参考資料

COSEL

TEST DATA OF CES48150-4

Regulated DC Power Supply
May 16, 2008

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COSEL CO.,LTD.

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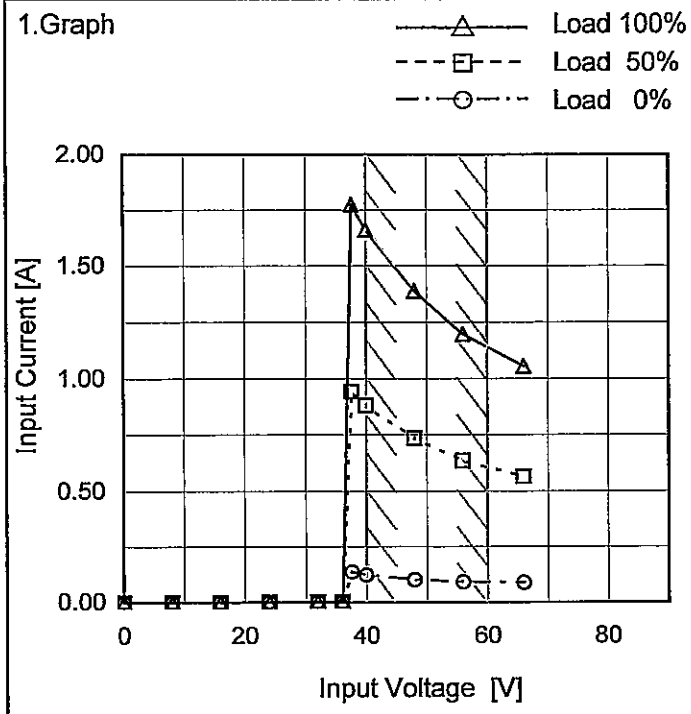
COSEL

Model	CES48150-4
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	0.000	0.000	0.000
16.0	0.000	0.000	0.000
24.0	0.002	0.002	0.000
32.0	0.002	0.002	0.002
36.0	0.002	0.002	0.002
37.6	0.136	0.944	1.776
40.0	0.123	0.882	1.663
48.0	0.100	0.735	1.389
56.0	0.090	0.637	1.198
66.0	0.087	0.566	1.056
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

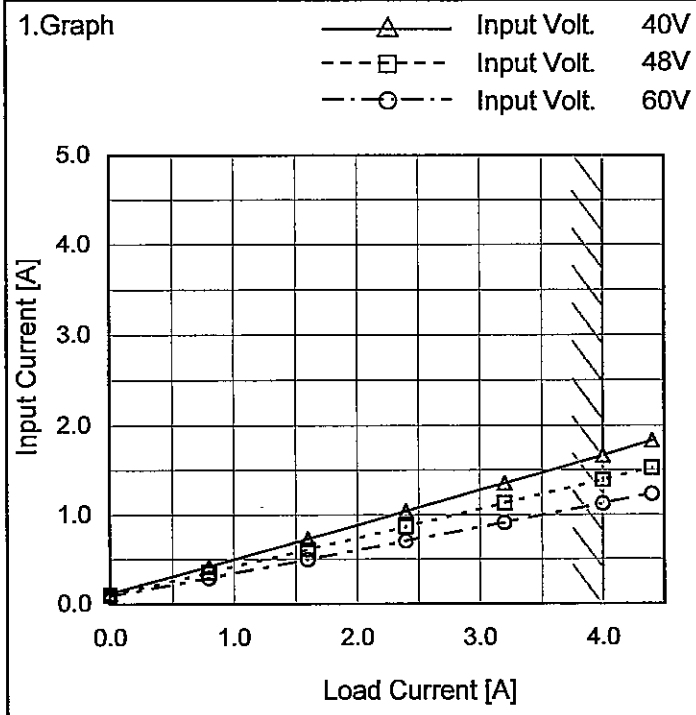
BC-10168

COSEL

Model	CES48150-4
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

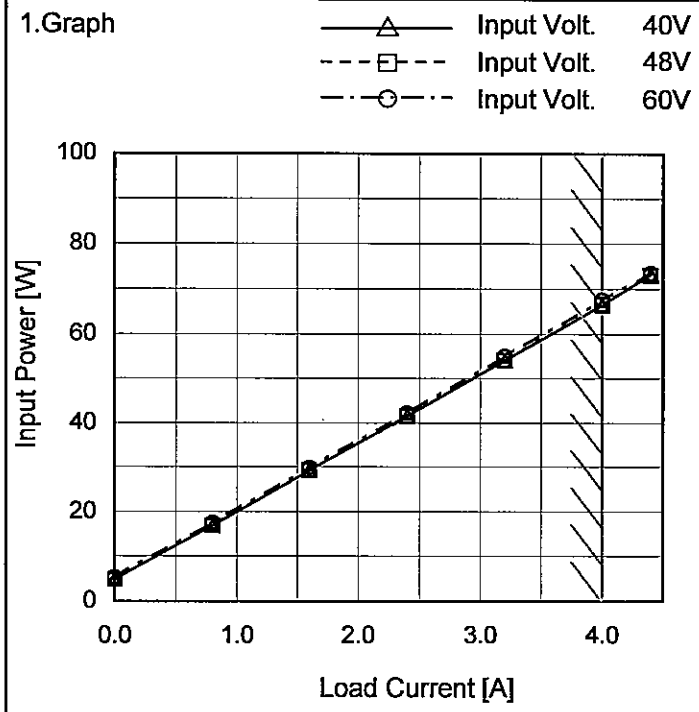
Load Current [A]	Input Current [A]		
	Input Volt. 40[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.0	0.121	0.100	0.088
0.8	0.422	0.351	0.291
1.6	0.729	0.607	0.497
2.4	1.041	0.866	0.705
3.2	1.354	1.128	0.914
4.0	1.663	1.389	1.126
4.4	1.831	1.525	1.232
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	CES48150-4
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

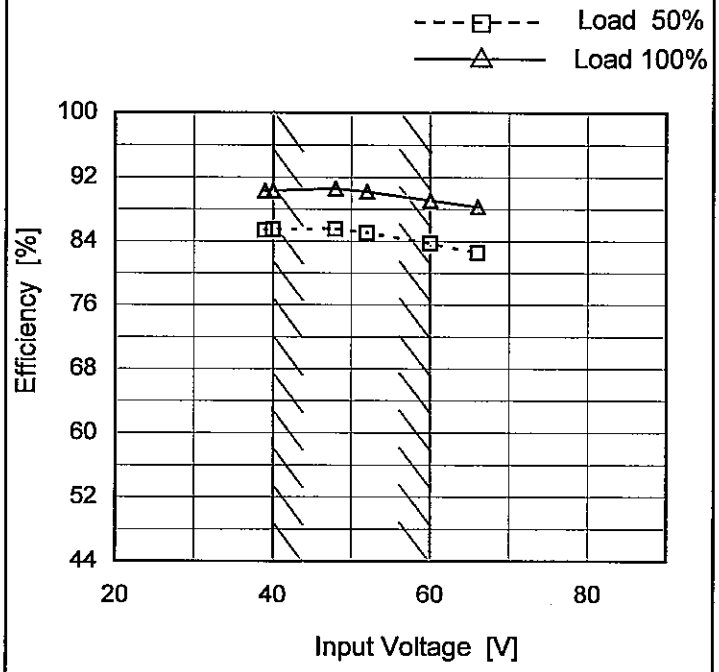
Load Current [A]	Input Power [W]		
	Input Volt. 40[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.0	4.91	4.80	5.31
0.8	16.90	16.90	17.51
1.6	29.22	29.21	29.89
2.4	41.70	41.60	42.30
3.2	54.10	54.20	55.00
4.0	66.52	66.70	67.60
4.4	73.20	73.00	73.50
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	CES48150-4
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

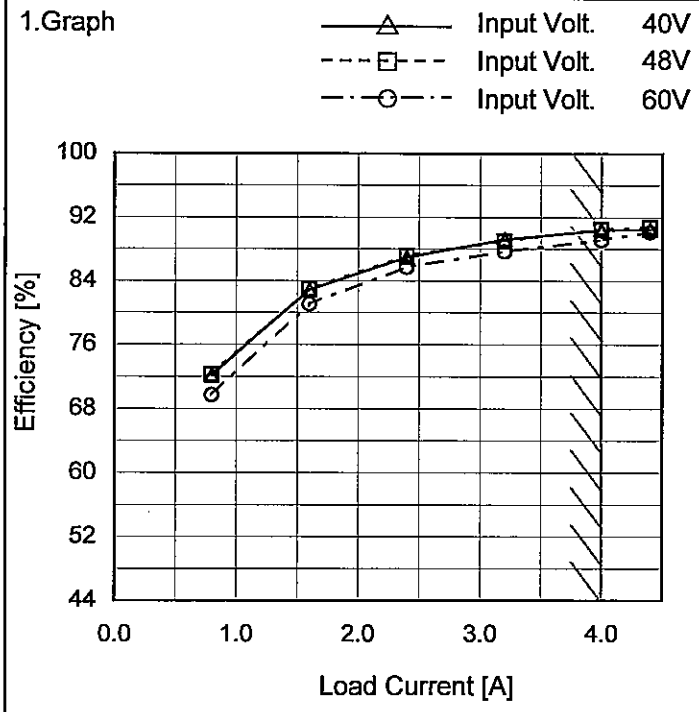
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
—	-	-
39	85.4	90.3
40	85.5	90.4
48	85.6	90.6
52	85.1	90.2
60	83.8	89.1
66	82.6	88.4
—	-	-
—	-	-

COSEL

Model	CES48150-4
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

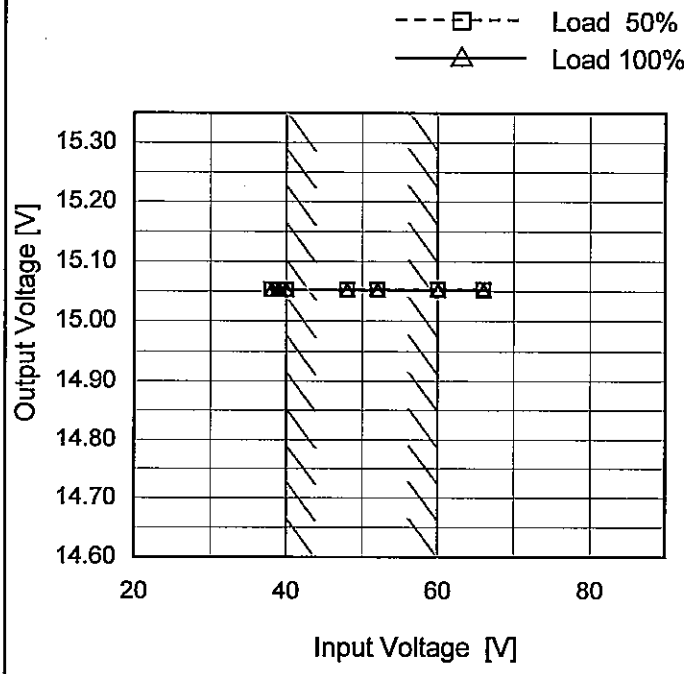
Load Current [A]	Efficiency [%] Input Volt. 40[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.0	-	-	-
0.8	72.2	72.3	69.7
1.6	82.9	83.0	81.1
2.4	87.0	87.1	85.7
3.2	89.2	89.0	87.7
4.0	90.4	90.6	89.1
4.4	90.5	90.8	90.1
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	CES48150-4
Item	Line Regulation
Object	+15V4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

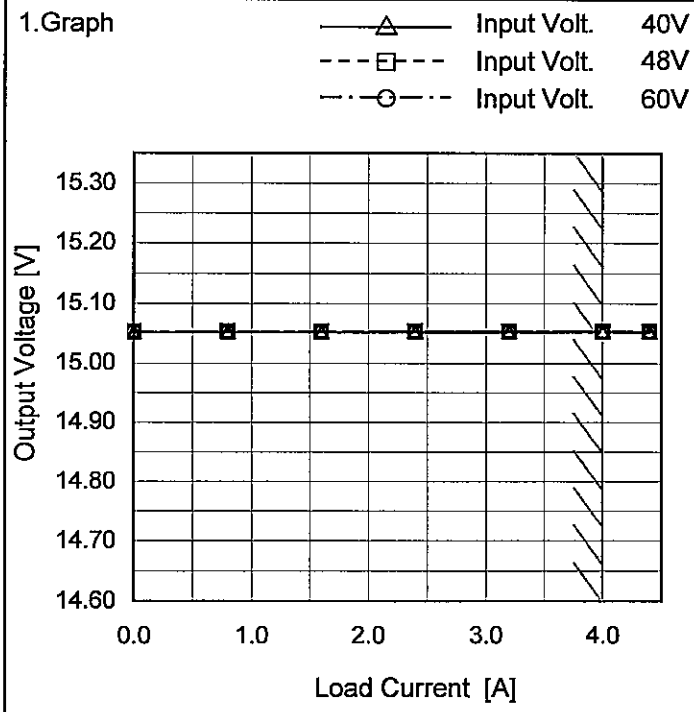
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
38	15.053	15.053
39	15.053	15.053
40	15.053	15.053
48	15.053	15.053
52	15.053	15.053
60	15.053	15.053
66	15.053	15.053
--	-	-
--	-	-

COSEL

Model	CES48150-4
Item	Load Regulation
Object	+15V4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

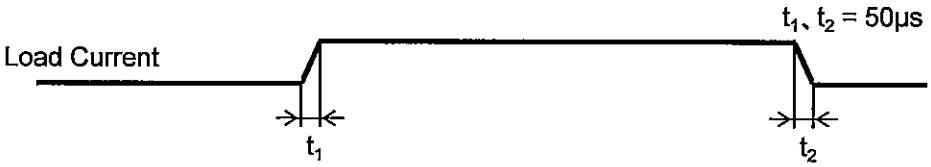
Load Current [A]	Output Voltage [V]		
	Input Volt. 40[V]	Input Volt. 48[V]	Input Volt. 60[V]
0.0	15.052	15.053	15.053
0.8	15.053	15.053	15.053
1.6	15.053	15.053	15.053
2.4	15.053	15.053	15.053
3.2	15.053	15.053	15.053
4.0	15.053	15.053	15.053
4.4	15.053	15.053	15.053
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

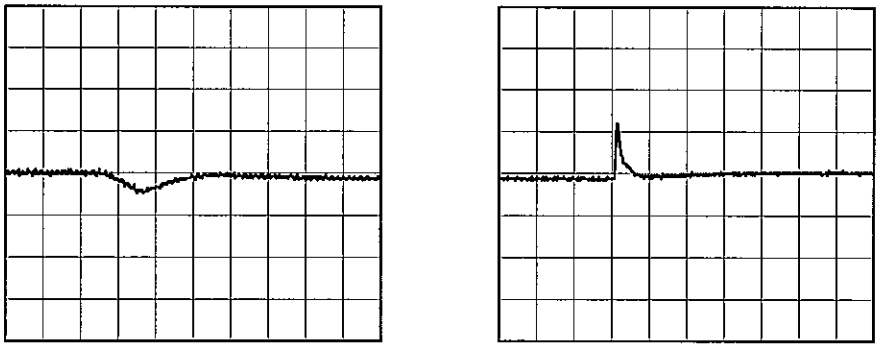
Model	CES48150-4
Item	Dynamic Load Response
Object	+15V4A

Temperature 25°C
Testing Circuitry Figure A

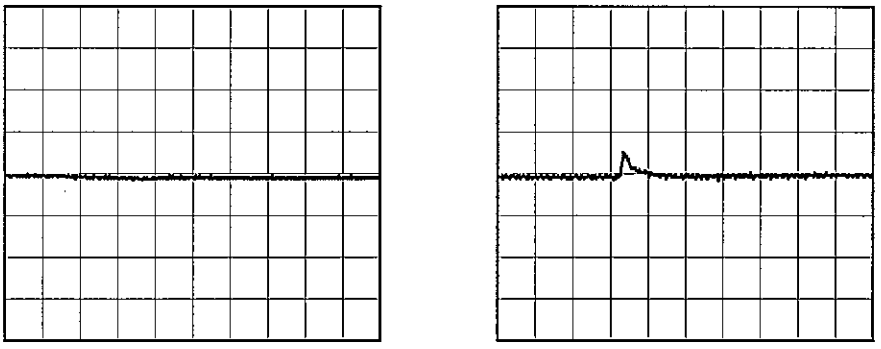
Input Volt. 48 V
Cycle 5 mS



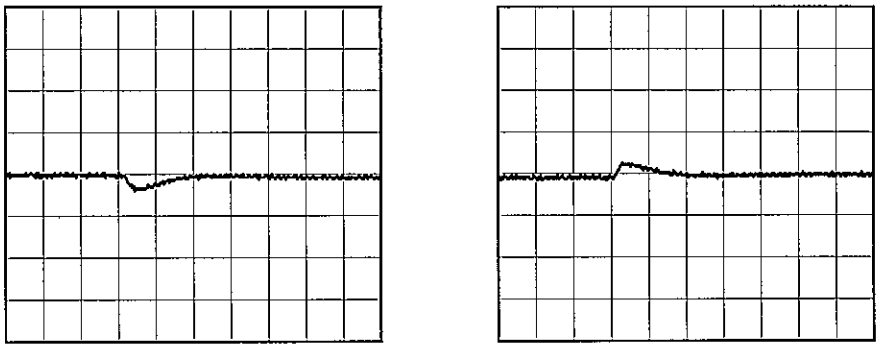
Min. Load (0A) ⟷ Load 100% (4A)



Min. Load (0A) ⟷ Load 50% (2A)



Load 50% (2A) ⟷ Load 100% (4A)



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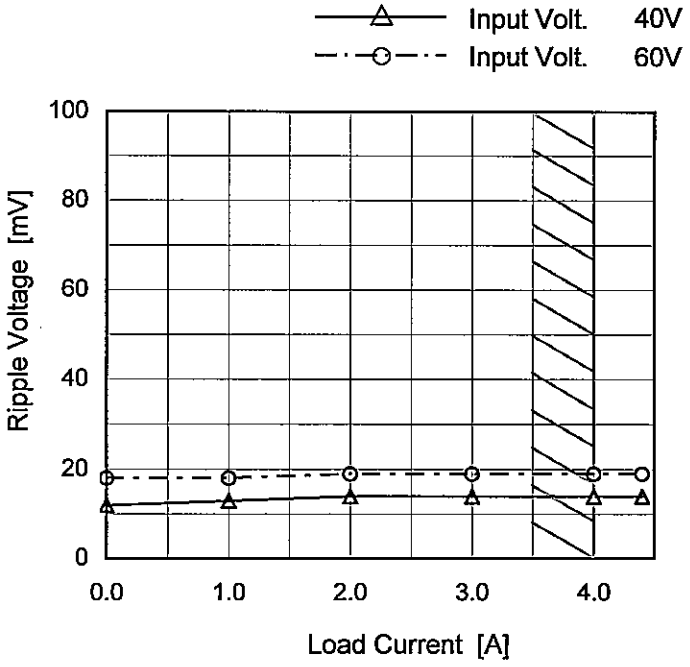
Model	CES48150-4
Item	Ripple Voltage (by Load Current)
Object	+15V4A

Temperature 25°C
Testing Circuitry Figure A

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]

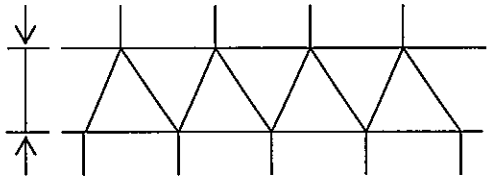


Fig.Complex Ripple Wave Form

2.Values

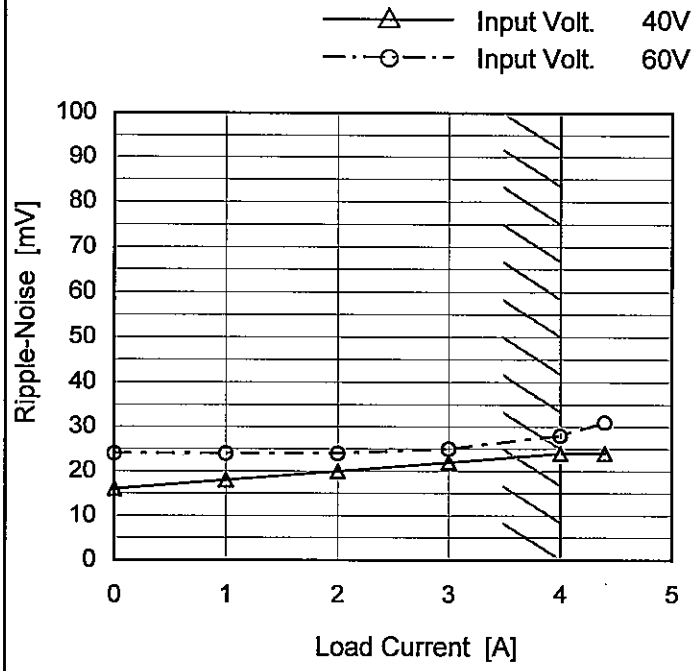
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 40 [V]	Input Volt. 60 [V]
0.0	12	18
1.0	13	18
2.0	14	19
3.0	14	19
4.0	14	19
4.4	14	19
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	CES48150-4
Item	Ripple-Noise
Object	+15V4A

Temperature 25°C
Testing Circuitry Figure A

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.

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 40 [V]	Input Volt. 60 [V]
0.0	16	24
1.0	18	24
2.0	20	24
3.0	22	25
4.4	24	28
4.4	24	31
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching

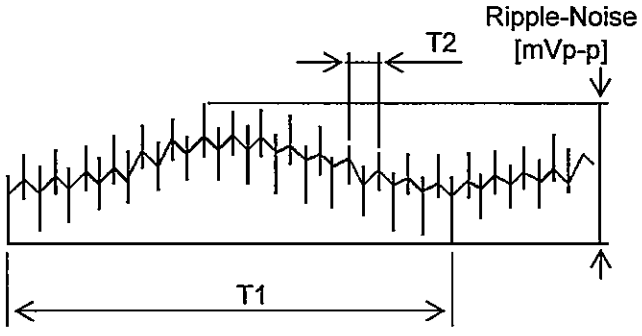


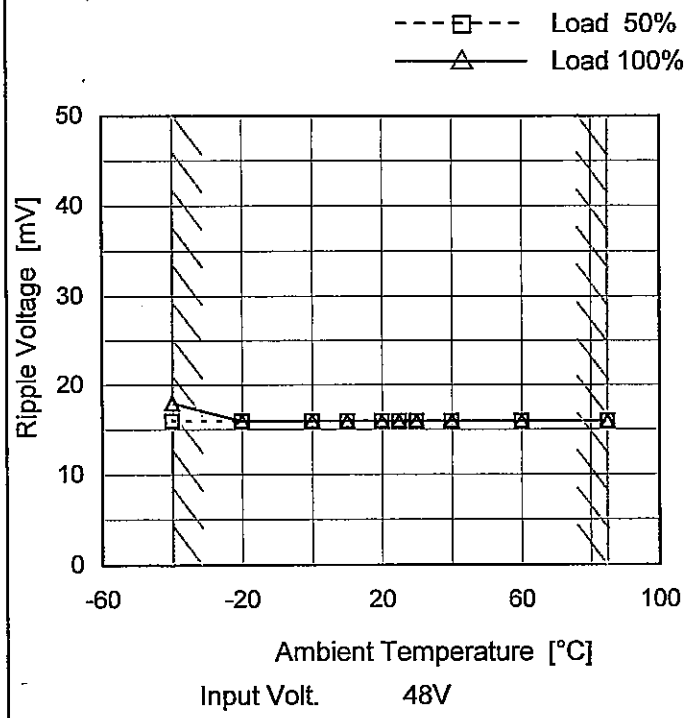
Fig. Complex Ripple Wave Form

COSEL

Model	CES48150-4
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V4A

Testing Circuitry Figure A

1.Graph



Input Volt. 48V

Measured by 100 MHz Oscilloscope.

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

2.Values

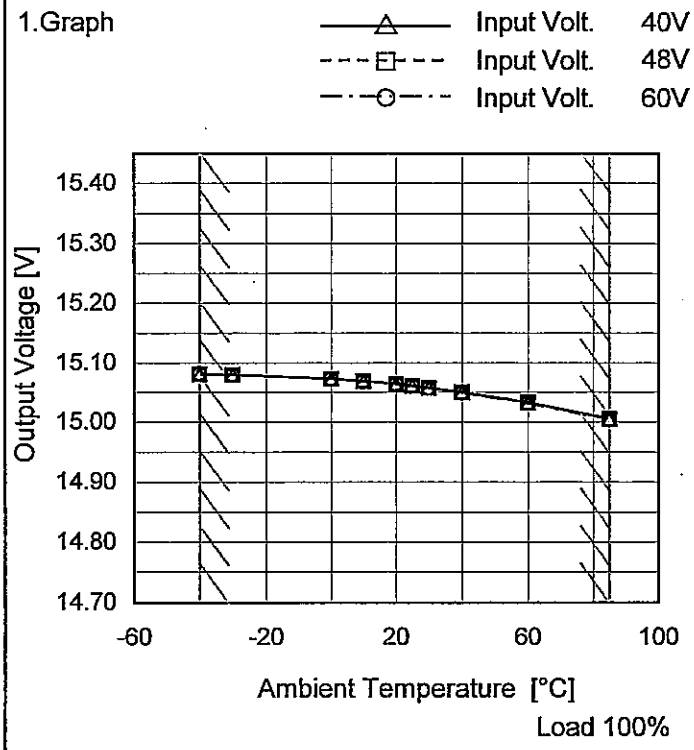
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-40	16	18
-20	16	16
0	16	16
10	16	16
20	16	16
25	16	16
30	16	16
40	16	16
60	16	16
85	16	16
---	-	-

COSEL

Model	CES48150-4
Item	Ambient Temperature Drift
Object	+15V4A

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. 40[V]	Input Volt. 48[V]	Input Volt. 60[V]
-40	15.081	15.081	15.082
-30	15.080	15.080	15.080
0	15.073	15.073	15.073
10	15.069	15.069	15.069
20	15.064	15.064	15.064
25	15.061	15.061	15.061
30	15.058	15.057	15.057
40	15.050	15.050	15.049
60	15.033	15.033	15.032
85	15.006	15.005	15.004
—	-	-	-

COSEL

Model	CES48150-4	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V4A	

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 - 85°C
Input Voltage : 40 - 60V
Load Current : 0 - 4A

* 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

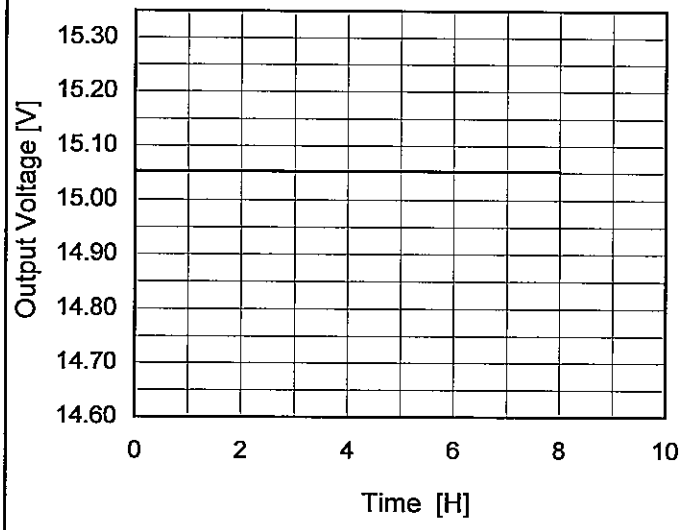
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	60	4	15.082	±39	±0.3
Minimum Voltage	85	60	4	15.004		

COSEL

Model	CES48150-4
Item	Time Lapse Drift
Object	+15V4A

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	15.058
0.5	15.053
1.0	15.053
2.0	15.053
3.0	15.053
4.0	15.053
5.0	15.053
6.0	15.053
7.0	15.053
8.0	15.053

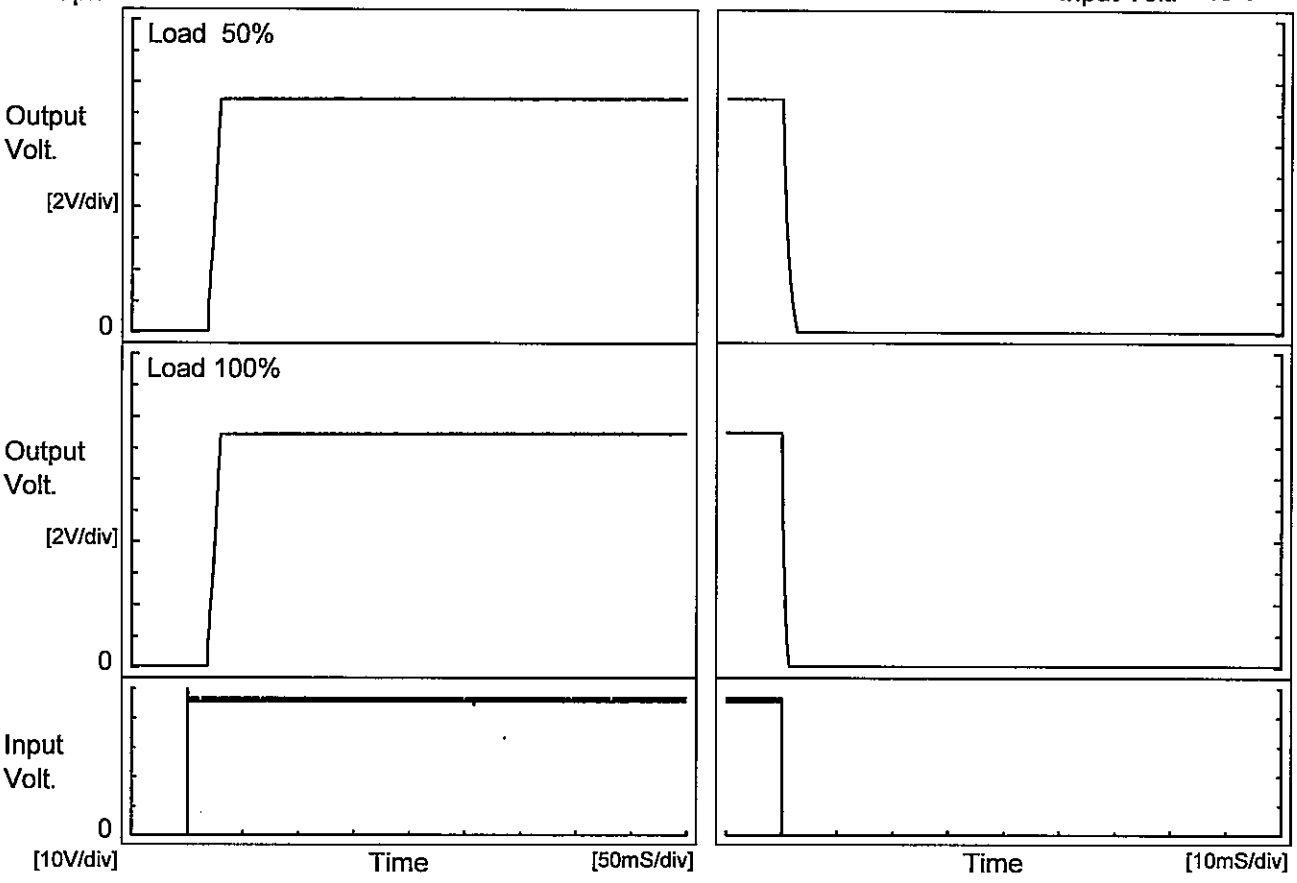
COSEL

Model	CES48150-4
Item	Rise and Fall Time
Object	+15V4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

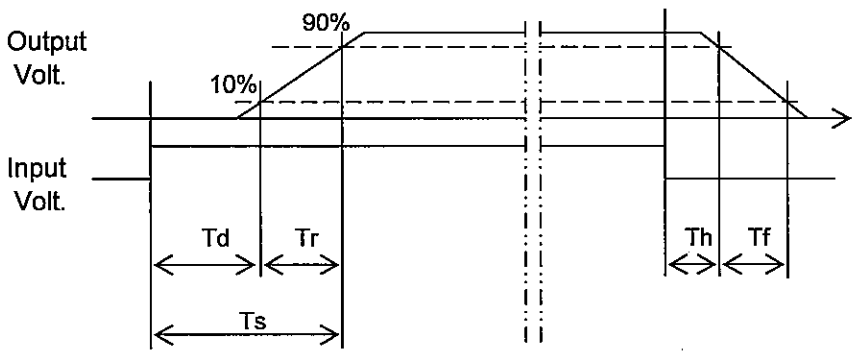
Input Volt. 48 V



2.Values

[mS]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	18.8	10.0	28.8	0.2	1.9
100 %	18.8	10.3	29.1	0.1	0.9

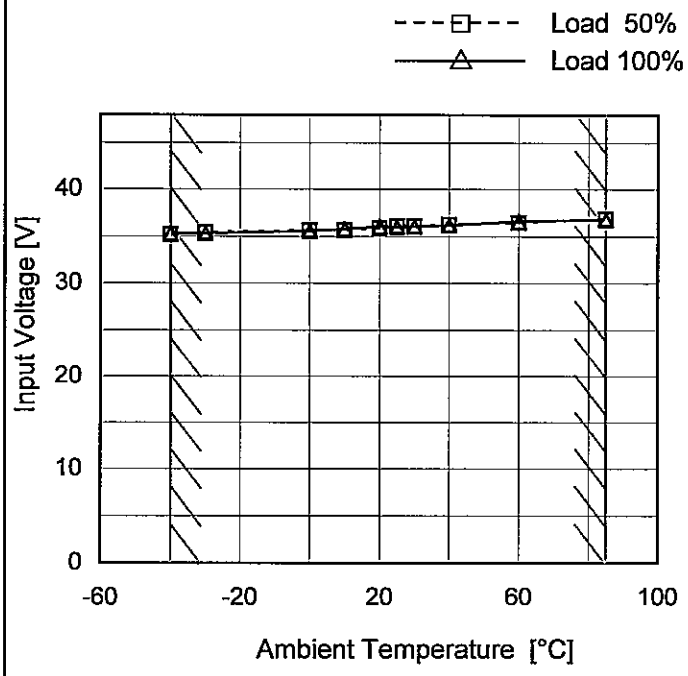


COSEL

Model	CES48150-4
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V4A

Testing Circuitry Figure A

1.Graph



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

2.Values

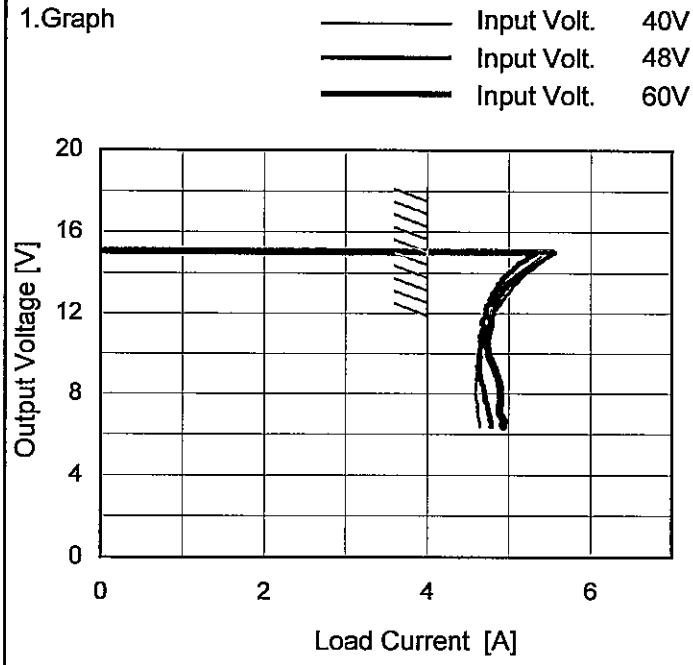
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-40	35.2	35.4
-30	35.5	35.4
0	35.7	35.6
10	35.7	35.9
20	35.9	36.1
25	36.1	36.1
30	36.1	36.1
40	36.3	36.2
60	36.5	36.7
85	36.9	36.9
--	-	-

COSEL

Model	CES48150-4
Item	Overcurrent Protection
Object	+15V4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

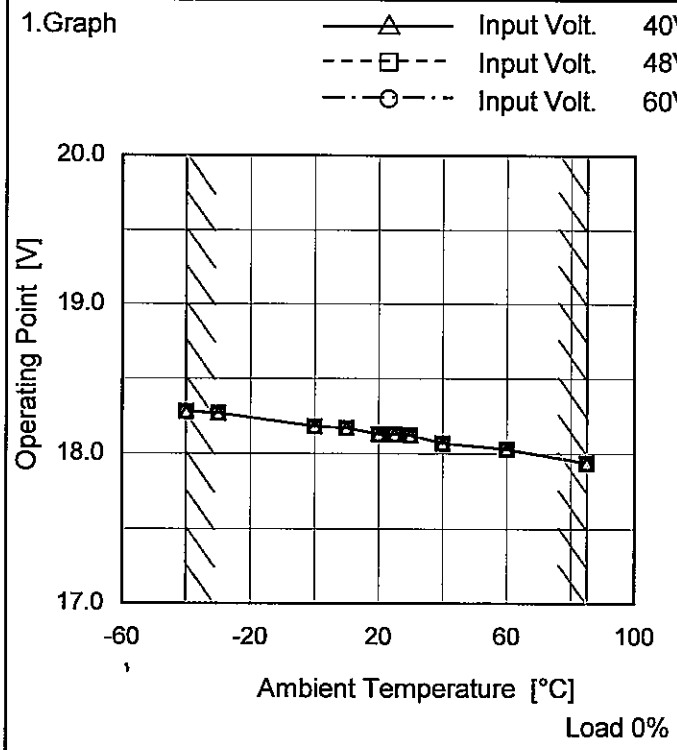
Output Voltage [V]	Load Current [A]		
	Input Volt. 40[V]	Input Volt. 48[V]	Input Volt. 60[V]
15.0	5.57	5.33	5.54
14.3	5.31	5.06	5.25
13.5	5.57	5.33	5.54
12.0	4.82	4.73	4.81
10.5	4.67	4.65	4.74
9.0	4.62	4.65	4.84
7.5	4.61	4.72	4.90
6.0	4.65	4.79	4.94
—	-	-	-
—	-	-	-
—	-	-	-
—	-	-	-

COSEL

Model	CES48150-4
Item	Overvoltage Protection
Object	+15V4A

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. 40[V]	Input Volt. 48[V]	Input Volt. 60[V]
-40	18.28	18.28	18.28
-30	18.27	18.27	18.27
0	18.18	18.18	18.18
10	18.17	18.17	18.17
20	18.13	18.13	18.13
25	18.13	18.13	18.13
30	18.12	18.12	18.12
40	18.07	18.07	18.07
60	18.03	18.03	18.03
85	17.94	17.94	17.94
—	-	-	-

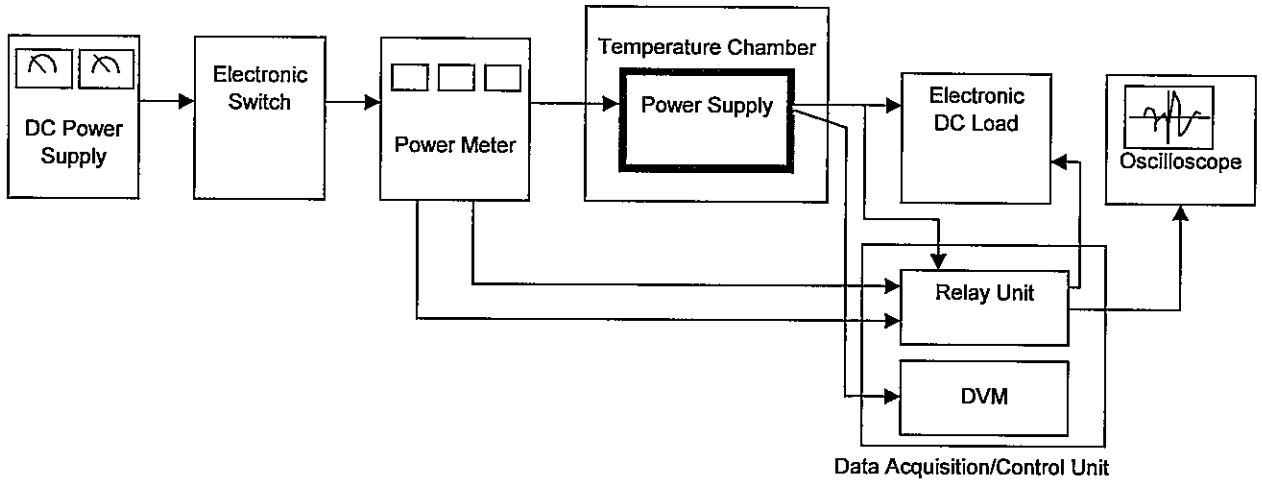


Figure A

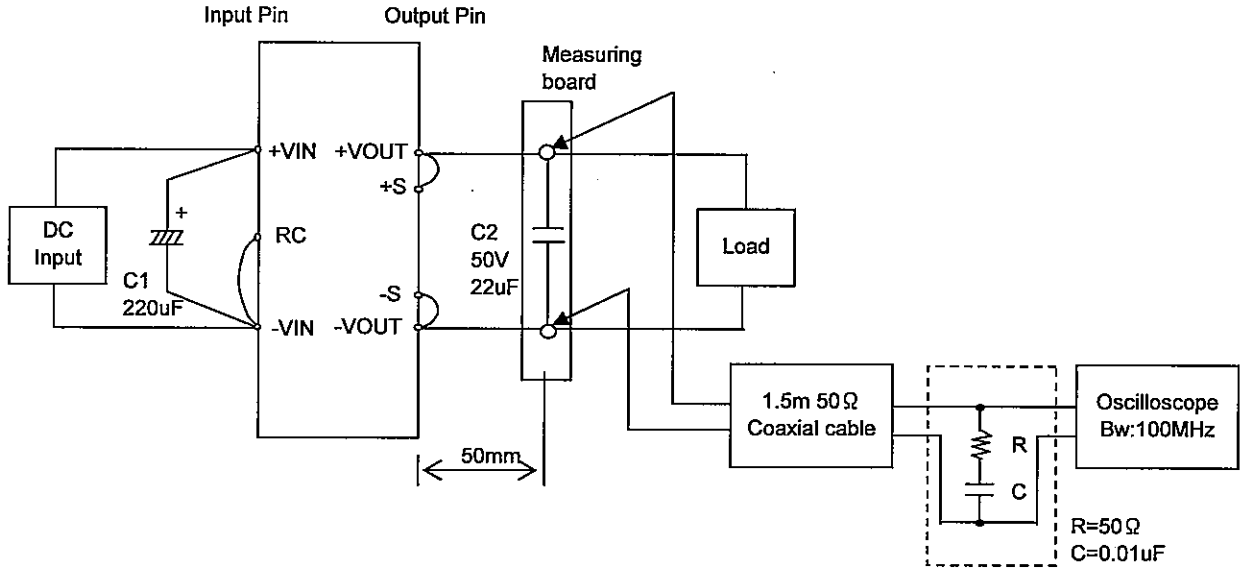


Figure B