COSEL

参考資料

TEST DATA OF DHS50A15

Regulated DC Power Supply
April 9, 2010

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COSEL CO.,LTD.

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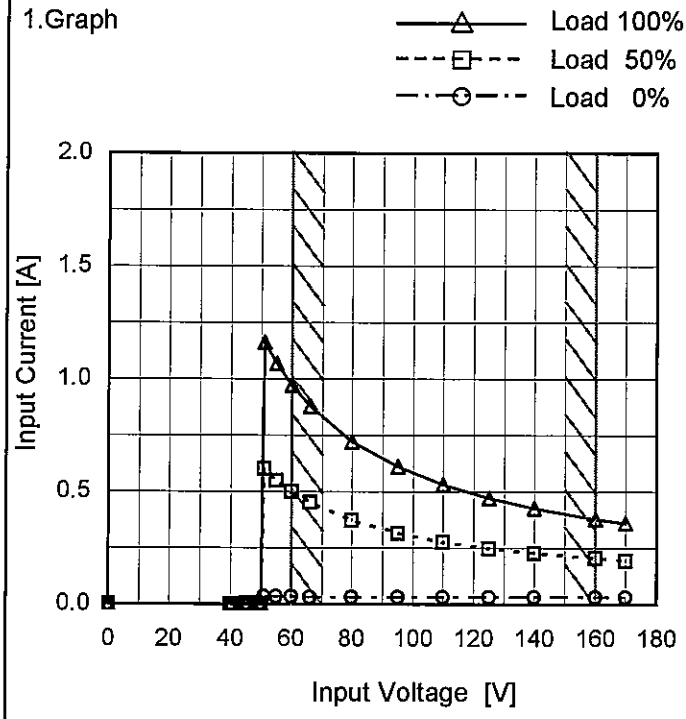
COSEL

Model	DHS50A15
Item	Input Current (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]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
40	0.001	0.001	0.001
45	0.002	0.002	0.002
50	0.003	0.003	0.003
51	0.035	0.601	1.163
55	0.034	0.549	1.068
60	0.033	0.500	0.972
66	0.032	0.452	0.879
80	0.031	0.372	0.722
95	0.031	0.316	0.610
110	0.031	0.277	0.531
125	0.030	0.248	0.471
140	0.030	0.226	0.426
160	0.030	0.203	0.379
170	0.030	0.194	0.360
--	-	-	-
--	-	-	-
--	-	-	-

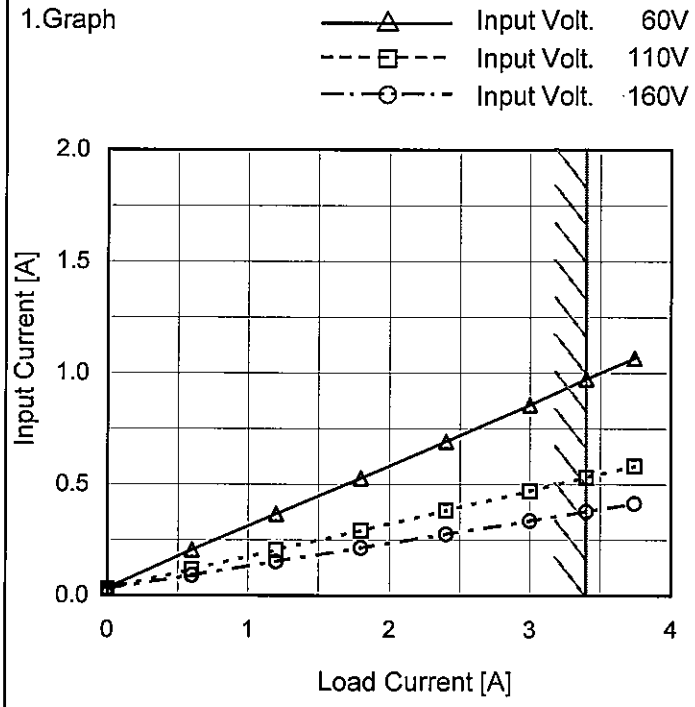
BC-10409

COSEL

Model	DHS50A15
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. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
0.00	0.033	0.030	0.030
0.60	0.206	0.116	0.091
1.20	0.366	0.204	0.153
1.80	0.528	0.292	0.214
2.40	0.692	0.382	0.276
3.00	0.856	0.469	0.337
3.40	0.972	0.531	0.379
3.74	1.067	0.582	0.414
--	-	-	-
--	-	-	-
--	-	-	-

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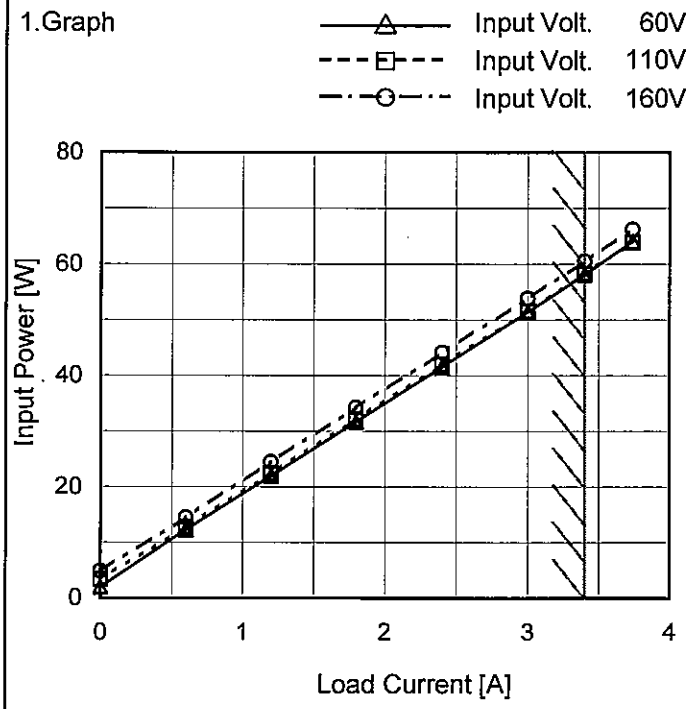
Model	DHS50A15
Item	Input Power (by Load Current)
Object	————————

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. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
0.00	1.96	3.33	4.82
0.60	12.32	12.77	14.50
1.20	21.95	22.41	24.47
1.80	31.66	32.11	34.25
2.40	41.53	41.93	44.11
3.00	51.35	51.57	53.86
3.40	58.13	58.25	60.51
3.74	64.01	63.90	66.23
--	-	-	-
--	-	-	-
--	-	-	-

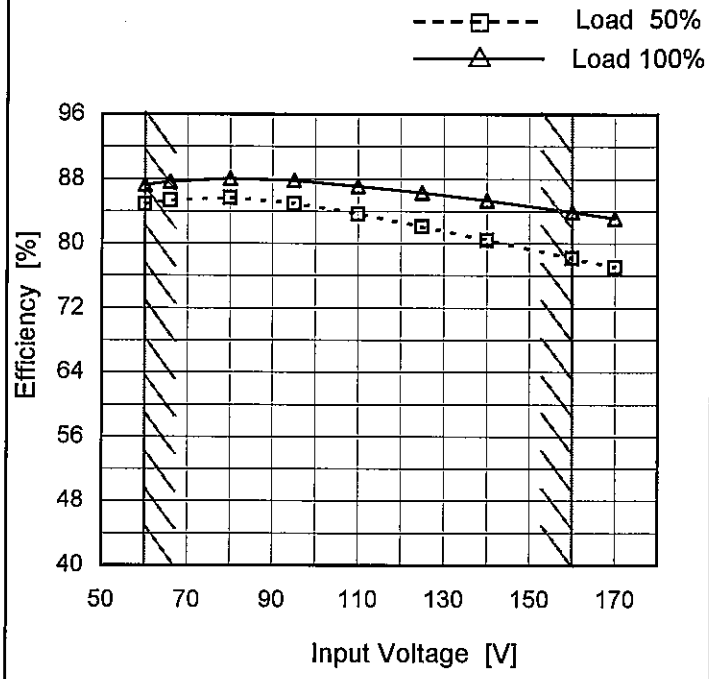
BC-10409

COSEL

Model	DHS50A15
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

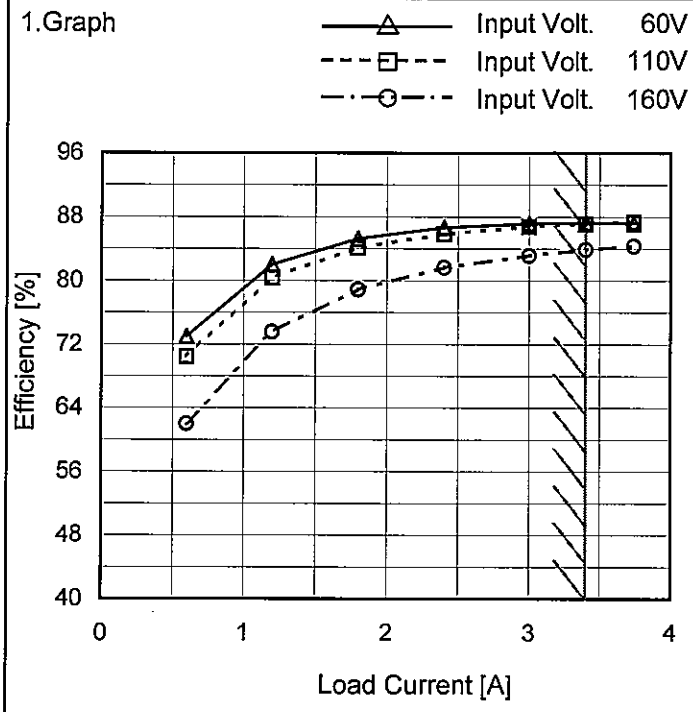
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
60	84.9	87.3
66	85.3	87.6
80	85.6	88.1
95	85.0	87.8
110	83.6	87.1
125	82.1	86.3
140	80.4	85.3
160	78.2	83.9
170	77.0	83.2

COSEL

Model	DHS50A15
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

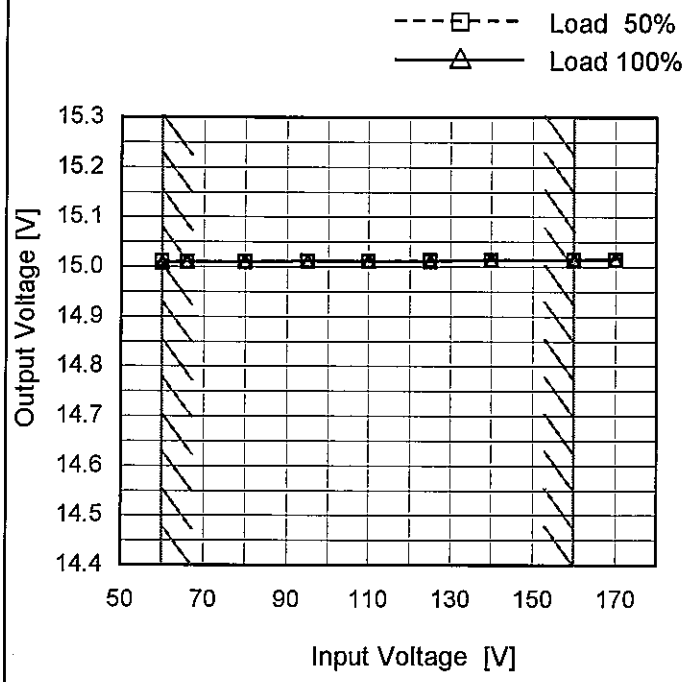
Load Current [A]	Efficiency [%]		
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
0.00	-	-	-
0.60	73.0	70.5	62.0
1.20	82.0	80.3	73.6
1.80	85.3	84.1	78.9
2.40	86.7	85.9	81.6
3.00	87.2	86.8	83.1
3.40	87.3	87.1	83.9
3.74	87.2	87.4	84.3
---	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	DHS50A15
Item	Line Regulation
Object	+15V3.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

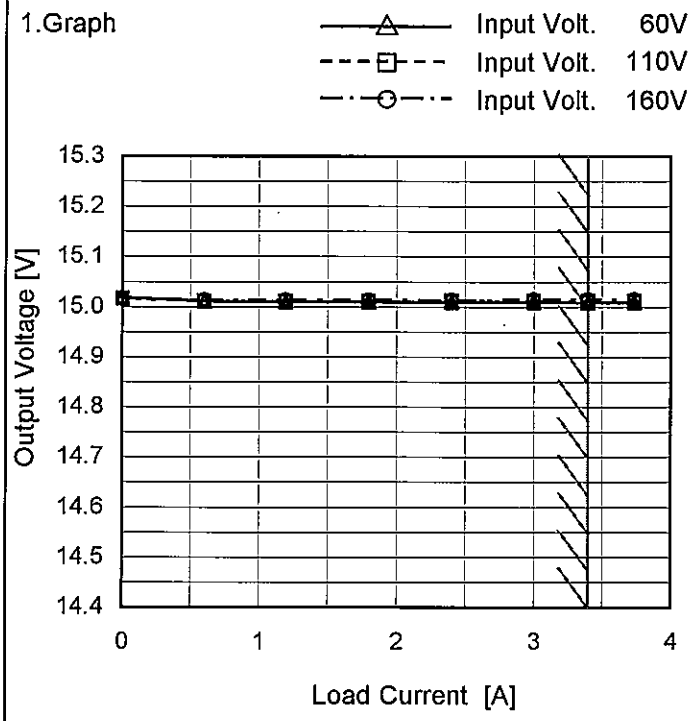
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
60	15.011	15.009
66	15.011	15.010
80	15.011	15.010
95	15.011	15.011
110	15.012	15.012
125	15.013	15.012
140	15.013	15.014
160	15.014	15.014
170	15.015	15.015

COSEL

Model	DHS50A15
Item	Load Regulation
Object	+15V3.4A

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. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
0.00	15.019	15.016	15.017
0.60	15.011	15.011	15.013
1.20	15.010	15.012	15.013
1.80	15.010	15.012	15.014
2.40	15.009	15.012	15.014
3.00	15.009	15.012	15.014
3.40	15.009	15.012	15.014
3.74	15.009	15.012	15.015
--	-	-	-
--	-	-	-
--	-	-	-

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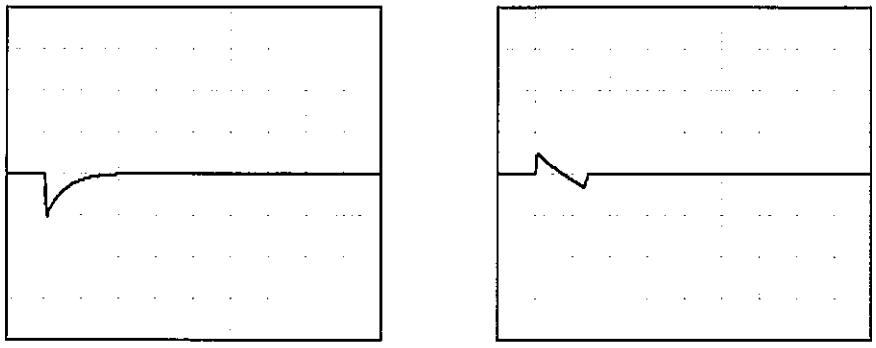
Model	DHS50A15
Item	Dynamic Load Response
Object	+15V3.4A

Temperature 25°C
Testing Circuitry Figure A

Input Volt. 110 V
Cycle 1000 ms

Load Current
3.4A / 20 μs

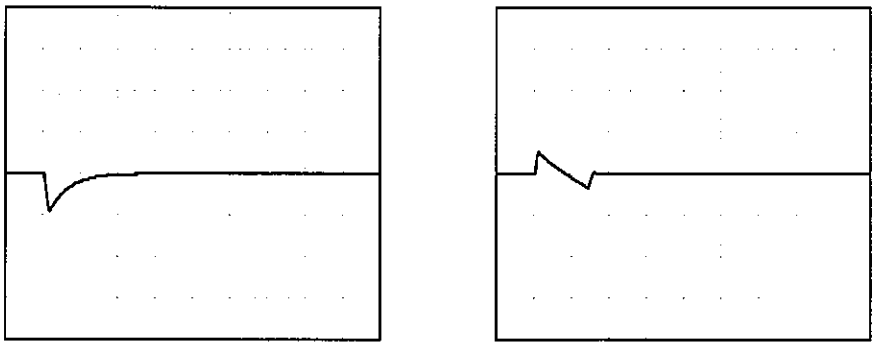
Min. Load (0A) ⟷
Load 100% (3.4A)



500mV/div

500 μs/div 10 ms/div

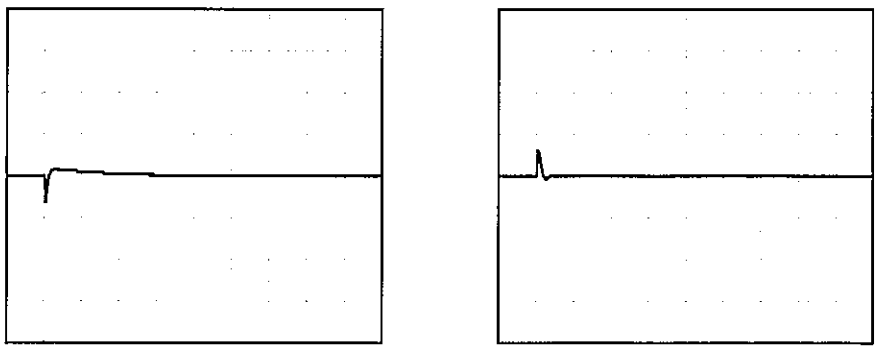
Min. Load (0A) ⟷
Load 50% (1.7A)



500mV/div

500 μs/div 10 ms/div

Load 10% (0.34A) ⟷
Load 100% (3.4A)



100mV/div

500 μs/div 10 ms/div

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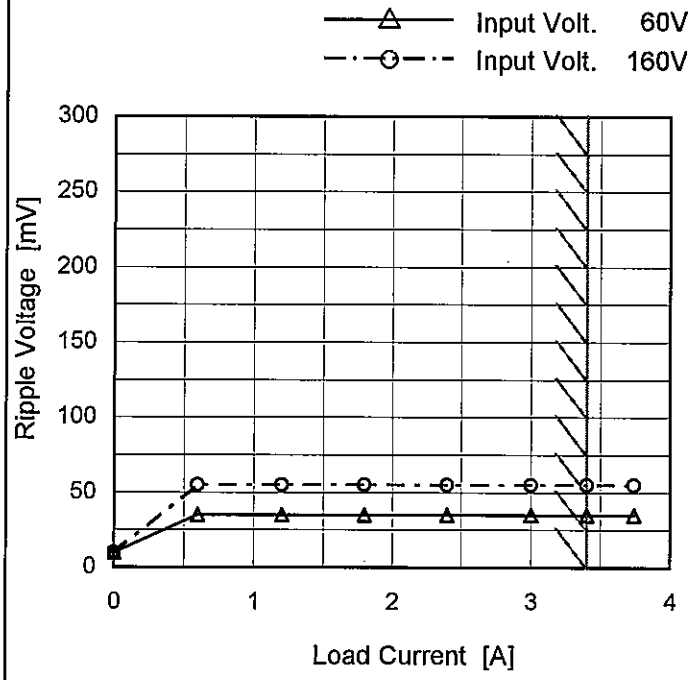
Model	DHS50A15
Item	Ripple Voltage (by Load Current)
Object	+15V3.4A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Measured by 500 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

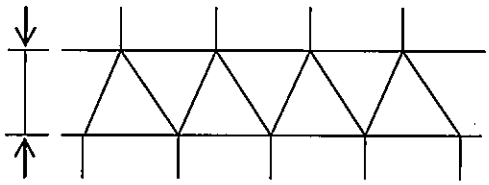


Fig.Complex Ripple Wave Form

2.Values

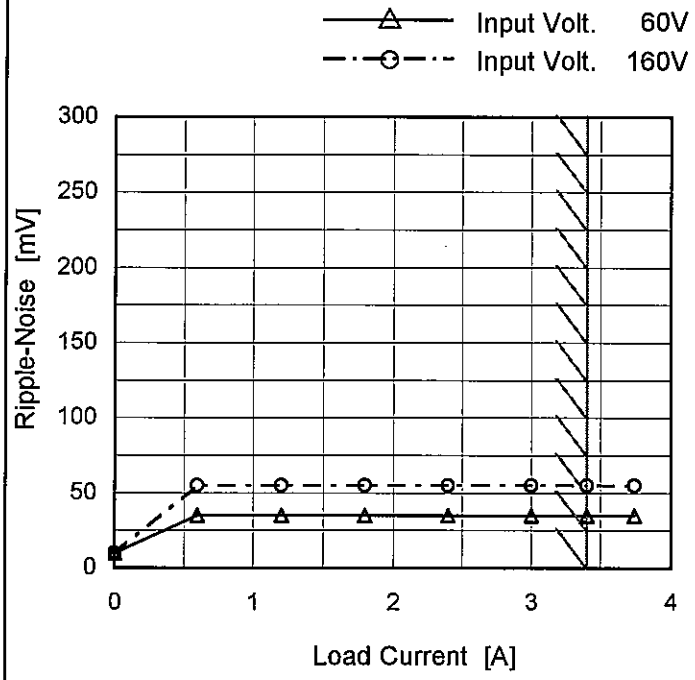
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 60 [V]	Input Volt. 160 [V]
0.00	10	10
0.60	35	55
1.20	35	55
1.80	35	55
2.40	35	55
3.00	35	55
3.40	35	55
3.74	35	55
--	-	-
--	-	-
--	-	-

COSEL

Model	DHS50A15
Item	Ripple-Noise
Object	+15V3.4A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Measured by 500 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

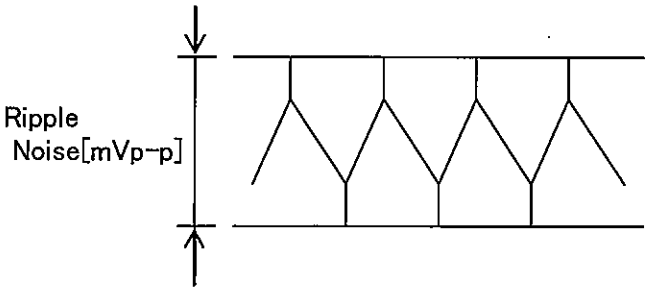


Fig.Complex Ripple Noise Wave Form

2.Values

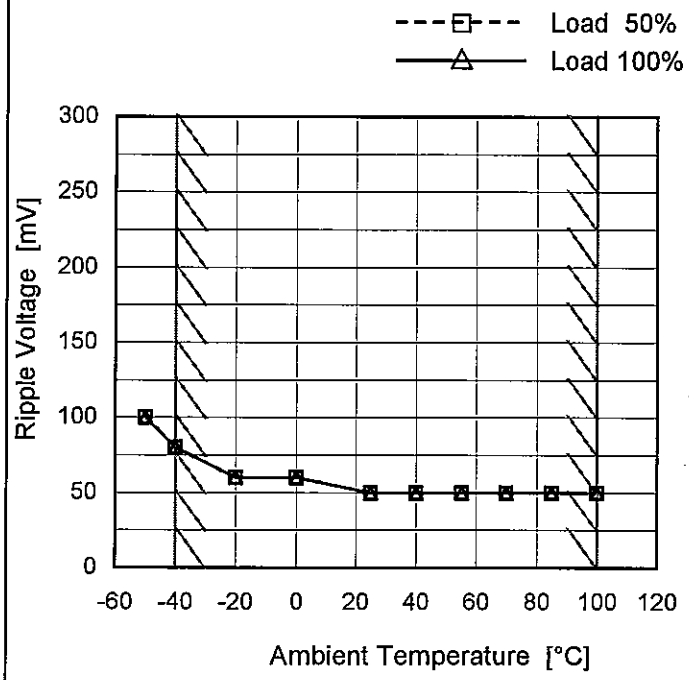
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 60 [V]	Input Volt. 160 [V]
0.00	10	10
0.60	35	55
1.20	35	55
1.80	35	55
2.40	35	55
3.00	35	55
3.40	35	55
3.74	35	55
--	-	-
--	-	-
--	-	-

COSEL

Model	DHS50A15
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V3.4A

Testing Circuitry Figure B

1.Graph



Input Volt. 110V

Measured by 500 MHz Oscilloscope.

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

Ripple [mVp-p]

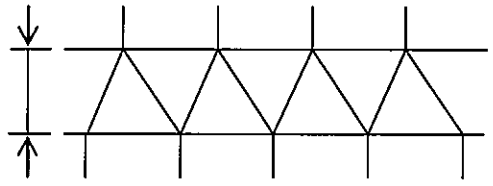


Fig.Complex Ripple Wave Form

2.Values

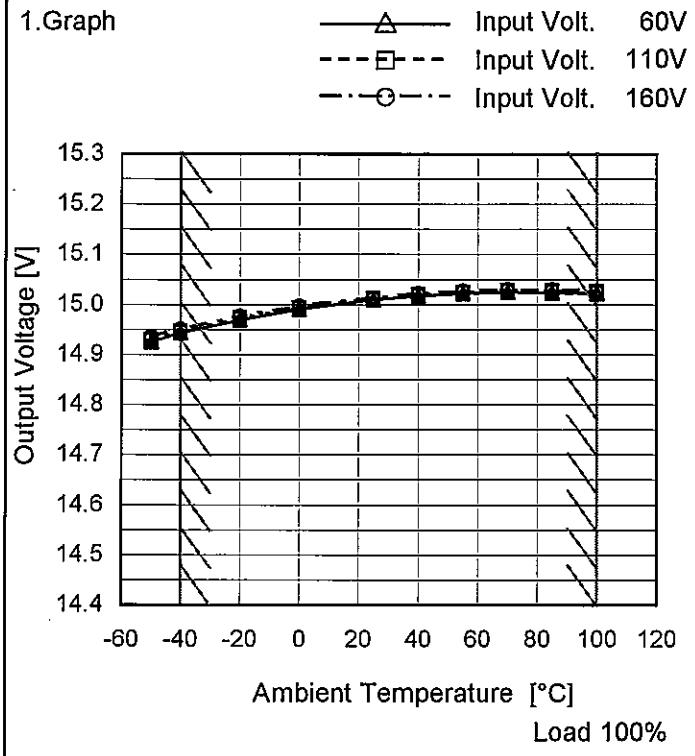
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	100	100
-40	80	80
-20	60	60
0	60	60
25	50	50
40	50	50
55	50	50
70	50	50
85	50	50
100	50	50
--	-	-

COSEL

Model	DHS50A15
Item	Ambient Temperature Drift
Object	+15V3.4A

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. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
-50	14.926	14.930	14.935
-40	14.943	14.946	14.951
-20	14.969	14.972	14.977
0	14.991	14.993	14.998
25	15.009	15.012	15.014
40	15.018	15.020	15.022
55	15.023	15.026	15.028
70	15.025	15.028	15.030
85	15.025	15.028	15.030
100	15.022	15.026	15.028
--	-	-	-

COSEL

Model	DHS50A15	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V3.4A	

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 : -40 - 100°C
Input Voltage : 60 - 160V
Load Current : 0 - 3.4A

* 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

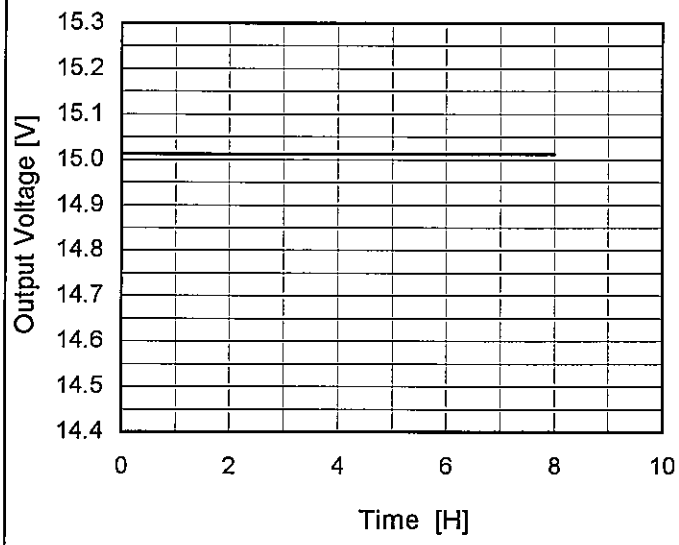
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	70	60	0	15.034	±46	±0.3
Minimum Voltage	-40	60	3.4	14.943		

COSEL

Model	DHS50A15
Item	Time Lapse Drift
Object	+15V3.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 110V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.012
0.5	15.012
1.0	15.012
2.0	15.012
3.0	15.012
4.0	15.012
5.0	15.012
6.0	15.012
7.0	15.012
8.0	15.012

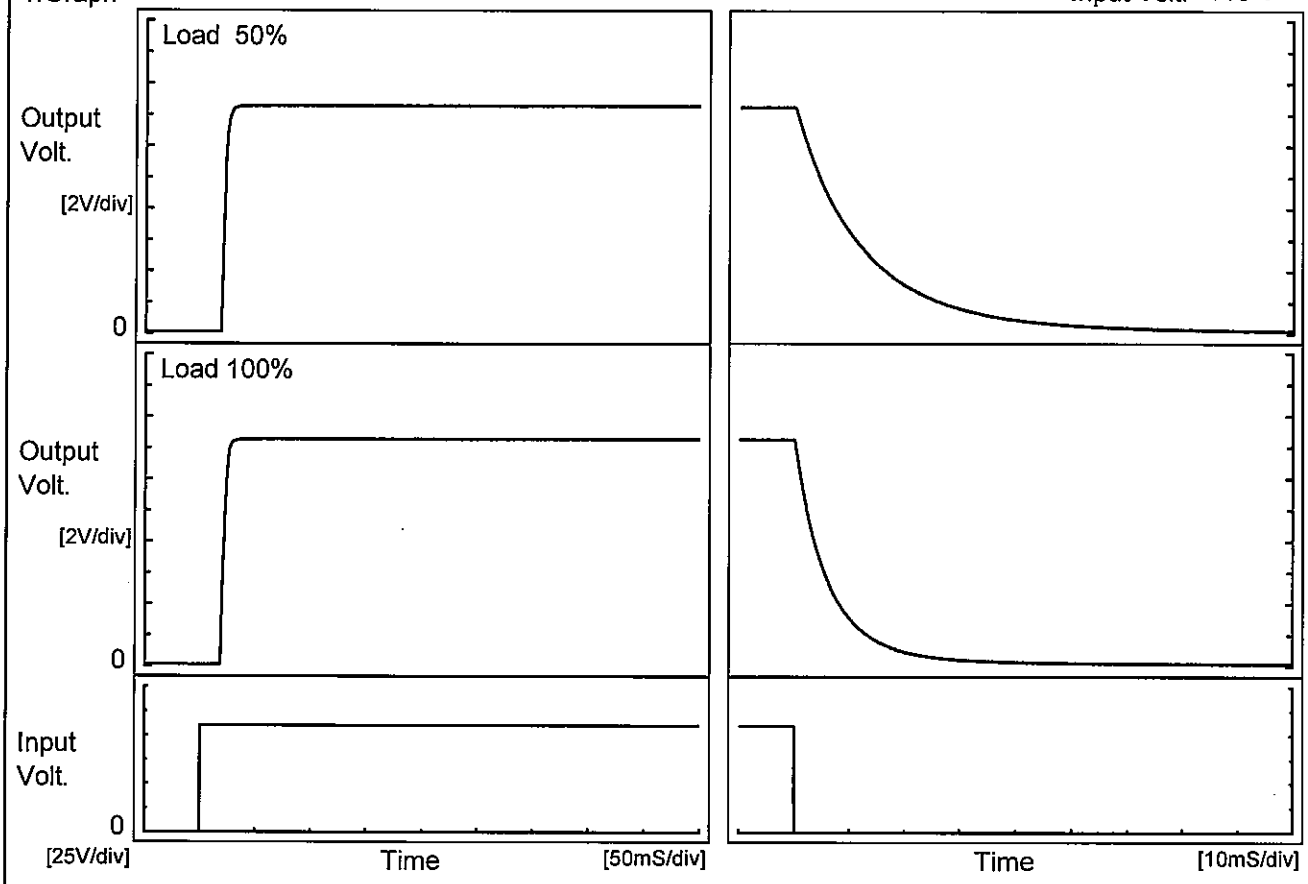
COSEL

Model	DHS50A15
Item	Rise and Fall Time
Object	+15V3.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

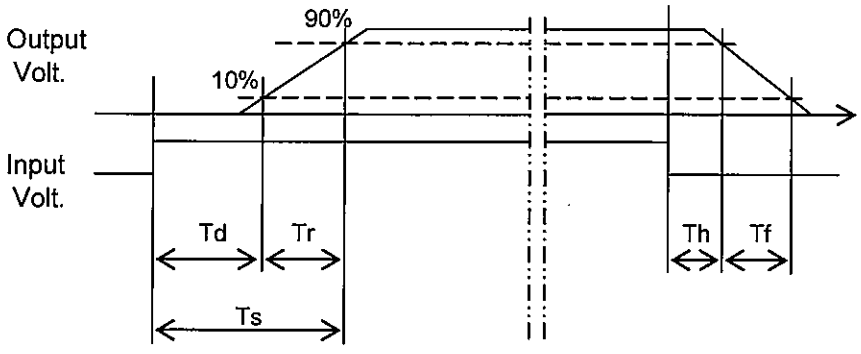
Input Volt. 110 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	19.3	6.5	25.8	0.8	30.7
100 %	19.3	6.5	25.8	0.5	15.4

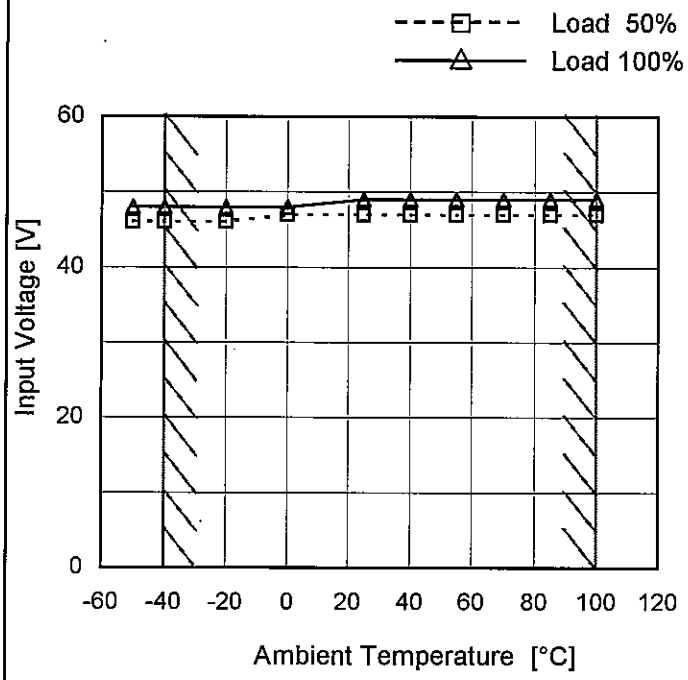


COSEL

Model	DHS50A15
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V3.4A

Testing Circuitry Figure A

1.Graph



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

2.Values

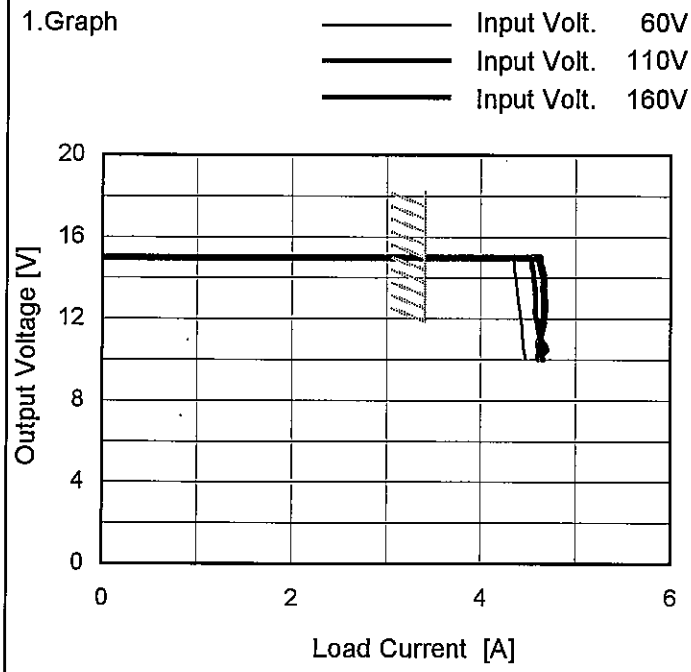
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	46	48
-40	46	48
-20	46	48
0	47	48
25	47	49
40	47	49
55	47	49
70	47	49
85	47	49
100	47	49
--	-	-

COSEL

Model	DHS50A15
Item	Overcurrent Protection
Object	+15V3.4A

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 10V to 0V.

2.Values

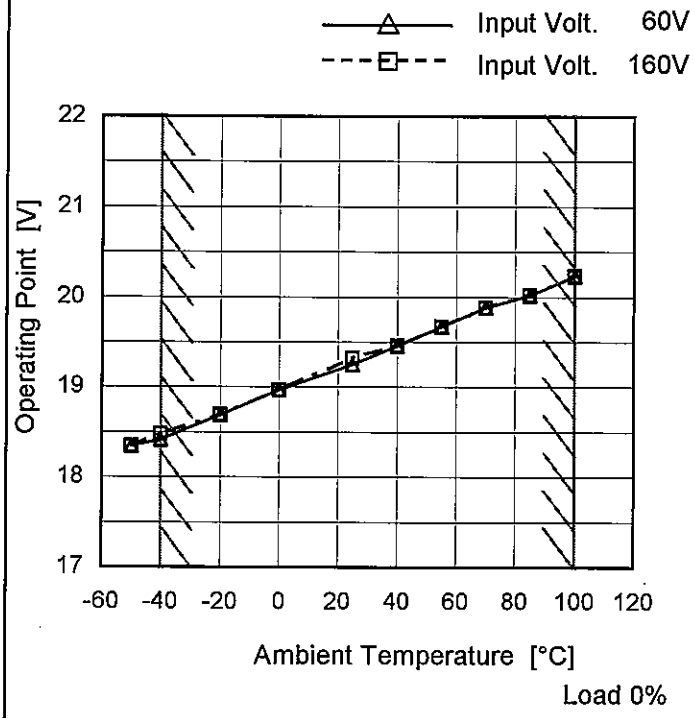
Output Voltage [V]	Load Current [A]		
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
15.0	3.42	3.42	3.42
14.3	4.36	4.56	4.66
13.5	4.38	4.57	4.67
12.0	4.43	4.58	4.67
10.5	4.46	4.70	4.62
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	DHS50A15
Item	Overvoltage Protection
Object	+15V3.4A

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. 60[V]	Input Volt. 160[V]
-50	18.34	18.34
-40	18.41	18.48
-20	18.69	18.69
0	18.97	18.97
25	19.25	19.32
40	19.46	19.46
55	19.67	19.67
70	19.88	19.88
85	20.02	20.02
100	20.23	20.23
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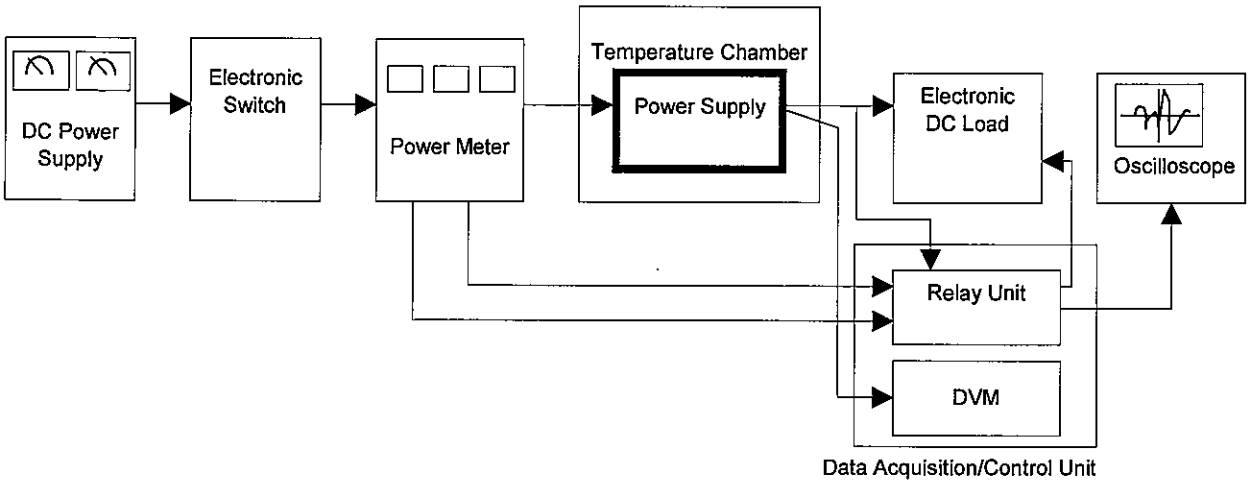
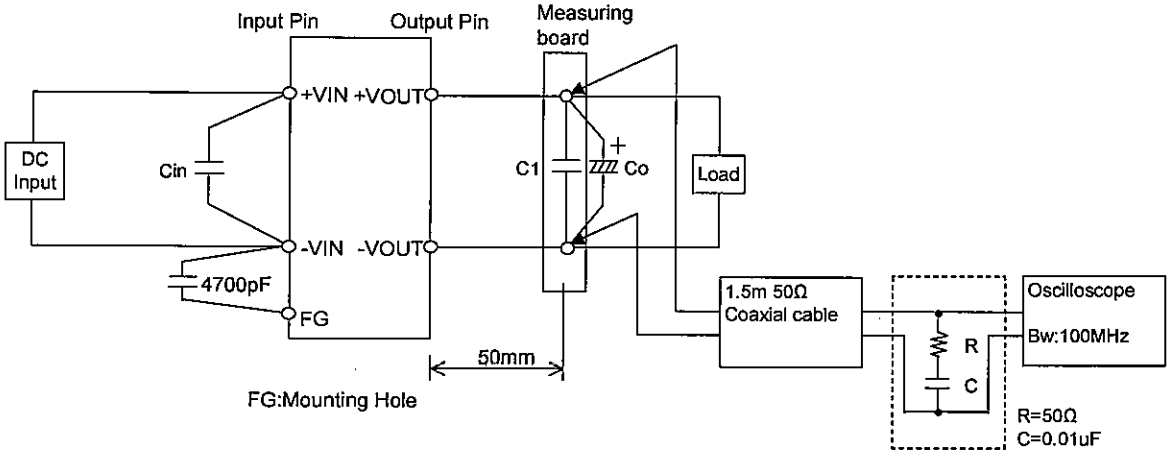


Figure A



C1 : DHS50A24 4.7uF
Others 10uF
Co : DHS50A05 2200uF
DHS50A12 470uF
DHS50A15 470uF
DHS50A24 220uF

Figure B