参考資料

TEST DATA OF MGXW62412

Regulated DC Power Supply
February 19, 2018

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Masumi Kitamura Design Engineer

COSEL CO.,LTD.

参考資料

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参考資料

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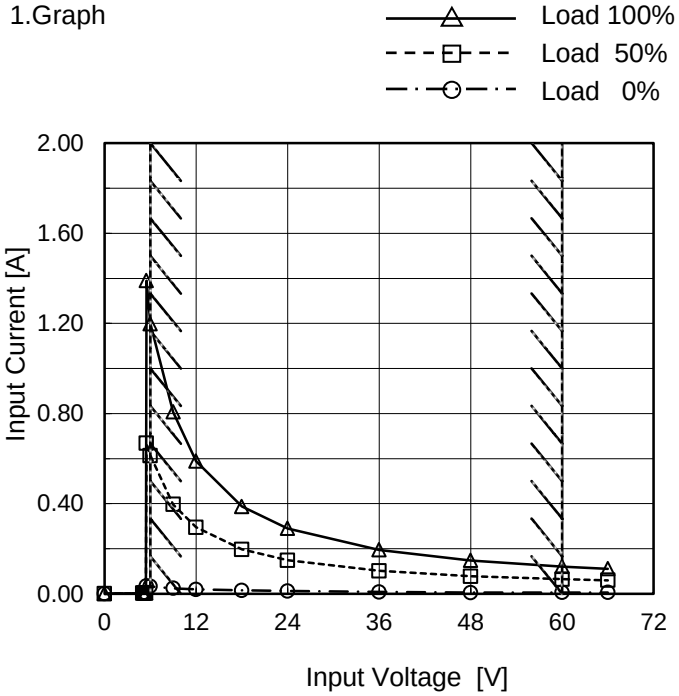
Model	MGXW62412
Item	Input Current (by Input Voltage)
Object	――――――――

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
5.0	0.003	0.003	0.003
5.2	0.003	0.003	0.003
5.4	0.003	0.003	0.003
5.5	0.035	0.668	1.390
6.0	0.033	0.613	1.199
9.0	0.024	0.397	0.807
12.0	0.020	0.295	0.589
18.0	0.015	0.197	0.387
24.0	0.012	0.149	0.290
36.0	0.008	0.102	0.195
48.0	0.005	0.078	0.148
60.0	0.006	0.065	0.121
66.0	0.006	0.060	0.111
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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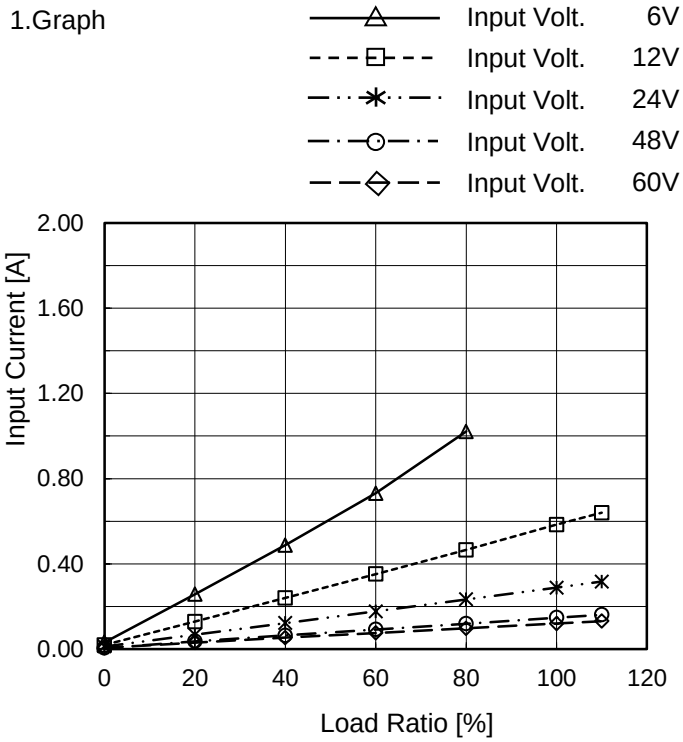
Model	MGXW62412
Item	Input Current (by Load Current)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Input Current [A]				
	Input Volt. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0	0.032	0.019	0.012	0.005	0.006
20	0.257	0.129	0.067	0.037	0.031
40	0.488	0.241	0.122	0.064	0.054
60	0.731	0.352	0.177	0.092	0.076
80	1.021	0.466	0.233	0.120	0.098
100	- ※	0.584	0.289	0.148	0.120
110	- ※	0.639	0.317	0.162	0.131
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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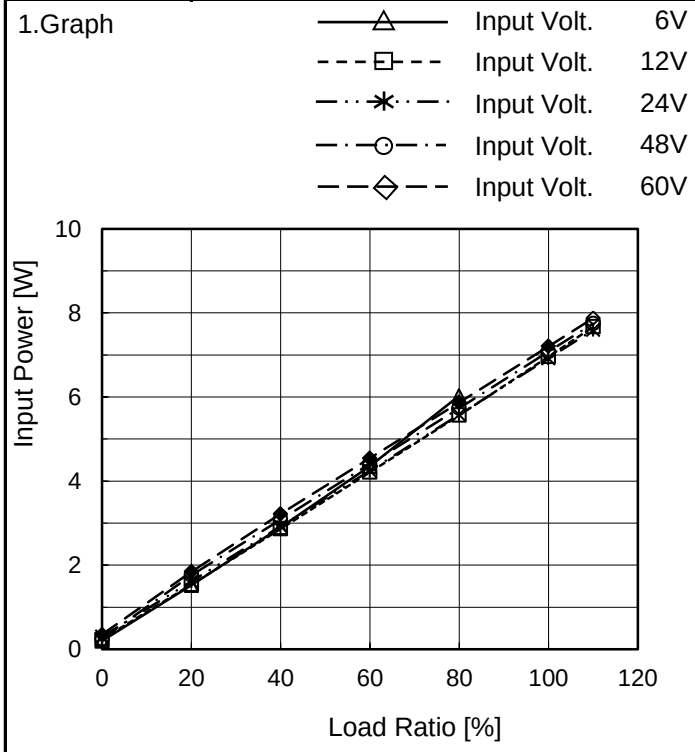
Model	MGXW62412
Item	Input Power (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Input Power [W]				
	Input Volt. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0	0.19	0.23	0.30	0.25	0.35
20	1.52	1.54	1.61	1.76	1.84
40	2.90	2.86	2.92	3.08	3.22
60	4.35	4.21	4.24	4.41	4.54
80	6.03	5.57	5.58	5.74	5.87
100	- ※	6.96	6.92	7.08	7.21
110	- ※	7.67	7.59	7.75	7.88
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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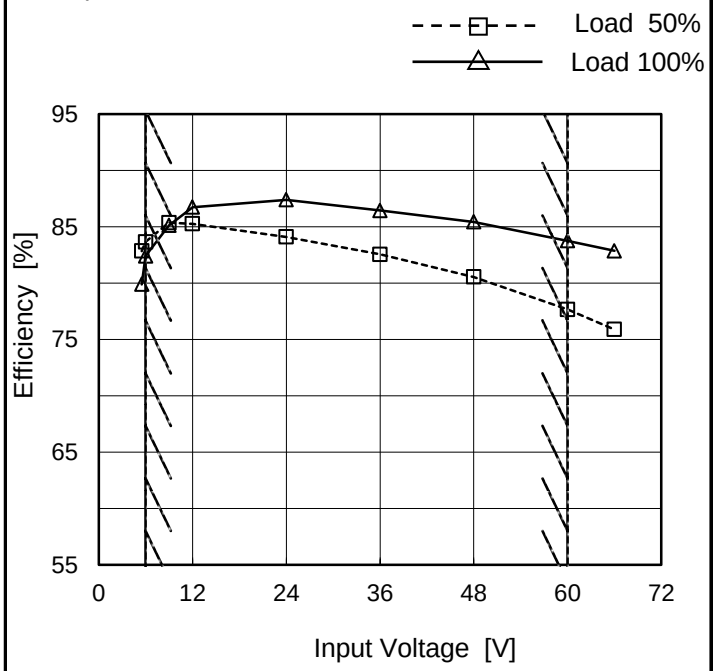
Model	MGXW62412
Item	Efficiency (by Input Voltage)
Object	――――――――――――

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%
5.5	82.9	79.9 ※1
6.0	83.7	82.4 ※1
9.0	85.4	85.1
12.0	85.3	86.8
24.0	84.1	87.4
36.0	82.6	86.4
48.0	80.6	85.4
60.0	77.7	83.8
66.0	75.9	82.9

※1：Load 70%

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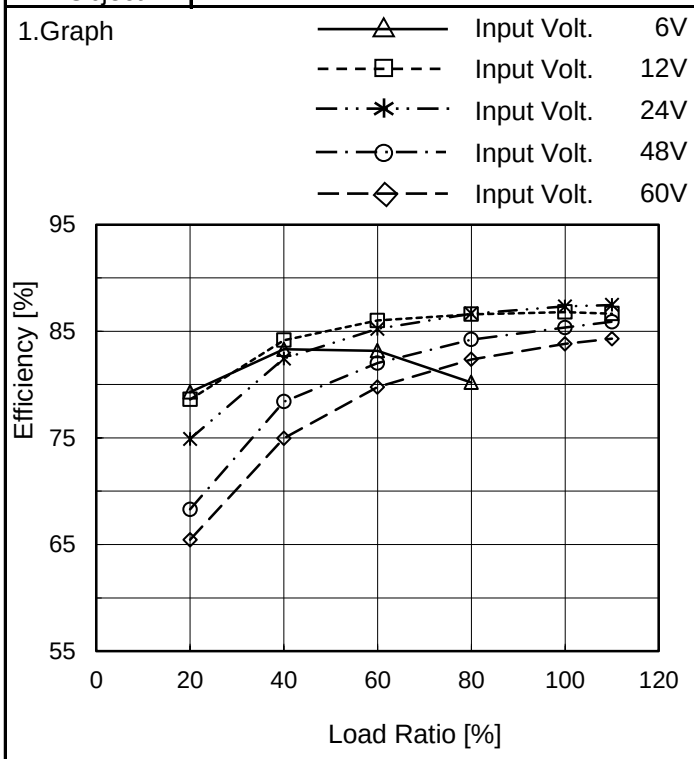
Model	MGXW62412
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Efficiency [%]				
	Input Volt. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0	-	-	-	-	-
20	79.3	78.6	74.9	68.3	65.4
40	83.3	84.2	82.4	78.4	75.0
60	83.2	86.0	85.2	82.0	79.8
80	80.2	86.6	86.6	84.2	82.4
100	- ※	86.8	87.3	85.3	83.8
110	- ※	86.7	87.5	85.9	84.3
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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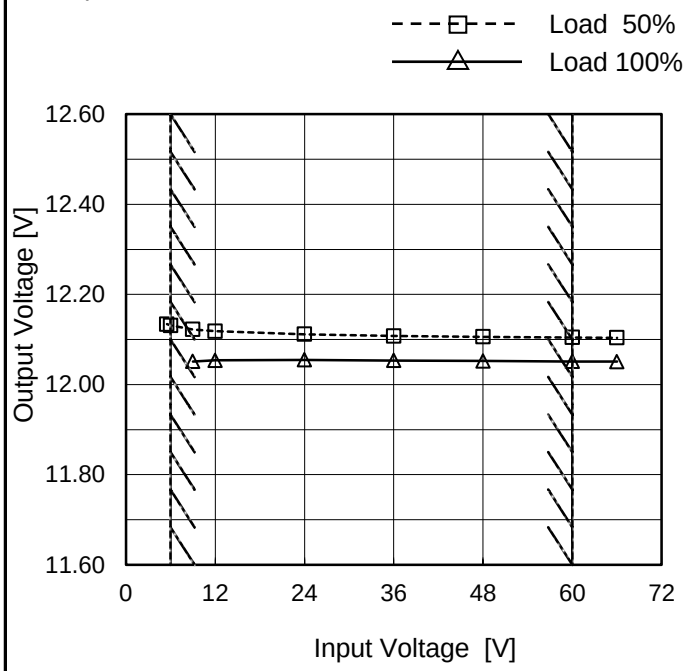
COSEL

Model	MGXW62412
Item	Line Regulation
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



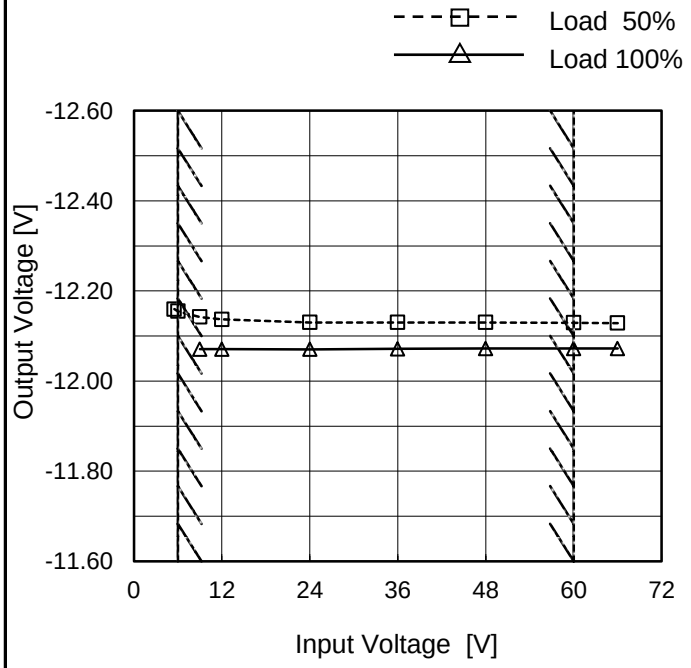
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
5.5	12.134	- ※
6.0	12.131	- ※
9.0	12.122	12.051
12.0	12.118	12.054
24.0	12.112	12.055
36.0	12.108	12.054
48.0	12.106	12.052
60.0	12.104	12.051
66.0	12.104	12.051

-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%
5.5	-12.160	- ※
6.0	-12.155	- ※
9.0	-12.142	-12.071
12.0	-12.137	-12.071
24.0	-12.130	-12.071
36.0	-12.130	-12.072
48.0	-12.130	-12.072
60.0	-12.129	-12.072
66.0	-12.129	-12.072

+12V: Rated Load Current

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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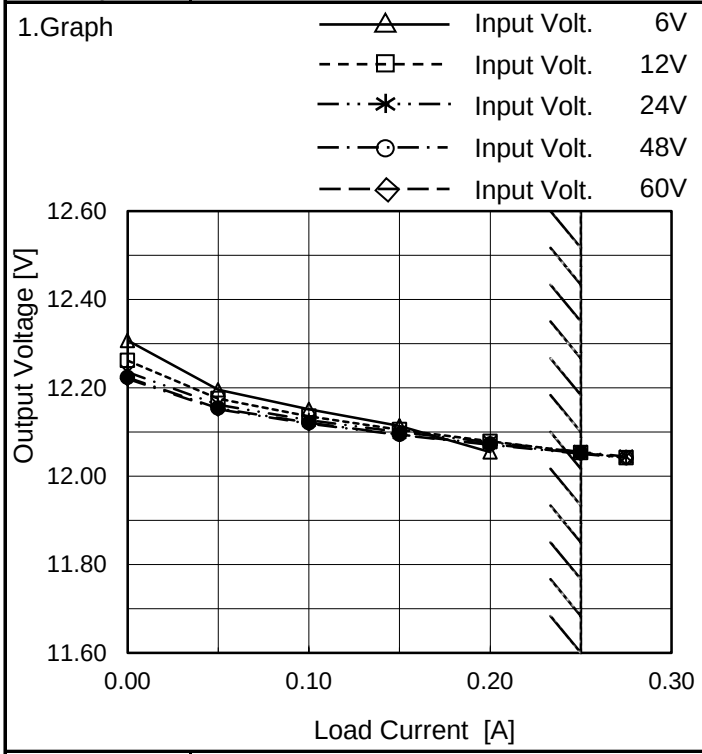
COSEL

Model	MGXW62412
Item	Load Regulation
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



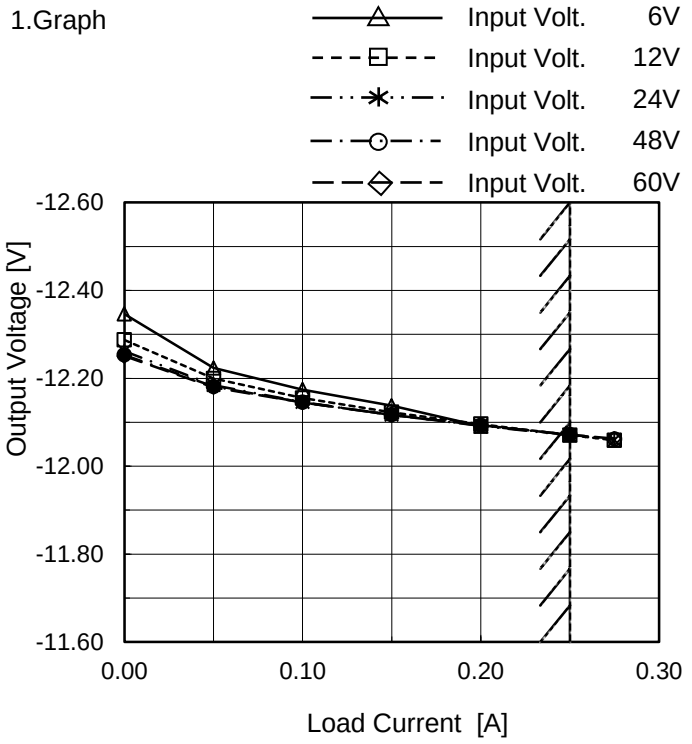
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.000	12.307	12.262	12.236	12.224	12.221
0.050	12.196	12.176	12.162	12.154	12.152
0.100	12.152	12.136	12.127	12.121	12.119
0.150	12.114	12.105	12.100	12.095	12.094
0.200	12.055	12.079	12.077	12.073	12.071
0.250	- ※	12.054	12.055	12.052	12.051
0.275	- ※	12.041	12.045	12.042	12.042
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.000	-12.346	-12.287	-12.262	-12.253	-12.251
0.050	-12.224	-12.200	-12.184	-12.181	-12.180
0.100	-12.174	-12.155	-12.146	-12.145	-12.145
0.150	-12.138	-12.123	-12.117	-12.117	-12.117
0.200	-12.091	-12.096	-12.092	-12.093	-12.093
0.250	- ※	-12.071	-12.070	-12.072	-12.072
0.275	- ※	-12.059	-12.060	-12.062	-12.062
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+12V: Rated Load Current

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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Model	MGXW62412	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.25A	

Input Volt. 24 V

-12V:Rated load current

Cycle 100 ms

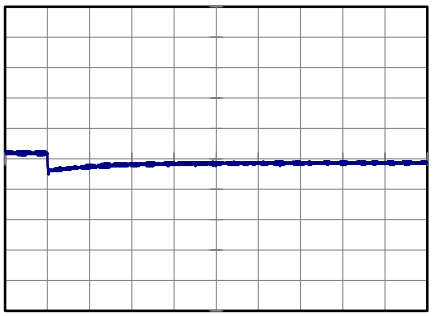
t1,t2 = 100 μs

Load Current

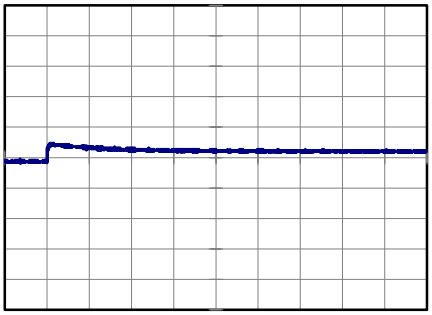
t1 t2

Min.Load (0A)←→
Load 100% (0.25A)

500 mV/div



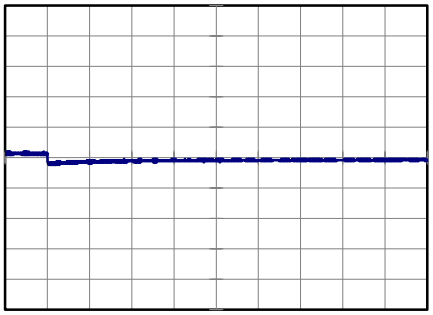
4 ms/div



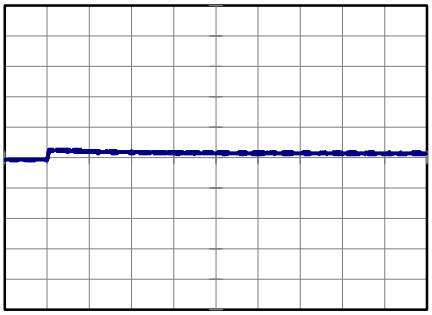
4 ms/div

Min.Load (0A)←→
Load 50% (0.125A)

500 mV/div



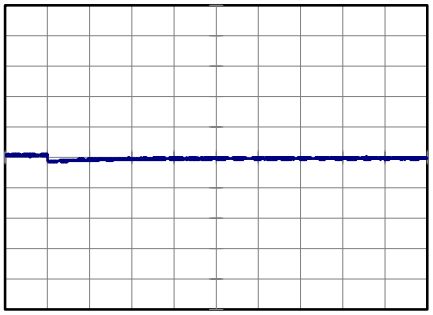
4 ms/div



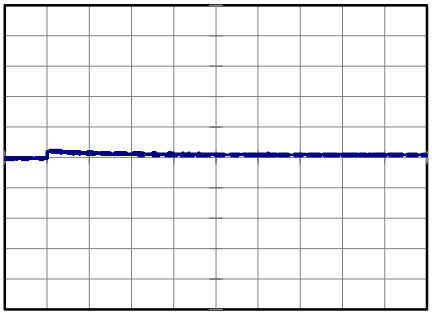
4 ms/div

Load 50% (0.125A)←→
Load 100% (0.25A)

500 mV/div



4 ms/div



4 ms/div

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Model	MGXW62412	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.25A	

Input Volt. 24 V

+12:Rated load current

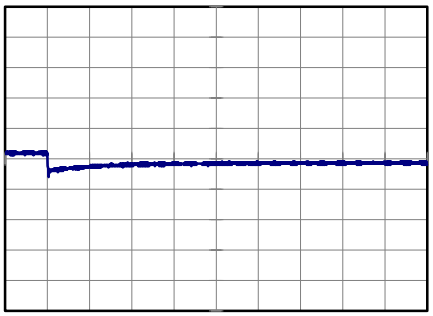
Cycle 100 ms

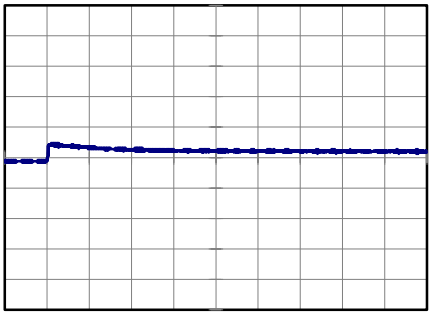
t1,t2 = 100 μ s

Load Current

t1 t2

Min.Load (0A)←→
Load 100% (0.25A)

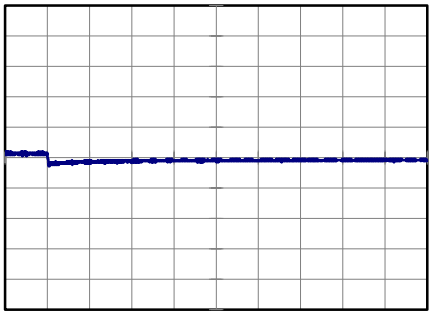


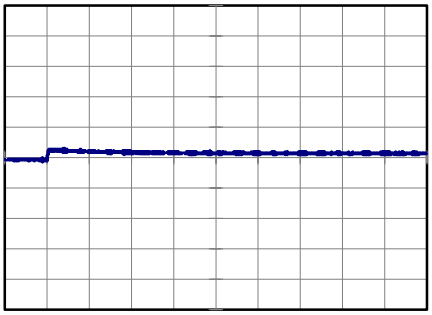


500 mV/div

4 ms/div 4 ms/div

Min.Load (0A)←→
Load 50% (0.125A)

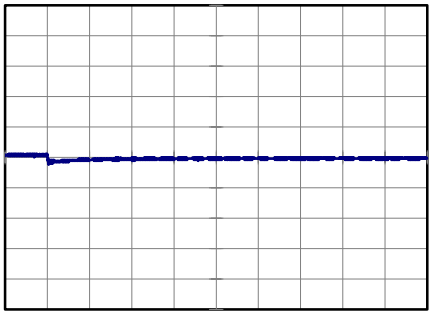


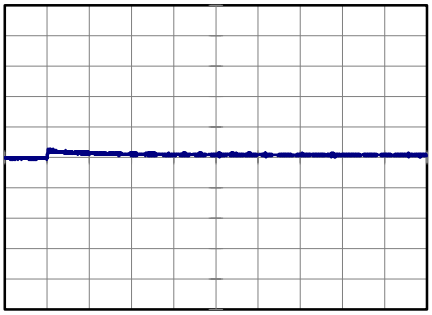


500 mV/div

4 ms/div 4 ms/div

Load 50% (0.125A)←→
Load 100% (0.25A)





500 mV/div

4 ms/div 4 ms/div

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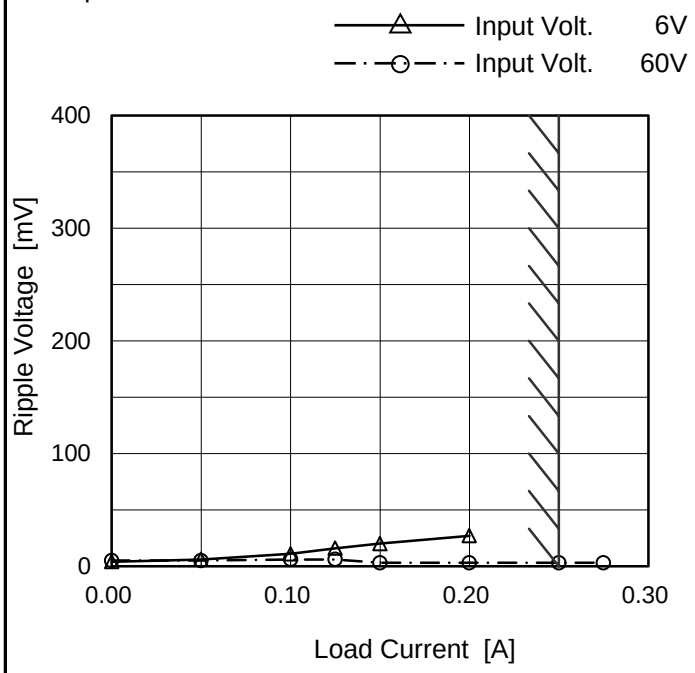
Model	MGXW62412
Item	Ripple Voltage (by Load Current)
Object	+12V0.25A

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]

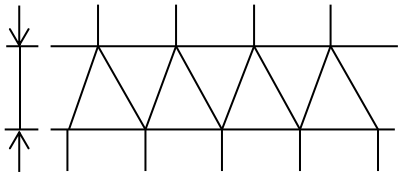


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.000	4	5
0.050	6	5
0.100	11	6
0.125	16	6
0.150	20	3
0.200	27	3
0.250	- ※	3
0.275	- ※	3
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

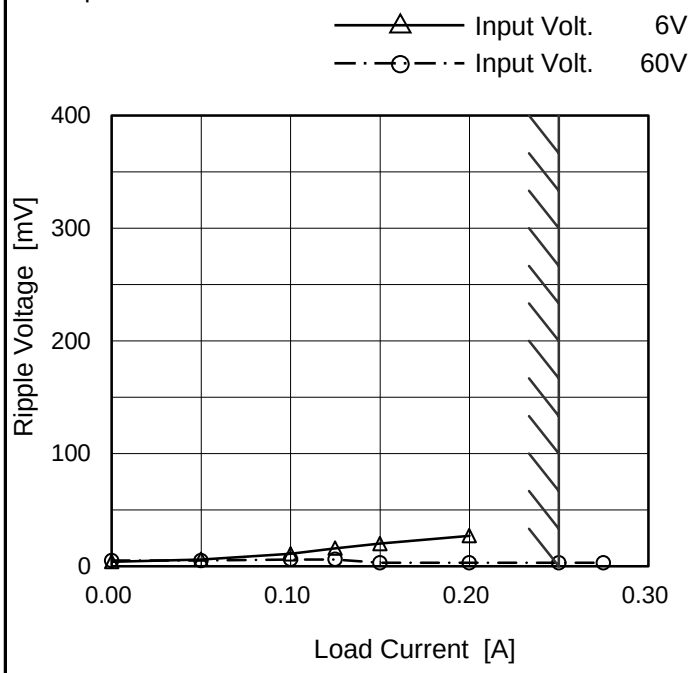
BC-11272

COSEL

Model	MGXW62412
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]

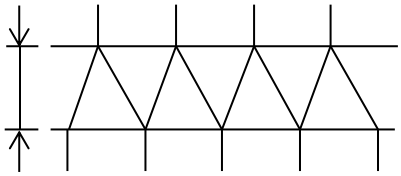


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.000	4	5
0.050	6	5
0.100	11	6
0.125	16	6
0.150	20	3
0.200	27	3
0.250	- ※	3
0.275	- ※	3
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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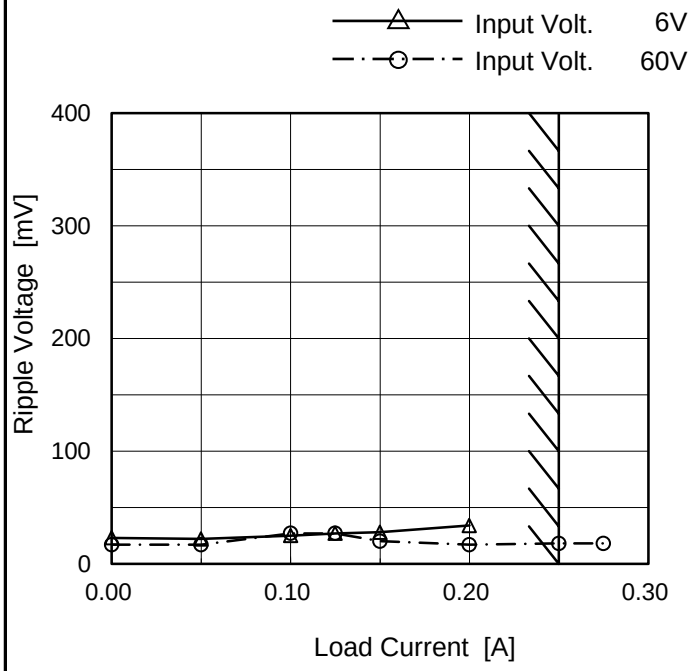
COSEL

Model	MGXW62412
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]

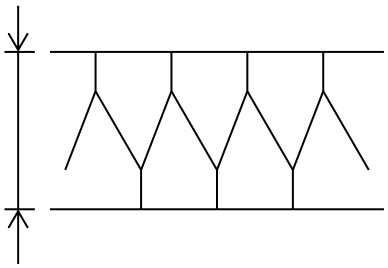


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.000	23	17
0.050	22	17
0.100	25	27
0.125	27	27
0.150	28	20
0.200	34	17
0.250	- ※	18
0.275	- ※	18
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

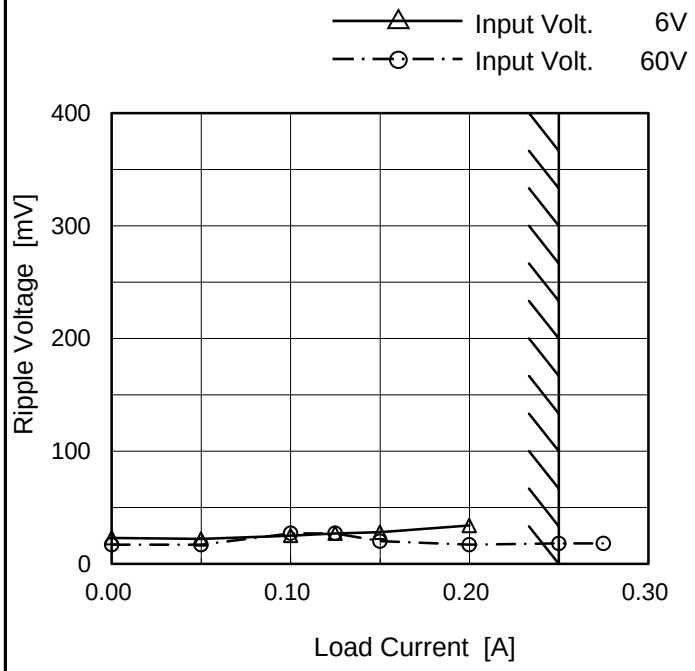
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW62412
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]

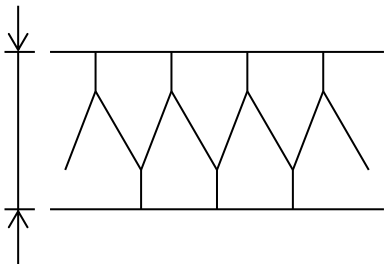


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.000	23	17
0.050	22	17
0.100	25	27
0.125	27	27
0.150	28	20
0.200	34	17
0.250	- ※	18
0.275	- ※	18
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

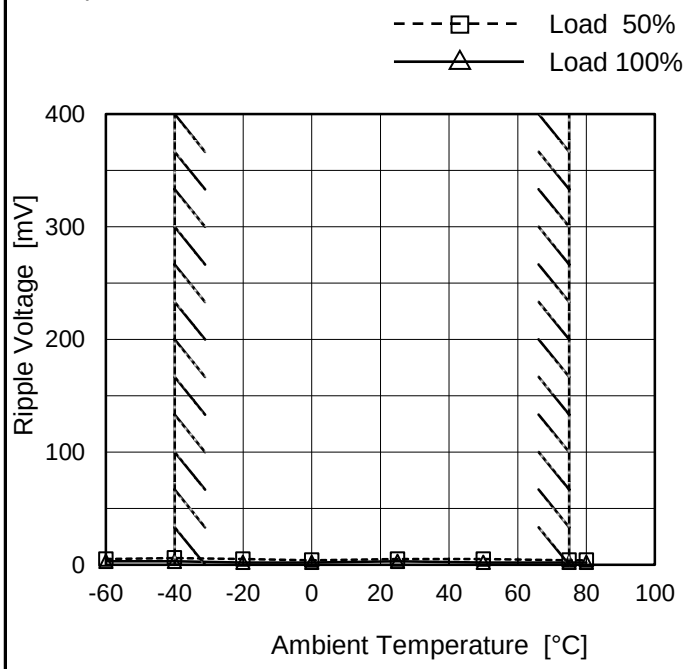
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW62412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.25A

Testing Circuitry Figure B

1.Graph



Input Volt. 24V

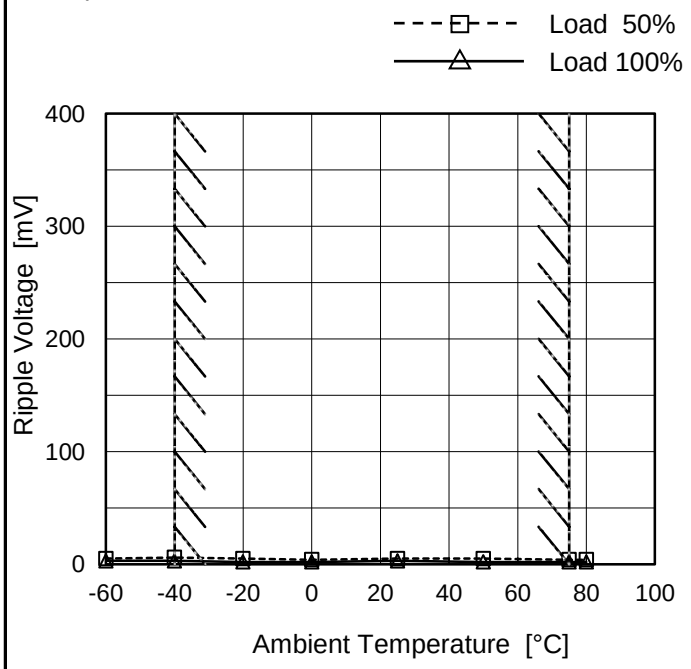
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	3
-40	6	3
-20	5	2
0	4	2
25	5	3
50	5	2
75	4	2
80	4	2
--	-	-
--	-	-
--	-	-

-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	3
-40	6	3
-20	5	2
0	4	2
25	5	3
50	5	2
75	4	2
80	4	2
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

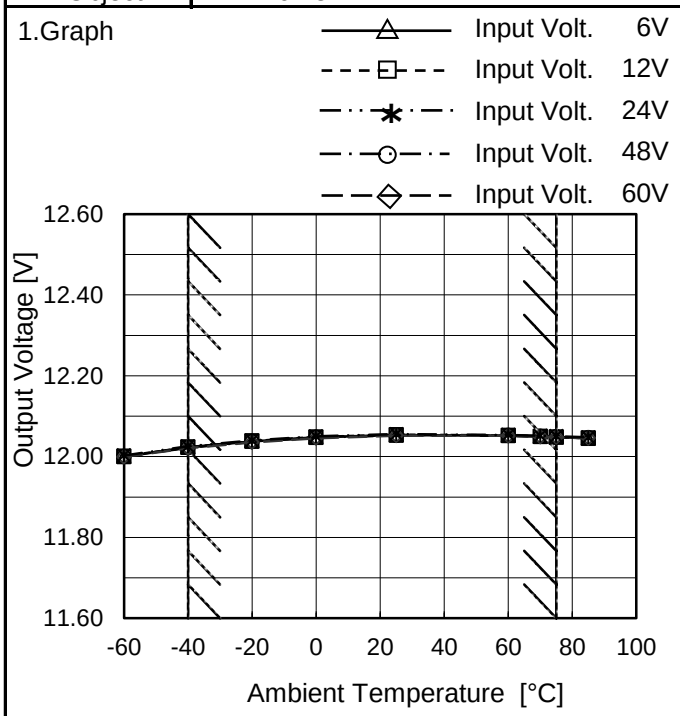
COSEL

Model	MGXW62412
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +12V0.25A

1.Graph



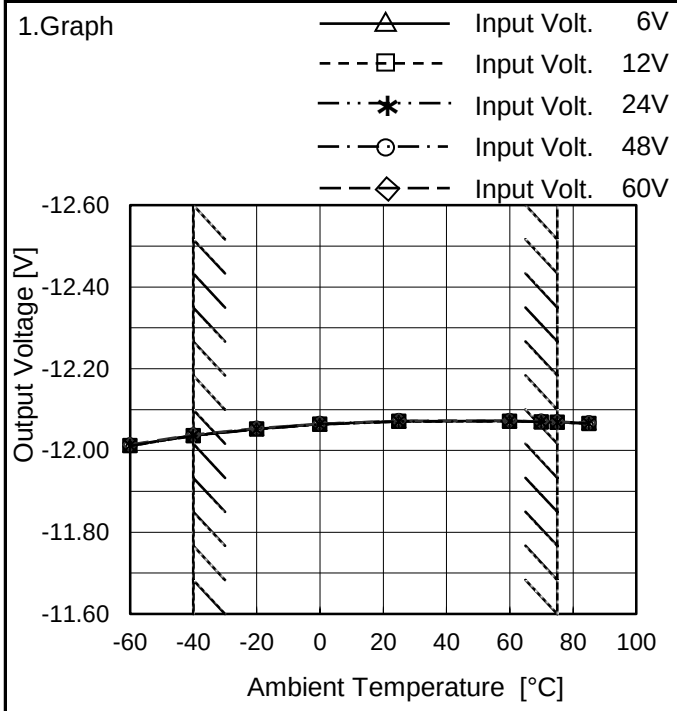
2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
-60	12.000	12.001	12.003	12.000	11.999
-40	12.023	12.024	12.025	12.022	12.021
-20	12.038	12.038	12.040	12.037	12.035
0	12.047	12.048	12.050	12.047	12.046
25	12.053	12.054	12.055	12.052	12.052
60	12.052	12.052	12.054	12.052	12.051
70	12.050	12.050	12.052	12.050	12.049
75	12.048	12.048	12.050	12.049	12.048
85	12.045	12.046	12.048	12.046	12.046
--	-	-	-	-	-
--	-	-	-	-	-

-12V: Rated Load Current

Object -12V0.25A

1.Graph



2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
-60	-12.013	-12.012	-12.012	-12.013	-12.014
-40	-12.036	-12.036	-12.036	-12.037	-12.038
-20	-12.053	-12.052	-12.052	-12.054	-12.055
0	-12.065	-12.064	-12.064	-12.065	-12.066
25	-12.072	-12.071	-12.071	-12.072	-12.073
60	-12.072	-12.072	-12.071	-12.073	-12.073
70	-12.071	-12.070	-12.070	-12.071	-12.071
75	-12.070	-12.069	-12.068	-12.070	-12.070
85	-12.067	-12.066	-12.066	-12.068	-12.067
--	-	-	-	-	-
--	-	-	-	-	-

+12V: Rated Load Current

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

Note: In case of input Volt. 6V, Load 70%.
Other case Load 100%.

COSEL

Model	MGXW62412	
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 : 6 - 60V

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	6	0	12.337	±254	±2.1
Minimum Voltage	75	6	0.175 ※	11.829		

Object	-12V0.25A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	75	6	0	-12.371	±260	±2.2
Minimum Voltage	75	6	0.175 ※	-11.852		

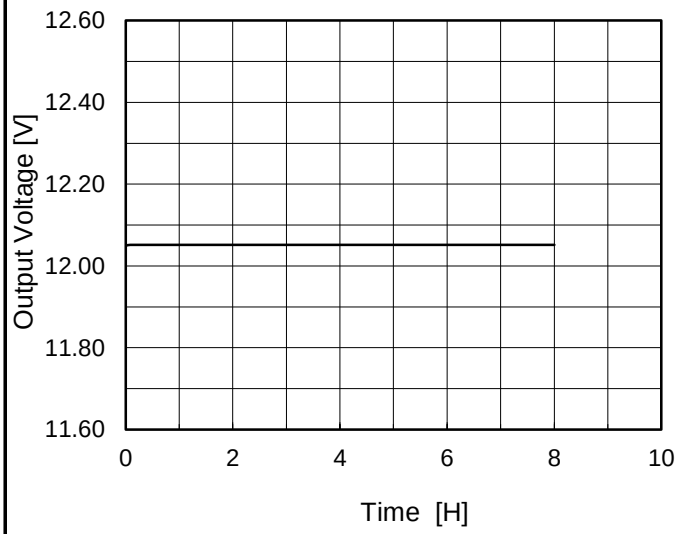
※: Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW62412
Item	Time Lapse Drift
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



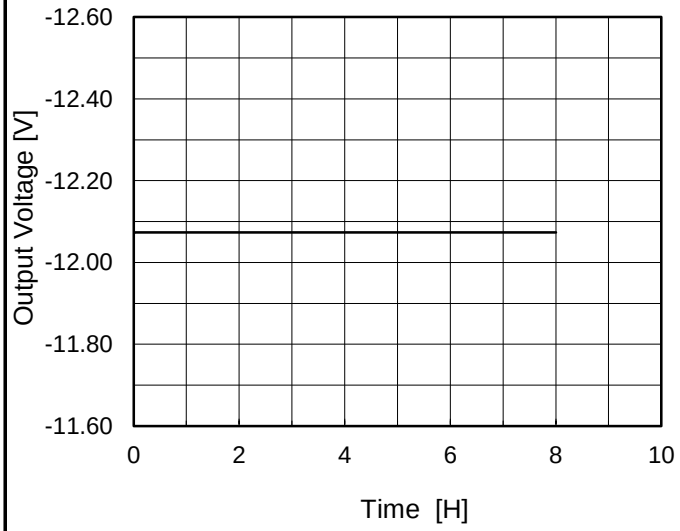
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.048
0.5	12.051
1.0	12.052
2.0	12.052
3.0	12.052
4.0	12.052
5.0	12.052
6.0	12.052
7.0	12.052
8.0	12.052

Object	-12V0.25A

1.Graph



Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.071
0.5	-12.073
1.0	-12.073
2.0	-12.073
3.0	-12.073
4.0	-12.073
5.0	-12.073
6.0	-12.073
7.0	-12.073
8.0	-12.073

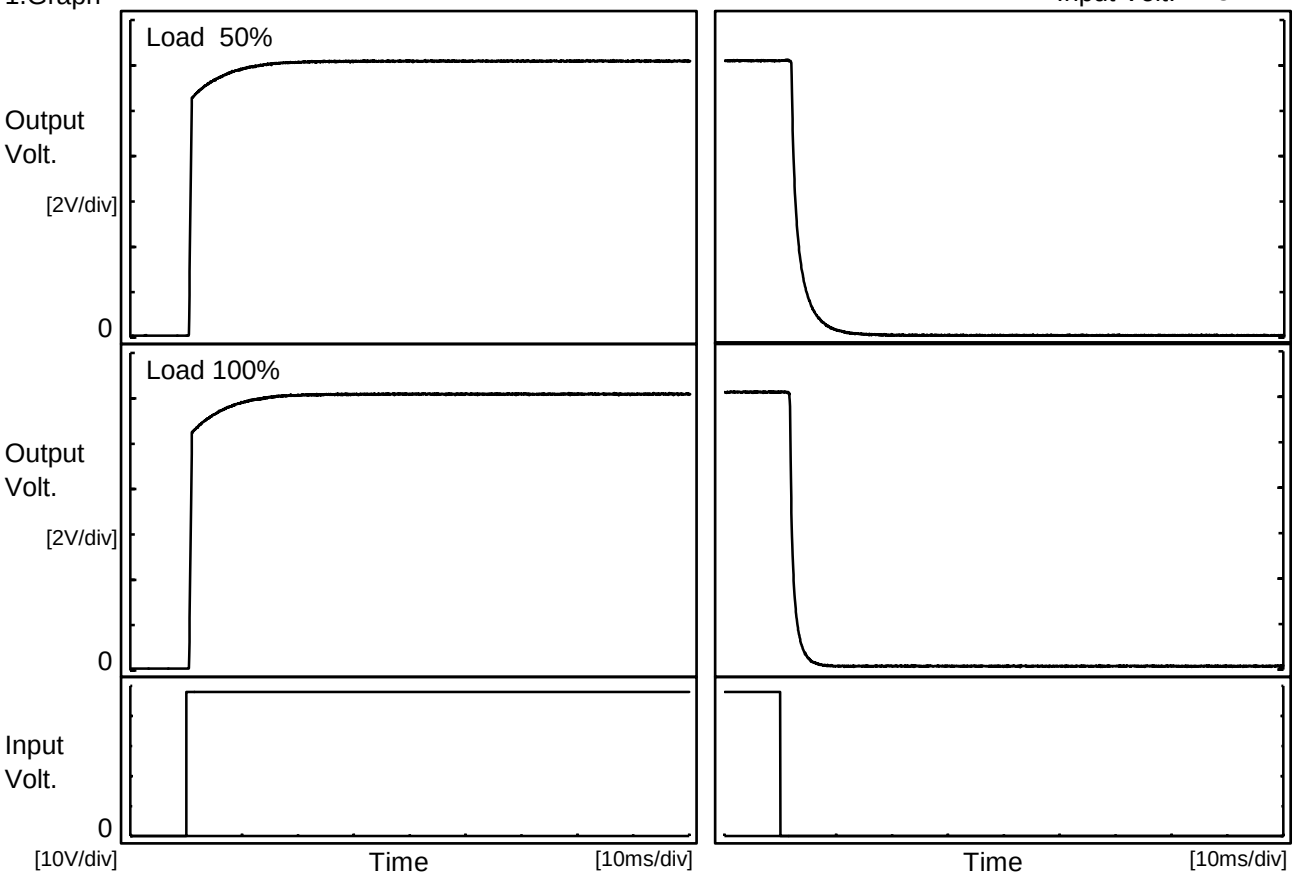
COSEL

Model	MGXW62412
Item	Rise and Fall Time
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

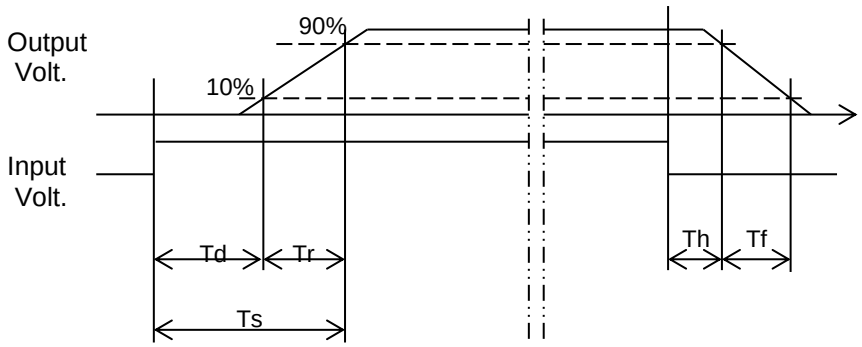
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.6	1.6	2.2	2.0	3.7
100 %	0.6	2.1	2.7	1.8	1.8



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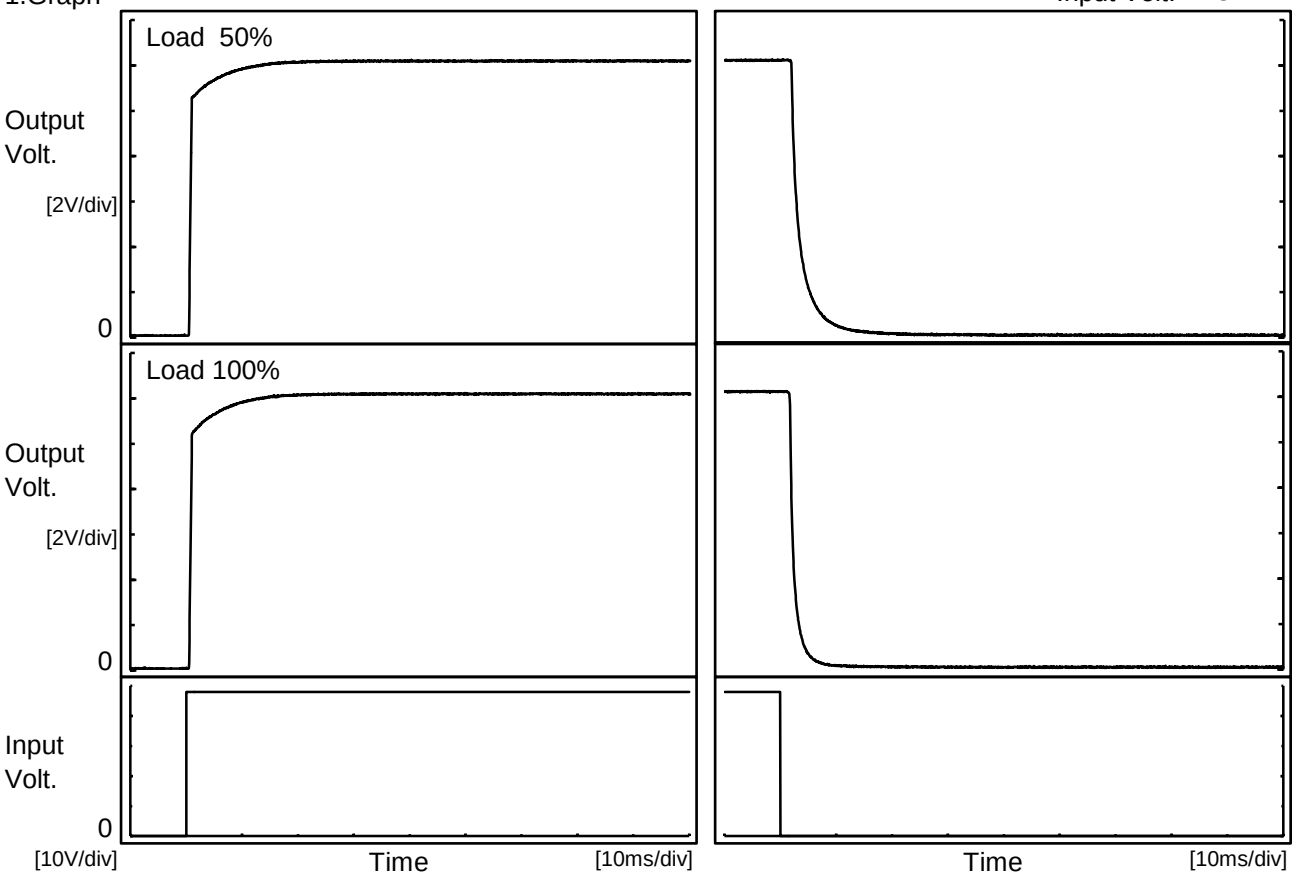
COSEL

Model	MGXW62412
Item	Rise and Fall Time
Object	-12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

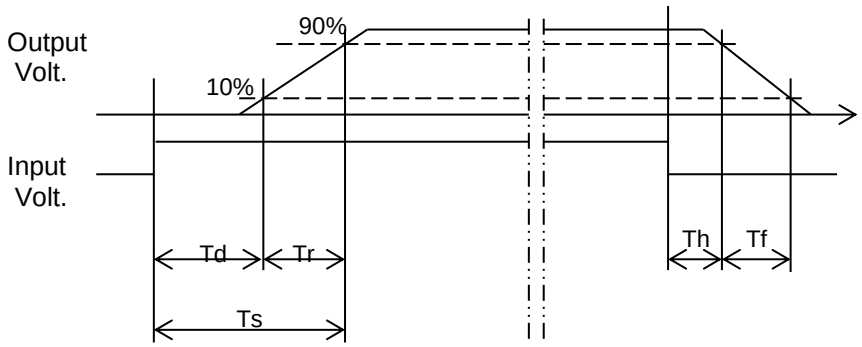
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.6	1.7	2.3	2.1	4.5
100 %	0.6	2.2	2.8	1.8	2.2



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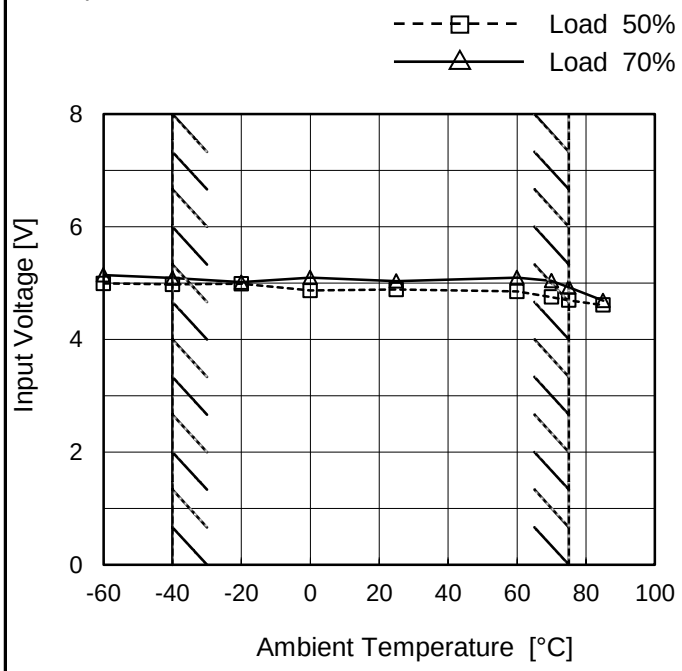
COSEL

Model	MGXW62412
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object: +12V0.25A

1.Graph

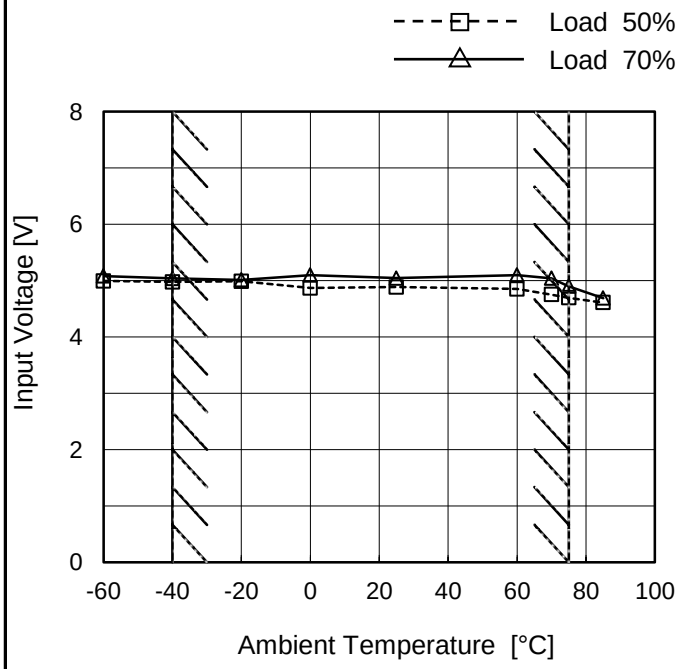


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	5.0	5.2
-40	5.0	5.1
-20	5.0	5.1
0	4.9	5.1
25	4.9	5.1
60	4.9	5.1
70	4.8	5.1
75	4.7	5.0
85	4.7	4.7
--	-	-
--	-	-

Object: -12V0.25A

1.Graph



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

2.Values

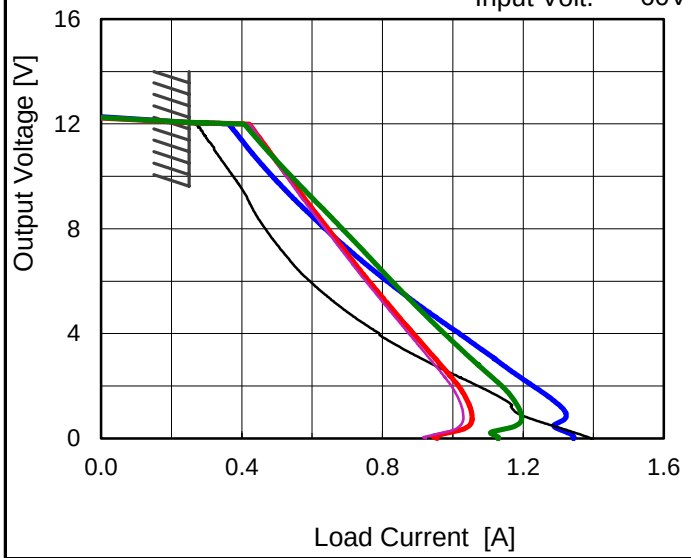
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	5.0	5.1
-40	5.0	5.1
-20	5.0	5.1
0	4.9	5.1
25	4.9	5.1
60	4.9	5.1
70	4.8	5.1
75	4.7	4.9
85	4.6	4.7
--	-	-
--	-	-

COSEL

Model	MGXW62412
Item	Overcurrent Protection
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



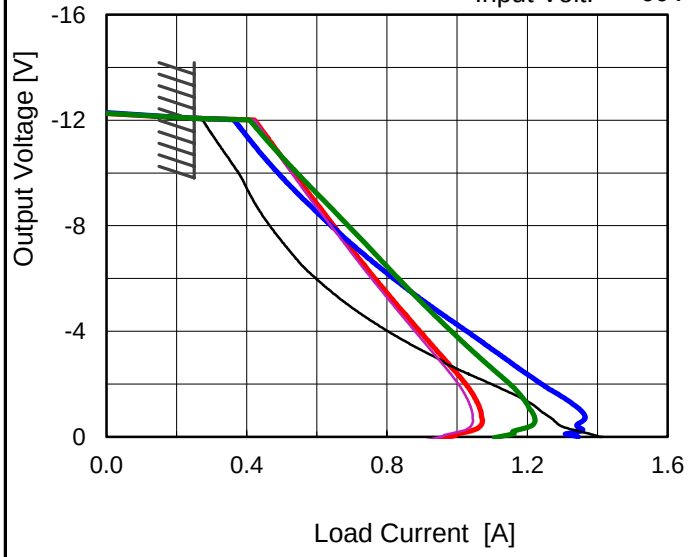
2.Values

Output Voltage [V]	Load Current [A]				
	Input Volt. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
11.4	0.302	0.398	0.444	0.454	0.454
10.8	0.332	0.434	0.483	0.485	0.483
9.6	0.396	0.514	0.567	0.552	0.546
8.4	0.446	0.605	0.656	0.620	0.614
7.2	0.510	0.701	0.743	0.689	0.681
6.0	0.592	0.813	0.826	0.760	0.750
4.8	0.700	0.930	0.915	0.837	0.825
3.6	0.834	1.057	1.006	0.913	0.898
2.4	1.008	1.183	1.105	0.991	0.973
1.2	1.165	1.307	1.186	1.048	1.025
0.0	1.394	1.343	1.129	0.955	0.924
--	-	-	-	-	-

-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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
-11.4	0.304	0.400	0.447	0.456	0.454
-10.8	0.335	0.435	0.487	0.487	0.485
-9.6	0.393	0.516	0.572	0.554	0.550
-8.4	0.444	0.607	0.660	0.624	0.616
-7.2	0.511	0.707	0.745	0.693	0.685
-6.0	0.597	0.816	0.830	0.765	0.754
-4.8	0.710	0.938	0.921	0.840	0.828
-3.6	0.852	1.067	1.013	0.919	0.904
-2.4	1.026	1.194	1.116	0.999	0.978
-1.2	1.217	1.332	1.200	1.061	1.036
0.0	1.406	1.346	1.106	0.940	0.911
--	-	-	-	-	-

+12V: Rated Load Current

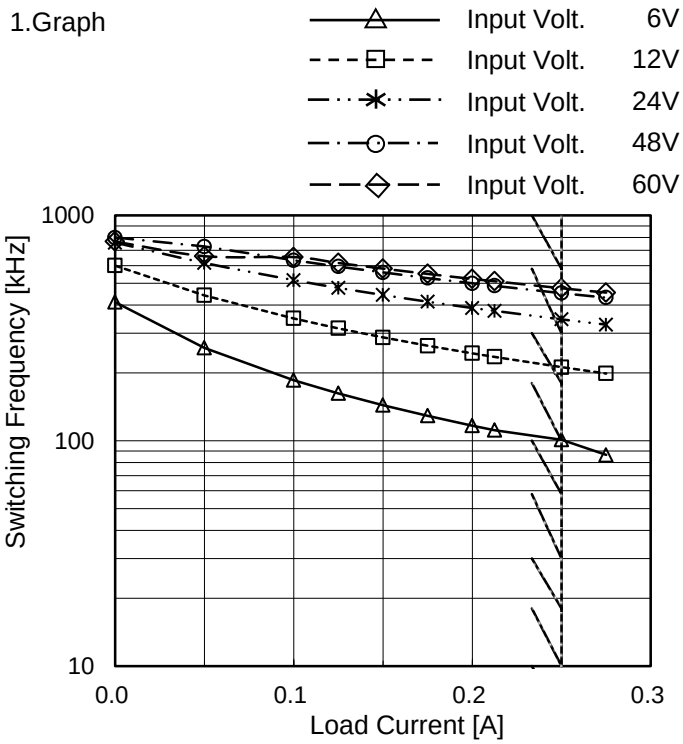
Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW62412
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. 6[V]	Input Volt. 12[V]	Input Volt. 24[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.000	413	600	758	799	766
0.050	259	443	616	728	660
0.100	186	349	517	633	654
0.125	163	316	478	593	616
0.150	144	288	444	559	581
0.175	129	264	415	528	551
0.200	117	245	389	500	523
0.213	112	236	378	488	511
0.250	- ※	212	346	453	476
0.275	- ※	199	328	432	455
--	-	-	-	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

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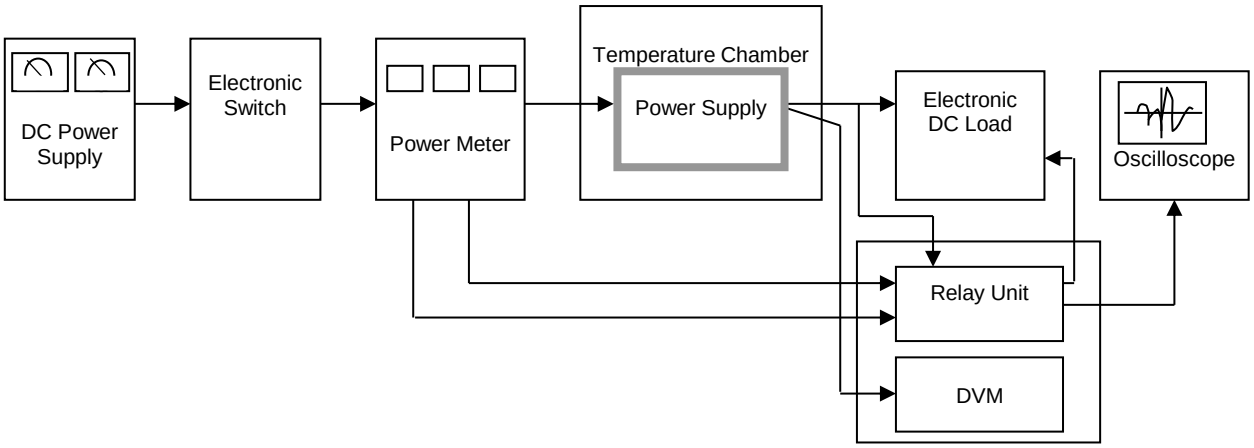

Figure A

Data Acquisition/Control Unit

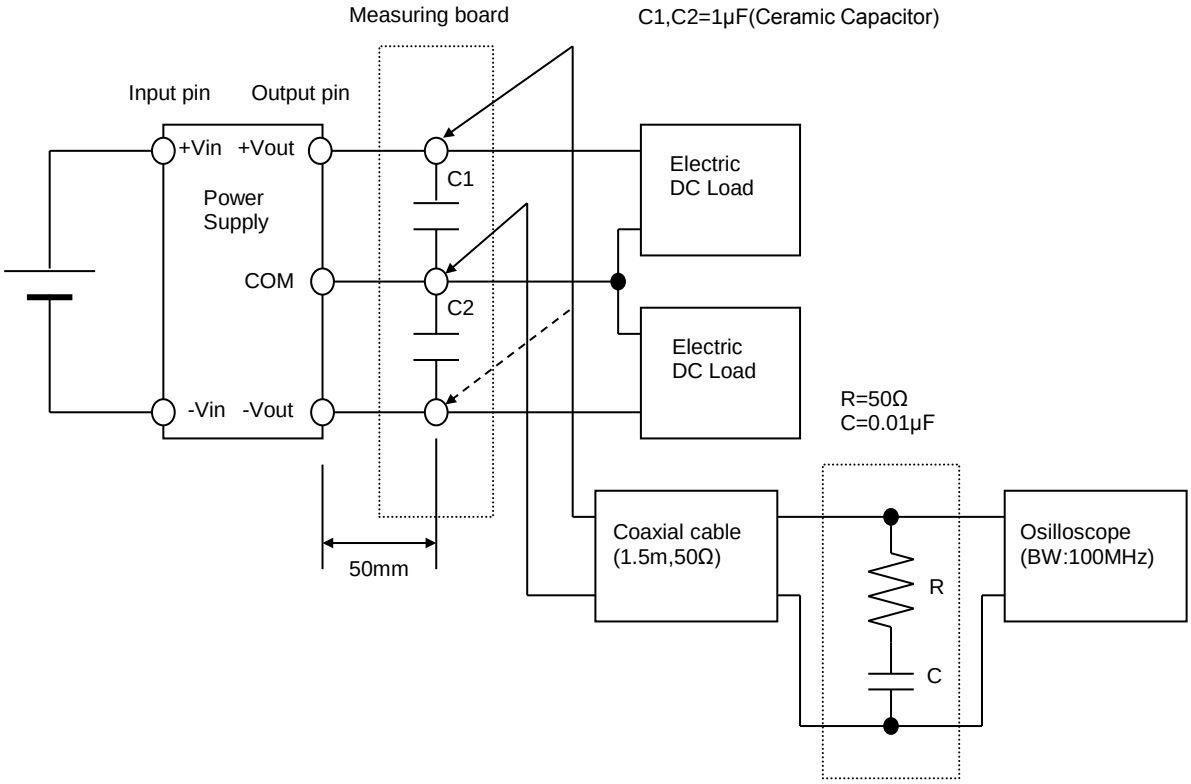

Figure B（Ripple and Ripple noise Characteristic）