COSEL

参考資料

TEST DATA OF MGFW304805

Regulated DC Power Supply
December 25, 2010

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Masashi Ueda Design Engineer

COSEL CO.,LTD.

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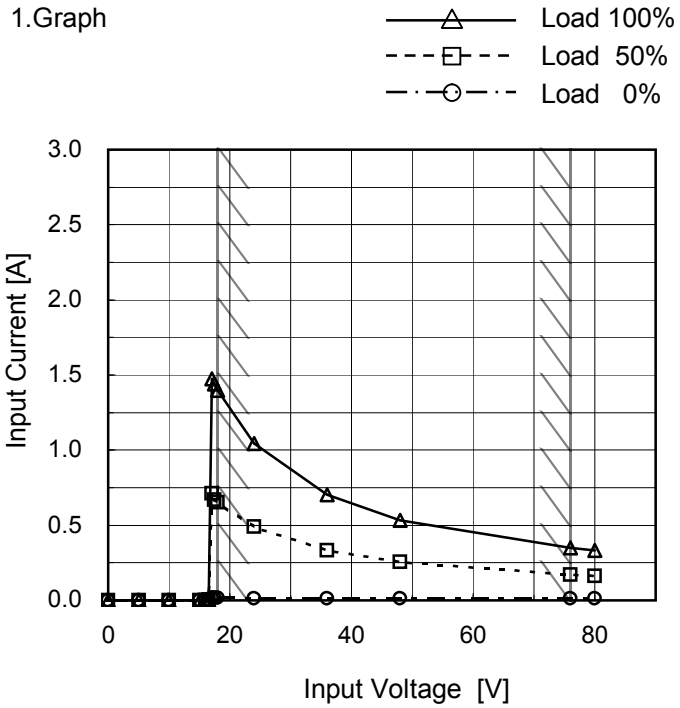
COSEL

Model	MGFW304805
Item	Input Current (by Input Voltage)
Object	――――――――

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]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
5.0	0.001	0.001	0.002
10.0	0.002	0.002	0.002
15.0	0.002	0.002	0.002
16.0	0.002	0.002	0.002
16.5	0.002	0.002	0.002
17.0	0.016	0.711	1.476
17.5	0.016	0.670	1.439
18.0	0.015	0.652	1.397
24.0	0.013	0.491	1.043
36.0	0.012	0.334	0.702
48.0	0.012	0.255	0.531
76.0	0.012	0.171	0.348
80.0	0.012	0.164	0.332
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

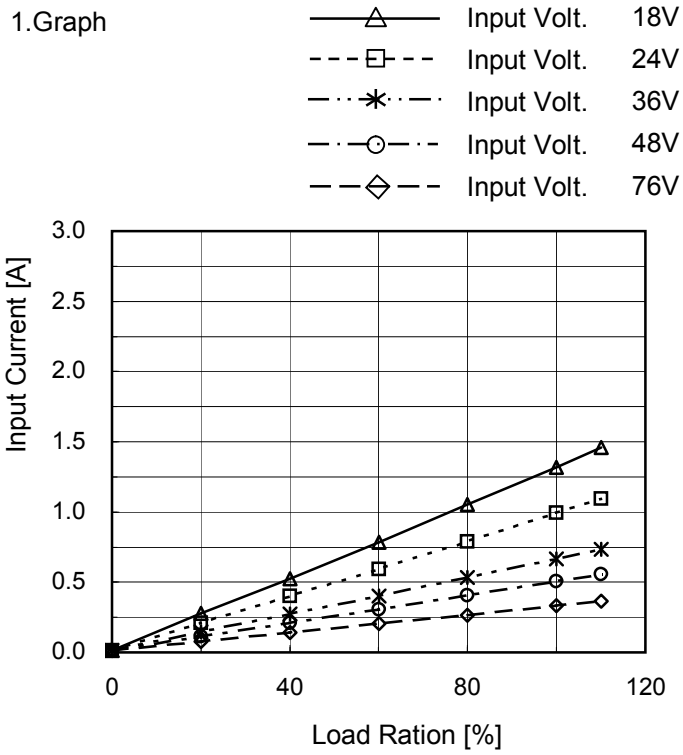
BC-10533

COSEL

Model	MGFW304805
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

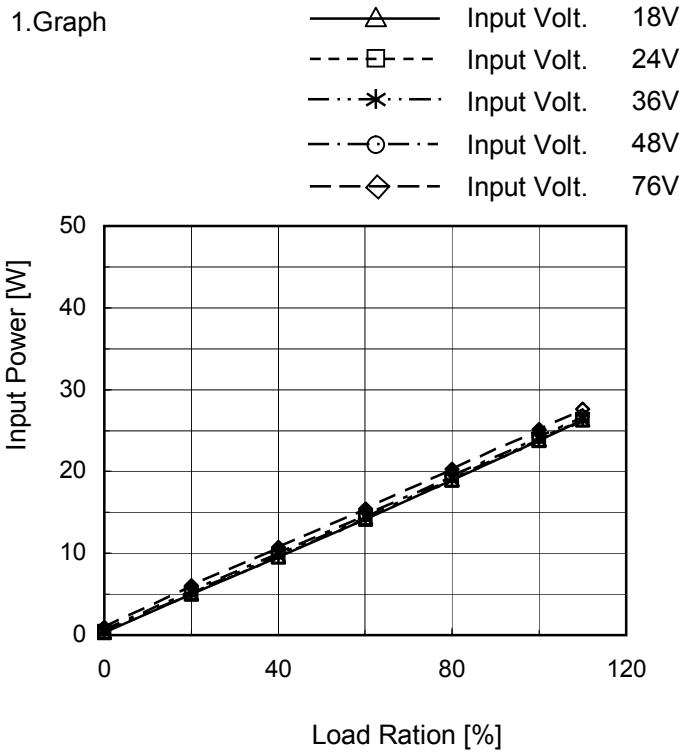
Load Ration [%]	Input Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.015	0.013	0.012	0.012	0.012
20	0.277	0.211	0.144	0.112	0.079
40	0.527	0.401	0.272	0.209	0.141
60	0.786	0.593	0.401	0.306	0.203
80	1.052	0.789	0.533	0.404	0.266
100	1.320	0.992	0.666	0.505	0.331
110	1.461	1.096	0.736	0.556	0.364
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW304805
Item	Input Power (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

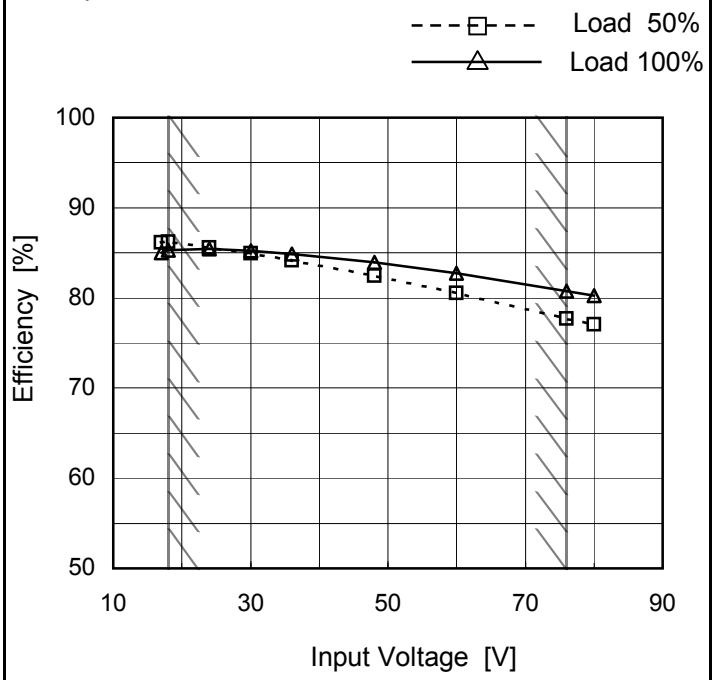
Load Ration [%]	Input Power [W]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.28	0.32	0.43	0.59	0.93
20	4.98	5.06	5.19	5.39	5.99
40	9.51	9.58	9.78	10.02	10.74
60	14.15	14.21	14.41	14.65	15.45
80	18.91	18.93	19.13	19.37	20.23
100	23.78	23.77	23.93	24.19	25.15
110	26.28	26.28	26.38	26.67	27.65
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW304805
Item	Efficiency (by Input Voltage)
Object	――――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

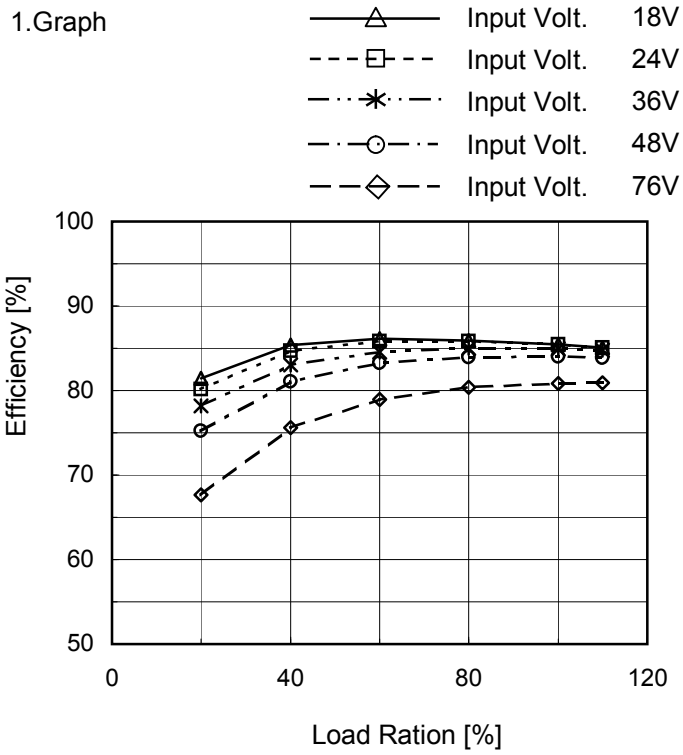
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	86.2	85.0
18	86.2	85.3
24	85.6	85.4
30	85.0	85.2
36	84.2	84.9
48	82.4	83.9
60	80.5	82.7
76	77.7	80.8
80	77.1	80.2

COSEL

Model	MGFW304805
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Efficiency [%]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	-	-	-	-	-
20	81.4	80.1	78.2	75.2	67.7
40	85.4	84.7	83.0	81.1	75.6
60	86.1	85.8	84.6	83.2	78.9
80	85.9	85.9	85.0	83.9	80.4
100	85.4	85.5	84.9	84.0	80.8
110	85.1	85.1	84.8	83.8	80.9
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

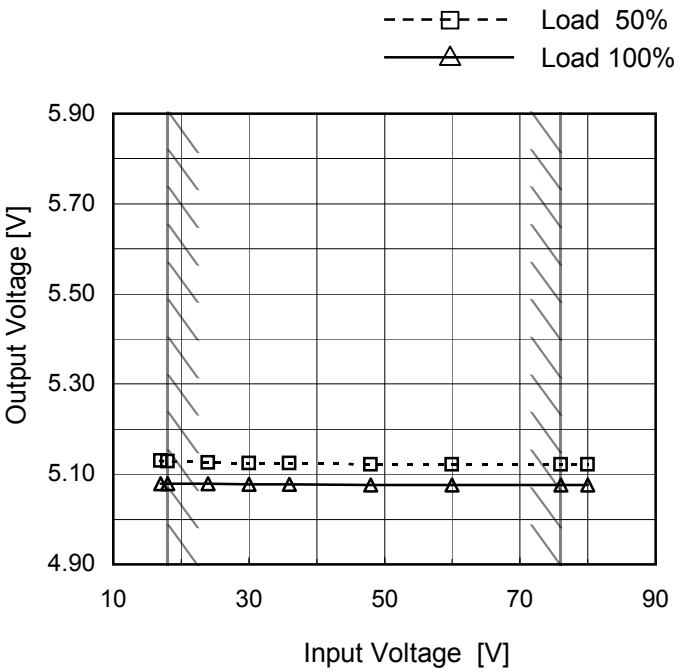
BC-10533

COSEL

Model	MGFW304805
Item	Line Regulation
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



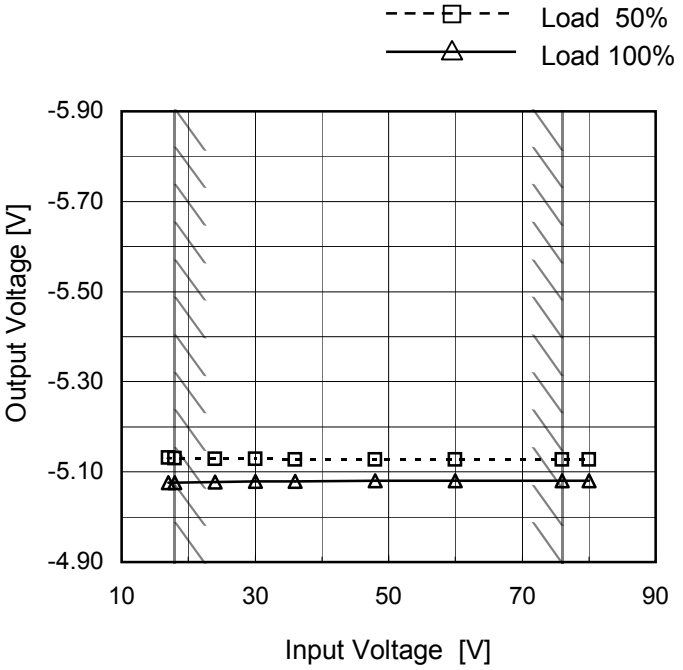
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	5.130	5.079
18	5.129	5.080
24	5.126	5.078
30	5.125	5.078
36	5.124	5.077
48	5.122	5.076
60	5.122	5.076
76	5.122	5.076
80	5.122	5.076

-5V: Rated output current

Object	-5V2A

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%
17	-5.131	-5.076
18	-5.130	-5.076
24	-5.129	-5.078
30	-5.128	-5.079
36	-5.128	-5.079
48	-5.127	-5.080
60	-5.127	-5.081
76	-5.127	-5.081
80	-5.127	-5.081

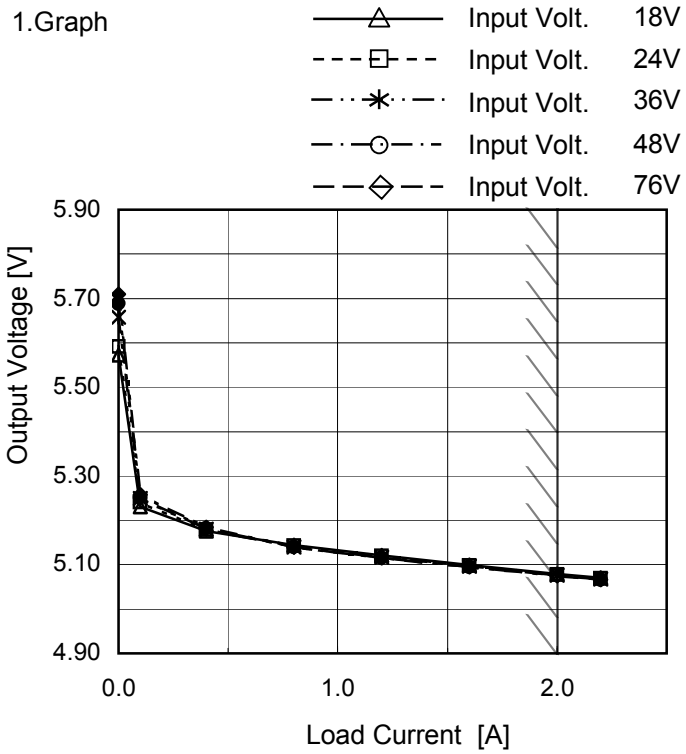
+5V: Rated output current

COSEL

Model	MGFW304805
Item	Load Regulation
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



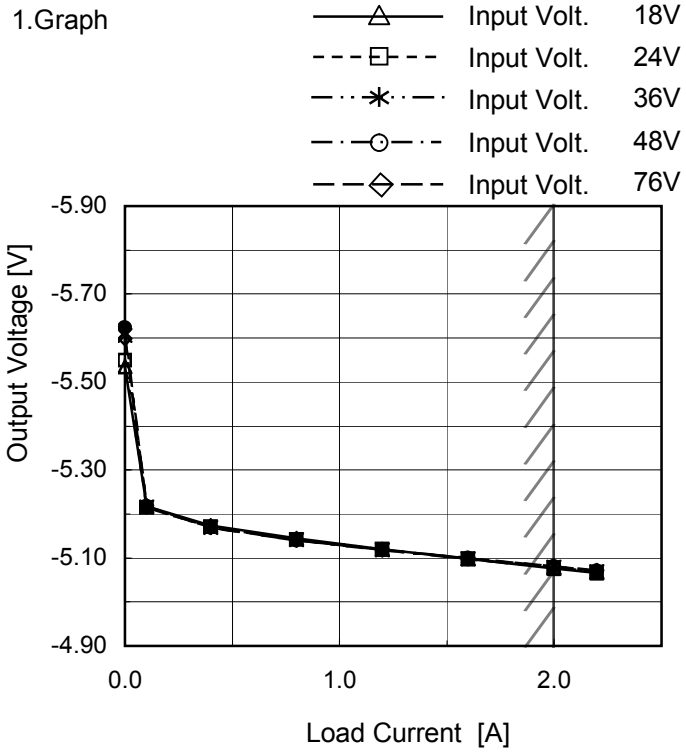
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	5.572	5.591	5.657	5.688	5.710
0.1	5.231	5.240	5.249	5.250	5.258
0.4	5.176	5.178	5.180	5.182	5.184
0.8	5.144	5.142	5.140	5.139	5.139
1.2	5.121	5.119	5.116	5.115	5.115
1.6	5.100	5.098	5.096	5.095	5.094
2.0	5.080	5.078	5.076	5.076	5.075
2.2	5.070	5.068	5.067	5.067	5.066
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-5V: Rated output current

Object	-5V2A

1.Graph



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

2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	-5.534	-5.550	-5.607	-5.623	-5.598
0.1	-5.217	-5.214	-5.215	-5.217	-5.219
0.4	-5.173	-5.171	-5.169	-5.169	-5.169
0.8	-5.144	-5.142	-5.141	-5.141	-5.141
1.2	-5.120	-5.119	-5.119	-5.119	-5.119
1.6	-5.098	-5.098	-5.099	-5.099	-5.100
2.0	-5.076	-5.077	-5.079	-5.080	-5.081
2.2	-5.065	-5.068	-5.069	-5.071	-5.072
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+5V: Rated output current

COSEL

Model	MGFW304805
Item	Dynamic Load Response
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure A

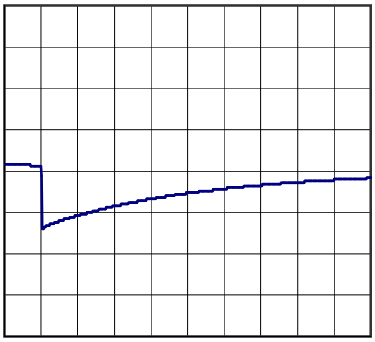
Input Volt. 48 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

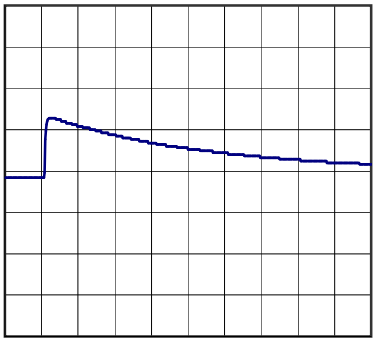
Load Current

Min. Load (0A) ←→
Load 100% (2A)

500mV/div



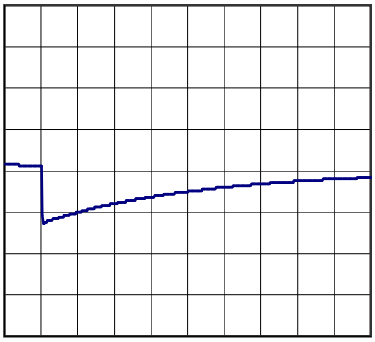
50ms/div



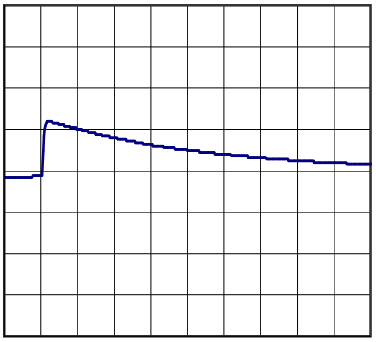
50ms/div

Min. Load (0A) ←→
Load 50% (1A)

500mV/div



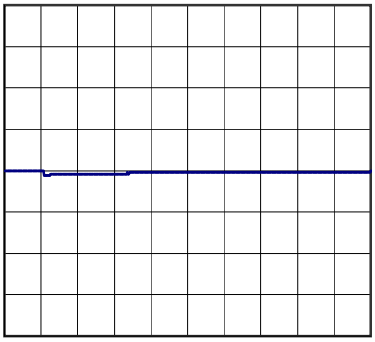
50ms/div



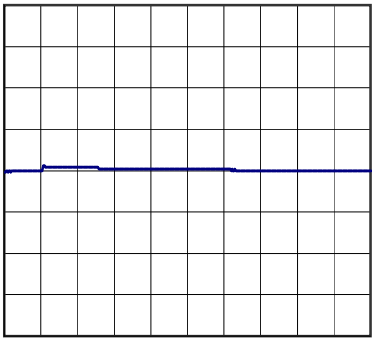
50ms/div

Load 50% (1A) ←→
Load 100% (2A)

500mV/div



50ms/div



50ms/div

COSEL

Model	MGFW304805
Item	Dynamic Load Response
Object	-5V2A

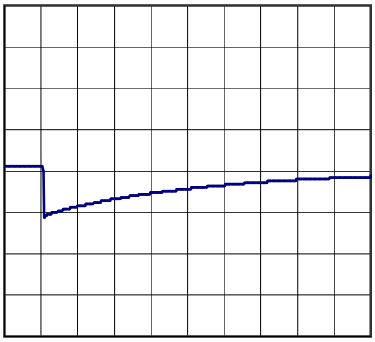
Temperature 25°C
Testing Circuitry Figure A

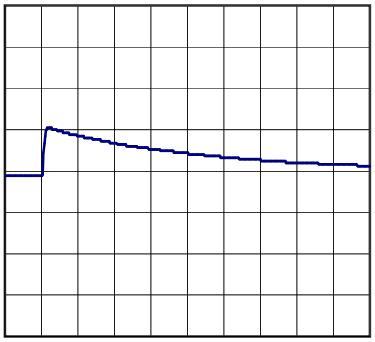
Input Volt. 48 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

Load Current

Min. Load (0A) ←→
Load 100% (2A)

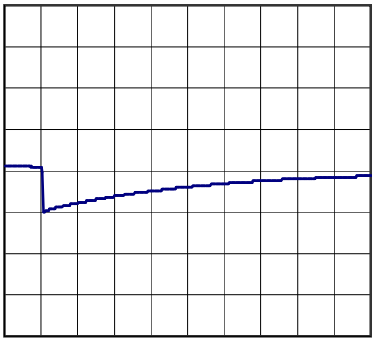


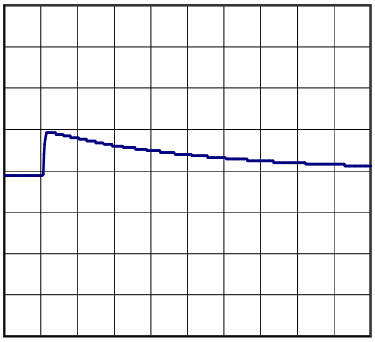


500mV/div

50ms/div 50ms/div

Min. Load (0A) ←→
Load 50% (1A)

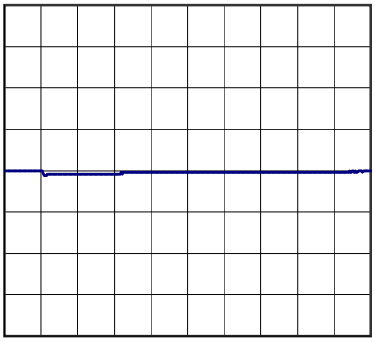


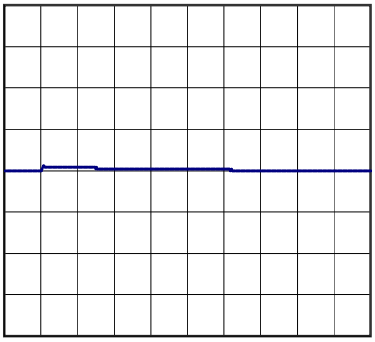


500mV/div

50ms/div 50ms/div

Load 50% (1A) ←→
Load 100% (2A)





500mV/div

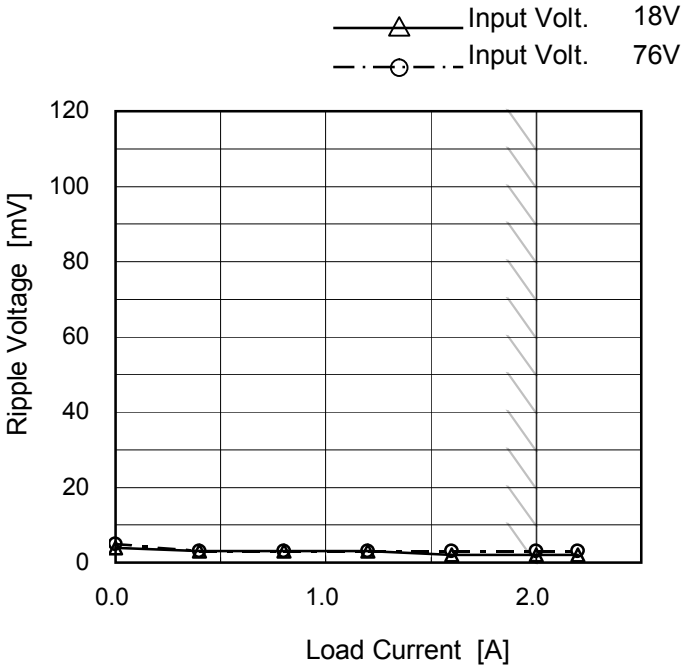
50ms/div 50ms/div

COSEL

Model	MGFW304805
Item	Ripple Voltage (by Load Current)
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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]

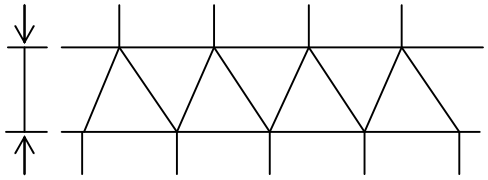


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	4	5
0.4	3	3
0.8	3	3
1.2	3	3
1.6	2	3
2.0	2	3
2.2	2	3
--	-	-
--	-	-
--	-	-
--	-	-

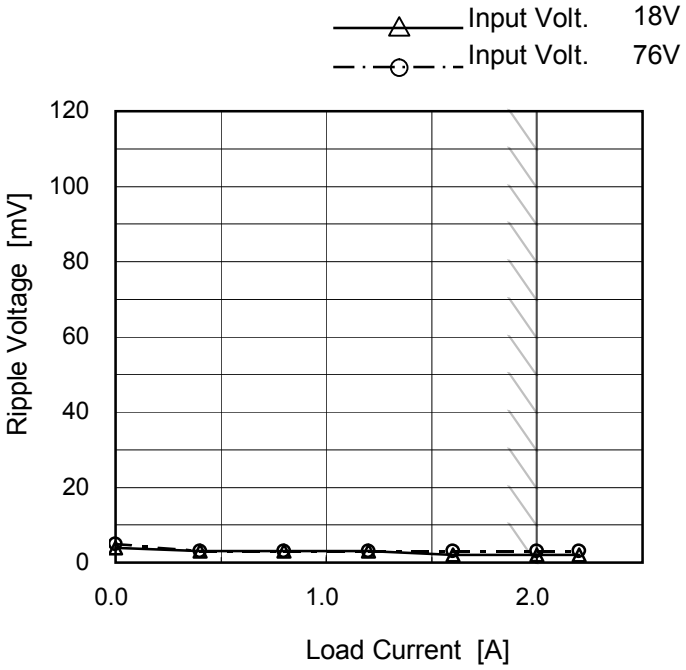
-5V: Rated output current

COSEL

Model	MGFW304805
Item	Ripple Voltage (by Load Current)
Object	-5V2A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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]

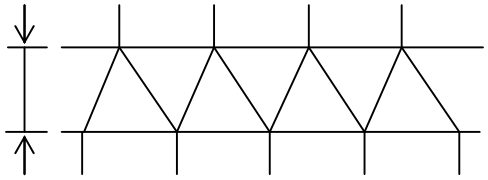


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	1	2
0.4	2	4
0.8	2	4
1.2	2	4
1.6	3	4
2.0	3	4
2.2	3	4
--	-	-
--	-	-
--	-	-
--	-	-

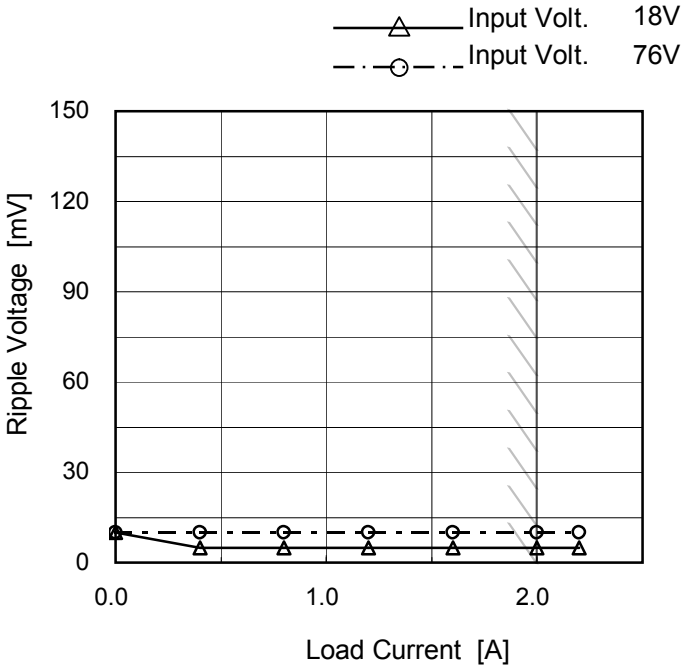
+5V: Rated output current

COSEL

Model	MGFW304805
Item	Ripple-Noise
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

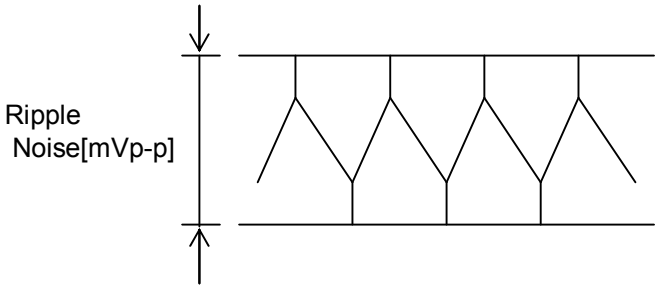


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	10	10
0.4	5	10
0.8	5	10
1.2	5	10
1.6	5	10
2.0	5	10
2.2	5	10
--	-	-
--	-	-
--	-	-
--	-	-

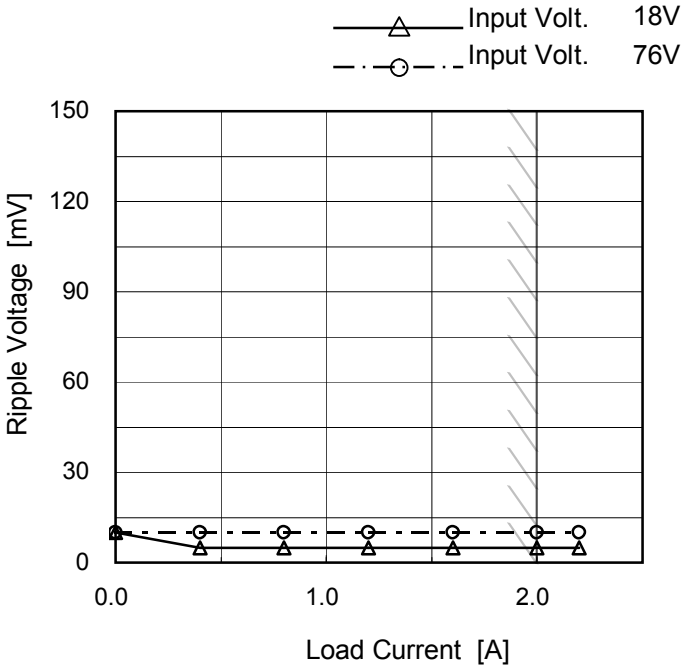
-5V: Rated output current

COSEL

Model	MGFW304805
Item	Ripple-Noise
Object	-5V2A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

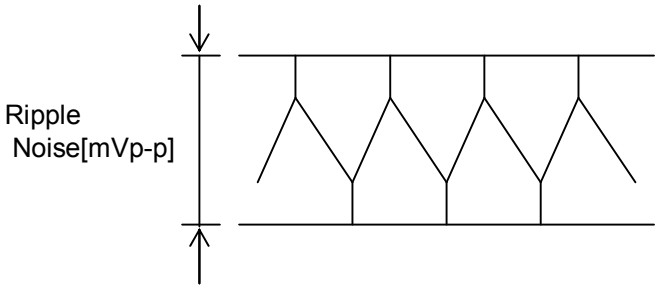


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	5	5
0.4	5	10
0.8	5	10
1.2	5	10
1.6	10	10
2.0	10	10
2.2	10	10
--	-	-
--	-	-
--	-	-
--	-	-

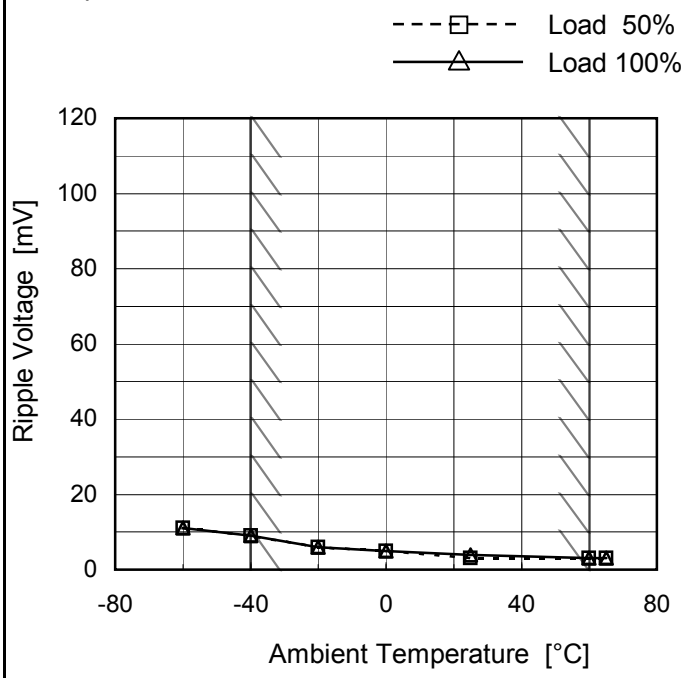
+5V: Rated output current

COSEL

Model	MGFW304805
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V2A

Testing Circuitry Figure A

1.Graph



Input Volt. 48V

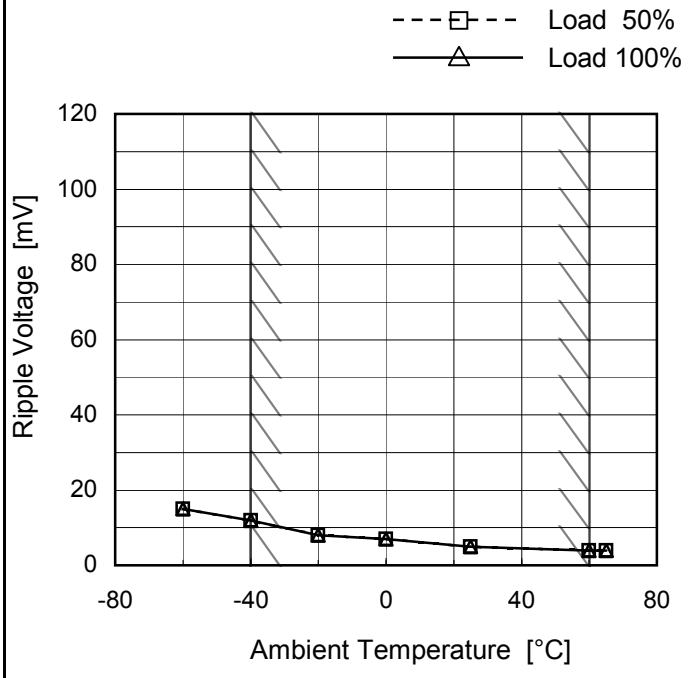
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	11	11
-40	9	9
-20	6	6
0	5	5
25	3	4
60	3	3
65	3	3
--	-	-
--	-	-
--	-	-
--	-	-

-5V: Rated output current

Object	-5V2A

1.Graph



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	15	15
-40	12	12
-20	8	8
0	7	7
25	5	5
60	4	4
65	4	4
--	-	-
--	-	-
--	-	-
--	-	-

+5V: Rated output current

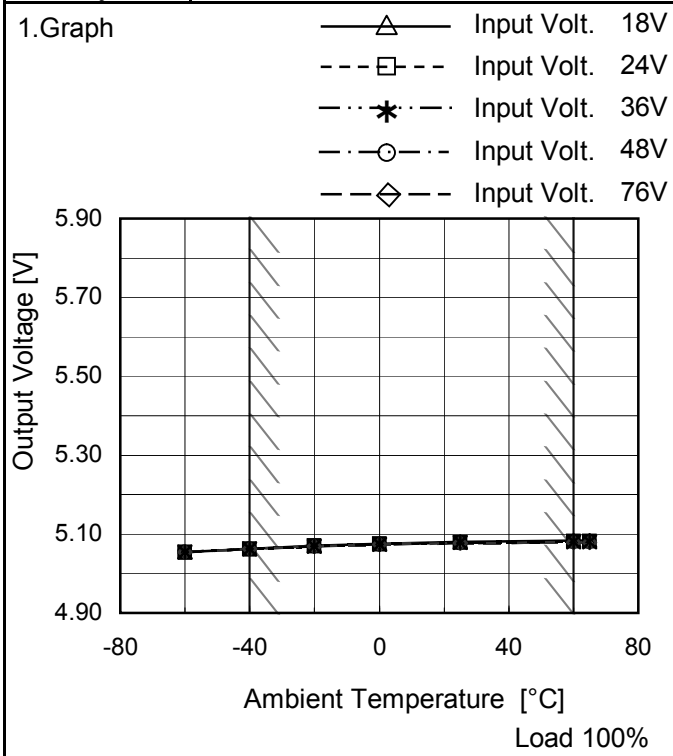
COSEL

Model	MGFW304805
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +5V2A

1.Graph

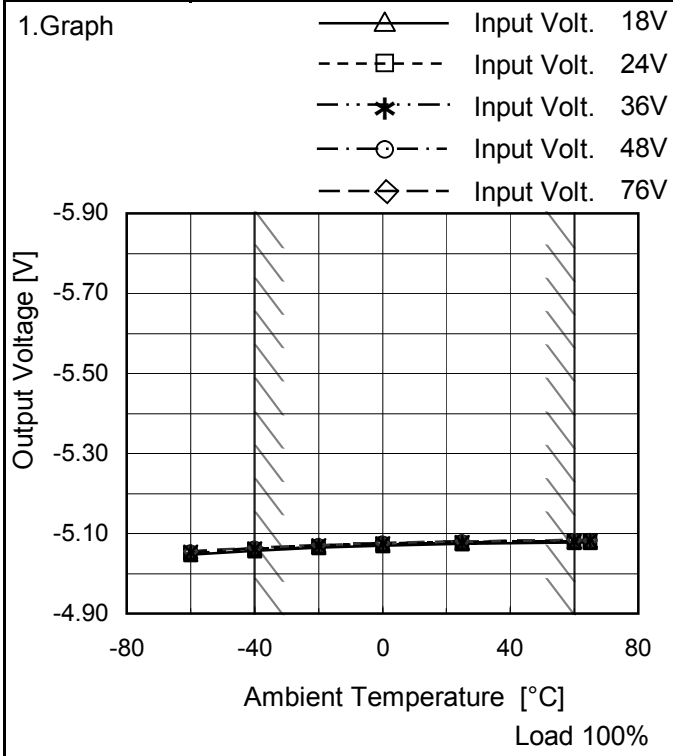


2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	5.054	5.054	5.054	5.054	5.054
-40	5.063	5.063	5.062	5.062	5.062
-20	5.070	5.070	5.069	5.069	5.069
0	5.076	5.075	5.074	5.074	5.073
25	5.081	5.079	5.078	5.078	5.077
60	5.084	5.082	5.081	5.080	5.079
65	5.084	5.082	5.080	5.079	5.079
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Object -5V2A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-60	-5.048	-5.050	-5.053	-5.054	-5.056
-40	-5.057	-5.060	-5.062	-5.063	-5.064
-20	-5.065	-5.067	-5.069	-5.070	-5.071
0	-5.070	-5.072	-5.074	-5.075	-5.076
25	-5.075	-5.077	-5.078	-5.079	-5.080
60	-5.078	-5.080	-5.082	-5.083	-5.083
65	-5.078	-5.080	-5.082	-5.083	-5.083
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW304805
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 : 18 - 76V
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) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2.Values

Object	+5V2A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	76	0	5.976	±457	±9.1
Minimum Voltage	-40	76	2	5.062		

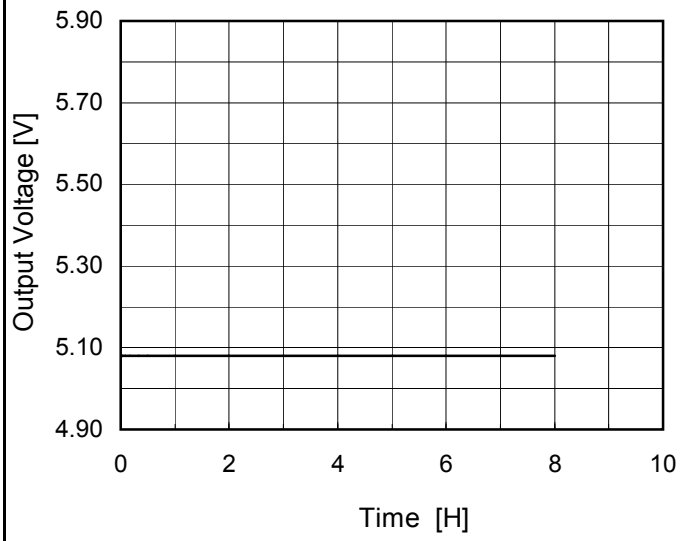
Object	-5V2A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	48	0	-5.673	±308	±6.2
Minimum Voltage	-40	18	2	-5.057		

COSEL

Model	MGFW304805
Item	Time Lapse Drift
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



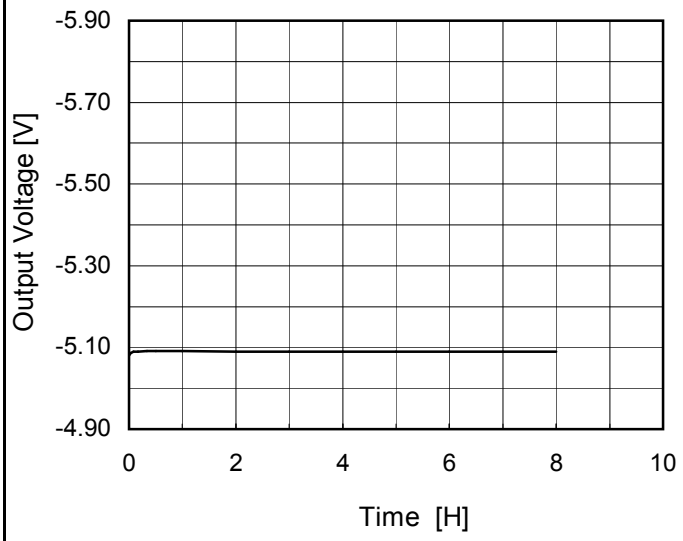
Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	5.076
0.5	5.081
1.0	5.080
2.0	5.080
3.0	5.080
4.0	5.080
5.0	5.080
6.0	5.080
7.0	5.080
8.0	5.080

Object	-5V2A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-5.080
0.5	-5.091
1.0	-5.091
2.0	-5.090
3.0	-5.090
4.0	-5.090
5.0	-5.090
6.0	-5.090
7.0	-5.090
8.0	-5.090

BC-10533

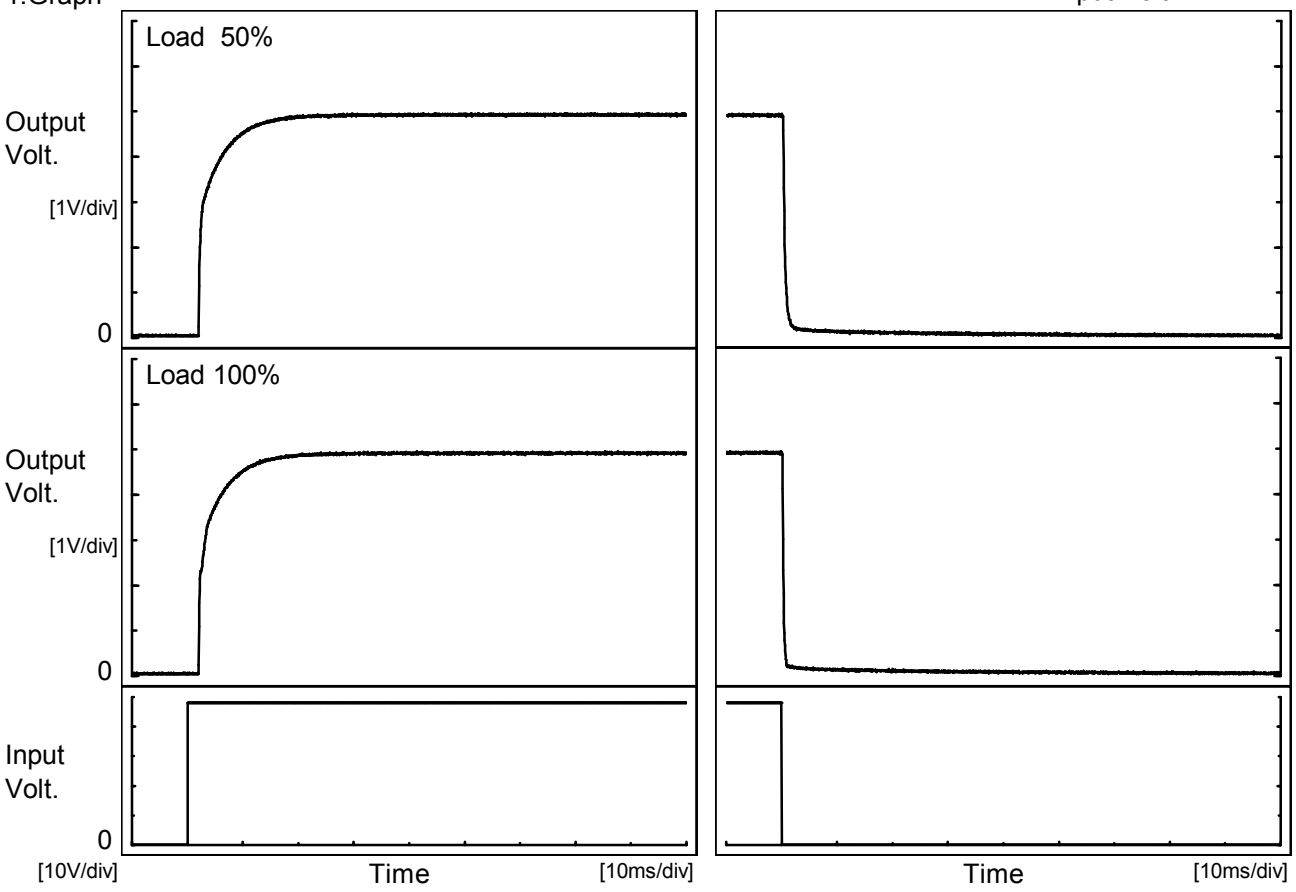
COSEL

Model	MGFW304805
Item	Rise and Fall Time
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

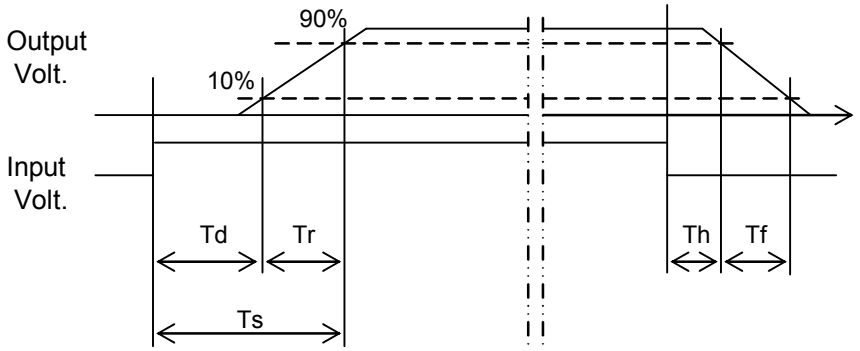
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.1	7.9	10.0	0.2	0.8
100 %	2.1	8.2	10.3	0.2	0.5



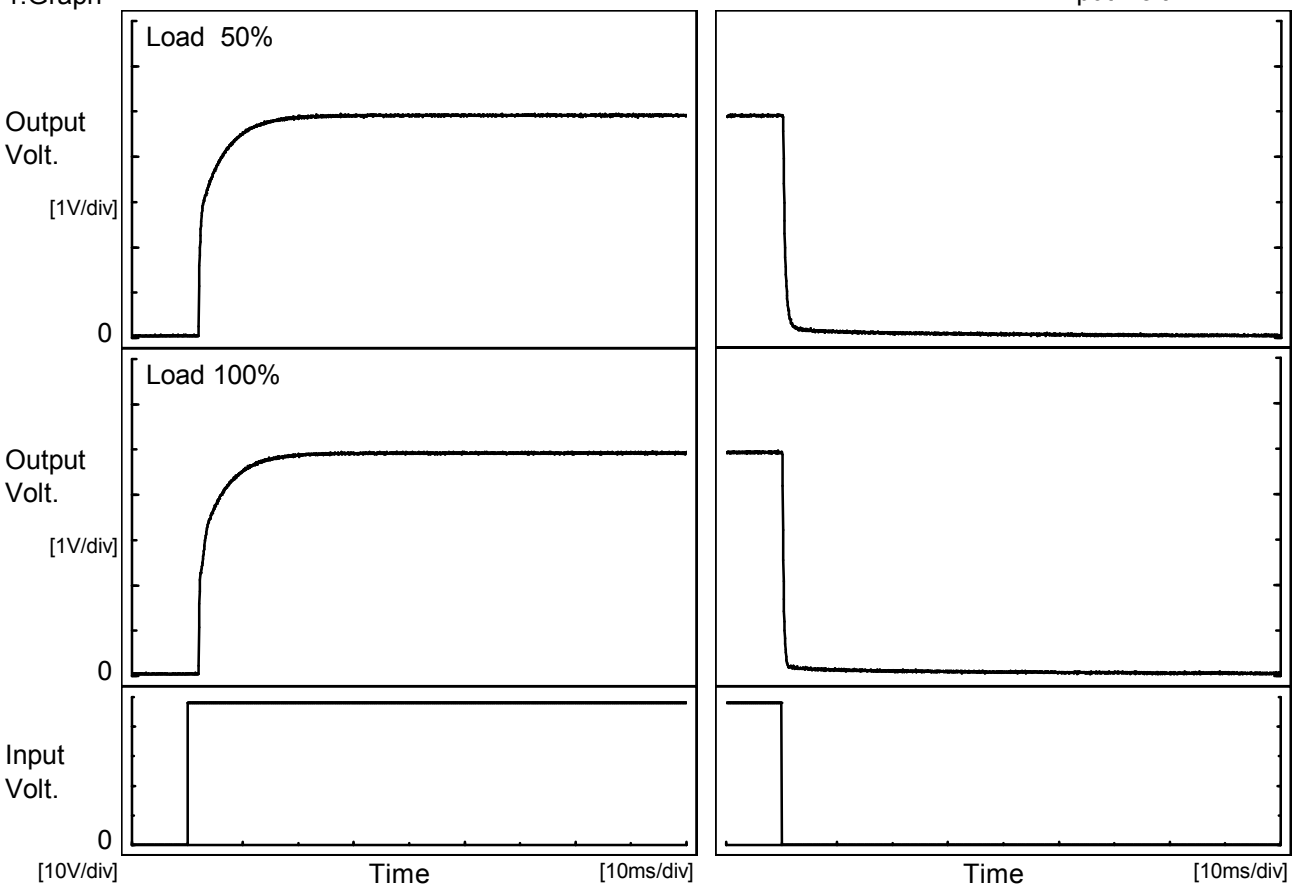
COSEL

Model	MGFW304805
Item	Rise and Fall Time
Object	-5V2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

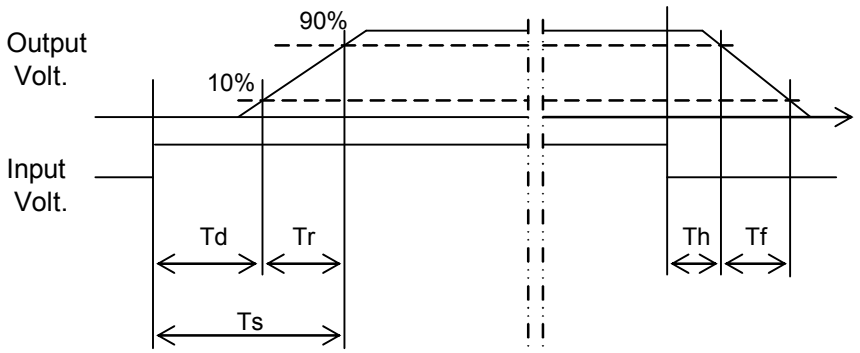
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.1	7.9	10.0	0.2	0.9
100 %	2.1	8.0	10.1	0.2	0.5



BC-10533

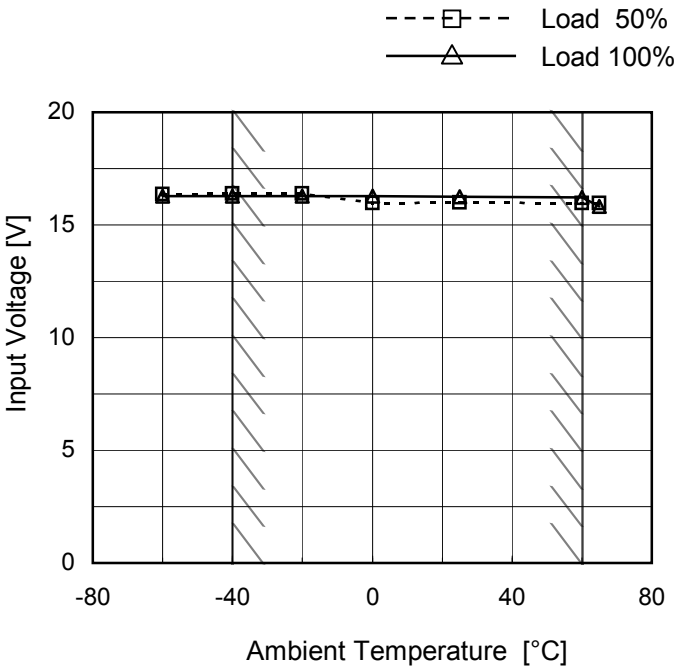
COSEL

Model	MGFW304805
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object: +5V2A

1.Graph

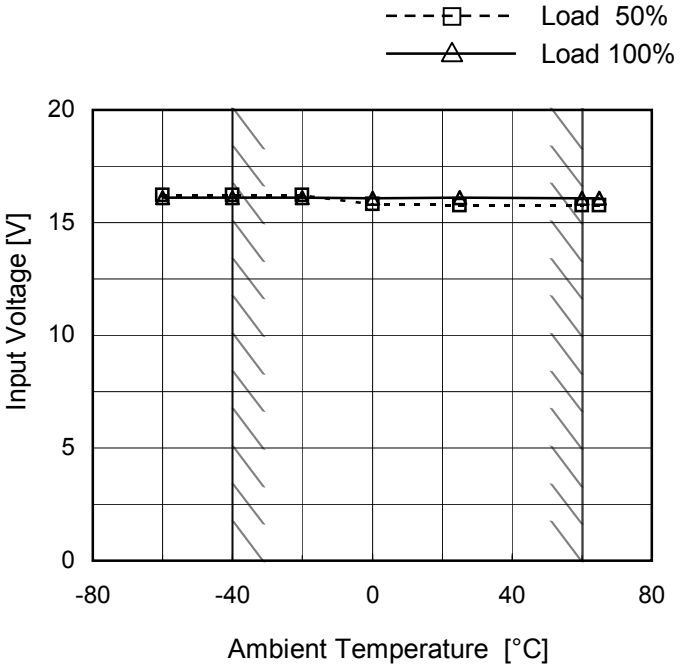


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	16.4	16.3
-40	16.4	16.3
-20	16.4	16.3
0	16.0	16.3
25	16.0	16.3
60	16.0	16.3
65	16.0	15.9
--	-	-
--	-	-
--	-	-
--	-	-

Object: -5V2A

1.Graph



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

2.Values

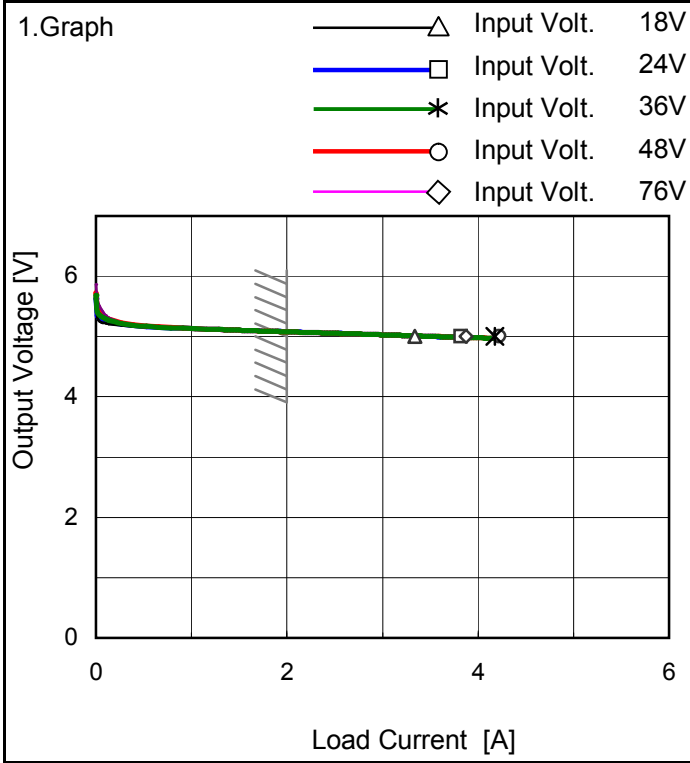
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	16.3	16.1
-40	16.3	16.1
-20	16.3	16.2
0	15.9	16.1
25	15.8	16.1
60	15.8	16.1
65	15.8	16.1
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFW304805
Item	Overcurrent Protection
Object	+5V2A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

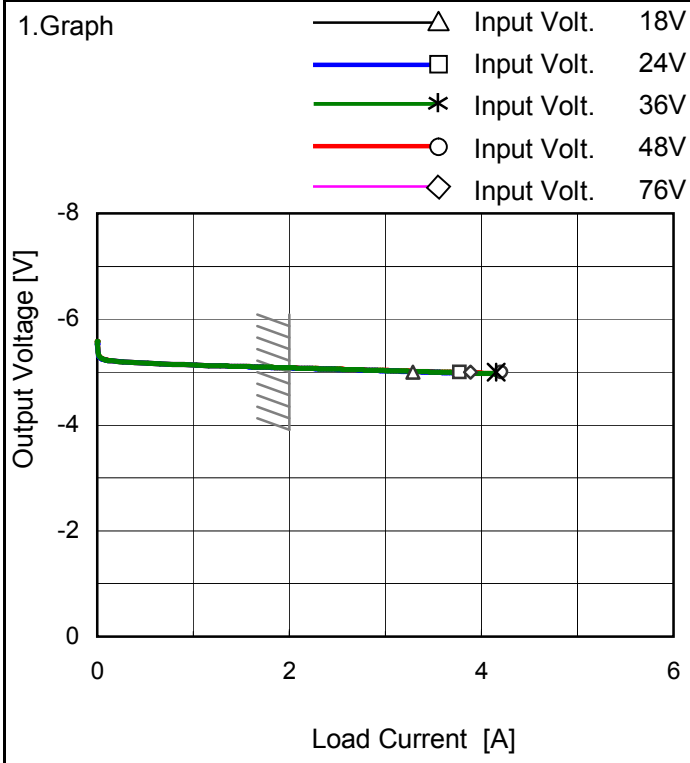


2.Values

Output Voltage [V]	Load Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
5.00	3.339	3.818	4.176	4.224	3.877
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



Note: Slanted line shows the range of the rated load current.
Intermittent operation occurs when overcurrent protection is activated.

2.Values

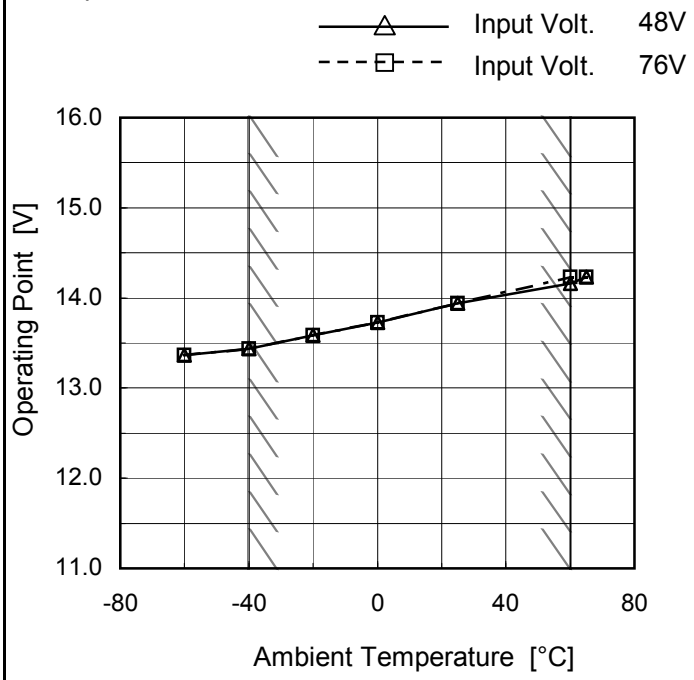
Output Voltage [V]	Load Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-5.00	3.289	3.775	4.155	4.204	3.886
-4.75	-	-	-	-	-
-4.50	-	-	-	-	-
-4.00	-	-	-	-	-
-3.50	-	-	-	-	-
-3.00	-	-	-	-	-
-2.50	-	-	-	-	-
-2.00	-	-	-	-	-
-1.50	-	-	-	-	-
-1.00	-	-	-	-	-
-0.50	-	-	-	-	-
0.00	-	-	-	-	-

COSEL

Model	MGFW304805
Item	Overvoltage Protection
Object	+10V2.5A

Testing Circuitry Figure A

1.Graph



Load 0%

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

Measured as a single output(+10V).

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 48[V]	Input Volt. 76[V]
-60	13.37	13.37
-40	13.44	13.44
-20	13.59	13.59
0	13.73	13.73
25	13.94	13.94
60	14.16	14.23
65	14.23	14.23
--	-	-
--	-	-
--	-	-
--	-	-

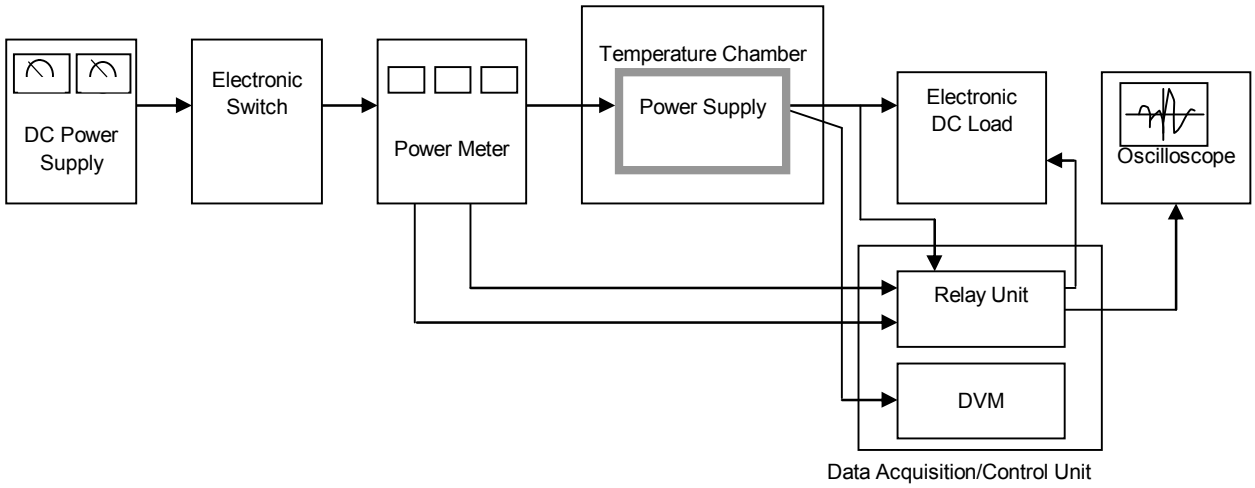


Figure A

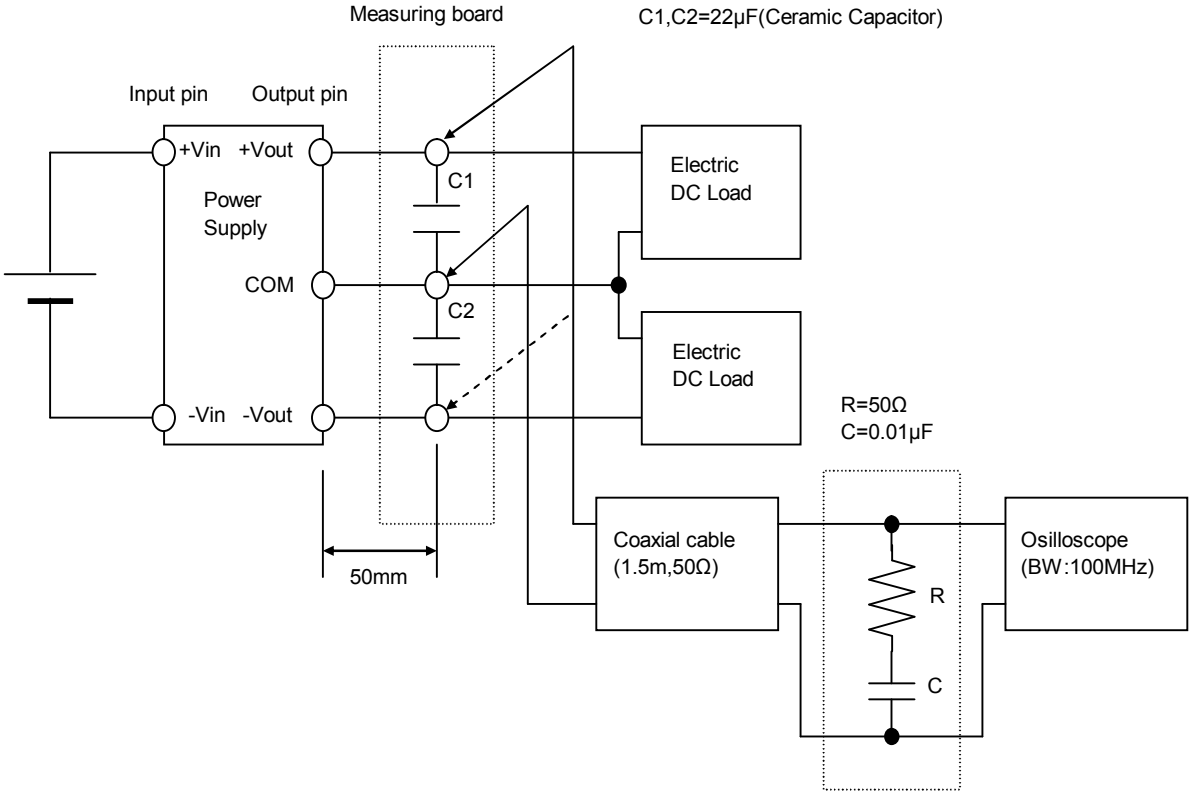


Figure B（Ripple and Ripple noise Characteristic）