参考資料

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TEST DATA OF LGA50A-24

Regulated DC Power Supply
April 1, 2008

Approved by : Yoshiaki Shimizu
Yoshiaki Shimizu Design Manager

Prepared by : Izumi Kumada
Izumi Kumada Design Engineer

COSEL CO.,LTD.

参考資料

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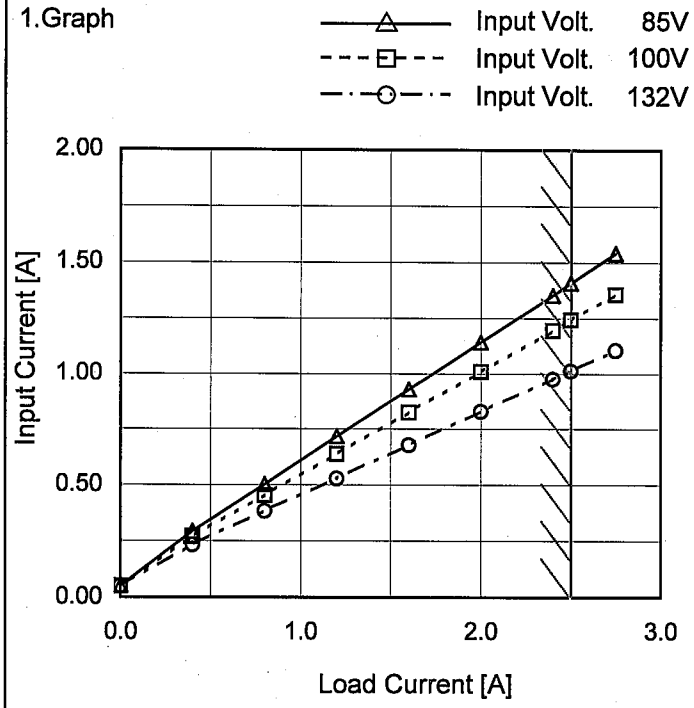
COSEL

Model	LGA50A-24
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.050	0.051	0.051
0.40	0.292	0.268	0.232
0.80	0.502	0.452	0.382
1.20	0.715	0.636	0.528
1.60	0.928	0.823	0.677
2.00	1.141	1.008	0.827
2.40	1.354	1.194	0.975
2.50	1.409	1.243	1.013
2.75	1.540	1.358	1.105
--	-	-	-
--	-	-	-

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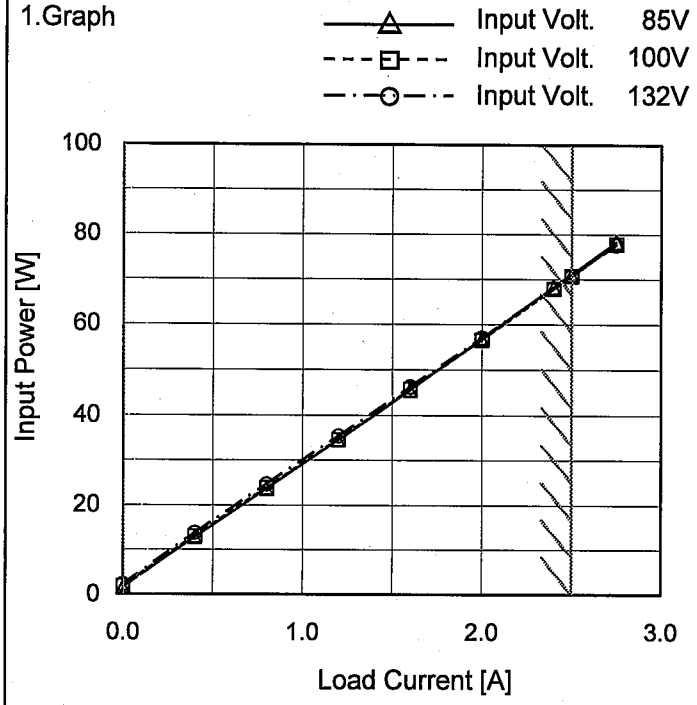
COSEL

Model	LGA50A-24
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Input Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	1.5	1.8	2.2
0.40	12.8	13.1	13.8
0.80	23.6	23.8	24.7
1.20	34.5	34.6	35.4
1.60	45.5	45.6	46.2
2.00	56.7	56.6	57.0
2.40	68.2	67.9	68.1
2.50	71.0	70.7	70.7
2.75	78.3	77.8	77.7
--	-	-	-
--	-	-	-

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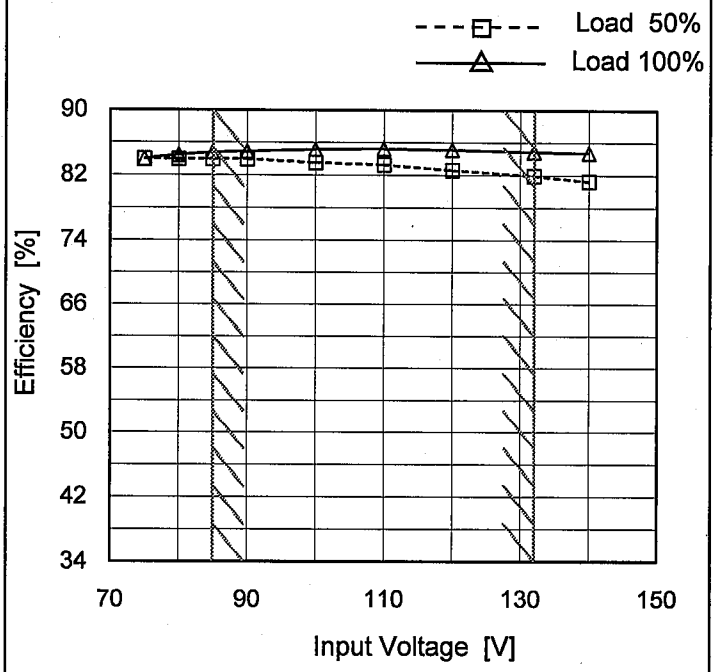
COSEL

Model	LGA50A-24
Item	Efficiency (by Input Voltage)
Object	――――――――

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]	Efficiency [%]	
	Load 50%	Load 100%
75	83.9	83.9
80	84.0	84.4
85	84.0	84.8
90	84.0	84.9
100	83.5	85.1
110	83.3	85.2
120	82.6	85.1
132	81.9	84.9
140	81.2	84.7

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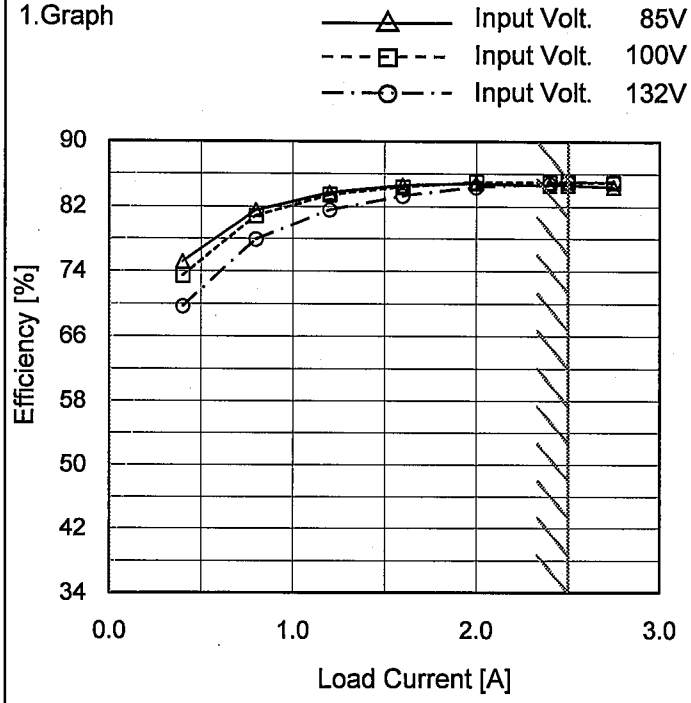
Model	LGA50A-24
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-	-	-
0.40	75.2	73.4	69.7
0.80	81.5	80.9	77.9
1.20	83.7	83.4	81.5
1.60	84.6	84.4	83.3
2.00	84.8	85.0	84.4
2.40	84.6	85.0	84.7
2.50	84.7	85.0	85.0
2.75	84.4	85.0	85.1
--	-	-	-
--	-	-	-

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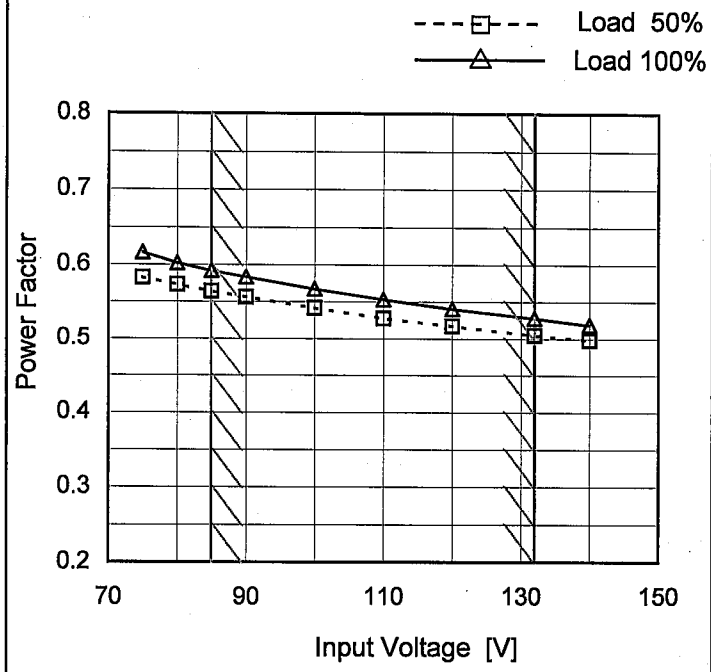
COSEL

Model	LGA50A-24
Item	Power Factor (by Input Voltage)
Object	――――――――――

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]	Power Factor	
	Load 50%	Load 100%
75	0.582	0.616
80	0.573	0.602
85	0.564	0.592
90	0.556	0.583
100	0.541	0.567
110	0.528	0.553
120	0.517	0.541
132	0.505	0.528
140	0.498	0.519

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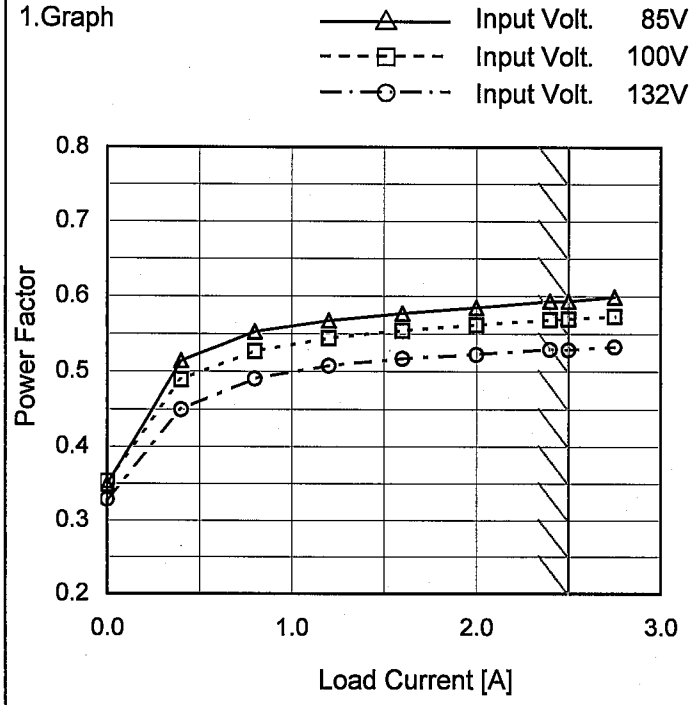
Model	LGA50A-24
Item	Power Factor (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.349	0.353	0.328
0.40	0.514	0.489	0.450
0.80	0.553	0.527	0.490
1.20	0.567	0.544	0.507
1.60	0.577	0.554	0.517
2.00	0.585	0.562	0.522
2.40	0.593	0.569	0.529
2.50	0.593	0.569	0.529
2.75	0.599	0.573	0.533
--	-	-	-
--	-	-	-

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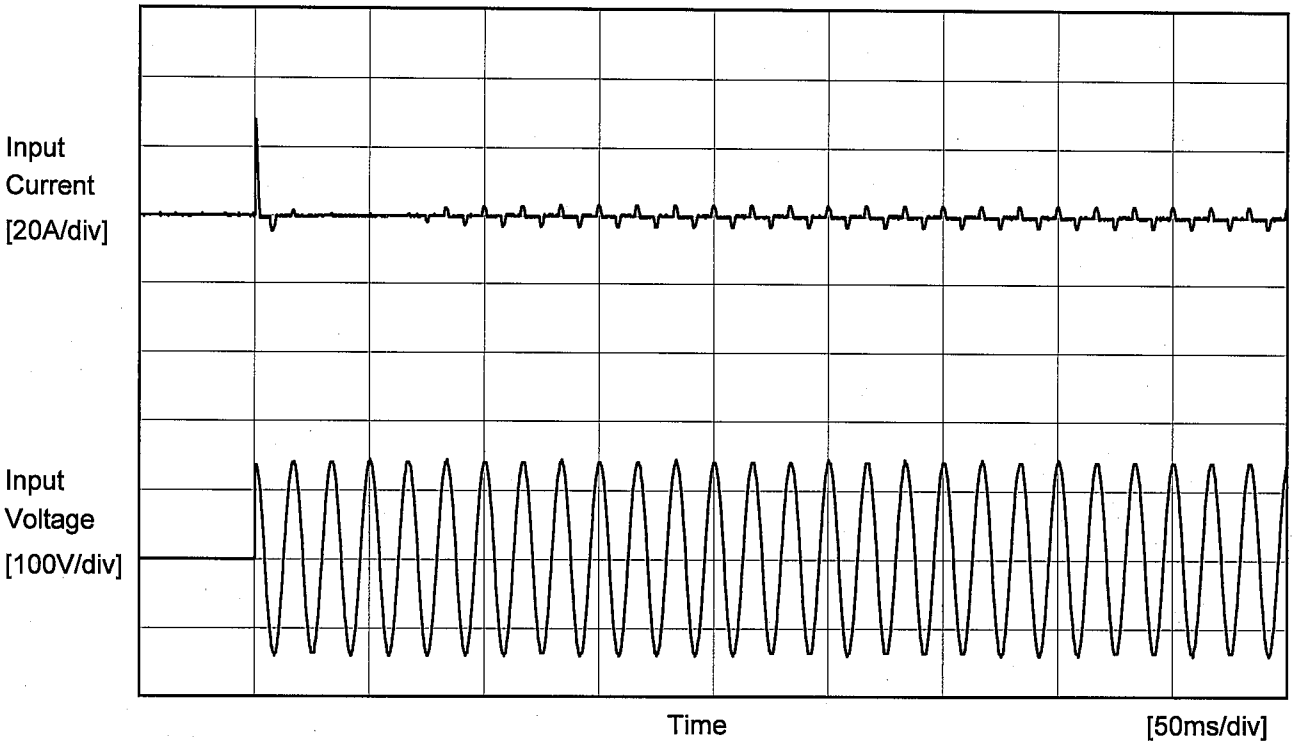
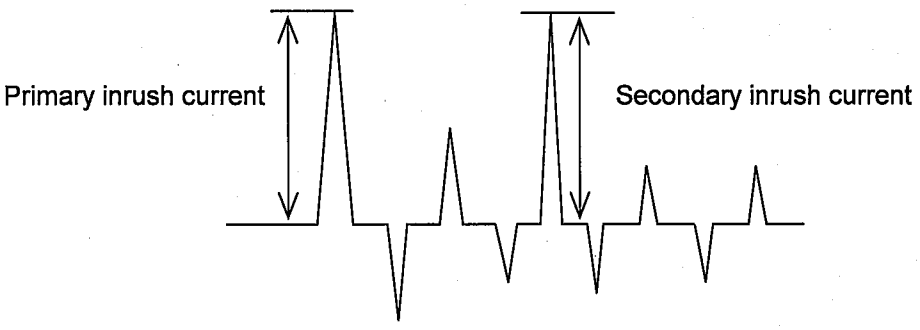
Model	LGA50A-24	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	————————		



Input Voltage	100 V
Frequency	60 Hz
Load	100 %
Primary inrush current	27.8 A
Secondary inrush current	3.2 A



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Model	LGA50A-24	Temperature 25°C Testing Circuitry Figure B
Item	Leakage Current	
Object	+24V2.5A	

1.Results

Standards	Leakage Current [mA]		
	Input Volt. 100 [V]	Input Volt. 120 [V]	Input Volt. 132 [V]
(A)DEN-AN	0.23	0.27	0.30
(B)IEC60950	0.24	0.30	0.33

frequency 60Hz

2.Condition

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

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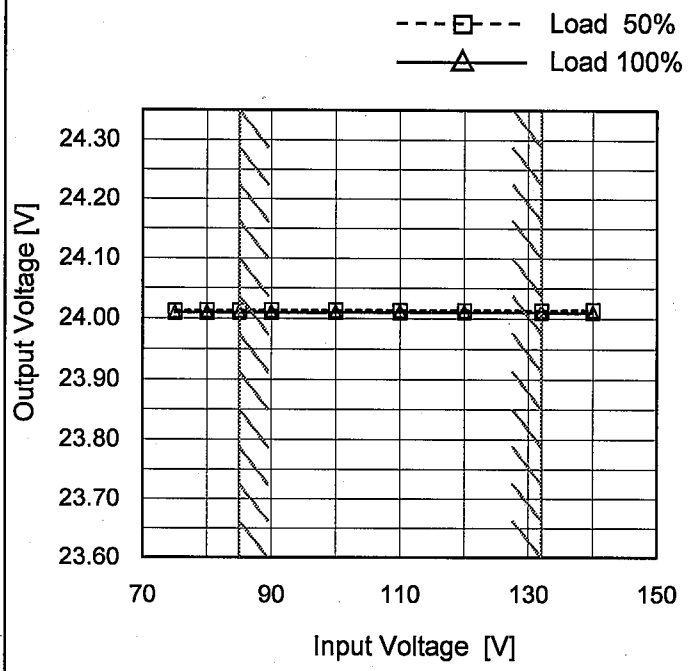
Model	LGA50A-24
Item	Line Regulation
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

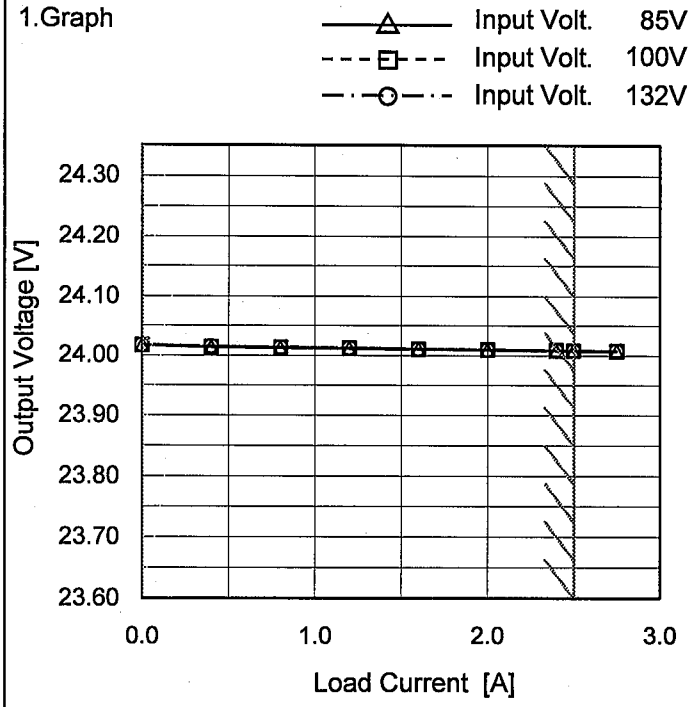
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	24.053	24.049
80	24.053	24.050
85	24.053	24.050
90	24.054	24.050
100	24.054	24.050
110	24.054	24.050
120	24.054	24.050
132	24.054	24.050
140	24.054	24.050

COSEL

Model	LGA50A-24
Item	Load Regulation
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Output Voltage [V] Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	24.057	24.057	24.057
0.40	24.054	24.055	24.055
0.80	24.053	24.054	24.054
1.20	24.052	24.052	24.052
1.60	24.050	24.051	24.051
2.00	24.049	24.050	24.050
2.40	24.048	24.049	24.049
2.50	24.048	24.048	24.048
2.75	24.047	24.048	24.048
--	-	-	-
--	-	-	-

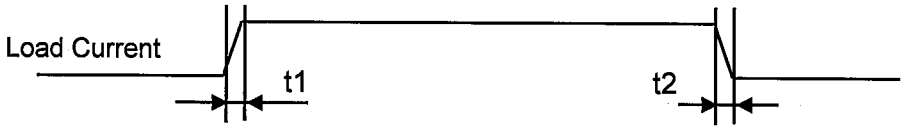
COSEL

Model	LGA50A-24
Item	Dynamic Load Response
Object	+24V2.5A

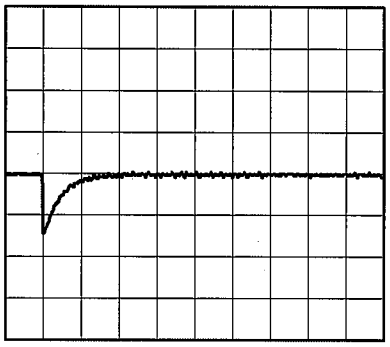
Temperature 25°C
Testing Circuitry Figure C

Input Volt. 100 V
Cycle 1000 ms

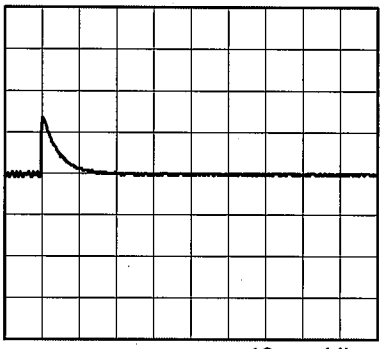
Response. t1=t2=50 μ s. Typ



Min. Load (0A) ⟷
Load 100% (2.5A)

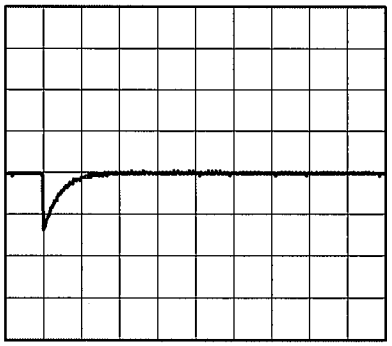


100 mV/div
40 ms/div

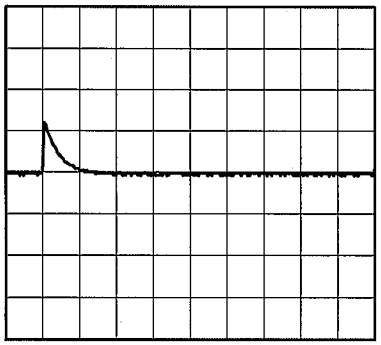


40 ms/div

Min. Load (0A) ⟷
Load 50% (1.25A)



100 mV/div
40 ms/div



40 ms/div

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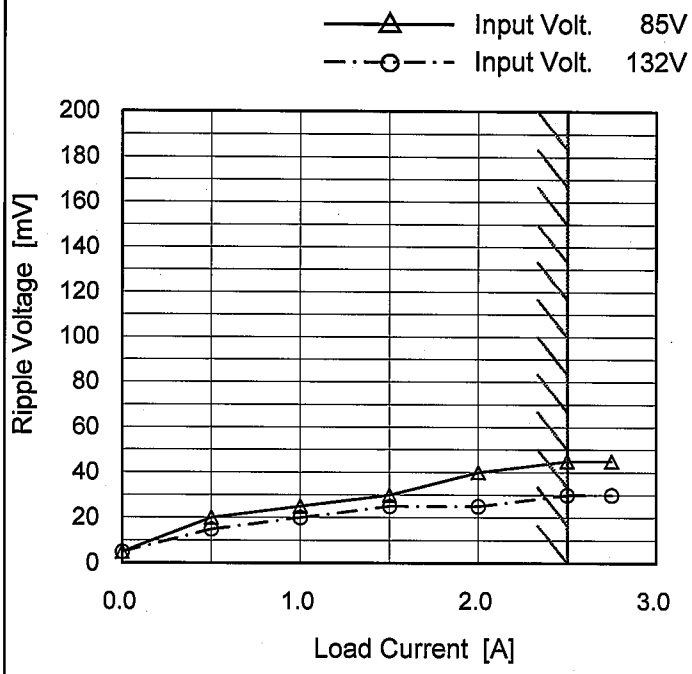
Model	LGA50A-24
Item	Ripple Voltage (by Load Current)
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



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.

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

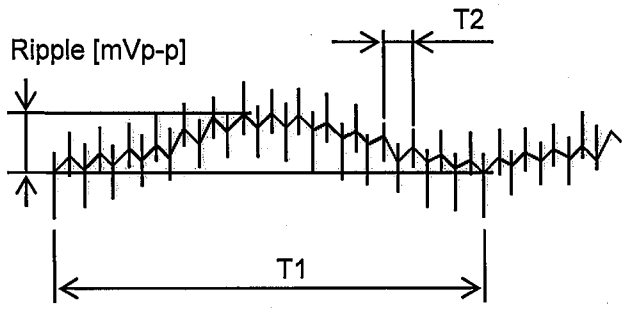


Fig. Complex Ripple Wave Form

2.Values

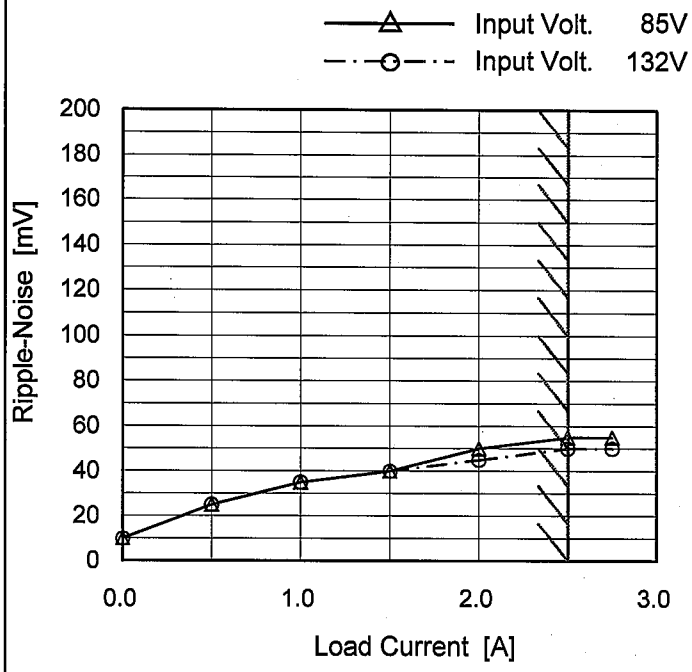
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	5	5
0.50	20	15
1.00	25	20
1.50	30	25
2.00	40	25
2.50	45	30
2.75	45	30
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LGA50A-24
Item	Ripple-Noise
Object	+24V2.5A

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.

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

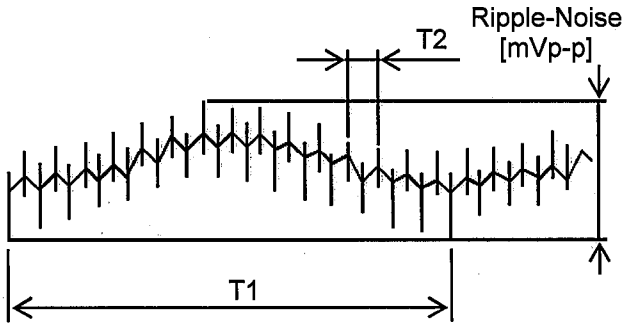


Fig. Complex Ripple Wave Form

2.Values

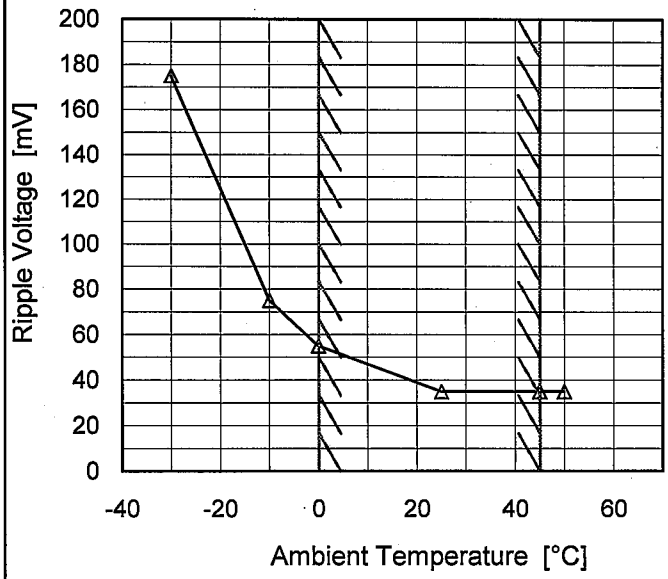
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	10	10
0.50	25	25
1.00	35	35
1.50	40	40
2.00	50	45
2.50	55	50
2.75	55	50
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LGA50A-24
Item	Ripple Voltage (by Ambient Temp.)
Object	+24V2.5A

Testing Circuitry Figure C

1.Graph



Input Volt. 100V

Load 100%

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 ambient temperature.

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

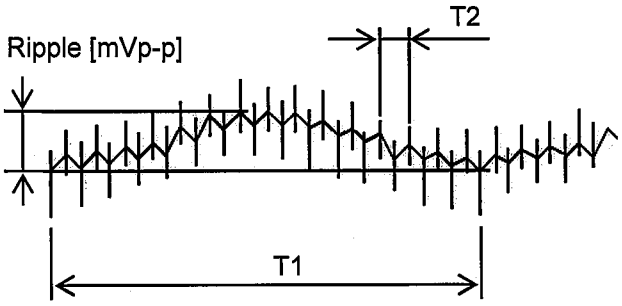


Fig. Complex Ripple Wave Form

2.Values

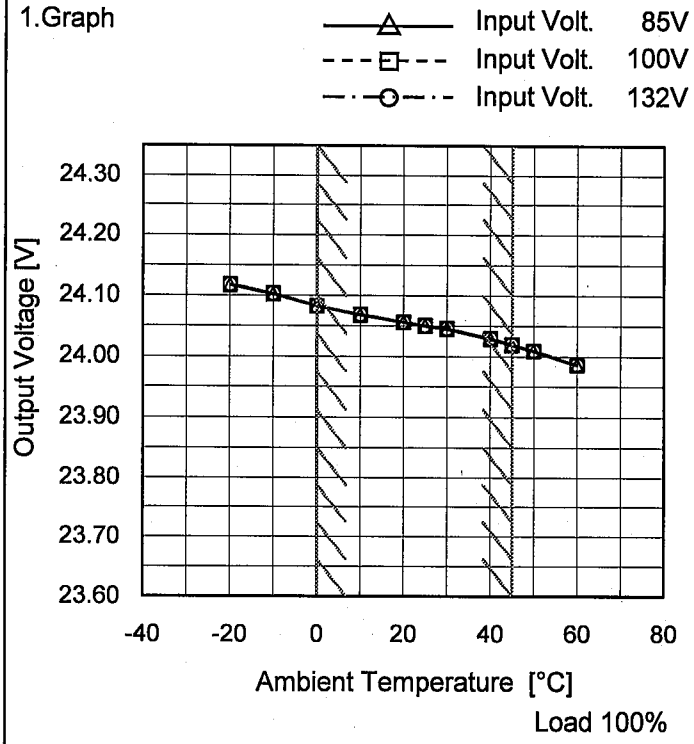
Ambient Temperature [°C]	Ripple Voltage [mV]
-30	175
-10	75
0	55
25	35
45	35
50	35
--	-
--	-
--	-
--	-
--	-

COSEL

Model	LGA50A-24
Item	Ambient Temperature Drift
Object	+24V2.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	24.117	24.118	24.118
-10	24.102	24.103	24.103
0	24.083	24.083	24.083
10	24.068	24.069	24.069
20	24.056	24.056	24.057
25	24.050	24.051	24.051
30	24.045	24.046	24.046
40	24.029	24.030	24.030
45	24.019	24.020	24.020
50	24.009	24.010	24.010
60	23.986	23.986	23.987

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Model	LGA50A-24
Item	Output Voltage Accuracy
Object	+24V2.5A

Testing Circuitry Figure A

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 - 45°C
Input Voltage : 85 - 132V
Load Current : 0 - 2.5A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2.Values

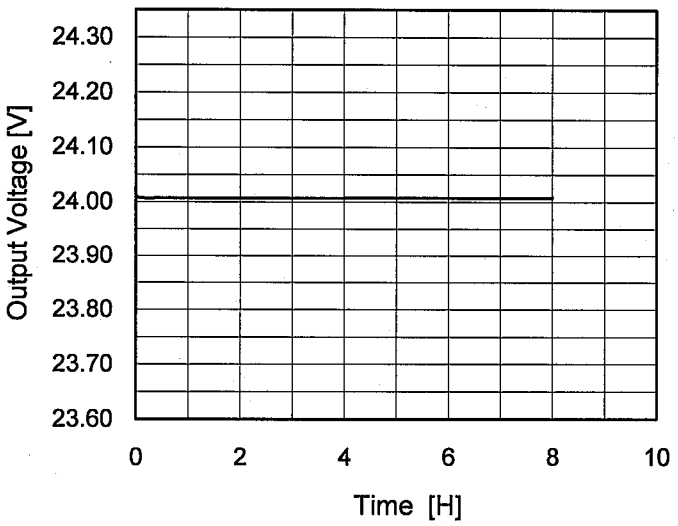
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	85	0	24.112	±47	±0.2
Minimum Voltage	45	85	2.5	24.019		

COSEL

Model	LGA50A-24
Item	Time Lapse Drift
Object	+24V2.5A

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	24.056
0.5	24.050
1.0	24.049
2.0	24.047
3.0	24.047
4.0	24.047
5.0	24.047
6.0	24.047
7.0	24.047
8.0	24.047

BC-10152

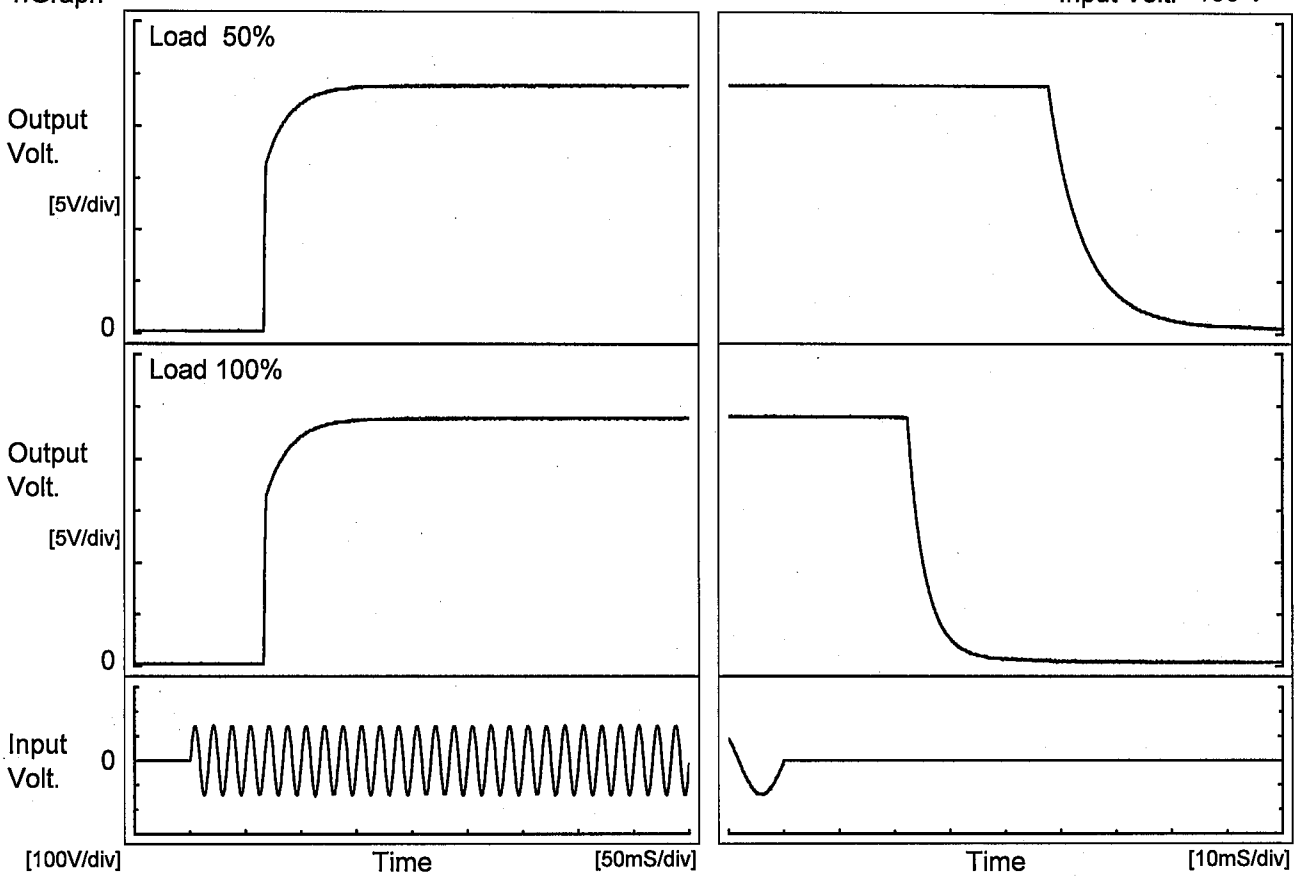
COSEL

Model	LGA50A-24
Item	Rise and Fall Time
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

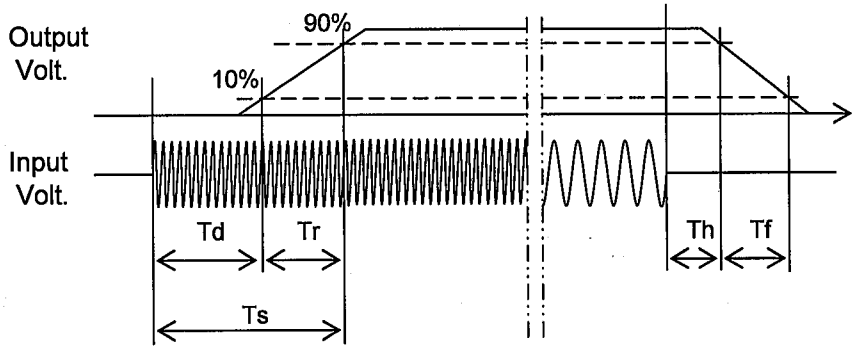
Input Volt. 100 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	67.0	29.8	96.8	48.2	14.8
100 %	66.8	29.8	96.6	22.6	7.6



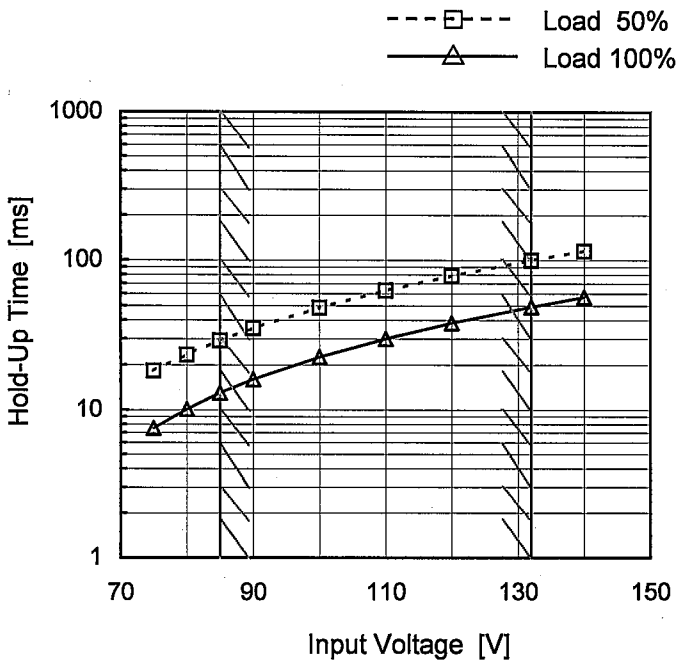
BC-10152

COSEL

Model	LGA50A-24
Item	Hold-Up Time
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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.

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	18	8
80	23	10
85	29	13
90	35	16
100	48	23
110	63	30
120	79	38
132	100	49
140	115	57

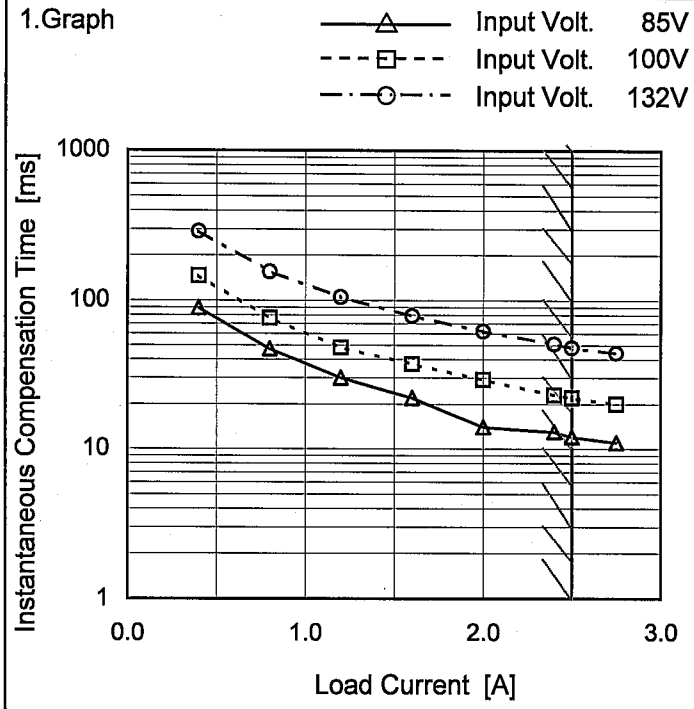
BC-10152

COSEL

Model	LGA50A-24
Item	Instantaneous Interruption Compensation
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

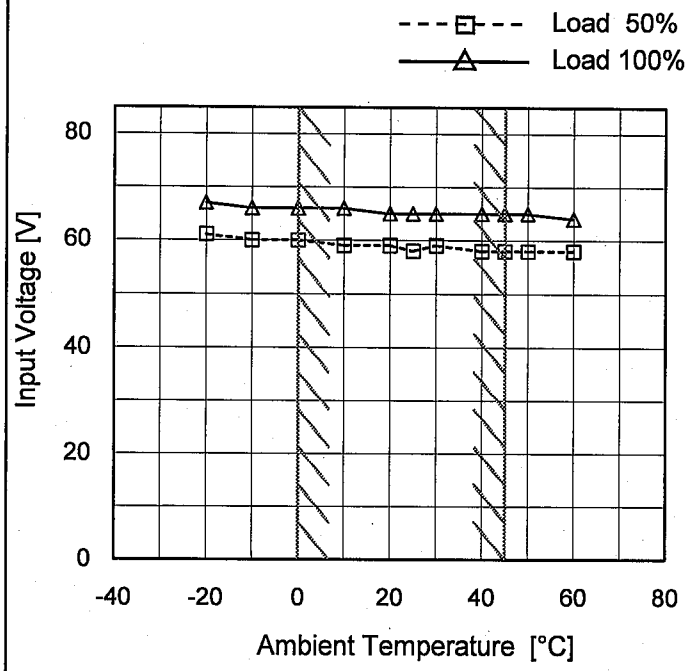
Load Current [A]	Time [ms]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-	-	-
0.40	89	145	289
0.80	47	76	155
1.20	30	48	105
1.60	22	37	79
2.00	14	29	62
2.40	13	23	51
2.50	12	22	48
2.75	11	20	44
--	-	-	-
--	-	-	-

COSEL

Model	LGA50A-24
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+24V2.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

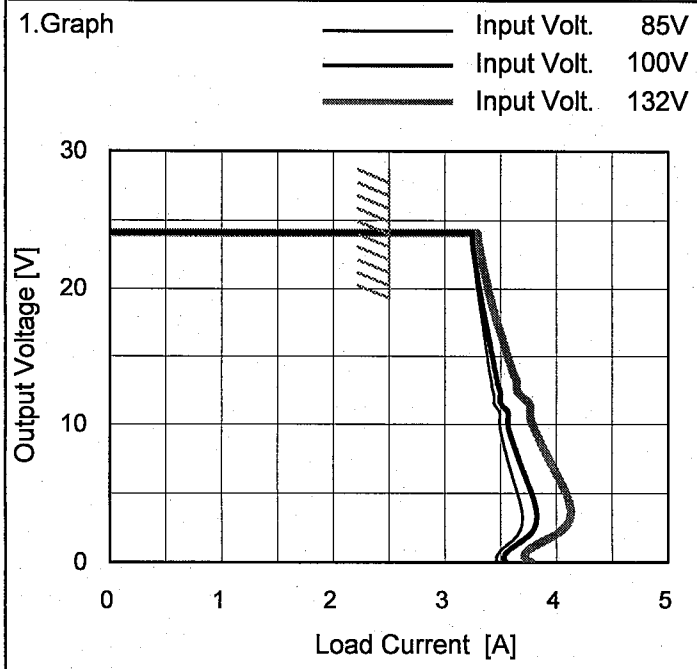
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	61	67
-10	60	66
0	60	66
10	59	66
20	59	65
25	58	65
30	59	65
40	58	65
45	58	65
50	58	65
60	58	64

COSEL

Model	LGA50A-24
Item	Overcurrent Protection
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

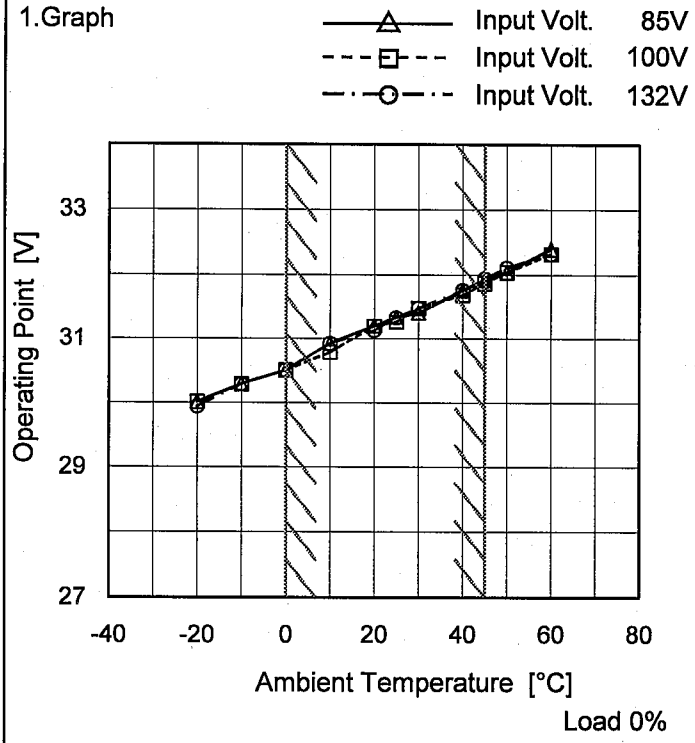
Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
24.0	3.24	3.24	3.29
22.8	3.25	3.26	3.31
21.6	3.26	3.28	3.34
19.2	3.30	3.32	3.41
16.8	3.35	3.38	3.49
14.4	3.39	3.43	3.58
12.0	3.44	3.50	3.70
9.6	3.49	3.57	3.80
7.2	3.56	3.67	3.95
4.8	3.65	3.78	4.10
2.4	3.69	3.81	4.06
0.0	3.48	3.56	3.78

COSEL

Model	LGA50A-24
Item	Overvoltage Protection
Object	+24V2.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	30.01	30.01	29.94
-10	30.29	30.29	30.29
0	30.50	30.50	30.50
10	30.92	30.78	30.92
20	31.20	31.20	31.13
25	31.34	31.27	31.34
30	31.41	31.48	31.48
40	31.76	31.69	31.76
45	31.92	31.87	31.94
50	32.04	32.04	32.11
60	32.39	32.32	32.32

COSEL

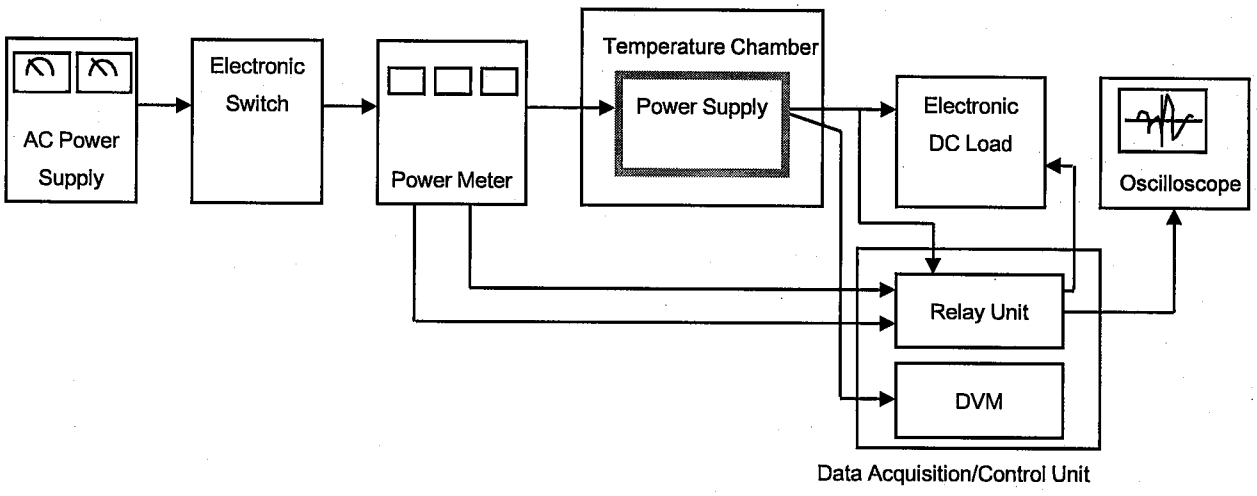


Figure A

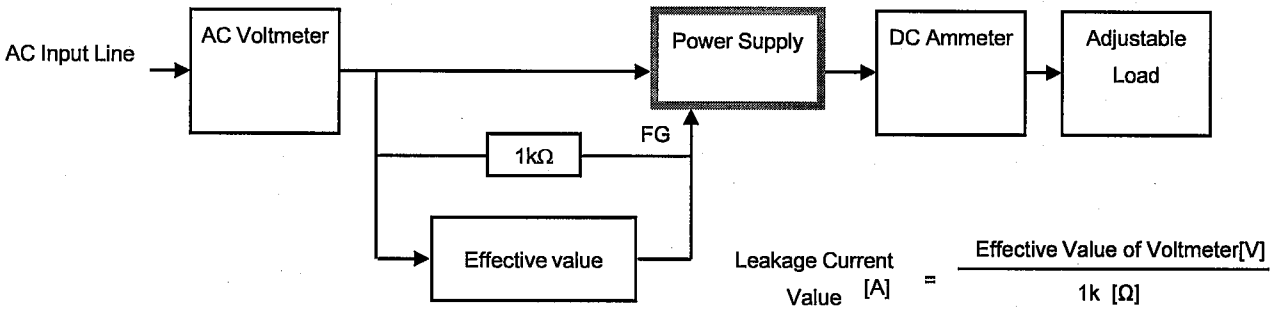


Figure B (DEN-AN)

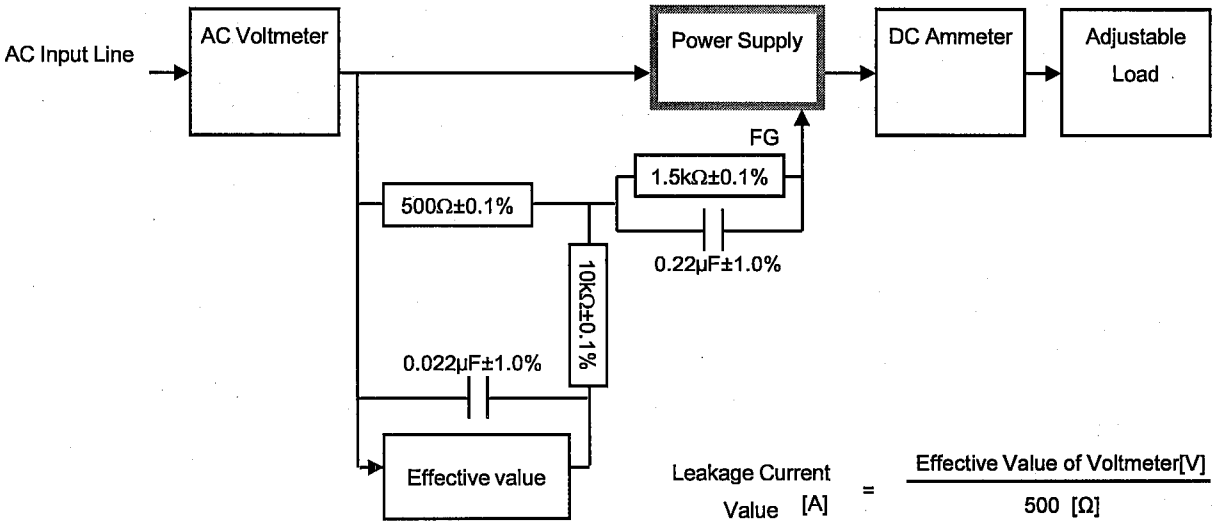


Figure B (IEC60950-1)

COSEL

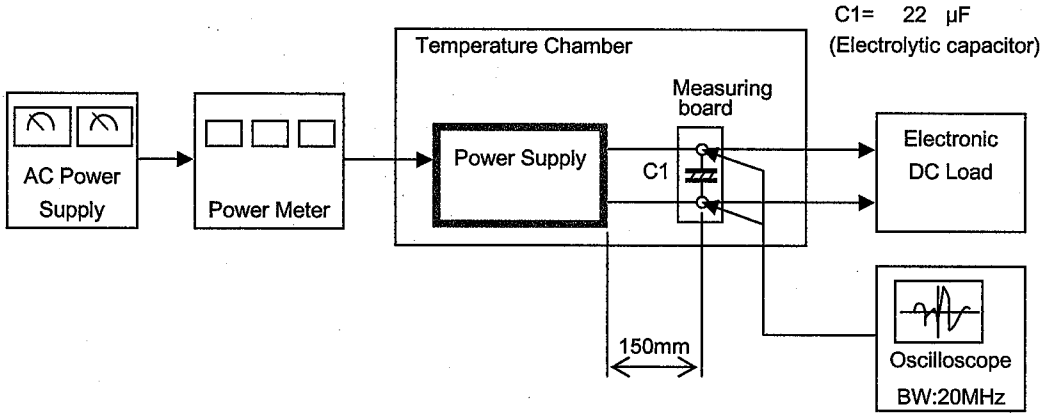


Figure C