参考資料

COSEL

TEST DATA OF SUW100512 SUCW100512

Regulated DC Power Supply
Mar 28, 2005

Approved by : Tetsuo Sugimori
Tetsuo Sugimori Design Manager

Prepared by : Yoshimichi Hirokawa
Yoshimichi Hirokawa Design Engineer

COSEL CO.,LTD.

参考資料

COSEL

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

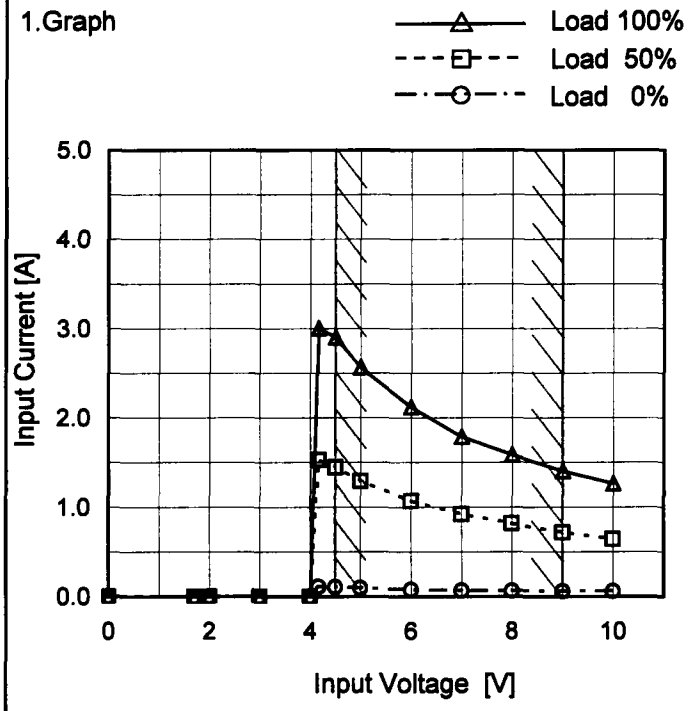
(Final Page 22)

COSEL

Model	SUW100512/SUCW100512
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%
0.00	0.000	0.000	0.000
1.70	0.000	0.000	0.000
2.00	0.000	0.000	0.000
3.00	0.000	0.000	0.000
4.00	0.000	0.000	0.000
4.16	0.111	1.530	3.006
4.50	0.109	1.447	2.903
5.00	0.096	1.292	2.569
6.00	0.078	1.071	2.122
7.00	0.069	0.922	1.791
8.00	0.064	0.817	1.587
9.00	0.061	0.718	1.405
10.00	0.061	0.645	1.265
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

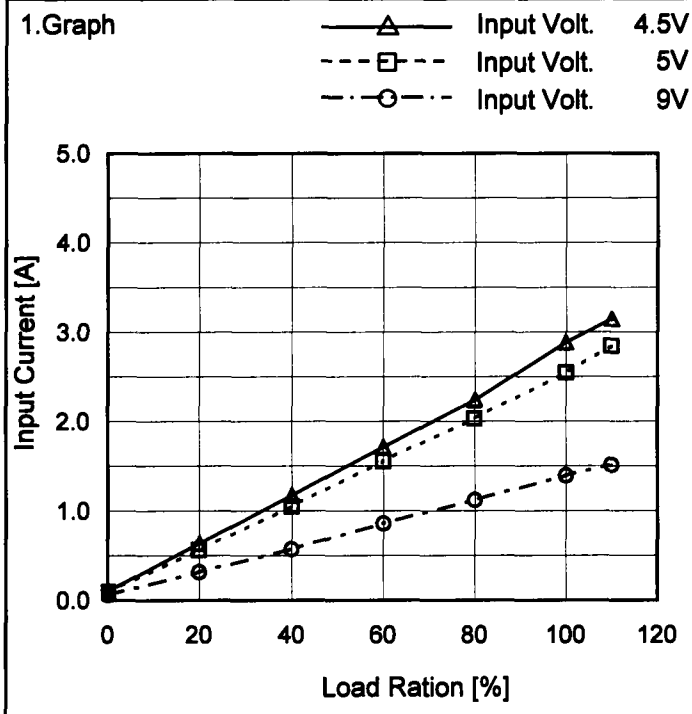
BC-3796

COSEL

Model	SUW100512/SUCW100512
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

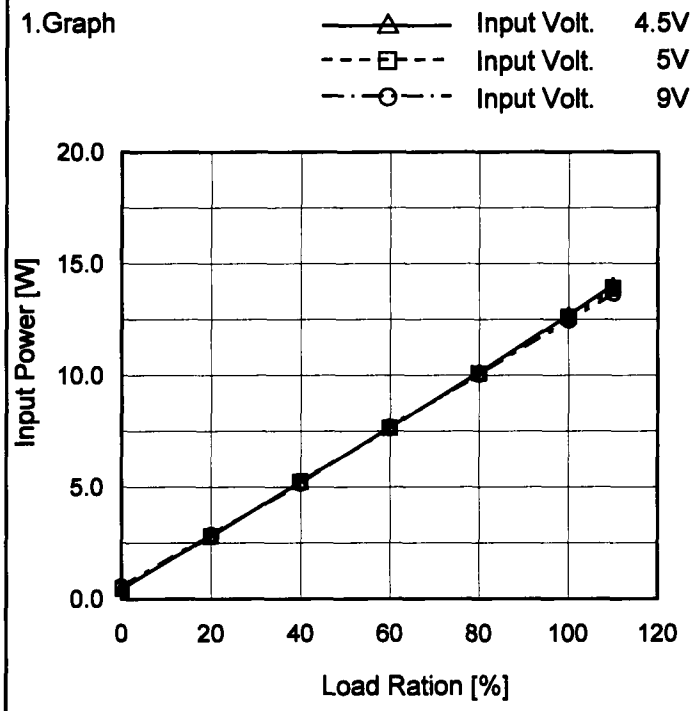
Load Ration [%]	Input Current [A]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	0.105	0.093	0.061
20	0.637	0.565	0.317
40	1.176	1.048	0.571
60	1.713	1.556	0.858
80	2.242	2.035	1.120
100	2.886	2.548	1.394
110	3.148	2.844	1.513
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUW100512/SUCW100512
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

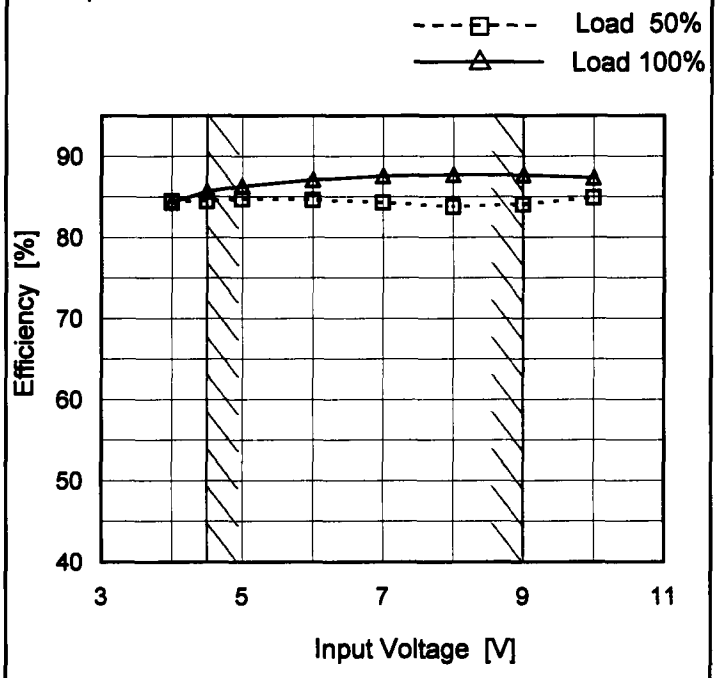
Load Ration [%]	Input Power [W]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0	0.48	0.47	0.56
20	2.82	2.81	2.87
40	5.24	5.24	5.16
60	7.67	7.64	7.71
80	10.13	10.09	10.04
100	12.70	12.61	12.45
110	14.04	13.91	13.64
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUW100512/SUCW100512
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

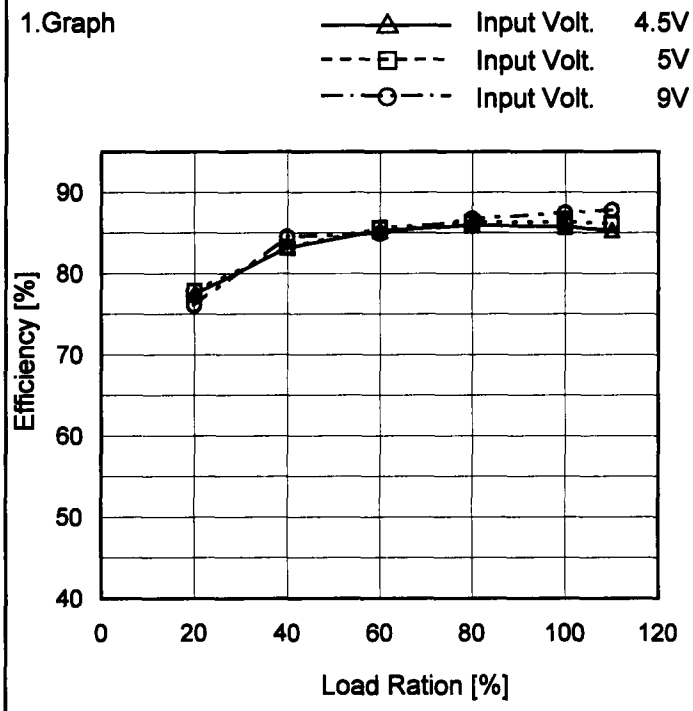
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
4.0	84.4	84.3
4.5	84.5	85.7
5.0	84.7	86.3
6.0	84.6	87.1
7.0	84.3	87.6
8.0	83.8	87.7
9.0	84.1	87.7
10.0	84.9	87.4
--	-	-

COSEL

Model	SUW100512/SUCW100512
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	77.4	77.9	76.1
40	83.2	83.2	84.5
60	85.3	85.6	84.9
80	86.0	86.3	86.7
100	85.8	86.3	87.5
110	85.3	86.1	87.8
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

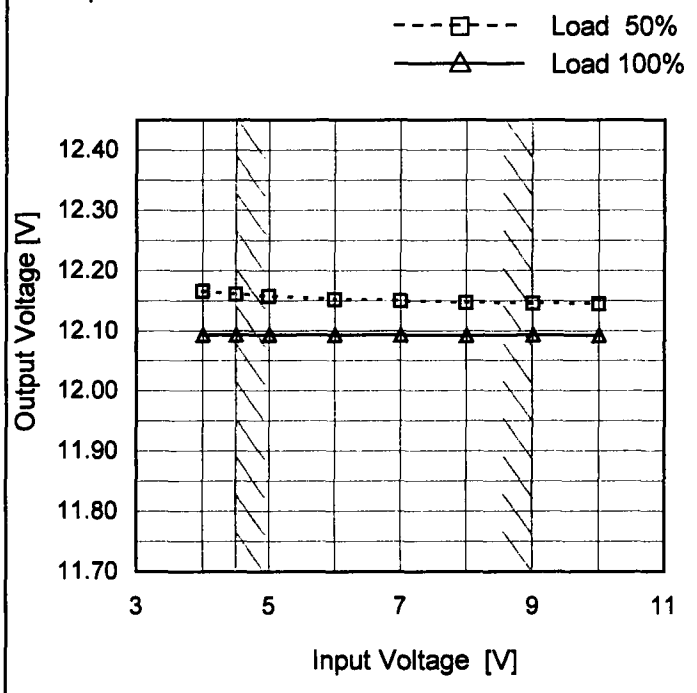
BC-3796

COSEL

Model	SUW100512/SUCW100512
Item	Line Regulation
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

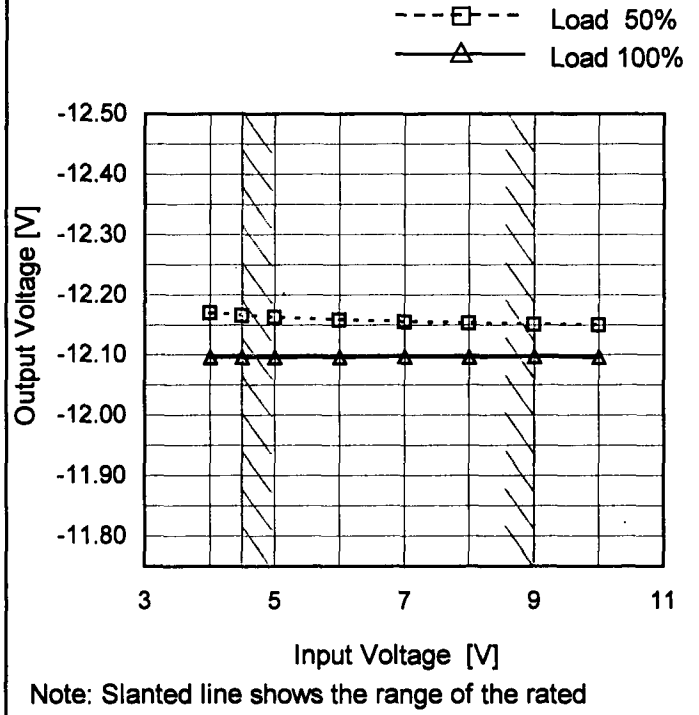


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	12.165	12.093
4.5	12.160	12.093
5.0	12.157	12.093
6.0	12.152	12.093
7.0	12.149	12.093
8.0	12.147	12.092
9.0	12.145	12.093
10.0	12.144	12.092
--	-	-

Object	-12V0.45A

1.Graph



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

2.Values

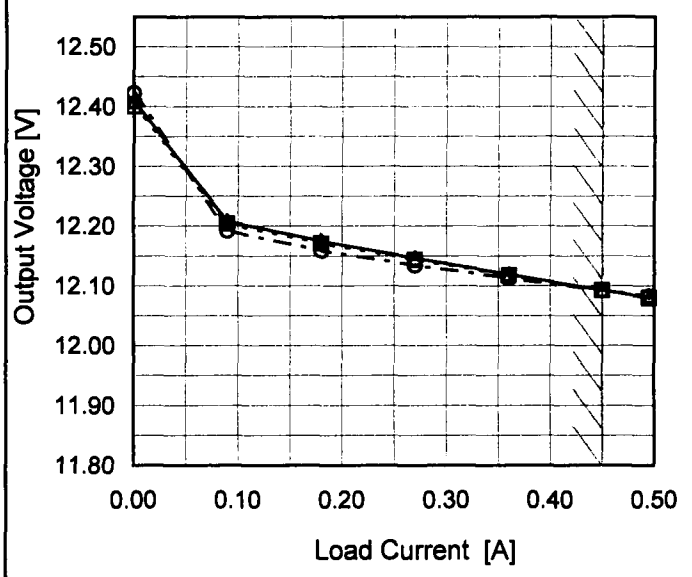
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.0	-12.170	-12.096
4.5	-12.165	-12.096
5.0	-12.163	-12.097
6.0	-12.158	-12.097
7.0	-12.155	-12.097
8.0	-12.152	-12.097
9.0	-12.151	-12.097
10.0	-12.149	-12.097
--	-	-

COSEL

Model	SUW100512/SUCW100512
Item	Load Regulation
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

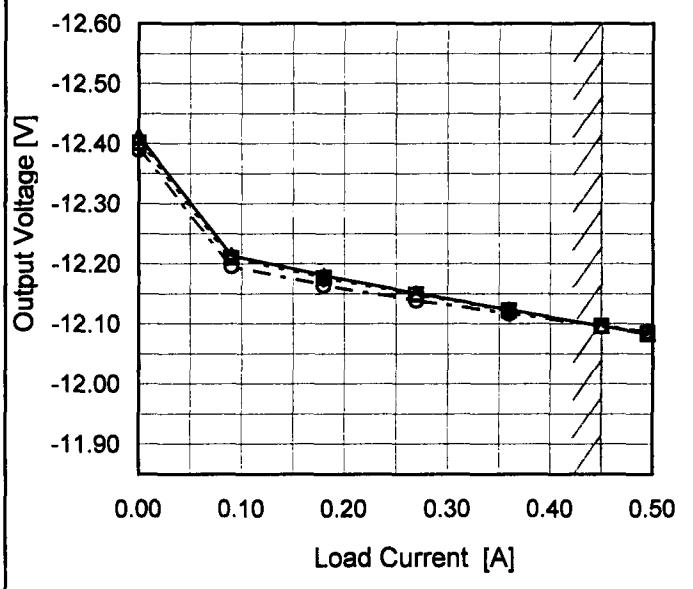


2.Values

Load Current [A]	Output Voltage [V] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.000	12.410	12.400	12.423
0.090	12.208	12.204	12.192
0.180	12.175	12.171	12.159
0.270	12.147	12.144	12.134
0.360	12.119	12.118	12.113
0.450	12.093	12.092	12.092
0.495	12.080	12.080	12.082
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-12V0.45A

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	-12.413	-12.402	-12.390
0.090	-12.214	-12.210	-12.196
0.180	-12.181	-12.177	-12.164
0.270	-12.151	-12.149	-12.139
0.360	-12.124	-12.122	-12.117
0.450	-12.097	-12.096	-12.097
0.495	-12.083	-12.084	-12.087
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

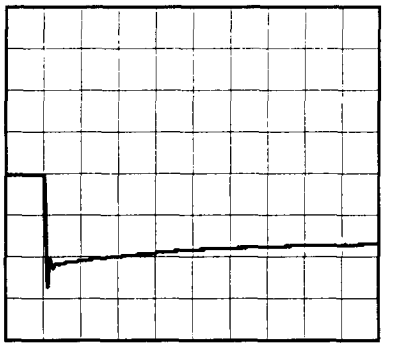
BC-3796

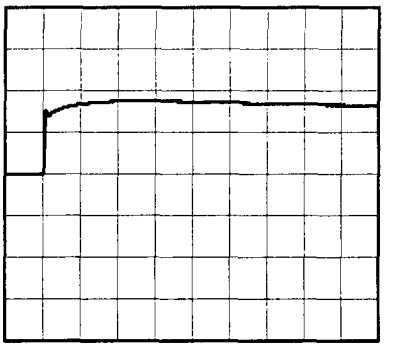
COSEL

Model	SUW100512/SUCW100512	Temperature 25°C
Item	Dynamic Load Response	Testing Circuitry Figure A
Object	+12V0.45A	

Input Volt. 5 V
Cycle 100 mS

Min. Load (0A) ⟷
Load 100% (0.45A)

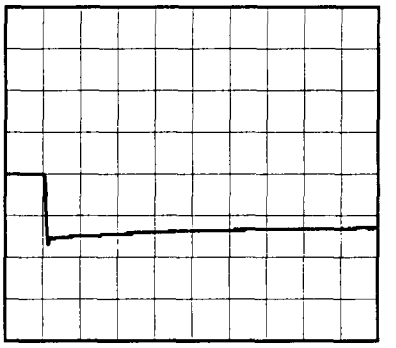


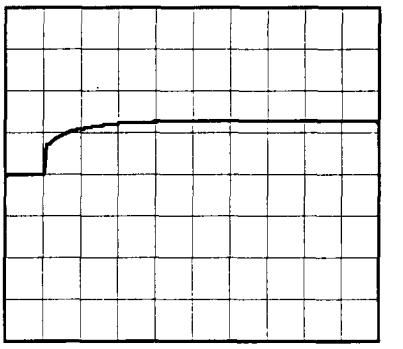


200mV/div

500μs/div 500μs/div

Min. Load (0A) ⟷
Load 50% (0.225A)

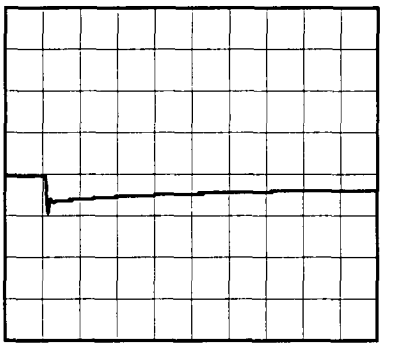


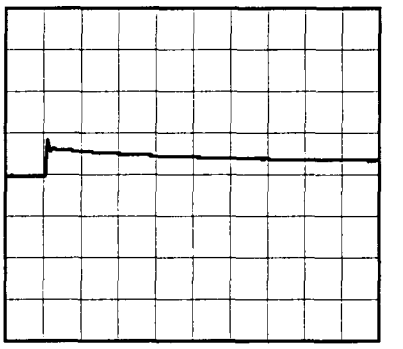


200mV/div

500μs/div 500μs/div

Load 50% (0.225A) ⟷
Load 100% (0.45A)





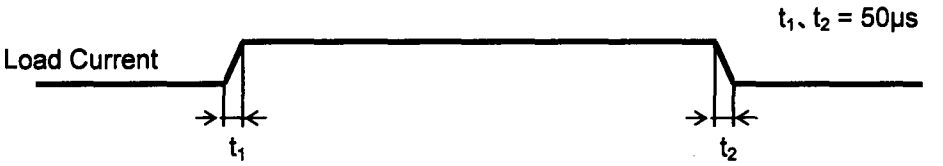
200mV/div

500μs/div 500μs/div

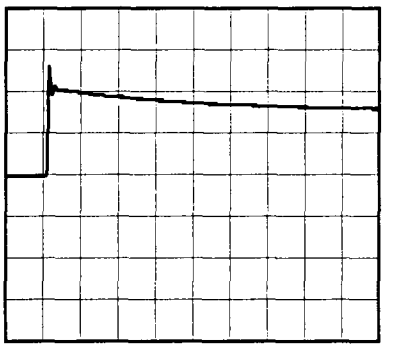
COSEL

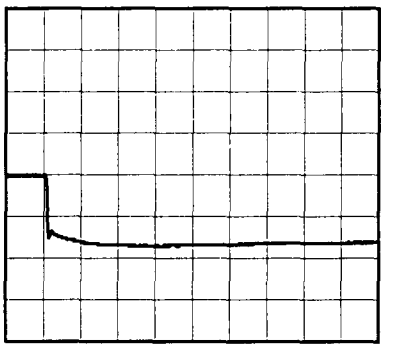
Model	SUW100512/SUCW100512	Temperature 25°C
Item	Dynamic Load Response	Testing Circuitry Figure A
Object	-12V0.45A	

Input Volt. 5 V
Cycle 100 mS



Min. Load (0A) ⟷
Load 100% (0.45A)

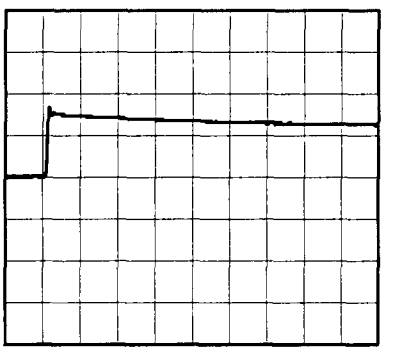


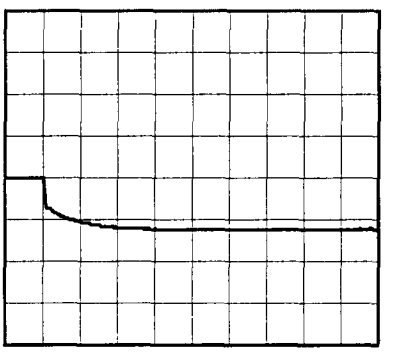


200mV/div

500μs/div 500μs/div

Min. Load (0A) ⟷
Load 50% (0.225A)

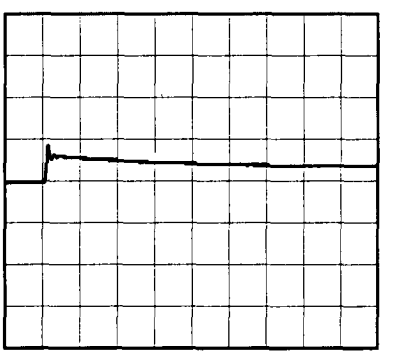


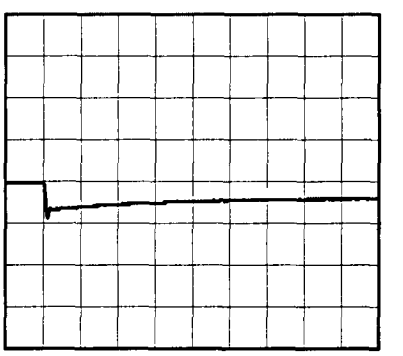


200mV/div

500μs/div 500μs/div

Load 50% (0.225A) ⟷
Load 100% (0.45A)





200mV/div

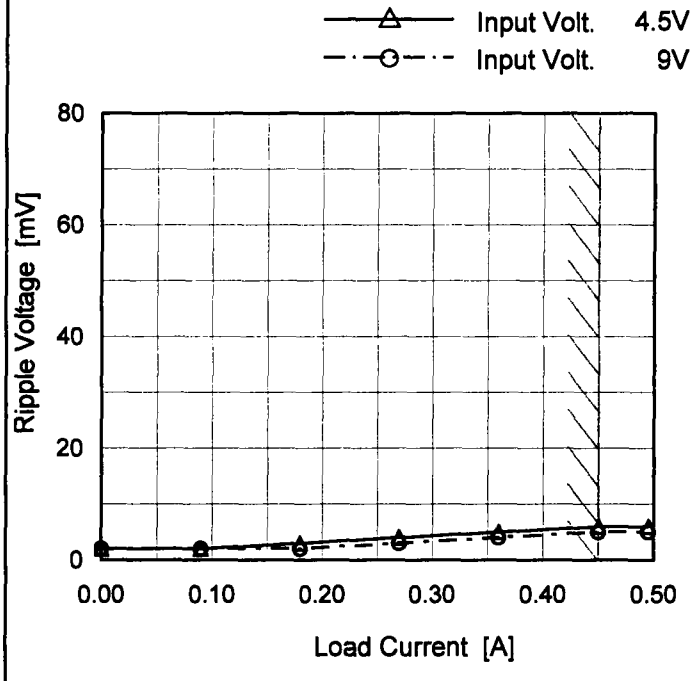
500μs/div 500μs/div

COSEL

Model	SUW100512/SUCW100512
Item	Ripple Voltage (by Load Current)
Object	+12V0.45A

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]

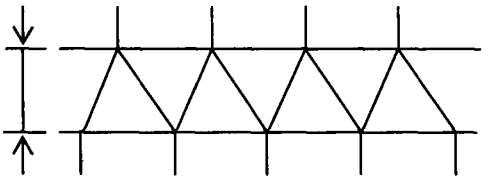


Fig.Complex Ripple Wave Form

2.Values

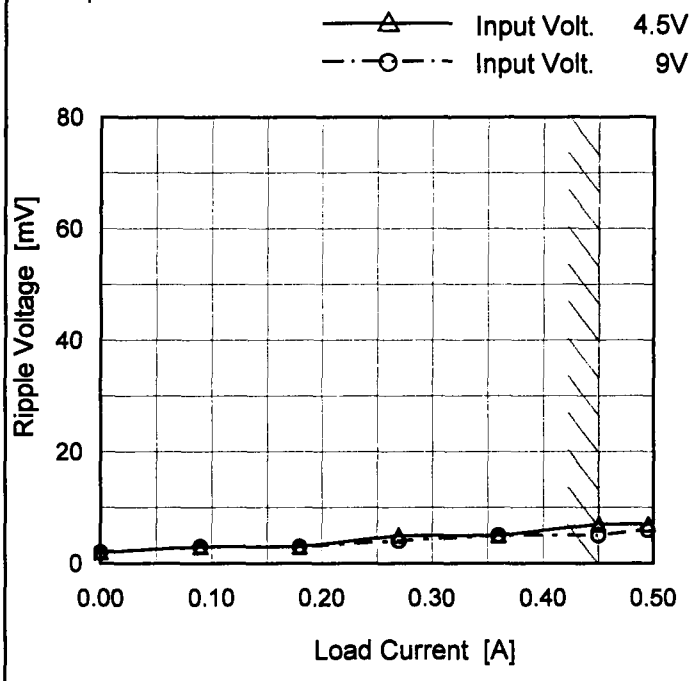
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.000	2	2
0.090	2	2
0.180	3	2
0.270	4	3
0.360	5	4
0.450	6	5
0.495	6	5
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW100512/SUCW100512
Item	Ripple Voltage (by Load Current)
Object	-12V0.45A

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]

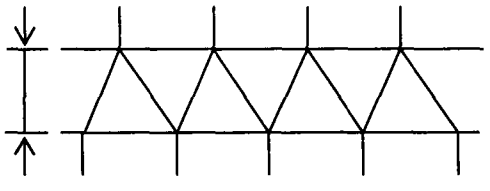


Fig.Complex Ripple Wave Form

2.Values

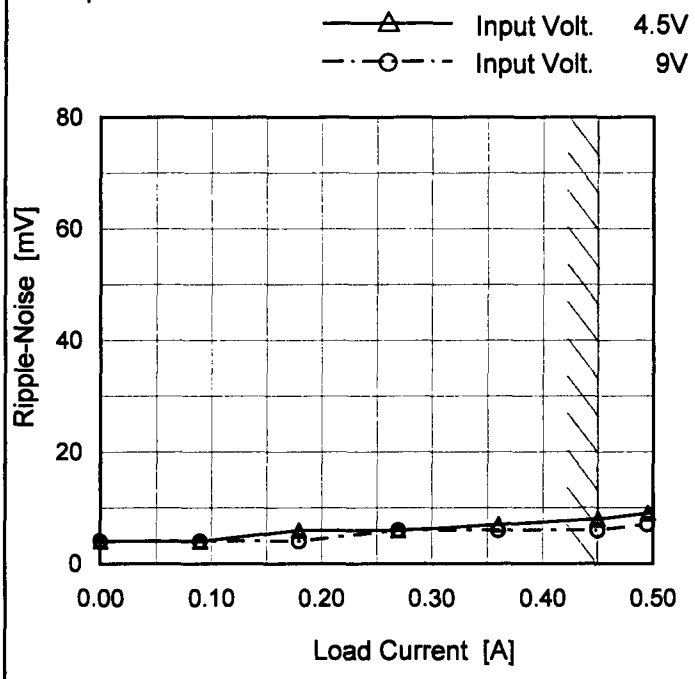
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.000	2	2
0.090	3	3
0.180	3	3
0.270	5	4
0.360	5	5
0.450	7	5
0.495	7	6
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW100512/SUCW100512
Item	Ripple-Noise
Object	+12V0.45A

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.

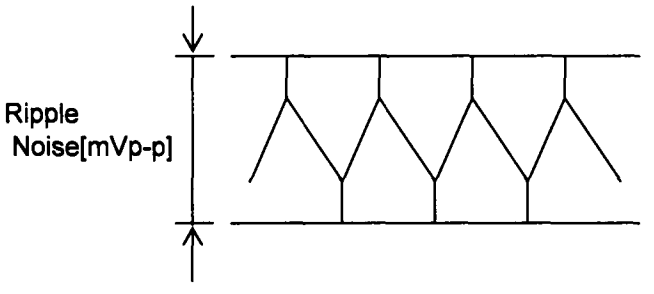


Fig.Complex Ripple Noise Wave Form

2.Values

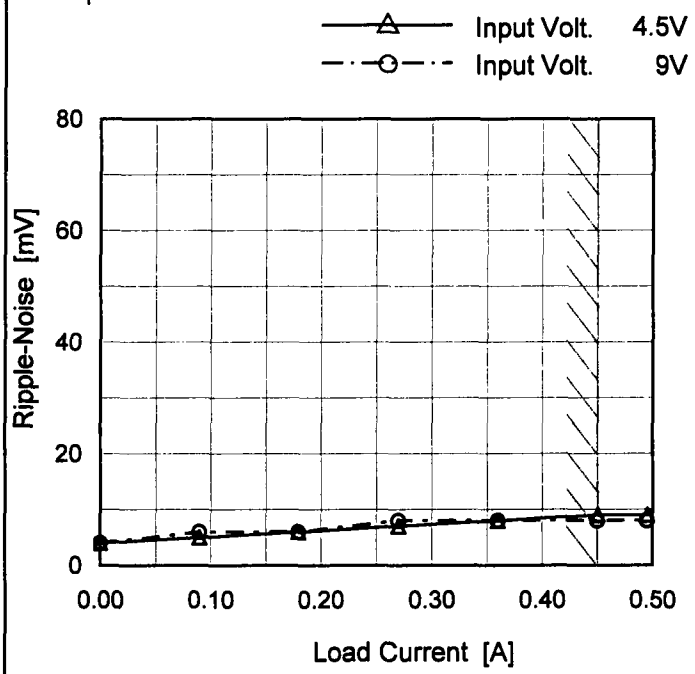
Load Current [A]	Ripple-Noise [mV] Input Volt. 4.5 [V]	Ripple-Noise [mV] Input Volt. 9 [V]
0.000	4	4
0.090	4	4
0.180	6	4
0.270	6	6
0.360	7	6
0.450	8	6
0.495	9	7
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW100512/SUCW100512
Item	Ripple-Noise
Object	-12V0.45A

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.

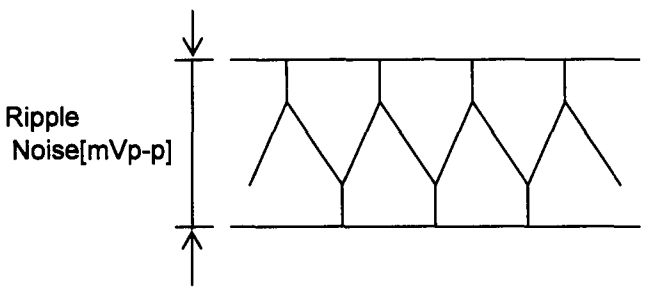


Fig.Complex Ripple Noise Wave Form

2.Values

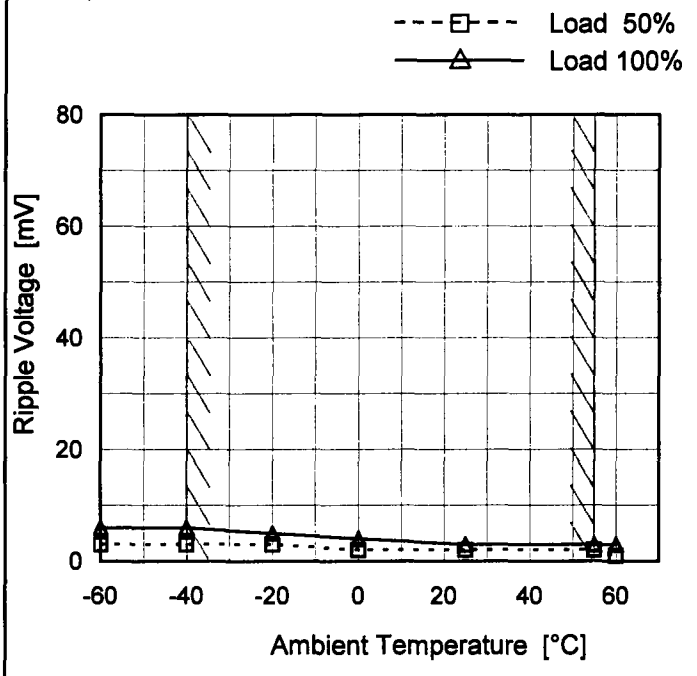
Load Current [A]	Ripple-Noise [mV] Input Volt. 4.5 [V]	Ripple-Noise [mV] Input Volt. 9 [V]
0.000	4	4
0.090	5	6
0.180	6	6
0.270	7	8
0.360	8	8
0.450	9	8
0.495	9	8
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW100512/SUCW100512
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.45A

Testing Circuitry Figure B

1.Graph



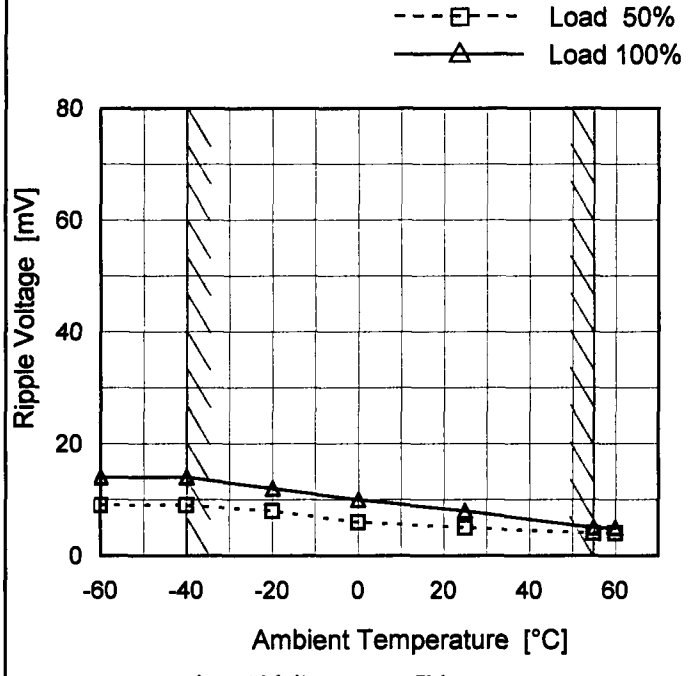
Input Volt. 5V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	3	6
-40	3	6
-20	3	5
0	2	4
25	2	3
55	2	3
60	1	3
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.45A

1.Graph



Input Volt. 5V

Measured by 100 MHz Oscilloscope.

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

2.Values

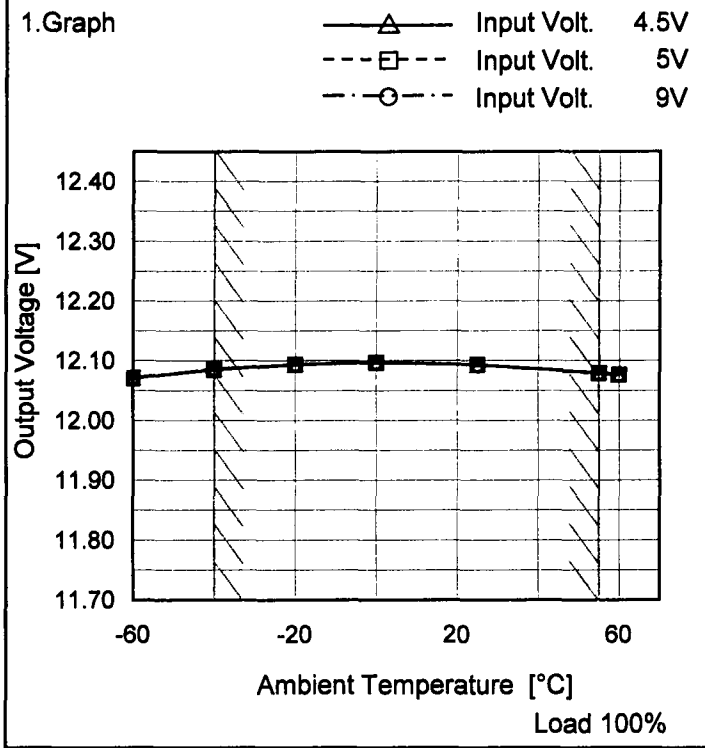
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	9	14
-40	9	14
-20	8	12
0	6	10
25	5	8
55	4	5
60	4	5
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUW100512/SUCW100512
Item	Ambient Temperature Drift
Object	+12V0.45A

Testing Circuitry Figure A

1.Graph

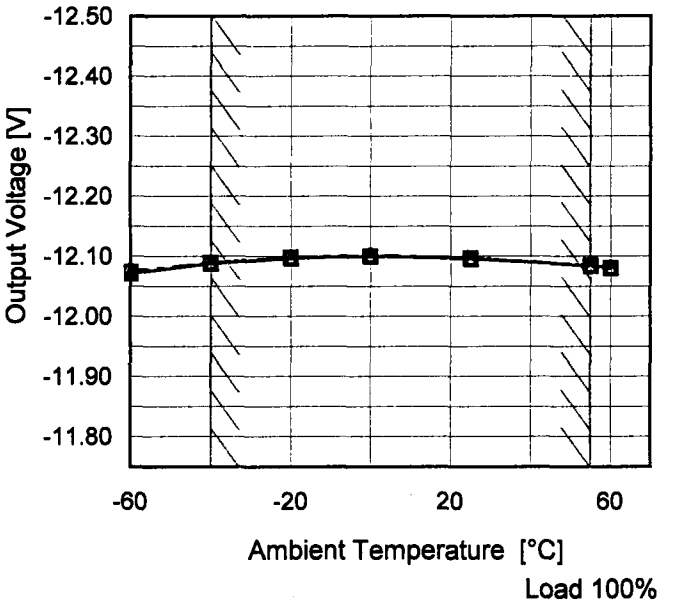


2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	12.071	12.071	12.071
-40	12.085	12.086	12.086
-20	12.094	12.094	12.094
0	12.097	12.097	12.097
25	12.093	12.093	12.092
55	12.080	12.079	12.079
60	12.077	12.076	12.076
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-12V0.45A

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	-12.072	-12.074	-12.075
-40	-12.088	-12.089	-12.089
-20	-12.097	-12.098	-12.098
0	-12.100	-12.100	-12.101
25	-12.096	-12.097	-12.097
55	-12.084	-12.084	-12.084
60	-12.081	-12.080	-12.081
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-3796

COSEL

Model	SUW100512/SUCW100512	
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 - 0.45A (AVR 2) : 0 - 0.45A
* Other Output : Rated Load

* 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	+12V0.45A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	0	9	0	12.427	±174	±1.5
Minimum Voltage	55	9	0.45	12.079		

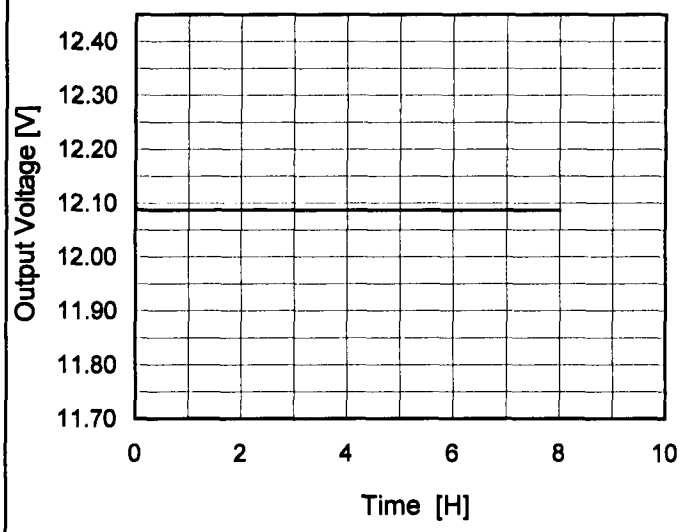
Object	-12V0.45A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	0	4.5	0	-12.415	±166	±1.4
Minimum Voltage	55	9	0.45	-12.084		

COSEL

Model	SUW100512/SUCW1001512
Item	Time Lapse Drift
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



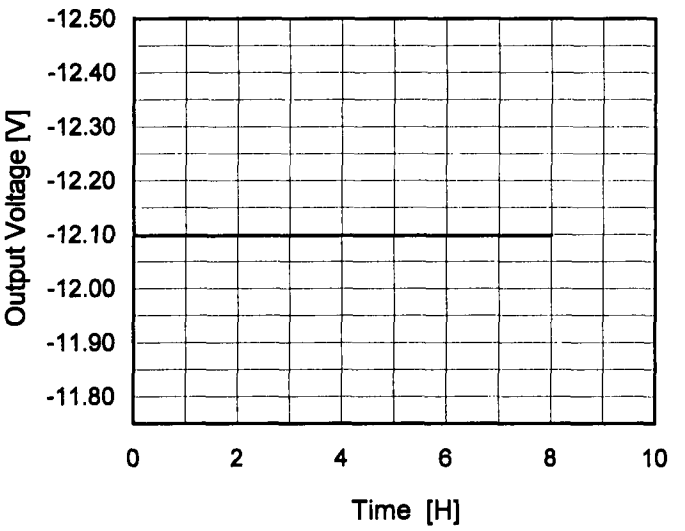
Input Volt. 5V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.094
0.5	12.087
1.0	12.087
2.0	12.087
3.0	12.087
4.0	12.087
5.0	12.087
6.0	12.087
7.0	12.087
8.0	12.087

Object	-12V0.45A

1.Graph



Input Volt. 5V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.102
0.5	-12.098
1.0	-12.098
2.0	-12.098
3.0	-12.098
4.0	-12.098
5.0	-12.098
6.0	-12.097
7.0	-12.098
8.0	-12.098

BC-3796

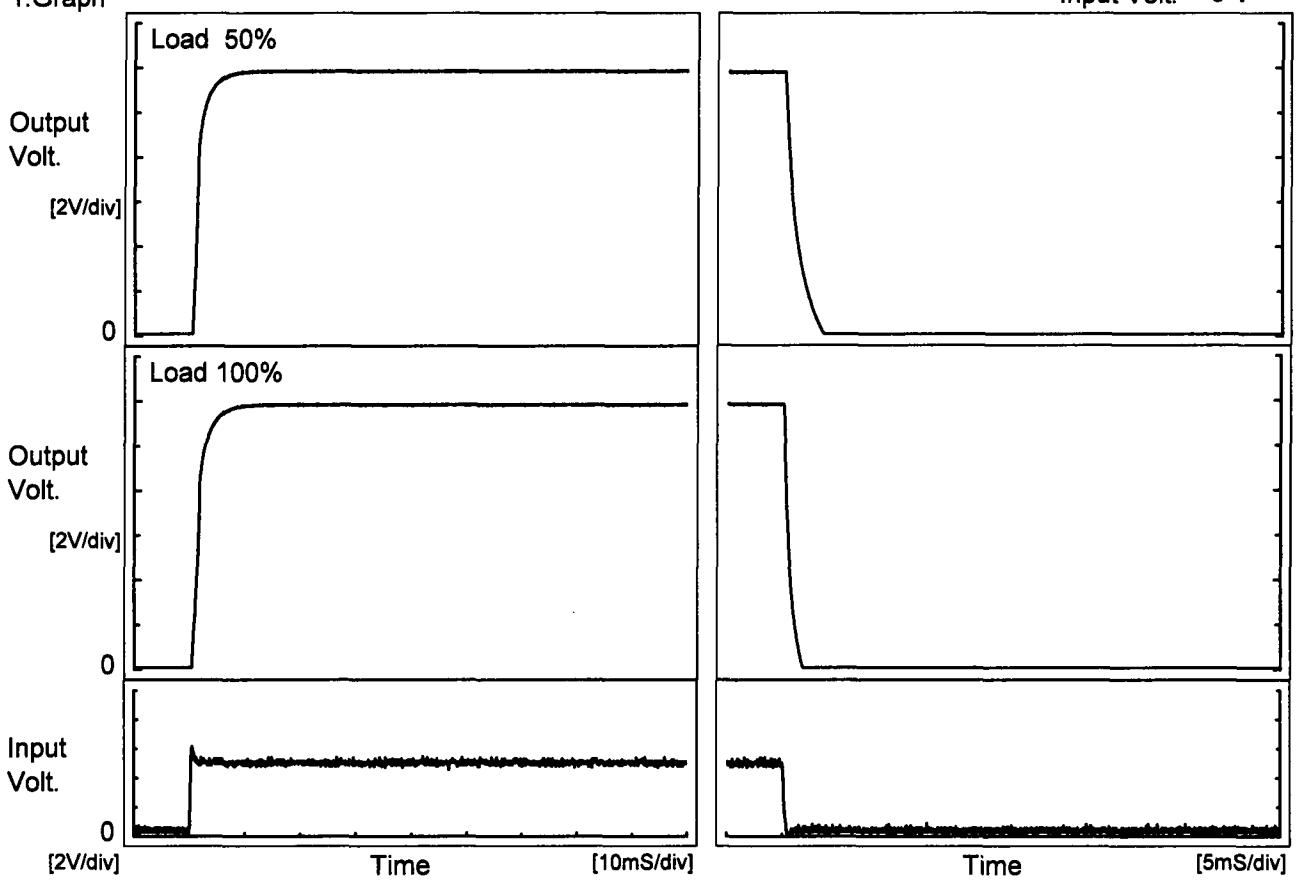
COSEL

Model	SUW100512/SUCW100512
Item	Rise and Fall Time
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

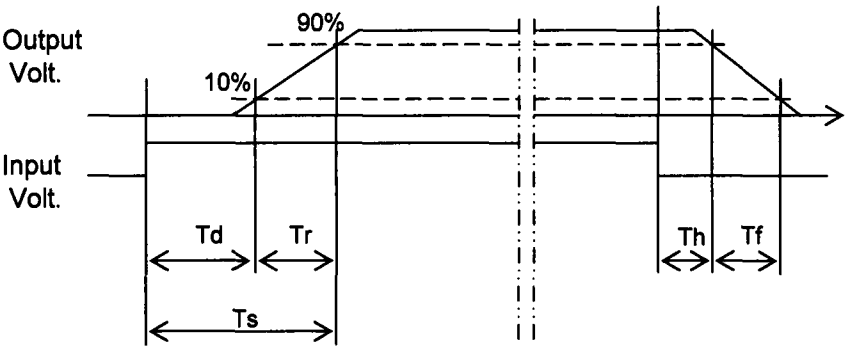
Input Volt. 5 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.6	3.1	3.7	0.2	2.3
100 %	0.6	3.5	4.1	0.2	1.2



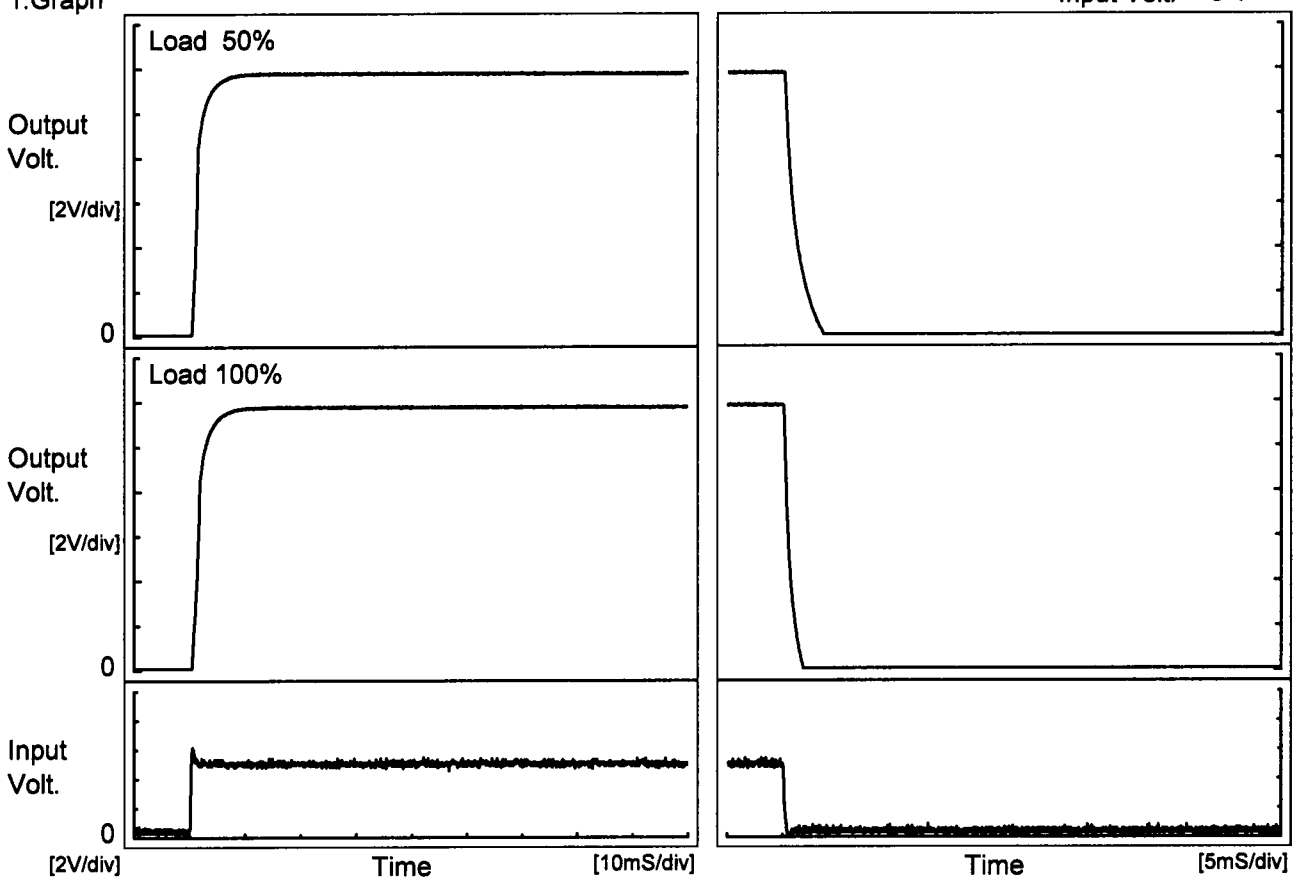
COSEL

Model	SUW100512/SUCW100512
Item	Rise and Fall Time
Object	-12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

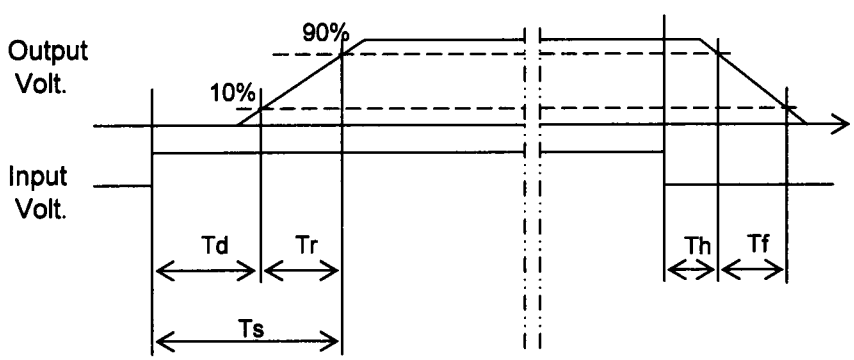
Input Volt. 5 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.6	3.3	3.9	0.2	2.4
100 %	0.6	3.7	4.3	0.2	1.2

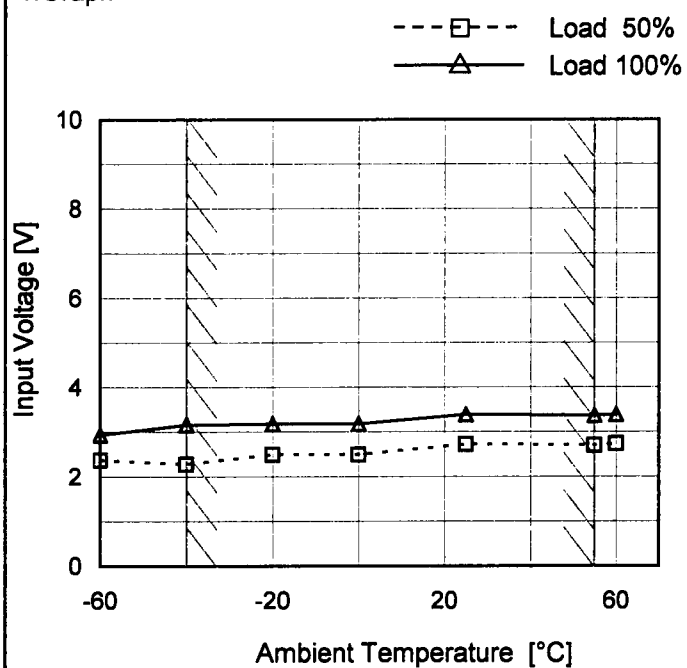


COSEL

Model	SUW100512/SUCW100512
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.45A

Testing Circuitry Figure A

1.Graph

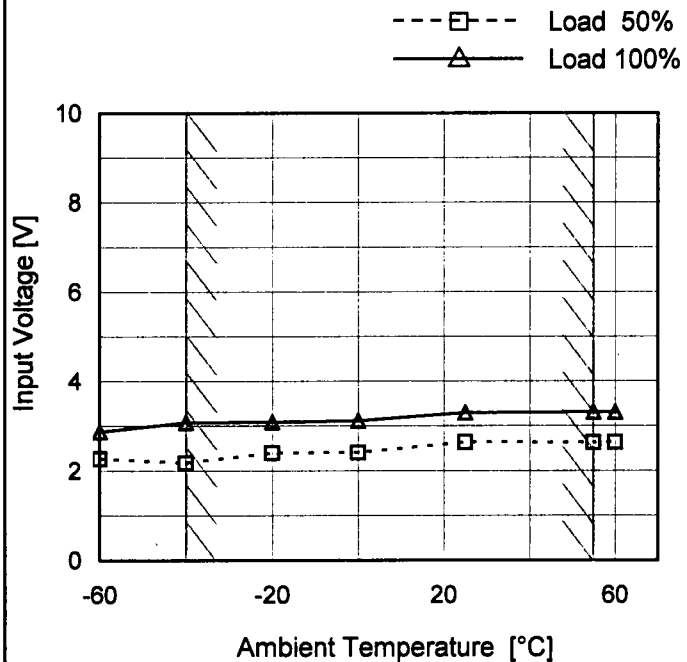


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	2.4	3.0
-40	2.3	3.2
-20	2.5	3.2
0	2.5	3.2
25	2.8	3.4
55	2.7	3.4
60	2.8	3.4
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.45A

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	2.3	2.9
-40	2.2	3.1
-20	2.4	3.1
0	2.5	3.2
25	2.7	3.3
55	2.7	3.4
60	2.7	3.4
--	-	-
--	-	-
--	-	-
--	-	-

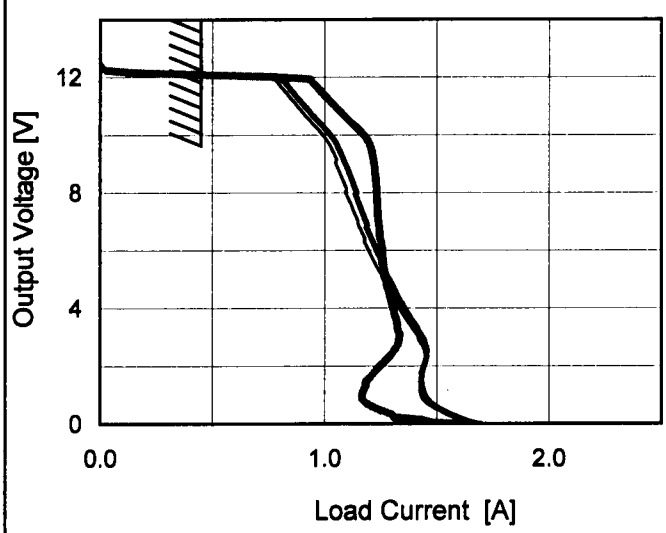
COSEL

Model	SUW100512/SUCW100512
Item	Overcurrent Protection

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.45A

1.Graph

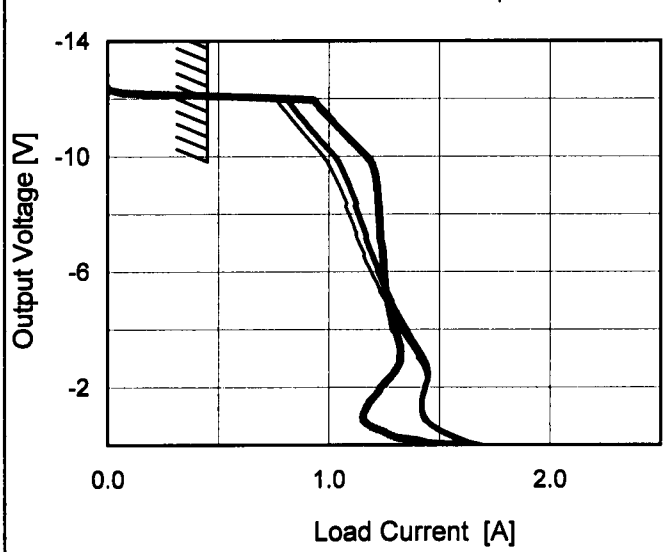


2.Values

Output Voltage [V]	Load Current [A] Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
12.0	0.74	0.76	0.75
11.4	0.83	0.87	0.99
10.8	0.90	0.93	1.07
9.6	1.03	1.06	1.20
8.4	1.08	1.12	1.23
7.2	1.14	1.17	1.24
6.0	1.20	1.23	1.26
4.8	1.28	1.31	1.28
3.6	1.36	1.39	1.32
2.4	1.45	1.46	1.29
1.2	1.45	1.43	1.18
0.0	1.71	1.70	1.69

Object -12V0.45A

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	0.76	0.81	0.93
-11.4	0.82	0.86	0.99
-10.8	0.88	0.93	1.06
-9.6	1.01	1.06	1.20
-8.4	1.08	1.12	1.22
-7.2	1.13	1.17	1.23
-6.0	1.19	1.22	1.25
-4.8	1.27	1.29	1.27
-3.6	1.36	1.39	1.31
-2.4	1.44	1.45	1.28
-1.2	1.43	1.42	1.16
0.0	1.69	1.69	1.67

COSEL

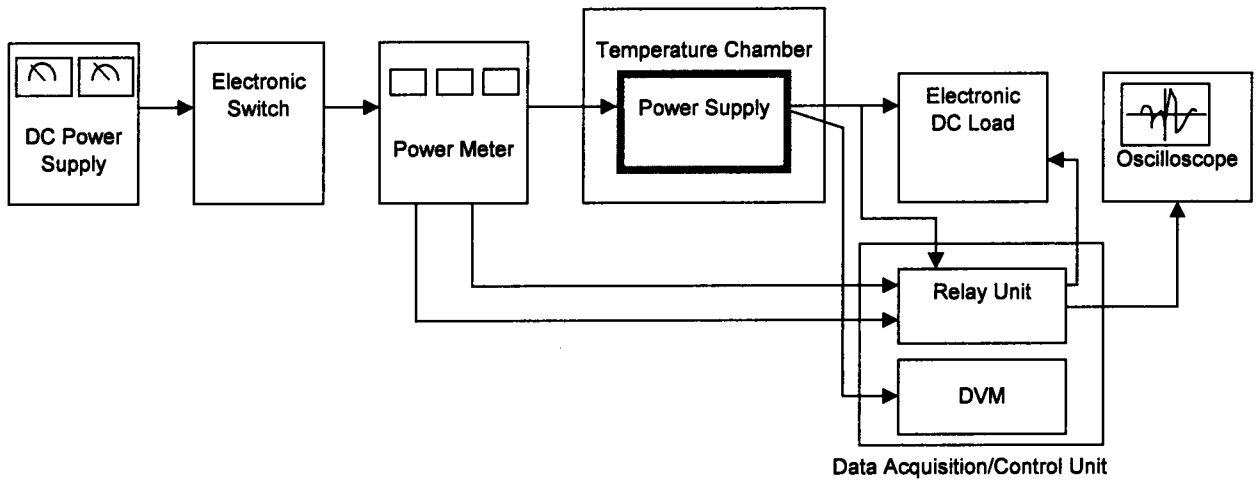


Figure A

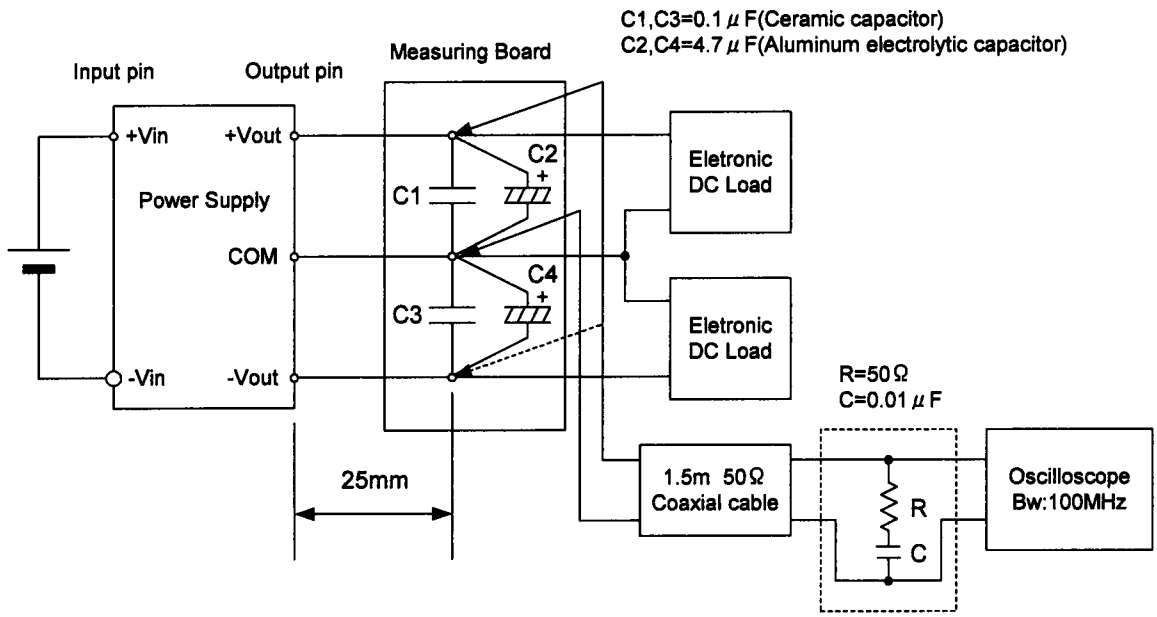


Figure B(Ripple and Ripple noise Characteristic)