

TEST DATA OF SUCW1R52412

Regulated DC Power Supply
Sep 28, 2004

Approved by : Tetsuo Sugimori
Tetsuo Sugimori Design Manager

Prepared by : Masahiro Shima
Masahiro Shima Design Engineer

COSEL CO.,LTD.

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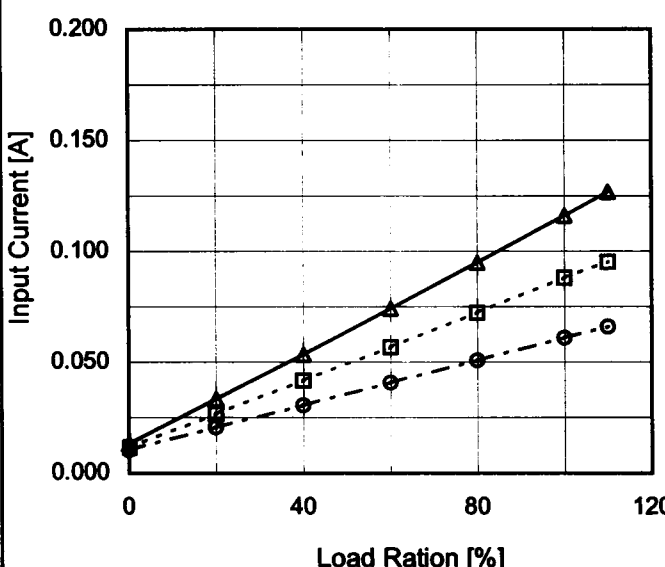
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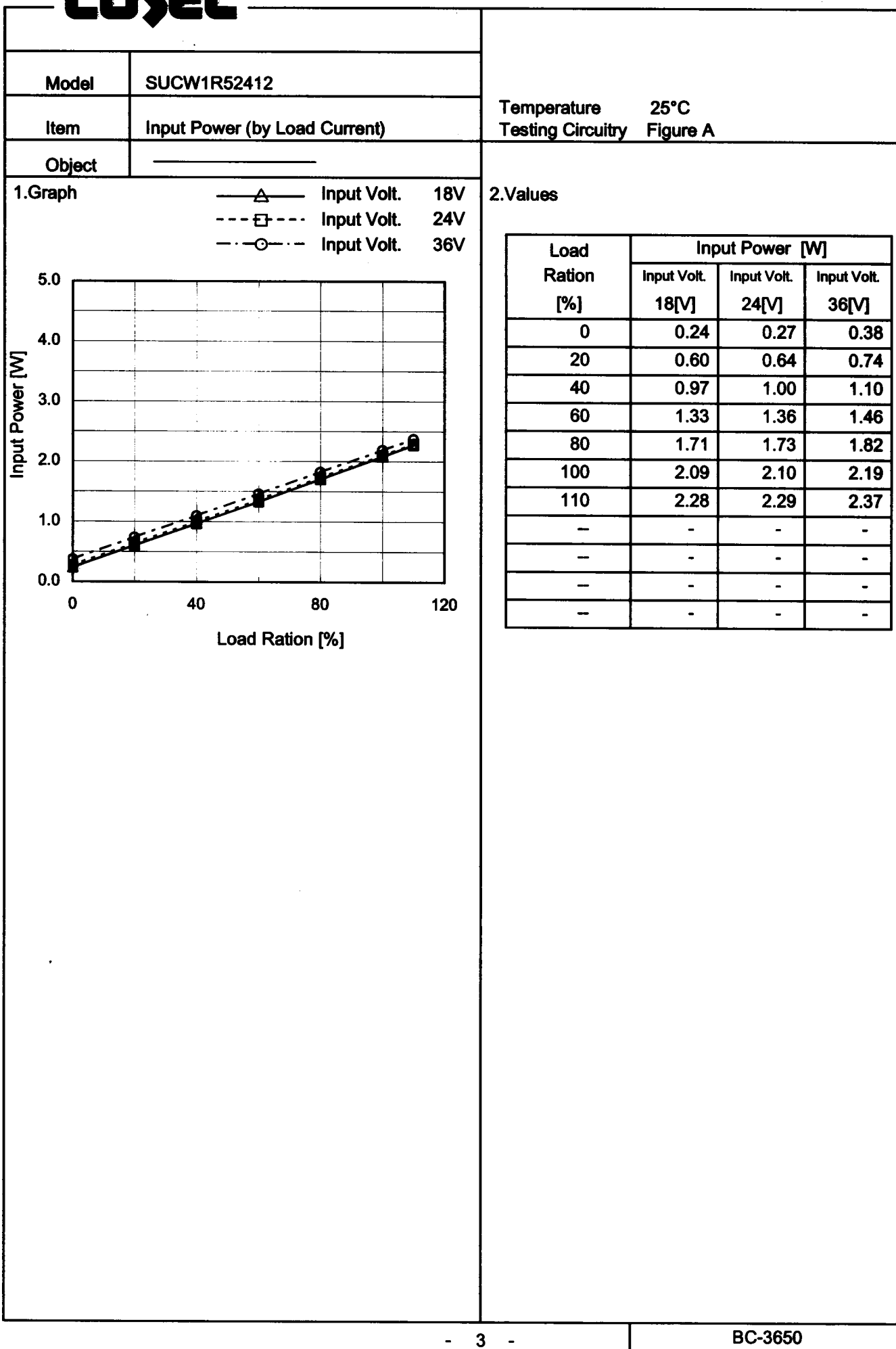
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Model

SUCW1R52412

Item

Efficiency (by Input Voltage)

Object

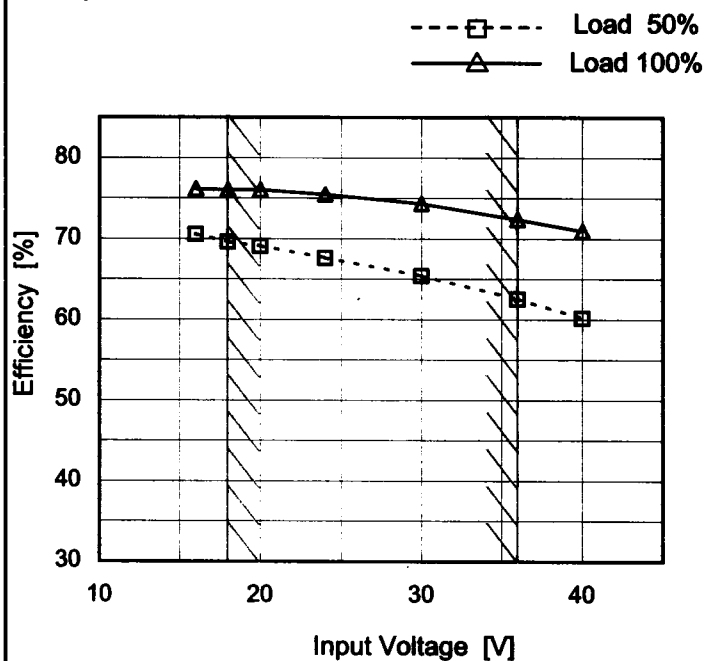
Temperature

25°C

Testing Circuitry

Figure A

1. Graph

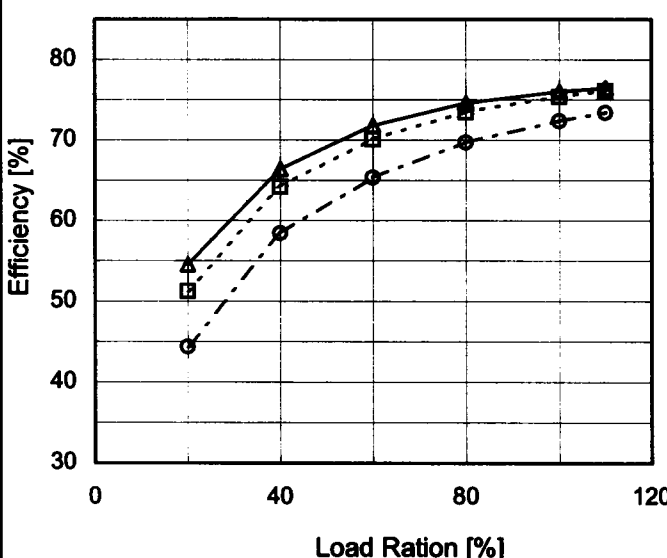


Note: Slanted line shows the range of the rated input voltage.

2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
16	70.5	76.1
18	69.6	76.0
20	69.1	76.0
24	67.6	75.5
30	65.4	74.3
36	62.6	72.4
40	60.2	71.0
—	—	—
—	—	—

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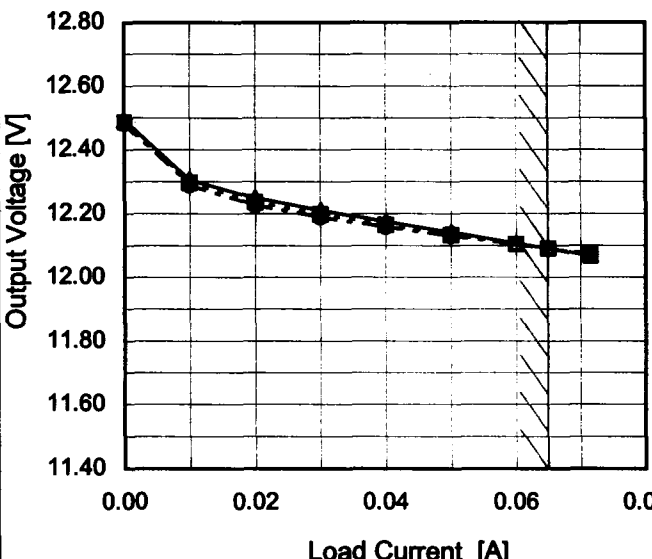
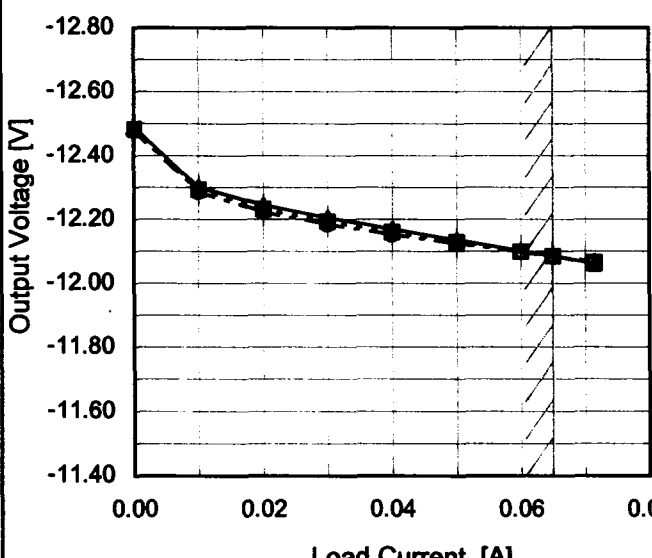
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BC-3650

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0.072	-12.062	-12.066	-12.068																																																					
—	-	-	-																																																					
—	-	-	-																																																					
Note: Slanted line shows the range of the rated load current.																																																								

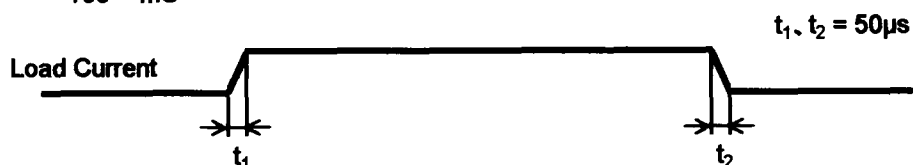
-7-

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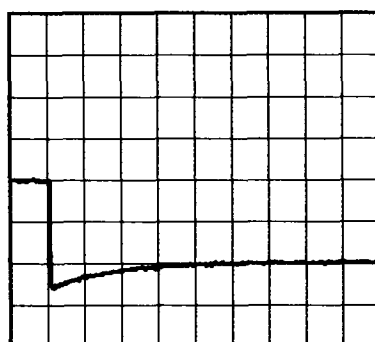
Model	SUCW1R52412	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V0.065A		

Input Volt. 24 V
Cycle 100 mS

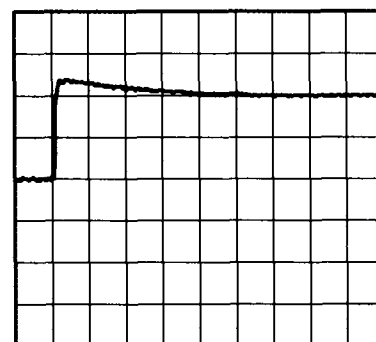


Min. Load (0A) \longleftrightarrow
Load 100% (0.065A)

200mV/div



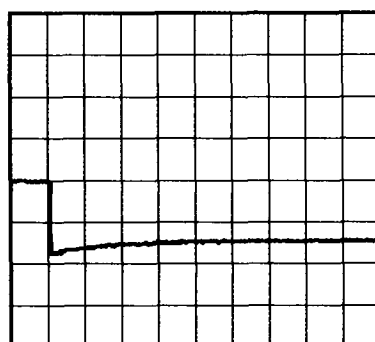
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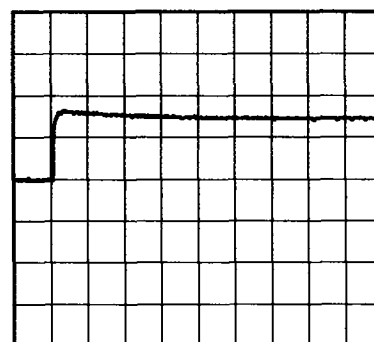
2ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.0325A)

200mV/div



2ms/div



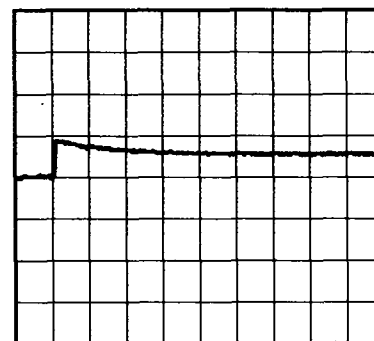
2ms/div

Load 50% (0.0325A) \longleftrightarrow
Load 100% (0.065A)

200mV/div



2ms/div

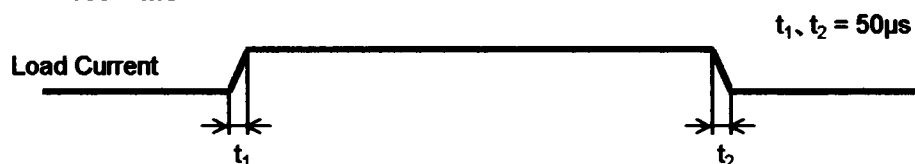


2ms/div

COSEL

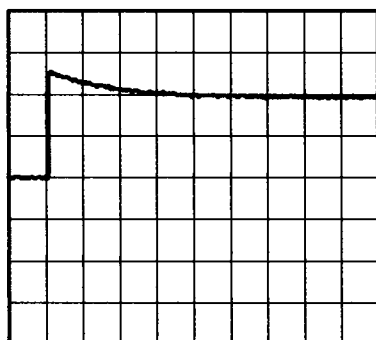
Model	SUCW1R52412	Temperature 25°C Testing Circuitry Figure A	
Item	Dynamic Load Response		
Object	-12V0.065A		

Input Volt. 24 V
Cycle 100 mS



Min. Load (0A) \longleftrightarrow
Load 100% (0.065A)

200mV/div



2ms/div



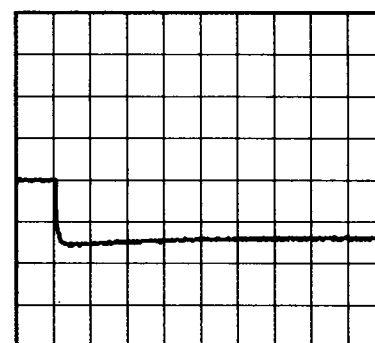
2ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.0325A)

200mV/div



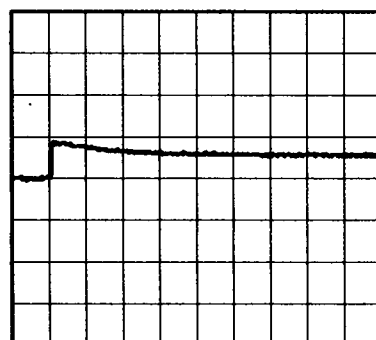
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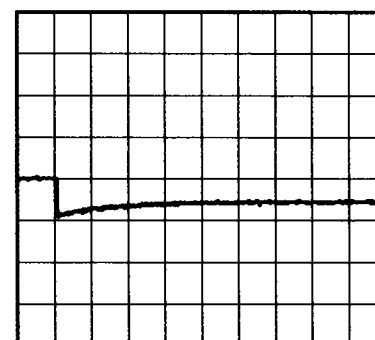
2ms/div

Load 50% (0.0325A) \longleftrightarrow
Load 100% (0.065A)

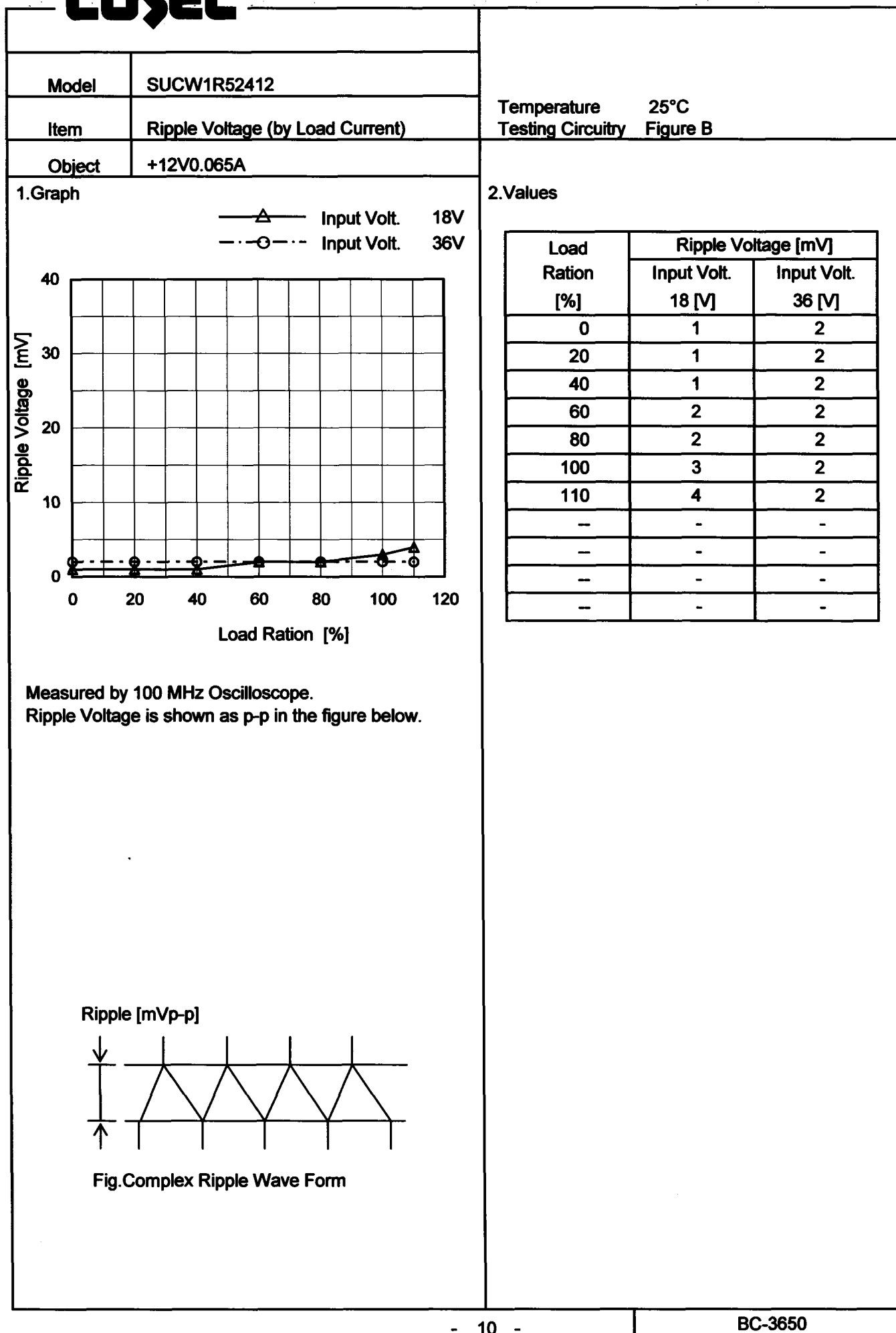
200mV/div



2ms/div



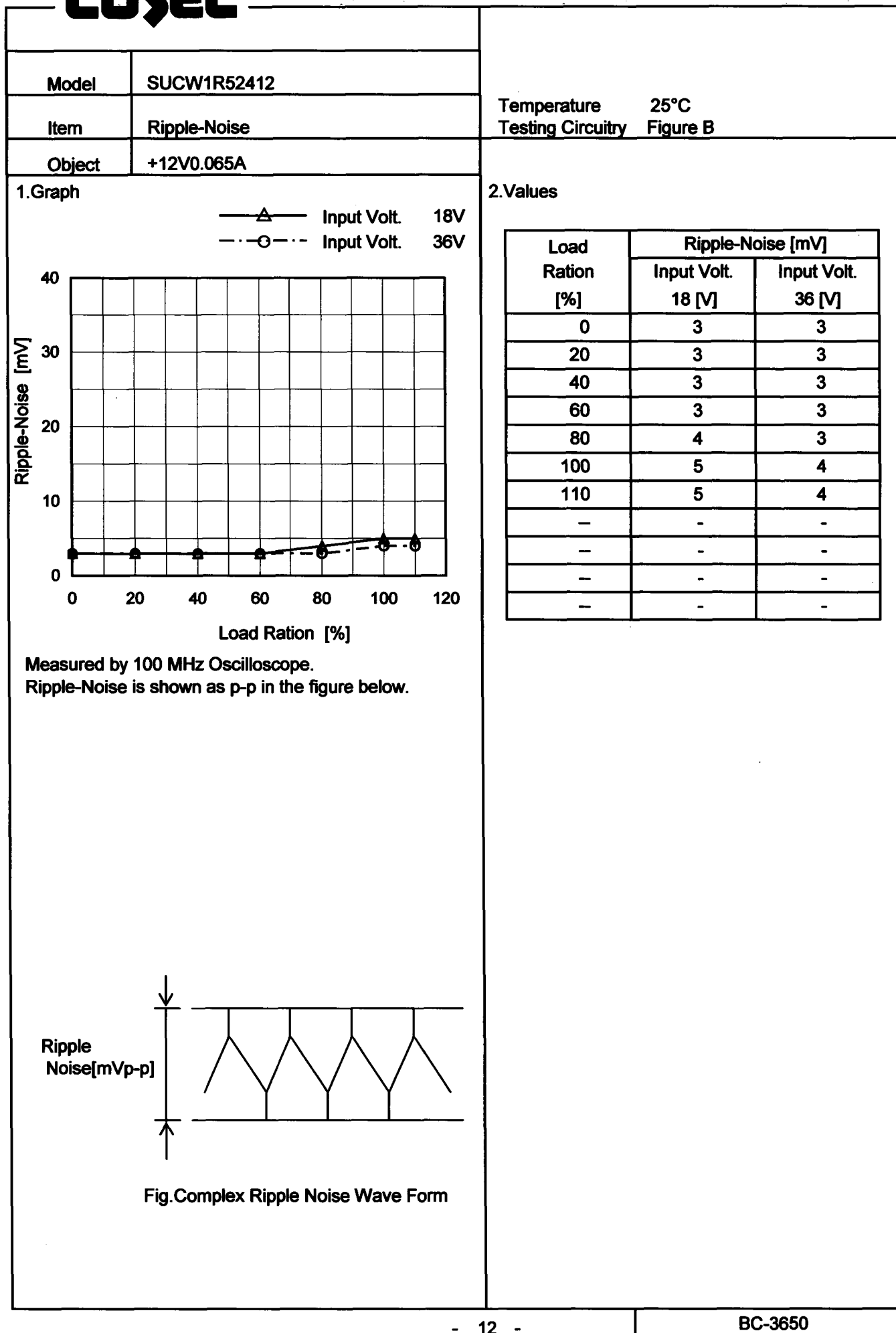
2ms/div

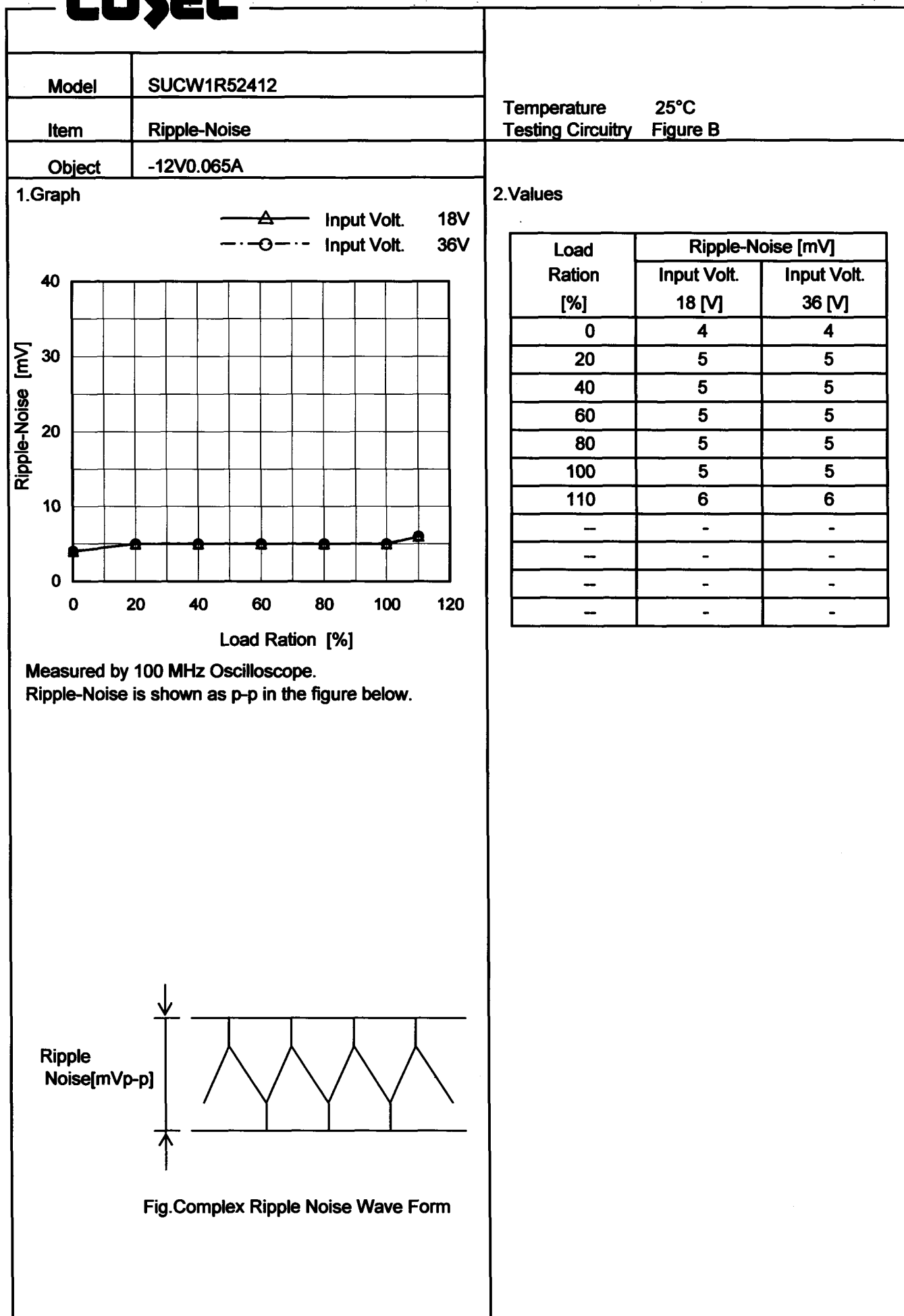
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Model	SUCW1R52412	Temperature25°C Testing CircuitryFigure B																																							
Item	Ripple Voltage (by Load Current)																																								
Object	-12V0.065A																																								
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt.18V</div></div><div><div>- - -○- - -</div><div>Input Volt.36V</div></div></div> <p>Ripple Voltage [mV]</p> <p>Load Ration [%]</p>		<table><tr><th rowspan="2">Load Ration [%]</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</td><td>2</td><td>2</td></tr><tr><td>20</td><td>2</td><td>3</td></tr><tr><td>40</td><td>2</td><td>3</td></tr><tr><td>60</td><td>2</td><td>3</td></tr><tr><td>80</td><td>2</td><td>3</td></tr><tr><td>100</td><td>3</td><td>3</td></tr><tr><td>110</td><td>4</td><td>3</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 Ration [%]	Ripple Voltage [mV]		Input Volt. 18 [V]	Input Volt. 36 [V]	0	2	2	20	2	3	40	2	3	60	2	3	80	2	3	100	3	3	110	4	3	--	-	-	--	-	-	--	-	-	--	-	-
Load Ration [%]	Ripple Voltage [mV]																																								
	Input Volt. 18 [V]	Input Volt. 36 [V]																																							
0	2	2																																							
20	2	3																																							
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80	2	3																																							
100	3	3																																							
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--	-	-																																							
Measured by 100 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below.																																									
<p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																									

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Model		SUCW1R52412																																					
Item		Ripple Voltage (by Ambient Temp.)																																					
Object		+12V0.065A																																					
1.Graph																																							
<div><div><div><div><div></div><div></div></div><div></div></div><div><div><div></div><div></div></div><div></div></div><div><div><div></div><div></div></div><div></div></div></div><div>Load 50%</div><div>Load 100%</div></div> <div><table><thead><tr><th>Ambient Temperature [°C]</th><th>Load 50% [mV]</th><th>Load 100% [mV]</th></tr></thead><tbody><tr><td>-60</td><td>2</td><td>3</td></tr><tr><td>-40</td><td>2</td><td>3</td></tr><tr><td>-20</td><td>2</td><td>2</td></tr><tr><td>0</td><td>2</td><td>2</td></tr><tr><td>25</td><td>2</td><td>3</td></tr><tr><td>55</td><td>1</td><td>2</td></tr><tr><td>60</td><td>1</td><td>2</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></tbody></table></div> <div>Input Volt. 24V</div>				Ambient Temperature [°C]	Load 50% [mV]	Load 100% [mV]	-60	2	3	-40	2	3	-20	2	2	0	2	2	25	2	3	55	1	2	60	1	2	-	-	-	-	-	-	-	-	-	-	-	-
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Object		-12V0.065A																																					
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Ambient Temperature [°C]	Load 50% [mV]	Load 100% [mV]																																					
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Testing Circuitry		Figure B																																					
2.Values																																							
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Ambient Temperature [°C]		Ripple Voltage [mV]	
		Load 50%	Load 100%
-60		3	2
-40		3	2
-20		2	2
0		2	2
25		2	2
55		2	2
60		2	2
-		-	-
-		-	-
-		-	-
-		-	-

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Model		SUCW1R52412																																																				
Item		Ambient Temperature Drift																																																				
Object		+12V0.065A																																																				
1.Graph		<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> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>		2.Values																																																		
		<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>12.084</td><td>12.084</td><td>12.084</td></tr><tr><td>-40</td><td>12.095</td><td>12.095</td><td>12.095</td></tr><tr><td>-20</td><td>12.100</td><td>12.099</td><td>12.099</td></tr><tr><td>0</td><td>12.099</td><td>12.099</td><td>12.098</td></tr><tr><td>25</td><td>12.091</td><td>12.090</td><td>12.089</td></tr><tr><td>55</td><td>12.074</td><td>12.072</td><td>12.071</td></tr><tr><td>60</td><td>12.069</td><td>12.068</td><td>12.067</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	12.084	12.084	12.084	-40	12.095	12.095	12.095	-20	12.100	12.099	12.099	0	12.099	12.099	12.098	25	12.091	12.090	12.089	55	12.074	12.072	12.071	60	12.069	12.068	12.067	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ambient Temperature [°C]	Output Voltage [V]																																																					
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Object		-12V0.065A																																																				
1.Graph		<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> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>		2.Values																																																		
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Note: Slanted line shows the range of the rated ambient temperature.																																																						

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Model	SUCW1R52412		
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 - 0.065A (AVR 2):0 - 0.065A

* 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

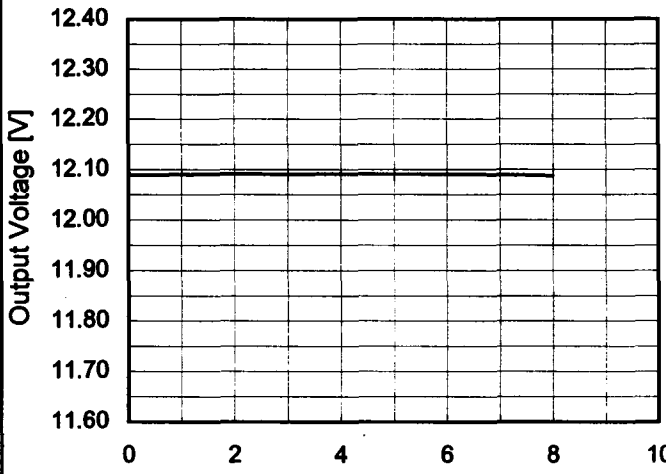
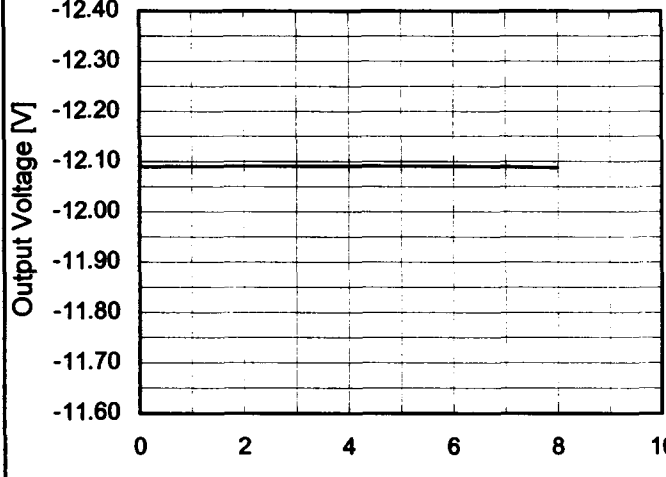
Object	+12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	18	0	12.490	±210	±1.8
Minimum Voltage	55	36	0.065	12.071		

Object	-12V0.065A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	18	0	-12.487	±212	±1.8
Minimum Voltage	55	36	0.065	-12.064		

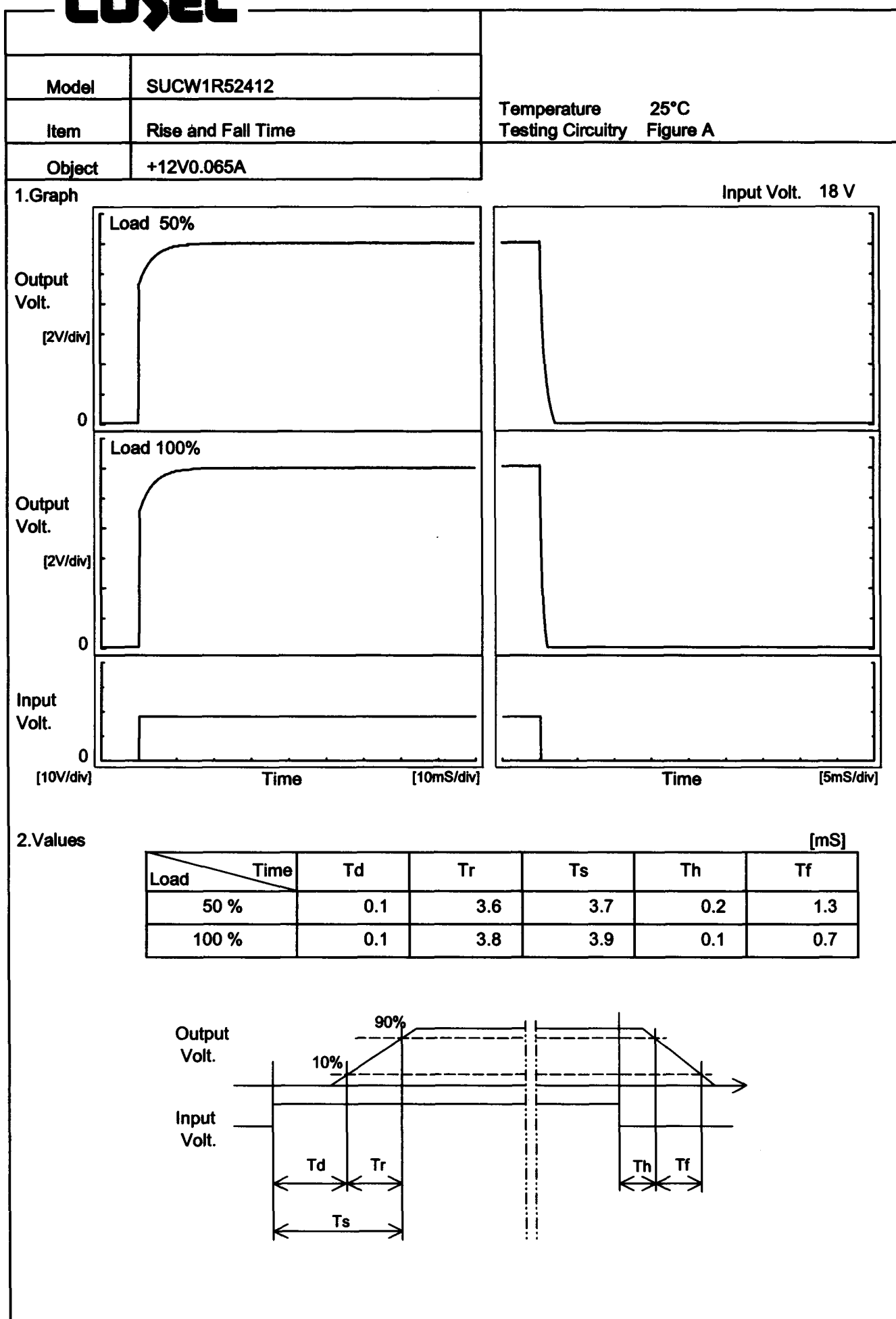
- 16 -

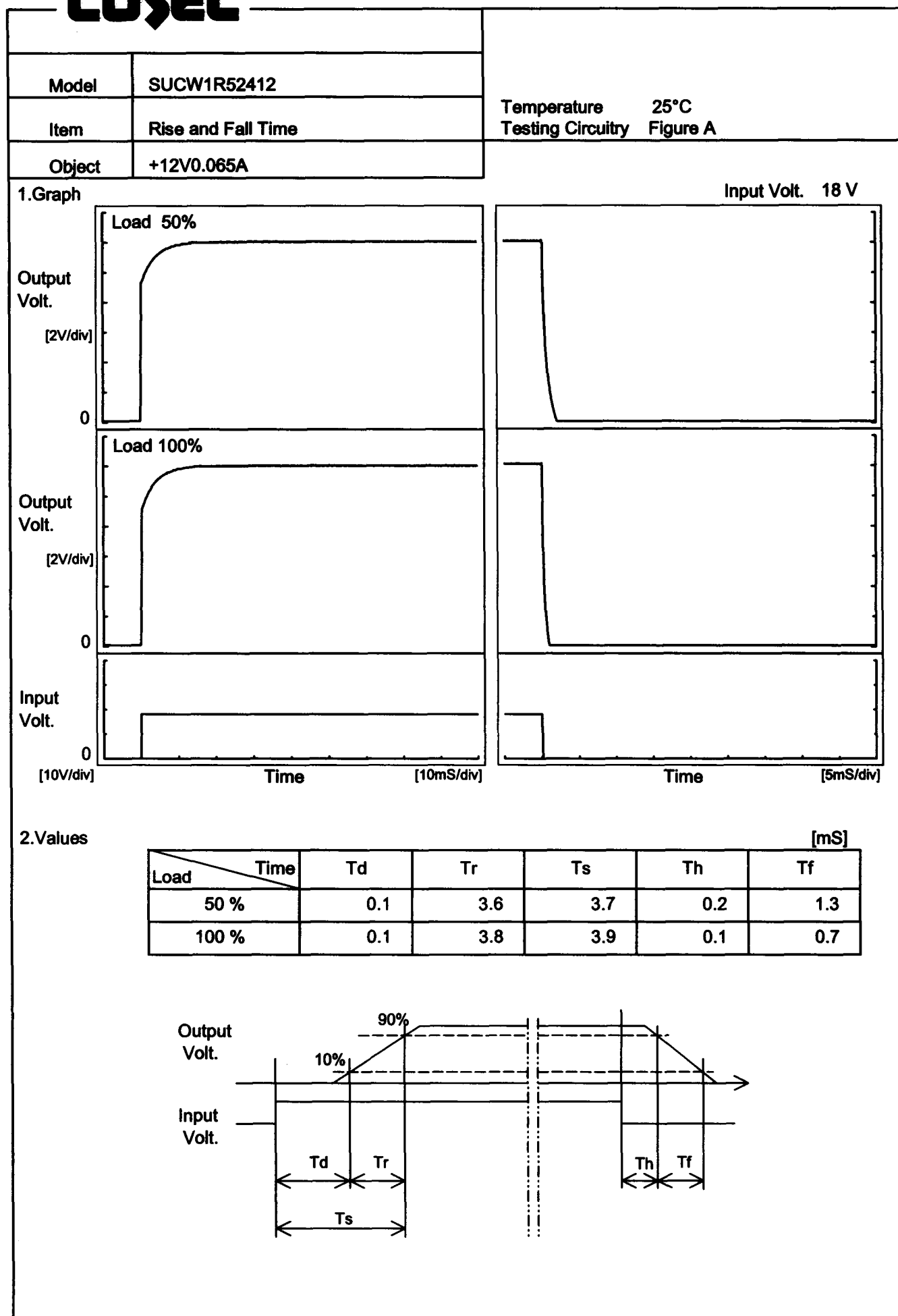
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Model	SUCW1R52412	Temperature 25°C Testing Circuitry Figure A																							
Item	Time Lapse Drift																								
Object	+12V0.065A																								
1.Graph		2.Values																							
<div><div>Output Voltage [V]</div><div></div><div>Time [H]</div></div> <div>Input Volt. 24V Load 100%</div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.095</td></tr><tr><td>0.5</td><td>12.090</td></tr><tr><td>1.0</td><td>12.091</td></tr><tr><td>2.0</td><td>12.092</td></tr><tr><td>3.0</td><td>12.092</td></tr><tr><td>4.0</td><td>12.092</td></tr><tr><td>5.0</td><td>12.092</td></tr><tr><td>6.0</td><td>12.091</td></tr><tr><td>7.0</td><td>12.090</td></tr><tr><td>8.0</td><td>12.088</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.095	0.5	12.090	1.0	12.091	2.0	12.092	3.0	12.092	4.0	12.092	5.0	12.092	6.0	12.091	7.0	12.090	8.0	12.088
Time since start [H]	Output Voltage [V]																								
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<div><div>Output Voltage [V]</div><div></div><div>Time [H]</div></div> <div>Input Volt. 24V Load 100%</div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>-12.095</td></tr><tr><td>0.5</td><td>-12.091</td></tr><tr><td>1.0</td><td>-12.091</td></tr><tr><td>2.0</td><td>-12.092</td></tr><tr><td>3.0</td><td>-12.091</td></tr><tr><td>4.0</td><td>-12.092</td></tr><tr><td>5.0</td><td>-12.091</td></tr><tr><td>6.0</td><td>-12.091</td></tr><tr><td>7.0</td><td>-12.090</td></tr><tr><td>8.0</td><td>-12.088</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	-12.095	0.5	-12.091	1.0	-12.091	2.0	-12.092	3.0	-12.091	4.0	-12.092	5.0	-12.091	6.0	-12.091	7.0	-12.090	8.0	-12.088
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Model	SUCW1R52412	Testing Circuitry Figure A																																					
Item	Minimum Input Voltage for Regulated Output Voltage																																						
Object	+12V0.065A																																						
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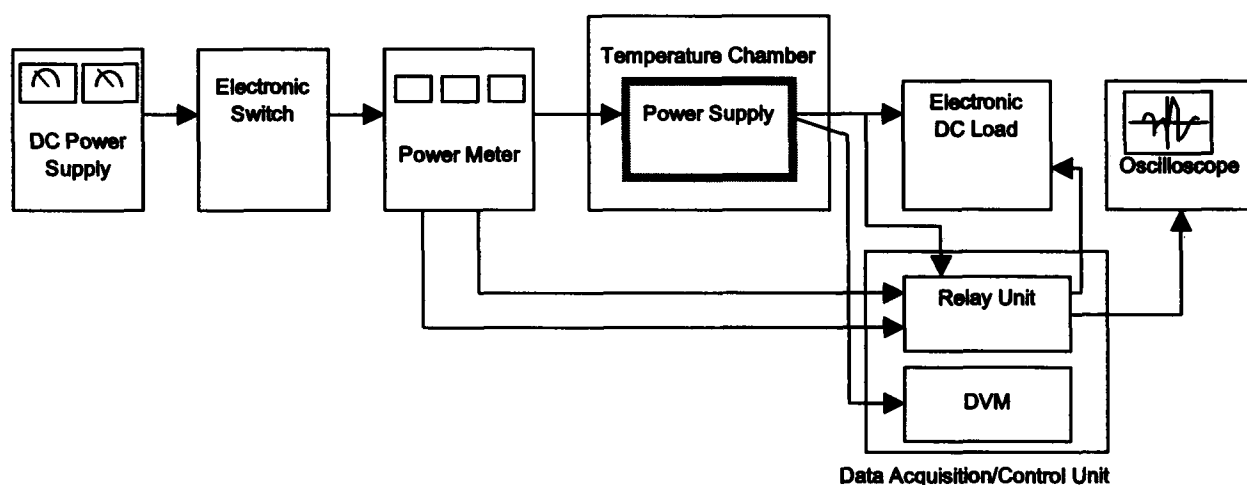


Figure A

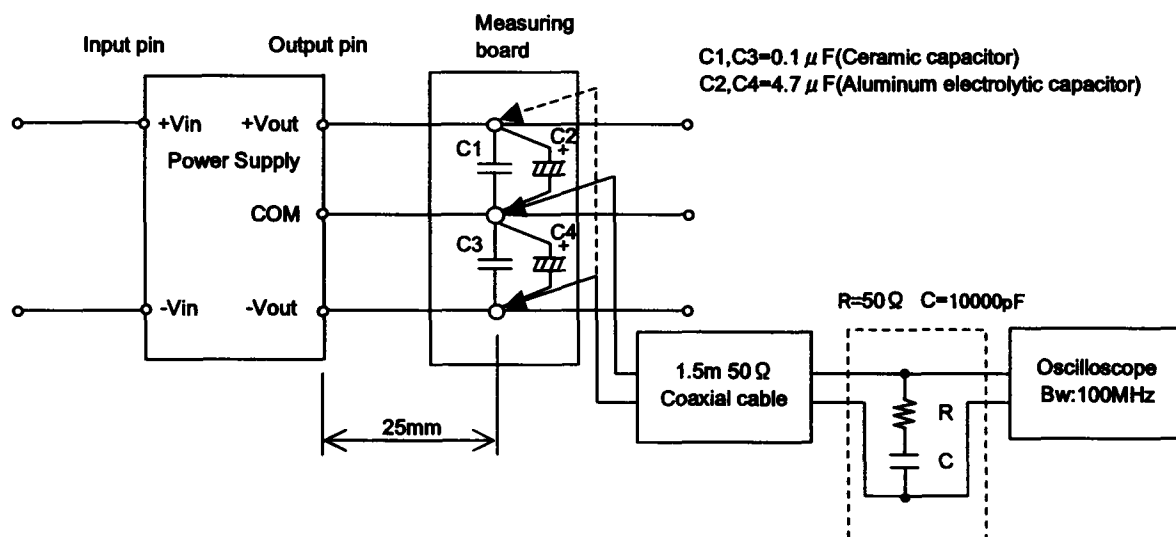


Figure B (Ripple and Ripple noise Characteristic)