参考資料

COSEL

TEST DATA OF SUW30515

Regulated DC Power Supply
Mar 16, 2005

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Hayato Nakatsubo — Design Engineer

COSEL CO.,LTD.

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COSEL

Model	SUW30515
Item	Input Current (by Input Voltage)
Object	————————

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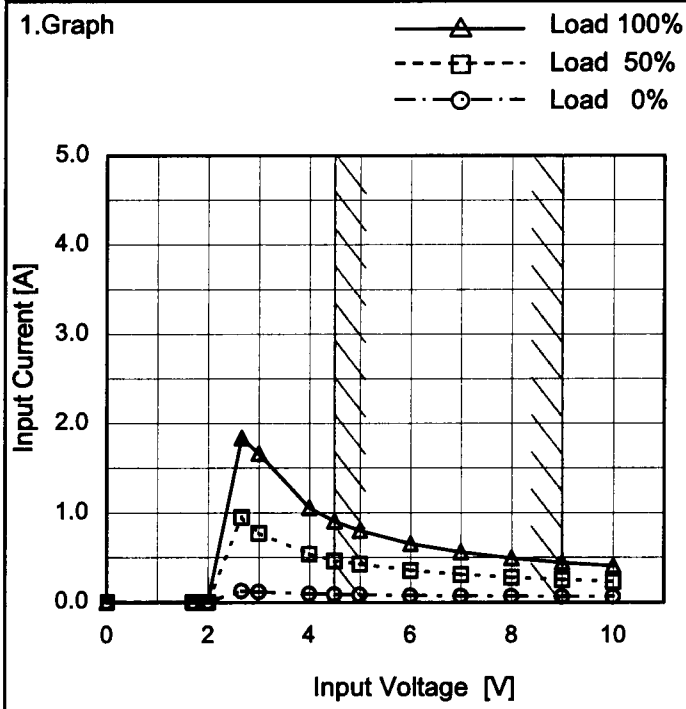
Testing Circuitry Figure A

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%
0.00	0.000	0.000	0.000
1.70	0.000	0.000	0.000
2.00	0.000	0.000	0.000
2.66	0.126	0.952	1.839
3.00	0.116	0.772	1.663
4.00	0.094	0.538	1.057
4.50	0.087	0.465	0.905
5.00	0.082	0.427	0.800
6.00	0.073	0.357	0.654
7.00	0.067	0.311	0.560
8.00	0.063	0.276	0.492
9.00	0.061	0.250	0.442
10.00	0.060	0.231	0.404
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
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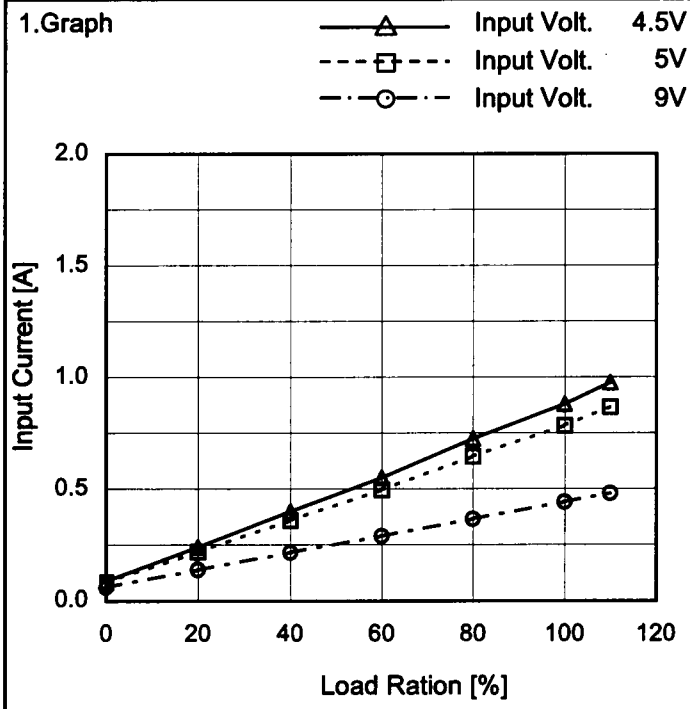
COSEL

Model	SUW30515
Item	Input Current (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

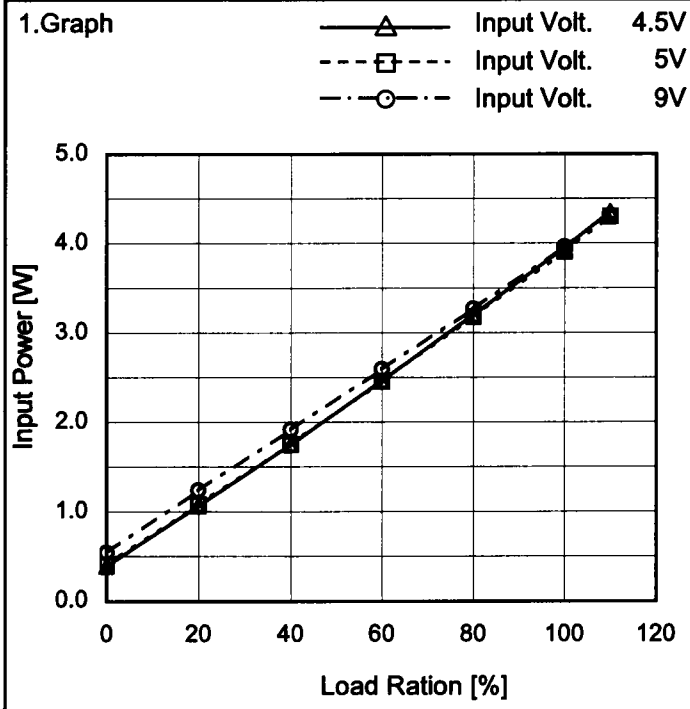
Load Ration [%]	Input Current [A]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	0.087	0.082	0.061
20	0.240	0.219	0.139
40	0.400	0.359	0.215
60	0.551	0.496	0.288
80	0.724	0.645	0.365
100	0.880	0.783	0.442
110	0.976	0.866	0.480
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUW30515
Item	Input Power (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

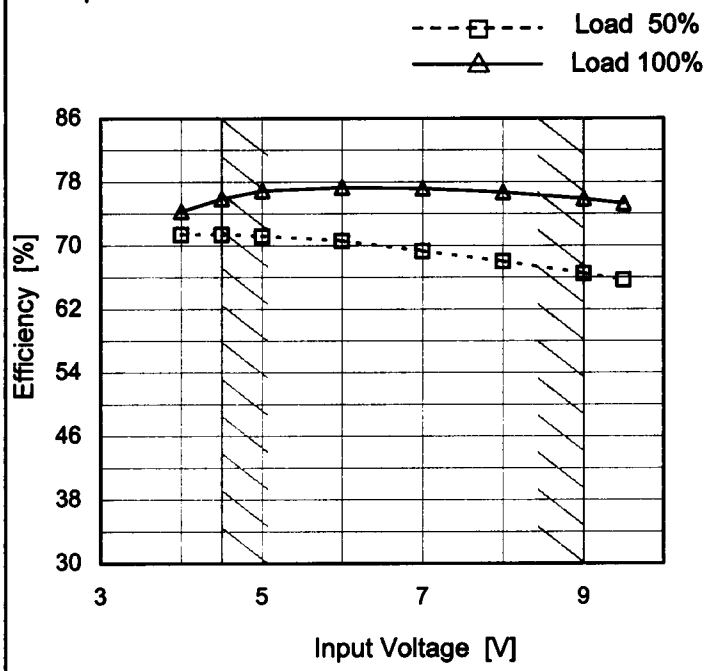
Load Ration [%]	Input Power [W]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	0.39	0.41	0.54
20	1.06	1.08	1.24
40	1.75	1.76	1.92
60	2.46	2.46	2.59
80	3.20	3.18	3.27
100	3.95	3.91	3.96
110	4.35	4.30	4.30
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUW30515
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

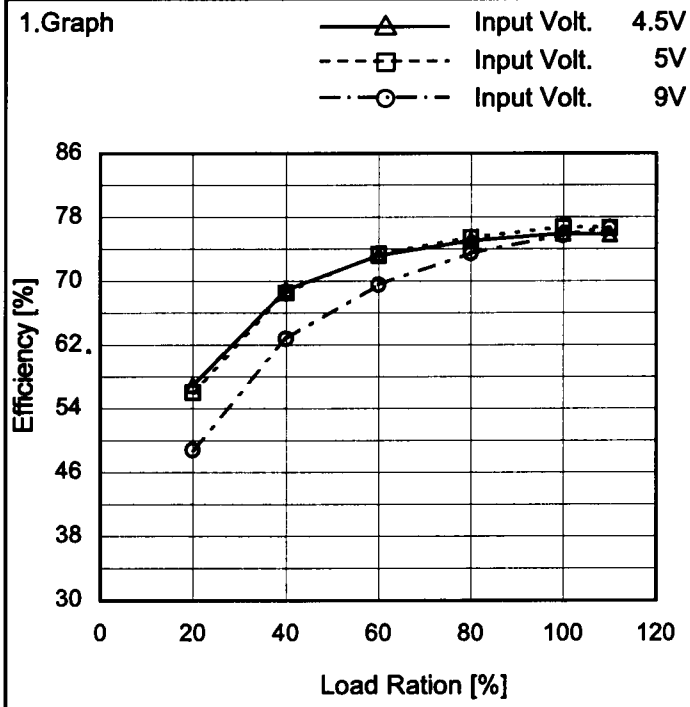
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
4.0	71.4	74.3
4.5	71.4	75.9
5.0	71.2	76.9
6.0	70.6	77.3
7.0	69.3	77.2
8.0	68.0	76.7
9.0	66.5	75.9
9.5	65.7	75.3
—	-	-

COSEL

Model	SUW30515
Item	Efficiency (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

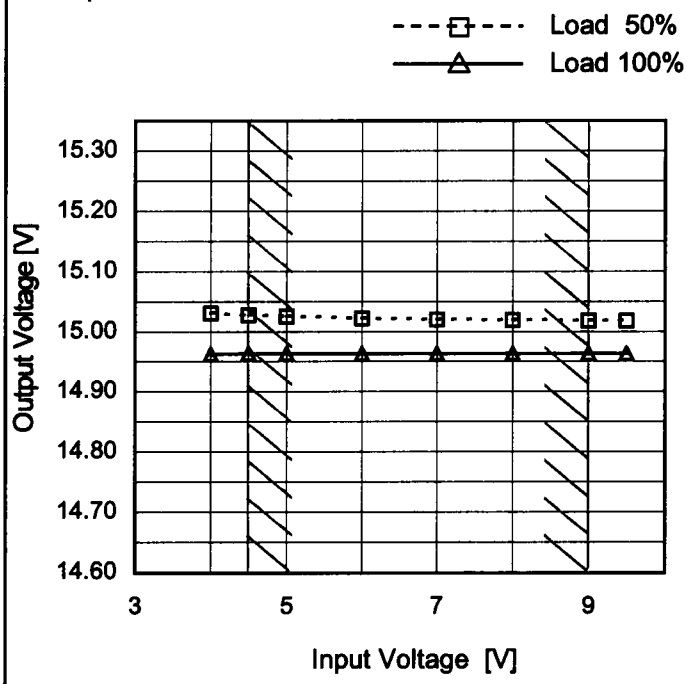
Load Ration [%]	Efficiency [%]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	-	-	-
20	56.9	56.1	48.8
40	68.9	68.6	62.8
60	73.2	73.4	69.5
80	75.1	75.5	73.5
100	76.0	76.8	75.7
110	75.8	76.7	76.7
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUW30515
Item	Line Regulation
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

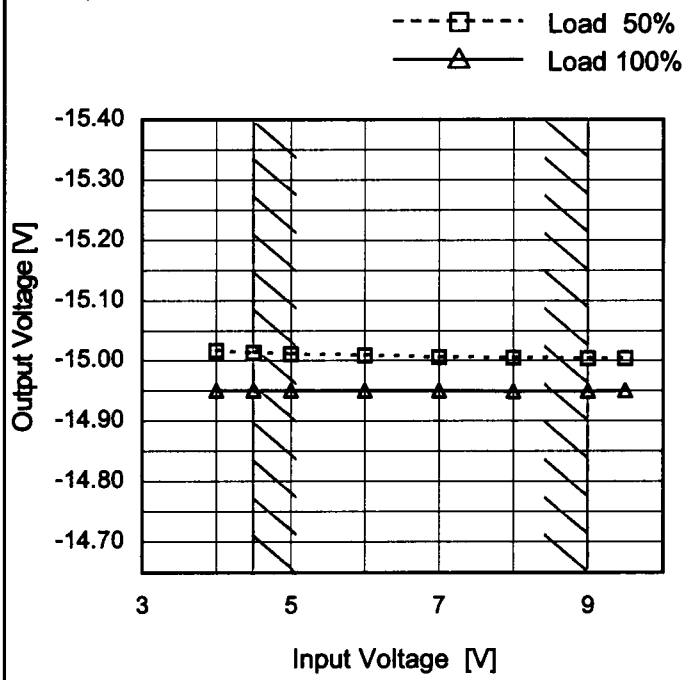


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	15.031	14.963
4.5	15.027	14.963
5.0	15.025	14.964
6.0	15.022	14.964
7.0	15.020	14.964
8.0	15.019	14.964
9.0	15.018	14.964
9.5	15.018	14.963
--	-	-

Object	-15V0.1A

1.Graph



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

2.Values

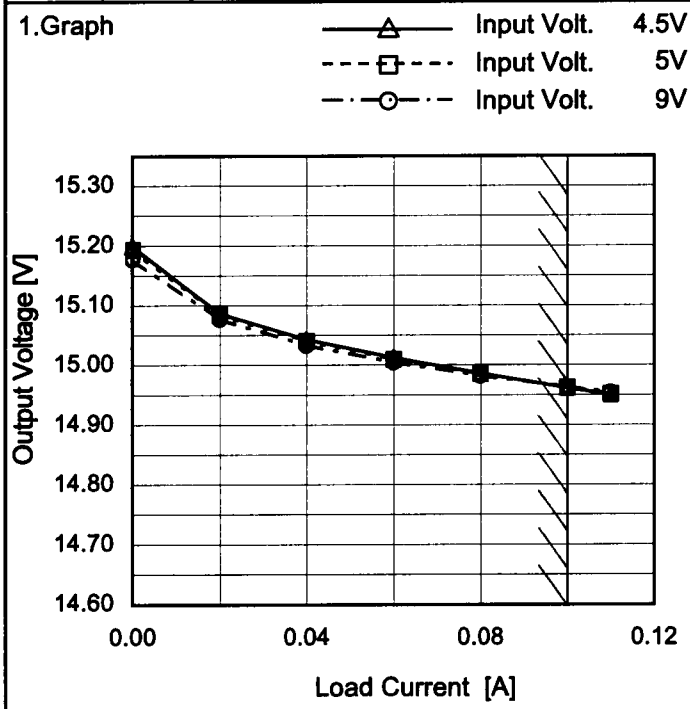
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	-15.017	-14.950
4.5	-15.014	-14.950
5.0	-15.011	-14.950
6.0	-15.009	-14.950
7.0	-15.006	-14.950
8.0	-15.005	-14.950
9.0	-15.004	-14.950
9.5	-15.003	-14.950
--	-	-

COSEL

Model	SUW30515
Item	Load Regulation
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

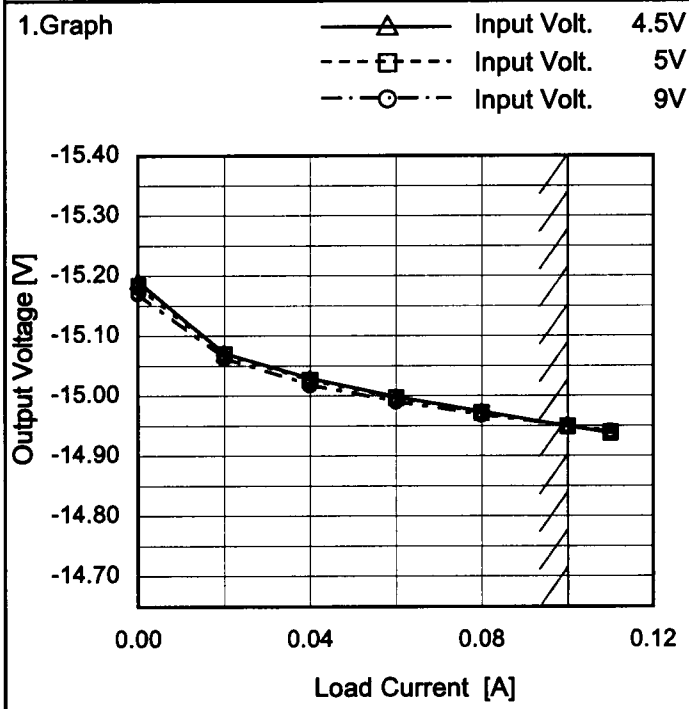


2.Values

Load Current [A]	Output Voltage [V] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	15.199	15.193	15.177
0.02	15.086	15.084	15.077
0.04	15.043	15.041	15.033
0.06	15.012	15.010	15.005
0.08	14.987	14.985	14.982
0.10	14.962	14.962	14.963
0.11	14.950	14.952	14.954
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V0.1A

1.Graph



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

2.Values

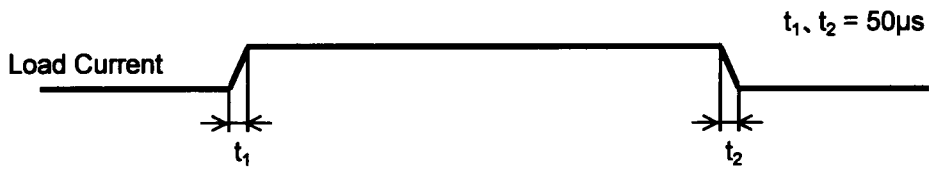
Load Current [A]	Output Voltage [V] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	-15.191	-15.184	-15.171
0.02	-15.071	-15.070	-15.063
0.04	-15.029	-15.026	-15.018
0.06	-14.999	-14.997	-14.991
0.08	-14.974	-14.972	-14.969
0.10	-14.950	-14.949	-14.950
0.11	-14.938	-14.939	-14.941
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

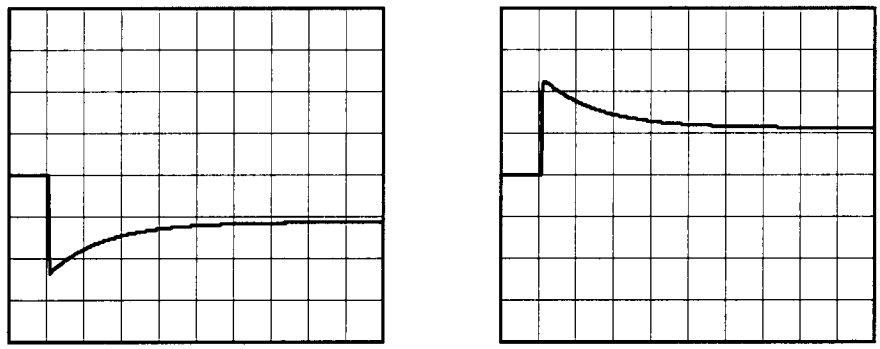
Model	SUW30515
Item	Dynamic Load Response
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

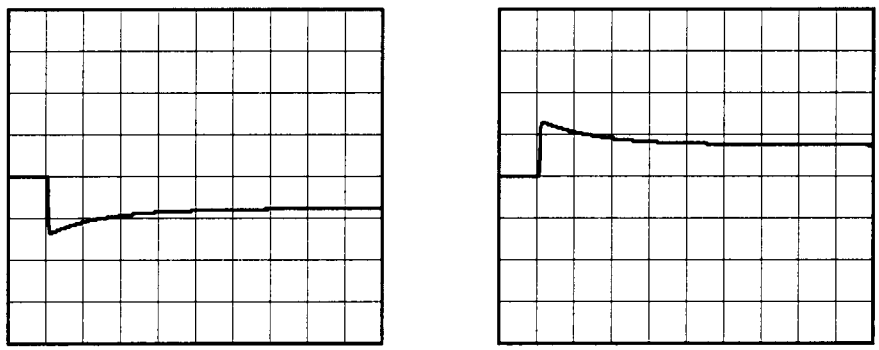
Input Volt. 5 V
Cycle 100 mS



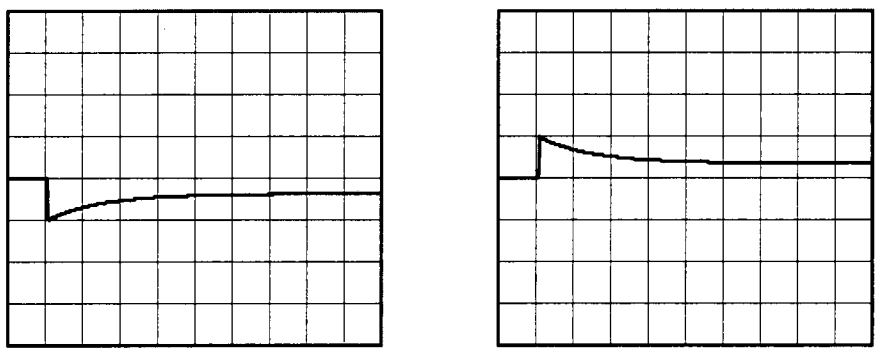
Min. Load (0A) ⟷ Load 100% (0.1A)



Min. Load (0A) ⟷ Load 50% (0.05A)



Load 50% (0.05A) ⟷ Load 100% (0.1A)

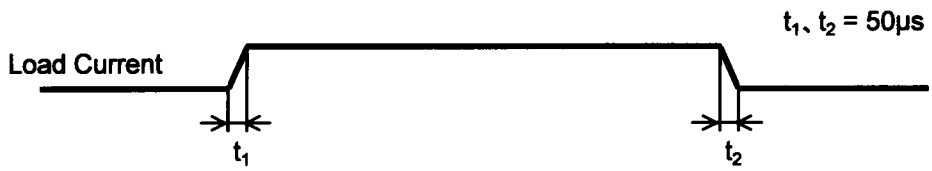


COSEL

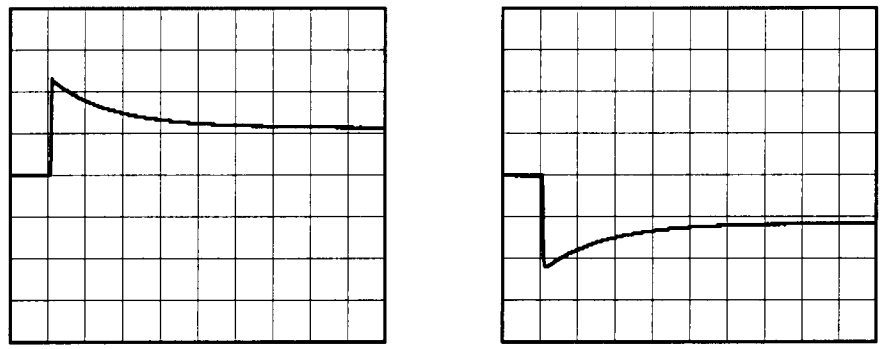
Model	SUW30515
Item	Dynamic Load Response
Object	-15V0.1A

Temperature 25°C
Testing Circuitry Figure A

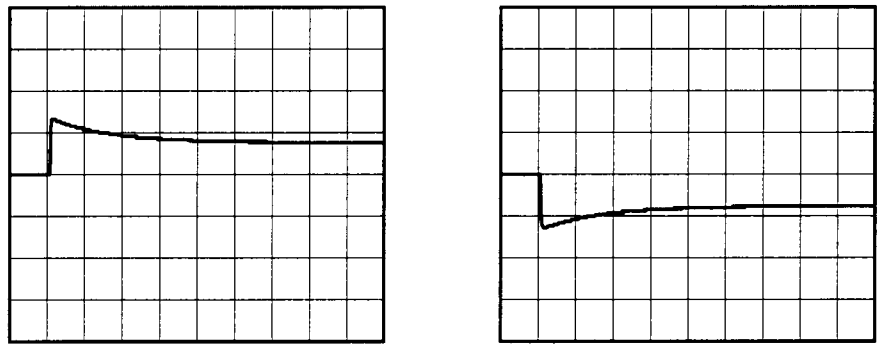
Input Volt. 5 V
Cycle 100 mS



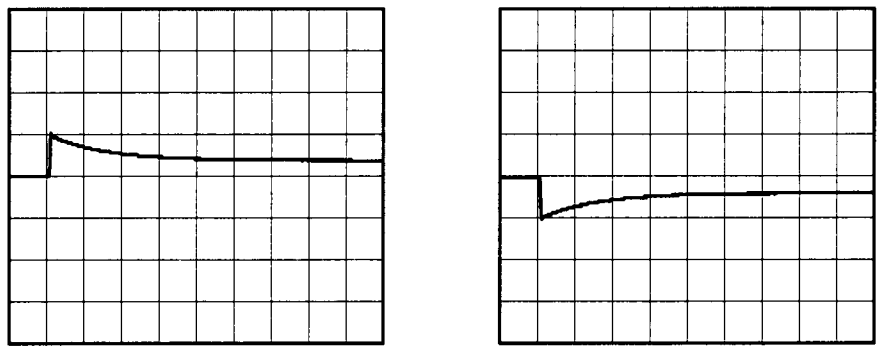
Min. Load (0A) ⟷ Load 100% (0.1A)



Min. Load (0A) ⟷ Load 50% (0.05A)



Load 50% (0.05A) ⟷ Load 100% (0.1A)

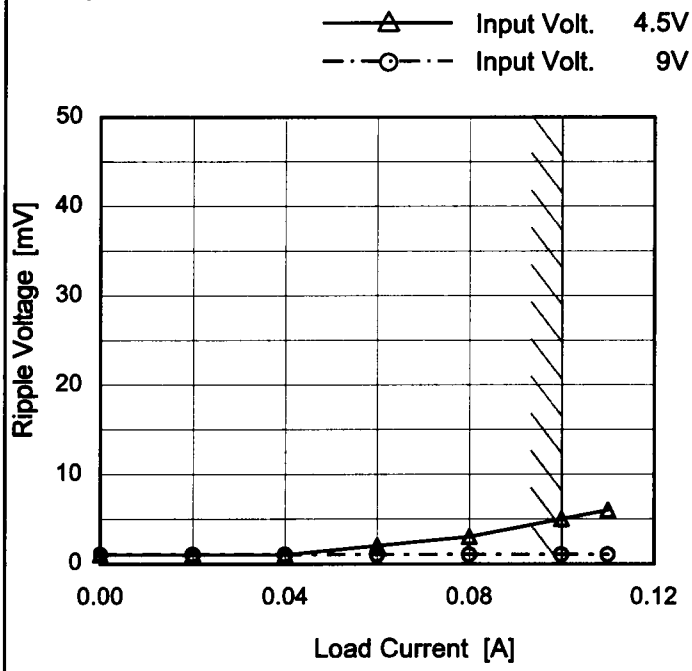


COSEL

Model	SUW30515
Item	Ripple Voltage (by Load Current)
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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.

Ripple [mVp-p]

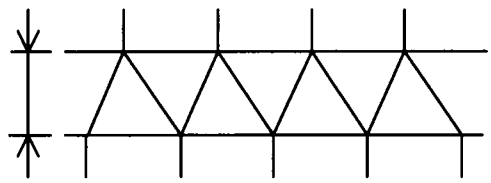


Fig.Complex Ripple Wave Form

2.Values

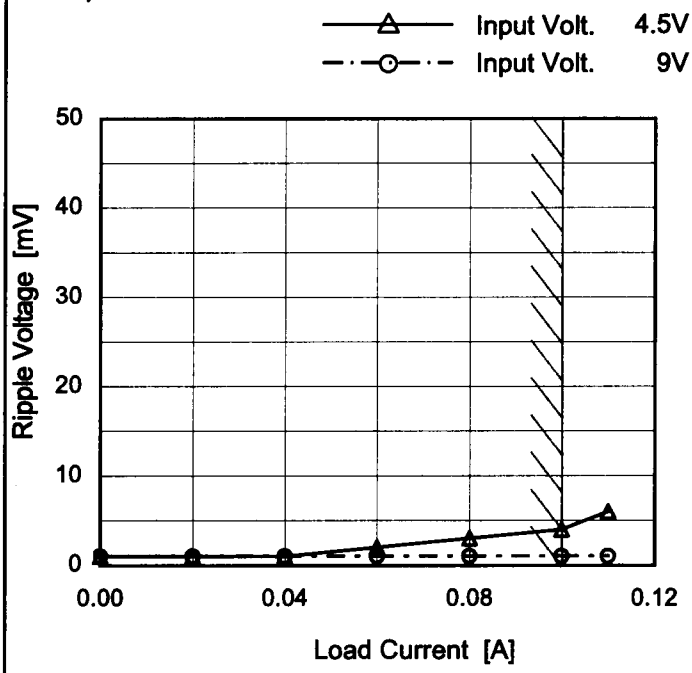
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.00	1	1
0.02	1	1
0.04	1	1
0.06	2	1
0.08	3	1
0.10	5	1
0.11	6	1
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW30515
Item	Ripple Voltage (by Load Current)
Object	-15V0.1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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.

Ripple [mVp-p]

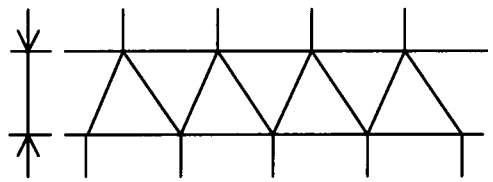


Fig.Complex Ripple Wave Form

2.Values

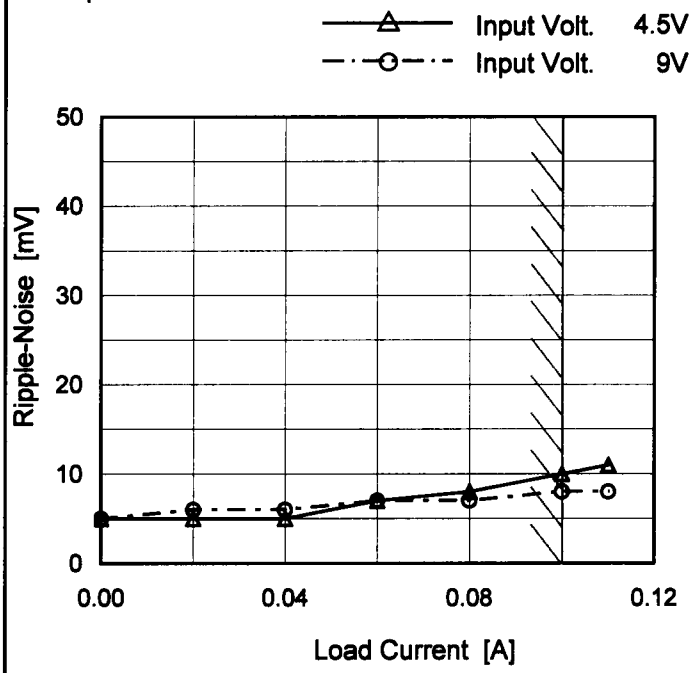
Load Current [A]	Ripple Voltage [mV] Input Volt. 4.5 [V]	Ripple Voltage [mV] Input Volt. 9 [V]
0.00	1	1
0.02	1	1
0.04	1	1
0.06	2	1
0.08	3	1
0.10	4	1
0.11	6	1
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW30515
Item	Ripple-Noise
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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.

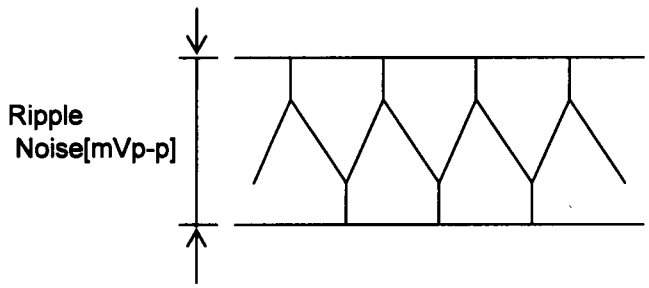


Fig.Complex Ripple Noise Wave Form

2.Values

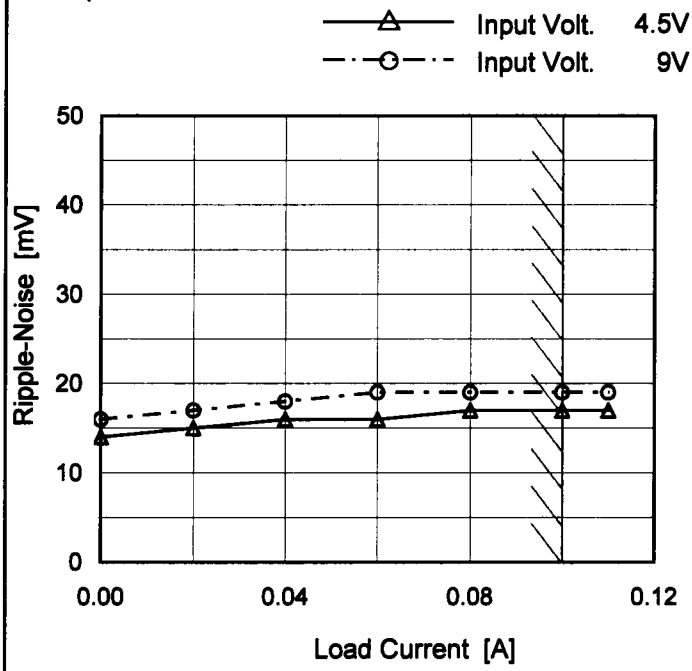
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.00	5	5
0.02	5	6
0.04	5	6
0.06	7	7
0.08	8	7
0.10	10	8
0.11	11	8
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW30515
Item	Ripple-Noise
Object	-15V0.1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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.

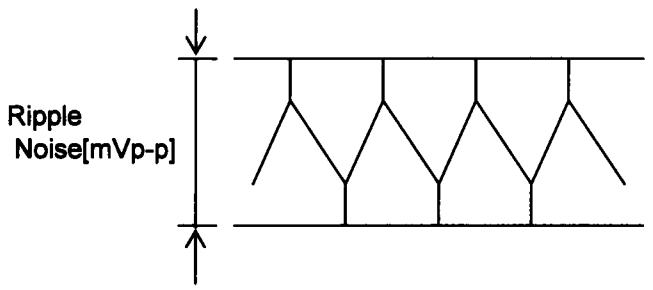


Fig.Complex Ripple Noise Wave Form

2.Values

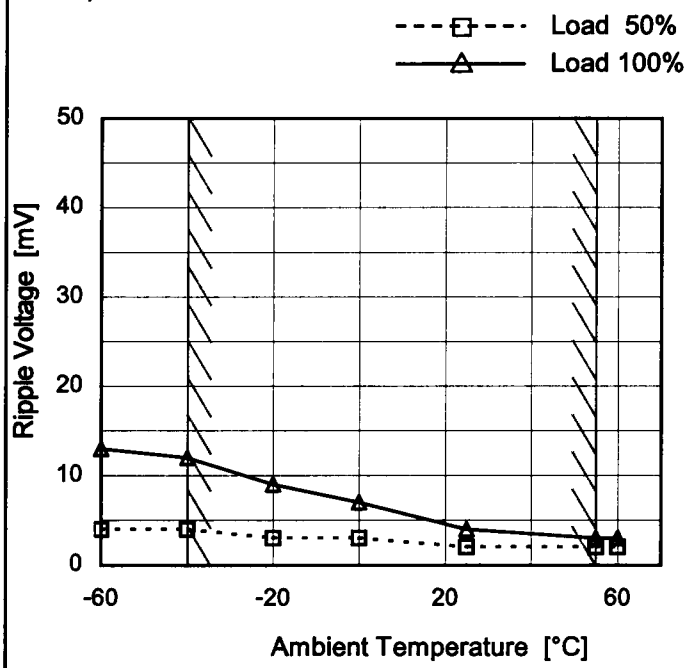
Load Current [A]	Ripple-Noise [mV] Input Volt. 4.5 [V]	Ripple-Noise [mV] Input Volt. 9 [V]
0.00	14	16
0.02	15	17
0.04	16	18
0.06	16	19
0.08	17	19
0.10	17	19
0.11	17	19
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW30515
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.1A

Testing Circuitry Figure B

1.Graph



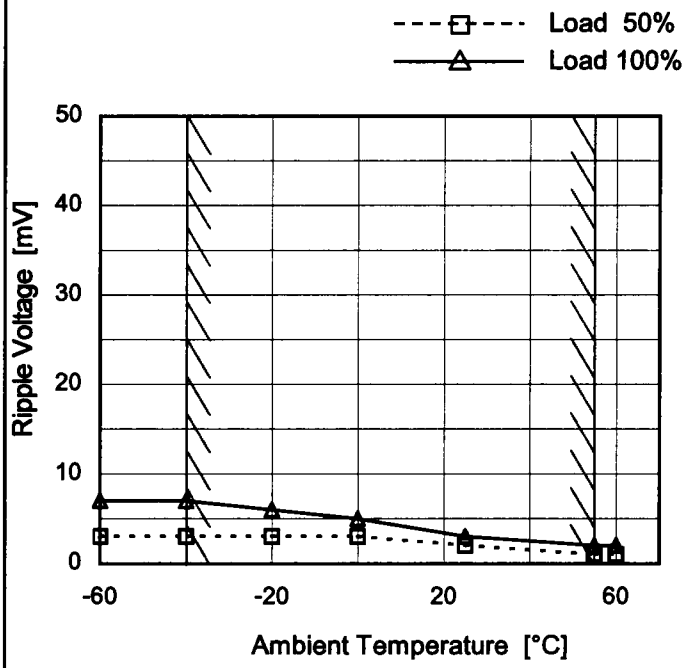
Input Volt. 5V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	4	13
-40	4	12
-20	3	9
0	3	7
25	2	4
55	2	3
60	2	3
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V0.1A

1.Graph



Input Volt. 5V

Measured by 100 MHz Oscilloscope.

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

2.Values

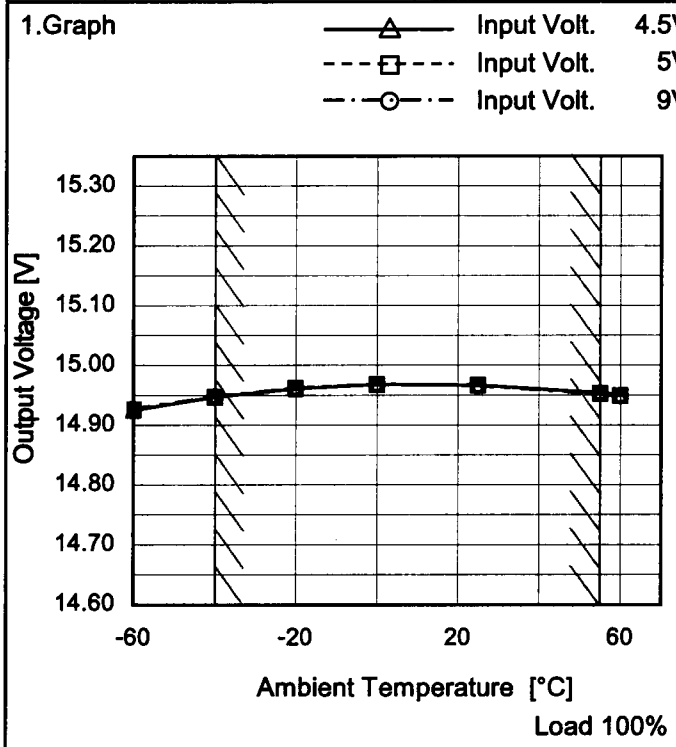
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	3	7
-40	3	7
-20	3	6
0	3	5
25	2	3
55	1	2
60	1	2
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW30515
Item	Ambient Temperature Drift
Object	+15V0.1A

Testing Circuitry Figure A

1.Graph

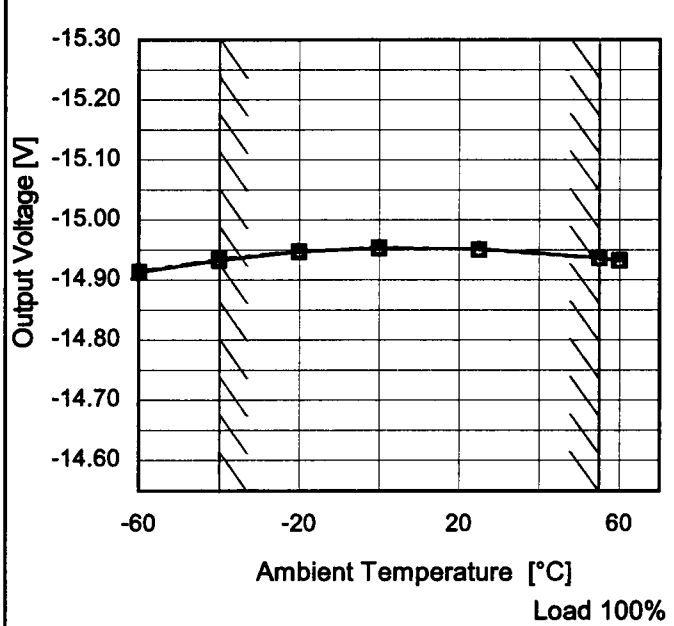


2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	14.925	14.926	14.927
-40	14.947	14.947	14.948
-20	14.961	14.962	14.962
0	14.968	14.968	14.968
25	14.967	14.967	14.966
55	14.954	14.953	14.952
60	14.950	14.949	14.948
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V0.1A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	-14.913	-14.914	-14.914
-40	-14.933	-14.934	-14.935
-20	-14.947	-14.947	-14.948
0	-14.953	-14.954	-14.953
25	-14.952	-14.951	-14.951
55	-14.937	-14.937	-14.936
60	-14.933	-14.933	-14.932
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUW30515	
Item	Output Voltage Accuracy	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 - 55°C
Input Voltage : 4.5 - 9V
Load Current (AVR 1) : 0 - 0.1A (AVR 2):0 - 0.1A
* Other Output : Rated Load

* 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

Object	+15V0.1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	4.5	0	15.203	±128	±0.9
Minimum Voltage	-40	4.5	0.1	14.947		

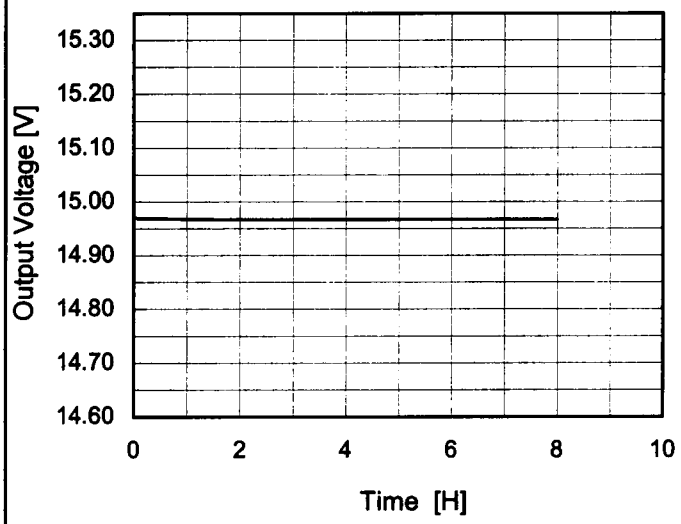
Object	-15V0.1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	4.5	0	-15.194	±131	±0.9
Minimum Voltage	-40	4.5	0.1	-14.933		

COSEL

Model	SUW30515
Item	Time Lapse Drift
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



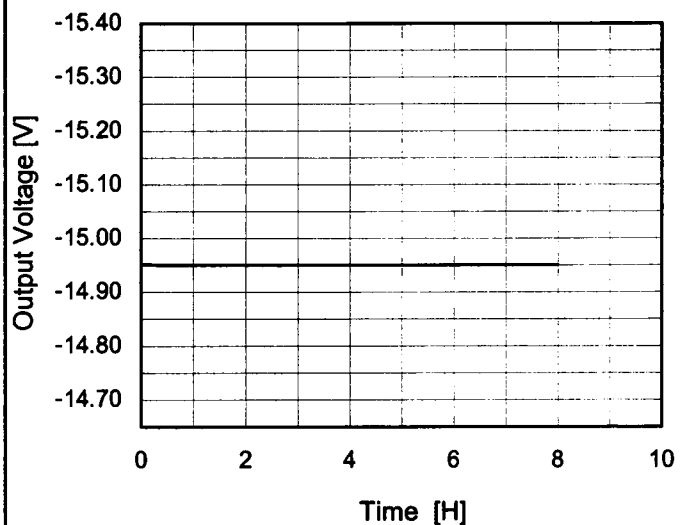
Input Volt. 5V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	14.971
0.5	14.969
1.0	14.968
2.0	14.967
3.0	14.967
4.0	14.967
5.0	14.967
6.0	14.967
7.0	14.967
8.0	14.967

Object	-15V0.1A

1.Graph



Input Volt. 5V
Load 100%

2.Values

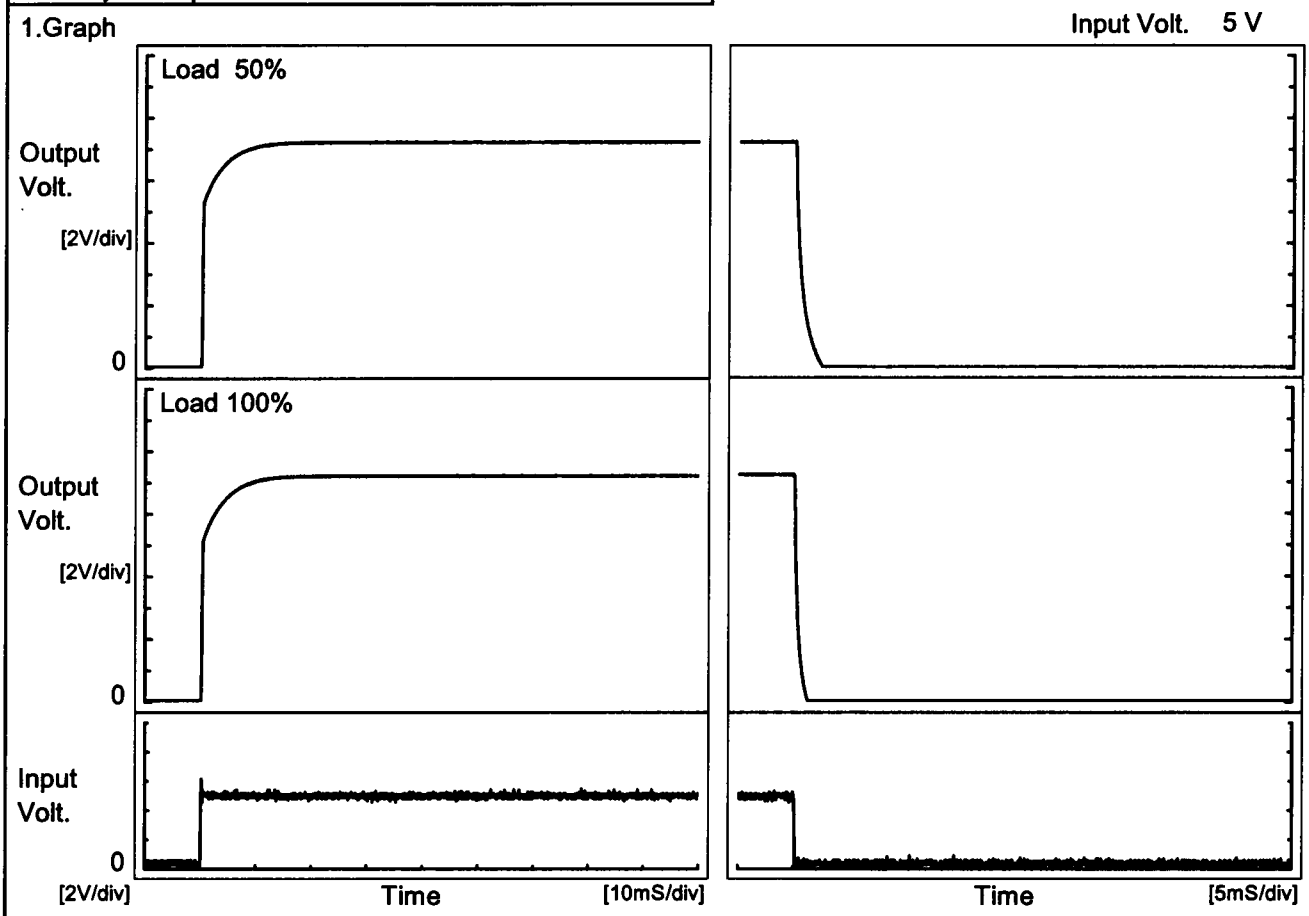
Time since start [H]	Output Voltage [V]
0.0	-14.953
0.5	-14.951
1.0	-14.951
2.0	-14.951
3.0	-14.951
4.0	-14.951
5.0	-14.951
6.0	-14.951
7.0	-14.951
8.0	-14.951

COSEL

Model	SUW30515
Item	Rise and Fall Time
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

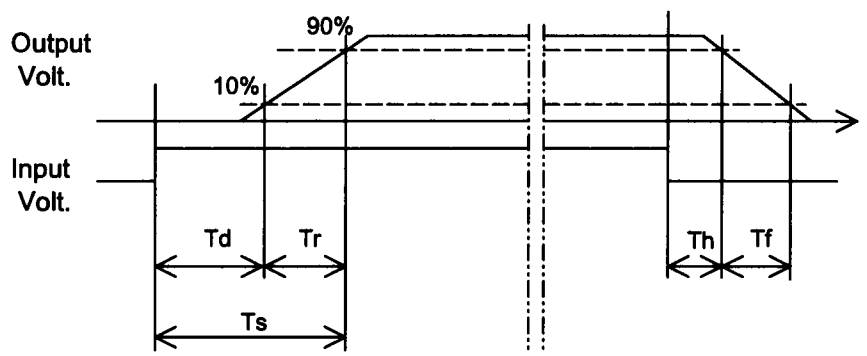
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.2	6.1	6.3	0.1	1.5
100 %	0.2	6.5	6.7	0.1	0.8

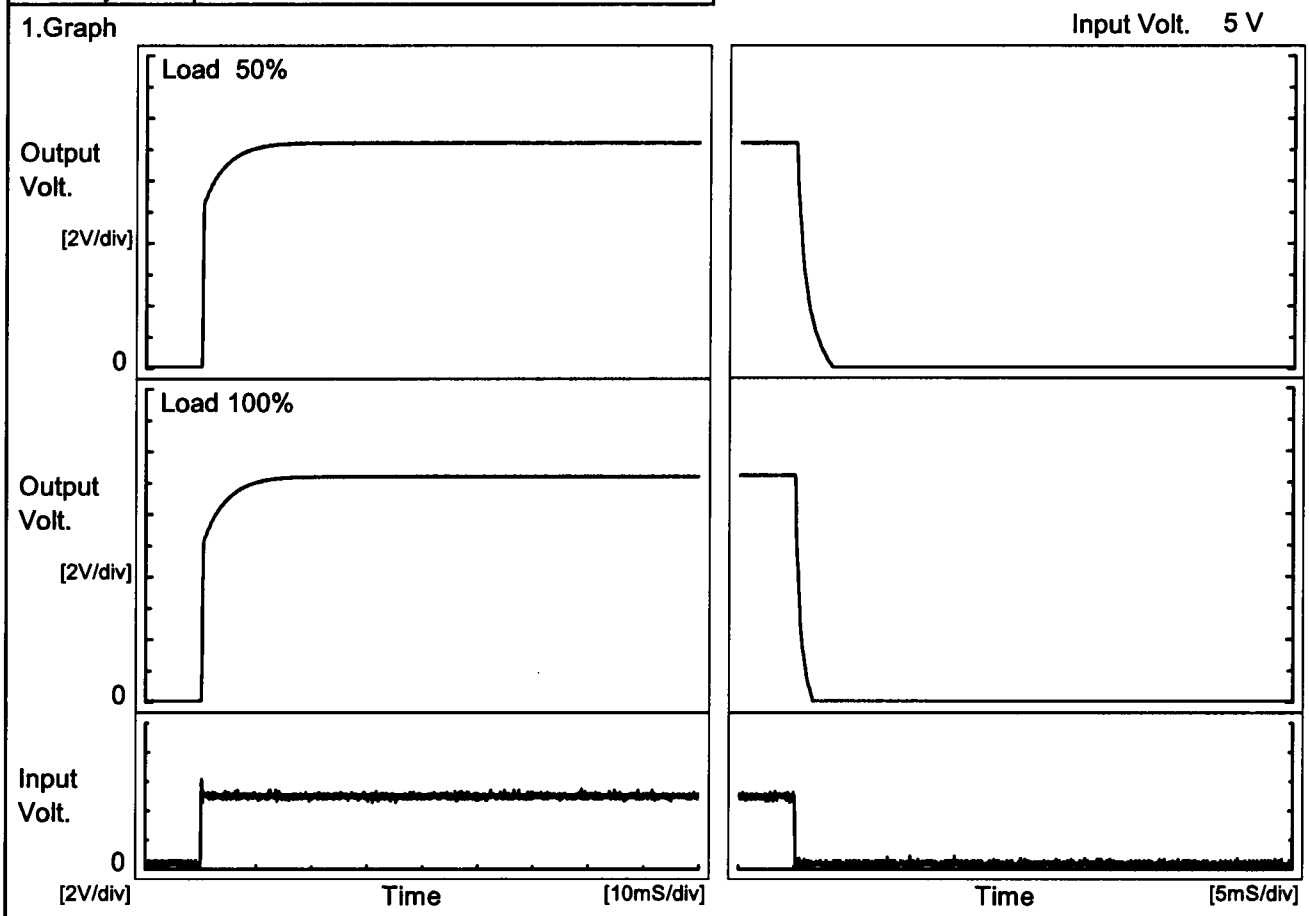


COSEL

Model	SUW30515
Item	Rise and Fall Time
Object	-15V0.1A

Temperature 25°C
Testing Circuitry Figure A

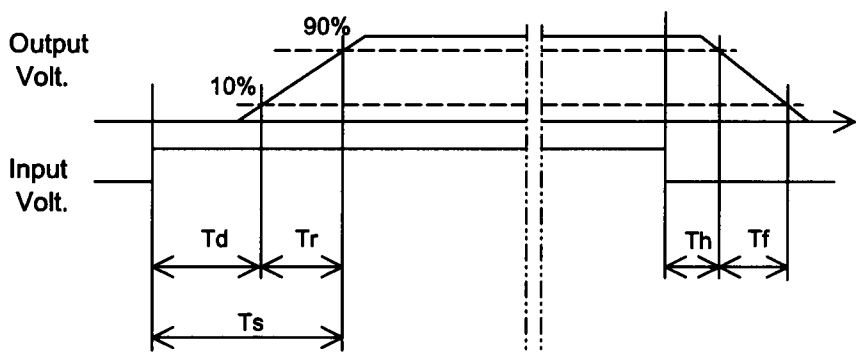
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.2	6.4	6.6	0.1	2.1
100 %	0.2	6.8	7.0	0.1	1.1

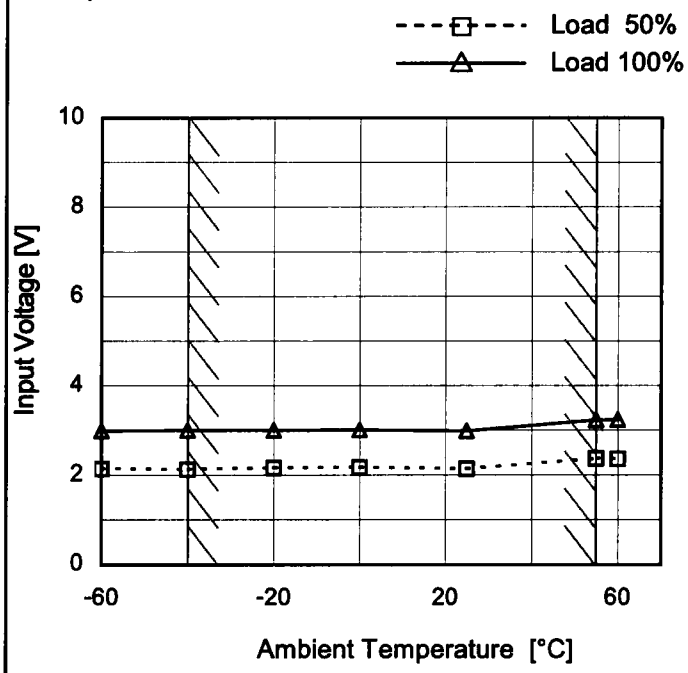


COSEL

Model	SUW30515
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.1A

Testing Circuitry Figure A

1.Graph

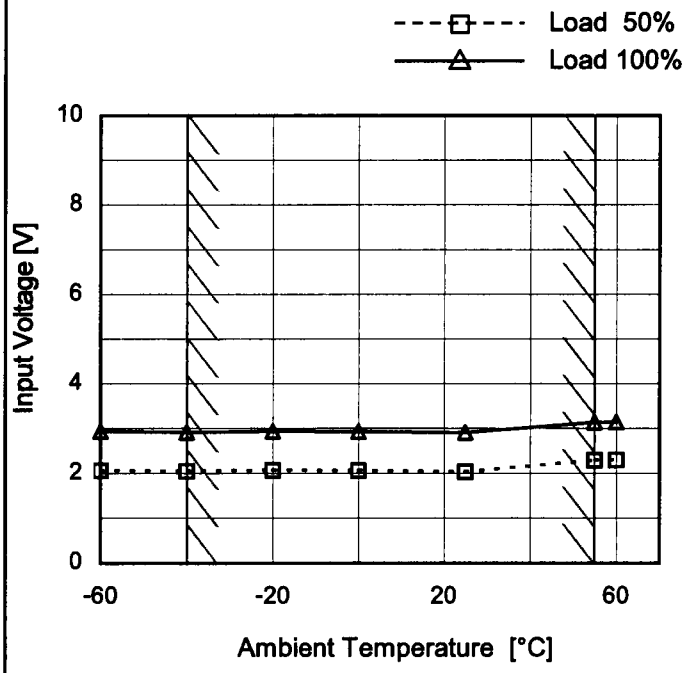


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	2.2	3.0
-40	2.2	3.0
-20	2.2	3.0
0	2.2	3.1
25	2.2	3.0
55	2.4	3.3
60	2.4	3.3
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V0.1A

1.Graph



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

2.Values

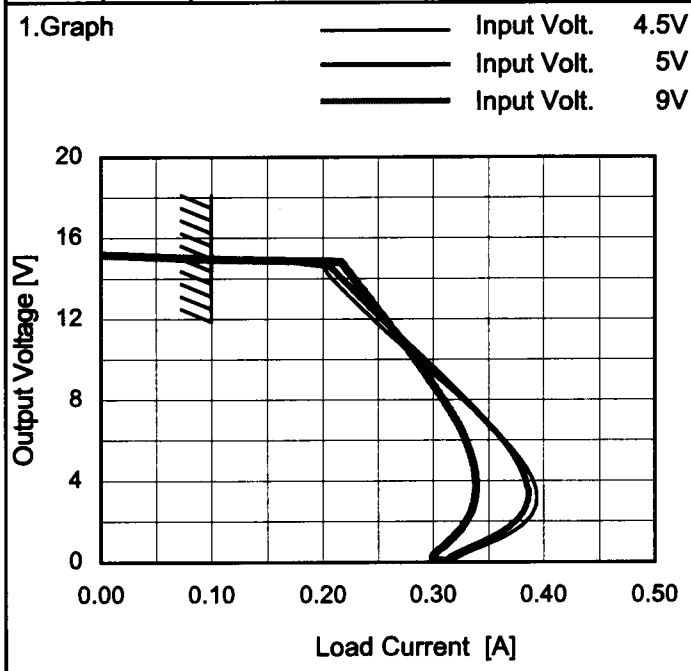
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	2.1	3.0
-40	2.1	3.0
-20	2.1	3.0
0	2.1	3.0
25	2.1	3.0
55	2.3	3.2
60	2.3	3.2
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW30515
Item	Overcurrent Protection
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

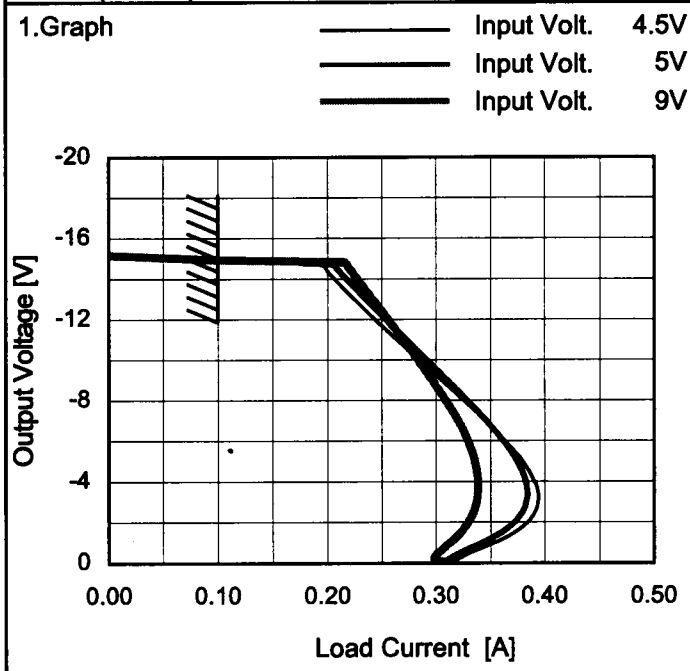


2.Values

Output Voltage [V]	Load Current [A] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
15.0	0.10	0.10	0.10
14.3	0.20	0.21	0.22
13.5	0.22	0.23	0.24
12.0	0.25	0.25	0.26
10.5	0.28	0.28	0.28
9.0	0.31	0.31	0.30
7.5	0.34	0.34	0.31
6.0	0.37	0.36	0.33
4.5	0.39	0.38	0.34
3.0	0.39	0.39	0.34
1.5	0.37	0.36	0.32
0.0	0.32	0.31	0.32

Object	-15V0.1A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-15.0	0.10	0.10	0.10
-14.3	0.20	0.21	0.22
-13.5	0.22	0.23	0.23
-12.0	0.25	0.25	0.26
-10.5	0.27	0.28	0.28
-9.0	0.30	0.31	0.30
-7.5	0.34	0.34	0.32
-6.0	0.36	0.36	0.33
-4.5	0.39	0.38	0.34
-3.0	0.39	0.38	0.34
-1.5	0.37	0.36	0.32
0.0	0.32	0.31	0.32

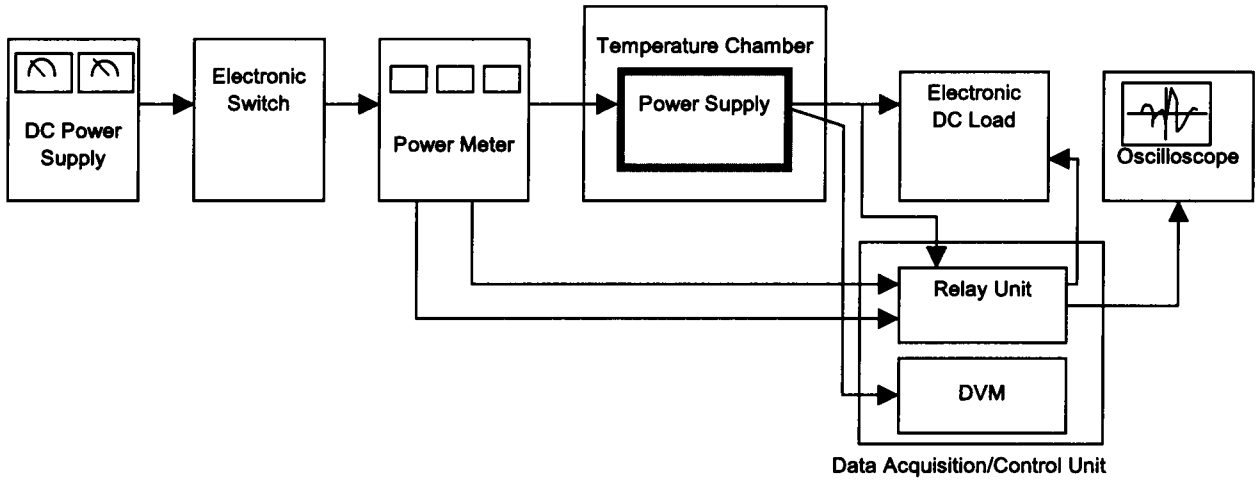


Figure A

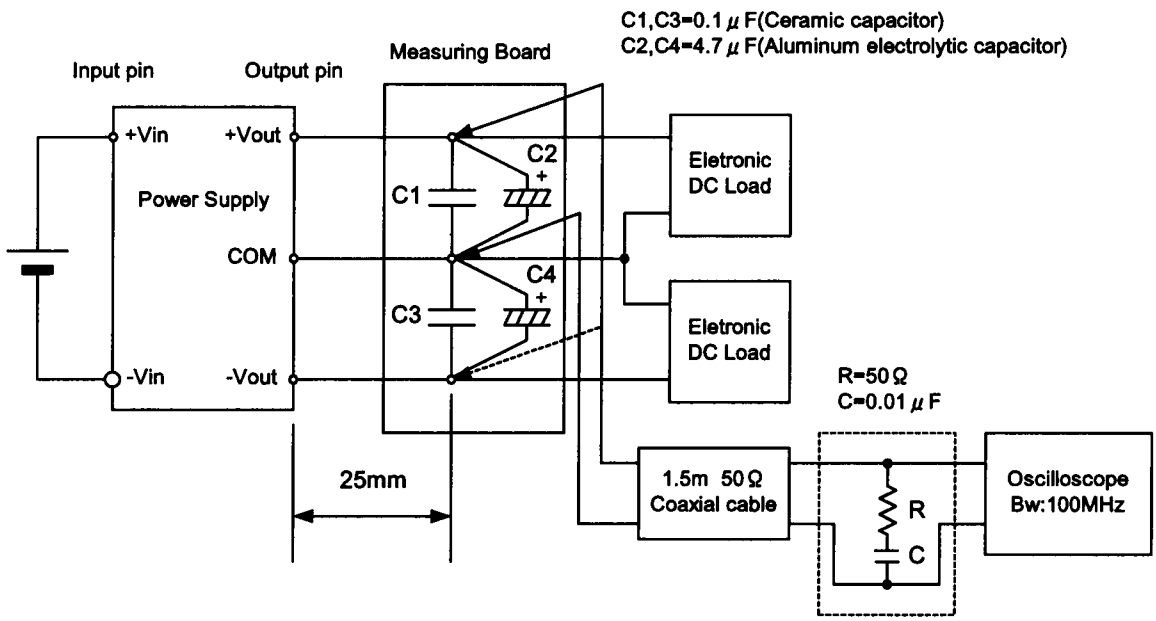


Figure B (Ripple and Ripple noise Characteristic)