COSEL

参考資料

TEST DATA OF SUW1R50515

Regulated DC Power Supply
Sep 14, 2004

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COSEL CO.,LTD.

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CONTENTS

1.Input Current (by Input Voltage) 1
2.Input Current (by Load Current) 2
3.Input Power (by Load Current) 3
4.Efficiency (by Input Voltage) 4
5.Efficiency (by Load Current) 5
6.Line Regulation 6
7.Load Regulation 7
8.Dynamic Load Response 8
9.Ripple Voltage (by Load Current) 10
10.Ripple-Noise 12
11.Ripple Voltage (by Ambient Temperature) 14
12.Ambient Temperature Drift 15
13.Output Voltage Accuracy 16
14.Time Lapse Drift 17
15.Rise and Fall Time 18
16.Minimum Input Voltage for Regulated Output Voltage 20
17.Overcurrent Protection 21
18.Figure of Testing Circuitry 22
(Final Page 22)

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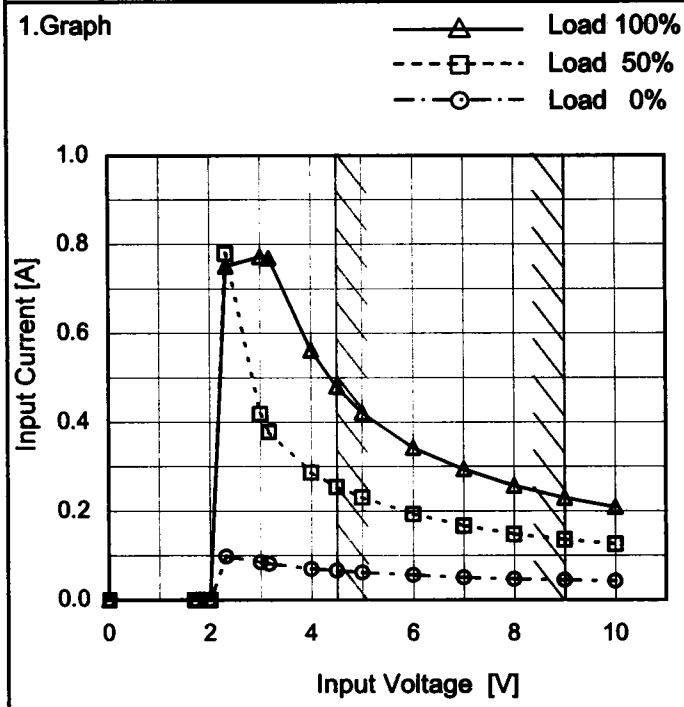
Model	SUW1R50515
Item	Input Current (by Input Voltage)
Object	————————

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
1.7	0.000	0.000	0.000
2.0	0.000	0.000	0.000
2.3	0.098	0.779	0.751
3.0	0.085	0.419	0.772
3.2	0.081	0.379	0.769
4.0	0.070	0.287	0.562
4.5	0.066	0.254	0.481
5.0	0.062	0.230	0.422
6.0	0.056	0.193	0.343
7.0	0.051	0.166	0.294
8.0	0.047	0.148	0.258
9.0	0.044	0.136	0.230
10.0	0.043	0.126	0.209
—	-	-	-
—	-	-	-

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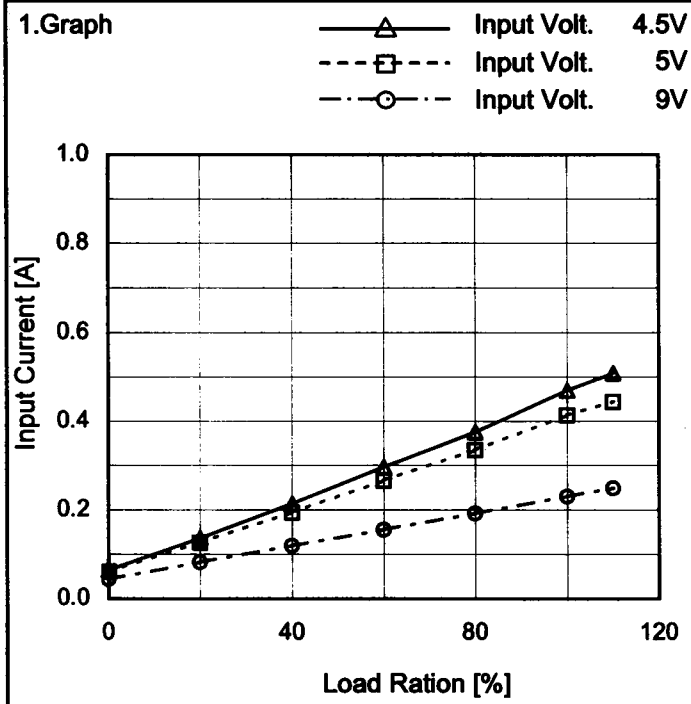
Model	SUW1R50515
Item	Input Current (by Load Current)
Object	———————

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	0.064	0.061	0.044
20	0.137	0.126	0.082
40	0.214	0.194	0.119
60	0.297	0.266	0.155
80	0.376	0.335	0.192
100	0.470	0.414	0.230
110	0.509	0.444	0.249
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

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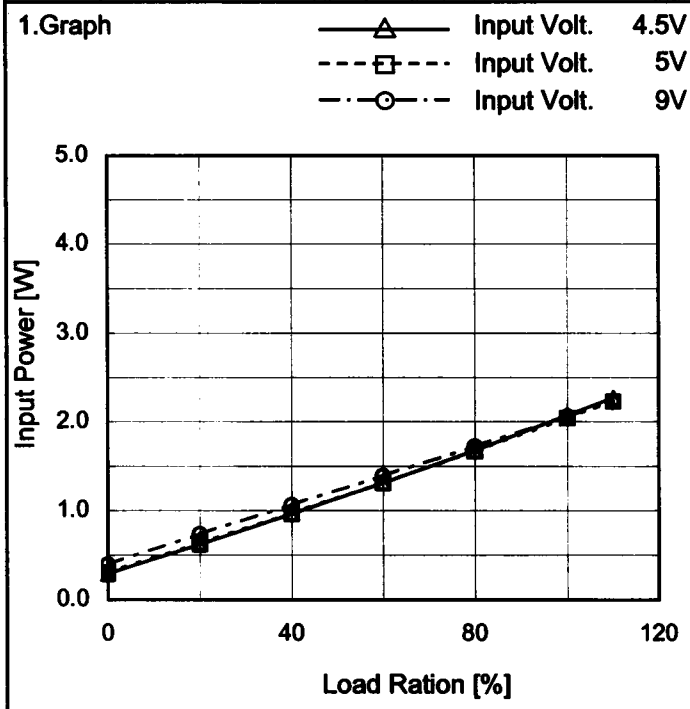
Model	SUW1R50515
Item	Input Power (by Load Current)
Object	———————

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	0.29	0.30	0.40
20	0.62	0.64	0.73
40	0.96	0.97	1.06
60	1.32	1.31	1.39
80	1.68	1.67	1.72
100	2.07	2.04	2.06
110	2.27	2.23	2.22
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

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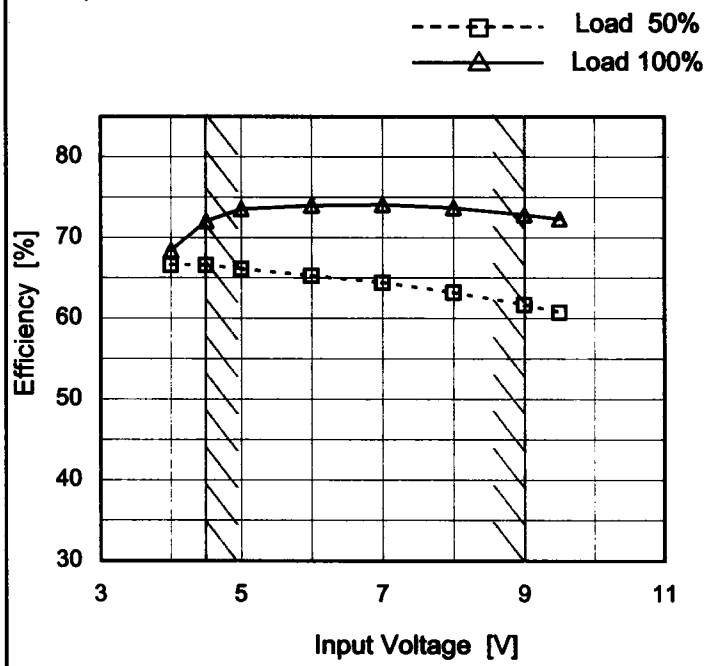
Model	SUW1R50515
Item	Efficiency (by Input Voltage)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

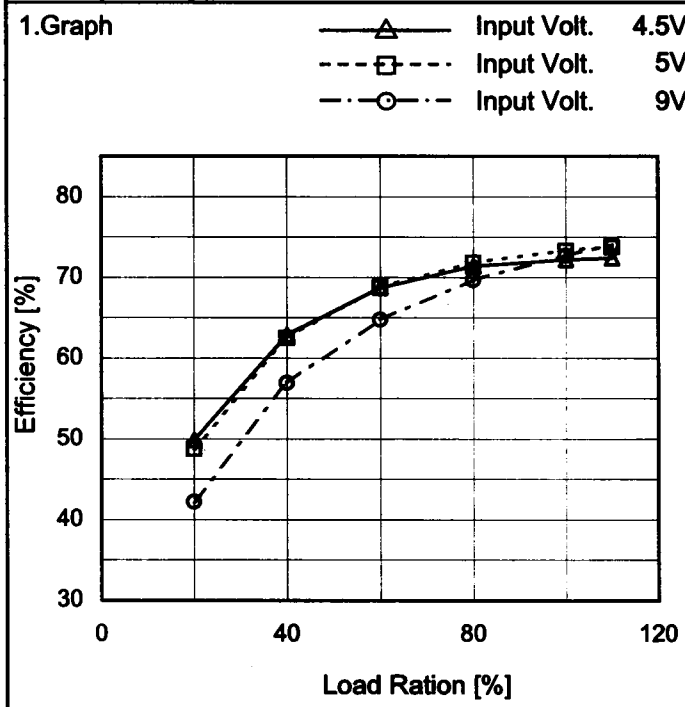
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
4.0	66.6	68.4
4.5	66.6	72.0
5.0	66.1	73.5
6.0	65.3	74.0
7.0	64.4	74.1
8.0	63.2	73.7
9.0	61.7	72.8
9.5	60.7	72.3
—	-	-

COSEL

Model	SUW1R50515
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	49.9	48.8	42.2
40	62.9	62.5	57.0
60	68.7	68.8	64.8
80	71.4	71.8	69.7
100	72.2	73.4	72.7
110	72.4	73.8	74.0
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

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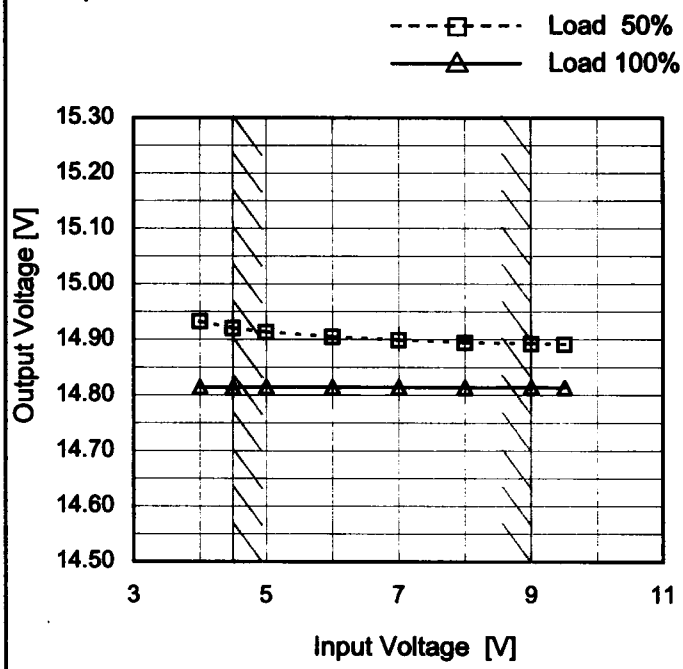
Model	SUW1R50515
Item	Line Regulation
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

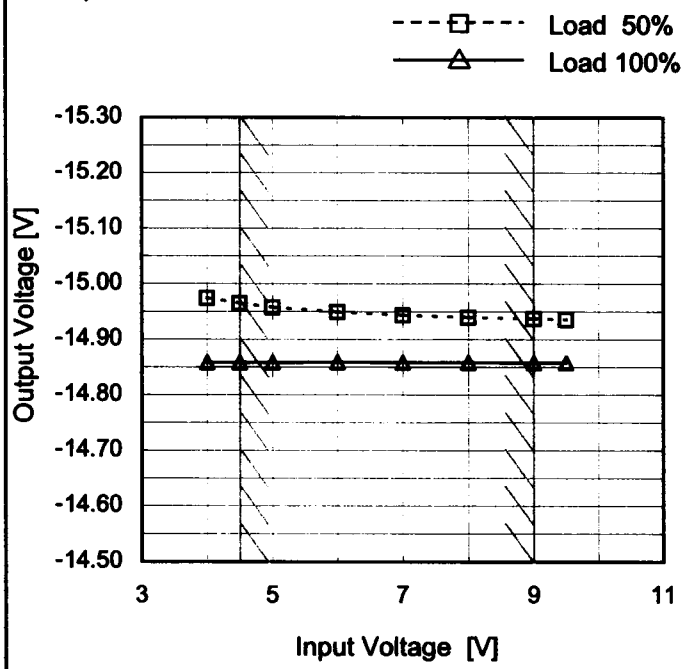


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	14.932	14.814
4.5	14.920	14.814
5.0	14.913	14.815
6.0	14.905	14.814
7.0	14.899	14.814
8.0	14.895	14.814
9.0	14.892	14.814
9.5	14.891	14.814
--	-	-

Object	-15V0.05A

1.Graph



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

2.Values

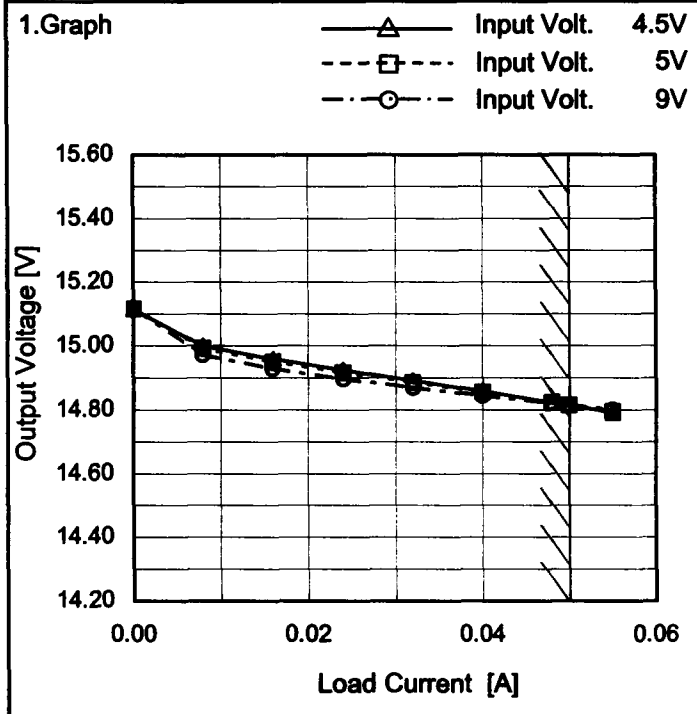
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	-14.974	-14.859
4.5	-14.965	-14.859
5.0	-14.957	-14.858
6.0	-14.949	-14.859
7.0	-14.944	-14.859
8.0	-14.940	-14.858
9.0	-14.937	-14.858
9.5	-14.936	-14.858
--	-	-

COSEL

Model	SUW1R50515
Item	Load Regulation
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

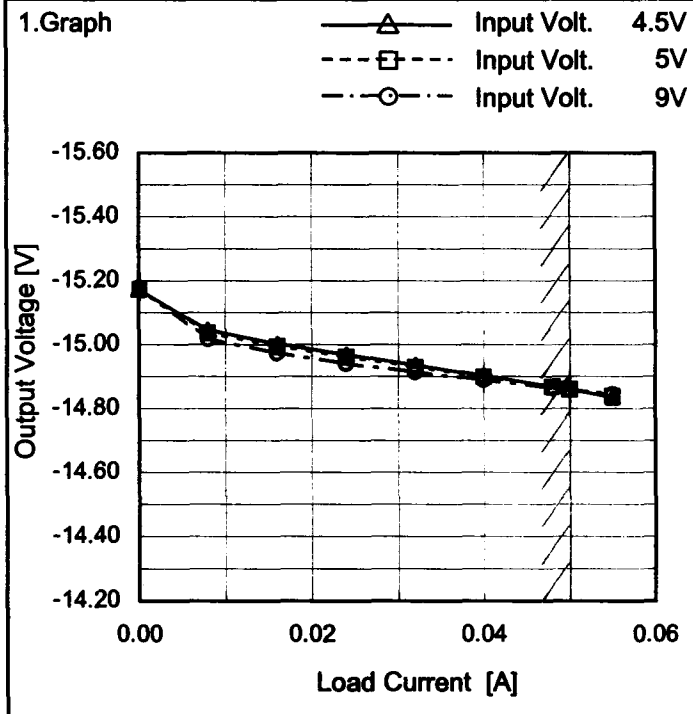


2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.000	15.117	15.118	15.119
0.008	15.000	14.992	14.972
0.016	14.959	14.951	14.928
0.024	14.925	14.917	14.896
0.032	14.892	14.886	14.869
0.040	14.859	14.856	14.844
0.048	14.824	14.824	14.821
0.050	14.816	14.816	14.815
0.055	14.792	14.795	14.801
–	-	-	-
–	-	-	-

Object	-15V0.05A

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]
0.000	-15.173	-15.173	-15.179
0.008	-15.046	-15.037	-15.018
0.016	-15.004	-14.995	-14.973
0.024	-14.970	-14.962	-14.941
0.032	-14.937	-14.931	-14.913
0.040	-14.904	-14.900	-14.888
0.048	-14.868	-14.868	-14.865
0.050	-14.860	-14.860	-14.859
0.055	-14.836	-14.840	-14.845
–	-	-	-
–	-	-	-

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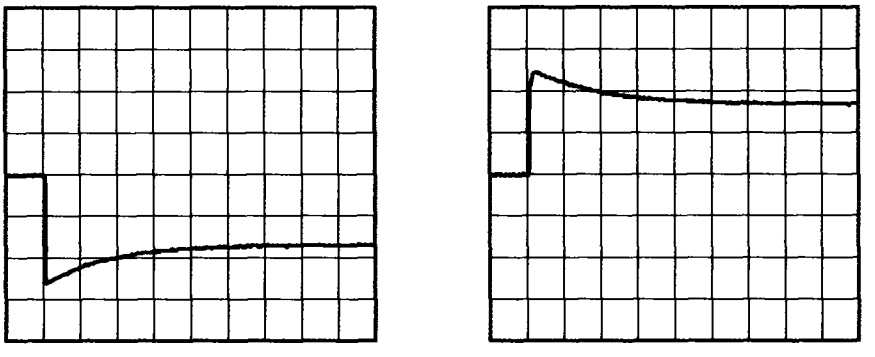
Model	SUW1R50515
Item	Dynamic Load Response
Object	+15V0.05A

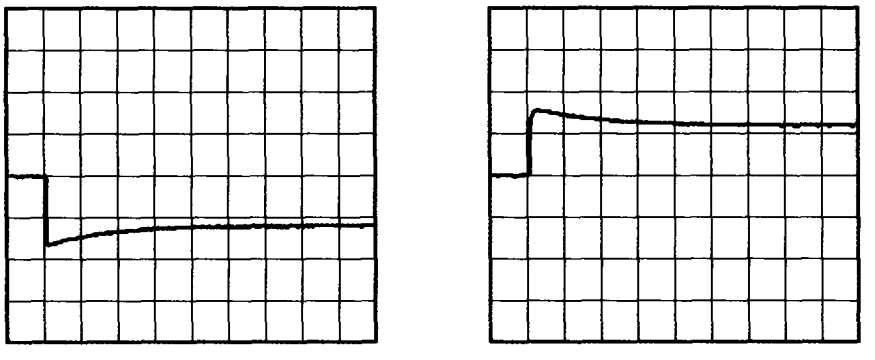
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 5 V
Cycle 100 mS

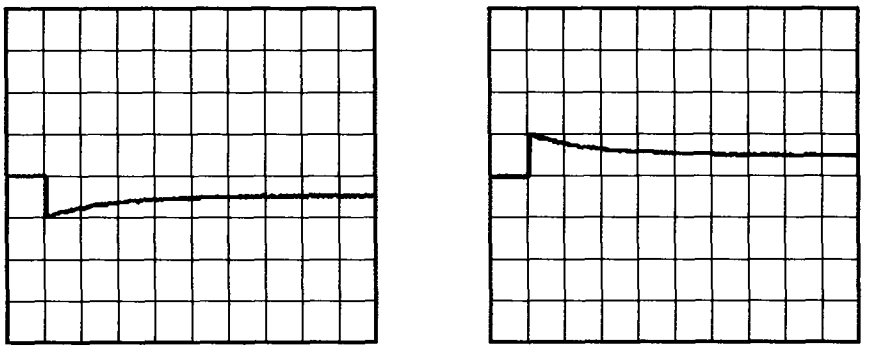
Min. Load (0A) ⟷
Load 100% (0.05A)



Min. Load (0A) ⟷
Load 50% (0.025A)



Load 50% (0.025A) ⟷
Load 100% (0.05A)



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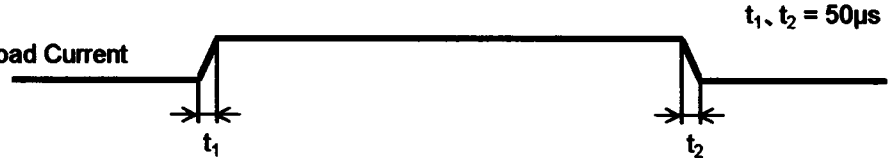
Model	SUW1R50515
Item	Dynamic Load Response
Object	-15V0.05A

Temperature 25°C
Testing Circuitry Figure A

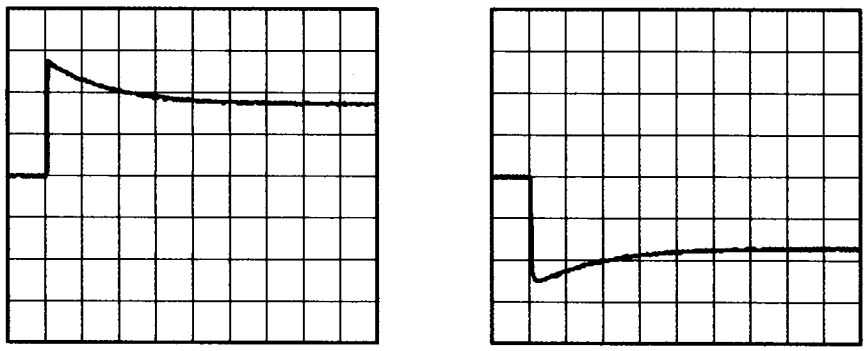
Input Volt. 5 V
Cycle 100 mS

t_1、t_2 = 50μs

Load Current



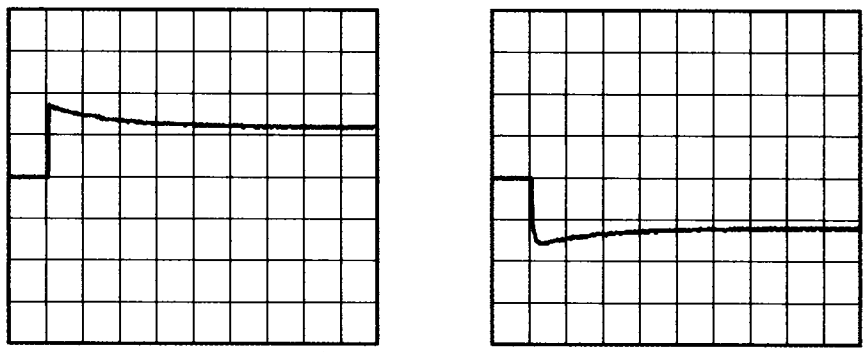
Min. Load (0A) ⟷
Load 100% (0.05A)



200mV/div

2ms/div 2ms/div

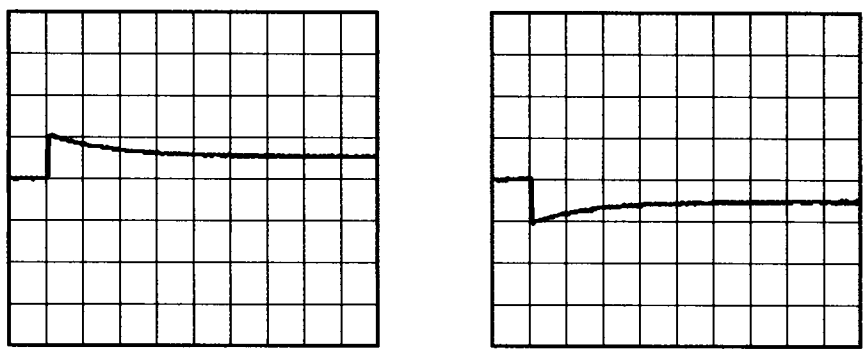
Min. Load (0A) ⟷
Load 50% (0.025A)



200mV/div

2ms/div 2ms/div

Load 50% (0.025A) ⟷
Load 100% (0.05A)



200mV/div

2ms/div 2ms/div

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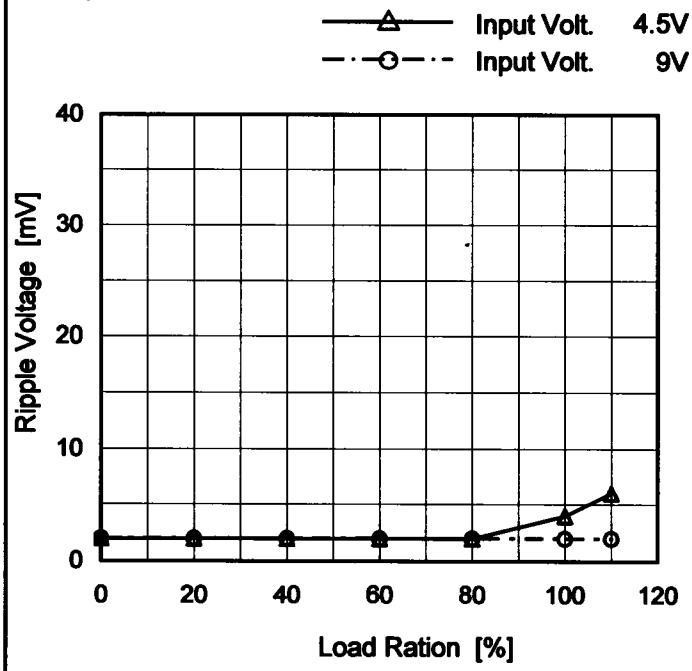
Model	SUW1R50515
Item	Ripple Voltage (by Load Current)
Object	+15V0.05A

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.

2.Values

Load Ration [%]	Ripple Voltage [mV] Input Volt. 4.5 [V]	Ripple Voltage [mV] Input Volt. 9 [V]
0	2	2
20	2	2
40	2	2
60	2	2
80	2	2
100	4	2
110	6	2
–	-	-
–	-	-
–	-	-
–	-	-

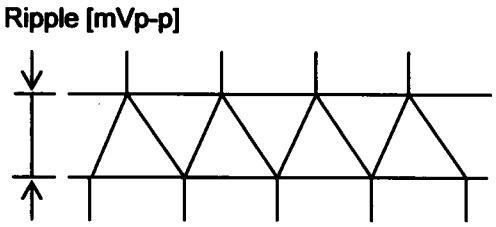


Fig.Complex Ripple Wave Form

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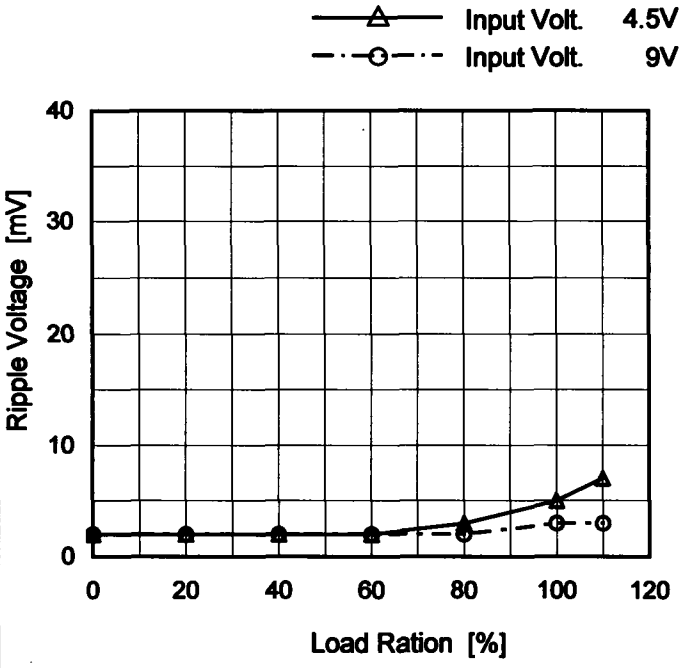
Model	SUW1R50515
Item	Ripple Voltage (by Load Current)
Object	-15V0.05A

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.

2.Values

Load Ration [%]	Ripple Voltage [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0	2	2
20	2	2
40	2	2
60	2	2
80	3	2
100	5	3
110	7	3
–	-	-
–	-	-
–	-	-
–	-	-

Ripple [mVp-p]

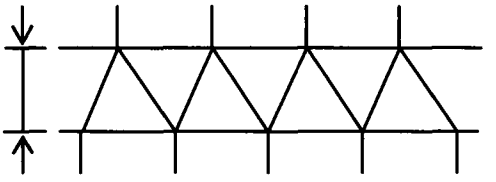


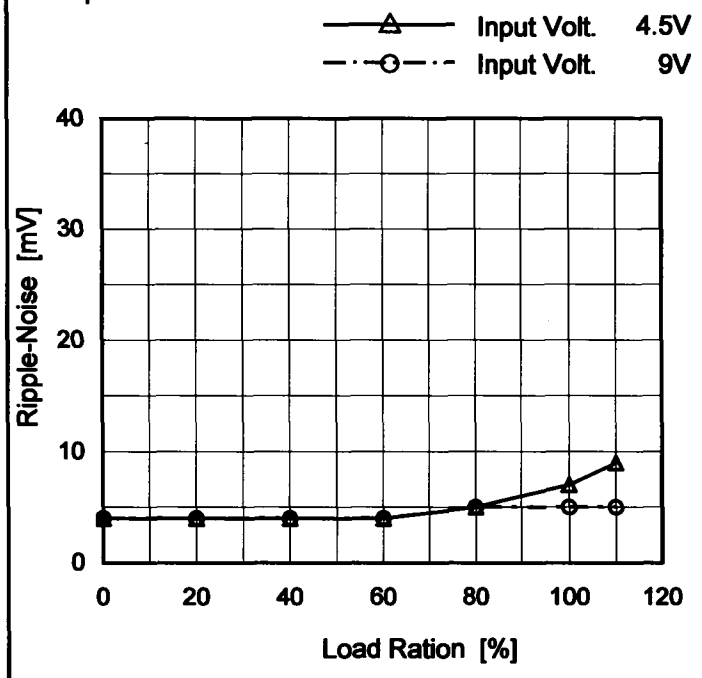
Fig.Complex Ripple Wave Form

COSEL

Model	SUW1R50515
Item	Ripple-Noise
Object	+15V0.05A

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.

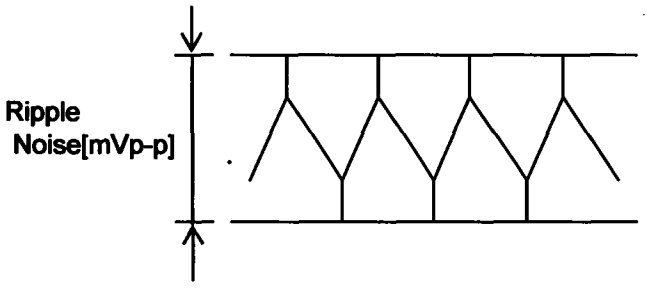


Fig.Complex Ripple Noise Wave Form

2.Values

Load Ration [%]	Ripple-Noise [mV] Input Volt. 4.5 [V]	Ripple-Noise [mV] Input Volt. 9 [V]
0	4	4
20	4	4
40	4	4
60	4	4
80	5	5
100	7	5
110	9	5
–	-	-
–	-	-
–	-	-
–	-	-

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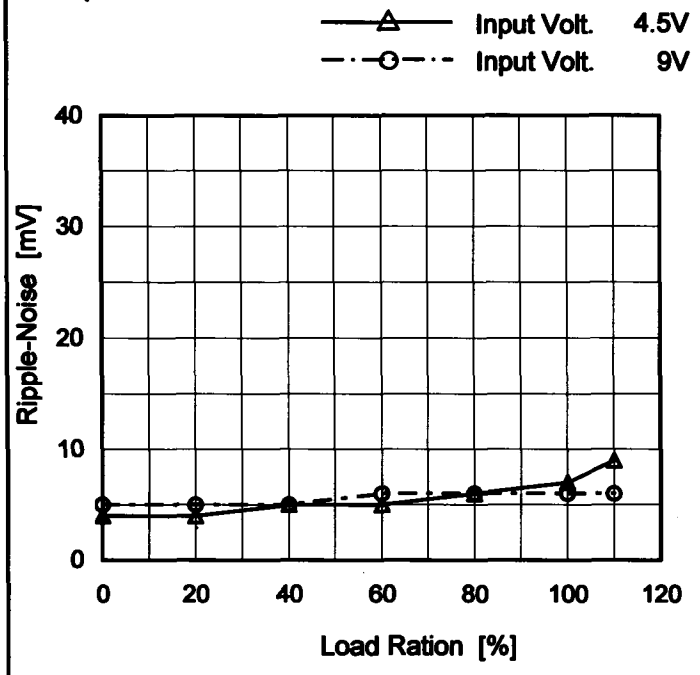
Model	SUW1R50515
Item	Ripple-Noise
Object	-15V0.05A

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.

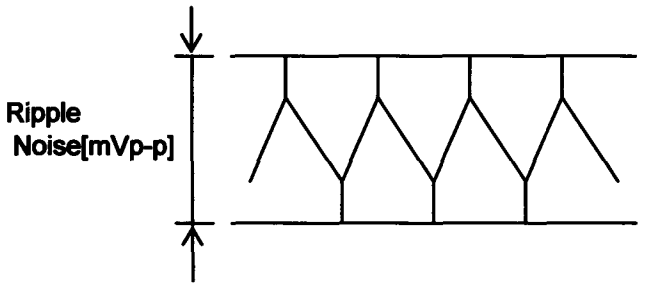


Fig.Complex Ripple Noise Wave Form

2.Values

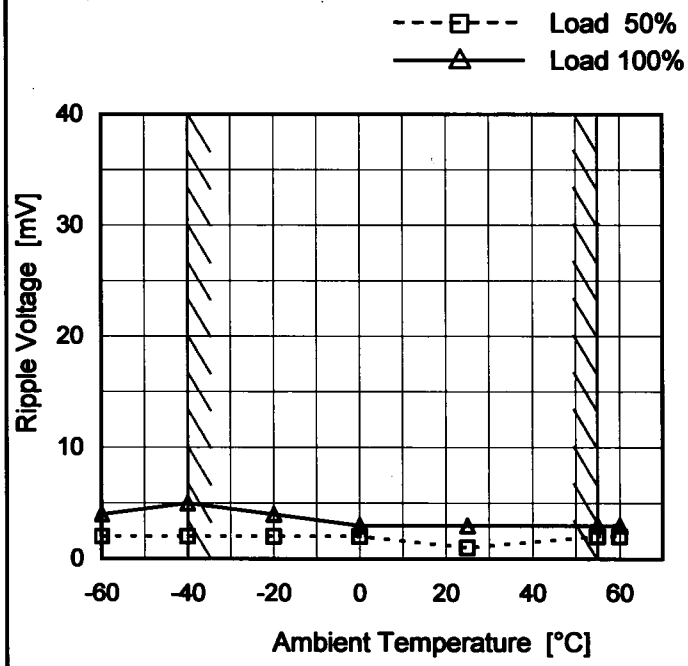
Load Ration [%]	Ripple-Noise [mV] Input Volt. 4.5 [V]	Ripple-Noise [mV] Input Volt. 9 [V]
0	4	5
20	4	5
40	5	5
60	5	6
80	6	6
100	7	6
110	9	6
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUW1R50515
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.05A

Testing Circuitry Figure B

1.Graph



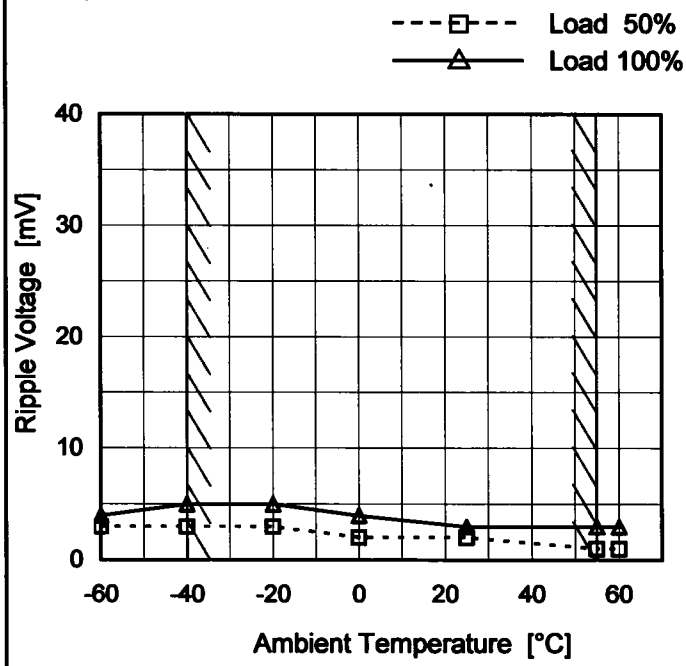
Input Volt. 5V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	2	4
-40	2	5
-20	2	4
0	2	3
25	1	3
55	2	3
60	2	3
—	-	-
—	-	-
—	-	-
—	-	-

Object	-15V0.05A

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	4
-40	3	5
-20	3	5
0	2	4
25	2	3
55	1	3
60	1	3
—	-	-
—	-	-
—	-	-
—	-	-

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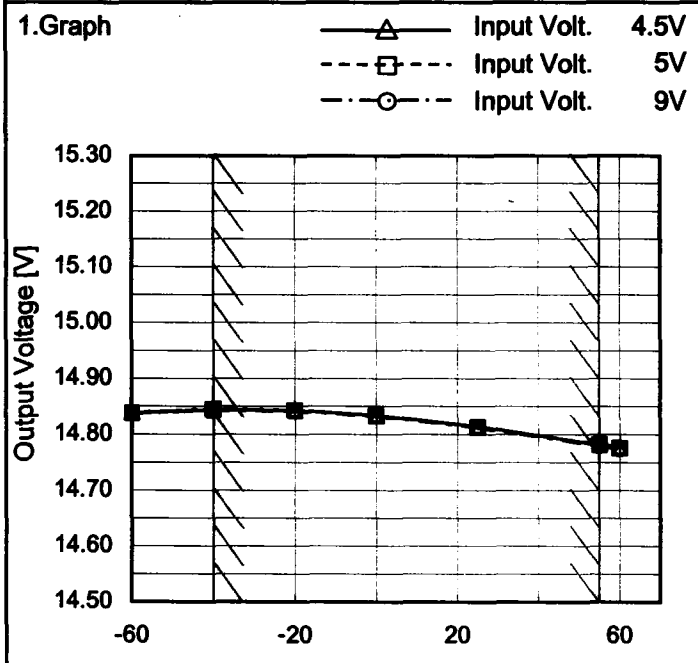
Model	SUW1R50515
Item	Ambient Temperature Drift
Object	+15V0.05A

Testing Circuitry Figure A

1.Graph

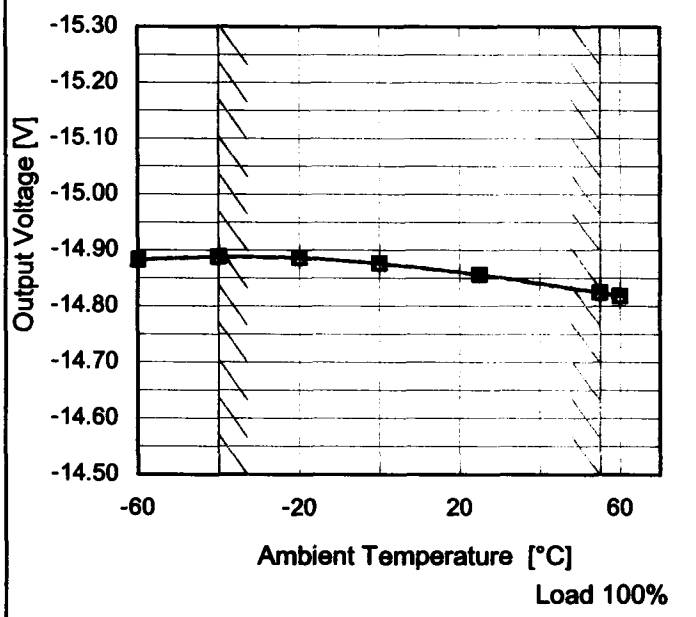


2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	14.838	14.838	14.837
-40	14.844	14.845	14.843
-20	14.843	14.843	14.841
0	14.834	14.833	14.832
25	14.814	14.813	14.812
55	14.782	14.782	14.779
60	14.777	14.776	14.774
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

Object	-15V0.05A

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	-14.883	-14.884	-14.882
-40	-14.889	-14.889	-14.888
-20	-14.887	-14.887	-14.886
0	-14.877	-14.877	-14.876
25	-14.857	-14.857	-14.855
55	-14.825	-14.825	-14.823
60	-14.819	-14.819	-14.817
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

COSEL

Model	SUW1R50515	
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 - 0.05A (AVR 2):0 - 0.05A

* 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	+15V0.05A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-20	9	0	15.149	±185	±1.2
Minimum Voltage	55	9	0.05	14.779		

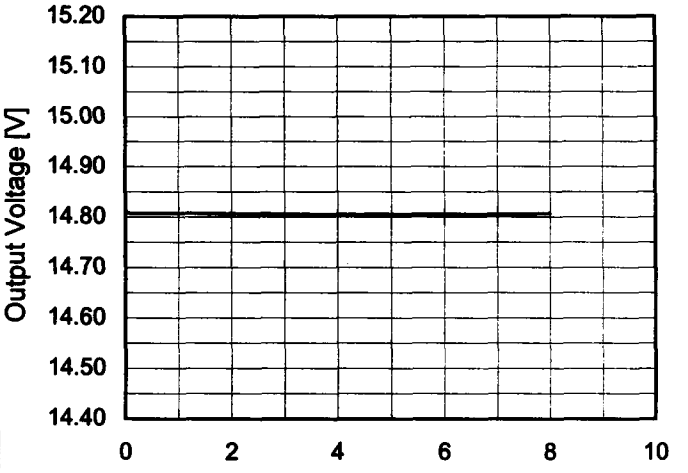
Object	-15V0.05A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-20	9	0	-15.212	±195	±1.3
Minimum Voltage	55	9	0.05	-14.823		

COSEL

Model	SUW1R50515
Item	Time Lapse Drift
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



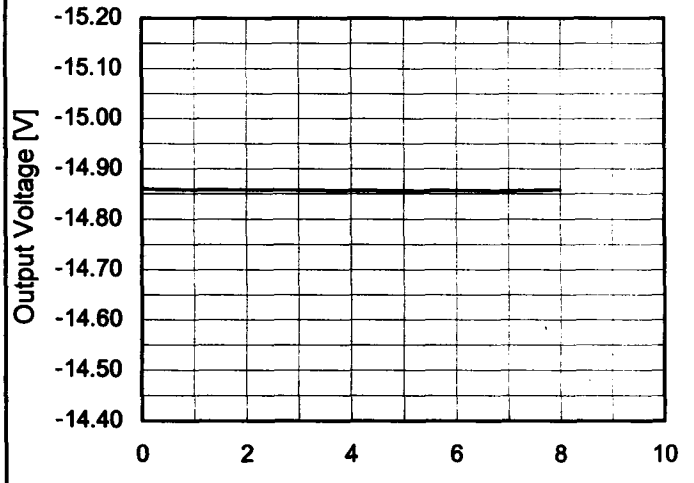
Input Volt. 5V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	14.819
0.5	14.807
1.0	14.807
2.0	14.807
3.0	14.806
4.0	14.805
5.0	14.805
6.0	14.806
7.0	14.806
8.0	14.807

Object	-15V0.05A

1.Graph



Input Volt. 5V
Load 100%

2.Values

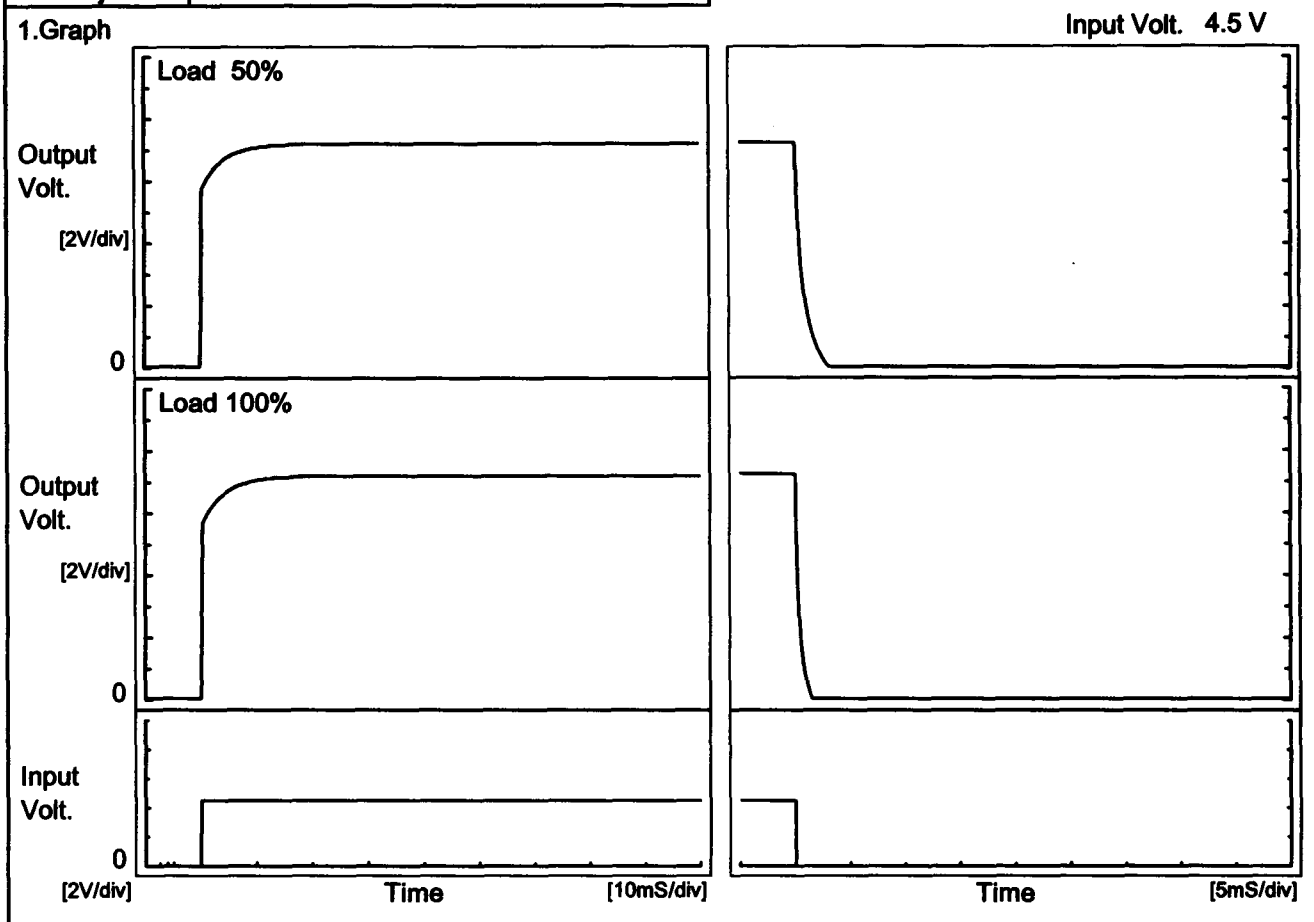
Time since start [H]	Output Voltage [V]
0.0	-14.868
0.5	-14.859
1.0	-14.859
2.0	-14.858
3.0	-14.858
4.0	-14.857
5.0	-14.857
6.0	-14.857
7.0	-14.857
8.0	-14.858

COSEL

Model	SUW1R50515
Item	Rise and Fall Time
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

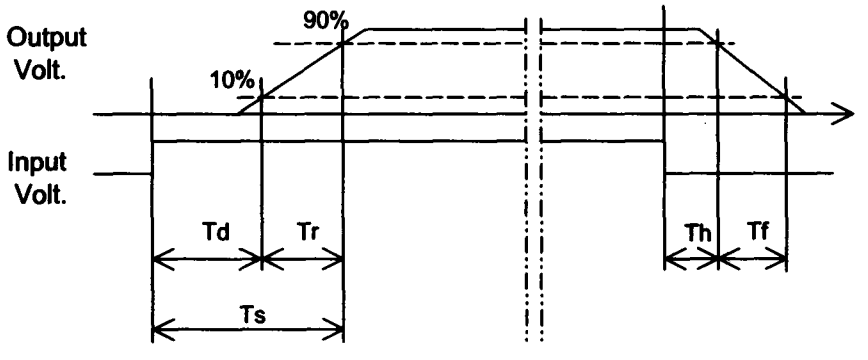
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	5.2	5.3	0.1	3.8
100 %	0.1	5.5	5.6	0.0	1.9



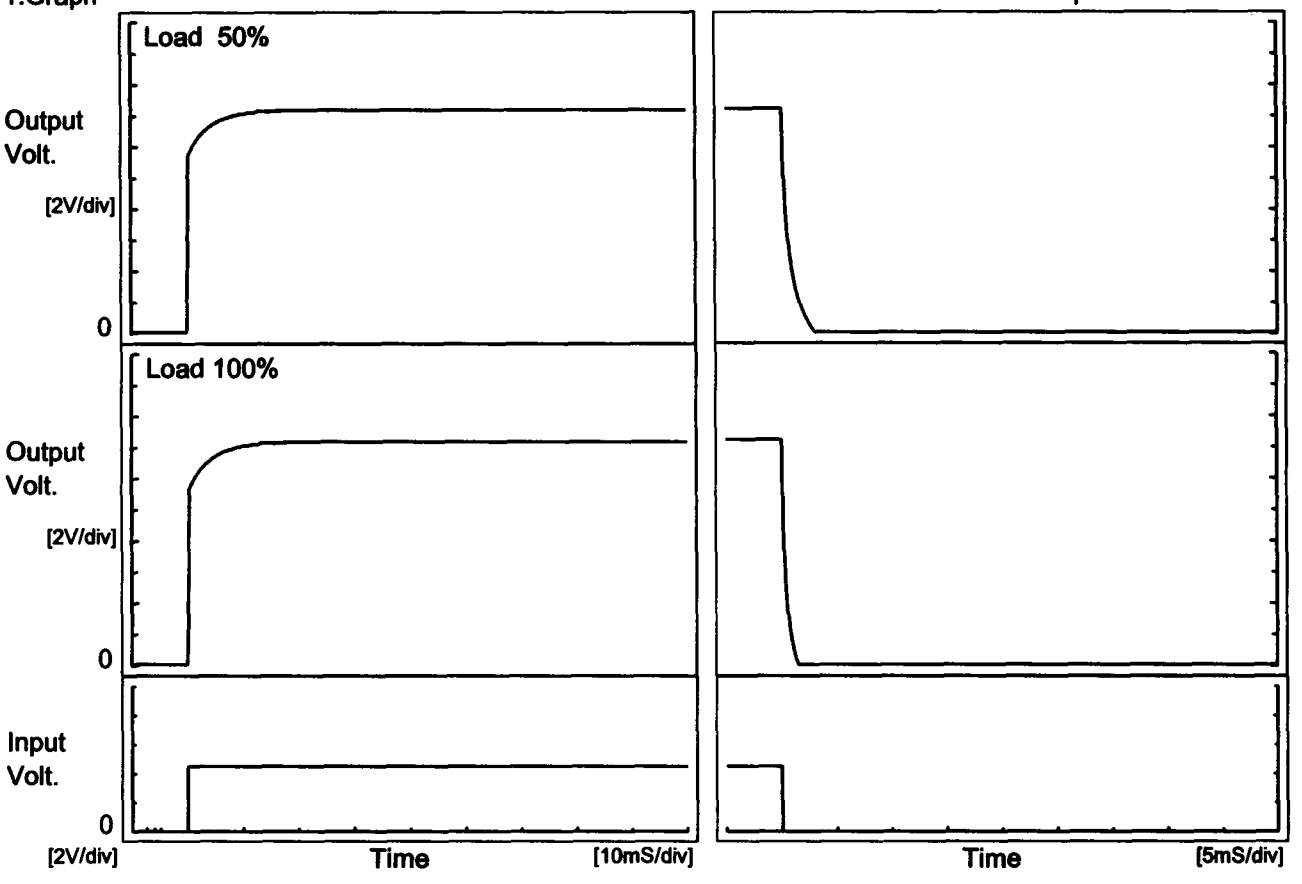
COSEL

Model	SUW1R50515
Item	Rise and Fall Time
Object	-15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

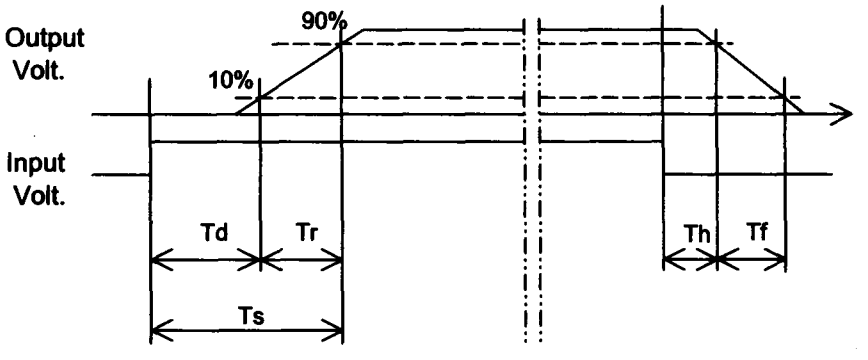
Input Volt. 4.5 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	5.2	5.3	0.1	3.8
100 %	0.1	5.5	5.6	0.0	1.9

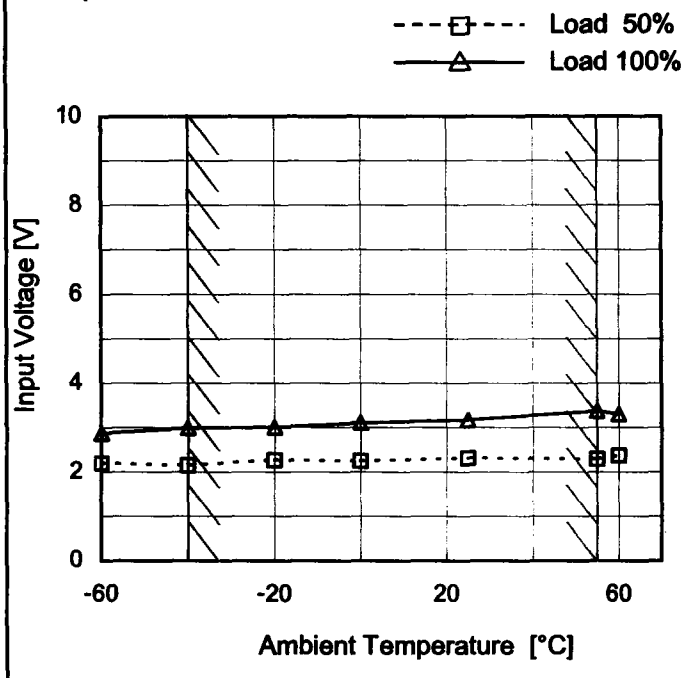


COSEL

Model	SUW1R50515
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.05A

Testing Circuitry Figure A

1.Graph

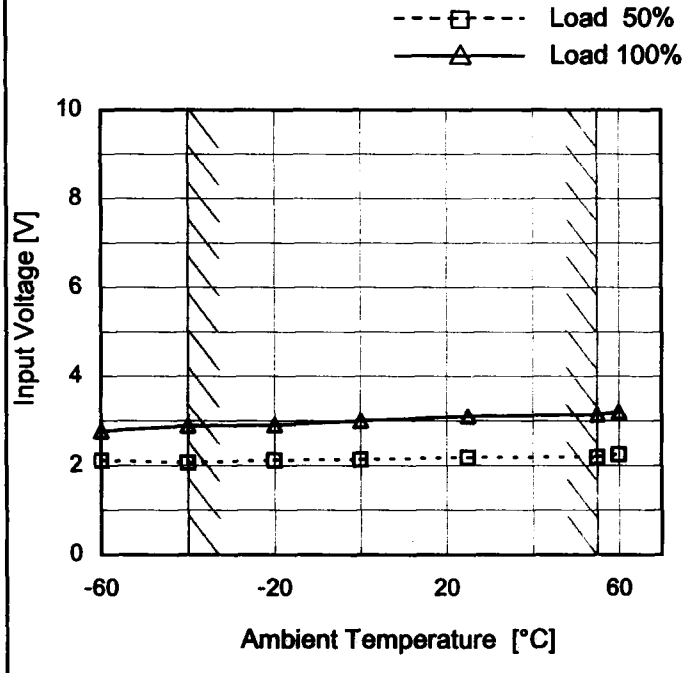


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	2.2	2.9
-40	2.2	3.0
-20	2.3	3.0
0	2.3	3.2
25	2.4	3.2
55	2.3	3.4
60	2.4	3.3
—	-	-
—	-	-
—	-	-
—	-	-

Object	-15V0.05A

1.Graph



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

2.Values

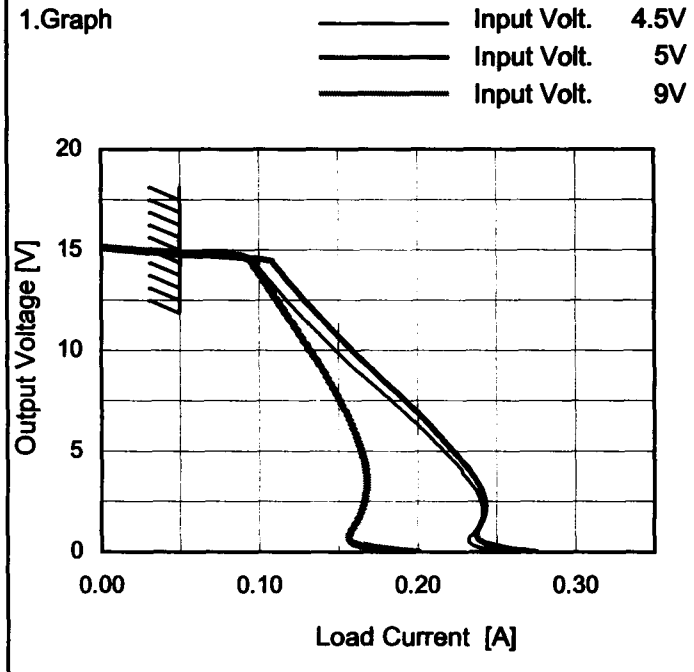
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	2.2	2.8
-40	2.1	2.9
-20	2.2	3.0
0	2.2	3.1
25	2.2	3.2
55	2.2	3.2
60	2.3	3.2
—	-	-
—	-	-
—	-	-
—	-	-

COSEL

Model	SUW1R50515
Item	Overcurrent Protection
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

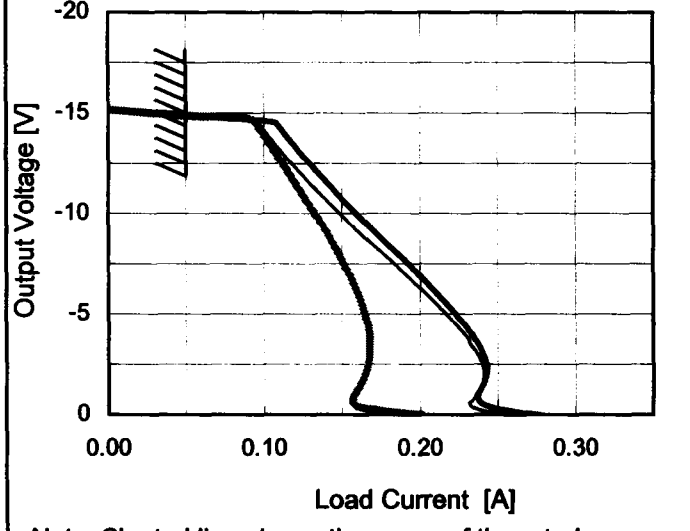


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
15.0	0.05	0.05	0.05
14.3	0.10	0.11	0.10
13.5	0.11	0.12	0.10
12.0	0.12	0.13	0.12
10.5	0.14	0.15	0.13
9.0	0.16	0.17	0.14
7.5	0.18	0.19	0.15
6.0	0.20	0.21	0.16
4.5	0.22	0.23	0.17
3.0	0.24	0.24	0.17
1.5	0.24	0.24	0.16
0.0	0.25	0.28	0.20

Object	-15V0.05A

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]
-15.00	0.05	0.05	0.05
-14.25	0.10	0.11	0.10
-13.50	0.11	0.12	0.10
-12.00	0.12	0.14	0.12
-10.50	0.14	0.15	0.13
-9.00	0.16	0.17	0.14
-7.50	0.18	0.19	0.15
-6.00	0.20	0.21	0.16
-4.50	0.22	0.23	0.17
-3.00	0.24	0.24	0.17
-1.50	0.24	0.24	0.16
0.00	0.25	0.28	0.20

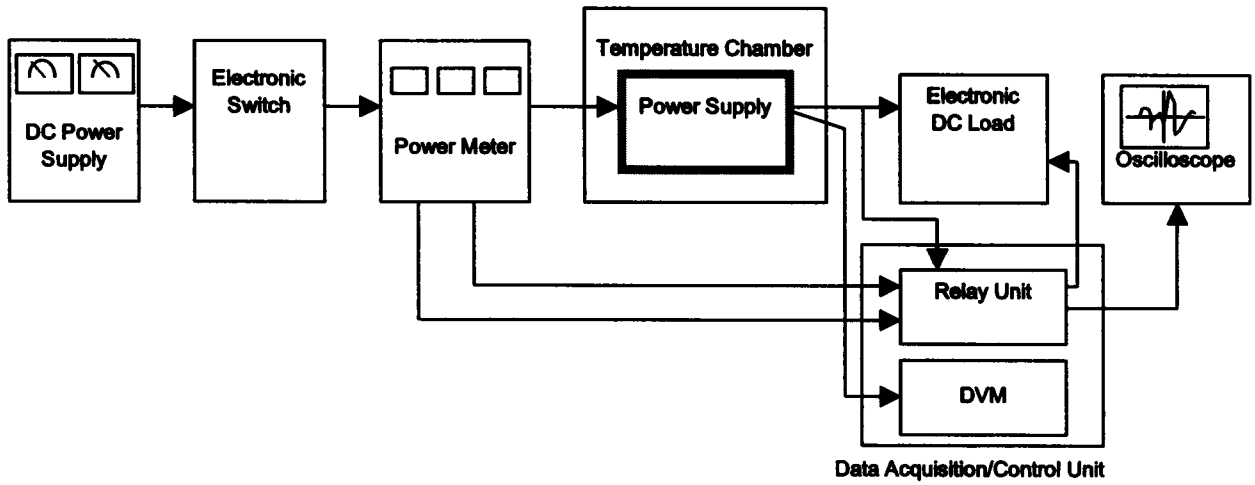


Figure A

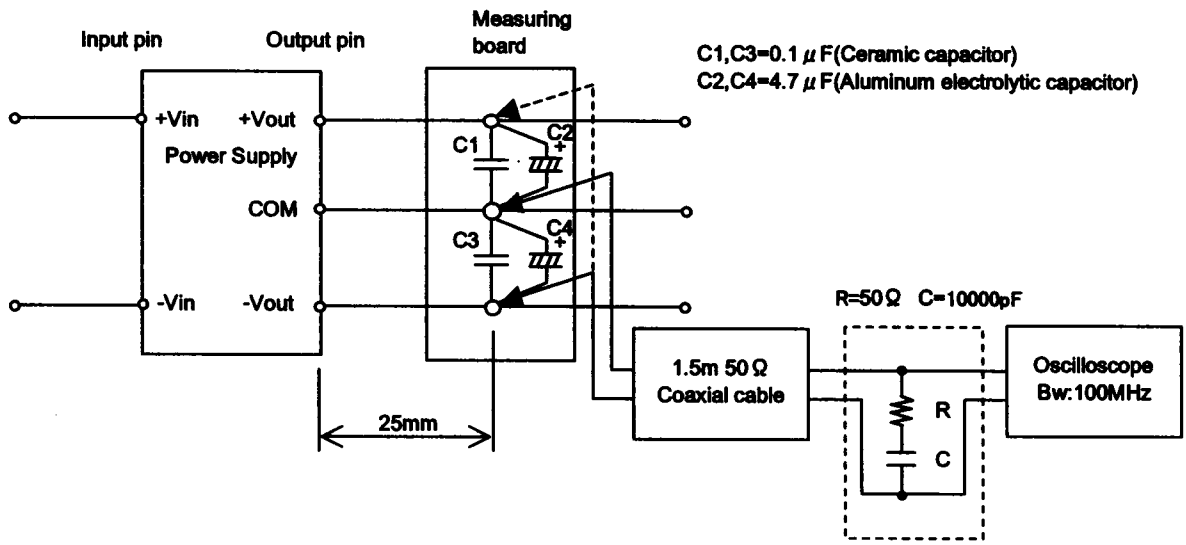


Figure B (Ripple and Ripple noise Characteristic)