

# TEST DATA OF SUS61212 SUCS61212

Regulated DC Power Supply  
Feb 18, 2005

Approved by : Tetsuo Sugimori  
Tetsuo Sugimori Design Manager

Prepared by : Yoshikazu Mizuno  
Yoshikazu Mizuno Design Engineer

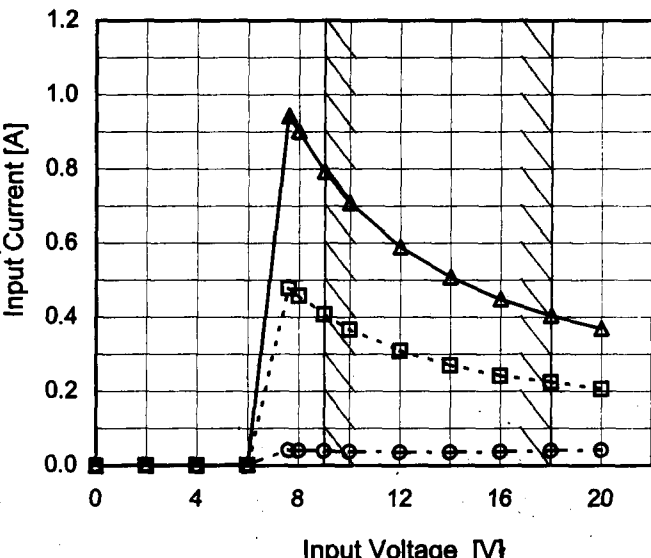
**COSEL CO.,LTD.**

## CONTENTS

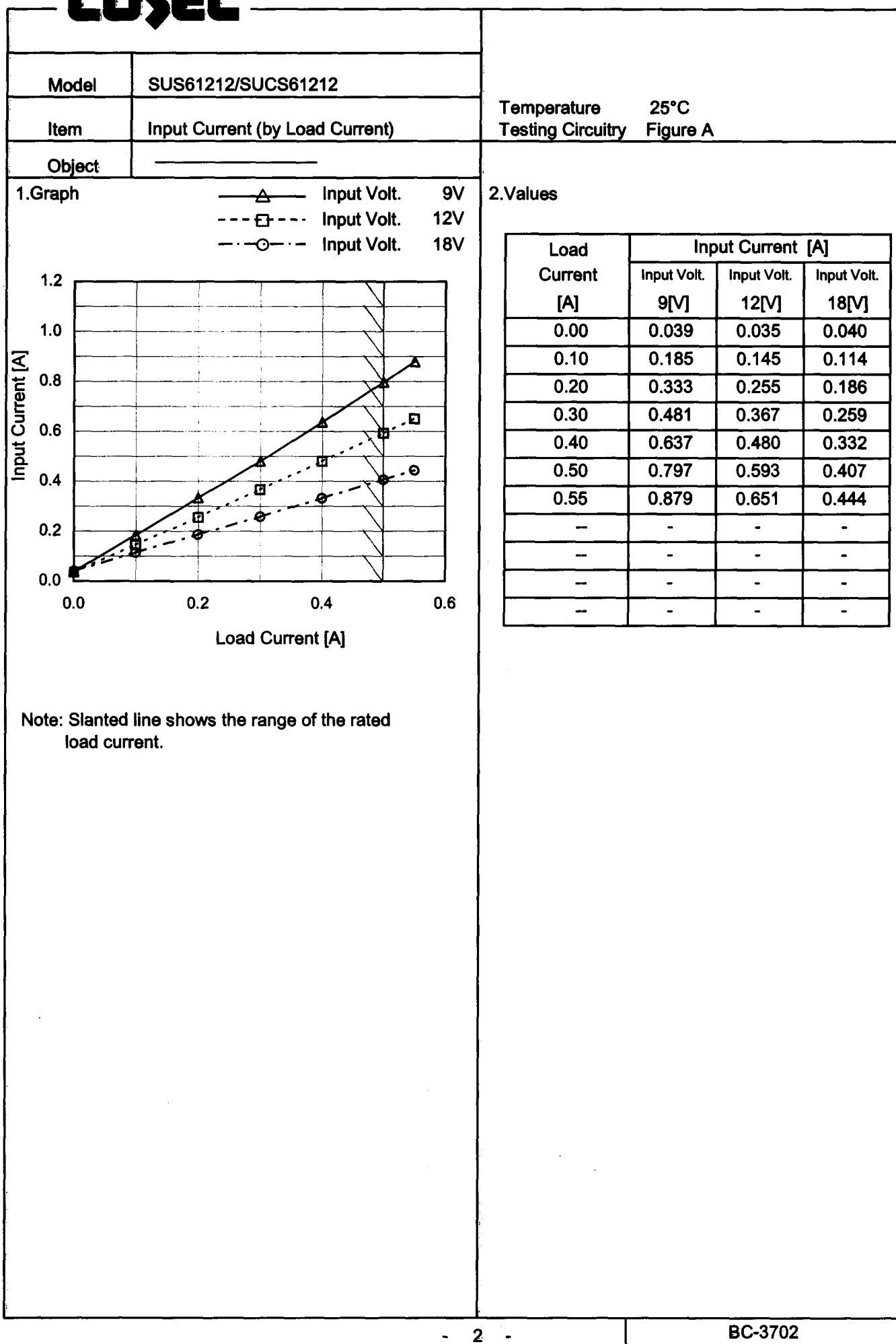
1.Input Current (by Input Voltage) . . . . .	1
2.Input Current (by Load Current) . . . . .	2
3.Input Power (by Load Current) . . . . .	3
4.Efficiency (by Input Voltage) . . . . .	4
5.Efficiency (by Load Current) . . . . .	5
6.Line Regulation . . . . .	6
7.Load Regulation . . . . .	7
8.Dynamic Load Response . . . . .	8
9.Ripple Voltage (by Load Current) . . . . .	9
10.Ripple-Noise . . . . .	10
11.Ripple Voltage (by Ambient Temperature) . . . . .	11
12.Ambient Temperature Drift . . . . .	12
13.Output Voltage Accuracy . . . . .	13
14.Time Lapse Drift . . . . .	14
15.Rise and Fall Time . . . . .	15
16.Minimum Input Voltage for Regulated Output Voltage . . . . .	16
17.Overcurrent Protection . . . . .	17
18.Figure of Testing Circuitry . . . . .	18

(Final Page 18)

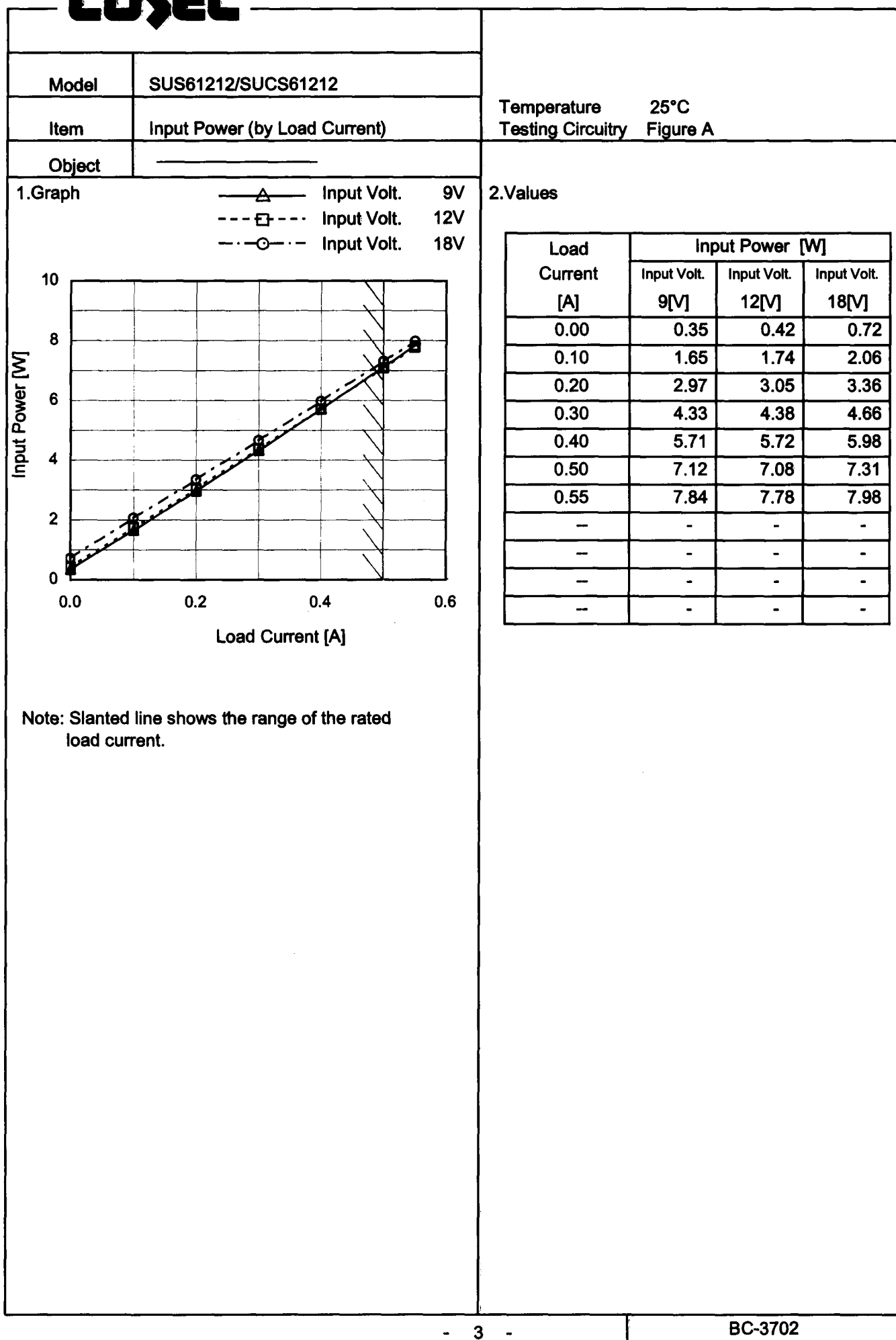
# COSEL

Model		SUS61212/SUCS61212		Temperature 25°C																																																																								
Item		Input Current (by Input Voltage)		Testing Circuitry Figure A																																																																								
Object																																																																												
1.Graph		<div><div><div></div><div>—△—</div><div>Load 100%</div></div><div><div>- - □ - -</div><div>Load 50%</div></div><div><div>- · ○ · -</div><div>Load 0%</div></div></div>  <p>Note: Slanted line shows the range of the rated input voltage.</p>		2.Values																																																																								
		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Load 0%</th><th>Load 50%</th><th>Load 100%</th></tr><tr><td>0.0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>2.0</td><td>0.001</td><td>0.001</td><td>0.001</td></tr><tr><td>4.0</td><td>0.001</td><td>0.001</td><td>0.001</td></tr><tr><td>6.0</td><td>0.002</td><td>0.002</td><td>0.002</td></tr><tr><td>7.6</td><td>0.042</td><td>0.478</td><td>0.943</td></tr><tr><td>8.0</td><td>0.041</td><td>0.459</td><td>0.902</td></tr><tr><td>9.0</td><td>0.039</td><td>0.407</td><td>0.793</td></tr><tr><td>10.0</td><td>0.037</td><td>0.367</td><td>0.709</td></tr><tr><td>12.0</td><td>0.035</td><td>0.309</td><td>0.590</td></tr><tr><td>14.0</td><td>0.035</td><td>0.271</td><td>0.508</td></tr><tr><td>16.0</td><td>0.037</td><td>0.243</td><td>0.449</td></tr><tr><td>18.0</td><td>0.040</td><td>0.225</td><td>0.405</td></tr><tr><td>20.0</td><td>0.042</td><td>0.207</td><td>0.370</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>				Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0.0	0.000	0.000	0.000	2.0	0.001	0.001	0.001	4.0	0.001	0.001	0.001	6.0	0.002	0.002	0.002	7.6	0.042	0.478	0.943	8.0	0.041	0.459	0.902	9.0	0.039	0.407	0.793	10.0	0.037	0.367	0.709	12.0	0.035	0.309	0.590	14.0	0.035	0.271	0.508	16.0	0.037	0.243	0.449	18.0	0.040	0.225	0.405	20.0	0.042	0.207	0.370	--	-	-	-	--	-	-	-	--	-	-	-
Input Voltage [V]	Input Current [A]																																																																											
	Load 0%	Load 50%	Load 100%																																																																									
0.0	0.000	0.000	0.000																																																																									
2.0	0.001	0.001	0.001																																																																									
4.0	0.001	0.001	0.001																																																																									
6.0	0.002	0.002	0.002																																																																									
7.6	0.042	0.478	0.943																																																																									
8.0	0.041	0.459	0.902																																																																									
9.0	0.039	0.407	0.793																																																																									
10.0	0.037	0.367	0.709																																																																									
12.0	0.035	0.309	0.590																																																																									
14.0	0.035	0.271	0.508																																																																									
16.0	0.037	0.243	0.449																																																																									
18.0	0.040	0.225	0.405																																																																									
20.0	0.042	0.207	0.370																																																																									
--	-	-	-																																																																									
--	-	-	-																																																																									
--	-	-	-																																																																									
		BC-3702																																																																										

# COSEL



# COSEL



# COSEL

Model		SUS61212/SUCS61212	
Item		Efficiency (by Input Voltage)	
Object			
1.Graph		2.Values	

# COSEL

Model		SUS61212/SUCS61212		Temperature 25°C																																																				
Item		Efficiency (by Load Current)		Testing Circuitry Figure A																																																				
Object																																																								
1.Graph		<div><div>—△—</div>Input Volt. 9V</div> <div><div>- - □ - -</div>Input Volt. 12V</div> <div><div>- · - ○ - ·</div>Input Volt. 18V</div>		2.Values																																																				
<div><div>Efficiency [%]</div><div><div>0.00.20.40.60</div><div>Load Current [A]</div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</th></tr><tr><th>Input Volt. 9[V]</th><th>Input Volt. 12[V]</th><th>Input Volt. 18[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.10</td><td>72.9</td><td>69.1</td><td>58.3</td></tr><tr><td>0.20</td><td>80.8</td><td>79.0</td><td>71.6</td></tr><tr><td>0.30</td><td>83.4</td><td>82.4</td><td>77.4</td></tr><tr><td>0.40</td><td>84.2</td><td>84.0</td><td>80.4</td></tr><tr><td>0.50</td><td>84.4</td><td>84.8</td><td>82.2</td></tr><tr><td>0.55</td><td>84.3</td><td>84.9</td><td>82.8</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>		Load Current [A]	Efficiency [%]			Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	0.00	-	-	-	0.10	72.9	69.1	58.3	0.20	80.8	79.0	71.6	0.30	83.4	82.4	77.4	0.40	84.2	84.0	80.4	0.50	84.4	84.8	82.2	0.55	84.3	84.9	82.8	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-		
Load Current [A]	Efficiency [%]																																																							
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]																																																					
0.00	-	-	-																																																					
0.10	72.9	69.1	58.3																																																					
0.20	80.8	79.0	71.6																																																					
0.30	83.4	82.4	77.4																																																					
0.40	84.2	84.0	80.4																																																					
0.50	84.4	84.8	82.2																																																					
0.55	84.3	84.9	82.8																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
Note: Slanted line shows the range of the rated load current.																																																								

- 5 -

BC-3702

# COSEL

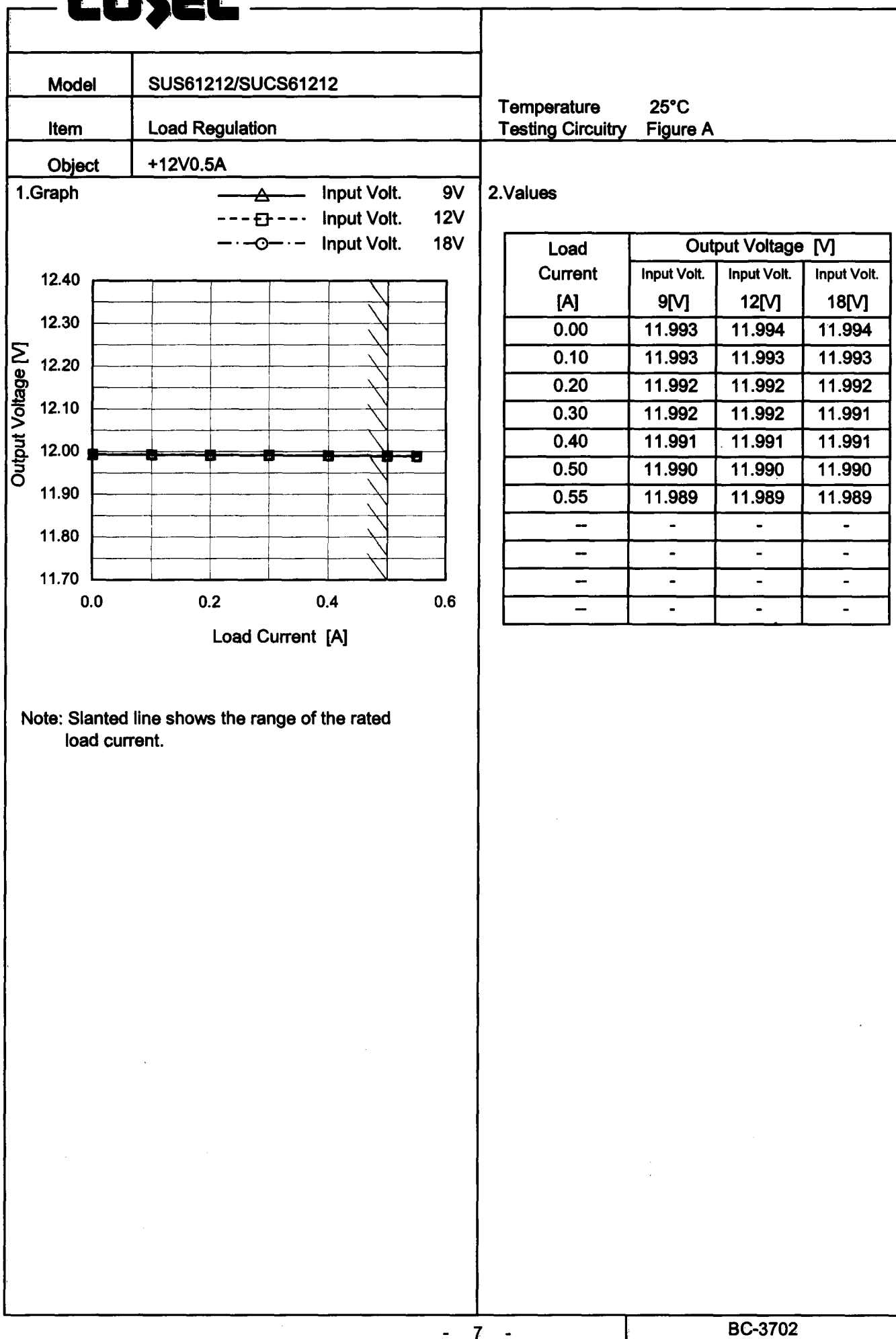
Model		SUS61212/SUCS61212	
Item		Line Regulation	
Object		+12V0.5A	

1.Graph

<



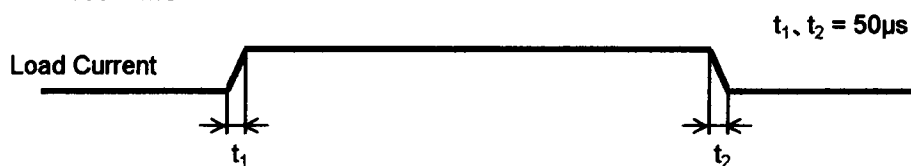
# COSEL



# COSEL

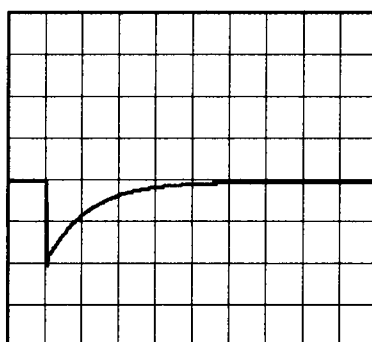
Model	SUS61212/SUCS61212	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V0.5A		

Input Volt. 12 V  
Cycle 100 mS

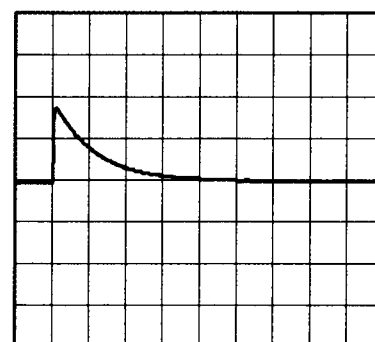


Min. Load (0A)  $\longleftrightarrow$   
Load 100% (0.5A)

200mV/div



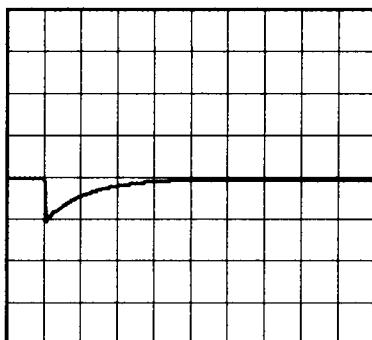
1ms/div



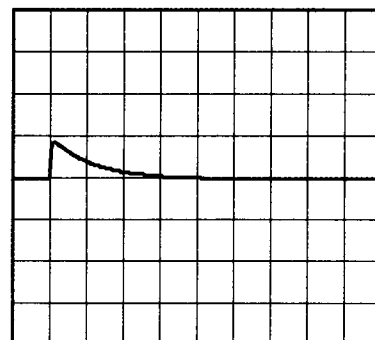
1ms/div

Min. Load (0A)  $\longleftrightarrow$   
Load 50% (0.25A)

200mV/div



1ms/div



1ms/div

Load 50% (0.25A)  $\longleftrightarrow$   
Load 100% (0.5A)

200mV/div



1ms/div



1ms/div

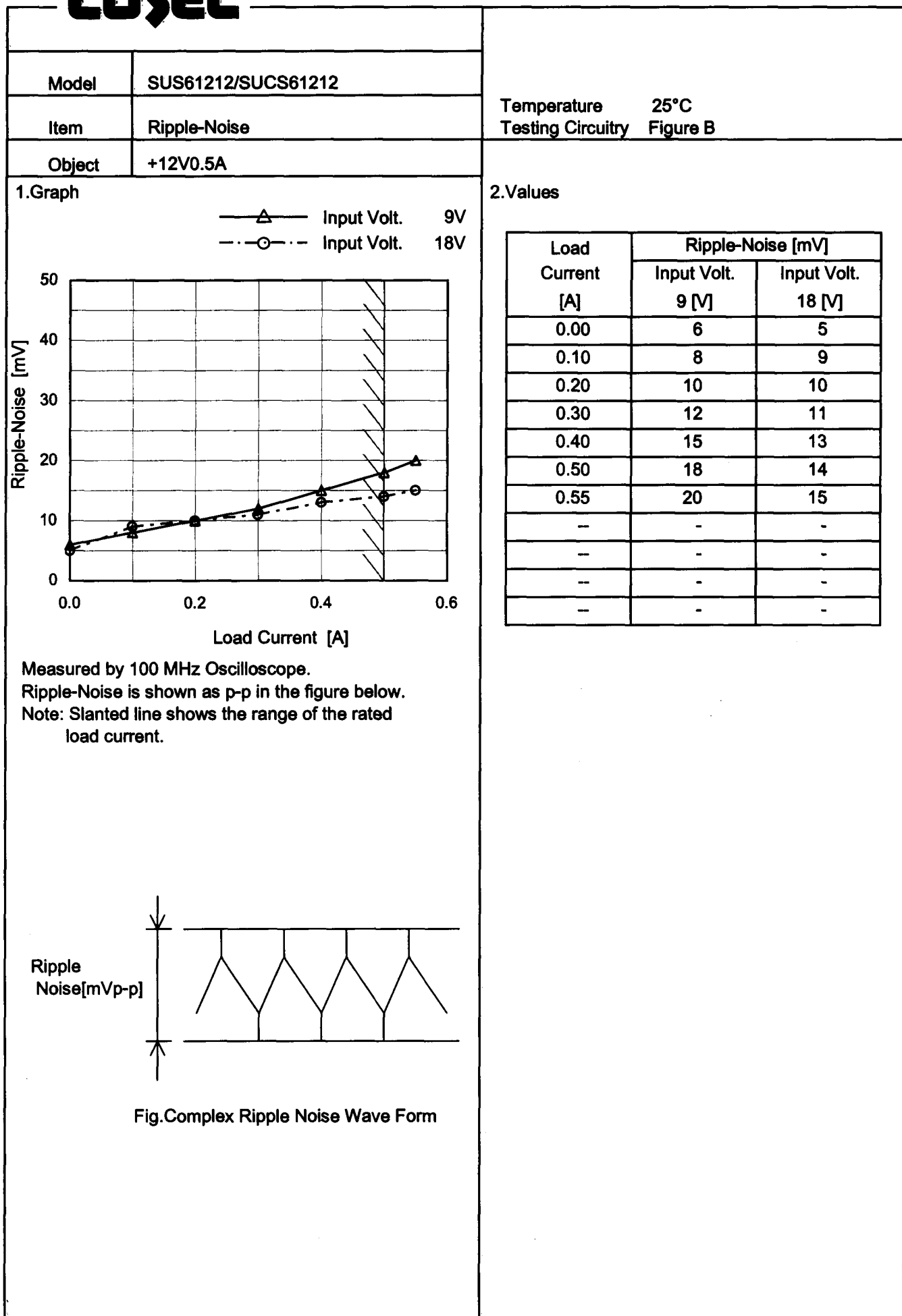
# COSEL

Model	SUS61212/SUCS61212	Temperature 25°C Testing Circuitry Figure B																																							
Item	Ripple Voltage (by Load Current)																																								
Object	+12V0.5A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt.</div><div>9V</div></div><div><div>- - -○- - -</div><div>Input Volt.</div><div>18V</div></div></div> <div><div>Ripple Voltage [mV]</div><div>50</div><div>40</div><div>30</div><div>20</div><div>10</div><div>0</div><div>0.0</div><div>0.2</div><div>0.4</div><div>0.6</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. 9 [V]</th><th>Input Volt. 18 [V]</th></tr><tr><td>0.00</td><td>4</td><td>4</td></tr><tr><td>0.10</td><td>4</td><td>4</td></tr><tr><td>0.20</td><td>4</td><td>4</td></tr><tr><td>0.30</td><td>4</td><td>4</td></tr><tr><td>0.40</td><td>4</td><td>4</td></tr><tr><td>0.50</td><td>5</td><td>4</td></tr><tr><td>0.55</td><td>6</td><td>4</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. 9 [V]	Input Volt. 18 [V]	0.00	4	4	0.10	4	4	0.20	4	4	0.30	4	4	0.40	4	4	0.50	5	4	0.55	6	4	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 9 [V]	Input Volt. 18 [V]																																							
0.00	4	4																																							
0.10	4	4																																							
0.20	4	4																																							
0.30	4	4																																							
0.40	4	4																																							
0.50	5	4																																							
0.55	6	4																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
--	-	-																																							
<p>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.</p>																																									
<div><div>Ripple [mVp-p]</div><div>Fig.Complex Ripple Wave Form</div></div>																																									

- 9 -

BC-3702

# COSEL









		Testing Circuitry Figure A
Model	SUS61212/SUCS61212	
Item	Output Voltage Accuracy	
Object	+12V0.5A	

### 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 : 0 - 0.5A

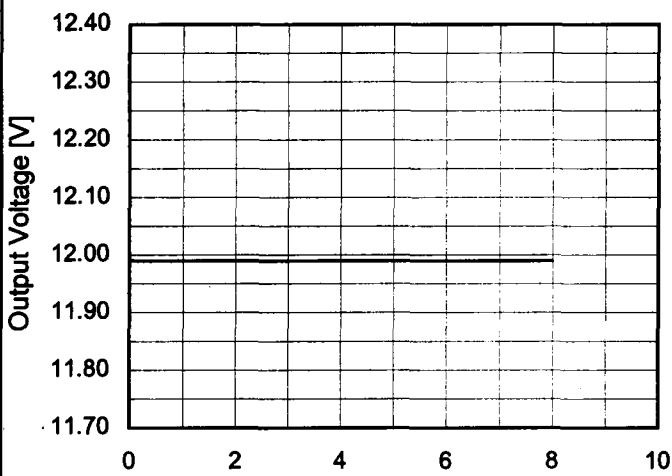
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* 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	25	18	0	11.995	±12	±0.1
Minimum Voltage	-40	9	0.5	11.971		

**COSEL**

Model	SUS61212/SUCS61212																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+12V0.5A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><div><div>12.40</div><div>12.30</div><div>12.20</div><div>12.10</div><div>12.00</div><div>11.90</div><div>11.80</div><div>11.70</div></div><div></div><div><div>0</div><div>2</div><div>4</div><div>6</div><div>8</div><div>10</div></div><div><div>Time [H]</div><div>Input Volt. 12V</div><div>Load 100%</div></div></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>11.992</td></tr><tr><td>0.5</td><td>11.990</td></tr><tr><td>1.0</td><td>11.990</td></tr><tr><td>2.0</td><td>11.990</td></tr><tr><td>3.0</td><td>11.990</td></tr><tr><td>4.0</td><td>11.990</td></tr><tr><td>5.0</td><td>11.990</td></tr><tr><td>6.0</td><td>11.990</td></tr><tr><td>7.0</td><td>11.990</td></tr><tr><td>8.0</td><td>11.990</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	11.992	0.5	11.990	1.0	11.990	2.0	11.990	3.0	11.990	4.0	11.990	5.0	11.990	6.0	11.990	7.0	11.990	8.0	11.990
Time since start [H]	Output Voltage [V]																								
0.0	11.992																								
0.5	11.990																								
1.0	11.990																								
2.0	11.990																								
3.0	11.990																								
4.0	11.990																								
5.0	11.990																								
6.0	11.990																								
7.0	11.990																								
8.0	11.990																								

- 14 -

BC-3702

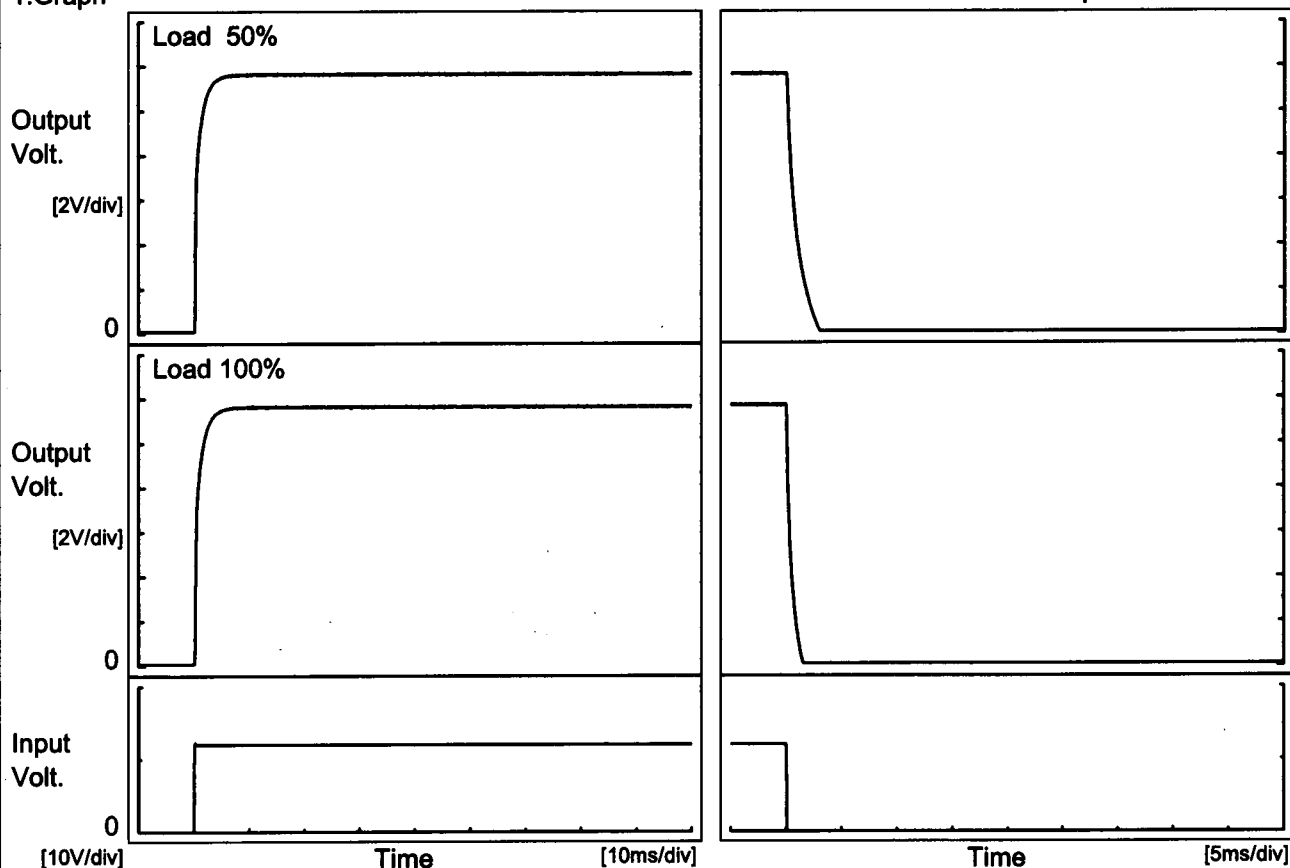


**COSEL**

Model	SUS61212/SUCS61212	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V0.5A		

## 1. Graph

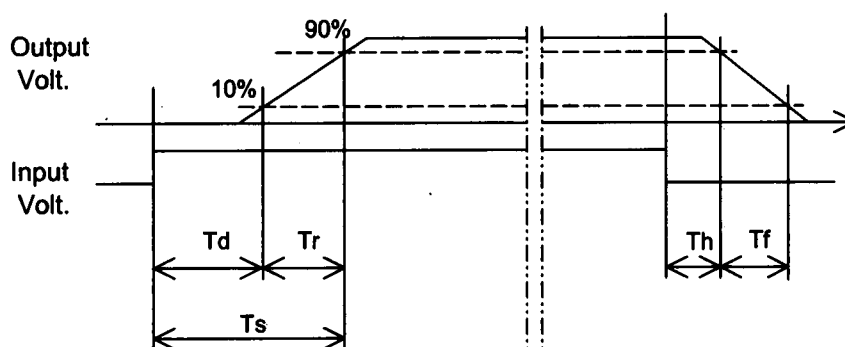
Input Volt. 12 V



## 2. Values

[ms]

Load	Time	Td	Tr	Ts	Th	Tf
50 %		0.2	2.5	2.7	0.1	2.1
100 %		0.2	2.7	2.9	0.1	1.1



# COSEL

Model		SUS61212/SUCS61212	
Item		Minimum Input Voltage for Regulated Output Voltage	
Object		+12V0.5A	
1.Graph		2.Values	

<

BC-3702

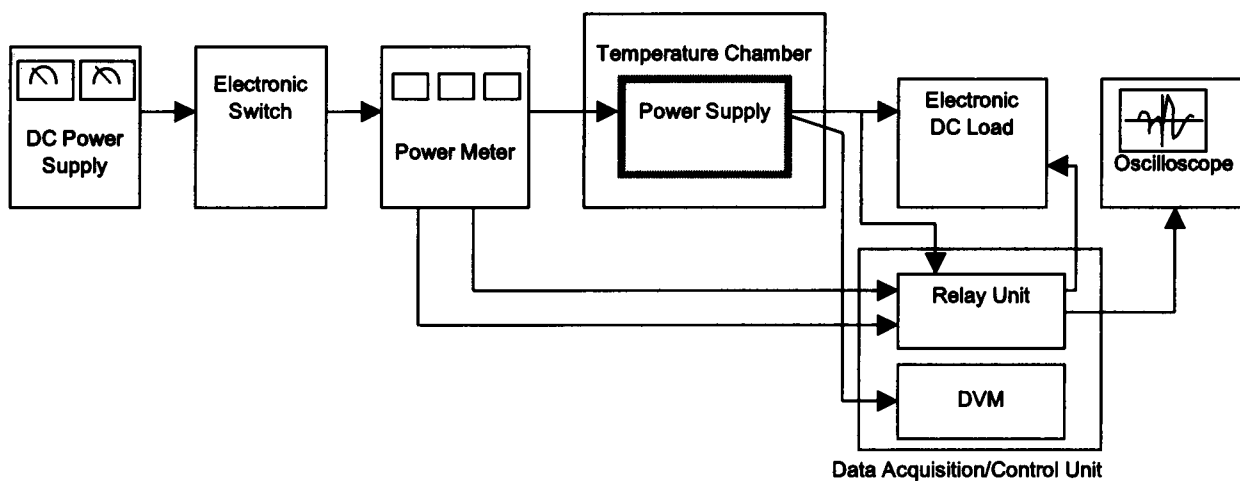


Figure A

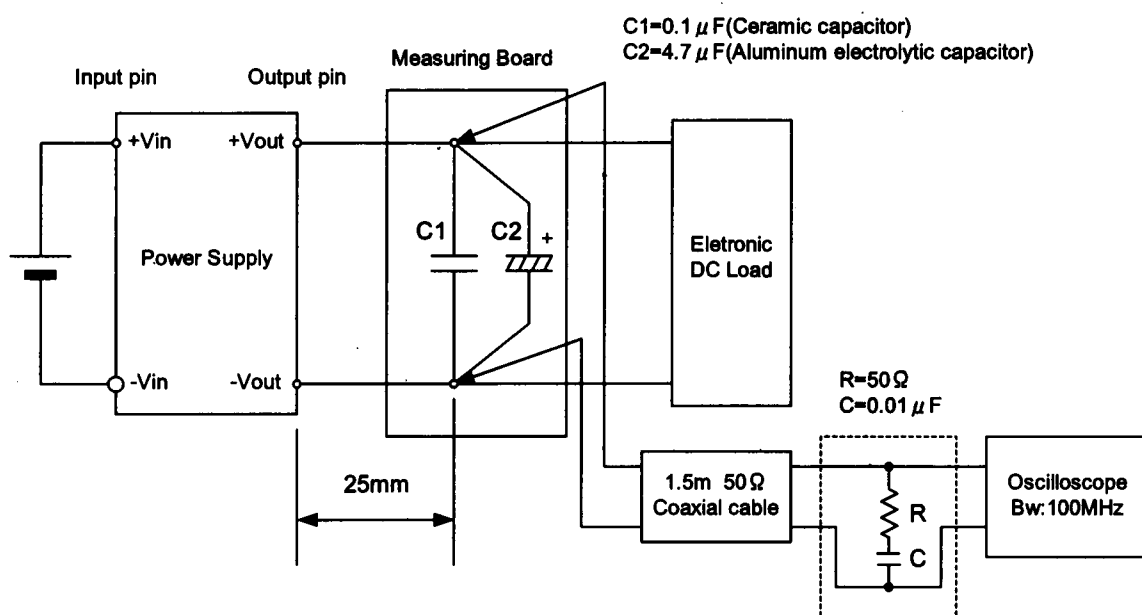


Figure B (Ripple and Ripple noise Characteristic)