COSEL

TEST DATA OF MGFS102405

Regulated DC Power Supply
December 13, 2016

Approved by : _Takayuki Fukuda_
Takayuki Fukuda   Design Manager

Prepared by : _Takaaki Sekiguchi_
Takaaki Sekiguchi   Design Engineer

COSEL CO.,LTD.

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Model	MGFS102405
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	0.004
8.2	0.003	0.003	0.003
8.4	0.037	0.698	1.421
8.6	0.036	0.679	1.385
8.8	0.036	0.662	1.348
9.0	0.036	0.647	1.316
12.0	0.030	0.482	0.971
18.0	0.023	0.321	0.634
24.0	0.021	0.242	0.473
30.0	0.005	0.195	0.378
36.0	0.004	0.164	0.317
40.0	0.005	0.150	0.286
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGFS102405
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

Input Current [A] vs Load Current [A]

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]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	0.036	0.030	0.023	0.021	0.004
0.4	0.272	0.206	0.141	0.107	0.075
0.8	0.521	0.390	0.262	0.197	0.134
1.2	0.784	0.579	0.384	0.288	0.195
1.6	1.051	0.776	0.510	0.380	0.256
1.8	1.195	0.878	0.574	0.428	0.287
2.0	- ※	0.971	0.634	0.473	0.317
2.2	- ※	1.076	0.703	0.523	0.349
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

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Model	MGFS102405
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

Load Current [A]

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]
0.0	0.32	0.36	0.42	0.50	0.15
0.4	2.43	2.47	2.52	2.57	2.70
0.8	4.64	4.64	4.69	4.71	4.83
1.2	6.95	6.89	6.87	6.91	7.04
1.6	9.34	9.20	9.12	9.10	9.21
1.8	10.61	10.39	10.27	10.24	10.33
2.0	- ※	11.58	11.42	11.38	11.45
2.2	- ※	12.79	12.57	12.52	12.55
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

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Model	MGFS102405
Item	Efficiency (by Input Voltage)
Object	————————————

Temperature   25°C
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	87.8	86.7 ※1
9.0	87.9	87.1 ※1
12.0	88.4	87.8
15.0	88.4	88.6
18.0	88.1	89.1
24.0	87.5	89.4
30.0	86.8	89.6
36.0	85.8	89.1
40.0	84.7	88.6

※1：Load 80%

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Model	MGFS102405
Item	Efficiency (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

Efficiency [%] vs Load Current [A]

2.Values

Load Current [A]	Efficiency [%]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	-	-	-	-	-
0.4	83.6	82.4	80.6	79.1	75.2
0.8	87.7	87.7	86.8	86.4	84.2
1.2	87.9	88.6	88.8	88.4	86.7
1.6	87.1	88.5	89.2	89.4	88.4
1.8	86.3	88.1	89.1	89.4	88.6
2.0	- ※	87.8	89.1	89.4	89.1
2.2	- ※	87.5	89.0	89.4	89.1
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

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

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Model	MGFS102405
Item	Line Regulation
Object	+5V2A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
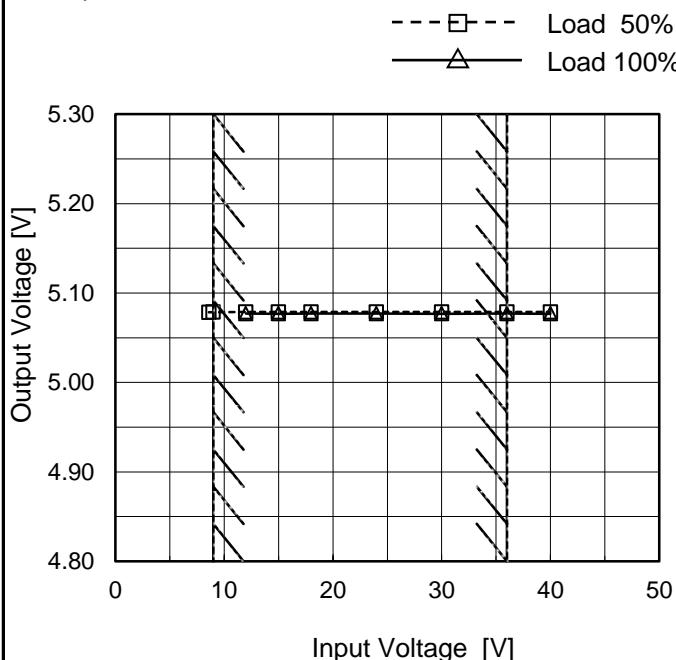
Load 50%

Load 100%

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

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.6	5.079	- ※
9.0	5.079	- ※
12.0	5.079	5.077
15.0	5.079	5.077
18.0	5.079	5.077
24.0	5.079	5.077
30.0	5.079	5.077
36.0	5.079	5.077
40.0	5.079	5.077

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

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Model	MGFS102405
Item	Load Regulation
Object	+5V2A

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	Output Voltage [V]				
Current	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[A]	9[V]	12[V]	18[V]	24[V]	36[V]
0.0	5.084	5.084	5.083	5.083	5.083
0.4	5.082	5.082	5.082	5.082	5.082
0.8	5.081	5.081	5.081	5.081	5.081
1.2	5.080	5.080	5.080	5.079	5.079
1.6	5.078	5.078	5.078	5.078	5.078
1.8	5.077	5.078	5.078	5.078	5.078
2.0	- ※	5.077	5.077	5.077	5.077
2.2	- ※	5.076	5.076	5.076	5.076
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

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Model	MGFS102405
Item	Dynamic Load Response
Object	+5V2A

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% (2A)

200 mV/div
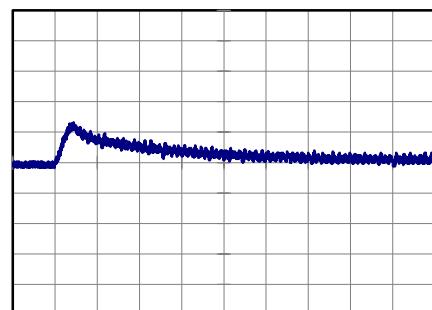
200 μs/div   200 μs/div

Min.Load (0A)⟵⟶
Load 50% (1A)

200 mV/div
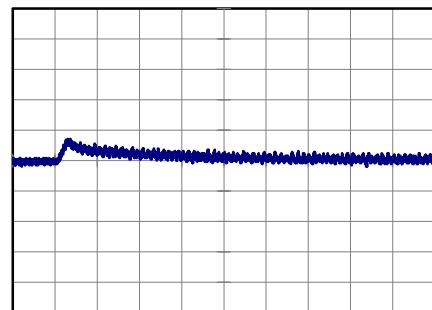
200 μs/div   200 μs/div

Load 50% (1A)⟵⟶
Load 100% (2A)

200 mV/div

200 μs/div   200 μs/div

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Model	MGFS102405
Item	Ripple Voltage (by Load Current)
Object	+5V2A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

——△—— Input Volt.   12V
—·—○—·— Input Volt.   36V

Load Current [A]

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 12 [V]	Input Volt. 36 [V]
0.0	50	25
0.4	5	5
0.8	5	5
1.2	10	5
1.6	15	5
1.8	15	5
2.0	20	5
2.2	30	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	MGFS102405
Item	Ripple-Noise
Object	+5V2A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

——△—— Input Volt.   12V
—·—○—·— Input Volt.   36V

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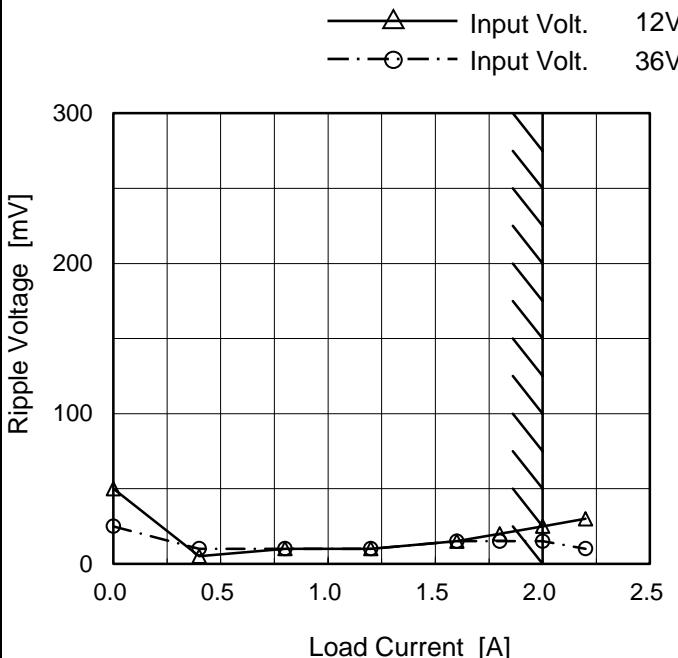
2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 12 [V]	Input Volt. 36 [V]
0.0	50	25
0.4	5	10
0.8	10	10
1.2	10	10
1.6	15	15
1.8	20	15
2.0	25	15
2.2	30	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]
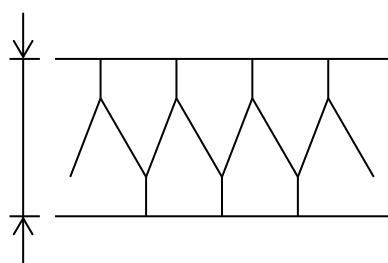
Fig.Complex Ripple Noise Wave Form

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Model	MGFS102405
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V2A

Testing Circuitry   Figure B

1.Graph

2.Values

---- Load 50%
—△— Load 100%

Ambient Temperature [°C]

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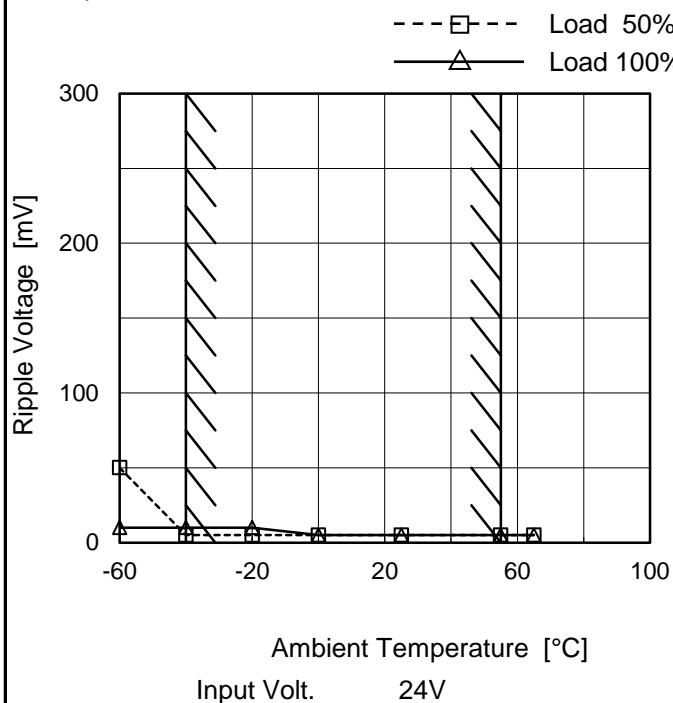
Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
        ambient temperature.

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	50	10
-40	5	10
-20	5	10
0	5	5
25	5	5
55	5	5
65	5	5
--	-	-
--	-	-
--	-	-
--	-	-
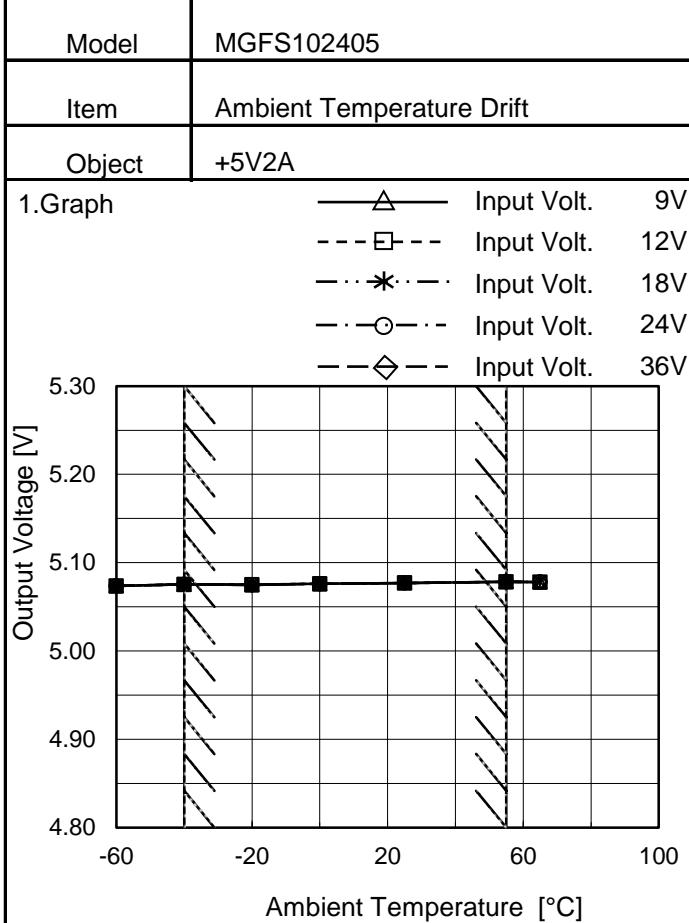
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Model	MGFS102405
Item	Ambient Temperature Drift
Object	+5V2A

Testing Circuitry   Figure A

1.Graph

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

Ambient Temperature [°C]

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

2.Values

Ambient	Output Voltage [V]				
Temperature	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[°C]	9[V]	12[V]	18[V]	24[V]	36[V]
-60	5.074	5.074	5.074	5.074	5.074
-40	5.075	5.075	5.076	5.075	5.075
-20	5.075	5.075	5.075	5.075	5.075
0	5.076	5.076	5.076	5.076	5.076
25	5.077	5.077	5.077	5.077	5.077
55	5.078	5.078	5.079	5.078	5.078
65	5.078	5.078	5.078	5.078	5.078
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of Input Volt. 9V, Load 80%.
Other case Load 100%.

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Model	MGFS102405		
Item	Output Voltage Accuracy	Testing Circuitry	Figure A
Object	+5V2A		

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 - 55°C
     Input Voltage : 12 - 36V
      Load Current : 0 - 2A

 * 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	55	36	0	5.085	±6	±0.1
Minimum Voltage	0	12	2	5.074		

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Model	MGFS102405
Item	Time Lapse Drift
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
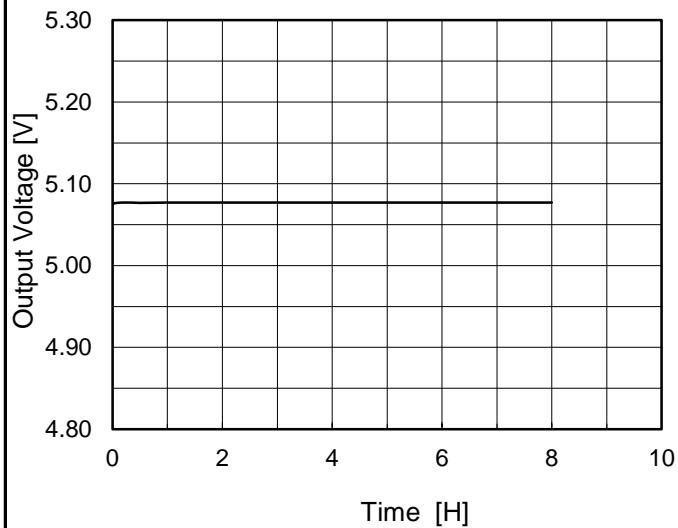
Input Volt.   24V
Load   100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	5.074
0.5	5.077
1.0	5.077
2.0	5.077
3.0	5.077
4.0	5.077
5.0	5.077
6.0	5.077
7.0	5.077
8.0	5.077

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Model	MGFS102405
Item	Rise and Fall Time
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph   Input Volt.   24 V

Load 50%

Output Volt.

[1V/div]

0

Load 100%

Output Volt.

[1V/div]

0

Input Volt.

0

[10V/div]   Time   [5ms/div]   Time   [1ms/div]
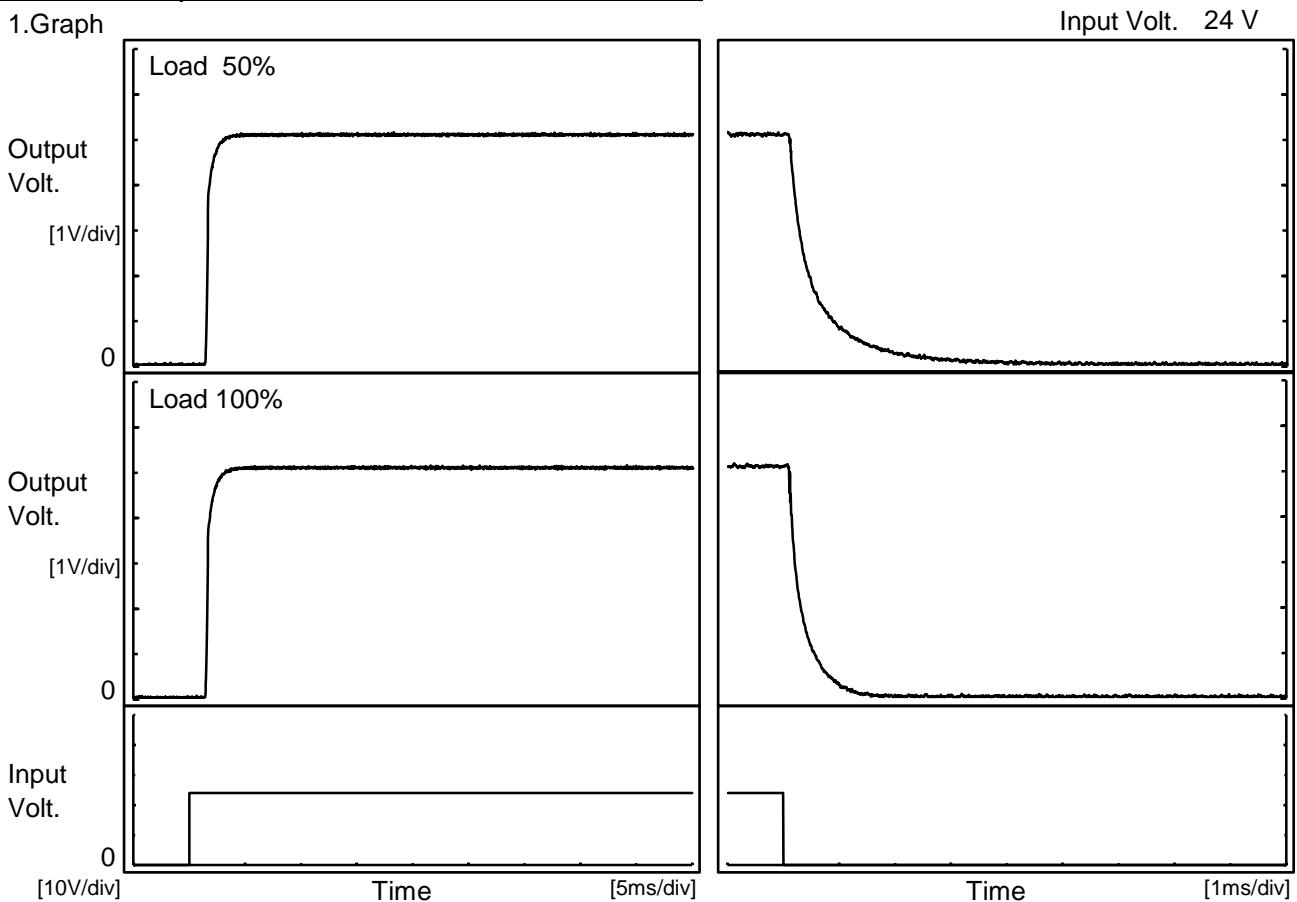
2.Values   [ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.5	0.7	2.2	0.1	1.3
100 %	1.5	0.7	2.2	0.1	0.7

Output Volt.

90%

10%

Input Volt.

Td   Tr

Ts

Th   Tf

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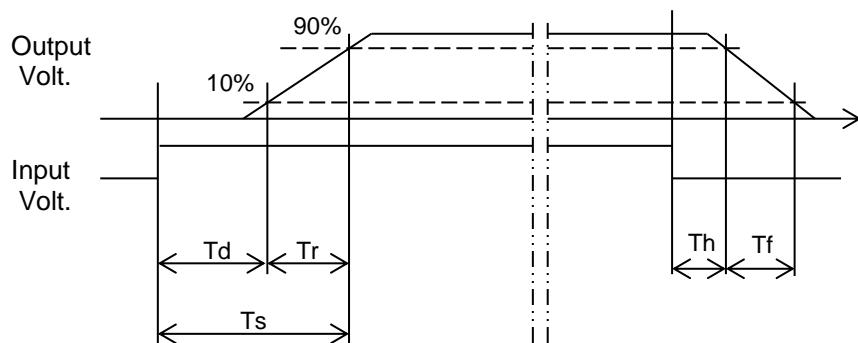
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Model	MGFS102405
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V2A

Testing Circuitry   Figure A

1.Graph

--- ⊟ --- Load 50%

———△——— Load 80%

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

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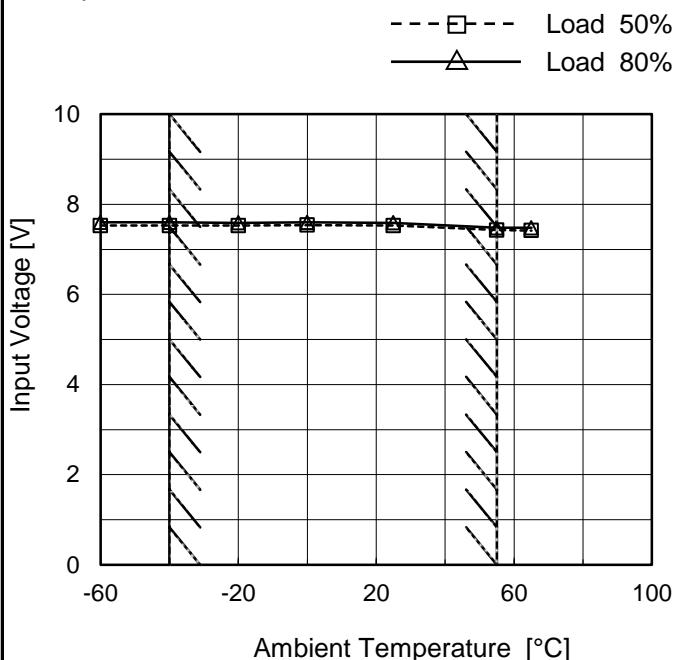
2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 80%
-60	7.6	7.6
-40	7.6	7.6
-20	7.6	7.6
0	7.6	7.6
25	7.6	7.6
55	7.5	7.5
65	7.5	7.5
--	-	-
--	-	-
--	-	-
--	-	-

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Model	MGFS102405
Item	Overcurrent Protection
Object	+5V2A

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.

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

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]
4.75	2.238	2.575	2.723	2.649	2.630
4.50	2.324	2.654	2.798	2.710	2.677
4.00	2.513	2.833	2.970	2.838	2.771
3.50	2.735	3.040	3.151	2.978	2.867
3.00	2.986	3.282	3.325	3.121	2.964
2.50	3.257	3.537	3.476	3.230	3.052
2.00	3.386	3.659	3.592	3.347	3.145
1.50	3.560	3.867	3.775	3.480	3.263
1.00	3.745	4.133	4.003	3.657	3.399
0.50	4.095	4.379	4.284	3.853	3.547
0.00	4.500	4.466	4.028	3.626	3.589
--	-	-	-	-	-

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Model	MGFS102405
Item	Switching frequency (by Load Current)
Object	+5V2A

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.

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]
0.0	661	758	897	980	1160
0.4	429	530	680	767	856
0.8	292	377	502	584	674
1.2	219	291	397	469	554
1.6	175	235	328	393	471
1.8	159	216	304	365	440
2.0	- ※	197	280	338	409
2.2	- ※	182	260	315	384
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

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Figure A

Data Acquisition/Control Unit
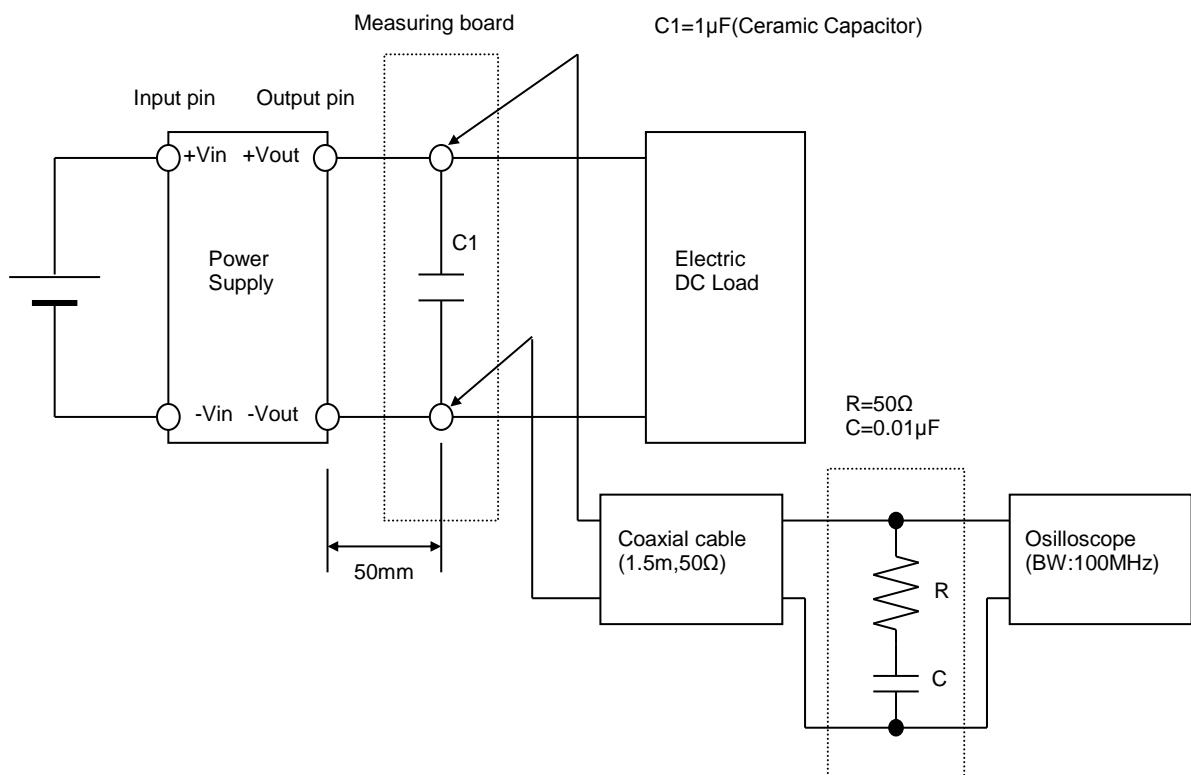
Figure B（Ripple and Ripple noise Characteristic）

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