



# TEST DATA OF LGA75A-24

Regulated DC Power Supply  
April 4, 2008

Approved by : Yoshiaki Shimizu Design Manager  
Yoshiaki Shimizu

Prepared by : Yousuke Murata Design Engineer  
Yousuke Murata

**COSEL CO.,LTD.**

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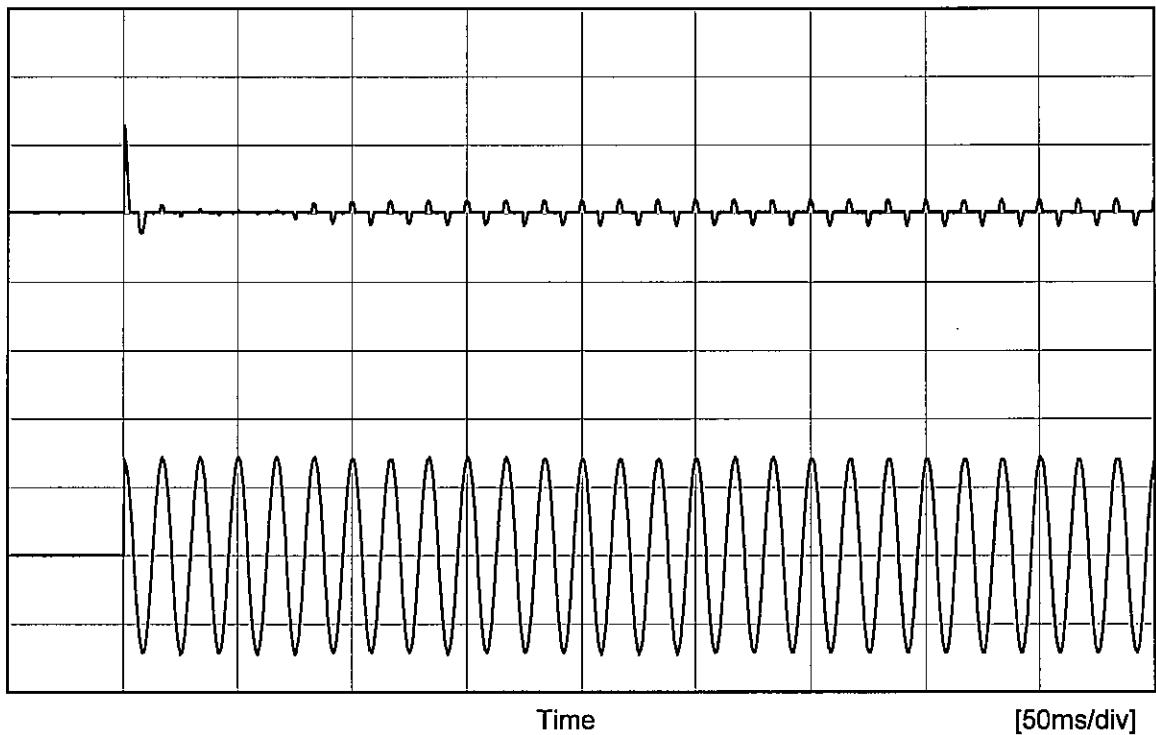
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Model LGA75A-24

Item Inrush Current

Temperature 25°C  
Testing Circuitry Figure A

Object \_\_\_\_\_

Input  
Current  
[20A/div]Input  
Voltage  
[100V/div]

Time

[50ms/div]

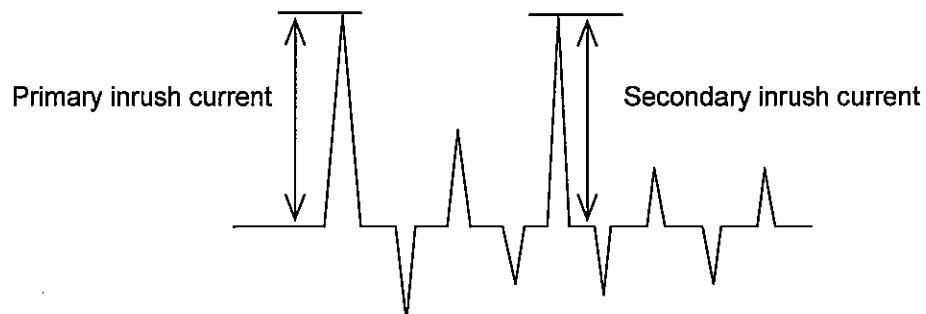
Input Voltage 100 V

Frequency 60 Hz

Load 100 %

Primary inrush current 25.3 A

Secondary inrush current 3.9 A





Model	LGA75A-24	Temperature	25°C
Item	Leakage Current	Testing Circuitry	Figure B
Object	_____		

### 1. Results

Standards	Leakage Current [mA]		
	Input Volt. 100 [V]	Input Volt. 120 [V]	Input Volt. 132 [V]
(A)DEN-AN	0.08	0.10	0.12
(B)IEC60950	0.09	0.11	0.12

frequency 60Hz

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

### 2. Condition

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

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Model	LGA75A-24	Temperature Testing Circuitry 25°C Figure A
Item	Line Regulation	
Object	+24V3.2A	

1. Graph

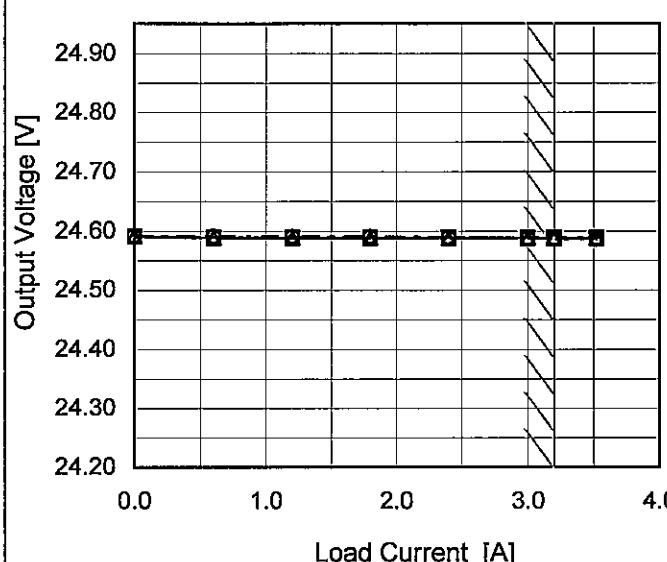
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
70	24.60	24.60
80	24.60	24.60
85	24.60	24.60
90	24.60	24.60
100	24.60	24.60
110	24.60	24.60
130	24.60	24.60
150	24.60	24.60

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

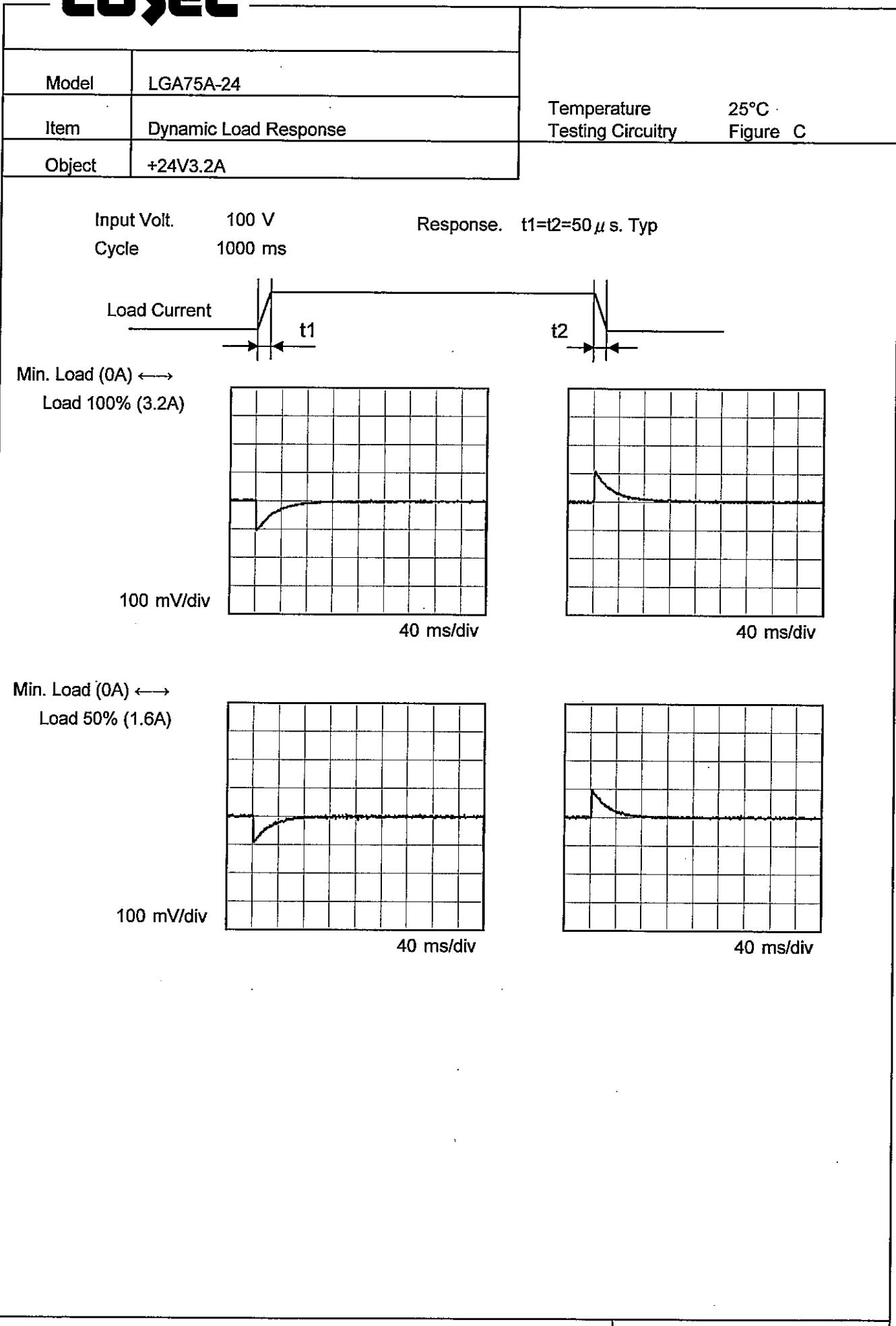
## 2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	24.600	24.591
80	24.599	24.591
85	24.598	24.591
90	24.597	24.591
100	24.597	24.591
110	24.596	24.591
120	24.596	24.590
132	24.596	24.589
140	24.595	24.587

**COSEL**

Model	LGA75A-24		
Item	Load Regulation	Temperature Testing Circuitry	25°C Figure A
Object	+24V3.2A		
1.Graph	<p>—△— Input Volt. 85V      - -□--- Input Volt. 100V      - ·○--- Input Volt. 132V</p>  <p>Output Voltage [V]</p> <p>Load Current [A]</p>	2.Values	
Load Current [A]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	24.591	24.591	24.592
0.60	24.588	24.590	24.591
1.20	24.588	24.590	24.591
1.80	24.588	24.589	24.591
2.40	24.588	24.589	24.590
3.00	24.588	24.589	24.588
3.20	24.588	24.589	24.587
3.52	24.587	24.588	24.586
---	-	-	-
---	-	-	-
---	-	-	-

Note: Slanted line shows the range of the rated load current.

**COSEL**


**COSEL**

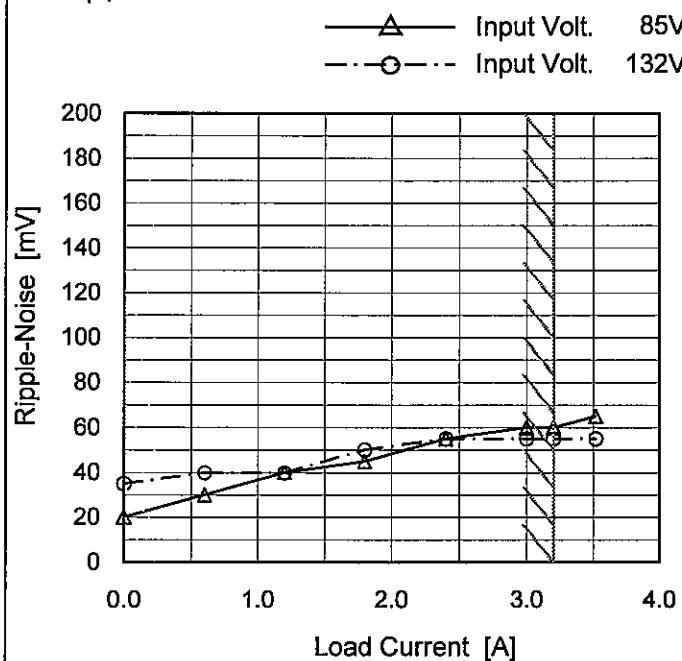
Model	LGA75A-24																																						
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure C																																					
Object	+24V3.2A																																						
1.Graph																																							
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The graph shows two sets of data points: Input Volt. 85V (solid line with triangle markers) and Input Volt. 132V (dashed line with circle markers). The x-axis represents Load Current [A] from 0.0 to 4.0. The y-axis represents Ripple Voltage [mV] from 0 to 200. A slanted line indicates the rated load current range.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Voltage [mV] (Input Volt. 85V)</th> <th>Ripple Voltage [mV] (Input Volt. 132V)</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>10</td><td>10</td></tr> <tr><td>0.60</td><td>15</td><td>10</td></tr> <tr><td>1.20</td><td>20</td><td>15</td></tr> <tr><td>1.80</td><td>20</td><td>15</td></tr> <tr><td>2.40</td><td>25</td><td>15</td></tr> <tr><td>3.00</td><td>30</td><td>20</td></tr> <tr><td>3.20</td><td>30</td><td>20</td></tr> <tr><td>3.52</td><td>35</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> </tbody> </table>		Load Current [A]	Ripple Voltage [mV] (Input Volt. 85V)	Ripple Voltage [mV] (Input Volt. 132V)	0.00	10	10	0.60	15	10	1.20	20	15	1.80	20	15	2.40	25	15	3.00	30	20	3.20	30	20	3.52	35	20	--	-	-	--	-	-	--	-	-		
Load Current [A]	Ripple Voltage [mV] (Input Volt. 85V)	Ripple Voltage [mV] (Input Volt. 132V)																																					
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Load Current [A]	Ripple Voltage [mV]																																						
	Input Volt. 85 [V]	Input Volt. 132 [V]																																					
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0.60	15	10																																					
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<p>Measured by 20 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p> <p>T1: Due to AC Input Line T2: Due to Switching</p> <p>Fig. Complex Ripple Wave Form</p>																																							

**COSEL**

Model	LGA75A-24
Item	Ripple-Noise
Object	+24V3.2A

Temperature 25°C  
Testing Circuitry Figure C

## 1. Graph



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.

## 2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	20	35
0.60	30	40
1.20	40	40
1.80	45	50
2.40	55	55
3.00	60	55
3.20	60	55
3.52	65	55
--	-	-
--	-	-
--	-	-

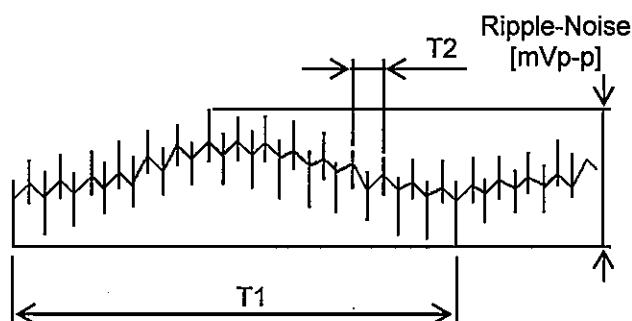
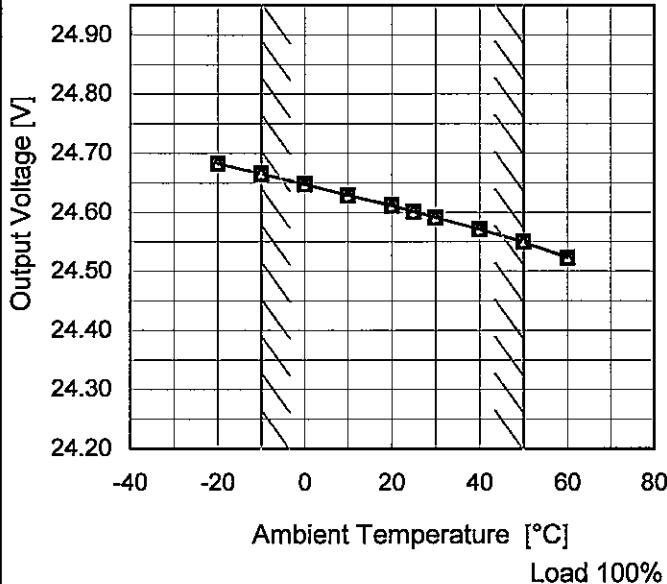
T1: Due to AC Input Line  
T2: Due to Switching

Fig. Complex Ripple Wave Form

# COSEL

Model	LGA75A-24	Testing Circuitry FigureC																										
Item	Ripple Voltage (by Ambient Temp.)																											
Object	+24V3.2A																											
1.Graph		2.Values																										
<p>Ambient Temperature [°C]</p> <p>Ripple Voltage [mV]</p> <p>Input Volt. 100V Input Load. 100%</p>		<table border="1"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>Ripple Voltage [mV]</th> </tr> </thead> <tbody> <tr><td>-30</td><td>80</td></tr> <tr><td>-10</td><td>40</td></tr> <tr><td>0</td><td>35</td></tr> <tr><td>25</td><td>15</td></tr> <tr><td>50</td><td>15</td></tr> <tr><td>--</td><td>-</td></tr> <tr><td>--</td><td>-</td></tr> <tr><td>--</td><td>-</td></tr> <tr><td>--</td><td>-</td></tr> <tr><td>--</td><td>-</td></tr> <tr><td>--</td><td>-</td></tr> <tr><td>--</td><td>-</td></tr> </tbody> </table>	Ambient Temperature [°C]	Ripple Voltage [mV]	-30	80	-10	40	0	35	25	15	50	15	--	-	--	-	--	-	--	-	--	-	--	-	--	-
Ambient Temperature [°C]	Ripple Voltage [mV]																											
-30	80																											
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<p>Measured by 20 MHz Oscilloscope.</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<p>T1: Due to AC Input Line T2: Due to Switching</p> <p>Ripple [mVp-p]</p> <p>T1</p> <p>T2</p> <p>Fig. Complex Ripple Wave Form</p>																										

**COSEL**

Model	LGA75A-24	Testing Circuitry Figure A																																																					
Item	Ambient Temperature Drift																																																						
Object	+24V3.2A																																																						
1.Graph	<p>—▲— Input Volt. 85V        - - - □--- Input Volt. 100V        - · - ○--- Input Volt. 132V</p> 																																																						
2.Values	<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 85[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 132[V]</th> </tr> </thead> <tbody> <tr> <td>-20</td><td>24.683</td><td>24.683</td><td>24.683</td></tr> <tr> <td>-10</td><td>24.665</td><td>24.666</td><td>24.665</td></tr> <tr> <td>0</td><td>24.647</td><td>24.648</td><td>24.647</td></tr> <tr> <td>10</td><td>24.629</td><td>24.629</td><td>24.629</td></tr> <tr> <td>20</td><td>24.611</td><td>24.612</td><td>24.612</td></tr> <tr> <td>25</td><td>24.601</td><td>24.601</td><td>24.601</td></tr> <tr> <td>30</td><td>24.591</td><td>24.591</td><td>24.591</td></tr> <tr> <td>40</td><td>24.571</td><td>24.571</td><td>24.571</td></tr> <tr> <td>50</td><td>24.549</td><td>24.550</td><td>24.550</td></tr> <tr> <td>60</td><td>24.523</td><td>24.523</td><td>24.523</td></tr> <tr> <td>---</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>				Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	-20	24.683	24.683	24.683	-10	24.665	24.666	24.665	0	24.647	24.648	24.647	10	24.629	24.629	24.629	20	24.611	24.612	24.612	25	24.601	24.601	24.601	30	24.591	24.591	24.591	40	24.571	24.571	24.571	50	24.549	24.550	24.550	60	24.523	24.523	24.523	---	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																						
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																				
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10	24.629	24.629	24.629																																																				
20	24.611	24.612	24.612																																																				
25	24.601	24.601	24.601																																																				
30	24.591	24.591	24.591																																																				
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---	-	-	-																																																				
Note:	Slanted line shows the range of the rated ambient temperature.																																																						



Model	LGA75A-24	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+24V3.2A	

### 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 ~ 3.2A

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

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

### 2. Values

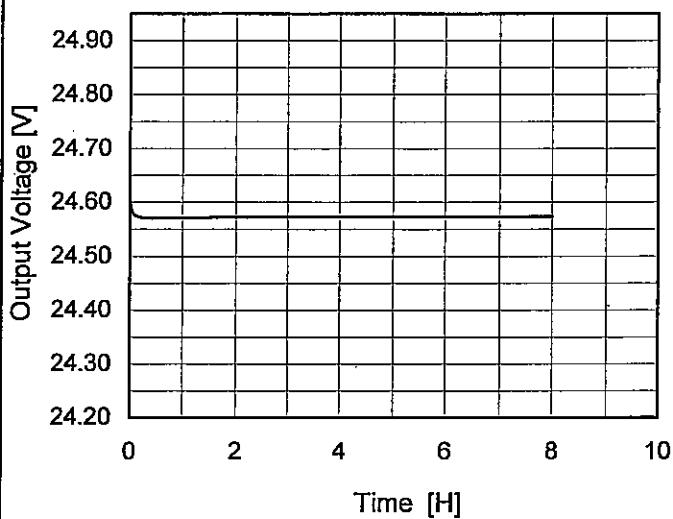
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	85	0	24.671	$\pm 61$	$\pm 0.3$
Minimum Voltage	50	85	3.2	24.549		

**COSEL**

Model	LGA75A-24
Item	Time Lapse Drift
Object	+24V3.2A

Temperature 25°C  
 Testing Circuitry Figure A

## 1.Graph



Input Volt. 100V  
 Load 100%

## 2.Values

Time since start [H]	Output Voltage [V]
0.0	24.607
0.5	24.570
1.0	24.571
2.0	24.572
3.0	24.573
4.0	24.573
5.0	24.573
6.0	24.574
7.0	24.573
8.0	24.573

**COSEL**

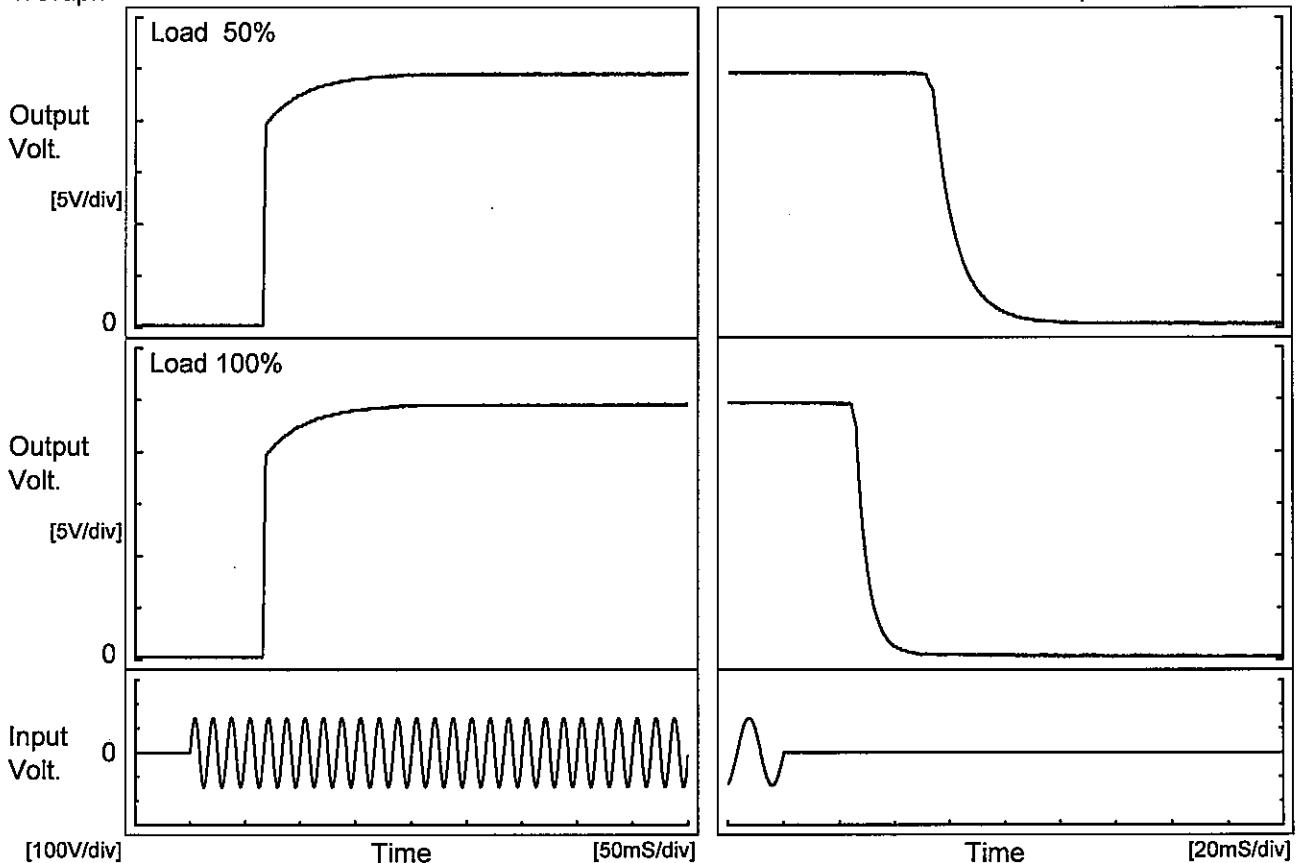
Model LGA75A-24

Item Rise and Fall Time

Temperature 25°C  
Testing Circuitry Figure A

Object +24V3.2A

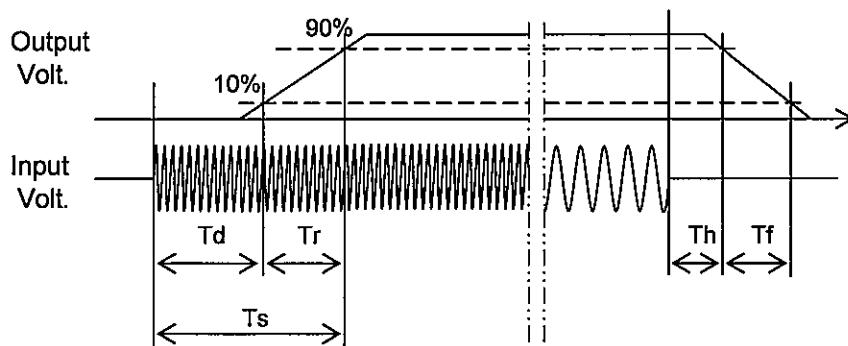
## 1. Graph



## 2. Values

[mS]

Load	Time	Td	Tr	Ts	Th	Tf
50 %		66.3	23.0	89.3	54.4	19.0
100 %		66.5	22.8	89.3	26.0	9.6



**COSEL**

Model	LGA75A-24																																	
Item	Hold-Up Time	Temperature 25°C Testing Circuitry Figure A																																
Object	+24V3.2A																																	
1. Graph																																		
<p>Hold-Up Time [ms]</p> <p>Input Voltage [V]</p> <p>Legend: Load 50% (dashed line with squares), Load 100% (solid line with triangles)</p>																																		
2. Values																																		
<table border="1"> <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>19</td><td>8</td></tr> <tr><td>80</td><td>25</td><td>11</td></tr> <tr><td>85</td><td>31</td><td>14</td></tr> <tr><td>90</td><td>38</td><td>17</td></tr> <tr><td>100</td><td>53</td><td>25</td></tr> <tr><td>110</td><td>69</td><td>33</td></tr> <tr><td>120</td><td>87</td><td>42</td></tr> <tr><td>132</td><td>111</td><td>55</td></tr> <tr><td>140</td><td>129</td><td>63</td></tr> </tbody> </table>			Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	19	8	80	25	11	85	31	14	90	38	17	100	53	25	110	69	33	120	87	42	132	111	55	140	129	63
Input Voltage [V]	Hold-Up Time [ms]																																	
	Load 50%	Load 100%																																
75	19	8																																
80	25	11																																
85	31	14																																
90	38	17																																
100	53	25																																
110	69	33																																
120	87	42																																
132	111	55																																
140	129	63																																
<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>																																		

**COSEL**

Model	LGA75A-24					
Item	Instantaneous Interruption Compensation					
Object	+24V3.2A					
1. Graph						
<p>Legend:</p> <ul style="list-style-type: none"> <li>—△— Input Volt. 85V</li> <li>- -□-- Input Volt. 100V</li> <li>- -○-- Input Volt. 132V</li> </ul>						
2. Values						
Load Current [A]	Time [ms]					
Input Volt.	85[V]	100[V]	132[V]			
0.00	-	-	-			
0.60	83	137	280			
1.20	43	71	148			
1.80	28	48	100			
2.40	21	35	75			
3.00	14	27	59			
3.20	14	26	56			
3.52	13	22	50			
--	-	-	-			
--	-	-	-			
--	-	-	-			

Note: Slanted line shows the range of the rated load current.

**COSEL**

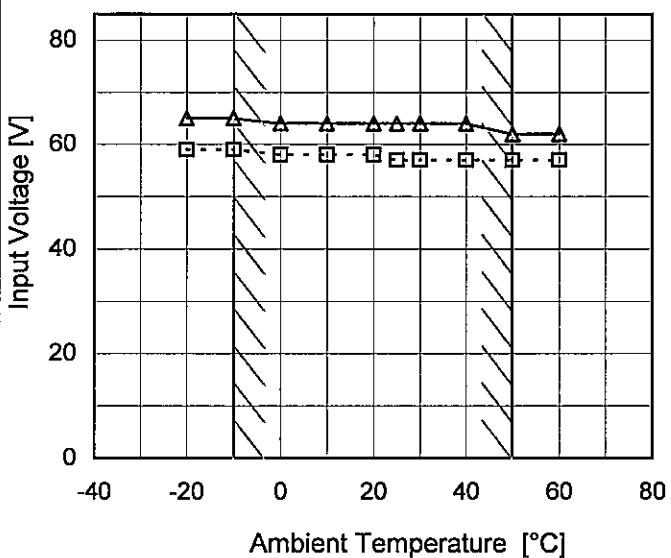
Model LGA75A-24

Item Minimum Input Voltage  
for Regulated Output Voltage

Object +24V3.2A

## 1. Graph

---□--- Load 50%  
 —△— Load 100%



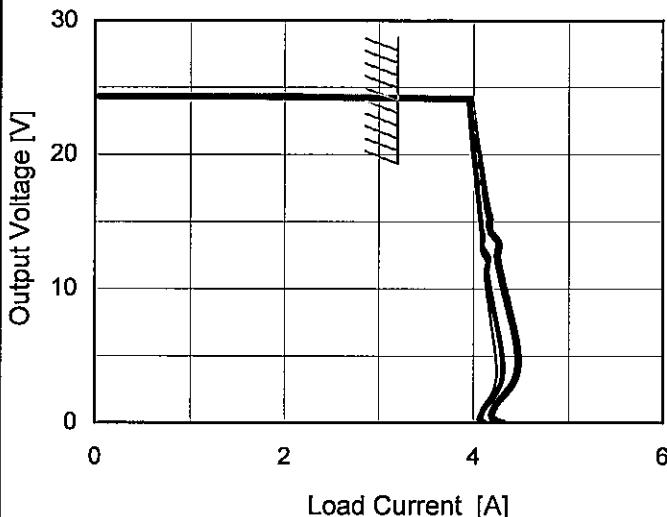
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure A

## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	59	65
-10	59	65
0	58	64
10	58	64
20	58	64
25	57	64
30	57	64
40	57	64
50	57	62
60	57	62
--	-	-

**COSEL**

Model	LGA75A-24		
Item	Overcurrent Protection		
Object	+24V3.2A		
1.Graph	Input Volt. 85V	Input Volt. 100V	Input Volt. 132V
			
Note:	Slanted line shows the range of the rated load current.		
Temperature	25°C	Testing Circuitry	Figure A
2.Values			
Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
24.0	3.97	3.95	3.97
22.8	3.98	3.96	3.99
21.6	3.99	3.95	3.97
19.2	4.02	4.01	4.06
16.8	4.04	4.05	4.12
14.4	4.07	4.08	4.16
12.0	4.13	4.16	4.26
9.6	4.14	4.18	4.33
7.2	4.19	4.24	4.41
4.8	4.23	4.30	4.47
2.4	4.21	4.26	4.36
0.0	4.08	4.14	4.32

**COSEL**

Model	LGA75A-24																																																					
Item	Overvoltage Protection																																																					
Object	+24V3.2A																																																					
1.Graph	<p>Operating Point V</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Legend:</p> <ul style="list-style-type: none"> <li>—△— Input Volt. 85V</li> <li>- -□-- Input Volt. 100V</li> <li>- -○--- Input Volt. 132V</li> </ul>																																																					
Testing Circuitry	Figure A																																																					
2.Values	<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>-20</td><td>30.00</td><td>29.93</td><td>29.93</td></tr> <tr> <td>-10</td><td>30.21</td><td>30.21</td><td>30.21</td></tr> <tr> <td>0</td><td>30.49</td><td>30.49</td><td>30.56</td></tr> <tr> <td>10</td><td>30.77</td><td>30.77</td><td>30.77</td></tr> <tr> <td>20</td><td>31.05</td><td>31.05</td><td>31.05</td></tr> <tr> <td>25</td><td>31.19</td><td>31.19</td><td>31.19</td></tr> <tr> <td>30</td><td>31.33</td><td>31.33</td><td>31.33</td></tr> <tr> <td>40</td><td>31.61</td><td>31.61</td><td>31.61</td></tr> <tr> <td>50</td><td>31.89</td><td>31.89</td><td>31.89</td></tr> <tr> <td>60</td><td>32.10</td><td>32.17</td><td>32.17</td></tr> <tr> <td>—</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>			Ambient Temperature [°C]	Operating Point [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	-20	30.00	29.93	29.93	-10	30.21	30.21	30.21	0	30.49	30.49	30.56	10	30.77	30.77	30.77	20	31.05	31.05	31.05	25	31.19	31.19	31.19	30	31.33	31.33	31.33	40	31.61	31.61	31.61	50	31.89	31.89	31.89	60	32.10	32.17	32.17	—	-	-	-
Ambient Temperature [°C]	Operating Point [V]																																																					
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																			
-20	30.00	29.93	29.93																																																			
-10	30.21	30.21	30.21																																																			
0	30.49	30.49	30.56																																																			
10	30.77	30.77	30.77																																																			
20	31.05	31.05	31.05																																																			
25	31.19	31.19	31.19																																																			
30	31.33	31.33	31.33																																																			
40	31.61	31.61	31.61																																																			
50	31.89	31.89	31.89																																																			
60	32.10	32.17	32.17																																																			
—	-	-	-																																																			
Note:	Slanted line shows the range of the rated ambient temperature.																																																					

COSEL

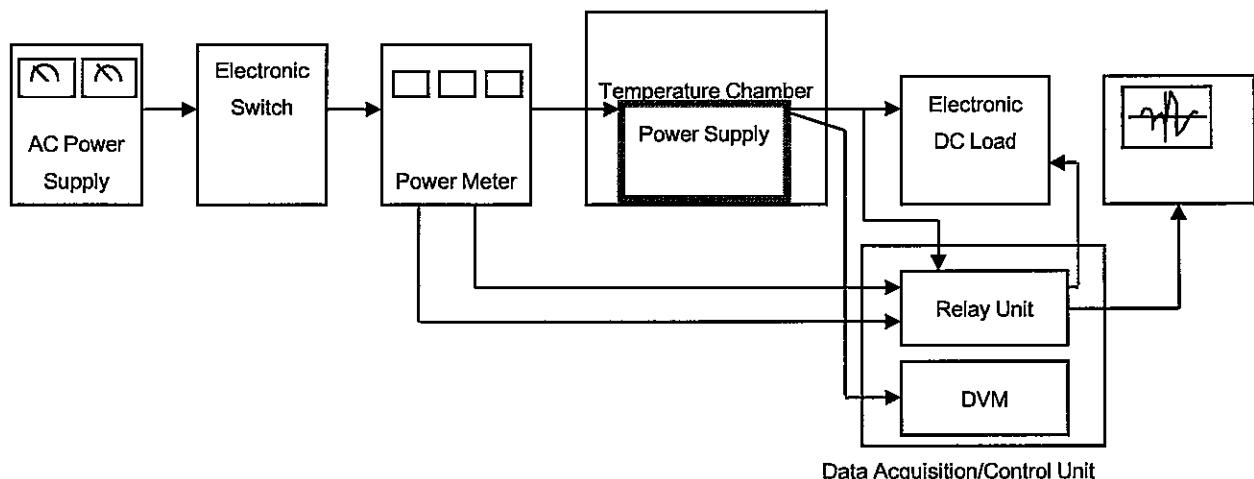


Figure A

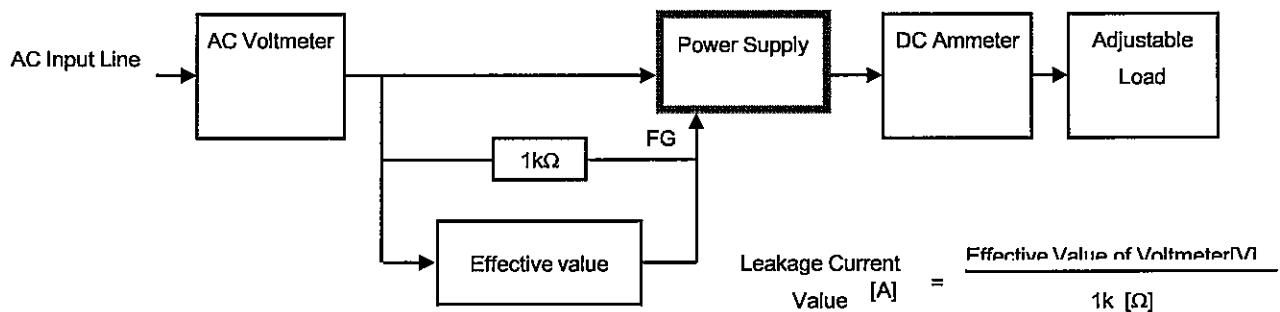


Figure B ( DEN-AN )

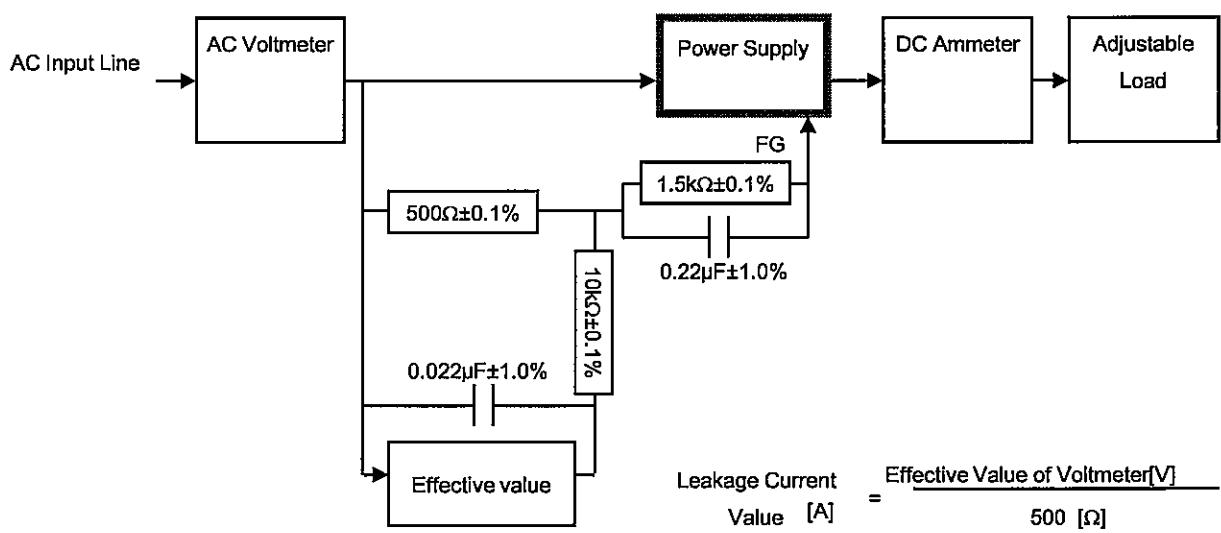


Figure B ( IEC60950 -1)

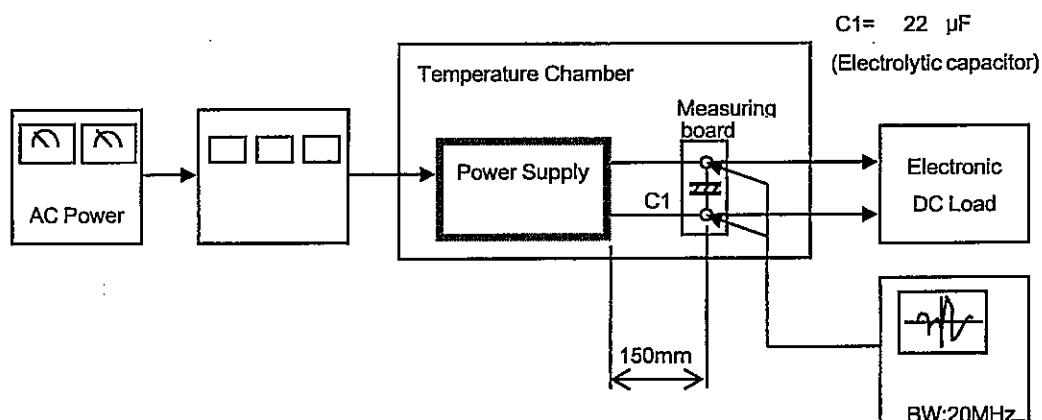
**COSEL**

Figure C