COSEL

TEST DATA OF MGFW302405

Regulated DC Power Supply
November 19, 2010

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COSEL CO.,LTD.

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Model	MGFW302405

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
2.0	0.000	0.000	0.000
4.0	0.000	0.000	0.000
6.0	0.002	0.002	0.002
7.0	0.002	0.002	0.002
8.0	0.002	0.002	0.002
8.4	0.031	1.382	2.980
8.5	0.031	1.364	2.940
9.0	0.031	1.288	2.763
9.2	0.031	1.273	2.697
12.0	0.023	0.976	2.060
18.0	0.019	0.661	1.380
24.0	0.017	0.504	1.038
36.0	0.017	0.351	0.706
40.0	0.017	0.321	0.642
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGFW302405
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 Ration [%]

2.Values

Load Ration [%]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.031	0.025	0.019	0.018	0.017
20	0.556	0.419	0.289	0.225	0.161
40	1.057	0.799	0.540	0.415	0.290
60	1.567	1.180	0.794	0.603	0.417
80	2.090	1.564	1.049	0.796	0.545
100	2.622	1.974	1.313	0.993	0.675
110	2.910	2.164	1.448	1.088	0.741
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFW302405
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

Input Power [W] vs Load Ration [%]

2.Values

Load Ration [%]	Input Power [W]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.28	0.29	0.35	0.43	0.61
20	4.98	5.03	5.18	5.38	5.81
40	9.47	9.53	9.71	9.91	10.44
60	14.05	14.09	14.24	14.46	14.98
80	18.75	18.73	18.86	19.04	19.58
100	23.52	23.49	23.56	23.74	24.24
110	25.95	25.91	25.94	26.11	26.59
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFW302405
Item	Efficiency (by Input Voltage)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

--- ⊟ --- Load 50%
———△——— Load 100%

Efficiency [%] vs Input Voltage [V]

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

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8.5	86.3	86.0
9.0	86.8	86.4
12.0	86.3	86.5
15.0	85.7	86.6
18.0	84.9	86.3
24.0	83.5	85.7
30.0	81.9	84.9
36.0	80.0	83.9
40.0	78.8	83.2

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COSEL

Model	MGFW302405
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 Ration [%]

2.Values

Load Ration [%]	Efficiency [%]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-	-	-
20	81.5	80.7	78.4	75.5	69.9
40	85.8	85.3	83.7	82.0	77.8
60	86.8	86.5	85.6	84.3	81.4
80	86.7	86.8	86.2	85.4	83.1
100	86.4	86.5	86.3	85.6	83.8
110	86.2	86.3	86.2	85.6	84.1
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFW302405
Item	Line Regulation
Object	+5V2A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

- - -□- - - Load 50%
———△——— Load 100%

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	5.124	5.077
9.0	5.124	5.077
12.0	5.122	5.077
15.0	5.121	5.077
18.0	5.120	5.076
24.0	5.119	5.076
30.0	5.119	5.076
36.0	5.119	5.076
40.0	5.119	5.076

-5V: Rated output current

Object	-5V2A

1.Graph

- - -□- - - Load 50%
———△——— Load 100%

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	-5.124	-5.071
9.0	-5.124	-5.071
12.0	-5.121	-5.072
15.0	-5.120	-5.072
18.0	-5.120	-5.072
24.0	-5.119	-5.073
30.0	-5.119	-5.073
36.0	-5.119	-5.073
40.0	-5.119	-5.073

+5V: Rated output current

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

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Model	MGFW302405
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

Output Voltage [V] vs Load Current [A]

2.Values

Load Current	Output Voltage [V]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[A]	9[V]	12[V]	18[V]	24[V]	36[V]
0.000	5.586	5.595	5.621	5.635	5.695
0.100	5.210	5.209	5.188	5.184	5.181
0.400	5.163	5.162	5.160	5.160	5.161
0.800	5.136	5.135	5.132	5.131	5.132
1.200	5.115	5.113	5.112	5.111	5.111
1.600	5.095	5.095	5.093	5.092	5.092
2.000	5.076	5.076	5.075	5.075	5.075
2.200	5.067	5.067	5.066	5.067	5.066
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-5V: Rated output current

Object	-5V2A

1.Graph

		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	Output Voltage [V]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[A]	9[V]	12[V]	18[V]	24[V]	36[V]
0.000	-5.541	-5.558	-5.587	-5.603	-5.685
0.1	-5.203	-5.200	-5.184	-5.179	-5.174
0.4	-5.165	-5.163	-5.162	-5.162	-5.163
0.8	-5.135	-5.133	-5.131	-5.130	-5.130
1.2	-5.112	-5.110	-5.109	-5.109	-5.109
1.6	-5.091	-5.090	-5.090	-5.090	-5.090
2.0	-5.070	-5.071	-5.071	-5.072	-5.072
2.2	-5.061	-5.062	-5.063	-5.063	-5.064
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+5V: Rated output current

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Model	MGFW302405
Item	Dynamic Load Response
Object	+5V2A

Temperature	25°C
Testing Circuitry	Figure A

Input Volt.   24   V
Other output current   rated
Cycle   1000   ms

t_1、t_2 = 50μs

Load Current

t_1 t_2

Min. Load (0A) ←→
    Load 100% (2A)

500mV/div

50ms/div

50ms/div

Min. Load (0A) ←→
    Load 50% (1A)

500mV/div

50ms/div

50ms/div

Load 50% (1A) ←→
    Load 100% (2A)

500mV/div

50ms/div

50ms/div

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Model	MGFW302405		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	-5V2A		

Input Volt.   24   V
Other output current   rated
Cycle   1000 ms

t_1、t_2 = 50μs

Load Current

t_1 t_2

Min. Load (0A) ←→
   Load 100% (2A)

500mV/div

50ms/div   50ms/div

Min. Load (0A) ←→
   Load 50% (1A)

500mV/div

50ms/div   50ms/div

Load 50% (1A) ←→
   Load 100% (2A)

500mV/div

50ms/div   50ms/div

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Model	MGFW302405
Item	Ripple Voltage (by Load Current)
Object	+5V2A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

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

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]
0.0	2	1
0.4	2	3
0.8	2	3
1.2	2	3
1.6	3	3
2.0	3	3
2.2	3	3
--	-	-
--	-	-
--	-	-
--	-	-

-5V: Rated output current

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Model	MGFW302405
Item	Ripple Voltage (by Load Current)
Object	-5V2A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

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

Ripple Voltage [mV] vs Load Current [A]

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	2	1
0.4	2	4
0.8	2	4
1.2	2	4
1.6	3	4
2.0	3	4
2.2	3	4
--	-	-
--	-	-
--	-	-
--	-	-

+5V: Rated output current

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	MGFW302405
Item	Ripple-Noise
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

Input Volt. 9V
Input Volt. 36V

Ripple Voltage [mV] vs Load Current [A]

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]
0.0	5	5
0.4	5	10
0.8	5	10
1.2	5	10
1.6	5	10
2.0	5	10
2.2	5	10
--	-	-
--	-	-
--	-	-
--	-	-

-5V: Rated output current

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Model	MGFW302405
Item	Ripple-Noise
Object	-5V2A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

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

Ripple Voltage [mV] vs Load Current [A]

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	5	5
0.4	5	10
0.8	5	10
1.2	5	10
1.6	5	10
2.0	5	10
2.2	5	10
--	-	-
--	-	-
--	-	-
--	-	-

+5V: Rated output current

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	MGFW302405
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V2A
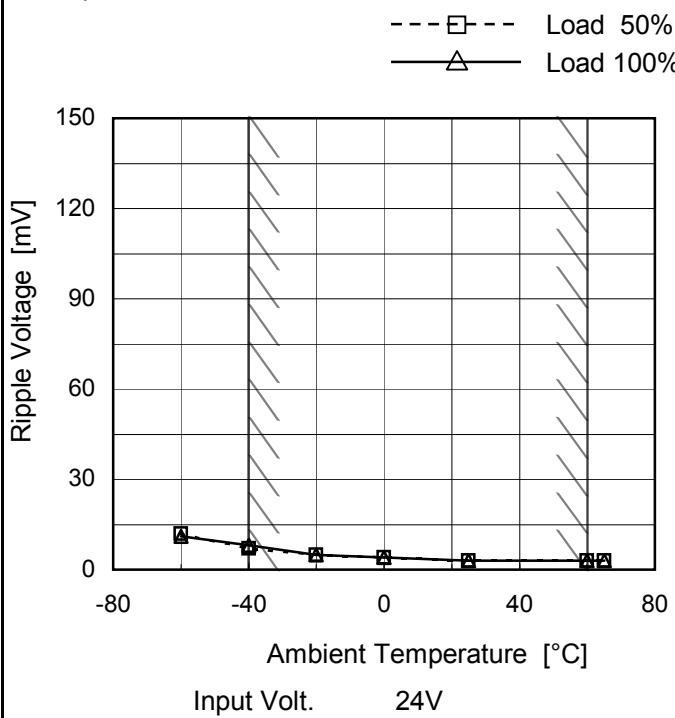
Testing Circuitry   Figure A

1.Graph

--- ⊟ --- Load 50%
—△— Load 100%

Ripple Voltage [mV]

Ambient Temperature [°C]

Input Volt.   24V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	12	11
-40	7	8
-20	5	5
0	4	4
25	3	3
60	3	3
65	3	3
--	-	-
--	-	-
--	-	-
--	-	-

-5V: Rated output current

Object	-5V2A

1.Graph

--- ⊟ --- Load 50%
—△— Load 100%

Ripple Voltage [mV]

Ambient Temperature [°C]

Input Volt.   24V

Measured by 100 MHz Oscilloscope.

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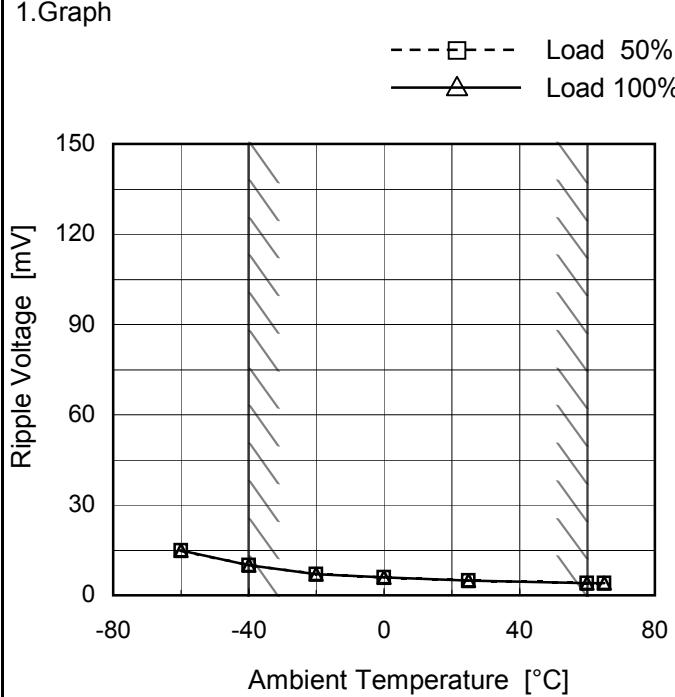
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	15	15
-40	10	10
-20	7	7
0	6	6
25	5	5
60	4	4
65	4	4
--	-	-
--	-	-
--	-	-
--	-	-

+5V: Rated output current

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Model	MGFW302405
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

Output Voltage [V] vs Ambient Temperature [°C]
Load 100%

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	5.053	5.054	5.055	5.056	5.056
-40	5.062	5.063	5.063	5.064	5.064
-20	5.069	5.069	5.070	5.070	5.070
0	5.074	5.074	5.074	5.074	5.074
25	5.077	5.077	5.077	5.077	5.076
60	5.078	5.078	5.077	5.077	5.076
65	5.078	5.077	5.077	5.076	5.075
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Object	-5V2A

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%

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	-5.046	-5.048	-5.049	-5.051	-5.051
-40	-5.055	-5.057	-5.058	-5.059	-5.060
-20	-5.062	-5.063	-5.064	-5.065	-5.066
0	-5.067	-5.068	-5.068	-5.069	-5.070
25	-5.070	-5.071	-5.072	-5.072	-5.073
60	-5.071	-5.072	-5.073	-5.073	-5.073
65	-5.071	-5.072	-5.072	-5.073	-5.073
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

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Model	MGFW302405		
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   : 9 - 36V
      Load Current (AVR 1) : 0 - 2A   (AVR 2) : 0 - 2A

* Other Output : Rated Load

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

* Output Voltage Accuracy (Ration) = $\dfrac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2.Values

Object	+5V2A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	36	0	5.706	±322	±6.4
Minimum Voltage	-40	9	2	5.062		

Object	-5V2A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	0	36	0	-5.697	±321	±6.4
Minimum Voltage	-40	9	2	-5.055		

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Model	MGFW302405

Item	Time Lapse Drift
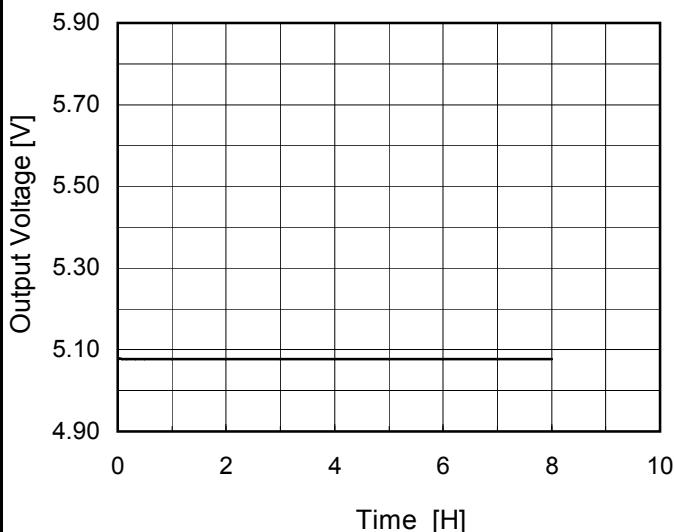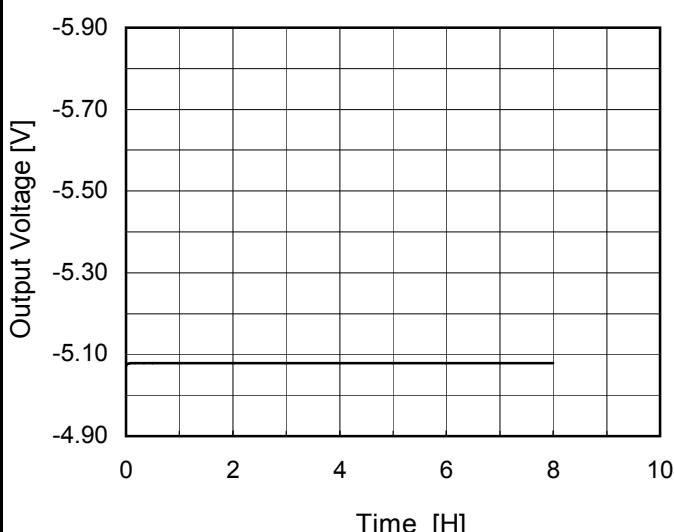
Temperature   25°C
Testing Circuitry   Figure A

Object	+5V2A

1.Graph

2.Values

Time [H]

Input Volt.   24V

Load   100%

Time since start [H]	Output Voltage [V]
0.0	5.075
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

Object	-5V2A

1.Graph

2.Values

Time [H]

Input Volt.   24V

Load   100%

Time since start [H]	Output Voltage [V]
0.0	-5.072
0.5	-5.079
1.0	-5.079
2.0	-5.079
3.0	-5.079
4.0	-5.079
5.0	-5.079
6.0	-5.079
7.0	-5.079
8.0	-5.079

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Model	MGFW302405
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   [10ms/div]   Time   [10ms/div]
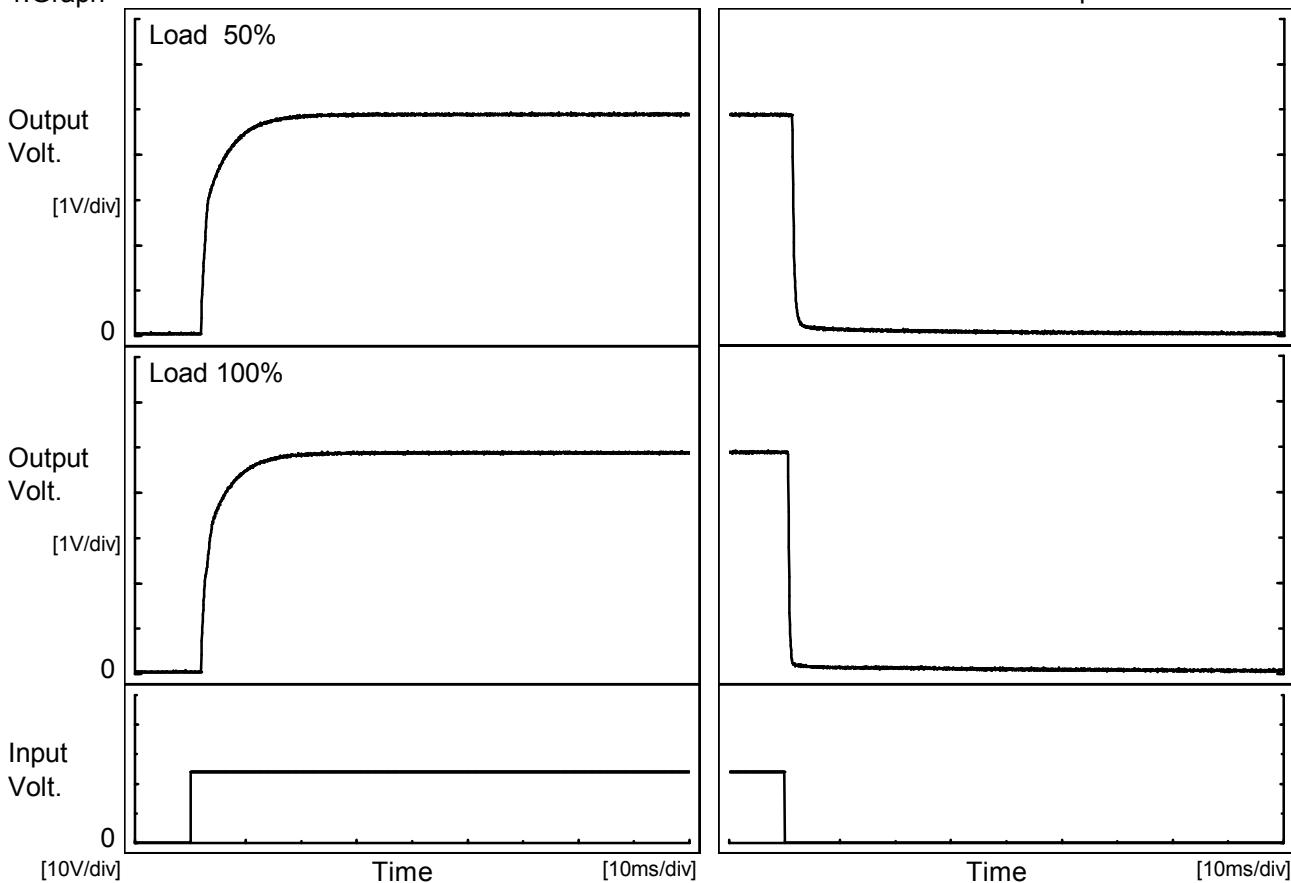
2.Values   [ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.1	8.4	10.5	1.3	0.8
100 %	2.1	8.5	10.6	0.6	0.5
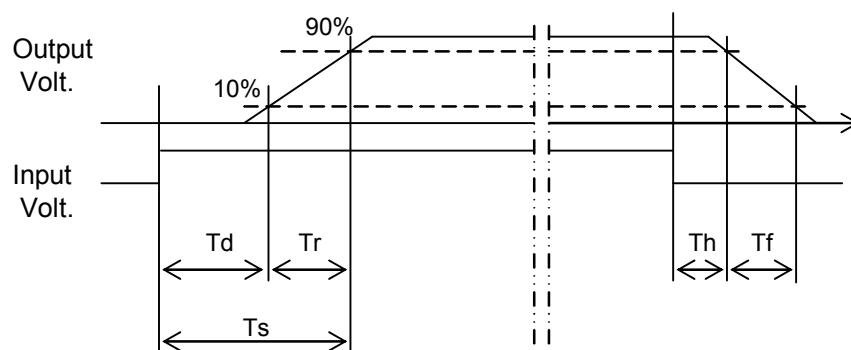
Output Volt.

90%

10%

Input Volt.

Td Tr   Th Tf

Ts

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参考資料

Model	MGFW302405
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　　[10ms/div]　　　　Time　　[10ms/div]
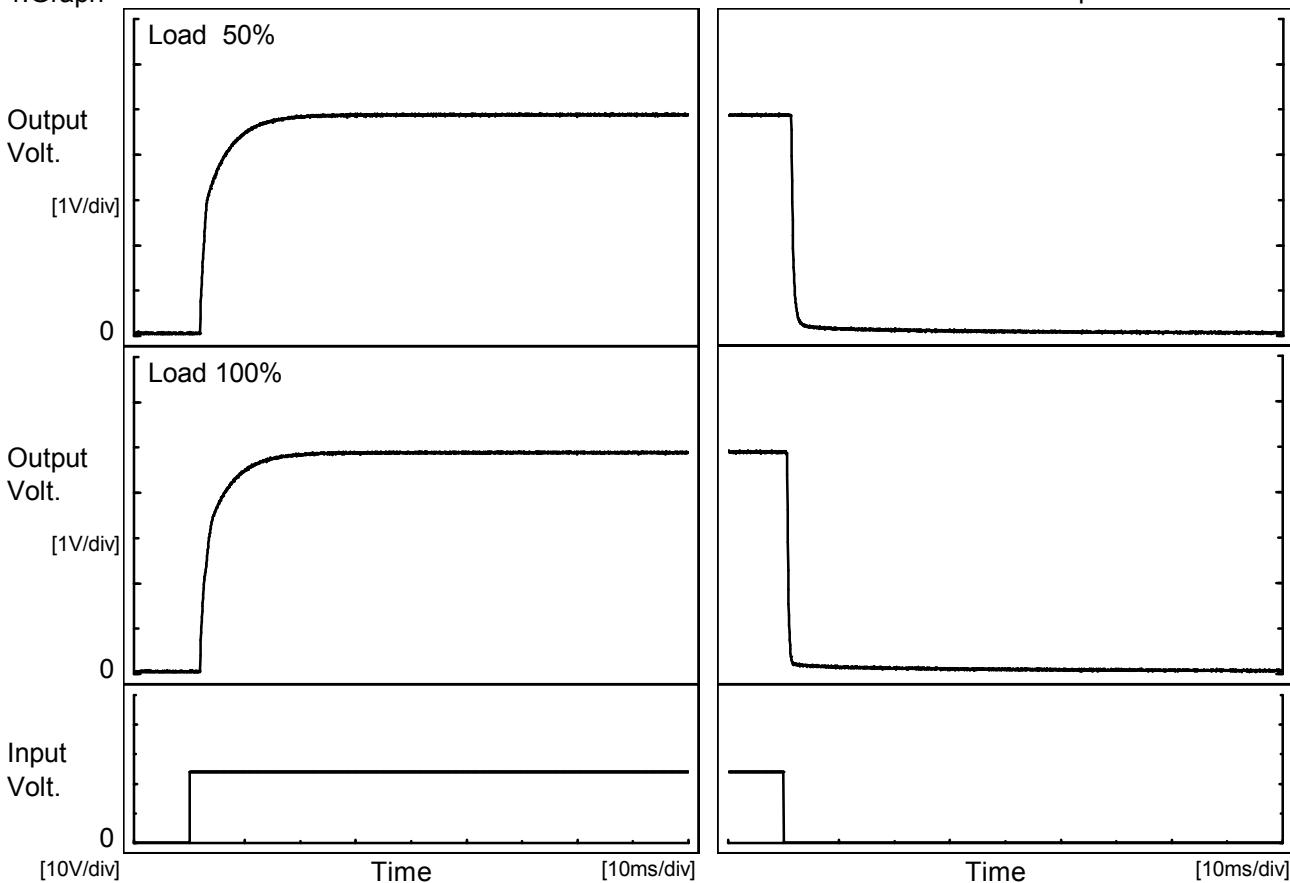
2.Values　　　　　　　　　　　　　　　　　　　　　[ms]

Load＼Time	Td	Tr	Ts	Th	Tf
50 %	2.1	8.5	10.6	1.3	1.0
100 %	2.1	8.4	10.5	0.6	0.6

Output
Volt.

90%

10%

Input
Volt.

Td　Tr　　　Th　Tf

Ts

COSEL
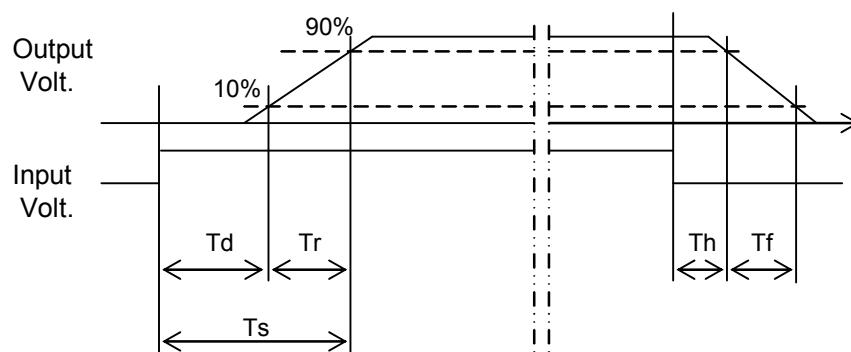
Model	MGFW302405
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V2A

Testing Circuitry   Figure A

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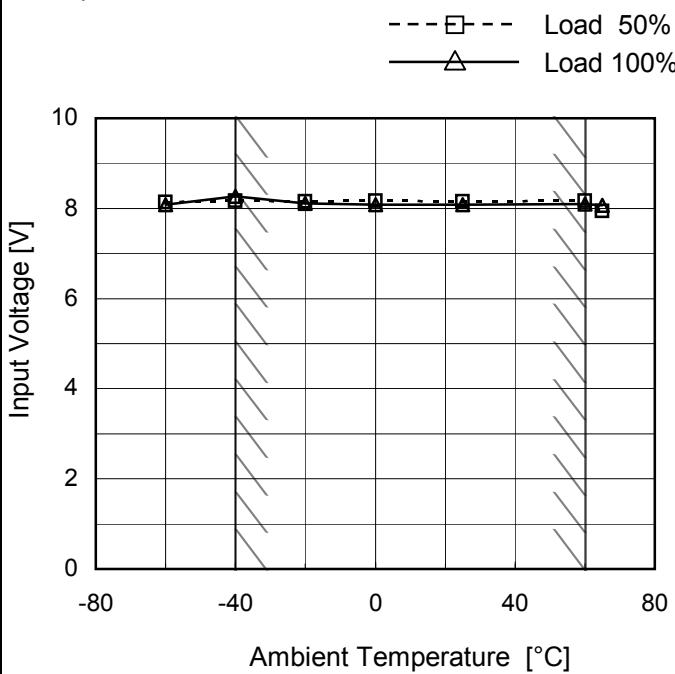
--- ⊟ --- Load 50%
—△— Load 100%

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	8.2	8.1
-40	8.2	8.3
-20	8.2	8.2
0	8.2	8.1
25	8.2	8.1
60	8.2	8.1
65	8.0	8.1
--	-	-
--	-	-
--	-	-
--	-	-

Object	-5V2A

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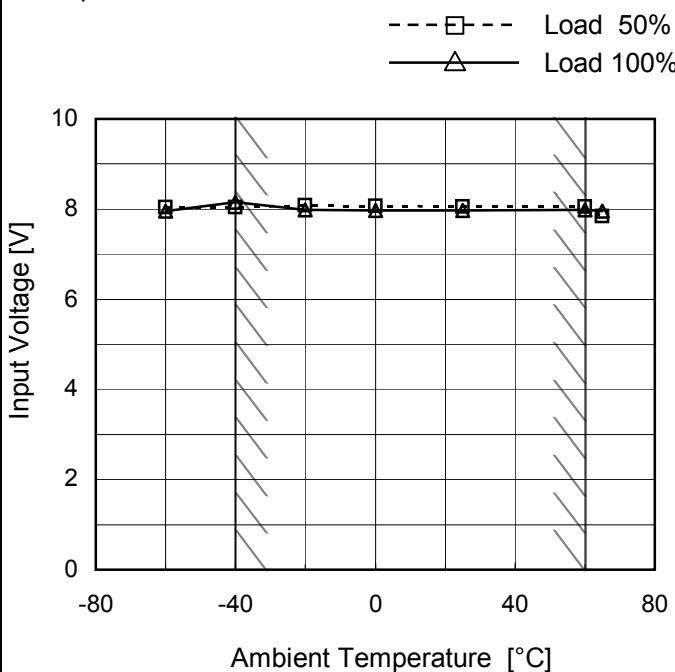
--- ⊟ --- Load 50%
—△— Load 100%

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	8.1	8.0
-40	8.1	8.2
-20	8.1	8.0
0	8.1	8.0
25	8.1	8.0
60	8.1	8.0
65	7.9	8.0
--	-	-
--	-	-
--	-	-
--	-	-

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

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COSEL

Model	MGFW302405
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

Output Voltage [V] vs Load Current [A]

2.Values

Output Voltage	Load Current [A]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[V]	9[V]	12[V]	18[V]	24[V]	36[V]
5.00	2.993	3.551	3.989	3.964	3.445
4.75	-	-	-	-	-
4.50	-	-	-	-	-
4.00	-	-	-	-	-
3.50	-	-	-	-	-
3.00	-	-	-	-	-
2.50	-	-	-	-	-
2.00	-	-	-	-	-
1.50	-	-	-	-	-
1.00	-	-	-	-	-
0.50	-	-	-	-	-
0.00	-	-	-	-	-

Object	-5V2A

1.Graph

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

Output Voltage [V] vs Load Current [A]

2.Values

Output Voltage	Load Current [A]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[V]	9[V]	12[V]	18[V]	24[V]	36[V]
-5.00	2.928	3.521	3.967	3.967	3.441
-4.75	-	-	-	-	-
-4.50	-	-	-	-	-
-4.00	-	-	-	-	-
-3.50	-	-	-	-	-
-3.00	-	-	-	-	-
-2.50	-	-	-	-	-
-2.00	-	-	-	-	-
-1.50	-	-	-	-	-
-1.00	-	-	-	-	-
-0.50	-	-	-	-	-
0.00	-	-	-	-	-

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

Intermittent operation occurs when overcurrent protection is activated.

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COSEL

Model	MGFW302405
Item	Overvoltage Protection
Object	+10V2.5A

Testing Circuitry   Figure A

1.Graph

— △ —   Input Volt.   24V
--- ⊟ ---   Input Volt.   36V

Ambient Temperature [°C]

Load 0%
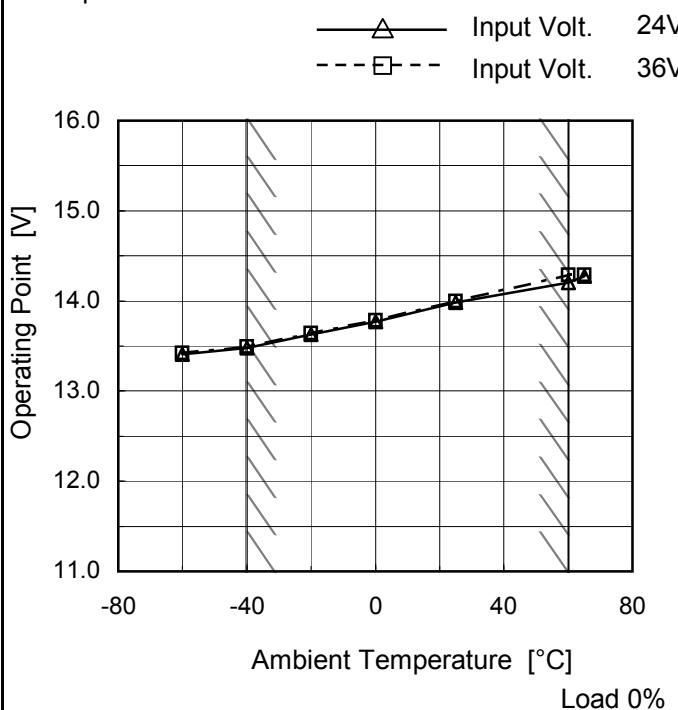
2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 24[V]	Input Volt. 36[V]
-60	13.41	13.42
-40	13.48	13.49
-20	13.63	13.64
0	13.77	13.78
25	13.98	14.00
60	14.20	14.29
65	14.28	14.29
--	-	-
--	-	-
--	-	-
--	-	-

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

Measured as a single output(+10V).

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COSEL
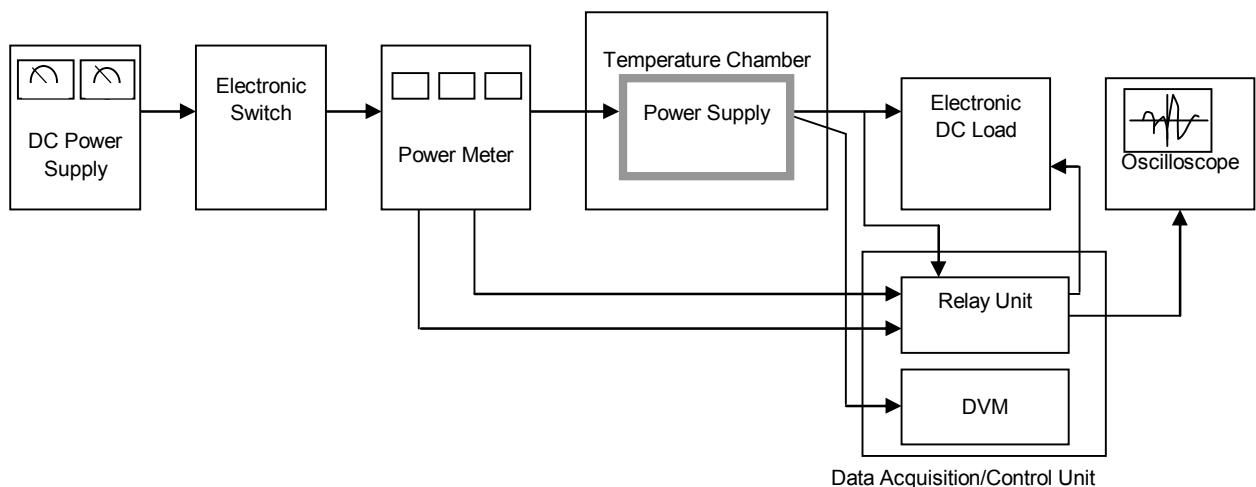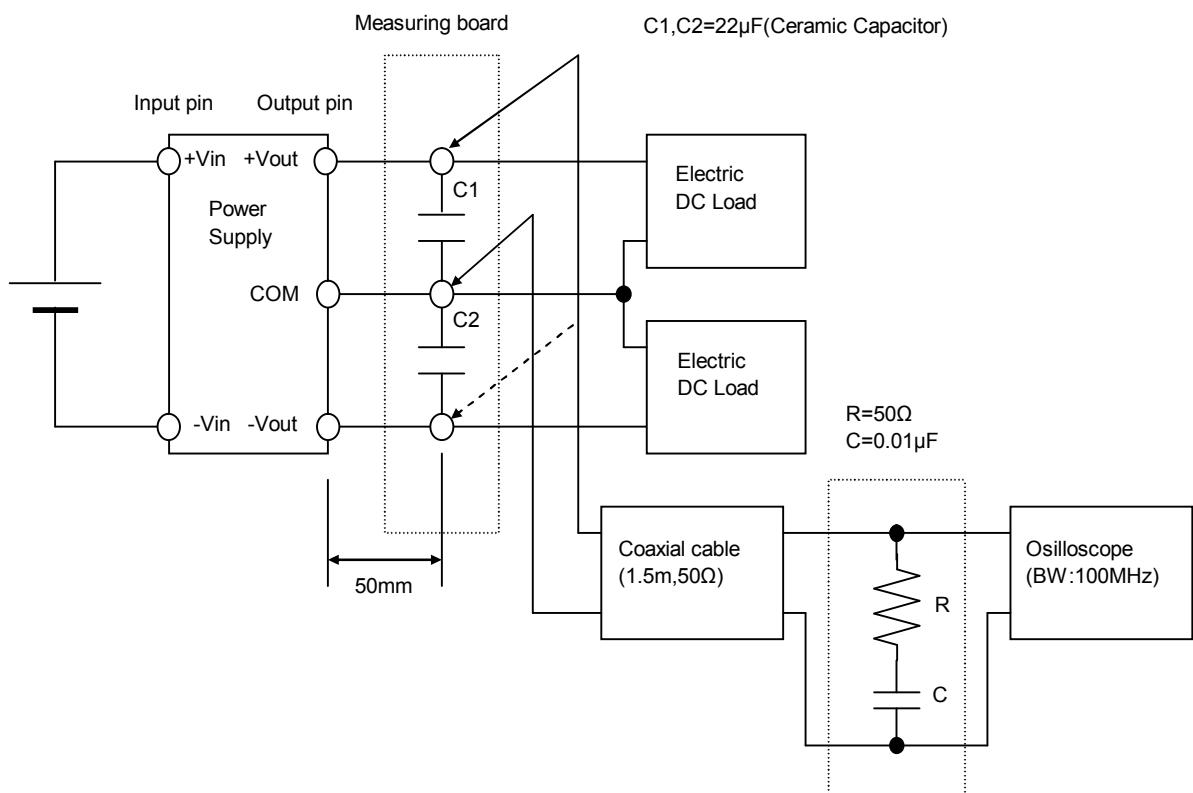
Figure A

Figure B（Ripple and Ripple noise Characteristic）

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