COSEL

参考資料

TEST DATA OF MGFW64812

Regulated DC Power Supply
December 20, 2016

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Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

参考資料

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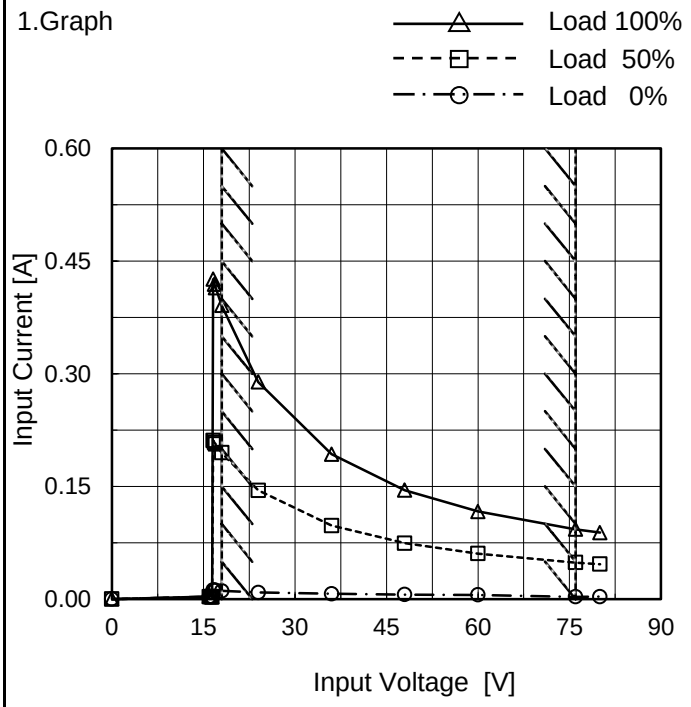
参考資料

COSEL

Model	MGFW64812
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	0.000	0.000	0.000
16.0	0.003	0.003	0.004
16.2	0.003	0.003	0.004
16.4	0.003	0.003	0.003
16.6	0.012	0.211	0.426
16.8	0.012	0.208	0.419
17.0	0.012	0.206	0.415
18.0	0.011	0.195	0.391
24.0	0.009	0.145	0.289
36.0	0.007	0.098	0.193
48.0	0.006	0.074	0.145
60.0	0.006	0.061	0.117
76.0	0.003	0.049	0.093
80.0	0.003	0.047	0.089
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

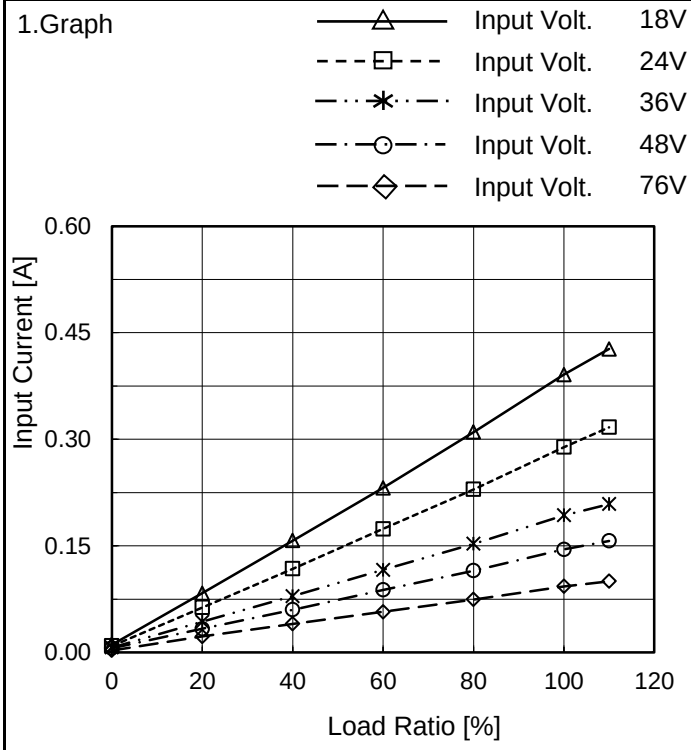
BC-11044

COSEL

Model	MGFW64812
Item	Input Current (by Load Ratio)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

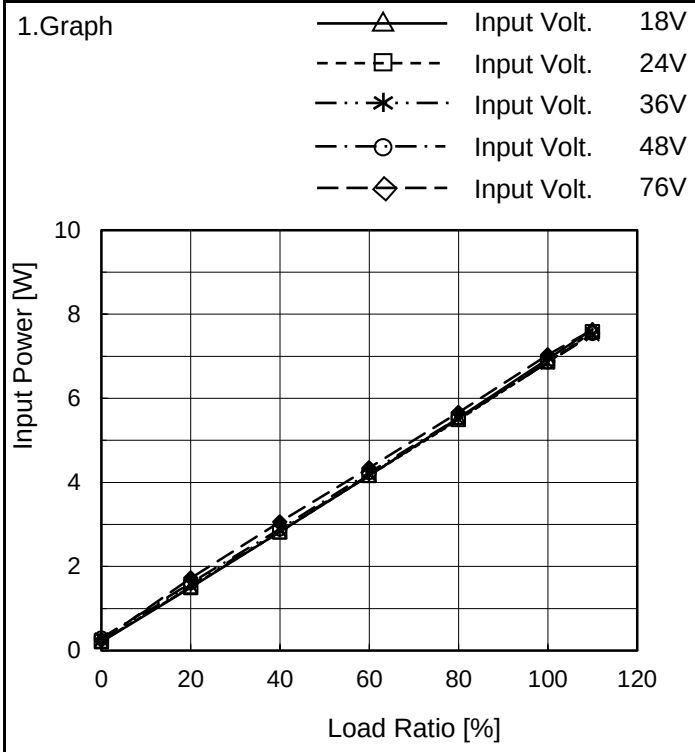
Load Ratio [%]	Input Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.011	0.009	0.007	0.006	0.003
20	0.083	0.063	0.043	0.033	0.023
40	0.157	0.118	0.079	0.060	0.040
60	0.232	0.174	0.116	0.088	0.057
80	0.310	0.230	0.153	0.115	0.075
100	0.391	0.289	0.193	0.145	0.093
110	0.427	0.317	0.209	0.157	0.100
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW64812
Item	Input Power (by Load Ratio)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

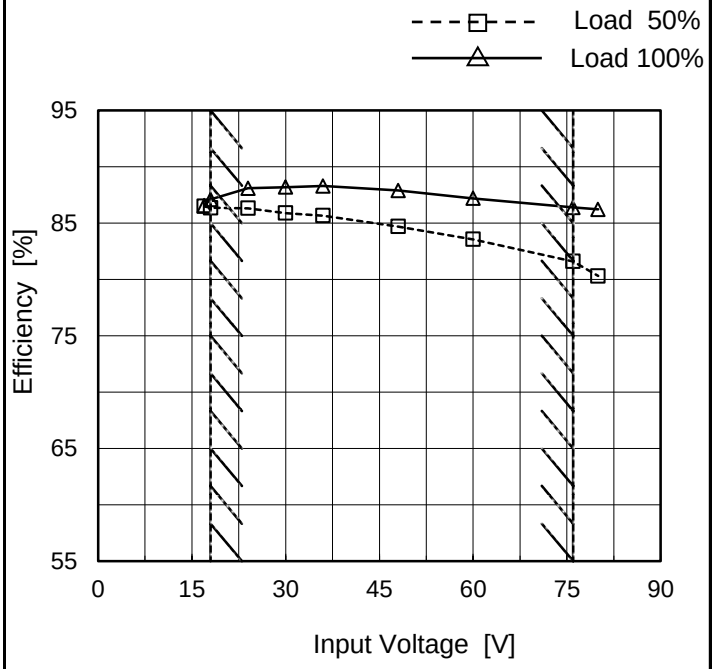
Load Ratio [%]	Input Power [W]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.21	0.22	0.26	0.29	0.24
20	1.50	1.52	1.56	1.61	1.72
40	2.82	2.82	2.86	2.89	3.06
60	4.17	4.16	4.18	4.23	4.34
80	5.54	5.49	5.51	5.53	5.66
100	6.94	6.86	6.85	6.86	7.03
110	7.63	7.58	7.52	7.54	7.63
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW64812
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

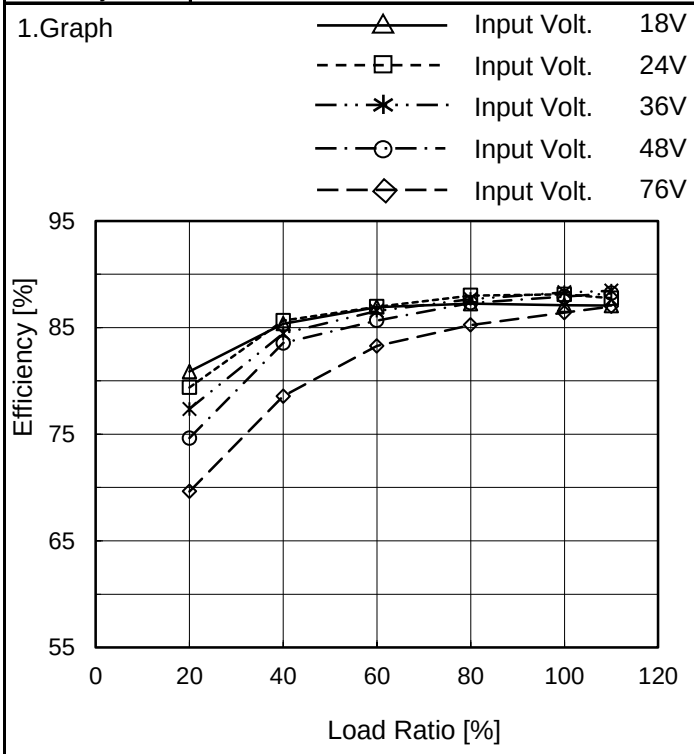
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	86.5	86.6
18	86.4	87.1
24	86.3	88.1
30	85.9	88.2
36	85.7	88.3
48	84.7	87.9
60	83.6	87.2
76	81.6	86.4
80	80.3	86.2

COSEL

Model	MGFW64812
Item	Efficiency (by Load Ratio)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Efficiency [%]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	-	-	-	-	-
20	80.9	79.4	77.4	74.6	69.6
40	85.4	85.6	84.4	83.5	78.6
60	86.9	87.0	86.6	85.7	83.3
80	87.2	88.0	87.7	87.3	85.2
100	87.1	88.1	88.3	87.9	86.4
110	87.1	87.7	88.5	88.2	87.0
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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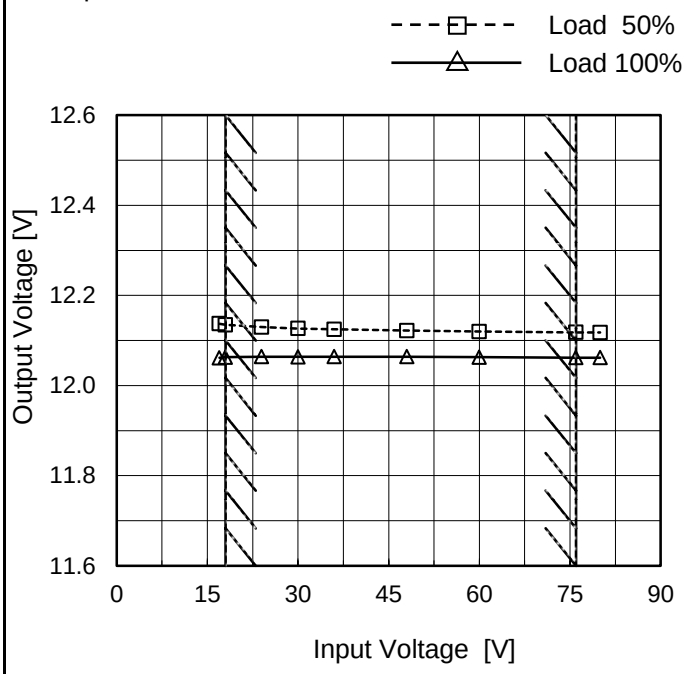
COSEL

Model	MGFW64812
Item	Line Regulation
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



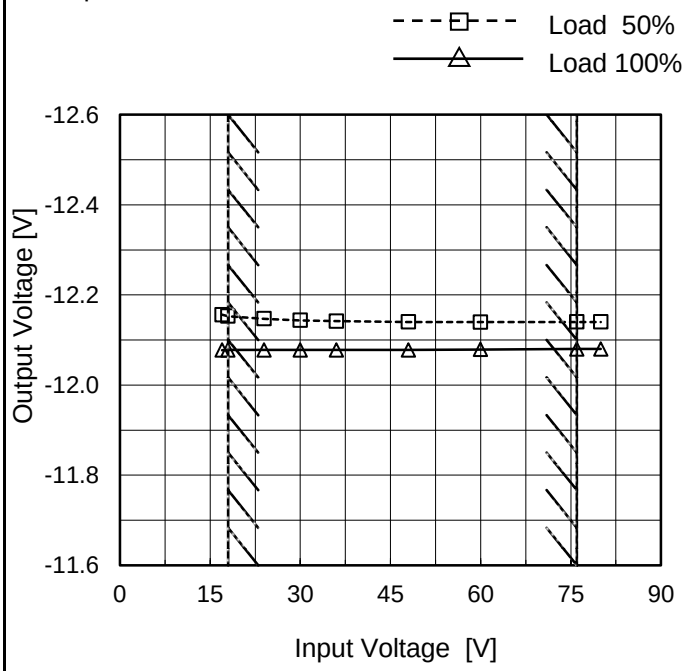
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	12.137	12.061
18	12.135	12.063
24	12.130	12.064
30	12.127	12.064
36	12.125	12.064
48	12.122	12.064
60	12.120	12.063
76	12.118	12.062
80	12.118	12.062

-12V : Rated Load Current

Object	-12V0.25A

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	-12.156	-12.078
18	-12.153	-12.078
24	-12.147	-12.078
30	-12.144	-12.078
36	-12.142	-12.078
48	-12.140	-12.078
60	-12.140	-12.079
76	-12.140	-12.080
80	-12.140	-12.080

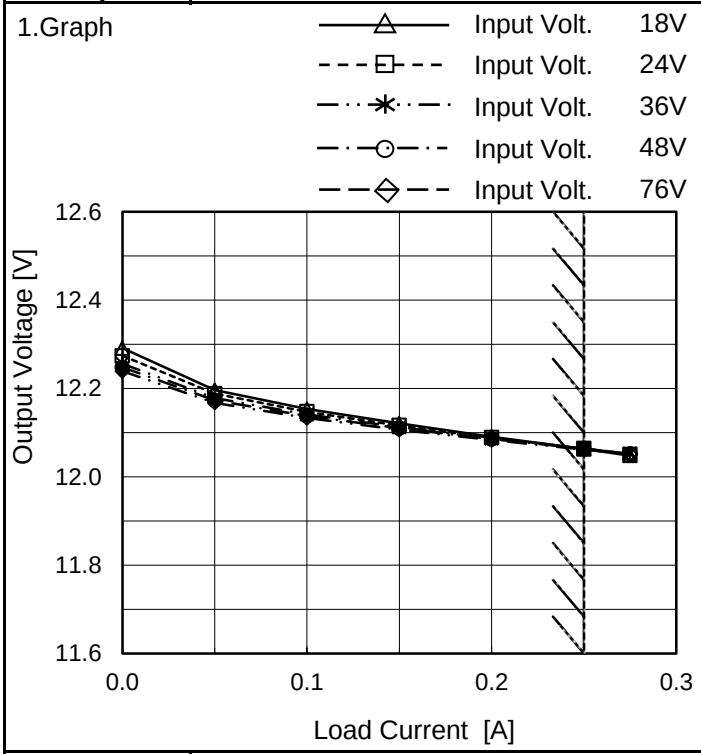
+12V : Rated Load Current

COSEL

Model	MGFW64812
Item	Load Regulation
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



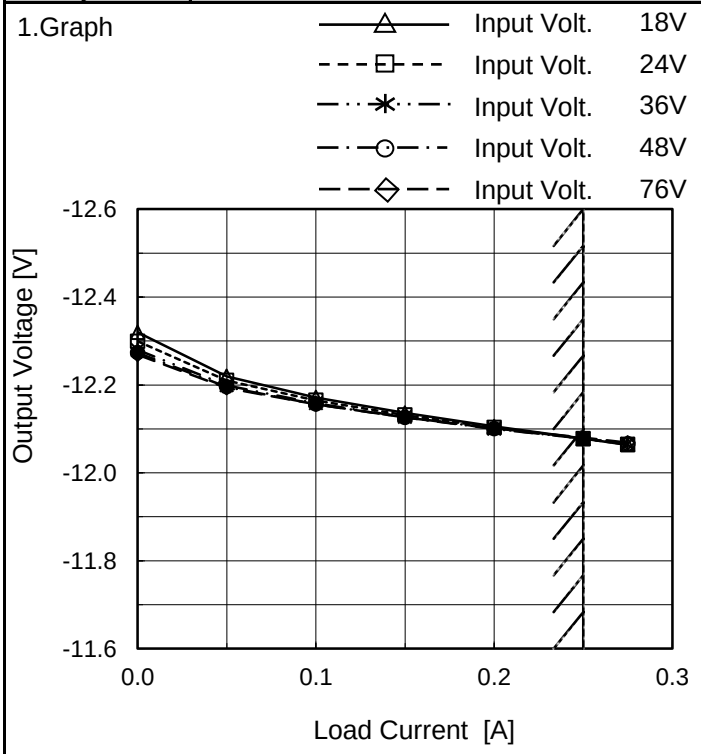
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	12.291	12.274	12.256	12.248	12.239
0.050	12.197	12.188	12.179	12.173	12.168
0.100	12.154	12.148	12.141	12.138	12.133
0.150	12.121	12.116	12.112	12.110	12.107
0.200	12.091	12.089	12.087	12.085	12.083
0.250	12.063	12.064	12.064	12.064	12.062
0.275	12.048	12.051	12.052	12.053	12.052
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-12V : Rated Load Current

Object	-12V0.25A

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]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	-12.320	-12.299	-12.280	-12.274	-12.269
0.050	-12.220	-12.210	-12.199	-12.195	-12.193
0.100	-12.171	-12.165	-12.158	-12.156	-12.156
0.150	-12.136	-12.131	-12.127	-12.126	-12.126
0.200	-12.105	-12.103	-12.101	-12.100	-12.101
0.250	-12.078	-12.078	-12.078	-12.078	-12.080
0.275	-12.064	-12.065	-12.066	-12.067	-12.068
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+12V : Rated Load Current

COSEL

Model	MGFW64812	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.25A	

Input Volt. 48 V

-12V:rated load current.

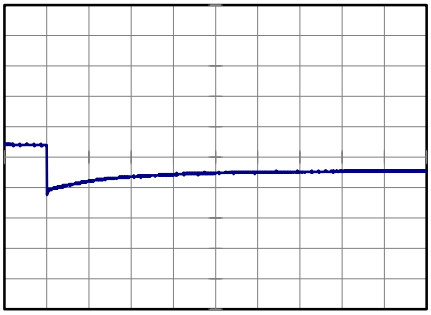
Cycle 100 ms

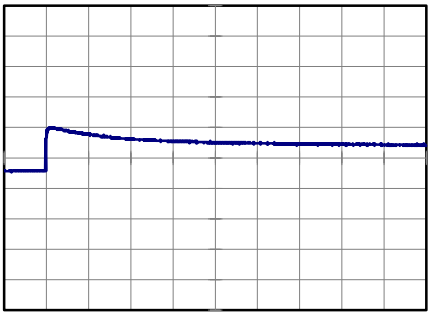
t1,t2 = 100 μs

Load Current

t1 t2

Min.Load (0A)←→
Load 100% (0.25A)

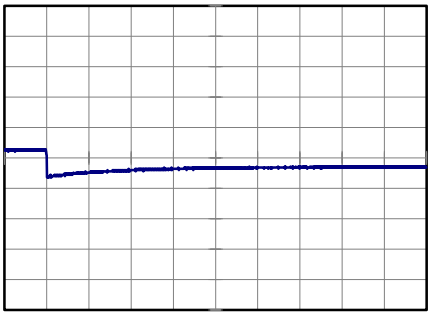


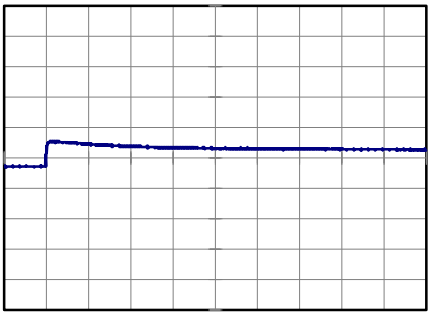


200 mV/div

4 ms/div 4 ms/div

Min.Load (0A)←→
Load 50% (0.125A)

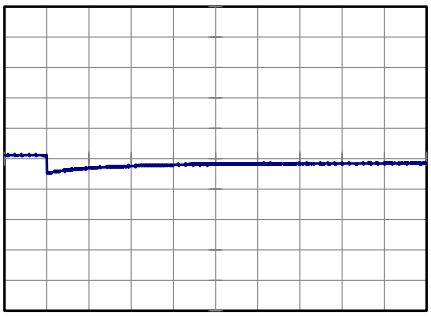


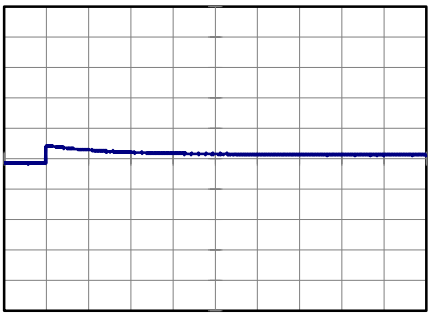


200 mV/div

4 ms/div 4 ms/div

Load 50% (0.125A)←→
Load 100% (0.25A)





200 mV/div

4 ms/div 4 ms/div

COSEL

Model	MGFW64812	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.25A	

Input Volt. 48 V

+12V:rated load current.

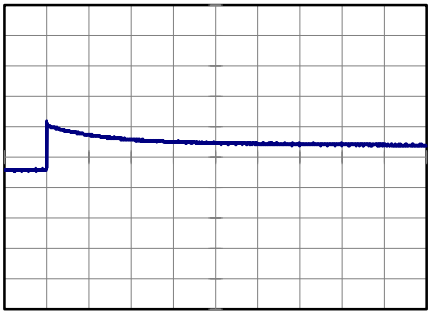
Cycle 100 ms

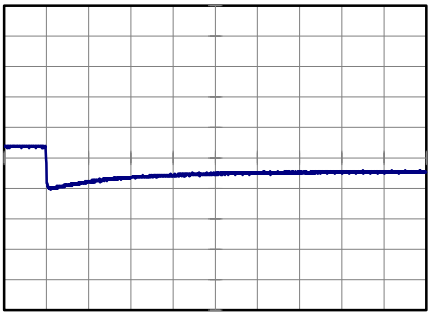
t1,t2 = 100 μs

Load Current

t1 t2

Min.Load (0A)←→
Load 100% (0.25A)

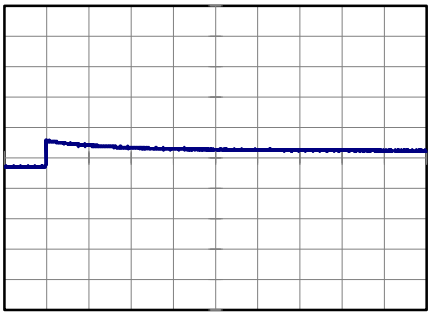


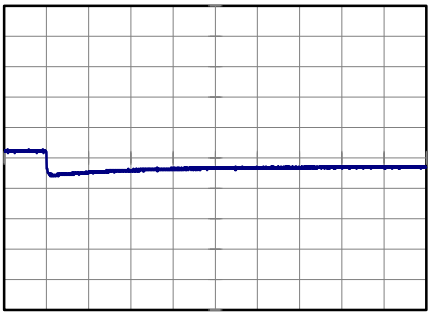


200 mV/div

4 ms/div 4 ms/div

Min.Load (0A)←→
Load 50% (0.125A)

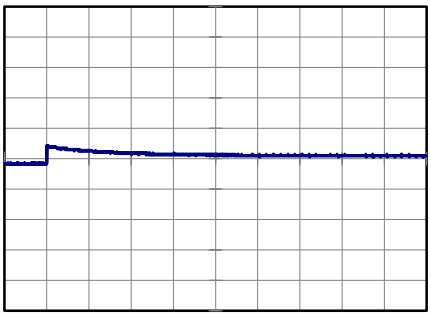


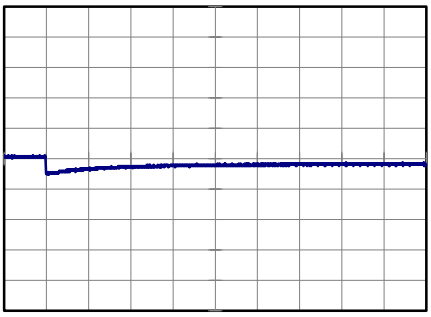


200 mV/div

4 ms/div 4 ms/div

Load 50% (0.125A)←→
Load 100% (0.25A)





200 mV/div

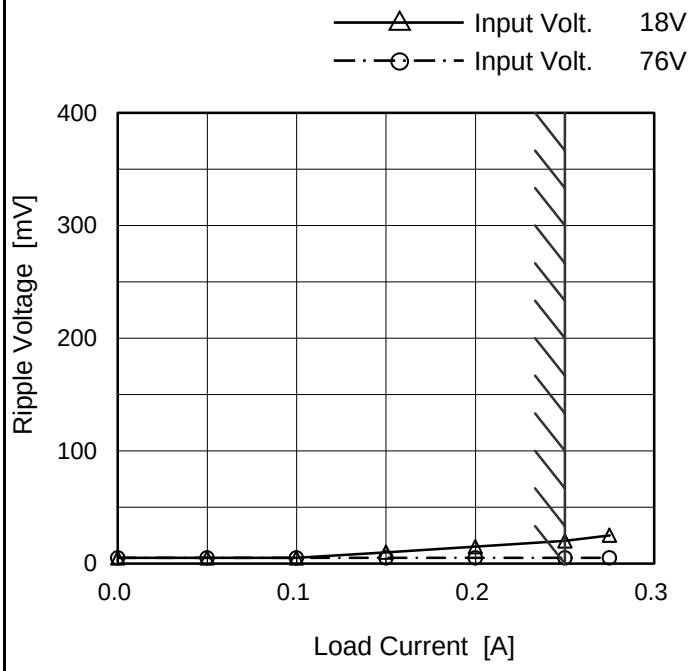
4 ms/div 4 ms/div

COSEL

Model	MGFW64812
Item	Ripple Voltage (by Load Current)
Object	+12V0.25A

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]

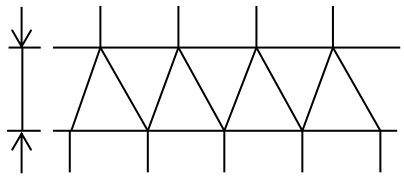


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	10	5
0.200	15	5
0.250	20	5
0.275	25	5
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

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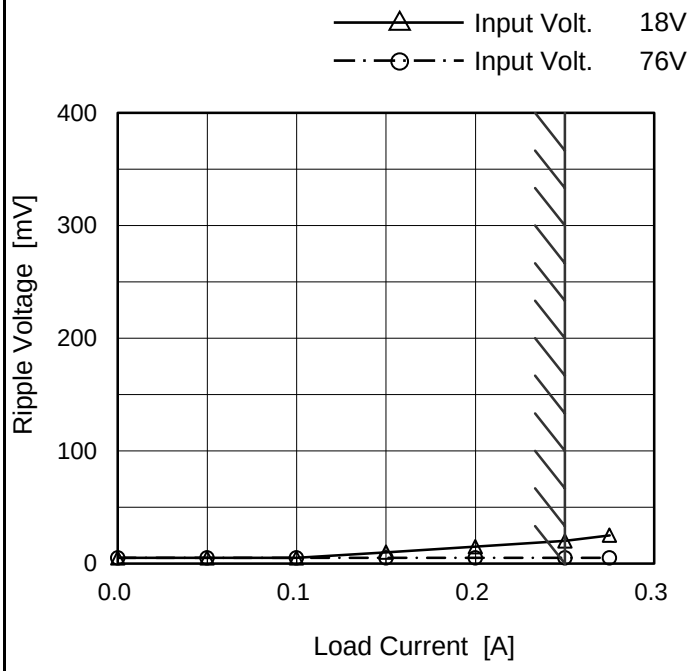
COSEL

Model	MGFW64812
Item	Ripple Voltage (by Load Current)
Object	-12V0.25A

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]

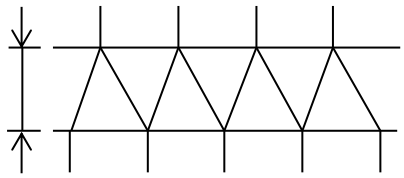


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	10	5
0.200	15	5
0.250	20	5
0.275	25	5
--	-	-
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

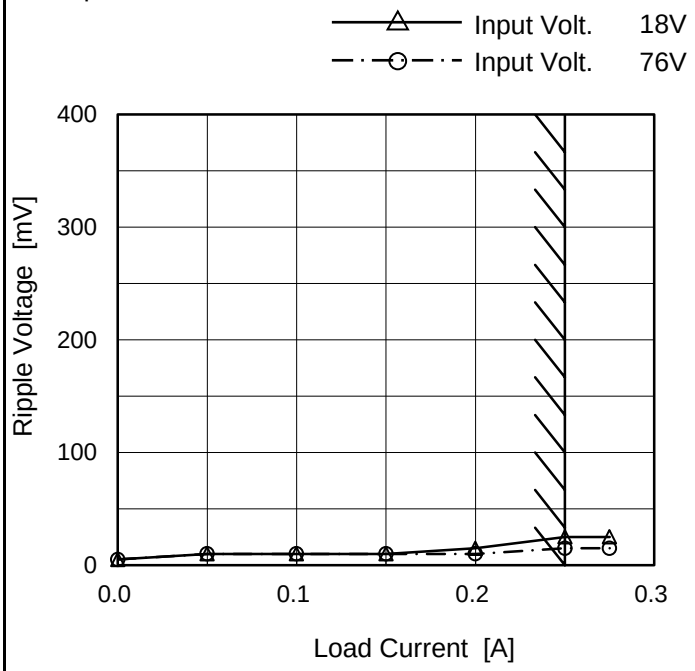
BC-11044

COSEL

Model	MGFW64812
Item	Ripple-Noise
Object	+12V0.25A

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.

Ripple Noise[mVp-p]

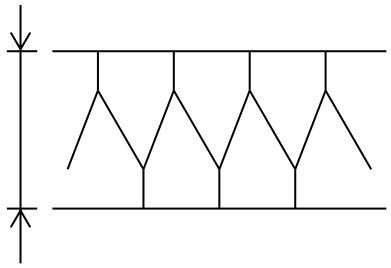


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	5	5
0.050	10	10
0.100	10	10
0.150	10	10
0.200	15	10
0.250	25	15
0.275	25	15
--	-	-
--	-	-
--	-	-
--	-	-

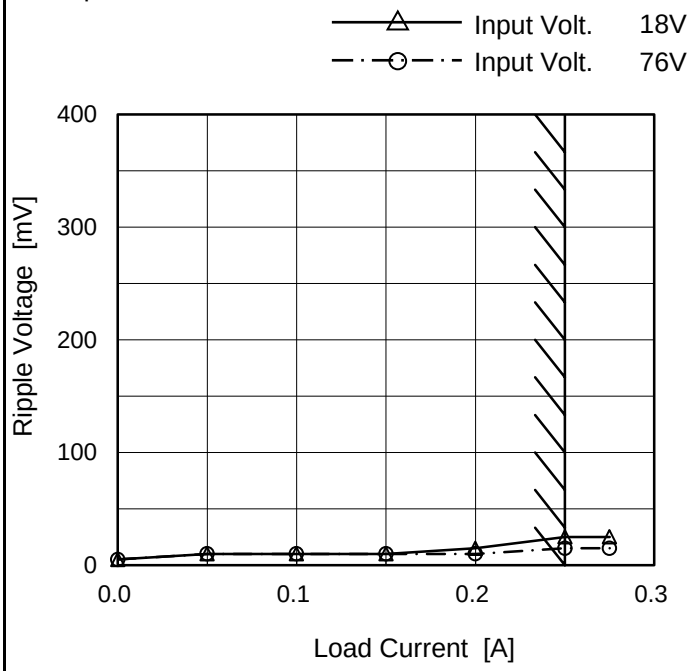
-12V: Rated Load Current

COSEL

Model	MGFW64812
Item	Ripple-Noise
Object	-12V0.25A

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.

Ripple Noise[mVp-p]

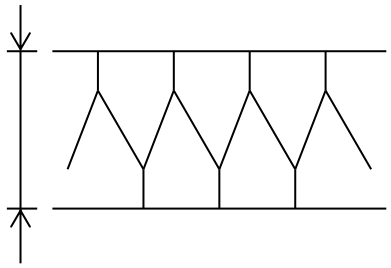


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	5	5
0.050	10	10
0.100	10	10
0.150	10	10
0.200	15	10
0.250	25	15
0.275	25	15
--	-	-
--	-	-
--	-	-
--	-	-

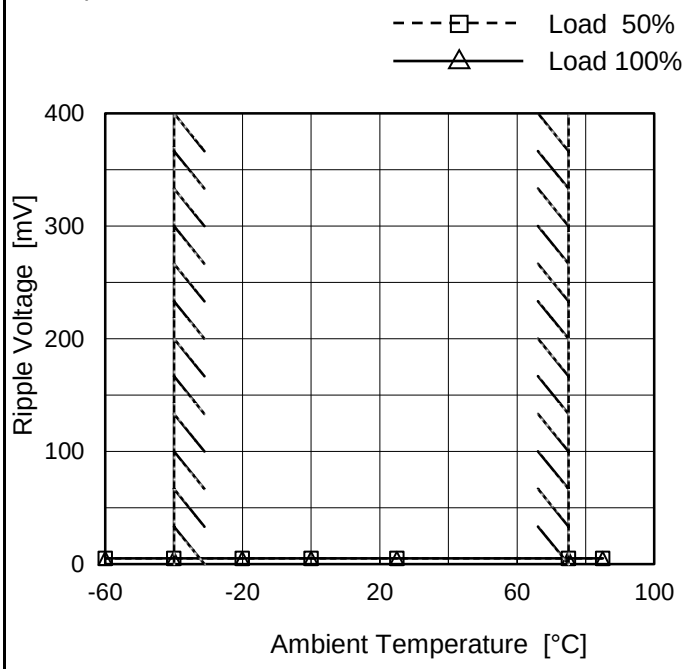
+12V: Rated Load Current

COSEL

Model	MGFW64812
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.25A

Testing Circuitry Figure B

1.Graph



Input Volt. 48V

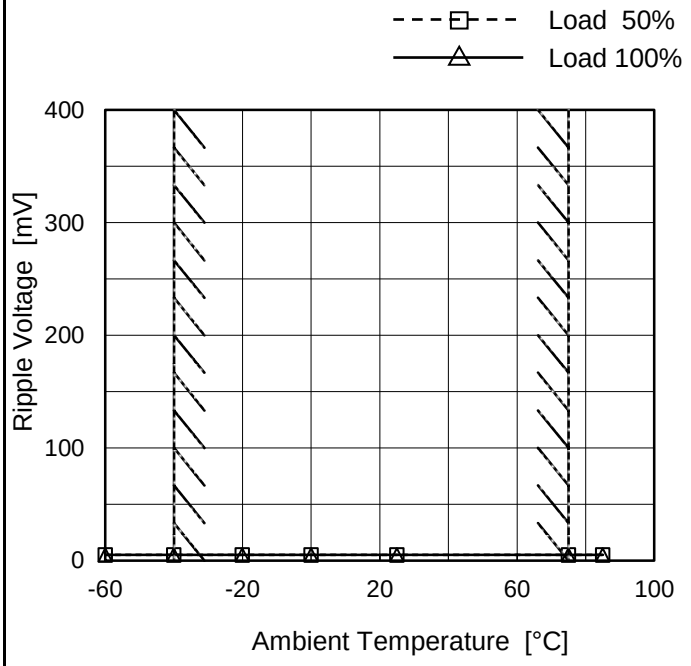
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	5
-40	5	5
-20	5	5
0	5	5
25	5	5
75	5	5
85	5	5
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

Object	-12V0.25A

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	5	5
-40	5	5
-20	5	5
0	5	5
25	5	5
75	5	5
85	5	5
--	-	-
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

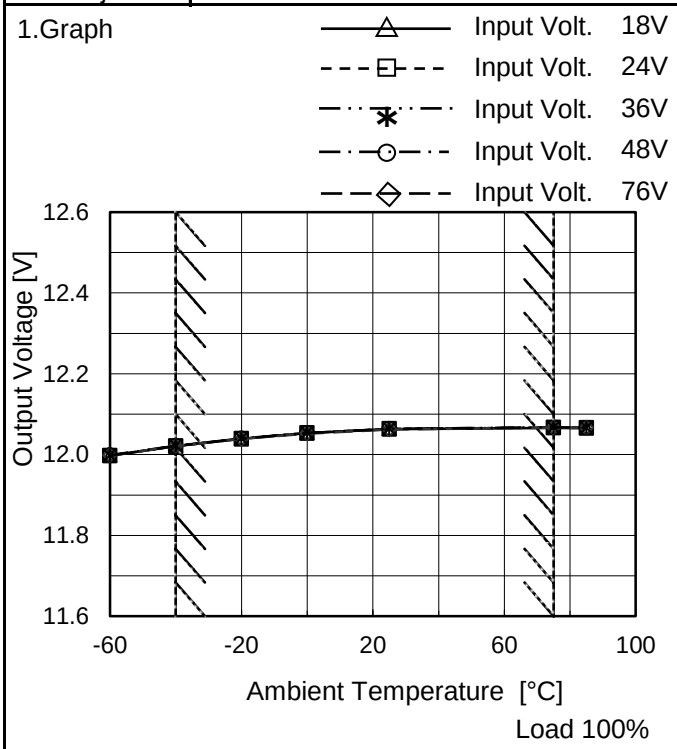
COSEL

Model	MGFW64812
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +12V0.25A

1.Graph



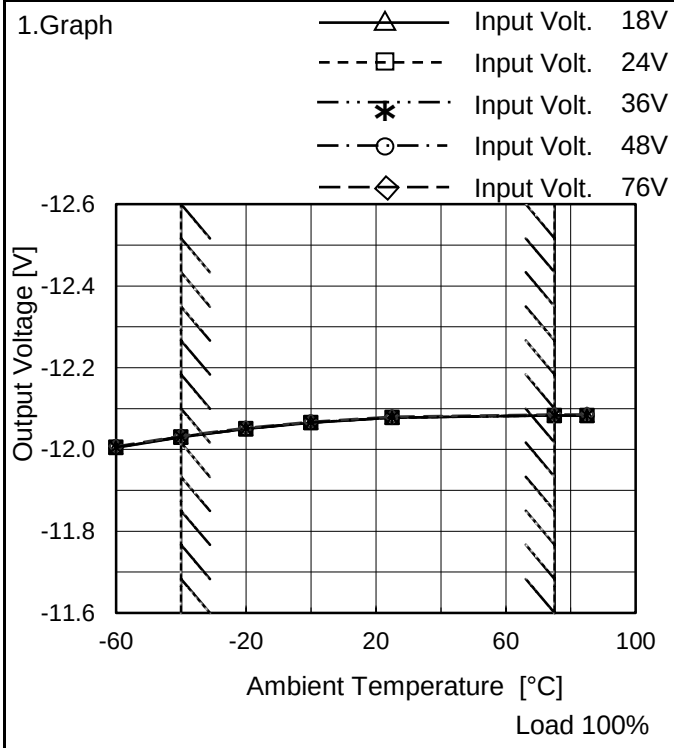
2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	11.997	11.998	11.998	11.999	11.998
-40	12.021	12.021	12.022	12.022	12.021
-20	12.039	12.040	12.040	12.040	12.039
0	12.053	12.054	12.054	12.054	12.052
25	12.063	12.064	12.064	12.064	12.062
75	12.066	12.067	12.067	12.067	12.067
85	12.065	12.066	12.067	12.067	12.066
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-12V : Rated Load Current

Object -12V0.25A

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]	Input Volt. 48[V]	Input Volt. 76[V]
-60	-12.005	-12.005	-12.005	-12.006	-12.007
-40	-12.030	-12.031	-12.031	-12.032	-12.033
-20	-12.050	-12.051	-12.051	-12.051	-12.053
0	-12.066	-12.066	-12.066	-12.066	-12.068
25	-12.078	-12.078	-12.078	-12.078	-12.080
75	-12.083	-12.083	-12.083	-12.084	-12.086
85	-12.083	-12.083	-12.083	-12.084	-12.086
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+12V : Rated Load Current

COSEL

Model	MGFW64812	
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 - 75°C

Input Voltage : 18 - 76V

Load Current (AVR 1) : 0 - 0.25A (AVR 2) : 0 - 0.25A

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

$$* \text{ Output Voltage Accuracy (Ratio)} = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

2.Values

Object	+12V0.25A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	75	18	0	12.320	±253	±2.1
Minimum Voltage	75	18	0.25	11.815		

Object	-12V0.25A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	75	18	0	-12.347	±253	±2.1
Minimum Voltage	75	18	0.25	-11.842		

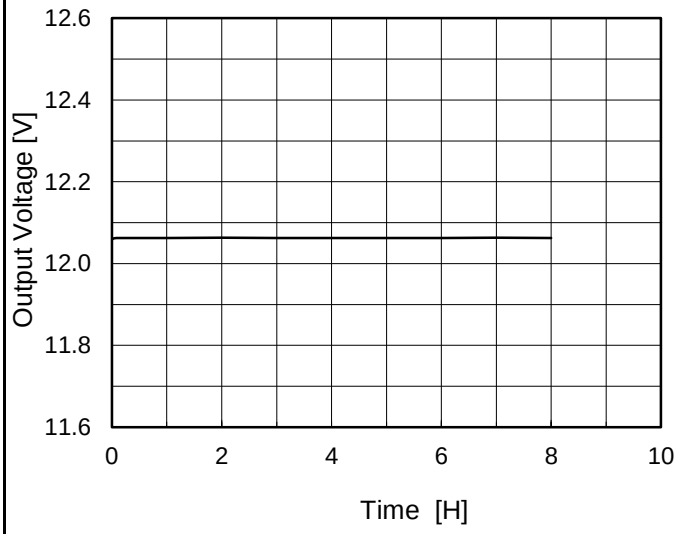
COSEL

Model	MGFW64812
Item	Time Lapse Drift

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.25A

1.Graph



Input Volt. 48V
Load 100%

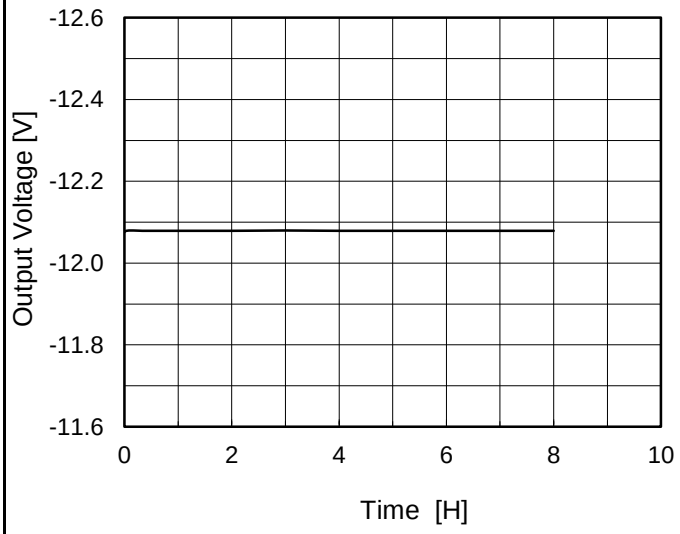
2.Values

Time since start [H]	Output Voltage [V]
0.0	12.058
0.5	12.063
1.0	12.063
2.0	12.063
3.0	12.063
4.0	12.063
5.0	12.063
6.0	12.063
7.0	12.063
8.0	12.063

-12V : Rated Load Current

Object -12V0.25A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.076
0.5	-12.079
1.0	-12.079
2.0	-12.079
3.0	-12.079
4.0	-12.079
5.0	-12.079
6.0	-12.079
7.0	-12.079
8.0	-12.079

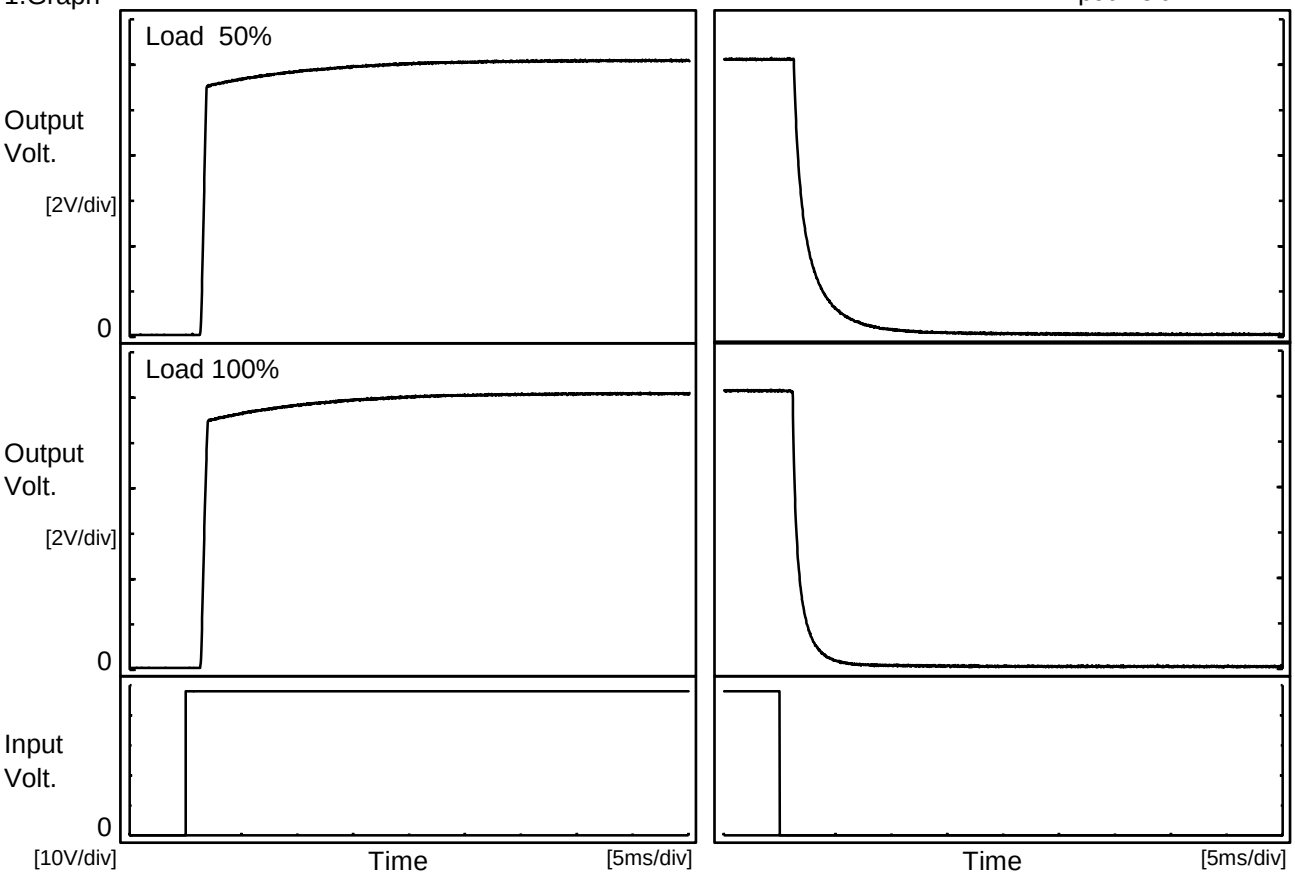
+12V : Rated Load Current

COSEL

Model	MGFW64812	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.25A	

1.Graph

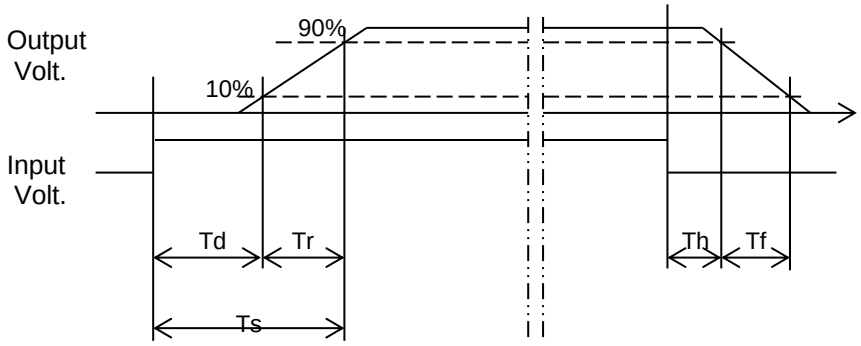
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.4	0.4	1.8	1.3	3.6
100 %	1.4	0.6	2.0	1.2	1.7



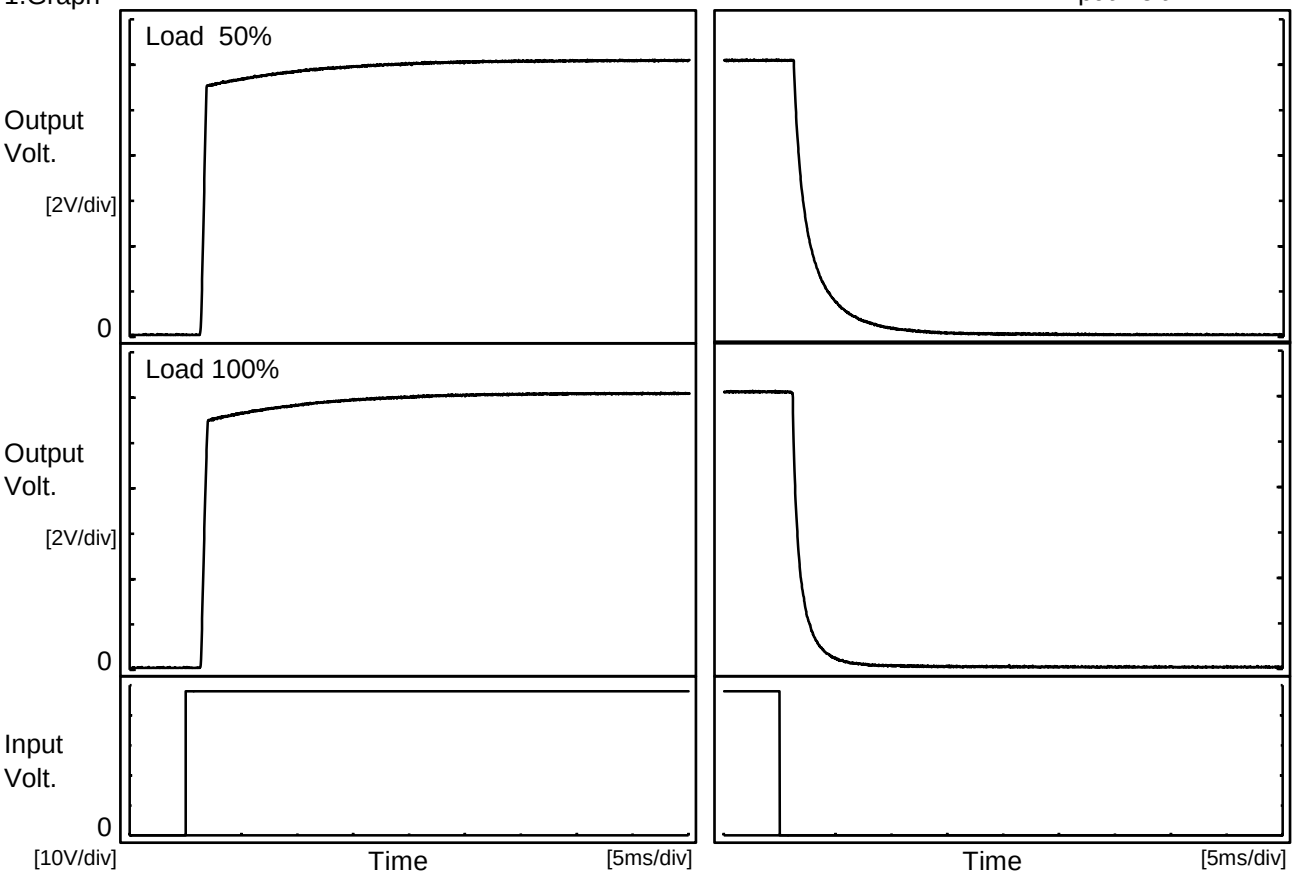
COSEL

Model	MGFW64812
Item	Rise and Fall Time
Object	-12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

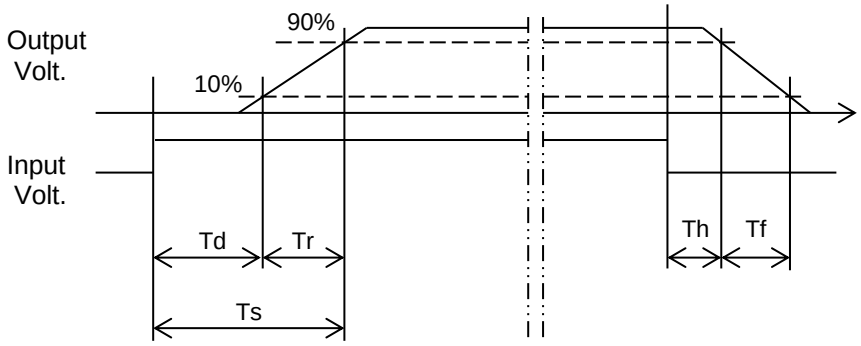
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.4	0.4	1.8	1.4	4.2
100 %	1.4	0.6	2.0	1.2	2.0



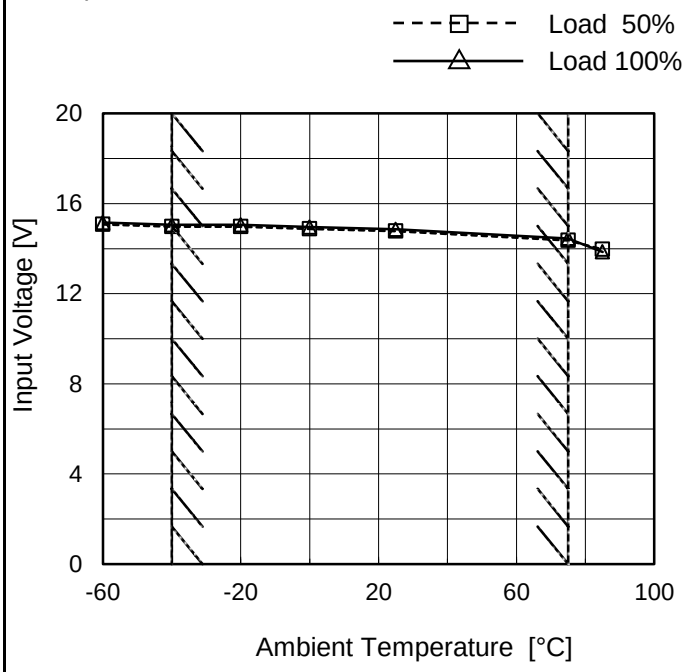
COSEL

Model	MGFW64812
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object +12V0.25A

1.Graph

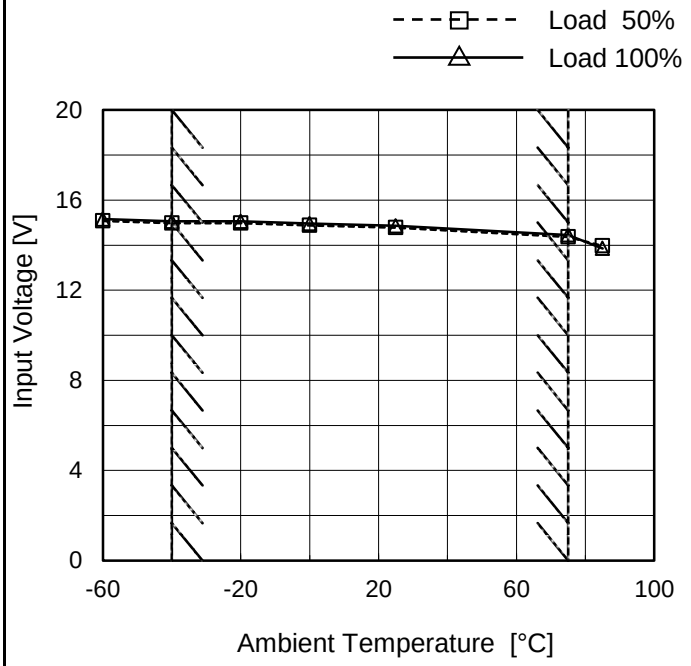


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	15.1	15.2
-40	15.0	15.1
-20	15.0	15.1
0	14.9	15.0
25	14.8	14.9
75	14.4	14.5
85	14.0	13.9
--	-	-
--	-	-
--	-	-
--	-	-

Object -12V0.25A

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	15.1	15.2
-40	15.0	15.1
-20	15.0	15.1
0	14.9	15.0
25	14.8	14.9
75	14.4	14.5
85	14.0	13.9
--	-	-
--	-	-
--	-	-
--	-	-

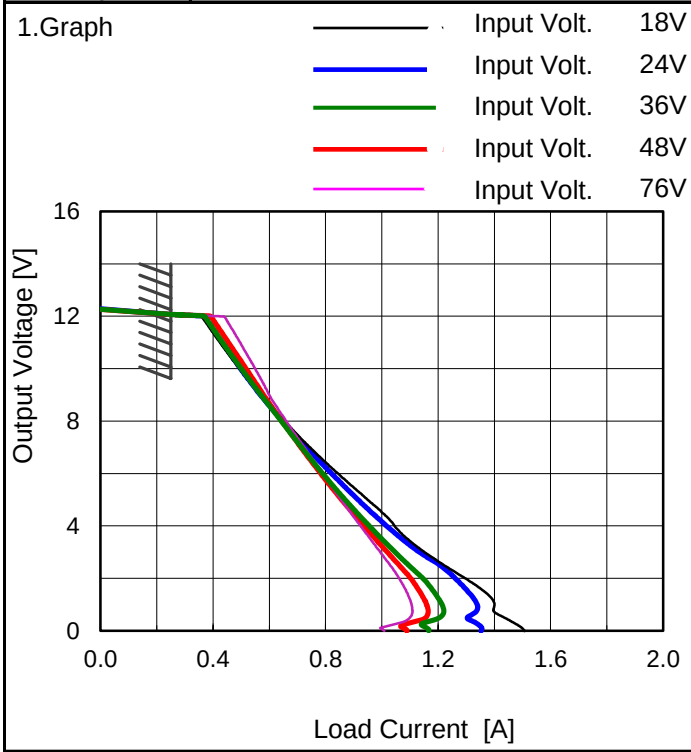
BC-11044

COSEL

Model	MGFW64812
Item	Overcurrent Protection
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



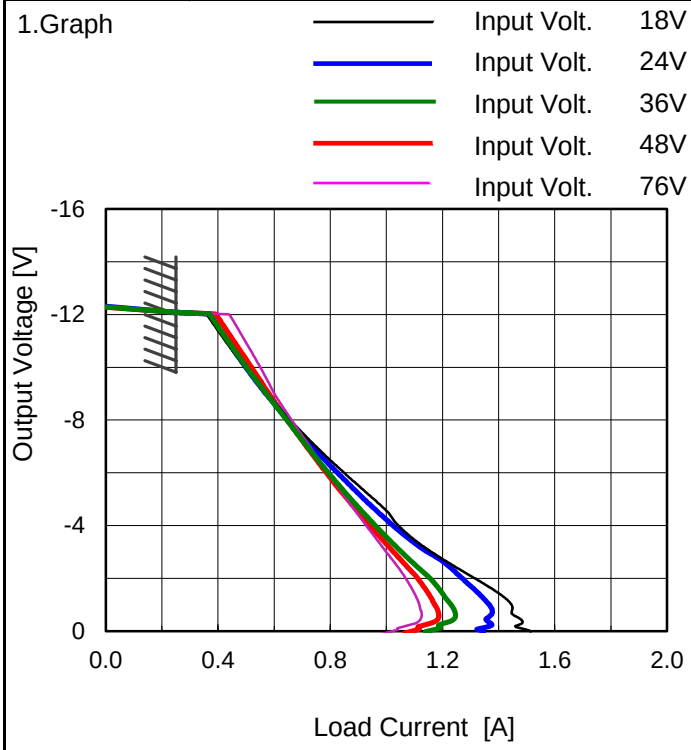
2.Values

Output Voltage [V]	Load Current [A] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
11.4	0.397	0.406	0.408	0.429	0.473
10.8	0.436	0.442	0.446	0.465	0.505
9.6	0.523	0.523	0.527	0.540	0.569
8.4	0.617	0.613	0.612	0.616	0.634
7.2	0.724	0.713	0.697	0.697	0.710
6.0	0.841	0.820	0.789	0.783	0.789
4.8	0.968	0.932	0.886	0.872	0.867
3.6	1.079	1.060	0.989	0.967	0.951
2.4	1.236	1.218	1.104	1.069	1.035
1.2	1.391	1.328	1.201	1.150	1.099
0.0	1.508	1.353	1.167	1.089	1.009
--	-	-	-	-	-

-12V : Rated Load Current

Object	-12V0.25A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-11.4	0.399	0.408	0.409	0.430	0.474
-10.8	0.439	0.446	0.447	0.467	0.507
-9.6	0.526	0.526	0.528	0.543	0.571
-8.4	0.620	0.616	0.615	0.619	0.636
-7.2	0.728	0.717	0.701	0.701	0.712
-6.0	0.847	0.823	0.791	0.784	0.791
-4.8	0.975	0.938	0.889	0.874	0.871
-3.6	1.082	1.066	0.996	0.973	0.956
-2.4	1.251	1.229	1.114	1.076	1.042
-1.2	1.427	1.350	1.215	1.162	1.109
0.0	1.516	1.346	1.139	1.064	0.986
--	-	-	-	-	-

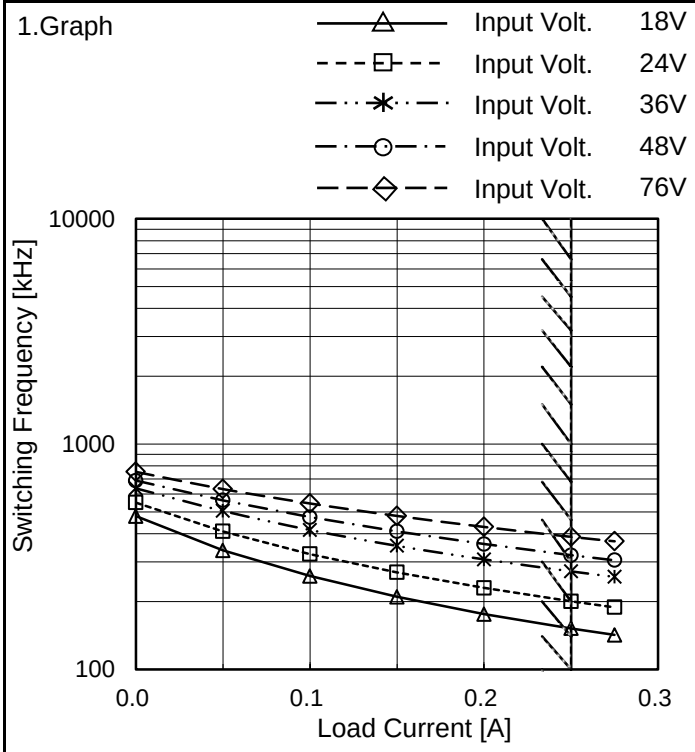
+12V : Rated Load Current

COSEL

Model	MGFW64812
Item	Switching frequency (by Load Current)
Object	+/-12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

When load current is low, MG operates intermittently, so switching frequency would not become constant.

2.Values

Load Current [A]	Input Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	479	550	636	688	753
0.050	337	410	505	563	632
0.100	259	325	416	474	545
0.150	210	270	354	410	480
0.200	176	230	308	360	429
0.250	152	201	272	321	388
0.275	142	189	257	305	370
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

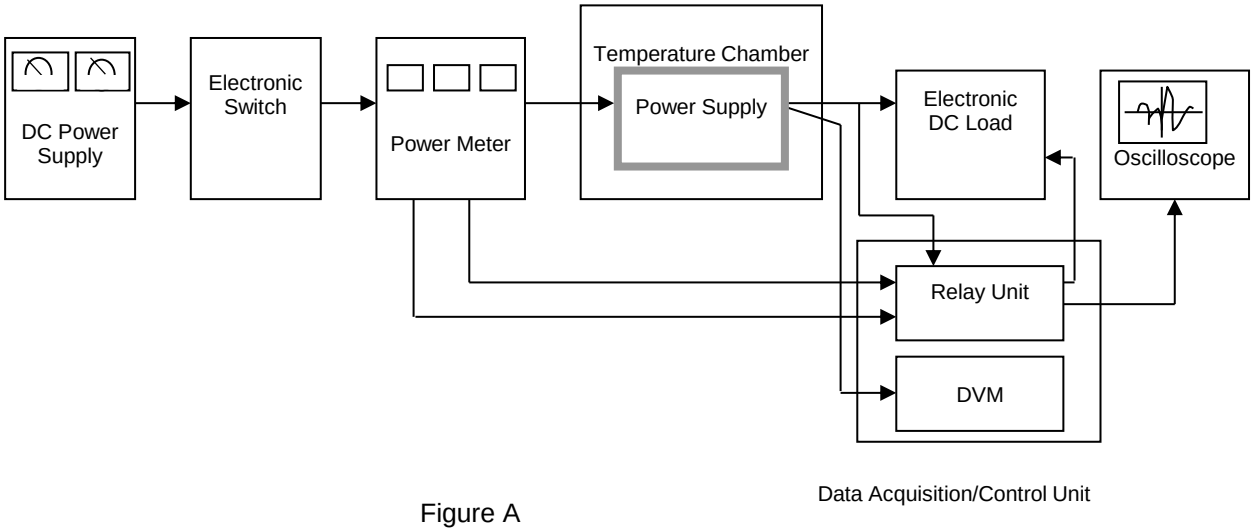


Figure A

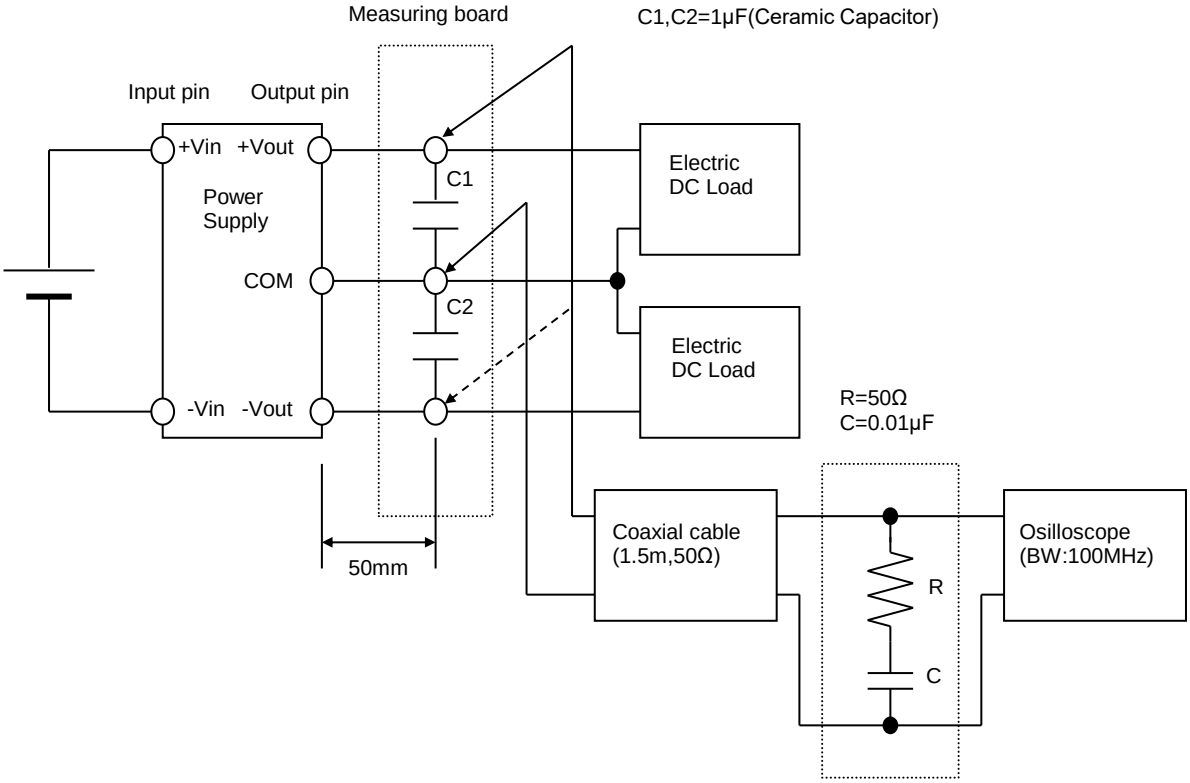


Figure B（Ripple and Ripple noise Characteristic）