

TEST DATA OF CBS2004812

(48V INPUT)

Regulated DC Power Supply
Feb. 21, 2001

Approved by : Takayuki Fukuda
Takayuki Fukuda Design Manager

Prepared by : Atsushi Yoshiyama
Atsushi Yoshiyama Design Engineer

コーセル株式会社
COSEL CO.,LTD.

CONTENTS

1. Line Regulation	1
静的入力変動	
2. Input Current (by Input Voltage)	2
入力電流 (入力電圧特性)	
3. Input Current (by Load Current)	3
入力電流 (負荷特性)	
4. Input Power (by Load Current)	4
入力電力 (負荷特性)	
5. Efficiency (by Input Voltage)	5
効率 (入力電圧特性)	
6. Efficiency (by Load Current)	6
効率 (負荷特性)	
7. Load Regulation	7
静的負荷変動	
8. Ripple Voltage (by Load Current)	8
リップル電圧 (負荷特性)	
9. Ripple-Noise	9
リップルノイズ	
10. Overcurrent Protection	10
過電流保護	
11. Overvoltage Protection	11
過電圧保護	
12. Dynamic Load Response	12
動的負荷変動	
13. Rise and Fall Time	13
立上り、立下り時間	
14. Ambient Temperature Drift	14
周囲温度変動	
15. Minimum Input Voltage for Regulated Output Voltage	15
最低レギュレーション電圧	
16. Ripple Voltage (by Ambient Temperature)	16
リップル電圧 (周囲温度特性)	
17. Time Lapse Drift	17
経時ドリフト	
18. Output Voltage Accuracy	18
定電圧精度	
19. Condensation	19
結露特性	
20. Line Noise Tolerance	20
入力雑音耐量	
21. Figure of Testing Circuitry	21
測定回路図	

(Final Page 21)

COSEL

Model	CBS2004812																																		
Item	Line Regulation 静の入力変動	Temperature	25℃																																
Object	+12V16.7A	Testing Circuitry	Figure A																																
1. Graph		2. Values																																	
<div>---□--- Load 50%</div> <div>—△— Load 100%</div> <p>Output Voltage [V]</p> <p>Input Voltage [V]</p>		<table><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><tr><td>33</td><td>11.967</td><td>11.965</td></tr><tr><td>36</td><td>11.966</td><td>11.964</td></tr><tr><td>40</td><td>11.966</td><td>11.964</td></tr><tr><td>48</td><td>11.966</td><td>11.964</td></tr><tr><td>55</td><td>11.966</td><td>11.964</td></tr><tr><td>60</td><td>11.966</td><td>11.963</td></tr><tr><td>70</td><td>11.966</td><td>11.963</td></tr><tr><td>76</td><td>11.966</td><td>11.963</td></tr><tr><td>80</td><td>11.965</td><td>11.963</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	33	11.967	11.965	36	11.966	11.964	40	11.966	11.964	48	11.966	11.964	55	11.966	11.964	60	11.966	11.963	70	11.966	11.963	76	11.966	11.963	80	11.965	11.963
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
33	11.967	11.965																																	
36	11.966	11.964																																	
40	11.966	11.964																																	
48	11.966	11.964																																	
55	11.966	11.964																																	
60	11.966	11.963																																	
70	11.966	11.963																																	
76	11.966	11.963																																	
80	11.965	11.963																																	
Note: Slanted line shows the range of the rated input voltage.																																			
(注) 斜線は定格入力電圧範囲を示す。																																			

COSEL

Model		CBS2004812	
Item	Input Current (by Input Voltage) 入力電流 (入力電圧特性)		
Object			

1. Graph

—△— Load 100%

---□--- Load 50%

---○--- Load 0%

Input Voltage [V]	Load 0% [A]	Load 50% [A]	Load 100% [A]
8.0	0.000	0.000	0.000
16.0	0.000	0.000	0.000
24.0	0.009	0.009	0.009
30.6	0.081	3.693	7.334
31.4	0.079	3.578	7.310
33.0	0.076	3.378	6.880
36.0	0.070	3.068	6.230
40.0	0.060	2.750	5.560
48.0	0.049	2.288	4.590
60.0	0.044	1.840	3.654
70.0	0.040	1.582	3.132
76.0	0.037	1.463	2.886
80.0	0.037	1.394	2.744
--	--	--	--
--	--	--	--
--	--	--	--

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

(注) 斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
8.0	0.000	0.000	0.000
16.0	0.000	0.000	0.000
24.0	0.009	0.009	0.009
30.6	0.081	3.693	7.334
31.4	0.079	3.578	7.310
33.0	0.076	3.378	6.880
36.0	0.070	3.068	6.230
40.0	0.060	2.750	5.560
48.0	0.049	2.288	4.590
60.0	0.044	1.840	3.654
70.0	0.040	1.582	3.132
76.0	0.037	1.463	2.886
80.0	0.037	1.394	2.744
--	--	--	--
--	--	--	--
--	--	--	--

COSEL

Model		CBS2004812		
Item	Input Current (by Load Current)		Temperature	25℃
	入力電流 (負荷特性)		Testing Circuitry	Figure A
Object				

1. Graph

—△—

Input Volt.

36V

---□---

Input Volt.

48V

---○---

Input Volt.

76V

Input Current [A]

Load Current [A]

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。

2. Values

Load Current [A]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	0.070	0.050	0.037
3.0	1.167	0.875	0.578
6.0	2.249	1.679	1.083
9.0	3.369	2.510	1.600
12.0	4.535	3.362	2.132
15.0	5.750	4.242	2.676
16.7	6.460	4.750	2.986
18.4	7.200	5.280	3.308
--	--	--	--
--	--	--	--
--	--	--	--

COSEL

Model		CBS2004812	
Item		Input Power (by Load Current) 入力電力 (負荷特性)	
Object			

1. Graph

—△—

Input Volt.

36V

---□---

Input Volt.

48V

---○---

Input Volt.

76V

Input Power [W]

<

COSEL

Model		CBS2004812	
Item		Efficiency (by Input Voltage) 効率 (入力電圧特性)	
Object			

1. Graph

□

Load 50%

—

△

—

Load 100%

Efficiency [%]

100

96

92

88

84

80

76

72

20

40

60

80

Input Voltage [V]

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

(注) 斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
33	88.9	87.0
36	89.3	87.5
40	89.5	87.9
48	89.5	88.2
55	89.2	88.3
60	88.9	88.3
70	88.4	87.8
76	88.0	87.7
80	87.8	87.7

COSEL

Model		CBS2004812		Temperature		25℃																																																	
Item		Efficiency (by Load Current) 効率 (負荷特性)		Testing Circuitry		Figure A																																																	
Object																																																							
1. Graph				2. Values																																																			
<div><div><div>—△—</div><div>Input Volt. 36V</div></div><div><div>---□---</div><div>Input Volt. 48V</div></div><div><div>---○---</div><div>Input Volt. 76V</div></div></div> <table><thead><tr><th>Load Current [A]</th><th>36V Efficiency [%]</th><th>48V Efficiency [%]</th><th>76V Efficiency [%]</th></tr></thead><tbody><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>3.0</td><td>85.0</td><td>85.0</td><td>80.9</td></tr><tr><td>6.0</td><td>88.7</td><td>89.0</td><td>86.6</td></tr><tr><td>9.0</td><td>89.4</td><td>89.5</td><td>88.2</td></tr><tr><td>12.0</td><td>89.0</td><td>89.4</td><td>88.2</td></tr><tr><td>15.0</td><td>88.1</td><td>88.8</td><td>88.0</td></tr><tr><td>16.7</td><td>87.4</td><td>88.2</td><td>87.8</td></tr><tr><td>18.4</td><td>86.7</td><td>87.7</td><td>87.5</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></tbody></table>				Load Current [A]	36V Efficiency [%]	48V Efficiency [%]	76V Efficiency [%]	0.0	-	-	-	3.0	85.0	85.0	80.9	6.0	88.7	89.0	86.6	9.0	89.4	89.5	88.2	12.0	89.0	89.4	88.2	15.0	88.1	88.8	88.0	16.7	87.4	88.2	87.8	18.4	86.7	87.7	87.5	--	-	-	-	--	-	-	-	--	-	-	-				
Load Current [A]	36V Efficiency [%]	48V Efficiency [%]	76V Efficiency [%]																																																				
0.0	-	-	-																																																				
3.0	85.0	85.0	80.9																																																				
6.0	88.7	89.0	86.6																																																				
9.0	89.4	89.5	88.2																																																				
12.0	89.0	89.4	88.2																																																				
15.0	88.1	88.8	88.0																																																				
16.7	87.4	88.2	87.8																																																				
18.4	86.7	87.7	87.5																																																				
--	-	-	-																																																				
--	-	-	-																																																				
--	-	-	-																																																				
<p>Note: Slanted line shows the range of the rated load current.</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p>																																																							

COSEL

Model		CBS2004812	
Item		Load Regulation 静的負荷変動	
Object		+12V16.7A	

1. Graph

—△—

Input Volt.

36V

---□---

Input Volt.

48V

---○---

Input Volt.

76V

Output Voltage [V]

COSEL

Model		CBS2004812		Temperature		25℃																																																																											
Item		Ripple Voltage (by Load Current) リップル電圧 (負荷特性)		Testing Circuitry		Figure A																																																																											
Object		+12V16.7A																																																																															
1. Graph				2. Values																																																																													
<div><div>—△— Input Volt. 36V</div><div>- -○- - Input Volt. 76V</div><table><thead><tr><th>Load Current [A]</th><th>Input Volt. 36 [V] [mV]</th><th>Input Volt. 76 [V] [mV]</th></tr></thead><tbody><tr><td>0.0</td><td>5</td><td>5</td></tr><tr><td>3.3</td><td>10</td><td>15</td></tr><tr><td>6.7</td><td>10</td><td>15</td></tr><tr><td>10.0</td><td>10</td><td>15</td></tr><tr><td>13.4</td><td>10</td><td>15</td></tr><tr><td>16.7</td><td>10</td><td>15</td></tr><tr><td>20.0</td><td>10</td><td>15</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>				Load Current [A]	Input Volt. 36 [V] [mV]	Input Volt. 76 [V] [mV]	0.0	5	5	3.3	10	15	6.7	10	15	10.0	10	15	13.4	10	15	16.7	10	15	20.0	10	15	---	—	—	---	—	—	---	—	—	---	—	—	<table><thead><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Output Voltage [mV]</th></tr><tr><th>Input Volt. 36 [V]</th><th>Input Volt. 76 [V]</th></tr></thead><tbody><tr><td>0.0</td><td>5</td><td>5</td></tr><tr><td>3.3</td><td>10</td><td>15</td></tr><tr><td>6.7</td><td>10</td><td>15</td></tr><tr><td>10.0</td><td>10</td><td>15</td></tr><tr><td>13.4</td><td>10</td><td>15</td></tr><tr><td>16.7</td><td>10</td><td>15</td></tr><tr><td>20.0</td><td>10</td><td>15</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>				Load Current [A]	Ripple Output Voltage [mV]		Input Volt. 36 [V]	Input Volt. 76 [V]	0.0	5	5	3.3	10	15	6.7	10	15	10.0	10	15	13.4	10	15	16.7	10	15	20.0	10	15	---	—	—	---	—	—	---	—	—	---	—	—
Load Current [A]	Input Volt. 36 [V] [mV]	Input Volt. 76 [V] [mV]																																																																															
0.0	5	5																																																																															
3.3	10	15																																																																															
6.7	10	15																																																																															
10.0	10	15																																																																															
13.4	10	15																																																																															
16.7	10	15																																																																															
20.0	10	15																																																																															
---	—	—																																																																															
---	—	—																																																																															
---	—	—																																																																															
---	—	—																																																																															
Load Current [A]	Ripple Output Voltage [mV]																																																																																
	Input Volt. 36 [V]	Input Volt. 76 [V]																																																																															
0.0	5	5																																																																															
3.3	10	15																																																																															
6.7	10	15																																																																															
10.0	10	15																																																																															
13.4	10	15																																																																															
16.7	10	15																																																																															
20.0	10	15																																																																															
---	—	—																																																																															
---	—	—																																																																															
---	—	—																																																																															
---	—	—																																																																															
<p>Ripple Voltage is shown as p-p in the figure below.</p> <p>Note: Slanted line shows the range of the rated load current.</p> <p>リップル電圧は、下図 p-p 値で示される。</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p>																																																																																	
<p>Ripple [mVp-p]</p> <p>Fig. Complex Ripple Wave Form</p> <p>図 リップル波形図</p>																																																																																	

COSEL

ModelCBS2004812

ItemRipple-Noise
リップルノイズ

Object+12V16.7A

1. Graph

—△—Input Volt. 36V

---○---Input Volt. 76V

Ripple-Noise [mV]

COSEL

Model	CBS2004812																																																														
Item	Overcurrent Protection 過電流保護	Temperature	25℃																																																												
Object	+12V16.7A	Testing Circuitry	Figure A																																																												
1. Graph		2. Values																																																													
<div><div><div></div><div></div><div></div></div><div>Input Volt. 36V Input Volt. 48V Input Volt. 76V</div></div> <p>Output Voltage [V]</p> <p>Load Current [A]</p> <p>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。</p> <p>Intermittent operation occurs when the output voltage is from 8V to 0V. 8V～0V間は、間欠モードとなる。</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>12.0</td><td>18.79</td><td>20.59</td><td>20.46</td></tr><tr><td>11.4</td><td>21.98</td><td>21.85</td><td>22.43</td></tr><tr><td>10.8</td><td>21.91</td><td>21.90</td><td>22.54</td></tr><tr><td>9.6</td><td>22.07</td><td>21.99</td><td>22.75</td></tr><tr><td>8.4</td><td>22.04</td><td>22.07</td><td>23.00</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><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>			Output Voltage [V]	Load Current [A]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	12.0	18.79	20.59	20.46	11.4	21.98	21.85	22.43	10.8	21.91	21.90	22.54	9.6	22.07	21.99	22.75	8.4	22.04	22.07	23.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Output Voltage [V]	Load Current [A]																																																														
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]																																																												
12.0	18.79	20.59	20.46																																																												
11.4	21.98	21.85	22.43																																																												
10.8	21.91	21.90	22.54																																																												
9.6	22.07	21.99	22.75																																																												
8.4	22.04	22.07	23.00																																																												
--	--	--	--																																																												
--	--	--	--																																																												
--	--	--	--																																																												
--	--	--	--																																																												
--	--	--	--																																																												
--	--	--	--																																																												
--	--	--	--																																																												
--	--	--	--																																																												

COSEL

Model		CBS2004812																																																				
Item		Overvoltage Protection 過電圧保護																																																				
Object		+12V16.7A																																																				
1. Graph		—△— Input Volt. 36V ---□--- Input Volt. 48V -·-○-·- Input Volt. 76V																																																				
<div><div>Operating Point [V]</div><div><div>Ambient Temperature [°C]</div></div></div> <div>Load 0%</div> <div>Note: Slanted line shows the range of the rated ambient temperature.</div> <div>(注) 斜線は定格周囲温度範囲を示す。</div>		2. Values																																																				
		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Operating Point [V]</th></tr><tr><th>Input Volt. 36[V]</th><th>Input Volt. 48[V]</th><th>Input Volt. 76[V]</th></tr><tr><td>-50</td><td>15.51</td><td>15.51</td><td>15.51</td></tr><tr><td>-40</td><td>15.51</td><td>15.51</td><td>15.51</td></tr><tr><td>-20</td><td>15.50</td><td>15.50</td><td>15.50</td></tr><tr><td>0</td><td>15.50</td><td>15.50</td><td>15.50</td></tr><tr><td>25</td><td>15.50</td><td>15.50</td><td>15.50</td></tr><tr><td>40</td><td>15.50</td><td>15.50</td><td>15.50</td></tr><tr><td>60</td><td>15.49</td><td>15.49</td><td>15.49</td></tr><tr><td>85</td><td>15.49</td><td>15.49</td><td>15.49</td></tr><tr><td>100</td><td>15.42</td><td>15.42</td><td>15.42</td></tr><tr><td>105</td><td>15.41</td><td>15.41</td><td>15.41</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]			Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]	-50	15.51	15.51	15.51	-40	15.51	15.51	15.51	-20	15.50	15.50	15.50	0	15.50	15.50	15.50	25	15.50	15.50	15.50	40	15.50	15.50	15.50	60	15.49	15.49	15.49	85	15.49	15.49	15.49	100	15.42	15.42	15.42	105	15.41	15.41	15.41	--	-	-	-
Ambient Temperature [°C]	Operating Point [V]																																																					
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]																																																			
-50	15.51	15.51	15.51																																																			
-40	15.51	15.51	15.51																																																			
-20	15.50	15.50	15.50																																																			
0	15.50	15.50	15.50																																																			
25	15.50	15.50	15.50																																																			
40	15.50	15.50	15.50																																																			
60	15.49	15.49	15.49																																																			
85	15.49	15.49	15.49																																																			
100	15.42	15.42	15.42																																																			
105	15.41	15.41	15.41																																																			
--	-	-	-																																																			

BC-3335

COSEL

Model	CBS2004812	Temperature	25°C
Item	Dynamic Load Response 動的負荷変動	Testing Circuitry	Figure A
Object	+12V16.7A		

Input Volt. 48 V
Cycle 1000 ms

Load Current

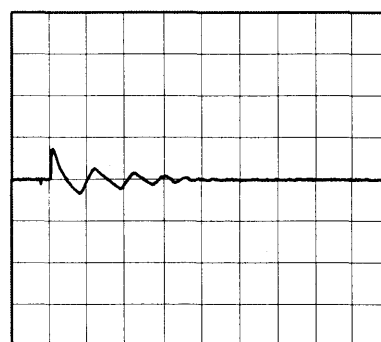


Min. Load (0A) ←→
Load 100% (16.7A)

500 mV/div



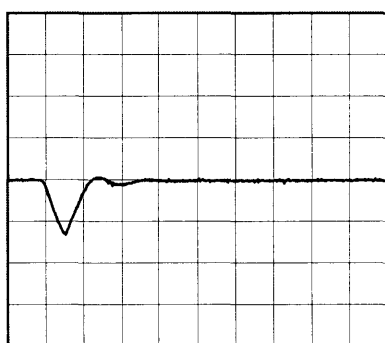
200 μs/div



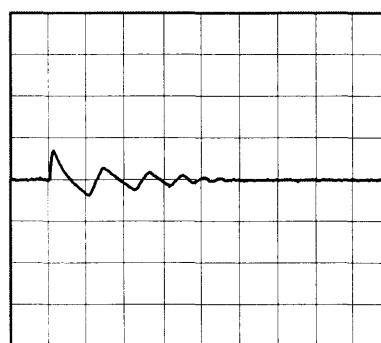
5 ms/div

Min. Load (0A) ←→
Load 50% (8.35A)

500 mV/div



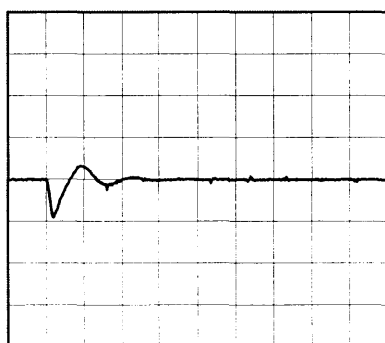
200 μs/div



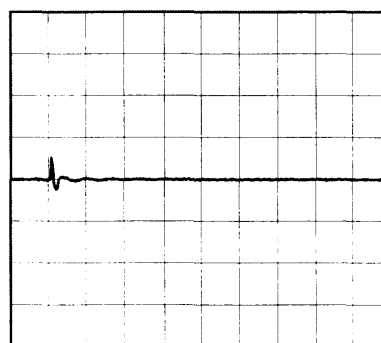
5 ms/div

Load 10% (1.67A) ←→
Load 100% (16.7A)

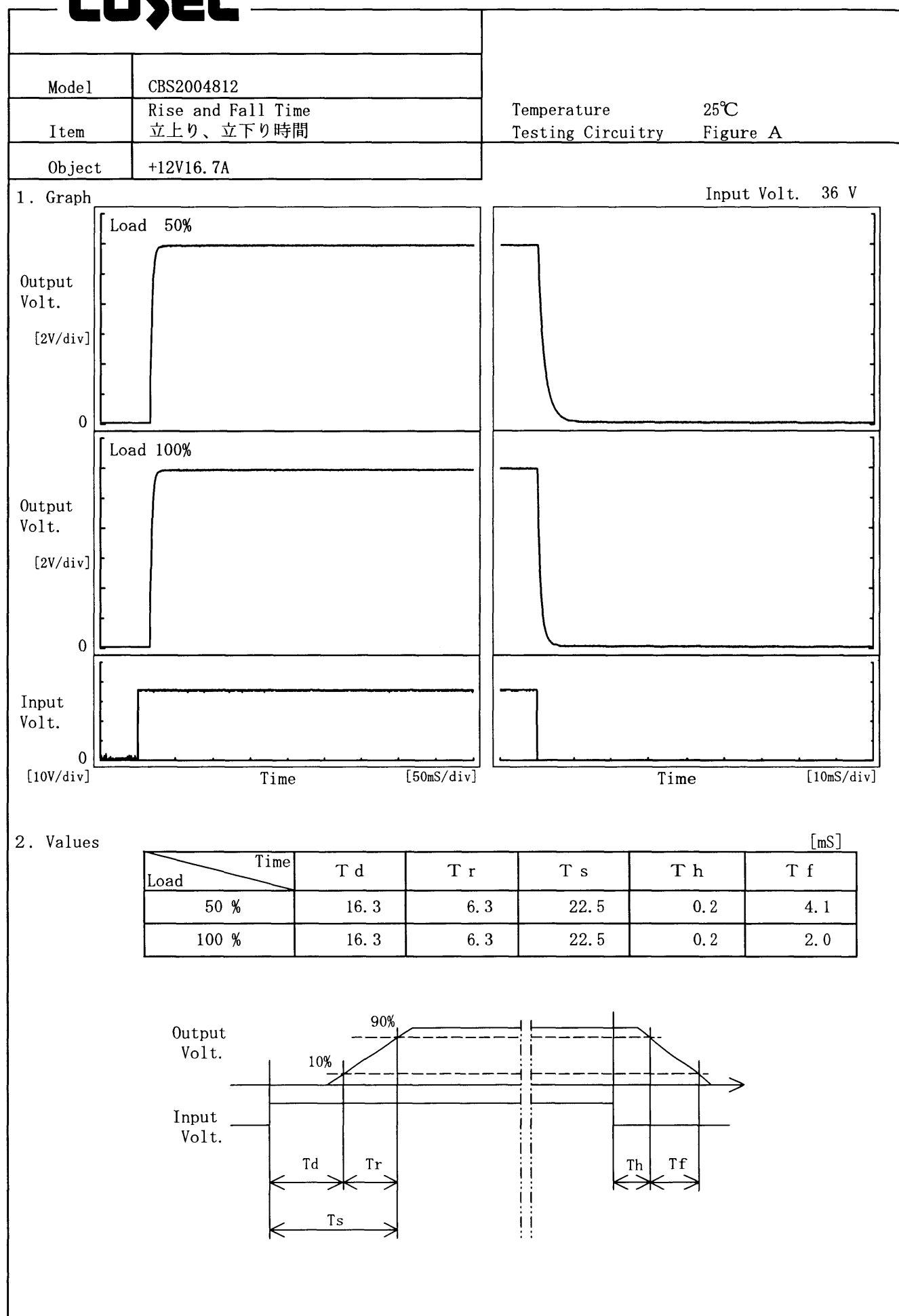
500 mV/div






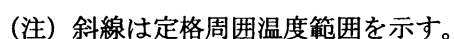
200 μs/div



5 ms/div

COSEL

1. Graph		Input Volt.	36V
		Input Volt.	48V
		Input Volt.	76V



2. Values

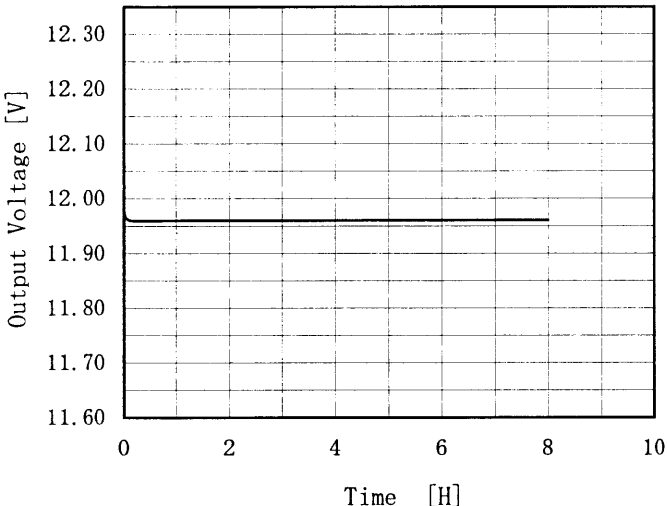
Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-50	12.002	12.002	12.002
-40	12.000	12.000	12.000
-20	11.996	11.996	11.996
0	11.993	11.993	11.993
25	11.982	11.981	11.982
40	11.970	11.969	11.969
60	11.950	11.950	11.949
85	11.920	11.919	11.919
100	11.900	11.900	11.899
105	11.891	11.891	11.891
--	-	-	-

COSEL

COSEL

Model	CBS2004812																																								
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)	Testing Circuitry	Figure A																																						
Object	+12V16.7A																																								
1. Graph		2. Values																																							
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <p style="text-align: center;">Ambient Temperature [°C]</p> <p style="text-align: center;">Input Volt. 48V</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>-50</td><td>115</td><td>115</td></tr><tr><td>-40</td><td>95</td><td>95</td></tr><tr><td>-20</td><td>45</td><td>45</td></tr><tr><td>0</td><td>20</td><td>20</td></tr><tr><td>25</td><td>15</td><td>15</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>15</td><td>10</td></tr><tr><td>105</td><td>15</td><td>15</td></tr><tr><td>--</td><td>—</td><td>—</td></tr></table>		Ambient Temperature [°C]	Ripple Voltage [mV]		Load 50%	Load 100%	-50	115	115	-40	95	95	-20	45	45	0	20	20	25	15	15	40	10	10	60	10	10	85	10	10	100	15	10	105	15	15	--	—	—
Ambient Temperature [°C]	Ripple Voltage [mV]																																								
	Load 50%	Load 100%																																							
-50	115	115																																							
-40	95	95																																							
-20	45	45																																							
0	20	20																																							
25	15	15																																							
40	10	10																																							
60	10	10																																							
85	10	10																																							
100	15	10																																							
105	15	15																																							
--	—	—																																							
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	CBS2004812																								
Item	Time Lapse Drift 経時ドリフト	Temperature	25℃																						
Object	+12V16.7A	Testing Circuitry	Figure A																						
1. Graph		2. Values																							
<div></div> <div>Input Volt. 48V Load 100%</div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>11.975</td></tr><tr><td>0.5</td><td>11.960</td></tr><tr><td>1.0</td><td>11.960</td></tr><tr><td>2.0</td><td>11.960</td></tr><tr><td>3.0</td><td>11.960</td></tr><tr><td>4.0</td><td>11.960</td></tr><tr><td>5.0</td><td>11.961</td></tr><tr><td>6.0</td><td>11.961</td></tr><tr><td>7.0</td><td>11.961</td></tr><tr><td>8.0</td><td>11.961</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	11.975	0.5	11.960	1.0	11.960	2.0	11.960	3.0	11.960	4.0	11.960	5.0	11.961	6.0	11.961	7.0	11.961	8.0	11.961
Time since start [H]	Output Voltage [V]																								
0.0	11.975																								
0.5	11.960																								
1.0	11.960																								
2.0	11.960																								
3.0	11.960																								
4.0	11.960																								
5.0	11.961																								
6.0	11.961																								
7.0	11.961																								
8.0	11.961																								

COSEL

Model	CBS2004812	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+12V16.7A	

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℃

Input Voltage : 36 ~ 76V

Load Current : 0 ~ 16.7A

* 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℃

入力電圧 : 36 ~ 76V

負荷電流 : 0 ~ 16.7A

* 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 [℃]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	36	0	12.000	±53	±0.4
Minimum Voltage	100	76	16.7	11.894		

		Testing Circuitry Figure A
Model	CBS2004812	
Item	Condense 結露特性	
Object	+12V16.7A	

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℃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℃、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]	12.064	Input Volt. :48V, Load Current. :16.7A
Line Regulation [mV]	2	Input Volt. :36~76V, Load Current. :16.7A
Load Regulation [mV]	1	Input Volt. :48V, Load Current. :0~16.7A

COSEL

Model	CBS2004812		
Item	Line Noise Tolerance 入力雑音耐量	Temperature	25°C
		Testing Circuitry	Figure B
Object	+12V16.7A		

1. Conditions

- Input Voltage : 48 V
- Pulse Input Duration : 1 min. or more
- Pulse Voltage : 2000 V
- Load : 100 %
- Pulse Cycle : 16.7 ms

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

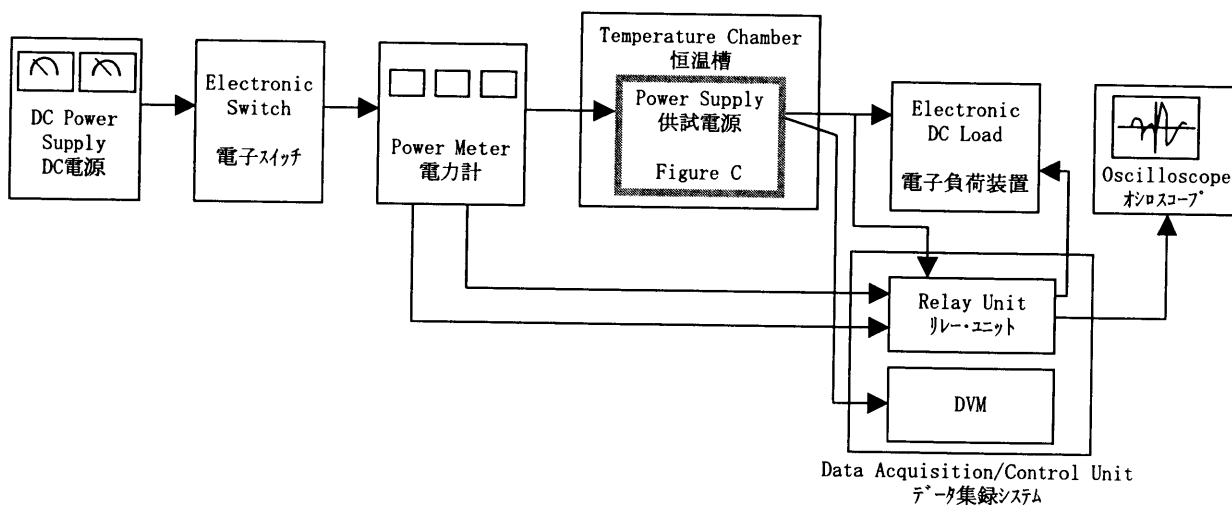


Figure A

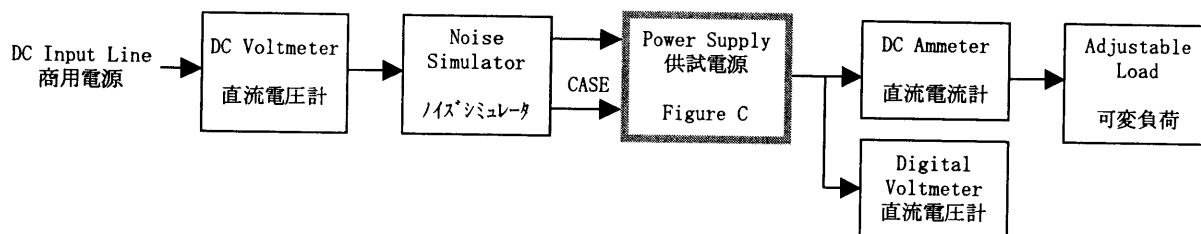


Figure B

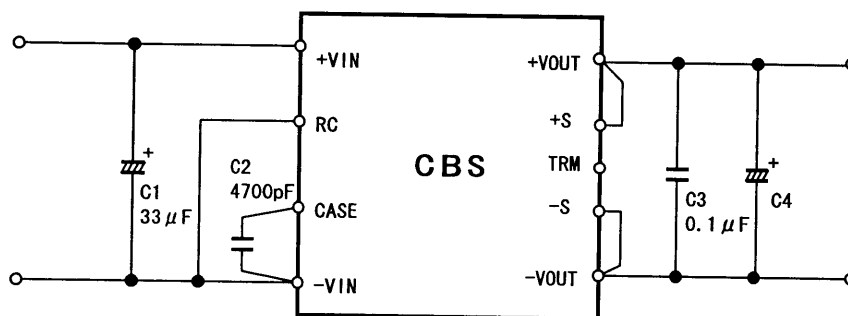


Figure C

C1 : 100V 33 μ F

C2 : 4700pF

C3 : 50V 0.1 μ F $(-40^{\circ}\text{C} \leq T_B \leq -20^{\circ}\text{C})$

C4 : CBS2004803, 05	10V 2200 μ F × 2
CBS2004812, 15	25V 1000 μ F × 2
CBS2004824, 28	35V 470 μ F × 2

 $(-20^{\circ}\text{C} < T_B \leq 100^{\circ}\text{C})$

C4 : CBS2004803, 05	10V 2200 μ F
CBS2004812, 15	25V 1000 μ F
CBS2004824, 28	35V 470 μ F

 T_B : Base Plate Temp.