参考資料

COSEL

TEST DATA OF LGA75A-12

Regulated DC Power Supply
April 4, 2008

Approved by : Yoshiaki Shimizu
Yoshiaki Shimizu Design Manager

Prepared by : Yousuke Murata
Yousuke Murata Design Engineer

COSEL CO.,LTD.

COSEL

CONTENTS

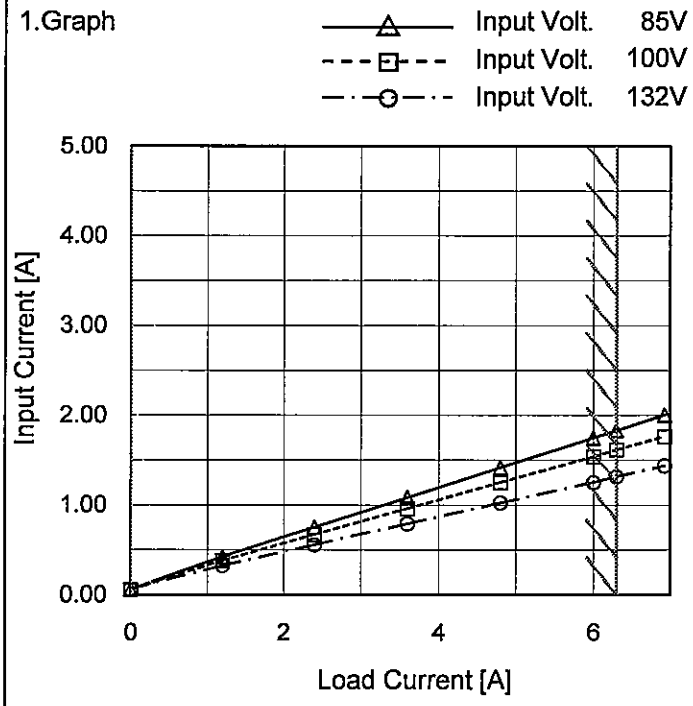
1.Input Current (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 1
2.Input Power (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 2
3.Efficiency (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・ 3
4.Efficiency (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 4
5.Power Factor (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・ 5
6.Power Factor (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.Overvoltage Protection ・・・・・・・・・・・・・・・・・・・・・・・・・ 23
24.Figure of Testing Circuitry ・・・・・・・・・・・・・・・・・・・・・・・ 24
(Final Page 25)

COSEL

Model	LGA75A-12
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	0.058	0.059	0.059
1.20	0.422	0.380	0.324
2.40	0.749	0.667	0.555
3.60	1.082	0.959	0.789
4.80	1.413	1.252	1.024
6.00	1.744	1.535	1.252
6.30	1.827	1.613	1.317
6.93	2.000	1.764	1.436
--	-	-	-
--	-	-	-
--	-	-	-

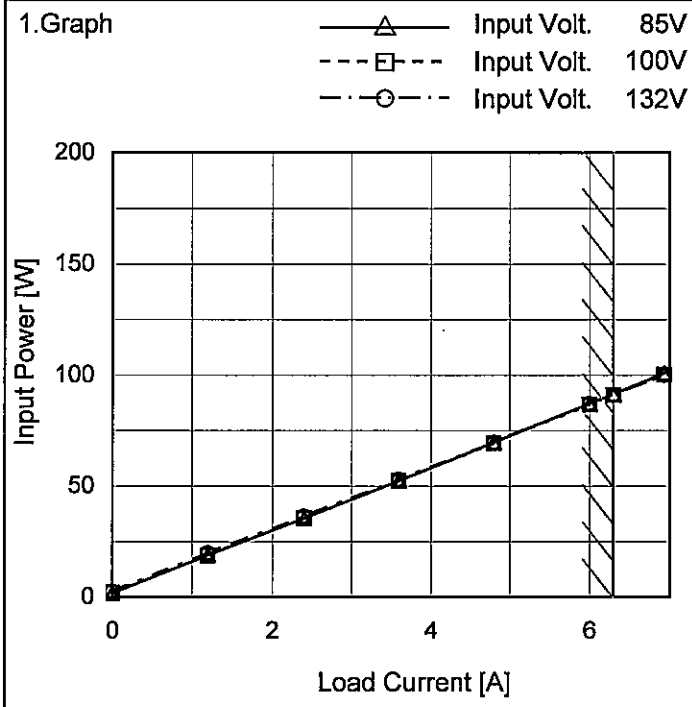
BC-10154

COSEL

Model	LGA75A-12
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

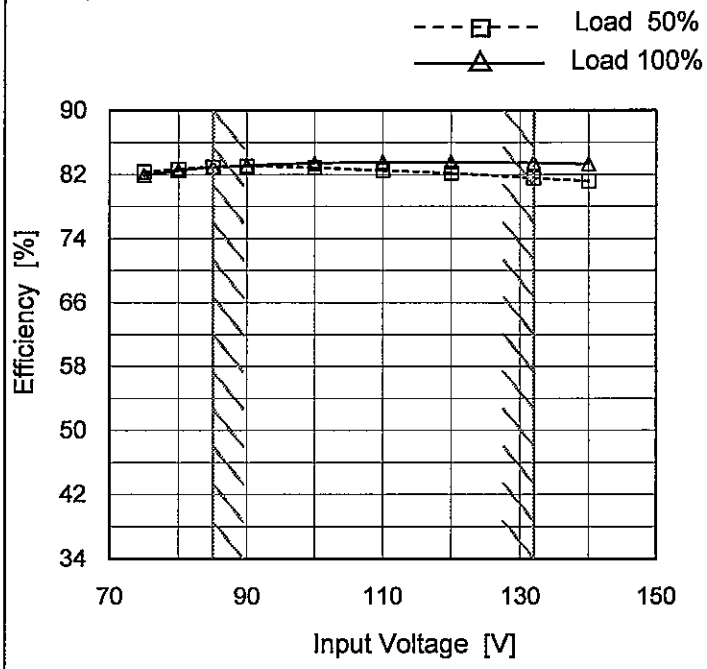
Load Current [A]	Input Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	1.7	2.0	2.6
1.20	18.8	18.9	19.9
2.40	35.4	35.5	36.3
3.60	52.3	52.2	52.8
4.80	69.5	69.2	69.6
6.00	87.0	86.7	87.0
6.30	91.5	90.9	90.9
6.93	100.8	100.2	100.0
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LGA75A-12
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

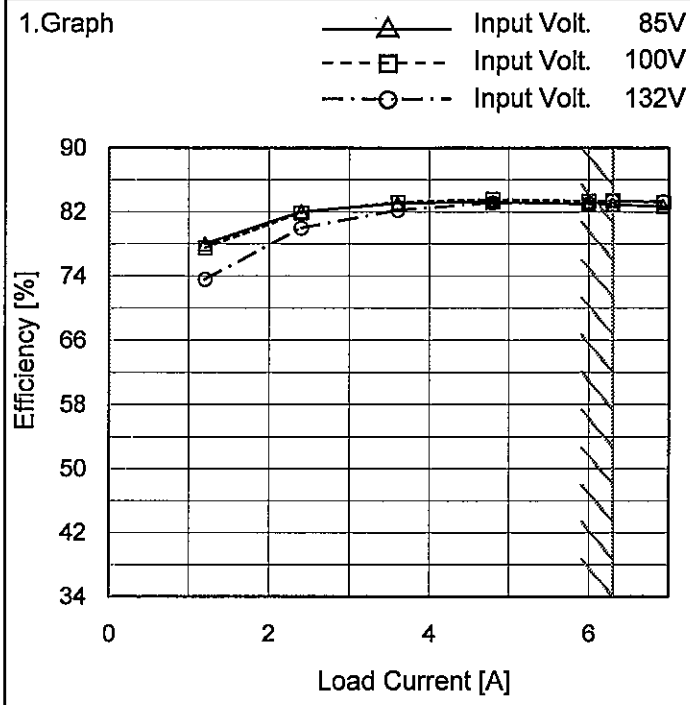
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	82.3	81.9
80	82.7	82.5
85	82.9	82.9
90	83.0	83.1
100	82.9	83.4
110	82.5	83.6
120	82.2	83.6
132	81.6	83.5
140	81.2	83.3

COSEL

Model	LGA75A-12
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

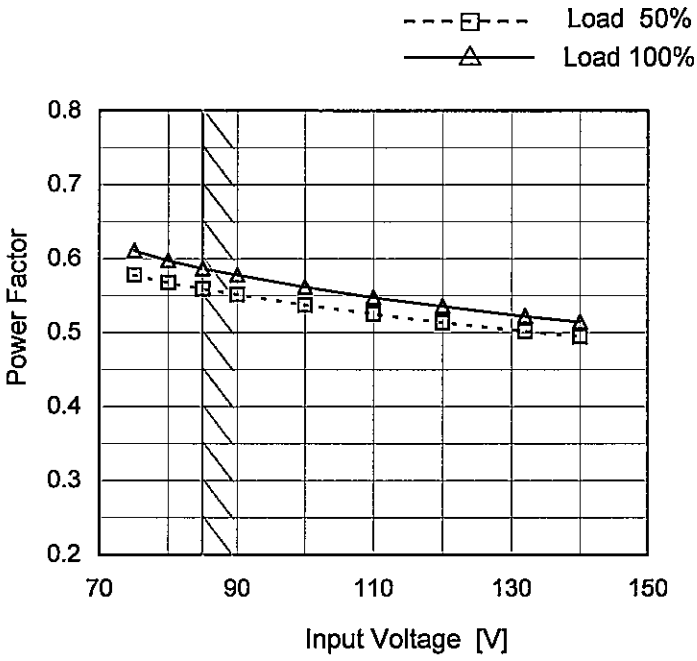
Load Current [A]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-	-	-
1.20	78.0	77.5	73.6
2.40	82.0	81.9	80.0
3.60	83.0	83.2	82.2
4.80	83.2	83.5	83.1
6.00	83.0	83.3	83.0
6.30	82.9	83.4	83.4
6.93	82.7	83.2	83.3
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LGA75A-12
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

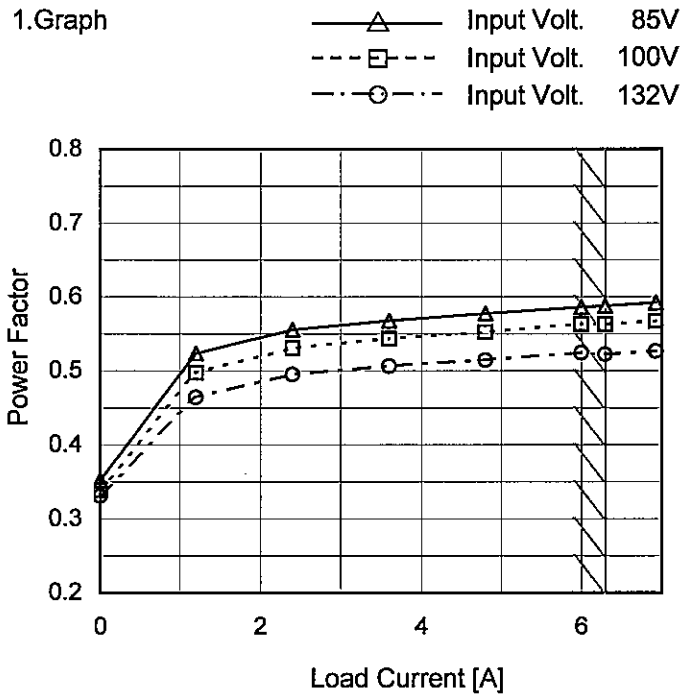
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.577	0.611
80	0.567	0.598
85	0.559	0.587
90	0.551	0.578
100	0.537	0.562
110	0.525	0.547
120	0.513	0.535
132	0.502	0.522
140	0.495	0.514

COSEL

Model	LGA75A-12
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.

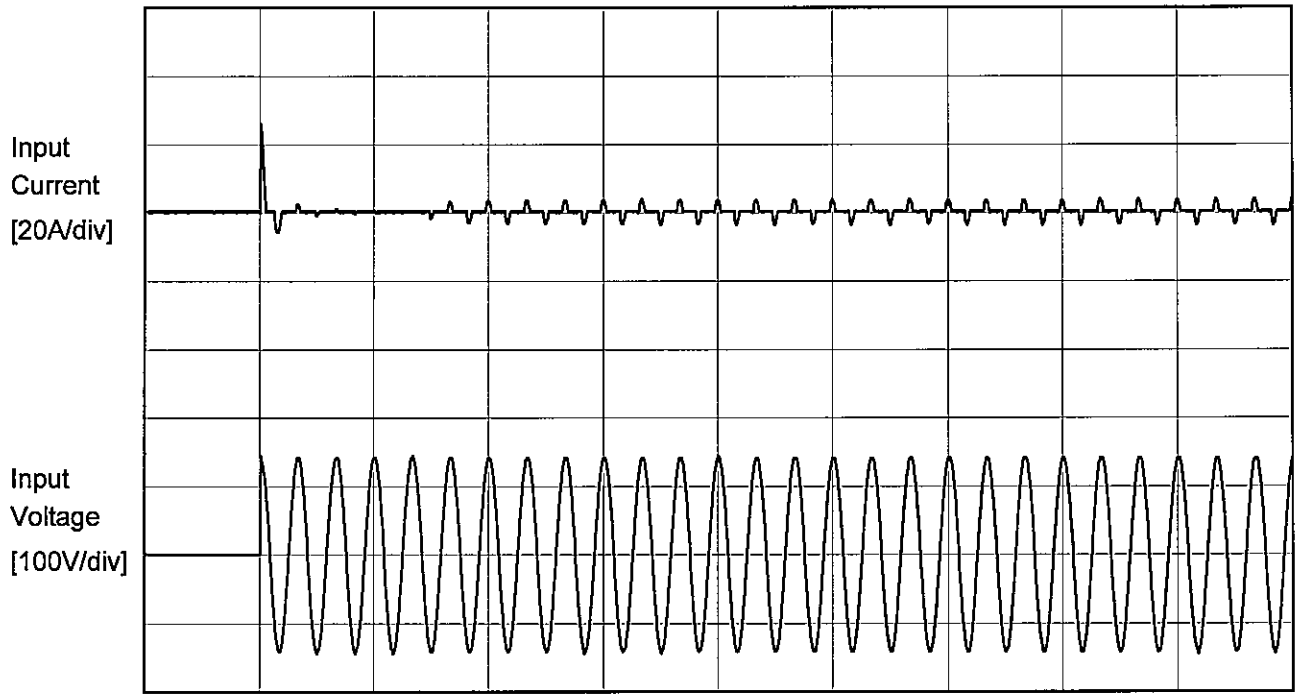
2.Values

Load Current [A]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.352	0.338	0.331
1.20	0.523	0.497	0.464
2.40	0.555	0.530	0.495
3.60	0.567	0.543	0.506
4.80	0.577	0.552	0.514
6.00	0.586	0.563	0.524
6.30	0.587	0.562	0.522
6.93	0.592	0.567	0.526
--	-	-	-
--	-	-	-
--	-	-	-

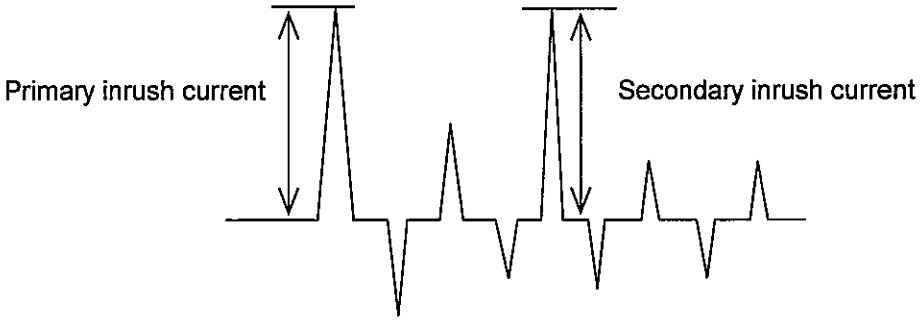
COSEL

Model	LGA75A-12
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



Input Voltage	100 V
Frequency	60 Hz
Load	100 %
Primary inrush current	25.7 A
Secondary inrush current	3.9 A



COSEL

Model	LGA75A-12		
Item	Leakage Current	Temperature	25°C
		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

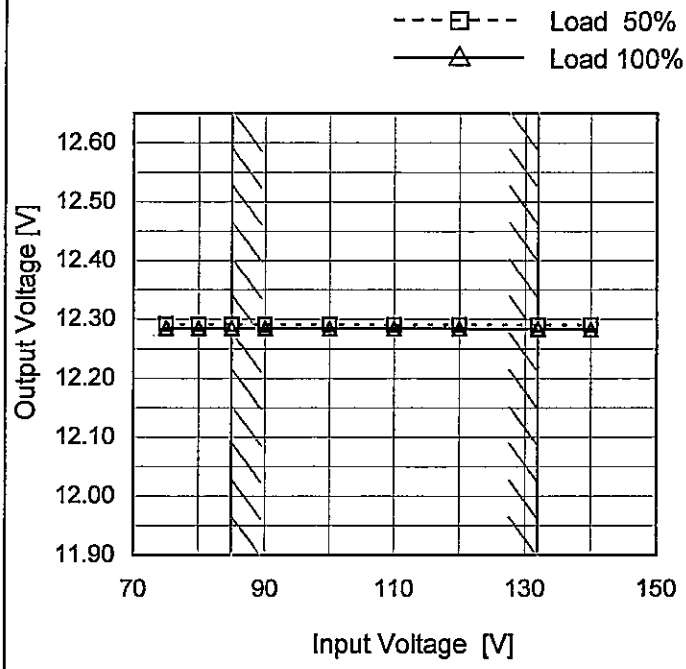
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	LGA75A-12
Item	Line Regulation
Object	+12V6.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

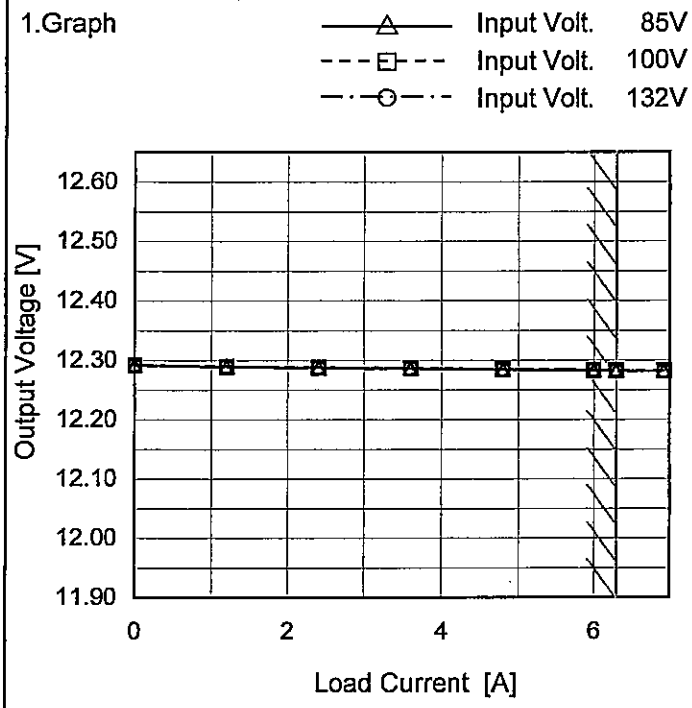
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	12.292	12.284
80	12.291	12.284
85	12.291	12.284
90	12.290	12.284
100	12.290	12.284
110	12.290	12.284
120	12.290	12.284
132	12.290	12.283
140	12.290	12.282

COSEL

Model	LGA75A-12
Item	Load Regulation
Object	+12V6.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

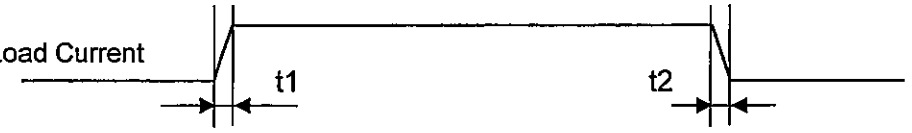
Load Current [A]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	12.292	12.292	12.292
1.20	12.289	12.289	12.290
2.40	12.287	12.288	12.288
3.60	12.286	12.286	12.287
4.80	12.284	12.285	12.285
6.00	12.283	12.283	12.283
6.30	12.282	12.283	12.283
6.93	12.281	12.282	12.282
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

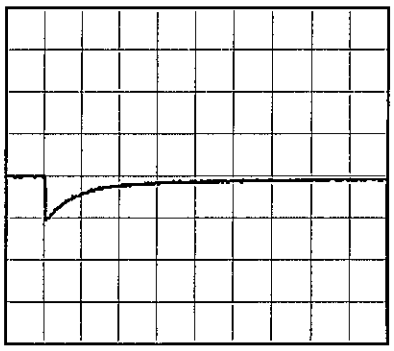
Model	LGA75A-12		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure C
Object	+12V6.3A		

Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50 μ s. Typ

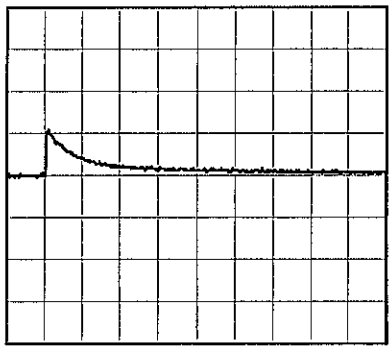


Min. Load (0A) ⟷
Load 100% (6.3A)



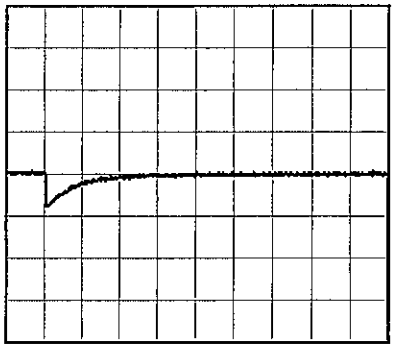
100 mV/div

40 ms/div



40 ms/div

Min. Load (0A) ⟷
Load 50% (3.15A)



100 mV/div

40 ms/div

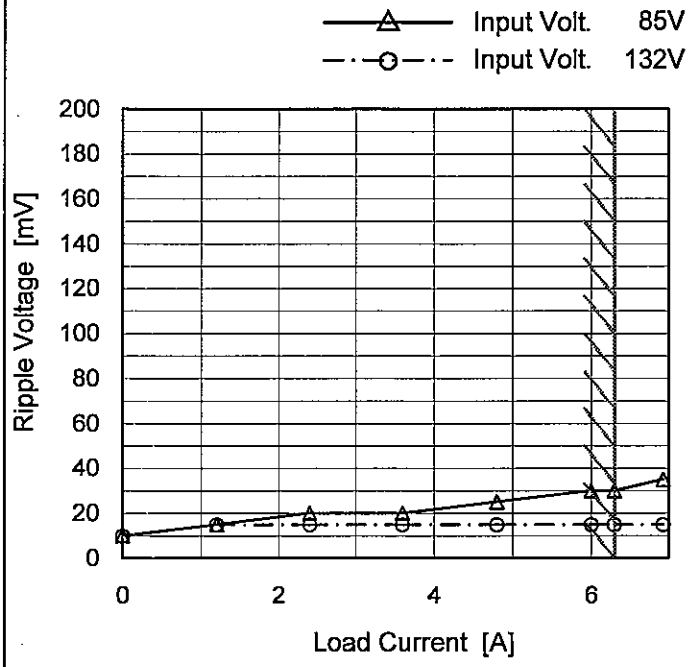
40 ms/div

COSEL

Model	LGA75A-12
Item	Ripple Voltage (by Load Current)
Object	+12V6.3A

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.

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	10	10
1.20	15	15
2.40	20	15
3.60	20	15
4.80	25	15
6.00	30	15
6.30	30	15
6.93	35	15
--	-	-
--	-	-
--	-	-

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

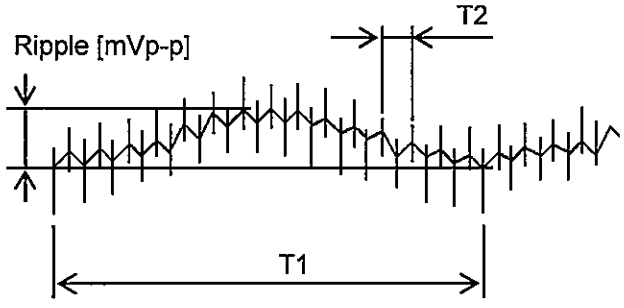


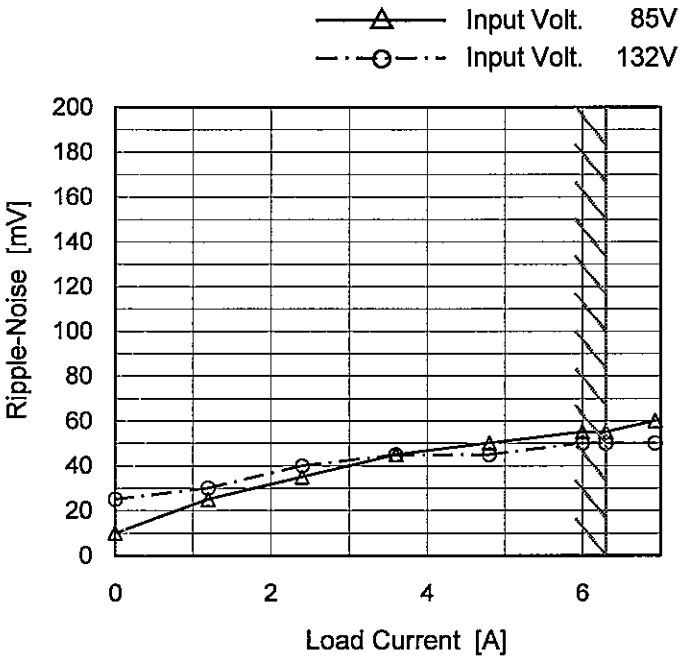
Fig. Complex Ripple Wave Form

COSEL

Model	LGA75A-12
Item	Ripple-Noise
Object	+12V6.3A

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]	Ripple-Noise [mV] Input Volt. 132 [V]
0.00	10	25
1.20	25	30
2.40	35	40
3.60	45	45
4.80	50	45
6.00	55	50
6.30	55	50
6.93	60	50
--	-	-
--	-	-
--	-	-

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

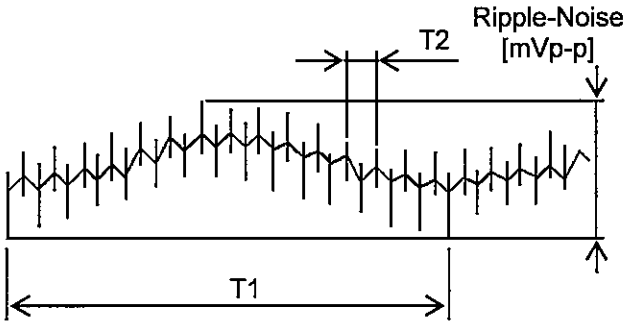


Fig. Complex Ripple Wave Form

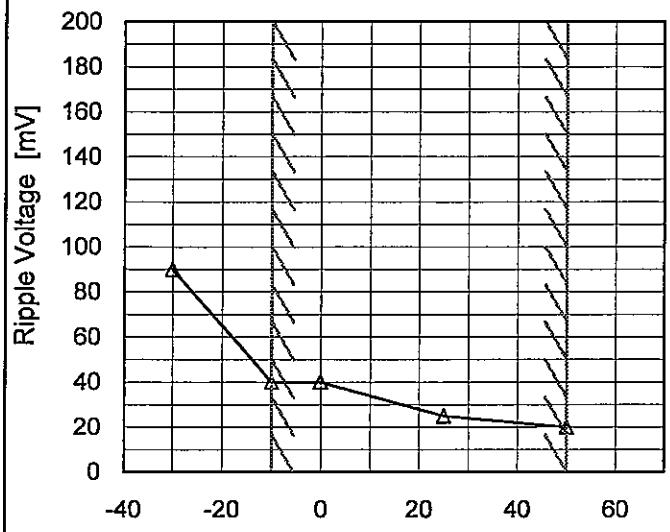
BC-10154

COSEL

Model	LGA75A-12
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V6.3A

Testing Circuitry FigureC

1.Graph



Input Volt. 100V

Input Load. 100%

Measured by 20 MHz Oscilloscope.

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

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

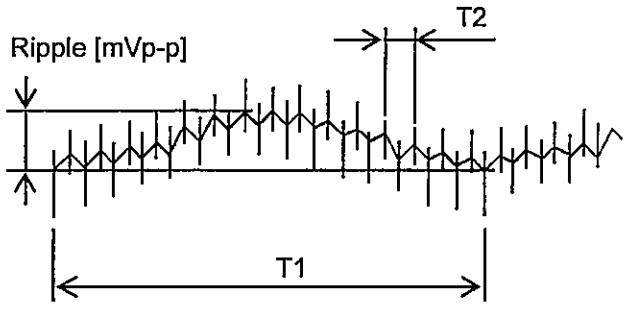


Fig. Complex Ripple Wave Form

2.Values

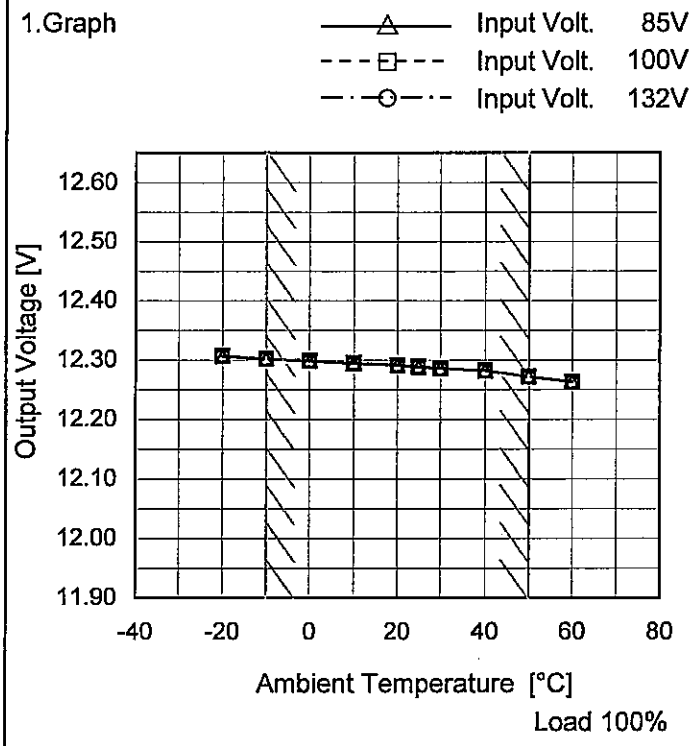
Ambient Temperature [°C]	Ripple Voltage [mV]
-30	90
-10	40
0	40
25	25
50	20
--	-
--	-
--	-
--	-
--	-
--	-

COSEL

Model	LGA75A-12
Item	Ambient Temperature Drift
Object	+12V6.3A

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	12.306	12.307	12.307
-10	12.302	12.302	12.302
0	12.298	12.299	12.298
10	12.294	12.295	12.295
20	12.291	12.291	12.291
25	12.288	12.289	12.289
30	12.286	12.286	12.286
40	12.282	12.282	12.282
50	12.272	12.272	12.272
60	12.263	12.263	12.263
--	-	-	-

COSEL

Model	LGA75A-12	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V6.3A	

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 - 6.3A

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

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

2.Values

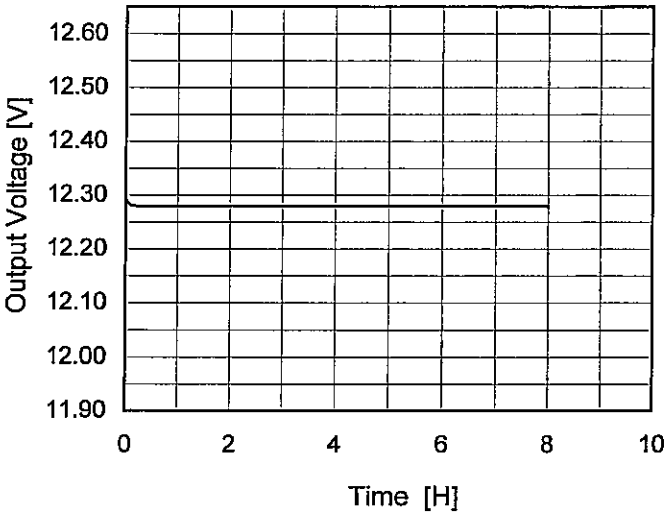
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	132	0	12.311	±20	±0.2
Minimum Voltage	50	132	6.3	12.272		

COSEL

Model	LGA75A-12
Item	Time Lapse Drift
Object	+12V6.3A

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	12.294
0.5	12.279
1.0	12.279
2.0	12.280
3.0	12.280
4.0	12.280
5.0	12.280
6.0	12.280
7.0	12.280
8.0	12.279

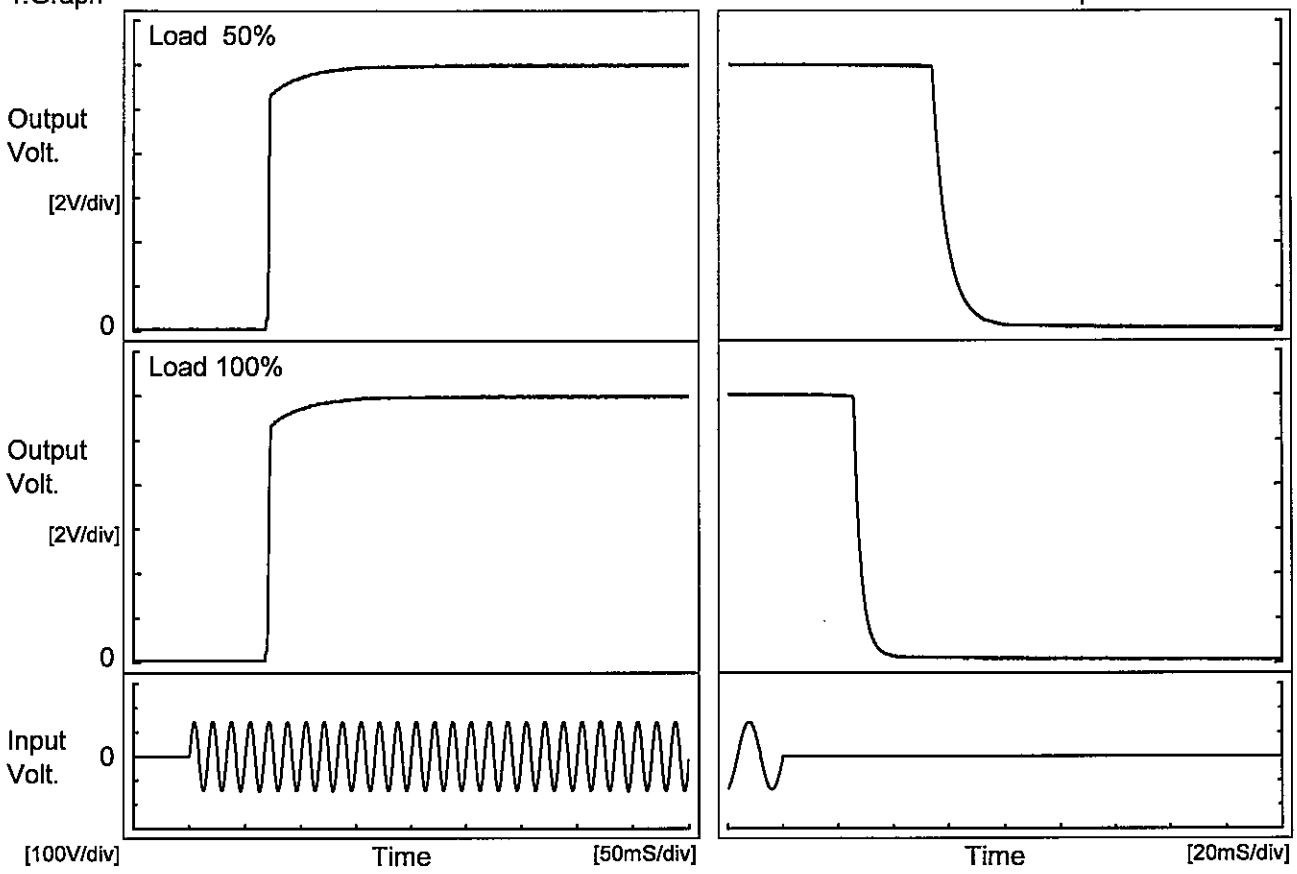
COSEL

Model	LGA75A-12
Item	Rise and Fall Time
Object	+12V6.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

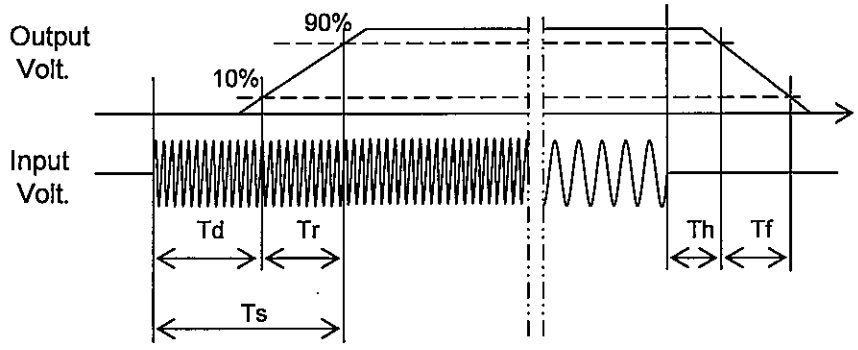
Input Volt. 100 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	70.3	9.0	79.3	54.4	11.8
100 %	70.0	8.8	78.8	25.8	6.2



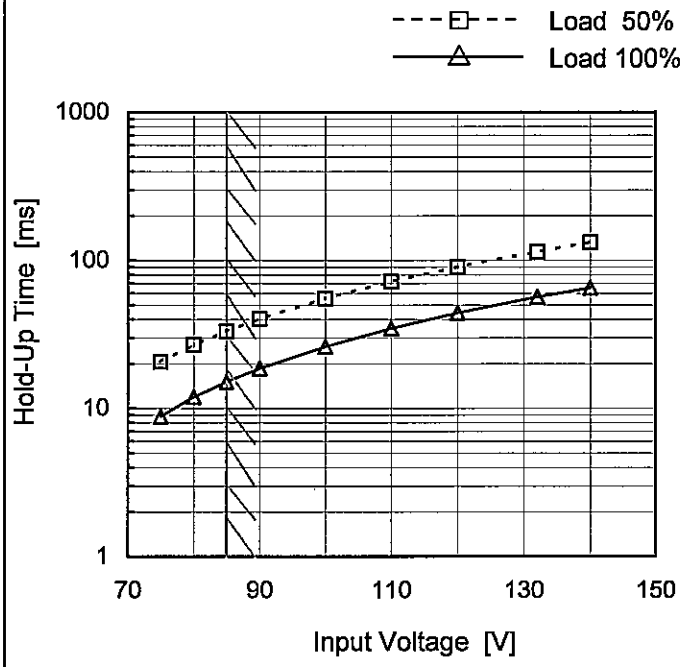
BC-10154

COSEL

Model	LGA75A-12
Item	Hold-Up Time
Object	+12V6.3A

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

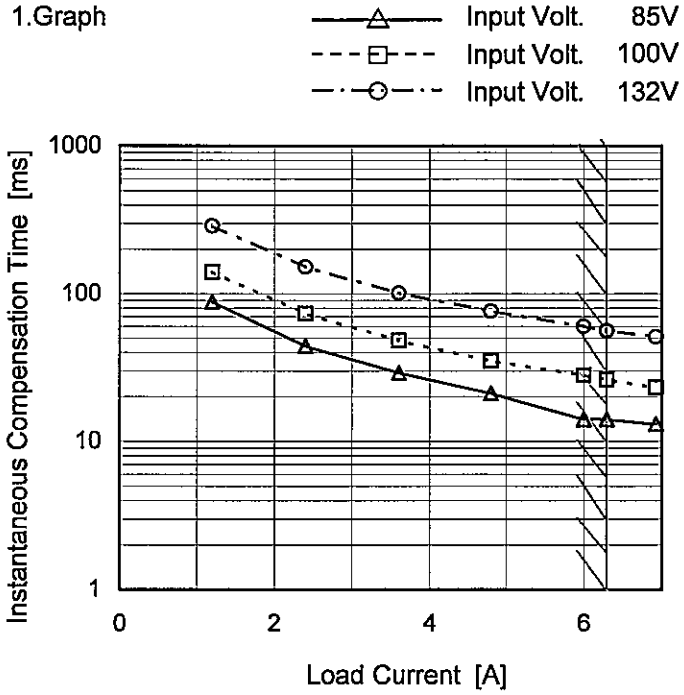
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	21	9
80	27	12
85	33	15
90	40	19
100	55	26
110	72	35
120	90	44
132	115	56
140	132	65

COSEL

Model	LGA75A-12
Item	Instantaneous Interruption Compensation
Object	+12V6.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

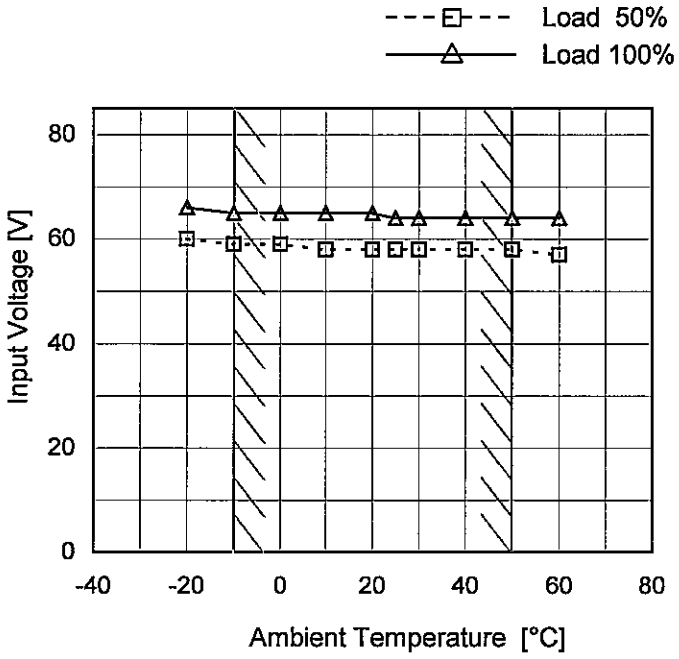
Load Current [A]	Time [ms] Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-	-	-
1.20	88	140	288
2.40	44	73	152
3.60	29	48	101
4.80	21	35	76
6.00	14	28	60
6.30	14	26	56
6.93	13	23	51
--	-	-	-
--	-	-	-
---	-	-	-

COSEL

Model	LGA75A-12
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V6.3A

Testing Circuitry Figure A

1.Graph



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

2.Values

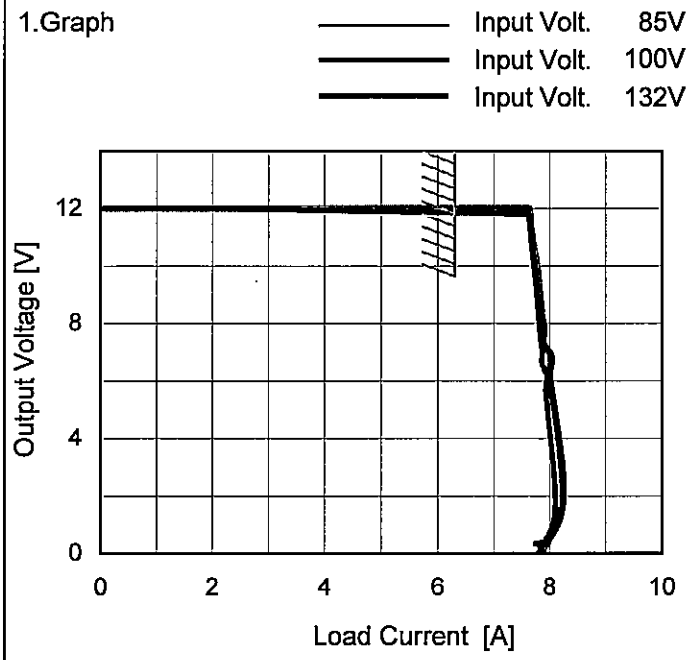
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	60	66
-10	59	65
0	59	65
10	58	65
20	58	65
25	58	64
30	58	64
40	58	64
50	58	64
60	57	64
--	-	-

COSEL

Model	LGA75A-12
Item	Overcurrent Protection
Object	+12V6.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

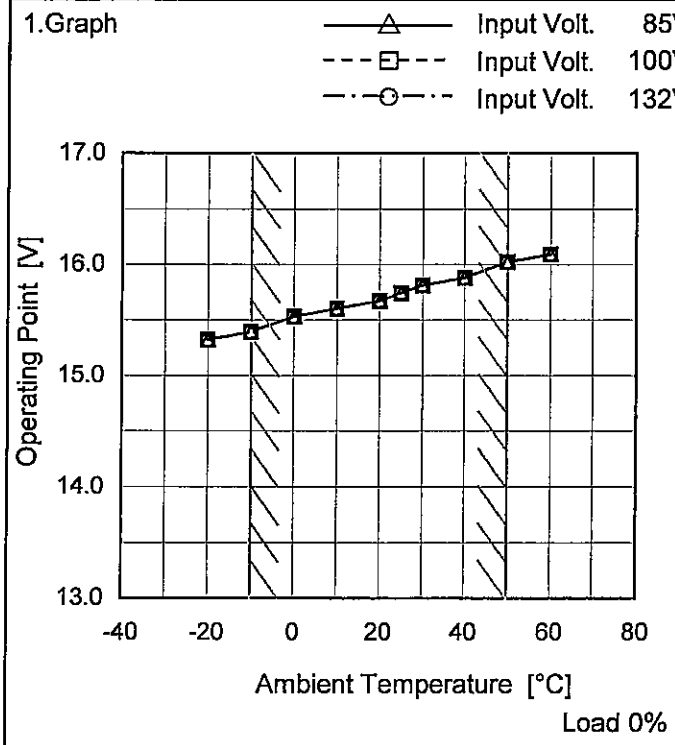
Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
12.0	7.69	7.62	7.64
11.4	7.70	7.64	7.66
10.8	7.72	7.67	7.70
9.6	7.77	7.73	7.78
8.4	7.81	7.79	7.85
7.2	7.86	7.84	7.89
6.0	7.96	7.96	8.00
4.8	7.96	7.97	8.09
3.6	8.02	8.03	8.18
2.4	8.06	8.09	8.24
1.2	8.07	8.09	8.18
0.0	7.85	7.82	7.88

COSEL

Model	LGA75A-12
Item	Overvoltage Protection
Object	+12V6.3A

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	15.32	15.32	15.32
-10	15.39	15.39	15.39
0	15.53	15.53	15.53
10	15.60	15.60	15.60
20	15.67	15.67	15.67
25	15.74	15.74	15.74
30	15.81	15.81	15.81
40	15.88	15.88	15.88
50	16.02	16.02	16.02
60	16.09	16.09	16.09
--	-	-	-

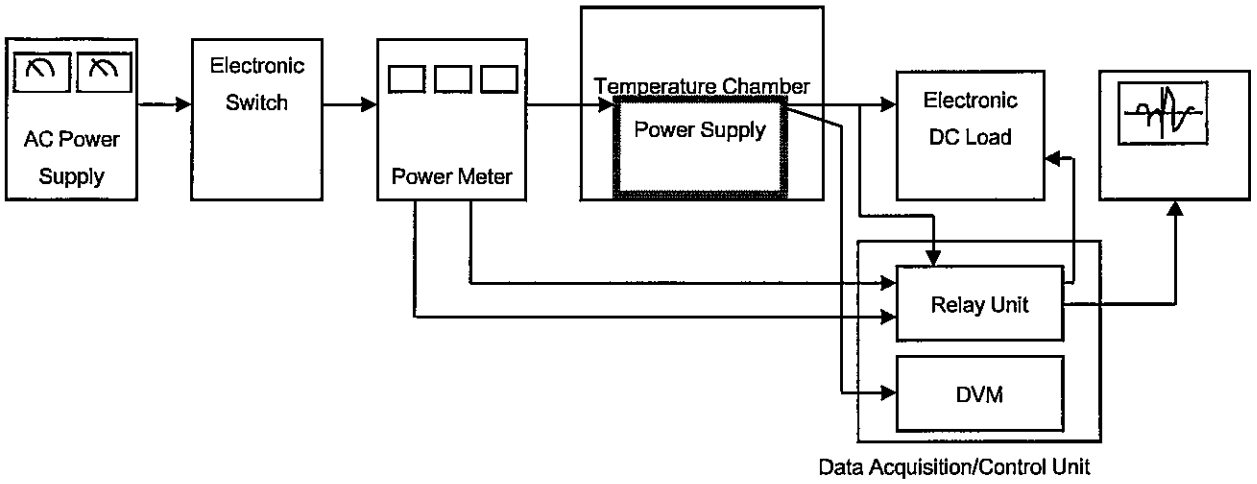


Figure A

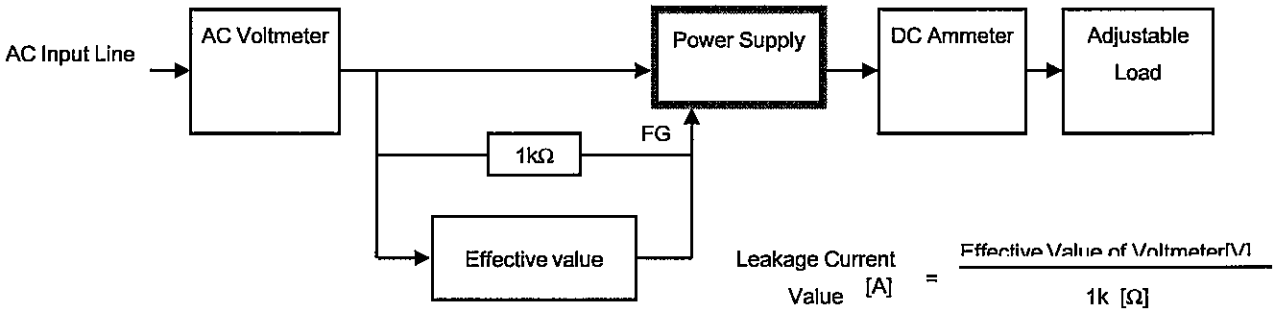


Figure B (DEN-AN)

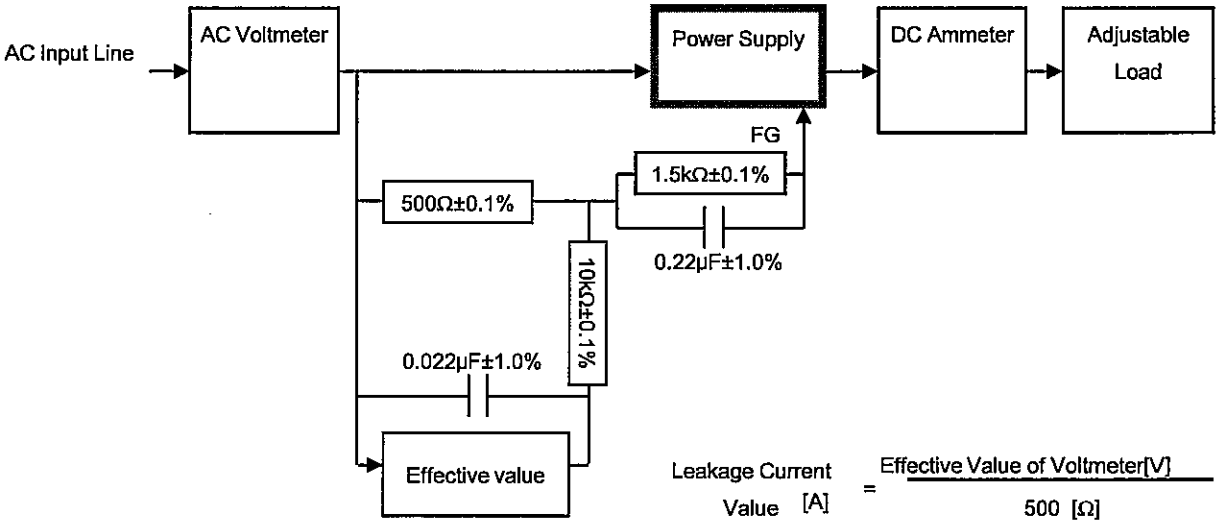


Figure B (IEC60950 -1)

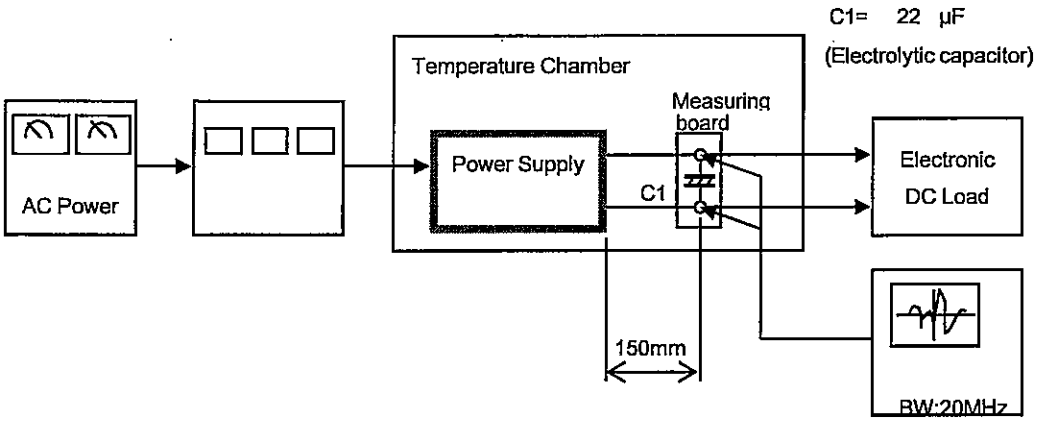

C1= 22 µF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
Power Supply
C1
Electronic DC Load
AC Power
150mm
BW:20MHz

Figure C