



# TEST DATA OF LFA10F-3R3-Y

Regulated DC Power Supply  
June 26, 2009

Approved by : *Yoshiaki Shimizu*  
Yoshiaki Shimizu Design Manager

Prepared by : *Yuki Nakamura*  
Yuki Nakamura Design Engineer

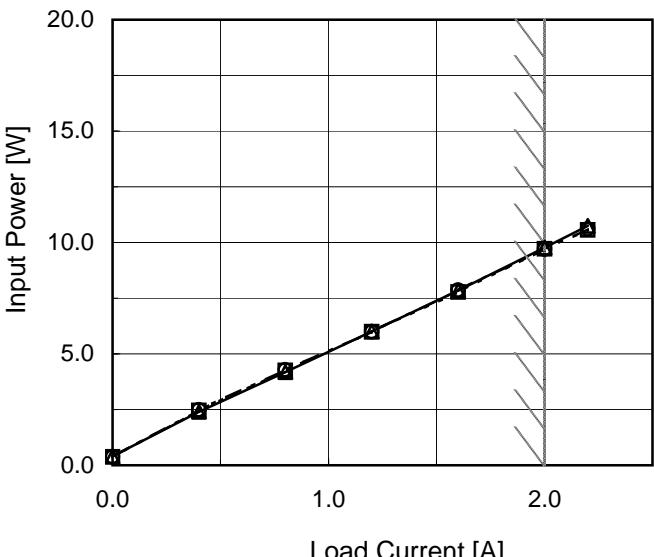
**COSEL CO.,LTD.**

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Model	LFA10F-3R3-Y																																																					
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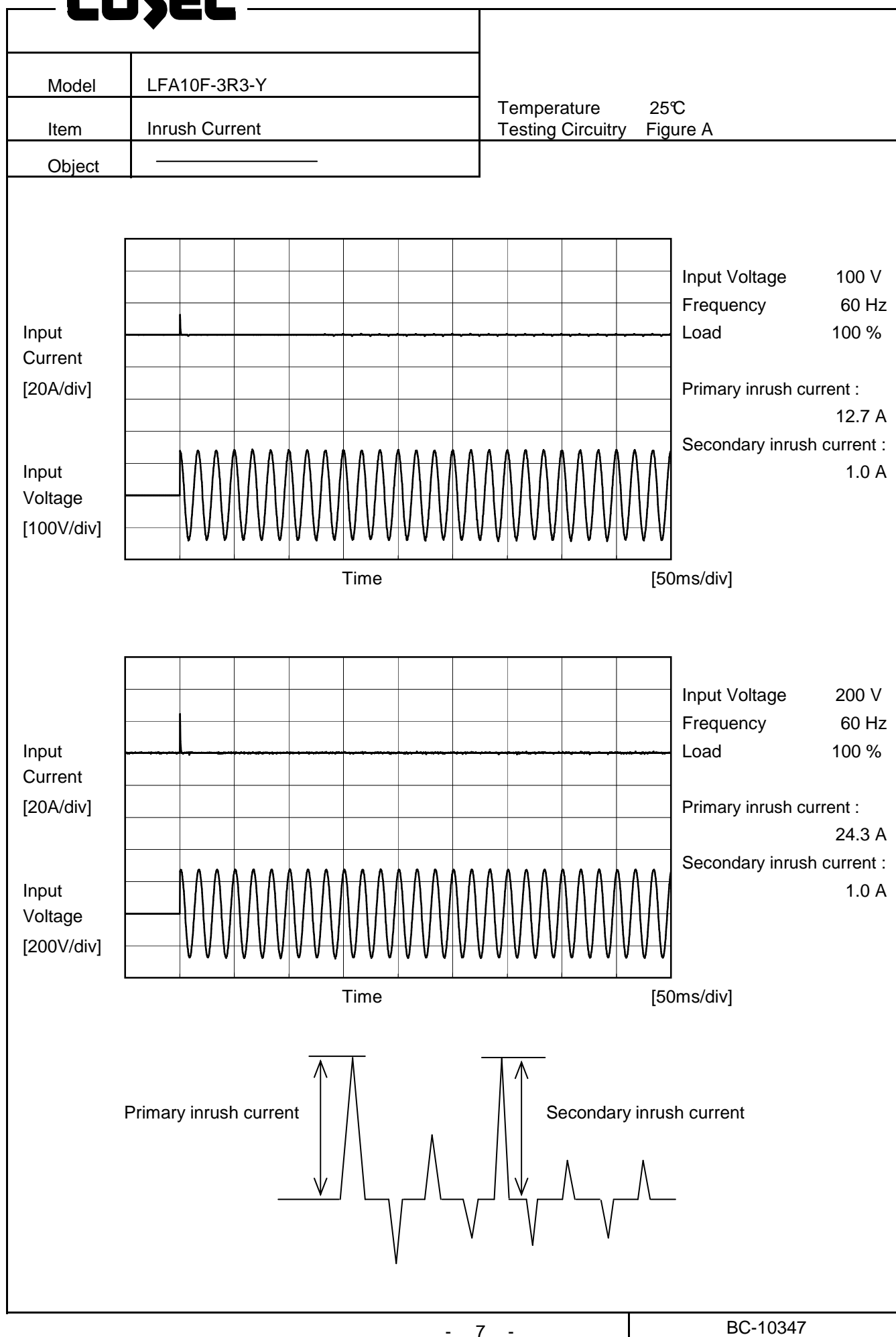
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		Temperature 25℃ Testing Circuitry Figure B
Model	LFA10F-3R3-Y	
Item	Leakage Current	
Object	_____	

## 1.Results

[mA]

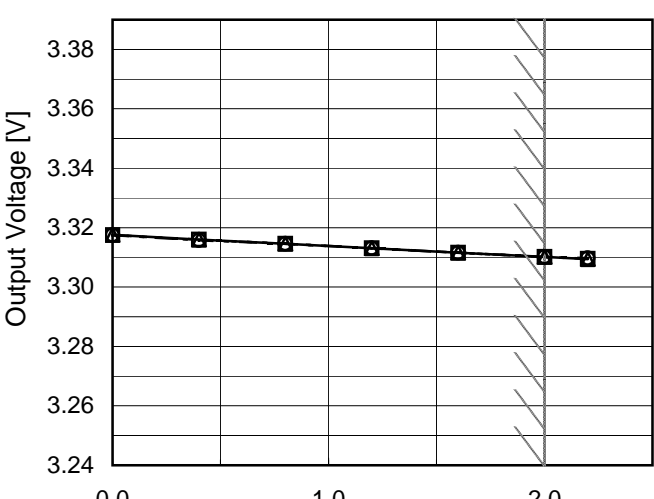
Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.07	0.14	0.16	Operation
	One of phase	0.13	0.27	0.33	stand by
IEC60950-1	Both phases	0.09	0.19	0.20	Operation
	One of phase	0.13	0.28	0.31	stand by

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-3R3-Y																																		
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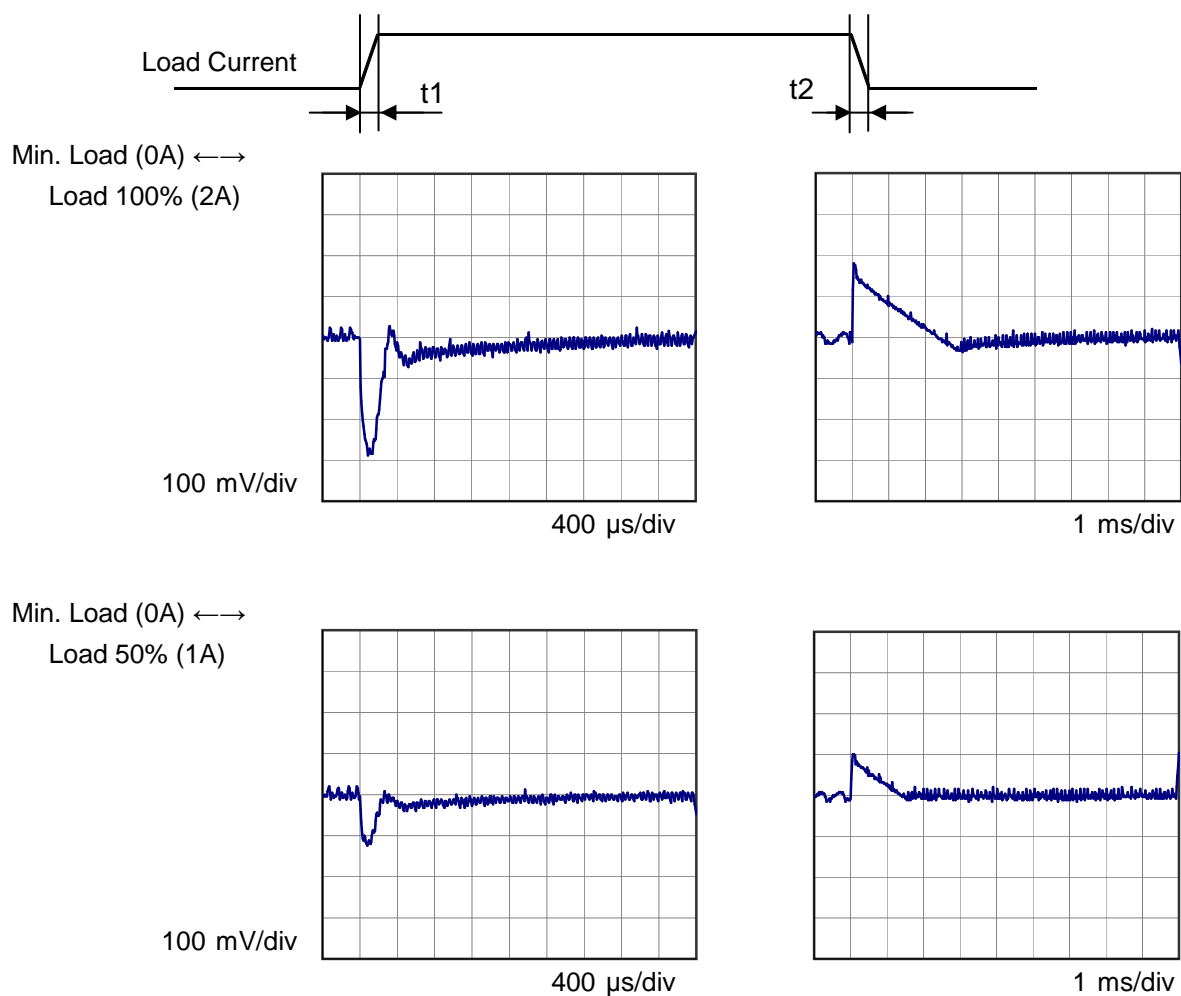
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Model	LFA10F-3R3-Y	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Response		
Object	+3.3V2A		

Input Volt. 100 V  
Cycle 1000 ms

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



Model	LFA10F-3R3-Y																																								
Item	Ripple Voltage (by Load Current)	Temperature	25℃																																						
Object	+3.3V2A	Testing Circuitry	Figure C																																						
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 100V</div><div>-·-○-·- Input Volt. 200V</div></div><p>Ripple Voltage [mV]</p><p>Load Current [A]</p></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 100 [V]</th><th>Input Volt. 200 [V]</th></tr><tr><td>0.0</td><td>35</td><td>65</td></tr><tr><td>0.4</td><td>10</td><td>75</td></tr><tr><td>0.8</td><td>15</td><td>15</td></tr><tr><td>1.2</td><td>20</td><td>20</td></tr><tr><td>1.6</td><td>25</td><td>25</td></tr><tr><td>2.0</td><td>25</td><td>25</td></tr><tr><td>2.2</td><td>25</td><td>25</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>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	0.0	35	65	0.4	10	75	0.8	15	15	1.2	20	20	1.6	25	25	2.0	25	25	2.2	25	25	--	-	-	--	-	-	--	-	-	--	-	-
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<p>Measured by 20 MHz Oscilloscope.</p> <p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p>																																									
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Model	LFA10F-3R3-Y																																								
Item	Ripple-Noise	Temperature	25℃																																						
Object	+3.3V2A	Testing Circuitry	Figure C																																						
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<div><div><div><div></div><div>—△—</div><div>Input Volt. 100V</div></div><div><div></div><div>-·-○--</div><div>Input Volt. 200V</div></div></div><div>Ripple-Noise [mV]</div><div>Load Current [A]</div></div> <div>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.</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. 200 [V]</th></tr><tr><td>0.0</td><td>35</td><td>65</td></tr><tr><td>0.4</td><td>10</td><td>75</td></tr><tr><td>0.8</td><td>15</td><td>20</td></tr><tr><td>1.2</td><td>20</td><td>25</td></tr><tr><td>1.6</td><td>30</td><td>30</td></tr><tr><td>2.0</td><td>30</td><td>30</td></tr><tr><td>2.2</td><td>30</td><td>30</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>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	0.0	35	65	0.4	10	75	0.8	15	20	1.2	20	25	1.6	30	30	2.0	30	30	2.2	30	30	--	-	-	--	-	-	--	-	-	--	-	-
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Model		LFA10F-3R3-Y	Testing Circuitry    Figure C																																																																										
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<div><div><div>--- □ ---</div><div>Input Volt.    100V</div></div><div><div>— △ —</div><div>Input Volt.    200V</div></div></div> <table><caption>Graph Data Points (Estimated)</caption><tr><th>Ambient Temperature [°C]</th><th>100V Input Ripple [mV]</th><th>200V Input Ripple [mV]</th></tr><tr><td>-30</td><td>110</td><td>110</td></tr><tr><td>-10</td><td>75</td><td>75</td></tr><tr><td>0</td><td>50</td><td>50</td></tr><tr><td>25</td><td>25</td><td>25</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></table>			Ambient Temperature [°C]	100V Input Ripple [mV]	200V Input Ripple [mV]	-30	110	110	-10	75	75	0	50	50	25	25	25	50	25	20	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	<table><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><tr><td>-30</td><td>110</td><td>110</td></tr><tr><td>-10</td><td>75</td><td>75</td></tr><tr><td>0</td><td>50</td><td>50</td></tr><tr><td>25</td><td>25</td><td>25</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></table>	Ambient Temperature [°C]	Ripple Voltage [mV]		Input Volt. 100 [V]	Input Volt. 200 [V]	-30	110	110	-10	75	75	0	50	50	25	25	25	50	25	20	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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BC-10347



Model	LFA10F-3R3-Y																																																					
Item	Ambient Temperature Drift	Testing Circuitry    Figure A																																																				
Object	+3.3V2A																																																					
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		Testing Circuitry Figure A
Model	LFA10F-3R3-Y	
Item	Output Voltage Accuracy	
Object	+3.3V2A	

### 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 - 2A

\* 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

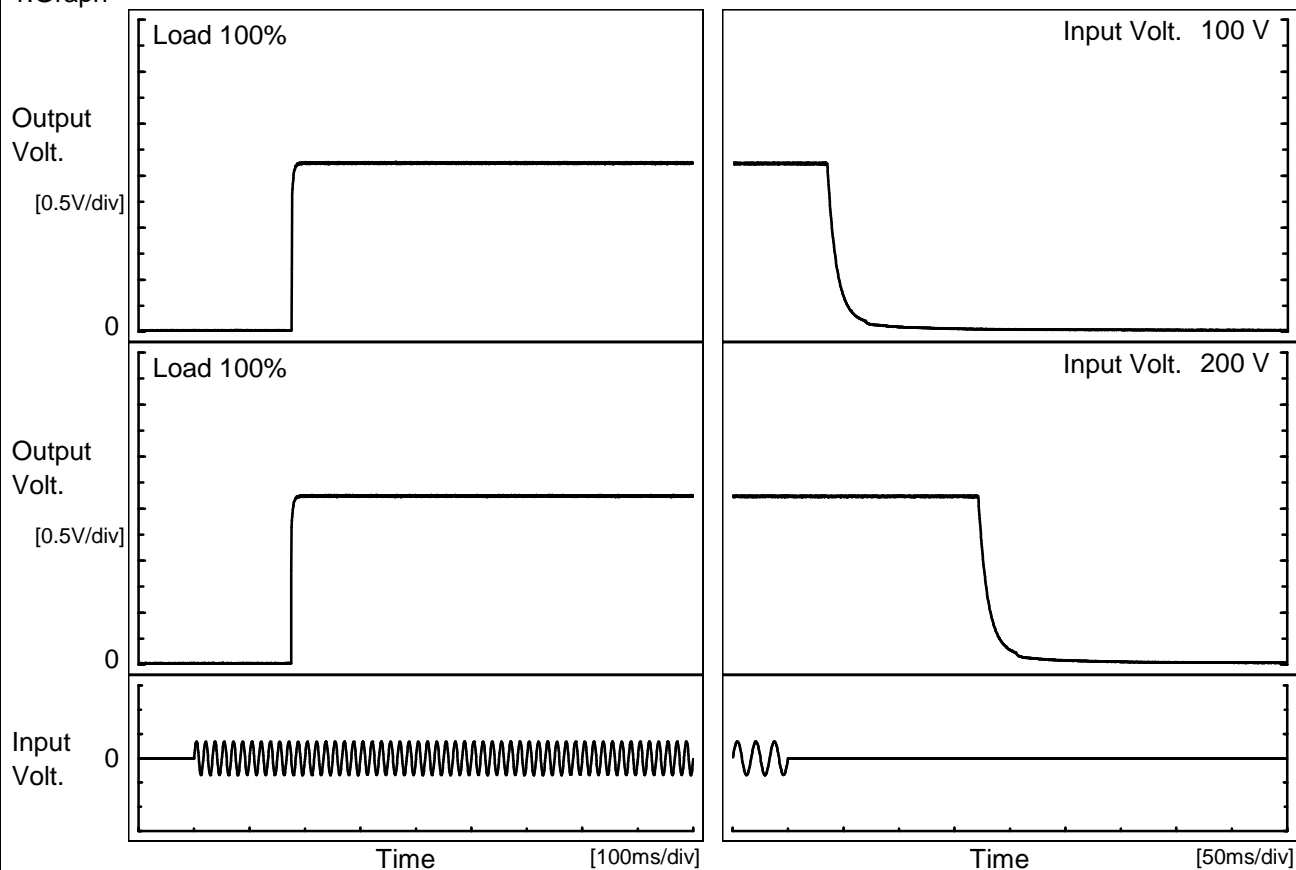
Item	Temperature [℃]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	30	264	0	3.318	±5	±0.2
Minimum Voltage	-10	85	2	3.308		

Model	LFA10F-3R3-Y		
Item	Time Lapse Drift	Temperature	25℃
		Testing Circuitry	Figure A
Object	+3.3V2A		
1.Graph		2.Values	
<div><div><div>Output Voltage [V]</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><di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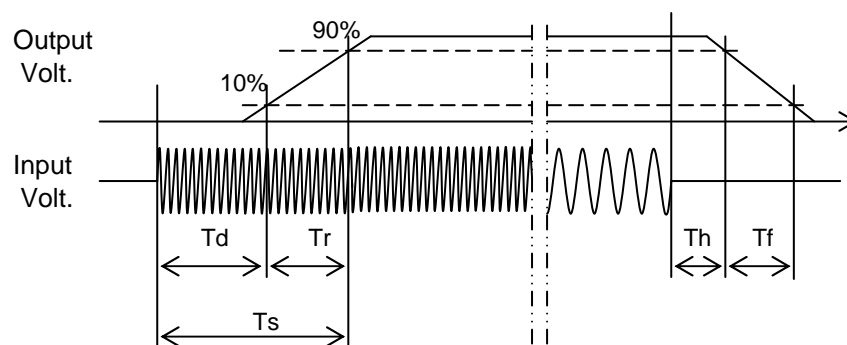
Model	LFA10F-3R3-Y	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+3.3V2A		

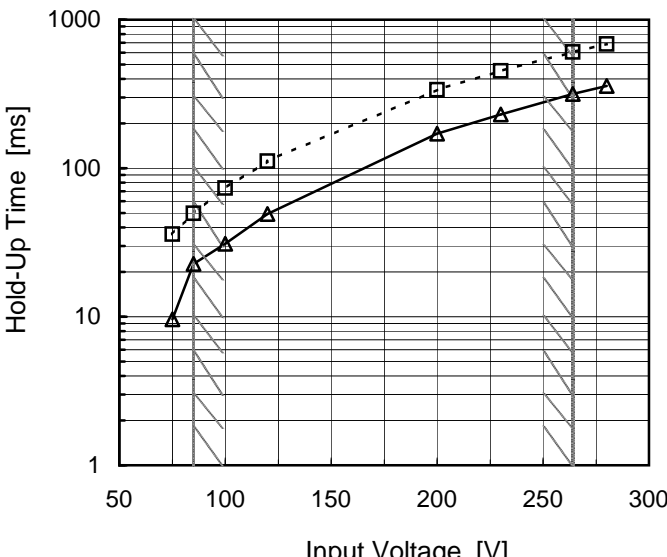
## 1. Graph



## 2. Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	176.5	3.0	179.5	35.5	22.5
200 V	175.5	3.0	178.5	172.0	24.0



Model		LFA10F-3R3-Y	Temperature		25℃																																																														
Item		Hold-Up Time	Testing Circuitry		Figure A																																																														
Object		+3.3V2A																																																																	
1.Graph			2.Values																																																																
<div><div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</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. Note: Slanted line shows the range of the rated input voltage.</p></div> <table><thead><tr><th>Input Voltage [V]</th><th>Hold-Up Time [ms] Load 50%</th><th>Hold-Up Time [ms] Load 100%</th></tr></thead><tbody><tr><td>75</td><td>36</td><td>10</td></tr><tr><td>85</td><td>50</td><td>23</td></tr><tr><td>100</td><td>74</td><td>31</td></tr><tr><td>120</td><td>111</td><td>49</td></tr><tr><td>200</td><td>337</td><td>171</td></tr><tr><td>230</td><td>453</td><td>230</td></tr><tr><td>264</td><td>605</td><td>316</td></tr><tr><td>280</td><td>685</td><td>359</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>			Input Voltage [V]	Hold-Up Time [ms] Load 50%	Hold-Up Time [ms] Load 100%	75	36	10	85	50	23	100	74	31	120	111	49	200	337	171	230	453	230	264	605	316	280	685	359	--	-	-	<table><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Hold-Up Time [ms]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>75</td><td>36</td><td>10</td></tr><tr><td>85</td><td>50</td><td>23</td></tr><tr><td>100</td><td>74</td><td>31</td></tr><tr><td>120</td><td>111</td><td>49</td></tr><tr><td>200</td><td>337</td><td>171</td></tr><tr><td>230</td><td>453</td><td>230</td></tr><tr><td>264</td><td>605</td><td>316</td></tr><tr><td>280</td><td>685</td><td>359</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>			Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	36	10	85	50	23	100	74	31	120	111	49	200	337	171	230	453	230	264	605	316	280	685	359	--	-	-
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BC-10347

Model	LFA10F-3R3-Y																																																					
Item	Instantaneous Interruption Compensation	Temperature	25℃																																																			
Object	+3.3V2A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div>—△— Input Volt. 100V</div><div>- - □ - - Input Volt. 200V</div><div>- · - ○ - · - Input Volt. 230V</div></div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.4</td><td>164</td><td>714</td><td>990</td></tr><tr><td>0.8</td><td>92</td><td>411</td><td>550</td></tr><tr><td>1.2</td><td>63</td><td>287</td><td>386</td></tr><tr><td>1.6</td><td>47</td><td>219</td><td>295</td></tr><tr><td>2.0</td><td>31</td><td>171</td><td>230</td></tr><tr><td>2.2</td><td>26</td><td>153</td><td>208</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	-	-	-	0.4	164	714	990	0.8	92	411	550	1.2	63	287	386	1.6	47	219	295	2.0	31	171	230	2.2	26	153	208	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
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BC-10347

Model	LFA10F-3R3-Y	
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A
Object	+3.3V2A	

1.Graph

Legend:  
 ---□--- Load 50%  
 —△— Load 100%

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

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	34	44
-10	34	44
0	34	44
10	34	44
20	34	44
25	33	44
30	33	44
40	33	44
50	33	44
60	33	44
--	-	-

Model	LFA10F-3R3-Y																																											
Item	Overcurrent Protection	Temperature	25℃																																									
		Testing Circuitry	Figure A																																									
Object	+3.3V2A																																											
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>3.300</td><td>4.02</td><td>4.80</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></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 200[V]	3.300	4.02	4.80	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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	Input Volt. 100[V]	Input Volt. 200[V]																																										
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3.135	-	-																																										
2.970	-	-																																										
2.640	-	-																																										
2.310	-	-																																										
1.980	-	-																																										
1.650	-	-																																										
1.320	-	-																																										
0.990	-	-																																										
0.660	-	-																																										
0.330	-	-																																										
0.000	-	-																																										



Model	LFA10F-3R3-Y																																							
Item	Overvoltage Protection	Testing Circuitry    Figure A																																						
Object	+3.3V2A																																							
1.Graph  <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		2.Values <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>4.93</td><td>4.93</td></tr> <tr><td>-10</td><td>4.86</td><td>4.86</td></tr> <tr><td>0</td><td>4.79</td><td>4.79</td></tr> <tr><td>10</td><td>4.79</td><td>4.79</td></tr> <tr><td>20</td><td>4.72</td><td>4.72</td></tr> <tr><td>25</td><td>4.72</td><td>4.72</td></tr> <tr><td>30</td><td>4.72</td><td>4.72</td></tr> <tr><td>40</td><td>4.65</td><td>4.65</td></tr> <tr><td>50</td><td>4.58</td><td>4.58</td></tr> <tr><td>60</td><td>4.58</td><td>4.58</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	4.93	4.93	-10	4.86	4.86	0	4.79	4.79	10	4.79	4.79	20	4.72	4.72	25	4.72	4.72	30	4.72	4.72	40	4.65	4.65	50	4.58	4.58	60	4.58	4.58	--	-	-
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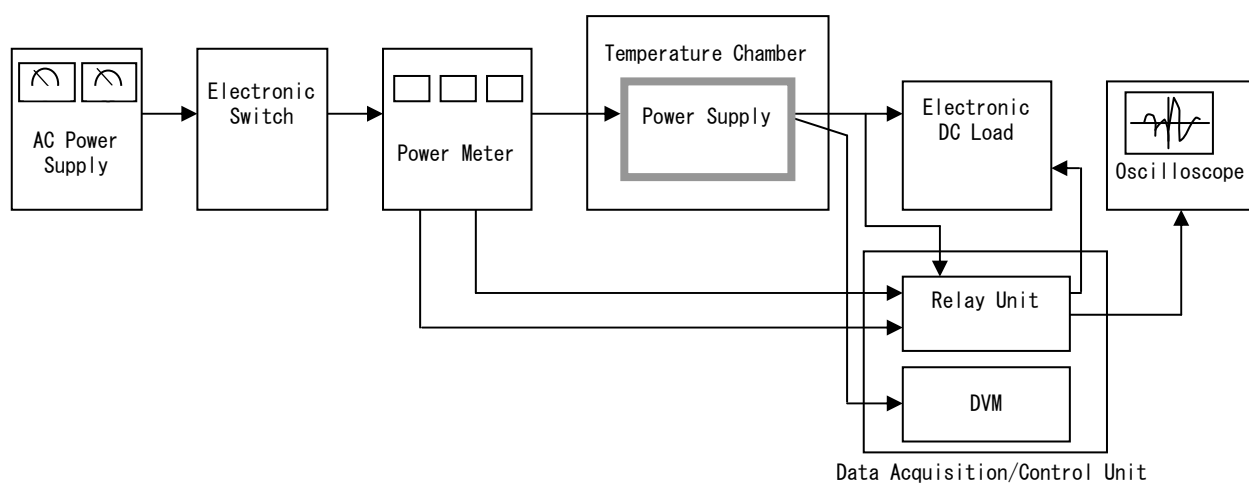


Figure A

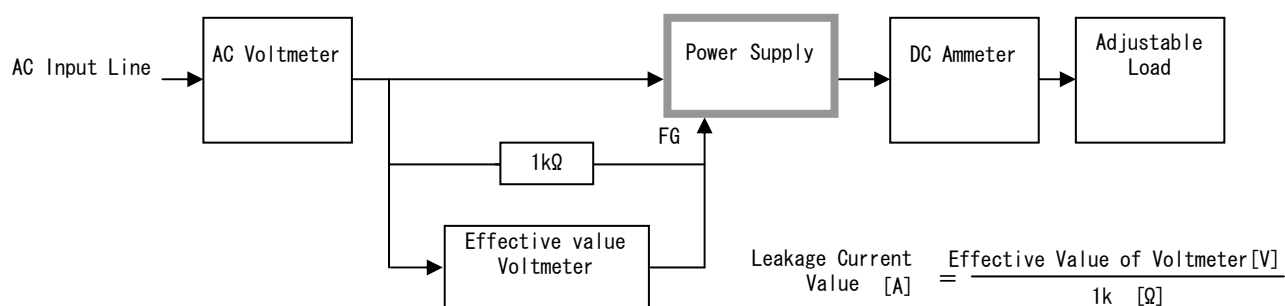


Figure B ( DEN-AN )

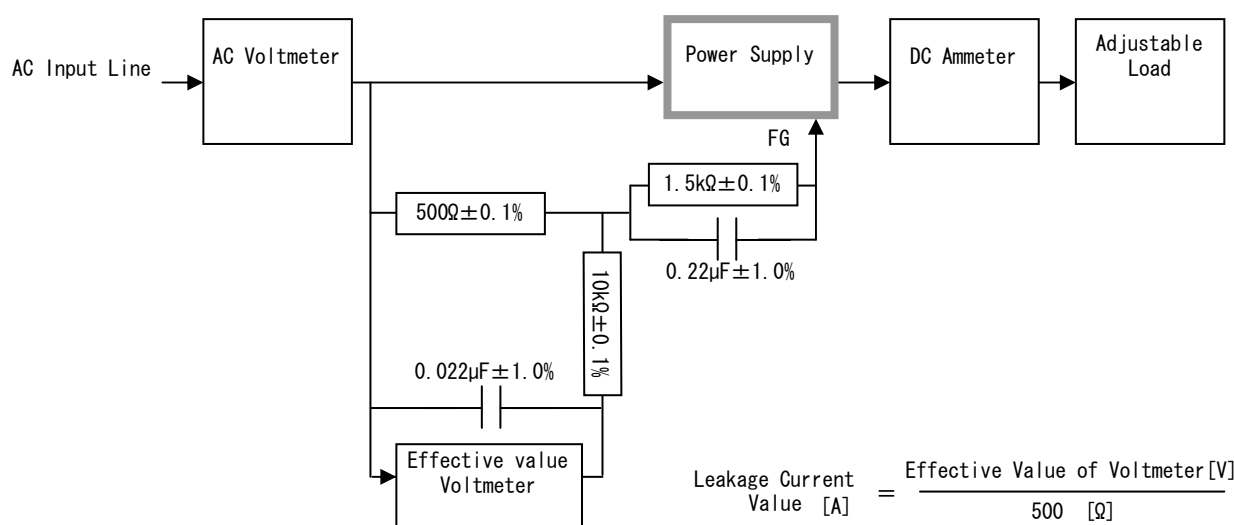


Figure B ( IEC60950-1 )

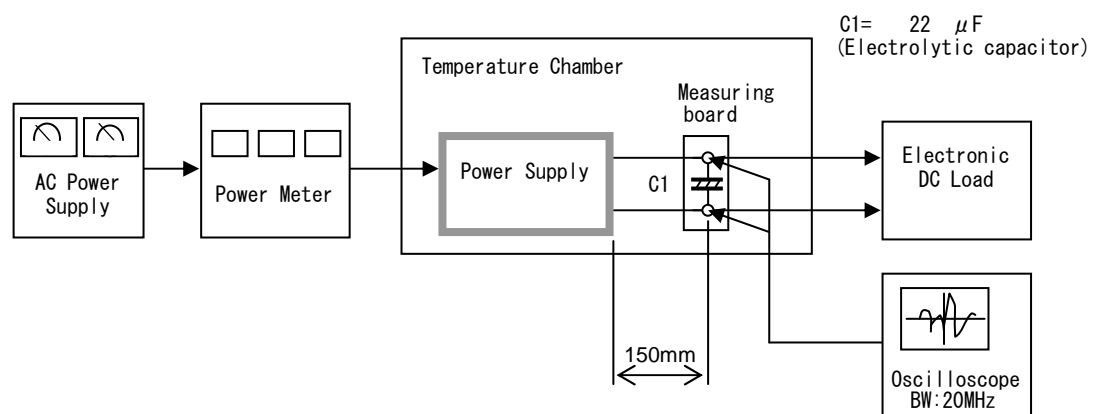


Figure C