



TEST DATA OF SUW32412

Regulated DC Power Supply
Mar 14, 2005

Approved by : Tetsuo Sugimori
Tetsuo Sugimori Design Manager

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Hayato Nakatsubo Design Engineer

COSEL CO.,LTD.

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(Final Page 22)

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Model

SUW32412

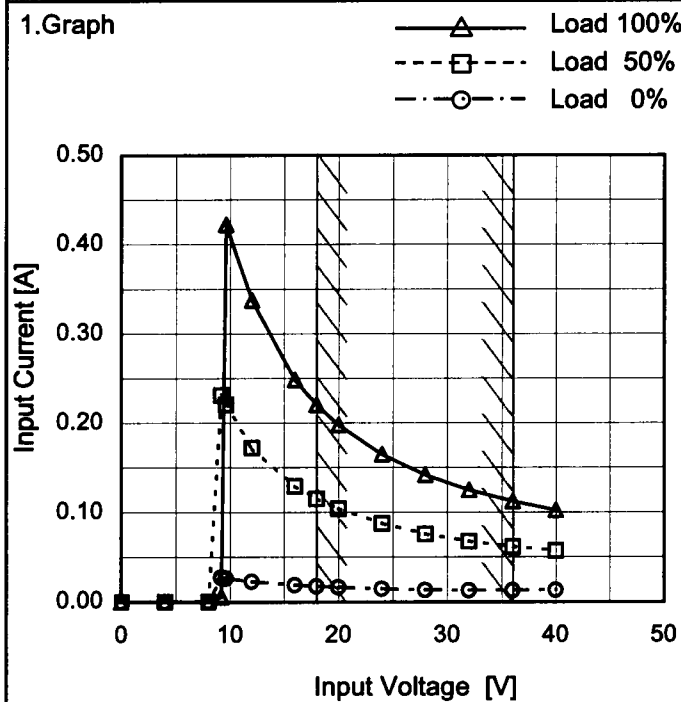
Item

Input Current (by Input Voltage)

Object

Temperature
Testing Circuitry25°C
Figure A

1. Graph

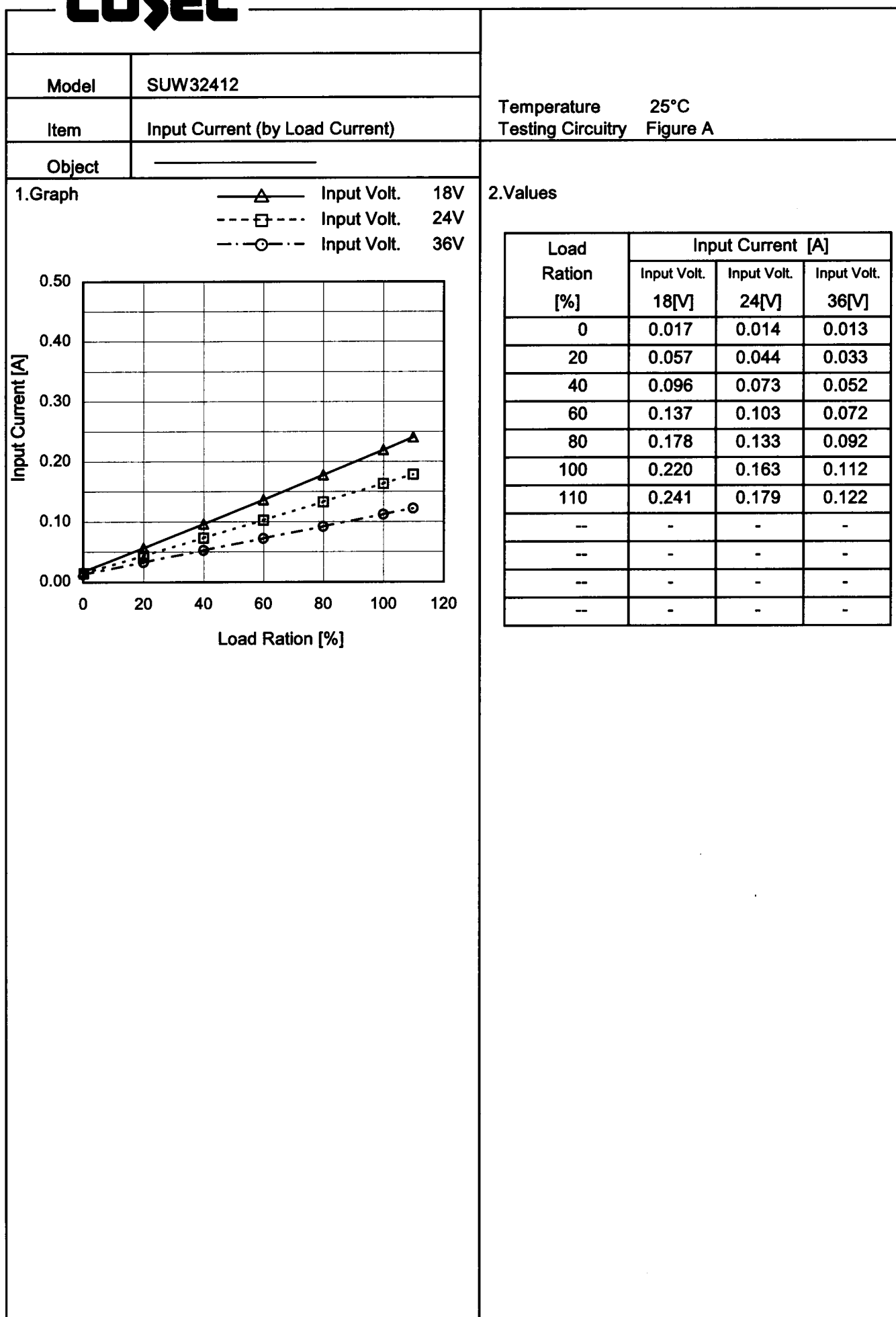


Note: Slanted line shows the range of the rated input voltage.

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	0.000	0.000	0.000
9.2	0.027	0.231	0.005
9.6	0.026	0.221	0.422
12.0	0.023	0.172	0.338
16.0	0.019	0.129	0.249
18.0	0.017	0.115	0.221
20.0	0.016	0.104	0.198
24.0	0.014	0.088	0.165
28.0	0.013	0.076	0.142
32.0	0.012	0.068	0.125
36.0	0.013	0.062	0.112
40.0	0.013	0.057	0.103
--	-	-	-
--	-	-	-
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COSEL

Model

SUW32412

Item

Input Power (by Load Current)

Object

Temperature

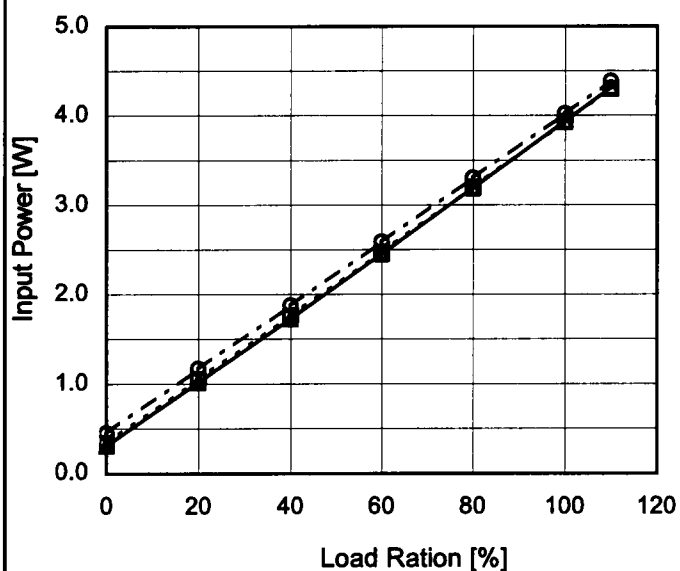
25°C

Testing Circuitry

Figure A

1.Graph

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



2.Values

Load Ration [%]	Input Power [W]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.31	0.34	0.45
20	1.02	1.05	1.17
40	1.73	1.76	1.88
60	2.45	2.48	2.59
80	3.19	3.20	3.31
100	3.94	3.93	4.02
110	4.31	4.30	4.38
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model		SUW32412																																	
Item		Efficiency (by Input Voltage)																																	
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Model

SUW32412

Item

Efficiency (by Load Current)

Object

Temperature

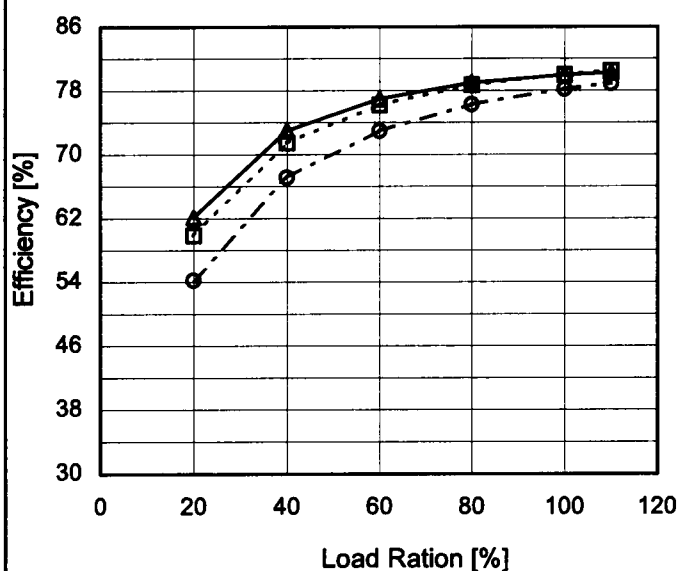
25°C

Testing Circuitry

Figure A

1. Graph

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



2. Values

Load Ration [%]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	-	-	-
20	62.2	59.9	54.3
40	73.0	71.5	67.1
60	77.0	76.2	73.0
80	79.0	78.7	76.2
100	80.0	80.0	78.2
110	80.2	80.5	78.9
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

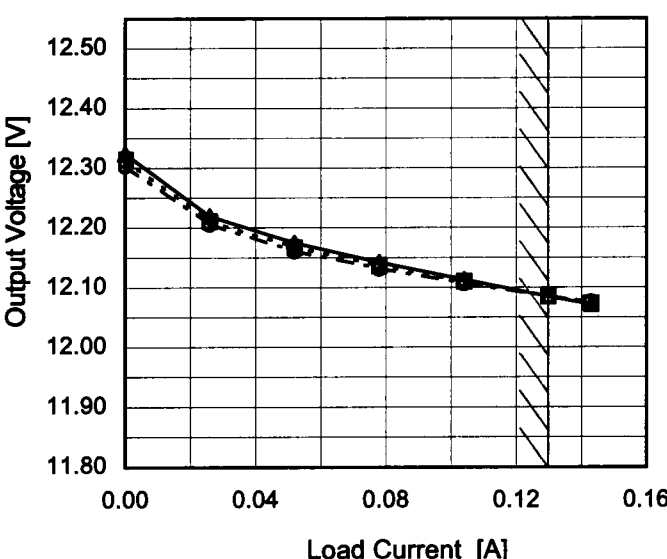
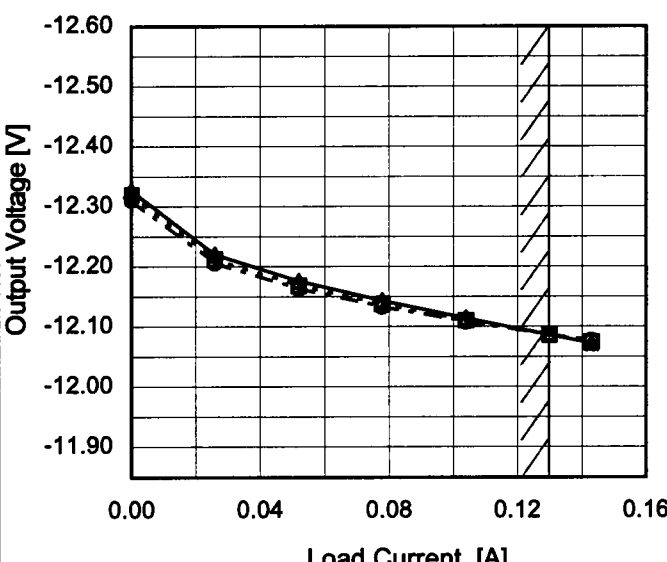
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Model		SUW32412																																	
Item		Line Regulation																																	
Object		+12V0.13A																																	
1.Graph		2.Values																																	
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>16</td><td>12.162</td><td>12.086</td></tr><tr><td>18</td><td>12.157</td><td>12.087</td></tr><tr><td>20</td><td>12.155</td><td>12.087</td></tr><tr><td>24</td><td>12.151</td><td>12.087</td></tr><tr><td>30</td><td>12.148</td><td>12.087</td></tr><tr><td>36</td><td>12.146</td><td>12.087</td></tr><tr><td>40</td><td>12.146</td><td>12.087</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%	Load 100%	16	12.162	12.086	18	12.157	12.087	20	12.155	12.087	24	12.151	12.087	30	12.148	12.087	36	12.146	12.087	40	12.146	12.087	—	-	-	—	-	-		
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20	12.155	12.087																																	
24	12.151	12.087																																	
30	12.148	12.087																																	
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Model	SUW32412	Temperature 25°C Testing Circuitry Figure A																																																					
Item	Load Regulation																																																						
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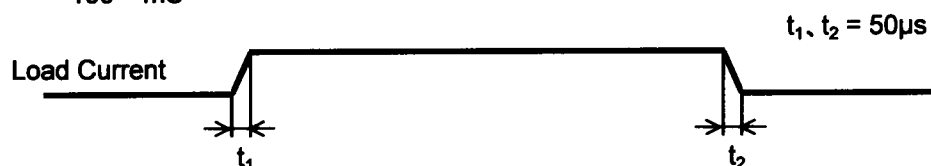
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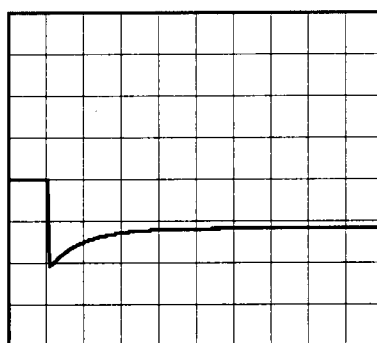
Model	SUW32412	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V0.13A		

Input Volt. 24 V
Cycle 100 mS

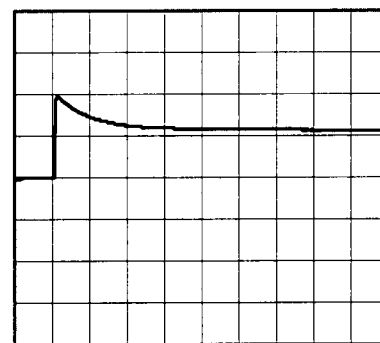


Min. Load (0A) \longleftrightarrow
Load 100% (0.13A)

200mV/div



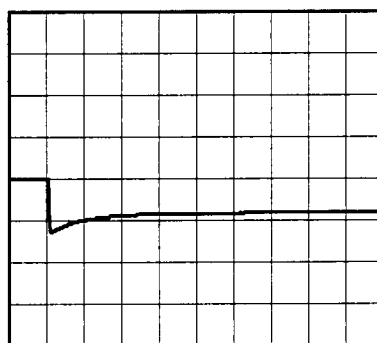
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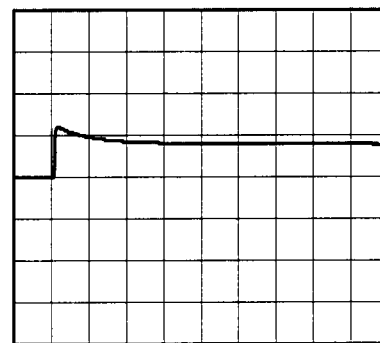
2ms/div

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

200mV/div



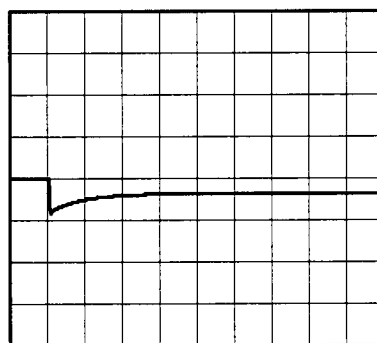
2ms/div



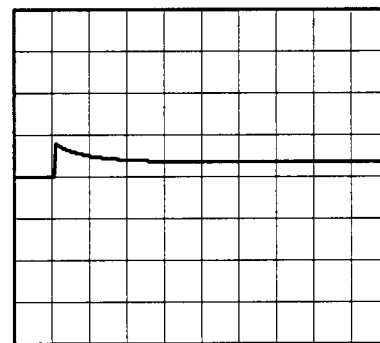
2ms/div

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

200mV/div



2ms/div

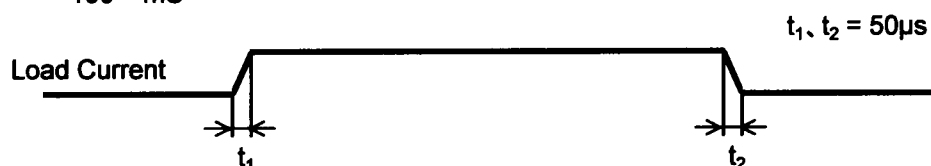


2ms/div

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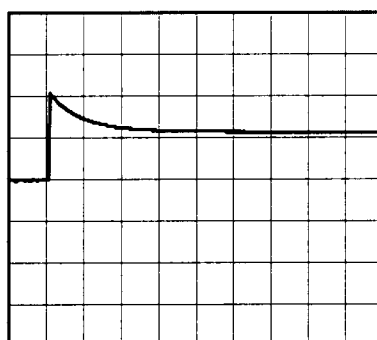
Model	SUW32412	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	-12V0.13A		

Input Volt. 24 V
Cycle 100 mS

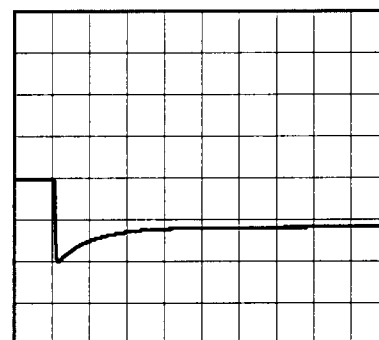


Min. Load (0A) \longleftrightarrow
Load 100% (0.13A)

200mV/div



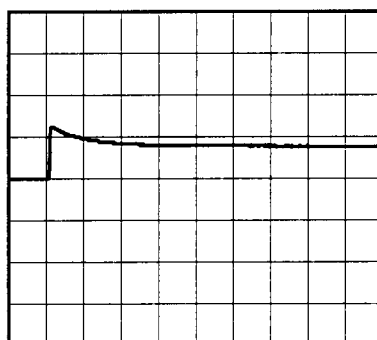
2ms/div



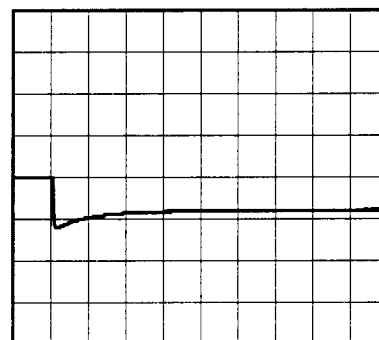
2ms/div

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

200mV/div



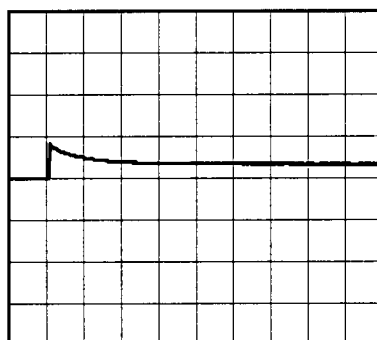
2ms/div



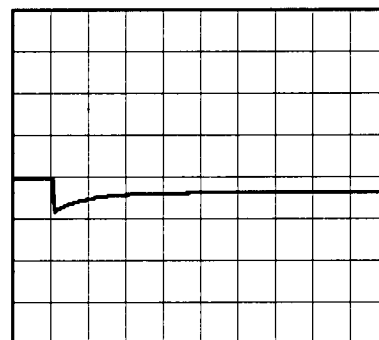
2ms/div

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

200mV/div



2ms/div



2ms/div

COSEL

Model	SUW32412																																																																												
Item	Ripple Voltage (by Load Current)	Temperature	25°C																																																																										
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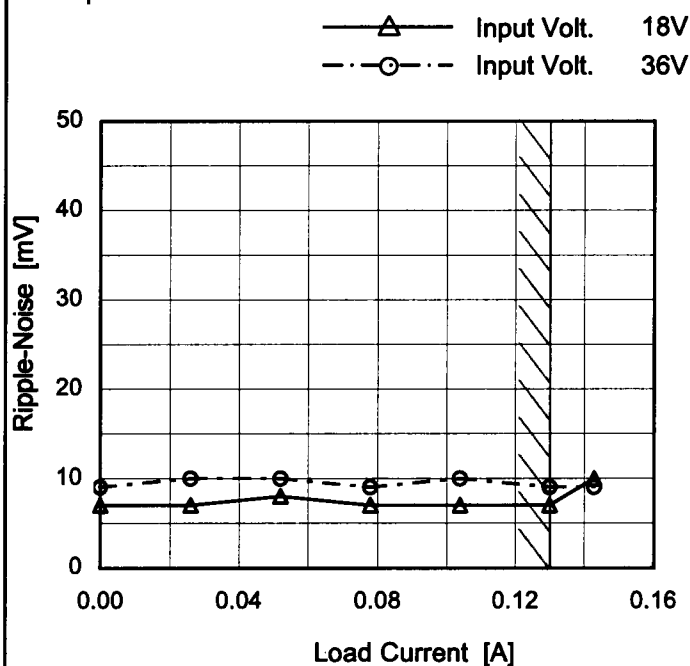
Model SUW32412

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.

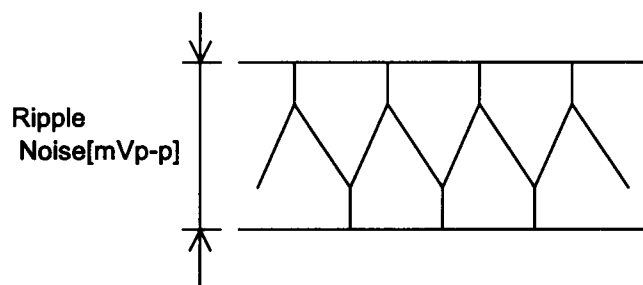


Fig.Complex Ripple Noise Wave Form

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	7	9
0.026	7	10
0.052	8	10
0.078	7	9
0.104	7	10
0.130	7	9
0.143	10	9
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COSEL

Model		SUW32412																																					
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Object		+12V0.13A																																					
1.Graph																																							
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<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><div><div>Load 100%</div></div></div><div><table border="1"><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>6</td></tr><tr><td>-40</td><td>2</td><td>6</td></tr><tr><td>-20</td><td>2</td><td>5</td></tr><tr><td>0</td><td>2</td><td>5</td></tr><tr><td>25</td><td>1</td><td>4</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>				Ambient Temperature [°C]	Load 50% [mV]	Load 100% [mV]	-60	2	6	-40	2	6	-20	2	5	0	2	5	25	1	4	55	1	2	60	1	2	--	-	-	--	-	-	--	-	-	--	-	-
Ambient Temperature [°C]	Load 50% [mV]	Load 100% [mV]																																					
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-20	2	5																																					
0	2	5																																					
25	1	4																																					
55	1	2																																					
60	1	2																																					
--	-	-																																					
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--	-	-																																					
--	-	-																																					
Input Volt. 24V																																							
Measured by 100 MHz Oscilloscope.																																							
Note: Slanted line shows the range of the rated ambient temperature.																																							
Testing Circuitry		Figure B																																					
2.Values																																							
Ambient Temperature [°C]		Ripple Voltage [mV]																																					
		Load 50%	Load 100%																																				
-60		3	12																																				
-40		3	11																																				
-20		3	9																																				
0		3	7																																				
25		2	4																																				
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60		2	2																																				
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Ambient Temperature [°C]		Ripple Voltage [mV]	
		Load 50%	Load 100%
-60		2	6
-40		2	6
-20		2	5
0		2	5
25		1	4
55		1	2
60		1	2
--		-	-
--		-	-
--		-	-
--		-	-

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BC-3757



		Testing Circuitry Figure A
Model	SUW32412	
Item	Output Voltage Accuracy	

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

* Other Output : Rated Load

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

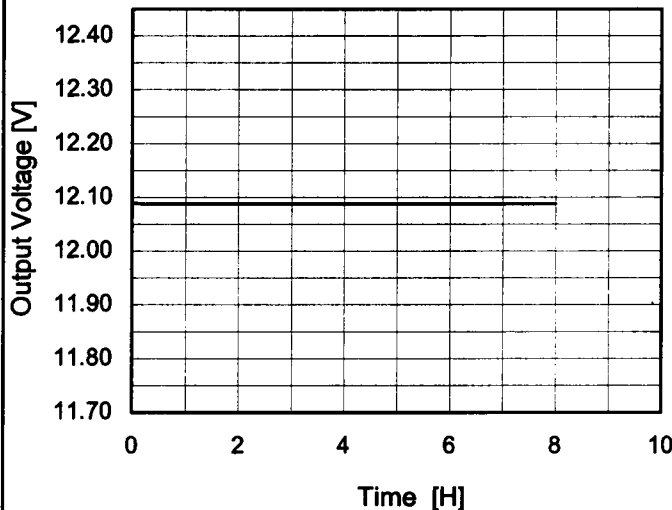
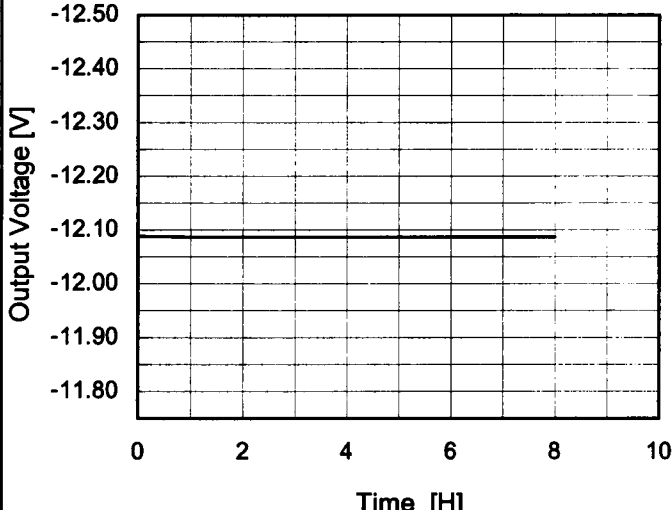
* Output Voltage Accuracy (Ratio) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2. Values

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	12.331	±143	±1.2
Minimum Voltage	-40	18	0.13	12.046		

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	-12.335	±144	±1.2
Minimum Voltage	-40	18	0.13	-12.047		

COSEL

Model	SUW32412																								
Item	Time Lapse Drift	Temperature	25°C																						
Object	+12V0.13A	Testing Circuitry	Figure A																						
1.Graph		2.Values																							
<div><p>Input Volt. 24V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.090</td></tr><tr><td>0.5</td><td>12.088</td></tr><tr><td>1.0</td><td>12.088</td></tr><tr><td>2.0</td><td>12.088</td></tr><tr><td>3.0</td><td>12.088</td></tr><tr><td>4.0</td><td>12.088</td></tr><tr><td>5.0</td><td>12.088</td></tr><tr><td>6.0</td><td>12.088</td></tr><tr><td>7.0</td><td>12.088</td></tr><tr><td>8.0</td><td>12.088</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.090	0.5	12.088	1.0	12.088	2.0	12.088	3.0	12.088	4.0	12.088	5.0	12.088	6.0	12.088	7.0	12.088	8.0	12.088
Time since start [H]	Output Voltage [V]																								
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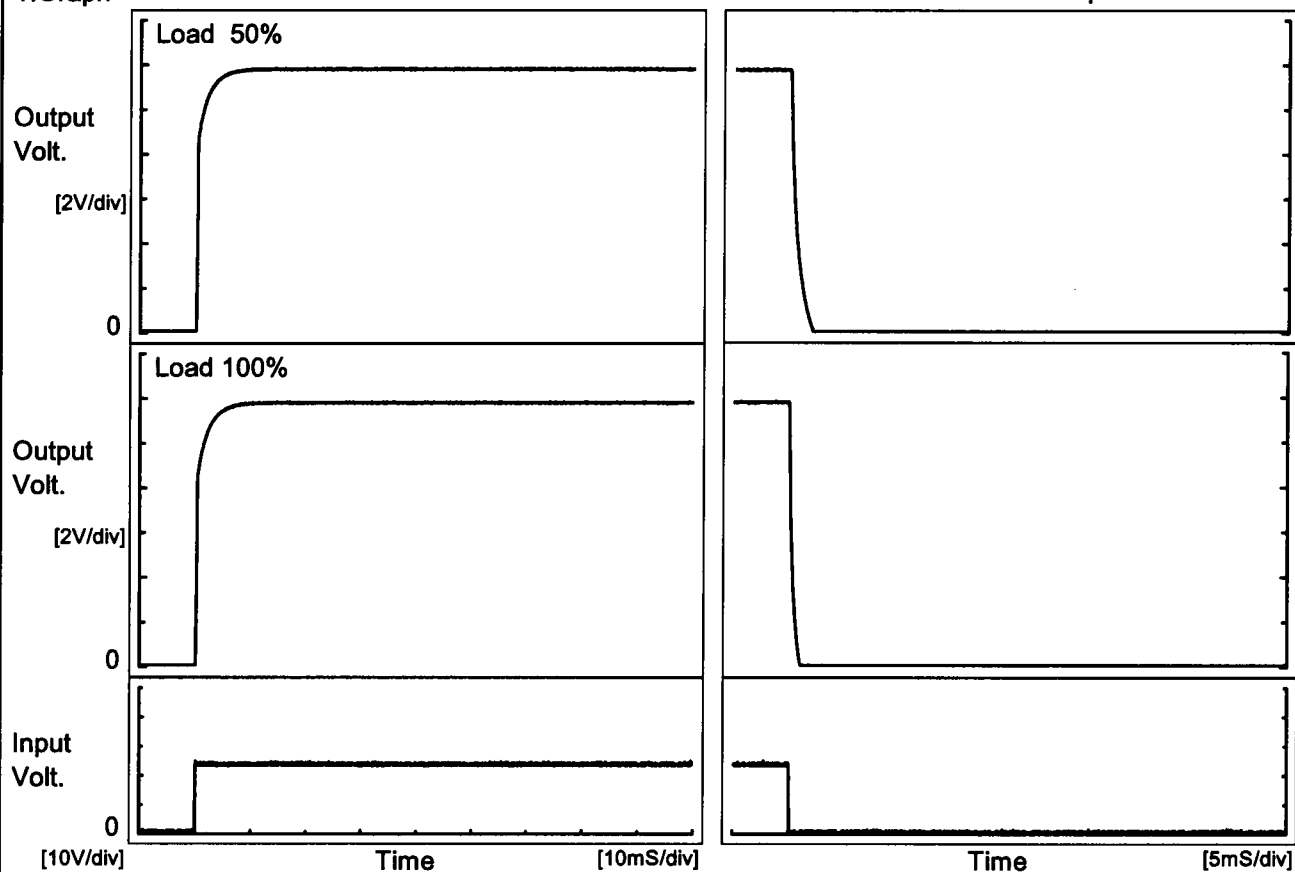
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COSEL

Model	SUW32412	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V0.13A		

1.Graph

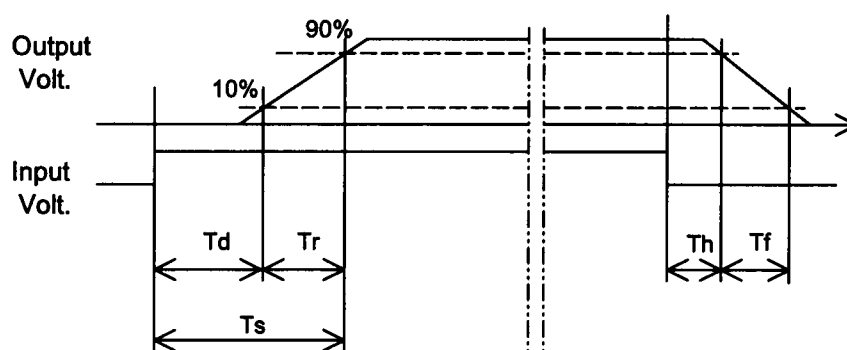
Input Volt. 24 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	2.6	2.7	0.1	1.4
100 %	0.1	2.8	2.9	0.1	0.7

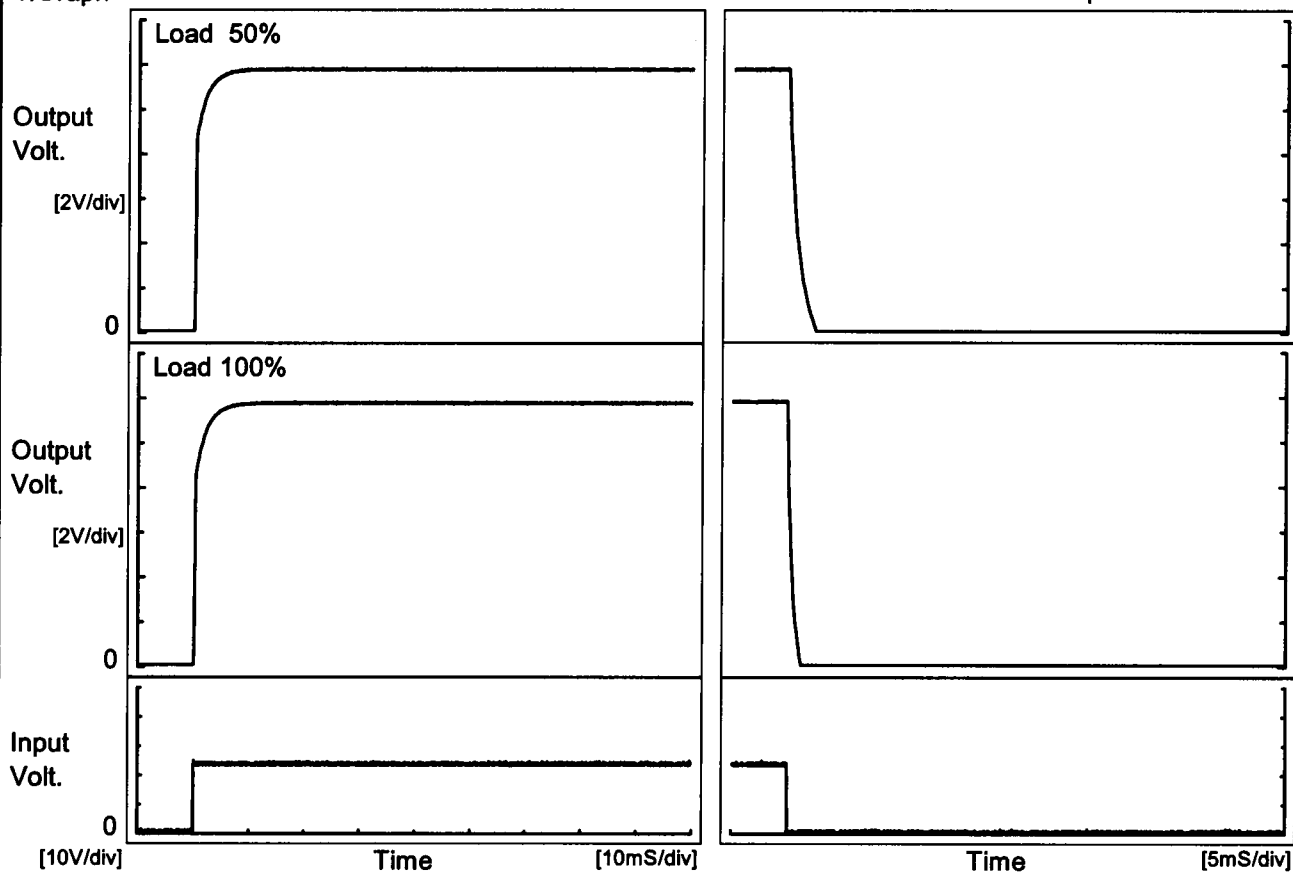


COSEL

Model	SUW32412	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-12V0.13A		

1. Graph

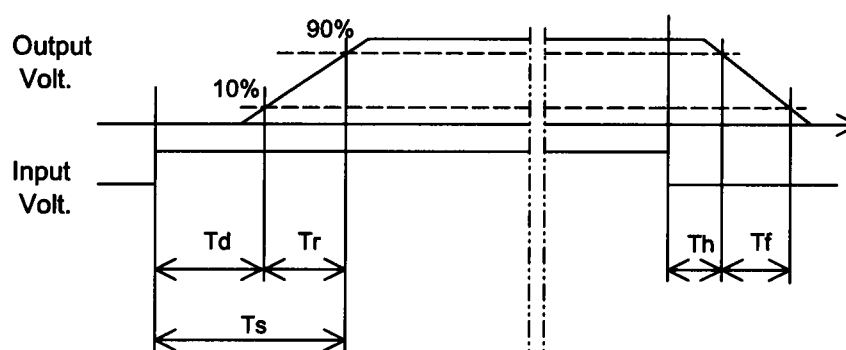
Input Volt. 24 V



2. Values

[mS]

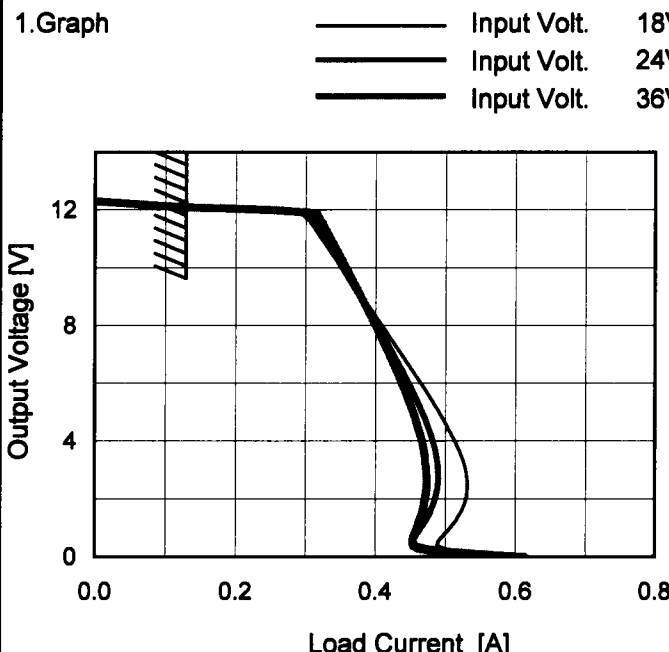
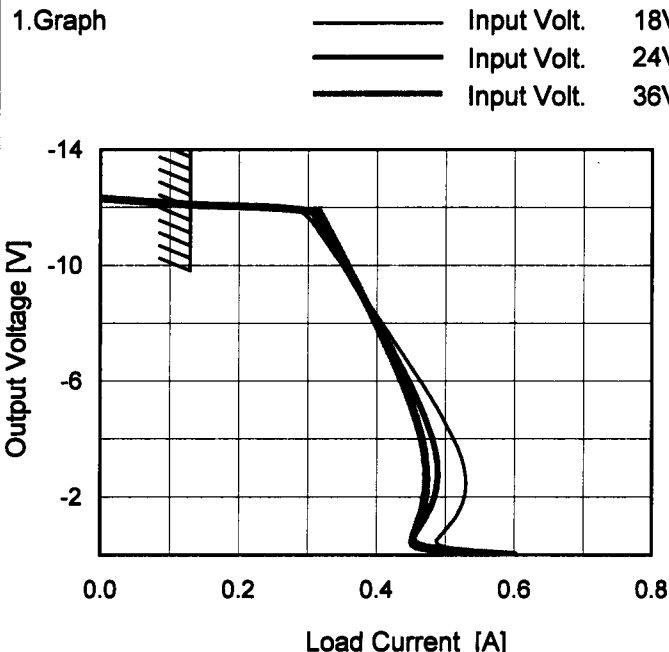
Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.1	2.7	2.8	0.1	1.7
100 %	0.1	2.9	3.0	0.1	0.9



COSEL

Model		SUW32412																																					
Item		Minimum Input Voltage for Regulated Output Voltage																																					
Object		+12V0.13A																																					
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>Ambient Temperature [°C]</th><th>Load 50%</th><th>Load 100%</th></tr></thead><tbody><tr><td>-60</td><td>6.6</td><td>9.6</td></tr><tr><td>-40</td><td>6.5</td><td>9.6</td></tr><tr><td>-20</td><td>6.5</td><td>9.4</td></tr><tr><td>0</td><td>6.4</td><td>9.4</td></tr><tr><td>25</td><td>6.5</td><td>9.6</td></tr><tr><td>55</td><td>6.6</td><td>9.8</td></tr><tr><td>60</td><td>6.7</td><td>10.0</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>		Ambient Temperature [°C]	Load 50%	Load 100%	-60	6.6	9.6	-40	6.5	9.6	-20	6.5	9.4	0	6.4	9.4	25	6.5	9.6	55	6.6	9.8	60	6.7	10.0	--	-	-	--	-	-	--	-	-	--	-	-		
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Note: Slanted line shows the range of the rated ambient temperature.																																							

COSEL

Model	SUW32412																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+12V0.13A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
<div><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></div> <div></div>		<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>0.13</td><td>0.13</td><td>0.13</td></tr><tr><td>11.4</td><td>0.31</td><td>0.32</td><td>0.33</td></tr><tr><td>10.8</td><td>0.33</td><td>0.33</td><td>0.34</td></tr><tr><td>9.6</td><td>0.36</td><td>0.36</td><td>0.37</td></tr><tr><td>8.4</td><td>0.40</td><td>0.39</td><td>0.39</td></tr><tr><td>7.2</td><td>0.43</td><td>0.42</td><td>0.41</td></tr><tr><td>6.0</td><td>0.47</td><td>0.45</td><td>0.44</td></tr><tr><td>4.8</td><td>0.50</td><td>0.47</td><td>0.46</td></tr><tr><td>3.6</td><td>0.52</td><td>0.49</td><td>0.47</td></tr><tr><td>2.4</td><td>0.53</td><td>0.49</td><td>0.47</td></tr><tr><td>1.2</td><td>0.51</td><td>0.47</td><td>0.46</td></tr><tr><td>0.0</td><td>0.60</td><td>0.56</td><td>0.61</td></tr></table>		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	0.32	0.33	10.8	0.33	0.33	0.34	9.6	0.36	0.36	0.37	8.4	0.40	0.39	0.39	7.2	0.43	0.42	0.41	6.0	0.47	0.45	0.44	4.8	0.50	0.47	0.46	3.6	0.52	0.49	0.47	2.4	0.53	0.49	0.47	1.2	0.51	0.47	0.46	0.0	0.60	0.56	0.61
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Note: Slanted line shows the range of the rated load current.																																																										

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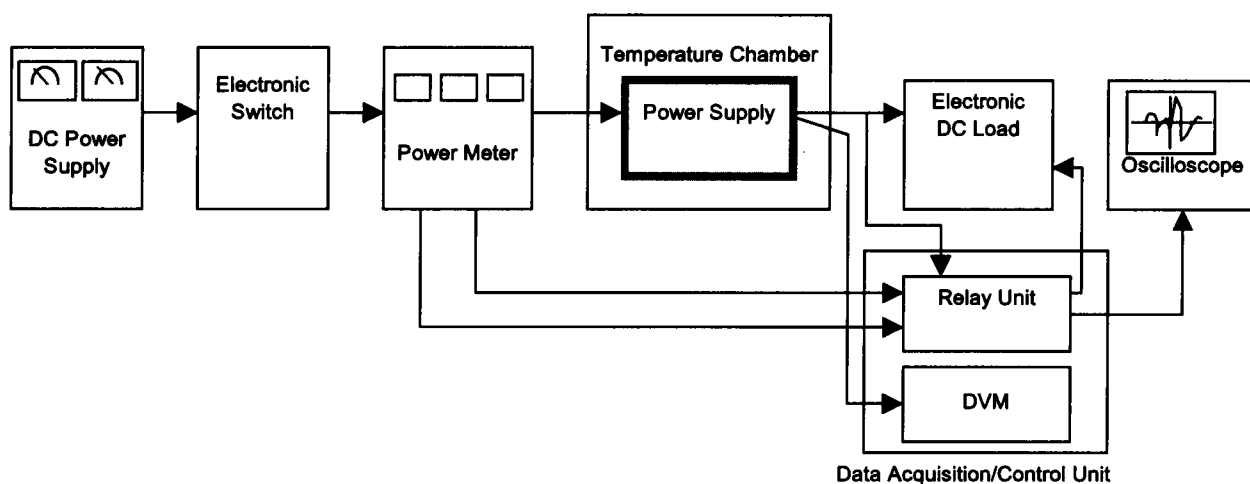


Figure A

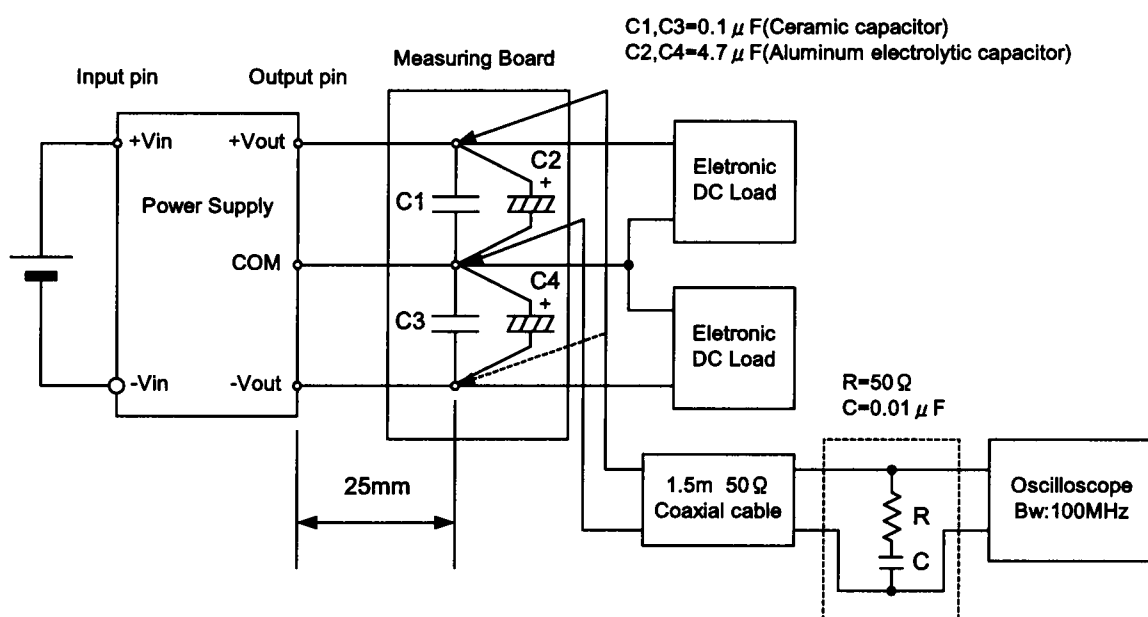


Figure B (Ripple and Ripple noise Characteristic)