参考資料

COSEL

TEST DATA OF PBW30F-5

Regulated DC Power Supply
Sep 29, 2005

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COSEL CO.,LTD.

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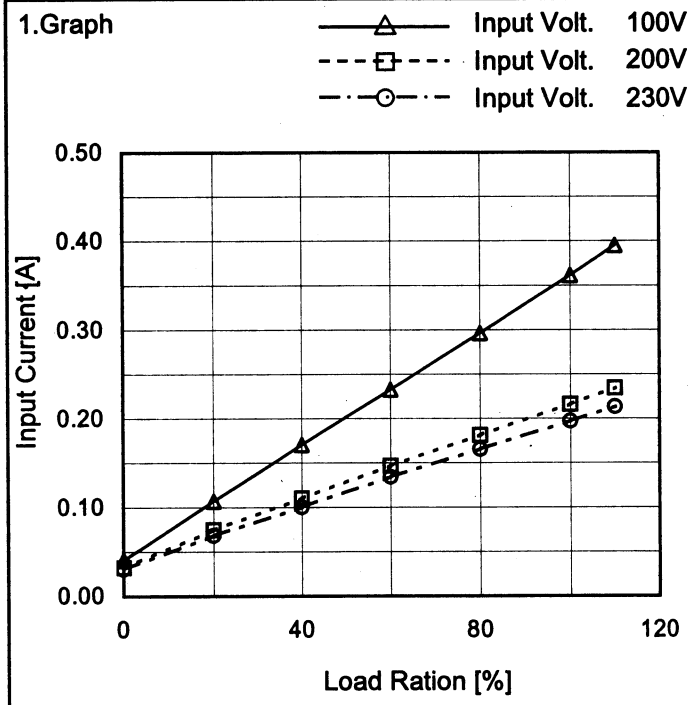
Model	PBW30F-5
Item	Input Current (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.041	0.032	0.030
20	0.107	0.075	0.068
40	0.171	0.110	0.100
60	0.233	0.147	0.134
80	0.297	0.181	0.166
100	0.361	0.216	0.197
110	0.395	0.235	0.213
--	-	-	-
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--	-	-	-
--	-	-	-

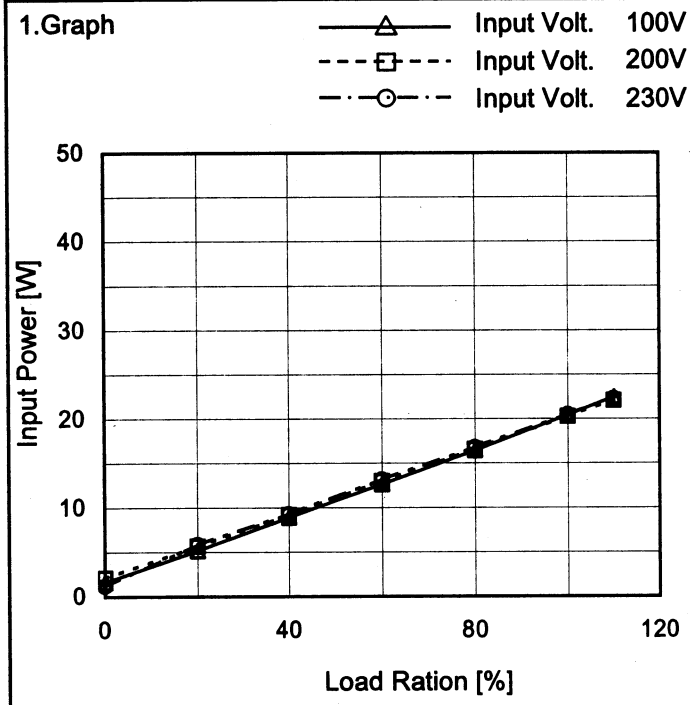
BC-10016

COSEL

Model	PBW30F-5
Item	Input Power (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	1.62	2.13	1.19
20	5.17	5.69	5.86
40	8.90	9.20	9.29
60	12.63	13.00	13.20
80	16.46	16.60	16.80
100	20.43	20.30	20.50
110	22.47	22.10	22.30
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

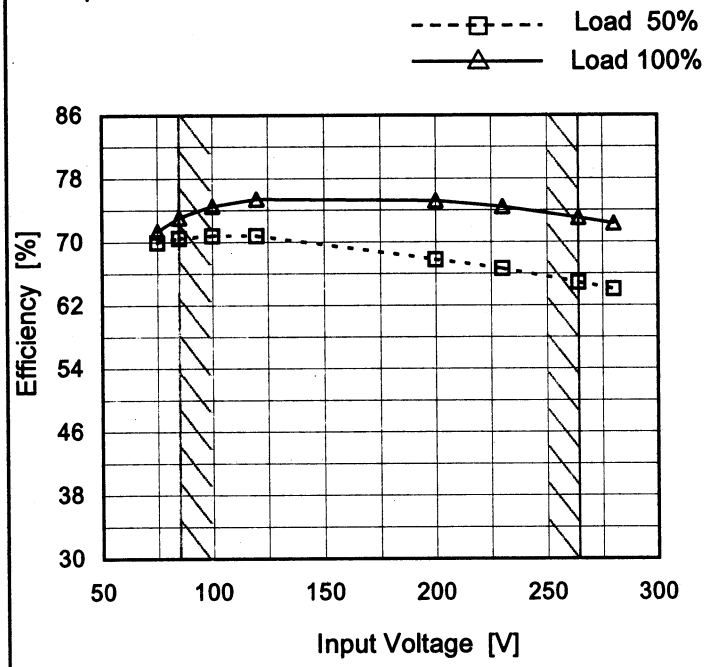
BC-10016

COSEL

Model	PBW30F-5
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%
75	70.0	71.4
85	70.5	73.1
100	70.8	74.5
120	70.8	75.4
200	67.8	75.2
230	66.6	74.5
264	64.9	73.0
280	64.0	72.3
--	-	-

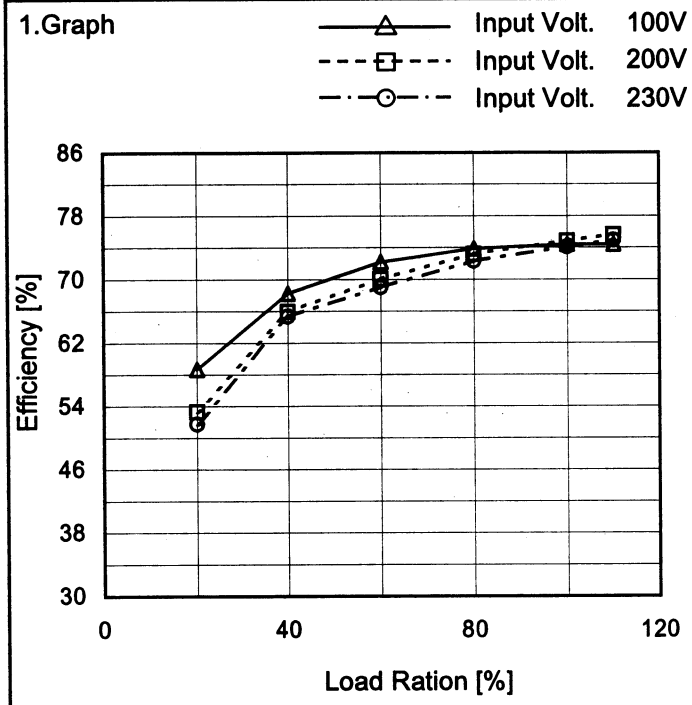
BC-10016

COSEL

Model	PBW30F-5
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	-	-	-
20	58.7	53.3	51.8
40	68.3	66.0	65.3
60	72.2	70.1	69.0
80	73.9	73.2	72.3
100	74.4	74.9	74.1
110	74.4	75.6	74.9
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

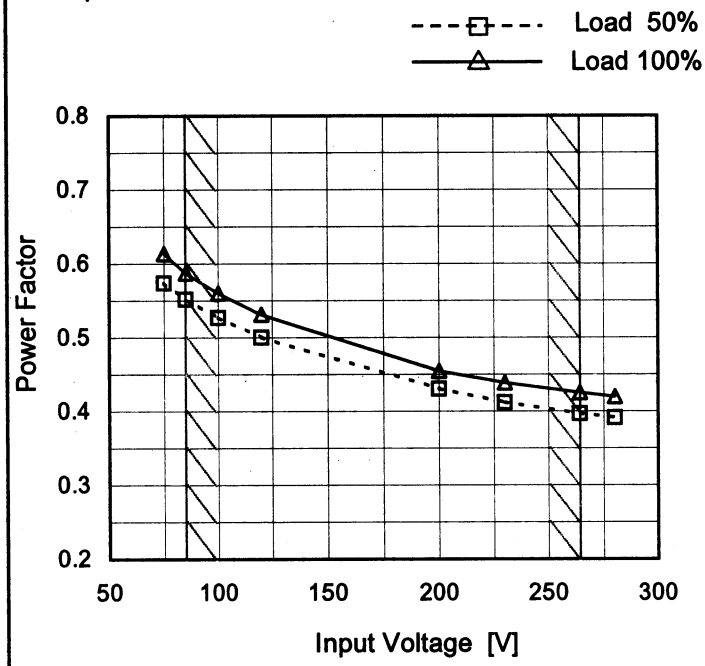
BC-10016

COSEL

Model	PBW30F-5
Item	Power Factor (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]	Power Factor	
	Load 50%	Load 100%
75	0.574	0.614
85	0.552	0.588
100	0.527	0.560
120	0.500	0.532
200	0.431	0.455
230	0.412	0.439
264	0.397	0.425
280	0.392	0.420
--	-	-

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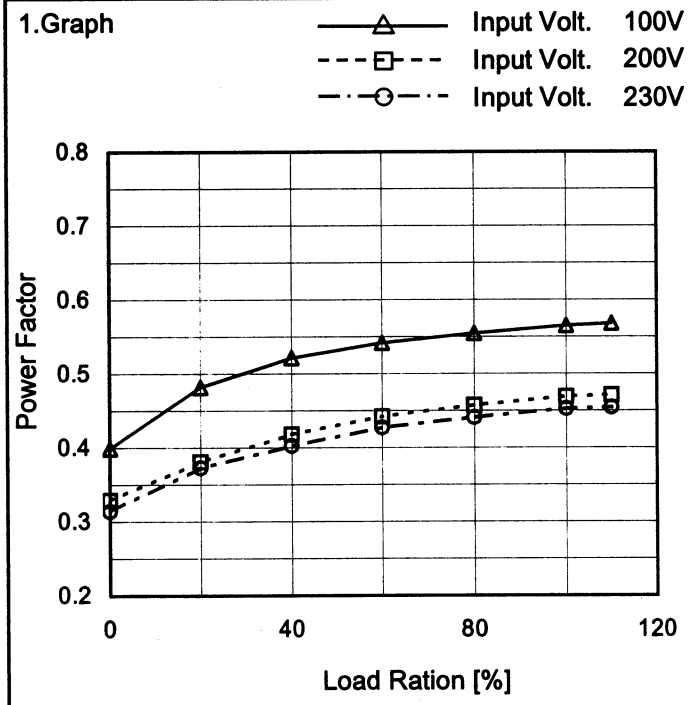
Model	PBW30F-5
Item	Power Factor (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Ration [%]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0	0.399	0.329	0.314
20	0.482	0.381	0.373
40	0.521	0.418	0.403
60	0.542	0.442	0.427
80	0.555	0.457	0.441
100	0.565	0.469	0.453
110	0.568	0.471	0.454
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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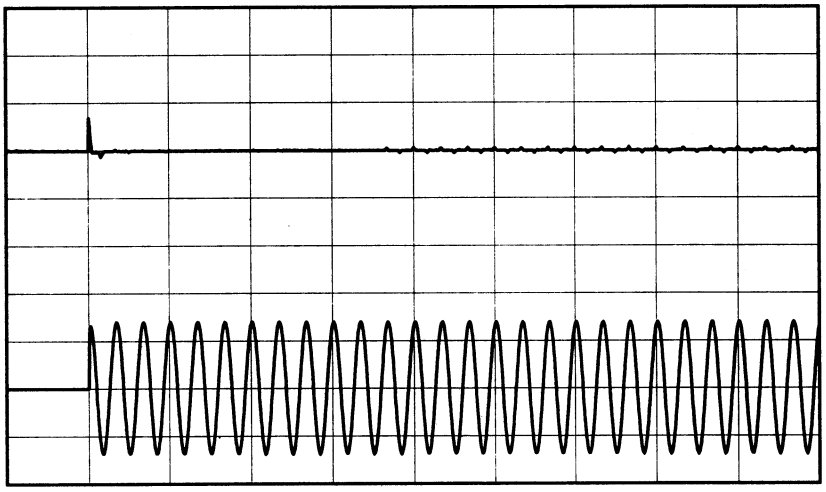
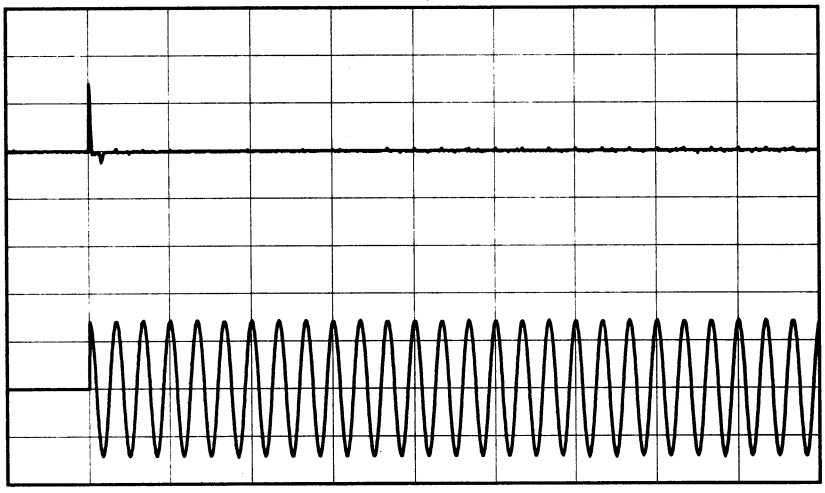
Model	PBW30F-5	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	———————		



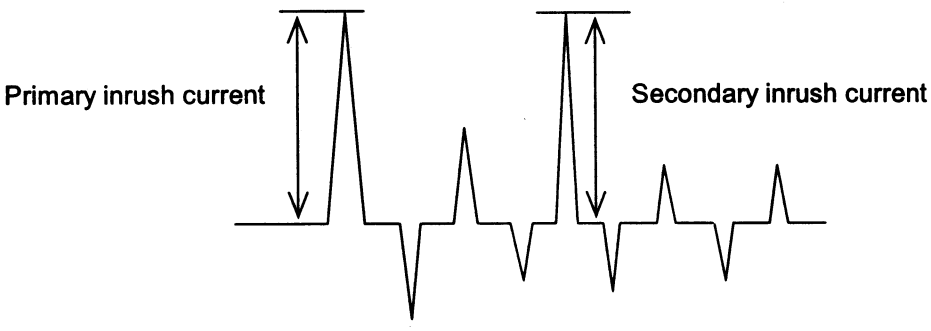
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
13.7 A
Secondary inrush current :
1.4 A



Input Voltage 200 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
28.3 A
Secondary inrush current :
1.3 A



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Model	PBW30F-5	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	———————	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	200 [V]	240 [V]	
DEN-AN	Both phases	0.15	0.32	0.39	Operation
	One of phase	0.30	0.64	0.79	stand by
IEC60950	Both phases	0.19	0.44	0.52	Operation
	One of phase	0.29	0.64	0.79	stand by

The value for "One of phase" is the reference value only.

2.Condition

Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

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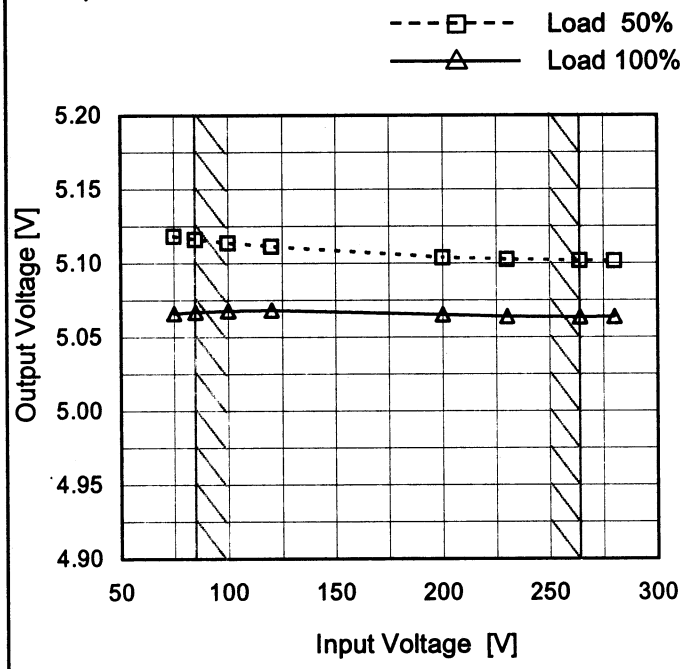
Model	PBW30F-5
Item	Line Regulation
Object	+5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

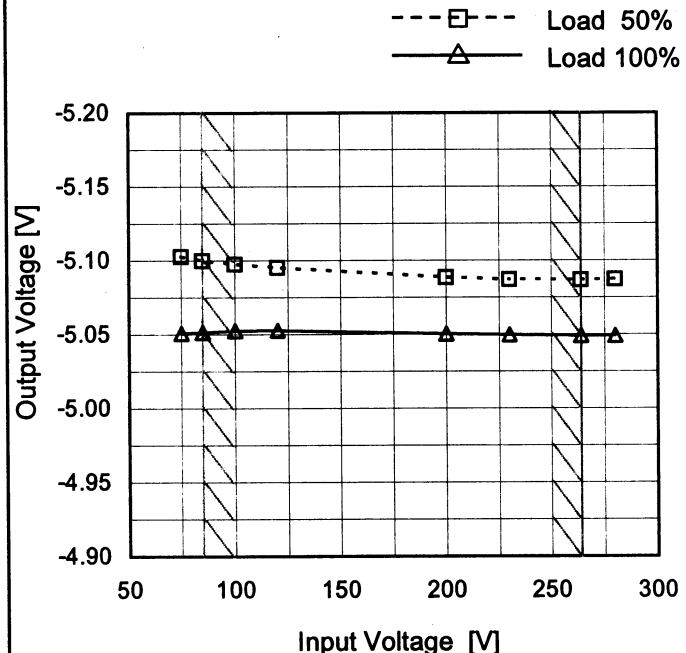


2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	5.118	5.066
85	5.116	5.067
100	5.114	5.068
120	5.112	5.068
200	5.104	5.065
230	5.103	5.064
264	5.102	5.064
280	5.102	5.064
--	-	-

Object	-5V1.5A

1.Graph



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

2.Values

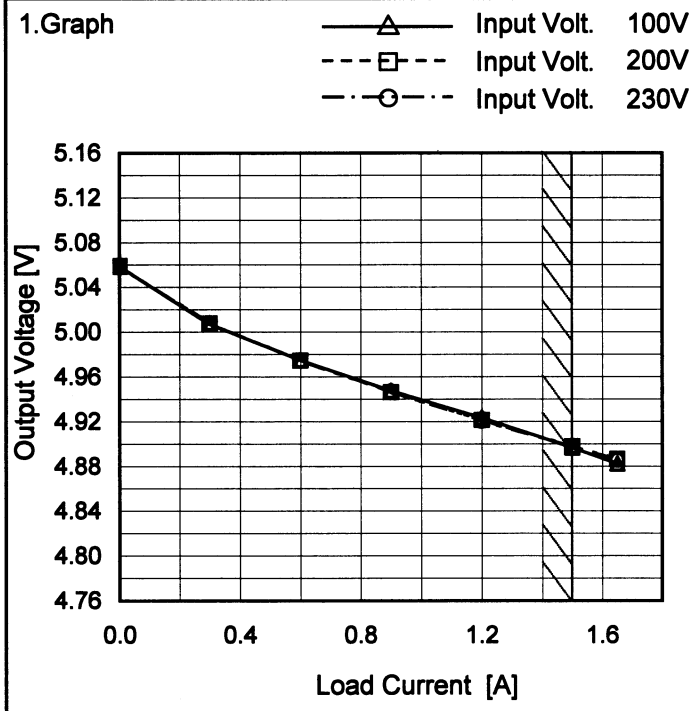
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	-5.103	-5.051
85	-5.100	-5.052
100	-5.098	-5.053
120	-5.095	-5.053
200	-5.089	-5.051
230	-5.087	-5.050
264	-5.087	-5.049
280	-5.087	-5.049
--	-	-

COSEL

Model	PBW30F-5
Item	Load Regulation
Object	+5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



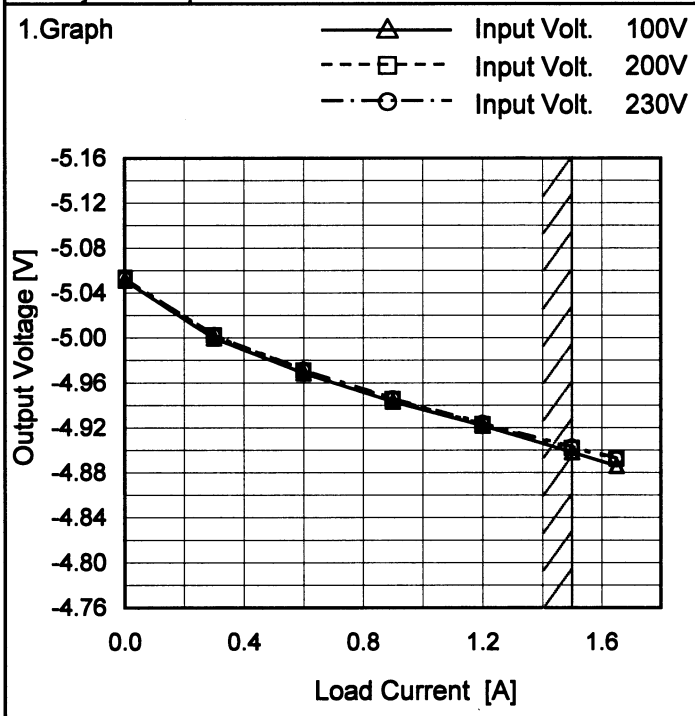
2.Values

Load Current [A]	Output Voltage [V] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	5.059	5.059	5.059
0.30	5.007	5.008	5.008
0.60	4.975	4.975	4.975
0.90	4.948	4.946	4.947
1.20	4.923	4.921	4.921
1.50	4.897	4.898	4.897
1.65	4.883	4.886	4.886
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

-5V: Rated output current 1

Object	-5V1.5A

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]
0.00	-5.052	-5.054	-5.054
0.30	-5.000	-5.002	-5.003
0.60	-4.969	-4.971	-4.972
0.90	-4.943	-4.946	-4.946
1.20	-4.922	-4.923	-4.924
1.50	-4.898	-4.902	-4.903
1.65	-4.886	-4.892	-4.893
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

+5V: Rated output current 1

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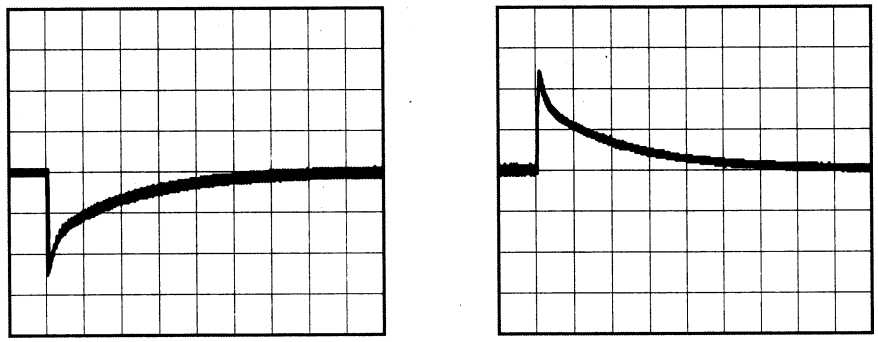
Model	PBW30F-5		
Item	Dynamic Load Response	Temperature	25℃
Object	+5V1.5A	Testing Circuitry	Figure A

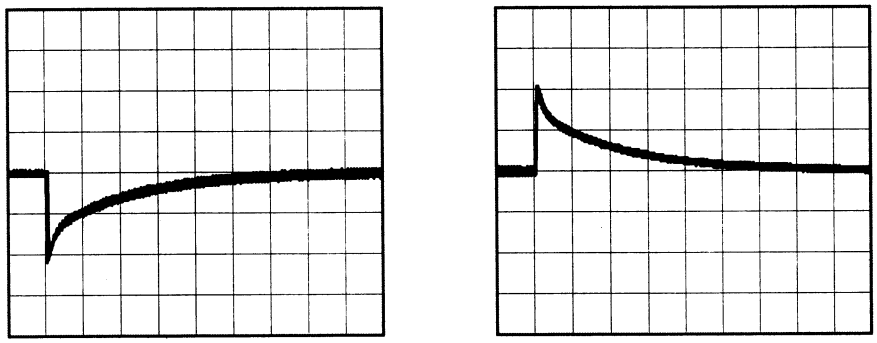
Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ⟷
Output current 2 (2A)
* -5V: 1A



Min. Load (0A) ⟷
Output current 1 (1.5A)
* -5V: 1.5A



* The characteristic of AC200V is equal.

COSEL

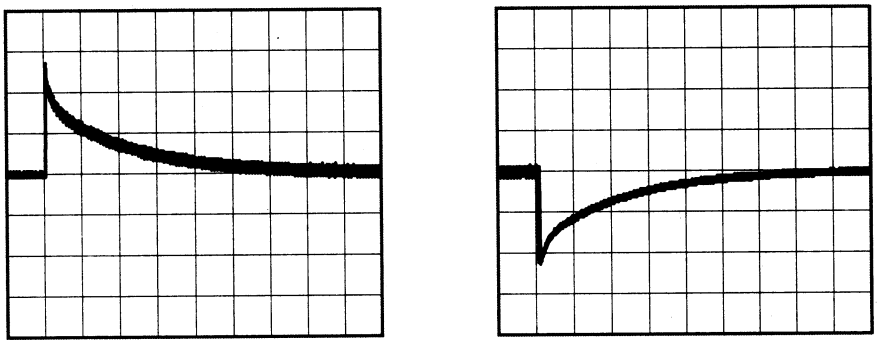
Model	PBW30F-5
Item	Dynamic Load Response
Object	-5V1.5A

Temperature 25℃
Testing Circuitry Figure A

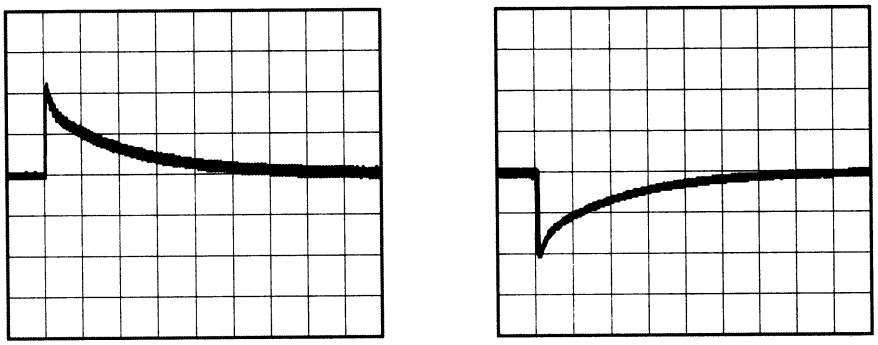
Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ⟷
Output current 2 (2A)
* +5V: 1A



Min. Load (0A) ⟷
Output current 1 (1.5A)
* +5V: 1.5A



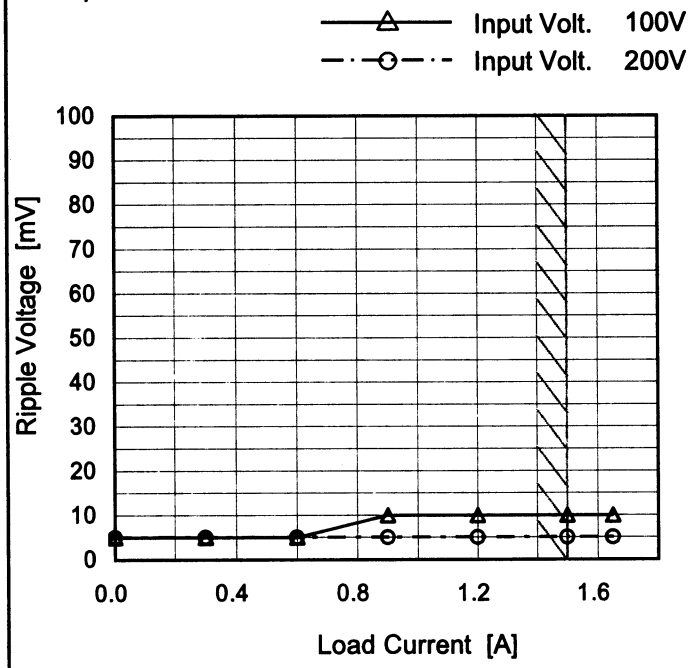
* The characteristic of AC200V is equal.

COSEL

Model	PBW30F-5
Item	Ripple Voltage (by Load Current)
Object	+5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.
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

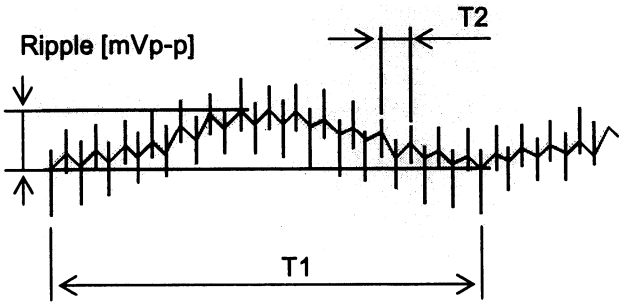


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
0.00	5	5
0.30	5	5
0.60	5	5
0.90	10	5
1.20	10	5
1.50	10	5
1.65	10	5
--	-	-
--	-	-
--	-	-
--	-	-

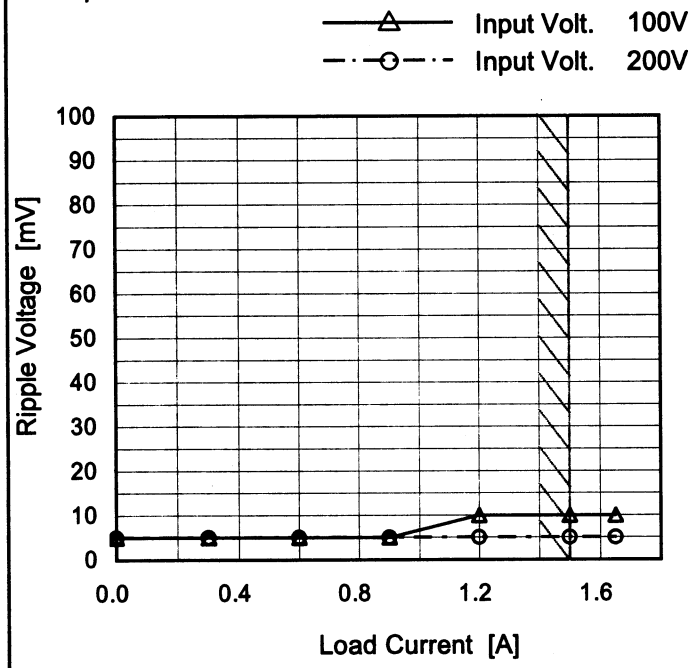
-5V: Rated output current 1

COSEL

Model	PBW30F-5
Item	Ripple Voltage (by Load Current)
Object	-5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.
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

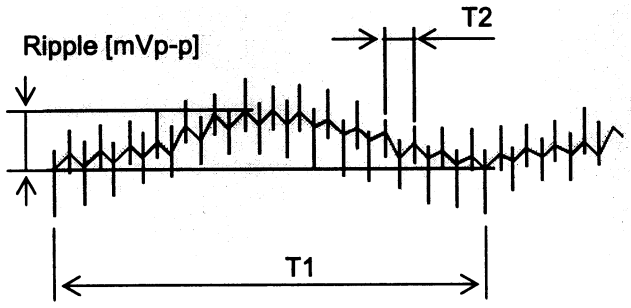


Fig. Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV] Input Volt. 100 [V]	Ripple Voltage [mV] Input Volt. 200 [V]
0.00	5	5
0.30	5	5
0.60	5	5
0.90	5	5
1.20	10	5
1.50	10	5
1.65	10	5
--	-	-
--	-	-
--	-	-
--	-	-

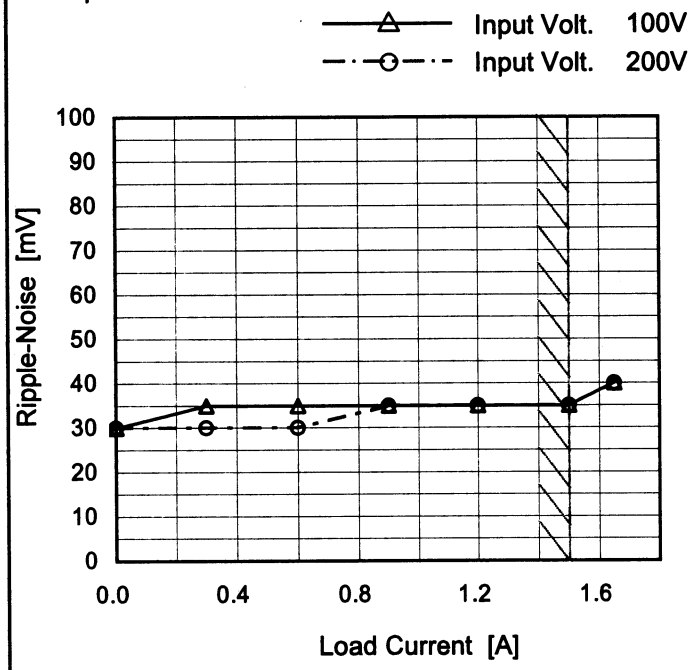
+5V: Rated output current 1

COSEL

Model	PBW30F-5
Item	Ripple-Noise
Object	+5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Measured by 20 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. 100 [V]	Input Volt. 200 [V]
0.00	30	30
0.30	35	30
0.60	35	30
0.90	35	35
1.20	35	35
1.50	35	35
1.65	40	40
--	-	-
--	-	-
--	-	-
--	-	-

-5V: Rated output current 1

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

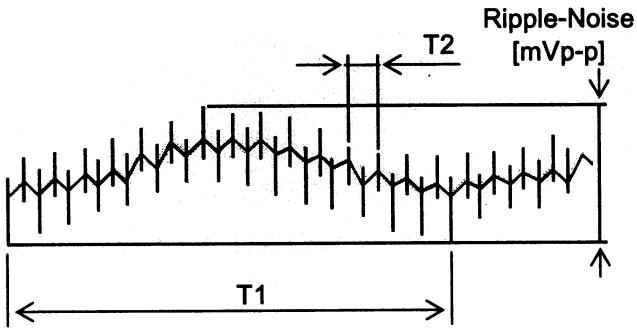


Fig. Complex Ripple Wave Form

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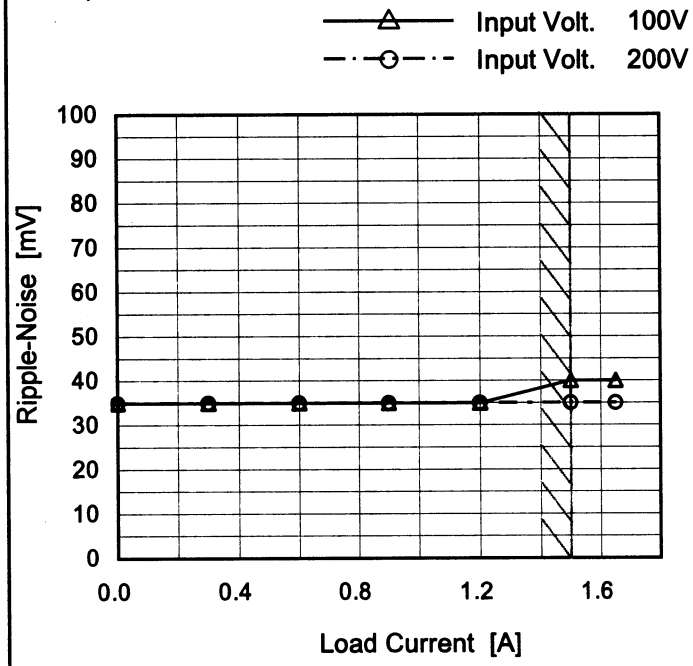
COSEL

Model	PBW30F-5
Item	Ripple-Noise
Object	-5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Measured by 20 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. 100 [V]	Ripple-Noise [mV] Input Volt. 200 [V]
0.00	35	35
0.30	35	35
0.60	35	35
0.90	35	35
1.20	35	35
1.50	40	35
1.65	40	35
--	-	-
--	-	-
--	-	-
--	-	-

+5V: Rated output current 1

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

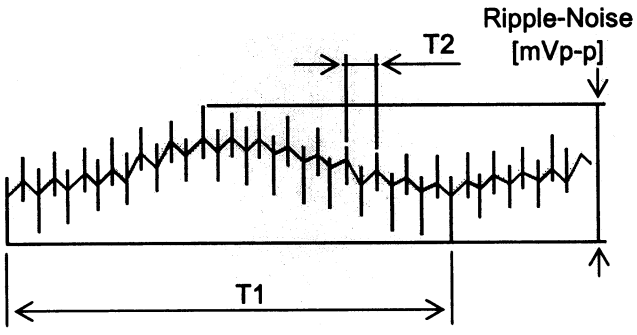


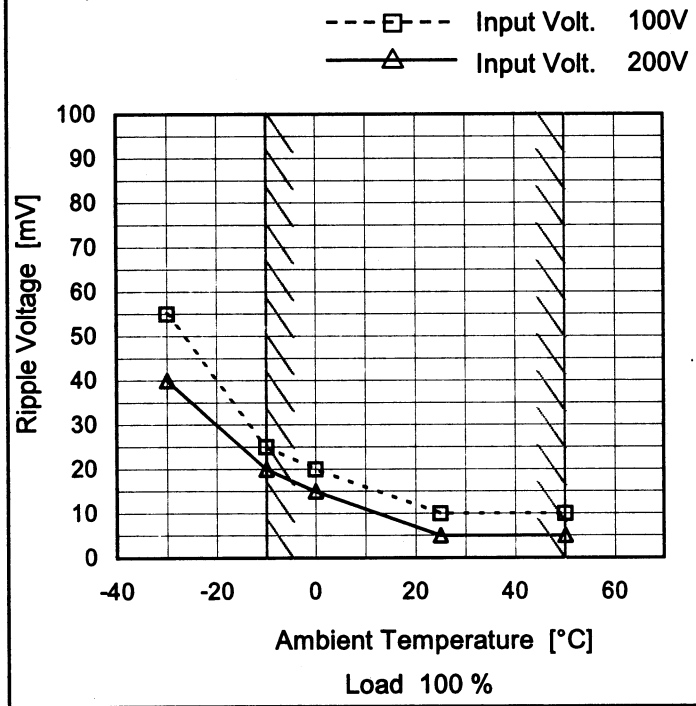
Fig. Complex Ripple Wave Form

COSEL

Model	PBW30F-5
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V1.5A

Testing Circuitry Figure A

1.Graph



Load 100 %

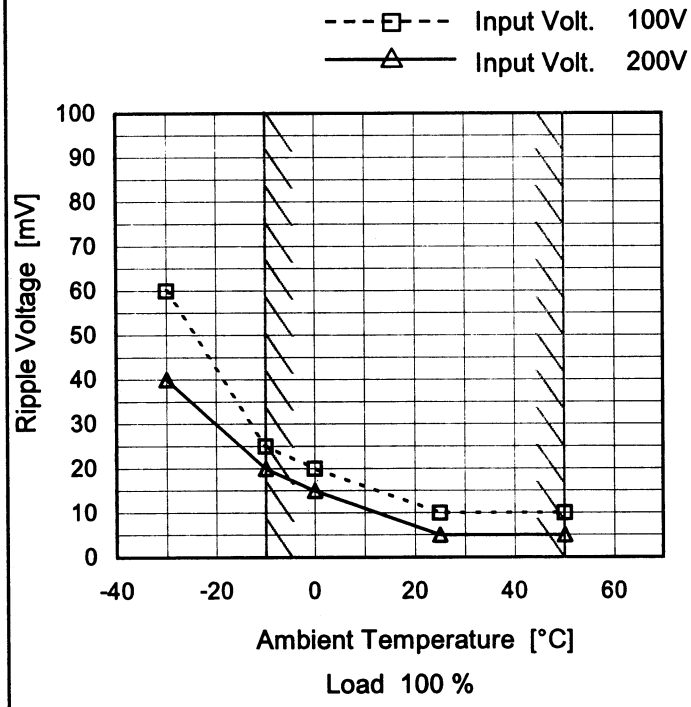
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 100 [V]	Input Volt. 200 [V]
-30	55	40
-10	25	20
0	20	15
25	10	5
50	10	5
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

-5V: Rated output current 1

Object	-5V1.5A

1.Graph



Load 100 %

Measured by 20 MHz Oscilloscope.

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]
-30	60	40
-10	25	20
0	20	15
25	10	5
50	10	5
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

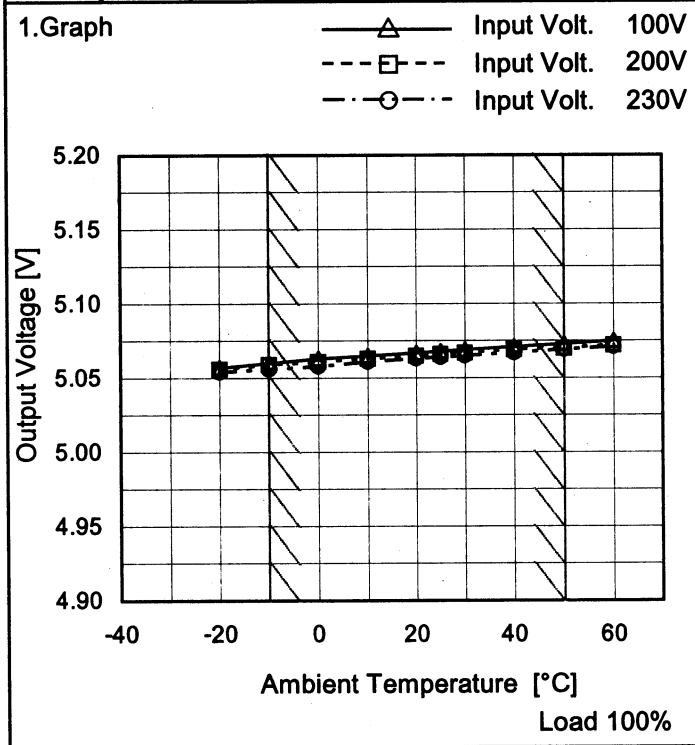
+5V: Rated output current 1

COSEL

Model	PBW30F-5
Item	Ambient Temperature Drift
Object	+5V1.5A

Testing Circuitry Figure A

1.Graph

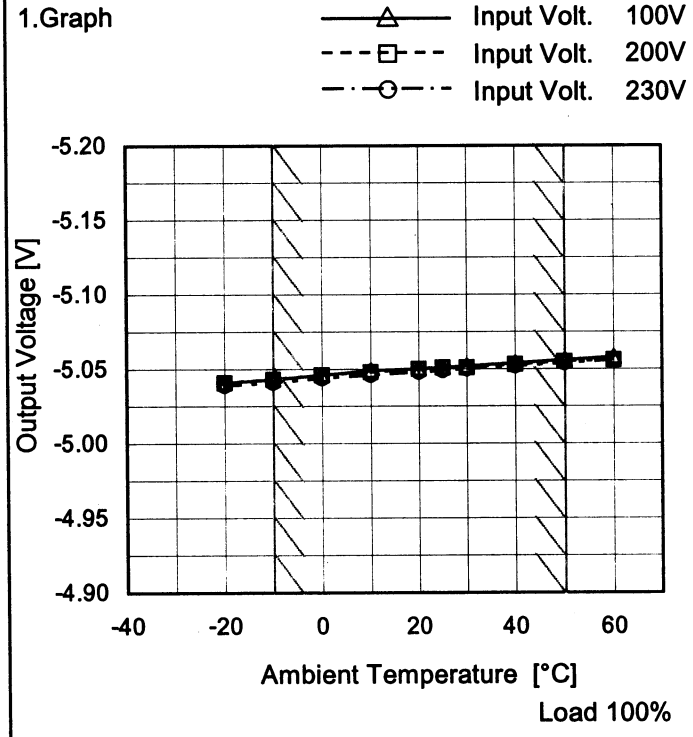


2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	5.057	5.056	5.054
-10	5.060	5.059	5.056
0	5.063	5.061	5.058
10	5.065	5.063	5.061
20	5.067	5.065	5.063
25	5.068	5.066	5.064
30	5.069	5.067	5.065
40	5.071	5.069	5.067
50	5.073	5.070	5.069
60	5.075	5.072	5.071
--	-	-	-

Object	-5V1.5A

1.Graph



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	-5.041	-5.041	-5.039
-10	-5.043	-5.043	-5.041
0	-5.046	-5.046	-5.044
10	-5.049	-5.048	-5.046
20	-5.050	-5.050	-5.048
25	-5.051	-5.051	-5.049
30	-5.052	-5.051	-5.050
40	-5.054	-5.053	-5.052
50	-5.056	-5.055	-5.054
60	-5.058	-5.056	-5.056
--	-	-	-

COSEL

Model	PBW30F-5	
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 : -10 - 50°C
Input Voltage : 85 - 264V
Load Current (AVR 1) : 0 - 1.5A (AVR 2) : 0 - 1.5A

* 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	+5V1.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	85	0	5.235	±90	±1.8
Minimum Voltage	-10	264	1.5	5.056		

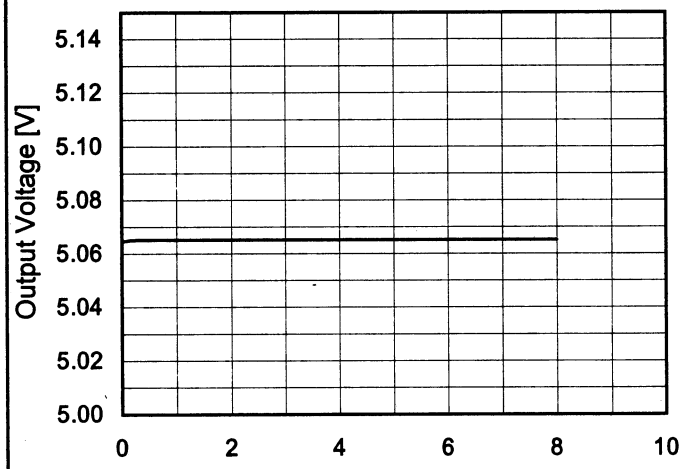
Object	-5V1.5A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	85	0	-5.232	±96	±1.9
Minimum Voltage	-10	264	1.5	-5.041		

COSEL

Model	PBW30F-5
Item	Time Lapse Drift
Object	+5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



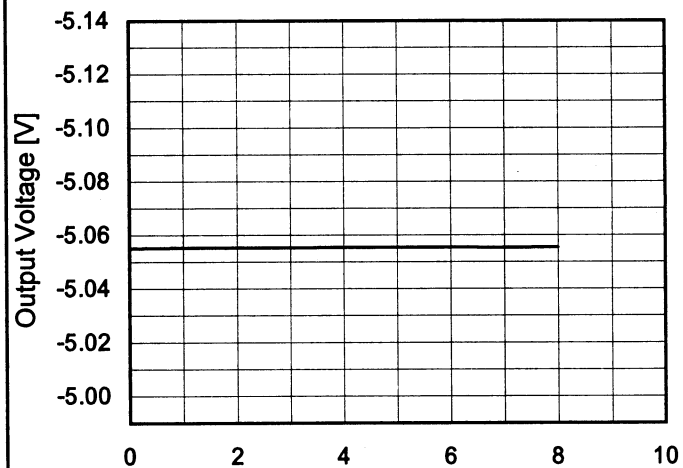
Input Volt. 100V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	5.064
0.5	5.065
1.0	5.065
2.0	5.065
3.0	5.065
4.0	5.065
5.0	5.065
6.0	5.065
7.0	5.065
8.0	5.065

Object	-5V1.5A

1.Graph



Input Volt. 100V
Load 100%

2.Values

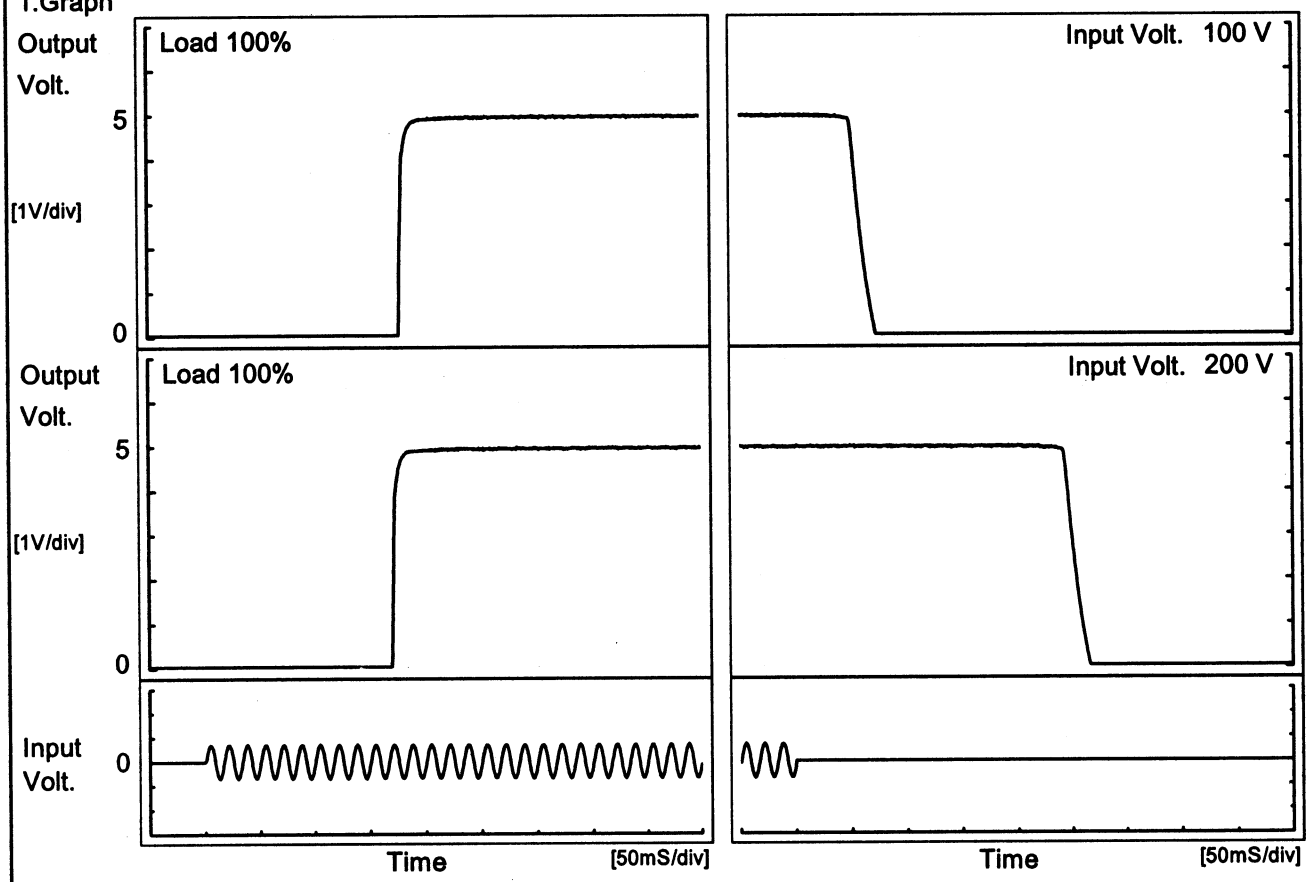
Time since start [H]	Output Voltage [V]
0.0	-5.055
0.5	-5.055
1.0	-5.055
2.0	-5.055
3.0	-5.055
4.0	-5.056
5.0	-5.056
6.0	-5.056
7.0	-5.055
8.0	-5.056

* The characteristic of AC200V is equal.

COSEL

Model	PBW30F-5	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+5V1.5A	

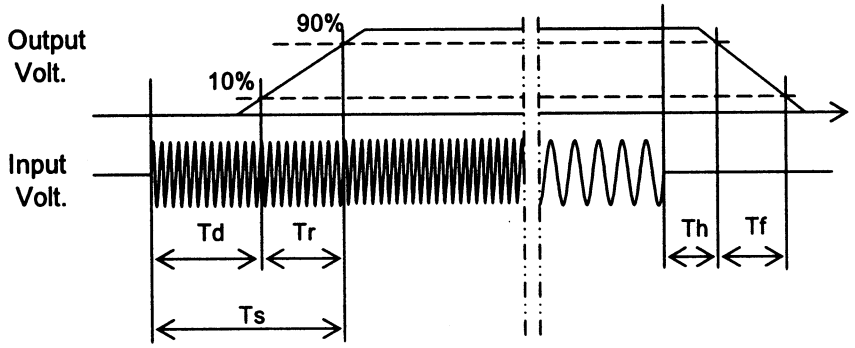
1.Graph



2.Values

[mS]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	177.0	6.5	183.5	50.3	18.5
200 V	170.5	6.0	176.5	243.8	19.0

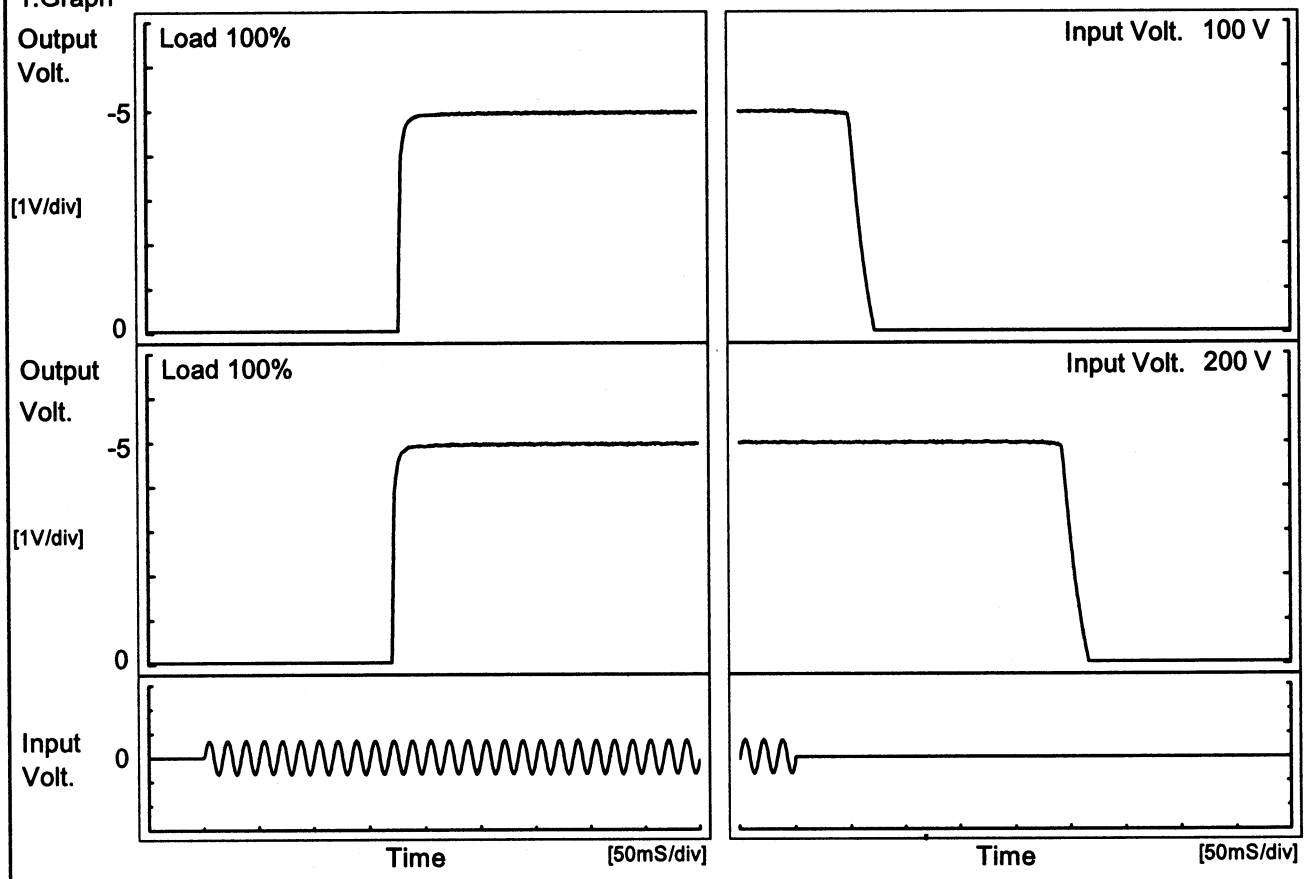


BC-10016

COSEL

Model	PBW30F-5	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	-5V1.5A	

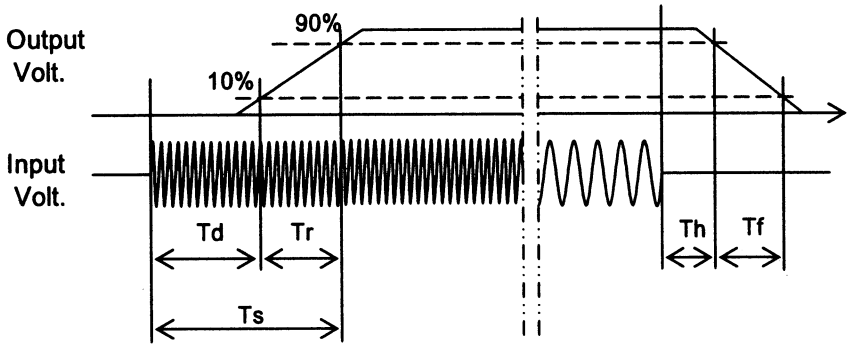
1.Graph



2.Values

[mS]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	177.3	6.5	183.8	50.3	18.8
200 V	170.3	6.5	176.8	243.8	19.0



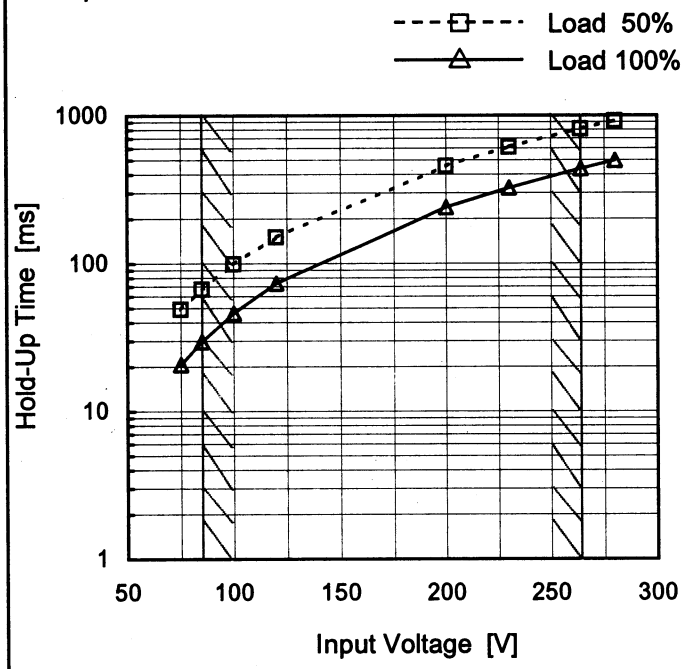
BC-10016

COSEL

Model	PBW30F-5
Item	Hold-Up Time
Object	+5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.
Note: Slanted line shows the range of the rated input voltage.

2.Values

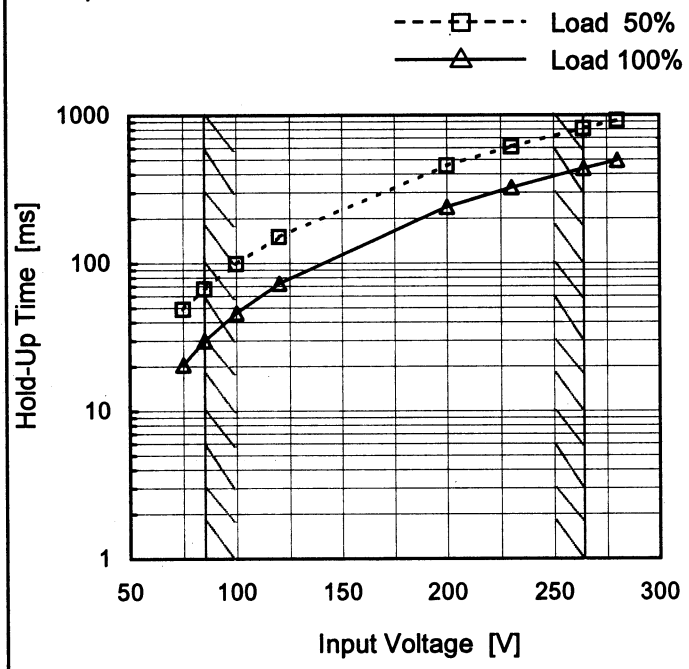
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	49	21
85	67	30
100	100	46
120	151	73
200	457	239
230	612	324
264	813	437
280	920	496
--	-	-

COSEL

Model	PBW30F-5
Item	Hold-Up Time
Object	-5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.
Note: Slanted line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	49	21
85	67	30
100	100	46
120	151	73
200	457	239
230	612	325
264	813	436
280	920	495
--	-	-

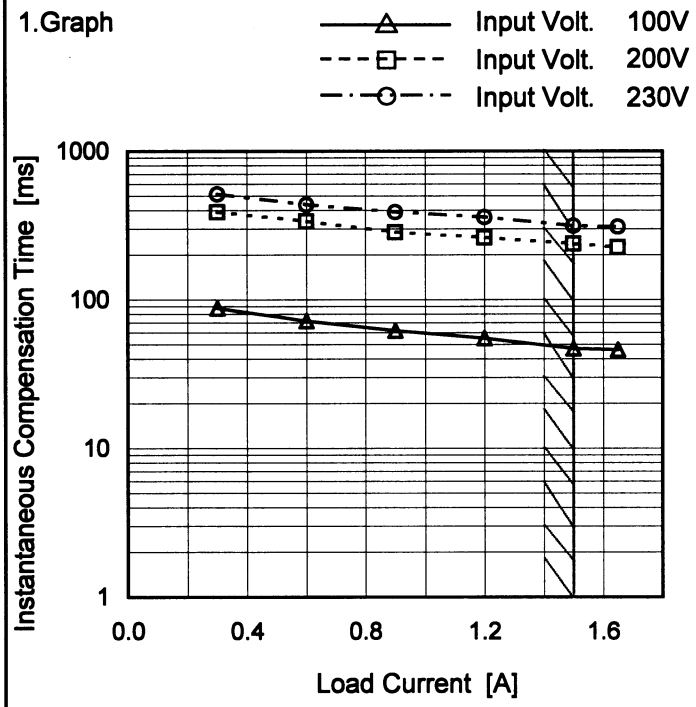
BC-10016

COSEL

Model	PBW30F-5
Item	Instantaneous Interruption Compensation
Object	+5V1.5A

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]	Time [ms] Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.30	88	389	514
0.60	72	338	436
0.90	62	285	389
1.20	55	262	360
1.50	47	238	314
1.65	46	226	310
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

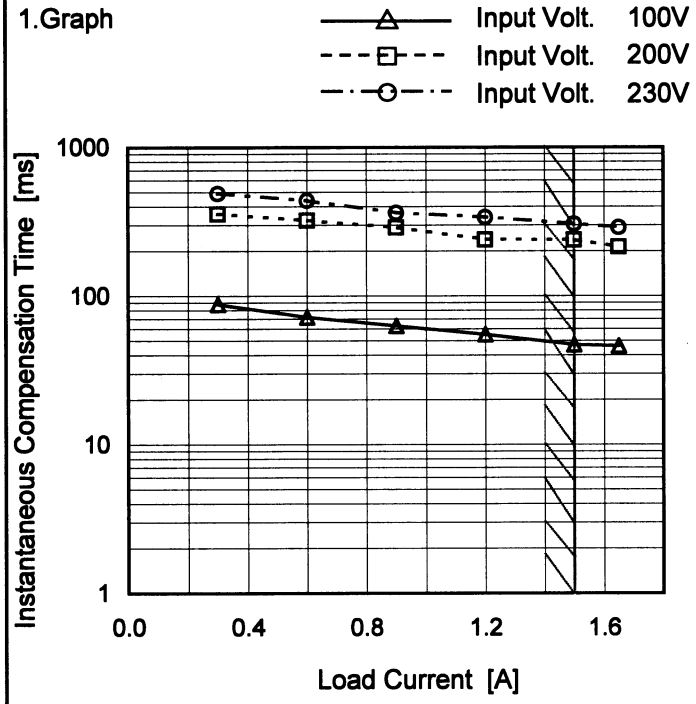
-5V: Rated output current 1

COSEL

Model	PBW30F-5
Item	Instantaneous Interruption Compensation
Object	-5V1.5A

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]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.00	-	-	-
0.30	88	356	490
0.60	72	322	439
0.90	63	289	364
1.20	55	239	339
1.50	47	238	306
1.65	46	214	289
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

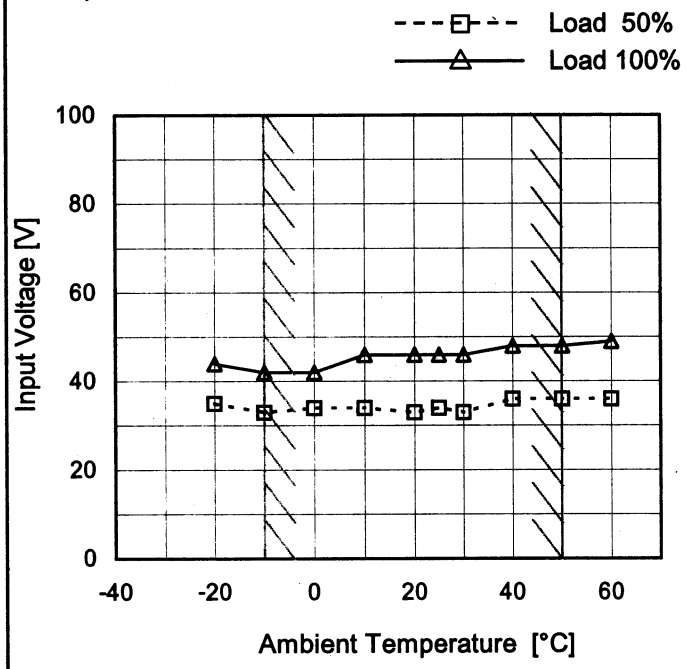
+5V: Rated output current 1

COSEL

Model	PBW30F-5
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V1.5A

Testing Circuitry Figure A

1.Graph

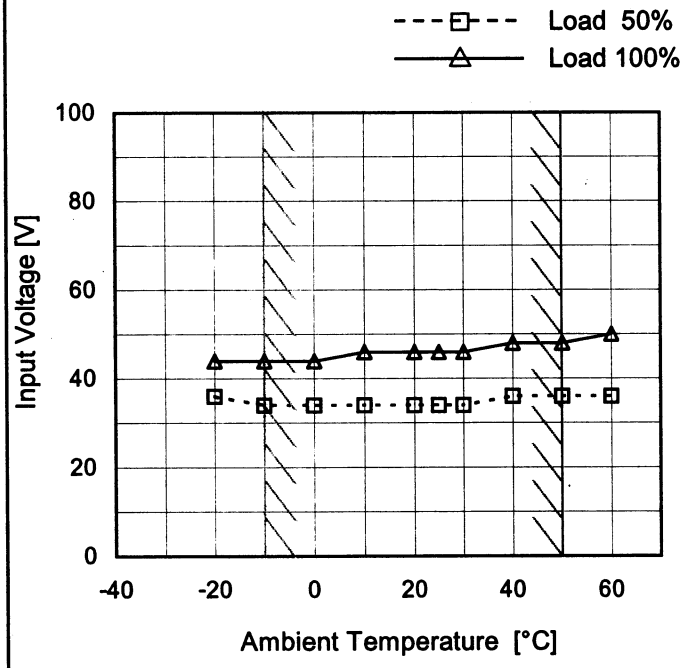


2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	35	44
-10	33	42
0	34	42
10	34	46
20	33	46
25	34	46
30	33	46
40	36	48
50	36	48
60	36	49
--	-	-

Object	-5V1.5A

1.Graph



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

2.Values

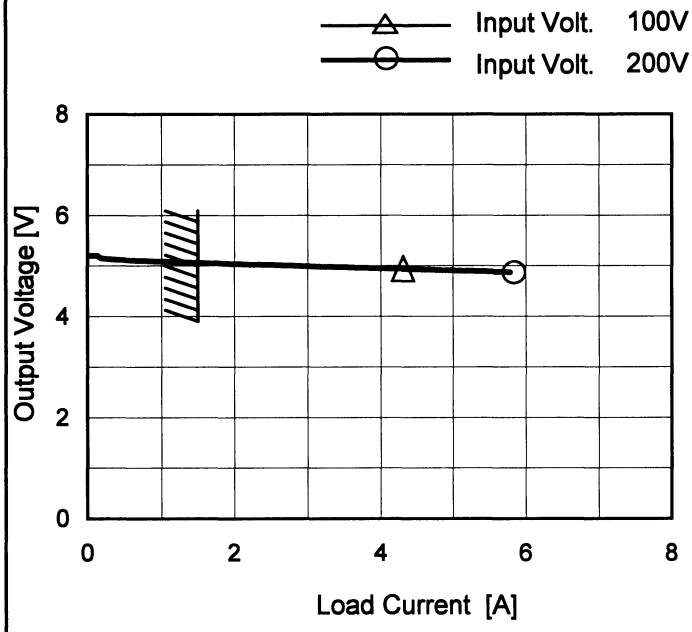
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	36	44
-10	34	44
0	34	44
10	34	46
20	34	46
25	34	46
30	34	46
40	36	48
50	36	48
60	36	50
--	-	-

COSEL

Model	PBW30F-5
Item	Overcurrent Protection
Object	+5V1.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Intermittent operation occurs when the output voltage is less than rated output voltage.

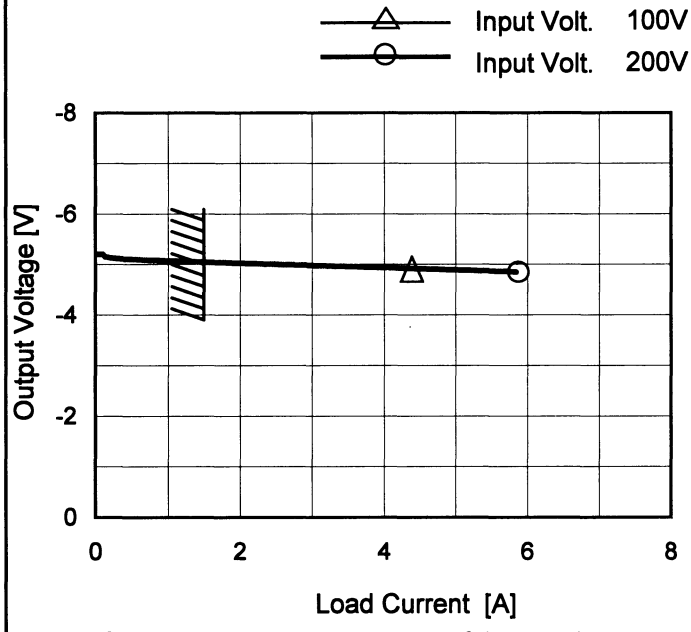
2.Values

Output Voltage [V]	Load Current [A] Input Volt. 100[V]	Load Current [A] Input Volt. 200[V]
5	4.42	5.83
4.75	-	-
4.50	-	-
4.00	-	-
3.50	-	-
3.00	-	-
2.50	-	-
2.00	-	-
1.50	-	-
1.00	-	-
0.50	-	-
0.00	-	-

-5V:Rated output current 1

Object	-5V1.5A

1.Graph



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

Intermittent operation occurs when the output voltage is less than rated output voltage.

2.Values

Output Voltage [V]	Load Current [A] Input Volt. 100[V]	Load Current [A] Input Volt. 200[V]
-5	4.41	5.84
-4.75	-	-
-4.50	-	-
-4.00	-	-
-3.50	-	-
-3.00	-	-
-2.50	-	-
-2.00	-	-
-1.50	-	-
-1.00	-	-
-0.50	-	-
0.00	-	-

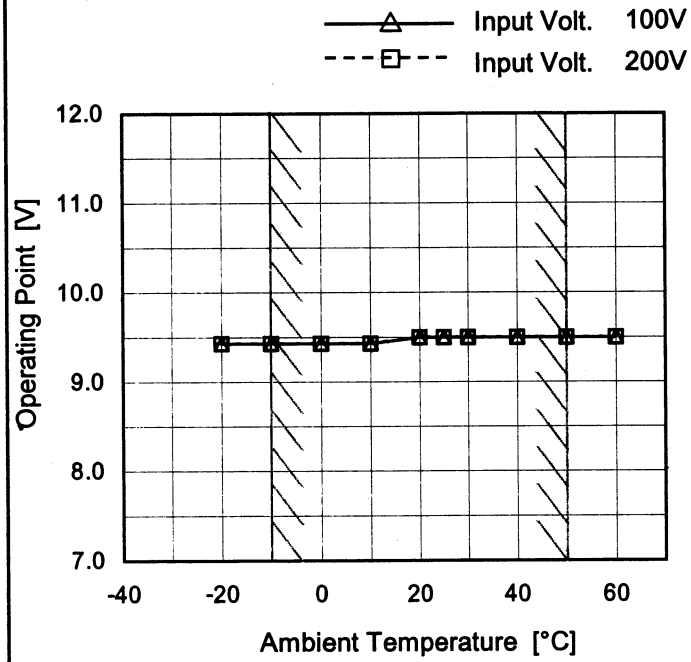
+5V:Rated output current 1

COSEL

Model	PBW30F-5
Item	Overvoltage Protection
Object	+5V1.5A

Testing Circuitry Figure A

1.Graph



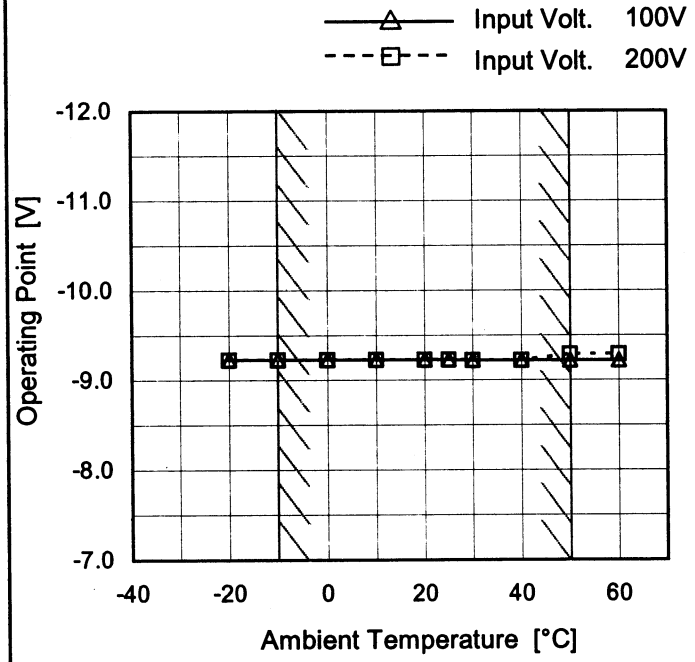
Load 0%

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 200[V]
-20	9.43	9.43
-10	9.43	9.43
0	9.43	9.43
10	9.43	9.43
20	9.50	9.50
25	9.50	9.50
30	9.50	9.50
40	9.50	9.50
50	9.50	9.50
60	9.50	9.50
--	-	-

Object	-5V1.5A

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	-9.23	-9.23
-10	-9.23	-9.23
0	-9.23	-9.23
10	-9.23	-9.23
20	-9.23	-9.23
25	-9.23	-9.23
30	-9.22	-9.22
40	-9.22	-9.22
50	-9.22	-9.29
60	-9.22	-9.29
--	-	-

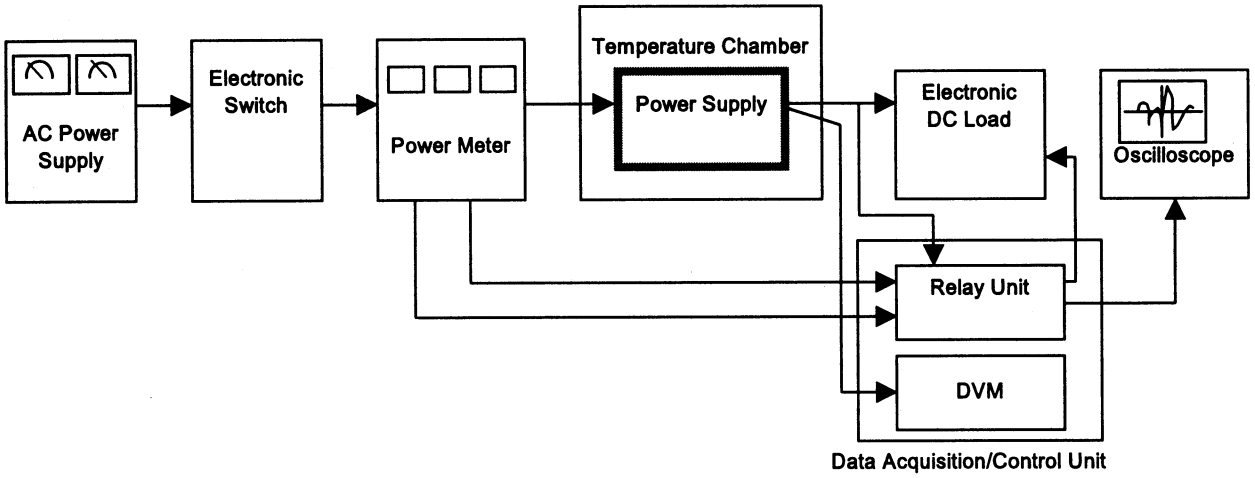


Figure A

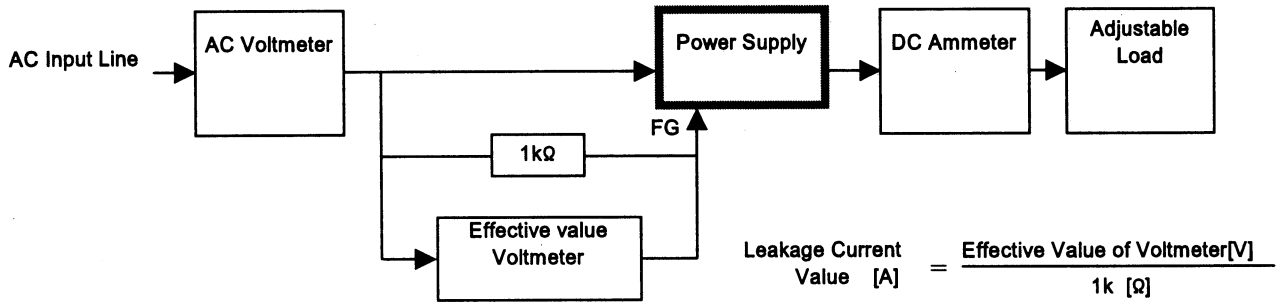


Figure B (DEN-AN)

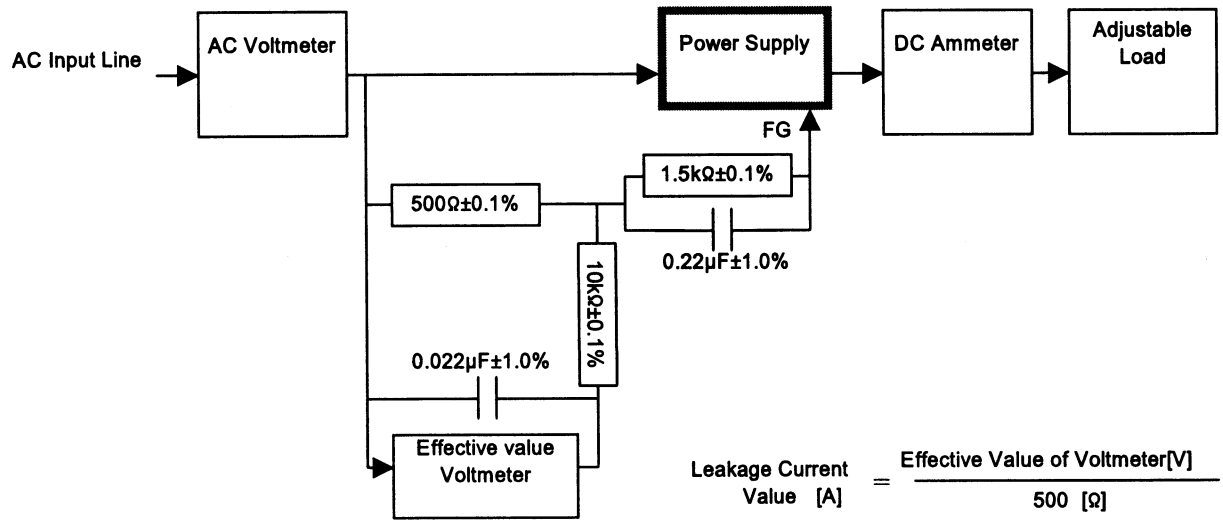


Figure B (IEC60950)