COSEL

参考資料

TEST DATA OF MGFW1R54815

Regulated DC Power Supply
January 5, 2017

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Takaaki Sekiguchi Design Engineer

COSEL CO.,LTD.

参考資料

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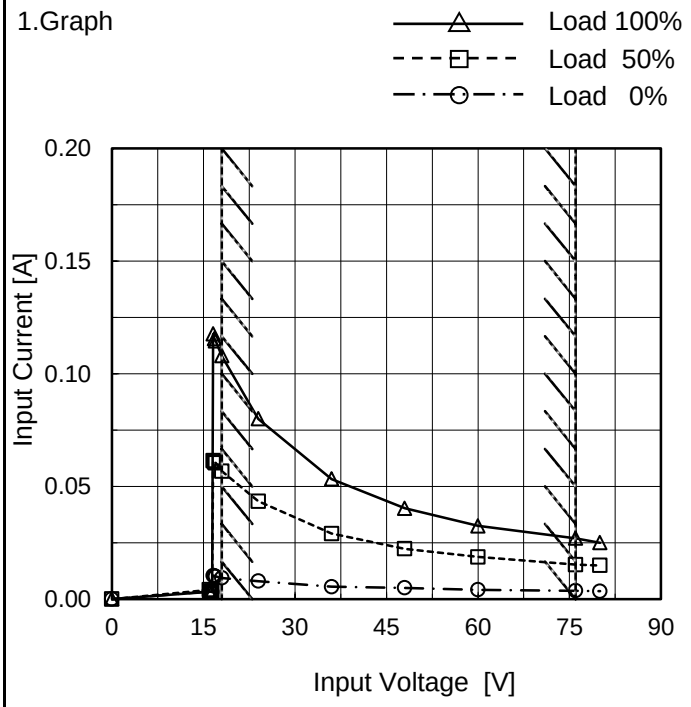
参考資料

COSEL

Model	MGFW1R54815
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
16.0	0.003	0.004	0.003
16.2	0.003	0.004	0.003
16.4	0.003	0.003	0.003
16.6	0.010	0.062	0.118
16.8	0.010	0.061	0.116
17.0	0.010	0.061	0.115
18.0	0.009	0.057	0.108
24.0	0.008	0.043	0.080
36.0	0.006	0.029	0.053
48.0	0.005	0.022	0.040
60.0	0.004	0.019	0.033
76.0	0.004	0.015	0.027
80.0	0.004	0.015	0.025
--	-	-	-
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--	-	-	-
--	-	-	-

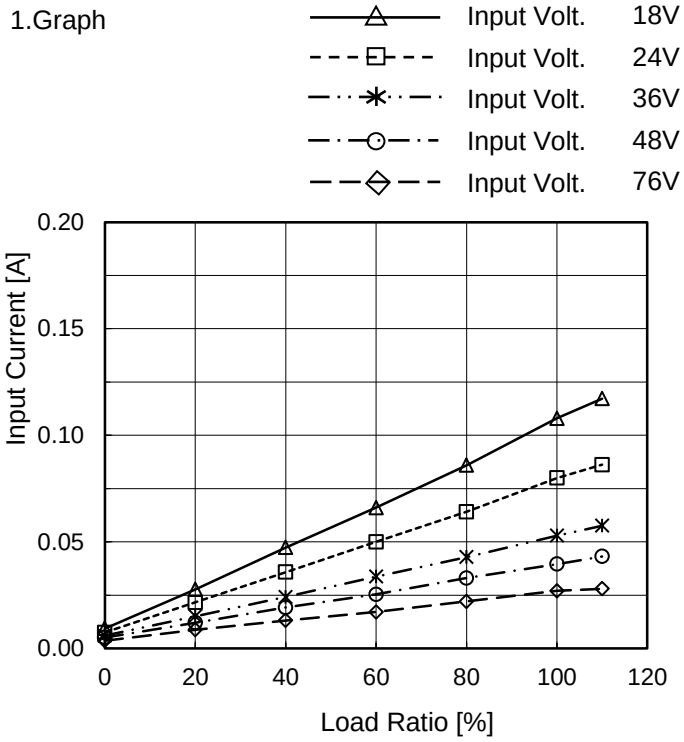
BC-10973

COSEL

Model	MGFW1R54815
Item	Input Current (by Load Ratio)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

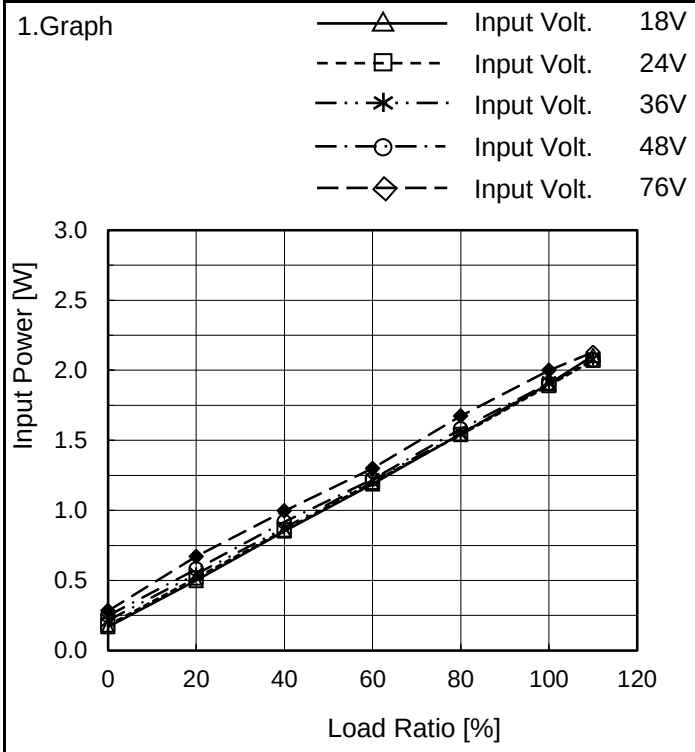
Load Ratio [%]	Input Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.009	0.008	0.006	0.005	0.004
20	0.028	0.022	0.015	0.012	0.009
40	0.047	0.036	0.024	0.019	0.013
60	0.066	0.050	0.034	0.025	0.017
80	0.086	0.064	0.043	0.033	0.022
100	0.108	0.080	0.053	0.040	0.027
110	0.117	0.086	0.058	0.043	0.028
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW1R54815
Item	Input Power (by Load Ratio)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

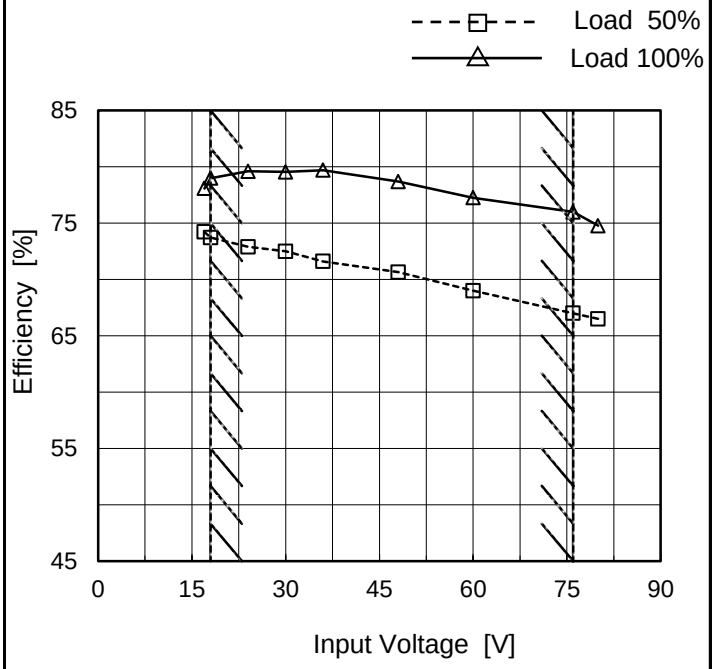
Load Ratio [%]	Input Power [W]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.17	0.18	0.21	0.25	0.28
20	0.50	0.52	0.54	0.58	0.67
40	0.85	0.86	0.87	0.92	1.00
60	1.19	1.20	1.22	1.22	1.30
80	1.55	1.54	1.55	1.58	1.67
100	1.90	1.89	1.91	1.91	2.00
110	2.10	2.07	2.08	2.07	2.13
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW1R54815
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

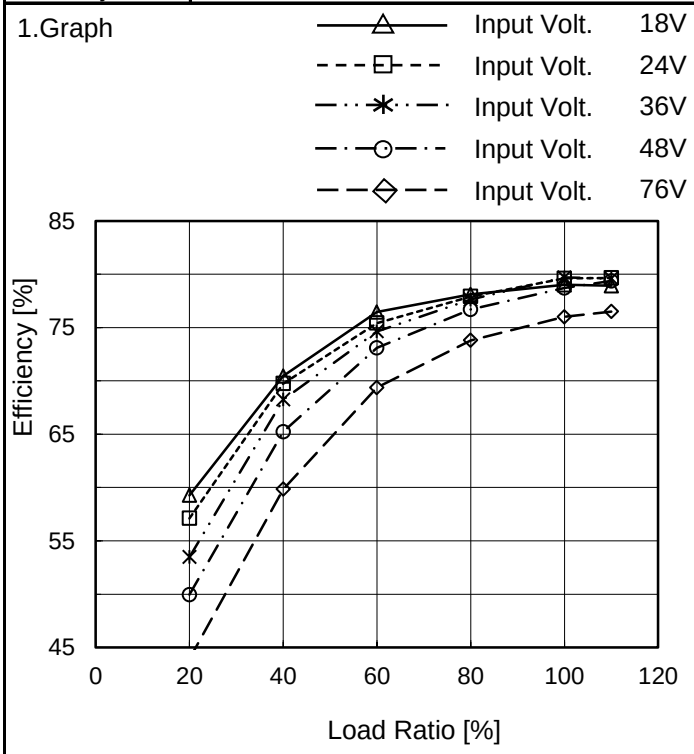
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	74.2	78.1
18	73.7	79.0
24	72.9	79.6
30	72.5	79.6
36	71.6	79.7
48	70.7	78.7
60	69.0	77.3
76	67.0	76.0
80	66.5	74.8

COSEL

Model	MGFW1R54815
Item	Efficiency (by Load Ratio)
Object	――――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ratio [%]	Efficiency [%]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	-	-	-	-	-
20	59.3	57.1	53.5	49.9	43.9
40	70.5	69.8	68.2	65.2	59.8
60	76.5	75.4	74.6	73.1	69.4
80	78.1	77.9	77.6	76.7	73.8
100	79.0	79.6	79.7	78.7	76.0
110	78.9	79.7	79.6	79.4	76.5
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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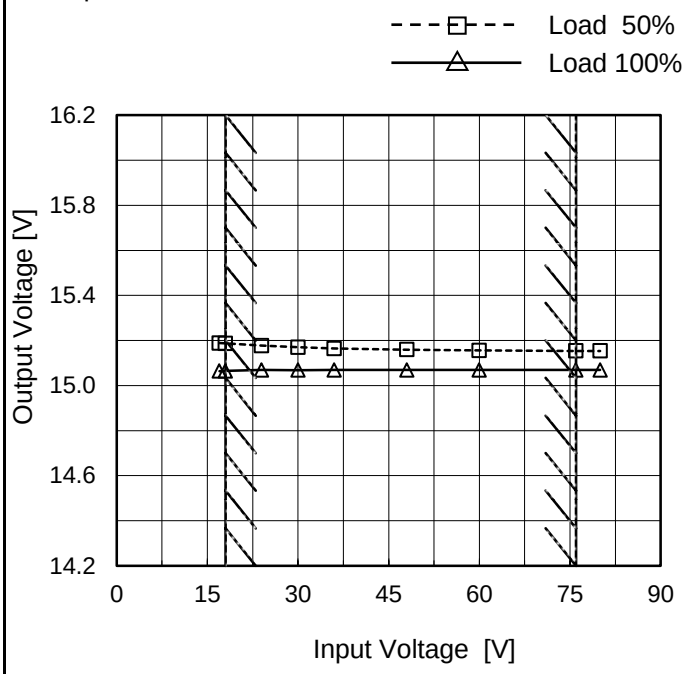
COSEL

Model	MGFW1R54815
Item	Line Regulation
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



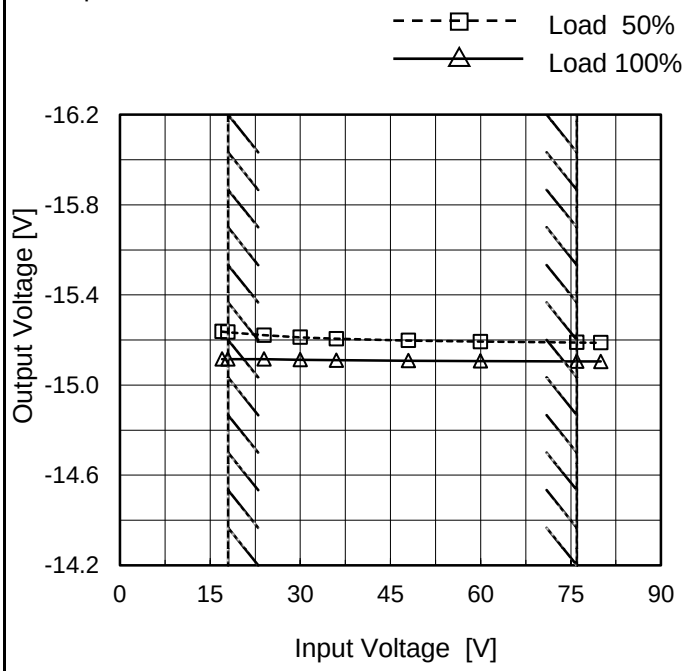
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	15.189	15.064
18	15.187	15.065
24	15.177	15.069
30	15.170	15.069
36	15.165	15.069
48	15.159	15.069
60	15.156	15.069
76	15.154	15.069
80	15.153	15.069

-15V : Rated Load Current

Object	-15V0.05A

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	-15.237	-15.115
18	-15.234	-15.115
24	-15.222	-15.115
30	-15.212	-15.113
36	-15.205	-15.110
48	-15.197	-15.108
60	-15.193	-15.107
76	-15.189	-15.105
80	-15.188	-15.104

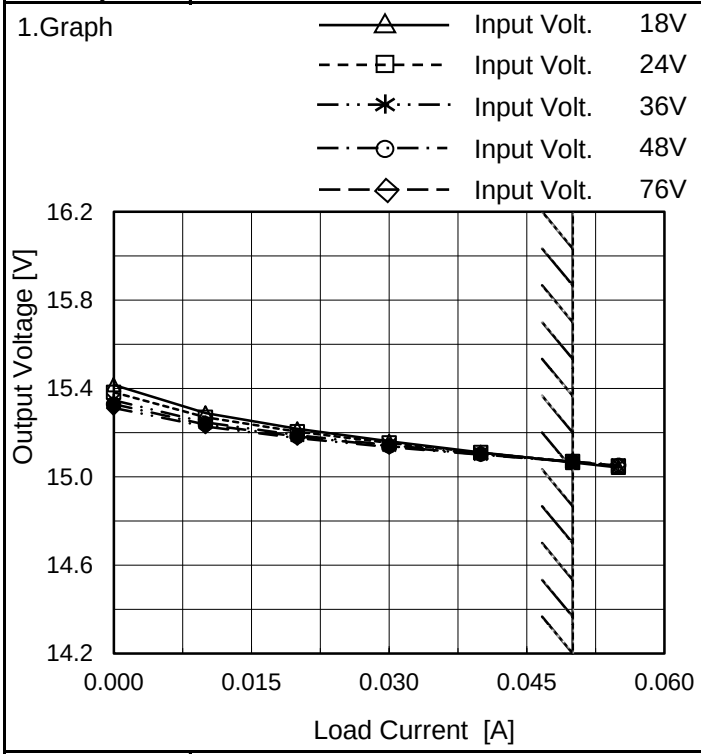
+15V : Rated Load Current

COSEL

Model	MGFW1R54815
Item	Load Regulation
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



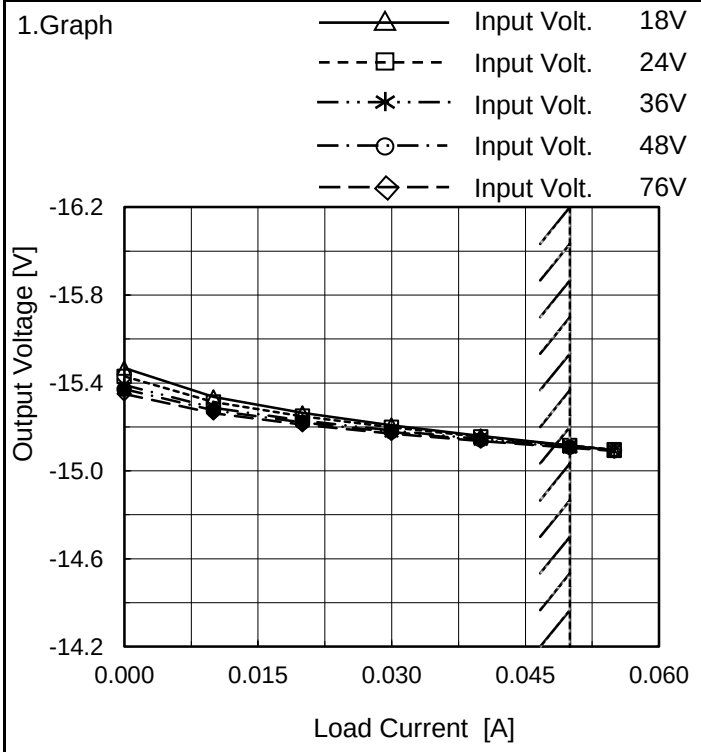
2.Values

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]
0.000	15.417	15.382	15.346	15.329	15.312
0.010	15.289	15.269	15.247	15.237	15.227
0.020	15.217	15.204	15.189	15.182	15.175
0.030	15.161	15.154	15.144	15.139	15.135
0.040	15.111	15.109	15.104	15.102	15.101
0.050	15.065	15.069	15.069	15.069	15.069
0.055	15.042	15.049	15.051	15.052	15.054
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-15V : Rated Load Current

Object	-15V0.05A

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]
0.000	-15.467	-15.430	-15.390	-15.371	-15.350
0.010	-15.336	-15.313	-15.288	-15.276	-15.263
0.020	-15.264	-15.248	-15.229	-15.220	-15.210
0.030	-15.208	-15.198	-15.184	-15.177	-15.170
0.040	-15.159	-15.154	-15.145	-15.141	-15.135
0.050	-15.115	-15.115	-15.110	-15.108	-15.105
0.055	-15.093	-15.096	-15.093	-15.092	-15.090
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+15V : Rated Load Current

COSEL

Model	MGFW1R54815	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+15V0.05A	

Input Volt. 48 V

-15V:rated load current.

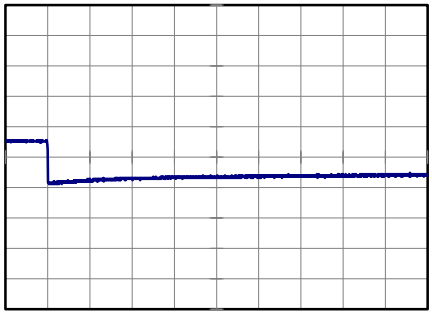
Cycle 100 ms

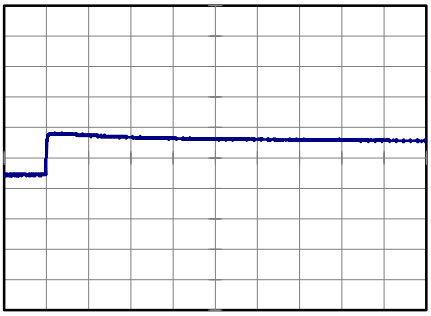
t1,t2 = 100 μs

Load Current

t1 t2

Min.Load (0A)←→
Load 100% (0.05A)

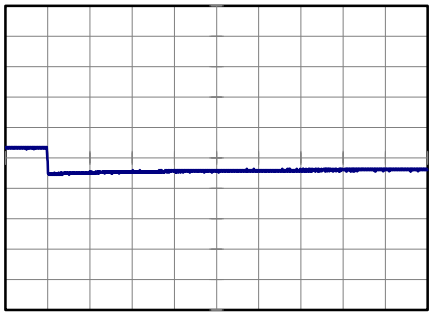


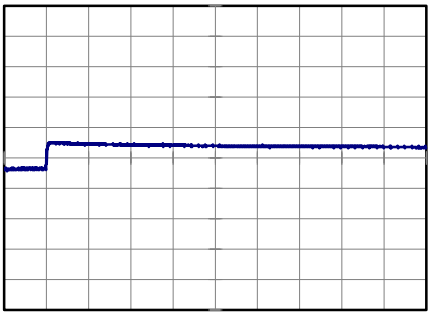


200 mV/div

4 ms/div 4 ms/div

Min.Load (0A)←→
Load 50% (0.025A)

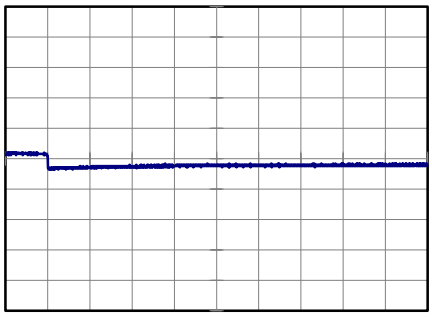


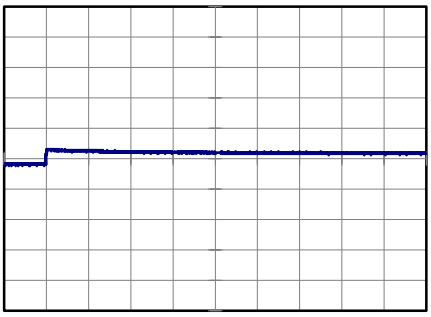


200 mV/div

4 ms/div 4 ms/div

Load 50% (0.025A)←→
Load 100% (0.05A)





200 mV/div

4 ms/div 4 ms/div

COSEL

Model	MGFW1R54815	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	-15V0.05A	

Input Volt. 48 V

+15V:rated load current.

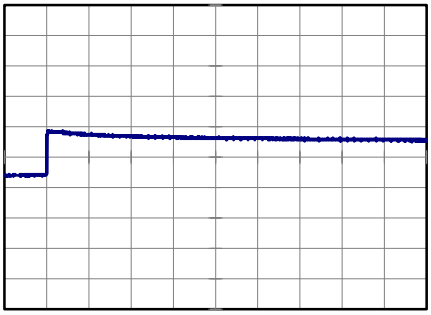
Cycle 100 ms

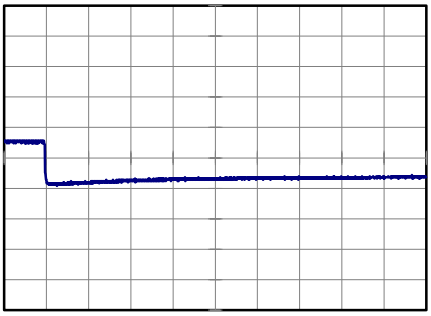
t1,t2 = 100 μs

Load Current

t1 t2

Min.Load (0A)←→
Load 100% (0.05A)

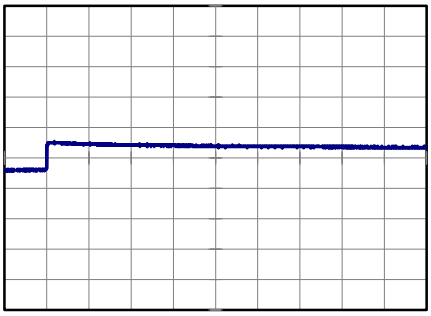


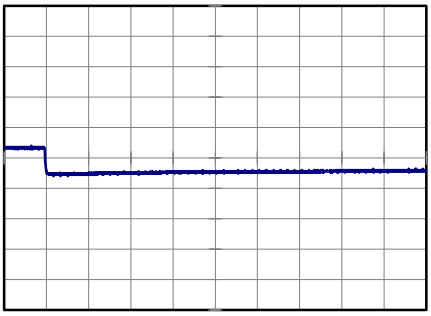


200 mV/div

4 ms/div 4 ms/div

Min.Load (0A)←→
Load 50% (0.025A)

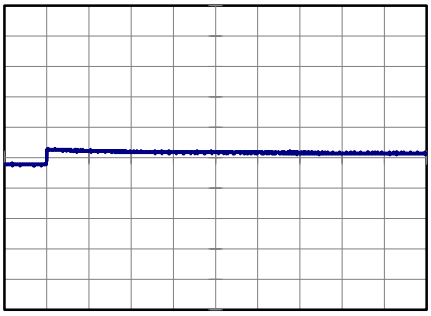


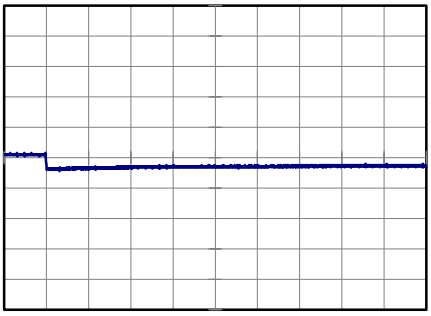


200 mV/div

4 ms/div 4 ms/div

Load 50% (0.025A)←→
Load 100% (0.05A)





200 mV/div

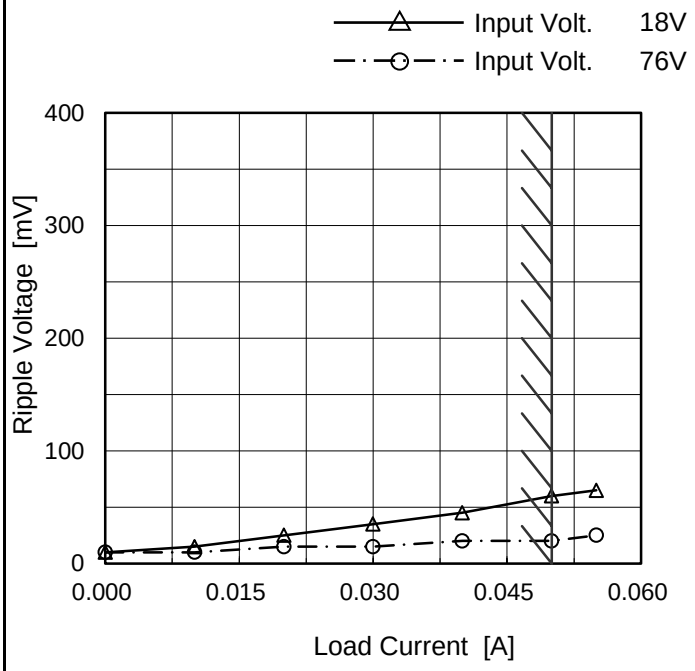
4 ms/div 4 ms/div

COSEL

Model	MGFW1R54815
Item	Ripple Voltage (by Load Current)
Object	+15V0.05A

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]

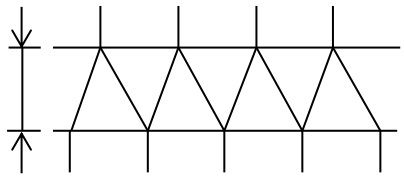


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	10	10
0.010	15	10
0.020	25	15
0.030	35	15
0.040	45	20
0.050	60	20
0.055	65	25
--	-	-
--	-	-
--	-	-
--	-	-

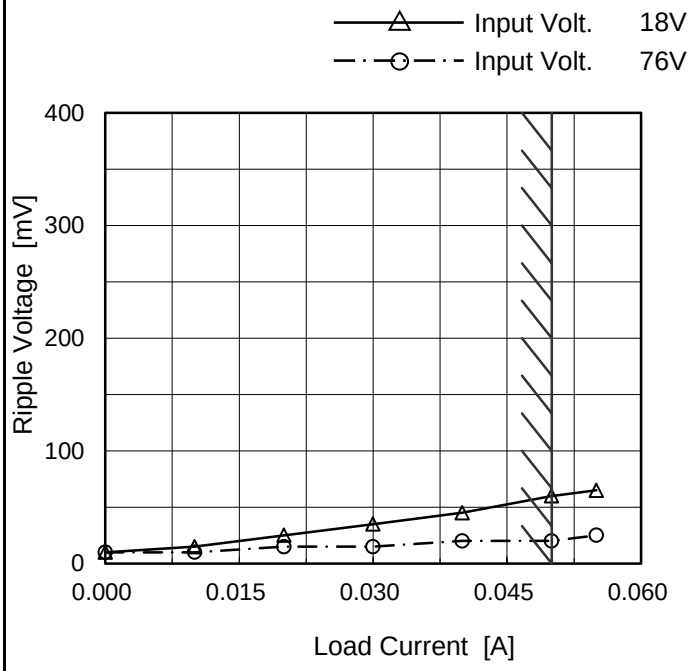
-15V: Rated Load Current

COSEL

Model	MGFW1R54815
Item	Ripple Voltage (by Load Current)
Object	-15V0.05A

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]

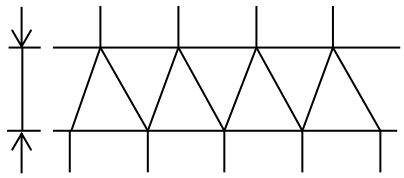


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	10	10
0.010	15	10
0.020	25	15
0.030	35	15
0.040	45	20
0.050	60	20
0.055	65	25
--	-	-
--	-	-
--	-	-
--	-	-

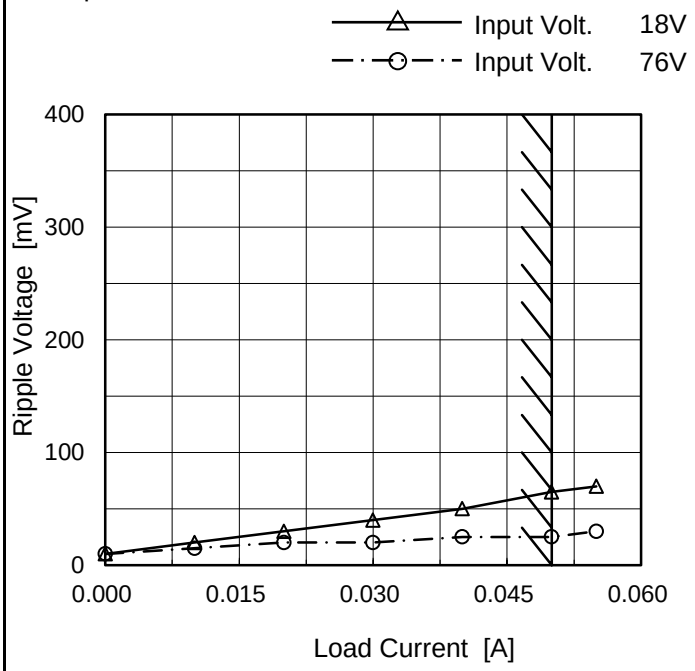
+15V: Rated Load Current

COSEL

Model	MGFW1R54815
Item	Ripple-Noise
Object	+15V0.05A

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]

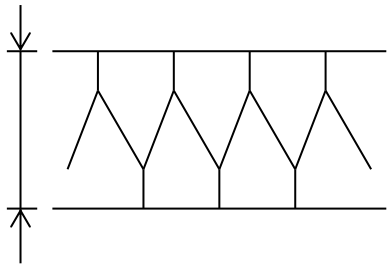


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	10	10
0.010	20	15
0.020	30	20
0.030	40	20
0.040	50	25
0.050	65	25
0.055	70	30
--	-	-
--	-	-
--	-	-
--	-	-

-15V: Rated Load Current

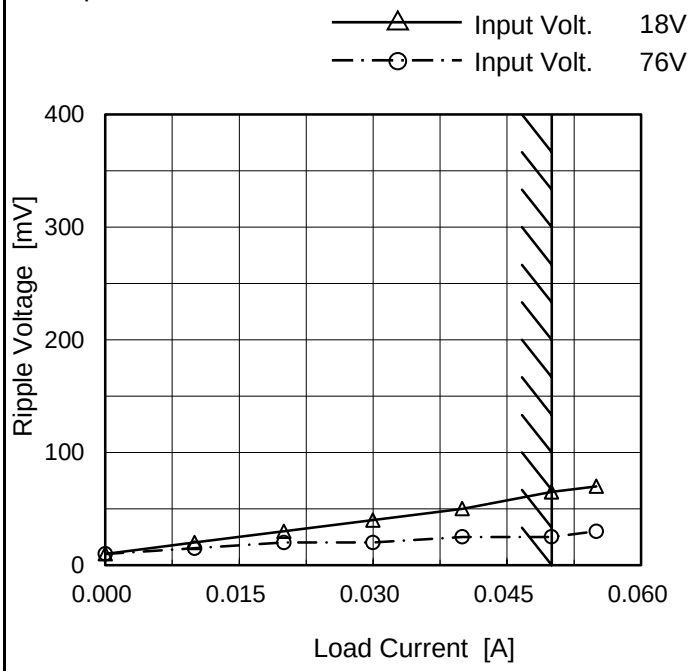
BC-10973

COSEL

Model	MGFW1R54815
Item	Ripple-Noise
Object	-15V0.05A

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]

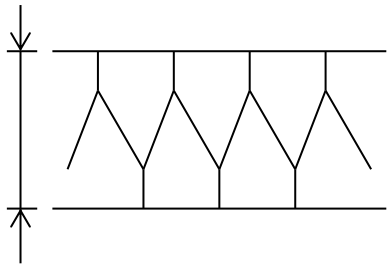


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	10	10
0.010	20	15
0.020	30	20
0.030	40	20
0.040	50	25
0.050	65	25
0.055	70	30
--	-	-
--	-	-
--	-	-
--	-	-

+15V: Rated Load Current

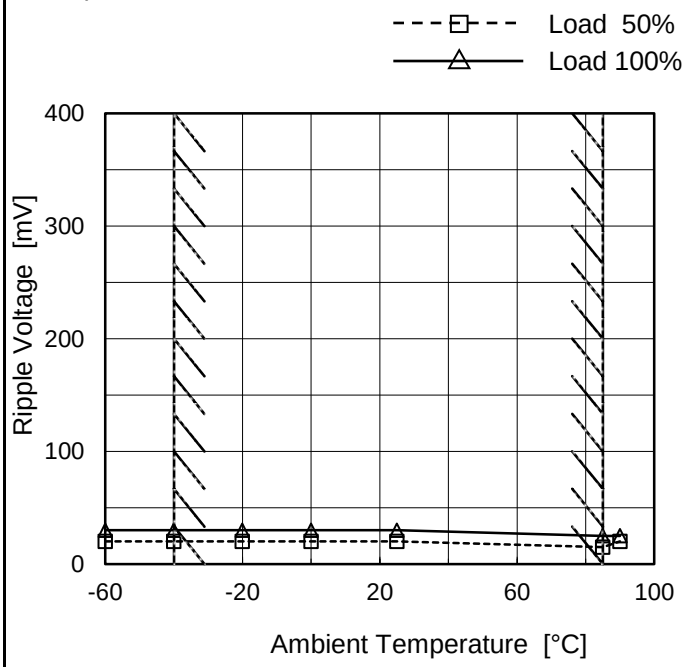
BC-10973

COSEL

Model	MGFW1R54815
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.05A

Testing Circuitry Figure B

1.Graph



Input Volt. 48V

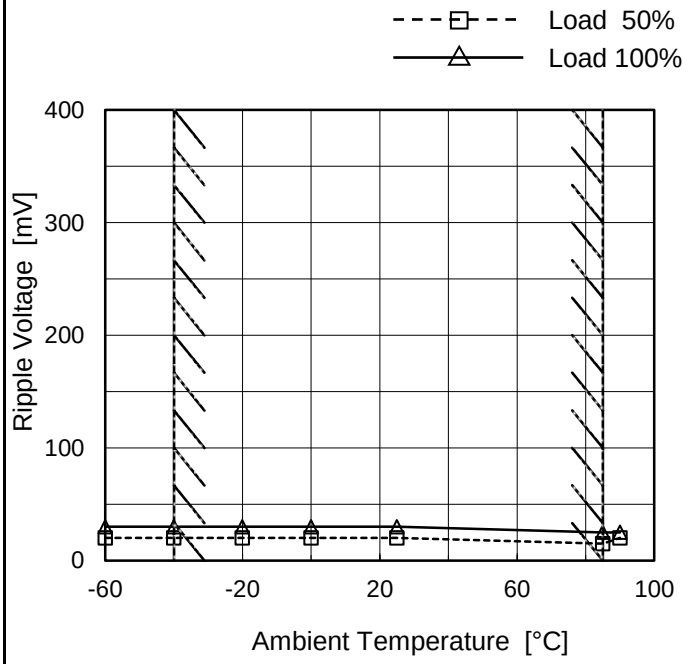
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	20	30
-40	20	30
-20	20	30
0	20	30
25	20	30
85	15	25
90	20	25
--	-	-
--	-	-
--	-	-
--	-	-

-15V: Rated Load Current

Object	-15V0.05A

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	20	30
-40	20	30
-20	20	30
0	20	30
25	20	30
85	15	25
90	20	25
--	-	-
--	-	-
--	-	-
--	-	-

+15V: Rated Load Current

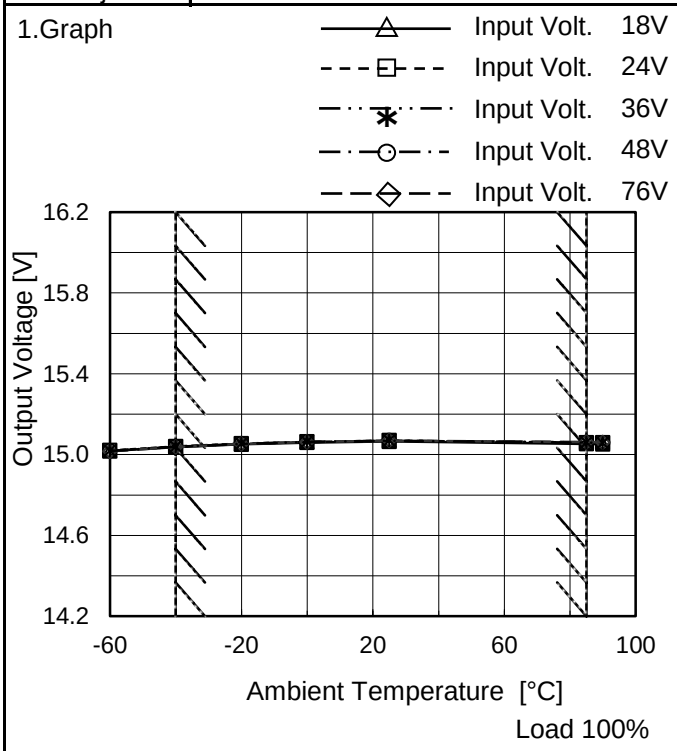
COSEL

Model	MGFW1R54815
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +15V0.05A

1.Graph



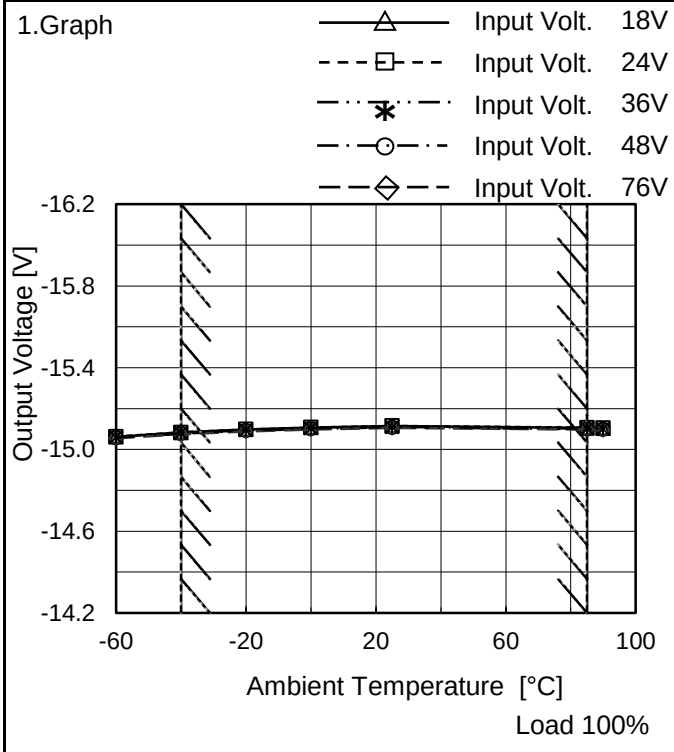
2.Values

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	15.017	15.020	15.019	15.018	15.016
-40	15.037	15.040	15.039	15.039	15.038
-20	15.051	15.054	15.054	15.053	15.052
0	15.059	15.063	15.063	15.062	15.062
25	15.065	15.069	15.069	15.069	15.069
85	15.054	15.059	15.059	15.060	15.062
90	15.051	15.058	15.057	15.058	15.060
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-15V : Rated Load Current

Object -15V0.05A

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	-15.062	-15.063	-15.059	-15.058	-15.055
-40	-15.083	-15.083	-15.079	-15.078	-15.075
-20	-15.098	-15.098	-15.094	-15.092	-15.089
0	-15.108	-15.108	-15.103	-15.101	-15.098
25	-15.115	-15.115	-15.110	-15.108	-15.105
85	-15.105	-15.107	-15.102	-15.100	-15.097
90	-15.104	-15.105	-15.100	-15.098	-15.096
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+15V : Rated Load Current

COSEL

Model	MGFW1R54815	
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 - 85°C

Input Voltage : 18 - 76V

Load Current (AVR 1) : 0 - 0.05A (AVR 2) : 0 - 0.05A

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

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

2.Values

Object	+15V0.05A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	18	0	15.451	±387	±2.6
Minimum Voltage	85	18	0.05	14.678		

Object	-15V0.05A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	18	0	-15.501	±386	±2.6
Minimum Voltage	85	18	0.05	-14.729		

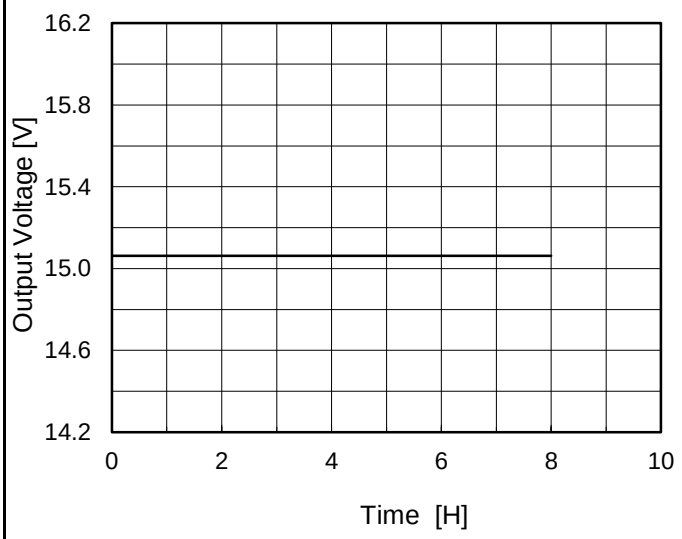
COSEL

Model	MGFW1R54815
Item	Time Lapse Drift

Temperature 25°C
Testing Circuitry Figure A

Object +15V0.05A

1.Graph



Input Volt. 48V
Load 100%

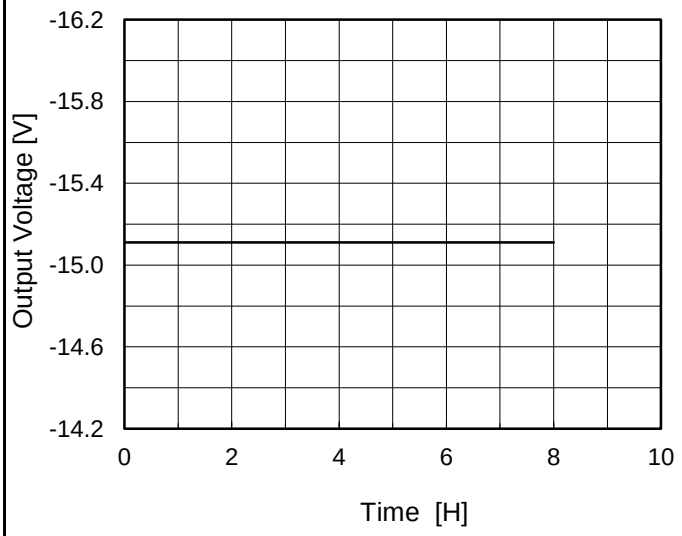
2.Values

Time since start [H]	Output Voltage [V]
0.0	15.062
0.5	15.062
1.0	15.062
2.0	15.062
3.0	15.062
4.0	15.063
5.0	15.062
6.0	15.062
7.0	15.062
8.0	15.063

-15V : Rated Load Current

Object -15V0.05A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-15.110
0.5	-15.111
1.0	-15.111
2.0	-15.111
3.0	-15.111
4.0	-15.111
5.0	-15.111
6.0	-15.111
7.0	-15.111
8.0	-15.112

+15V : Rated Load Current

BC-10973

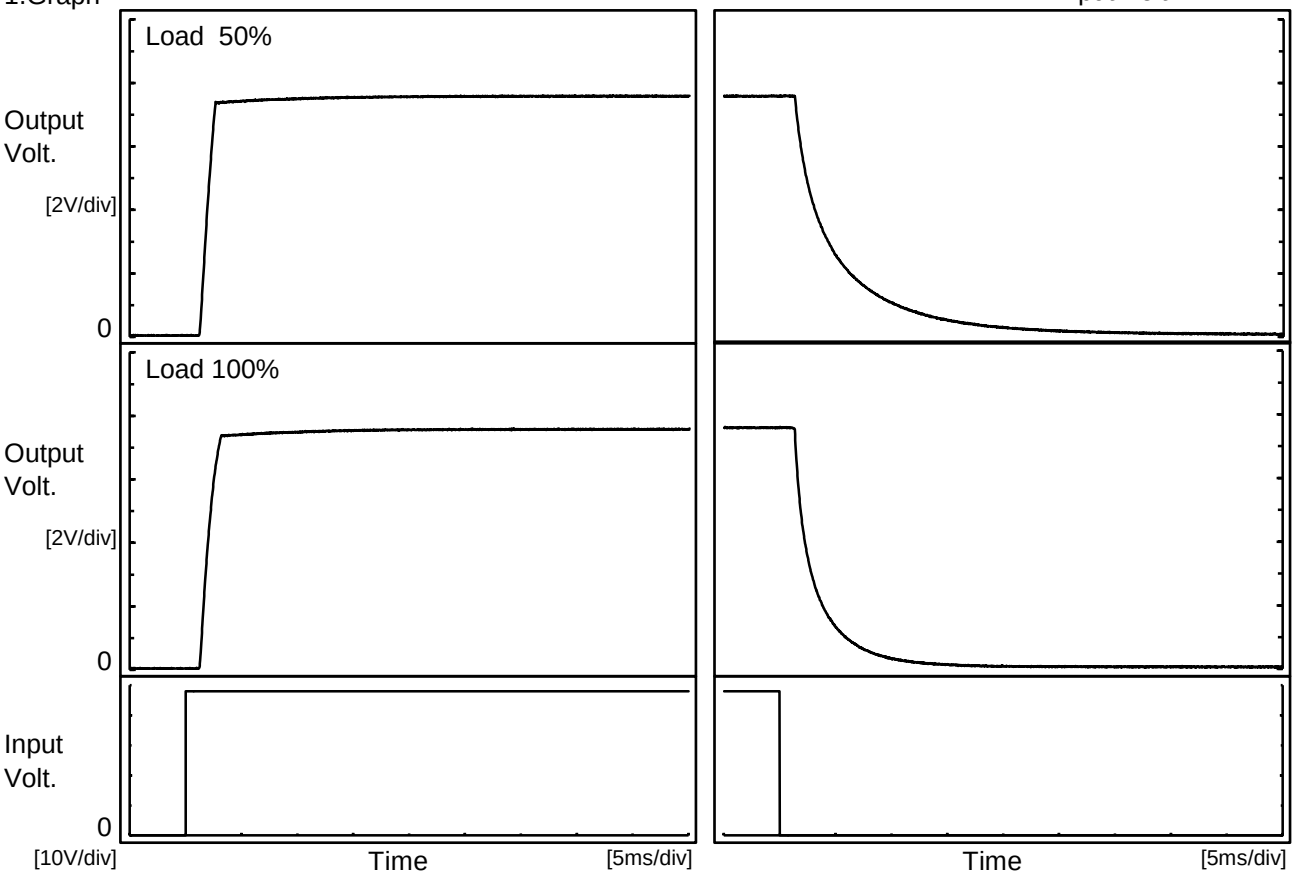
COSEL

Model	MGFW1R54815
Item	Rise and Fall Time
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

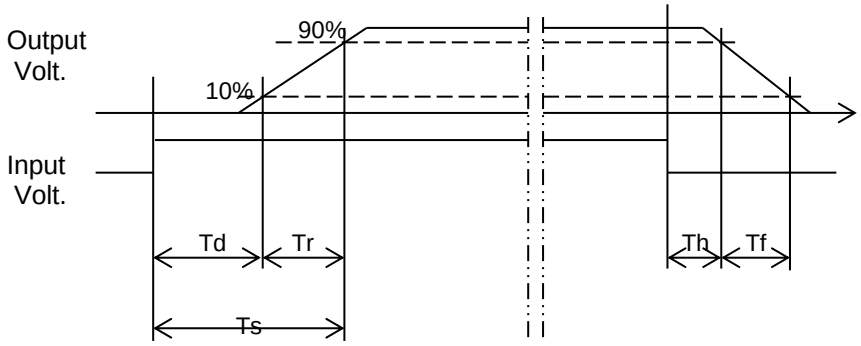
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.4	1.1	2.5	1.6	10.6
100 %	1.4	1.5	2.9	1.5	5.3



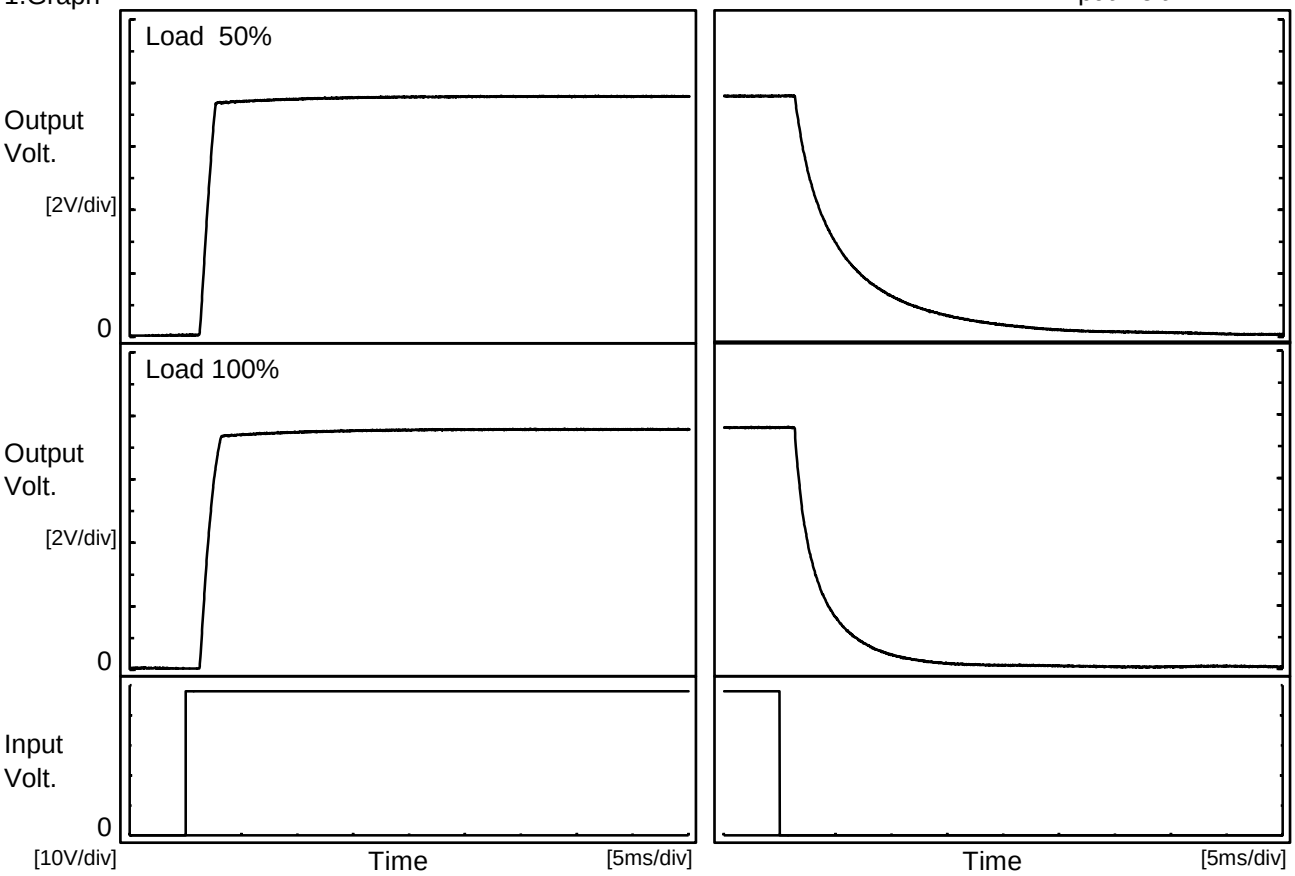
COSEL

Model	MGFW1R54815
Item	Rise and Fall Time
Object	-15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

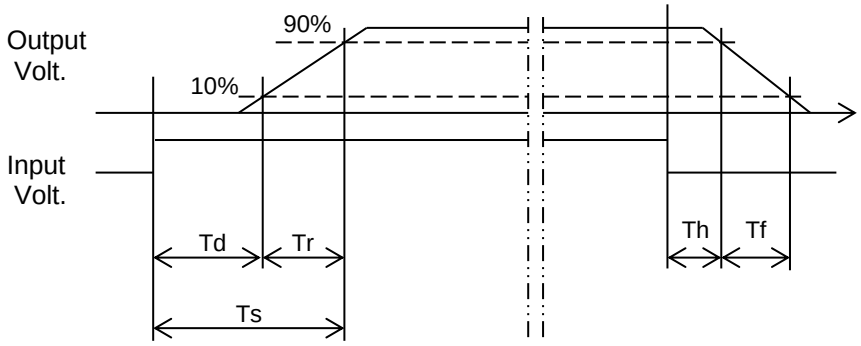
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.4	1.1	2.5	1.7	12.1
100 %	1.4	1.5	2.9	1.5	6.2



BC-10973

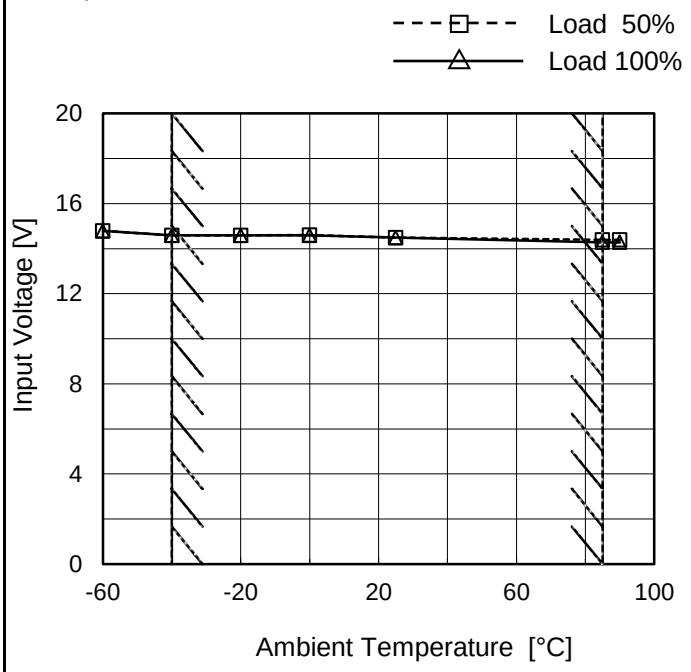
COSEL

Model	MGFW1R54815
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object: +15V0.05A

1.Graph

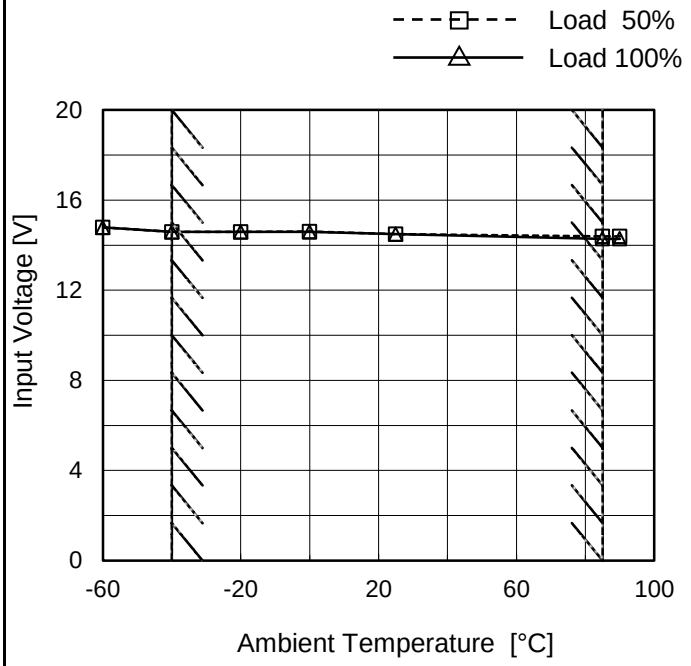


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	14.8	14.8
-40	14.6	14.6
-20	14.6	14.6
0	14.6	14.6
25	14.5	14.5
85	14.4	14.3
90	14.4	14.3
--	-	-
--	-	-
--	-	-
--	-	-

Object: -15V0.05A

1.Graph



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

2.Values

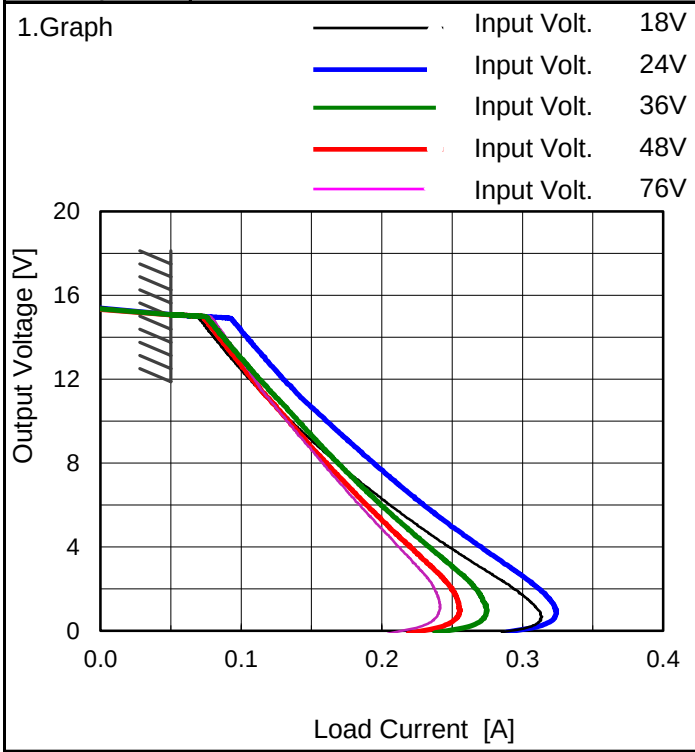
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	14.8	14.8
-40	14.6	14.6
-20	14.6	14.6
0	14.6	14.6
25	14.5	14.5
85	14.4	14.3
90	14.4	14.3
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFW1R54815
Item	Overcurrent Protection
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



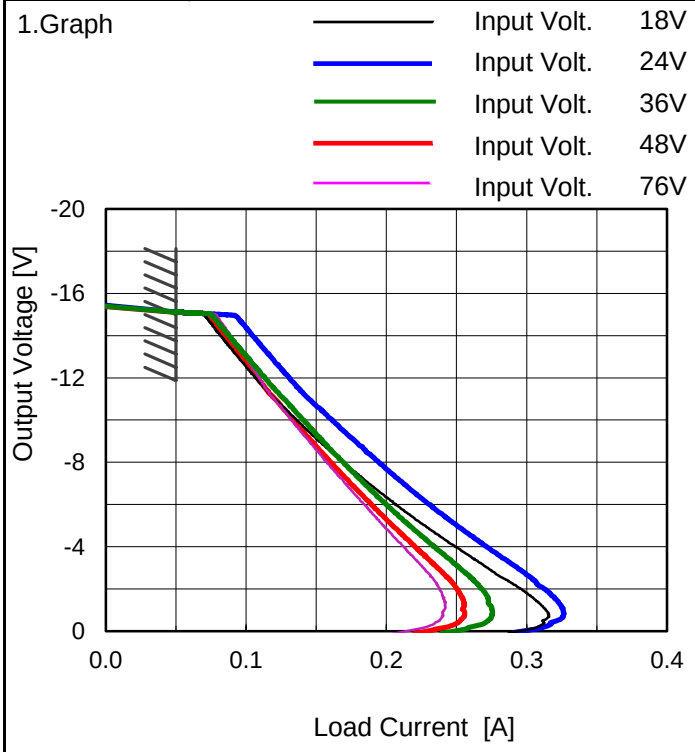
2.Values

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]
14.3	0.077	0.101	0.084	0.082	0.087
13.5	0.086	0.110	0.093	0.090	0.094
12.0	0.106	0.130	0.112	0.108	0.109
10.5	0.127	0.152	0.133	0.127	0.126
9.0	0.151	0.177	0.154	0.146	0.145
7.5	0.177	0.202	0.176	0.167	0.164
6.0	0.205	0.229	0.199	0.189	0.184
4.5	0.236	0.259	0.224	0.212	0.205
3.0	0.271	0.292	0.251	0.236	0.226
1.5	0.304	0.319	0.272	0.253	0.241
0.0	0.285	0.289	0.238	0.219	0.204
--	-	-	-	-	-

-15V : Rated Load Current

Object	-15V0.05A

1.Graph



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

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]
-14.3	0.078	0.101	0.085	0.081	0.086
-13.5	0.088	0.111	0.093	0.090	0.094
-12.0	0.107	0.131	0.114	0.108	0.109
-10.5	0.128	0.153	0.133	0.127	0.126
-9.0	0.152	0.177	0.154	0.147	0.145
-7.5	0.179	0.203	0.176	0.167	0.164
-6.0	0.207	0.230	0.200	0.189	0.184
-4.5	0.238	0.260	0.225	0.212	0.205
-3.0	0.271	0.293	0.252	0.236	0.226
-1.5	0.306	0.321	0.273	0.255	0.241
0.0	0.287	0.291	0.239	0.220	0.204
--	-	-	-	-	-

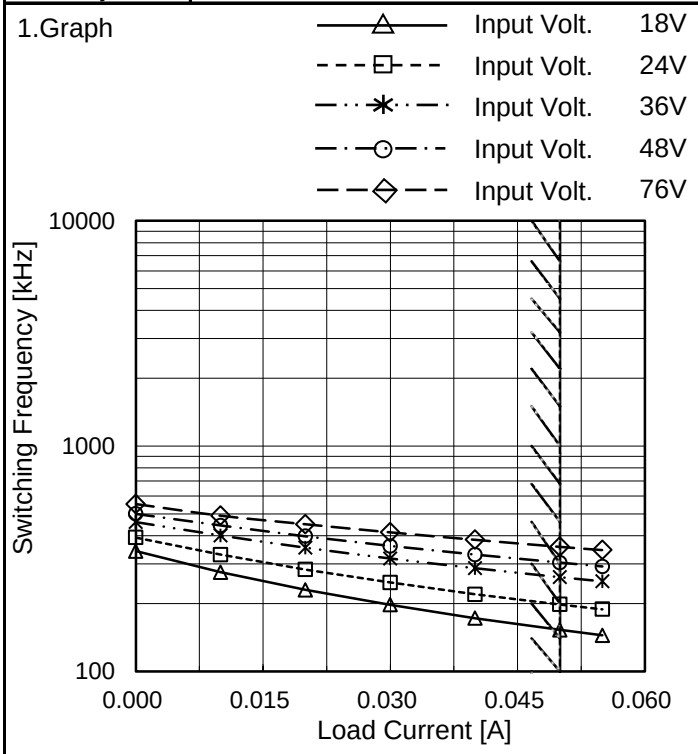
+15V : Rated Load Current

COSEL

Model	MGFW1R54815
Item	Switching frequency (by Load Current)
Object	+/-15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

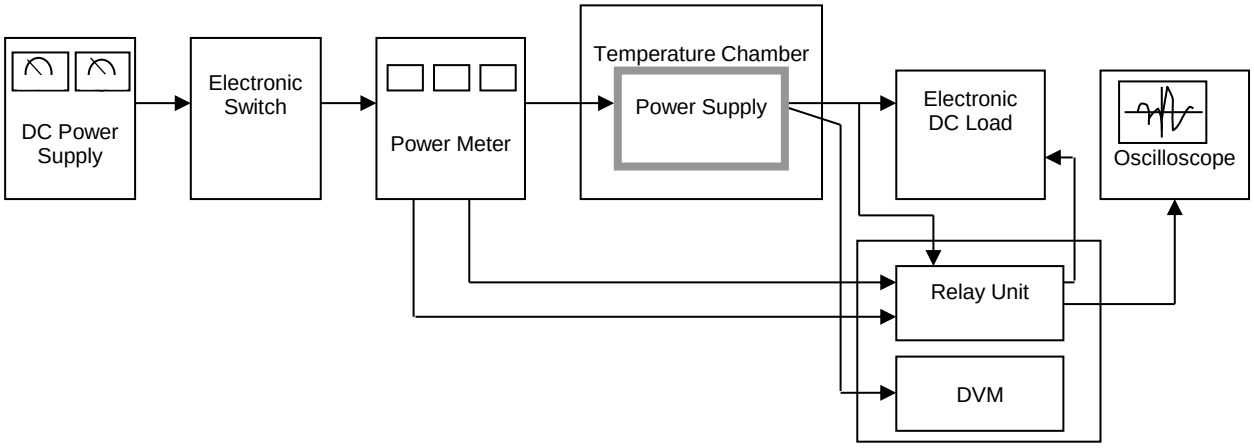


Note: Slanted line shows the range of the rated load current.

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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.000	342	393	460	500	553
0.010	275	330	401	444	491
0.020	230	283	354	398	450
0.030	197	248	317	360	414
0.040	172	220	287	330	384
0.050	153	198	262	304	357
0.055	145	189	251	292	346
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-



Data Acquisition/Control Unit

Figure A

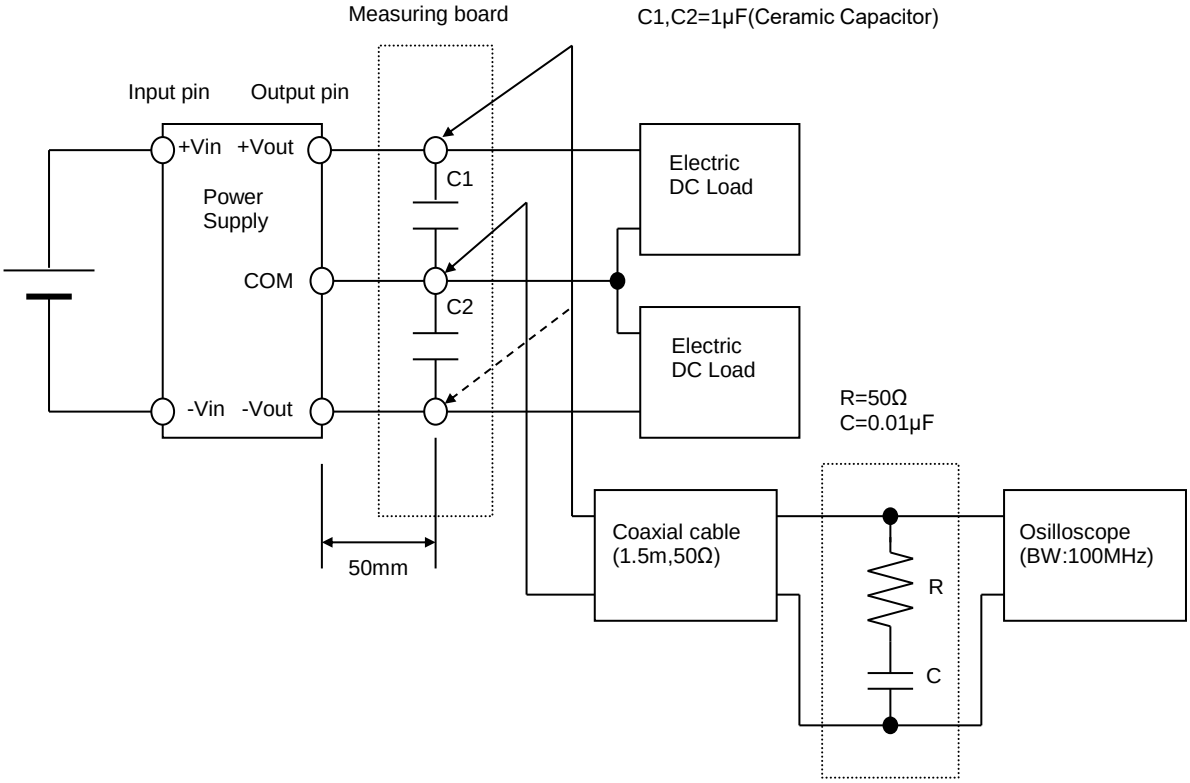


Figure B（Ripple and Ripple noise Characteristic）