参考資料

TEST DATA OF MGFS404805

Regulated DC Power Supply
December 6, 2018

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COSEL CO.,LTD.

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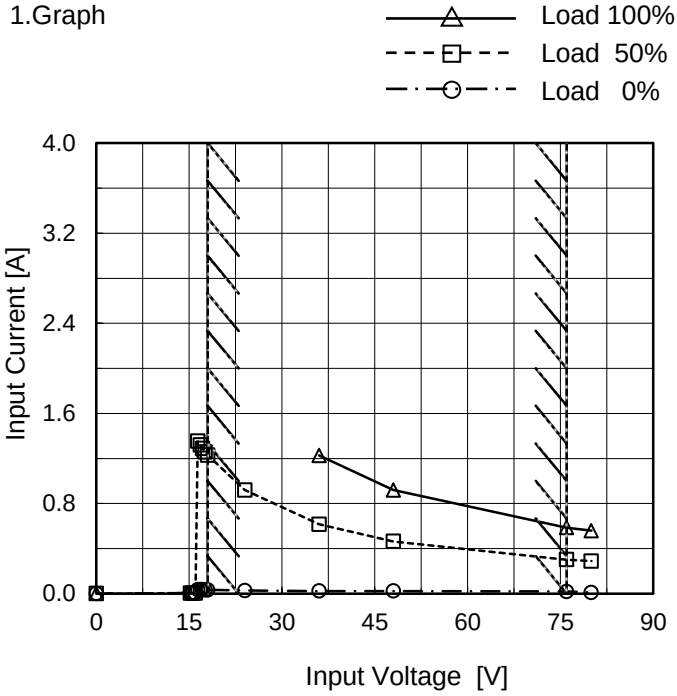
Model	MGFS404805
Item	Input Current (by Input Voltage)
Object	————————

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
15.2	0.004	0.004	- ※
15.6	0.004	0.004	- ※
16.0	0.004	0.004	- ※
16.4	0.035	1.353	- ※
16.8	0.034	1.320	- ※
17.2	0.034	1.288	- ※
17.6	0.033	1.257	- ※
18.0	0.033	1.229	- ※
24.0	0.027	0.919	- ※
36.0	0.023	0.616	1.227
48.0	0.023	0.464	0.919
76.0	0.018	0.302	0.586
80.0	0.010	0.288	0.558
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

※During this area, overcurrent protection activates and power supply operates in hiccup mode.

BC-11322

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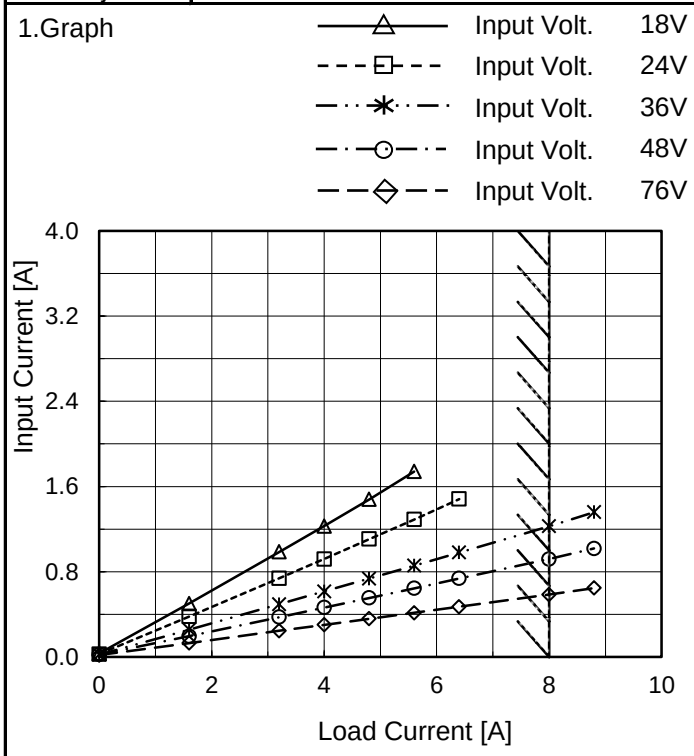
Model	MGFS404805
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	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	0.033	0.027	0.023	0.023	0.018
1.6	0.502	0.379	0.256	0.195	0.131
3.2	0.987	0.738	0.495	0.375	0.246
4.0	1.229	0.919	0.616	0.464	0.302
4.8	1.480	1.107	0.736	0.555	0.358
5.6	1.740	1.290	0.857	0.645	0.414
6.4	- ※1	1.482	0.981	0.737	0.472
8.0	- ※1	- ※2	1.227	0.919	0.586
8.8	- ※1	- ※2	1.360	1.018	0.647
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

BC-11322

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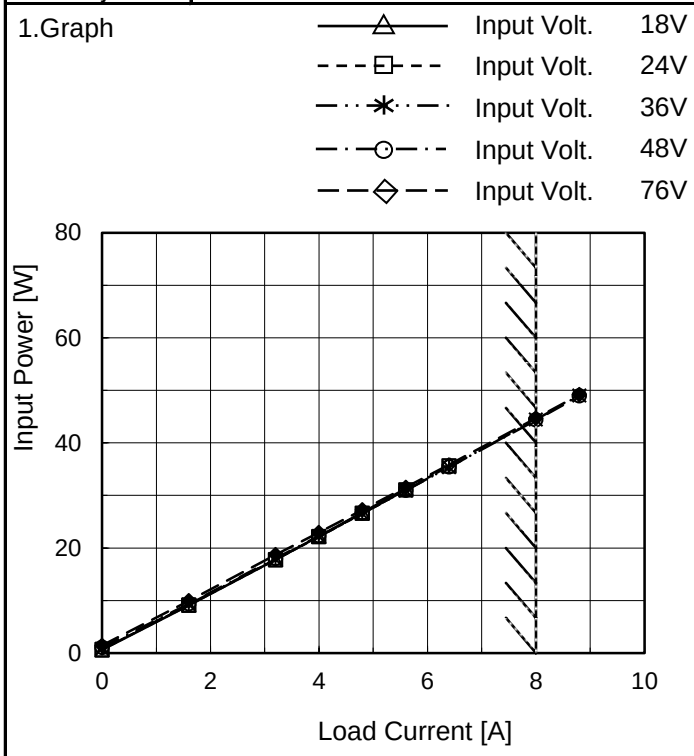
Model	MGFS404805
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	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	0.59	0.66	0.80	1.08	1.45
1.6	9.08	9.12	9.23	9.37	9.94
3.2	17.77	17.76	17.83	18.00	18.70
4.0	22.22	22.14	22.17	22.30	22.95
4.8	26.74	26.57	26.52	26.64	27.24
5.6	31.32	31.06	30.93	30.99	31.52
6.4	- ※1	35.62	35.37	35.40	35.88
8.0	- ※1	- ※2	44.44	44.36	44.70
8.8	- ※1	- ※2	49.03	48.91	49.18
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

BC-11322

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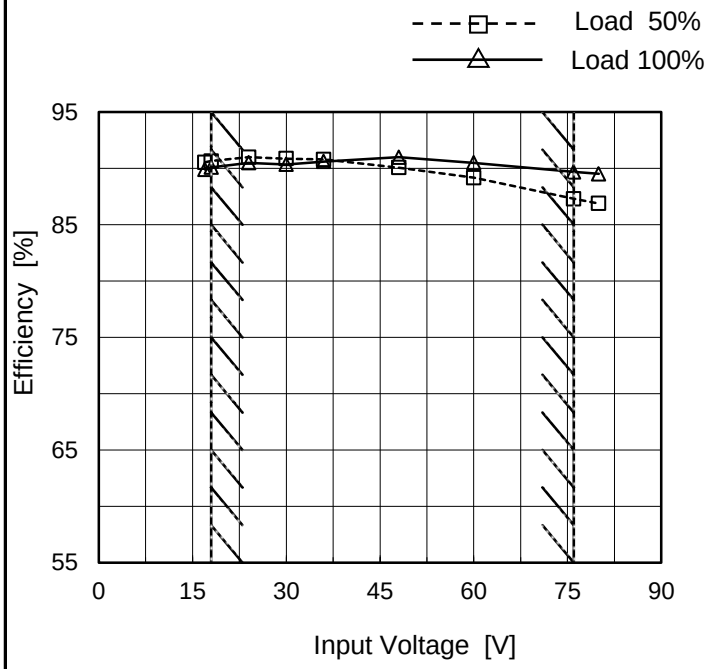
Model	MGFS404805
Item	Efficiency (by Input Voltage)
Object	――――――――――

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	90.5	89.9 ※1
18	90.7	90.1 ※1
24	91.0	90.5 ※2
30	90.9	90.4
36	90.8	90.6
48	90.1	91.0
60	89.2	90.5
76	87.3	89.7
80	86.9	89.5

※1：Load 70%
※2：Load 80%

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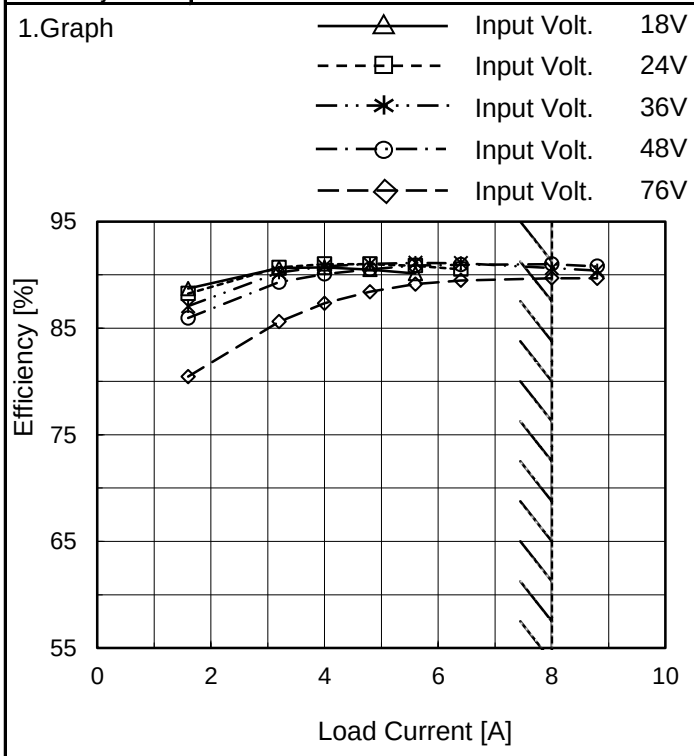
Model	MGFS404805
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Efficiency [%]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	-	-	-	-	-
1.6	88.7	88.2	87.1	86.0	80.4
3.2	90.6	90.7	90.2	89.3	85.6
4.0	90.7	91.0	90.8	90.1	87.3
4.8	90.5	91.0	91.0	90.5	88.4
5.6	90.1	90.8	91.1	90.9	89.1
6.4	- ※1	90.5	91.1	90.9	89.5
8.0	- ※1	- ※2	90.6	91.0	89.7
8.8	- ※1	- ※2	90.4	90.8	89.7
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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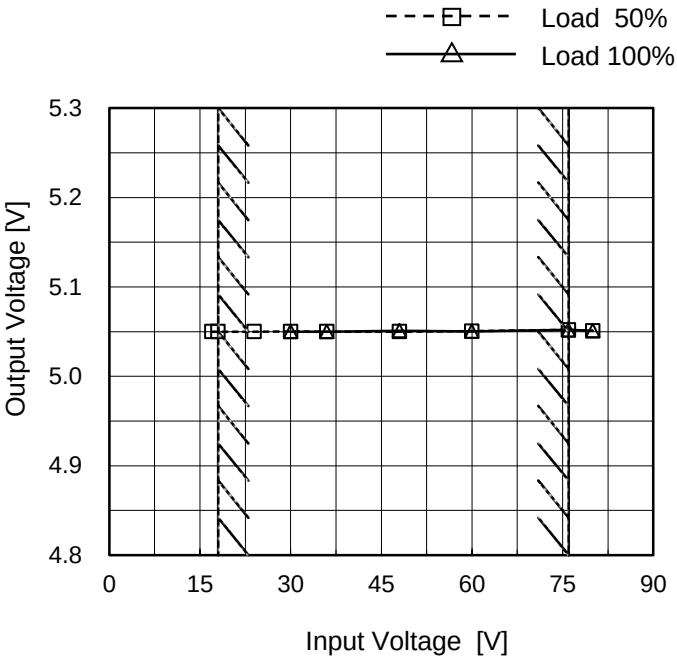
Model	MGFS404805
Item	Line Regulation
Object	+5V8A

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]	Output Voltage [V]	
	Load 50%	Load 100%
17	5.050	- ※1
18	5.050	- ※1
24	5.050	- ※2
30	5.050	5.050
36	5.050	5.050
48	5.050	5.051
60	5.051	5.050
76	5.052	5.052
80	5.051	5.051

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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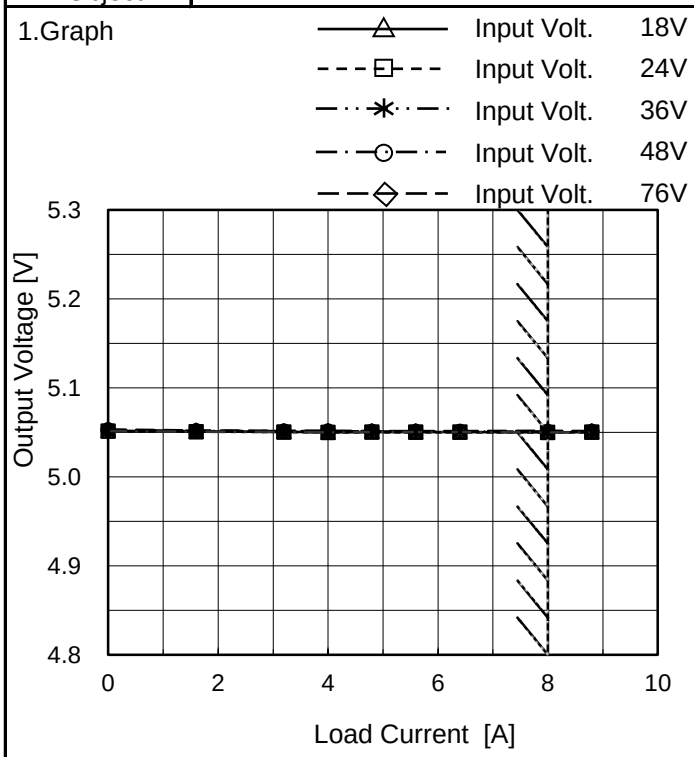
Model	MGFS404805
Item	Load Regulation
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure A

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	5.052	5.051	5.051	5.053	5.053
1.6	5.051	5.051	5.051	5.052	5.052
3.2	5.051	5.050	5.050	5.051	5.052
4.0	5.050	5.050	5.050	5.051	5.052
4.8	5.050	5.050	5.050	5.051	5.052
5.6	5.050	5.050	5.050	5.051	5.052
6.4	- ※1	5.050	5.050	5.051	5.052
8.0	- ※1	- ※2	5.050	5.051	5.052
8.8	- ※1	- ※2	5.050	5.051	5.052
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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Model	MGFS404805
Item	Dynamic Load Response
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure A

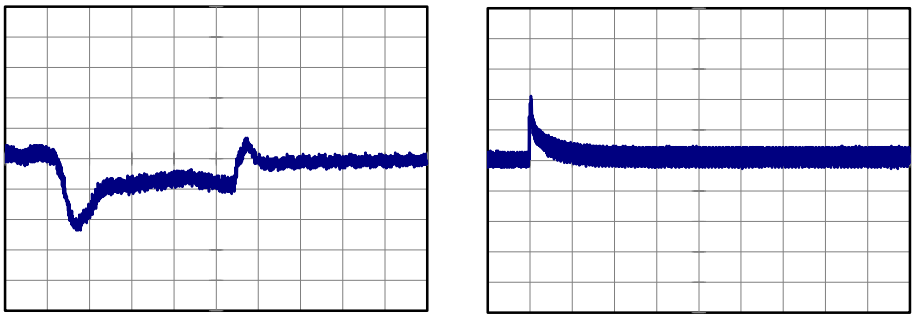
Input Volt. 48 V
Cycle 100 ms

t1,t2 = 100 μ s

Load Current

t1 t2

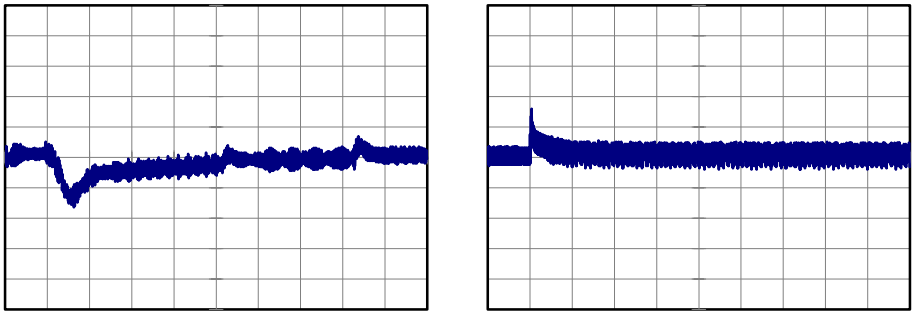
Min.Load (0A)←→
Load 100% (8A)



100 mV/div

100 μs/div 1 ms/div

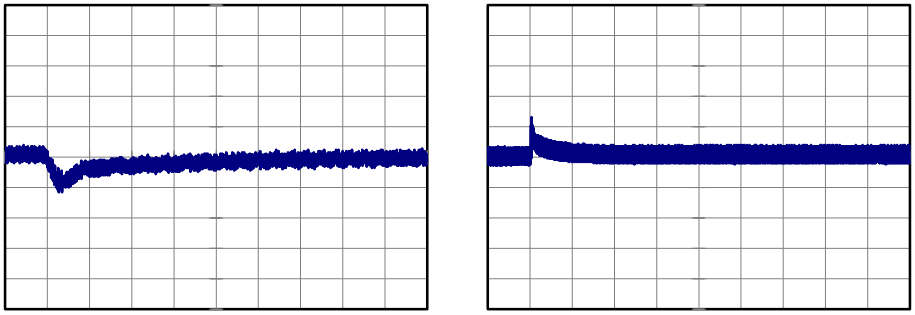
Min.Load (0A)←→
Load 50% (4A)



100 mV/div

100 μs/div 1 ms/div

Load 50% (4A)←→
Load 100% (8A)



100 mV/div

100 μs/div 1 ms/div

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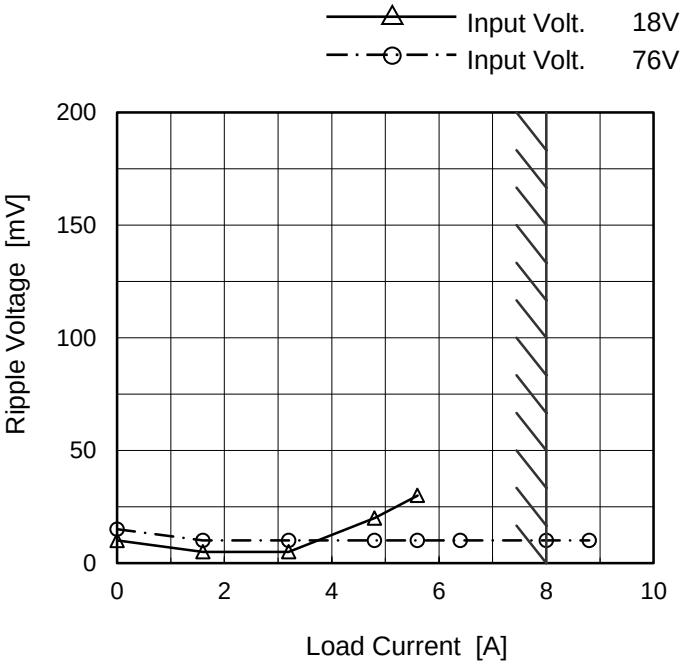
Model	MGFS404805
Item	Ripple Voltage (by Load Current)
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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]

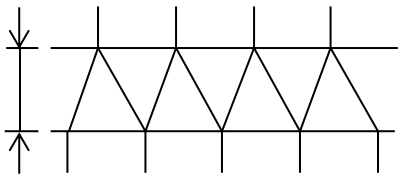


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	10	15
1.6	5	10
3.2	5	10
4.8	20	10
5.6	30	10
6.4	- ※	10
8.0	- ※	10
8.8	- ※	10
--	-	-
--	-	-
--	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.

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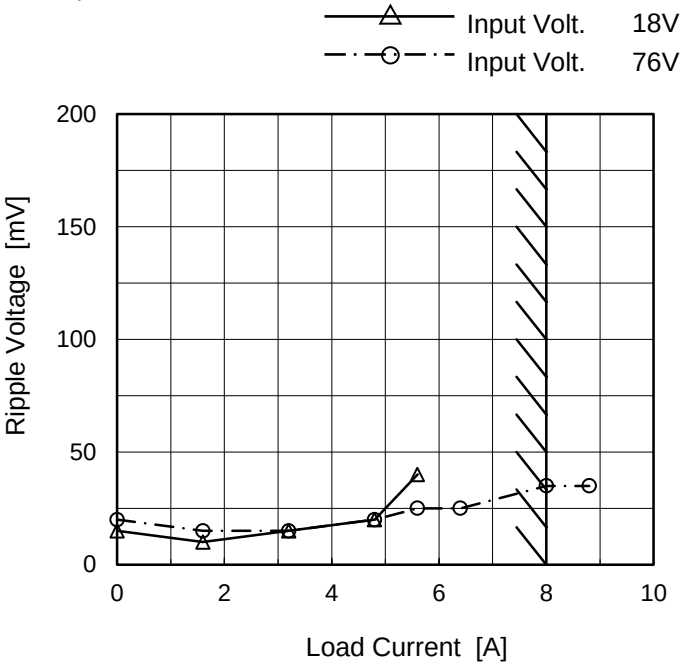
Model	MGFS404805
Item	Ripple-Noise
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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]

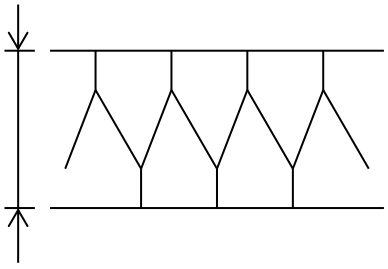


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.0	15	20
1.6	10	15
3.2	15	15
4.8	20	20
5.6	40	25
6.4	- ※	25
8.0	- ※	35
8.8	- ※	35
--	-	-
--	-	-
--	-	-

※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.

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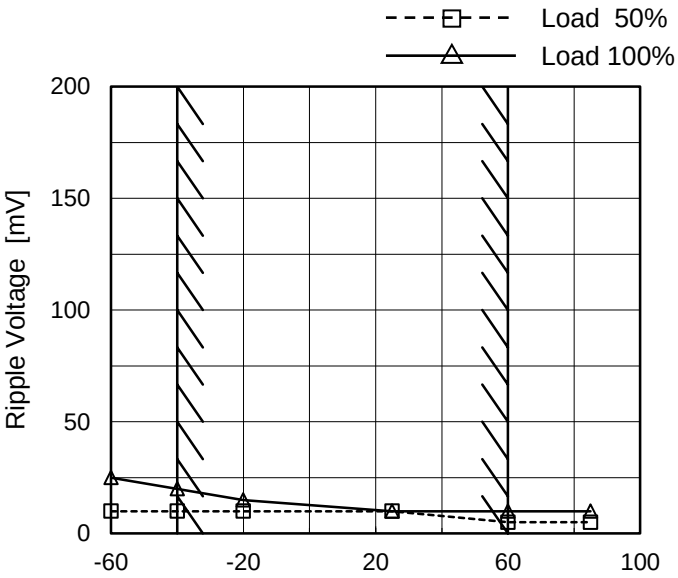
Model	MGFS404805
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V8A

Testing Circuitry Figure B

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	10	25
-40	10	20
-20	10	15
25	10	10
60	5	10
85	5	10
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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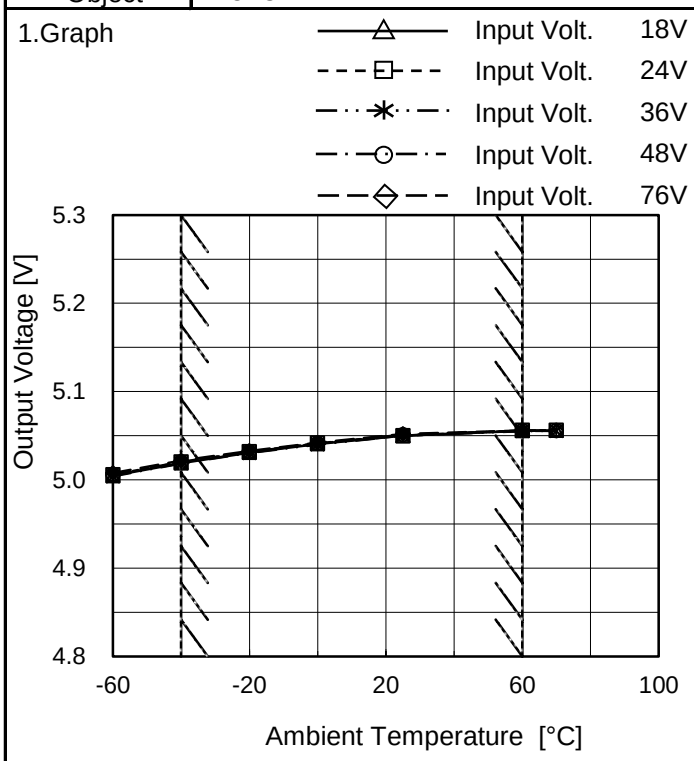
Model	MGFS404805
Item	Ambient Temperature Drift
Object	+5V8A

Testing Circuitry Figure A

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	5.005	5.006	5.004	5.006	5.008
-40	5.019	5.020	5.019	5.020	5.022
-20	5.031	5.032	5.030	5.032	5.033
0	5.041	5.041	5.040	5.041	5.042
25	5.050	5.050	5.050	5.051	5.052
60	5.056	5.056	5.055	5.056	5.056
70	5.056	5.056	5.055	5.056	5.056
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of input Volt. 18V, Load 70%.
24V, Load 80%.
Other case Load 100%.

Model	MGFS404805	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+5V8A	

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 : 0 - 8A

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

$$\text{* Output Voltage Accuracy (Ratio)} = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	60	18	0	5.058	±20	±0.4
Minimum Voltage	-40	36	8	5.019		

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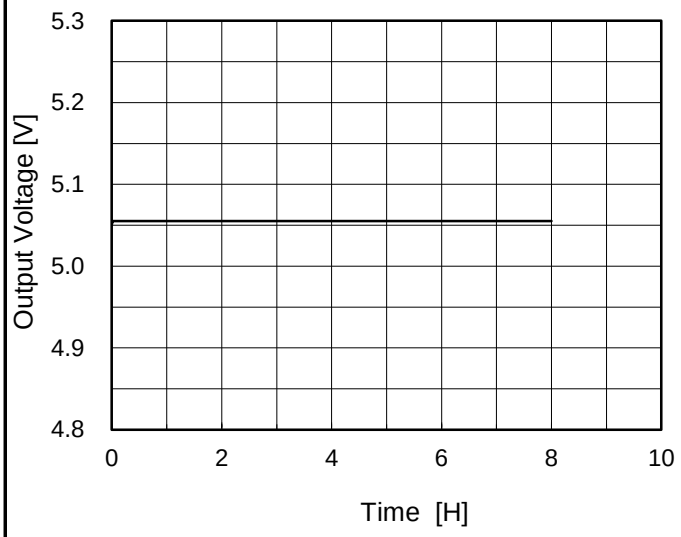
Model	MGFS404805
Item	Time Lapse Drift
Object	+5V8A

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	5.050
0.5	5.055
1.0	5.055
2.0	5.055
3.0	5.055
4.0	5.055
5.0	5.055
6.0	5.055
7.0	5.055
8.0	5.055

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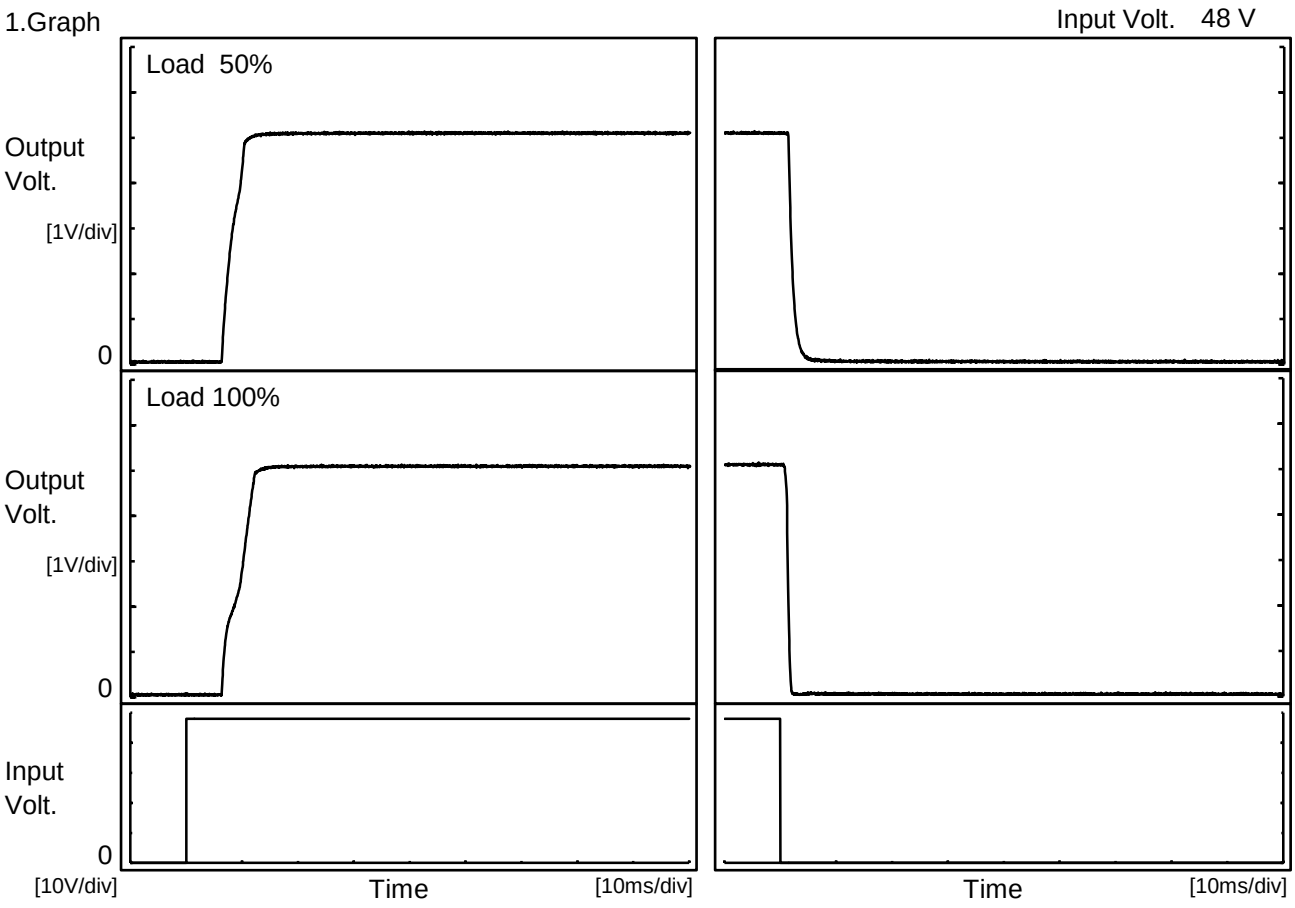
Model	MGFS404805	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+5V8A	

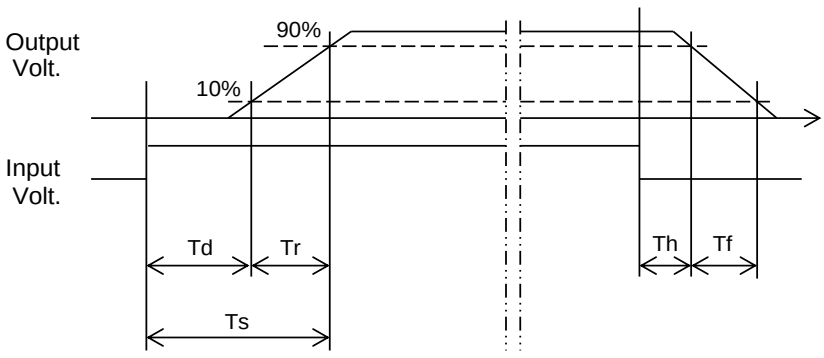
1.Graph



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.6	3.6	10.2	1.5	1.7
100 %	6.6	5.3	11.9	1.1	0.7

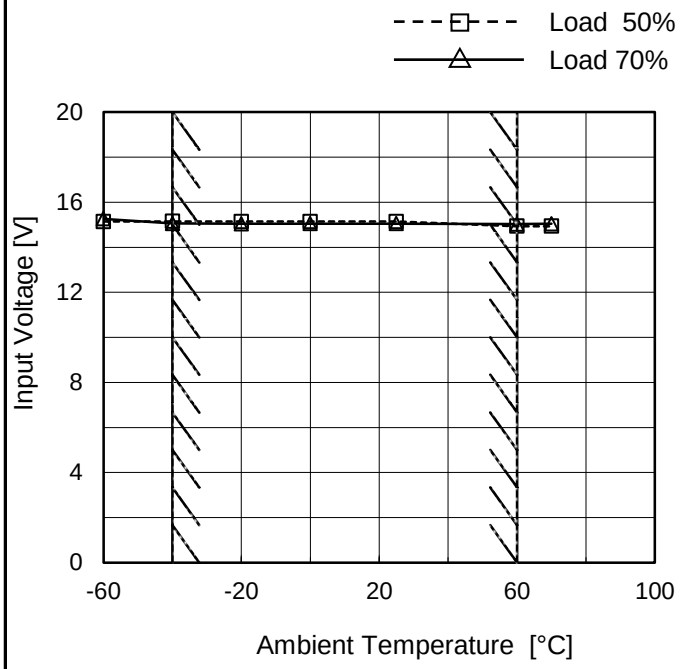


COSEL

Model	MGFS404805
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V8A

Testing Circuitry Figure A

1.Graph



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

2.Values

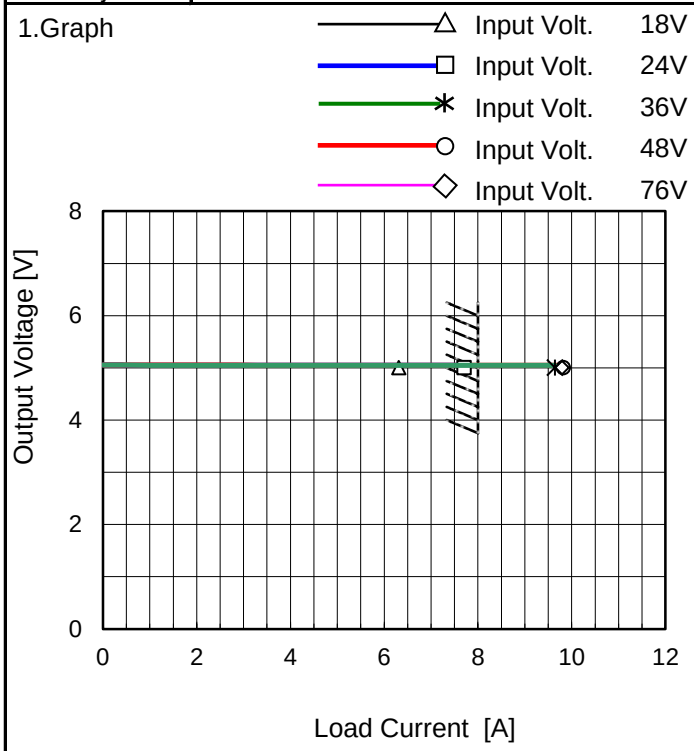
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	15.2	15.3
-40	15.2	15.1
-20	15.2	15.1
0	15.2	15.1
25	15.2	15.1
60	15.0	15.1
70	15.0	15.1
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFS404805
Item	Overcurrent Protection
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

Intermittent operation activates 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	6.311	7.703	9.645	9.825	9.795
4.75	- ※1	- ※2	-	-	-
4.50	-	-	-	-	-
4.00	-	-	-	-	-
3.50	-	-	-	-	-
3.00	-	-	-	-	-
2.50	-	-	-	-	-
2.00	-	-	-	-	-
1.50	-	-	-	-	-
1.00	-	-	-	-	-
0.50	-	-	-	-	-
0.00	-	-	-	-	-

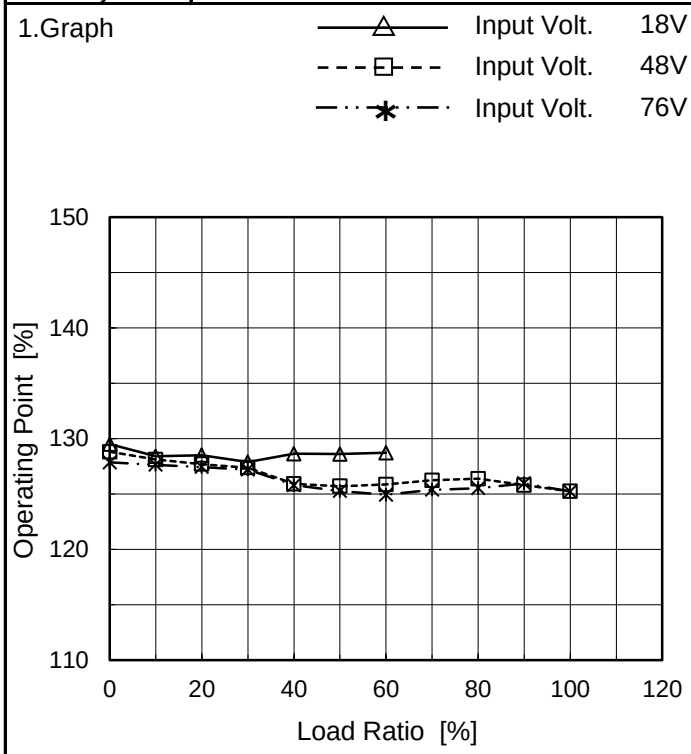
※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 24V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGFS404805
Item	Overvoltage Protection
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

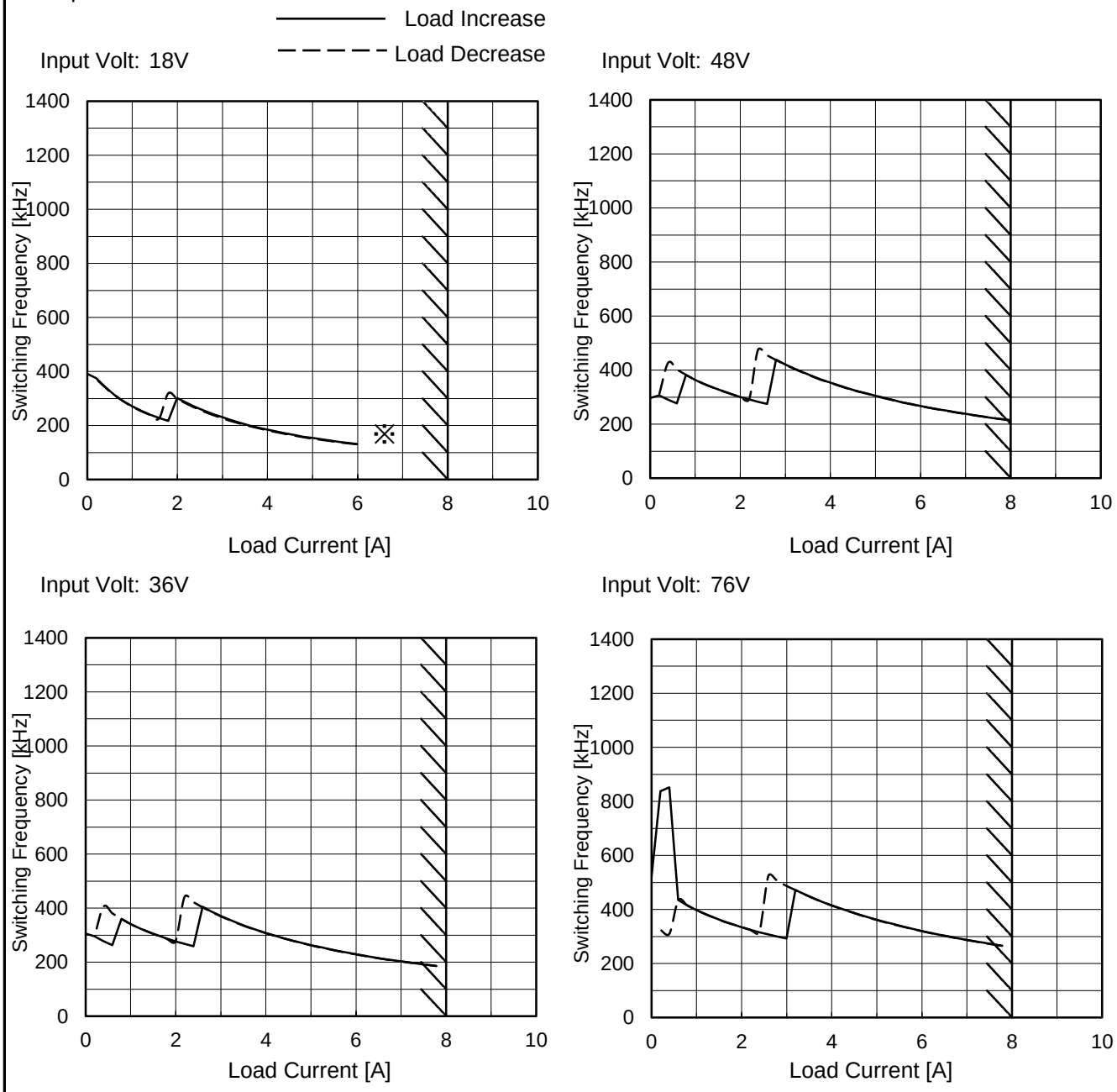
Load Ratio [%]	Operating Point [%] Input Volt. 18[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	130	129	128
10	128	128	128
20	129	128	127
30	128	127	127
40	129	126	126
50	129	126	125
60	129	126	125
70	- ※	126	125
80	- ※	126	126
90	- ※	126	126
100	- ※	125	125

※During this area, overcurrent protection activates.

COSEL

Model	MGFS404805	
Item	Switching frequency (by Load Current)	Temperature 25°C Testing Circuitry Figure A
Object	+5V8A	

1.Graph



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

-switching frequency of MG40 changes depending on load current and input voltage.
When load current is low, switching frequency becomes high and step down to low frequency at certain point.
There is hysteresis, so characteristic is different between load increase (sweep from 0% to 100%) and load decrease (sweep from 100% to 0%).

-When load current is low, MG40 operates intermittently, so switching frequency can not be stable.
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

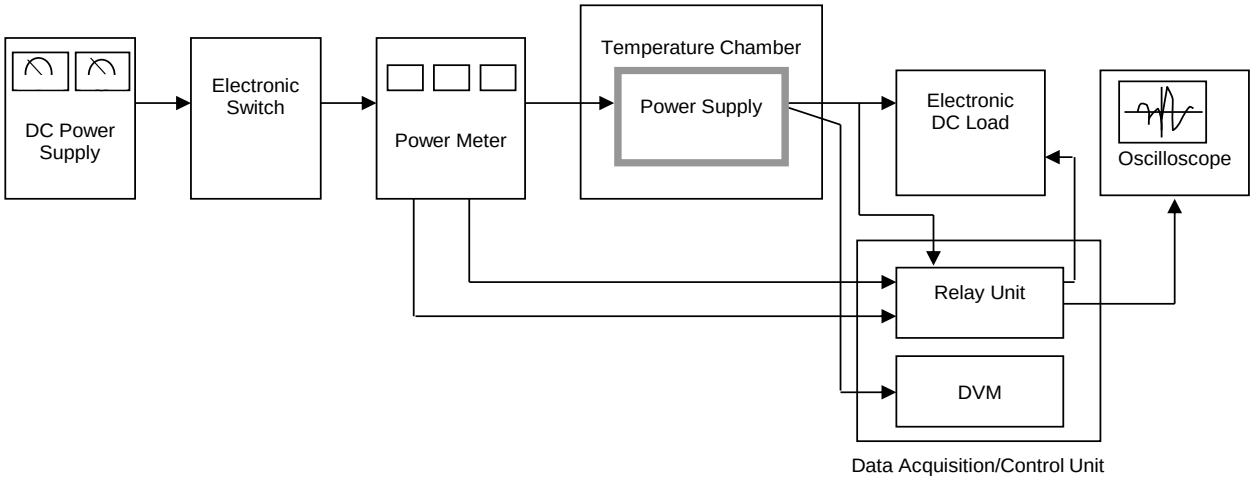


Figure A

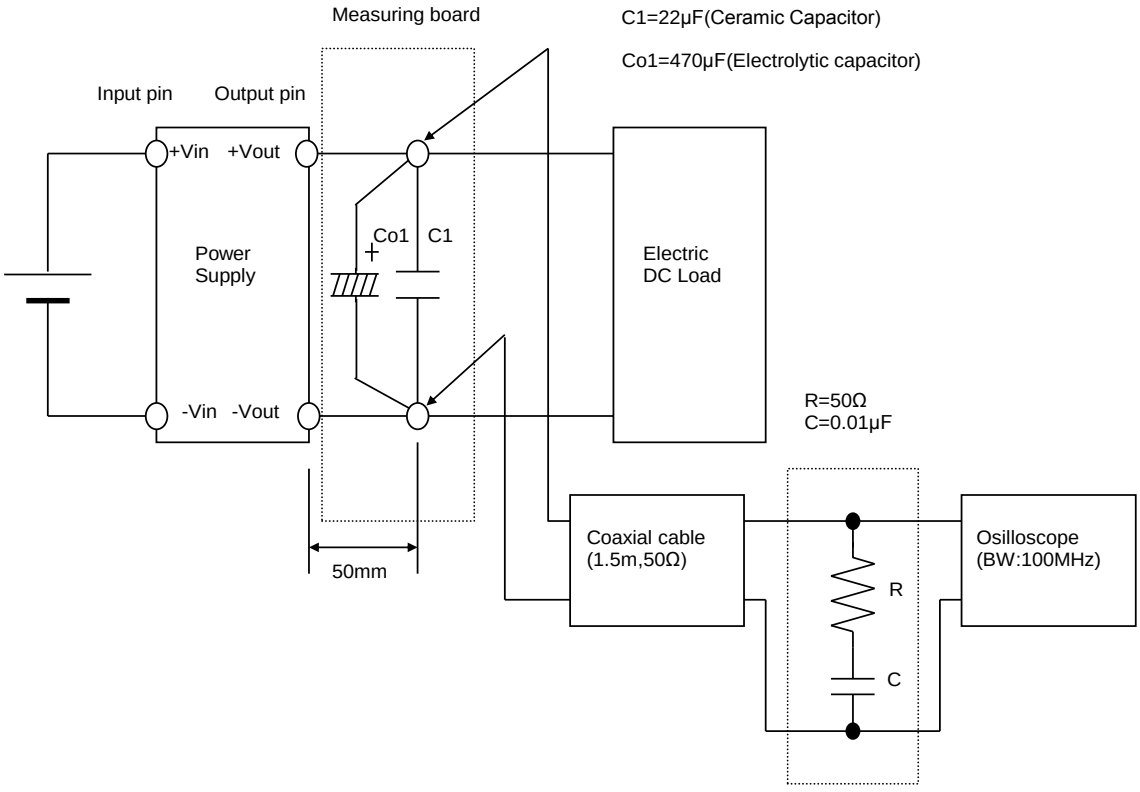


Figure B（Ripple and Ripple noise Characteristic）