参考資料

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# TEST DATA OF LGA150A-3R3-Y

Regulated DC Power Supply
May 20, 2011

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Hironobu Shimizu Design Engineer

COSEL CO.,LTD.

参考資料

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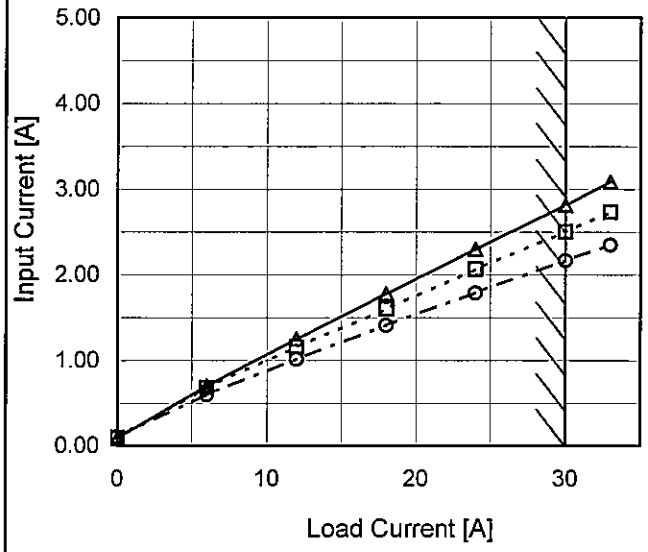
| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Input Current (by Load Current) |
| Object | ———————— |

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 | 0.091 | 0.097 | 0.106 |
| 6 | 0.703 | 0.684 | 0.601 |
| 12 | 1.255 | 1.155 | 1.016 |
| 18 | 1.781 | 1.599 | 1.412 |
| 24 | 2.304 | 2.067 | 1.793 |
| 30 | 2.817 | 2.505 | 2.169 |
| 33 | 3.088 | 2.729 | 2.352 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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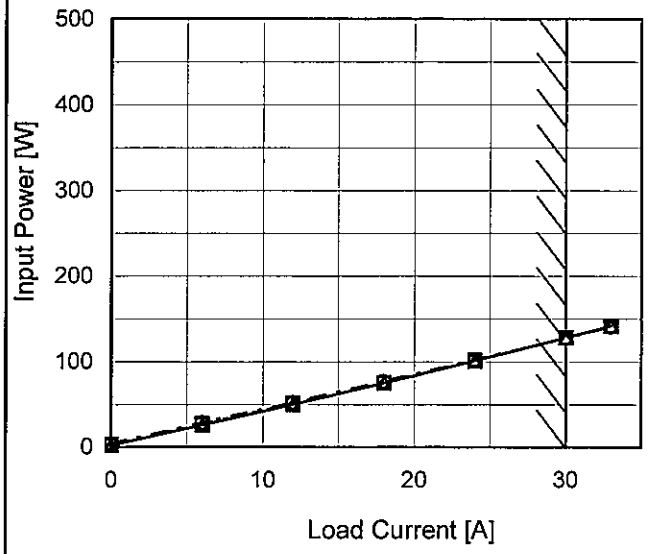
| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Input Power (by Load Current) |
| Object | ———————— |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

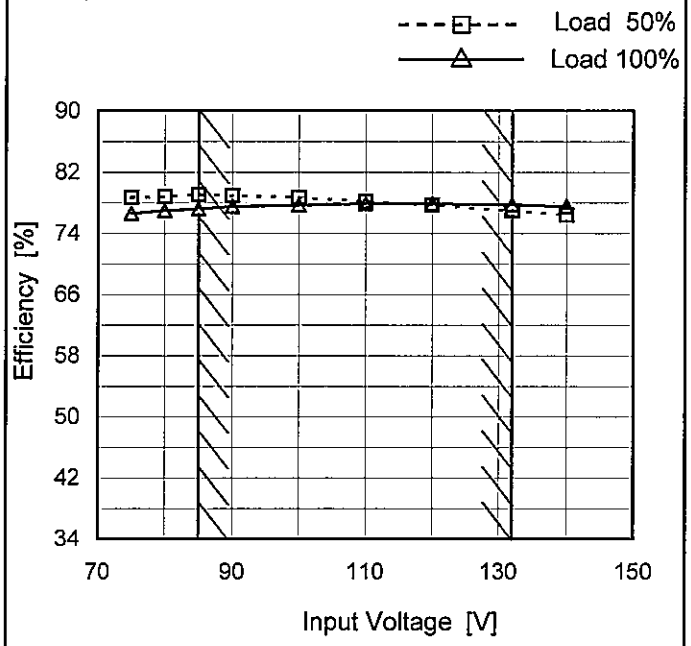
| Load Current [A] | Input Power [W] | | |
|---|---|---|---|
| | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 0 | 2.5 | 3.0 | 4.0 |
| 6 | 26.4 | 27.1 | 28.8 |
| 12 | 50.4 | 50.9 | 52.4 |
| 18 | 75.6 | 75.6 | 77.1 |
| 24 | 101.4 | 101.4 | 102.0 |
| 30 | 128.4 | 127.5 | 127.8 |
| 33 | 142.2 | 141.0 | 141.0 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| 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

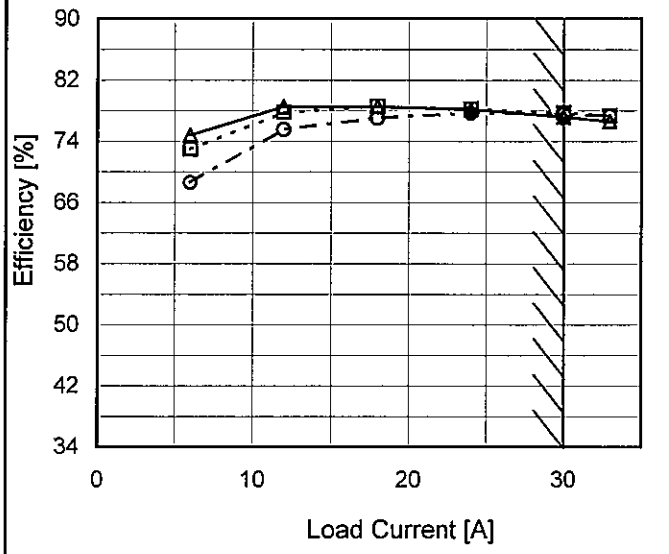
| Input Voltage [V] | Efficiency [%] | |
|---|---|---|
| | Load 50% | Load 100% |
| 75 | 78.7 | 76.7 |
| 80 | 78.8 | 77.0 |
| 85 | 79.1 | 77.2 |
| 90 | 78.9 | 77.6 |
| 100 | 78.7 | 77.7 |
| 110 | 78.2 | 77.9 |
| 120 | 77.7 | 77.9 |
| 132 | 77.0 | 77.8 |
| 140 | 76.4 | 77.6 |

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| 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 | 74.9 | 72.9 | 68.6 |
| 12 | 78.5 | 77.8 | 75.6 |
| 18 | 78.6 | 78.6 | 77.1 |
| 24 | 78.2 | 78.2 | 77.7 |
| 30 | 77.2 | 77.7 | 77.6 |
| 33 | 76.7 | 77.3 | 77.3 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



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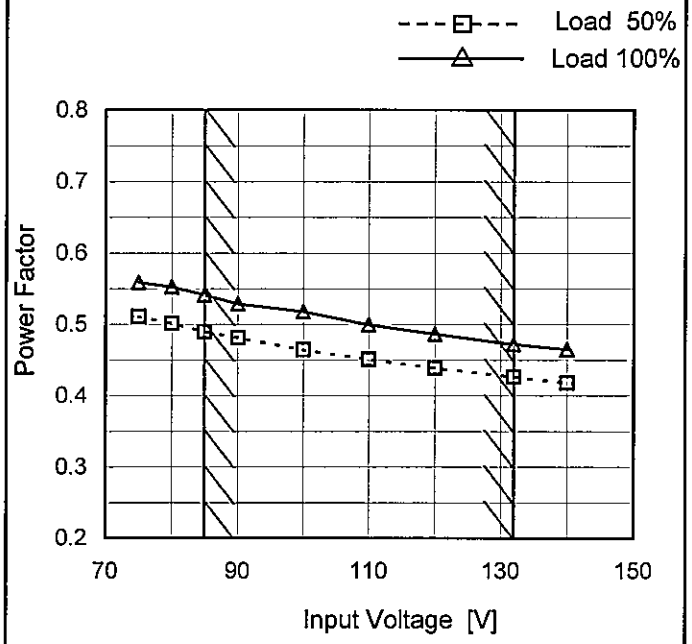
| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Power Factor (by Input Voltage) |
| Object | ―――――――― |

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 | 0.511 | 0.559 |
| 80 | 0.501 | 0.553 |
| 85 | 0.490 | 0.541 |
| 90 | 0.481 | 0.529 |
| 100 | 0.464 | 0.518 |
| 110 | 0.451 | 0.500 |
| 120 | 0.439 | 0.486 |
| 132 | 0.426 | 0.473 |
| 140 | 0.418 | 0.465 |

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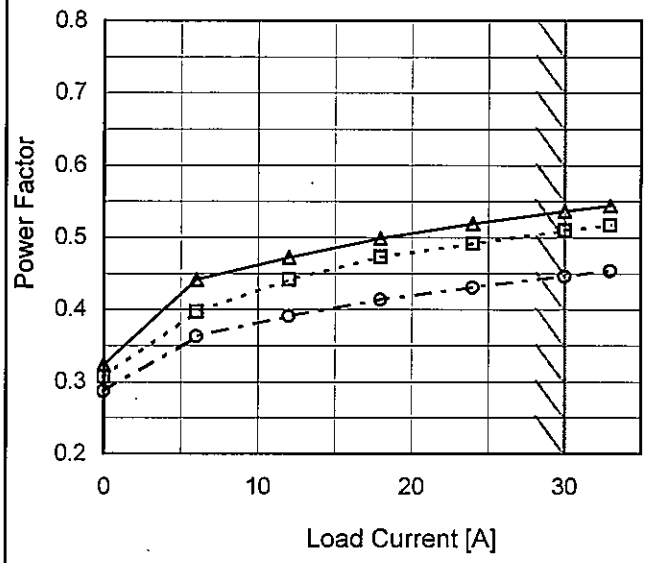
| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Power Factor (by Load Current) |
| Object | ―――――― |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

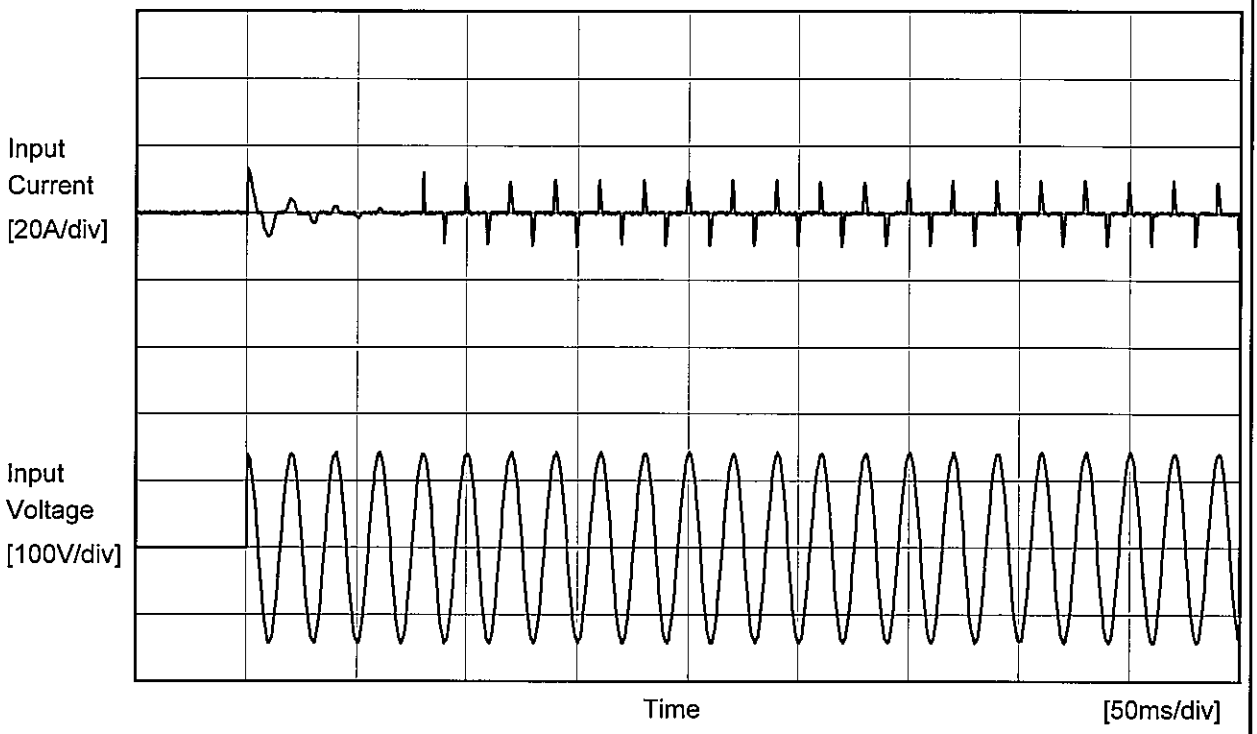
2.Values

| Load Current [A] | Power Factor | | |
|---|---|---|---|
| | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 0 | 0.323 | 0.307 | 0.287 |
| 6 | 0.442 | 0.397 | 0.363 |
| 12 | 0.473 | 0.441 | 0.391 |
| 18 | 0.499 | 0.473 | 0.414 |
| 24 | 0.519 | 0.492 | 0.431 |
| 30 | 0.537 | 0.509 | 0.447 |
| 33 | 0.544 | 0.517 | 0.454 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

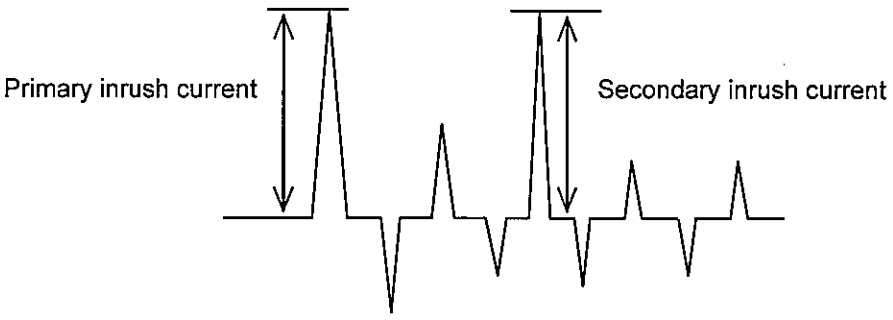
COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| 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 | 12.0 A |



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| | | | |
|---|---|---|---|
| Model | LGA150A-3R3-Y | 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 | 0.30 | 0.39 | 0.43 |
| (B)IEC60950-1 | 0.30 | 0.37 | 0.42 |

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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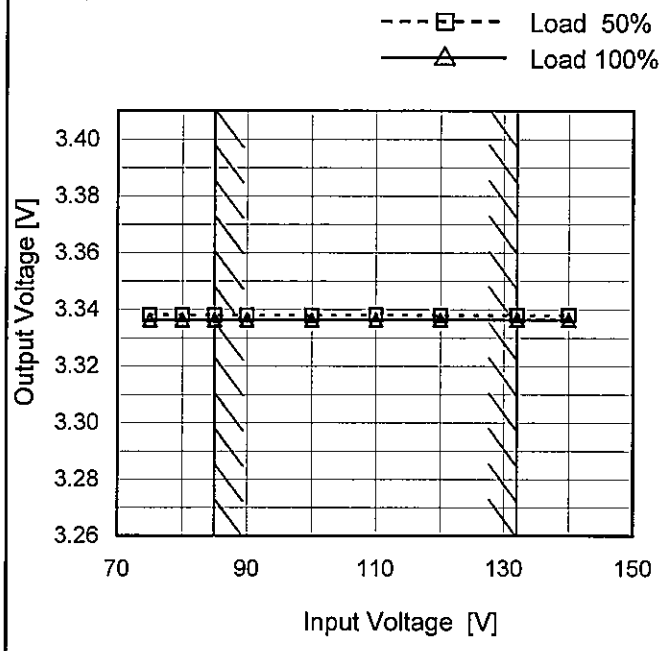
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Line Regulation |
| Object | +3.3V30A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

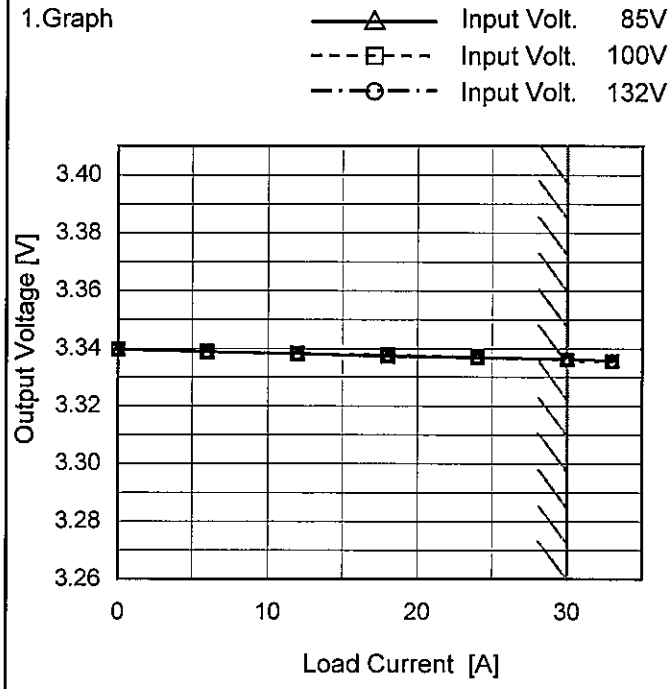
| Input Voltage [V] | Output Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| 75 | 3.338 | 3.336 |
| 80 | 3.338 | 3.336 |
| 85 | 3.338 | 3.336 |
| 90 | 3.338 | 3.336 |
| 100 | 3.338 | 3.336 |
| 110 | 3.338 | 3.336 |
| 120 | 3.338 | 3.336 |
| 132 | 3.338 | 3.336 |
| 140 | 3.338 | 3.336 |

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Load Regulation |
| Object | +3.3V30A |

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] | Output Voltage [V] | | |
|---|---|---|---|
| | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 0 | 3.340 | 3.340 | 3.340 |
| 6 | 3.339 | 3.339 | 3.339 |
| 12 | 3.338 | 3.338 | 3.338 |
| 18 | 3.337 | 3.338 | 3.338 |
| 24 | 3.337 | 3.337 | 3.337 |
| 30 | 3.336 | 3.336 | 3.336 |
| 33 | 3.336 | 3.335 | 3.336 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

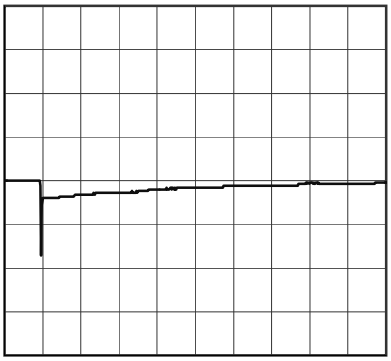
| | | | |
|---|---|---|---|
| Model | LGA150A-3R3-Y | | |
| Item | Dynamic Load Response | Temperature<br>Testing Circuitry | 25°C<br>Figure C |
| Object | +3.3V30A | | |

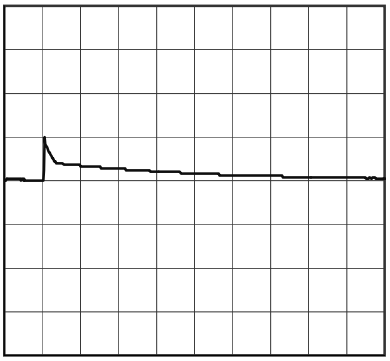
Input Volt. 100 V

Cycle 1000 ms

Response. t1=t2=50 μ s. Typ

Min. Load (0A) ←→
Load 100% (30A)



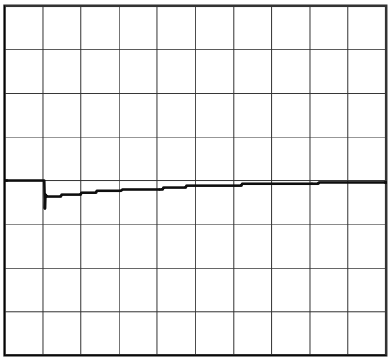


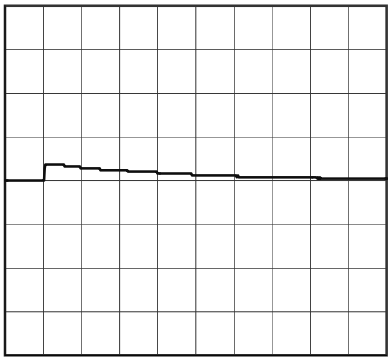
100 mV/div

5 ms/div

5 ms/div

Min. Load (0A) ←→
Load 50% (15A)





100 mV/div

5 ms/div

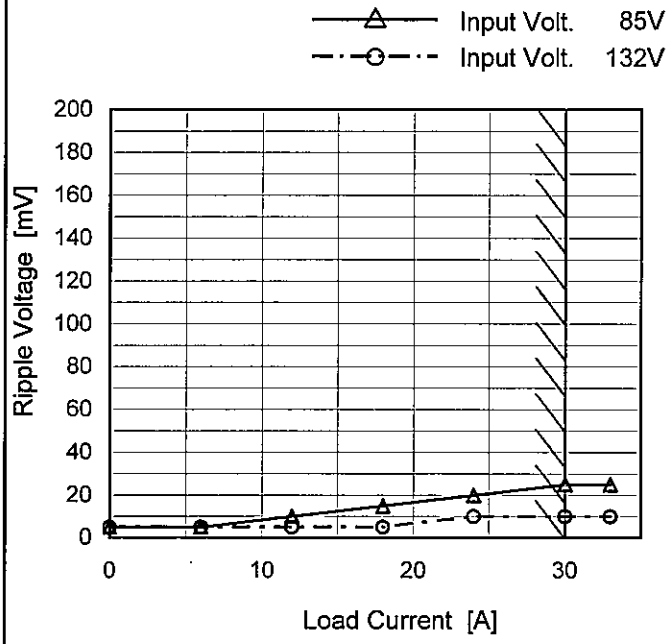
5 ms/div

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Ripple Voltage (by Load Current) |
| Object | +3.3V30A |

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

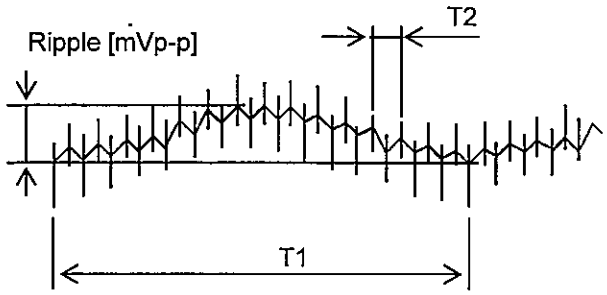



Fig. Complex Ripple Wave Form

2.Values

| Load Current [A] | Ripple Voltage [mV] Input Volt. 85 [V] | Ripple Voltage [mV] Input Volt. 132 [V] |
|---|---|---|
| 0 | 5 | 5 |
| 6 | 5 | 5 |
| 12 | 10 | 5 |
| 18 | 15 | 5 |
| 24 | 20 | 10 |
| 30 | 25 | 10 |
| 33 | 25 | 10 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |



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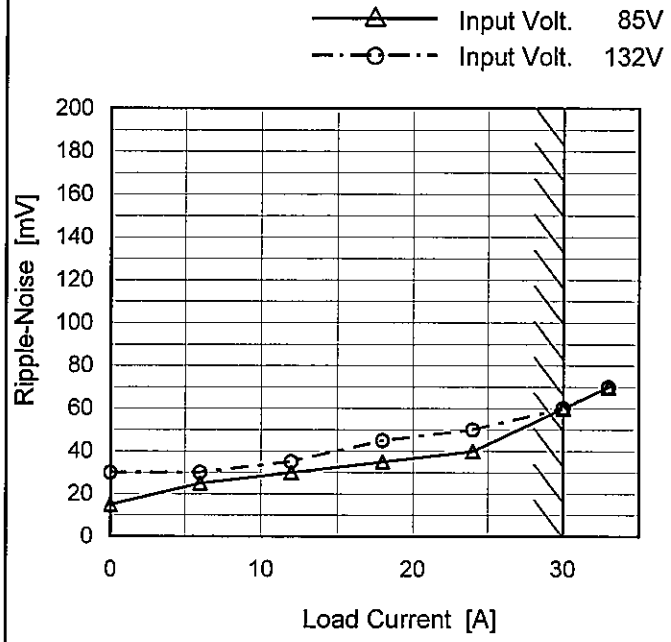
| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Ripple-Noise |
| Object | +3.3V30A |

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.

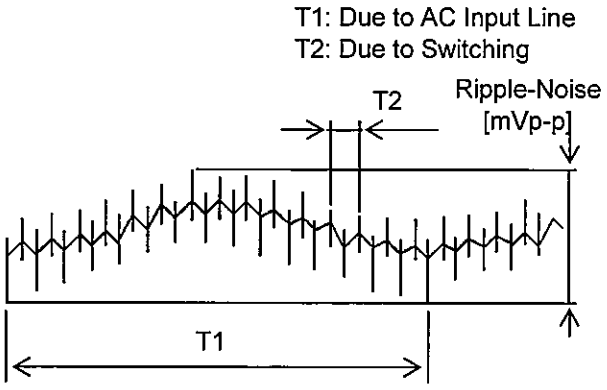



Fig. Complex Ripple Wave Form

2.Values

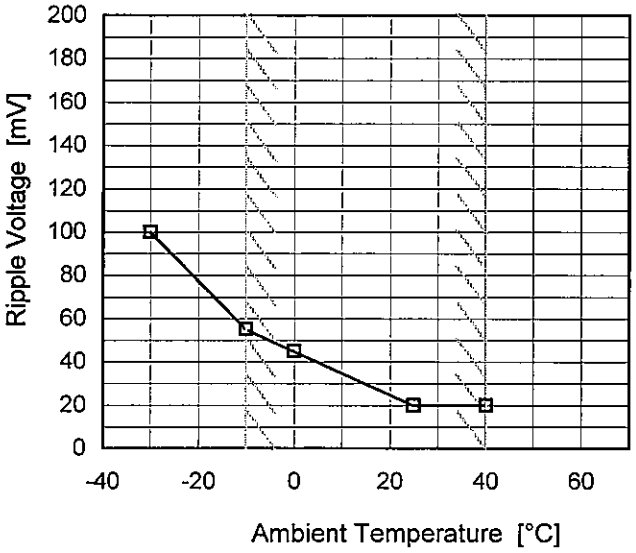
| Load Current [A] | Ripple-Noise [mV] | |
|---|---|---|
| | Input Volt. 85 [V] | Input Volt. 132 [V] |
| 0 | 15 | 30 |
| 6 | 25 | 30 |
| 12 | 30 | 35 |
| 18 | 35 | 45 |
| 24 | 40 | 50 |
| 30 | 60 | 60 |
| 33 | 70 | 70 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Ripple Voltage (by Ambient Temp.) |
| Object | +3.3V30A |

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.

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

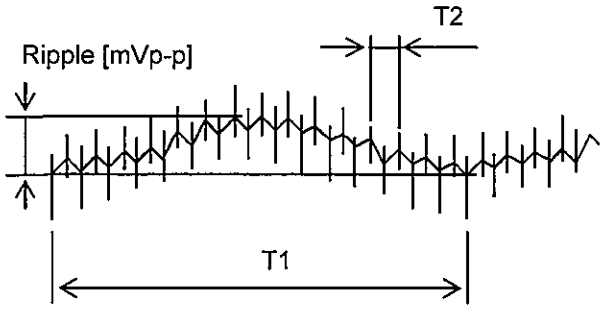



Fig. Complex Ripple Wave Form

2.Values

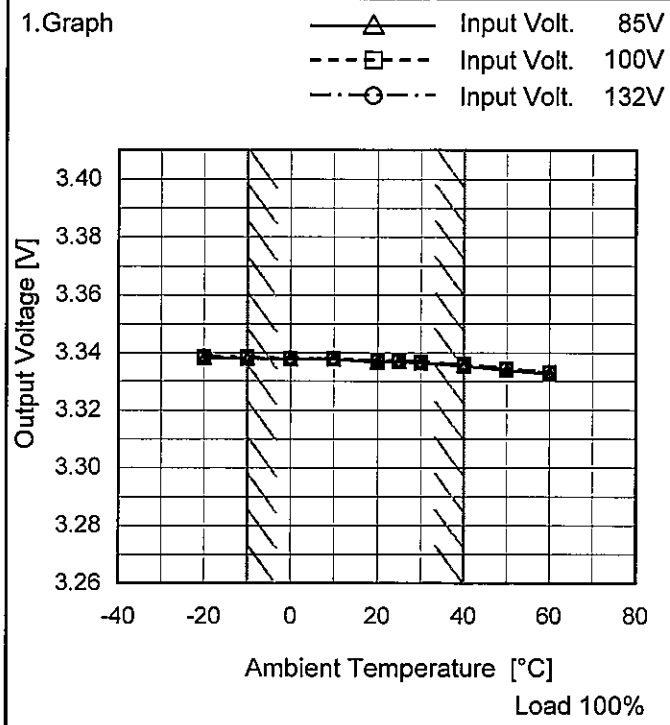
| Ambient Temperature [°C] | Ripple Voltage [mV] |
|---|---|
| -30 | 100 |
| -10 | 55 |
| 0 | 45 |
| 25 | 20 |
| 40 | 20 |
| -- | - |
| -- | - |
| -- | - |
| -- | - |
| -- | - |
| -- | - |

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Ambient Temperature Drift |
| Object | +3.3V30A |

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 | 3.338 | 3.338 | 3.339 |
| -10 | 3.338 | 3.339 | 3.339 |
| 0 | 3.338 | 3.338 | 3.338 |
| 10 | 3.338 | 3.338 | 3.338 |
| 20 | 3.337 | 3.337 | 3.337 |
| 25 | 3.337 | 3.337 | 3.337 |
| 30 | 3.337 | 3.337 | 3.337 |
| 40 | 3.336 | 3.336 | 3.336 |
| 50 | 3.334 | 3.334 | 3.335 |
| 60 | 3.333 | 3.333 | 3.333 |
| -- | - | - | - |

COSEL

| | | |
|---|---|---|
| Model | LGA150A-3R3-Y | |
| Item | Output Voltage Accuracy | Testing Circuitry Figure A |
| Object | +3.3V30A | |

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 - 40°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

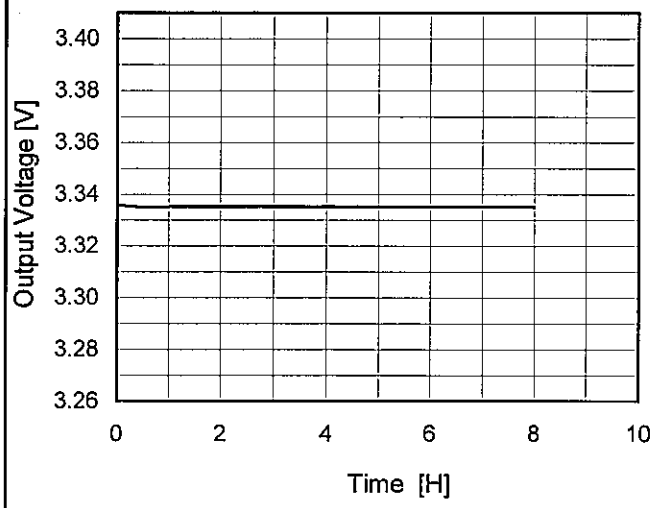
| Item | Temperature [°C] | Input Voltage[V] | Output | | Output Voltage Accuracy | |
|---|---|---|---|---|---|---|
| | | | Current[A] | Voltage[V] | Value [mV] | Ration [%] |
| Maximum Voltage | -10 | 85 | 0 | 3.342 | ±3 | ±0.1 |
| Minimum Voltage | 40 | 85 | 30 | 3.336 | | |

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Time Lapse Drift |
| Object | +3.3V30A |

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 | 3.337 |
| 0.5 | 3.335 |
| 1.0 | 3.335 |
| 2.0 | 3.335 |
| 3.0 | 3.335 |
| 4.0 | 3.335 |
| 5.0 | 3.335 |
| 6.0 | 3.335 |
| 7.0 | 3.335 |
| 8.0 | 3.335 |



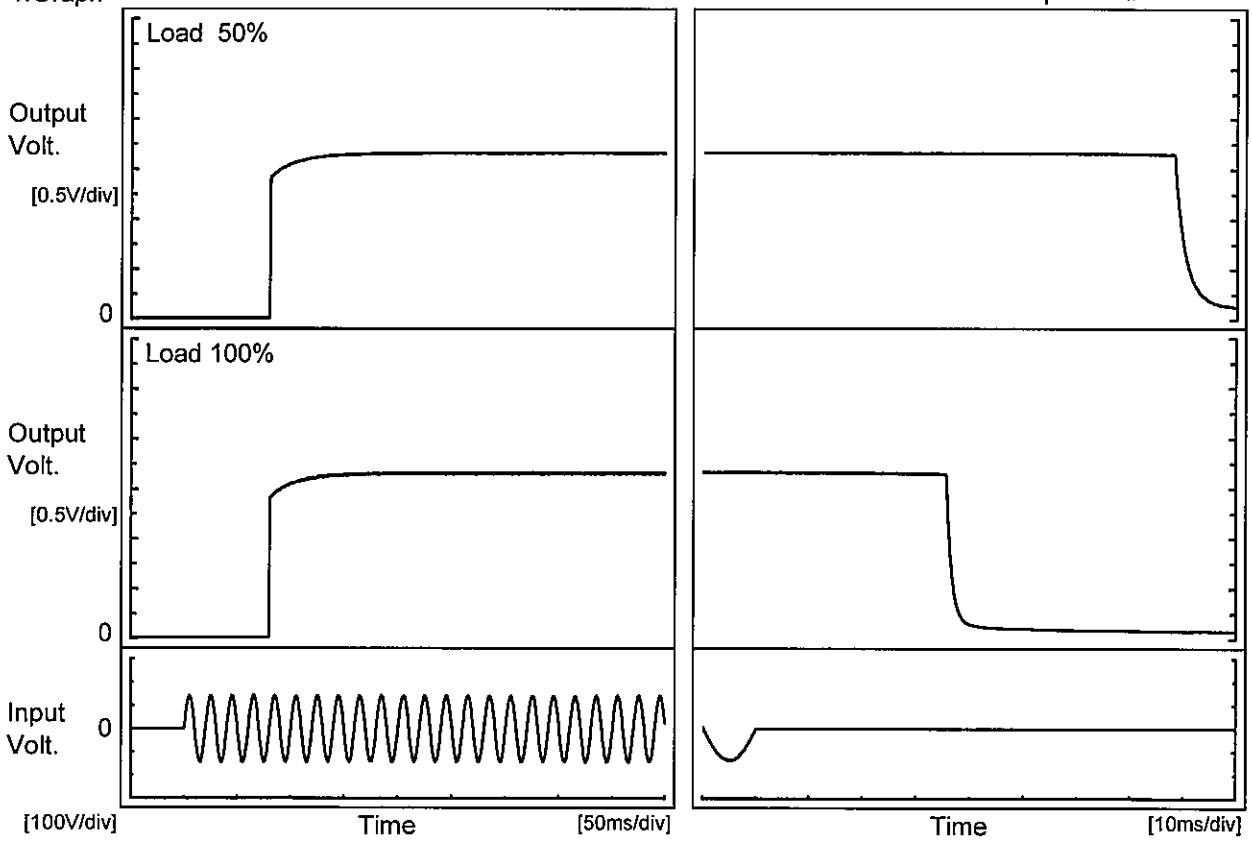
BC-10549

COSEL

| | | | |
|---|---|---|---|
| Model | LGA150A-3R3-Y | | |
| Item | Rise and Fall Time | Temperature<br>Testing Circuitry | 25°C<br>Figure A |
| Object | +3.3V30A | | |

1.Graph

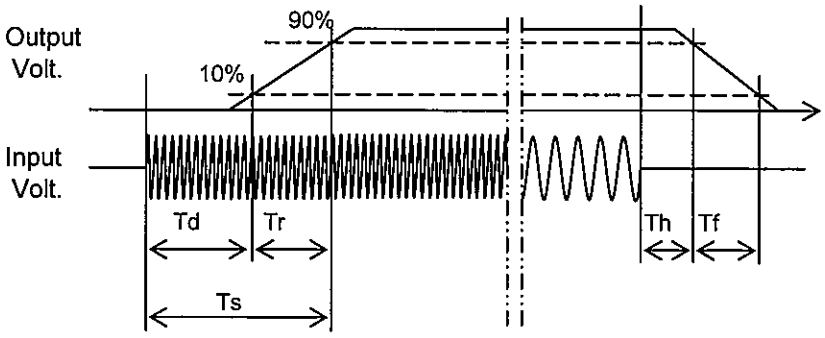
Input Volt. 100 V




2.Values

[ms]

| Load \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 50 % | 80.0 | 9.3 | 89.3 | 78.4 | 6.9 |
| 100 % | 80.0 | 9.3 | 89.3 | 35.8 | 3.3 |

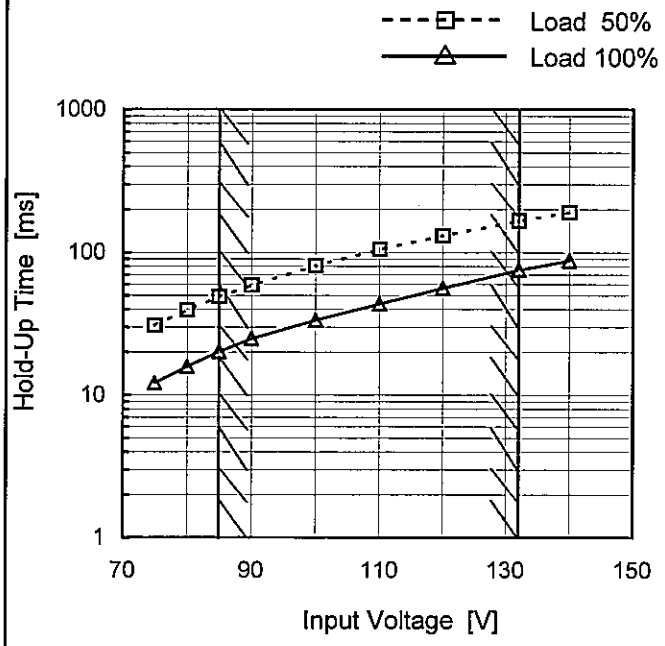


COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Hold-Up Time |
| Object | +3.3V30A |

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 | 31 | 12 |
| 80 | 39 | 16 |
| 85 | 49 | 20 |
| 90 | 59 | 25 |
| 100 | 81 | 34 |
| 110 | 104 | 44 |
| 120 | 131 | 56 |
| 132 | 166 | 76 |
| 140 | 191 | 88 |



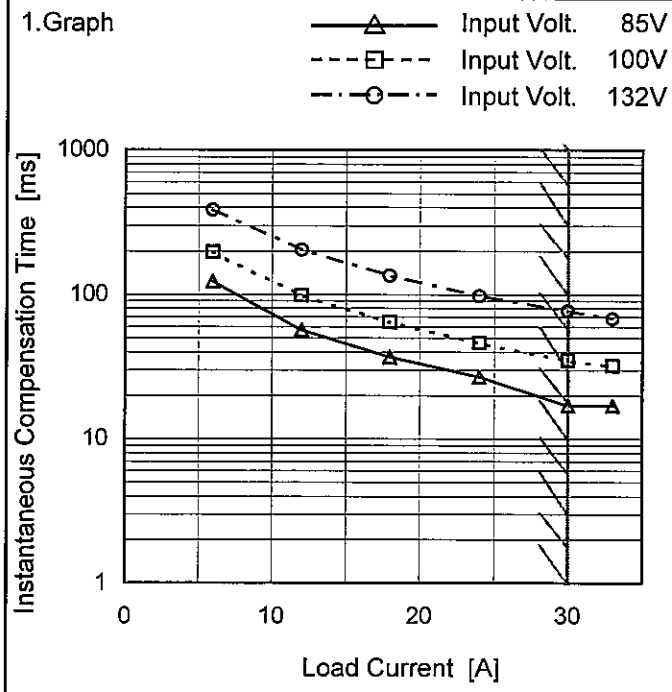
BC-10549

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Instantaneous Interruption Compensation |
| Object | +3.3V30A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

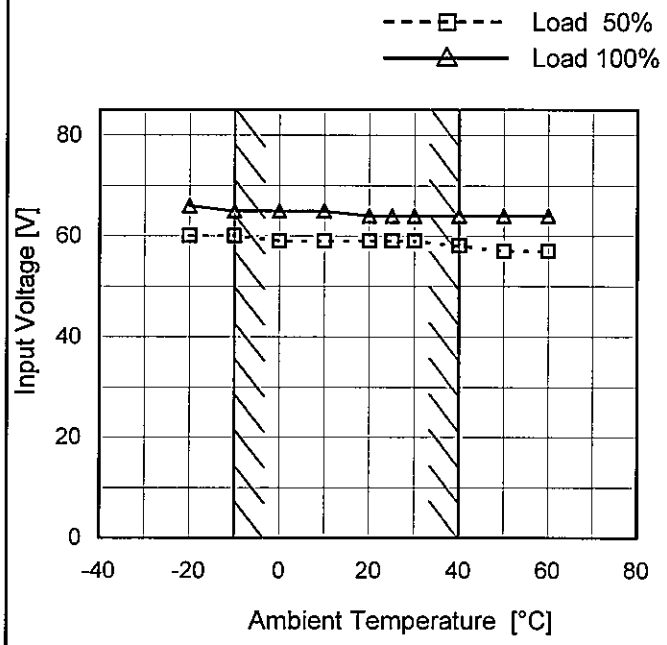
| Load Current [A] | Time [ms] | | |
|---|---|---|---|
| | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 0 | - | - | - |
| 6 | 124 | 197 | 387 |
| 12 | 57 | 98 | 204 |
| 18 | 37 | 64 | 135 |
| 24 | 27 | 46 | 98 |
| 30 | 17 | 35 | 77 |
| 33 | 17 | 32 | 68 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Minimum Input Voltage for Regulated Output Voltage |
| Object | +3.3V30A |

Testing Circuitry Figure A

1.Graph




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

2.Values

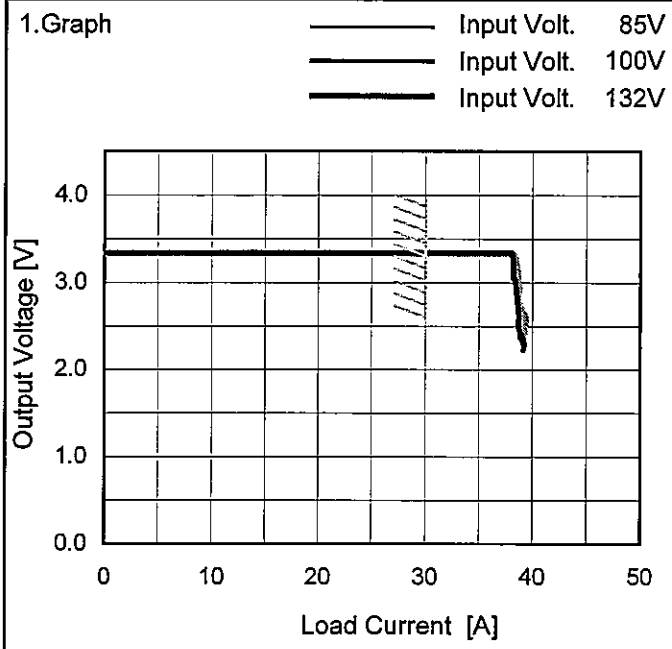
| Ambient Temperature [°C] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -20 | 60 | 66 |
| -10 | 60 | 65 |
| 0 | 59 | 65 |
| 10 | 59 | 65 |
| 20 | 59 | 64 |
| 25 | 59 | 64 |
| 30 | 59 | 64 |
| 40 | 58 | 64 |
| 50 | 57 | 64 |
| 60 | 57 | 64 |
| -- | - | - |

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Overcurrent Protection |
| Object | +3.3V30A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

Intermittent operation occurs when the output voltage is from 2.21V to 0V.

2.Values

| Output Voltage [V] | Load Current [A] | | |
|---|---|---|---|
| | Input Volt. 85[V] | Input Volt. 100[V] | Input Volt. 132[V] |
| 3.30 | 30.72 | 30.24 | 31.91 |
| 3.14 | 38.22 | 38.17 | 38.52 |
| 2.97 | 38.26 | 38.44 | 38.67 |
| 2.64 | 38.62 | 38.66 | 39.14 |
| 2.31 | 38.92 | 39.18 | 39.13 |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |
| -- | - | - | - |



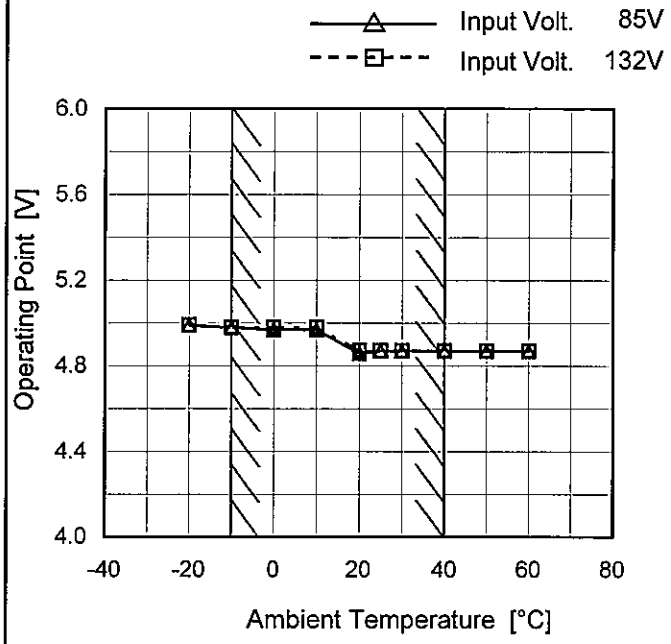
BC-10549

COSEL

| | |
|---|---|
| Model | LGA150A-3R3-Y |
| Item | Overvoltage Protection |
| Object | +3.3V30A |

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 | 4.99 | 4.99 |
| -10 | 4.98 | 4.98 |
| 0 | 4.97 | 4.98 |
| 10 | 4.97 | 4.98 |
| 20 | 4.86 | 4.87 |
| 25 | 4.87 | 4.87 |
| 30 | 4.87 | 4.87 |
| 40 | 4.87 | 4.87 |
| 50 | 4.87 | 4.87 |
| 60 | 4.87 | 4.87 |
| -- | - | - |

COSEL

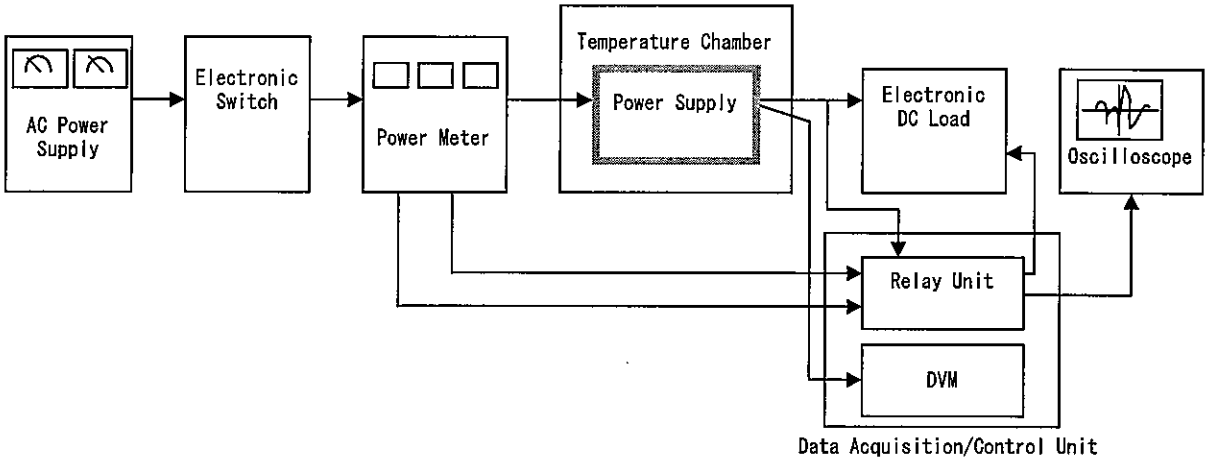



Figure A

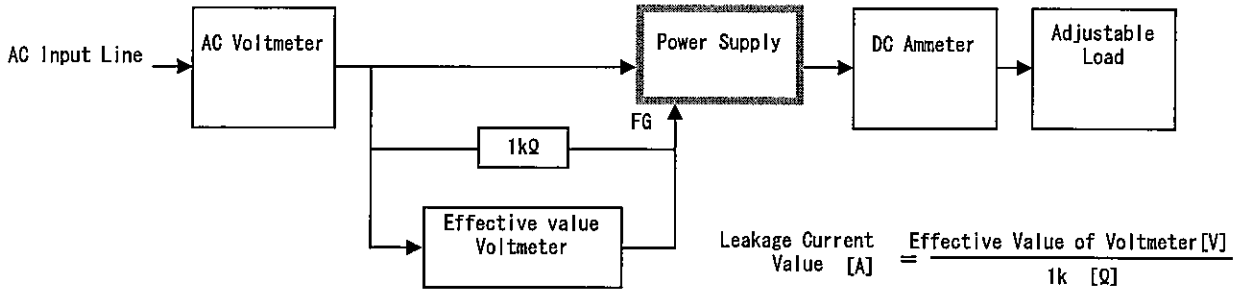



Figure B ( DEN-AN )

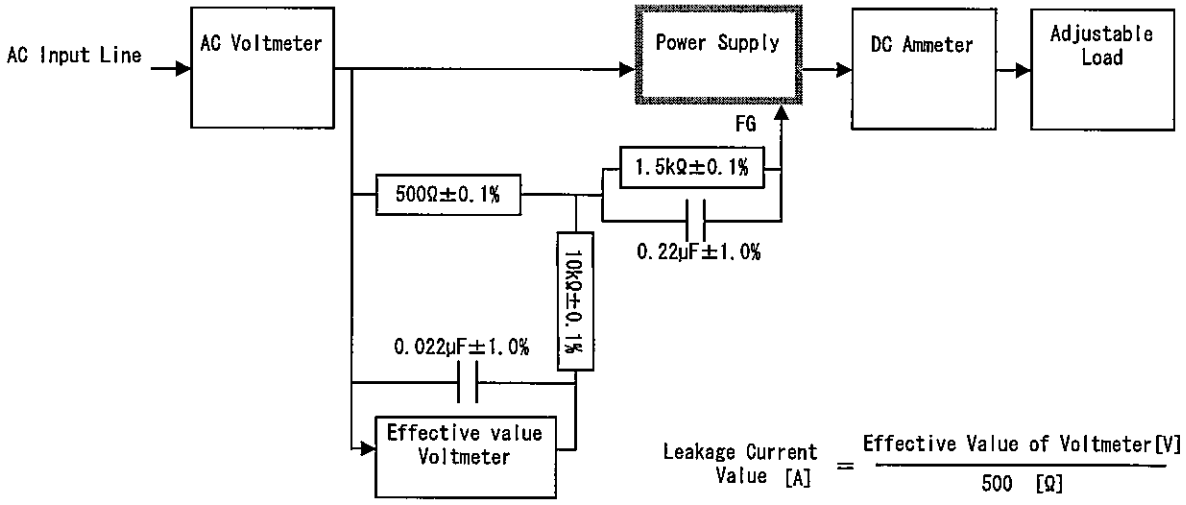



Figure B ( IEC60950-1 )

COSEL

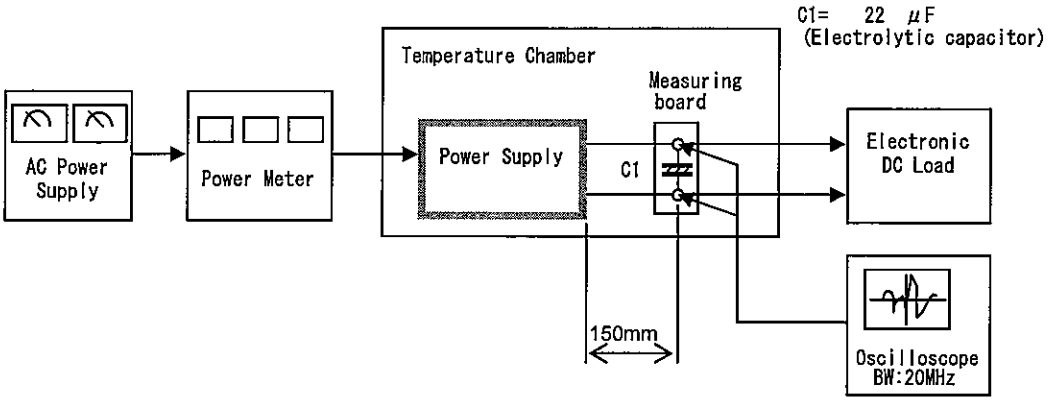



Figure C