

TEST DATA OF DHS200A15

Regulated DC Power Supply
Aug 3, 2010

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Hou Ryou Design Engineer

COSEL CO.,LTD.

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(Final Page 19)

Model	DHS200A15
Item	Input Current (by Input Voltage)
Object	

1. Graph

Input Voltage [V]	Load 0% [A]	Load 50% [A]	Load 100% [A]
0	0.000	0.000	0.000
40	0.000	0.000	0.000
50	0.000	0.000	0.000
55	0.019	2.060	4.063
56	0.018	2.017	4.097
60	0.017	1.868	3.825
66	0.015	1.686	3.431
80	0.013	1.398	2.836
95	0.012	1.181	2.390
110	0.010	1.026	2.075
125	0.011	0.906	1.817
140	0.010	0.814	1.619
160	0.009	0.720	1.430
170	0.008	0.682	1.352
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

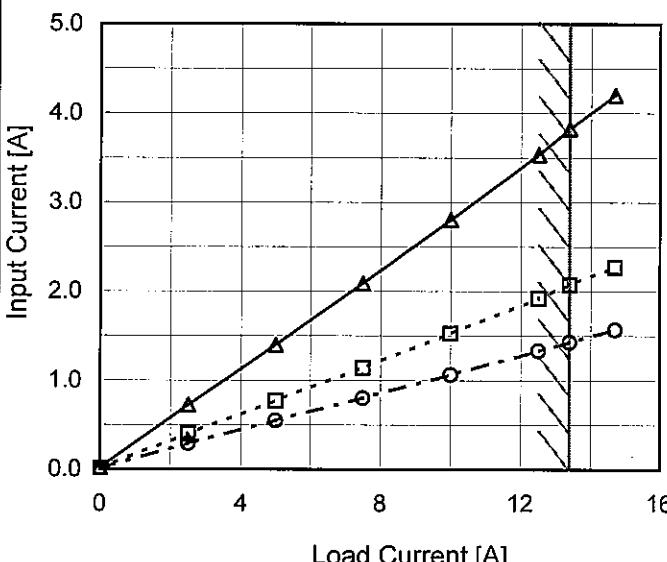
Note: Slanted line shows the range of the rated input voltage.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
40	0.000	0.000	0.000
50	0.000	0.000	0.000
55	0.019	2.060	4.063
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Model	DHS200A15	Temperature 25°C Testing Circuitry Figure A																																																					
Item	Input Current (by Load Current)																																																						
Object	_____																																																						
1.Graph	<p style="text-align: center;"> —△— Input Volt. 60V ---□--- Input Volt. 110V ---○--- Input Volt. 160V </p>  <p>The graph plots Input Current [A] on the y-axis against Load Current [A] on the x-axis. Three curves are shown for different input voltages: 60V (solid triangles), 110V (dashed squares), and 160V (dashed circles). All curves show a positive linear relationship. A slanted line is drawn across the graph, representing the rated load current range.</p>	2.Values																																																					
		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Input Current [A]</th> </tr> <tr> <th>Input Volt. 60[V]</th> <th>Input Volt. 110[V]</th> <th>Input Volt. 160[V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>0.017</td><td>0.010</td><td>0.009</td></tr> <tr><td>2.5</td><td>0.722</td><td>0.397</td><td>0.290</td></tr> <tr><td>5.0</td><td>1.397</td><td>0.769</td><td>0.545</td></tr> <tr><td>7.5</td><td>2.092</td><td>1.144</td><td>0.801</td></tr> <tr><td>10.0</td><td>2.801</td><td>1.527</td><td>1.065</td></tr> <tr><td>12.5</td><td>3.535</td><td>1.922</td><td>1.332</td></tr> <tr><td>13.4</td><td>3.825</td><td>2.075</td><td>1.430</td></tr> <tr><td>14.7</td><td>4.204</td><td>2.272</td><td>1.570</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>			Load Current [A]	Input Current [A]			Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]	0.0	0.017	0.010	0.009	2.5	0.722	0.397	0.290	5.0	1.397	0.769	0.545	7.5	2.092	1.144	0.801	10.0	2.801	1.527	1.065	12.5	3.535	1.922	1.332	13.4	3.825	2.075	1.430	14.7	4.204	2.272	1.570	--	-	-	-	--	-	-	-	--	-	-	-
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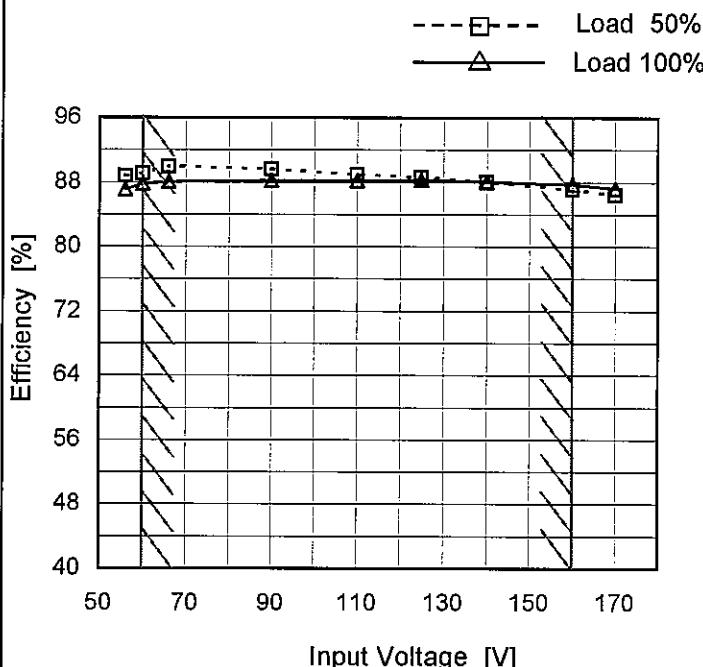
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Model	DHS200A15	Temperature Testing Circuitry	25°C Figure A																																																			
Item	Input Power (by Load Current)																																																					
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Note: Slanted line shows the range of the rated load current.

Model	DHS200A15
Item	Efficiency (by Input Voltage)
Object	—

1. Graph



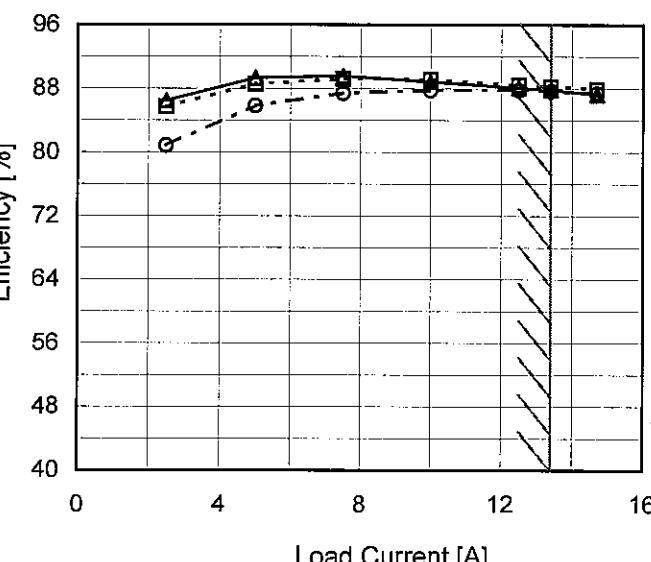
Note: Slanted line shows the range of the rated input voltage.

Temperature 25°C
Testing Circuitry Figure A

2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
56	88.8	87.1
60	89.1	87.8
66	90.0	88.0
90	89.6	88.2
110	89.0	88.2
125	88.6	88.3
140	88.0	88.0
160	87.1	87.7
170	86.5	87.2

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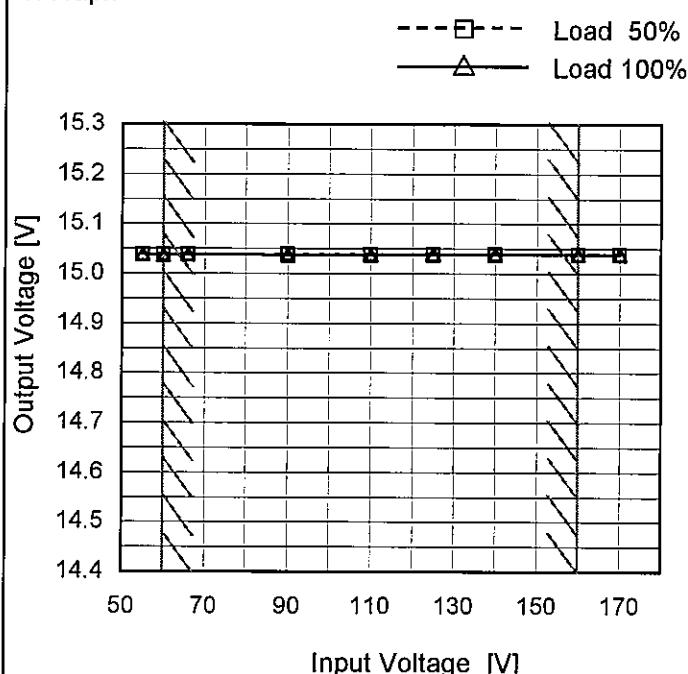
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Note:	Slanted line shows the range of the rated load current.																																																						

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Model	DHS200A15
Item	Line Regulation
Object	+15V13.4A

Temperature 25°C
 Testing Circuitry Figure A

1.Graph



2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
56	15.039	15.038
60	15.039	15.038
66	15.038	15.038
90	15.038	15.038
110	15.039	15.038
125	15.038	15.038
140	15.038	15.038
160	15.038	15.038
170	15.038	15.038

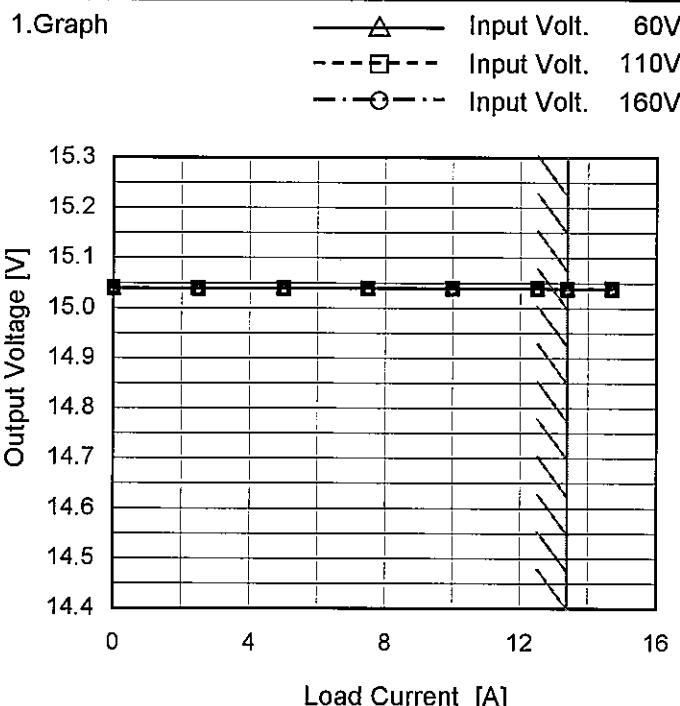
Note: Slanted line shows the range of the rated input voltage.

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Model DHS200A15

Item Load Regulation

Object +15V13.4A



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

Temperature 25°C
Testing Circuitry Figure A

2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
0.0	15.040	15.040	15.040
2.5	15.040	15.039	15.039
5.0	15.039	15.040	15.040
7.5	15.039	15.039	15.039
10.0	15.039	15.039	15.039
12.5	15.039	15.039	15.039
13.4	15.038	15.038	15.038
14.7	15.038	15.039	15.038
--	-	-	-
--	-	-	-
--	-	-	-

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Model DHS200A15

Temperature 25°C
Testing Circuitry Figure A

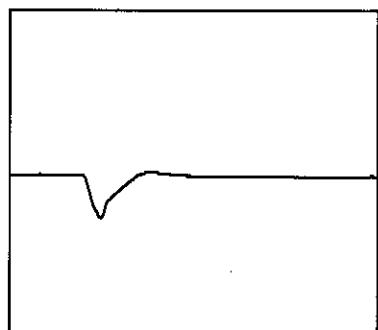
Object +15V13.4A

Input Volt. 110 V
Cycle 1000 ms

Load Current

13.4A / 50 μ sMin. Load (0A) \longleftrightarrow
Load 100% (13.4A)

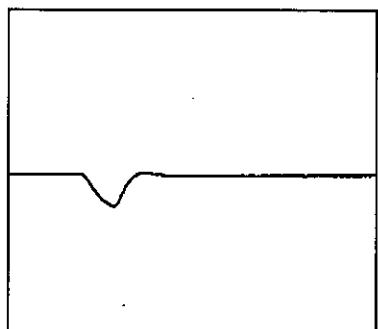
1V/div

200 μ s/div

50 ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (6.7A)

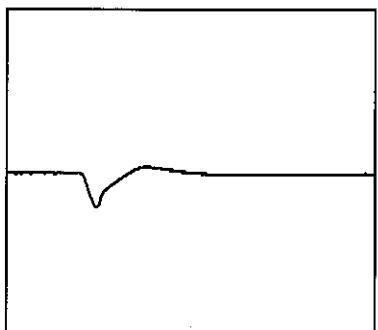
1V/div

200 μ s/div

50 ms/div

Load 10% (1.34A) \longleftrightarrow
Load 100% (13.4A)

1V/div

200 μ s/div

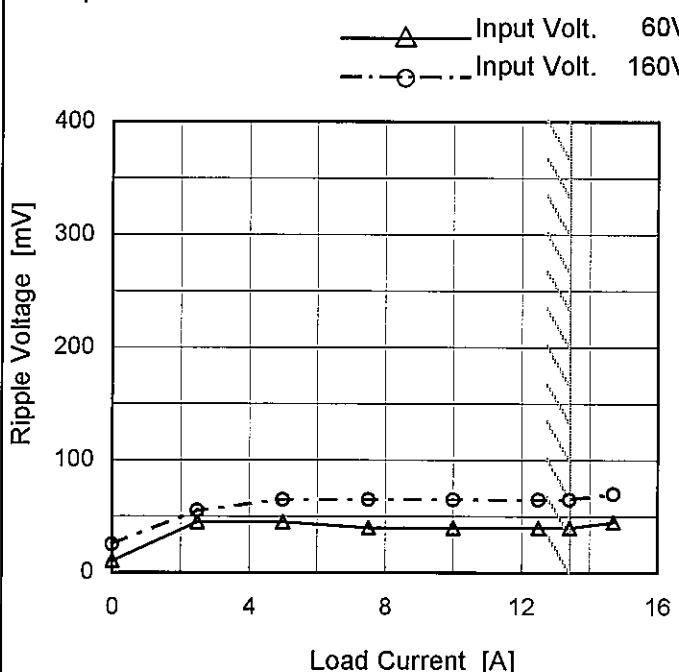
2 ms/div

Model	DHS200A15	Temperature	25°C																																						
Item	Ripple Voltage (by Load Current)	Testing Circuitry	Figure B																																						
Object	+15V13.4A																																								
1.Graph			2.Values																																						
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 400 mV, and the X-axis ranges from 0 to 16 A. Two curves are plotted: Input Volt. 60V (solid line with triangles) and Input Volt. 160V (dashed line with circles). Both curves show a sharp increase in ripple voltage as load current approaches the rated value of 13.4A.</p>			<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Voltage [mV]</th> </tr> <tr> <th>Input Volt. 60 [V]</th> <th>Input Volt. 160 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5</td><td>15</td></tr> <tr><td>2.5</td><td>35</td><td>50</td></tr> <tr><td>5.0</td><td>35</td><td>60</td></tr> <tr><td>7.5</td><td>35</td><td>60</td></tr> <tr><td>10.0</td><td>35</td><td>60</td></tr> <tr><td>12.5</td><td>30</td><td>60</td></tr> <tr><td>13.4</td><td>30</td><td>60</td></tr> <tr><td>14.7</td><td>30</td><td>60</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </tbody> </table>	Load Current [A]	Ripple Voltage [mV]		Input Volt. 60 [V]	Input Volt. 160 [V]	0.0	5	15	2.5	35	50	5.0	35	60	7.5	35	60	10.0	35	60	12.5	30	60	13.4	30	60	14.7	30	60	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
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<p>Measured by 100 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>																																									
<p>Ripple [mVp-p]</p> <p>Diagram illustrating a Complex Ripple Wave Form. The vertical axis is labeled "Ripple [mVp-p]" with arrows indicating the measurement range. The wave form consists of a series of sharp, triangular pulses superimposed on a DC level.</p>																																									
<p>Fig.Complex Ripple Wave Form</p>																																									

Model	DHS200A15
Item	Ripple-Noise
Object	+15V13.4A

Temperature 25°C
Testing Circuitry Figure B

1. Graph



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 60 [V]	Input Volt. 160 [V]
0.0	10	25
2.5	45	55
5.0	45	65
7.5	40	65
10.0	40	65
12.5	40	65
13.4	40	65
14.7	45	70
--	-	-
--	-	-
--	-	-

Measured by 100 MHz Oscilloscope.

Ripple-Noise is shown as p-p in the figure below.

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

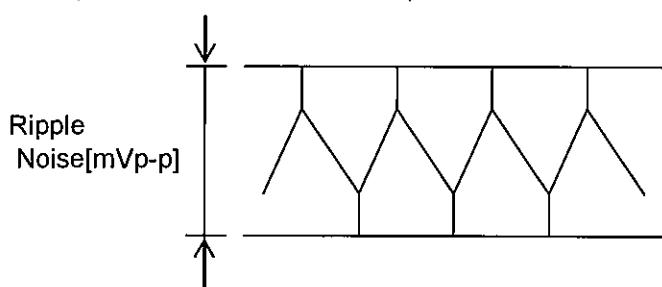


Fig.Complex Ripple Noise Wave Form

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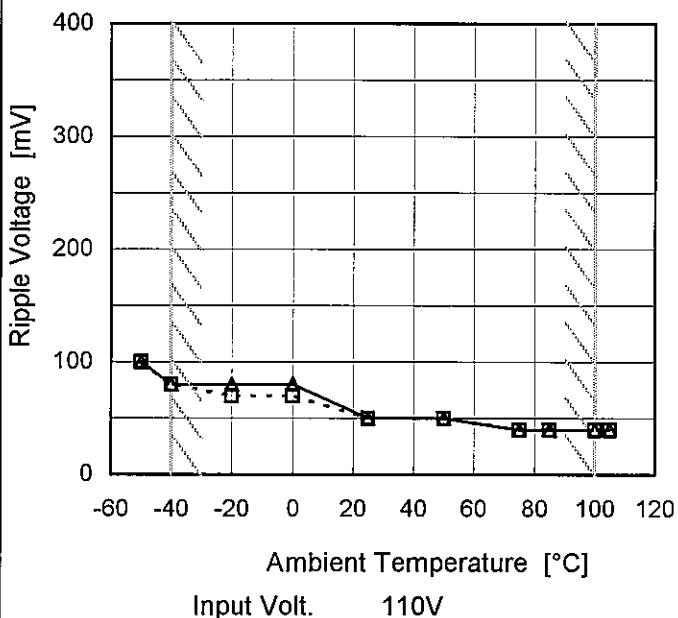
Model DHS200A15

Item Ripple Voltage (by Ambient Temp.)

Object +15V13.4A

1. Graph

---□--- Load 50%
 —△— Load 100%



Measured by 100 MHz Oscilloscope.

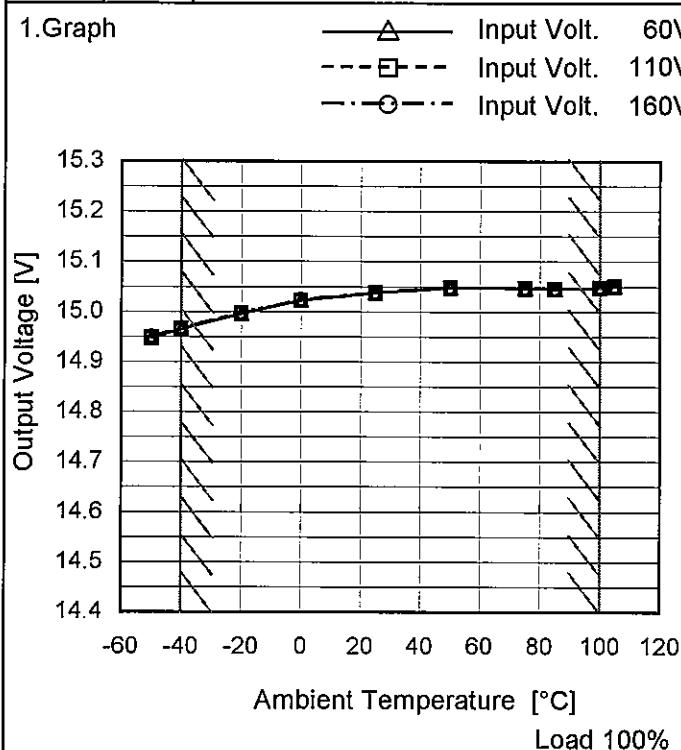
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure B

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	100	100
-40	80	80
-20	70	80
0	70	80
25	50	50
50	50	50
75	40	40
85	40	40
100	40	40
105	40	40
--	-	-

Model	DHS200A15
Item	Ambient Temperature Drift
Object	+15V13.4A



Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
-50	14.947	14.948	14.949
-40	14.966	14.966	14.967
-20	14.996	14.997	14.997
0	15.023	15.023	15.024
25	15.038	15.038	15.038
50	15.048	15.048	15.048
75	15.047	15.047	15.047
85	15.046	15.046	15.046
100	15.048	15.048	15.048
105	15.051	15.051	15.051
--	-	-	-

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



Model	DHS200A15
Item	Output Voltage Accuracy
Object	+15V13.4A

Testing Circuitry Figure A

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 - 13.4A

* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

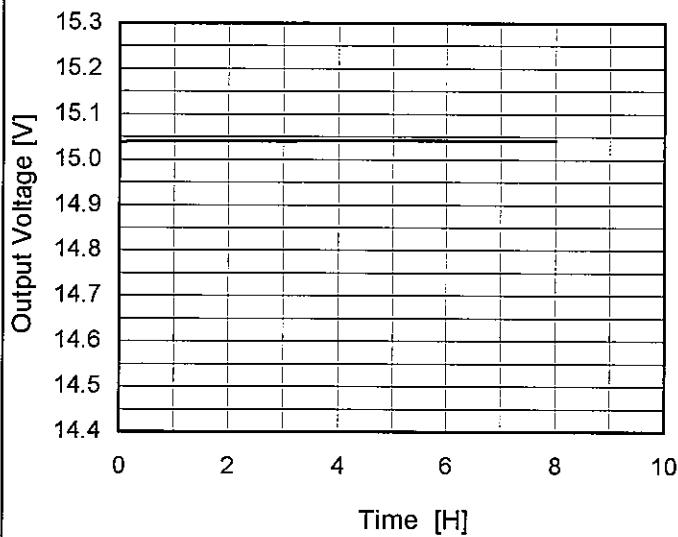
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	100	110	0	15.048	±41	±0.3
Minimum Voltage	-40	60	13.4	14.966		

COSEL

Model	DHS200A15
Item	Time Lapse Drift
Object	+15V13.4A

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	15.038
0.5	15.040
1.0	15.040
2.0	15.041
3.0	15.041
4.0	15.042
5.0	15.042
6.0	15.042
7.0	15.042
8.0	15.042

COSEL

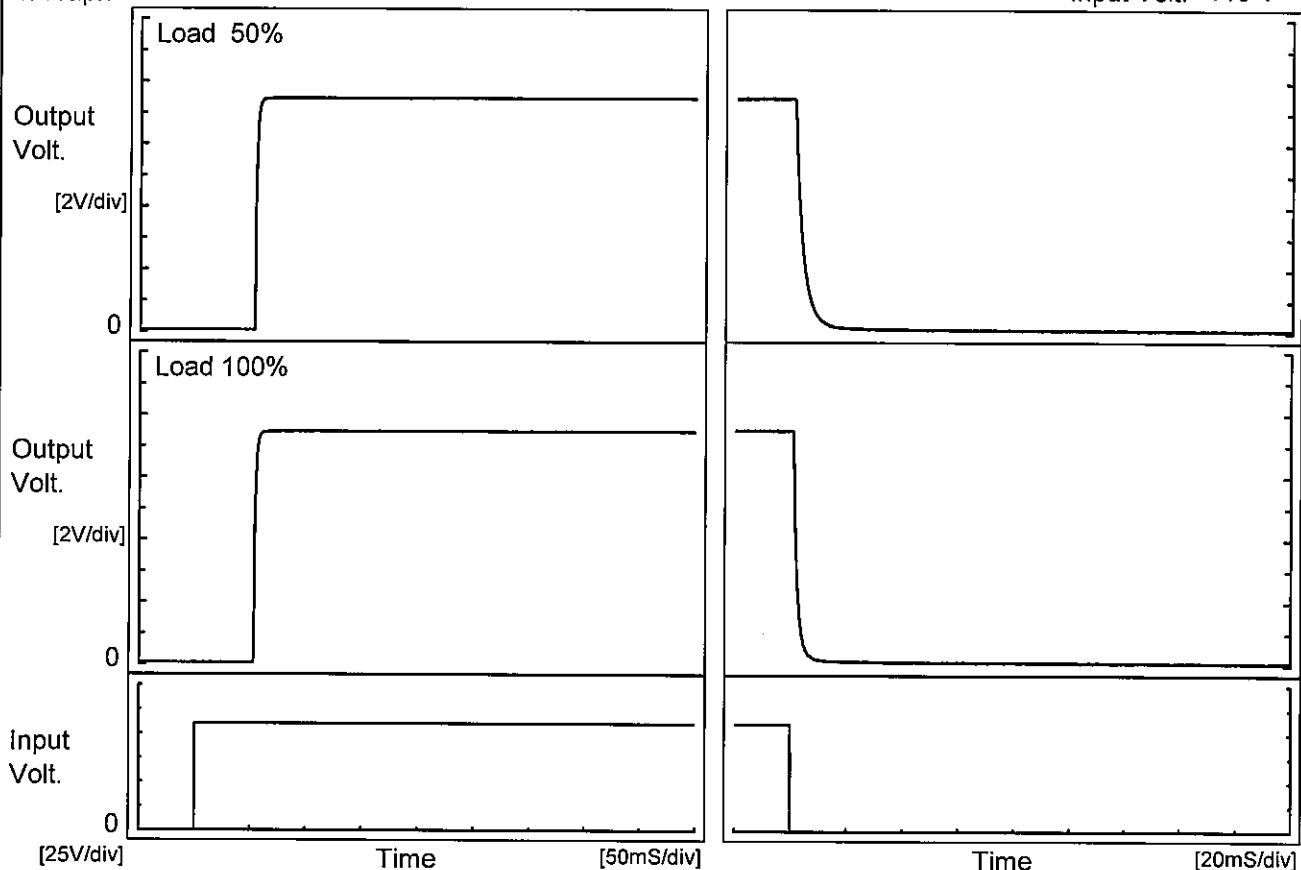
Model DHS200A15

Item Rise and Fall Time

Object +15V13.4A

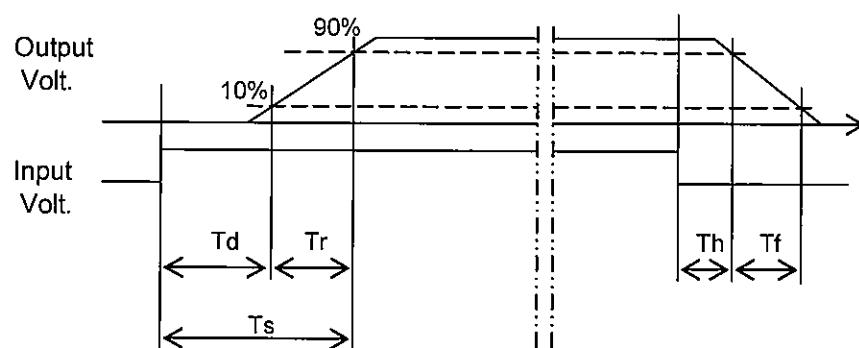
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

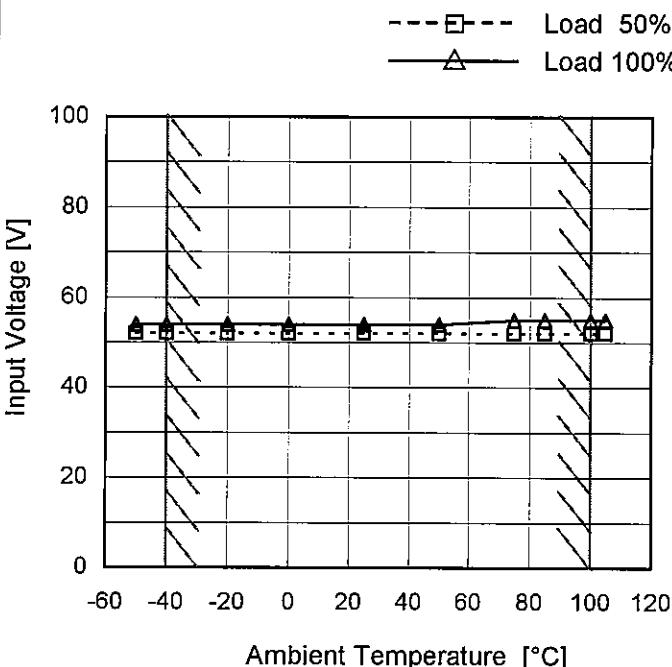
Load	Time	Td	Tr	Ts	Th	Tf	[mS]
50 %		53.5	3.0	56.5	1.2	6.3	
100 %		53.3	3.0	56.3	1.0	3.2	



Model	DHS200A15
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V13.4A

Testing Circuitry Figure A

1.Graph



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

2.Values

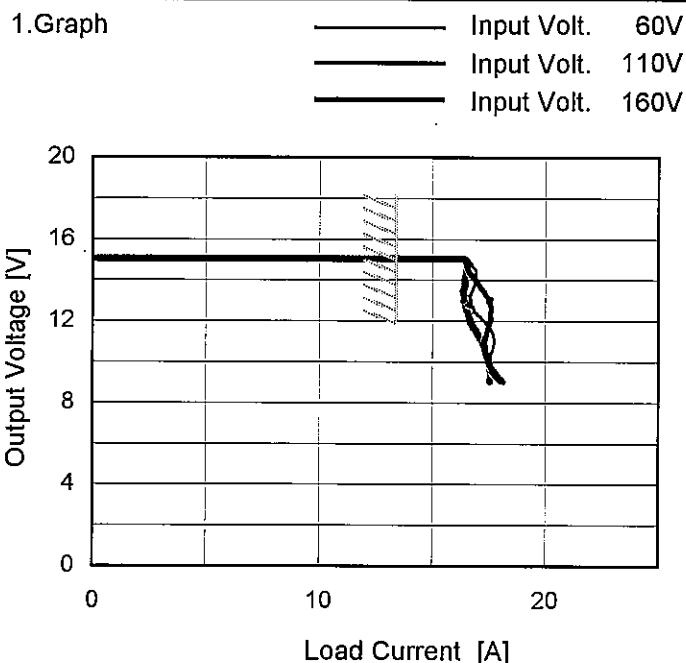
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	52	54
-40	52	54
-20	52	54
0	52	54
25	52	54
50	52	54
75	52	55
85	52	55
100	52	55
105	52	55
--	-	-

COSEL

Model DHS200A15

Item Overcurrent Protection

Object +15V13.4A



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

Intermittent operation occurs when the output voltage is from 9V to 0V.

Temperature 25°C
Testing Circuitry Figure A

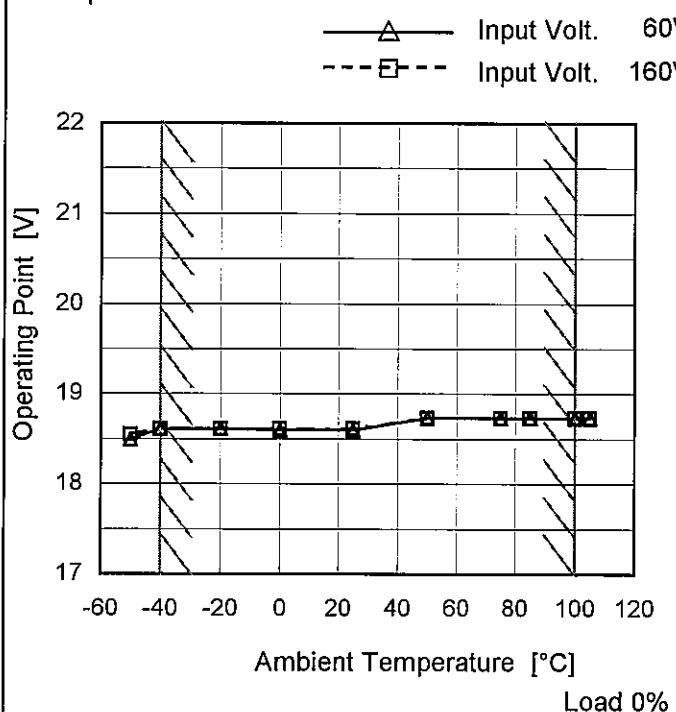
2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 60[V]	Input Volt. 110[V]	Input Volt. 160[V]
14.3	16.93	16.71	16.46
13.5	16.77	17.19	16.39
12.0	17.21	17.56	16.66
10.5	17.66	17.29	17.35
9.0	17.96	18.13	17.52
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	DHS200A15
Item	Overvoltage Protection
Object	+15V13.4A

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	18.49	18.55
-40	18.61	18.61
-20	18.61	18.61
0	18.60	18.61
25	18.60	18.61
50	18.73	18.73
75	18.73	18.73
85	18.73	18.73
100	18.73	18.73
105	18.73	18.73
--	-	-

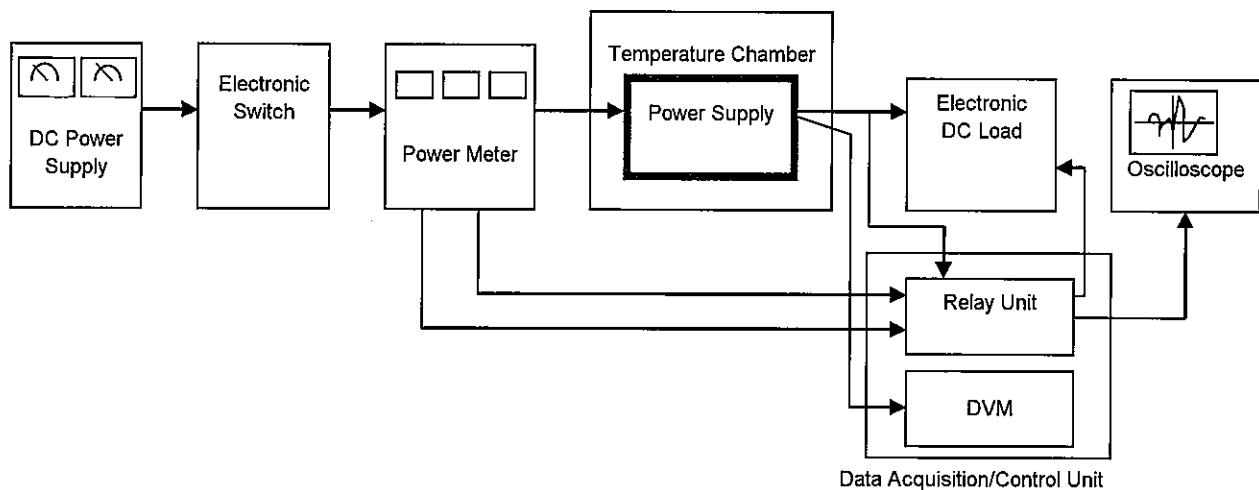
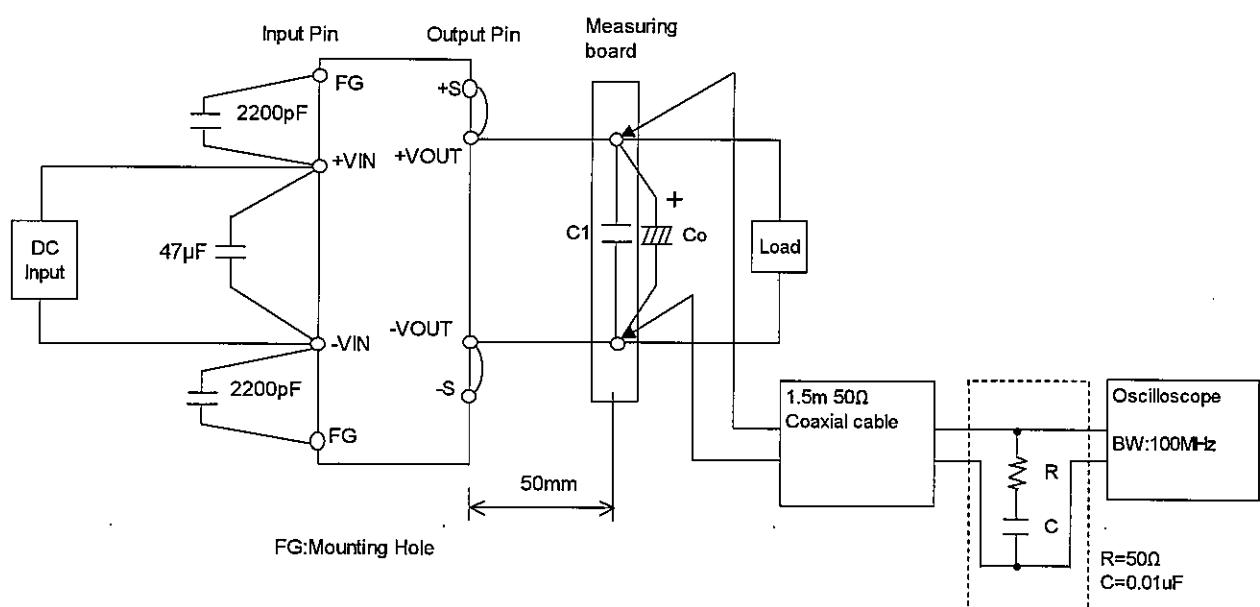


Figure A



C1
DHS200A24
Others

4.7 μ F
10 μ F

Co
DHS200A05
DHS200A12
DHS200A15
DHS200A24

2200 μ F
1000 μ F
1000 μ F
470 μ F

Figure B