TEST DATA OF MGFS1R52415

Regulated DC Power Supply
December 29, 2016

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COSEL CO.,LTD.

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Model	MGFS1R52415
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
6.0	0.003	0.003	0.003
8.0	0.003	0.003	0.003
8.2	0.003	0.003	0.003
8.4	0.003	0.004	0.003
8.6	0.016	0.113	0.216
8.8	0.015	0.110	0.211
9.0	0.015	0.108	0.202
12.0	0.013	0.082	0.153
18.0	0.009	0.055	0.102
24.0	0.008	0.043	0.078
30.0	0.007	0.035	0.063
36.0	0.005	0.030	0.054
40.0	0.005	0.028	0.049
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-10965

COSEL

Model	MGFS1R52415
Item	Input Current (by Load Current)
Object	
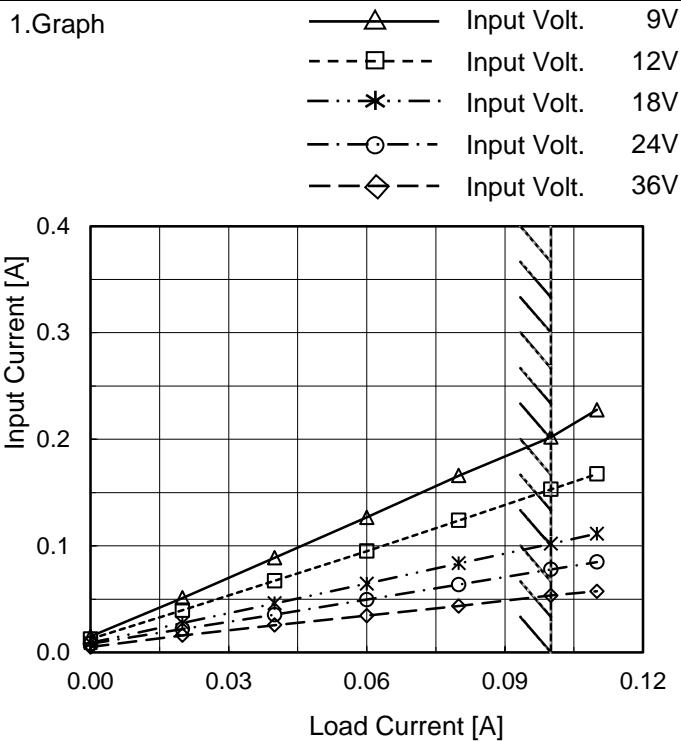
Temperature   25°C
Testing Circuitry   Figure A

1.Graph

—△— Input Volt. 9V
- - -⊟- - - Input Volt. 12V
—··—✳··—· Input Volt. 18V
—·—○—·· Input Volt. 24V
— —◇— — Input Volt. 36V

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

2.Values

Load Current	Input Current [A]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[A]	9[V]	12[V]	18[V]	24[V]	36[V]
0.00	0.015	0.013	0.009	0.008	0.005
0.02	0.051	0.040	0.028	0.022	0.016
0.04	0.089	0.067	0.046	0.035	0.026
0.06	0.127	0.095	0.065	0.050	0.035
0.08	0.166	0.124	0.084	0.064	0.044
0.10	0.202	0.153	0.102	0.078	0.054
0.11	0.228	0.168	0.111	0.085	0.057
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFS1R52415
Item	Input Power (by Load Current)
Object	
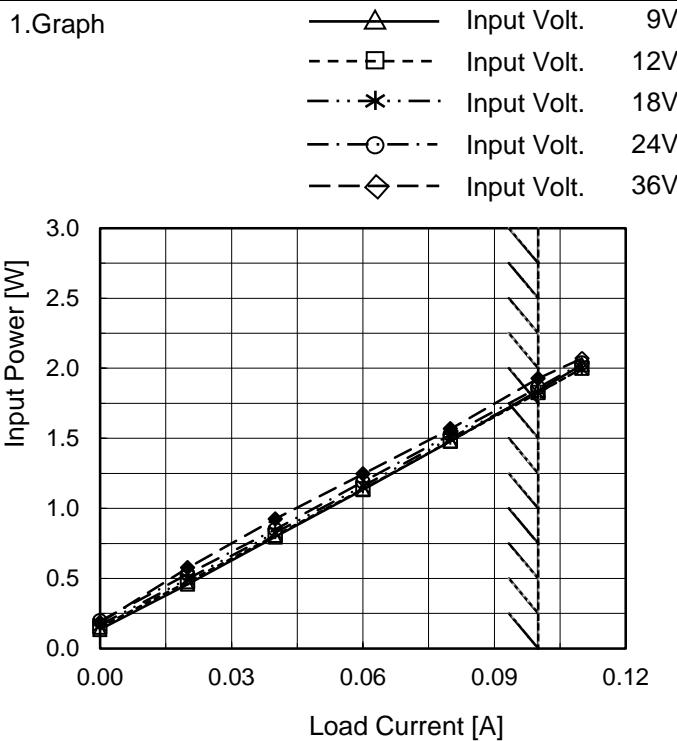
Temperature 25°C
Testing Circuitry Figure A

1.Graph

———△———	Input Volt.	9V
– – –⊟– – –	Input Volt.	12V
—··—✳··—·	Input Volt.	18V
—·—○—·—	Input Volt.	24V
— —◇— —	Input Volt.	36V

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

2.Values

Load Current [A]	Input Power [W]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	0.14	0.15	0.17	0.20	0.19
0.02	0.46	0.48	0.50	0.53	0.58
0.04	0.80	0.81	0.83	0.85	0.92
0.06	1.13	1.14	1.16	1.19	1.24
0.08	1.48	1.48	1.50	1.53	1.57
0.10	1.84	1.83	1.83	1.86	1.93
0.11	2.02	2.00	2.00	2.04	2.07
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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COSEL

Model	MGFS1R52415
Item	Efficiency (by Input Voltage)
Object	

Temperature 25℃
Testing Circuitry Figure A

1.Graph

Load 50%
Load 100%

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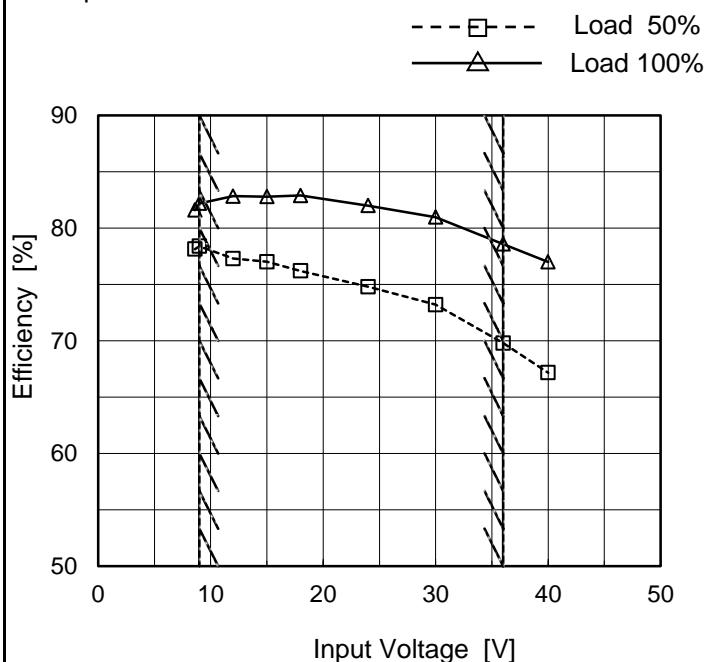
2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8.6	78.1	81.6
9.0	78.4	82.2
12.0	77.3	82.8
15.0	77.0	82.8
18.0	76.2	82.9
24.0	74.8	82.0
30.0	73.2	81.0
36.0	69.8	78.6
40.0	67.2	77.0

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COSEL

Model	MGFS1R52415
Item	Efficiency (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

		Input Volt.	9V
—△—		Input Volt.	9V
– – ⊟ – –		Input Volt.	12V
— · · ✳ · · — ·		Input Volt.	18V
— · —○— · · —		Input Volt.	24V
— — ◇ — —		Input Volt.	36V

Load Current [A]

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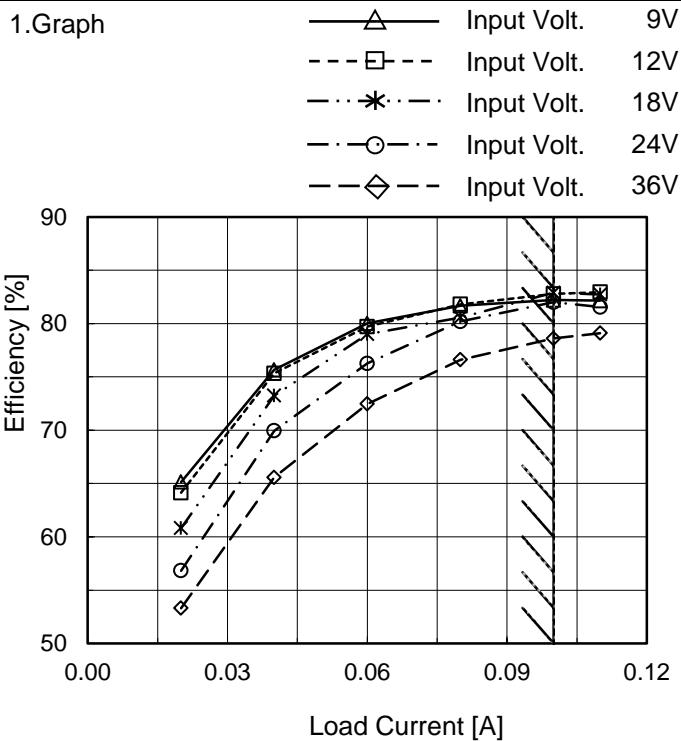
2.Values

Load Current	Efficiency [%]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[A]	9[V]	12[V]	18[V]	24[V]	36[V]
0.00	-	-	-	-	-
0.02	65.1	64.1	60.8	56.8	53.3
0.04	75.7	75.3	73.2	69.9	65.6
0.06	80.0	79.7	79.0	76.3	72.5
0.08	81.7	81.8	80.6	80.2	76.6
0.10	82.2	82.8	82.9	82.0	78.6
0.11	82.2	82.9	82.7	81.5	79.1
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFS1R52415
Item	Line Regulation
Object	+15V0.1A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
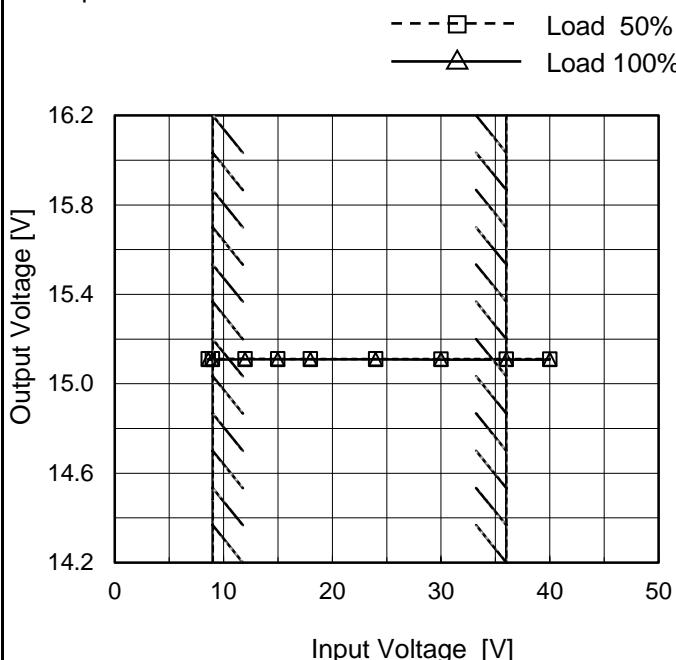
2.Values

--- ⊟ --- Load 50%
——△—— Load 100%

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.6	15.111	15.108
9.0	15.111	15.108
12.0	15.112	15.109
15.0	15.111	15.109
18.0	15.111	15.109
24.0	15.111	15.109
30.0	15.111	15.109
36.0	15.110	15.108
40.0	15.110	15.108

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

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Model	MGFS1R52415
Item	Load Regulation
Object	+15V0.1A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

		Input Volt.	9V
	△	Input Volt.	9V
	◻	Input Volt.	12V
	✳	Input Volt.	18V
	○	Input Volt.	24V
	◇	Input Volt.	36V

Output Voltage [V] vs Load Current [A]

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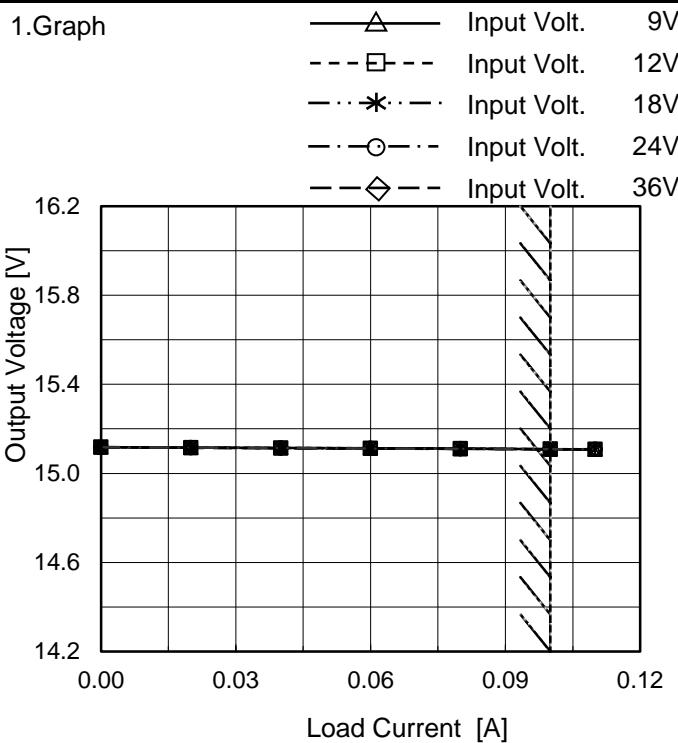
2.Values

Load Current [A]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	15.118	15.118	15.117	15.117	15.118
0.02	15.116	15.116	15.115	15.115	15.115
0.04	15.114	15.114	15.114	15.113	15.113
0.06	15.113	15.113	15.112	15.112	15.111
0.08	15.111	15.111	15.111	15.111	15.110
0.10	15.108	15.109	15.109	15.109	15.108
0.11	15.107	15.109	15.108	15.108	15.108
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFS1R52415
Item	Dynamic Load Response
Object	+15V0.1A

Temperature   25°C
Testing Circuitry   Figure A

Input Volt.   24 V
Cycle   100 ms

t1,t2 = 100 μ s

Load Current

t1   t2

Min.Load (0A)←→
  Load 100% (0.1A)

100 mV/div

4 ms/div   4 ms/div

Min.Load (0A)←→
  Load 50% (0.05A)

100 mV/div

4 ms/div   4 ms/div

Load 50% (0.05A)←→
  Load 100% (0.1A)

100 mV/div

4 ms/div   4 ms/div

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Model	MGFS1R52415
Item	Ripple Voltage (by Load Current)
Object	+15V0.1A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

—△— Input Volt.   9V
—·—○—·— Input Volt.   36V

Load Current [A]

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. 9 [V]	Input Volt. 36 [V]
0.00	5	10
0.02	15	10
0.04	25	10
0.06	30	15
0.08	45	20
0.10	65	25
0.11	70	25
--	-	-
--	-	-
--	-	-
--	-	-

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COSEL

Model	MGFS1R52415
Item	Ripple-Noise
Object	+15V0.1A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

△——— Input Volt.   9V
—·○—·· Input Volt.   36V

Ripple Voltage [mV] vs Load Current [A]

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]
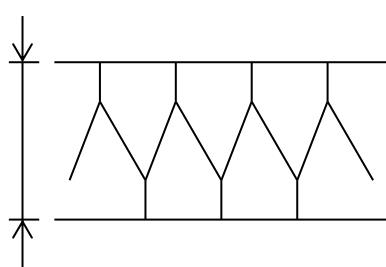
Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.00	5	10
0.02	15	10
0.04	25	15
0.06	30	15
0.08	50	25
0.10	70	30
0.11	80	30
--	-	-
--	-	-
--	-	-
--	-	-

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COSEL

Model	MGFS1R52415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.1A

Testing Circuitry   Figure B

1.Graph

--□-- Load 50%
—△— Load 100%

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

Input Volt.   24V
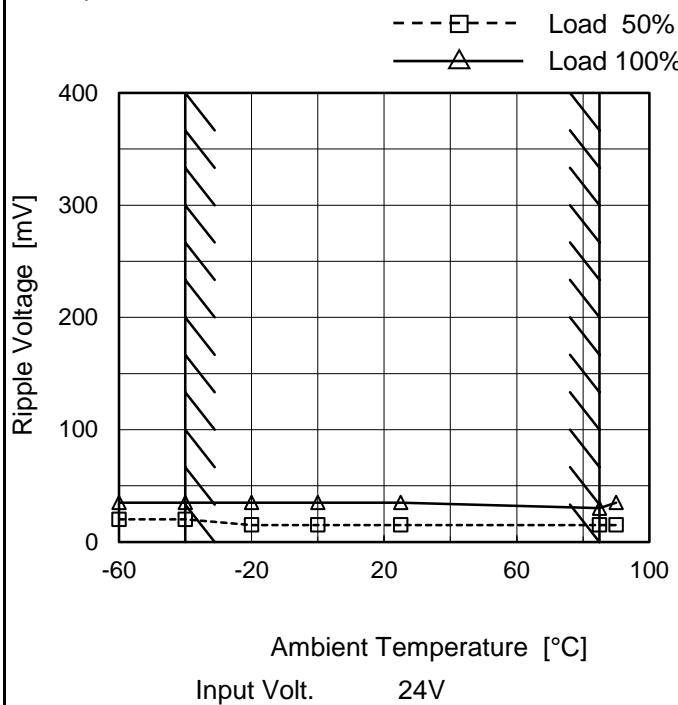
Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
        ambient temperature.

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	20	35
-40	20	35
-20	15	35
0	15	35
25	15	35
85	15	30
90	15	35
--	-	-
--	-	-
--	-	-
--	-	-

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COSEL

Model	MGFS1R52415
Item	Ambient Temperature Drift
Object	+15V0.1A
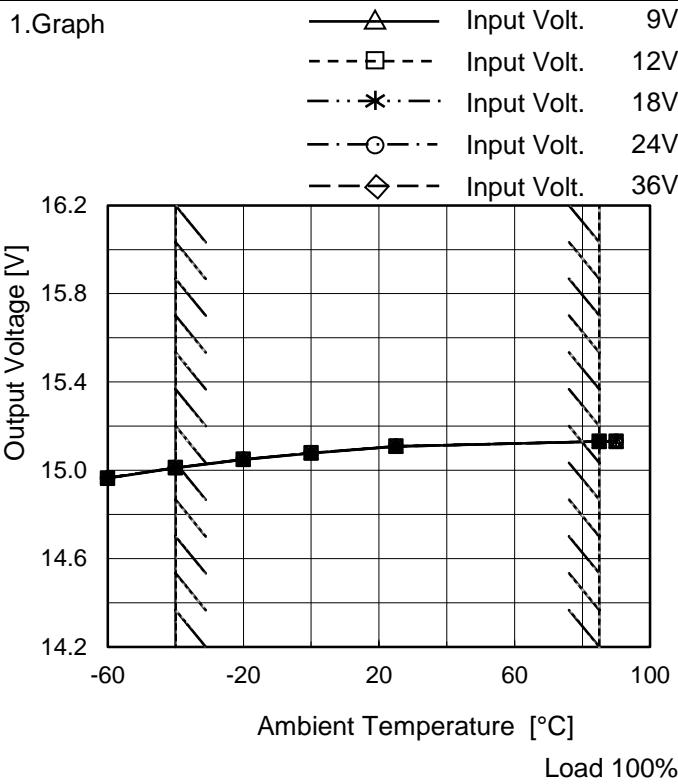
Testing Circuitry   Figure A

1.Graph

		Input Volt.	9V
		Input Volt.	12V
		Input Volt.	18V
		Input Volt.	24V
		Input Volt.	36V

Output Voltage [V] vs 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]	Input Volt. 24[V]	Input Volt. 36[V]
-60	14.964	14.965	14.965	14.965	14.965
-40	15.011	15.012	15.012	15.012	15.012
-20	15.048	15.049	15.050	15.049	15.049
0	15.078	15.079	15.079	15.079	15.078
25	15.108	15.109	15.109	15.109	15.108
85	15.130	15.131	15.131	15.131	15.131
90	15.130	15.131	15.131	15.131	15.131
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFS1R52415	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V0.1A	

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   :   9   -   36V

Load Current   :   0   -   0.1A

* 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	85	36	0	15.144	±67	±0.4
Minimum Voltage	-40	9	0.1	15.011		

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COSEL

Model	MGFS1R52415
Item	Time Lapse Drift
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt.   24V
Load   100%
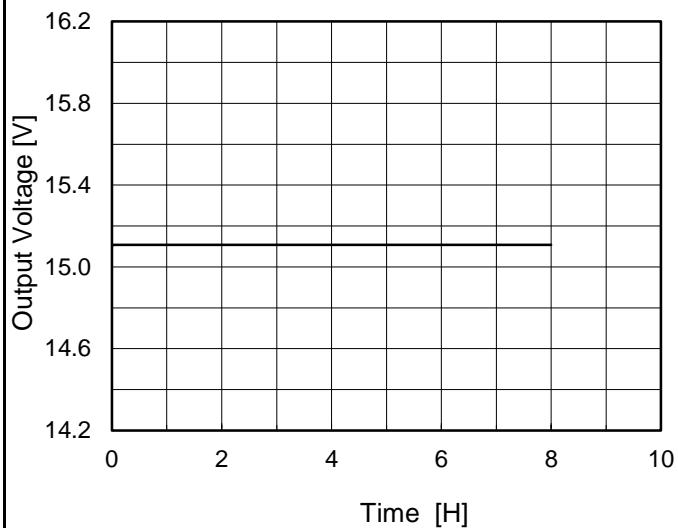
2.Values

Time since start [H]	Output Voltage [V]
0.0	15.104
0.5	15.108
1.0	15.108
2.0	15.108
3.0	15.108
4.0	15.108
5.0	15.108
6.0	15.108
7.0	15.108
8.0	15.108

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COSEL

Model	MGFS1R52415
Item	Rise and Fall Time
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 24 V

Load 50%

Output Volt. [2V/div]

Load 100%

Output Volt. [2V/div]

Input Volt. [10V/div]

Time [5ms/div]

Time [5ms/div]
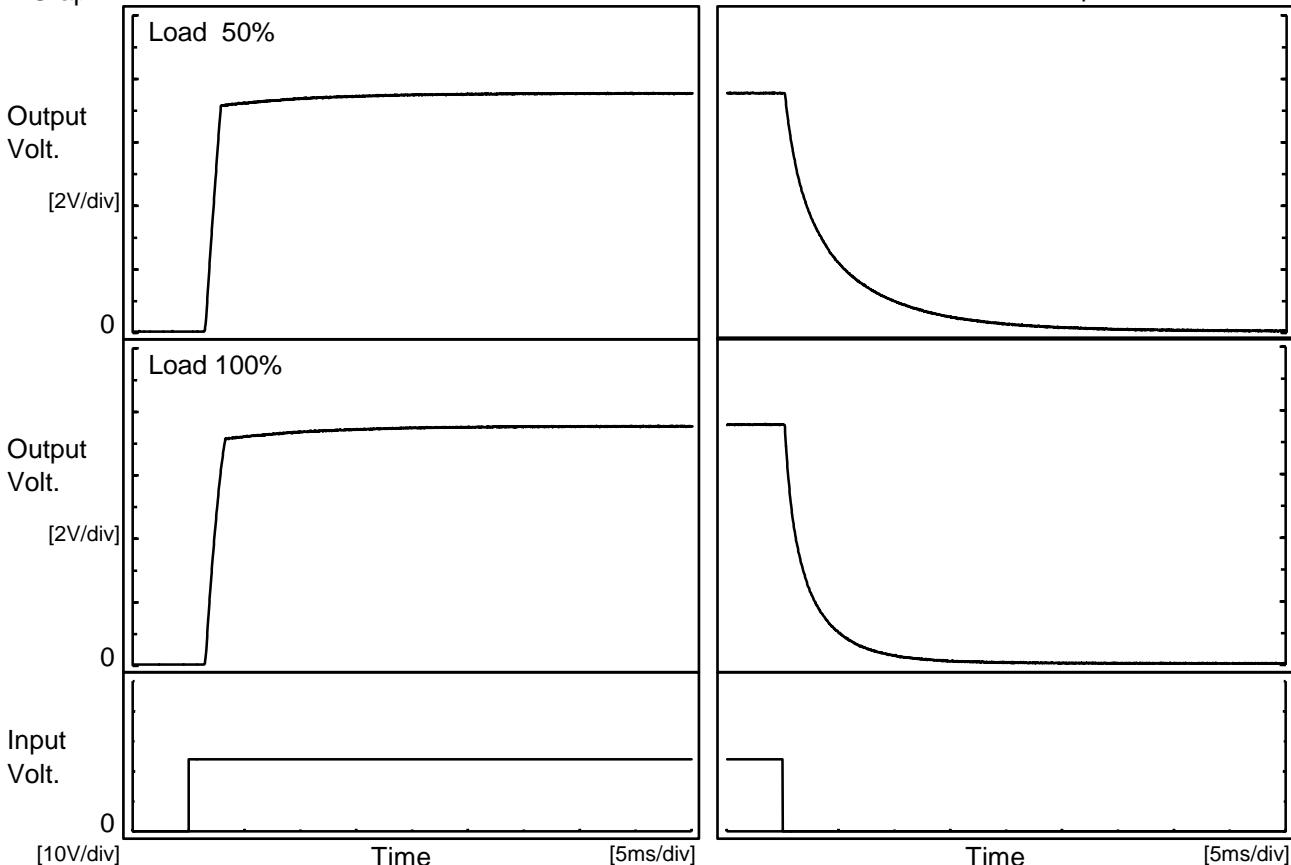
2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.6	1.2	2.8	0.4	11.3
100 %	1.7	1.5	3.2	0.3	5.6

Output Volt.

90%

10%

Input Volt.

Td | Tr

Ts

Th | Tf

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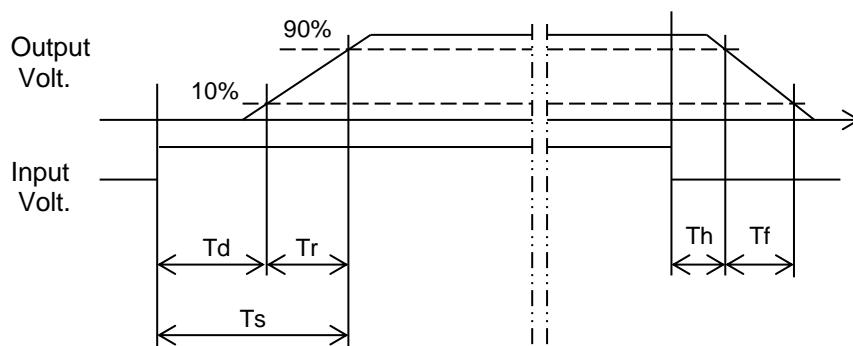
COSEL

Model	MGFS1R52415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.1A
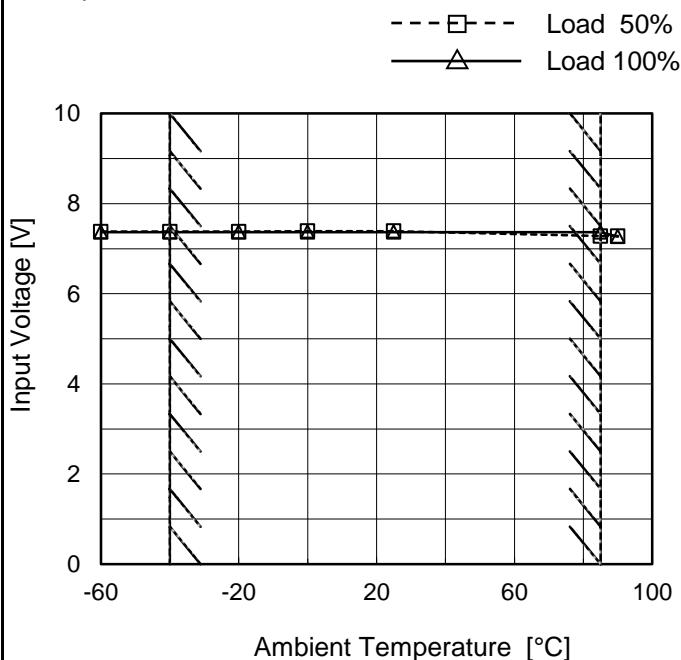
Testing Circuitry   Figure A

1.Graph

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

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	7.4	7.4
-40	7.4	7.4
-20	7.4	7.4
0	7.4	7.4
25	7.4	7.4
85	7.3	7.4
90	7.3	7.3
--	-	-
--	-	-
--	-	-
--	-	-

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COSEL

Model	MGFS1R52415
Item	Overcurrent Protection
Object	+15V0.1A
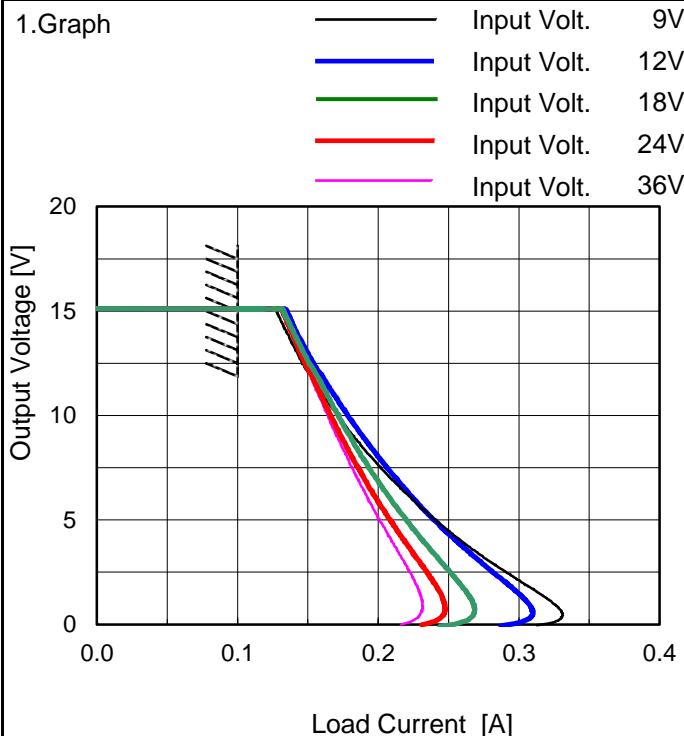
Temperature　　25°C
Testing Circuitry　Figure A

1.Graph

	Input Volt.	9V
	Input Volt.	12V
	Input Volt.	18V
	Input Volt.	24V
	Input Volt.	36V

Load Current [A]

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]	Input Volt. 24[V]	Input Volt. 36[V]
14.3	0.133	0.140	0.138	0.137	0.138
13.5	0.139	0.146	0.143	0.142	0.142
12.0	0.150	0.159	0.155	0.152	0.151
10.5	0.166	0.173	0.167	0.162	0.161
9.0	0.183	0.189	0.180	0.174	0.170
7.5	0.202	0.206	0.193	0.186	0.181
6.0	0.224	0.225	0.209	0.199	0.193
4.5	0.249	0.247	0.226	0.213	0.205
3.0	0.279	0.273	0.244	0.230	0.219
1.5	0.314	0.299	0.263	0.244	0.229
0.0	0.313	0.287	0.244	0.231	0.216
--	-	-	-	-	-

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Model	MGFS1R52415
Item	Switching frequency (by Load Current)
Object	+15V0.1A

Temperature　　　25℃
Testing Circuitry　　Figure A

1.Graph

—△— Input Volt. 9V
‐‐‐□‐‐‐ Input Volt. 12V
—‥✳‥—‧ Input Volt. 18V
—‧—○—‧‐ Input Volt. 24V
——◇—— Input Volt. 36V

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.
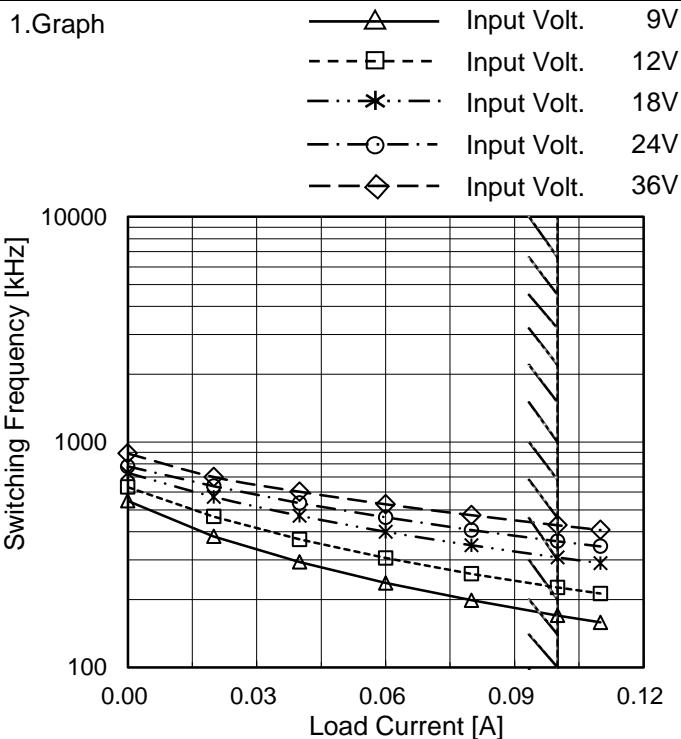
2.Values

| Load Current [A]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	548	631	730	780	890
0.02	381	467	571	637	700
0.04	294	369	471	536	602
0.06	237	306	400	463	530
0.08	199	260	348	406	474
0.10	170	226	308	363	428
0.11	158	213	290	344	407
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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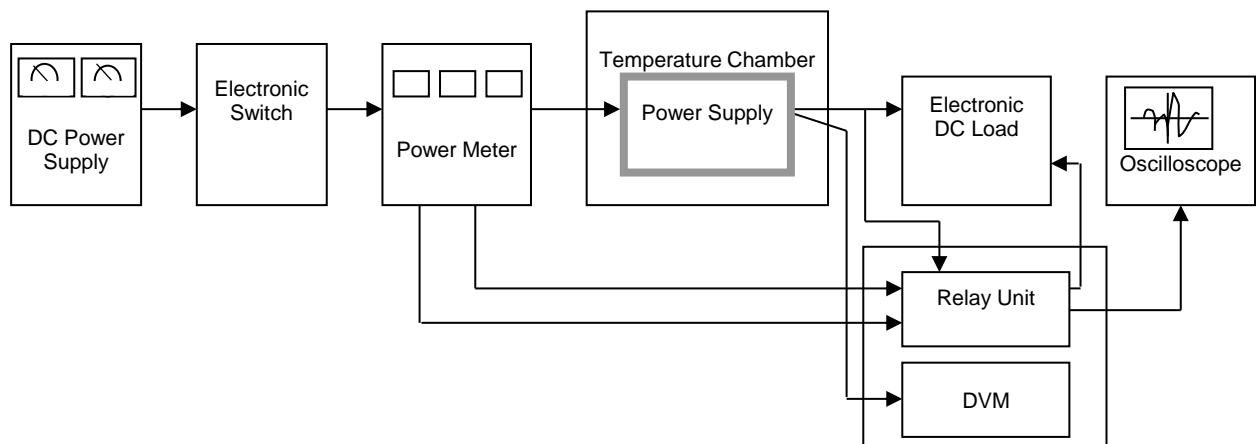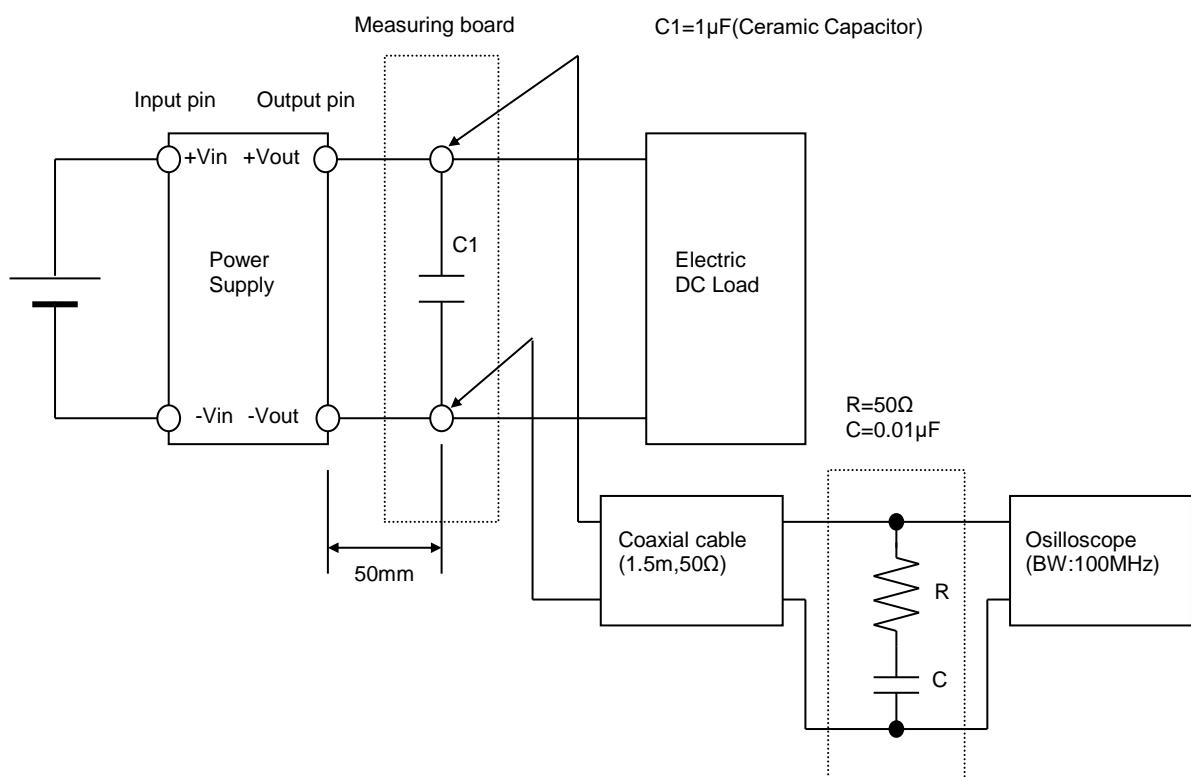
Figure A

Figure B（Ripple and Ripple noise Characteristic）

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