COSEL

参考資料

TEST DATA OF SUTW31215

Regulated DC Power Supply
March 5, 2009

Approved by : Kazunari Asano

Kazunari Asano　　Design Manager

Prepared by : Sho Saito

Sho Saito　　Design Engineer

COSEL CO.,LTD.

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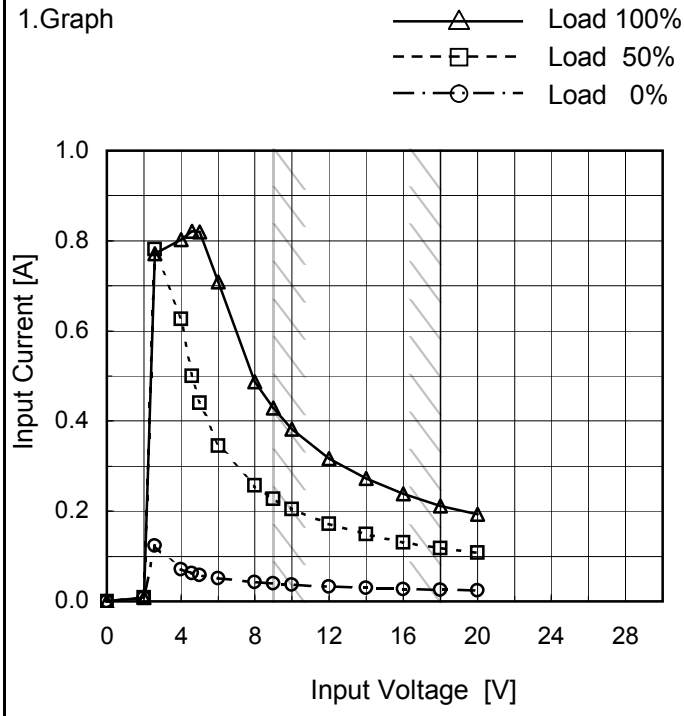
COSEL

Model	SUTW31215
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

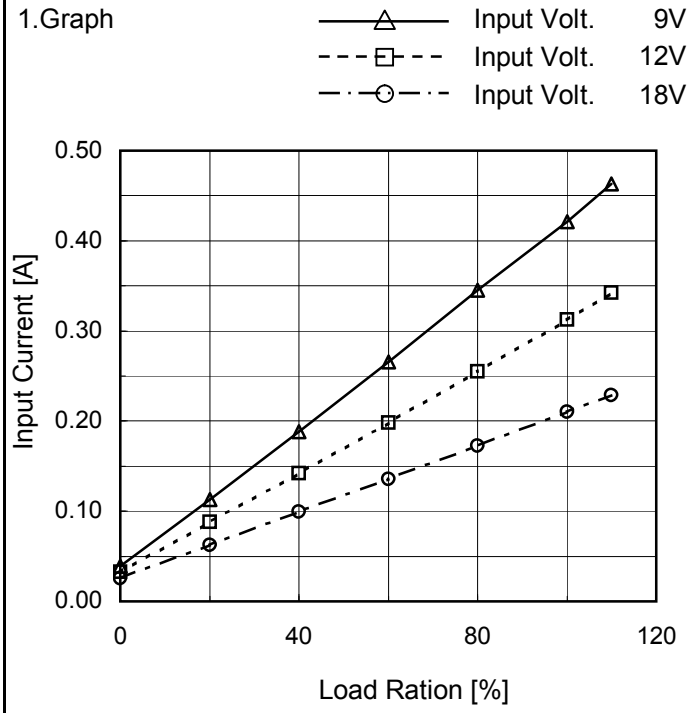
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
2.0	0.009	0.009	0.009
2.6	0.124	0.782	0.771
4.0	0.071	0.627	0.802
4.6	0.062	0.500	0.822
5.0	0.059	0.441	0.820
6.0	0.051	0.345	0.708
8.0	0.042	0.257	0.488
9.0	0.039	0.228	0.429
10.0	0.037	0.205	0.382
12.0	0.033	0.172	0.316
14.0	0.030	0.149	0.272
16.0	0.027	0.131	0.239
18.0	0.026	0.118	0.212
20.0	0.024	0.108	0.193
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW31215
Item	Input Current (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

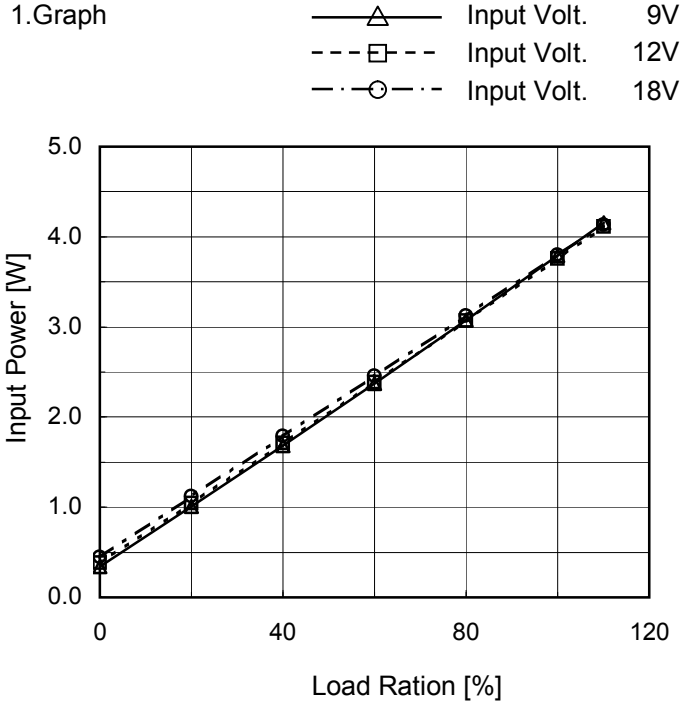
Load Ration [%]	Input Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0	0.039	0.033	0.025
20	0.113	0.088	0.062
40	0.188	0.142	0.099
60	0.266	0.198	0.136
80	0.345	0.255	0.173
100	0.422	0.312	0.210
110	0.463	0.342	0.229
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW31215
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

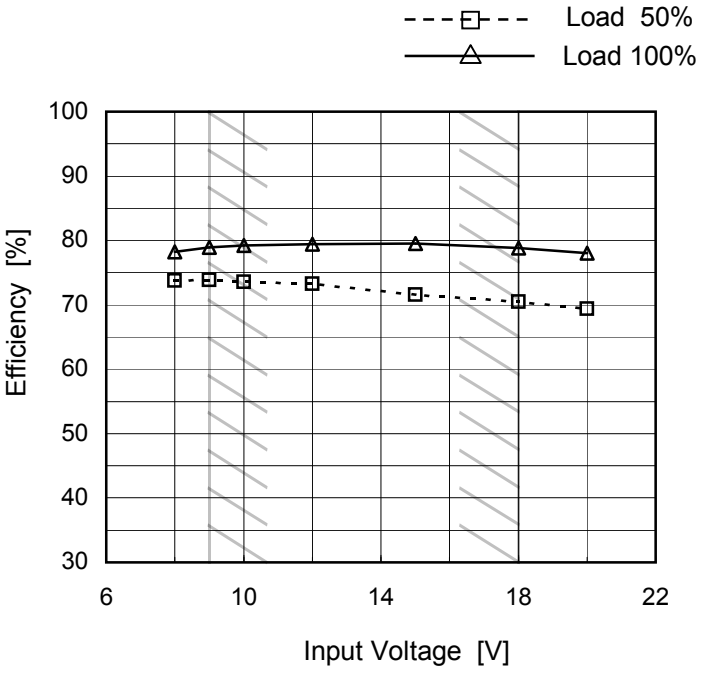
Load Ration [%]	Input Power [W]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0	0.34	0.38	0.45
20	1.01	1.05	1.12
40	1.68	1.71	1.79
60	2.37	2.39	2.46
80	3.07	3.07	3.12
100	3.79	3.76	3.80
110	4.16	4.11	4.13
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW31215
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

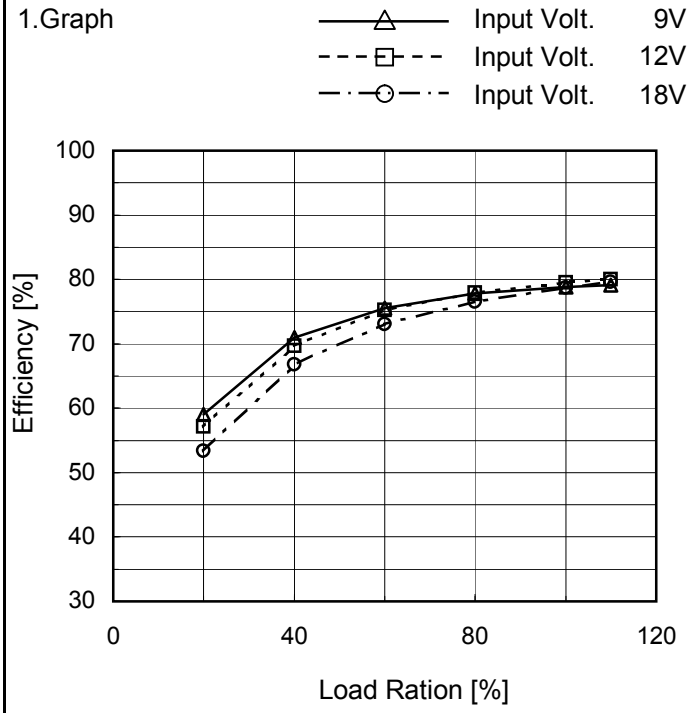
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
8	73.8	78.2
9	73.8	78.9
10	73.6	79.2
12	73.3	79.4
15	71.5	79.5
18	70.4	78.8
20	69.3	78.0
--	-	-
--	-	-

COSEL

Model	SUTW31215
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]
0	-	-	-
20	59.0	57.2	53.4
40	71.0	69.7	66.8
60	75.6	75.2	73.0
80	77.8	77.9	76.5
100	78.8	79.6	78.7
110	79.1	80.0	79.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

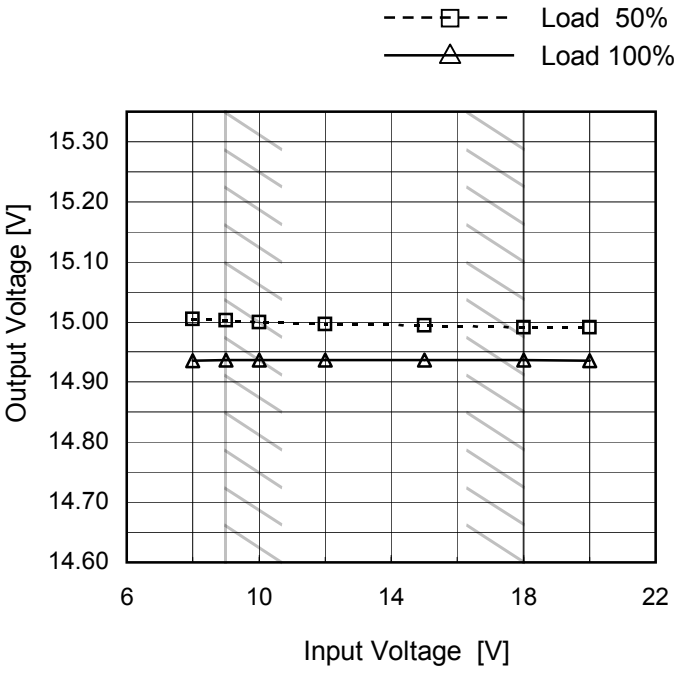
COSEL

Model	SUTW31215
Item	Line Regulation

Temperature 25°C
Testing Circuitry Figure A

Object +15V0.1A

1.Graph

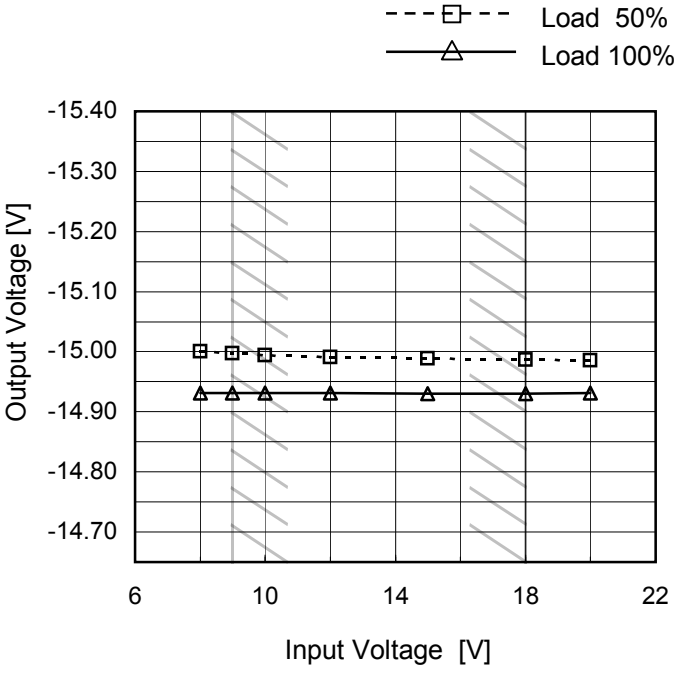


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8	15.005	14.936
9	15.002	14.937
10	15.000	14.937
12	14.996	14.937
15	14.994	14.937
18	14.991	14.937
20	14.991	14.936
--	-	-
--	-	-

Object -15V0.1A

1.Graph



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

2.Values

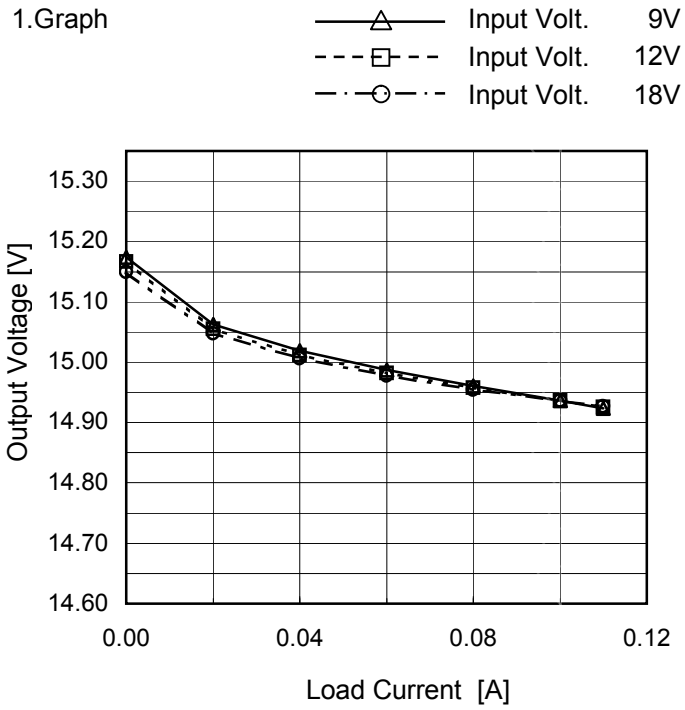
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8	-15.000	-14.931
9	-14.997	-14.932
10	-14.994	-14.931
12	-14.991	-14.931
15	-14.989	-14.931
18	-14.987	-14.931
20	-14.986	-14.931
--	-	-
--	-	-

COSEL

Model	SUTW31215
Item	Load Regulation
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

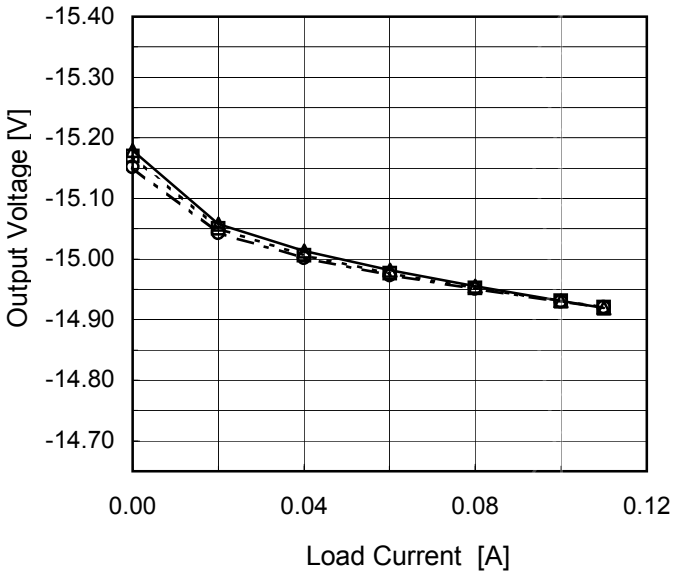


2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
0.00	15.174	15.166	15.149
0.02	15.063	15.056	15.048
0.04	15.019	15.012	15.006
0.06	14.987	14.982	14.978
0.08	14.960	14.957	14.955
0.10	14.936	14.936	14.936
0.11	14.924	14.926	14.927
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V0.1A

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]
0.00	-15.179	-15.170	-15.152
0.02	-15.058	-15.050	-15.043
0.04	-15.014	-15.006	-15.002
0.06	-14.982	-14.977	-14.973
0.08	-14.955	-14.952	-14.951
0.10	-14.931	-14.931	-14.930
0.11	-14.919	-14.921	-14.921
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

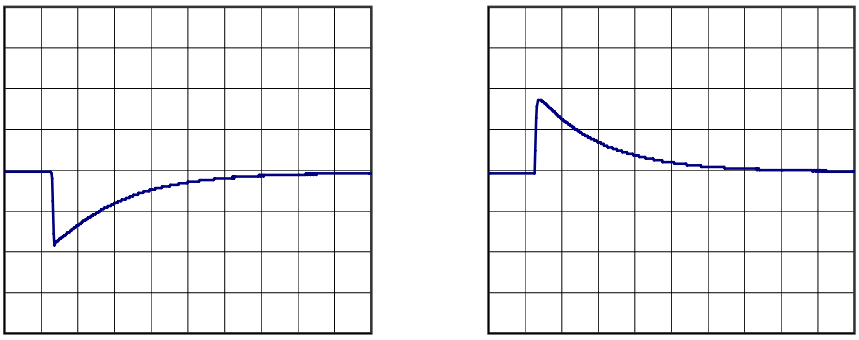
COSEL

Model	SUTW31215
Item	Dynamic Load Response
Object	+15V0.1A

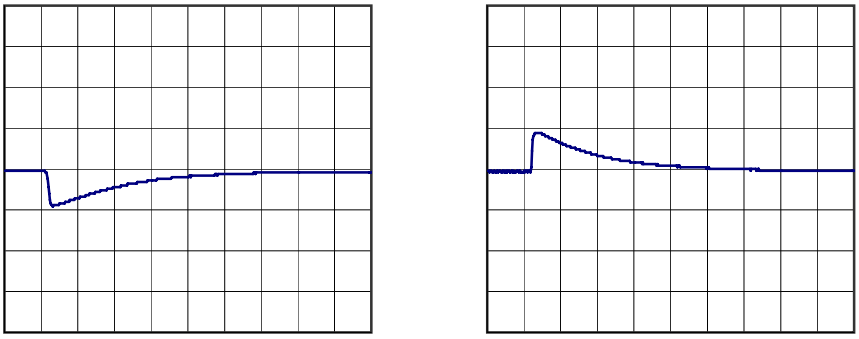
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 12 V
Cycle 100 mS

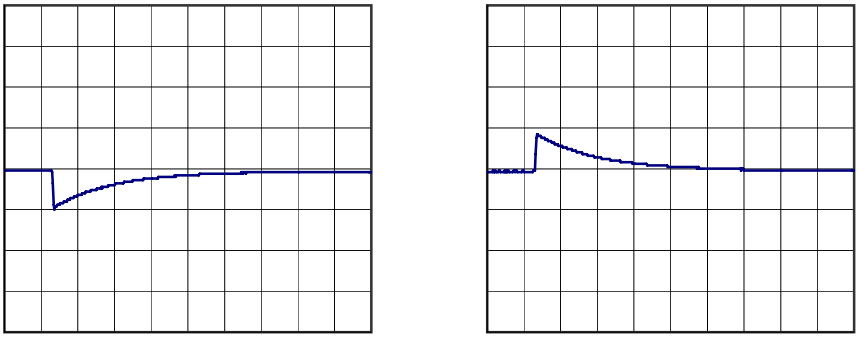
Min. Load (0A) ⟷
Load 100% (0.1A)



Min. Load (0A) ⟷
Load 50% (0.05A)



Load 50% (0.05A) ⟷
Load 100% (0.1A)



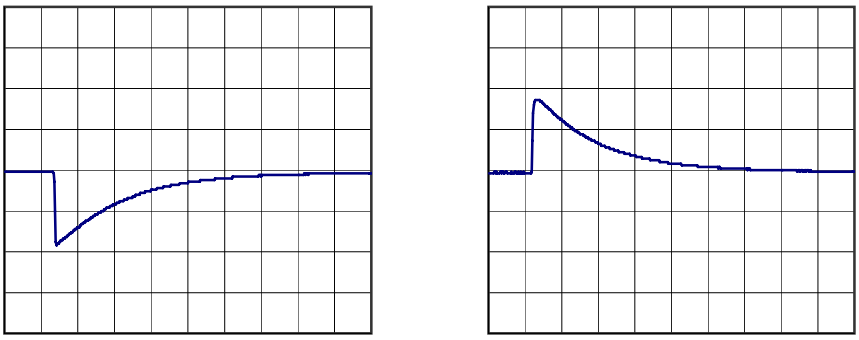
COSEL

Model	SUTW31215
Item	Dynamic Load Response
Object	-15V0.1A

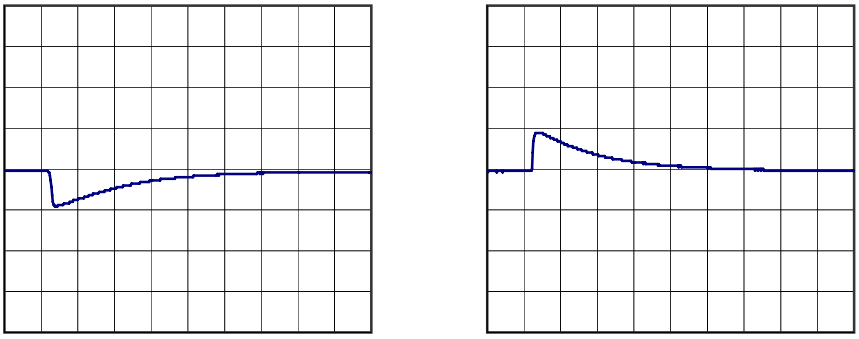
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 12 V
Cycle 100 mS

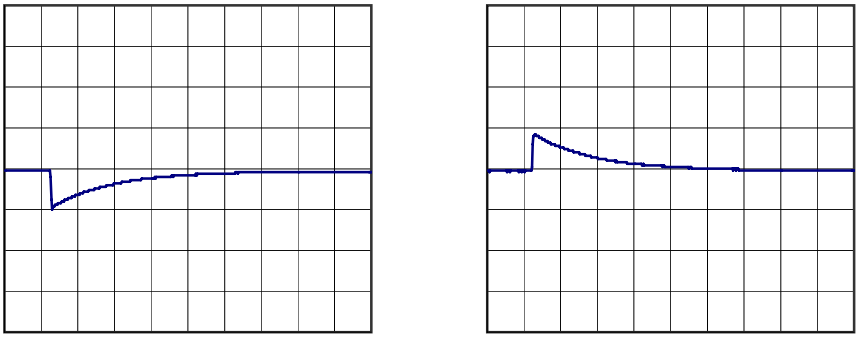
Min. Load (0A) ⟷
Load 100% (0.1A)



Min. Load (0A) ⟷
Load 50% (0.05A)



Load 50% (0.05A) ⟷
Load 100% (0.1A)

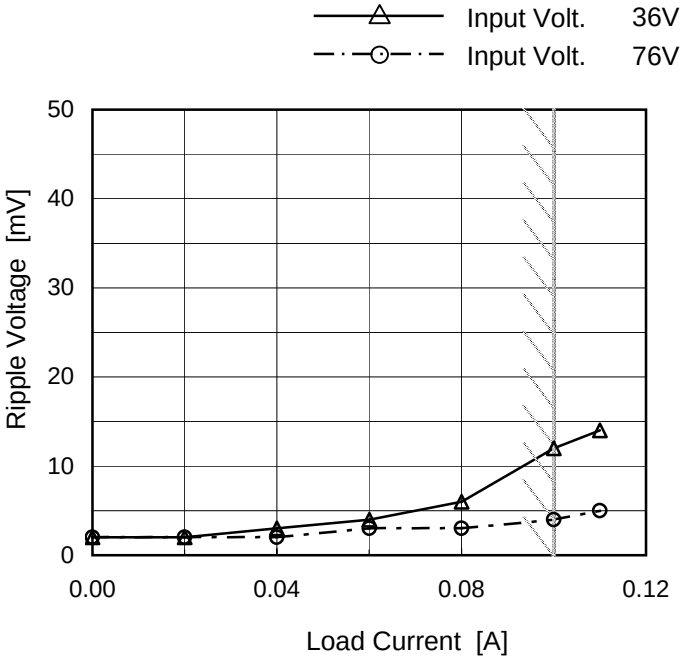


COSEL

Model	SUTW31215
Item	Ripple Voltage (by Load Current)
Object	+15V0.1A

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]

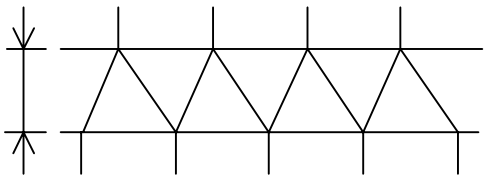


Fig.Complex Ripple Wave Form

2.Values

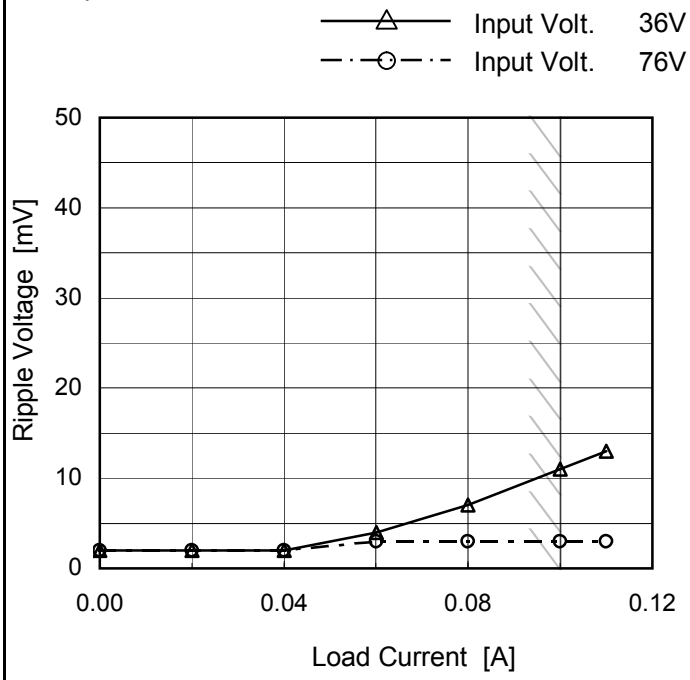
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	2	2
0.02	2	2
0.04	3	2
0.06	4	3
0.08	6	3
0.10	12	4
0.11	14	5
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW31215
Item	Ripple Voltage (by Load Current)
Object	-15V0.1A

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]

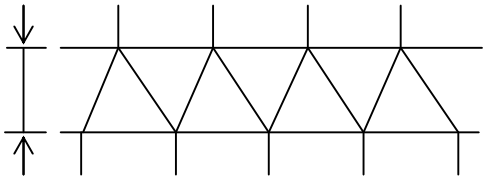


Fig.Complex Ripple Wave Form

2.Values

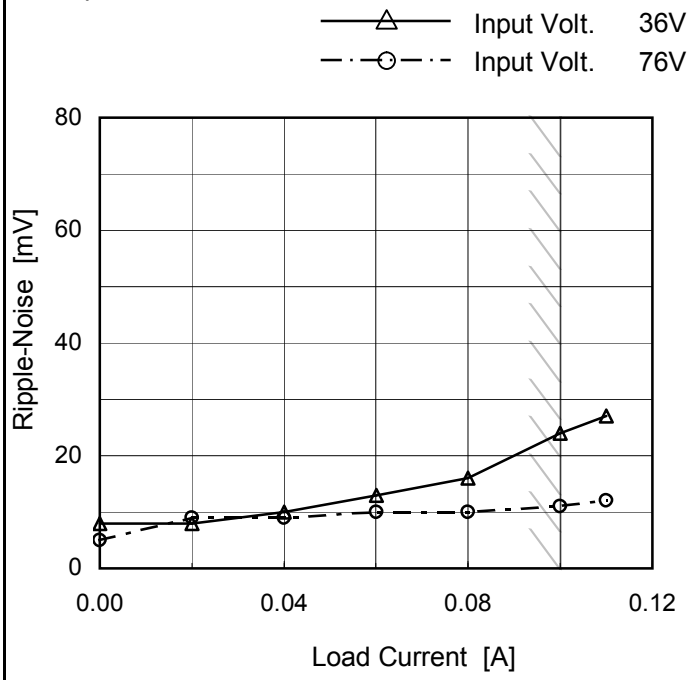
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	2	2
0.02	2	2
0.04	2	2
0.06	4	3
0.08	7	3
0.10	11	3
0.11		3
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW31215
Item	Ripple-Noise
Object	+15V0.1A

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.

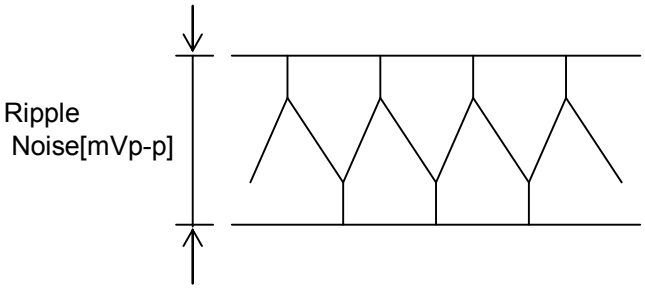


Fig.Complex Ripple Noise Wave Form

2.Values

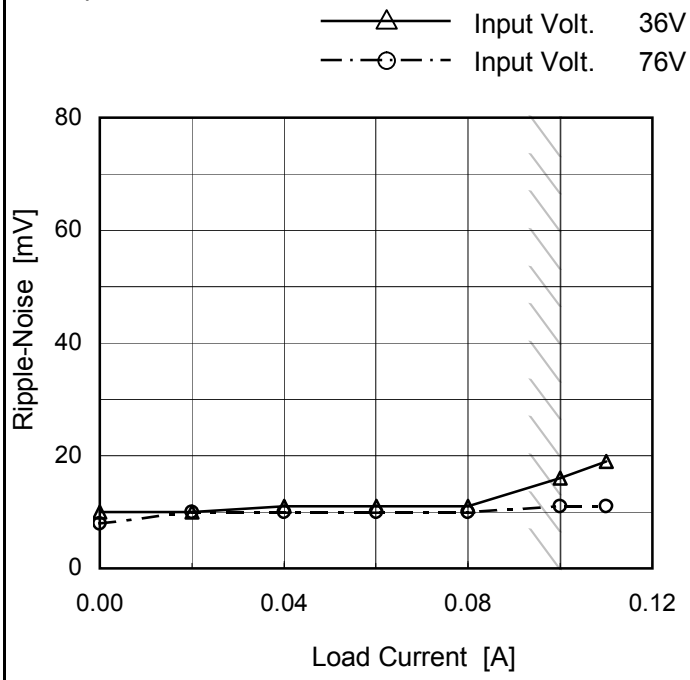
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	8	5
0.02	8	9
0.04	10	9
0.06	13	10
0.08	16	10
0.10	24	11
0.11	27	12
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW31215
Item	Ripple-Noise
Object	-15V0.1A

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.

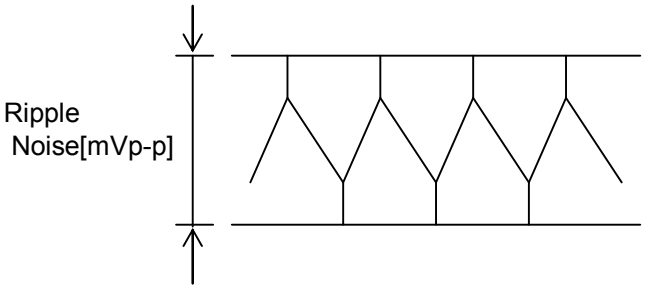


Fig.Complex Ripple Noise Wave Form

2.Values

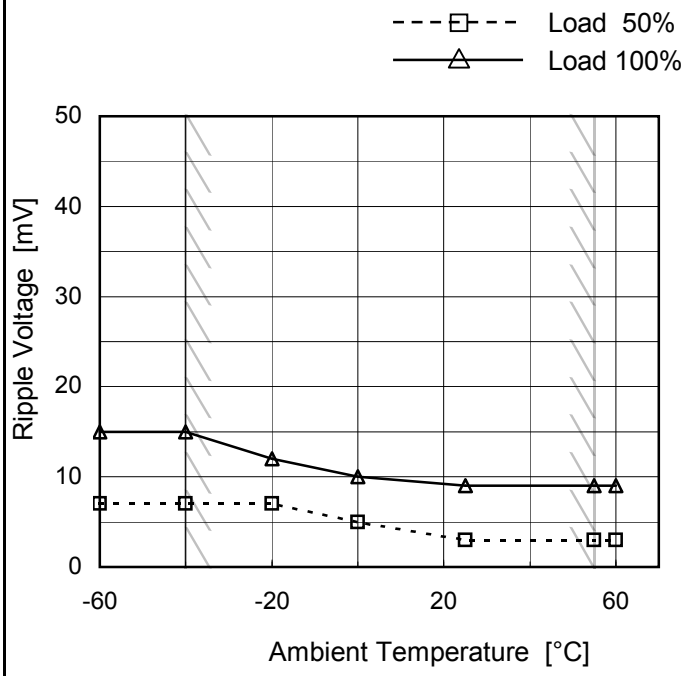
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.00	10	8
0.02	10	10
0.04	11	10
0.06	11	10
0.08	11	10
0.10	16	11
0.11	19	11
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW31215
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.1A

Testing Circuitry Figure B

1.Graph



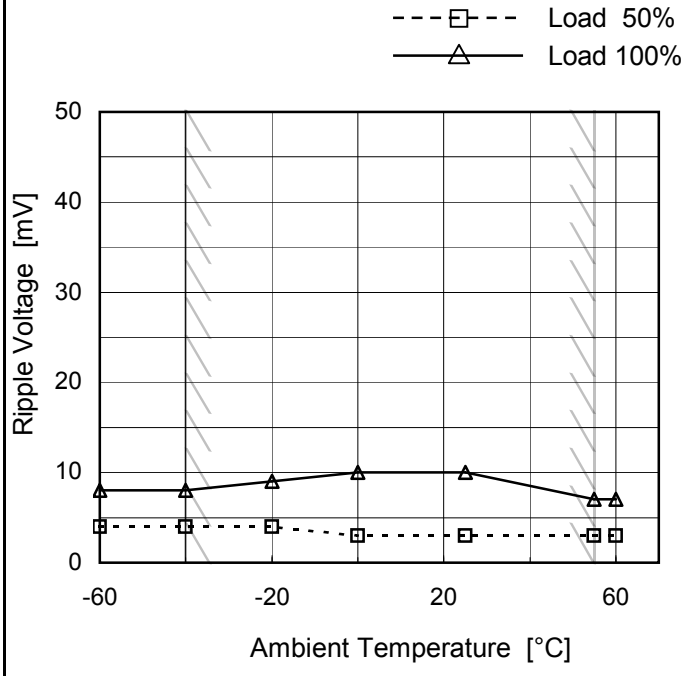
Input Volt. 48V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	7	15
-40	7	15
-20	7	12
0	5	10
25	3	9
55	3	9
60	3	9
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V0.1A

1.Graph



Input Volt. 48V

Measured by 100 MHz Oscilloscope.

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

2.Values

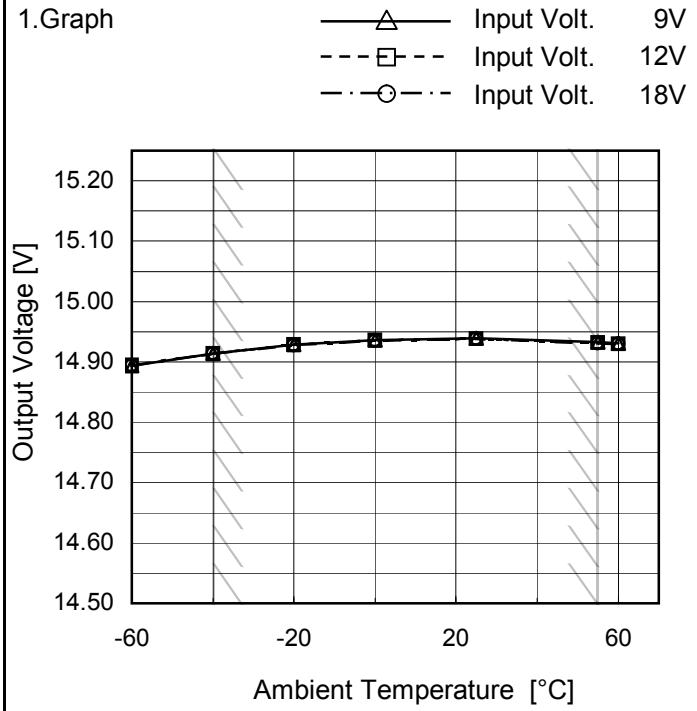
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	4	8
-40	4	8
-20	4	9
0	3	10
25	3	10
55	3	7
60	3	7
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW31215
Item	Ambient Temperature Drift
Object	+15V0.1A

Testing Circuitry Figure A

1.Graph

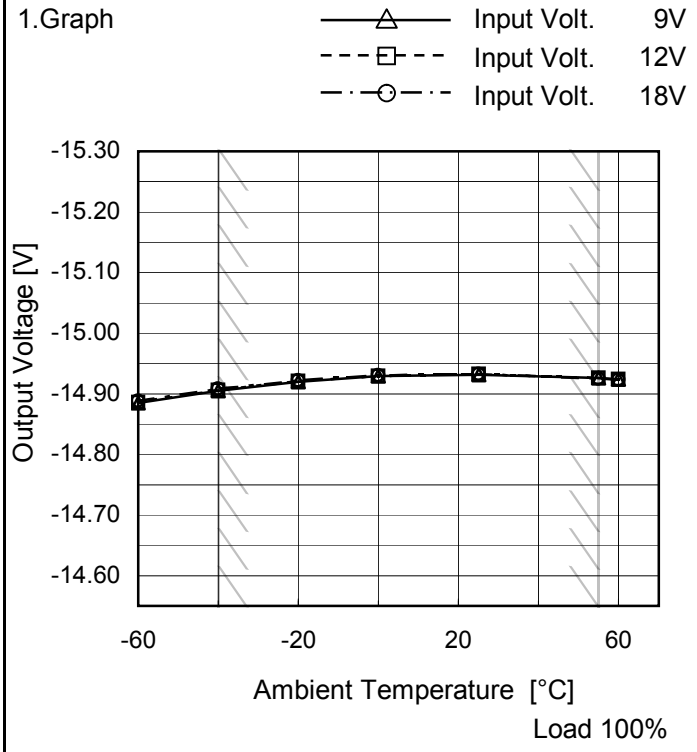


2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-60	14.894	14.894	14.894
-40	14.914	14.914	14.914
-20	14.928	14.928	14.927
0	14.936	14.936	14.935
25	14.939	14.938	14.938
55	14.932	14.932	14.931
60	14.931	14.930	14.930
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V0.1A

1.Graph



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]
-60	-14.885	-14.886	-14.888
-40	-14.905	-14.907	-14.908
-20	-14.920	-14.921	-14.922
0	-14.929	-14.929	-14.930
25	-14.932	-14.932	-14.932
55	-14.926	-14.926	-14.925
60	-14.924	-14.924	-14.923
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW31215	
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 : 9 - 18V

Load Current (AVR 1) : 0 - 0.1A (AVR 2) : 0 - 0.1A

* 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	+15V0.1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	9	0	15.175	±249	±1.7
Minimum Voltage	-40	9	0.1	14.677		

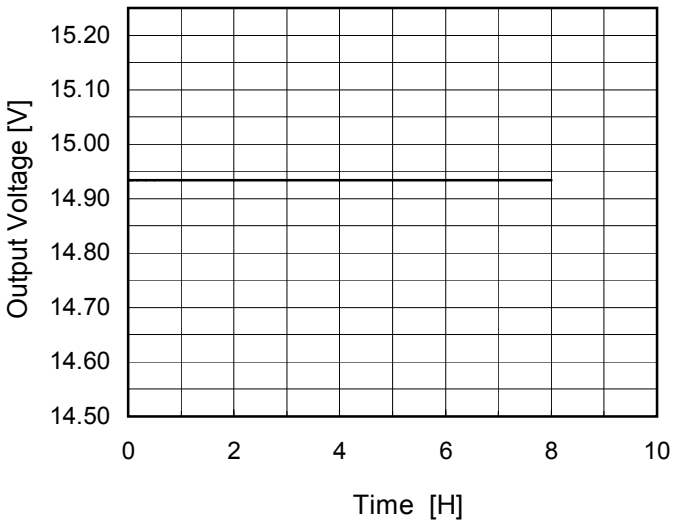
Object	-15V0.1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	9	0	-15.180	±249	±1.7
Minimum Voltage	-40	9	0.1	-14.682		

COSEL

Model	SUTW31215
Item	Time Lapse Drift
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



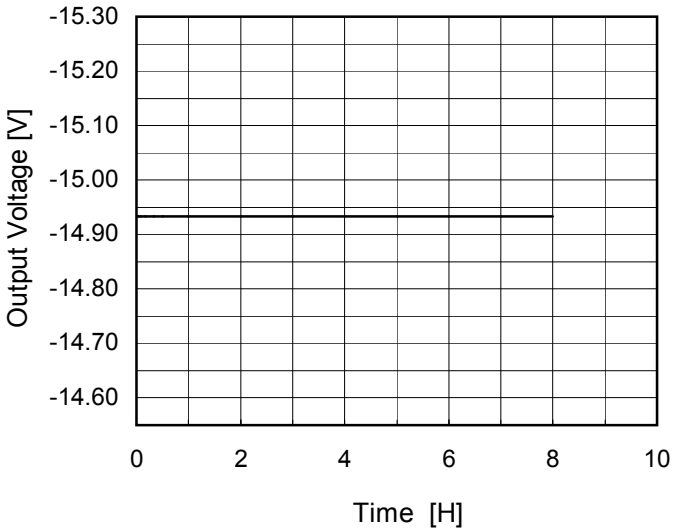
Input Volt. 12V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	14.934
0.5	14.934
1.0	14.934
2.0	14.934
3.0	14.934
4.0	14.934
5.0	14.934
6.0	14.934
7.0	14.934
8.0	14.934

Object	-15V0.1A

1.Graph



Input Volt. 12V
Load 100%

2.Values

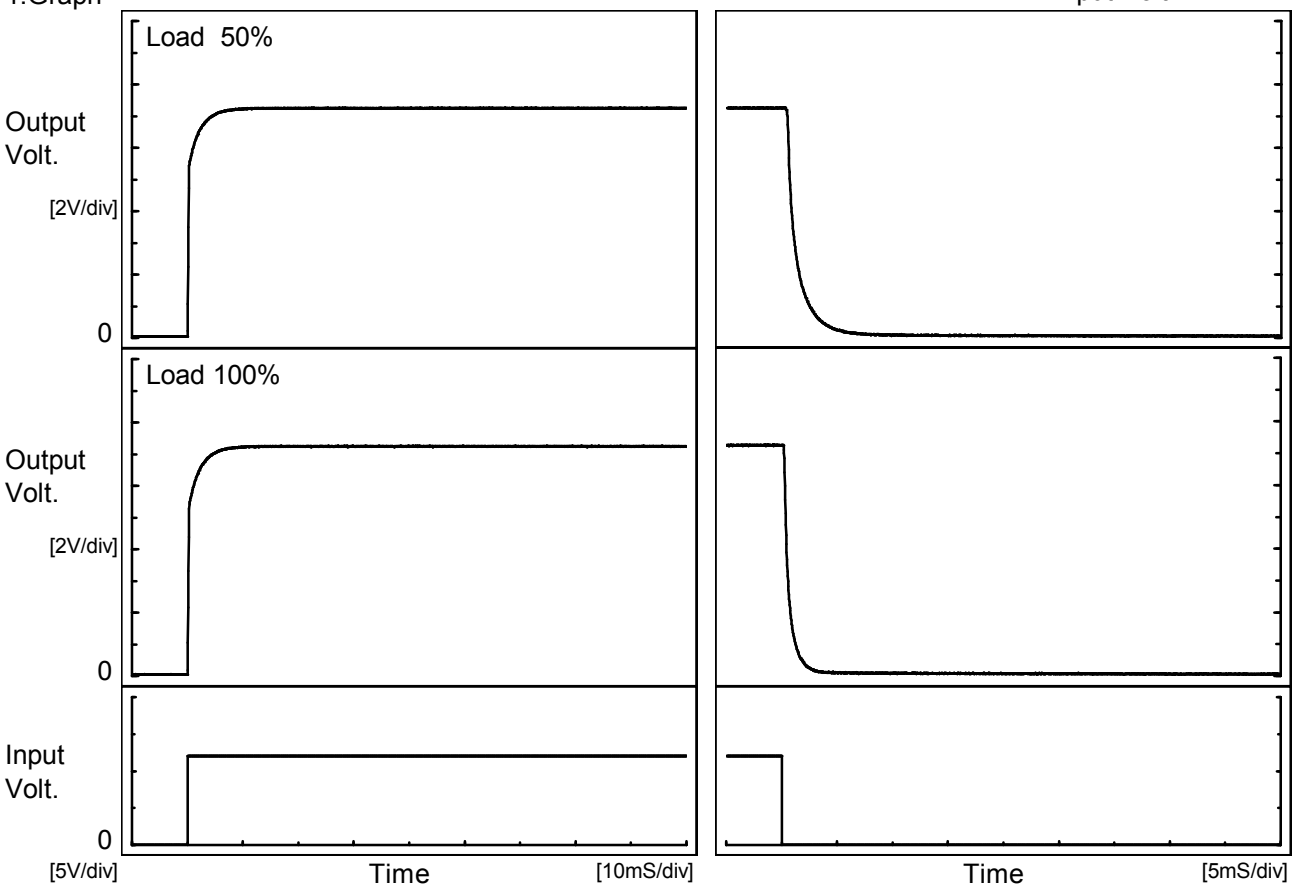
Time since start [H]	Output Voltage [V]
0.0	-14.933
0.5	-14.933
1.0	-14.933
2.0	-14.933
3.0	-14.933
4.0	-14.933
5.0	-14.933
6.0	-14.933
7.0	-14.933
8.0	-14.933

COSEL

Model	SUTW31215	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V0.1A	

1.Graph

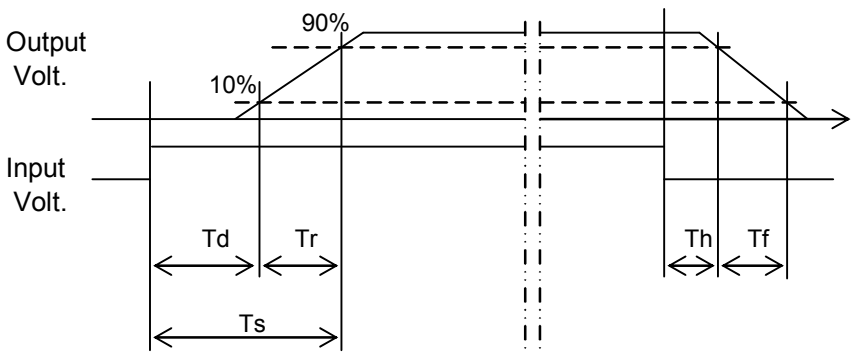
Input Volt. 12 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	3.0	3.1	0.5	2.4
100 %	0.1	3.2	3.3	0.3	1.2

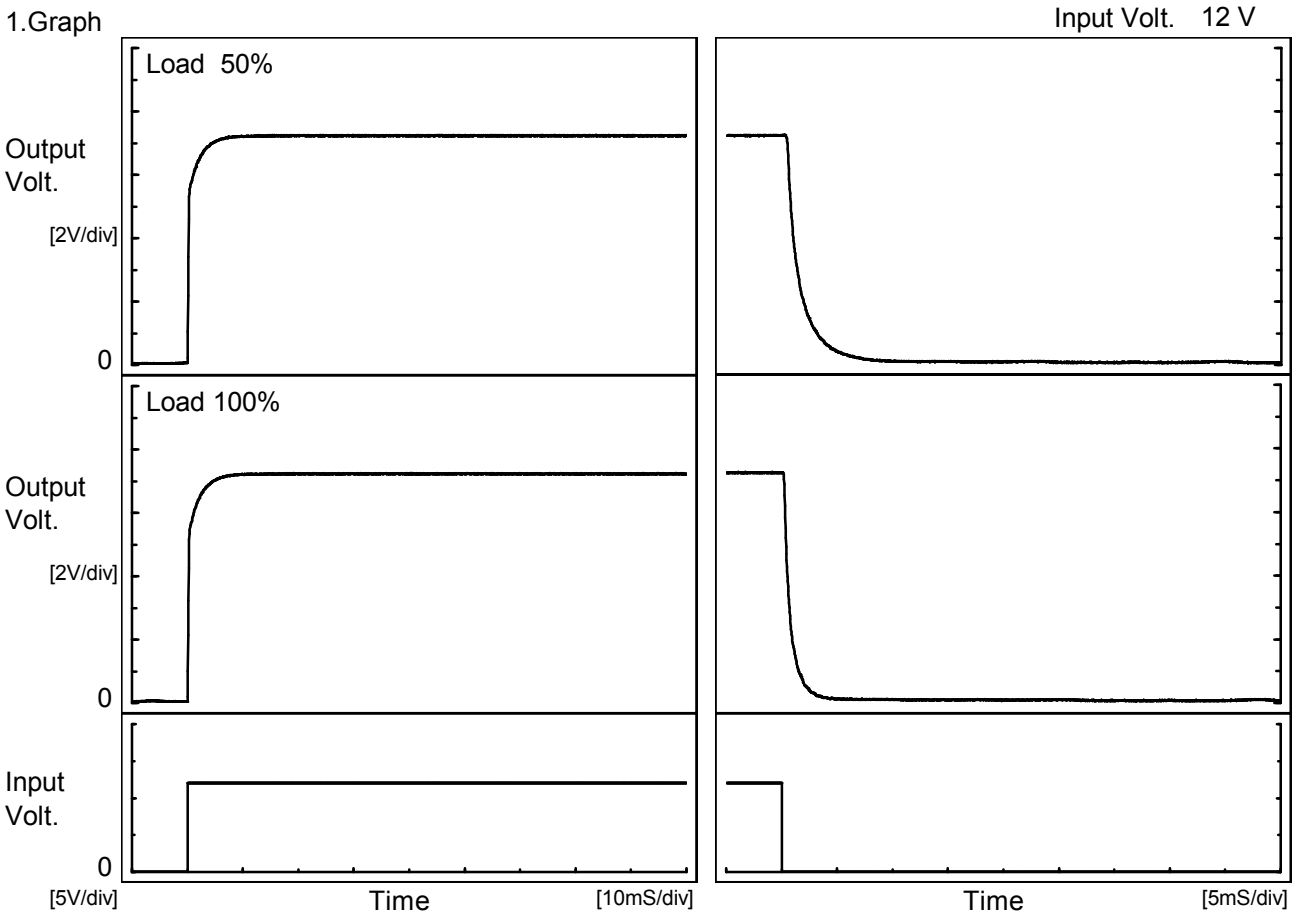


COSEL

Model	SUTW31215
Item	Rise and Fall Time
Object	-15V0.1A

Temperature 25°C
Testing Circuitry Figure A

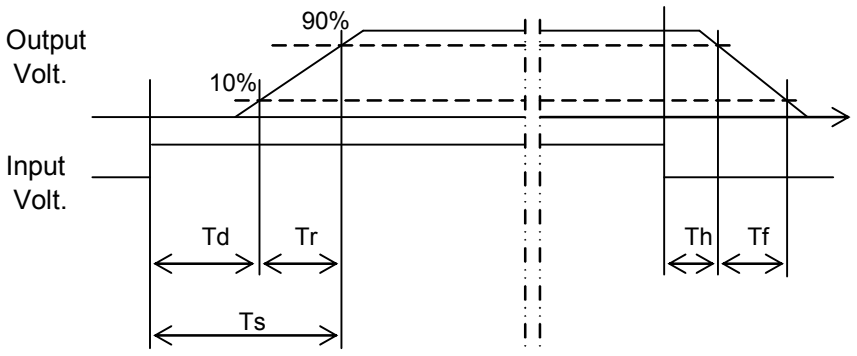
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	3.1	3.2	0.5	3.1
100 %	0.1	3.2	3.3	0.3	1.5



BC-10249

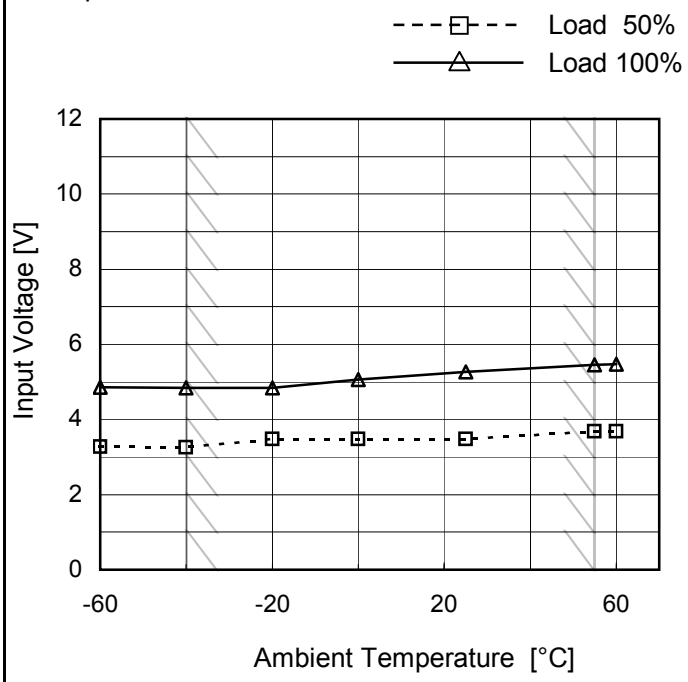
COSEL

Model	SUTW31215
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object +15V0.1A

1.Graph

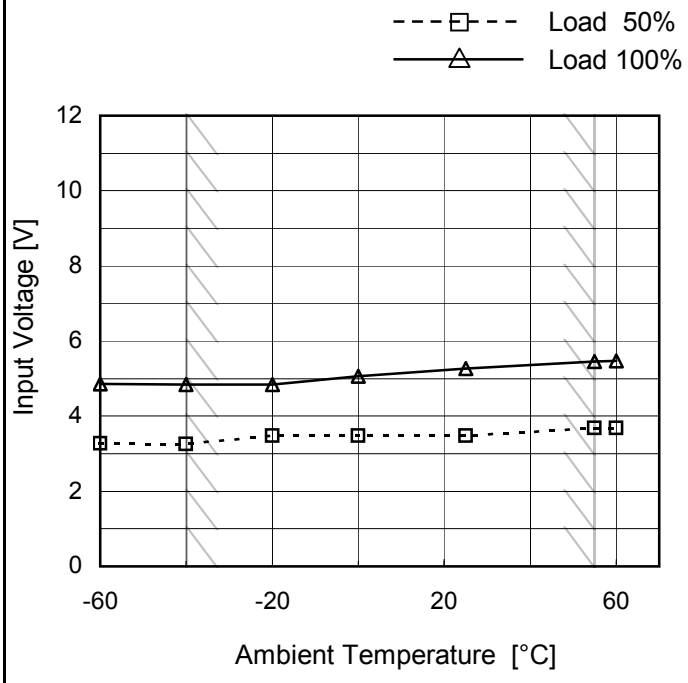


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.3	4.9
-40	3.3	4.9
-20	3.5	4.9
0	3.5	5.1
25	3.5	5.3
55	3.7	5.5
60	3.7	5.5
--	-	-
--	-	-
--	-	-
--	-	-

Object -15V0.1A

1.Graph



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

2.Values

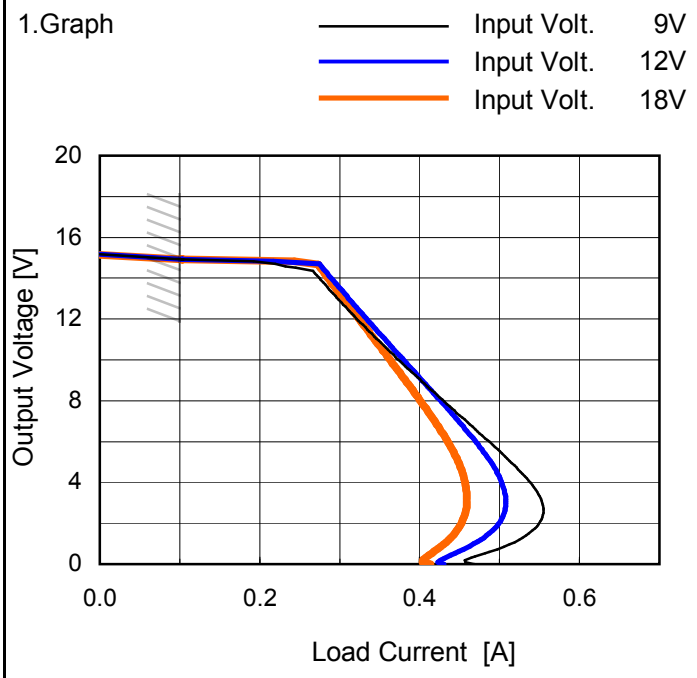
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.3	4.9
-40	3.3	4.9
-20	3.5	4.9
0	3.5	5.1
25	3.5	5.3
55	3.7	5.5
60	3.7	5.5
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW31215
Item	Overcurrent Protection
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

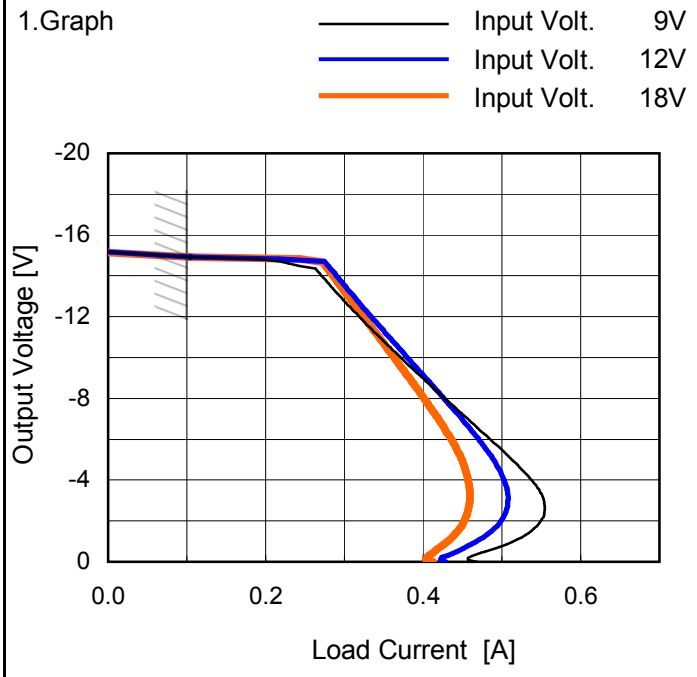


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
15.0	0.10	0.10	0.10
14.3	0.27	0.28	0.28
13.5	0.28	0.30	0.29
12.0	0.32	0.33	0.32
10.5	0.36	0.37	0.35
9.0	0.40	0.40	0.38
7.5	0.44	0.44	0.41
6.0	0.48	0.47	0.43
4.5	0.53	0.50	0.45
3.0	0.55	0.51	0.46
1.5	0.54	0.49	0.44
0.0	0.47	0.43	0.41

Object	-15V0.1A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]
-15.00	0.10	0.10	0.10
-14.25	0.27	0.29	0.28
-13.50	0.28	0.30	0.29
-12.00	0.32	0.33	0.32
-10.50	0.36	0.37	0.35
-9.00	0.40	0.40	0.38
-7.50	0.44	0.44	0.41
-6.00	0.48	0.47	0.43
-4.50	0.53	0.50	0.45
-3.00	0.55	0.51	0.46
-1.50	0.54	0.49	0.44
0.00	0.47	0.43	0.41

BC-10249

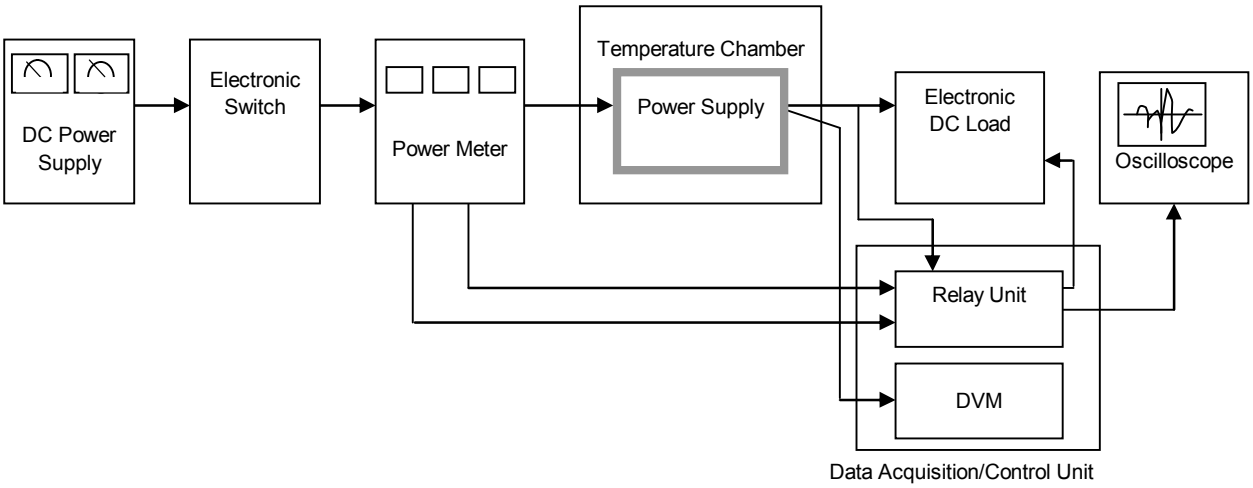


Figure A

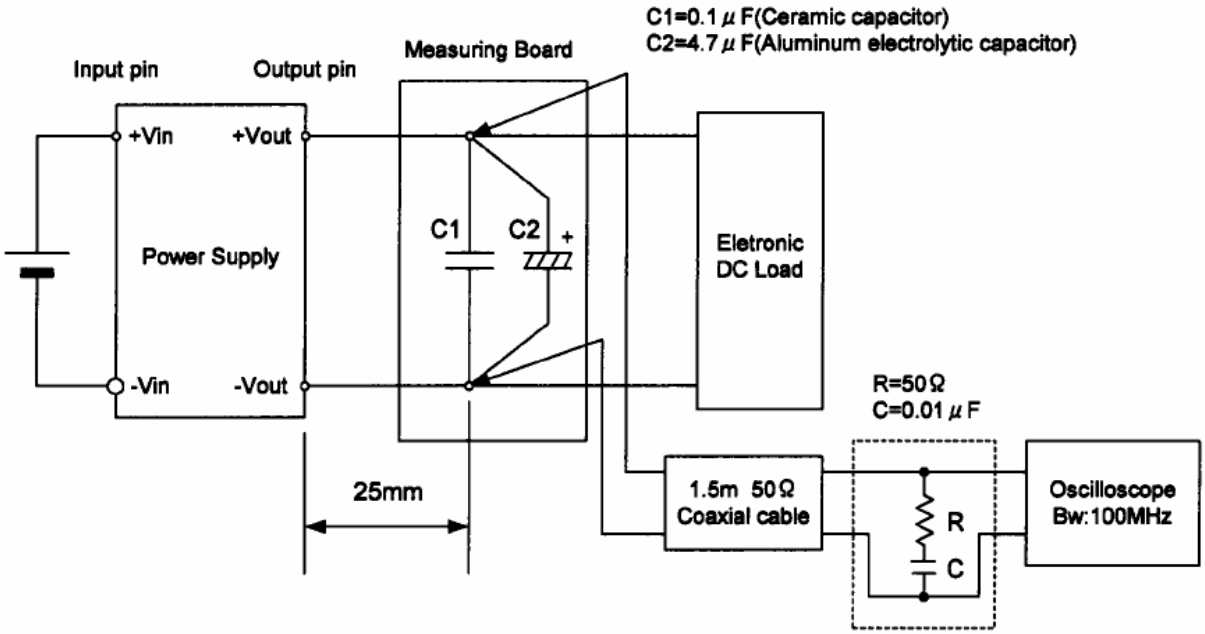


Figure B (Ripple and Ripple noise Characteristic)