COSEL

参考資料

TEST DATA OF SUTW62412

Regulated DC Power Supply
March 17, 2009

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Sho Saito Design Engineer

COSEL CO.,LTD.

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参考資料

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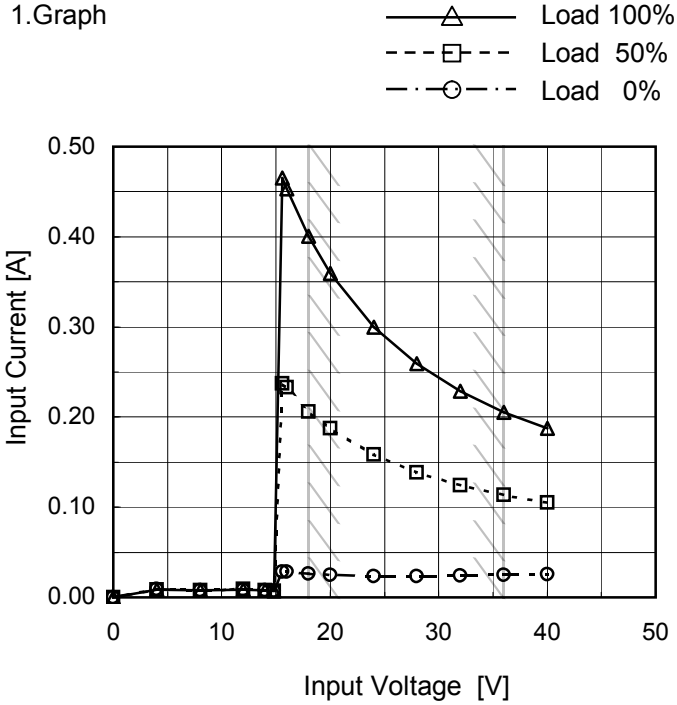
Model	SUTW62412
Item	Input Current (by Input Voltage)
Object	――――――

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	0.009	0.009	0.009
8.0	0.008	0.008	0.008
12.0	0.009	0.009	0.009
14.0	0.008	0.008	0.008
14.8	0.007	0.007	0.007
15.6	0.029	0.238	0.466
16.0	0.028	0.233	0.453
18.0	0.026	0.206	0.401
20.0	0.025	0.187	0.359
24.0	0.023	0.158	0.300
28.0	0.023	0.139	0.259
32.0	0.024	0.124	0.229
36.0	0.025	0.114	0.205
40.0	0.026	0.105	0.188
--	-	-	-
--	-	-	-
--	-	-	-

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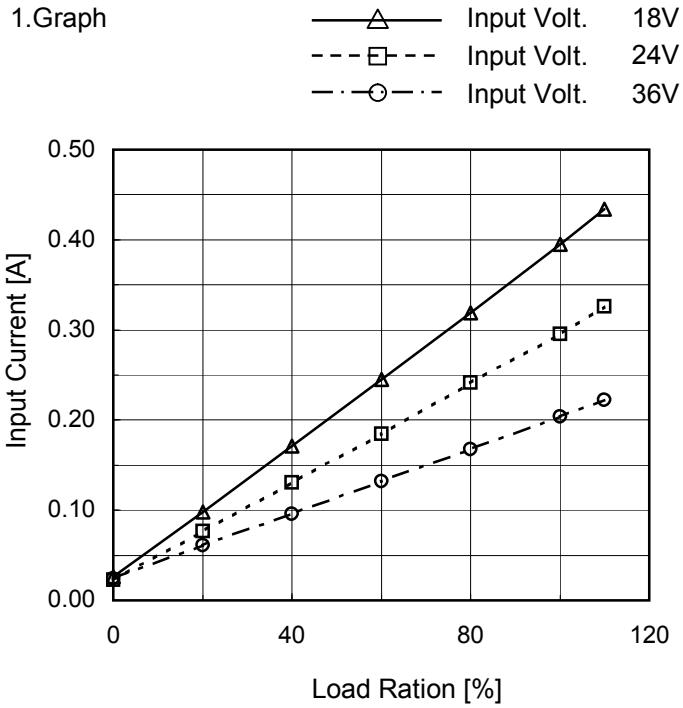
Model	SUTW62412
Item	Input Current (by Load Current)
Object	――――――

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	0.023	0.024
20	0.098	0.077	0.061
40	0.171	0.130	0.096
60	0.245	0.185	0.132
80	0.319	0.241	0.168
100	0.395	0.296	0.204
110	0.434	0.326	0.222
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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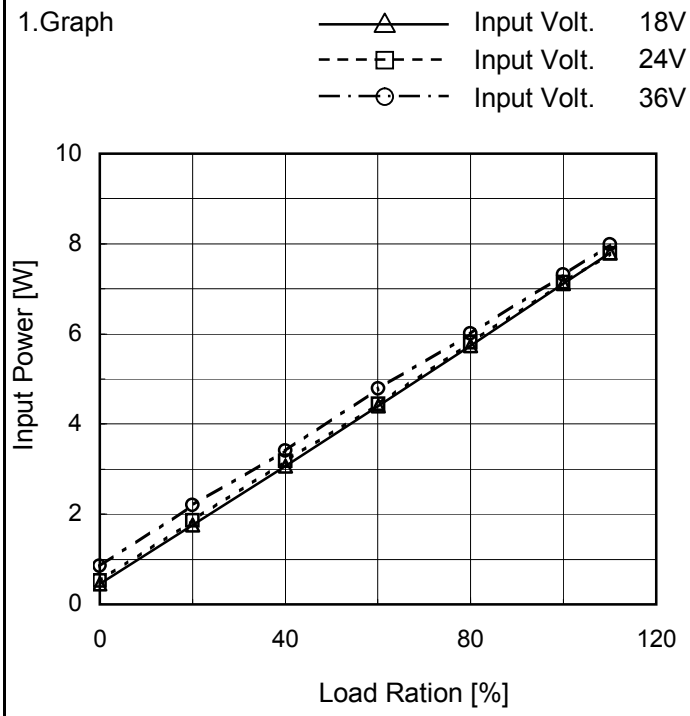
COSEL

Model	SUTW62412
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	0.46	0.53	0.85
20	1.76	1.86	2.20
40	3.07	3.18	3.41
60	4.40	4.44	4.78
80	5.74	5.81	6.01
100	7.12	7.14	7.31
110	7.80	7.78	7.99
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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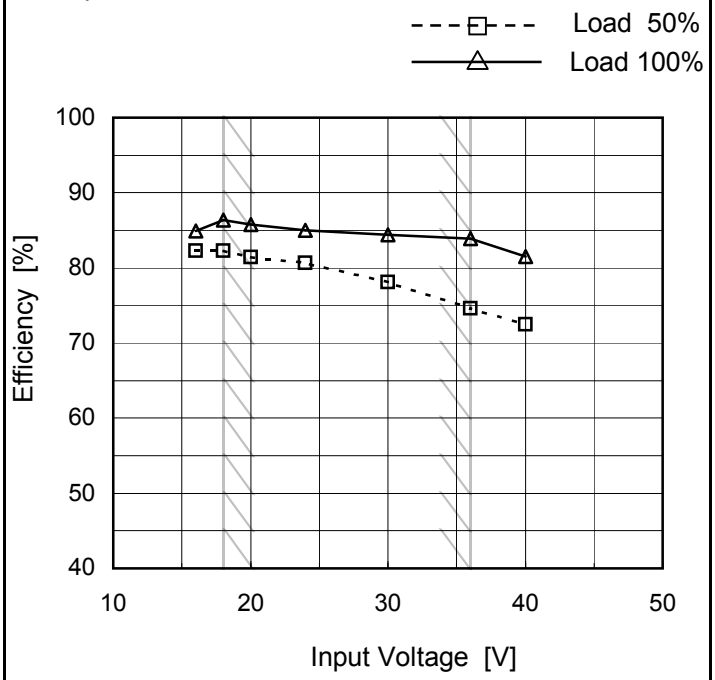
COSEL

Model	SUTW62412
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	82.2	84.9
18	82.3	86.4
20	81.4	85.8
24	80.6	85.0
30	78.1	84.4
36	74.6	83.9
40	72.5	81.5
--	-	-
--	-	-

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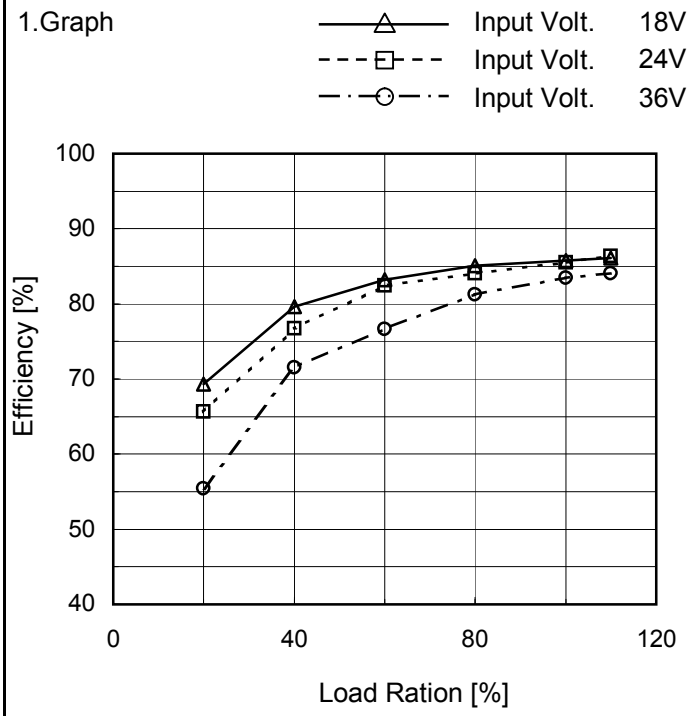
COSEL

Model	SUTW62412
Item	Efficiency (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

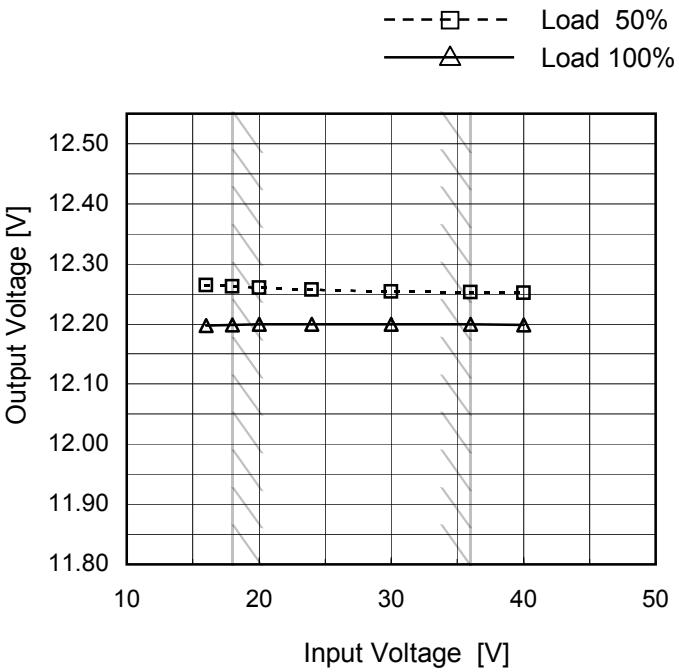
Load Ration [%]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-
20	69.3	65.7	55.4
40	79.6	76.7	71.6
60	83.2	82.5	76.6
80	85.1	84.0	81.2
100	85.7	85.5	83.5
110	86.1	86.3	84.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW62412
Item	Line Regulation
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

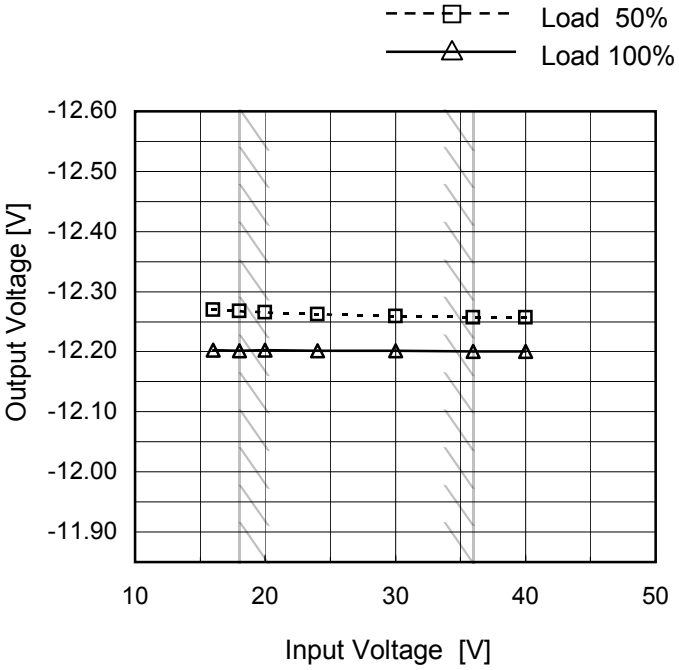


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	12.264	12.198
18	12.262	12.199
20	12.261	12.199
24	12.258	12.199
30	12.254	12.199
36	12.253	12.199
40	12.252	12.199
--	-	-
--	-	-

Object	-12V0.25A

1.Graph



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

2.Values

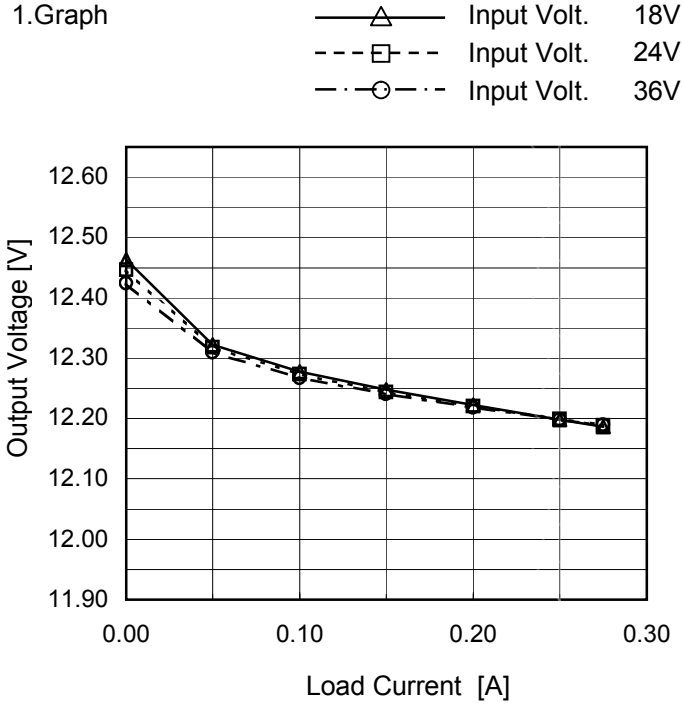
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	-12.270	-12.202
18	-12.268	-12.202
20	-12.265	-12.202
24	-12.262	-12.202
30	-12.259	-12.201
36	-12.257	-12.201
40	-12.257	-12.201
--	-	-
--	-	-

COSEL

Model	SUTW62412
Item	Load Regulation
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

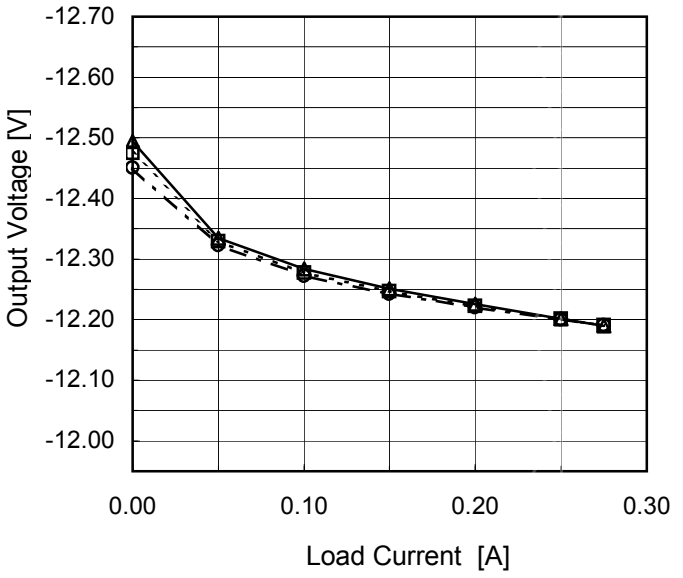


2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	12.463	12.447	12.424
0.050	12.322	12.318	12.310
0.100	12.278	12.273	12.267
0.150	12.248	12.244	12.241
0.200	12.222	12.220	12.218
0.250	12.198	12.199	12.199
0.275	12.186	12.188	12.189
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-12V0.25A

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	-12.494	-12.476	-12.451
0.050	-12.334	-12.329	-12.323
0.100	-12.284	-12.278	-12.272
0.150	-12.251	-12.247	-12.243
0.200	-12.225	-12.223	-12.220
0.250	-12.202	-12.201	-12.200
0.275	-12.190	-12.191	-12.191
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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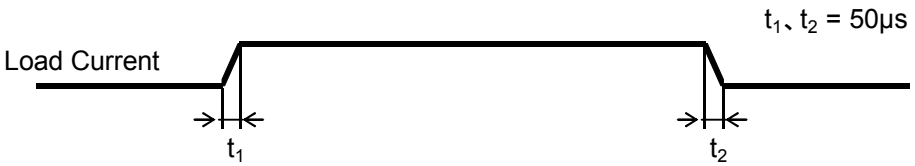
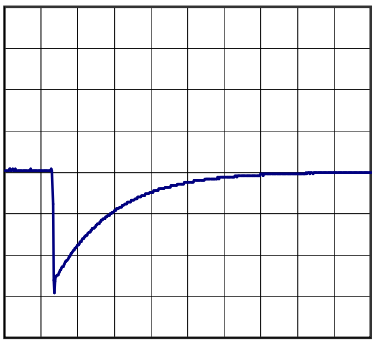
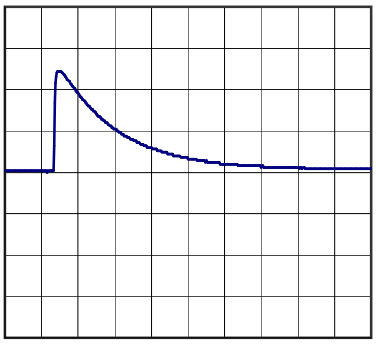
Model	SUTW62412	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+12V0.25A	

Input Volt. 12 V
Cycle 100 mS



Min. Load (0A) ←→
Load 100% (0.25A)

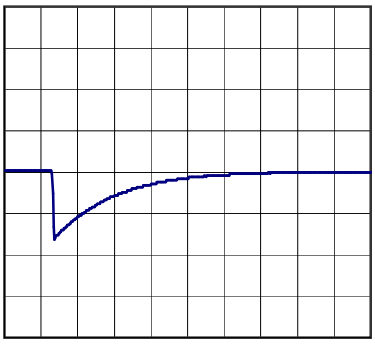


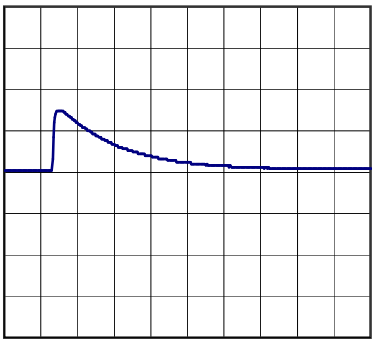


200mV/div

1ms/div 1ms/div

Min. Load (0A) ←→
Load 50% (0.125A)

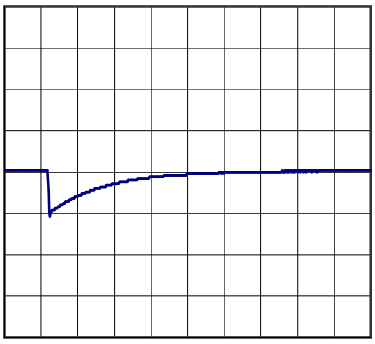


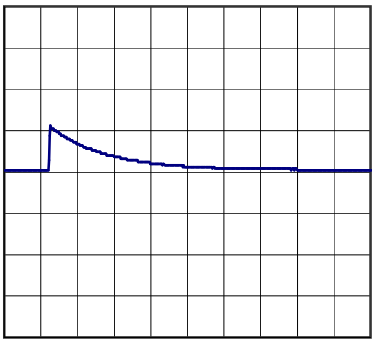


200mV/div

1ms/div 1ms/div

Load 50% (0.125A) ←→
Load 100% (0.25A)





200mV/div

1ms/div 1ms/div

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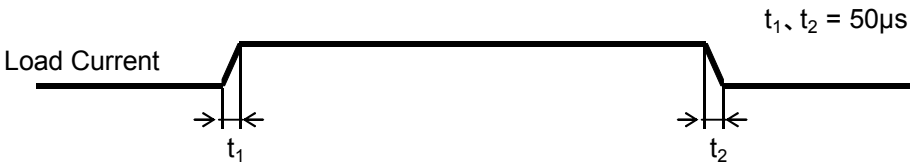
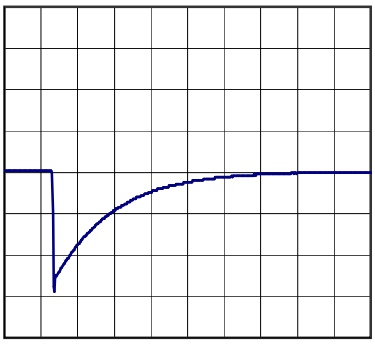
Model	SUTW62412
Item	Dynamic Load Response
Object	-12V0.25A

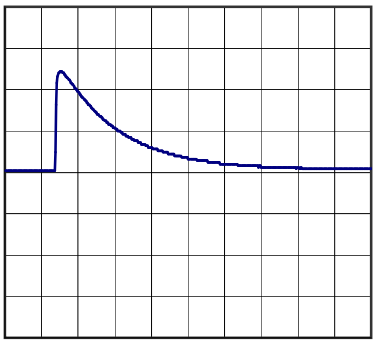
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 12 V
Cycle 100 mS



Min. Load (0A) ←→
Load 100% (0.25A)

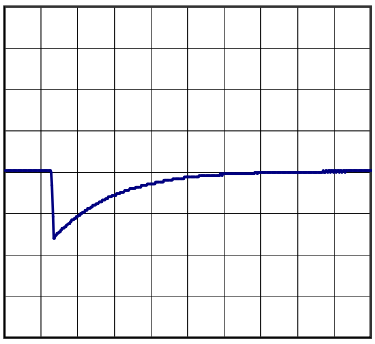


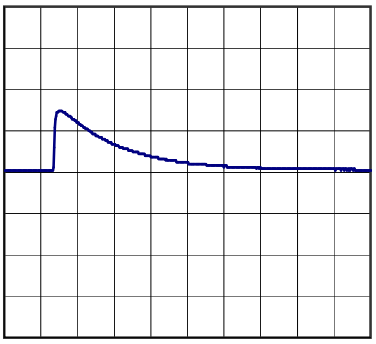


200mV/div

1ms/div 1ms/div

Min. Load (0A) ←→
Load 50% (0.125A)

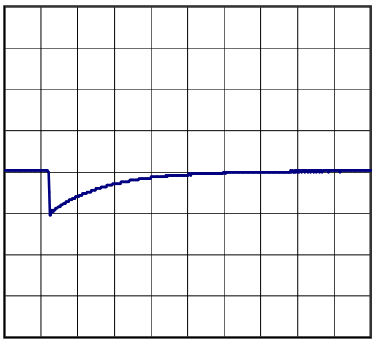


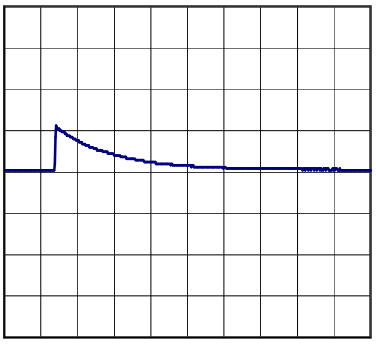


200mV/div

1ms/div 1ms/div

Load 50% (0.125A) ←→
Load 100% (0.25A)





200mV/div

1ms/div 1ms/div

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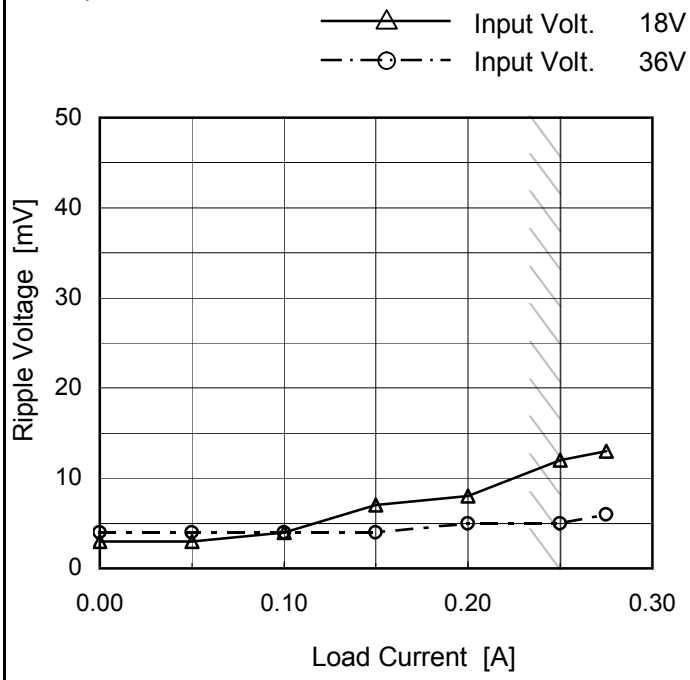
Model	SUTW62412
Item	Ripple Voltage (by Load Current)
Object	+12V0.25A

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]

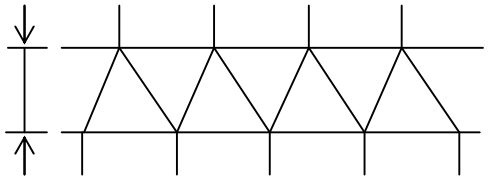


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV] Input Volt. 18 [V]	Ripple Voltage [mV] Input Volt. 36 [V]
0.000	3	4
0.050	3	4
0.100	4	4
0.150	7	4
0.200	8	5
0.250	12	5
0.275	13	6
--	-	-
--	-	-
--	-	-
--	-	-

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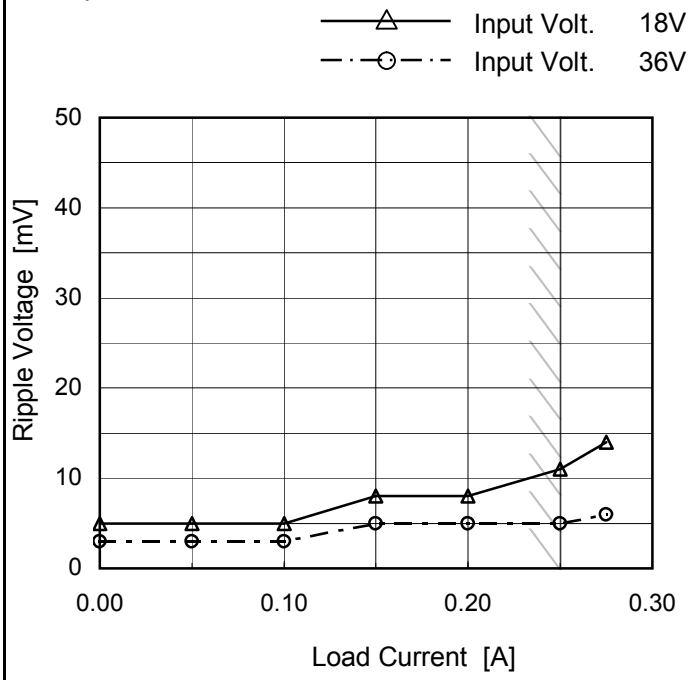
COSEL

Model	SUTW62412
Item	Ripple Voltage (by Load Current)
Object	-12V0.25A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



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

Ripple [mVp-p]

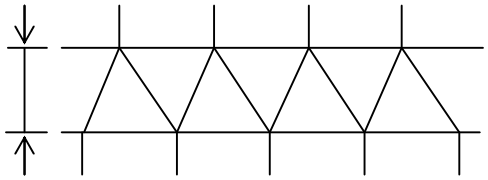


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	5	3
0.050	5	3
0.100	5	3
0.150	8	5
0.200	8	5
0.250	11	5
0.275	14	6
--	-	-
--	-	-
--	-	-
--	-	-

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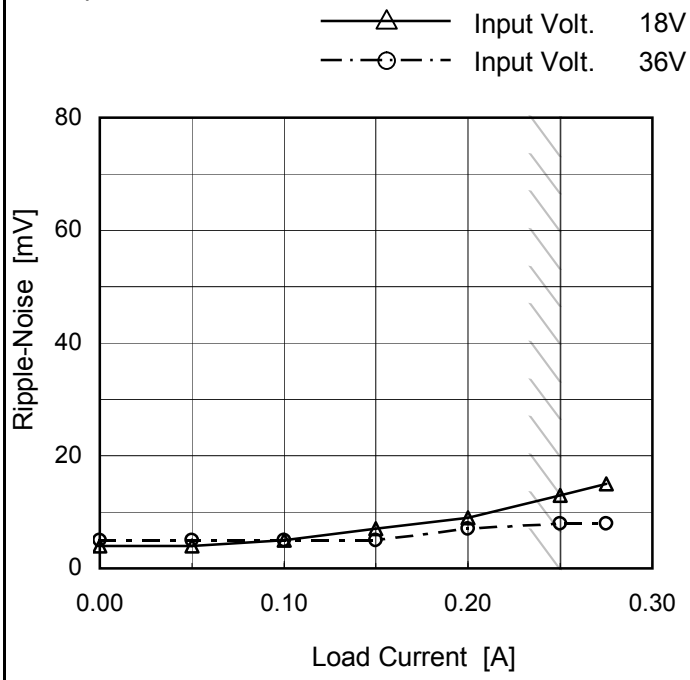
COSEL

Model	SUTW62412
Item	Ripple-Noise
Object	+12V0.25A

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.

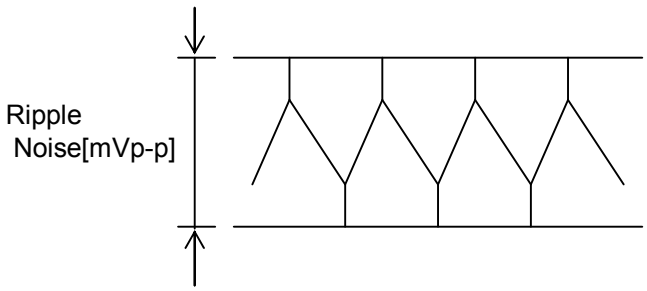


Fig.Complex Ripple Noise Wave Form

2.Values

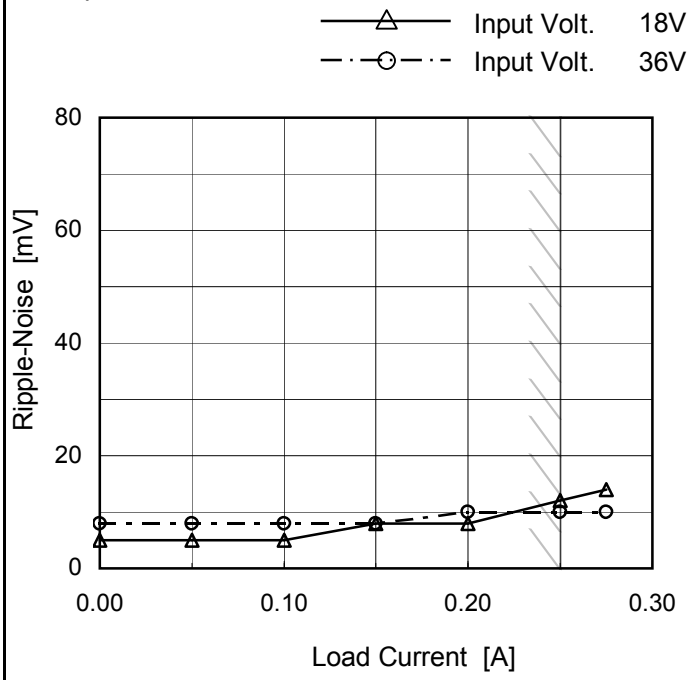
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	4	5
0.050	4	5
0.100	5	5
0.150	7	5
0.200	9	7
0.250	13	8
0.275	15	8
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW62412
Item	Ripple-Noise
Object	-12V0.25A

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.

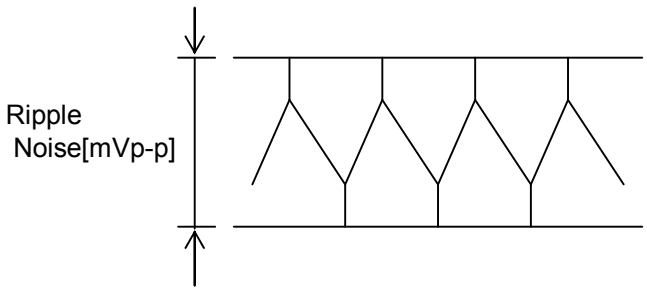


Fig.Complex Ripple Noise Wave Form

2.Values

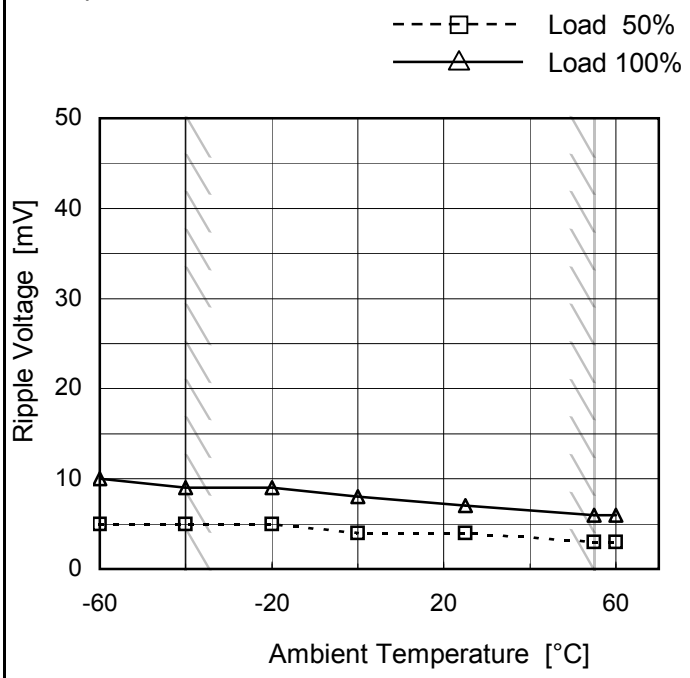
Load Current [A]	Ripple-Noise [mV] Input Volt. 18 [V]	Ripple-Noise [mV] Input Volt. 36 [V]
0.000	5	8
0.050	5	8
0.100	5	8
0.150	8	8
0.200	8	10
0.250	12	10
0.275	14	10
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW62412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.25A

Testing Circuitry Figure B

1.Graph



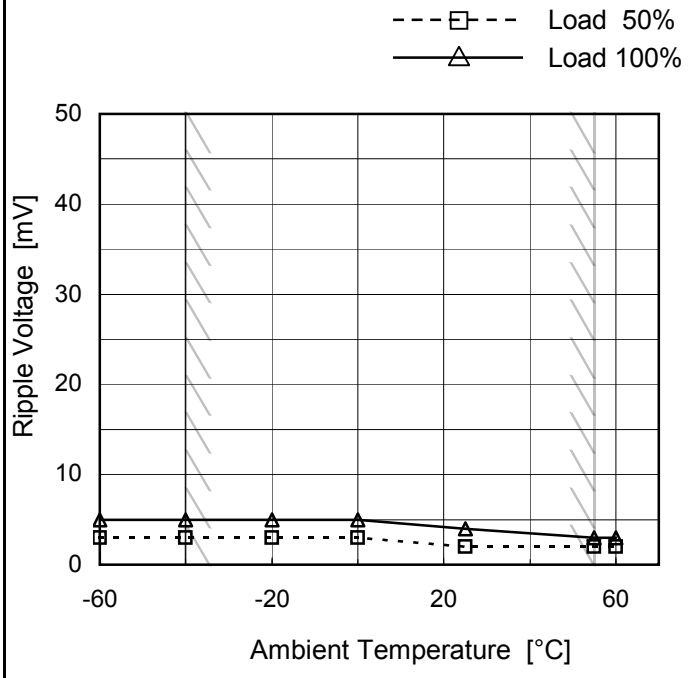
Input Volt. 24V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	10
-40	5	9
-20	5	9
0	4	8
25	4	7
55	3	6
60	3	6
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.25A

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	3	5
-40	3	5
-20	3	5
0	3	5
25	2	4
55	2	3
60	2	3
--	-	-
--	-	-
--	-	-
--	-	-

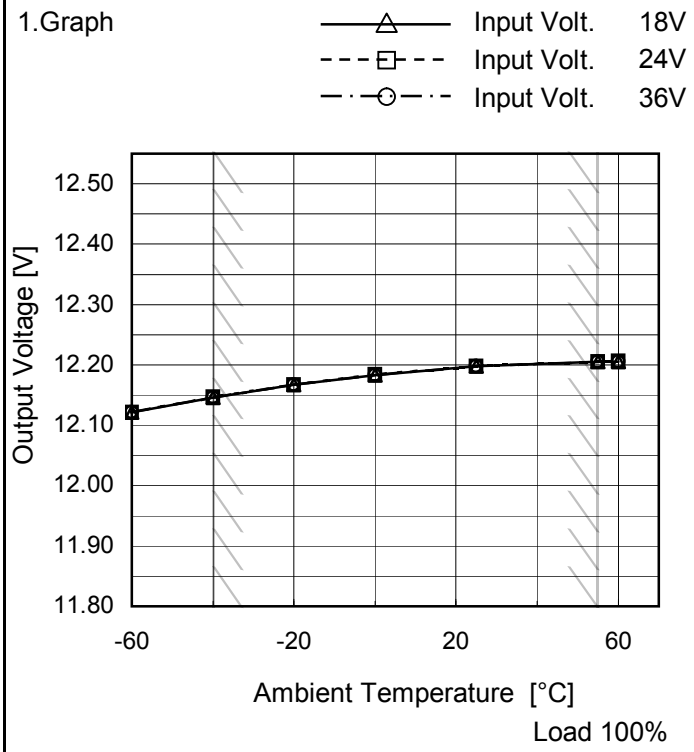
COSEL

Model	SUTW62412
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +12V0.25A

1.Graph

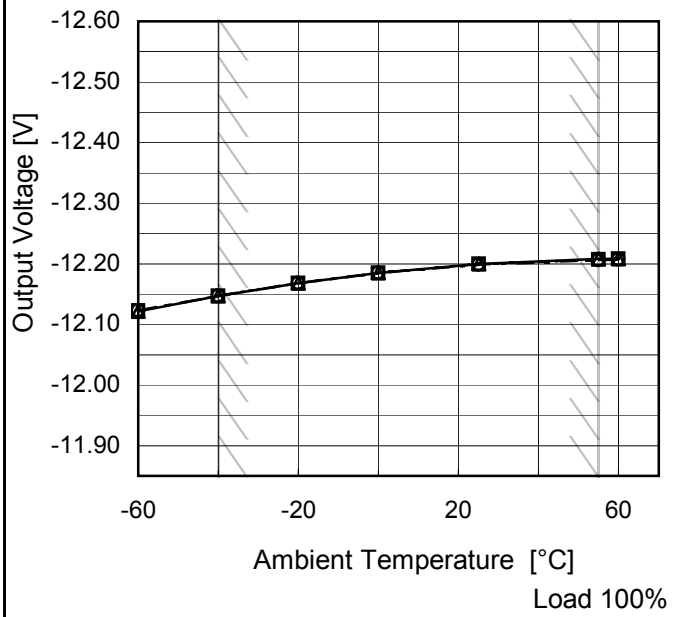


2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	12.121	12.122	12.121
-40	12.146	12.146	12.146
-20	12.167	12.167	12.167
0	12.183	12.184	12.183
25	12.197	12.198	12.197
55	12.205	12.206	12.205
60	12.206	12.206	12.206
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object -12V0.25A

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	-12.122	-12.122
-40	-12.147	-12.147	-12.147
-20	-12.168	-12.168	-12.168
0	-12.185	-12.185	-12.185
25	-12.200	-12.199	-12.199
55	-12.208	-12.207	-12.207
60	-12.209	-12.208	-12.207
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW62412
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 - 0.25A (AVR 2) : 0 - 0.25A

* 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	+12V0.25A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	12.480	±295	±2.5
Minimum Voltage	-40	18	0.25	11.890		

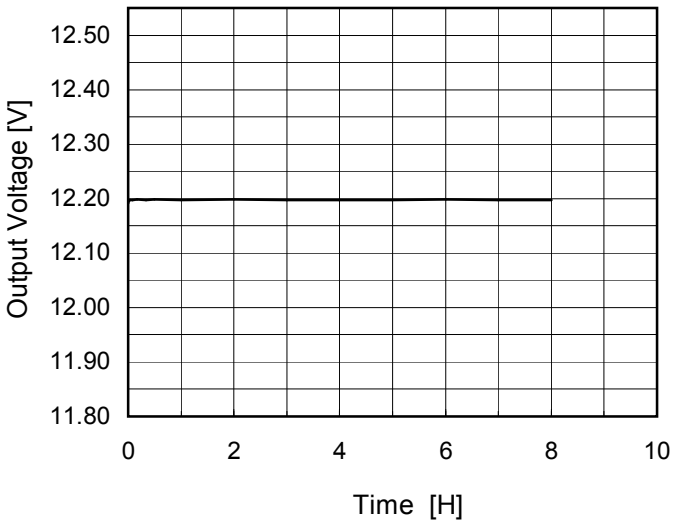
Object	-12V0.25A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	-12.509	±293	±2.4
Minimum Voltage	-40	18	0.25	-11.924		

COSEL

Model	SUTW62412
Item	Time Lapse Drift
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



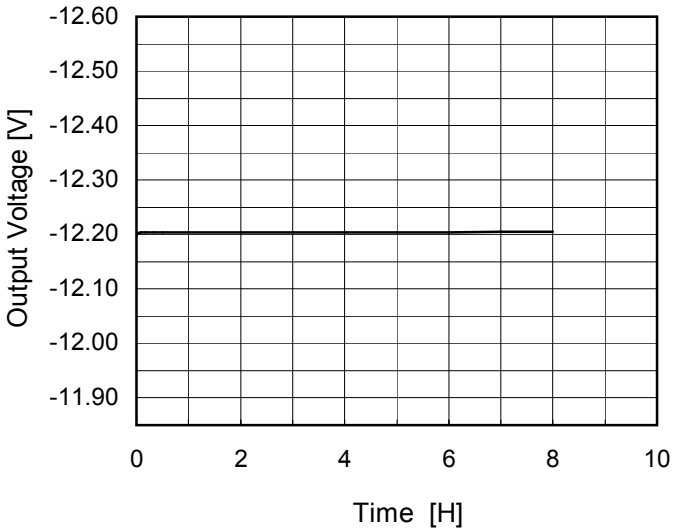
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.192
0.5	12.198
1.0	12.198
2.0	12.198
3.0	12.198
4.0	12.198
5.0	12.198
6.0	12.198
7.0	12.198
8.0	12.198

Object	-12V0.25A

1.Graph



Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.198
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	-12.205
8.0	-12.205

BC-10278

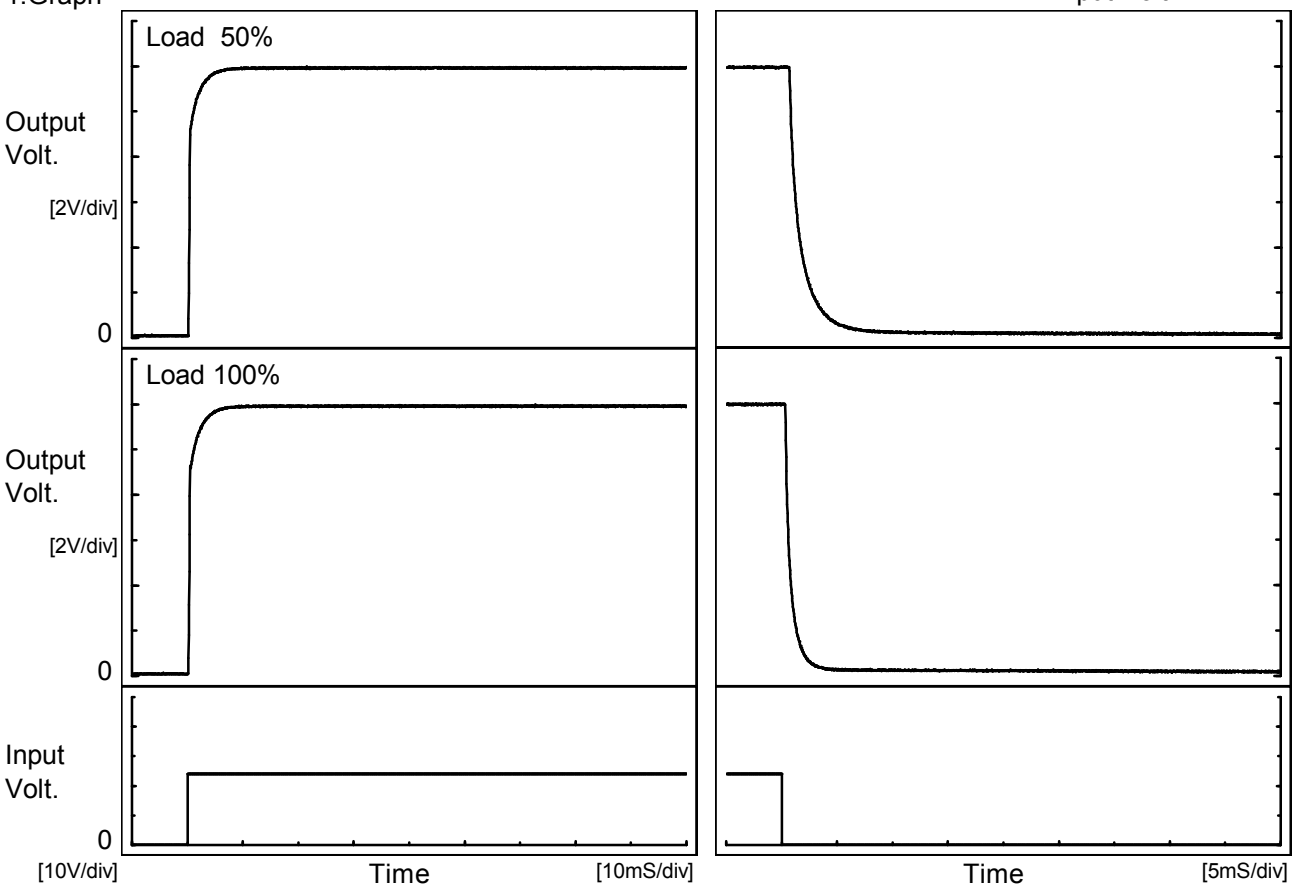
COSEL

Model	SUTW62412
Item	Rise and Fall Time
Object	+12V0.25A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

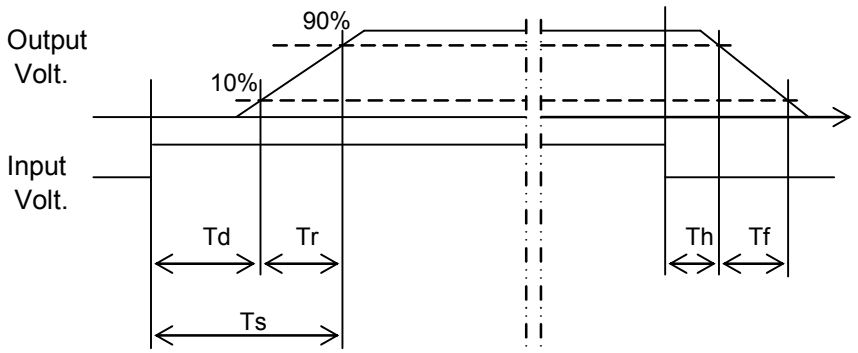
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.3	1.9	2.2	0.7	2.8
100 %	0.3	2.1	2.4	0.4	1.4



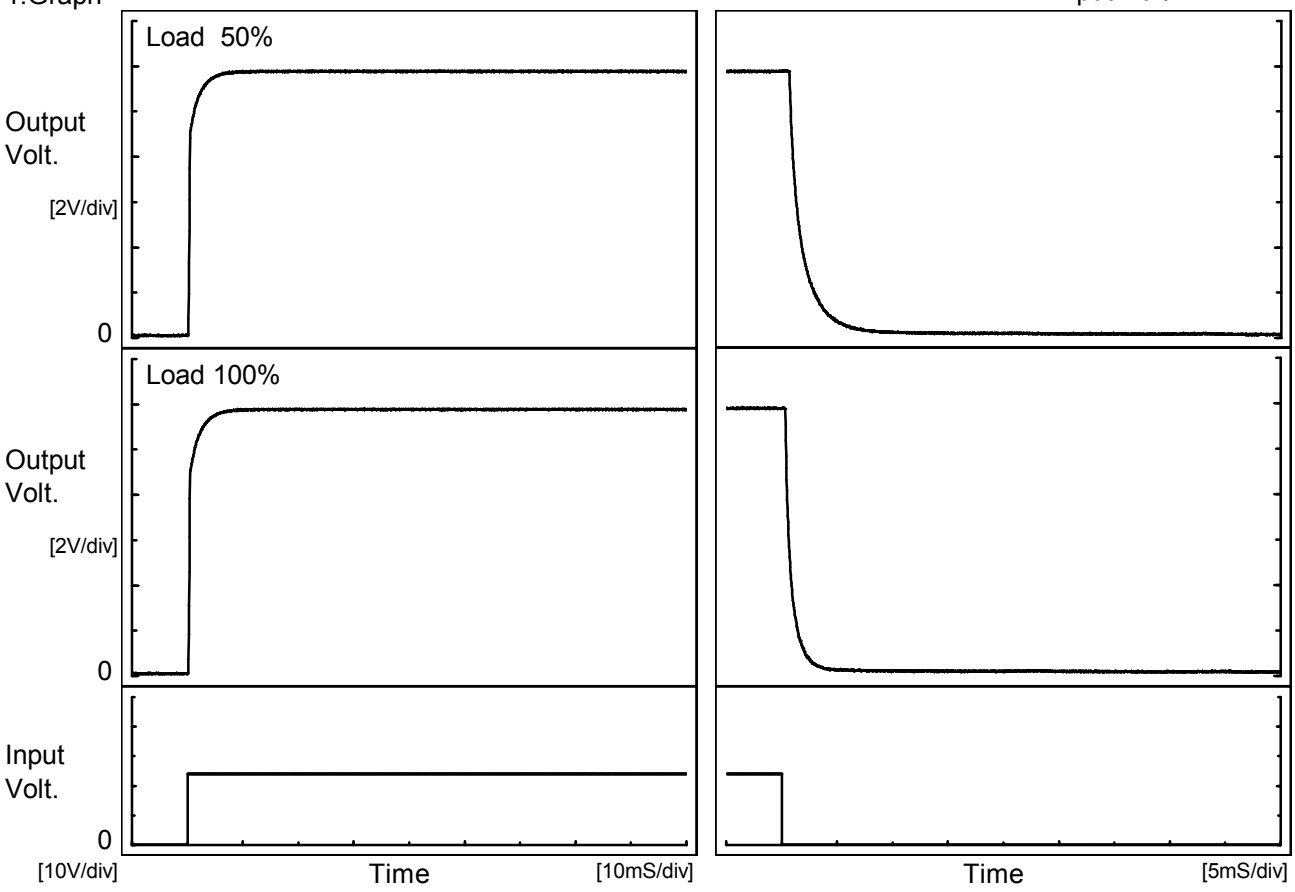
BC-10278

COSEL

Model	SUTW62412	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	-12V0.25A	

1.Graph

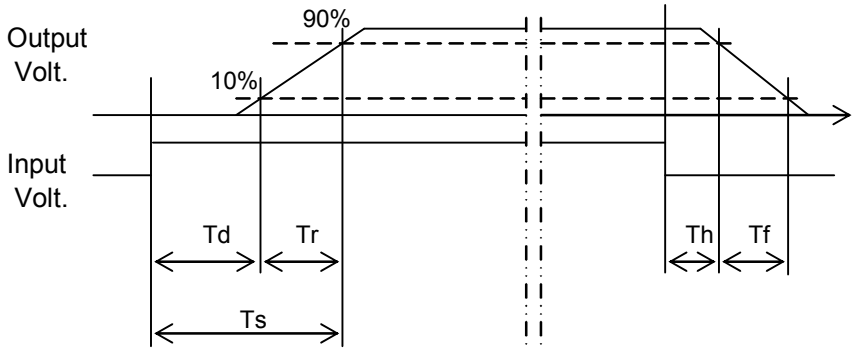
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.3	2.2	2.5	0.7	3.0
100 %	0.3	2.3	2.6	0.4	1.5

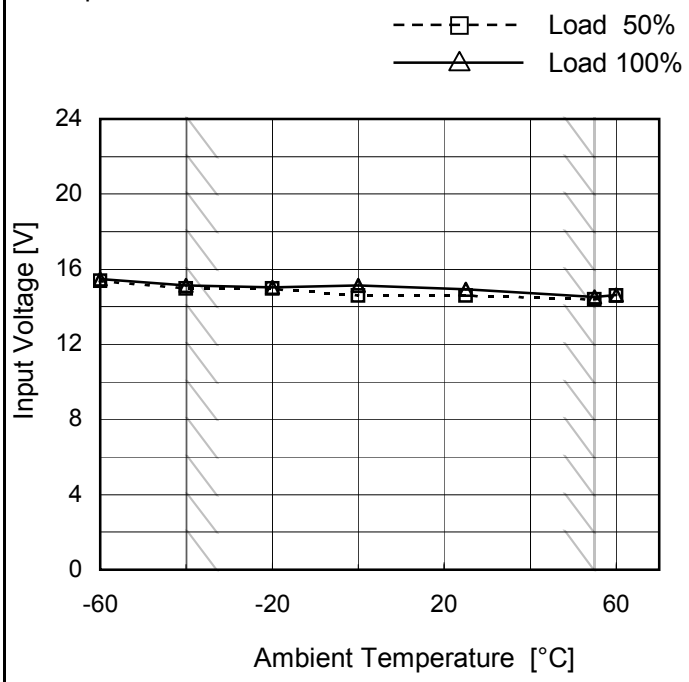


COSEL

Model	SUTW62412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.25A

Testing Circuitry Figure A

1.Graph

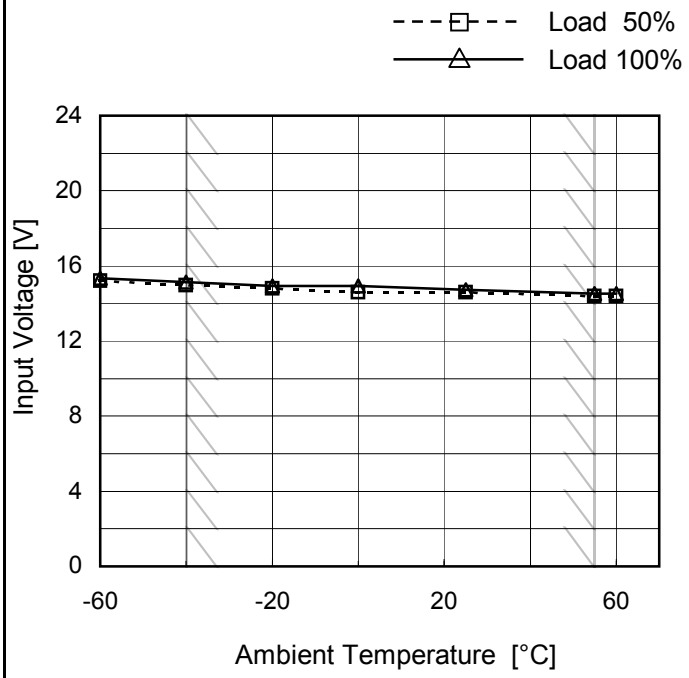


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	15.4	15.5
-40	15.0	15.2
-20	15.0	15.1
0	14.6	15.2
25	14.6	15.0
55	14.4	14.6
60	14.6	14.7
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.25A

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	15.2	15.4
-40	15.0	15.2
-20	14.8	15.0
0	14.6	15.0
25	14.6	14.8
55	14.4	14.6
60	14.4	14.6
--	-	-
--	-	-
--	-	-
--	-	-

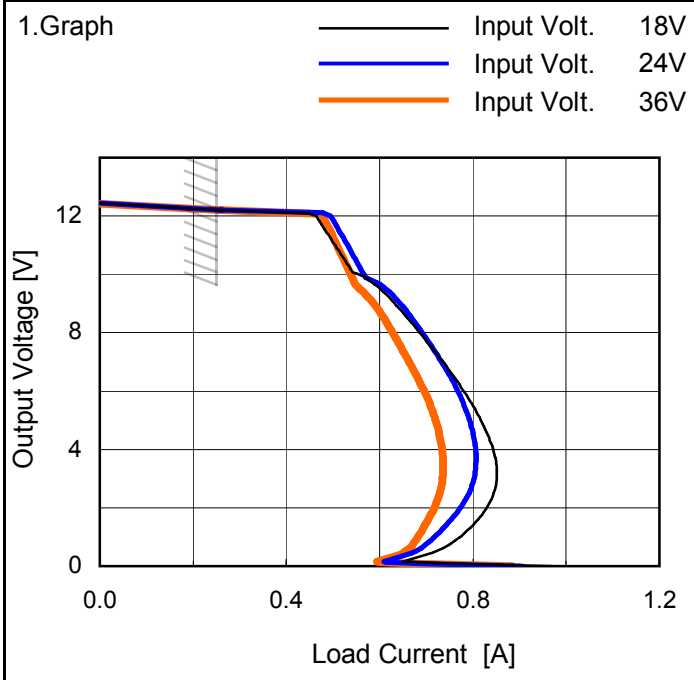
COSEL

Model	SUTW62412
Item	Overcurrent Protection

Temperature 25°C
Testing Circuitry Figure A

Object +12V0.25A

1.Graph

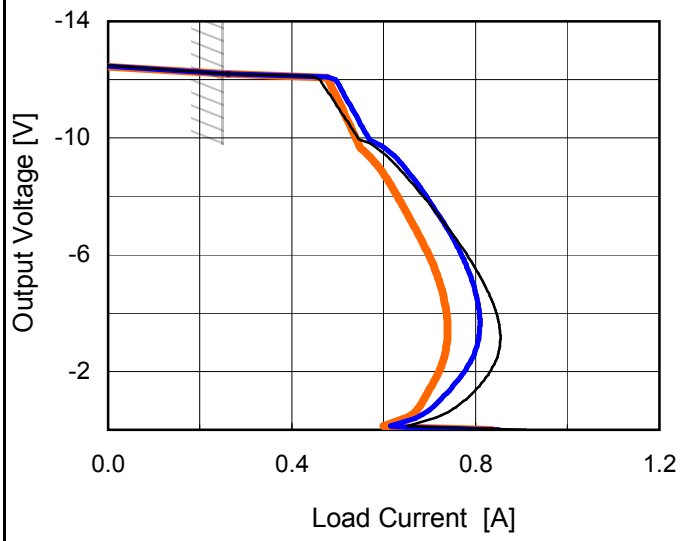


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
12.0	0.26	0.26	0.26
11.4	0.49	0.52	0.50
10.8	0.51	0.54	0.51
9.6	0.59	0.60	0.55
8.4	0.66	0.67	0.61
7.2	0.73	0.72	0.65
6.0	0.78	0.77	0.69
4.8	0.82	0.80	0.72
3.6	0.85	0.81	0.74
2.4	0.84	0.79	0.73
1.2	0.79	0.73	0.69
0.0	0.97	0.91	0.88

Object -12V0.25A

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	0.26	0.26	0.26
-11.4	0.49	0.52	0.50
-10.8	0.51	0.54	0.51
-9.6	0.59	0.60	0.55
-8.4	0.66	0.67	0.61
-7.2	0.73	0.73	0.66
-6.0	0.78	0.77	0.70
-4.8	0.82	0.80	0.73
-3.6	0.85	0.81	0.74
-2.4	0.85	0.79	0.73
-1.2	0.79	0.74	0.69
0.0	0.91	0.85	0.83

COSEL

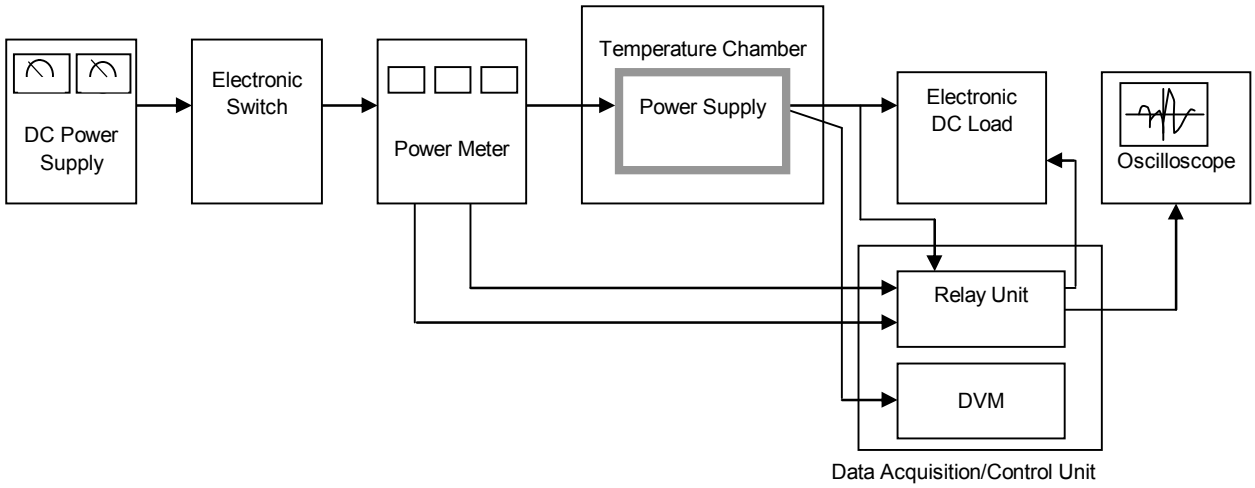


Figure A

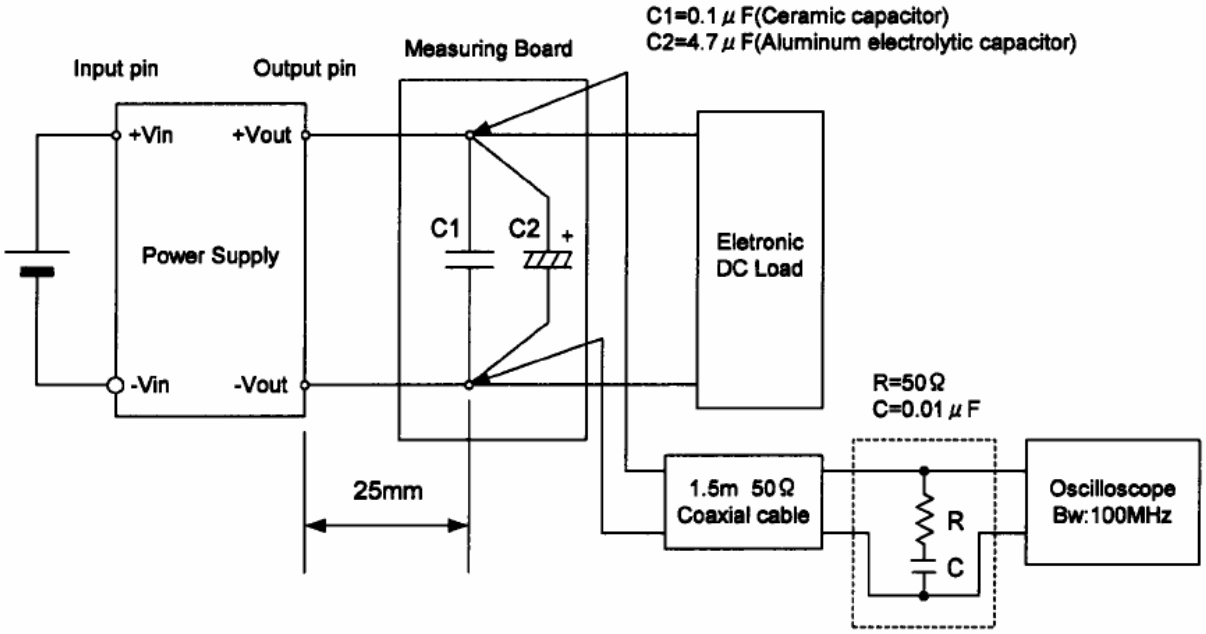


Figure B (Ripple and Ripple noise Characteristic)