COSEL

TEST DATA OF MODULE K
(AME series)

Regulated DC Power Supply
October 28, 2020

Approved by : _____ Satoshi Uetani _____

Design Manager

Prepared by : _____ Yuta Watanabe _____

Design Engineer

COSEL CO.,LTD.

CONTENTS

(Final Page 12)

COSEL

Model	MODULE K
Item	Line Regulation
Object	+7.5V12A

Temperature 25°C
Testing Circuitry Figure A

1. Graph

--- ☐ --- Load 50%
——— △ ——— Load 100%

Output Voltage [V] vs Input Voltage [V]

Note:
 Hatched line shows the input voltage range.

2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	7.549	7.545
90	7.548	7.545
100	7.549	7.546
115	7.549	7.546
150	7.548	7.546
200	7.549	7.546
230	7.549	7.546
264	7.549	7.545
--	-	-

BC-11638

CO$EL

Model	MODULE K
Item	Load Regulation
Object	+7.5V12A

Temperature   25°C
Testing Circuitry   Figure A

1. Graph

————△———— Input Volt.   100V
- - -☐- - - Input Volt.   200V
—·—○—·— Input Volt.   230V

Output Voltage [V] vs Load Current [A]

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

2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	7.552	7.552	7.552
2.0	7.552	7.552	7.551
4.0	7.550	7.550	7.550
6.0	7.549	7.549	7.549
8.0	7.549	7.548	7.549
10.0	7.547	7.547	7.548
12.0	7.546	7.546	7.546
13.2	7.545	7.544	7.544
--	-	-	-
--	-	-	-
--	-	-	-

BC-11638

CO$EL

Model	MODULE K
Item	Dynamic Load Response
Object	+7.5V12A

Temperature	25° C
Testing Circuitry	Figure A

Input Volt. 100 V Response t1=t2=50us. Typ
Cycle 1000 ms

Load Current

t1

t2

Min. Load (0A) ←→
Load 100% (12A)

100 mV/div

2 ms/div

2 ms/div

Min. Load (0A) ←→
Load 50% (6A)

100 mV/div

2 ms/div

2 ms/div

BC-11638
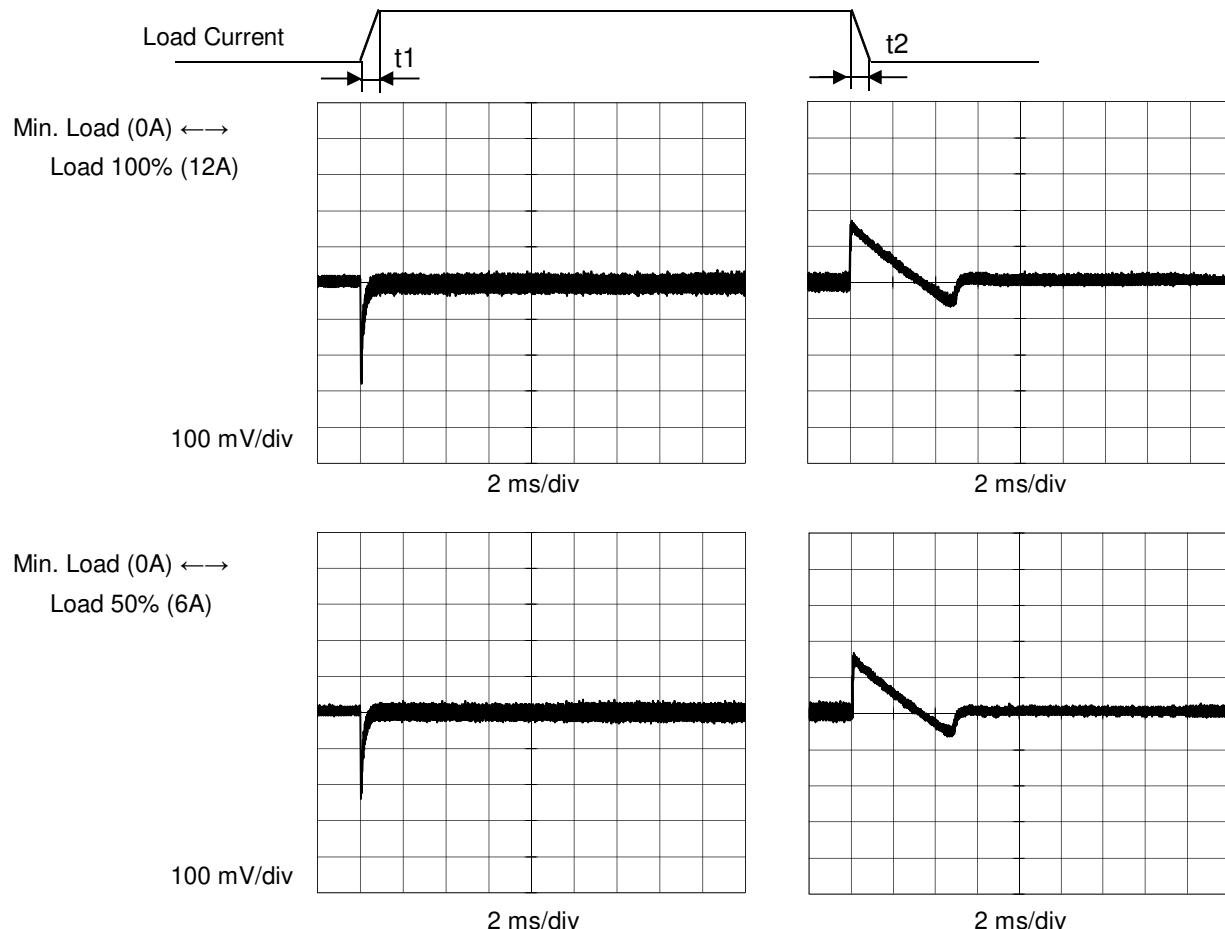
Model	MODULE K
Item	Ripple Voltage (by Load Current)
Object	+7.5V12A

Temperature　　25°C
Testing Circuitry　Figure B

1. Graph

△———— Input Volt.　　100 V
—·—○—·— Input Volt.　　230 V
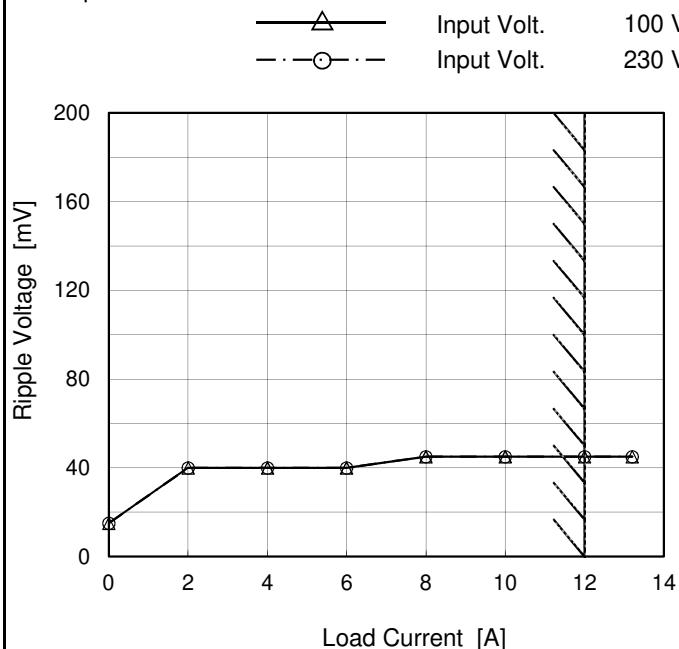
2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100[V]	Input Volt. 230[V]
0.0	15	15
2.0	40	40
4.0	40	40
6.0	40	40
8.0	45	45
10.0	45	45
12.0	45	45
13.2	45	45
--	--	--
--	--	--
--	--	--

Note:
　Measured by 20MHz Oscilloscope.

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

　Hatched line shows the range of the rated
　load current.

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

Fig. Complex Ripple Wave Form

BC-11638

Model	MODULE K
Item	Ripple Noise
Object	+7.5V12A

Temperature 25°C
Testing Circuitry Figure B

1. Graph

Input Volt. 100 V
Input Volt. 230 V

Ripple-Noise [mV] (y-axis: 0, 40, 80, 120, 160, 200)

Load Current [A] (x-axis: 0, 2, 4, 6, 8, 10, 12, 14)

2. Values

Load Current [A]	Ripple Noise [mV]	
	Input Volt. 100[V]	Input Volt. 230[V]
0.0	35	35
2.0	60	60
4.0	55	55
6.0	55	55
8.0	55	55
10.0	60	60
12.0	60	60
13.2	65	65
--	--	--
--	--	--
--	--	--

Note:
Measured by 20MHz Oscilloscope.

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

Hatched line shows the range of the rated load current.

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

Ripple Noise [mVp-p]

T2

T1

Fig. Complex Ripple Wave Form

- 5 -

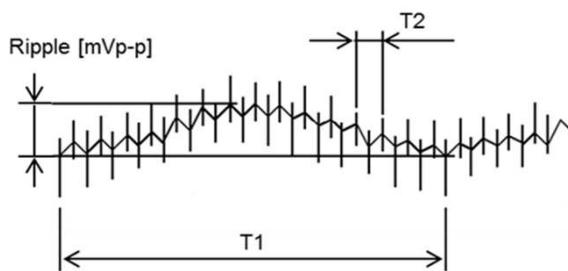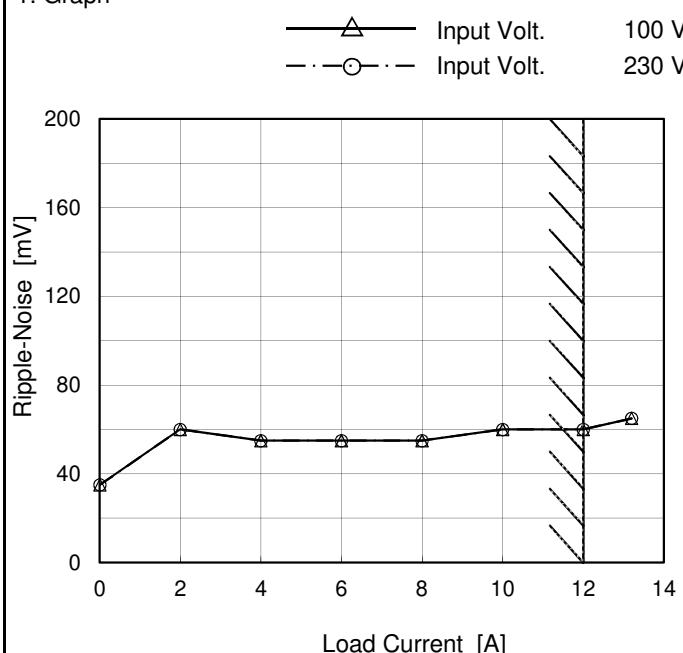# CO$EL
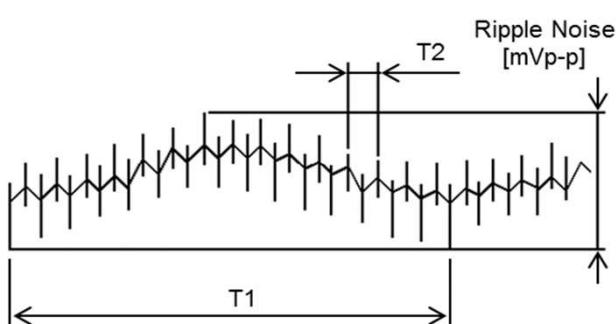
Model	MODULE K
Item	Ripple Voltage (by Ambient Temp.)
Object	+7.5V12A

Testing Circuitry   Figure B

1. Graph

- - -⊟- - - Input Volt.   100V

———△——— Input Volt.   230V

Ambient Temperature [°C]

Load   100 %

Note:
Measured by 20MHz Oscilloscope.

Hatched line shows the range of the rated operating temperature.
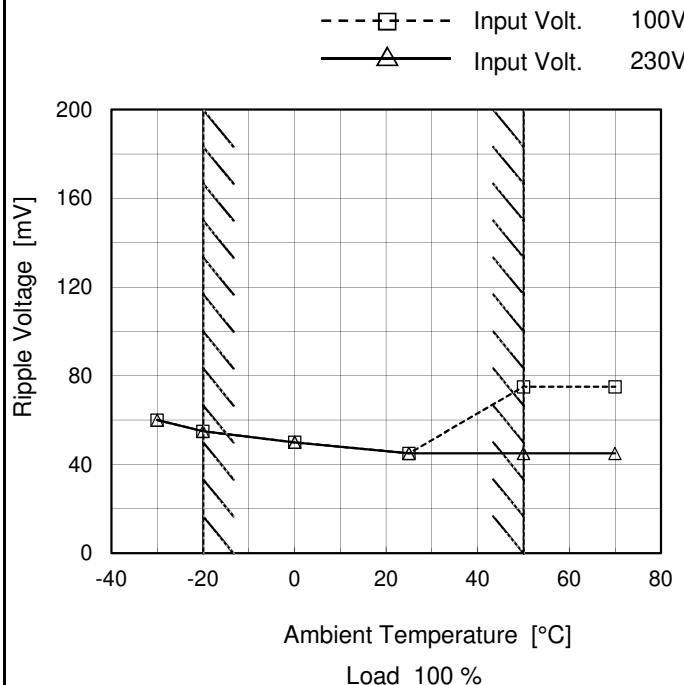
2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	60	60
-20	55	55
0	50	50
25	45	45
50	75	45
70	75	45
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

BC-11638

COSEL

Model	MODULE K
Item	Ambient Temperature Drift
Object	+7.5V12A

Testing Circuitry   Figure A

1. Graph

———△——— Input Volt.   100V
--- ▱ --- Input Volt.   200V
—·—○—·— Input Volt.   230V

Output Voltage [V]

Ambient Temperature [°C]

Load 100%
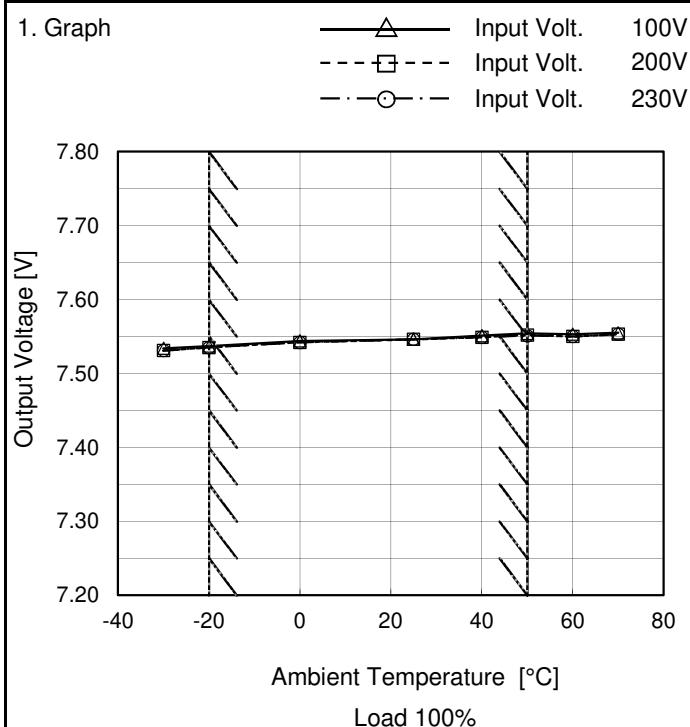
2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-30	7.534	7.531	7.531
-20	7.537	7.535	7.535
0	7.544	7.542	7.542
25	7.546	7.546	7.546
40	7.551	7.549	7.549
50	7.554	7.552	7.551
60	7.553	7.550	7.550
70	7.555	7.553	7.553
--	-	-	-
--	-	-	-
--	-	-	-

Note:
Hatched line shows the range of the rated operating temperature.

BC-11638

				CO$EL		

Model	MODULE K	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+7.5V12A	

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 : -20 - 50°C

Input Voltage : 85 - 264V

Load Current : 0 - 12A

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

* Output Voltage Accuracy (Ratio) = $\dfrac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2. Values

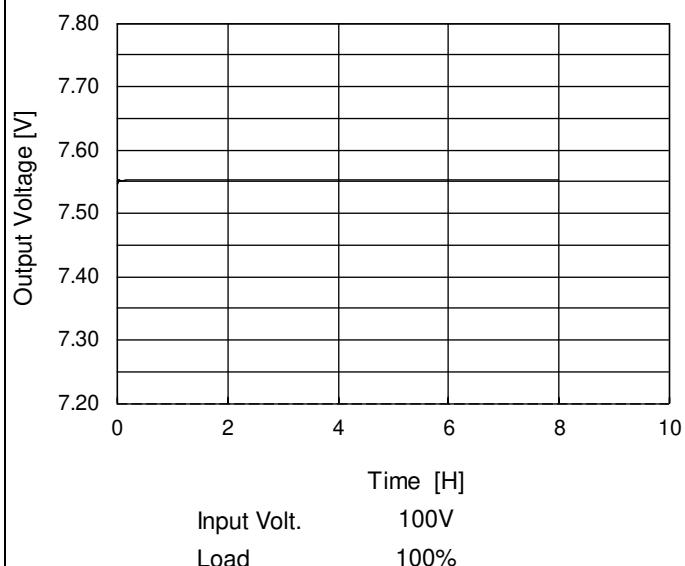| Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	50	100	0	7.565	±15	±0.2
Minimum Voltage	-20	200	12	7.535		

BC-11638

COSEL

Model	MODULE K
Item	Time Lapse Drift
Object	+7.5V12A

Temperature   25°C
Testing Circuitry   Figure A

1. Graph

Input Volt.   100V
Load   100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	7.547
0.5	7.552
1.0	7.552
2.0	7.552
3.0	7.552
4.0	7.552
5.0	7.552
6.0	7.552
7.0	7.552
8.0	7.552

BC-11638

CO$EL

Model	MODULE K
Item	Overcurrent Protection
Object	+7.5V12A

Temperature   25°C
Testing Circuitry   Figure A

1. Graph

Input Volt.   100V
Input Volt.   200V
Input Volt.   230V

Output Voltage [V] vs Load Current [A]

2. Values

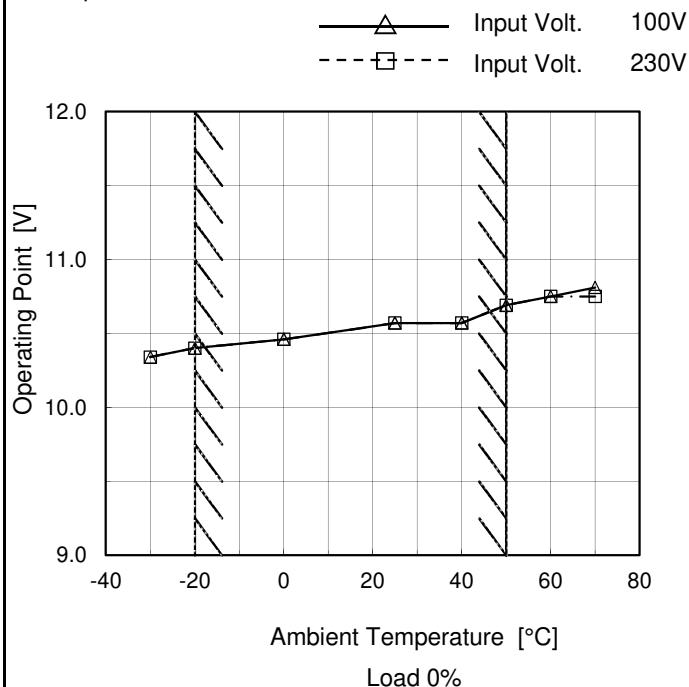| Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
7.13	14.25	14.39	14.22
6.75	14.23	14.18	14.21
6.00	14.27	14.29	14.29
5.25	14.22	14.27	14.27
4.50	14.17	14.25	14.31
3.75	14.37	14.40	14.45
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

   Hiccup mode activates when the output voltage is below 3.75V.

BC-11638

CO$EL

Model	MODULE K
Item	Overvoltage Protection
Object	+7.5V12A

Testing Circuitry   Figure A

1. Graph

———△——— Input Volt.   100V

– – –☐– – – Input Volt.   230V

Ambient Temperature [°C]

Load 0%

Note:
Hatched line shows the range of the rated operating temperature.

2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-30	10.34	10.34
-20	10.40	10.40
0	10.46	10.46
25	10.57	10.57
40	10.57	10.57
50	10.69	10.69
60	10.75	10.75
70	10.81	10.75
--	-	-
--	-	-
--	-	-

BC-11638

COSEL

AC Power Supply → Electronic Switch → Power Meter → Temperature Chamber [Power Supply] → Electronic DC Load → Oscilloscope

Relay Unit

DVM

Date Acquisition/Control Unit

Figure A

Temperature Chamber

AC Power Supply → Power Meter → Power Supply → Measuring board C1 → Electronic DC Load

Oscilloscope
BW : 20MHz

150mm

Figure B

C1 = 22 μF
(Electrolytic capacitor)

BC-11638