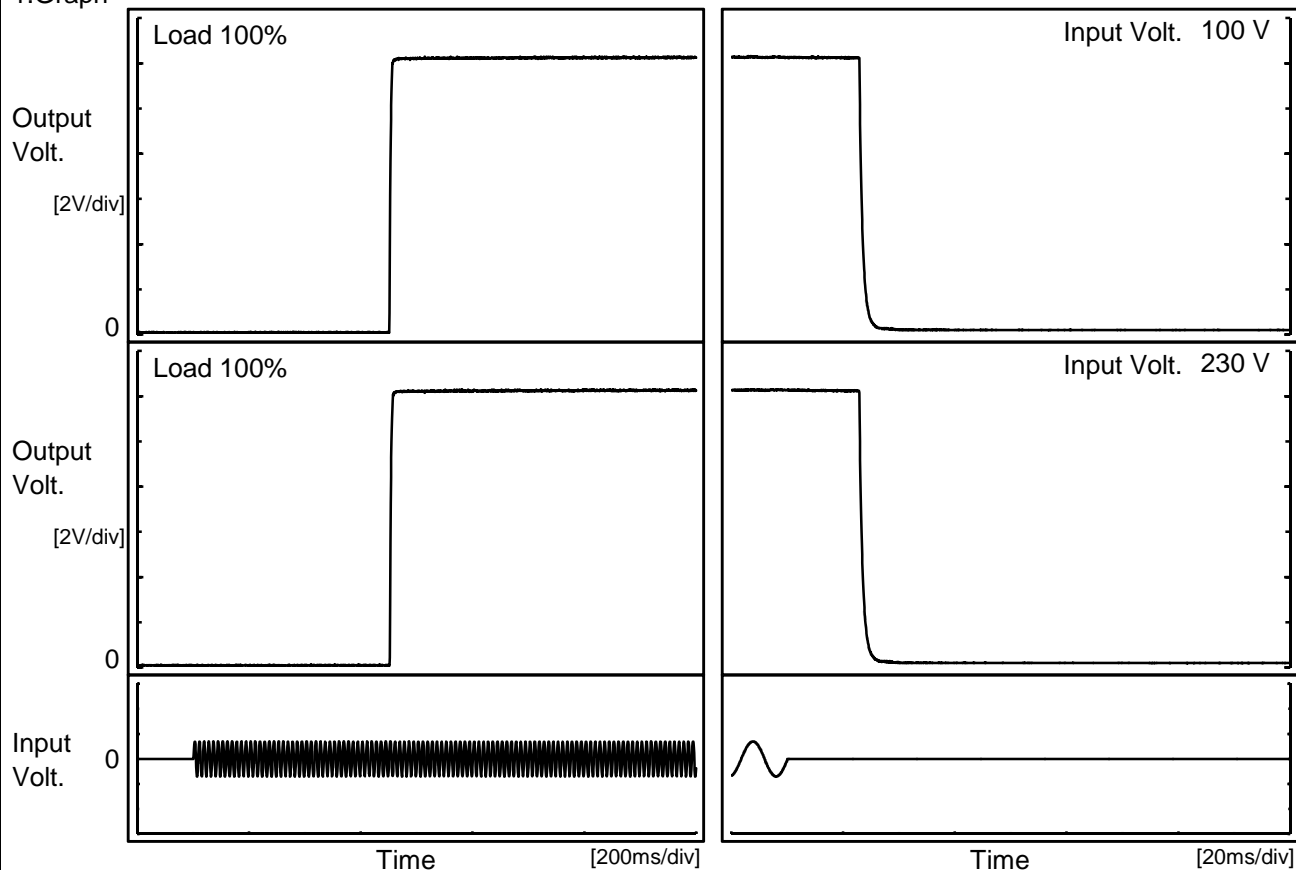


Model		LHA300F-12-Y	Testing Circuitry    Figure A																																																			
Item		Ambient Temperature Drift																																																				
Object		+12V25A																																																				
1.Graph																																																						
		<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>	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>12.311</td><td>12.311</td><td>12.311</td></tr><tr><td>-10</td><td>12.322</td><td>12.322</td><td>12.322</td></tr><tr><td>0</td><td>12.332</td><td>12.332</td><td>12.332</td></tr><tr><td>10</td><td>12.340</td><td>12.340</td><td>12.340</td></tr><tr><td>20</td><td>12.348</td><td>12.348</td><td>12.348</td></tr><tr><td>25</td><td>12.351</td><td>12.351</td><td>12.351</td></tr><tr><td>30</td><td>12.354</td><td>12.354</td><td>12.355</td></tr><tr><td>40</td><td>12.360</td><td>12.360</td><td>12.360</td></tr><tr><td>50</td><td>12.364</td><td>12.364</td><td>12.364</td></tr><tr><td>60</td><td>12.367</td><td>12.367</td><td>12.367</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	12.311	12.311	12.311	-10	12.322	12.322	12.322	0	12.332	12.332	12.332	10	12.340	12.340	12.340	20	12.348	12.348	12.348	25	12.351	12.351	12.351	30	12.354	12.354	12.355	40	12.360	12.360	12.360	50	12.364	12.364	12.364	60	12.367	12.367	12.367	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
-20	12.311	12.311	12.311																																																			
-10	12.322	12.322	12.322																																																			
0	12.332	12.332	12.332																																																			
10	12.340	12.340	12.340																																																			
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Note: Slanted line shows the range of the rated ambient temperature.																																																						



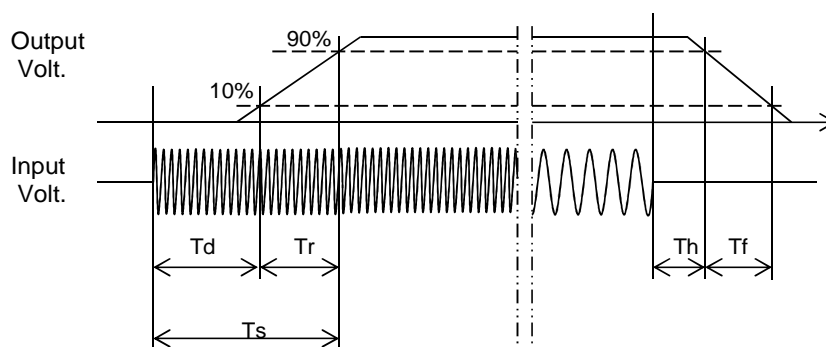
Model	LHA300F-12-Y	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V25A		

# 1.Graph



# 2.Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		703.0	7.0	710.0	25.9	2.7
230 V		704.0	7.0	711.0	25.9	2.7



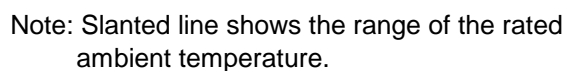


Model		LHA300F-12-Y	Temperature25°C Testing CircuitryFigure A			
Item		Hold-Up Time				
Object		+12V25A				
1.Graph			2.Values			
<div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div>---</div><div>□</div><div>---</div></div><div>Load 50%</div></div><div><div>—</div><div>△</div><div>—</div></div><div>Load 100%</div></div> <div><div>Hold-Up Time [ms]</div><div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>50</div><div>100</div><div>150</div><div>200</div><div>250</div><div>300</div></div><div>Input Voltage [V]</div></div> <tr><td colspan="3">This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy. Note: Slanted line shows the range of the rated input voltage.</td><td></td></tr>				This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy. Note: Slanted line shows the range of the rated input voltage.		
This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy. Note: Slanted line shows the range of the rated input voltage.						

Model	LHA300F-12-Y																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+12V25A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div><div><div></div><div>△</div></div><div>Input Volt. 100V</div></div><div><div><div></div><div>□</div></div><div>Input Volt. 200V</div></div><div><div><div></div><div>○</div></div><div>Input Volt. 230V</div></div></div><div><p>Instantaneous Compensation Time [ms]</p><p>Load Current [A]</p></div><p>Note: Slanted line shows the range of the rated load current.</p></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>4.0</td><td>141</td><td>152</td><td>154</td></tr><tr><td>8.0</td><td>78</td><td>80</td><td>80</td></tr><tr><td>12.0</td><td>52</td><td>53</td><td>54</td></tr><tr><td>16.0</td><td>39</td><td>39</td><td>39</td></tr><tr><td>20.0</td><td>29</td><td>31</td><td>31</td></tr><tr><td>24.0</td><td>25</td><td>25</td><td>25</td></tr><tr><td>25.0</td><td>21</td><td>20</td><td>21</td></tr><tr><td>27.5</td><td>18</td><td>17</td><td>17</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	-	-	-	4.0	141	152	154	8.0	78	80	80	12.0	52	53	54	16.0	39	39	39	20.0	29	31	31	24.0	25	25	25	25.0	21	20	21	27.5	18	17	17	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
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24.0	25	25	25																																																			
25.0	21	20	21																																																			
27.5	18	17	17																																																			
--	-	-	-																																																			
--	-	-	-																																																			

Testing Circuitry Figure A

## 2.Values



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



Model		LHA300F-12-Y																																																
Item		Overcurrent Protection																																																
Object		+12V25A																																																
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>12</td><td>37.10</td><td>37.10</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]	12	37.10	37.10	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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<div><div><div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 230V</div></div></div><div><p>Operating Point [V]</p><p>Ambient Temperature [°C]</p><p>Load 0%</p></div><p>Note: Slanted line shows the range of the rated ambient temperature.</p></div><div><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>14.77</td><td>14.77</td></tr><tr><td>-10</td><td>14.77</td><td>14.77</td></tr><tr><td>0</td><td>14.88</td><td>14.88</td></tr><tr><td>10</td><td>14.94</td><td>14.94</td></tr><tr><td>20</td><td>15.06</td><td>15.06</td></tr><tr><td>25</td><td>15.06</td><td>15.06</td></tr><tr><td>30</td><td>15.06</td><td>15.06</td></tr><tr><td>40</td><td>15.18</td><td>15.18</td></tr><tr><td>50</td><td>15.29</td><td>15.29</td></tr><tr><td>60</td><td>15.35</td><td>15.35</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table></div></div>			Ambient Temperature [°C]	Operating Point [V]		Input Volt. 100[V]	Input Volt. 230[V]	-20	14.77	14.77	-10	14.77	14.77	0	14.88	14.88	10	14.94	14.94	20	15.06	15.06	25	15.06	15.06	30	15.06	15.06	40	15.18	15.18	50	15.29	15.29	60	15.35	15.35	--	-	-
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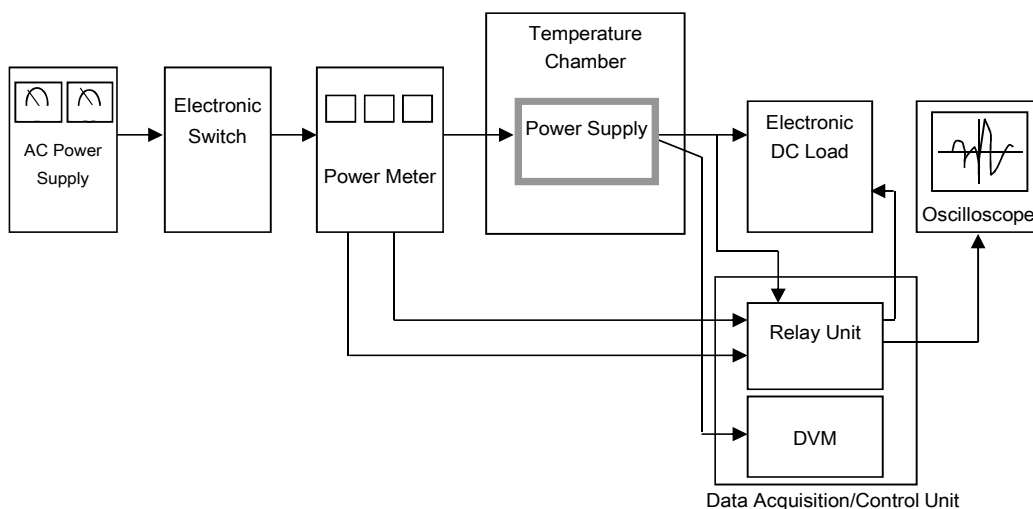


Figure A

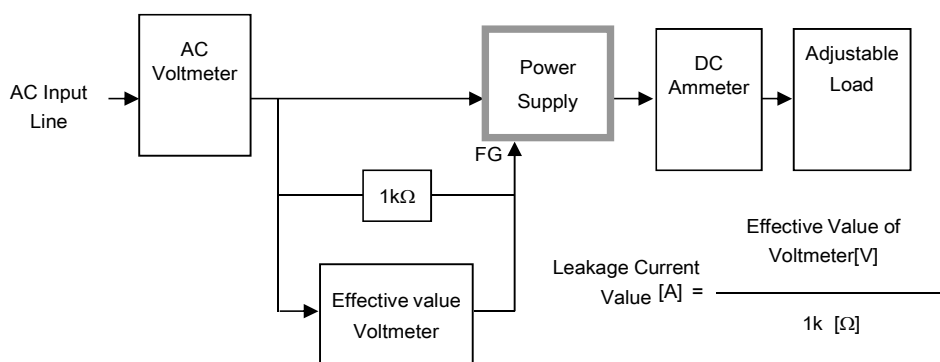


Figure B-1 ( DEN-AN )

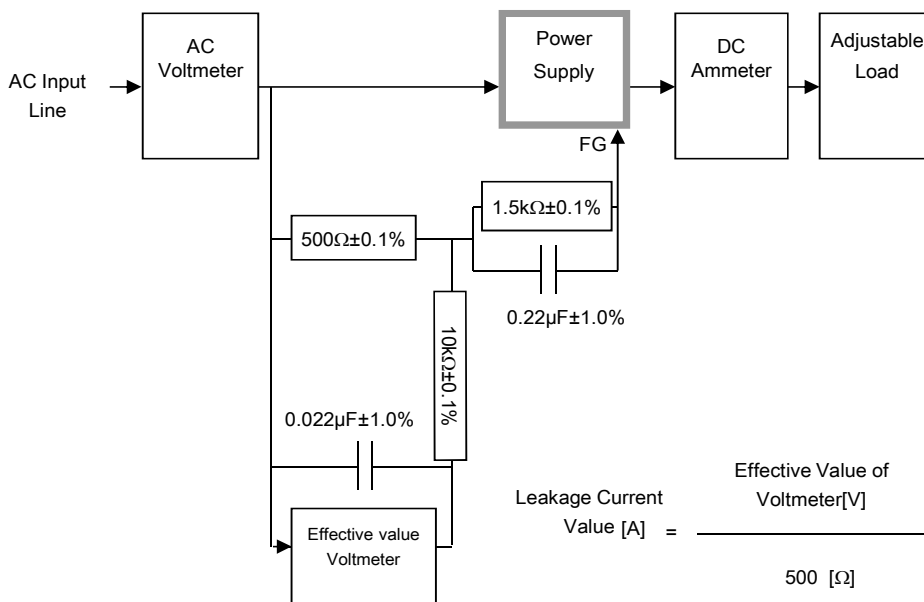


Figure B-2 ( IEC62368-1 refer to IEC60990 Fig.4 )

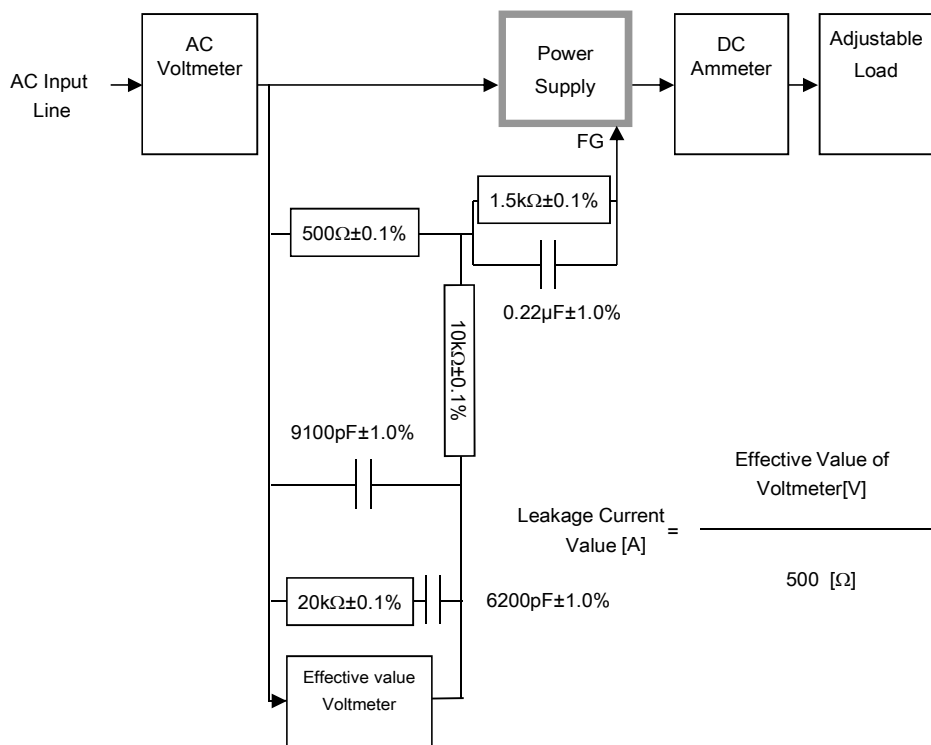


Figure B-3 ( IEC62368-1 refer to IEC60990 Fig.5 )

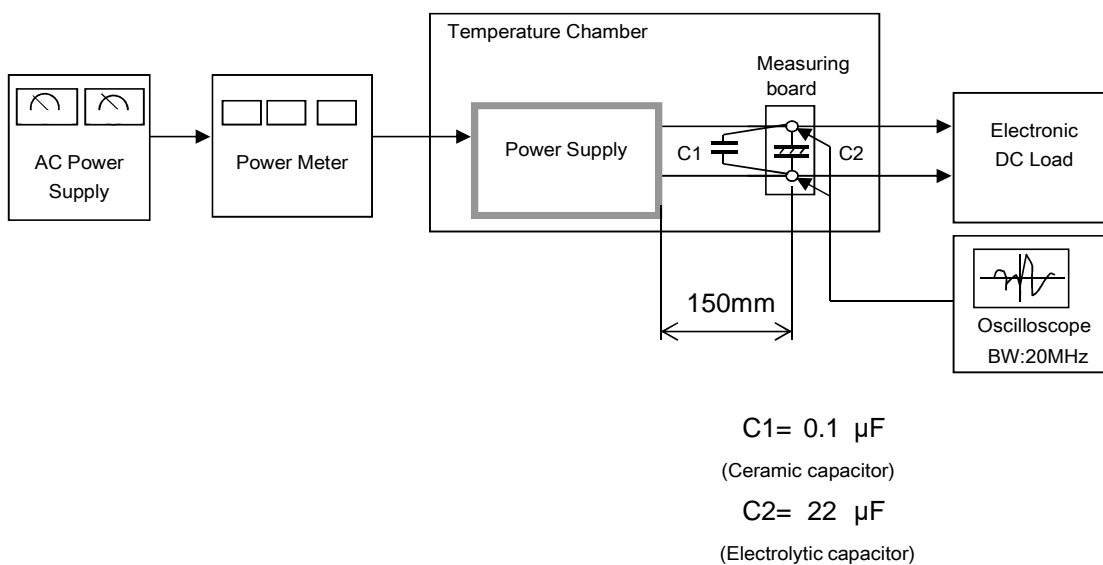


Figure C