

TEST DATA OF CBS1002412

(24V INPUT)

Regulated DC Power Supply
Sep. 12. 2001

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Isao Yasuda Design Manager

Prepared by : Kouichi Kinoshita
Kouichi Kinoshita Design Engineer

コーセル株式会社
COSEL CO.,LTD.

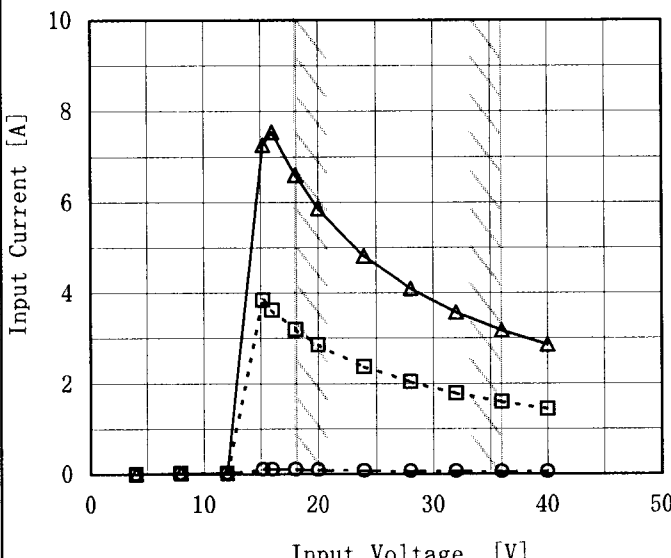
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Model	CBS1002412																																		
Item	Line Regulation 静的入力変動	Temperature	25℃																																
Object	+12V8.4A	Testing Circuitry	Figure A																																
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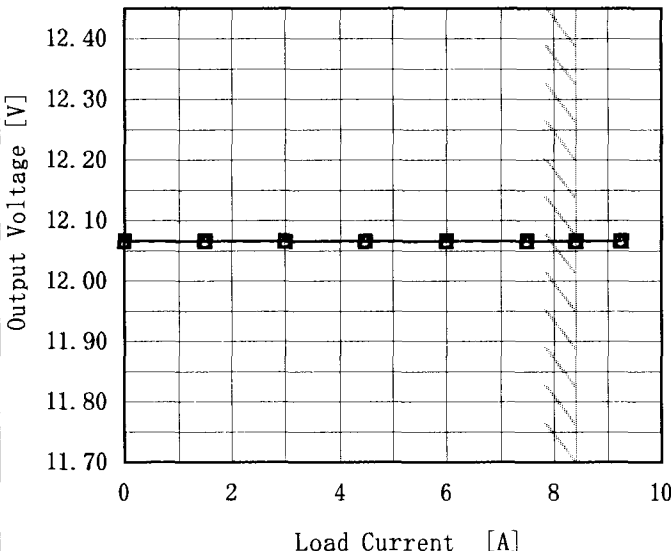
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<div><div><div>—△—</div><div>Input Volt. 18V</div></div><div><div>---□---</div><div>Input Volt. 24V</div></div><div><div>---○---</div><div>Input Volt. 36V</div></div></div>  <p>Output Voltage [V]</p> <p>Load Current [A]</p>				<table><tr><th rowspan="2">Load Current [A]</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>0.00</td><td>12.067</td><td>12.066</td><td>12.066</td></tr><tr><td>1.50</td><td>12.066</td><td>12.066</td><td>12.066</td></tr><tr><td>3.00</td><td>12.066</td><td>12.066</td><td>12.066</td></tr><tr><td>4.50</td><td>12.066</td><td>12.066</td><td>12.066</td></tr><tr><td>6.00</td><td>12.066</td><td>12.066</td><td>12.066</td></tr><tr><td>7.50</td><td>12.067</td><td>12.066</td><td>12.066</td></tr><tr><td>8.40</td><td>12.066</td><td>12.066</td><td>12.066</td></tr><tr><td>9.24</td><td>12.066</td><td>12.066</td><td>12.066</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]	Output Voltage [V]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0.00	12.067	12.066	12.066	1.50	12.066	12.066	12.066	3.00	12.066	12.066	12.066	4.50	12.066	12.066	12.066	6.00	12.066	12.066	12.066	7.50	12.067	12.066	12.066	8.40	12.066	12.066	12.066	9.24	12.066	12.066	12.066	--	--	--	--	---	---	---	---
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6.00	12.066	12.066	12.066																																																			
7.50	12.067	12.066	12.066																																																			
8.40	12.066	12.066	12.066																																																			
9.24	12.066	12.066	12.066																																																			
--	--	--	--																																																			
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Note: Slanted line shows the range of the rated load current.																																																						
(注) 斜線は定格負荷電流範囲を示す。																																																						

COSEL

ModelCBS1002412

ItemRipple Voltage (by Load Current)
リップル電圧 (負荷特性)

Object+12V8.4A

1. Graph

—△—

Input Volt. 18V

---○---

Input Volt. 36V

Ripple Voltage [mV]

50

40

30

20

10

0

0

4

8

12

Load Current [A]

Ripple Voltage is shown as p-p in the figure below.

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

リップル電圧は、下図 p-p 値で示される。

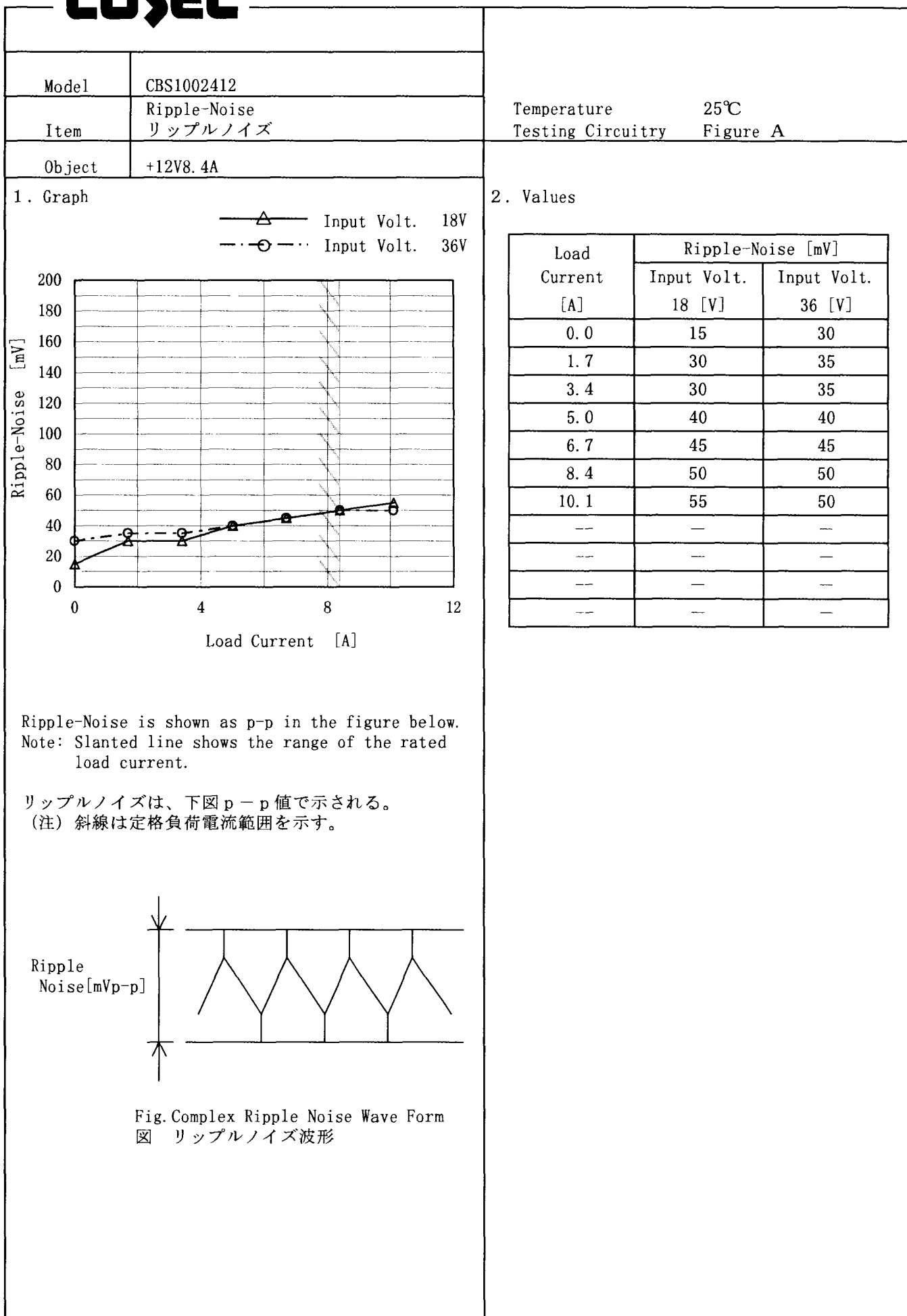
(注) 斜線は定格負荷電流範囲を示す。

Ripple [mVp-p]

<

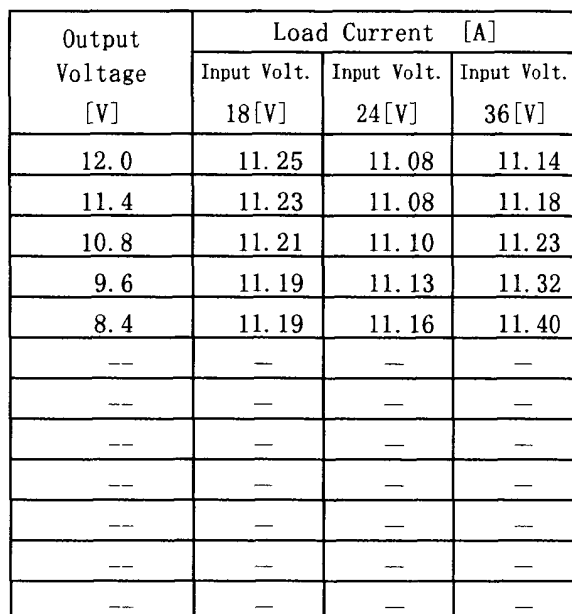
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.0	5	5
1.7	5	10
3.4	5	10
5.0	5	10
6.7	5	10
8.4	5	10
10.1	5	10
---	---	---
---	---	---
---	---	---
---	---	---

COSEL



Temperature	25°C
Testing Circuitry	Figure A

2. Values



(注) 斜線は定格負荷電流範囲を示す。

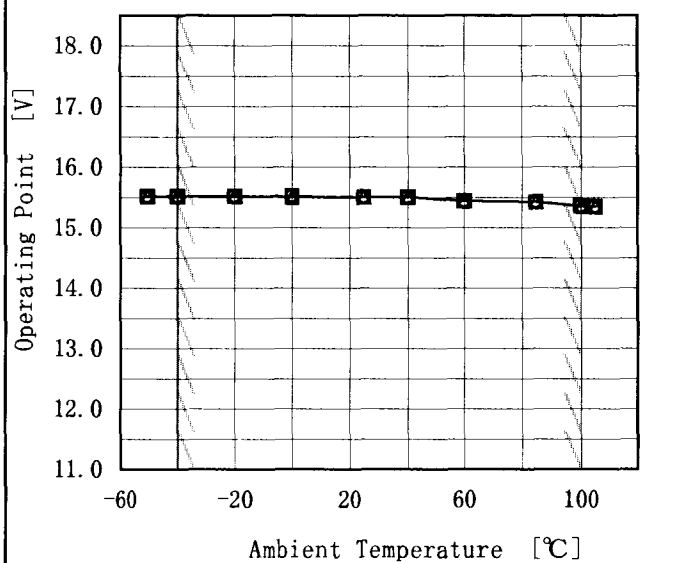
Intermittent operation occurs when the output voltage is from 8.4V to 0V.
8.4V~0V間は、間欠モードとなる。

COSEL

Model	CBS1002412
Item	Overvoltage Protection 過電圧保護
Object	+12V8.4A

1. Graph

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



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

(注) 斜線は定格周囲温度範囲を示す。

Testing Circuitry Figure A

2. Values

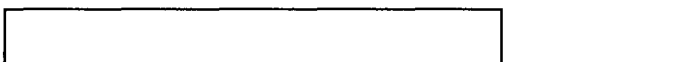
Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-50	15.52	15.52	15.52
-40	15.52	15.52	15.52
-20	15.52	15.52	15.52
0	15.51	15.52	15.52
25	15.51	15.51	15.51
40	15.51	15.51	15.51
60	15.44	15.44	15.44
85	15.43	15.43	15.43
100	15.36	15.36	15.36
105	15.35	15.35	15.35
--	—	—	—

COSEL

Model	CBS1002412	Temperature	25°C
Item	Dynamic Load Response 動的負荷変動	Testing Circuitry	Figure A
Object	+12V8.4A		

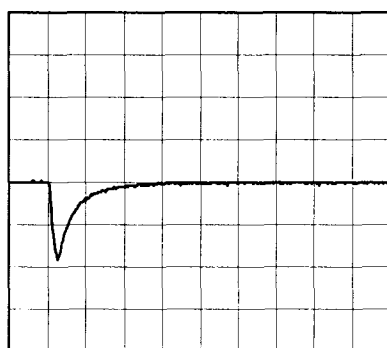
Input Volt. 24 V
Cycle 1000 ms

Load Current

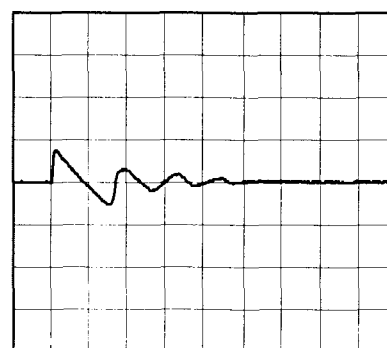


Min. Load (0A) \longleftrightarrow
Load 100% (8.4A)

500 mV/div



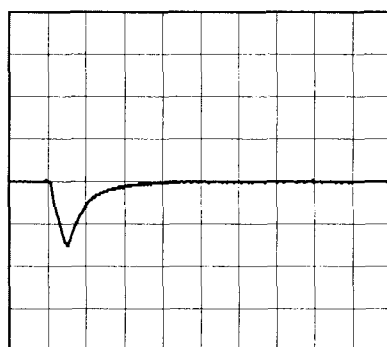
200 μ s/div



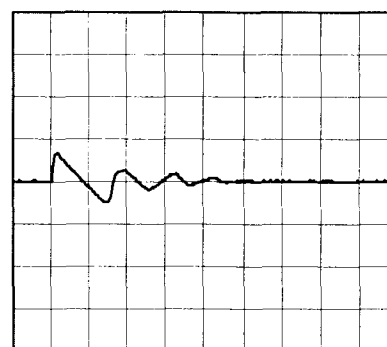
5 ms/div

Min. Load (0A) \longleftrightarrow
Load 50% (4.2A)

500 mV/div



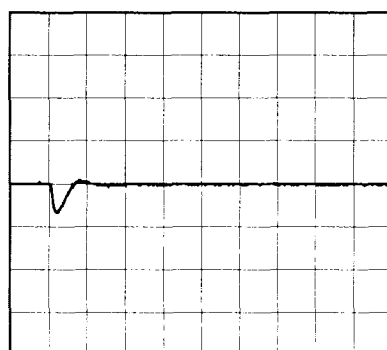
200 μ s/div



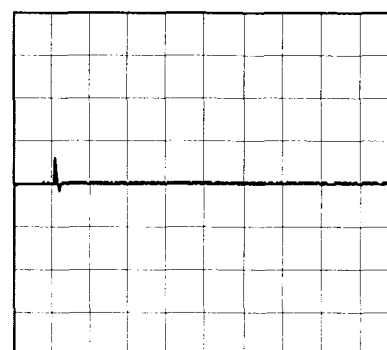
5 ms/div

Load 10% (0.84A) \longleftrightarrow
Load 100% (8.4A)

500 mV/div



200 μ s/div



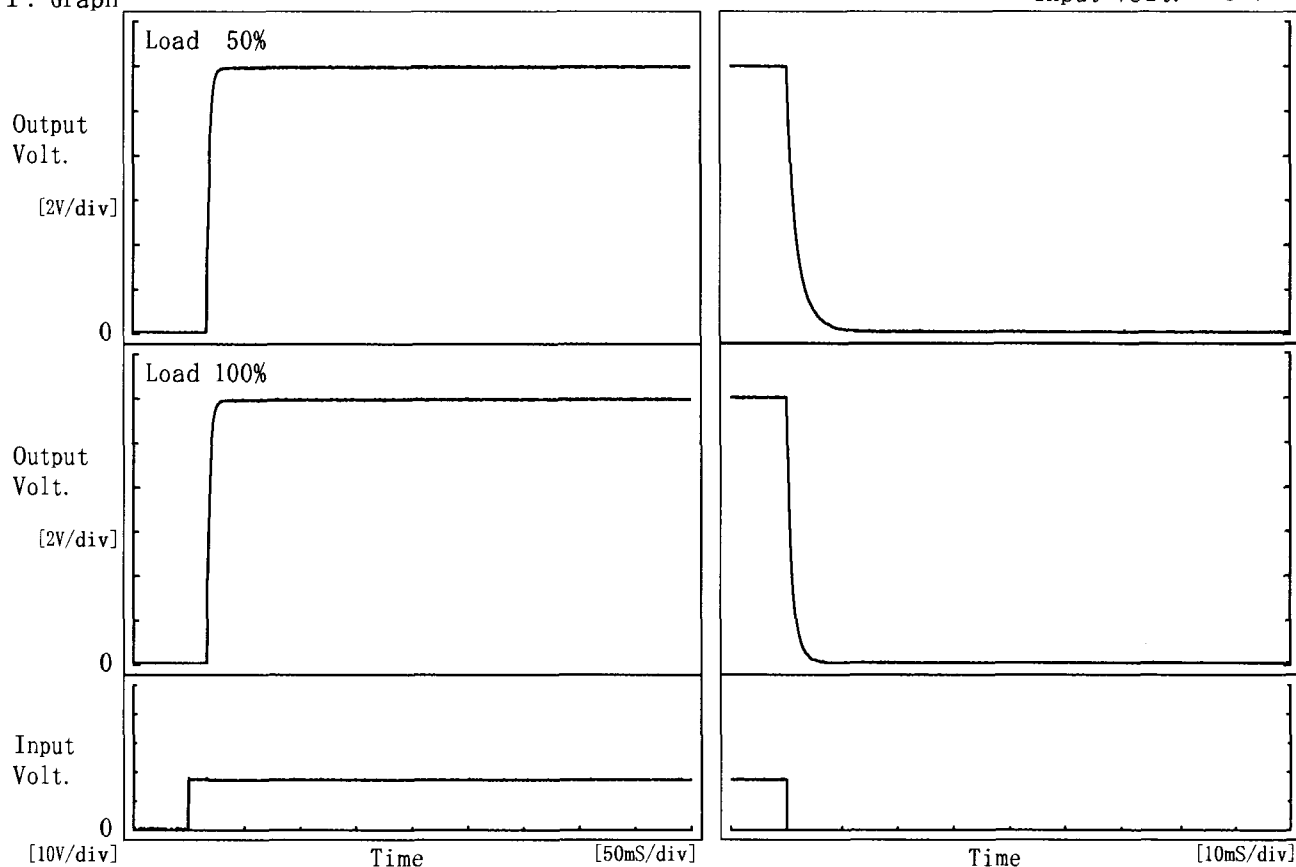
5 ms/div

COSEL

Model	CBS1002412	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+12V8.4A		

1. Graph

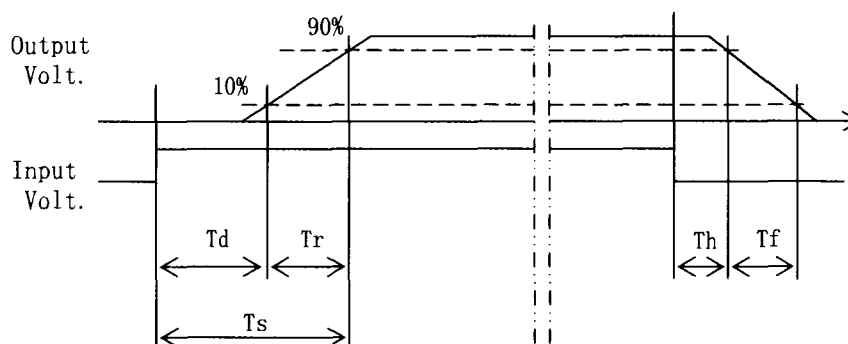
Input Volt. 18 V

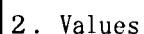


2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	16.0	5.8	21.8	0.3	4.4
100 %	16.0	5.8	21.8	0.2	2.3



Testing Circuitry Figure A

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-50	12.057	12.057	12.057
-40	12.060	12.060	12.060
-20	12.067	12.067	12.067
0	12.076	12.076	12.076
25	12.081	12.081	12.081
40	12.076	12.077	12.076
60	12.067	12.067	12.067
85	12.051	12.052	12.052
100	12.038	12.038	12.038
105	12.033	12.033	12.033
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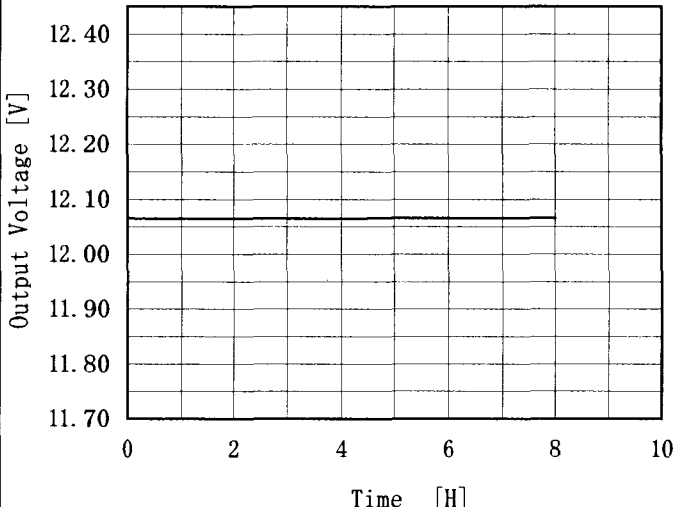
(注) 斜線は定格周囲温度範囲を示す。

Model		CBS1002412	
Item		Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧	
Object		+12V8.4A	
1. Graph		2. Values	

</

Model	CBS1002412																																						
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)	Testing Circuitry Figure A																																					
Object	+12V8.4A																																						
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% [mV]</th><th>Load 100% [mV]</th></tr></thead><tbody><tr><td>-50</td><td>55</td><td>55</td></tr><tr><td>-40</td><td>40</td><td>45</td></tr><tr><td>-20</td><td>25</td><td>25</td></tr><tr><td>0</td><td>15</td><td>15</td></tr><tr><td>25</td><td>10</td><td>10</td></tr><tr><td>40</td><td>10</td><td>10</td></tr><tr><td>60</td><td>10</td><td>10</td></tr><tr><td>85</td><td>10</td><td>10</td></tr><tr><td>100</td><td>10</td><td>10</td></tr><tr><td>105</td><td>10</td><td>10</td></tr><tr><td>---</td><td>---</td><td>---</td></tr></tbody></table> <p>Input Volt. 24V</p>		Ambient Temperature [°C]	Load 50% [mV]	Load 100% [mV]	-50	55	55	-40	40	45	-20	25	25	0	15	15	25	10	10	40	10	10	60	10	10	85	10	10	100	10	10	105	10	10	---	---	---		
Ambient Temperature [°C]	Load 50% [mV]	Load 100% [mV]																																					
-50	55	55																																					
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---	---	---																																					
Note: Slanted line shows the range of the rated ambient temperature.																																							
(注) 斜線は定格周囲温度範囲を示す。																																							

COSEL

Model	CBS1002412																								
Item	Time Lapse Drift 経時ドリフト	Temperature	25℃																						
Object	+12V8.4A	Testing Circuitry	Figure A																						
1. Graph		2. Values																							
<div><p>Output Voltage [V]</p><p>Time [H]</p><p>Input Volt. 24V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>12.068</td></tr><tr><td>0.5</td><td>12.065</td></tr><tr><td>1.0</td><td>12.065</td></tr><tr><td>2.0</td><td>12.065</td></tr><tr><td>3.0</td><td>12.065</td></tr><tr><td>4.0</td><td>12.065</td></tr><tr><td>5.0</td><td>12.066</td></tr><tr><td>6.0</td><td>12.066</td></tr><tr><td>7.0</td><td>12.066</td></tr><tr><td>8.0</td><td>12.066</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	12.068	0.5	12.065	1.0	12.065	2.0	12.065	3.0	12.065	4.0	12.065	5.0	12.066	6.0	12.066	7.0	12.066	8.0	12.066
Time since start [H]	Output Voltage [V]																								
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6.0	12.066																								
7.0	12.066																								
8.0	12.066																								

Model		CBS1002412
Item		Output Voltage Accuracy 定電圧精度
Object		+12V8.4A

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 ~ 100°C

Input Voltage : 18 ~ 36V

Load Current : 0 ~ 8.4A

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

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

1. 定電圧精度

周囲温度、入力電圧、負荷電流を下記仕様内で、任意に変動させたときの出力電圧の変動をいう。

周囲温度 : -40 ~ 100°C

入力電圧 : 18 ~ 36V

負荷電流 : 0 ~ 8.4A

* 定電圧精度(変動値) = $\pm (\text{出力電圧の最高値} - \text{出力電圧の最低値}) / 2$

* 定電圧精度(変動率) = $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	18	8.4	12.081	±23	±0.2
Minimum Voltage	100	24	0	12.035		

		Testing Circuitry Figure A
Model	CBS1002412	
Item	Condense 結露特性	
Object	+12V8.4A	

1. Condensation test

Testing procedure is as follows.

- ① Keeping and cooling the unit in a tank at -10°C for an hour with the input off.
- ② Taking it out of the tank and dewing itself in a room where the temperature is 25°C and the humidity is 40%RH.
- ③ Testing electrical characteristics of the unit to confirm there be no fault.

1. 結露特性試験

入力を切った状態で、恒温槽で -10°C に冷却しておき、約1時間後に恒温槽から取り出し、室温 25°C 、湿度40%RHの状態におき結露させ、その電気的特性の測定を行い異常のないことを確認する。

2. Values

Item	Data	Testing Conditions
Output Voltage [V]	12.001	Input Volt. : 24V, Load Current. : 8.4A
Line Regulation [mV]	7	Input Volt. : 18~36V, Load Current. : 8.4A
Load Regulation [mV]	3	Input Volt. : 24V, Load Current. : 0~8.4A

Model	CBS1002412		
Item	Line Noise Tolerance 入力雑音耐量	Temperature	25℃
		Testing Circuitry	Figure B
Object	+12V8.4A		

1. Conditions

- Input Voltage : 24 V
- Pulse Voltage : 2000 V
- Pulse Cycle : 16.7 mS
- Pulse Input Duration : 1 min. or more
- Load : 100 %

2. Results

Pulse Width [nS]	MODE		No protection failure should occur	DC-like Regulation of Output Voltage
		POLARITY	保護回路の誤動作がない	出力電圧の直流的変動
50	COMMON	+	OK	no fluctuation
		—	OK	no fluctuation
	NORMAL	+	OK	no fluctuation
		—	OK	no fluctuation
1000	COMMON	+	OK	no fluctuation
		—	OK	no fluctuation
	NORMAL	+	OK	no fluctuation
		—	OK	no fluctuation

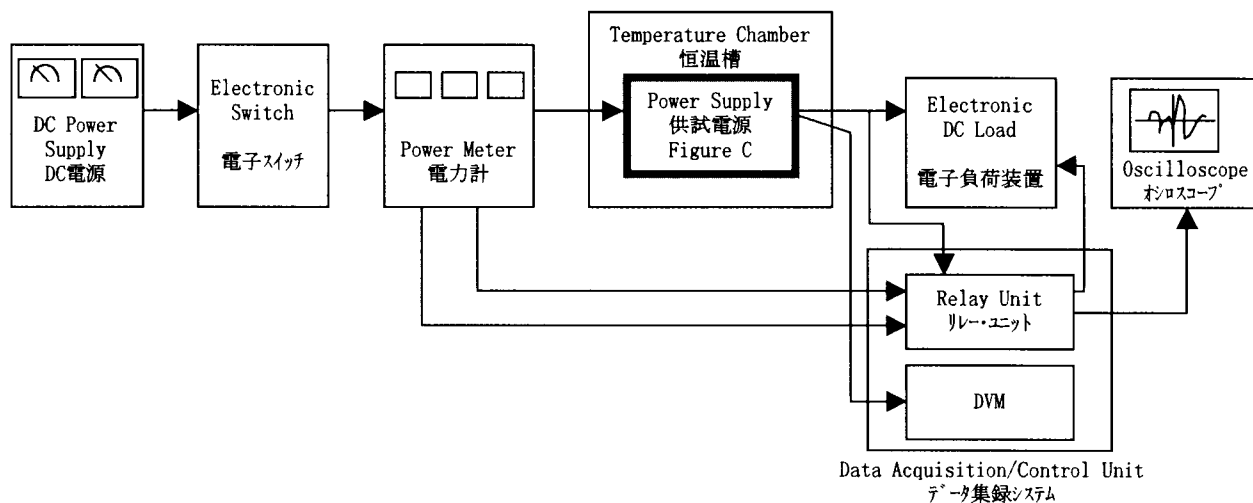


Figure A

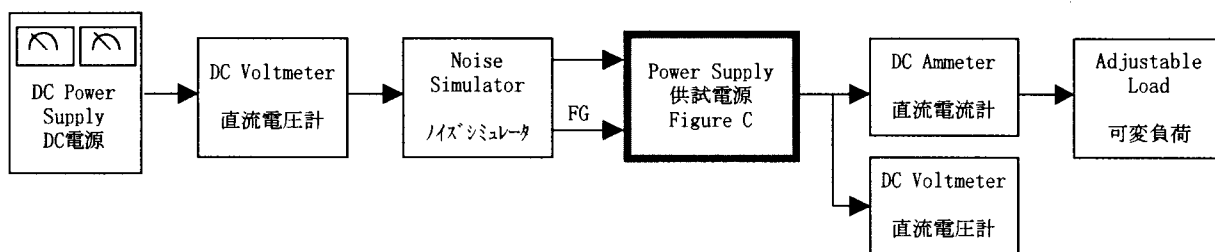


Figure B

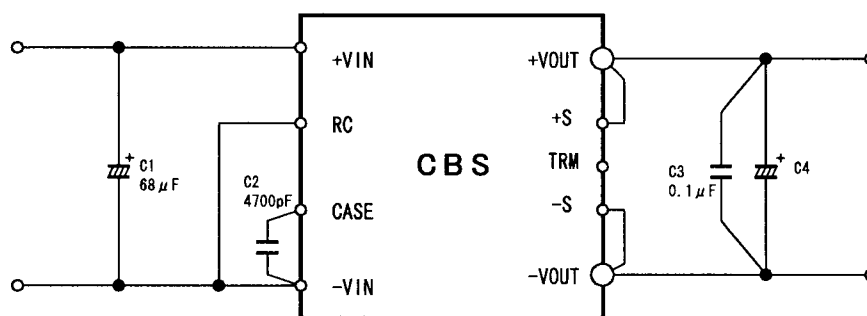


Figure C

C1 : 50V 68 μ F
 C2 : 4700pF
 C3 : 50V 0.1 μ F
 C4 : 35V 470 μ F $\times 2$ $(-40^{\circ}\text{C} \leq T_B < -20^{\circ}\text{C})$
 35V 470 μ F $(-20^{\circ}\text{C} \leq T_B \leq 100^{\circ}\text{C})$

T_B : Base Plate Temp.