参考資料

TEST DATA OF MGFW1R54812

Regulated DC Power Supply
January 5, 2017

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COSEL CO.,LTD.

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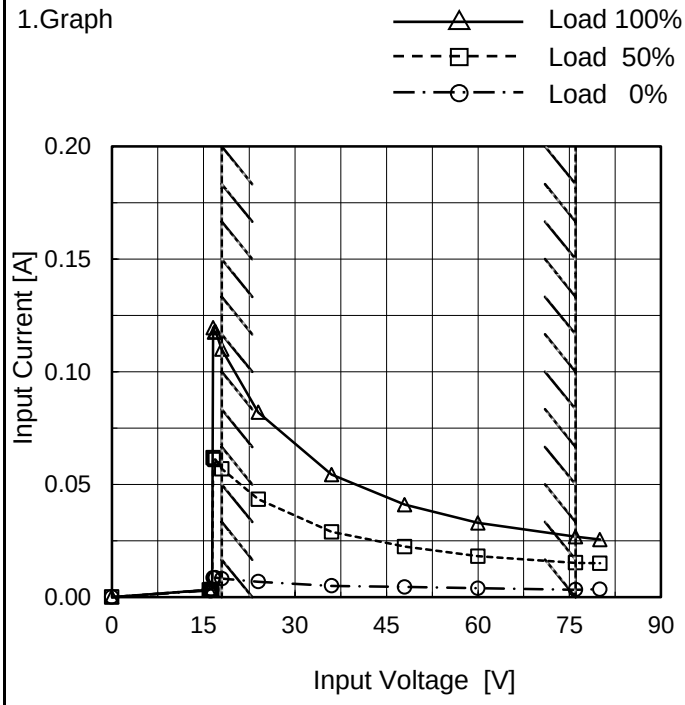
Model	MGFW1R54812
Item	Input Current (by Input Voltage)
Object	————————

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	0.003	0.003
16.2	0.003	0.003	0.004
16.4	0.003	0.003	0.003
16.6	0.009	0.062	0.120
16.8	0.008	0.061	0.118
17.0	0.009	0.061	0.118
18.0	0.008	0.057	0.110
24.0	0.007	0.043	0.082
36.0	0.005	0.029	0.054
48.0	0.005	0.022	0.041
60.0	0.004	0.018	0.033
76.0	0.003	0.015	0.027
80.0	0.004	0.015	0.026
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

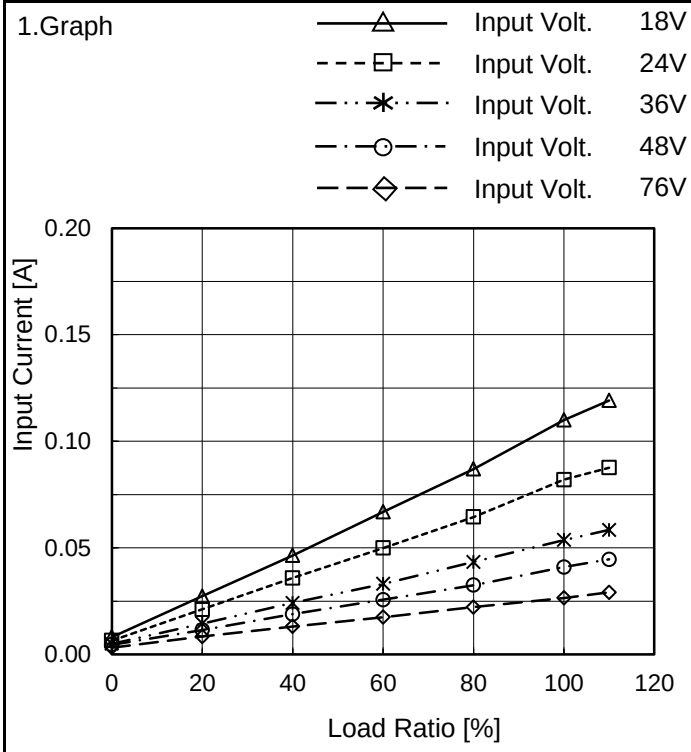
BC-10972

COSEL

Model	MGFW1R54812
Item	Input Current (by Load Ratio)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

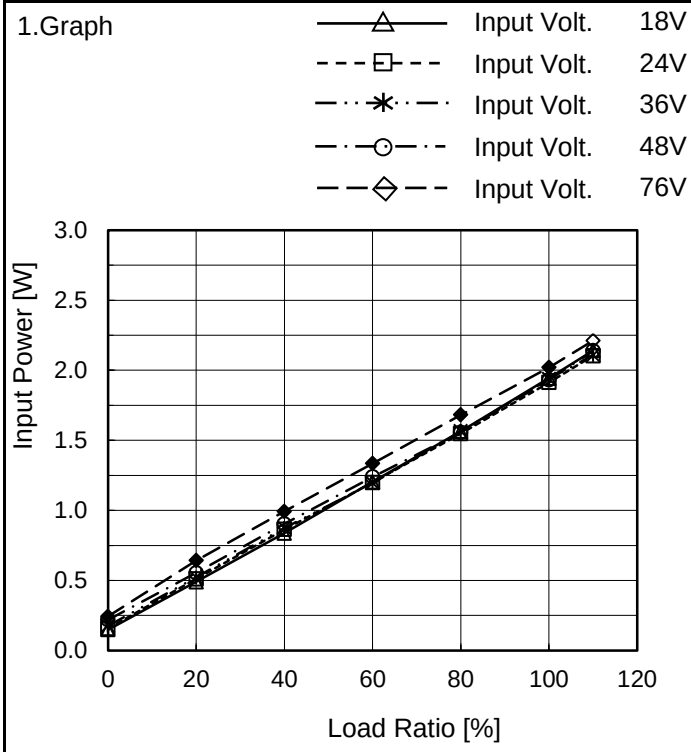
Load Ratio [%]	Input Current [A]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.008	0.007	0.005	0.005	0.003
20	0.027	0.021	0.015	0.012	0.008
40	0.047	0.036	0.024	0.019	0.013
60	0.067	0.050	0.033	0.026	0.018
80	0.087	0.065	0.043	0.033	0.022
100	0.110	0.082	0.054	0.041	0.027
110	0.119	0.088	0.058	0.045	0.029
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW1R54812
Item	Input Power (by Load Ratio)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

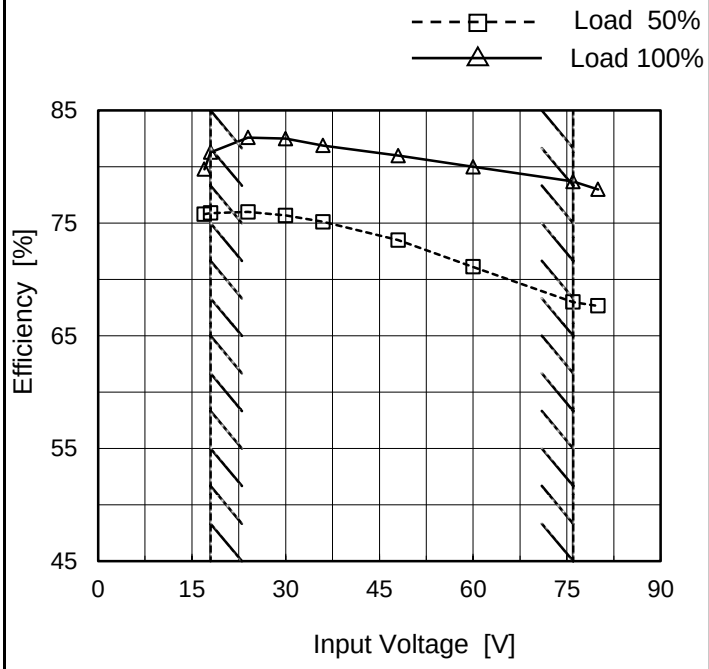
Load Ratio [%]	Input Power [W]				
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0	0.15	0.16	0.18	0.22	0.24
20	0.49	0.51	0.52	0.55	0.64
40	0.84	0.86	0.88	0.90	0.99
60	1.20	1.20	1.19	1.24	1.33
80	1.56	1.55	1.56	1.56	1.68
100	1.94	1.91	1.94	1.93	2.02
110	2.14	2.10	2.11	2.14	2.21
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW1R54812
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

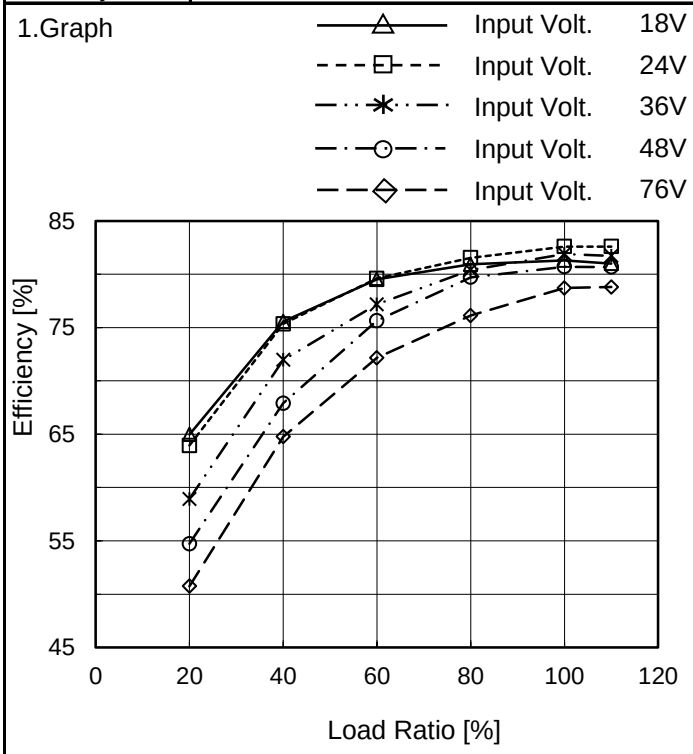
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	75.8	79.8
18	75.9	81.3
24	76.0	82.6
30	75.7	82.5
36	75.1	81.9
48	73.5	81.0
60	71.1	80.0
76	68.0	78.7
80	67.7	78.0

COSEL

Model	MGFW1R54812
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	65.0	63.9	58.9	54.7	50.7
40	75.6	75.4	72.0	67.9	64.8
60	79.5	79.6	77.2	75.6	72.2
80	80.9	81.6	80.4	79.7	76.1
100	81.3	82.6	81.9	80.7	78.7
110	81.0	82.6	81.7	80.7	78.8
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

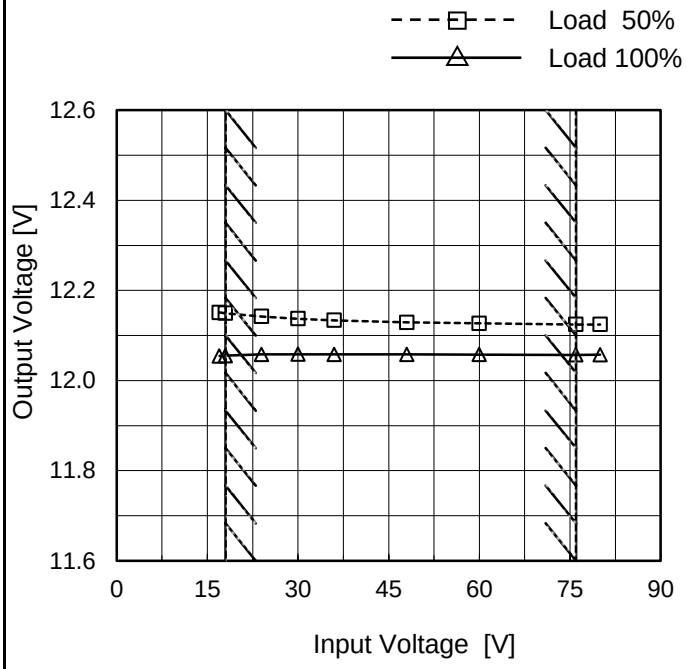
COSEL

Model	MGFW1R54812
Item	Line Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.065A

1.Graph



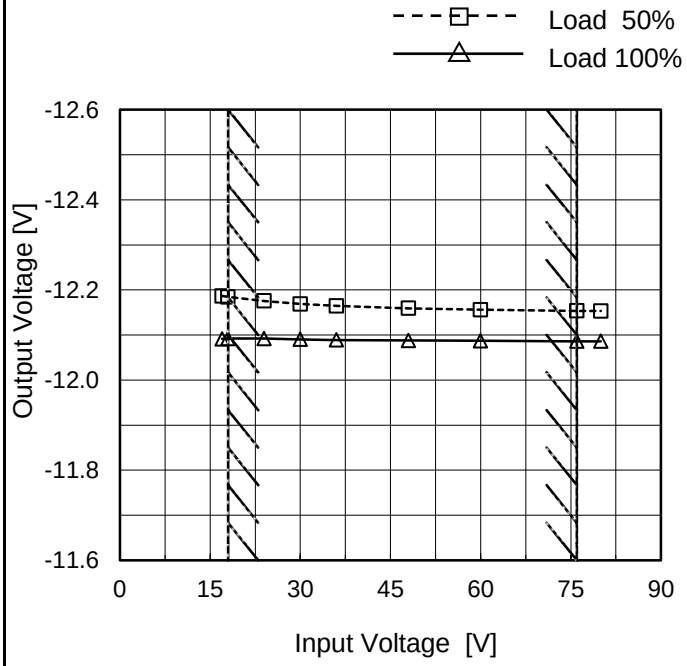
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	12.151	12.055
18	12.149	12.055
24	12.142	12.058
30	12.137	12.058
36	12.134	12.058
48	12.129	12.058
60	12.127	12.058
76	12.125	12.057
80	12.124	12.057

-12V : Rated Load Current

Object -12V0.065A

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	-12.187	-12.092
18	-12.184	-12.092
24	-12.176	-12.092
30	-12.169	-12.091
36	-12.164	-12.089
48	-12.159	-12.088
60	-12.156	-12.087
76	-12.154	-12.086
80	-12.153	-12.086

+12V : Rated Load Current

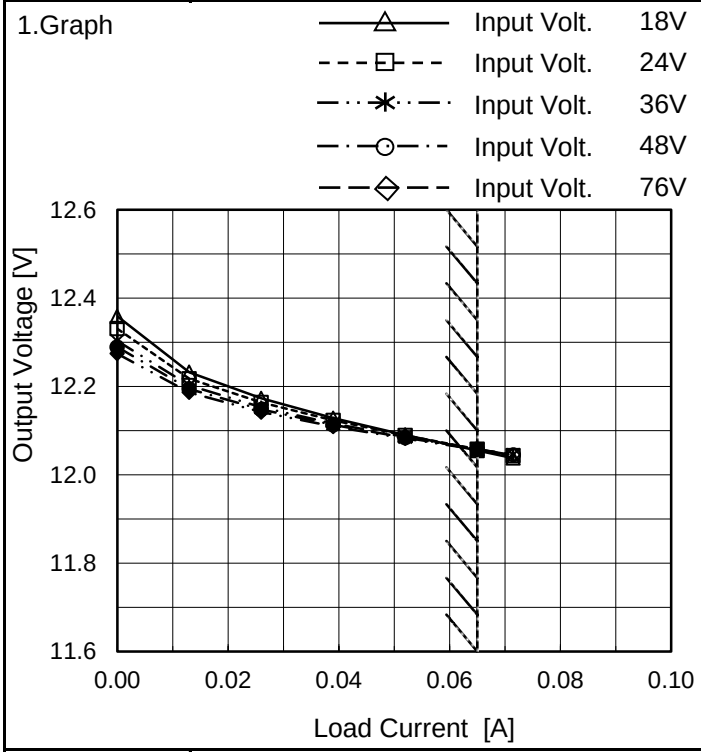
COSEL

Model	MGFW1R54812
Item	Load Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.065A

1.Graph



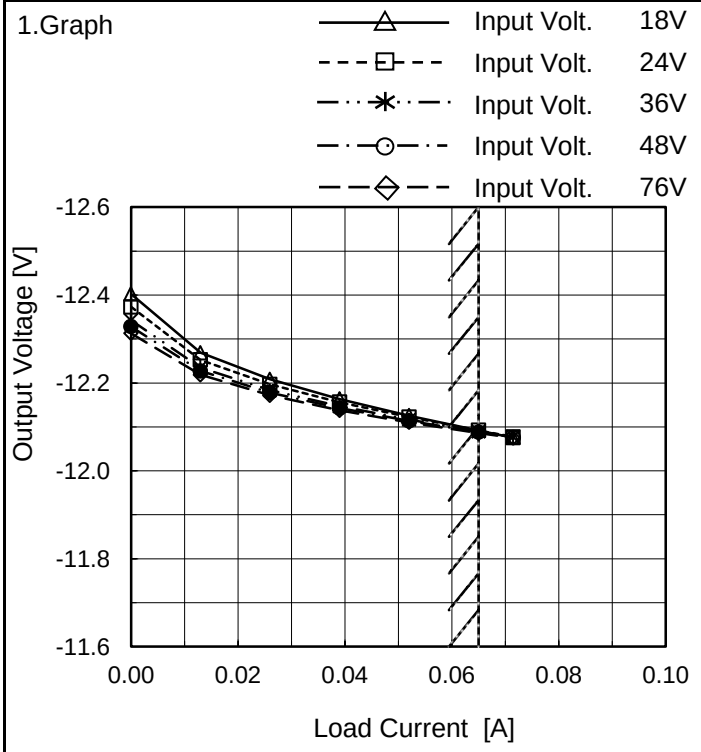
2.Values

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	12.359	12.331	12.303	12.289	12.274
0.013	12.232	12.218	12.202	12.194	12.187
0.026	12.173	12.164	12.153	12.148	12.142
0.039	12.128	12.123	12.116	12.113	12.110
0.052	12.090	12.089	12.086	12.084	12.082
0.065	12.055	12.058	12.058	12.058	12.057
0.072	12.038	12.043	12.045	12.045	12.045
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-12V:Rated Load Current

Object -12V0.065A

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	-12.402	-12.373	-12.342	-12.328	-12.313
0.013	-12.269	-12.252	-12.235	-12.227	-12.219
0.026	-12.208	-12.197	-12.184	-12.178	-12.172
0.039	-12.163	-12.156	-12.147	-12.143	-12.138
0.052	-12.126	-12.122	-12.117	-12.114	-12.110
0.065	-12.092	-12.092	-12.089	-12.088	-12.086
0.072	-12.075	-12.077	-12.077	-12.076	-12.075
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+12V:Rated Load Current

COSEL

Model	MGFW1R54812
Item	Dynamic Load Response
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

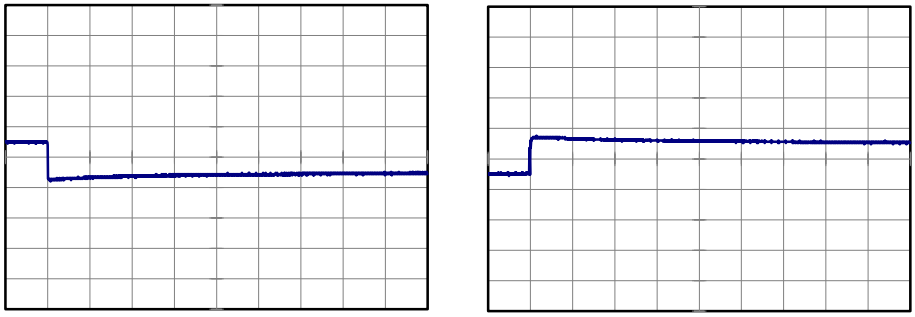
Input Volt. 48 V
-12V:rated load current.
Cycle 100 ms

t1,t2 = 100 μs

Load Current

t1 t2

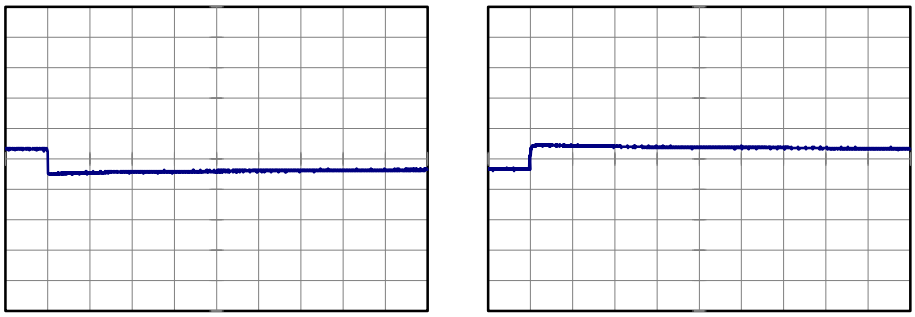
Min.Load (0A)←→
Load 100% (0.065A)



200 mV/div

4 ms/div 4 ms/div

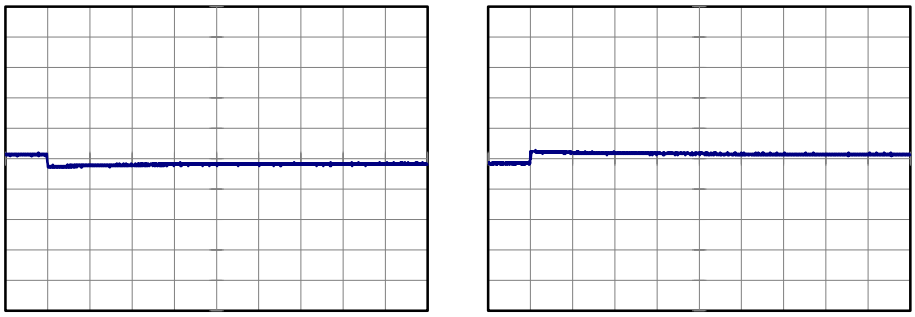
Min.Load (0A)←→
Load 50% (0.0325A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.0325A)←→
Load 100% (0.065A)



200 mV/div

4 ms/div 4 ms/div

COSEL

Model	MGFW1R54812
Item	Dynamic Load Response
Object	-12V0.065A

Temperature 25°C
Testing Circuitry Figure A

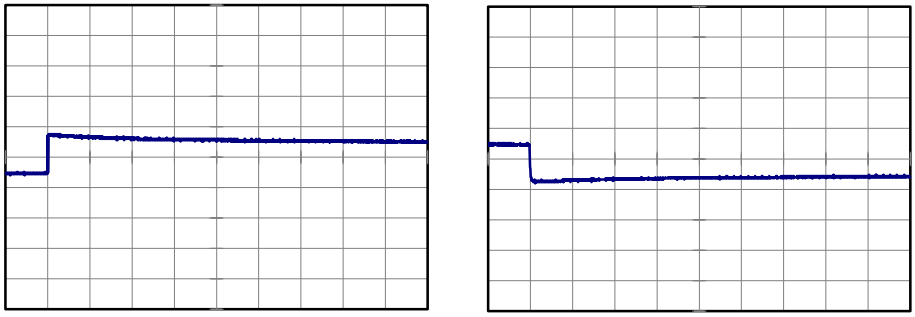
Input Volt. 48 V
+12V:rated load current.
Cycle 100 ms

t1,t2 = 100 μs

Load Current

t1 t2

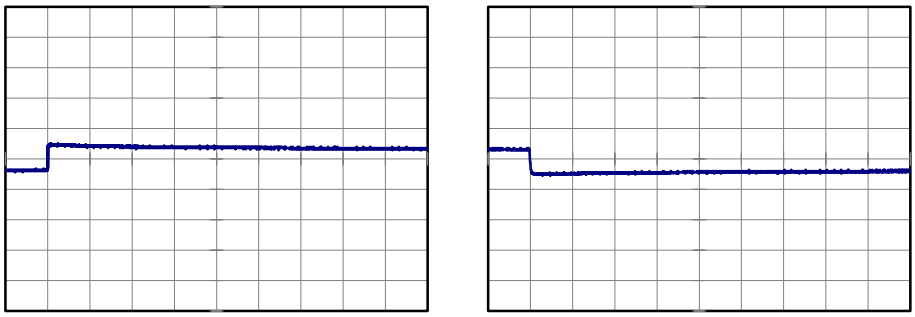
Min.Load (0A)←→
Load 100% (0.065A)



200 mV/div

4 ms/div 4 ms/div

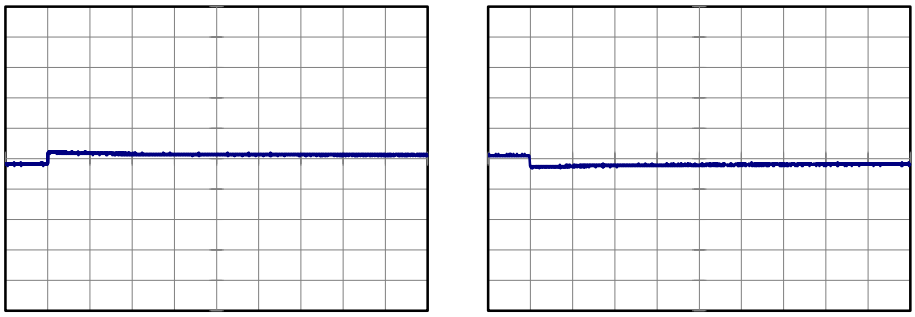
Min.Load (0A)←→
Load 50% (0.0325A)



200 mV/div

4 ms/div 4 ms/div

Load 50% (0.0325A)←→
Load 100% (0.065A)



200 mV/div

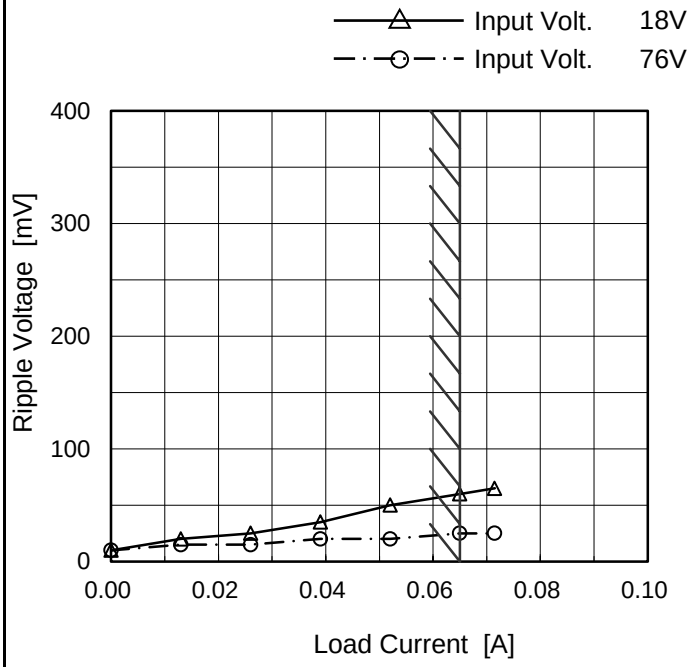
4 ms/div 4 ms/div

COSEL

Model	MGFW1R54812
Item	Ripple Voltage (by Load Current)
Object	+12V0.065A

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]

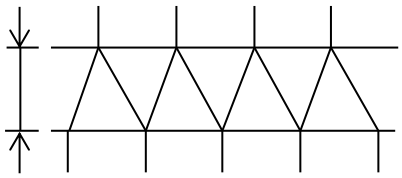


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	10	10
0.013	20	15
0.026	25	15
0.039	35	20
0.052	50	20
0.065	60	25
0.072	65	25
--	-	-
--	-	-
--	-	-
--	-	-

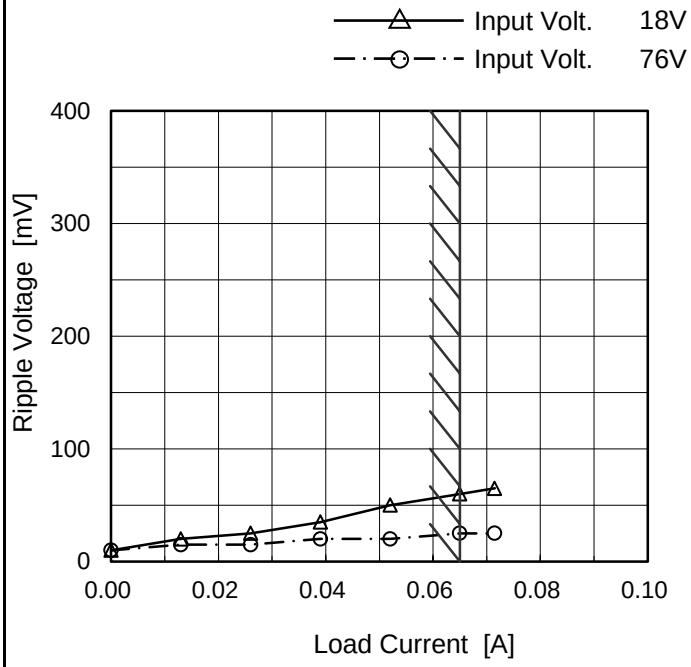
-12V: Rated Load Current

COSEL

Model	MGFW1R54812
Item	Ripple Voltage (by Load Current)
Object	-12V0.065A

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]

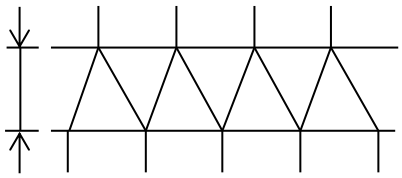


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	10	10
0.013	20	15
0.026	25	15
0.039	35	20
0.052	50	20
0.065	60	25
0.072	65	25
--	-	-
--	-	-
--	-	-
--	-	-

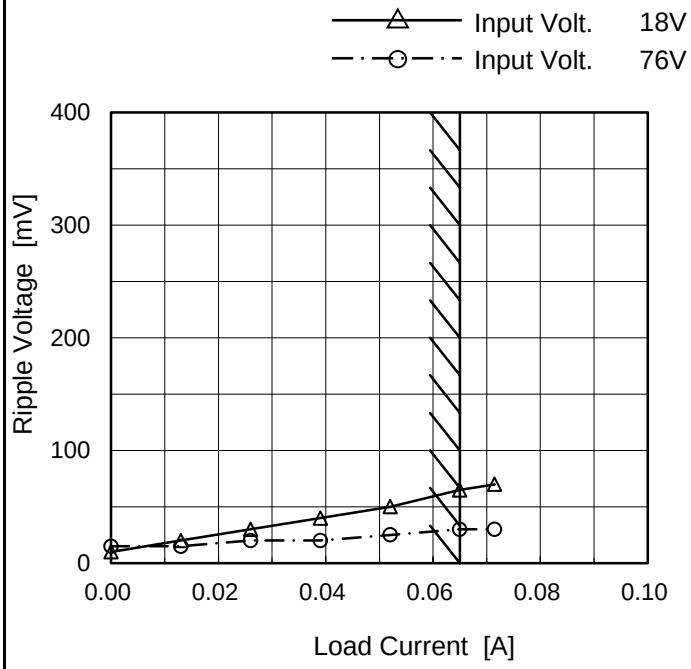
+12V: Rated Load Current

COSEL

Model	MGFW1R54812
Item	Ripple-Noise
Object	+12V0.065A

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]

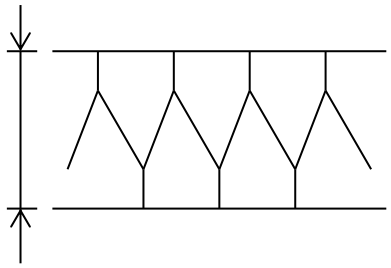


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	10	15
0.013	20	15
0.026	30	20
0.039	40	20
0.052	50	25
0.065	65	30
0.072	70	30
--	-	-
--	-	-
--	-	-
--	-	-

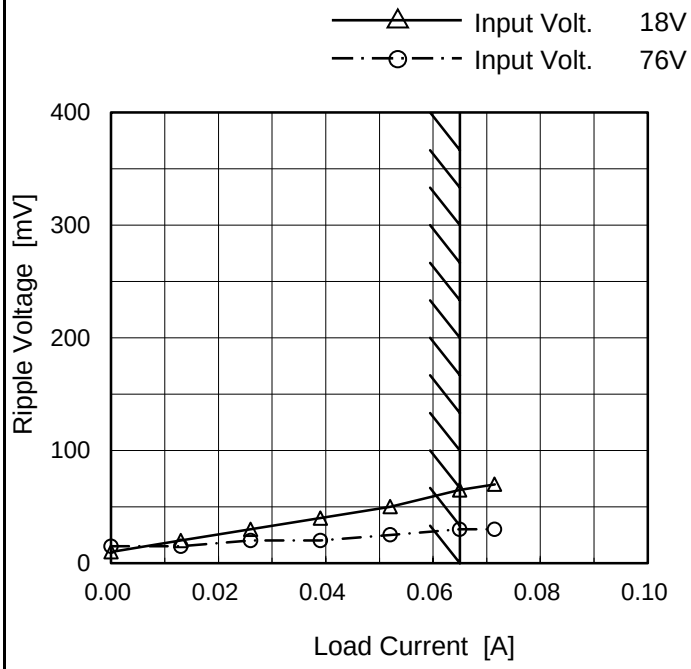
-12V: Rated Load Current

COSEL

Model	MGFW1R54812
Item	Ripple-Noise
Object	-12V0.065A

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]

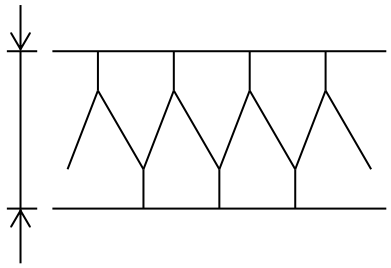


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 76 [V]
0.000	10	15
0.013	20	15
0.026	30	20
0.039	40	20
0.052	50	25
0.065	65	30
0.072	70	30
--	-	-
--	-	-
--	-	-
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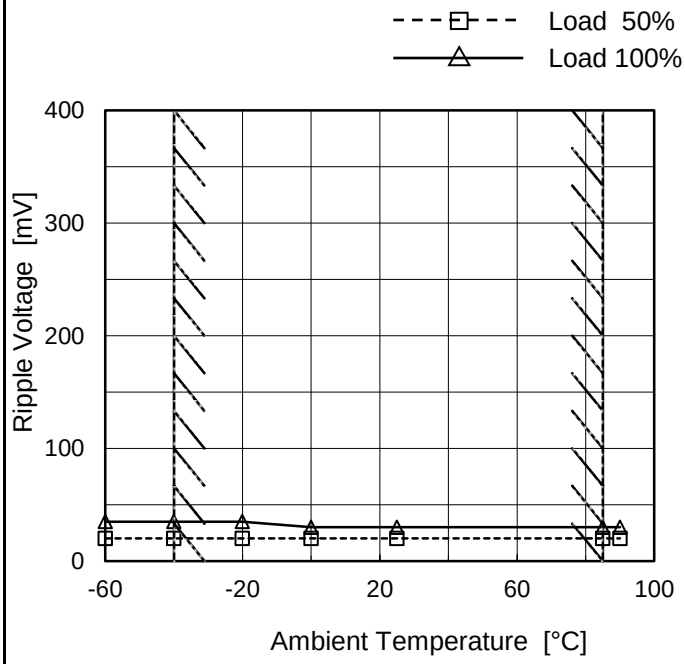
+12V: Rated Load Current

COSEL

Model	MGFW1R54812
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.065A

Testing Circuitry Figure B

1.Graph



Input Volt. 48V

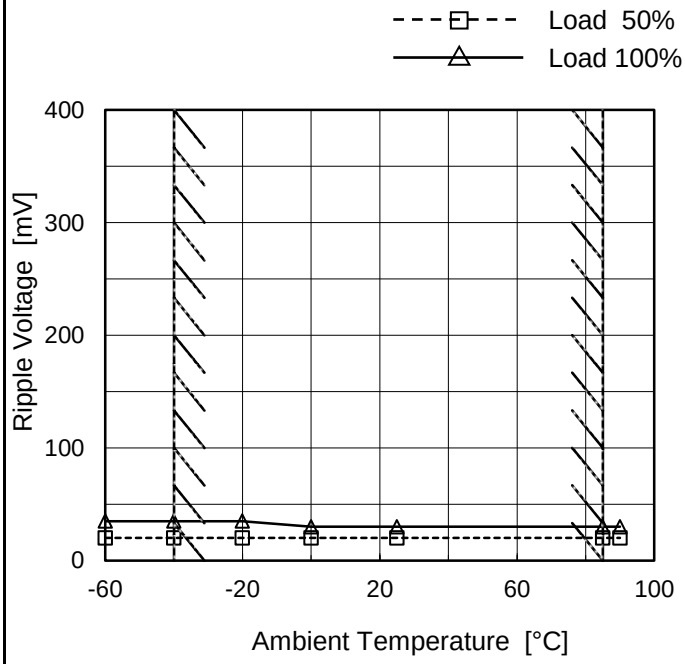
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	20	35
-40	20	35
-20	20	35
0	20	30
25	20	30
85	20	30
90	20	30
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated Load Current

Object	-12V0.065A

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	35
-40	20	35
-20	20	35
0	20	30
25	20	30
85	20	30
90	20	30
--	-	-
--	-	-
--	-	-
--	-	-

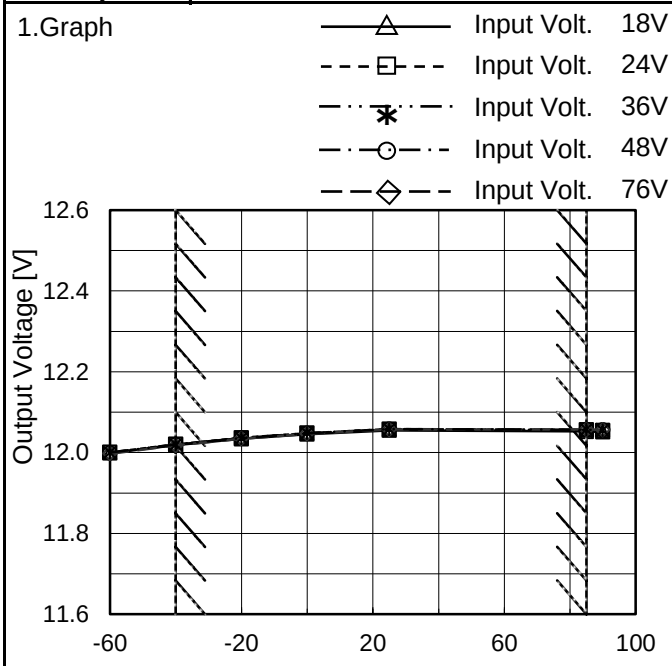
+12V: Rated Load Current

COSEL

Model	MGFW1R54812
Item	Ambient Temperature Drift
Object	+12V0.065A

Testing Circuitry Figure A

1.Graph



Load 100%

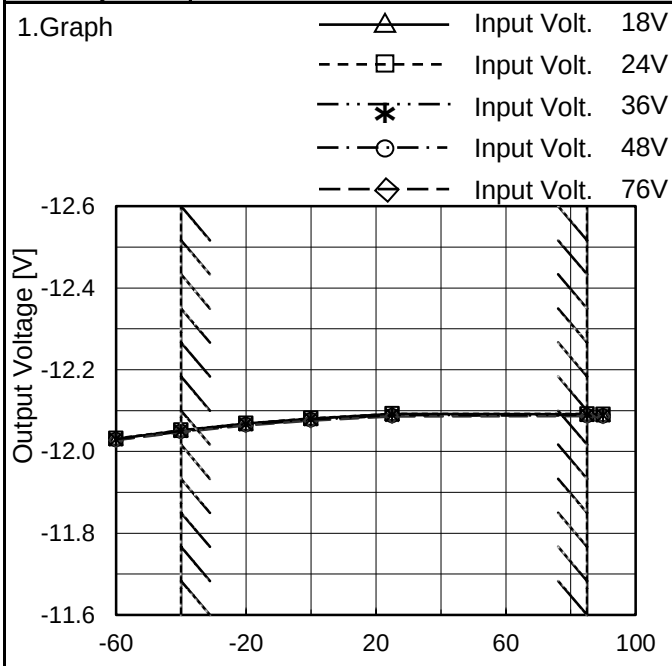
2.Values

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	11.999	12.001	12.000	11.999	11.997
-40	12.018	12.020	12.020	12.019	12.018
-20	12.034	12.036	12.036	12.036	12.034
0	12.046	12.048	12.048	12.048	12.047
25	12.055	12.058	12.058	12.058	12.057
85	12.052	12.056	12.057	12.057	12.057
90	12.051	12.055	12.056	12.056	12.056
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-12V:Rated Load Current

Object	-12V0.065A

1.Graph



Load 100%

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	-12.031	-12.032	-12.030	-12.029	-12.027
-40	-12.052	-12.052	-12.050	-12.049	-12.048
-20	-12.068	-12.069	-12.067	-12.066	-12.064
0	-12.080	-12.081	-12.079	-12.077	-12.076
25	-12.092	-12.092	-12.089	-12.088	-12.086
85	-12.091	-12.092	-12.089	-12.088	-12.086
90	-12.090	-12.091	-12.088	-12.087	-12.085
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+12V:Rated Load Current

COSEL

Model	MGFW1R54812	
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 - 0.065A (AVR 2) : 0 - 0.065A

* 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

Object	+12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	18	0	12.401	±344	±2.9
Minimum Voltage	85	18	0.065	11.713		

Object	-12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	18	0	-12.444	±344	±2.9
Minimum Voltage	85	18	0.065	-11.756		

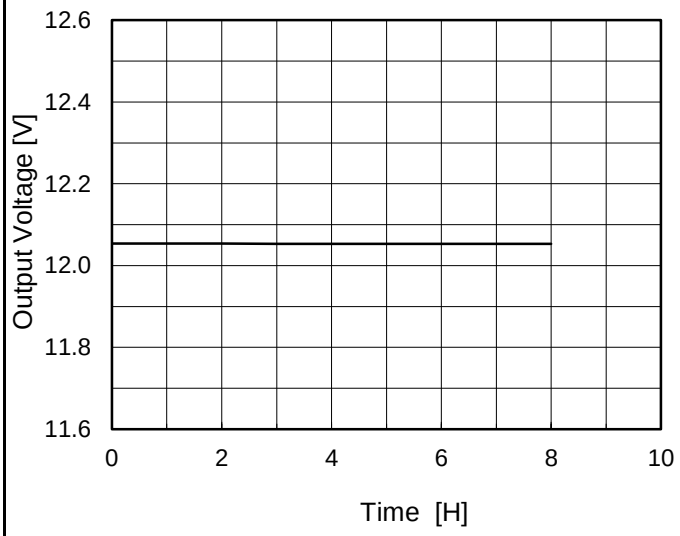
COSEL

Model	MGFW1R54812
Item	Time Lapse Drift

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.065A

1.Graph



Input Volt. 48V
Load 100%

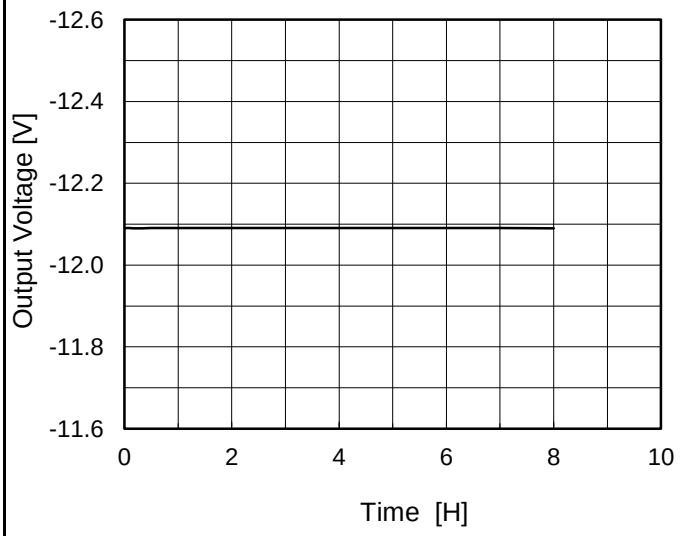
2.Values

Time since start [H]	Output Voltage [V]
0.0	12.053
0.5	12.054
1.0	12.054
2.0	12.054
3.0	12.054
4.0	12.053
5.0	12.053
6.0	12.053
7.0	12.053
8.0	12.053

-12V:Rated Load Current

Object -12V0.065A

1.Graph



Input Volt. 48V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.089
0.5	-12.091
1.0	-12.091
2.0	-12.090
3.0	-12.091
4.0	-12.091
5.0	-12.090
6.0	-12.090
7.0	-12.090
8.0	-12.090

+12V:Rated Load Current

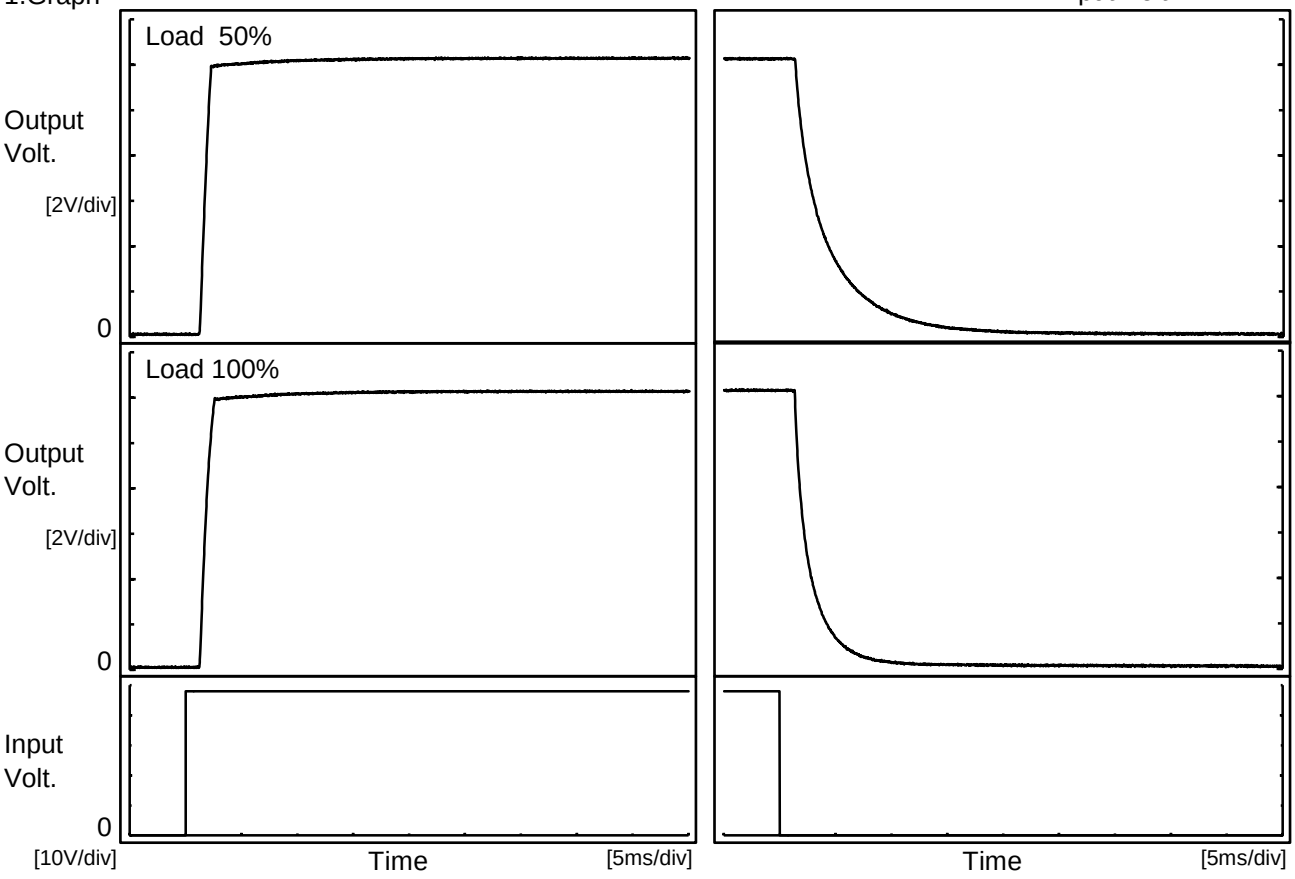
COSEL

Model	MGFW1R54812
Item	Rise and Fall Time
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

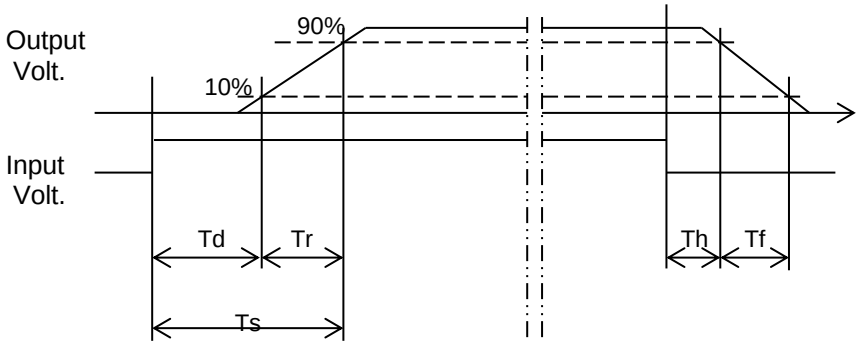
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.4	0.8	2.2	1.6	7.4
100 %	1.4	1.0	2.4	1.5	3.7



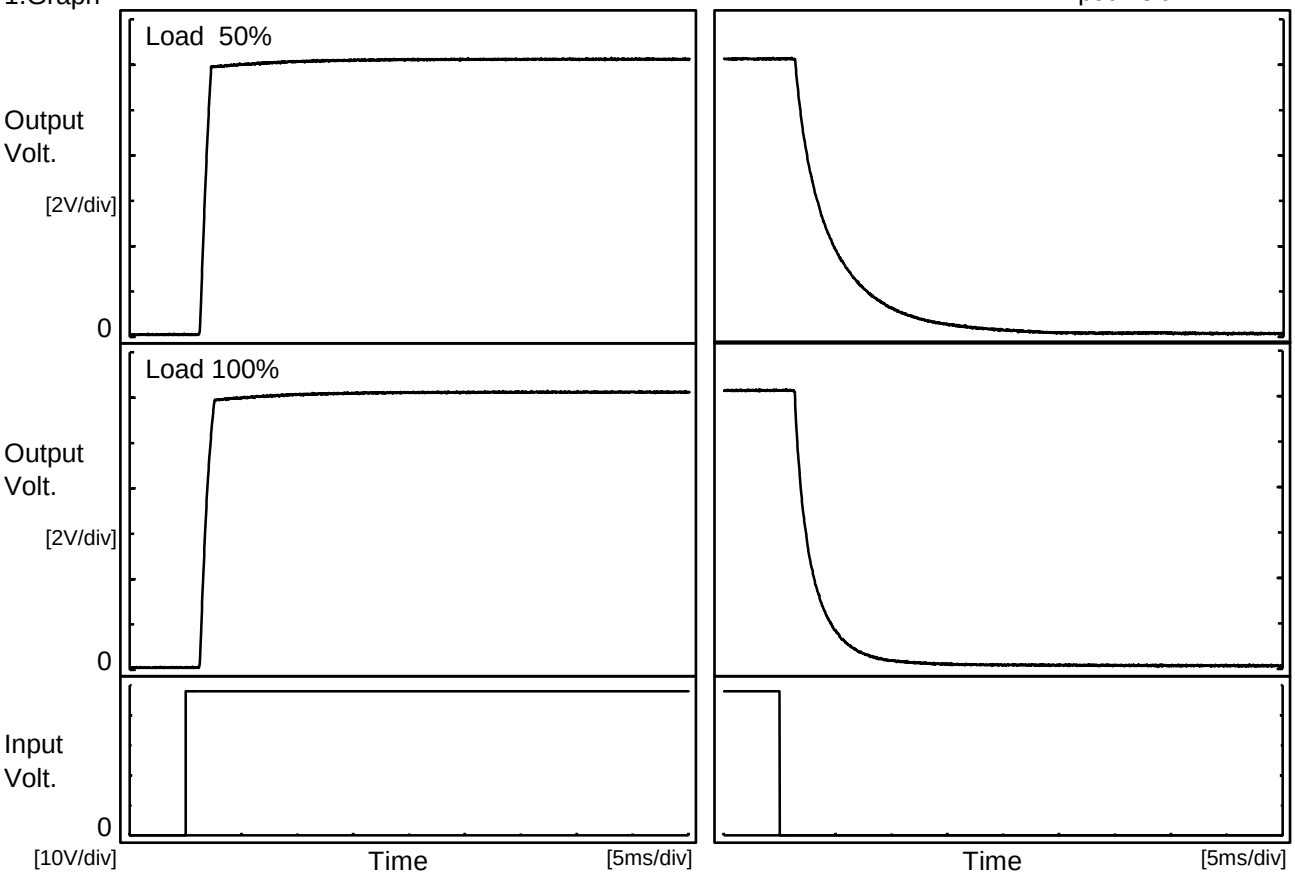
COSEL

Model	MGFW1R54812
Item	Rise and Fall Time
Object	-12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

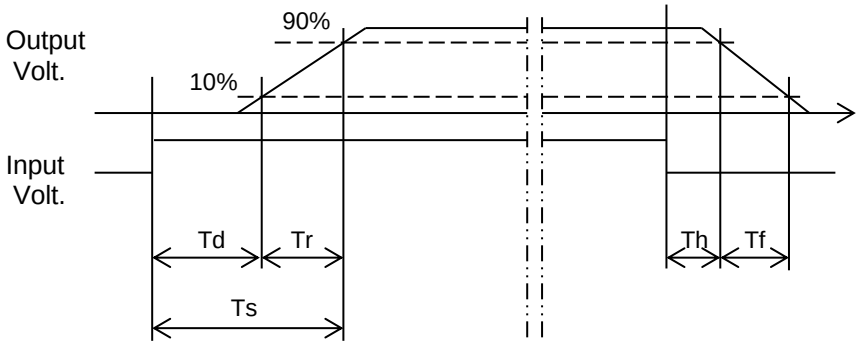
Input Volt. 48 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.4	0.8	2.2	1.6	8.4
100 %	1.4	1.0	2.4	1.5	4.3

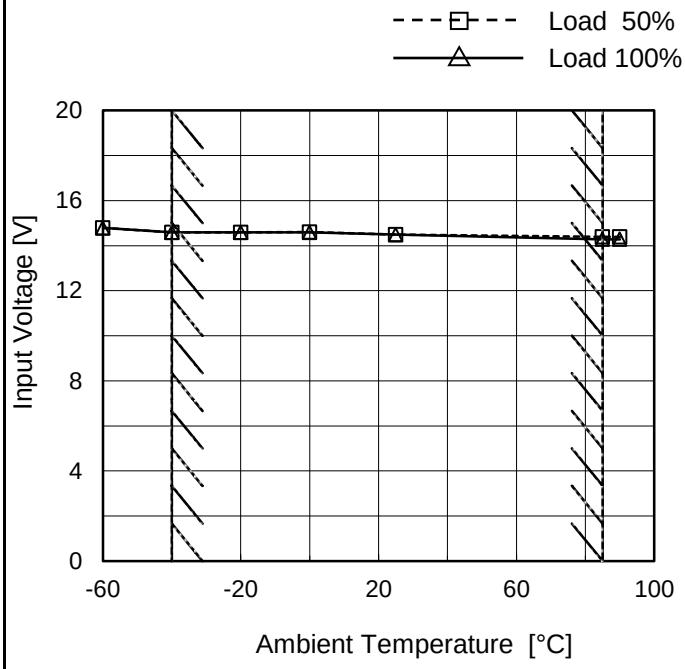


COSEL

Model	MGFW1R54812
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.065A

Testing Circuitry Figure A

1.Graph

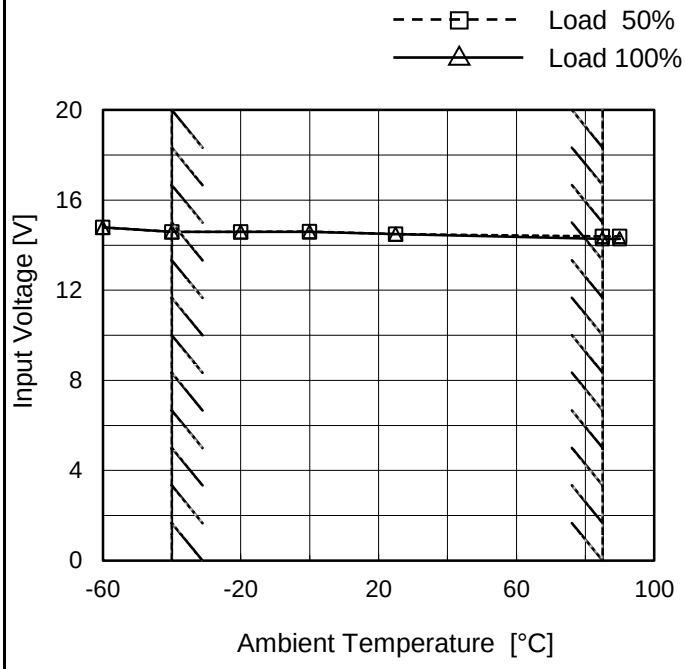


2.Values

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	-12V0.065A

1.Graph



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

2.Values

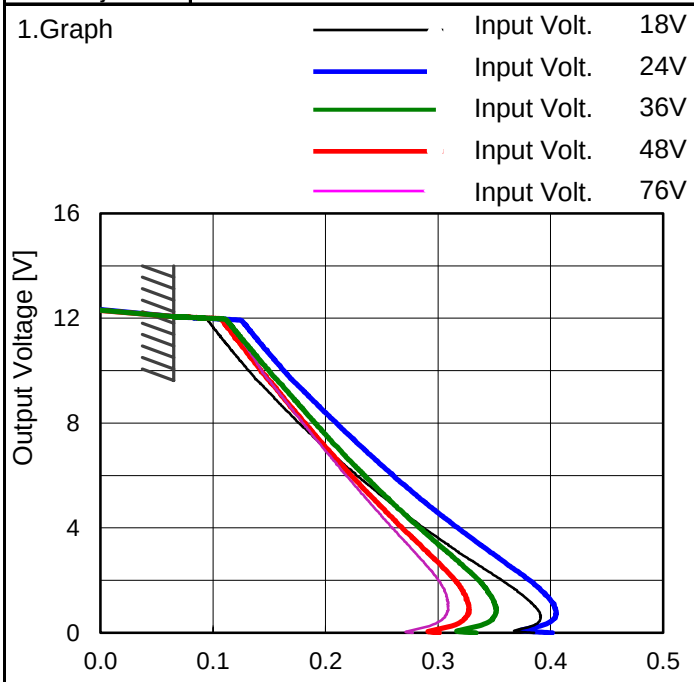
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	14.8	14.8
-40	14.6	14.6
-20	14.6	14.6
0	14.6	14.6
25	14.5	14.5
85	14.4	14.3
90	14.4	14.3
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	MGFW1R54812
Item	Overcurrent Protection
Object	+12V0.065A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



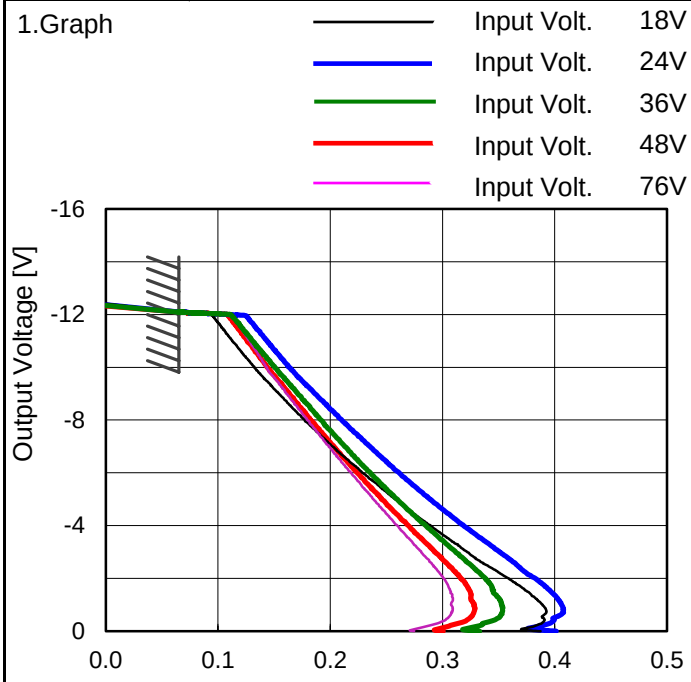
2.Values

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]
11.4	0.105	0.135	0.123	0.117	0.122
10.8	0.116	0.147	0.133	0.128	0.131
9.6	0.139	0.171	0.158	0.150	0.150
8.4	0.166	0.199	0.182	0.173	0.172
7.2	0.196	0.228	0.207	0.197	0.195
6.0	0.227	0.259	0.234	0.223	0.218
4.8	0.262	0.293	0.263	0.250	0.242
3.6	0.300	0.330	0.294	0.277	0.268
2.4	0.342	0.368	0.326	0.306	0.293
1.2	0.381	0.401	0.349	0.326	0.309
0.0	0.385	0.402	0.334	0.301	0.278
--	-	-	-	-	-

-12V : Rated Load Current

Object	-12V0.065A

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]
-11.4	0.106	0.136	0.123	0.119	0.122
-10.8	0.117	0.147	0.135	0.130	0.130
-9.6	0.140	0.172	0.159	0.151	0.150
-8.4	0.168	0.199	0.183	0.175	0.172
-7.2	0.196	0.230	0.209	0.199	0.194
-6.0	0.228	0.261	0.236	0.224	0.218
-4.8	0.264	0.294	0.264	0.250	0.243
-3.6	0.301	0.331	0.295	0.278	0.267
-2.4	0.343	0.369	0.328	0.307	0.293
-1.2	0.384	0.403	0.351	0.325	0.309
0.0	0.387	0.401	0.333	0.301	0.275
--	-	-	-	-	-

+12V : Rated Load Current

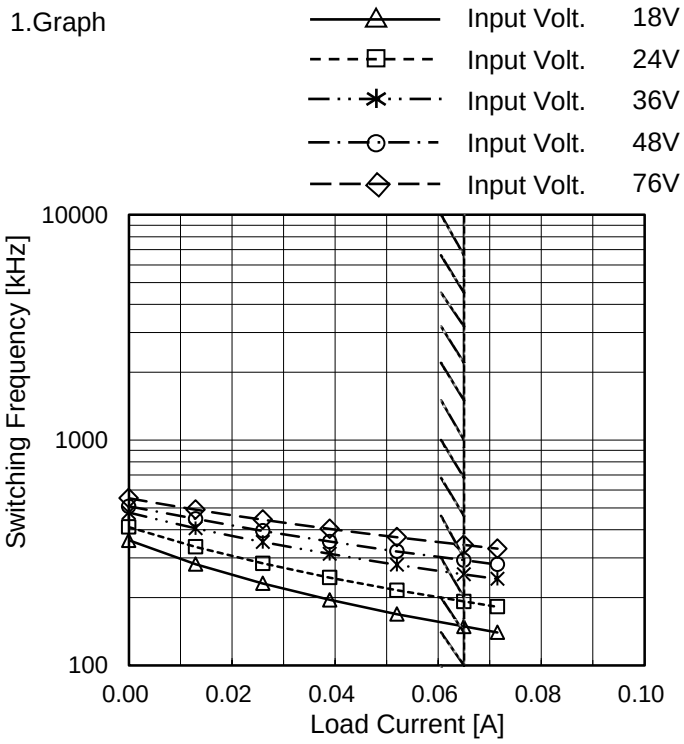
BC-10972

COSEL

Model	MGFW1R54812
Item	Switching frequency (by Load Current)
Object	+/-12V0.065A

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	359	411	477	508	552
0.013	281	336	406	447	491
0.026	231	284	353	395	443
0.039	195	245	313	354	404
0.052	169	215	280	321	371
0.065	149	192	254	293	343
0.072	140	182	242	280	330
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

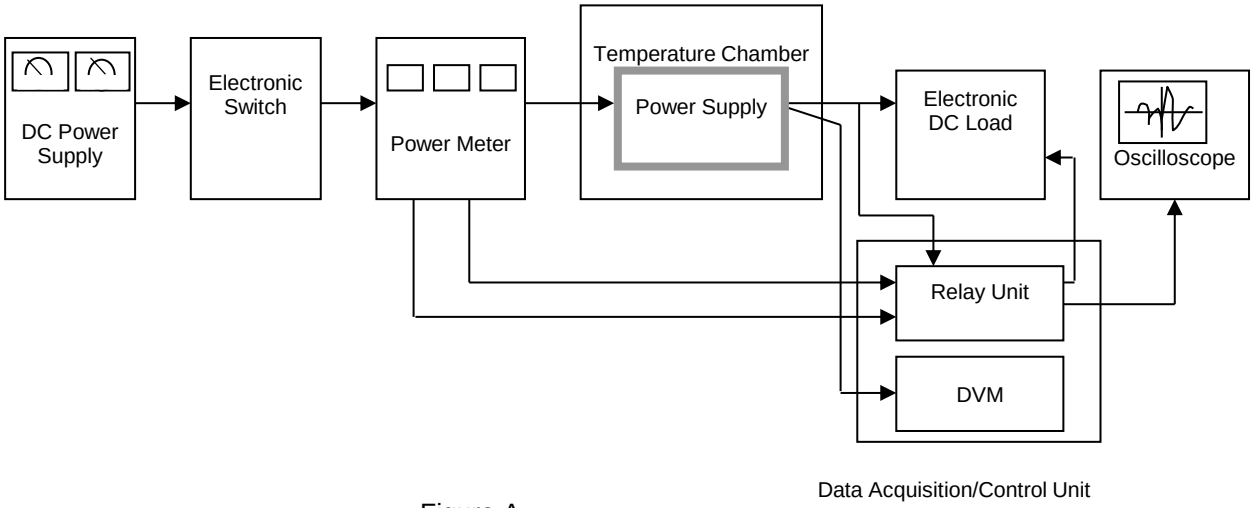


Figure A

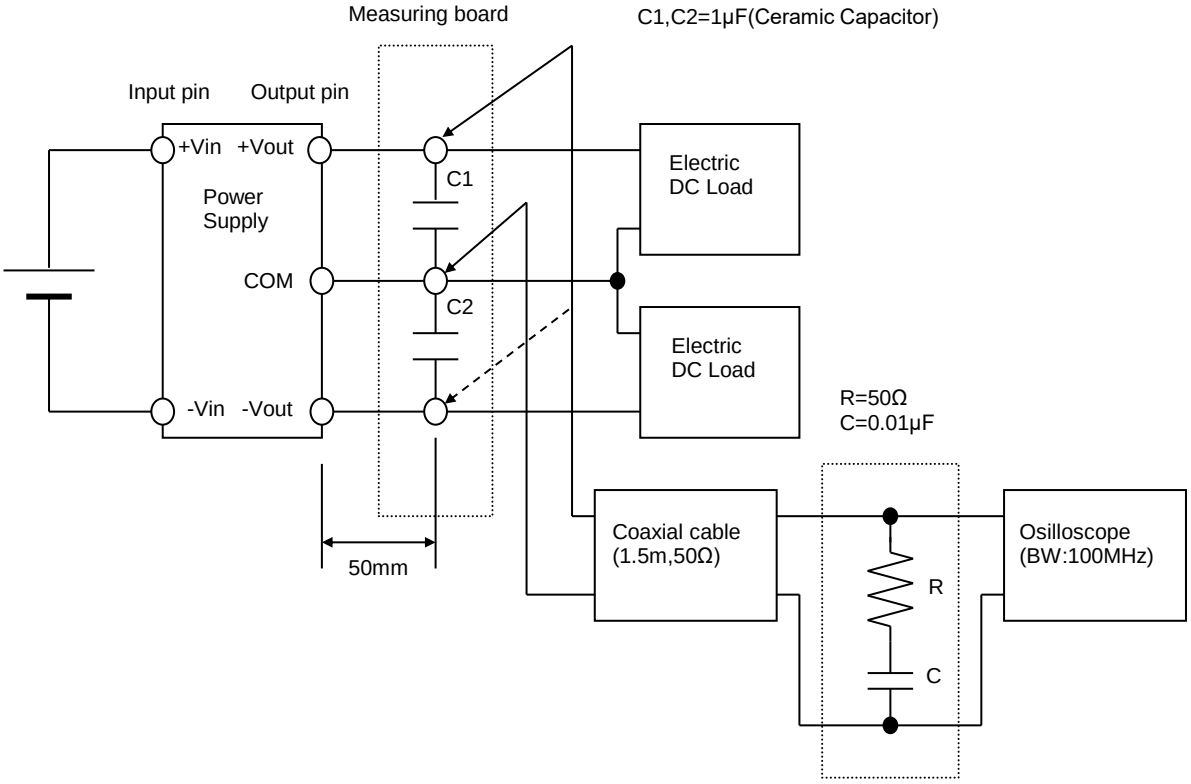


Figure B（Ripple and Ripple noise Characteristic）