参考資料

COSEL

TEST DATA OF SFS302412/SFCS302412

Regulated DC Power Supply
May.29. 2007

Approved by : Toshiyuki Tsuri
Toshiyuki Tsuri — Design Manager

Prepared by : K. Shibutani
Kenichi Shibutani — Design Engineer

COSEL CO.,LTD.

COSEL

CONTENTS

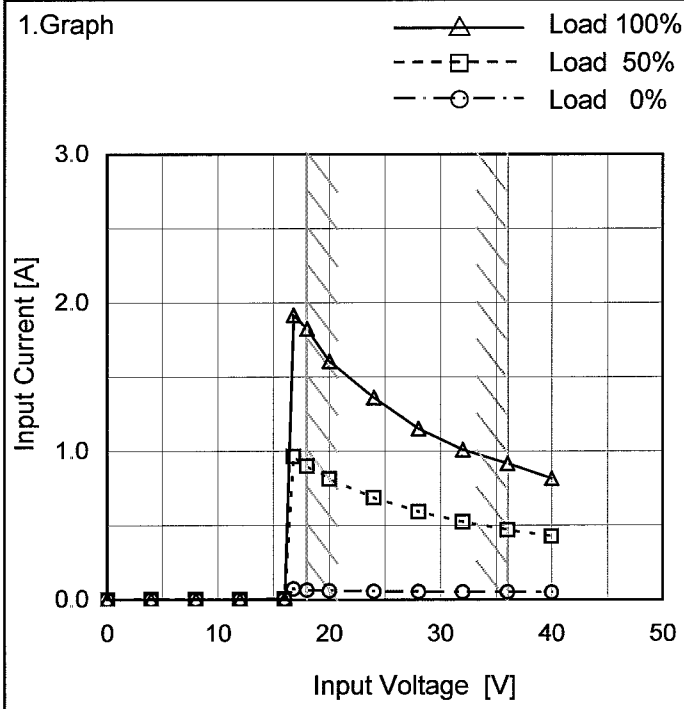
1.Input Current (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 1
2.Input Current (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 2
3.Input Power (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 3
4.Efficiency (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 4
5.Efficiency (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 5
6.Line Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 6
7.Load Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 7
8.Dynamic Load Response ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 8
9.Ripple Voltage (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・ 9
10.Ripple-Noise ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 10
11.Ripple Voltage (by Ambient Temperature) ・・・・・・・・・・・・・・・・・ 11
12.Ambient Temperature Drift ・・・・・・・・・・・・・・・・・・・・・・・・・ 12
13.Output Voltage Accuracy ・・・・・・・・・・・・・・・・・・・・・・・・・・ 13
14.Time Lapse Drift ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 14
15.Rise and Fall Time ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 15
16.Minimum Input Voltage for Regulated Output Voltage ・・・・・・・・・・・ 16
17.Overcurrent Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 17
18.Overvoltage Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 18
19.Figure of Testing Circuitry ・・・・・・・・・・・・・・・・・・・・・・・・・ 19
(Final Page 19)

COSEL

Model	SFS302412/SFCS302412
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
4	0.002	0.002	0.002
8	0.002	0.002	0.002
12	0.003	0.003	0.003
16	0.004	0.004	0.004
17	0.073	0.966	1.918
18	0.065	0.900	1.826
20	0.060	0.815	1.608
24	0.057	0.687	1.362
28	0.054	0.593	1.153
32	0.052	0.523	1.010
36	0.051	0.469	0.918
40	0.050	0.426	0.817
--	-	-	-
--	-	-	-
--	-	-	-

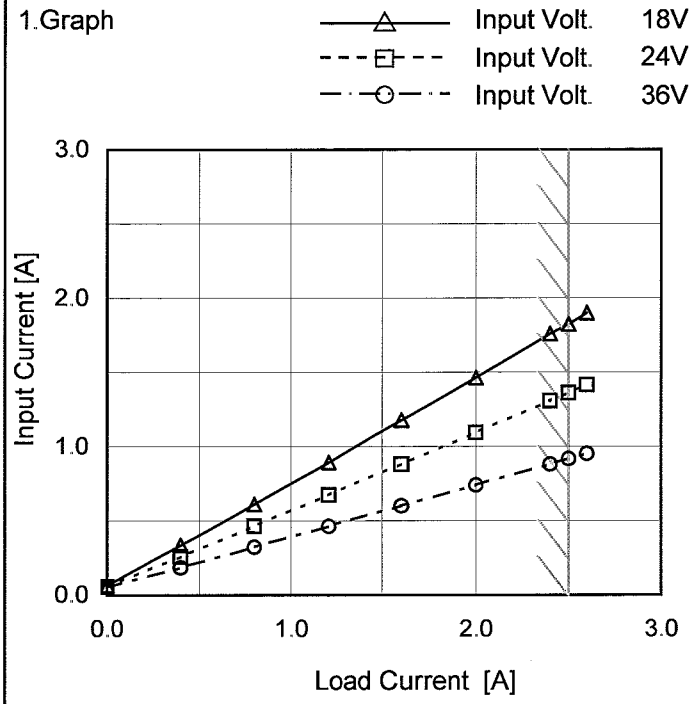
BC-10066

COSEL

Model	SFS302412/SFCS302412
Item	Input Current (by Load Current)
Object	———————

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]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	0.065	0.057	0.051
0.4	0.336	0.259	0.186
0.8	0.612	0.465	0.323
1.2	0.894	0.674	0.463
1.6	1.178	0.882	0.602
2.0	1.465	1.094	0.741
2.4	1.760	1.308	0.882
2.5	1.826	1.362	0.918
2.6	1.900	1.415	0.953
--	-	-	-
--	-	-	-

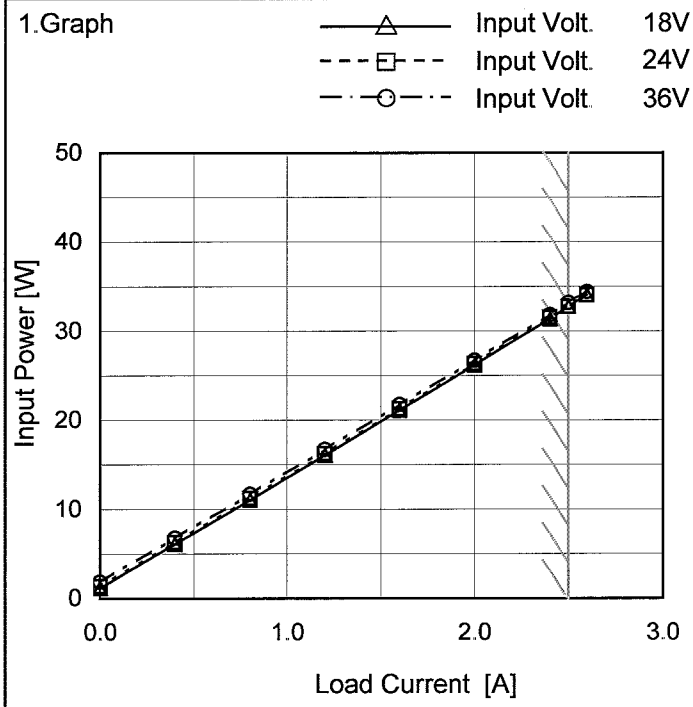
BC-10066

COSEL

Model	SFS302412/SFCS302412
Item	Input Power (by Load Current)
Object	———————

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]	Input Power [W]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	1.19	1.38	1.86
0.4	6.09	6.27	6.79
0.8	11.07	11.25	11.72
1.2	16.08	16.28	16.75
1.6	21.14	21.30	21.77
2.0	26.23	26.36	26.74
2.4	31.39	31.52	31.82
2.5	32.80	32.76	33.20
2.6	34.10	34.06	34.40
--	-	-	-
--	-	-	-

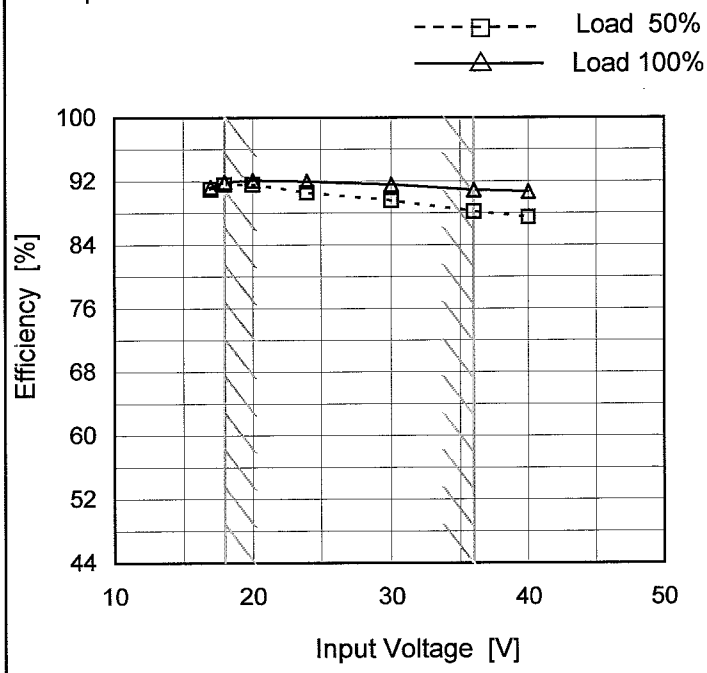
BC-10066

COSEL

Model	SFS302412/SFCS302412
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

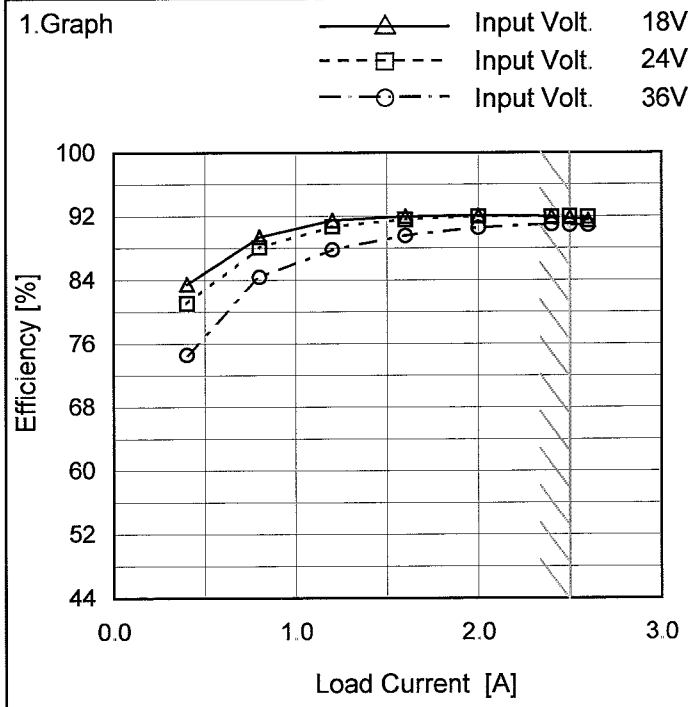
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	91.0	91.3
18	91.6	91.9
20	91.6	92.1
24	90.6	92.0
30	89.6	91.6
36	88.2	90.9
40	87.5	90.7
--	-	-
--	-	-

COSEL

Model	SFS302412/SFCS302412
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

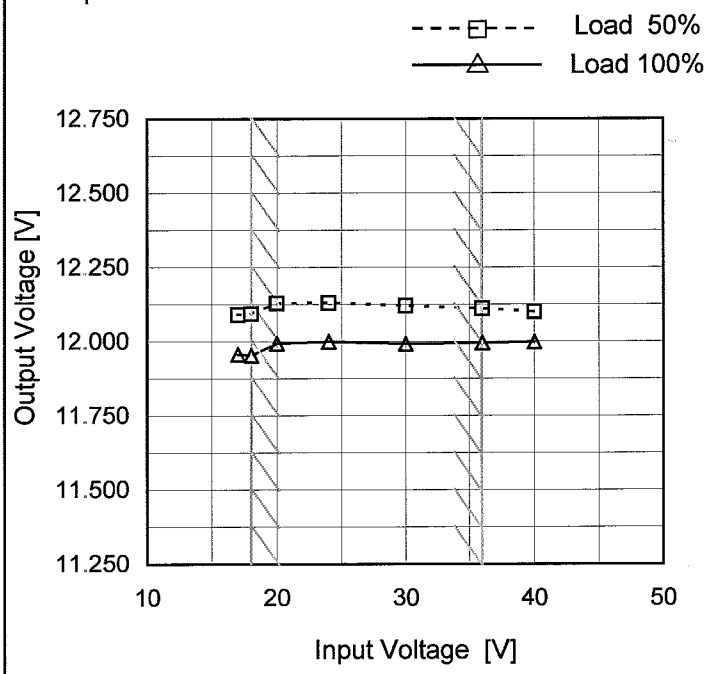
Load Current [A]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	-	-	-
0.4	83.5	81.1	74.6
0.8	89.4	88.1	84.4
1.2	91.5	90.7	87.8
1.6	92.0	91.6	89.6
2.0	92.1	92.0	90.6
2.4	92.0	91.9	91.0
2.5	91.9	92.0	90.9
2.6	91.5	91.9	90.9
--	-	-	-
--	-	-	-

COSEL

Model	SFS302412/SFCS302412
Item	Line Regulation
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

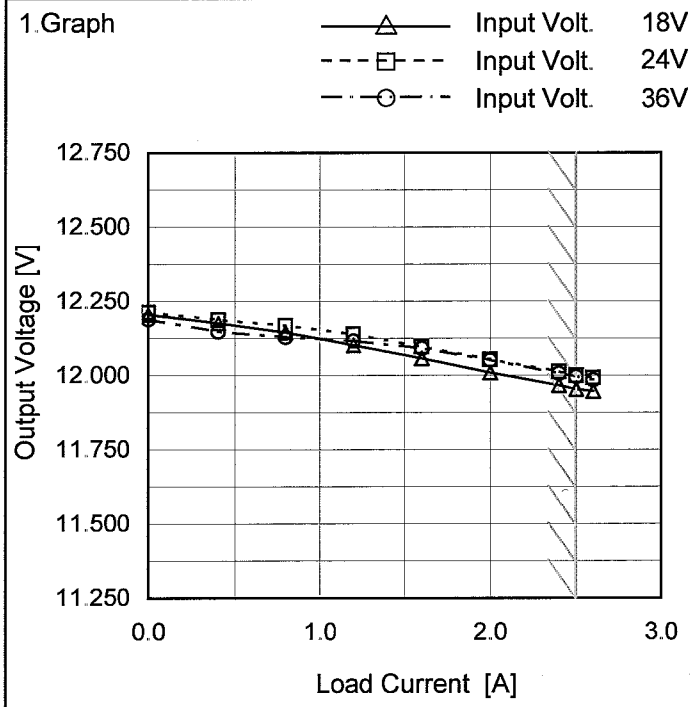
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	12.090	11.957
18	12.094	11.954
20	12.129	11.993
24	12.130	12.000
30	12.121	11.992
36	12.111	11.996
40	12.100	11.999
--	-	-
--	-	-

COSEL

Model	SFS302412/SFCS302412
Item	Load Regulation
Object	+12V2.5A

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]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	12.206	12.213	12.190
0.4	12.177	12.187	12.148
0.8	12.146	12.168	12.129
1.2	12.102	12.139	12.116
1.6	12.058	12.097	12.092
2.0	12.010	12.054	12.052
2.4	11.967	12.013	12.007
2.5	11.954	12.000	11.996
2.6	11.947	11.992	11.985
---	-	-	-
---	-	-	-

COSEL

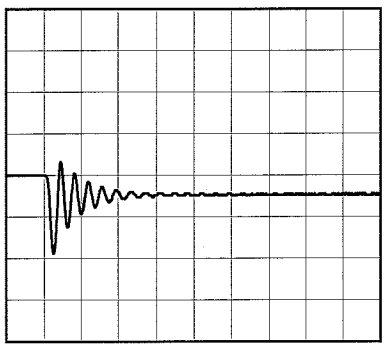
Model	SFS302412/SFCS302412
Item	Dynamic Load Response
Object	+12V2.5A

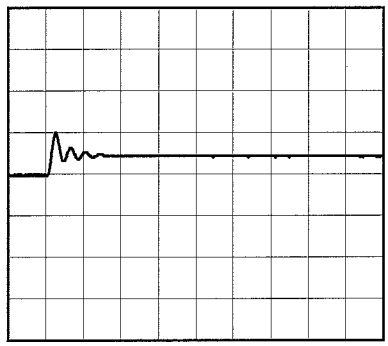
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 24 V
Cycle 1000 mS

Load Current
2.5A / 200 μ sec

Min. Load (0A) ⟷
Load 100% (2.5A)



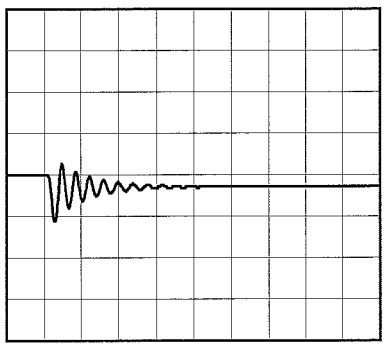


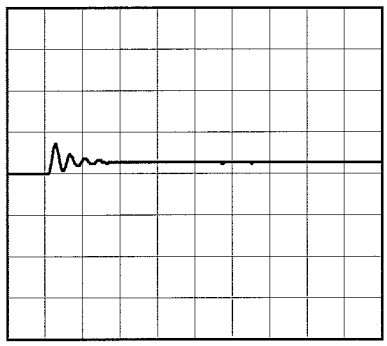
500mV/div

200 μs/div

200 μs/div

Min. Load (0A) ⟷
Load 50% (1.25A)



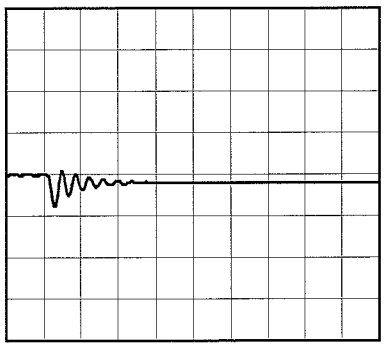


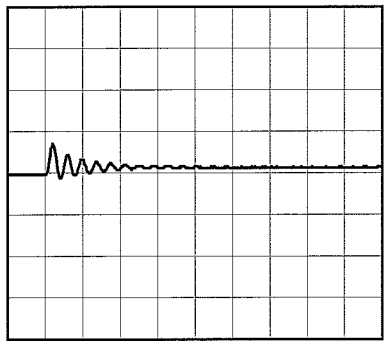
500mV/div

200 μs/div

200 μs/div

Load 50% (1.25A) ⟷
Load 100% (2.5A)





500mV/div

200 μs/div

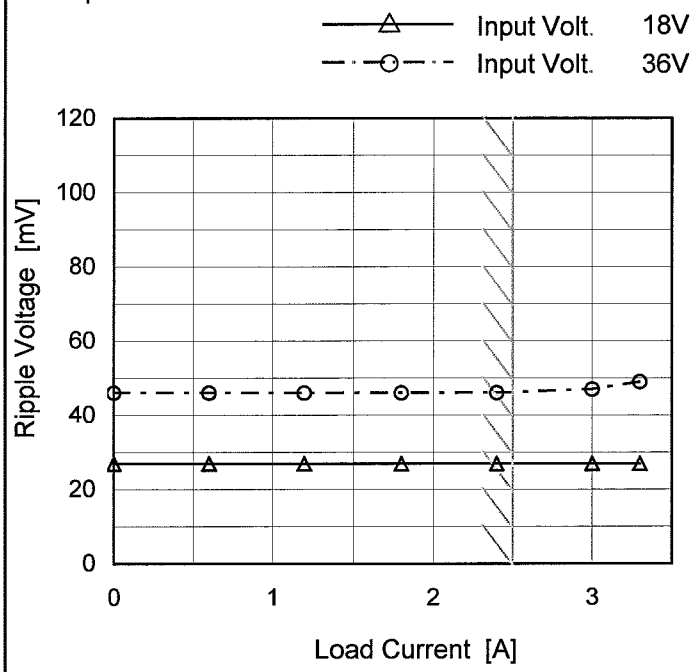
200 μs/div

COSEL

Model	SFS302412/SFCS302412
Item	Ripple Voltage (by Load Current)
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure C

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.

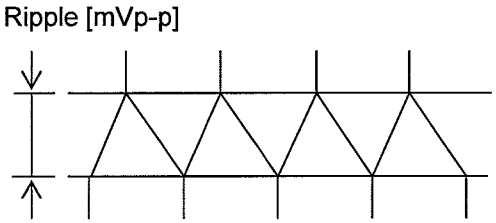


Fig.Complex Ripple Wave Form

2.Values

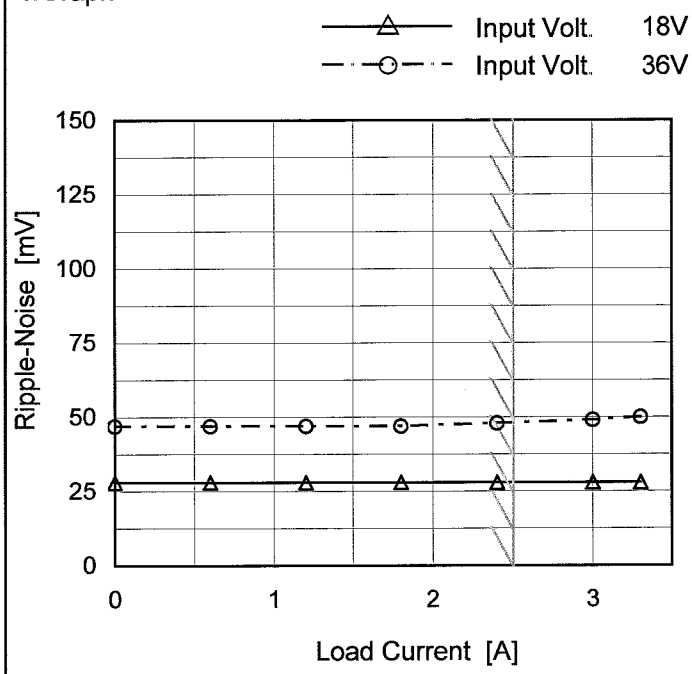
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	27	46
0.6	27	46
1.2	27	46
1.8	27	46
2.4	27	46
3.0	27	47
3.3	27	49
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SFS302412/SFCS302412
Item	Ripple-Noise
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure C

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.

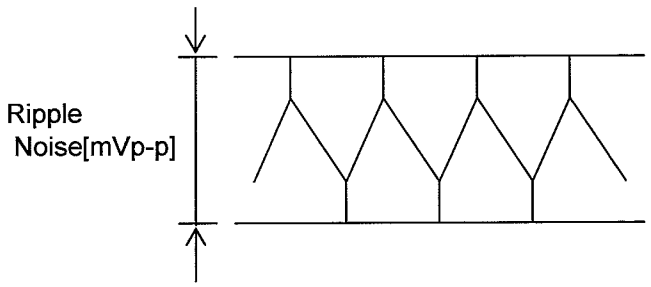


Fig.Complex Ripple Noise Wave Form

2.Values

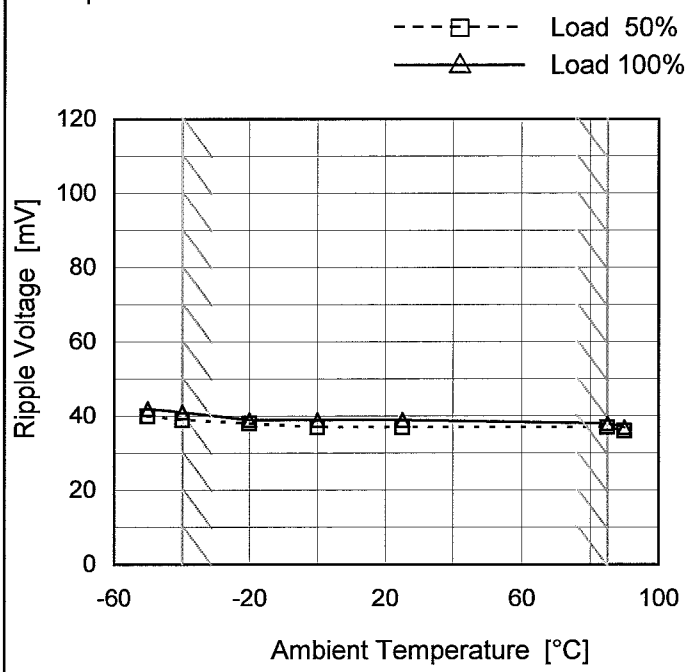
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	28	47
0.6	28	47
1.2	28	47
1.8	28	47
2.4	28	48
3.0	28	49
3.3	28	50
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SFS302412/SFCS302412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V2.5A

Testing Circuitry Figure C

1.Graph



Input Volt. 24V

Measured by 100 MHz Oscilloscope.

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

2.Values

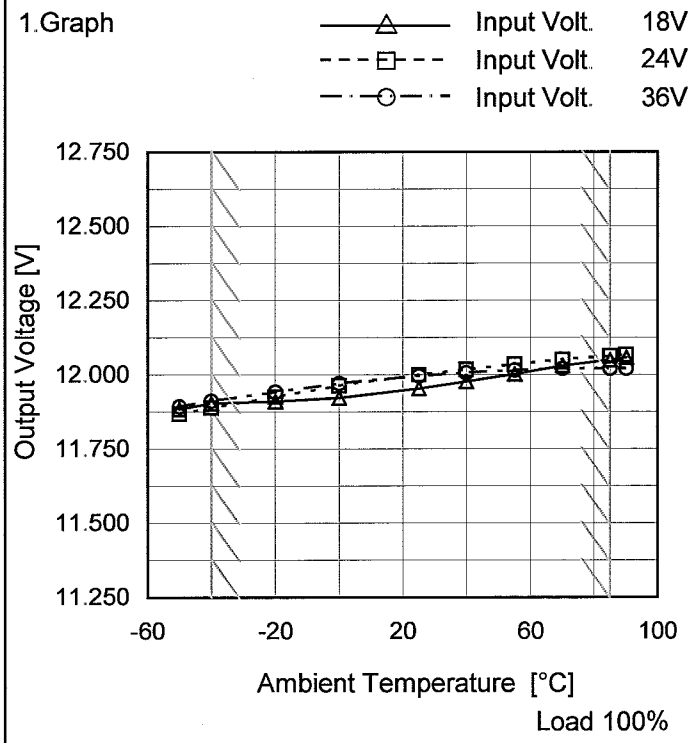
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	40	42
-40	39	41
-20	38	39
0	37	39
25	37	39
85	37	38
90	36	37
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SFS302412/SFCS302412
Item	Ambient Temperature Drift
Object	+12V2.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-50	11.885	11.868	11.893
-40	11.904	11.889	11.912
-20	11.911	11.926	11.942
0	11.922	11.963	11.971
25	11.954	12.000	11.996
40	11.977	12.017	12.006
55	12.002	12.034	12.015
70	12.030	12.051	12.021
85	12.050	12.063	12.021
90	12.058	12.067	12.020
--	-	-	-

BC-10066

COSEL

Model	SFS302412/SFCS302412	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V2.5A	

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 - 85°C
Input Voltage : 18 - 36V
Load Current : 0 - 2.5A

* 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

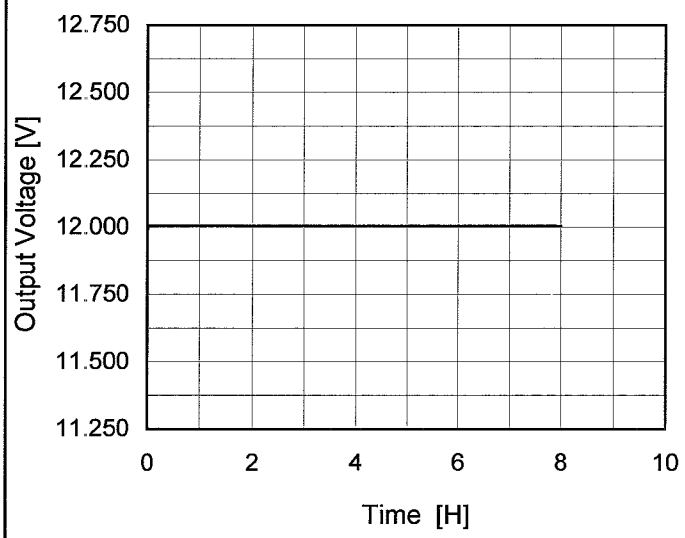
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	85	18	0	12.330	±221	±1.8
Minimum Voltage	-40	24	2.5	11.889		

COSEL

Model	SFS302412/SFCS302412
Item	Time Lapse Drift
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 24V
Load 100%

2.Values

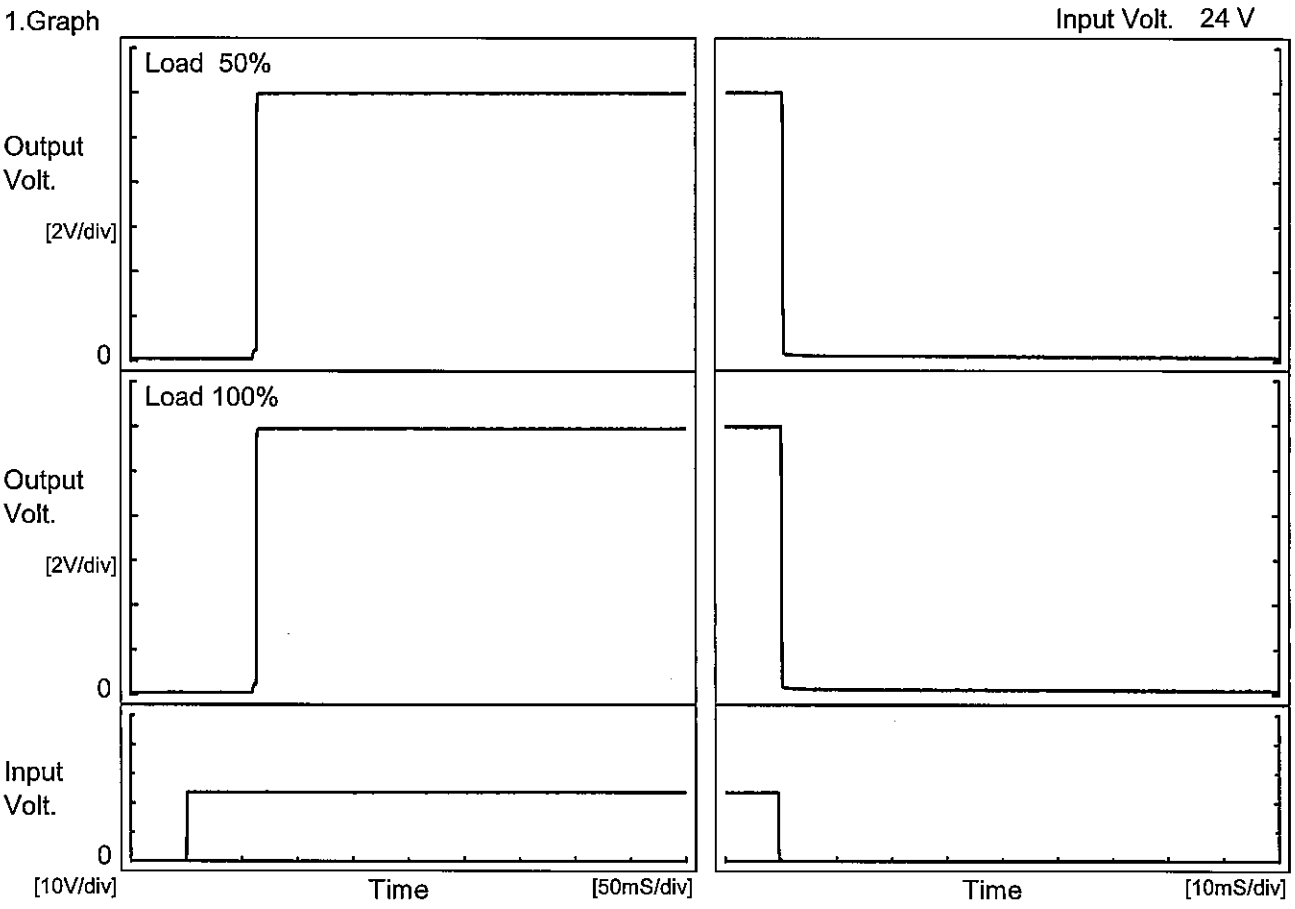
Time since start [H]	Output Voltage [V]
0.0	11.988
0.5	12.005
1.0	12.005
2.0	12.005
3.0	12.005
4.0	12.005
5.0	12.005
6.0	12.005
7.0	12.005
8.0	12.005

COSEL

Model	SFS302412/SFCS302412
Item	Rise and Fall Time
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure A

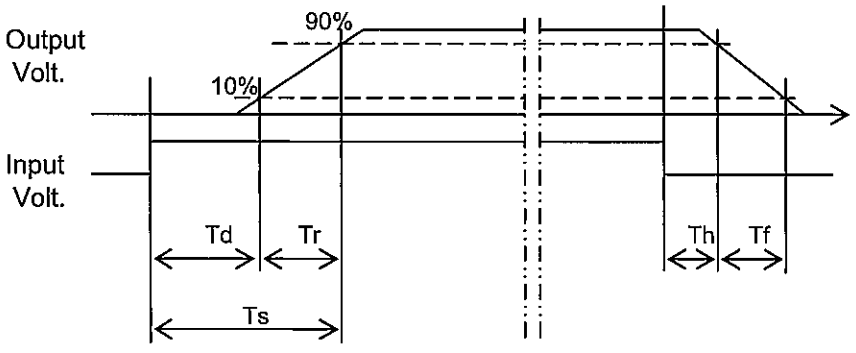
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	61.8	0.6	62.4	0.1	0.6
100 %	61.8	0.6	62.4	0.1	0.4

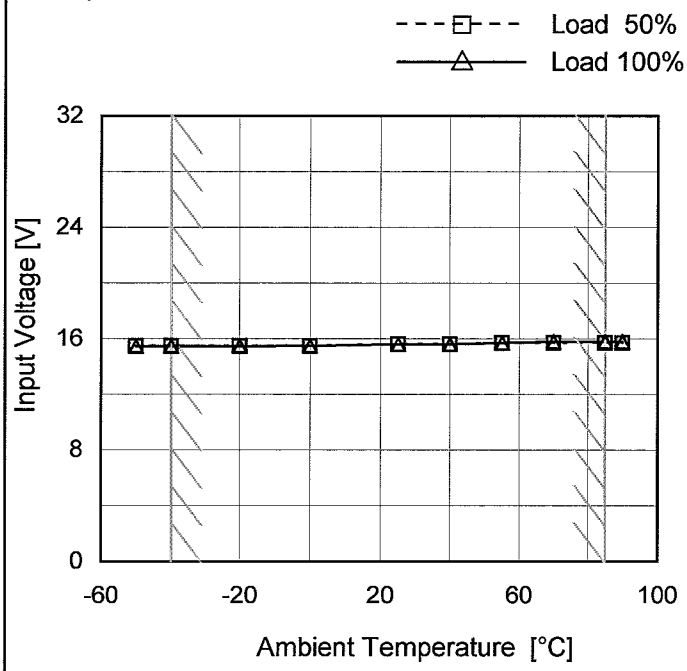


COSEL

Model	SFS302412/SFCS302412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V2.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

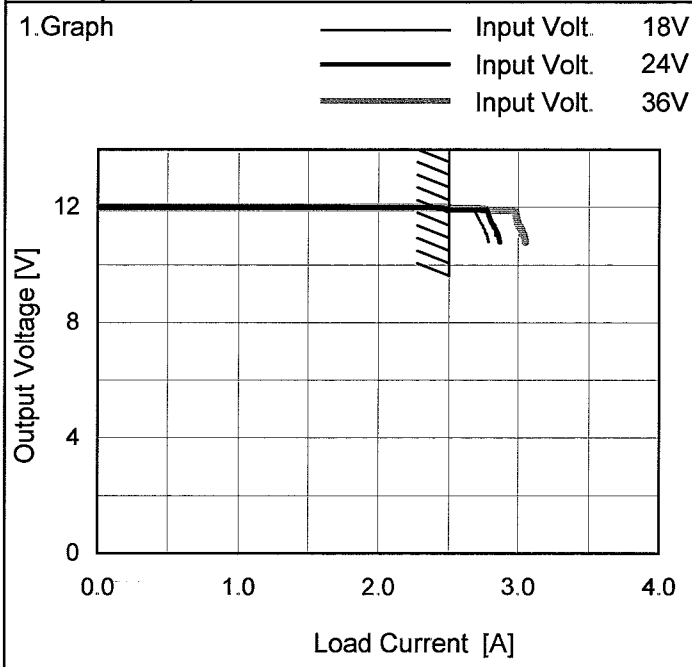
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	15.5	15.5
-40	15.5	15.5
-20	15.5	15.5
0	15.5	15.5
25	15.6	15.6
40	15.6	15.6
55	15.7	15.7
70	15.7	15.8
85	15.7	15.8
90	15.7	15.8
--	-	-

COSEL

Model	SFS302412/SFCS302412
Item	Overcurrent Protection
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

When the output voltage fell to less than 10.8V,the unit shuts off the output by operating low voltage protection.

2.Values

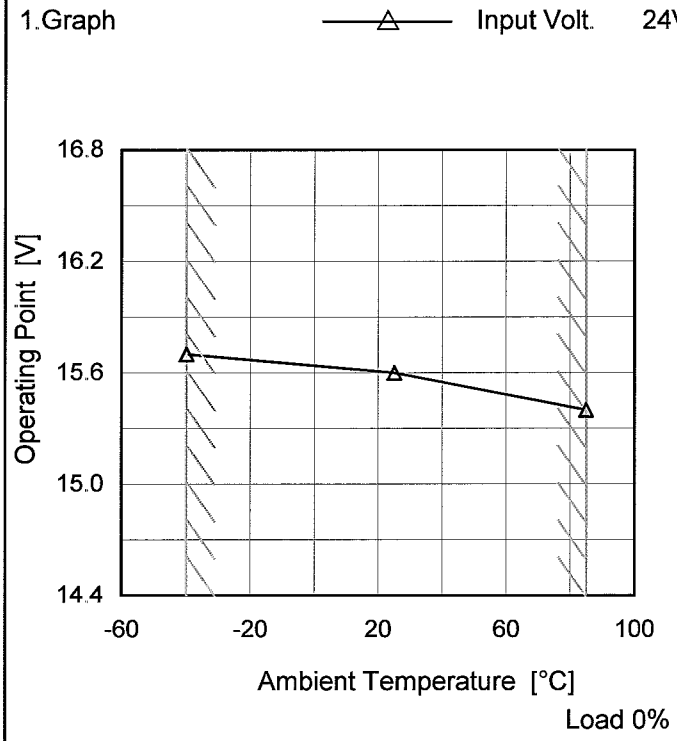
Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
12.0	2.54	2.55	2.51
11.4	2.77	2.85	3.01
10.8	2.79	2.87	3.05
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SFS302412/SFCS302412
Item	Overvoltage Protection
Object	+12V2.5A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 24[V]	Input Volt.	Input Volt.
-40	15.7	-	-
25	15.6	-	-
85	15.4	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

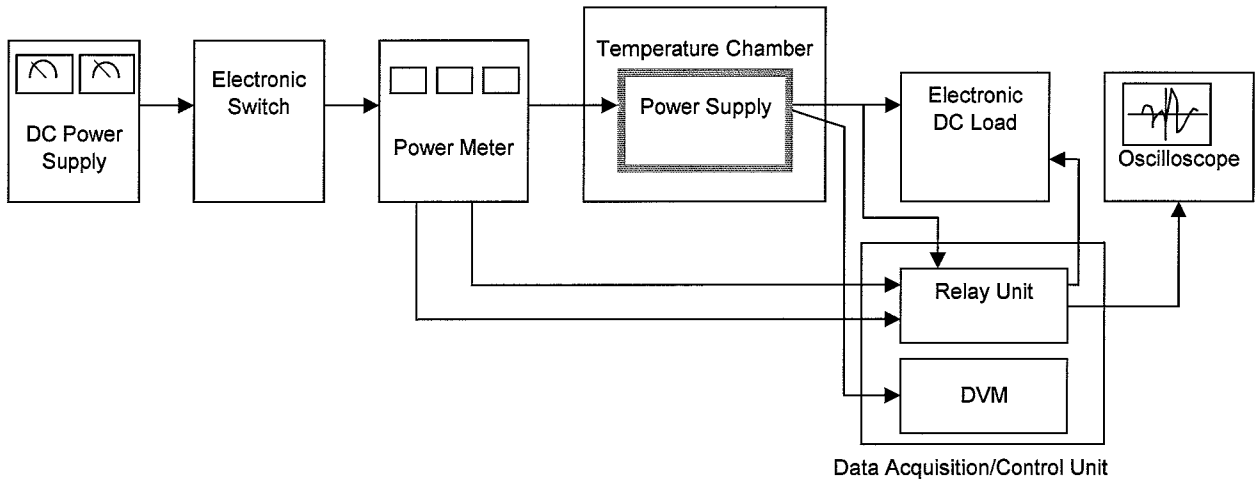


Figure A

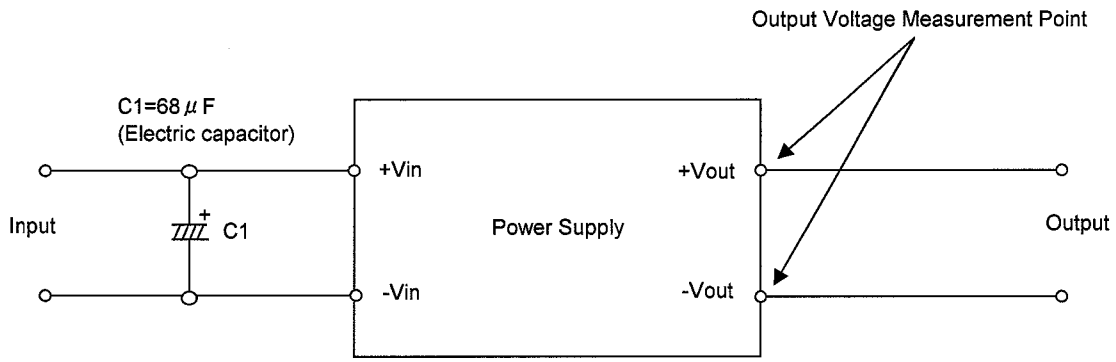


Figure B (General Electric Characteristic)

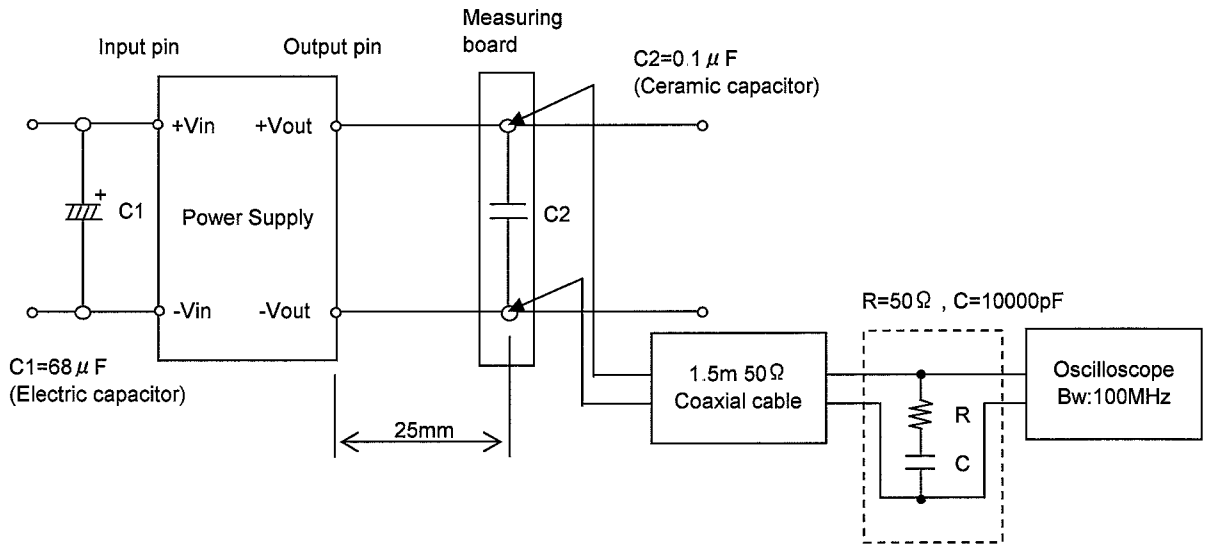


Figure C (Ripple and Ripple noise Characteristic)