



# TEST DATA OF LFA10F-12

Regulated DC Power Supply  
June 19, 2009

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Yoshiaki Shimizu Design Manager

Prepared by : Yuki Nakamura  
Yuki Nakamura Design Engineer

**COSEL CO.,LTD.**

## CONTENTS

1.Input Current (by Load Current) . . . . .	1
2.Input Power (by Load Current) . . . . .	2
3.Efficiency (by Input Voltage) . . . . .	3
4.Efficiency (by Load Current) . . . . .	4
5.Power Factor (by Input Voltage) . . . . .	5
6.Power Factor (by Load Current) . . . . .	6
7.Inrush Current . . . . .	7
8.Leakage Current . . . . .	8
9.Line Regulation . . . . .	9
10.Load Regulation . . . . .	10
11.Dynamic Load Response . . . . .	11
12.Ripple Voltage (by Load Current) . . . . .	12
13.Ripple-Noise . . . . .	13
14.Ripple Voltage (by Ambient Temperature) . . . . .	14
15.Ambient Temperature Drift . . . . .	15
16.Output Voltage Accuracy . . . . .	16
17.Time Lapse Drift . . . . .	17
18.Rise and Fall Time . . . . .	18
19.Hold-Up Time . . . . .	19
20.Instantaneous Interruption Compensation . . . . .	20
21.Minimum Input Voltage for Regulated Output Voltage . . . . .	21
22.Overcurrent Protection . . . . .	22
23.Oversvoltage Protection . . . . .	23
24.Figure of Testing Circuitry . . . . .	24

(Final Page 25)

Model	LFA10F-12																																																					
Item	Input Current (by Load Current)	Temperature	25℃																																																			
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- 5 -

BC-10349

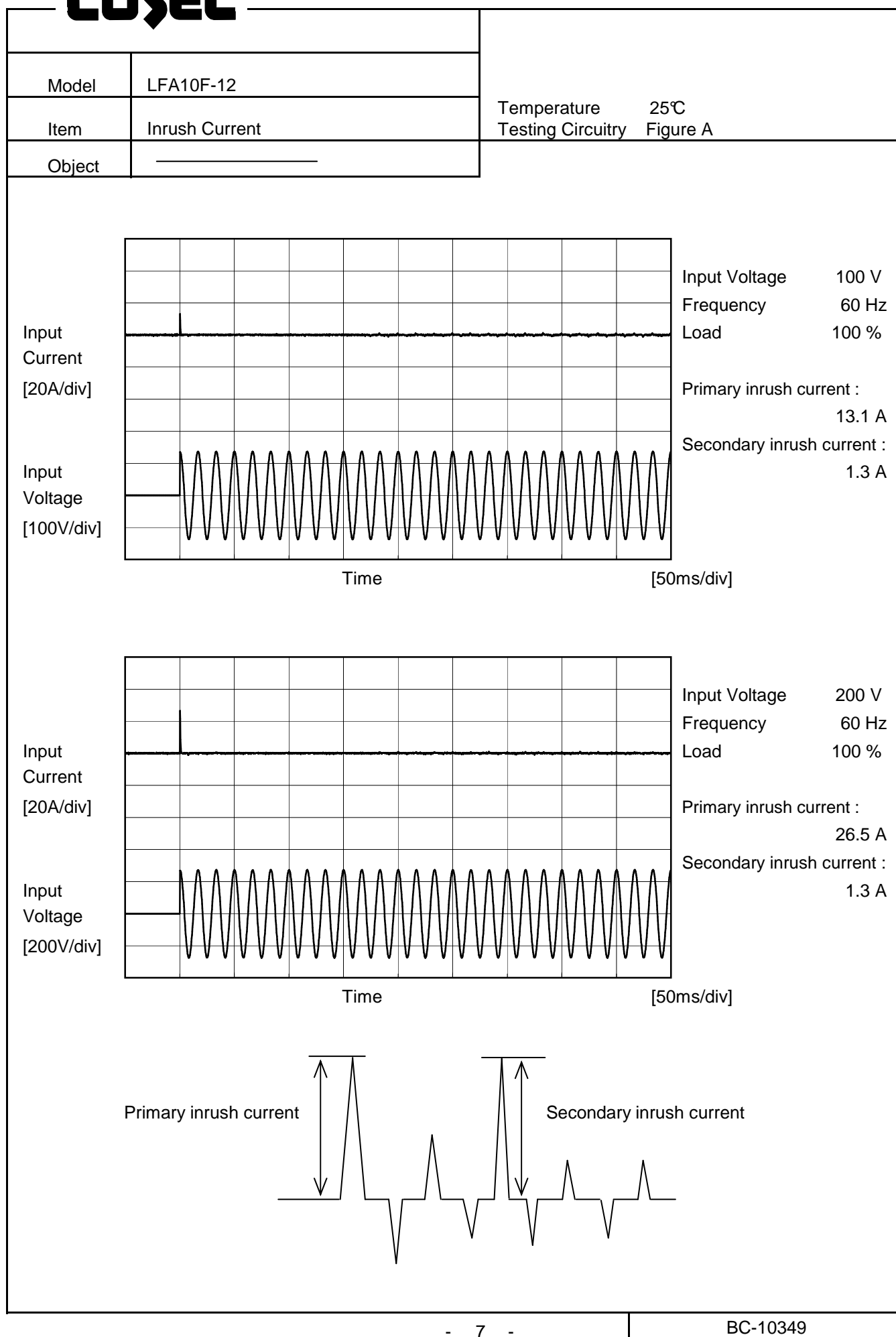
Model	LFA10F-12																																																					
Item	Power Factor (by Load Current)	Temperature	25℃																																																			
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- 6 -

BC-10349



# COSEL





		Temperature 25℃ Testing Circuitry Figure B
Model	LFA10F-12	
Item	Leakage Current	
Object	_____	

## 1.Results

[mA]

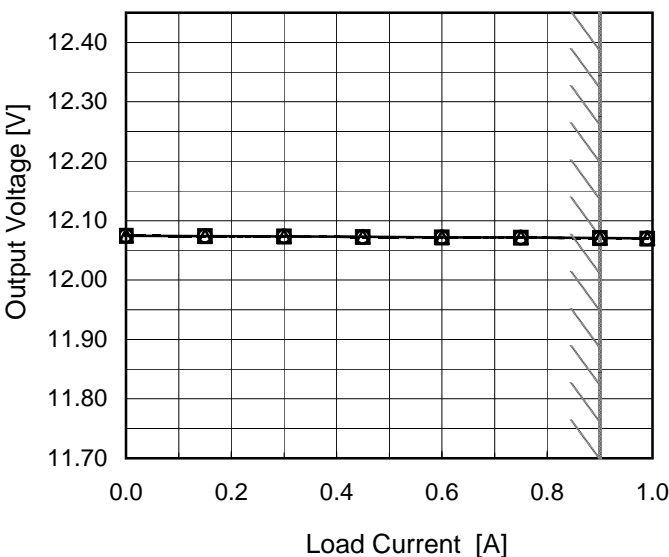
Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.07	0.14	0.16	Operation
	One of phase	0.13	0.27	0.33	stand by
IEC60950-1	Both phases	0.09	0.19	0.20	Operation
	One of phase	0.13	0.28	0.31	stand by

The value for "One phase" is the reference value only.

## 2.Condition

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

Model	LFA10F-12																																		
Item	Line Regulation	Temperature	25℃																																
		Testing Circuitry	Figure A																																
Object	+12V0.9A																																		
1.Graph		2.Values																																	
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- 10 -

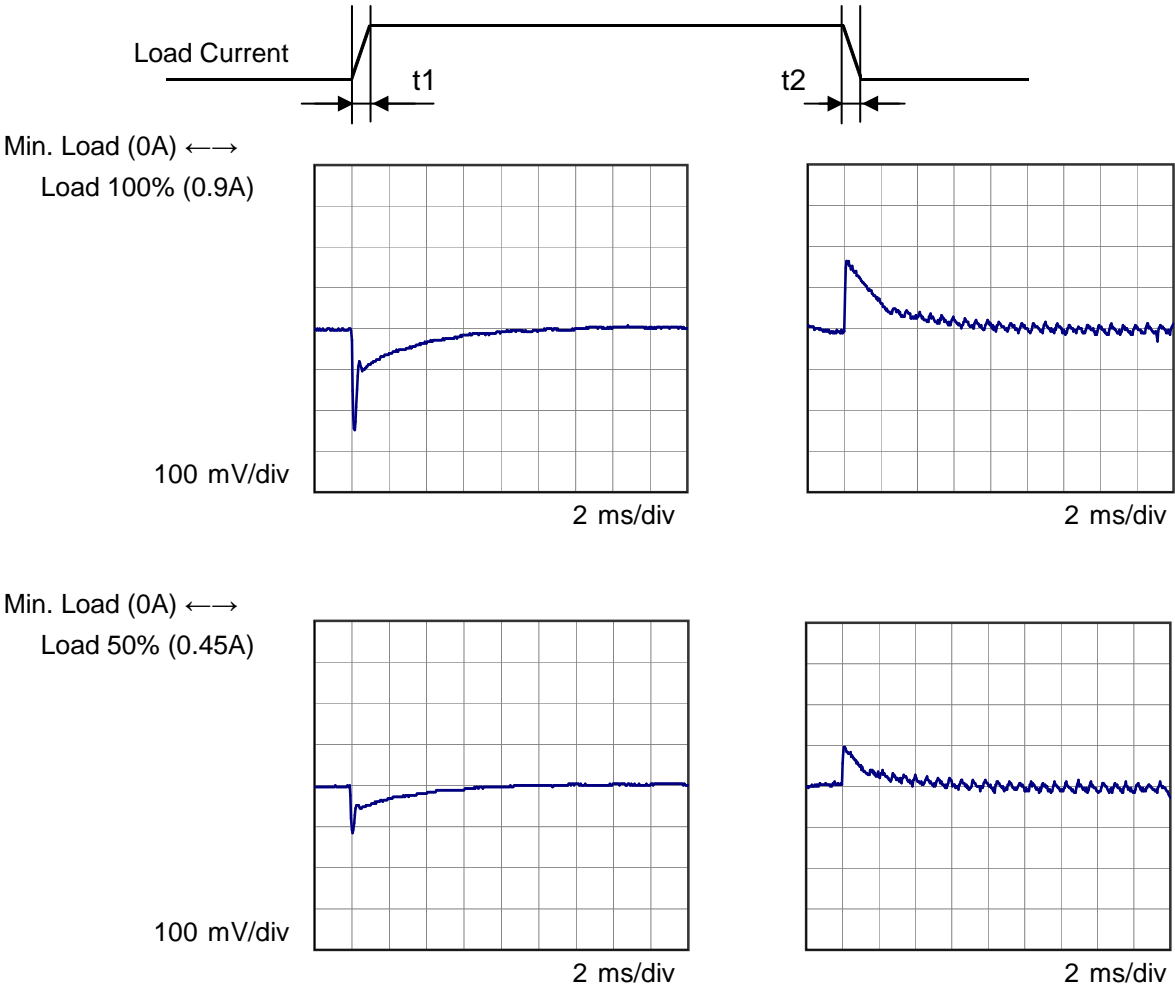
BC-10349



Model	LFA10F-12		
Item	Dynamic Load Response	Temperature	25°C
Object	+12V0.9A	Testing Circuitry	Figure A

Input Volt. 100 V  
Cycle 1000 ms

Response.  $t_1=t_2=50\mu\text{s}$ . Typ



Model	LFA10F-12																																								
Item	Ripple Voltage (by Load Current)	Temperature	25℃																																						
Object	+12V0.9A	Testing Circuitry	Figure C																																						
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Model	LFA10F-12																																							
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry    Figure C																																						
Object	+12V0.9A																																							
<p>1.Graph</p> <div style="text-align: right;">             ---□--- Input Volt. 100V              —△— Input Volt. 200V           </div> <p style="text-align: center;">Ambient Temperature [°C] Load 100 %</p>		<p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 100 [V]</th> <th>Input Volt. 200 [V]</th> </tr> </thead> <tbody> <tr><td>-30</td><td>160</td><td>140</td></tr> <tr><td>-10</td><td>75</td><td>70</td></tr> <tr><td>0</td><td>50</td><td>50</td></tr> <tr><td>25</td><td>25</td><td>20</td></tr> <tr><td>50</td><td>25</td><td>20</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> </tbody> </table>	Ambient Temperature [°C]	Ripple Voltage [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	-30	160	140	-10	75	70	0	50	50	25	25	20	50	25	20	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Object	+12V0.9A																																																					
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> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<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>12.051</td><td>12.052</td><td>12.052</td></tr><tr><td>-10</td><td>12.056</td><td>12.056</td><td>12.056</td></tr><tr><td>0</td><td>12.059</td><td>12.059</td><td>12.059</td></tr><tr><td>10</td><td>12.062</td><td>12.062</td><td>12.062</td></tr><tr><td>20</td><td>12.065</td><td>12.065</td><td>12.065</td></tr><tr><td>25</td><td>12.066</td><td>12.066</td><td>12.066</td></tr><tr><td>30</td><td>12.068</td><td>12.068</td><td>12.067</td></tr><tr><td>40</td><td>12.068</td><td>12.068</td><td>12.068</td></tr><tr><td>50</td><td>12.067</td><td>12.067</td><td>12.067</td></tr><tr><td>60</td><td>12.064</td><td>12.063</td><td>12.063</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	12.051	12.052	12.052	-10	12.056	12.056	12.056	0	12.059	12.059	12.059	10	12.062	12.062	12.062	20	12.065	12.065	12.065	25	12.066	12.066	12.066	30	12.068	12.068	12.067	40	12.068	12.068	12.068	50	12.067	12.067	12.067	60	12.064	12.063	12.063	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
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60	12.064	12.063	12.063																																																			
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- 15 -

BC-10349



		Testing Circuitry Figure A
Model	LFA10F-12	
Item	Output Voltage Accuracy	
Object	+12V0.9A	

### 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℃

Input Voltage : 85 - 264V

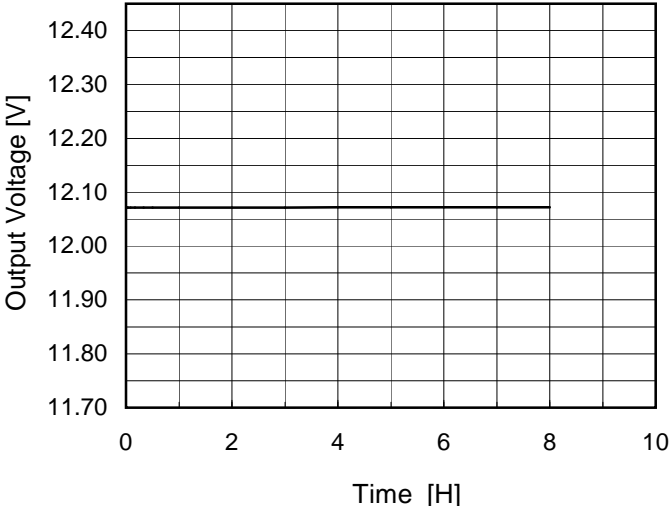
Load Current : 0 - 0.9A

\* 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 [℃]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	264	0	12.072	±8	±0.1
Minimum Voltage	-10	85	0.9	12.056		

Model	LFA10F-12																								
Item	Time Lapse Drift	Temperature	25℃																						
		Testing Circuitry	Figure A																						
Object	+12V0.9A																								
1.Graph		2.Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 100V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.073</td></tr><tr><td>0.5</td><td>12.071</td></tr><tr><td>1.0</td><td>12.071</td></tr><tr><td>2.0</td><td>12.072</td></tr><tr><td>3.0</td><td>12.072</td></tr><tr><td>4.0</td><td>12.072</td></tr><tr><td>5.0</td><td>12.072</td></tr><tr><td>6.0</td><td>12.072</td></tr><tr><td>7.0</td><td>12.072</td></tr><tr><td>8.0</td><td>12.072</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.073	0.5	12.071	1.0	12.071	2.0	12.072	3.0	12.072	4.0	12.072	5.0	12.072	6.0	12.072	7.0	12.072	8.0	12.072
Time since start [H]	Output Voltage [V]																								
0.0	12.073																								
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6.0	12.072																								
7.0	12.072																								
8.0	12.072																								
* The characteristic of AC200V is equal.																									

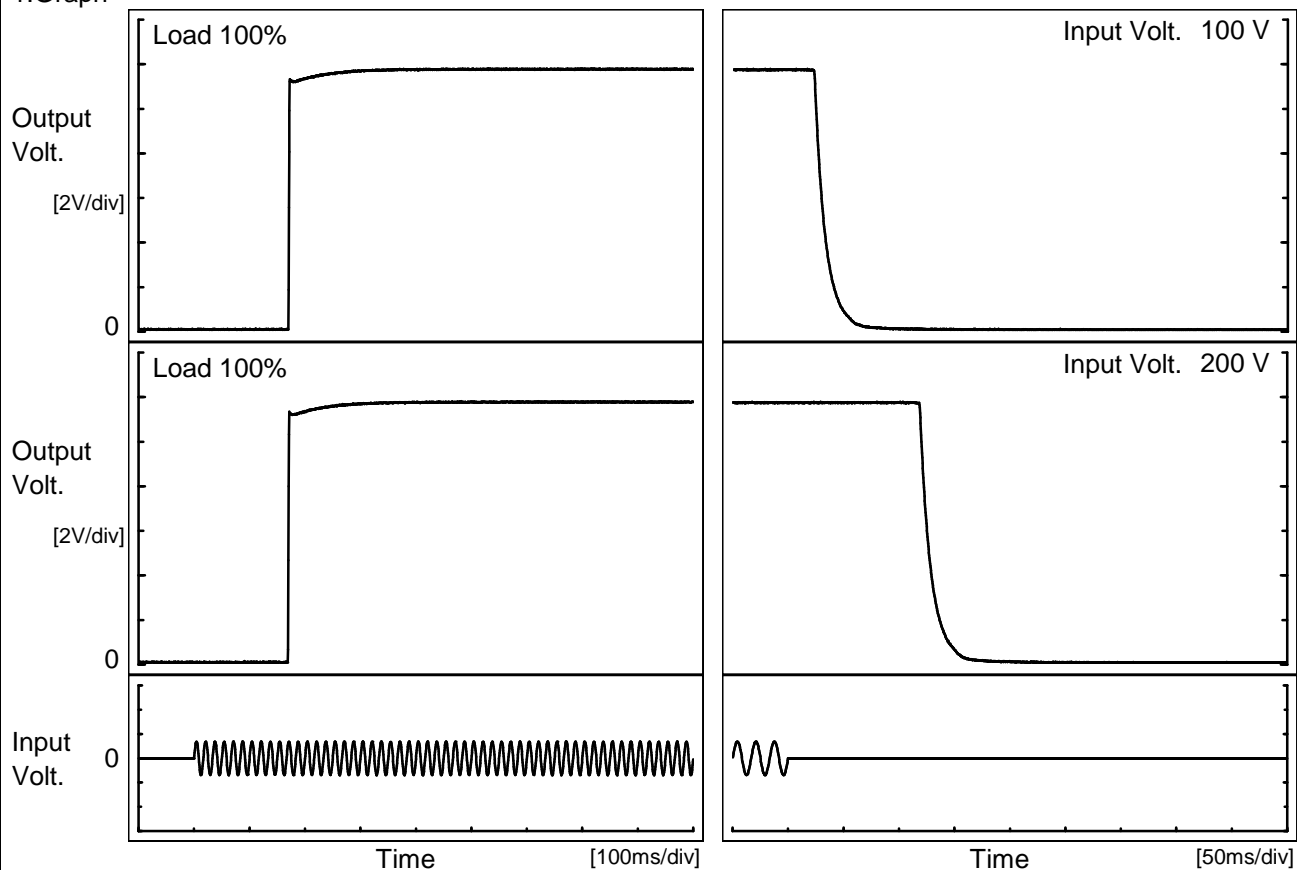
- 17 -

BC-10349

# COSEL

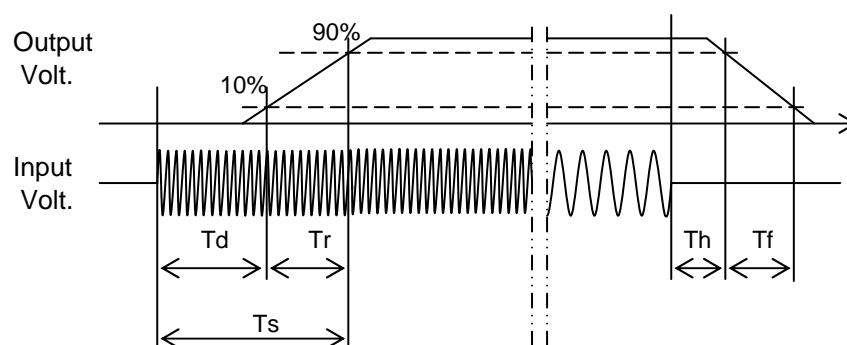
Model	LFA10F-12	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V0.9A		

## 1. Graph



## 2. Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	170.5	2.0	172.5	23.8	21.8
200 V	170.0	1.5	171.5	119.3	22.5



Model	LFA10F-12																																		
Item	Hold-Up Time	Temperature	25℃																																
		Testing Circuitry	Figure A																																
Object	+12V0.9A																																		
1.Graph		2.Values																																	
<div><div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div><div>Hold-Up Time [ms]</div><div>Input Voltage [V]</div></div> <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>		<table><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><tr><td>75</td><td>24</td><td>5</td></tr><tr><td>85</td><td>34</td><td>10</td></tr><tr><td>100</td><td>50</td><td>20</td></tr><tr><td>120</td><td>77</td><td>32</td></tr><tr><td>200</td><td>236</td><td>116</td></tr><tr><td>230</td><td>318</td><td>158</td></tr><tr><td>264</td><td>425</td><td>218</td></tr><tr><td>280</td><td>483</td><td>248</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	24	5	85	34	10	100	50	20	120	77	32	200	236	116	230	318	158	264	425	218	280	483	248	--	-	-
Input Voltage [V]	Hold-Up Time [ms]																																		
	Load 50%	Load 100%																																	
75	24	5																																	
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280	483	248																																	
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- 19 -

BC-10349

Model	LFA10F-12																																																					
Item	Instantaneous Interruption Compensation	Temperature	25℃																																																			
Object	+12V0.9A	Testing Circuitry	Figure A																																																			
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>Instantaneous Compensation Time [ms]</div> <div>Load Current [A]</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">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>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.15</td><td>140</td><td>620</td><td>823</td></tr><tr><td>0.30</td><td>77</td><td>347</td><td>464</td></tr><tr><td>0.45</td><td>52</td><td>238</td><td>320</td></tr><tr><td>0.60</td><td>33</td><td>175</td><td>238</td></tr><tr><td>0.75</td><td>25</td><td>140</td><td>190</td></tr><tr><td>0.90</td><td>20</td><td>116</td><td>158</td></tr><tr><td>0.99</td><td>17</td><td>104</td><td>143</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]	0.00	-	-	-	0.15	140	620	823	0.30	77	347	464	0.45	52	238	320	0.60	33	175	238	0.75	25	140	190	0.90	20	116	158	0.99	17	104	143	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
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- 20 -

BC-10349

[illegible]

Model	LFA10F-12																																											
Item	Overcurrent Protection	Temperature	25℃																																									
Object	+12V0.9A	Testing Circuitry	Figure A																																									
1.Graph		2.Values																																										
<div><div><div>△</div><div>Input Volt. 100V</div></div><div><div>○</div><div>Input Volt. 200V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Intermittent operation occurs when the output voltage is less than rated output voltage.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="2">Load Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th></tr><tr><td>12.0</td><td>1.75</td><td>2.14</td></tr><tr><td>11.4</td><td>-</td><td>-</td></tr><tr><td>10.8</td><td>-</td><td>-</td></tr><tr><td>9.6</td><td>-</td><td>-</td></tr><tr><td>8.4</td><td>-</td><td>-</td></tr><tr><td>7.2</td><td>-</td><td>-</td></tr><tr><td>6.0</td><td>-</td><td>-</td></tr><tr><td>4.8</td><td>-</td><td>-</td></tr><tr><td>3.6</td><td>-</td><td>-</td></tr><tr><td>2.4</td><td>-</td><td>-</td></tr><tr><td>1.2</td><td>-</td><td>-</td></tr><tr><td>0.0</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	12.0	1.75	2.14	11.4	-	-	10.8	-	-	9.6	-	-	8.4	-	-	7.2	-	-	6.0	-	-	4.8	-	-	3.6	-	-	2.4	-	-	1.2	-	-	0.0	-	-
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- 22 -

BC-10349



Model	LFA10F-12																																							
Item	Overvoltage Protection	Testing Circuitry Figure A																																						
Object	+12V0.9A																																							
<p>1.Graph</p> <div style="text-align: center;"> <p>—△— Input Volt. 100V ---□--- Input Volt. 200V</p> </div> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<p>2.Values</p> <table border="1"> <thead> <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. 200[V]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>14.78</td><td>14.78</td></tr> <tr><td>-10</td><td>14.85</td><td>14.85</td></tr> <tr><td>0</td><td>14.92</td><td>14.92</td></tr> <tr><td>10</td><td>15.06</td><td>15.06</td></tr> <tr><td>20</td><td>15.14</td><td>15.14</td></tr> <tr><td>25</td><td>15.14</td><td>15.13</td></tr> <tr><td>30</td><td>15.20</td><td>15.20</td></tr> <tr><td>40</td><td>15.27</td><td>15.27</td></tr> <tr><td>50</td><td>15.34</td><td>15.34</td></tr> <tr><td>60</td><td>15.48</td><td>15.41</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Operating Point [V]		Input Volt. 100[V]	Input Volt. 200[V]	-20	14.78	14.78	-10	14.85	14.85	0	14.92	14.92	10	15.06	15.06	20	15.14	15.14	25	15.14	15.13	30	15.20	15.20	40	15.27	15.27	50	15.34	15.34	60	15.48	15.41	--	-	-
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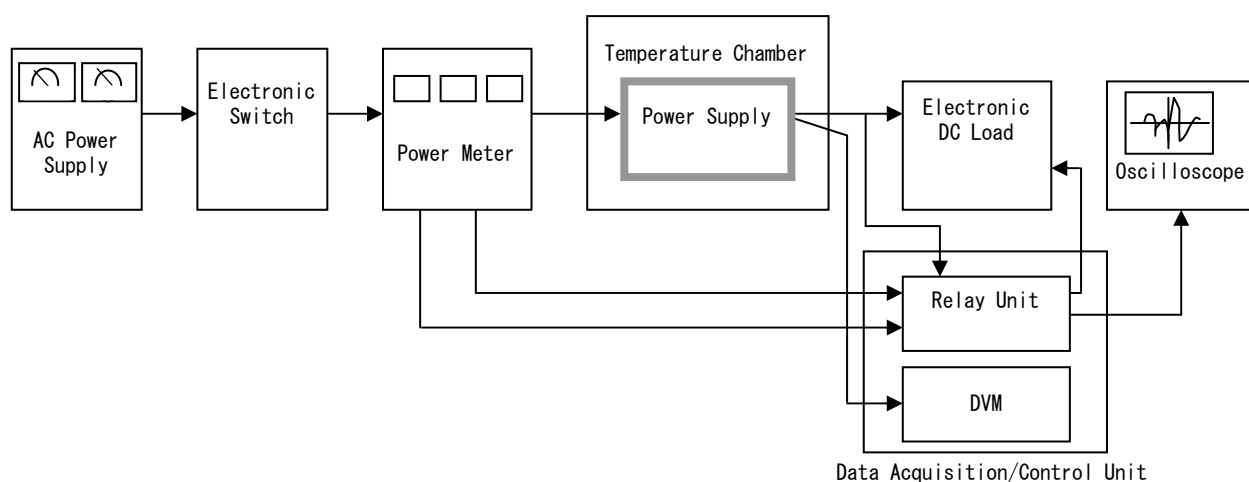


Figure A

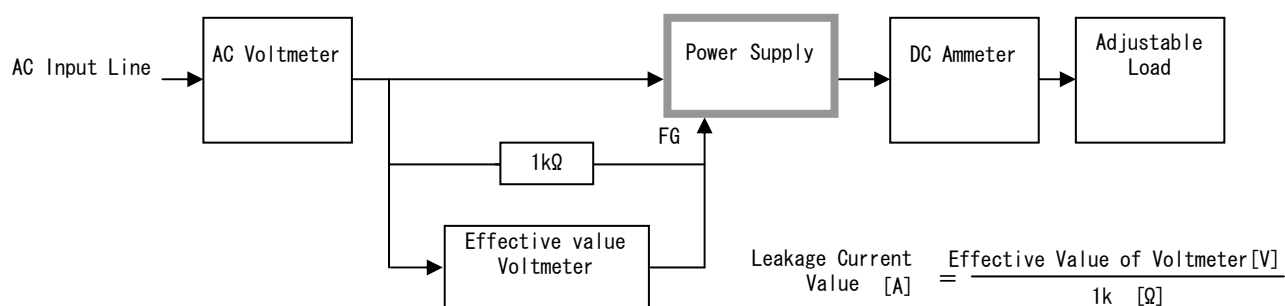


Figure B ( DEN-AN )

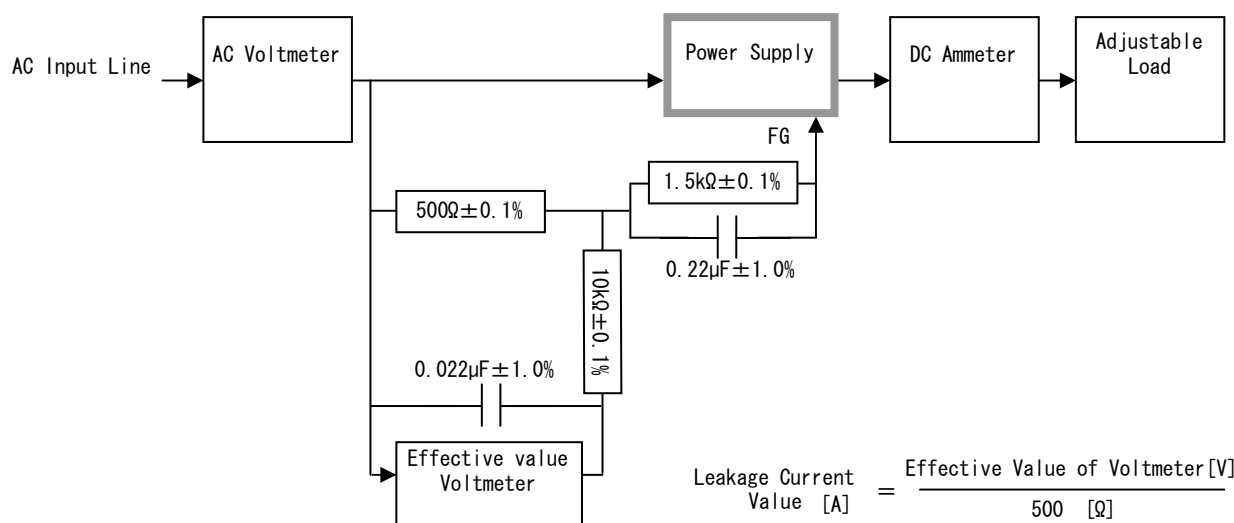


Figure B ( IEC60950-1 )

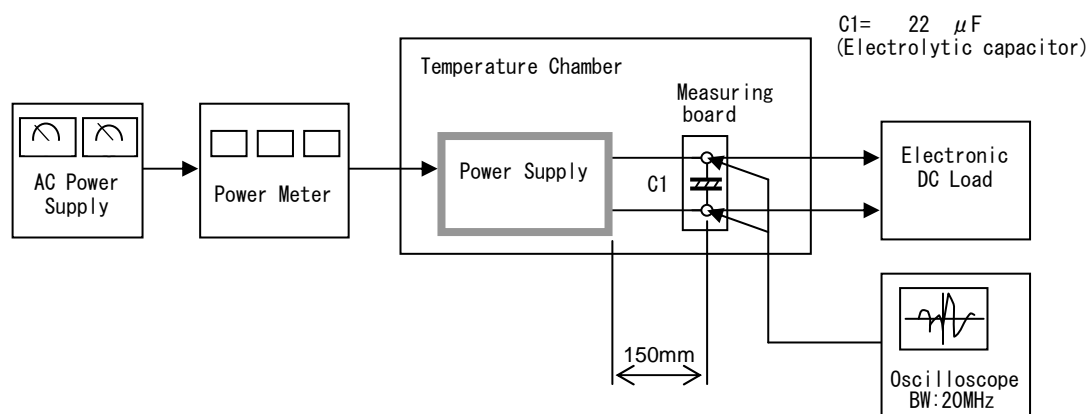


Figure C