COSEL

TEST DATA OF MGS64815

Regulated DC Power Supply
August 1, 2016

Approved by : *Takayuki Fukuda*
Takayuki Fukuda   Design Manager

Prepared by : *Ryosuke Nakao*
Ryosuke Nakao   Design Engineer

COSEL CO.,LTD.

COSEL

CONTENTS

(Final Page 19)

COSEL

Model	MGS64815
Item	Input Current (by Input Voltage)
Object	

Temperature	25°C
Testing Circuitry	Figure A

1.Graph

Load 100%
Load 50%
Load 0%

Input Current [A] vs 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
24.0	0.003	0.003	0.003
31.0	0.003	0.003	0.003
31.8	0.005	0.107	0.211
32.0	0.006	0.106	0.209
32.2	0.006	0.106	0.208
32.4	0.006	0.105	0.207
33.0	0.005	0.103	0.203
33.4	0.005	0.101	0.201
36.0	0.006	0.094	0.186
48.0	0.006	0.071	0.140
60.0	0.005	0.058	0.112
70.0	0.003	0.050	0.096
76.0	0.003	0.046	0.089
80.0	0.002	0.044	0.085
--	-	-	-
--	-	-	-
--	-	-	-

BC-11025

COSEL

Model	MGS64815
Item	Input Current (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

— △ — Input Volt. 36V
--- ⊟ --- Input Volt. 48V
— · ⊖ — · — Input Volt. 76V

Load Current [A] vs Input Current [A]

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.00	0.006	0.006	0.003
0.08	0.041	0.032	0.021
0.16	0.076	0.058	0.038
0.24	0.112	0.085	0.055
0.32	0.148	0.113	0.073
0.40	0.186	0.140	0.089
0.44	0.204	0.154	0.098
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

BC-11025

CO$EL

Model	MGS64815
Item	Input Power (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

⎯⎯△⎯⎯ Input Volt. 36V
- - -⊟- - - Input Volt. 48V
—·—⊖—·— Input Volt. 76V

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

2.Values

Load Current [A]	Input Power [W]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.00	0.20	0.24	0.19
0.08	1.49	1.53	1.60
0.16	2.75	2.80	2.89
0.24	4.06	4.10	4.18
0.32	5.36	5.42	5.58
0.40	6.73	6.69	6.82
0.44	7.38	7.39	7.45
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11025

CO$EL

Model	MGS64815
Item	Efficiency (by Input Voltage)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
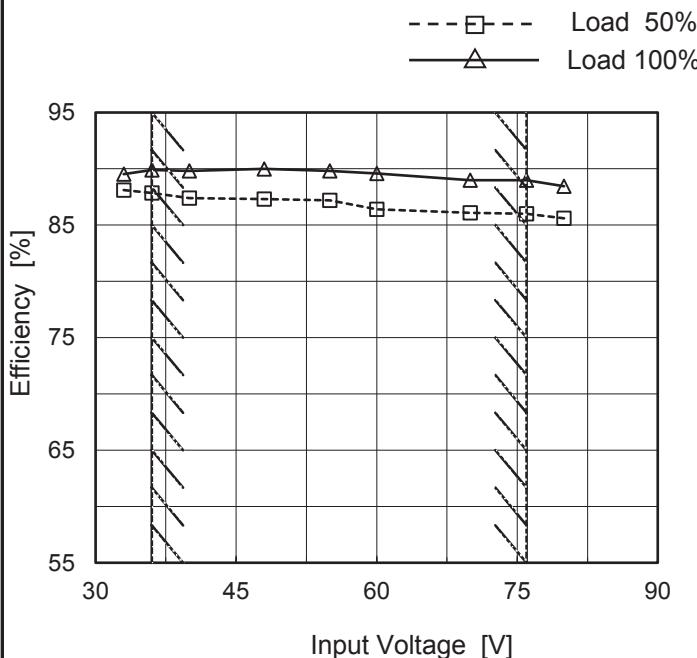
- - -□- - -   Load 50%
——△——   Load 100%

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
33	88.1	89.5
36	87.9	89.9
40	87.4	89.8
48	87.3	90.0
55	87.2	89.8
60	86.4	89.6
70	86.1	89.0
76	86.0	89.0
80	85.6	88.4

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

COSEL

Model	MGS64815
Item	Efficiency (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

△ Input Volt. 36V
☐ Input Volt. 48V
○ Input Volt. 76V

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

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.00	-	-	-
0.08	81.0	78.6	75.3
0.16	87.5	85.8	83.4
0.24	89.0	88.2	86.5
0.32	89.9	88.9	87.5
0.40	89.9	90.0	89.0
0.44	89.8	89.6	88.9
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11025

CO$EL

Model	MGS64815
Item	Line Regulation
Object	+15V0.4A

Temperature　　25°C
Testing Circuitry　Figure A

1.Graph

- - - ⊟ - - -　Load 50%
————△————　Load 100%

Output Voltage [V]

Input Voltage [V]

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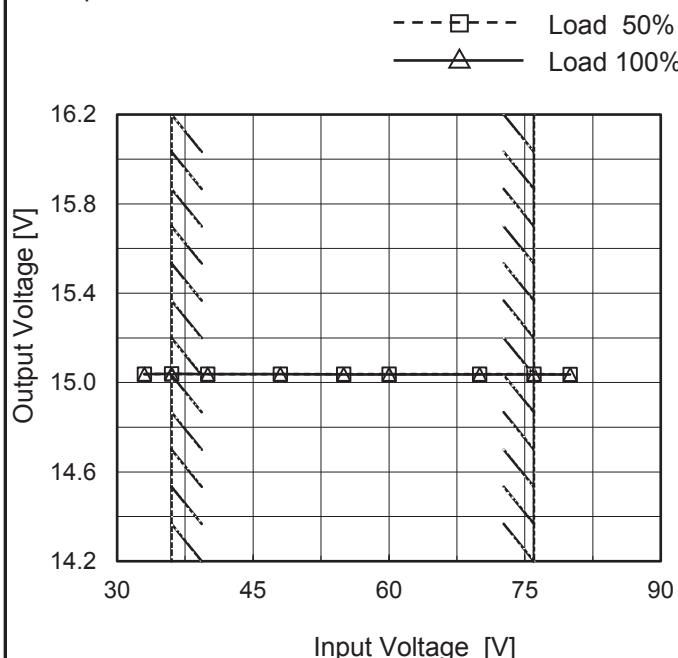
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
33	15.038	15.038
36	15.039	15.039
40	15.038	15.037
48	15.038	15.037
55	15.037	15.037
60	15.037	15.036
70	15.037	15.036
76	15.037	15.036
80	15.037	15.036

BC-11025

COSEL

Model	MGS64815
Item	Load Regulation
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

————△———— Input Volt. 36V
– – –⊟– – – Input Volt. 48V
—·—○—·— Input Volt. 76V

2.Values

Load Current [A]

Note: Slanted line shows the range of the rated
load current.
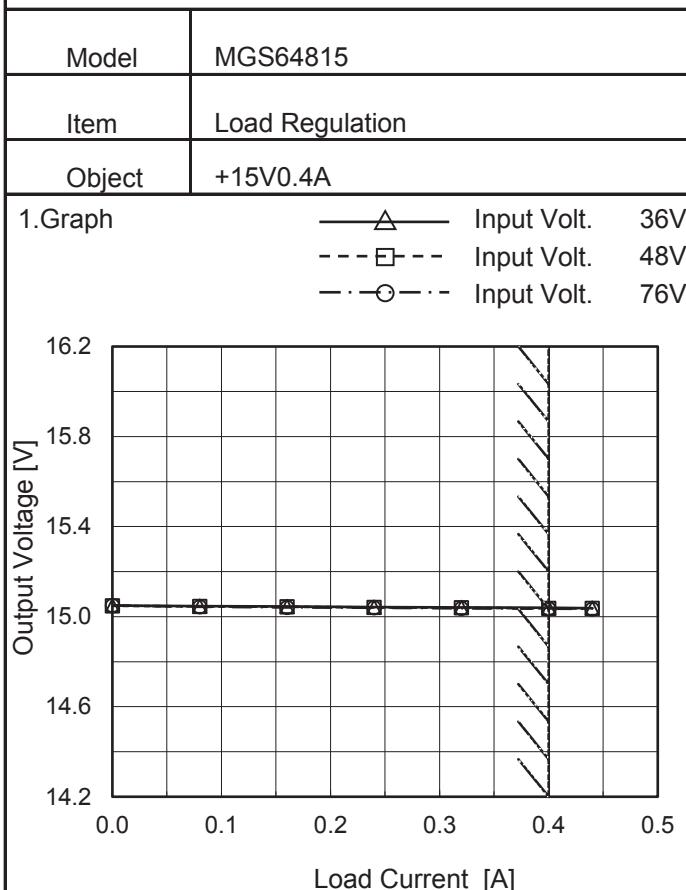
Load Current [A]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.00	15.049	15.048	15.050
0.08	15.047	15.045	15.043
0.16	15.045	15.043	15.041
0.24	15.043	15.041	15.039
0.32	15.041	15.039	15.037
0.40	15.039	15.037	15.036
0.44	15.038	15.036	15.035
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11025

COSEL

Model	MGS64815
Item	Dynamic Load Response
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure A

Input Volt.   48 V

Cycle   100 ms

t1,t2 = 100 μ s

Load Current

t1   t2

Min.Load (0A)←→
  Load 100% (0.4A)

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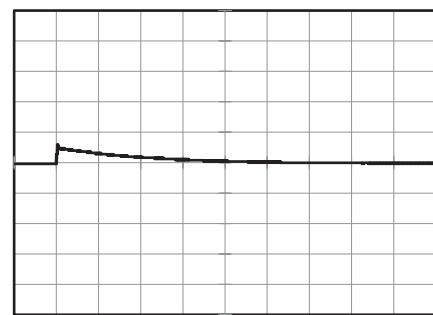
2 ms/div   2 ms/div

Min.Load (0A)←→
  Load 50% (0.2A)

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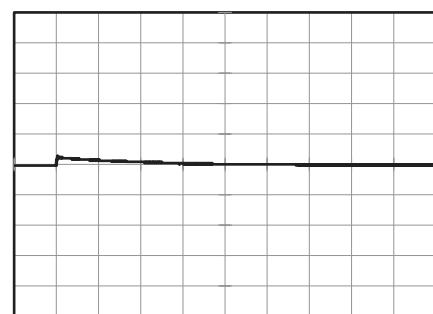
2 ms/div   2 ms/div

Load 50% (0.2A)←→
  Load 100% (0.4A)

500 mV/div

2 ms/div   2 ms/div

BC-11025
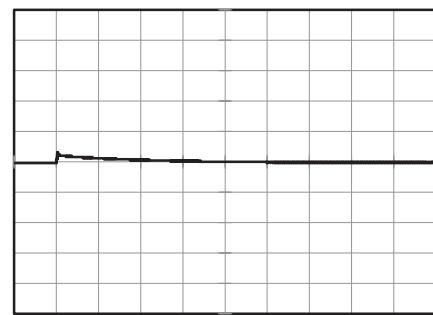
COSEL

Model	MGS64815
Item	Ripple Voltage (by Load Current)
Object	+15V0.4A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

— △ — Input Volt.   36V
— · — ○ — · · — Input Volt.   76V

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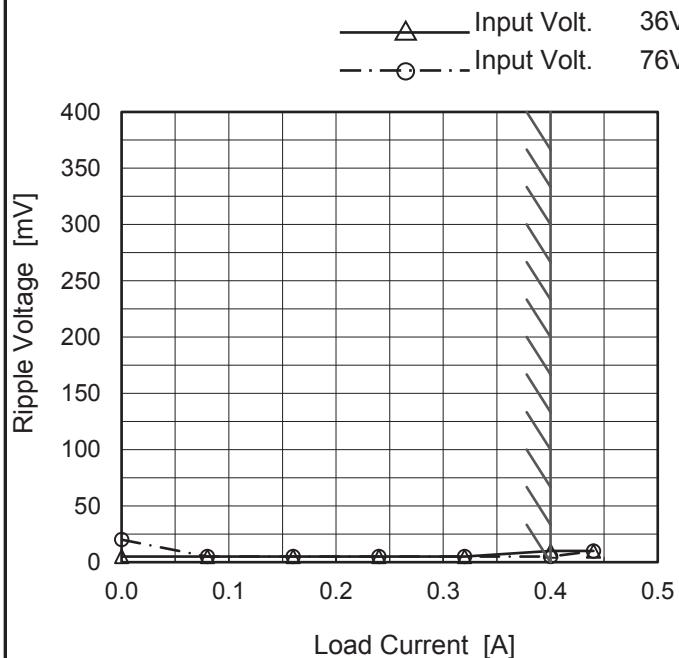
2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	5	20
0.08	5	5
0.16	5	5
0.24	5	5
0.32	5	5
0.40	10	5
0.44	10	10
--	-	-
--	-	-
--	-	-
--	-	-

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]
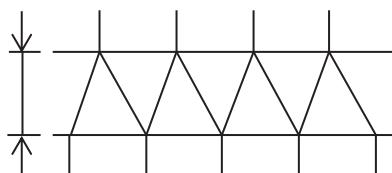
Fig.Complex Ripple Wave Form

BC-11025

COSEL

Model	MGS64815
Item	Ripple-Noise
Object	+15V0.4A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

——△—— Input Volt.   36V
— · —○— · — Input Volt.   76V

Ripple Voltage [mV] vs Load Current [A]

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	5	20
0.08	5	10
0.16	5	5
0.24	10	10
0.32	10	10
0.40	10	10
0.44	15	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

BC-11025

COSEL

Model	MGS64815
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.4A

Testing Circuitry　Figure B

1.Graph

- - -□- - - 　Load　50%
——△——　Load 100%

Ripple Voltage [mV]

Ambient Temperature [°C]

Input Volt.　　48V
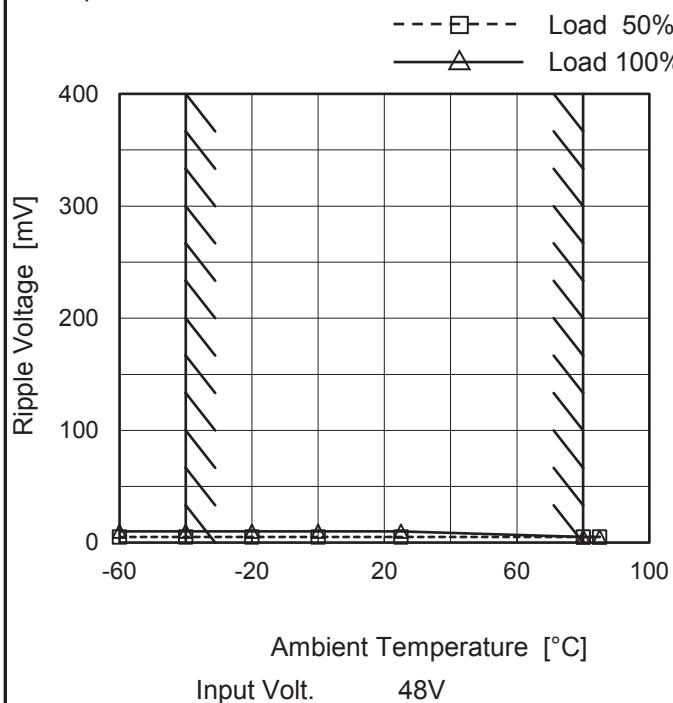
Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
　　　ambient temperature.

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load　50%	Load　100%
-60	5	10
-40	5	10
-20	5	10
0	5	10
25	5	10
80	5	5
85	5	5
--	-	-
--	-	-
--	-	-
--	-	-

BC-11025

CO$EL

Model	MGS64815
Item	Ambient Temperature Drift
Object	+15V0.4A

Testing Circuitry   Figure A

1.Graph

— △ — Input Volt.   36V
--- ⊟ --- Input Volt.   48V
— · — ○ — · — Input Volt.   76V

Ambient Temperature [°C]

Load 100%

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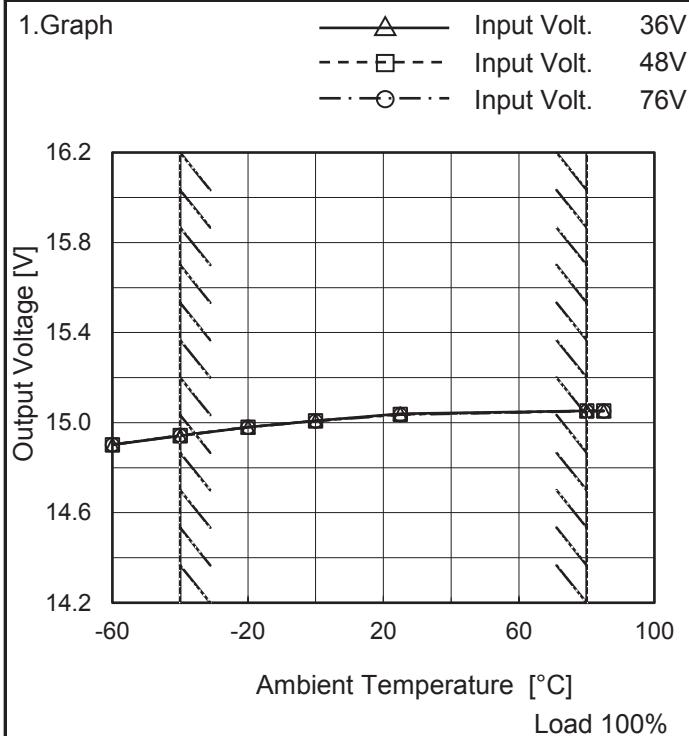
2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	14.902	14.902	14.902
-40	14.942	14.943	14.943
-20	14.980	14.980	14.980
0	15.008	15.008	15.007
25	15.039	15.037	15.036
80	15.052	15.052	15.051
85	15.053	15.052	15.051
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11025

COSEL

Model	MGS64815
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 : 36 - 76V
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 Current[A]	Output Voltage[V]	Output Voltage Accuracy Value [mV]	Output Voltage Accuracy Ratio [%]
Maximum Voltage	80	76	0	15.067	±63	±0.4
Minimum Voltage	-40	36	0.4	14.942		

BC-11025

COSEL

Model	MGS64815
Item	Time Lapse Drift
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
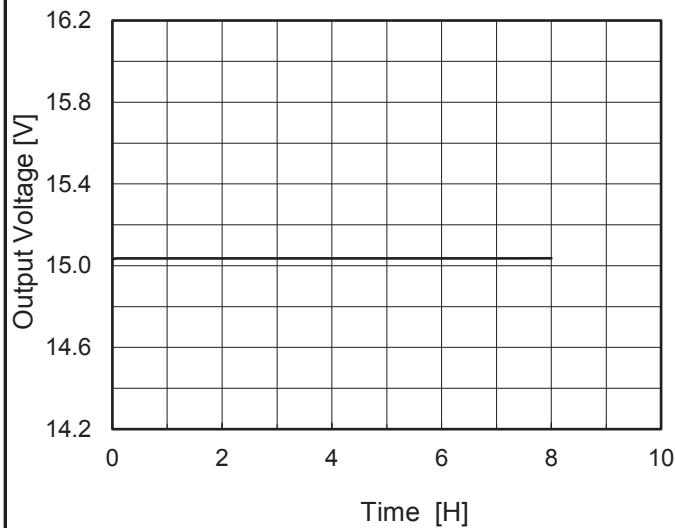
Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.029
0.5	15.036
1.0	15.036
2.0	15.036
3.0	15.036
4.0	15.036
5.0	15.036
6.0	15.036
7.0	15.036
8.0	15.036

BC-11025

COSEL

Model	MGS64815
Item	Rise and Fall Time
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 48 V

Load 50%

Output Volt.

[2V/div]

0

Load 100%

Output Volt.

[2V/div]

0

Input Volt.

0

[10V/div] Time [5ms/div]

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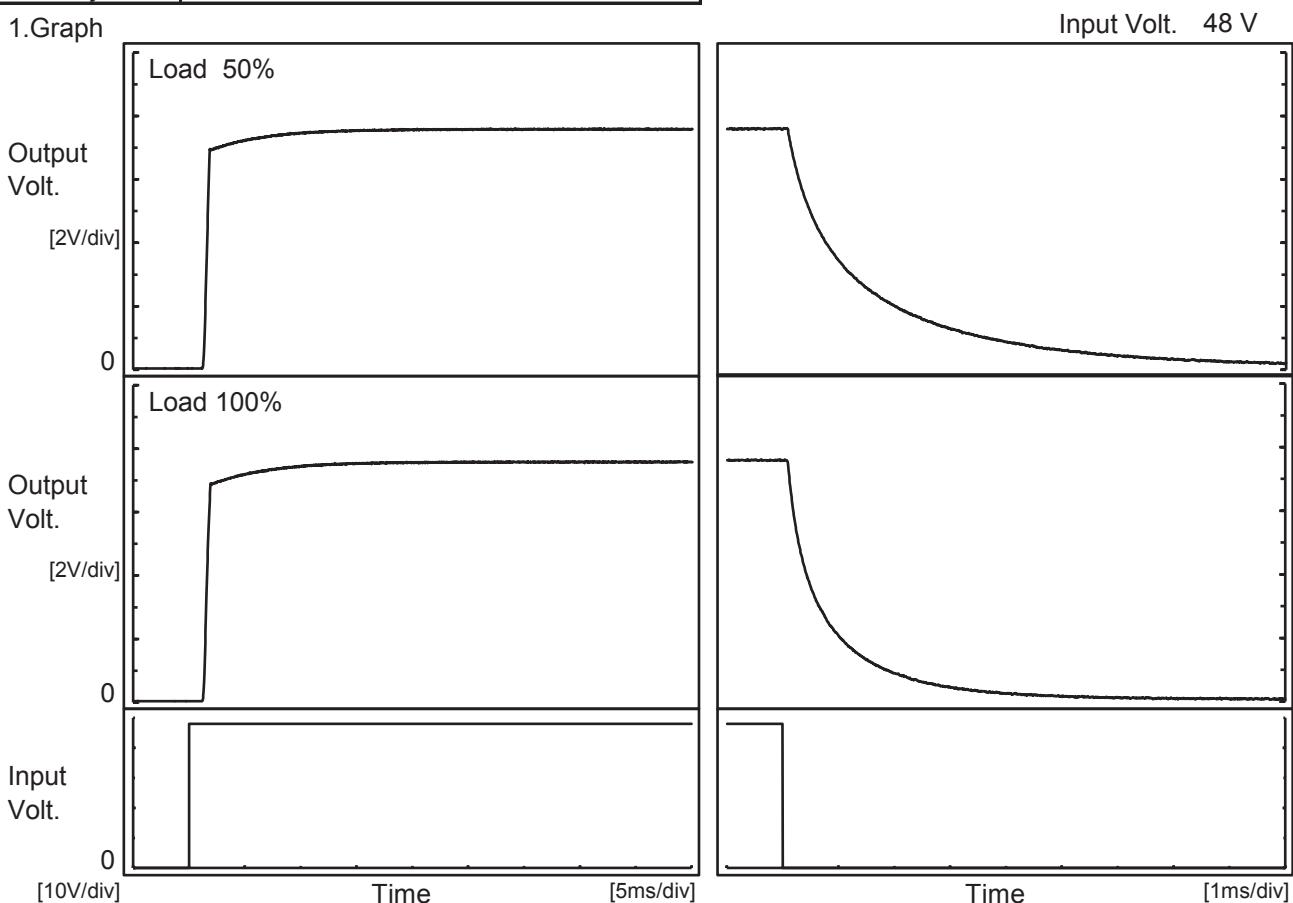
2.Values [ms]

Load / Time	Td	Tr	Ts	Th	Tf
50 %	1.4	0.5	1.9	0.2	4.1
100 %	1.4	0.6	2.0	0.1	2.1

Output Volt.

90%

10%

Input Volt.

Td   Tr   Th   Tf

Ts

- 15 -

BC-11025
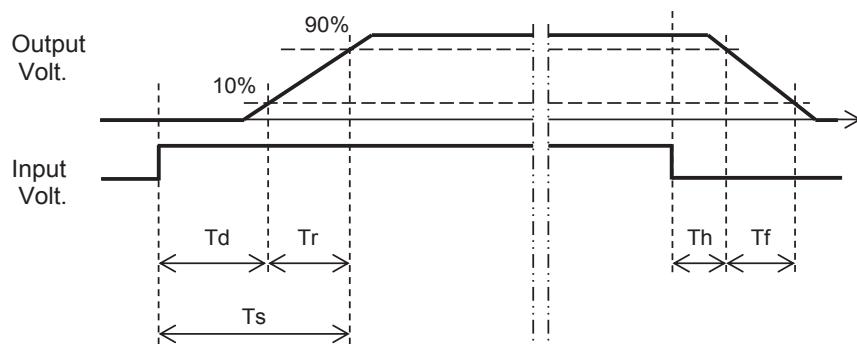
COSEL

Model	MGS64815
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]

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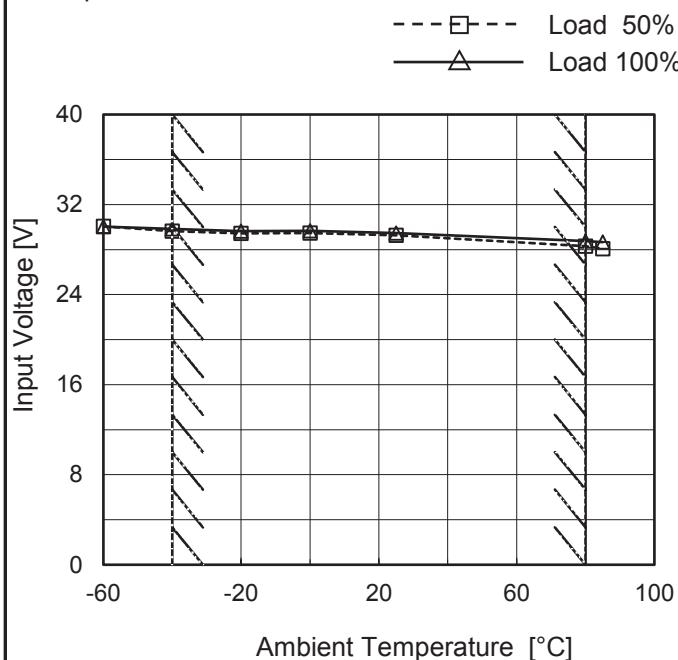
2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load　50%	Load　100%
-60	30.1	30.1
-40	29.7	29.9
-20	29.5	29.7
0	29.5	29.7
25	29.3	29.5
80	28.3	28.8
85	28.1	28.7
--	-	-
--	-	-
--	-	-
--	-	-

BC-11025

COSEL

Model	MGS64815
Item	Overcurrent Protection
Object	+15V0.4A
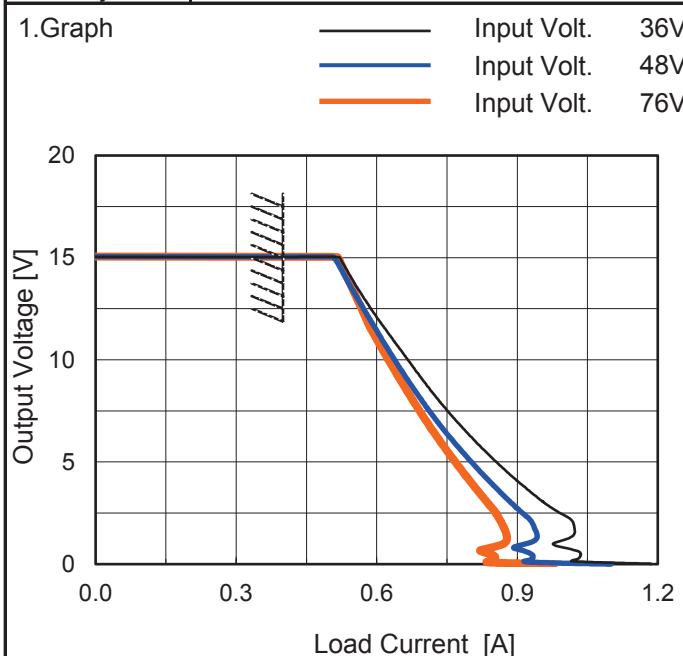
Temperature　25°C
Testing Circuitry　Figure A

1.Graph

	Input Volt.	36V
	Input Volt.	48V
	Input Volt.	76V

Load Current [A]

Output Voltage [V]

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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
15.0	0.40	0.40	0.40
14.3	0.54	0.53	0.53
13.5	0.56	0.55	0.55
12.0	0.60	0.58	0.58
10.5	0.65	0.62	0.61
9.0	0.70	0.67	0.65
7.5	0.75	0.71	0.69
6.0	0.81	0.76	0.74
4.5	0.88	0.82	0.78
3.0	0.96	0.89	0.84
1.5	1.02	0.94	0.88
0.0	1.18	1.10	0.98

BC-11025

COSEL

Model	MGS64815
Item	Switching Frequency (by Load Current)
Object	+15V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

— △ — Input Volt. 36V
– – □ – – Input Volt. 48V
— · — ○ — · — Input Volt. 76V

Switching Frequency [kHz] vs Load Current [A]
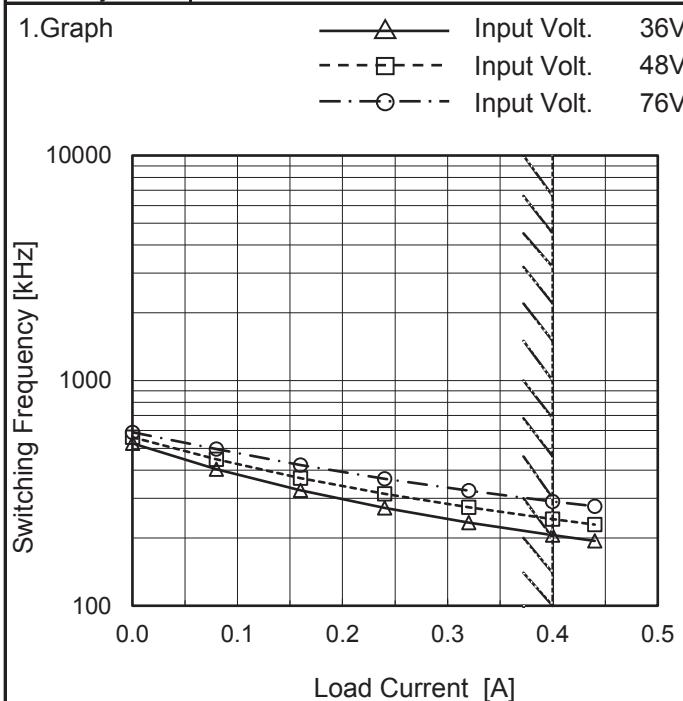
2.Values

Load Current [A]	Frequency [kHz]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.00	527	561	590
0.08	404	447	496
0.16	326	369	422
0.24	272	314	367
0.32	234	274	325
0.40	206	242	291
0.44	194	229	277
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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.

BC-11025

COSEL
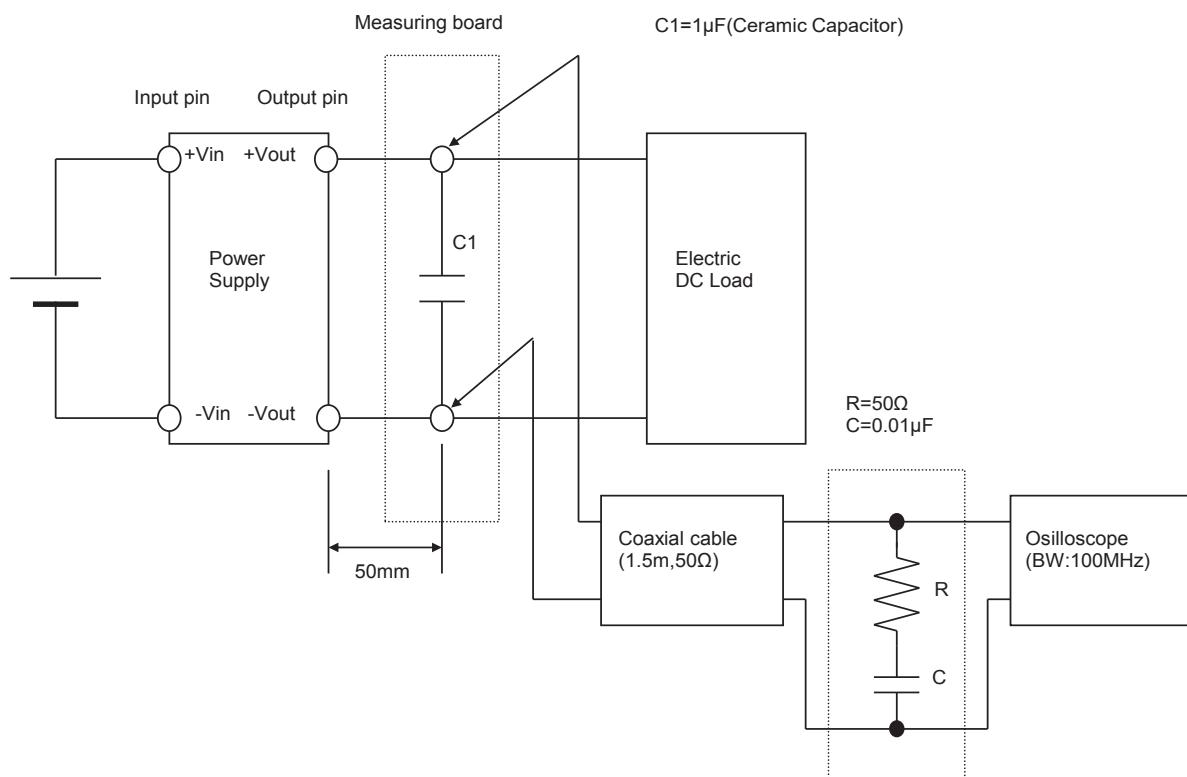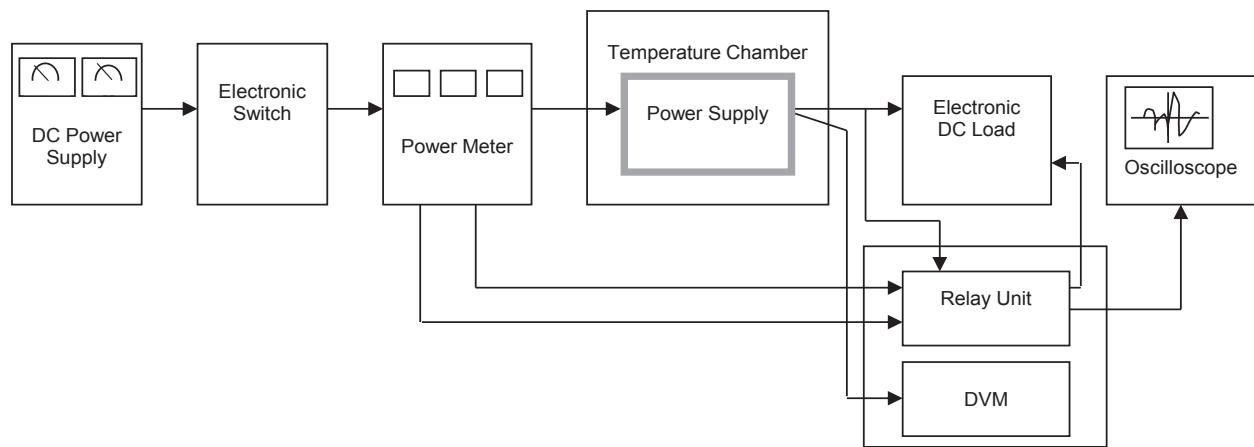
Figure A

Figure B（Ripple and Ripple noise Characteristic）

BC-11025