参考資料

TEST DATA OF MGFW804812

Regulated DC Power Supply
April 12, 2019

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COSEL CO.,LTD.

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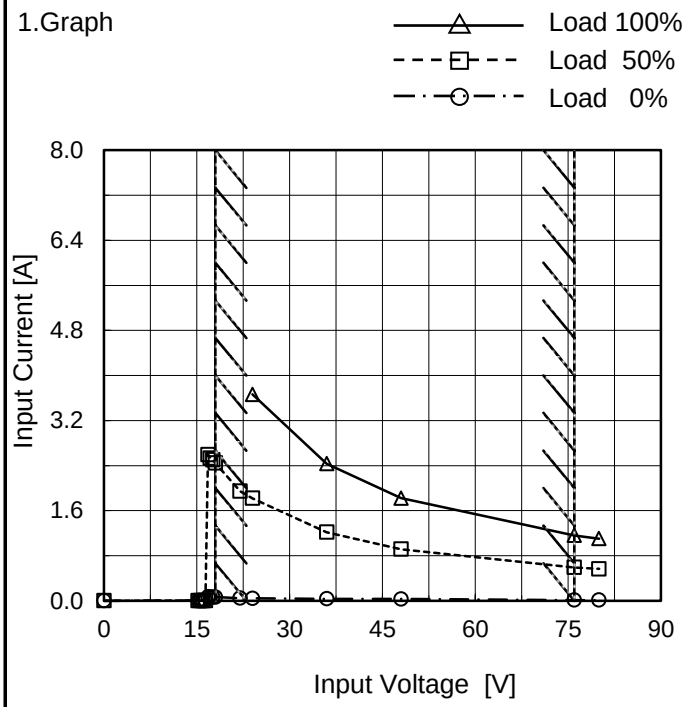
Model	MGFW804812
Item	Input Current (by Input Voltage)
Object	――――――――

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
15.2	0.004	0.004	- ※
15.6	0.004	0.004	- ※
16.0	0.004	0.004	- ※
16.4	0.004	0.004	- ※
16.8	0.068	2.597	- ※
17.2	0.067	2.534	- ※
17.6	0.066	2.504	- ※
18.0	0.065	2.446	- ※
22.0	0.046	1.944	- ※
24.0	0.044	1.819	3.664
36.0	0.035	1.218	2.432
48.0	0.031	0.917	1.821
76.0	0.012	0.592	1.159
80.0	0.012	0.565	1.104
--	-	-	-
--	-	-	-
--	-	-	-

※During this area, overcurrent protection activates and power supply operates in hiccup mode.

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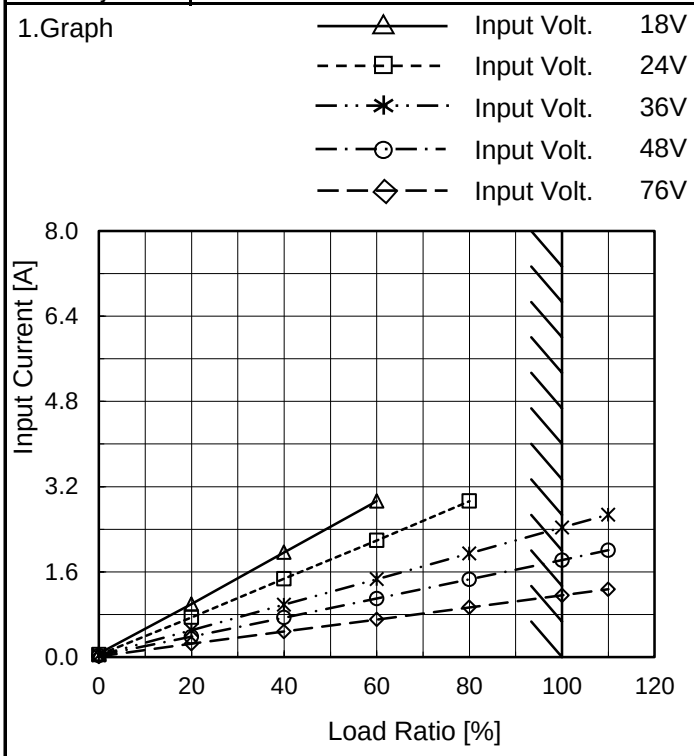
Model	MGFW804812
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Input Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.065	0.044	0.035	0.031	0.012
20	0.996	0.748	0.503	0.383	0.252
40	1.968	1.472	0.986	0.741	0.479
60	2.929	2.190	1.463	1.100	0.707
80	- ※1	2.928	1.945	1.460	0.932
100	- ※1	- ※2	2.432	1.821	1.159
110	- ※1	- ※2	2.674	2.005	1.272
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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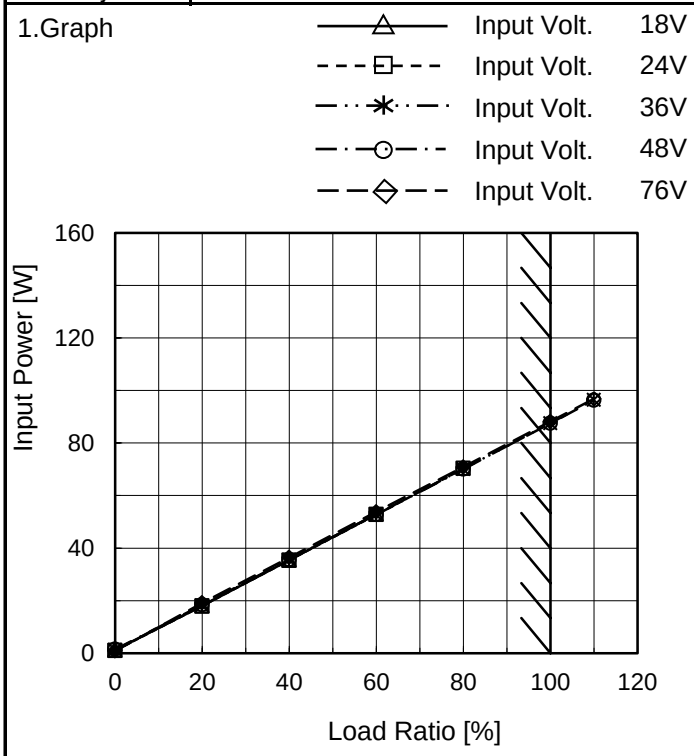
Model	MGFW804812
Item	Input Power (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Input Power [W]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	1.18	1.07	1.25	1.46	0.88
20	17.97	18.01	18.15	18.40	19.16
40	35.43	35.40	35.50	35.63	36.44
60	52.95	52.76	52.71	52.84	53.78
80	- ※1	70.33	70.09	70.14	70.89
100	- ※1	- ※2	87.58	87.52	88.13
110	- ※1	- ※2	96.45	96.31	96.81
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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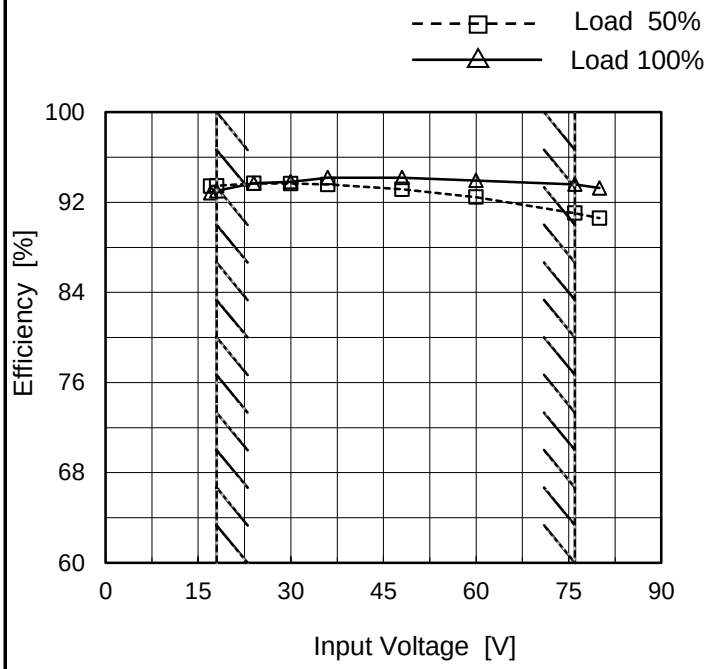
Model	MGFW804812
Item	Efficiency (by Input Voltage)
Object	――――――――――

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	93.4	92.8 ※1
18	93.5	93.0 ※1
24	93.7	93.7 ※2
30	93.7	93.8
36	93.6	94.2
48	93.2	94.2
60	92.5	93.9
76	91.0	93.6
80	90.6	93.3

※1:Load 70%
※2:Load 80%

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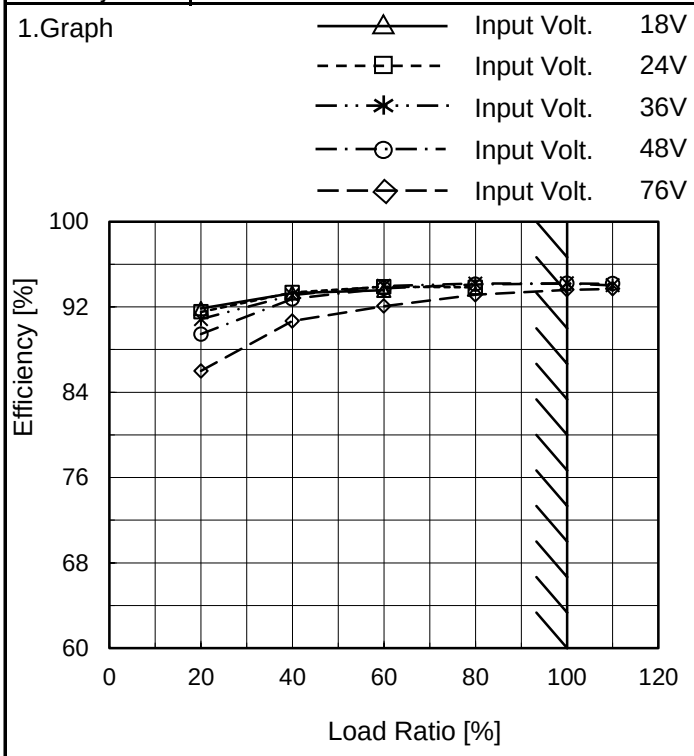
Model	MGFW804812
Item	Efficiency (by Load Current)
Object	————————

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	91.8	91.5	90.9	89.4	86.0
40	93.3	93.3	93.1	92.7	90.7
60	93.6	93.9	94.0	93.7	92.1
80	- ※1	93.8	94.2	94.1	93.1
100	- ※1	- ※2	94.2	94.2	93.6
110	- ※1	- ※2	94.0	94.2	93.7
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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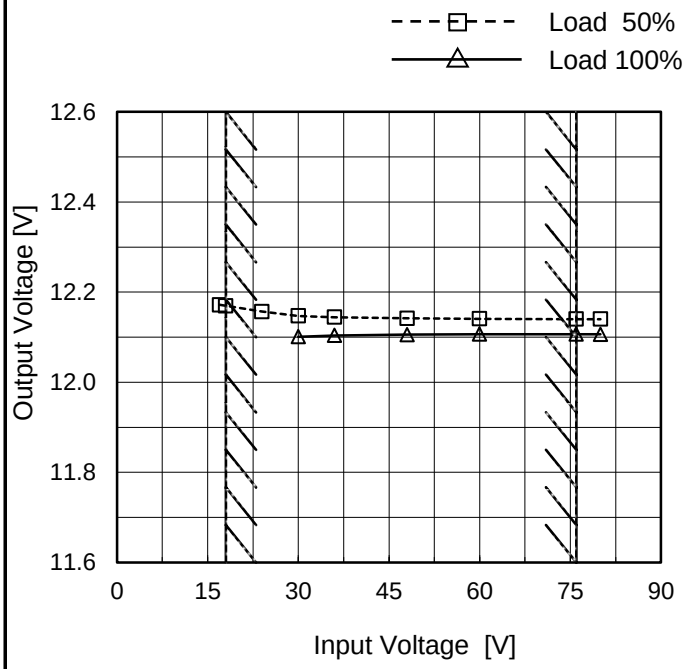
Model	MGFW804812
Item	Line Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +12V3.4A

1.Graph



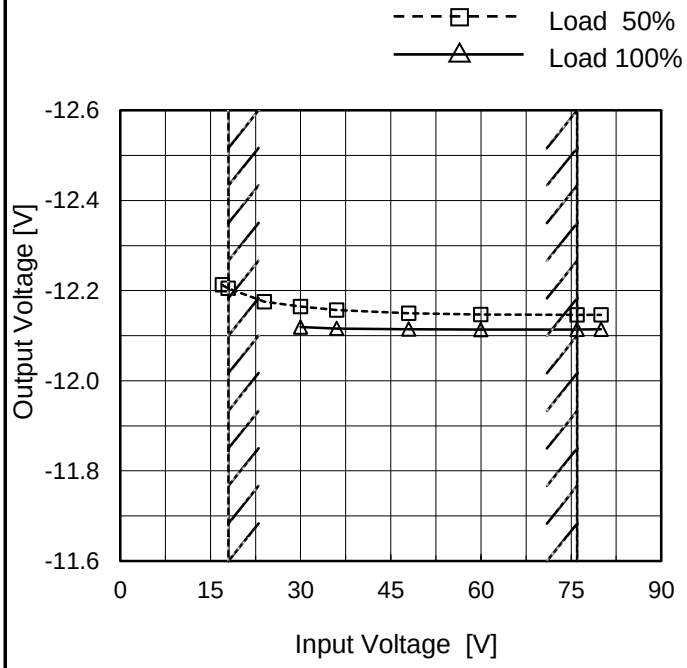
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	12.172	- ※1
18	12.170	- ※1
24	12.157	- ※2
30	12.147	12.101
36	12.144	12.104
48	12.142	12.106
60	12.141	12.107
76	12.140	12.107
80	12.140	12.106

-12V: Rated Load Current

Object -12V3.4A

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	-12.213	- ※1
18	-12.205	- ※1
24	-12.175	- ※2
30	-12.165	-12.119
36	-12.157	-12.116
48	-12.150	-12.115
60	-12.147	-12.113
76	-12.146	-12.114
80	-12.146	-12.114

+12V: Rated Load Current

※1 Maximum output current at minimum input Voltage is 70% of rated load current.

※2 Maximum output current at V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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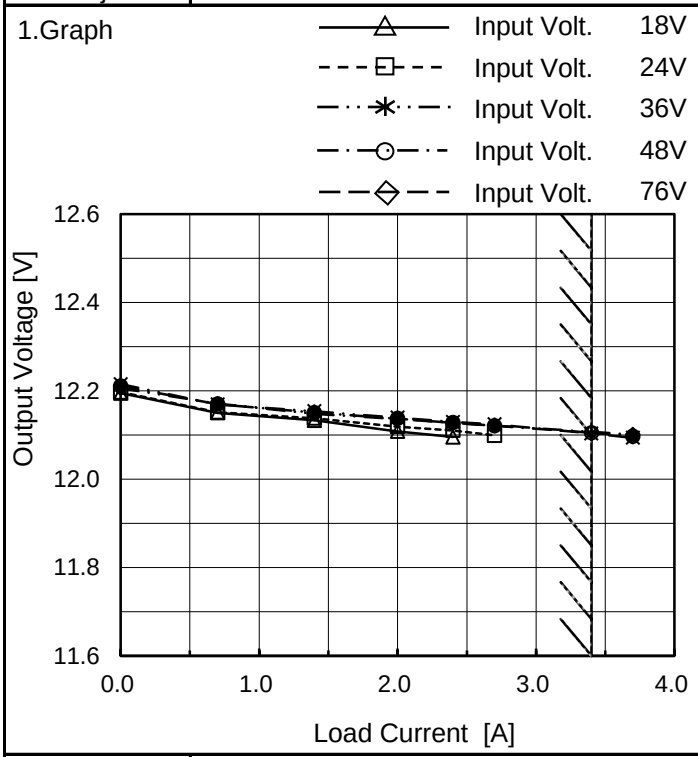
Model	MGFW804812
Item	Load Regulation
Object	+12V3.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



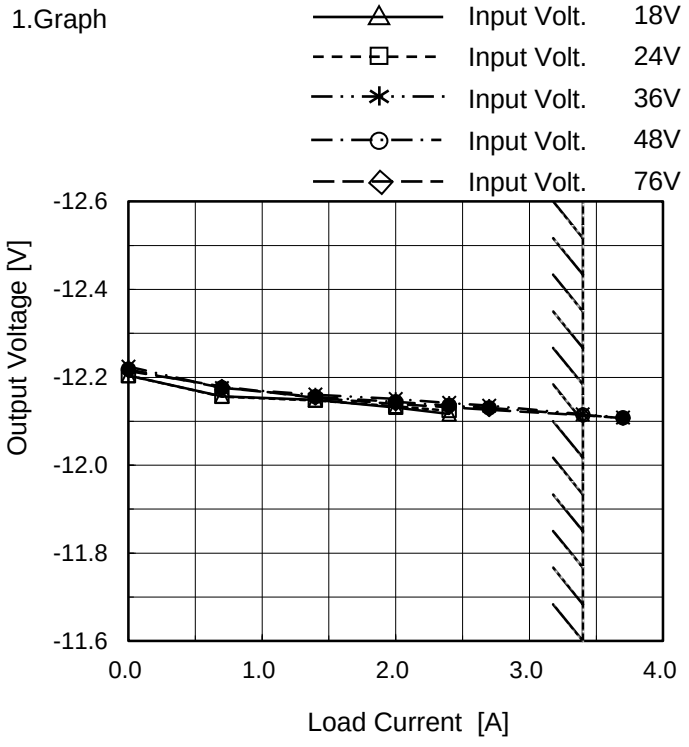
2.Values

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]
0.0	12.195	12.197	12.215	12.211	12.206
0.7	12.150	12.152	12.169	12.170	12.171
1.4	12.133	12.138	12.154	12.151	12.148
2.0	12.108	12.119	12.139	12.137	12.137
2.4	12.096	12.110	12.130	12.128	12.128
2.7	- ※1	12.099	12.124	12.121	12.121
3.4	- ※1	- ※2	12.104	12.105	12.107
3.7	- ※1	- ※2	12.094	12.097	12.101
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-12V: Rated Load Current

Object	-12V3.4A

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]
0.0	-12.204	-12.204	-12.224	-12.218	-12.215
0.7	-12.157	-12.156	-12.175	-12.176	-12.179
1.4	-12.148	-12.147	-12.161	-12.156	-12.153
2.0	-12.132	-12.134	-12.151	-12.144	-12.140
2.4	-12.116	-12.124	-12.142	-12.136	-12.132
2.7	- ※1	-12.113	-12.135	-12.130	-12.126
3.4	- ※1	- ※2	-12.116	-12.115	-12.114
3.7	- ※1	- ※2	-12.108	-12.107	-12.107
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+12V: Rated Load Current

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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Model	MGFW804812
Item	Dynamic Load Response
Object	+12V3.4A

Temperature 25°C
Testing Circuitry Figure A

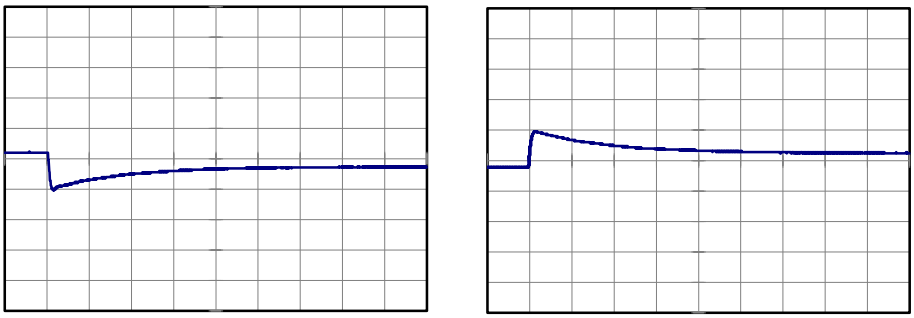
Input Volt. 48 V
-12V:rated load current.
Cycle 100 ms

t1,t2 = 100 μ s

Load Current

t1 t2

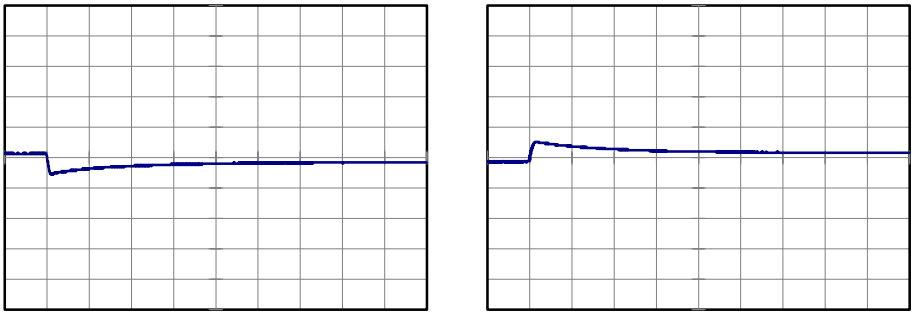
Min.Load (0A)←→
Load 100% (3.4A)



200 mV/div

2 ms/div 2 ms/div

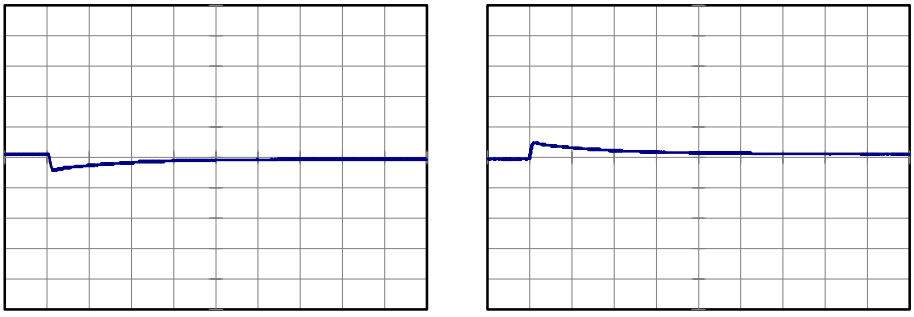
Min.Load (0A)←→
Load 50% (1.7A)



200 mV/div

2 ms/div 2 ms/div

Load 50% (1.7A)←→
Load 100% (3.4A)



200 mV/div

2 ms/div 2 ms/div

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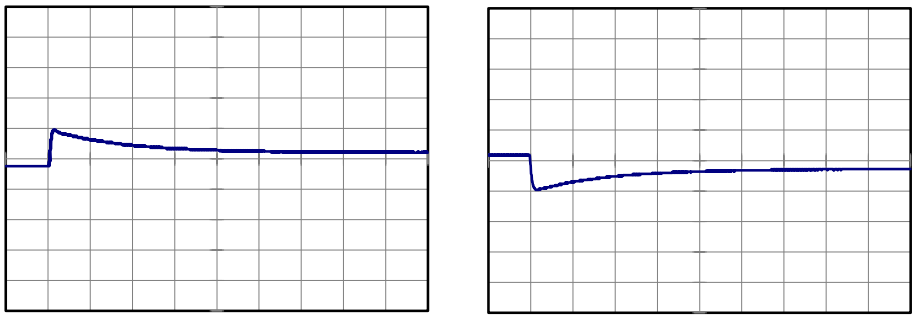
Model	MGFW804812	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-12V3.4A	

Input Volt. 48 V

+12V:rated load current.

Cycle 100 ms

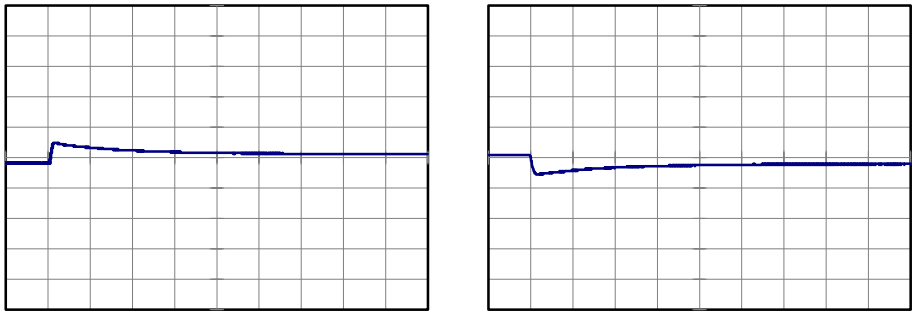
Min.Load (0A)←→
Load 100% (3.4A)



200 mV/div

2 ms/div 2 ms/div

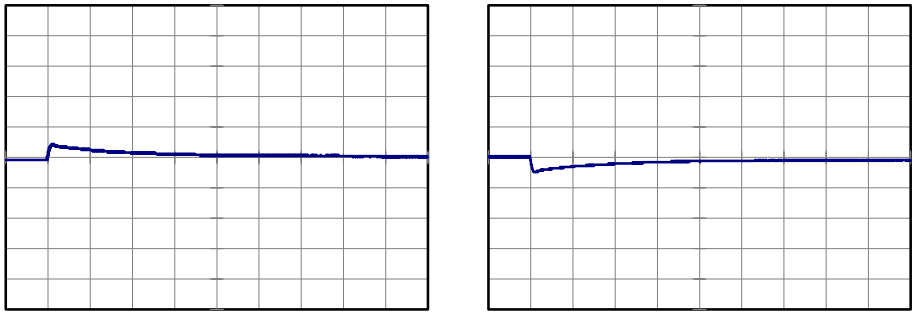
Min.Load (0A)←→
Load 50% (1.7A)



200 mV/div

2 ms/div 2 ms/div

Load 50% (1.7A)←→
Load 100% (3.4A)



200 mV/div

2 ms/div 2 ms/div

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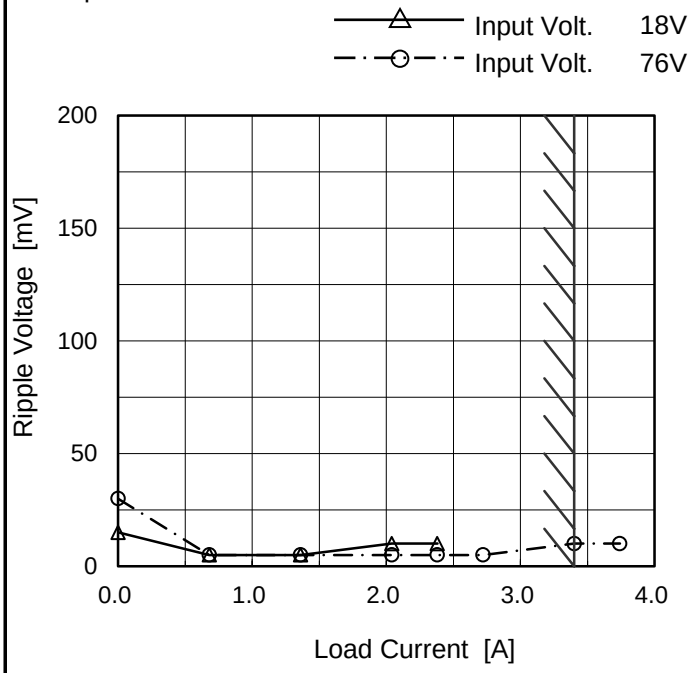
Model	MGFW804812
Item	Ripple Voltage (by Load Current)
Object	+12V3.4A

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]

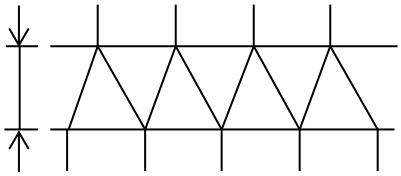


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	30
0.7	5	5
1.4	5	5
2.0	10	5
2.4	10	5
2.7	- ※	5
3.4	- ※	10
3.7	- ※	10
--	-	-
--	-	-
--	-	-

-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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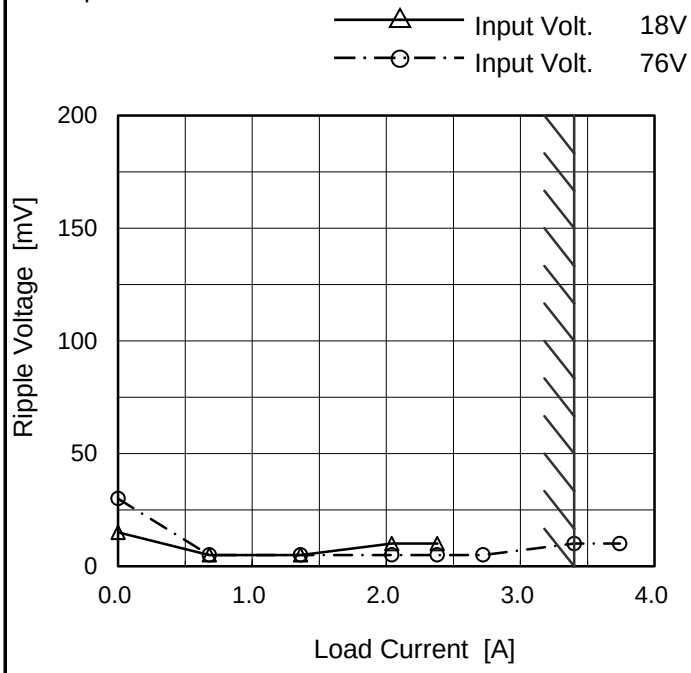
Model	MGFW804812
Item	Ripple Voltage (by Load Current)
Object	-12V3.4A

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]

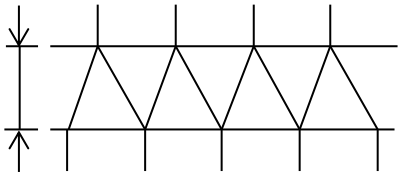


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	30
0.7	5	5
1.4	5	5
2.0	10	5
2.4	10	5
2.7	- ※	5
3.4	- ※	10
3.7	- ※	10
--	-	-
--	-	-
--	-	-

+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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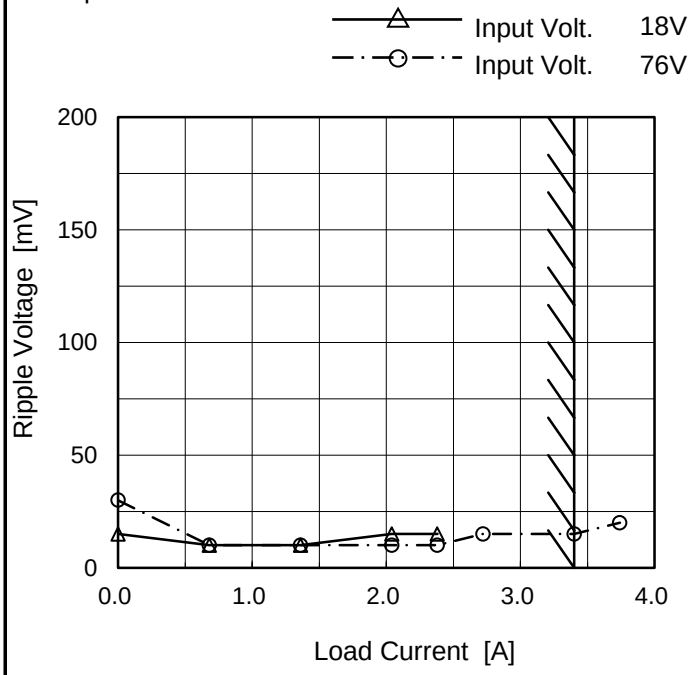
Model	MGFW804812
Item	Ripple-Noise
Object	+12V3.4A

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]

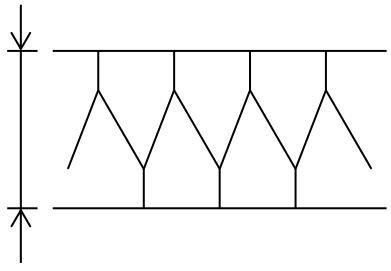


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	30
0.7	10	10
1.4	10	10
2.0	15	10
2.4	15	10
2.7	- ※	15
3.4	- ※	15
3.7	- ※	20
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

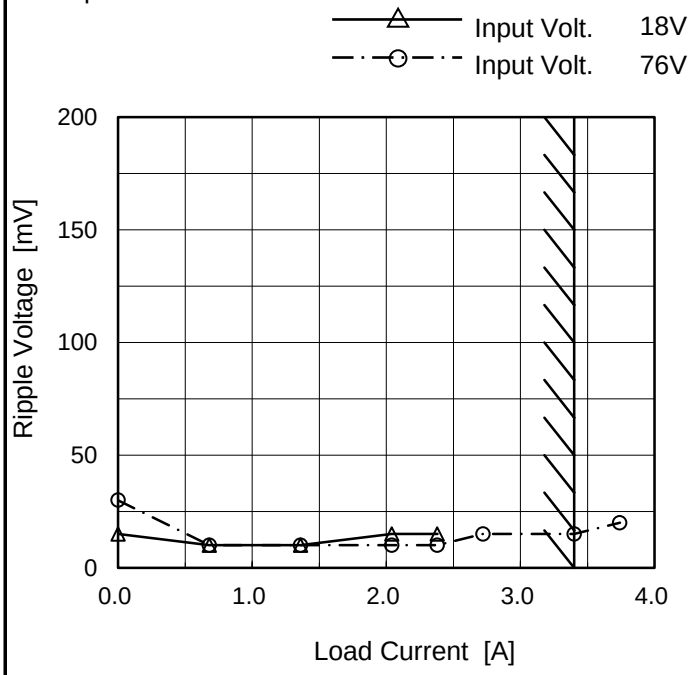
※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.

COSEL

Model	MGFW804812
Item	Ripple-Noise
Object	-12V3.4A

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]

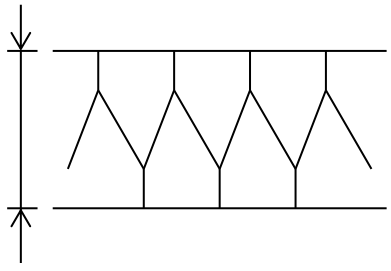


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	30
0.7	10	10
1.4	10	10
2.0	15	10
2.4	15	10
2.7	- ※	15
3.4	- ※	15
3.7	- ※	20
--	-	-
--	-	-
--	-	-

+12V: Rated Load Current

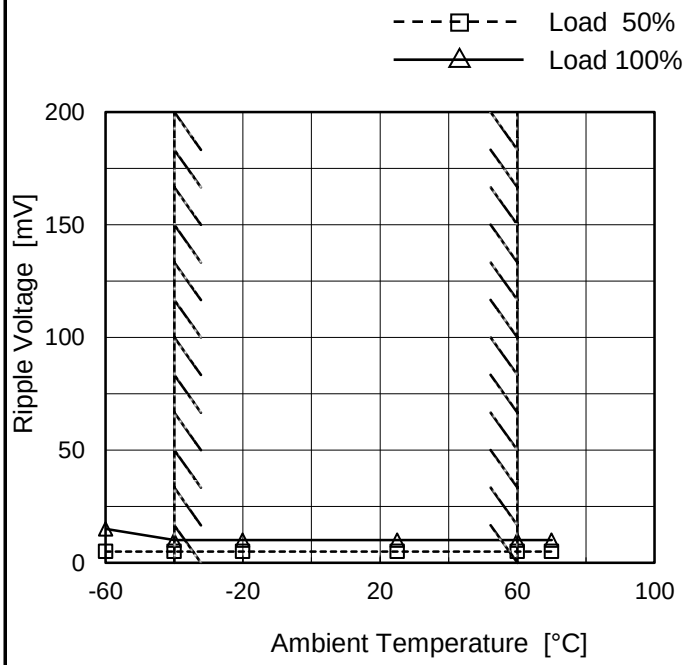
※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.

COSEL

Model	MGFW804812
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V3.4A

Testing Circuitry Figure B

1.Graph



Input Volt. 48V

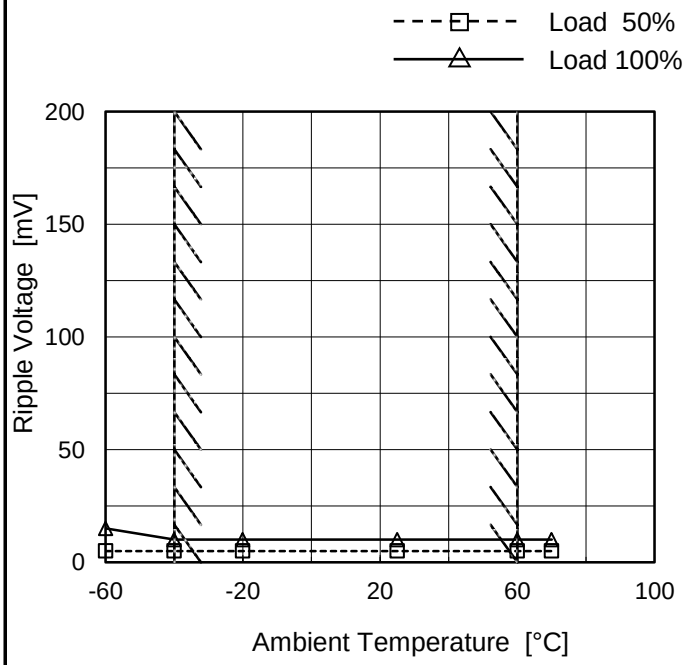
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	15
-40	5	10
-20	5	10
25	5	10
60	5	10
70	5	10
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

Object	-12V3.4A

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	15
-40	5	10
-20	5	10
25	5	10
60	5	10
70	5	10
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

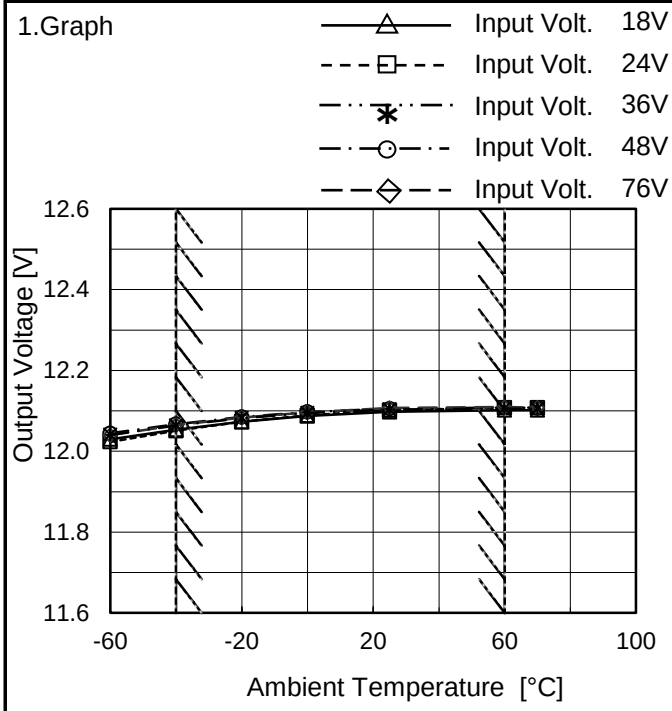
+12V: Rated Load Current

COSEL

Model	MGFW804812
Item	Ambient Temperature Drift
Object	+12V3.4A

Testing Circuitry Figure A

1.Graph

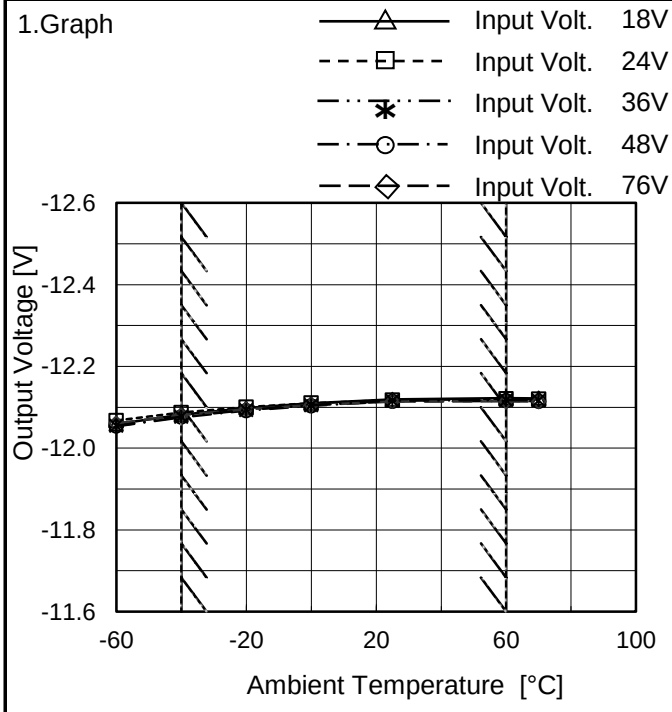


2.Values

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	12.030	12.023	12.041	12.044	12.040
-40	12.054	12.051	12.064	12.067	12.064
-20	12.073	12.073	12.082	12.085	12.083
0	12.087	12.089	12.095	12.097	12.096
25	12.098	12.101	12.104	12.105	12.107
60	12.102	12.108	12.106	12.108	12.109
70	12.102	12.108	12.105	12.107	12.108
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Object	-12V3.4A

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	-12.059	-12.068	-12.055	-12.054	-12.061
-40	-12.082	-12.087	-12.077	-12.076	-12.081
-20	-12.099	-12.101	-12.093	-12.092	-12.095
0	-12.110	-12.110	-12.105	-12.104	-12.105
25	-12.119	-12.118	-12.116	-12.115	-12.114
60	-12.123	-12.120	-12.118	-12.116	-12.114
70	-12.122	-12.120	-12.117	-12.115	-12.114
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of input Volt.18V, Load 70%.
24V, Load 80%.
Other case Load 100%.

Model	MGFW804812	
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 - 60°C

Input Voltage : 18 - 76V

Load Current (AVR 1) : 0 - 3.4A (AVR 2) : 0 - 3.4A

* 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	+12V3.4A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	18	0	12.234	±92	±0.8
Minimum Voltage	-40	24	2.7	12.051		

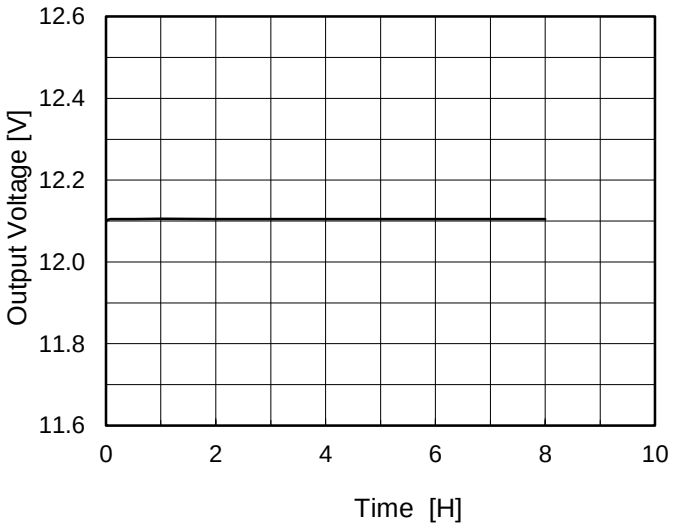
Object	-12V3.4A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	36	0	-12.238	±81	±0.7
Minimum Voltage	-40	48	3.4	-12.076		

COSEL

Model	MGFW804812
Item	Time Lapse Drift
Object	+12V3.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 48V
Load 100%

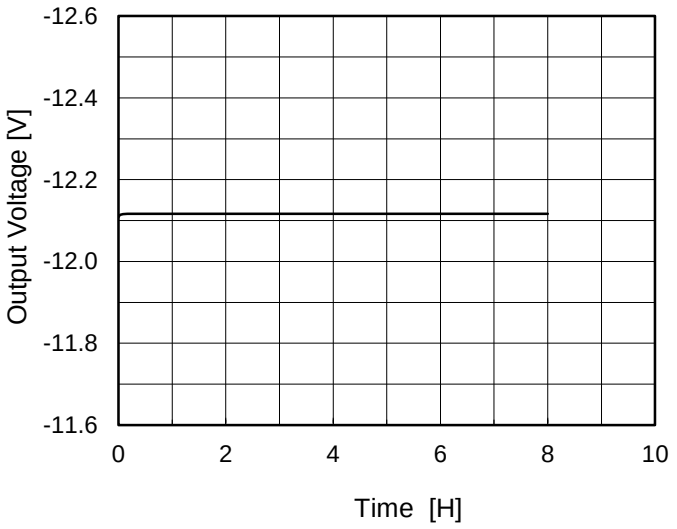
2.Values

Time since start [H]	Output Voltage [V]
0.0	12.099
0.5	12.105
1.0	12.105
2.0	12.105
3.0	12.105
4.0	12.105
5.0	12.105
6.0	12.105
7.0	12.105
8.0	12.105

-12V: Rated Load Current

Object	-12V3.4A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.109
0.5	-12.116
1.0	-12.116
2.0	-12.116
3.0	-12.116
4.0	-12.117
5.0	-12.117
6.0	-12.117
7.0	-12.117
8.0	-12.117

+12V: Rated Load Current

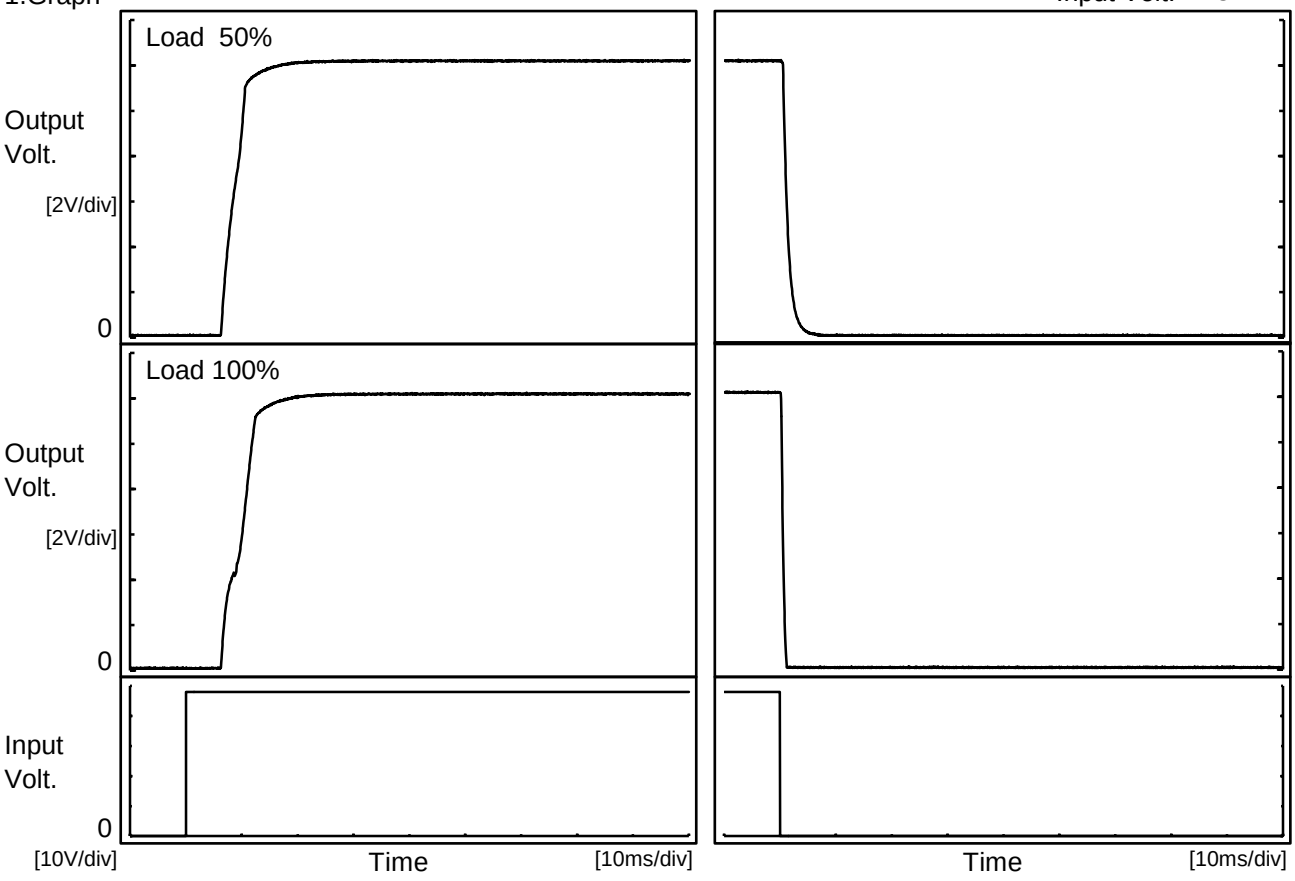
COSEL

Model	MGFW804812
Item	Rise and Fall Time
Object	+12V3.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

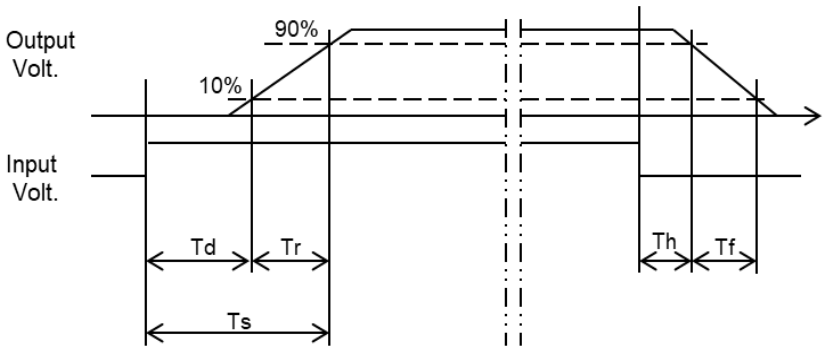
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.6	4.0	10.6	0.6	2.0
100 %	6.6	5.7	12.3	0.3	0.7



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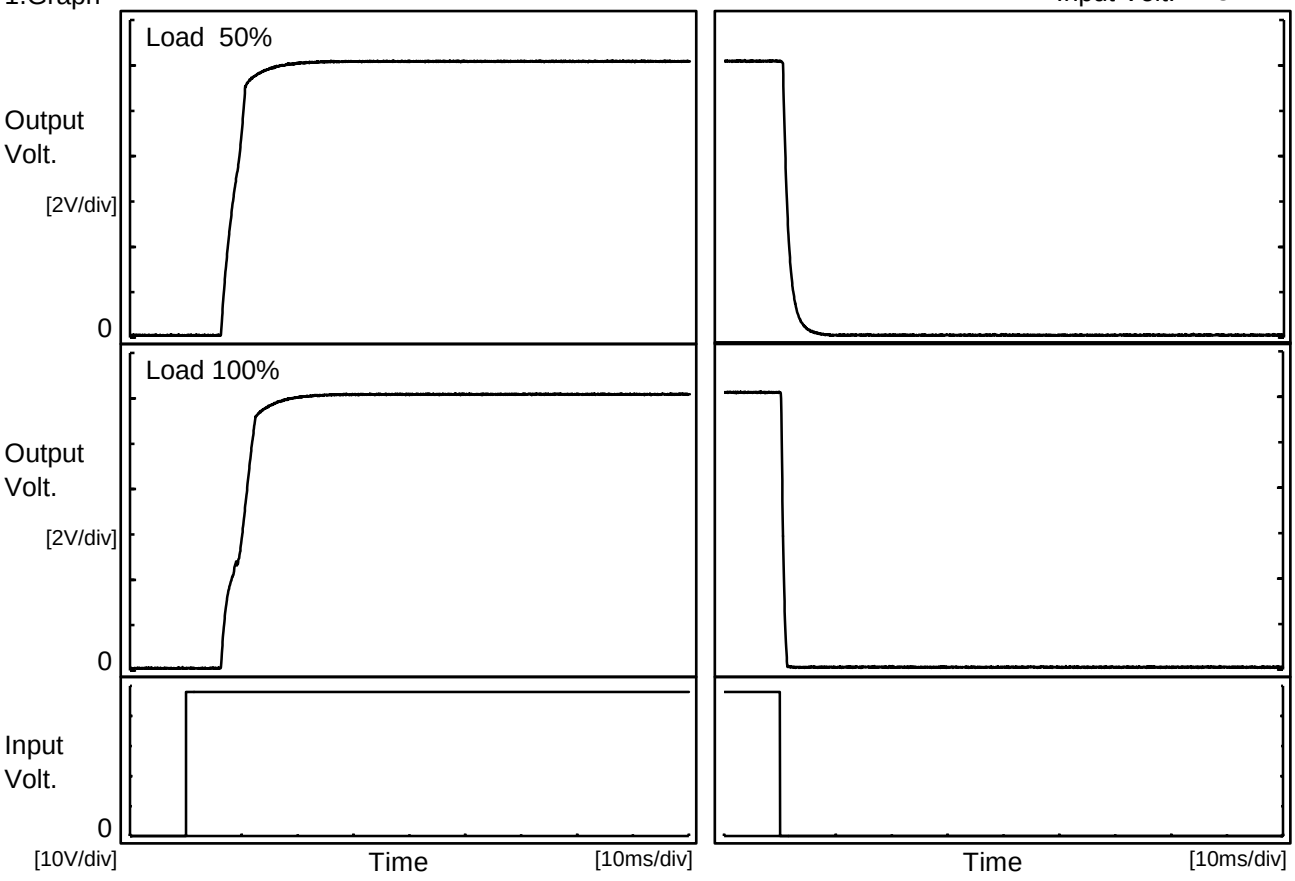
COSEL

Model	MGFW804812	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	-12V3.4A	

1.Graph

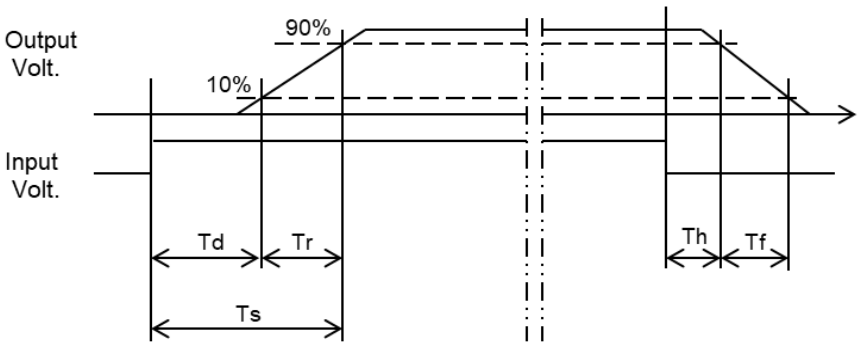
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.6	4.0	10.6	0.6	2.3
100 %	6.6	5.7	12.3	0.3	0.8

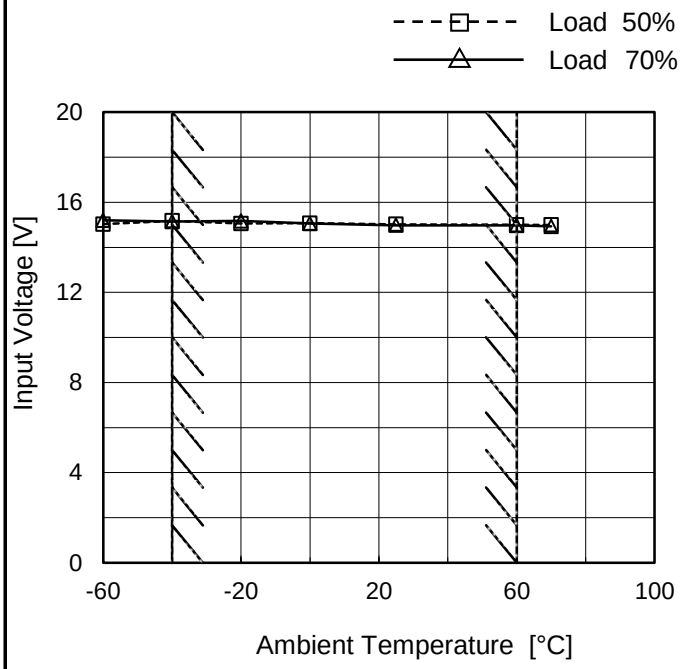


COSEL

Model	MGFW804812
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V2.38A

Testing Circuitry Figure A

1.Graph

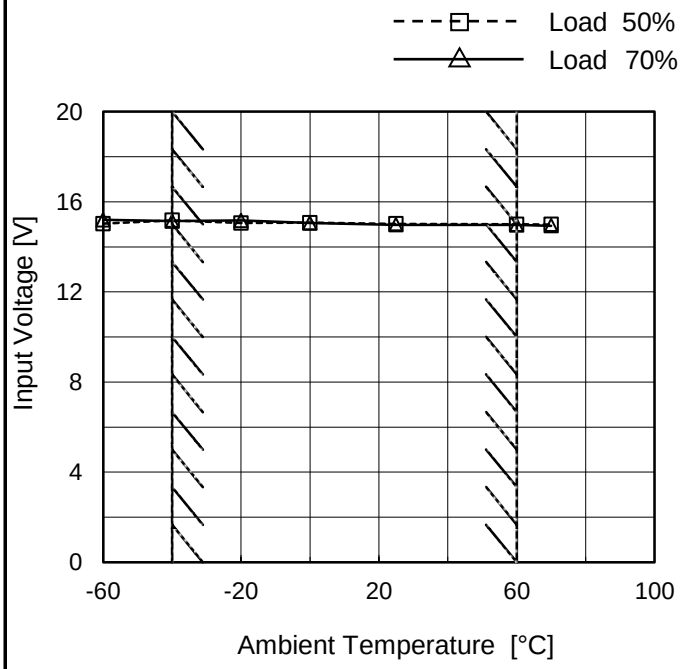


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	15.1	15.2
-40	15.2	15.2
-20	15.1	15.2
0	15.1	15.1
25	15.1	15.0
60	15.0	15.0
70	15.0	15.0
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V2.38A

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	15.1	15.2
-40	15.2	15.2
-20	15.1	15.2
0	15.1	15.1
25	15.1	15.0
60	15.0	15.0
70	15.0	15.0
--	-	-
--	-	-
--	-	-
--	-	-

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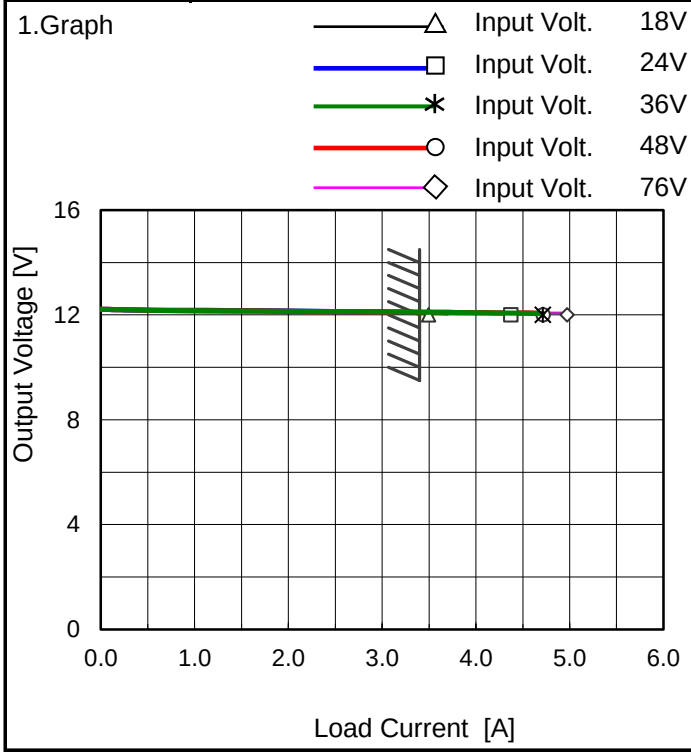
COSEL

Model	MGFW804812
Item	Overcurrent Protection
Object	+12V3.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



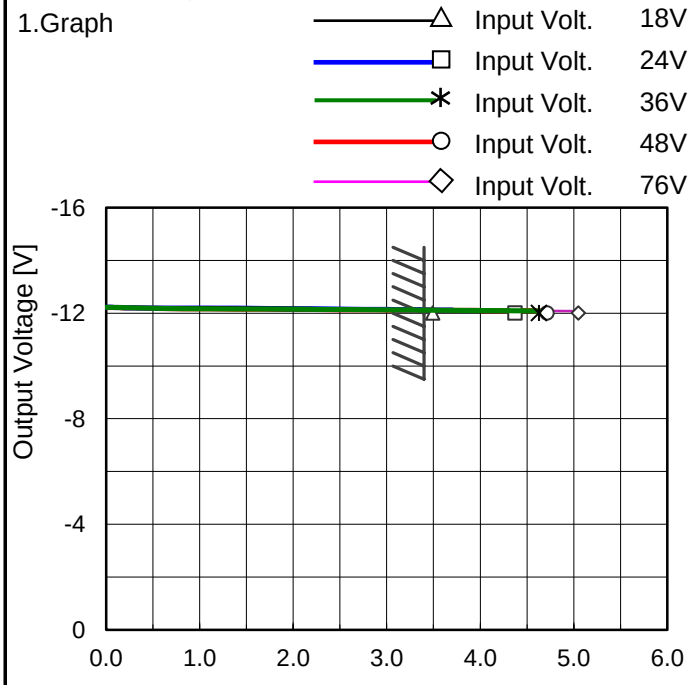
2.Values

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]
12.0	3.495	4.373	4.714	4.718	4.974
11.4	- ※1	- ※2	-	-	-
10.8	-	-	-	-	-
9.6	-	-	-	-	-
8.4	-	-	-	-	-
7.2	-	-	-	-	-
6.0	-	-	-	-	-
4.8	-	-	-	-	-
3.6	-	-	-	-	-
0.0	-	-	-	-	-

-12V: Rated Load Current

Object	-12V3.4A

1.Graph



Note: Slanted line shows the range of the rated load current.
Intermittent operation occurs when overcurrent protection is activated.

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]
-12.0	3.495	4.373	4.630	4.716	5.052
-11.4	- ※1	- ※2	-	-	-
-10.8	-	-	-	-	-
-9.6	-	-	-	-	-
-8.4	-	-	-	-	-
-7.2	-	-	-	-	-
-6.0	-	-	-	-	-
-4.8	-	-	-	-	-
-3.6	-	-	-	-	-
0.0	-	-	-	-	-

+12V: Rated Load Current

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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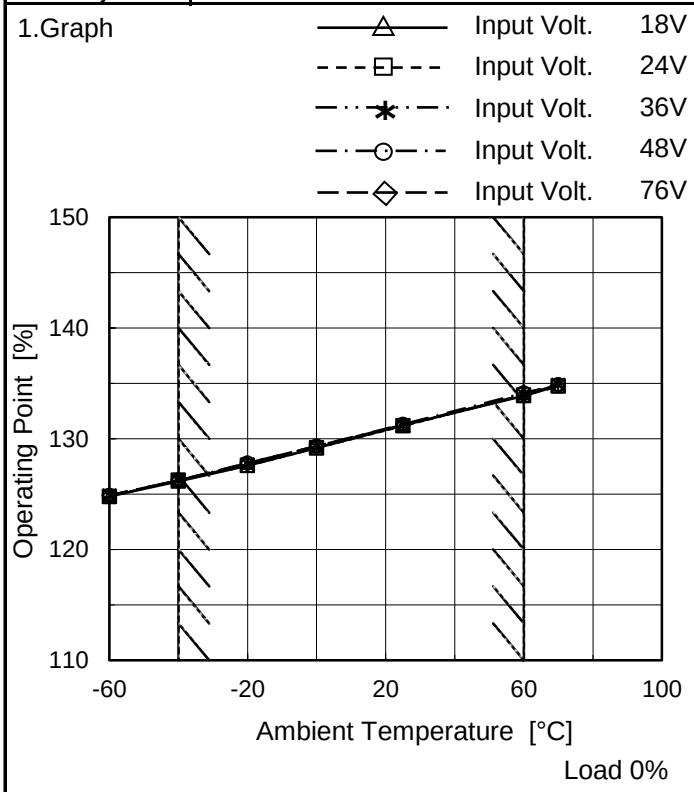
COSEL

Model	MGFW804812
Item	Overvoltage Protection
Object	+24V3.4A

Testing Circuitry Figure A

1.Graph



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

Measured as a single output (+24V).

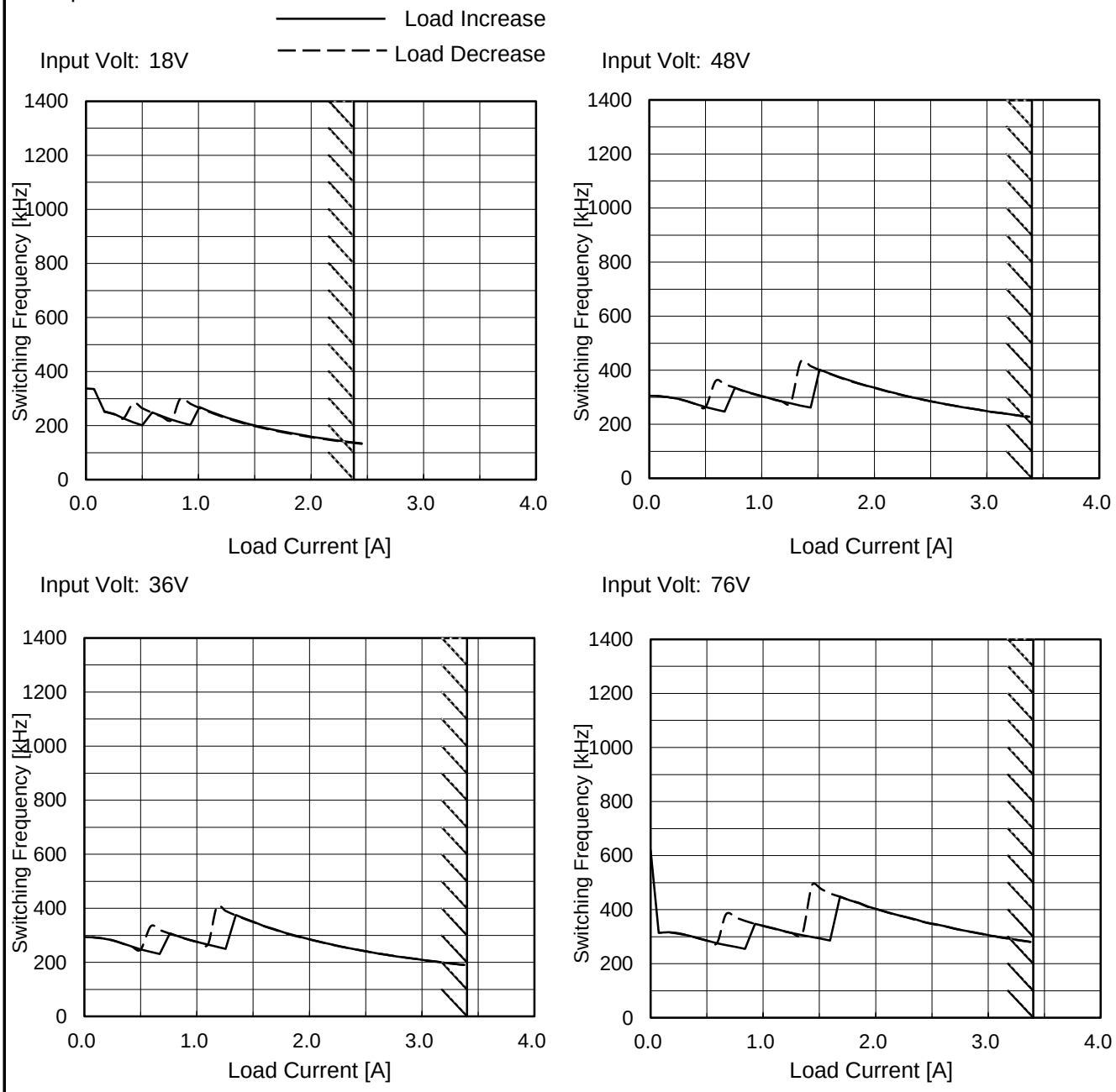
2.Values

Ambient Temperature [°C]	Operating Point [%] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	125	125	125	125	125
-40	126	126	126	126	126
-20	128	128	128	128	128
0	129	129	129	129	129
25	131	131	131	131	131
60	134	134	134	134	134
70	135	135	135	135	135
0	-	-	-	-	-
0	-	-	-	-	-
0	-	-	-	-	-
0	-	-	-	-	-

COSEL

Model	MGFW804812	
Item	Switching frequency (by Load Current)	Temperature 25°C Testing Circuitry Figure A
Object	+/-12V3.4A	

1.Graph



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

-switching frequency of MG80 changes depending on load current and input voltage.
When load current is low, switching frequency becomes high and step down to low frequency at certain point. There is hysteresis, so characteristic is different between load increase (sweep from 0% to 100%) and load decrease (sweep from 100% to 0%).

-When load current is low, MG80 operates intermittently, so switching frequency would not become constant.
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

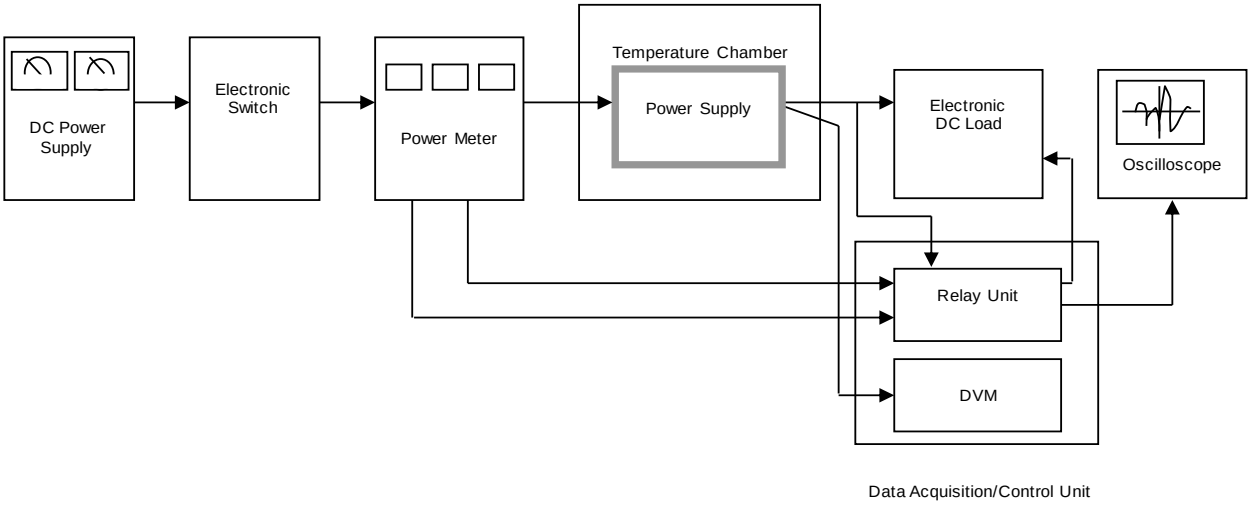


Figure A

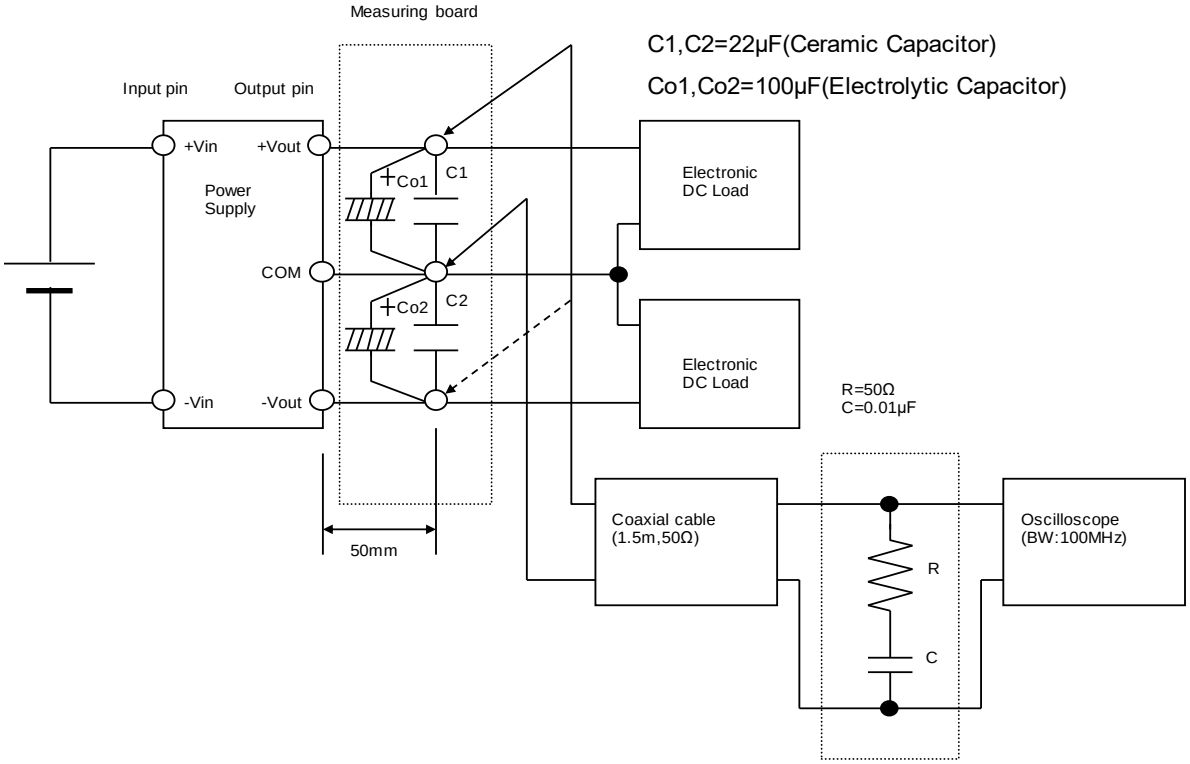


Figure B（Ripple and Ripple noise Characteristic）