COSEL

参考資料

TEST DATA OF SUTW102412

Regulated DC Power Supply
February 24, 2009

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COSEL CO.,LTD.

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CONTENTS

1.Input Current (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 1
2.Input Current (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 2
3.Input Power (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 3
4.Efficiency (by Input Voltage) ・・・・・・・・・・・・・・・・・・・・・・・・ 4
5.Efficiency (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 5
6.Line Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 6
7.Load Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 7
8.Dynamic Load Response ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 8
9.Ripple Voltage (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・ 10
10.Ripple-Noise ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 12
11.Ripple Voltage (by Ambient Temperature) ・・・・・・・・・・・・・・・・・ 14
12.Ambient Temperature Drift ・・・・・・・・・・・・・・・・・・・・・・・・・ 15
13.Output Voltage Accuracy ・・・・・・・・・・・・・・・・・・・・・・・・・・ 16
14.Time Lapse Drift ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 17
15.Rise and Fall Time ・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 18
16.Minimum Input Voltage for Regulated Output Voltage ・・・・・・・・・・ 20
17.Overcurrent Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・ 21
18.Figure of Testing Circuitry ・・・・・・・・・・・・・・・・・・・・・・・・ 22
(Final Page 22)

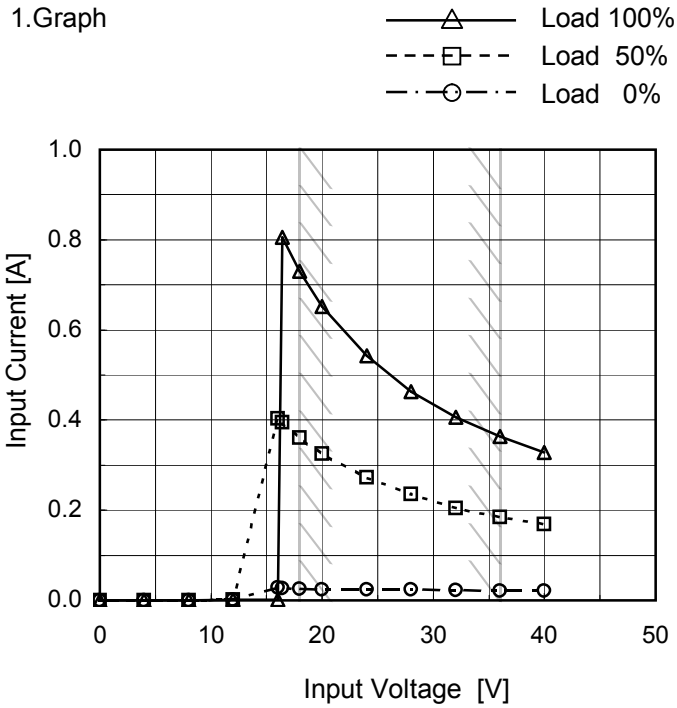
参考資料

COSEL

Model	SUTW102412
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	0.000	0.000	0.000
8.0	0.001	0.001	0.001
12.0	0.001	0.001	0.001
16.0	0.028	0.404	0.002
16.4	0.028	0.395	0.806
18.0	0.026	0.361	0.730
20.0	0.025	0.325	0.652
24.0	0.024	0.273	0.543
28.0	0.024	0.235	0.463
32.0	0.022	0.205	0.407
36.0	0.022	0.185	0.363
40.0	0.021	0.170	0.328
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

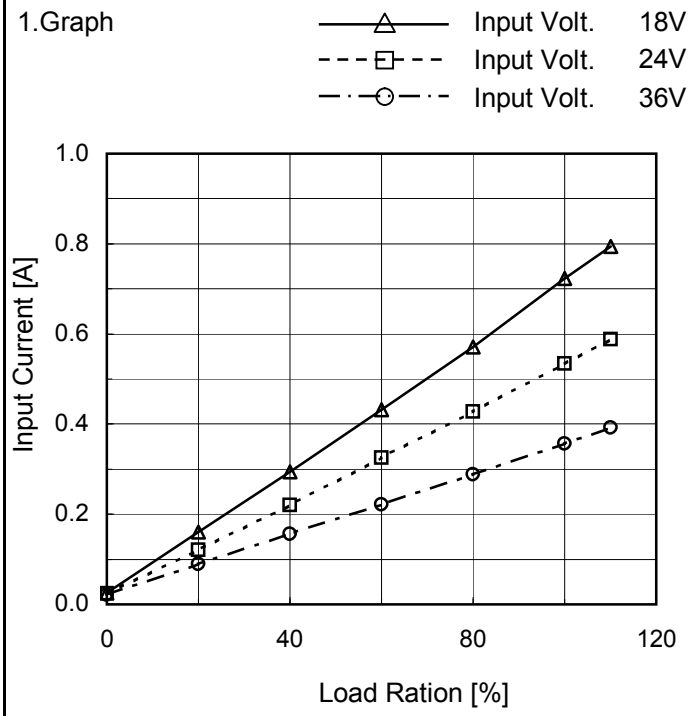
BC-10302

COSEL

Model	SUTW102412
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

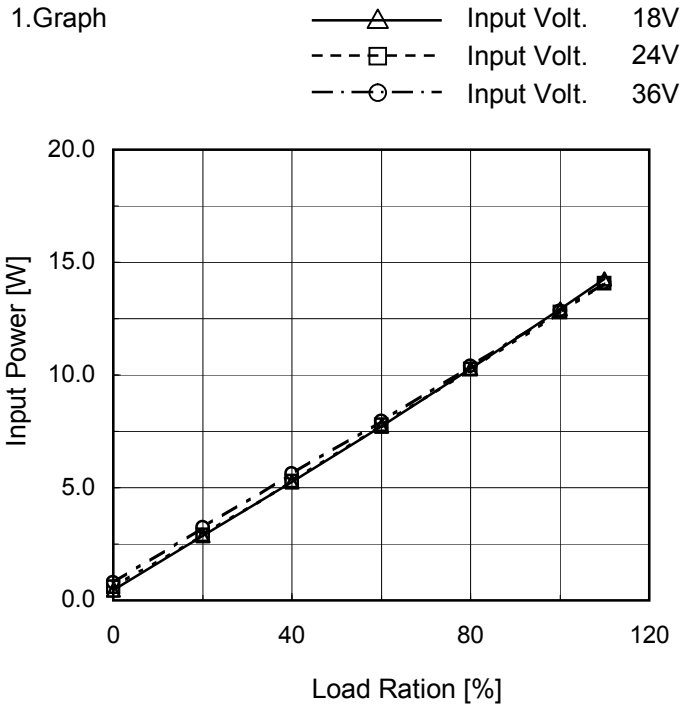
Load Ration [%]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.026	0.024	0.022
20	0.160	0.121	0.090
40	0.294	0.221	0.156
60	0.431	0.325	0.221
80	0.571	0.428	0.289
100	0.723	0.534	0.357
110	0.795	0.588	0.392
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102412
Item	Input Power (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

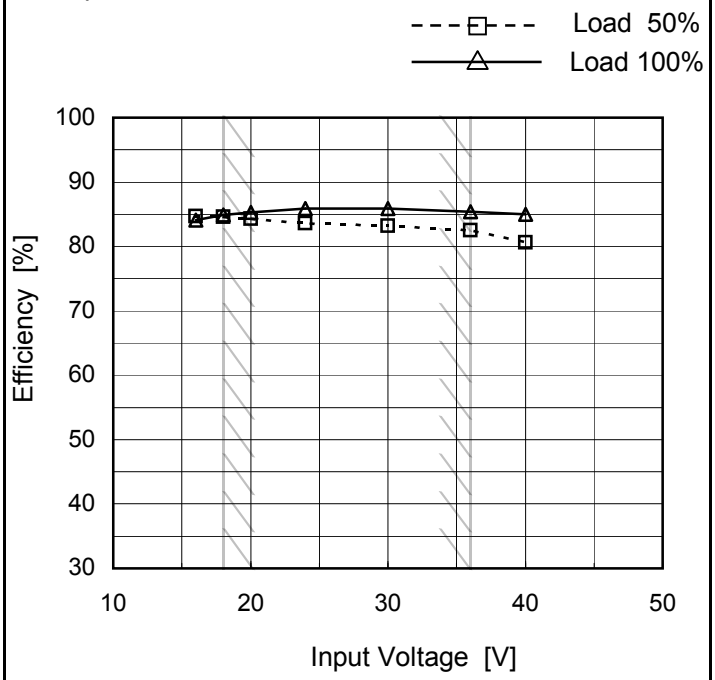
Load Ration [%]	Input Power [W]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.47	0.59	0.79
20	2.87	2.91	3.23
40	5.27	5.29	5.61
60	7.74	7.79	7.95
80	10.27	10.25	10.40
100	12.91	12.78	12.84
110	14.27	14.07	14.10
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102412
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

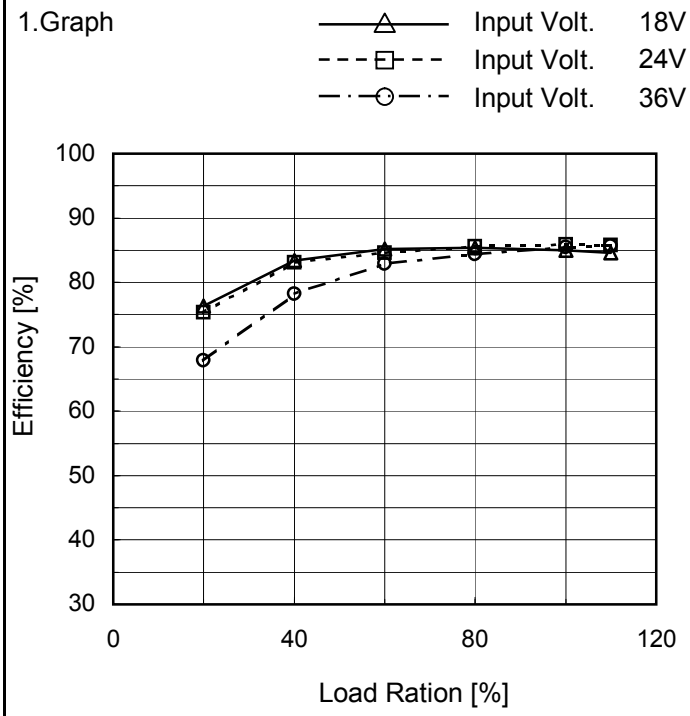
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
16	84.7	84.1
18	84.6	84.9
20	84.3	85.3
24	83.6	85.8
30	83.2	85.9
36	82.5	85.4
40	80.7	85.0
--	-	-
--	-	-

COSEL

Model	SUTW102412
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

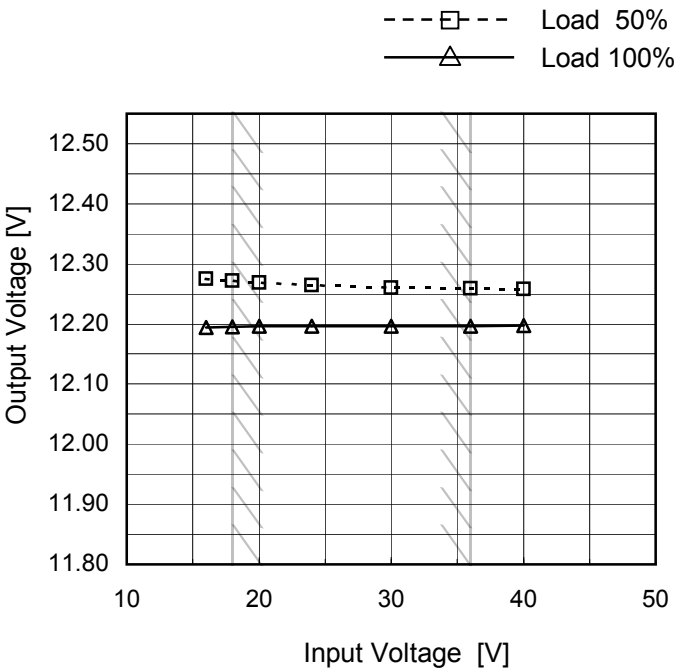
Load Ration [%]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-
20	76.3	75.3	67.9
40	83.4	83.1	78.2
60	85.2	84.6	82.9
80	85.4	85.6	84.4
100	85.0	85.9	85.5
110	84.6	85.8	85.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102412
Item	Line Regulation
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

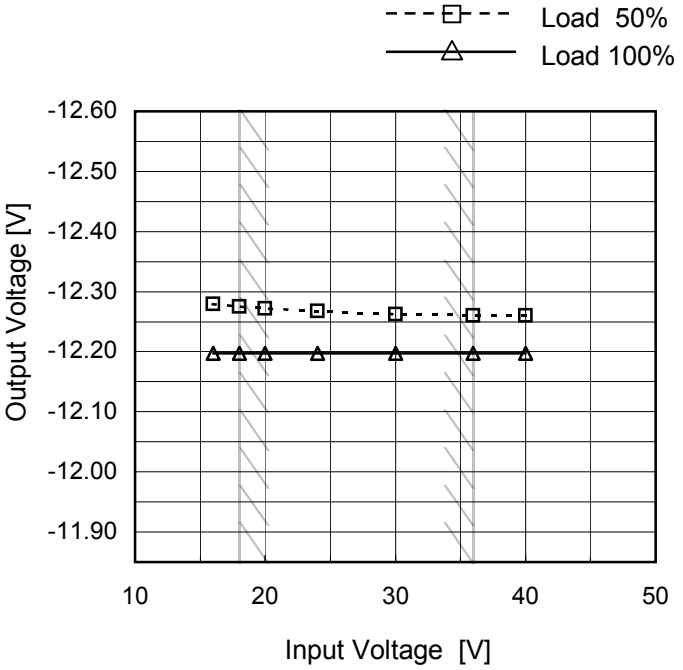


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	12.275	12.195
18	12.272	12.195
20	12.269	12.196
24	12.264	12.196
30	12.261	12.197
36	12.259	12.197
40	12.258	12.197
--	-	-
--	-	-

Object	-12V0.45A

1.Graph



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

2.Values

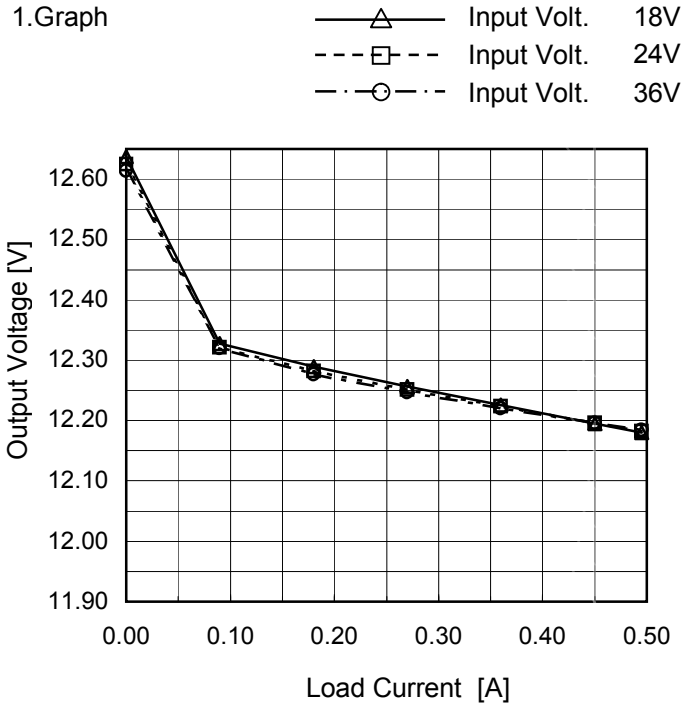
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	-12.279	-12.197
18	-12.275	-12.197
20	-12.272	-12.198
24	-12.267	-12.197
30	-12.263	-12.197
36	-12.261	-12.198
40	-12.260	-12.198
--	-	-
--	-	-

COSEL

Model	SUTW102412
Item	Load Regulation
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

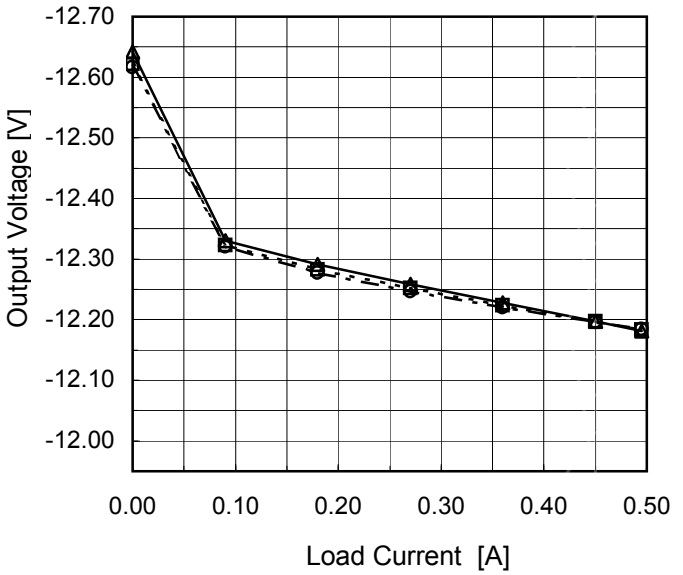


2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	12.637	12.625	12.614
0.090	12.328	12.321	12.320
0.180	12.289	12.282	12.277
0.270	12.256	12.251	12.247
0.360	12.225	12.223	12.221
0.450	12.195	12.196	12.196
0.495	12.180	12.182	12.185
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-12V0.45A

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]
0.000	-12.642	-12.622	-12.617
0.090	-12.331	-12.323	-12.321
0.180	-12.292	-12.283	-12.277
0.270	-12.259	-12.253	-12.247
0.360	-12.227	-12.224	-12.221
0.450	-12.197	-12.197	-12.197
0.495	-12.182	-12.183	-12.185
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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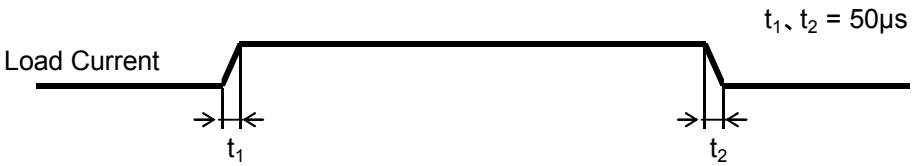
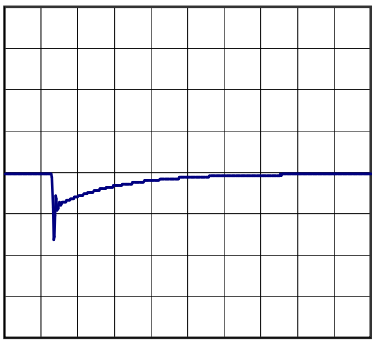
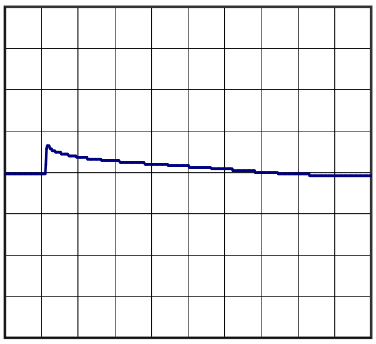
Model	SUTW102412	Temperature 25°C
Item	Dynamic Load Response	Testing Circuitry Figure A
Object	-12V0.45A	

Input Volt. 48 V
Cycle 100 mS



Min. Load (0A) ←→
Load 100% (0.45A)

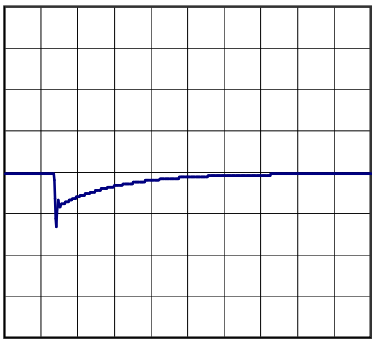


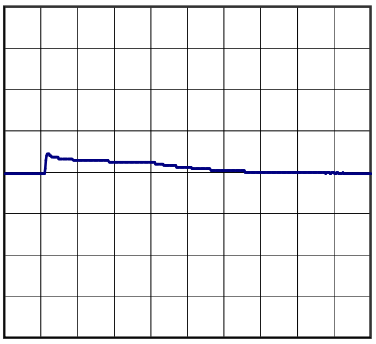


500mV/div

1ms/div 1ms/div

Min. Load (0A) ←→
Load 50% (0.225A)

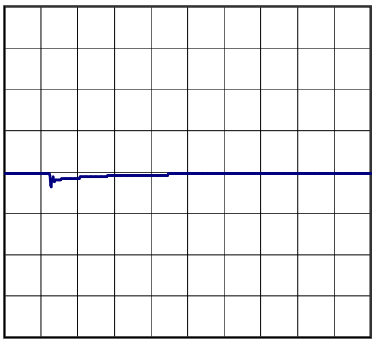


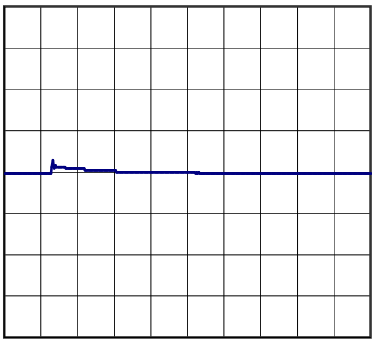


500mV/div

1ms/div 1ms/div

Load 50% (0.225A) ←→
Load 100% (0.45A)





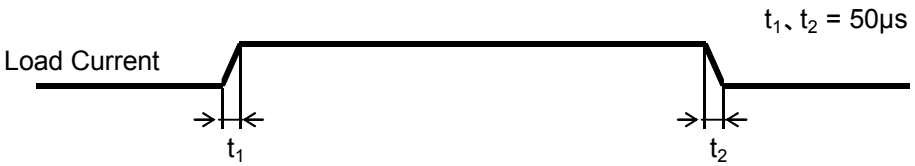
500mV/div

1ms/div 1ms/div

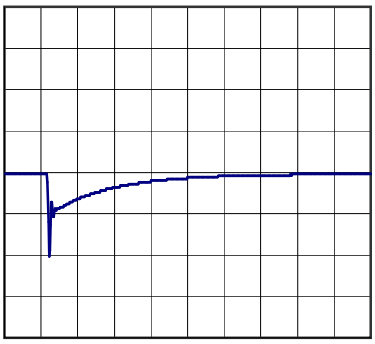
COSEL

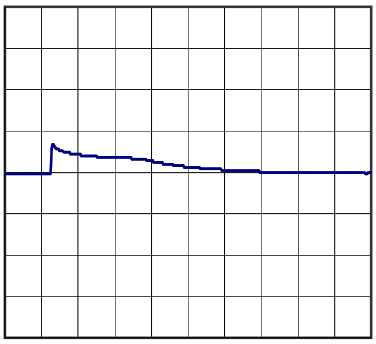
Model	SUTW102412	Temperature 25°C
Item	Dynamic Load Response	Testing Circuitry Figure A
Object	-12V0.45A	

Input Volt. 48 V
Cycle 100 mS



Min. Load (0A) ←→
Load 100% (0.45A)

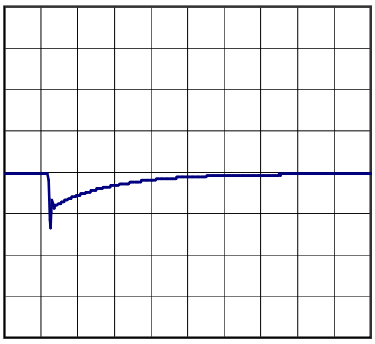


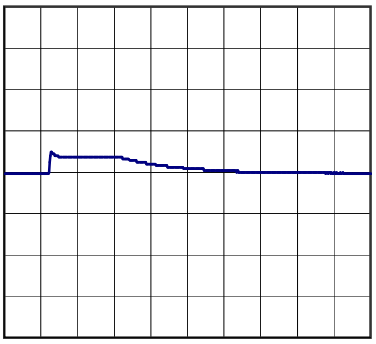


500mV/div

1ms/div 1ms/div

Min. Load (0A) ←→
Load 50% (0.225A)

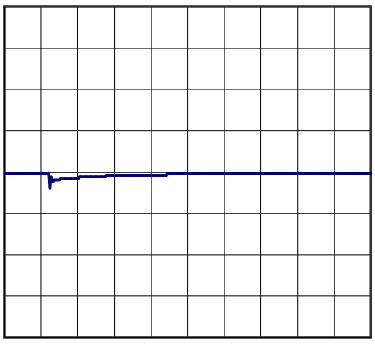


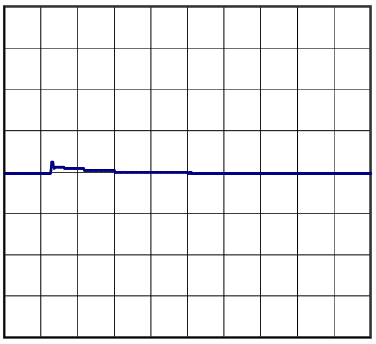


500mV/div

1ms/div 1ms/div

Load 50% (0.225A) ←→
Load 100% (0.45A)





500mV/div

1ms/div 1ms/div

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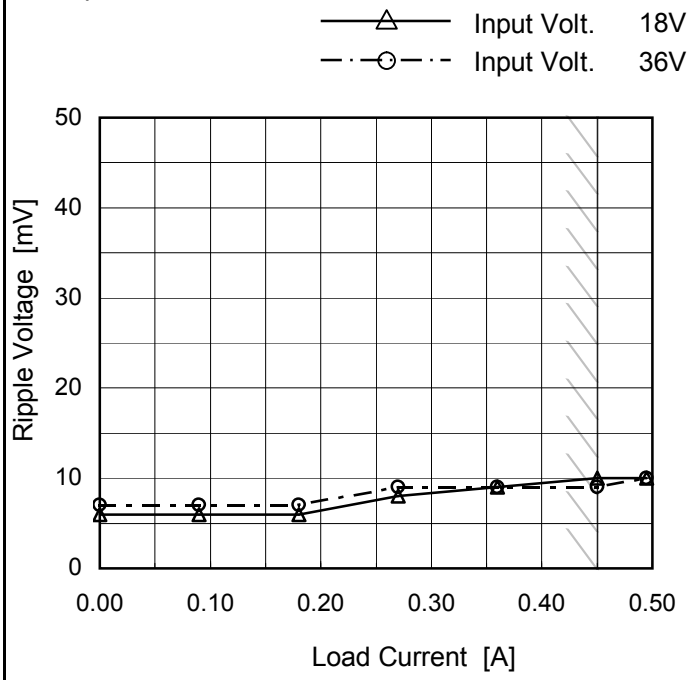
Model	SUTW102412
Item	Ripple Voltage (by Load Current)
Object	+12V0.45A

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]

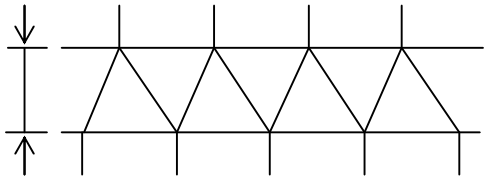


Fig.Complex Ripple Wave Form

2.Values

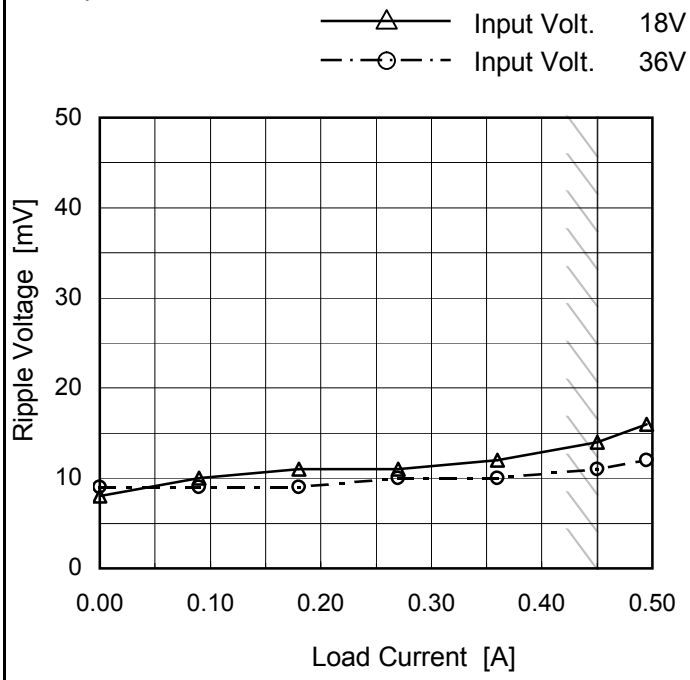
Load Current [A]	Ripple Voltage [mV] Input Volt. 18 [V]	Ripple Voltage [mV] Input Volt. 36 [V]
0.000	6	7
0.090	6	7
0.180	6	7
0.270	8	9
0.360	9	9
0.450	10	9
0.495	10	10
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102412
Item	Ripple Voltage (by Load Current)
Object	-12V0.45A

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]

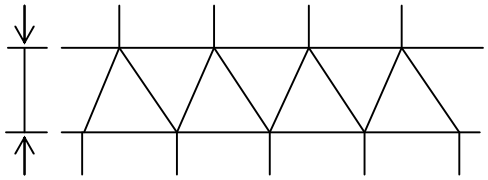


Fig.Complex Ripple Wave Form

2.Values

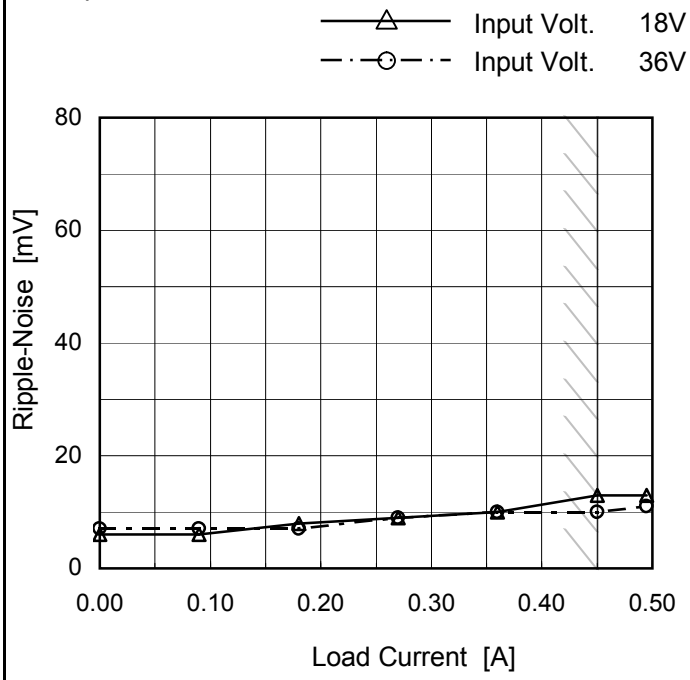
Load Current [A]	Ripple Voltage [mV] Input Volt. 18 [V]	Ripple Voltage [mV] Input Volt. 36 [V]
0.000	8	9
0.090	10	9
0.180	11	9
0.270	11	10
0.360	12	10
0.450	14	11
0.495	16	12
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102412
Item	Ripple-Noise
Object	+12V0.45A

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.

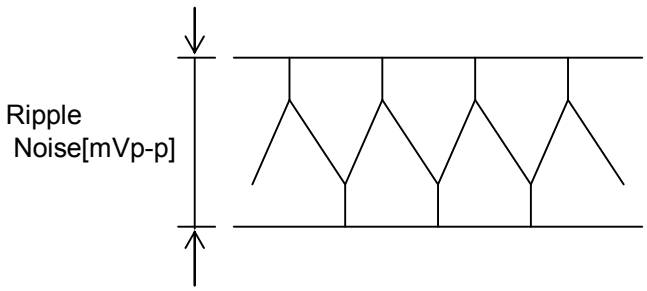


Fig.Complex Ripple Noise Wave Form

2.Values

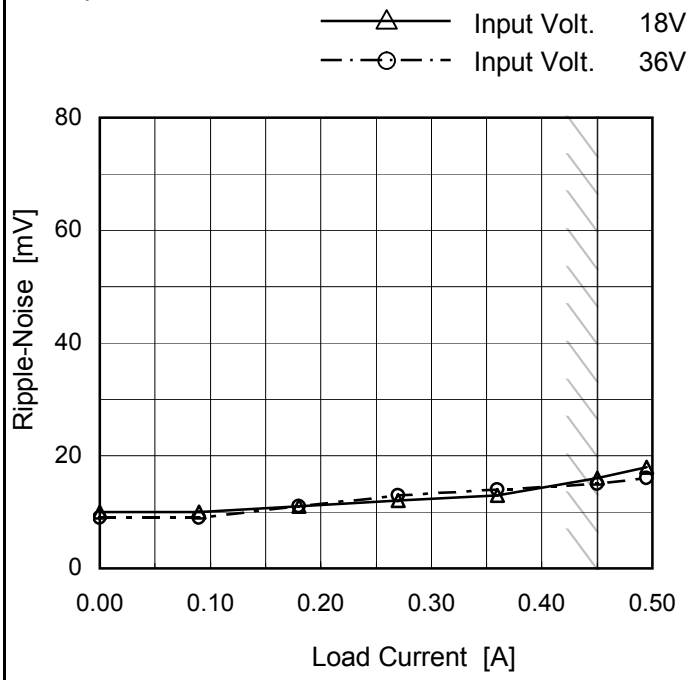
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	6	7
0.090	6	7
0.180	8	7
0.270	9	9
0.360	10	10
0.450	13	10
0.495	13	11
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102412
Item	Ripple-Noise
Object	-12V0.45A

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.

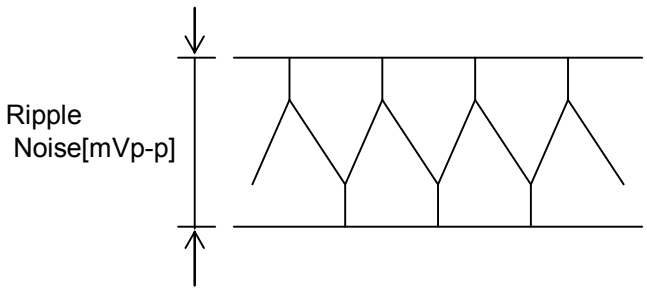


Fig.Complex Ripple Noise Wave Form

2.Values

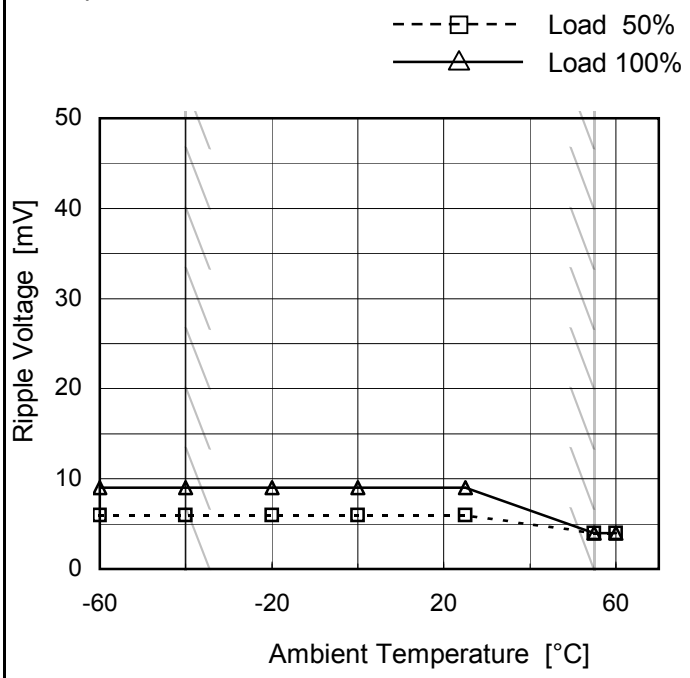
Load Current [A]	Ripple-Noise [mV] Input Volt. 18 [V]	Ripple-Noise [mV] Input Volt. 36 [V]
0.000	10	9
0.090	10	9
0.180	11	11
0.270	12	13
0.360	13	14
0.450	16	15
0.495	18	16
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.45A

Testing Circuitry Figure B

1.Graph



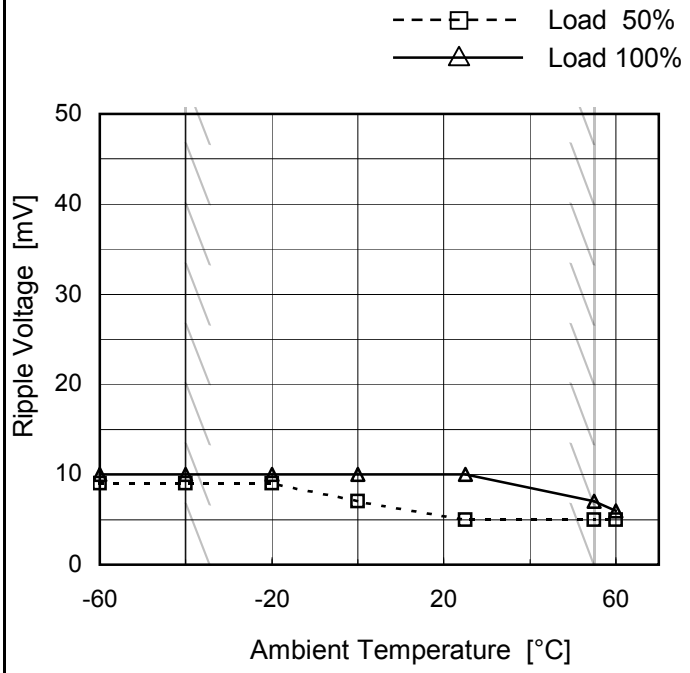
Input Volt. 24V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	6	9
-40	6	9
-20	6	9
0	6	9
25	6	9
55	4	4
60	4	4
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.45A

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	9	10
-40	9	10
-20	9	10
0	7	10
25	5	10
55	5	7
60	5	6
--	-	-
--	-	-
--	-	-
--	-	-

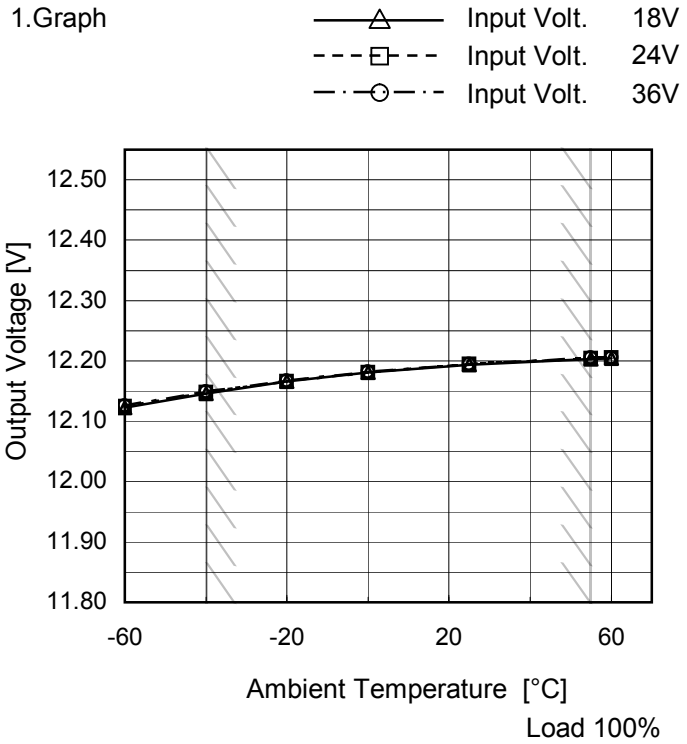
COSEL

Model	SUTW102412
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +12V0.45A

1.Graph

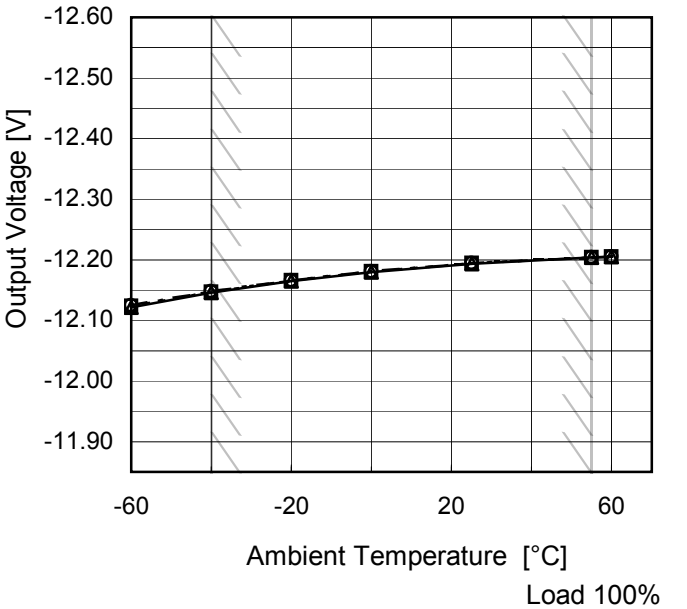


2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	12.123	12.124	12.126
-40	12.146	12.148	12.149
-20	12.166	12.166	12.167
0	12.180	12.181	12.182
25	12.194	12.194	12.195
55	12.204	12.204	12.205
60	12.204	12.205	12.206
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object -12V0.45A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	-12.122	-12.123	-12.125
-40	-12.146	-12.147	-12.148
-20	-12.164	-12.166	-12.166
0	-12.179	-12.180	-12.181
25	-12.193	-12.194	-12.194
55	-12.204	-12.204	-12.204
60	-12.205	-12.205	-12.205
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102412	
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 - 55°C

Input Voltage : 18 - 36V

Load Current (AVR 1) : 0 - 0.45A (AVR 2) : 0 - 0.45A

* 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	+12V0.45A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	12.649	±462	±3.9
Minimum Voltage	-40	18	0.45	11.726		

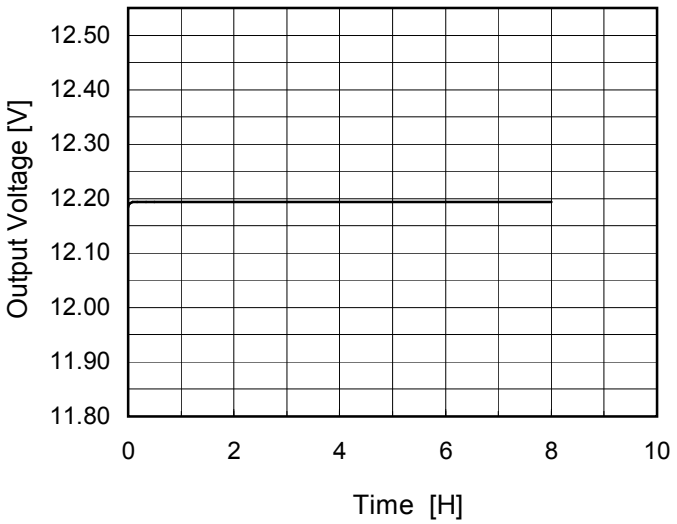
Object	-12V0.45A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	-12.653	±463	±3.9
Minimum Voltage	-40	18	0.45	-11.727		

COSEL

Model	SUTW102412
Item	Time Lapse Drift
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



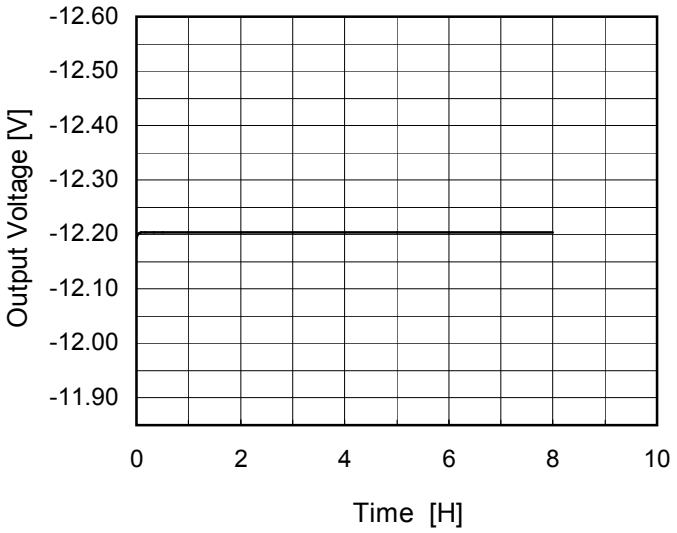
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.185
0.5	12.194
1.0	12.194
2.0	12.194
3.0	12.194
4.0	12.194
5.0	12.194
6.0	12.194
7.0	12.194
8.0	12.194

Object	-12V0.45A

1.Graph



Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.193
0.5	-12.204
1.0	-12.204
2.0	-12.204
3.0	-12.204
4.0	-12.204
5.0	-12.204
6.0	-12.204
7.0	-12.204
8.0	-12.204

BC-10302

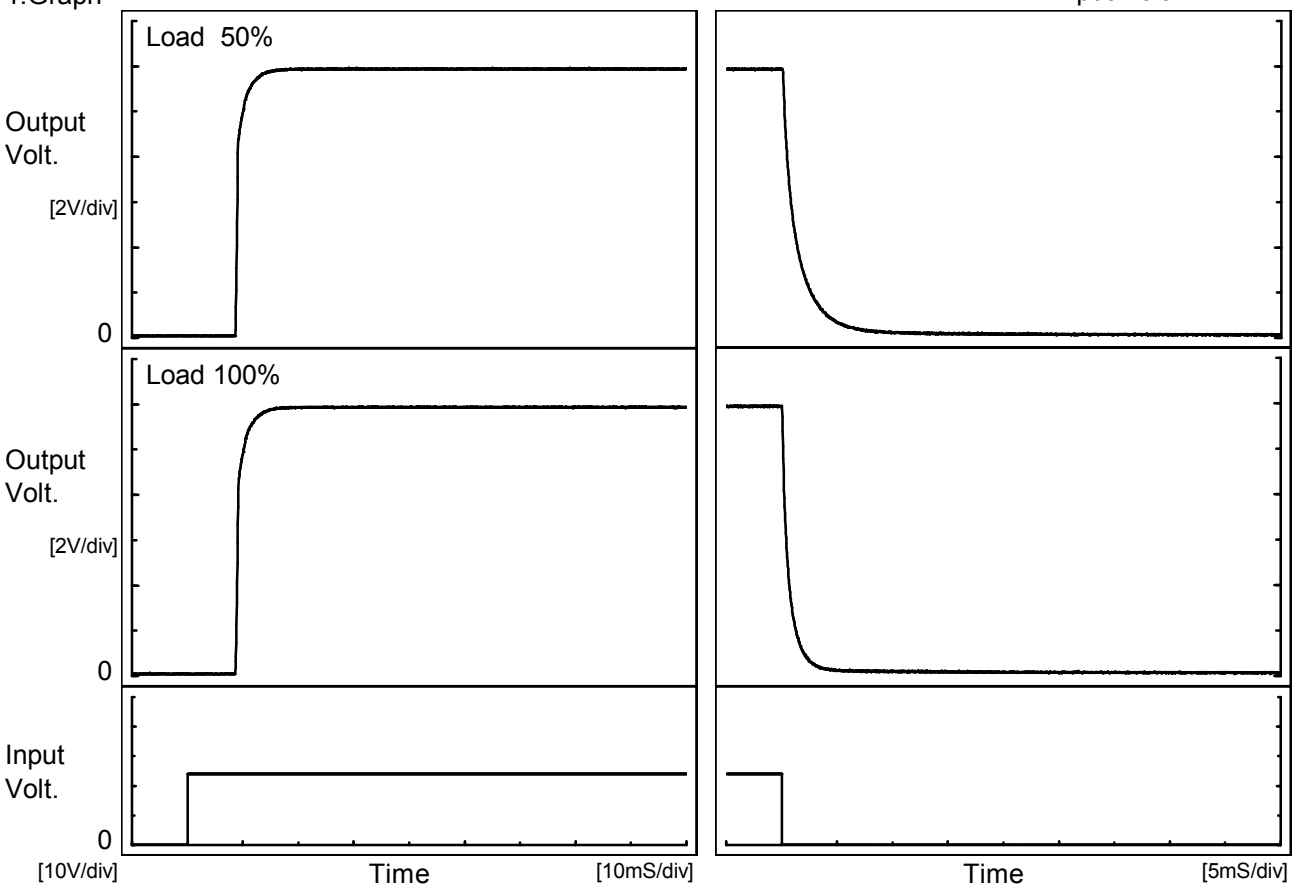
COSEL

Model	SUTW102412
Item	Rise and Fall Time
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

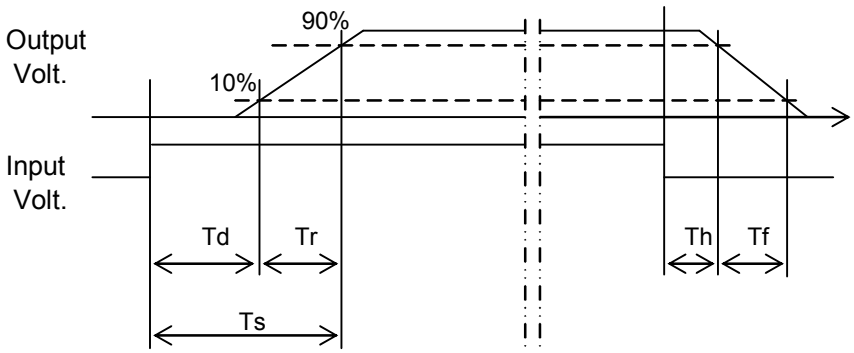
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	8.8	2.3	11.1	0.1	3.3
100 %	8.8	2.3	11.1	0.1	1.7



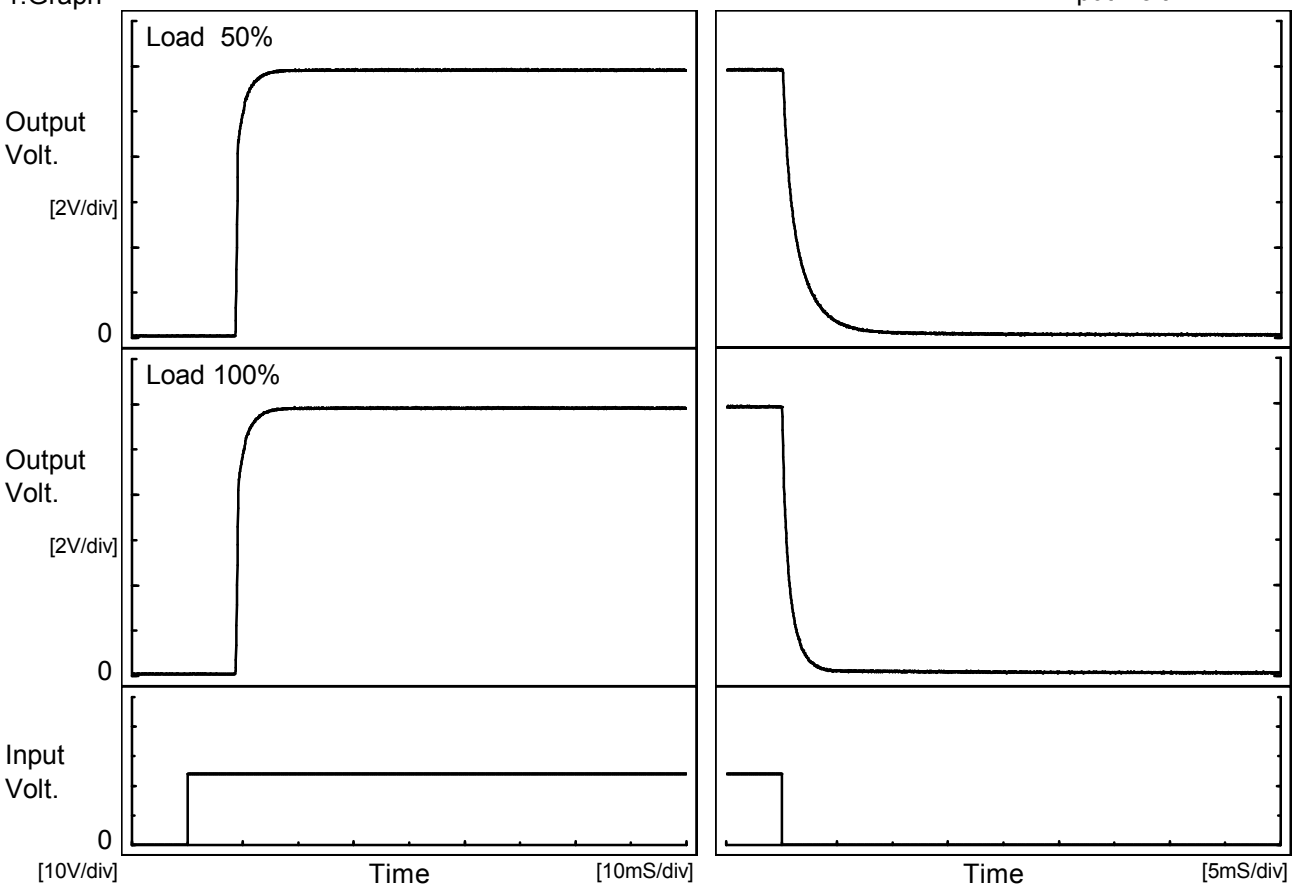
COSEL

Model	SUTW102412
Item	Rise and Fall Time
Object	-12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

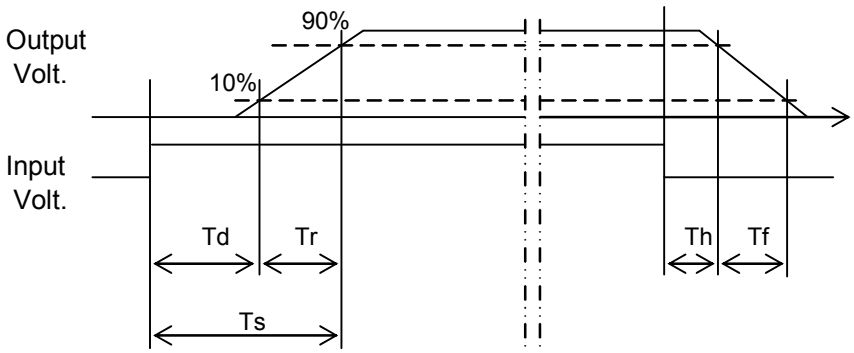
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	8.8	2.4	11.2	0.1	3.5
100 %	8.8	2.4	11.2	0.1	1.7



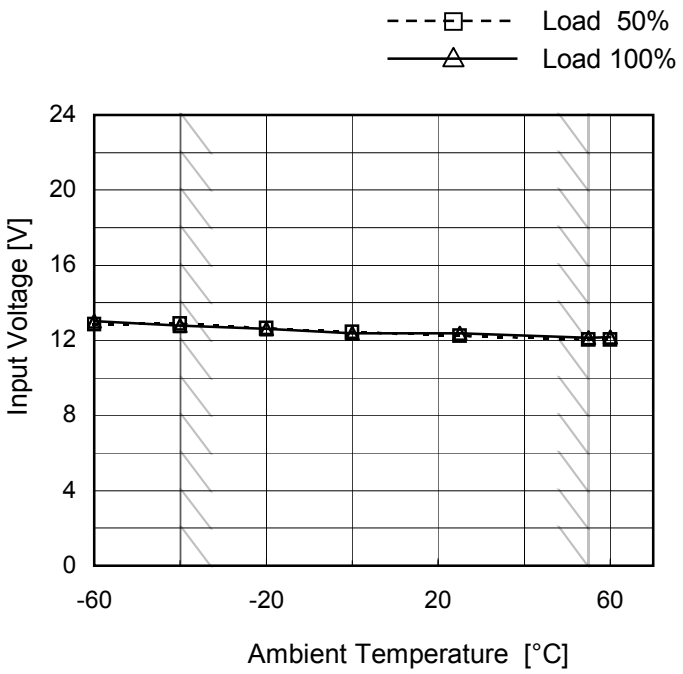
COSEL

Model	SUTW102412
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object +12V0.45A

1.Graph

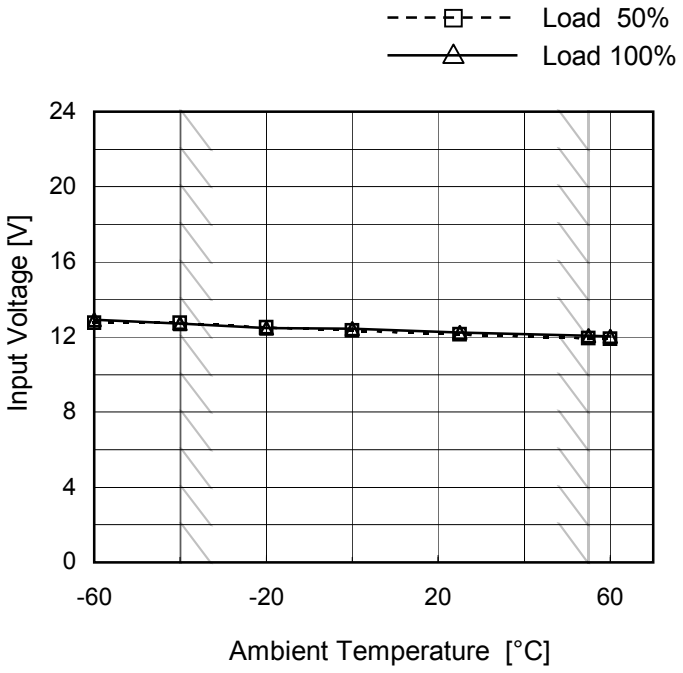


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	12.9	13.1
-40	12.9	12.8
-20	12.7	12.6
0	12.5	12.4
25	12.3	12.4
55	12.1	12.2
60	12.1	12.2
--	-	-
--	-	-
--	-	-
--	-	-

Object -12V0.45A

1.Graph



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

2.Values

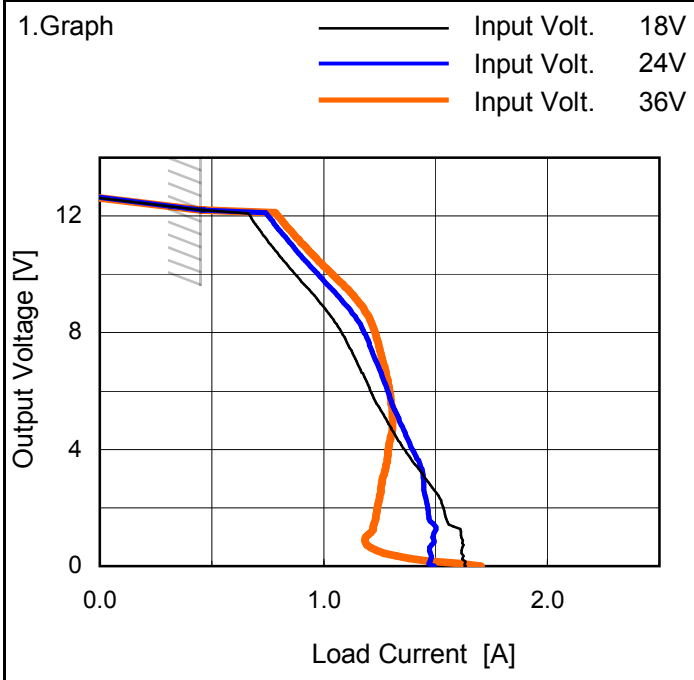
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	12.8	13.0
-40	12.8	12.8
-20	12.6	12.5
0	12.4	12.5
25	12.2	12.3
55	12.0	12.1
60	12.0	12.1
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102412
Item	Overcurrent Protection
Object	+12V0.45A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

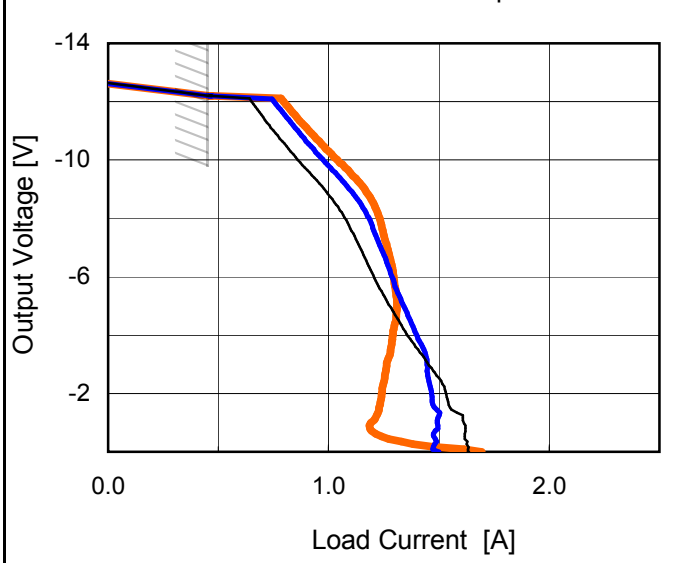


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
12.0	0.46	0.46	0.46
11.4	0.72	0.82	0.87
10.8	0.78	0.88	0.93
9.6	0.91	1.02	1.09
8.4	1.04	1.15	1.21
7.2	1.13	1.22	1.26
6.0	1.21	1.29	1.29
4.8	1.29	1.35	1.31
3.6	1.40	1.42	1.29
2.4	1.51	1.45	1.25
1.2	1.61	1.50	1.22
0.0	1.63	1.49	1.70

Object	-12V0.45A

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]
-12.0	0.46	0.46	0.46
-11.4	0.71	0.82	0.87
-10.8	0.77	0.88	0.93
-9.6	0.90	1.02	1.09
-8.4	1.04	1.15	1.21
-7.2	1.13	1.22	1.26
-6.0	1.20	1.29	1.29
-4.8	1.29	1.35	1.31
-3.6	1.39	1.42	1.28
-2.4	1.51	1.46	1.25
-1.2	1.61	1.50	1.22
0.0	1.63	1.49	1.69

COSEL

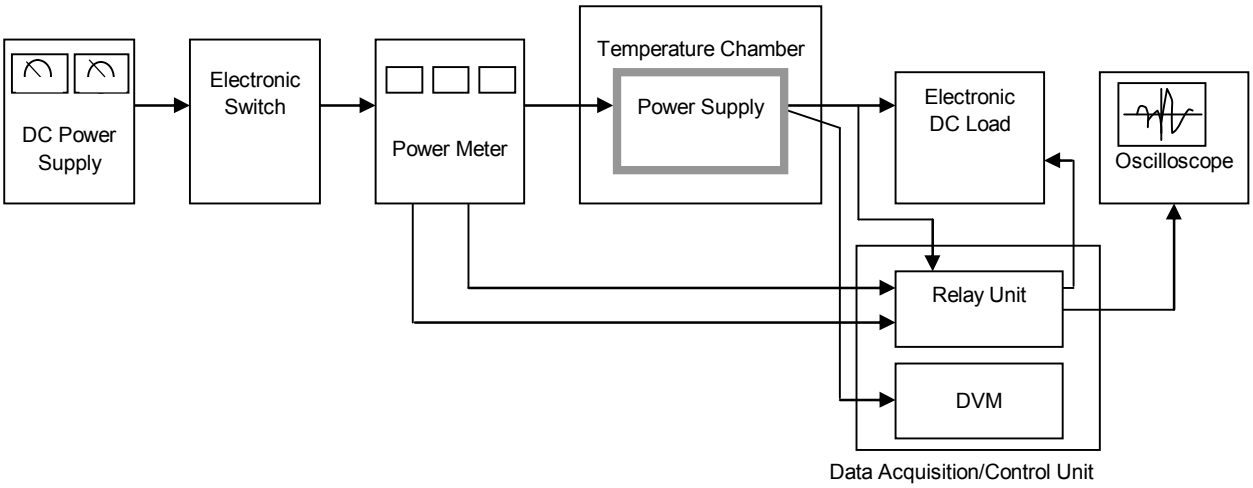


Figure A

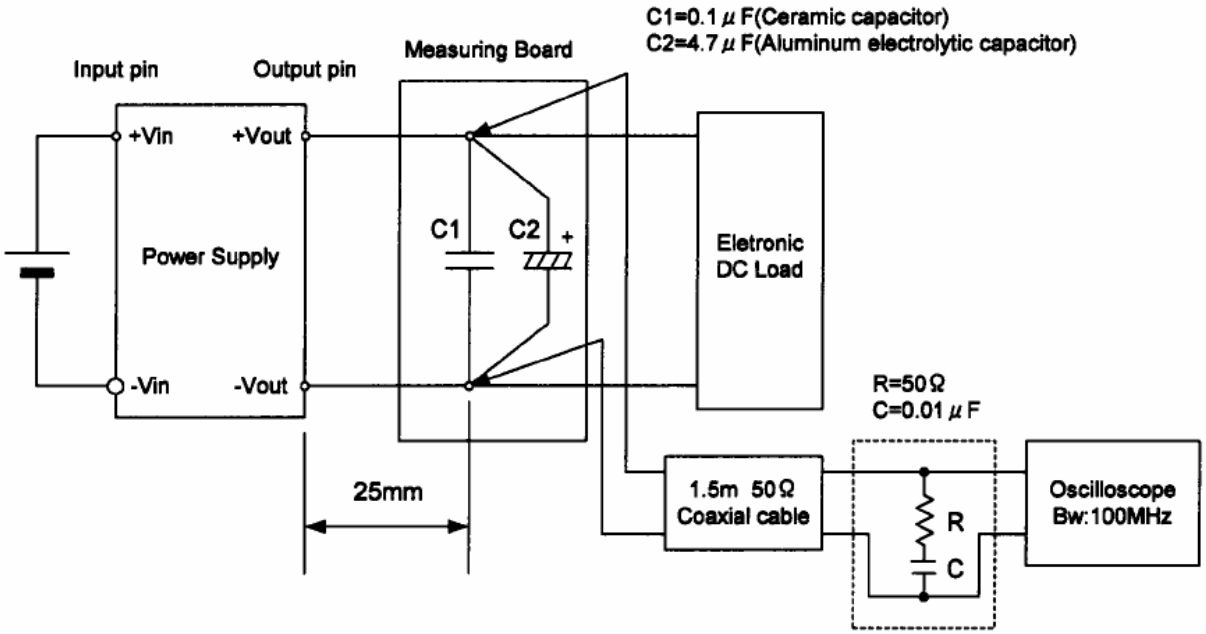


Figure B (Ripple and Ripple noise Characteristic)