COSEL

TEST DATA OF MODULE J

(AME series)

Regulated DC Power Supply
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Model	MODULE J
Item	Line Regulation
Object	+3.3V15.2A

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.
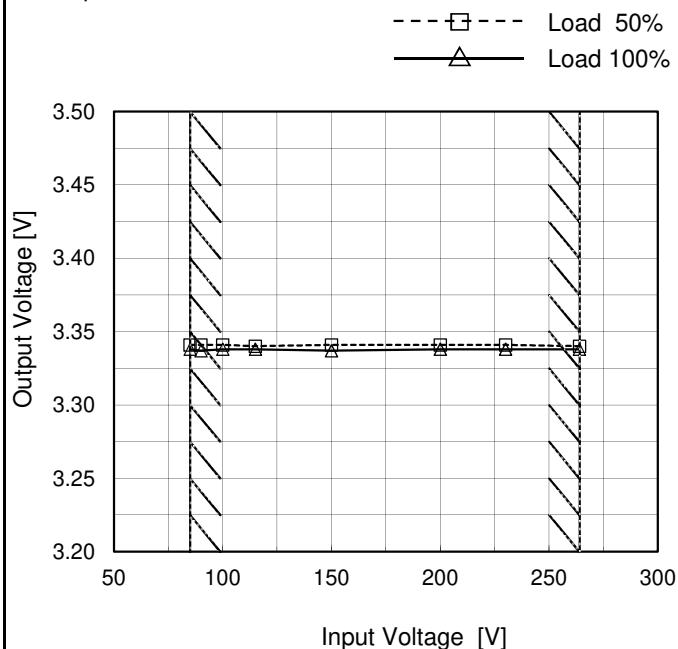
2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	3.341	3.338
90	3.341	3.337
100	3.341	3.338
115	3.340	3.338
150	3.341	3.337
200	3.341	3.338
230	3.341	3.338
264	3.340	3.338
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Model	MODULE J
Item	Load Regulation
Object	+3.3V15.2A

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	3.343	3.343	3.343
3.0	3.343	3.342	3.343
5.0	3.342	3.342	3.342
7.6	3.341	3.341	3.341
10.1	3.339	3.339	3.340
12.6	3.338	3.339	3.339
15.2	3.338	3.338	3.338
16.7	3.337	3.338	3.338
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Model	MODULE J		
Item	Dynamic Load Response	Temperature	25° C
		Testing Circuitry	Figure A
Object	+3.3V15.2A		

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

Cycle   1000 ms

Load Current   t1   t2

Min. Load (0A) ←→

    Load 100% (15.2A)

    100 mV/div

2 ms/div   2 ms/div

Min. Load (0A) ←→

    Load 50% (7.6A)

    100 mV/div

2 ms/div   2 ms/div

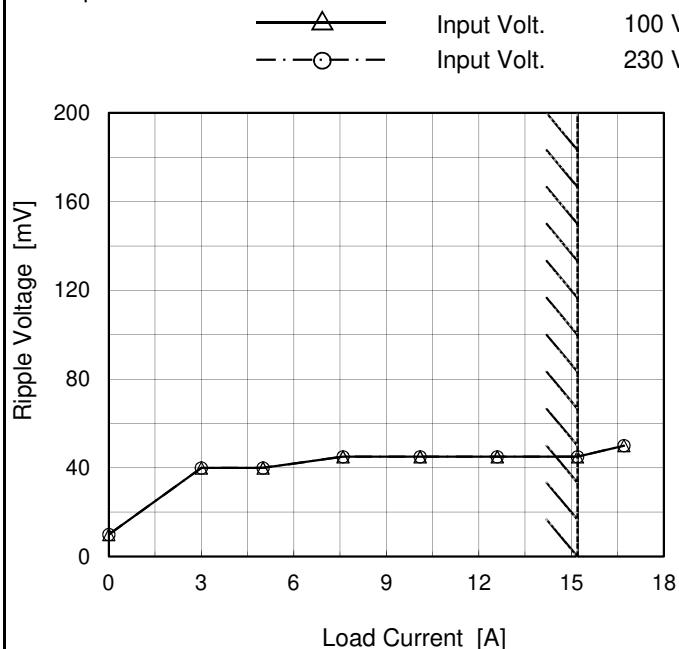BC-11637

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Model	MODULE J
Item	Ripple Voltage (by Load Current)
Object	+3.3V15.2A

Temperature 25°C
Testing Circuitry Figure B

1. Graph

△	Input Volt.	100 V
○	Input Volt.	230 V

Load Current [A]

2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100[V]	Input Volt. 230[V]
0.0	10	10
3.0	40	40
5.0	40	40
7.6	45	45
10.1	45	45
12.6	45	45
15.2	45	45
16.7	50	50
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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.

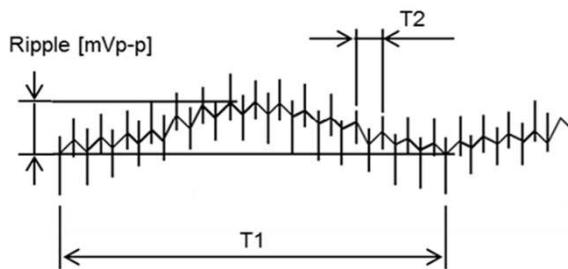T1: Due to AC Input Line
T2: Due to Switching

Ripple [mVp-p]

Fig. Complex Ripple Wave Form

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Model	MODULE J
Item	Ripple Noise
Object	+3.3V15.2A

Temperature   25°C
Testing Circuitry   Figure B

1. Graph

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

Ripple-Noise [mV] vs Load Current [A]

2. Values

Load Current [A]	Ripple Noise [mV]	
	Input Volt. 100[V]	Input Volt. 230[V]
0.0	20	20
3.0	45	45
5.0	50	50
7.6	50	50
10.1	50	50
12.6	55	55
15.2	55	55
16.7	60	60
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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.
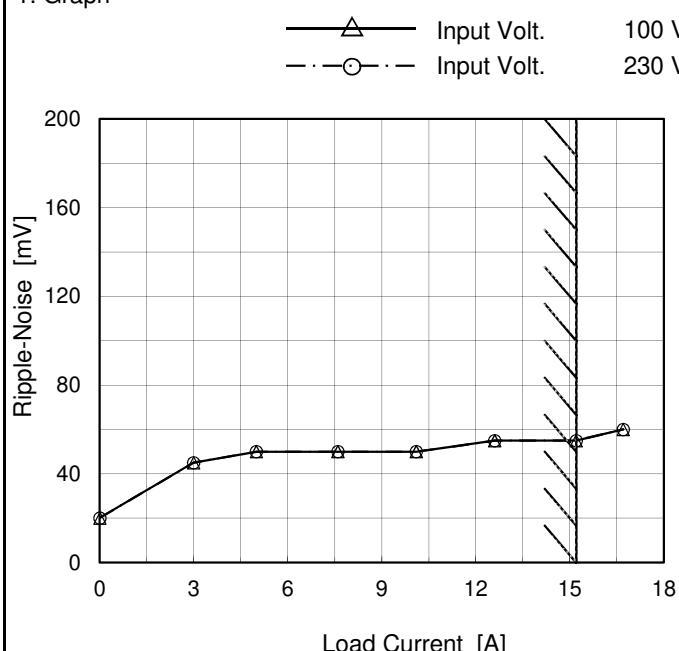
T1: Due to AC Input Line
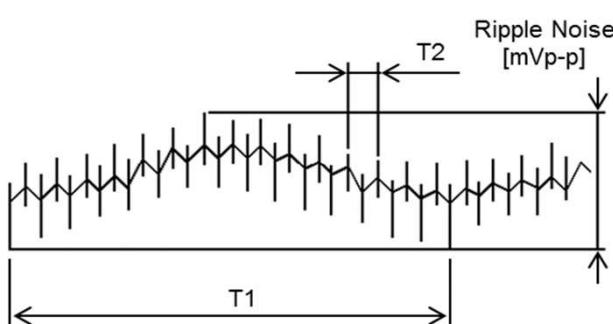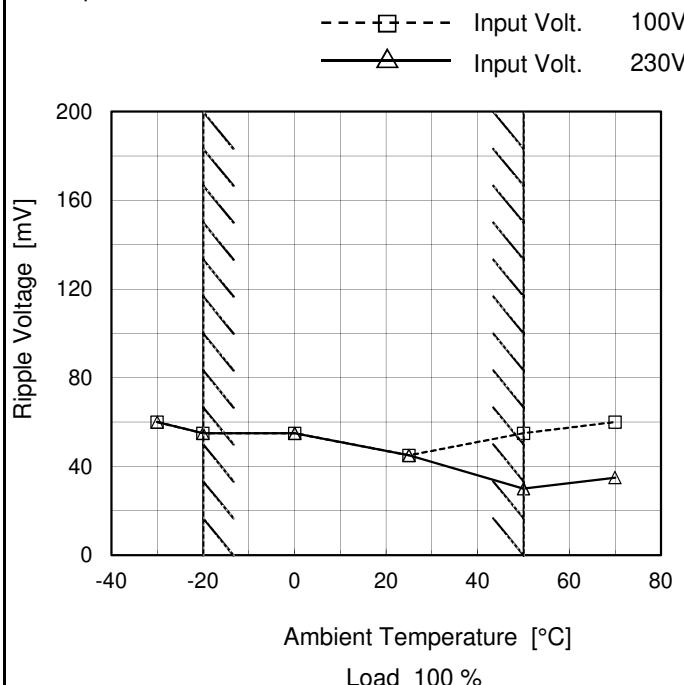T2: Due to Switching

Ripple Noise [mVp-p]

T2

T1

Fig. Complex Ripple Wave Form

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Model	MODULE J
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V15.2A

Testing Circuitry   Figure B

1. Graph

- - - ☐ - - -   Input Volt.   100V

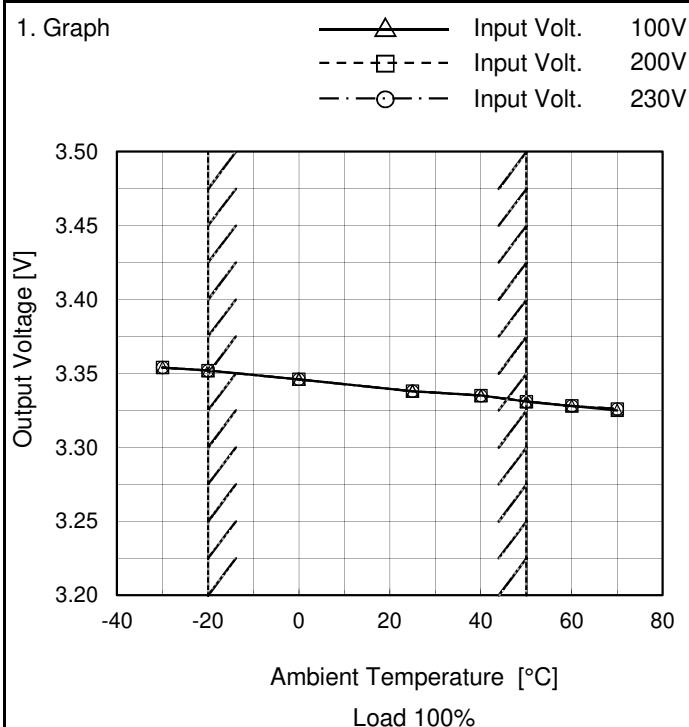△ ————   Input Volt.   230V

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	55	55
25	45	45
50	55	30
70	60	35
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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Model	MODULE J
Item	Ambient Temperature Drift
Object	+3.3V15.2A

Testing Circuitry   Figure A

1. Graph

──△── Input Volt. 100V
---□--- Input Volt. 200V
─·─○─·─ Input Volt. 230V

Output Voltage [V] (vertical axis)

Ambient Temperature [°C] (horizontal axis)

Load 100%

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

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-30	3.354	3.354	3.354
-20	3.352	3.352	3.352
0	3.346	3.346	3.346
25	3.338	3.338	3.338
40	3.335	3.335	3.335
50	3.331	3.331	3.331
60	3.328	3.328	3.328
70	3.325	3.326	3.326
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MODULE J
Item	Output Voltage Accuracy
Object	+3.3V15.2A

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   : -20 - 50°C

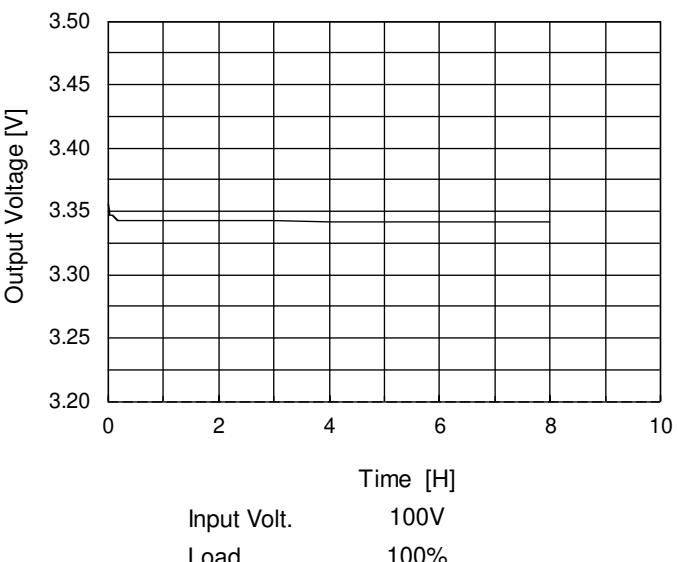Input Voltage : 85 - 264V

Load Current   : 0 - 15.2A

* 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	-20	230	0	3.354	±12	±0.4
Minimum Voltage	50	200	15.2	3.331		

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Model	MODULE J
Item	Time Lapse Drift
Object	+3.3V15.2A

Temperature   25°C
Testing Circuitry   Figure A

1. Graph

Output Voltage [V]

Time [H]

Input Volt.   100V
Load   100%

2. Values

Time since start [H]	Output Voltage [V]
0.0	3.355
0.5	3.343
1.0	3.343
2.0	3.343
3.0	3.342
4.0	3.342
5.0	3.342
6.0	3.342
7.0	3.342
8.0	3.341

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Model	MODULE J
Item	Overcurrent Protection
Object	+3.3V15.2A

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.

Hiccup mode activates when the output voltage is below 1.65V.

2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
3.14	17.98	18.02	18.07
2.97	18.04	18.13	18.15
2.64	18.23	18.34	18.34
2.31	18.39	18.45	18.46
1.98	18.47	18.54	18.53
1.65	18.62	18.67	18.67
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MODULE J
Item	Overvoltage Protection
Object	+3.3V15.2A

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.
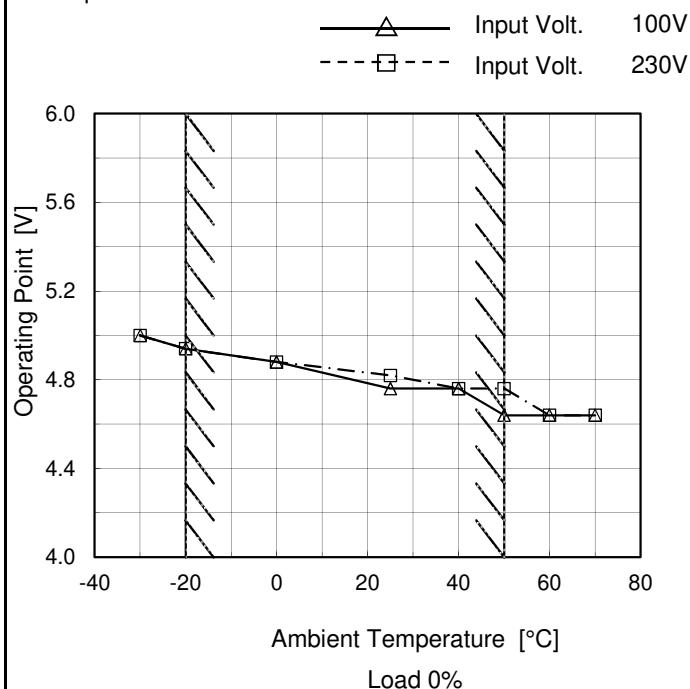
2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-30	5.00	5.00
-20	4.94	4.94
0	4.88	4.88
25	4.76	4.82
40	4.76	4.76
50	4.64	4.76
60	4.64	4.64
70	4.64	4.64
--	-	-
--	-	-
--	-	-

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Figure A

AC Power Supply → Electronic Switch → Power Meter → Temperature Chamber (Power Supply) → Electronic DC Load → Oscilloscope

Relay Unit

DVM

Date Acquisition/Control Unit

Figure A

Figure B

AC Power Supply → Power Meter → Temperature Chamber (Power Supply) → Measuring board (C1) → Electronic DC Load

Oscilloscope
BW : 20MHz

150mm

C1 = 22 µF
(Electrolytic capacitor)

Figure B

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