COSEL

参考資料

TEST DATA OF SUTW32412

Regulated DC Power Supply
March 10, 2009

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COSEL CO.,LTD.

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参考資料

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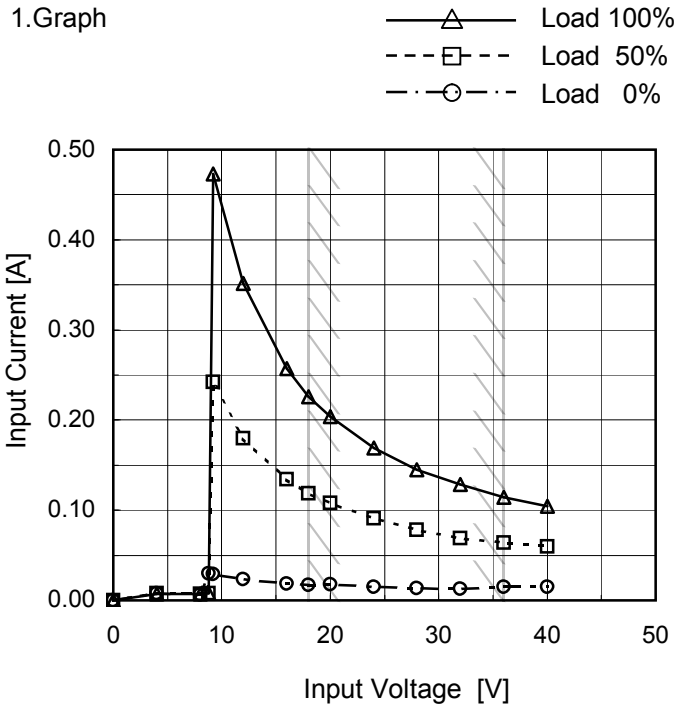
Model	SUTW32412
Item	Input Current (by Input Voltage)
Object	――――――――

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	0.008	0.008	0.007
8.0	0.007	0.007	0.007
8.8	0.030	0.008	0.008
9.2	0.029	0.242	0.473
12.0	0.023	0.180	0.352
16.0	0.019	0.134	0.257
18.0	0.017	0.119	0.226
20.0	0.018	0.108	0.204
24.0	0.015	0.091	0.169
28.0	0.013	0.078	0.145
32.0	0.013	0.069	0.129
36.0	0.015	0.064	0.114
40.0	0.015	0.060	0.104
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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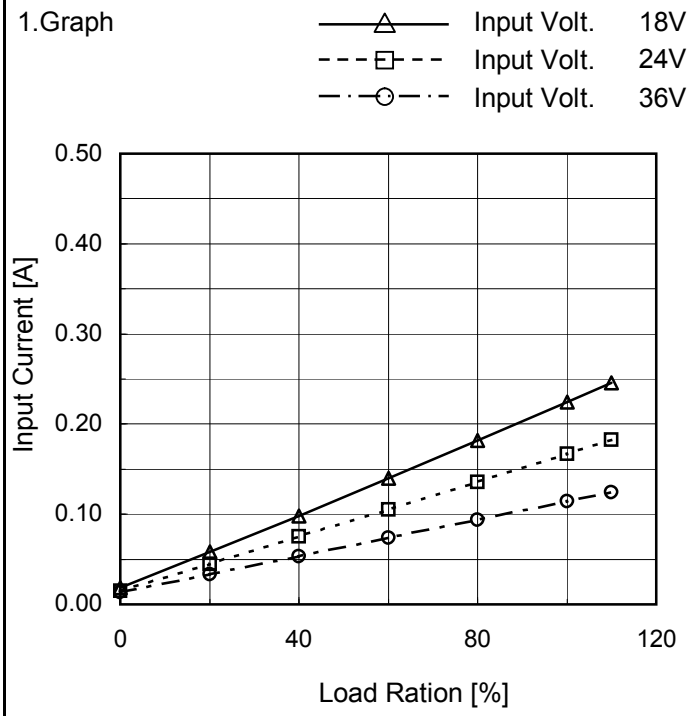
COSEL

Model	SUTW32412
Item	Input Current (by Load Current)
Object	――――――

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

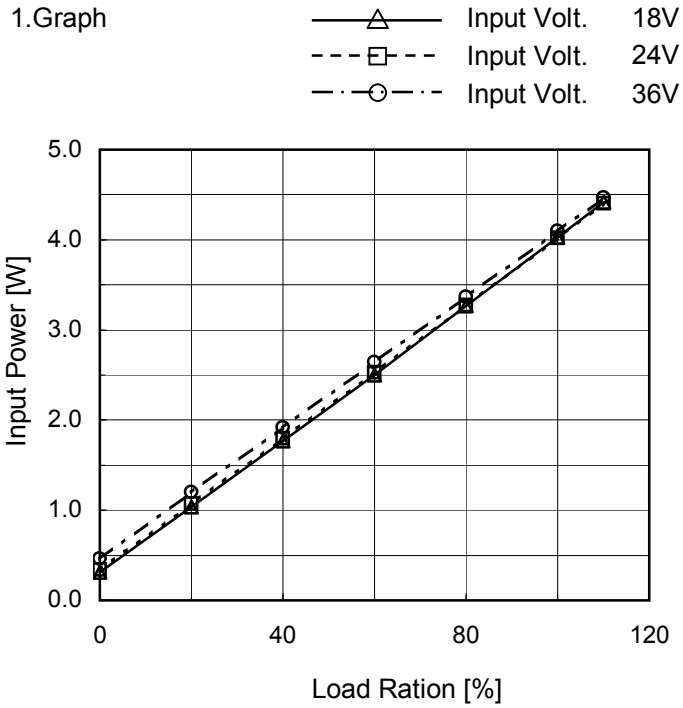
Load Ration [%]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.018	0.015	0.014
20	0.058	0.045	0.034
40	0.098	0.075	0.054
60	0.140	0.105	0.074
80	0.182	0.136	0.094
100	0.224	0.167	0.114
110	0.246	0.182	0.124
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW32412
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	0.31	0.34	0.46
20	1.04	1.08	1.20
40	1.77	1.80	1.92
60	2.50	2.53	2.65
80	3.27	3.27	3.37
100	4.03	4.02	4.10
110	4.42	4.40	4.47
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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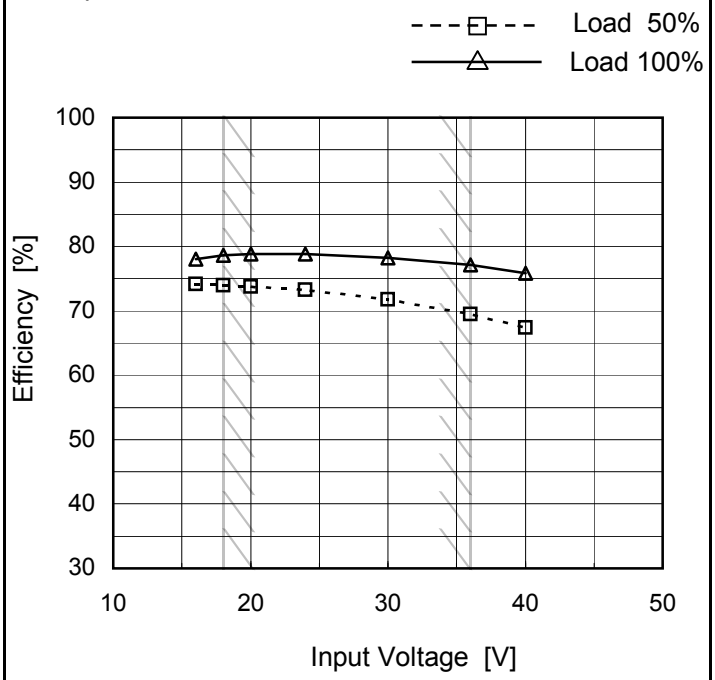
COSEL

Model	SUTW32412
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

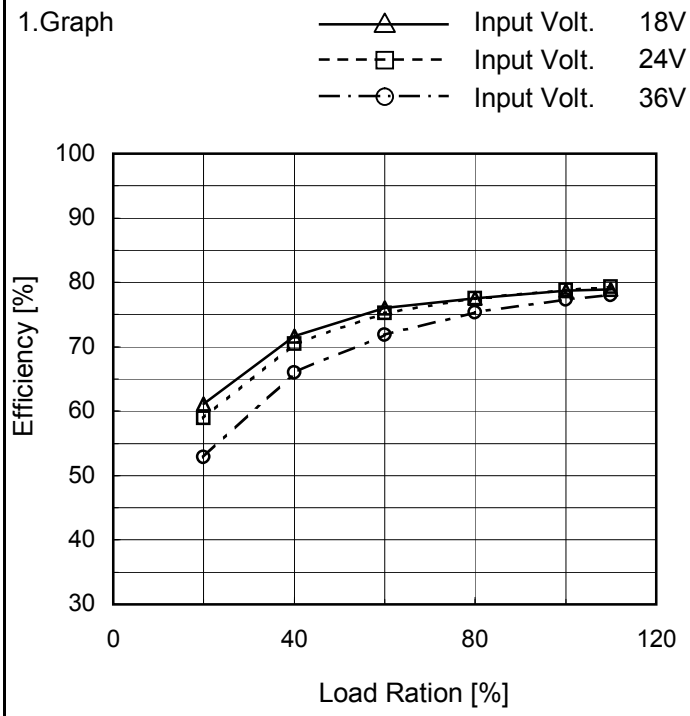
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
16	74.2	78.0
18	74.0	78.7
20	73.8	78.9
24	73.2	78.8
30	71.8	78.2
36	69.5	77.1
40	67.4	75.8
--	-	-
--	-	-

COSEL

Model	SUTW32412
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	61.1	59.0	52.9
40	71.7	70.5	66.0
60	76.0	75.2	71.9
80	77.5	77.6	75.3
100	78.7	78.9	77.3
110	78.9	79.3	78.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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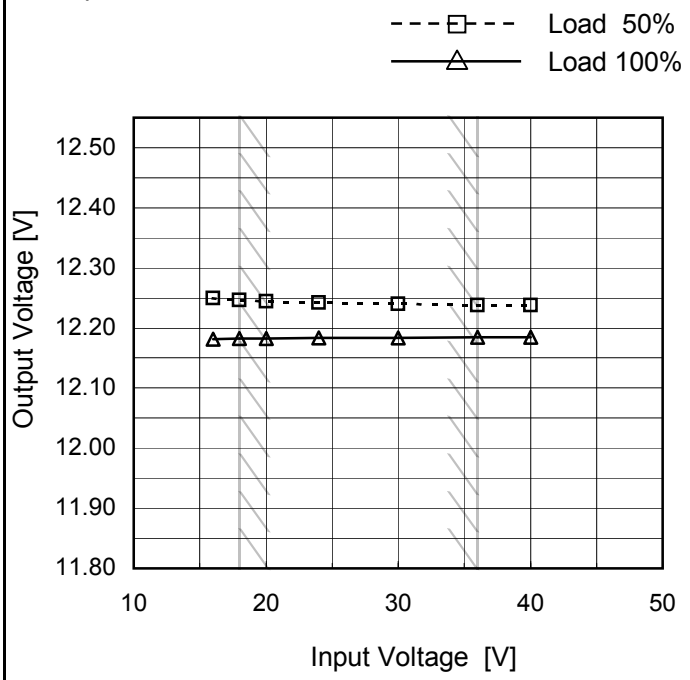
COSEL

Model	SUTW32412
Item	Line Regulation
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

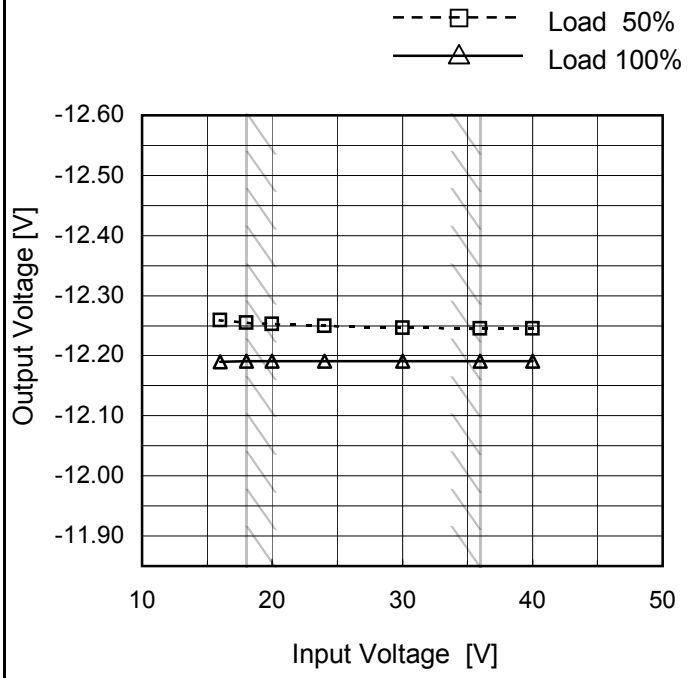


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
16	12.249	12.181
18	12.247	12.182
20	12.245	12.183
24	12.242	12.184
30	12.240	12.184
36	12.238	12.184
40	12.238	12.184
--	-	-
--	-	-

Object	-12V0.13A

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	-12.259	-12.190
18	-12.255	-12.191
20	-12.253	-12.191
24	-12.249	-12.191
30	-12.247	-12.191
36	-12.245	-12.191
40	-12.245	-12.191
--	-	-
--	-	-

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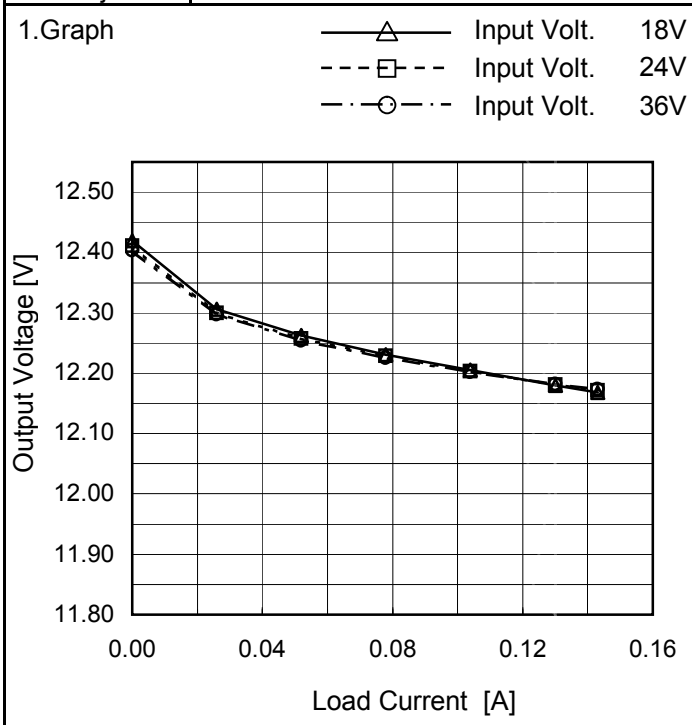
COSEL

Model	SUTW32412
Item	Load Regulation
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

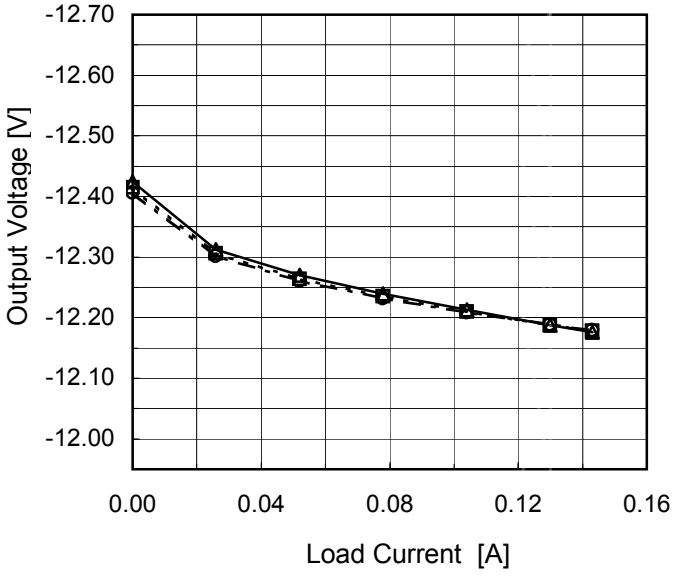


2.Values

Load Current [A]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	12.419	12.411	12.404
0.026	12.306	12.300	12.297
0.052	12.262	12.258	12.254
0.078	12.231	12.228	12.225
0.104	12.205	12.204	12.202
0.130	12.180	12.181	12.182
0.143	12.168	12.171	12.173
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object	-12V0.13A

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	-12.424	-12.415	-12.407
0.026	-12.313	-12.306	-12.302
0.052	-12.270	-12.264	-12.260
0.078	-12.239	-12.235	-12.232
0.104	-12.213	-12.210	-12.209
0.130	-12.188	-12.188	-12.188
0.143	-12.176	-12.178	-12.180
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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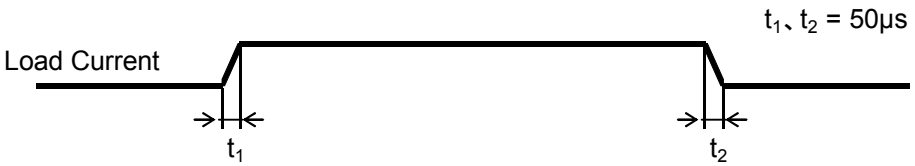
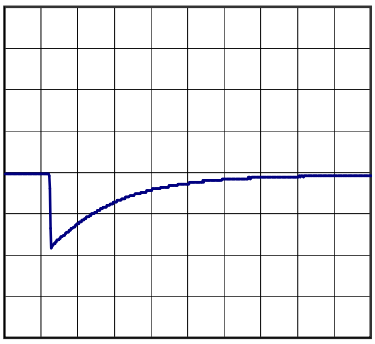
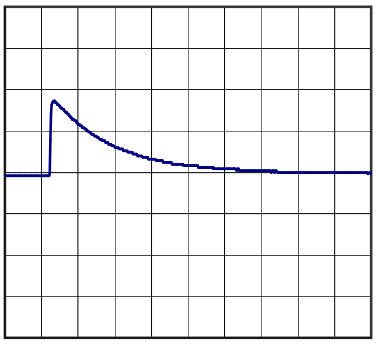
Model	SUTW32412	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+12V0.13A	

Input Volt. 24 V
Cycle 100 mS



Min. Load (0A) ←→
Load 100% (0.13A)

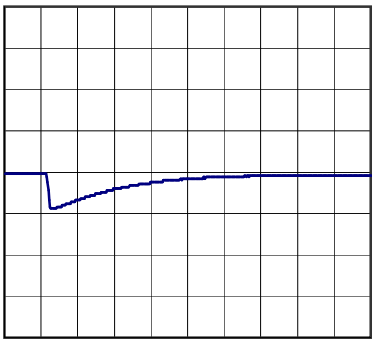


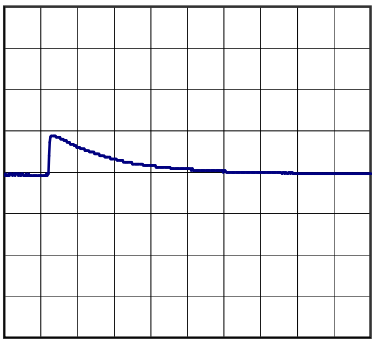


200mV/div

1ms/div 1ms/div

Min. Load (0A) ←→
Load 50% (0.065A)

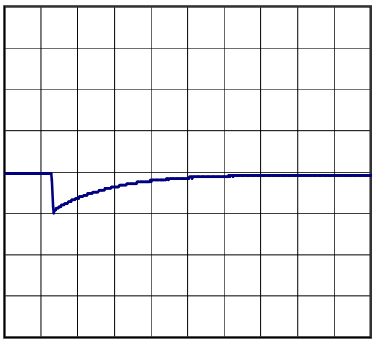


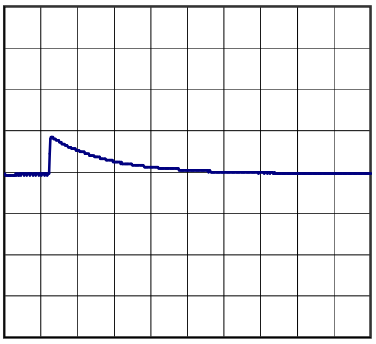


200mV/div

1ms/div 1ms/div

Load 50% (0.065A) ←→
Load 100% (0.13A)





200mV/div

1ms/div 1ms/div

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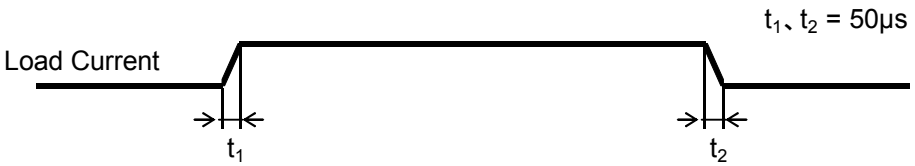
COSEL

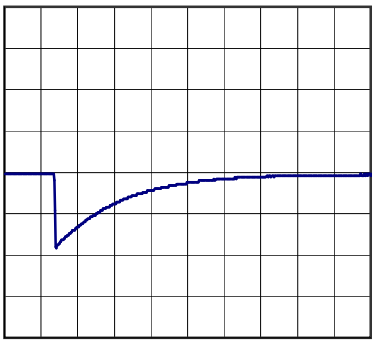
Model	SUTW32412
Item	Dynamic Load Response
Object	-12V0.13A

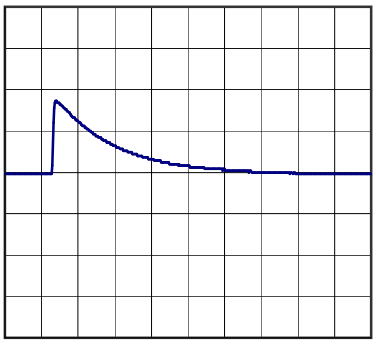
Temperature 25°C
Testing Circuitry Figure A

Input Volt. 24 V
Cycle 100 mS



Min. Load (0A) ←→
Load 100% (0.13A)

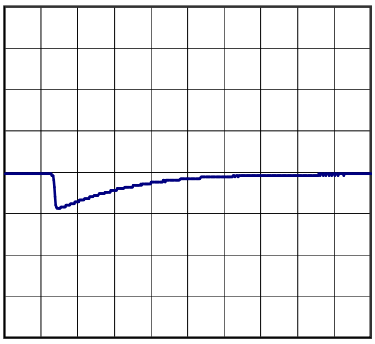


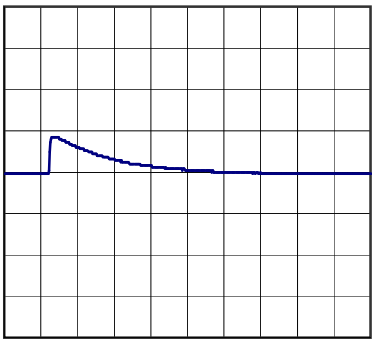


200mV/div

1ms/div 1ms/div

Min. Load (0A) ←→
Load 50% (0.065A)

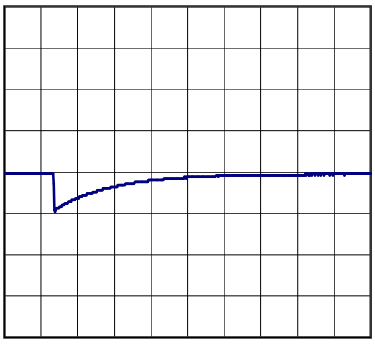


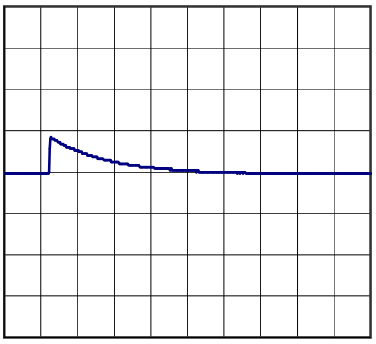


200mV/div

1ms/div 1ms/div

Load 50% (0.065A) ←→
Load 100% (0.13A)





200mV/div

1ms/div 1ms/div

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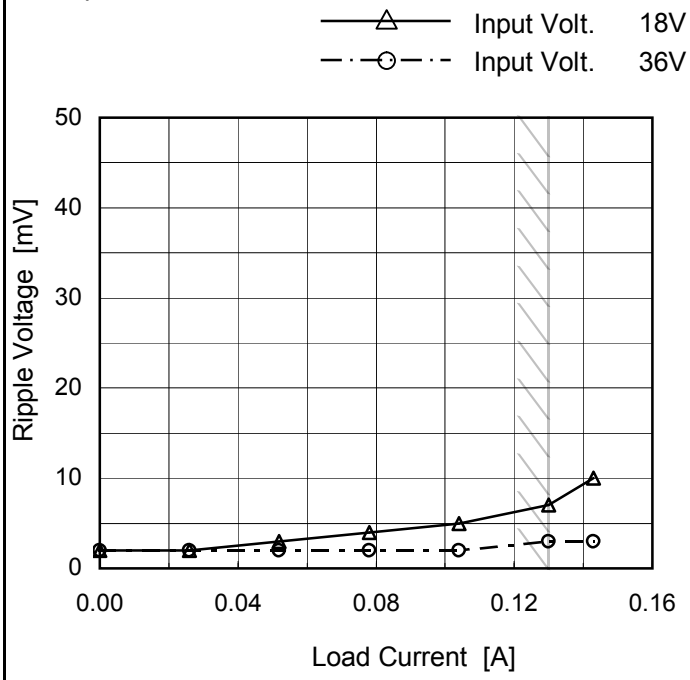
Model	SUTW32412
Item	Ripple Voltage (by Load Current)
Object	+12V0.13A

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]

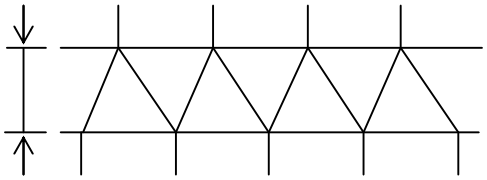


Fig.Complex Ripple Wave Form

2.Values

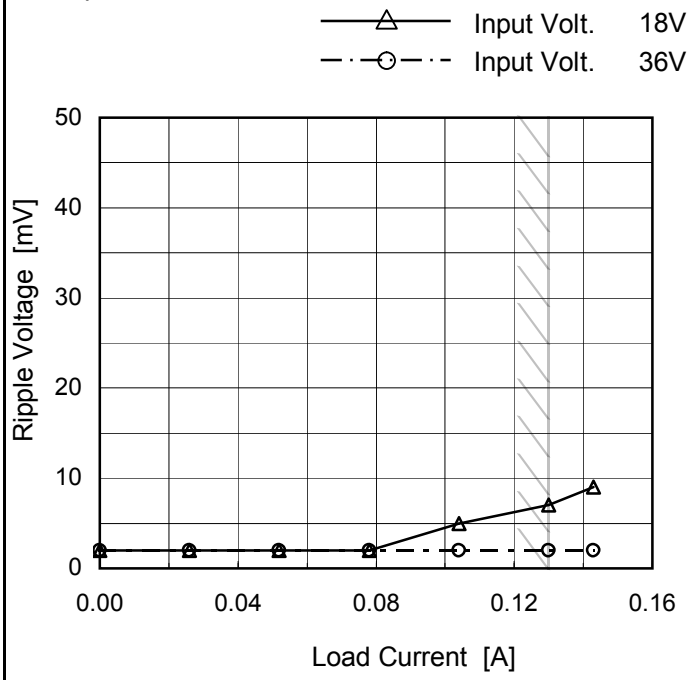
Load Current [A]	Ripple Voltage [mV] Input Volt. 18 [V]	Ripple Voltage [mV] Input Volt. 36 [V]
0.000	2	2
0.026	2	2
0.052	3	2
0.078	4	2
0.104	5	2
0.130	7	3
0.143	10	3
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW32412
Item	Ripple Voltage (by Load Current)
Object	-12V0.13A

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]

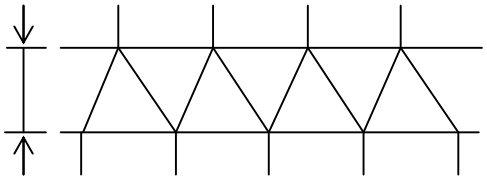


Fig.Complex Ripple Wave Form

2.Values

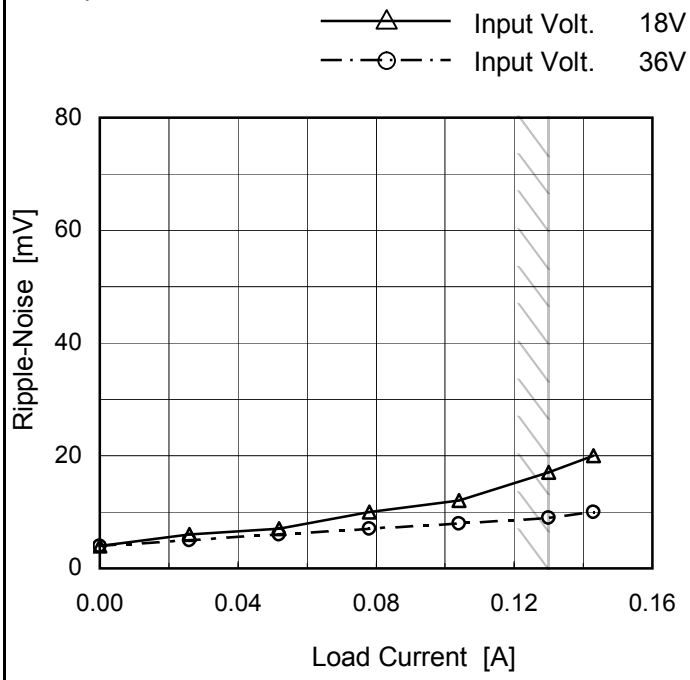
Load Current [A]	Ripple Voltage [mV] Input Volt. 18 [V]	Ripple Voltage [mV] Input Volt. 36 [V]
0.000	2	2
0.026	2	2
0.052	2	2
0.078	2	2
0.104	5	2
0.130	7	2
0.143	9	2
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW32412
Item	Ripple-Noise
Object	+12V0.13A

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.

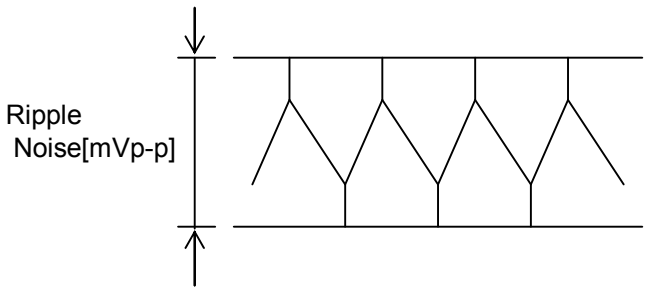


Fig.Complex Ripple Noise Wave Form

2.Values

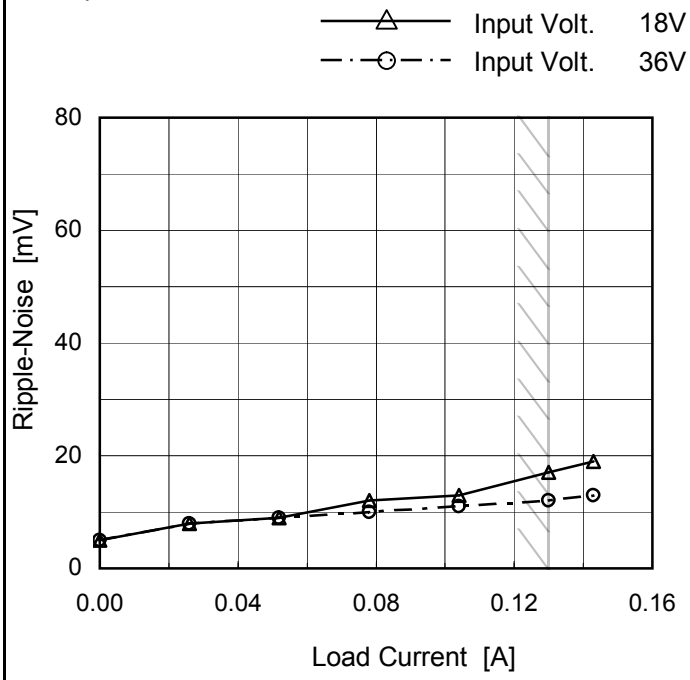
Load Current [A]	Ripple-Noise [mV] Input Volt. 18 [V]	Ripple-Noise [mV] Input Volt. 36 [V]
0.000	4	4
0.026	6	5
0.052	7	6
0.078	10	7
0.104	12	8
0.130	17	9
0.143	20	10
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW32412
Item	Ripple-Noise
Object	-12V0.13A

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.

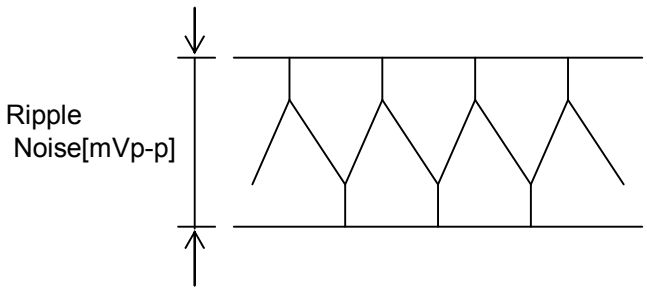


Fig.Complex Ripple Noise Wave Form

2.Values

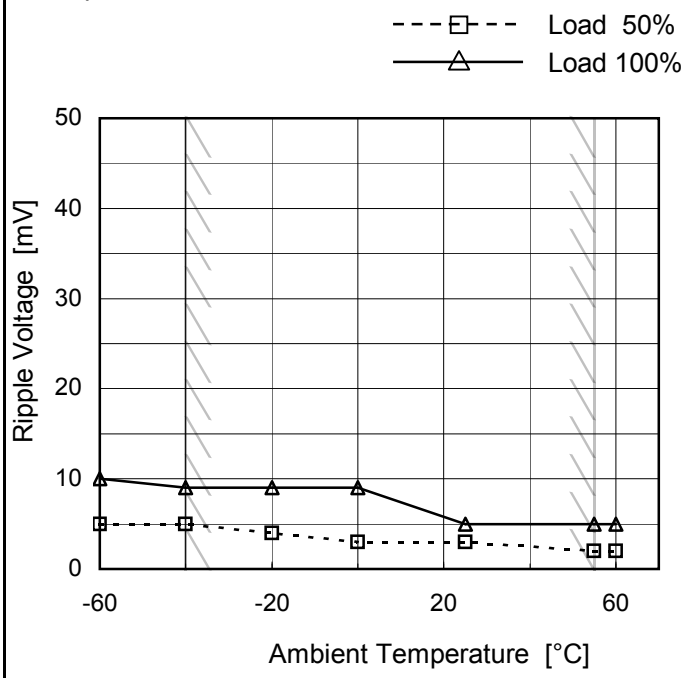
Load Current [A]	Ripple-Noise [mV] Input Volt. 18 [V]	Ripple-Noise [mV] Input Volt. 36 [V]
0.000	5	5
0.026	8	8
0.052	9	9
0.078	12	10
0.104	13	11
0.130	17	12
0.143	19	13
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW32412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.13A

Testing Circuitry Figure B

1.Graph



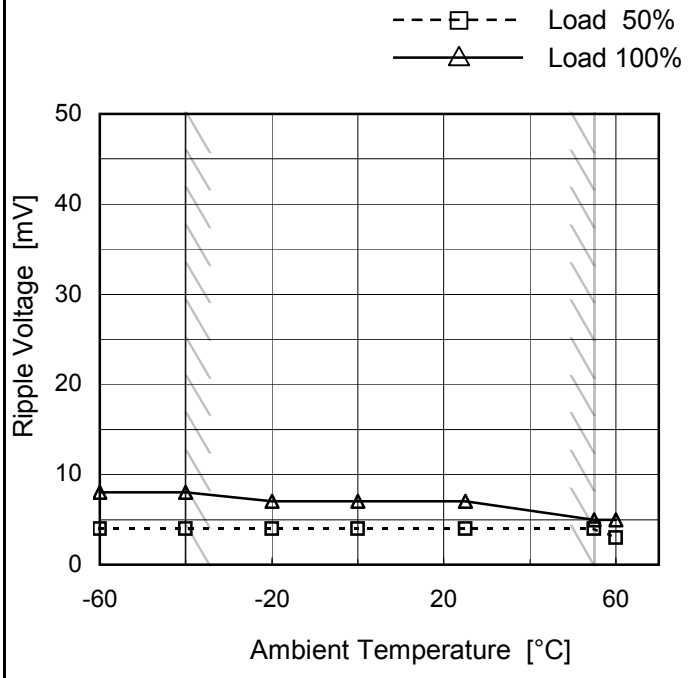
Input Volt. 24V

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	5	10
-40	5	9
-20	4	9
0	3	9
25	3	5
55	2	5
60	2	5
--	-	-
--	-	-
--	-	-
--	-	-

Object	-12V0.13A

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	4	8
-40	4	8
-20	4	7
0	4	7
25	4	7
55	4	5
60	3	5
--	-	-
--	-	-
--	-	-
--	-	-

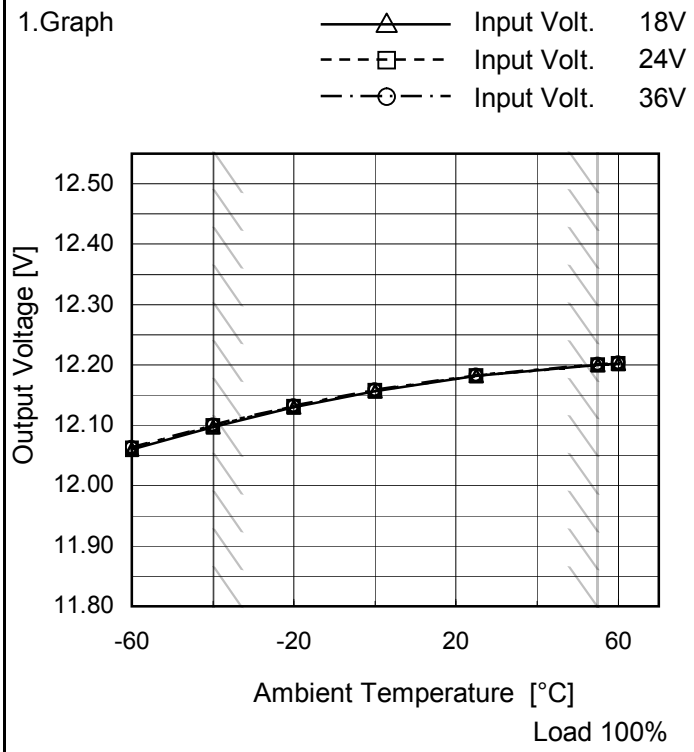
COSEL

Model	SUTW32412
Item	Ambient Temperature Drift

Testing Circuitry Figure A

Object +12V0.13A

1.Graph

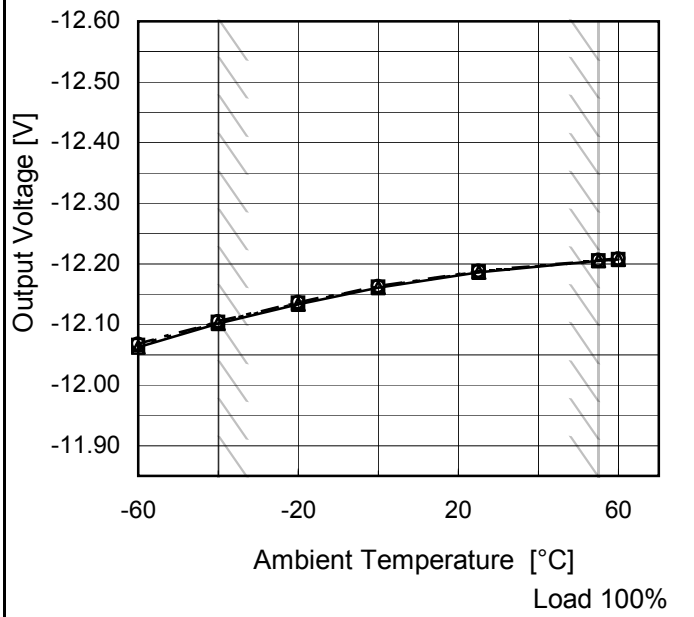


2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	12.059	12.062	12.064
-40	12.097	12.099	12.100
-20	12.130	12.131	12.132
0	12.156	12.157	12.158
25	12.181	12.182	12.183
55	12.200	12.200	12.201
60	12.202	12.202	12.203
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Object -12V0.13A

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	-12.062	-12.066	-12.068
-40	-12.101	-12.103	-12.105
-20	-12.133	-12.135	-12.137
0	-12.161	-12.162	-12.163
25	-12.186	-12.187	-12.188
55	-12.205	-12.205	-12.206
60	-12.207	-12.207	-12.208
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUTW32412
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 - 0.13A (AVR 2) : 0 - 0.13A

* 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	+12V0.13A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	12.444	±280	±2.3
Minimum Voltage	-40	18	0.13	11.884		

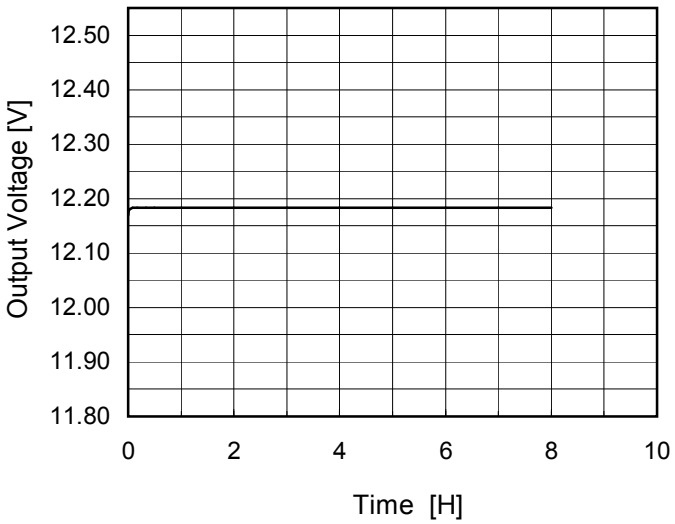
Object	-12V0.13A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	18	0	-12.448	±283	±2.4
Minimum Voltage	-40	18	0.13	-11.883		

COSEL

Model	SUTW32412
Item	Time Lapse Drift
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



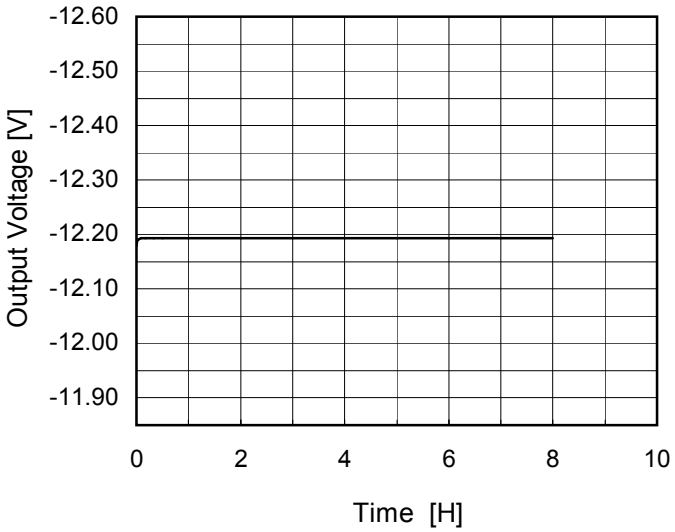
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.169
0.5	12.184
1.0	12.184
2.0	12.184
3.0	12.184
4.0	12.184
5.0	12.184
6.0	12.184
7.0	12.184
8.0	12.184

Object	-12V0.13A

1.Graph



Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-12.180
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

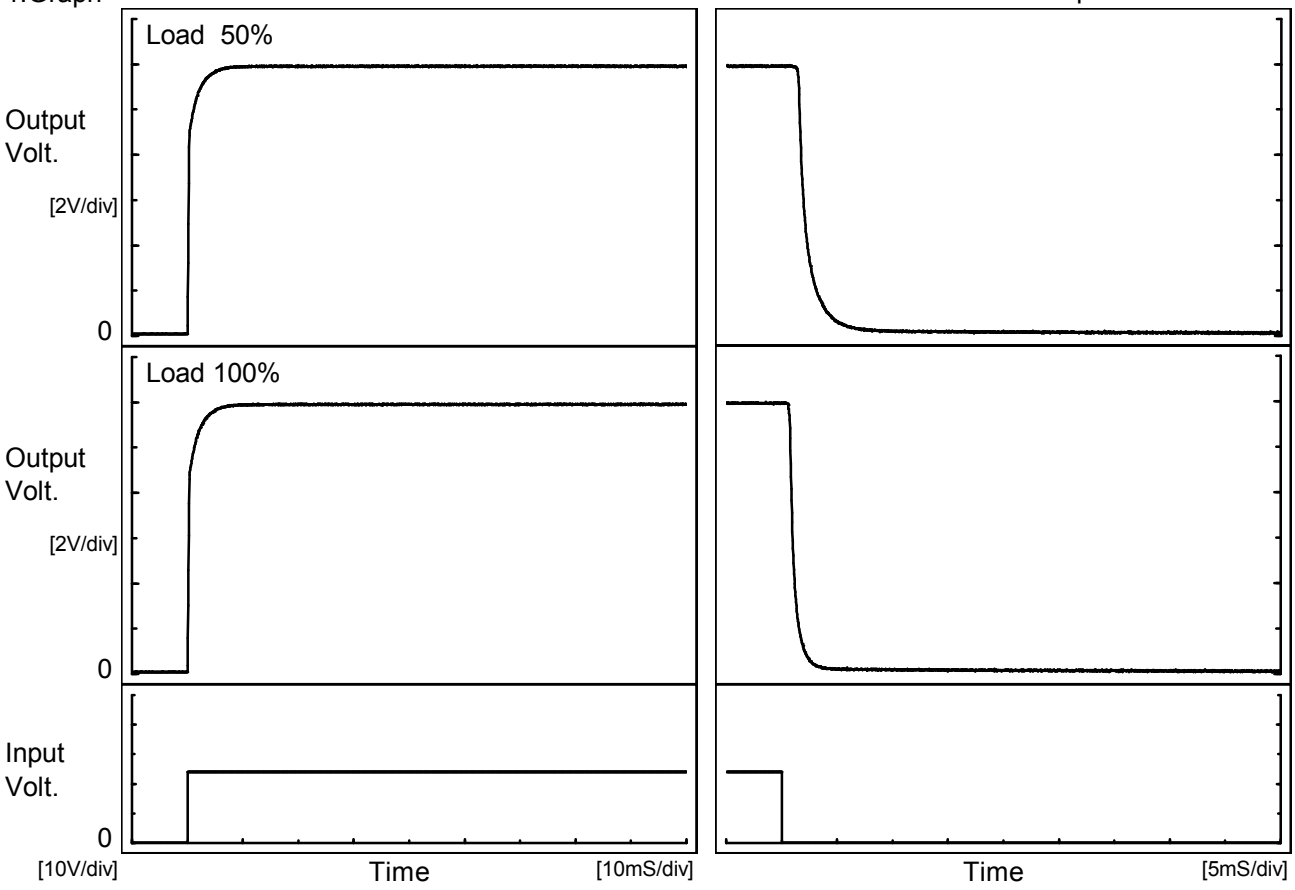
BC-10254

COSEL

Model	SUTW32412	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+12V0.13A	

1.Graph

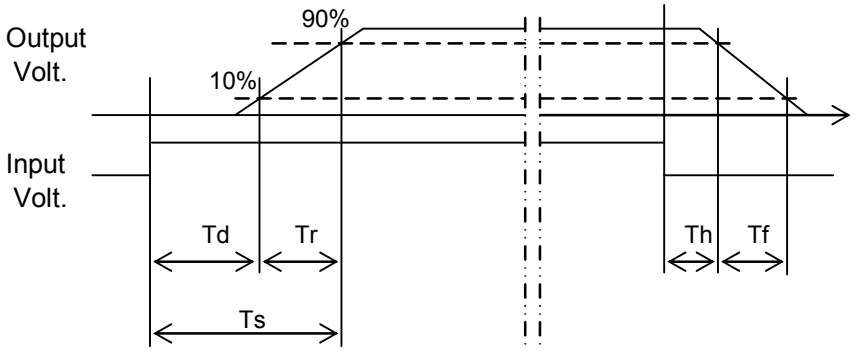
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	2.1	2.2	1.5	2.3
100 %	0.1	2.3	2.4	0.7	1.2



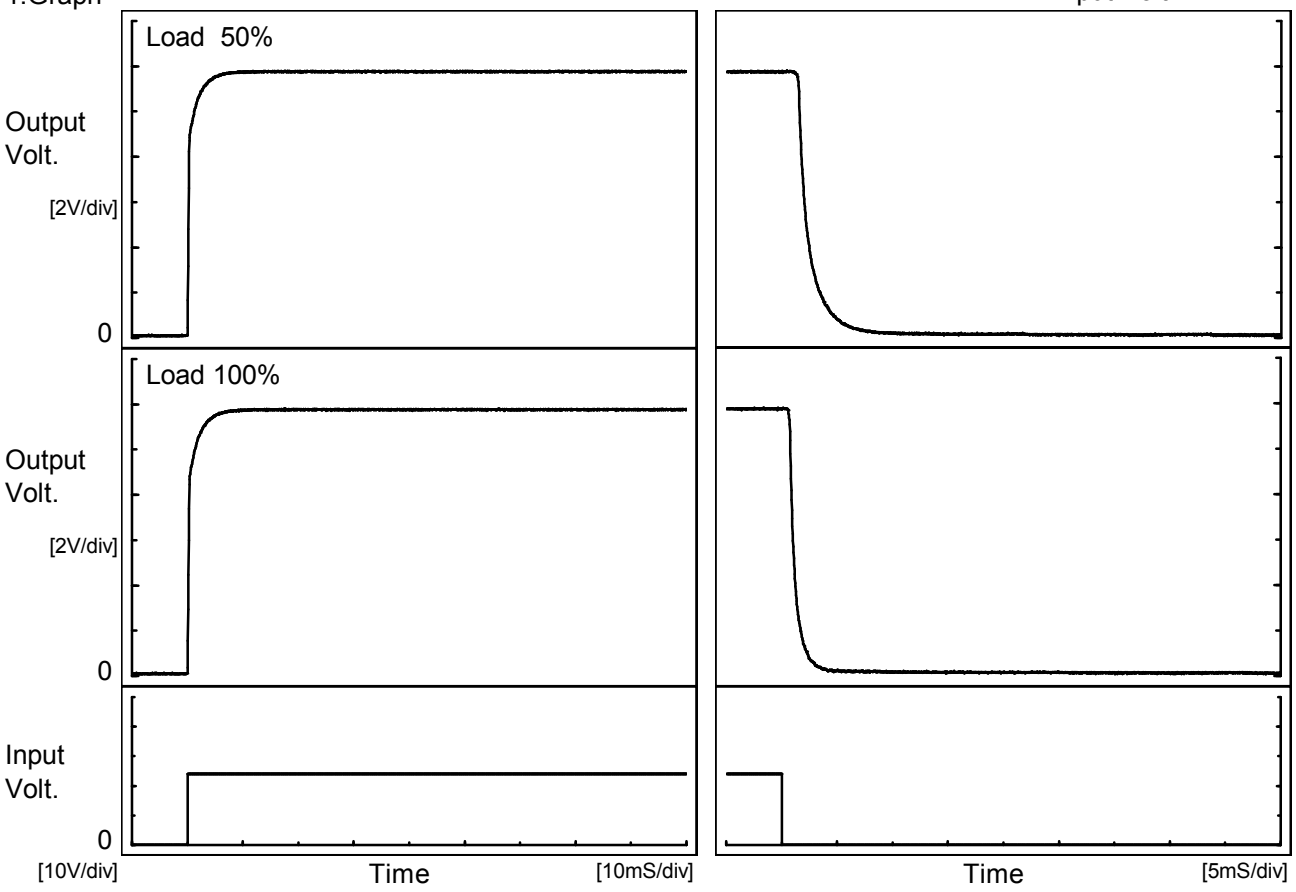
COSEL

Model	SUTW32412
Item	Rise and Fall Time
Object	-12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

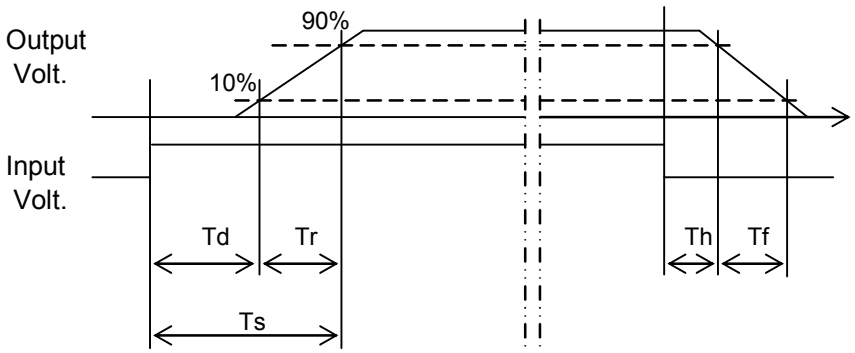
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	2.3	2.4	1.5	2.7
100 %	0.1	2.6	2.7	0.7	1.4



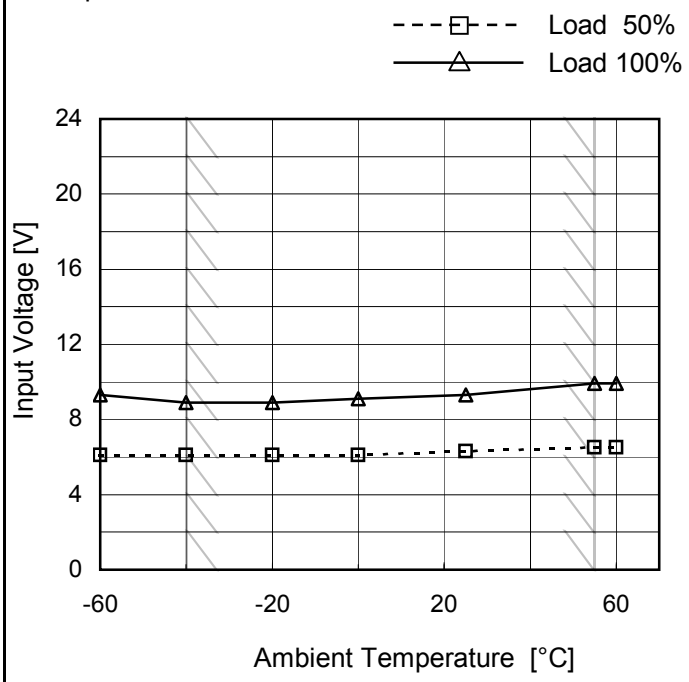
COSEL

Model	SUTW32412
Item	Minimum Input Voltage for Regulated Output Voltage

Testing Circuitry Figure A

Object +12V0.13A

1.Graph

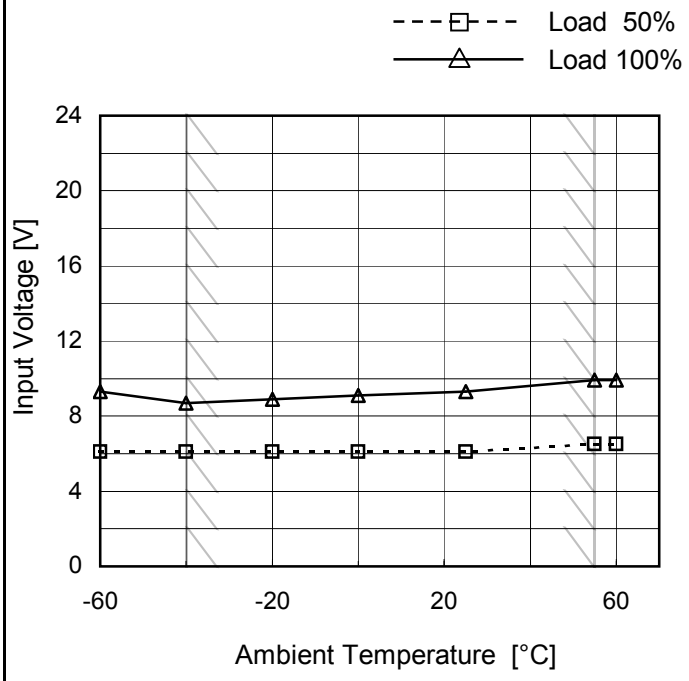


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	6.2	9.4
-40	6.2	9.0
-20	6.1	8.9
0	6.1	9.1
25	6.3	9.4
55	6.6	10.0
60	6.6	10.0
--	-	-
--	-	-
--	-	-
--	-	-

Object -12V0.13A

1.Graph



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

2.Values

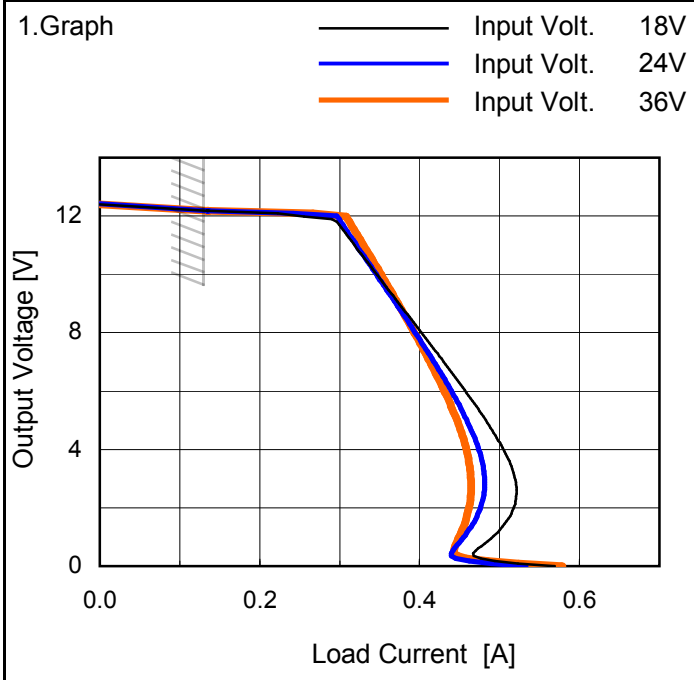
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	6.2	9.4
-40	6.2	8.8
-20	6.1	8.9
0	6.1	9.1
25	6.1	9.4
55	6.6	10.0
60	6.6	10.0
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	SUTW32412
Item	Overcurrent Protection
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

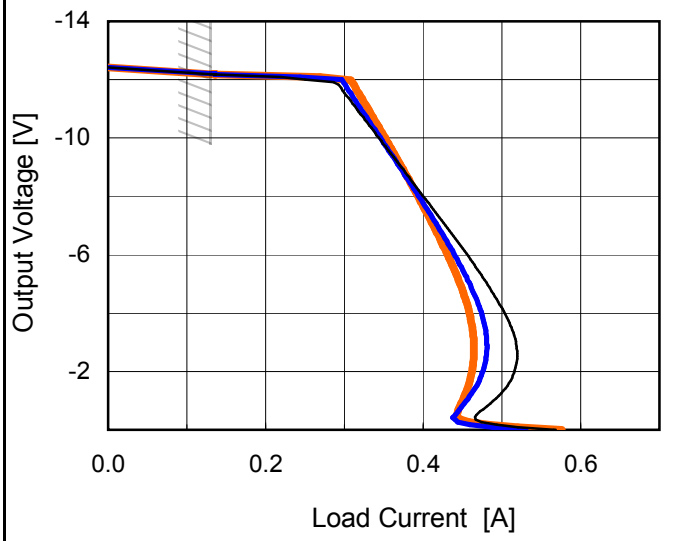


2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
12.0	0.13	0.13	0.13
11.4	0.31	0.31	0.32
10.8	0.32	0.33	0.33
9.6	0.36	0.35	0.36
8.4	0.39	0.38	0.38
7.2	0.42	0.41	0.41
6.0	0.46	0.44	0.43
4.8	0.49	0.46	0.45
3.6	0.51	0.48	0.46
2.4	0.52	0.48	0.46
1.2	0.50	0.46	0.45
0.0	0.57	0.53	0.58

Object	-12V0.13A

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	0.13	0.13	0.13
-11.4	0.31	0.31	0.32
-10.8	0.32	0.32	0.33
-9.6	0.35	0.35	0.36
-8.4	0.39	0.38	0.38
-7.2	0.42	0.41	0.41
-6.0	0.46	0.44	0.43
-4.8	0.48	0.46	0.45
-3.6	0.51	0.48	0.46
-2.4	0.52	0.48	0.46
-1.2	0.50	0.46	0.45
0.0	0.57	0.53	0.57

COSEL

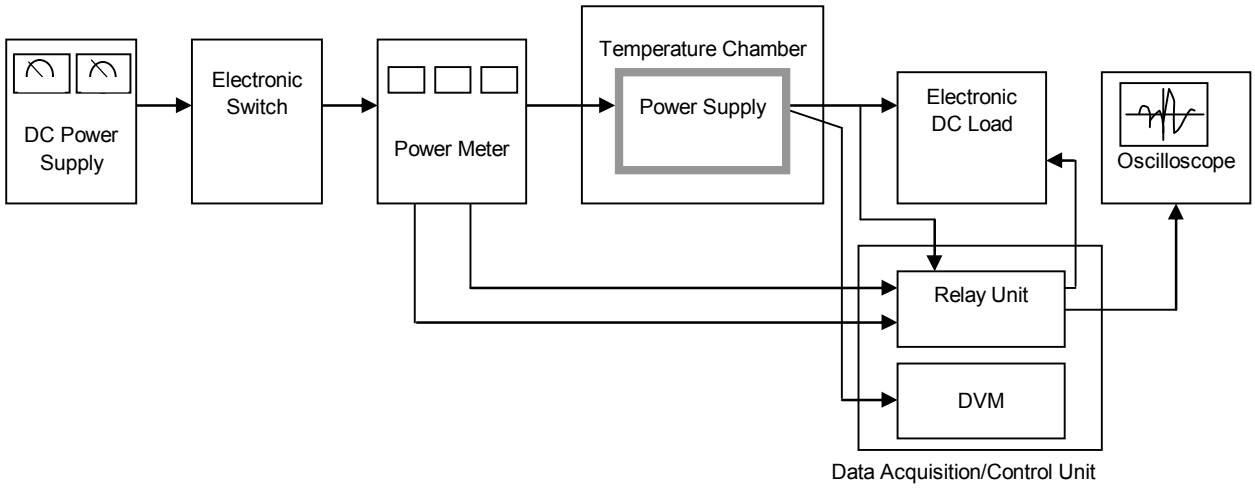


Figure A

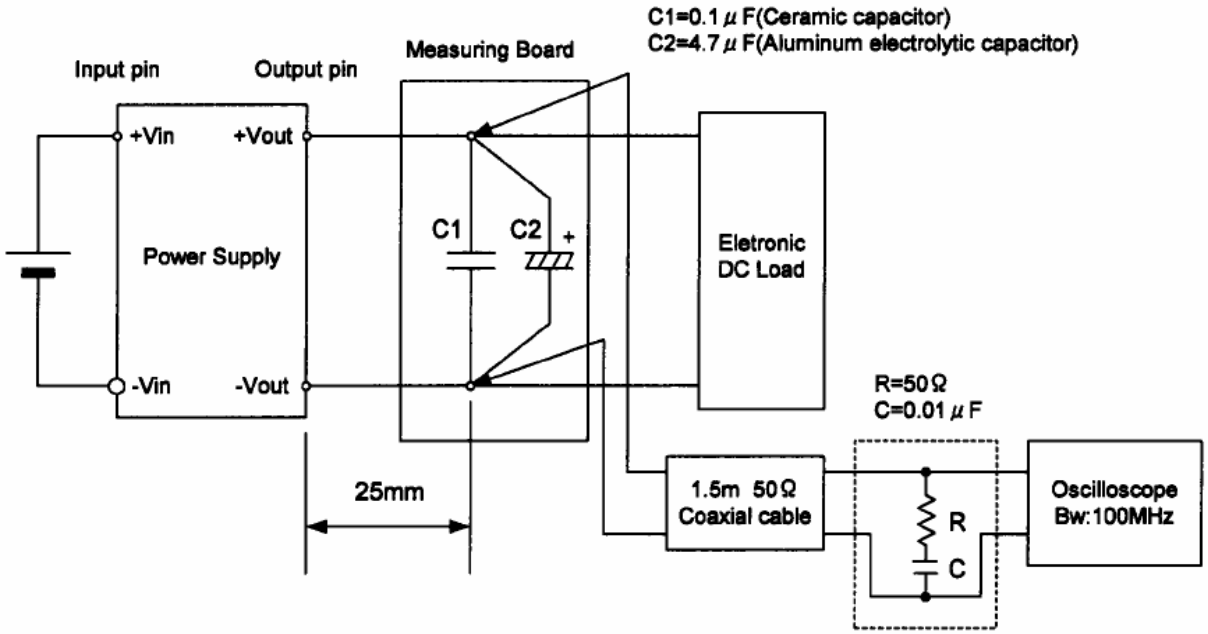


Figure B (Ripple and Ripple noise Characteristic)