



# TEST DATA OF SUS102412 SUCS102412

Regulated DC Power Supply  
Mar 28, 2005

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Tetsuo Sugimori Design Manager

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Yoshimichi Hirokawa Design Engineer

**COSEL CO.,LTD.**

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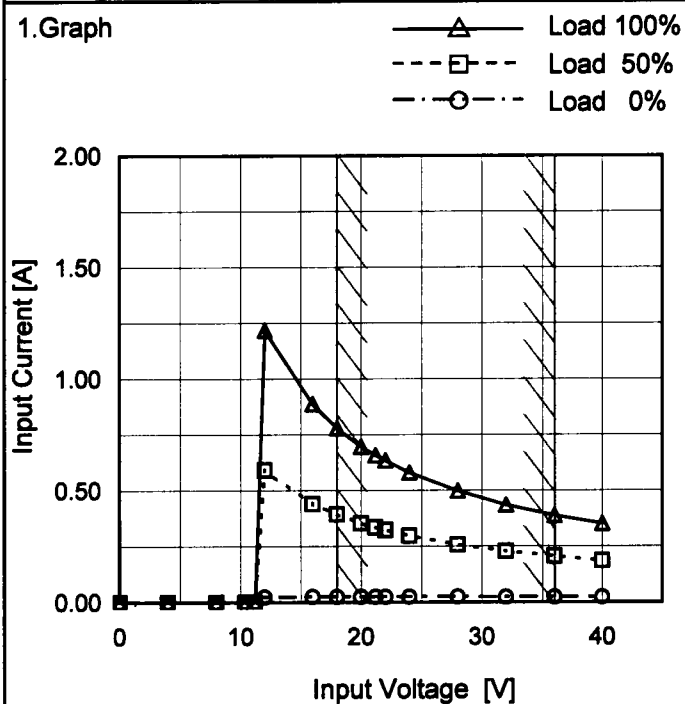
(Final Page 18)

# COSEL

**Model** SUS102412/SUCS102412

**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	0.000	0.000	0.000
8.0	0.001	0.001	0.001
10.4	0.001	0.001	0.001
11.2	0.001	0.001	0.001
12.0	0.023	0.592	1.219
16.0	0.024	0.440	0.889
18.0	0.025	0.393	0.780
20.0	0.025	0.354	0.697
21.2	0.025	0.335	0.658
22.0	0.025	0.324	0.635
24.0	0.025	0.298	0.580
28.0	0.024	0.258	0.498
32.0	0.023	0.228	0.436
36.0	0.023	0.205	0.389
40.0	0.023	0.186	0.353
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# COSEL

Model

SUS102412/SUCS102412

Item

Input Current (by Load Current)

Object

Temperature

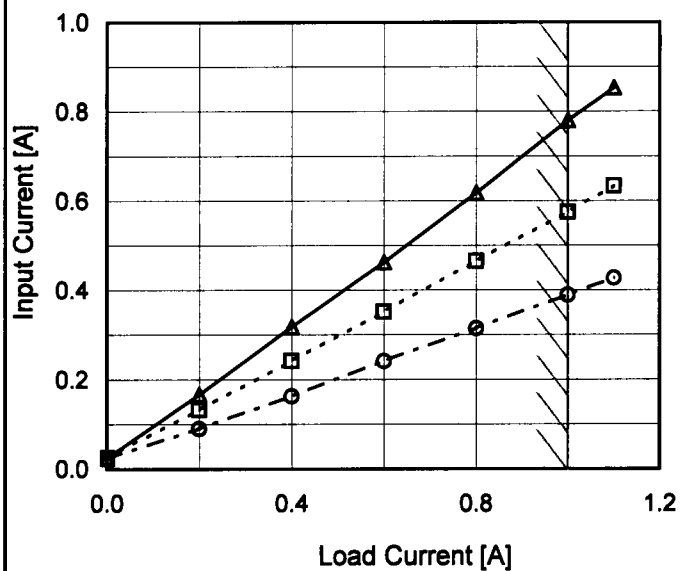
25°C

Testing Circuitry

Figure A

## 1. Graph

—△— Input Volt. 18V  
 ---□--- Input Volt. 24V  
 - - -○- - - Input Volt. 36V

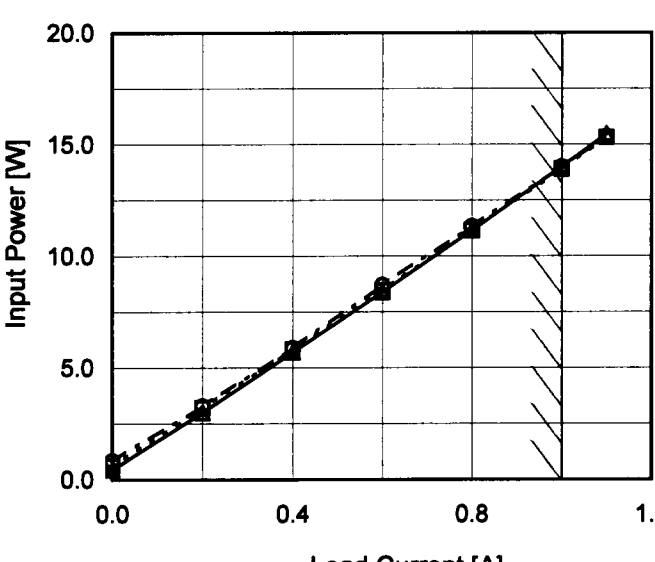


Note: Slanted line shows the range of the rated load current.

## 2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.0	0.025	0.025	0.024
0.2	0.167	0.133	0.091
0.4	0.319	0.242	0.163
0.6	0.463	0.352	0.241
0.8	0.618	0.466	0.315
1.0	0.780	0.575	0.389
1.1	0.853	0.634	0.427
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--	-	-	-
--	-	-	-
--	-	-	-

# COSEL

Model	SUS102412/SUCS102412																																																						
Item	Input Power (by Load Current)																																																						
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# COSEL

Model		SUS102412/SUCS102412	
Item		Efficiency (by Input Voltage)	
Object			

1.Graph

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□

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Load 50%

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△

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Load 100%

Efficiency [%]

90

80

70

60

50

40

10

20

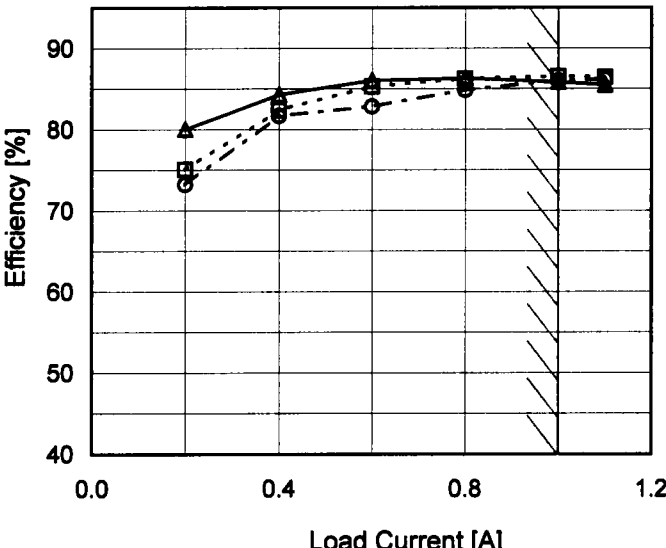
30

40

Input Voltage [V]

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# COSEL

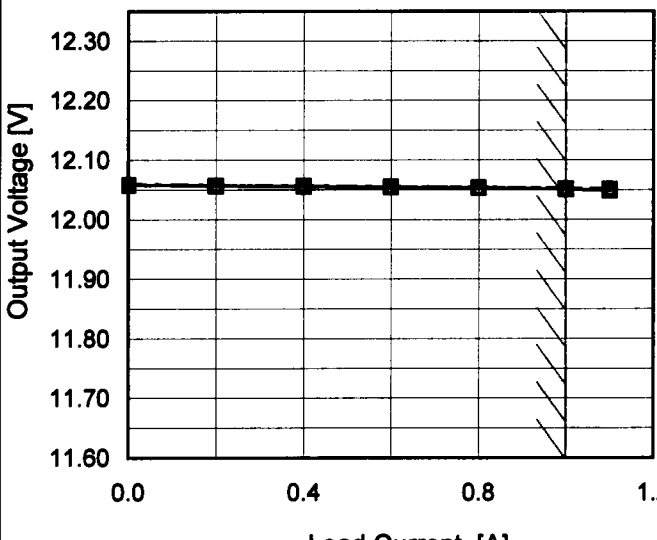
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**COSEL**

Model	SUS102412/SUCS102412																																
Item	Line Regulation	Temperature	25°C																														
Object	+12V1A	Testing Circuitry	Figure A																														
1.Graph		2.Values																															
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>---△---</div><div>Load 100%</div></div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Output Voltage [V] Load 50%</th><th>Output Voltage [V] Load 100%</th></tr></thead><tbody><tr><td>16</td><td>12.055</td><td>12.050</td></tr><tr><td>18</td><td>12.055</td><td>12.051</td></tr><tr><td>20</td><td>12.055</td><td>12.051</td></tr><tr><td>24</td><td>12.055</td><td>12.051</td></tr><tr><td>30</td><td>12.055</td><td>12.051</td></tr><tr><td>36</td><td>12.055</td><td>12.051</td></tr><tr><td>40</td><td>12.055</td><td>12.051</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table>		Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%	16	12.055	12.050	18	12.055	12.051	20	12.055	12.051	24	12.055	12.051	30	12.055	12.051	36	12.055	12.051	40	12.055	12.051	--	-	-	--	-	-		
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**COSEL**

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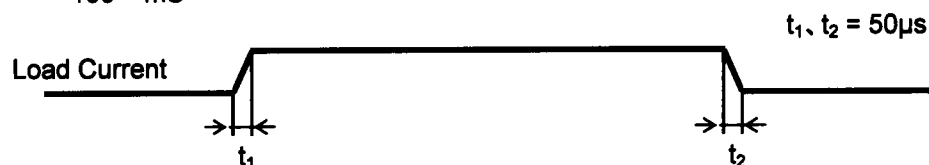
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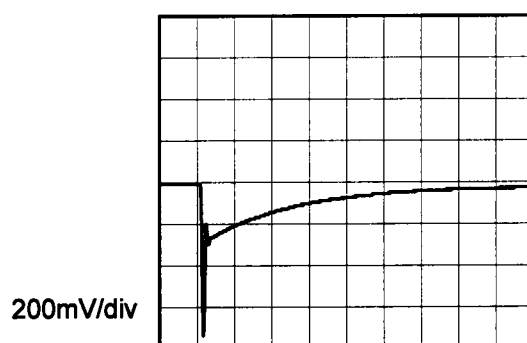
# COSEL

Model	SUS102412/SUCS102412	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V1A		

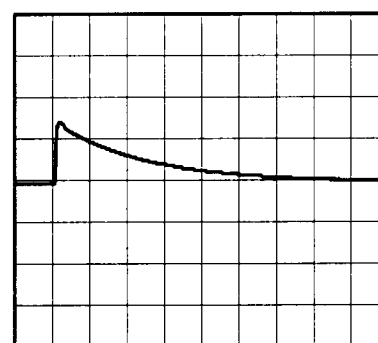
Input Volt. 24 V  
Cycle 100 mS



Min. Load (0A)  $\longleftrightarrow$   
Load 100% (1A)

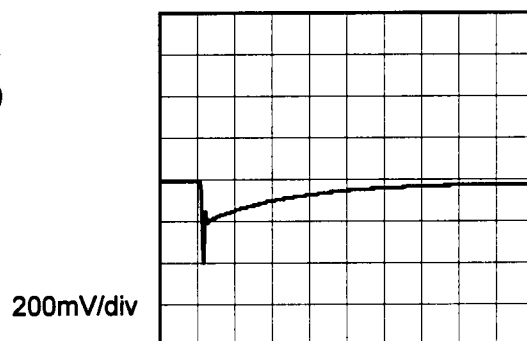


500µs/div

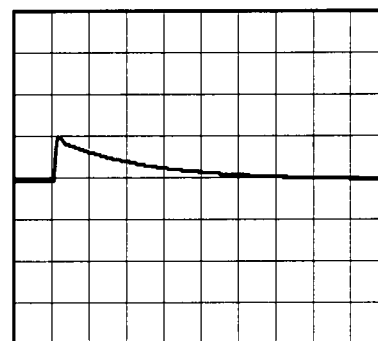


500µs/div

Min. Load (0A)  $\longleftrightarrow$   
Load 50% (0.5A)

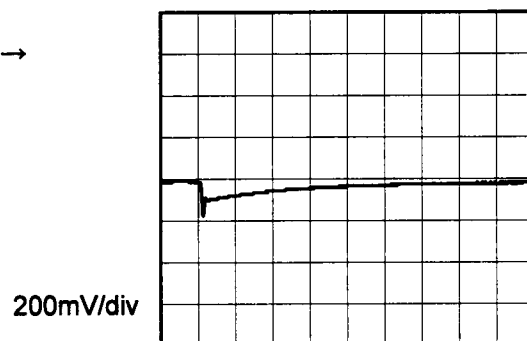


500µs/div

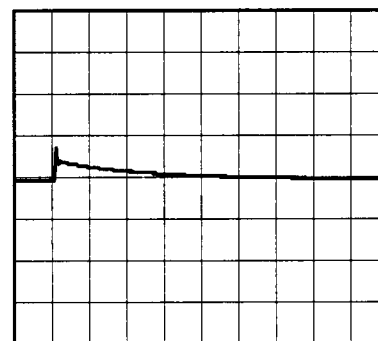


500µs/div

Load 50% (0.5A)  $\longleftrightarrow$   
Load 100% (1A)



500µs/div



500µs/div

# COSEL

Model	SUS102412/SUCS102412	Temperature 25°C Testing Circuitry Figure B																																							
Item	Ripple Voltage (by Load Current)																																								
Object	+12V1A																																								
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<div><div><div>—△— Input Volt. 18V</div><div>- - -○- - - Input Volt. 36V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 18 [V]</th><th>Input Volt. 36 [V]</th></tr><tr><td>0.0</td><td>3</td><td>3</td></tr><tr><td>0.2</td><td>3</td><td>4</td></tr><tr><td>0.4</td><td>4</td><td>3</td></tr><tr><td>0.6</td><td>6</td><td>5</td></tr><tr><td>0.8</td><td>8</td><td>6</td></tr><tr><td>1.0</td><td>10</td><td>7</td></tr><tr><td>1.1</td><td>11</td><td>8</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 36 [V]	0.0	3	3	0.2	3	4	0.4	4	3	0.6	6	5	0.8	8	6	1.0	10	7	1.1	11	8	—	—	—	—	—	—	—	—	—	—	—	—
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<div>Measured by 100 MHz Oscilloscope.</div> <div>Ripple Voltage is shown as p-p in the figure below.</div> <div>Note: Slanted line shows the range of the rated load current.</div>																																									
<div><div>Ripple [mVp-p]</div><div>Fig.Complex Ripple Wave Form</div></div>																																									

**COSEL**

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Load Current [A]	Ripple-Noise [mV]																																								
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0.2	7	8																																							
0.4	10	10																																							
0.6	13	12																																							
0.8	16	14																																							
1.0	21	17																																							
1.1	23	18																																							
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<div><div><div><div></div><div>Ripple Noise[mVp-p]</div></div><div><div>Fig.Complex Ripple Noise Wave Form</div></div></div></div>																																									

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BC-3806

# COSEL

Model		SUS102412/SUCS102412
Item		Ripple Voltage (by Ambient Temp.)
Object		+12V1A

1.Graph

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□

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Load 50%

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△

—

Load 100%

Ripple Voltage [mV]

-60

-40

-20

0

20

40

60

Ambient Temperature [°C]

Input Volt.24V

-60

-40

-20

0

20

40

60

80

-60

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0

20

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-60

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Model		SUS102412/SUCS102412		Testing Circuitry    Figure A																																																		
Item		Ambient Temperature Drift																																																				
Object		+12V1A																																																				
1. Graph		<div><div>—△—</div><div>---□---</div><div>-·-○-·-</div></div> <div><div>Input Volt.</div><div>Input Volt.</div><div>Input Volt.</div></div> <div><div>18V</div><div>24V</div><div>36V</div></div>		2. Values																																																		
<div><div>Output Voltage [V]</div><div><div><div>-60</div><div>-20</div><div>20</div><div>60</div></div><div><div>Ambient Temperature [°C]</div><div>Load 100%</div></div></div></div>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th></tr><tr><td>-60</td><td>12.032</td><td>12.036</td><td>12.037</td></tr><tr><td>-40</td><td>12.046</td><td>12.048</td><td>12.049</td></tr><tr><td>-20</td><td>12.053</td><td>12.055</td><td>12.055</td></tr><tr><td>0</td><td>12.055</td><td>12.056</td><td>12.056</td></tr><tr><td>25</td><td>12.050</td><td>12.051</td><td>12.050</td></tr><tr><td>55</td><td>12.037</td><td>12.037</td><td>12.036</td></tr><tr><td>60</td><td>12.034</td><td>12.034</td><td>12.034</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	-60	12.032	12.036	12.037	-40	12.046	12.048	12.049	-20	12.053	12.055	12.055	0	12.055	12.056	12.056	25	12.050	12.051	12.050	55	12.037	12.037	12.036	60	12.034	12.034	12.034	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]																																																			
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-40	12.046	12.048	12.049																																																			
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0	12.055	12.056	12.056																																																			
25	12.050	12.051	12.050																																																			
55	12.037	12.037	12.036																																																			
60	12.034	12.034	12.034																																																			
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--	-	-	-																																																			
Note: Slanted line shows the range of the rated ambient temperature.																																																						

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		Testing Circuitry Figure A
Model	SUS102412/SUCS102412	
Item	Output Voltage Accuracy	
Object	+12V1A	

### 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 : 0 - 1A

\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* Output Voltage Accuracy (Ratio) =  $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	0	36	0	12.062	±13	±0.1
Minimum Voltage	55	36	1	12.036		

**COSEL**

Model

SUS102412/SUCS102412

Item

Time Lapse Drift

Temperature

25°C

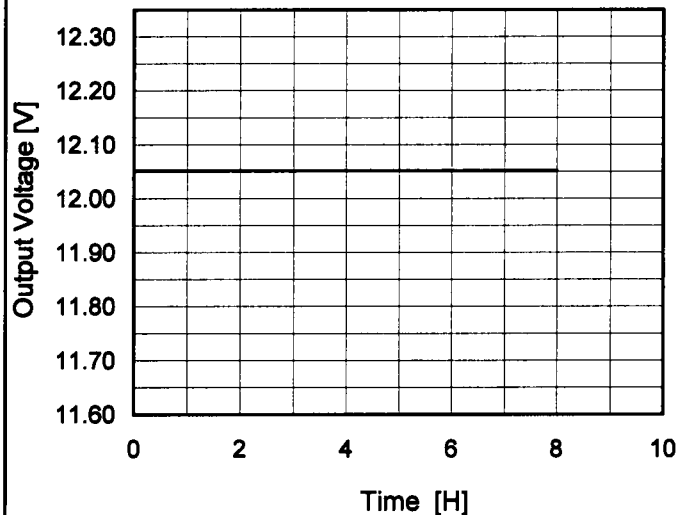
Testing Circuitry

Figure A

Object

+12V1A

## 1.Graph



## 2.Values

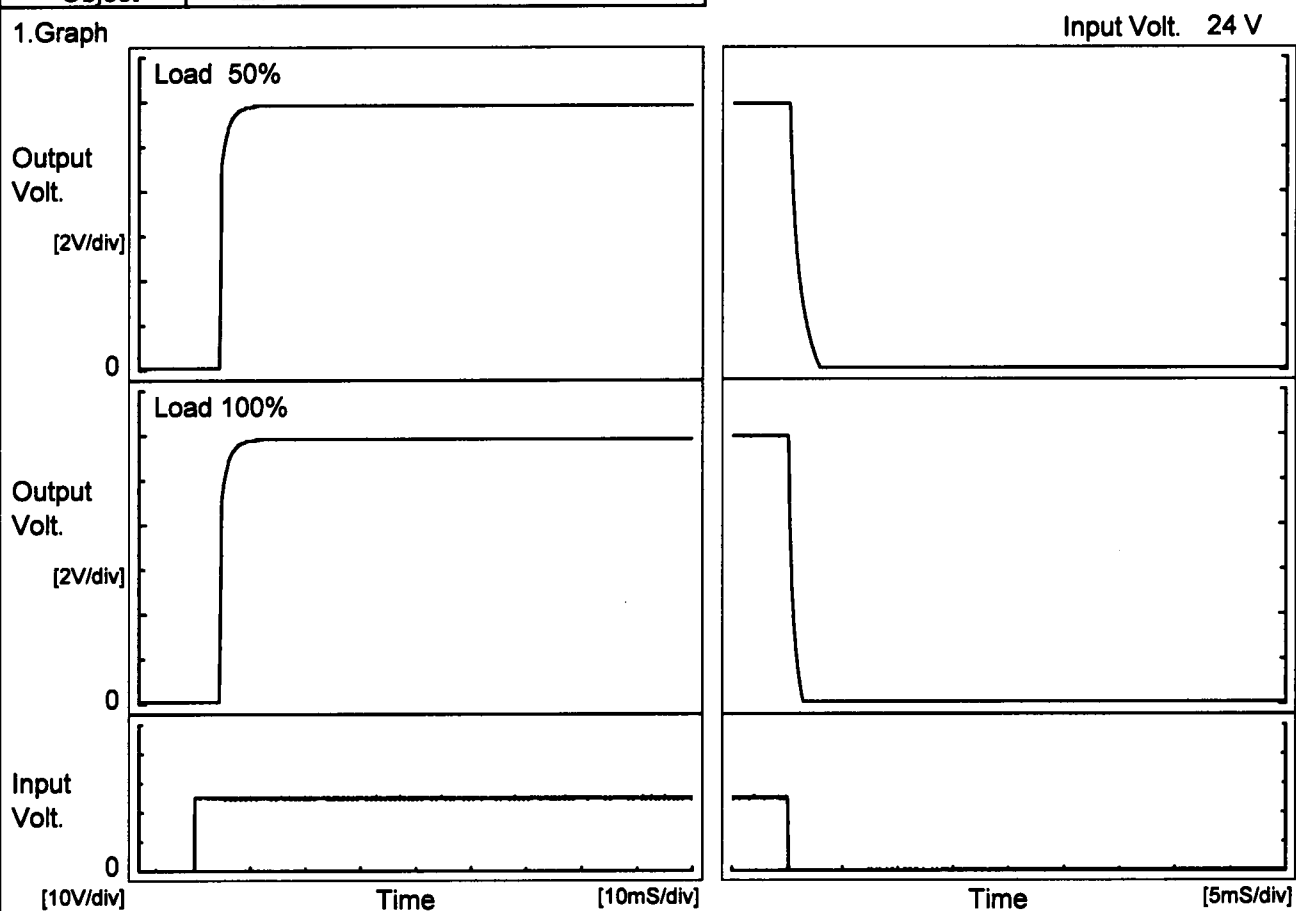
Time since start [H]	Output Voltage [V]
0.0	12.055
0.5	12.052
1.0	12.052
2.0	12.052
3.0	12.052
4.0	12.051
5.0	12.052
6.0	12.052
7.0	12.052
8.0	12.052



# COSEL

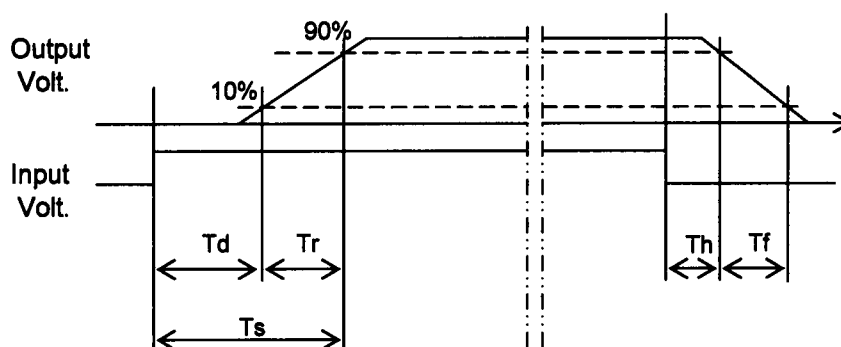
Model	SUS102412/SUCS102412	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V1A		

## 1. Graph



## 2. Values

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	4.5	1.6	6.1	0.2	1.9
100 %	4.5	1.7	6.2	0.1	0.9



**COSEL**

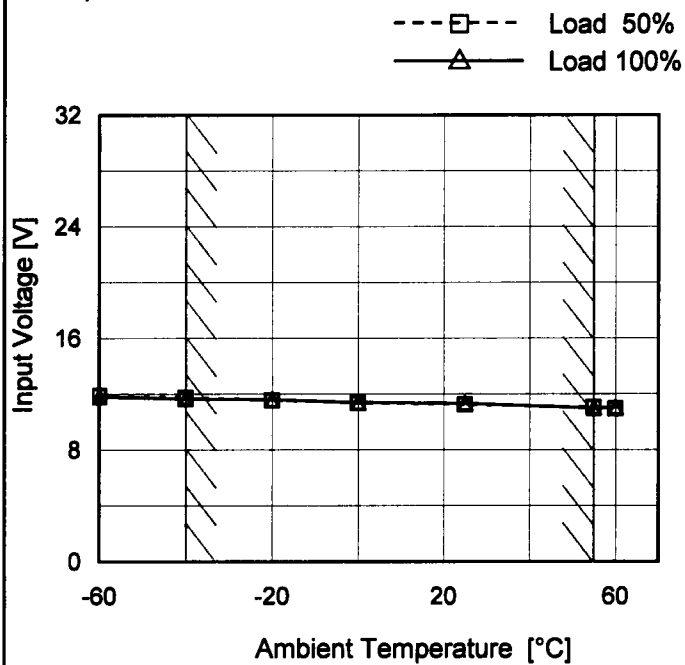
Model SUS102412/SUCS102412

Item Minimum Input Voltage  
for Regulated Output Voltage

Object +12V1A

Testing Circuitry Figure A

## 1. Graph



## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	12.0	11.9
-40	11.8	11.7
-20	11.6	11.7
0	11.4	11.5
25	11.3	11.4
55	11.1	11.0
60	11.0	11.1
—	—	—
—	—	—
—	—	—
—	—	—

# COSEL

Model	SUS102412/SUCS102412																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+12V1A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
<div><div><div></div><div>Input Volt. 18V</div></div><div><div></div><div>Input Volt. 24V</div></div><div><div></div><div>Input Volt. 36V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th></tr><tr><td>12.0</td><td>1.35</td><td>1.41</td><td>1.51</td></tr><tr><td>11.4</td><td>1.39</td><td>1.52</td><td>1.56</td></tr><tr><td>10.8</td><td>1.44</td><td>1.58</td><td>1.61</td></tr><tr><td>9.6</td><td>1.55</td><td>1.69</td><td>1.73</td></tr><tr><td>8.4</td><td>1.65</td><td>1.78</td><td>1.82</td></tr><tr><td>7.2</td><td>1.71</td><td>1.83</td><td>1.83</td></tr><tr><td>6.0</td><td>1.77</td><td>1.87</td><td>1.84</td></tr><tr><td>4.8</td><td>1.85</td><td>1.92</td><td>1.80</td></tr><tr><td>3.6</td><td>1.94</td><td>1.95</td><td>1.73</td></tr><tr><td>2.4</td><td>2.01</td><td>1.94</td><td>1.65</td></tr><tr><td>1.2</td><td>2.07</td><td>1.92</td><td>1.56</td></tr><tr><td>0.0</td><td>2.03</td><td>1.93</td><td>2.64</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	12.0	1.35	1.41	1.51	11.4	1.39	1.52	1.56	10.8	1.44	1.58	1.61	9.6	1.55	1.69	1.73	8.4	1.65	1.78	1.82	7.2	1.71	1.83	1.83	6.0	1.77	1.87	1.84	4.8	1.85	1.92	1.80	3.6	1.94	1.95	1.73	2.4	2.01	1.94	1.65	1.2	2.07	1.92	1.56	0.0	2.03	1.93	2.64
Output Voltage [V]	Load Current [A]																																																									
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3.6	1.94	1.95	1.73																																																							
2.4	2.01	1.94	1.65																																																							
1.2	2.07	1.92	1.56																																																							
0.0	2.03	1.93	2.64																																																							

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BC-3806

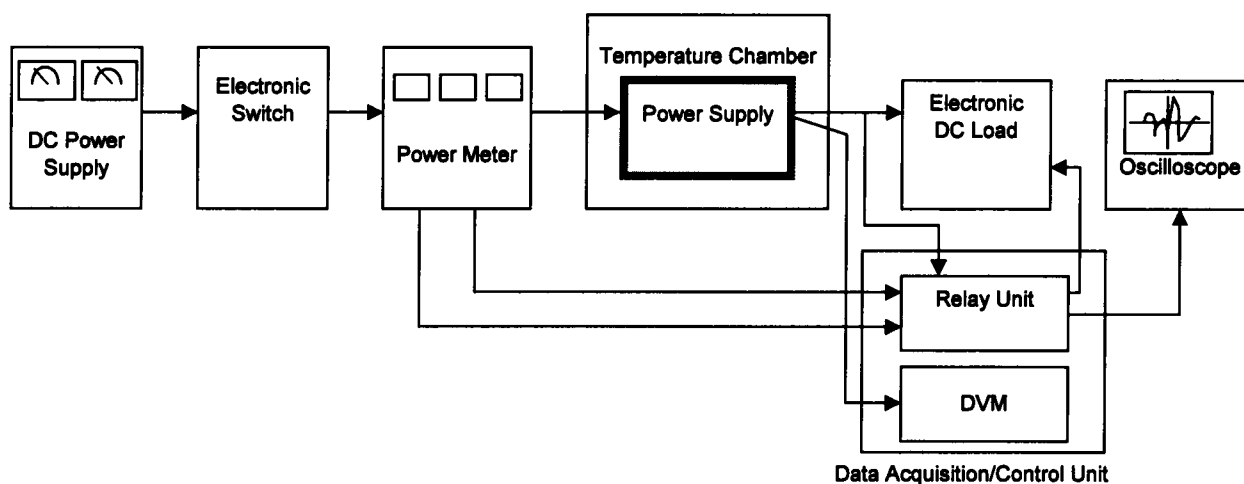


Figure A

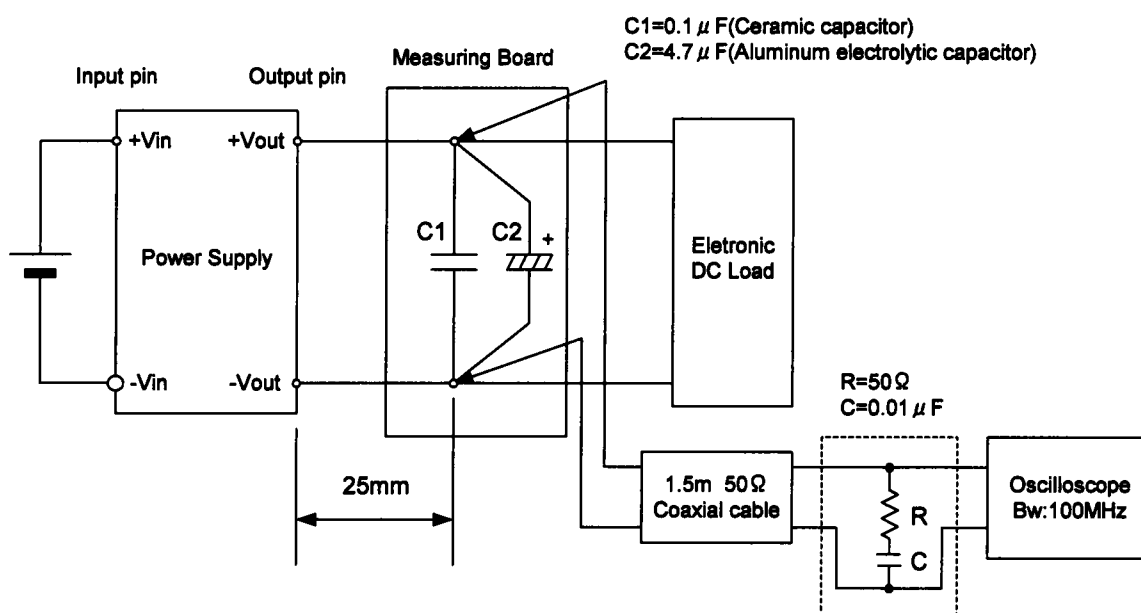


Figure B (Ripple and Ripple noise Characteristic)