COSEL

TEST DATA OF MGS61215

Regulated DC Power Supply
July 28, 2016

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COSEL CO.,LTD.

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Model	MGS61215
Item	Input Current (by Input Voltage)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

△ Load 100%
☐ Load 50%
○ Load 0%

Input Voltage [V]

Note: Slanted line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
6.0	0.003	0.003	0.003
8.0	0.003	0.003	0.003
8.2	0.028	0.417	0.827
8.4	0.027	0.407	0.806
8.6	0.026	0.398	0.787
8.8	0.026	0.388	0.769
9.0	0.025	0.380	0.754
10.0	0.023	0.342	0.673
12.0	0.013	0.286	0.561
16.0	0.008	0.217	0.420
18.0	0.006	0.195	0.376
20.0	0.007	0.178	0.339
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--	-	-	-
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--	-	-	-
--	-	-	-

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Model	MGS61215
Item	Input Current (by Load Current)
Object	

Temperature　　25°C
Testing Circuitry　Figure A

1.Graph

△——— Input Volt.　　9V
--□--- Input Volt.　12V
—·—○—·— Input Volt.　18V

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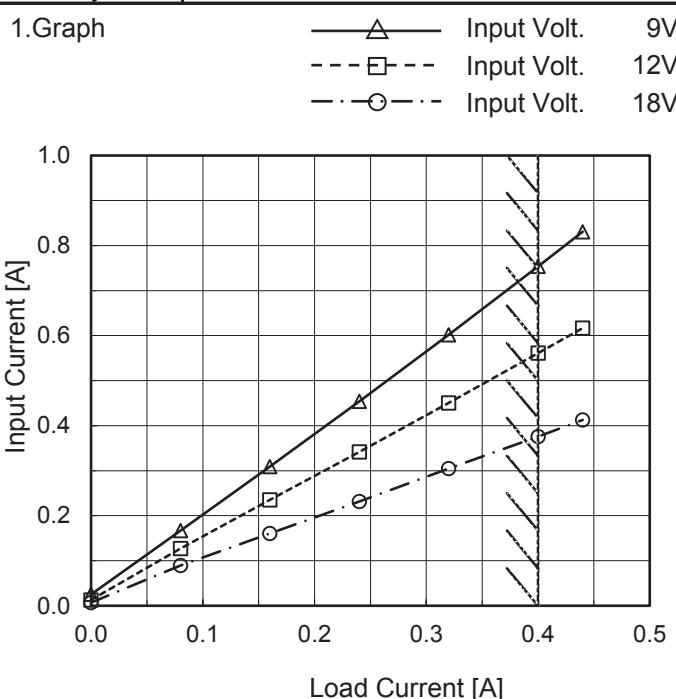
2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	0.025	0.013	0.007
0.08	0.167	0.127	0.090
0.16	0.309	0.235	0.161
0.24	0.454	0.341	0.232
0.32	0.602	0.450	0.304
0.40	0.754	0.561	0.376
0.44	0.831	0.617	0.413
--	-	-	-
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--	-	-	-

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Model	MGS61215
Item	Input Power (by Load Current)
Object	————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

—△— Input Volt.   9V
---⊟--- Input Volt.   12V
—·—⊙—·— Input Volt.   18V
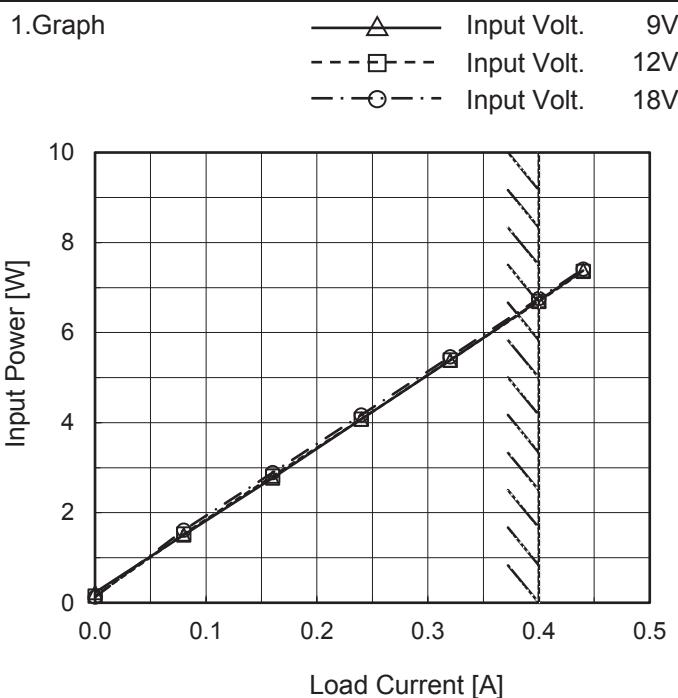
2.Values

Input Power [W]

Load Current [A]

Load Current [A]	Input Power [W]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	0.23	0.15	0.12
0.08	1.51	1.52	1.61
0.16	2.77	2.81	2.89
0.24	4.08	4.08	4.17
0.32	5.38	5.39	5.46
0.40	6.71	6.69	6.75
0.44	7.38	7.36	7.41
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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Model	MGS61215
Item	Efficiency (by Input Voltage)
Object	

Temperature　　25°C
Testing Circuitry　Figure A

1.Graph
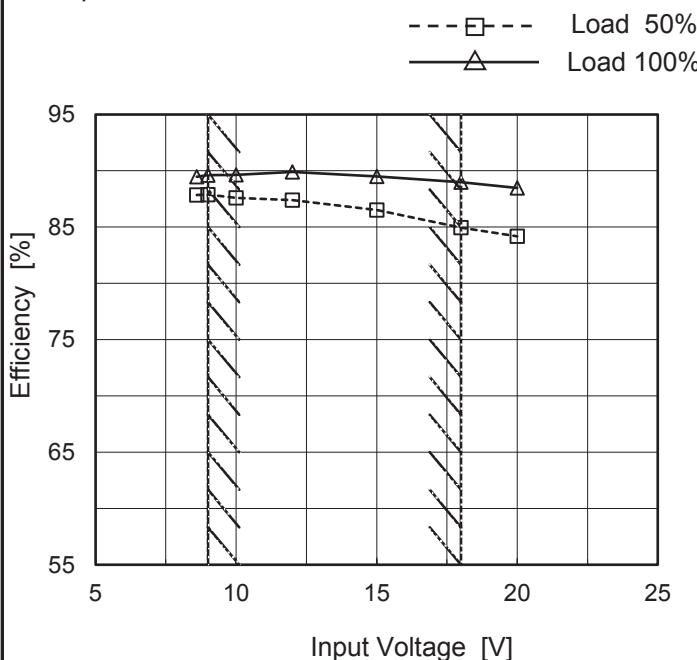
2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8.6	87.9	89.5
9.0	87.9	89.6
10.0	87.6	89.6
12.0	87.4	89.9
15.0	86.5	89.5
18.0	84.9	89.0
20.0	84.2	88.5
--	-	-
--	-	-

Note: Slanted line shows the range of the rated
input voltage.

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Model	MGS61215
Item	Efficiency (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

△ Input Volt. 9V
□ Input Volt. 12V
○ Input Volt. 18V

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

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	-	-	-
0.08	79.6	78.9	74.5
0.16	86.7	85.4	83.1
0.24	88.5	88.5	86.5
0.32	89.3	89.2	88.0
0.40	89.6	89.9	89.0
0.44	89.6	89.8	89.2
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS61215
Item	Line Regulation
Object	+15V0.4A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

Note: Slanted line shows the range of the rated
input voltage.
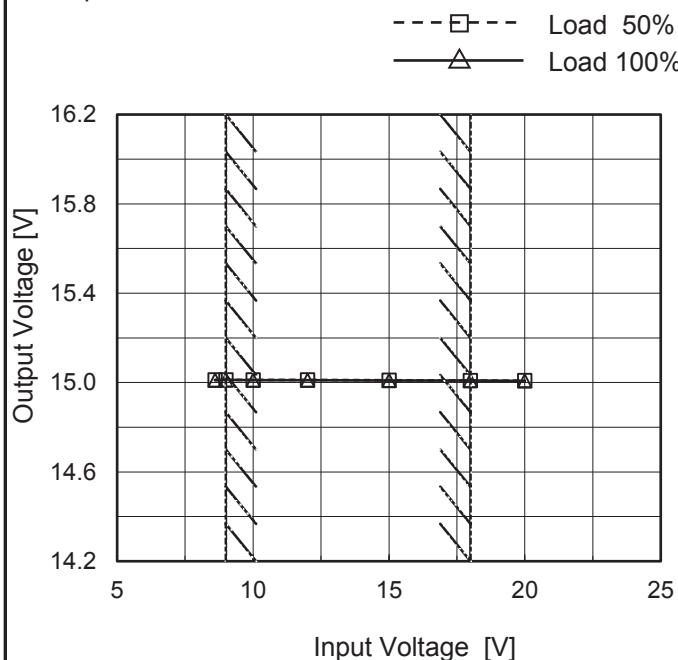
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.6	15.012	15.011
9.0	15.012	15.012
10.0	15.012	15.011
12.0	15.012	15.011
15.0	15.010	15.010
18.0	15.009	15.009
20.0	15.008	15.007
--	-	-
--	-	-

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Model	MGS61215
Item	Load Regulation
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

——△—— Input Volt. 9V
- - -⊟- - - Input Volt. 12V
—·—⊖—·— Input Volt. 18V

Load Current [A]

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

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	15.022	15.023	15.023
0.08	15.019	15.019	15.016
0.16	15.018	15.016	15.014
0.24	15.016	15.015	15.012
0.32	15.014	15.013	15.010
0.40	15.012	15.011	15.009
0.44	15.011	15.011	15.007
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS61215
Item	Dynamic Load Response
Object	+15V0.4A

Temperature   25°C
Testing Circuitry   Figure A

Input Volt.   12 V

Cycle   100 ms

t1,t2 = 100 μ s

Load Current

t1   t2

Min.Load (0A)←→
  Load 100% (0.4A)

500 mV/div
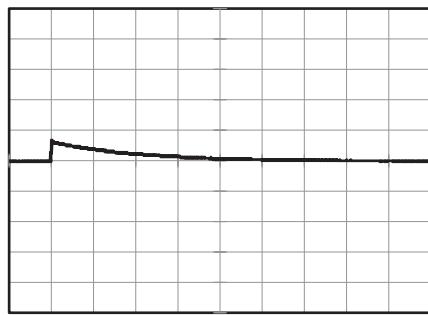
2 ms/div   2 ms/div

Min.Load (0A)←→
  Load 50% (0.2A)

500 mV/div

2 ms/div   2 ms/div
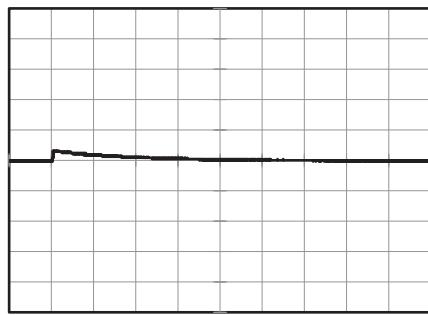
Load 50% (0.2A)←→
  Load 100% (0.4A)

500 mV/div

2 ms/div   2 ms/div

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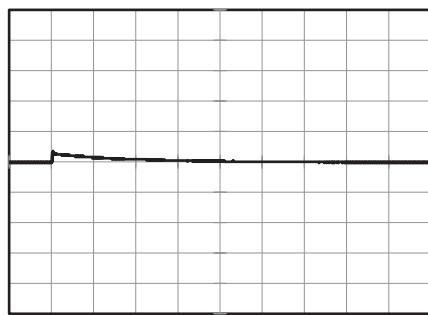
Model	MGS61215
Item	Ripple Voltage (by Load Current)
Object	+15V0.4A

Temperature　　25°C
Testing Circuitry　Figure B

1.Graph

――△―― Input Volt. 9V
―・―○―・・ Input Volt. 18V

Ripple Voltage [mV] vs Load Current [A]
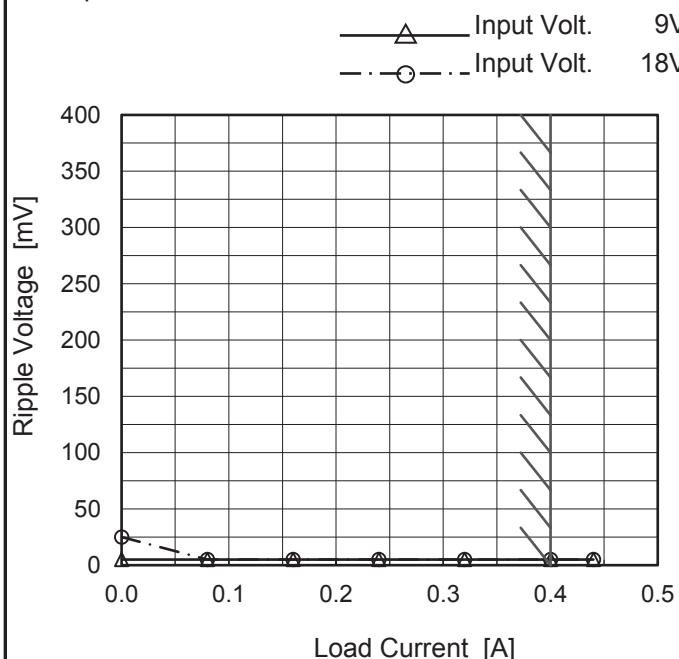
2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.00	5	25
0.08	5	5
0.16	5	5
0.24	5	5
0.32	5	5
0.40	5	5
0.44	5	5
--	-	-
--	-	-
--	-	-
--	-	-

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]
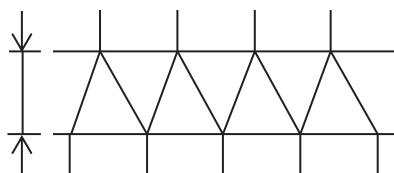
Fig.Complex Ripple Wave Form

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Model	MGS61215
Item	Ripple-Noise
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

△——— Input Volt. 9V
—·—○—·— Input Volt. 18V

Ripple Voltage [mV] vs Load Current [A]

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.00	10	30
0.08	10	10
0.16	10	10
0.24	10	10
0.32	10	10
0.40	10	10
0.44	10	10
--	-	-
--	-	-
--	-	-
--	-	-

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

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Model	MGS61215
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.4A

Testing Circuitry   Figure B

1.Graph

```
         ---⊟--- Load  50%
         ──△── Load 100%
```


Ripple Voltage [mV] vs Ambient Temperature [°C]

Input Volt.   12V
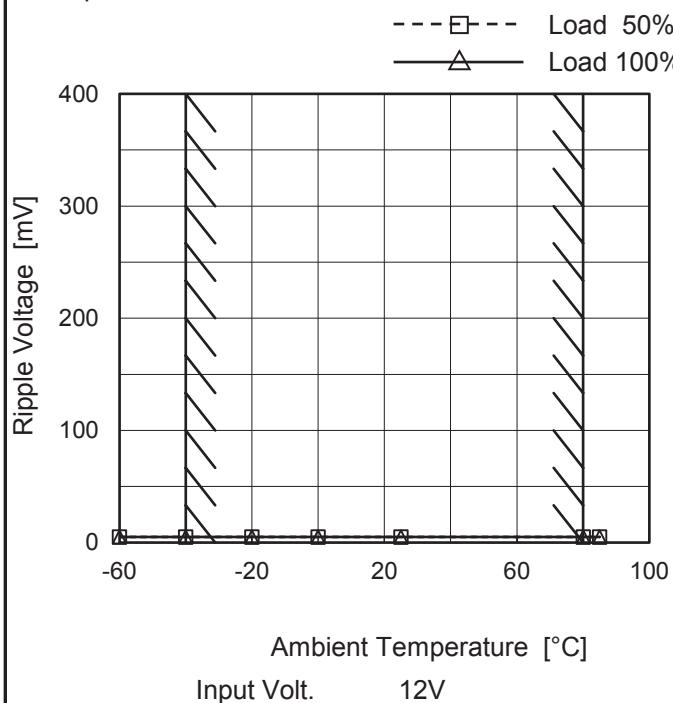
Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
        ambient temperature.

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	5
-40	5	5
-20	5	5
0	5	5
25	5	5
80	5	5
85	5	5
--	-	-
--	-	-
--	-	-
--	-	-

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参考資料

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Model	MGS61215
Item	Ambient Temperature Drift
Object	+15V0.4A

Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.   9V
- - -⊟- - - Input Volt.   12V
—·—◯—·— Input Volt.   18V

Ambient Temperature [°C]

Load 100%

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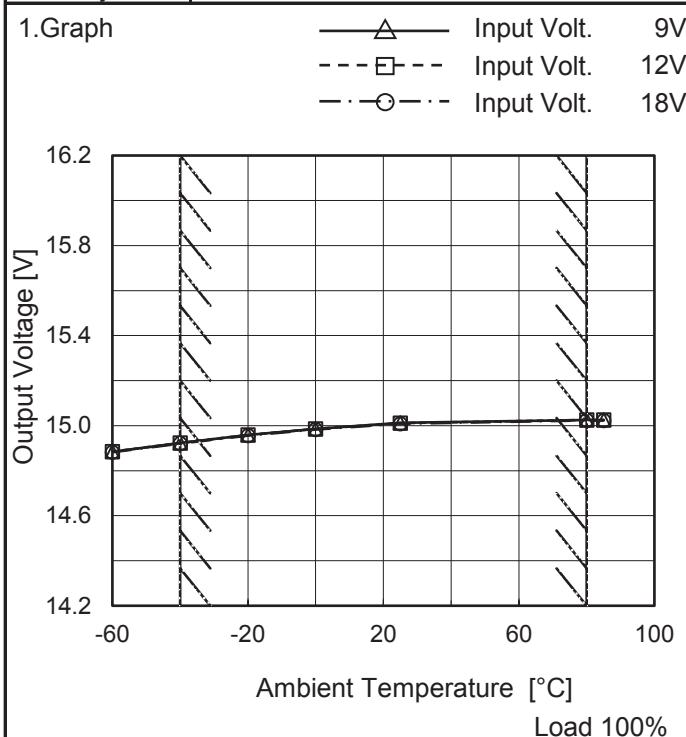
2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-60	14.884	14.884	14.882
-40	14.922	14.923	14.921
-20	14.958	14.959	14.956
0	14.985	14.986	14.983
25	15.012	15.011	15.009
80	15.025	15.025	15.023
85	15.025	15.025	15.023
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS61215
Item	Output Voltage Accuracy
Object	+15V0.4A

Testing Circuitry   Figure A

1.Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and
input voltage varied at random in the range as specified below.

        Temperature   : -40 - 80°C
        Input Voltage : 9 - 18V
        Load Current : 0 - 0.4A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

* Output Voltage Accuracy (Ratio) = $\dfrac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}}$ × 100

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	80	18	0	15.040	±60	±0.4
Minimum Voltage	-40	18	0.4	14.921		

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Model	MGS61215
Item	Time Lapse Drift
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
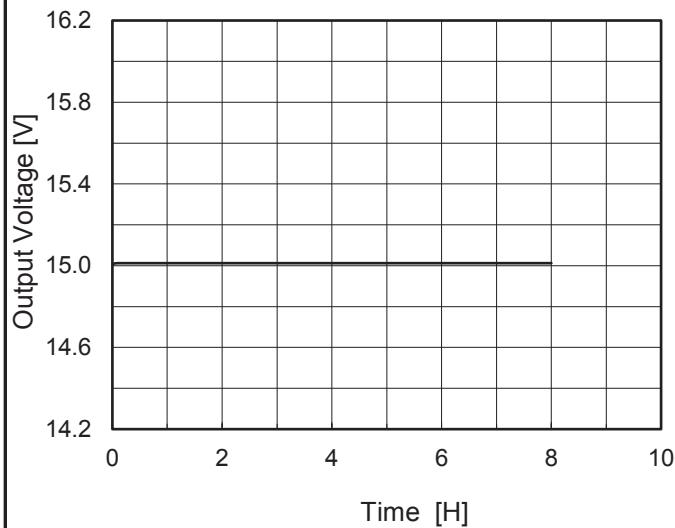
Input Volt. 12V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.005
0.5	15.012
1.0	15.012
2.0	15.012
3.0	15.012
4.0	15.012
5.0	15.012
6.0	15.012
7.0	15.012
8.0	15.012

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Model	MGS61215
Item	Rise and Fall Time
Object	+15V0.4A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
Input Volt.   12 V

Load 50%

Output
Volt.

[2V/div]

0

Load 100%

Output
Volt.

[2V/div]

0

Input
Volt.

0

[5V/div]   Time   [5ms/div]   Time   [1ms/div]
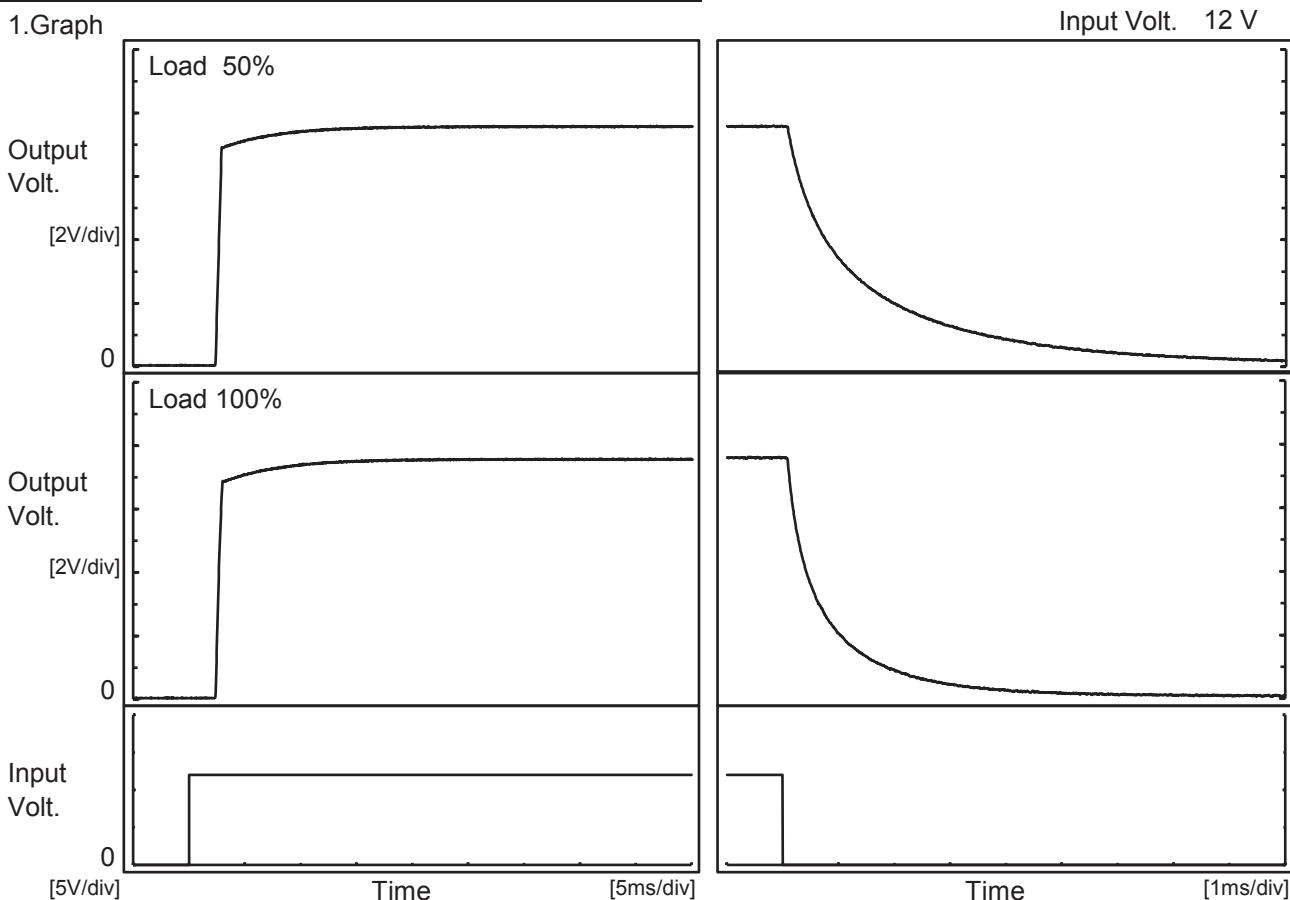
2.Values
[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.4	0.5	2.9	0.2	4.1
100 %	2.4	0.6	3.0	0.1	2.1

Output
Volt.

90%

10%

Input
Volt.

Td   Tr   Th   Tf

Ts

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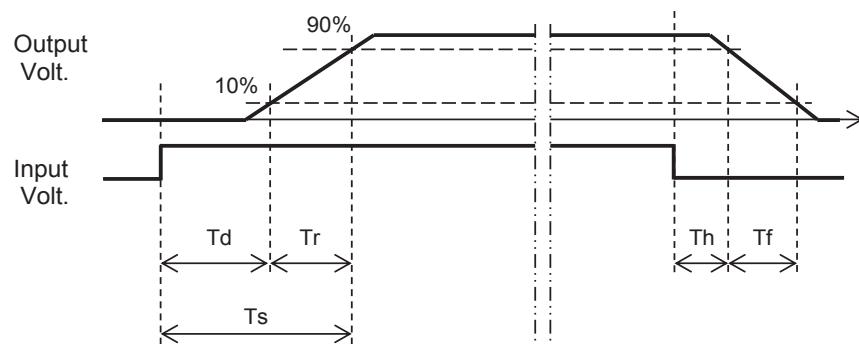
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Model	MGS61215
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.4A
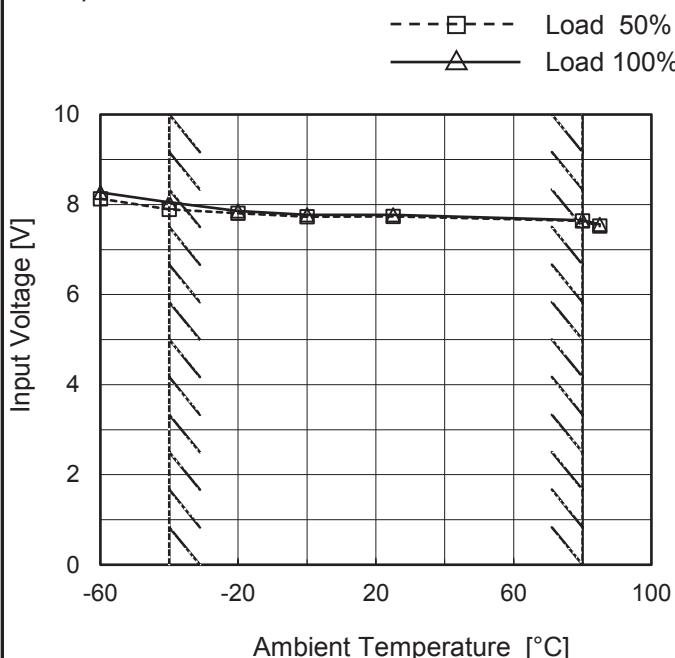
Testing Circuitry   Figure A

1.Graph

- - -☐- - - Load 50%
——△—— Load 100%

Input Voltage [V] vs Ambient Temperature [°C]

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	8.2	8.3
-40	7.9	8.1
-20	7.9	7.9
0	7.8	7.8
25	7.8	7.8
80	7.7	7.7
85	7.6	7.6
--	-	-
--	-	-
--	-	-
--	-	-

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

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Model	MGS61215
Item	Overcurrent Protection
Object	+15V0.4A
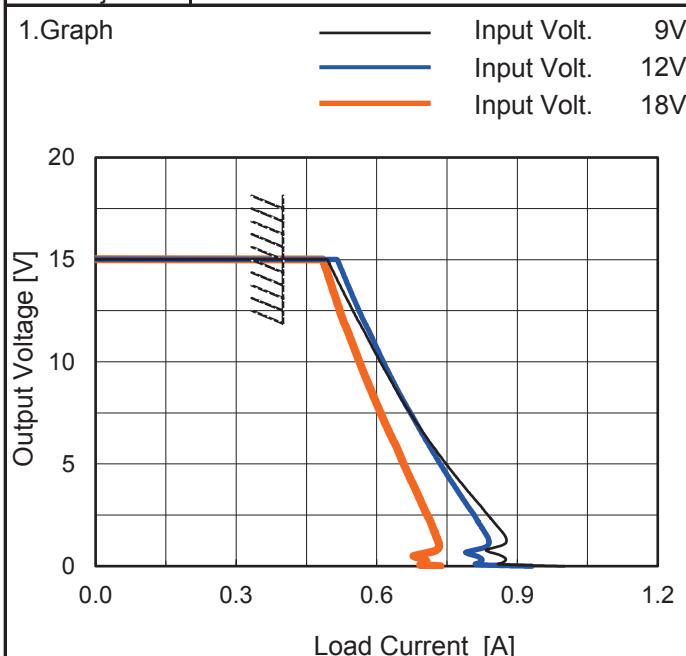
Temperature 25°C
Testing Circuitry Figure A

1.Graph

—— Input Volt. 9V
—— Input Volt. 12V
—— Input Volt. 18V

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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
15.0	0.40	0.40	0.40
14.3	0.51	0.53	0.50
13.5	0.53	0.54	0.51
12.0	0.56	0.57	0.53
10.5	0.60	0.60	0.55
9.0	0.63	0.64	0.58
7.5	0.67	0.67	0.61
6.0	0.72	0.71	0.64
4.5	0.76	0.75	0.67
3.0	0.82	0.79	0.70
1.5	0.87	0.83	0.73
0.0	1.00	0.93	0.74

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Model	MGS61215
Item	Switching Frequency (by Load Current)
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

———△——— Input Volt. 9V
- - -⊟- - - Input Volt. 12V
—·—○—·— Input Volt. 18V

Switching Frequency [kHz] vs Load Current [A]

2.Values

Load Current [A]	Frequency [kHz]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	936	970	845
0.08	600	668	735
0.16	441	506	578
0.24	348	408	477
0.32	287	341	406
0.40	244	293	353
0.44	227	274	331
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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.

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Figure A

Data Acquisition/Control Unit

Figure B（Ripple and Ripple noise Characteristic）

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