参考資料

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# TEST DATA OF LCA150S-3

Regulated DC Power Supply
Aug.17. 2004

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Prepared by : A.Kawai Design Engineer

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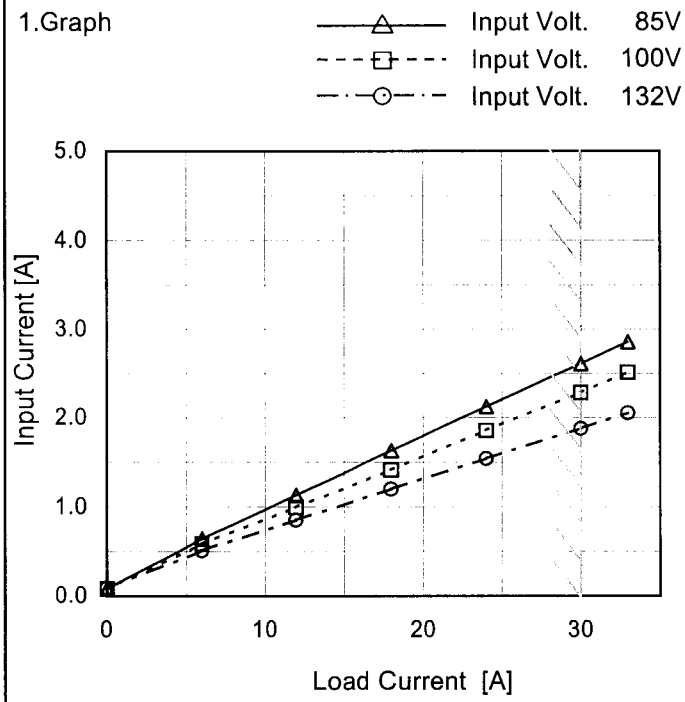
| | |
|---|---|
| Model | LCA150S-3 |
| Item | Input Current (by Load Current) |
| Object | ———————— |

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 | 0.081 | 0.086 | 0.089 |
| 6 | 0.643 | 0.586 | 0.511 |
| 12 | 1.131 | 0.996 | 0.853 |
| 18 | 1.632 | 1.415 | 1.199 |
| 24 | 2.128 | 1.857 | 1.542 |
| 30 | 2.611 | 2.285 | 1.878 |
| 33 | 2.860 | 2.516 | 2.054 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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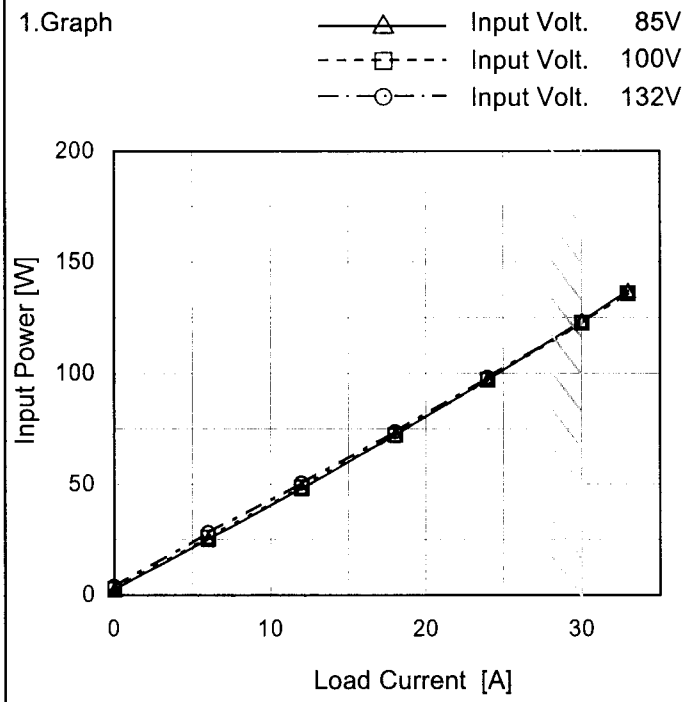
| | |
|---|---|
| Model | LCA150S-3 |
| Item | Input Power (by Load Current) |
| Object | ——————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

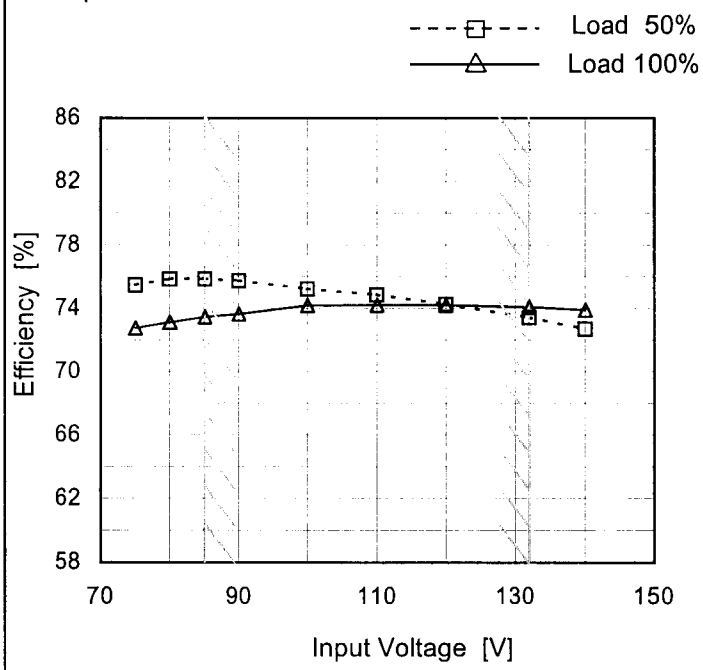
| Load Current [A] | Input Power [W] | | |
|---|---|---|---|
| | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 0 | 2.5 | 2.9 | 3.8 |
| 6 | 25.3 | 26.1 | 28.3 |
| 12 | 48.1 | 48.7 | 50.6 |
| 18 | 72.3 | 72.2 | 73.7 |
| 24 | 97.2 | 97.2 | 98.1 |
| 30 | 123.5 | 122.7 | 123.0 |
| 33 | 137.1 | 135.9 | 135.9 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| 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 | 75.5 | 72.8 |
| 80 | 75.8 | 73.1 |
| 85 | 75.8 | 73.5 |
| 90 | 75.7 | 73.7 |
| 100 | 75.2 | 74.2 |
| 110 | 74.9 | 74.2 |
| 120 | 74.3 | 74.2 |
| 132 | 73.4 | 74.1 |
| 140 | 72.7 | 73.9 |

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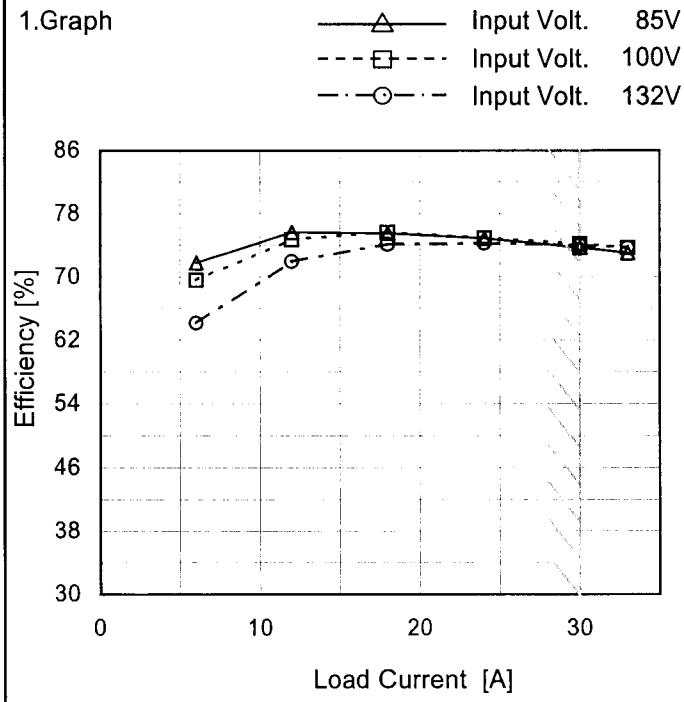
| | |
|---|---|
| Model | LCA150S-3 |
| Item | Efficiency (by Load Current) |
| Object | ———————— |

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 | - | - | - |
| 6 | 71.8 | 69.6 | 64.2 |
| 12 | 75.7 | 74.7 | 71.9 |
| 18 | 75.6 | 75.7 | 74.1 |
| 24 | 74.9 | 74.9 | 74.3 |
| 30 | 73.7 | 74.2 | 74.0 |
| 33 | 73.0 | 73.7 | 73.7 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

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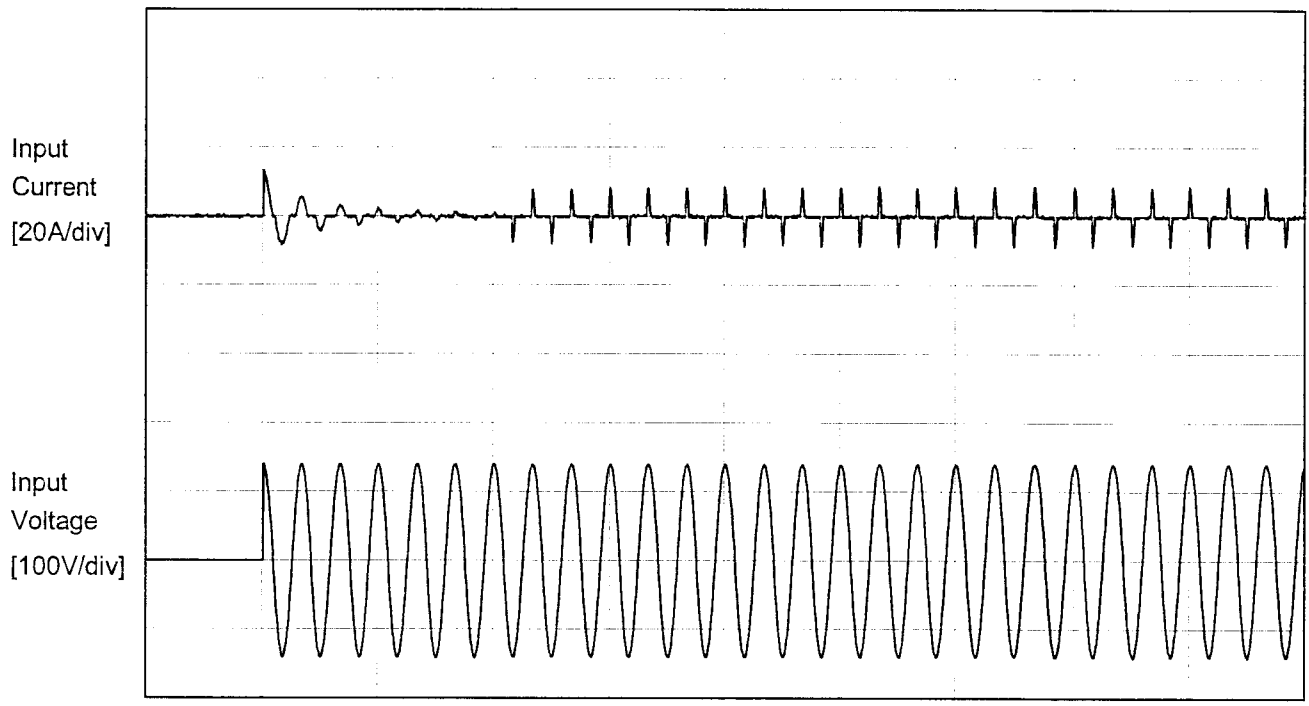
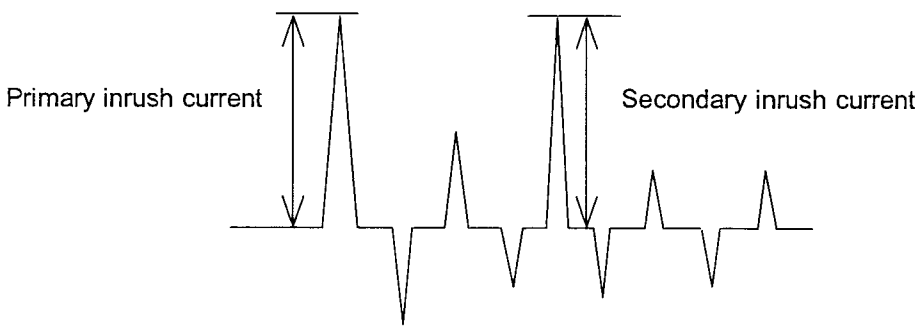
| | |
|---|---|
| Model | LCA150S-3 |
| Item | Inrush Current |
| Object | ——————— |

Temperature 25°C
Testing Circuitry Figure A




| | |
|---|---|
| Input Voltage | 100 V |
| Frequency | 60 Hz |
| Load | 100 % |
| Primary inrush current | 13.2 A |
| Secondary inrush current | 8.8 A |



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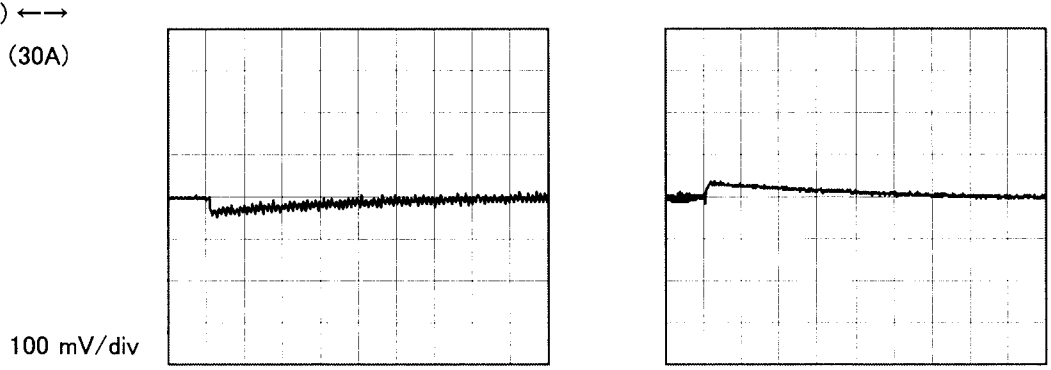
| | | | |
|---|---|---|---|
| Model | LCA150S-3 | | |
| Item | Dynamic Load Response<br>動的負荷変動 | Temperature<br>Testing Circuitry | 25℃<br>Figure A |
| Object | +3V30A | | |

Input Volt. 100 V

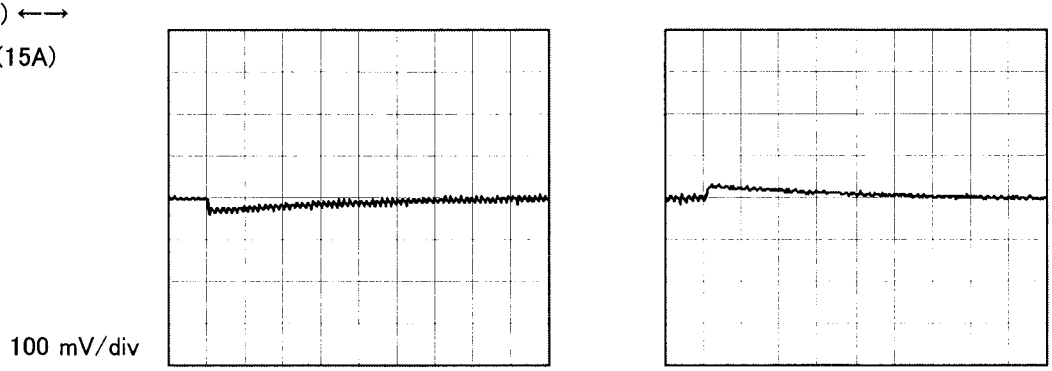
Cycle 1000 ms

Load Current

Min. Load (0A) ←→
Load 100% (30A)




Min. Load (0A) ←→
Load 50% (15A)

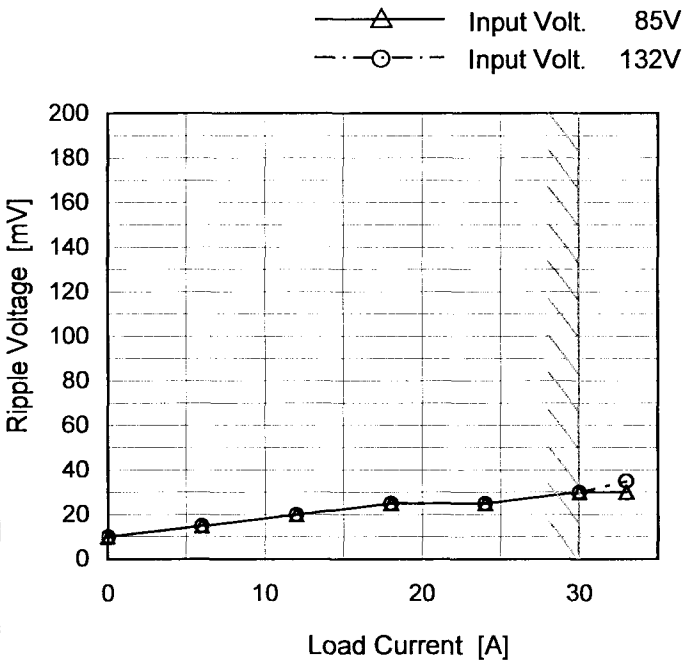


COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| Item | Ripple Voltage (by Load Current) |
| Object | +3V30A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Measured by 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 | 10 | 10 |
| 6 | 15 | 15 |
| 12 | 20 | 20 |
| 18 | 25 | 25 |
| 24 | 25 | 25 |
| 30 | 30 | 30 |
| 33 | 30 | 35 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

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

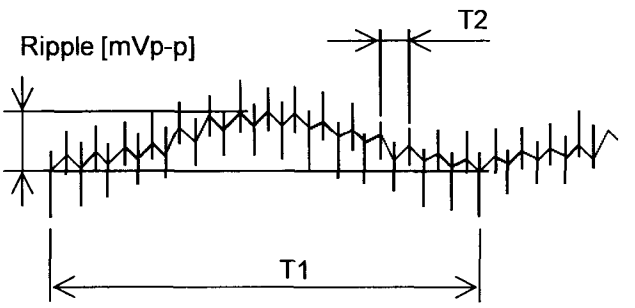


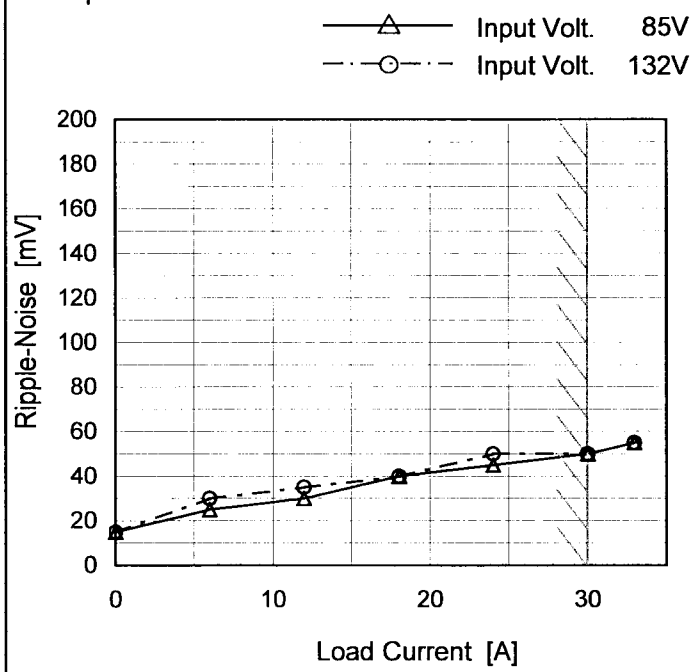

Fig. Complex Ripple Wave Form

COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| Item | Ripple-Noise |
| Object | +3V30A |

Temperature 25°C
Testing Circuitry Figure A

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

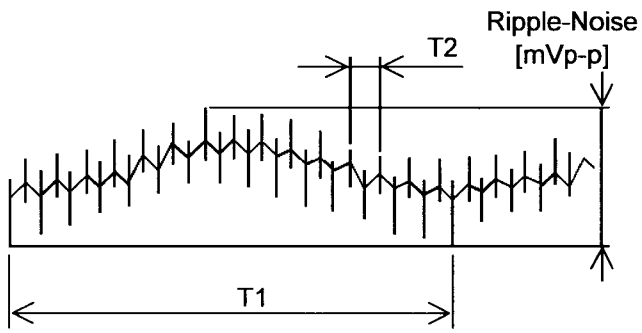



Fig. Complex Ripple Wave Form

2.Values

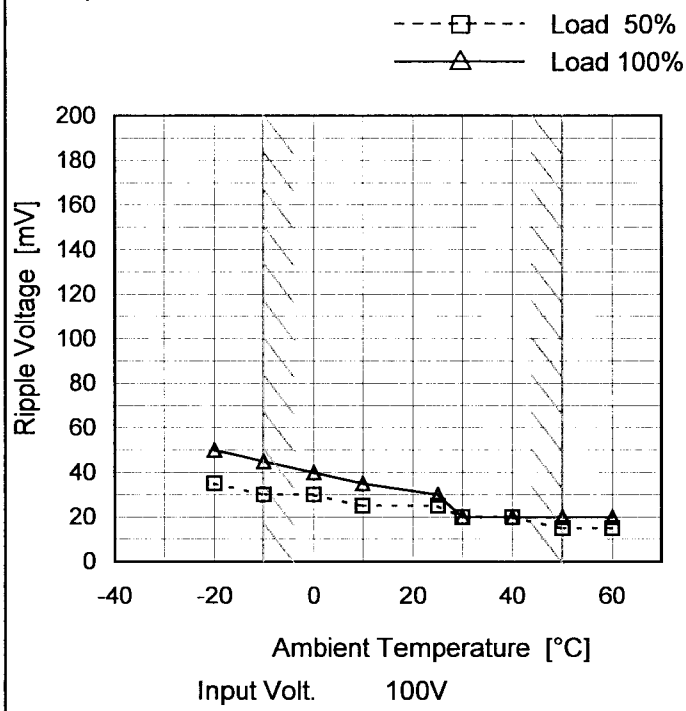
| Load Current [A] | Ripple-Noise [mV] Input Volt. 85 [V] | Ripple-Noise [mV] Input Volt. 132 [V] |
|---|---|---|
| 0 | 15 | 15 |
| 6 | 25 | 30 |
| 12 | 30 | 35 |
| 18 | 40 | 40 |
| 24 | 45 | 50 |
| 30 | 50 | 50 |
| 33 | 55 | 55 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| Item | Ripple Voltage (by Ambient Temp.) |
| Object | +3V30A |

Testing Circuitry Figure A

1.Graph




Input Volt. 100V

Measured by 20 MHz Oscilloscope.

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

2.Values

| Ambient Temperature [°C] | Ripple Voltage [mV] | |
|---|---|---|
| | Load 50% | Load 100% |
| -20 | 35 | 50 |
| -10 | 30 | 45 |
| 0 | 30 | 40 |
| 10 | 25 | 35 |
| 25 | 25 | 30 |
| 30 | 20 | 20 |
| 40 | 20 | 20 |
| 50 | 15 | 20 |
| 60 | 15 | 20 |
| -- | - | - |
| -- | - | - |

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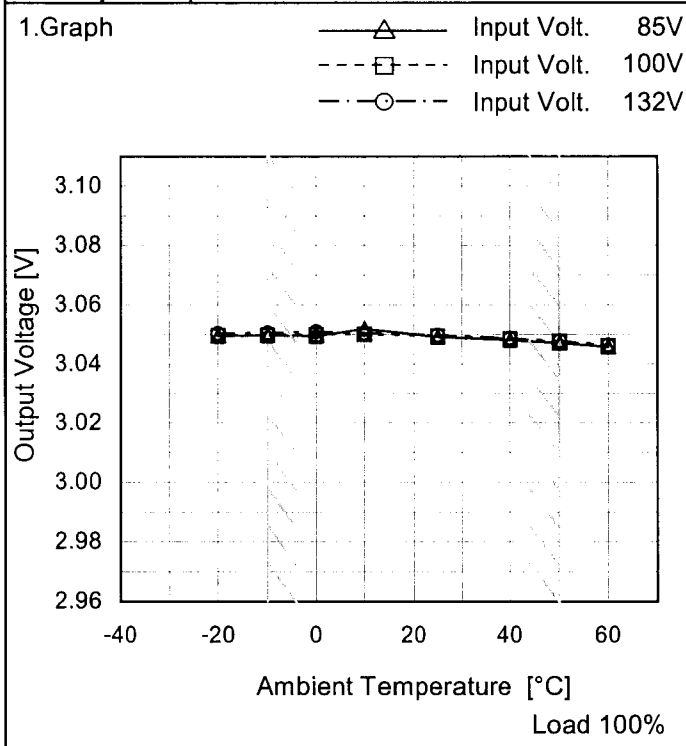
| Model | LCA150S-3 |
|---|---|
| Item | Ambient Temperature Drift |
| Object | +3V30A |

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 | 3.050 | 3.050 | 3.050 |
| -10 | 3.050 | 3.050 | 3.051 |
| 0 | 3.050 | 3.050 | 3.051 |
| 10 | 3.052 | 3.050 | 3.050 |
| 25 | 3.049 | 3.049 | 3.050 |
| 40 | 3.048 | 3.049 | 3.049 |
| 50 | 3.047 | 3.048 | 3.048 |
| 60 | 3.046 | 3.046 | 3.046 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | | |
|---|---|---|
| Model | LCA150S-3 | |
| Item | Output Voltage Accuracy | Testing Circuitry Figure A |
| Object | +3V30A | |

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 - 30A

* 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

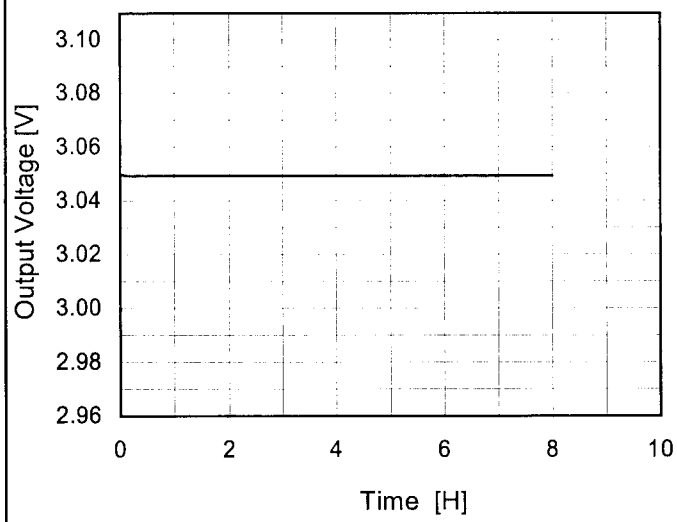
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
|---|---|---|---|---|---|---|
| | | | Current[A] | Voltage[V] | Value [mV] | Ration [%] |
| Maximum Voltage | -10 | 132 | 0 | 3.050 | ±2 | ±0.1 |
| Minimum Voltage | 50 | 85 | 30 | 3.047 | | |

COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| Item | Time Lapse Drift |
| Object | +3V30A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Input Volt. 100V
Load 100%

2.Values

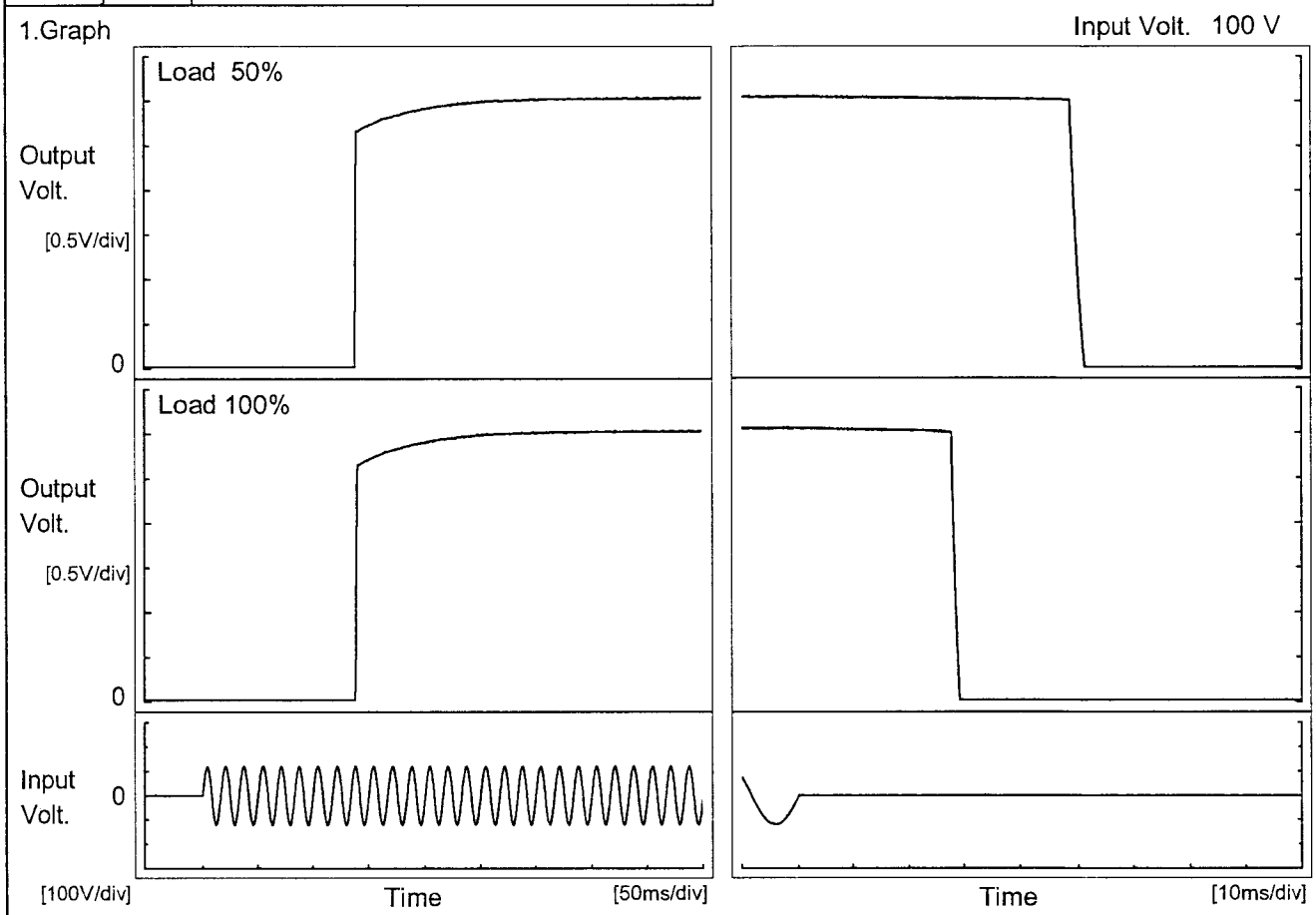
| Time since start [H] | Output Voltage [V] |
|---|---|
| 0.0 | 3.050 |
| 0.5 | 3.049 |
| 1.0 | 3.049 |
| 2.0 | 3.049 |
| 3.0 | 3.049 |
| 4.0 | 3.049 |
| 5.0 | 3.049 |
| 6.0 | 3.049 |
| 7.0 | 3.049 |
| 8.0 | 3.049 |

COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| Item | Rise and Fall Time |
| Object | +3V30A |

Temperature 25°C
Testing Circuitry Figure A

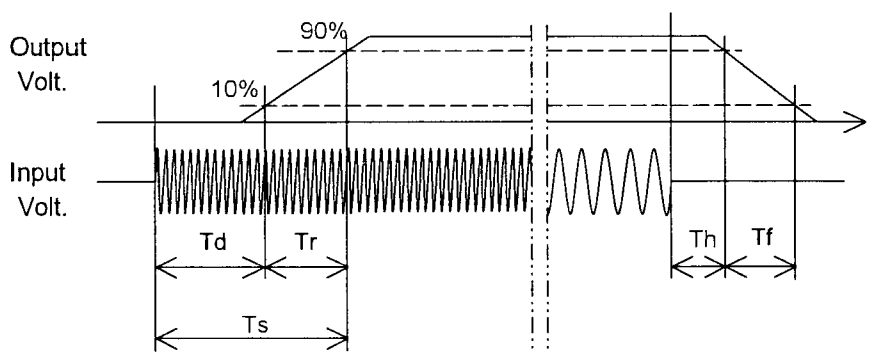
1.Graph




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 138.0 | 10.5 | 148.5 | 48.7 | 2.0 |
| 100 % | 138.3 | 13.0 | 151.3 | 27.8 | 1.3 |



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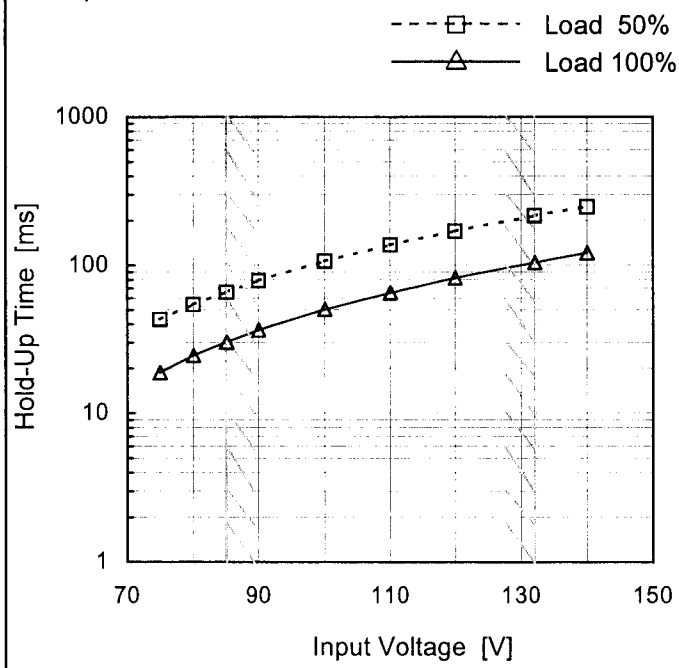
| | |
|---|---|
| Model | LCA150S-3 |
| Item | Hold-Up Time |
| Object | +3V30A |

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

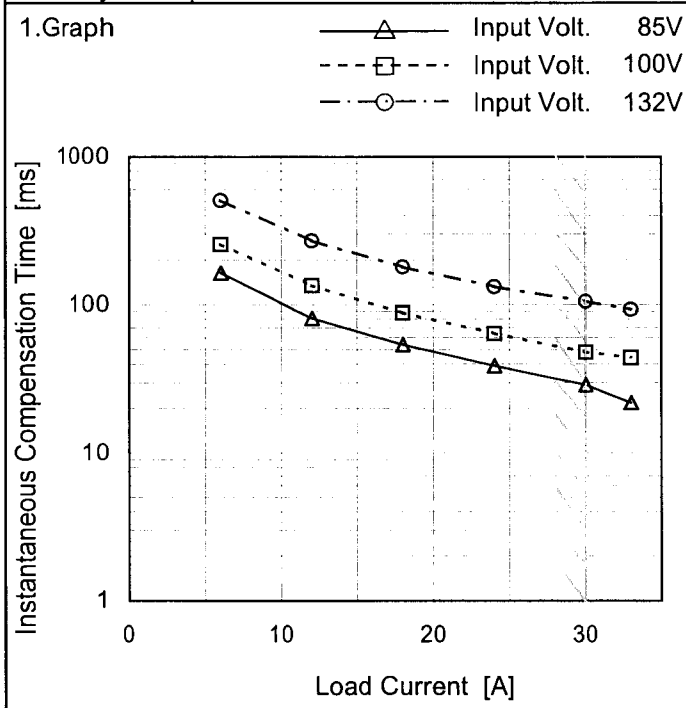
| Input Voltage [V] | Hold-Up Time [ms] | |
|---|---|---|
| | Load 50% | Load 100% |
| 75 | 43 | 19 |
| 80 | 54 | 25 |
| 85 | 66 | 30 |
| 90 | 79 | 37 |
| 100 | 107 | 50 |
| 110 | 137 | 65 |
| 120 | 170 | 82 |
| 132 | 216 | 105 |
| 140 | 248 | 121 |

COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| Item | Instantaneous Interruption Compensation |
| Object | +3V30A |

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 | - | - | - |
| 6 | 164 | 256 | 507 |
| 12 | 81 | 135 | 270 |
| 18 | 54 | 88 | 180 |
| 24 | 39 | 64 | 132 |
| 30 | 29 | 48 | 105 |
| 33 | 22 | 44 | 93 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

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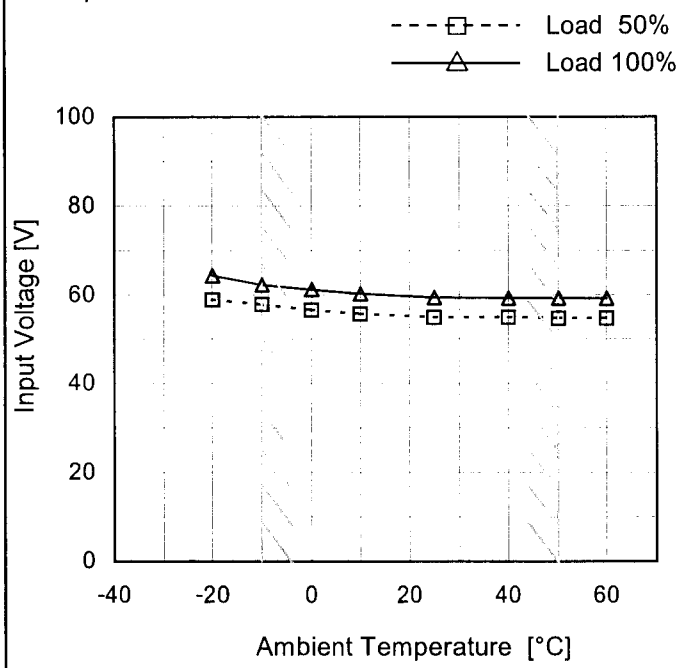
| Model | LCA150S-3 |
|---|---|
| Item | Minimum Input Voltage for Regulated Output Voltage |
| Object | +3V30A |

Testing Circuitry Figure A

1.Graph




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

2.Values

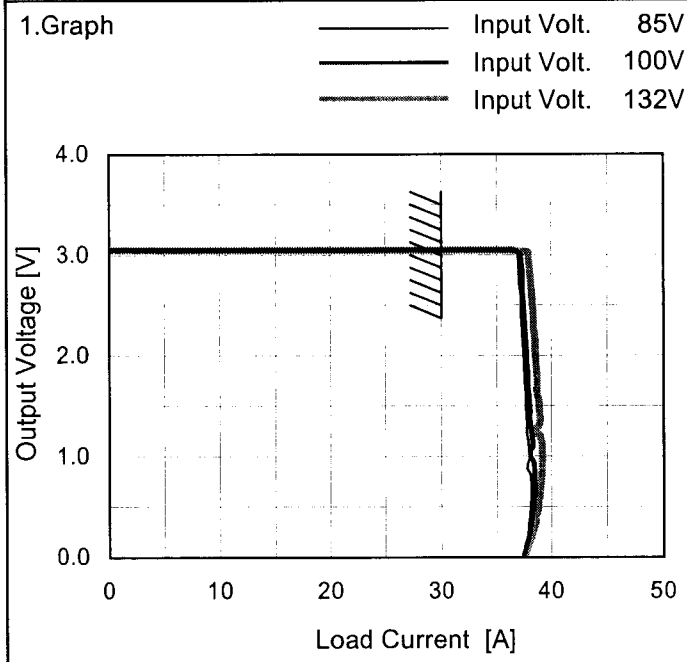
| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -20 | 59 | 65 |
| -10 | 58 | 63 |
| 0 | 57 | 62 |
| 10 | 56 | 61 |
| 25 | 55 | 60 |
| 40 | 55 | 60 |
| 50 | 55 | 60 |
| 60 | 55 | 60 |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| Item | Overcurrent Protection |
| Object | +3V30A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

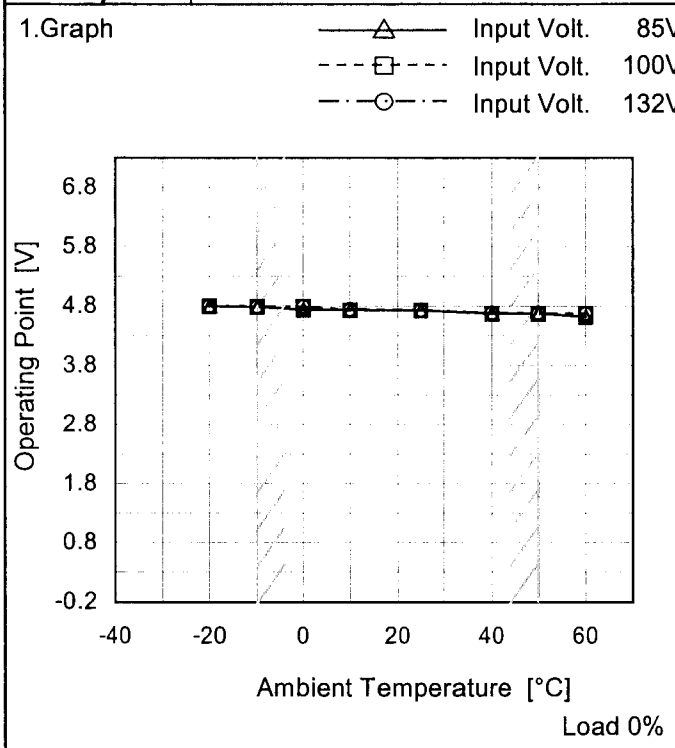
| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 3.00 | 34.17 | 33.79 | 33.63 |
| 2.85 | 36.99 | 37.31 | 38.03 |
| 2.70 | 37.07 | 37.37 | 38.14 |
| 2.40 | 37.21 | 37.49 | 38.34 |
| 2.10 | 37.38 | 37.70 | 38.50 |
| 1.80 | 37.52 | 37.86 | 38.68 |
| 1.50 | 37.63 | 38.02 | 38.86 |
| 1.20 | 37.80 | 38.21 | 38.94 |
| 0.90 | 37.75 | 38.41 | 39.14 |
| 0.60 | 38.11 | 38.36 | 38.93 |
| 0.30 | 37.90 | 38.01 | 38.43 |
| 0.00 | 37.29 | 37.30 | 37.27 |

COSEL

| | |
|---|---|
| Model | LCA150S-3 |
| Item | Overvoltage Protection |
| Object | +3V30A |

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 | 4.84 | 4.84 | 4.84 |
| -10 | 4.83 | 4.83 | 4.83 |
| 0 | 4.78 | 4.83 | 4.83 |
| 10 | 4.78 | 4.77 | 4.78 |
| 25 | 4.77 | 4.77 | 4.77 |
| 40 | 4.72 | 4.71 | 4.72 |
| 50 | 4.72 | 4.71 | 4.72 |
| 60 | 4.66 | 4.71 | 4.71 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

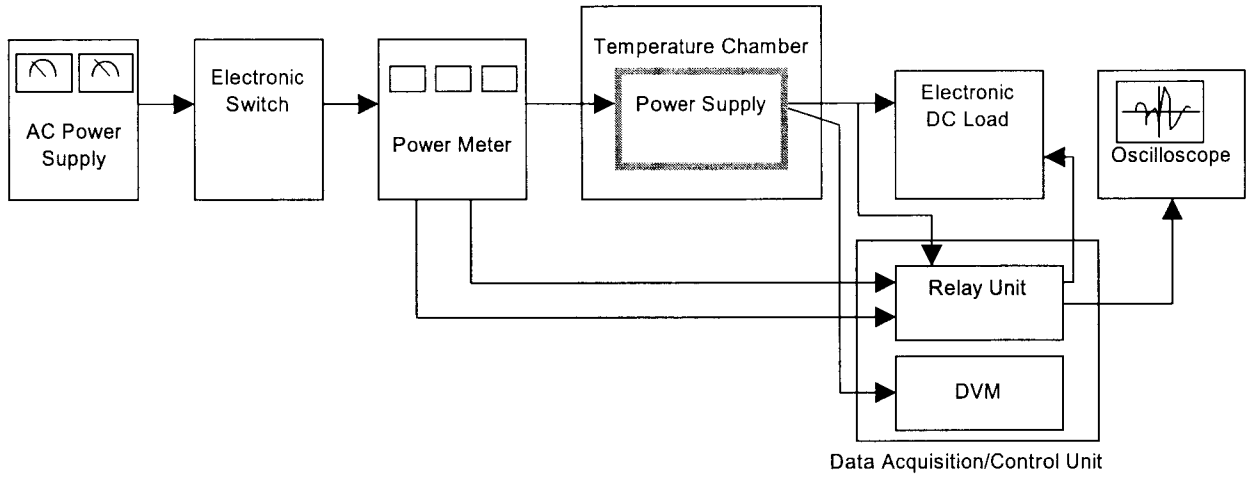



Figure A

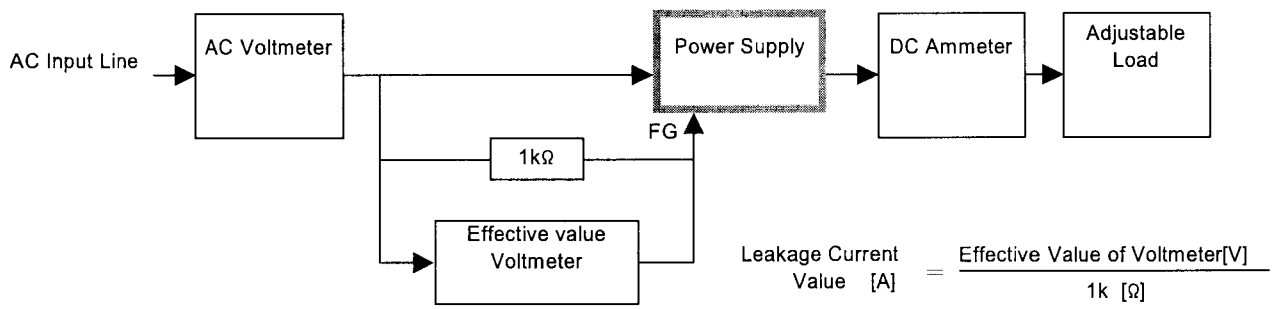



Figure B ( DEN-AN )

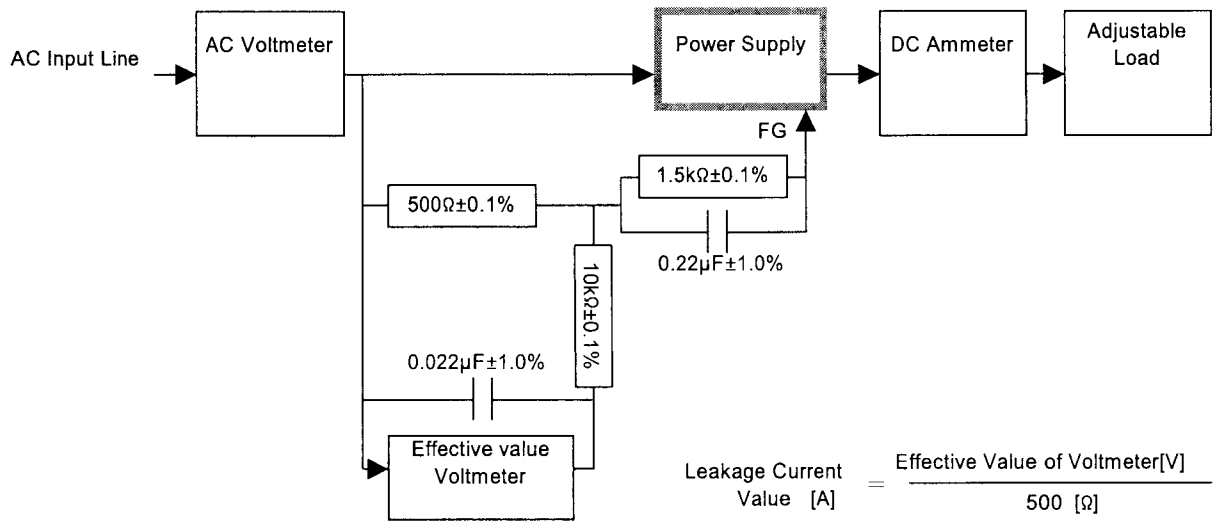



Figure B ( IEC60950 )