参考資料

TEST DATA OF MGFS802415

Regulated DC Power Supply
April 10, 2019

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COSEL CO.,LTD.

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Model	MGFS802415
Item	Input Current (by Input Voltage)
Object	————————

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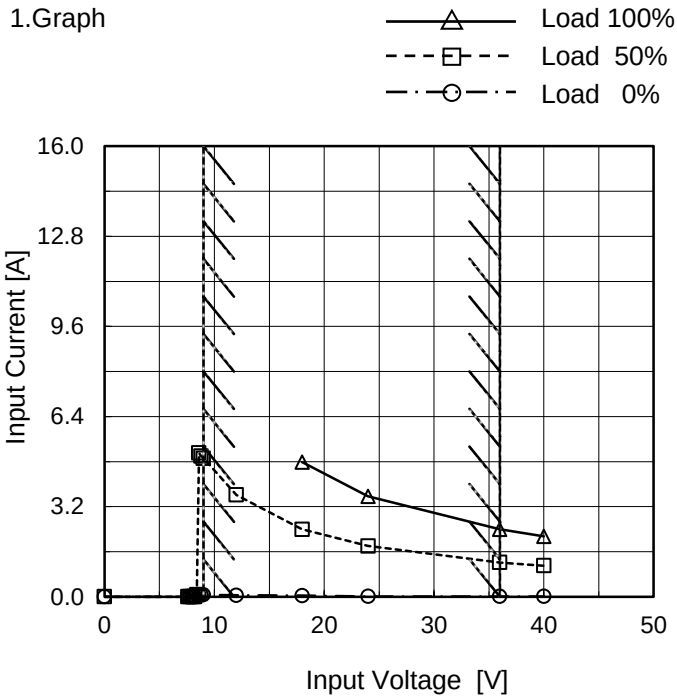
Testing Circuitry Figure A

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
7.6	0.001	0.001	- ※
7.8	0.001	0.001	- ※
8.0	0.001	0.001	- ※
8.2	0.001	0.001	- ※
8.4	0.071	0.071	- ※
8.6	0.069	5.106	- ※
8.8	0.068	4.991	- ※
9.0	0.067	4.918	- ※
12.0	0.054	3.613	- ※
18.0	0.043	2.394	4.783
24.0	0.015	1.804	3.563
36.0	0.014	1.215	2.393
40.0	0.014	1.102	2.144
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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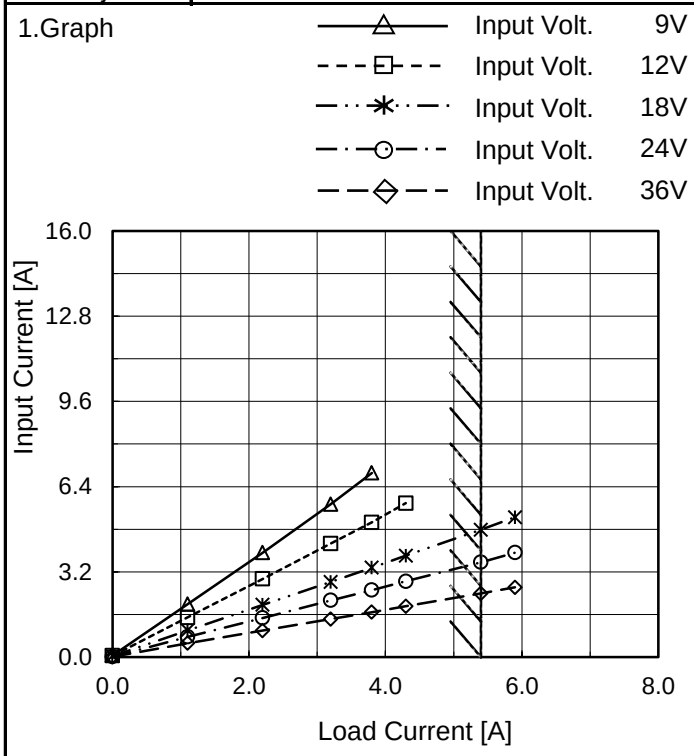
Model	MGFS802415
Item	Input Current (by Load Current)
Object	――――――

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	0.067	0.054	0.043	0.015	0.014
1.1	1.987	1.489	1.000	0.762	0.524
2.2	3.920	2.939	1.963	1.473	0.997
3.2	5.740	4.263	2.824	2.130	1.430
3.8	6.913	5.058	3.359	2.515	1.689
4.3	- ※1	5.778	3.809	2.847	1.911
5.4	- ※1	- ※2	4.783	3.563	2.393
5.9	- ※1	- ※2	5.252	3.925	2.616
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 12V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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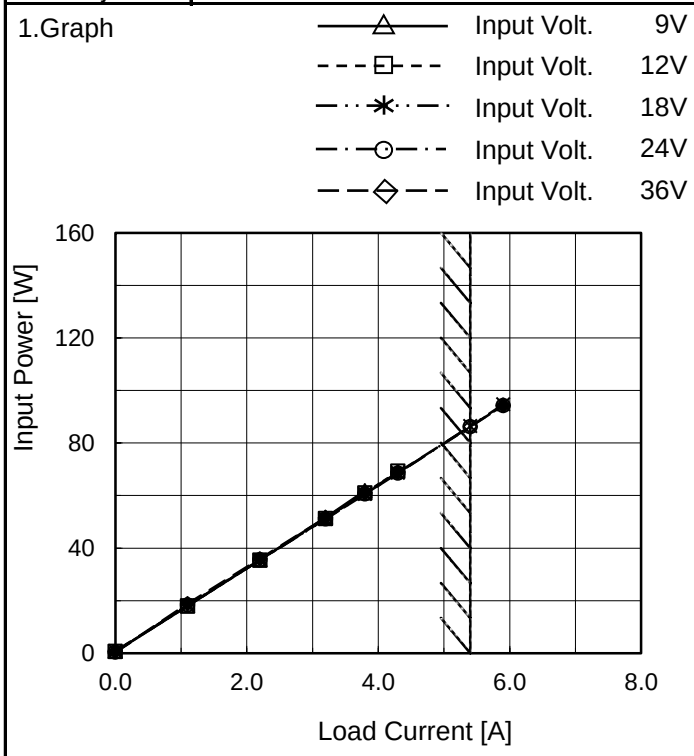
Model	MGFS802415
Item	Input Power (by Load Current)
Object	————————

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	0.61	0.66	0.78	0.36	0.50
1.1	17.96	17.98	18.09	18.33	18.86
2.2	35.49	35.40	35.38	35.49	35.91
3.2	51.68	51.26	51.08	51.13	51.60
3.8	61.83	61.00	60.61	60.59	60.97
4.3	- ※1	69.23	68.63	68.54	68.83
5.4	- ※1	- ※2	86.41	86.14	86.26
5.9	- ※1	- ※2	94.67	94.25	94.27
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 12V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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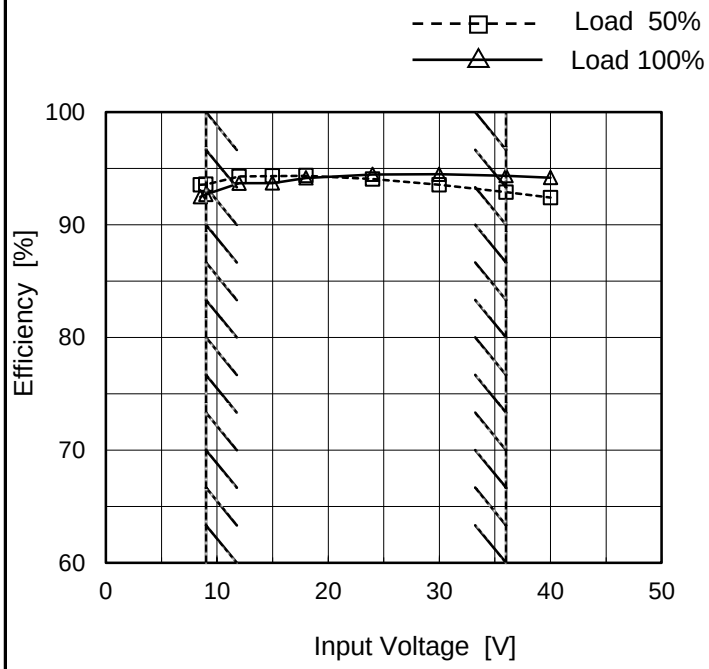
Model	MGFS802415
Item	Efficiency (by Input Voltage)
Object	――――――――――

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%
8.5	93.6	92.5 ※1
9.0	93.6	92.7 ※1
12.0	94.3	93.7 ※2
15.0	94.3	93.7
18.0	94.4	94.2
24.0	94.1	94.5
30.0	93.6	94.5
36.0	92.9	94.4
40.0	92.4	94.2

※1：Load 70%
※2：Load 80%

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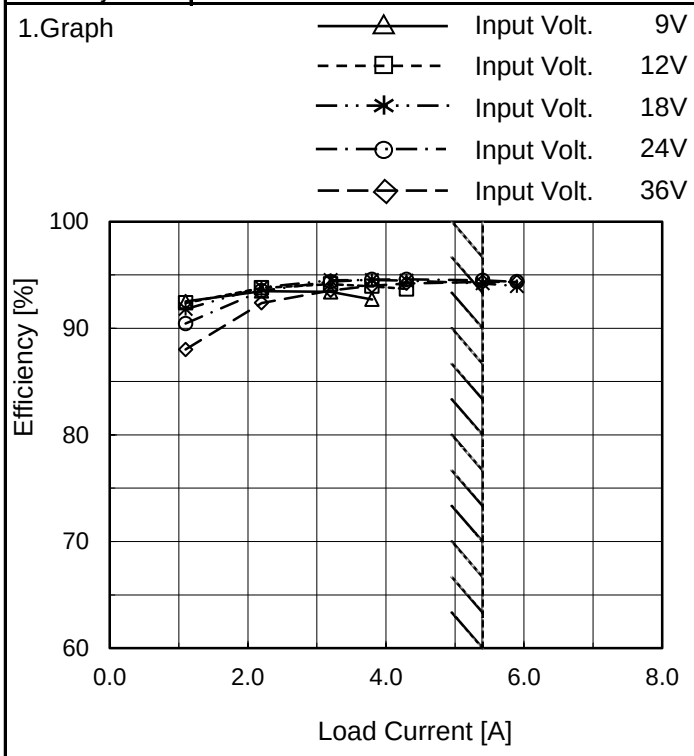
Model	MGFS802415
Item	Efficiency (by Load Current)
Object	――――――

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	-	-	-	-	-
1.1	92.5	92.4	91.8	90.4	88.0
2.2	93.5	93.8	93.8	93.5	92.4
3.2	93.4	94.1	94.5	94.4	93.5
3.8	92.7	93.9	94.5	94.6	94.0
4.3	- ※1	93.7	94.5	94.6	94.2
5.4	- ※1	- ※2	94.2	94.5	94.3
5.9	- ※1	- ※2	93.9	94.4	94.3
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 12V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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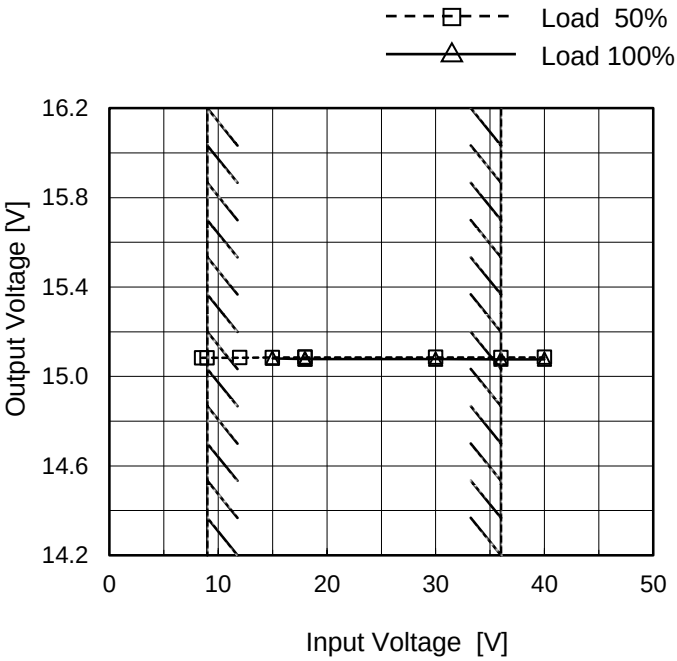
Model	MGFS802415
Item	Line Regulation
Object	+15V5.4A

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%
8.5	15.083	- ※1
9.0	15.083	- ※1
12.0	15.084	- ※2
15.0	15.085	15.081
18.0	15.085	15.078
18.0	15.085	15.077
30.0	15.085	15.077
36.0	15.085	15.077
40.0	15.085	15.077

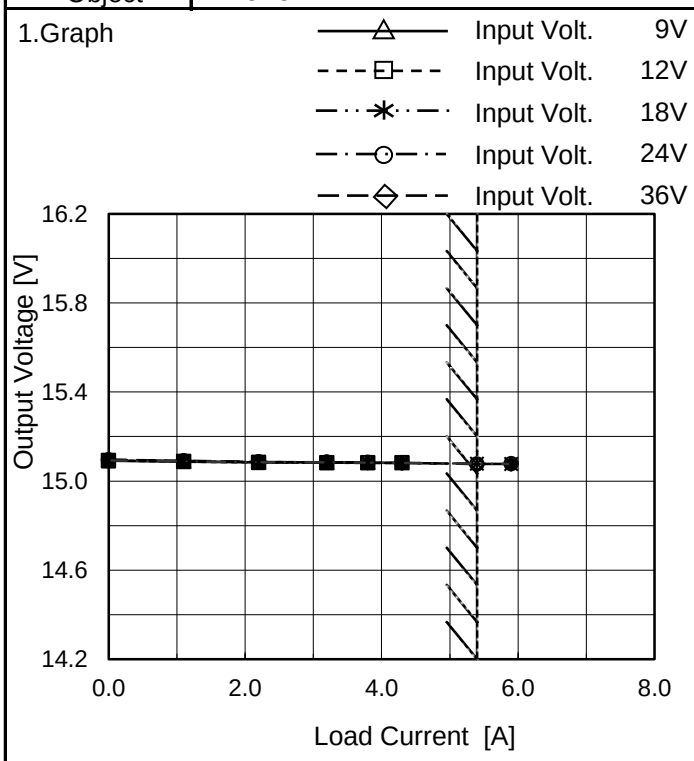
※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 12V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

COSEL

Model	MGFS802415
Item	Load Regulation
Object	+15V5.4A

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	15.091	15.092	15.093	15.095	15.096
1.1	15.087	15.088	15.088	15.090	15.091
2.2	15.084	15.084	15.085	15.086	15.086
3.2	15.084	15.082	15.084	15.085	15.085
3.8	15.084	15.082	15.082	15.083	15.083
4.3	- ※1	15.082	15.081	15.082	15.081
5.4	- ※1	- ※2	15.078	15.077	15.077
5.9	- ※1	- ※2	15.077	15.077	15.077
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 12V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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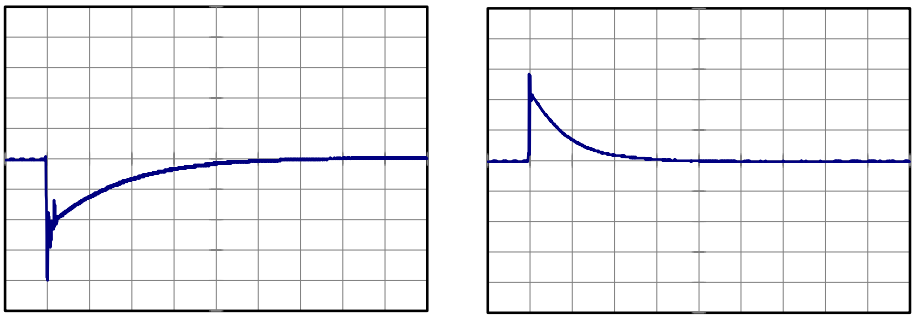
Model	MGFS802415	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+15V5.4A	

Input Volt. 24 V
Cycle 100 ms

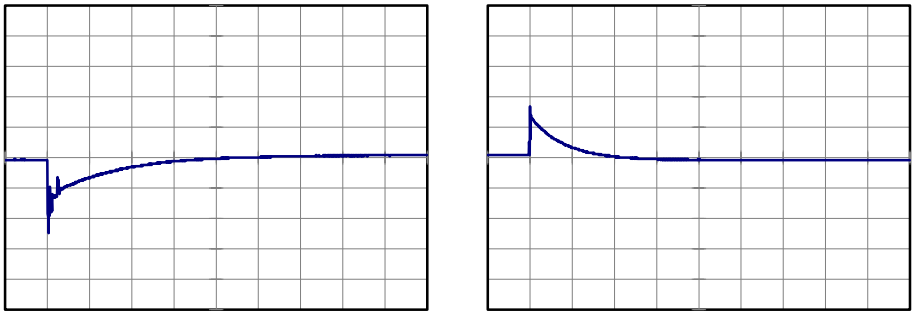
Min.Load (0A)←→
Load 100% (5.4A)



200 mV/div

2 ms/div 4 ms/div

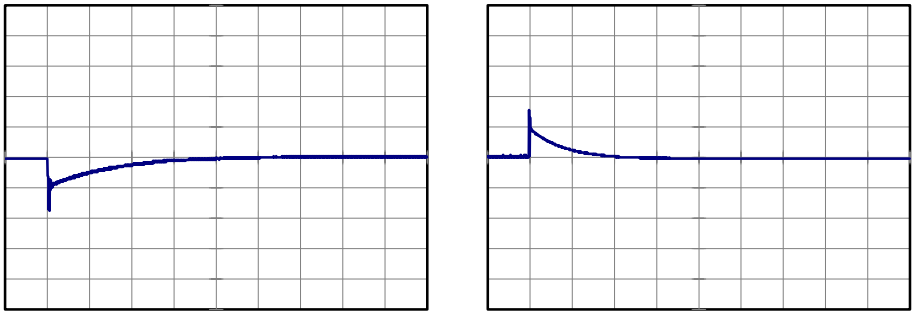
Min.Load (0A)←→
Load 50% (2.7A)



200 mV/div

2 ms/div 4 ms/div

Load 50% (2.7A)←→
Load 100% (5.4A)



200 mV/div

2 ms/div 4 ms/div

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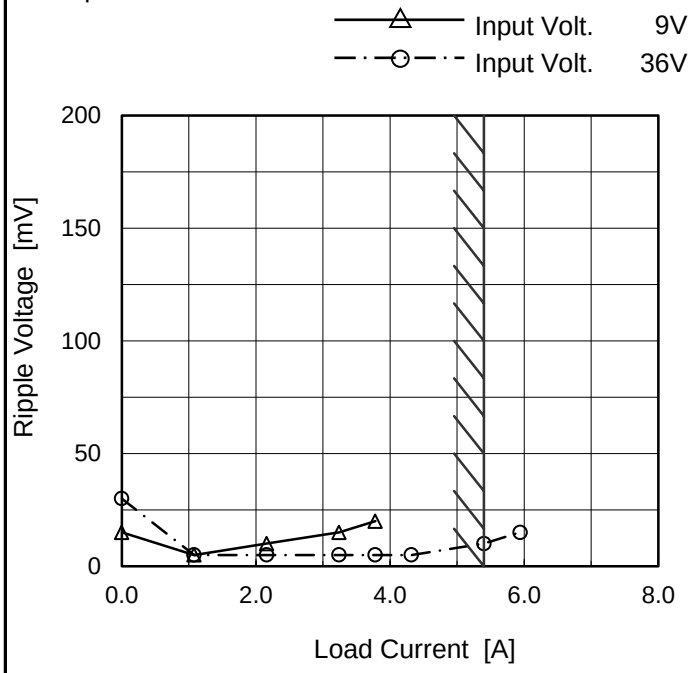
Model	MGFS802415
Item	Ripple Voltage (by Load Current)
Object	+15V5.4A

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]

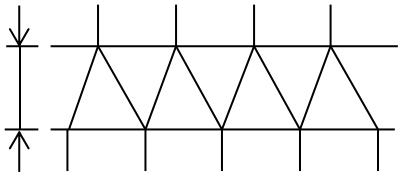


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	15	30
1.1	5	5
2.2	10	5
3.2	15	5
3.8	20	5
4.3	- ※	5
5.4	- ※	10
5.9	- ※	15
--	-	-
--	-	-
--	-	-

※ 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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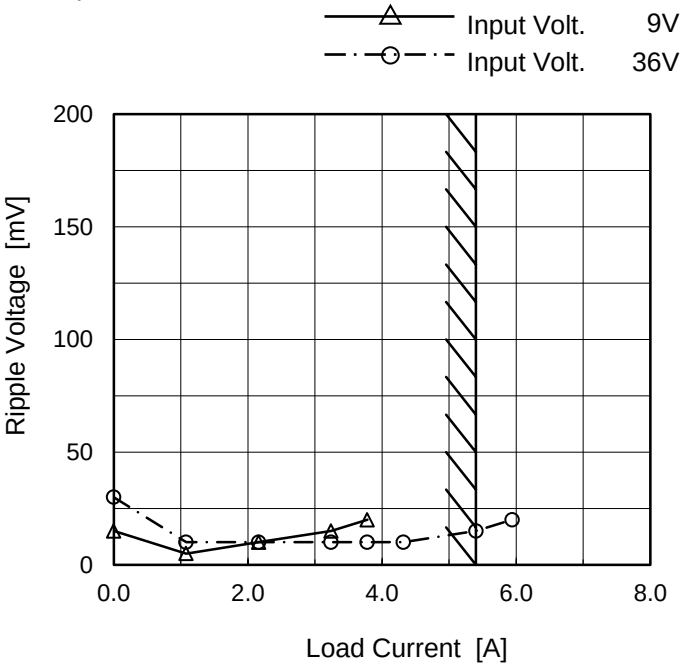
Model	MGFS802415
Item	Ripple-Noise
Object	+15V5.4A

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]

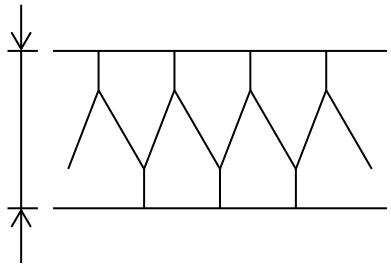


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	15	30
1.1	5	10
2.2	10	10
3.2	15	10
3.8	20	10
4.3	- ※	10
5.4	- ※	15
5.9	- ※	20
--	-	-
--	-	-
--	-	-

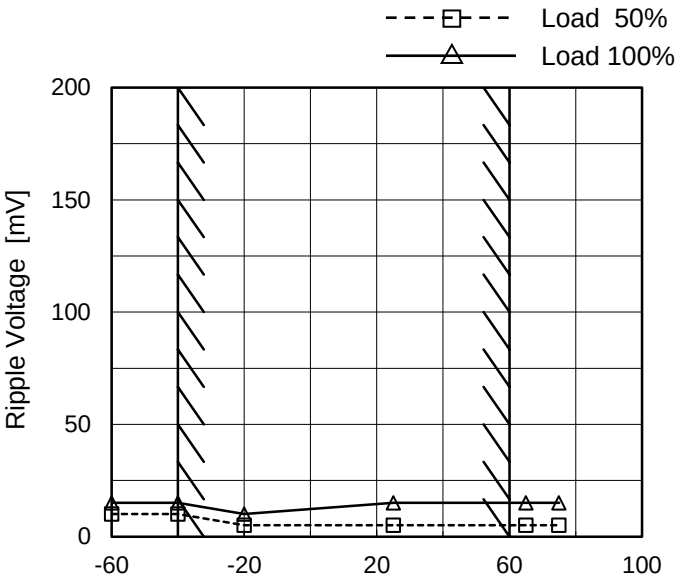
※ Maximum output current at minimum input Voltage is 70% of rated load current. Refer to instruction manuals for details of input derating.

COSEL

Model	MGFS802415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V5.4A

Testing Circuitry Figure B

1.Graph



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	10	15
-40	10	15
-20	5	10
25	5	15
65	5	15
75	5	15
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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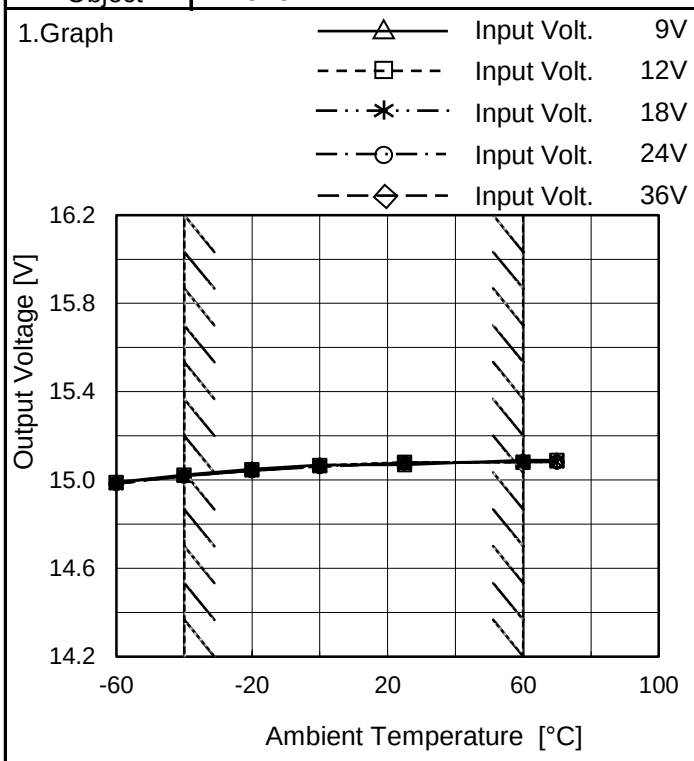
Model	MGFS802415
Item	Ambient Temperature Drift
Object	+15V5.4A

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	14.990	14.987	14.983	14.983	14.984
-40	15.024	15.021	15.018	15.017	15.018
-20	15.050	15.046	15.043	15.042	15.043
0	15.069	15.065	15.061	15.060	15.060
25	15.069	15.080	15.078	15.077	15.077
60	15.090	15.080	15.083	15.082	15.081
70	15.090	15.087	15.082	15.081	15.080
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Note: In case of input Volt.9V, Load 70%.
12V, Load 80%.
Other case Load 100%.

Model	MGFS802415	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V5.4A	

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 : 0 - 5.4A

* 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	9	0	15.101	±42	±0.3
Minimum Voltage	-40	24	5.4	15.017		

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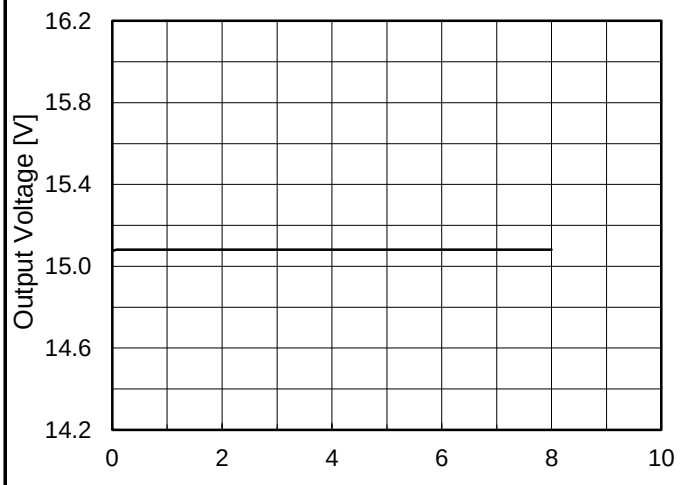
Model	MGFS802415
Item	Time Lapse Drift
Object	+15V5.4A

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	15.074
0.5	15.081
1.0	15.081
2.0	15.081
3.0	15.081
4.0	15.081
5.0	15.081
6.0	15.081
7.0	15.081
8.0	15.081

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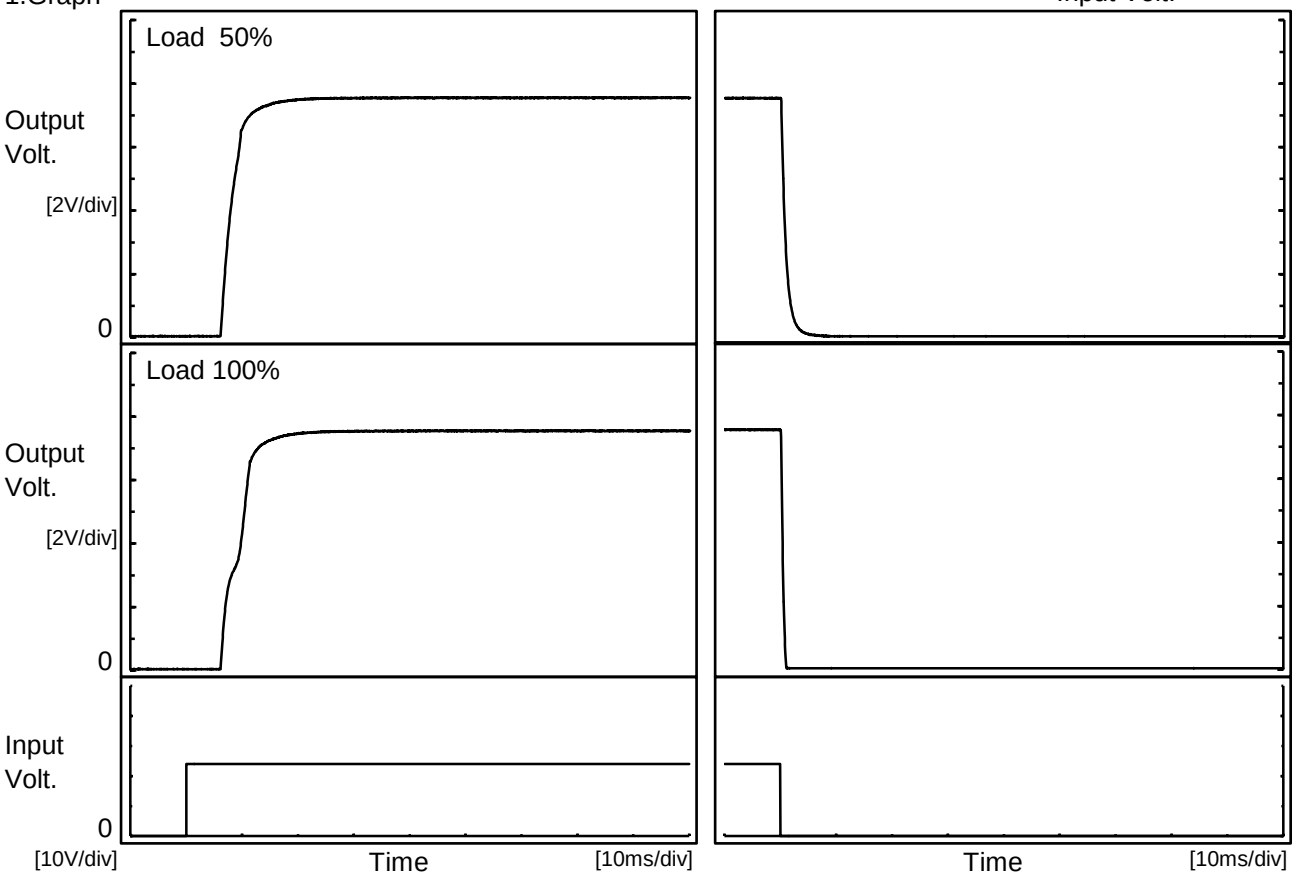
Model	MGFS802415	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V5.4A	

1.Graph

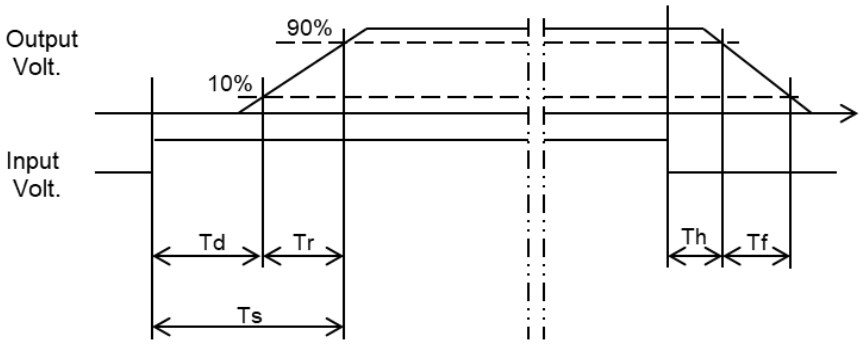
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	6.4	4.2	10.6	0.2	1.9
100 %	6.5	5.6	12.1	0.2	0.7



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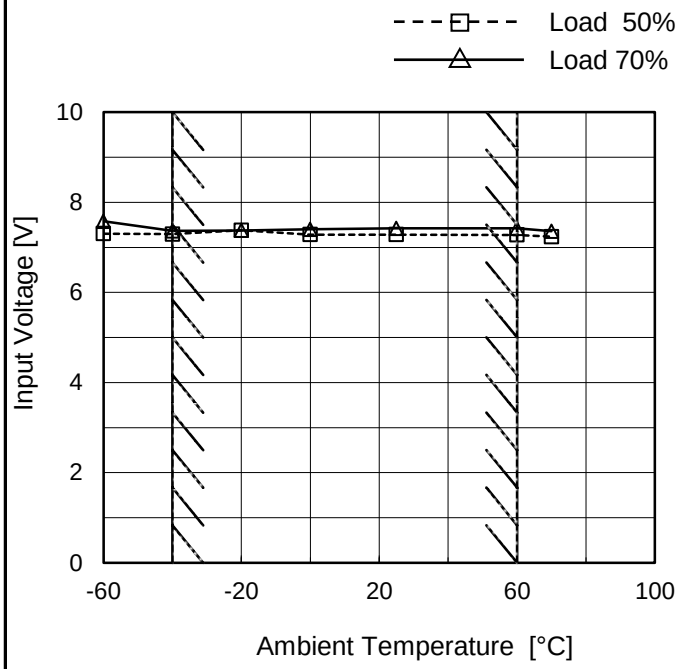
Model	MGFS802415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V3.78A

Testing Circuitry Figure A

1.Graph



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

2.Values

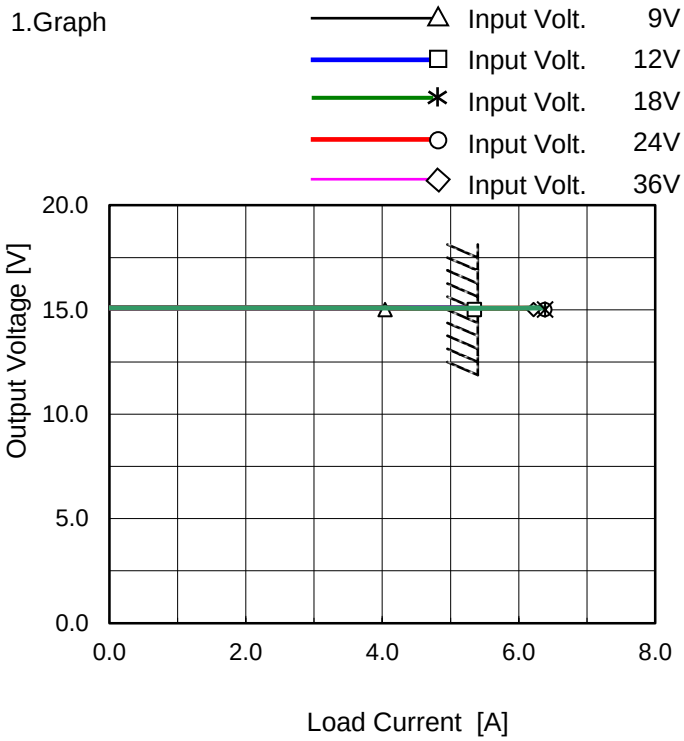
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 70%
-60	7.3	7.6
-40	7.3	7.4
-20	7.4	7.4
0	7.3	7.4
25	7.3	7.5
60	7.3	7.5
70	7.3	7.4
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFS802415
Item	Overcurrent Protection
Object	+15V5.4A

Temperature 25°C
Testing Circuitry Figure A

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
15.0	4.042	5.354	6.388	6.386	6.220
14.3	- ※1	- ※2	-	-	-
13.5	-	-	-	-	-
12.0	-	-	-	-	-
10.5	-	-	-	-	-
9.0	-	-	-	-	-
7.5	-	-	-	-	-
6.0	-	-	-	-	-
4.5	-	-	-	-	-
3.0	-	-	-	-	-
1.5	-	-	-	-	-
0.0	-	-	-	-	-

※1 Maximum output current at minimum input Voltage is 70% of rated load current.
※2 Maximum output current at 12V input Voltage is 80% of rated load current.
Refer to instruction manuals for details of input derating.

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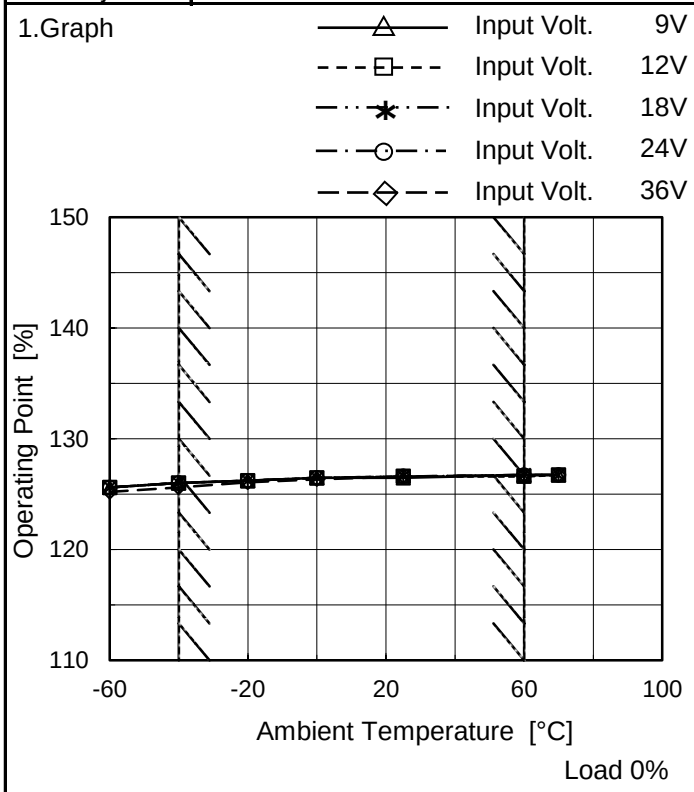
Model	MGFS802415
Item	Overvoltage Protection
Object	+15V5.4A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Operating Point [%] Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	126	126	126	126	125
-40	126	126	126	126	126
-20	126	126	126	126	126
0	126	126	126	126	126
25	126	127	127	127	127
60	127	127	127	127	127
70	127	127	127	127	127
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
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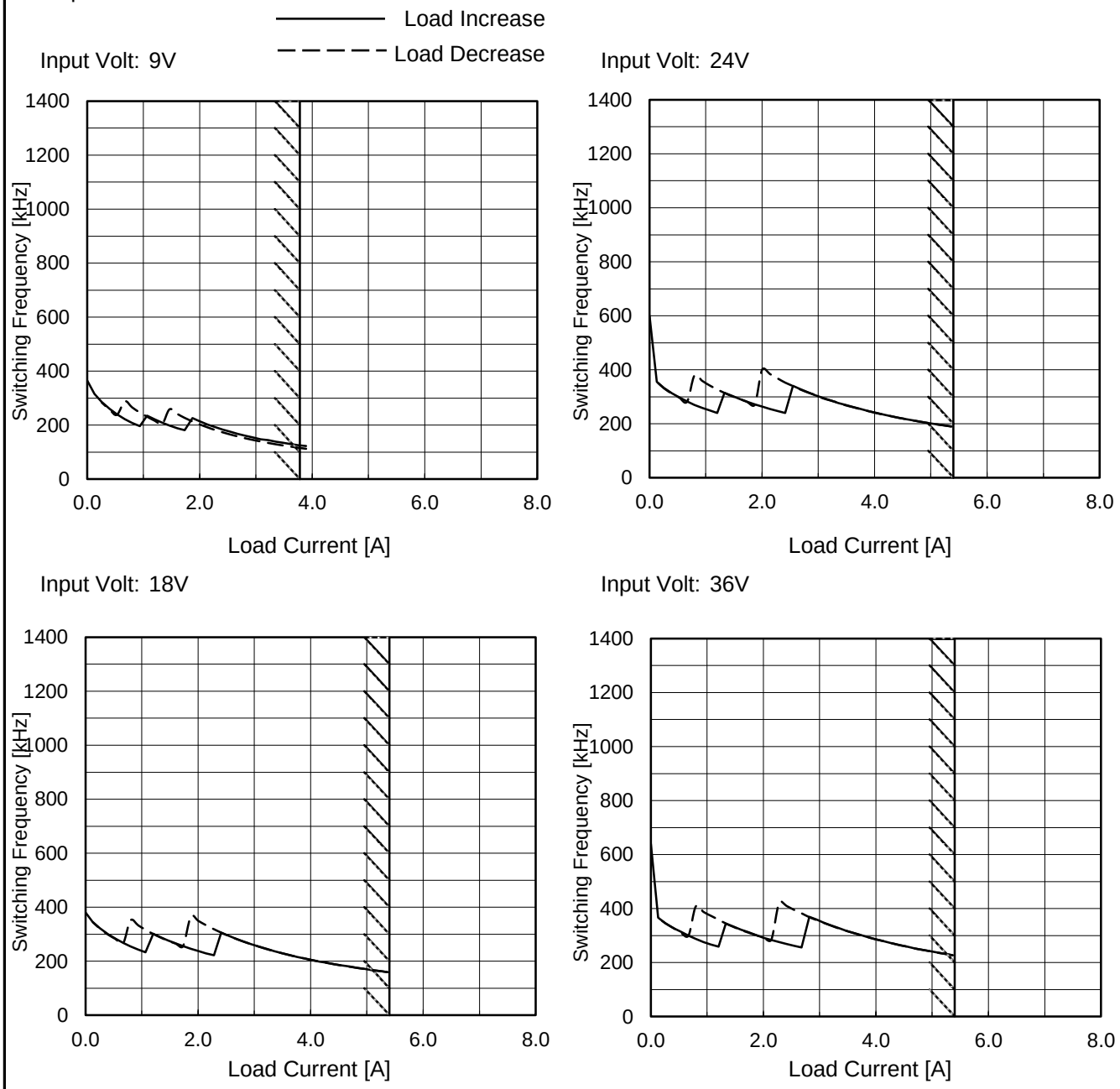
COSEL

Model	MGFS802415	
Item	Switching frequency (by Load Current)	Temperature 25°C Testing Circuitry Figure A
Object	+15V5.4A	

1.Graph



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

-switching frequency of MG80 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, MG80 operates intermittently, so switching frequency would not become constant.
※ Maximum output current at minimum input Voltage is 70% of rated load current.
Refer to instruction manuals for details of input derating.

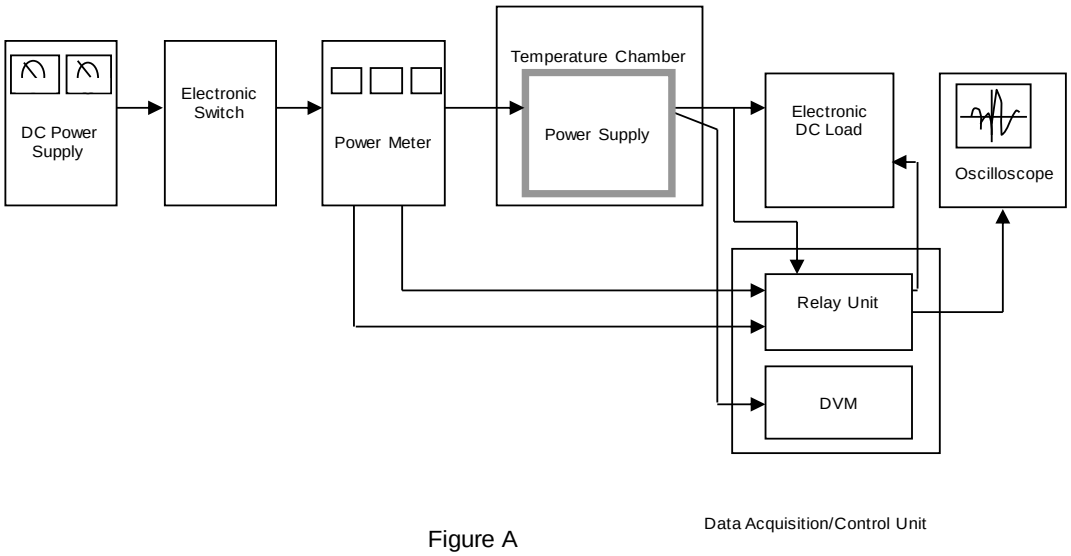


Figure A

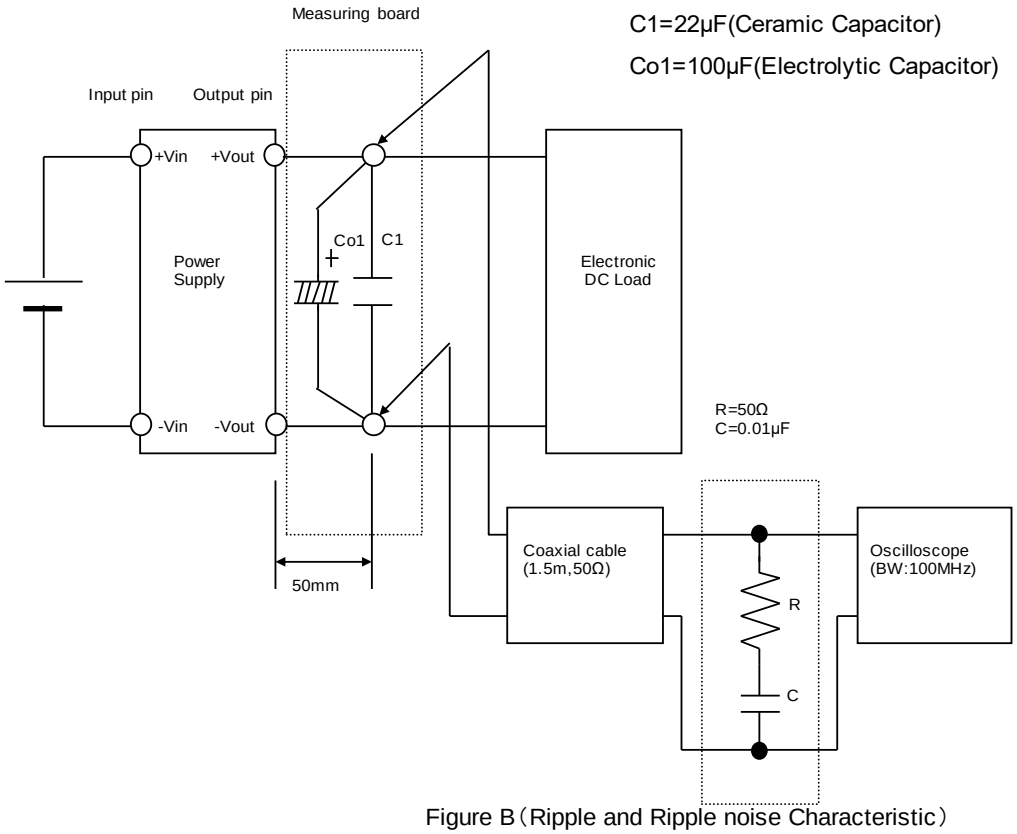


Figure B（Ripple and Ripple noise Characteristic）