COSEL

参考資料

TEST DATA OF CHS4004812

Regulated DC Power Supply
March 26, 2013

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Shuhei Sawada Design Engineer

COSEL CO.,LTD.

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Item	Input Current (by Input Voltage)
Object	———————

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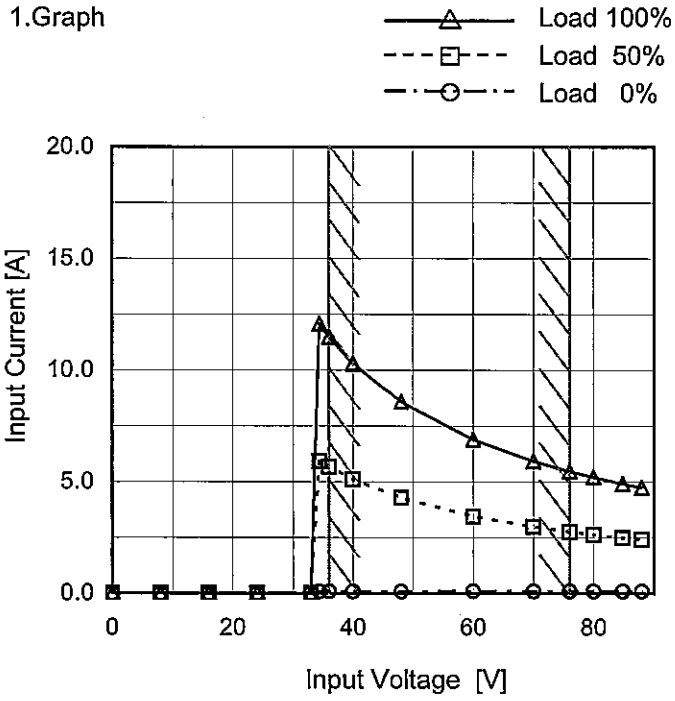


Note: Slanted line shows the range of the rated input voltage.

2.Values

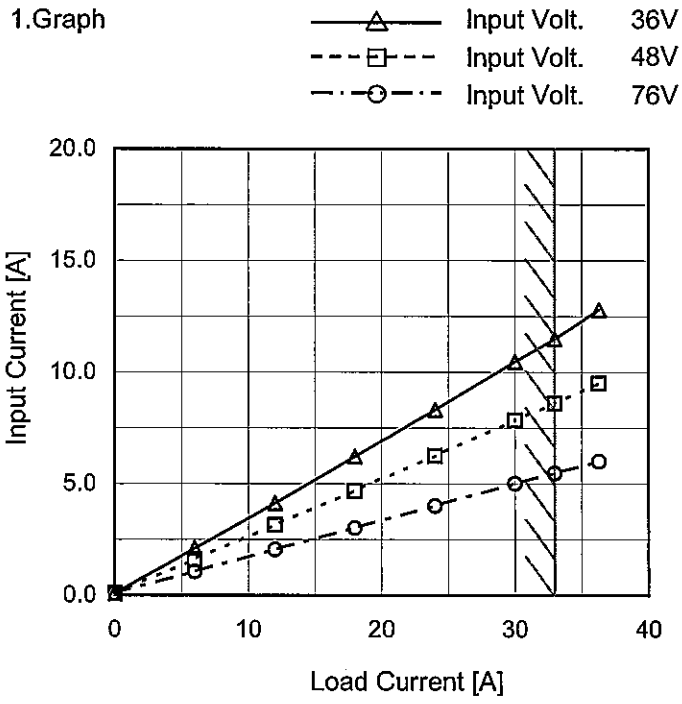
Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
8.0	0.000	0.000	0.000
16.0	0.000	0.000	0.000
24.0	0.006	0.006	0.006
33.0	0.013	0.013	0.013
34.4	0.088	5.920	12.090
36.0	0.088	5.680	11.490
40.0	0.088	5.110	10.300
48.0	0.091	4.277	8.590
60.0	0.096	3.452	6.890
70.0	0.100	2.984	5.930
76.0	0.102	2.764	5.470
80.0	0.104	2.634	5.210
84.8	0.105	2.492	4.920
88.0	0.107	2.410	4.760
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	CHS4004812
Item	Input Current (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	0.088	0.091	0.102
6.0	2.108	1.615	1.066
12.0	4.144	3.142	2.048
18.0	6.220	4.690	3.022
24.0	8.320	6.250	4.008
30.0	10.480	7.840	5.010
33.0	11.490	8.590	5.470
36.3	12.800	9.500	6.000
--	-	-	-
--	-	-	-
--	-	-	-

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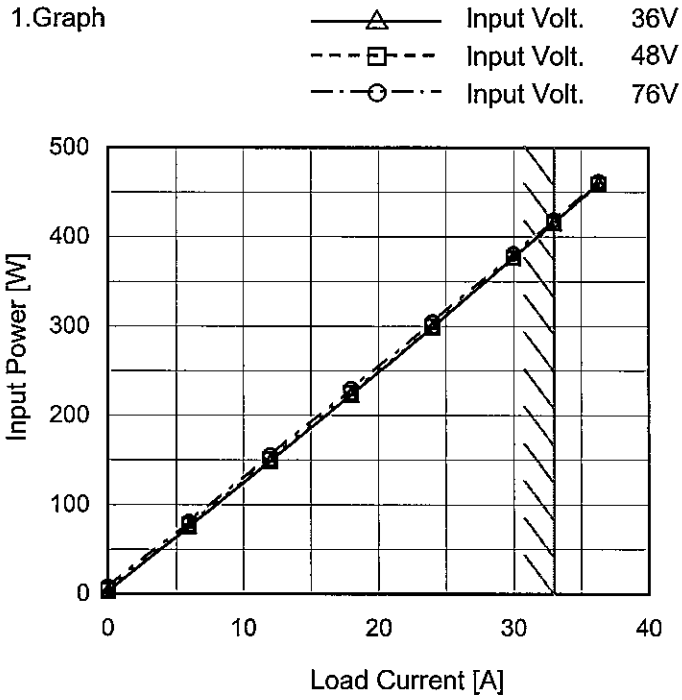
Model	CHS4004812
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Input Power [W]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	3.1	4.4	7.8
6.0	75.8	77.4	81.0
12.0	149.2	150.8	155.7
18.0	223.4	225.1	229.8
24.0	299.0	300.0	304.5
30.0	377.0	376.4	381.0
33.0	416.0	415.4	419.0
36.3	460.0	459.0	462.0
--	-	-	-
--	-	-	-
--	-	-	-

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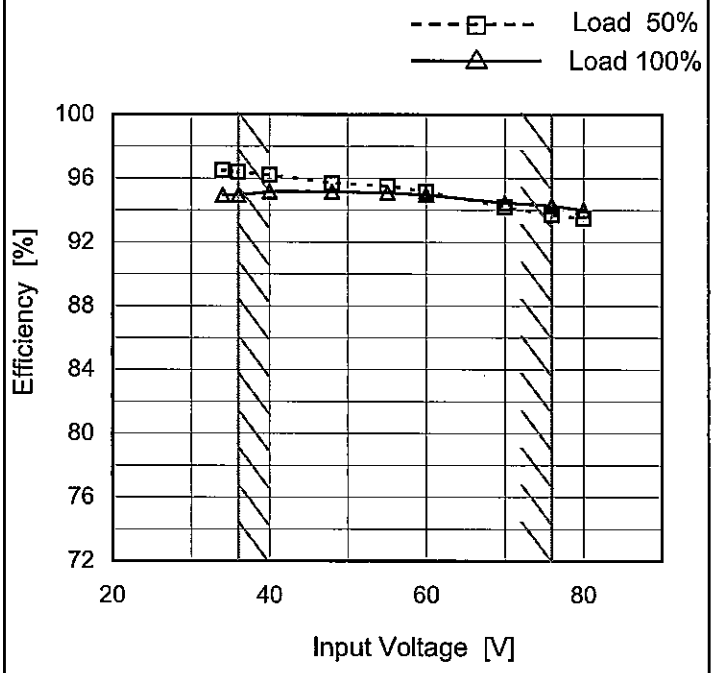
Model	CHS4004812
Item	Efficiency (by Input Voltage)
Object	

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%
34	96.5	94.9
36	96.4	95.0
40	96.2	95.2
48	95.7	95.2
55	95.5	95.1
60	95.1	95.0
70	94.2	94.5
76	93.7	94.3
80	93.5	94.0

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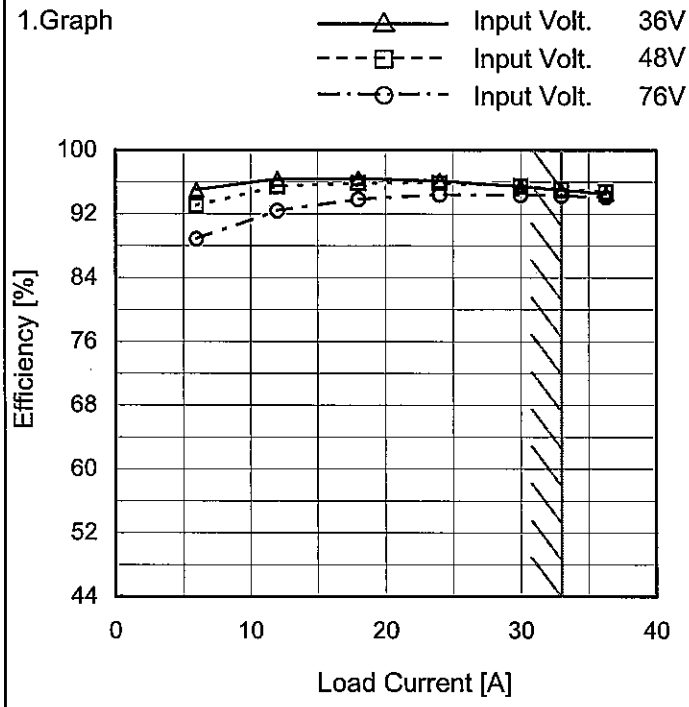
Model	CHS4004812
Item	Efficiency (by Load Current)
Object	———————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	-	-	-
6.0	95.0	93.0	88.9
12.0	96.4	95.4	92.4
18.0	96.4	95.8	93.8
24.0	96.2	95.9	94.4
30.0	95.4	95.5	94.4
33.0	95.0	95.2	94.3
36.3	94.5	94.7	94.1
--	-	-	-
--	-	-	-
--	-	-	-

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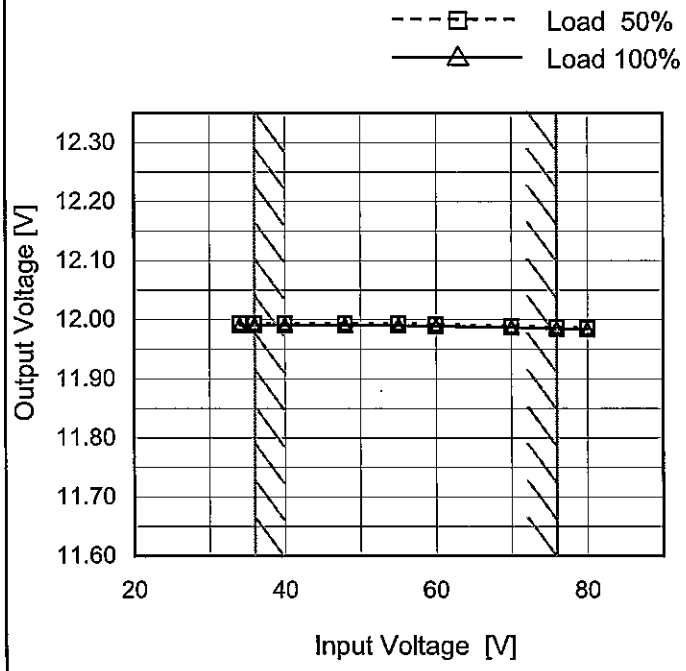
Model	CHS4004812
Item	Line Regulation
Object	+12V33A

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]	Output Voltage [V]	
	Load 50%	Load 100%
34	11.994	11.991
36	11.994	11.991
40	11.994	11.991
48	11.994	11.991
55	11.994	11.991
60	11.992	11.990
70	11.989	11.987
76	11.988	11.985
80	11.986	11.984

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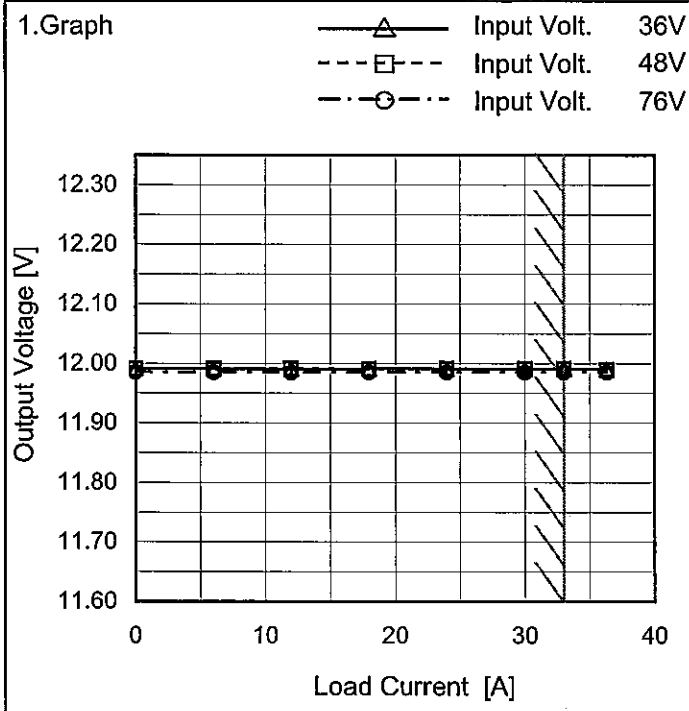
Model	CHS4004812
Item	Load Regulation
Object	+12V33A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
0.0	11.991	11.991	11.985
6.0	11.991	11.991	11.985
12.0	11.991	11.991	11.985
18.0	11.991	11.991	11.985
24.0	11.991	11.991	11.985
30.0	11.991	11.991	11.985
33.0	11.991	11.991	11.985
36.3	11.990	11.989	11.985
--	-	-	-
--	-	-	-
--	-	-	-

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Model	CHS4004812		
Item	Dynamic Load Response	Temperature	25℃
		Testing Circuitry	Figure A
Object	+12V33A		

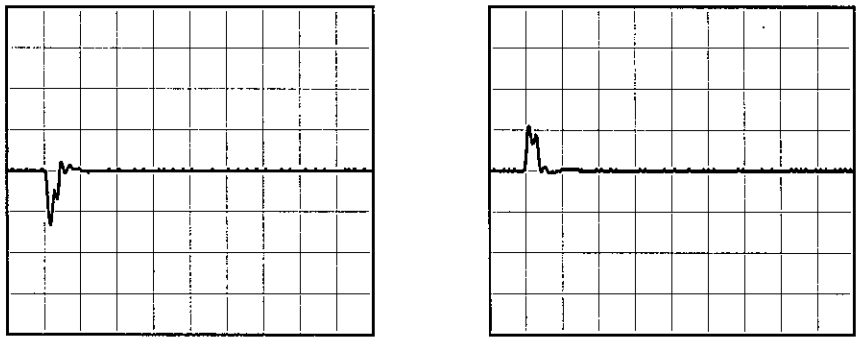
Input Volt. 48 V
Cycle 5 ms

t1,t2=50 μ S

Load Current

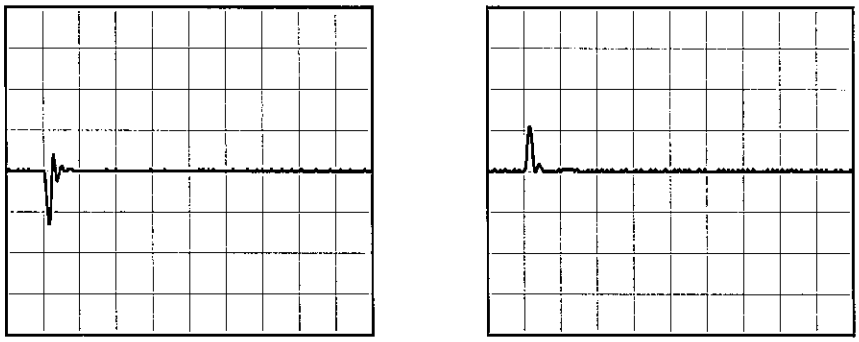
t1 t2

Min. Load (0A) ⟷
Load 100% (33A)



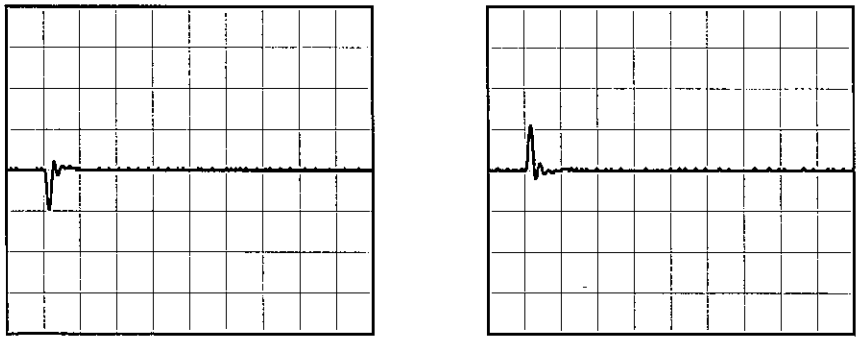
500 mV/div
200 μs/div
200 μs/div

Min. Load (0A) ⟷
Load 50% (16.5A)



500 mV/div
200 μs/div
200 μs/div

Load 50% (16.5A) ⟷
Load 100% (33A)



500 mV/div
200 μs/div
200 μs/div

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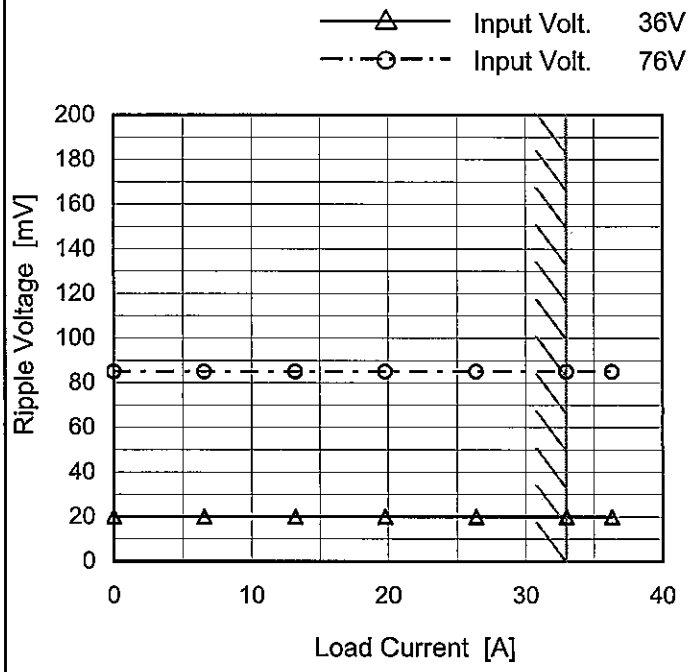
Model	CHS4004812
Item	Ripple Voltage (by Load Current)
Object	+12V33A

Temperature 25°C
Testing Circuitry Figure B

1.Graph



Measured by 100 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

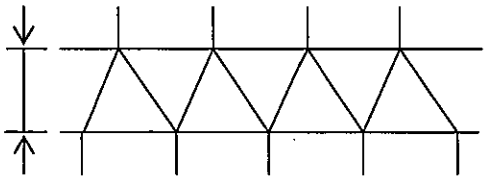


Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.0	20	85
6.6	20	85
13.2	20	85
19.8	20	85
26.4	20	85
33.0	20	85
36.3	20	85
--	-	-
--	-	-
--	-	-
--	-	-

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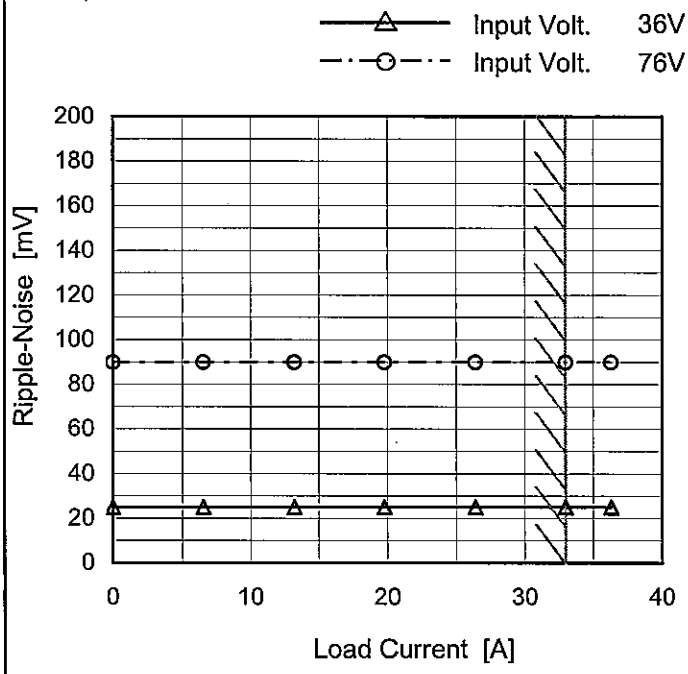
Model	CHS4004812
Item	Ripple-Noise
Object	+12V33A

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.

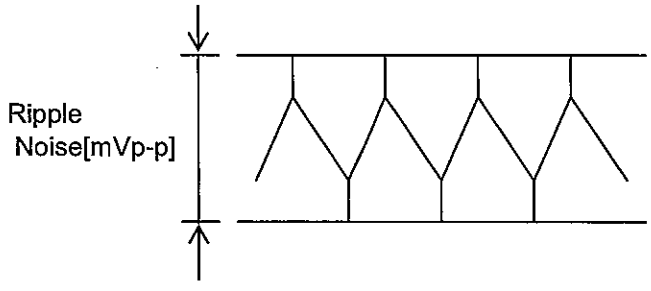


Fig.Complex Ripple Noise Wave Form

2.Values

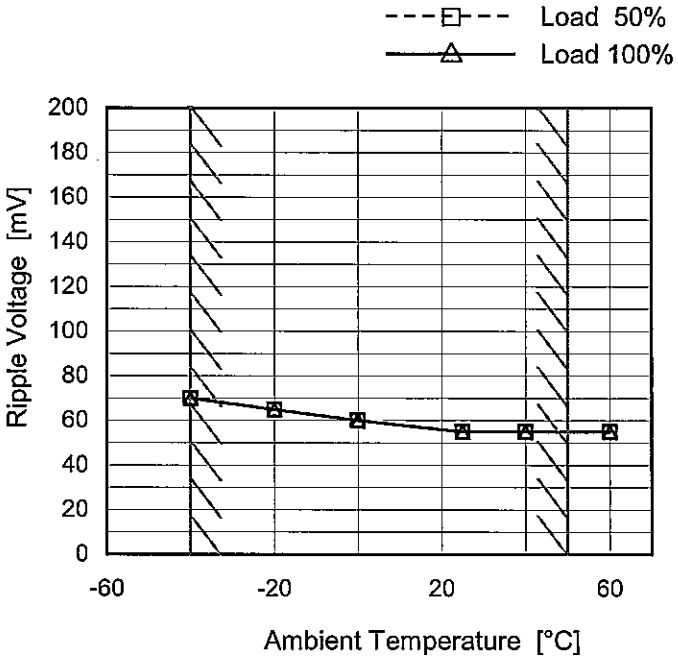
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 36 [V]	Input Volt. 76 [V]
0.0	25	90
6.6	25	90
13.2	25	90
19.8	25	90
26.4	25	90
33.0	25	90
36.3	25	90
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	CHS4004812
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V33A

Testing Circuitry Figure B

1.Graph



Input Volt. 48 V

Measured by 100 MHz Oscilloscope.

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

Ripple [mVp-p]

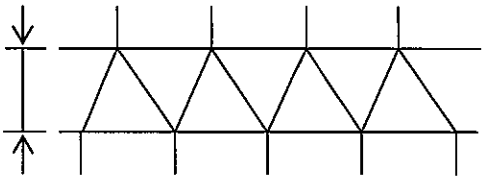


Fig.Complex Ripple Wave Form

2.Values

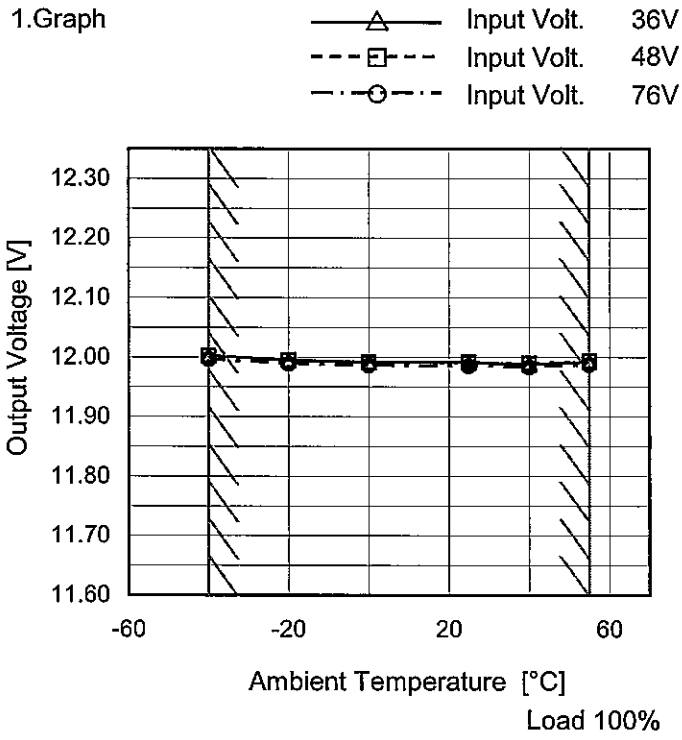
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	70	70
-20	65	65
0	60	60
25	55	55
40	55	55
60	55	55
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	CHS4004812
Item	Ambient Temperature Drift
Object	+12V33A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
-40	12.003	12.002	11.996
-20	11.995	11.995	11.989
0	11.992	11.991	11.986
25	11.991	11.991	11.985
40	11.989	11.990	11.984
55	11.992	11.993	11.988
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	CHS4004812	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V33A	

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 : 36 - 76V
Load Current : 0 - 33A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2.Values

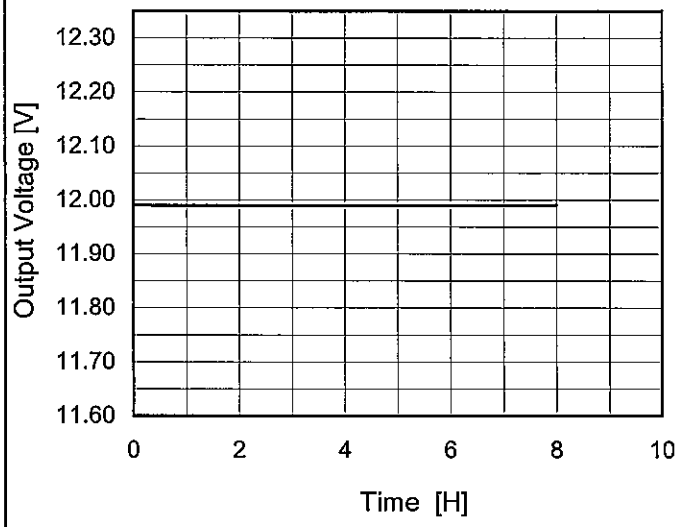
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	36	0	12.003	±9.5	±0.1
Minimum Voltage	40	76	0	11.984		

COSEL

Model	CHS4004812
Item	Time Lapse Drift
Object	+12V33A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 48V
Load 100%

2.Values

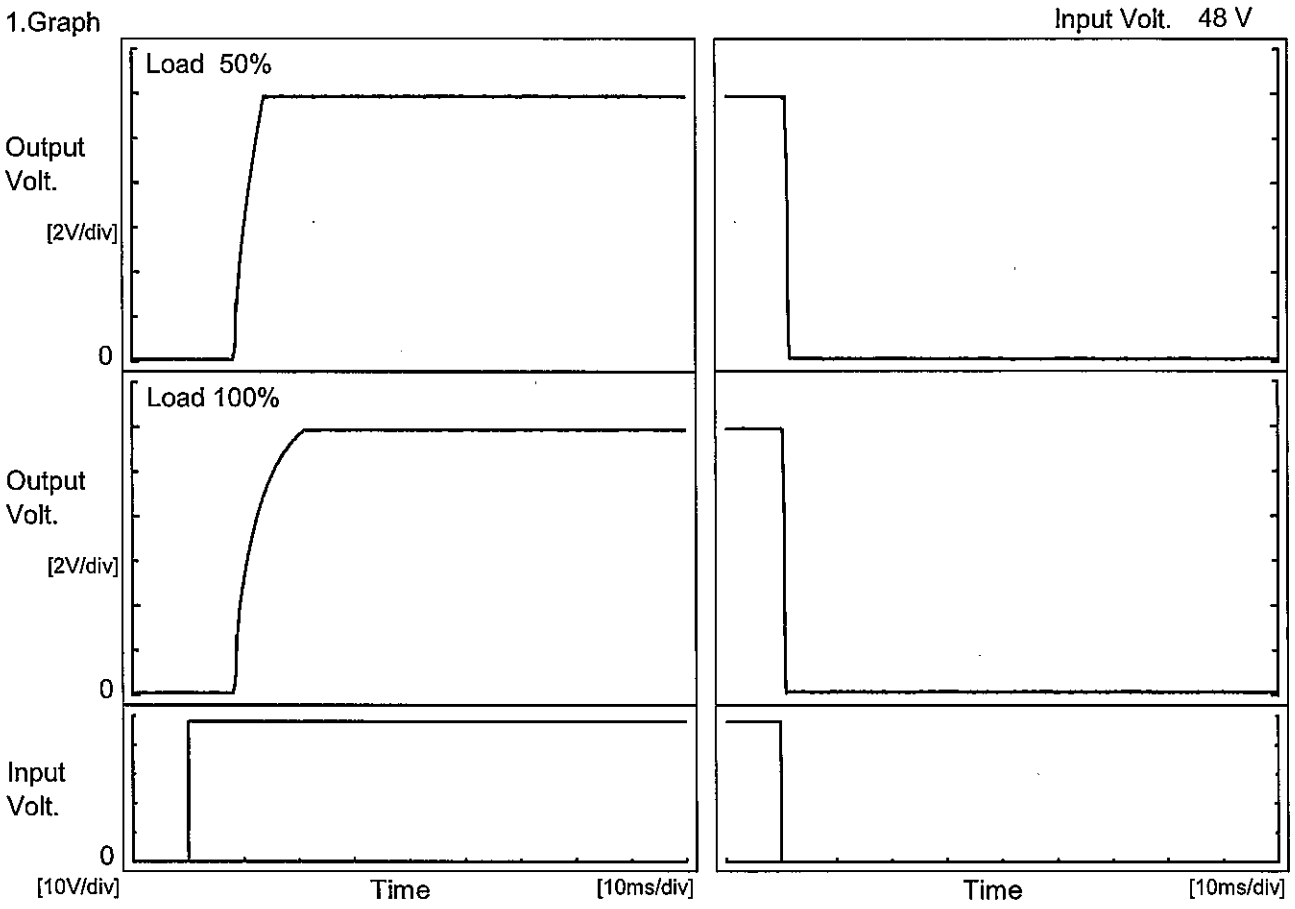
Time since start [H]	Output Voltage [V]
0.0	11.995
0.5	11.990
1.0	11.991
2.0	11.990
3.0	11.990
4.0	11.990
5.0	11.991
6.0	11.990
7.0	11.990
8.0	11.991

COSEL

Model	CHS4004812
Item	Rise and Fall Time
Object	+12V33A

Temperature 25°C
Testing Circuitry Figure A

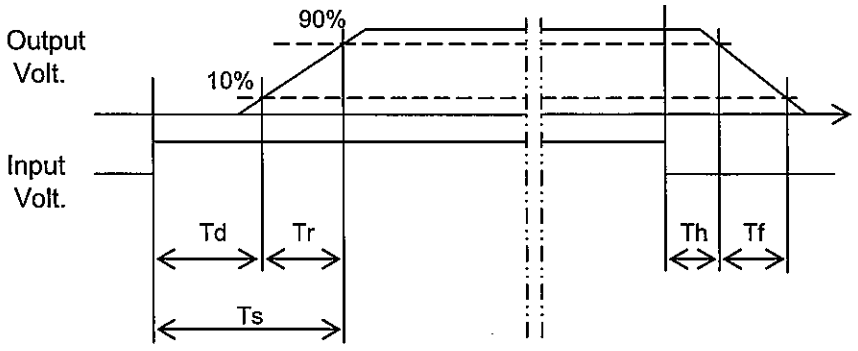
1.Graph



2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	8.7	4.4	13.1	0.8	0.5
100 %	8.7	8.8	17.5	0.4	0.4

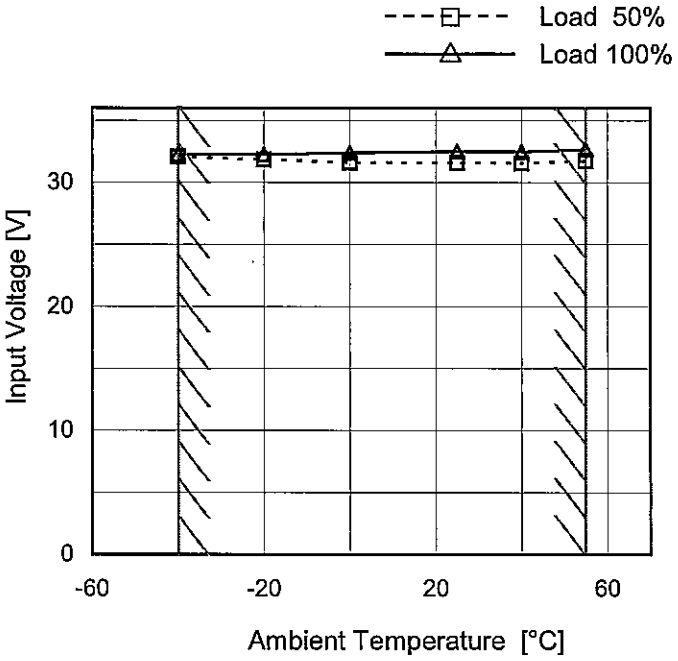


COSEL

Model	CHS4004812
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V33A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-40	32.1	32.4
-20	31.9	32.3
0	31.7	32.5
25	31.6	32.6
40	31.6	32.5
55	31.8	32.7
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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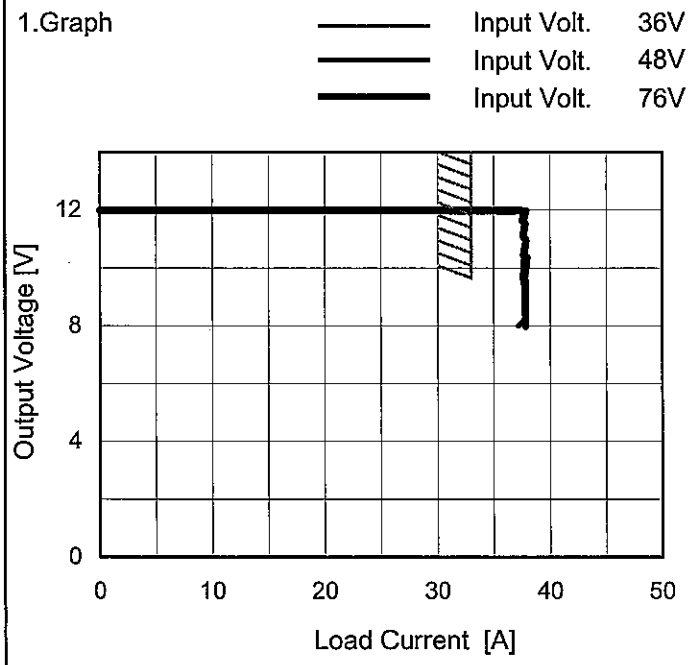
Model	CHS4004812
Item	Overcurrent Protection
Object	+12V33A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

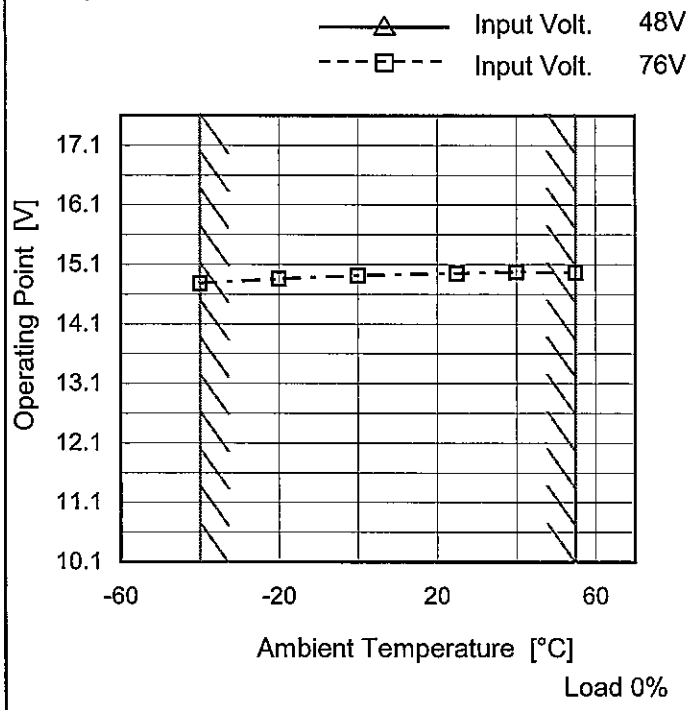
Output Voltage [V]	Load Current [A]		
	Input Volt. 36[V]	Input Volt. 48[V]	Input Volt. 76[V]
11.4	37.99	37.76	37.76
10.8	37.74	37.87	37.92
9.6	37.90	37.62	37.78
8.4	37.73	37.79	37.73
8.0	37.75	37.79	37.72
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	CHS4004812
Item	Overvoltage Protection
Object	+12V33A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Operating Point [V] Input Volt. 48[V]	Operating Point [V] Input Volt. 76[V]
-40	14.79	14.78
-20	14.87	14.86
0	14.92	14.91
25	14.99	14.95
40	14.98	14.97
55	14.98	14.96
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

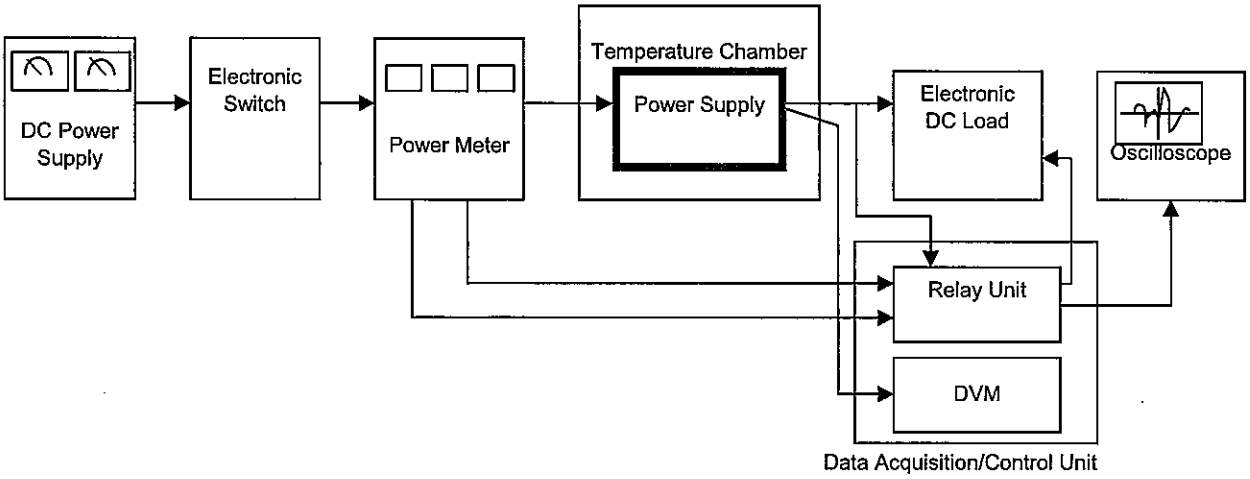


Figure A

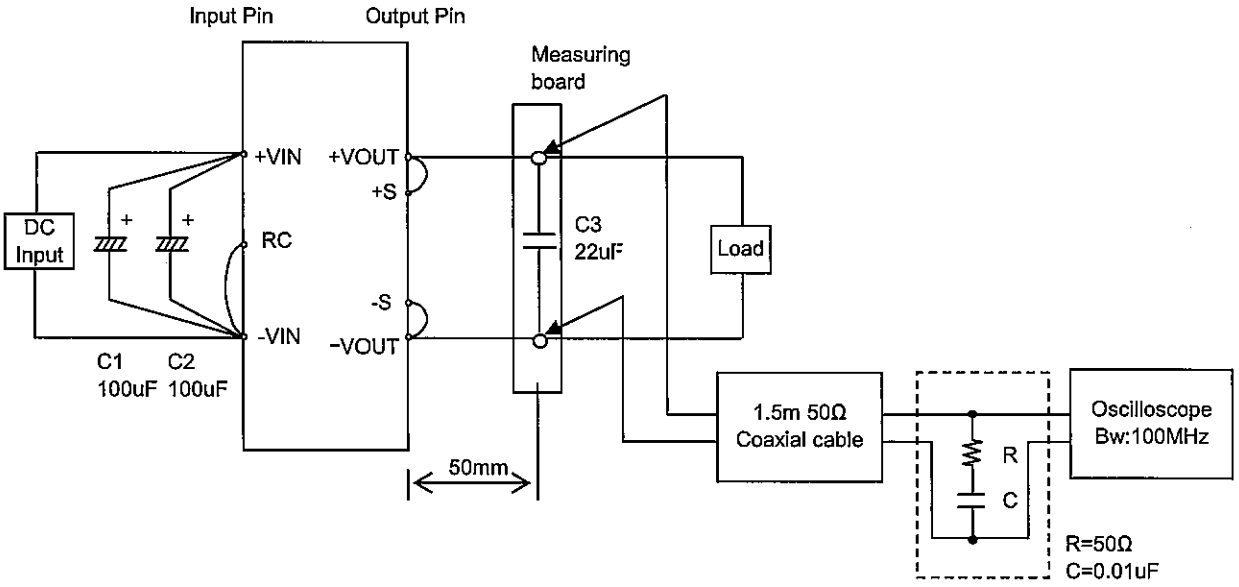


Figure B