COSEL

参考資料

TEST DATA OF SUW1R54812

Regulated DC Power Supply
Sep 29, 2004

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Masahiro Shima Design Engineer

COSEL CO.,LTD.

参考資料

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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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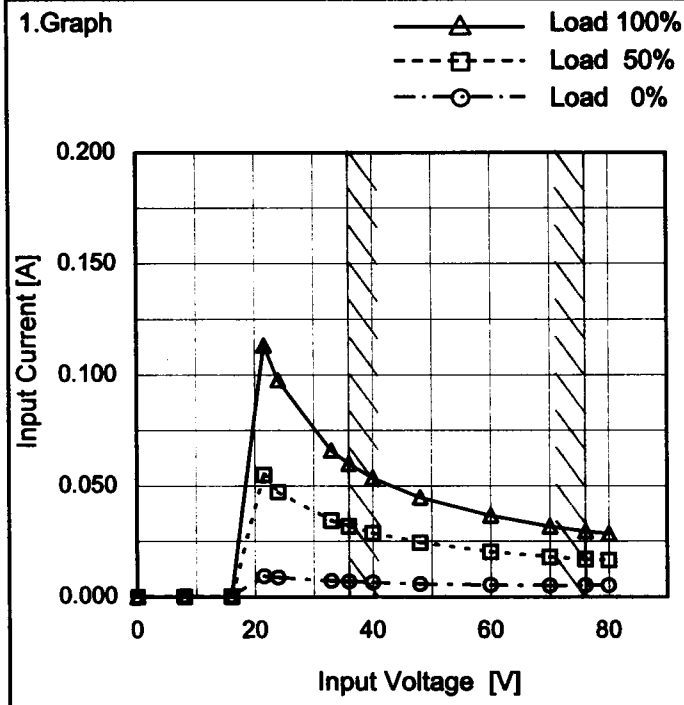
Model	SUW1R54812
Item	Input Current (by Input Voltage)
Object	――――――

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
8.0	0.000	0.000	0.000
16.0	0.000	0.000	0.000
21.6	0.009	0.055	0.113
24.0	0.009	0.047	0.098
33.0	0.007	0.034	0.066
36.0	0.007	0.032	0.060
40.0	0.007	0.029	0.054
48.0	0.006	0.024	0.045
60.0	0.005	0.020	0.037
70.0	0.005	0.018	0.032
76.0	0.005	0.017	0.030
80.0	0.005	0.017	0.028
–	-	-	-
–	-	-	-
–	-	-	-

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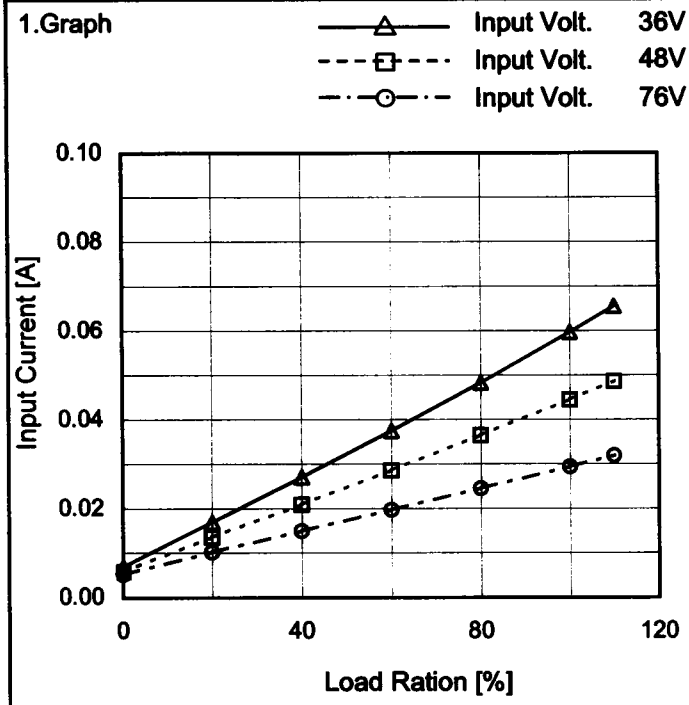
Model	SUW1R54812
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

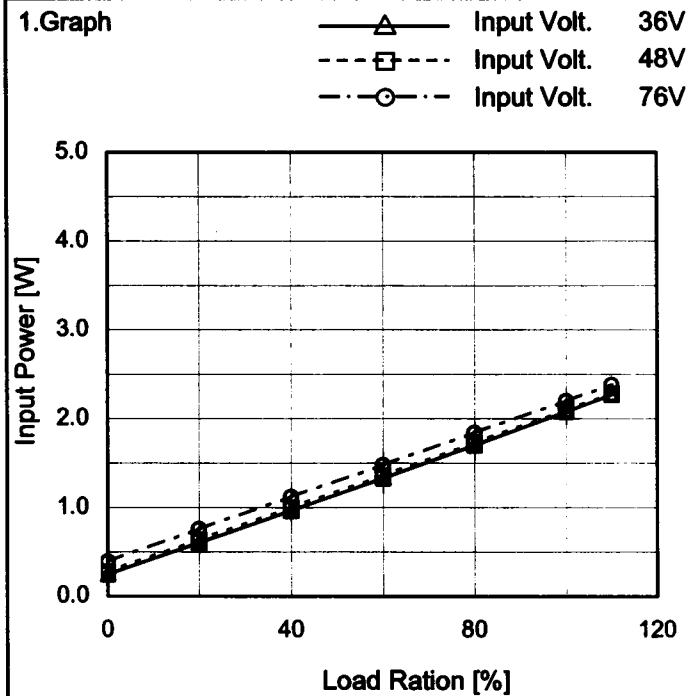
Load Ration [%]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.007	0.006	0.005
20	0.017	0.014	0.010
40	0.027	0.021	0.015
60	0.038	0.029	0.020
80	0.048	0.037	0.025
100	0.060	0.045	0.029
110	0.066	0.049	0.032
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

COSEL

Model	SUW1R54812
Item	Input Power (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

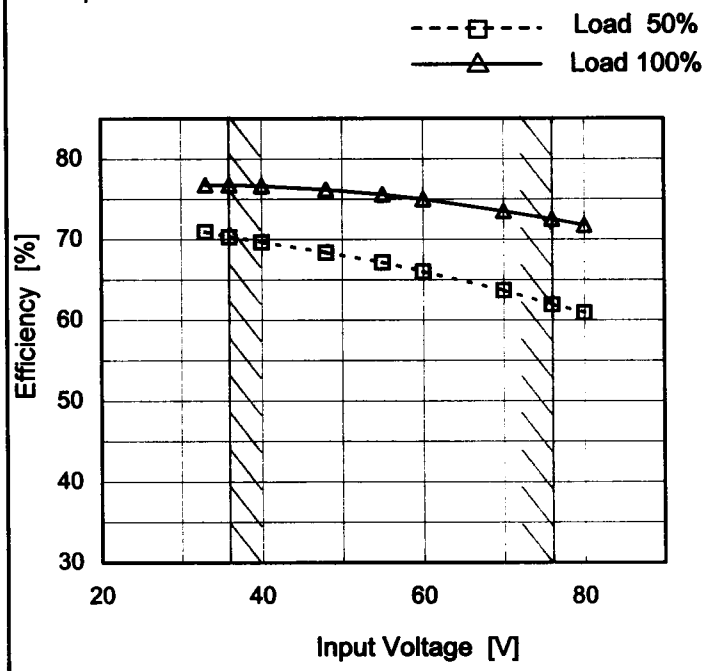
Load Ration [%]	Input Power [W]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.25	0.28	0.39
20	0.61	0.64	0.76
40	0.97	1.00	1.12
60	1.33	1.36	1.48
80	1.70	1.73	1.84
100	2.08	2.10	2.20
110	2.27	2.29	2.38
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

COSEL

Model	SUW1R54812
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%
33	70.9	76.8
36	70.3	76.8
40	69.7	76.7
48	68.4	76.2
55	67.2	75.6
60	66.0	75.0
70	63.7	73.5
76	61.9	72.5
80	60.9	71.8

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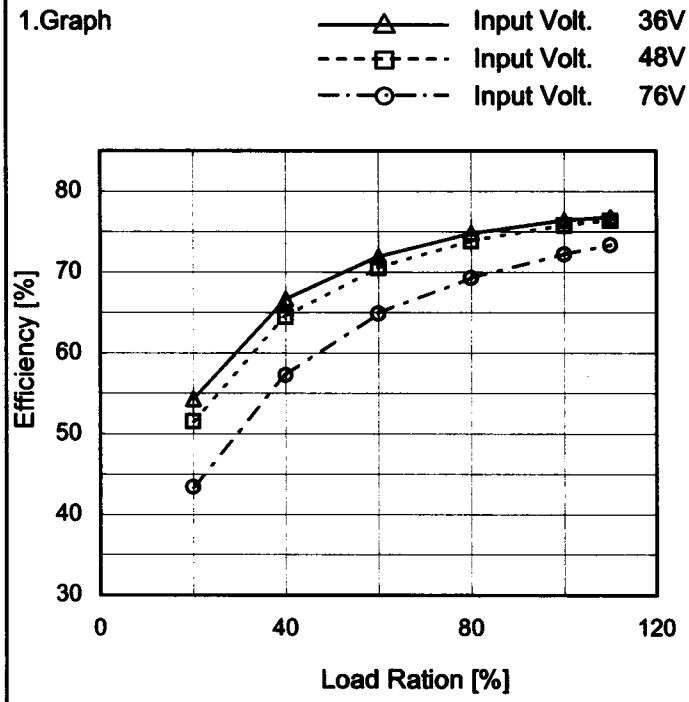
Model	SUW1R54812
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	-	-	-
20	54.3	51.6	43.4
40	66.6	64.5	57.3
60	71.9	70.5	64.9
80	74.8	73.8	69.3
100	76.4	75.8	72.2
110	76.8	76.4	73.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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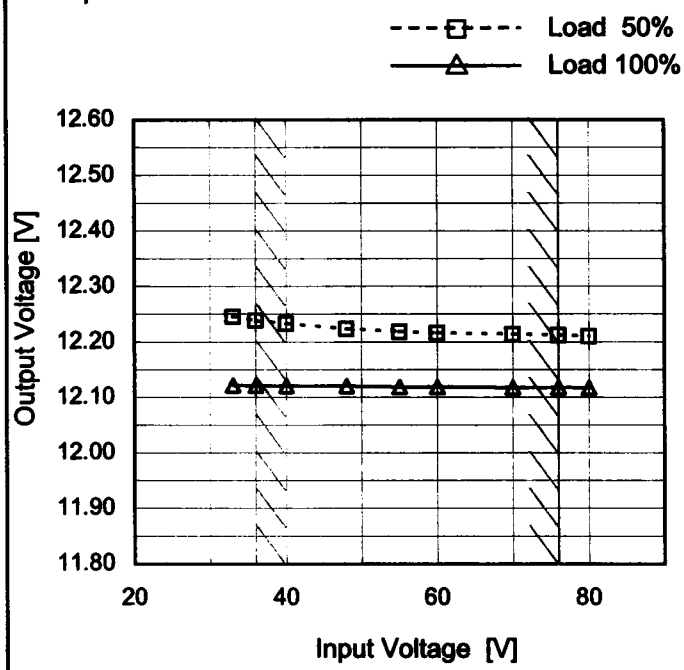
Model	SUW1R54812
Item	Line Regulation
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

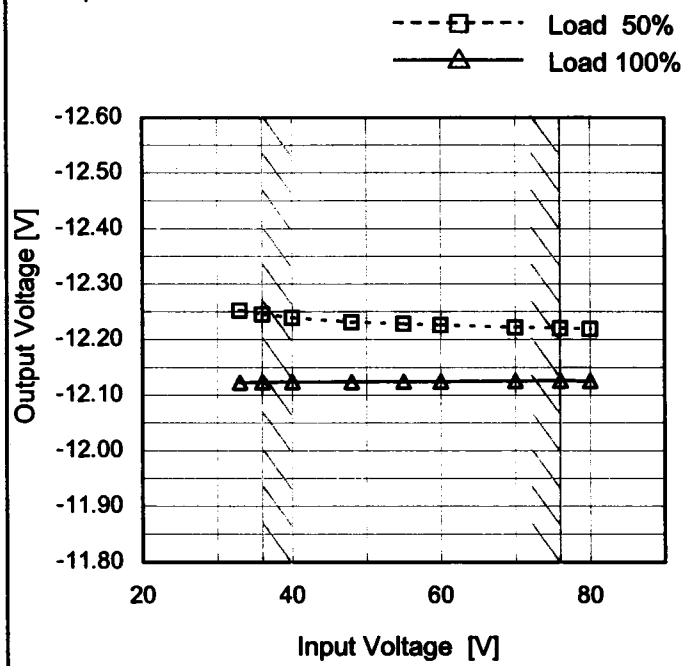


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
33	12.245	12.122
36	12.238	12.122
40	12.233	12.121
48	12.223	12.121
55	12.219	12.119
60	12.216	12.119
70	12.214	12.118
76	12.212	12.118
80	12.211	12.117

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%
33	-12.252	-12.123
36	-12.246	-12.124
40	-12.239	-12.124
48	-12.231	-12.124
55	-12.228	-12.125
60	-12.226	-12.125
70	-12.222	-12.126
76	-12.220	-12.126
80	-12.219	-12.126

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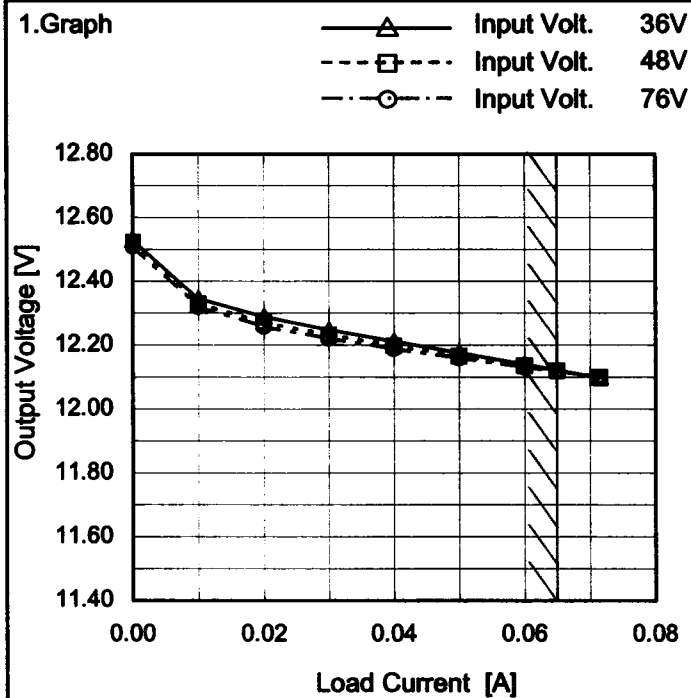
Model	SUW1R54812
Item	Load Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.065A

1.Graph

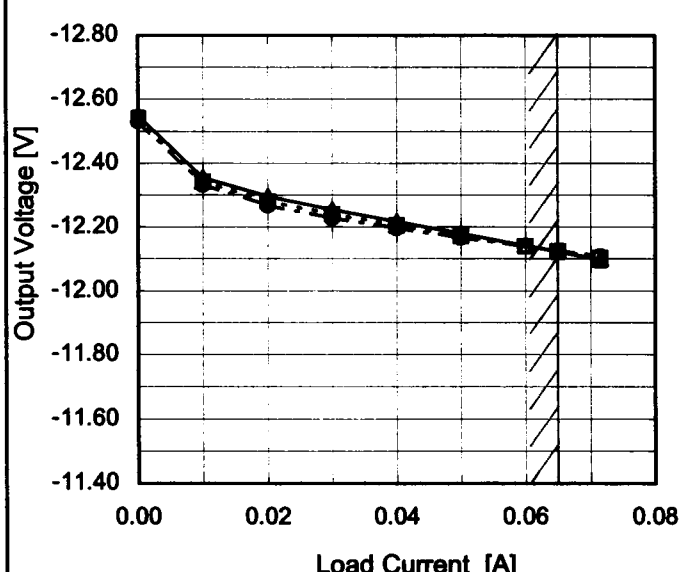


2.Values

Load Current [A]	Output Voltage [V] Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	12.528	12.522	12.509
0.010	12.346	12.329	12.319
0.020	12.289	12.270	12.258
0.030	12.248	12.232	12.220
0.040	12.212	12.198	12.189
0.050	12.176	12.167	12.159
0.060	12.140	12.136	12.131
0.065	12.122	12.120	12.118
0.072	12.098	12.100	12.101
–	-	-	-
–	-	-	-

Object -12V0.065A

1.Graph



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

2.Values

Load Current [A]	Output Voltage [V] Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	-12.550	-12.542	-12.531
0.010	-12.355	-12.342	-12.332
0.020	-12.296	-12.280	-12.267
0.030	-12.255	-12.240	-12.228
0.040	-12.218	-12.205	-12.196
0.050	-12.180	-12.172	-12.167
0.060	-12.143	-12.140	-12.140
0.065	-12.124	-12.124	-12.126
0.072	-12.098	-12.103	-12.108
–	-	-	-
–	-	-	-

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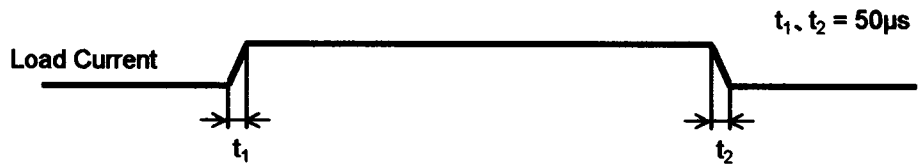
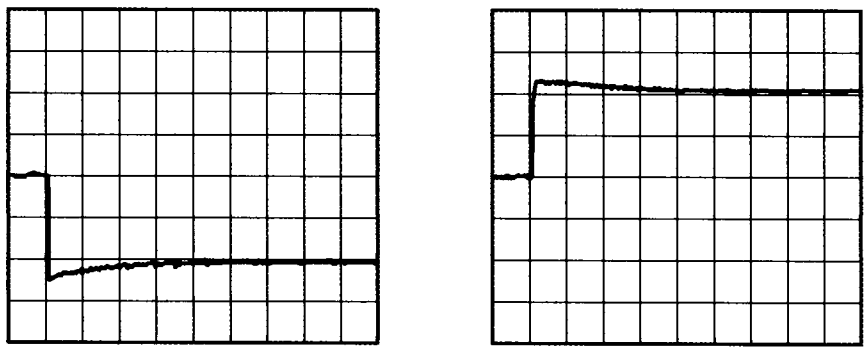
Model	SUW1R54812
Item	Dynamic Load Response
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

Input Volt. 48 V
Cycle 100 mS



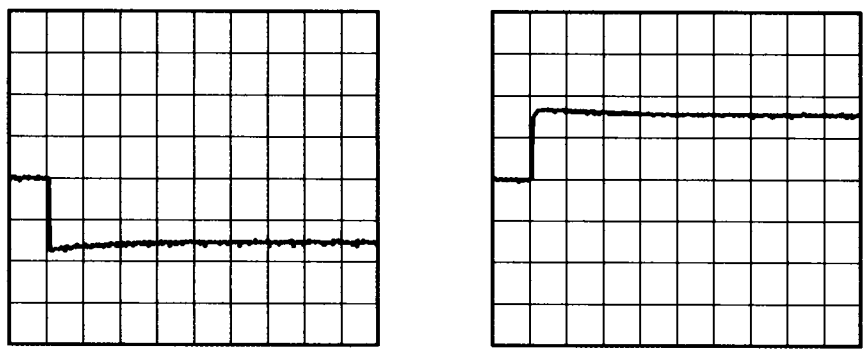
Min. Load (0A) ←→
Load 100% (0.065A)



200mV/div

2ms/div 2ms/div

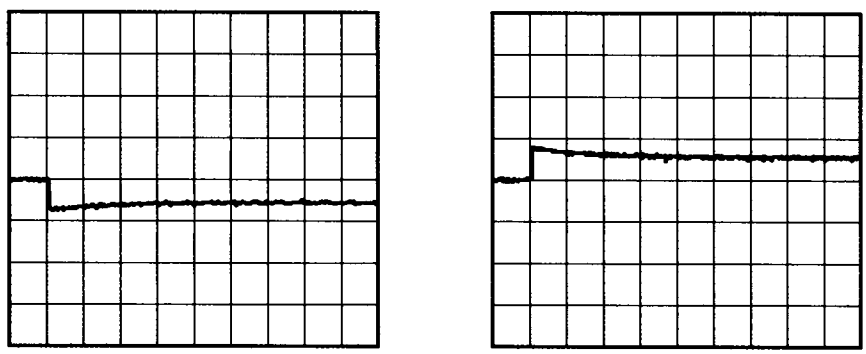
Min. Load (0A) ←→
Load 50% (0.0325A)



200mV/div

2ms/div 2ms/div

Load 50% (0.0325A) ←→
Load 100% (0.065A)



200mV/div

2ms/div 2ms/div

COSEL

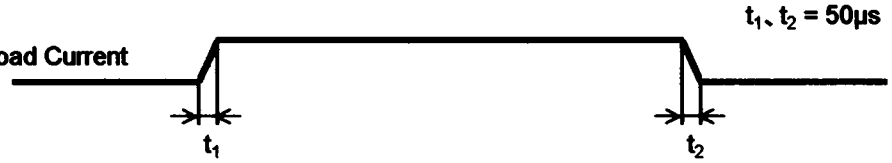
Model	SUW1R54812
Item	Dynamic Load Response
Object	-12V0.065A

Temperature 25°C
Testing Circuitry Figure A

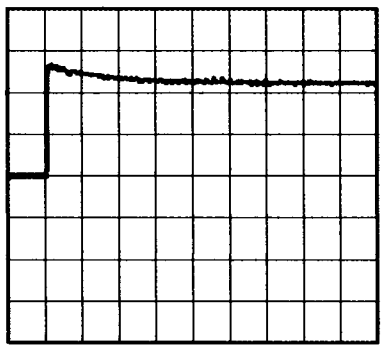
Input Volt. 48 V
Cycle 100 mS

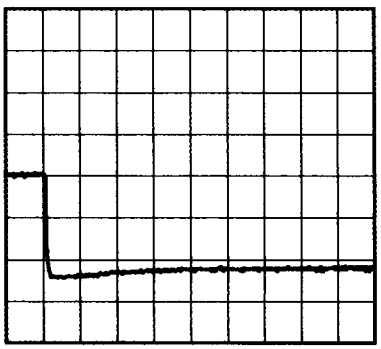
t_1、t_2 = 50μs

Load Current



Min. Load (0A) ←→
Load 100% (0.065A)

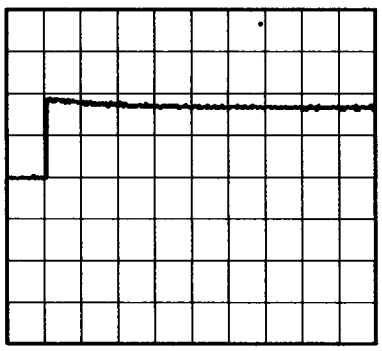


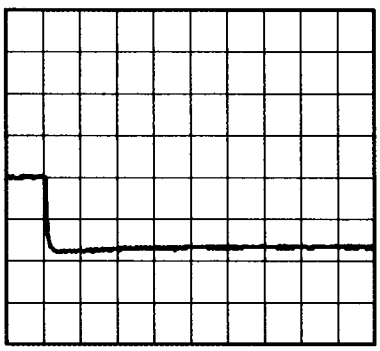


200mV/div

2ms/div 2ms/div

Min. Load (0A) ←→
Load 50% (0.0325A)

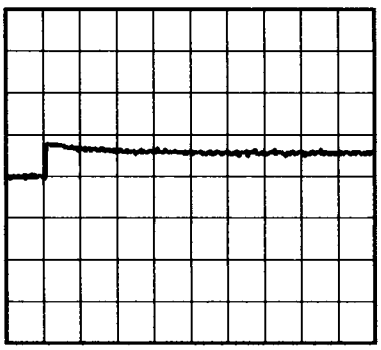


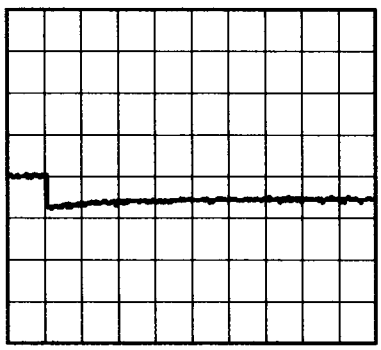


200mV/div

2ms/div 2ms/div

Load 50% (0.0325A) ←→
Load 100% (0.065A)





200mV/div

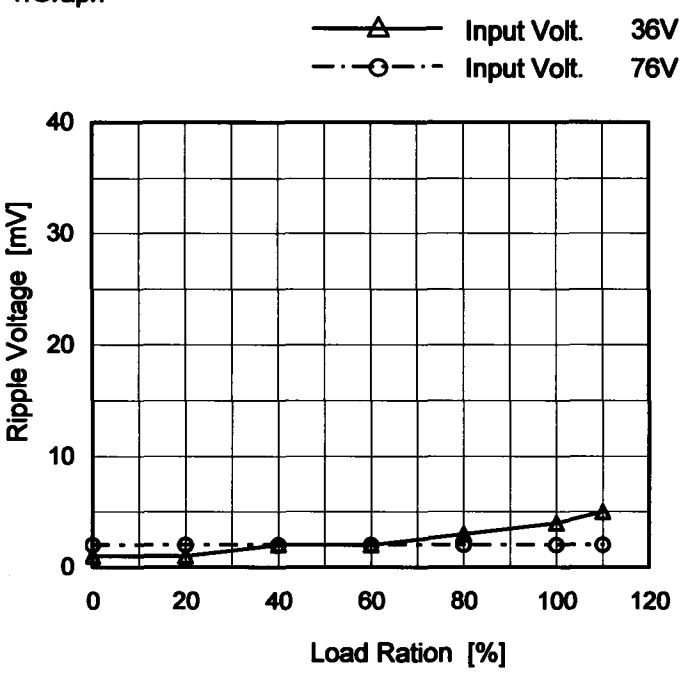
2ms/div 2ms/div

COSEL

Model	SUW1R54812
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.

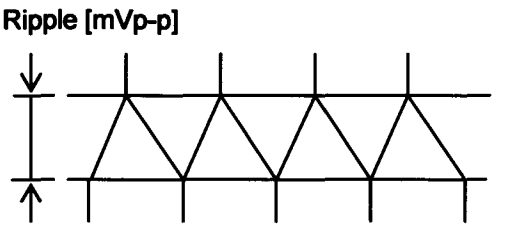


Fig.Complex Ripple Wave Form

2.Values

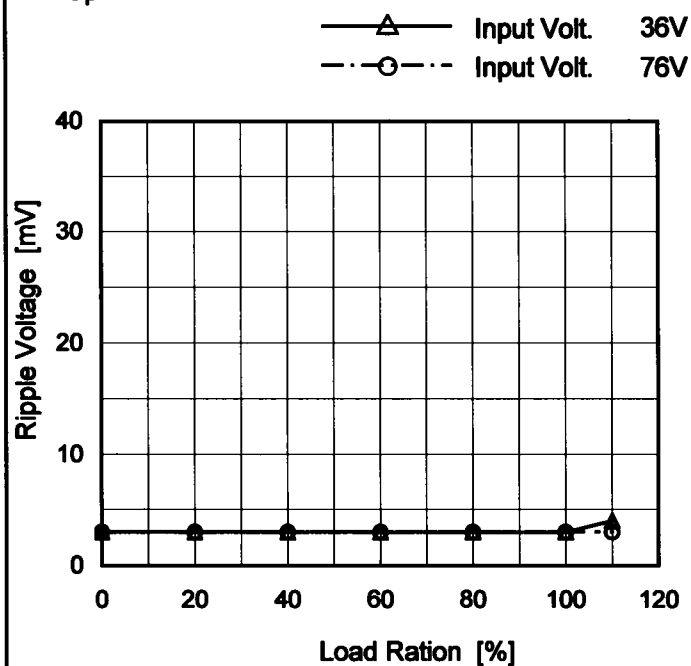
Load Ration [%]	Ripple Voltage [mV] Input Volt. 36 [V]	Ripple Voltage [mV] Input Volt. 76 [V]
0	1	2
20	1	2
40	2	2
60	2	2
80	3	2
100	4	2
110	5	2
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUW1R54812
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]

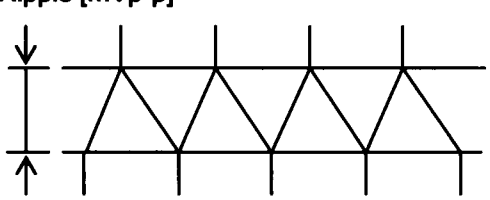


Fig.Complex Ripple Wave Form

2.Values

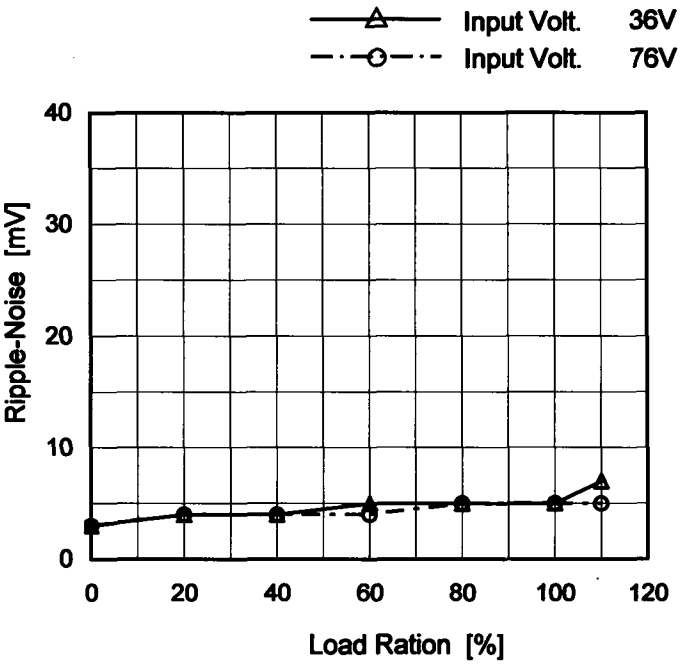
Load Ration [%]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0	3	3
20	3	3
40	3	3
60	3	3
80	3	3
100	3	3
110	4	3
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUW1R54812
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.

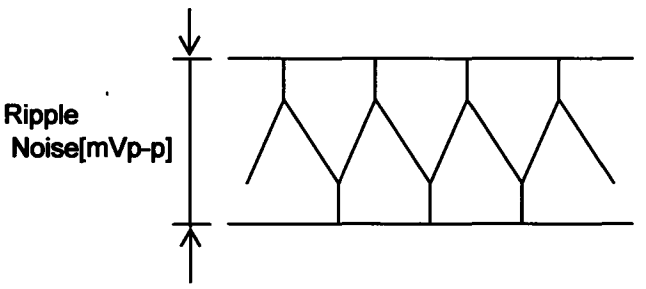


Fig.Complex Ripple Noise Wave Form

2.Values

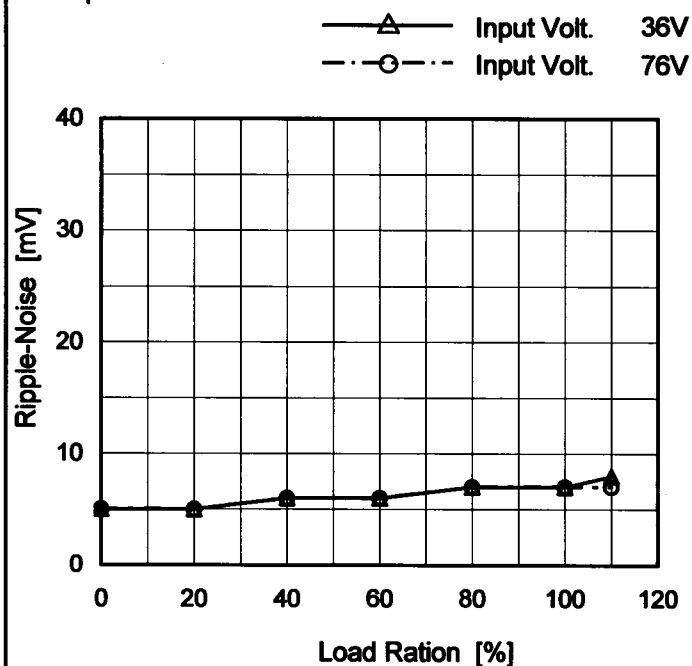
Load Ration [%]	Ripple-Noise [mV] Input Volt. 36 [V]	Ripple-Noise [mV] Input Volt. 76 [V]
0	3	3
20	4	4
40	4	4
60	5	4
80	5	5
100	5	5
110	7	5
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUW1R54812
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.

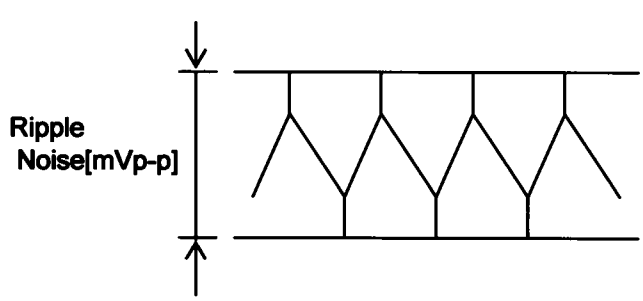


Fig.Complex Ripple Noise Wave Form

2.Values

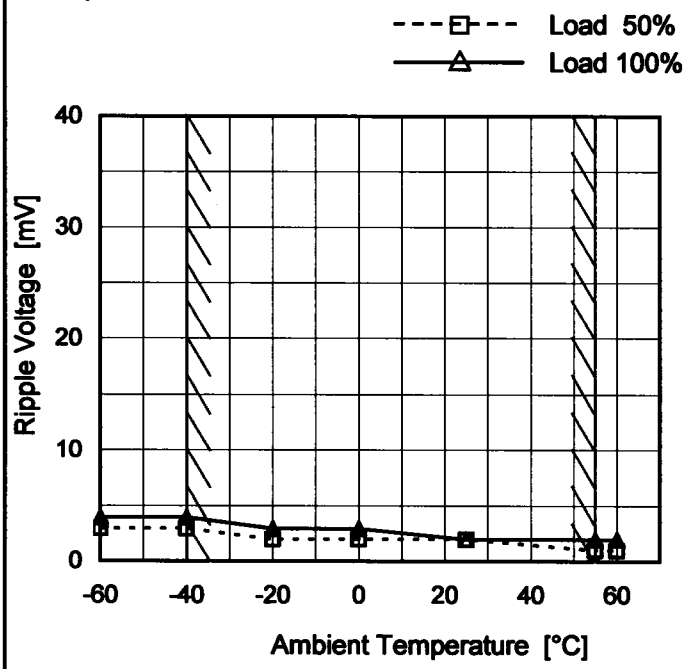
Load Ration [%]	Ripple-Noise [mV] Input Volt. 36 [V]	Ripple-Noise [mV] Input Volt. 76 [V]
0	5	5
20	5	5
40	6	6
60	6	6
80	7	7
100	7	7
110	8	7
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUW1R54812
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.065A

Testing Circuitry Figure B

1.Graph



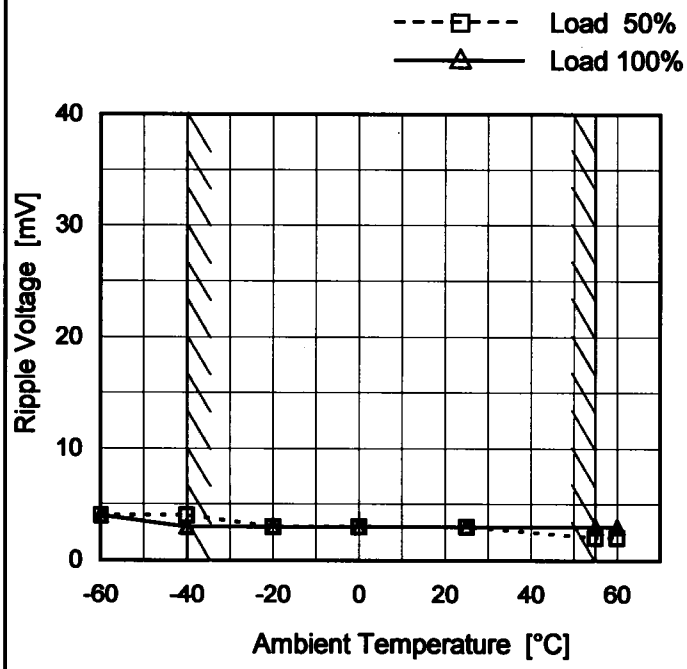
Input Volt. 48V

2.Values

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

Object	-12V0.065A

1.Graph



Input Volt. 48V

Measured by 100 MHz Oscilloscope.

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

2.Values

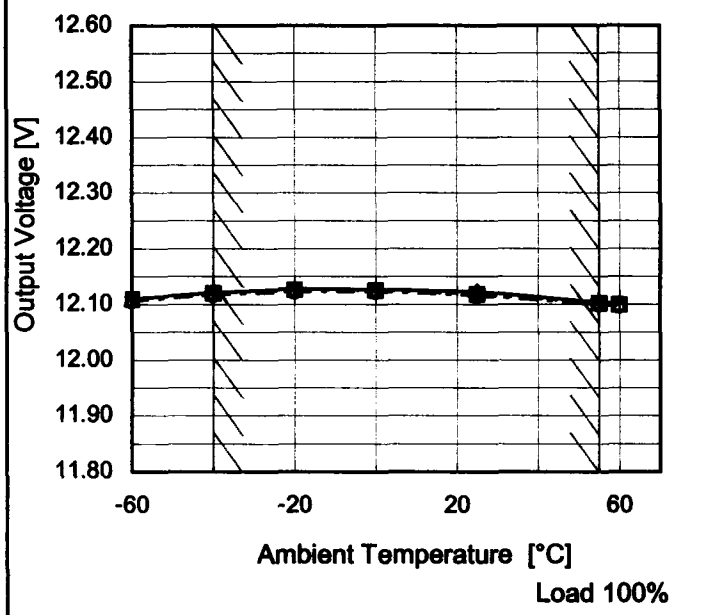
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	4	4
-40	4	3
-20	3	3
0	3	3
25	3	3
55	2	3
60	2	3
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUW1R54812
Item	Ambient Temperature Drift
Object	+12V0.065A

Testing Circuitry Figure A

1.Graph

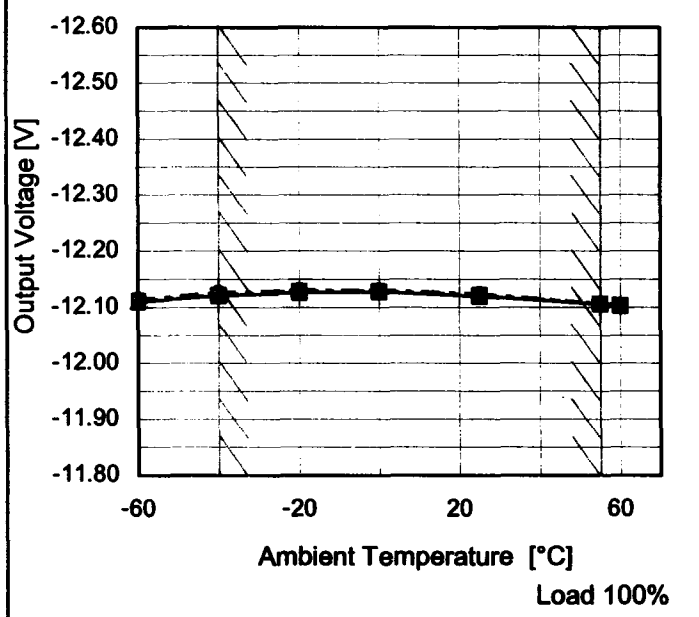


2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	12.110	12.109	12.106
-40	12.121	12.120	12.117
-20	12.128	12.126	12.123
0	12.127	12.125	12.123
25	12.123	12.118	12.116
55	12.104	12.102	12.100
60	12.101	12.099	12.097
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	-12.110	-12.112	-12.114
-40	-12.121	-12.122	-12.126
-20	-12.127	-12.129	-12.131
0	-12.128	-12.129	-12.131
25	-12.120	-12.122	-12.124
55	-12.106	-12.107	-12.107
60	-12.103	-12.104	-12.104
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUW1R54812	
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 : 36 - 76V
Load Current (AVR 1) : 0 - 0.065A (AVR 2) : 0 - 0.065A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

* 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	25	36	0	12.525	±213	±1.8
Minimum Voltage	55	76	0.065	12.100		

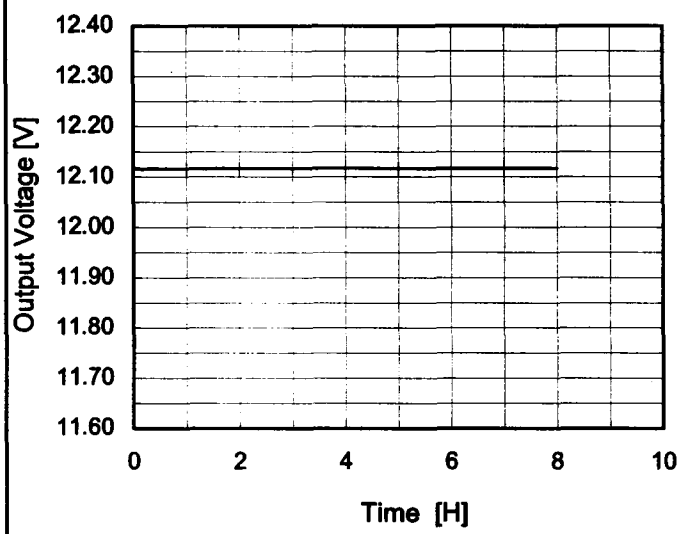
Object	-12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	36	0	-12.545	±220	±1.8
Minimum Voltage	55	36	0.065	-12.106		

COSEL

Model	SUW1R54812
Item	Time Lapse Drift
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



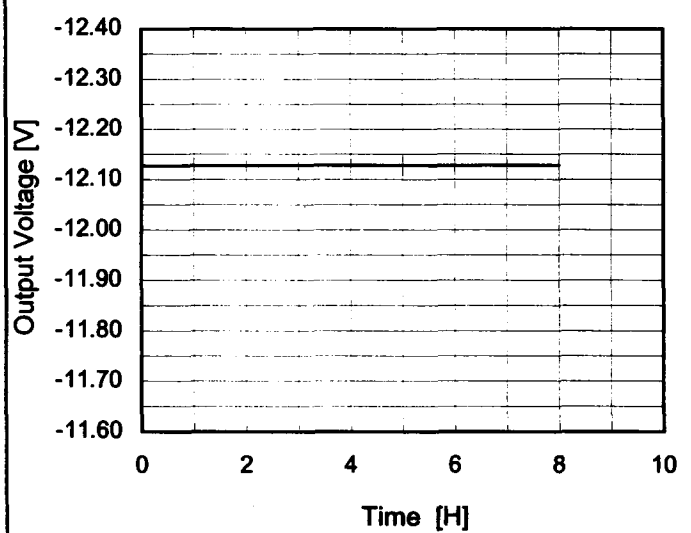
Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.122
0.5	12.117
1.0	12.117
2.0	12.117
3.0	12.117
4.0	12.118
5.0	12.118
6.0	12.117
7.0	12.117
8.0	12.117

Object	-12V0.065A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.133
0.5	-12.128
1.0	-12.128
2.0	-12.128
3.0	-12.128
4.0	-12.129
5.0	-12.128
6.0	-12.128
7.0	-12.129
8.0	-12.129

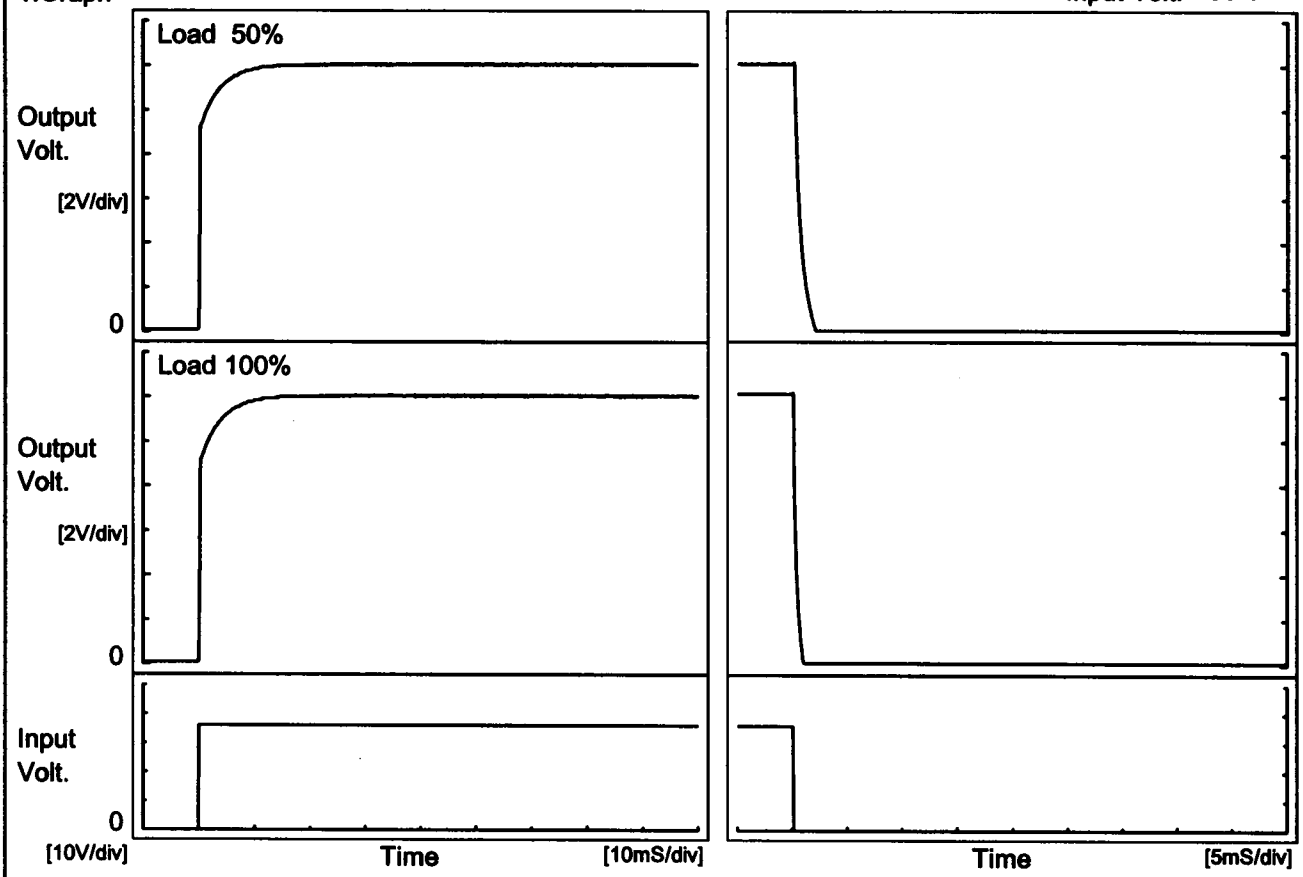
COSEL

Model	SUW1R54812
Item	Rise and Fall Time
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

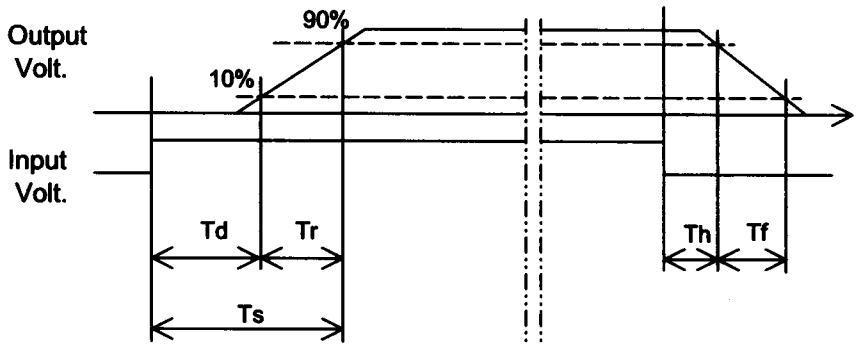
Input Volt. 36 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	3.5	3.6	0.2	1.3
100 %	0.1	3.7	3.8	0.1	0.6



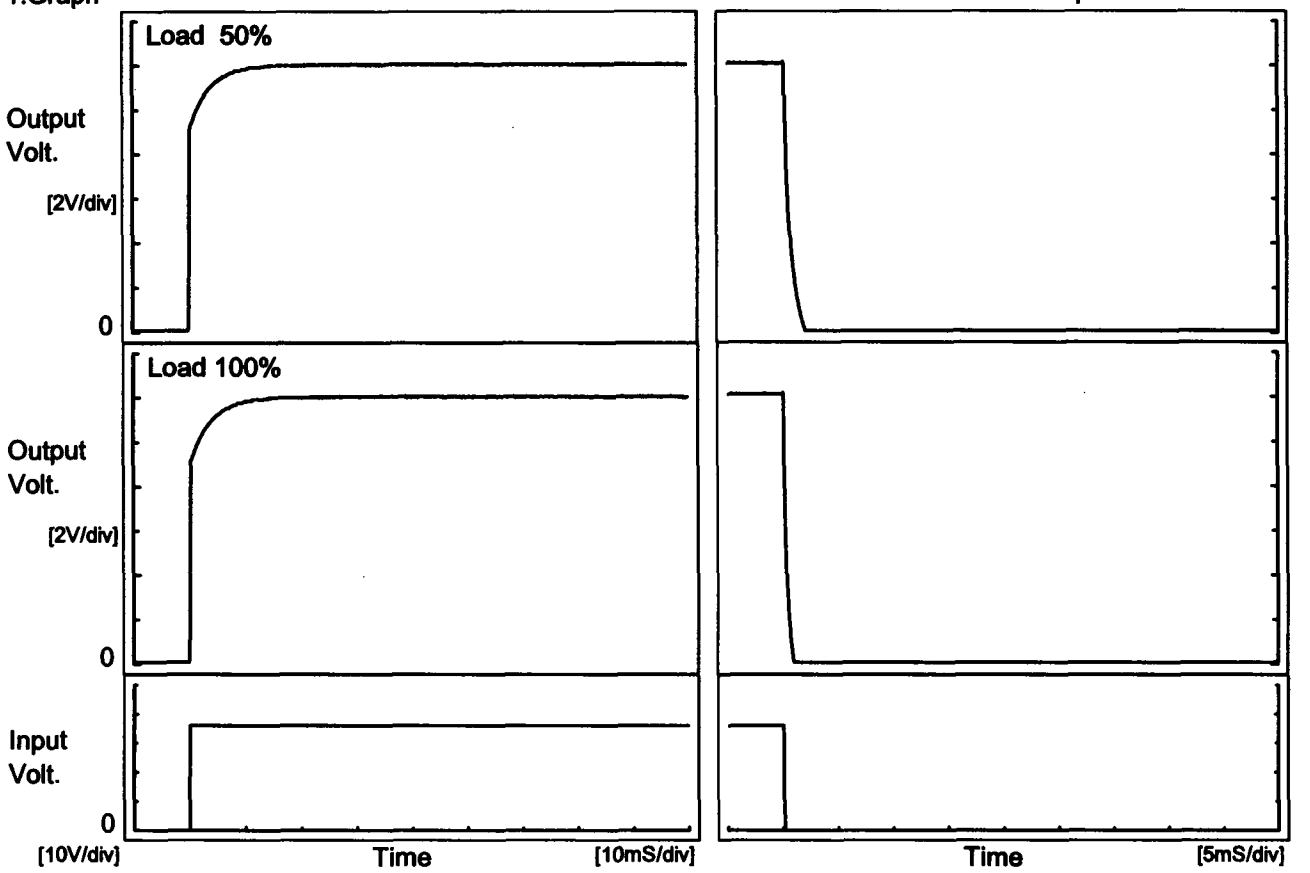
COSEL

Model	SUW1R54812
Item	Rise and Fall Time
Object	-12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

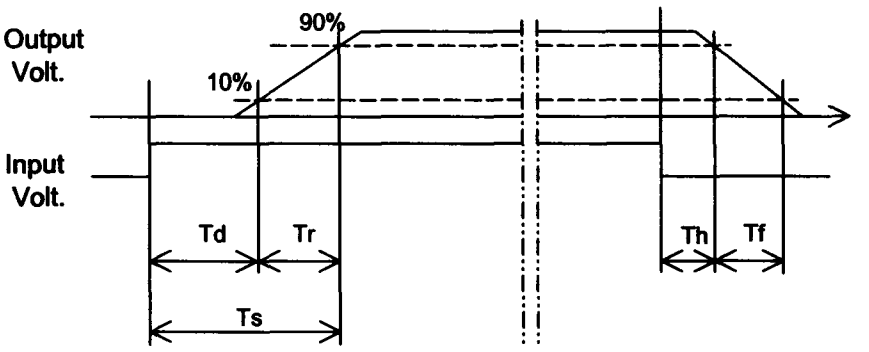
Input Volt. 36 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	3.5	3.6	0.2	1.3
100 %	0.1	3.7	3.8	0.1	0.6

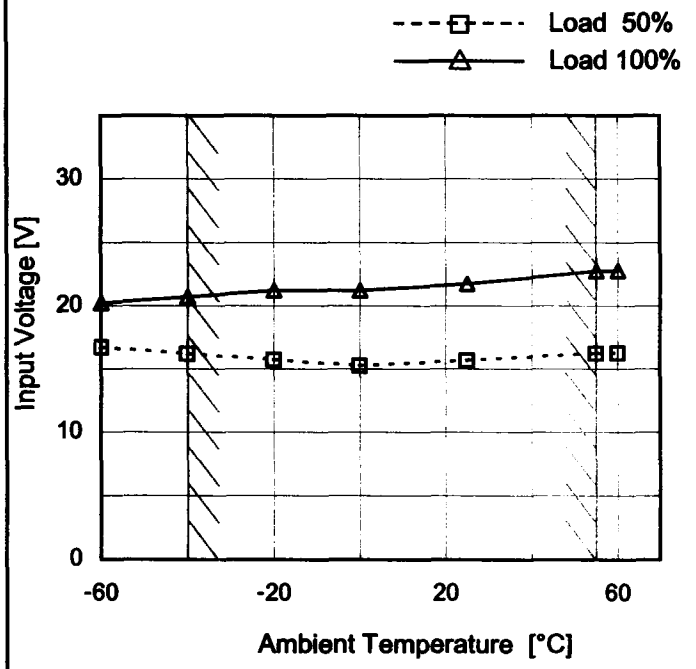


COSEL

Model	SUW1R54812
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.065A

Testing Circuitry Figure A

1.Graph

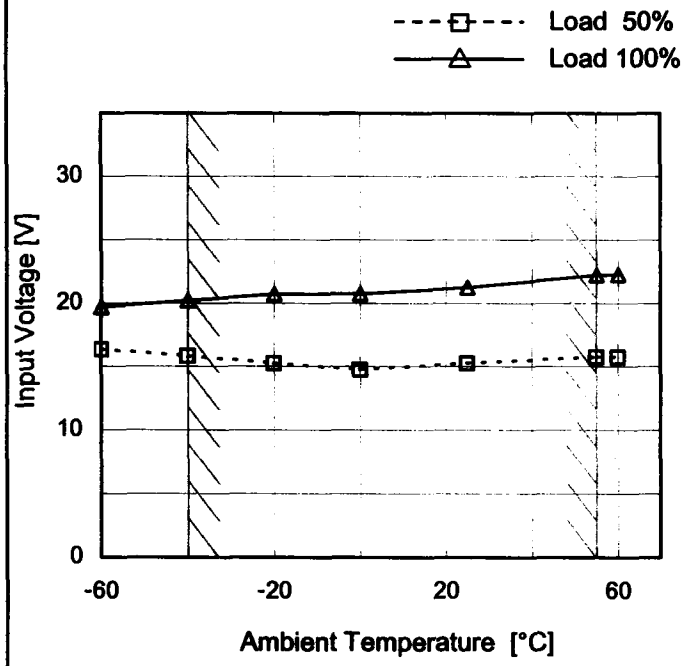


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	16.8	20.3
-40	16.3	20.8
-20	15.8	21.3
0	15.3	21.3
25	15.7	21.8
55	16.3	22.8
60	16.3	22.8
–	-	-
–	-	-
–	-	-
–	-	-

Object	-12V0.065A

1.Graph



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

2.Values

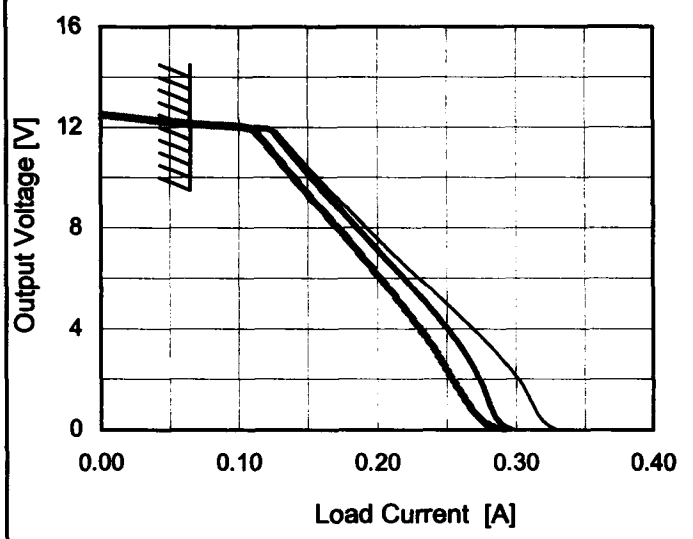
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	16.4	19.7
-40	15.9	20.3
-20	15.3	20.8
0	14.8	20.8
25	15.3	21.3
55	15.8	22.3
60	15.8	22.3
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUW1R54812
Item	Overcurrent Protection
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

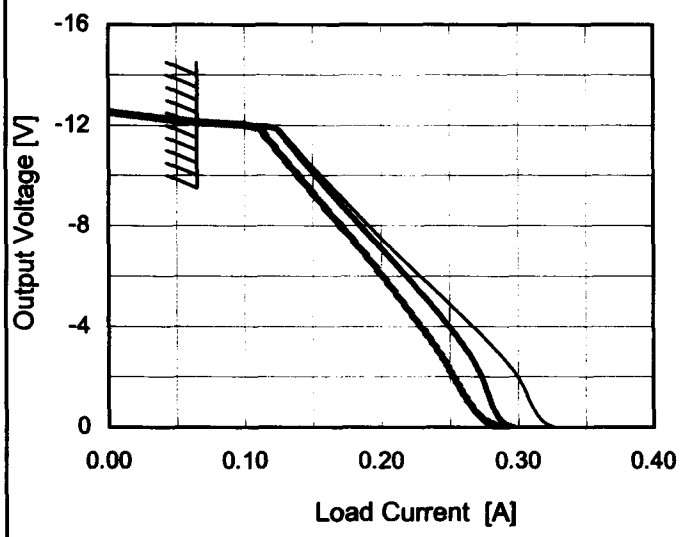


2.Values

Output Voltage [V]	Load Current [A] Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
12.0	0.07	0.07	0.07
11.4	0.13	0.13	0.12
10.8	0.14	0.14	0.13
9.6	0.16	0.16	0.15
8.4	0.18	0.18	0.16
7.2	0.21	0.20	0.19
6.0	0.23	0.22	0.20
4.8	0.25	0.24	0.22
3.6	0.28	0.26	0.24
2.4	0.30	0.27	0.25
1.2	0.31	0.28	0.26
0.0	0.33	0.30	0.29

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. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-12.0	0.07	0.07	0.07
-11.4	0.13	0.13	0.12
-10.8	0.14	0.14	0.13
-9.6	0.16	0.16	0.15
-8.4	0.18	0.18	0.16
-7.2	0.21	0.20	0.18
-6.0	0.23	0.22	0.20
-4.8	0.25	0.24	0.22
-3.6	0.27	0.26	0.23
-2.4	0.29	0.27	0.25
-1.2	0.31	0.28	0.26
0.0	0.33	0.30	0.29

COSEL

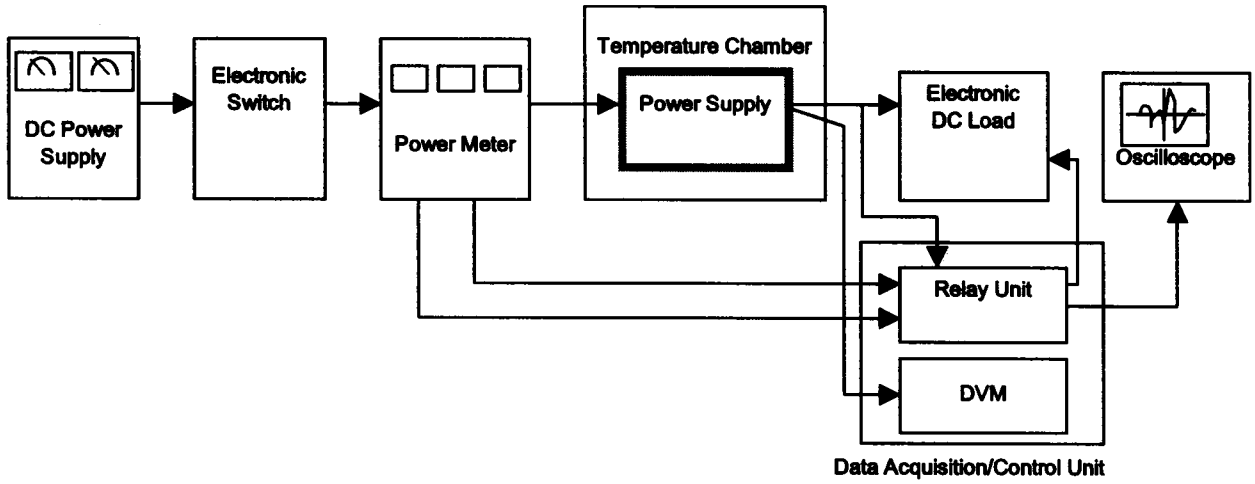


Figure A

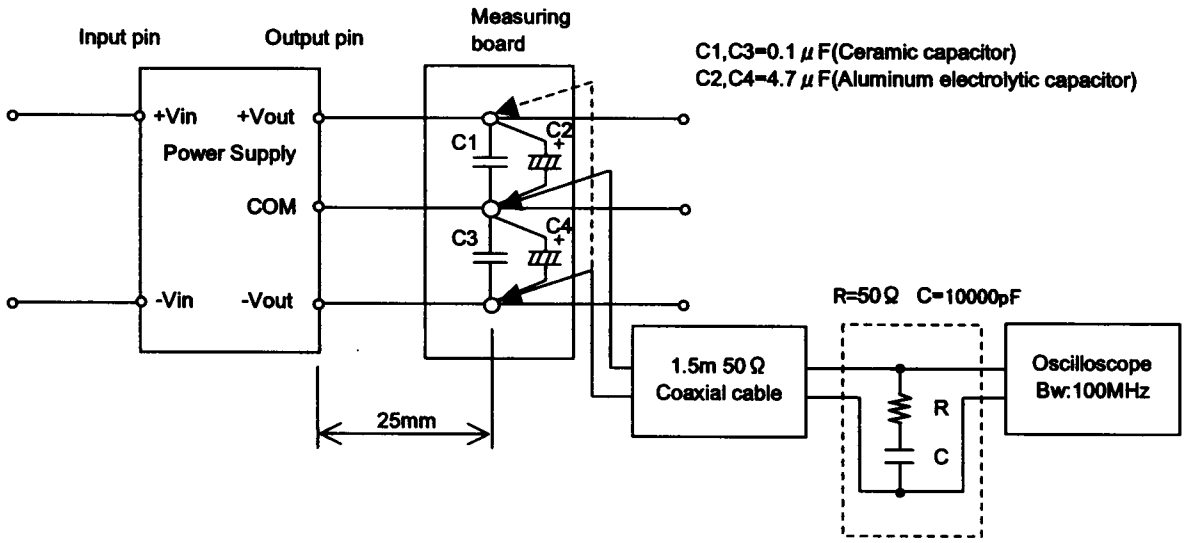


Figure B (Ripple and Ripple noise Characteristic)