COSEL

参考資料

TEST DATA OF MGW302415

Regulated DC Power Supply
December 13, 2010

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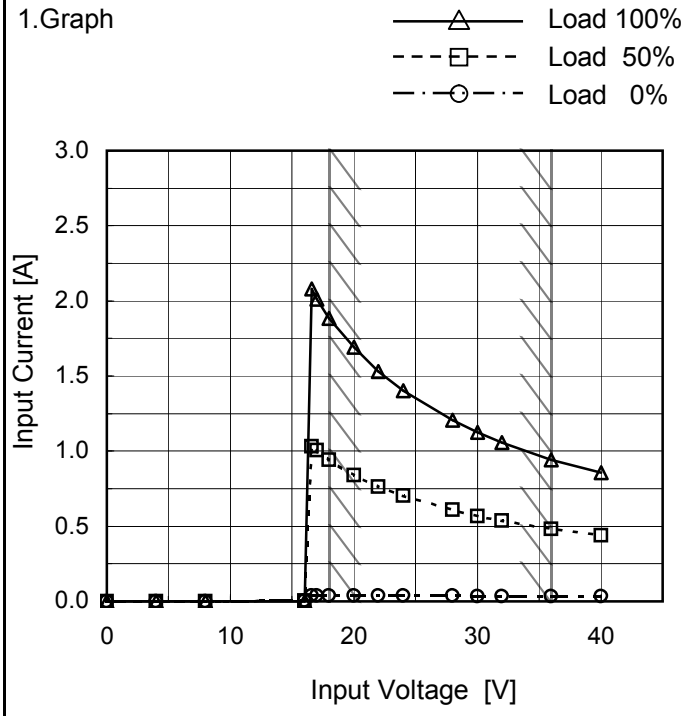
Model	MGW302415
Item	Input Current (by Input Voltage)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated input voltage.

2.Values

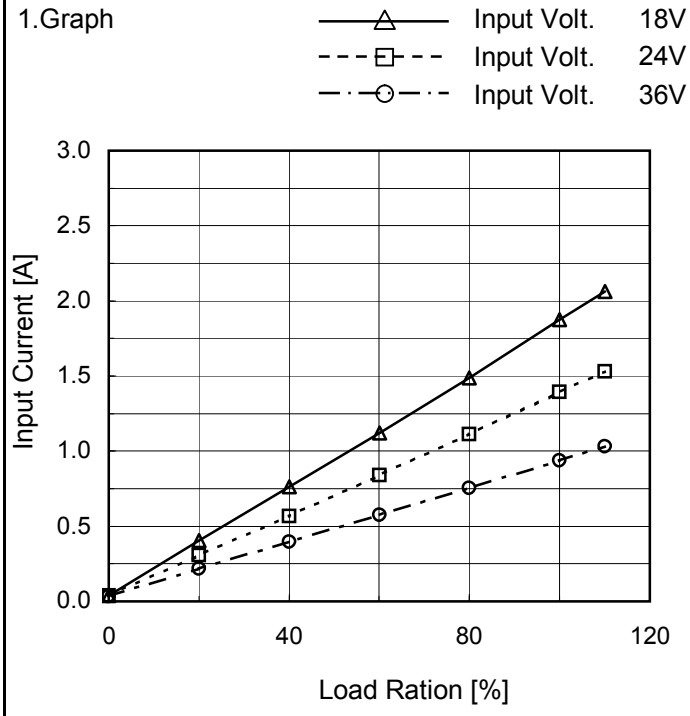
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
4.0	0.001	0.001	0.001
8.0	0.002	0.002	0.002
16.0	0.002	0.002	0.002
16.6	0.039	1.033	2.081
17.0	0.039	1.004	2.011
18.0	0.039	0.941	1.885
20.0	0.038	0.840	1.692
22.0	0.038	0.762	1.530
24.0	0.038	0.703	1.402
28.0	0.037	0.608	1.206
30.0	0.036	0.568	1.123
32.0	0.035	0.536	1.056
36.0	0.034	0.483	0.944
40.0	0.034	0.440	0.855
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW302415
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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.039	0.038	0.034
20	0.406	0.306	0.218
40	0.762	0.569	0.396
60	1.123	0.839	0.575
80	1.489	1.111	0.753
100	1.875	1.392	0.937
110	2.062	1.528	1.030
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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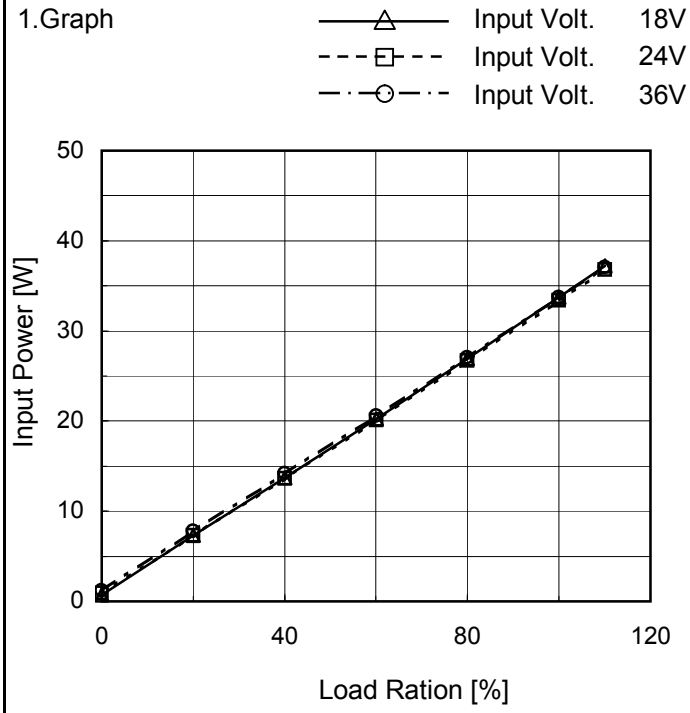
Model	MGW302415
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

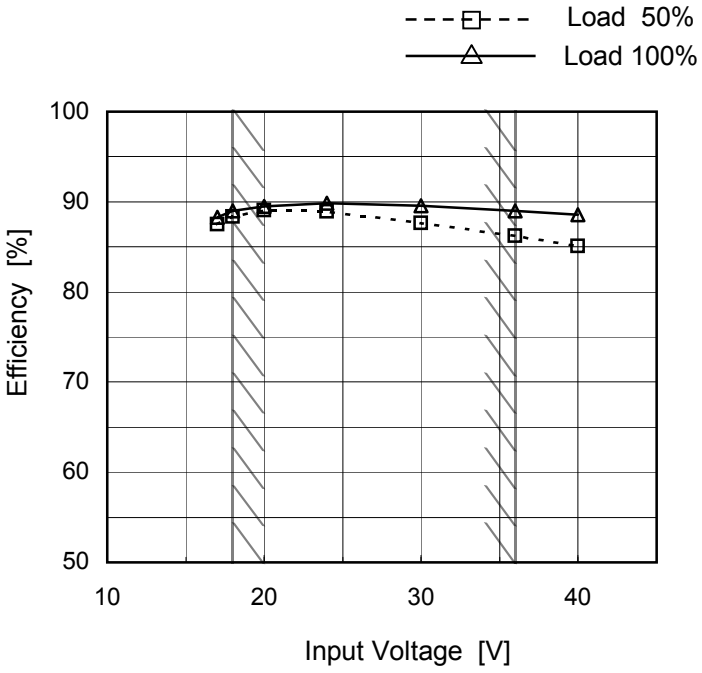
Load Ration [%]	Input Power [W]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.70	0.91	1.24
20	7.29	7.34	7.84
40	13.70	13.67	14.23
60	20.23	20.11	20.61
80	26.90	26.69	27.09
100	33.72	33.39	33.73
110	37.20	36.77	37.07
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW302415
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

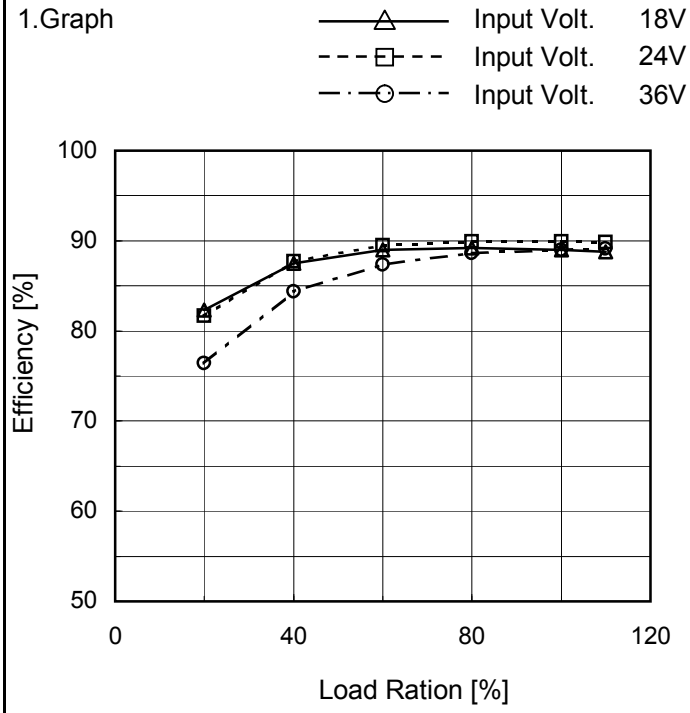
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	87.5	88.3
18	88.3	89.0
20	89.0	89.5
24	88.9	89.9
30	87.6	89.5
36	86.2	89.0
40	85.1	88.6
--	-	-
--	-	-

COSEL

Model	MGW302415
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

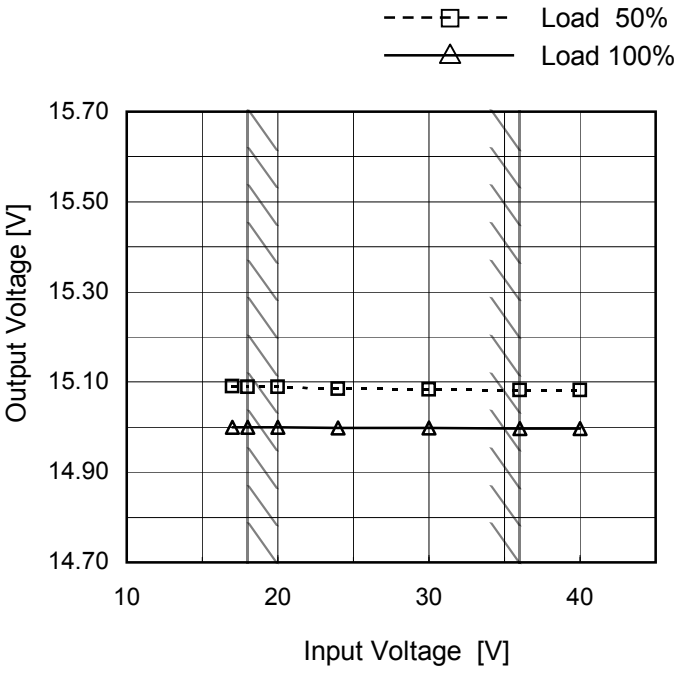
Load Ration [%]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-
20	82.3	81.7	76.4
40	87.5	87.7	84.3
60	89.0	89.5	87.3
80	89.2	89.9	88.7
100	89.0	89.9	89.0
110	88.8	89.8	89.1
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW302415
Item	Line Regulation
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



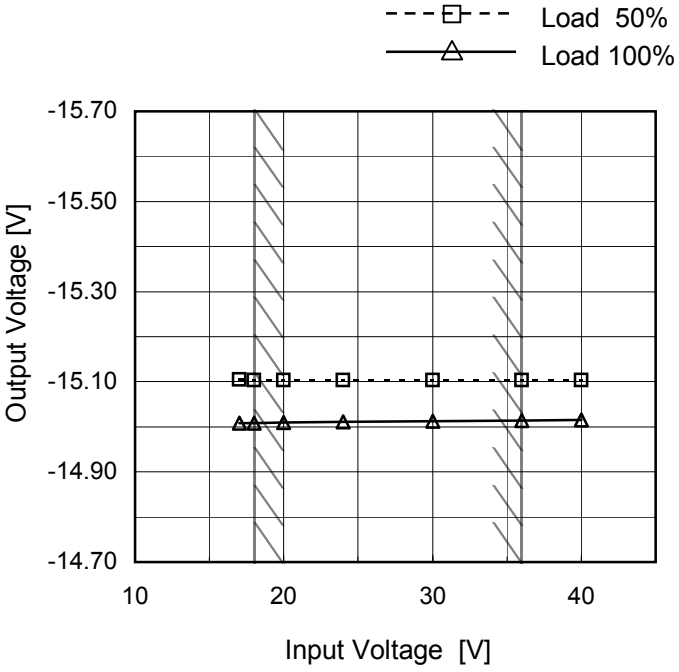
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	15.091	15.000
18	15.090	15.000
20	15.089	15.000
24	15.086	14.999
30	15.083	14.998
36	15.082	14.997
40	15.082	14.997
--	-	-
--	-	-

-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%
17	-15.105	-15.008
18	-15.104	-15.009
20	-15.104	-15.010
24	-15.103	-15.011
30	-15.103	-15.013
36	-15.104	-15.015
40	-15.104	-15.015
--	-	-
--	-	-

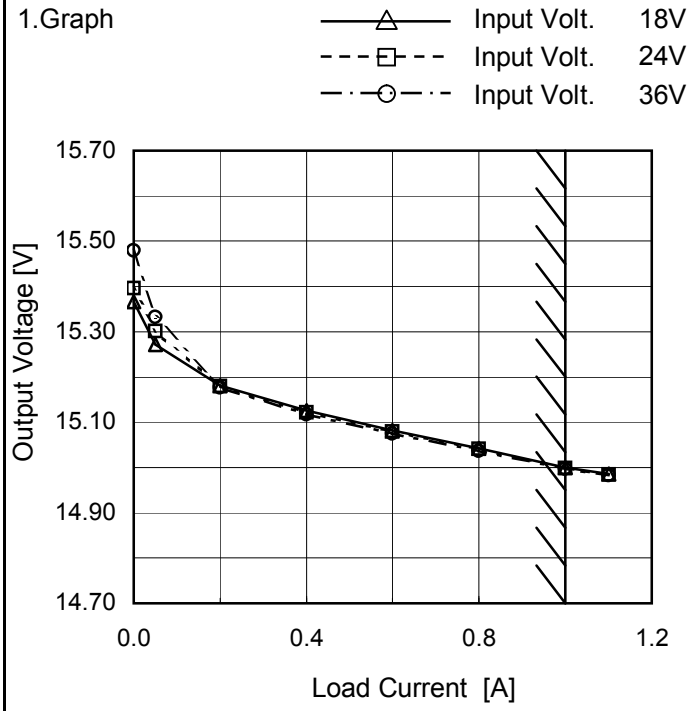
+15V: Rated output current

COSEL

Model	MGW302415
Item	Load Regulation
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



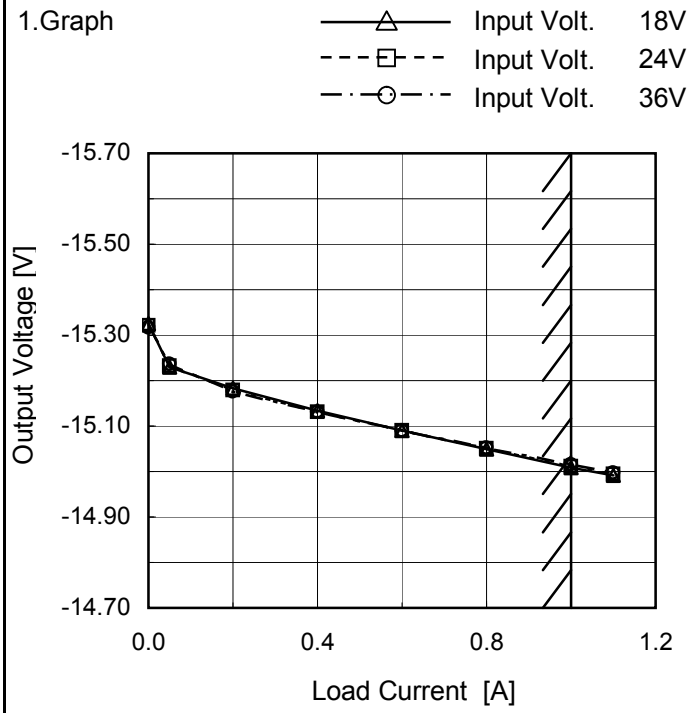
2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	15.367	15.396	15.479
0.05	15.272	15.301	15.332
0.20	15.181	15.179	15.176
0.40	15.126	15.121	15.117
0.60	15.083	15.079	15.075
0.80	15.043	15.041	15.037
1.00	15.000	14.999	14.997
1.10	14.985	14.984	14.982
--	-	-	-
--	-	-	-
--	-	-	-

-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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	-15.325	-15.321	-15.317
0.05	-15.230	-15.233	-15.236
0.20	-15.183	-15.179	-15.177
0.40	-15.133	-15.131	-15.130
0.60	-15.090	-15.090	-15.090
0.80	-15.050	-15.051	-15.053
1.00	-15.009	-15.011	-15.015
1.10	-14.992	-14.995	-14.998
--	-	-	-
--	-	-	-
--	-	-	-

+15V: Rated output current

COSEL

Model	MGW301215
Item	Dynamic Load Response
Object	+15V1A

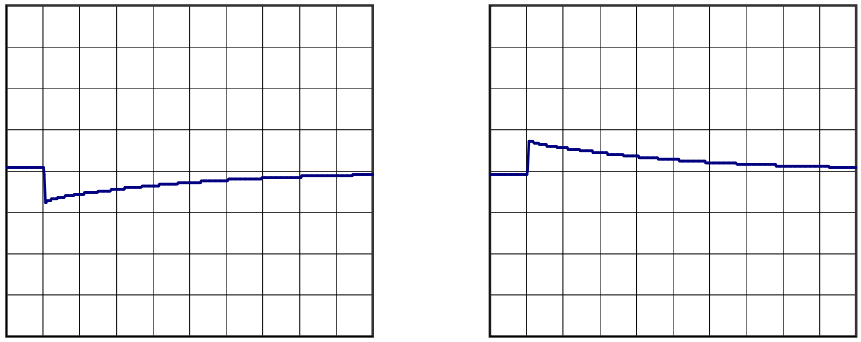
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 12 V
Other output current rated
Cycle 1000 ms

t_1、t_2 = 50μs

Load Current

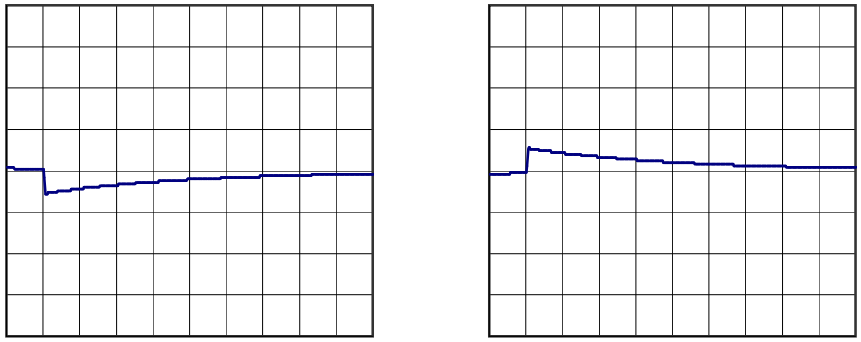
Min. Load (0A) ←→
Load 100% (1A)



500mV/div

50ms/div 50ms/div

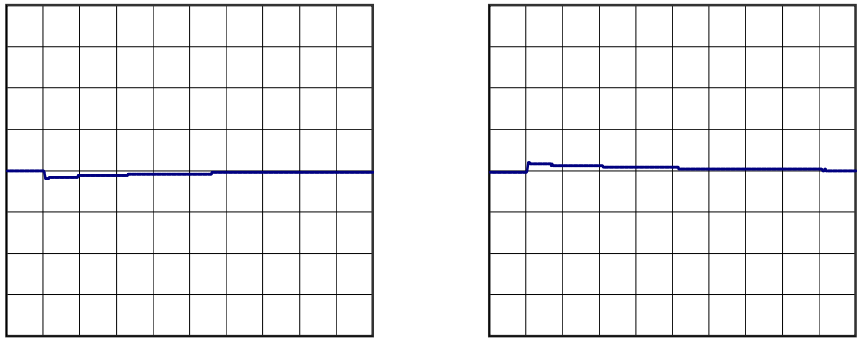
Min. Load (0A) ←→
Load 50% (0.5A)



500mV/div

50ms/div 50ms/div

Load 50% (0.5A) ←→
Load 100% (1A)



500mV/div

50ms/div 50ms/div

COSEL

Model	MGW301215
Item	Dynamic Load Response
Object	-15V1A

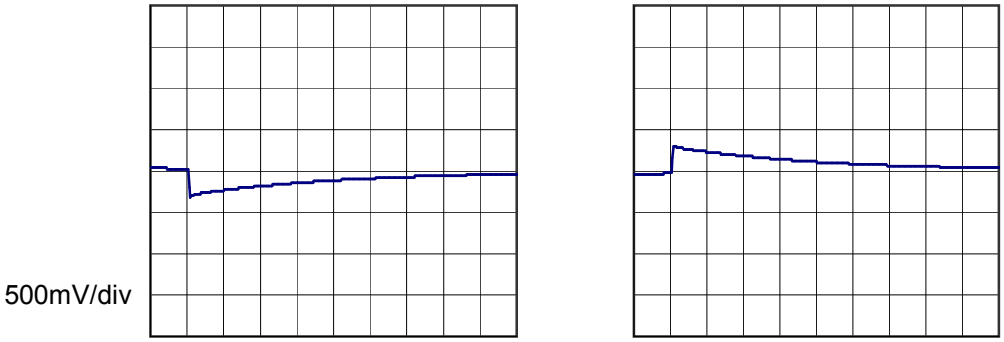
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 12 V
Other output current rated
Cycle 1000 ms

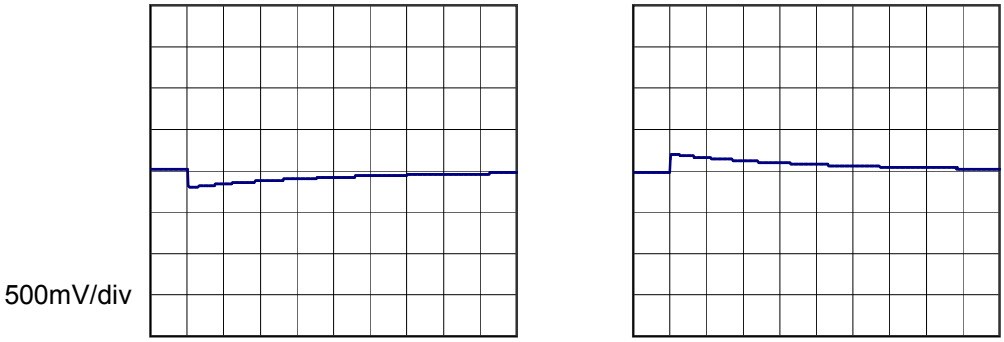
t_1、t_2 = 50μs

Load Current

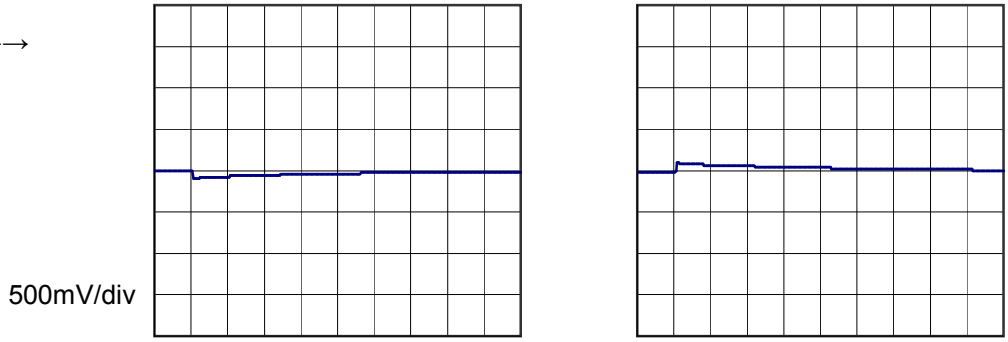
Min. Load (0A) ⟷ Load 100% (1A)



Min. Load (0A) ⟷ Load 50% (0.5A)



Load 50% (0.5A) ⟷ Load 100% (1A)



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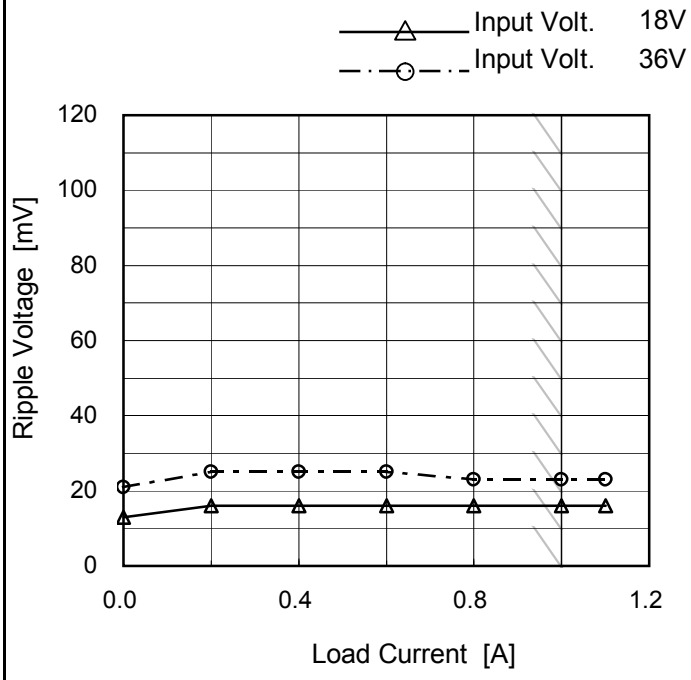
Model	MGW302415
Item	Ripple Voltage (by Load Current)
Object	+15V1A

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.

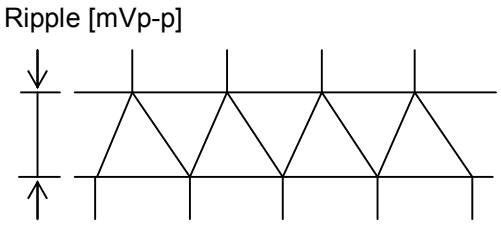


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	13	21
0.2	16	25
0.4	16	25
0.6	16	25
0.8	16	23
1.0	16	23
1.1	16	23
--	-	-
--	-	-
--	-	-
--	-	-

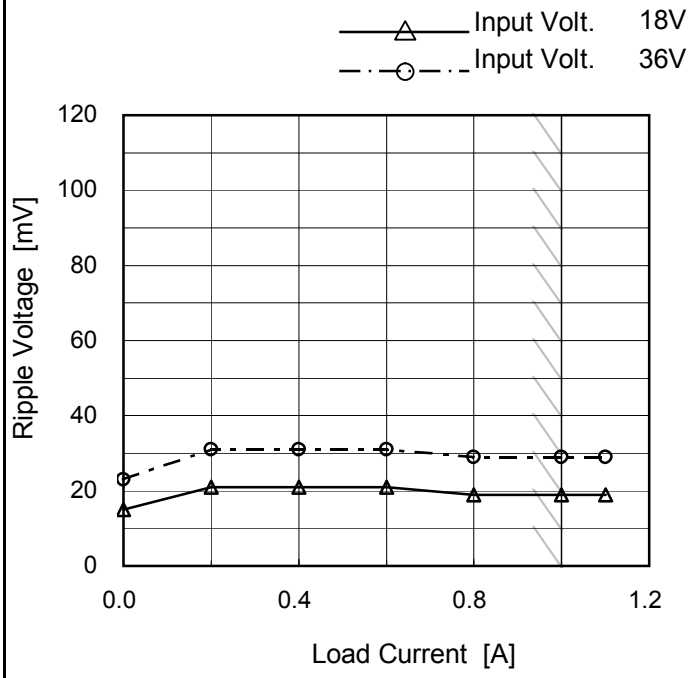
-15V: Rated output current

COSEL

Model	MGW302415
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.

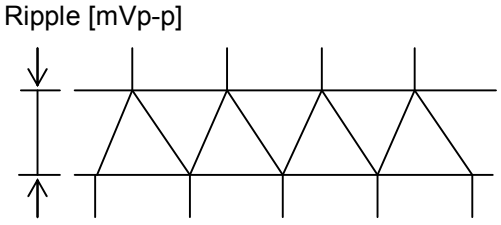


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	15	23
0.2	21	31
0.4	21	31
0.6	21	31
0.8	19	29
1.0	19	29
1.1	19	29
--	-	-
--	-	-
--	-	-
--	-	-

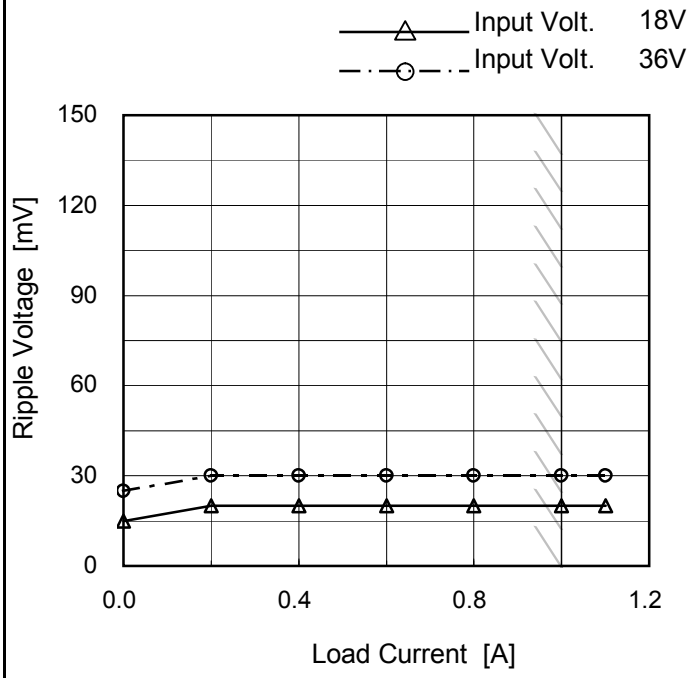
+15V: Rated output current

COSEL

Model	MGW302415
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.

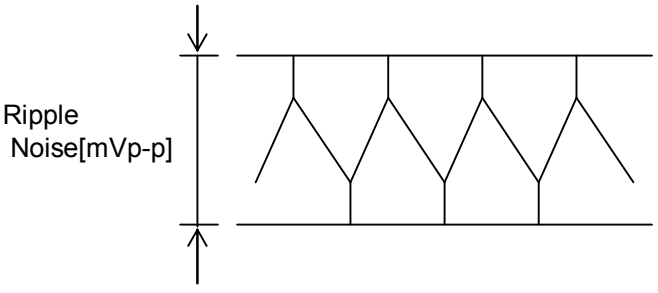


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	15	25
0.2	20	30
0.4	20	30
0.6	20	30
0.8	20	30
1.0	20	30
1.1	20	30
--	-	-
--	-	-
--	-	-
--	-	-

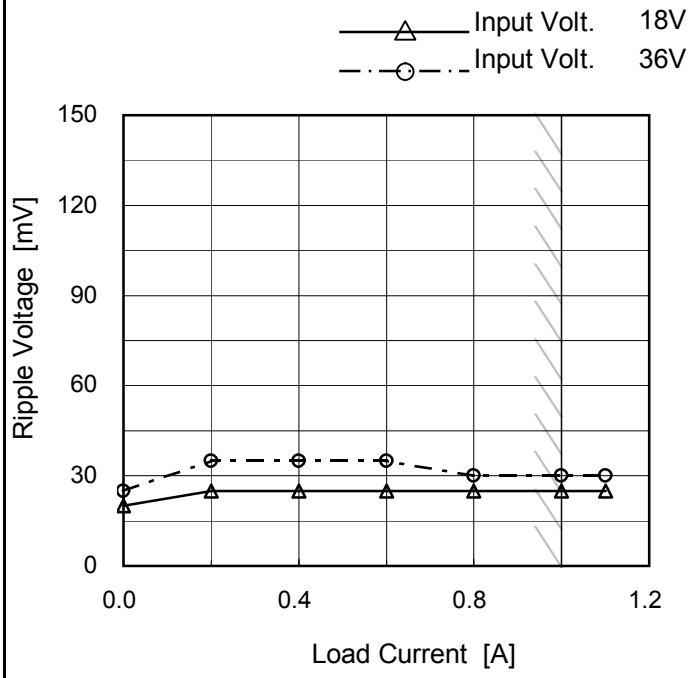
-15V: Rated output current

COSEL

Model	MGW302415
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.

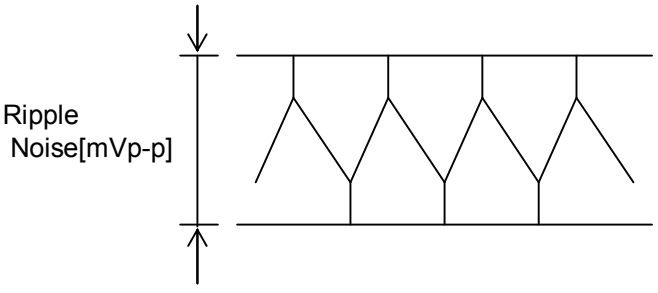


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	20	25
0.2	25	35
0.4	25	35
0.6	25	35
0.8	25	30
1.0	25	30
1.1	25	30
--	-	-
--	-	-
--	-	-
--	-	-

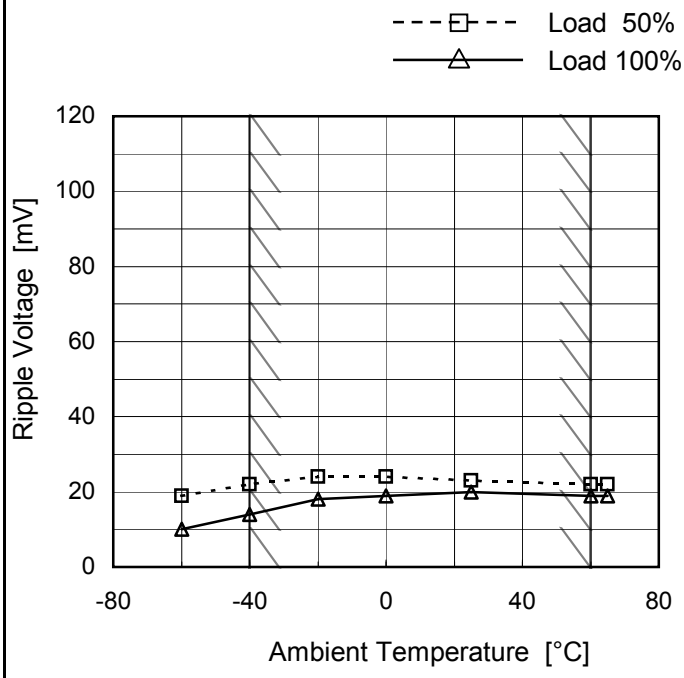
+15V: Rated output current

COSEL

Model	MGW302415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V1A

Testing Circuitry Figure A

1.Graph



Input Volt. 24V

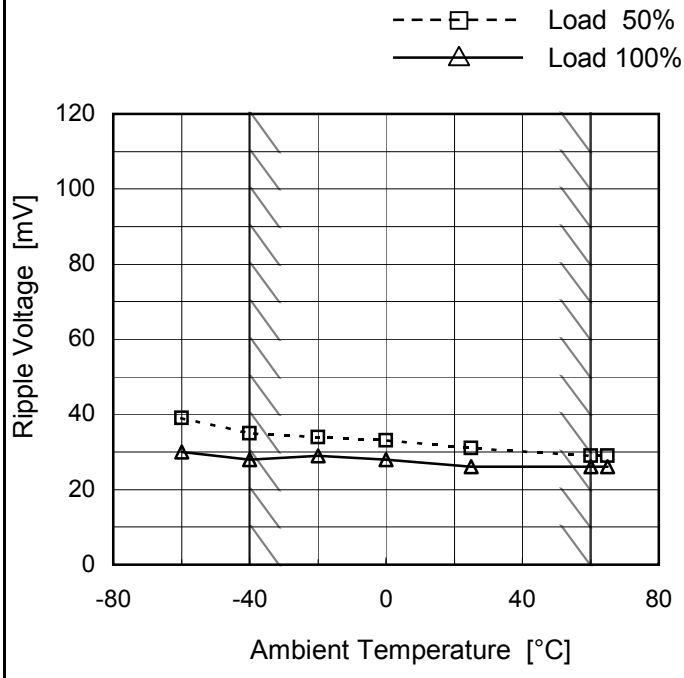
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	19	10
-40	22	14
-20	24	18
0	24	19
25	23	20
60	22	19
65	22	19
--	-	-
--	-	-
--	-	-
--	-	-

-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	39	30
-40	35	28
-20	34	29
0	33	28
25	31	26
60	29	26
65	29	26
--	-	-
--	-	-
--	-	-
--	-	-

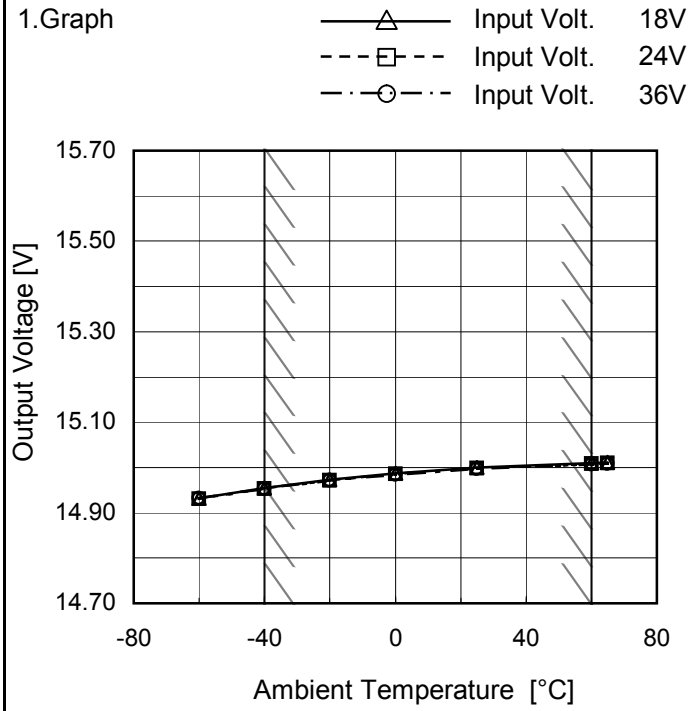
+15V: Rated output current

COSEL

Model	MGW302415
Item	Ambient Temperature Drift
Object	+15V1A

Testing Circuitry Figure A

1.Graph



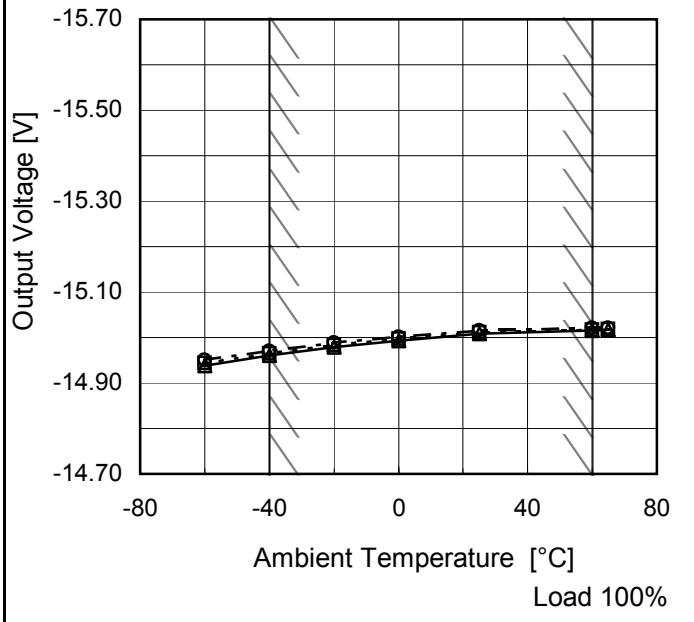
Load 100%

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	14.931	14.931	14.932
-40	14.954	14.953	14.953
-20	14.973	14.972	14.971
0	14.987	14.986	14.985
25	15.000	14.999	14.997
60	15.010	15.009	15.007
65	15.011	15.010	15.008
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V1A

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]
-60	-14.938	-14.943	-14.950
-40	-14.960	-14.965	-14.971
-20	-14.979	-14.983	-14.988
0	-14.993	-14.997	-15.001
25	-15.009	-15.011	-15.015
60	-15.015	-15.018	-15.021
65	-15.016	-15.019	-15.022
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MGW302415	
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 : 18 - 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	15.482	±265	±1.8
Minimum Voltage	-40	24	1	14.953		

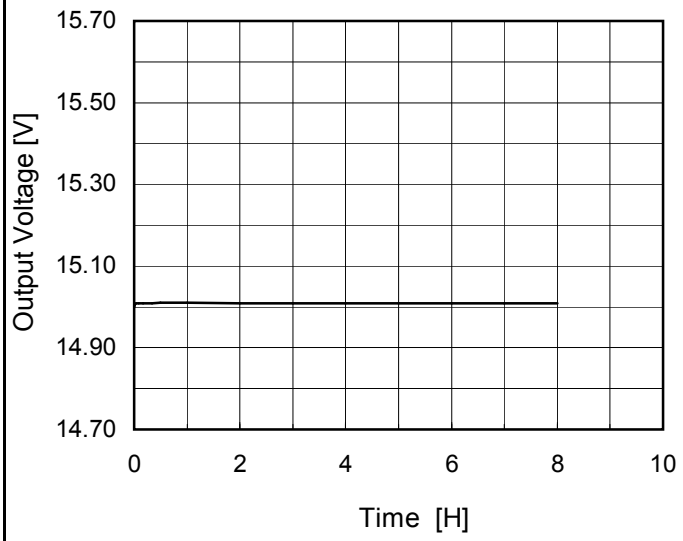
Object	-15V1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	18	0	-15.331	±186	±1.2
Minimum Voltage	-40	18	1	-14.960		

COSEL

Model	MGW302415
Item	Time Lapse Drift
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



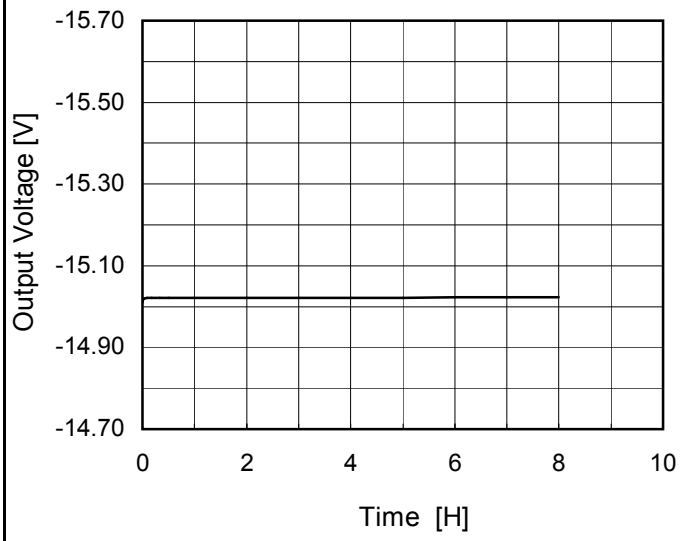
Input Volt. 12V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	14.999
0.5	15.010
1.0	15.010
2.0	15.010
3.0	15.009
4.0	15.009
5.0	15.009
6.0	15.009
7.0	15.009
8.0	15.009

Object	-15V1A

1.Graph



Input Volt. 12V
Load 100%

2.Values

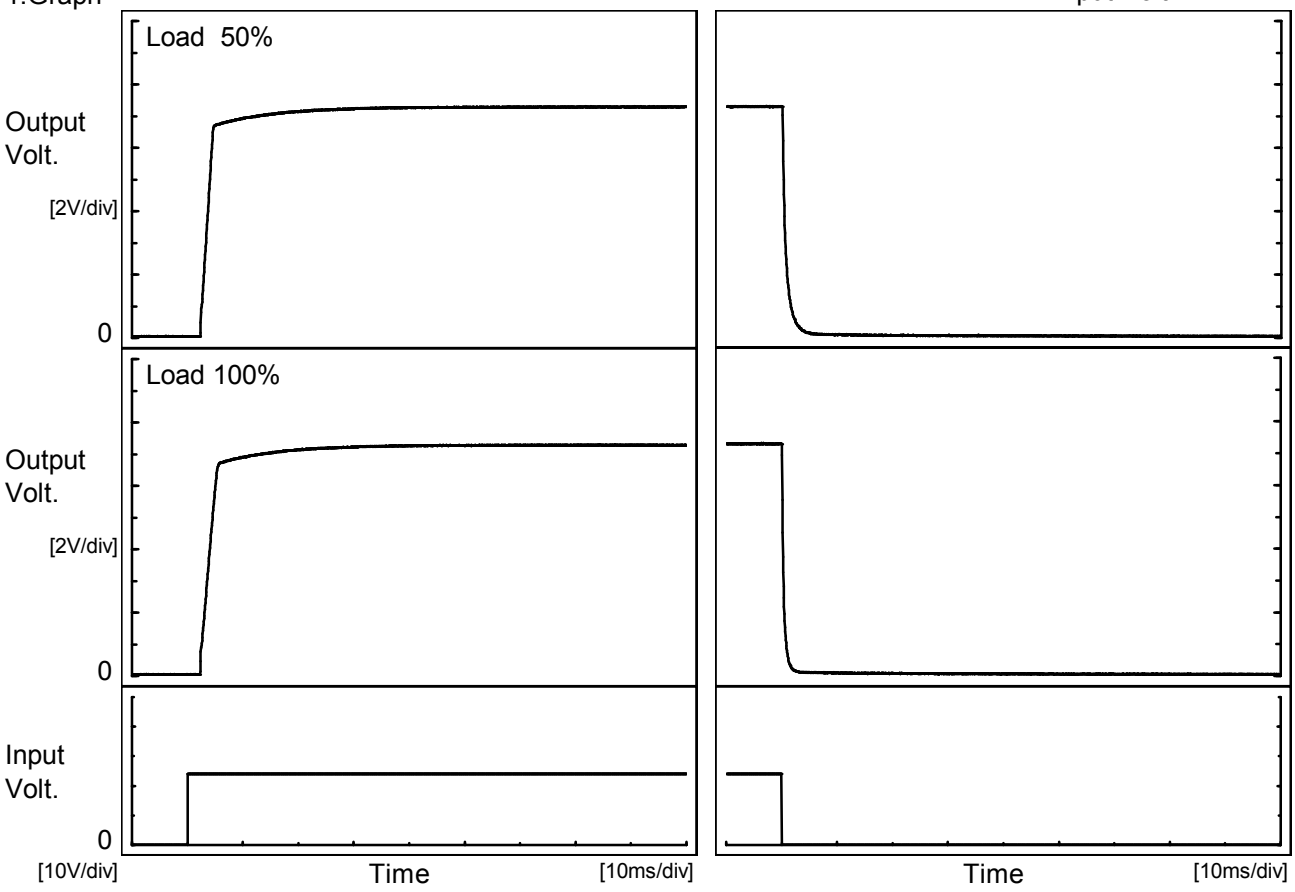
Time since start [H]	Output Voltage [V]
0.0	-15.011
0.5	-15.022
1.0	-15.022
2.0	-15.022
3.0	-15.022
4.0	-15.022
5.0	-15.022
6.0	-15.022
7.0	-15.022
8.0	-15.022

COSEL

Model	MGW302415	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V1A	

1.Graph

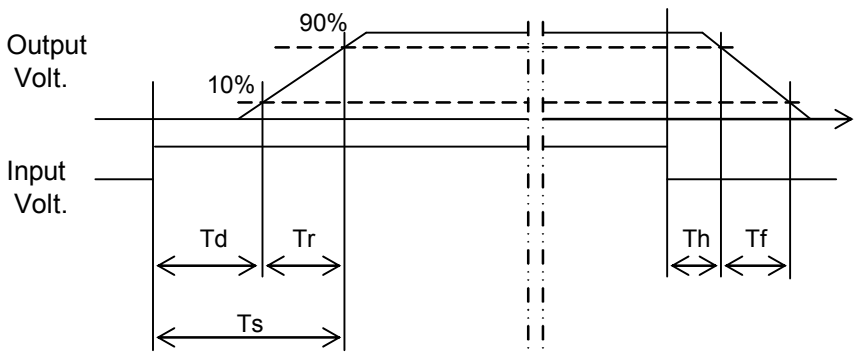
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.5	4.0	6.5	0.1	1.8
100 %	2.5	4.7	7.2	0.1	0.8

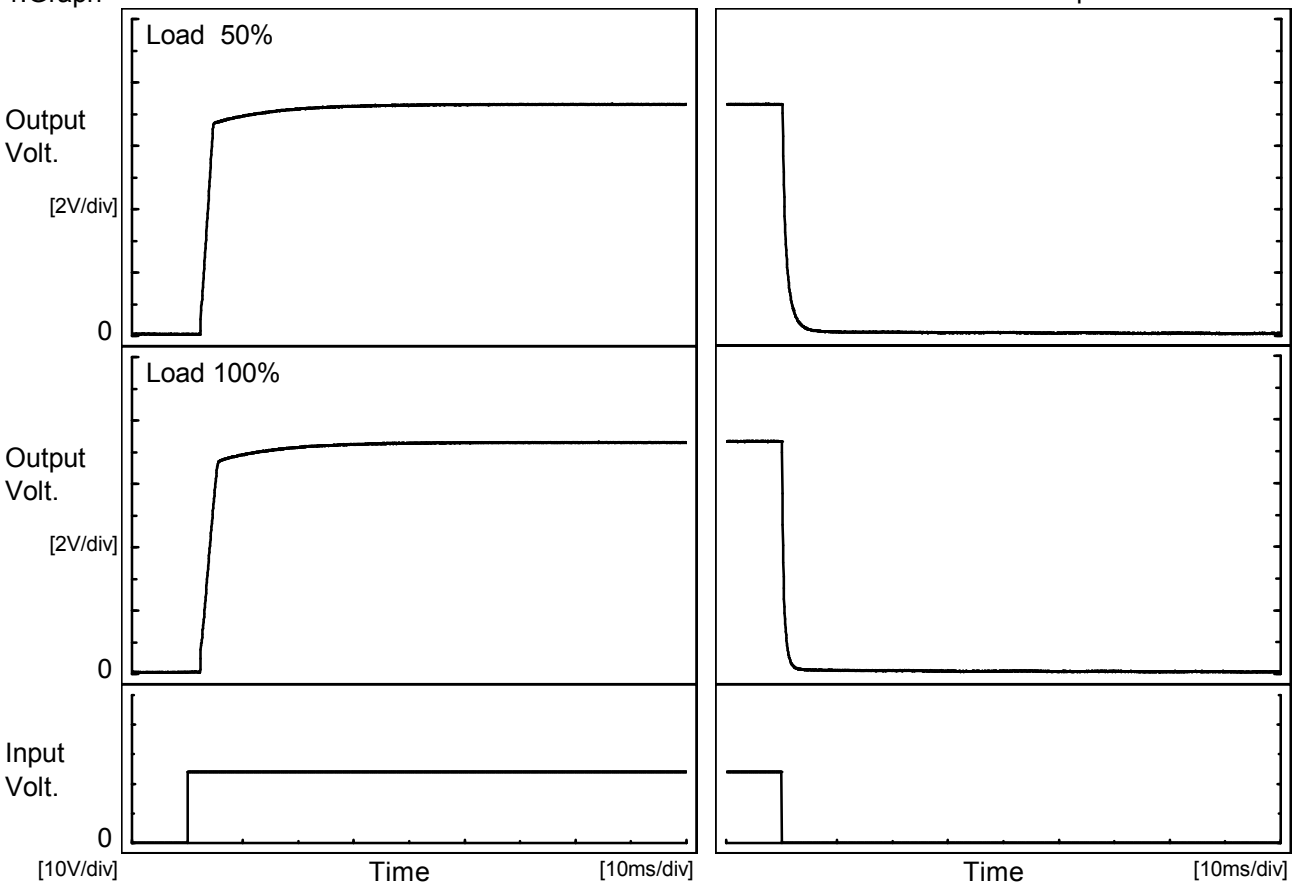


COSEL

Model	MGW302415	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	-15V1A	

1.Graph

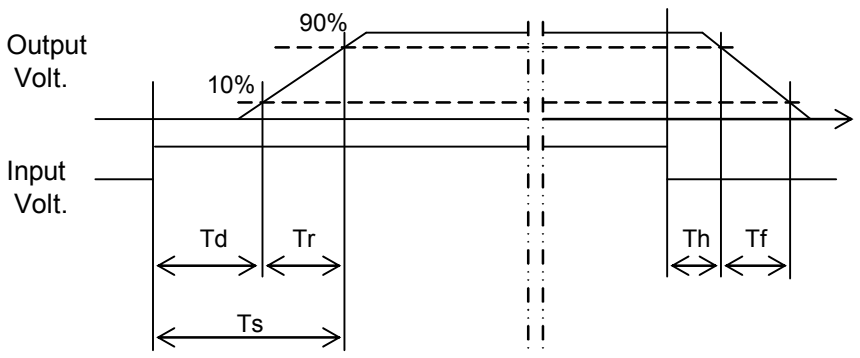
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	2.5	3.7	6.2	0.1	1.9
100 %	2.5	4.6	7.1	0.1	0.9

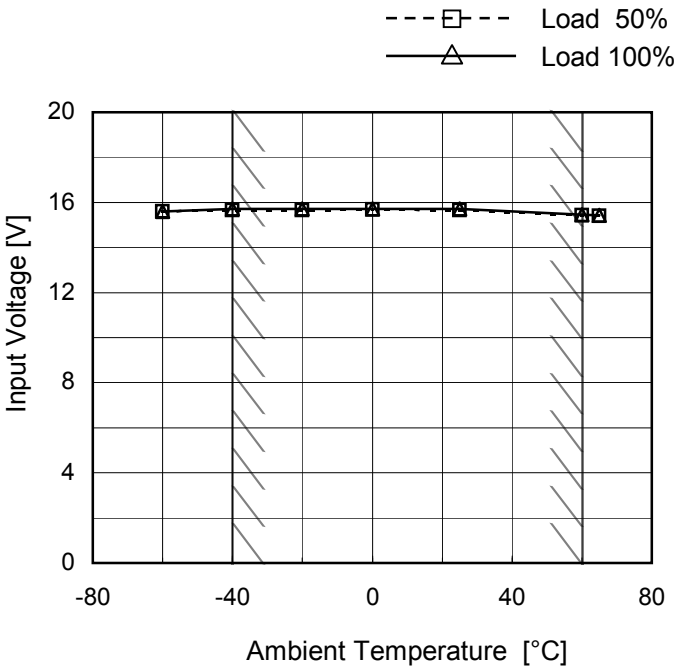


COSEL

Model	MGW302415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V1A

Testing Circuitry Figure A

1.Graph

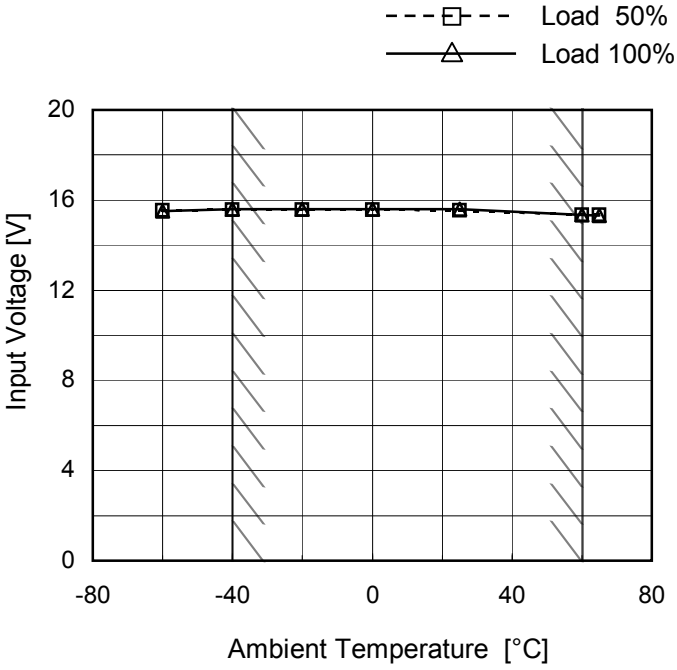


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	15.7	15.6
-40	15.7	15.7
-20	15.7	15.8
0	15.7	15.7
25	15.7	15.7
60	15.5	15.5
65	15.5	15.5
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V1A

1.Graph



2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	15.6	15.5
-40	15.6	15.6
-20	15.6	15.7
0	15.6	15.7
25	15.6	15.6
60	15.4	15.4
65	15.4	15.4
--	-	-
--	-	-
--	-	-
--	-	-

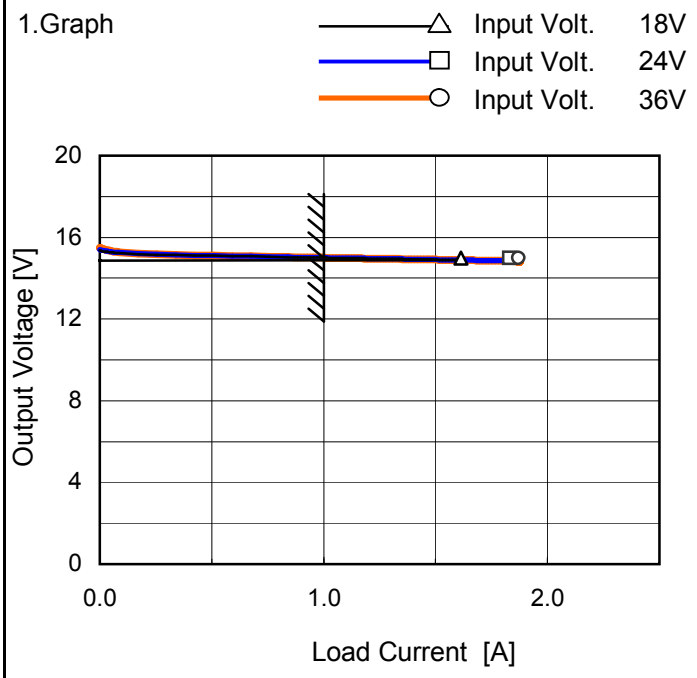
Note: Slanted line shows the range of the rated ambient temperature.

COSEL

Model	MGW302415
Item	Overcurrent Protection
Object	+15V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

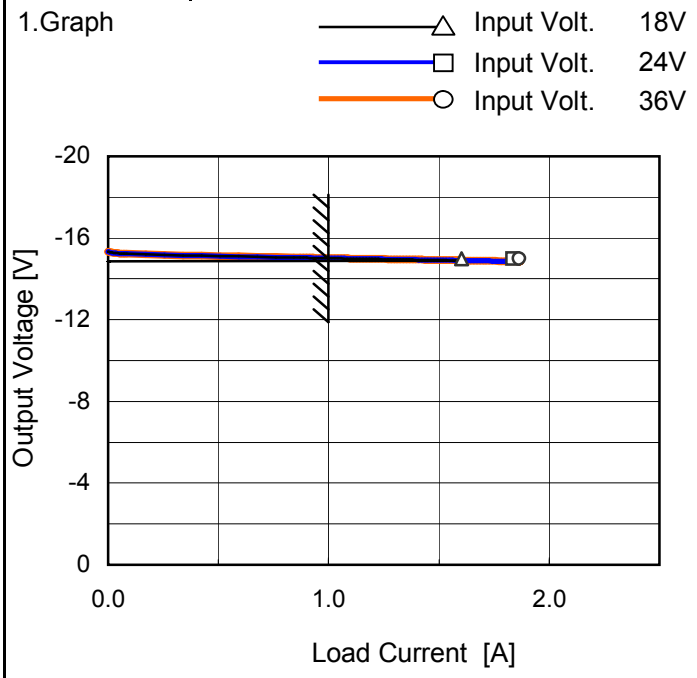


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
15.00	1.61	1.83	1.87
14.25	-	-	-
13.50	-	-	-
12.00	-	-	-
10.50	-	-	-
9.00	-	-	-
7.50	-	-	-
6.00	-	-	-
4.50	-	-	-
3.00	-	-	-
1.50	-	-	-
0.00	-	-	-

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

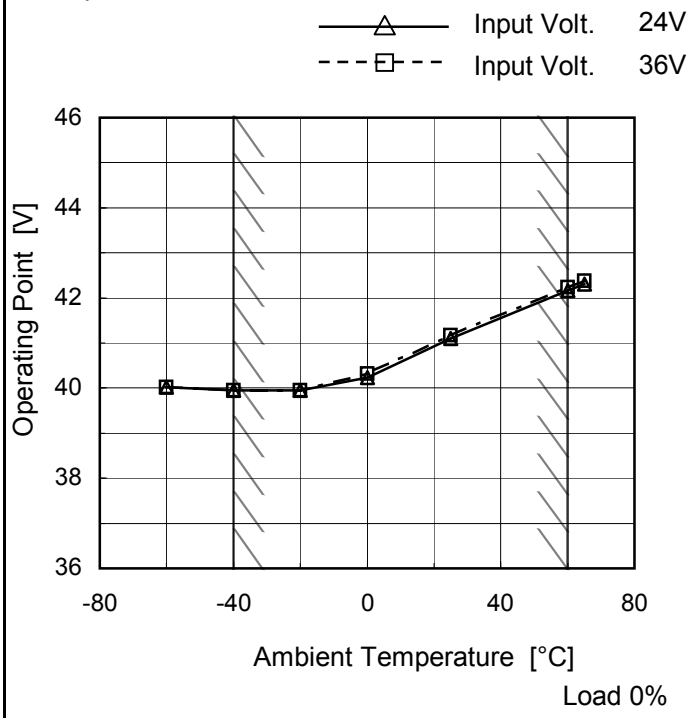
Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-15.00	1.60	1.84	1.86
-14.25	-	-	-
-13.50	-	-	-
-12.00	-	-	-
-10.50	-	-	-
-9.00	-	-	-
-7.50	-	-	-
-6.00	-	-	-
-4.50	-	-	-
-3.00	-	-	-
-1.50	-	-	-
0.00	-	-	-

COSEL

Model	MGW302415
Item	Overvoltage Protection
Object	+30V1A

Testing Circuitry Figure A

1.Graph



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	40.02	40.02
-40	39.95	39.95
-20	39.95	39.95
0	40.24	40.32
25	41.10	41.17
60	42.16	42.23
65	42.30	42.38
--	-	-
--	-	-
--	-	-
--	-	-

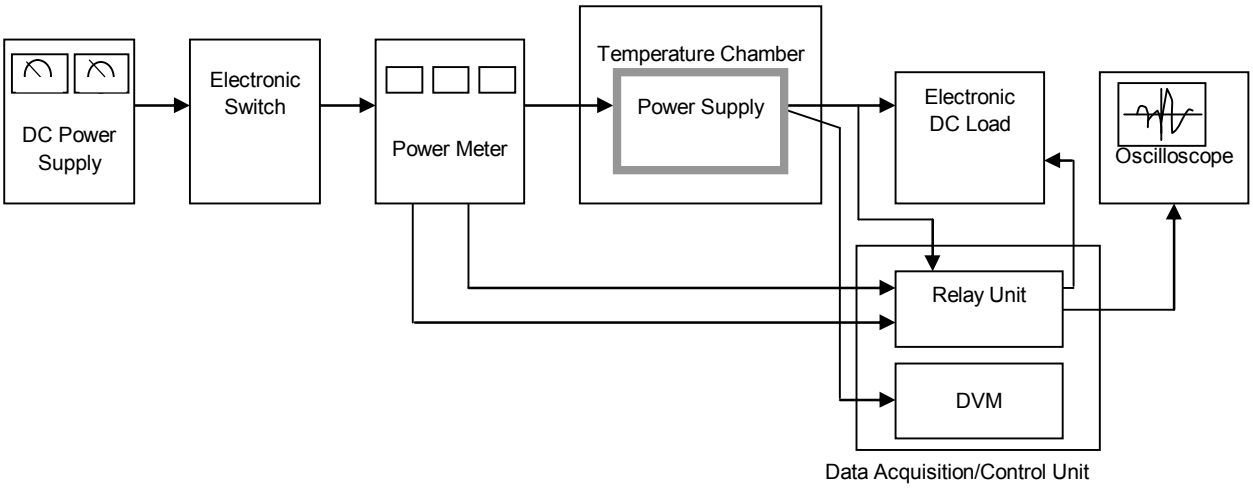


Figure A

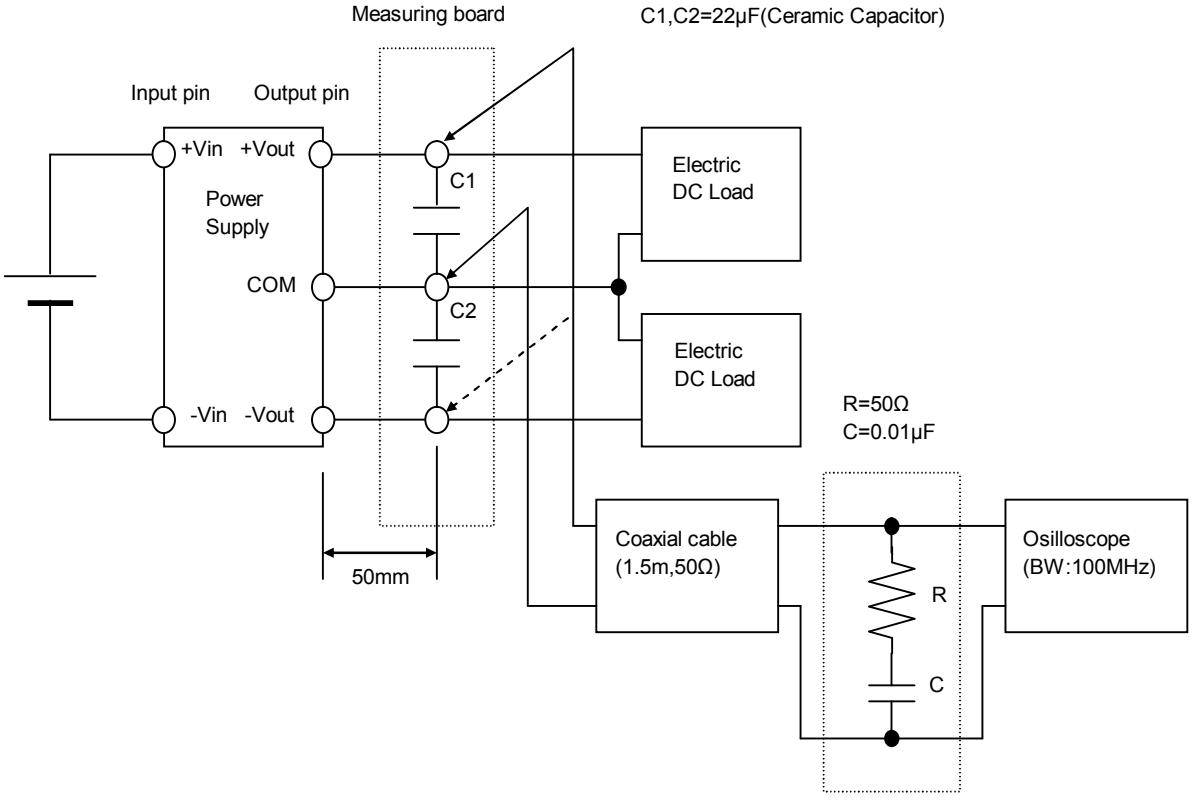


Figure B（Ripple and Ripple noise Characteristic）