COSEL

参考資料

TEST DATA OF SUTW102415

Regulated DC Power Supply
February 24, 2009

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Sho Saito Design Engineer

COSEL CO.,LTD.

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Model	SUTW102415
Item	Input Current (by Input Voltage)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

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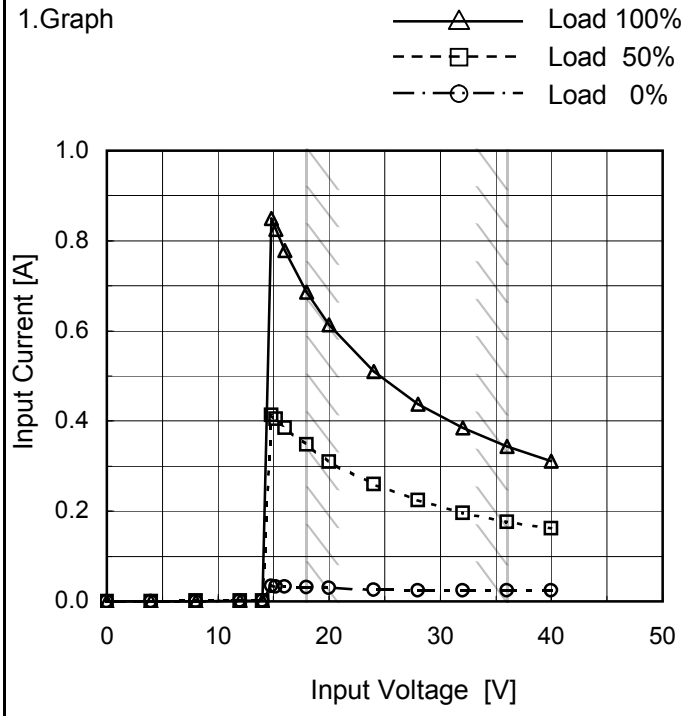


Note: Slanted line shows the range of the rated input voltage.

2.Values

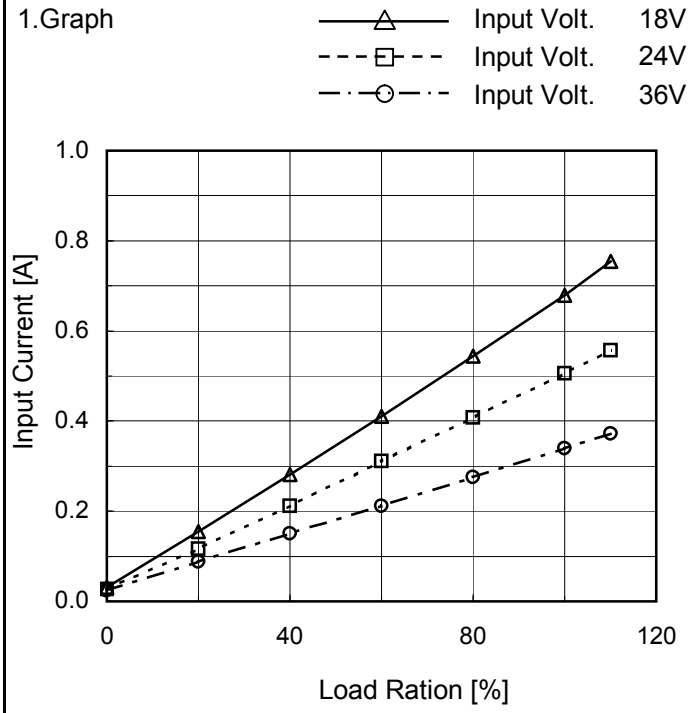
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
4.0	0.000	0.000	0.000
8.0	0.001	0.001	0.001
12.0	0.001	0.001	0.001
14.0	0.002	0.001	0.001
14.8	0.033	0.413	0.849
15.2	0.033	0.404	0.825
16.0	0.033	0.384	0.778
18.0	0.031	0.349	0.686
20.0	0.029	0.310	0.614
24.0	0.026	0.261	0.509
28.0	0.024	0.225	0.437
32.0	0.024	0.196	0.384
36.0	0.024	0.176	0.343
40.0	0.024	0.162	0.311
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102415
Item	Input Current (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

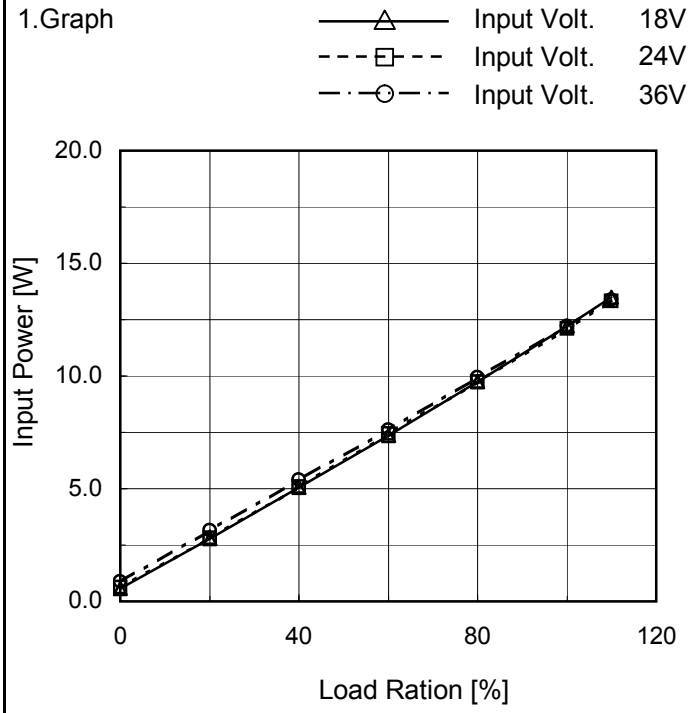
Load Ration [%]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.031	0.027	0.024
20	0.155	0.117	0.088
40	0.282	0.212	0.150
60	0.411	0.310	0.212
80	0.545	0.407	0.276
100	0.679	0.506	0.340
110	0.755	0.557	0.373
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102415
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

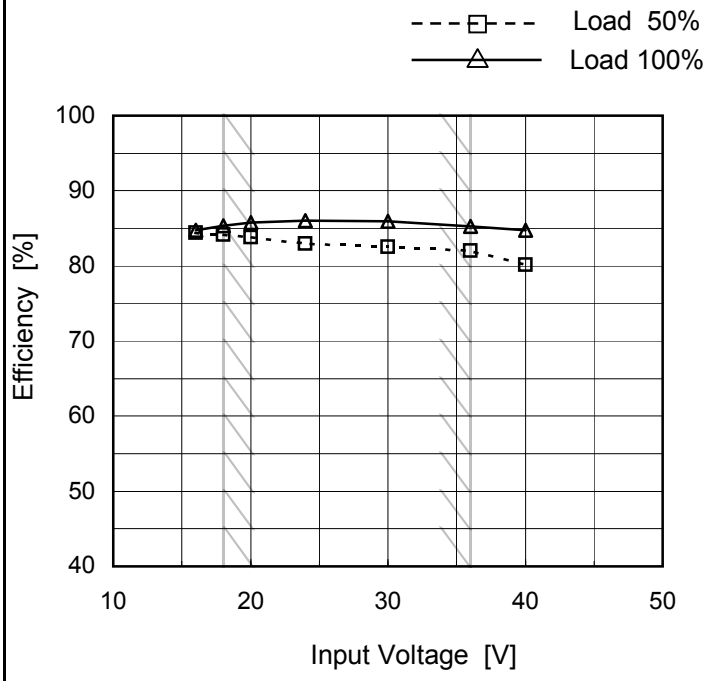
Load Ration [%]	Input Power [W] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.56	0.64	0.87
20	2.79	2.81	3.16
40	5.05	5.07	5.40
60	7.36	7.43	7.62
80	9.75	9.75	9.93
100	12.22	12.11	12.22
110	13.48	13.32	13.39
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102415
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

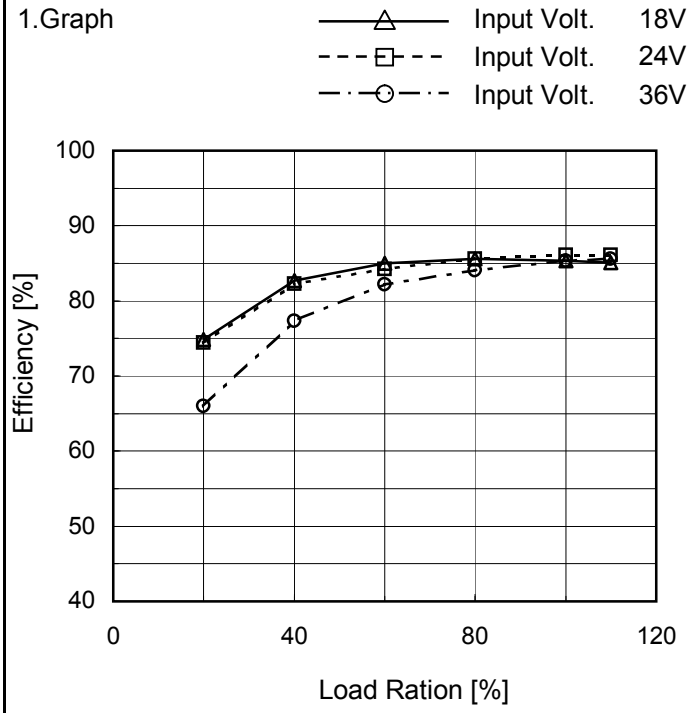
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
16	84.4	84.7
18	84.2	85.4
20	83.8	85.8
24	83.0	86.1
30	82.5	85.9
36	82.0	85.3
40	80.1	84.8
--	-	-
--	-	-

COSEL

Model	SUTW102415
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

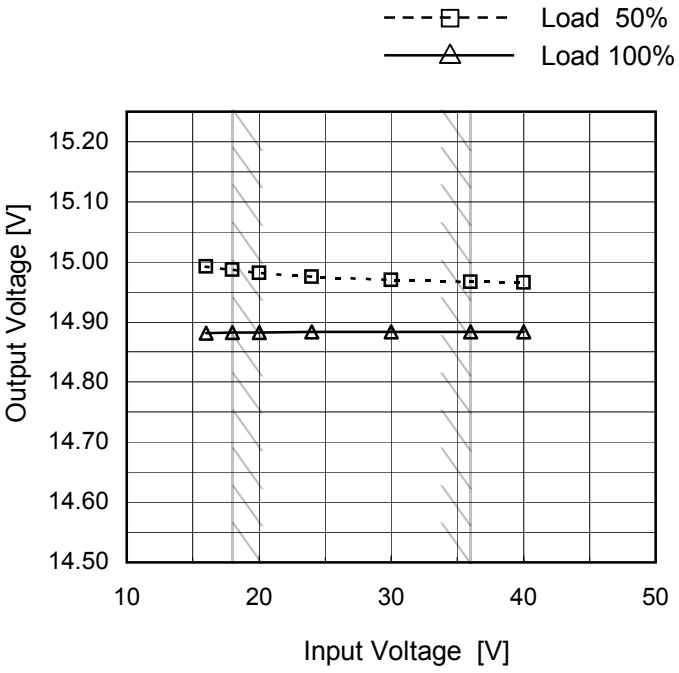
Load Ration [%]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-
20	74.8	74.4	66.0
40	82.7	82.2	77.3
60	85.0	84.2	82.2
80	85.6	85.6	84.0
100	85.4	86.1	85.3
110	85.1	86.1	85.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102415
Item	Line Regulation
Object	+15V0.35A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

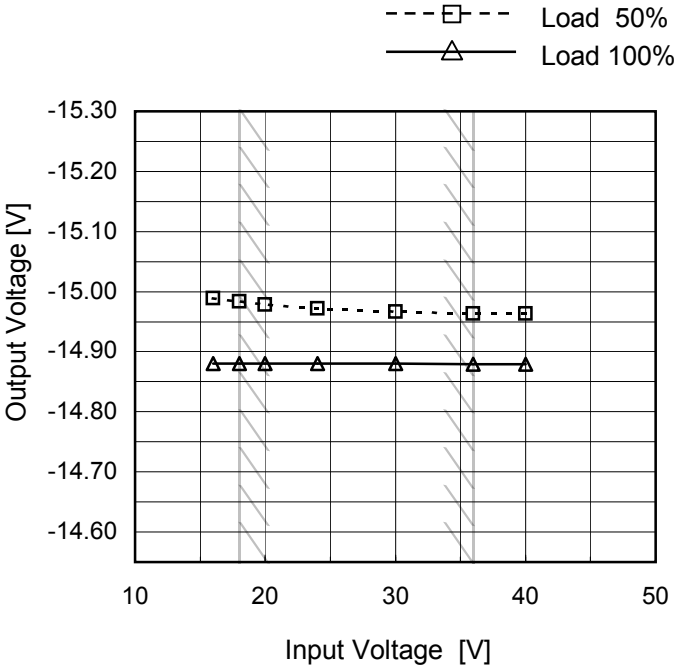


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	14.992	14.882
18	14.986	14.882
20	14.982	14.883
24	14.976	14.883
30	14.969	14.883
36	14.966	14.883
40	14.965	14.883
--	-	-
--	-	-

Object	-15V0.35A

1.Graph



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

2.Values

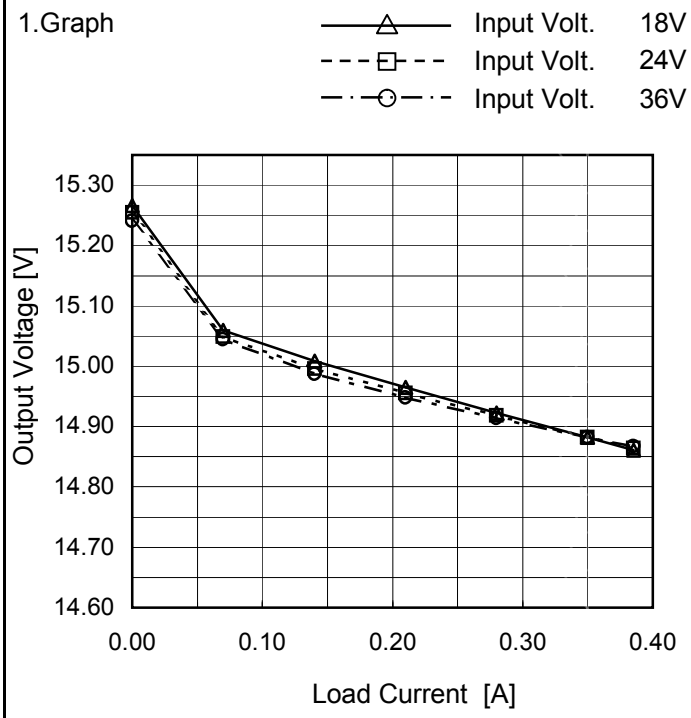
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	-14.989	-14.880
18	-14.984	-14.880
20	-14.978	-14.880
24	-14.972	-14.880
30	-14.966	-14.880
36	-14.964	-14.880
40	-14.963	-14.880
--	-	-
--	-	-

COSEL

Model	SUTW102415
Item	Load Regulation
Object	+15V0.35A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

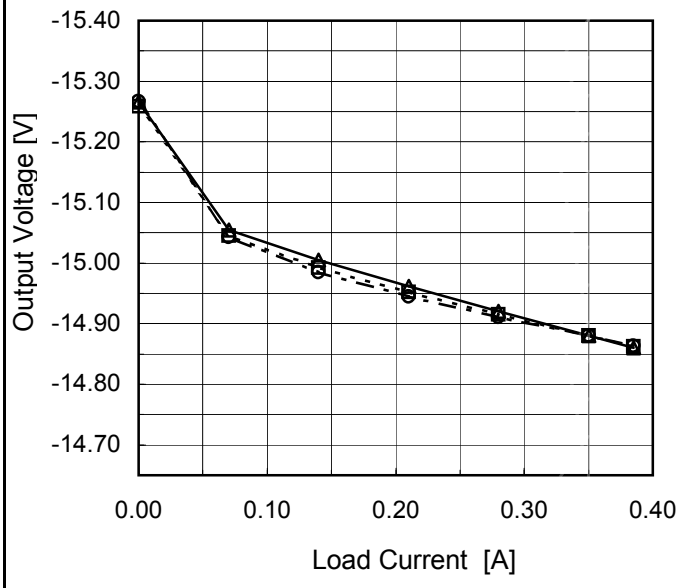


2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	15.267	15.255	15.241
0.070	15.059	15.048	15.045
0.140	15.008	14.996	14.988
0.210	14.965	14.956	14.948
0.280	14.923	14.918	14.914
0.350	14.882	14.883	14.883
0.385	14.861	14.864	14.867
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V0.35A

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	-15.266	-15.259	-15.267
0.070	-15.055	-15.045	-15.043
0.140	-15.005	-14.992	-14.985
0.210	-14.962	-14.953	-14.944
0.280	-14.920	-14.916	-14.911
0.350	-14.880	-14.880	-14.880
0.385	-14.860	-14.862	-14.864
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

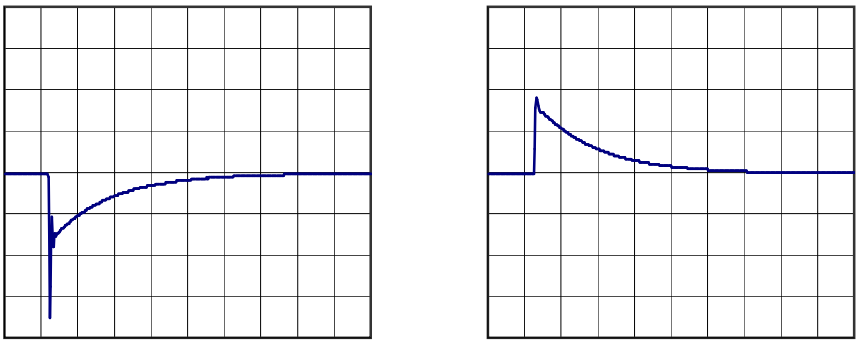
COSEL

Model	SUTW102415
Item	Dynamic Load Response
Object	-15V0.35A

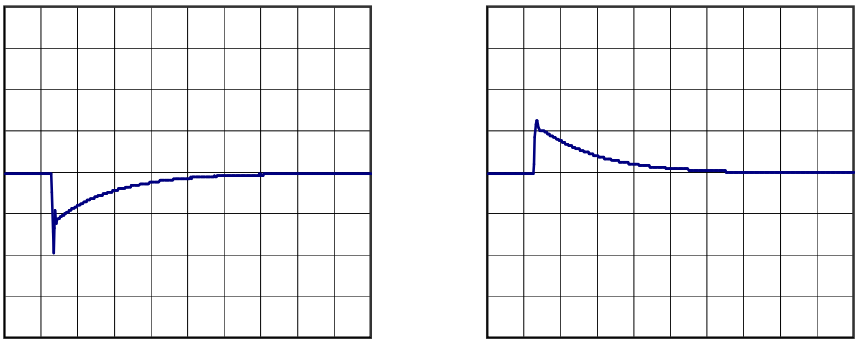
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 48 V
Cycle 100 mS

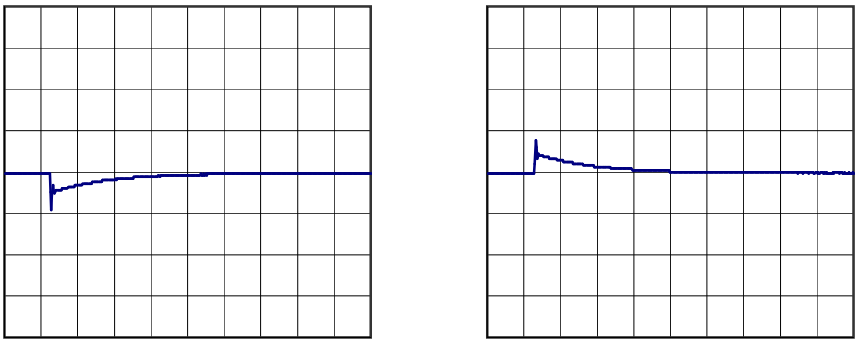
Min. Load (0A) ⟷
Load 100% (0.35A)



Min. Load (0A) ⟷
Load 50% (0.175A)



Load 50% (0.175A) ⟷
Load 100% (0.35A)



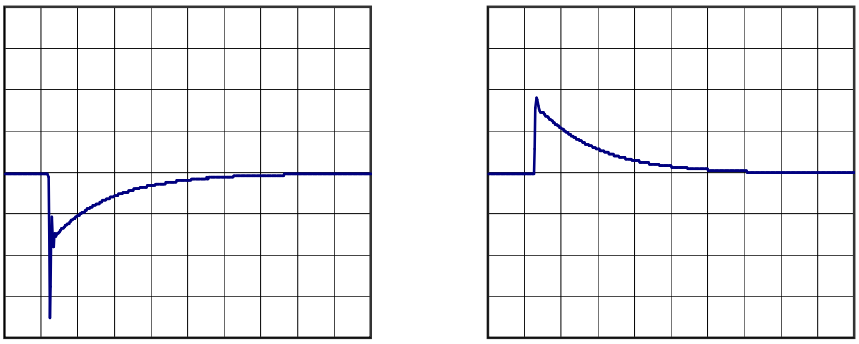
COSEL

Model	SUTW102415
Item	Dynamic Load Response
Object	15V0.35A

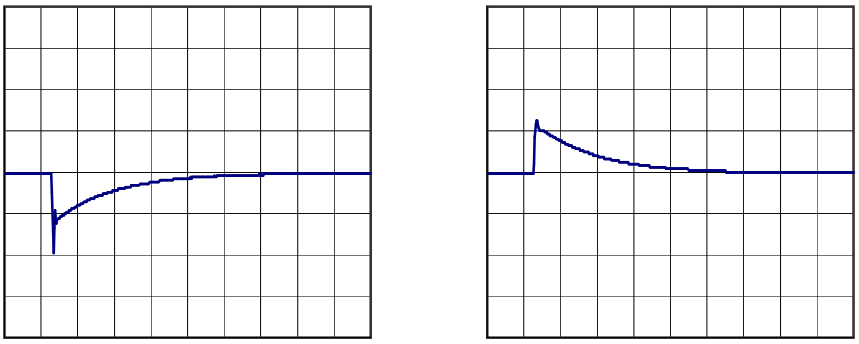
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 48 V
Cycle 100 mS

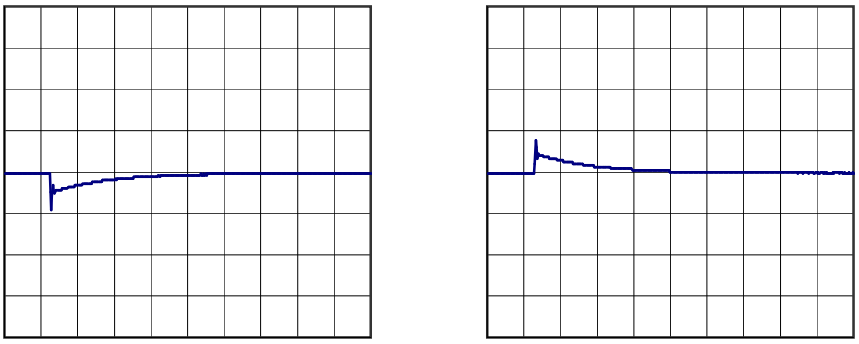
Min. Load (0A) ⟷
Load 100% (0.35A)



Min. Load (0A) ⟷
Load 50% (0.175A)



Load 50% (0.175A) ⟷
Load 100% (0.35A)



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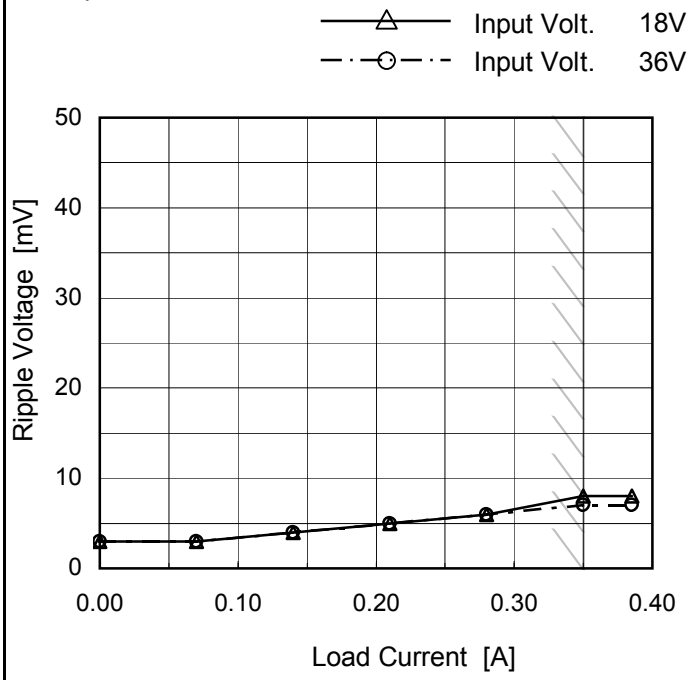
Model	SUTW102415
Item	Ripple Voltage (by Load Current)
Object	+15V0.35A

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]

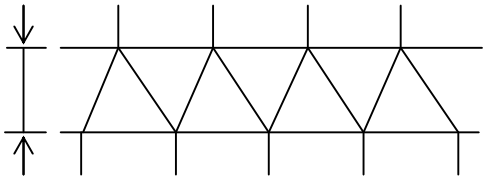


Fig.Complex Ripple Wave Form

2.Values

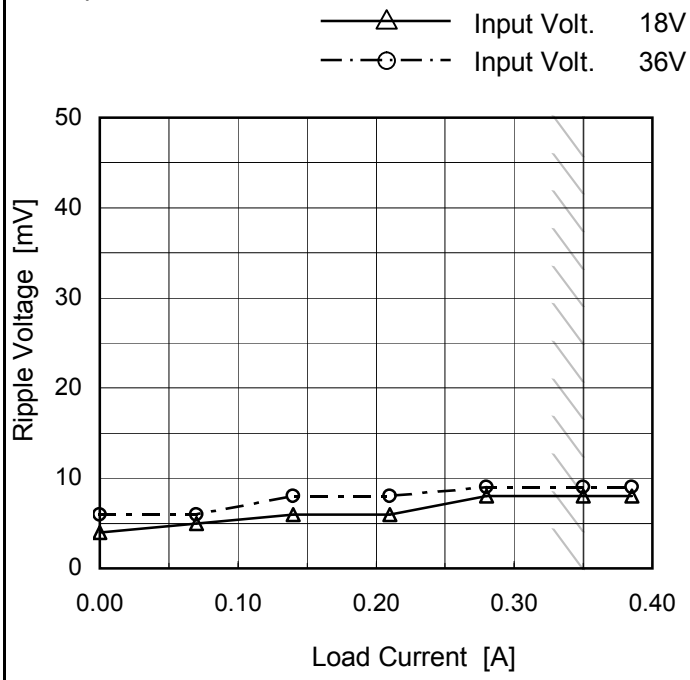
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	3	3
0.070	3	3
0.140	4	4
0.210	5	5
0.280	6	6
0.350	8	7
0.385	8	7
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102415
Item	Ripple Voltage (by Load Current)
Object	-15V0.35A

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]

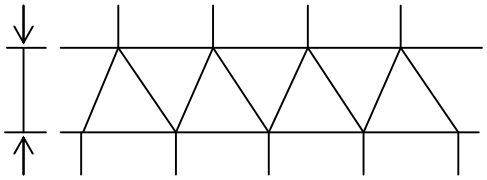


Fig.Complex Ripple Wave Form

2.Values

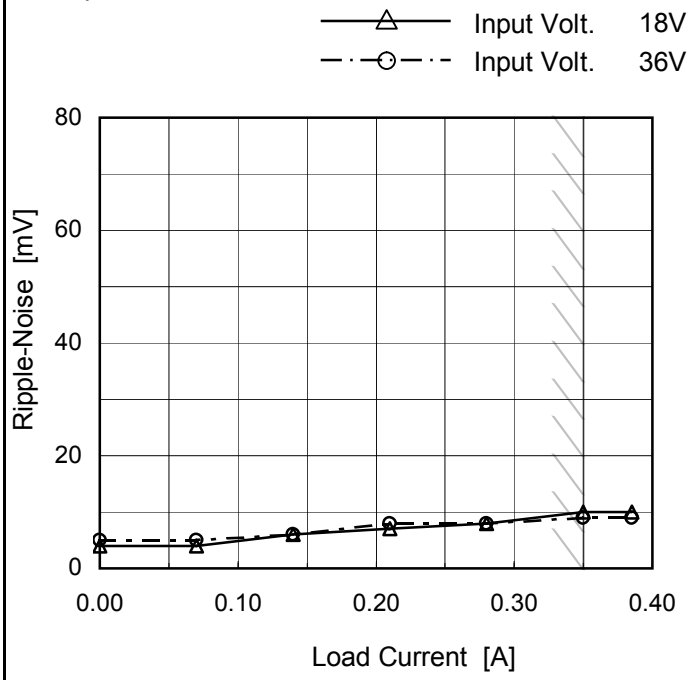
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	4	6
0.070	5	6
0.140	6	8
0.210	6	8
0.280	8	9
0.350	8	9
0.385	8	9
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102415
Item	Ripple-Noise
Object	+15V0.35A

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.

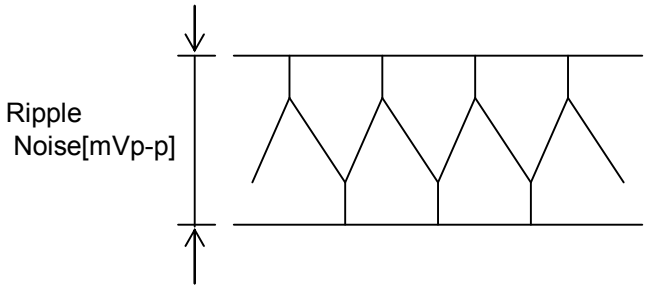


Fig.Complex Ripple Noise Wave Form

2.Values

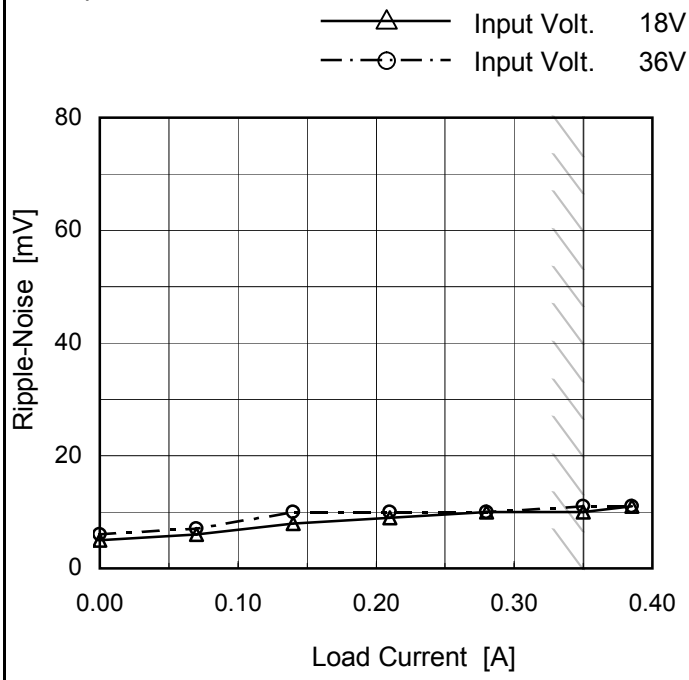
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	4	5
0.070	4	5
0.140	6	6
0.210	7	8
0.280	8	8
0.350	10	9
0.385	10	9
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102415
Item	Ripple-Noise
Object	-15V0.35A

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.

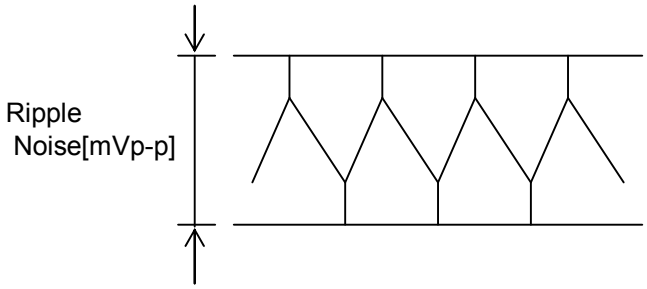


Fig.Complex Ripple Noise Wave Form

2.Values

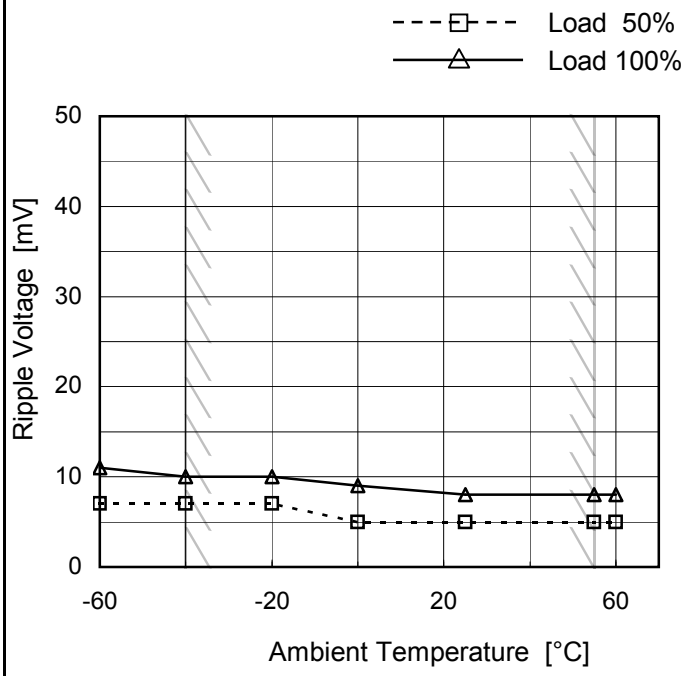
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	5	6
0.070	6	7
0.140	8	10
0.210	9	10
0.280	10	10
0.350	10	11
0.385	11	11
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102415
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V0.35A

Testing Circuitry Figure B

1.Graph



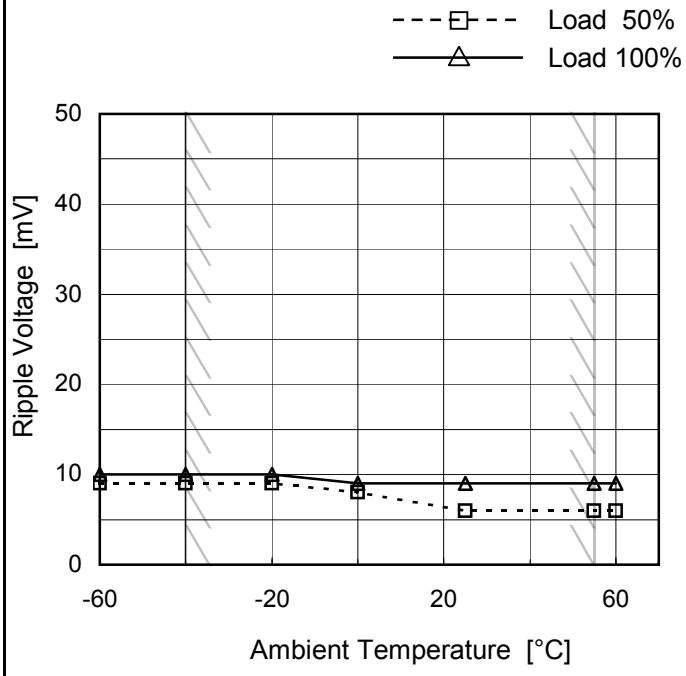
Input Volt. 24V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	7	11
-40	7	10
-20	7	10
0	5	9
25	5	8
55	5	8
60	5	8
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V0.35A

1.Graph



Input Volt. 24V

Measured by 100 MHz Oscilloscope.

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

2.Values

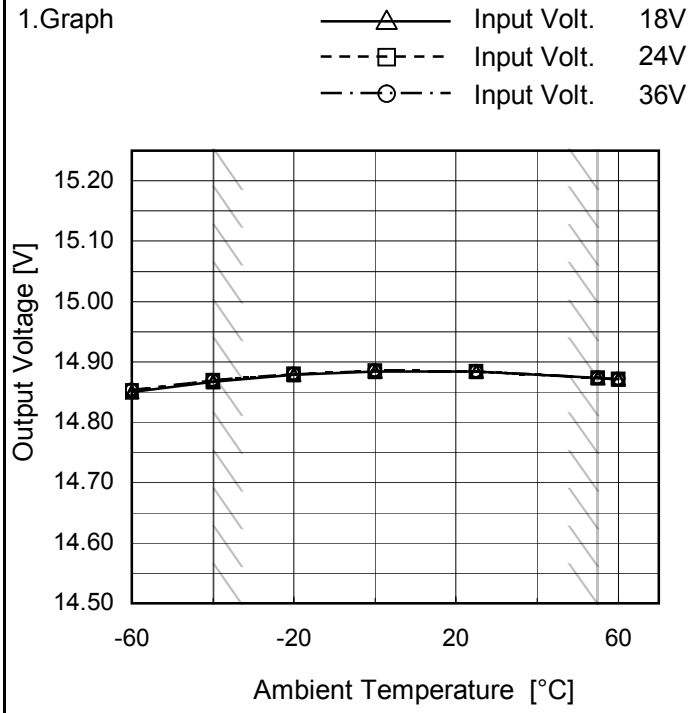
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	9	10
-40	9	10
-20	9	10
0	8	9
25	6	9
55	6	9
60	6	9
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102415
Item	Ambient Temperature Drift
Object	+15V0.35A

Testing Circuitry Figure A

1.Graph



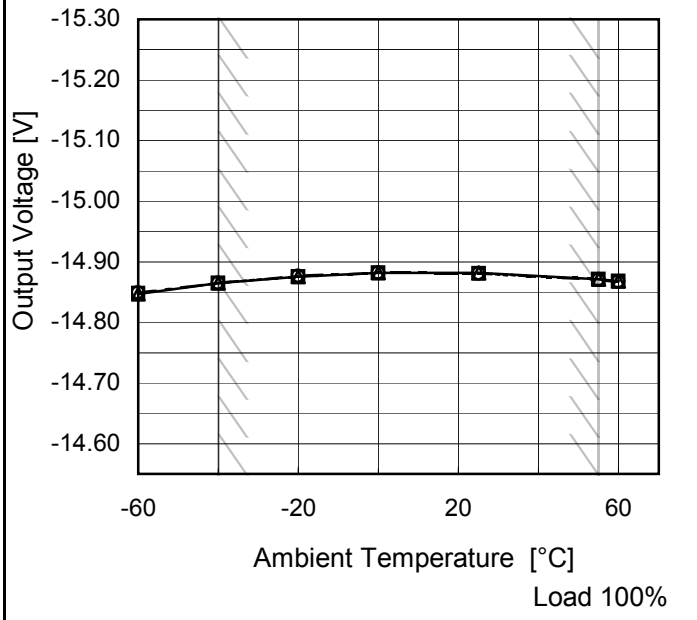
Load 100%

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	14.850	14.852	14.853
-40	14.868	14.869	14.869
-20	14.879	14.880	14.880
0	14.884	14.885	14.885
25	14.884	14.884	14.884
55	14.874	14.874	14.874
60	14.871	14.871	14.871
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-15V0.35A

1.Graph



Load 100%

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

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	-14.847	-14.848	-14.849
-40	-14.865	-14.865	-14.865
-20	-14.876	-14.876	-14.876
0	-14.882	-14.882	-14.881
25	-14.881	-14.881	-14.881
55	-14.871	-14.871	-14.870
60	-14.868	-14.868	-14.867
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW102415	
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 - 0.35A (AVR 2) : 0 - 0.35A

* 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	+15V0.35A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	15.268	±395	±2.6
Minimum Voltage	55	36	0.35	14.478		

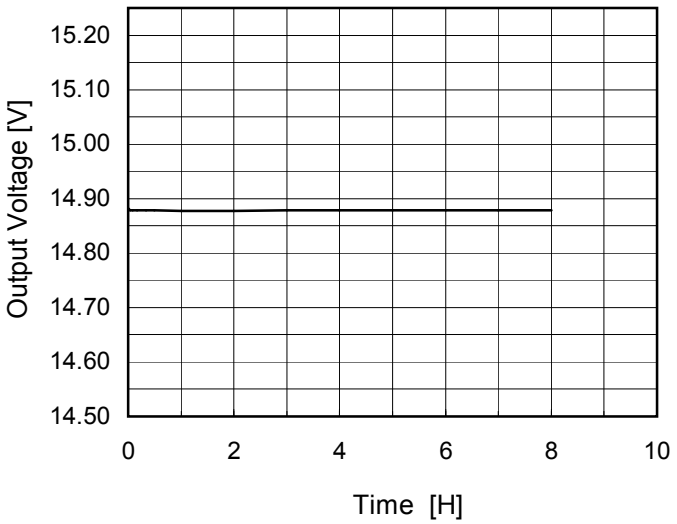
Object	-15V0.35A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	36	0	-15.271	±395	±2.6
Minimum Voltage	55	18	0.35	-14.482		

COSEL

Model	SUTW102415
Item	Time Lapse Drift
Object	+15V0.35A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



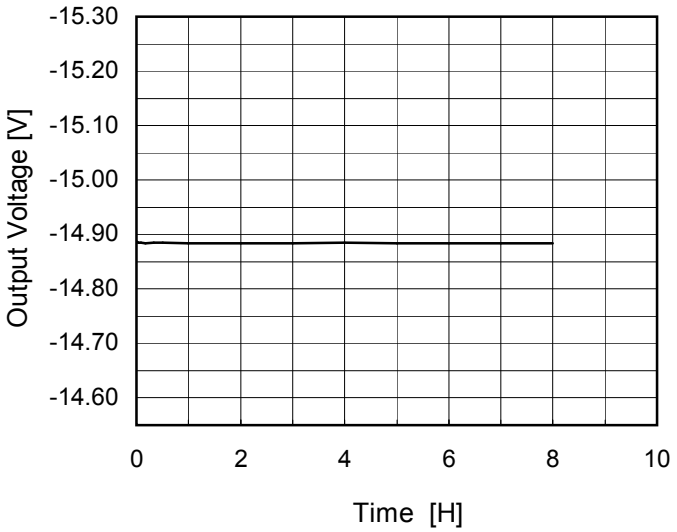
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	14.882
0.5	14.878
1.0	14.878
2.0	14.878
3.0	14.878
4.0	14.878
5.0	14.878
6.0	14.878
7.0	14.878
8.0	14.878

Object	-15V0.35A

1.Graph



Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-14.887
0.5	-14.885
1.0	-14.884
2.0	-14.884
3.0	-14.884
4.0	-14.885
5.0	-14.884
6.0	-14.884
7.0	-14.884
8.0	-14.884

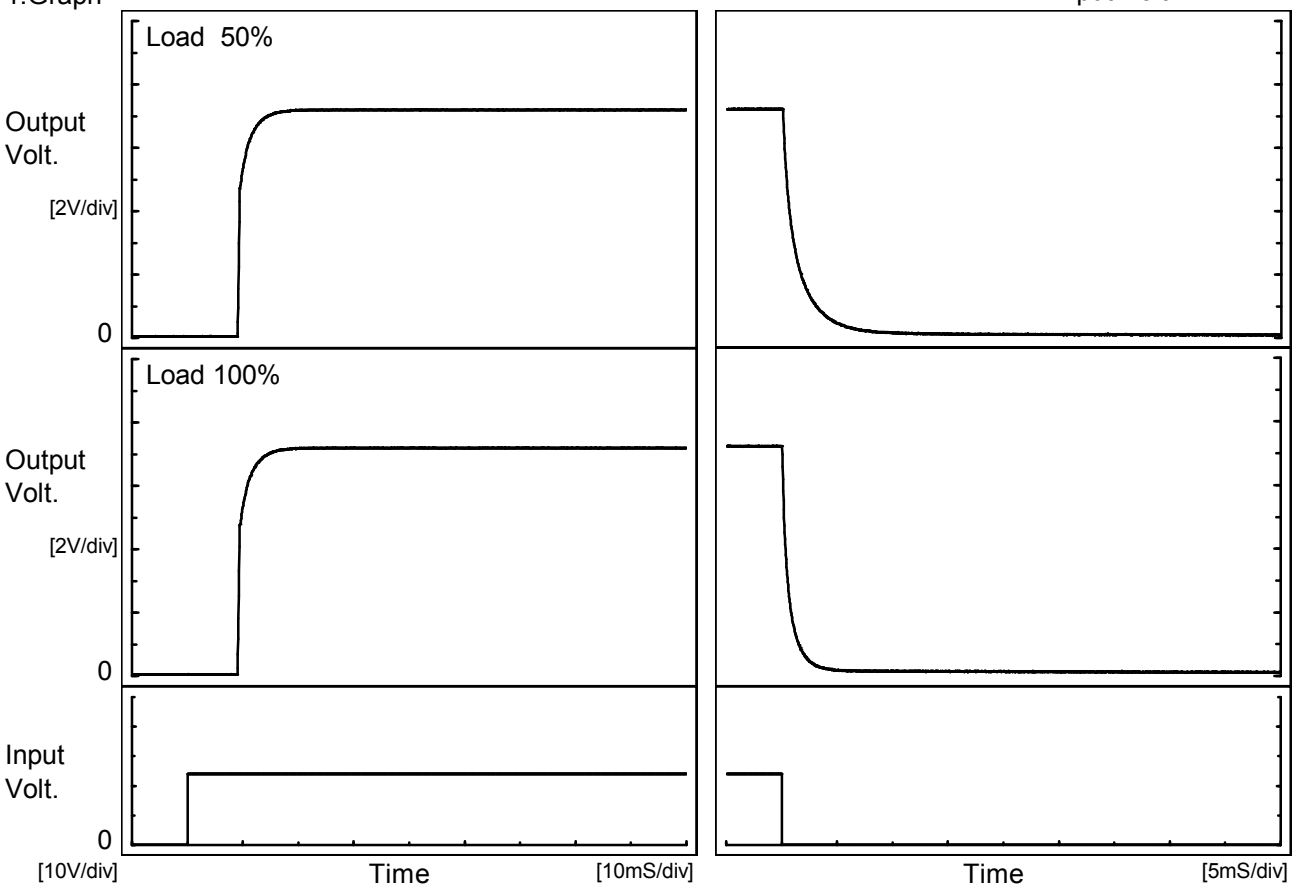
COSEL

Model	SUTW102415
Item	Rise and Fall Time
Object	+15V0.35A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

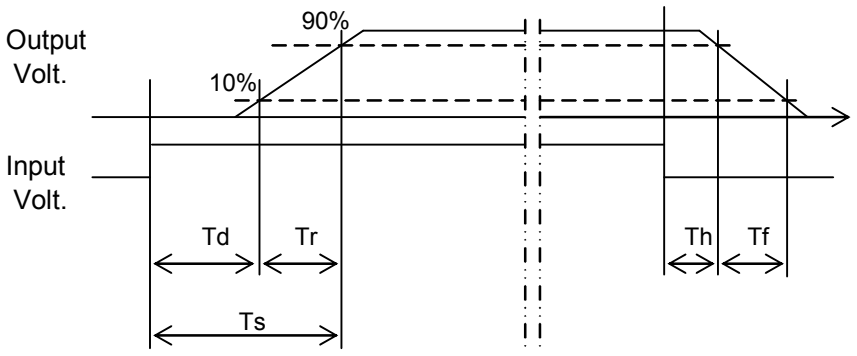
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	9.2	3.8	13.0	0.1	3.5
100 %	9.2	3.9	13.1	0.1	1.7



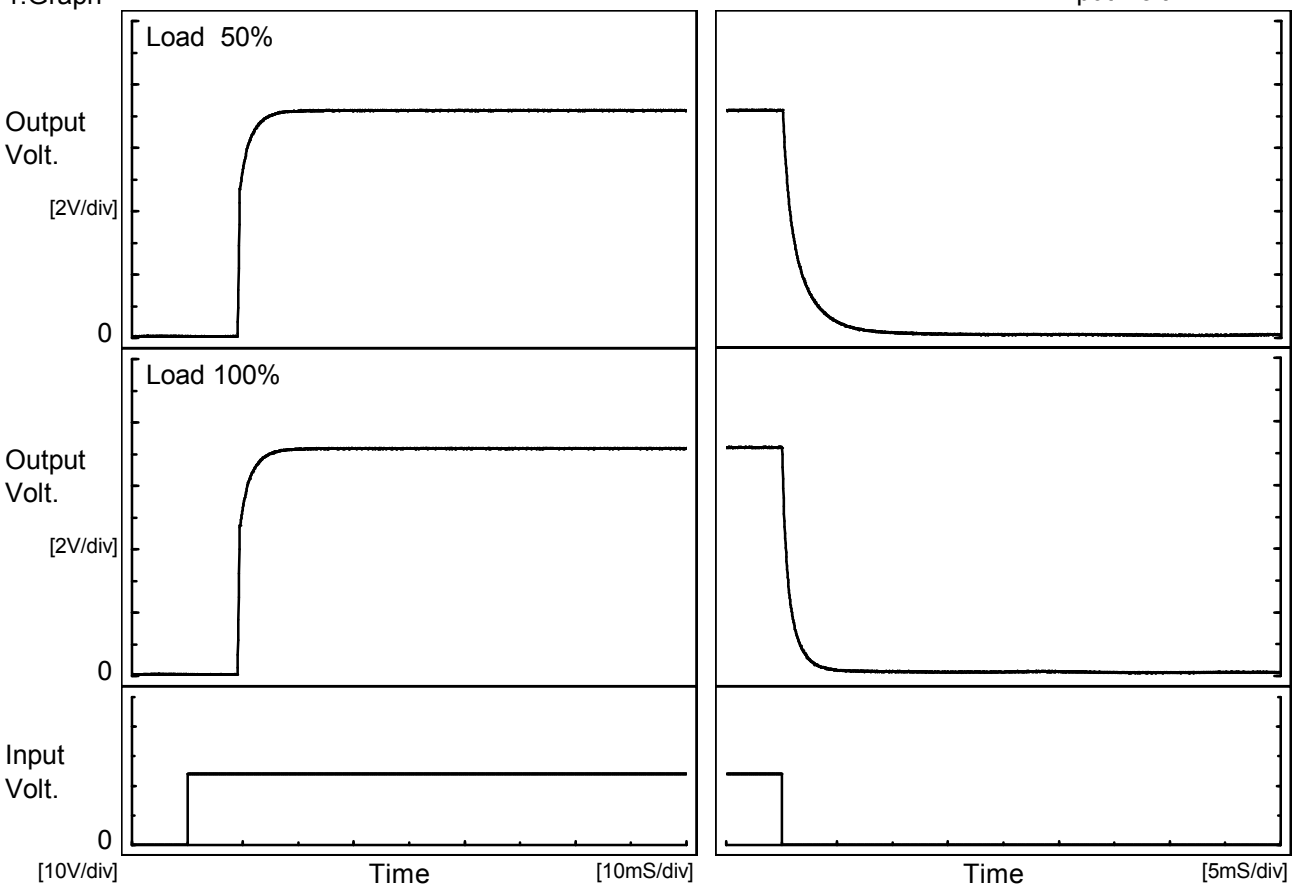
COSEL

Model	SUTW102415
Item	Rise and Fall Time
Object	-15V0.35A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

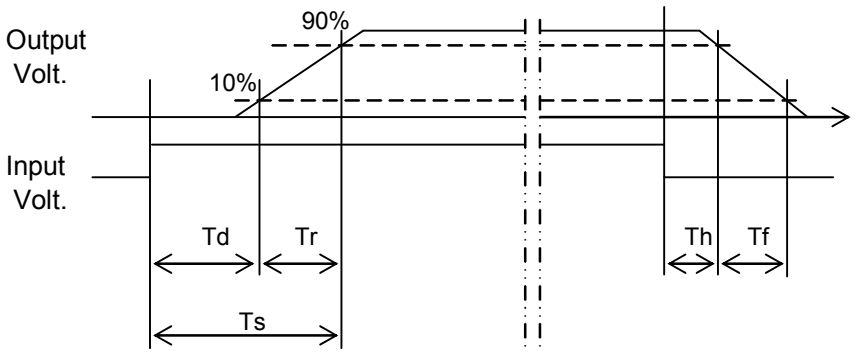
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	9.2	4.0	13.2	0.1	3.7
100 %	9.2	4.0	13.2	0.1	1.9

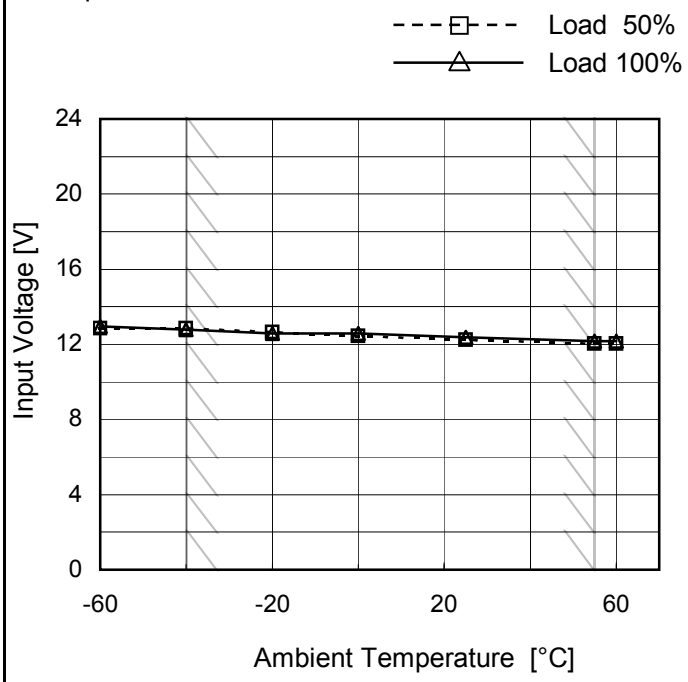


COSEL

Model	SUTW102415
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.35A

Testing Circuitry Figure A

1.Graph

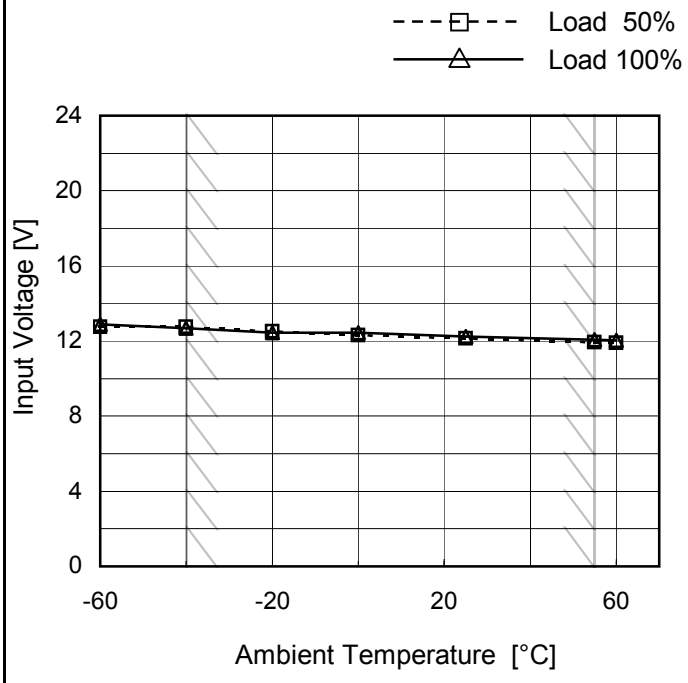


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	12.9	13.0
-40	12.9	12.8
-20	12.7	12.6
0	12.5	12.6
25	12.3	12.4
55	12.1	12.2
60	12.1	12.2
--	-	-
--	-	-
--	-	-
--	-	-

Object	-15V0.35A

1.Graph



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

2.Values

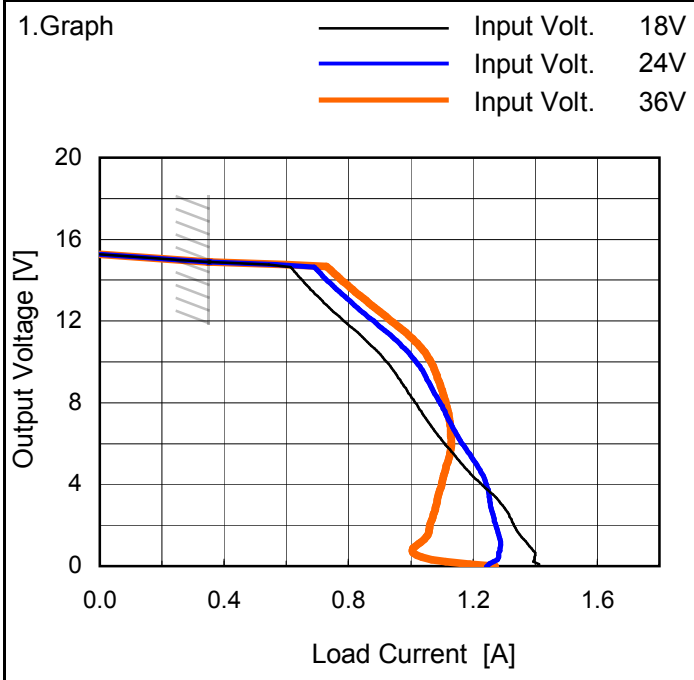
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	12.8	12.9
-40	12.8	12.7
-20	12.6	12.5
0	12.4	12.5
25	12.2	12.3
55	12.0	12.1
60	11.9	12.1
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW102415
Item	Overcurrent Protection
Object	+15V0.35A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

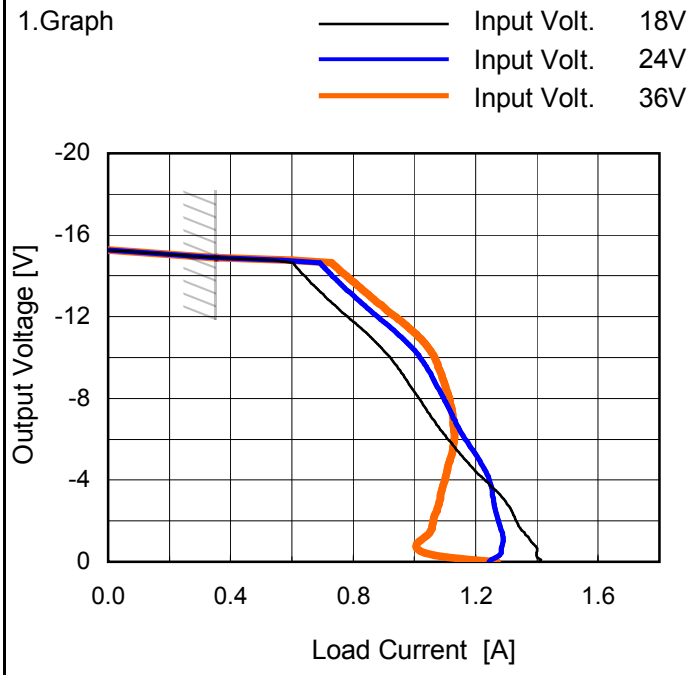


2.Values

Output Voltage [V]	Load Current [A] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
15.0	0.35	0.35	0.35
14.3	0.64	0.72	0.76
13.5	0.68	0.76	0.81
12.0	0.78	0.87	0.93
10.5	0.89	0.99	1.04
9.0	0.97	1.06	1.09
7.5	1.03	1.11	1.12
6.0	1.11	1.16	1.13
4.5	1.19	1.23	1.11
3.0	1.29	1.26	1.08
1.5	1.35	1.28	1.05
0.0	1.41	1.24	1.27

Object	-15V0.35A

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	0.35	0.35	0.35
-14.25	0.62	0.72	0.76
-13.50	0.67	0.76	0.81
-12.00	0.78	0.87	0.93
-10.50	0.89	0.99	1.04
-9.00	0.97	1.06	1.09
-7.50	1.03	1.11	1.12
-6.00	1.11	1.17	1.13
-4.50	1.19	1.23	1.11
-3.00	1.29	1.26	1.08
-1.50	1.35	1.28	1.05
0.00	1.41	1.24	1.27

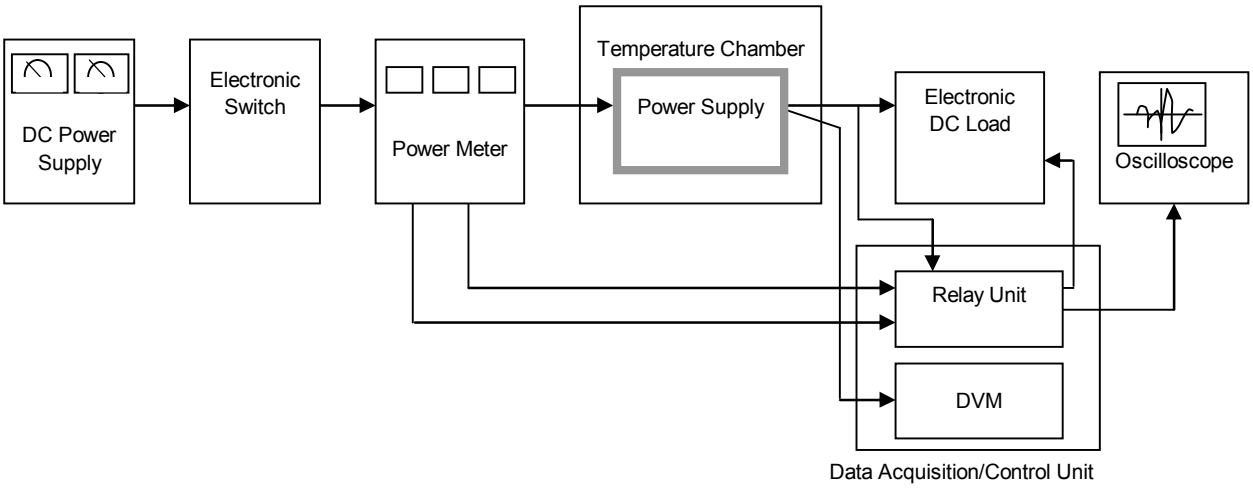


Figure A

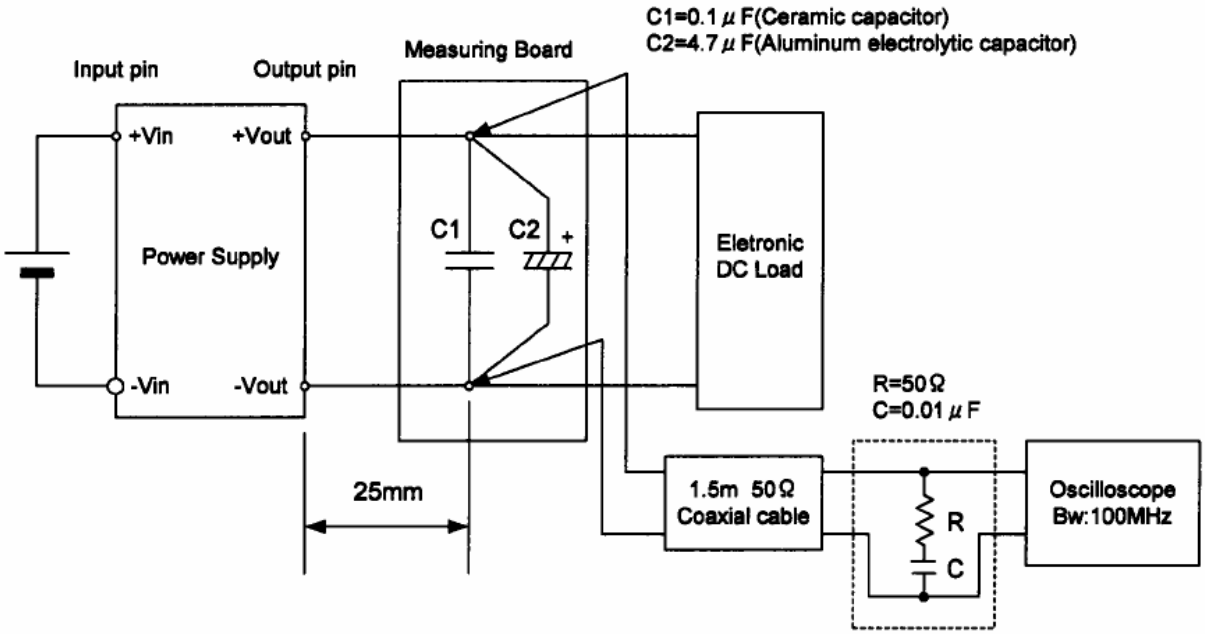


Figure B (Ripple and Ripple noise Characteristic)