参考資料

TEST DATA OF MGXW1R52412

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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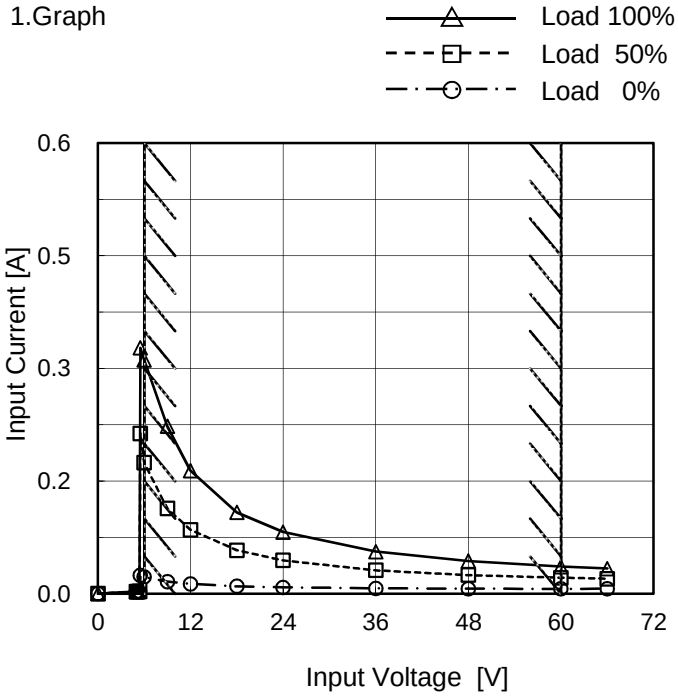
Model	MGXW1R52412
Item	Input Current (by Input Voltage)
Object	――――――

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	0.024	0.213	0.327
6.0	0.022	0.174	0.311
9.0	0.016	0.113	0.223
12.0	0.013	0.085	0.164
18.0	0.010	0.058	0.108
24.0	0.008	0.044	0.082
36.0	0.007	0.031	0.056
48.0	0.007	0.025	0.044
60.0	0.007	0.021	0.036
66.0	0.007	0.020	0.034
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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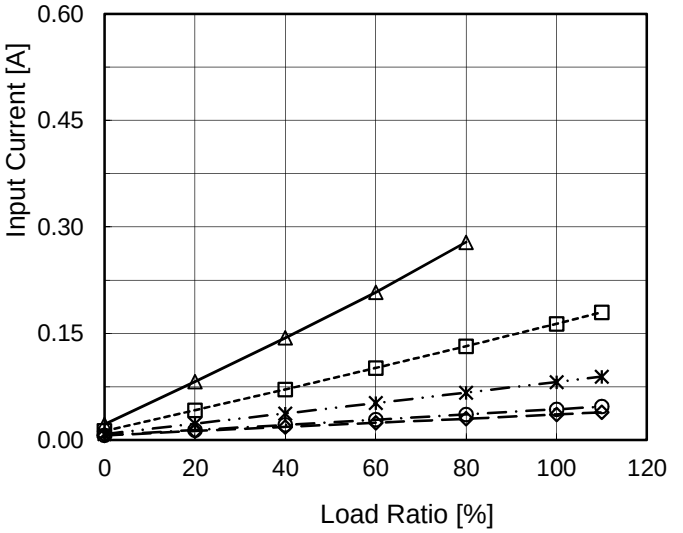
COSEL

Model	MGXW1R52412
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	0.022	0.013	0.008	0.007	0.007
20	0.082	0.042	0.023	0.014	0.013
40	0.144	0.071	0.037	0.021	0.018
60	0.208	0.101	0.052	0.029	0.024
80	0.279	0.132	0.067	0.036	0.030
100	- ※	0.164	0.082	0.043	0.036
110	- ※	0.180	0.089	0.047	0.039
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

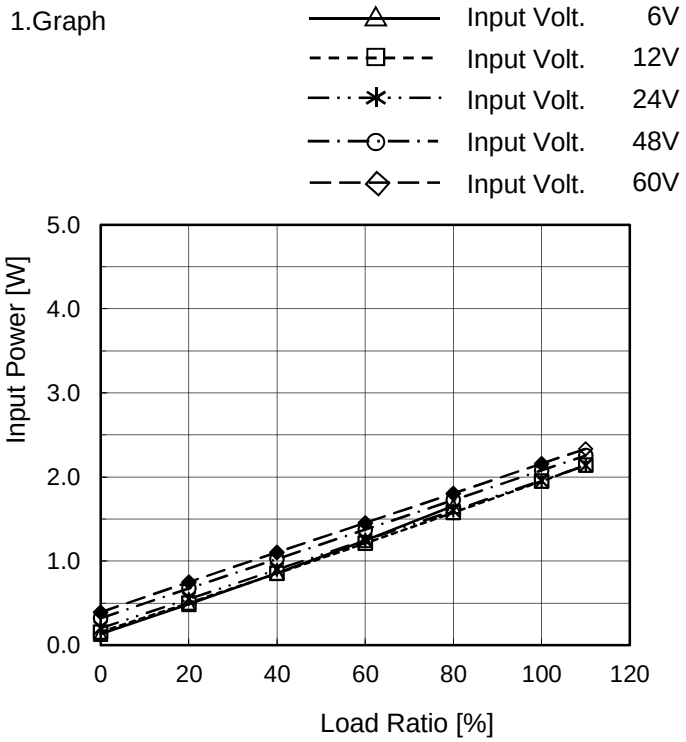
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW1R52412
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	0.13	0.15	0.20	0.32	0.39
20	0.49	0.50	0.55	0.67	0.75
40	0.86	0.85	0.90	1.02	1.10
60	1.24	1.21	1.25	1.37	1.45
80	1.65	1.58	1.60	1.72	1.80
100	- ※	1.95	1.96	2.08	2.16
110	- ※	2.14	2.14	2.25	2.33
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※ 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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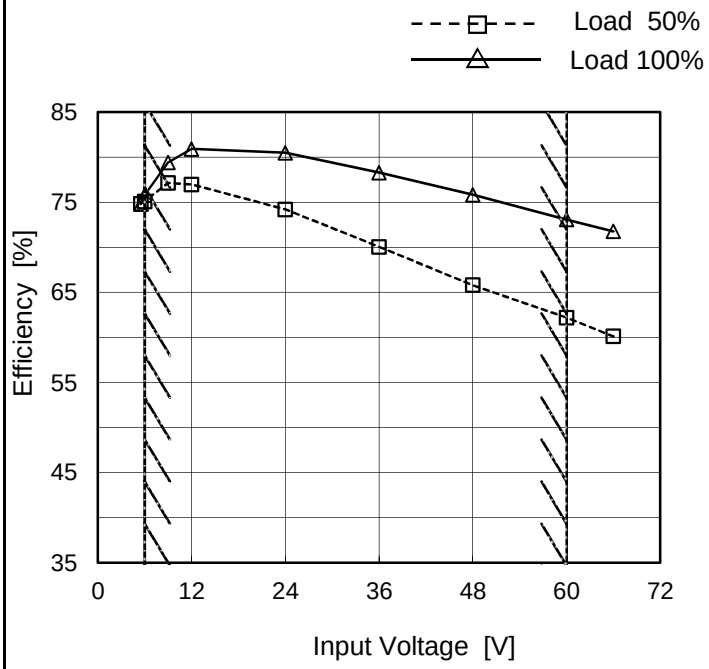
COSEL

Model	MGXW1R52412
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	74.9	74.8 ※1
6.0	75.1	75.8 ※1
9.0	77.1	79.4
12.0	77.0	80.9
24.0	74.2	80.5
36.0	70.1	78.3
48.0	65.8	75.8
60.0	62.2	73.1
66.0	60.1	71.8

※1:Load 70%

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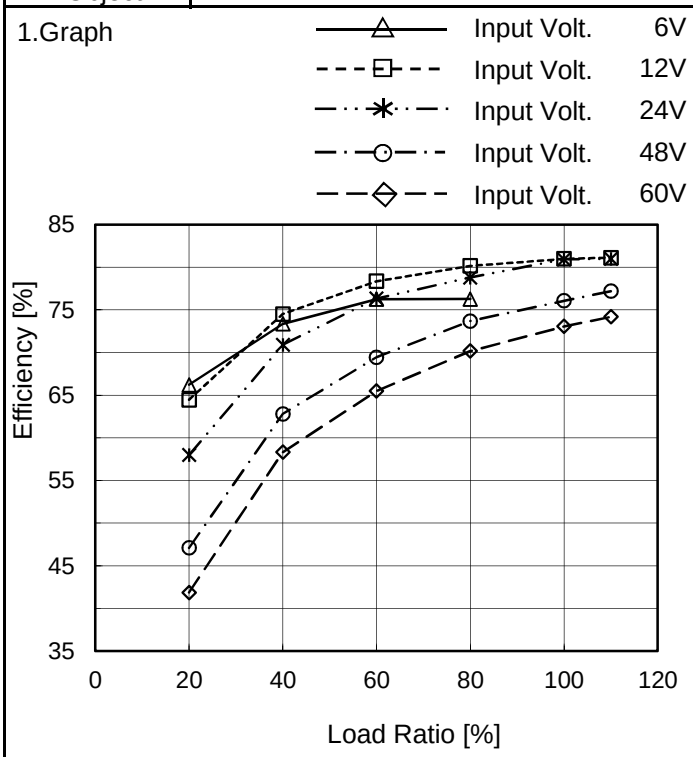
COSEL

Model	MGXW1R52412
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	66.2	64.4	58.0	47.1	41.9
40	73.4	74.5	70.9	62.8	58.3
60	76.3	78.4	76.3	69.4	65.5
80	76.3	80.1	78.8	73.7	70.2
100	- ※	81.0	80.9	76.1	73.1
110	- ※	81.1	81.0	77.2	74.2
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

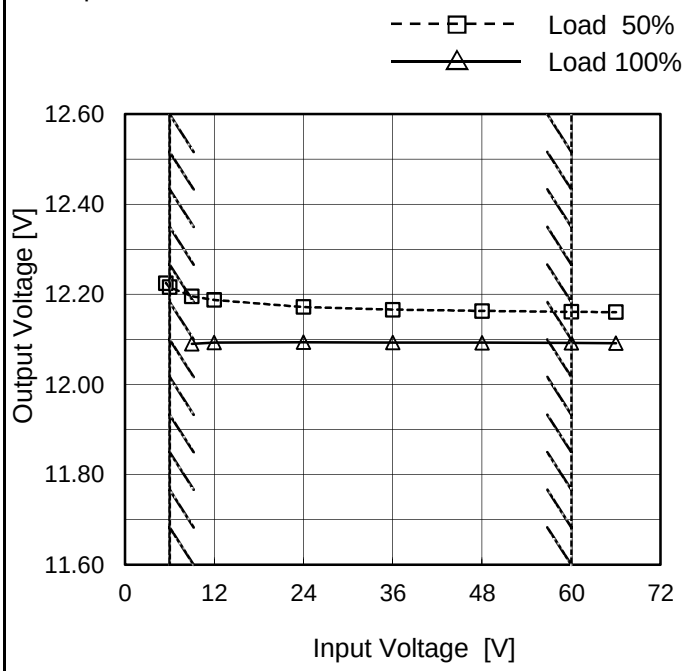
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW1R52412
Item	Line Regulation
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



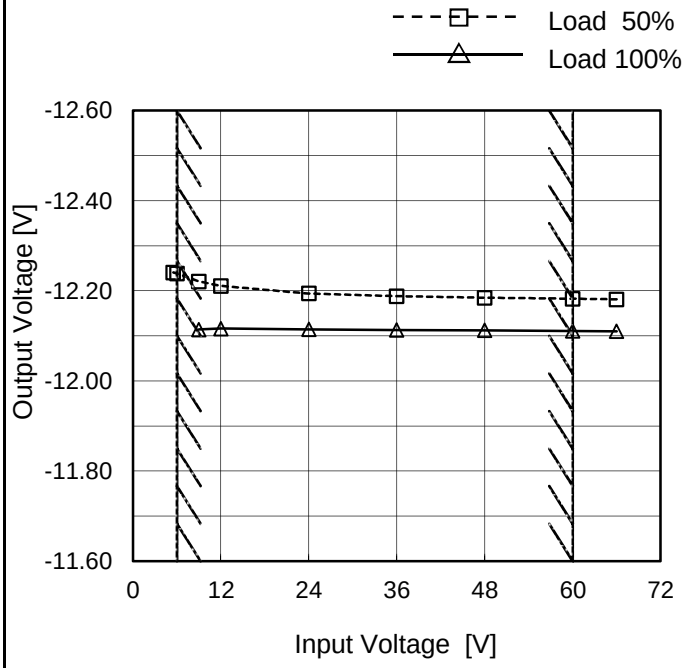
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
5.5	12.225	- ※
6.0	12.216	- ※
9.0	12.196	12.091
12.0	12.188	12.093
24.0	12.172	12.094
36.0	12.166	12.093
48.0	12.163	12.093
60.0	12.161	12.092
66.0	12.161	12.092

-12V:Rated Load Current

Object	-12V0.065A

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	-12.241	- ※
6.0	-12.238	- ※
9.0	-12.221	-12.114
12.0	-12.211	-12.116
24.0	-12.194	-12.114
36.0	-12.188	-12.113
48.0	-12.184	-12.112
60.0	-12.182	-12.111
66.0	-12.181	-12.110

+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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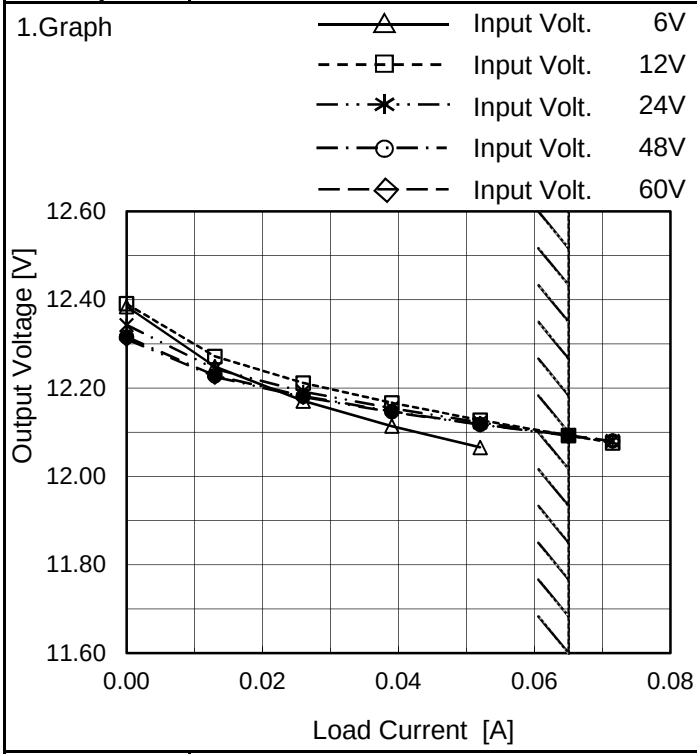
COSEL

Model	MGXW1R52412
Item	Load Regulation
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



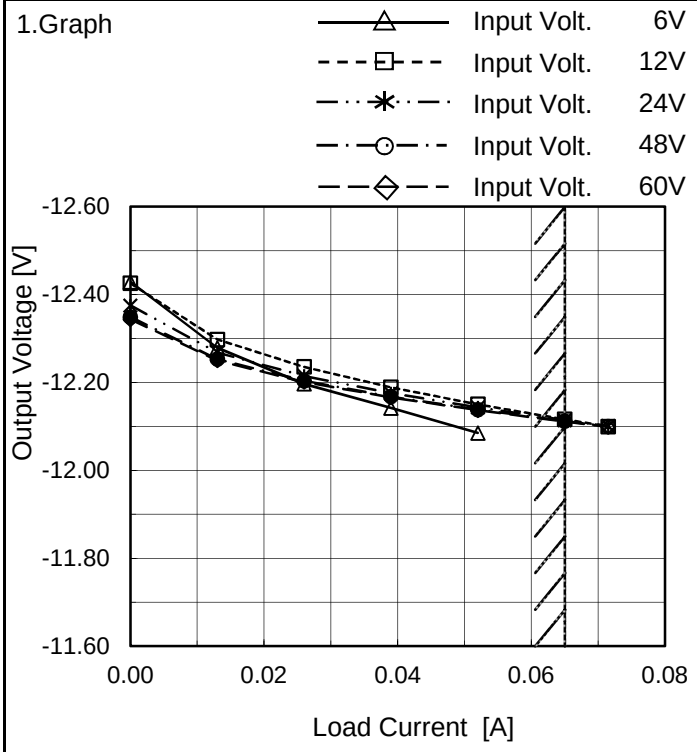
2.Values

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	12.385	12.391	12.343	12.316	12.311
0.013	12.249	12.272	12.244	12.228	12.225
0.026	12.171	12.212	12.193	12.182	12.180
0.039	12.114	12.167	12.155	12.147	12.146
0.052	12.066	12.128	12.123	12.118	12.117
0.065	- ※	12.093	12.094	12.093	12.092
0.072	- ※	12.076	12.080	12.080	12.080
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-12V:Rated Load Current

Object	-12V0.065A

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	-12.429	-12.426	-12.375	-12.349	-12.344
0.013	-12.279	-12.298	-12.268	-12.253	-12.250
0.026	-12.197	-12.236	-12.215	-12.204	-12.201
0.039	-12.142	-12.189	-12.176	-12.168	-12.166
0.052	-12.085	-12.150	-12.143	-12.138	-12.137
0.065	- ※	-12.116	-12.114	-12.112	-12.111
0.072	- ※	-12.100	-12.101	-12.100	-12.099
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+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

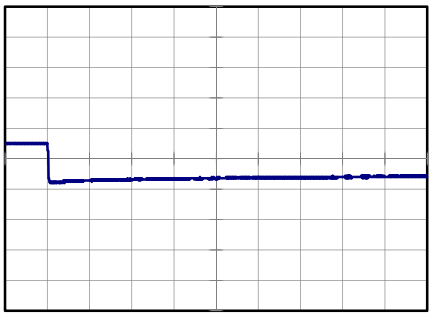
Model	MGXW1R52412	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.065A	

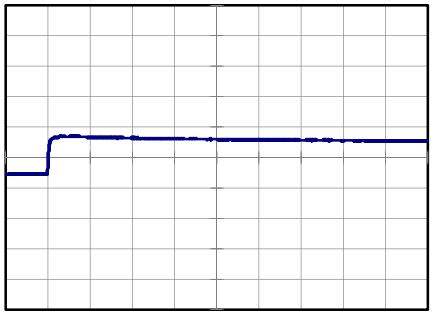
Input Volt. 24 V
-12V:rated load Current
Cycle 100 ms

t1,t2 = 100 μ s

Load Current

Min.Load (0A)←→
Load 100% (0.065A)



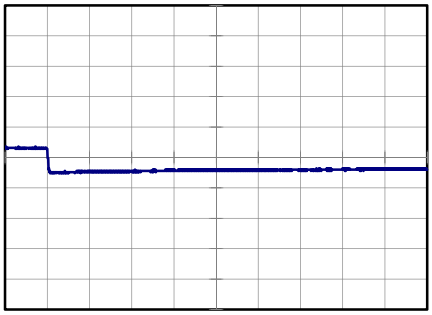


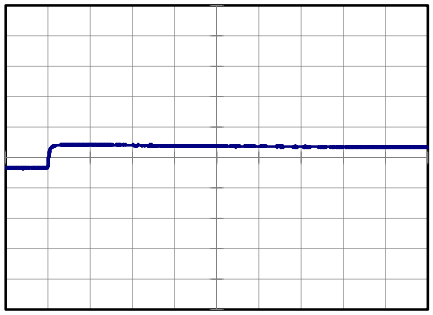
200 mV/div

4 ms/div

4 ms/div

Min.Load (0A)←→
Load 50% (0.0325A)



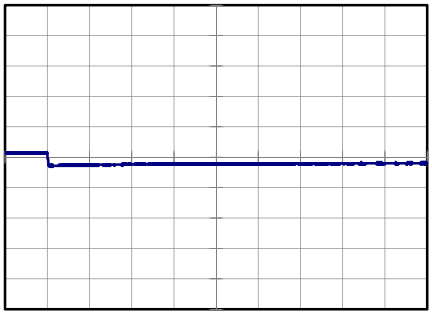


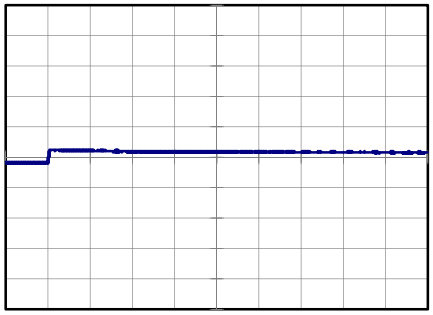
200 mV/div

4 ms/div

4 ms/div

Load 50% (0.0325A)←→
Load 100% (0.065A)





200 mV/div

4 ms/div

4 ms/div

COSEL

Model	MGXW1R52412	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.065A	

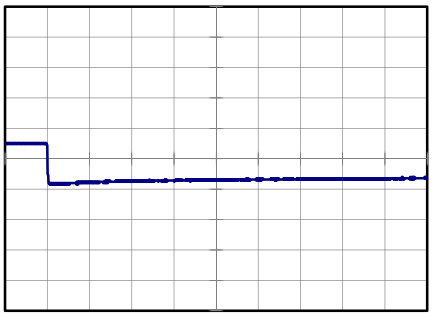
Input Volt. 24 V
+12V:rated load Current
Cycle 100 ms

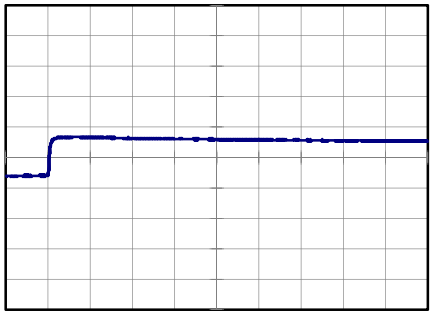
t1,t2 = 100 μ s

Load Current

t1 t2

Min.Load (0A)←→
Load 100% (0.065A)

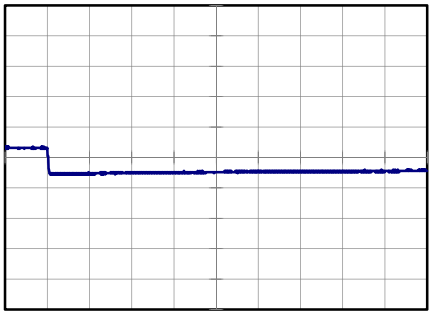


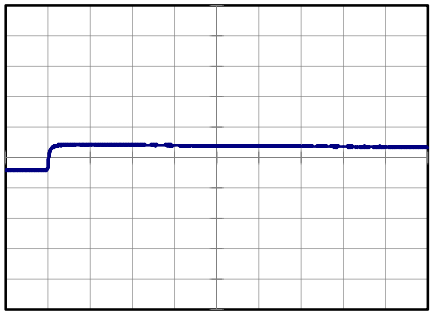


200 mV/div

4 ms/div 4 ms/div

Min.Load (0A)←→
Load 50% (0.0325A)

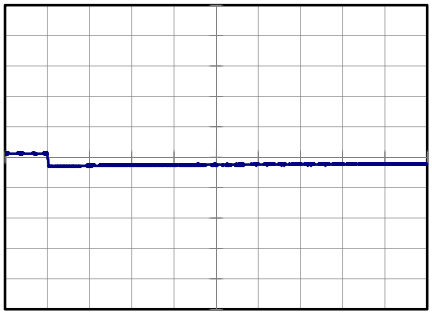


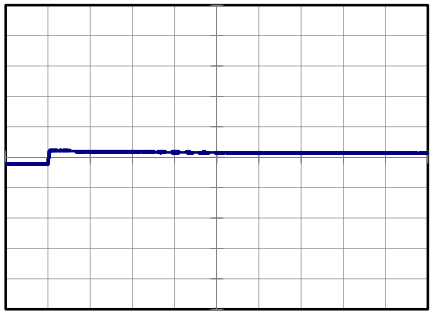


200 mV/div

4 ms/div 4 ms/div

Load 50% (0.0325A)←→
Load 100% (0.065A)





200 mV/div

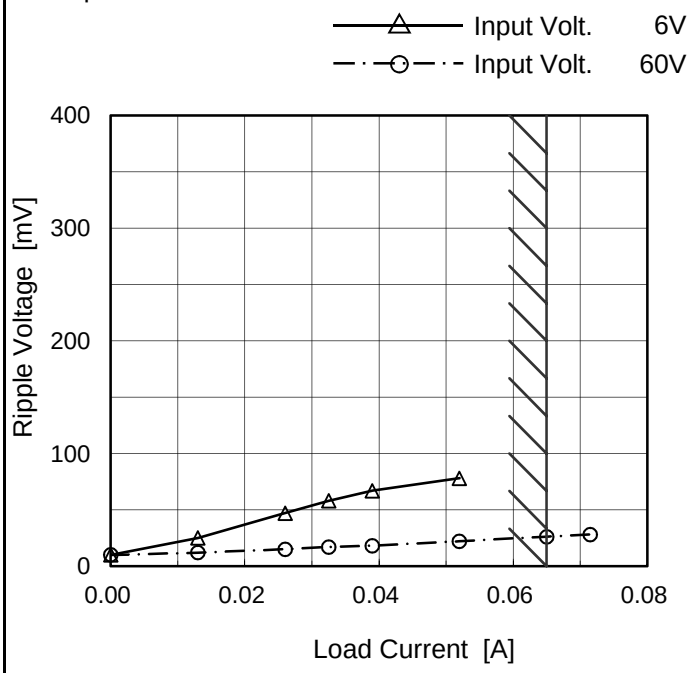
4 ms/div 4 ms/div

COSEL

Model	MGXW1R52412
Item	Ripple Voltage (by Load Current)
Object	+12V0.065A

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]

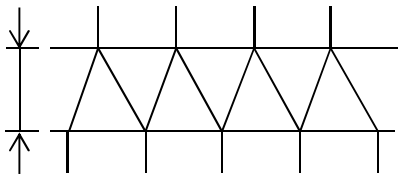


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.000	10	10
0.013	25	12
0.026	47	15
0.033	58	17
0.039	67	18
0.052	78	22
0.065	- ※	26
0.072	- ※	28
--	-	-
--	-	-
--	-	-

-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.

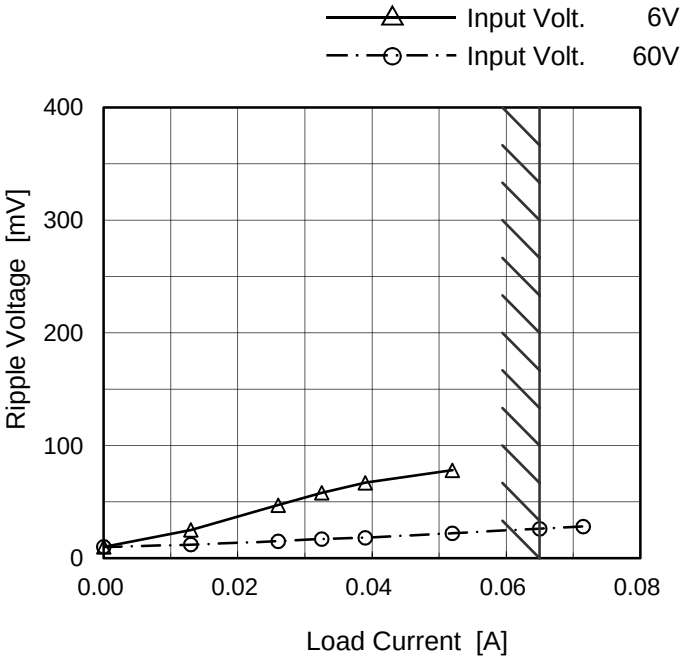
BC-11266

COSEL

Model	MGXW1R52412
Item	Ripple Voltage (by Load Current)
Object	-12V0.065A

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]

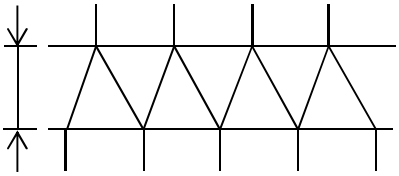


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.000	10	10
0.013	25	12
0.026	47	15
0.033	58	17
0.039	67	18
0.052	78	22
0.065	- ※	26
0.072	- ※	28
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

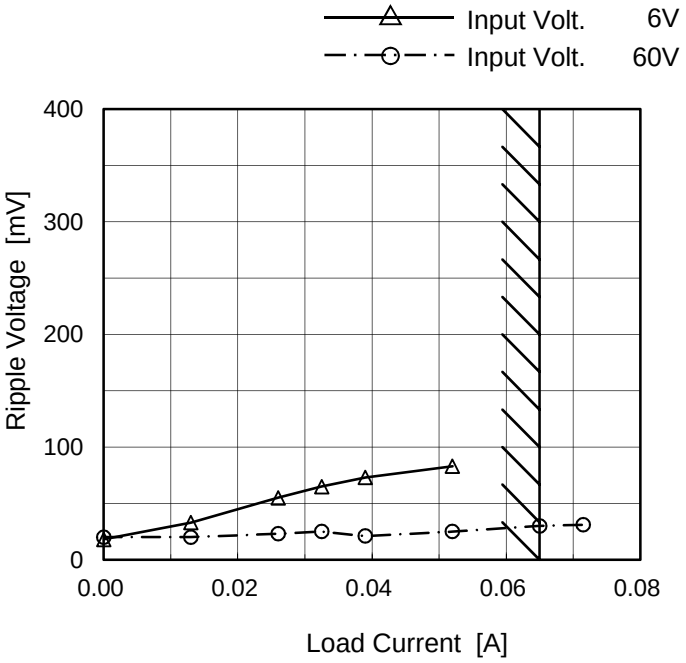
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW1R52412
Item	Ripple-Noise
Object	+12V0.065A

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]

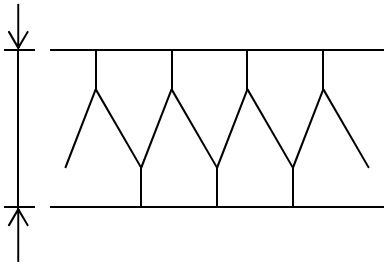


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.000	18	20
0.013	33	20
0.026	55	23
0.033	65	25
0.039	73	21
0.052	83	25
0.065	- ※	30
0.072	- ※	31
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

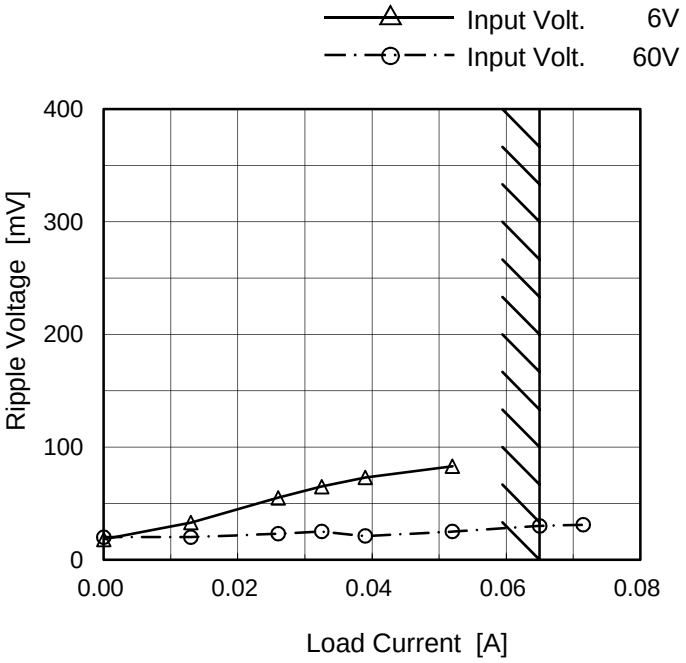
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW1R52412
Item	Ripple-Noise
Object	-12V0.065A

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]

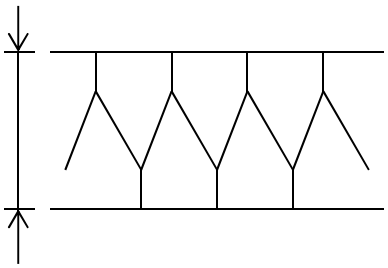


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 6 [V]	Input Volt. 60 [V]
0.000	18	20
0.013	33	20
0.026	55	23
0.033	65	25
0.039	73	21
0.052	83	25
0.065	- ※	30
0.072	- ※	31
--	-	-
--	-	-
--	-	-

+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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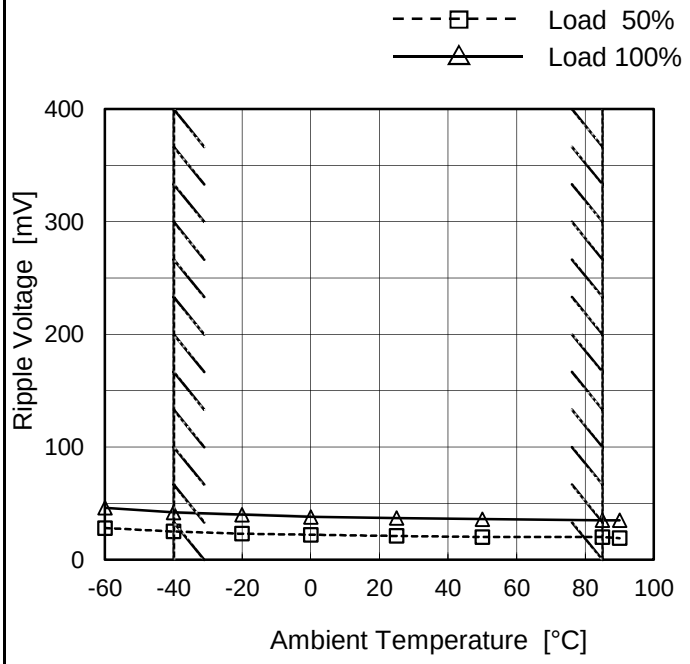
COSEL

Model	MGXW1R52412
Item	Ripple Voltage (by Ambient Temp.)

Testing Circuitry Figure B

Object +12V0.065A

1.Graph



Input Volt. 24V

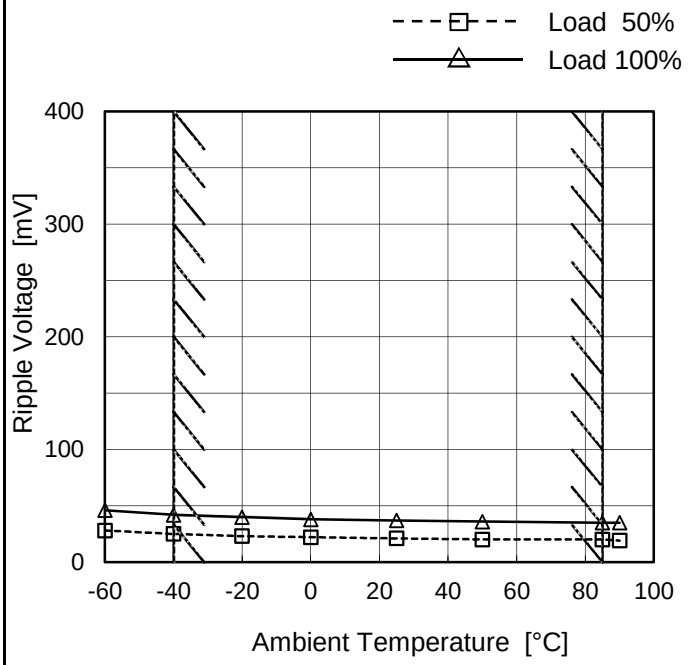
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	28	46
-40	25	42
-20	23	40
0	22	38
25	21	37
50	20	36
85	20	35
90	19	35
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

Object -12V0.065A

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	28	46
-40	25	42
-20	23	40
0	22	38
25	21	37
50	20	36
85	20	35
90	19	35
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

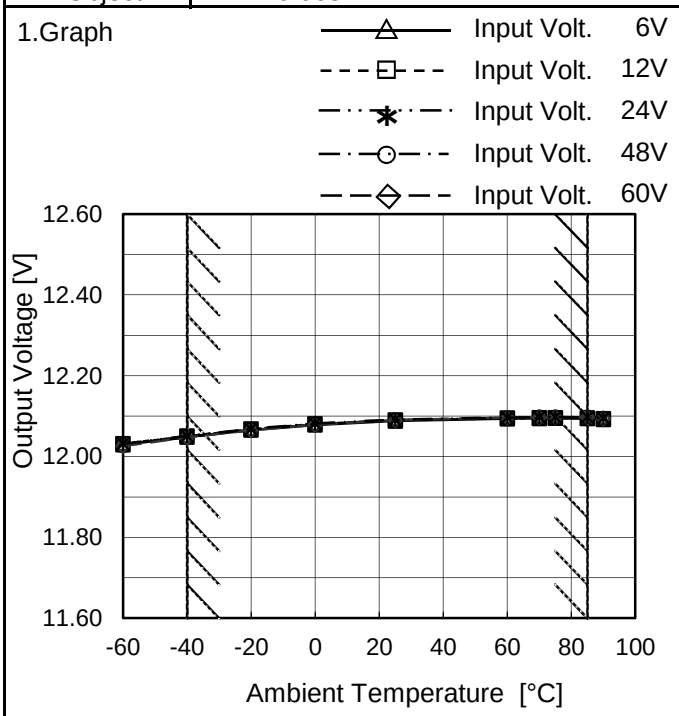
COSEL

Model	MGXW1R52412
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +12V0.065A

1.Graph



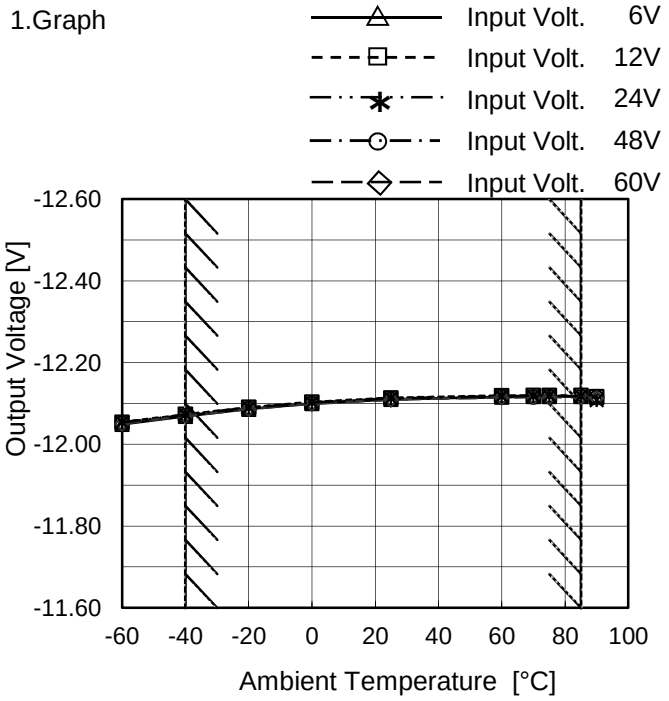
2.Values

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	12.029	12.031	12.031	12.027	12.026
-40	12.048	12.051	12.051	12.048	12.047
-20	12.065	12.068	12.068	12.066	12.065
0	12.078	12.080	12.082	12.079	12.079
25	12.088	12.090	12.091	12.090	12.089
60	12.093	12.095	12.096	12.096	12.096
70	12.094	12.095	12.097	12.097	12.097
75	12.095	12.096	12.097	12.097	12.097
85	12.094	12.095	12.097	12.097	12.097
90	12.092	12.093	12.095	12.094	12.093
--	-	-	-	-	-

-12V: Rated Load Current

Object -12V0.065A

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	-12.049	-12.054	-12.054	-12.051	-12.050
-40	-12.069	-12.074	-12.073	-12.070	-12.070
-20	-12.086	-12.091	-12.090	-12.088	-12.086
0	-12.100	-12.104	-12.103	-12.100	-12.099
25	-12.110	-12.114	-12.113	-12.110	-12.109
60	-12.116	-12.119	-12.118	-12.116	-12.114
70	-12.117	-12.120	-12.118	-12.116	-12.115
75	-12.117	-12.120	-12.119	-12.117	-12.115
85	-12.117	-12.119	-12.118	-12.116	-12.115
90	-12.115	-12.116	-12.108	-12.115	-12.113
--	-	-	-	-	-

+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	MGXW1R52412	
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 - 85°C

Input Voltage : 6 - 60V

Load Current (AVR 1) : 0 - 0.065A (AVR 2) : 0 - 0.065A

* 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	+12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	6	0	12.426	±330	±2.8
Minimum Voltage	85	6	0.046 ※	11.767		

Object	-12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	6	0	-12.458	±330	±2.8
Minimum Voltage	85	6	0.046 ※	-11.799		

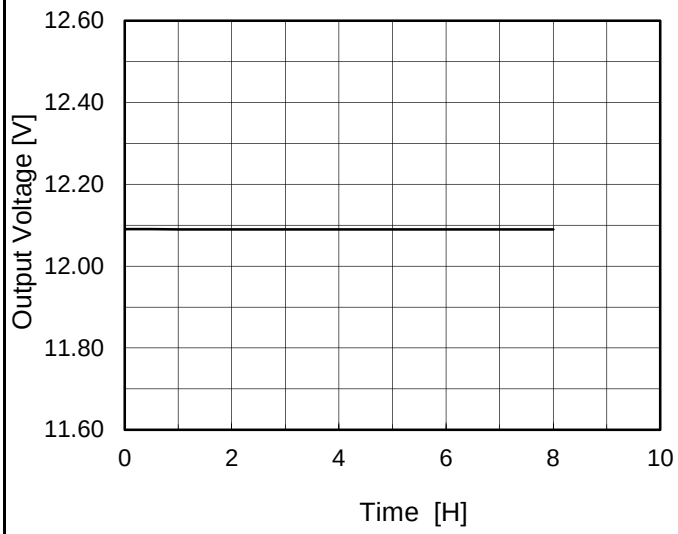
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW1R52412
Item	Time Lapse Drift
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 24V
Load 100%

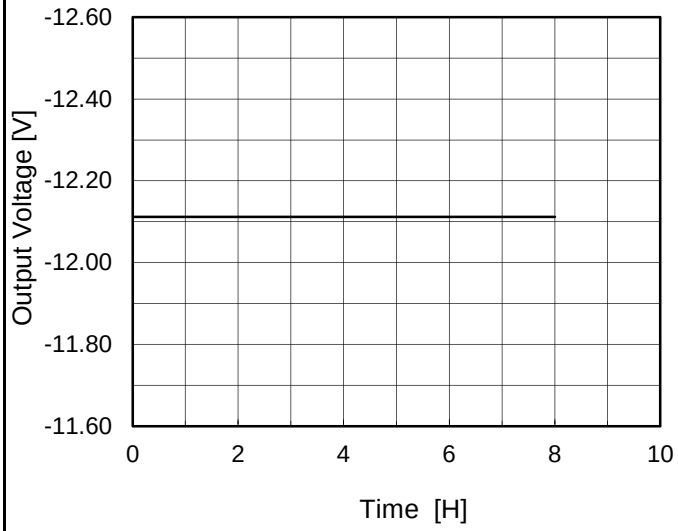
2.Values

Time since start [H]	Output Voltage [V]
0.0	12.088
0.5	12.090
1.0	12.090
2.0	12.090
3.0	12.090
4.0	12.090
5.0	12.090
6.0	12.090
7.0	12.090
8.0	12.090

-12V:Rated Load Current

Object	-12V0.065A

1.Graph



Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.110
0.5	-12.112
1.0	-12.112
2.0	-12.112
3.0	-12.112
4.0	-12.112
5.0	-12.112
6.0	-12.112
7.0	-12.112
8.0	-12.112

+12V:Rated Load Current

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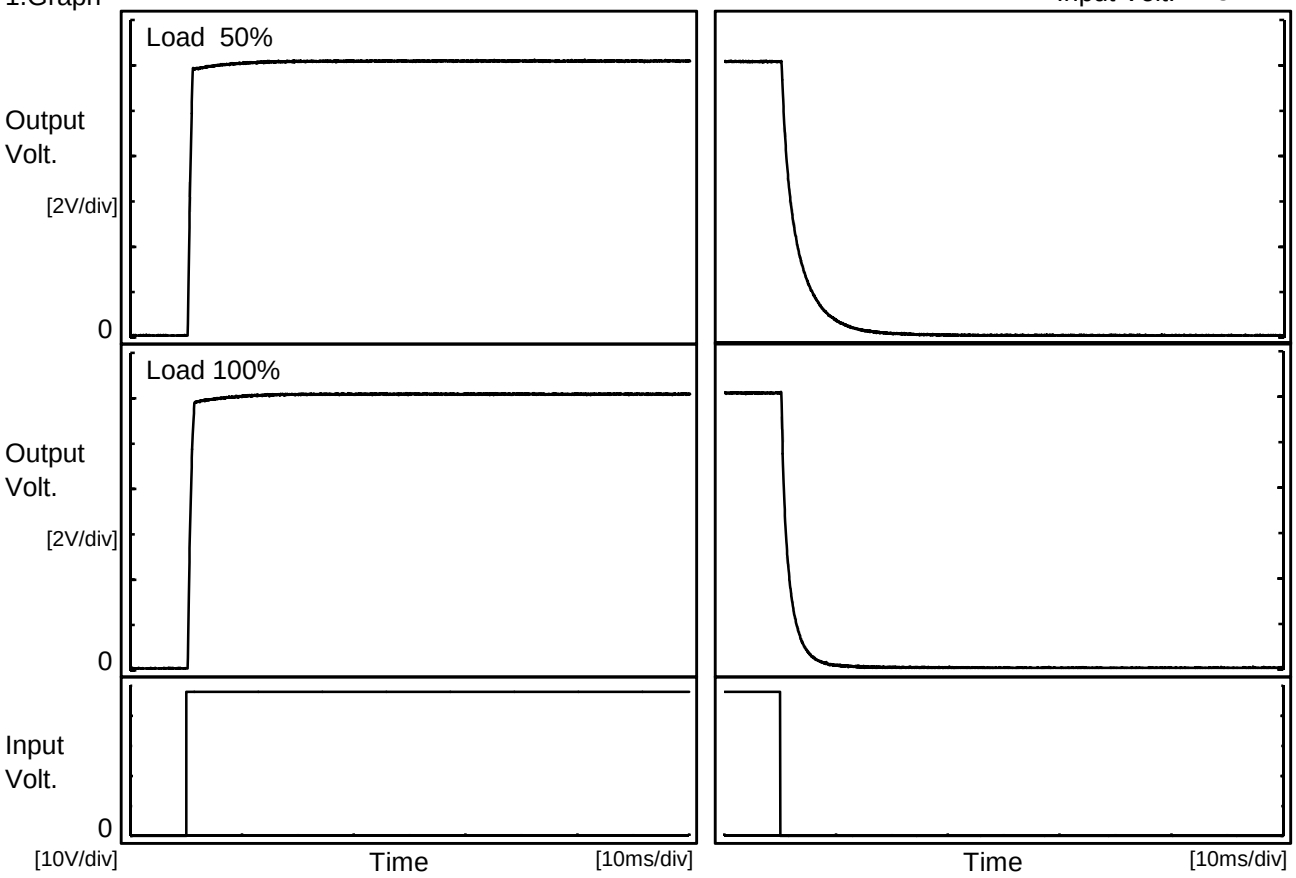
COSEL

Model	MGXW1R52412	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.065A	

1.Graph

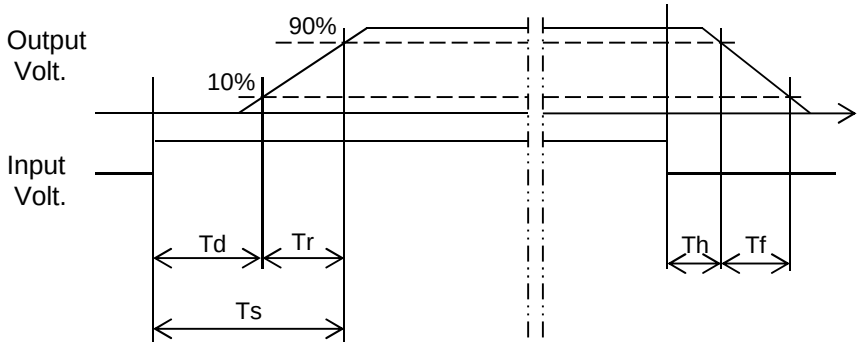
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.4	0.8	1.2	0.4	7.1
100 %	0.4	0.9	1.3	0.3	3.5



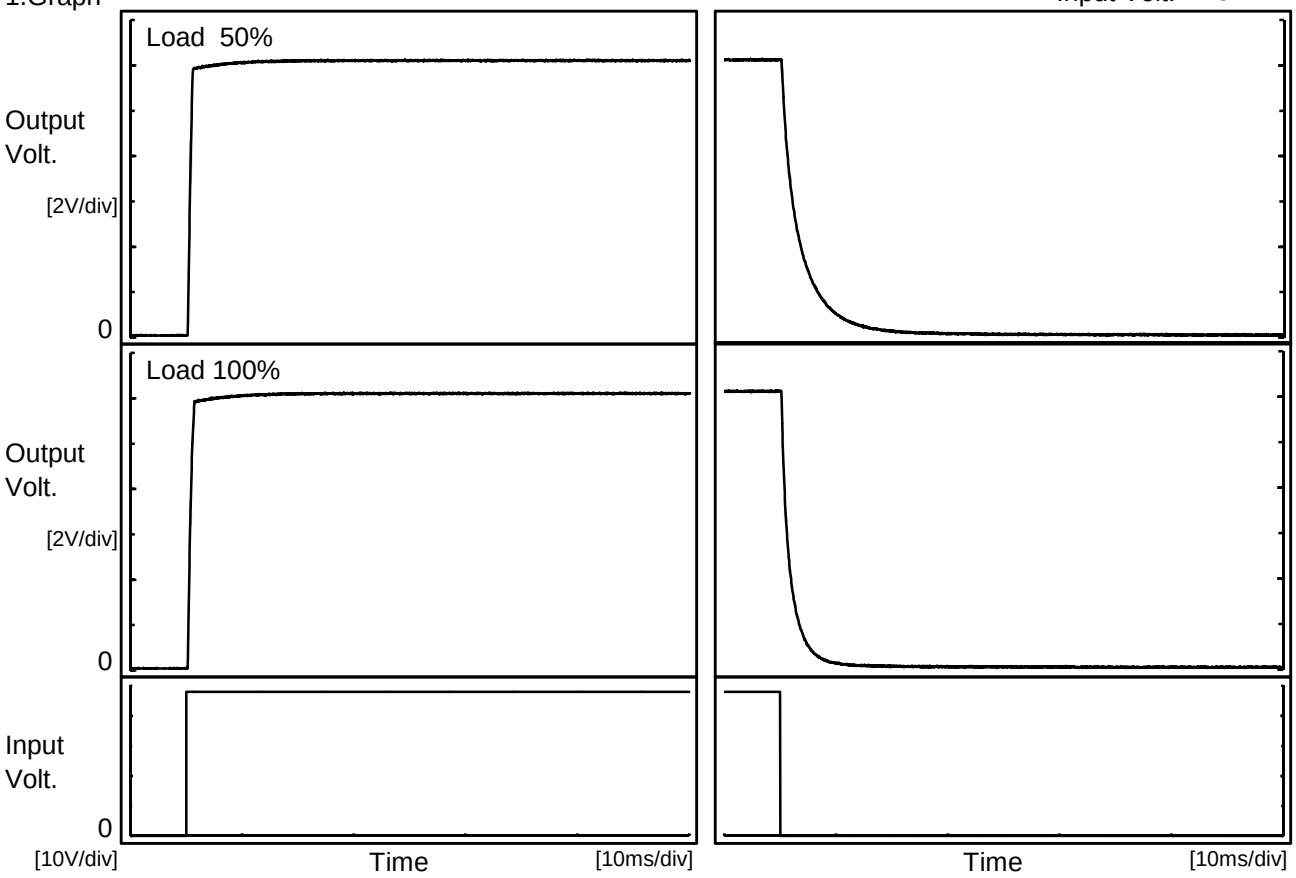
COSEL

Model	MGXW1R52412
Item	Rise and Fall Time
Object	-12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

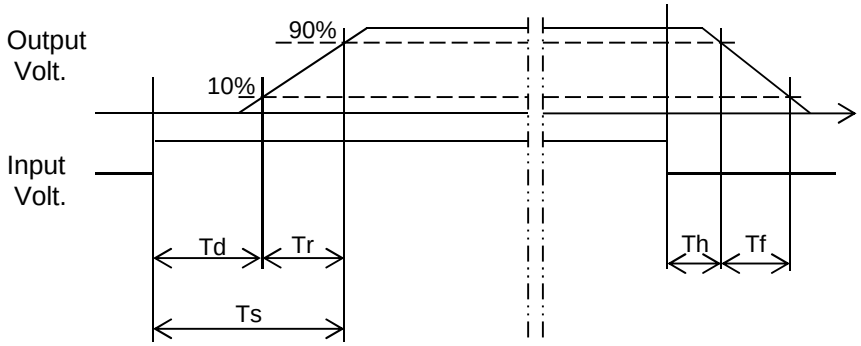
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.4	0.8	1.2	0.5	8.5
100 %	0.4	1.0	1.4	0.3	4.1



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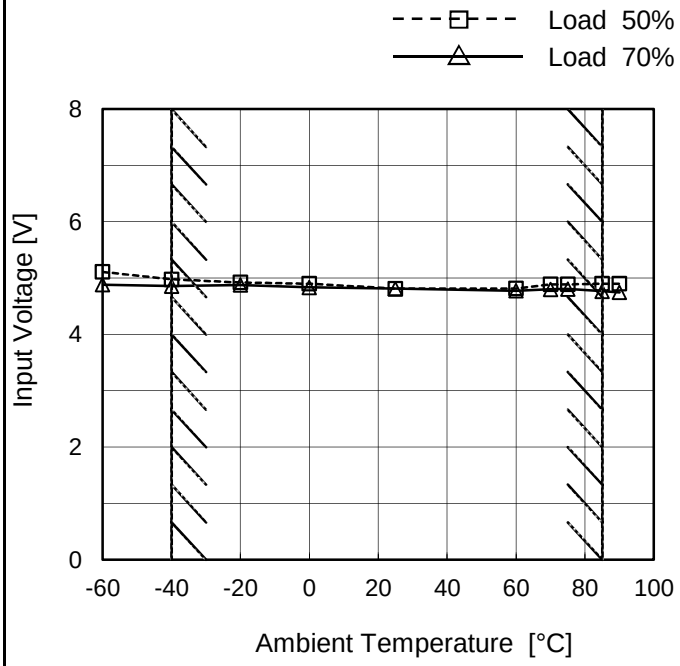
COSEL

Model	MGXW1R52412
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object: +12V0.065A

1.Graph

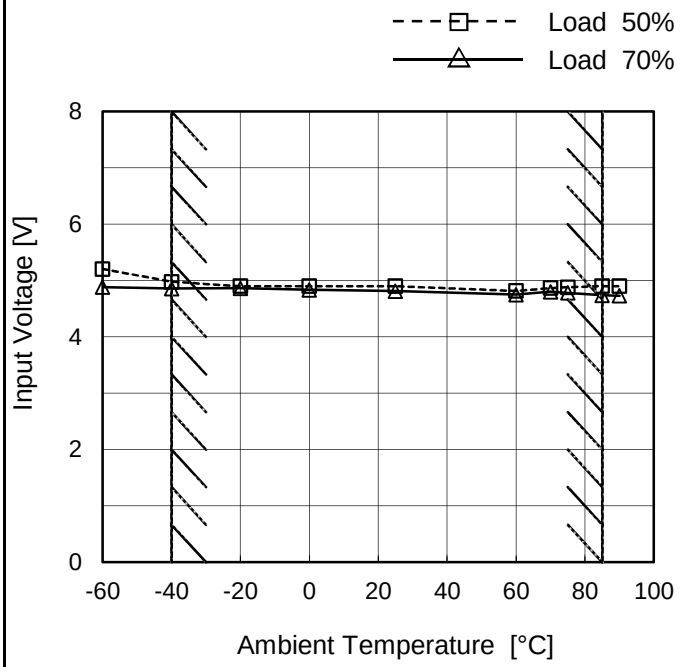


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	5.2	4.9
-40	5.0	4.9
-20	5.0	4.9
0	4.9	4.9
25	4.9	4.9
60	4.9	4.8
70	4.9	4.8
75	4.9	4.8
85	4.9	4.8
90	4.9	4.8
--	-	-

Object: -12V0.065A

1.Graph



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

2.Values

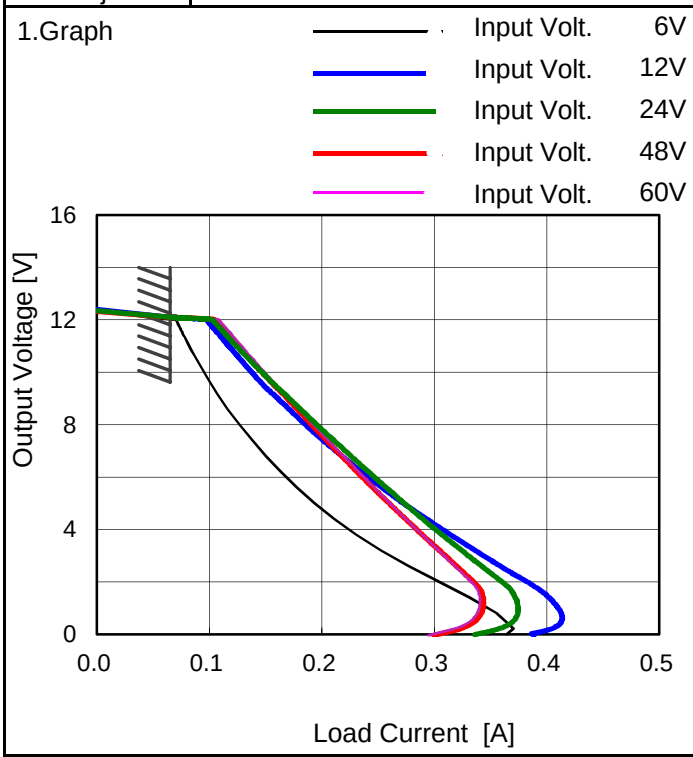
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	5.2	4.9
-40	5.0	4.9
-20	4.9	4.9
0	4.9	4.9
25	4.9	4.9
60	4.9	4.8
70	4.9	4.8
75	4.9	4.8
85	4.9	4.8
90	4.9	4.8
--	-	-

COSEL

Model	MGXW1R52412
Item	Overcurrent Protection
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



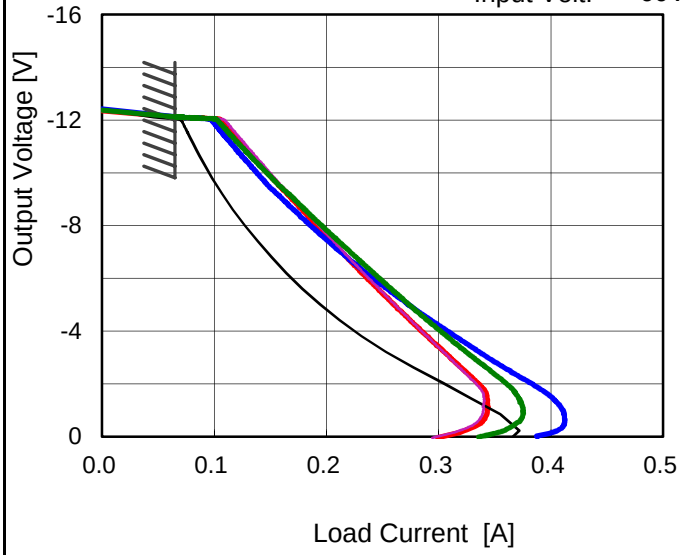
2.Values

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	0.077	0.110	0.115	0.117	0.120
10.8	0.084	0.121	0.128	0.130	0.132
9.6	0.098	0.146	0.156	0.156	0.157
8.4	0.116	0.175	0.185	0.182	0.184
7.2	0.138	0.206	0.215	0.208	0.210
6.0	0.164	0.240	0.246	0.236	0.236
4.8	0.194	0.279	0.279	0.264	0.265
3.6	0.231	0.321	0.312	0.294	0.294
2.4	0.277	0.366	0.348	0.325	0.323
1.2	0.331	0.406	0.373	0.344	0.340
0.0	0.364	0.389	0.336	0.300	0.295
--	-	-	-	-	-

-12V:Rated Load Current

Object	-12V0.065A

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	0.077	0.109	0.116	0.117	0.121
-10.8	0.084	0.121	0.128	0.130	0.133
-9.6	0.098	0.146	0.155	0.156	0.158
-8.4	0.116	0.176	0.185	0.183	0.184
-7.2	0.139	0.207	0.216	0.208	0.210
-6.0	0.164	0.240	0.246	0.236	0.237
-4.8	0.194	0.279	0.279	0.265	0.265
-3.6	0.231	0.322	0.313	0.294	0.294
-2.4	0.277	0.367	0.349	0.325	0.323
-1.2	0.329	0.407	0.374	0.343	0.340
0.0	0.366	0.388	0.336	0.299	0.294
--	-	-	-	-	-

+12V:Rated Load Current

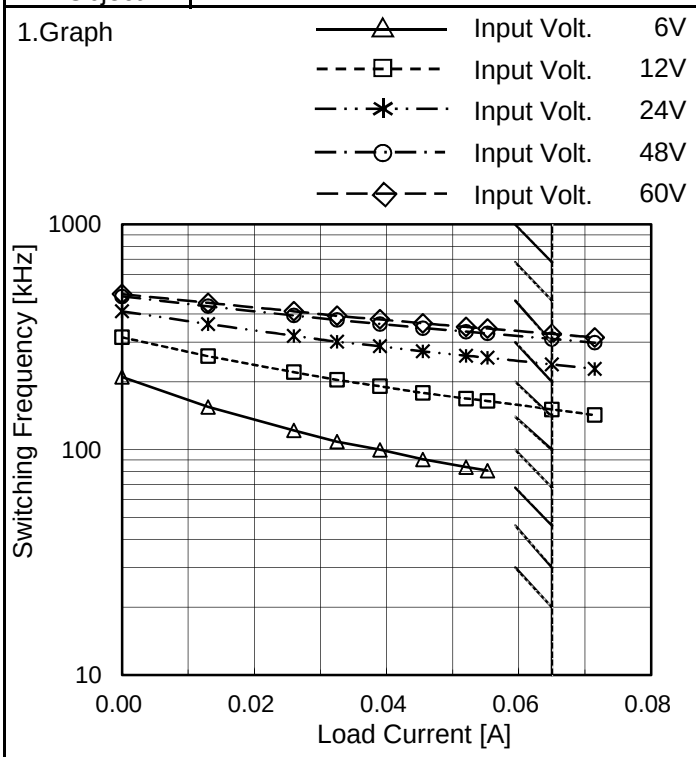
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGXW1R52412
Item	Switching frequency (by Load Current)
Object	+/-12V0.065A

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	210	316	412	479	491
0.013	155	260	361	434	449
0.026	122	221	321	395	412
0.033	109	204	302	377	393
0.039	100	192	288	362	379
0.046	91	179	273	346	364
0.052	84	169	262	334	351
0.055	81	165	256	328	345
0.065	- ※	151	239	310	327
0.072	- ※	143	228	299	315
--	-	-	-	-	-

※ 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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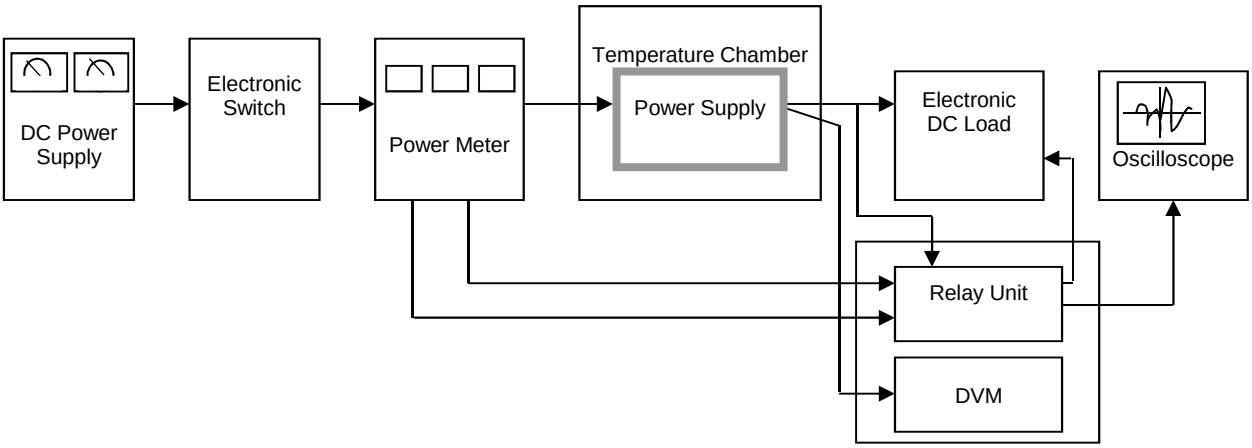

Figure A

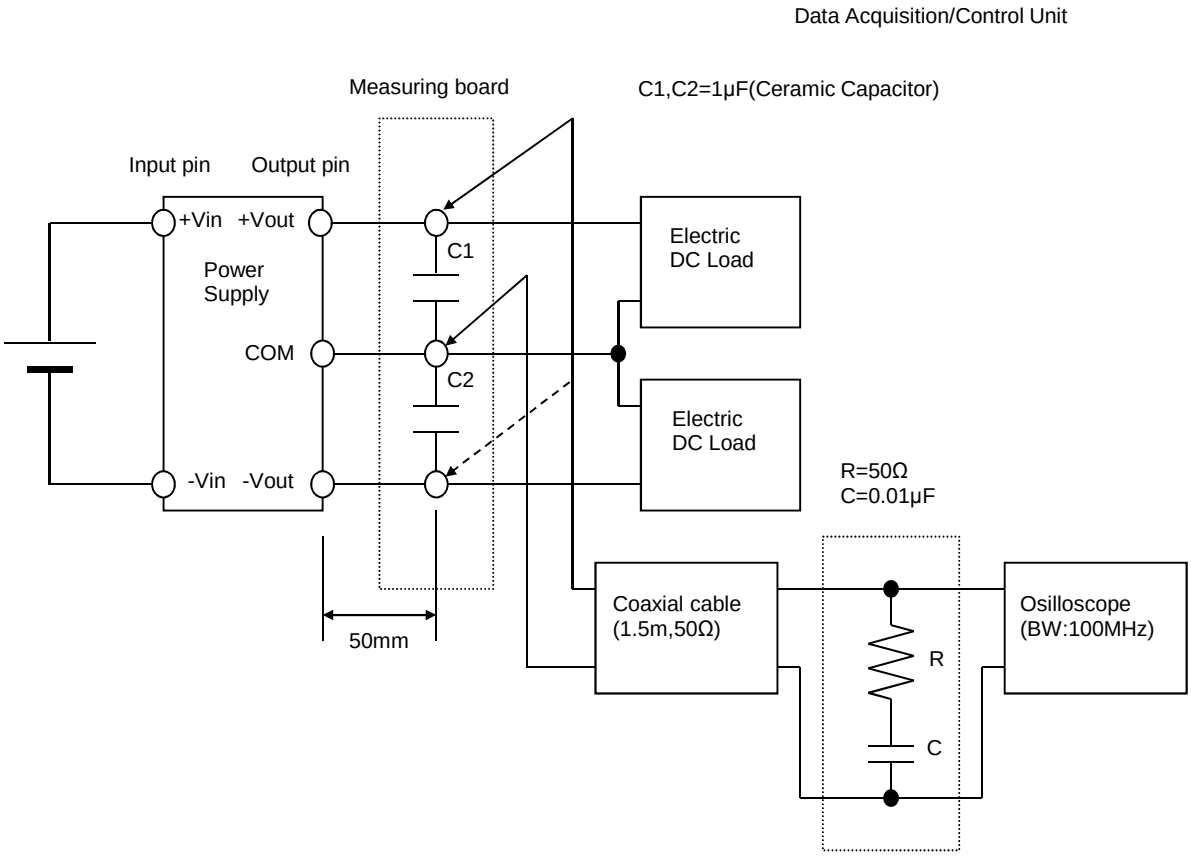

Figure B（Ripple and Ripple noise Characteristic）