参考資料

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TEST DATA OF MGFW152412

Regulated DC Power Supply
September 15, 2010

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COSEL CO.,LTD.

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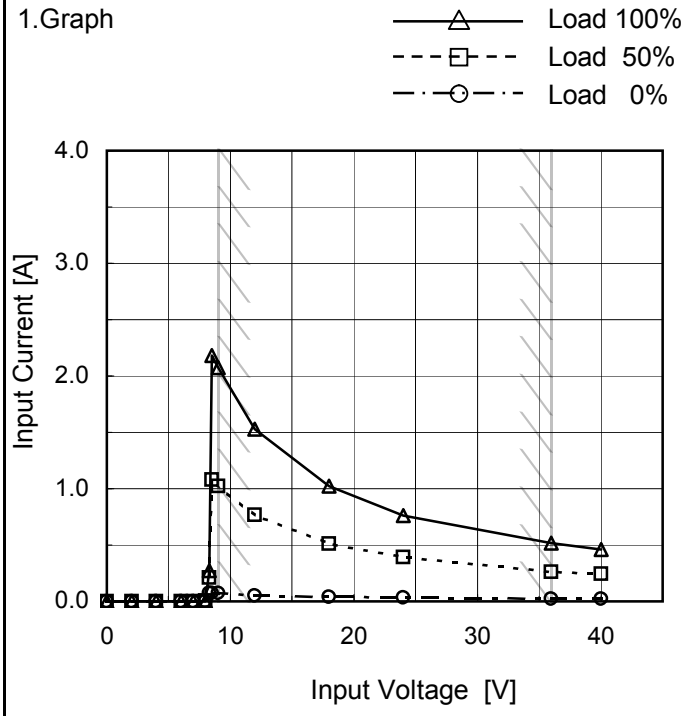
Model	MGFW152412
Item	Input Current (by Input Voltage)
Object	————————

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	0.001	0.000	0.001
4.0	0.002	0.002	0.001
6.0	0.002	0.003	0.002
7.0	0.003	0.003	0.003
8.0	0.003	0.003	0.003
8.3	0.075	0.209	0.271
8.5	0.074	1.081	2.185
9.0	0.071	1.024	2.074
12.0	0.053	0.769	1.527
18.0	0.037	0.510	1.020
24.0	0.034	0.393	0.759
36.0	0.022	0.263	0.515
40.0	0.020	0.242	0.462
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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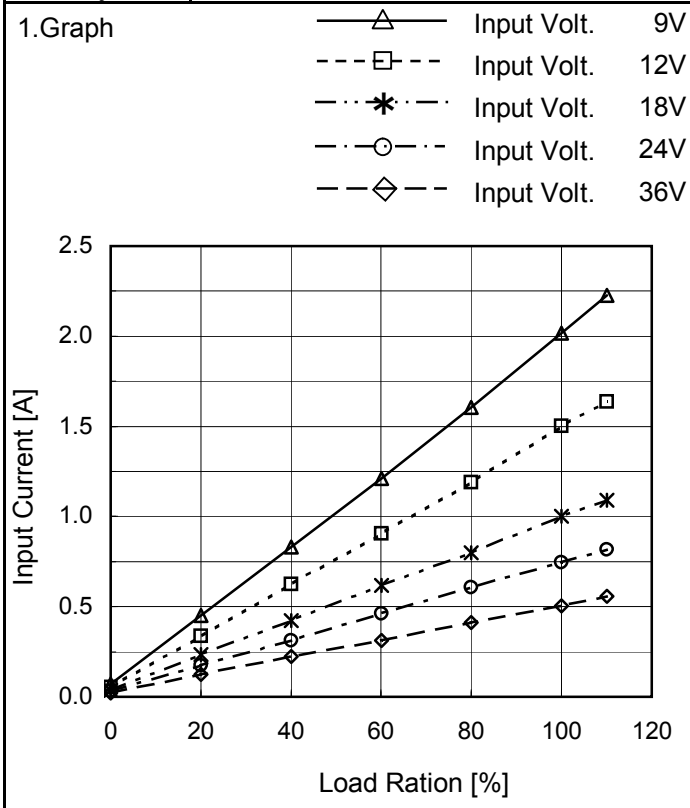
COSEL

Model	MGFW152412
Item	Input Current (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

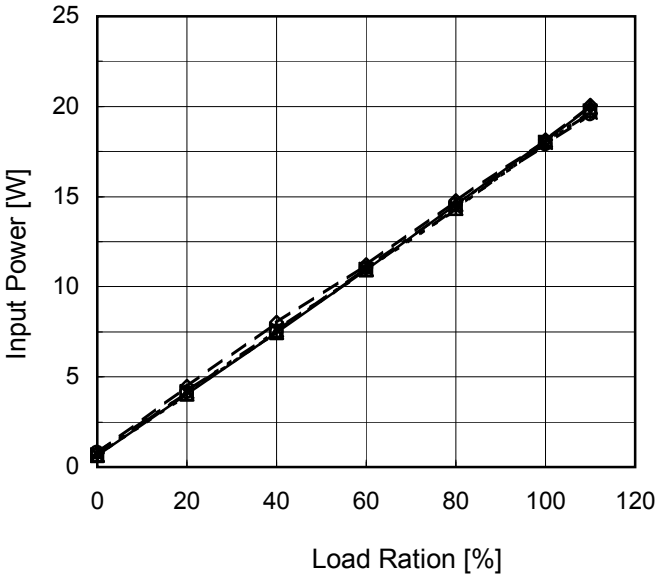
Load Ration [%]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.072	0.053	0.037	0.034	0.022
20	0.449	0.339	0.233	0.174	0.124
40	0.832	0.626	0.422	0.313	0.223
60	1.211	0.907	0.617	0.463	0.312
80	1.605	1.190	0.799	0.606	0.411
100	2.016	1.502	1.003	0.746	0.504
110	2.226	1.637	1.092	0.817	0.559
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW152412
Item	Input Power (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

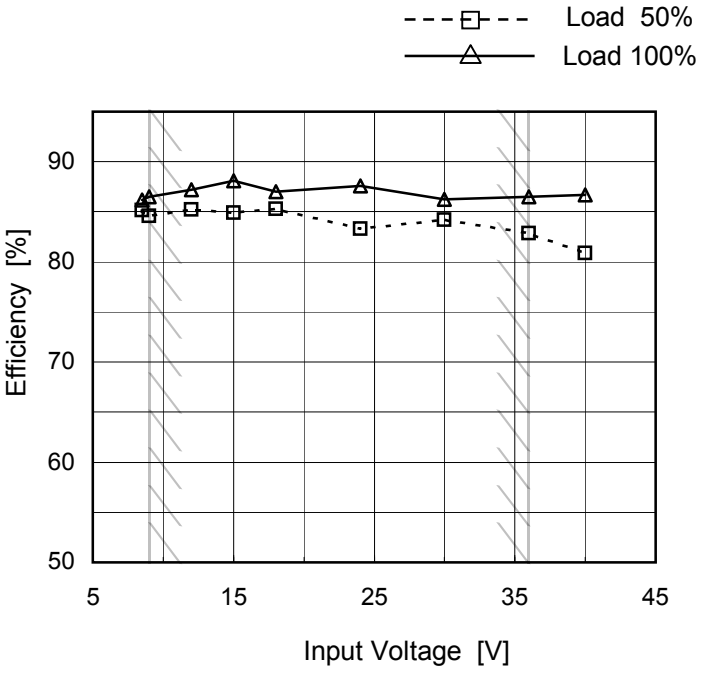
Load Ration [%]	Input Power [W]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.64	0.64	0.67	0.81	0.79
20	4.03	4.06	4.19	4.16	4.48
40	7.47	7.53	7.62	7.51	8.01
60	10.95	10.94	10.98	11.06	11.21
80	14.54	14.33	14.35	14.55	14.78
100	18.12	17.99	18.00	17.89	18.13
110	19.95	19.76	19.69	19.58	20.05
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW152412
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

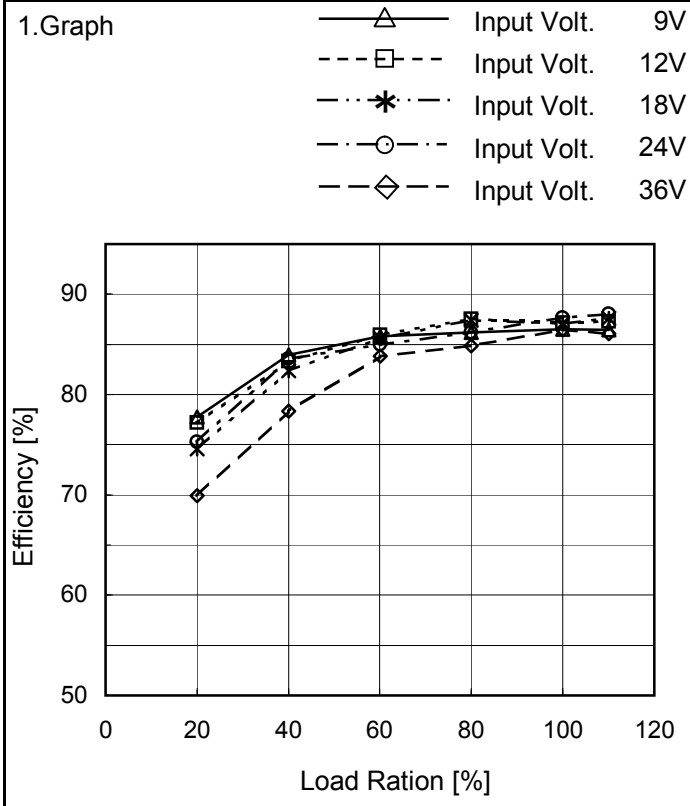
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8.5	85.2	86.1
9.0	84.6	86.5
12.0	85.2	87.2
15.0	84.9	88.1
18.0	85.3	87.0
24.0	83.3	87.6
30.0	84.2	86.3
36.0	82.9	86.5
40.0	80.9	86.7

COSEL

Model	MGFW152412
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

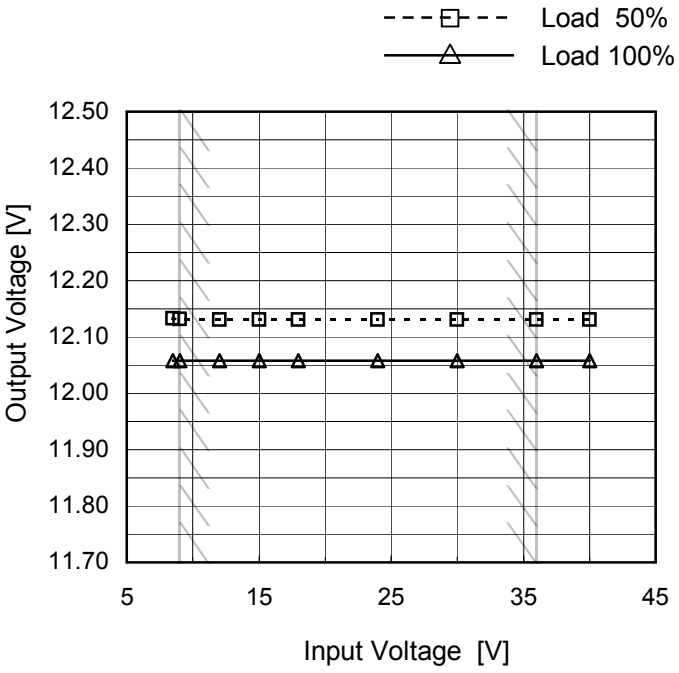
Load Ration [%]	Efficiency [%]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-	-	-
20	77.7	77.2	74.6	75.3	69.9
40	84.0	83.3	82.3	83.6	78.3
60	85.8	85.9	85.6	85.0	83.8
80	86.2	87.5	87.4	86.2	84.8
100	86.5	87.2	87.1	87.6	86.4
110	86.5	87.3	87.6	88.1	86.0
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW152412
Item	Line Regulation
Object	+12V0.65A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



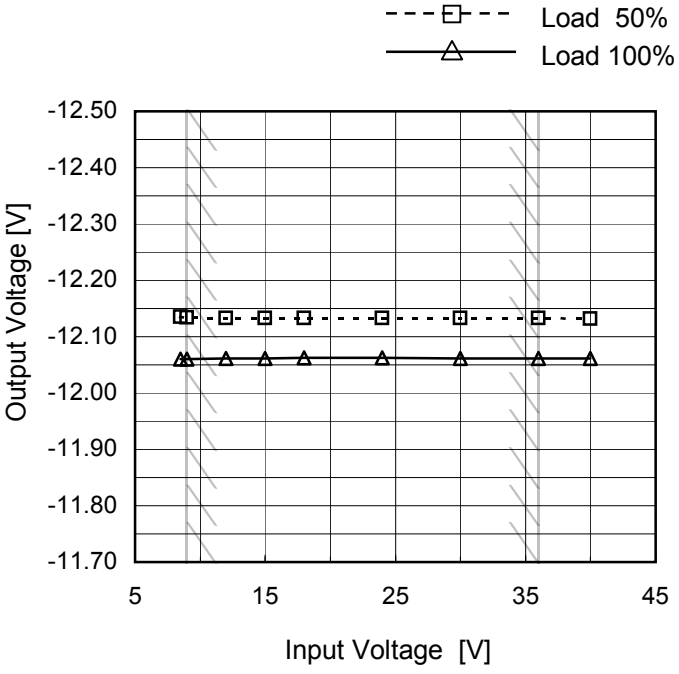
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	12.133	12.058
9.0	12.132	12.058
12.0	12.131	12.058
15.0	12.131	12.058
18.0	12.131	12.058
24.0	12.130	12.058
30.0	12.130	12.058
36.0	12.131	12.058
40.0	12.131	12.058

-12V: Rated output current

Object	-12V0.65A

1.Graph



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

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.5	-12.135	-12.060
9.0	-12.134	-12.061
12.0	-12.133	-12.062
15.0	-12.133	-12.062
18.0	-12.133	-12.062
24.0	-12.133	-12.062
30.0	-12.133	-12.062
36.0	-12.132	-12.062
40.0	-12.132	-12.062

+12V: Rated output current

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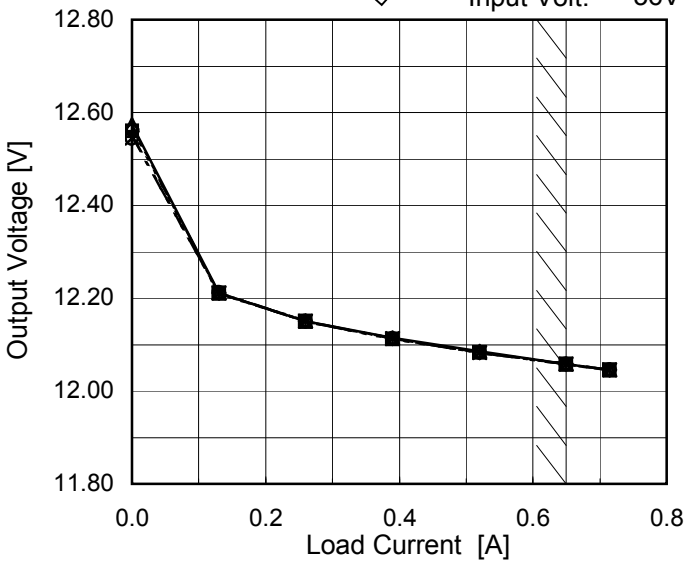
COSEL

Model	MGFW152412
Item	Load Regulation
Object	+12V0.65A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



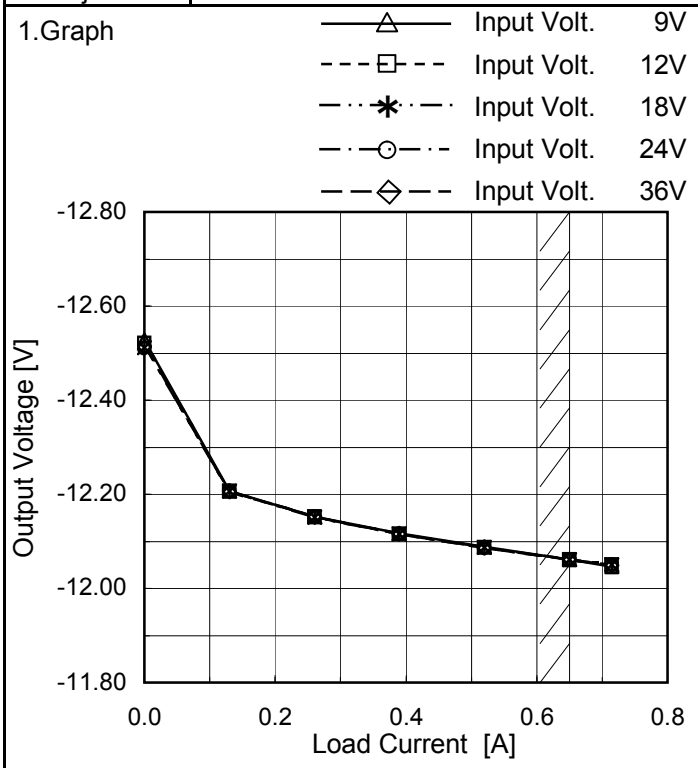
2.Values

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	12.573	12.561	12.545	12.544	12.565
0.130	12.212	12.211	12.211	12.212	12.212
0.260	12.150	12.150	12.150	12.151	12.150
0.390	12.115	12.112	12.113	12.113	12.113
0.520	12.085	12.082	12.083	12.083	12.083
0.650	12.058	12.057	12.058	12.057	12.057
0.715	12.045	12.045	12.046	12.046	12.046
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

-12V: Rated output current

Object	-12V0.65A

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	-12.528	-12.522	-12.512	-12.510	-12.513
0.130	-12.207	-12.207	-12.207	-12.207	-12.206
0.260	-12.152	-12.152	-12.152	-12.152	-12.152
0.390	-12.117	-12.116	-12.116	-12.116	-12.115
0.520	-12.088	-12.087	-12.087	-12.086	-12.086
0.650	-12.061	-12.061	-12.061	-12.062	-12.061
0.715	-12.047	-12.050	-12.050	-12.050	-12.049
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

+12V: Rated output current

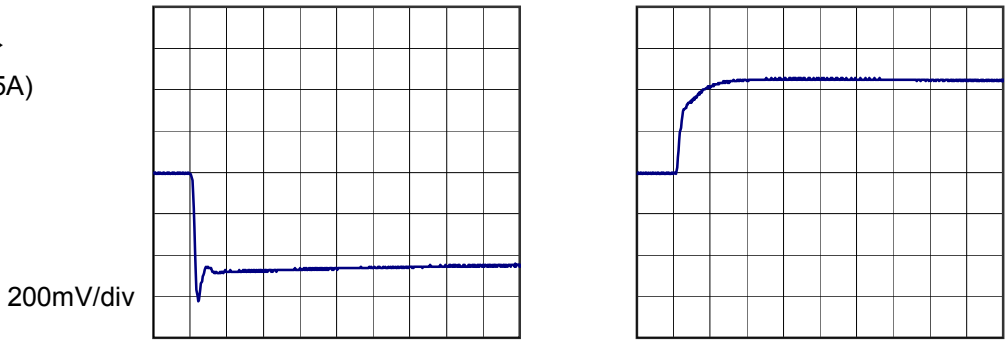
COSEL

Model	MGFW152412
Item	Dynamic Load Response
Object	+12V0.65A

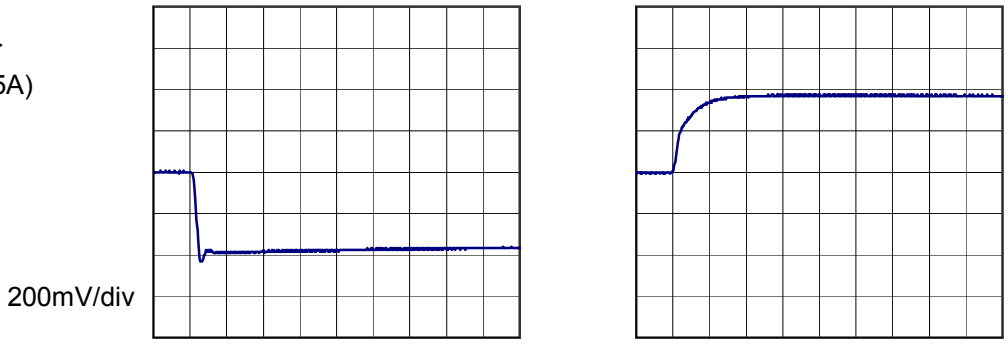
Temperature 25°C
Testing Circuitry Figure A

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

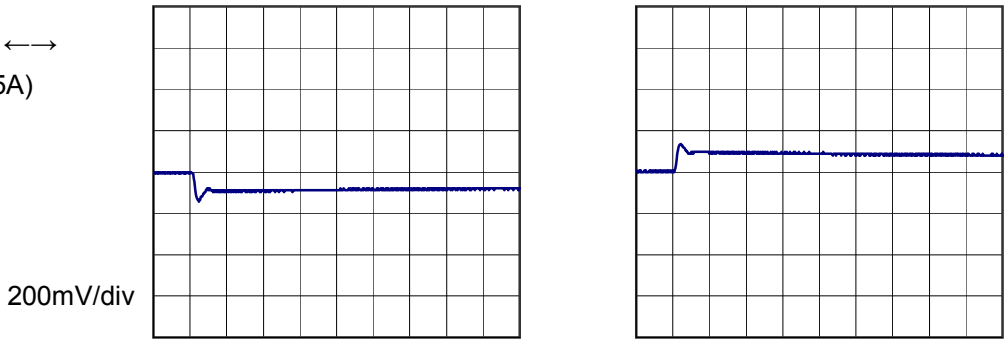
Min. Load (0A) ⟷
Load 100% (0.65A)



Min. Load (0A) ⟷
Load 50% (0.325A)



Load 50% (0.325A) ⟷
Load 100% (0.65A)



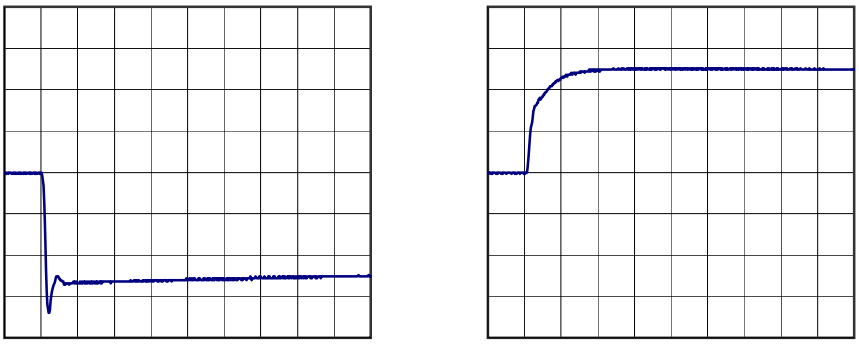
COSEL

Model	MGFW152412
Item	Dynamic Load Response
Object	-12V0.65A

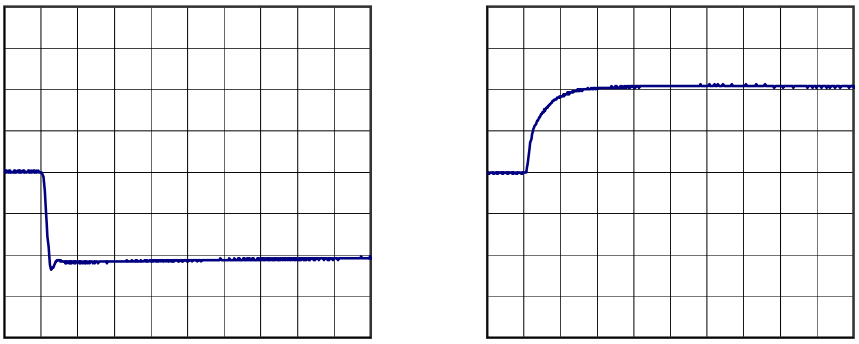
Temperature 25°C
Testing Circuitry Figure A

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

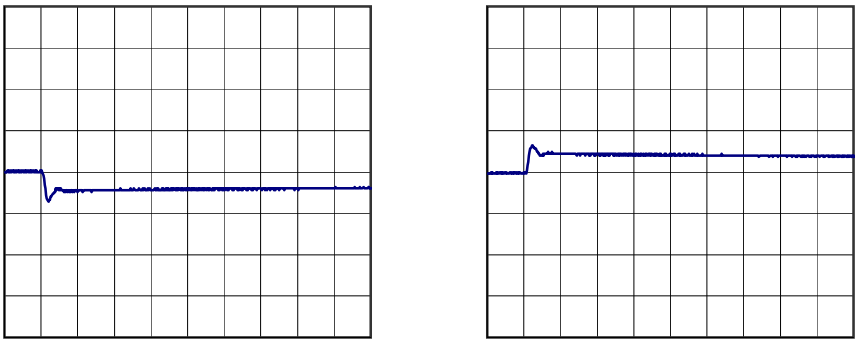
Min. Load (0A) ⟷
Load 100% (0.65A)



Min. Load (0A) ⟷
Load 50% (0.325A)



Load 50% (0.325A) ⟷
Load 100% (0.65A)



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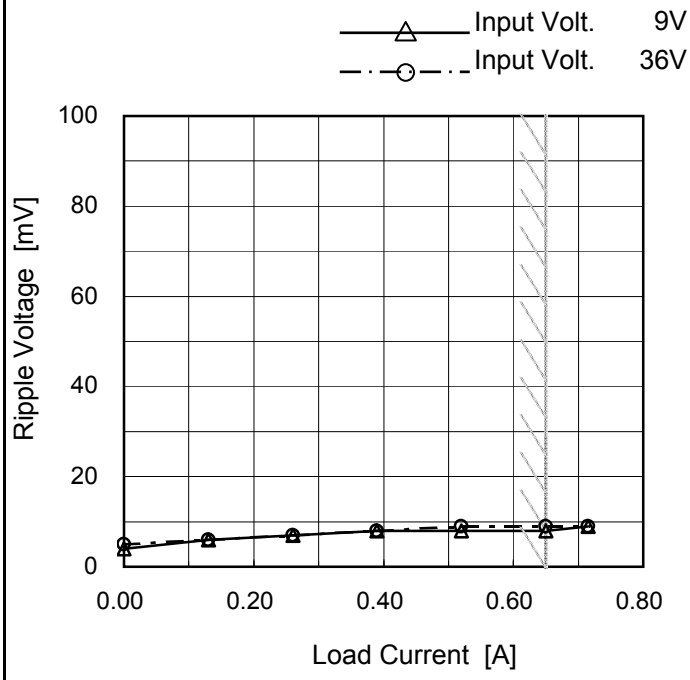
Model	MGFW152412
Item	Ripple Voltage (by Load Current)
Object	+12V0.65A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Measured by 100 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

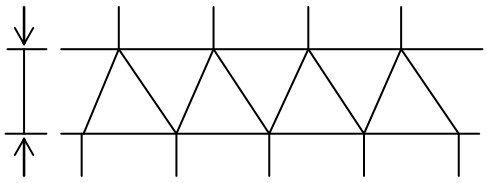


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.000	4	5
0.130	6	6
0.260	7	7
0.390	8	8
0.520	8	9
0.650	8	9
0.715	9	9
--	-	-
--	-	-
--	-	-
--	-	-

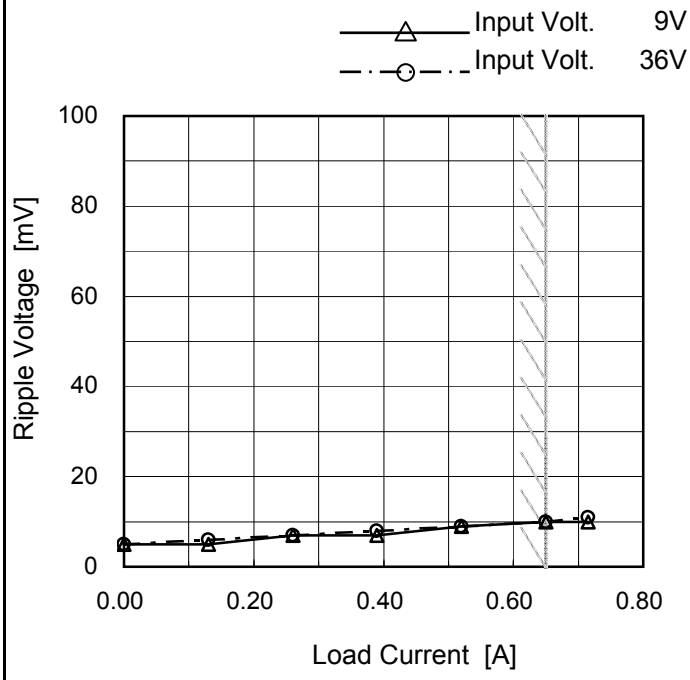
−12V: Rated output current

COSEL

Model	MGFW152412
Item	Ripple Voltage (by Load Current)
Object	-12V0.65A

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.

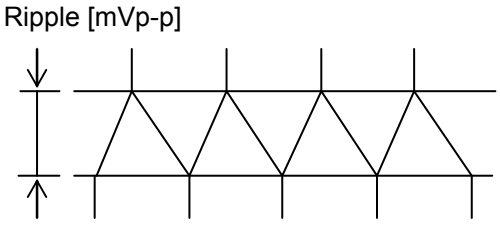


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.000	5	5
0.130	5	6
0.260	7	7
0.390	7	8
0.520	9	9
0.650	10	10
0.715	10	11
--	-	-
--	-	-
--	-	-
--	-	-

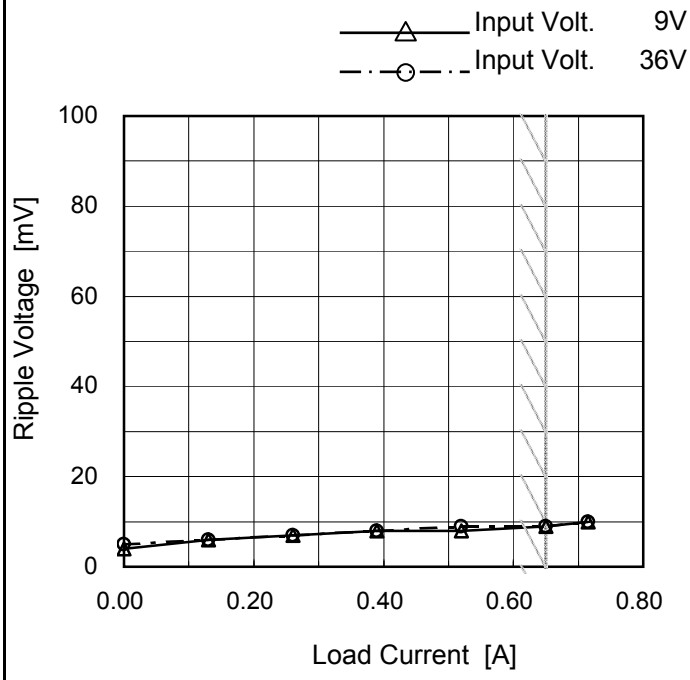
+12V: Rated output current

COSEL

Model	MGFW152412
Item	Ripple-Noise
Object	+12V0.65A

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.

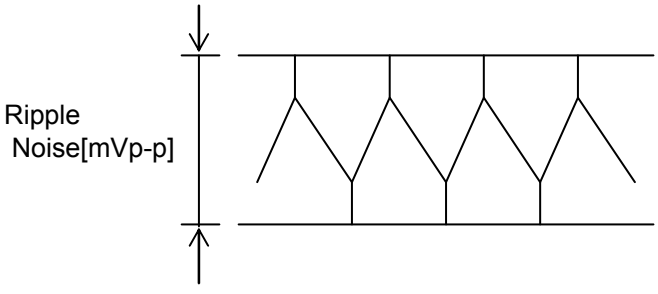


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.000	4	5
0.130	6	6
0.260	7	7
0.390	8	8
0.520	8	9
0.650	9	9
0.715	10	10
--	-	-
--	-	-
--	-	-
--	-	-

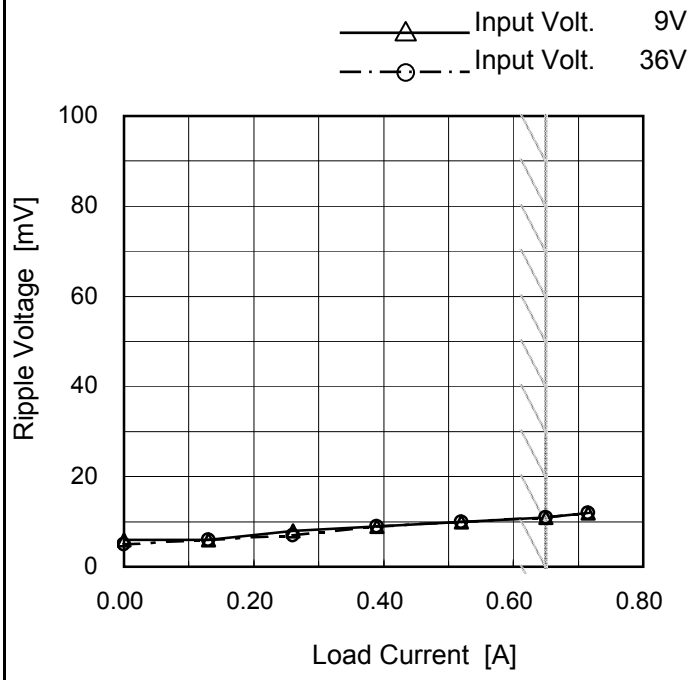
−12V: Rated output current

COSEL

Model	MGFW152412
Item	Ripple-Noise
Object	-12V0.65A

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.

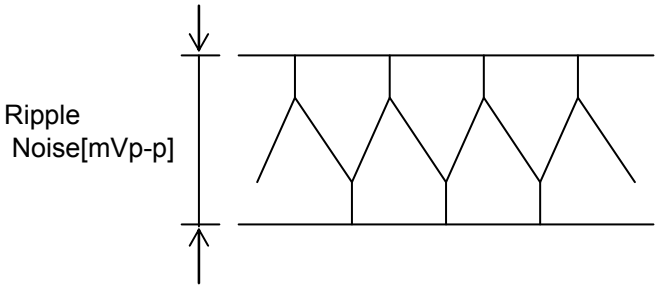


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.000	6	5
0.130	6	6
0.260	8	7
0.390	9	9
0.520	10	10
0.650	11	11
0.715	12	12
--	-	-
--	-	-
--	-	-
--	-	-

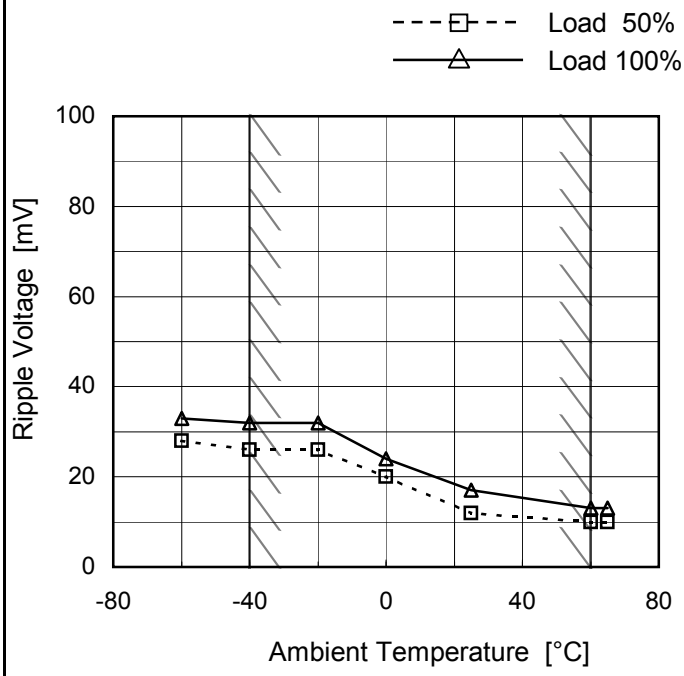
+12V: Rated output current

COSEL

Model	MGFW152412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.65A

Testing Circuitry Figure B

1.Graph



Input Volt. 24V

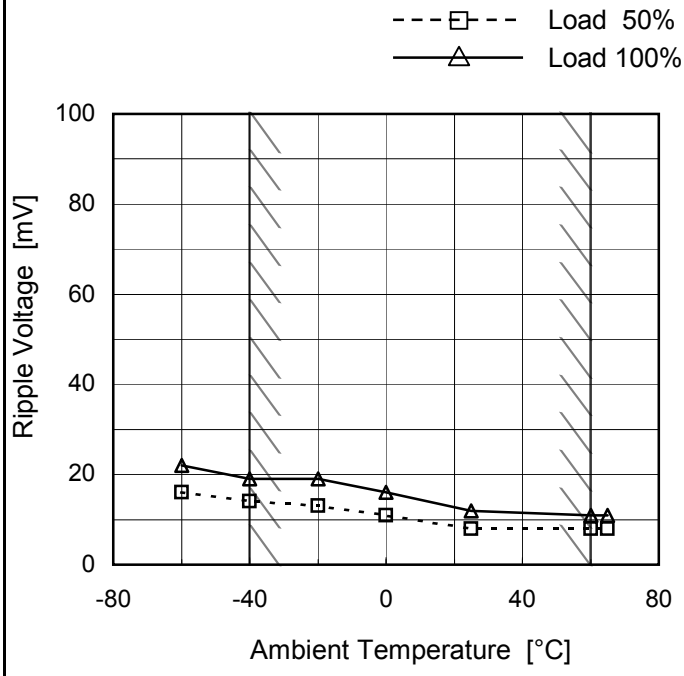
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	28	33
-40	26	32
-20	26	32
0	20	24
25	12	17
60	10	13
65	10	13
--	-	-
--	-	-
--	-	-
--	-	-

-12V: Rated output current

Object	-12V0.65A

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	16	22
-40	14	19
-20	13	19
0	11	16
25	8	12
60	8	11
65	8	11
--	-	-
--	-	-
--	-	-
--	-	-

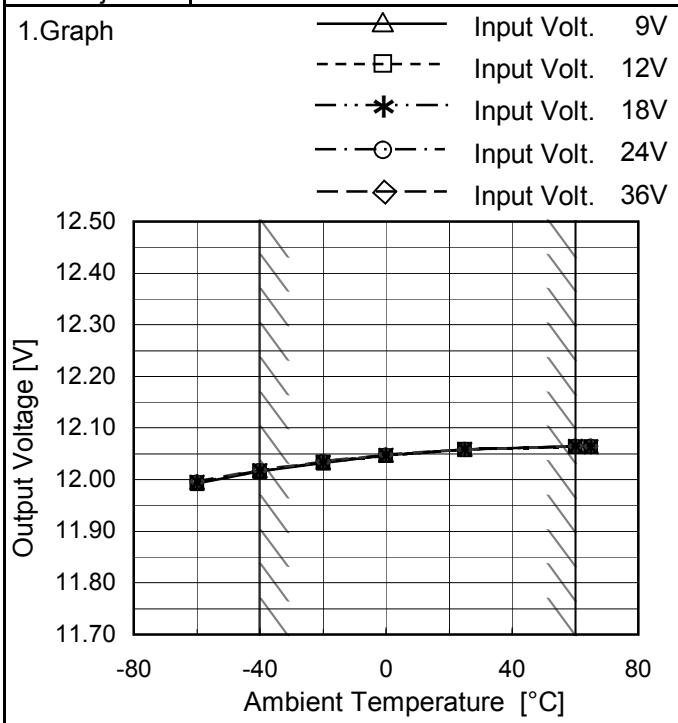
+12V: Rated output current

COSEL

Model	MGFW152412
Item	Ambient Temperature Drift
Object	+12V0.65A

Testing Circuitry Figure A

1.Graph



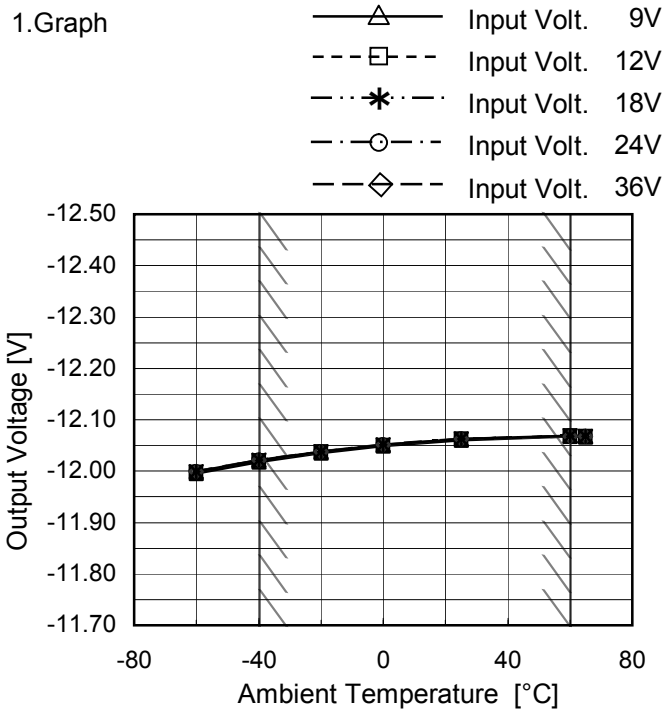
Load 100%

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	11.993	11.994	11.995	11.995	11.996
-40	12.016	12.017	12.018	12.018	12.019
-20	12.033	12.033	12.034	12.035	12.035
0	12.047	12.047	12.047	12.048	12.048
25	12.058	12.058	12.058	12.059	12.059
60	12.065	12.064	12.065	12.065	12.065
65	12.064	12.064	12.064	12.064	12.065
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

Object	-12V0.65A

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. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	-11.995	-11.998	-11.999	-11.999	-11.999
-40	-12.018	-12.021	-12.021	-12.021	-12.022
-20	-12.035	-12.037	-12.038	-12.038	-12.038
0	-12.049	-12.051	-12.051	-12.052	-12.051
25	-12.061	-12.062	-12.063	-12.063	-12.063
60	-12.067	-12.068	-12.069	-12.068	-12.068
65	-12.067	-12.068	-12.068	-12.068	-12.068
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

COSEL

Model	MGFW152412	
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 - 0.65A (AVR 2) : 0 - 0.65A

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

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

2.Values

Object	+12V0.65A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	9	0	12.579	±282	±2.4
Minimum Voltage	-40	9	0.65	12.016		

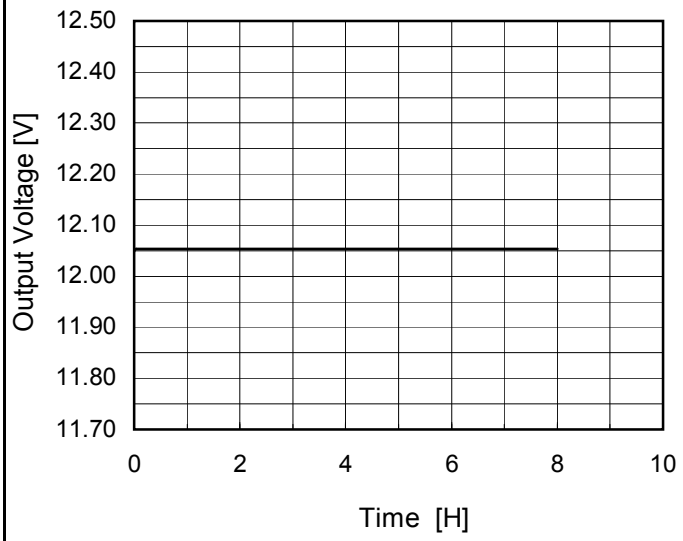
Object	-12V0.65A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	60	9	0	-12.545	±264	±2.2
Minimum Voltage	-40	9	0.65	-12.018		

COSEL

Model	MGFW152412
Item	Time Lapse Drift
Object	+12V0.65A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



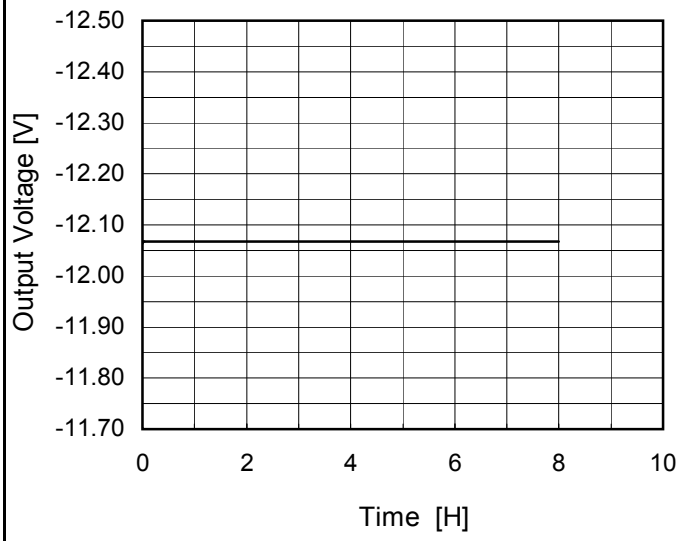
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.048
0.5	12.054
1.0	12.054
2.0	12.054
3.0	12.054
4.0	12.054
5.0	12.054
6.0	12.054
7.0	12.054
8.0	12.054

Object	-12V0.65A

1.Graph



Input Volt. 24V
Load 100%

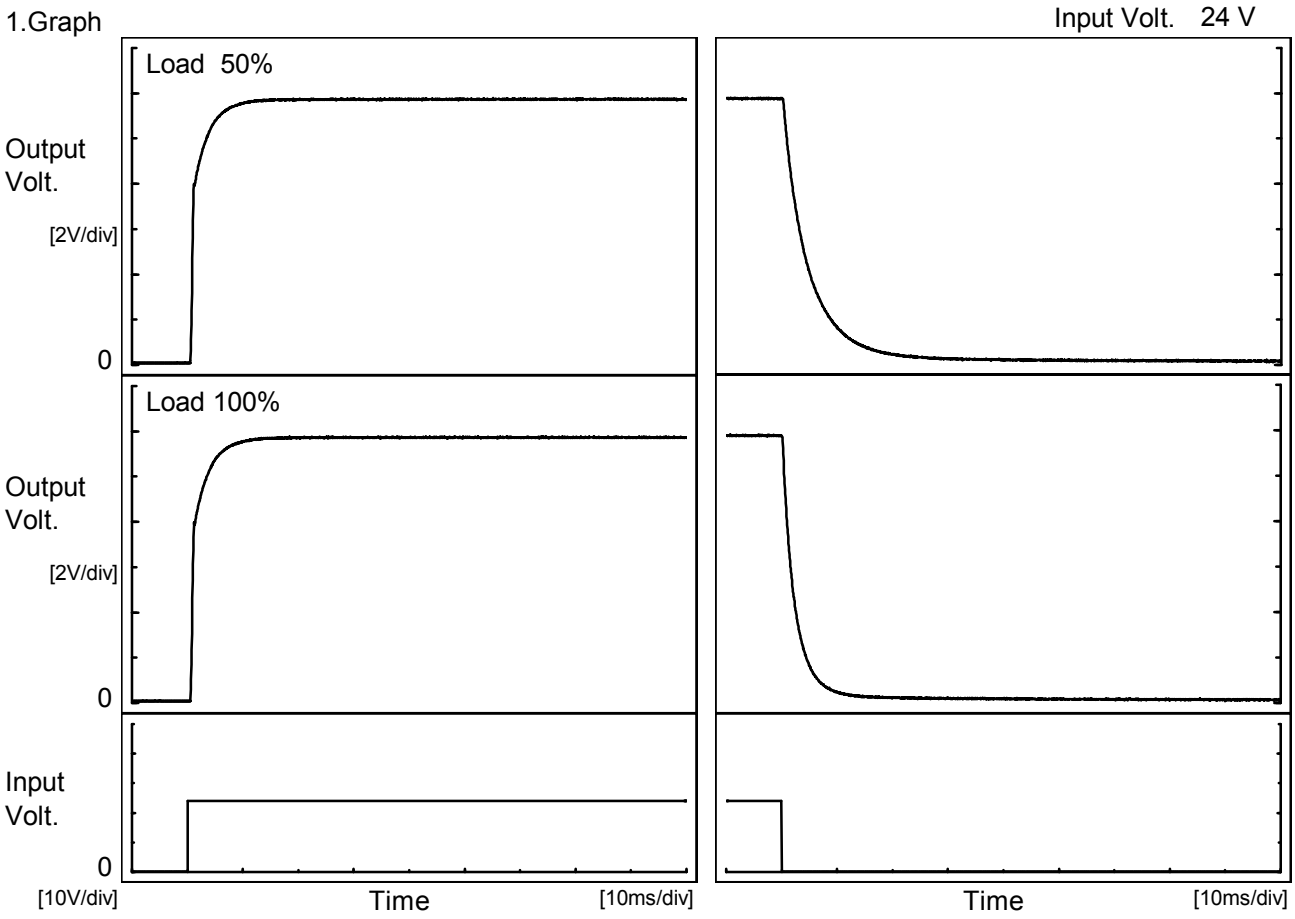
2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.064
0.5	-12.068
1.0	-12.068
2.0	-12.068
3.0	-12.067
4.0	-12.067
5.0	-12.068
6.0	-12.068
7.0	-12.068
8.0	-12.068

COSEL

Model	MGFW152412	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.65A	

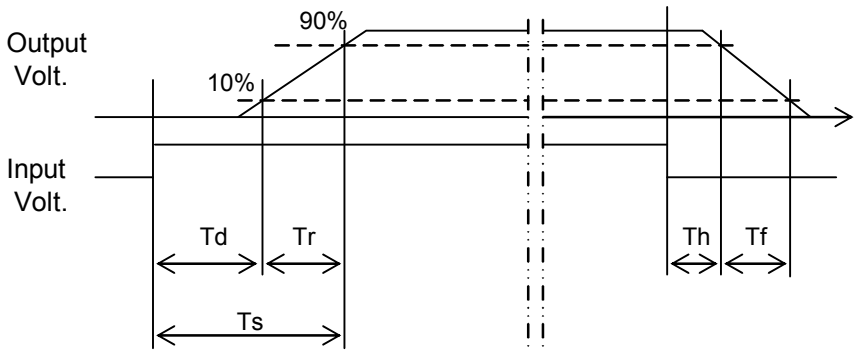
1.Graph



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.7	4.7	5.4	0.5	11.1
100 %	0.7	4.7	5.4	0.3	5.4



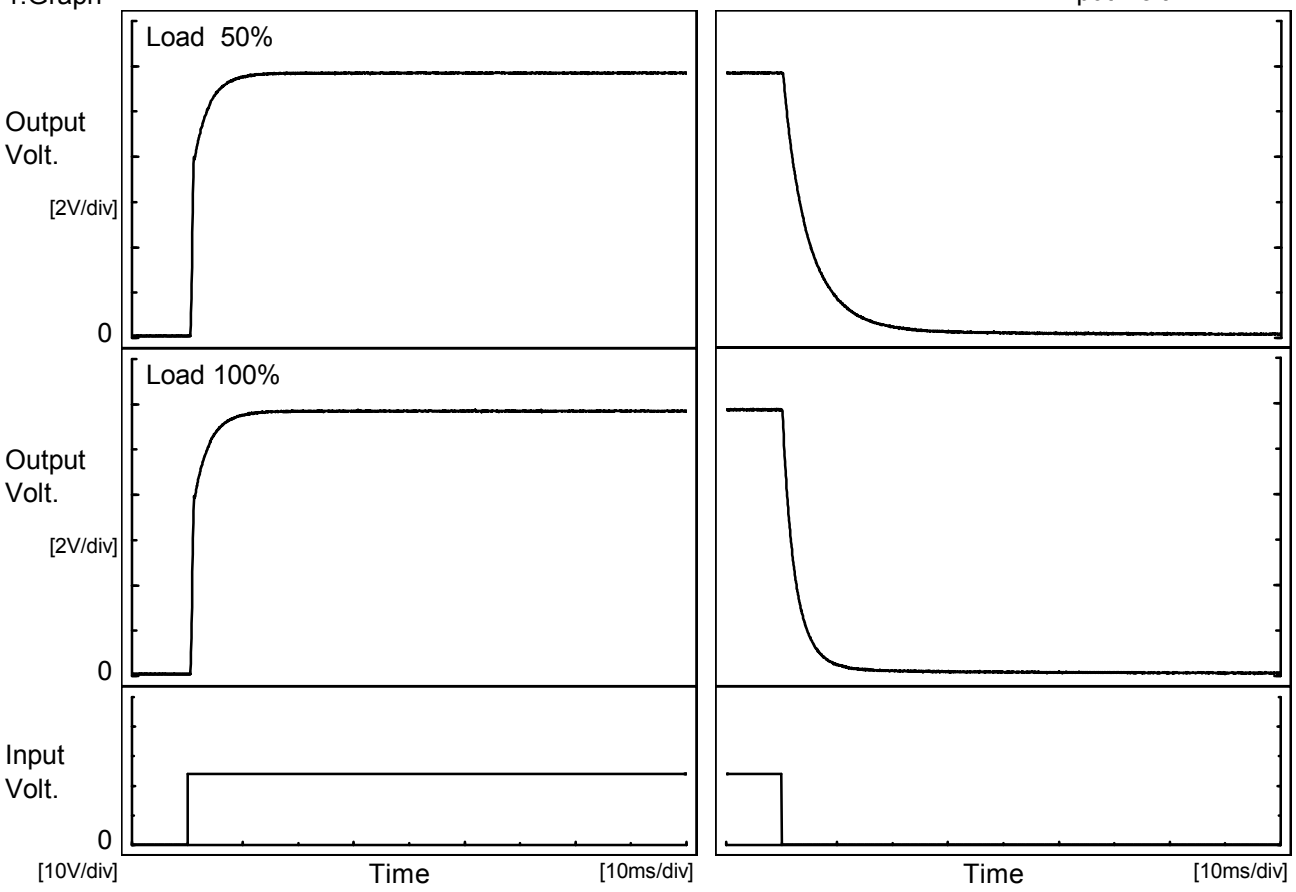
COSEL

Model	MGFW152412
Item	Rise and Fall Time
Object	-12V0.65A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

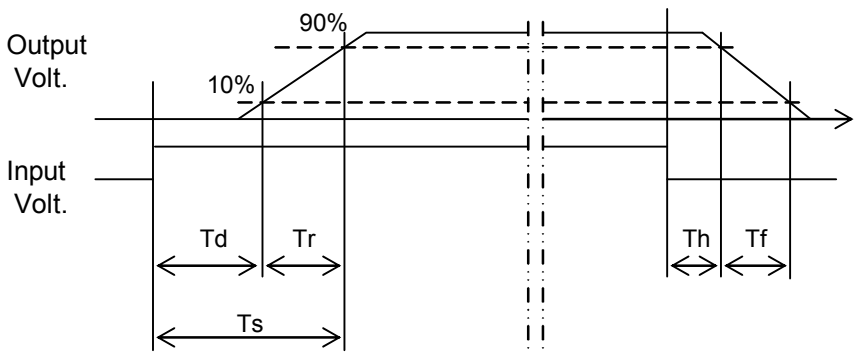
Input Volt. 24 V



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.7	4.8	5.5	0.5	11.5
100 %	0.7	4.9	5.6	0.3	5.7



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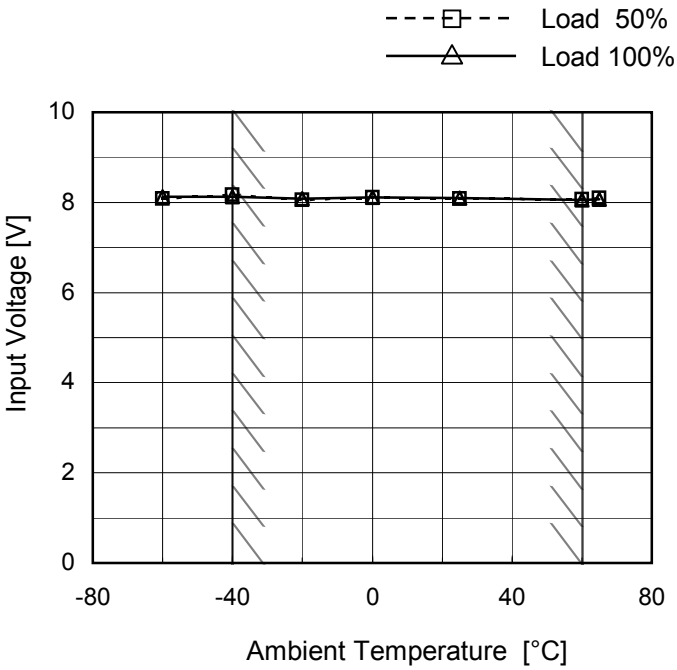
COSEL

Model	MGFW152412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.65A

Testing Circuitry Figure A

1.Graph

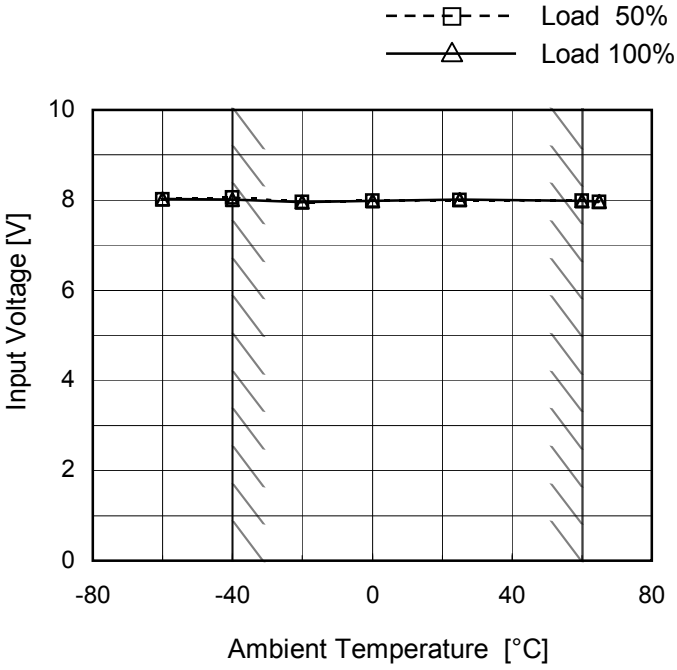


2.Values

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

Object	-12V0.65A

1.Graph



2.Values

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

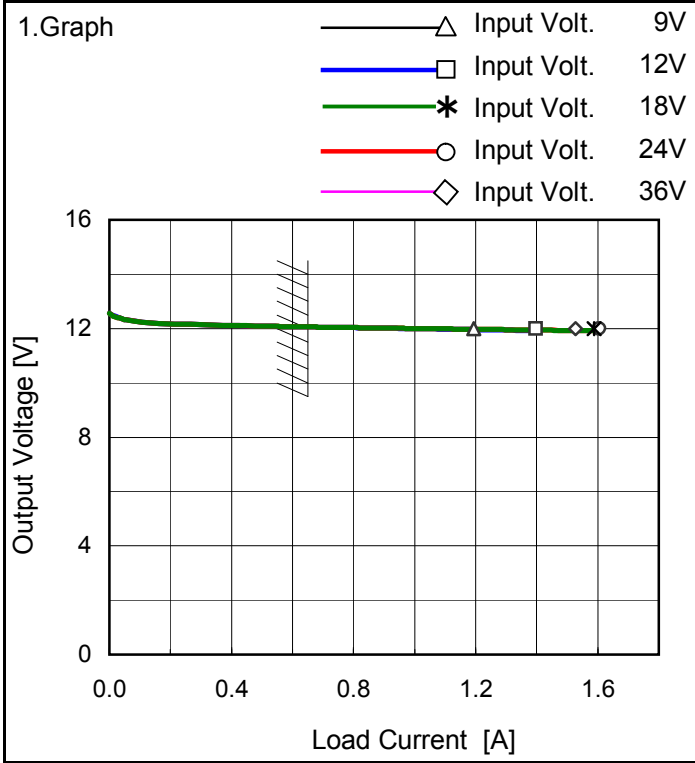
Note: Slanted line shows the range of the rated ambient temperature.

COSEL

Model	MGFW152412
Item	Overcurrent Protection
Object	+12V0.65A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



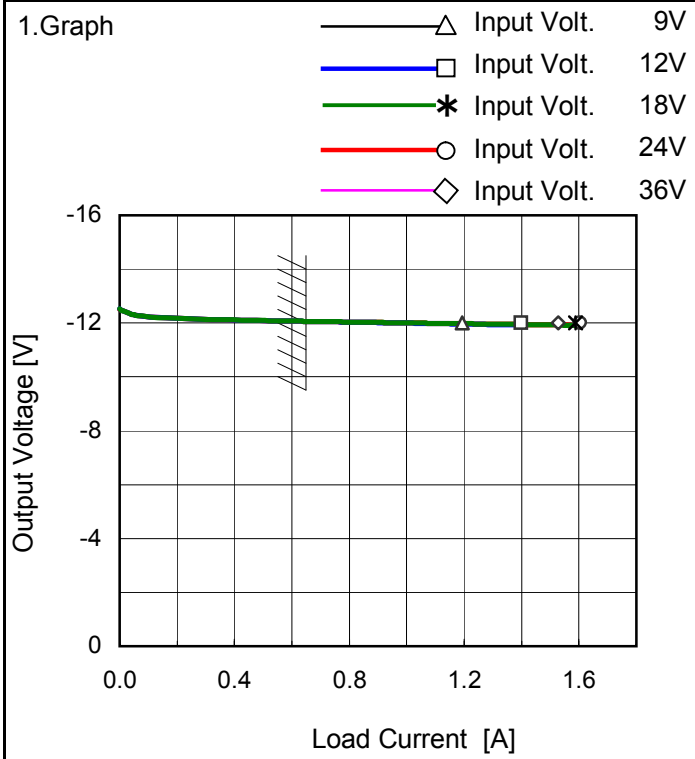
2.Values

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]
12.0	1.194	1.398	1.589	1.604	1.527
11.4	-	-	-	-	-
10.8	-	-	-	-	-
9.6	-	-	-	-	-
8.4	-	-	-	-	-
7.2	-	-	-	-	-
6.0	-	-	-	-	-
4.8	-	-	-	-	-
3.6	-	-	-	-	-
2.4	-	-	-	-	-
1.2	-	-	-	-	-
0.0	-	-	-	-	-

-12V: Rated output current

Object	-12V0.65A

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]
-12.0	1.194	1.398	1.589	1.604	1.527
-11.4	-	-	-	-	-
-10.8	-	-	-	-	-
-9.6	-	-	-	-	-
-8.4	-	-	-	-	-
-7.2	-	-	-	-	-
-6.0	-	-	-	-	-
-4.8	-	-	-	-	-
-3.6	-	-	-	-	-
-2.4	-	-	-	-	-
-1.2	-	-	-	-	-
0.0	-	-	-	-	-

+12V: Rated output current

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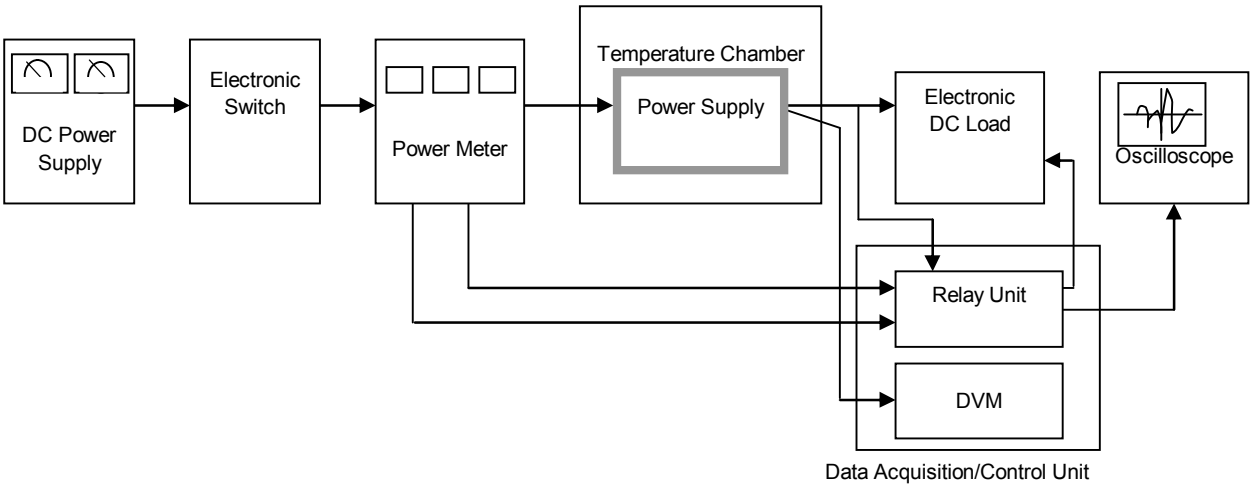

Figure A

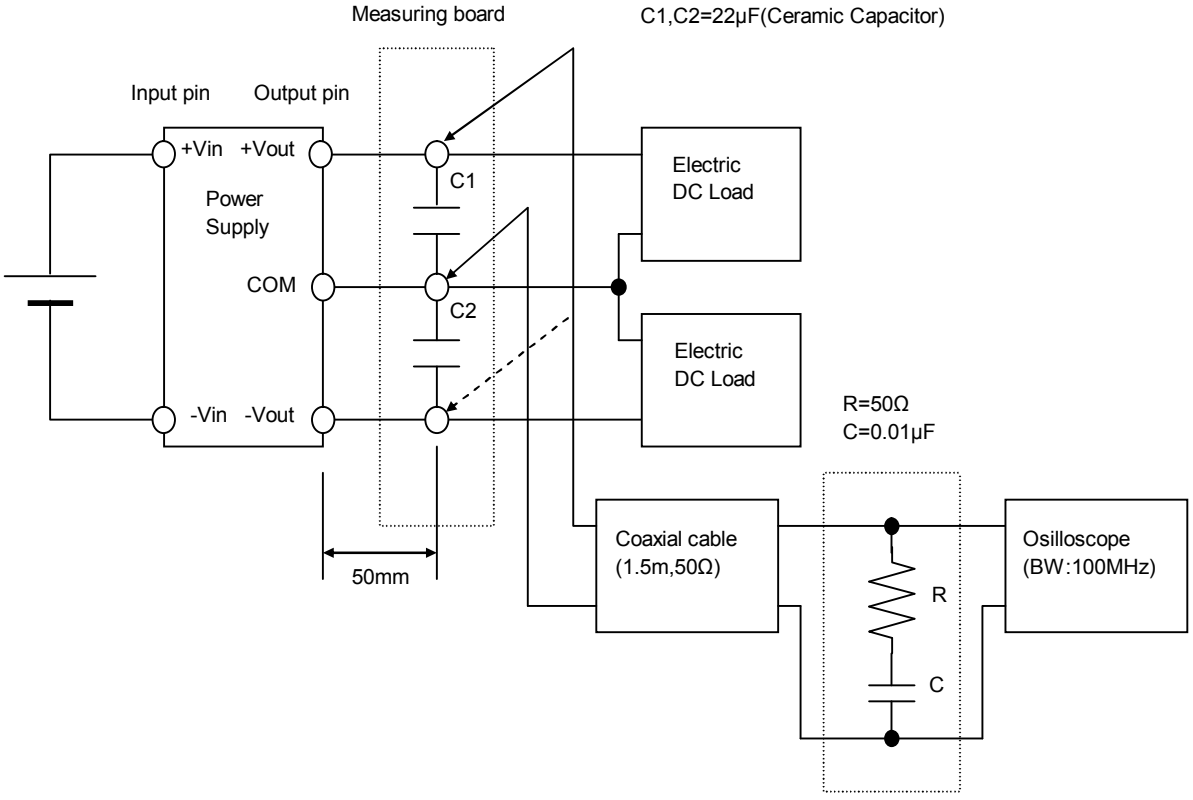

Figure B（Ripple and Ripple noise Characteristic）