参考資料

TEST DATA OF SUCW1R52415

Regulated DC Power Supply
Sep 28, 2004

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Masahiro Shima Design Engineer

COSEL CO.,LTD.

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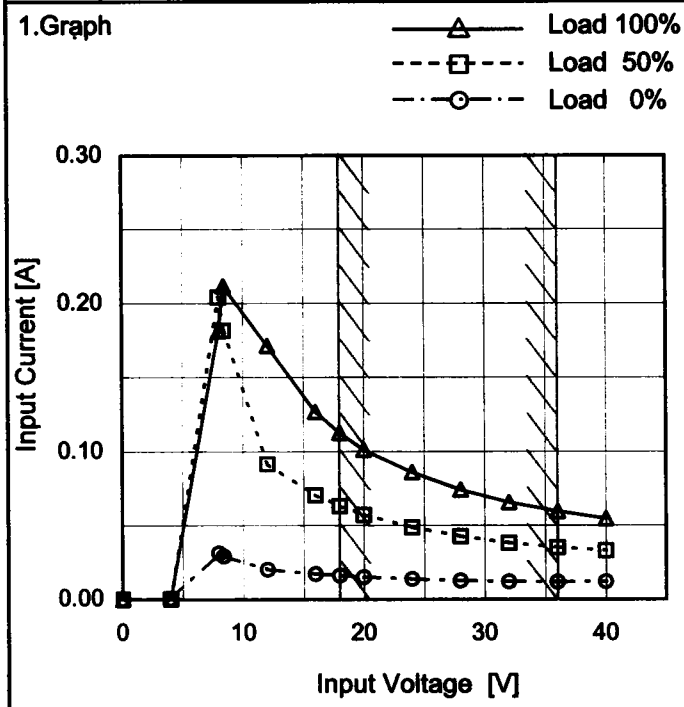
Model	SUCW1R52415
Item	Input Current (by Input Voltage)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

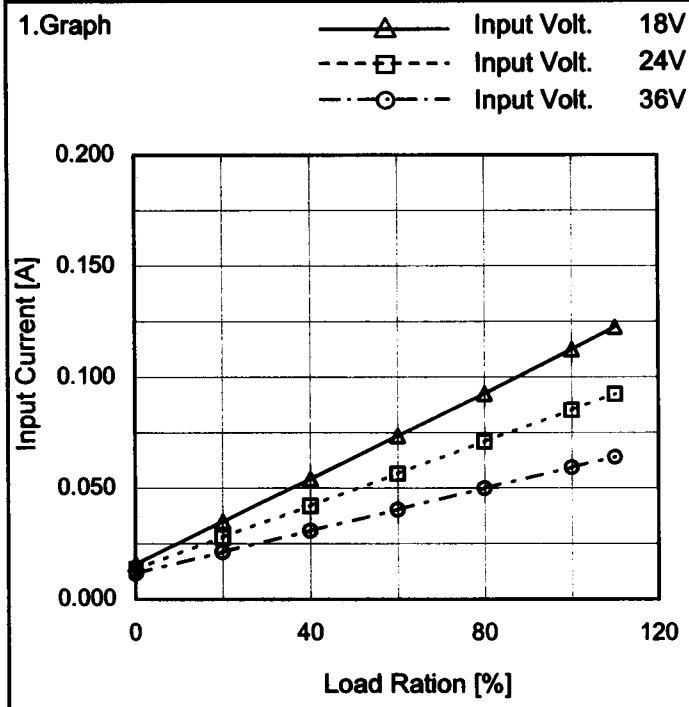
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
4.0	0.000	0.000	0.000
8.0	0.031	0.204	0.181
8.4	0.029	0.182	0.212
12.0	0.020	0.092	0.171
16.0	0.017	0.071	0.127
18.0	0.016	0.063	0.113
20.0	0.015	0.057	0.101
24.0	0.014	0.049	0.086
28.0	0.013	0.043	0.074
32.0	0.012	0.038	0.066
36.0	0.012	0.035	0.060
40.0	0.012	0.033	0.055
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	SUCW1R52415
Item	Input Current (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

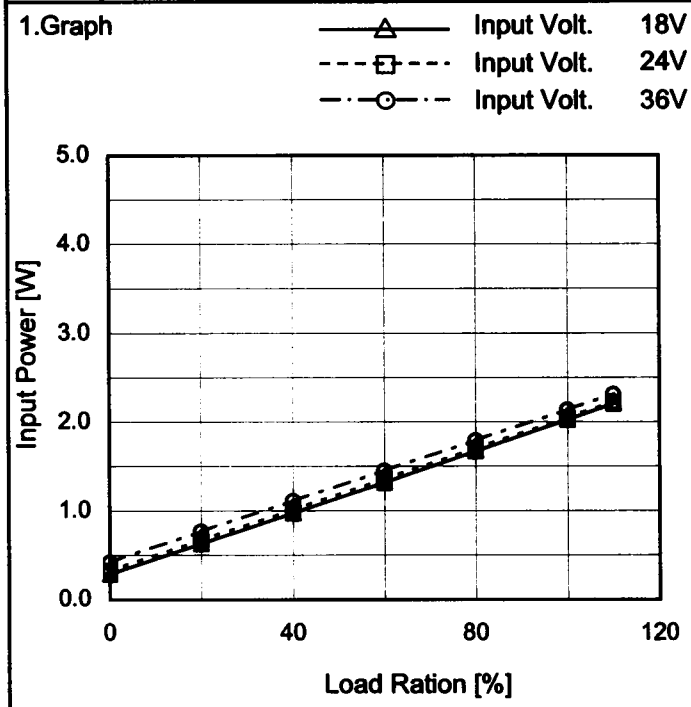
Load Ration [%]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.016	0.014	0.012
20	0.035	0.028	0.021
40	0.054	0.042	0.031
60	0.074	0.056	0.040
80	0.093	0.071	0.050
100	0.112	0.085	0.059
110	0.123	0.092	0.064
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	SUCW1R52415
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

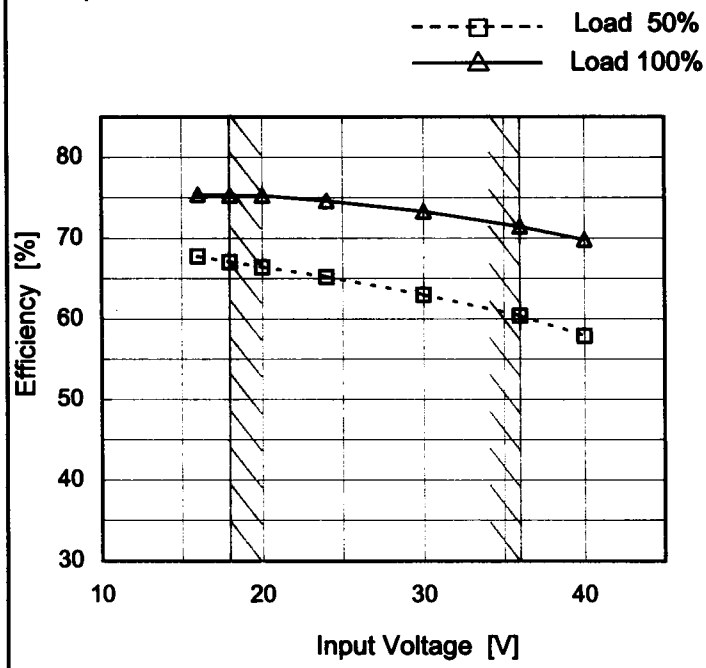
Load Ration [%]	Input Power [W]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.29	0.33	0.42
20	0.63	0.67	0.77
40	0.97	1.01	1.11
60	1.32	1.35	1.45
80	1.67	1.70	1.79
100	2.03	2.05	2.14
110	2.21	2.22	2.31
–	-	-	-
–	-	-	-
–	-	-	-
–	-	-	-

COSEL

Model	SUCW1R52415
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

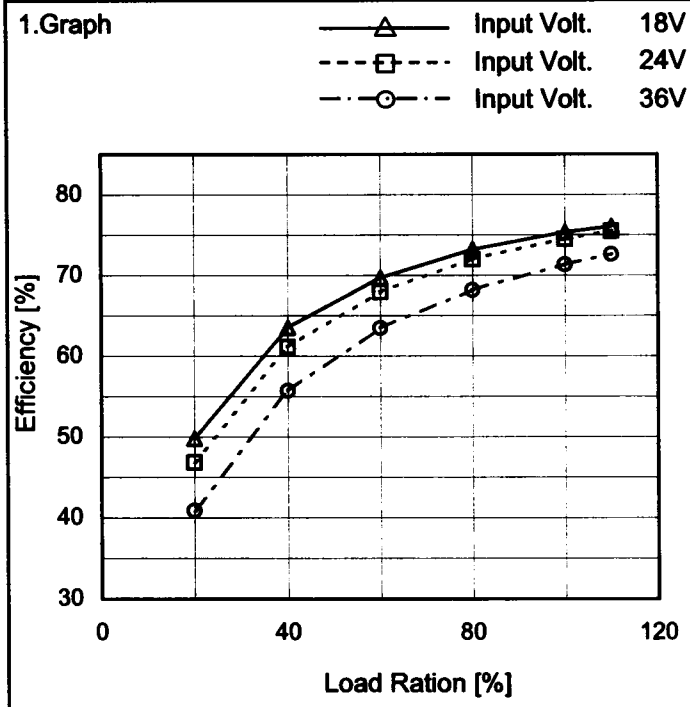
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
16	67.8	75.4
18	67.0	75.3
20	66.4	75.3
24	65.2	74.6
30	63.0	73.3
36	60.4	71.4
40	57.9	69.8
–	-	-
–	-	-

COSEL

Model	SUCW1R52415
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	49.8	46.9	40.9
40	63.5	61.1	55.7
60	69.7	67.9	63.5
80	73.2	72.0	68.2
100	75.4	74.5	71.3
110	76.1	75.5	72.6
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

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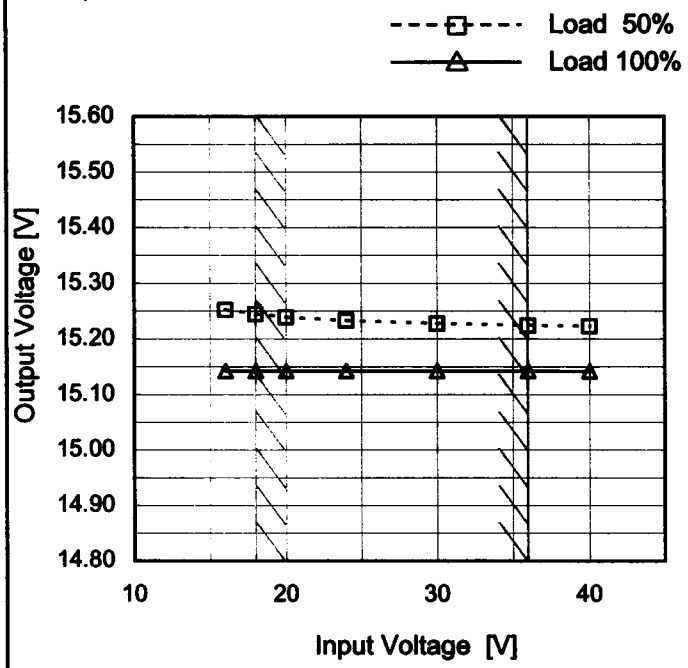
Model	SUCW1R52415
Item	Line Regulation
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

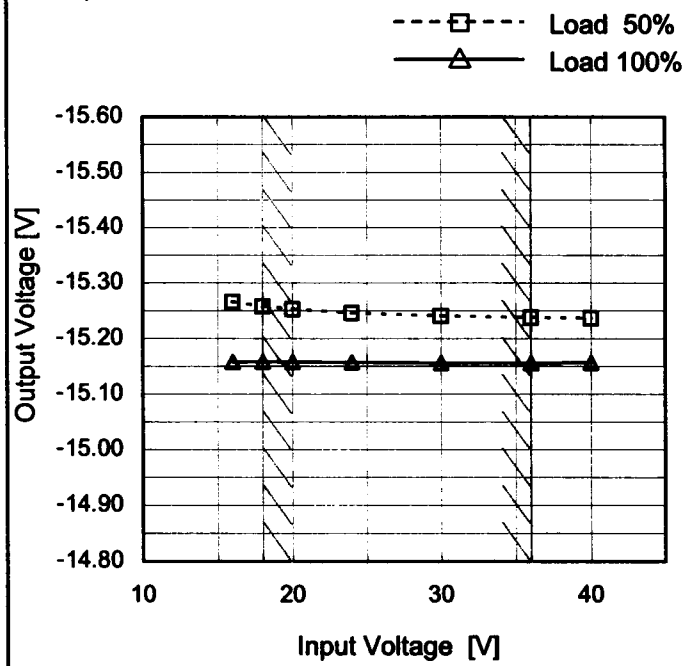


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	15.252	15.142
18	15.245	15.142
20	15.239	15.143
24	15.233	15.143
30	15.227	15.143
36	15.224	15.143
40	15.223	15.142
–	-	-
–	-	-

Object	-15V0.05A

1.Graph



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

2.Values

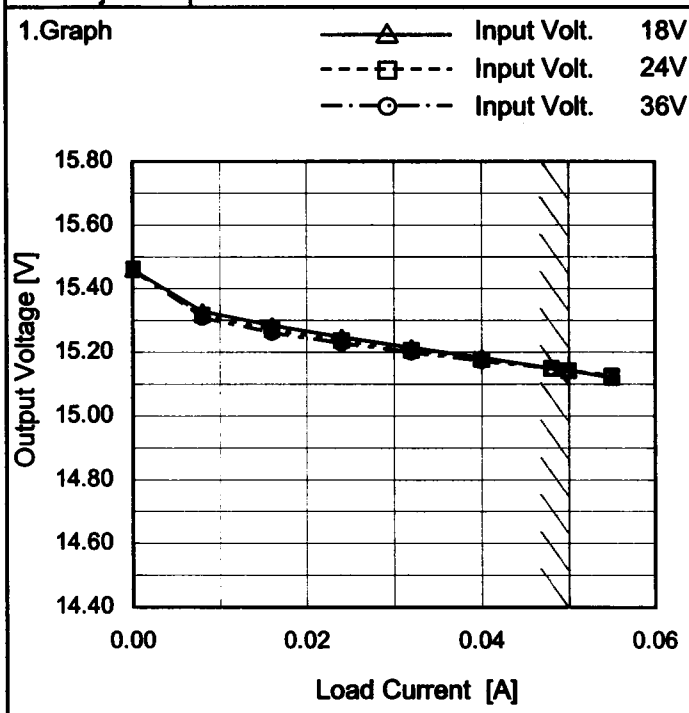
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	-15.266	-15.158
18	-15.258	-15.158
20	-15.253	-15.158
24	-15.246	-15.157
30	-15.241	-15.157
36	-15.238	-15.156
40	-15.237	-15.157
–	-	-
–	-	-

COSEL

Model	SUCW1R52415
Item	Load Regulation
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

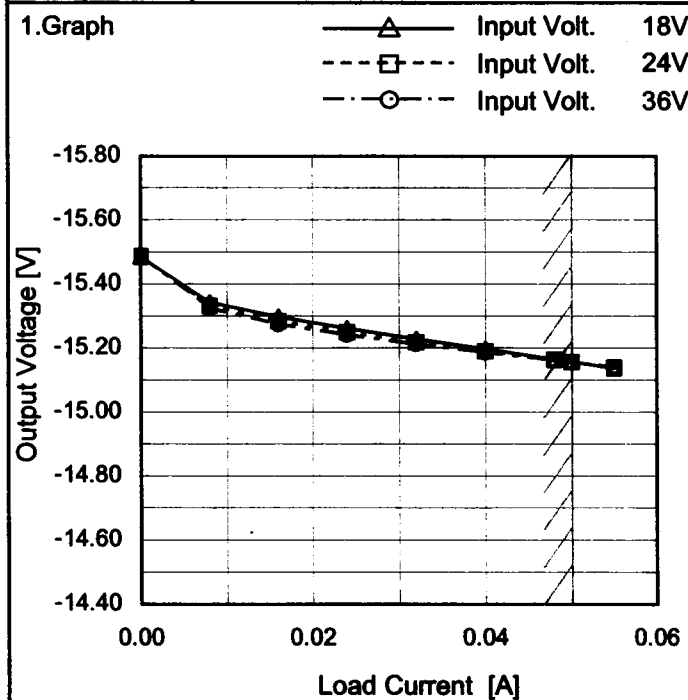


2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	15.460	15.463	15.461
0.008	15.330	15.317	15.308
0.016	15.285	15.272	15.261
0.024	15.248	15.237	15.228
0.032	15.216	15.206	15.199
0.040	15.183	15.177	15.173
0.048	15.150	15.149	15.148
0.050	15.143	15.142	15.142
0.055	15.121	15.125	15.127
–	-	-	-
–	-	-	-

Object	-15V0.05A

1.Graph



Note: Slanted line shows the range of the rated load current.

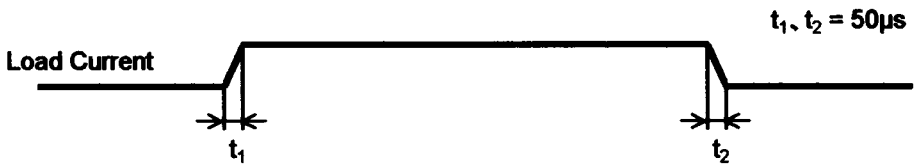
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	-15.484	-15.487	-15.488
0.008	-15.343	-15.332	-15.324
0.016	-15.298	-15.284	-15.275
0.024	-15.262	-15.249	-15.241
0.032	-15.229	-15.219	-15.212
0.040	-15.197	-15.191	-15.186
0.048	-15.166	-15.163	-15.161
0.050	-15.158	-15.157	-15.156
0.055	-15.137	-15.139	-15.141
–	-	-	-
–	-	-	-

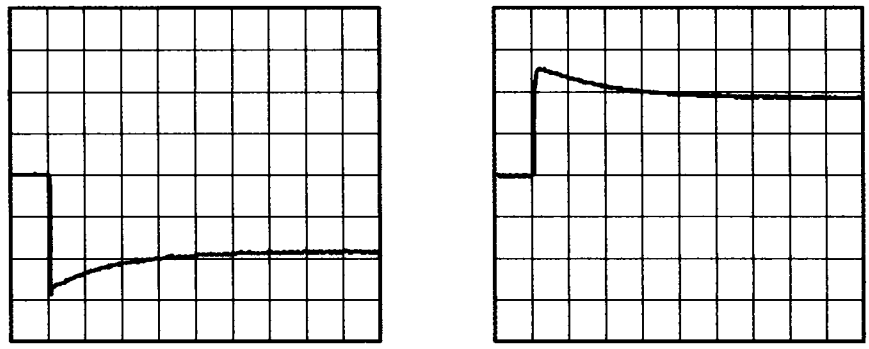
COSEL

Model	SUCW1R52415	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+15V0.05A	

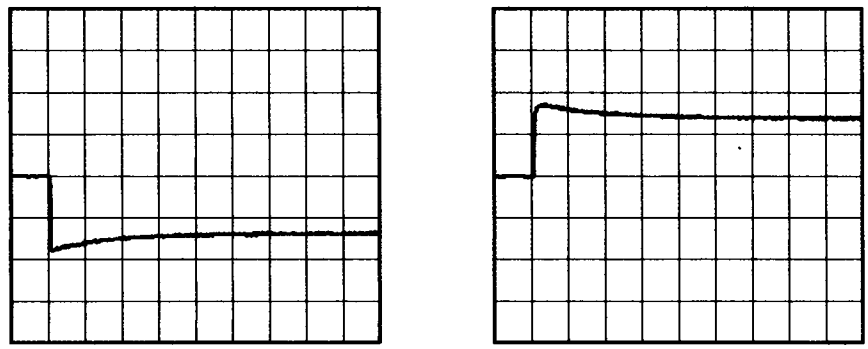
Input Volt. 24 V
Cycle 100 mS



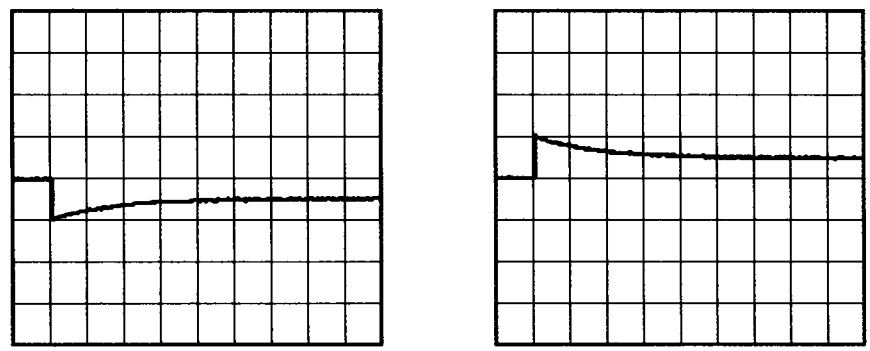
Min. Load (0A) ⟷
Load 100% (0.05A)



Min. Load (0A) ⟷
Load 50% (0.025A)



Load 50% (0.025A) ⟷
Load 100% (0.05A)



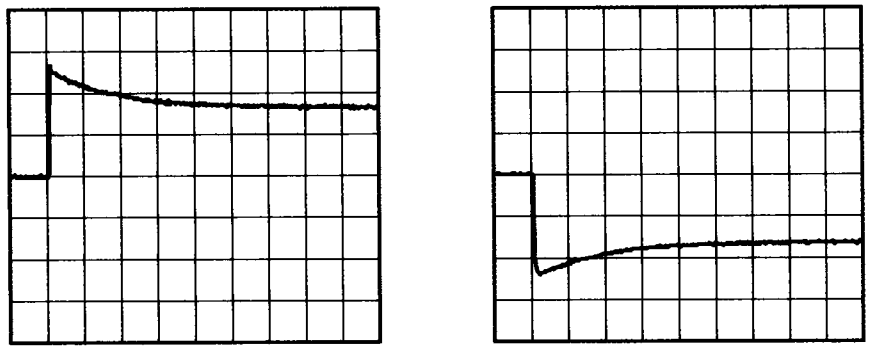
COSEL

Model	SUCW1R52415
Item	Dynamic Load Response
Object	-15V0.05A

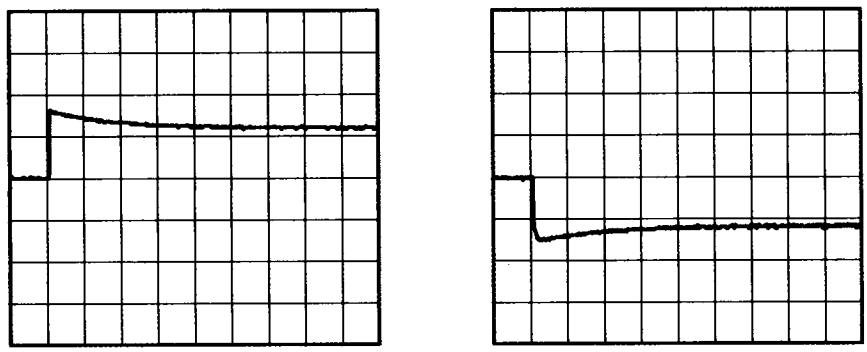
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 24 V
Cycle 100 mS

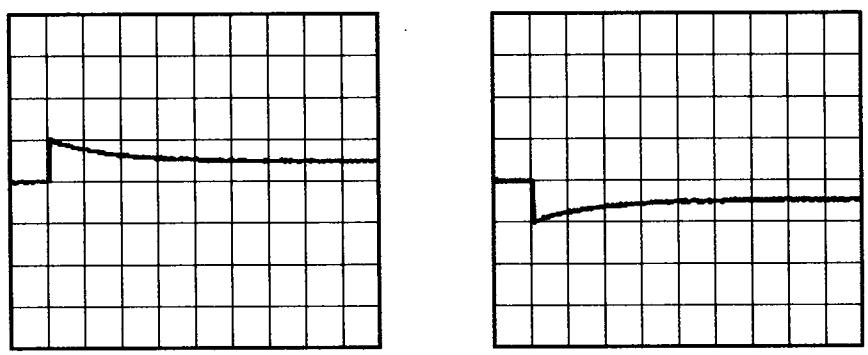
Min. Load (0A) ⟷ Load 100% (0.05A)



Min. Load (0A) ⟷ Load 50% (0.025A)



Load 50% (0.025A) ⟷ Load 100% (0.05A)

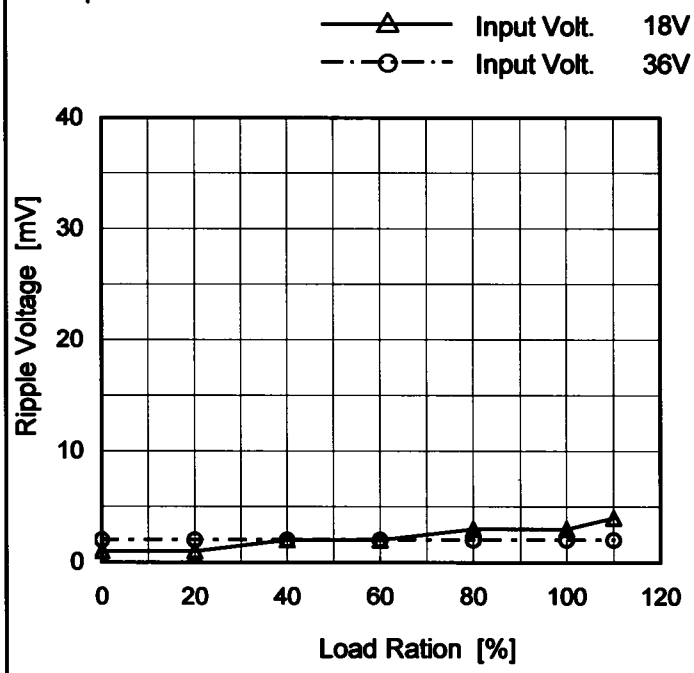


COSEL

Model	SUCW1R52415
Item	Ripple Voltage (by Load Current)
Object	+15V0.05A

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.

Ripple [mVp-p]

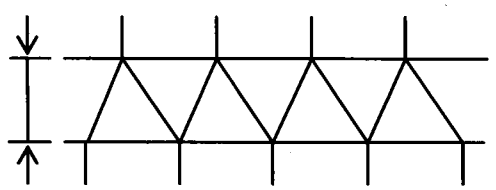


Fig.Complex Ripple Wave Form

2.Values

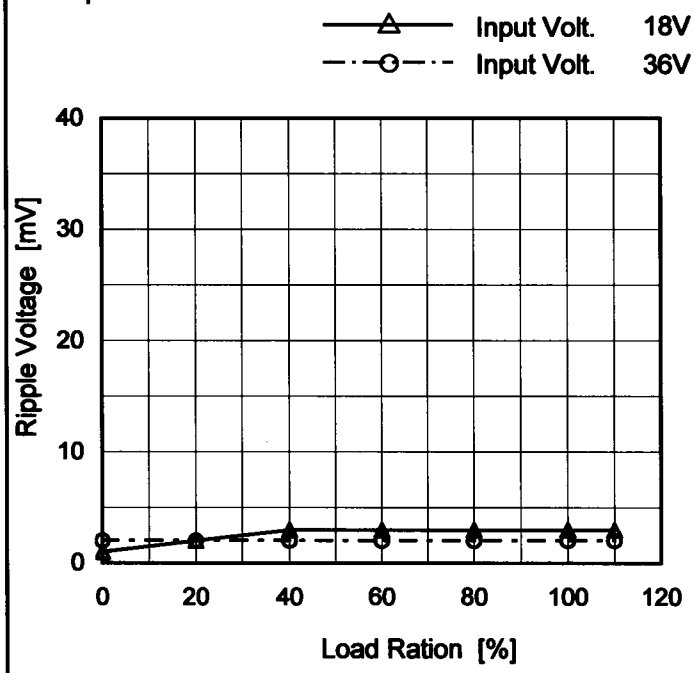
Load Ration [%]	Ripple Voltage [mV] Input Volt. 18 [V]	Input Volt. 36 [V]
0	1	2
20	1	2
40	2	2
60	2	2
80	3	2
100	3	2
110	4	2
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUCW1R52415
Item	Ripple Voltage (by Load Current)
Object	-15V0.05A

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.

2.Values

Load Ration [%]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0	1	2
20	2	2
40	3	2
60	3	2
80	3	2
100	3	2
110	3	2
–	-	-
–	-	-
–	-	-
–	-	-

Ripple [mVp-p]

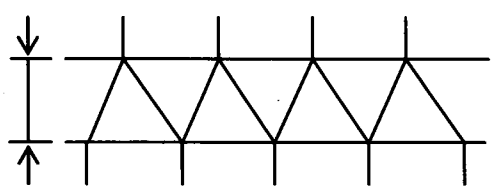


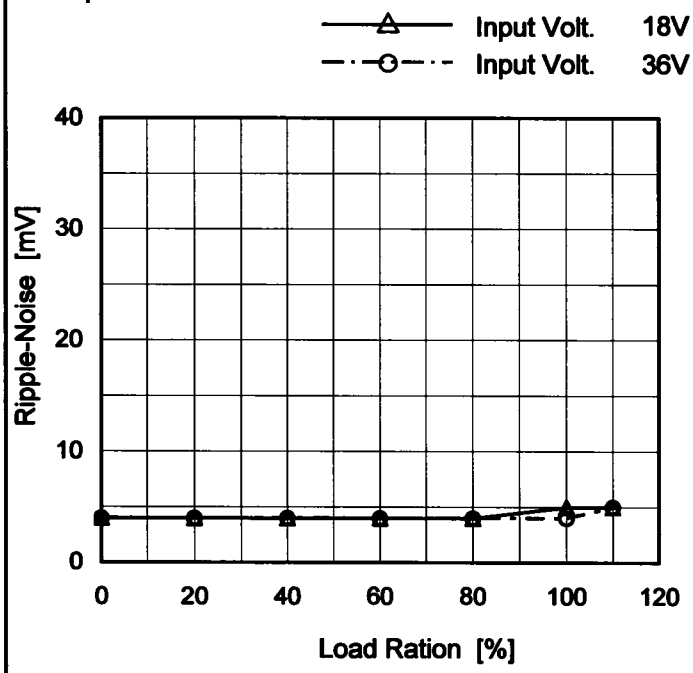
Fig.Complex Ripple Wave Form

COSEL

Model	SUCW1R52415
Item	Ripple-Noise
Object	+15V0.05A

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.

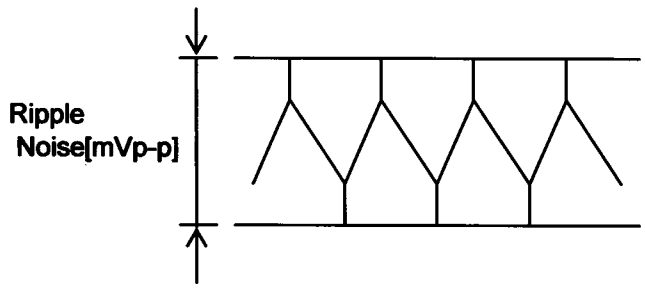


Fig.Complex Ripple Noise Wave Form

2.Values

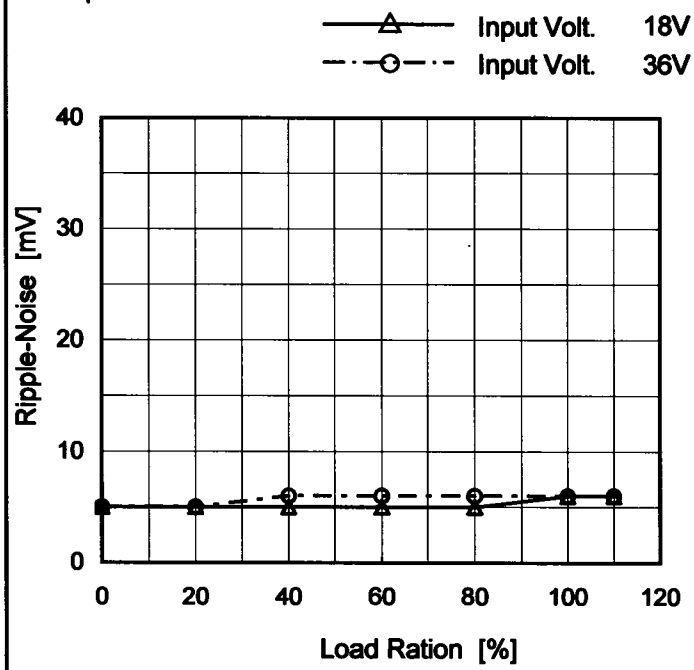
Load Ration [%]	Ripple-Noise [mV] Input Volt. 18 [V]	Ripple-Noise [mV] Input Volt. 36 [V]
0	4	4
20	4	4
40	4	4
60	4	4
80	4	4
100	5	4
110	5	5
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUCW1R52415
Item	Ripple-Noise
Object	-15V0.05A

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.

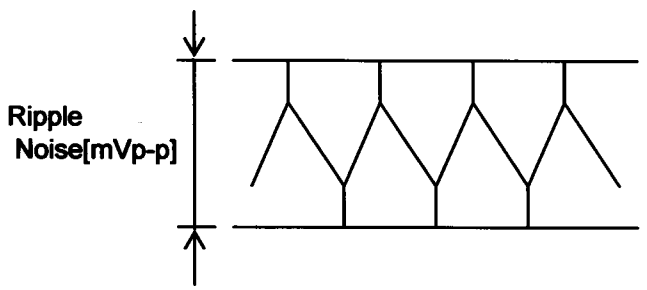


Fig.Complex Ripple Noise Wave Form

2.Values

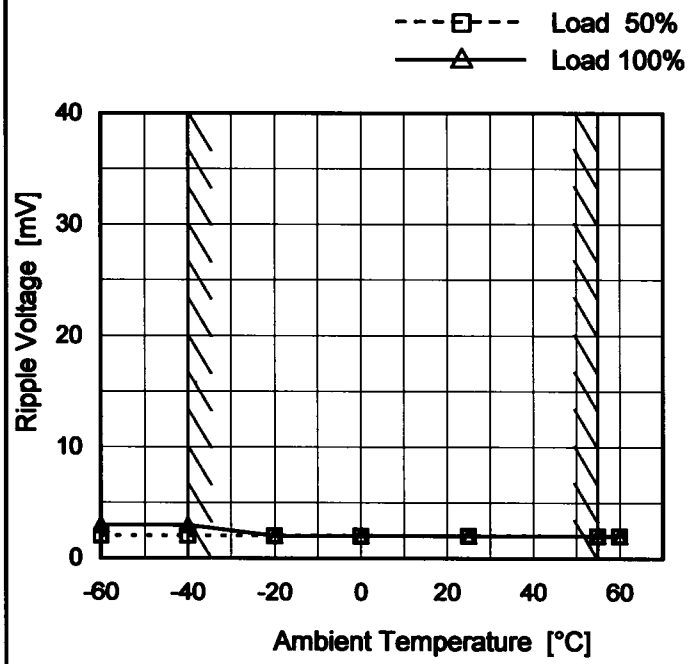
Load Ration [%]	Ripple-Noise [mV] Input Volt. 18 [V]	Ripple-Noise [mV] Input Volt. 36 [V]
0	5	5
20	5	5
40	5	6
60	5	6
80	5	6
100	6	6
110	6	6
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUCW1R52415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.05A

Testing Circuitry Figure B

1.Graph



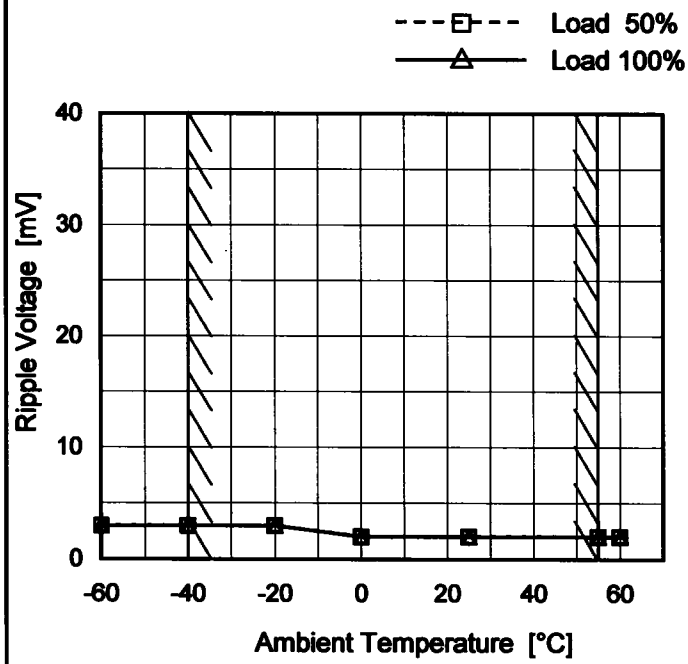
Input Volt. 24V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	2	3
-40	2	3
-20	2	2
0	2	2
25	2	2
55	2	2
60	2	2
–	-	-
–	-	-
–	-	-
–	-	-

Object	-15V0.05A

1.Graph



Input Volt. 24V

Measured by 100 MHz Oscilloscope.

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

2.Values

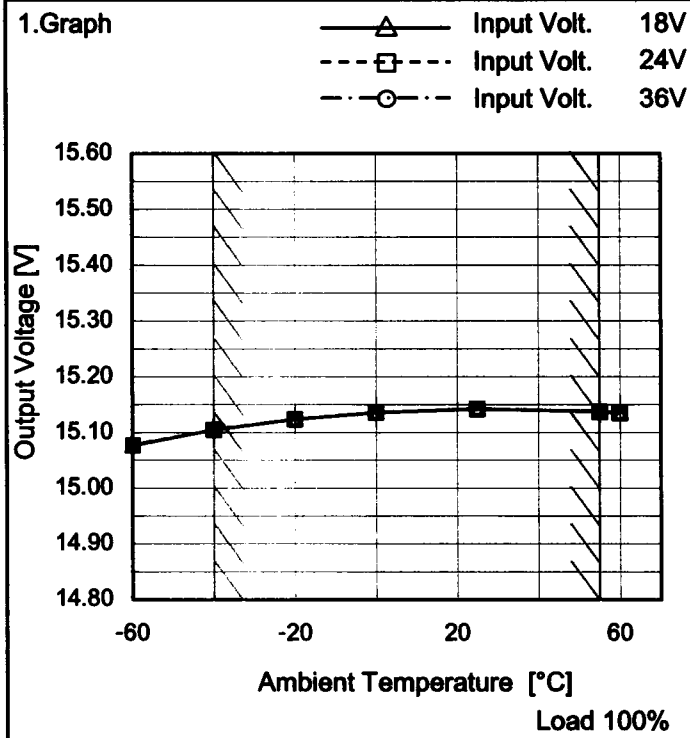
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	3	3
-40	3	3
-20	3	3
0	2	2
25	2	2
55	2	2
60	2	2
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUCW1R52415
Item	Ambient Temperature Drift
Object	+15V0.05A

Testing Circuitry Figure A

1.Graph

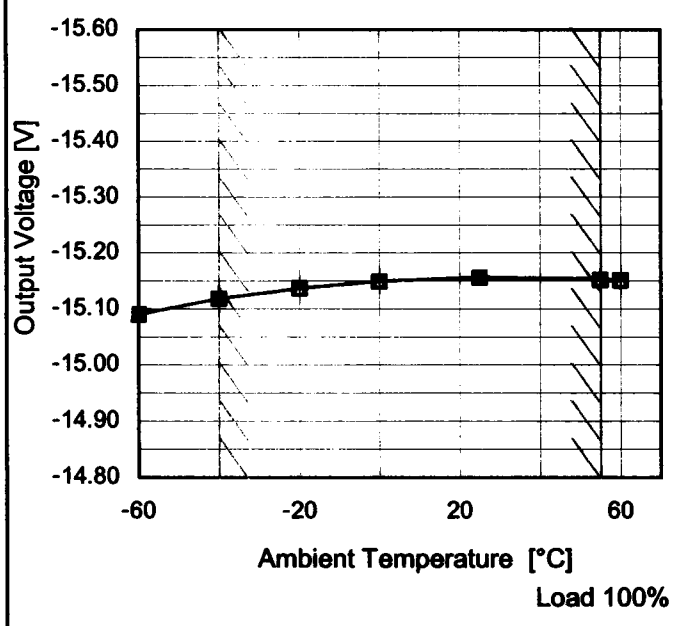


2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	15.077	15.077	15.077
-40	15.105	15.105	15.105
-20	15.124	15.124	15.124
0	15.136	15.136	15.136
25	15.142	15.142	15.142
55	15.138	15.137	15.137
60	15.136	15.135	15.135
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V0.05A

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	-15.090	-15.090	-15.090
-40	-15.119	-15.118	-15.118
-20	-15.137	-15.137	-15.136
0	-15.150	-15.149	-15.149
25	-15.157	-15.156	-15.155
55	-15.154	-15.152	-15.151
60	-15.151	-15.151	-15.149
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUCW1R52415	
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 - 0.05A (AVR 2):0 - 0.05A

* 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	+15V0.05A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	24	0	15.459	±177	±1.2
Minimum Voltage	-40	36	0.05	15.105		

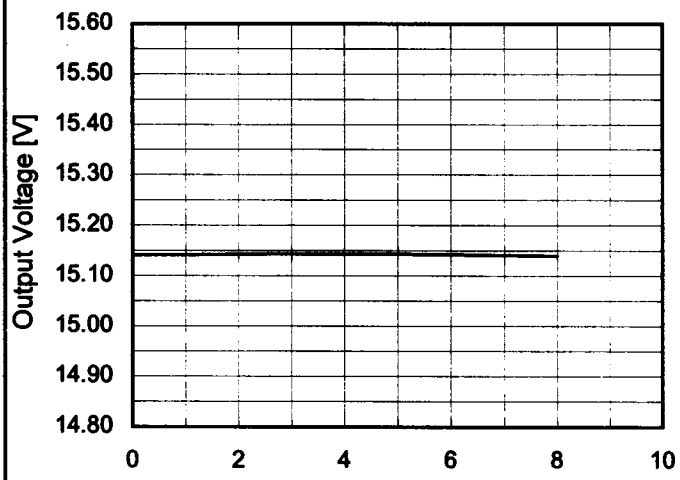
Object	-15V0.05A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	36	0	-15.485	±184	±1.2
Minimum Voltage	-40	36	0.05	-15.118		

COSEL

Model	SUCW1R52415
Item	Time Lapse Drift
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



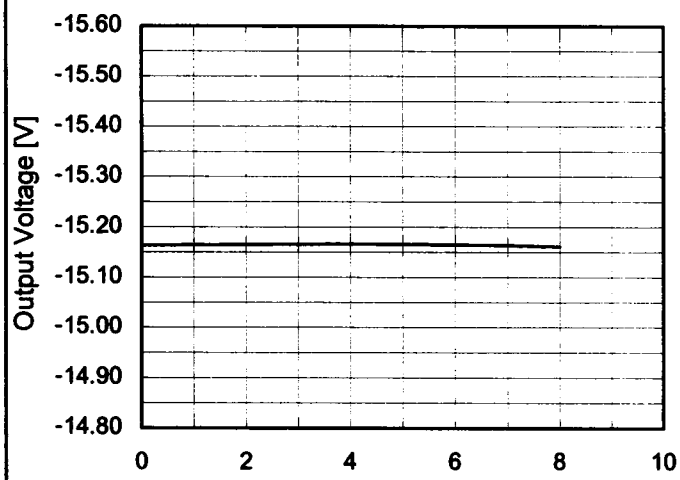
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.141
0.5	15.142
1.0	15.142
2.0	15.143
3.0	15.143
4.0	15.144
5.0	15.143
6.0	15.142
7.0	15.141
8.0	15.140

Object	-15V0.05A

1.Graph



Input Volt. 24V
Load 100%

2.Values

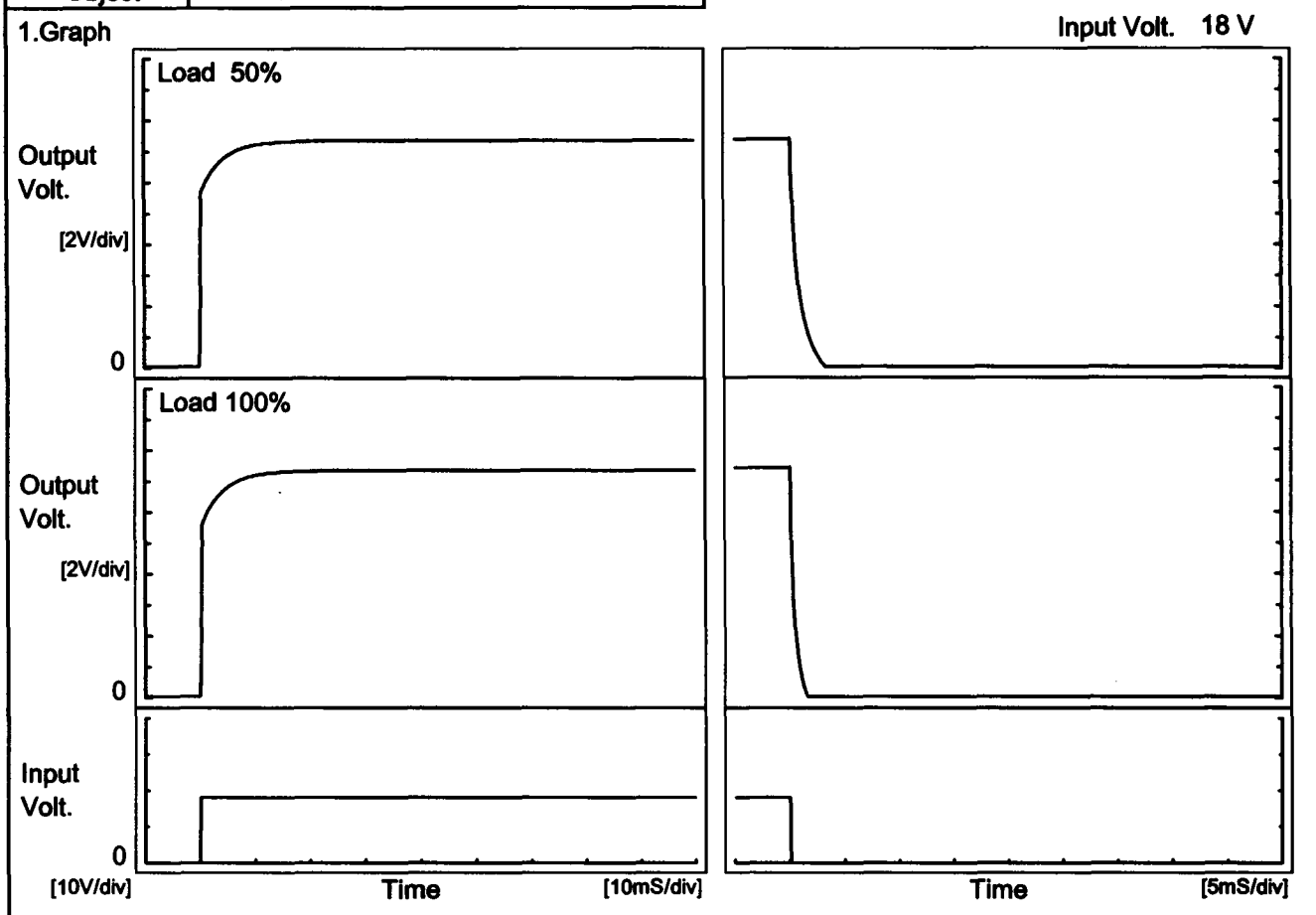
Time since start [H]	Output Voltage [V]
0.0	-15.161
0.5	-15.164
1.0	-15.165
2.0	-15.165
3.0	-15.166
4.0	-15.166
5.0	-15.166
6.0	-15.165
7.0	-15.164
8.0	-15.162

COSEL

Model	SUCW1R52415
Item	Rise and Fall Time
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

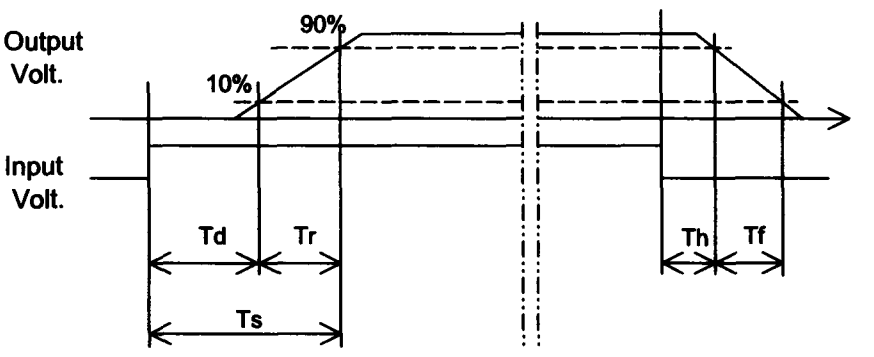
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	4.6	4.7	0.2	2.0
100 %	0.1	4.9	5.0	0.1	1.0

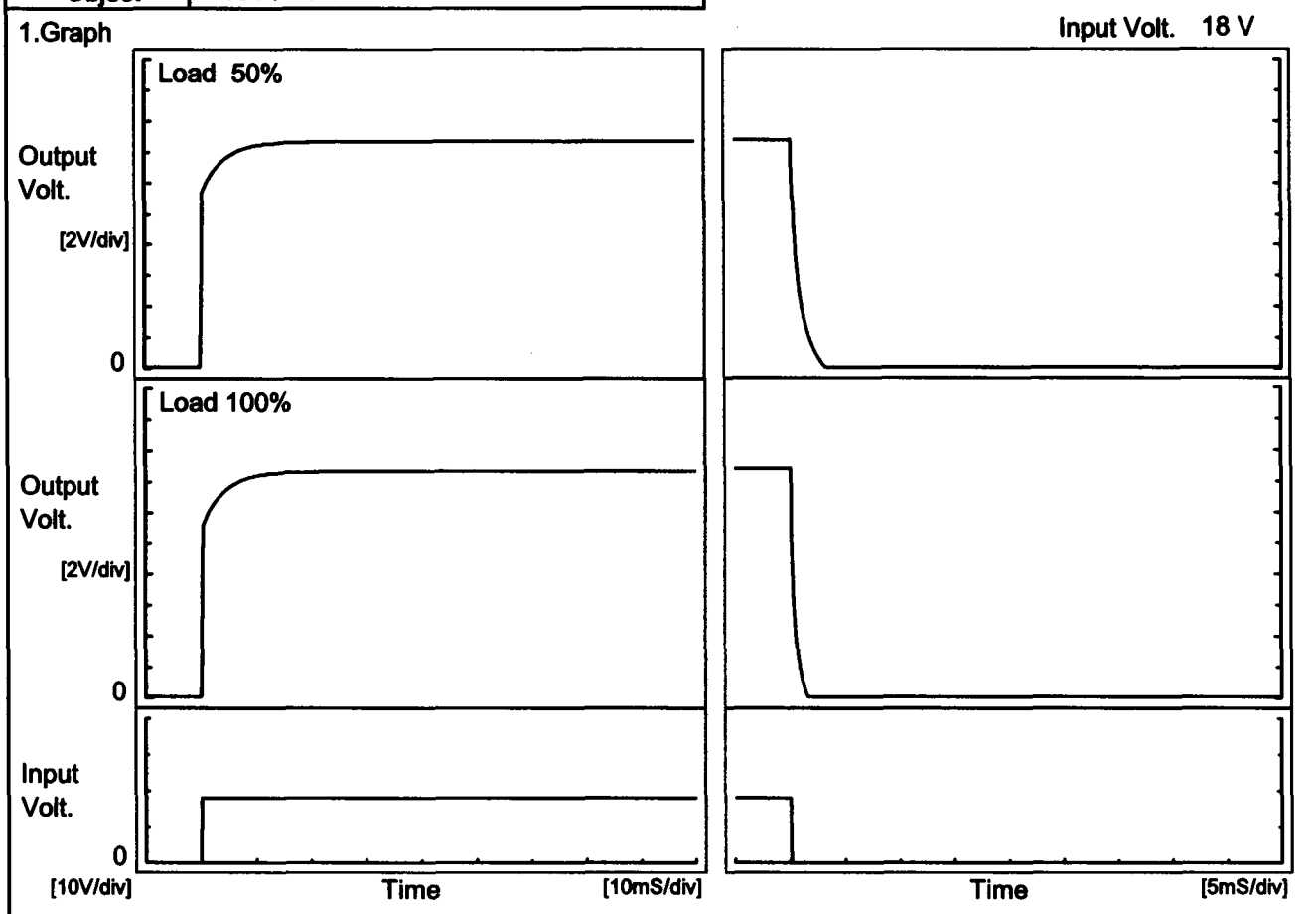


COSEL

Model	SUCW1R52415
Item	Rise and Fall Time
Object	-15V0.05A

Temperature 25°C
Testing Circuitry Figure A

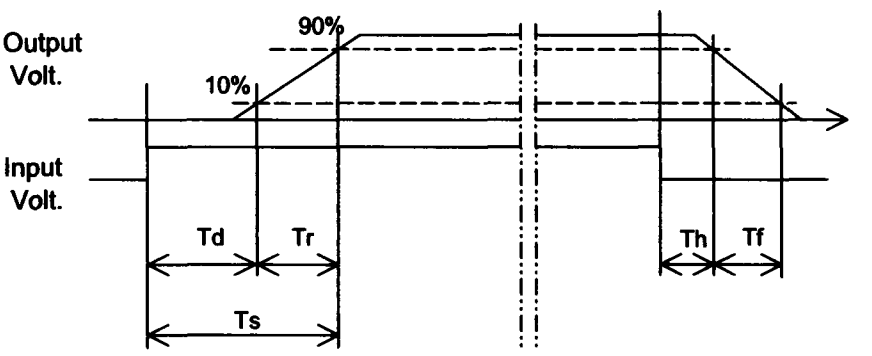
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	4.6	4.7	0.2	2.0
100 %	0.1	4.9	5.0	0.1	1.0

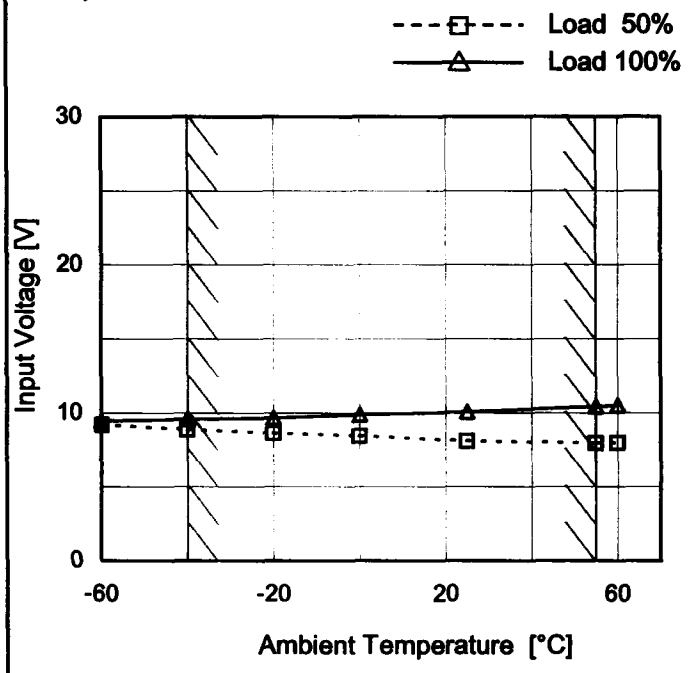


COSEL

Model	SUCW1R52415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.05A

Testing Circuitry Figure A

1.Graph

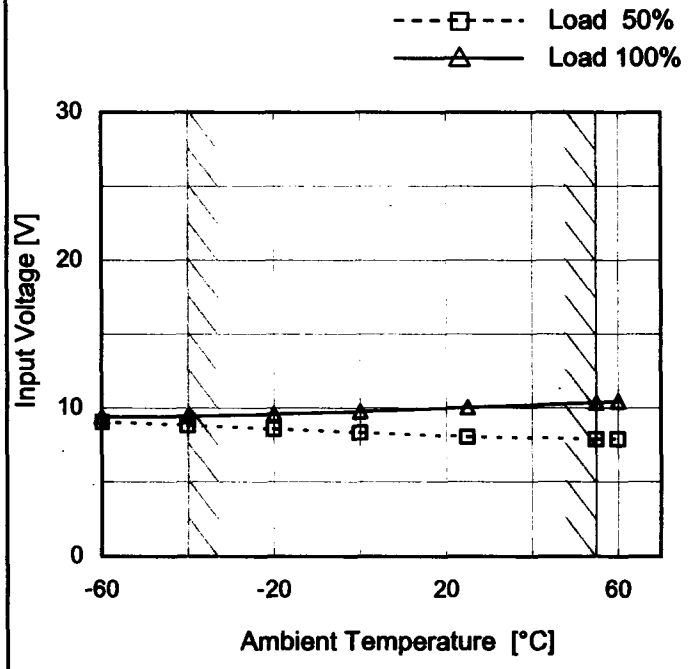


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	9.2	9.5
-40	8.9	9.6
-20	8.7	9.7
0	8.5	9.9
25	8.2	10.1
55	8.0	10.5
60	8.0	10.6
–	-	-
–	-	-
–	-	-
–	-	-

Object	-15V0.05A

1.Graph



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

2.Values

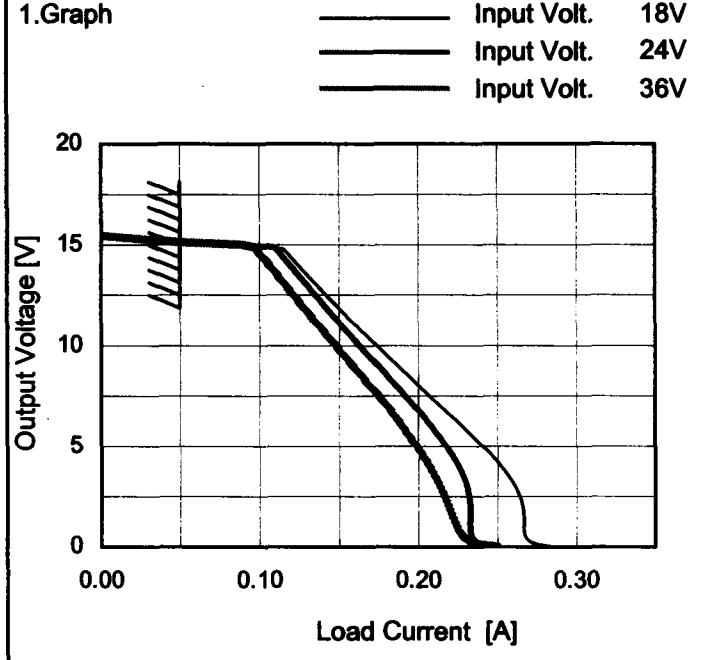
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	9.1	9.4
-40	8.9	9.5
-20	8.6	9.6
0	8.4	9.8
25	8.1	10.1
55	7.9	10.4
60	7.9	10.5
–	-	-
–	-	-
–	-	-
–	-	-

COSEL

Model	SUCW1R52415
Item	Overcurrent Protection
Object	+15V0.05A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

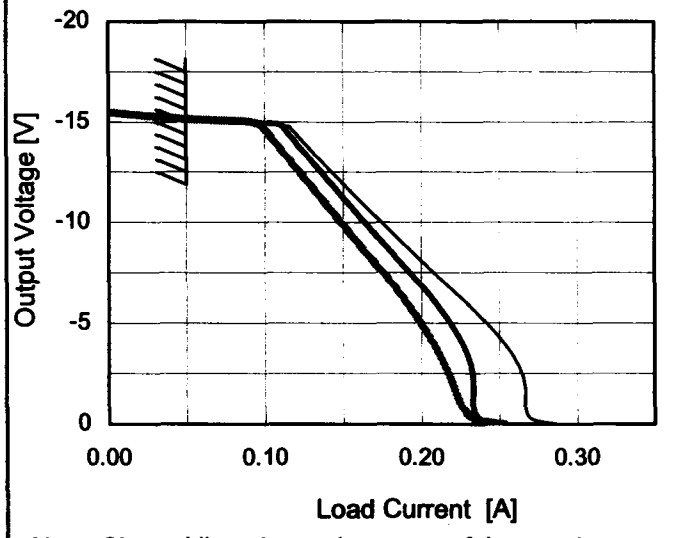


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
15.0	0.05	0.05	0.05
14.3	0.12	0.12	0.10
13.5	0.13	0.12	0.11
12.0	0.15	0.14	0.13
10.5	0.17	0.16	0.14
9.0	0.19	0.18	0.16
7.5	0.21	0.19	0.18
6.0	0.23	0.21	0.19
4.5	0.25	0.22	0.20
3.0	0.26	0.23	0.21
1.5	0.27	0.23	0.22
0.0	0.28	0.25	0.25

Object	-15V0.05A

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]
-15.00	0.05	0.05	0.05
-14.25	0.12	0.12	0.10
-13.50	0.13	0.13	0.11
-12.00	0.15	0.14	0.13
-10.50	0.17	0.16	0.14
-9.00	0.19	0.18	0.16
-7.50	0.21	0.19	0.18
-6.00	0.23	0.21	0.19
-4.50	0.25	0.22	0.20
-3.00	0.26	0.23	0.21
-1.50	0.27	0.23	0.22
0.00	0.29	0.25	0.25

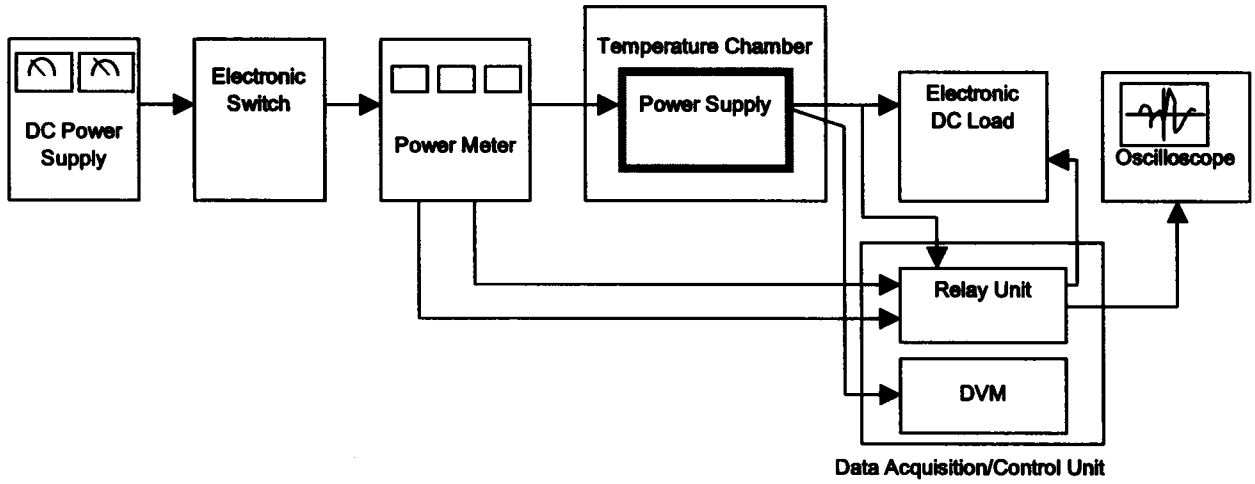


Figure A

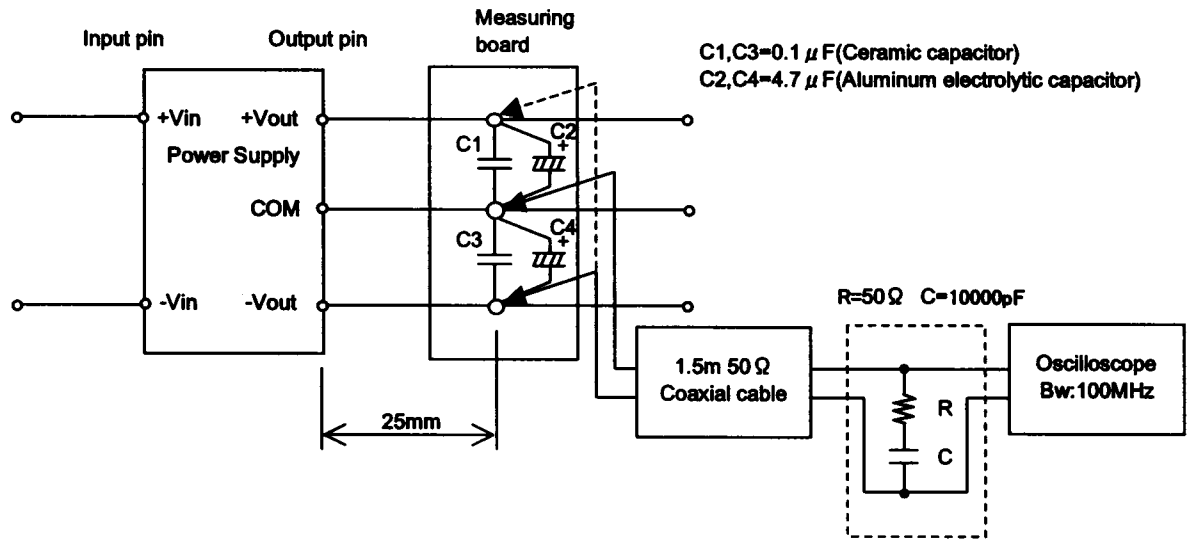


Figure B (Ripple and Ripple noise Characteristic)