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参考資料

TEST DATA OF MGFW302415

Regulated DC Power Supply
November 22, 2010

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Masashi Ueda Design Engineer

COSEL CO.,LTD.

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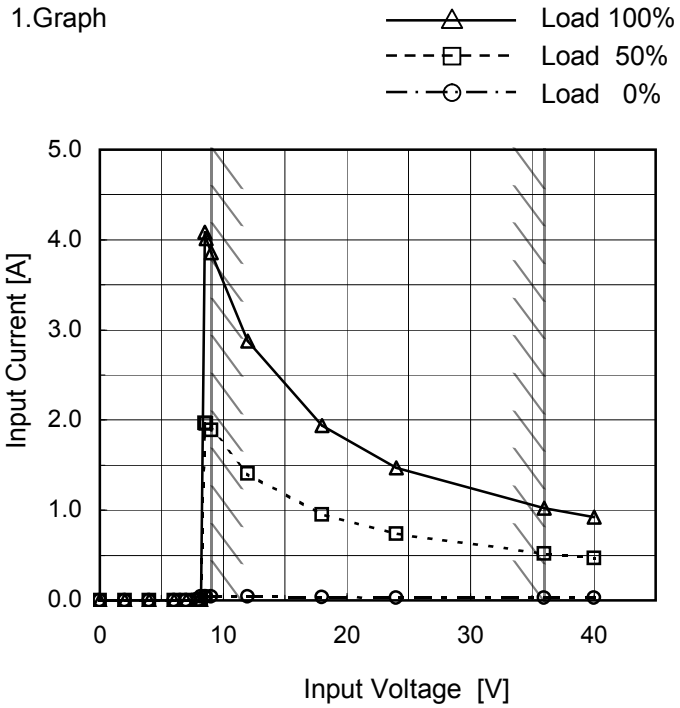
参考資料

COSEL

Model	MGFW302415
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
2.0	0.000	0.000	0.000
4.0	0.000	0.000	0.000
6.0	0.000	0.000	0.000
7.0	0.000	0.000	0.000
8.0	0.002	0.002	0.000
8.2	0.045	0.006	0.004
8.5	0.044	1.969	4.085
8.6	0.044	1.958	4.010
9.0	0.044	1.887	3.859
12.0	0.041	1.408	2.877
18.0	0.033	0.955	1.938
24.0	0.030	0.737	1.471
36.0	0.028	0.515	1.021
40.0	0.028	0.472	0.925
--	-	-	-
--	-	-	-
--	-	-	-

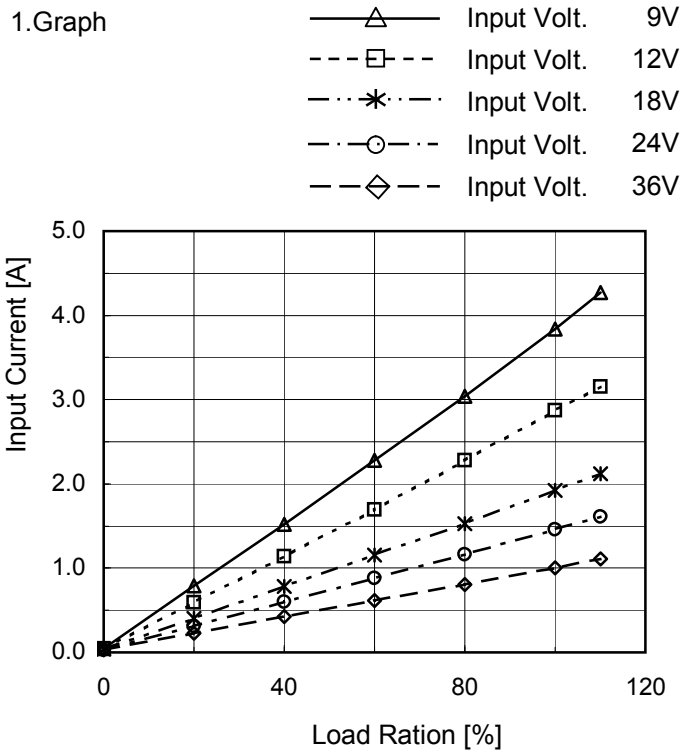
BC-10532

COSEL

Model	MGFW302415
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

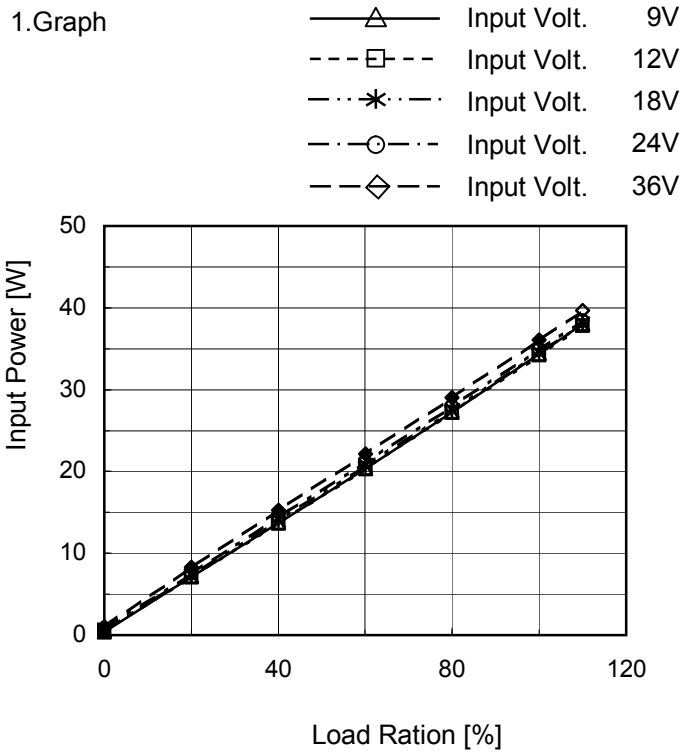
Load Ration [%]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.045	0.043	0.035	0.032	0.028
20	0.792	0.595	0.406	0.315	0.230
40	1.522	1.141	0.780	0.600	0.424
60	2.281	1.694	1.152	0.881	0.616
80	3.042	2.277	1.529	1.165	0.808
100	3.834	2.875	1.924	1.457	1.006
110	4.273	3.155	2.120	1.608	1.107
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW302415
Item	Input Power (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

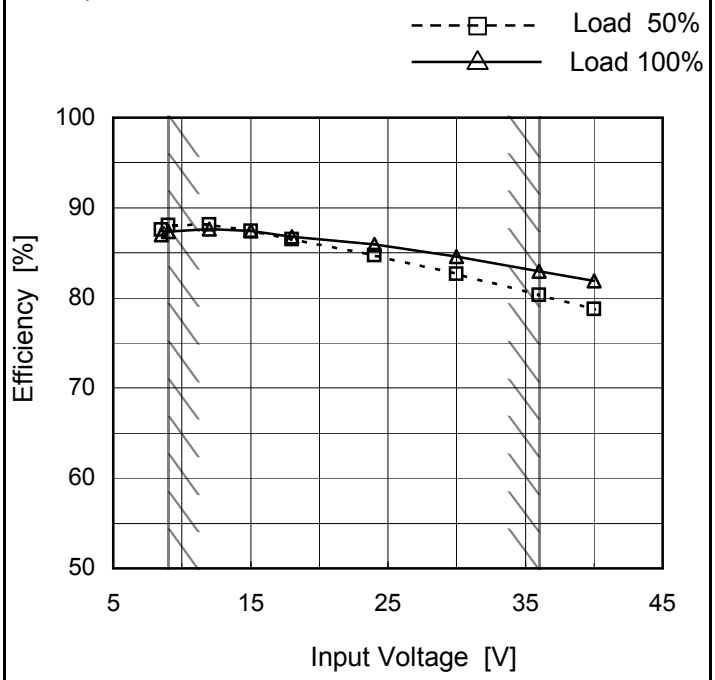
Load Ration [%]	Input Power [W]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.40	0.52	0.63	0.76	1.01
20	7.13	7.14	7.30	7.52	8.28
40	13.67	13.69	14.01	14.36	15.25
60	20.37	20.36	20.71	21.10	22.13
80	27.26	27.21	27.50	27.94	29.06
100	34.38	34.20	34.50	34.88	36.10
110	38.02	37.81	38.00	38.45	39.70
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW302415
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

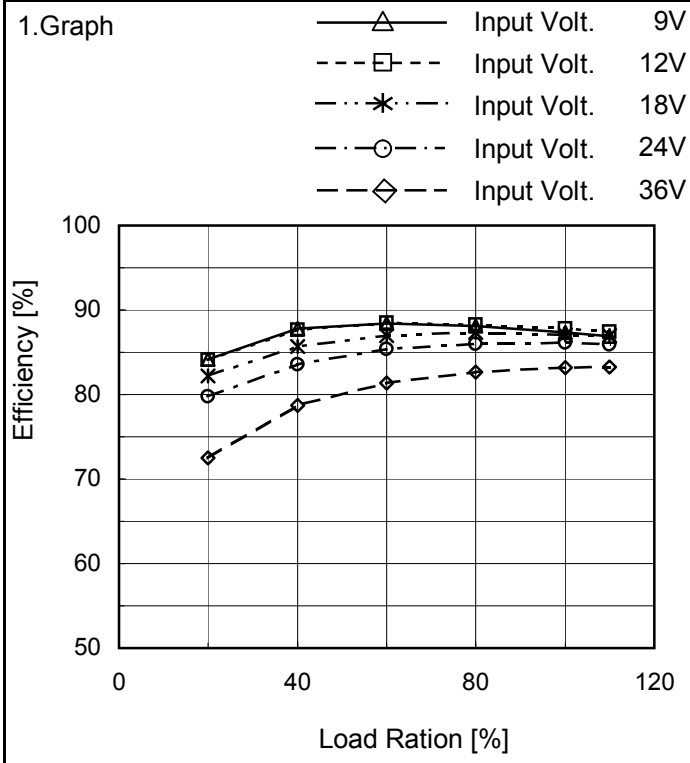
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8.5	87.6	87.0
9.0	88.1	87.4
12.0	88.2	87.7
15.0	87.4	87.4
18.0	86.5	86.8
24.0	84.7	86.0
30.0	82.6	84.6
36.0	80.3	83.0
40.0	78.7	81.9

COSEL

Model	MGFW302415
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

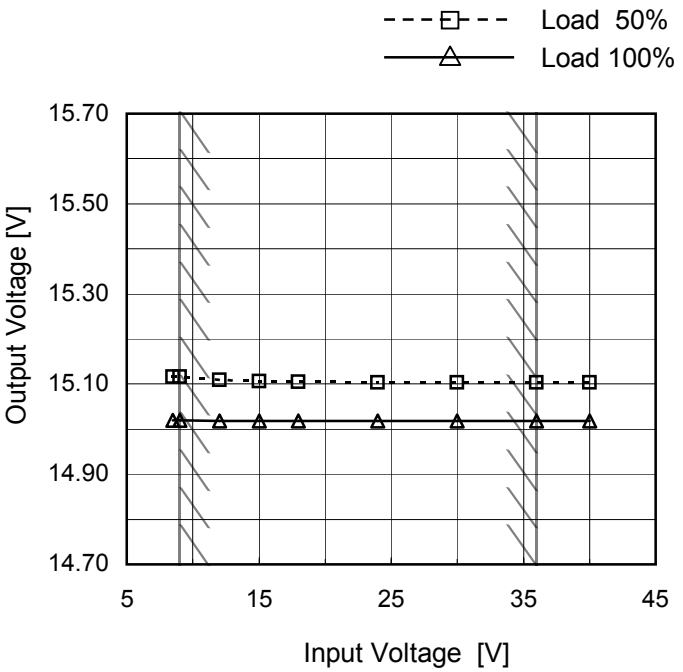
Load Ration [%]	Efficiency [%]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-	-	-
20	84.2	84.1	82.2	79.8	72.5
40	87.8	87.7	85.7	83.6	78.7
60	88.4	88.5	87.0	85.4	81.4
80	88.1	88.3	87.4	86.0	82.7
100	87.4	87.8	87.1	86.1	83.2
110	86.9	87.4	87.0	85.9	83.2
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW302415
Item	Line Regulation
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



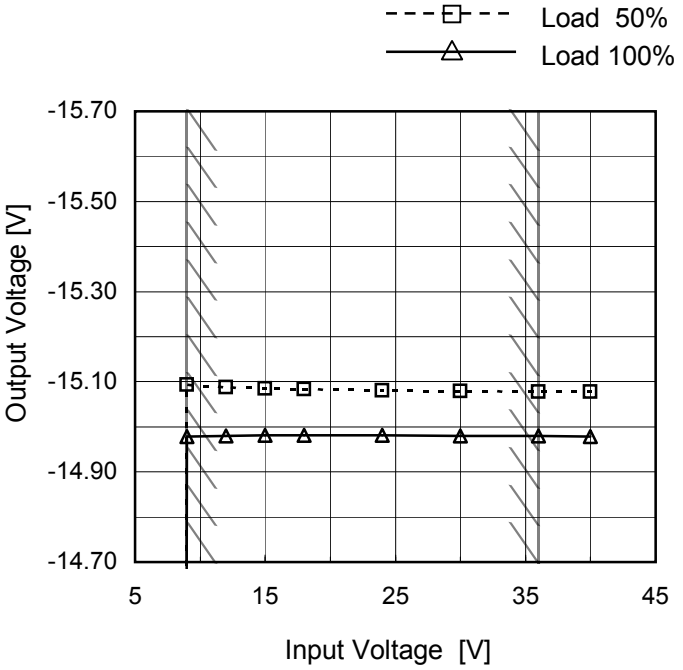
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	15.116	15.020
9.0	15.116	15.020
12.0	15.110	15.019
15.0	15.107	15.018
18.0	15.105	15.018
24.0	15.104	15.018
30.0	15.104	15.018
36.0	15.103	15.018
40.0	15.103	15.018

-15V: Rated output current

Object	-15V1A

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	-0.001	-0.001
9	-15.093	-14.978
12	-15.088	-14.980
15	-15.085	-14.981
18	-15.083	-14.981
24	-15.080	-14.981
30	-15.079	-14.980
36	-15.078	-14.980
40	-15.078	-14.979

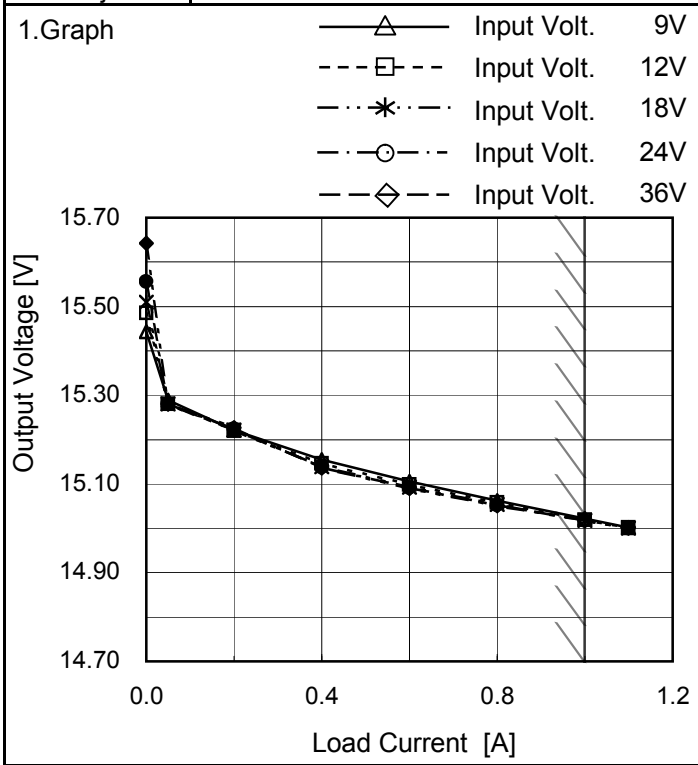
+15V: Rated output current

COSEL

Model	MGFW302415
Item	Load Regulation
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



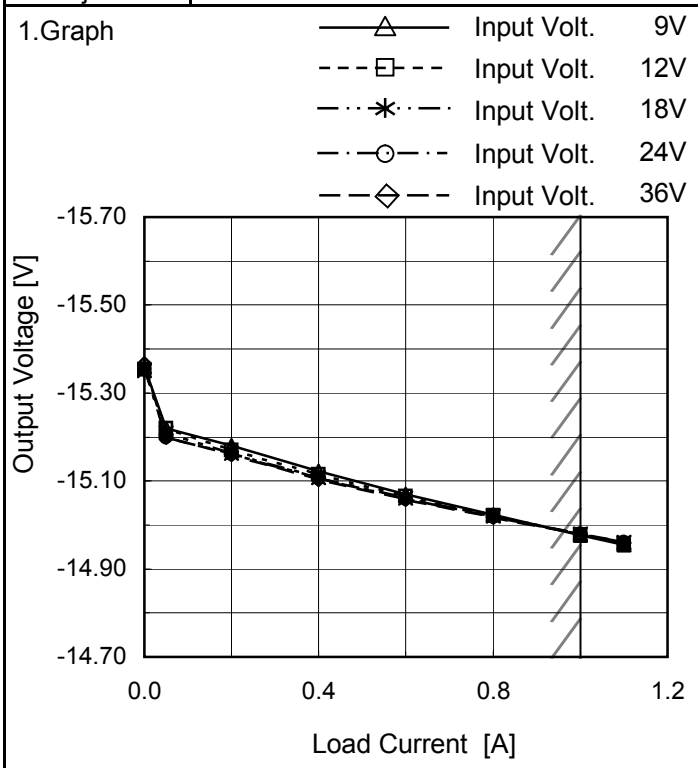
2.Values

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]
0.000	15.443	15.485	15.510	15.556	15.642
0.050	15.288	15.280	15.280	15.280	15.280
0.200	15.222	15.221	15.221	15.224	15.226
0.400	15.154	15.146	15.139	15.137	15.135
0.600	15.106	15.098	15.092	15.091	15.089
0.800	15.062	15.057	15.054	15.052	15.051
1.000	15.022	15.019	15.018	15.017	15.017
1.100	15.002	15.002	15.001	15.001	15.001
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-15V: Rated output current

Object	-15V1A

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]
0.000	-15.360	-15.354	-15.350	-15.354	-15.366
0.05	-15.220	-15.220	-15.210	-15.200	-15.200
0.20	-15.180	-15.171	-15.163	-15.162	-15.160
0.40	-15.122	-15.114	-15.108	-15.106	-15.103
0.60	-15.070	-15.066	-15.062	-15.060	-15.058
0.80	-15.023	-15.022	-15.020	-15.018	-15.017
1.00	-14.977	-14.979	-14.980	-14.979	-14.978
1.10	-14.955	-14.958	-14.960	-14.960	-14.959
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+15V: Rated output current

COSEL

Model	MGFW302415
Item	Dynamic Load Response
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

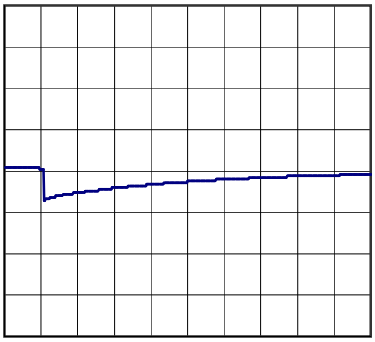
Input Volt. 24 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

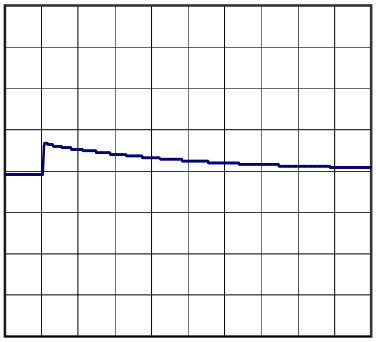
Load Current

Min. Load (0A) ←→
Load 100% (1A)

500mV/div



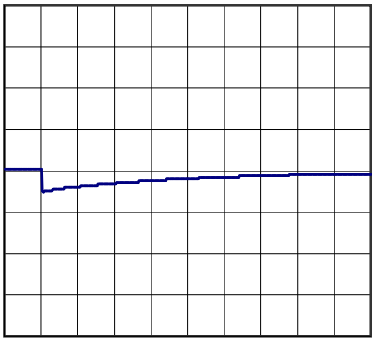
50ms/div



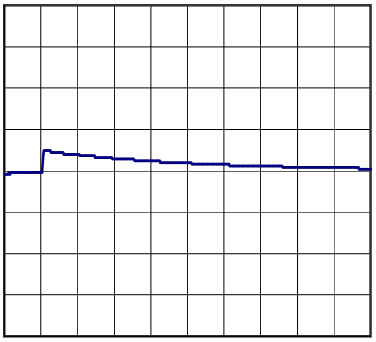
50ms/div

Min. Load (0A) ←→
Load 50% (0.5A)

500mV/div



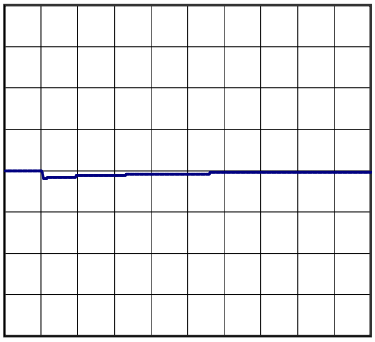
50ms/div



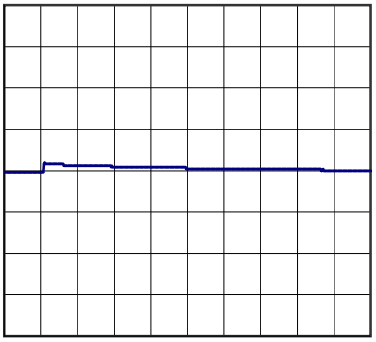
50ms/div

Load 50% (0.5A) ←→
Load 100% (1A)

500mV/div



50ms/div



50ms/div

COSEL

Model	MGFW302415
Item	Dynamic Load Response
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

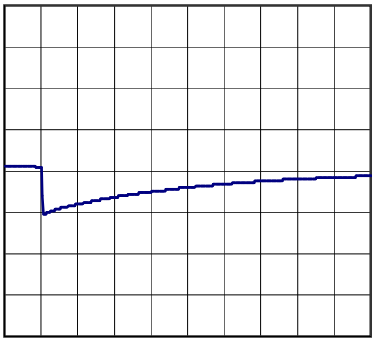
Input Volt. 24 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

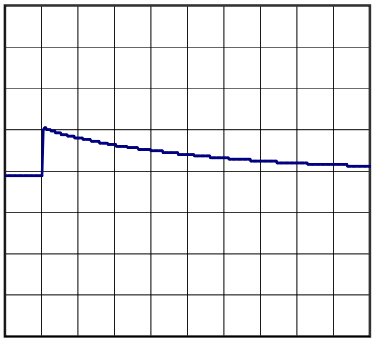
Load Current

Min. Load (0A) ←→
Load 100% (1A)

500mV/div



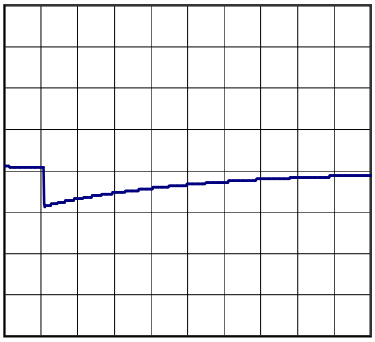
50ms/div



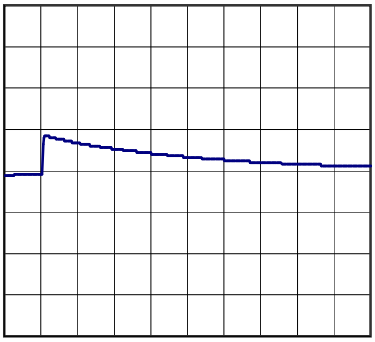
50ms/div

Min. Load (0A) ←→
Load 50% (0.5A)

500mV/div



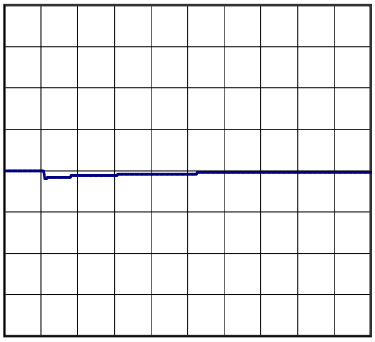
50ms/div



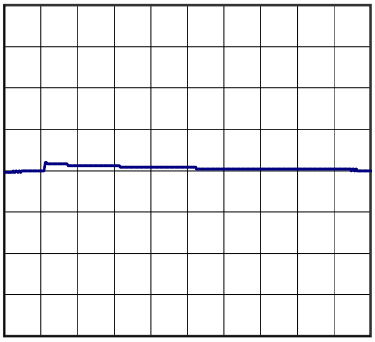
50ms/div

Load 50% (0.5A) ←→
Load 100% (1A)

500mV/div



50ms/div



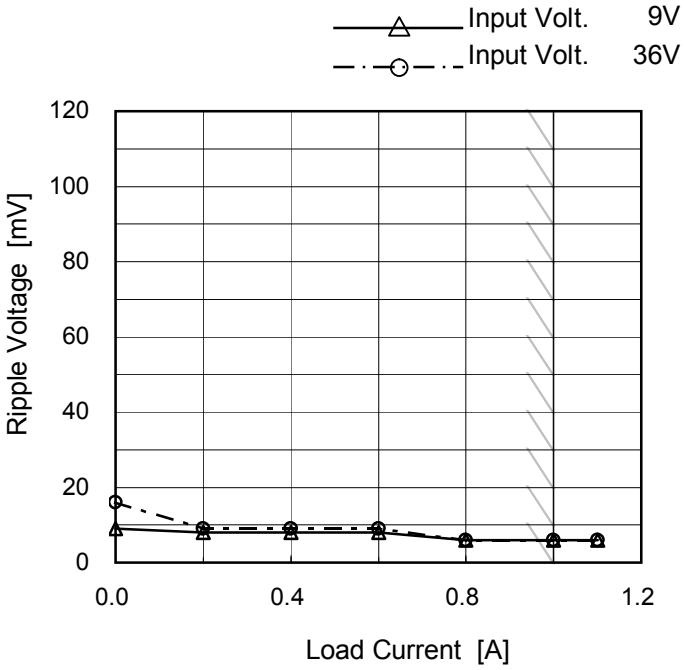
50ms/div

COSEL

Model	MGFW302415
Item	Ripple Voltage (by Load Current)
Object	+15V1A

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]

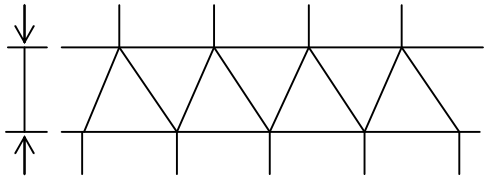


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	9	16
0.2	8	9
0.4	8	9
0.6	8	9
0.8	6	6
1.0	6	6
1.1	6	6
--	-	-
--	-	-
--	-	-
--	-	-

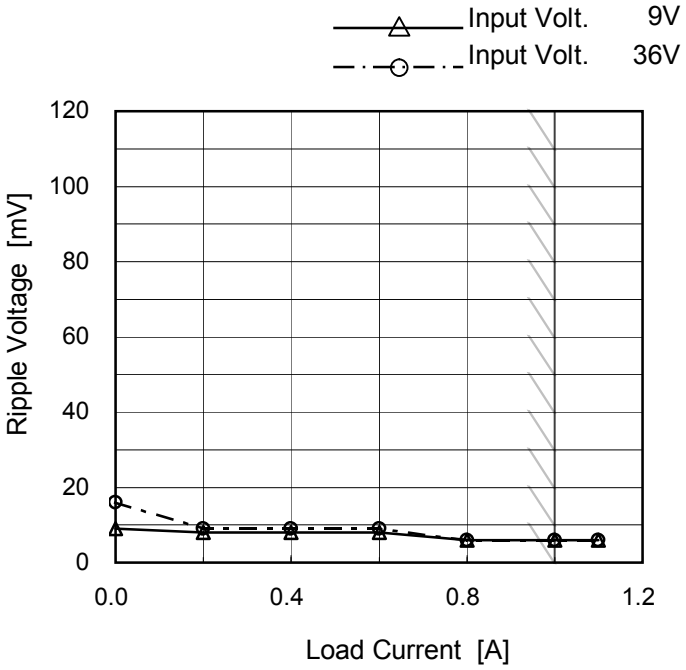
-15V: Rated output current

COSEL

Model	MGFW302415
Item	Ripple Voltage (by Load Current)
Object	-15V1A

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]

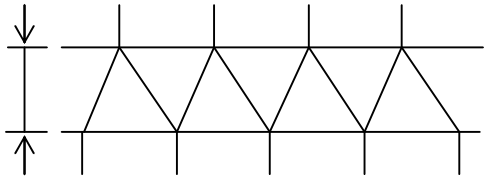


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	11	17
0.2	15	26
0.4	15	26
0.6	15	26
0.8	13	24
1.0	13	24
1.1	13	24
--	-	-
--	-	-
--	-	-
--	-	-

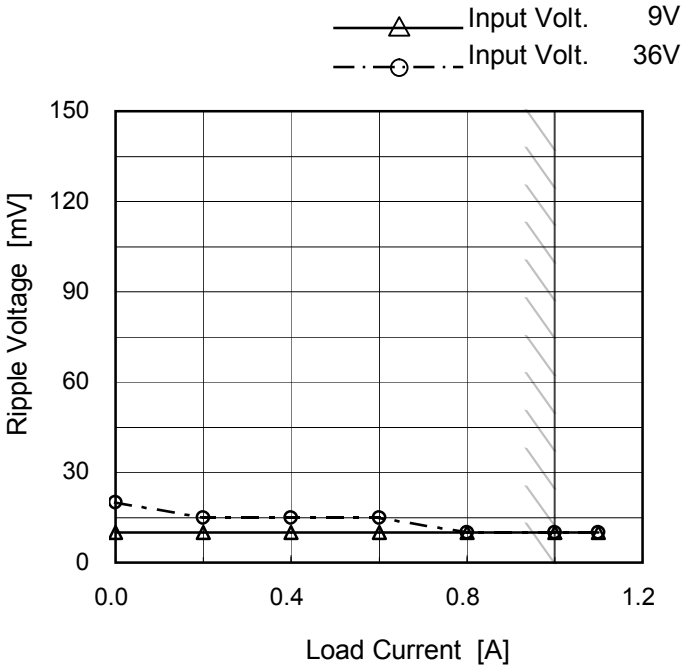
+15V: Rated output current

COSEL

Model	MGFW302415
Item	Ripple-Noise
Object	+15V1A

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.

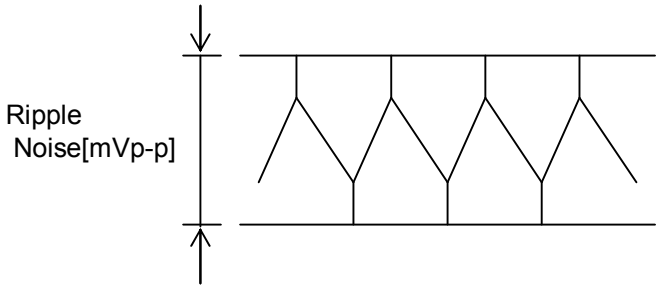


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	10	20
0.2	10	15
0.4	10	15
0.6	10	15
0.8	10	10
1.0	10	10
1.1	10	10
--	-	-
--	-	-
--	-	-
--	-	-

-15V: Rated output current

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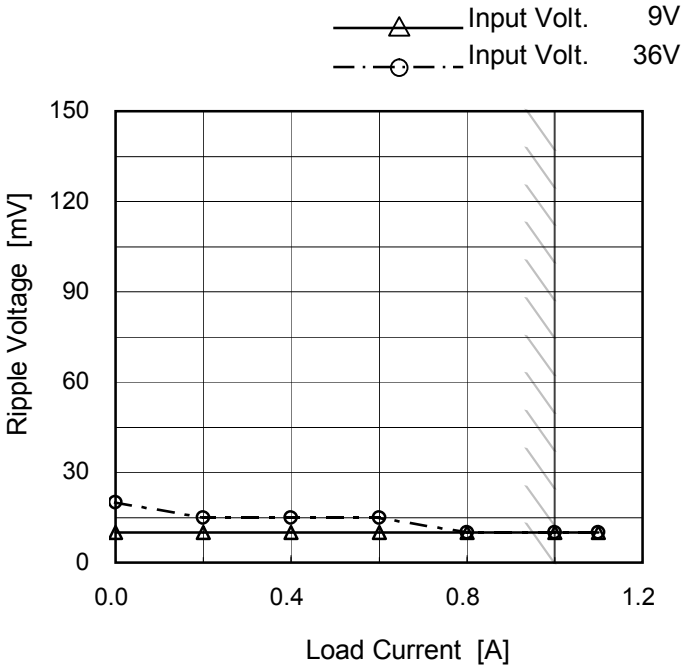
COSEL

Model	MGFW302415
Item	Ripple-Noise
Object	-15V1A

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.

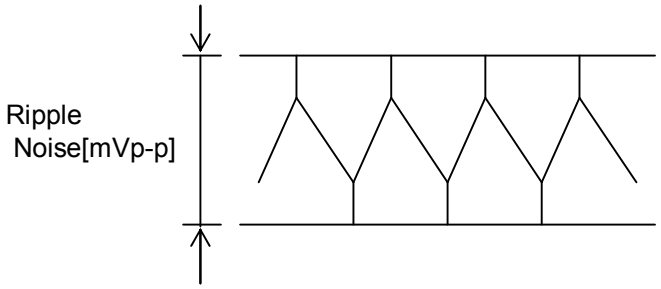


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.0	15	20
0.2	20	30
0.4	20	30
0.6	20	30
0.8	15	30
1.0	15	30
1.1	15	30
--	-	-
--	-	-
--	-	-
--	-	-

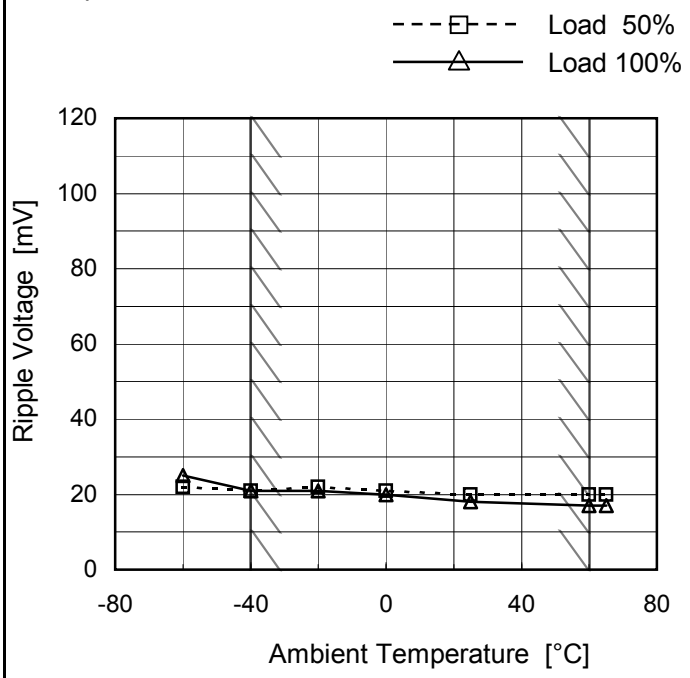
+15V: Rated output current

COSEL

Model	MGFW302415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V1A

Testing Circuitry Figure A

1.Graph



Input Volt. 24V

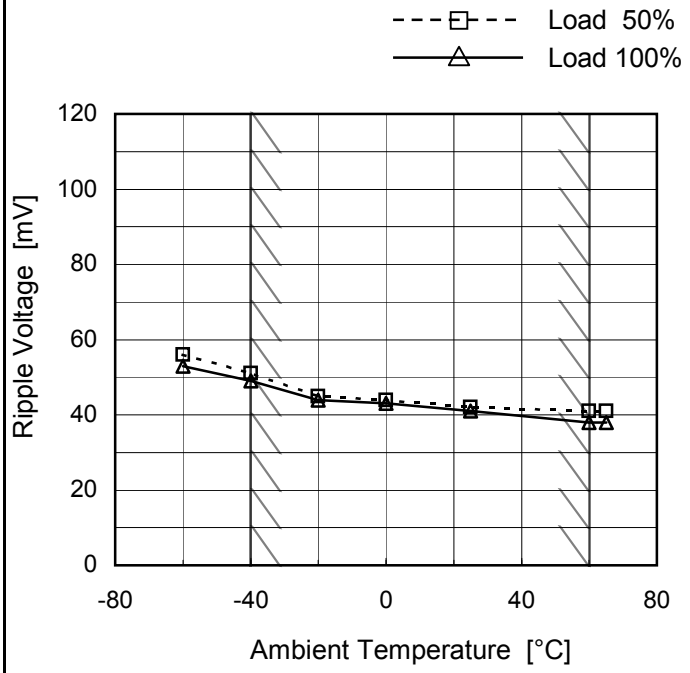
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	22	25
-40	21	21
-20	22	21
0	21	20
25	20	18
60	20	17
65	20	17
--	-	-
--	-	-
--	-	-
--	-	-

-15V: Rated output current

Object	-15V1A

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	56	53
-40	51	49
-20	45	44
0	44	43
25	42	41
60	41	38
65	41	38
--	-	-
--	-	-
--	-	-
--	-	-

+15V: Rated output current

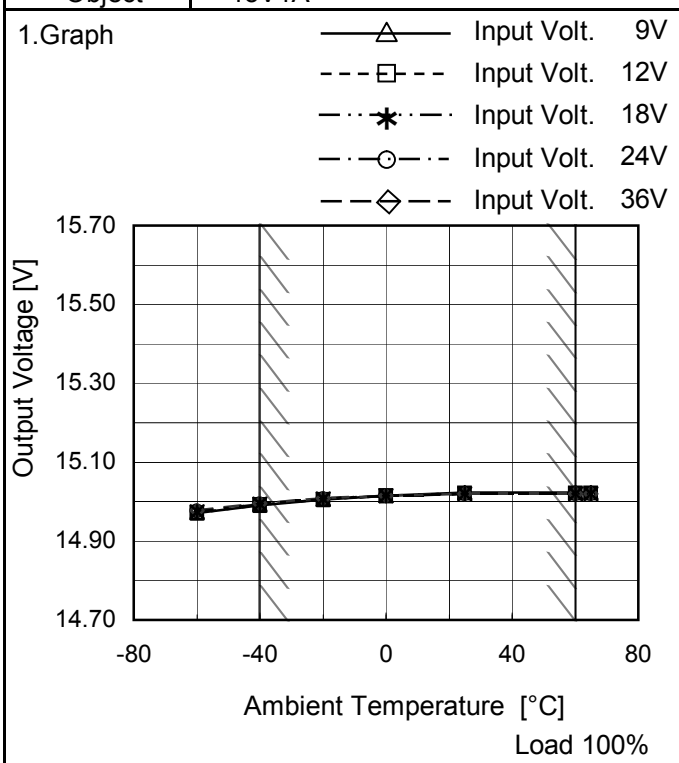
COSEL

Model	MGFW302415
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +15V1A

1.Graph

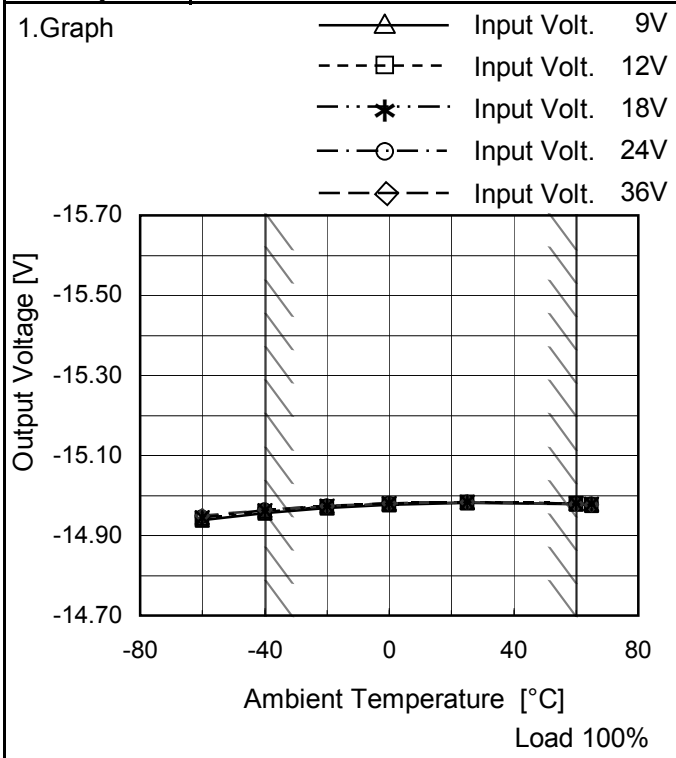


2.Values

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	14.971	14.972	14.974	14.976	14.978
-40	14.991	14.992	14.993	14.995	14.996
-20	15.005	15.005	15.006	15.007	15.008
0	15.015	15.015	15.014	15.015	15.016
25	15.022	15.021	15.020	15.020	15.021
60	15.023	15.022	15.020	15.020	15.020
65	15.022	15.021	15.020	15.019	15.019
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Object -15V1A

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	-14.938	-14.942	-14.946	-14.947	-14.949
-40	-14.957	-14.960	-14.963	-14.963	-14.965
-20	-14.969	-14.972	-14.974	-14.974	-14.974
0	-14.977	-14.979	-14.980	-14.980	-14.980
25	-14.981	-14.983	-14.984	-14.984	-14.983
60	-14.978	-14.980	-14.980	-14.980	-14.979
65	-14.975	-14.977	-14.979	-14.978	-14.977
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW302415	
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 : 9 - 36V
Load Current (AVR 1) : 0 - 1A (AVR 2) : 0 - 1A

* 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	+15V1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	36	0	15.845	±467	±3.1
Minimum Voltage	-40	9	1	14.911		

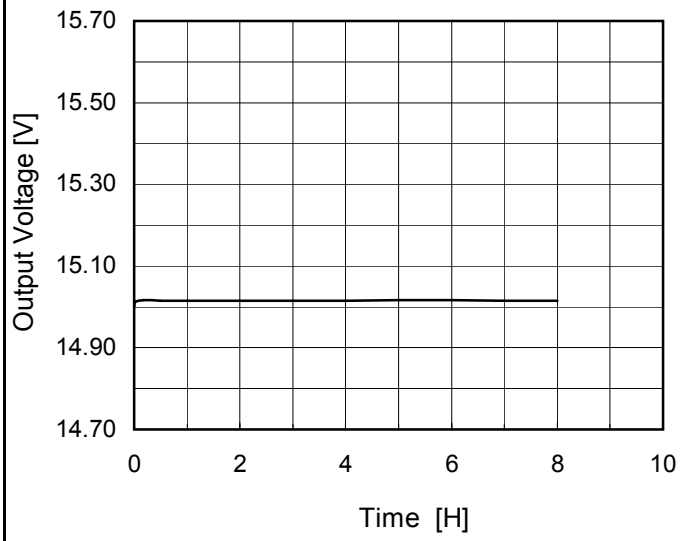
Object	-15V1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	36	0	-15.368	±206	±1.4
Minimum Voltage	-40	9	1	-14.957		

COSEL

Model	MGFW302415
Item	Time Lapse Drift
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



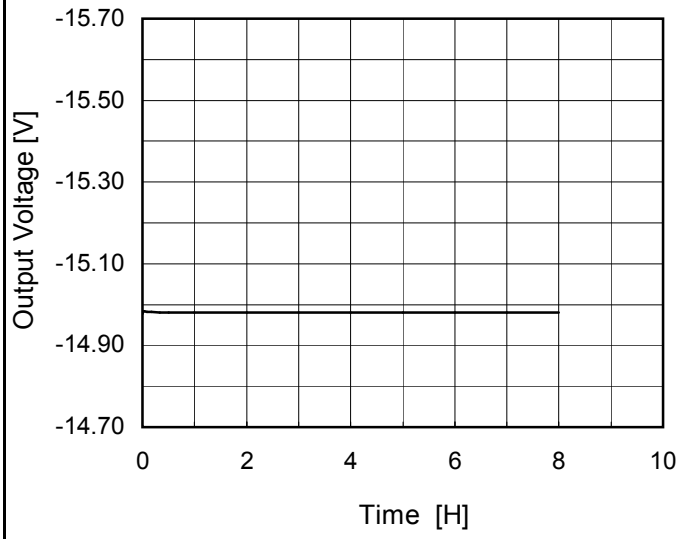
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.002
0.5	15.016
1.0	15.016
2.0	15.016
3.0	15.016
4.0	15.016
5.0	15.016
6.0	15.016
7.0	15.016
8.0	15.016

Object	-15V1A

1.Graph



Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-14.978
0.5	-14.981
1.0	-14.981
2.0	-14.981
3.0	-14.981
4.0	-14.981
5.0	-14.981
6.0	-14.981
7.0	-14.981
8.0	-14.981

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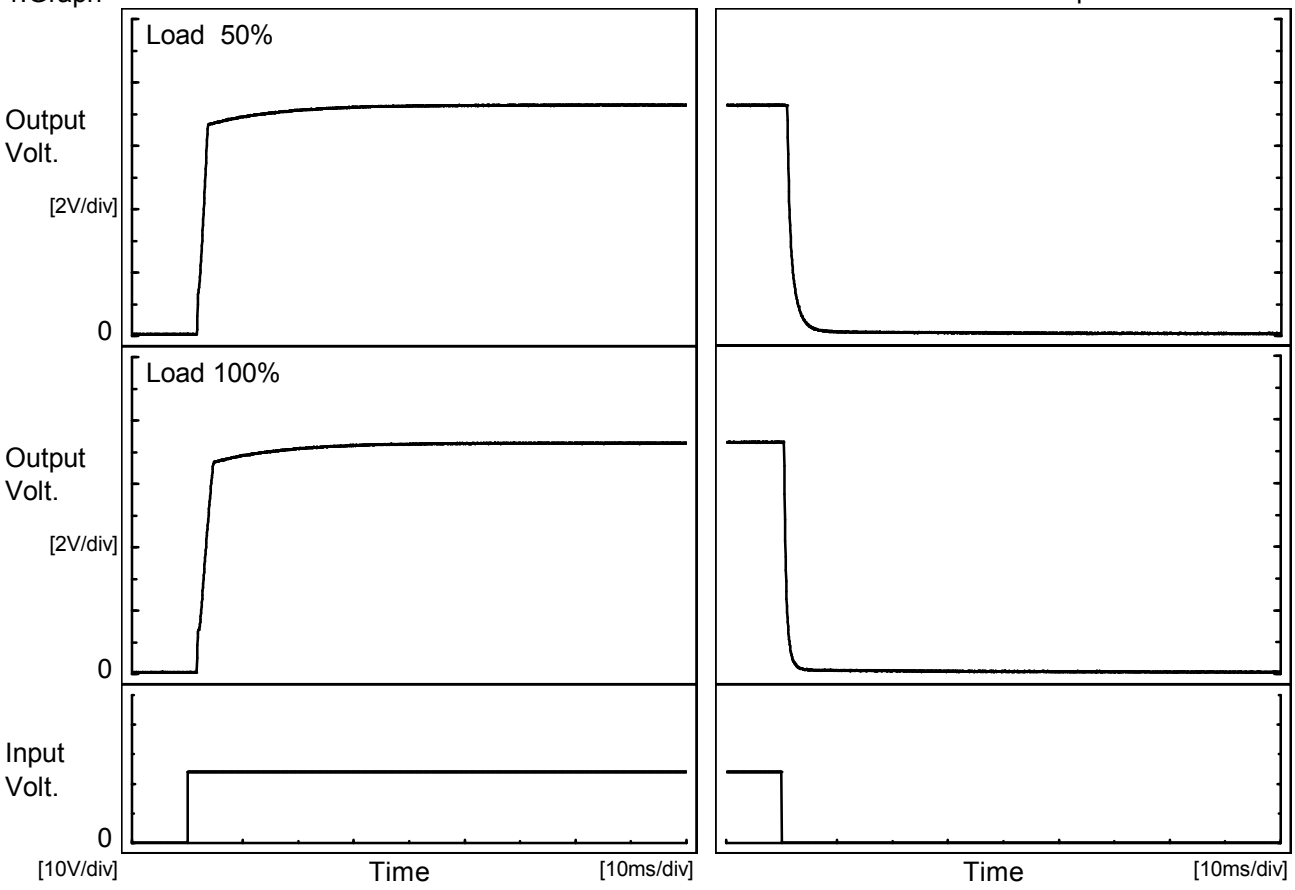
COSEL

Model	MGFW302415	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V1A	

1.Graph

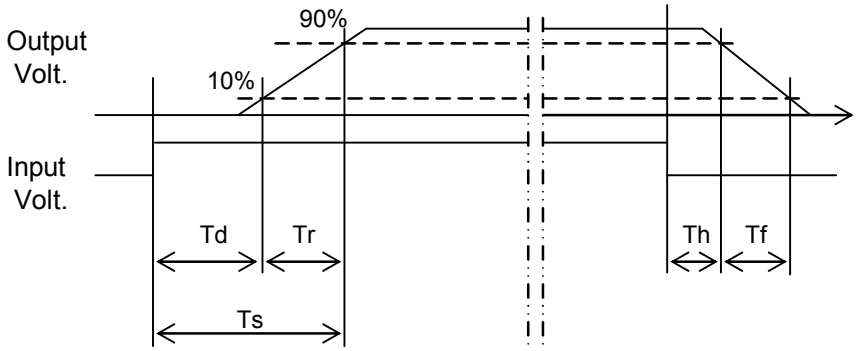
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.9	4.6	6.5	1.0	2.2
100 %	1.8	5.4	7.2	0.5	1.1



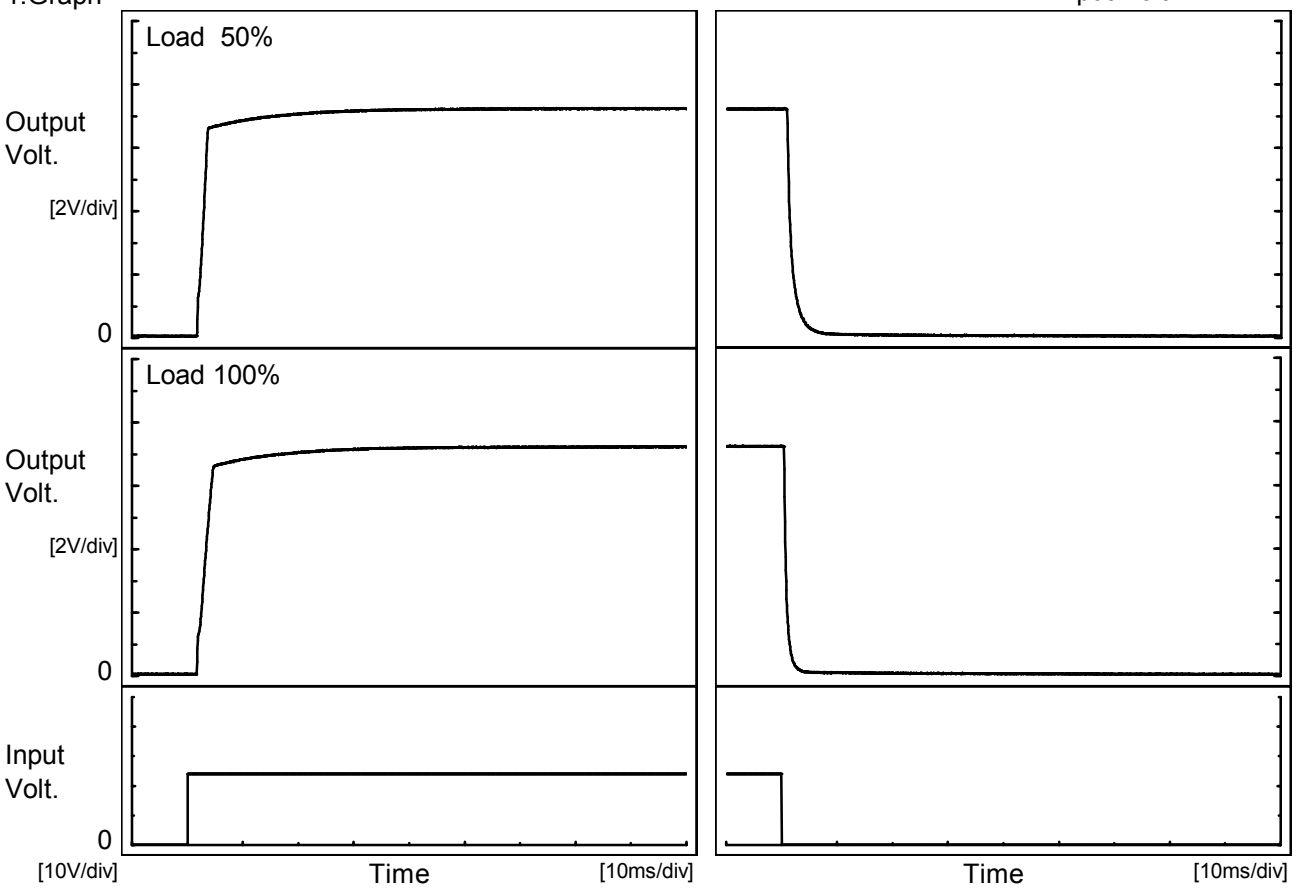
COSEL

Model	MGFW302415
Item	Rise and Fall Time
Object	-15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

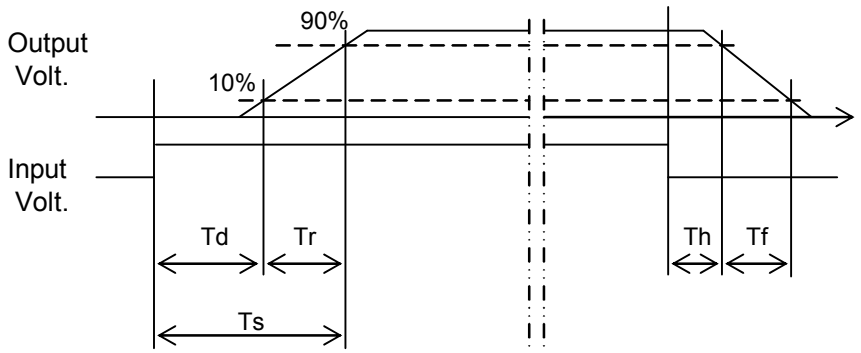
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.9	5.7	7.6	0.9	2.3
100 %	1.8	6.6	8.4	0.5	1.2



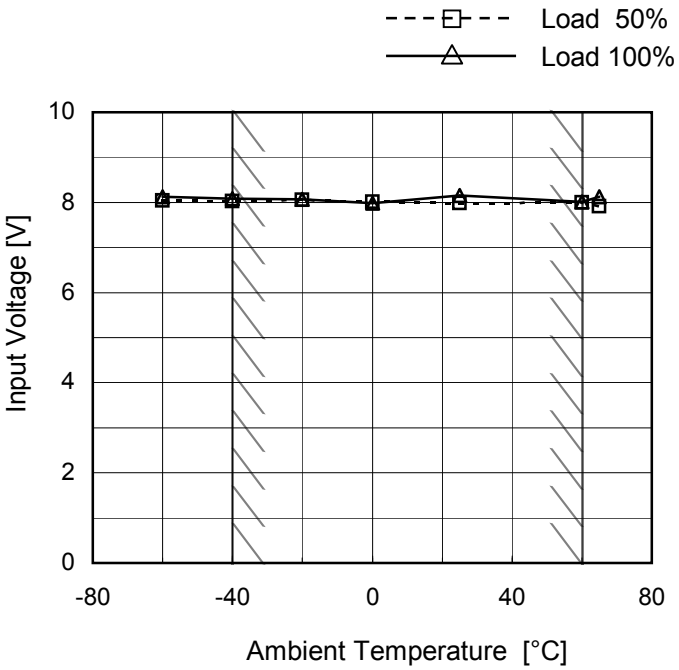
BC-10532

COSEL

Model	MGFW302415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V1A

Testing Circuitry Figure A

1.Graph

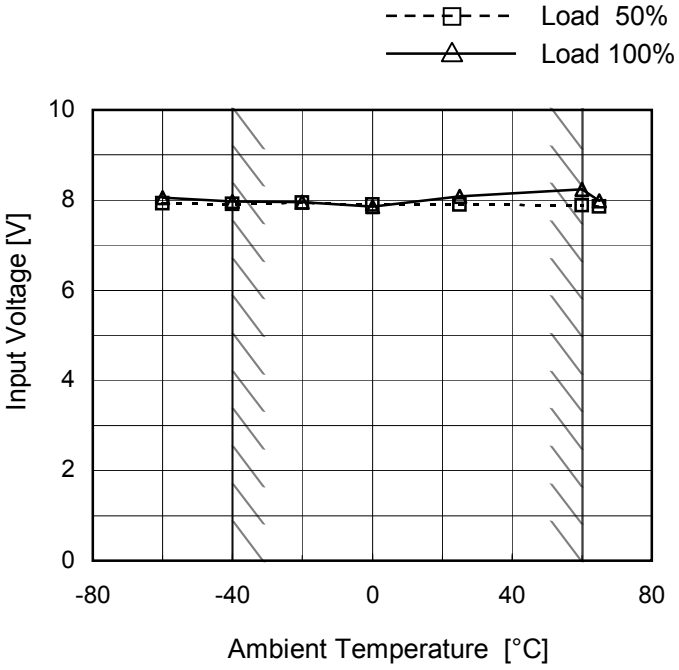


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	8.1	8.2
-40	8.1	8.1
-20	8.1	8.1
0	8.1	8.0
25	8.0	8.2
60	8.0	8.1
65	8.0	8.2
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V1A

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	8.0	8.1
-40	8.0	8.0
-20	8.0	8.0
0	7.9	7.9
25	7.9	8.1
60	7.9	8.3
65	7.9	8.0
--	-	-
--	-	-
--	-	-
--	-	-

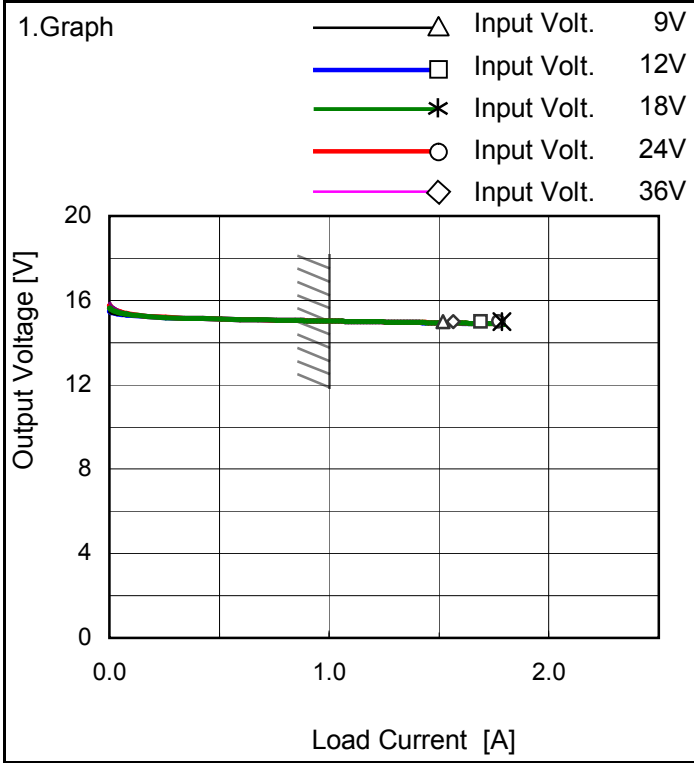
COSEL

Model	MGFW302415
Item	Overcurrent Protection

Temperature 25°C
Testing Circuitry Figure A

Object +15V1A

1.Graph

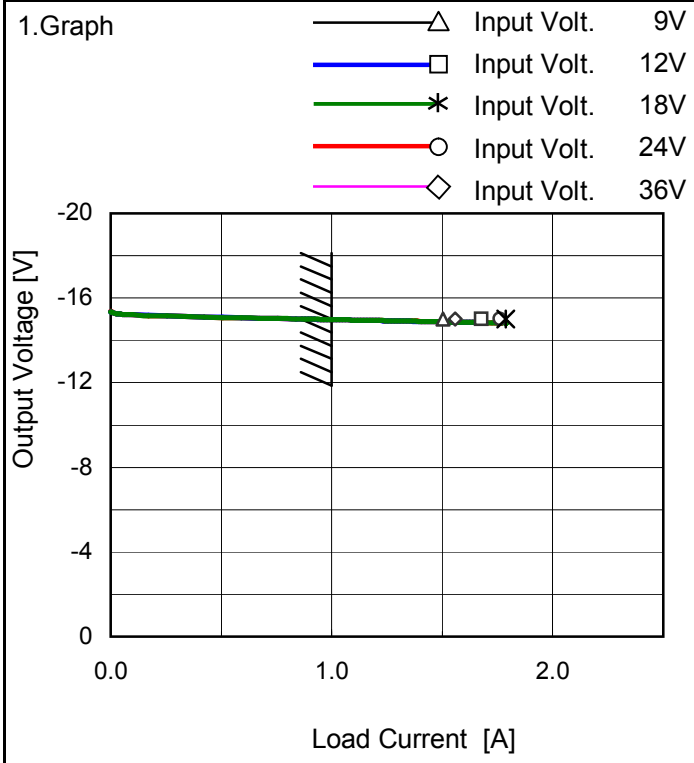


2.Values

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	1.519	1.689	1.786	1.772	1.564
14.3	-	-	-	-	-
13.5	-	-	-	-	-
12.0	-	-	-	-	-
10.5	-	-	-	-	-
9.0	-	-	-	-	-
7.5	-	-	-	-	-
6.0	-	-	-	-	-
4.5	-	-	-	-	-
3.0	-	-	-	-	-
1.5	-	-	-	-	-
0.0	-	-	-	-	-

Object -15V1A

1.Graph



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

2.Values

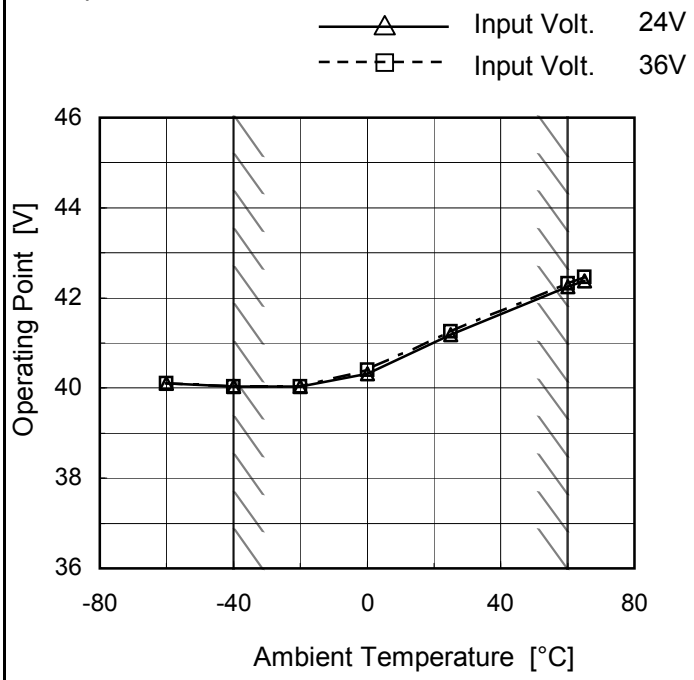
Output Voltage [V]	Load Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-15.0	1.505	1.677	1.787	1.760	1.557
-14.3	-	-	-	-	-
-13.5	-	-	-	-	-
-12.0	-	-	-	-	-
-10.5	-	-	-	-	-
-9.0	-	-	-	-	-
-7.5	-	-	-	-	-
-6.0	-	-	-	-	-
-4.5	-	-	-	-	-
-3.0	-	-	-	-	-
-1.5	-	-	-	-	-
0.0	-	-	-	-	-

COSEL

Model	MGFW302415
Item	Overvoltage Protection
Object	+30V1A

Testing Circuitry Figure A

1.Graph



Load 0%

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

Measured as a single output(+30V).

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 24[V]	Input Volt. 36[V]
-60	40.10	40.10
-40	40.03	40.03
-20	40.03	40.03
0	40.32	40.40
25	41.18	41.25
60	42.24	42.31
65	42.38	42.46
--	-	-
--	-	-
--	-	-
--	-	-

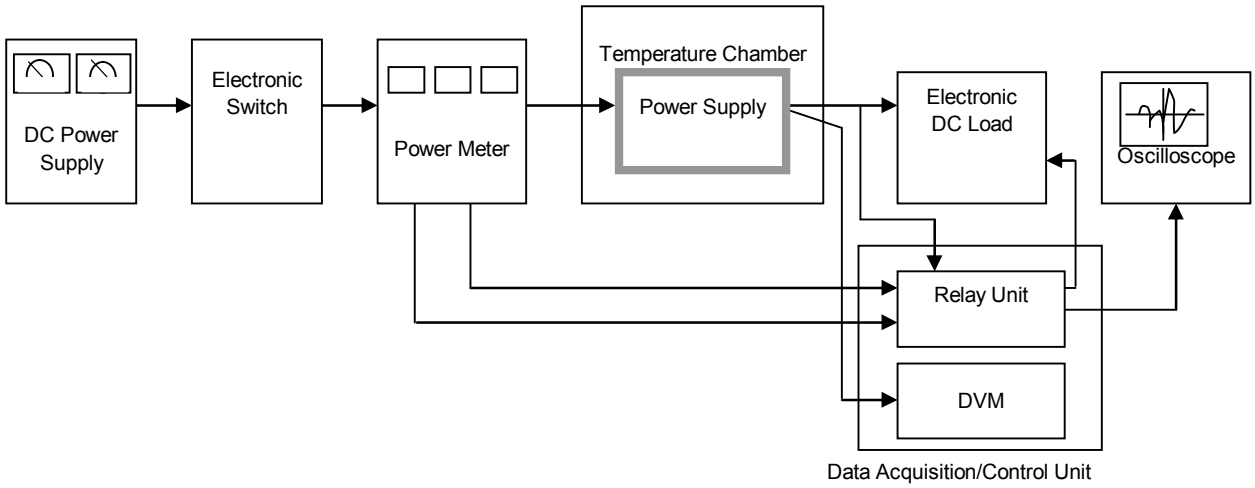


Figure A

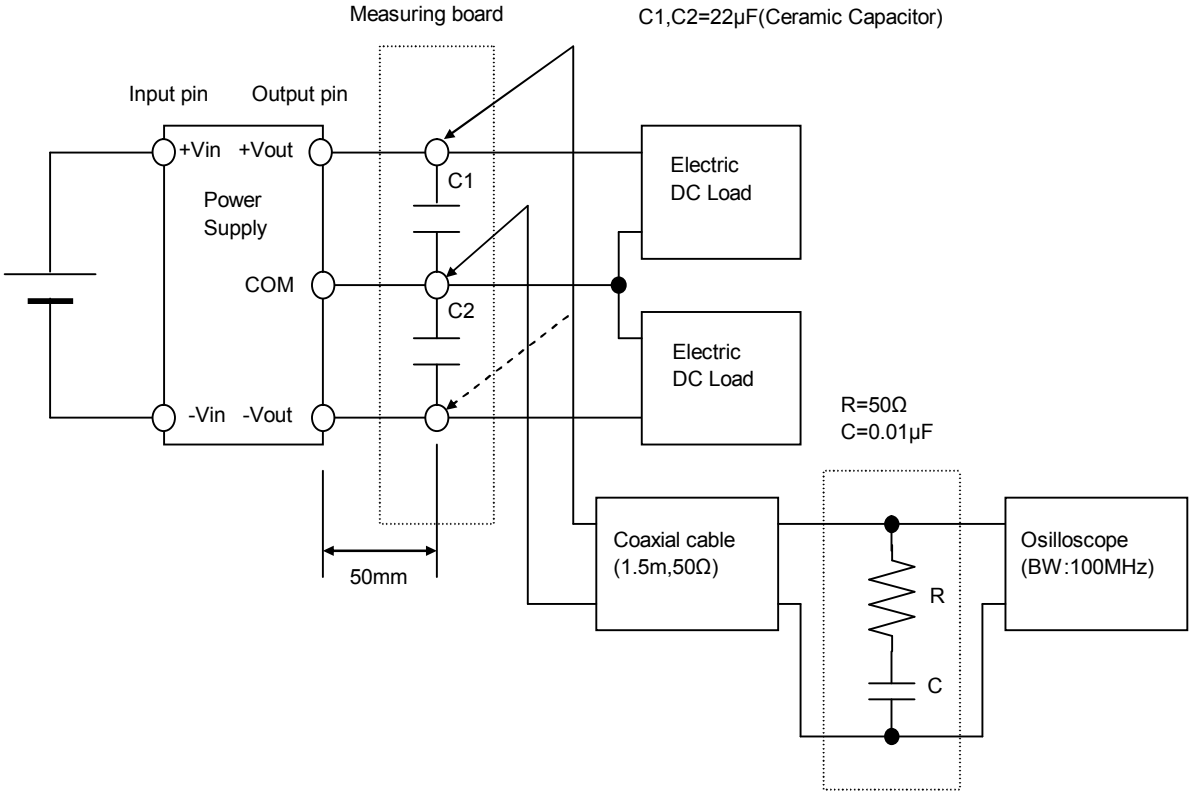


Figure B（Ripple and Ripple noise Characteristic）