参考資料

COSEL

TEST DATA OF MODULE V

(ACE series)

Regulated DC power supply
Jun.5.2003

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COSEL CO.,LTD.

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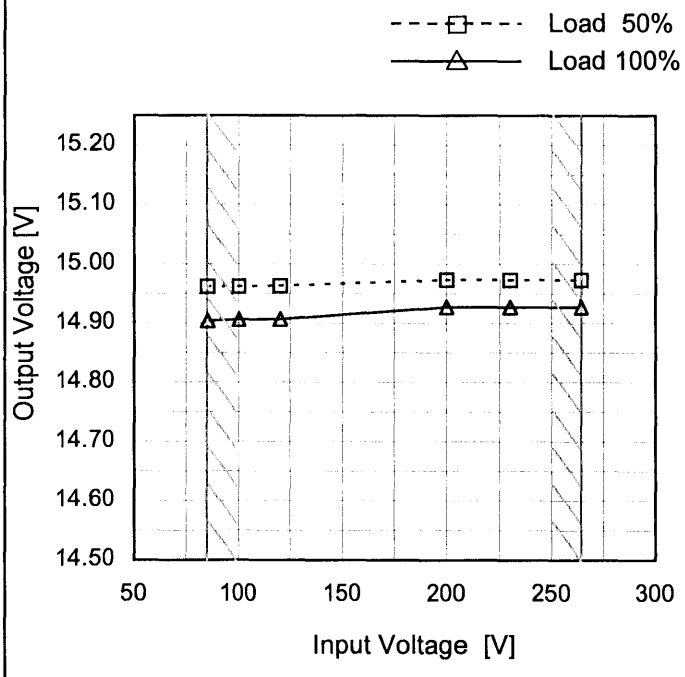
Model	MODULE V
Item	Line Regulation
Object	+15V5.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

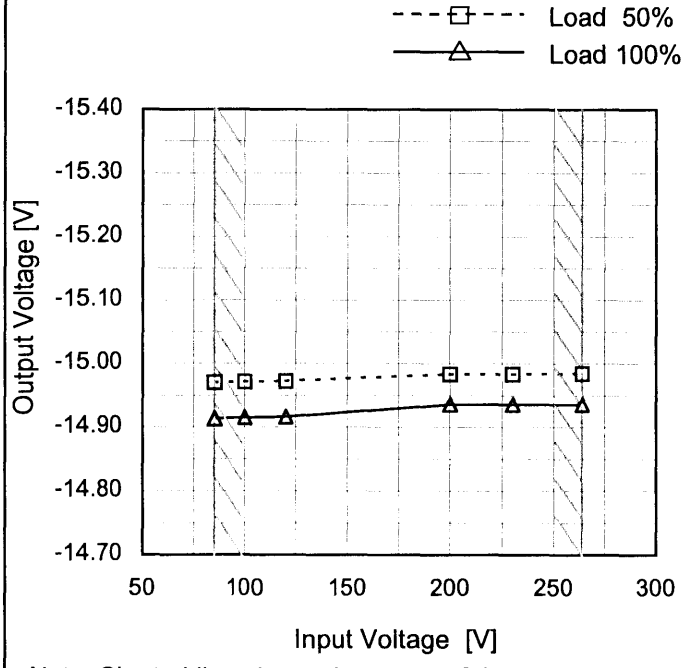


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	14.962	14.904
100	14.962	14.906
120	14.963	14.907
200	14.973	14.927
230	14.973	14.927
264	14.973	14.927
--	-	-
--	-	-
--	-	-

Object	-15V5.5A

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%
85	-14.970	-14.913
100	-14.971	-14.915
120	-14.972	-14.916
200	-14.983	-14.936
230	-14.983	-14.936
264	-14.984	-14.936
--	-	-
--	-	-
--	-	-

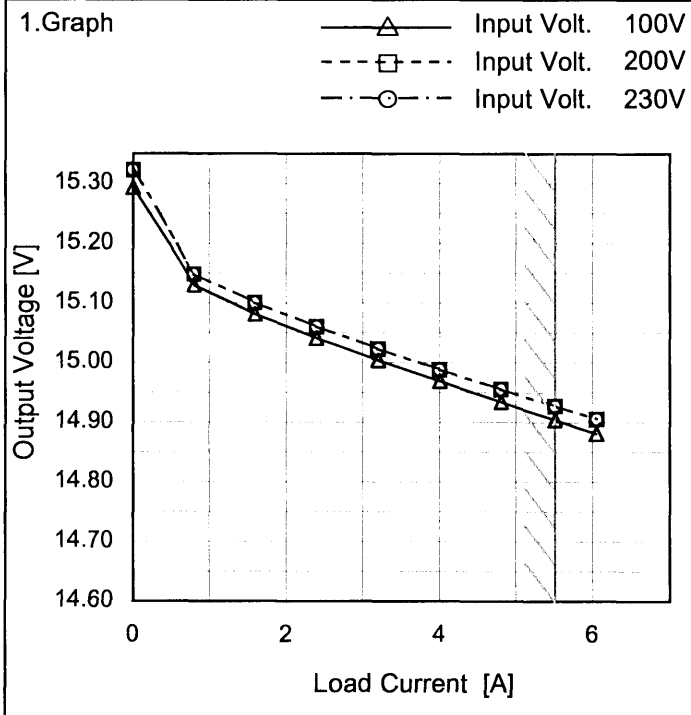
BC-0898

COSEL

Model	MODULE V
Item	Load Regulation
Object	+15V5.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

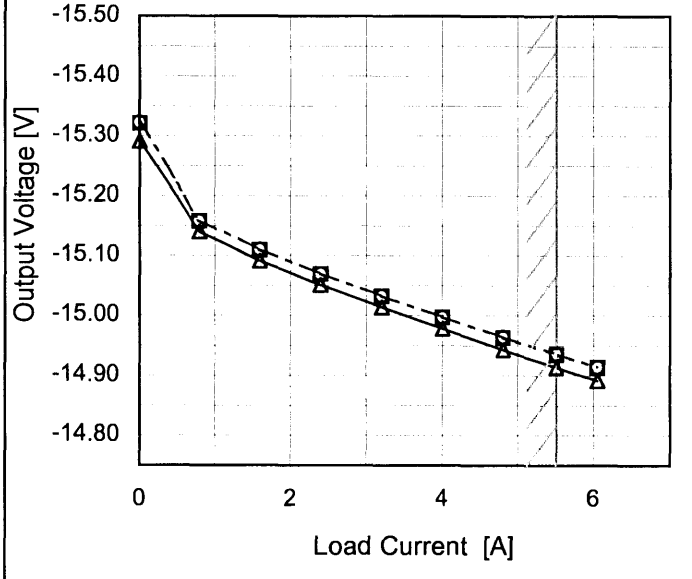


2.Values

Load Current [A]	Output Voltage [V] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	15.293	15.322	15.322
0.8	15.130	15.148	15.148
1.6	15.081	15.100	15.100
2.4	15.041	15.060	15.060
3.2	15.004	15.023	15.023
4.0	14.969	14.988	14.988
4.8	14.934	14.955	14.955
5.5	14.904	14.927	14.927
6.1	14.881	14.905	14.905
--	-	-	-
--	-	-	-

Object	-15V5.5A

1.Graph



Note: Slanted 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	-15.291	-15.321	-15.322
0.8	-15.140	-15.158	-15.158
1.6	-15.091	-15.109	-15.110
2.4	-15.051	-15.069	-15.069
3.2	-15.014	-15.032	-15.032
4.0	-14.978	-14.997	-14.997
4.8	-14.943	-14.963	-14.964
5.5	-14.914	-14.935	-14.936
6.1	-14.892	-14.914	-14.914
--	-	-	-
--	-	-	-

COSEL

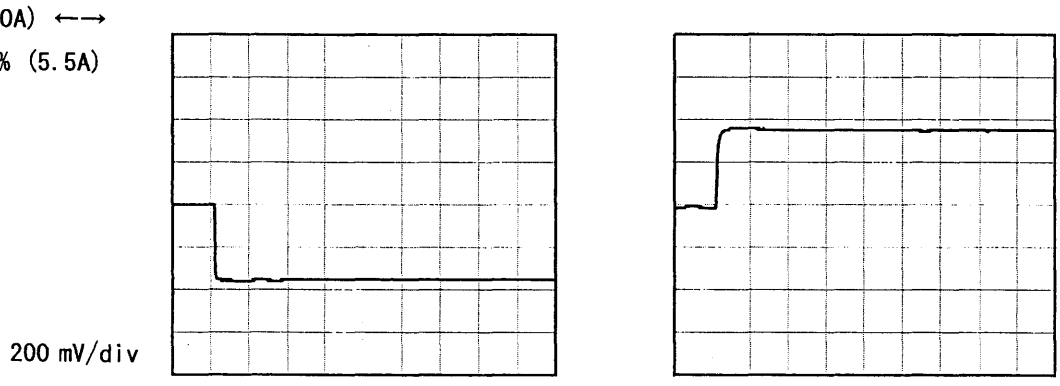
Model	MODULE V
Item	Dynamic Load Response
Object	+15V5.5A

Temperature 25°C
Testing Circuitry Figure A

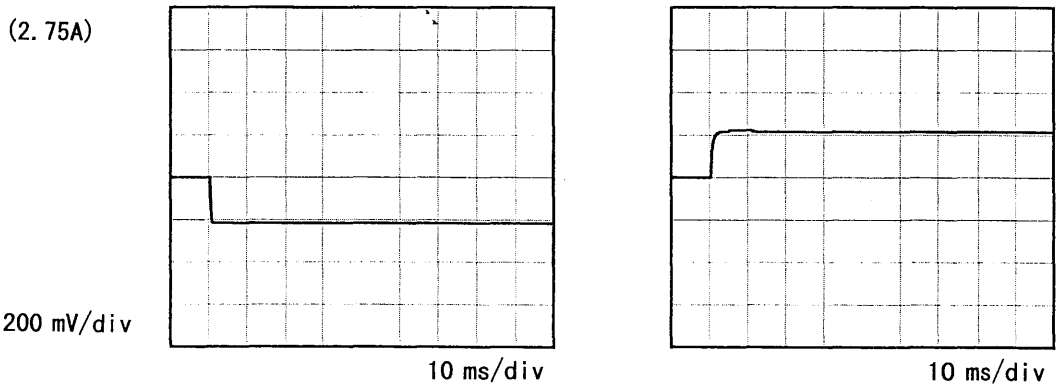
Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ←→
Load 100% (5.5A)



Min. Load (0A) ←→
Load 50% (2.75A)



* The characteristic of AC200V is equal.

COSEL

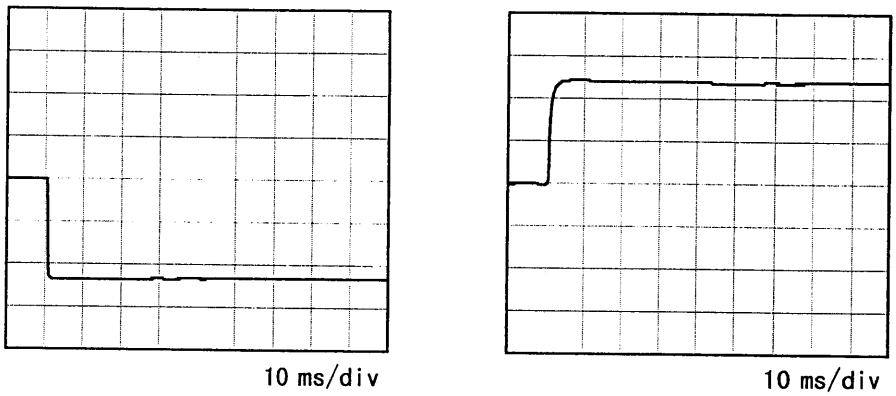
Model	MODULE V
Item	Dynamic Load Response
Object	-15V5.5A

Temperature 25°C
Testing Circuitry Figure A

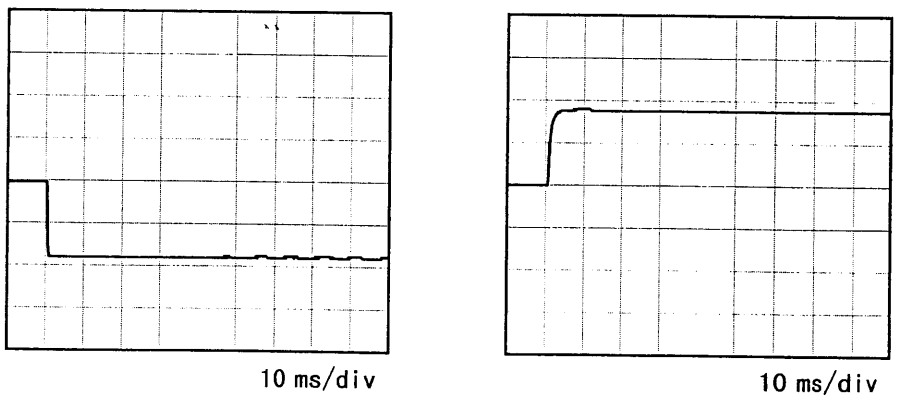
Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ⟷
Load 100% (5.5A)



Min. Load (0A) ⟷
Load 50% (2.75A)



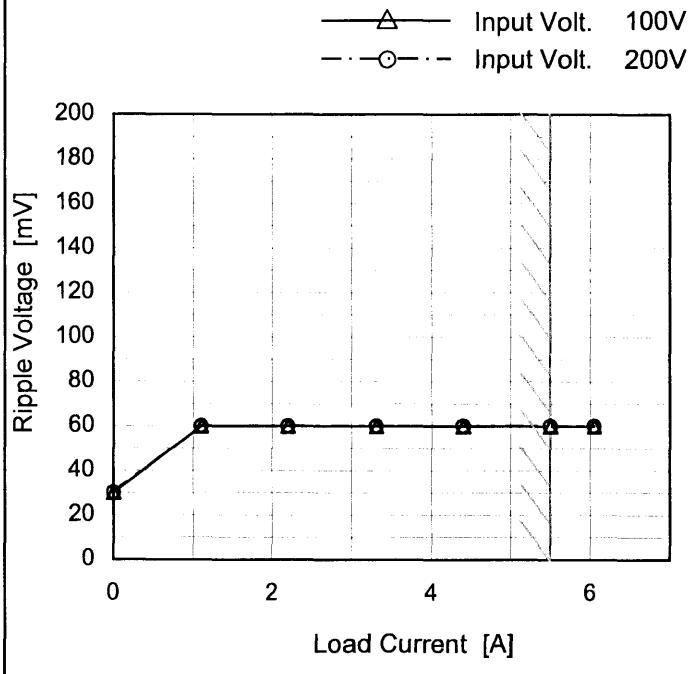
* The characteristic of AC200V is equal.

COSEL

Model	MODULE V
Item	Ripple Voltage (by Load Current)
Object	+15V5.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

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

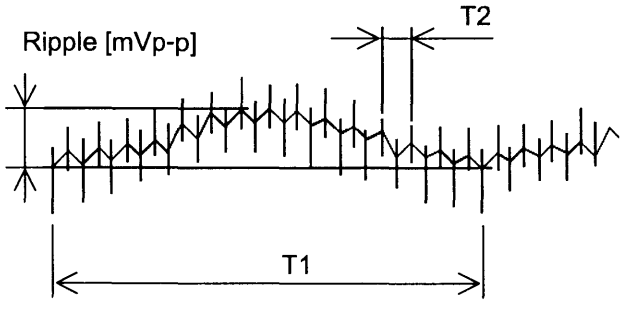


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	30	30
1.1	60	60
2.2	60	60
3.3	60	60
4.4	60	60
5.5	60	60
6.1	60	60
--	-	-
--	-	-
--	-	-
--	-	-

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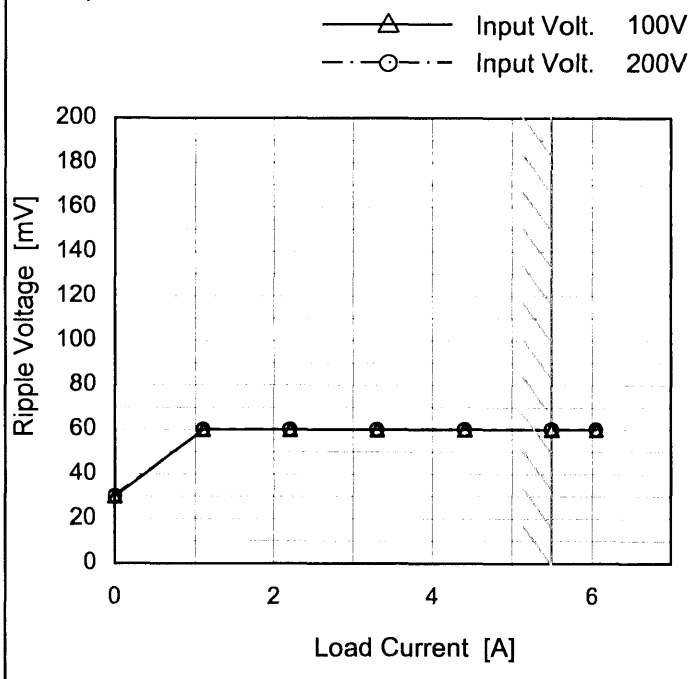
Model	MODULE V
Item	Ripple Voltage (by Load Current)
Object	-15V5.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

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

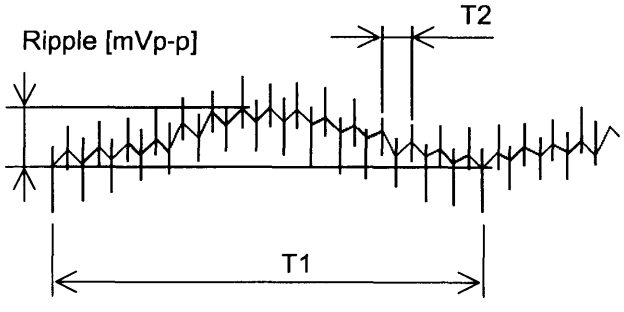


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.0	30	30
1.1	60	60
2.2	60	60
3.3	60	60
4.4	60	60
5.5	60	60
6.1	60	60
--	-	-
--	-	-
--	-	-
--	-	-

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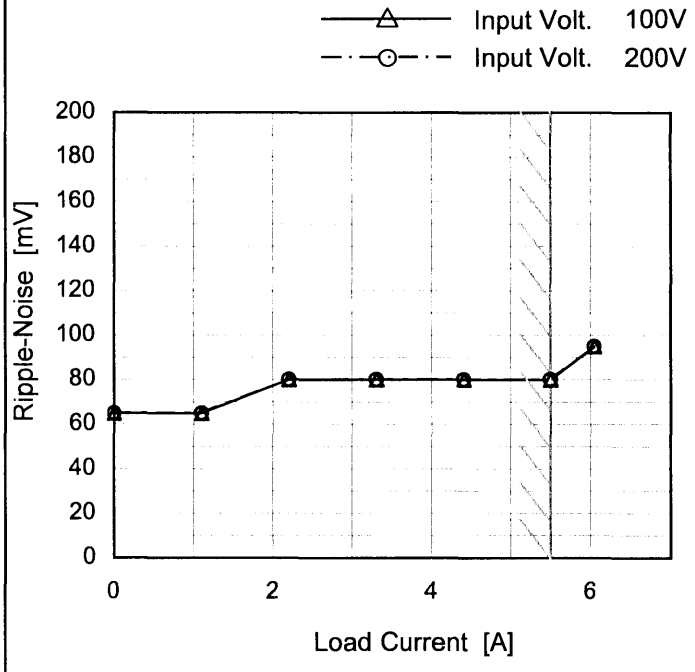
Model	MODULE V
Item	Ripple-Noise
Object	+15V5.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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. 100 [V]	Input Volt. 200 [V]
0.0	65	65
1.1	65	65
2.2	80	80
3.3	80	80
4.4	80	80
5.5	80	80
6.1	95	95
--	-	-
--	-	-
--	-	-
--	-	-

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

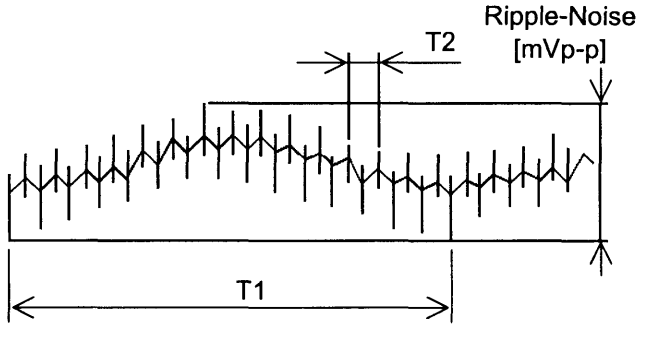


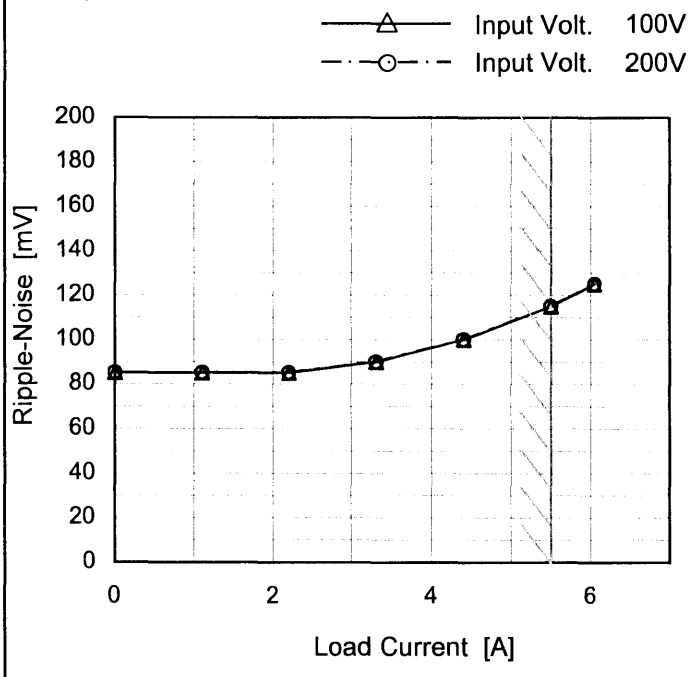
Fig. Complex Ripple Wave Form

COSEL

Model	MODULE V
Item	Ripple-Noise
Object	-15V5.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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. 100 [V]	Input Volt. 200 [V]
0.0	85	85
1.1	85	85
2.2	85	85
3.3	90	90
4.4	100	100
5.5	115	115
6.1	125	125
--	-	-
--	-	-
--	-	-
--	-	-

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

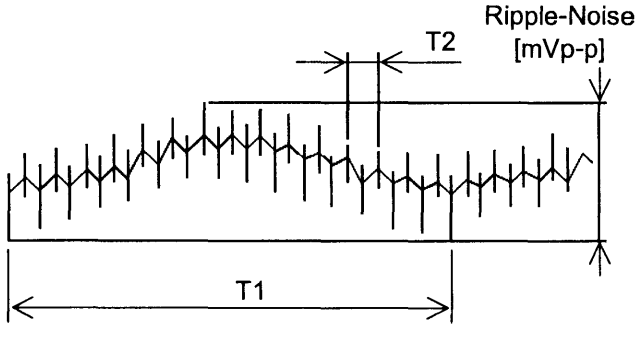


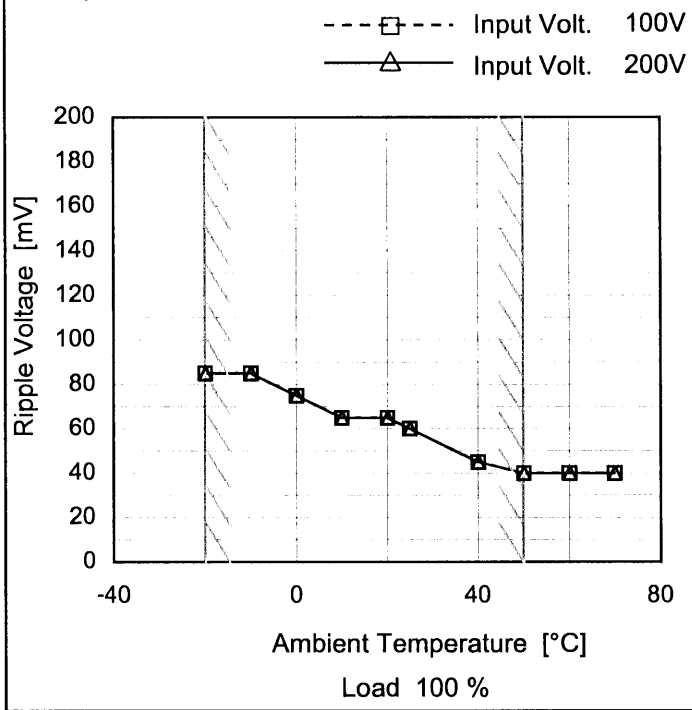
Fig. Complex Ripple Wave Form

COSEL

Model	MODULE V
Item	Ripple Voltage (by Ambient Temp.)
Object	+15V5.5A

Testing Circuitry Figure A

1.Graph



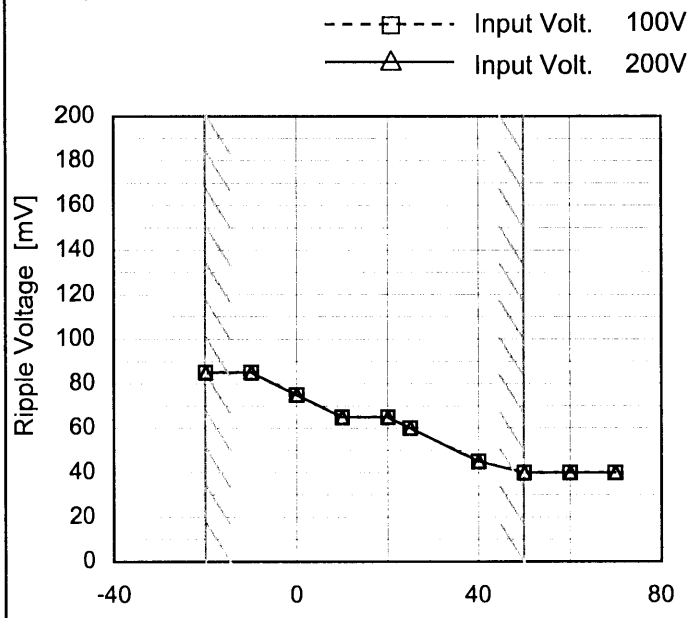
Load 100 %

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-20	85	85
-10	85	85
0	75	75
10	65	65
20	65	65
25	60	60
40	45	45
50	40	40
60	40	40
70	40	40

Object	-15V5.5A

1.Graph



Load 100 %

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

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-20	85	85
-10	85	85
0	75	75
10	65	65
20	65	65
25	60	60
40	45	45
50	40	40
60	40	40
70	40	40

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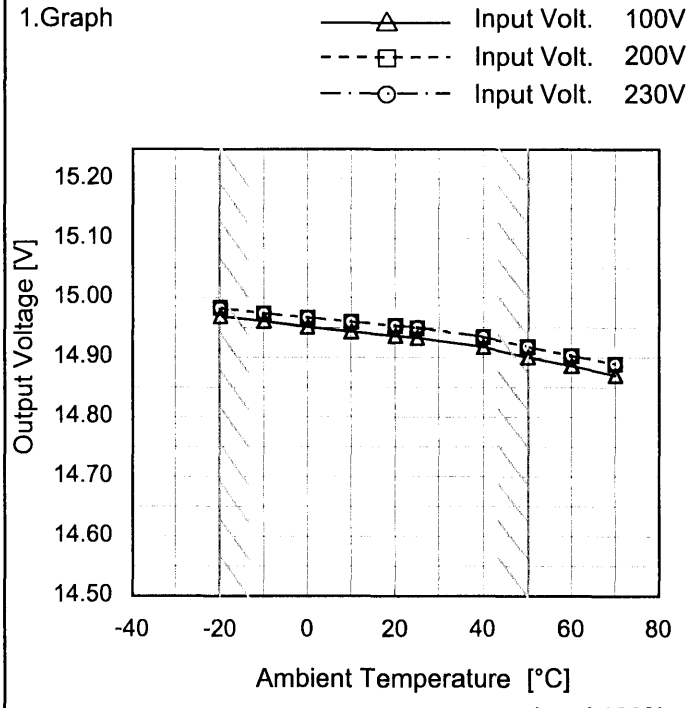
Model	MODULE V
Item	Ambient Temperature Drift
Object	+15V5.5A

Testing Circuitry Figure A

1.Graph



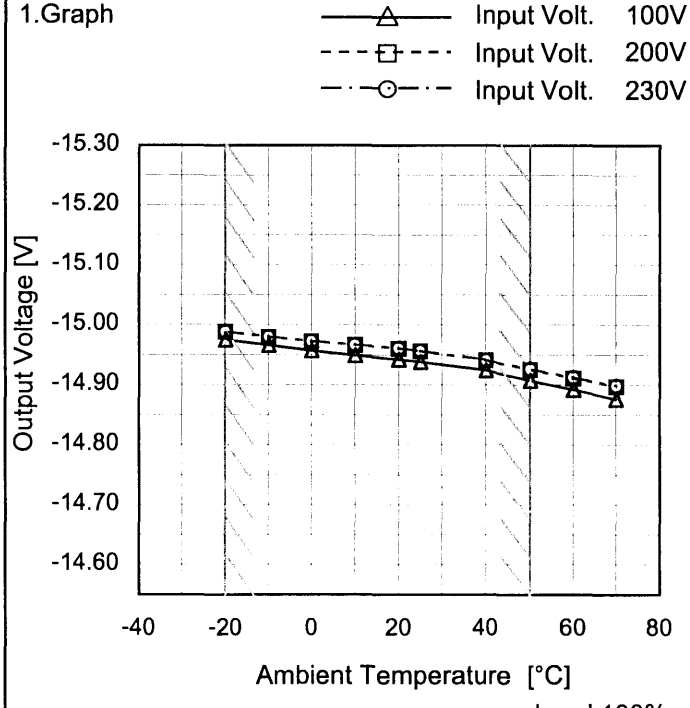
Load 100%

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	14.969	14.983	14.982
-10	14.961	14.973	14.973
0	14.951	14.966	14.966
10	14.943	14.959	14.959
20	14.936	14.953	14.953
25	14.933	14.949	14.950
40	14.918	14.934	14.934
50	14.901	14.918	14.918
60	14.886	14.903	14.903
70	14.870	14.889	14.889
--	-	-	-

Object	-15V5.5A

1.Graph



Load 100%

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

2.Values

Ambient Temperature [°C]	Output Voltage [V] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	-14.975	-14.988	-14.988
-10	-14.966	-14.979	-14.979
0	-14.957	-14.972	-14.972
10	-14.949	-14.966	-14.966
20	-14.942	-14.960	-14.960
25	-14.938	-14.956	-14.956
40	-14.924	-14.941	-14.941
50	-14.907	-14.925	-14.926
60	-14.892	-14.911	-14.912
70	-14.876	-14.897	-14.898
--	-	-	-

COSEL

Model	MODULE V	
Item	Output Voltage Accuracy	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 (AVR 1) : 0 - 5.5A (AVR 2) : 0 - 5.5A

* 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

Object	+15V5.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	170	0	15.340	±242	±1.6
Minimum Voltage	50	85	5.5	14.856		

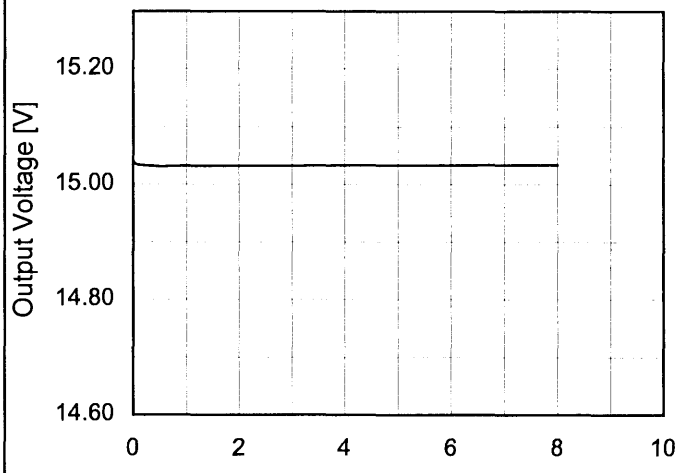
Object	-15V5.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	25	170	0	-15.336	±235	±1.6
Minimum Voltage	50	85	5.5	-14.866		

COSEL

Model	MODULE V
Item	Time Lapse Drift
Object	+15V5.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



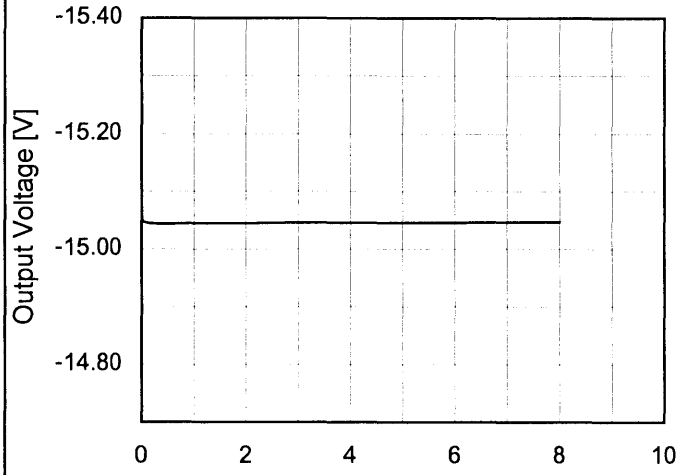
Input Volt. 100V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.040
0.5	15.031
1.0	15.032
2.0	15.032
3.0	15.032
4.0	15.033
5.0	15.033
6.0	15.033
7.0	15.034
8.0	15.034

Object	-15V5.5A

1.Graph



Input Volt. 100V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-15.052
0.5	-15.044
1.0	-15.045
2.0	-15.045
3.0	-15.046
4.0	-15.046
5.0	-15.046
6.0	-15.046
7.0	-15.047
8.0	-15.047

* The characteristic of AC200V is equal.

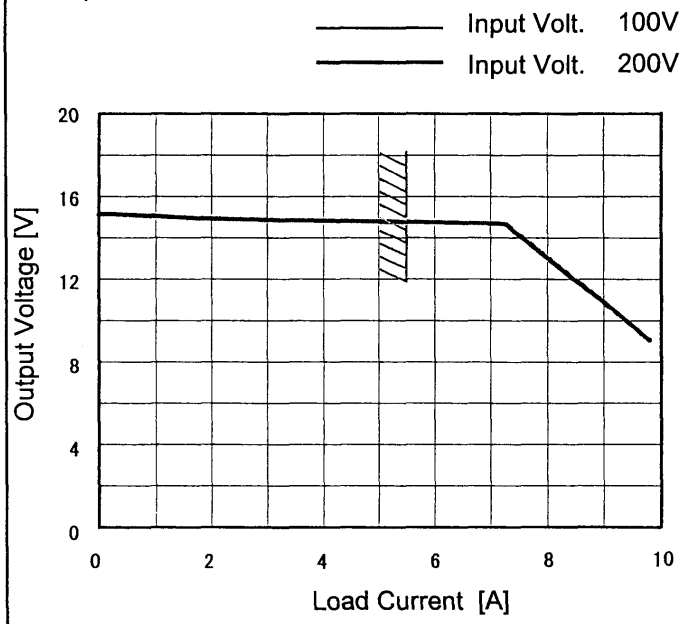
COSEL

Model	MODULE V
Item	Overcurrent Protection

Temperature 25°C
Testing Circuitry Figure A

Object +15V5.5A

1.Graph



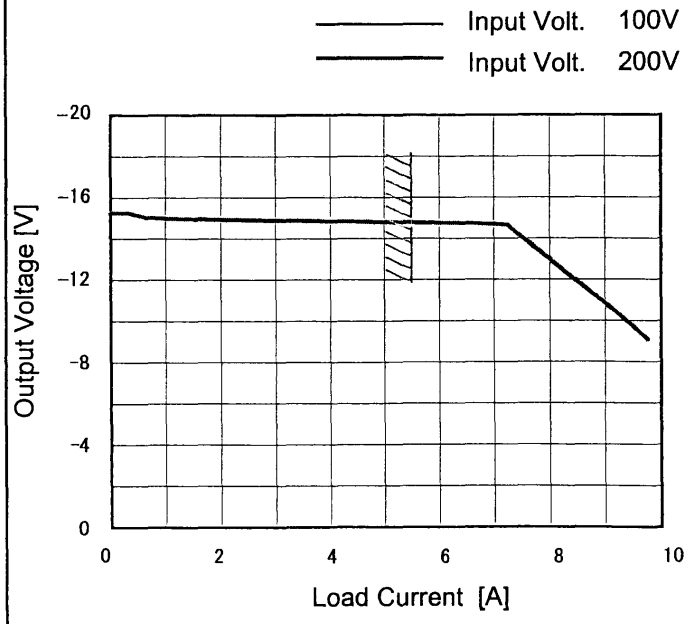
Intermittent operation occurs when the output voltage is from 9V to 0V.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
15.0	6.36	6.35
14.3	7.44	7.45
13.5	7.77	7.79
12.0	8.47	8.49
10.5	9.18	9.17
9.0	9.85	9.83
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Object -15V5.5A

1.Graph



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

Intermittent operation occurs when the output voltage is from 9V to 0V.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 200[V]
15.0	6.59	6.57
14.3	7.41	7.42
13.5	7.67	7.69
12.0	8.53	8.55
10.5	9.13	9.12
9.0	9.83	9.82
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

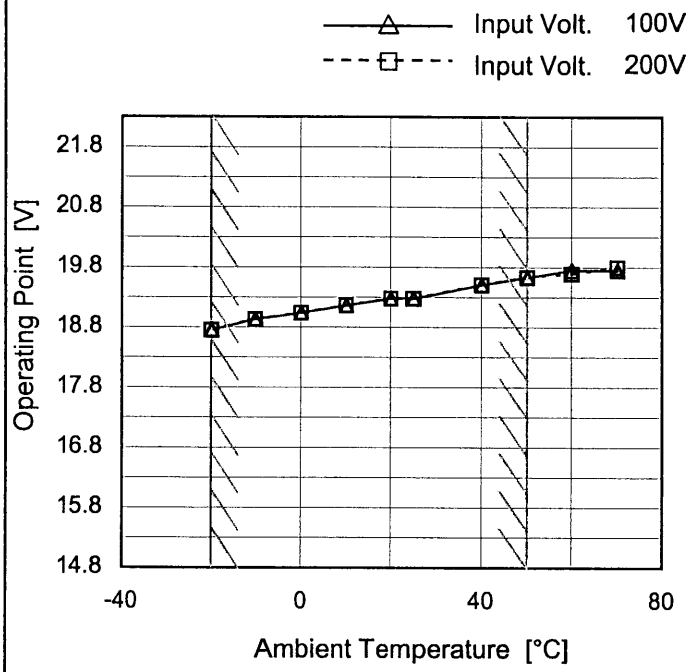
BC-0898

COSEL

Model	MODULE V
Item	Overvoltage Protection
Object	+15V5.5A

Testing Circuitry Figure A

1.Graph



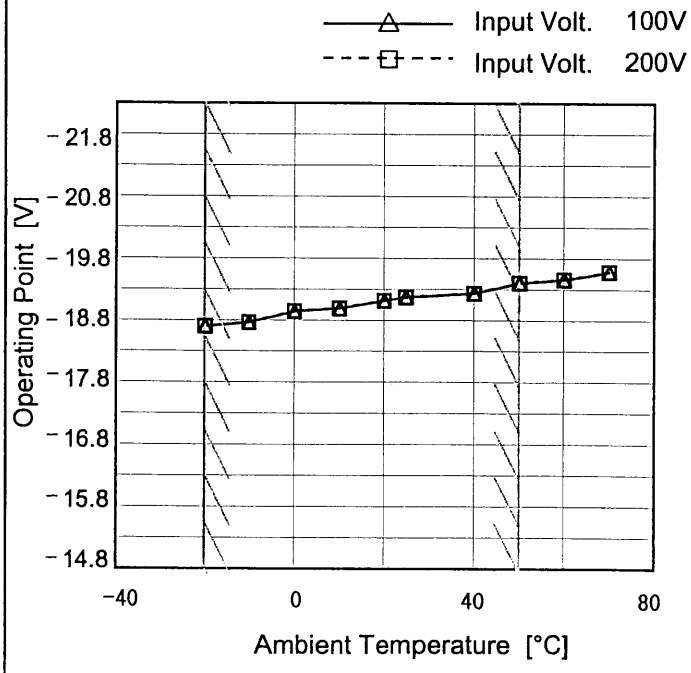
Load 0%

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	18.70	18.70
-10	18.88	18.88
0	18.99	18.99
10	19.11	19.11
20	19.23	19.23
25	19.23	19.23
40	19.46	19.46
50	19.58	19.58
60	19.70	19.64
70	19.70	19.75
--	-	-

Object	-15V5.5A

1.Graph



Load 0%

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

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	-18.70	-18.70
-10	-18.76	-18.76
0	-18.94	-18.94
10	-18.99	-18.99
20	-19.11	-19.11
25	-19.17	-19.17
40	-19.23	-19.23
50	-19.40	-19.40
60	-19.46	-19.46
70	-19.58	-19.58
--	-	-

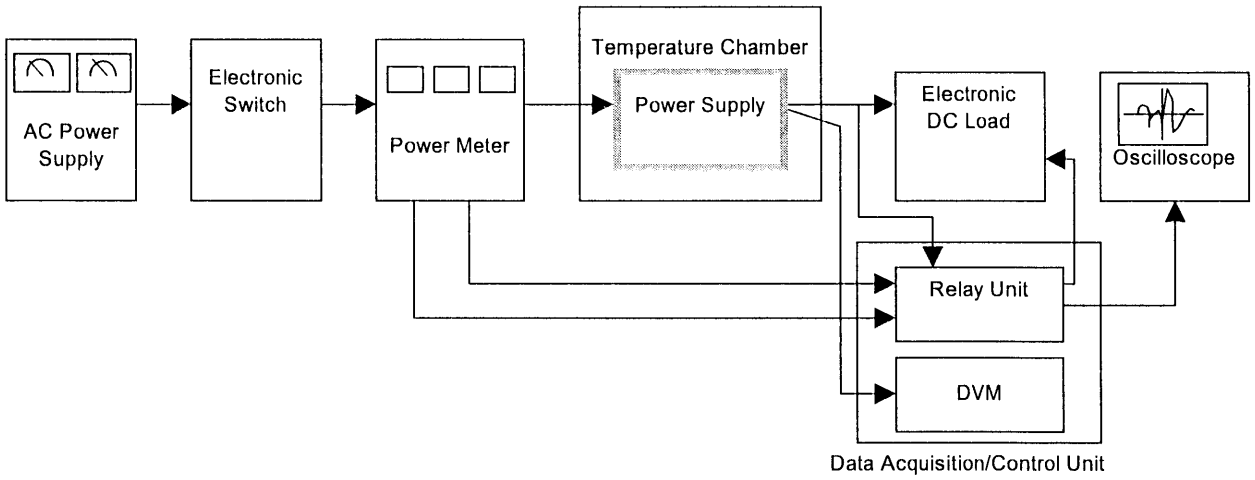


Figure A

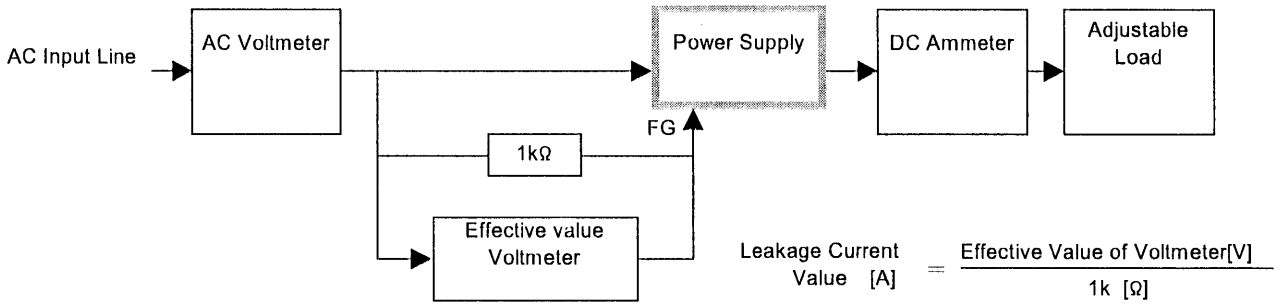


Figure B (DEN-AN)

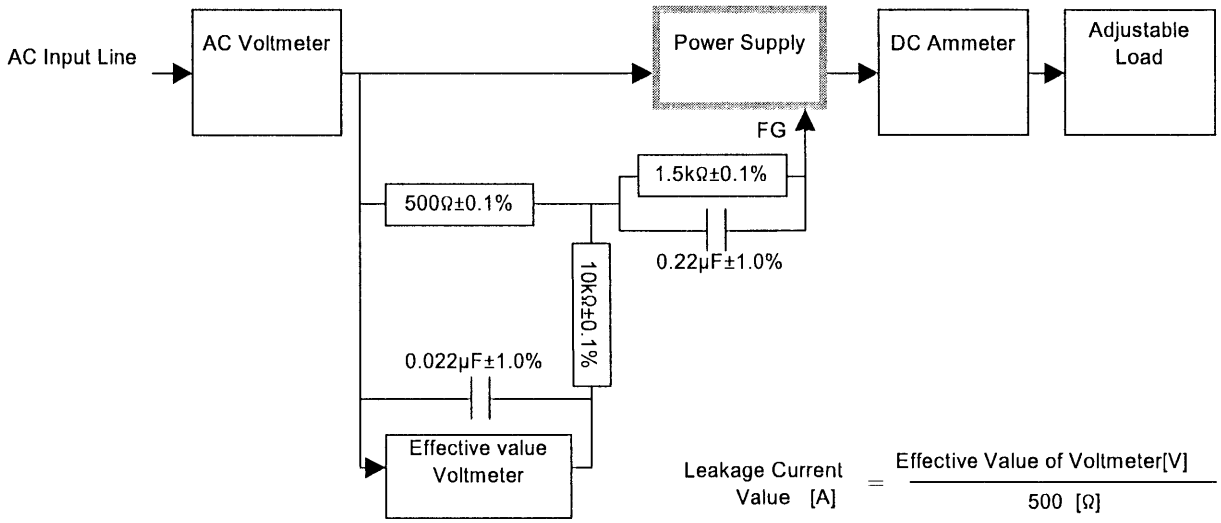


Figure B (IEC60950)