COSEL

TEST DATA OF MODULE E

(AME series)

Regulated DC Power Supply
August 21, 2019

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COSEL CO.,LTD.

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Object	+5V32A

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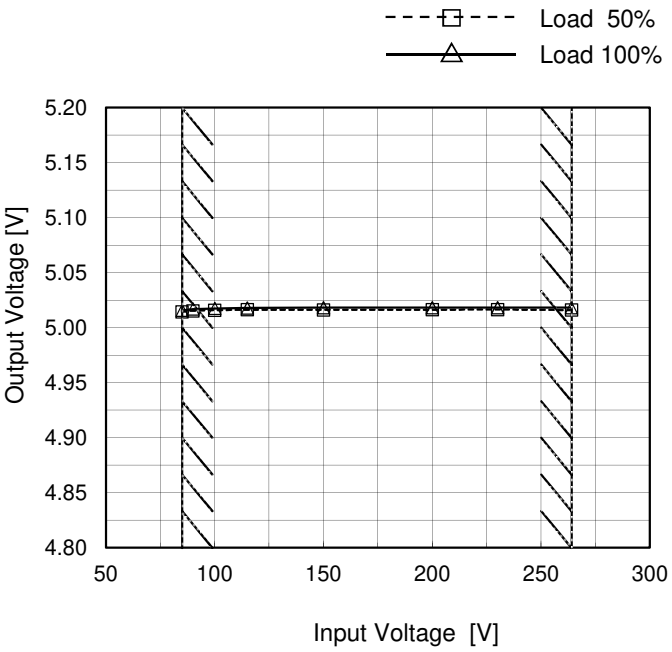

Note:
Hatched line shows the input voltage range.

2. Value

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	5.014	5.016
90	5.015	5.017
100	5.016	5.017
115	5.016	5.018
150	5.016	5.018
200	5.016	5.018
230	5.016	5.018
264	5.016	5.018
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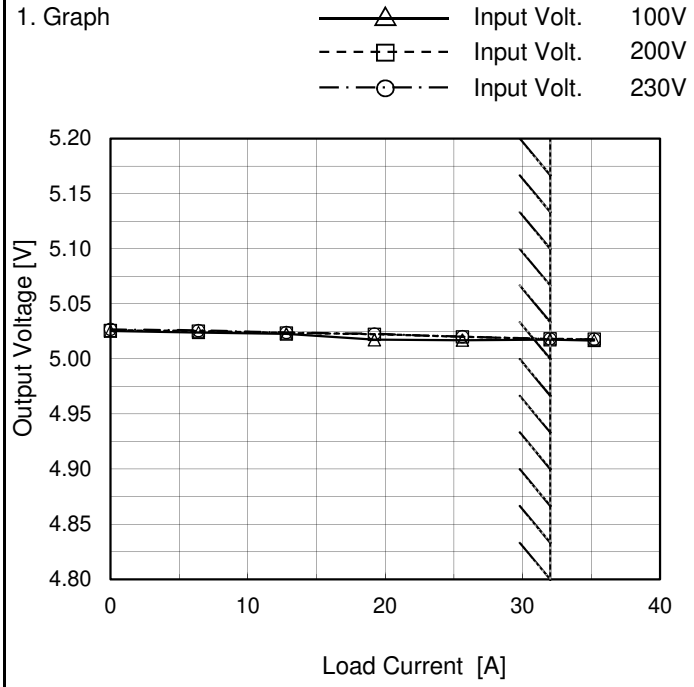
Model	MODULE E
Item	Load Regulation
Object	+5V32A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

2. Value

Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	5.025	5.026	5.027
6.4	5.024	5.025	5.026
12.8	5.023	5.024	5.024
19.2	5.017	5.022	5.023
25.6	5.017	5.020	5.020
32.0	5.017	5.018	5.018
35.2	5.017	5.018	5.018
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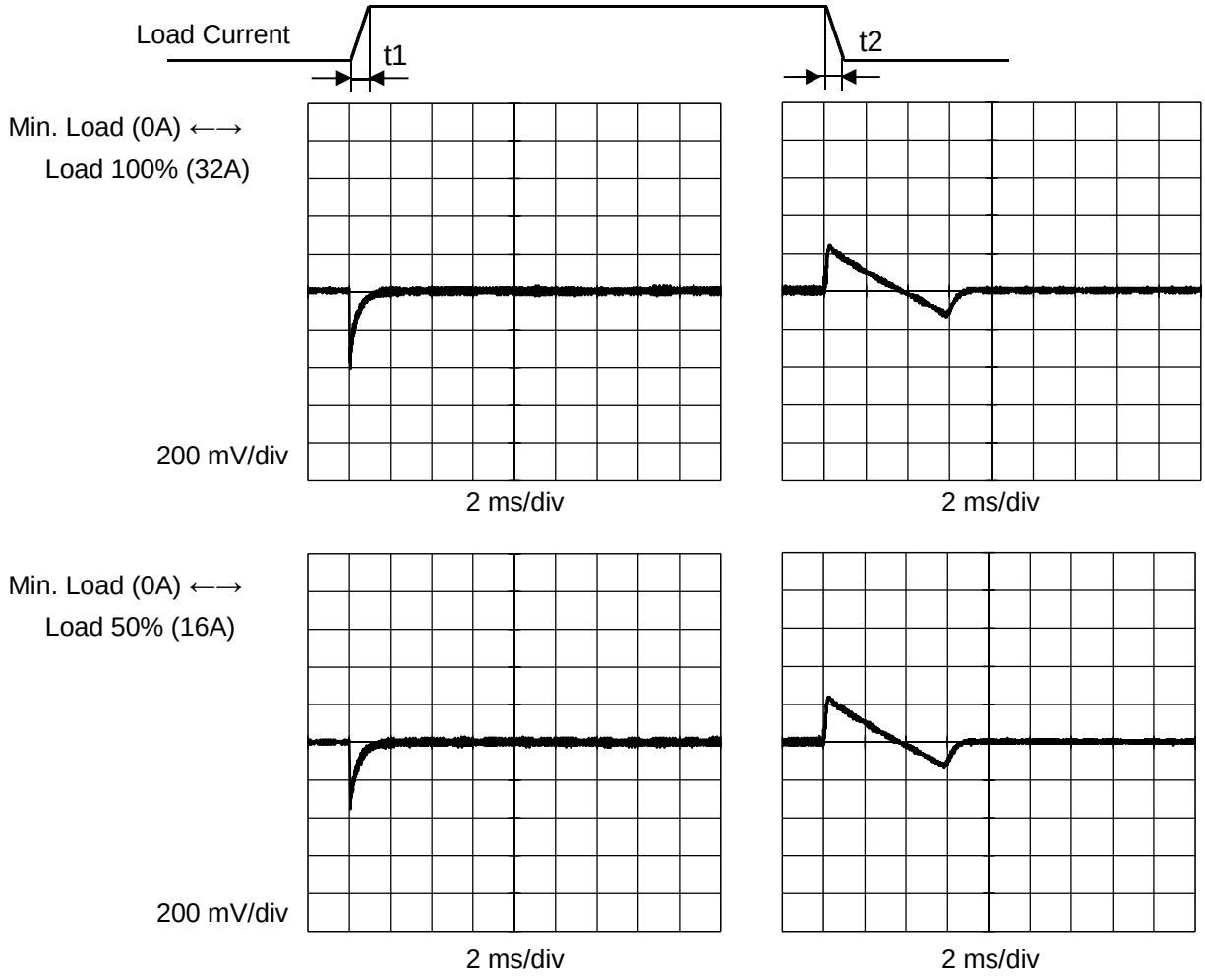
Model	MODULE E		
Item	Dynamic Load Response	Temperature Testing Circuitry	25° C Figure A
Object	+5V32A		

Input Volt. 100 V
Cycle 1000 ms

Response t1=t2=50us. Typ



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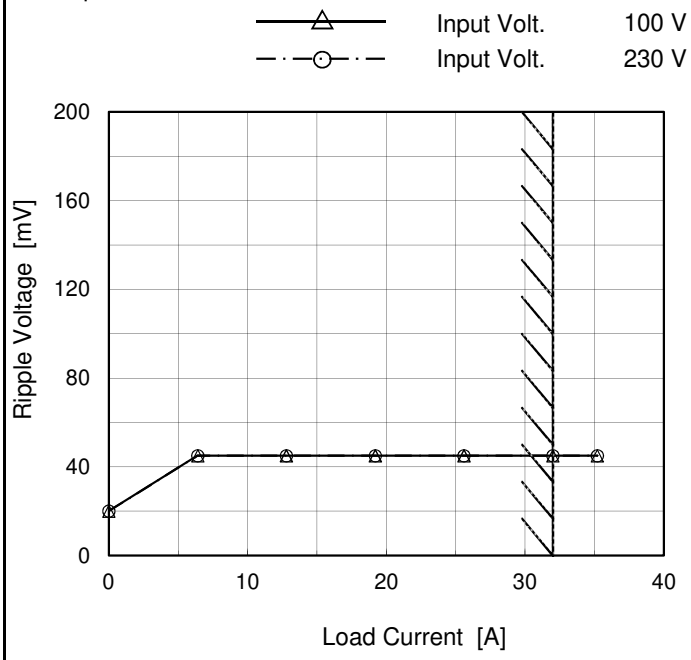
Model	MODULE E
Item	Ripple Voltage (by Load Current)
Object	+5V32A

Temperature 25°C
Testing Circuitry Figure B

1. Graph



2. Value

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100[V]	Input Volt. 230[V]
0.0	20	20
6.4	45	45
12.8	45	45
19.2	45	45
25.6	45	45
32.0	45	45
35.2	45	45
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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.

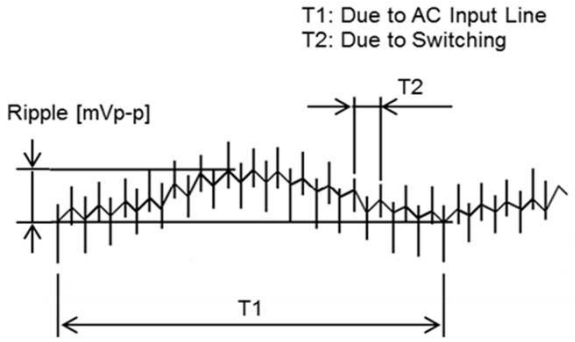

Fig. Complex Ripple Wave Form

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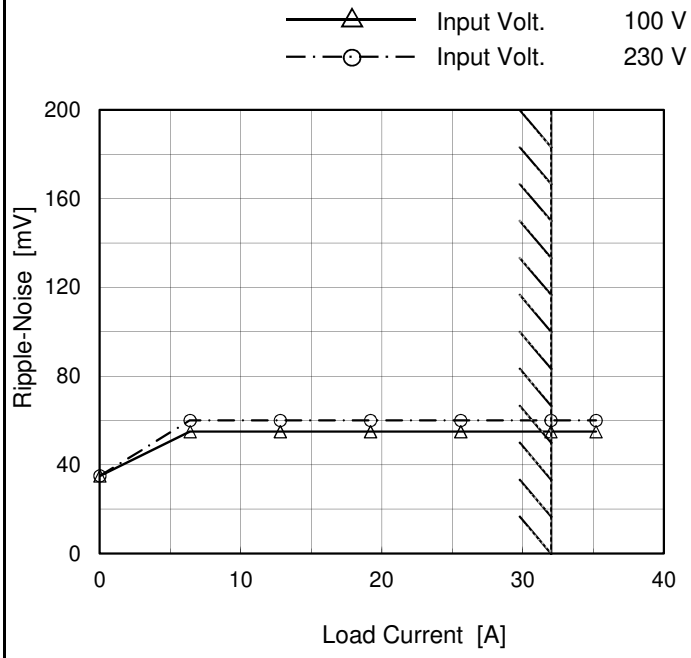
Model	MODULE E
Item	Ripple Noise
Object	+5V32A

Temperature 25°C
Testing Circuitry Figure B

1. Graph



2. Value

Load Current [A]	Ripple Noise [mV]	
	Input Volt. 100[V]	Input Volt. 230[V]
0.0	35	35
6.4	55	60
12.8	55	60
19.2	55	60
25.6	55	60
32.0	55	60
35.2	55	60
--	-	-
--	-	-
--	-	-
--	-	-

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.

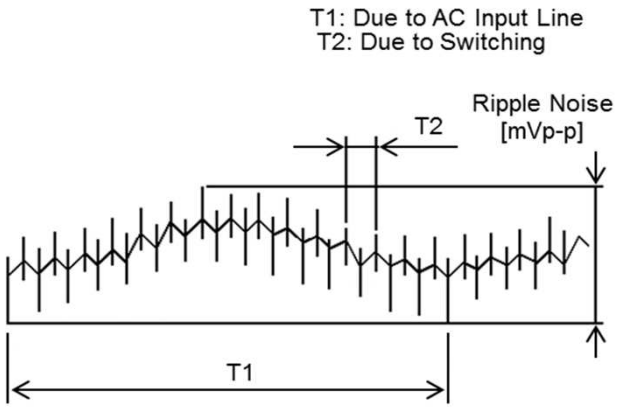


Fig. Complex Ripple Wave Form

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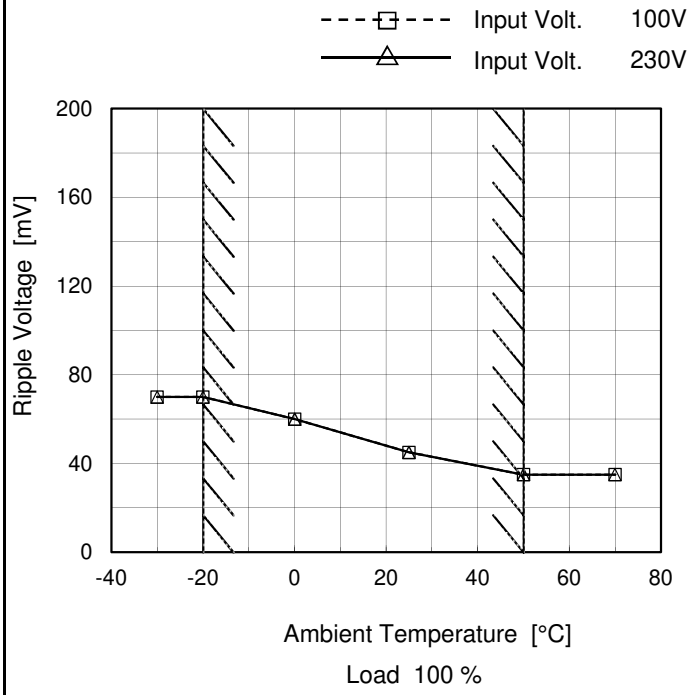
Model	MODULE E
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V32A

Testing Circuitry Figure B

1. Graph



Load 100 %

Note:
Measured by 20MHz Oscilloscope.

Hatched line shows the range of the rated operating temperature.

2. Value

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
-30	70	70
-20	70	70
0	60	60
25	45	45
50	35	35
70	35	35
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

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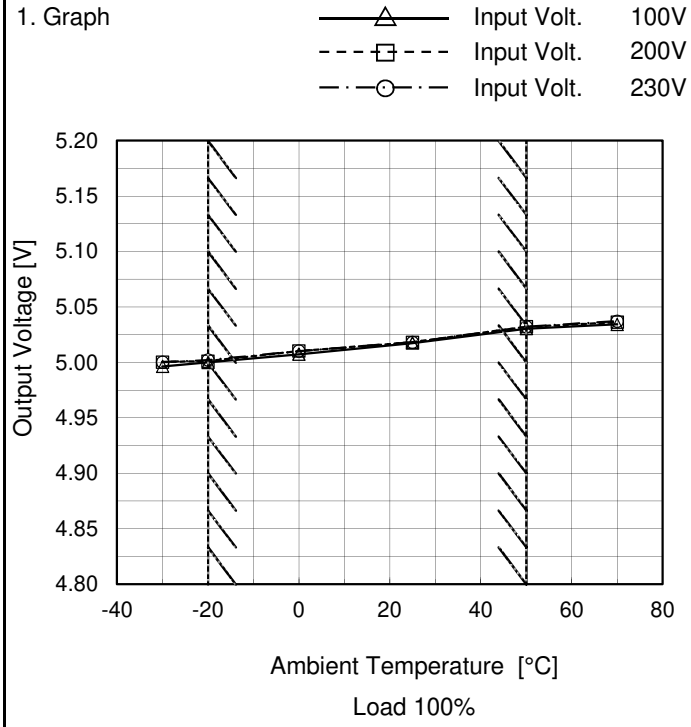
Model	MODULE E
Item	Ambient Temperature Drift
Object	+5V32A

Testing Circuitry Figure A

1. Graph



Load 100%

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

2. Value

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-30	4.996	5.000	5.000
-20	5.000	5.001	5.002
0	5.007	5.010	5.010
25	5.017	5.018	5.018
50	5.030	5.032	5.032
70	5.034	5.036	5.037
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--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	MODULE E	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+5V32A	

1. Output Voltage Accuracy

This means the output voltage fluctuation of the time the ambient temperature, the input voltage and/or the load current are varied arbitrarily in the range below.

Temperature : -20 - 50°C
Input Voltage : 85 - 264V
Load Current : 0 - 32A

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

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

2. Value

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	50	90	0	5.039	±20	±0.4
Minimum Voltage	-20	100	32	5.000		

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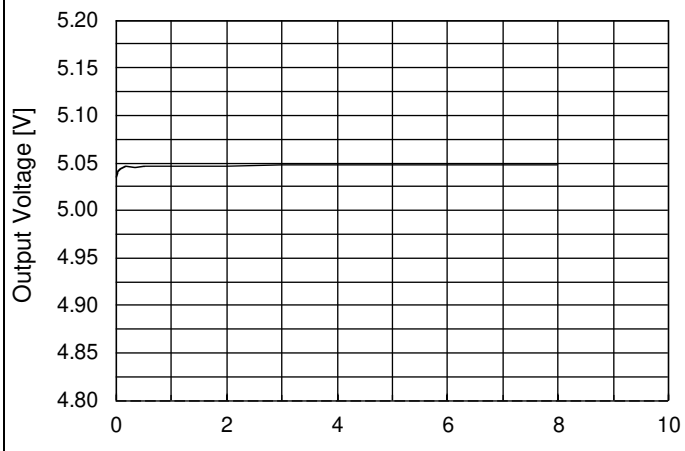
Model	MODULE E
Item	Time Lapse Drift
Object	+5V32A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



Input Voltage 100V
Load 100%

2. Value

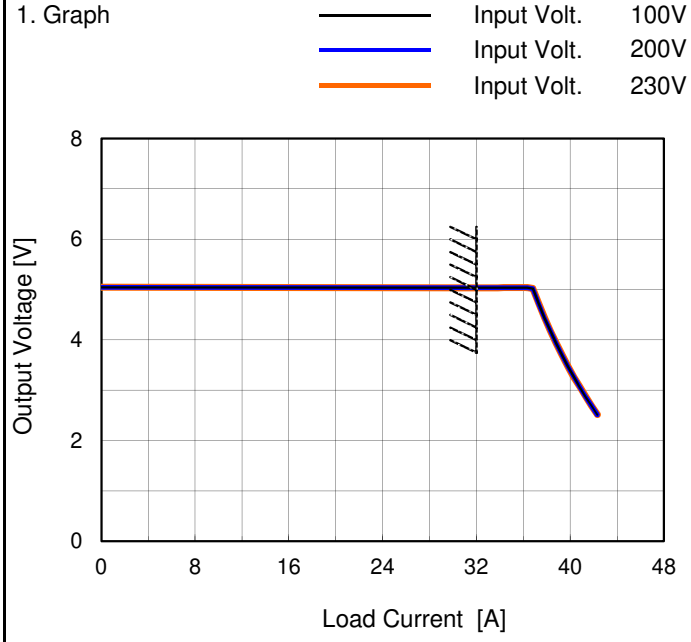
Time since start [H]	Output Voltage [V]
0.0	5.035
0.5	5.047
1.0	5.047
2.0	5.047
3.0	5.048
4.0	5.048
5.0	5.048
6.0	5.048
7.0	5.048
8.0	5.048

COSEL

Model	MODULE E
Item	Overcurrent Protection
Object	+5V32A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

Hiccup mode activates when the output voltage is below 2.5V.

2. Value

Output Voltage [V]	Load Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
4.75	37.34	37.33	37.34
4.50	37.83	37.83	37.83
4.00	38.83	38.83	38.83
3.50	39.82	39.82	39.82
3.00	40.82	40.82	40.82
2.50	42.33	42.33	42.33
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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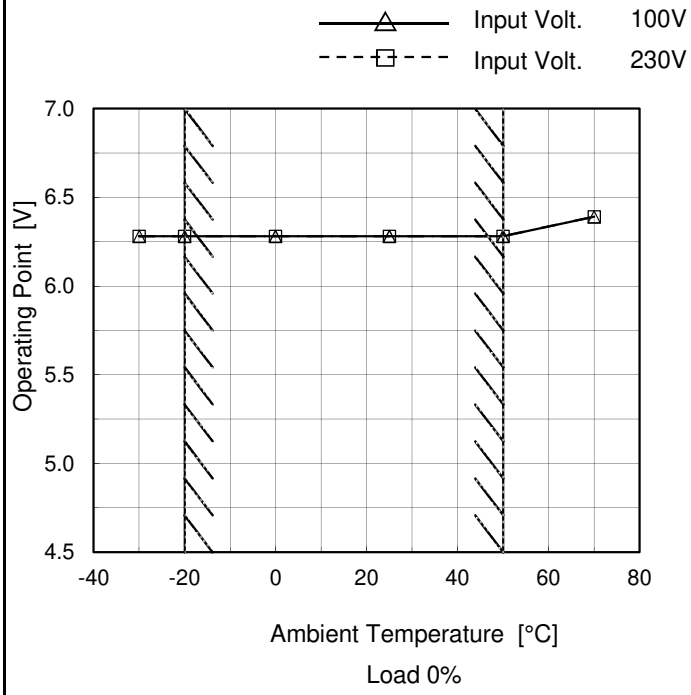
Model	MODULE E
Item	Overvoltage Protection
Object	+5V32A

Testing Circuitry Figure A

1. Graph



Load 0%

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

2. Value

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-30	6.28	6.28
-20	6.28	6.28
0	6.28	6.28
25	6.28	6.28
50	6.28	6.28
70	6.39	6.39
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--	-	-
--	-	-
--	-	-
--	-	-

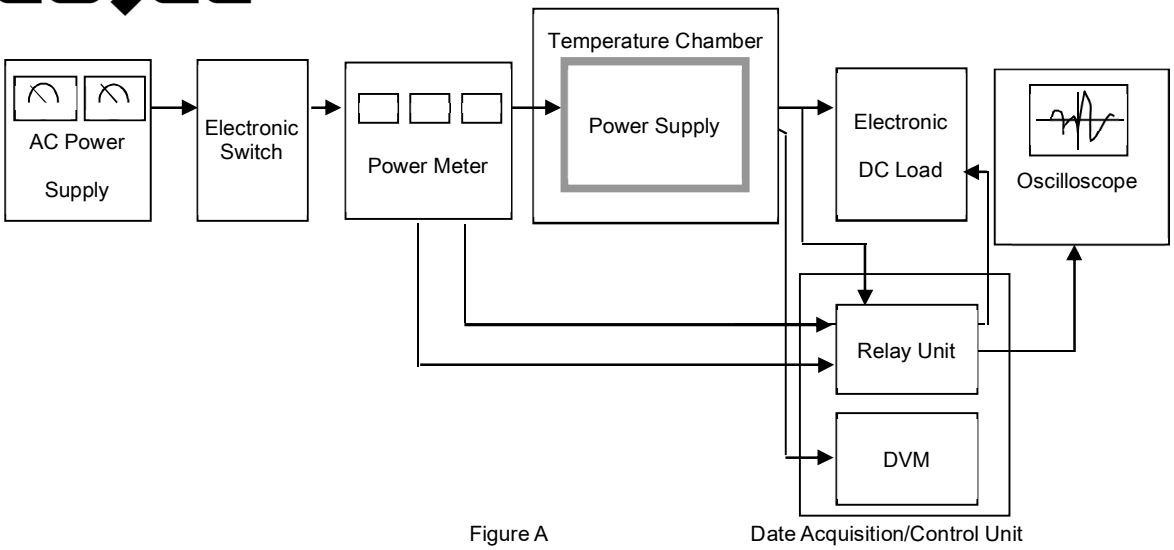

Figure A

Date Acquisition/Control Unit

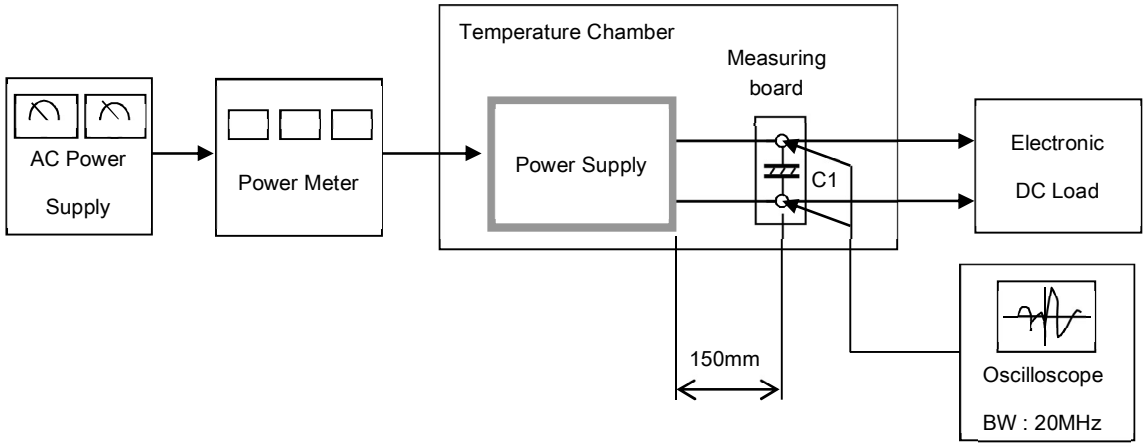

Figure B

C1 = 22 μF
(Electrolytic capacitor)