参考資料

COSEL

TEST DATA OF LGA50A-15

Regulated DC Power Supply
May 20, 2011

Approved by : Kenji Shiho
Kenji Shiho Design Manager

Prepared by : Yosuke Saitou
Yosuke Saitou Design Engineer

COSEL CO.,LTD.

COSEL

CONTENTS

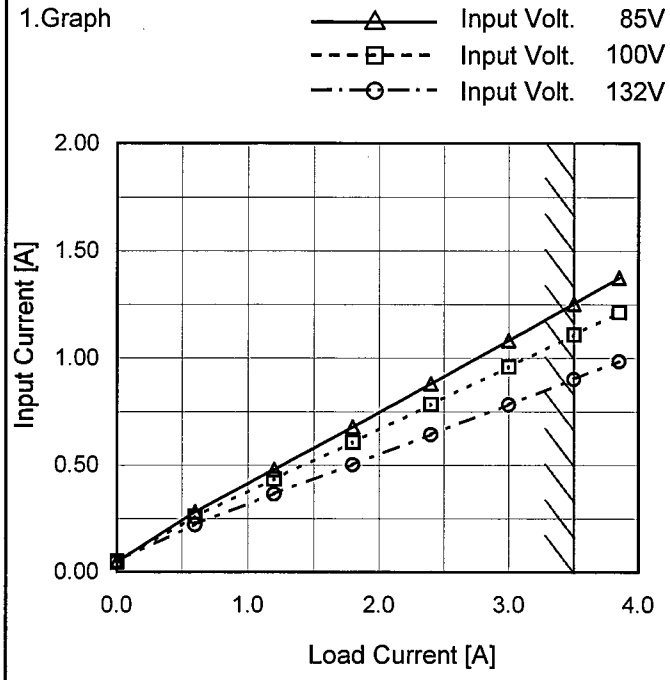
(Final Page 25)

COSEL

Model	LGA50A-15
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	0.048	0.050	0.051
0.60	0.283	0.259	0.222
1.20	0.480	0.434	0.366
1.80	0.680	0.607	0.503
2.40	0.881	0.783	0.643
3.00	1.084	0.959	0.783
3.50	1.255	1.108	0.902
3.85	1.375	1.213	0.986
--	-	-	-
--	-	-	-
--	-	-	-

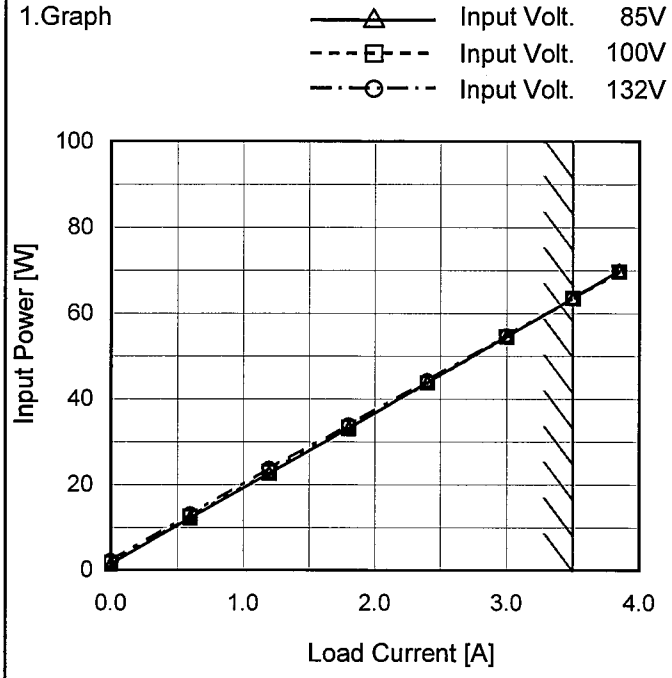
BC-10541

COSEL

Model	LGA50A-15
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	1.53	1.75	2.25
0.60	12.30	12.48	13.14
1.20	22.70	23.00	23.79
1.80	33.20	33.30	34.00
2.40	43.90	43.70	44.30
3.00	54.60	54.50	54.80
3.50	63.60	63.40	63.60
3.85	70.00	69.60	69.70
--	-	-	-
--	-	-	-
--	-	-	-

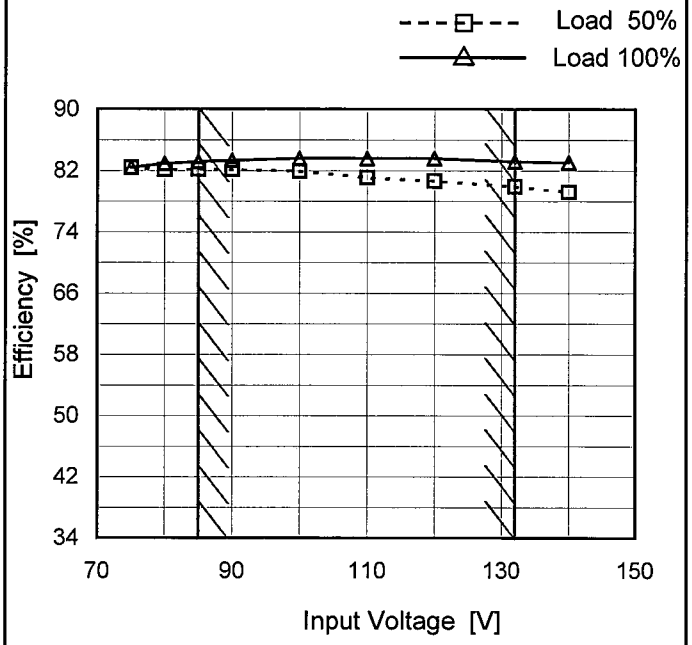
BC-10541

COSEL

Model	LGA50A-15
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

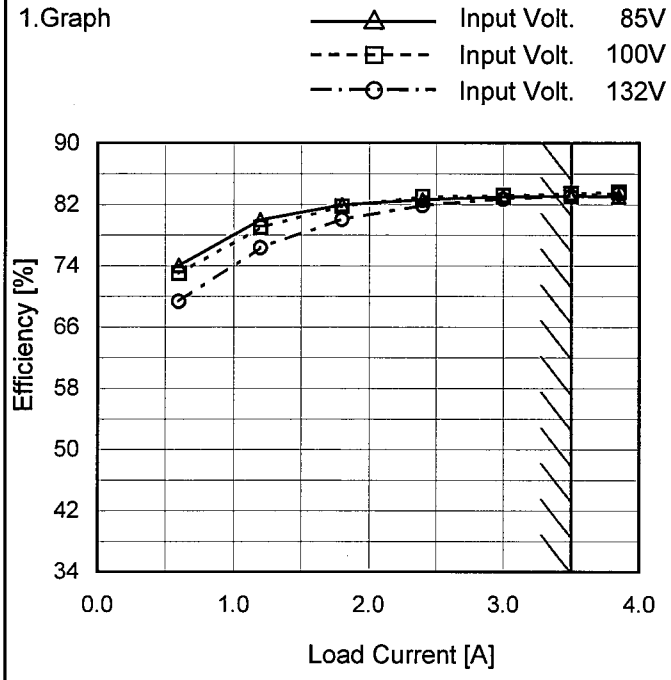
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	82.4	82.4
80	82.1	82.9
85	82.1	83.2
90	82.1	83.4
100	81.9	83.6
110	81.1	83.6
120	80.6	83.6
132	79.9	83.2
140	79.2	83.1

COSEL

Model	LGA50A-15
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

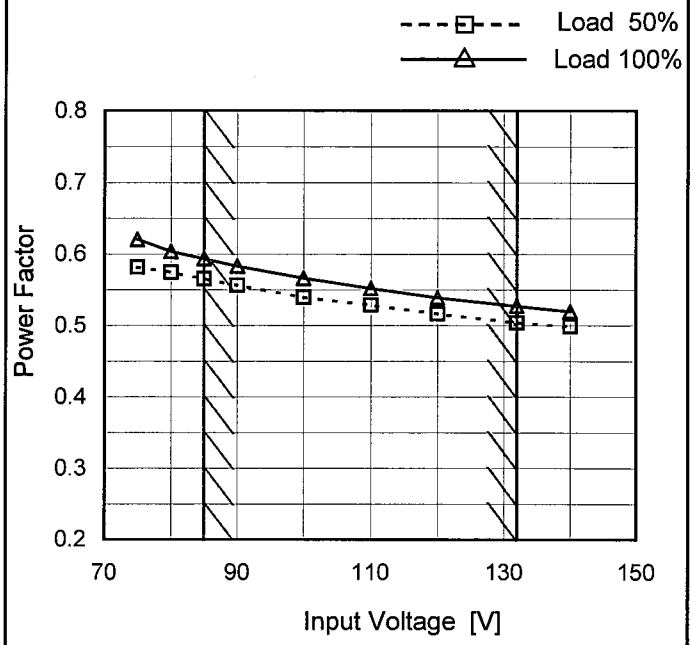
Load Current [A]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-	-	-
0.60	74.1	73.0	69.4
1.20	80.0	79.0	76.4
1.80	82.0	81.7	80.0
2.40	82.6	83.0	81.9
3.00	83.0	83.2	82.7
3.50	83.1	83.4	83.1
3.85	83.1	83.5	83.4
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LGA50A-15
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

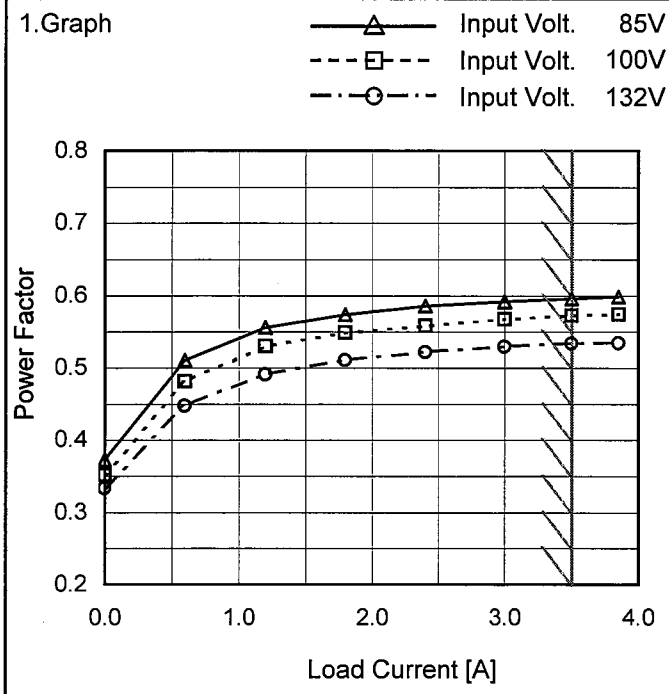
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.582	0.621
80	0.574	0.604
85	0.565	0.593
90	0.556	0.583
100	0.539	0.566
110	0.528	0.552
120	0.517	0.539
132	0.504	0.527
140	0.499	0.520

COSEL

Model	LGA50A-15
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

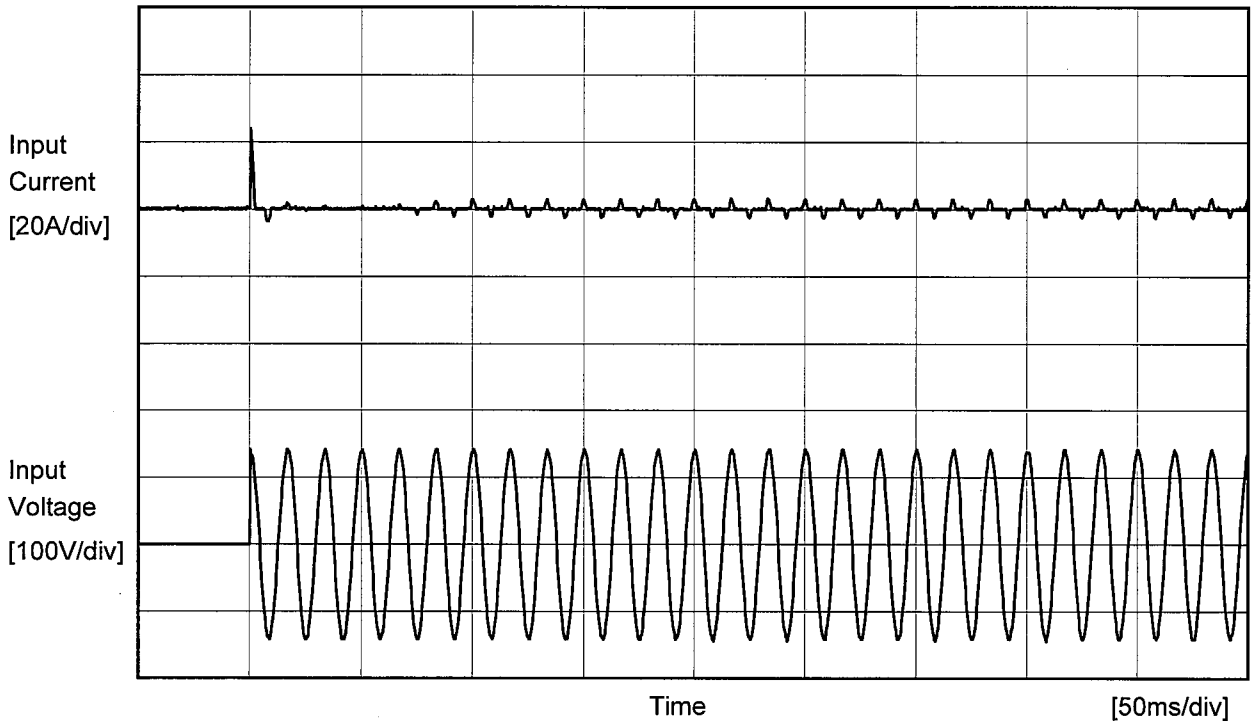
Load Current [A]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	0.373	0.351	0.334
0.60	0.511	0.482	0.448
1.20	0.556	0.530	0.491
1.80	0.574	0.549	0.511
2.40	0.586	0.558	0.522
3.00	0.592	0.568	0.530
3.50	0.597	0.572	0.534
3.85	0.599	0.574	0.535
--	-	-	-
--	-	-	-
--	-	-	-

BC-10541

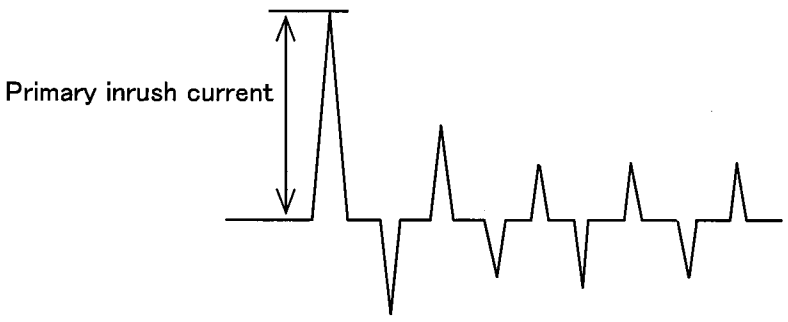
COSEL

Model	LGA50A-15
Item	Inrush Current
Object	———————

Temperature 25°C
Testing Circuitry Figure A



Input Voltage	100 V
Frequency	60 Hz
Load	100 %
Primary inrush current	23.8 A



BC-10541

COSEL

Model	LGA50A-15
Item	Leakage Current
Object	———————————

Temperature 25°C
Testing Circuitry Figure B

1.Results

Standards	Leakage Current [mA]		
	Input Volt. 100 [V]	Input Volt. 120 [V]	Input Volt. 132 [V]
(A)DEN-AN	0.18	0.20	0.24
(B)IEC60950-1	0.18	0.25	0.27

frequency 60Hz

2.Condition

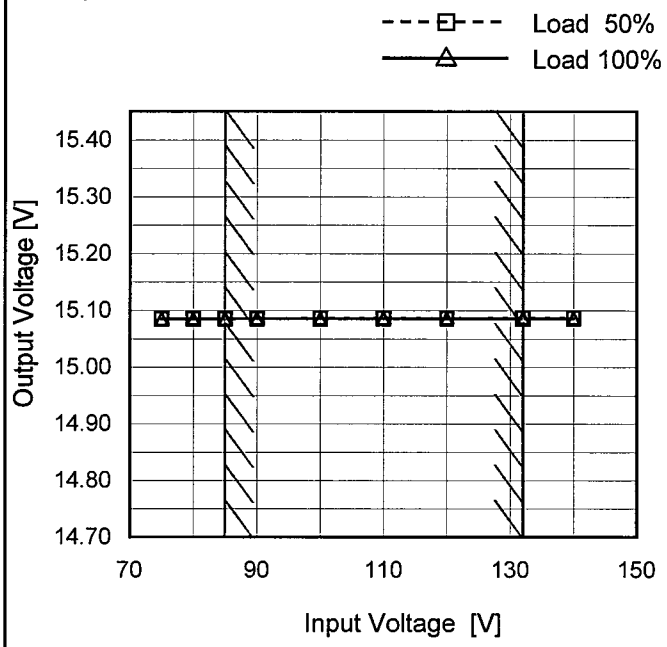
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	LGA50A-15
Item	Line Regulation
Object	+15V3.5A

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	15.085	15.085
80	15.085	15.085
85	15.085	15.085
90	15.086	15.086
100	15.086	15.086
110	15.086	15.086
120	15.086	15.086
132	15.087	15.086
140	15.087	15.086

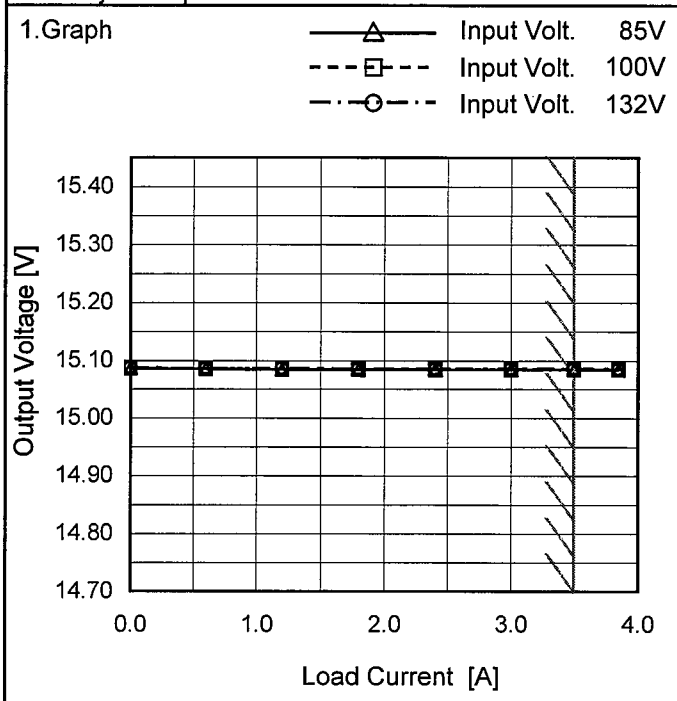
BC-10541

COSEL

Model	LGA50A-15
Item	Load Regulation
Object	+15V3.5A

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	15.087	15.087	15.087
0.60	15.085	15.086	15.087
1.20	15.085	15.086	15.087
1.80	15.085	15.085	15.086
2.40	15.085	15.086	15.086
3.00	15.085	15.085	15.086
3.50	15.084	15.085	15.086
3.85	15.084	15.085	15.086
--	-	-	-
--	-	-	-
--	-	-	-

BC-10541

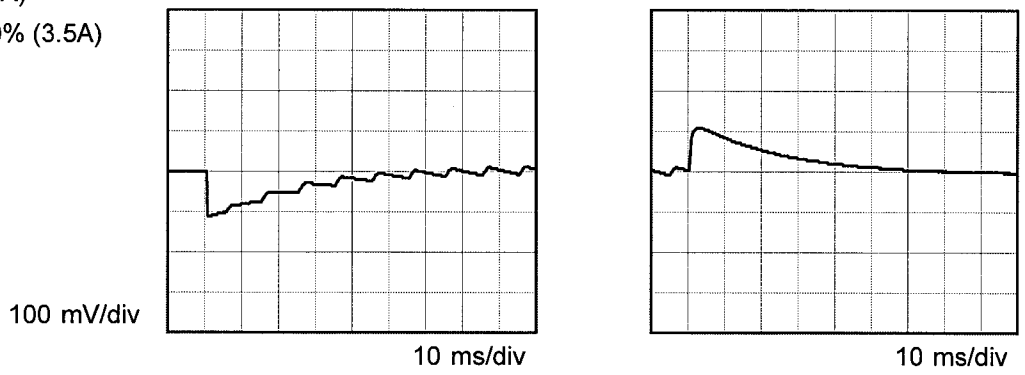
COSEL

Model	LGA50A-15		
Item	Dynamic Load Response	Temperature Testing Circuitry	25°C Figure C
Object	+15V3.5A		

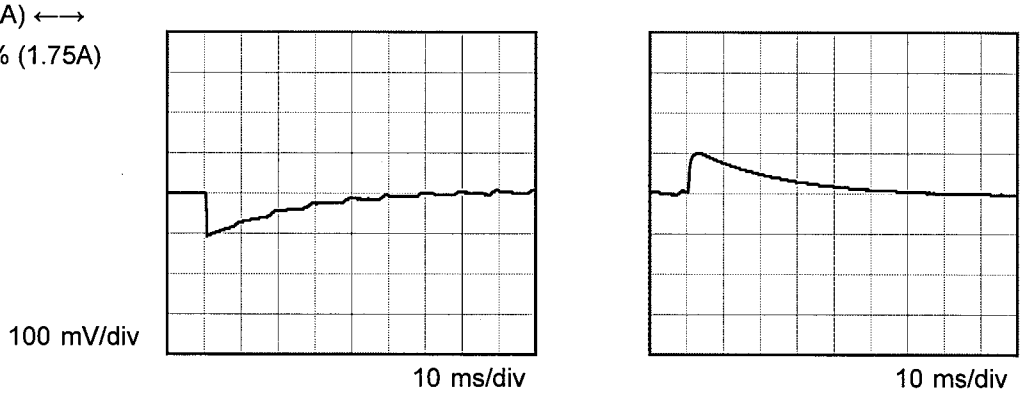
Input Volt. 100 V
Cycle 1000 ms

Response. t1=t2=50 μs. Typ

Min. Load (0A) ⟷
Load 100% (3.5A)



Min. Load (0A) ⟷
Load 50% (1.75A)

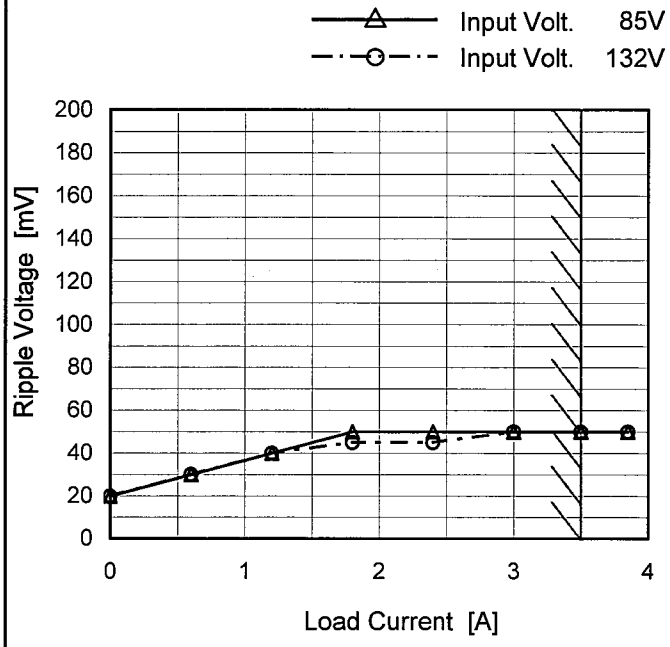


COSEL

Model	LGA50A-15
Item	Ripple Voltage (by Load Current)
Object	+15V3.5A

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

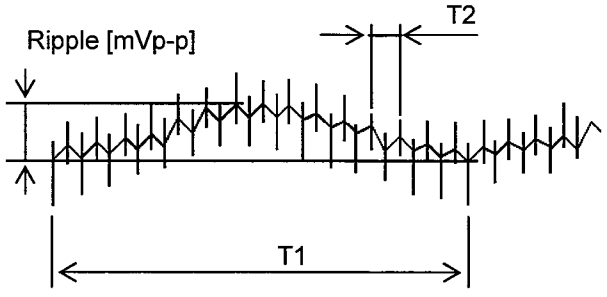


Fig. Complex Ripple Wave Form

2.Values

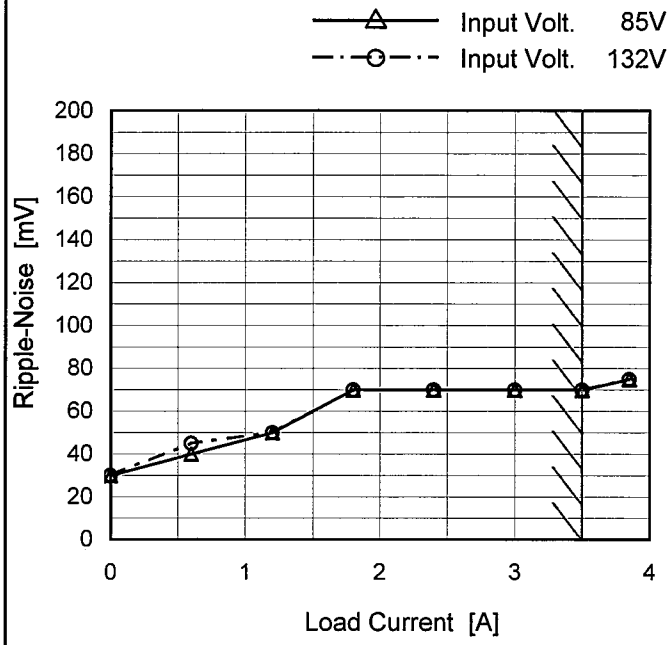
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	20	20
0.60	30	30
1.20	40	40
1.80	50	45
2.40	50	45
3.00	50	50
3.50	50	50
3.85	50	50
--	-	-
--	-	-
--	-	-

COSEL

Model	LGA50A-15
Item	Ripple-Noise
Object	+15V3.5A

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.

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	30	30
0.60	40	45
1.20	50	50
1.80	70	70
2.40	70	70
3.00	70	70
3.50	70	70
3.85	75	75
--	-	-
--	-	-
--	-	-

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

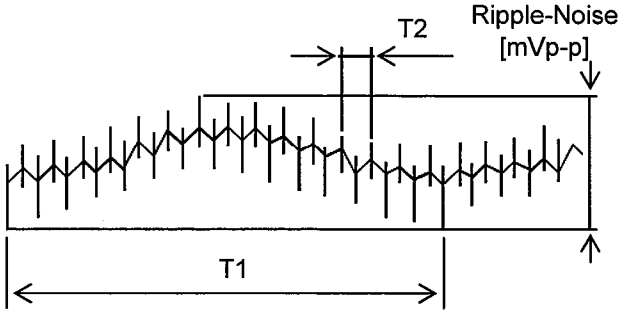


Fig. Complex Ripple Wave Form

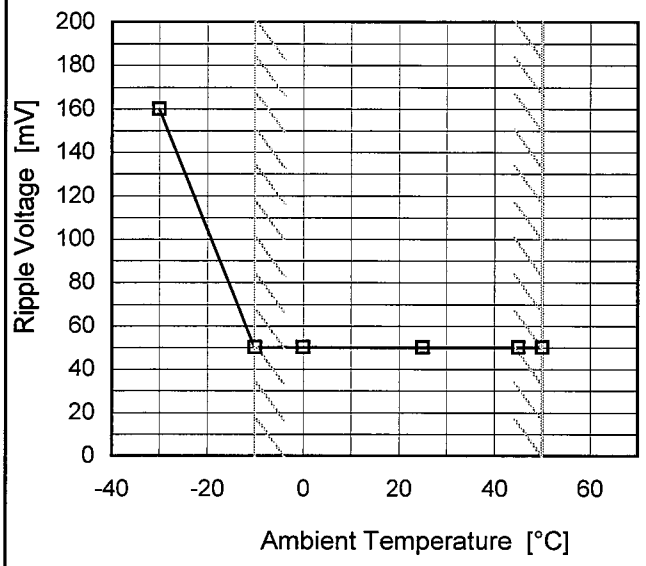
BC-10541

COSEL

Model	LGA50A-15
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V3.5A

Testing Circuitry Figure C

1.Graph



Input Volt. 100V

Input Load. 100%

Measured by 20 MHz Oscilloscope.

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

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]
-30	160
-10	50
0	50
25	50
45	50
50	50
--	-
--	-
--	-
--	-
--	-

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

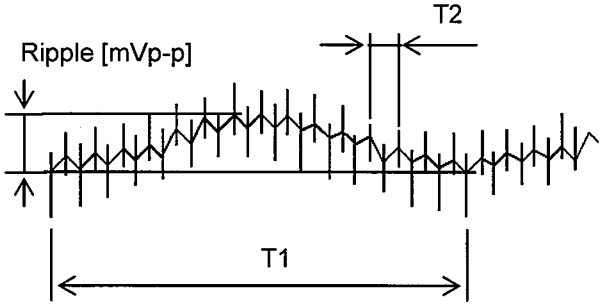


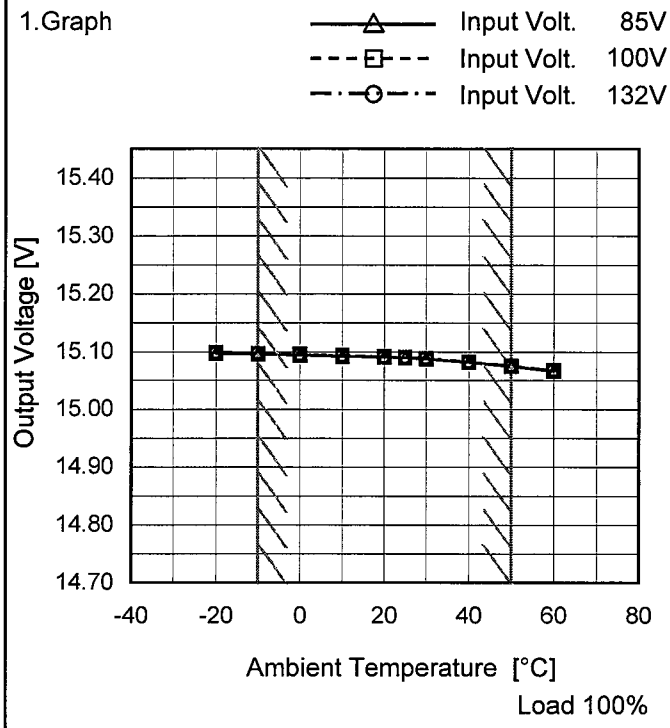
Fig. Complex Ripple Wave Form

COSEL

Model	LGA50A-15
Item	Ambient Temperature Drift
Object	+15V3.5A

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	15.097	15.098	15.099
-10	15.096	15.097	15.097
0	15.094	15.095	15.095
10	15.093	15.093	15.094
20	15.091	15.091	15.092
25	15.089	15.090	15.090
30	15.087	15.088	15.088
40	15.082	15.083	15.083
50	15.075	15.075	15.076
60	15.067	15.067	15.068
--	-	-	-

BC-10541

COSEL

Model	LGA50A-15	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V3.5A	

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 - 3.5A

* 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

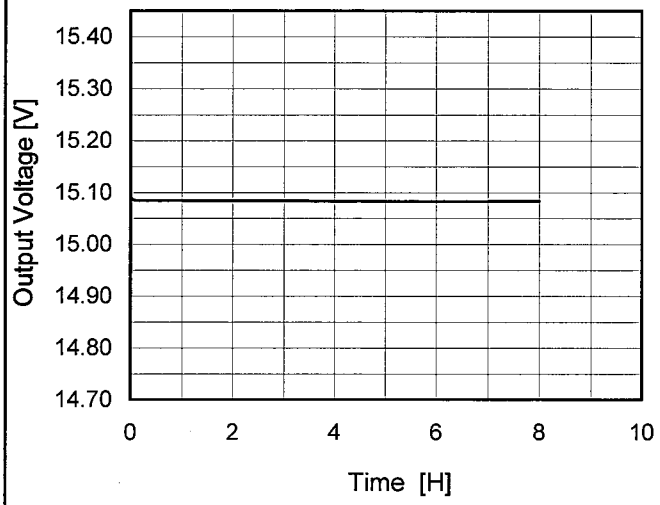
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	100	0	15.099	±12	±0.1
Minimum Voltage	50	85	3.5	15.075		

COSEL

Model	LGA50A-15
Item	Time Lapse Drift
Object	+15V3.5A

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	15.094
0.5	15.085
1.0	15.085
2.0	15.085
3.0	15.085
4.0	15.084
5.0	15.084
6.0	15.084
7.0	15.084
8.0	15.084

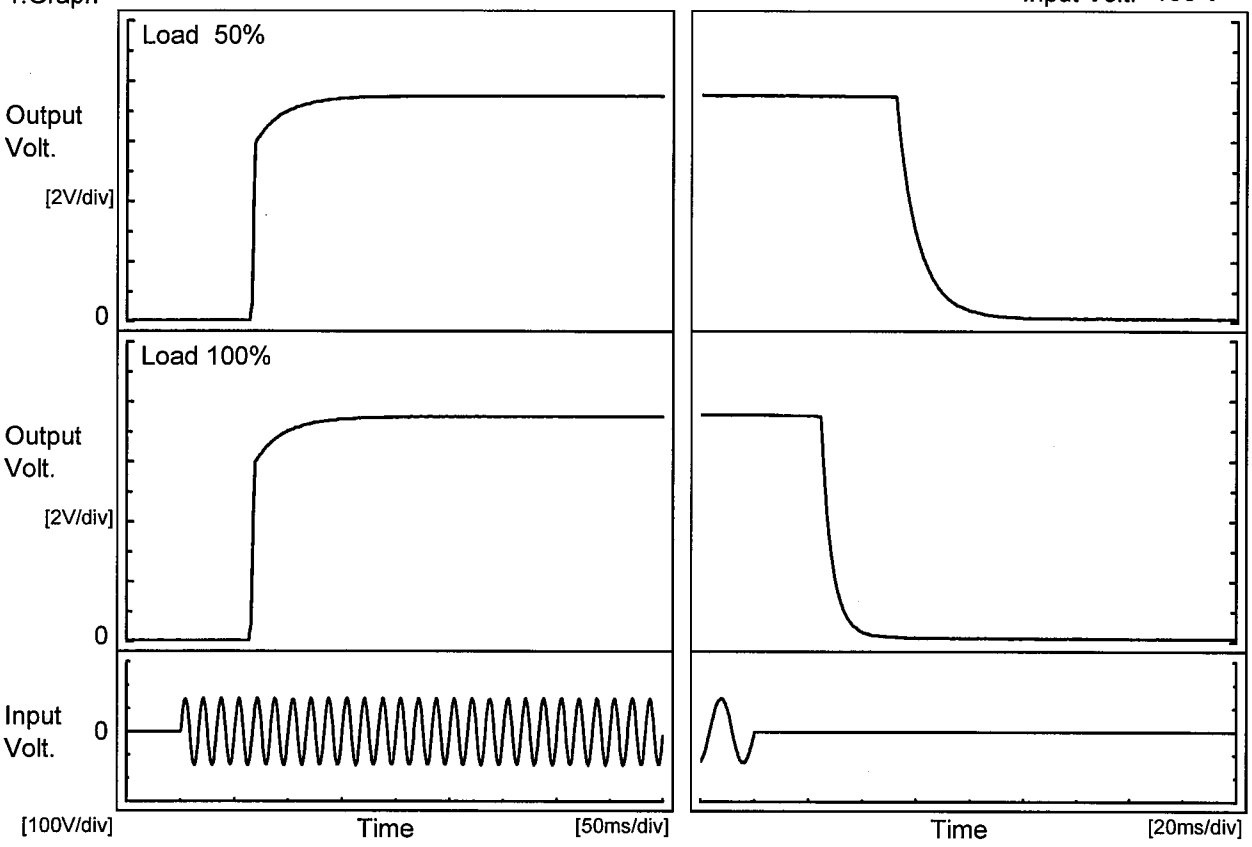
COSEL

Model	LGA50A-15
Item	Rise and Fall Time
Object	+15V3.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

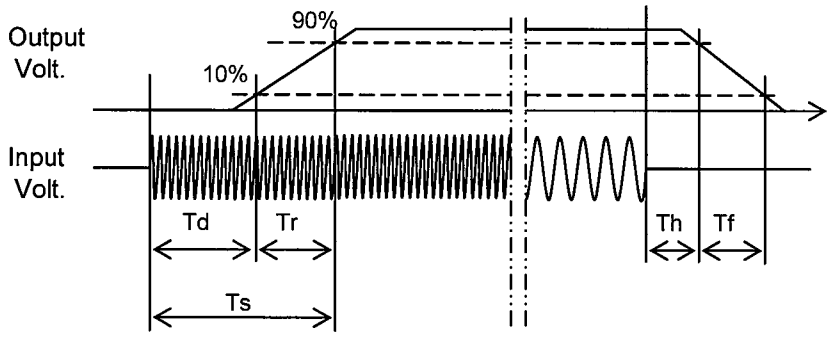
Input Volt. 100 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	66.3	23.5	89.8	53.0	18.7
100 %	65.8	23.8	89.6	25.1	9.5

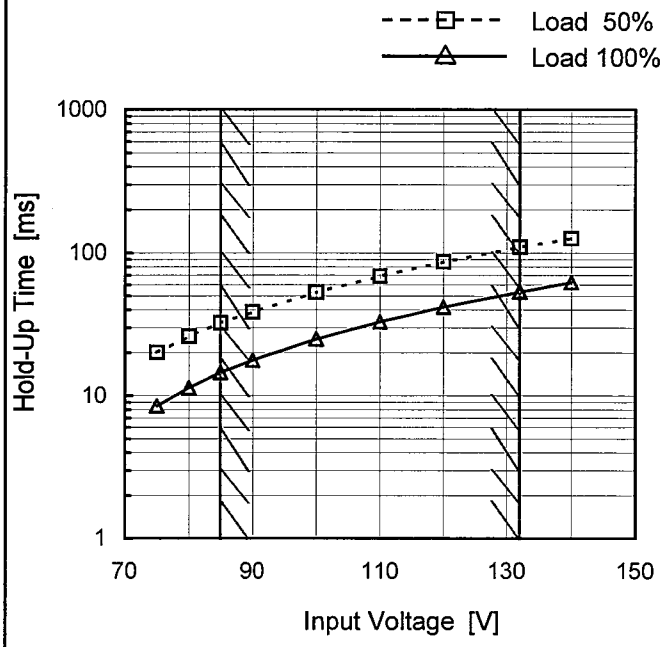


COSEL

Model	LGA50A-15
Item	Hold-Up Time
Object	+15V3.5A

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	20	9
80	26	11
85	32	15
90	38	18
100	53	25
110	69	33
120	86	42
132	110	54
140	126	62

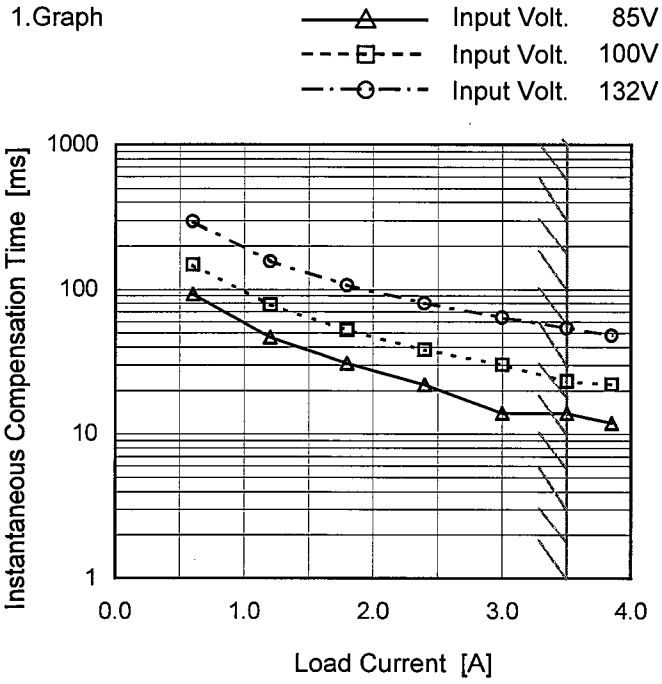
BC-10541

COSEL

Model	LGA50A-15
Item	Instantaneous Interruption Compensation
Object	+15V3.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

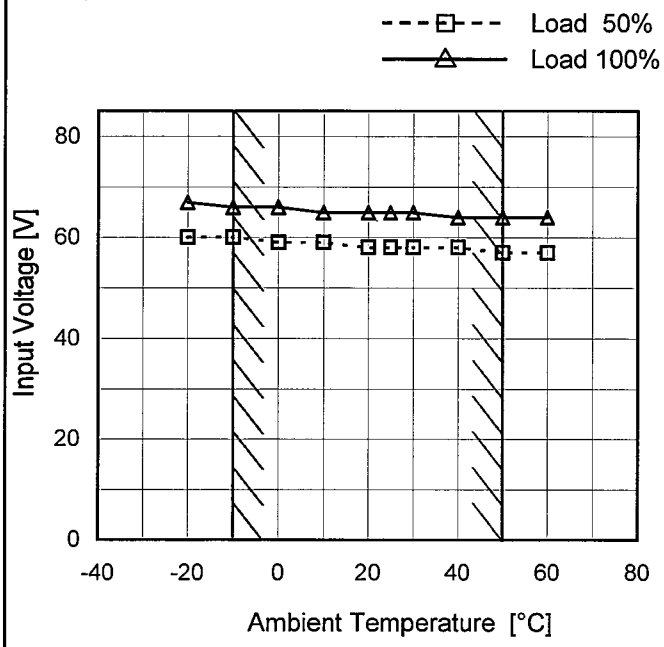
Load Current [A]	Time [ms]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-	-	-
0.60	93	148	297
1.20	47	78	157
1.80	31	52	107
2.40	22	38	80
3.00	14	30	64
3.50	14	23	54
3.85	12	22	48
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LGA50A-15
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V3.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

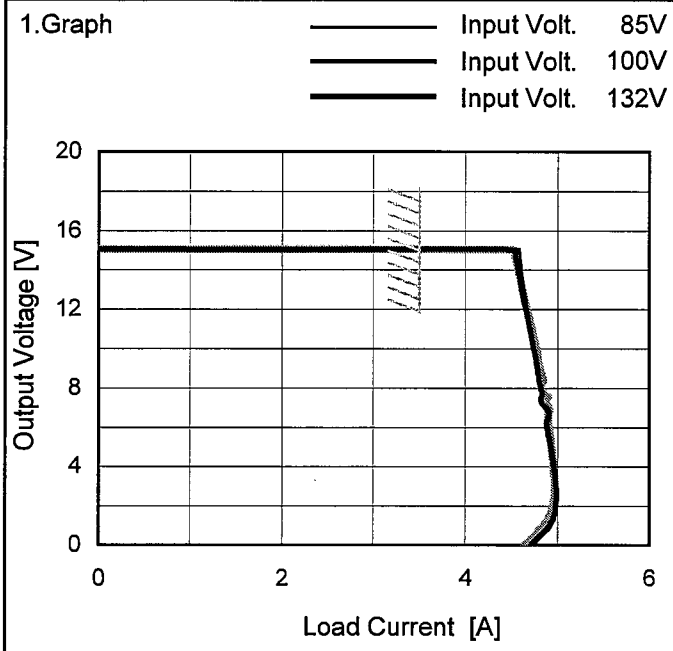
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	60	67
-10	60	66
0	59	66
10	59	65
20	58	65
25	58	65
30	58	65
40	58	64
50	57	64
60	57	64
--	-	-

COSEL

Model	LGA50A-15
Item	Overcurrent Protection
Object	+15V3.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

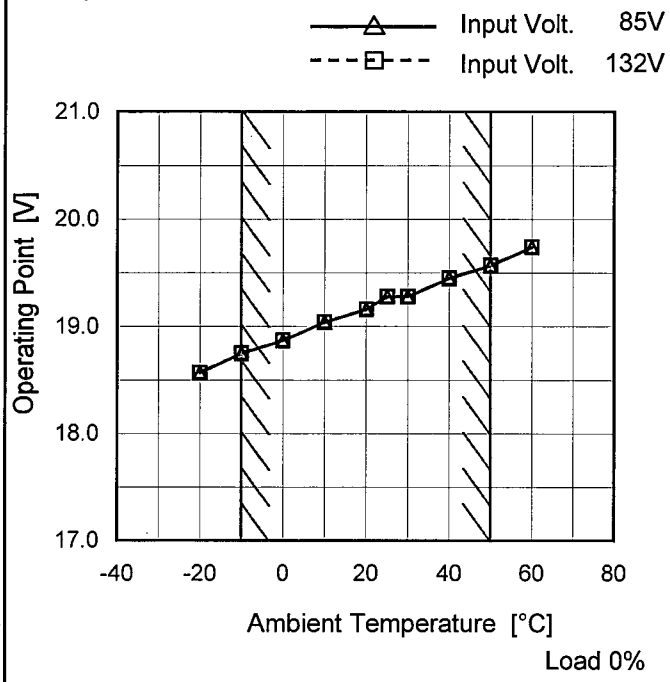
Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
15.0	3.77	3.52	3.78
14.3	4.60	4.56	4.56
13.5	4.62	4.59	4.59
12.0	4.67	4.65	4.66
10.5	4.72	4.72	4.74
9.0	4.77	4.78	4.81
7.5	4.83	4.82	4.90
6.0	4.88	4.89	4.91
4.5	4.93	4.94	4.95
3.0	4.98	4.98	4.97
1.5	4.97	4.96	4.92
0.0	4.74	4.70	4.63

COSEL

Model	LGA50A-15
Item	Overvoltage Protection
Object	+15V3.5A

Testing Circuitry Figure A

1.Graph



Load 0%

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. 132[V]
-20	18.57	18.57
-10	18.75	18.75
0	18.87	18.87
10	19.04	19.04
20	19.16	19.16
25	19.28	19.28
30	19.28	19.28
40	19.45	19.45
50	19.57	19.57
60	19.74	19.74
--	-	-

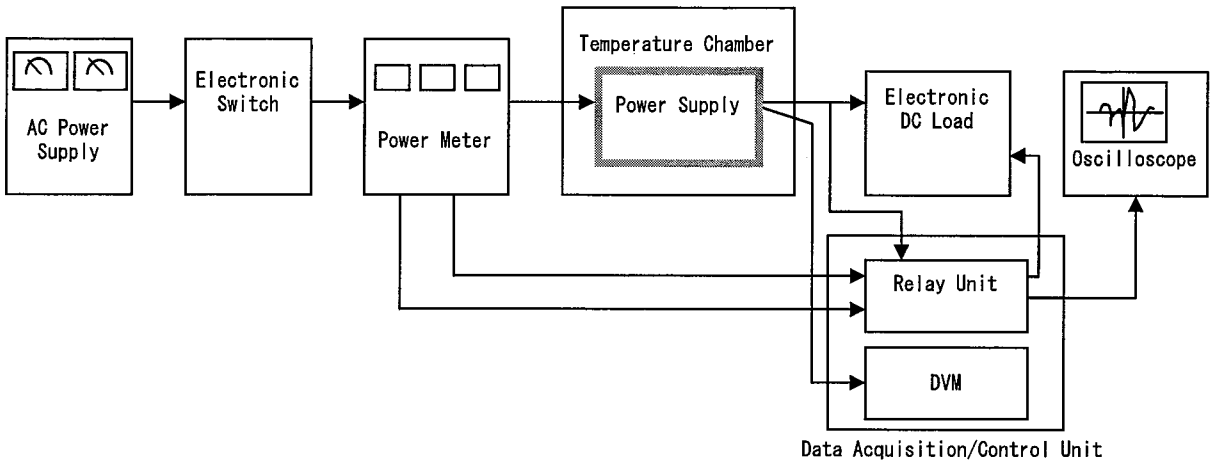


Figure A

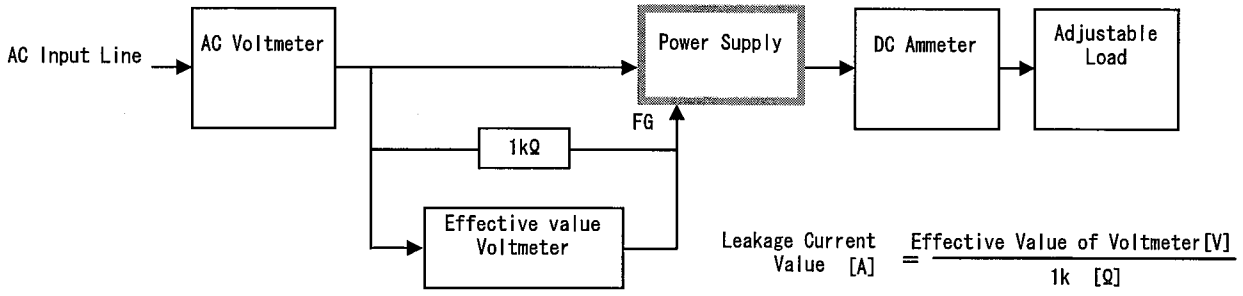


Figure B (DEN-AN)

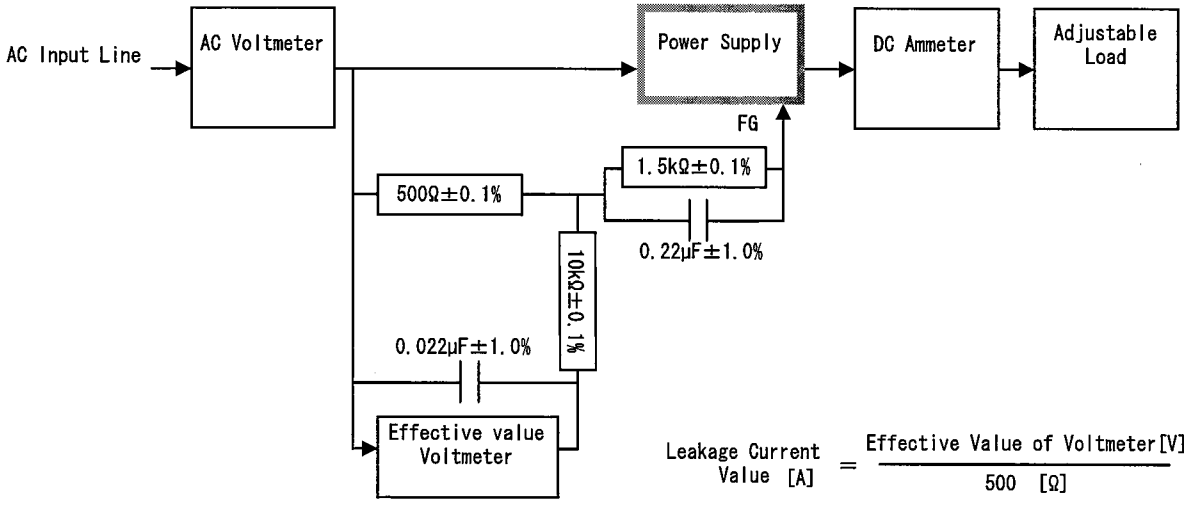


Figure B (IEC60950-1)

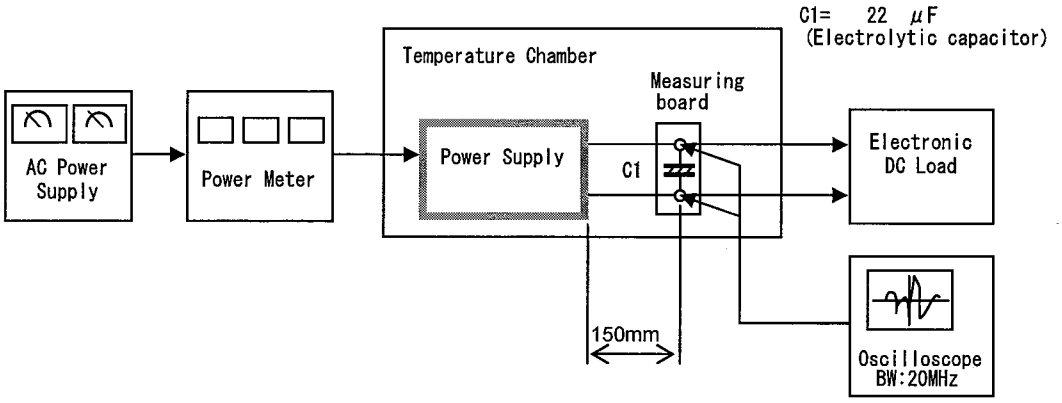

C1= 22 μF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
C1
Electronic DC Load
150mm
Oscilloscope BW:20MHz

Figure C