

TEST DATA OF LCA50S-3

Regulated DC Power Supply

Approved by : 
Kenichi Shibutani Design Manager

Prepared by : 
Jun Uchida Design Engineer

COSEL CO.,LTD.

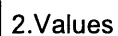
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Temperature	25°C
Testing Circuitry	Figure A



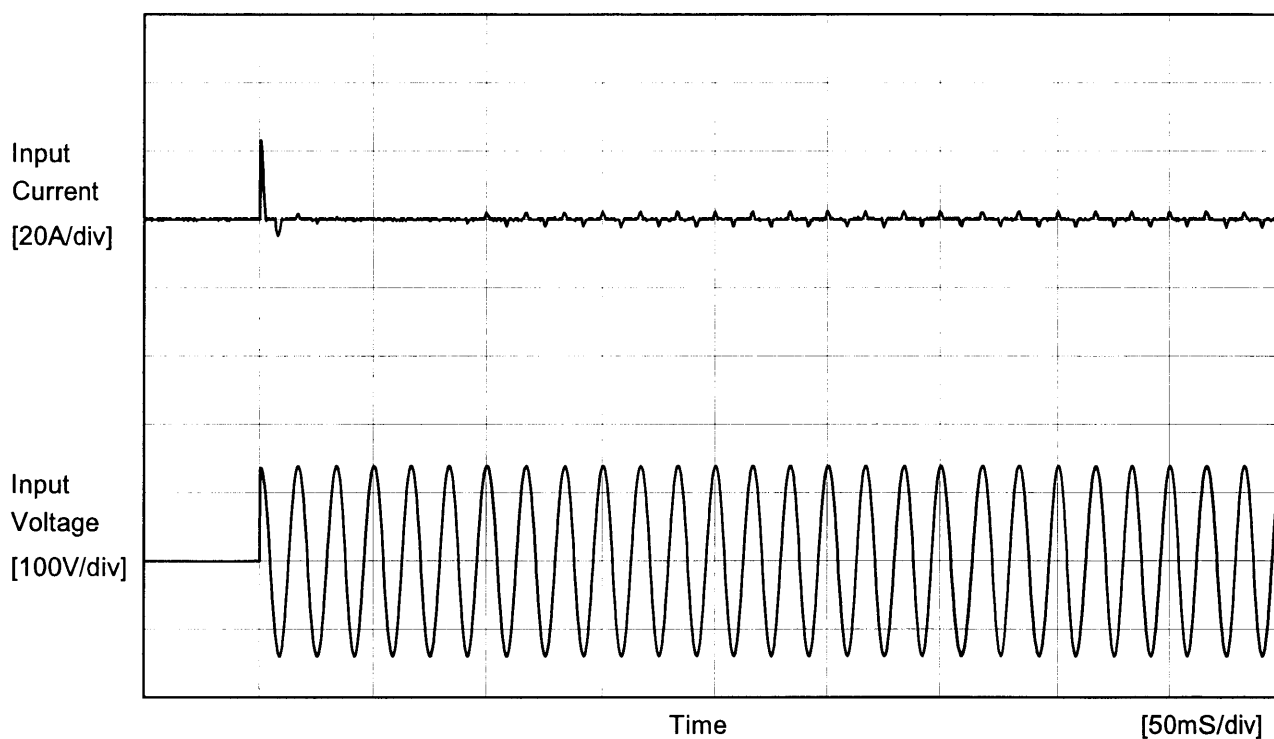
Load Current [A]	Input Power [W]		
	Input Volt.	Input Volt.	Input Volt.
	85[V]	100[V]	132[V]
0.0	1.38	1.65	2.31
1.5	7.59	8.07	9.21
3.0	13.39	13.80	14.88
4.5	19.40	19.74	20.75
6.0	25.60	25.90	26.80
7.5	32.00	32.30	33.10
9.0	38.70	38.80	39.40
10.0	43.20	43.20	43.70
11.0	47.90	47.70	48.20
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Note: Slanted line shows the range of the rated load current.

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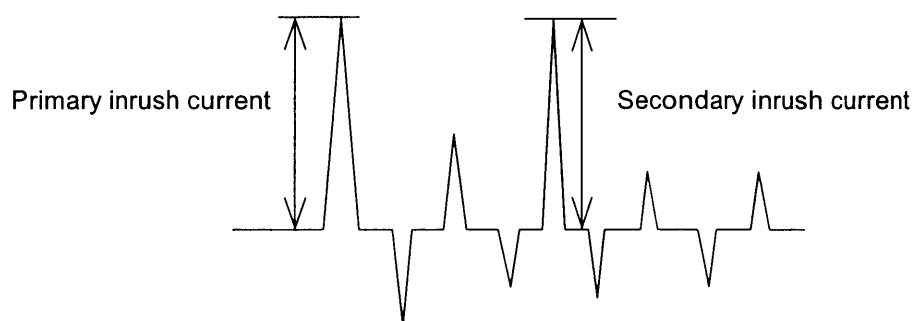
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Model		LCA50S-3	Temperature 25°C Testing Circuitry Figure A
Item		Inrush Current	
Object		_____	



Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current 23.0 A
Secondary inrush current 2.6 A



		Temperature 25°C Testing Circuitry Figure B
Model	LCA50S-3	
Item	Leakage Current	
Object	_____	

1.Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A)DEN-AN	0.16	0.19	0.25
(B)IEC60950	0.16	0.19	0.25

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 264 [V]
(B)IEC60950	-	-	-

2.Condition

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

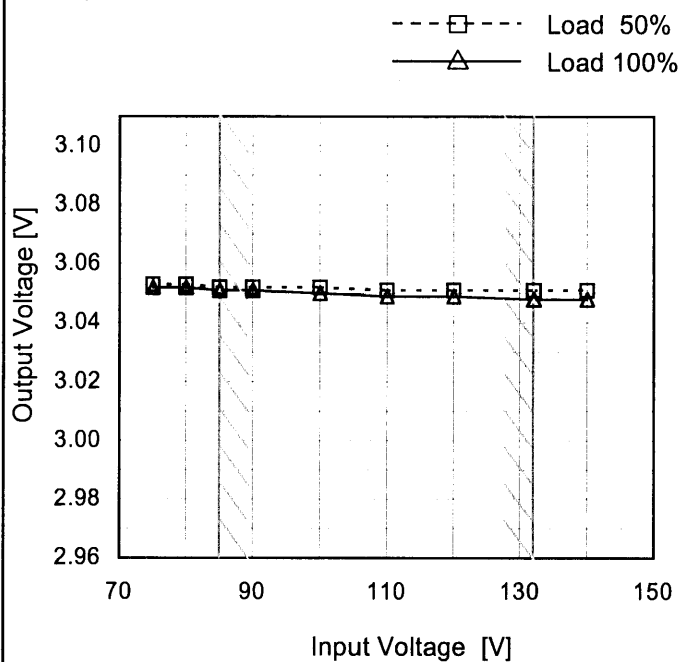
Model LCA50S-3

Item Line Regulation

Object +3V10A

 Temperature 25°C
 Testing Circuitry Figure A

1. Graph

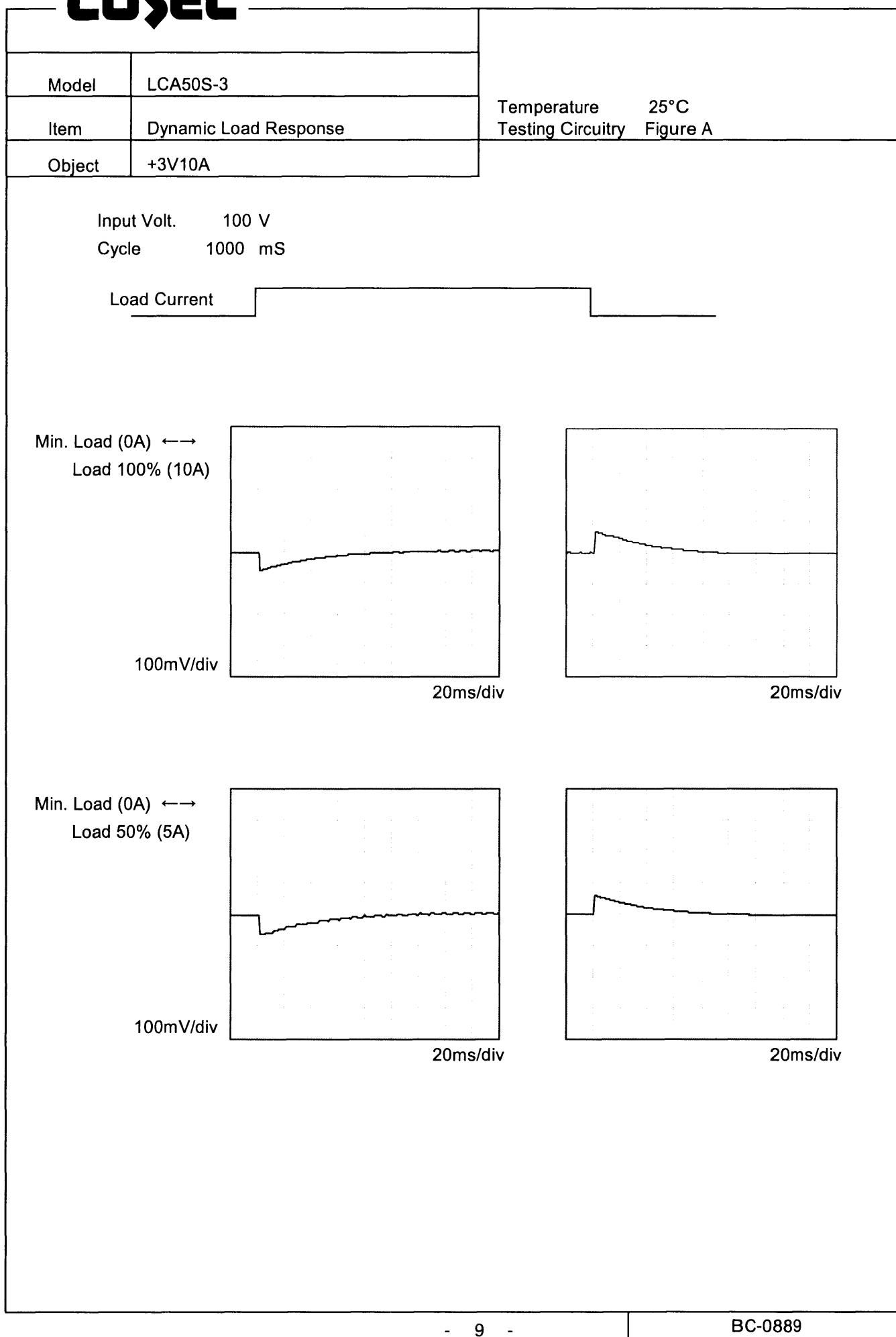


Note: Slanted line shows the range of the rated input voltage.

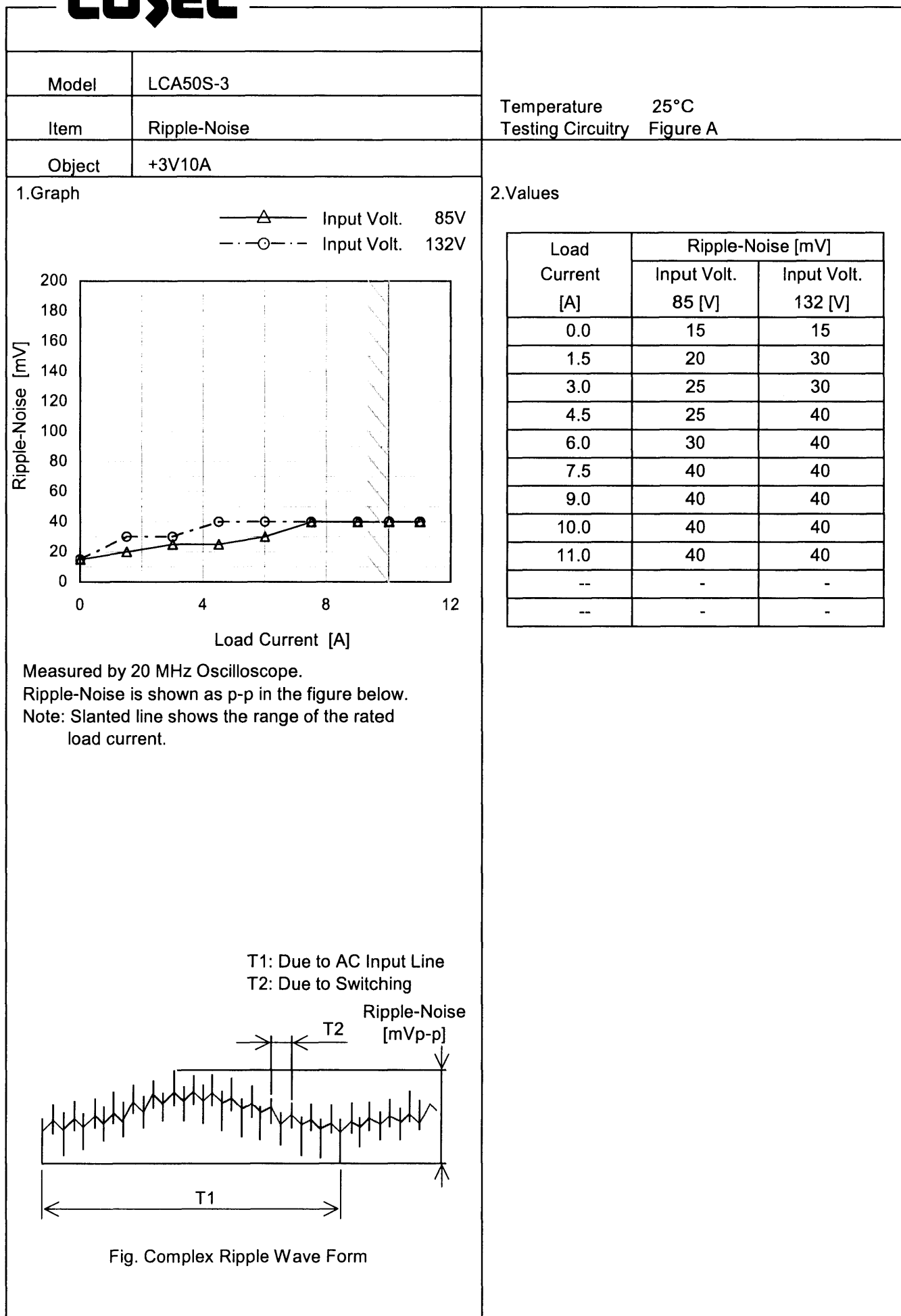
2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	3.053	3.052
80	3.053	3.052
85	3.052	3.051
90	3.052	3.051
100	3.052	3.050
110	3.051	3.049
120	3.051	3.049
132	3.051	3.048
140	3.051	3.048

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COSEL

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<div>Measured by 20 MHz Oscilloscope.</div> <div>Ripple Voltage 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><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div><div><div><div>Ripple [mVp-p]</div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div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Model	LCA50S-3																																								
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry Figure A																																							
Object	+3V10A																																								
1.Graph		2.Values																																							
<div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div> <p>Ripple Voltage [mV]</p> <p>Ambient Temperature [°C]</p> <p>Input Volt. 100V</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>-20</td><td>80</td><td>80</td></tr><tr><td>-10</td><td>70</td><td>70</td></tr><tr><td>0</td><td>50</td><td>50</td></tr><tr><td>10</td><td>40</td><td>40</td></tr><tr><td>20</td><td>35</td><td>35</td></tr><tr><td>25</td><td>30</td><td>30</td></tr><tr><td>30</td><td>30</td><td>30</td></tr><tr><td>40</td><td>30</td><td>30</td></tr><tr><td>50</td><td>30</td><td>30</td></tr><tr><td>60</td><td>25</td><td>25</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-20	80	80	-10	70	70	0	50	50	10	40	40	20	35	35	25	30	30	30	30	30	40	30	30	50	30	30	60	25	25	--	-	-
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60	25	25																																							
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Measured by 20 MHz Oscilloscope. Note: Slanted line shows the range of the rated ambient temperature.																																									

- 12 -

BC-0889

BC-0889

Model		LCA50S-3	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+3V10A	

1. Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

Temperature : -10 - 50°C

Input Voltage : 85 - 132V

Load Current : 0 - 10A

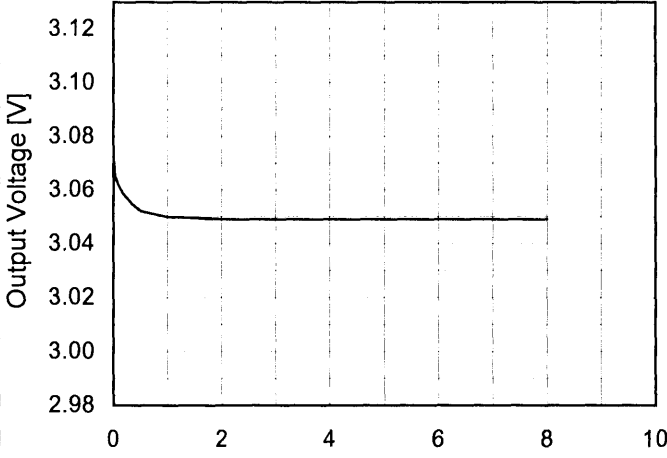
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

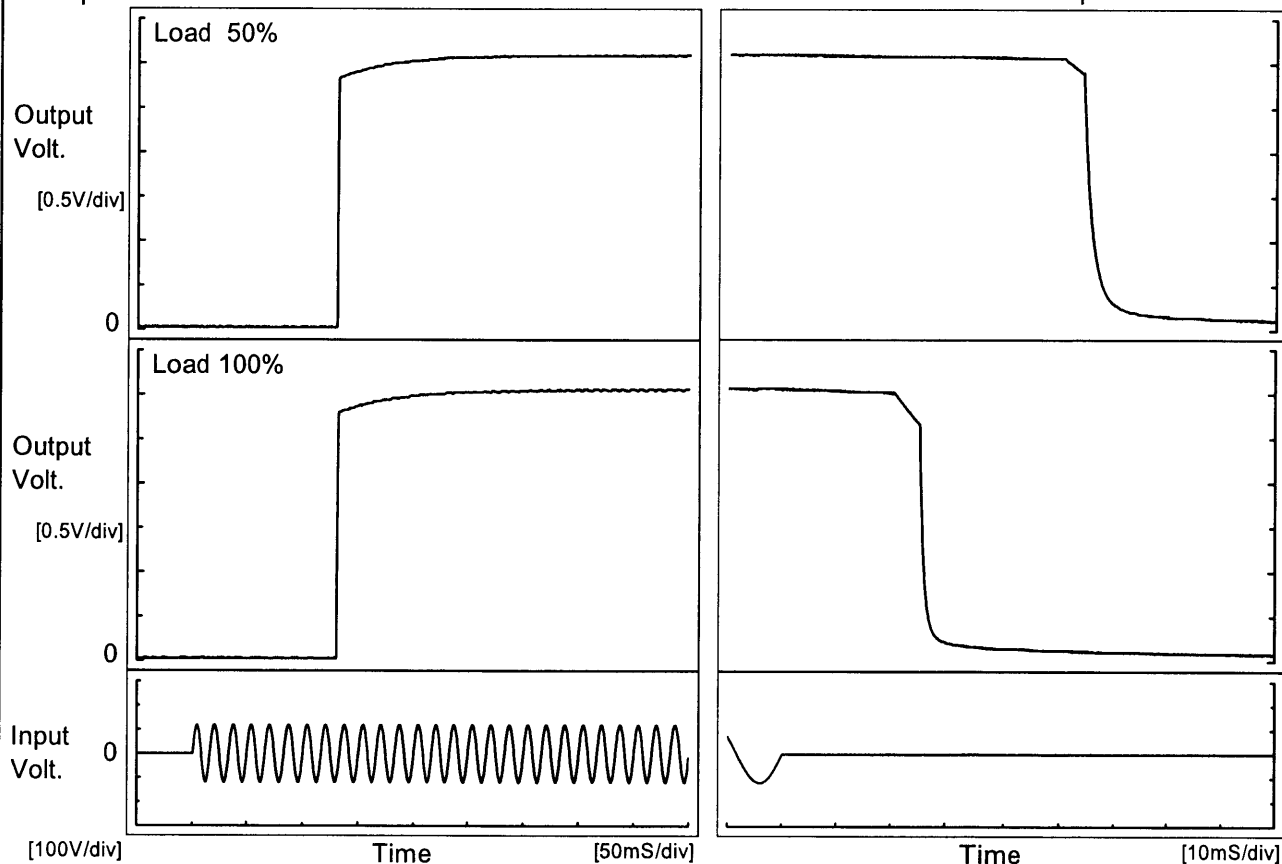
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	85	0	3.072	±11	±0.4
Minimum Voltage	50	132	10	3.050		

COSEL

Model	LCA50S-3																								
Item	Time Lapse Drift	Temperature	25°C																						
		Testing Circuitry	Figure A																						
Object	+3V10A																								
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>3.072</td></tr><tr><td>0.5</td><td>3.052</td></tr><tr><td>1.0</td><td>3.050</td></tr><tr><td>2.0</td><td>3.049</td></tr><tr><td>3.0</td><td>3.049</td></tr><tr><td>4.0</td><td>3.049</td></tr><tr><td>5.0</td><td>3.049</td></tr><tr><td>6.0</td><td>3.049</td></tr><tr><td>7.0</td><td>3.049</td></tr><tr><td>8.0</td><td>3.049</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	3.072	0.5	3.052	1.0	3.050	2.0	3.049	3.0	3.049	4.0	3.049	5.0	3.049	6.0	3.049	7.0	3.049	8.0	3.049
Time since start [H]	Output Voltage [V]																								
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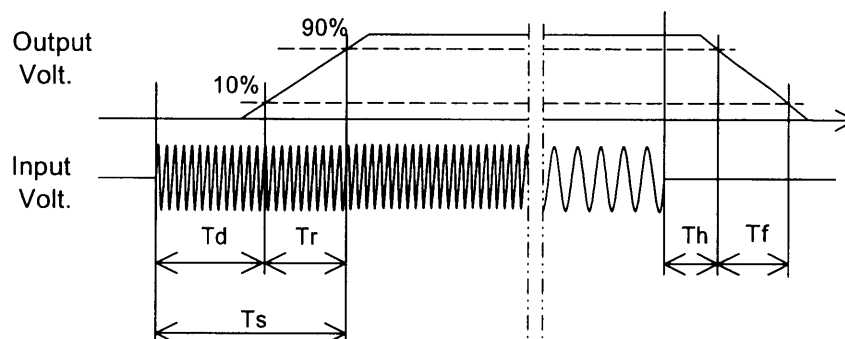
Model	LCA50S-3	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+3V10A		

1. Graph



2. Values

		[mS]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		130.5	1.0	131.5	54.5	4.9
100 %		130.5	1.3	131.8	24.4	3.5



Model		LCA50S-3	
Item		Hold-Up Time	
Object		+3V10A	
1.Graph		2.Values	

---□---

Load 50%

—△—

Load 100%

Hold-Up Time [mS]

Input Voltage [V]

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.

Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	31	12
80	41	16
85	51	22
90	62	27
100	86	39
110	112	53
120	141	67
132	179	87
140	207	101

Model	LCA50S-3																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+3V10A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>85V</div></div><div><div>---□---</div><div>Input Volt.</div><div>100V</div></div><div><div>---○---</div><div>Input Volt.</div><div>132V</div></div></div> <div>Instantaneous Compensation Time [mS]</div> <div>Load Current [A]</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [mS]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.5</td><td>164</td><td>265</td><td>489</td></tr><tr><td>3.0</td><td>89</td><td>145</td><td>290</td></tr><tr><td>4.5</td><td>60</td><td>98</td><td>201</td></tr><tr><td>6.0</td><td>41</td><td>72</td><td>151</td></tr><tr><td>7.5</td><td>32</td><td>55</td><td>120</td></tr><tr><td>9.0</td><td>26</td><td>45</td><td>98</td></tr><tr><td>10.0</td><td>22</td><td>40</td><td>88</td></tr><tr><td>11.0</td><td>20</td><td>36</td><td>80</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. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	-	-	-	1.5	164	265	489	3.0	89	145	290	4.5	60	98	201	6.0	41	72	151	7.5	32	55	120	9.0	26	45	98	10.0	22	40	88	11.0	20	36	80	--	-	-	-	--	-	-	-
Load Current [A]	Time [mS]																																																					
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Note: Slanted line shows the range of the rated load current.																																																						

Model		LCA50S-3
Item		Minimum Input Voltage for Regulated Output Voltage
Object		+3V10A

1.Graph

□

Load 50%

—

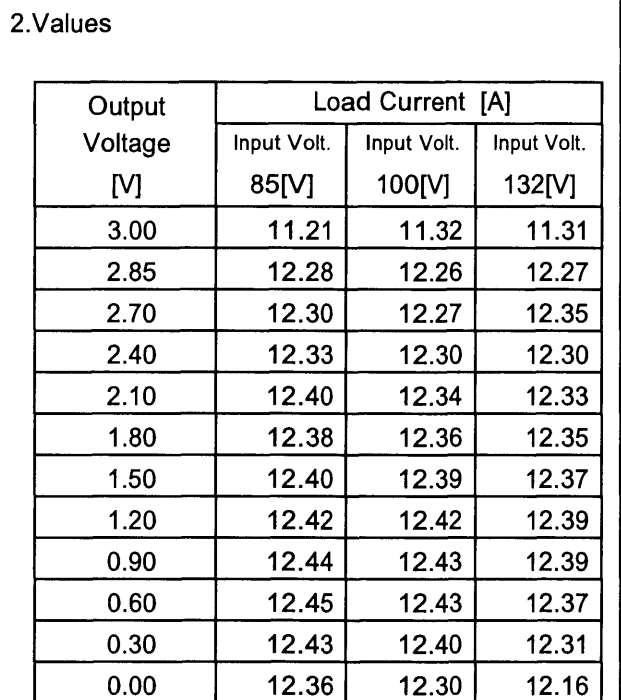
△

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Load 100%

Input Voltage [V]

Temperature	25°C
Testing Circuitry	Figure A



Model		LCA50S-3																																																				
Item		Overvoltage Protection																																																				
Object		+3V10A																																																				
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt. 85V</div></div><div><div>---□---</div><div>Input Volt. 100V</div></div><div><div>-·-○-·-</div><div>Input Volt. 132V</div></div></div> <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</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">Operating Point [V]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>-20</td><td>4.88</td><td>4.88</td><td>4.88</td></tr><tr><td>-10</td><td>4.88</td><td>4.88</td><td>4.87</td></tr><tr><td>0</td><td>4.82</td><td>4.87</td><td>4.87</td></tr><tr><td>10</td><td>4.81</td><td>4.81</td><td>4.81</td></tr><tr><td>20</td><td>4.81</td><td>4.81</td><td>4.81</td></tr><tr><td>25</td><td>4.70</td><td>4.81</td><td>4.81</td></tr><tr><td>30</td><td>4.70</td><td>4.81</td><td>4.81</td></tr><tr><td>45</td><td>4.70</td><td>4.70</td><td>4.70</td></tr><tr><td>50</td><td>4.70</td><td>4.70</td><td>4.70</td></tr><tr><td>60</td><td>4.69</td><td>4.69</td><td>4.69</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	-20	4.88	4.88	4.88	-10	4.88	4.88	4.87	0	4.82	4.87	4.87	10	4.81	4.81	4.81	20	4.81	4.81	4.81	25	4.70	4.81	4.81	30	4.70	4.81	4.81	45	4.70	4.70	4.70	50	4.70	4.70	4.70	60	4.69	4.69	4.69	--	-	-	-
Ambient Temperature [°C]	Operating Point [V]																																																					
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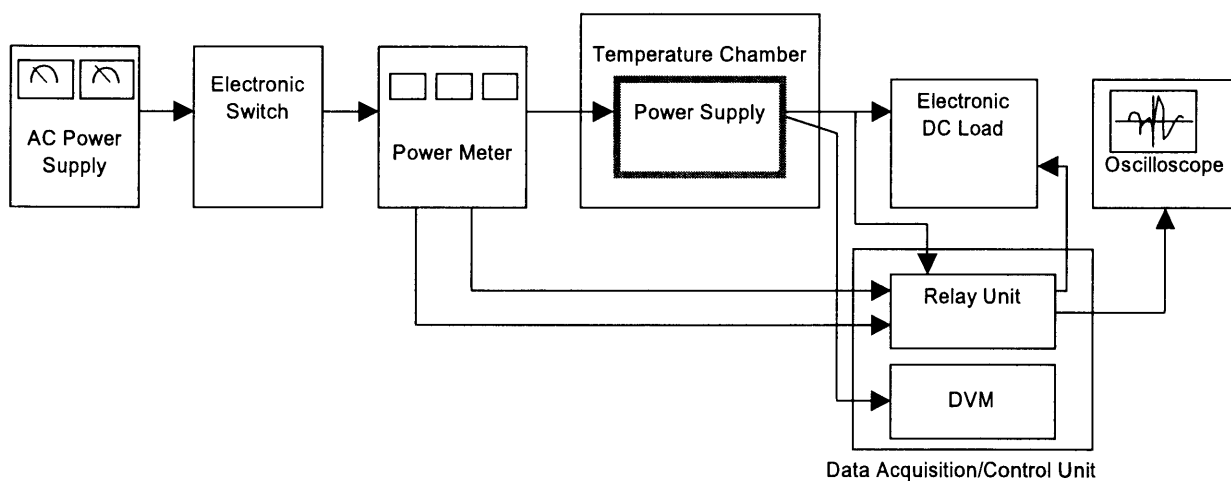


Figure A

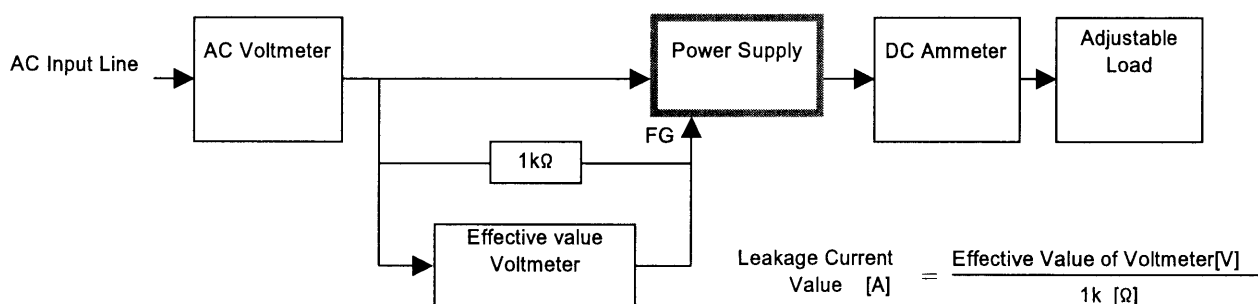


Figure B (DEN-AN)

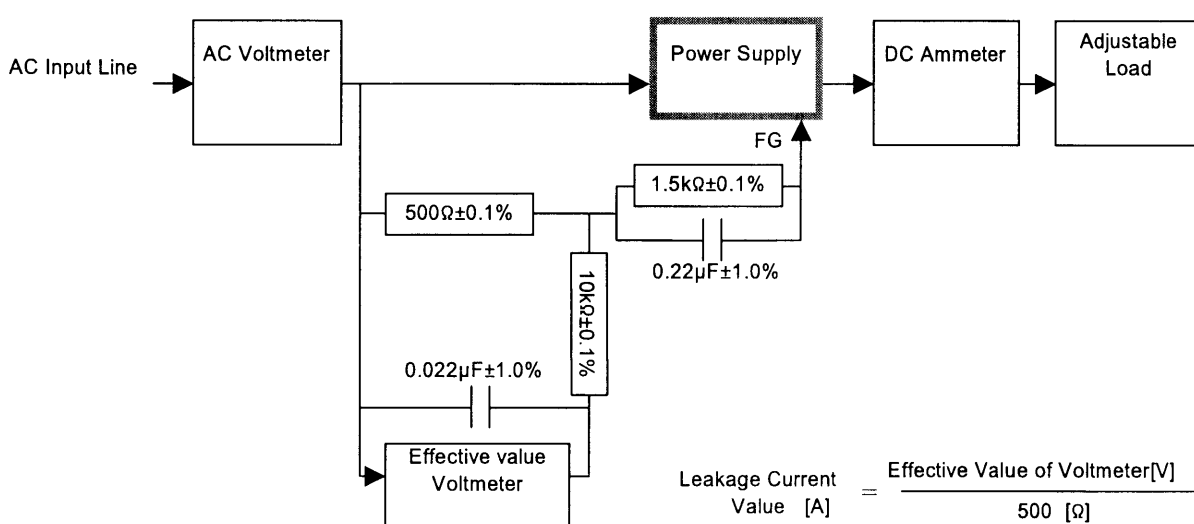


Figure B (IEC60950)