COSEL

参考資料

TEST DATA OF G1W-12

Regulated DC Power Supply
October 13, 2010

Approved by : Eiyoshi Wakamatsu
Eiyoshi Wakamatsu Design Manager

Prepared by : Satoshi Kinoshita
Satoshi Kinoshita Design Engineer

COSEL CO.,LTD.

COSEL

CONTENTS

1.Input Current (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 1
2.Input Power (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 2
3.Efficiency (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 3
4.Efficiency (by Load Current)・・・・・・・・・・・・・・・・・・・・・・・・・ 4
5.Power Factor (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・ 5
6.Power Factor (by Load Current)・・・・・・・・・・・・・・・・・・・・・・・・ 6
7.Inrush Current・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 7
8.Line Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 8
9.Load Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 9
10.Dynamic Load Response ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 10
11.Ripple Voltage (by Load Current)・・・・・・・・・・・・・・・・・・・・・・ 12
12.Ripple Voltage (by Ambient Temperature) ・・・・・・・・・・・・・・・・・・ 14
13.Ambient Temperature Drift ・・・・・・・・・・・・・・・・・・・・・・・・・ 15
14.Output Voltage Accuracy ・・・・・・・・・・・・・・・・・・・・・・・・・・ 16
15.Time Lapse Drift・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 17
16.Rise and Fall Time・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 18
17.Hold-Up Time・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 20
18.Instantaneous Interruption Compensation ・・・・・・・・・・・・・・・・・・ 22
19.Minimum Input Voltage for Regulated Output Voltage ・・・・・・・・・・・・ 24
20.Overcurrent Protection・・・・・・・・・・・・・・・・・・・・・・・・・・・ 25
21.Figure of Testing Circuitry ・・・・・・・・・・・・・・・・・・・・・・・・・ 26

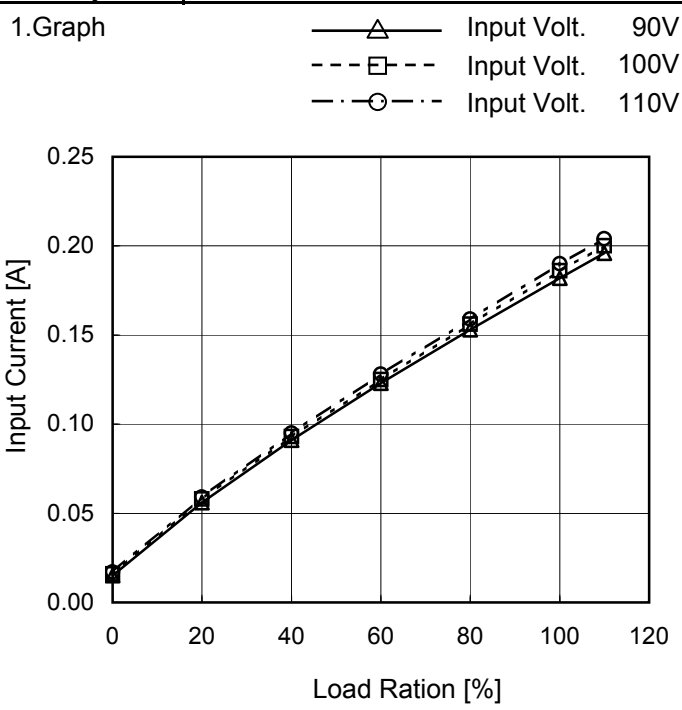
(Final Page 26)

COSEL

Model	G1W-12
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. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0	0.015	0.016	0.017
20	0.056	0.058	0.059
40	0.091	0.093	0.095
60	0.123	0.125	0.128
80	0.153	0.156	0.159
100	0.182	0.186	0.190
110	0.196	0.200	0.204
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

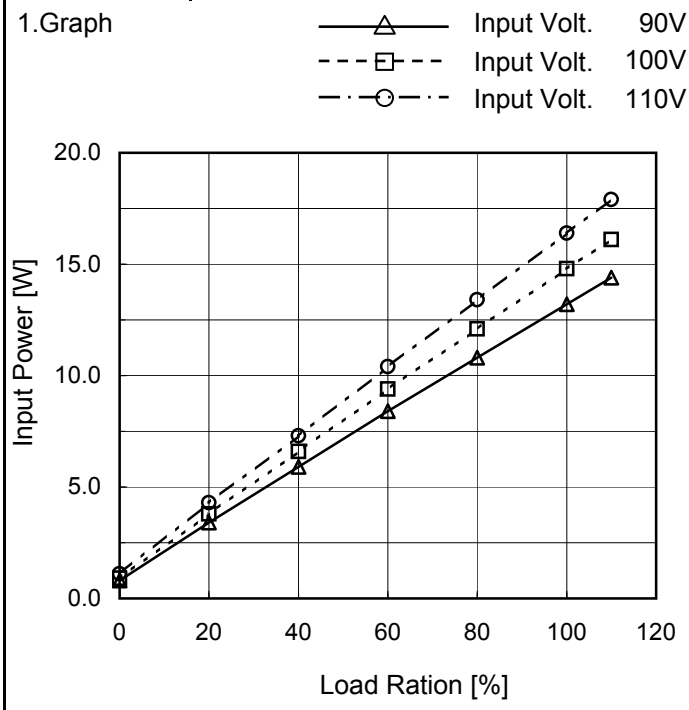
BC-10211

COSEL

Model	G1W-12
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

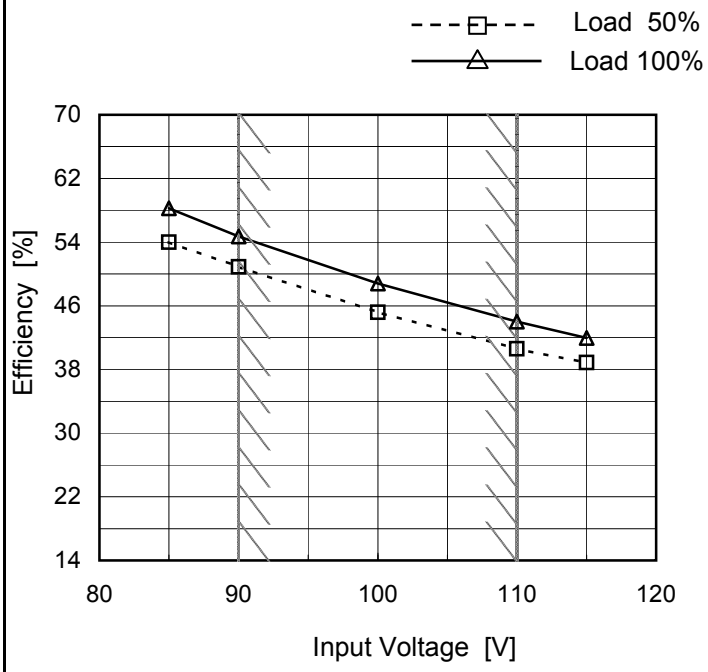
Load Ration [%]	Input Power [W]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0	0.80	0.90	1.10
20	3.40	3.80	4.30
40	5.90	6.60	7.30
60	8.40	9.40	10.40
80	10.80	12.10	13.40
100	13.20	14.80	16.40
110	14.40	16.10	17.90
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	G1W-12
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

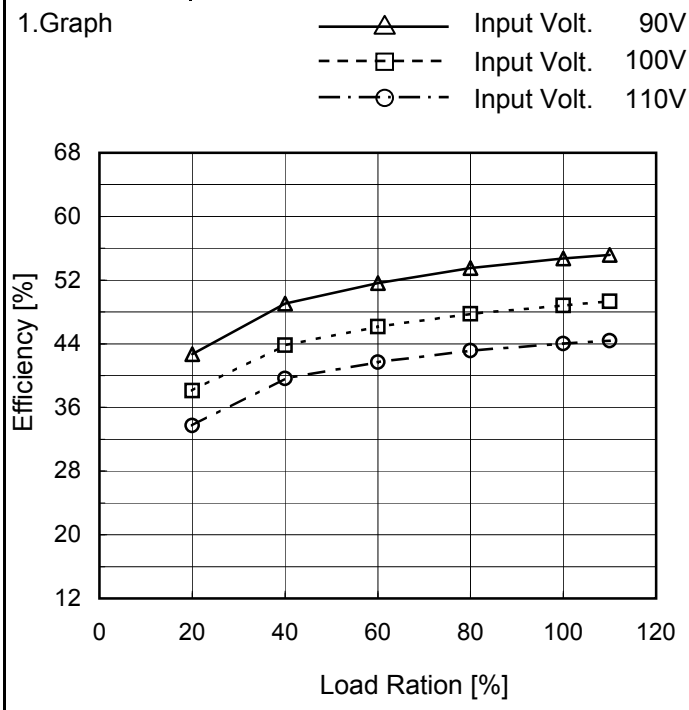
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
85	54.0	58.2
90	50.9	54.7
100	45.2	48.8
110	40.6	44.0
115	38.9	42.0
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	G1W-12
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

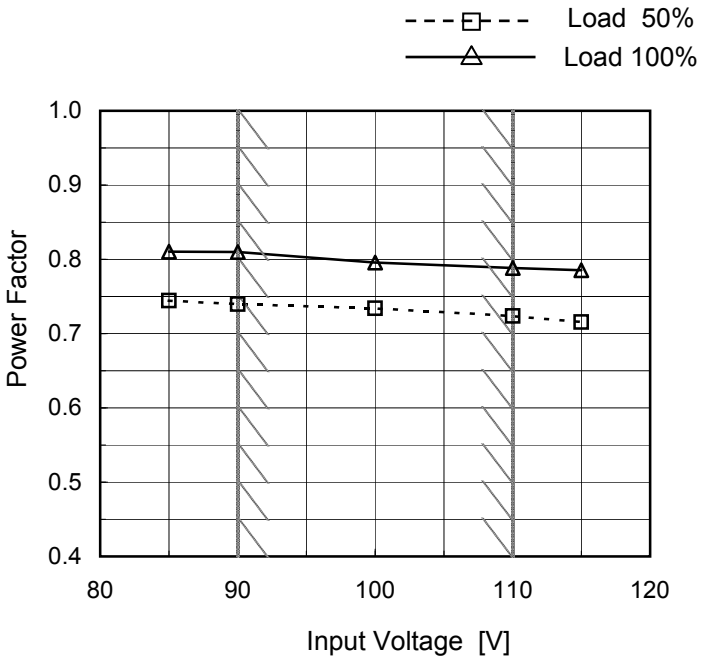
Load Ration [%]	Efficiency [%]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0	-	-	-
20	42.7	38.1	33.7
40	49.0	43.8	39.6
60	51.6	46.1	41.7
80	53.5	47.8	43.1
100	54.7	48.8	44.0
110	55.2	49.3	44.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	G1W-12
Item	Power Factor (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

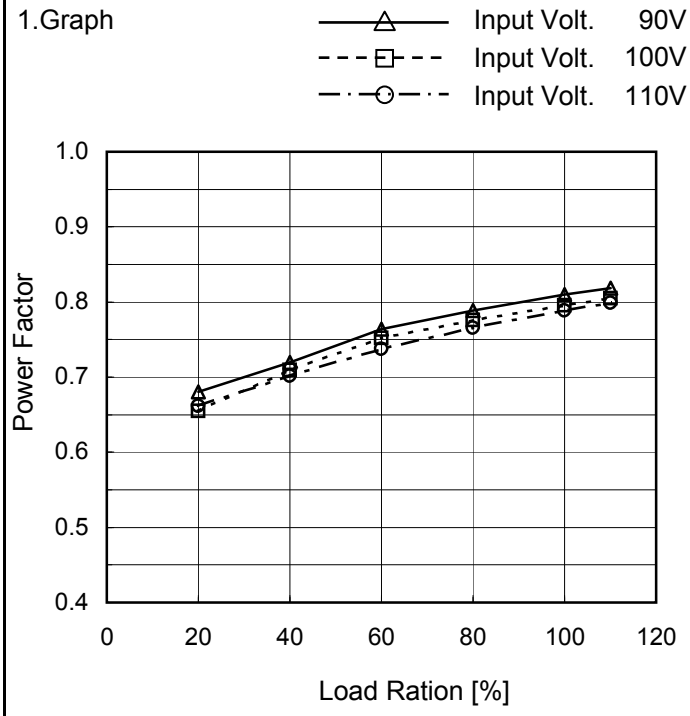
Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
85	0.744	0.810
90	0.740	0.810
100	0.734	0.796
110	0.724	0.788
115	0.715	0.785
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	G1W-12
Item	Power Factor (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



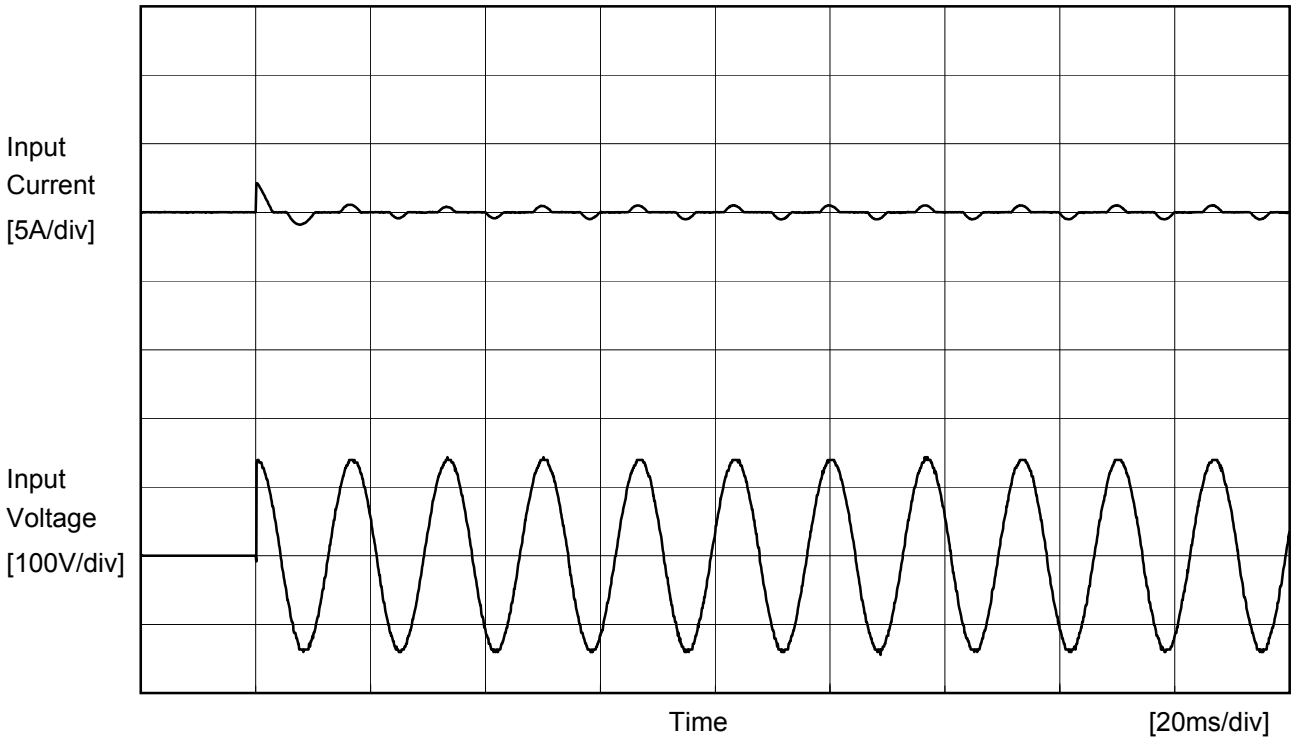
2.Values

Load Ration [%]	Power Factor		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0	-	-	-
20	0.680	0.655	0.662
40	0.720	0.710	0.702
60	0.764	0.752	0.738
80	0.788	0.776	0.766
100	0.810	0.796	0.788
110	0.818	0.805	0.799
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

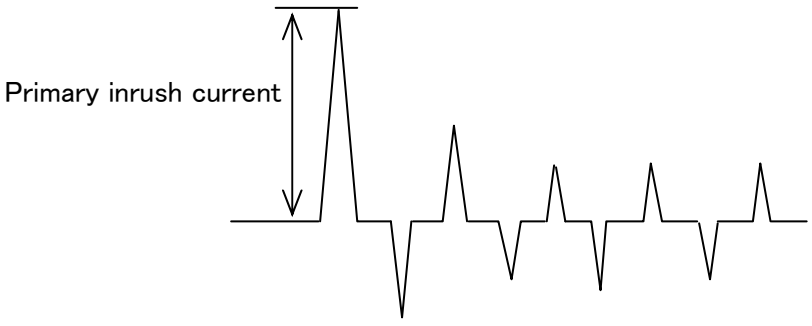
COSEL

Model	G1W-12
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



Input Voltage	100 V
Frequency	60 Hz
Load	100 %
Primary inrush current	2.1 A



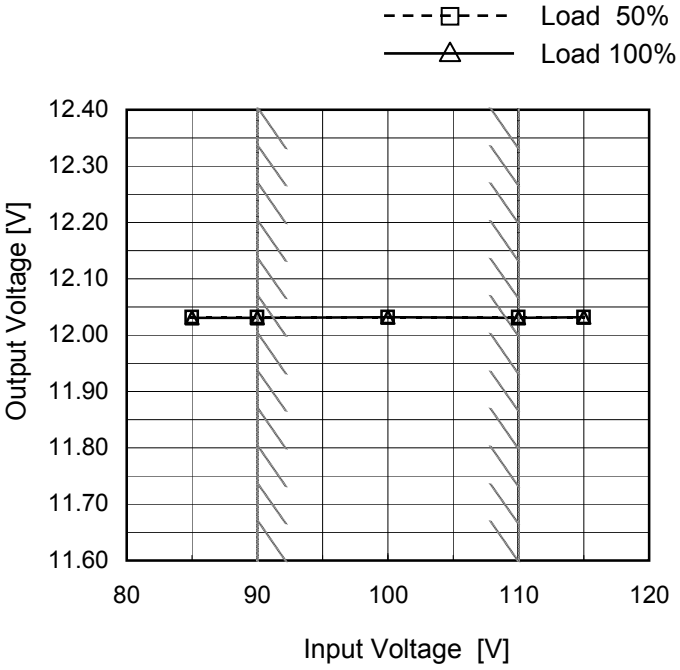
COSEL

Model	G1W-12
Item	Line Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.3A

1.Graph

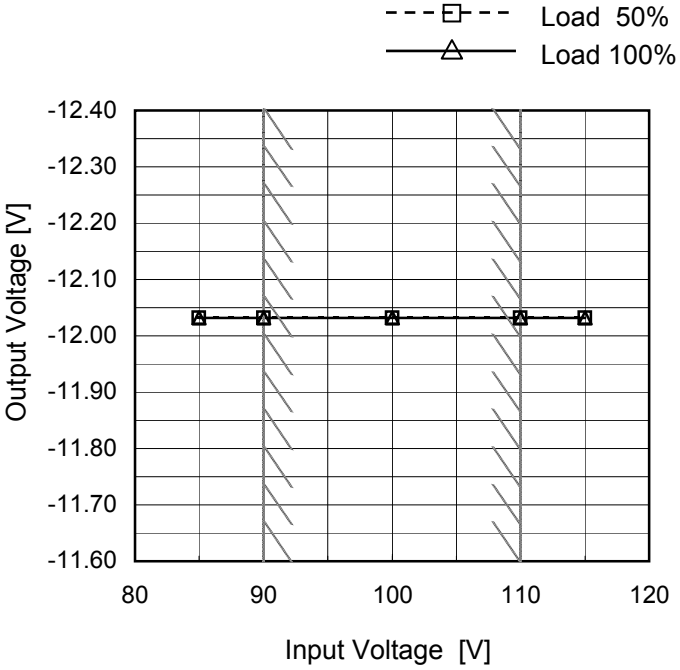


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	12.032	12.031
90	12.032	12.031
100	12.031	12.031
110	12.032	12.031
115	12.032	12.031
--	-	-
--	-	-
--	-	-
--	-	-

Object -12V0.3A

1.Graph



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

2.Values

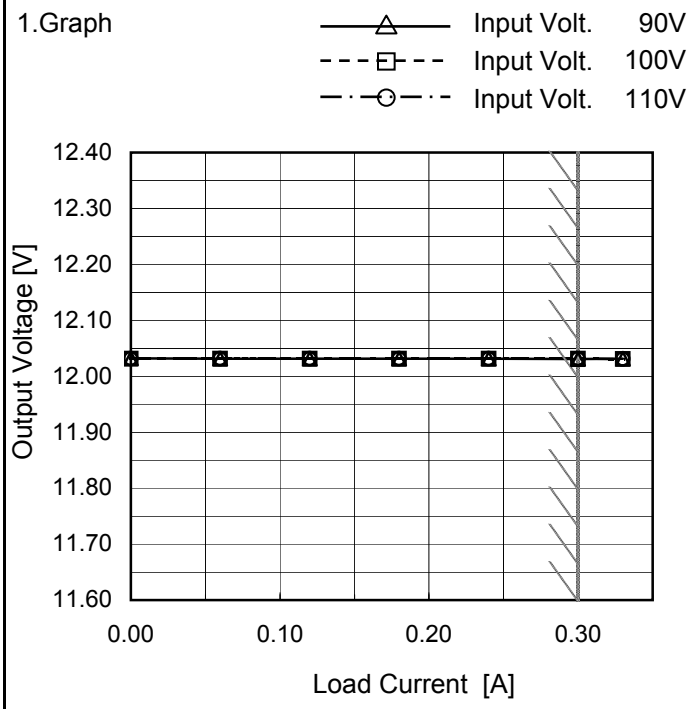
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	-12.032	-12.032
90	-12.032	-12.032
100	-12.032	-12.032
110	-12.032	-12.032
115	-12.032	-12.032
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	G1W-12
Item	Load Regulation
Object	+12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

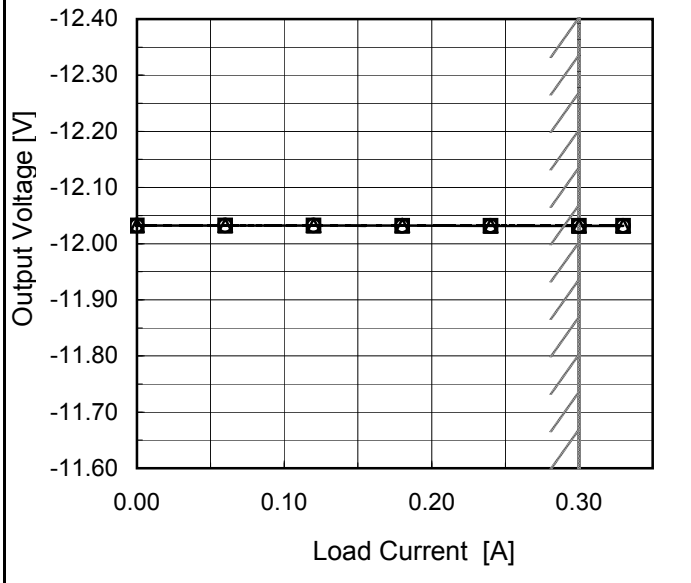


2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.00	12.032	12.032	12.032
0.06	12.032	12.032	12.032
0.12	12.031	12.032	12.031
0.18	12.031	12.032	12.032
0.24	12.031	12.031	12.031
0.30	12.031	12.031	12.031
0.33	12.031	12.031	12.031
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-12V0.3A

1.Graph



2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.00	-12.032	-12.032	-12.032
0.06	-12.032	-12.032	-12.032
0.12	-12.032	-12.032	-12.032
0.18	-12.032	-12.032	-12.032
0.24	-12.032	-12.032	-12.032
0.30	-12.032	-12.032	-12.032
0.33	-12.032	-12.032	-12.032
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

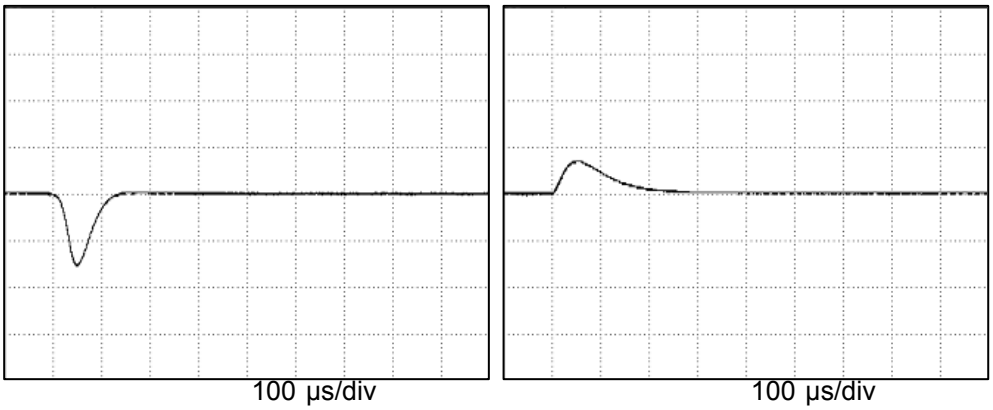
COSEL

Model	G1W-12		
Item	Dynamic Load Response	Temperature Testing Circuitry	25°C Figure A
Object	+12V0.3A		

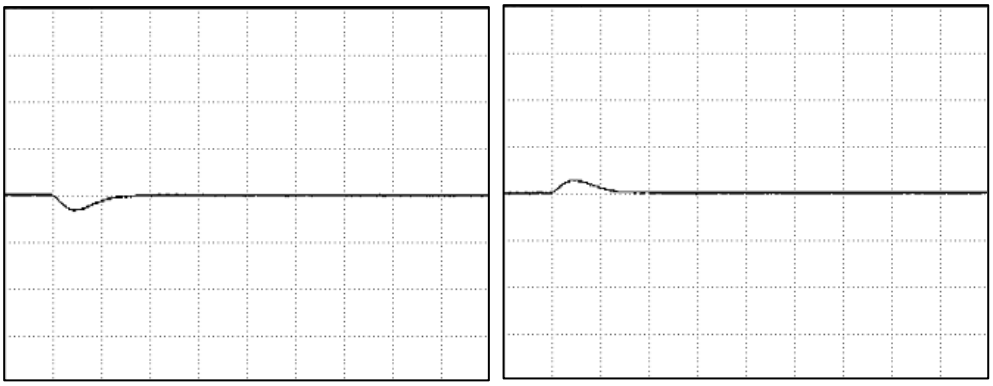
Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ←→
Load 100% (0.3A)



Load 50% (0.15A) ←→
Load 100% (0.3A)



COSEL

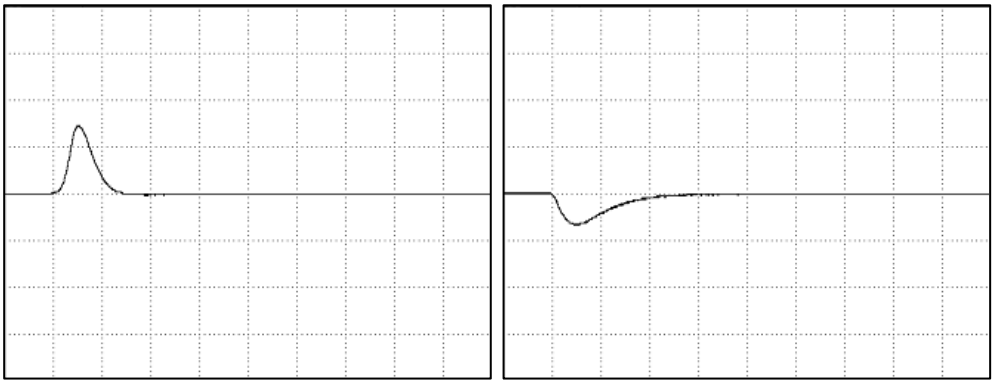
Model	G1W-12
Item	Dynamic Load Response
Object	-12V0.3A

Temperature 25°C
Testing Circuitry Figure A

Input Volt. 100 V
Cycle 1000 ms

Load Current

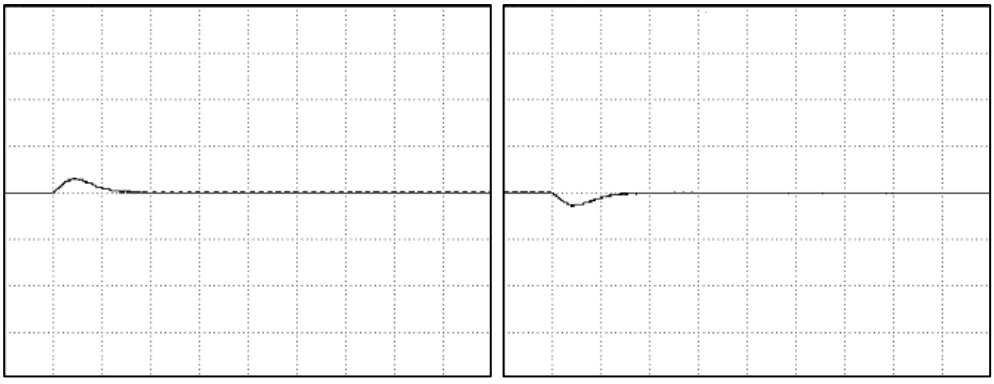
Min. Load (0A) ←→
Load 100% (0.3A)



50 mV/div

100 μs/div 100 μs/div

Load 50% (0.15A) ←→
Load 100% (0.3A)



50 mV/div

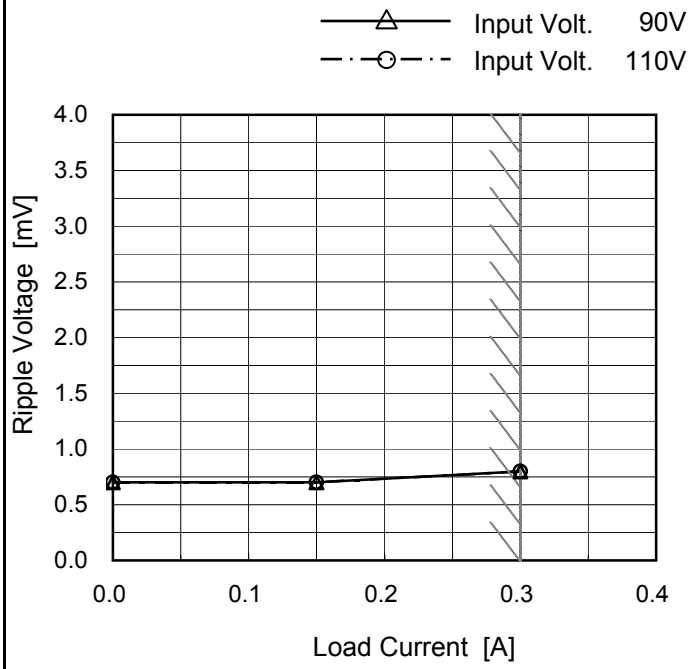
100 μs/div 100 μs/div

COSEL

Model	G1W-12
Item	Ripple Voltage (by Load Current)
Object	+12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.
Note: Slanted line shows the range of the rated load current.

2.Values

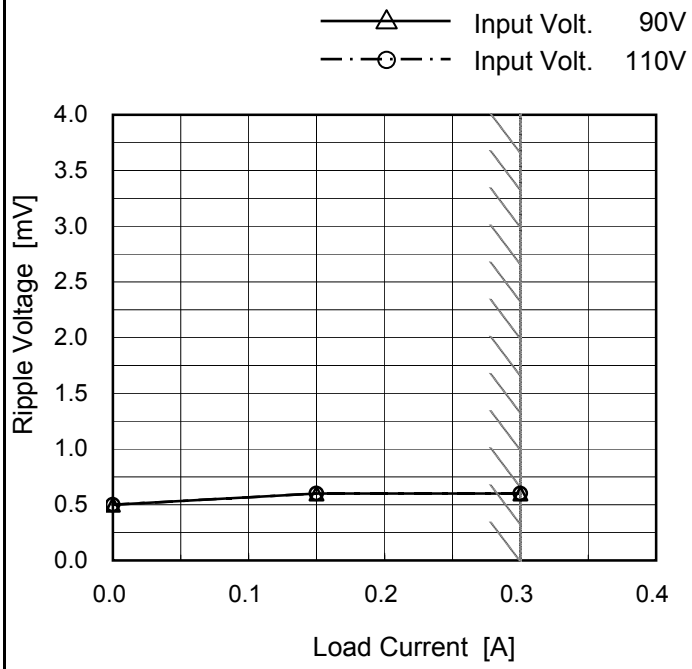
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 90 [V]	Input Volt. 110 [V]
0.00	0.7	0.7
0.15	0.7	0.7
0.30	0.8	0.8
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	G1W-12
Item	Ripple Voltage (by Load Current)
Object	-12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.
Note: Slanted line shows the range of the rated load current.

2.Values

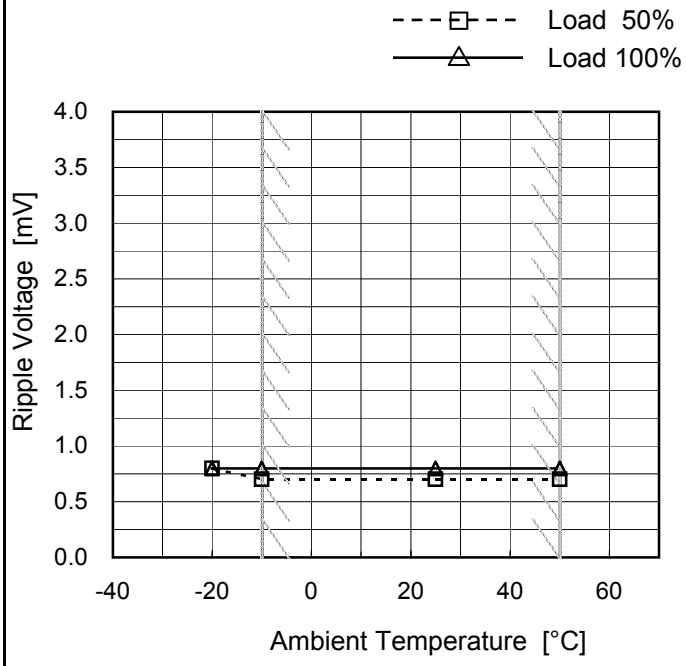
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 90 [V]	Input Volt. 110 [V]
0.00	0.5	0.5
0.15	0.6	0.6
0.30	0.6	0.6
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	G1W-12
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.3A

Testing Circuitry Figure A

1.Graph



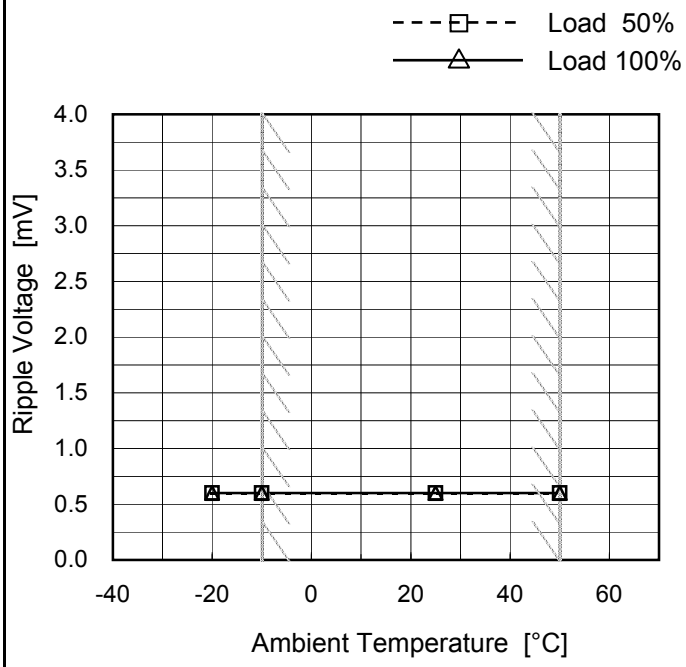
Input Volt. 100V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	0.8	0.8
-10	0.7	0.8
25	0.7	0.8
50	0.7	0.8
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.3A

1.Graph



Input Volt. 100V

Measured by 20 MHz Oscilloscope.

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

2.Values

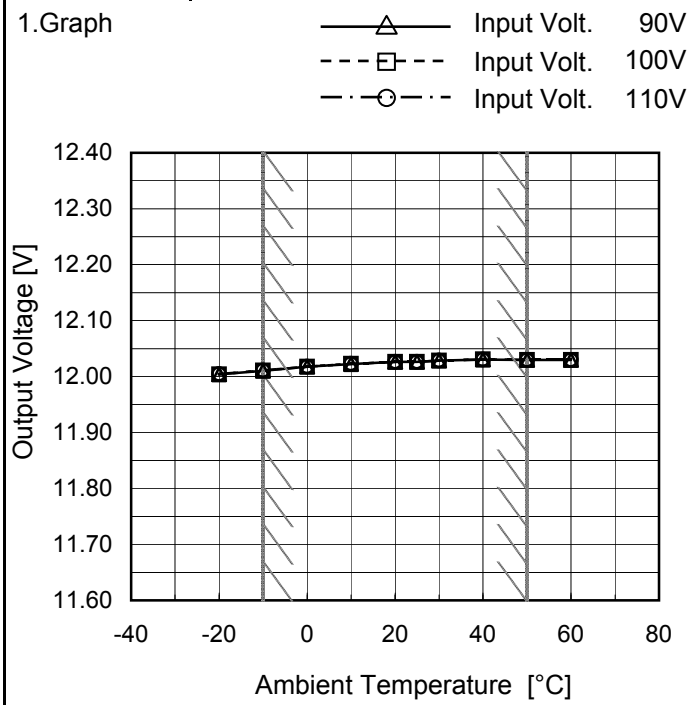
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	0.6	0.6
-10	0.6	0.6
25	0.6	0.6
50	0.6	0.6
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	G1W-12
Item	Ambient Temperature Drift
Object	+12V0.3A

Testing Circuitry Figure A

1.Graph



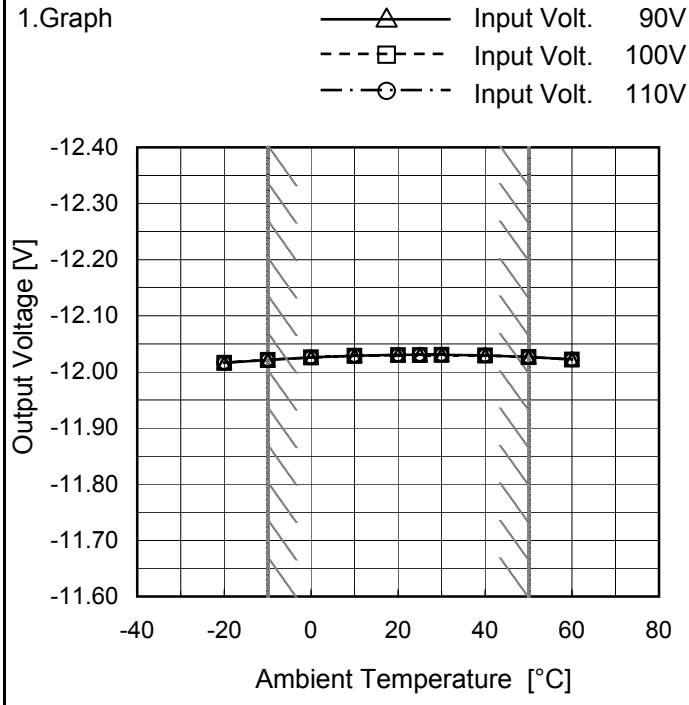
Load 100%

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
-20	12.004	12.004	12.004
-10	12.011	12.011	12.011
0	12.018	12.018	12.018
10	12.023	12.023	12.023
20	12.027	12.026	12.027
25	12.027	12.027	12.027
30	12.029	12.029	12.029
40	12.031	12.031	12.031
50	12.030	12.030	12.030
60	12.030	12.030	12.030
--	-	-	-

Object	-12V0.3A

1.Graph



Load 100%

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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
-20	-12.016	-12.016	-12.016
-10	-12.022	-12.022	-12.022
0	-12.026	-12.026	-12.026
10	-12.029	-12.029	-12.029
20	-12.030	-12.030	-12.030
25	-12.030	-12.030	-12.030
30	-12.030	-12.030	-12.030
40	-12.030	-12.030	-12.029
50	-12.027	-12.027	-12.026
60	-12.022	-12.022	-12.022
--	-	-	-

COSEL

Model	G1W-12	
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 : -10 - 50°C
Input Voltage : 90 - 110V
Load Current (AVR 1) : 0 - 0.3A (AVR 2) : 0 - 0.3A

* 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	+12V0.3A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	110	0	12.031	±11	±0.1
Minimum Voltage	-10	90	0	12.010		

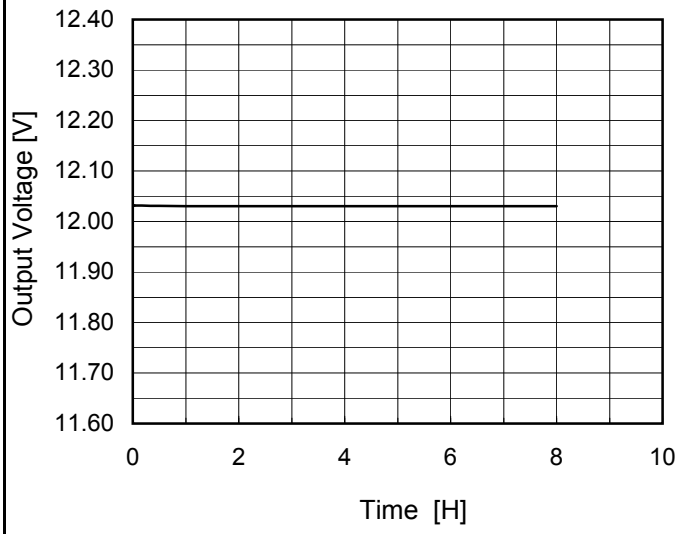
Object	-12V0.3A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	30	90	0	-12.031	±5	±0.1
Minimum Voltage	-10	100	0.3	-12.021		

COSEL

Model	G1W-12
Item	Time Lapse Drift
Object	+12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



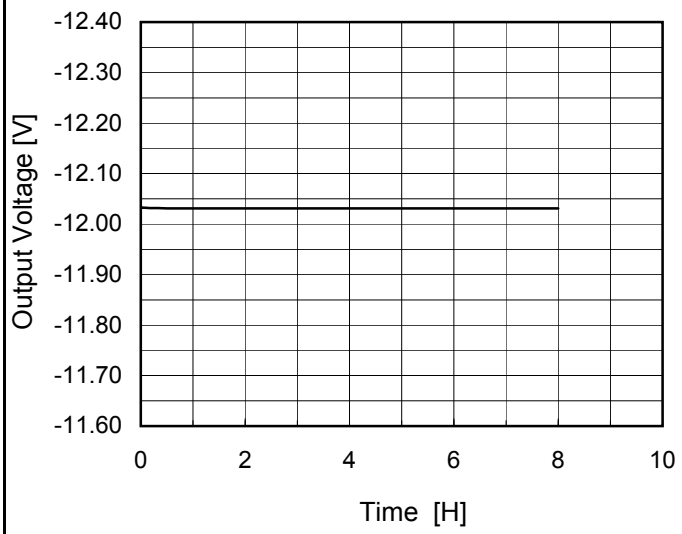
Input Volt. 100V
Load 100%

2.Values

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

Object	-12V0.3A

1.Graph



Input Volt. 100V
Load 100%

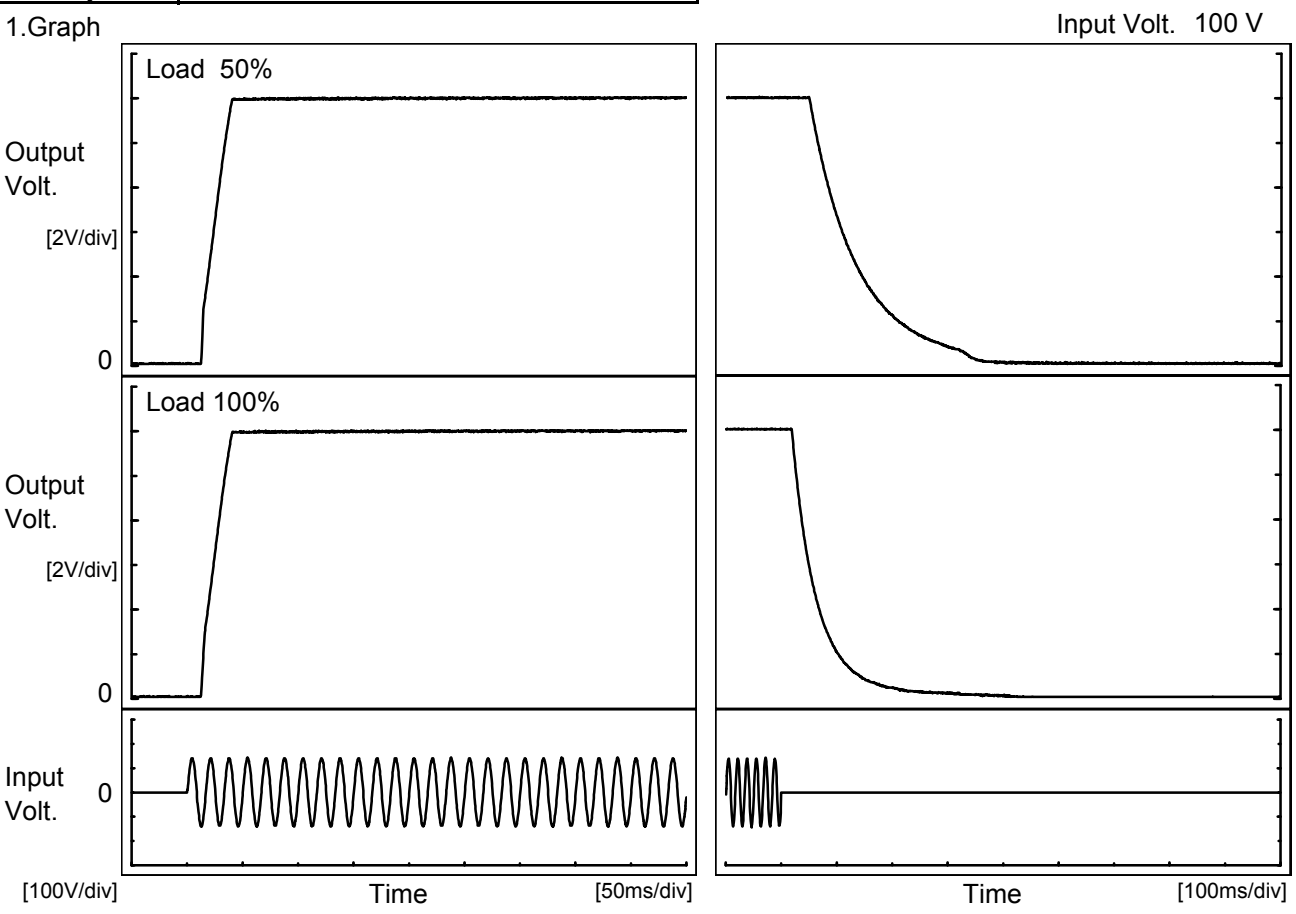
2.Values

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

COSEL

Model	G1W-12	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.3A	

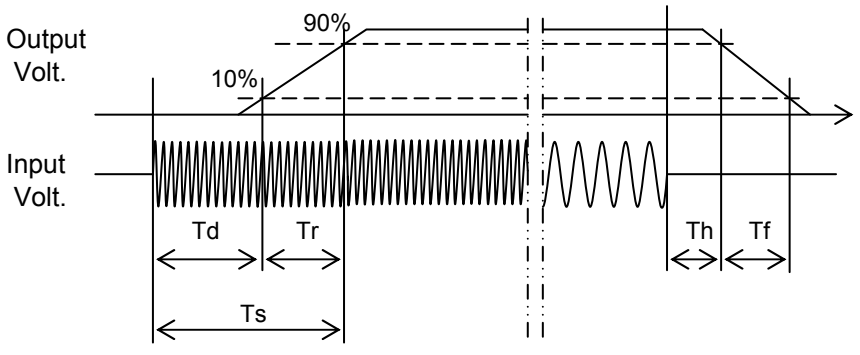
1.Graph



2.Values

[ms]

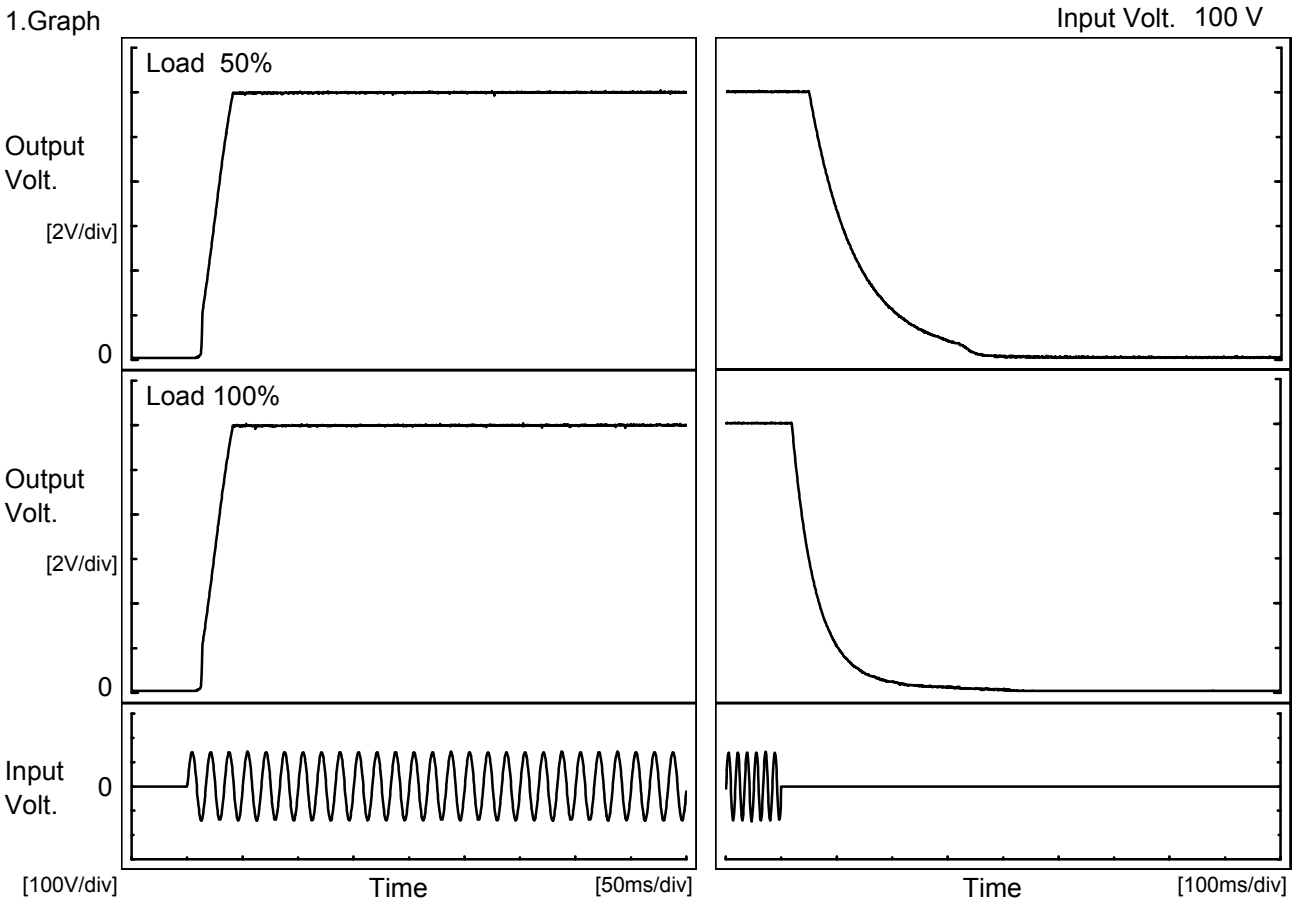
Load \ Time	Td	Tr	Ts	Th	Tf
50 %	13.8	23.3	37.1	57.0	201.0
100 %	14.0	23.0	37.0	23.0	104.0



COSEL

Model	G1W-12	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.3A	

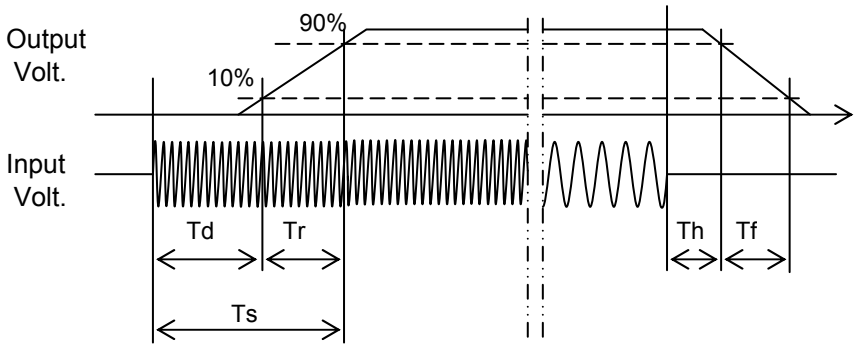
1.Graph



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	13.5	24.0	37.5	56.0	197.0
100 %	13.5	24.0	37.5	22.5	103.5

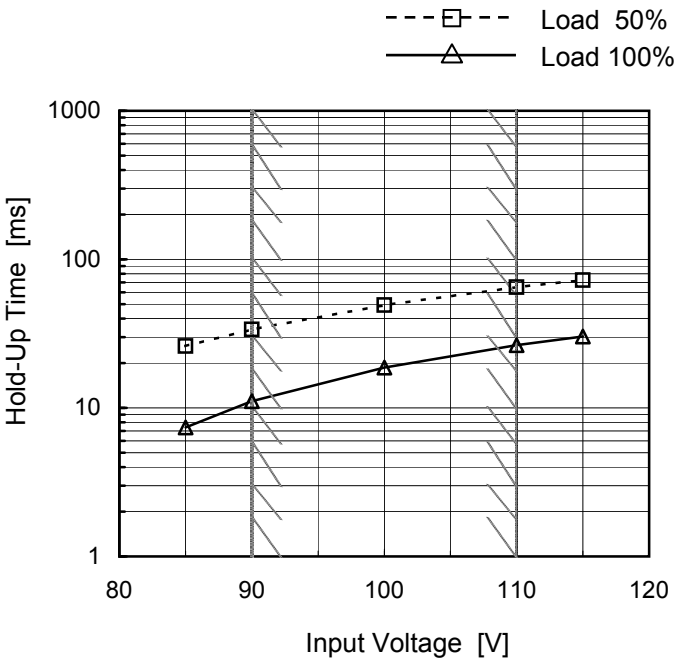


COSEL

Model	G1W-12
Item	Hold-Up Time
Object	+12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.
Note: Slanted line shows the range of the rated input voltage.

2.Values

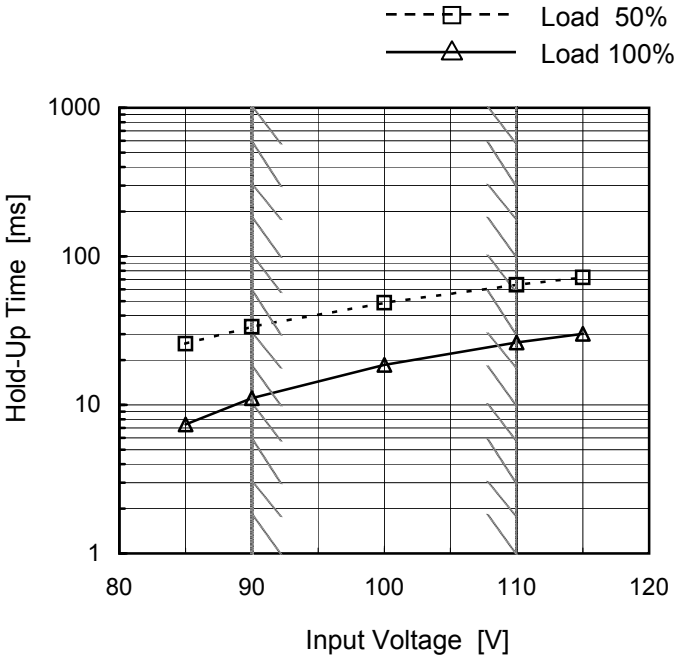
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	26	7
90	34	11
100	49	19
110	65	27
115	73	30
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	G1W-12
Item	Hold-Up Time
Object	-12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.
Note: Slanted line shows the range of the rated input voltage.

2.Values

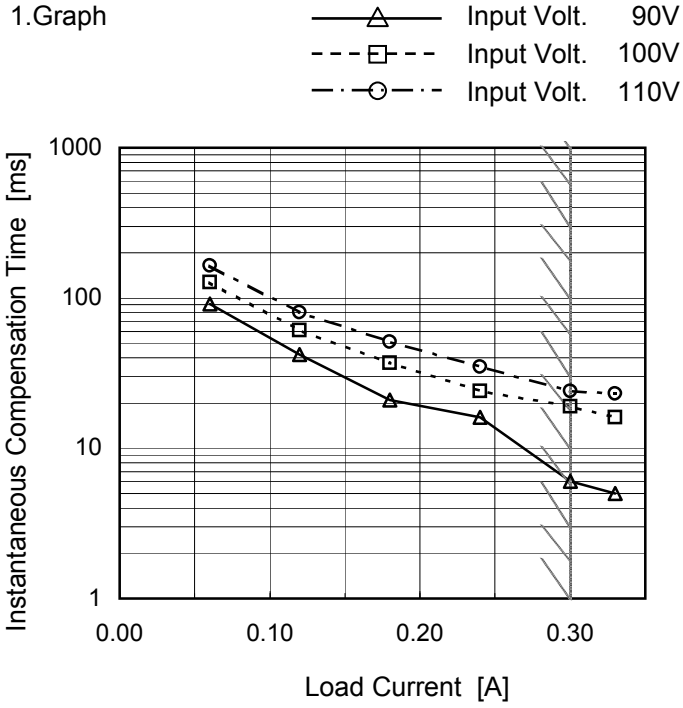
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	26	7
90	34	11
100	49	19
110	64	26
115	72	30
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	G1W-12
Item	Instantaneous Interruption Compensation
Object	+12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

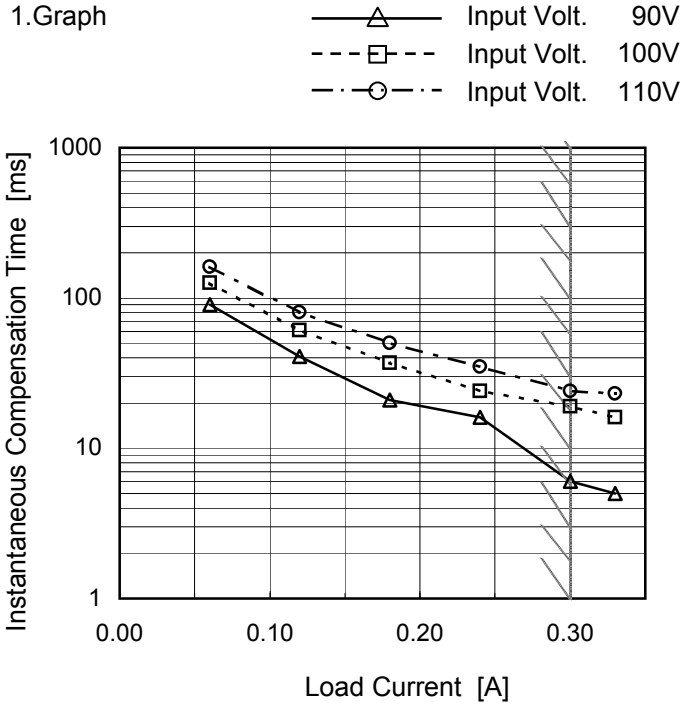
Load Current [A]	Time [ms]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.00	-	-	-
0.06	91	128	165
0.12	42	61	80
0.18	21	37	51
0.24	16	24	35
0.30	6	19	24
0.33	5	16	23
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	G1W-12
Item	Instantaneous Interruption Compensation
Object	-12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

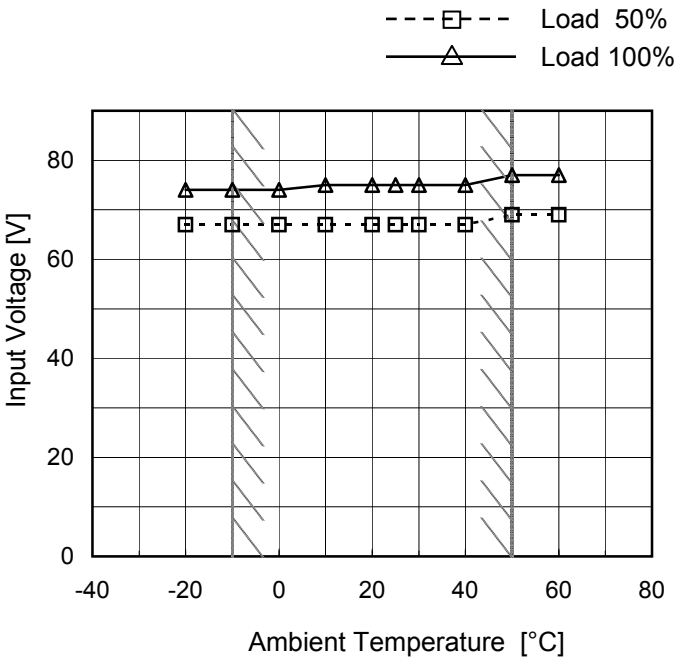
2.Values

Load Current [A]	Time [ms]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.00	-	-	-
0.06	90	126	162
0.12	41	61	80
0.18	21	37	50
0.24	16	24	35
0.30	6	19	24
0.33	5	16	23
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	G1W-12
Item	Minimum Input Voltage for Regulated Output Voltage
Testing Circuitry	Figure A
Object	+12V0.3A

1.Graph

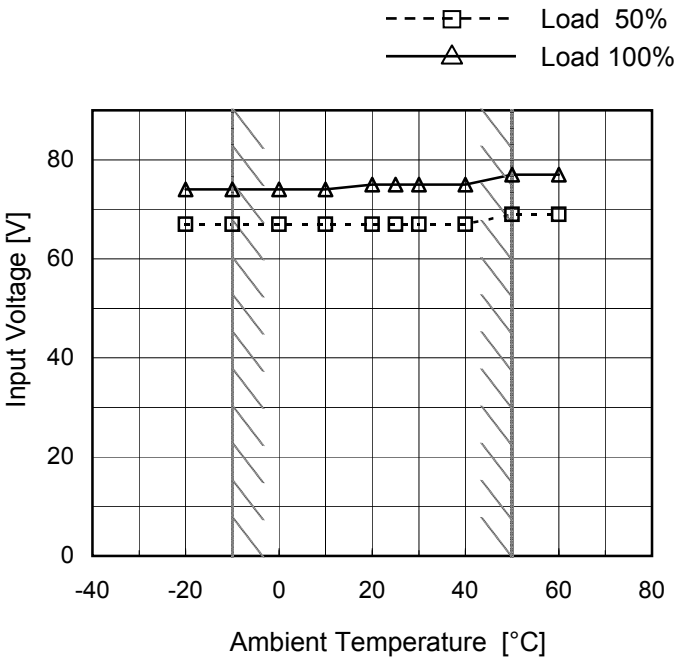


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	67	74
-10	67	74
0	67	74
10	67	75
20	67	75
25	67	75
30	67	75
40	67	75
50	69	77
60	69	77
--	-	-

Object	-12V0.3A

1.Graph



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

2.Values

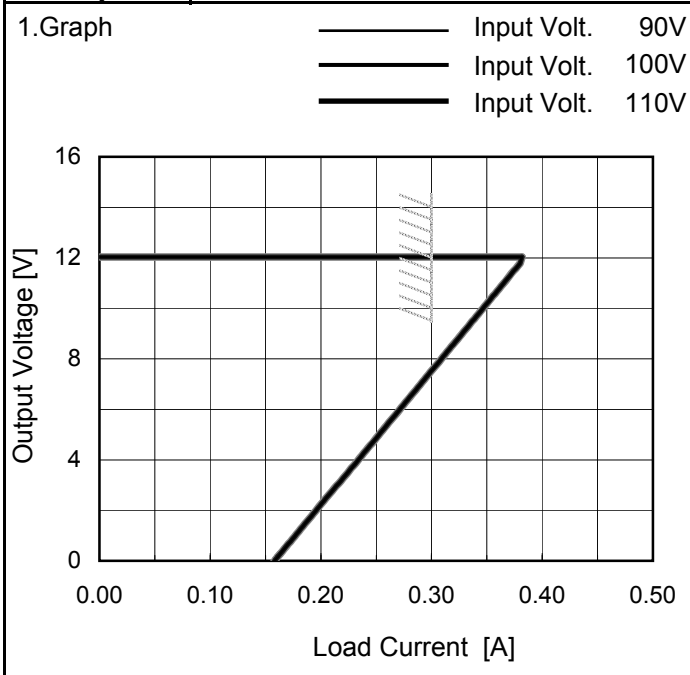
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	67	74
-10	67	74
0	67	74
10	67	74
20	67	75
25	67	75
30	67	75
40	67	75
50	69	77
60	69	77
--	-	-

COSEL

Model	G1W-12
Item	Overcurrent Protection
Object	+12V0.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

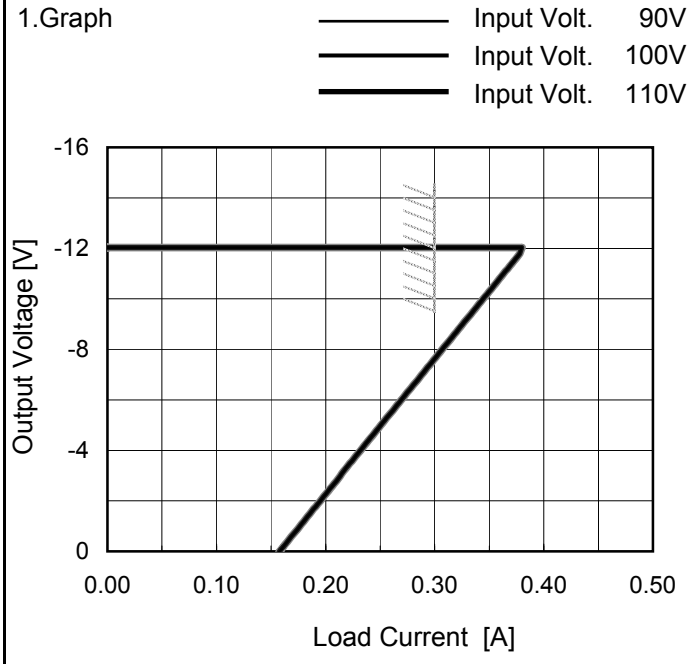


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
12.0	0.38	0.38	0.38
11.4	0.37	0.37	0.37
10.8	0.36	0.36	0.36
9.6	0.34	0.34	0.34
8.4	0.32	0.32	0.32
7.2	0.30	0.30	0.30
6.0	0.27	0.27	0.27
4.8	0.25	0.25	0.25
3.6	0.23	0.23	0.23
2.4	0.20	0.20	0.20
1.2	0.18	0.18	0.18
0.0	0.16	0.16	0.16

Object	-12V0.3A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
-12.0	0.38	0.38	0.38
-11.4	0.37	0.37	0.37
-10.8	0.36	0.36	0.36
-9.6	0.34	0.34	0.34
-8.4	0.32	0.32	0.32
-7.2	0.29	0.29	0.29
-6.0	0.27	0.27	0.27
-4.8	0.25	0.25	0.25
-3.6	0.23	0.23	0.23
-2.4	0.20	0.20	0.20
-1.2	0.18	0.18	0.18
0.0	0.16	0.16	0.16

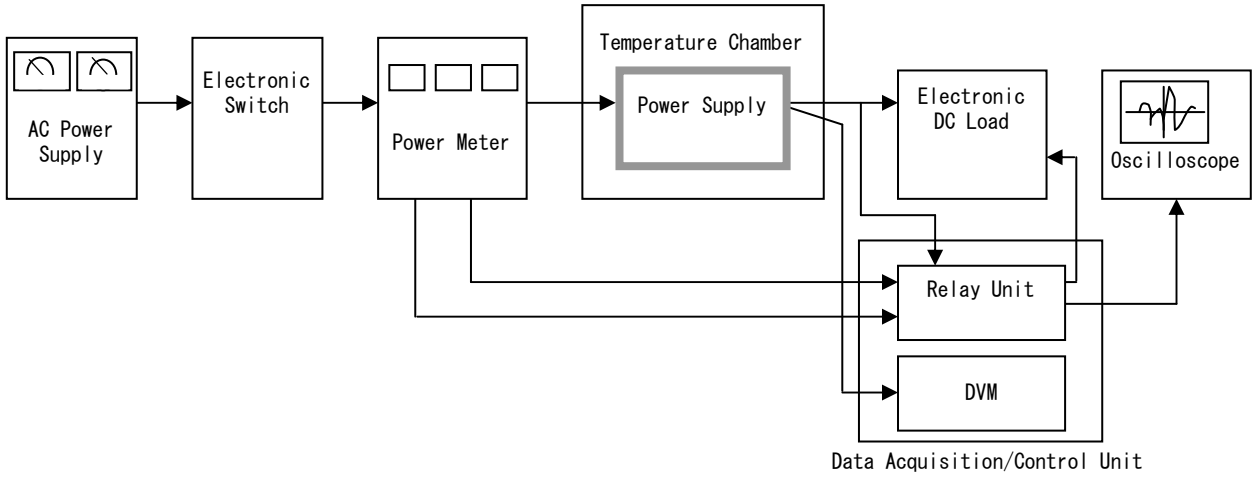

AC Power Supply
Electronic Switch
Power Meter
Temperature Chamber
Power Supply
Electronic DC Load
Oscilloscope
Relay Unit
DVM
Data Acquisition/Control Unit

Figure A