COSEL

参考資料

TEST DATA OF SUCW1R50512

Regulated DC Power Supply
Sep 14, 2004

Approved by : Tetsuo Sugimori
Tetsuo Sugimori Design Manager

Prepared by : Masahiro Shima
Masahiro Shima Design Engineer

COSEL CO.,LTD.

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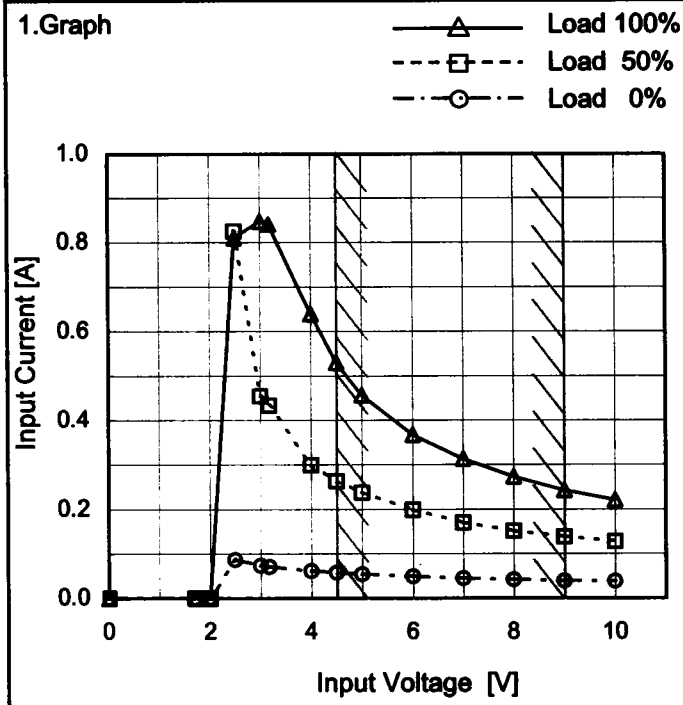
Model	SUCW1R50512
Item	Input Current (by Input Voltage)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

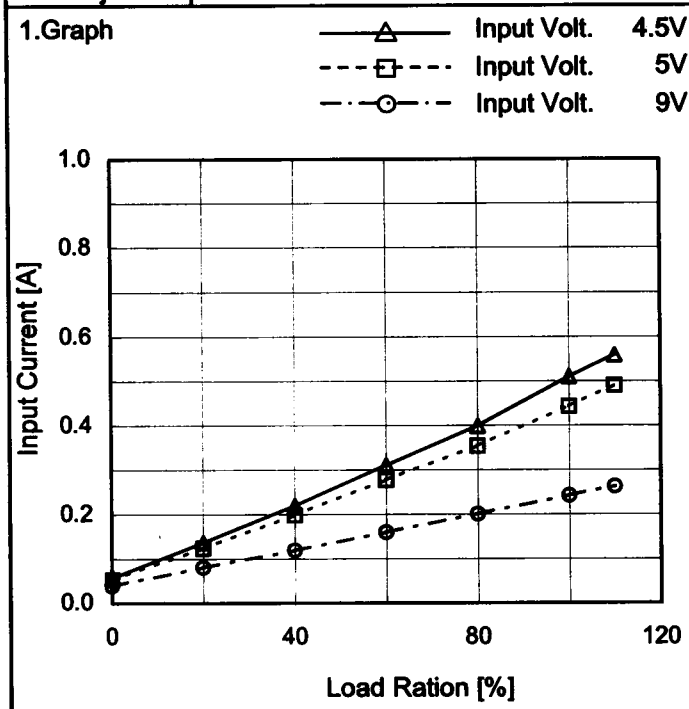
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
1.7	0.000	0.000	0.000
2.0	0.000	0.000	0.000
2.5	0.086	0.826	0.811
3.0	0.074	0.455	0.848
3.2	0.071	0.434	0.841
4.0	0.061	0.300	0.639
4.5	0.057	0.264	0.530
5.0	0.054	0.238	0.457
6.0	0.049	0.199	0.368
7.0	0.045	0.171	0.314
8.0	0.041	0.152	0.274
9.0	0.039	0.138	0.243
10.0	0.038	0.128	0.221
–	-	-	-
–	-	-	-

COSEL

Model	SUCW1R50512
Item	Input Current (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

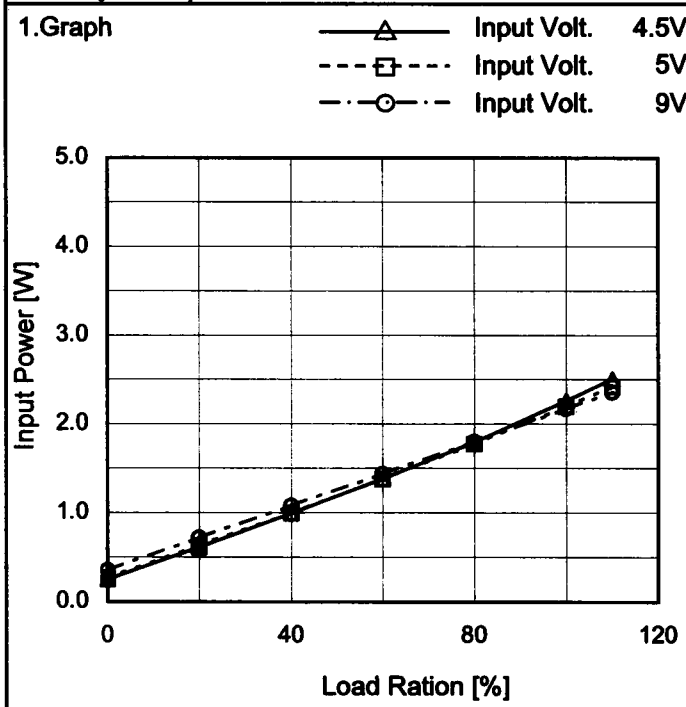
Load Ration [%]	Input Current [A]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	0.057	0.053	0.039
20	0.137	0.124	0.080
40	0.220	0.199	0.120
60	0.311	0.278	0.160
80	0.399	0.354	0.200
100	0.510	0.443	0.242
110	0.559	0.491	0.263
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	SUCW1R50512
Item	Input Power (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

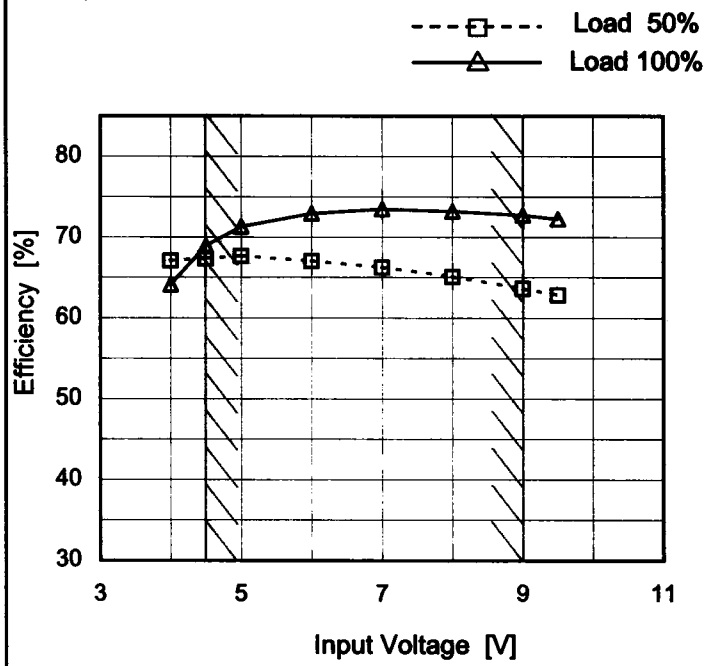
Load Ration [%]	Input Power [W]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	0.25	0.27	0.35
20	0.61	0.63	0.72
40	0.99	1.00	1.08
60	1.38	1.38	1.44
80	1.80	1.77	1.80
100	2.26	2.20	2.17
110	2.50	2.42	2.35
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUCW1R50512
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

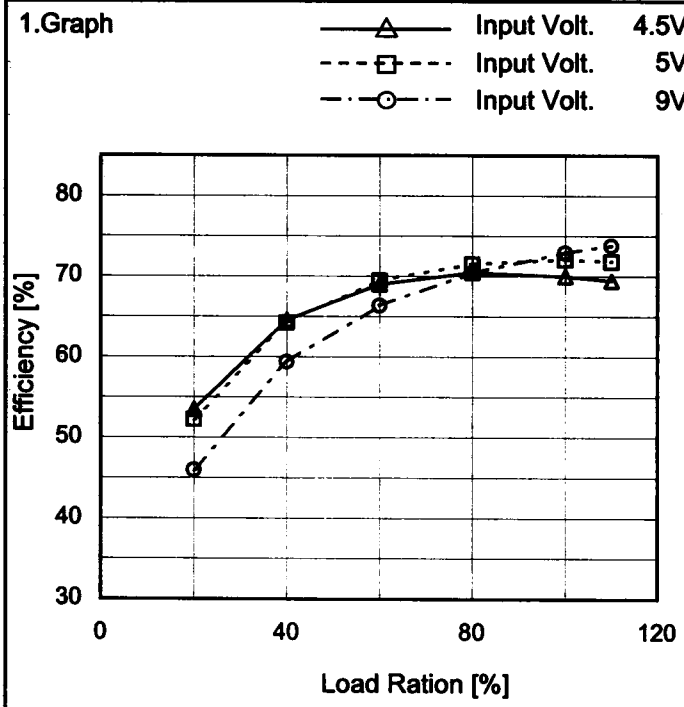
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
4.0	67.1	64.1
4.5	67.3	68.9
5.0	67.6	71.3
6.0	67.0	73.0
7.0	66.2	73.5
8.0	65.1	73.2
9.0	63.6	72.8
9.5	62.9	72.3
–	-	-

COSEL

Model	SUCW1R50512
Item	Efficiency (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

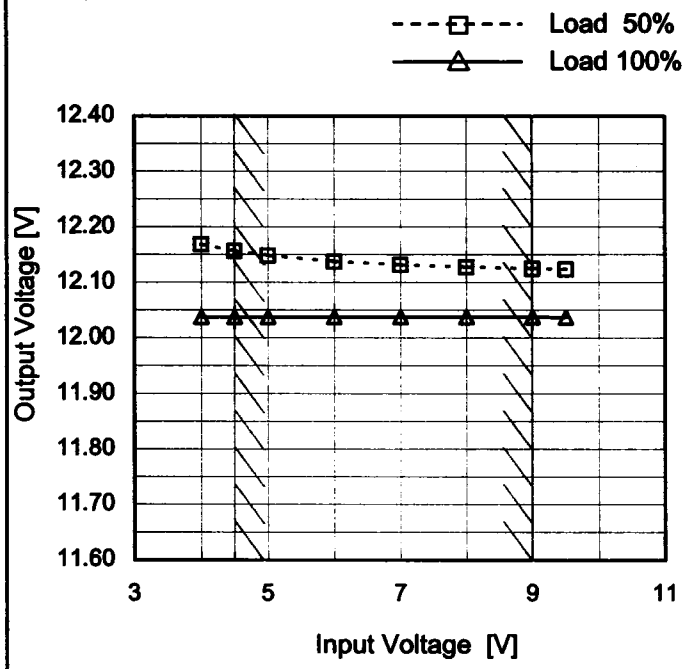
Load Ration [%]	Efficiency [%]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	-	-	-
20	53.5	52.2	46.0
40	64.6	64.3	59.4
60	69.0	69.5	66.3
80	70.5	71.5	70.4
100	70.0	72.1	72.9
110	69.4	71.8	73.8
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	SUCW1R50512
Item	Line Regulation
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

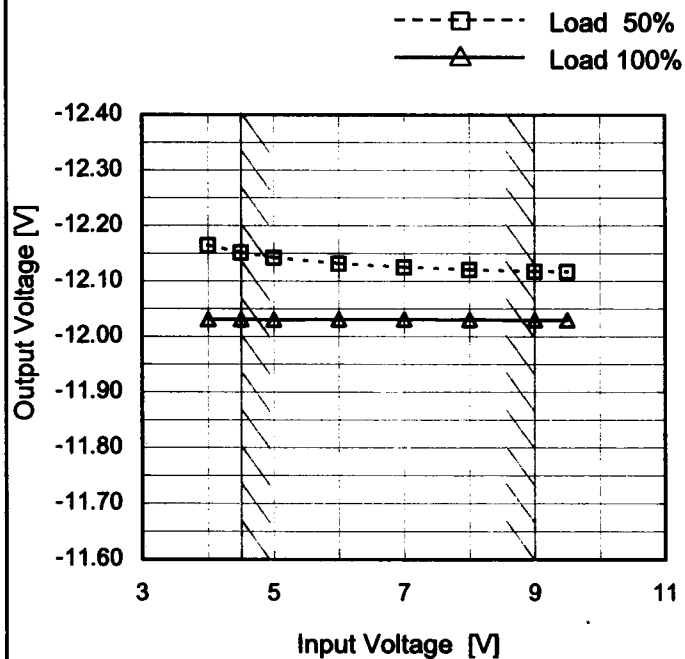


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	12.168	12.038
4.5	12.156	12.038
5.0	12.148	12.038
6.0	12.138	12.037
7.0	12.132	12.037
8.0	12.128	12.037
9.0	12.125	12.037
9.5	12.124	12.037
-	-	-

Object	-12V0.065A

1.Graph



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

2.Values

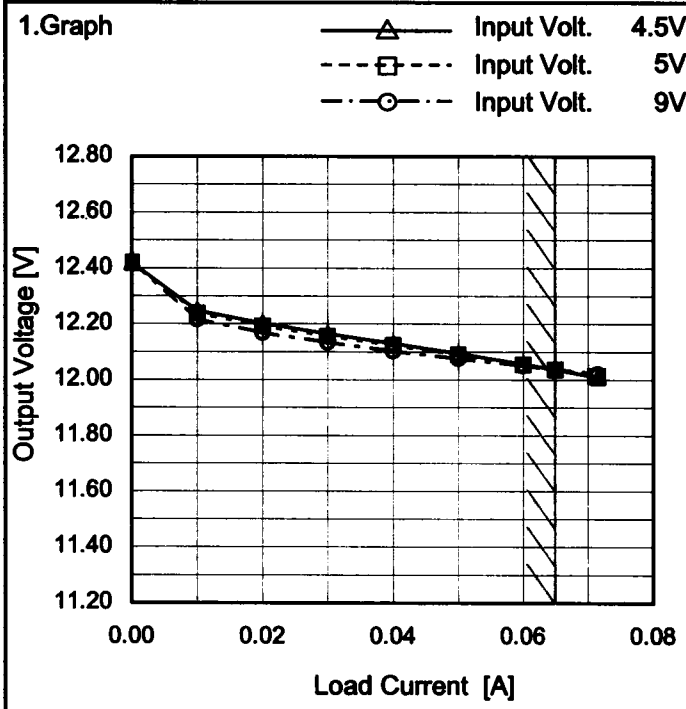
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	-12.165	-12.031
4.5	-12.152	-12.031
5.0	-12.142	-12.031
6.0	-12.132	-12.031
7.0	-12.125	-12.031
8.0	-12.121	-12.030
9.0	-12.118	-12.030
9.5	-12.117	-12.030
-	-	-

COSEL

Model	SUCW1R50512
Item	Load Regulation
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

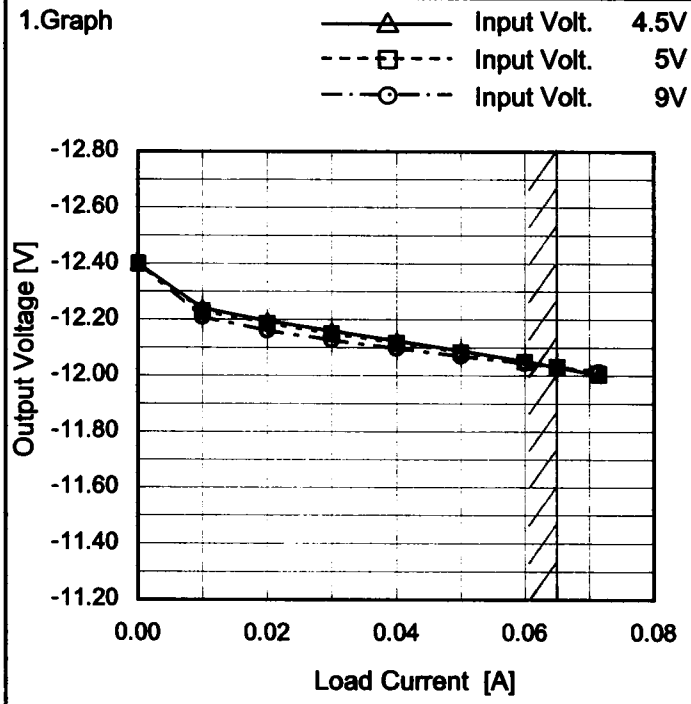


2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.000	12.419	12.420	12.422
0.010	12.248	12.238	12.216
0.020	12.203	12.193	12.167
0.030	12.165	12.156	12.132
0.040	12.130	12.123	12.102
0.050	12.095	12.090	12.076
0.060	12.057	12.056	12.050
0.065	12.037	12.038	12.038
0.072	12.011	12.015	12.022
–	-	-	-
–	-	-	-

Object	-12V0.065A

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	-12.400	-12.401	-12.403
0.010	-12.241	-12.231	-12.208
0.020	-12.196	-12.186	-12.160
0.030	-12.160	-12.150	-12.126
0.040	-12.125	-12.117	-12.096
0.050	-12.089	-12.084	-12.070
0.060	-12.051	-12.050	-12.044
0.065	-12.032	-12.032	-12.031
0.072	-12.004	-12.009	-12.015
–	-	-	-
–	-	-	-

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

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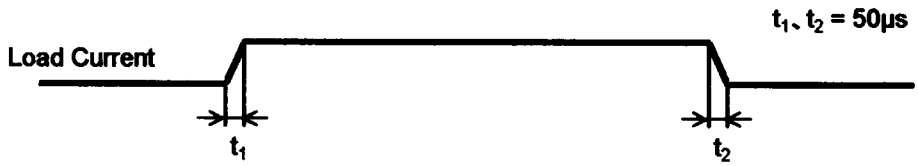
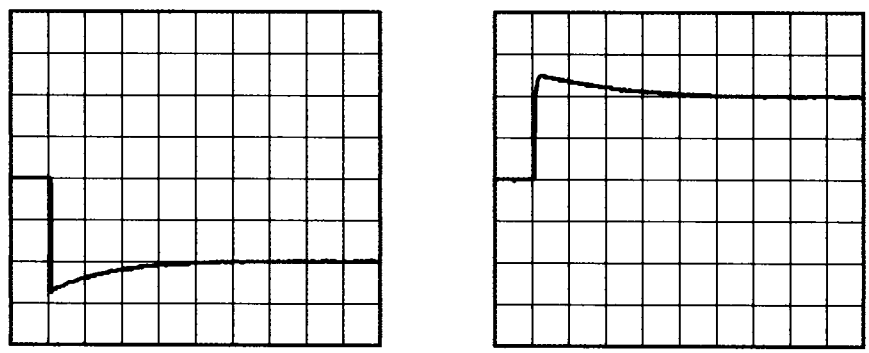
Model	SUCW1R50512
Item	Dynamic Load Response
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

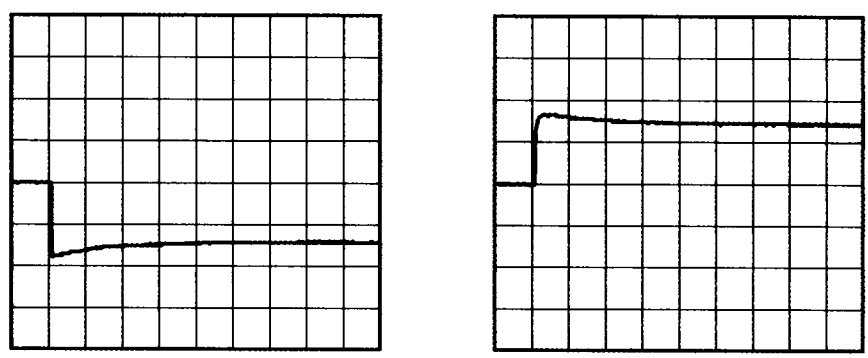
Input Volt. 5 V
Cycle 100 mS



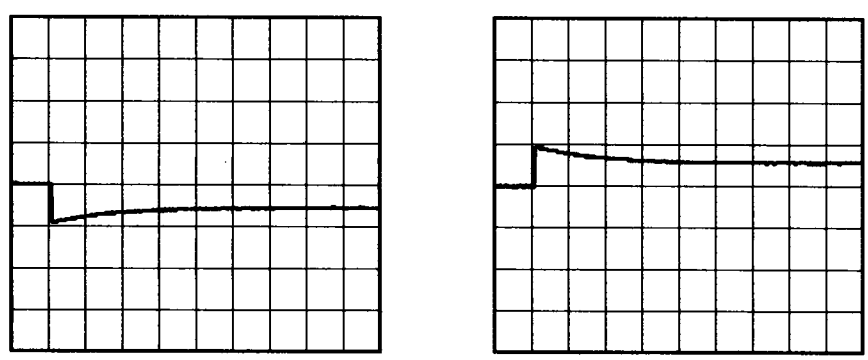
Min. Load (0A) ⟷
Load 100% (0.065A)



Min. Load (0A) ⟷
Load 50% (0.0325A)



Load 50% (0.0325A) ⟷
Load 100% (0.065A)



COSEL

Model	SUCW1R50512
Item	Dynamic Load Response
Object	-12V0.065A

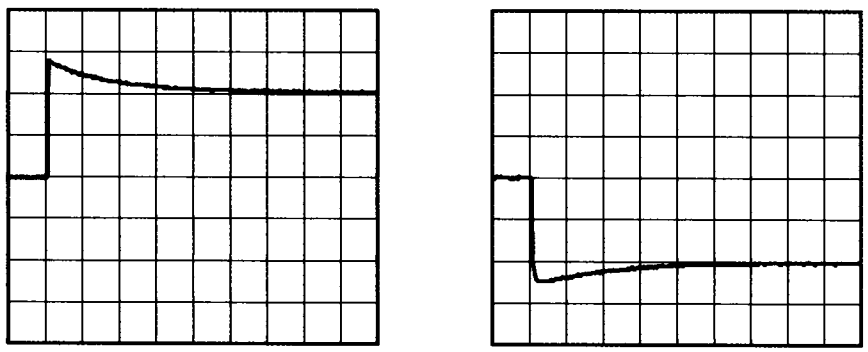
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 5 V
Cycle 100 mS

t_1、t_2 = 50μs

Load Current

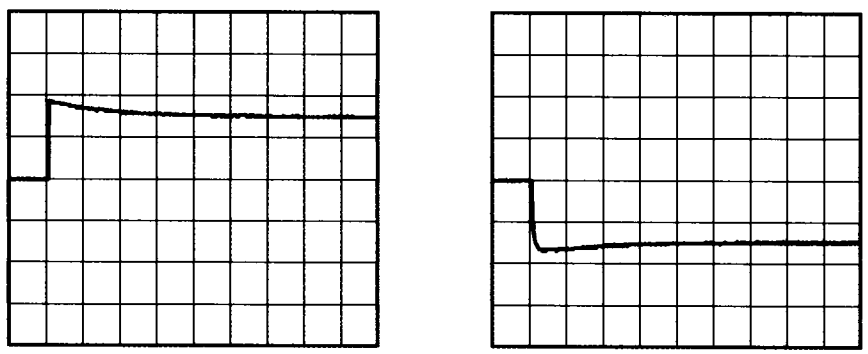
Min. Load (0A) ⟷
Load 100% (0.065A)



200mV/div

2ms/div 2ms/div

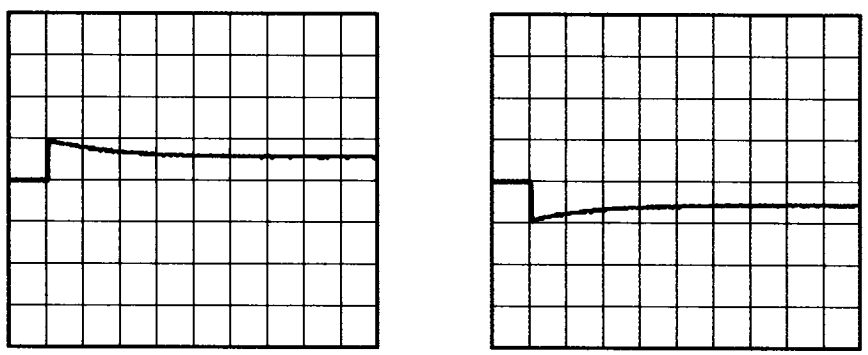
Min. Load (0A) ⟷
Load 50% (0.0325A)



200mV/div

2ms/div 2ms/div

Load 50% (0.0325A) ⟷
Load 100% (0.065A)



200mV/div

2ms/div 2ms/div

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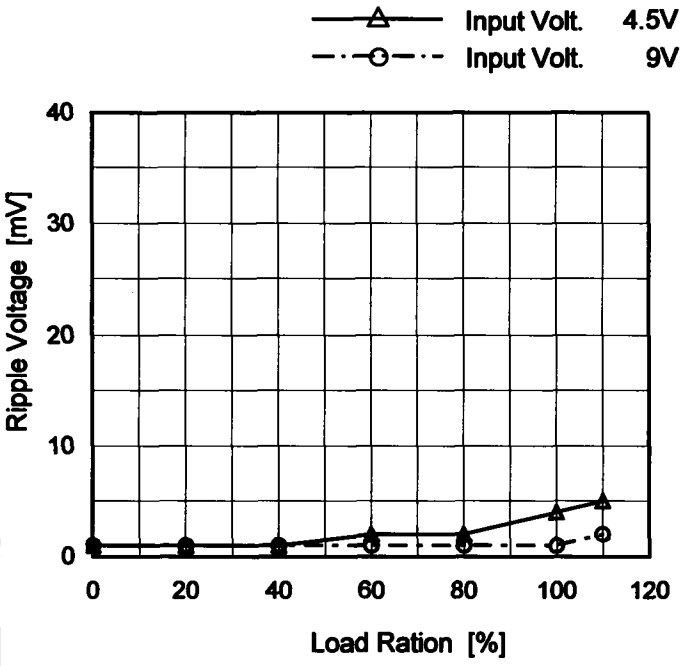
Model	SUCW1R50512
Item	Ripple Voltage (by Load Current)
Object	+12V0.065A

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.

Ripple [mVp-p]

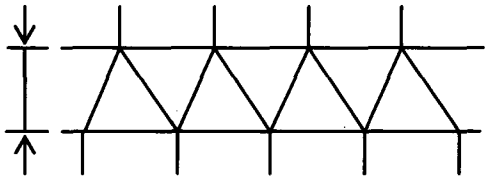


Fig.Complex Ripple Wave Form

2.Values

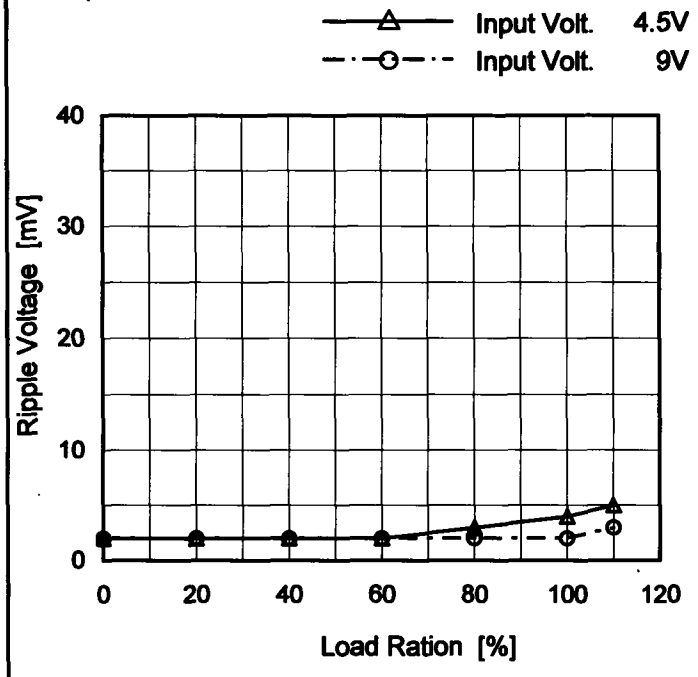
Load Ration [%]	Ripple Voltage [mV] Input Volt. 4.5 [V]	Input Volt. 9 [V]
0	1	1
20	1	1
40	1	1
60	2	1
80	2	1
100	4	1
110	5	2
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUCW1R50512
Item	Ripple Voltage (by Load Current)
Object	-12V0.065A

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	4	2
110	5	3
–	-	-
–	-	-
–	-	-
–	-	-

Ripple [mVp-p]

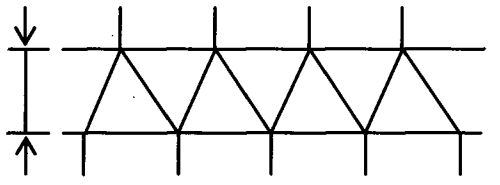


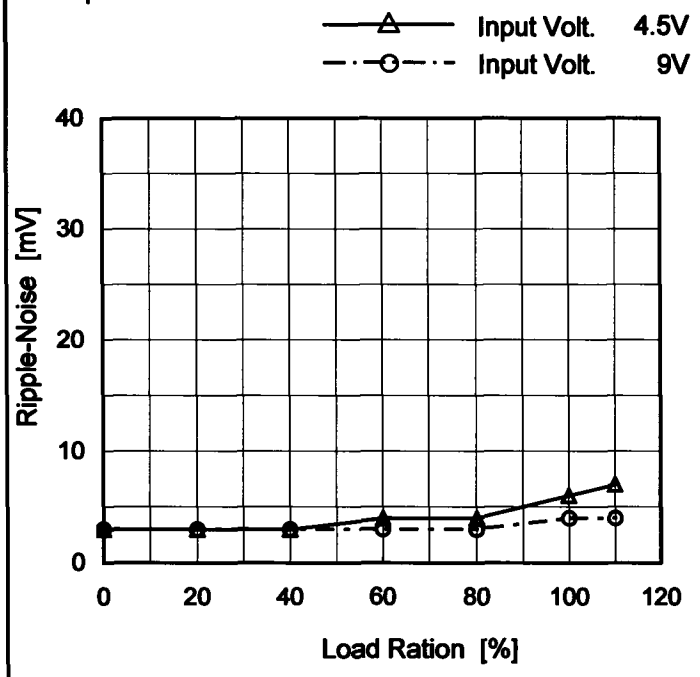
Fig.Complex Ripple Wave Form

COSEL

Model	SUCW1R50512
Item	Ripple-Noise
Object	+12V0.065A

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.

2.Values

Load Ration [%]	Ripple-Noise [mV] Input Volt. 4.5 [V]	Ripple-Noise [mV] Input Volt. 9 [V]
0	3	3
20	3	3
40	3	3
60	4	3
80	4	3
100	6	4
110	7	4
–	-	-
–	-	-
–	-	-
–	-	-

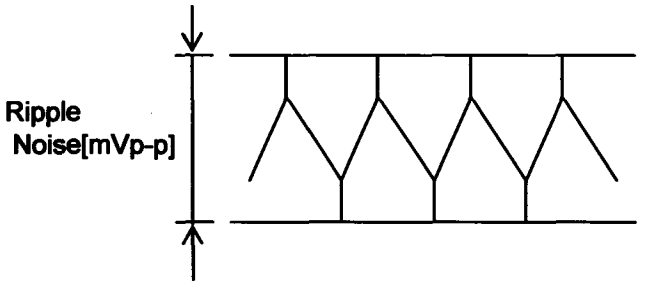


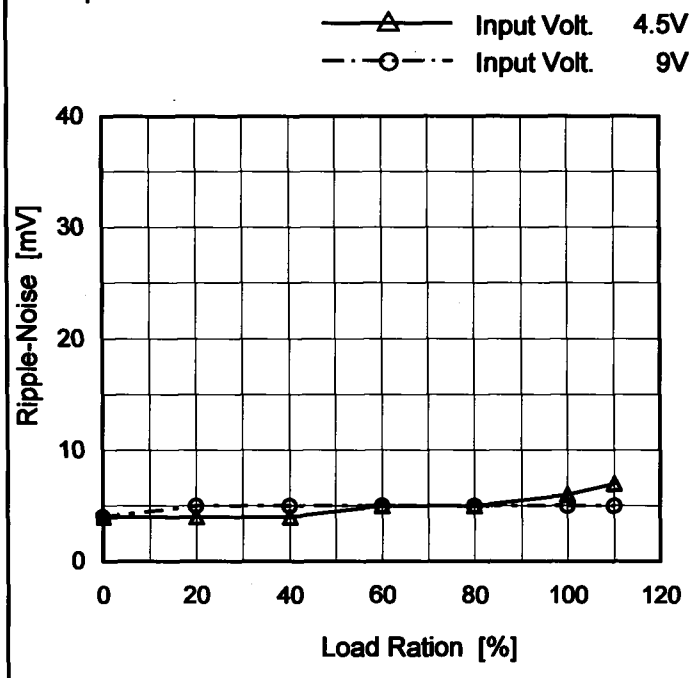
Fig.Complex Ripple Noise Wave Form

COSEL

Model	SUCW1R50512
Item	Ripple-Noise
Object	-12V0.065A

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.

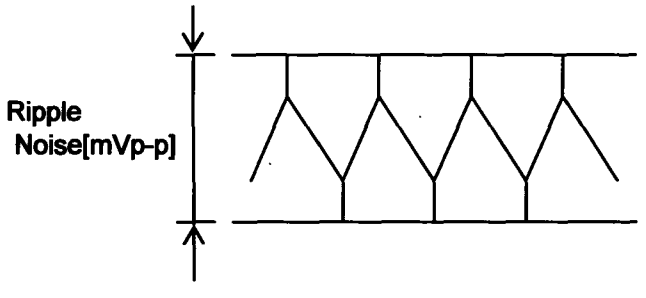


Fig.Complex Ripple Noise Wave Form

2.Values

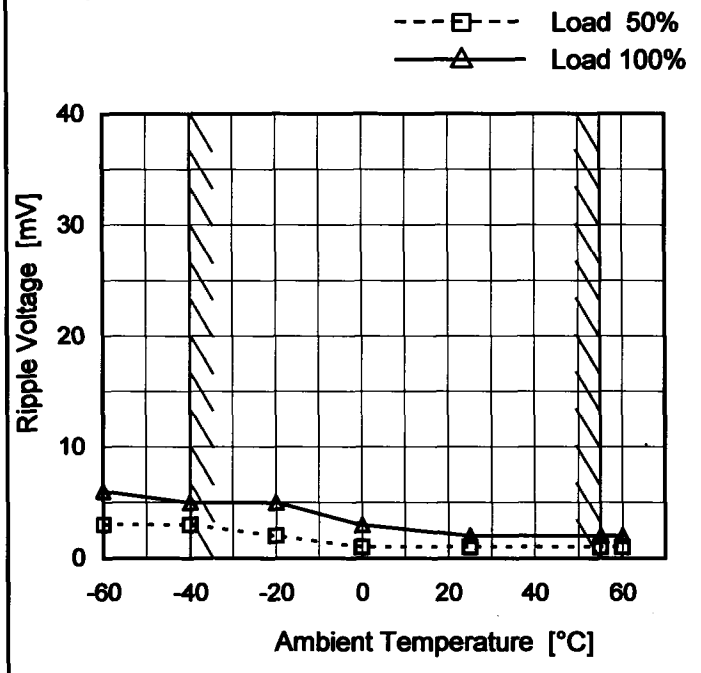
Load Ration [%]	Ripple-Noise [mV] Input Volt. 4.5 [V]	Ripple-Noise [mV] Input Volt. 9 [V]
0	4	4
20	4	5
40	4	5
60	5	5
80	5	5
100	6	5
110	7	5
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUCW1R50512
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.065A

Testing Circuitry Figure B

1.Graph



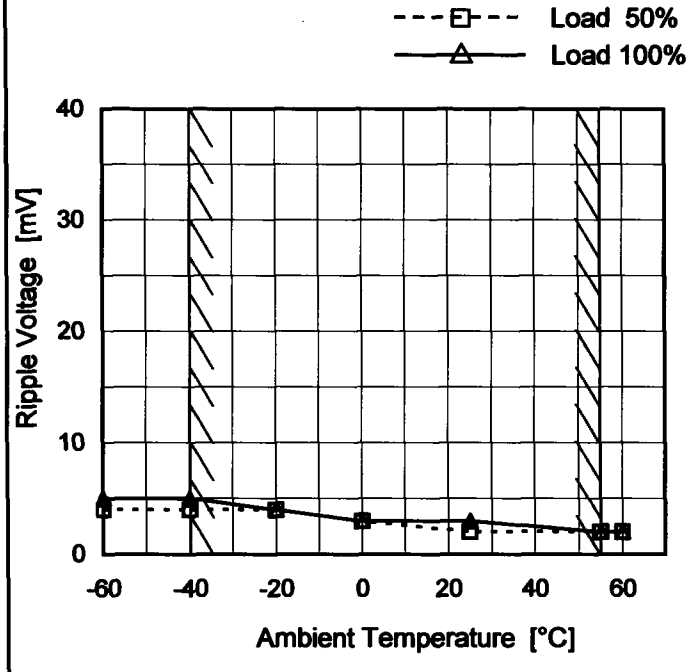
Input Volt. 5V

2.Values

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

Object	-12V0.065A

1.Graph



Input Volt. 5V

Measured by 100 MHz Oscilloscope.

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

2.Values

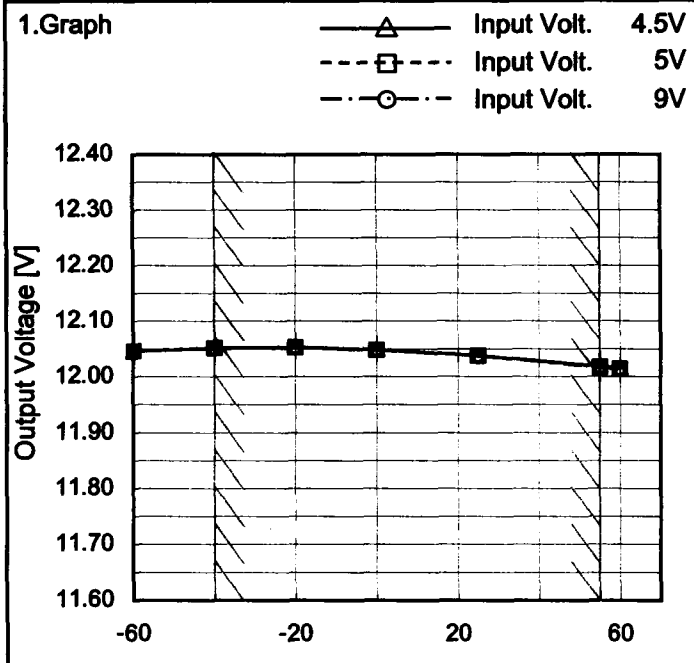
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	4	5
-40	4	5
-20	4	4
0	3	3
25	2	3
55	2	2
60	2	2
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUCW1R50512
Item	Ambient Temperature Drift
Object	+12V0.065A

Testing Circuitry Figure A

1.Graph

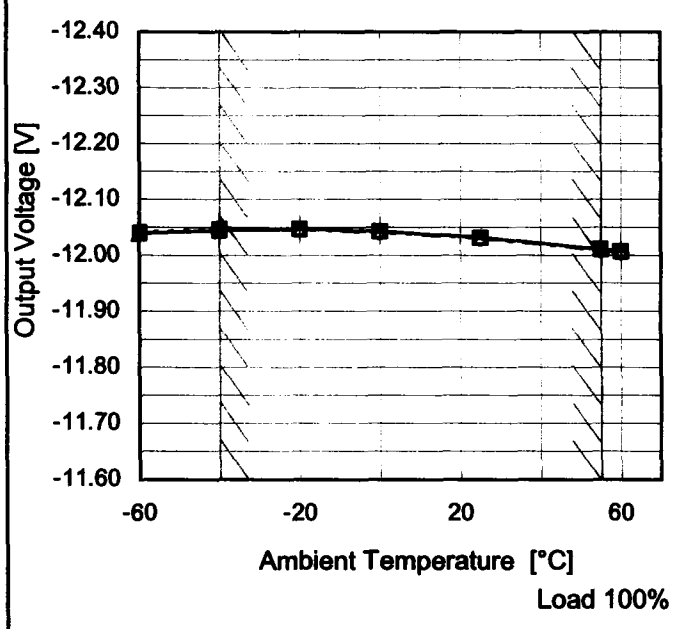


2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	12.046	12.046	12.046
-40	12.052	12.052	12.051
-20	12.053	12.053	12.052
0	12.049	12.048	12.048
25	12.038	12.038	12.037
55	12.019	12.017	12.016
60	12.015	12.014	12.013
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

Object	-12V0.065A

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	-12.039	-12.041	-12.039
-40	-12.045	-12.047	-12.045
-20	-12.047	-12.047	-12.046
0	-12.043	-12.043	-12.041
25	-12.032	-12.031	-12.030
55	-12.011	-12.011	-12.009
60	-12.007	-12.007	-12.005
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

COSEL

Model	SUCW1R50512	
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 - 0.065A (AVR 2):0 - 0.065A

* 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	+12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	0	9	0	12.439	±212	±1.8
Minimum Voltage	55	9	0.065	12.016		

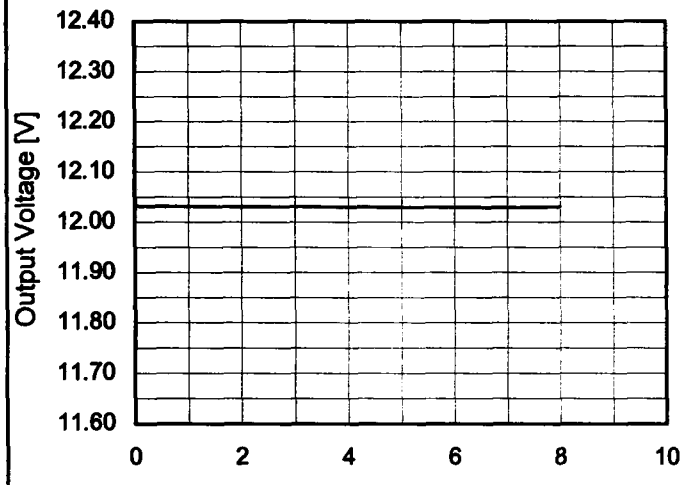
Object	-12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	0	9	0	-12.418	±205	±1.7
Minimum Voltage	55	9	0.065	-12.009		

COSEL

Model	SUCW1R50512
Item	Time Lapse Drift
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



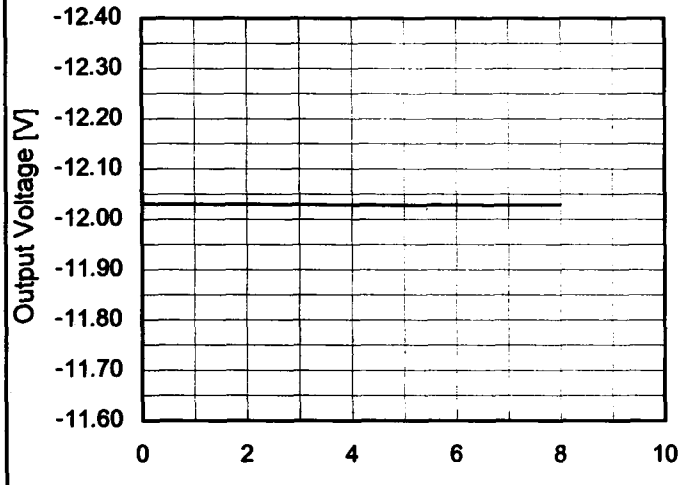
Input Volt. 5V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.040
0.5	12.032
1.0	12.032
2.0	12.031
3.0	12.031
4.0	12.030
5.0	12.030
6.0	12.030
7.0	12.029
8.0	12.031

Object	-12V0.065A

1.Graph



Input Volt. 5V
Load 100%

2.Values

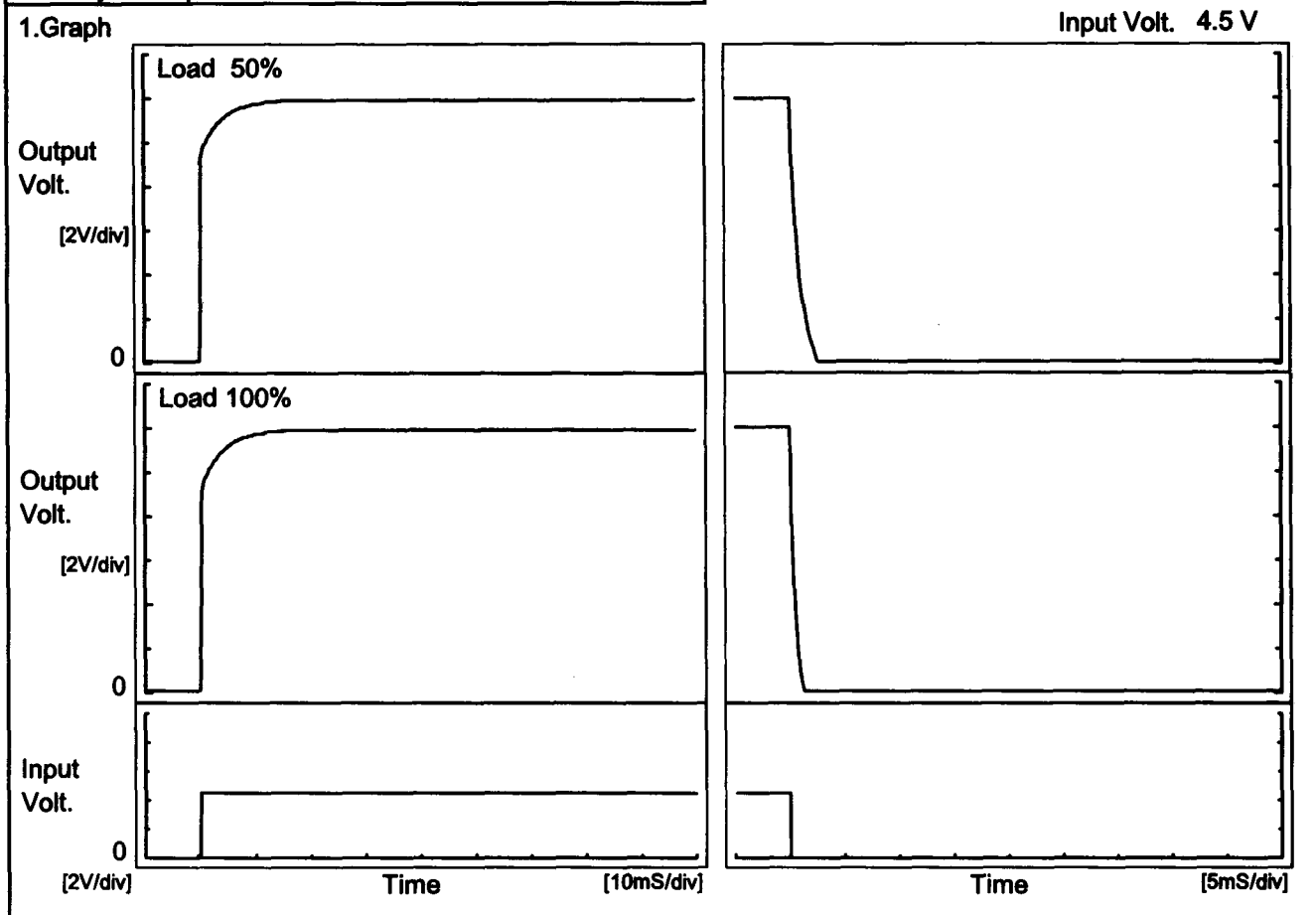
Time since start [H]	Output Voltage [V]
0.0	-12.038
0.5	-12.030
1.0	-12.031
2.0	-12.030
3.0	-12.030
4.0	-12.029
5.0	-12.029
6.0	-12.029
7.0	-12.029
8.0	-12.030

COSEL

Model	SUCW1R50512
Item	Rise and Fall Time
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

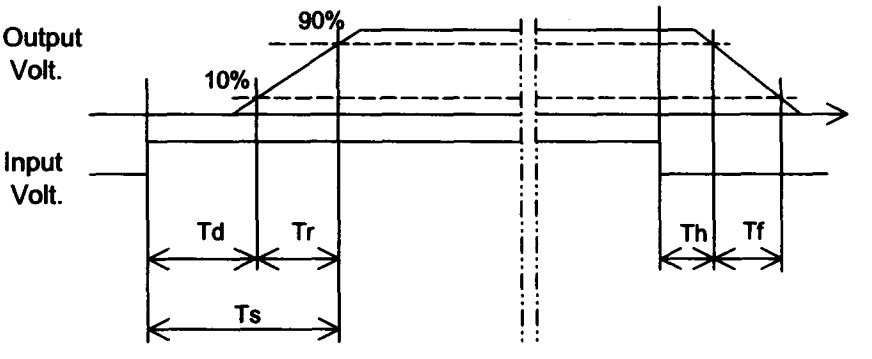
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	3.3	3.4	0.1	3.6
100 %	0.1	3.6	3.7	0.1	1.8

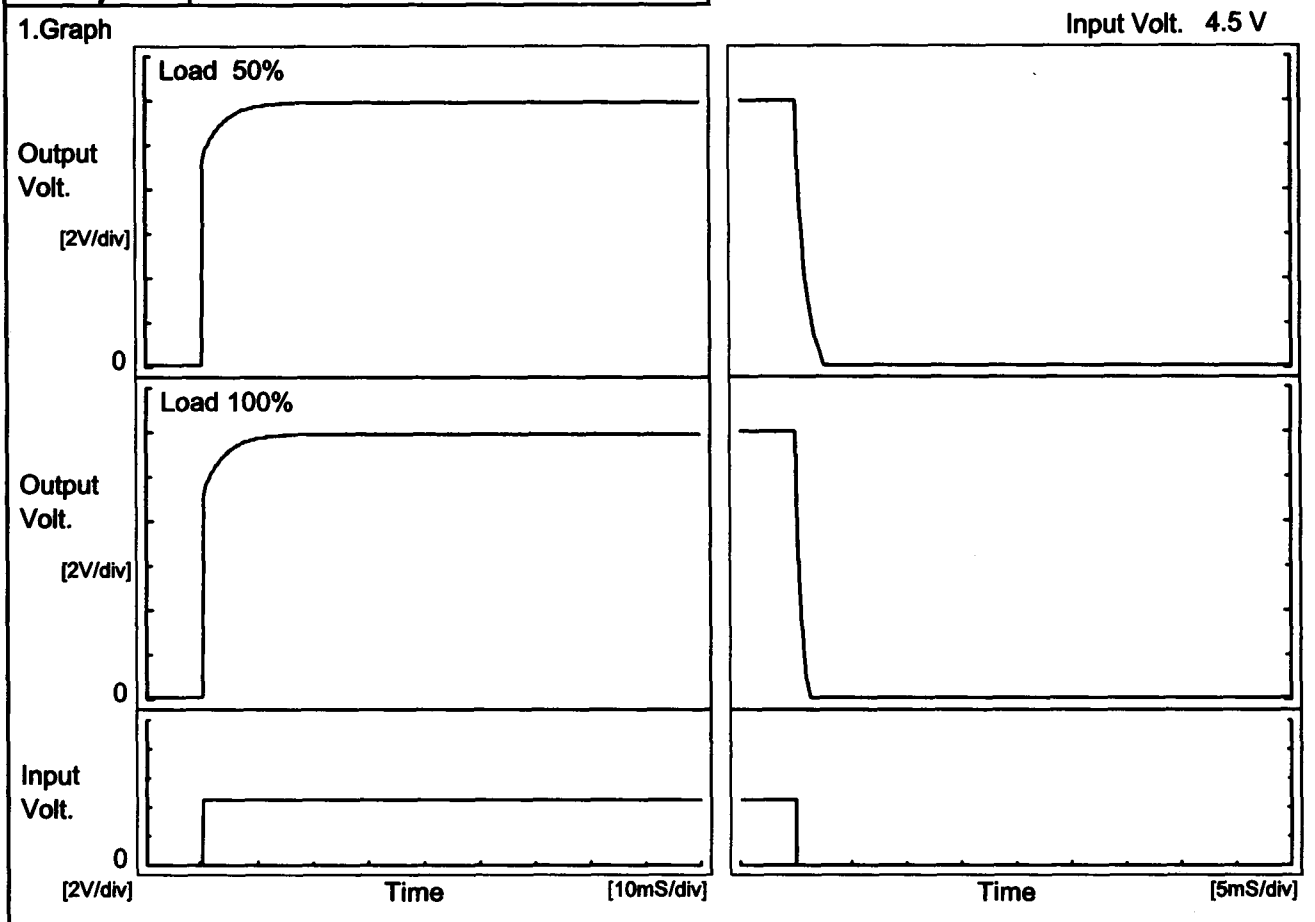


COSEL

Model	SUCW1R50512
Item	Rise and Fall Time
Object	-12V0.065A

Temperature 25°C
Testing Circuitry Figure A

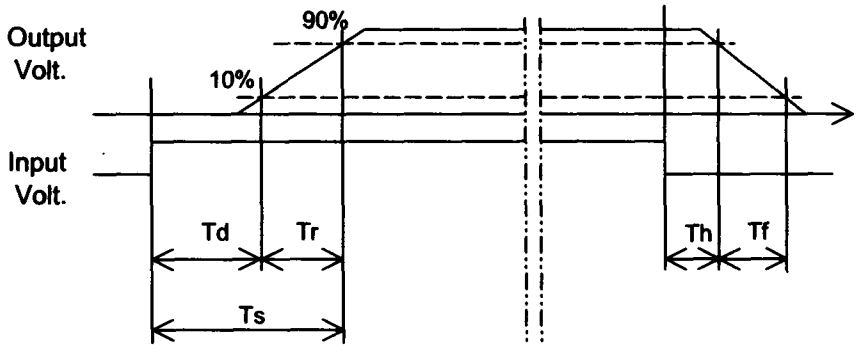
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	3.3	3.4	0.1	3.6
100 %	0.1	3.6	3.7	0.1	1.8

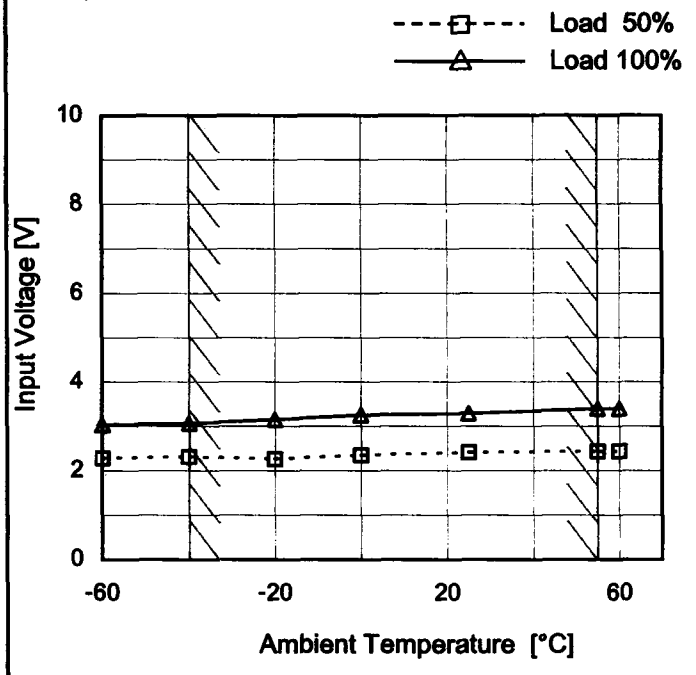


COSEL

Model	SUCW1R50512
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.065A

Testing Circuitry Figure A

1.Graph

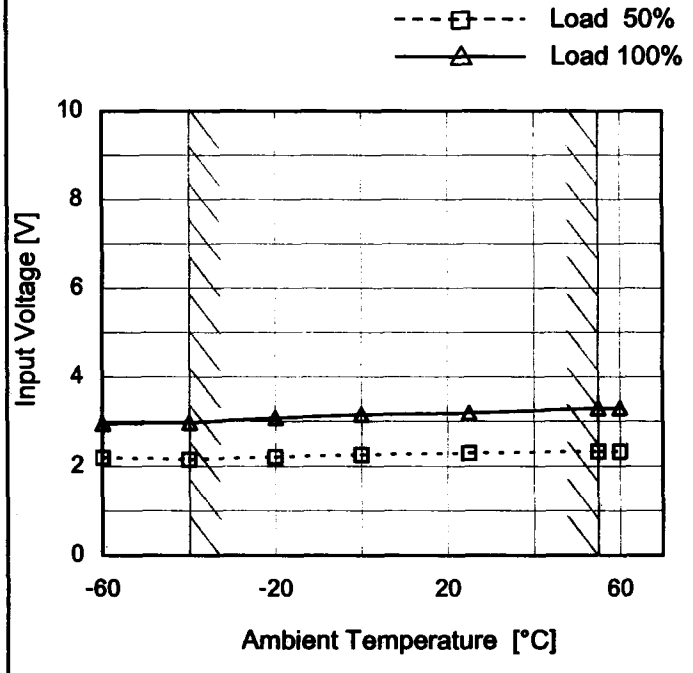


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	2.3	3.1
-40	2.4	3.1
-20	2.3	3.2
0	2.4	3.3
25	2.5	3.3
55	2.5	3.4
60	2.5	3.4
–	-	-
–	-	-
–	-	-
–	-	-

Object	-12V0.065A

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	3.1
0	2.3	3.2
25	2.3	3.2
55	2.4	3.3
60	2.4	3.3
–	-	-
–	-	-
–	-	-
–	-	-

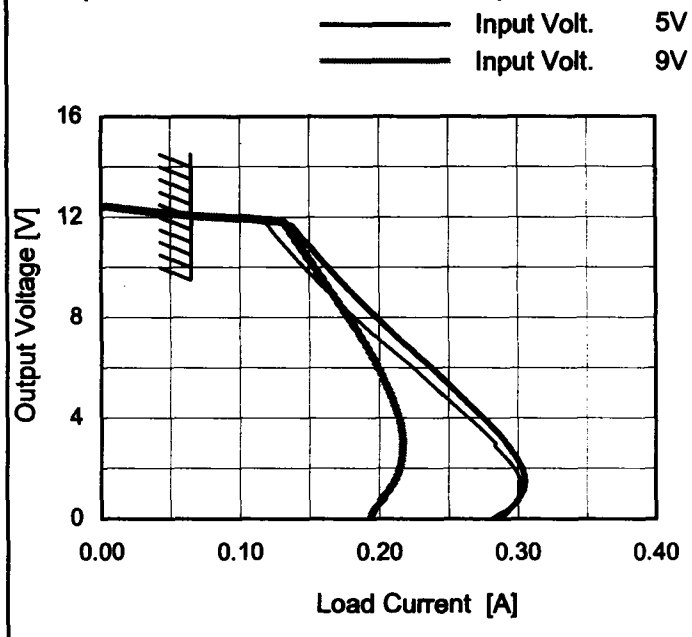
Note: Slanted line shows the range of the rated ambient temperature.

COSEL

Model	SUCW1R50512
Item	Overcurrent Protection
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

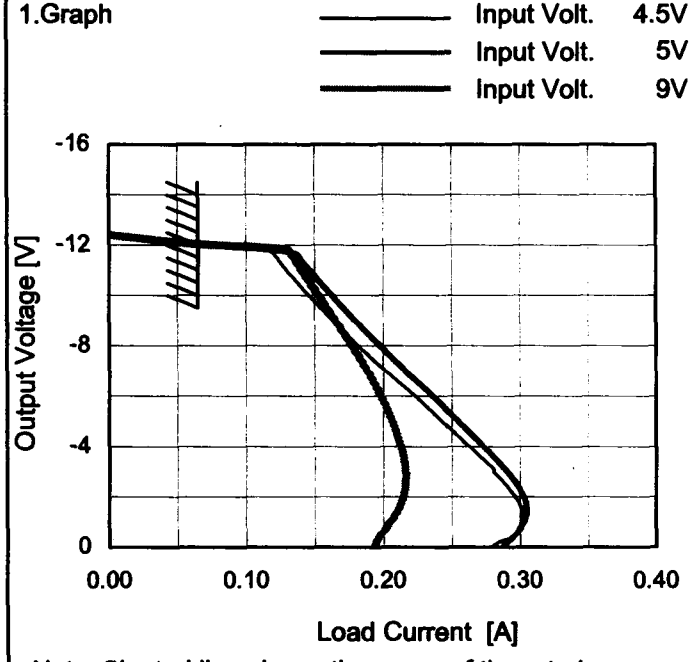


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
12.0	0.07	0.07	0.07
11.4	0.12	0.14	0.14
10.8	0.13	0.15	0.14
9.6	0.15	0.17	0.16
8.4	0.18	0.19	0.17
7.2	0.20	0.21	0.19
6.0	0.23	0.24	0.20
4.8	0.25	0.26	0.21
3.6	0.27	0.28	0.22
2.4	0.29	0.30	0.22
1.2	0.30	0.30	0.21
0.0	0.28	0.29	0.19

Object	-12V0.065A

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]
-12.0	0.07	0.07	0.07
-11.4	0.12	0.14	0.14
-10.8	0.13	0.15	0.14
-9.6	0.15	0.17	0.16
-8.4	0.17	0.19	0.17
-7.2	0.20	0.21	0.19
-6.0	0.22	0.24	0.20
-4.8	0.25	0.26	0.21
-3.6	0.27	0.28	0.21
-2.4	0.29	0.30	0.22
-1.2	0.30	0.30	0.21
0.0	0.28	0.29	0.19

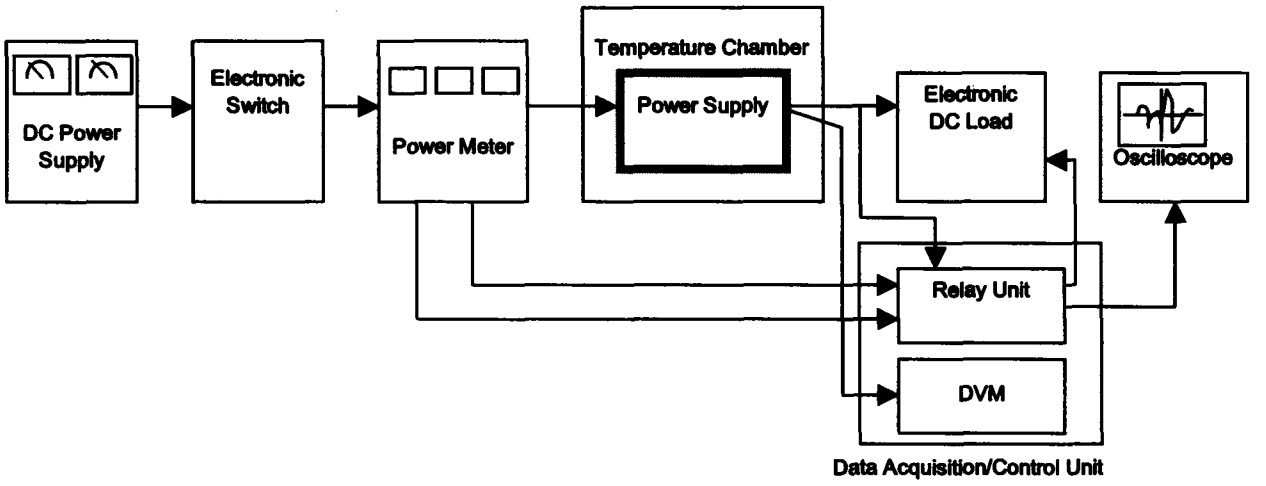


Figure A

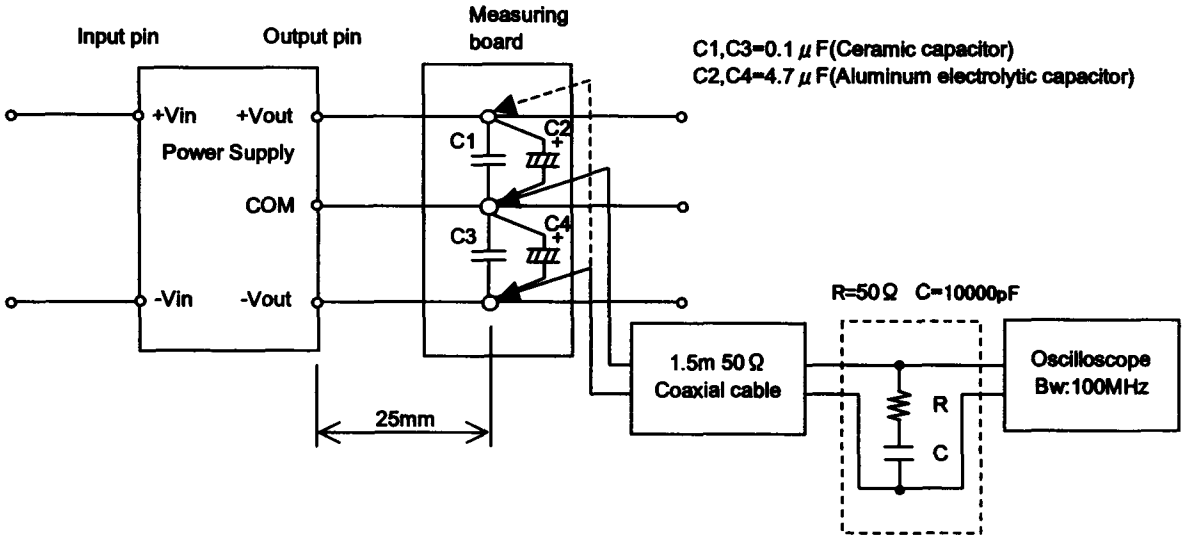


Figure B (Ripple and Ripple noise Characteristic)