参考資料

COSEL

TEST DATA OF CBS4504824

Regulated DC Power Supply
Jul 4, 2007

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Eiji Nagata Design Engineer

COSEL CO.,LTD.

COSEL

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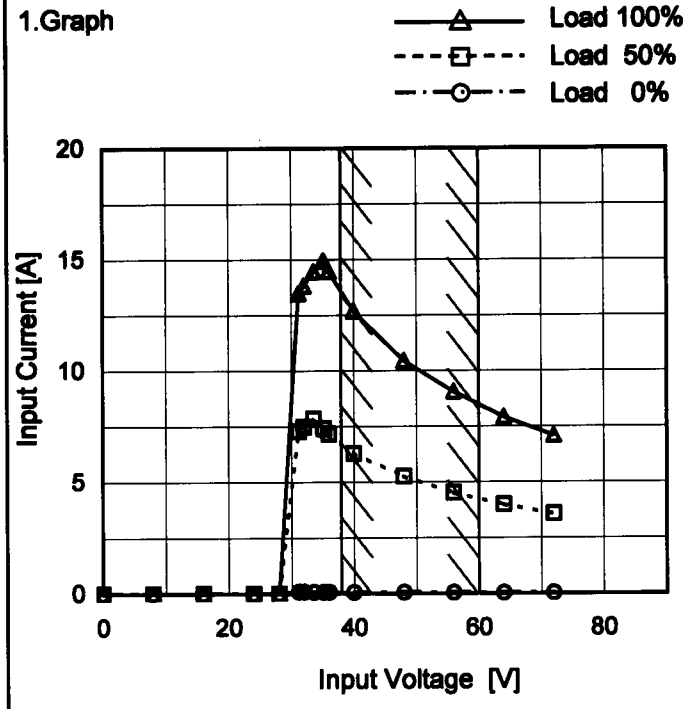
COSEL

Model	CBS4504824
Item	Input Current (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]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
8.0	0.002	0.002	0.002
16.0	0.002	0.002	0.002
24.0	0.006	0.006	0.006
28.0	0.006	0.006	0.006
31.2	0.085	7.270	13.480
32.0	0.081	7.470	13.810
33.6	0.077	7.830	14.460
35.2	0.072	7.400	14.940
36.0	0.070	7.150	14.470
40.0	0.061	6.280	12.680
48.0	0.051	5.240	10.450
56.0	0.042	4.514	9.050
64.0	0.036	3.976	7.920
72.0	0.031	3.564	7.080
--	-	-	-
--	-	-	-
--	-	-	-

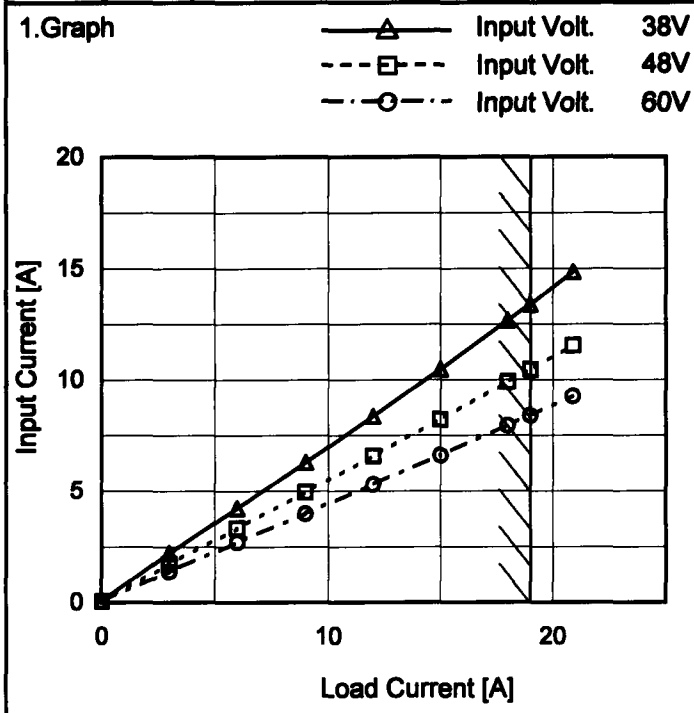
BC-10102

COSEL

Model	CBS4504824
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. 38[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.0	0.063	0.047	0.037
3.0	2.207	1.719	1.384
6.0	4.230	3.326	2.696
9.0	6.280	4.940	3.976
12.0	8.350	6.560	5.290
15.0	10.480	8.210	6.600
18.0	12.660	9.900	7.930
19.0	13.380	10.450	8.380
20.9	14.840	11.540	9.260
--	-	-	-
--	-	-	-

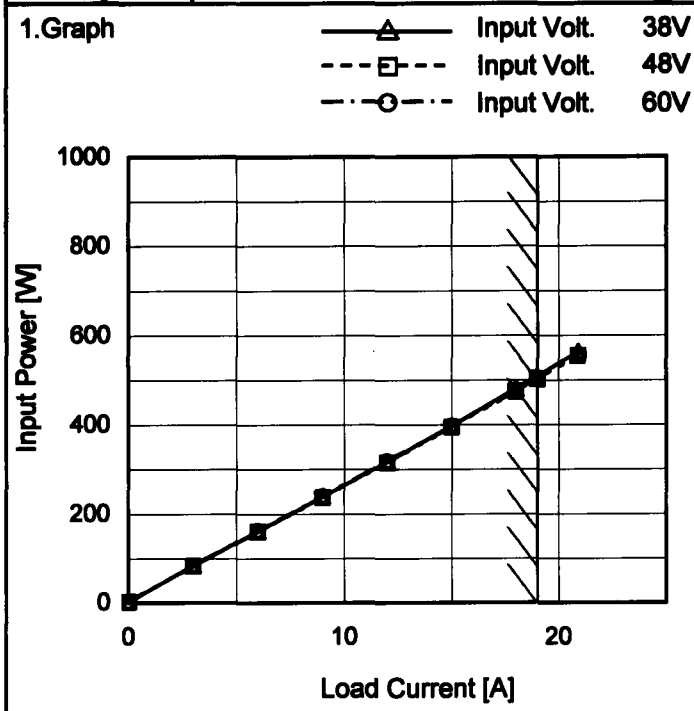
BC-10102

COSEL

Model	CBS4504824
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. 38[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.0	2.4	2.3	2.2
3.0	83.6	82.5	83.0
6.0	160.6	159.5	161.6
9.0	238.3	236.9	239.2
12.0	317.0	314.9	317.3
15.0	397.0	394.1	396.2
18.0	480.0	474.0	475.9
19.0	508.0	502.0	502.7
20.9	563.0	554.0	555.0
--	-	-	-
--	-	-	-

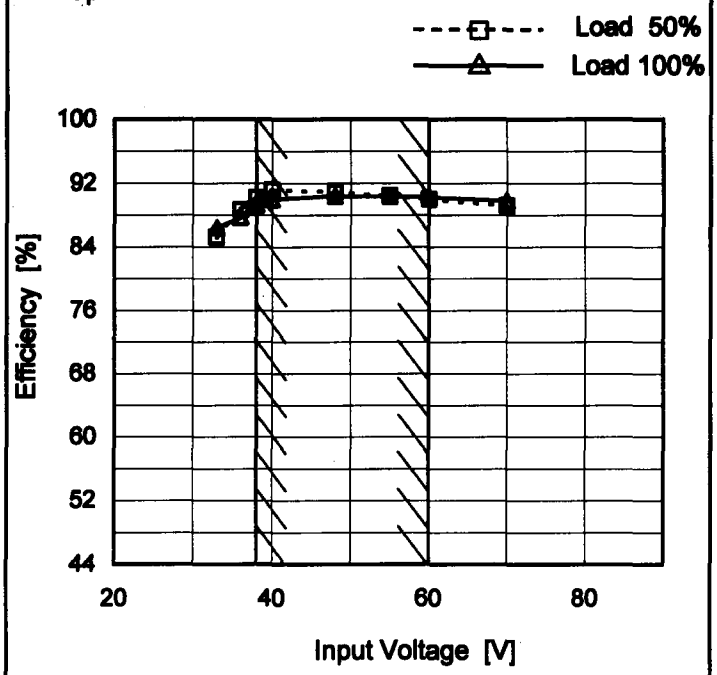
BC-10102

COSEL

Model	CBS4504824
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

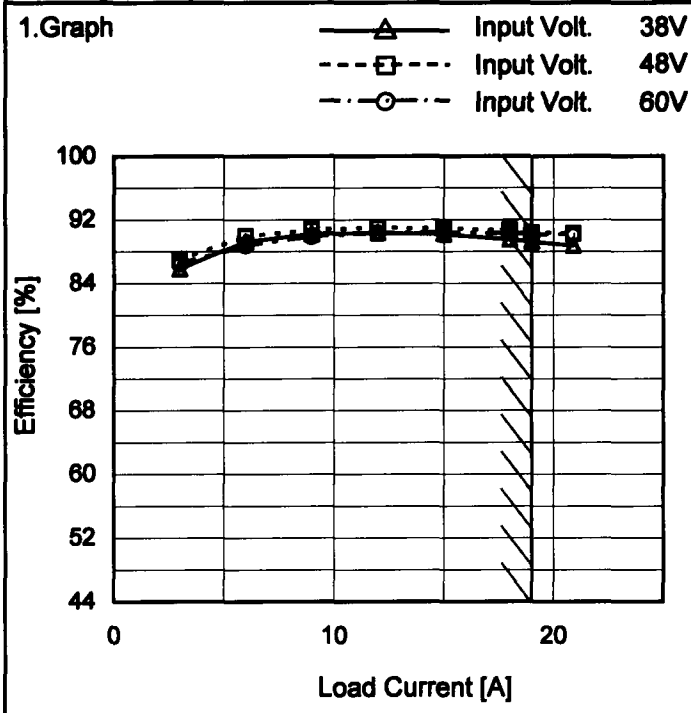
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
33	85.2	86.4
36	88.7	87.7
38	90.2	89.3
40	91.1	90.0
48	90.9	90.4
55	90.4	90.4
60	90.0	90.3
70	89.2	89.8
-	-	-

COSEL

Model	CBS4504824
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. 38[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.0	-	-	-
3.0	85.8	86.9	86.4
6.0	89.2	89.9	88.7
9.0	90.2	90.7	89.9
12.0	90.3	91.0	90.3
15.0	90.2	90.9	90.4
18.0	89.5	90.7	90.3
19.0	89.3	90.4	90.3
20.9	88.7	90.2	90.1
—	-	-	-
—	-	-	-

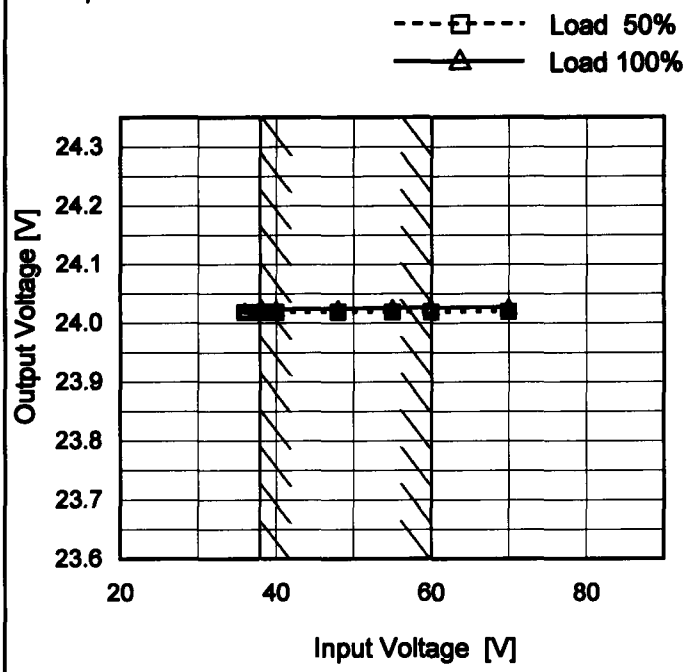
BC-10102

COSEL

Model	CBS4504824
Item	Line Regulation
Object	+24V19A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

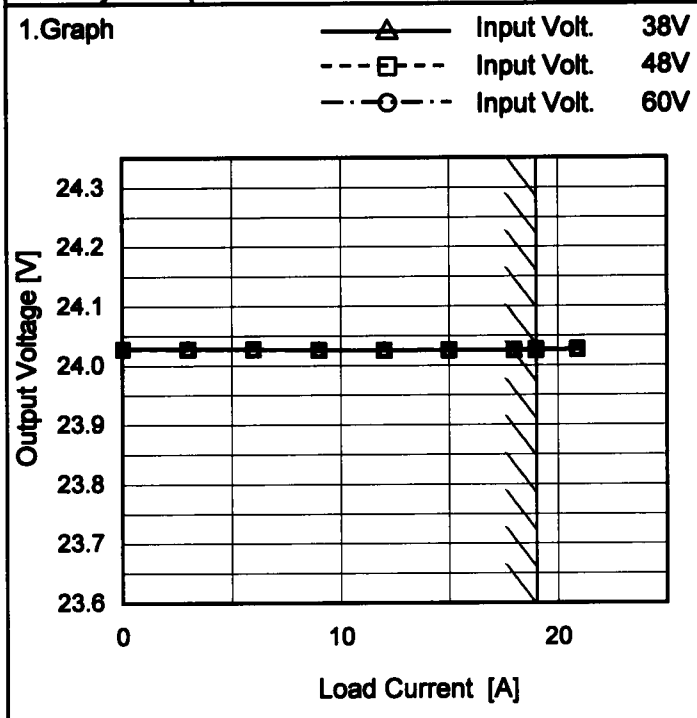
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
36	24.018	24.021
38	24.018	24.022
40	24.018	24.023
48	24.019	24.025
55	24.019	24.026
60	24.019	24.026
70	24.019	24.027
--	-	-
--	-	-

COSEL

Model	CBS4504824
Item	Load Regulation
Object	+24V19A

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. 38[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.0	24.029	24.027	24.027
3.0	24.029	24.027	24.027
6.0	24.028	24.027	24.027
9.0	24.026	24.025	24.026
12.0	24.025	24.025	24.026
15.0	24.025	24.025	24.025
18.0	24.025	24.025	24.026
19.0	24.025	24.026	24.026
20.9	24.026	24.027	24.027
–	-	-	-
–	-	-	-

COSEL

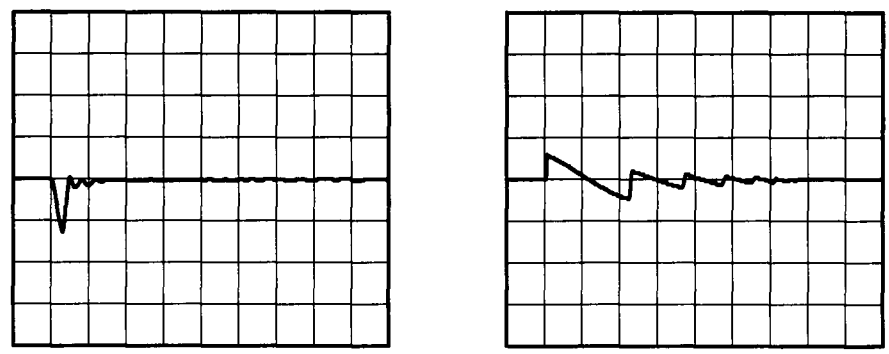
Model	CBS4504824
Item	Dynamic Load Response
Object	+24V19A

Temperature 25°C
Testing Circuitry Figure A

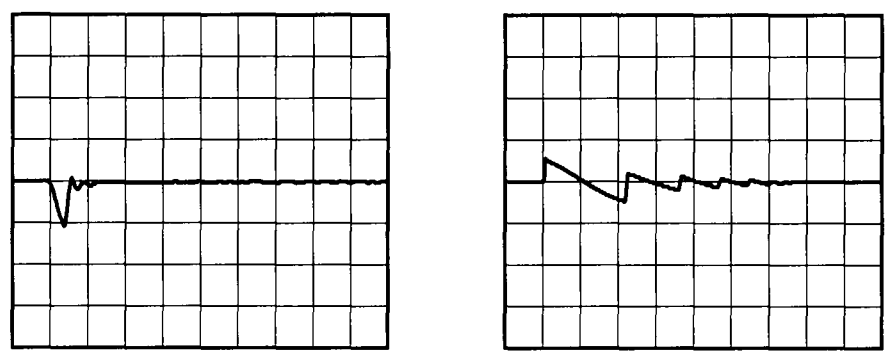
Input Volt. 48 V
Cycle 10 mS

Load Current

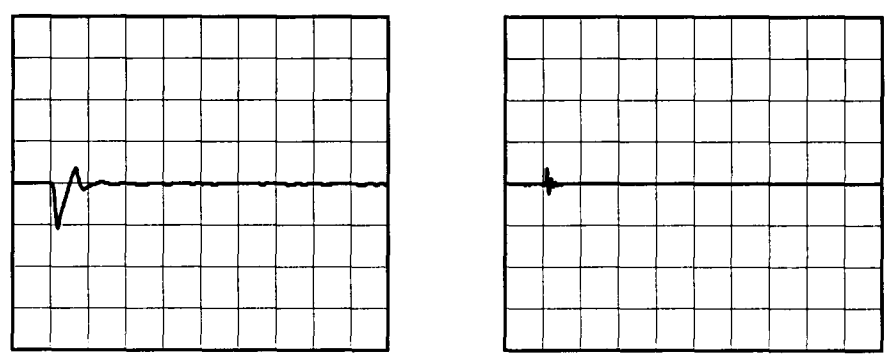
Min. Load (0A) ⟷
Load 100% (19A)



Min. Load (0A) ⟷
Load 50% (9.5A)



Load 10% (1.9A) ⟷
Load 100% (19A)

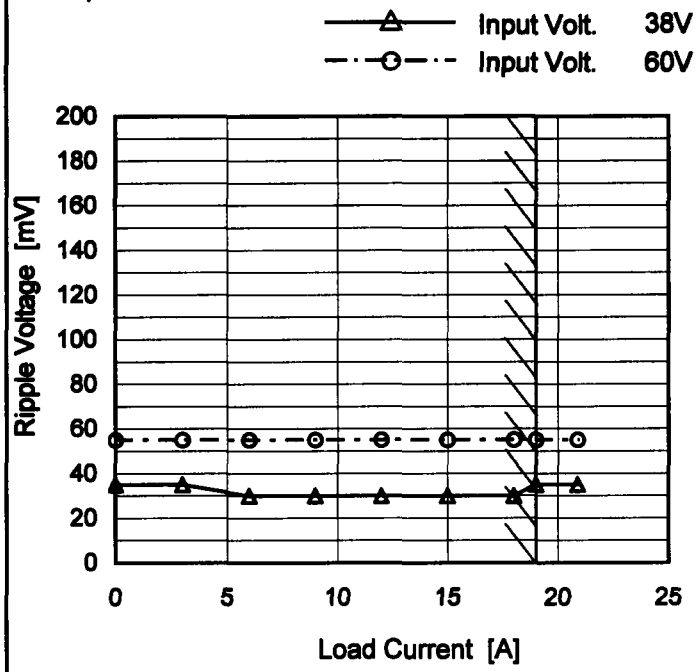


COSEL

Model	CBS4504824
Item	Ripple Voltage (by Load Current)
Object	+24V19A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 38 [V]	Input Volt. 60 [V]
0.0	35	55
3.0	35	55
6.0	30	55
9.0	30	55
12.0	30	55
15.0	30	55
18.0	30	55
19.0	35	55
20.9	35	55
--	-	-
--	-	-

Measured by 100MHz Ossiloscope.
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]

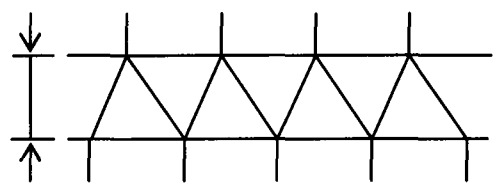


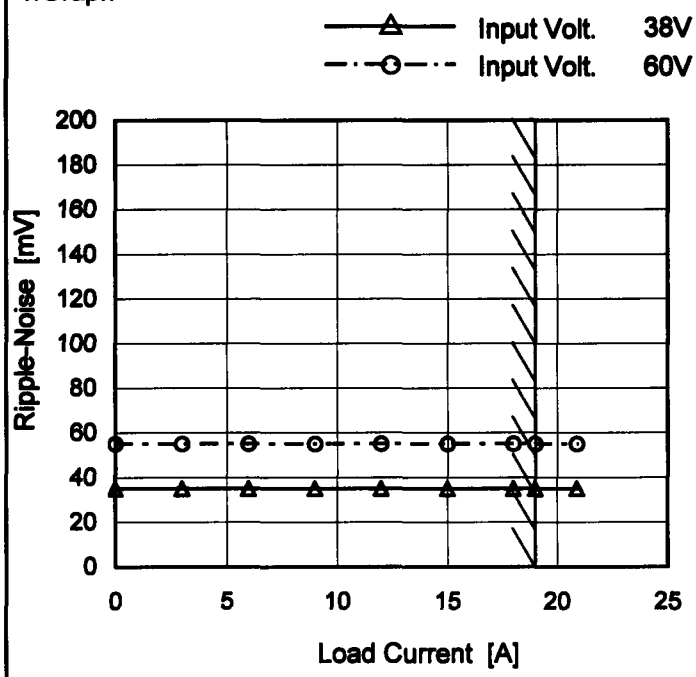
Fig.Complex Ripple Wave Form

COSEL

Model	CBS4504824
Item	Ripple-Noise
Object	+24V19A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



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

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 38 [V]	Input Volt. 60 [V]
0.0	35	55
3.0	35	55
6.0	35	55
9.0	35	55
12.0	35	55
15.0	35	55
18.0	35	55
19.0	35	55
20.9	35	55
–	-	-
–	-	-

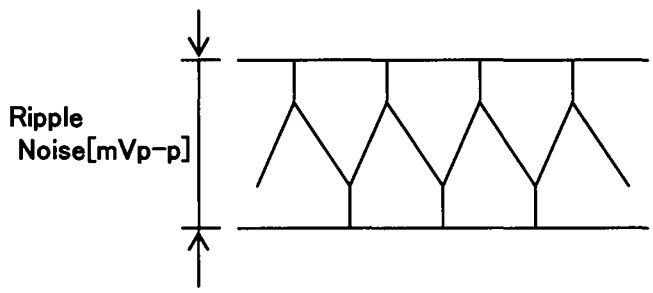


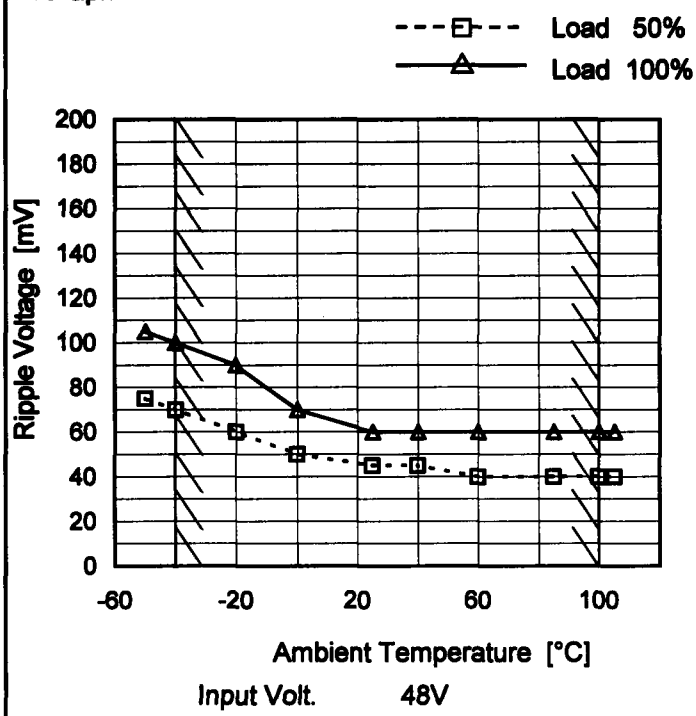
Fig.Complex Ripple Noise Wave Form

COSEL

Model	CBS4504824
Item	Ripple Voltage (by Ambient Temp.)
Object	+24V19A

Testing Circuitry Figure C

1.Graph



Input Volt. 48V

Measured by 100MHz Ossiloscope.
Note: Slanted line shows the range of the rated ambient temperature.

2.Values

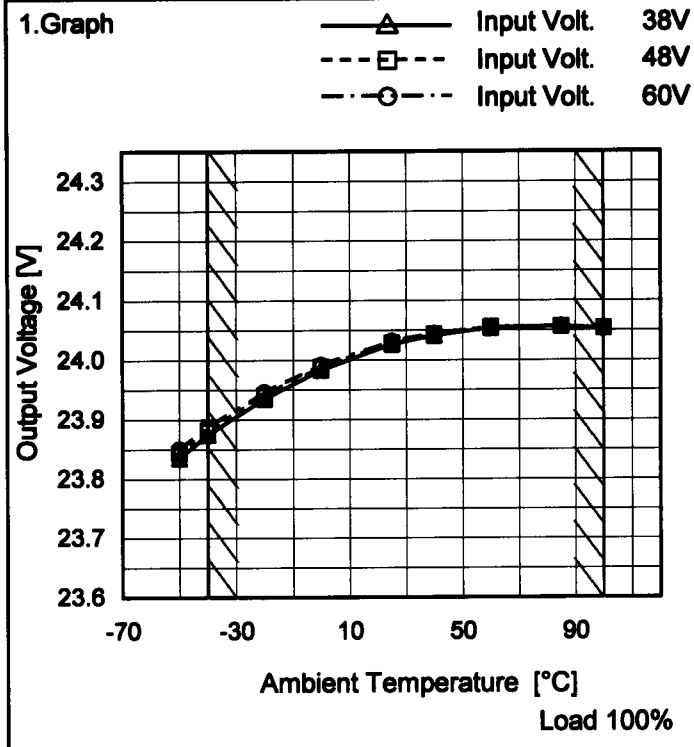
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	75	105
-40	70	100
-20	60	90
0	50	70
25	45	60
40	45	60
60	40	60
85	40	60
100	40	60
105	40	60
–	-	-

COSEL

Model	CBS4504824
Item	Ambient Temperature Drift
Object	+24V19A

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. 38[V]	Input Volt. 48[V]	Input Volt. 60[V]
-50	23.835	23.843	23.850
-40	23.874	23.881	23.887
-20	23.935	23.941	23.946
0	23.983	23.988	23.991
25	24.026	24.028	24.031
40	24.041	24.043	24.044
60	24.053	24.055	24.055
85	24.057	24.056	24.056
100	24.053	24.053	24.052
—	-	-	-
—	-	-	-

COSEL

Model	CBS4504824
Item	Output Voltage Accuracy
Object	+24V19A

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 : 38 - 60V
Load Current : 0 - 19A

* 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

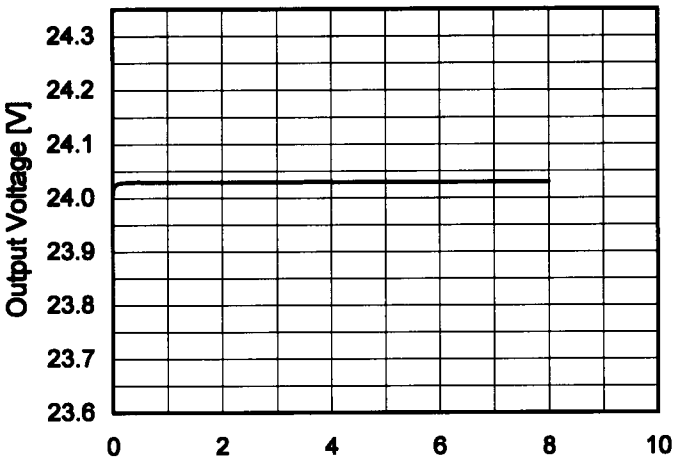
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	85	48	0	24.058	±92	±0.4
Minimum Voltage	-40	38	19	23.874		

COSEL

Model	CBS4504824
Item	Time Lapse Drift
Object	+24V19A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 48V
Load 100%

2.Values

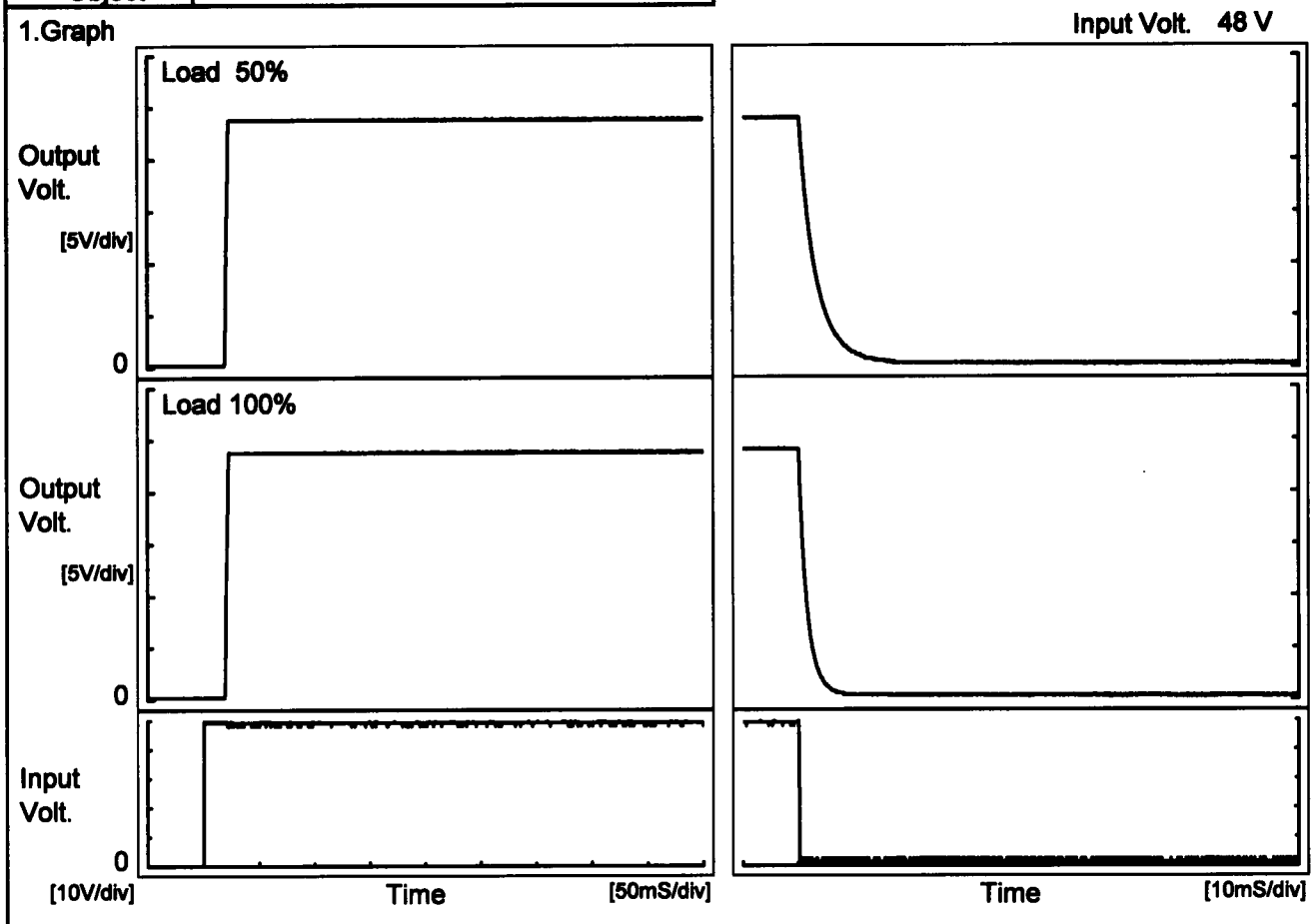
Time since start [H]	Output Voltage [V]
0.0	24.006
0.5	24.030
1.0	24.029
2.0	24.029
3.0	24.029
4.0	24.030
5.0	24.029
6.0	24.029
7.0	24.029
8.0	24.029

COSEL

Model	CBS4504824
Item	Rise and Fall Time
Object	+24V19A

Temperature 25°C
Testing Circuitry Figure A

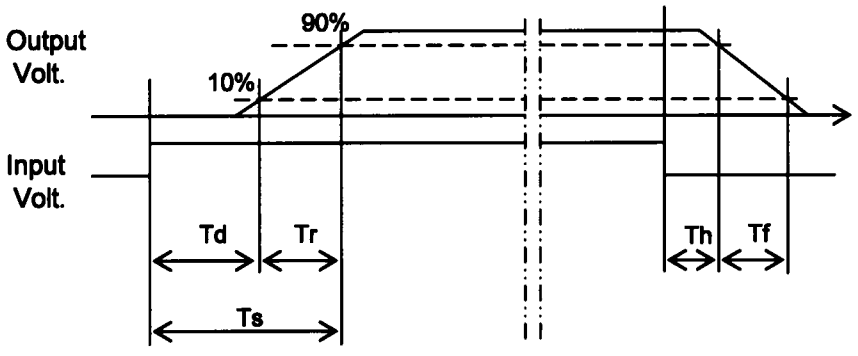
1.Graph



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	19.8	2.8	22.6	0.4	7.2
100 %	19.8	2.8	22.6	0.2	3.6

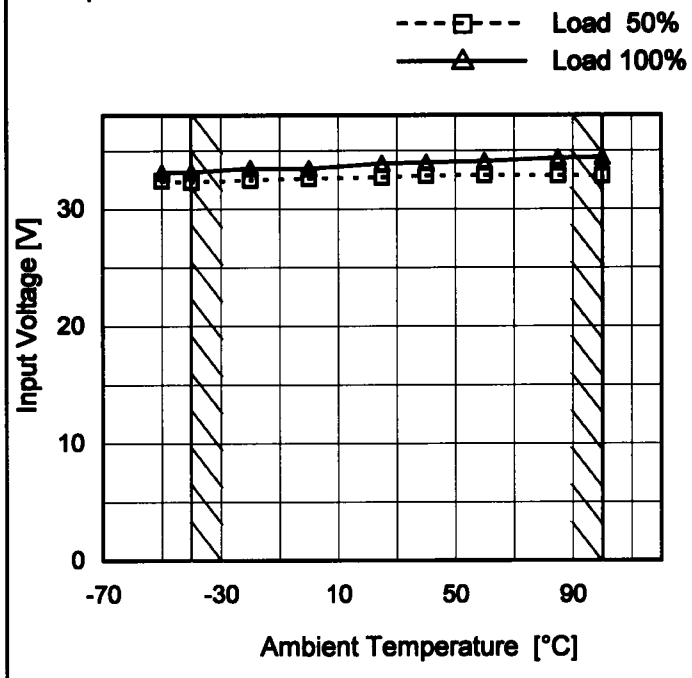


COSEL

Model	CBS4504824
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+24V19A

Testing Circuitry Figure A

1.Graph



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

2.Values

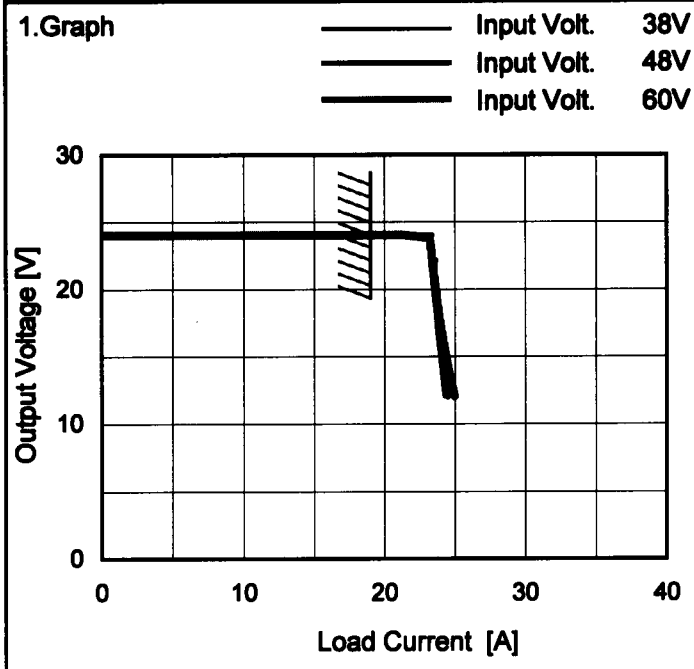
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-50	32.5	33.1
-40	32.3	33.2
-20	32.5	33.5
0	32.6	33.5
25	32.7	33.9
40	32.9	34.0
60	32.9	34.1
85	32.9	34.4
100	32.9	34.4
--	-	-
--	-	-

COSEL

Model	CBS4504824
Item	Overcurrent Protection
Object	+24V19A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

Intermittent operation occurs when the output voltage is from 12V to 0V.

2.Values

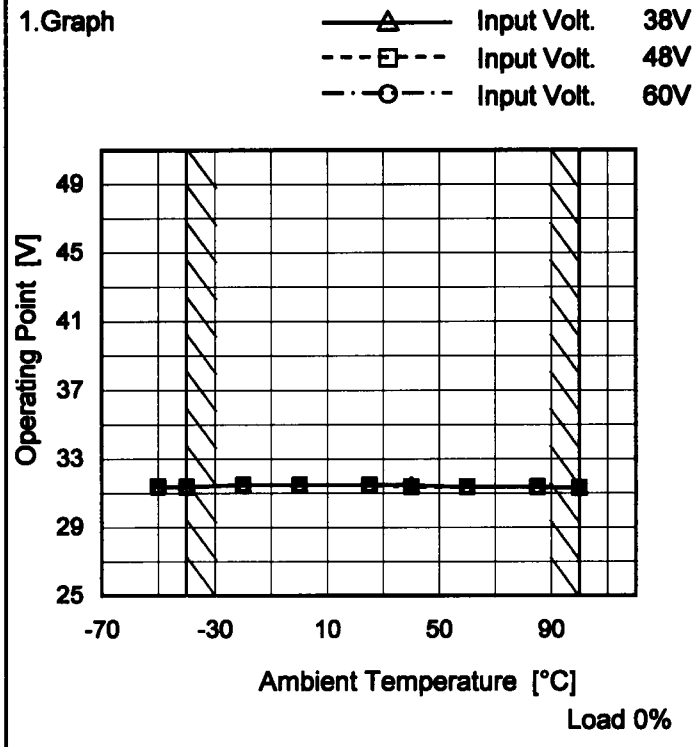
Output Voltage [V]	Load Current [A]		
	Input Volt. 38[V]	Input Volt. 48[V]	Input Volt. 60[V]
24.0	19.28	19.27	19.27
22.8	23.25	23.31	23.32
21.6	23.64	23.38	23.46
19.2	23.59	23.60	23.73
16.8	23.73	23.88	24.06
14.4	24.00	24.18	24.48
12.0	24.24	24.49	24.97
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	CBS4504824
Item	Overvoltage Protection
Object	+24V19A

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. 38[V]	Input Volt. 48[V]	Input Volt. 60[V]
-50	31.36	31.36	31.36
-40	31.35	31.35	31.35
-20	31.47	31.47	31.47
0	31.47	31.47	31.47
25	31.47	31.47	31.47
40	31.47	31.35	31.35
60	31.35	31.35	31.35
85	31.35	31.35	31.35
100	31.29	31.29	31.29
--	-	-	-
--	-	-	-

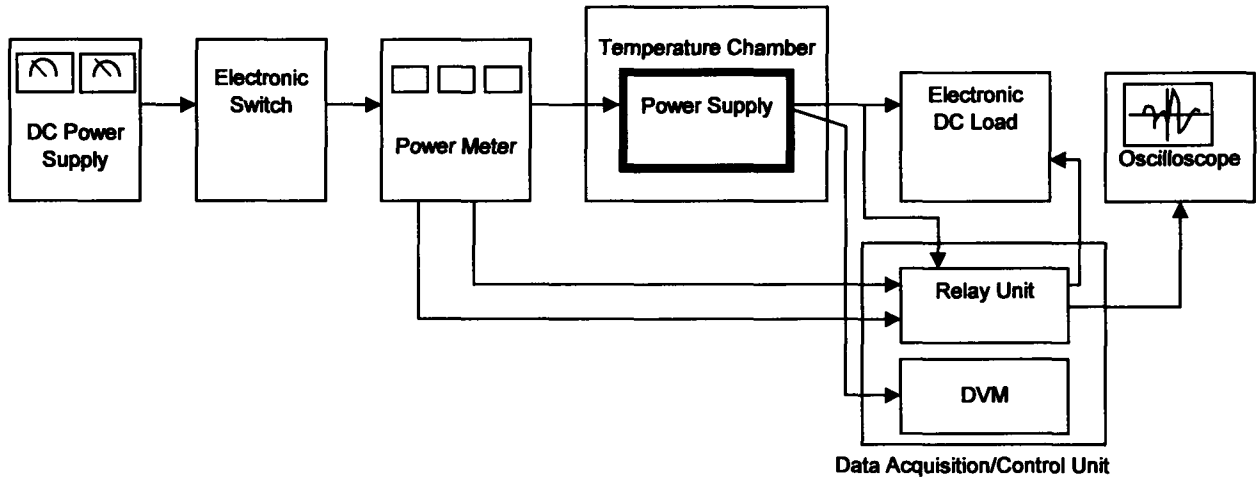
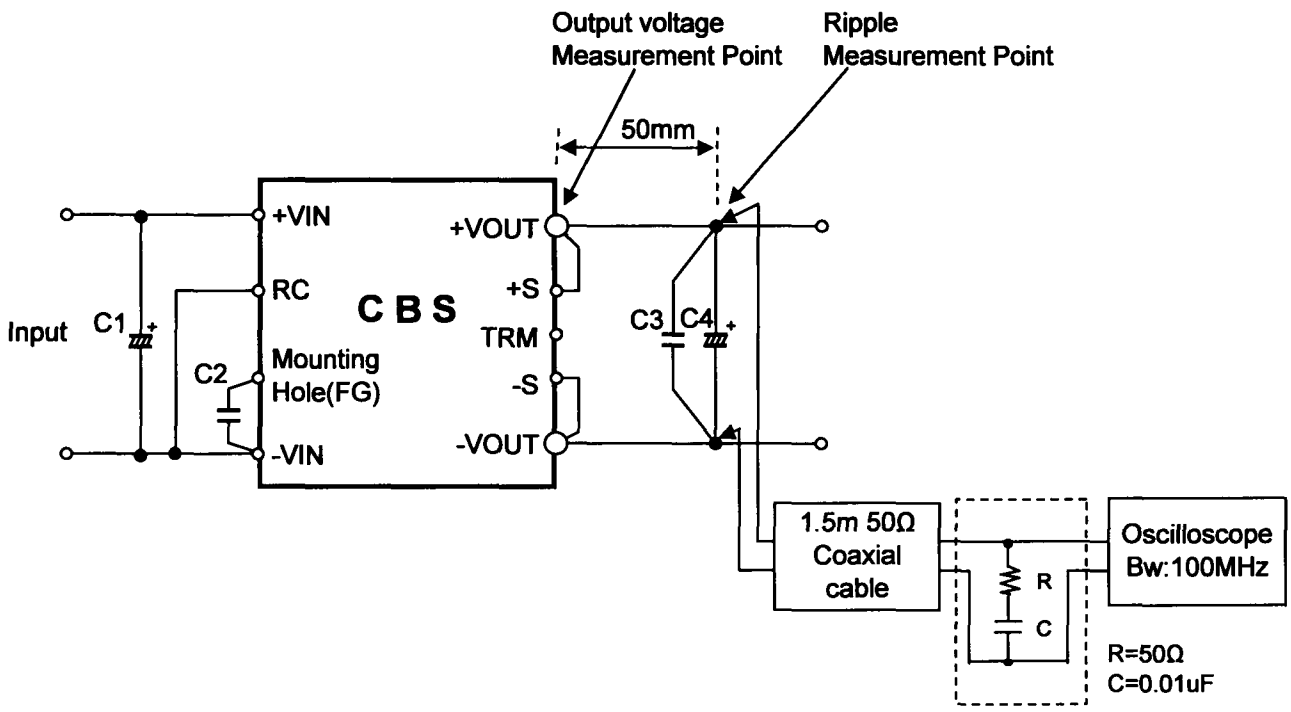


Figure A



C1 : 100V 68μF ×2
C2 : 4700pF
C3 : 50V 0.1μF
C4 : 35V 220μF ×3 (-40℃≦T_B≦-20℃)
35V 220μF (-20℃<T_B≦100℃)
T_B : Base Plate Temp.

Figure C