

# TEST DATA OF SUCS1R52412

Regulated DC Power Supply  
Sep 17, 2004

Approved by : Tetsuo Sugimori  
Tetsuo Sugimori Design Manager

Prepared by : Masahiro Shima  
Masahiro Shima Design Engineer

**COSEL CO.,LTD.**

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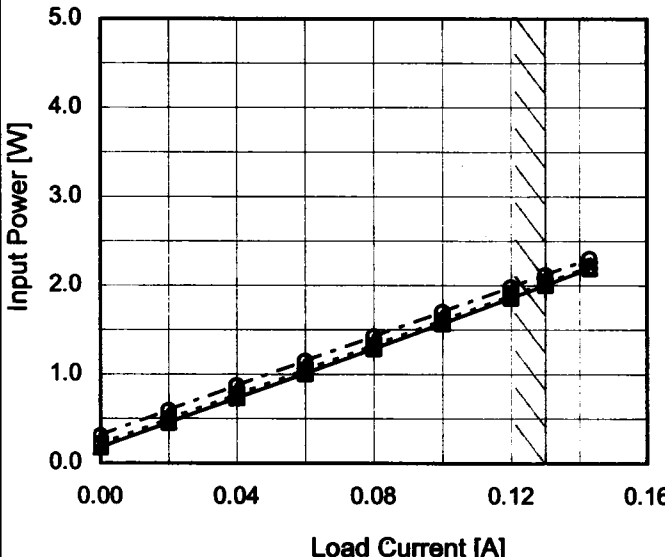
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<div><div><div>—△—</div><div>Load 100%</div></div><div><div>---□---</div><div>Load 50%</div></div><div><div>---○---</div><div>Load 0%</div></div></div> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<table><tr><th rowspan="2">Input 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</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>4.0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr><tr><td>8.0</td><td>0.015</td><td>0.000</td><td>0.000</td></tr><tr><td>10.4</td><td>0.014</td><td>0.168</td><td>0.196</td></tr><tr><td>12.0</td><td>0.011</td><td>0.089</td><td>0.170</td></tr><tr><td>16.0</td><td>0.010</td><td>0.067</td><td>0.125</td></tr><tr><td>18.0</td><td>0.010</td><td>0.060</td><td>0.111</td></tr><tr><td>20.0</td><td>0.009</td><td>0.054</td><td>0.100</td></tr><tr><td>24.0</td><td>0.009</td><td>0.046</td><td>0.085</td></tr><tr><td>28.0</td><td>0.008</td><td>0.041</td><td>0.073</td></tr><tr><td>32.0</td><td>0.008</td><td>0.037</td><td>0.065</td></tr><tr><td>36.0</td><td>0.009</td><td>0.034</td><td>0.059</td></tr><tr><td>40.0</td><td>0.009</td><td>0.032</td><td>0.054</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	0.000	0.000	0.000	4.0	0.000	0.000	0.000	8.0	0.015	0.000	0.000	10.4	0.014	0.168	0.196	12.0	0.011	0.089	0.170	16.0	0.010	0.067	0.125	18.0	0.010	0.060	0.111	20.0	0.009	0.054	0.100	24.0	0.009	0.046	0.085	28.0	0.008	0.041	0.073	32.0	0.008	0.037	0.065	36.0	0.009	0.034	0.059	40.0	0.009	0.032	0.054	—	-	-	-	—	-	-	-	—	-	-	-
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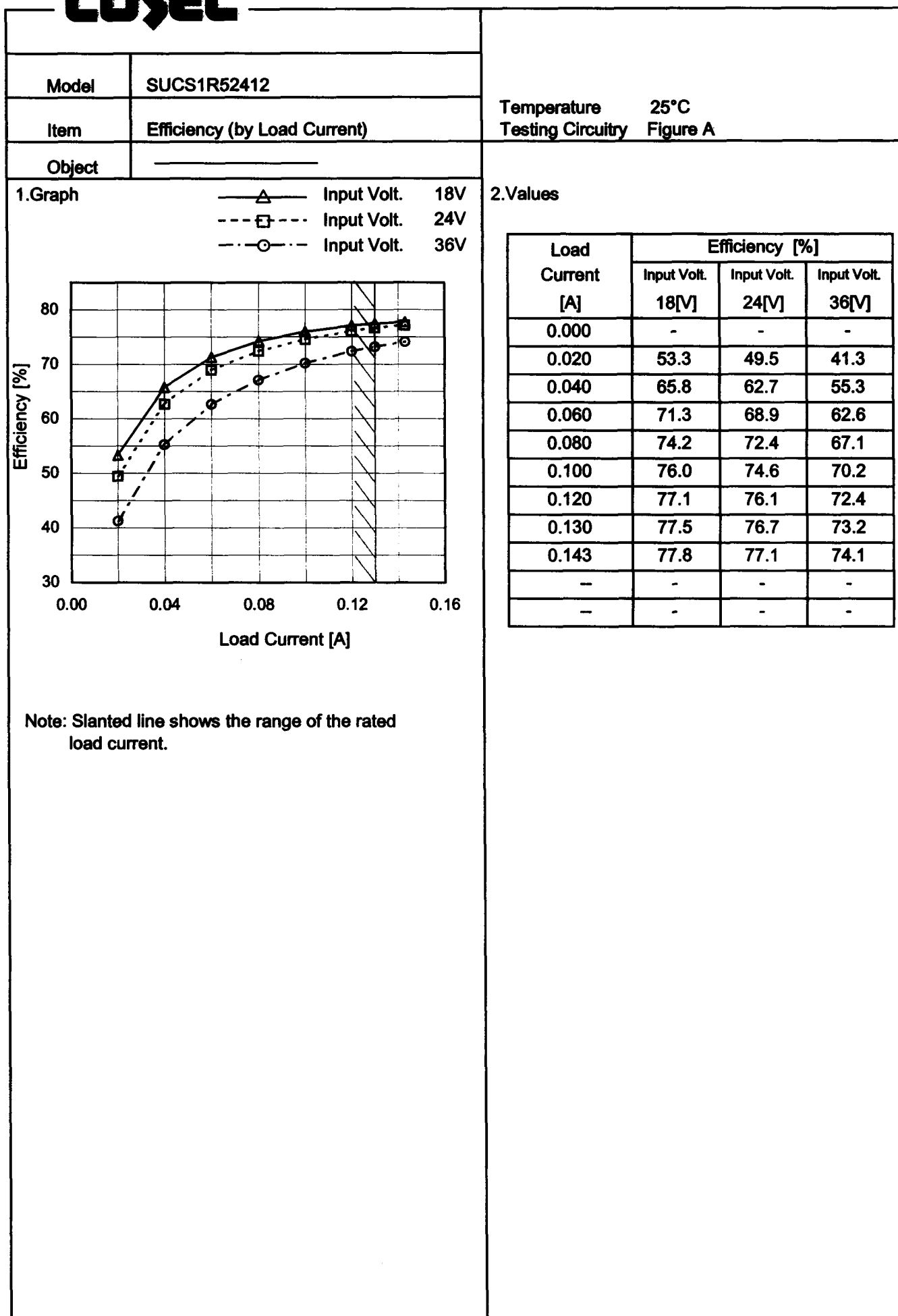
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<div><div><div>—△—</div><div>Input Volt.</div><div>18V</div></div><div><div>---□---</div><div>Input Volt.</div><div>24V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>36V</div></div></div>  <div>Note: Slanted line shows the range of the rated load current.</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Power [W]</th></tr><tr><th>Input Volt. 18[V]</th><th>Input Volt. 24[V]</th><th>Input Volt. 36[V]</th></tr><tr><td>0.000</td><td>0.18</td><td>0.21</td><td>0.31</td></tr><tr><td>0.020</td><td>0.46</td><td>0.49</td><td>0.59</td></tr><tr><td>0.040</td><td>0.73</td><td>0.77</td><td>0.87</td></tr><tr><td>0.060</td><td>1.01</td><td>1.05</td><td>1.15</td></tr><tr><td>0.080</td><td>1.29</td><td>1.32</td><td>1.43</td></tr><tr><td>0.100</td><td>1.57</td><td>1.60</td><td>1.70</td></tr><tr><td>0.120</td><td>1.86</td><td>1.89</td><td>1.98</td></tr><tr><td>0.130</td><td>2.01</td><td>2.03</td><td>2.12</td></tr><tr><td>0.143</td><td>2.20</td><td>2.21</td><td>2.30</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]	Input Power [W]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0.000	0.18	0.21	0.31	0.020	0.46	0.49	0.59	0.040	0.73	0.77	0.87	0.060	1.01	1.05	1.15	0.080	1.29	1.32	1.43	0.100	1.57	1.60	1.70	0.120	1.86	1.89	1.98	0.130	2.01	2.03	2.12	0.143	2.20	2.21	2.30	—	-	-	-	--	-	-	-
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Object	+12V0.13A	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>11.935</td><td>11.934</td></tr><tr><td>18</td><td>11.936</td><td>11.934</td></tr><tr><td>20</td><td>11.936</td><td>11.934</td></tr><tr><td>24</td><td>11.936</td><td>11.933</td></tr><tr><td>30</td><td>11.936</td><td>11.933</td></tr><tr><td>36</td><td>11.936</td><td>11.933</td></tr><tr><td>40</td><td>11.936</td><td>11.933</td></tr><tr><td>—</td><td>-</td><td>-</td></tr><tr><td>—</td><td>-</td><td>-</td></tr></tbody></table> <p>Note: Slanted line shows the range of the rated input voltage.</p>		Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%	16	11.935	11.934	18	11.936	11.934	20	11.936	11.934	24	11.936	11.933	30	11.936	11.933	36	11.936	11.933	40	11.936	11.933	—	-	-	—	-	-		
Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%																															
16	11.935	11.934																															
18	11.936	11.934																															
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24	11.936	11.933																															
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36	11.936	11.933																															
40	11.936	11.933																															
—	-	-																															
—	-	-																															

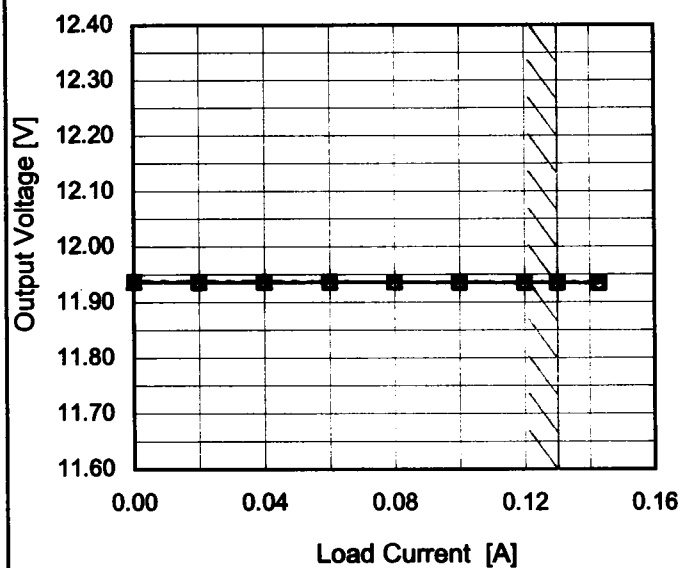


# COSEL

Model	SUCS1R52412
Item	Load Regulation
Object	+12V0.13A

1.Graph

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



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

Temperature 25°C  
 Testing Circuitry Figure A

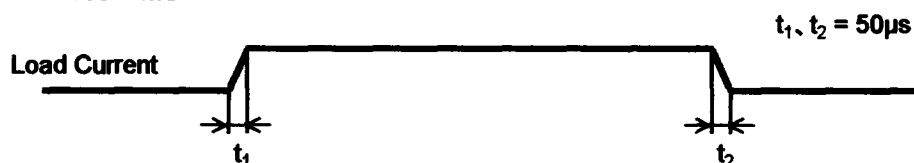
## 2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	11.937	11.937	11.938
0.020	11.936	11.937	11.937
0.040	11.936	11.937	11.937
0.060	11.936	11.937	11.937
0.080	11.936	11.936	11.936
0.100	11.936	11.936	11.936
0.120	11.935	11.936	11.935
0.130	11.935	11.935	11.935
0.143	11.935	11.935	11.934
—	—	—	—
—	—	—	—

# COSEL

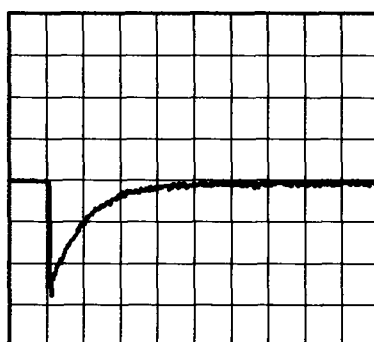
Model	SUCS1R52412	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V0.13A		

Input Volt. 24 V  
Cycle 100 mS

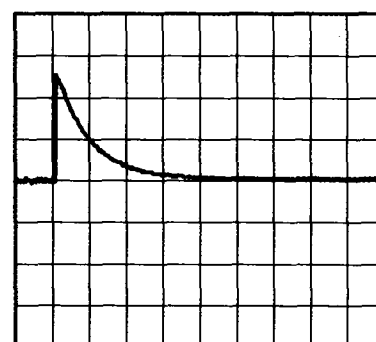


Min. Load (0A)  $\longleftrightarrow$   
Load 100% (0.13A)

100mV/div



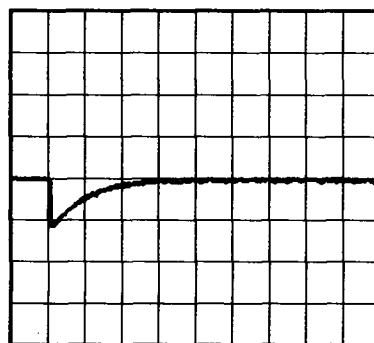
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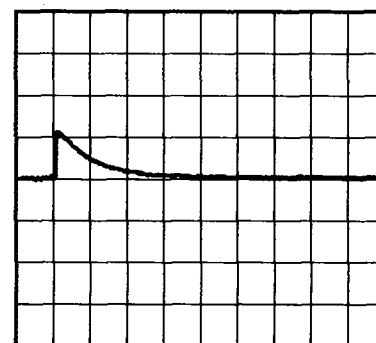
2ms/div

Min. Load (0A)  $\longleftrightarrow$   
Load 50% (0.065A)

100mV/div



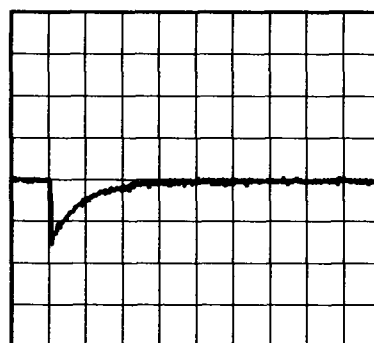
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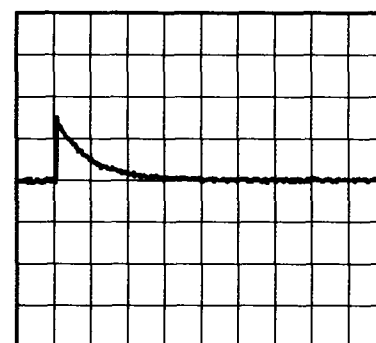
2ms/div

Load 50% (0.065A)  $\longleftrightarrow$   
Load 100% (0.13A)

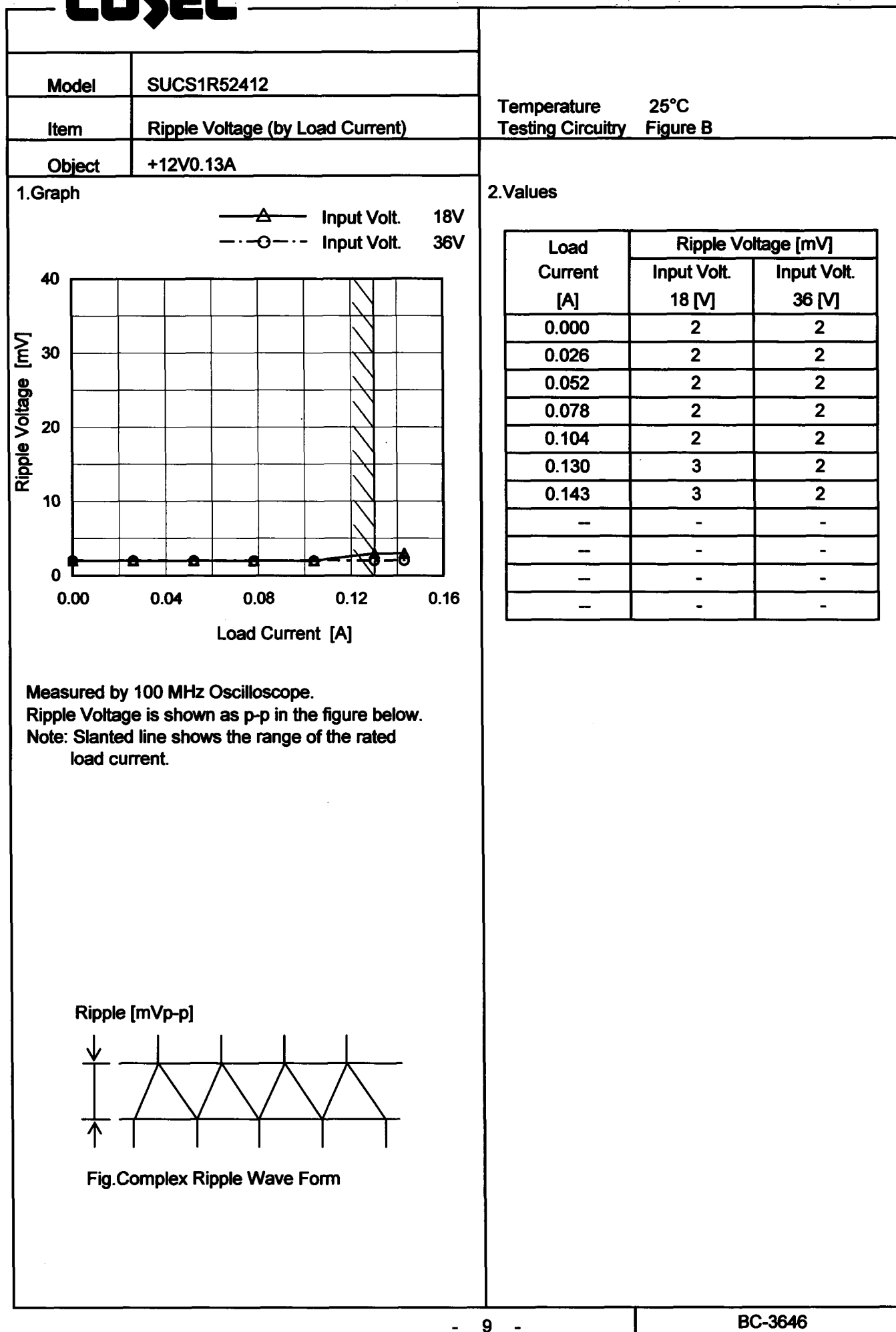
100mV/div



2ms/div



2ms/div

**COSEL**

**COSEL**

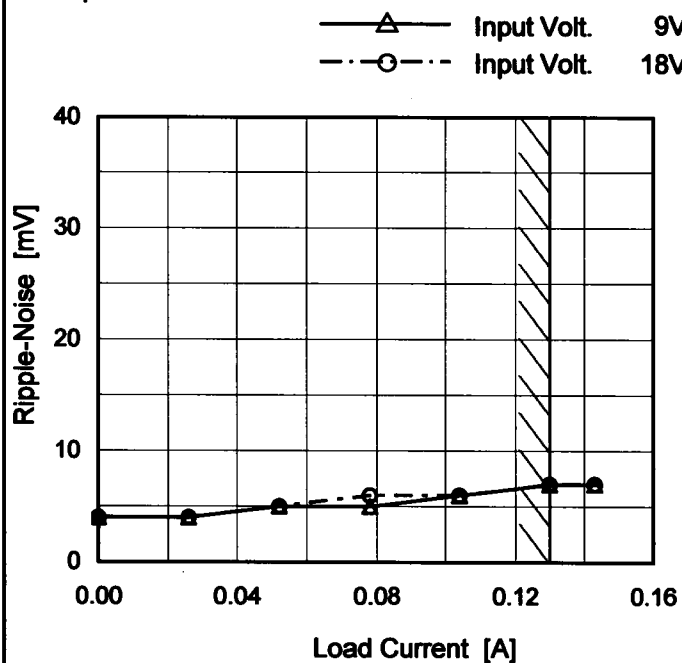
Model SUCS1R52412

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.

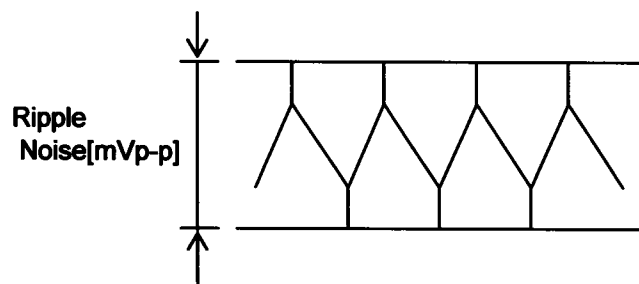
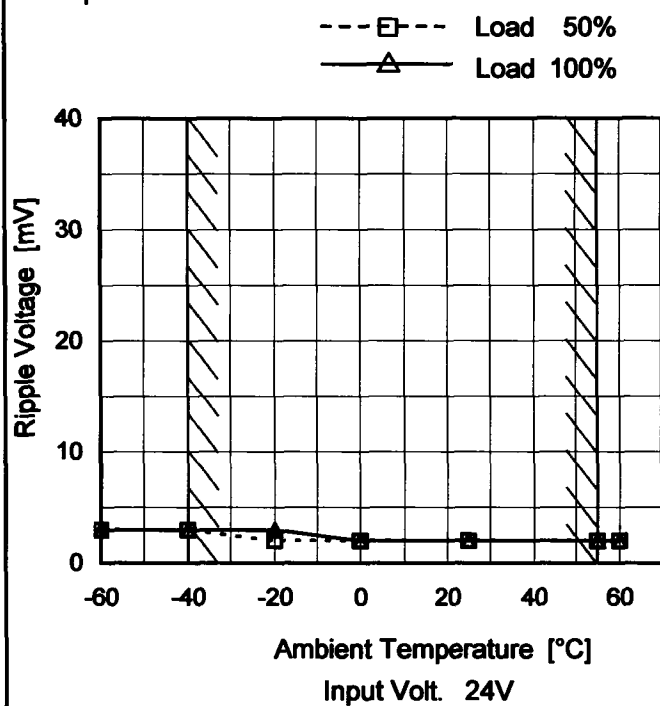


Fig.Complex Ripple Noise Wave Form

## 2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 18 [V]
0.000	4	4
0.026	4	4
0.052	5	5
0.078	5	6
0.104	6	6
0.130	7	7
0.143	7	7
—	—	—
—	—	—
—	—	—
—	—	—

**COSEL****Model** SUCS1R52412**Item** Ripple Voltage (by Ambient Temp.)**Object** +12V0.13A**Testing Circuitry** Figure B**1. Graph**

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	3	3
-40	3	3
-20	2	3
0	2	2
25	2	2
55	2	2
60	2	2
--	-	-
--	-	-
--	-	-
--	-	-

### Testing Circuitry Figure A



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

**COSEL**

		Testing Circuitry Figure A
Model	SUCS1R52412	
Item	Output Voltage Accuracy	
Object	+12V0.13A	

### 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 - 0.13A

\* 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	-20	36	0	11.946	±16	±0.1
Minimum Voltage	55	36	0.13	11.914		

**COSEL**

Model		SUCS1R52412	
Item		Time Lapse Drift	
Object		+12V0.13A	

1.Graph

Output Voltage [V]

12.40

12.30

12.20

12.10

12.00

11.90

11.80

11.70

11.60

0

2

4

6

8

10

Time [H]

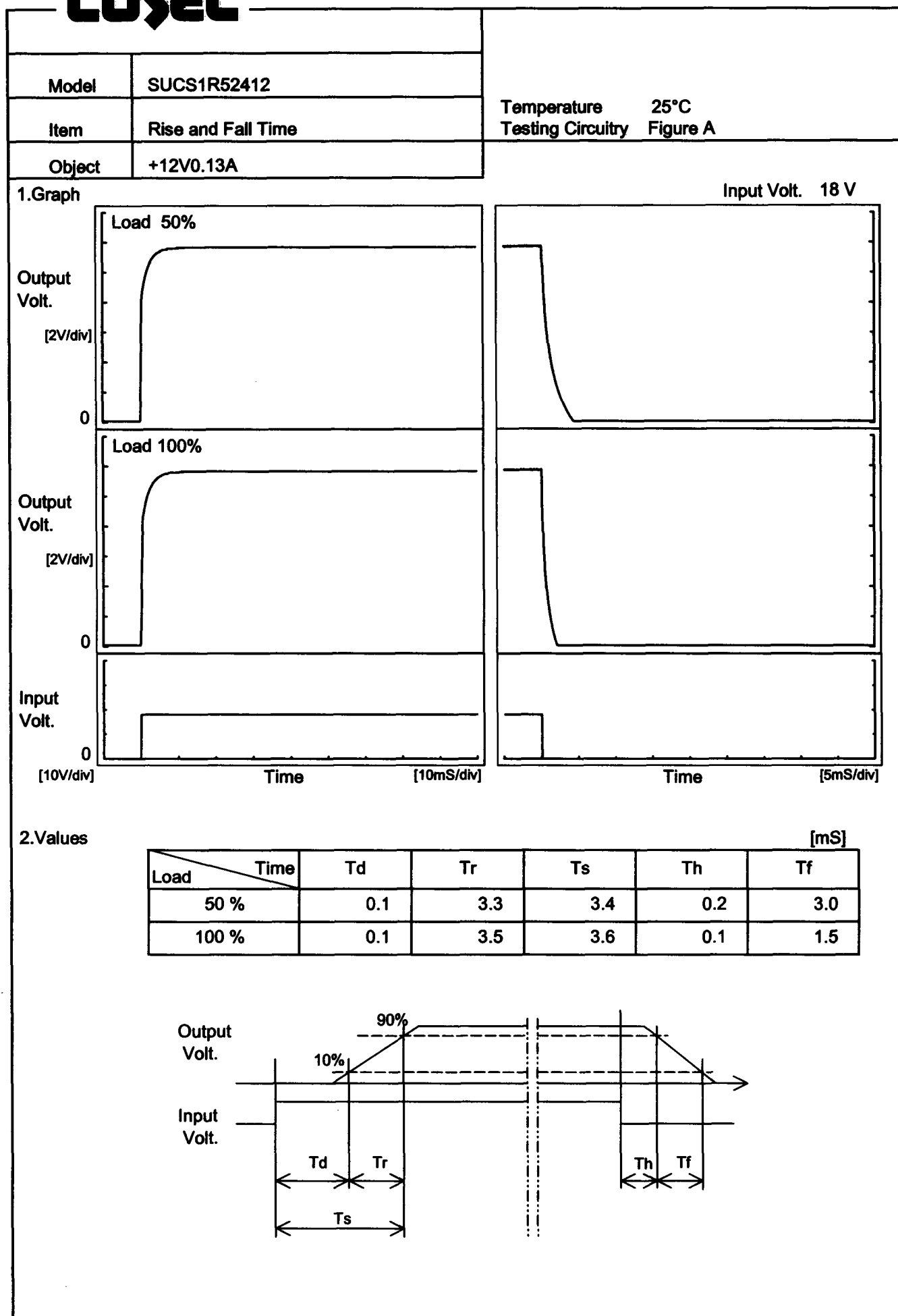
Input Volt. 24V

Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	11.942
0.5	11.935
1.0	11.935
2.0	11.934
3.0	11.934
4.0	11.934
5.0	11.937
6.0	11.938
7.0	11.939
8.0	11.938

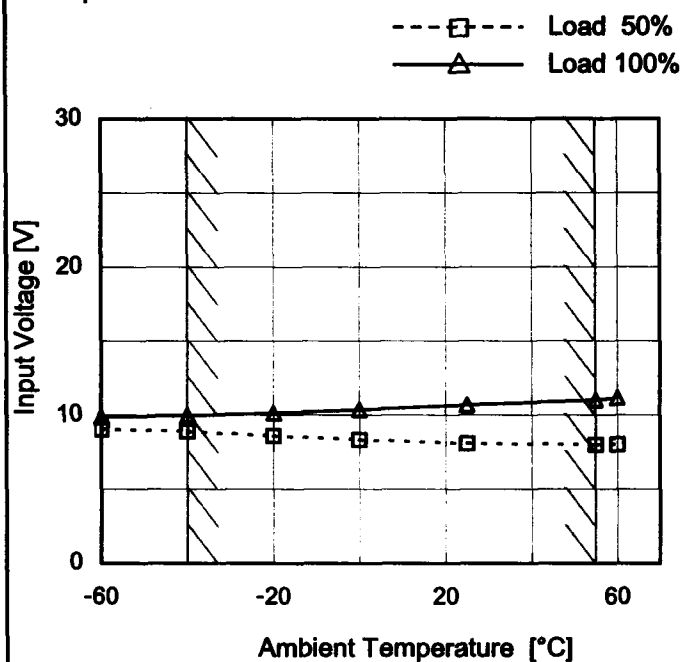


**COSEL**

# COSEL

Model	SUCS1R52412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.13A

## 1. Graph

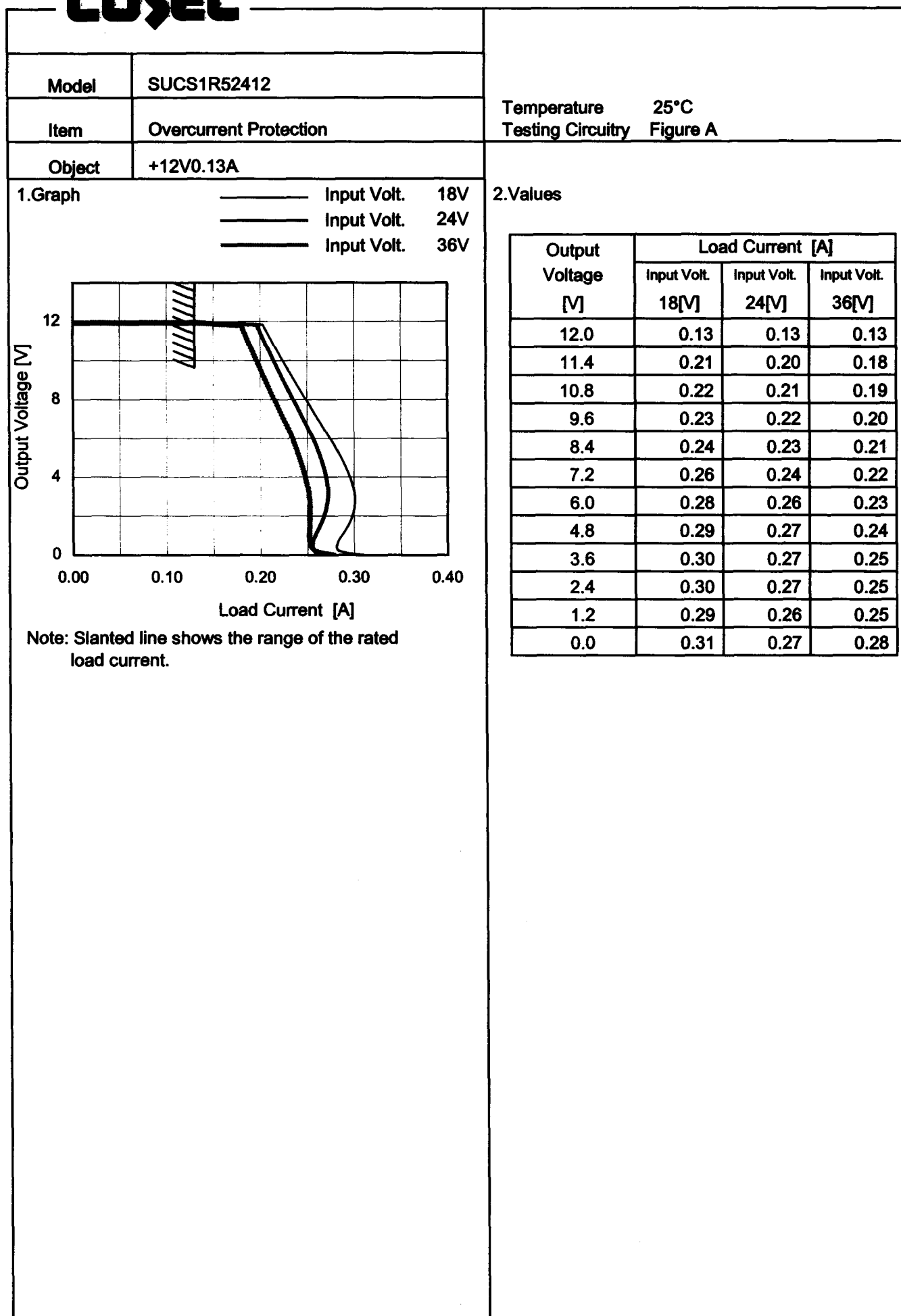


Note: Slanted line shows the range of the rated ambient temperature.

## Testing Circuitry Figure A

## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	9.1	9.9
-40	8.9	10.0
-20	8.6	10.2
0	8.4	10.4
25	8.1	10.7
55	8.0	11.1
60	8.1	11.2
-	-	-
-	-	-
-	-	-
-	-	-

**COSEL**

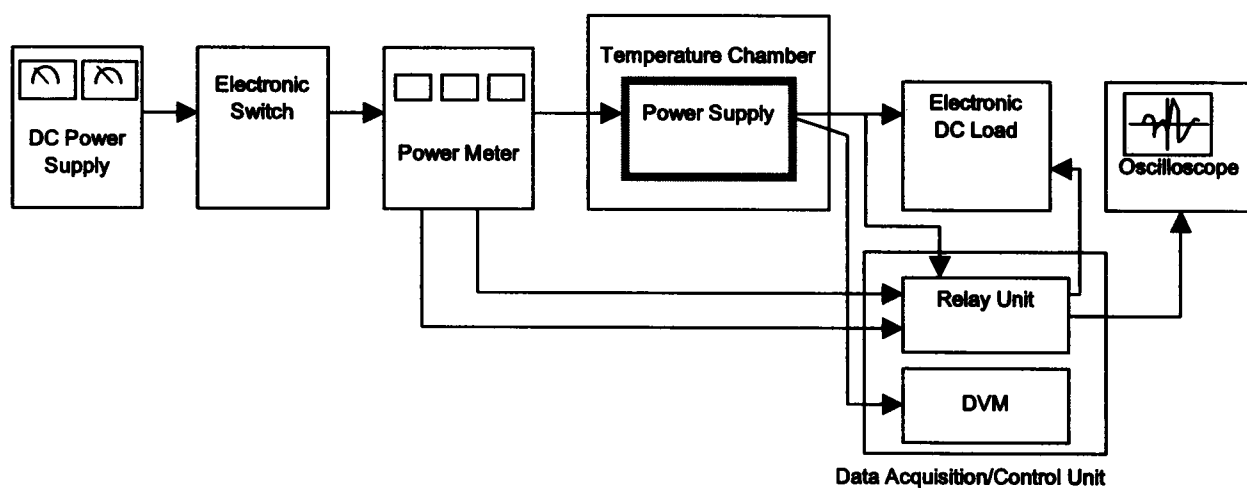


Figure A

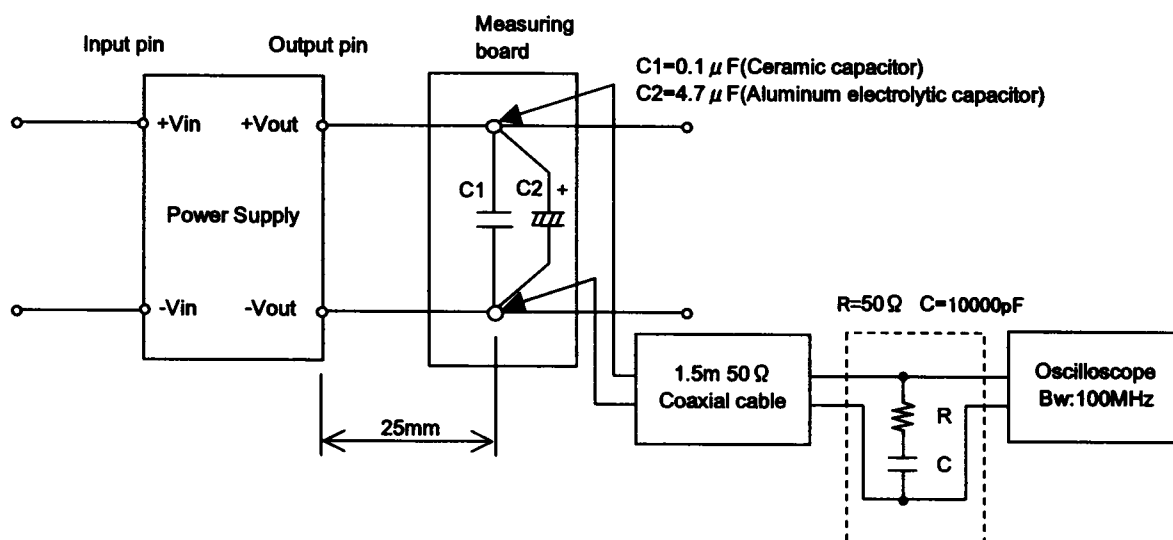


Figure B (Ripple and Ripple noise Characteristic)