参考資料

TEST DATA OF MGFW62412

Regulated DC Power Supply
December 22, 2016

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Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

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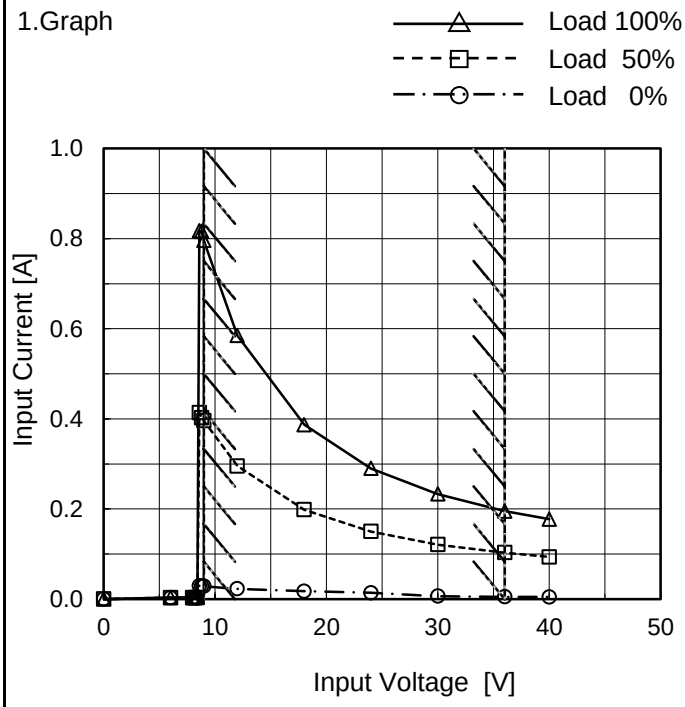
Model	MGFW62412
Item	Input Current (by Input Voltage)
Object	――――――――

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
6.0	0.003	0.003	0.003
8.0	0.003	0.003	0.003
8.2	0.004	0.003	0.003
8.4	0.003	0.003	0.004
8.6	0.030	0.414	0.818
8.8	0.028	0.403	0.816
9.0	0.028	0.396	0.796
12.0	0.023	0.295	0.585
18.0	0.017	0.198	0.387
24.0	0.014	0.150	0.290
30.0	0.006	0.121	0.233
36.0	0.005	0.103	0.195
40.0	0.005	0.093	0.177
--	-	-	-
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--	-	-	-
--	-	-	-

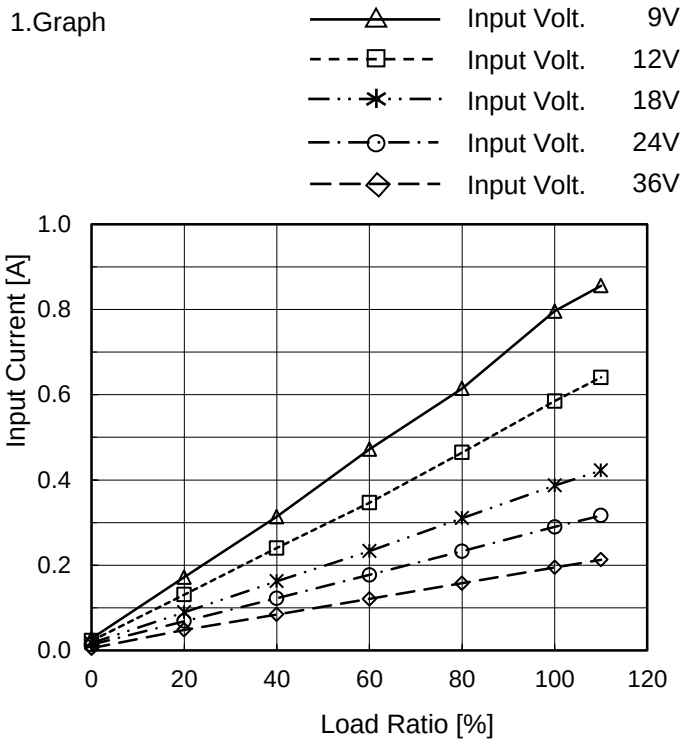
BC-11042

COSEL

Model	MGFW62412
Item	Input Current (by Load Ratio)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

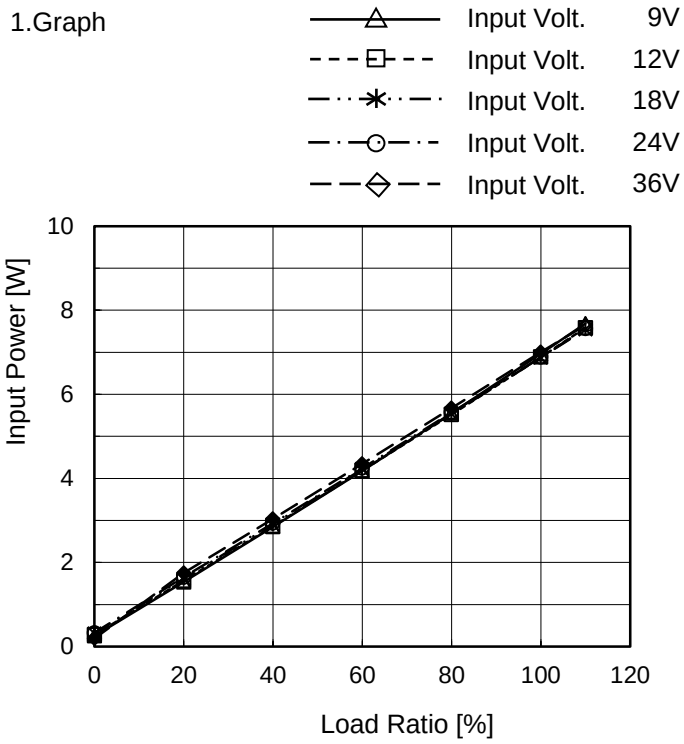
Load Ratio [%]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.028	0.023	0.017	0.014	0.005
20	0.172	0.131	0.090	0.069	0.049
40	0.314	0.240	0.162	0.122	0.084
60	0.472	0.347	0.233	0.177	0.121
80	0.615	0.465	0.310	0.233	0.158
100	0.796	0.585	0.387	0.290	0.195
110	0.856	0.640	0.423	0.317	0.213
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW62412
Item	Input Power (by Load Ratio)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

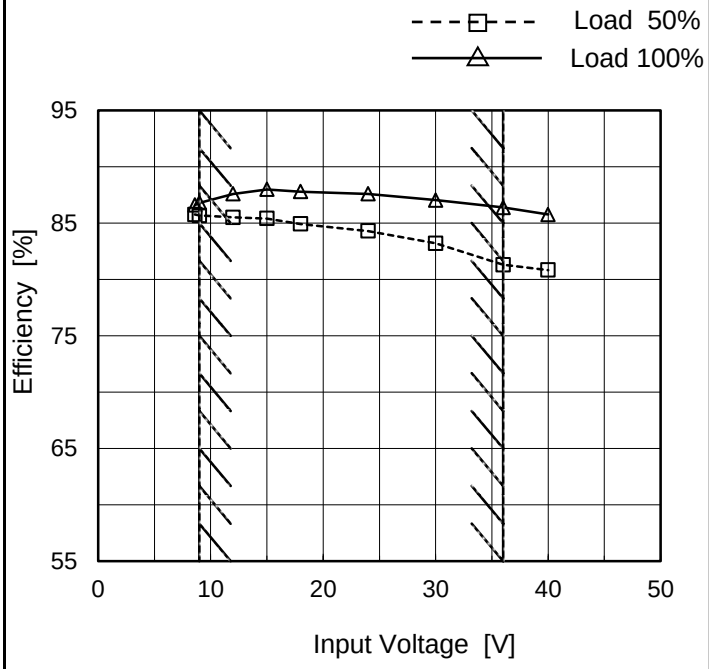
Load Ratio [%]	Input Power [W]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.25	0.28	0.31	0.32	0.19
20	1.53	1.57	1.61	1.65	1.75
40	2.85	2.86	2.91	2.93	3.04
60	4.18	4.19	4.22	4.24	4.34
80	5.55	5.52	5.54	5.57	5.67
100	6.96	6.88	6.87	6.88	7.00
110	7.68	7.58	7.54	7.56	7.65
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW62412
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

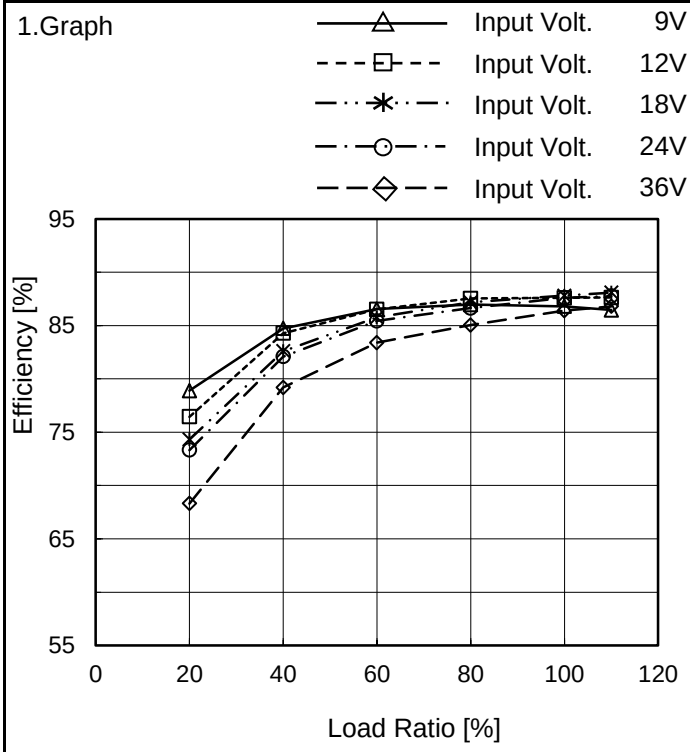
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8.6	85.8	86.6
9.0	85.7	86.8
12.0	85.5	87.6
15.0	85.4	88.0
18.0	84.9	87.8
24.0	84.3	87.6
30.0	83.2	87.0
36.0	81.3	86.4
40.0	80.8	85.8

COSEL

Model	MGFW62412
Item	Efficiency (by Load Ratio)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Efficiency [%]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-	-	-
20	78.9	76.4	74.3	73.3	68.3
40	84.7	84.3	82.6	82.1	79.2
60	86.5	86.5	85.8	85.4	83.4
80	87.0	87.5	87.2	86.6	85.0
100	86.8	87.6	87.8	87.6	86.4
110	86.5	87.6	88.1	87.8	86.8
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

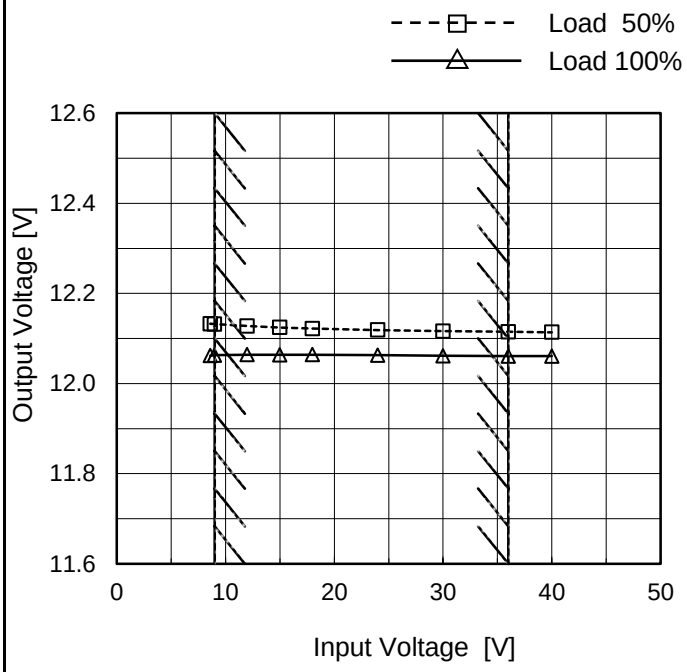
COSEL

Model	MGFW62412
Item	Line Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.25A

1.Graph



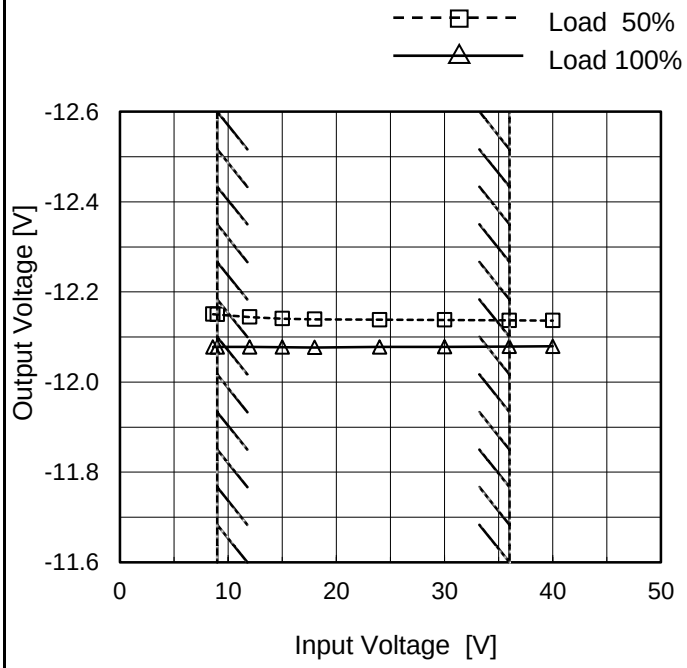
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.6	12.133	12.062
9.0	12.132	12.063
12.0	12.128	12.064
15.0	12.125	12.064
18.0	12.122	12.064
24.0	12.119	12.063
30.0	12.116	12.062
36.0	12.115	12.061
40.0	12.114	12.061

-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%
8.6	-12.151	-12.078
9.0	-12.150	-12.078
12.0	-12.145	-12.078
15.0	-12.141	-12.078
18.0	-12.139	-12.077
24.0	-12.138	-12.078
30.0	-12.138	-12.078
36.0	-12.137	-12.079
40.0	-12.137	-12.079

+12V : Rated Load Current

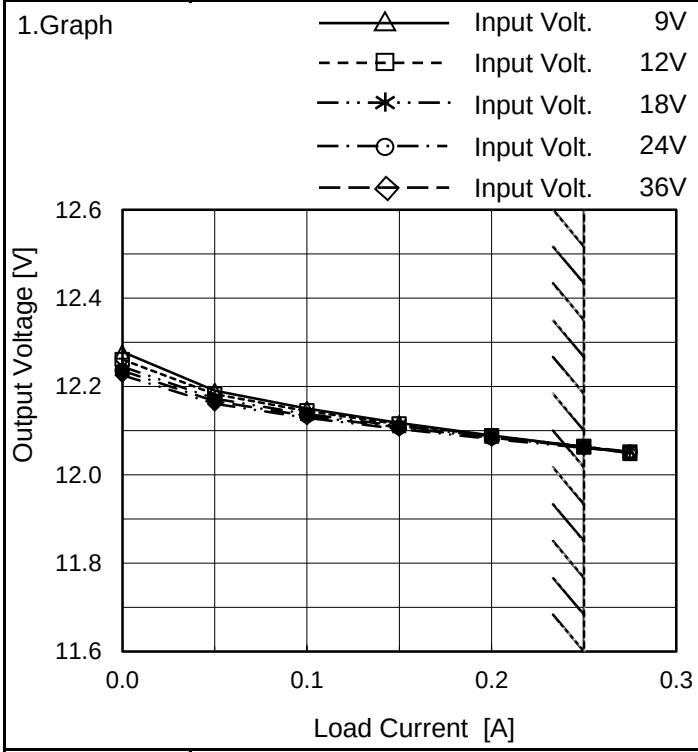
COSEL

Model	MGFW62412
Item	Load Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.25A

1.Graph



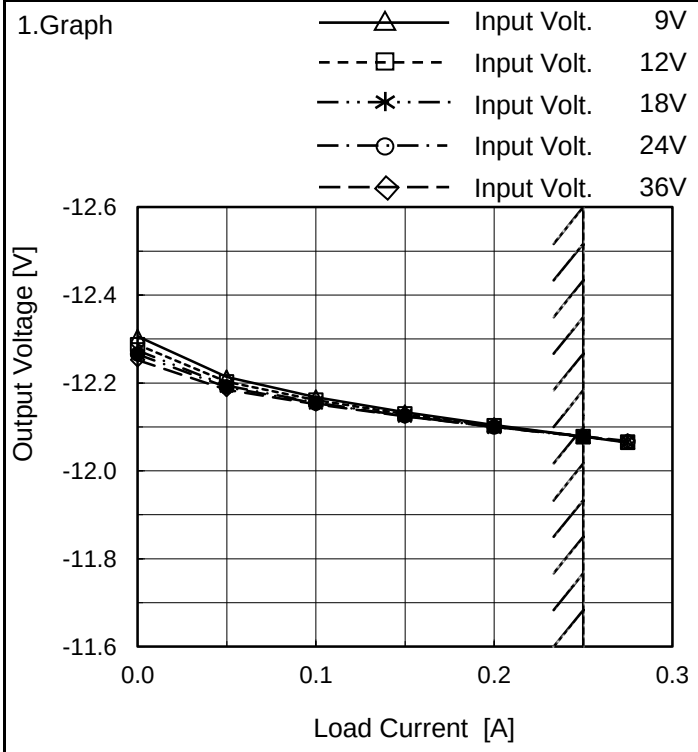
2.Values

Load Current [A]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	12.278	12.261	12.245	12.236	12.226
0.050	12.191	12.183	12.173	12.167	12.161
0.100	12.150	12.145	12.138	12.134	12.129
0.150	12.118	12.115	12.110	12.107	12.104
0.200	12.089	12.088	12.086	12.084	12.081
0.250	12.063	12.064	12.064	12.063	12.061
0.275	12.048	12.051	12.052	12.052	12.051
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	-12.306	-12.287	-12.274	-12.265	-12.252
0.050	-12.213	-12.202	-12.194	-12.190	-12.185
0.100	-12.168	-12.161	-12.155	-12.154	-12.152
0.150	-12.134	-12.129	-12.125	-12.125	-12.124
0.200	-12.105	-12.102	-12.100	-12.100	-12.100
0.250	-12.078	-12.078	-12.077	-12.078	-12.079
0.275	-12.064	-12.065	-12.066	-12.067	-12.068
--	-	-	-	-	-
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--	-	-	-	-	-

+12V:Rated Load Current

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COSEL

Model	MGFW62412
Item	Dynamic Load Response
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

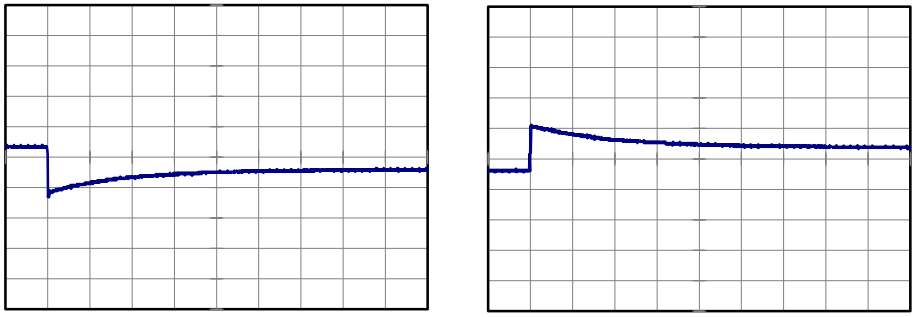
Input Volt. 24 V
-12V:rated load current.
Cycle 100 ms

t1,t2 = 100 μs

Load Current

t1 t2

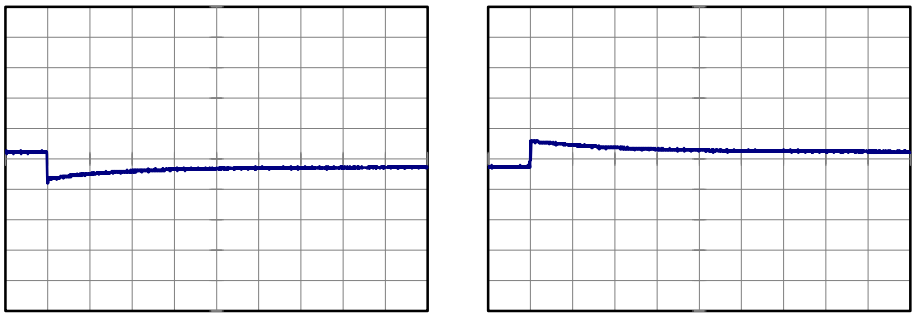
Min.Load (0A)←→
Load 100% (0.25A)



200 mV/div

4 ms/div 4 ms/div

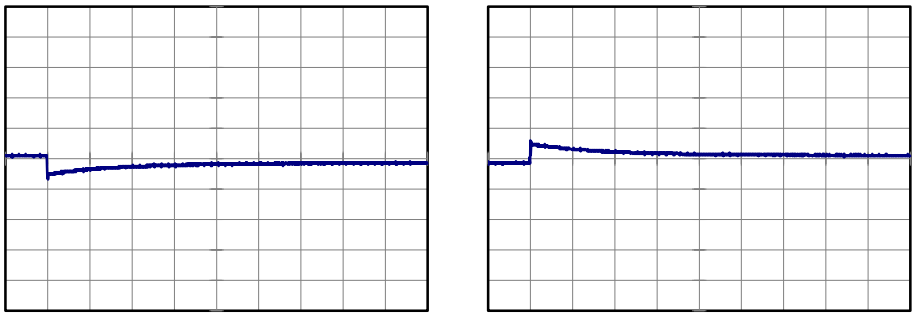
Min.Load (0A)←→
Load 50% (0.125A)



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	MGFW62412
Item	Dynamic Load Response
Object	-12V0.25A

Temperature 25°C
Testing Circuitry Figure A

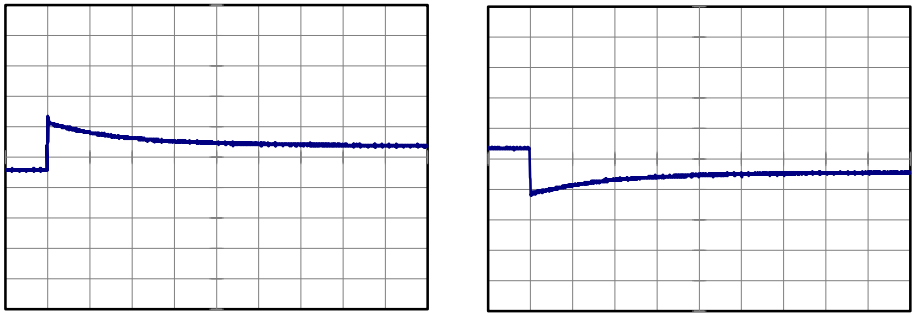
Input Volt. 24 V
+12V:rated load current.
Cycle 100 ms

t1,t2 = 100 μs

Load Current

t1 t2

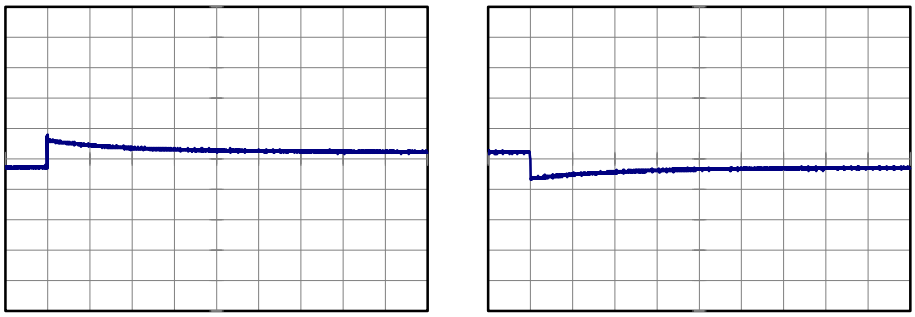
Min.Load (0A)←→
Load 100% (0.25A)



200 mV/div

4 ms/div 4 ms/div

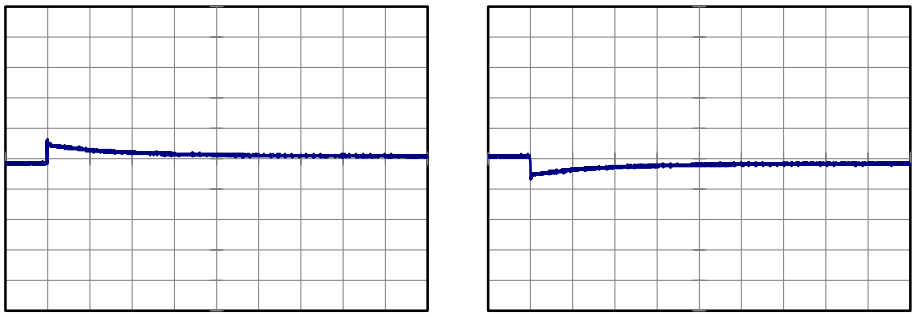
Min.Load (0A)←→
Load 50% (0.125A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.125A)←→
Load 100% (0.25A)



200 mV/div

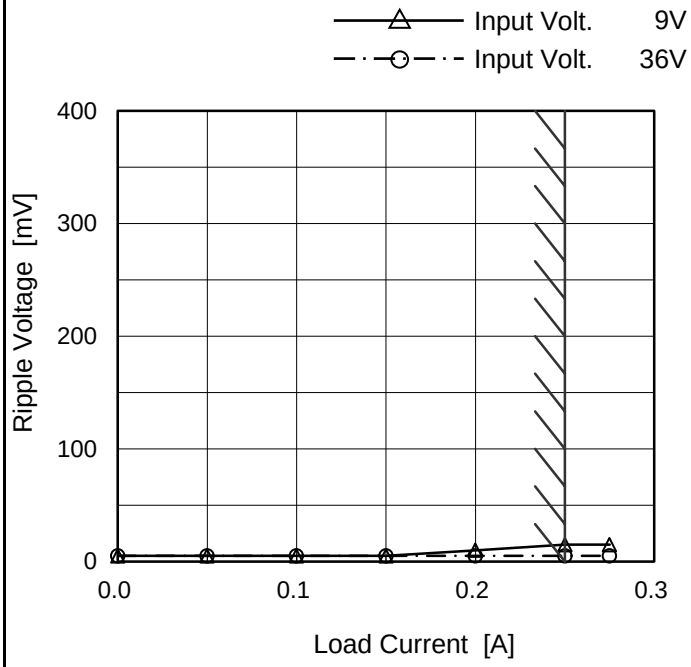
4 ms/div 4 ms/div

COSEL

Model	MGFW62412
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]

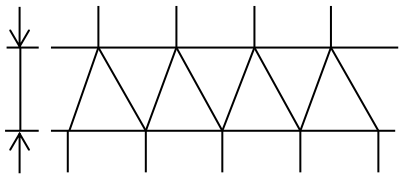


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	5	5
0.200	10	5
0.250	15	5
0.275	15	5
--	-	-
--	-	-
--	-	-
--	-	-

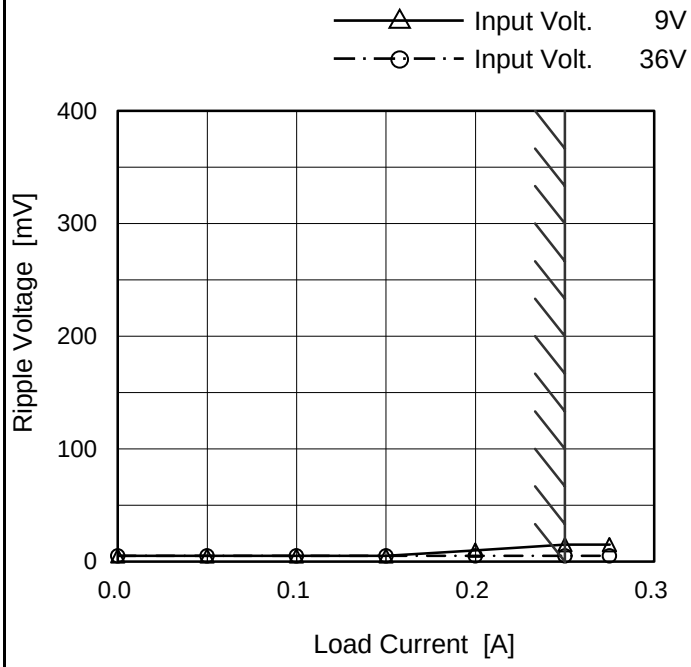
-12V: Rated Load Current

COSEL

Model	MGFW62412
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]

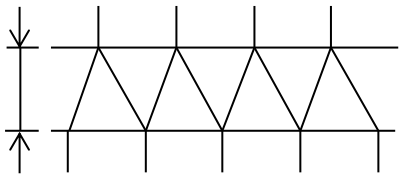


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	5	5
0.200	10	5
0.250	15	5
0.275	15	5
--	-	-
--	-	-
--	-	-
--	-	-

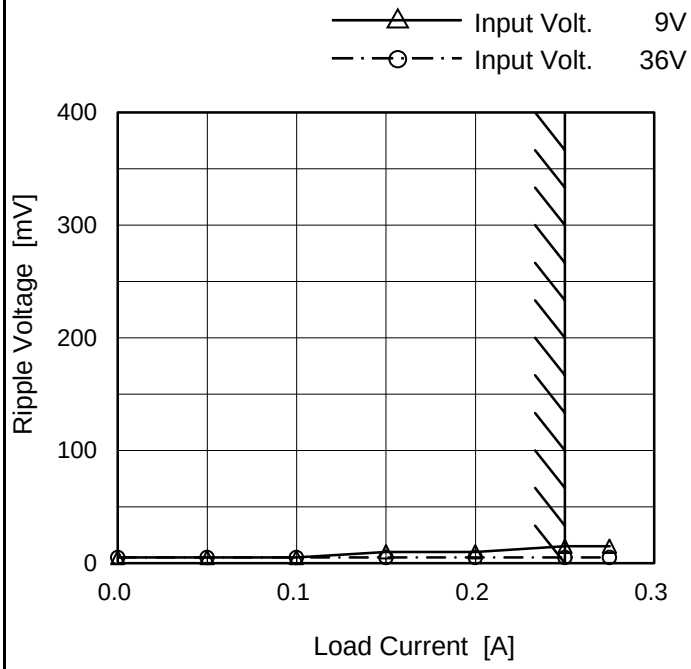
+12V: Rated Load Current

COSEL

Model	MGFW62412
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]

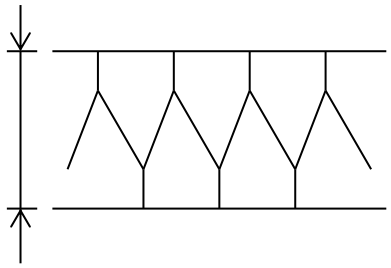


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	10	5
0.200	10	5
0.250	15	5
0.275	15	5
--	-	-
--	-	-
--	-	-
--	-	-

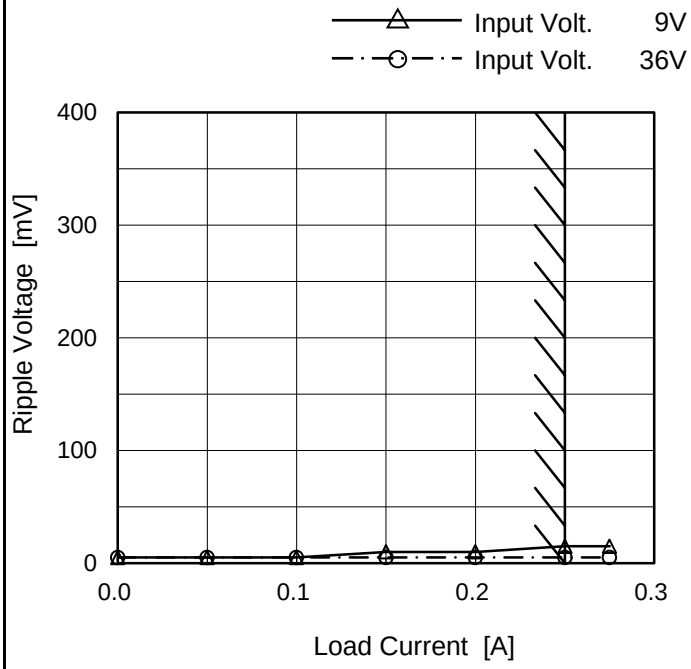
-12V: Rated Load Current

COSEL

Model	MGFW62412
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]

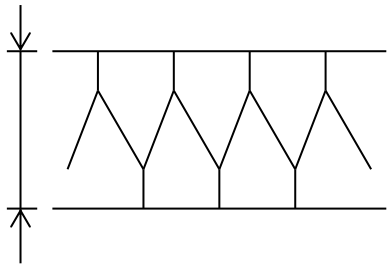


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.000	5	5
0.050	5	5
0.100	5	5
0.150	10	5
0.200	10	5
0.250	15	5
0.275	15	5
--	-	-
--	-	-
--	-	-
--	-	-

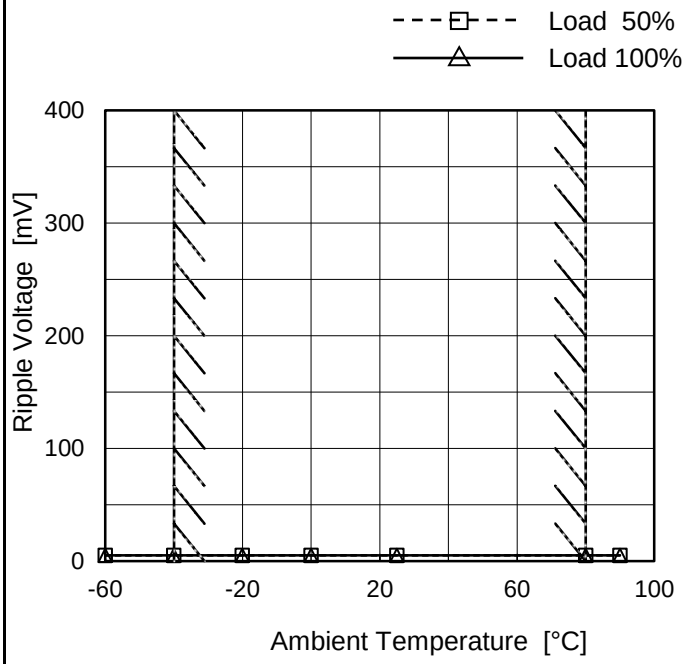
+12V: Rated Load Current

COSEL

Model	MGFW62412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.25A

Testing Circuitry Figure B

1.Graph



Input Volt. 24V

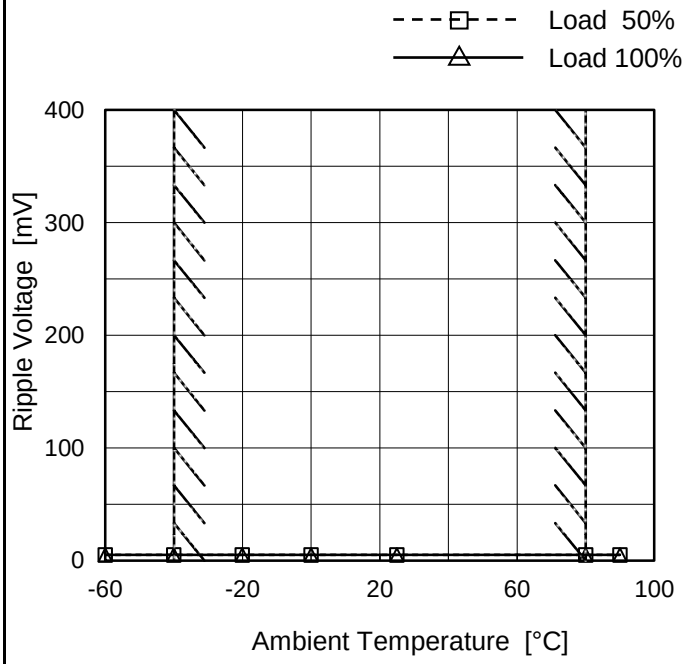
2.Values

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
80	5	5
90	5	5
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

Object	-12V0.25A

1.Graph



Input Volt. 24V

Measured by 100 MHz Oscilloscope.

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

2.Values

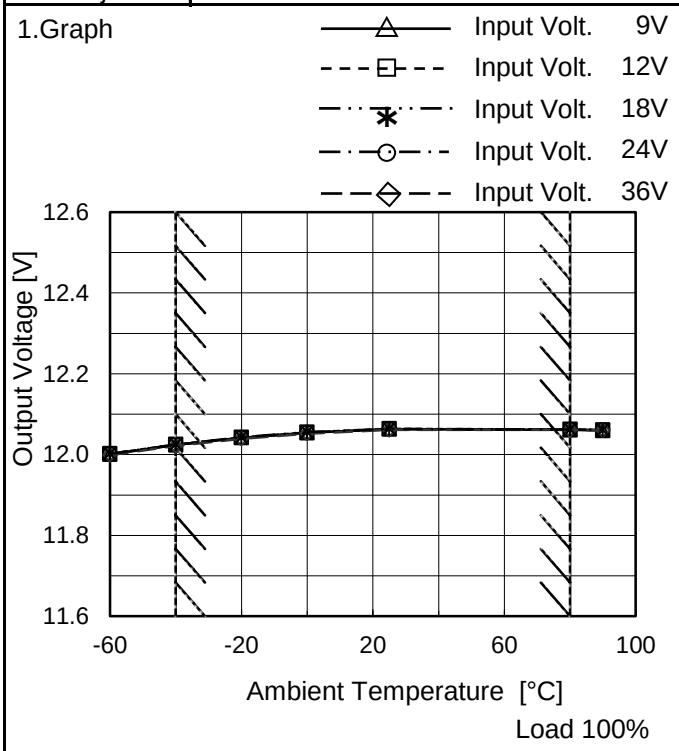
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	5
-40	5	5
-20	5	5
0	5	5
25	5	5
80	5	5
90	5	5
--	-	-
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

COSEL

Model	MGFW62412	
Item	Ambient Temperature Drift	Testing Circuitry Figure A
Object	+12V0.25A	

1.Graph



Load 100%

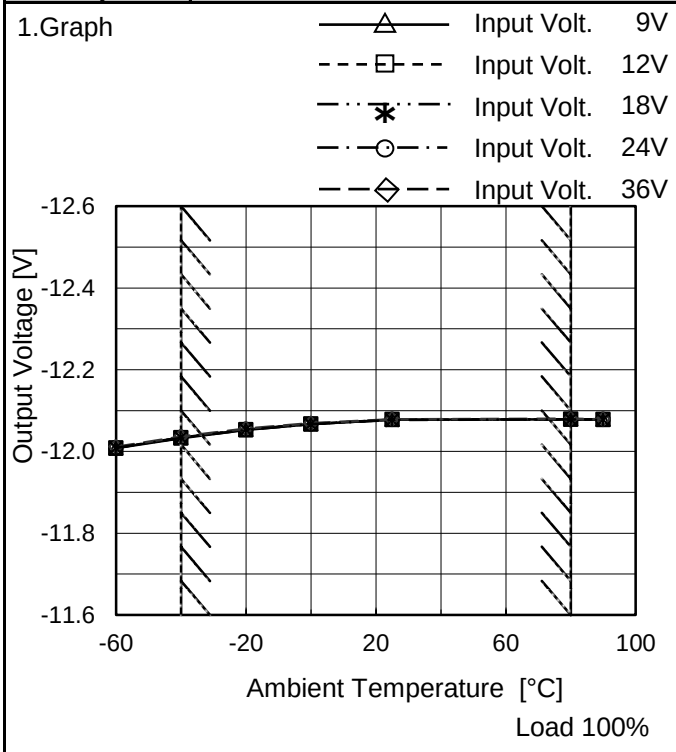
2.Values

Ambient Temperature [°C]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	12.001	12.002	12.002	12.002	11.999
-40	12.024	12.025	12.025	12.024	12.022
-20	12.042	12.042	12.043	12.042	12.039
0	12.054	12.055	12.055	12.054	12.052
25	12.063	12.064	12.064	12.063	12.061
80	12.061	12.062	12.062	12.062	12.061
90	12.059	12.061	12.061	12.061	12.060
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-12V:Rated Load Current

Object	-12V0.25A

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	-12.008	-12.009	-12.009	-12.009	-12.012
-40	-12.033	-12.034	-12.034	-12.034	-12.037
-20	-12.053	-12.053	-12.053	-12.054	-12.056
0	-12.067	-12.067	-12.067	-12.068	-12.069
25	-12.078	-12.078	-12.077	-12.078	-12.079
80	-12.079	-12.079	-12.079	-12.079	-12.080
90	-12.078	-12.078	-12.077	-12.078	-12.079
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+12V:Rated Load Current

COSEL

Model	MGFW62412	
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 - 80°C
Input Voltage : 9 - 36V
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	9	0	12.301	±238	±2.0
Minimum Voltage	75	9	0.25	11.826		

Object	-12V0.25A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	75	9	0	-12.327	±238	±2.0
Minimum Voltage	75	9	0.25	-11.852		

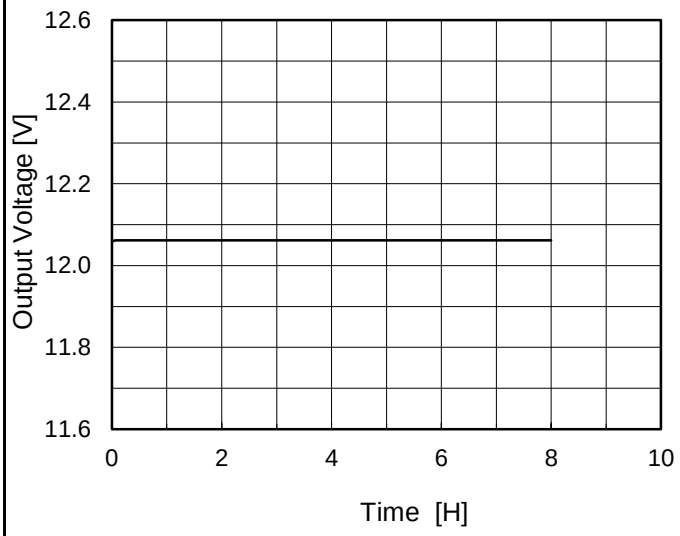
COSEL

Model	MGFW62412
Item	Time Lapse Drift

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.25A

1.Graph



Input Volt. 24V
Load 100%

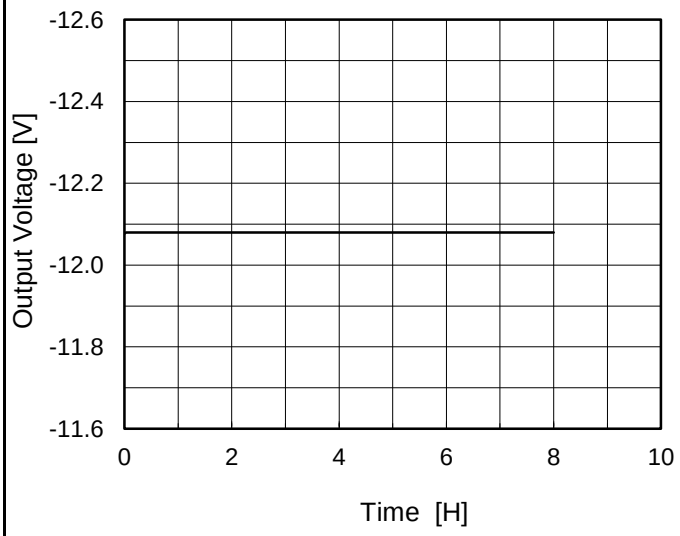
2.Values

Time since start [H]	Output Voltage [V]
0.0	12.058
0.5	12.062
1.0	12.062
2.0	12.062
3.0	12.062
4.0	12.062
5.0	12.062
6.0	12.062
7.0	12.062
8.0	12.062

-12V : Rated Load Current

Object -12V0.25A

1.Graph



Input Volt. 24V
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	-12.080
4.0	-12.080
5.0	-12.079
6.0	-12.080
7.0	-12.080
8.0	-12.079

+12V : Rated Load Current

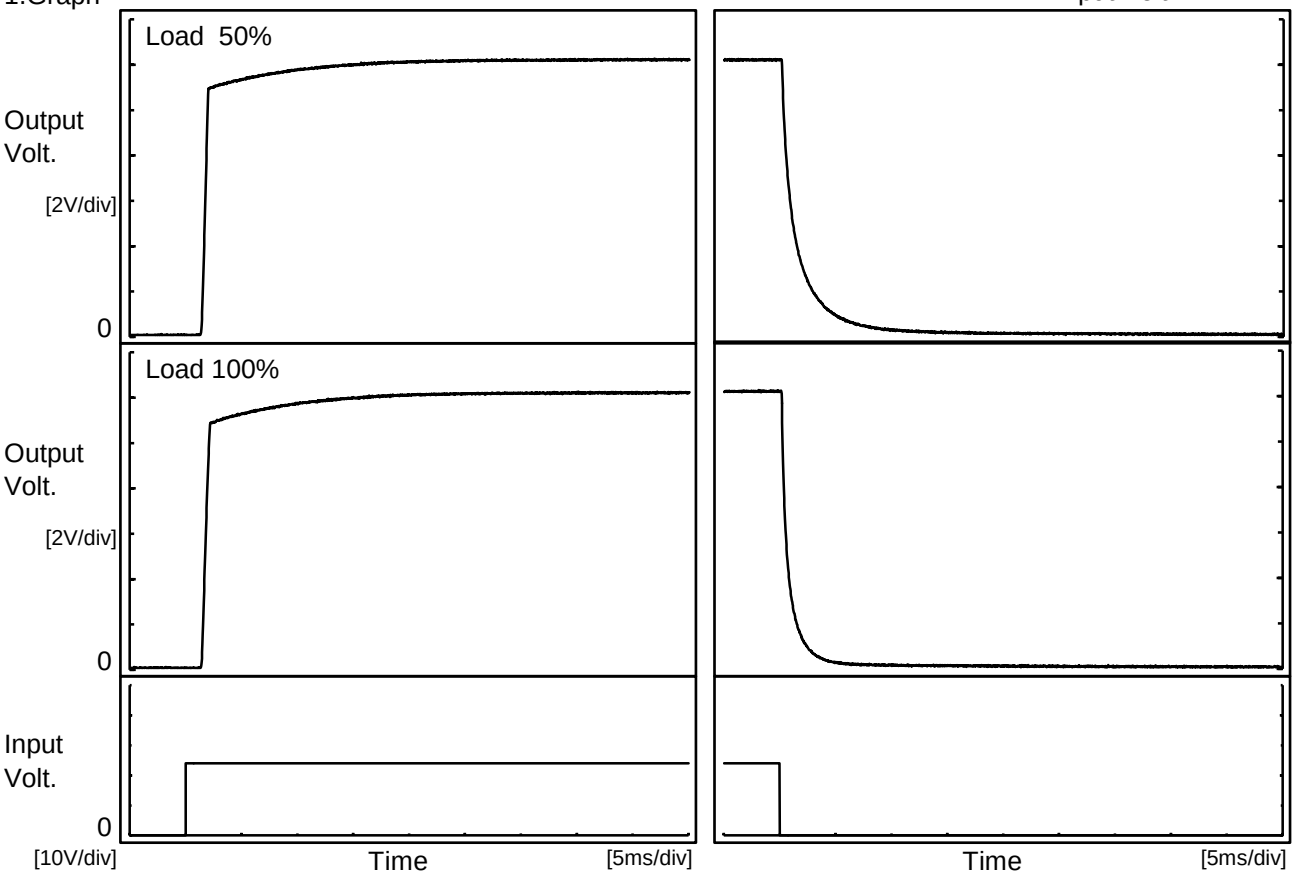
COSEL

Model	MGFW62412
Item	Rise and Fall Time
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

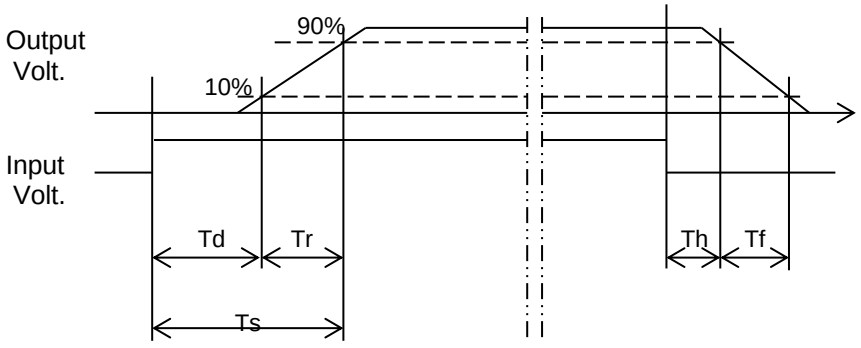
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.5	0.5	2.0	0.3	3.9
100 %	1.5	0.7	2.2	0.2	1.9

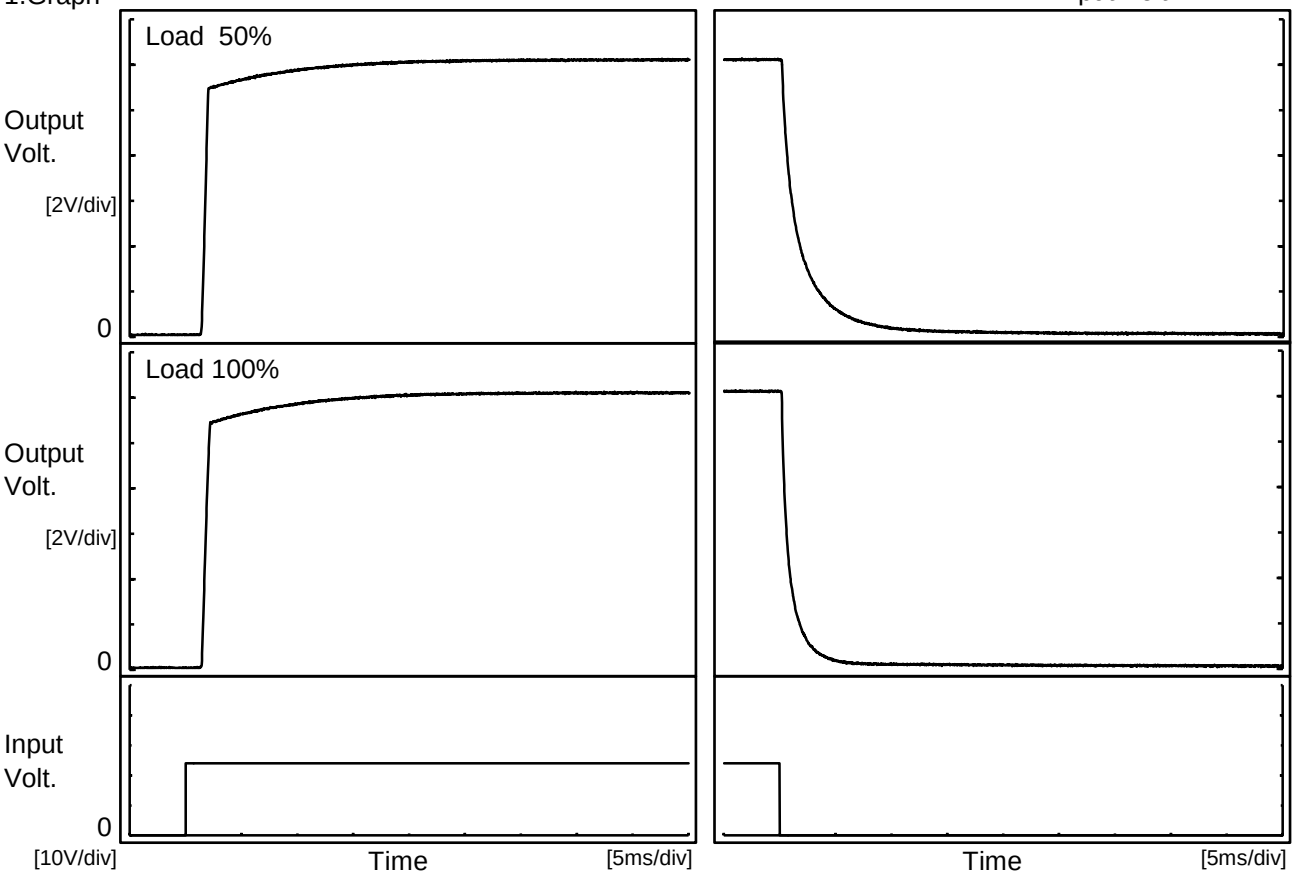


COSEL

Model	MGFW62412	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.25A	

1.Graph

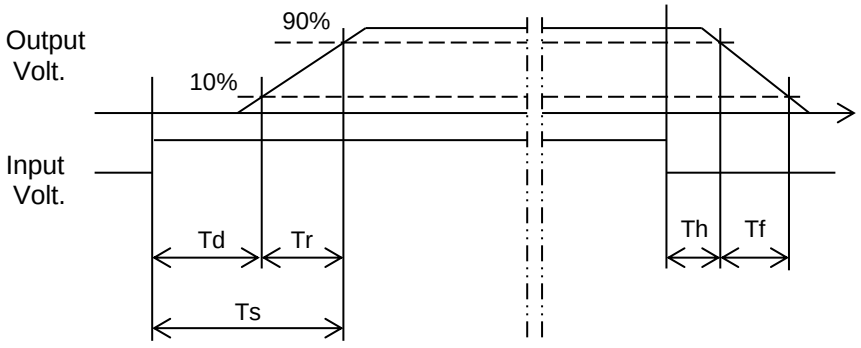
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.5	0.5	2.0	0.3	4.6
100 %	1.5	0.7	2.2	0.2	2.2

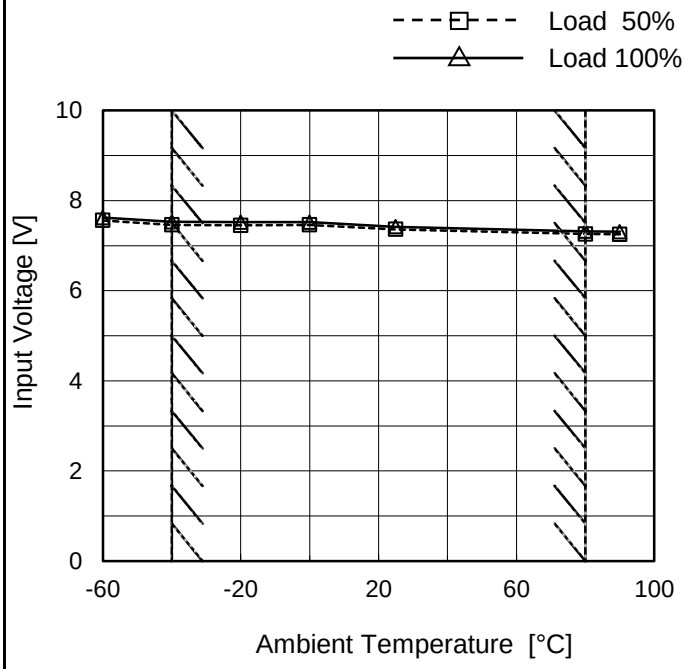


COSEL

Model	MGFW62412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.25A

Testing Circuitry Figure A

1.Graph

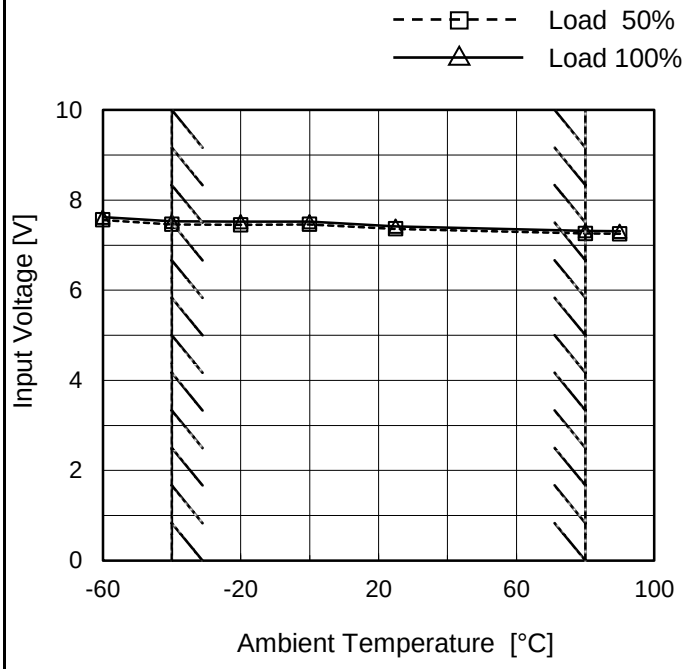


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	7.6	7.7
-40	7.5	7.6
-20	7.5	7.6
0	7.5	7.6
25	7.4	7.5
80	7.3	7.4
90	7.3	7.4
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.25A

1.Graph



2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	7.6	7.7
-40	7.5	7.6
-20	7.5	7.6
0	7.5	7.6
25	7.4	7.5
80	7.3	7.4
90	7.3	7.4
--	-	-
--	-	-
--	-	-
--	-	-

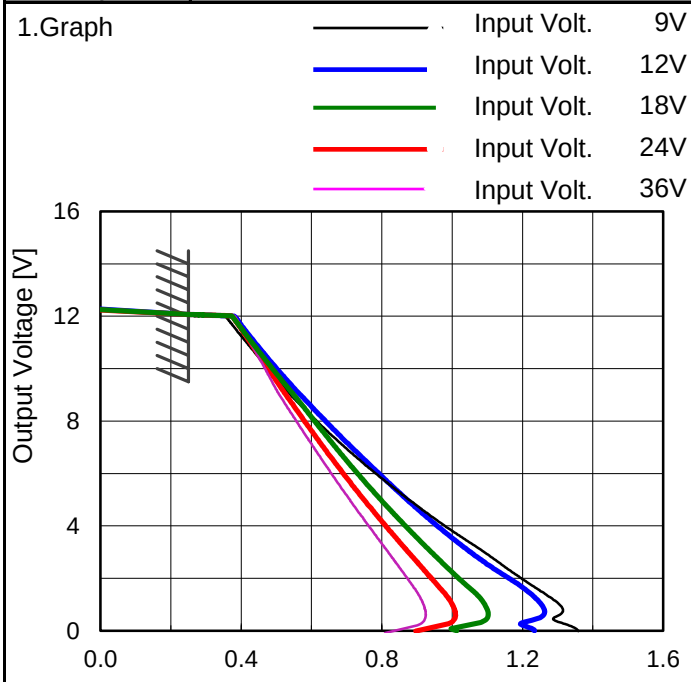
Note: Slanted line shows the range of the rated ambient temperature.

COSEL

Model	MGFW62412
Item	Overcurrent Protection
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



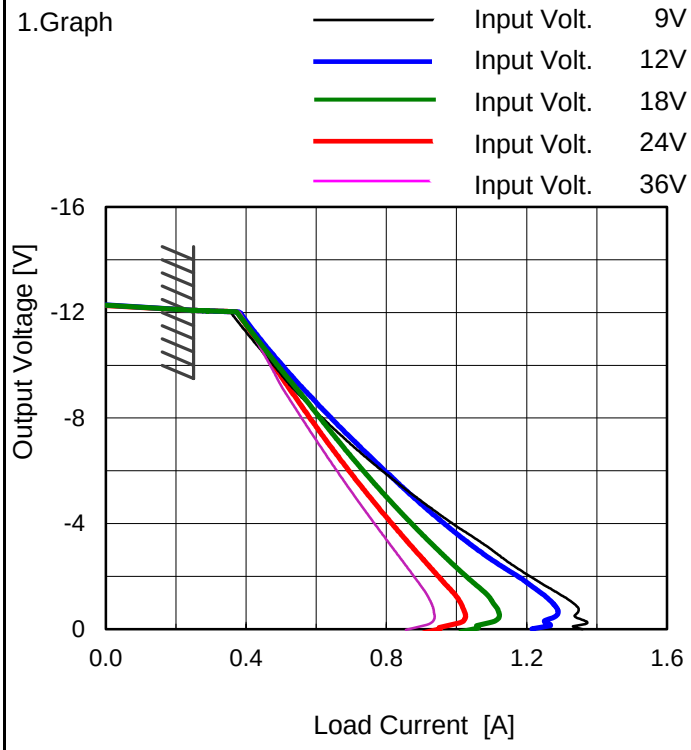
2.Values

Output Voltage [V]	Load Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
11.4	0.391	0.414	0.408	0.406	0.408
10.8	0.426	0.450	0.441	0.436	0.434
9.6	0.500	0.526	0.513	0.496	0.484
8.4	0.583	0.611	0.586	0.558	0.537
7.2	0.676	0.696	0.656	0.622	0.596
6.0	0.782	0.790	0.730	0.688	0.656
4.8	0.896	0.886	0.810	0.760	0.719
3.6	1.023	0.993	0.895	0.836	0.783
2.4	1.152	1.114	0.985	0.914	0.850
1.2	1.286	1.239	1.082	0.991	0.911
0.0	1.359	1.235	1.013	0.897	0.809
--	-	-	-	-	-

-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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-11.4	0.391	0.417	0.408	0.407	0.409
-10.8	0.427	0.451	0.441	0.437	0.434
-9.6	0.502	0.527	0.514	0.499	0.483
-8.4	0.587	0.613	0.587	0.561	0.538
-7.2	0.682	0.702	0.657	0.625	0.598
-6.0	0.785	0.795	0.733	0.693	0.658
-4.8	0.902	0.893	0.813	0.764	0.722
-3.6	1.033	1.001	0.901	0.841	0.788
-2.4	1.162	1.125	0.993	0.921	0.856
-1.2	1.308	1.256	1.093	1.001	0.920
0.0	1.359	1.219	1.012	0.906	0.856
--	-	-	-	-	-

+12V : Rated Load Current

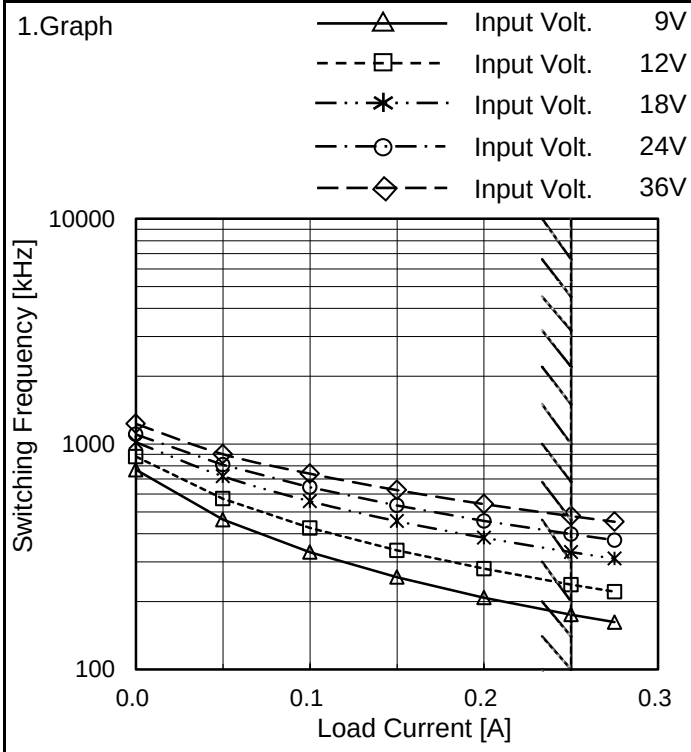
BC-11042

COSEL

Model	MGFW62412
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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	770	880	1020	1105	1230
0.050	462	573	720	810	902
0.100	331	424	558	644	739
0.150	257	338	455	534	625
0.200	208	280	384	456	542
0.250	175	238	332	398	479
0.275	162	221	310	375	452
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

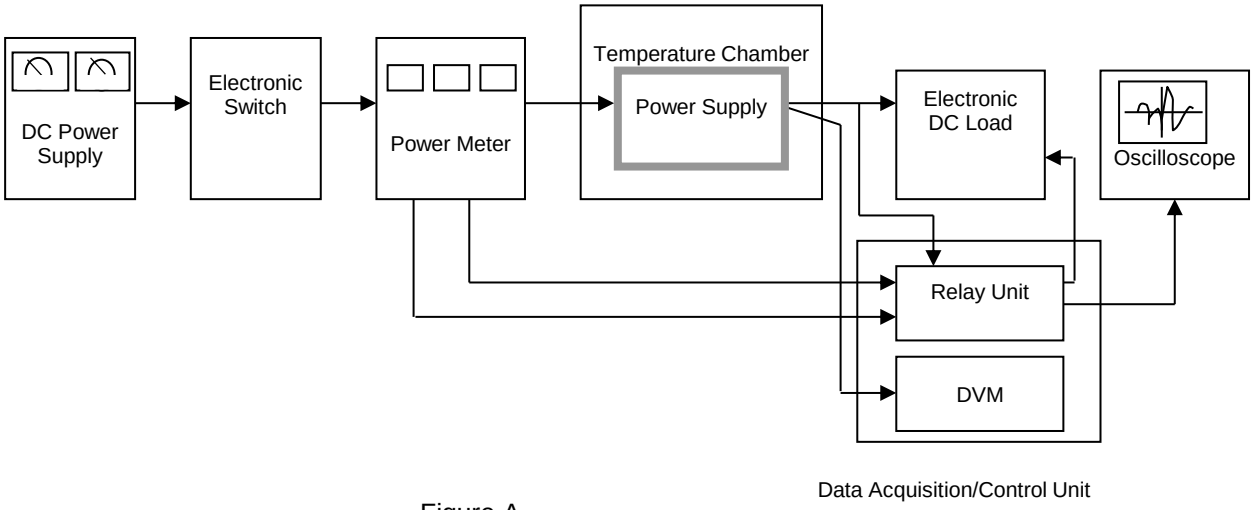


Figure A

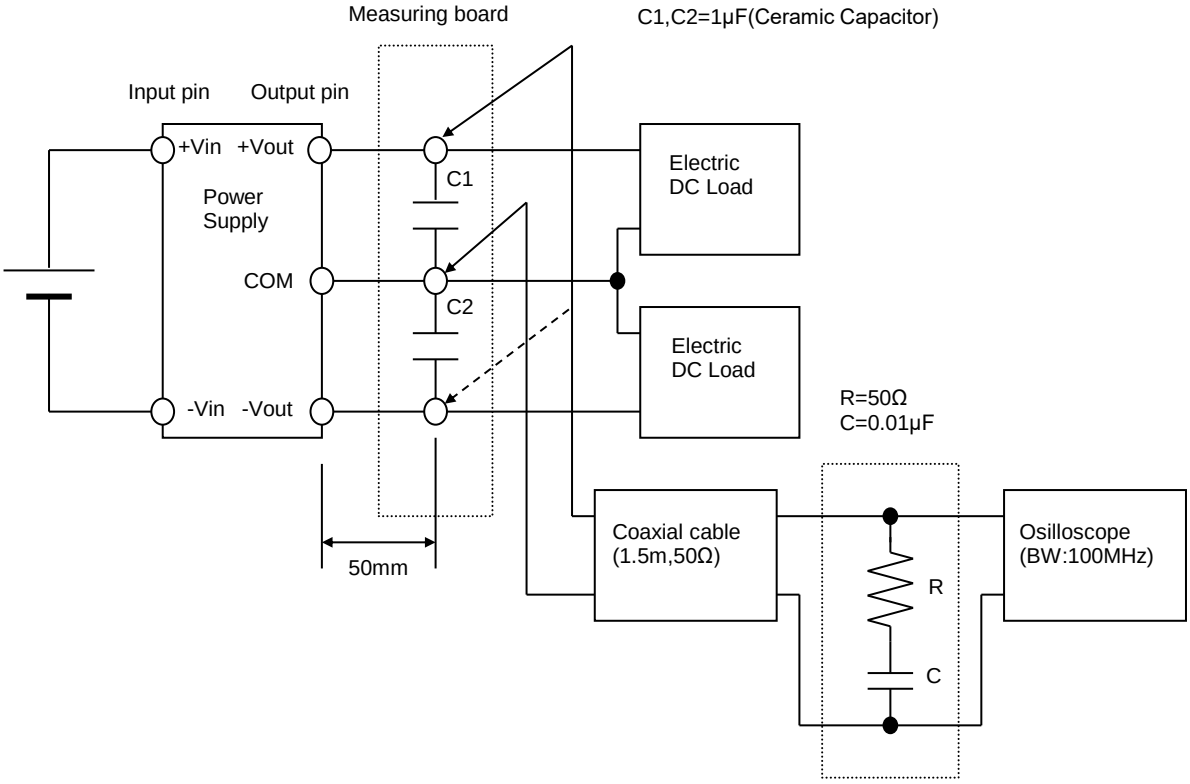


Figure B（Ripple and Ripple noise Characteristic）