COSEL

参考資料

TEST DATA OF MGFW804815

Regulated DC Power Supply
April 12, 2019

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COSEL CO.,LTD.

参考資料

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参考資料

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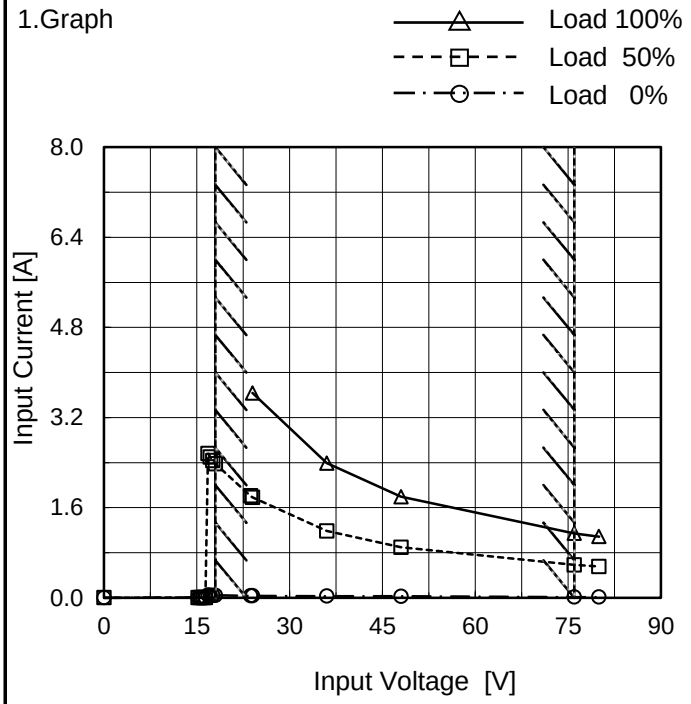
Model	MGFW804815
Item	Input Current (by Input Voltage)
Object	――――――――

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%
0.00	0	0	0
15.20	0.001	0.001	- ※
15.60	0.001	0.001	- ※
16.00	0.001	0.001	- ※
16.40	0.001	0.001	- ※
16.80	0.045	2.560	- ※
17.20	0.044	2.496	- ※
17.60	0.044	2.436	- ※
18.00	0.043	2.379	- ※
23.68	0.035	1.807	- ※
24.00	0.035	1.783	3.635
36.00	0.028	1.185	2.391
48.00	0.026	0.897	1.793
76.00	0.012	0.582	1.142
80.00	0.012	0.556	1.087
--	-	-	-
--	-	-	-
--	-	-	-

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

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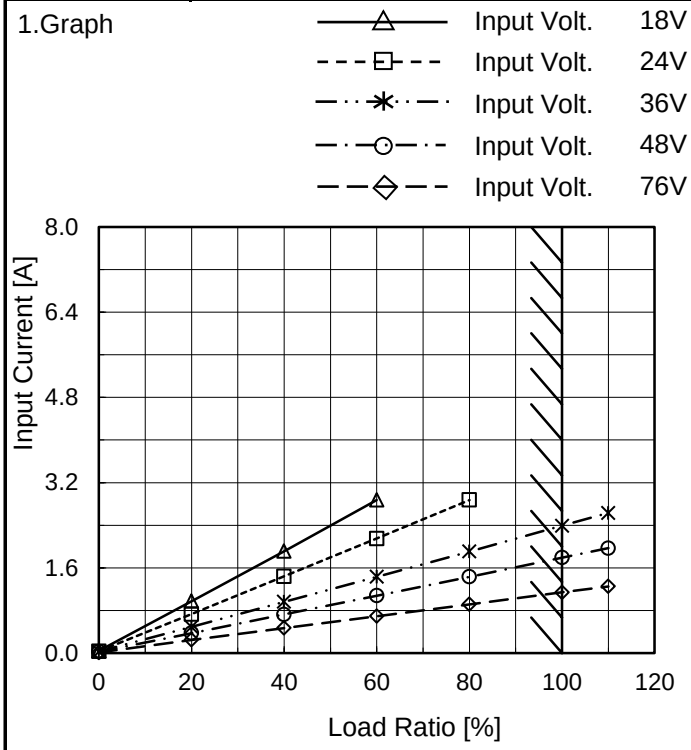
Model	MGFW804815
Item	Input Current (by Load Current)
Object	――――――

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	0.043	0.035	0.028	0.026	0.012
20	0.975	0.733	0.492	0.375	0.249
40	1.914	1.441	0.963	0.727	0.471
60	2.873	2.149	1.431	1.078	0.694
80	- ※1	2.876	1.908	1.432	0.915
100	- ※1	- ※2	2.391	1.793	1.142
110	- ※1	- ※2	2.630	1.970	1.252
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※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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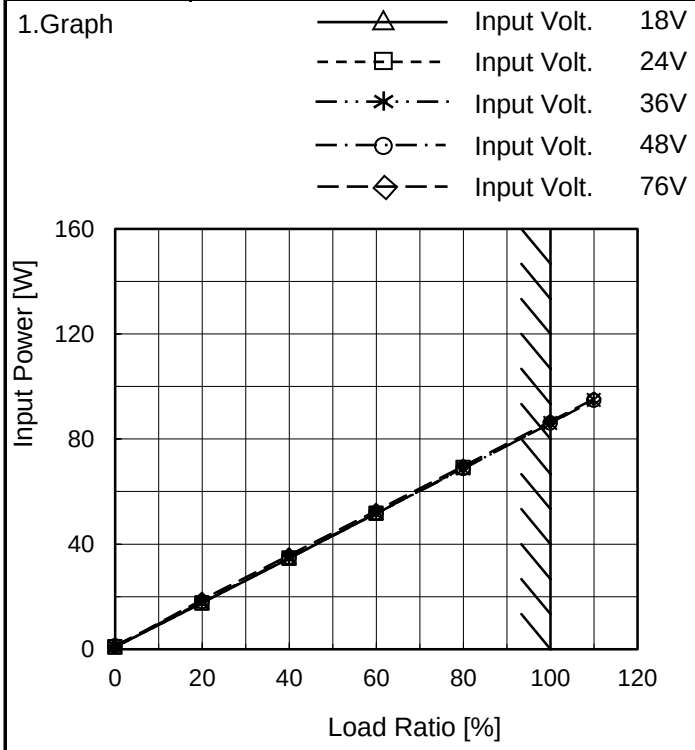
Model	MGFW804815
Item	Input Power (by Load Current)
Object	――――――

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	0.78	0.84	1.01	1.26	0.95
20	17.60	17.62	17.71	18.03	18.91
40	34.59	34.67	34.72	34.91	35.82
60	51.92	51.66	51.58	51.78	52.80
80	- ※1	69.07	68.72	68.80	69.64
100	- ※1	- ※2	86.11	86.02	86.71
110	- ※1	- ※2	94.89	94.72	95.31
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※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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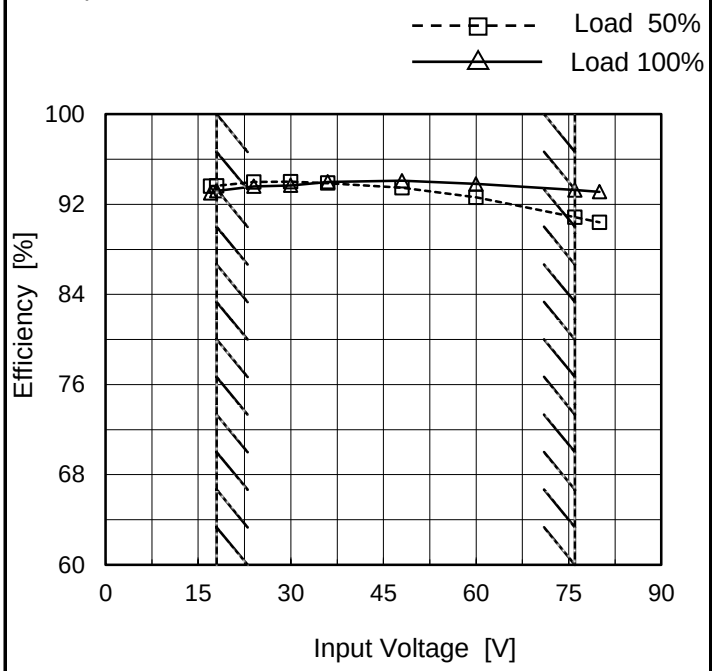
Model	MGFW804815
Item	Efficiency (by Input Voltage)
Object	――――――――――――

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	93.6	93.0 ※1
18	93.6	93.2 ※1
24	94.0	93.6 ※2
30	94.0	93.7
36	93.9	94.0
48	93.5	94.1
60	92.6	93.8
76	90.9	93.3
80	90.4	93.1

※1：Load 70%
※2：Load 80%

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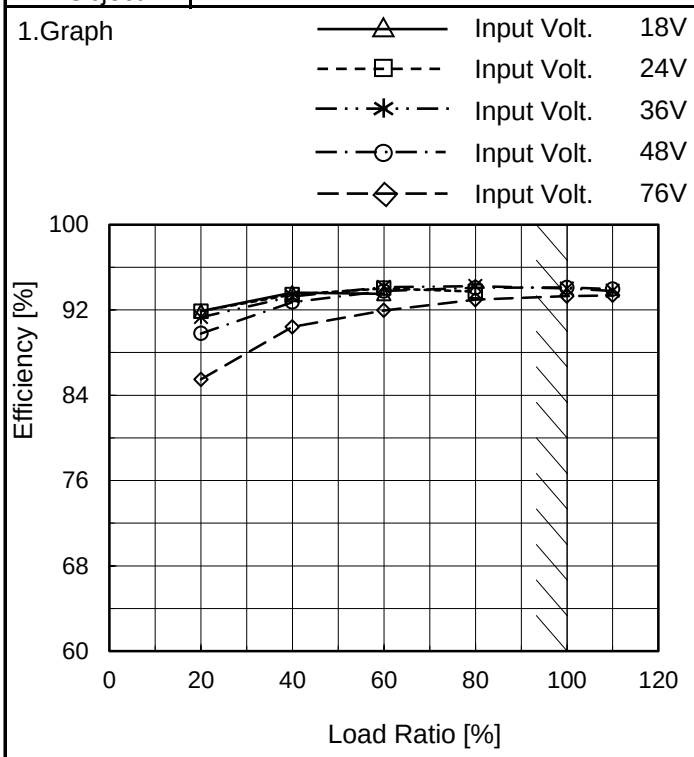
Model	MGFW804815
Item	Efficiency (by Load Current)
Object	――――――

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	91.9	91.9	91.3	89.8	85.5
40	93.6	93.4	93.2	92.7	90.4
60	93.5	94.0	94.1	93.8	91.9
80	- ※1	93.7	94.2	94.1	93.0
100	- ※1	- ※2	94.0	94.1	93.3
110	- ※1	- ※2	93.8	93.9	93.4
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※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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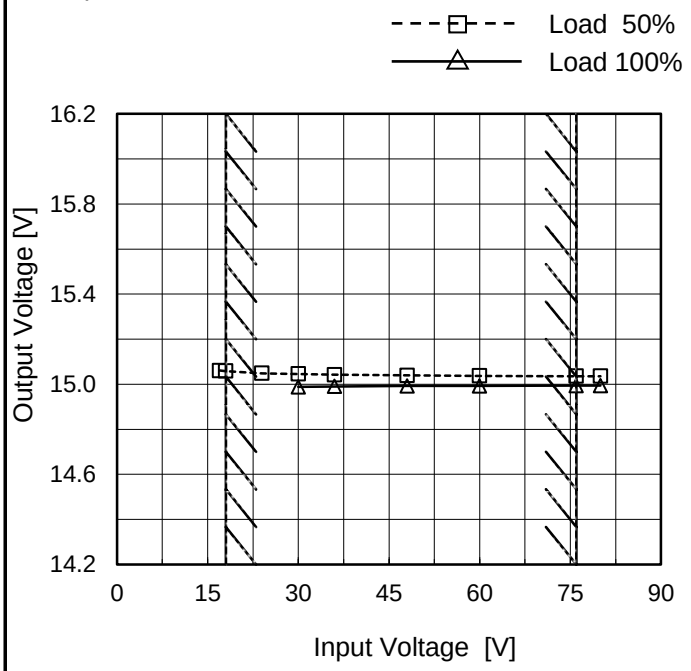
Model	MGFW804815
Item	Line Regulation
Object	+15V2.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



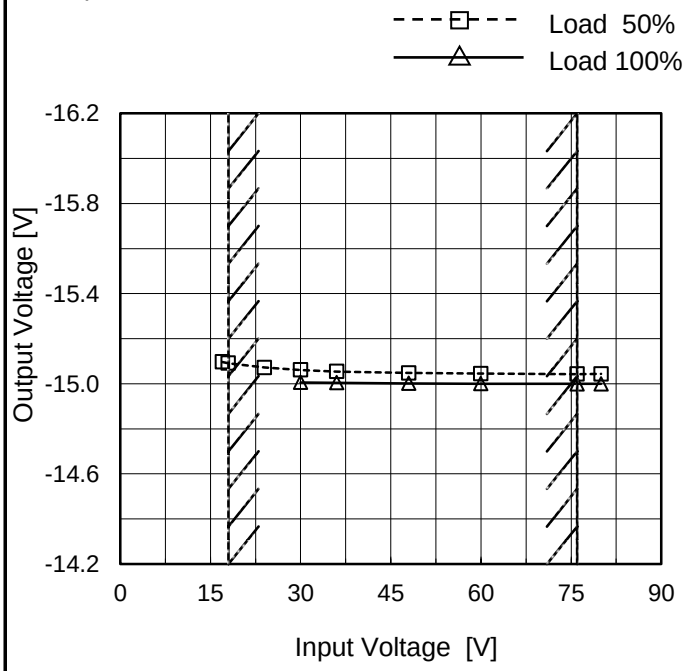
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	15.061	- ※1
18	15.059	- ※1
24	15.049	- ※2
30	15.046	14.988
36	15.042	14.990
48	15.039	14.992
60	15.037	14.993
76	15.036	14.994
80	15.036	14.994

-15V: Rated Load Current

Object	-15V2.7A

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	-15.097	- ※1
18	-15.091	- ※1
24	-15.072	- ※2
30	-15.061	-15.006
36	-15.054	-15.005
48	-15.048	-15.002
60	-15.045	-15.000
76	-15.043	-15.000
80	-15.043	-15.000

+15V: 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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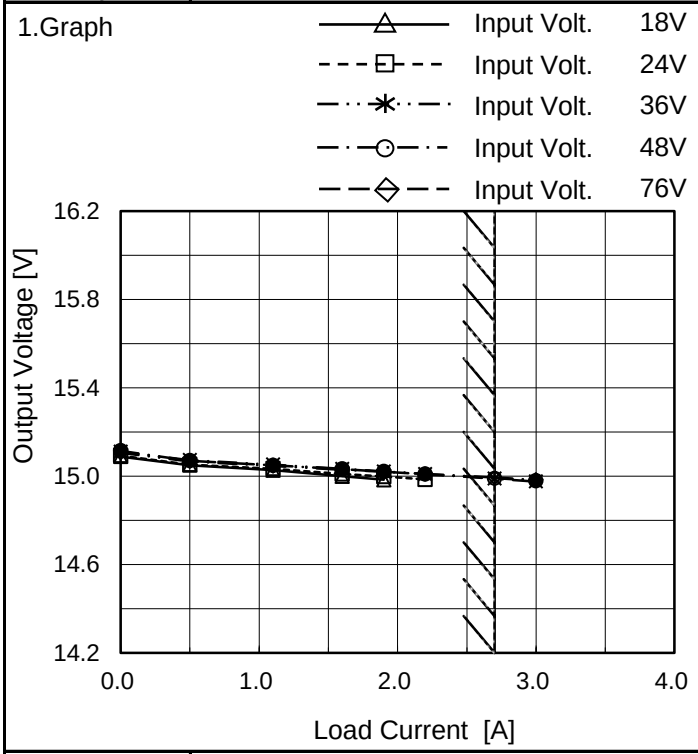
Model	MGFW804815
Item	Load Regulation
Object	+15V2.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



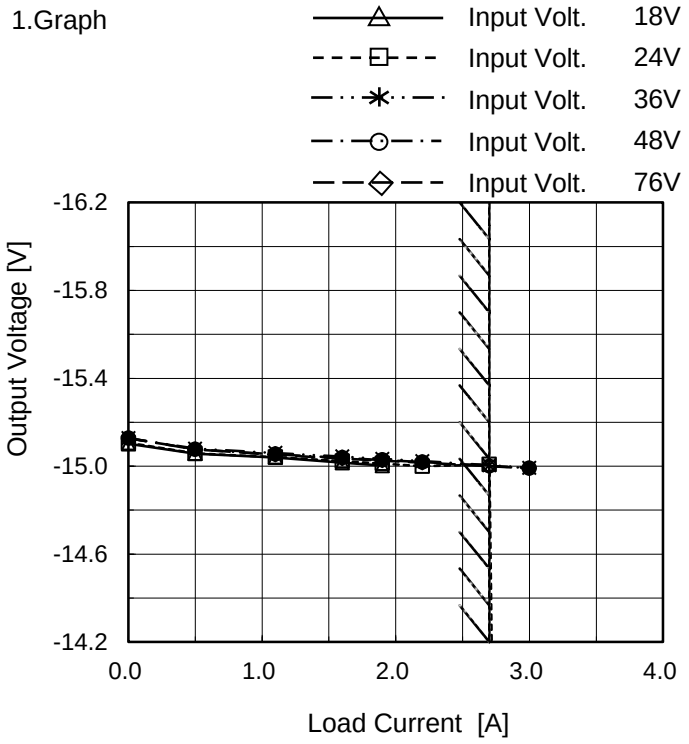
2.Values

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	15.089	15.093	15.111	15.115	15.106
0.5	15.050	15.053	15.073	15.070	15.067
1.1	15.027	15.034	15.053	15.049	15.046
1.6	14.999	15.010	15.033	15.032	15.030
1.9	14.984	14.998	15.022	15.021	15.020
2.2	- ※1	14.985	15.010	15.009	15.010
2.7	- ※1	- ※2	14.989	14.991	14.994
3.0	- ※1	- ※2	14.976	14.980	14.983
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-15V: Rated Load Current

Object	-15V2.7A

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	-15.102	-15.106	-15.127	-15.128	-15.127
0.5	-15.057	-15.058	-15.080	-15.076	-15.077
1.1	-15.040	-15.041	-15.060	-15.055	-15.052
1.6	-15.016	-15.023	-15.045	-15.039	-15.035
1.9	-15.003	-15.012	-15.034	-15.028	-15.025
2.2	- ※1	-15.000	-15.023	-15.019	-15.016
2.7	- ※1	- ※2	-15.004	-15.001	-15.000
3.0	- ※1	- ※2	-14.992	-14.991	-14.990
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+15V: 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	MGFW804815	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+15V2.7A	

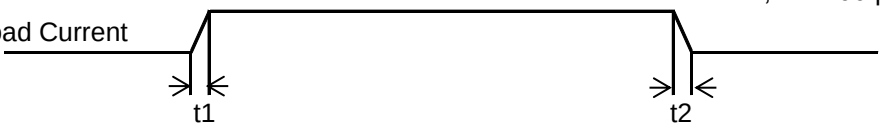
Input Volt. 48 V

-15V:rated load current.

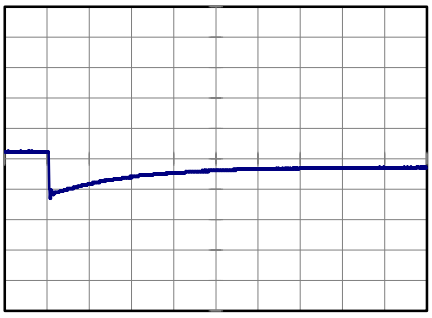
Cycle 100 ms

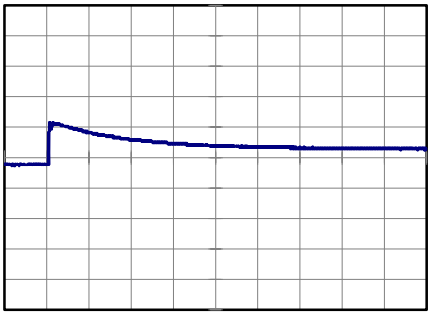
t1,t2 = 100 μ s

Load Current



Min.Load (0A)←→
Load 100% (2.7A)



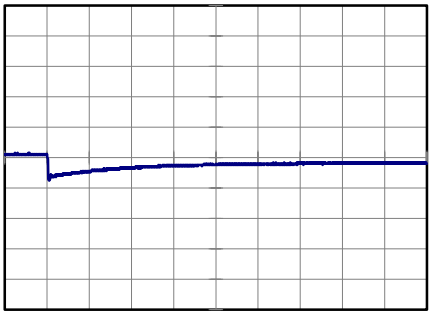


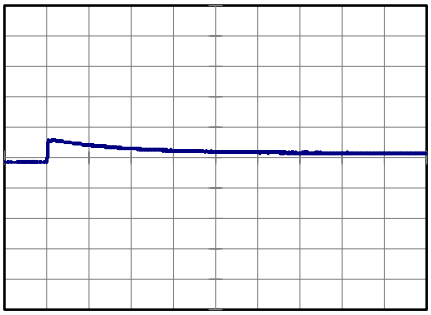
200 mV/div

2 ms/div

2 ms/div

Min.Load (0A)←→
Load 50% (1.35A)



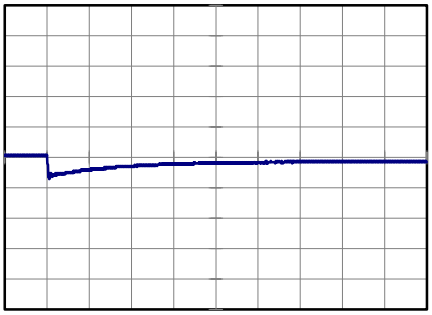


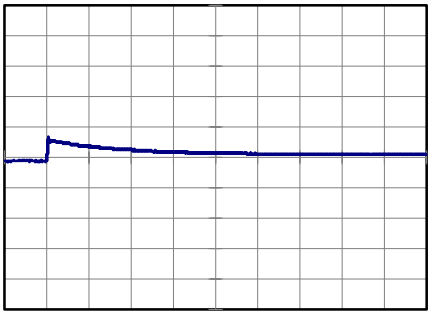
200 mV/div

2 ms/div

2 ms/div

Load 50% (1.35A)←→
Load 100% (2.7A)





200 mV/div

2 ms/div

2 ms/div

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Model	MGFW804815	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-15V2.7A	

Input Volt. 48 V

+15V:rated load current.

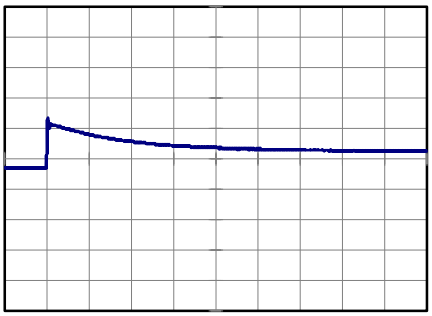
Cycle 100 ms

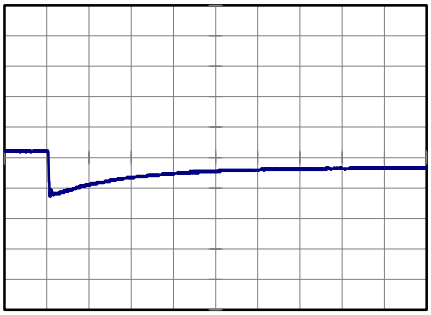
t1,t2 = 100 μs

Load Current

t1 t2

Min.Load (0A)←→
Load 100% (2.7A)

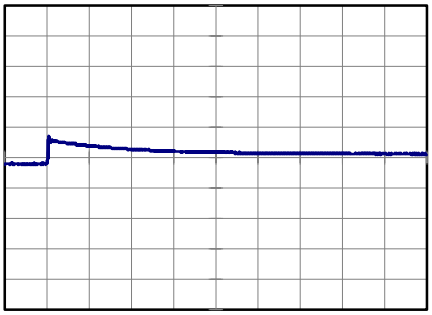


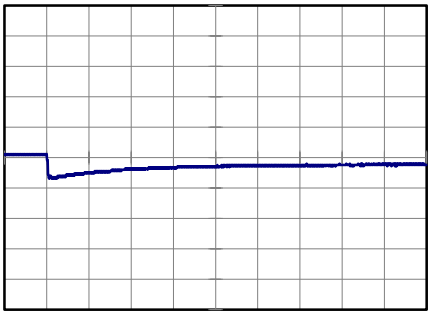


200 mV/div

2 ms/div 2 ms/div

Min.Load (0A)←→
Load 50% (1.35A)

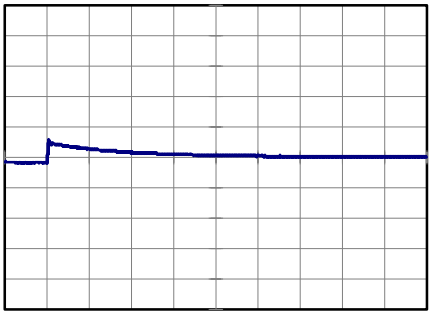


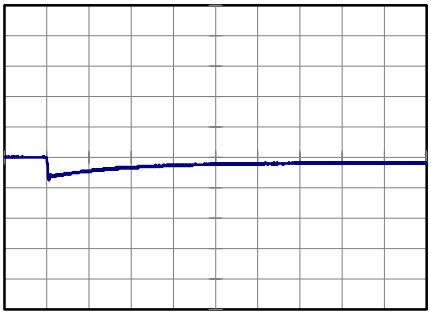


200 mV/div

2 ms/div 2 ms/div

Load 50% (1.35A)←→
Load 100% (2.7A)





200 mV/div

2 ms/div 2 ms/div

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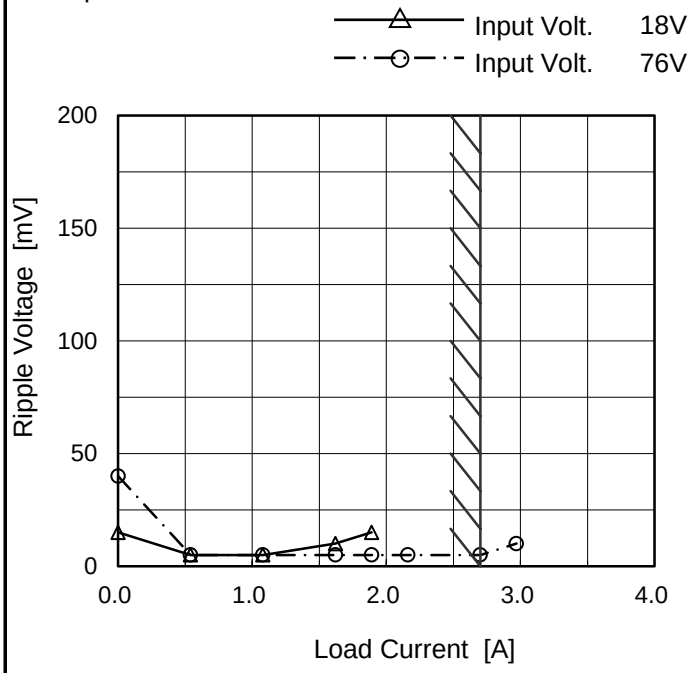
Model	MGFW804815
Item	Ripple Voltage (by Load Current)
Object	+15V2.7A

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]

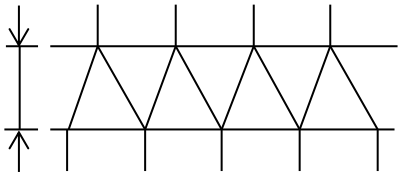


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	40
0.5	5	5
1.1	5	5
1.6	10	5
1.9	15	5
2.2	- ※	5
2.7	- ※	5
3.0	- ※	10
--	-	-
--	-	-
--	-	-

-15V: 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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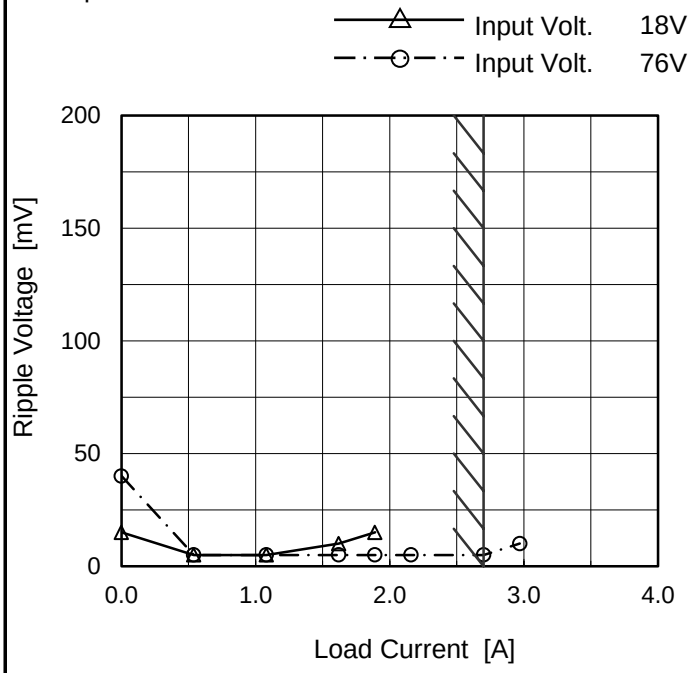
COSEL

Model	MGFW804815
Item	Ripple Voltage (by Load Current)
Object	-15V2.7A

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]

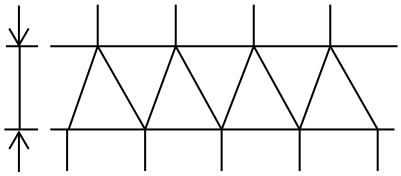


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	40
0.5	5	5
1.1	5	5
1.6	10	5
1.9	15	5
2.2	- ※	5
2.7	- ※	5
3.0	- ※	10
--	-	-
--	-	-
--	-	-

+15V: 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.

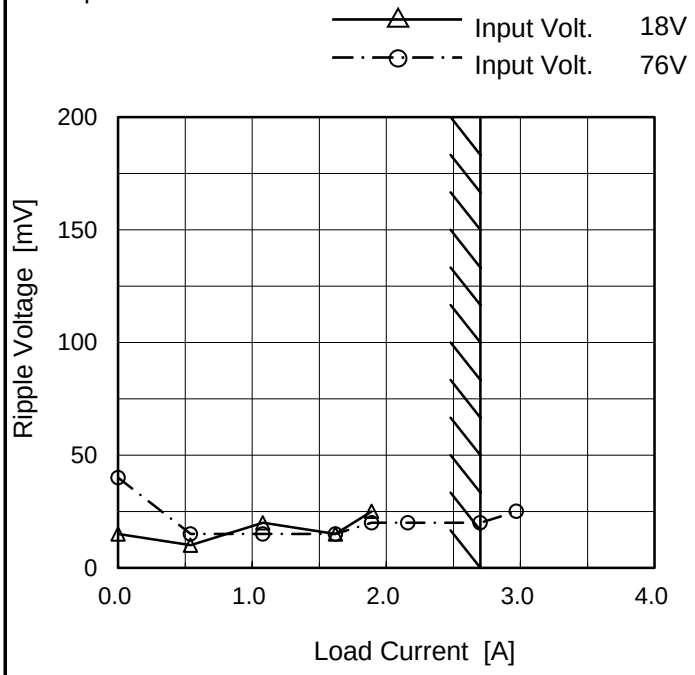
BC-11378

COSEL

Model	MGFW804815
Item	Ripple-Noise
Object	+15V2.7A

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]

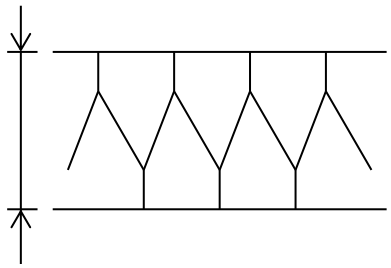


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	40
0.5	10	15
1.1	20	15
1.6	15	15
1.9	25	20
2.2	- ※	20
2.7	- ※	20
3.0	- ※	25
--	-	-
--	-	-
--	-	-

-15V: 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.

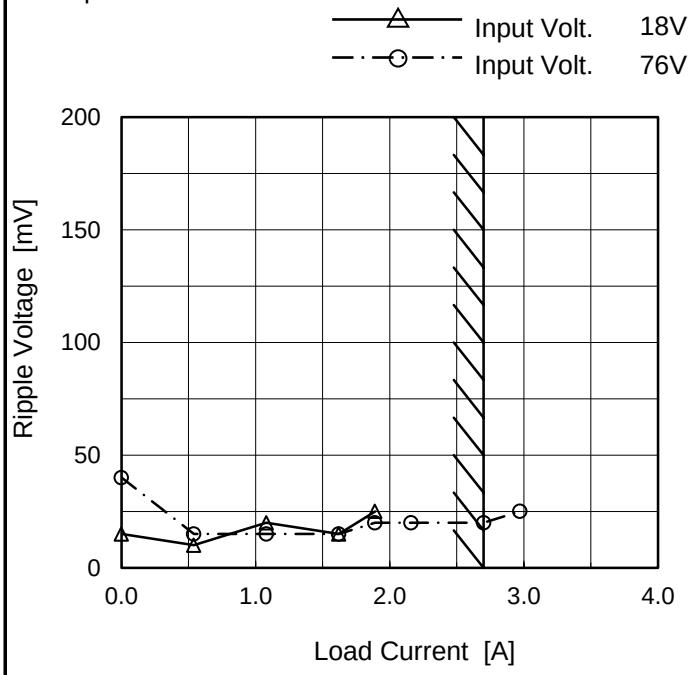
BC-11378

COSEL

Model	MGFW804815
Item	Ripple-Noise
Object	-15V2.7A

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]

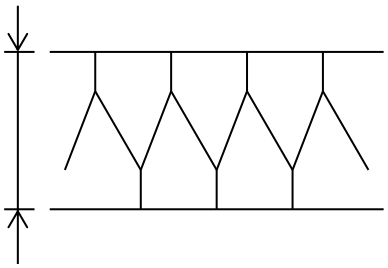


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	40
0.5	10	15
1.1	20	15
1.6	15	15
1.9	25	20
2.2	- ※	20
2.7	- ※	20
3.0	- ※	25
--	-	-
--	-	-
--	-	-

+15V: 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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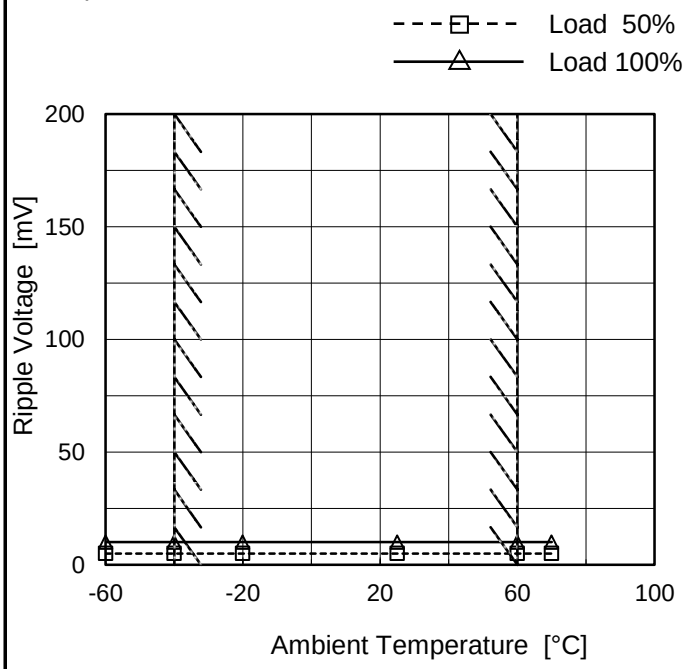
COSEL

Model	MGFW804815
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V2.7A

Testing Circuitry Figure B

1.Graph



Input Volt. 48V

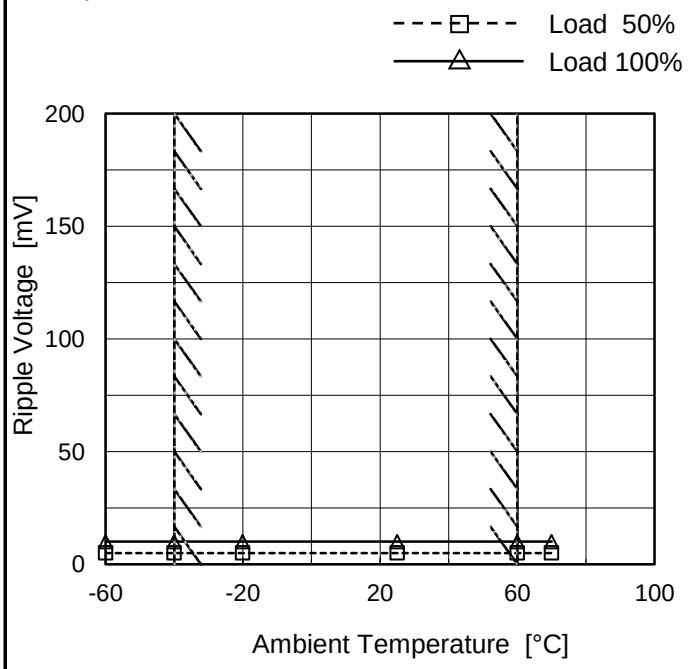
2.Values

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

-15V: Rated Load Current

Object	-15V2.7A

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

+15V: Rated Load Current

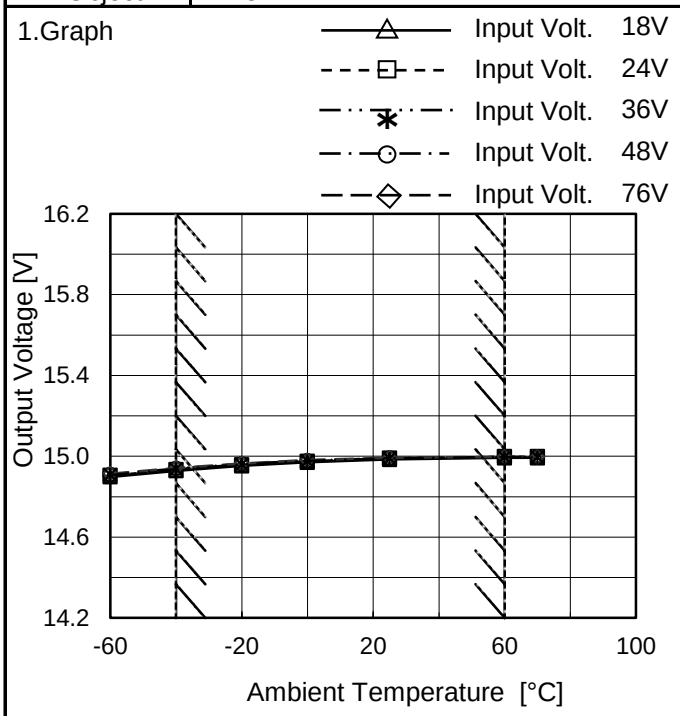
COSEL

Model	MGFW804815
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +15V2.7A

1.Graph

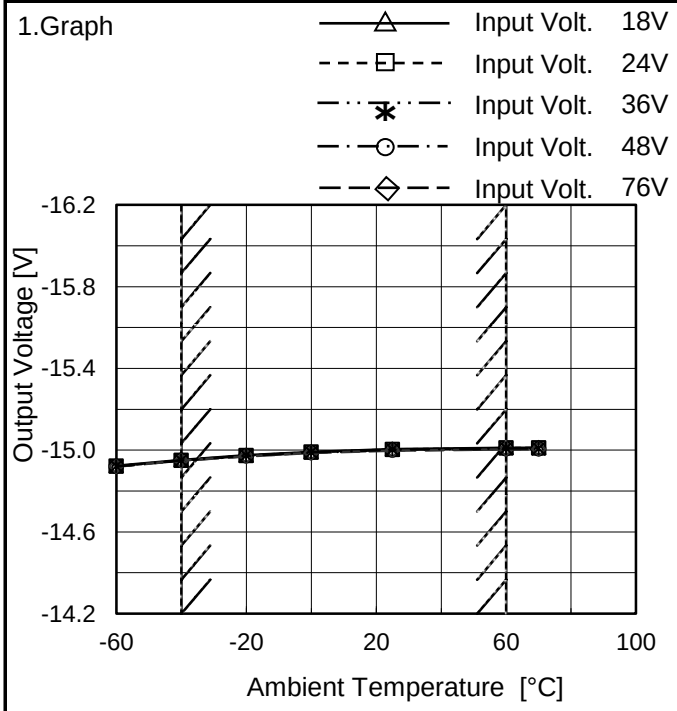


2.Values

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	14.898	14.904	14.908	14.910	14.914
-40	14.928	14.934	14.936	14.939	14.942
-20	14.952	14.957	14.959	14.962	14.965
0	14.970	14.975	14.976	14.978	14.981
25	14.985	14.990	14.989	14.991	14.993
60	14.992	14.998	14.995	14.996	14.998
70	14.992	14.998	14.995	14.996	14.997
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Object -15V2.7A

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	-14.923	-14.921	-14.921	-14.921	-14.920
-40	-14.952	-14.950	-14.950	-14.949	-14.948
-20	-14.975	-14.974	-14.973	-14.971	-14.970
0	-14.991	-14.990	-14.990	-14.987	-14.986
25	-15.005	-15.003	-15.003	-15.000	-14.998
60	-15.012	-15.011	-15.009	-15.006	-15.004
70	-15.012	-15.011	-15.008	-15.006	-15.004
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

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COSEL

Model	MGFW804815	
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 - 2.7A (AVR 2) : 0 - 2.7A

* 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	+15V2.7A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	24	0	15.136	±104	±0.7
Minimum Voltage	-40	18	2.4	14.928		

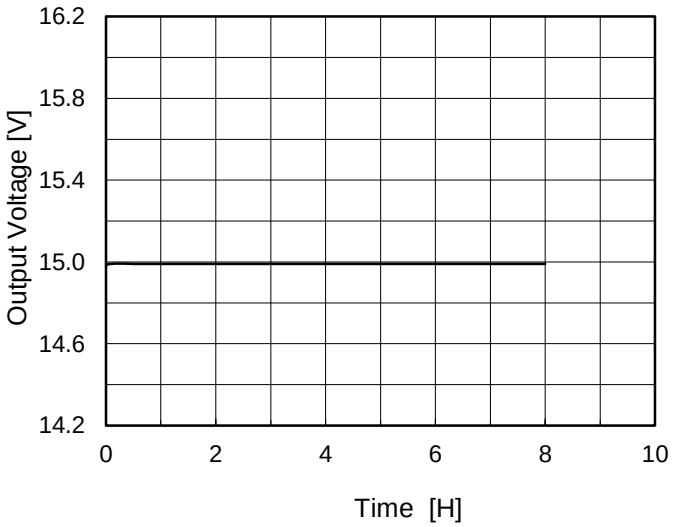
Object	-15V2.7A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	36	0	-15.151	±102	±0.7
Minimum Voltage	-40	76	2.7	-14.948		

COSEL

Model	MGFW804815
Item	Time Lapse Drift
Object	+15V2.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 48V
Load 100%

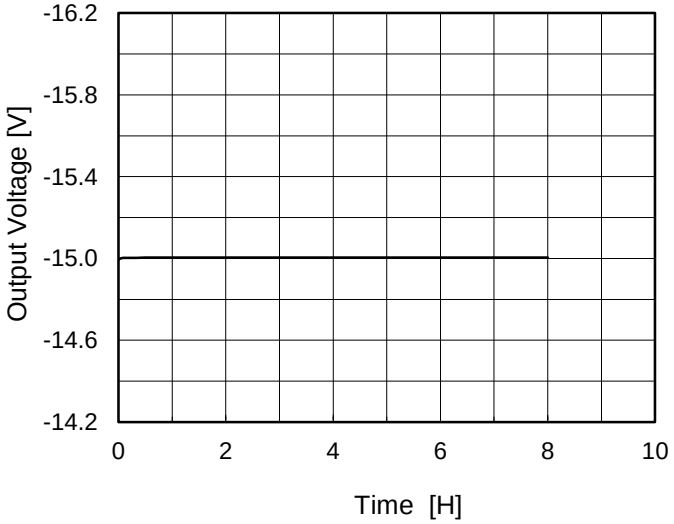
2.Values

Time since start [H]	Output Voltage [V]
0.0	14.982
0.5	14.990
1.0	14.991
2.0	14.990
3.0	14.990
4.0	14.990
5.0	14.990
6.0	14.990
7.0	14.990
8.0	14.990

-15V: Rated Load Current

Object	-15V2.7A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-14.993
0.5	-15.004
1.0	-15.004
2.0	-15.004
3.0	-15.004
4.0	-15.004
5.0	-15.004
6.0	-15.004
7.0	-15.004
8.0	-15.004

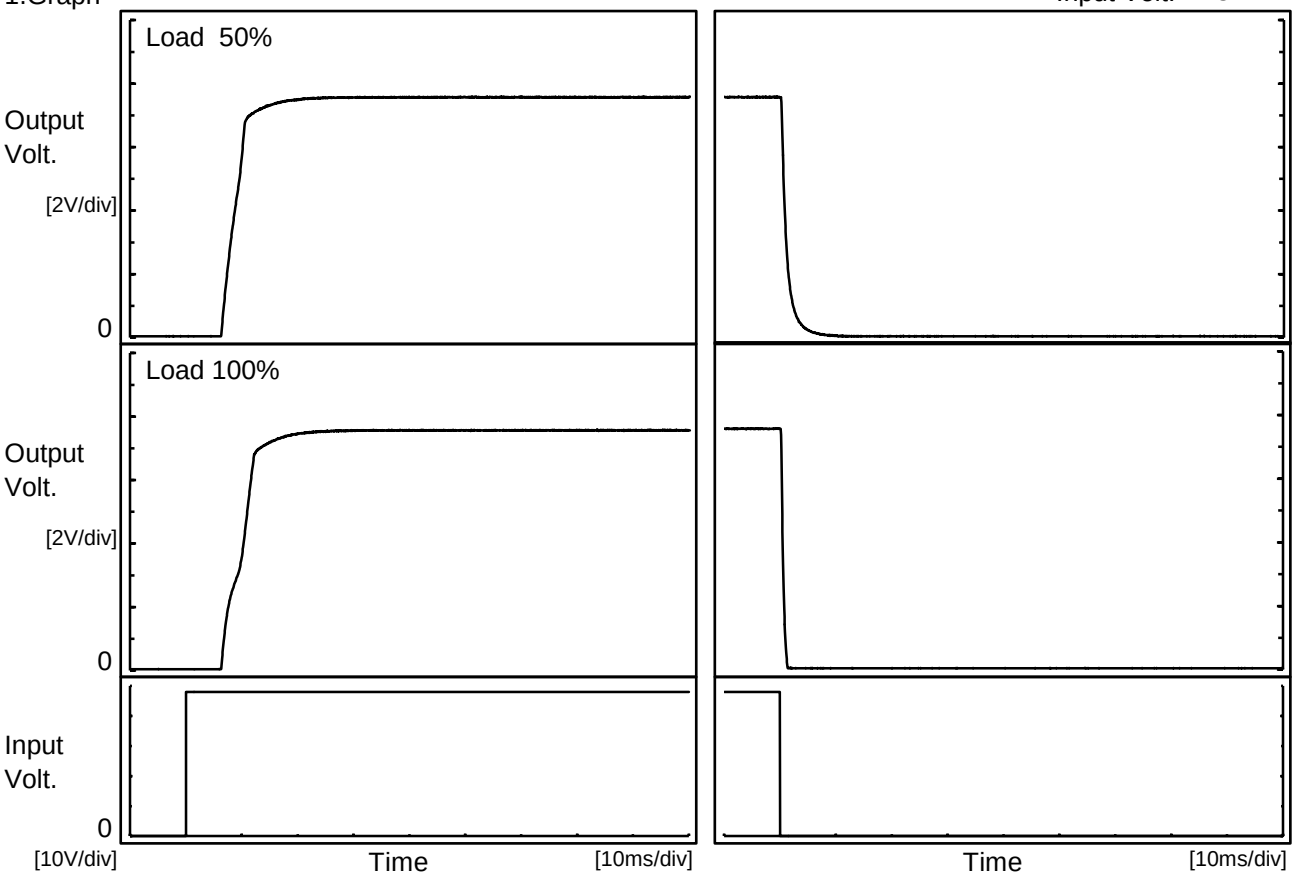
+15V: Rated Load Current

COSEL

Model	MGFW804815	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V2.7A	

1.Graph

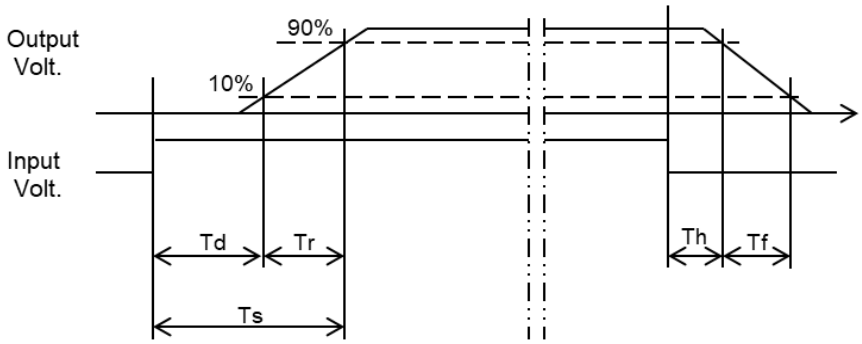
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.7	4.0	10.7	0.3	2.4
100 %	6.7	5.5	12.2	0.3	0.8



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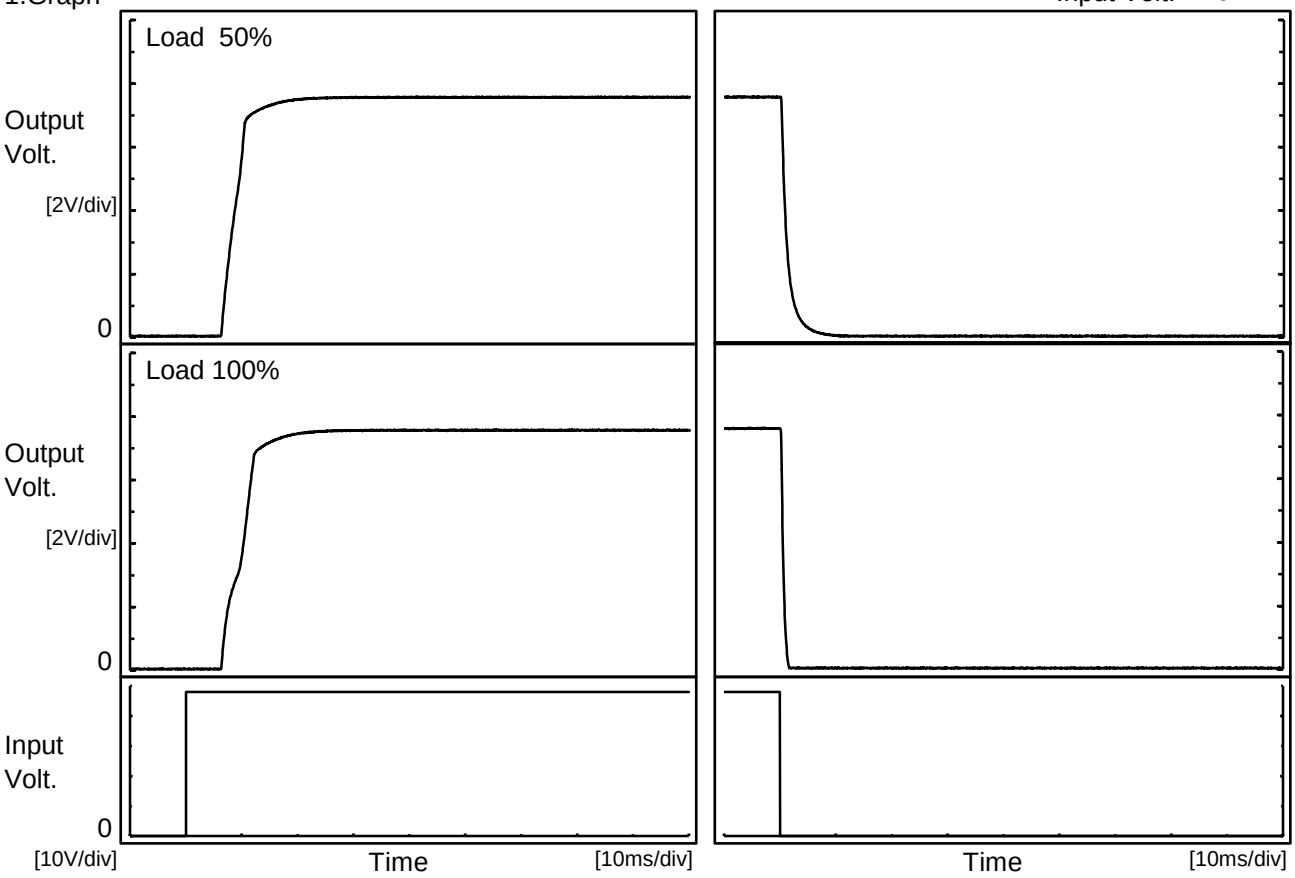
COSEL

Model	MGFW804815
Item	Rise and Fall Time
Object	-15V2.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

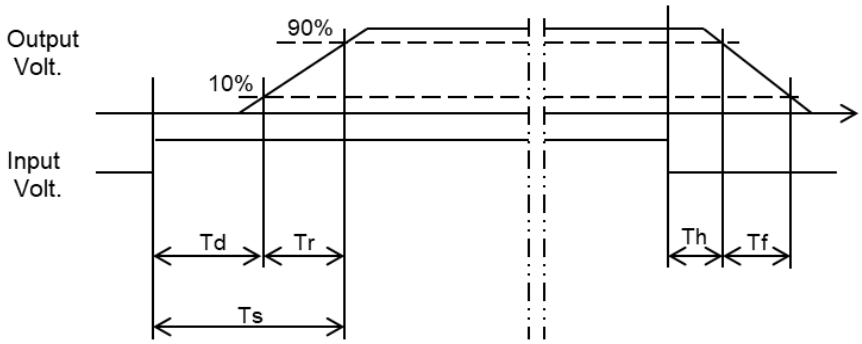
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.7	4.0	10.7	0.4	2.7
100 %	6.7	5.5	12.2	0.3	0.9



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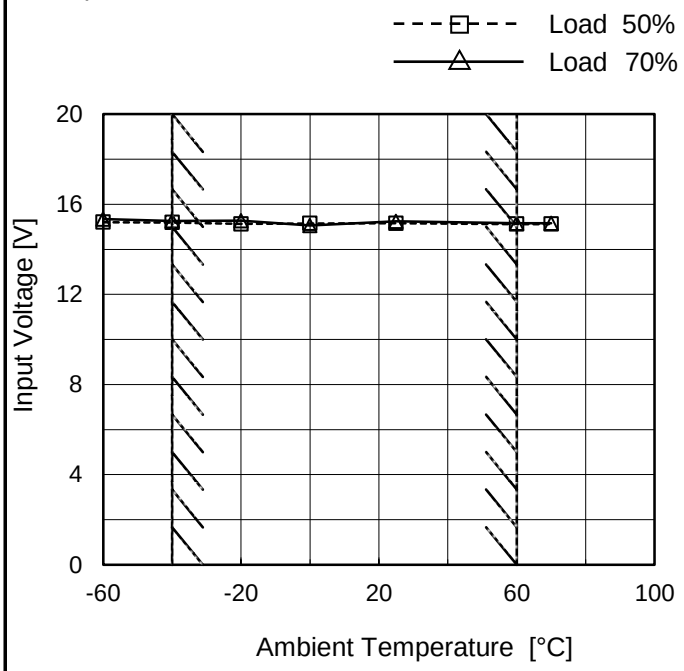
COSEL

Model	MGFW804815
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object: +15V1.89A

1.Graph

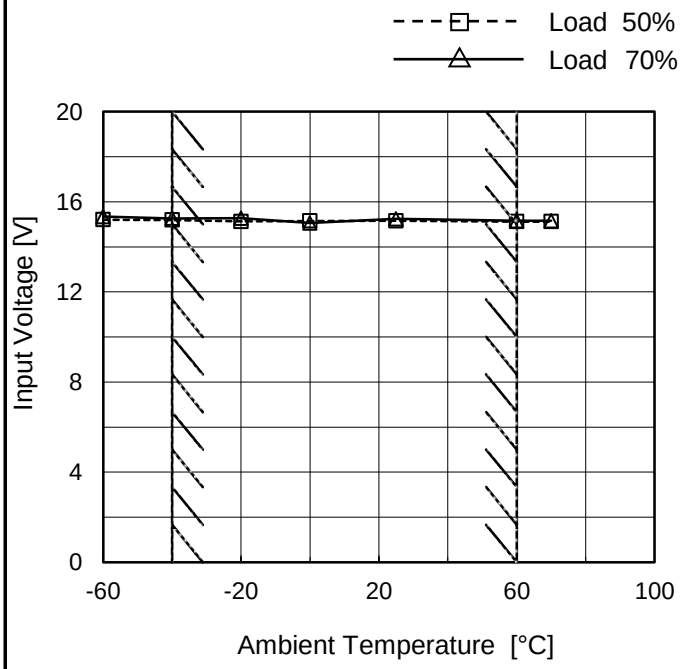


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	15.3	15.4
-40	15.2	15.3
-20	15.2	15.3
0	15.2	15.1
25	15.2	15.3
60	15.2	15.2
70	15.2	15.2
--	-	-
--	-	-
--	-	-
--	-	-

Object: -15V1.89A

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	15.3	15.4
-40	15.2	15.3
-20	15.2	15.3
0	15.2	15.1
25	15.2	15.3
60	15.2	15.2
70	15.2	15.2
--	-	-
--	-	-
--	-	-
--	-	-

BC-11378

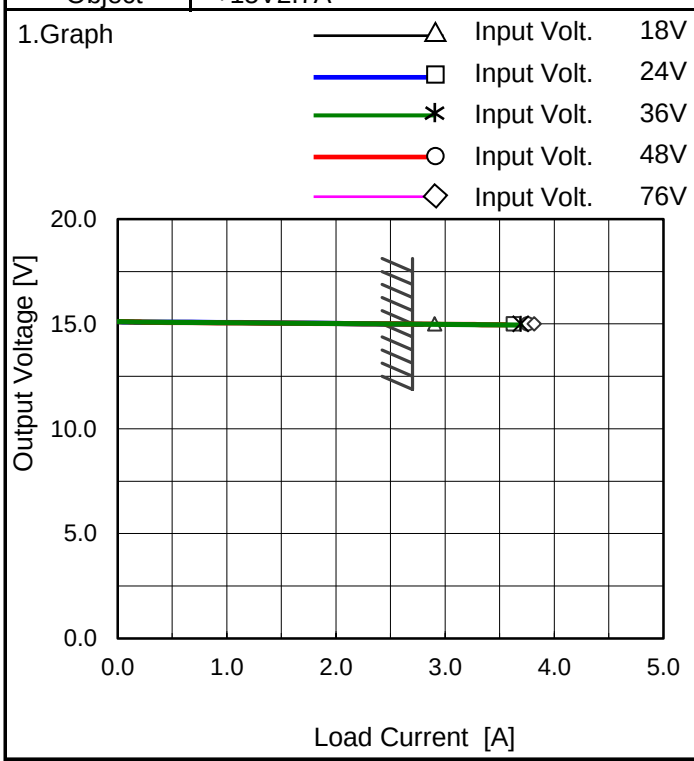
COSEL

Model	MGFW804815
Item	Overcurrent Protection

Temperature 25°C
Testing Circuitry Figure A

Object +15V2.7A

1.Graph



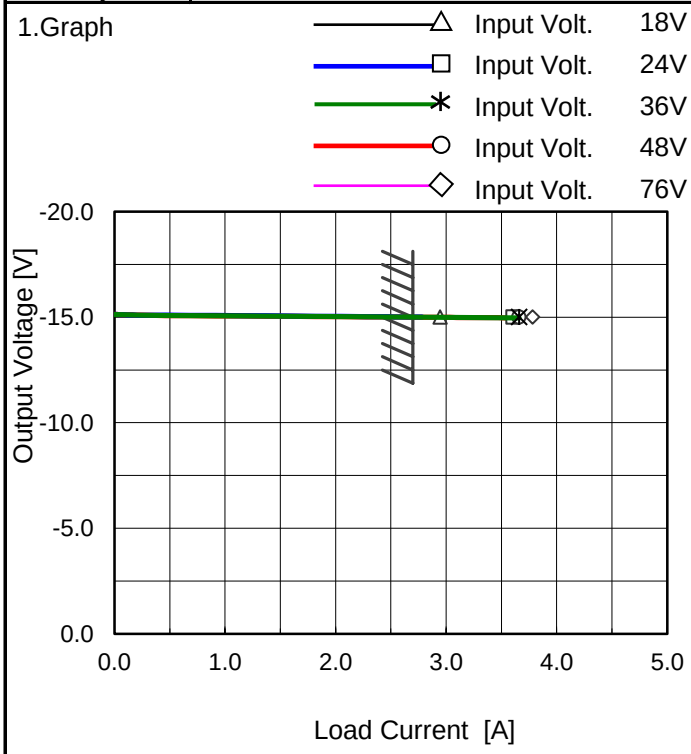
2.Values

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]
15.0	2.905	3.625	3.694	3.757	3.817
14.3	- ※1	- ※2	-	-	-
13.5	-	-	-	-	-
12.0	-	-	-	-	-
10.5	-	-	-	-	-
9.0	-	-	-	-	-
7.5	-	-	-	-	-
6.0	-	-	-	-	-
4.5	-	-	-	-	-
0.0	-	-	-	-	-

-15V: Rated Load Current

Object -15V2.7A

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]
-15.0	2.945	3.606	3.660	3.660	3.784
-14.3	- ※1	- ※2	-	-	-
-13.5	-	-	-	-	-
-12.0	-	-	-	-	-
-10.5	-	-	-	-	-
-9.0	-	-	-	-	-
-7.5	-	-	-	-	-
-6.0	-	-	-	-	-
-4.5	-	-	-	-	-
0.0	-	-	-	-	-

+15V: 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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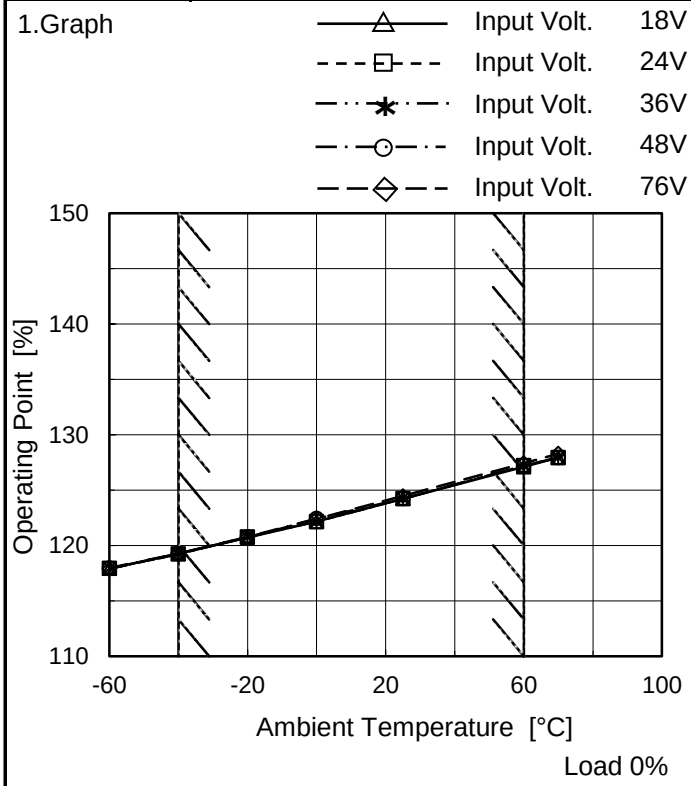
COSEL

Model	MGFW804815
Item	Overvoltage Protection
Object	+30V1.89A

Testing Circuitry Figure A

1.Graph



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

Measured as a single output (+30V).

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	118	118	118	118	118
-40	119	119	119	119	119
-20	121	121	121	121	121
0	122	122	122	122	122
25	124	124	124	124	124
60	127	127	127	127	127
70	128	128	128	128	128
0	-	-	-	-	-
0	-	-	-	-	-
0	-	-	-	-	-
0	-	-	-	-	-

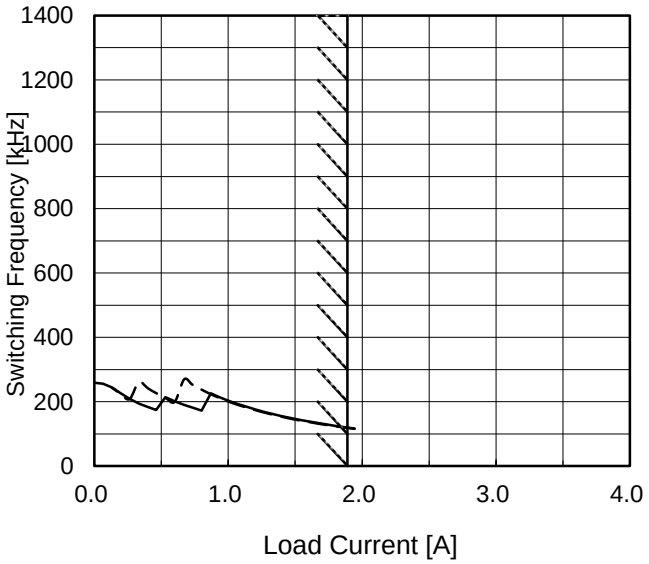
COSEL

Model	MGFW804815	
Item	Switching frequency (by Load Current)	Temperature 25°C Testing Circuitry Figure A
Object	+/-15V2.7A	

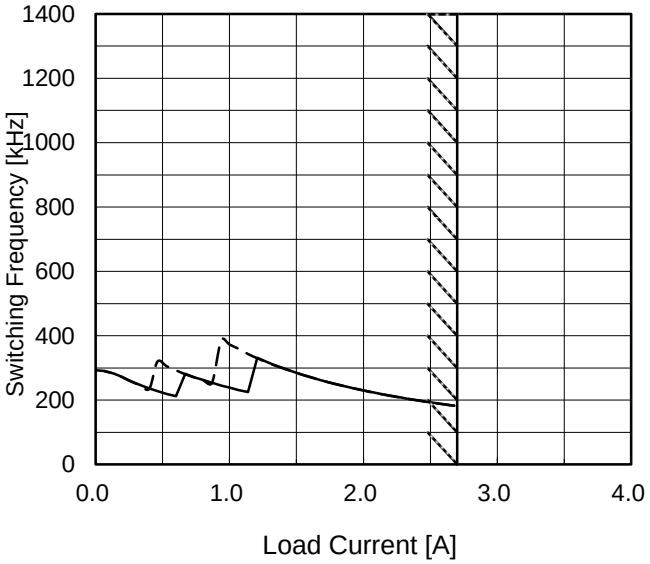
1.Graph

Load Increase
Load Decrease

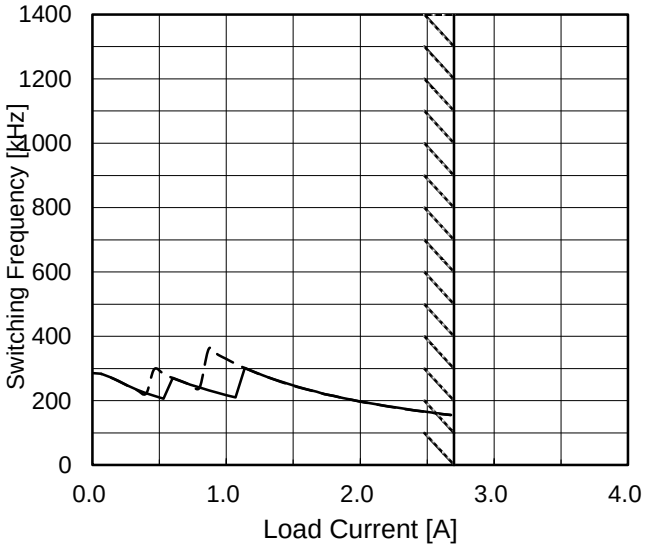
Input Volt: 18V



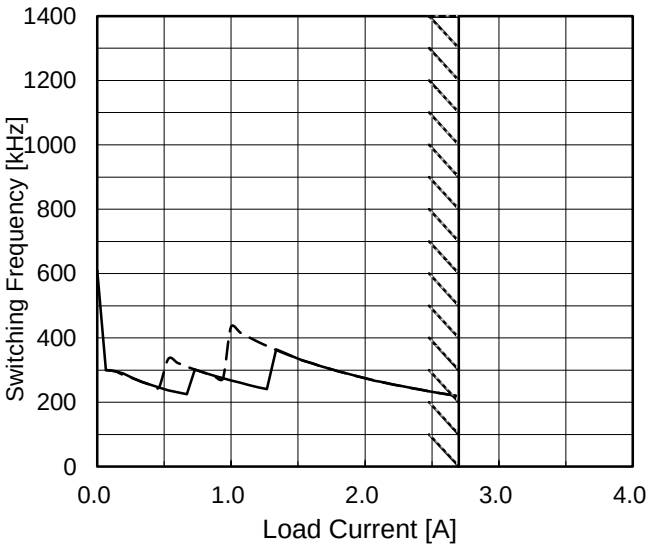
Input Volt: 48V



Input Volt: 36V



Input Volt: 76V



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.

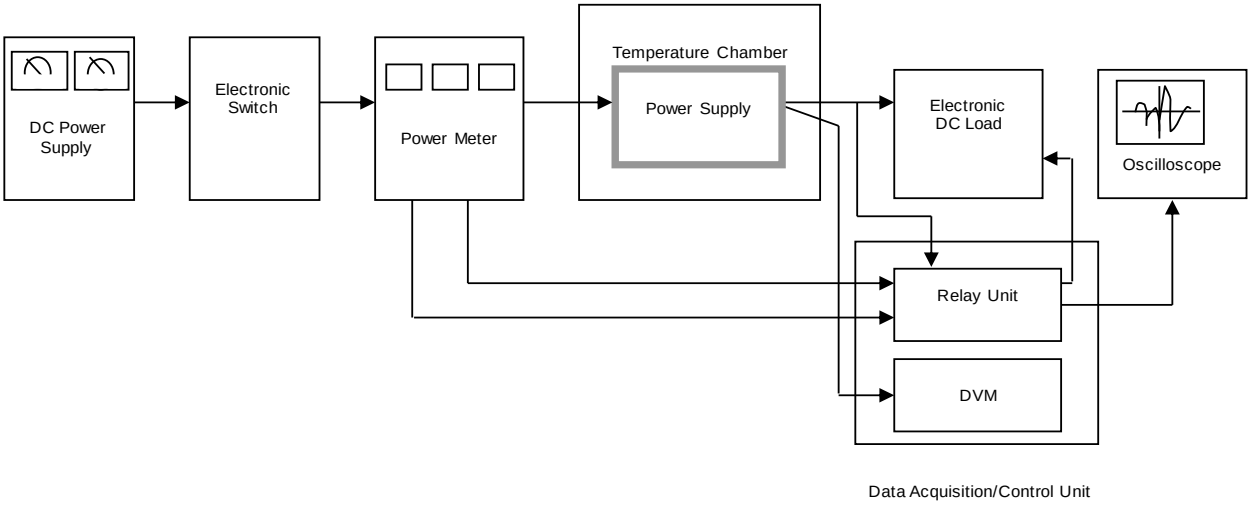


Figure A

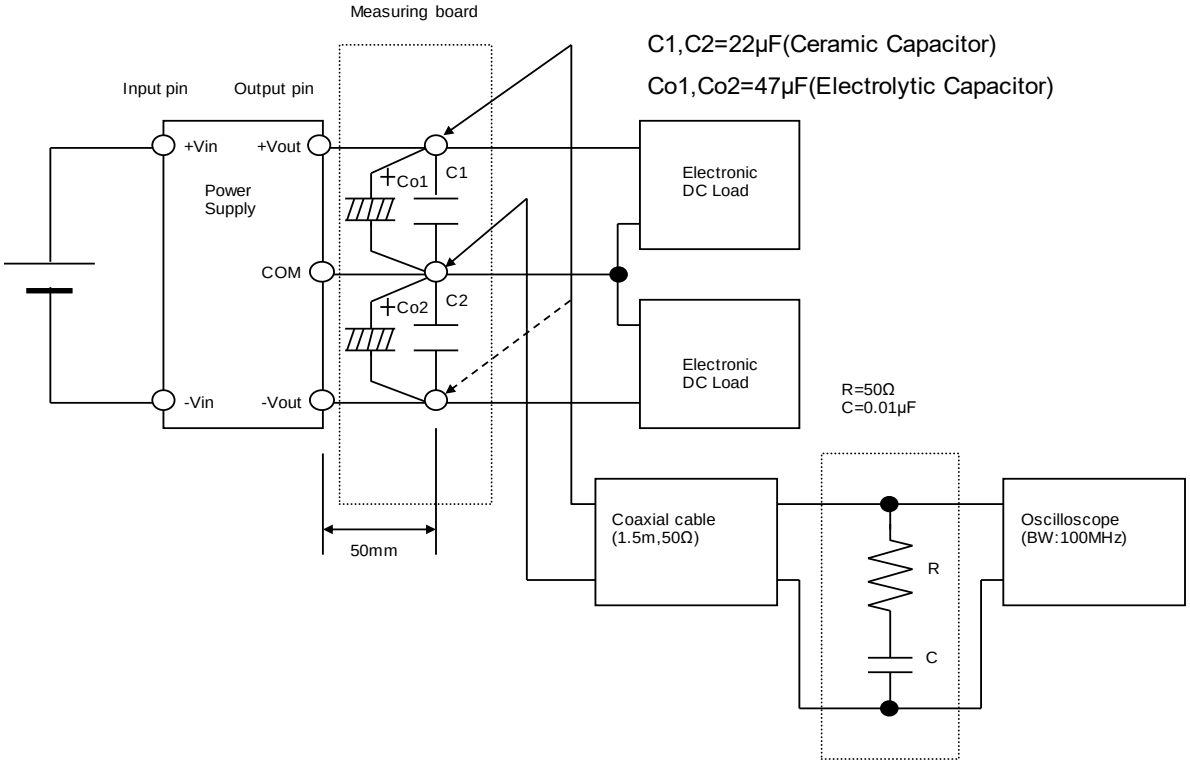


Figure B（Ripple and Ripple noise Characteristic）