Reference

TEST DATA OF WDA60F-24

Regulated DC Power Supply
August 17, 2022

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Object	+24V2.5A

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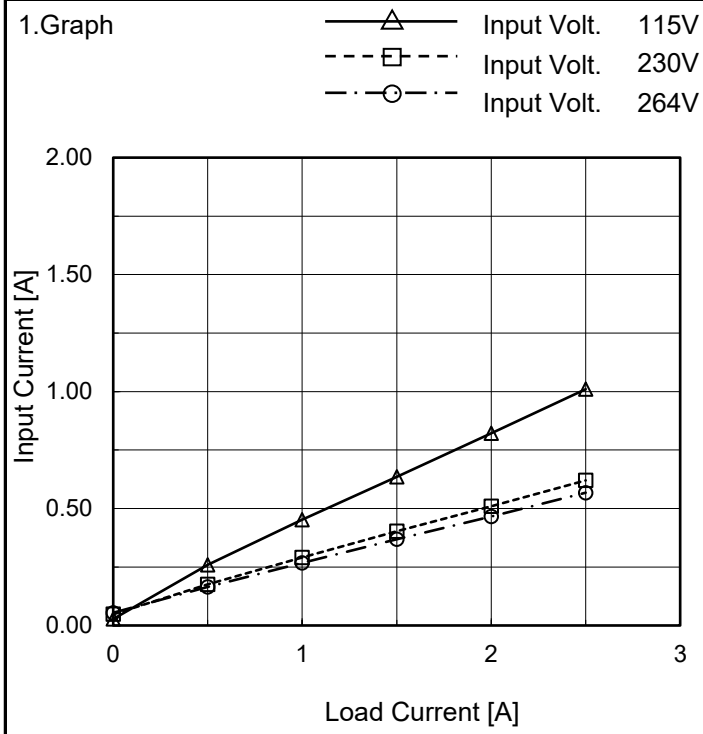


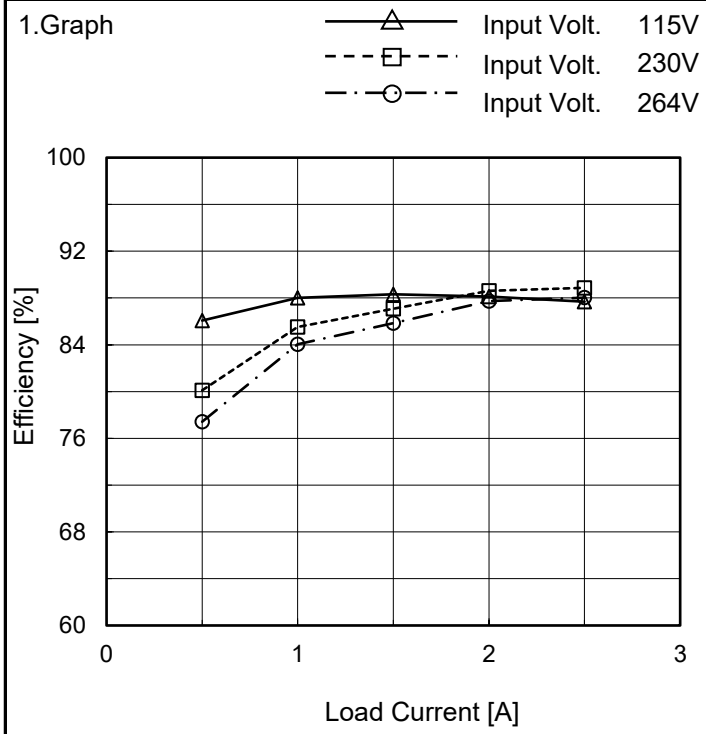
2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.0	0.028	0.048	0.054
0.5	0.260	0.176	0.165
1.0	0.453	0.291	0.267
1.5	0.635	0.403	0.369
2.0	0.822	0.510	0.466
2.5	1.010	0.620	0.568
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	WDA60F-24
Item	Efficiency (by Load Current)
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



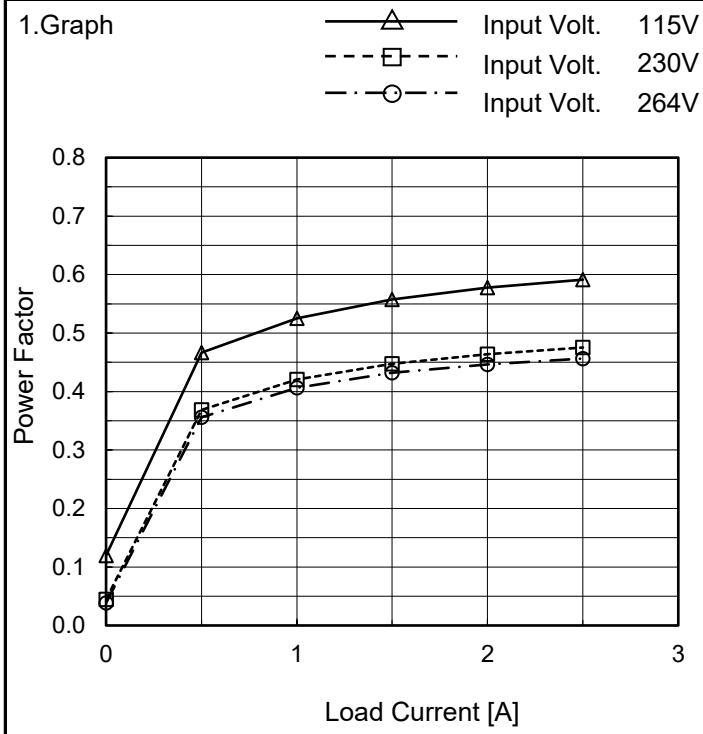
2.Values

Load Current [A]	Efficiency [%] Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.0	-	-	-
0.5	86.1	80.1	77.4
1.0	88.0	85.5	84.0
1.5	88.3	87.1	85.8
2.0	88.1	88.6	87.7
2.5	87.7	88.9	88.0
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	WDA60F-24
Item	Power Factor (by Load Current)
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Current [A]	Power Factor Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.0	0.120	0.045	0.038
0.5	0.466	0.369	0.356
1.0	0.525	0.420	0.407
1.5	0.557	0.447	0.432
2.0	0.578	0.464	0.446
2.5	0.591	0.475	0.456
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
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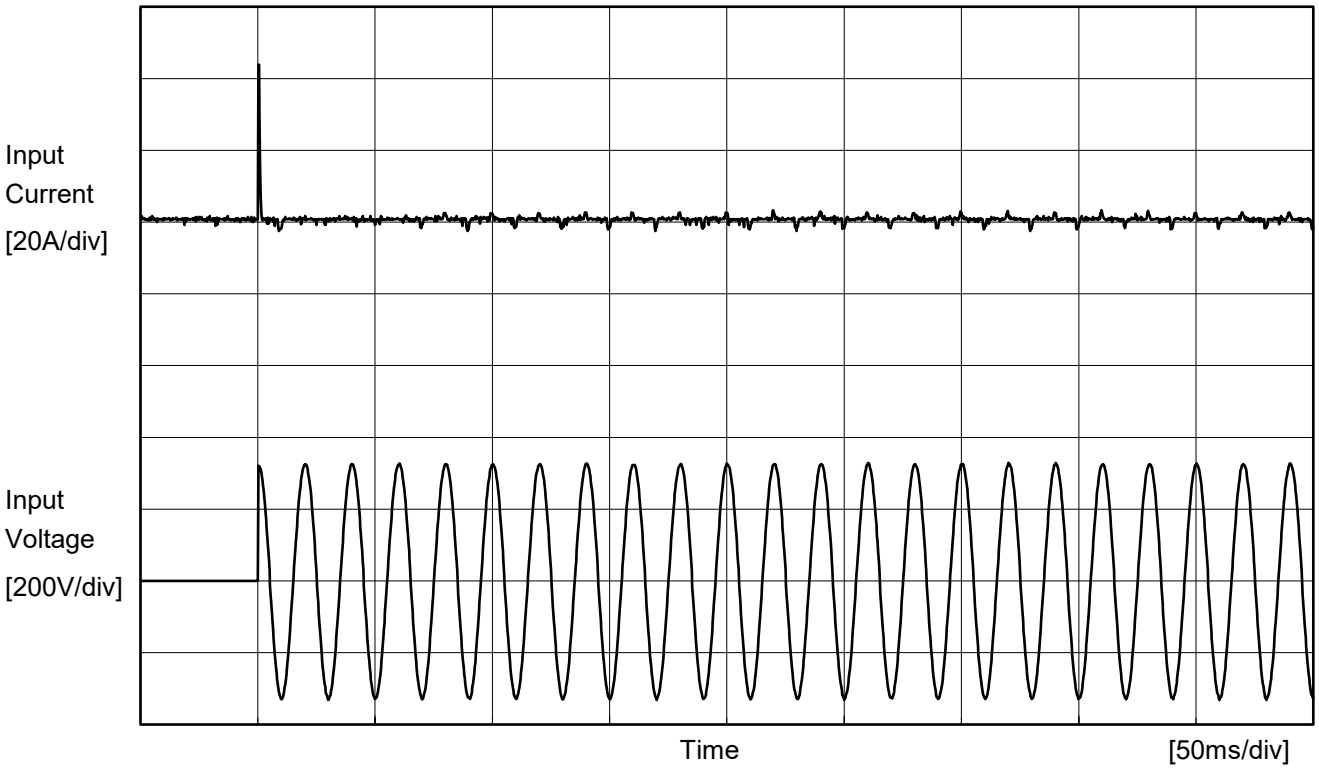
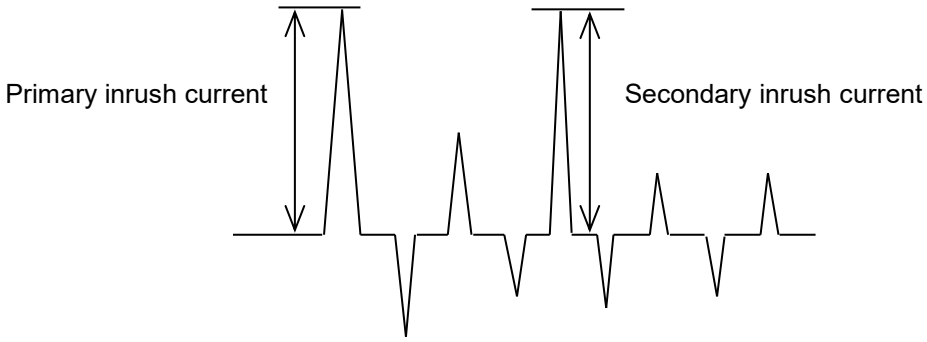
Model	WDA60F-24
Item	Inrush Current
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A



Input Voltage	230 V
Frequency	50 Hz
Load	100 %
Primary inrush current	43.4 A
Secondary inrush current	0.0 A



Model	WDA60F-24
Item	Leakage Current
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure C

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			115 [V]	240 [V]	264 [V]	
DEN-AN	Figure C-1	Both phases	0.14	0.32	0.35	Operation
		One of phases	0.26	0.58	0.64	Stand by
IEC62368-1	Figure C-2	Both phases	0.14	0.30	0.33	Operation
		One of phases	0.25	0.58	0.60	Stand by
	Figure C-3	Both phases	0.13	0.29	0.33	Operation
		One of phases	0.24	0.54	0.60	Stand by

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

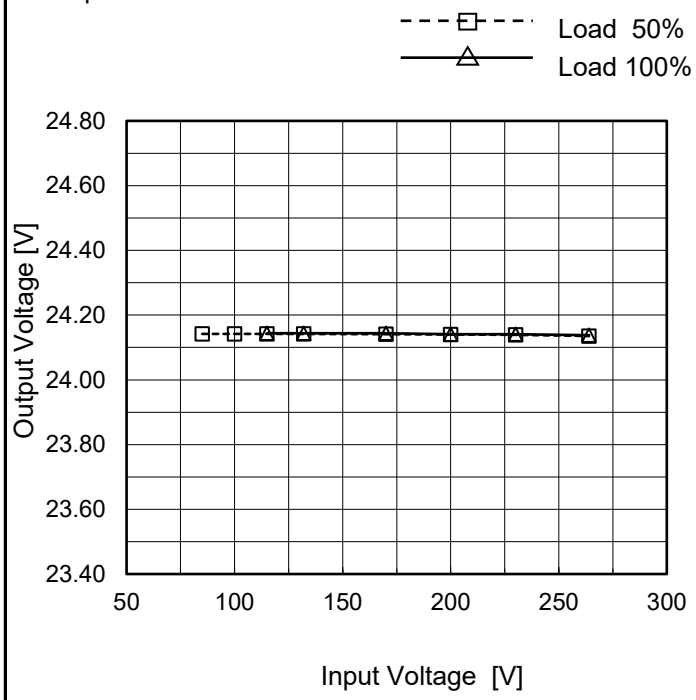
2.Condition

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

Model	WDA60F-24
Item	Line Regulation
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



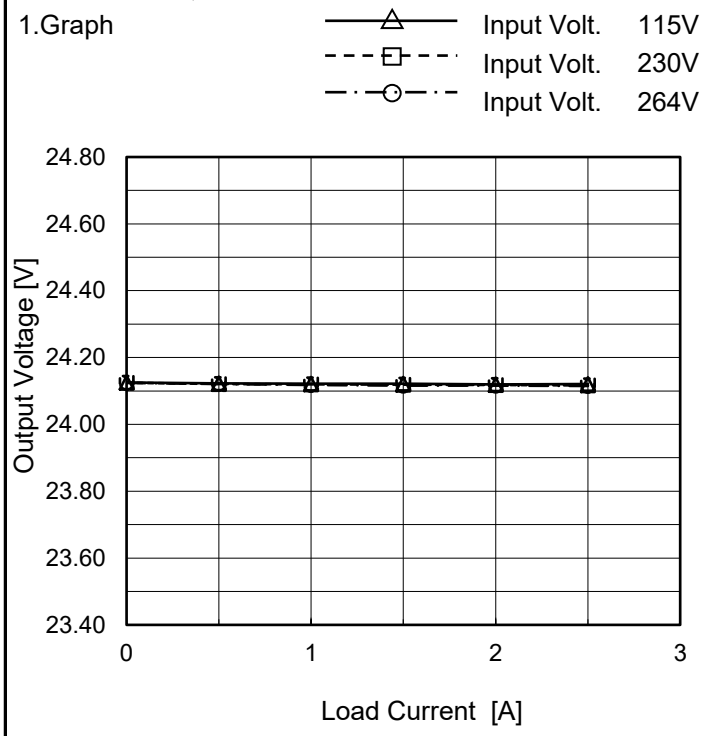
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	24.142	-
100	24.142	-
115	24.142	24.144
132	24.142	24.144
170	24.141	24.144
200	24.140	24.141
230	24.139	24.141
264	24.135	24.138
--	-	-

Model	WDA60F-24
Item	Load Regulation
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.0	24.125	24.125	24.124
0.5	24.123	24.121	24.120
1.0	24.122	24.120	24.118
1.5	24.121	24.119	24.116
2.0	24.120	24.118	24.116
2.5	24.121	24.117	24.115
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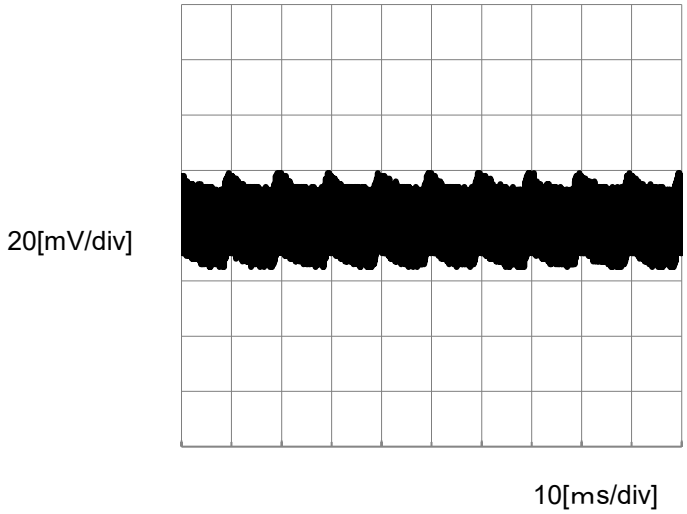
Item	Ripple-Noise
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

Input Voltage 230V
Load 100%



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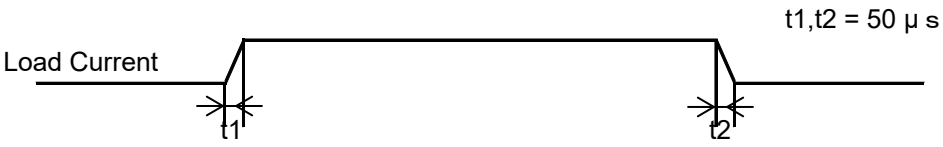
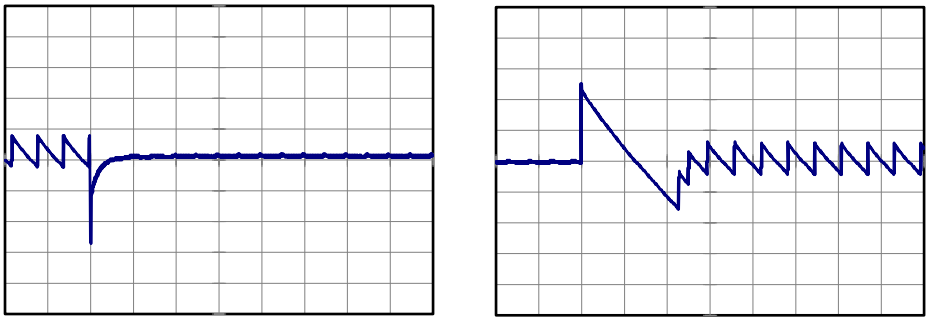
Model	WDA60F-24		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+24V2.5A		

Input Volt. 230 V

Cycle 1000 ms



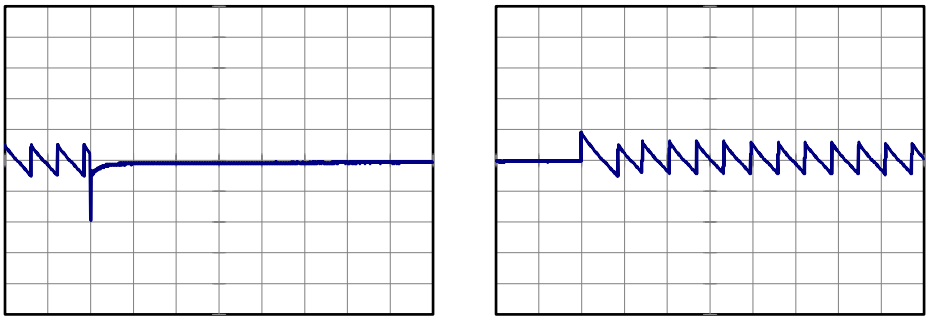
Min.Load (0A)←→
Load 100% (2.5A)



100 mV/div

20 ms/div 20 ms/div

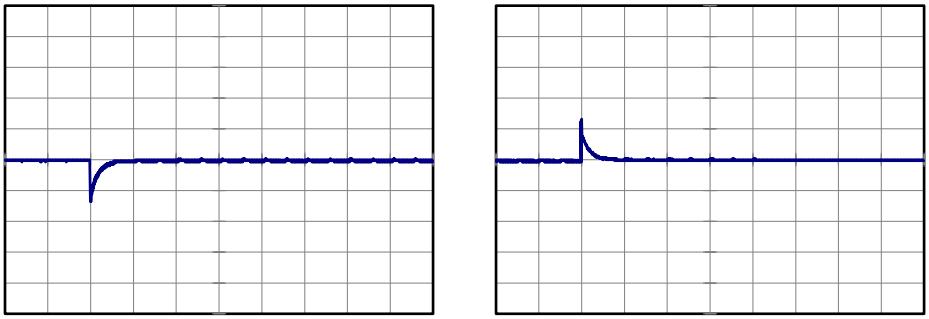
Min.Load (0A)←→
Load 50% (1.25A)



100 mV/div

20 ms/div 20 ms/div

Load 50% (1.25A)←→
Load 100% (2.5A)



100 mV/div

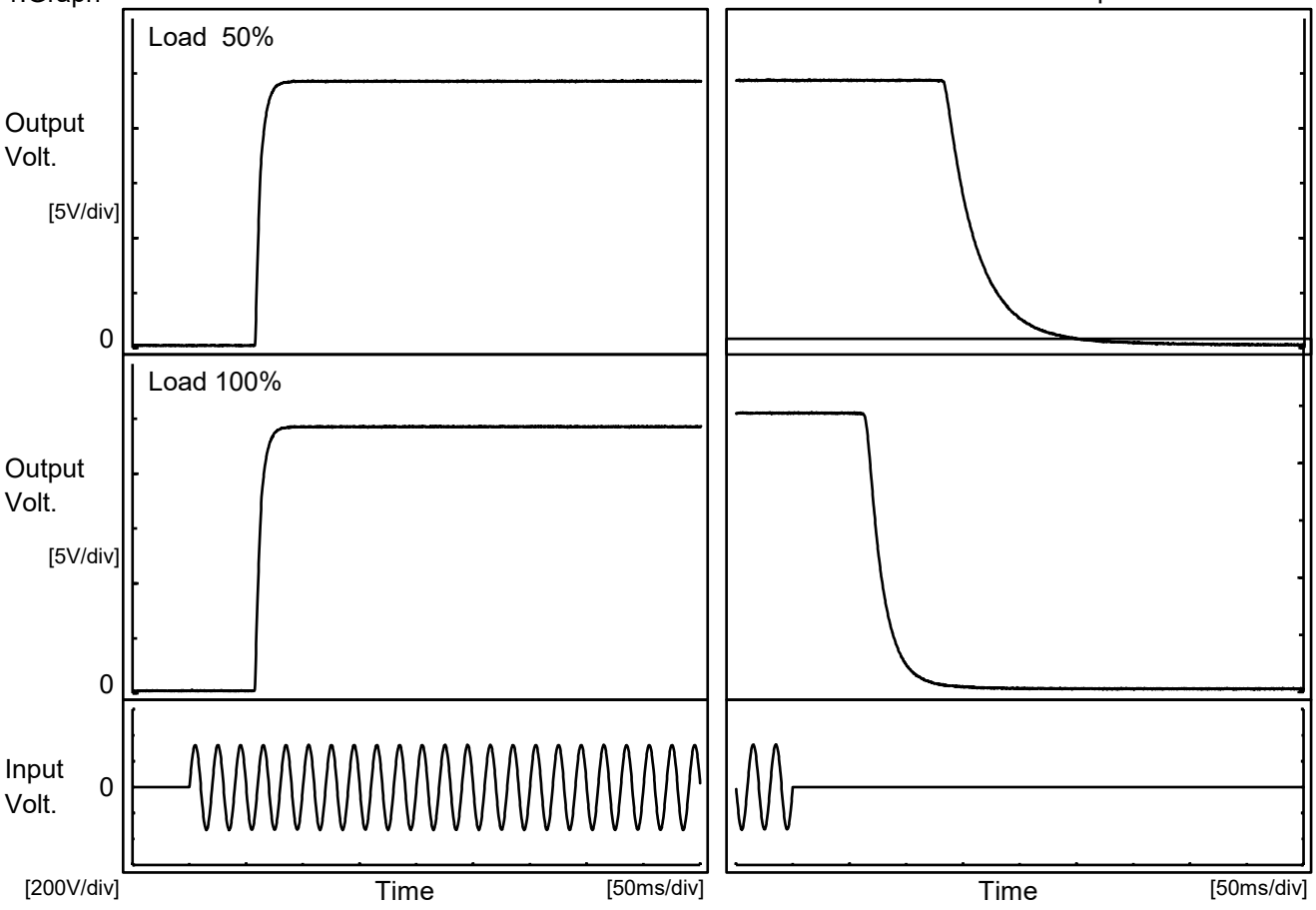
20 ms/div 20 ms/div

Model	WDA60F-24
Item	Rise and Fall Time
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

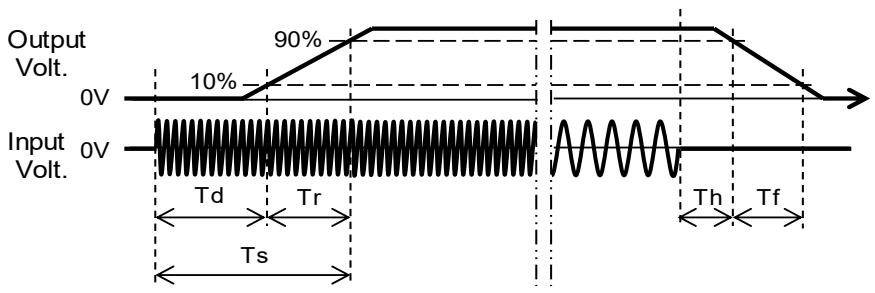
Input Volt. 230 V



2.Values

[ms]

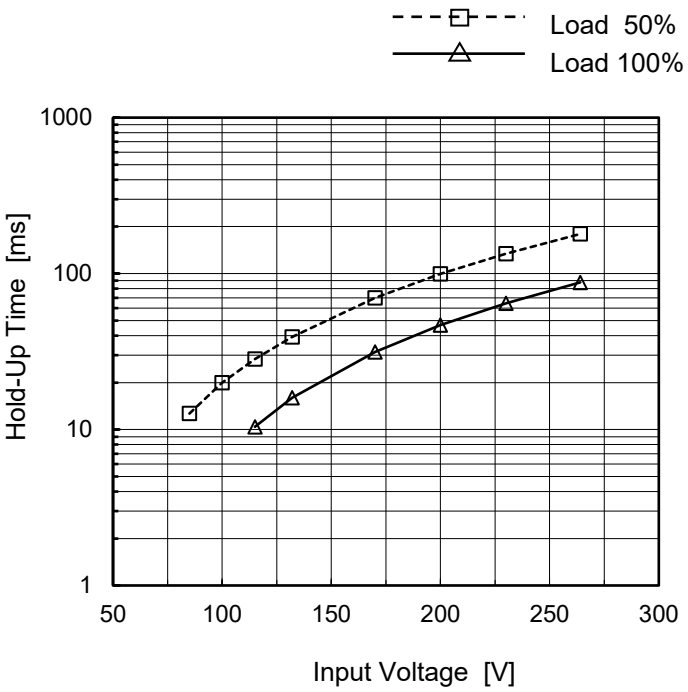
Load \ Time	Td	Tr	Ts	Th	Tf
50 %	58.8	9.8	68.6	137.0	63.8
100 %	58.5	9.8	68.3	66.5	32.3



Model	WDA60F-24
Item	Hold-Up Time
Object	+24V2.5A

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.

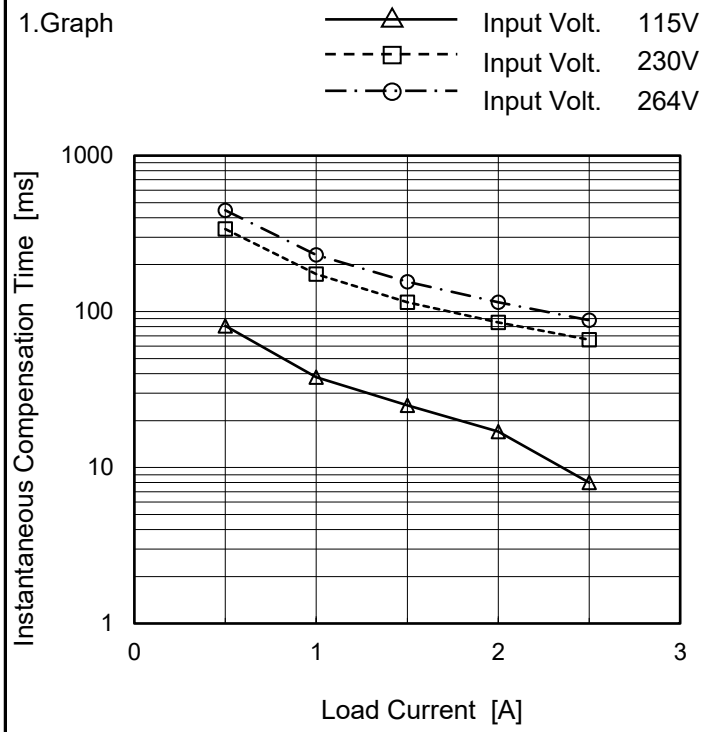
2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	13	-
100	20	-
115	28	10
132	39	16
170	70	31
200	100	47
230	134	64
264	180	88
--	-	-

Model	WDA60F-24
Item	Instantaneous Interruption Compensation
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



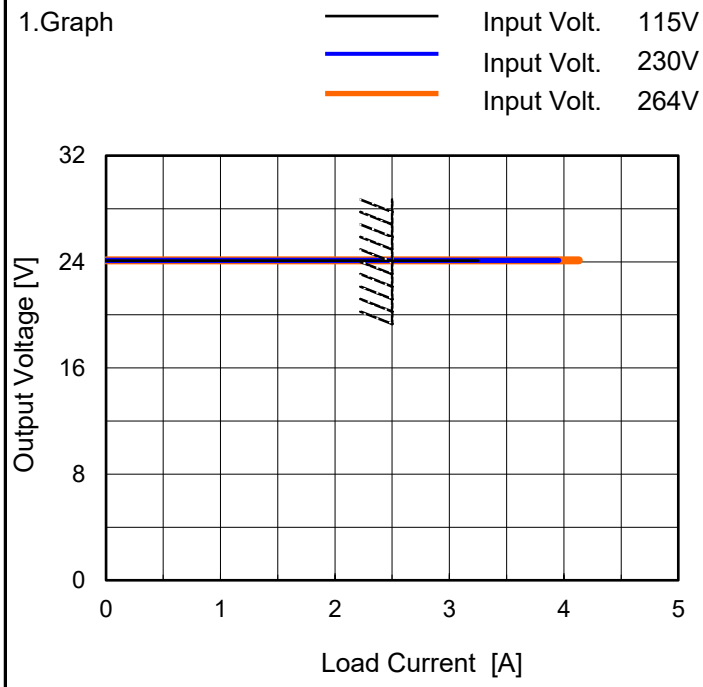
2.Values

Load Current [A]	Time [ms] Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.0	-	-	-
0.5	81	338	446
1.0	38	174	231
1.5	25	115	155
2.0	17	85	115
2.5	8	66	88
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	WDA60F-24
Item	Overcurrent Protection
Object	+24V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
24	3.25	3.96	4.13
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model	WDA60F-24
Item	Ambient Temperature Drift
Object	+24V2.5A

Testing Circuitry Figure A

1.Values

Load 100%

Ambient Temperature[℃]	Output Voltage [V]		
	Input Volt. 115V	Input Volt. 230V	Input Volt. 264V
-20	24.059	24.060	24.058
25	24.113	24.109	24.106
50	24.128	24.127	24.124

Item	Minimum Input Voltage for Regulated Output Voltage
Object	+24V2.5A

Testing Circuitry Figure A

1.Values

Ambient Temperature[℃]	Input Voltage [V]	
	Load 50%	Load 100%
-20	44	79
25	44	78
50	44	78

Item	Overvoltage Protection
Object	+24V2.5A

Testing Circuitry Figure A

1.Values

Load 0%

Ambient Temperature[℃]	Operating Point [V]	
	Input Volt. 115V	Input Volt. 264V
-20	30.73	30.66
25	31.83	31.83
50	30.73	32.42

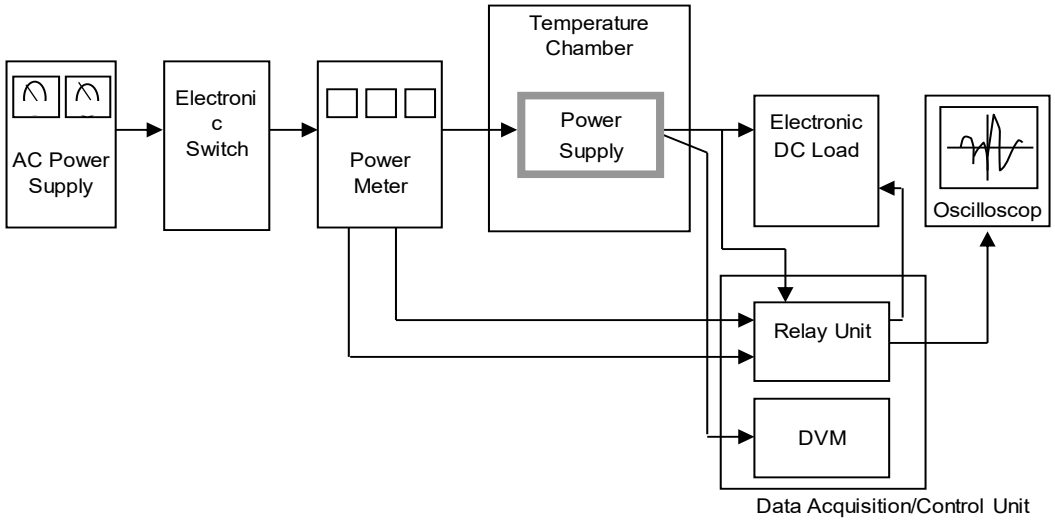
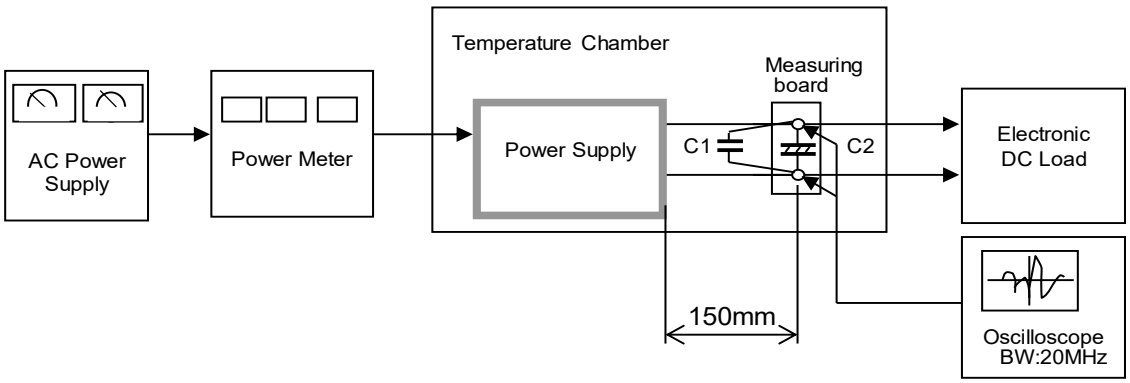


Figure A



C1= 0.1 μF
(Ceramic capacitor)

C2= 47 μF
(Electrolytic capacitor)

Figure B

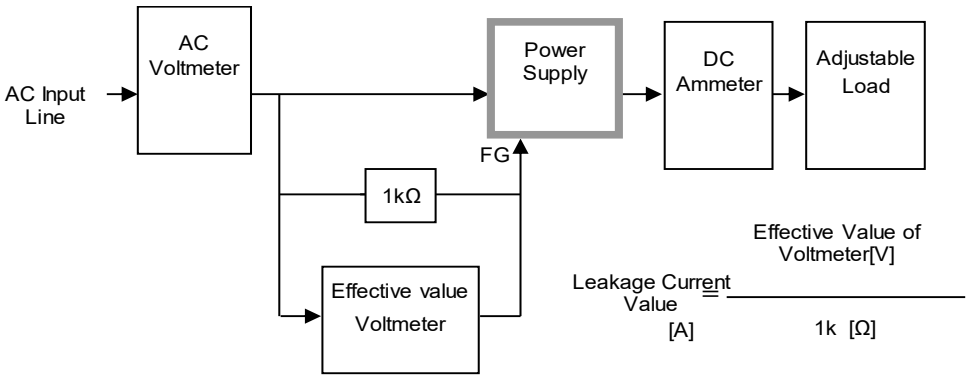


Figure C-1 (DEN-AN)

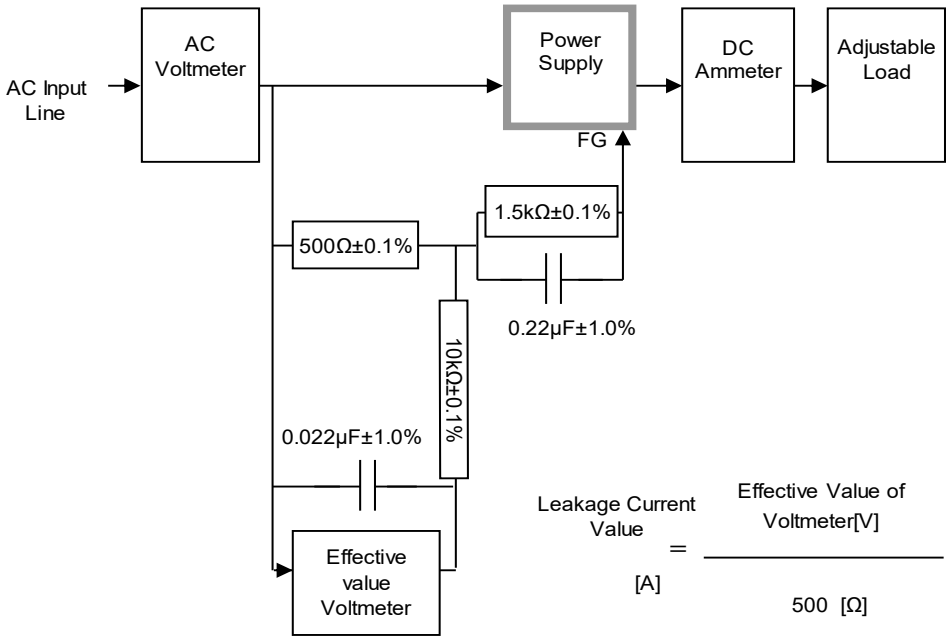


Figure C-2 (IEC62368-1 refer to IEC60990 Fig.4)

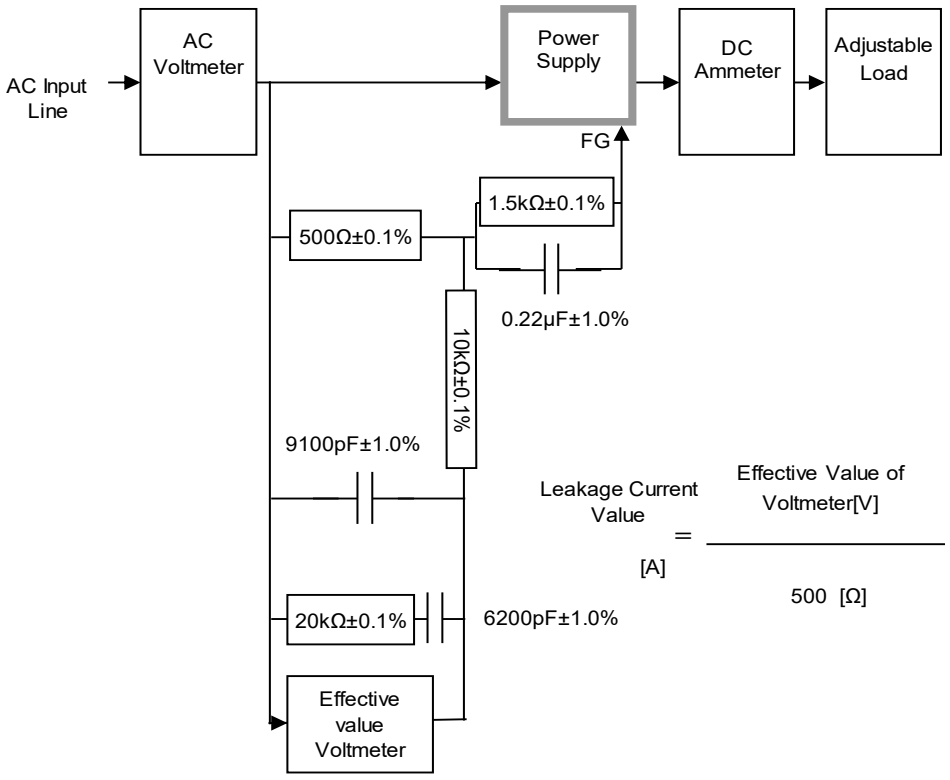


Figure C-3 (IEC62368-1 refer to IEC60990 Fig.5)